• DC/DC Converter •

Catalogue

ZimTec Electronics GmbH
Kirchstraße 5-6, 39606 Osterburg
Tel.: 03937 2925110 Fax: 03937 2925112
www.zimtec-electronics.de
info@zimtec-electronics.de

Über uns

ZimTec Electronics GmbH

„Wir“ - die Firma ZimTec Electronics GmbH sind ein junges und innovatives mittelständisches Elektronik-Unternehmen aus dem Herzen der Altmark in Sachsen-Anhalt.

Unser Service ist Ihr Vorteil, denn als Hersteller mit eigenem Direktvertrieb bieten wir Ihnen qualitativ hochwertige DC/DC und AC/DC Spannungswandler an.

Unser umfangreiches Sortiment umfasst DC/DC Spannungswandler in den Leistungsbereichen von 0,5 bis 40 Watt in den Bauformen SMD, SIP und DIP sowie AC/DC Spannungswandler und Schaltnetzteile von 1 bis 60 Watt.

Spannungswandler von ZimTec Electronics sind für höchste Ansprüche geschaffen und finden Ihren Einsatz in den Bereichen Steuerungselektronik, Medizin- und Bahntechnik und überall da, wo Qualität und Zuverlässigkeit benötigt werden!

Wir stehen Ihnen als zuverlässiger Partner bei Ihren Projekten und Neuentwicklungen zur Seite und unterstützen Sie auch gerne mit kostenlosen Mustern oder fertigen für Sie individuell angepasste Spannungswandler nach Ihren Vorgaben und Parametern an.

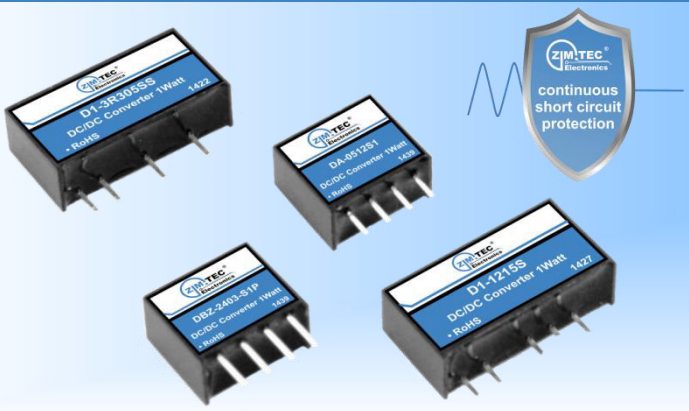
Scheuen Sie sich nicht, uns zu kontaktieren, unser Team steht Ihnen selbstverständlich bei Fragen zur Verfügung.

ZimTec Electronics GmbH
Kirchstraße 5-6
39606 Osterburg

www.zimtec-electronics.de
info@zimtec-electronics.de

Tel.: 03937 – 2925110
Fax: 03937 - 2925112

DC/DC Converter



- High isolation up to 6000 VDC
- Low ripple and noise
- Meet RoHS, CE, UL standard
- High operating temperature
- ± 5%, ± 10% input range
- Continuous short circuit protection

DC/DC FIXED INPUT, ISOLATION, UNREGULATED SERIES

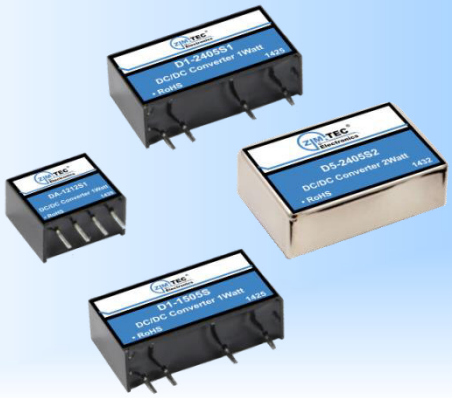
Product Series	Watt	Single/Dual	Input Voltage (VDC)	Output Voltage (VDC)	Isolation	Package Style / Note
DA	0.5W	Single	3.3, 5, 12, 15, 24, 48	3.3, 5, 7.2, 9, 12, 15, 18, 24	1KV - 3KV	4 Pin SIP / 8 Pin DIP Package, Efficiency up to 86%
	1W	Single Dual Separate				
	1.5W	Single				
DL	1W	Single/Dual	5, 9,12, 15, 24	3.3, 5, 9, 12, 15/ ±3.3, ±5, ±9, ±12, ±15	6KV	7 Pin SIP Package, Efficiency up to 81%
D1	0.5W	Single/Dual	3.3, 5, 12, 15, 24, 48	3.3, 5, 7.2, 9, 12, 15, 18, 24 / ±3.3, ±5, ±7.2, ±9, ±12, ±15, ±18, ±24	1KV - 6KV	7 Pin SIP / 14 Pin DIP Package, Efficiency up to 86%
	0.75W					
	1W					
DST1	1W	Single/Dual	5, 12, 24 (±10)	5, 12, 15 / ±5, ±12, ±15,	1.5KV - 3KV	7 Pin SIP Package, Continuous short circuit protection, Efficiency up to 81%, Operating temp.: -40°C ~ +105°C
DBZ	1W	Single	3.3, 5, 12, 15, 24 (±10)	3.3, 5, 9, 12, 15, 24	1.5KV	4 Pin SIP / 7 Pin DIP Package, Continuous short circuit protection, Efficiency up to 82%, Operating temp.: -40°C ~ +105°C
DFZ	1W	Single	3.3, 5, 9, 12, 15, 24 (±10)	3.3, 5, 9, 12, 15, 24	3KV	7 Pin SIP Package, Continuous short circuit protection, Efficiency up to 89%, Operating temp.: -40°C ~ +105°C
	2W					
DEZ	1W	Dual	3.3, 5, 9, 12, 15, 24 (±10)	±5, ±9, ±12, ±15, ±24	3KV	7 Pin SIP Package, Continuous short circuit protection, Efficiency up to 85%, Operating temp.: -40°C ~ +105°C
	2W					
DE	2W	Single	5, 12, 15, 24, 48	3.3, 5, 7.2, 9, 12, 15, 24	1KV - 3KV	4 Pin SIP Package, Efficiency up to 88%
D3	2W	Single/Dual	3.3, 5, 12, 24, 48	3.3, 5, 7.2, 9, 12, 15, 18, 24/ ±3.3, ±5, ±7.2, ±9, ±12, ±15, ±18, ±24	1KV - 6KV	7 Pin SIP / 14 Pin DIP Package, Efficiency up to 86%

DC/DC FIXED INPUT, ISOLATION, REGULATED SERIES

Product Series	Watt	Single/Dual	Input Voltage (VDC)	Output Voltage (VDC)	Isolation	Package Style / Note
D5	2W	Single/Dual	5, 12, 24	3.3, 5, 7.2, 9, 12, 15, 24/ ±3.3, ±5, ±7.2, ±9, ±12, ±15, ±24	1KV - 6KV	24 Pin DIP Package, Efficiency up to 81%
	3W					

ZimTec Electronics GmbH
Kirchstraße 5-6, 39606 Osterburg
Tel.: 03937 2925110
Fax: 03937 2925112
info@zimtec-electronics.de
www.zimtec-electronics.de

DC/DC Converter



- 2:1, 4:1 input range
- High isolation
- Meet RoHS, CE, UL standard
- High operating temperature
- ± 5%, ± 10% input range
- Remote control and output voltage

DC/DC WIDE INPUT, ISOLATION, REGULATED SERIES

Product Series	Watt	Single/Dual	Input Voltage (VDC)	Output Voltage (VDC)	Isolation	Package Style / Note
DB	1W 2W 3W	Single/Dual	4.5 -9, 9 - 18, 18 - 36, 36 -72	3.3, 5, 9, 12, 15, 24/ ±3.3, ±5, ±9, ±12, ±15, ±24	1KV - 3KV	2:1 Wide input range, Continuous short circuit protection, 8 Pin SIP / 16 Pin DIP Package, Efficiency up to 84%
DJ	1.5W 3W	Single/Dual	9 - 36, 18 -72	3.3, 5, 9, 12, 15, 24/ ±3.3, ±5, ±9, ±12, ±15, ±24	1.5KV - 3.5KV	4:1 Wide input range, Continuous short circuit protection, 24 Pin DIP Package, Efficiency up to 80%
DRD	1.5W 3W	Single/Dual	4.5 - 9, 9 - 18, 18 - 36, 36 - 72	5, 7.2, 9, 12, 15, 18, 24/ ±5, ±7.2, ±9, ±12, ±15, ±18, ±24	1.5KV - 3.5KV	2:1 Wide input range, Continuous short circuit protection, 24 Pin DIP Package, Efficiency up to 82%
DR6	1.5W	Single/Dual	4.5 - 9, 9 - 18, 18 - 36, 36 - 72	5, 7.2, 9, 12, 15, 18, 24/ ±5, ±7.2, ±9, ±12, ±15, ±18,±24	1.5KV - 3.5KV	2:1 Wide input range, Continuous short circuit protection, 24 Pin DIP Package, Efficiency up to 75%
DRK	1.5W	Single/Dual	9 - 36, 18 -72	5, 9, 12, 15, 24/ ±5, ±9, ±12, ±15, ±24	1.5KV - 3.5KV	4:1 Wide input range, Continuous short circuit protection, 24 Pin DIP Package, Efficiency up to 74%
D6	1.5W 2W 3W 4W 5W 6W	Single/Dual	9 - 18, 18 - 36, 36 -72	3.3, 5, 9, 12, 15, 24/ ±3.3, ±5, ±9, ±12, ±15, ±24	1.5KV - 3.5KV	2:1 Wide input range, Continuous short circuit protection, 24 Pin DIP Package, Efficiency up to 83%
DK	4W 5W	Single/Dual	9 - 36, 18 - 72	3.3, 5, 7.2, 9, 12, 15, 18, 24/ ±3.3, ±5, ±7.2, ±9, ±12, ±15, ±18, ±24	1.5KV - 3.5KV	4:1 Wide input range, Continuous short circuit protection, 24 Pin DIP Package, Efficiency up to 84%
DD	3W 5W 6W 8W	Single/Dual	9 - 18, 18 - 36, 36 - 72	3.3, 5, 9, 12, 15, 24/ ±3.3, ±5, ±9, ±12, ±15, ±24	1.5KV - 3.5KV	2:1 Wide input range, Continuous short circuit protection, 24 Pin DIP Package, Efficiency up to 85%
D7	7.5W 12W	Single/Dual	9 - 18, 18 - 36, 36 - 72	3.3, 5, 7.2, 9, 12, 15, 18, 24/ ±3.3, ±5, ±7.2, ±9, ±12, ±15, ±18, ±24	1.5KV - 3.5KV	2:1 Wide input range, Continuous short circuit protection, 5 Pin DIP Package, Efficiency up to 86%
D7W	10W 12W 15W	Single/Dual	9 - 36, 18 - 72	3.3, 5, 7.2, 9, 12, 15/ ±5, ±7.2, ±9, ±12, ±15	1.5KV	4:1 Wide Input Range, Continuous short circuit protection, 6 Pin DIP Package, Efficiency up to 86%

ZimTec Electronics GmbH
Kirchstraße 5-6, 39606 Osterburg
Tel.: 03937 2925110
Fax: 03937 2925112
info@zimtec-electronics.de
www.zimtec-electronics.de

DC/DC Converter

DC/DC WIDE INPUT, ISOLATION, REGULATED SERIES

Product Series	Watt	Single/Dual	Input Voltage (VDC)	Output Voltage (VDC)	Isolation	Package Style / Note
DU	12W	Single/Dual	9 - 18, 18 - 36, 36 - 75	2.5, 3.3, 5, 12, 15/ ±12, ±15	1.6KV	2:1 Wide input range, Continuous short circuit protection, 24 Pin DIP Package, Efficiency up to 91%
Z7	10	Single/Dual	9 - 36, 18 - 75	3.3, 5, 12, 15, 24/ ±5, ±12, ±15	1.5KV	4:1 Wide input range, Short circuit protection, 6 Pin DIP Package, Efficiency up to 90%
	15					
	20					
	30					
D7L	15W	Single/Dual	9 - 18, 18 - 36, 36 - 72	3.3, 5, 7.2, 9, 12, 15, 18, 24/ ±3.3, ±5, ±7.2, ±9, ±12, ±15, ±18, ±24	1.5KV	2:1 Wide input range, Continuous short circuit protection, 5 Pin DIP Package, Efficiency up to 88%
	20W					
	25W					
	30W					
D9	20W	Single/Dual	9 - 36, 18 - 75	3.3, 5, 12, 15/ ±5, ±12, ±15	1.6KV	4:1 Wide input range, Continuous short circuit protection, 6 Pin DIP Package, Efficiency up to 91%
DT	30W	Single/Dual	9 - 18, 18 - 36, 36 - 75	3.3, 5, 5.1, 12, 15/ ±5, ±12, ±15	1.6KV	2:1 Wide input range, Continuous short circuit protection, 6 Pin DIP Package, Efficiency up to 92%
	40W					
DM	25W	Single/Dual	9 - 18 , 18 - 36, 36 - 75	3.3 , 5, 12, 15/ ±12, ±15	1.5KV	2:1 Wide input range, Continuous short circuit protection, 7 Pin DIP Package, Efficiency up to 91%
	30W					
DM40A	40W	Single/Dual	9 - 36, 18 - 75	3.3, 5, 12, 15/ ±12, ±15	1.6KV	4:1 Wide input range, Continuous short circuit protection, 8 Pin DIP Package, Efficiency up to 92%

DC/DC WIDE INPUT, NON-ISOLATION, REGULATED SERIES

Product Series	Output Current	Single/Dual	Input Voltage (VDC)	Output Voltage (VDC)	Isolation	Package Style / Note
DR78M	500mA	Single	4.75 - 34	1.5, 1.8, 2.5, 3.3, 5, 6.5, 7.2, 9, 12, 15	non	3 Pin SIP Package, Continuous short circuit protection, Efficiency up to 97%
DKZ-78-500P	500mA	Single	4.75 - 32	1.5, 1.8, 2.5, 3.3, 5, 5.2, 6.5, 9, 12, 15	non	3 Pin SIP Package, Continuous short circuit protection, Efficiency up to 96%
DR78	1000mA	Single	4.75 - 18	1.5, 1.8, 2.5, 3.3, 5	non	3 Pin SIP Package, Continuous short circuit protection, Efficiency up to 94%
DKZ-78-1000 (L)	1000mA	Single	4.75 - 32	1.5, 1.8, 2.5, 3.3, 5, 6.5, 9, 12, 15	non	3 Pin SIP Package, Short circuit protection, Efficiency up to 97%
DKLZ-78-1000P	1000mA	Single	4.75 - 18	1.5, 1.8, 2.5, 3.3, 5	non	3 Pin SIP Package, Continuous short circuit protection, Efficiency up to 91%
DKZ-78-1500 (L)	1500mA	Single	4.75 - 18	1.5, 1.8, 2.5, 3.3, 5, 6.5	non	3 Pin SIP Package, Short circuit protection, Efficiency up to 95%
DKZ-78-2000 (L)	2000mA	Single	4.75 - 18	1.5, 1.8, 2.5, 3.3, 5, 6.5	non	3 Pin SIP Package, Short circuit protection, Efficiency up to 92%

ZimTec Electronics GmbH
Kirchstraße 5-6, 39606 Osterburg
Tel.: 03937 2925110
Fax: 03937 2925112
info@zimtec-electronics.de
www.zimtec-electronics.de

DC/DC Converter

- Ultra-Miniature SMD Package
- Continuous short circuit protection
- High isolation up to 3000 VDC
- Meet RoHS, CE, UL standard
- High operating temperature
- Industry standard pinout

DC/DC SMD PACKAGE, FIXED INPUT, ISOLATION, UNREGULATED SERIES

Product Series	Watt	Single/Dual	Input Voltage (VDC)	Output Voltage (VDC)	Isolation	Package Style / Note
DBZ_XTP2	0.25W	Single	5, 12 (±10%)	5, 12	1.5KV	SMD Package, Continuous short circuit protection, Efficiency up to 80%, Operating temp.: -40°C ~ +105°C
DAZ_XT1P	1W	Dual	3.3, 5, 12, 24 (±10%)	±5, ±9, ±12, ±15, ±24	1.5KV	SMD Package, Continuous short circuit protection, Efficiency up to 82%, Operating temp.: -40°C ~ +105°C
DBZ_XT1P	1W	Single	3.3, 5, 12, 15, 24 (±10%)	3.3, 5, 9, 12, 15, 24	1.5KV	SMD Package, Continuous short circuit protection, Efficiency up to 81%, Operating temp.: -40°C ~ +105°C
DEZ_XT1P	1W	Dual	5, 12, 24 (±10%)	±5, ±9, ±12, ±15, ±24	3KV	SMD Package, Continuous short circuit protection, Efficiency up to 82%, Operating temp.: -40°C ~ +105°C
DFZ_XT1P	1W	Single	3.3, 5, 12, 15, 24 (±10%)	3.3, 5, 9, 12, 15, 24	3KV	SMD Package, Continuous short circuit protection, Efficiency up to 81%, Operating temp.: -40°C ~ +105°C
DSA1-LF	1W	Single/Dual	3.3, 5, 12, 15, 24	3.3, 5, 9, 12, 15/ ±3.3, ±5, ±9, ±12, ±15	1KV - 3KV	SMD Package, Efficiency up to 83%
DBZ_XT2P	2W	Single	5, 12, 15, 24 (±10%)	3.3, 5, 9, 12, 15, 24	3KV	SMD Package, Continuous short circuit protection, Efficiency up to 86%, Operating temp.: -40°C ~ +105°C
DFZ_XT2P	2W	Single	5, 12, 15, 24 (±10%)	3.3, 5, 9, 12, 15, 24	3KV	SMD Package, Continuous short circuit protection, Efficiency up to 86%, Operating temp.: -40°C ~ +105°C

DC/DC SMD PACKAGE, WIDE INPUT, ISOLATION, REGULATED SERIES

Product Series	Watt	Single/Dual	Input Voltage (VDC)	Output Voltage (VDC)	Isolation	Package Style / Note
Z9Y_MT3P	3W	Single	9 - 18, 18 - 36, 36 -75	3.3, 5, 12, 15,24	1.5KV	2:1 Wide input range, SMD Package, Efficiency up to 83%
Z9K_MT3P	3W	Single	9 - 18, 18 - 36, 36 -75	3.3, 5, 12, 15,24	3KV	2:1 Wide input range, SMD Package, Efficiency up to 83%

ZimTec Electronics GmbH
Kirchstraße 5-6, 39606 Osterburg
Tel.: 03937 2925110
Fax: 03937 2925112
info@zimtec-electronics.de
www.zimtec-electronics.de

Contents

DA-0.5W Series

0.5W Unregulated Single output

Features

- 4 Pin SIL / 8 Pin DIL Package
- 1000 VDC Isolation
- Up to 3000 VDC Isolation
- Low Ripple and Noise
- Efficiency up to 83%
- -40 ~ 85°C Operation Temperature Range
- Non-Conductive Black Plastic Case
- EMI Complies With EN55022 Class B

PART NUMBER STRUCTURE

DA - 12 05 S H

- **Series Name**
- **Input Voltage**: **3R3** - 3.3V, **05** - 5V, **12** - 12V, **15** - 15V, **24** - 24V, **48** - 48V(for SIP)
- **Output Voltage**: **3R3** - 3.3V, **05** - 5V, **7R2** - 7.2V, **09** - 9V, **12** - 12V, **15** - 15V, **18** - 18V, **24** - 24V
- **Case Type**: **S** - SIP Case, **D** - DIP Case
- **3KVDC Isolation**: Optional, if no suffix "H" mean 1 KVDC Isolation

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage accuracy	±3%
Line regulation	±1.2% / Per 1% Vin Change
Load regulation	(From 20% to 100% Load) ±10% (Output 3.3V Model) ±20%
Ripple & noise (20 MHz bandwidth)(1)	100mV pk-pk
Temperature coefficient	±0.02%/°C
Capacitor load (2)	See table

INPUT SPECIFICATIONS

Voltage Range	±10%
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	Capacitors
Input Reflected Ripple Current (3)	20mA pk-pk

GENERAL SPECIFICATIONS

Efficiency	See table
I/O Isolation V oltage (3 sec) Input/Output	1000~3000Vdc
I/O Isolation Capacitance	60 pF Typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	Variable 80kHz
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1.121Mhrs
Safety Standard : (designed to meet)	IEC 60950-1

ENVIRONMENT SPECIFICATIONS

Operating Temperature	-40 °C~85 °C(See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

PHYSICAL SPECIFICATIONS

Case Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	
SIP Case	0.5mm Alloy42 Solder-coated
DIP Case	0.5mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	(SIP/1.5g) (DIP/1.8g)
Dimensions	SIP Case 0.46"x0.24"x0.40" DIP Case 0.50"x0.40"x0.27"

ABSOLUTE MAXIMUM RATINGS(4)

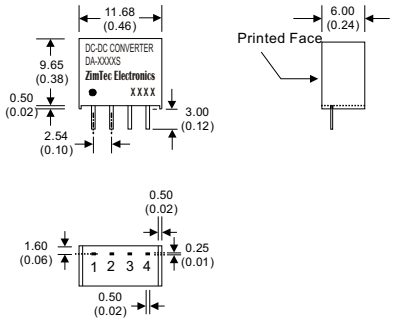
These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge Voltage(100mS)	
3.3 Models	6 Vdc ,max.
5 Models	7 Vdc ,max.
12 Models	15 Vdc ,max.
15 Models	18 Vdc ,max.
24 Models	28 Vdc ,max.
48 Models(for SIP)	54 Vdc ,max.
Soldering Temperature (1.5mm from case 10 sec. max.)	260 °C ,max.

EMC SPECIFICATIONS

Radiated Emissions	EN55022	CLASS B
Conducted Emissions (6)	EN55022	CLASS B
ESD	IEC 61000-4-2	Perf. Criteria A
RS	IEC 61000-4-3	Perf. Criteria A
EFT (7)	IEC 61000-4-4	Perf. Criteria A
Surge (7)	IEC 61000-4-5	Perf. Criteria A
CS	IEC 61000-4-6	Perf. Criteria A
PFMF	IEC 61000-4-8	Perf. Criteria A

MECHANICAL SPECIFICATIONS



* The thickness of 48V input voltage model is 7.50(0.29)

4 Pin SIL Package

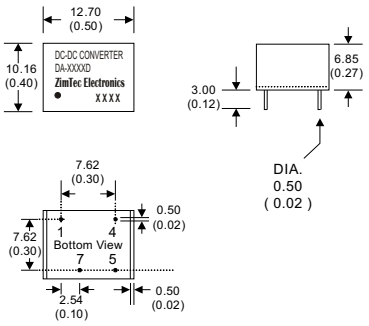
Notes : All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5±0.05 (0.02±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS	
PIN NUMBER	SINGLE
1	−V Input
2	+V Input
3	−V Output
4	+V Output

(The Pin Connection of high isolation one is the same with normal one.)

DA - 0.5W Unregulated Single output

MECHANICAL SPECIFICATIONS



8 Pin DIL Package

Notes : All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5±0.05 (0.02±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS	
PIN NUMBER	SINGLE
1	−V Input
4	+V Input
5	+V Output
7	−V Output

(The Pin Connection of high isolation one is the same with normal one.)

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
DA-3R33R3S	3.3	20	205	3.3	152	76	100
DA-3R305S	3.3	25	216	5	100	70	100
DA-3R37R2S	3.3	25	216	7.2	69	70	100
DA-3R309S	3.3	25	216	9	56	70	100
DA-3R312S	3.3	25	201	12	42	72	100
DA-3R315S	3.3	25	208	15	33	73	100
DA-3R318S	3.3	25	208	18	28	73	100
DA-3R324S	3.3	25	208	24	21	73	100
DA-053R3S	5	20	132	3.3	152	76	100
DA-0505S	5	13	121	5	100	83	100
DA-057R2S	5	15	134	7.2	69	75	100
DA-0509S	5	15	128	9	56	78	100
DA-0512S	5	18	127	12	42	79	100
DA-0515S	5	22	130	15	33	77	100
DA-0518S	5	20	127	18	28	79	100
DA-0524S	5	25	134	24	21	75	100
DA-123R3S	12	15	58	3.3	152	72	100
DA-1205S	12	10	54	9	100	78	100
DA-127R2S	12	15	57	7.2	69	73	100
DA-1209S	12	15	57	9	56	73	100
DA-1212S	12	20	58	12	42	72	100
DA-1215S	12	20	61	15	33	69	100
DA-1218S	12	15	61	18	28	68	100
DA-1224S	12	15	59	24	21	71	100
DA-153R3S	15	10	44	3.3	152	75	100
DA-1505S	15	8	43	5	100	78	100
DA-157R2S	15	12	44	7.2	69	75	100
DA-1509S	15	12	44	9	56	75	100
DA-1512S	15	10	44	12	42	77	100
DA-1515S	15	15	48	15	33	70	100
DA-1518S	15	12	51	18	28	66	100
DA-1524S	15	10	51	24	21	66	100
DA-243R3S	24	8	31	3.3	152	69	100
DA-2405S	24	8	29	5	100	73	100
DA-247R2S	24	10	30	7.2	69	70	100
DA-2409S	24	10	30	9	56	71	100
DA-2412S	24	8	30	12	42	71	100
DA-2415S	24	10	29	15	33	73	100
DA-2418S	24	10	29	18	28	73	100
DA-2424S	24	10	29	24	21	72	100

Suffix “H” means 3 KVdc isolation

DA - 0.5W Unregulated Single output

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
DA-483R3S	48	6	17	3.3	152	60	100
DA-4805S	48	6	16	5	100	66	100
DA-487R2S	48	6	17	7.2	69	60	100
DA-4809S	48	6	17	9	56	62	100
DA-4812S	48	6	17	12	42	64	100
DA-4815S	48	6	17	15	33	62	100
DA-4818S	48	6	17	18	28	62	100
DA-4824S	48	10	18	24	21	61	100
DA-3R33R3D	3.3	20	205	3.3	152	76	100
DA-3R305D	3.3	25	216	5	100	70	100
DA-3R37R2D	3.3	25	216	7.2	69	70	100
DA-3R309D	3.3	25	216	9	56	70	100
DA-3R312D	3.3	25	201	12	42	72	100
DA-3R315D	3.3	25	208	15	33	73	100
DA-3R318D	3.3	25	208	18	28	73	100
DA-3R324D	3.3	25	208	24	21	73	100
DA-053R3D	5	16	132	3.3	152	76	100
DA-0505D	5	15	124	5	100	81	100
DA-057R2D	5	15	134	7.2	69	75	100
DA-0509D	5	15	128	9	56	78	100
DA-0512D	5	18	127	12	42	79	100
DA-0515D	5	22	130	15	33	77	100
DA-0518D	5	20	127	18	28	79	100
DA-0524D	5	25	134	24	21	75	100
DA-123R3D	12	15	58	3.3	152	73	100
DA-1205D	12	12	54	5	100	78	100
DA-127R2D	12	15	57	7.2	69	73	100
DA-1209D	12	15	58	9	56	73	100
DA-1212D	12	20	58	12	42	72	100
DA-1215D	12	20	61	15	33	69	100
DA-1218D	12	15	61	18	28	68	100
DA-1224D	12	15	59	24	21	71	100
DA-153R3D	15	10	44	3.3	152	75	100
DA-1505D	15	8	43	5	100	78	100
DA-157R2D	15	12	44	7.2	69	75	100
DA-1509D	15	12	44	9	56	75	100
DA-1512D	15	10	44	12	42	77	100
DA-1515D	15	15	48	15	33	70	100
DA-1518D	15	12	51	18	28	66	100
DA-1524D	15	10	51	24	21	66	100
DA-243R3D	24	8	31	3.3	152	69	100
DA-2405D	24	10	29	5	100	74	100
DA-247R2D	24	10	31	7.2	69	69	100
DA-2409D	24	10	30	9	56	71	100
DA-2412D	24	10	31	12	42	69	100
DA-2415D	24	9	31	15	33	69	100
DA-2418D	24	10	29	18	28	73	100
DA-2424D	24	10	29	24	21	72	100

Suffix “H” means 3 KVdc isolation

DA-1W Series

1W Unregulated Single output

Features

- 4 Pin SIL / 8 Pin DIL Package
- 1000 VDC Isolation
- Up to 3000 VDC Isolation
- Low Ripple and Noise
- Efficiency up to 83%
- -40 ~ 85°C Operation Temperature Range
- Non-Conductive Black Plastic Case
- EMI Complies With EN55022 Class B

PART NUMBER STRUCTURE

DA - 12 05 S 1 H

- **Series Name**
- **Input Voltage**: **3R3** - 3.3V, **05** - 5V, **12** - 12V, **15** - 15V, **24** - 24V, **48** - 48V(for SIP)
- **Output Voltage**: **3R3** - 3.3V, **05** - 5V, **7R2** - 7.2V, **09** - 9V, **12** - 12V, **15** - 15V, **18** - 18V, **24** - 24V
- **Case Type**: **S** - SIP Case, **D** - DIP Case
- **1W**
- **3KVDC Isolation**: Optional, if no suffix "H" mean 1 KVDC Isolation

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage accuracy	±3%
Line regulation	± 1.2% / Per 1% Vin Change
Load regulation	(From 20% to 100% Load) ±10% (Output 3.3V Model) ±20%
Ripple & noise (20 MHz bandwidth)(1)	100mV pk-pk
Temperature coefficient	±0.02%/°C
Capacitor load(2)	See table

INPUT SPECIFICATIONS

Voltage Range	±10%
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	Capacitors
Input Reflected Ripple Current (3)	20mA pk-pk

ENVIRONMENT SPECIFICATIONS

Operating Temperature	-40 °C~85 °C(See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

GENERAL SPECIFICATIONS

Efficiency	See table
I/O Isolation V oltage (3 sec)	
Input/Output	1000~3000Vdc
I/O Isolation Capacitance	60 pF Typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	Variable 80kHz
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1.121Mhrs
Safety Standard : (designed to meet)	IEC 60950-1

PHYSICAL SPECIFICATIONS

Case Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	
SIP Case	0.5mm Alloy42 Solder-coated
DIP Case	0.5mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	(SIP/1.5g) (DIP/1.8g)
Dimensions	SIP Case 0.46"x0.24"x0.40"
	DIP Case 0.50"x0.40"x0.27"

ABSOLUTE MAXIMUM RATINGS (4)

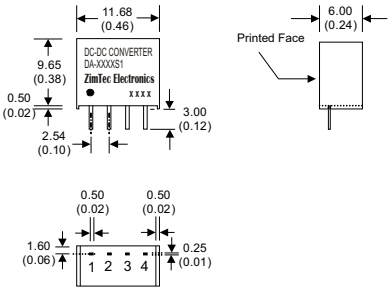
These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge V oltage (100mS)	
3.3 Models	6 Vdc ,max.
5 Models	7 Vdc ,max.
12 Models	15 Vdc ,max.
15 Models	18 Vdc ,max.
24 Models	28 Vdc ,max.
48 Models(for SIP)	54 Vdc ,max.
Soldering Temperature (1.5mm from case 10 sec. max.)	260°C ,max.

EMC SPECIFICATIONS

Radiated Emissions	EN55022	CLASS B
Conducted Emissions (6)	EN55022	CLASS B
ESD	IEC 61000-4-2	Perf. Criteria A
RS	IEC 61000-4-3	Perf. Criteria A
EFT (7)	IEC 61000-4-4	Perf. Criteria A
Surge (7)	IEC 61000-4-5	Perf. Criteria A
CS	IEC 61000-4-6	Perf. Criteria A
PFMF	IEC 61000-4-8	Perf. Criteria A

MECHANICAL SPECIFICATIONS



* The thickness of 48V input voltage model is 7.50(0.29)

4 Pin SIL Package

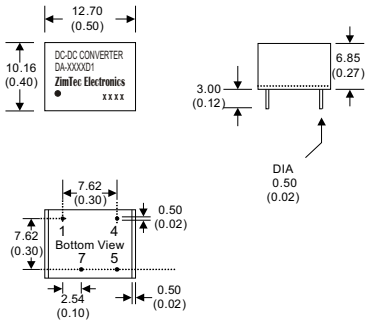
Notes : All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5±0.05 (0.02±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS	
PIN NUMBER	SINGLE
1	−V Input
2	+V Input
3	−V Output
4	+V Output

(The Pin Connection of high isolation one is the same with normal one.)

DA - 1W Unregulated Single output

MECHANICAL SPECIFICATIONS



8 Pin DIL Package

Notes : All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5±0.05 (0.02±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS	
PIN NUMBER	SINGLE
1	−V Input
4	+V Input
5	+V Output
7	−V Output

(The Pin Connection of high isolation one is the same with normal one.)

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
DA-3R33R3S1	3.3	25	421	3.3	303	72	220
DA-3R305S1	3.3	25	394	5	200	77	220
DA-3R37R2S1	3.3	25	384	7.2	139	79	220
DA-3R309S1	3.3	30	404	9	111	75	220
DA-3R312S1	3.3	45	473	12	100	77	220
DA-3R315S1	3.3	35	384	15	67	79	220
DA-3R318S1	3.3	35	399	18	56	76	220
DA-3R324S1	3.3	53	461	24	50	79	220
DA-053R3S1	5	20	257	3.3	303	78	220
DA-0505S1	5	25	247	5	200	81	220
DA-057R2S1	5	16	241	7.2	139	83	220
DA-0509S1	5	26	250	9	111	80	220
DA-0512S1	5	25	300	12	100	80	220
DA-0515S1	5	35	244	15	67	82	220
DA-0518S1	5	25	247	18	56	81	220
DA-0524S1	5	35	289	24	50	83	220
DA-123R3S1	12	15	107	3.3	303	78	220
DA-1205S1	12	16	105	5	200	79	220
DA-127R2S1	12	16	100	7.2	139	83	220
DA-1209S1	12	15	107	9	111	78	220
DA-1212S1	12	15	125	12	100	80	220
DA-1215S1	12	15	105	15	67	79	220
DA-1218S1	12	20	104	18	56	80	220
DA-1224S1	12	25	123	24	50	81	220
DA-153R3S1	15	15	89	3.3	303	75	220
DA-1505S1	15	9	82	5	200	81	220
DA-157R2S1	15	12	88	7.2	139	76	220
DA-1509S1	15	10	90	9	111	74	220
DA-1512S1	15	13	100	12	100	80	220
DA-1515S1	15	15	84	15	67	79	220
DA-1518S1	15	12	85	18	56	78	220
DA-1524S1	15	10	99	24	50	81	220
DA-243R3S1	24	8	54	3.3	303	77	220
DA-2405S1	24	8	52	5	200	80	220
DA-247R2S1	24	10	54	7.2	139	77	220
DA-2409S1	24	7	54	9	111	77	220
DA-2412S1	24	8	62	12	100	80	220
DA-2415S1	24	8	51	15	67	81	220
DA-2418S1	24	8	52	18	56	80	220
DA-2424S1	24	9	60	24	50	83	220

Suffix “H” means 3 KVdc isolation

DA - 1W Unregulated Single output

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
DA-483R3S1	48	6	29	3.3	303	73	220
DA-4805S1	48	6	28	5	200	74	220
DA-487R2S1	48	7	27	7.2	139	77	220
DA-4809S1	48	5	27	9	111	78	220
DA-4812S1	48	5	32	12	100	77	220
DA-4815S1	48	5	27	15	67	76	220
DA-4818S1	48	8	28	18	56	75	220
DA-4824S1	48	8	31	24	50	80	220
DA-3R33R3D1	3.3	25	410	3.3	303	74	220
DA-3R305D1	3.3	25	394	5	200	77	220
DA-3R37R2D1	3.3	30	404	7.2	139	75	220
DA-3R309D1	3.3	30	399	9	111	76	220
DA-3R312D1	3.3	45	485	12	100	75	220
DA-3R315D1	3.3	25	384	15	67	79	220
DA-3R318S1	3.3	35	399	18	56	76	220
DA-3R324D1	3.3	90	485	24	50	75	220
DA-053R3D1	5	16	256	3.3	303	78	220
DA-0505D1	5	15	253	5	200	79	220
DA-057R2D1	5	16	241	7.2	139	83	220
DA-0509D1	5	25	253	9	111	79	220
DA-0512D1	5	25	296	12	100	81	220
DA-0515D1	5	25	244	15	67	82	220
DA-0518D1	5	25	241	18	56	83	220
DA-0524D1	5	28	293	24	50	82	220
DA-123R3D1	12	15	108	3.3	303	77	220
DA-1205D1	12	16	105	5	200	79	220
DA-127R2D1	12	16	100	7.2	139	83	220
DA-1209D1	12	15	105	9	111	79	220
DA-1212D1	12	8	125	12	100	80	220
DA-1215D1	12	17	105	15	67	79	220
DA-1218D1	12	15	103	18	56	81	220
DA-1224D1	12	25	127	24	50	79	220
DA-153R3D1	15	15	89	3.3	303	75	220
DA-1505D1	15	10	83	5	200	80	220
DA-157R2D1	15	12	88	7.2	139	76	220
DA-1509D1	15	10	85	9	111	78	220
DA-1512D1	15	13	98	12	100	82	220
DA-1515D1	15	15	83	15	67	80	220
DA-1518D1	15	12	85	18	56	78	220
DA-1524D1	15	10	99	24	50	81	220
DA-243R3D1	24	8	53	3.3	303	79	220
DA-2405D1	24	8	53	5	200	79	220
DA-247R2D1	24	10	56	7.2	139	74	220
DA-2409D1	24	7	53	9	111	79	220
DA-2412D1	24	8	63	12	100	80	220
DA-2415D1	24	8	52	15	67	80	220
DA-2418D1	24	8	51	18	56	82	220
DA-2424D1	24	9	61	24	50	82	220

Suffix “H” means 3 KVdc isolation

DA-D01 Series

1W Unregulated Dual Separate output

Features

- 8 Pin DIL Package
- 1000 VDC Isolation
- Up to 3000 VDC Isolation
- Low Ripple and Noise
- Efficiency up to 83%
- -40 ~ 85°C Operation Temperature Range
- Non-Conductive Black Plastic Case
- EMI Complies With EN55022 Class B

PART NUMBER STRUCTURE

DA - 12 05 D01 H

- **Series Name**
- **Input Voltage**: **3R3** - 3.3V; **5** - 5V; **12** - 12V; **15** - 15V; **24** - 24V
- **Dual Separate Output Voltage(1W)**: **3R3** - 3.3V ,3.3V; **5** - 5V , 5V; **7R2** - 7.2V , 7.2V; **9** - 9V , 9V; **12** - 12V , 12V; **15** - 15V , 15V; **18** - 18V , 18V; **24** - 24V , 24V
- **Case Type**: **D** - DIP Case
- **3KVdc Isolation**: Optional, if no suffix "H" mean 1 KVdc Isolation

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage accuracy	±3%
Line regulation	±1.2% / Per 1% Vin Change
Load regulation	(From 20% to 100% Load) ±10% (Output 3.3V Model) ±15%
Ripple & noise (20 MHz bandwidth)(1)	100mV pk-pk
Temperature coefficient	±0.02%/°C
Capacitor load(2)	See table

INPUT SPECIFICATIONS

Voltage Range	±10%
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	Capacitors
Input Reflected Ripple Current (3)	20mA pk-pk

PHYSICAL SPECIFICATIONS

Case Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	¨ 0.5mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	1.8g
Dimensions	0.50"x0.40"x0.27"

ENVIRONMENT SPECIFICATIONS

Operating Temperature	-40 °C~85 °C(See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

GENERAL SPECIFICATIONS

Efficiency	See table
I/O Isolation V oltage (3 sec)	
Input/Output1&Output2	1000~3000Vdc
Output1/Output2	1000Vdc
I/O Isolation Capacitance	60 pF Typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	Variable 80kHz
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1.121 Mhrs
Safety Standard : (designed to meet)	IEC 60950-1

ABSOLUTE MAXIMUM RATINGS(4)

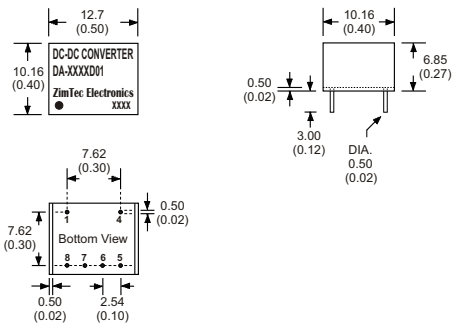
These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge Voltage(100mS)	
3.3 Models	5 Vdc ,max.
5 Models	7 Vdc ,max.
12 Models	15 Vdc ,max.
15 Models	18 Vdc ,max.
24 Models	28 Vdc ,max.
Soldering Temperature (1.5mm from case 10 sec. max.)	260 °C ,max.

EMC SPECIFICATIONS

Radiated Emissions	EN55022	CLASS B
Conducted Emissions (6)	EN55022	CLASS B
ESD	IEC 61000-4-2	Perf. Criteria A
RS	IEC 61000-4-3	Perf. Criteria A
EFT (7)	IEC 61000-4-4	Perf. Criteria A
Surge (7)	IEC 61000-4-5	Perf. Criteria A
CS	IEC 61000-4-6	Perf. Criteria A
PFMF	IEC 61000-4-8	Perf. Criteria A

MECHANICAL SPECIFICATIONS



8 Pin DIL Package

Notes : All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5±0.05 (0.02±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

(The Pin Connection of high isolation one is the same with normal one.)

PIN CONNECTIONS	
PIN NUMBER	Dual Separate
1	−V Input
4	+V Input
5	+V1 Output
6	−V1 Output
7	+V2 Output
8	−V2 Output

DA - 1W Unregulated Dual Separate output

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
DA-3R33R3D01	3.3	20	399	3.3 , 3.3	152 , 152	76	100
DA-3R305D01	3.3	25	433	5 , 5	100 , 100	70	100
DA-3R37R2D01	3.3	25	433	7.2 , 7.2	69 , 69	70	100
DA-3R309D01	3.3	30	410	9 , 9	56 , 56	74	100
DA-3R312D01	3.3	38	478	12 , 12	50 , 50	76	100
DA-3R315D01	3.3	30	404	15 , 15	33 , 33	75	100
DA-3R318D01	3.3	30	399	18 , 18	28 , 28	76	100
DA-3R324D01	3.3	30	472	24 , 24	25 , 25	77	100
DA-053R3D01	5	15	299	3.3 , 3.3	152 , 152	67	100
DA-0505D01	5	20	247	5 , 5	100 , 100	81	100
DA-057R2D01	5	16	260	7.2 , 7.2	69 , 69	77	100
DA-0509D01	5	15	253	9 , 9	56 , 56	79	100
DA-0512D01	5	20	300	12 , 12	50 , 50	80	100
DA-0515D01	5	20	247	15 , 15	33 , 33	81	100
DA-0518D01	5	20	247	18 , 18	28 , 28	81	100
DA-0524D01	5	25	320	24 , 24	25 , 25	75	100
DA-123R3D01	12	15	111	3.3 , 3.3	152 , 152	75	100
DA-1205D01	12	10	111	5 , 5	100 , 100	75	100
DA-127R2D01	12	10	107	7.2 , 7.2	69 , 69	78	100
DA-1209D01	12	10	105	9 , 9	56 , 56	79	100
DA-1212D01	12	15	125	12 , 12	50 , 50	80	100
DA-1215D01	12	13	104	15 , 15	33 , 33	80	100
DA-1218D01	12	20	107	18 , 18	28 , 28	78	100
DA-1224D01	12	20	128	24 , 24	25 , 25	78	100
DA-153R3D01	15	20	89	3.3 , 3.3	152 , 152	75	100
DA-1505D01	15	20	88	5 , 5	100 , 100	76	100
DA-157R2D01	15	20	88	7.2 , 7.2	69 , 69	76	100
DA-1509D01	15	15	88	9 , 9	56 , 56	76	100
DA-1512D01	15	15	107	12 , 12	50 , 50	75	100
DA-1515D01	15	15	89	15 , 15	33 , 33	75	100
DA-1518D01	15	20	87	18 , 18	28 , 28	77	100
DA-1524D01	15	20	104	24 , 24	25 , 25	77	100
DA-243R3D01	24	5	53	3.3 , 3.3	152 , 152	79	100
DA-2405D01	24	8	50	5 , 5	100 , 100	83	100
DA-247R2D01	24	5	53	7.2 , 7.2	69 , 69	78	100
DA-2409D01	24	8	54	9 , 9	56 , 56	77	100
DA-2412D01	24	6	63	12 , 12	50 , 50	80	100
DA-2415D01	24	6	54	15 , 15	33 , 33	77	100
DA-2418D01	24	13	56	18 , 18	28 , 28	74	100
DA-2424D01	24	5	65	24 , 24	25 , 25	77	100

Suffix “H” means 3 KVdc isolation

DA-1.5W Series

1.5W Unregulated Single output

Features

- 4 Pin SIL / 8 Pin DIL Package
- 1000 VDC Isolation
- Up to 3000 VDC Isolation
- Low Ripple and Noise
- Efficiency up to 88%
- -40 ~ 85°C Operation Temperature Range
- Non-Conductive Black Plastic Case

PART NUMBER STRUCTURE

DA - 12 05 S 1.5 H

- **Series Name**
- **Input Voltage**: **05** - 5V, **12** - 12V, **24** - 24V, **48** - 48V(for SIP)
- **Output Voltage**: **3R3** - 3.3V, **05** - 5V, **7R2** - 7.2V, **09** - 9V, **12** - 12V, **15** - 15V, **18** - 18V, **24** - 24V
- **Case Type**: **S** - SIP Case, **D** - DIP Case
- 1.5Watt
- **3KVdc Isolation** Optional, if no suffix "H" mean 1 KVdc Isolation

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage accuracy	±3%
Line regulation	± 1.2% / Per 1% Vin Change
Load regulation	(From 20% to 100% Load) ±10%
	(Output 3.3V Model) ±20%
Ripple & noise (20 MHz bandwidth)(1)	100mV pk-pk
Temperature coefficient	±0.02%/°C
Capacitor load(2)	See table

INPUT SPECIFICATIONS

Voltage Range	±10%
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	Capacitors
Input Reflected Ripple Current (3)	20mA pk-pk

ABSOLUTE MAXIMUM RATINGS(4)

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge Voltage(100mS)	7 Vdc ,max.
5 Models	15 Vdc ,max.
12 Models	28 Vdc ,max.
24 Models	54 Vdc ,max.
48 Models(for SIP)	260 °C ,max.
Soldering Temperature (1.5mm from case 10 sec. max.)	

PHYSICAL SPECIFICATIONS

Case Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	
SIP Case	0.5mm Alloy42 Solder-coated
DIP Case	¨ 0.5mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	(SIP/1.5g) (DIP/1.8g)
Dimensions	SIP Case 0.46"x0.24"x0.40"
	DIP Case 0.50"x0.40"x0.27"

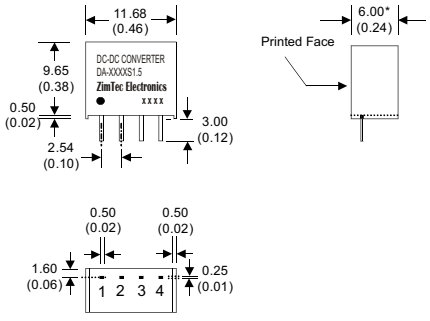
ENVIRONMENT SPECIFICATIONS

Operating Temperature	-40 °C~85 °C(See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

GENERAL SPECIFICATIONS

Efficiency	See table
I/O Isolation V oltage (3 sec)	
Input/Output	1000~3000Vdc
I/O Isolation Capacitance	60 pF Typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	Variable 80kHz
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1.121Mhrs
Safety Standard : (designed to meet)	IEC 60950-1

MECHANICAL SPECIFICATIONS



* The thickness of 48V input voltage model is 7.50(0.29)

4 Pin SIL Package

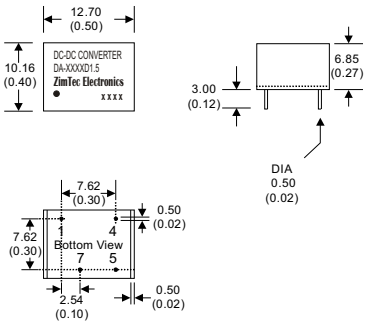
Notes : All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5±0.05 (0.02±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS	
PIN NUMBER	SINGLE
1	−V Input
2	+V Input
3	−V Output
4	+V Output

(The Pin Connection of high isolation one is the same with normal one.)

DA - 1.5W Unregulated Single output

MECHANICAL SPECIFICATIONS



8 Pin DIL Package

Notes : All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5±0.05 (0.02±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS	
PIN NUMBER	SINGLE
1	−V Input
4	+V Input
5	+V Output
7	−V Output

（The Pin Connection of high isolation one is the same with normal one.）

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
DA-053R3S1.5	5	30	370	3.3	400	81	220
DA-0505S1.5	5	30	380	5	300	79	220
DA-057R2S1.5	5	35	366	7.2	208	82	220
DA-0509S1.5	5	25	400	9	166	75	220
DA-0512S1.5	5	25	385	12	125	78	220
DA-0515S1.5	5	30	375	15	100	80	220
DA-0518S1.5	5	30	353	18	83	85	220
DA-0524S1.5	5	35	357	24	63	84	220
DA-123R3S1.5	12	15	167	3.3	400	75	220
DA-1205S1.5	12	25	156	5	300	80	220
DA-127R2S1.5	12	25	167	7.2	208	75	220
DA-1209S1.5	12	20	151	9	166	83	220
DA-1212S1.5	12	15	152	12	125	82	220
DA-1215S1.5	12	15	156	15	100	80	220
DA-1218S1.5	12	15	156	18	83	80	220
DA-1224S1.5	12	15	164	24	63	76	220
DA-243R3S1.5	24	15	83	3.3	400	75	220
DA-2405S1.5	24	15	76	5	300	82	220
DA-247R2S1.5	24	10	78	7.2	208	80	220
DA-2409S1.5	24	10	78	9	167	80	220
DA-2412S1.5	24	15	74	12	125	84	220
DA-2415S1.5	24	10	74	15	100	84	220
DA-2418S1.5	24	10	78	18	83	80	220
DA-2424S1.5	24	8	71	24	63	88	220
DA-483R3S1.5	48	10	42	3.3	400	75	220
DA-4805S1.5	48	10	42	5	300	75	220
DA-487R2S1.5	48	8	41	7.2	208	76	220
DA-4809S1.5	48	8	41	9	167	76	220
DA-4812S1.5	48	6	41	12	125	77	220
DA-4815S1.5	48	6	41	15	100	77	220
DA-4818S1.5	48	6	41	18	83	77	220
DA-4824S1.5	48	6	40	24	63	78	220

Suffix “H” means 3 KVdc isolation

DA - 1.5W Unregulated Single output

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
DA-053R3D1.5	5	35	390	3.3	400	77	220
DA-0505D1.5	5	30	385	5	300	78	220
DA-057R2D1.5	5	30	400	7.2	208	75	220
DA-0509D1.5	5	25	400	9	167	75	220
DA-0512D1.5	5	25	370	12	125	81	220
DA-0515D1.5	5	25	366	15	100	82	220
DA-0518D1.5	5	25	375	18	83	80	220
DA-0524D1.5	5	30	361	24	63	83	220
DA-123R3D1.5	12	15	170	3.3	400	74	220
DA-1205D1.5	12	15	154	5	300	81	220
DA-127R2D1.5	12	25	164	7.2	208	76	220
DA-1209D1.5	12	15	149	9	167	84	220
DA-1212D1.5	12	15	156	12	125	80	220
DA-1215D1.5	12	15	156	15	100	80	220
DA-1218D1.5	12	15	156	18	83	80	220
DA-1224D1.5	12	15	164	24	63	76	220
DA-243R3D1.5	24	10	83	3.3	400	75	220
DA-2405D1.5	24	9	76	5	300	82	220
DA-247R2D1.5	24	10	75	7.2	208	83	220
DA-2409D1.5	24	10	74	9	167	85	220
DA-2412D1.5	24	10	78	12	125	80	220
D-2415D1.5	24	8	76	15	100	82	220
DA-2418D1.5	24	8	78	18	83	80	220
DA-2424D1.5	24	9	76	24	63	82	220

Suffix “H” means 3 KVdc isolation

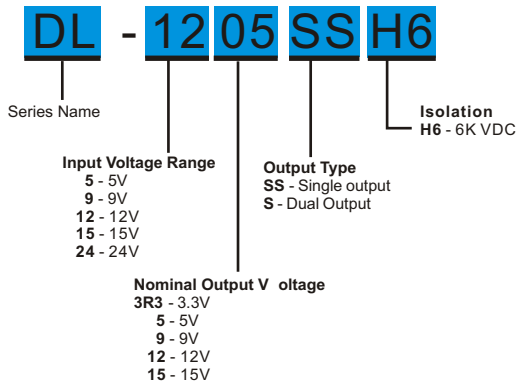
DL-1W Series

1W Unregulated Single & Dual output

Features

- 7 Pin SIL Package
- 6000 VDC High Isolation
- Physical Clearance of Isolation Barrier 2.5mm
- Low Ripple and Noise
- Efficiency up to 81%
- Long Term Short Circuit Protection
- -40 ~ 85°C Operation Temperature Range
- 100% safety production test
- Rated working voltage for 250Vrms
- Low coupling capacity

PART NUMBER STRUCTURE



All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage Accuracy	±3%
Line Regulation	±1.2% / Per 1% Vin Change
Load Regulation	(From 10% to 100% Load) ±10%
Ripple & Noise(1) (20 Mhz bandwidth)	200mV pk-pk
Short Circuit Protection	Indefinite (Automatic Recovery)
Temperature Coefficient	±0.03%/℃
Capacitor Load(2)	See Table

INPUT SPECIFICATIONS

Voltage Range	±10% ,max.
Input Current	See Table
No-Load Input Current	See Table
Input Filter	Capacitor
Input Reflected Ripple(3) rms thru 12uH inductor,5Hz to20MHz	20 mA rms

GENERAL SPECIFICATIONS

Efficiency	See table
I/O Isolation V oltage(60 sec)	6000Vdc
I/O Isolation Capacitance	10 pF
I/O Isolation Resistance	1000M Ohm
Switching Frequency	Typical 20~50KHz
Humidity	95% rel H
Reliability Calculated MTBF (MIL-HDBK-217 F)	>2.39 Mhrs
Safety Standard : (designed to meet)	IEC 60950-1

ENVIRONMENT SPECIFICATIONS

Operating Temperature	40 ℃~85 ℃
Maximum Case Temperature	100 ℃
Storage Temperature	-40 ℃~125 ℃
Cooling	Nature Convection

PHYSICAL SPECIFICATIONS

Clearance Distance	(Input to Output) 2.5 mm
Case Material	Epoxy encapsulated(UL94V-0 rated)
Pin Material	0.5mm Alloy 42 Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	4.2g
Dimensions	0.77"x0.39"x0.49"

ABSOLUTE MAXIMUM RATINGS(4)

These are stress ratings. Exposure of devices to anyof these conditions may adversely affect long-term reliability.

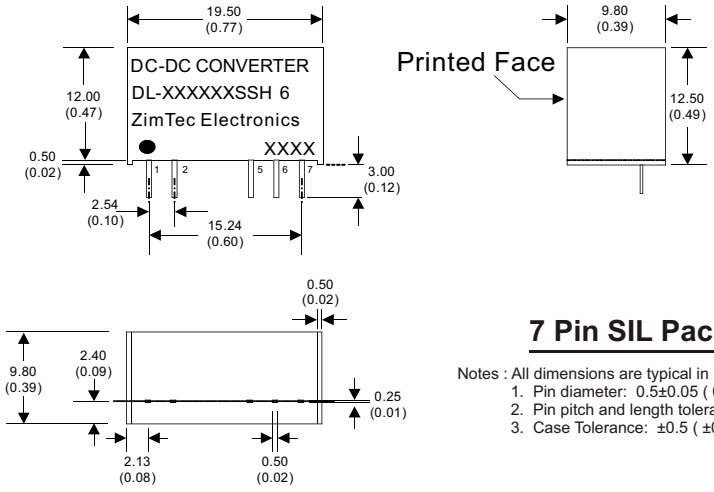
Input Surge Voltage(100mS)	
5 Models	7 Vdc ,max.
9 Models	12 Vdc ,max.
12 Models	15 Vdc ,max.
15 Models	18 Vdc ,max.
24 Models	28 Vdc ,max.
Soldering Temperature (1.5mm from case 10 sec. max.)	260°C ,max.

EMC SPECIFICATIONS

Conducted Emissions(6)	EN55022	CLASS B
Radiated Emissions	EN55022	CLASS B
ESD	IEC 61000-4-2	Perf. Criteria A
RS	IEC 61000-4-3	Perf. Criteria A
EFT(7)	IEC 61000-4-4	Perf. Criteria A
CS	IEC 61000-4-6	Perf. Criteria A
PFMF	IEC 61000-4-8	Perf. Criteria A

DL - 1W Unregulated Single & Dual output

MECHANICAL SPECIFICATIONS



7 Pin SIL Package

Notes : All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5±0.05 (0.02±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
1	+V Input	+V Input
2	−V Input	−V Input
5	−V Output	−V Output
6	N.P.	Common
7	+V Output	+V Output

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	OUTPUT		EFFICIENC Y @FL(%)	Capacitor Load(uF)
		Voltage(Vdc)	Current(mA)		
DL-XX3R3SSH6	5, 9, 12, 15, 24	3.3	303	69 - 75	220
DL-XX05SSH6	5, 9, 12, 15, 24	5	200	70 - 77	220
DL-XX09SSH6	5, 9, 12, 15, 24	9	111.1	70 - 80	220
DL-XX12SSH6	5, 9, 12, 15, 24	12	83.3	70 - 80	220
DL-XX15SSH6	5, 9, 12, 15, 24	15	66.7	70 - 80	220
DL-XX3R3SH6	5, 9, 12, 15, 24	±3.3	±151.5	68 - 75	±100
DL-XX05SH6	5, 9, 12, 15, 24	±5	±100	70 - 78	±100
DL-XX09SH6	5, 9, 12, 15, 24	±9	±55.6	70 - 81	±100
DL-XX12SH6	5, 9, 12, 15, 24	±12	±41.7	72 - 81	±100
DL-XX15SH6	5, 9, 12, 15, 24	±15	±33.3	70 - 81	±100
DL-XX1509SH6	5, 9, 12, 15, 24	±15/-9	±33/-55	70 - 80	±100

XX=Input Voltage

D1-0.5W Series

0.5W Unregulated Single & Dual output

Features

- 7 Pin SIL / 14 Pin DIL Package
- 1000 VDC Isolation
- Up to 6000 VDC Isolation
- Low Ripple and Noise
- Efficiency up to 80%
- -40 ~ 85°C Operation Temperature Range
- Non-Conductive Black Plastic Case

PART NUMBER STRUCTURE

D1 - 12 05 SS 05 H6

- **D1** — Series Name
- **12** — Input Voltage: **05** - 5V; **12** - 12V; **24** - 24V; **48** - 48V
- **05** — Output Voltage: **3R3** - 3.3V; **05** - 5V; **7R2** - 7.2V; **09** - 9V; **12** - 12V; **15** - 15V; **18** - 18V; **24** - 24V
- **SS** — Case & Output T ype: **S** - SIP Case, Dual Output; **D** - DIP Case, Dual Output; **SS** - SIP Case, Single Output; **DS** - DIP Case, Single Output
- **05** — 0.5 Watts
- **H6** — 3KVDC Isolation. Optional, if no suffix "H" mean 1 KVDC Isolation: **H** - 3KVdc Isolation; **H2** - 2KVdc Isolation; **H4** - 4KVdc Isolation; **H5** - 5.2KVdc Isolation; **H6** - 6KVdc Isolation

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage accuracy	±3%
Line regulation	±1.2% / Per 1% Vin Change
Load regulation	(From 20% to 100% Load) ±10% (Output 3.3V Model) ±20%
Ripple & noise (20 MHz bandwidth)(1)	75mV pk-pk
Temperature coefficient	±0.02%/°C
Capacitor load(2)	See table

INPUT SPECIFICATIONS

Voltage Range	±10%
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	Capacitors
Input Reflected Ripple Current (3)	20mA pk-pk

ABSOLUTE MAXIMUM RATINGS(4)

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge Voltage(100mS)	
5 Models	7 Vdc ,max.
12 Models	15 Vdc ,max.
24 Models	28 Vdc ,max.
48 Models	54 Vdc ,max.
Soldering Temperature (1.5mm from case 10 sec. max.)	260 °C ,max.

PHYSICAL SPECIFICATIONS

Case Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	0.5mm Alloy42 Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	(SIP/2.3g) (DIP/2.6g)
Dimensions	SIP Case 0.76"x0.24"x0.39" DIP Case 0.80"x0.40"x0.27"

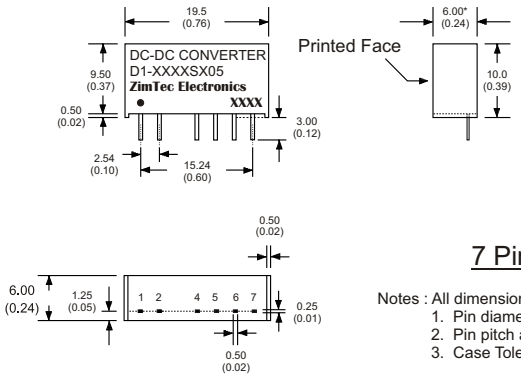
ENVIRONMENT SPECIFICATIONS

Operating Temperature	-40 °C~85 °C(See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

GENERAL SPECIFICATIONS

Efficiency	See table
I/O Isolation V oltage (3 sec)	
Input/Output	1000~6000Vdc
I/O Isolation Capacitance	60 pF Typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	Variable 80kHz
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1.121 Mhrs
Safety Standard : (designed to meet)	IEC 60950-1

MECHANICAL SPECIFICATIONS



* The thickness of 48V input voltage model is 7.20(0.28)

7 Pin SIL Package

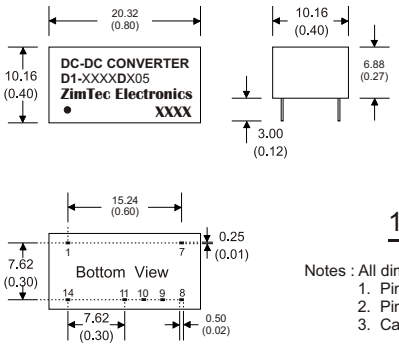
Notes : All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5±0.05 (0.02±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS

PIN NUMBER	SINGLE	DUAL	SINGLE-H	DUAL-H
1	+V Input	+V Input	+V Input	+V Input
2	−V Input	−V Input	−V Input	−V Input
4	−V Output	−V Output	N.P.	N.P.
5	N.P.	Common	−V Output	−V Output
6	+V Output	+V Output	N.P.	Common
7	N.P.	N.P.	+V Output	+V Output

D1 - 0.5W Unregulated Single & Dual output

MECHANICAL SPECIFICATIONS



14 Pin DIL Package

Notes : All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5±0.05 (0.02±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS				
PIN NUMBER	SINGLE	DUAL	SINGLE-H	DUAL-H
1	−V Input	−V Input	−V Input	−V Input
7	N.C.	N.C.	N.C.	N.C.
8	N.P.	Common	+V Output	+V Output
9	+V Output	+V Output	N.P.	Common
10	N.P.	N.P.	−V Output	−V Output
11	−V Output	−V Output	N.P.	N.P.
14	+V Input	+V Input	+V Input	+V Input

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
D1-053R3S05	5	30	166	±3.3	±75.7	60	±100
D1-0505S05	5	30	135	±5	±50	74	±100
D1-057R2S05	5	30	129	±7.2	±34.7	77	±100
D1-0509S05	5	30	128	±9	±27.7	78	±100
D1-0512S05	5	30	128	±12	±20.8	78	±100
D1-0515S05	5	30	128	±15	±16.7	78	±100
D1-0518S05	5	30	126	±18	±13.9	79	±100
D1-0524S05	5	30	126	±24	±10.4	79	±100
D1-123R3S05	12	20	69	±3.3	±75.7	60	±100
D1-1205S05	12	20	56	±5	±50	74	±100
D1-127R2S05	12	20	54	±7.2	±34.7	77	±100
D1-1209S05	12	20	53	±9	±27.7	78	±100
D1-1212S05	12	20	53	±12	±20.8	78	±100
D1-1215S05	12	20	53	±15	±16.7	78	±100
D1-1218S05	12	20	52	±18	±13.9	80	±100
D1-1224S05	12	20	52	±24	±10.4	80	±100
D1-243R3S05	24	10	35	±3.3	±75.7	60	±100
D1-2405S05	24	10	28	±5	±50	74	±100
D1-247R2S05	24	10	27	±7.2	±34.7	76	±100
D1-2409S05	24	10	27	±9	±27.7	76	±100
D1-2412S05	24	10	26	±12	±20.8	78	±100
D1-2415S05	24	10	26	±15	±16.7	78	±100
D1-2418S05	24	10	26	±18	±13.9	78	±100
D1-2424S05	24	10	26	±24	±10.4	80	±100
D1-483R3S05	48	6	17	±3.3	±75.7	60	±100
D1-4805S05	48	6	14	±5	±50	74	±100
D1-487R2S05	48	6	13	±7.2	±34.7	76	±100
D1-4809S05	48	6	13	±9	±27.7	76	±100
D1-4812S05	48	6	13	±12	±20.8	76	±100
D1-4815S05	48	6	13	±15	±16.7	77	±100
D1-4818S05	48	6	13	±18	±13.9	77	±100
D1-4824S05	48	6	13	±24	±10.4	79	±100

Suffix “H” means 3 KVdc isolation Suffix “H2” means 2 KVdc isolation Suffix “H4” means 4 KVdc isolation
Suffix “H5” means 5.2 KVdc isolation Suffix “H6” means 6 KVdc isolation

D1 - 0.5W Unregulated Single & Dual output

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
D1-053R3D05	5	30	166	±3.3	±75.7	60	±100
D1-0505D05	5	30	135	±5	±50	74	±100
D1-057R2D05	5	30	129	±7.2	±34.7	77	±100
D1-0509D05	5	30	128	±9	±27.7	78	±100
D1-0512D05	5	30	128	±12	±20.8	78	±100
D1-0515D05	5	30	128	±15	±16.7	78	±100
D1-0518D05	5	30	126	±18	±13.9	79	±100
D1-0524D05	5	30	126	±24	±10.4	79	±100
D1-123R3D05	12	20	69	±3.3	±75.7	60	±100
D1-1205D05	12	20	56	±5	±50	74	±100
D1-127R2D05	12	20	54	±7.2	±34.7	77	±100
D1-1209D05	12	20	53	±9	±27.7	78	±100
D1-1212D05	12	20	53	±12	±20.8	78	±100
D1-1215D05	12	20	53	±15	±16.7	78	±100
D1-1218D05	12	20	52	±18	±13.9	80	±100
D1-1224D05	12	20	52	±24	±10.4	80	±100
D1-243R3D05	24	10	35	±3.3	±75.7	60	±100
D1-2405D05	24	10	28	±5	±50	74	±100
D1-247R2D05	24	10	27	±7.2	±34.7	76	±100
D1-2409D05	24	10	27	±9	±27.7	76	±100
D1-2412D05	24	10	26	±12	±20.8	78	±100
D1-2415D05	24	10	26	±15	±16.7	78	±100
D1-2418D05	24	10	26	±18	±13.9	78	±100
D1-2424D05	24	10	26	±24	±10.4	80	±100
D1-483R3D05	48	6	17	±3.3	±75.7	60	±100
D1-4805D05	48	6	14	±5	±50	74	±100
D1-487R2D05	48	6	13	±7.2	±34.7	76	±100
D1-4809D05	48	6	13	±9	±27.7	76	±100
D1-4812D05	48	6	13	±12	±20.8	76	±100
D1-4815D05	48	6	13	±15	±16.7	77	±100
D1-4818D05	48	6	13	±18	±13.9	77	±100
D1-4824D05	48	6	13	±24	±10.4	79	±100
D1-053R3SS05	5	30	142	3.3	151.5	70	100
D1-0505SS05	5	30	135	5	100	74	100
D1-057R2SS05	5	30	135	7.2	69.4	74	100
D1-0509SS05	5	30	133	9	55.5	75	100
D1-0512SS05	5	30	131	12	41.6	76	100
D1-0515SS05	5	30	131	15	33.3	76	100
D1-0518SS05	5	30	131	18	27.8	76	100
D1-0524SS05	5	30	128	24	20.8	78	100
D1-123R3SS05	12	20	59	3.3	151.5	70	100
D1-1205SS05	12	20	57	5	100	73	100
D1-127R2SS05	12	20	56	7.2	69.4	74	100
D1-1209SS05	12	20	55	9	55.5	75	100
D1-1212SS05	12	20	54	12	41.6	76	100
D1-1215SS05	12	20	54	15	33.3	76	100
D1-1218SS05	12	20	54	18	27.8	76	100
D1-1224SS05	12	20	53	24	20.8	78	100

Suffix “H” means 3 KVdc isolation Suffix “H2” means 2 KVdc isolation Suffix “H4” means 4 KVdc isolation
Suffix “H5” means 5.2 KVdc isolation Suffix “H6” means 6 KVdc isolation

D1 - 0.5W Unregulated Single & Dual output

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
D1-243R3SS05	24	10	29	3.3	151.5	70	100
D1-2405SS05	24	10	28	5	100	73	100
D1-247R2SS05	24	10	28	7.2	69.4	74	100
D1-2409SS05	24	10	28	9	55.5	75	100
D1-2412SS05	24	10	27	12	41.6	76	100
D1-2415SS05	24	10	26	15	33.3	78	100
D1-2418SS05	24	10	26	18	27.8	78	100
D1-2424SS05	24	10	26	24	20.8	78	100
D1-483R3SS05	48	6	14	3.3	151.5	70	100
D1-4805SS05	48	6	14	5	100	72	100
D1-487R2SS05	48	6	14	7.2	69.4	72	100
D1-4809SS05	48	6	14	9	55.5	74	100
D1-4812SS05	48	6	14	12	41.6	74	100
D1-4815SS05	48	6	13	15	33.3	75	100
D1-4818SS05	48	6	13	18	27.8	75	100
D1-4824SS05	48	6	13	24	20.8	77	100
D1-053R3DS05	5	30	142	3.3	151.5	70	100
D1-0505DS05	5	30	135	5	100	74	100
D1-057R2DS05	5	30	135	7.2	69.4	74	100
D1-0509DS05	5	30	133	9	55.5	75	100
D1-0512DS05	5	30	131	12	41.6	76	100
D1-0515DS05	5	30	131	15	33.3	76	100
D1-0518DS05	5	30	131	18	27.8	76	100
D1-0524DS05	5	30	128	24	20.8	78	100
D1-123R3DS05	12	20	59	3.3	151.5	70	100
D1-1205DS05	12	20	57	5	100	73	100
D1-127R2DS05	12	20	111	7.2	69.4	74	100
D1-1209DS05	12	20	55	9	55.5	75	100
D1-1212DS05	12	20	54	12	41.6	76	100
D1-1215DS05	12	20	54	15	33.3	76	100
D1-1218DS05	12	20	54	18	27.8	76	100
D1-1224DS05	12	20	53	24	20.8	78	100
D1-243R3DS05	24	10	29	3.3	151.5	70	100
D1-2405DS05	24	10	28	5	100	73	100
D1-247R2DS05	24	10	28	7.2	69.4	74	100
D1-2409DS05	24	10	28	9	55.5	75	100
D1-2412DS05	24	10	27	12	41.6	76	100
D1-2415DS05	24	10	26	15	33.3	78	100
D1-2418DS05	24	10	26	18	27.8	78	100
D1-2424DS05	24	10	26	24	20.8	78	100
D1-483R3DS05	48	6	14	3.3	151.5	70	100
D1-4805DS05	48	6	14	5	100	72	100
D1-487R2DS05	48	6	14	7.2	69.4	72	100
D1-4809DS05	48	6	14	9	55.5	74	100
D1-4812DS05	48	6	14	12	41.6	74	100
D1-4815DS05	48	6	13	15	33.3	75	100
D1-4818DS05	48	6	13	18	27.8	75	100
D1-4824DS05	48	6	13	24	20.8	77	100

Suffix “H” means 3 KVdc isolation Suffix “H2” means 2 KVdc isolation Suffix “H4” means 4 KVdc isolation
Suffix “H5” means 5.2 KVdc isolation Suffix “H6” means 6 KVdc isolation

D1-0.75W Series

0.75W Unregulated Single & Dual output

Features

- 7 Pin SIL / 14 Pin DIL Package
- 1000 VDC Isolation
- Up to 6000 VDC Isolation
- Low Ripple and Noise
- Efficiency up to 80%
- -40 ~ 85°C Operation Temperature Range
- Non-Conductive Black Plastic Case

PART NUMBER STRUCTURE

D1 - 12 05 SS 07 H6

- **Series Name**
- **Input Voltage**: **05** - 5V, **12** - 12V, **24** - 24V, **48** - 48V
- **Output Voltage**: **3R3** - 3.3V, **05** - 5V, **7R2** - 7.2V, **09** - 9V, **12** - 12V, **15** - 15V, **18** - 18V, **24** - 24V
- **Case & Output T ype**: **S** - SIP Case, Dual Output; **D** - DIP Case, Dual Output; **SS** - SIP Case, Single Output; **DS** - DIP Case, Single Output
- 0.75 Watts
- **3KVDC Isolation** Optional, if no suffix "H" mean 1 KVDC Isolation; **H** - 3KVdc Isolation; **H2** - 2KVdc Isolation; **H4** - 4KVdc Isolation; **H5** - 5.2KVdc Isolation; **H6** - 6KVdc Isolation

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage accuracy	±3%
Line regulation	±1.2% / Per 1% Vin Change
Load regulation	(From 20% to 100% Load) ±10%
	(Output 3.3V Model) ±20%
Ripple & noise (20 MHz bandwidth)(1)	75mV pk-pk
Temperature coefficient	±0.02%/°C
Capacitor load(2)	See table

INPUT SPECIFICATIONS

Voltage Range	±10%
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	Capacitors
Input Reflected Ripple Current (3)	20mA pk-pk

ABSOLUTE MAXIMUM RATINGS(4)

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge Voltage(100mS)	
5 Models	7 Vdc ,max.
12 Models	15 Vdc ,max.
24 Models	28 Vdc ,max.
48 Models	54 Vdc ,max.
Soldering Temperature (1.5mm from case 10 sec. max.)	260 °C ,max.

PHYSICAL SPECIFICATIONS

Case Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	0.5mm Alloy42 Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	(SIP/2.3g) (DIP/2.6g)
Dimensions	SIP Case 0.76"x0.24"x0.39"
	DIP Case 0.80"x0.40"x0.27"

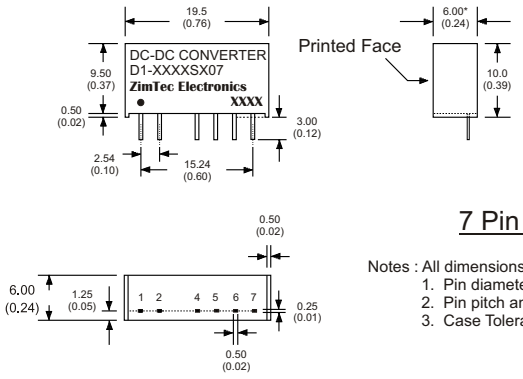
ENVIRONMENT SPECIFICATIONS

Operating Temperature	-40 °C~85 °C(See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

GENERAL SPECIFICATIONS

Efficiency	See table
I/O Isolation V oltage (3 sec)	
Input/Output	1000~6000Vdc
I/O Isolation Capacitance	60 pF Typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	Variable 80kHz
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1.121 Mhrs
Safety Standard : (designed to meet)	IEC 60950-1

MECHANICAL SPECIFICATIONS



* The thickness of 48V input voltage model is 7.20(0.28)

7 Pin SIL Package

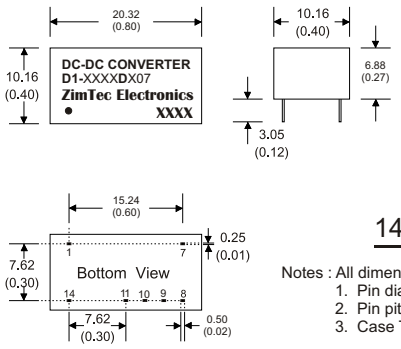
Notes : All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5±0.05 (0.02±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS

PIN NUMBER	SINGLE	DUAL	SINGLE-H	DUAL-H
1	+V Input	+V Input	+V Input	+V Input
2	−V Input	−V Input	−V Input	−V Input
4	−V Output	−V Output	N.P.	N.P.
5	N.P.	Common	−V Output	−V Output
6	+V Output	+V Output	N.P.	Common
7	N.P.	N.P.	+V Output	+V Output

D1 - 0.75W Unregulated Single & Dual output

MECHANICAL SPECIFICATIONS



14 Pin DIL Package

Notes : All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5±0.05 (0.02±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS				
PIN NUMBER	SINGLE	DUAL	SINGLE-H	DUAL-H
1	−V Input	−V Input	−V Input	−V Input
7	N.C.	N.C.	N.C.	N.C.
8	N.P.	Common	+V Output	+V Output
9	+V Output	+V Output	N.P.	Common
10	N.P.	N.P.	−V Output	−V Output
11	−V Output	−V Output	N.P.	N.P.
14	+V Input	+V Input	+V Input	+V Input

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
D1-053R3S07	5	30	230	±3.3	±113.6	65	±100
D1-0505S07	5	30	211	±5	±75	71	±100
D1-057R2S07	5	30	202	±7.2	±52	74	±100
D1-0509S07	5	30	202	±9	±41.6	74	±100
D1-0512S07	5	30	197	±12	±31.2	76	±100
D1-0515S07	5	30	197	±15	±25	76	±100
D1-0518S07	5	30	189	±18	±20.8	79	±100
D1-0524S07	5	30	189	±24	±15.6	79	±100
D1-123R3S07	12	20	126	±3.3	±113.6	65	±100
D1-1205S07	12	20	85	±5	±75	73	±100
D1-127R2S07	12	20	84	±7.2	±52	74	±100
D1-1209S07	12	20	84	±9	±41.6	74	±100
D1-1212S07	12	20	80	±12	±31.2	78	±100
D1-1215S07	12	20	78	±15	±25	80	±100
D1-1218S07	12	20	78	±18	±20.8	80	±100
D1-1224S07	12	20	80	±24	±15.6	78	±100
D1-243R3S07	24	10	46	±3.3	±113.6	67	±100
D1-2405S07	24	10	42	±5	±75	74	±100
D1-247R2S07	24	10	41	±7.2	±52	76	±100
D1-2409S07	24	10	41	±9	±41.6	76	±100
D1-2412S07	24	10	40	±12	±31.2	78	±100
D1-2415S07	24	10	40	±15	±25	78	±100
D1-2418S07	24	10	40	±18	±20.8	78	±100
D1-2424S07	24	10	40	±24	±15.6	78	±100
D1-483R3S07	48	6	25	±3.3	±113.6	62	±100
D1-4805S07	48	6	24	±5	±75	65	±100
D1-487R2S07	48	6	22	±7.2	±52	70	±100
D1-4809S07	48	6	21	±9	±41.6	72	±100
D1-4812S07	48	6	21	±12	±31.2	74	±100
D1-4815S07	48	6	21	±15	±25	74	±100
D1-4818S07	48	6	21	±18	±20.8	72	±100
D1-4824S07	48	6	22	±24	±15.6	70	±100

Suffix “H” means 3 KVdc isolation
Suffix “H2” means 2 KVdc isolation
Suffix “H4” means 4 KVdc isolation
Suffix “H5” means 5.2 KVdc isolation
Suffix “H6” means 6 KVdc isolation

D1 - 0.75W Unregulated Single & Dual output

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
D1-053R3D07	5	30	230	±3.3	±113.6	65	±100
D1-0505D07	5	30	211	±5	±75	71	±100
D1-057R2D07	5	30	202	±7.2	±52	74	±100
D1-0509D07	5	30	202	±9	±41.6	74	±100
D1-0512D07	5	30	197	±12	±31.2	76	±100
D1-0515D07	5	30	197	±15	±25	76	±100
D1-0518D07	5	30	189	±18	±20.8	79	±100
D1-0524D07	5	30	189	±24	±15.6	79	±100
D1-123R3D07	12	20	126	±3.3	±113.6	65	±100
D1-1205D07	12	20	85	±5	±75	73	±100
D1-127R2D07	12	20	84	±7.2	±52	74	±100
D1-1209D07	12	20	84	±9	±41.6	74	±100
D1-1212D07	12	20	80	±12	±31.2	78	±100
D1-1215D07	12	20	78	±15	±25	80	±100
D1-1218D07	12	20	78	±18	±20.8	80	±100
D1-1224D07	12	20	80	±24	±15.6	78	±100
D1-243R3D07	24	10	46	±3.3	±113.6	67	±100
D1-2405D07	24	10	42	±5	±75	74	±100
D1-247R2D07	24	10	41	±7.2	±52	76	±100
D1-2409D07	24	10	41	±9	±41.6	76	±100
D1-2412D07	24	10	40	±12	±31.2	78	±100
D1-2415D07	24	10	40	±15	±25	78	±100
D1-2418D07	24	10	40	±18	±20.8	78	±100
D1-2424D07	24	10	40	±24	±15.6	78	±100
D1-483R3D07	48	6	25	±3.3	±113.6	62	±100
D1-4805D07	48	6	24	±5	±75	65	±100
D1-487R2D07	48	6	22	±7.2	±52	70	±100
D1-4809D07	48	6	21	±9	±41.6	72	±100
D1-4812D07	48	6	21	±12	±31.2	74	±100
D1-4815D07	48	6	21	±15	±25	74	±100
D1-4818D07	48	6	21	±18	±20.8	72	±100
D1-4824D07	48	6	22	±24	±15.6	70	±100
D1-053R3SS07	5	30	205	3.3	227.3	73	100
D1-0505SS07	5	30	200	5	150	75	100
D1-057R2SS07	5	30	202	7.2	104.2	74	100
D1-0509SS07	5	30	200	9	83.3	75	100
D1-0512SS07	5	30	197	12	62.5	76	100
D1-0515SS07	5	30	197	15	50	76	100
D1-0518SS07	5	30	197	18	41.7	76	100
D1-0524SS07	5	30	194	24	31.2	77	100
D1-123R3SS07	12	20	85	3.3	227.3	73	100
D1-1205SS07	12	20	84	5	150	74	100
D1-127R2SS07	12	20	84	7.2	104.2	74	100
D1-1209SS07	12	20	83	9	83.3	75	100
D1-1212SS07	12	20	81	12	62.5	77	100
D1-1215SS07	12	20	80	15	50	78	100
D1-1218SS07	12	20	80	18	41.7	78	100
D1-1224SS07	12	20	80	24	31.2	78	100

Suffix “H” means 3 KVdc isolation Suffix “H2” means 2 KVdc isolation Suffix “H4” means 4 KVdc isolation
Suffix “H5” means 5.2 KVdc isolation Suffix “H6” means 6 KVdc isolation

D1 - 0.75W Unregulated Single & Dual output

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
D1-243R3SS07	24	10	42	3.3	227.3	74	100
D1-2405SS07	24	10	42	5	150	74	100
D1-247R2SS07	24	10	41	7.2	104.2	75	100
D1-2409SS07	24	10	41	9	83.3	75	100
D1-2412SS07	24	10	40	12	62.5	78	100
D1-2415SS07	24	10	40	15	50	78	100
D1-2418SS07	24	10	40	18	41.7	78	100
D1-2424SS07	24	10	39	24	31.2	80	100
D1-483R3SS07	48	6	21	3.3	227.3	72	100
D1-4805SS07	48	6	21	5	150	72	100
D1-487R2SS07	48	6	21	7.2	104.2	72	100
D1-4809SS07	48	6	21	9	83.3	74	100
D1-4812SS07	48	6	21	12	62.5	74	100
D1-4815SS07	48	6	20	15	50	75	100
D1-4818SS07	48	6	20	18	41.7	75	100
D1-4824SS07	48	6	21	24	31.2	73	100
D1-053R3DS07	5	30	205	3.3	227.3	73	100
D1-0505DS07	5	30	200	5	150	75	100
D1-057R2DS07	5	30	202	7.2	104.2	74	100
D1-0509DS07	5	30	200	9	83.3	75	100
D1-0512DS07	5	30	197	12	62.5	76	100
D1-0515DS07	5	30	197	15	50	76	100
D1-0518DS07	5	30	197	18	41.7	76	100
D1-0524DS07	5	30	194	24	31.2	77	100
D1-123R3DS07	12	20	85	3.3	227.3	73	100
D1-1205DS07	12	20	84	5	150	74	100
D1-127R2DS07	12	20	84	7.2	104.2	74	100
D1-1209DS07	12	20	83	9	83.3	75	100
D1-1212DS07	12	20	81	12	62.5	77	100
D1-1215DS07	12	20	80	15	50	78	100
D1-1218DS07	12	20	80	18	41.7	78	100
D1-1224DS07	12	20	80	24	31.2	78	100
D1-243R3DS07	24	10	42	3.3	227.3	74	100
D1-2405DS07	24	10	42	5	150	74	100
D1-247R2DS07	24	10	41	7.2	104.2	75	100
D1-2409DS07	24	10	41	9	83.3	75	100
D1-2412DS07	24	10	40	12	62.5	78	100
D1-2415DS07	24	10	40	15	50	78	100
D1-2418DS07	24	10	40	18	41.7	78	100
D1-2424DS07	24	10	39	24	31.2	80	100
D1-483R3DS07	48	6	21	3.3	227.3	72	100
D1-4805DS07	48	6	21	5	150	72	100
D1-487R2DS07	48	6	21	7.2	104.2	72	100
D1-4809DS07	48	6	21	9	83.3	74	100
D1-4812DS07	48	6	21	12	62.5	74	100
D1-4815DS07	48	6	20	15	50	75	100
D1-4818DS07	48	6	20	18	41.7	75	100
D1-4824DS07	48	6	21	24	31.2	73	100

Suffix “H” means 3 KVdc isolation Suffix “H2” means 2 KVdc isolation Suffix “H4” means 4 KVdc isolation
Suffix “H5” means 5.2 KVdc isolation Suffix “H6” means 6 KVdc isolation

D1-1W Series

1W Unregulated Single & Dual output

Features

- 7 Pin SIL / 14 Pin DIL Package
- 1000 VDC Isolation
- Up to 6000 VDC Isolation
- Low Ripple and Noise
- Efficiency up to 86%
- -40 ~ 85°C Operation Temperature Range
- Non-Conductive Black Plastic Case
- EMI Complies With EN55022 Class B

PART NUMBER STRUCTURE

D1 - 12 05 SS H6

- **Series Name**
- **Input Voltage**: 3R3 - 3.3V; 05 - 5V; 12 - 12V; 15 - 15V; 24 - 24V; 48 - 48V
- **Output Voltage**: 3R3 - 3.3V; 05 - 5V; 7R2 - 7.2V; 09 - 9V; 12 - 12V; 15 - 15V; 18 - 18V; 24 - 24V
- **Case & Output T ype**: S - SIP Case, Dual Output; D - DIP Case, Dual Output; SS - SIP Case, Single Output; DS - DIP Case, Single Output
- **High Isolation**: Optional, if no suffix "H" mean 1 KVDC Isolation; H - 3KVdc Isolation; H4 - 4KVdc Isolation; H5 - 5.2KVdc Isolation; H6 - 6KVdc Isolation

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage accuracy	±3%
Line regulation	±1.2% / Per 1% Vin Change
Load regulation	(From 20% to 100% Load) ±10% (Output 3.3V Model) ±20%
Ripple & noise (20 MHz bandwidth)(1)	75mV pk-pk
Temperature coefficient	±0.02%/°C
Capacitor load(2)	See table

INPUT SPECIFICATIONS

Voltage Range	±10%
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	Capacitors
Input Reflected Ripple Current (3)	20mA pk-pk

ENVIRONMENT SPECIFICATIONS

Operating Temperature	-40 °C~85 °C(See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

GENERAL SPECIFICATIONS

Efficiency	See table
I/O Isolation V oltage (3 sec)	
Input/Output	1000~6000Vdc
I/O Isolation Capacitance	60 pF Typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	Variable 80kHz
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1.121 Mhrs
Safety Standard	UL/cUL 60950-1 , IEC/EN 60950-1
Safety Approvals	UL/cUL 60950-1 , IEC/EN 60950-1

EMC SPECIFICATIONS

Radiated Emissions	EN55022	CLASS B
Conducted Emissions (4)	EN55022	CLASS B
ESD	IEC 61000-4-2	Perf. Criteria A
RS	IEC 61000-4-3	Perf. Criteria A
EFT (5)	IEC 61000-4-4	Perf. Criteria A
Surge (5)	IEC 61000-4-5	Perf. Criteria A
CS	IEC 61000-4-6	Perf. Criteria A
PFMF	IEC 61000-4-8	Perf. Criteria A

PHYSICAL SPECIFICATIONS

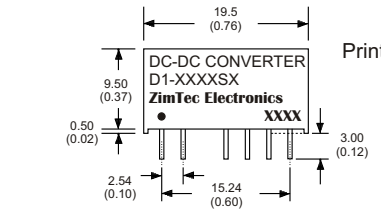
Case Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	0.5mm Alloy42 Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	(SIP/2.3g) (DIP/2.6g)
Dimensions	SIP Case 0.76"x0.24"x0.39" DIP Case 0.80"x0.40"x0.27"

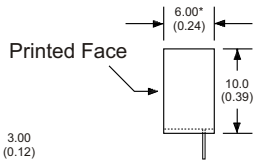
ABSOLUTE MAXIMUM RATINGS(6)

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

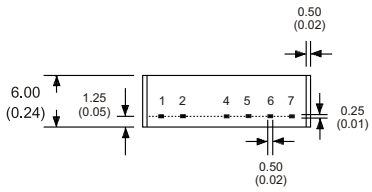
Input Surge Voltage(100mS)	
3.3 Models	6 Vdc ,max.
5 Models	7 Vdc ,max.
12 Models	15 Vdc ,max.
15 Models	18 Vdc ,max.
24 Models	28 Vdc ,max.
48 Models	54 Vdc ,max.
Soldering Temperature (1.5mm from case 10 sec. max.)	260 °C ,max.

MECHANICAL SPECIFICATIONS





* The thickness of 48V input voltage model is 7.20(0.28)



7 Pin SIL Package

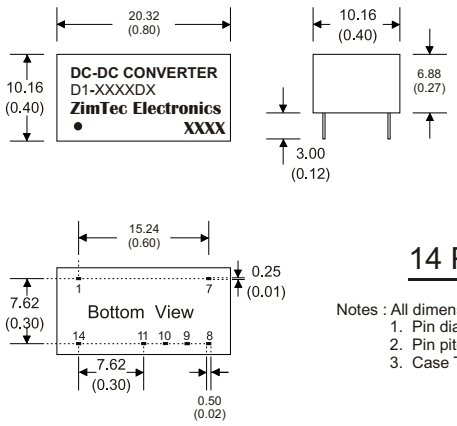
Notes : All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5±0.05 (0.02±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS

PIN NUMBER	SINGLE	DUAL	SINGLE-H	DUAL-H
1	+V Input	+V Input	+V Input	+V Input
2	−V Input	−V Input	−V Input	−V Input
4	−V Output	−V Output	N.P.	N.P.
5	N.P.	Common	−V Output	−V Output
6	+V Output	+V Output	N.P.	Common
7	N.P.	N.P.	+V Output	+V Output

D1 - 1W Unregulated Single & Dual output

MECHANICAL SPECIFICATIONS



14 Pin DIL Package

Notes : All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5±0.05 (0.02±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS				
PIN NUMBER	SINGLE	DUAL	SINGLE-H	DUAL-H
1	−V Input	−V Input	−V Input	−V Input
7	N.C.	N.C.	N.C.	N.C.
8	N.P.	Common	+V Output	+V Output
9	+V Output	+V Output	N.P.	Common
10	N.P.	N.P.	−V Output	−V Output
11	−V Output	−V Output	N.P.	N.P.
14	+V Input	+V Input	+V Input	+V Input

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
D1-3R33R3SS	3.3	28	399	3.3	303	76	220
D1-3R305SS	3.3	22	389	5	200	78	220
D1-3R309SS	3.3	35	379	9	111	80	220
D1-3R312SS	3.3	30	394	12	83	77	220
D1-3R315SS	3.3	30	389	15	67	78	220
D1-053R3SS	5	15	256	3.3	303	78	220
D1-0505SS	5	17	247	5	200	81	220
D1-057R2SS	5	16	247	7.2	139	81	220
D1-0509SS	5	15	244	9	111	82	220
D1-0512SS	5	17	253	12	83	79	220
D1-0515SS	5	17	233	15	67	86	220
D1-0518SS	5	16	241	18	56	83	220
D1-0524SS	5	20	244	24	42	82	220
D1-123R3SS	12	12	111	3.3	303	75	220
D1-1205SS	12	14	105	5	200	79	220
D1-127R2SS	12	14	111	7.2	139	75	220
D1-1209SS	12	9	104	9	111	80	220
D1-1212SS	12	13	105	12	83	79	220
D1-1215SS	12	10	102	15	67	82	220
D1-1218SS	12	11	103	18	56	81	220
D1-1224SS	12	20	110	24	42	76	220
D1-1505SS	15	7	82	5	200	81	220
D1-1512SS	15	8	83	12	83	80	220
D1-1515SS	15	12	84	15	67	79	220
D1-243R3SS	24	8	56	3.3	303	74	220
D1-2405SS	24	6	54	5	200	77	220
D1-247R2SS	24	6	57	7.2	139	73	220
D1-2409SS	24	6	55	9	111	76	220
D1-2412SS	24	6	53	12	83	78	220
D1-2415SS	24	5	52	15	67	80	220
D1-2418SS	24	5	51	18	56	82	220
D1-2424SS	24	8	52	24	42	80	220

Suffix “H” means 3 KVdc isolation Suffix “H4” means 4 KVdc isolation
Suffix “H5” means 5.2 KVdc isolation Suffix “H6” means 6 KVdc isolation

D1 - 1W Unregulated Single & Dual output

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
D1-483R3SS	48	5	29	3.3	303	73	220
D1-4805SS	48	5	29	5	200	73	220
D1-4809SS	48	5	27	9	111	76	220
D1-4812SS	48	5	27	12	83	76	220
D1-4815SS	48	5	27	15	67	77	220
D1-4824SS	48	6	27	24	42	76	220
D1-3R33R3S	3.3	30	459	±3.3	±152	66	220
D1-3R305S	3.3	30	433	±5.0	±100	70	±100
D1-3R309S	3.3	26	404	±9.0	±56	75	±100
D1-3R315S	3.3	25	389	±15	±33	78	±100
D1-053R3S	5	20	299	±3.3	±152	67	±100
D1-0505S	5	20	270	±5.0	±100	74	±100
D1-057R2S	5	15	253	±7.2	±69	79	±100
D1-0509S	5	15	247	±9.0	±56	81	±100
D1-0512S	5	20	250	±12	±42	80	±100
D1-0515S	5	20	244	±15	±33	82	±100
D1-0518S	5	22	247	±18	±28	81	±100
D1-0524S	5	22	247	±24	±21	81	±100
D1-123R3S	12	13	123	±3.3	±152	68	±100
D1-1205S	12	10	113	±5.0	±100	74	±100
D1-127R2S	12	10	110	±7.2	±69	76	±100
D1-1209S	12	13	107	±9.0	±56	78	±100
D1-1212S	12	10	102	±12	±42	82	±100
D1-1215S	12	10	102	±15	±33	82	±100
D1-1218S	12	10	102	±18	±28	82	±100
D1-1224S	12	20	111	±24	±21	75	±100
D1-1505S	15	20	89	±5.0	±100	75	±100
D1-1509S	15	18	87	±9.0	±56	77	±100
D1-1512S	15	20	87	±12	±42	77	±100
D1-1515S	15	20	87	±15	±33	77	±100
D1-243R3S	24	7	62	±3.3	±152	67	±100
D1-2405S	24	6	56	±5.0	±100	74	±100
D1-247R2S	24	7	53	±7.2	±69	78	±100
D1-2409S	24	7	53	±9.0	±56	78	±100
D1-2412S	24	6	52	±12	±42	80	±100
D1-2415S	24	8	52	±15	±33	80	±100
D1-2418S	24	6	51	±18	±28	81	±100
D1-2424S	24	8	51	±24	±21	82	±100
D1-4805S	48	5	31	±5.0	±100	68	±100
D1-4809S	48	5	29	±9.0	±56	73	±100
D1-4812S	48	6	28	±12	±42	74	±100
D1-4815S	48	5	27	±15	±33	77	±100
D1-3R305DS	3.3	35	404	5	200	75	220
D1-3R37R2DS	3.3	35	404	7.2	139	75	220
D1-3R309DS	3.3	30	394	9	111	77	220
D1-3R312DS	3.3	30	399	12	83	76	220
D1-3R315DS	3.3	30	399	15	67	76	220
D1-053R3DS	5	20	260	3.3	303	77	220

Suffix “H” means 3 KVdc isolation Suffix “H4” means 4 KVdc isolation
Suffix “H5” means 5.2 KVdc isolation Suffix “H6” means 6 KVdc isolation

D1 - 1W Unregulated Single & Dual output

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current		OUTPUT Voltage (Vdc)	OUTPUT Current	EFFICIENCY @FL(%)	Capacitor Load(uF)
		No-Load (mA)	Full Load (mA)		Full load (mA)		
D1-0505DS	5	20	244	5	200	82	220
D1-057R2DS	5	20	244	7.2	139	82	220
D1-0509DS	5	20	250	9	111	80	220
D1-0512DS	5	16	247	12	83	81	220
D1-0515DS	5	20	250	15	67	80	220
D1-0518DS	5	25	250	18	56	80	220
D1-0524DS	5	22	244	24	42	82	220
D1-123R3DS	12	20	111	3.3	303	75	220
D1-1205DS	12	14	104	5	200	80	220
D1-127R2DS	12	15	110	7.2	139	76	220
D1-1209DS	12	10	104	9	111	80	220
D1-1212DS	12	13	108	12	83	77	220
D1-1215DS	12	15	110	15	67	76	220
D1-1218DS	12	20	114	18	56	73	220
D1-1224DS	12	25	114	24	42	73	220
D1-1505DS	15	7	82	5	200	81	220
D1-1512DS	15	10	83	12	83	80	220
D1-1515DS	15	10	84	15	67	79	220
D1-243R3DS	24	7	55	3.3	303	76	220
D1-2405DS	24	7	52	5	200	80	220
D1-247R2DS	24	8	57	7.2	139	73	220
D1-2409DS	24	7	56	9	111	75	220
D1-2412DS	24	6	53	12	83	78	220
D1-2415DS	24	6	52	15	67	80	220
D1-2418DS	24	5	52	18	56	80	220
D1-2424DS	24	5	51	24	42	81	220
D1-483R3DS	48	10	30	3.3	303	70	220
D1-4805DS	48	6	29	5	200	73	220
D1-4809DS	48	6	28	9	111	75	220
D1-4812DS	48	5	27	12	83	76	220
D1-4815DS	48	4	26	15	67	79	220
D1-4824DS	48	6	29	24	42	72	220
D1-3R33R3D	3.3	35	481	±3.3	±152	63	±100
D1-3R305D	3.3	25	452	±5.0	±100	67	±100
D1-3R309D	3.3	30	415	±9.0	±56	73	±100
D1-3R315D	3.3	30	399	±15	±33	76	±100
D1-053R3D	5	20	308	±3.3	±152	65	±100
D1-0505D	5	20	256	±5.0	±100	70	±100
D1-057R2D	5	20	274	±7.2	±69	73	±100
D1-0509D	5	16	253	±9.0	±56	79	±100
D1-0512D	5	20	250	±12	±42	80	±100
D1-0515D	5	20	247	±15	±33	81	±100
D1-0518D	5	18	244	±18	±28	82	±100
D1-0524D	5	20	244	±24	±21	82	±100
D1-123R3D	12	15	128	±3.3	±152	65	±100
D1-1205D	12	7	113	±5.0	±100	74	±100
D1-127R2D	12	13	111	±7.2	±69	75	±100
D1-1209D	12	15	104	±9.0	±56	80	±100

Suffix “H” means 3 KVdc isolation Suffix “H4” means 4 KVdc isolation
Suffix “H5” means 5.2 KVdc isolation Suffix “H6” means 6 KVdc isolation

D1 - 1W Unregulated Single & Dual output

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Full Load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
D1-1212D	12	14	103	±12	±42	81	±100
D1-1215D	12	11	102	±15	±33	82	±100
D1-1218D	12	15	111	±18	±28	75	±100
D1-1224D	12	20	110	±24	±21	76	±100
D1-1505D	15	20	89	±5.0	±100	75	±100
D1-1509D	15	18	87	±9.0	±56	77	±100
D1-1512D	15	20	87	±12	±42	77	±100
D1-1515D	15	20	87	±15	±33	77	±100
D1-243R3D	24	10	65	±3.3	±152	64	±100
D1-2405D	24	5	56	±5.0	±100	75	±100
D1-247R2D	24	7	56	±7.2	±69	75	±100
D1-2409D	24	5	52	±9.0	±56	80	±100
D1-2412D	24	6	53	±12	±42	79	±100
D1-2415D	24	8	51	±15	±33	81	±100
D1-2418D	24	10	53	±18	±28	78	±100
D1-2424D	24	9	53	±24	±21	78	±100
D1-4805D	48	6	32	±5.0	±100	65	±100
D1-4809D	48	5	30	±9.0	±56	70	±100
D1-4812D	48	6	29	±12	±42	71	±100
D1-4815D	48	6	29	±15	±33	72	±100

Suffix “H” means 3 KVdc isolation
Suffix “H4” means 4 KVdc isolation
Suffix “H5” means 5.2 KVdc isolation
Suffix “H6” means 6 KVdc isolation

DST1-1W Series

1W High temperature Single & Dual output

Features

- 7 Pin SIL Package
- 1500 VDC Isolation
- Up to 3000 VDC Isolation
- Continuous Short Circuit Protection
- Low Ripple and Noise
- Efficiency up to 81%
- -40 ~ 105°C Operation Temperature Range
- Non-Conductive Black Plastic Case

PART NUMBER STRUCTURE

DST1 - 12 05 SS H

Series Name

Input Voltage
05 - 5V
12 - 12V
24 - 24V

Output Voltage
05 - 5V
12 - 12V
15 - 15V

Case & Output Type
S - SIP Case, Dual Output
SS - SIP Case, Single Output

High Isolation
Optional, if no suffix "H" mean 1.5 KVDC Isolation
H - 3KVdc Isolation

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage accuracy	See tolerance envelope curve
Ripple & noise (20 MHz bandwidth)(1)	75mV pk-pk
Line regulation	±1.2% / Per 1% Vin Change
Load regulation(From 10% to 100% Load)	Input 5VDC 10% Other Input 7.5%
Cross Regulation (Dual Output) (2)	±4%
Temperature coefficient	±0.02%/°C
Short Circuit Protection	Continuous,auto recovery
Capacitor load(3)	See table

INPUT SPECIFICATIONS

Voltage Range	±10%
Input Current	See table, typ.
No-Load Input Current	See table, typ.
Input Filter	Capacitors
Input Reflected Ripple Current (4)	15mA pk-pk
Start up Time (Nominal Vin and constant resistive load)	20mS, typ.

GENERAL SPECIFICATIONS

Efficiency	See table,typ.
I/O Isolation Voltage(60 sec) Input/Output	1500~3000Vdc
I/O Isolation Capacitance	50 pF Typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	Variable 50kHz
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>3.6 Mhrs.
Safety Standard	IEC 60950-1

EMC SPECIFICATIONS

Radiated Emissions	EN55022	CLASS B
Conducted Emissions (5)	EN55022	CLASS B
ESD	IEC 61000-4-2	Perf. Criteria A
RS	IEC 61000-4-3	Perf. Criteria A
EFT	IEC 61000-4-4	Perf. Criteria A
SURGE(6)	IEC 61000-4-5	Perf. Criteria A
CS	IEC 61000-4-6	Perf. Criteria A
PFMF	IEC 61000-4-8	Perf. Criteria A

PHYSICAL SPECIFICATIONS

Case Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	C5191R-H Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	2.4g,Typ
Dimensions	SIP Case 0.76"x0.24"x0.39"

ENVIRONMENT SPECIFICATIONS

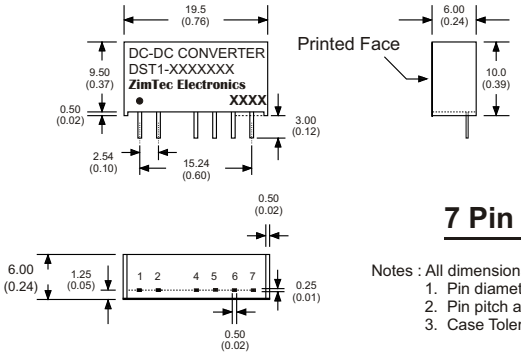
Operating Temperature	-40°C~105°C (See Derating Curve) -40°C~95°C (For 100% Load)
Maximum Case Temperature	115°C
Storage Temperature	-55°C~125°C
Cooling	Nature Convection

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge Voltage (1Sec)	
5 Models	9 Vdc, max.
12 Models	18 Vdc, max.
24 Models	30 Vdc, max.
Soldering Temperature (1.5mm from case 10 sec.max.)	260°C, max.

DST1 - 1W High Temperature Single & Dual output

MECHANICAL SPECIFICATIONS



7 Pin SIL Package

Notes : All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5±0.05 (0.02±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS				
PIN NUMBER	SINGLE	DUAL	SINGLE-H	DUAL-H
1	+V Input	+V Input	+V Input	+V Input
2	−V Input	−V Input	−V Input	−V Input
4	−V Output	−V Output	N.P.	N.P.
5	N.P.	Common	−V Output	−V Output
6	+V Output	+V Output	N.P.	Common
7	N.P.	N.P.	+V Output	+V Output

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
DST1-0505SS	5 (4.5 ~ 5.5)	40	253	5	200	80	220
DST1-0512SS	5 (4.5 ~ 5.5)	40	253	12	83.3	80	100
DST1-0515SS	5 (4.5 ~ 5.5)	40	253	15	66.7	80	100
DST1-1205SS	12 (10.8 ~ 13.2)	18	105	5	200	80	220
DST1-1212SS	12 (10.8 ~ 13.2)	18	105	12	83.3	80	100
DST1-1215SS	12 (10.8 ~ 13.2)	18	104	15	66.7	81	100
DST1-2405SS	24 (21.6 ~ 26.4)	9	53	5	200	80	220
DST1-2412SS	24 (21.6 ~ 26.4)	9	53	12	83.3	80	100
DST1-2415SS	24 (21.6 ~ 26.4)	9	53	15	66.7	80	100
DST1-0505S	5 (4.5 ~ 5.5)	40	253	±5	±100	80	±100
DST1-0512S	5 (4.5 ~ 5.5)	40	253	±12	±41.67	80	±47
DST1-0515S	5 (4.5 ~ 5.5)	40	250	±15	±33.33	81	±47
DST1-1205S	12 (10.8 ~ 13.2)	18	105	±5	±100	80	±100
DST1-1212S	12 (10.8 ~ 13.2)	18	105	±12	±41.67	80	±47
DST1-1215S	12 (10.8 ~ 13.2)	18	105	±15	±33.33	80	±47
DST1-2405S	24 (21.6 ~ 26.4)	9	53	±5	±100	80	±100
DST1-2412S	24 (21.6 ~ 26.4)	9	53	±12	±41.67	80	±47
DST1-2415S	24 (21.6 ~ 26.4)	9	53	±15	±33.33	80	±47

Suffix “H” means 3 K Vdc isolation

DBZ-1W Series

1W Unregulated Single output

Features

- Efficiency up to 82%
- Miniature SIP/DIP Package
- 1500VDC Isolation
- Operating Temperature Range: 40°C ~ +105°C
- No External Component Required
- PCB Mounting
- Industry Standard Pinout
- continuous short circut protection

PART NUMBER STRUCTURE

PART NUMBER SYSTEM

DBZ-0505-S1P

- Rated Power
- Package
- Output Voltage
- Input Voltage
- Product Series

DBZ_S1P & DBZ_D1P Series

INPUT SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Input Surge Voltage (1sec. max.)	3.3VDC Input Models	-0.7	--	5	VDC
	5VDC Input Models	-0.7	--	9	
	12VDC Input Models	-0.7	--	18	
	15VDC Input Models	-0.7	--	21	
	24VDC Input Models	-0.7	--	30	
Input Filter		Capacitor			

OUTPUT SPECIFICATIONS

Item	Test Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy			See tolerance envelope curve			
Line Voltage Regulation	For Vin change of ±1%	3.3V output	--	--	±1.5	%
		Others	--	--	±1.2	
Load Regulation	10% to 100% load	3.3V output	--	18	--	
		5V output	--	12	--	
		9V output	--	8	--	
		12V output	--	7	--	
		15V output	--	6	--	
		24V output	--	5	--	
Temperature drift coefficient	100% load		--	--	±0.03	%/°C
Ripple & Noise*	20MHz Bandwidth	Output Voltage ≤12V	--	30	--	mVp-p
		Others	--	60	--	
Short Circuit Protection			Continuous, automatic recovery			

Note:* Ripple and noise tested with “parallel cable” method. See detailed operation instructions at *DC-DC Application Notes*.

COMMON SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-Output, Tested for 1 minute and leakage current less than 1 mA	1500	--	--	VDC
Isolation Resistance	Input-Output, Test at 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-Output,100KHz/0.1V	--	20	--	pF
Switching Frequency	Full load, nominal input	--	100	300	KHz
MTBF	MIL-HDBK-217F@25℃	3500	--	--	K hours
Case Material		Plastic(UL94-V0)			
Weight	DBZ_S1P Series	--	1.2	--	g
	DBZ_D1P Series	--	1.8	--	

DBZ - 1W Unregulated Single output

ENVIRONMENTAL SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Storage Humidity	Non condensing	--	--	95	%
Operating Temperature	Power derating (above 85℃ see Figure 2)	-40	--	105	℃
Storage Temperature		-55	--	125	
Temperature rise	Ta=25°C,100% Load	--	25	--	
Lead Temperature	1.5mm from case for 10 seconds	--	--	300	
Cooling		Free air convection			

EMC SPECIFICATIONS

EMI	CE	CISPR22/EN55022 CLASS B（Recommended Circuit Refer to Figure1）
	RE	CISPR22/EN55022 CLASS B（Recommended Circuit Refer to Figure1）
EMS	ESD	IEC/EN61000-4-2 Contact ±8KV perf. Criteria B

MODEL SELECTION GUIDE

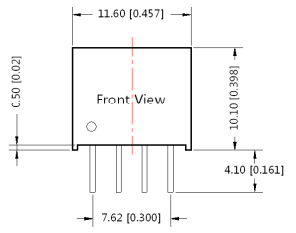
Model	Input Voltage(VDC)	Output Voltage (VDC)	Output Current (mA)		Input Current (mA)(Typ.)		Reflected Ripple Current (mA,Typ.)	Max. Capacitive Load(μF)	Efficiency (%, Typ.) @Max. Load
	Nominal (Range)		Max.	Min.	@Max. Load	@No Load			
DBZ-0303-S/D1P	3.3 (2.97-3.63)	3.3	303	30	405	25	15	220	75
DBZ-0305-S/D1P		5	200	20	380				80
DBZ-0503-S/D1P	5 (4.5-5.5)	3.3	303	30	263	20			76
DBZ-0505-S/D1P		5	200	20	250				80
DBZ-0509-S/D1P		9	111	12	250				80
DBZ-0512-S/D1P		12	84	9	248				81
DBZ-0515-S/D1P		15	67	7	248				81
DBZ-0515-S/D1P		24	42	4	248				81
DBZ-1203-S/D1P	12 (10.8-13.2)	3.3	303	30	111	15			76
DBZ-1205-S/D1P		5	200	20	104				80
DBZ-1209-S/D1P		9	111	12	104				80
DBZ-1212-S/D1P		12	83	9	103				81
DBZ-1215-S/D1P		15	67	7	103				80
DBZ-1515-S/D1P	15 (13.5-16.5)	15	67	7	82	10			81
DBZ-2403-S/D1P	24 (21.6-26.4)	3.3	303	30	55	7			76
DBZ-2405-S/D1P		5	200	20	52				80
DBZ-2409-S/D1P		9	111	12	52				80
DBZ-2412-S/D1P		12	84	9	50				81
DBZ-2415-S/D1P		15	67	7	50				82
DBZ-2424-S/D1P		24	42	4	50				82

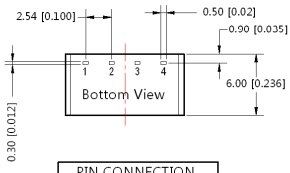
DBZ - 1W Unregulated Single output

MECHANICAL SPECIFICATIONS

DBZ_S1P

MECHANICAL DIMENSIONS



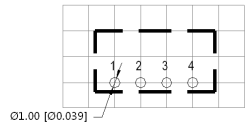


PIN CONNECTION	
Pin	B_S
1	GND
2	Vin
3	0V
4	+Vo

Note:
Unit :mm[inch]
Pin section tolerances :±0.10[±0.004]
General tolerances:±0.25[±0.010]

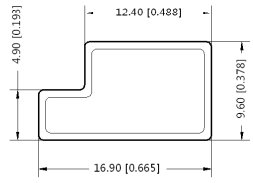
THIRD ANGLE PROJECTION

RECOMMENDED FOOTPRINT DETAILS



Note : Grid 2.54*2.54mm

TUBE PACKAGING DIMENSIONS

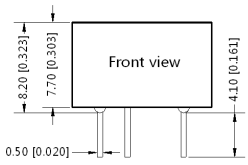


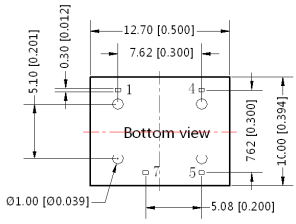
Note:
Unit :mm[inch]
General tolerances: ± 0.50[± 0.020]
L=220[8.661] Tube Quantity: 17pcs
L=530[20.866] Tube Quantity: 43pcs
Inner carton(S): L*W*H=255*170*80
Outer carton(S): L*W*H=375*280*270, 6 inner cartons(S)
Inner carton(L): L*W*H=580*200*100
Outer carton(L): L*W*H=600*215*220, 2 inner cartons(L)
Outer carton(L): L*W*H=600*215*325, 3 inner cartons(L)

1100000301-A0

DBZ_D1P

MECHANICAL DIMENSIONS



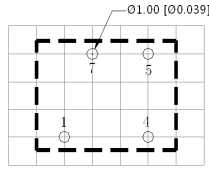


PIN CONNECTION	
Pin	B_D
1	GND
4	Vin
5	+Vo
7	0V

Note:
Unit :mm[inch]
Pin section tolerances:±0.10[±0.004]
General tolerances:±0.25[±0.010]

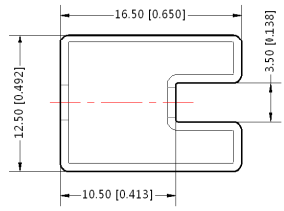
THIRD ANGLE PROJECTION

RECOMMENDED FOOTPRINT DETAILS



Note:Grid 2.54*2.54mm

TUBE PACKAGING DIMENSIONS



Note:
Unit :mm[inch]
General tolerances :±0.50[±0.020]
L=530[20.866] Tube Quantity:40pcs
L=220[8.661] Tube Quantity:16pcs
Inner carton(S): L*W*H=255*170*80
Outer carton(S): L*W*H=375*280*270, 6 inner cartons(S)
Inner carton(L): L*W*H=580*200*100
Outer carton(L): L*W*H=600*215*220, 2 inner cartons(L)
Outer carton(L): L*W*H=600*215*325, 3 inner cartons(L)

1100000501-A0

DFZ & DEZ-1W Series

1W Unregulated Single output

Features

- SIP package
- Efficiency up to 81%
- High power density
- No external component required
- Isolation voltage: 3000VDC
- Operating temperature range: -40℃ to +105 ℃
- International standard pin-out
- continuous short circuit protection

PART NUMBER STRUCTURE

PART NUMBER SYSTEM

DFZ-0505-S1P

- Rated Power
- Package
- Output Voltage
- Input Voltage
- Product Series

DFZ_S1P & DEZ_S1P Series

INPUT SPECIFICATIONS

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	3.3 VDC input	--	415/25	--	mA
	5 VDC input	--	274/20	--	
	9 VDC input	--	139/20	--	
	12 VDC input	--	114/15	--	
	15 VDC input	--	84/10	--	
	24 VDC input	--	58/7	--	
Surge Voltage (1sec. max.)	3.3 VDC input	-0.7	--	5	VDC
	5 VDC input	-0.7	--	9	
	9 VDC input	-0.7	--	12	
	12 VDC input	-0.7	--	18	
	15 VDC input	-0.7	--	21	
	24 VDC input	-0.7	--	30	
Input Filter		Capacitor filter			

OUTPUT SPECIFICATIONS

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy			See tolerance envelope graph (Fig. 1)			
Line Regulation	Input voltage change: ±1%	3.3 VDC output	--	--	±1.5	--
		Other output	--	--	±1.2	
Load Regulation	10%-100% load	3.3VDC output	--	18	--	%
		5VDC output	--	12	--	
		9VDC output	--	9	--	
		12VDC output	--	8	--	
		15VDC output	--	7	--	
		24VDC output	--	6	--	
Ripple & Noise*	20MHz bandwidth	The output voltage is 12VDC and under	--	30	--	mVp-p
		15VDC and 24VDC output voltage	--	60	--	
Temperature Drift Coefficient	100% load		--	--	±0.03	%/℃
Output Short Circuit Protection			--	--	1	s
	Others		Continuous, self-recovery			

Note: * Ripple and noise tested with "parallel cable" method, please see *DC-DC Converter Application Notes* for specific operation methods.

PHYSICAL SPECIFICATIONS

Casing Material	Black flame-retardant heat-proof epoxy resin (UL94-V0)
Package Dimensions	19.50*6.00*9.30 mm
Weight	2.40g(Typ.)
Cooling Method	Free air convection

DFZ & DEZ - 1W Unregulated Single output

GENERAL SPECIFICATIONS

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-output, with the test time of 1 minute and the leak current lower than 1mA	3000	--	--	VDC
Isolation Resistance	Input-output, isolation voltage 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output, 100KHz/0.1V	--	20	--	pF
Operating Temperature	Derating if the temperature ≥85℃ (see Fig. 2)	-40	--	105	℃
Storage Temperature		-55	--	125	
Casing Temperature Rise	Ta=25℃	--	25	--	℃
Pin Welding Resistance Temperature	Welding spot is 1.5mm away from the casing, 10 seconds	--	--	300	
Storage Humidity	Non-condensing	--	--	95	%
Switching Frequency	100% load, nominal input voltage	--	100	300	KHz
MTBF	MIL-HDFK-217F@25℃	3500	--	--	K hours

EMC SPECIFICATIONS

EMI	Conducted disturbance		CISPR22/EN55022 CLASS B (see Fig. 4 for recommended circuit)
	Radiated emission		CISPR22/EN55022 CLASS B (see Fig. 4 for recommended circuit)
EMS	Electrostatic discharge	DEZ_S1P	IEC/EN61000-4-2 Contact ±6KV perf. Criteria B
		DFZ_S1P	IEC/EN61000-4-2 Contact ±8KV perf. Criteria B

MODEL SELECTION GUIDE

Certification	Part No.	Input Voltage (VDC)	Output		Efficiency (%,Min./Typ.) @ Full Load	Max. Capacitive Load① (μF)
		Nominal (Range)	Output Voltage (VDC)	Output Current (mA) (Max./Min.)		
--	DEZ-0312-S1P	3.3 (2.97-3.63)	±12	±42/±5	72/76	100
	DFZ-0303-S1P		3.3	303/30	69/73	220
	DFZ-0305-S1P		5	200/20	74/78	
	DFZ-0324-S1P		24	42/5	74/78	
UL/CE	DEZ-0505-S1P	5 (4.5-5.5)	±5	±100/±10	76/80	100
	DEZ-0509-S1P		±9	±56/±6	76/80	
	DEZ-0512-S1P		±12	±42/±5	76/80	
	DEZ-0515-S1P		±15	±33/±4	77/81	
	DEZ-0524-S1P		±24	±21/±2	77/81	
--	DFZ-0503-S1P		3.3	303/30	71/75	220
UL/CE	DFZ-0505-S1P		5	200/20	76/80	
	DFZ-0509-S1P		9	111/12	76/80	
	DFZ-0512-S1P		12	83/9	76/80	
	DFZ-0515-S1P		15	67/7	77/81	
	DFZ-0524-S1P		24	42/5	77/81	
--	DEF-0909-S1P	9 (8.1-9.9)	±9	±56/±6	76/80	100
	DFZ-0909-S1P		9	111/12	76/80	220
UL/CE	DEZ-1205-S1P	12 (10.8-13.2)	±5	±100/±10	76/80	100
	DEZ-1212-S1P		±12	±42/±5	77/81	
	DEZ-1215-S1P		±15	±33/±4	77/81	
	DEZ-1224-S1P		±24	±21/±2	76/80	
--	DFZ-1203-S1P		3.3	303/30	71/75	220
UL/CE	DFZ-1205-S1P		5	200/20	76/80	
	DFZ-1209-S1P		9	111/12	76/80	
	DFZ-1212-S1P		12	83/9	76/80	
	DFZ-1215-S1P		15	67/7	77/81	
	DFZ-1224-S1P		24	42/5	77/81	
--	DEZ-1505-S1P	15 (13.5-16.5)	±5	±100/±10	76/80	100
	DEZ-1515-S1P		±15	±33/±4	77/81	

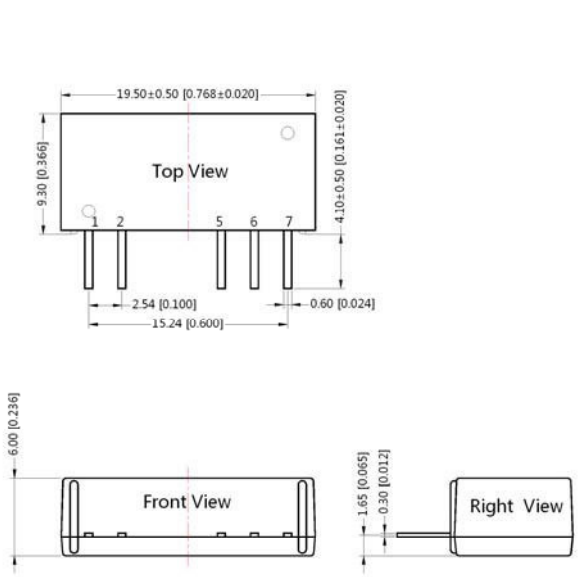
DFZ & DEZ - 1W Unregulated Single output

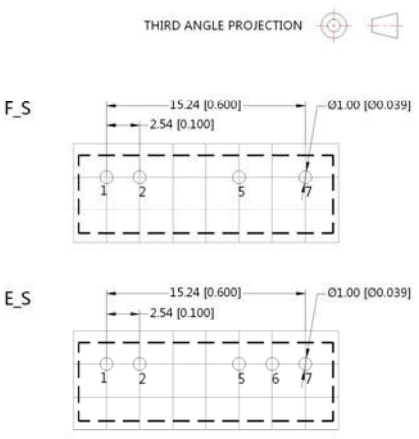
MODEL SELECTION GUIDE

CE	DFZ-1505-S1P	24 (21.6-26.4)	5	200/20	76/80	220
--	DFZ-1509-S1P		9	111/12	76/80	
	DFZ-1512-S1P		12	83/9	76/80	
CE	DFZ-1515-S1P		15	67/7	77/81	
UL/CE	DEZ-2405-S1P		±5	±100/±10	76/80	100
	DEZ-2409-S1P		±9	±56/±6	76/80	
	DEZ-2412-S1P		±12	±42/±5	77/81	
	DEZ-2415-S1P		±15	±33/±4	75/79	
	DEZ-2424-S1P		±24	±21/±2	76/80	
--	DFZ-2403-S1P		3.3	303/30	71/75	220
UL/CE	DFZ-2405-S1P		5	200/20	75/79	
	DFZ-2409-S1P		9	111/12	76/80	
	DFZ-2412-S1P		12	83/9	77/81	
	DFZ-2415-S1P		15	67/7	77/81	
	DFZ-2424-S1P		24	42/5	77/81	

Note：①The capacitive loads of positive and negative outputs are identical.

MECHANICAL SPECIFICATIONS





Note: Grid 2.54*2.54mm

Pin-Out		
Pin	F_S	E_S
1	Vin	Vin
2	GND	GND
5	0V	-Vo
6	No Pin	0V
7	+Vo	+Vo

Note:
Unit: mm[inch]
Pin section tolerances: ±0.10[±0.004]
General tolerances: ±0.25[±0.010]

DFZ & DEZ-2W Series

2W Unregulated Single output

Features

- SIP package
- Efficiency up to 89%
- High power density
- 3000VDC isolation
- Operating temperature range: -40℃ to +105 ℃
- No external component required
- International standard pin-out
- continuous short circuit protection

PART NUMBER STRUCTURE

PART NUMBER SYSTEM

DFZ-0505-S2P

- Rated Power
- Package
- Output Voltage
- Input Voltage
- Product Series

DFZ_S2P & DEZ_S2P Series

INPUT SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Input Surge Voltage (1sec. Max.)	5VDC Input	-0.7	--	9	VDC
	12VDC Input	-0.7	--	18	
	15VDC Input	-0.7	--	21	
	24VDC Input	-0.7	--	30	
Input Filter		Capacitance			

OUTPUT SPECIFICATIONS

Item	Test Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy			See tolerance envelope curve			
Line Voltage Regulation	For Vin change of ±1%		--	--	±1.2	%
Load Regulation	10% to 100% load	5VDC output	--	10	--	
		12VDC output	--	8	--	
		15VDC output	--	7	--	
		24VDC output	--	6	--	
Temperature coefficient	100% load		--	--	±0.03	%/°C
Ripple & Noise*	20MHz Bandwidth	Output Voltage ≤12VDC	--	60	--	mVp-p
		Output Voltage:15VDC, 24VDC	--	75	--	
Short Circuit Protection			Continuous, automatic recovery			

Note:* Ripple and noise tested with "parallel cable" method. See detailed operation instructions at *DC-DC Application Notes*.

COMMON SPECIFICATIONS

Item	Test Conditions		Min.	Typ.	Max.	Unit
Isolation Voltage	Input-Output, Tested for 1 minute and leakage current less than 1 mA		3000	--	--	VDC
Isolation Resistance	Input-Output, Test at 500VDC		1000	--	--	MΩ
Isolation Capacitance	Input-Output, 100KHz/0.1V	DEZ-2415-S2P/DFZ-2424-S2P	--	30	--	pF
		Others	--	20	--	
Switching Frequency	Full load, nominal input		--	100	300	KHz
MTBF	MIL-HDBK-217F@25℃		3500	--	--	K hours
Case Material			Plastic (UL94-V0)			
Weight			--	2.4	--	g

ENVIRONMENTAL SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Storage Humidity	Non condensing	--	--	95	%
Operating Temperature	Power derating (≥ 85℃, see figure 2)	-40	--	105	°C
Storage Temperature		-55	--	125	
Temp. rise	Ta=25°C,100% Load	--	25	--	
Lead Temperature	1.5mm from case for 10 seconds	--	--	300	
Cooling		Free air convection			

DFZ & DEZ - 2W Unregulated Single output

EMC SPECIFICATIONS

EMI	CE		CISPR22/EN55022 CLASS B（Typical Recommended Circuit Refer to Figure1）
	RE		CISPR22/EN55022 CLASS B（Typical Recommended Circuit Refer to Figure1）
EMS	ESD	DEZ_S2P	IEC/EN61000-4-2 Contact ±6KV perf. Criteria B
		DFZ_S2P	IEC/EN61000-4-2 Contact ±8KV perf. Criteria B

MODEL SELECTION GUIDE

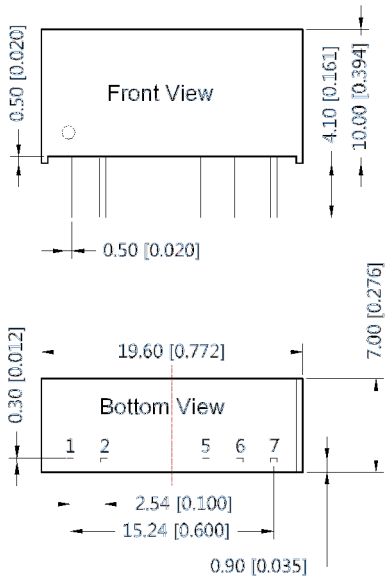
Model	Input Voltage(VDC) Nominal (Range)	Output Voltage (VDC)	Output Current (mA) Max.	Output Current (mA) Min.	Input Current (mA)(typ.) @Max. Load	Input Current (mA)(typ.) @No Load	Reflected Ripple Current (mA,typ.)	Max. Capacitive Load ① (μF)	Efficiency (%, typ.) @Max. Load
DEZ-0505-S2P	5 (4.5-5.5)	±5	±200	±20	476	25	10	100	80
DEZ-0512-S2P		±12	±83.3	±8.3	476				84
DEZ-0515-S2P		±15	±66.6	±6.7	476				84
DEZ-0524-S2P		±24	±41.6	±4.2	476				84
DFZ-0505-S2P		5	400	40	450			220	89
DFZ-0512-S2P		12	166.6	16.6	476				84
DFZ-0515-S2P		15	133.3	13.3	476				84
DFZ-0524-S2P		24	83.3	8.3	476				84
DEZ-1205-S2P	12 (10.8-13.2)	±5	±200	±20	198	15	5	100	84
DEZ-1212-S2P		±12	±83.3	±8.3	196				85
DEZ-1215-S2P		±15	±66.6	±6.7	198				84
DFZ-1205-S2P		5	400	40	198			220	84
DFZ-1212-S2P		12	166.6	16.6	198				84
DFZ-1215-S2P		15	133.3	13.3	198				84
DEZ-1515-S2P	15 (13.5-16.5)	±15	±66.6	±6.7	157	10		100	85
DEZ-2405-S2P	24 (21.6-26.4)	±5	±200	±20	99	8			84
DEZ-2412-S2P		±12	±83.3	±8.3	99				84
DEZ-2415-S2P		±15	±66.6	±6.7	99				84
DFZ-2405-S2P		5	400	40	99			220	84
DFZ-2412-S2P		12	166.6	16.6	99				84
DFZ-2415-S2P		15	133.3	13.3	99				84
DFZ-2424-S2P		24	83.3	8.3	98				85

Note: ① For dual output converter, the given value is the same for each output.

DFZ & DEZ - 2W Unregulated Single output

MECHANICAL SPECIFICATIONS

MECHANICAL DIMENSIONS

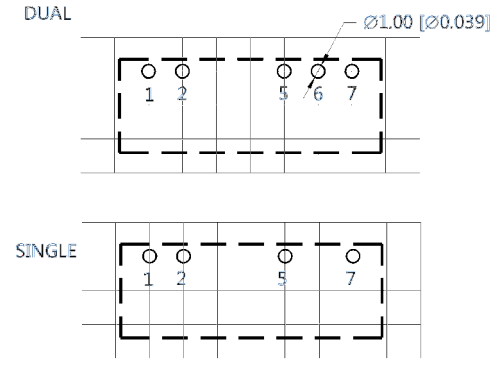


PIN CONNECTION		
Pin	Single	Dual
1	Vin	Vin
2	GND	GND
5	0V	-Vo
6	No Pin	0V
7	+Vo	+Vo

Note:
Unit :mm[inch]
Pin section tolerances:±0.1mm[±0.004inch]
General tolerances:±0.25mm[±0.010inch]

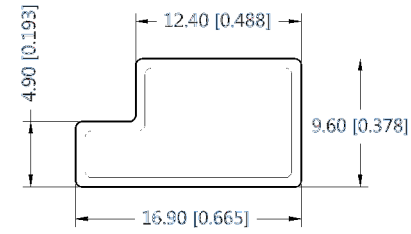
THIRD ANGLE PROJECTION

RECOMMENDED FOOTPRINT DETAILS



Note : Grid 2.54*2.54mm

TUBE PACKAGING DIMENSIONS



Note:
Unit:mm[inch]
General tolerances:±0.50mm[±0.020inch]
L=530mm[20.866inch] Tube Quantity:25 pcs
L=220mm[8.661inch] Tube Quantity:10 pcs
Inner carton(S): L*W*H=255*170*80 mm;
Outer carton(S): L*W*H=375*280*270mm, 6 inner cartons(S);
Inner carton(L): L*W*H=580*200*100mm;
Outer carton(L): L*W*H=600*215*220mm, 2 inner cartons(L);
Outer carton(L): L*W*H=600*215*325mm, 3 inner cartons(L);

1100000204-A0

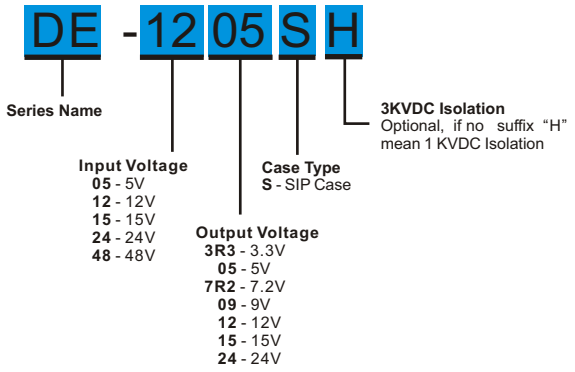
DE-2W Series

2W Unregulated Single output

Features

- 4 Pin SIL Package
- 1000 VDC Isolation
- Up to 3000 VDC Isolation
- Low Ripple and Noise
- Efficiency up to 88%
- -40 ~ 85°C Operation Temperature Range
- Non-Conductive Black Plastic Case
- EMI Complies With EN55022 Class B

PART NUMBER STRUCTURE



All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage accuracy	±3%
Line regulation	±1.2% / Per 1% Vin Change
Load regulation	(From 20% to 100% Load) ±10% (Output 3.3V Model) ±20% 150mV
Ripple & noise (20 MHz bandwidth)(1)	pk-pk
Temperature coefficient	±0.02%/°C
Capacitor load(2)	See table

INPUT SPECIFICATIONS

Voltage Range	±10%
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	Capacitors
Input Reflected Ripple Current (3)	20mA pk-pk

PHYSICAL SPECIFICATIONS

Case Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	0.5mm Alloy42 Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	1.8g
Dimensions	0.46"x0.29"x0.40"

ENVIRONMENT SPECIFICATIONS

Operating Temperature	-40°C~85°C(See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

ABSOLUTE MAXIMUM RATINGS(4)

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge Voltage(100mS)	
5 Models	7 Vdc ,max.
12 Models	15 Vdc ,max.
15 Models	18 Vdc ,max.
24 Models	28 Vdc ,max.
48 Models	54 Vdc ,max.
Soldering Temperature (1.5mm from case 10 sec. max.)	260°C ,max.

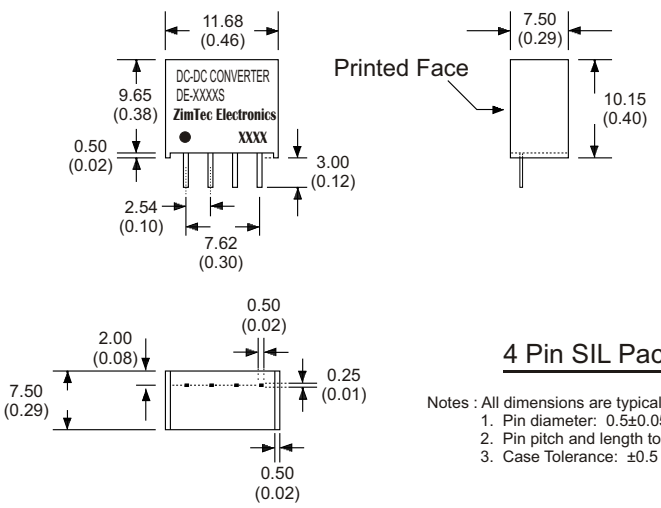
GENERAL SPECIFICATIONS

Efficiency	See table
I/O Isolation Voltage (3 sec) Input/Output	1000~3000Vdc
I/O Isolation Capacitance	60 pF Typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	Variable 70kHz
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1.121Mhrs
Safety Standard : (designed to meet)	IEC 60950-1

EMC SPECIFICATIONS

Radiated Emissions	EN55022	CLASS B
Conducted Emissions (6)	EN55022	CLASS B
ESD	IEC 61000-4-2	Perf. Criteria A
RS	IEC 61000-4-3	Perf. Criteria A
EFT (7)	IEC 61000-4-4	Perf. Criteria A
Surge (7)	IEC 61000-4-5	Perf. Criteria A
CS	IEC 61000-4-6	Perf. Criteria A
PFMF	IEC 61000-4-8	Perf. Criteria A

MECHANICAL SPECIFICATIONS



4 Pin SIL Package

Notes : All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5±0.05 (0.02±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS	
PIN NUMBER	SINGLE
1	−V Input
2	+V Input
3	−V Output
4	+V Output

(The Pin Connection of high isolation one is the same with normal one.)

DE - 2W Unregulated Single output

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
DE-053R3S	5	25	338	3.3	400	78	470
DE-0505S	5	25	494	5	400	81	470
DE-057R2S	5	35	500	7.2	278	80	470
DE-0509S	5	25	482	9	222	83	470
DE-0512S	5	30	476	12	167	84	470
DE-0515S	5	30	471	15	133	85	470
DE-0524S	5	30	465	24	83	86	470
DE-123R3S	12	20	152	3.3	400	72	470
DE-1205S	12	20	206	5	400	81	470
DE-127R2S	12	15	208	7.2	278	80	470
DE-1209S	12	15	196	9	222	85	470
DE-1212S	12	15	196	12	167	85	470
DE-1215S	12	15	196	15	133	85	470
DE-1224S	12	25	196	24	83	85	470
DE-153R3S	15	15	116	3.3	400	76	470
DE-1505S	15	15	165	5	400	81	470
DE-157R2S	15	15	161	7.2	278	83	470
DE-1509S	15	15	167	9	222	80	470
DE-1512S	15	15	158	12	167	84	470
DE-1515S	15	13	155	15	133	86	470
DE-1524S	15	17	159	24	83	84	470
DE-243R3S	24	7	68	3.3	400	81	470
DE-2405S	24	8	100	5	400	83	470
DE-247R2S	24	10	102	7.2	278	82	470
DE-2409S	24	6	98	9	222	85	470
DE-2412S	24	8	97	12	167	86	470
DE-2415S	24	8	97	15	133	86	470
DE-2424S	24	8	95	24	83	88	470
DE-483R3S	48	5	37	3.3	400	74	470
DE-4805S	48	5	53	5	400	79	470
DE-487R2S	48	5	50	7.2	278	83	470
DE-4809S	48	5	50	9	222	83	470
DE-4812S	48	5	51	12	167	81	470
DE-4815S	48	5	51	15	133	82	470
DE-4824S	48	5	48	24	83	86	470

Suffix “H” means 3 KVdc isolation

D3-2W Series

2W Unregulated Single & Dual output

Features

- 7 Pin SIL / 14 Pin DIL Package
- 1000 VDC Isolation
- Up to 6000 VDC Isolation
- Low Ripple and Noise
- Efficiency up to 86%
- -40 ~ 85℃ Operation Temperature Range
- Non-Conductive Black Plastic Case

PART NUMBER STRUCTURE

D3 - 12 05 SS H6

Series Name

Input Voltage
3R3 - 3.3V
05 - 5V
12 - 12V
24 - 24V
48 - 48V

Output Voltage
3R3 - 3.3V
05 - 5V
7R2 - 7.2V
09 - 9V
12 - 12V
15 - 15V
18 - 18V
24 - 24V

Case & Output T ype
S - SIP Case, Dual Output
D - DIP Case, Dual Output
SS - SIP Case, Single Output
DS - DIP Case, Single Output

High Isolation
Optional, if no suffix "H" mean 1 KVDC Isolation
H - 3KVdc Isolation
H2 - 2KVdc Isolation
H4 - 4KVdc Isolation
H5 - 5.2KVdc Isolation
H6 - 6KVdc Isolation

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage accuracy	±3%
Line regulation	± 1.2% / Per 1% Vin Change
Load regulation	(From 20% to 100% Load) ±10% (Output 3.3V Model) ±20%
Ripple & noise (20 MHz bandwidth)(1)	75mV pk-pk
Temperature coefficient	±0.02%/°C
Capacitor load(2)	See table

INPUT SPECIFICATIONS

Voltage Range	±10%
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	Capacitors
Input Reflected Ripple Current (3)	20mA pk-pk

ENVIRONMENT SPECIFICATIONS

Operating Temperature	-40°C~85°C(See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

GENERAL SPECIFICATIONS

Efficiency	See table
I/O Isolation V oltage (3 sec) Input/Output	1000~6000Vdc
I/O Isolation Capacitance	60 pF Typ.
I/O Isolation Resistance	1000M Ohm, min
Switching Frequency	Variable 80kHz
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1.121 Mhrs
Safety Standard : (designed to meet)	IEC 60950-1

EMC SPECIFICATIONS

Radiated Emissions	EN55022	CLASS B
Conducted Emissions (4)	EN55022	CLASS B
ESD	IEC 61000-4-2	Perf. Criteria A
RS	IEC 61000-4-3	Perf. Criteria A
EFT (5)	IEC 61000-4-4	Perf. Criteria A
Surge (5)	IEC 61000-4-5	Perf. Criteria A
CS	IEC 61000-4-6	Perf. Criteria A
PFMF	IEC 61000-4-8	Perf. Criteria A

PHYSICAL SPECIFICATIONS

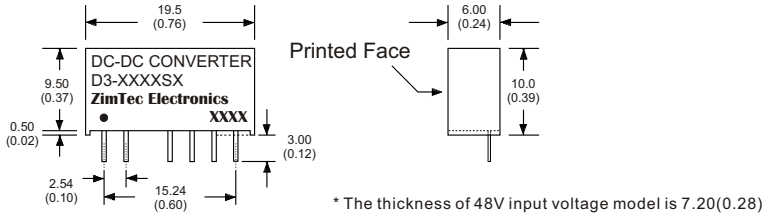
Case Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	0.5mm Alloy42 Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	(SIP/2.3g) (DIP/2.6g)
Dimensions	SIP Case 0.76"x0.24"x0.39" DIP Case 0.80"x0.40"x0.27"

ABSOLUTE MAXIMUM RATINGS (6)

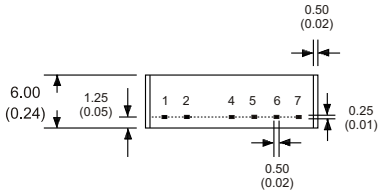
These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge Voltage(100mS)	
3.3 Models	6 Vdc ,max.
5 Models	7 Vdc ,max.
12 Models	15 Vdc ,max.
15 Models	18 Vdc ,max.
24 Models	28 Vdc ,max.
48 Models	54 Vdc ,max.
Soldering Temperature (1.5mm from case 10 sec. max.)	260 °C ,max.

MECHANICAL SPECIFICATIONS



* The thickness of 48V input voltage model is 7.20(0.28)



7 Pin SIL Package

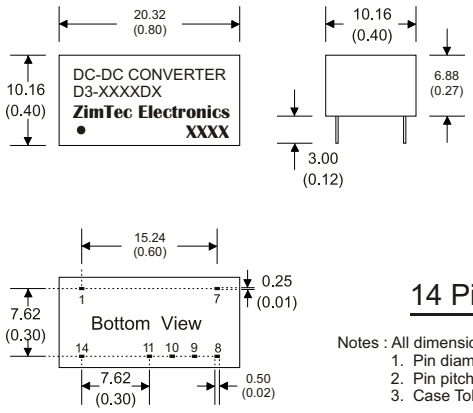
Notes : All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5±0.05 (0.02±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS

PIN NUMBER	SINGLE	DUAL	SINGLE-H	DUAL-H
1	+V Input	+V Input	+V Input	+V Input
2	−V Input	−V Input	−V Input	−V Input
4	−V Output	−V Output	N.P.	N.P.
5	N.P.	Common	−V Output	−V Output
6	+V Output	+V Output	N.P.	Common
7	N.P.	N.P.	+V Output	+V Output

D3 - 2W Unregulated Single & Dual output

MECHANICAL SPECIFICATIONS



14 Pin DIL Package

Notes : All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5±0.05 (0.02±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS				
PIN NUMBER	SINGLE	DUAL	SINGLE-H	DUAL-H
1	−V Input	−V Input	−V Input	−V Input
7	N.C.	N.C.	N.C.	N.C.
8	N.P.	Common	+V Output	+V Output
9	+V Output	+V Output	N.P.	Common
10	N.P.	N.P.	−V Output	−V Output
11	−V Output	−V Output	N.P.	N.P.
14	+V Input	+V Input	+V Input	+V Input

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
D3-3R33R3SS	3.3	26	797	3.3	400	76	470
D3-3R305SS	3.3	30	797	5	400	76	470
D3-3R37R2SS	3.3	30	808	7.2	278	75	470
D3-3R309SS	3.3	30	758	9	222	80	470
D3-3R312SS	3.3	35	748	12	167	81	470
D3-3R315SS	3.3	40	777	15	133	78	470
D3-3R318SS	3.3	35	787	18	111	77	470
D3-3R324SS	3.3	35	767	24	83	79	470
D3-053R3SS	5	16	513	3.3	400	78	470
D3-0505SS	5	20	488	5	400	82	470
D3-057R2SS	5	22	494	7.2	278	81	470
D3-0509SS	5	35	476	9	222	84	470
D3-0512SS	5	30	470	12	167	85	470
D3-0515SS	5	25	465	15	133	86	470
D3-0518SS	5	25	494	18	111	81	470
D3-0524SS	5	22	471	24	83	85	470
D3-123R3SS	12	20	242	3.3	400	69	470
D3-1205SS	12	20	203	5	400	82	470
D3-127R2SS	12	15	201	7.2	278	83	470
D3-1209SS	12	17	201	9	222	83	470
D3-1212SS	12	15	196	12	167	85	470
D3-1215SS	12	20	196	15	133	85	470
D3-1218SS	12	18	198	18	111	84	470
D3-1224SS	12	15	201	24	83	83	470
D3-243R3SS	24	5	107	3.3	400	78	470
D3-2405SS	24	10	104	5	400	80	470
D3-247R2SS	24	10	104	7.2	278	80	470
D3-2409SS	24	10	100	9	222	83	470
D3-2412SS	24	8	98	12	167	85	470
D3-2415SS	24	8	99	15	133	84	470
D3-2418SS	24	10	102	18	111	82	470
D3-2424SS	24	13	100	24	83	83	470

Suffix “H” means 3 KVdc isolation Suffix “H2” means 2 KVdc isolation Suffix “H4” means 4 KVdc isolation
Suffix “H5” means 5.2 KVdc isolation Suffix “H6” means 6 KVdc isolation

D3 - 2W Unregulated Single & Dual output

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
D3-483R3SS	48	5	53	3.3	400	78	470
D3-4805SS	48	5	53	5	400	78	470
D3-487R2SS	48	10	52	7.2	278	80	470
D3-4809SS	48	10	52	9	222	80	470
D3-4812SS	48	10	50	12	167	82	470
D3-4815SS	48	8	52	15	133	80	470
D3-4818SS	48	8	51	18	111	81	470
D3-4824SS	48	10	51	24	83	81	470
D3-3R33R3DS	3.3	26	808	3.3	400	75	470
D3-3R305DS	3.3	40	819	5	400	74	470
D3-3R37R2DS	3.3	40	808	7.2	278	75	470
D3-3R309DS	3.3	45	808	9	222	75	470
D3-3R312DS	3.3	50	767	12	167	79	470
D3-3R315DS	3.3	47	767	15	133	79	470
D3-3R318DS	3.3	50	787	18	111	77	470
D3-3R324DS	3.3	47	797	24	83	76	470
D3-053R3DS	5	20	506	3.3	400	79	470
D3-0505DS	5	20	470	5	400	85	470
D3-057R2DS	5	25	482	7.2	278	83	470
D3-0509DS	5	30	476	9	222	84	470
D3-0512DS	5	30	471	12	167	85	470
D3-0515DS	5	25	465	15	133	86	470
D3-0518DS	5	32	500	18	111	80	470
D3-0524DS	5	25	500	24	83	80	470
D3-123R3DS	12	12	219	3.3	400	76	470
D3-1205DS	12	10	211	5	400	79	470
D3-127R2DS	12	16	201	7.2	278	83	470
D3-1209DS	12	10	196	9	222	85	470
D3-1212DS	12	13	194	12	167	86	470
D3-1215DS	12	15	201	15	133	83	470
D3-1218DS	12	18	198	18	111	84	470
D3-1224DS	12	15	201	24	83	83	470
D3-243R3DS	24	10	110	3.3	400	76	470
D3-2405DS	24	8	102	5	400	82	470
D3-247R2DS	24	10	104	7.2	278	80	470
D3-2409DS	24	8	102	9	222	82	470
D3-2412DS	24	8	100	12	167	83	470
D3-2415DS	24	8	98	15	133	85	470
D3-2418DS	24	10	102	18	111	82	470
D3-2424DS	24	12	100	24	83	83	470
D3-483R3DS	48	5	53	3.3	400	78	470
D3-4805DS	48	5	53	5	400	78	470
D3-487R2DS	48	10	52	7.2	278	80	470
D3-4809DS	48	8	52	9	222	80	470
D3-4812DS	48	5	50	12	167	84	470
D3-4815DS	48	8	52	15	133	80	470
D3-4818DS	48	8	51	18	111	81	470
D3-4824DS	48	10	51	24	83	81	470

Suffix “H” means 3 KVdc isolation Suffix “H2” means 2 KVdc isolation Suffix “H4” means 4 KVdc isolation
Suffix “H5” means 5.2 KVdc isolation Suffix “H6” means 6 KVdc isolation

D3 - 2W Unregulated Single & Dual output

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
D3-3R33R3S	3.3	25	797	±3.3	±200	76	±220
D3-3R305S	3.3	40	777	±5	±200	78	±220
D3-3R37R2S	3.3	40	797	±7.2	±139	76	±220
D3-3R309S	3.3	40	797	±9	±111	76	±220
D3-3R312S	3.3	45	777	±12	±83.5	78	±220
D3-3R315S	3.3	45	777	±15	±66.6	78	±220
D3-3R318S	3.3	45	777	±18	±55.5	78	±220
D3-3R324S	3.3	45	767	±24	±41.6	79	±220
D3-053R3S	5	25	588	±3.3	±200	68	±220
D3-0505S	5	25	548	±5	±200	73	±220
D3-057R2S	5	25	519	±7.2	±139	77	±220
D3-0509S	5	30	506	±9	±111	79	±220
D3-0512S	5	30	494	±12	±83.5	81	±220
D3-0515S	5	30	488	±15	±66.6	82	±220
D3-0518S	5	26	482	±18	±55.5	83	±220
D3-0524S	5	30	488	±24	±41.6	82	±220
D3-123R3S	12	10	245	±3.3	±200	68	±220
D3-1205S	12	18	225	±5	±200	74	±220
D3-127R2S	12	15	211	±7.2	±139	79	±220
D3-1209S	12	13	203	±9	±111	82	±220
D3-1212S	12	23	203	±12	±83.5	82	±220
D3-1215S	12	20	201	±15	±66.6	83	±220
D3-1218S	12	16	198	±18	±55.5	84	±220
D3-1224S	12	15	196	±24	±41.6	85	±220
D3-243R3S	24	6	117	±3.3	±200	71	±220
D3-2405S	24	7	111	±5	±200	75	±220
D3-247R2S	24	12	110	±7.2	±139	76	±220
D3-2409S	24	7	103	±9	±111	81	±220
D3-2412S	24	6	99	±12	±83.5	84	±220
D3-2415S	24	6	98	±15	±66.6	85	±220
D3-2418S	24	6	97	±18	±55.5	86	±220
D3-2424S	24	8	97	±24	±41.6	86	±220
D3-483R3S	48	5	56	±3.3	±200	75	±220
D3-4805S	48	4	56	±5	±200	75	±220
D3-487R2S	48	5	53	±7.2	±139	78	±220
D3-4809S	48	5	54	±9	±111	77	±220
D3-4812S	48	4	50	±12	±83.5	83	±220
D3-4815S	48	5	50	±15	±66.6	83	±220
D3-4818S	48	6	52	±18	±55.5	80	±220
D3-4824S	48	6	52	±24	±41.6	80	±220
D3-3R33R3D	3.3	25	808	±3.3	±200	75	±220
D3-3R305D	3.3	45	808	±5	±200	75	±220
D3-3R37R2D	3.3	40	797	±7.2	±139	76	±220
D3-3R309D	3.3	40	797	±9	±111	76	±220
D3-3R312D	3.3	45	777	±12	±83.5	78	±220
D3-3R315D	3.3	45	777	±15	±66.6	78	±220
D3-3R318D	3.3	45	777	±18	±55.5	78	±220
D3-3R324D	3.3	45	767	±24	±41.6	79	±220

Suffix “H” means 3 KVdc isolation Suffix “H2” means 2 KVdc isolation Suffix “H4” means 4 KVdc isolation
Suffix “H5” means 5.2 KVdc isolation Suffix “H6” means 6 KVdc isolation

D3 - 2W Unregulated Single & Dual output

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
D3-053R3D	5	25	597	±3.3	±200	67	±220
D3-0505D	5	15	533	±5	±200	75	±220
D3-057R2D	5	35	556	±7.2	±139	72	±220
D3-0509D	5	30	476	±9	±111	84	±220
D3-0512D	5	25	488	±12	±83.5	82	±220
D3-0515D	5	25	488	±15	±66.6	82	±220
D3-0518D	5	25	476	±18	±55.5	84	±220
D3-0524D	5	40	482	±24	±41.6	83	±220
D3-123R3D	12	15	249	±3.3	±200	67	±220
D3-1205D	12	20	225	±5	±200	74	±220
D3-127R2D	12	20	219	±7.2	±139	76	±220
D3-1209D	12	15	206	±9	±111	81	±220
D3-1212D	12	23	203	±12	±83.5	82	±220
D3-1215D	12	20	201	±15	±66.6	83	±220
D3-1218D	12	16	198	±18	±55.5	84	±220
D3-1224D	12	16	196	±24	±41.6	85	±220
D3-243R3D	24	10	123	±3.3	±200	68	±220
D3-2405D	24	8	110	±5	±200	76	±220
D3-247R2D	24	15	111	±7.2	±139	75	±220
D3-2409D	24	7	105	±9	±111	79	±220
D3-2412D	24	7	100	±12	±83.5	83	±220
D3-2415D	24	7	98	±15	±66.6	85	±220
D3-2418D	24	10	99	±18	±55.5	84	±220
D3-2424D	24	8	99	±24	±41.6	84	±220
D3-483R3D	48	5	64	±3.3	±200	65	±220
D3-4805D	48	4	56	±5	±200	75	±220
D3-487R2D	48	10	56	±7.2	±139	74	±220
D3-4809D	48	5	54	±9	±111	77	±220
D3-4812D	48	5	52	±12	±83.5	80	±220
D3-4815D	48	8	51	±15	±66.6	81	±220
D3-4818D	48	6	52	±18	±55.5	80	±220
D3-4824D	48	6	52	±24	±41.6	80	±220

Suffix “H” means 3 KVdc isolation Suffix “H2” means 2 KVdc isolation Suffix “H4” means 4 KVdc isolation
Suffix “H5” means 5.2 KVdc isolation Suffix “H6” means 6 KVdc isolation

D5-2W Series

2W Regulated Single & Dual output

Features

- Regulated 24 Pin DIL Package
- Full SMD Technology
- 1000 VDC Isolation, Up to 6000 VDC (Metal Case Up To 3000Vdc)
- Continuous Short Circuit Protection
- Efficiency up to 81%
- -40 ~ 85°C Operation Temperature Range
- Plastic Case Standard, Optional Metal Case

PART NUMBER STRUCTURE

D5 - 24 05 S 2 H6 M - R

- **Series Name**
- **Input Voltage**: 05 - 5V; 12 - 12V; 24 - 24V
- **Output Voltage**: 3R3 - 3.3V; 05 - 5V; 7R2 - 7.2V; 09 - 9V; 12 - 12V; 15 - 15V; 18 - 18V; 24 - 24V
- **Output Type**: S - Single Output; D - Dual Output
- **2 Watt**
- **High Isolation.** Optional, if no suffix "H" mean1KVdc Isolation; H - 3KVdc Isolation; H4 - 4KVdc Isolation; H5 - 5.2KVdc Isolation; H6 - 6KVdc Isolation
- **Metal Case.** Optional, if no suffix "M" mean plastic Case
- **Note** For Dual Output

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage accuracy	±2%
Line regulation	Single & Dual : ±0.5 %,max.
Load regulation	Single (0% to 100%) : ±1.0%,max.
	Dual (0% to 100%) : ±0.5%,max(balanced load)
	Single & Dual (Output 3.3V Model) : ±2.0%,max.
Ripple & noise (20 MHz bandwidth)(1)	75mV pk-pk,max.
Short Circuit Protection	Indefinite(Automatic Recovery)
Temperature coefficient	±0.02%/°C
Capacitor load(2)	See table
Transient Recovery Time(3)	±3%, max.
Transient Response	(3.3V Output ±5%, max.)

INPUT SPECIFICATIONS

Voltage Range	±10%
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	PI type
Input Reflected Ripple Current(4)	35mA pk-pk

GENERAL SPECIFICATIONS

Efficiency	See table
I/O Isolation V oltage (3 sec)	
Input/Output	1000~6000Vdc
Metal Case/Input&Ouput	1000Vdc
I/O Isolation Capacitance	60 pF Typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	Single 40kHz typ
	Dual 250kHz typ
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1 Mhrs
Safety Standard : (designed to meet)	IEC 60950-1

PHYSICAL SPECIFICATIONS

Case Material	Non-conductive Black Plastic(UL94V-0 rated)
	Nickel-coated Copper
Base Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	0.5mm Alloy42 Solder-coated
	¨ 0.5mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	12.5g(Plastic Case)/15.0g(Metal Case)
Dimensions	1.25"x0.8"x0.4"

ENVIRONMENT SPECIFICATIONS

Operating Temperature	-40 °C~85 °C(See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

ABSOLUTE MAXIMUM RATINGS(5)

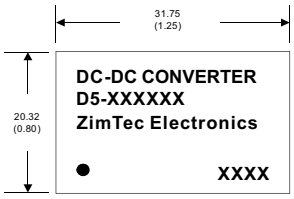
These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

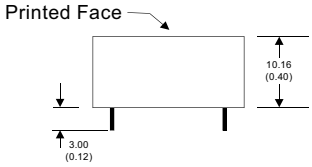
Input Surge V oltage (100mS)	
5 Models	7 Vdc ,max.
12 Models	15 Vdc ,max.
24 Models	28 Vdc ,max.
Soldering Temperature (1.5mm from case 10 sec. max.)	260 °C ,max.

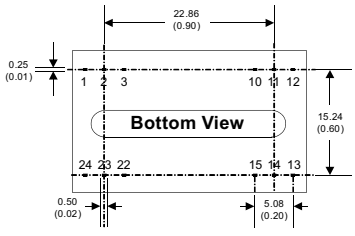
EMC SPECIFICATIONS

Radiated Emissions	EN55022	CLASS A
Conducted Emissions (7)	EN55022	CLASS A
ESD	IEC 61000-4-2	Perf. Criteria A
RS	IEC 61000-4-3	Perf. Criteria A
EFT (8)	IEC 61000-4-4	Perf. Criteria A
Surge (8)	IEC 61000-4-5	Perf. Criteria A
CS	IEC 61000-4-6	Perf. Criteria A
PFMF	IEC 61000-4-8	Perf. Criteria A

MECHANICAL SPECIFICATIONS







24 Pin DIL Package

Non-Conductive Plastic

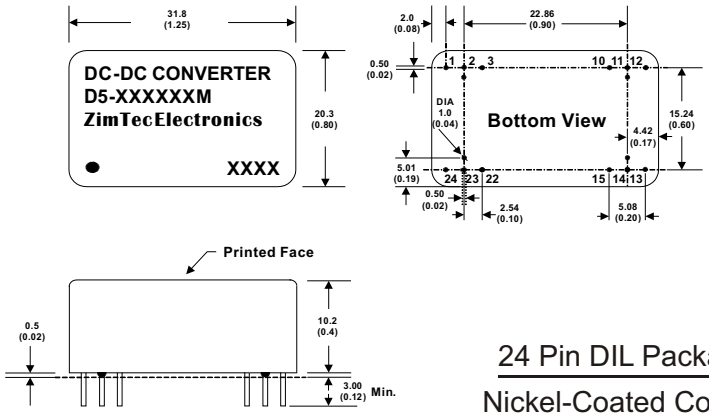
Notes : All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5±0.05 (0.02±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS

PIN NUMBER	SINGLE	DUAL	SINGLE-H	DUAL-H
1	+V Input	+V Input	+V Input	+V Input
2	N.C.	−V Output	+V Input	+V Input
3	N.C.	Common	N.P.	N.P.
10	−V Output	Common	N.P.	Common
11	+V Output	+V Output	N.P.	Common
12	−V Input	−V Input	−V Output	N.P.
13	−V Input	−V Input	+V Output	−V Output
14	+V Output	+V Output	N.P.	N.P.
15	−V Output	Common	N.P.	+V Output
22	N.C.	Common	N.P.	N.P.
23	N.C.	−V Output	−V Input	−V Input
24	+V Input	+V Input	−V Input	−V Input

D5 - 2W Regulated Single & Dual output

MECHANICAL SPECIFICATIONS



For "M" Case

24 Pin DIL Package

Nickel-Coated Copper

Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)
4. Stand-off tolerance: ±0.1 (±0.004)

PIN CONNECTIONS				
PIN NUMBER	SINGLE	DUAL	SINGLE-H	DUAL-H
1	+V Input	+V Input	+V Input	+V Input
2	N.C.	−V Output	+V Input	+V Input
3	N.C.	Common	N.P.	N.P.
10	−V Output	Common	N.P.	Common
11	+V Output	+V Output	N.P.	Common
12	−V Input	−V Input	−V Output	N.P.
13	−V Input	−V Input	+V Output	−V Output
14	+V Output	+V Output	N.P.	N.P.
15	−V Output	Common	N.P.	+V Output
22	N.C.	Common	N.P.	N.P.
23	N.C.	−V Output	−V Input	−V Input
24	+V Input	+V Input	−V Input	−V Input

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
D5-053R3S2	5	65	569	3.3	500	58	330
D5-0505S2	5	42	588	5	400	68	330
D5-057R2S2	5	50	588	7.2	278	68	330
D5-0509S2	5	55	571	9	222	70	330
D5-0512S2	5	52	563	12	167	71	330
D5-0515S2	5	55	588	15	133	68	330
D5-0518S2	5	55	597	18	111	67	330
D5-0524S2	5	95	606	24	83.3	66	330
D5-123R3S2	12	35	225	3.3	500	61	330
D5-1205S2	12	20	256	5	400	65	330
D5-127R2S2	12	25	256	7.2	278	65	330
D5-1209S2	12	31	238	9	222	70	330
D5-1212S2	12	30	231	12	167	72	330
D5-1215S2	12	35	238	15	133	70	330
D5-1218S2	12	40	238	18	111	70	330
D5-1224S2	12	40	235	24	83.3	71	330
D5-243R3S2	24	15	139	3.3	600	60	330
D5-2405S2	24	15	121	5	400	69	330
D5-247R2S2	24	20	126	7.2	278	66	330
D5-2409S2	24	25	128	9	222	65	330
D5-2412S2	24	20	121	12	167	69	330
D5-2415S2	24	20	121	15	133	69	330
D5-2418S2	24	20	121	18	111	69	330
D5-2424S2	24	20	116	24	83.3	72	330
D5-053R3D2-R	5	13	606	±3.3	±300	66	±1000
D5-0505D2-R	5	15	548	±5	±200	73	±1000
D5-057R2D2-R	5	20	548	±7.2	±278	73	±470
D5-0509D2-R	5	60	526	±9	±111	76	±470
D5-0512D2-R	5	20	563	±12	±83.3	71	±470
D5-0515D2-R	5	25	556	±15	±67	72	±470
D5-0518D2-R	5	42	556	±18	±111	72	±220

Suffix "H" means 3KVdc isolation Suffix "H4" means 4KVdc isolation Suffix "H5" means 5.2KVdc isolation
Suffix "H6" means 6KVdc isolation
Suffix "M" means Metal Case Up To 3KVdc isolation

D5 - 2W Regulated Single & Dual output

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current		OUTPUT Voltage (Vdc)	OUTPUT Current	EFFICIENCY @FL(%)	Capacitor Load(uF)
		No-Load (mA)	Full Load (mA)		Full load (mA)		
D5-0524D2-R	5	40	556	±24	±42	72	±220
D5-123R3D2-R	12	6	231	±3.3	±300	72	±1000
D5-1205D2-R	12	7	219	±5	±200	76	±1000
D5-127R2D2-R	12	10	222	±7.2	±278	75	±470
D5-1209D2-R	12	10	208	±9	±111	80	±470
D5-1212D2-R	12	12	208	±12	±83.3	80	±470
D5-1215D2-R	12	15	208	±15	±67	80	±470
D5-1218D2-R	12	20	222	±18	±111	75	±220
D5-1224D2-R	12	20	216	±24	±42	77	±220
D5-243R3D2-R	24	5	114	±3.3	±300	73	±1000
D5-2405D2-R	24	5	107	±5	±200	78	±1000
D5-247R2D2-R	24	6	104	±7.2	±278	80	±470
D5-2409D2-R	24	6	103	±9	±111	81	±470
D5-2412D2-R	24	6	103	±12	±83.3	81	±470
D5-2415D2-R	24	10	107	±15	±67	78	±470
D5-2418D2-R	24	10	110	±18	±111	76	±220
D5-2424D2-R	24	15	107	±24	±42	78	±220

Suffix “H” means 3KVdc isolation Suffix “H4” means 4KVdc isolation Suffix “H5” means 5.2KVdc isolation
Suffix “H6” means 6KVdc isolation
Suffix “M” means Metal Case Up To 3KVdc isolation

DB-1W Series

1W 2:1 Regulated Single & Dual output

Features

- 8 Pin SIL / 16 Pin DIL
- Wide 2:1 Input Range
- Full SMD Technology
- 1000 VDC Isolation, Up to 3000 VDC
- Continuous Short Circuit Protection
- Efficiency up to 77%
- -40 ~ 85°C Operation Temperature Range
- Plastic Case Standard, Optional Metal Case
- Remote on/off Control (Optional)

PART NUMBER STRUCTURE

DB - 24 05 SD 1 H M C

- **DB** — Series Name
- **24** — Input Voltage Range
  - **05** - 4.5~9V
  - **12** - 9 ~ 18V
  - **24** - 18 ~ 36V
  - **48** - 36 ~ 72V
- **05** — Output Voltage
  - **3R3** - 3.3V
  - **5** - 5V
  - **9** - 9V
  - **12** - 12V
  - **15** - 15V
  - **24** - 24V
- **SD** — Case Type
  - **S** - SIP Single Output
  - **D** - DIP Single Output
  - **SD** - SIP Dual Output
  - **DD** - DIP Dual Output
  - **SZ** - For TRACO TMR Series
- **1** — Watt
- **H** — 3KVdc Isolation. Optional, if no suffix "H" mean1KVdc Isolation
- **M** — Metal Case . Optional, if no suffix "M" mean plastic Case
- **C** — Control Pin Optional

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage Accuracy		±2%
Maximun Output Current		See table
Line Regulation		±0.5%,max
Load Regulation	(From 25% to 100% Loading)	±1%,max
Cross Regulation (Dual Output) (4)		±5%
Ripple & Noise (20 Mhz bandwidth)(5)		80mVpp,max
Short Circuit Protection		Indefinite (Automatic Recovery)
Temperature Coefficient		±0.02%/°C
Capacitive Load(6)		See table

INPUT SPECIFICATIONS

Voltage Range	See table
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	Capacitor
Input Reflected Ripple Current (7)	35mA pk-pk

ENVIRONMENT SPECIFICA TIONS

Operating Temperature	-40°C~85°C	(See Derating Curve)
Maximum Case Temperature		100°C
Storage Temperature		- 40°C~125°C
Cooling		Nature Convection

ABSOLUTE MAXIMUM RATINGS(8)

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge V oltage(100ms max)	
05 Models	12Vdc,max.
12 Models	24Vdc,max.
24 Models	40Vdc,max.
48 Models	80Vdc,max.
Soldering Temperature (1.5mm from case 10 sec. max.)	260°C max.

GENERAL SPECIFICA TIONS

Efficiency		See table
I/O Isolation V oltage	(tested for 3 sec)	1000~3000Vdc
Metal Case/Input & Output		1000Vdc
I/O Isolation Capacitance		60 pF,max
I/O Isolation Resistance		1000M Ohm,min
Switching Frequency		100~650kHz
Humidity		95%relH
Reliability Calculated MTBF	(MIL-HDBK-217 F)	>1.66 Mhrs
Safety Standard :	(designed to meet)	IEC/EN 60950-1
Remote On/Off (CTRL) (11)		

PHYSICAL SPECIFICATIONS

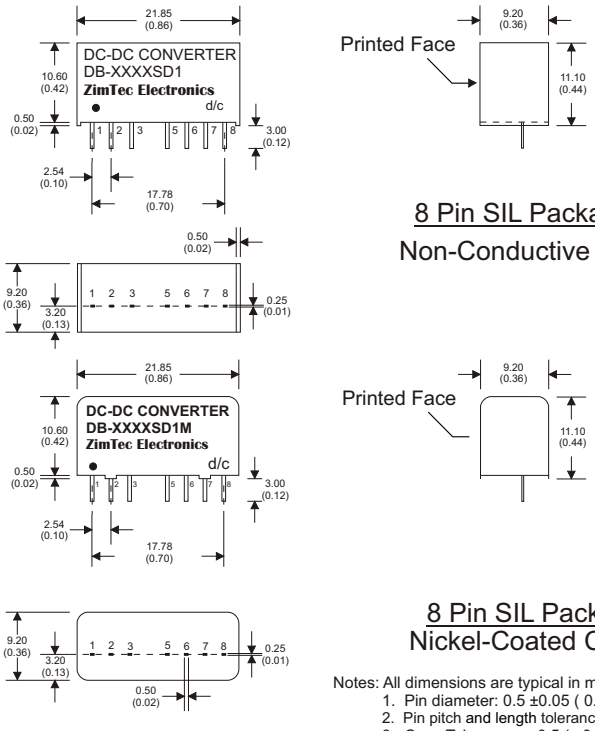
Case Material	Non-conductive Black Plastic (UL94V-0 rated)
Pin Material	Nickel-coated Copper
SIP Case	Alloy42 Solder-coated
DIP Case	¨0.5mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	4.5g(SIP)~6g(DIP) Metal Case/6.5g(SIP)~8g(DIP)
Dimensions	
SIP Case	0.86"x0.36"x0.44"
DIP Case	0.92"x0.55"x0.40"

EMC SPECIFICA TIONS

Radiated Emissions	EN55022	CLASS A
Conducted Emissions (12)	EN55022	CLASS A
ESD	IEC 61000-4-2	Perf. Criteria B
RS	IEC 61000-4-3	Perf. Criteria A
EFT (13)	IEC 61000-4-4	Perf. Criteria B
Surge (13)	IEC 61000-4-5	Perf. Criteria B
CS	IEC 61000-4-6	Perf. Criteria A
PFMF	IEC 61000-4-8	Perf. Criteria A

DB - 1W 2:1 Regulated Single & Dual output

MECHANICAL SPECIFICATIONS



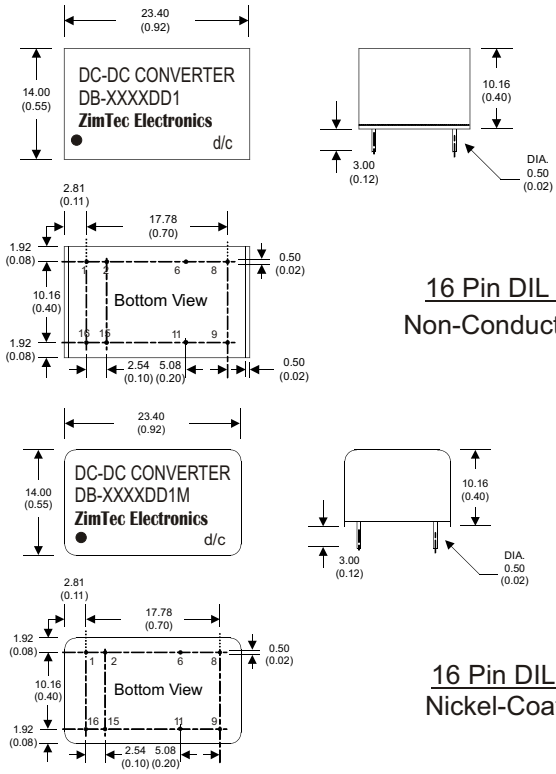
8 Pin SIL Package
Non-Conductive Plastic

8 Pin SIL Package
Nickel-Coated Copper

Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS			
PIN NUMBER	SINGLE	DUAL/(SD)	DUAL/(SZ)
1	−V Input	−V Input	−V Input
2	+V Input	+V Input	+V Input
3	N.P.	N.C.	N.C.
5	N.P.	N.C.	N.C.
6	+V Output	+V Output	+V Output
7	−V Output	−V Output	Common
8	N.C.	Common	−V Output
PIN NUMBER	SINGLE+C	DUAL/(SD+C)	DUAL/(SZ+C)
1	−V Input	−V Input	−V Input
2	+V Input	+V Input	+V Input
3	Remote On/Off	Remote On/Off	Remote On/Off
5	N.C.	N.C.	N.C.
6	+V Output	+V Output	+V Output
7	−V Output	−V Output	Common
8	N.C.	Common	−V Output

(The Pin Connection of high isolation one is the same with normal one.)



16 Pin DIL Package
Non-Conductive Plastic

16 Pin DIL Package
Nickel-Coated Copper

PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
1	−V Input	−V Input
2	−V Input	−V Input
6	N.C.	Common
8	N.C.	−V Output
9	+V Output	+V Output
11	−V Output	Common
15	+V Input	+V Input
16	+V Input	+V Input

(The Pin Connection of high isolation one is the same with normal one.)

DB - 1W 2:1 Regulated Single & Dual output

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
DB-053R3S1	4.5-9	15	298	3.3	76	303	67	3300
DB-0505S1	4.5-9	15	298	5	50	200	67	3300
DB-0509S1	4.5-9	40	285	9	28	111	70	470
DB-0512S1	4.5-9	55	285	12	21	83	70	470
DB-0515S1	4.5-9	55	285	15	17	67	70	470
DB-0524S1	4.5-9	70	294	24	10	42	68	220
DB-123R3S1	9-18	15	119	3.3	76	303	70	3300
DB-1205S1	9-18	15	115	5	50	200	72	3300
DB-1209S1	9-18	15	108	9	28	111	77	470
DB-1212S1	9-18	15	108	12	21	83	77	470
DB-1215S1	9-18	15	108	15	17	67	77	470
DB-1224S1	9-18	15	114	24	10	42	73	220
DB-243R3S1	18-36	8	59	3.3	76	303	70	3300
DB-2405S1	18-36	8	57	5	50	200	72	3300
DB-2409S1	18-36	8	55	9	28	111	75	470
DB-2412S1	18-36	8	55	12	21	83	75	470
DB-2415S1	18-36	8	55	15	17	67	75	470
DB-2424S1	18-36	8	55	24	10	42	75	220
DB-483R3S1	36-72	6	31	3.3	76	303	66	3300
DB-4805S1	36-72	6	30	5	50	200	68	3300
DB-4809S1	36-72	6	29	9	28	111	70	470
DB-4812S1	36-72	6	29	12	21	83	70	470
DB-4815S1	36-72	6	29	15	17	67	70	470
DB-4824S1	36-72	6	30	24	10	42	68	220
DB-053R3D1	4.5-9	15	298	3.3	76	303	67	3300
DB-0505D1	4.5-9	15	298	5	50	200	67	3300
DB-0509D1	4.5-9	40	285	9	28	111	70	470
DB-0512D1	4.5-9	55	285	12	21	83	70	470
DB-0515D1	4.5-9	55	285	15	17	67	70	470
DB-0524D1	4.5-9	70	294	24	10	42	68	220
DB-123R3D1	9-18	15	119	3.3	76	303	70	3300
DB-1205D1	9-18	15	115	5	50	200	72	3300
DB-1209D1	9-18	15	108	9	28	111	77	470
DB-1212D1	9-18	15	108	12	21	83	77	470
DB-1215D1	9-18	15	108	15	17	67	77	470
DB-1224D1	9-18	15	114	24	10	42	73	220
DB-243R3D1	18-36	8	59	3.3	76	303	70	3300
DB-2405D1	18-36	8	57	5	50	200	72	3300
DB-2409D1	18-36	8	55	9	28	111	75	470
DB-2412D1	18-36	8	55	12	21	83	75	470
DB-2415D1	18-36	8	55	15	17	67	75	470
DB-2424D1	18-36	8	55	24	10	42	75	220
DB-483R3D1	36-72	6	31	3.3	76	303	66	3300
DB-4805D1	36-72	6	30	5	50	200	68	3300
DB-4809D1	36-72	6	29	9	28	111	70	470
DB-4812D1	36-72	6	29	12	21	83	70	470
DB-4815D1	36-72	6	29	15	17	67	70	470
DB-4824D1	36-72	6	30	24	10	42	68	220

Suffix “H” means 3KVdc isolation Suffix “C” means with control pin Suffix “M” means with Metal Case

DB - 1W 2:1 Regulated Single & Dual output

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
DB-053R3SD1	4.5-9	15	285	±3.3	±38	±152	70	±1000
DB-0505SD1	4.5-9	15	270	±5	±25	±100	74	±1000
DB-0509SD1	4.5-9	20	270	±9	±14	±56	74	±220
DB-0512SD1	4.5-9	20	266	±12	±10	±42	75	±220
DB-0515SD1	4.5-9	40	285	±15	±8	±33	70	±220
DB-0524SD1	4.5-9	70	298	±24	±5	±21	67	±100
DB-123R3SD1	9-18	15	119	±3.3	±38	±152	70	±1000
DB-1205SD1	9-18	15	115	±5	±25	±100	72	±1000
DB-1209SD1	9-18	15	109	±9	±14	±56	76	±220
DB-1212SD1	9-18	15	109	±12	±10	±42	76	±220
DB-1215SD1	9-18	15	112	±15	±8	±33	74	±220
DB-1224SD1	9-18	40	124	±24	±5	±21	67	±100
DB-243R3SD1	18-36	8	59	±3.3	±38	±152	70	±1000
DB-2405SD1	18-36	8	59	±5	±25	±100	70	±1000
DB-2409SD1	18-36	8	54	±9	±14	±56	76	±220
DB-2412SD1	18-36	8	54	±12	±10	±42	77	±220
DB-2415SD1	18-36	8	55	±15	±8	±33	75	±220
DB-2424SD1	18-36	20	59	±24	±5	±21	70	±100
DB-483R3SD1	36-72	6	30	±3.3	±38	±152	70	±1000
DB-4805SD1	36-72	6	30	±5	±25	±100	70	±1000
DB-4809SD1	36-72	6	28	±9	±14	±56	74	±220
DB-4812SD1	36-72	6	27	±12	±10	±42	76	±220
DB-4815SD1	36-72	6	29	±15	±8	±33	72	±220
DB-4824SD1	36-72	12	30	±24	±5	±21	70	±100
DB-053R3DD1	4.5-9	15	285	±3.3	±38	±152	70	±1000
DB-0505DD1	4.5-9	15	270	±5	±25	±100	74	±1000
DB-0509DD1	4.5-9	20	270	±9	±14	±56	74	±220
DB-0512DD1	4.5-9	20	266	±12	±10	±42	75	±220
DB-0515DD1	4.5-9	40	285	±15	±8	±33	70	±220
DB-0524DD1	4.5-9	70	298	±24	±5	±21	67	±100
DB-123R3DD1	9-18	15	119	±3.3	±38	±152	70	±1000
DB-1205DD1	9-18	15	115	±5	±25	±100	72	±1000
DB-1209DD1	9-18	15	109	±9	±14	±56	76	±220
DB-1212DD1	9-18	15	109	±12	±10	±42	76	±220
DB-1215DD1	9-18	15	112	±15	±8	±33	74	±220
DB-1224DD1	9-18	40	124	±24	±5	±21	67	±100
DB-243R3DD1	18-36	8	59	±3.3	±38	±152	70	±1000
DB-2405DD1	18-36	8	59	±5	±25	±100	70	±1000
DB-2409DD1	18-36	8	54	±9	±14	±56	76	±220
DB-2412DD1	18-36	8	54	±12	±10	±42	77	±220
DB-2415DD1	18-36	8	55	±15	±8	±33	75	±220
DB-2424DD1	18-36	20	59	±24	±5	±21	70	±100
DB-483R3DD1	36-72	6	30	±3.3	±38	±152	70	±1000
DB-4805DD1	36-72	6	30	±5	±25	±100	70	±1000
DB-4809DD1	36-72	6	28	±9	±14	±56	74	±220
DB-4812DD1	36-72	6	27	±12	±10	±42	76	±220
DB-4815DD1	36-72	6	29	±15	±8	±33	72	±220
DB-4824DD1	36-72	12	30	±24	±5	±21	70	±100

Suffix “H” means 3KVdc isolation Suffix “C” means with control pin Suffix “M” means with Metal Case

DB-2W Series

2W 2:1 Regulated Single & Dual output

Features

- 8 Pin SIL / 16 Pin DIL
- Wide 2:1 Input Range
- Full SMD Technology
- 1000 VDC Isolation, Up to 3000 VDC
- Continuous Short Circuit Protection
- Efficiency up to 80%
- -40 ~ 85°C Operation Temperature Range
- Plastic Case Standard, Optional Metal Case
- Remote on/off Control (Optional)

PART NUMBER STRUCTURE

DB - 24 05 SD 2 H M C

- **DB** — Series Name
- **24** — Input Voltage: **05** - 4.5~9V; **12** - 9 ~ 18V; **24** - 18 ~ 36V; **48** - 36 ~ 72V
- **05** — Output Voltage: **3R3** - 3.3V; **5** - 5V; **9** - 9V; **12** - 12V; **15** - 15V; **24** - 24V
- **SD** — Case Type: **S** - SIP Single Output; **D** - DIP Single Output; **SD** - SIP Dual Output; **DD** - DIP Dual Output; **SZ** - For TRACO TMR Series
- **2** — Watt
- **H** — 3KVdc Isolation. Optional, if no suffix "H" mean1KVdc Isolation
- **M** — Metal Case . Optional, if no suffix "M" mean plastic Case
- **C** — Control Pin Optional

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage Accuracy		±2%
Maximun Output Current		See table
Line Regulation		±0.5%,max.
Load Regulation	(From 25% to 100% Loading)	±1%,max.
Cross Regulation (Dual Output) (4)		±5%
Ripple & Noise (20 Mhz bandwidth)(5)		80mVpp,max.
Short Circuit Protection		Indefinite (Automatic Recovery)
Temperature Coefficient		±0.02%/°C
Capacitive Load(6)		See table

INPUT SPECIFICATIONS

Voltage Range		See table
Max. Input Current		See table
No-Load Input Current		See table
Input Filter		Capacitor
Input Reflected Ripple Current (7)		35mA pk-pk

ENVIRONMENT SPECIFICATIONS

Operating Temperature	-40°C~85°C (See Derating Curve)	
Maximum Case Temperature		100°C
Storage Temperature		- 40°C~125°C
Cooling		Nature Convection

ABSOLUTE MAXIMUM RATINGS(8)

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge V oltage(100ms max)	
05 Models	12Vdc,max.
12 Models	24Vdc,max.
24 Models	40Vdc,max.
48 Models	80Vdc,max.
Soldering Temperature (1.5mm from case 10 sec. max.)	260°C max.

GENERAL SPECIFICATIONS

Efficiency		See table
I/O Isolation V oltage	(tested for 3 sec)	1000~3000Vdc
Metal Case/Input & Output		1000Vdc
I/O Isolation Capacitance		60 pF,max.
I/O Isolation Resistance		1000M Ohm,min.
Switching Frequency		100~650kHz
Humidity		95%relH
Reliability Calculated MTBF	(MIL-HDBK-217 F)	>1.61 Mhrs
Safety Standard :	(designed to meet)	IEC/EN 60950-1
Remote On/Off (CTRL) (11)		

PHYSICAL SPECIFICATIONS

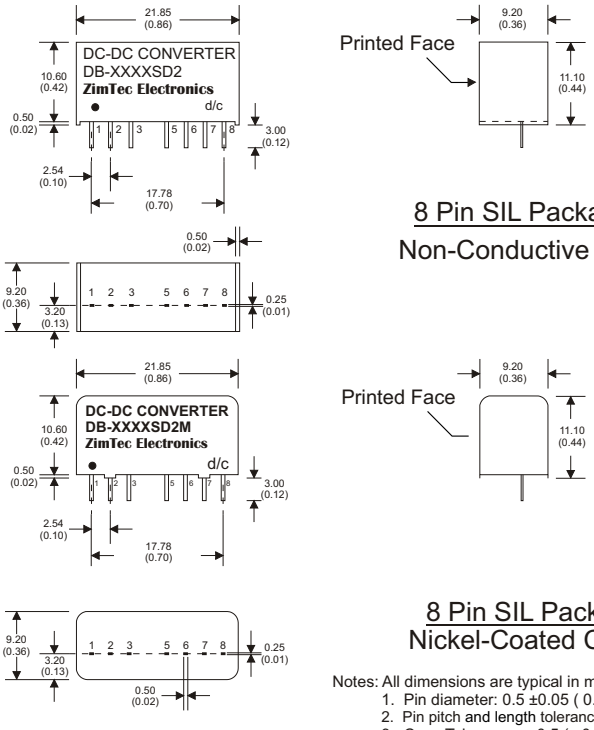
Case Material	Non-conductive Black Plastic (UL94V-0 rated)
Pin Material	Nickel-coated Copper
SIP Case	Alloy42 Solder-coated
DIP Case	¨0.5mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	4.5g(SIP)~6g(DIP)
	Metal Case/6.5g(SIP)~8g(DIP)
Dimensions	
SIP Case	0.86''x0.36''x0.44''
DIP Case	0.92''x0.55''x0.40''

EMC SPECIFICATIONS

Radiated Emissions	EN55022	CLASS A
Conducted Emissions (12)	EN55022	CLASS A
ESD	IEC 61000-4-2	Perf. Criteria B
RS	IEC 61000-4-3	Perf. Criteria A
EFT (13)	IEC 61000-4-4	Perf. Criteria B
Surge (13)	IEC 61000-4-5	Perf. Criteria B
CS	IEC 61000-4-6	Perf. Criteria A
PFMF	IEC 61000-4-8	Perf. Criteria A

DB - 2W 2:1 Regulated Single & Dual output

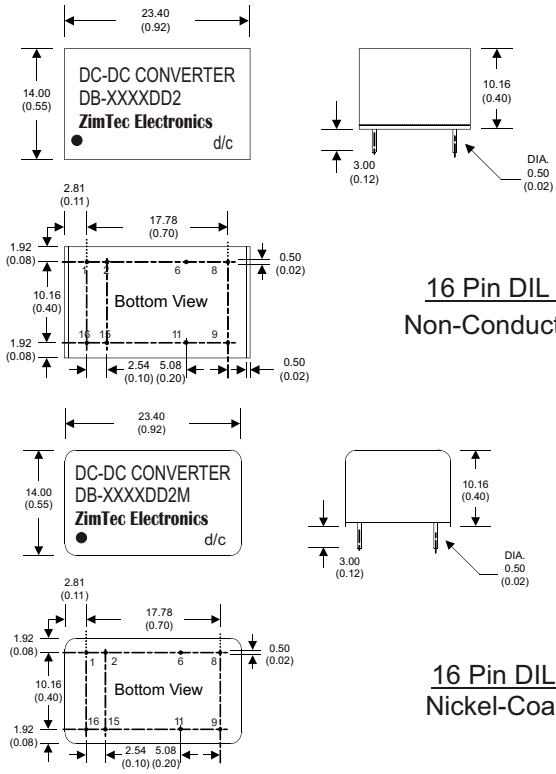
MECHANICAL SPECIFICATIONS



Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS			
PIN NUMBER	SINGLE	DUAL/(SD)	DUAL/(SZ)
1	−V Input	−V Input	−V Input
2	+V Input	+V Input	+V Input
3	N.P.	N.C.	N.C.
5	N.P.	N.C.	N.C.
6	+V Output	+V Output	+V Output
7	−V Output	−V Output	Common
8	N.C.	Common	−V Output
PIN NUMBER	SINGLE+C	DUAL/(SD+C)	DUAL/(SZ+C)
1	−V Input	−V Input	−V Input
2	+V Input	+V Input	+V Input
3	Remote On/Off	Remote On/Off	Remote On/Off
5	N.C.	N.C.	N.C.
6	+V Output	+V Output	+V Output
7	−V Output	−V Output	Common
8	N.C.	Common	−V Output

(The Pin Connection of high isolation one is the same with normal one.)



PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
1	−V Input	−V Input
2	−V Input	−V Input
6	N.C.	Common
8	N.C.	−V Output
9	+V Output	+V Output
11	−V Output	Common
15	+V Input	+V Input
16	+V Input	+V Input

(The Pin Connection of high isolation one is the same with normal one.)

DB - 2W 2:1 Regulated Single & Dual output

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
DB-053R3S2	4.5-9	15	492	3.3	125	500	67	3300
DB-0505S2	4.5-9	15	571	5	100	400	70	3300
DB-0509S2	4.5-9	30	555	9	56	222	72	470
DB-0512S2	4.5-9	30	555	12	42	167	72	470
DB-0515S2	4.5-9	30	547	15	33	133	73	470
DB-0524S2	4.5-9	60	533	24	21	83	75	220
DB-123R3S2	9-18	15	205	3.3	125	500	67	3300
DB-1205S2	9-18	15	216	5	100	400	77	3300
DB-1209S2	9-18	15	213	9	56	222	78	470
DB-1212S2	9-18	15	208	12	42	167	80	470
DB-1215S2	9-18	15	213	15	33	133	78	470
DB-1224S2	9-18	15	208	24	21	83	80	220
DB-243R3S2	18-36	8	98	3.3	125	500	70	3300
DB-2405S2	18-36	8	108	5	100	400	77	3300
DB-2409S2	18-36	8	104	9	56	222	80	470
DB-2412S2	18-36	8	104	12	42	167	80	470
DB-2415S2	18-36	8	104	15	33	133	80	470
DB-2424S2	18-36	8	104	24	21	83	80	220
DB-483R3S2	36-72	6	48	3.3	125	500	71	3300
DB-4805S2	36-72	6	56	5	100	400	74	3300
DB-4809S2	36-72	6	53	9	56	222	78	470
DB-4812S2	36-72	6	53	12	42	167	78	470
DB-4815S2	36-72	6	53	15	33	133	78	470
DB-4824S2	36-72	6	52	24	21	83	80	220
DB-053R3D2	4.5-9	15	492	3.3	125	500	67	3300
DB-0505D2	4.5-9	15	571	5	100	400	70	3300
DB-0509D2	4.5-9	30	555	9	56	222	72	470
DB-0512D2	4.5-9	30	555	12	42	167	72	470
DB-0515D2	4.5-9	30	547	15	33	133	73	470
DB-0524D2	4.5-9	60	533	24	21	83	75	220
DB-123R3D2	9-18	15	205	3.3	125	500	67	3300
DB-1205D2	9-18	15	216	5	100	400	77	3300
DB-1209D2	9-18	15	213	9	56	222	78	470
DB-1212D2	9-18	15	208	12	42	167	80	470
DB-1215D2	9-18	15	213	15	33	133	78	470
DB-1224D2	9-18	15	208	24	21	83	80	220
DB-243R3D2	18-36	8	98	3.3	125	500	70	3300
DB-2405D2	18-36	8	108	5	100	400	77	3300
DB-2409D2	18-36	8	104	9	56	222	80	470
DB-2412D2	18-36	8	104	12	42	167	80	470
DB-2415D2	18-36	8	104	15	33	133	80	470
DB-2424D2	18-36	8	104	24	21	83	80	220
DB-483R3D2	36-72	6	48	3.3	125	500	71	3300
DB-4805D2	36-72	6	56	5	100	400	74	3300
DB-4809D2	36-72	6	53	9	56	222	78	470
DB-4812D2	36-72	6	53	12	42	167	78	470
DB-4815D2	36-72	6	53	15	33	133	78	470
DB-4824D2	36-72	6	52	24	21	83	80	220

Suffix “H” means 3KVdc isolation Suffix “C” means with control pin Suffix “M” means with Metal Case

DB - 2W 2:1 Regulated Single & Dual output

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
DB-053R3SD2	4.5-9	20	471	±3.3	±63	±250	70	±1000
DB-0505SD2	4.5-9	20	571	±5	±50	±200	70	±1000
DB-0509SD2	4.5-9	20	540	±9	±28	±111	74	±220
DB-0512SD2	4.5-9	25	533	±12	±21	±83	75	±220
DB-0515SD2	4.5-9	25	533	±15	±17	±67	75	±220
DB-0524SD2	4.5-9	60	563	±24	±10	±42	71	±100
DB-123R3SD2	9-18	15	188	±3.3	±63	±250	73	±1000
DB-1205SD2	9-18	15	222	±5	±50	±200	75	±1000
DB-1209SD2	9-18	15	210	±9	±28	±111	79	±220
DB-1212SD2	9-18	15	208	±12	±21	±83	80	±220
DB-1215SD2	9-18	15	210	±15	±17	±67	79	±220
DB-1224SD2	9-18	30	219	±24	±10	±42	76	±100
DB-243R3SD2	18-36	8	94	±3.3	±63	±250	73	±1000
DB-2405SD2	18-36	8	106	±5	±50	±200	78	±1000
DB-2409SD2	18-36	8	105	±9	±28	±111	79	±220
DB-2412SD2	18-36	8	104	±12	±21	±83	80	±220
DB-2415SD2	18-36	8	104	±15	±17	±67	80	±220
DB-2424SD2	18-36	20	106	±24	±10	±42	78	±100
DB-483R3SD2	36-72	6	47	±3.3	±63	±250	73	±1000
DB-4805SD2	36-72	6	56	±5	±50	±200	74	±1000
DB-4809SD2	36-72	6	53	±9	±28	±111	79	±220
DB-4812SD2	36-72	6	53	±12	±21	±83	79	±220
DB-4815SD2	36-72	6	52	±15	±17	±67	80	±220
DB-4824SD2	36-72	12	55	±24	±10	±42	75	±100
DB-053R3DD2	4.5-9	20	471	±3.3	±63	±250	70	±1000
DB-0505DD2	4.5-9	20	571	±5	±50	±200	70	±1000
DB-0509DD2	4.5-9	20	540	±9	±28	±111	74	±220
DB-0512DD2	4.5-9	25	533	±12	±21	±83	75	±220
DB-0515DD2	4.5-9	25	533	±15	±17	±67	75	±220
DB-0524DD2	4.5-9	60	563	±24	±10	±42	71	±100
DB-123R3DD2	9-18	15	188	±3.3	±63	±250	73	±1000
DB-1205DD2	9-18	15	222	±5	±50	±200	75	±1000
DB-1209DD2	9-18	15	210	±9	±28	±111	79	±220
DB-1212DD2	9-18	15	208	±12	±21	±83	80	±220
DB-1215DD2	9-18	15	210	±15	±17	±67	79	±220
DB-1224DD2	9-18	30	219	±24	±10	±42	76	±100
DB-243R3DD2	18-36	8	94	±3.3	±63	±250	73	±1000
DB-2405DD2	18-36	8	106	±5	±50	±200	78	±1000
DB-2409DD2	18-36	8	105	±9	±28	±111	79	±220
DB-2412DD2	18-36	8	104	±12	±21	±83	80	±220
DB-2415DD2	18-36	8	104	±15	±17	±67	80	±220
DB-2424DD2	18-36	20	106	±24	±10	±42	78	±100
DB-483R3DD2	36-72	6	47	±3.3	±63	±250	73	±1000
DB-4805DD2	36-72	6	56	±5	±50	±200	74	±1000
DB-4809DD2	36-72	6	53	±9	±28	±111	79	±220
DB-4812DD2	36-72	6	53	±12	±21	±83	79	±220
DB-4815DD2	36-72	6	52	±15	±17	±67	80	±220
DB-4824DD2	36-72	12	55	±24	±10	±42	75	±100

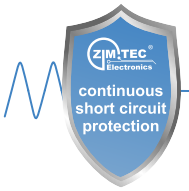
Suffix “H” means 3KVdc isolation Suffix “C” means with control pin Suffix “M” means with Metal Case

DB-3W Series

3W 2:1 Regulated Single & Dual output

Features

- 8 Pin SIL
- Wide 2:1 Input Range
- Full SMD Technology
- 1600 VDC Isolation
- Continuous Short Circuit Protection
- Efficiency up to 84%
- -40 ~ 71°C Operation Temperature Range
- Plastic Case Standard, Optional Metal Case
- Remote on/off Control (Optional)



PART NUMBER STRUCTURE

DB - 24 05 SD 3 M C

- DB: Series Name
- 24: Input Voltage Range
  - **05** - 4.5~9V
  - **12** - 9 ~ 18V
  - **24** - 18 ~ 36V
  - **48** - 36 ~ 72V
- 05: Nominal Output Voltage
  - **3R3** - 3.3V
  - **5** - 5V
  - **12** - 12V
  - **15** - 15V
- SD: Case Type
  - **S** - SIP Single Output
  - **SD** - SIP Dual Output
- 3: Watt
- M: Metal Case. Optional, if no suffix "M" mean plastic Case
- C: Remote Control Pin (Optional)

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage Accuracy		±1%
Maximun Output Current		See table
Line Regulation		±0.5%,max.
Load Regulation (1)	(From 25% to 100% Loading)	±1%,max.
Cross Regulation (Dual Output) (2)		±5%
Ripple & Noise (20 Mhz bandwidth)(3)		75mVpp,max.
Short Circuit Protection		Indefinite (Automatic Recovery)
Temperature Coefficient		±0.02%/°C
Capacitive Load(4)		See table
Transient Recovery Time (5)		300us, typ.
Transient Response Deviation(5)		±3%, max.

INPUT SPECIFICATIONS

Voltage Range	See table
Start up Time (Nominal Vin and constant resistive load)	20mS, typ.
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	Capacitor
Input Reflected Ripple Current(6)	35mA pk-pk

GENERAL SPECIFICATIONS

Efficiency	See table,typ.
I/O Isolation Voltage (tested for 3 sec)	1600Vdc
I/O Isolation Capacity	680 pF,max.
I/O Isolation Resistance	1000M Ohm,min.
Switching Frequency	100~650kHz
Humidity	95%relH
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1.34 Mhrs
Safety Standard	IEC/EN 60950-1
Safety Approvals	CB
Remote on/off controll(7)	
ON:	open or high impedance
OFF:	3-6mA input current (via 1K)
Off stand by input current (Nominal Vin)	3mA max.

PHYSICAL SPECIFICATIONS

Case Material	Non conductive black plastic
Potting Material	Epoxy (UL94V-0 rated)
Pin Material	C5191R-H Solder-coated
Weight	4.8g,typ.
Dimensions	0.86"x0.36"x0.44"

ENVIRONMENT SPECIFICATIONS

Operating Temperature	-40°C~71°C
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

ABSOLUTE MAXIMUM RATINGS(8)

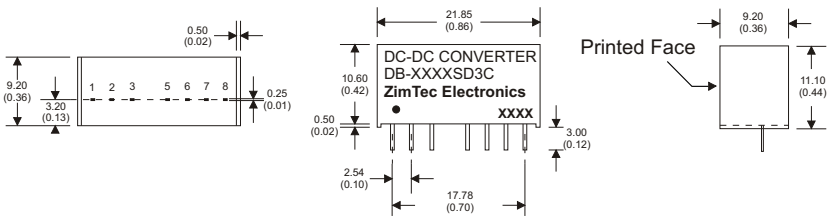
These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge Voltage(100ms max)	
05 Models	15 Vdc,max.
12 Models	36Vdc,max.
24 Models	50Vdc,max.
48 Models	100Vdc,max.
Soldering Temperature (1.5mm from case 10 sec. max.).	260°C max.

EMI CHARACTERISTICS

Conducted Emissions (10)	EN55022	CLASS A
Radiated Emissions	EN55022	CLASS A
ESD	IEC 61000-4-2	Perf. Criteria A
RS	IEC 61000-4-3	Perf. Criteria A
EFT(11)	IEC 61000-4-4	Perf. Criteria A
Surge(11)	IEC 61000-4-5	Perf. Criteria A
CS	IEC 61000-4-6	Perf. Criteria A
PFMF	IEC 61000-4-8	Perf. Criteria A

MECHANICAL SPECIFICATIONS



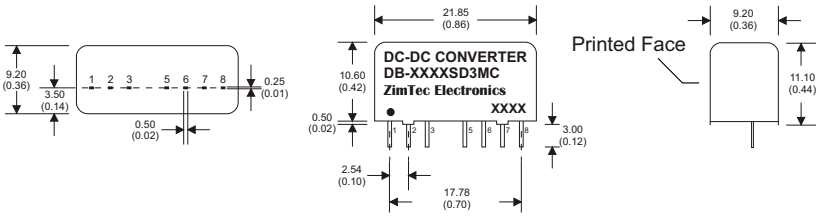
8 Pin SIL Package

Non-Conductive Plastic

PIN CONNECTIONS		
PIN NUMBER	SINGLE+C	DUAL+C
1	-V Input	-V Input
2	+V Input	+V Input
3	Remote On/Off	Remote On/Off
5	N.C.	N.C.
6	+V Output	+V Output
7	-V Output	Common
8	N.C.	-V Output

DB - 3W 2:1 Regulated Single & Dual output

MECHANICAL SPECIFICATIONS



8 Pin SIL Package
Nickel-Coated Copper

Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
1	-V Input	-V Input
2	+V Input	+V Input
3	N.P.	N.C.
5	N.P.	N.C.
6	+V Output	+V Output
7	-V Output	Common
8	N.C.	-V Output

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
DB-0505S3C	4.5-9	70	800	5	150	600	76	1000
DB-0512S3C	4.5-9	75	750	12	62.5	250	82	470
DB-0515S3C	4.5-9	75	750	15	50	200	82	220
DB-123R3S3C	9-18	25	260	3.3	175	700	76	2200
DB-1205S3C	9-18	15	320	5	150	600	81	1000
DB-1212S3C	9-18	35	305	12	62.5	250	84	470
DB-1215S3C	9-18	35	305	15	50	200	84	220
DB-243R3S3C	18-36	15	133	3.3	175	700	74	2200
DB-2405S3C	18-36	15	160	5	150	600	79	1000
DB-2412S3C	18-36	20	156	12	62.5	250	82	470
DB-2415S3C	18-36	20	152	15	50	200	84	220
DB-483R3S3C	36-72	10	66	3.3	175	700	75	2200
DB-4805S3C	36-72	10	82	5	150	600	78	1000
DB-4812S3C	36-72	15	78	12	62.5	250	81	470
DB-4815S3C	36-72	15	78	15	50	200	81	220
DB-0505SD3C	4.5-9	90	800	±5	±75	±300	77	±470
DB-0512SD3C	4.5-9	90	760	±12	±31.25	±125	81	±220
DB-0515SD3C	4.5-9	90	750	±15	±25	±100	82	±100
DB-1205SD3C	9-18	45	320	±5	±75	±300	80	±470
DB-1212SD3C	9-18	45	308	±12	±31.25	±125	83	±220
DB-1215SD3C	9-18	45	312	±15	±25	±100	82	±100
DB-2405SD3C	18-36	20	160	±5	±75	±300	80	±470
DB-2412SD3C	18-36	20	154	±12	±31.25	±125	83	±220
DB-2415SD3C	18-36	20	154	±15	±25	±100	83	±100
DB-4805SD3C	36-72	15	82	±5	±75	±300	78	±470
DB-4812SD3C	36-72	20	80	±12	±31.25	±125	80	±220
DB-4815SD3C	36-72	15	78	±15	±25	±100	81	±100

Suffix “C” means with control pin Suffix “M” means with Metal Case

DJ-1.5W Series

1.5W 4:1 Regulated Single & Dual output

Features

- Wide 4:1 Input Range
- Full SMD Technology
- 1500 VDC Isolation, Up to 3500 VDC
- Continuous Short Circuit Protection
- Efficiency up to 78%
- -40 ~ 85°C Operation Temperature Range
- Metal Case Standard, Optional Plastic Case

PART NUMBER STRUCTURE

DJ - 24 05 S 1 H P

- **Series Name**
- **Input Voltage** Range: **24** - 9 ~ 36V; **48** - 18 ~ 72V
- **Output Voltage**: **3R3** - 3.3V; **5** - 5V; **9** - 9V; **12** - 12V; **15** - 15V; **24** - 24V
- **Output Type**: **S** - Single output; **D** - Dual Output
- **1.5 Watt**
- **3.5KVdc Isolation.** Optional, if no suf fix "H" mean1.5KVdc Isolation
- **Plastic Case** . Optional, if no suffix "P" mean metal Case

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage accuracy	±1%
Line regulation	±0.5%
Load regulation	±0.5%
(Output 3.3V / ±3.3V Model)	±1.5%
Ripple & noise (20 MHz bandwidth)(1)	60mV pk-pk
Short circuit protection	Indefinite(Automatic Recovery)
Temperature coefficient	±0.02%/°C
Capacitor load(2)	See table

INPUT SPECIFICATIONS

Voltage Range	See table
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	PI Type
Input Reflected Ripple Current (3)	35mA pk-pk

GENERAL SPECIFICATIONS

Efficiency	See table, typ
I/O Isolation Voltage(3 sec)	
Input/Output	1500~3500Vdc
Metal Case/Input & Output	1000Vdc
I/O Isolation Capacitance	470 pF Typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	Typical 266kHz
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1.121 Mhrs
Safety Standard : (designed to meet)	IEC 60950-1

PHYSICAL SPECIFICA TIONS

Case Material	Nickel-coated Copper
	Non-conductive Black Plastic(UL94V-0 rated)
Base Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	¨ 0.5mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	17.0g (Metal Case)/13.5g(Plastic Case)
Dimensions	1.25 "x0.8 "x0.4 "

ENVIRONMENT SPECIFICA TIONS

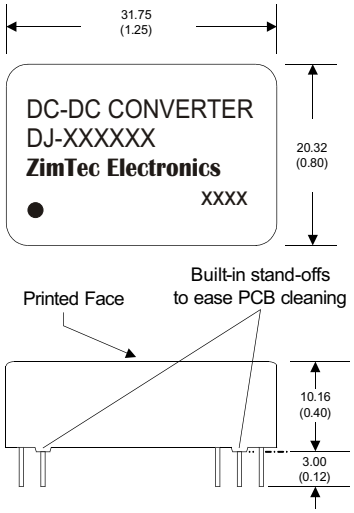
Operating Temperature	-40 °C~85 °C(See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

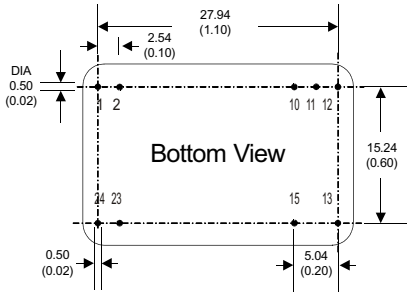
ABSOLUTE MAXIMUM RATINGS (4)

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge Voltage(100mS)	
24 Models	40 Vdc max.
48 Models	80 Vdc max.
Soldering Temperature (1.5mm from case 10 sec. max.)	260°C max.

MECHANICAL SPECIFICATIONS





24 Pin DIL Package
Nickel-Coated Copper

Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

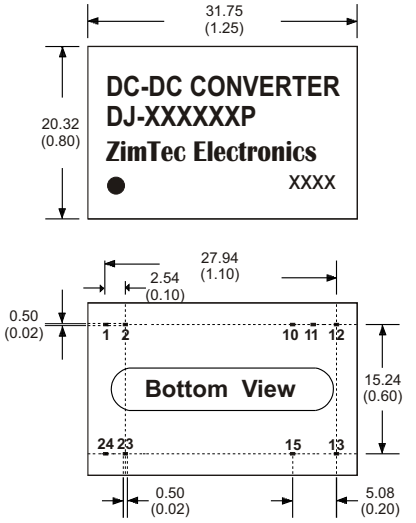
PIN CONNECTIONS

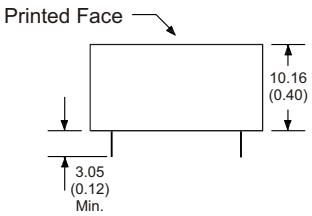
PIN NUMBER	SINGLE	DUAL
1	+V Input	+V Input
2	+V Input	+V Input
10	N.C.	Com mon
11	N.C.	Com mon
12	-V Output	N.C.
13	+V Output	–V Output
15	N.C.	+V Output
23	-V In put	-V In put
24	-V In put	-V In put

(The Pin Connection of high isolation one is the same with normal one.)

DJ - 1.5W 4:1 Regulated Single & Dual output

MECHANICAL SPECIFICATIONS





For "P" Case

24 Pin DIL Package
Non-Conductive Plastic

PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
1	+V Input	+V Input
2	+V Input	+V Input
10	N.C.	Com mon
11	N.C.	Com mon
12	-V Output	N.C.
13	+V Output	– V Output
15	N.C.	+V Output
23	-V In put	-V In put
24	-V In put	-V In put

Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

(The Pin Connection of high isolation one is the same with normal one.)

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
DJ-243R3S1	9-36	15	83.3	3.3	0	454	75	330
DJ-2405S1	9-36	15	82.2	5	0	300	76	220
DJ-2409S1	9-36	15	80.1	9	0	167	78	68
DJ-2412S1	9-36	15	80.1	12	0	125	78	47
DJ-2415S1	9-36	15	80.1	15	0	100	78	22
DJ-2424S1	9-36	15	80.1	24	0	63	78	10
DJ-243R3D1	9-36	15	83.3	±3.3	0	±227	75	±100
DJ-2405D1	9-36	15	82.2	±5	0	±150	76	±100
DJ-2409D1	9-36	15	80.1	±9	0	±84	78	±33
DJ-2412D1	9-36	15	80.1	±12	0	±63	78	±22
DJ-2415D1	9-36	15	80.1	±15	0	±50	78	±10
DJ-2424D1	9-36	15	80.1	±24	0	±32	78	±10
DJ-483R3S1	18-72	12	41.6	3.3	0	454	75	330
DJ-4805S1	18-72	12	41.1	5	0	300	76	220
DJ-4809S1	18-72	12	40.1	9	0	167	78	68
DJ-4812S1	18-72	12	40.1	12	0	125	78	47
DJ-4815S1	18-72	12	40.1	15	0	100	78	22
DJ-4824S1	18-72	12	40.1	24	0	63	78	10
DJ-483R3D1	18-72	12	41.6	±3.3	0	±227	75	±100
DJ-4805D1	18-72	12	41.1	±5	0	±150	76	±100
DJ-4809D1	18-72	12	40.1	±9	0	±84	78	±33
DJ-4812D1	18-72	12	40.1	±12	0	±63	78	±22
DJ-4815D1	18-72	12	40.1	±15	0	±50	78	±10
DJ-4824D1	18-72	12	40.1	±24	0	±32	78	±10

Suffix "H" means 3.5KVdc isolation
Suffix "P" means Plastic case instead of standard Metal Case

DJ-3W Series

3W 4:1 Regulated Single & Dual output

Features

- Wide 4:1 Input Range
- Full SMD Technology
- 1500 VDC Isolation, Up to 3500 VDC
- Continuous Short Circuit Protection
- Efficiency up to 80%
- -40 ~ 85°C Operation Temperature Range
- Metal Case Standard, Optional Plastic Case

PART NUMBER STRUCTURE

DJ - 24 05 S 3 H P

- **Series Name**
- **Input Voltage Range**: **24** - 9 ~ 36V; **48** - 18 ~ 72V
- **Output Voltage**: **3R3** - 3.3V; **5** - 5V; **9** - 9V; **12** - 12V; **15** - 15V; **24** - 24V
- **Output Type**: **S** - Single output; **D** - Dual Output
- **3 Watt**
- **Plastic Case** . Optional, if no suffix "P" mean metal Case
- **3.5KVdc Isolation.** Optional, if no suf fix "H" mean1.5KVdc Isolation

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage accuracy	±1%
Line regulation	±0.5%
Load regulation	±0.5%
(Output 3.3V / ±3.3V Model)	±1.5%
Ripple & noise (20 MHz bandwidth)(1)	60mV pk-pk
Short circuit protection	Indefinite(Automatic Recovery)
Temperature coefficient	±0.02%/°C
Capacitor load(2)	See table

INPUT SPECIFICATIONS

Voltage Range	See table
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	PI Type
Input Reflected Ripple Current (3)	35mA pk-pk

GENERAL SPECIFICATIONS

Efficiency	See table, typ
I/O Isolation Voltage(3 sec)	
Input/Output	1500~3500Vdc
Metal Case/Input & Output	1000Vdc
I/O Isolation Capacitance	470 pF Typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	Typical 266kHz
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1.121 Mhrs
Safety Standard : (designed to meet)	IEC 60950-1

PHYSICAL SPECIFICATIONS

Case Material	Nickel-coated Copper
	Non-conductive Black Plastic(UL94V-0 rated)
Base Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	0.5mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	17.0g (Metal Case)/ 13.5g(Plastic Case)
Dimensions	1.25 "x0.8 "x0.4 "

ENVIRONMENT SPECIFICATIONS

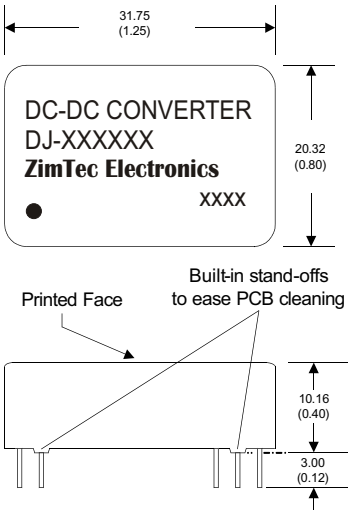
Operating Temperature	-40 °C~85 °C(See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

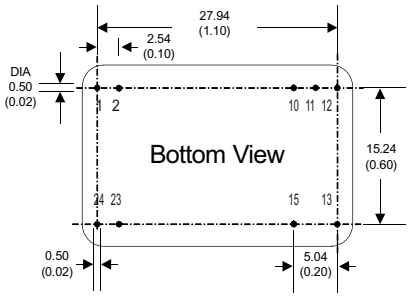
ABSOLUTE MAXIMUM RATINGS(4)

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge Voltage(100mS)	
24 Models	40 Vdc max.
48 Models	80 Vdc max.
Soldering Temperature (1.5mm from case 10 sec. max.)	260°C max.

MECHANICAL SPECIFICATIONS





24 Pin DIL Package

Nickel-Coated Copper

Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

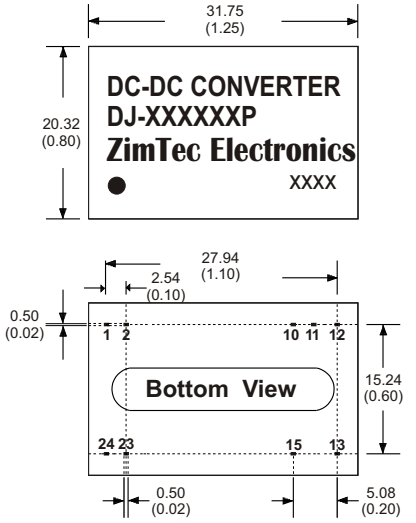
PIN CONNECTIONS

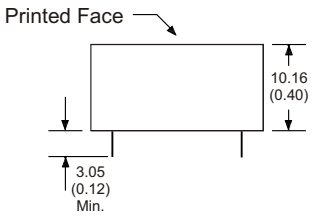
PIN NUMBER	SINGLE	DUAL
1	+V Input	+V Input
2	+V Input	+V Input
10	N.C.	Com mon
11	N.C.	Com mon
12	-V Output	N.C.
13	+V Output	−V Output
15	N.C.	+V Output
23	-V In put	-V In put
24	-V In put	-V In put

(The Pin Connection of high isolation one is the same with normal one.)

DJ - 3W 4:1 Regulated Single & Dual output

MECHANICAL SPECIFICATIONS





For "P" Case

24 Pin DIL Package
Non-Conductive Plastic

Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
1	+V Input	+V Input
2	+V Input	+V Input
10	N.C.	Com mon
11	N.C.	Com mon
12	-V Output	N.C.
13	+V O utput	– V Output
15	N.C.	+V Output
23	-V In put	-V In put
24	-V In put	-V In put

(The Pin Connection of high isolation one is the same with normal one.)

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
DJ-243R3S3	9-36	16	165	3.3	0	900	75	680
DJ-2405S3	9-36	16	160.3	5	0	600	78	470
DJ-2409S3	9-36	16	156.3	9	0	333	80	100
DJ-2412S3	9-36	16	156.3	12	0	250	80	68
DJ-2415S3	9-36	16	156.3	15	0	200	80	47
DJ-2424S3	9-36	16	156.3	24	0	125	80	22
DJ-243R3D3	9-36	16	165	±3.3	0	±454	75	±330
DJ-2405D3	9-36	16	160.3	±5	0	±300	78	±220
DJ-2409D3	9-36	16	156.3	±9	0	±166	80	±47
DJ-2412D3	9-36	16	156.3	±12	0	±125	80	±33
DJ-2415D3	9-36	16	156.3	±15	0	±100	80	±22
DJ-2424D3	9-36	16	156.3	±24	0	±63	80	±10
DJ-483R3S3	18-72	14	82.5	3.3	0	900	75	680
DJ-4805S3	18-72	14	80.1	5	0	600	78	470
DJ-4809S3	18-72	14	78.1	9	0	333	80	100
DJ-4812S3	18-72	14	78.1	12	0	250	80	68
DJ-4815S3	18-72	14	78.1	15	0	200	80	47
DJ-4824S3	18-72	14	78.1	24	0	125	80	22
DJ-483R3D3	18-72	14	83.3	±3.3	0	±454	75	±330
DJ-4805D3	18-72	14	80.1	±5	0	±300	78	±220
DJ-4809D3	18-72	14	78.1	±9	0	±166	80	±47
DJ-4812D3	18-72	14	78.1	±12	0	±125	80	±33
DJ-4815D3	18-72	14	78.1	±15	0	±100	80	±22
DJ-4824D3	18-72	14	78.1	±24	0	±63	80	±10

Suffix "H" means 3.5KVdc isolation
Suffix "P" means Plastic case instead of standard Metal Case

DRD-1.5W Series

1.5W 2:1 Regulated Single & Dual output

Features

- Wide 2:1 Input Range
- Full SMD Technology
- 1500 VDC Isolation, Up to 3500 VDC
- Continuous Short Circuit Protection
- Efficiency up to 75%
- -40 ~ 85°C Operating Temperature
- Plastic Case Standard, Optional Metal Case

PART NUMBER STRUCTURE

DRD - 24 05 S 1 H M

- DRD: Series Name
- 24: **Input Voltage Range**
  - **05** - 4.5 ~ 9V
  - **12** - 9 ~ 18V
  - **24** - 18 ~ 36V
  - **48** - 36 ~ 72V
- 05: **Output Voltage**
  - **5** - 5V
  - **7R2** - 7.2V
  - **9** - 9V
  - **12** - 12V
  - **15** - 15V
  - **18** - 18V
  - **24** - 24V
- S: **Output Type**
  - **S** - Single output
  - **D** - Dual Output
- 1: 1.5 Watt
- H: **3.5KVdc Isolation.** Optional, if no suffix "H" mean1.5KVdc Isolation
- M: **Metal Case.** Optional, if no suffix " M" mean plastic Case

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage accuracy	±1%
Line regulation	±0.5%
Load regulation	±0.5%
Ripple & noise (20 MHz bandwidth)(1)	60mV pk-pk
Short circuit protection	Continuous
Temperature coefficient	±0.02%/°C
Capacitor load(2)	See table

INPUT SPECIFICATIONS

Voltage Range	See table
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	PI Type
Input Reflected Ripple Current (3)	35mA pk-pk

GENERAL SPECIFICATIONS

Efficiency	See table, typ.
I/O Isolation Voltage(3 sec)	
Input/Output	1500~3500Vdc
Metal Case/Input & Output	1000Vdc
I/O Isolation Capacitance	60 pF Typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	100~400kHz
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1Mhrs
Safety Standard : (designed to meet)	IEC 60950-1

PHYSICAL SPECIFICA TIONS

Case Material	Non-conductive Black Plastic(UL94V-0 rated)
	Nickel-coated Copper
Base Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	0.5mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	12.5g(Plastic Case)/15.0g (Metal Case)
Dimensions	1.25 "x0.8 "x0.4 "

ENVIRONMENT SPECIFICATIONS

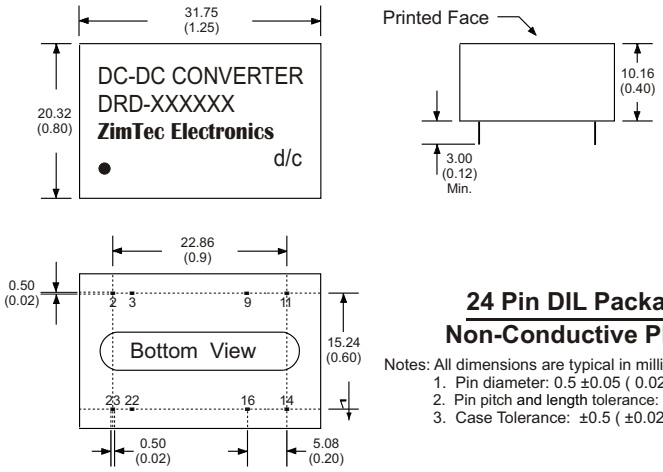
Operating Temperature	-40 °C~85 °C(See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

ABSOLUTE MAXIMUM RATINGS (4)

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge Voltage(100mS)	
5 Models	15 Vdc ,max.
12 Models	24 Vdc ,max.
24 Models	40 Vdc ,max.
48 Models	80 Vdc ,max.
Soldering Temperature (1.5mm from case 10 sec. max.)	260 °C ,max.

MECHANICAL SPECIFICATIONS FOR HIGH ISOLATION MODEL



24 Pin DIL Package
Non-Conductive Plastic

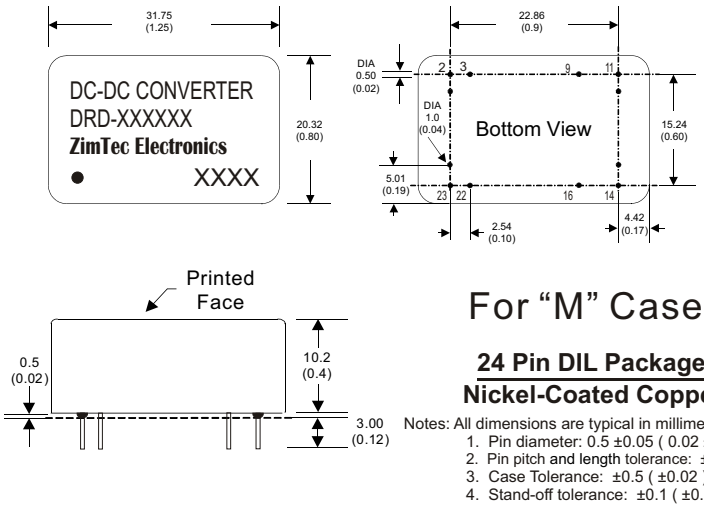
Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
2	-V Input	-V Input
3	-V Input	-V Input
9	N.P.	Common
11	N.C.	-V Output
14	+V Output	+V Output
16	-V Output	Common
22	+V Input	+V Input
23	+V Input	+V Input

(The Pin Connection of high isolation one is the same with normal one.)

DRD - 1.5W 2:1 Regulated Single & Dual output

MECHANICAL SPECIFICATIONS



For "M" Case

24 Pin DIL Package

Nickel-Coated Copper

Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)
4. Stand-off tolerance: ±0.1 (±0.004)

PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
2	−V Input	−V Input
3	−V Input	−V Input
9	N.P.	Common
11	N.C.	−V Output
14	+V Output	+V Output
16	−V Output	Common
22	+V Input	+V Input
23	+V Input	+V Input

(The Pin Connection of high isolation one is the same with normal one.)

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
DRD-0505S1	4.5-9	40	429	5	75	300	70	2200
DRD-057R2S1	4.5-9	40	423	7.2	52	208	70	1000
DRD-0509S1	4.5-9	40	423	9	42	167	71	470
DRD-0512S1	4.5-9	40	417	12	125	125	72	470
DRD-0515S1	4.5-9	40	417	15	31	100	72	470
DRD-0518S1	4.5-9	40	417	18	21	83	72	220
DRD-0524S1	4.5-9	40	429	24	16	63	72	220
DRD-0505D1	4.5-9	40	423	±5	±38	±150	65	±1000
DRD-057R2D1	4.5-9	40	423	±7.2	±26	±104	65	±220
DRD-0509D1	4.5-9	40	417	±9	±21	±83	67	±220
DRD-0512D1	4.5-9	40	417	±12	±16	±63	70	±220
DRD-0515D1	4.5-9	40	417	±15	±13	±50	67	±220
DRD-0518D1	4.5-9	40	423	±18	±10	±42	66	±220
DRD-0524D1	4.5-9	40	423	±24	±8	±31	66	±100
DRD-1205S1	9-18	20	176	5	75	300	71	2200
DRD-127R2S1	9-18	40	176	7.2	52	208	71	1000
DRD-1209S1	9-18	20	171	9	42	167	73	470
DRD-1212S1	9-18	20	171	12	125	125	73	470
DRD-1215S1	9-18	20	169	15	31	100	74	470
DRD-1218S1	9-18	40	174	18	21	83	72	220
DRD-1224S1	9-18	20	176	24	16	63	71	220
DRD-1205D1	9-18	20	176	±5	±38	±150	71	±1000
DRD-127R2D1	9-18	40	176	±7.2	±26	±104	71	±220
DRD-1209D1	9-18	20	171	±9	±21	±83	73	±220
DRD-1212D1	9-18	20	169	±12	±16	±63	74	±220
DRD-1215D1	9-18	20	171	±15	±13	±50	73	±220
DRD-1218D1	9-18	40	171	±18	±10	±42	73	±220
DRD-1224D1	9-18	20	174	±24	±8	±31	72	±100
DRD-2405S1	18-36	12	87	5	75	300	72	2200
DRD-247R2S1	18-36	12	87	7.2	52	208	72	1000

Suffix "H" means 3.5KVdc isolation
Suffix "M" means Metal Case instead of standard Plastic case

DRD - 1.5W 2:1 Regulated Single & Dual output

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
DRD-2409S1	18-36	12	84	9	42	167	74	470
DRD-2412S1	18-36	12	83	12	125	125	75	470
DRD-2415S1	18-36	12	83	15	31	100	75	470
DRD-2418S1	18-36	12	83	18	21	83	75	220
DRD-2424S1	18-36	12	86	24	16	63	73	220
DRD-2405D1	18-36	12	87	±5	±38	±150	72	±1000
DRD-247R2D1	18-36	12	87	±7.2	±26	±104	72	±220
DRD-2409D1	18-36	12	84	±9	±21	±83	74	±220
DRD-2412D1	18-36	12	84	±12	±16	±63	74	±220
DRD-2415D1	18-36	12	84	±15	±13	±50	74	±220
DRD-2418D1	18-36	12	86	±18	±10	±42	73	±220
DRD-2424D1	18-36	12	87	±24	±8	±31	72	±100
DRD-4805S1	36-72	8	45	5	75	300	70	2200
DRD-487R2S1	36-72	8	43	7.2	52	208	72	1000
DRD-4809S1	36-72	8	43	9	42	167	73	470
DRD-4812S1	36-72	8	42	12	125	125	74	470
DRD-4815S1	36-72	8	42	15	31	100	74	470
DRD-4818S1	36-72	8	43	18	21	83	73	220
DRD-4824S1	36-72	8	44	24	16	63	71	220
DRD-4805D1	36-72	8	43	±5	±38	±150	72	±1000
DRD-487R2D1	36-72	8	43	±7.2	±26	±104	72	±220
DRD-4809D1	36-72	8	43	±9	±21	±83	73	±220
DRD-4812D1	36-72	8	43	±12	±16	±63	73	±220
DRD-4815D1	36-72	8	43	±15	±13	±50	73	±220
DRD-4818D1	36-72	8	43	±18	±10	±42	72	±220
DRD-4824D1	36-72	8	44	±24	±8	±31	71	±100

Suffix “H” means 3.5KVdc isolation
Suffix “M” means Metal Case instead of standard Plastic case

DRD-3W Series

3W 2:1 Regulated Single & Dual output

Features

- Wide 2:1 Input Range
- Full SMD Technology
- 1500 VDC Isolation, Up to 3500 VDC
- Continuous Short Circuit Protection
- Efficiency up to 82%
- -40 ~ 85°C Operating Temperature
- Plastic Case Standard, Optional Metal Case

PART NUMBER STRUCTURE

DRD - 24 05 S 3 H M

- DRD: Series Name
- 24: Input Voltage Range
  - **05** - 4.5 ~ 9V
  - **12** - 9 ~ 18V
  - **24** - 18 ~ 36V
  - **48** - 36 ~ 72V
- 05: Output Voltage
  - **05** - 5V
  - **7R2** - 7.2V
  - **09** - 9V
  - **12** - 12V
  - **15** - 15V
  - **18** - 18V
  - **24** - 24V
- S: Output Type
  - **S** - Single output
  - **D** - Dual Output
- 3: 3 Watt
- H: **3.5KVdc Isolation.** Optional, if no suffix "H" mean1.5KVdc Isolation
- M: **Metal Case.** Optional, if no suffix " M" mean plastic Case

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage accuracy	±1%
Line regulation	±0.5%
Load regulation	±0.5%
Ripple & noise (20 MHz bandwidth)(1)	60mV pk-pk
Short circuit protection	Continuous
Temperature coefficient	±0.02%/°C
Capacitor load(2)	See table

INPUT SPECIFICATIONS

Voltage Range	See table
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	PI Type
Input Reflected Ripple Current (3)	35mA pk-pk

GENERAL SPECIFICATIONS

Efficiency	See table, typ.
I/O Isolation Voltage(3 sec)	
Input/Output	1500~3500Vdc
Metal Case/Input & Output	1000Vdc
I/O Isolation Capacitance	60 pF typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	100~400kHz
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1Mhrs
Safety Standard : (designed to meet)	IEC 60950-1

PHYSICAL SPECIFICATIONS

Case Material	Non-conductive Black Plastic(UL94V-0 rated)
	Nickel-coated Copper
Base Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	0.5mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	12.5g(Plastic Case)/15.0g (Metal Case)
Dimensions	1.25 "x0.8 "x0.4 "

ENVIRONMENT SPECIFICATIONS

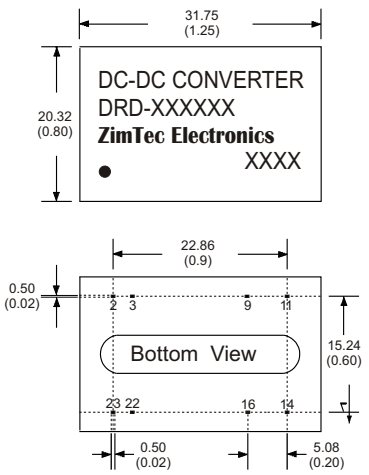
Operating Temperature	-40 °C~85 °C(See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

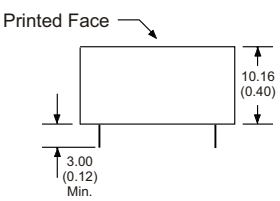
ABSOLUTE MAXIMUM RATINGS (4)

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge Voltage (100mS)	
5 Models	15 Vdc,max.
12 Models	24 Vdc,max.
24 Models	40 Vdc,max.
48 Models	80 Vdc,max.
Soldering Temperature (1.5mm from case 10 sec. max.)	260 °C max.

MECHANICAL SPECIFICATIONS FOR HIGH ISOLATION MODEL





24 Pin DIL Package
Non-Conductive Plastic

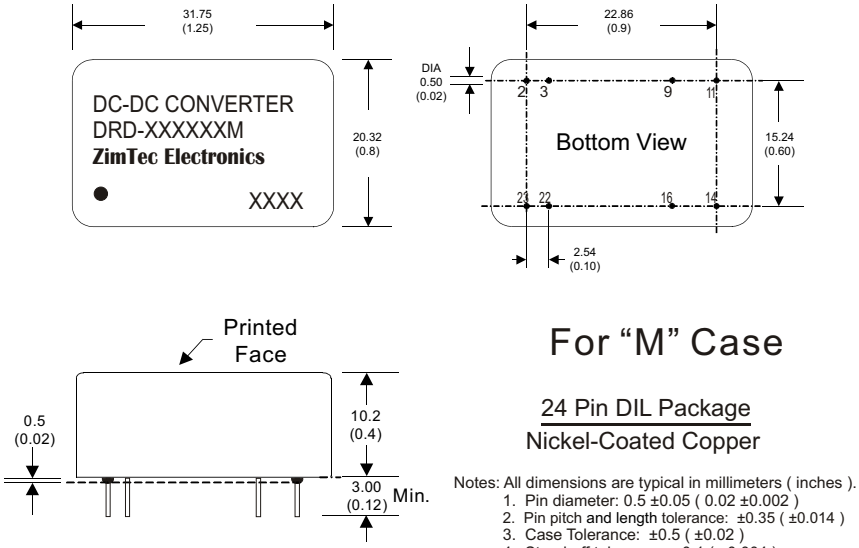
Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
2	-V Input	-V Input
3	-V Input	-V Input
9	N.P.	Common
11	N.C.	-V Output
14	+V Output	+V Output
16	-V Output	Common
22	+V Input	+V Input
23	+V Input	+V Input

(The Pin Connection of high isolation one is the same with normal one.)

DRD - 3W 2:1 Regulated Single & Dual output

MECHANICAL SPECIFICATIONS FOR HIGH ISOLATION MODEL



For "M" Case

24 Pin DIL Package
Nickel-Coated Copper

Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)
4. Stand-off tolerance: ±0.1 (±0.004)

PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
2	−V Input	−V Input
3	−V Input	−V Input
9	N.P.	Common
11	N.C.	−V Output
14	+V Output	+V Output
16	−V Output	Common
22	+V Input	+V Input
23	+V Input	+V Input

(The Pin Connection of high isolation one is the same with normal one.)

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
DRD-0505S3	4.5-9	40	857	5	150	600	70	2200
DRD-057R2S3	4.5-9	40	833	7.2	104	417	72	1000
DRD-0509S3	4.5-9	40	833	9	83	333	72	470
DRD-0512S3	4.5-9	40	810	12	63	250	74	470
DRD-0515S3	4.5-9	40	810	15	50	200	74	470
DRD-0518S3	4.5-9	40	810	18	42	167	74	220
DRD-0524S3	4.5-9	40	857	24	31	125	70	220
DRD-0505D3	4.5-9	40	869	±5	±75	±300	69	±1000
DRD-057R2D3	4.5-9	40	896	±7.2	±52	±208	67	±220
DRD-0509D3	4.5-9	40	857	±9	±42	±167	70	±220
DRD-0512D3	4.5-9	40	833	±12	±31	±125	72	±220
DRD-0515D3	4.5-9	40	810	±15	±25	±100	74	±220
DRD-0518D3	4.5-9	40	810	±18	±21	±83	74	±220
DRD-0524D3	4.5-9	40	857	±24	±16	±63	70	±100
DRD-1205S3	9-18	20	328	5	150	600	76	2200
DRD-127R2S3	9-18	20	338	7.2	104	417	74	1000
DRD-1209S3	9-18	20	324	9	83	333	77	470
DRD-1212S3	9-18	20	316	12	63	250	79	470
DRD-1215S3	9-18	20	316	15	50	200	79	470
DRD-1218S3	9-18	20	316	18	42	167	79	220
DRD-1224S3	9-18	20	316	24	31	125	79	220
DRD-1205D3	9-18	20	329	±5	±75	±300	76	±1000
DRD-127R2D3	9-18	20	325	±7.2	±52	±208	77	±220
DRD-1209D3	9-18	20	325	±9	±42	±167	77	±220
DRD-1212D3	9-18	20	316	±12	±31	±125	79	±220
DRD-1215D3	9-18	20	316	±15	±25	±100	79	±220
DRD-1218D3	9-18	20	321	±18	±21	±83	78	±220
DRD-1224D3	9-18	20	316	±24	±16	±63	79	±100
DRD-2405S3	18-36	12	156	5	150	600	80	2200
DRD-247R2S3	18-36	12	162	7.2	104	417	77	1000

Suffix "H" means 3.5KVdc isolation
Suffix "M" means Metal Case instead of standard Plastic case

DRD - 3W 2:1 Regulated Single & Dual output

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
DRD-2409S3	18-36	12	156	9	83	333	80	470
DRD-2412S3	18-36	12	152	12	62	250	82	470
DRD-2415S3	18-36	12	152	15	50	200	82	470
DRD-2418S3	18-36	12	158	18	42	167	79	220
DRD-2424S3	18-36	12	156	24	31	125	80	220
DRD-2405D3	18-36	12	156	±5	±75	±300	80	±1000
DRD-247R2D3	18-36	12	160	±7.2	±52	±208	78	±220
DRD-2409D3	18-36	12	158	±9	±42	±167	80	±220
DRD-2412D3	18-36	12	152	±12	±31	±125	82	±220
DRD-2415D3	18-36	12	152	±15	±25	±100	82	±220
DRD-2418D3	18-36	12	156	±18	±21	±83	80	±220
DRD-2424D3	18-36	12	156	±24	±16	±63	80	±100
DRD-4805S3	36-72	8	81	5	150	600	77	2200
DRD-487R2S3	36-72	8	80	7.2	104	417	78	1000
DRD-4809S3	36-72	8	80	9	83	333	78	470
DRD-4812S3	36-72	8	78	12	63	250	80	470
DRD-4815S3	36-72	8	78	15	50	200	80	470
DRD-4818S3	36-72	8	81	18	42	167	77	220
DRD-4824S3	36-72	8	78	24	31	125	80	220
DRD-4805D3	36-72	8	80	±5	±75	±300	78	±1000
DRD-487R2D3	36-72	8	80	±7.2	±52	±208	78	±220
DRD-4809D3	36-72	8	79	±9	±42	±167	79	±220
DRD-4812D3	36-72	8	78	±12	±31	±125	80	±220
DRD-4815D3	36-72	8	78	±15	±25	±100	80	±220
DRD-4818D3	36-72	8	80	±18	±21	±83	78	±220
DRD-4824D3	36-72	8	78	±24	±16	±63	80	±100

Suffix “H” means 3.5KVdc isolation
Suffix “M” means Metal Case instead of standard Plastic case

DR6-1.5W Series

1.5W 2:1 Regulated Single & Dual output

Features

- Wide 2:1 Input Range
- Full SMD Technology
- 1500 VDC Isolation, Up to 3500 VDC
- Continuous Short Circuit Protection
- Efficiency up to 75%
- -40 ~ 85°C Operating Temperature
- Plastic Case Standard, Optional Metal Case

PART NUMBER STRUCTURE

DR6 - 24 05 S 1 H M

- **Series Name**
- **Input Voltage Range**
  - **05** - 4.5 ~ 9V
  - **12** - 9 ~ 18V
  - **24** - 18 ~ 36V
  - **48** - 36 ~ 72V
- **Output Voltage**
  - **05** - 5V
  - **7R2** - 7.2V
  - **09** - 9V
  - **12** - 12V
  - **15** - 15V
  - **18** - 18V
  - **24** - 24V
- **Output Type**
  - **S** - Single output
  - **D** - Dual Output
- **1.5 Watt**
- **3.5KVdc Isolation.** Optional, if no suffix "H" mean1.5KVdc Isolation
- **Metal Case.** Optional, if no suffix " M" mean plastic Case

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage accuracy	±1%
Line regulation	±0.5%
Load regulation	±0.5%
Ripple & noise (20 MHz bandwidth)(1)	60mV pk-pk
Short circuit protection	Continuous
Temperature coefficient	±0.02%/°C
Capacitor load(2)	See table

INPUT SPECIFICATIONS

Voltage Range	See table
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	PI Type
Input Reflected Ripple Current (3)	35mA pk-pk

GENERAL SPECIFICATIONS

Efficiency	See table, typ.
I/O Isolation Voltage(3 sec)	
Input/Output	1500~3500Vdc
Metal Case/Input & Output	1000Vdc
I/O Isolation Capacitance	60 pF Typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	100~400kHz
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1Mhrs
Safety Standard : (desinged to meet)	IEC 60950-1

ENVIRONMENT SPECIFICATIONS

Operating Temperature	-40 °C~85 °C(See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

PHYSICAL SPECIFICATIONS

Case Material	Non-conductive Black Plastic(UL94V-0 rated)
	Nickel-coated Copper
Base Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	0.5mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	12.5g(Plastic Case)/15.0g (Metal Case)
Dimensions	1.25 "x0.8 "x0.4 "

ABSOLUTE MAXIMUM RATINGS (4)

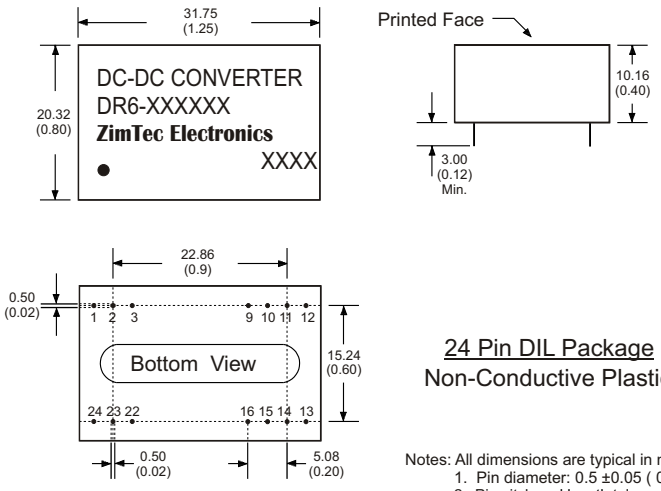
These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge Voltage(100mS)	
5 Models	15 Vdc ,max.
12 Models	24 Vdc ,max.
24 Models	40 Vdc ,max.
48 Models	80 Vdc ,max.
Soldering Temperature (1.5mm from case 10 sec. max.)	260°C max.

EMC SPECIFICATIONS

Radiated Emissions	EN55022	CLASS A
Conducted Emissions (7)	EN55022	CLASS A
ESD	IEC 61000-4-2	Perf. Criteria A
RS	IEC 61000-4-3	Perf. Criteria A
EFT (8)	IEC 61000-4-4	Perf. Criteria A
Surge (8)	IEC 61000-4-5	Perf. Criteria A
CS	IEC 61000-4-6	Perf. Criteria A
PFMF	IEC 61000-4-8	Perf. Criteria A

MECHANICAL SPECIFICATIONS FOR HIGH ISOLATION MODEL



24 Pin DIL Package
Non-Conductive Plastic

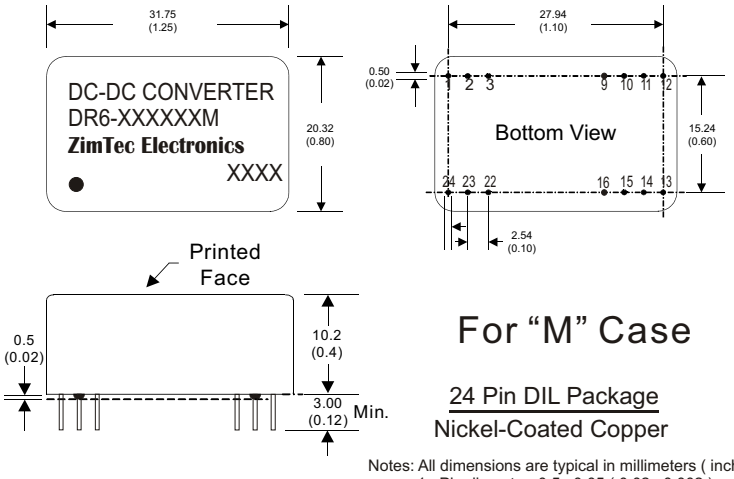
Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS

PIN NUMBER	SINGLE	DUAL	SINGLE-H	DUAL-H
1	+V Input	+V Input	N.P.	N.P.
2	N.C.	−V Output	-V Input	−V Input
3	N.C.	Common	-V Input	−V Input
9	N.P.	N.P.	N.P.	Common
10	−V Output	Common	N.P.	N.P.
11	+V Output	+V Output	N.C.	−V Output
12	−V Input	−V Input	N.P.	N.P.
13	−V Input	−V Input	N.P.	N.P.
14	+V Output	+V Output	+V Output	+V Output
15	−V Output	Common	N.P.	N.P.
16	N.P.	N.P.	−V Output	Common
22	N.C.	Common	+V Input	+V Input
23	N.C.	−V Output	+V Input	+V Input
24	+V Input	+V Input	N.P.	N.P.

Dr6 - 1.5W 2:1 Regulated Single & Dual output

MECHANICAL SPECIFICATIONS



For "M" Case

24 Pin DIL Package

Nickel-Coated Copper

Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)
4. Stand-off tolerance: ±0.1 (±0.004)

PIN CONNECTIONS				
PIN NUMBER	SINGLE	DUAL	SINGLE-H	DUAL-H
1	+V Input	+V Input	N.P.	N.P.
2	N.C.	−V Output	-V Input	−V Input
3	N.C.	Common	-V Input	−V Input
9	N.P.	N.P.	N.P.	Common
10	−V Output	Common	N.P.	N.P.
11	+V Output	+V Output	N.C.	−V Output
12	−V Input	−V Input	N.P.	N.P.
13	−V Input	−V Input	N.P.	N.P.
14	+V Output	+V Output	+V Output	+V Output
15	−V Output	Common	N.P.	N.P.
16	N.P.	N.P.	−V Output	Common
22	N.C.	Common	+V Input	+V Input
23	N.C.	−V Output	+V Input	+V Input
24	+V Input	+V Input	N.P.	N.P.

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
DR6-0505S1	4.5-9	40	429	5	75	300	70	2200
DR6-057R2S1	4.5-9	40	423	7.2	52	208	70	1000
DR6-0509S1	4.5-9	40	423	9	42	167	71	470
DR6-0512S1	4.5-9	40	417	12	125	125	72	470
DR6-0515S1	4.5-9	40	417	15	31	100	72	470
DR6-0518S1	4.5-9	40	417	18	21	83	72	220
DR6-0524S1	4.5-9	40	429	24	16	63	72	220
DR6-0505D1	4.5-9	40	423	±5	±38	±150	65	±1000
DR6-057R2D1	4.5-9	40	423	±7.2	±26	±104	65	±220
DR6-0509D1	4.5-9	40	417	±9	±21	±83	67	±220
DR6-0512D1	4.5-9	40	417	±12	±16	±63	70	±220
DR6-0515D1	4.5-9	40	417	±15	±13	±50	67	±220
DR6-0518D1	4.5-9	40	423	±18	±10	±42	66	±220
DR6-0524D1	4.5-9	40	423	±24	±8	±31	66	±100
DR6-1205S1	9-18	20	176	5	75	300	71	2200
DR6-127R2S1	9-18	40	176	7.2	52	208	71	1000
DR6-1209S1	9-18	20	171	9	42	167	73	470
DR6-1212S1	9-18	20	171	12	125	125	73	470
DR6-1215S1	9-18	20	169	15	31	100	74	470
DR6-1218S1	9-18	40	174	18	21	83	72	220
DR6-1224S1	9-18	20	176	24	16	63	71	220
DR6-1205D1	9-18	20	176	±5	±38	±150	71	±1000
DR6-127R2D1	9-18	40	176	±7.2	±26	±104	71	±220
DR6-1209D1	9-18	20	171	±9	±21	±83	73	±220
DR6-1212D1	9-18	20	169	±12	±16	±63	74	±220
DR6-1215D1	9-18	20	171	±15	±13	±50	73	±220
DR6-1218D1	9-18	40	171	±18	±10	±42	73	±220
DR6-1224D1	9-18	20	174	±24	±8	±31	72	±100
DR6-2405S1	18-36	12	87	5	75	300	72	2200
DR6-247R2S1	18-36	12	87	7.2	52	208	72	1000

Suffix "H" means 3.5KVdc isolation
Suffix "M" means Metal Case instead of standard Plastic case

Dr6 - 1.5W 2:1 Regulated Single & Dual output

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current		OUTPUT Voltage (Vdc)	OUTPUT Current		EFFICIENCY @FL(%)	Capacitor Load(uF)
		No-Load (mA)	Full Load (mA)		Min. load (mA)	Full load (mA)		
DR6-2409S1	18-36	12	84	9	42	167	74	470
DR6-2412S1	18-36	12	83	12	125	125	75	470
DR6-2415S1	18-36	12	83	15	31	100	75	470
DR6-2418S1	18-36	12	83	18	21	83	75	220
DR6-2424S1	18-36	12	86	24	16	63	73	220
DR6-2405D1	18-36	12	87	±5	±38	±150	72	±1000
DR6-247R2D1	18-36	12	87	±7.2	±26	±104	72	±220
DR6-2409D1	18-36	12	84	±9	±21	±83	74	±220
DR6-2412D1	18-36	12	84	±12	±16	±63	74	±220
DR6-2415D1	18-36	12	84	±15	±13	±50	74	±220
DR6-2418D1	18-36	12	86	±18	±10	±42	73	±220
DR6-2424D1	18-36	12	87	±24	±8	±31	72	±100
DR6-4805S1	36-72	8	45	5	75	300	70	2200
DR6-487R2S1	36-72	8	43	7.2	52	208	72	1000
DR6-4809S1	36-72	8	43	9	42	167	73	470
DR6-4812S1	36-72	8	42	12	125	125	74	470
DR6-4815S1	36-72	8	42	15	31	100	74	470
DR6-4818S1	36-72	8	43	18	21	83	73	220
DR6-4824S1	36-72	8	44	24	16	63	71	220
DR6-4805D1	36-72	8	43	±5	±38	±150	72	±1000
DR6-487R2D1	36-72	8	43	±7.2	±26	±104	72	±220
DR6-4809D1	36-72	8	43	±9	±21	±83	73	±220
DR6-4812D1	36-72	8	43	±12	±16	±63	73	±220
DR6-4815D1	36-72	8	43	±15	±13	±50	73	±220
DR6-4818D1	36-72	8	43	±18	±10	±42	72	±220
DR6-4824D1	36-72	8	44	±24	±8	±31	71	±100

Suffix “H” means 3.5KVdc isolation
Suffix “M” means Metal Case instead of standard Plastic case

DRK-1.5W Series

1.5W 4:1 Regulated Single & Dual output

Features

- Wide 4:1 Input Range
- Full SMD Technology
- 1500 VDC Isolation, Up to 3500 VDC
- Continuous Short Circuit Protection
- Efficiency up to 74%
- -40 ~ 85°C Operating Temperature
- Plastic Case Standard, Optional Metal Case

PART NUMBER STRUCTURE

DRK - 24 05 S 1 H M

- DRK — Series Name
- 24 — **Input Voltage Range**: **24** - 9 ~ 36V; **48** - 18 ~ 72V
- 05 — **Output Voltage**: **5** - 5V; **9** - 9V; **12** - 12V; **15** - 15V; **24** - 24V
- S — **Output Type**: **S** - Single output; **D** - Dual Output
- 1 — 1.5 Watt
- H — **3.5KVdc Isolation.** Optional, if no suffix "H" mean1.5KVdc Isolation
- M — **Metal Case.** Optional, if no suffix " M" mean plastic Case

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage accuracy	±1%
Line regulation	±0.5%
Load regulation	±0.5%
Ripple & noise (20 MHz bandwidth)(1)	60mV pk-pk
Short circuit protection	Continuous
Temperature coefficient	±0.02%/°C
Capacitor load(2)	See table

INPUT SPECIFICATIONS

Voltage Range	See table
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	PI Type
Input Reflected Ripple Current (3)	35mA pk-pk

GENERAL SPECIFICATIONS

Efficiency	See table, typ.
I/O Isolation Voltage(3 sec)	
Input/Output	1500~3500Vdc
Metal Case/Input & Output	1000Vdc
I/O Isolation Capacitance	60 pF Typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	100~400kHz
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1Mhrs
Safety Standard : (designed to meet)	IEC 60950-1

PHYSICAL SPECIFICATIONS

Case Material	Non-conductive Black Plastic(UL94V-0 rated)
	Nickel-coated Copper
Base Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	0.5mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	12.5g(Plastic Case)/15.0g (Metal Case)
Dimensions	1.25 "x0.8 "x0.4 "

ENVIRONMENT SPECIFICATIONS

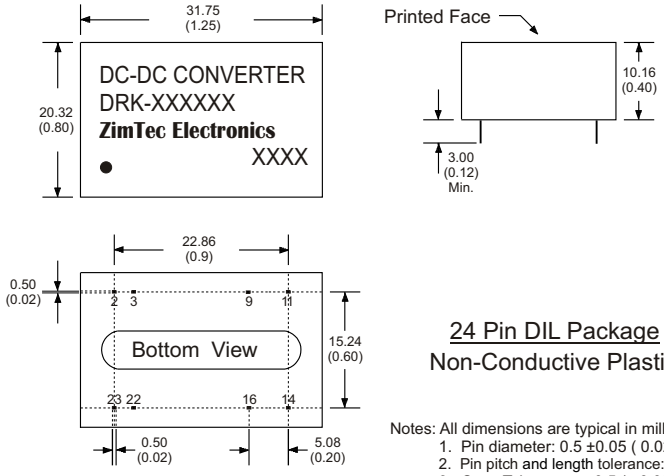
Operating Temperature	-40 °C~85 °C(See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

ABSOLUTE MAXIMUM RATINGS (4)

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge Voltage(100mS)	
24 Models	40 Vdc max.
48 Models	80 Vdc max.
Soldering Temperature (1.5mm from case 10 sec. max.)	260 °C max.

MECHANICAL SPECIFICATIONS



24 Pin DIL Package
Non-Conductive Plastic

Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

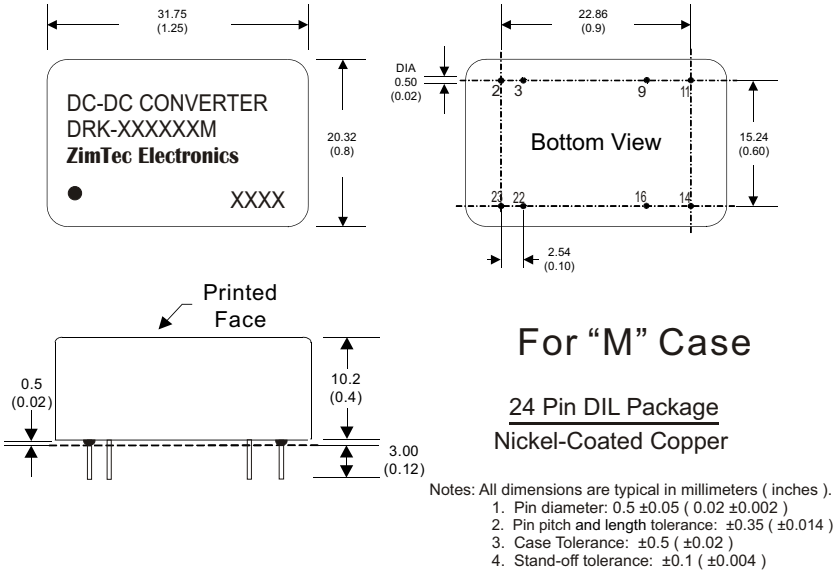
PIN CONNECTIONS

PIN NUMBER	SINGLE	DUAL
2	−V Input	−V Input
3	−V Input	−V Input
9	N.P.	Common
11	N.C.	−V Output
14	+V Output	+V Output
16	−V Output	Common
22	+V Input	+V Input
23	+V Input	+V Input

(The Pin Connection of high isolation one is the same with normal one.)

DRK - 1.5W 4:1 Regulated Single & Dual output

MECHANICAL SPECIFICATIONS



For "M" Case

24 Pin DIL Package

Nickel-Coated Copper

Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)
4. Stand-off tolerance: ±0.1 (±0.004)

PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
2	−V Input	−V Input
3	−V Input	−V Input
9	N.P.	Common
11	N.C.	−V Output
14	+V Output	+V Output
16	−V Output	Common
22	+V Input	+V Input
23	+V Input	+V Input

(The Pin Connection of high isolation one is the same with normal one.)

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
DRK-2405S1	9-36	20	91	5	100	300	68	2200
DRK-2409S1	9-36	20	89	9	55.7	167	70	470
DRK-2412S1	9-36	20	86	12	41.7	125	72	470
DRK-2415S1	9-36	20	86	15	33.3	100	72	470
DRK-2424S1	9-36	30	88	24	20.8	62.5	71	220
DRK-2405D1	9-36	20	94	±5	±50	±150	66	±1000
DRK-2409D1	9-36	20	91	±9	±27.8	±83.3	68	±220
DRK-2412D1	9-36	20	89	±12	±20.8	±62.5	70	±220
DRK-2415D1	9-36	20	89	±15	±16.7	±50	70	±220
DRK-2424D1	9-36	30	90	±24	±10.3	±31	69	±100
DRK-4805S1	18-72	10	44	5	100	300	70	2200
DRK-4809S1	18-72	10	43	9	55.7	167	72	470
DRK-4812S1	18-72	10	42	12	41.7	125	74	470
DRK-4815S1	18-72	10	42	15	33.3	100	74	470
DRK-4824S1	18-72	10	43	24	20.8	62.5	72	220
DRK-4805D1	18-72	10	45	±5	±50	±150	68	±1000
DRK-4809D1	18-72	10	44	±9	±27.8	±83.3	70	±220
DRK-4812D1	18-72	10	43	±12	±20.8	±62.5	72	±220
DRK-4815D1	18-72	10	43	±15	±16.7	±50	72	±220
DRK-4824D1	18-72	10	44	±24	±10.3	±31	71	±100

Suffix "H" means 3.5KVdc isolation
Suffix "M" means Metal Case instead of standard Plastic case

D6-1.5W Series

1.5W 2:1 Regulated Single & Dual output

Features

- Wide 2:1 Input Range
- Full SMD Technology
- 1500 VDC Isolation, Up to 3500 VDC
- Continuous Short Circuit Protection
- Efficiency up to 75%
- -40 ~ 85°C Operation Temperature Range
- Metal Case Standard, Optional Plastic Case

PART NUMBER STRUCTURE

D6 - 24 05 S 1 H P

- **Series Name**
- **Input Voltage Range**
  - **12** - 9 ~ 18V
  - **24** - 18 ~ 36V
  - **48** - 36 ~ 72V
- **Output Voltage**
  - **3R3** - 3.3V
  - **5** - 5V
  - **9** - 9V
  - **12** - 12V
  - **15** - 15V
  - **24** - 24V
- **Output Type**
  - **S** - Single output
  - **D** - Dual Output
- **1.5 Watt**
- **3.5KVdc Isolation.** Optional, if no suf fix "H" mean1.5KVdc Isolation
- **Plastic Case** . Optional, if no suffix "P" mean metal Case

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage accuracy	±1%
Line regulation	±0.5%
Load regulation	±0.5%
	(Output 3.3V / ±3.3V Model) ±1.5%
Ripple & noise (20 MHz bandwidth)(1)	60mV pk-pk
Short circuit protection	Indefinite(Automatic Recovery)
Temperature coefficient	±0.02%/°C
Capacitor load(2)	See table

INPUT SPECIFICATIONS

Voltage Range	See table
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	PI Type
Input Reflected Ripple Current (3)	35mA pk-pk

GENERAL SPECIFICATIONS

Efficiency	See table, typ.
I/O Isolation Voltage(3 sec)	
Input/Output	1500~3500Vdc
Metal Case/Input & Output	1000Vdc
I/O Isolation Capacitance	470 pF, typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	266kHz, typ.
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1.121 Mhrs
Safety Standard : (designed to meet)	IEC 60950-1

PHYSICAL SPECIFICATIONS

Case Material	Nickel-coated Copper
	Non-conductive Black Plastic(UL94V-0 rated)
Base Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	0.5mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	17.0g (Metal Case)/ 13.5g(Plastic Case)
Dimensions	1.25 "x0.8 "x0.4 "

ENVIRONMENT SPECIFICATIONS

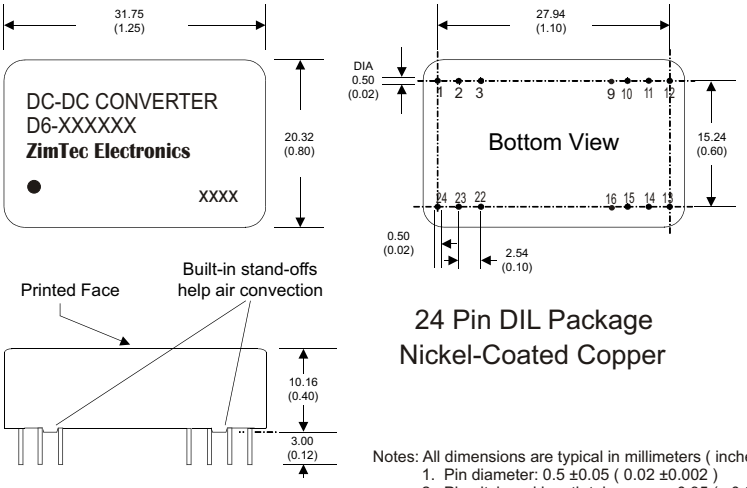
Operating Temperature	-40 °C~85 °C(See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

ABSOLUTE MAXIMUM RATINGS (4)

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge Voltage(100mS)	
12 Models	24 Vdc, max.
24 Models	40 Vdc, max.
48 Models	80 Vdc, max.
Soldering Temperature (1.5mm from case 10 sec. max.)	260°C, max.

MECHANICAL SPECIFICATIONS



24 Pin DIL Package
Nickel-Coated Copper

Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

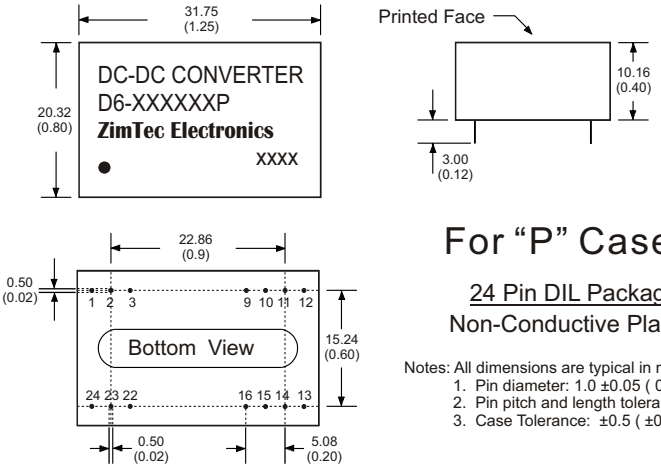
PIN CONNECTIONS

PIN NUMBER	SINGLE	DUAL	SINGLE-H	DUAL-H
1	+V Input	+V Input	N.P.	N.P.
2	N.C.	−V Output	-V Input	−V Input
3	N.C.	Common	-V Input	−V Input
9	N.P.	N.P.	N.P.	Common
10	−V Output	Common	N.P.	N.P.
11	+V Output	+V Output	N.C.	−V Output
12	−V Input	−V Input	N.P.	N.P.
13	−V Input	−V Input	N.P.	N.P.
14	+V Output	+V Output	+V Output	+V Output
15	−V Output	Common	N.P.	N.P.
16	N.P.	N.P.	−V Output	Common
22	N.C.	Common	+V Input	+V Input
23	N.C.	−V Output	+V Input	+V Input
24	+V Input	+V Input	N.P.	N.P.

(The Pin Connection of high isolation one is the same with normal one.)

D6 - 1.5W 2:1 Regulated Single & Dual output

MECHANICAL SPECIFICATIONS



For "P" Case

24 Pin DIL Package
Non-Conductive Plastic

Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 1.0 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS				
PIN NUMBER	SINGLE	DUAL	SINGLE-H	DUAL-H
1	+V Input	+V Input	N.P.	N.P.
2	N.C.	−V Output	-V Input	−V Input
3	N.C.	Common	-V Input	−V Input
9	N.P.	N.P.	N.P.	Common
10	−V Output	Common	N.P.	N.P.
11	+V Output	+V Output	N.C.	−V Output
12	−V Input	−V Input	N.P.	N.P.
13	−V Input	−V Input	N.P.	N.P.
14	+V Output	+V Output	+V Output	+V Output
15	−V Output	Common	N.P.	N.P.
16	N.P.	N.P.	−V Output	Common
22	N.C.	Common	+V Input	+V Input
23	N.C.	−V Output	+V Input	+V Input
24	+V Input	+V Input	N.P.	N.P.

(The Pin Connection of high isolation one is the same with normal one.)

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
D6-123R3S1	9-18	25	173	3.3	0	454	72	470
D6-1205S1	9-18	25	169	5	0	300	74	470
D6-1209S1	9-18	25	167	9	0	167	75	68
D6-1212S1	9-18	25	167	12	0	125	75	47
D6-1215S1	9-18	25	167	15	0	100	75	22
D6-1224S1	9-18	25	167	24	0	63	75	10
D6-123R3D1	9-18	25	173	±3.3	0	±227	72	±220
D6-1205D1	9-18	25	169	±5	0	±150	74	±220
D6-1209D1	9-18	25	167	±9	0	±84	75	±33
D6-1212D1	9-18	25	167	±12	0	±63	75	±22
D6-1215D1	9-18	25	167	±15	0	±50	75	±10
D6-1224D1	9-18	25	167	±24	0	±32	75	±10
D6-243R3S1	18-36	12	86	3.3	0	454	72	470
D6-2405S1	18-36	12	84	5	0	300	74	470
D6-2409S1	18-36	12	83	9	0	167	75	68
D6-2412S1	18-36	12	83	12	0	125	75	47
D6-2415S1	18-36	12	83	15	0	100	75	22
D6-2424S1	18-36	12	83	24	0	63	75	10
D6-243R3D1	18-36	12	86	±3.3	0	±227	72	±220
D6-2405D1	18-36	12	84	±5	0	±150	74	±220
D6-2409D1	18-36	12	83	±9	0	±84	75	±33
D6-2412D1	18-36	12	83	±12	0	±63	75	±22
D6-2415D1	18-36	12	83	±15	0	±50	75	±10
D6-2424D1	18-36	12	83	±24	0	±32	75	±10
D6-483R3S1	36-72	8	43	3.3	0	454	72	470
D6-4805S1	36-72	8	42	5	0	300	74	470
D6-4809S1	36-72	8	42	9	0	167	74	68
D6-4812S1	36-72	8	42	12	0	125	74	47
D6-4815S1	36-72	8	42	15	0	100	74	22
D6-4824S1	36-72	8	42	24	0	63	74	10
D6-483R3D1	36-72	8	43	±3.3	0	±227	72	±220
D6-4805D1	36-72	8	42	±5	0	±150	74	±220
D6-4809D1	36-72	8	42	±9	0	±84	74	±33
D6-4812D1	36-72	8	42	±12	0	±63	74	±22
D6-4815D1	36-72	8	42	±15	0	±50	74	±10
D6-4824D1	36-72	8	42	±24	0	±32	74	±10

Suffix "H" means 3.5KVdc isolation
Suffix "P" means Plastic case instead of standard Metal Case

D6-2W Series

2W 2:1 Regulated Single & Dual output

Features

- Wide 2:1 Input Range
- Full SMD Technology
- 1500 VDC Isolation, Up to 3500 VDC
- Continuous Short Circuit Protection
- Efficiency up to 78%
- -40 ~ 85°C Operation Temperature Range
- Metal Case Standard, Optional Plastic Case

PART NUMBER STRUCTURE

D6 - 24 05 S 2 H P

- **Series Name**
- **Input Voltage Range**: **12** - 9 ~ 18V; **24** - 18 ~ 36V; **48** - 36 ~ 72V
- **Output Voltage**: **3R3** - 3.3V; **5** - 5V; **9** - 9V; **12** - 12V; **15** - 15V; **24** - 24V
- **Output Type**: **S** - Single output; **D** - Dual Output
- **2 Watt**
- **3.5KVdc Isolation.** Optional, if no suf fix "H" mean1.5KVdc Isolation
- **Plastic Case** . Optional, if no suffix "P" mean metal Case

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage accuracy	±1%
Line regulation	±0.5%
Load regulation	±0.5%
	(Output 3.3V / ±3.3V Model) ±1.5%
Ripple & noise (20 MHz bandwidth)(1)	60mV pk-pk
Short circuit protection	Indefinite(Automatic Recovery)
Temperature coefficient	±0.02%/°C
Capacitor load(2)	See table

INPUT SPECIFICATIONS

Voltage Range	See table
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	PI Type
Input Reflected Ripple Current (3)	35mA pk-pk

GENERAL SPECIFICATIONS

Efficiency	See table, typ.
I/O Isolation Voltage(3 sec)	
Input/Output	1500~3500Vdc
Metal Case/Input & Output	1000Vdc
I/O Isolation Capacitance	470 pF, typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	266kHz, typ.
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1.121 Mhrs
Safety Standard : (designed to meet)	IEC 60950-1

PHYSICAL SPECIFICATIONS

Case Material	Nickel-coated Copper
	Non-conductive Black Plastic(UL94V-0 rated)
Base Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	0.5mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight 17.0g	(Metal Case)/13.5g(Plastic Case)
Dimensions	1.25 "x0.8 "x0.4 "

ENVIRONMENT SPECIFICATIONS

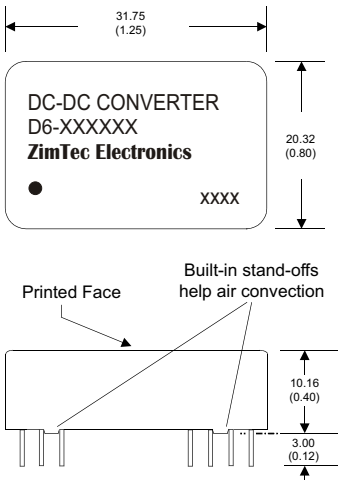
Operating Temperature	-40 °C~85 °C(See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

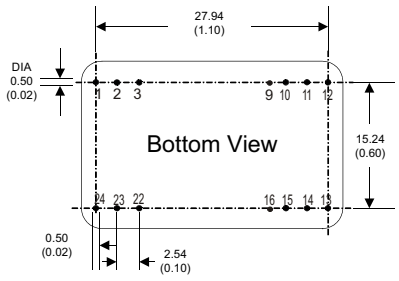
ABSOLUTE MAXIMUM RATINGS (4)

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge Voltage(100mS)	
12 Models	24 Vdc, max.
24 Models	40 Vdc, max.
48 Models	80 Vdc, max.
Soldering Temperature (1.5mm from case 10 sec. max.)	260 °C, max.

MECHANICAL SPECIFICATIONS





24 Pin DIL Package
Nickel-Coated Copper

Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

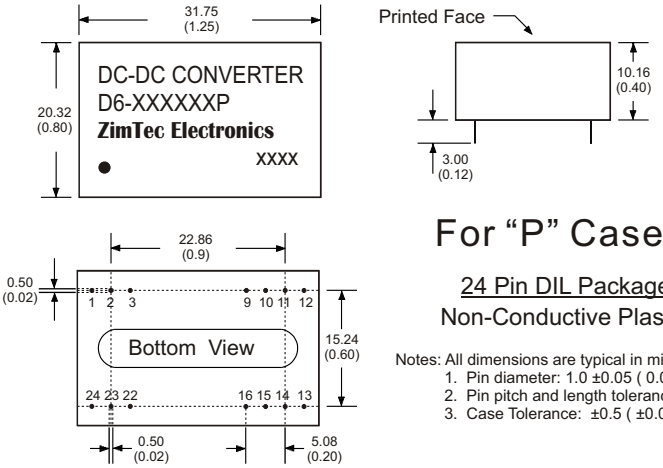
PIN CONNECTIONS

PIN NUMBER	SINGLE	DUAL	SINGLE-H	DUAL-H
1	+V Input	+V Input	N.P.	N.P.
2	N.C.	−V Output	-V Input	−V Input
3	N.C.	Common	-V Input	−V Input
9	N.P.	N.P.	N.P.	Common
10	−V Output	Common	N.P.	N.P.
11	+V Output	+V Output	N.C.	−V Output
12	−V Input	−V Input	N.P.	N.P.
13	−V Input	−V Input	N.P.	N.P.
14	+V Output	+V Output	+V Output	+V Output
15	−V Output	Common	N.P.	N.P.
16	N.P.	N.P.	−V Output	Common
22	N.C.	Common	+V Input	+V Input
23	N.C.	−V Output	+V Input	+V Input
24	+V Input	+V Input	N.P.	N.P.

(The Pin Connection of high isolation one is the same with normal one.)

D6 - 2W 2:1 Regulated Single & Dual output

MECHANICAL SPECIFICATIONS



For "P" Case

24 Pin DIL Package

Non-Conductive Plastic

Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 1.0 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS				
PIN NUMBER	SINGLE	DUAL	SINGLE-H	DUAL-H
1	+V Input	+V Input	N.P.	N.P.
2	N.C.	−V Output	-V Input	−V Input
3	N.C.	Common	-V Input	−V Input
9	N.P.	N.P.	N.P.	Common
10	−V Output	Common	N.P.	N.P.
11	+V Output	+V Output	N.C.	−V Output
12	−V Input	−V Input	N.P.	N.P.
13	−V Input	−V Input	N.P.	N.P.
14	+V Output	+V Output	+V Output	+V Output
15	−V Output	Common	N.P.	N.P.
16	N.P.	N.P.	−V Output	Common
22	N.C.	Common	+V Input	+V Input
23	N.C.	−V Output	+V Input	+V Input
24	+V Input	+V Input	N.P.	N.P.

(The Pin Connection of high isolation one is the same with normal one.)

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
D6-123R3S2	9-18	30	223	3.3	0	600	74	680
D6-1205S2	9-18	30	222	5	0	400	75	680
D6-1209S2	9-18	30	219	9	0	222	76	330
D6-1212S2	9-18	30	219	12	0	167	76	220
D6-1215S2	9-18	30	219	15	0	133	76	100
D6-1224S2	9-18	30	219	24	0	83	76	33
D6-123R3D2	9-18	30	229	±3.3	0	±300	72	±330
D6-1205D2	9-18	30	219	±5	0	±200	75	±330
D6-1209D2	9-18	30	219	±9	0	±111	76	±100
D6-1212D2	9-18	30	219	±12	0	±83	76	±47
D6-1215D2	9-18	30	219	±15	0	±67	76	±33
D6-1224D2	9-18	30	219	±24	0	±42	76	±22
D6-243R3S2	18-36	20	109	3.3	0	600	76	680
D6-2405S2	18-36	20	107	5	0	400	78	680
D6-2409S2	18-36	20	107	9	0	222	78	330
D6-2412S2	18-36	20	107	12	0	167	78	220
D6-2415S2	18-36	20	107	15	0	133	78	100
D6-2424S2	18-36	20	107	24	0	83	78	33
D6-243R3D2	18-36	20	112	±3.3	0	±300	74	±330
D6-2405D2	18-36	20	109	±5	0	±200	76	±330
D6-2409D2	18-36	20	107	±9	0	±111	78	±100
D6-2412D2	18-36	20	107	±12	0	±83	78	±47
D6-2415D2	18-36	20	107	±15	0	±67	78	±33
D6-2424D2	18-36	20	107	±24	0	±42	78	±22
D6-483R3S2	36-72	12	56	3.3	0	600	74	680
D6-4805S2	36-72	12	56	5	0	400	75	680
D6-4809S2	36-72	12	56	9	0	222	75	330
D6-4812S2	36-72	12	56	12	0	167	75	220
D6-4815S2	36-72	12	56	15	0	133	75	100
D6-4824S2	36-72	12	56	24	0	83	75	33
D6-483R3D2	36-72	12	56	±3.3	0	±300	74	±330
D6-4805D2	36-72	12	56	±5	0	±200	75	±330
D6-4809D2	36-72	12	56	±9	0	±111	75	±100
D6-4812D2	36-72	12	56	±12	0	±83	75	±47
D6-4815D2	36-72	12	56	±15	0	±67	75	±33
D6-4824D2	36-72	12	56	±24	0	±42	75	±22

Suffix "H" means 3.5KVdc isolation
Suffix "P" means Plastic case instead of standard Metal Case

D6-3W Series

3W 2:1 Regulated Single & Dual output

Features

- Wide 2:1 Input Range
- Full SMD Technology
- 1500 VDC Isolation, Up to 3500 VDC
- Continuous Short Circuit Protection
- Efficiency up to 82%
- -40 ~ 85°C Operation Temperature Range
- Metal Case Standard, Optional Plastic Case

PART NUMBER STRUCTURE

D6 - 24 05 S 3 H P

- **Series Name**
- **Input Voltage Range**: **12** - 9 ~ 18V; **24** - 18 ~ 36V; **48** - 36 ~ 72V
- **Output Voltage**: **3R3** - 3.3V; **5** - 5V; **9** - 9V; **12** - 12V; **15** - 15V; **24** - 24V
- **Output Type**: **S** - Single output; **D** - Dual Output
- **3 Watt**
- **3.5KVdc Isolation.** Optional, if no suf fix "H" mean1.5KVdc Isolation
- **Plastic Case** . Optional, if no suffix "P" mean metal Case

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage accuracy	±1%
Line regulation	±0.5%
Load regulation	±0.5%
(Output 3.3V / ±3.3V Model)	±1.5%
Ripple & noise (20 MHz bandwidth)(1)	60mV pk-pk
Short circuit protection	Indefinite(Automatic Recovery)
Temperature coefficient	±0.02%/°C
Capacitor load(2)	See table

INPUT SPECIFICATIONS

Voltage Range	See table
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	PI Type
Input Reflected Ripple Current (3)	35mA pk-pk

GENERAL SPECIFICATIONS

Efficiency	See table, typ.
I/O Isolation Voltage(3 sec)	
Input/Output	1500~3500Vdc
Metal Case/Input & Output	1000Vdc
I/O Isolation Capacitance	470 pF, typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	266kHz, typ.
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1.121 Mhrs
Safety Standard : (designed to meet)	IEC 60950-1

PHYSICAL SPECIFICATIONS

Case Material	Nickel-coated Copper
	Non-conductive Black Plastic(UL94V-0 rated)
Base Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	0.5mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	17.0g (Metal Case)/ 13.5g(Plastic Case)
Dimensions	1.25 "x0.8 "x0.4 "

ENVIRONMENT SPECIFICATIONS

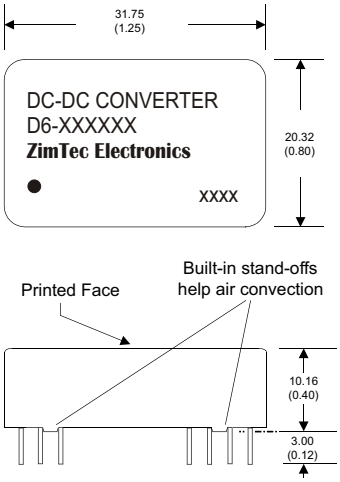
Operating Temperature	-40 °C~85 °C (See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

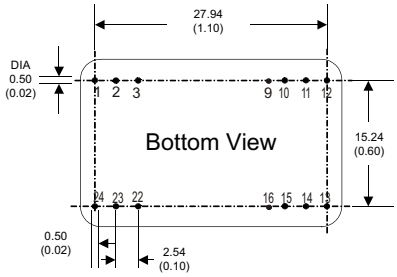
ABSOLUTE MAXIMUM RATINGS(4)

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge Voltage(100mS)	
12 Models	24 Vdc, max.
24 Models	40 Vdc, max.
48 Models	80 Vdc, max.
Soldering Temperature (1.5mm from case 10 sec.max.)	260°C, max.

MECHANICAL SPECIFICATIONS





24 Pin DIL Package
Nickel-Coated Copper

Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

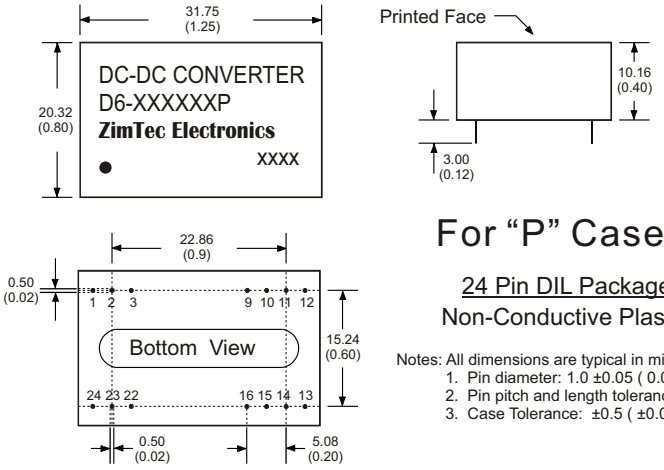
PIN CONNECTIONS

PIN NUMBER	SINGLE	DUAL	SINGLE-H	DUAL-H
1	+V Input	+V Input	N.P.	N.P.
2	N.C.	−V Output	-V Input	−V Input
3	N.C.	Common	-V Input	−V Input
9	N.P.	N.P.	N.P.	Common
10	−V Output	Common	N.P.	N.P.
11	+V Output	+V Output	N.C.	−V Output
12	−V Input	−V Input	N.P.	N.P.
13	−V Input	−V Input	N.P.	N.P.
14	+V Output	+V Output	+V Output	+V Output
15	−V Output	Common	N.P.	N.P.
16	N.P.	N.P.	−V Output	Common
22	N.C.	Common	+V Input	+V Input
23	N.C.	−V Output	+V Input	+V Input
24	+V Input	+V Input	N.P.	N.P.

(The Pin Connection of high isolation one is the same with normal one.)

D6 - 3W 2:1 Regulated Single & Dual output

MECHANICAL SPECIFICATIONS



For "P" Case

24 Pin DIL Package

Non-Conductive Plastic

Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 1.0 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS				
PIN NUMBER	SINGLE	DUAL	SINGLE-H	DUAL-H
1	+V Input	+V Input	N.P.	N.P.
2	N.C.	−V Output	-V Input	−V Input
3	N.C.	Common	-V Input	−V Input
9	N.P.	N.P.	N.P.	Common
10	−V Output	Common	N.P.	N.P.
11	+V Output	+V Output	N.C.	−V Output
12	−V Input	−V Input	N.P.	N.P.
13	−V Input	−V Input	N.P.	N.P.
14	+V Output	+V Output	+V Output	+V Output
15	−V Output	Common	N.P.	N.P.
16	N.P.	N.P.	−V Output	Common
22	N.C.	Common	+V Input	+V Input
23	N.C.	−V Output	+V Input	+V Input
24	+V Input	+V Input	N.P.	N.P.

(The Pin Connection of high isolation one is the same with normal one.)

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
D6-123R3S3	9-18	22	343	3.3	0	900	72	470
D6-1205S3	9-18	22	328	5	0	600	76	470
D6-1209S3	9-18	22	320	9	0	333	78	68
D6-1212S3	9-18	22	312	12	0	250	80	47
D6-1215S3	9-18	22	312	15	0	200	80	47
D6-1224S3	9-18	22	313	24	0	125	80	22
D6-123R3D3	9-18	22	343	±3.3	0	±450	72	±220
D6-1205D3	9-18	22	328	±5	0	±300	76	±220
D6-1209D3	9-18	22	312	±9	0	±167	80	±33
D6-1212D3	9-18	22	312	±12	0	±125	80	±22
D6-1215D3	9-18	22	312	±15	0	±100	80	±22
D6-1224D3	9-18	22	313	±24	0	±63	80	±10
D6-243R3S3	18-36	12	171	3.3	0	900	72	470
D6-2405S3	18-36	12	164	5	0	600	76	470
D6-2409S3	18-36	12	160	9	0	333	78	68
D6-2412S3	18-36	12	156	12	0	250	80	47
D6-2415S3	18-36	12	152	15	0	200	82	47
D6-2424S3	18-36	12	153	24	0	125	82	22
D6-243R3D3	18-36	12	171	±3.3	0	±450	72	±220
D6-2405D3	18-36	12	160	±5	0	±300	78	±220
D6-2409D3	18-36	12	156	±9	0	±167	80	±33
D6-2412D3	18-36	12	152	±12	0	±125	82	±22
D6-2415D3	18-36	12	152	±15	0	±100	82	±22
D6-2424D3	18-36	12	153	±24	0	±63	82	±10
D6-483R3S3	36-72	8	86	3.3	0	900	72	470
D6-4805S3	36-72	8	82	5	0	600	76	470
D6-4809S3	36-72	8	80	9	0	333	78	68
D6-4812S3	36-72	8	78	12	0	250	80	47
D6-4815S3	36-72	8	78	15	0	200	80	47
D6-4824S3	36-72	8	78	24	0	125	80	22
D6-483R3D3	36-72	8	86	±3.3	0	±450	72	±220
D6-4805D3	36-72	8	82	±5	0	±300	76	±220
D6-4809D3	36-72	8	80	±9	0	±167	78	±33
D6-4812D3	36-72	8	78	±12	0	±125	80	±22
D6-4815D3	36-72	8	78	±15	0	±100	80	±22
D6-4824D3	36-72	8	78	±24	0	±63	80	±10

Suffix "H" means 3.5KVdc isolation
Suffix "P" means Plastic case instead of standard Metal Case

D6-4W Series

4W 2:1 Regulated Single & Dual output

Features

- Wide 2:1 Input Range
- Full SMD Technology
- 1500 VDC Isolation, Up to 3500 VDC
- Continuous Short Circuit Protection
- Efficiency up to 82%
- -40 ~ 85°C Operation Temperature Range
- Metal Case Standard, Optional Plastic Case

PART NUMBER STRUCTURE

D6 - 24 05 S 4 H P

- **D6** — Series Name
- **24** — Input Voltage Range: **12** - 9 ~ 18V; **24** - 18 ~ 36V; **48** - 36 ~ 72V
- **05** — Output Voltage: **3R3** - 3.3V; **5** - 5V; **9** - 9V; **12** - 12V; **15** - 15V; **24** - 24V
- **S** — Output Type: **S** - Single output; **D** - Dual Output
- **4** — 4 Watt
- **H** — 3.5KVdc Isolation. Optional, if no suf fix "H" mean1.5KVdc Isolation
- **P** — Plastic Case . Optional, if no suffix "P" mean metal Case

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage accuracy	±1%
Line regulation	±0.5%
Load regulation	±0.5%
(Output 3.3V / ±3.3V Model)	±1.5%
Ripple & noise (20 MHz bandwidth)(1)	60mV pk-pk
Short circuit protection	Indefinite(Automatic Recovery)
Temperature coefficient	±0.02%/°C
Capacitor load(2)	See table

INPUT SPECIFICATIONS

Voltage Range	See table
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	PI Type
Input Reflected Ripple Current (3)	35mA pk-pk

GENERAL SPECIFICATIONS

Efficiency	See table, typ.
I/O Isolation Voltage(3 sec)	
Input/Output	1500~3500Vdc
Metal Case/Input & Output	1000Vdc
I/O Isolation Capacitance	470 pF, typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	266kHz, typ.
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1.121 Mhrs
Safety Standard : (designed to meet)	IEC 60950-1

PHYSICAL SPECIFICATIONS

Case Material	Nickel-coated Copper
	Non-conductive Black Plastic(UL94V-0 rated)
Base Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	0.5mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	17.0g (Metal Case)/ 13.5g(Plastic Case)
Dimensions	1.25 "x0.8 "x0.4 "

ENVIRONMENT SPECIFICATIONS

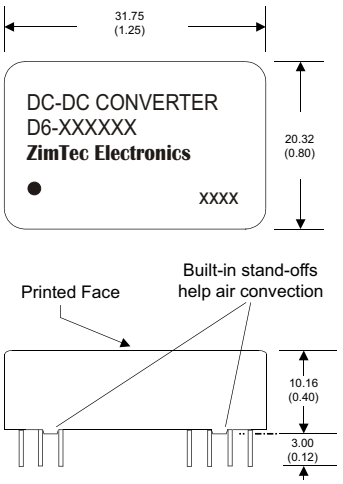
Operating Temperature	-40 °C~85 °C(See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

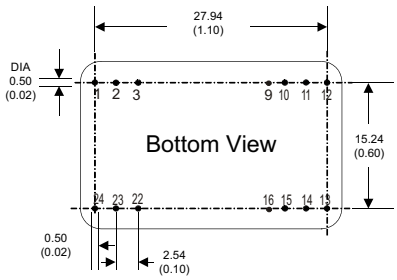
ABSOLUTE MAXIMUM RATINGS(4)

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge Voltage(100mS)	
12 Models	24 Vdc max.
24 Models	40 Vdc max.
48 Models	80 Vdc max.
Soldering Temperature (1.5mm from case 10 sec.max.)	260 °C max.

MECHANICAL SPECIFICATIONS





24 Pin DIL Package
Nickel-Coated Copper

Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

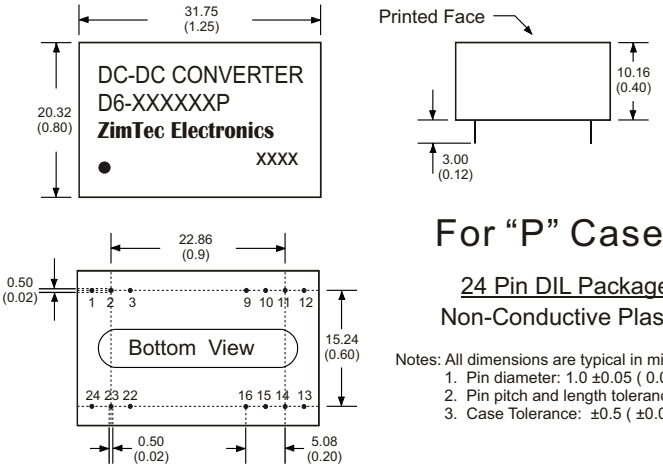
PIN CONNECTIONS

PIN NUMBER	SINGLE	DUAL	SINGLE-H	DUAL-H
1	+V Input	+V Input	N.P.	N.P.
2	N.C.	−V Output	-V Input	−V Input
3	N.C.	Common	-V Input	−V Input
9	N.P.	N.P.	N.P.	Common
10	−V Output	Common	N.P.	N.P.
11	+V Output	+V Output	N.C.	−V Output
12	−V Input	−V Input	N.P.	N.P.
13	−V Input	−V Input	N.P.	N.P.
14	+V Output	+V Output	+V Output	+V Output
15	−V Output	Common	N.P.	N.P.
16	N.P.	N.P.	−V Output	Common
22	N.C.	Common	+V Input	+V Input
23	N.C.	−V Output	+V Input	+V Input
24	+V Input	+V Input	N.P.	N.P.

(The Pin Connection of high isolation one is the same with normal one.)

D6 - 4W 2:1 Regulated Single & Dual output

MECHANICAL SPECIFICATIONS



For "P" Case

24 Pin DIL Package

Non-Conductive Plastic

Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 1.0 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS				
PIN NUMBER	SINGLE	DUAL	SINGLE-H	DUAL-H
1	+V Input	+V Input	N.P.	N.P.
2	N.C.	−V Output	-V Input	−V Input
3	N.C.	Common	-V Input	−V Input
9	N.P.	N.P.	N.P.	Common
10	−V Output	Common	N.P.	N.P.
11	+V Output	+V Output	N.C.	−V Output
12	−V Input	−V Input	N.P.	N.P.
13	−V Input	−V Input	N.P.	N.P.
14	+V Output	+V Output	+V Output	+V Output
15	−V Output	Common	N.P.	N.P.
16	N.P.	N.P.	−V Output	Common
22	N.C.	Common	+V Input	+V Input
23	N.C.	−V Output	+V Input	+V Input
24	+V Input	+V Input	N.P.	N.P.

(The Pin Connection of high isolation one is the same with normal one.)

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
D6-123R3S4	9-18	30	463	3.3	0	1200	72	3300
D6-1205S4	9-18	30	428	5	0	800	78	1000
D6-1209S4	9-18	30	428	9	0	444	78	470
D6-1212S4	9-18	30	417	12	0	333	80	220
D6-1215S4	9-18	30	417	15	0	266	80	100
D6-1224S4	9-18	30	417	24	0	166	80	47
D6-123R3D4	9-18	30	452	±3.3	0	±600	73	±680
D6-1205D4	9-18	30	428	±5	0	±400	78	±470
D6-1209D4	9-18	30	417	±9	0	±220	80	±220
D6-1212D4	9-18	30	417	±12	0	±166	80	±100
D6-1215D4	9-18	30	417	±15	0	±133	80	±47
D6-1224D4	9-18	30	421	±24	0	±83	79	±22
D6-243R3S4	18-36	20	223	3.3	0	1200	75	3300
D6-2405S4	18-36	20	209	5	0	800	80	1000
D6-2409S4	18-36	20	209	9	0	444	80	470
D6-2412S4	18-36	20	201	12	0	333	83	220
D6-2415S4	18-36	20	209	15	0	266	80	100
D6-2424S4	18-36	20	196	24	0	166	85	47
D6-243R3D4	18-36	20	226	±3.3	0	±600	73	±680
D6-2405D4	18-36	20	211	±5	0	±400	79	±470
D6-2409D4	18-36	20	209	±9	0	±220	80	±220
D6-2412D4	18-36	20	204	±12	0	±166	82	±100
D6-2415D4	18-36	20	209	±15	0	±133	80	±47
D6-2424D4	18-36	20	214	±24	0	±83	78	±22
D6-483R3S4	36-72	15	112	3.3	0	1200	75	3300
D6-4805S4	36-72	15	105	5	0	800	80	1000
D6-4809S4	36-72	15	102	9	0	444	82	470
D6-4812S4	36-72	15	105	12	0	333	80	220
D6-4815S4	36-72	15	103	15	0	266	81	100
D6-4824S4	36-72	15	102	24	0	166	82	47
D6-483R3D4	36-72	15	116	±3.3	0	±600	72	±680
D6-4805D4	36-72	15	107	±5	0	±400	78	±470
D6-4809D4	36-72	15	107	±9	0	±220	78	±220
D6-4812D4	36-72	15	105	±12	0	±166	80	±100
D6-4815D4	36-72	15	105	±15	0	±133	80	±47
D6-4824D4	36-72	15	105	±24	0	±83	80	±22

Suffix "H" means 3.5KVdc isolation
Suffix "P" means Plastic case instead of standard Metal Case

D6-5W Series

5W 2:1 Regulated Single & Dual output

Features

- Wide 2:1 Input Range
- Full SMD Technology
- 1500 VDC Isolation, Up to 3500 VDC
- Continuous Short Circuit Protection
- Efficiency up to 83%
- -40 ~ 85°C Operation Temperature Range
- Metal Case Standard, Optional Plastic Case

PART NUMBER STRUCTURE

D6 - 24 05 S 5 H P

- **Series Name**
- **Input Voltage Range**: **12** - 9 ~ 18V; **24** - 18 ~ 36V; **48** - 36 ~ 72V
- **Output Voltage**: **3R3** - 3.3V; **5** - 5V; **9** - 9V; **12** - 12V; **15** - 15V; **24** - 24V
- **Output Type**: **S** - Single output; **D** - Dual Output
- **5 Watt**
- **3.5KVdc Isolation.** Optional, if no suf fix "H" mean1.5KVdc Isolation
- **Plastic Case** . Optional, if no suffix "P" mean metal Case

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage accuracy	±1%
Line regulation	±0.5%
Load regulation	±0.5%
(Output 3.3V / ±3.3V Model)	±1.5%
Ripple & noise (20 MHz bandwidth)(1)	60mV pk-pk
Short circuit protection	Indefinite(Automatic Recovery)
Temperature coefficient	±0.02%/°C
Capacitor load(2)	See table

INPUT SPECIFICATIONS

Voltage Range	See table
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	PI Type
Input Reflected Ripple Current (3)	35mA pk-pk

GENERAL SPECIFICATIONS

Efficiency	See table, typ.
I/O Isolation Voltage(3 sec)	
Input/Output	1500~3500Vdc
Metal Case/Input & Output	1000Vdc
I/O Isolation Capacitance	470 pF typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	Typical 266kHz
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1.121 Mhrs
Safety Standard : (designed to meet)	IEC 60950-1

PHYSICAL SPECIFICATIONS

Case Material	Nickel-coated Copper
	Non-conductive Black Plastic(UL94V-0 rated)
Base Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	¨ 0.5mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0rated)
Weight	17.0g (Metal Case)/ 13.5g(Plastic Case)
Dimensions	1.25 "x0.8 "x0.4 "

ENVIRONMENT SPECIFICATIONS

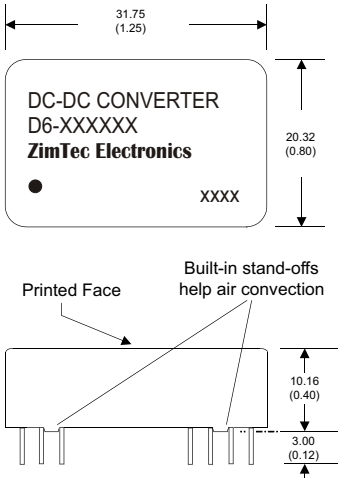
Operating Temperature	-40 °C~85 °C(See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

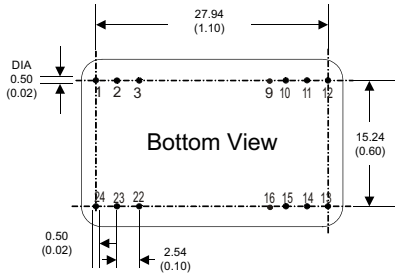
ABSOLUTE MAXIMUM RATINGS(4)

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge Voltage(100mS)	
12 Models	24 Vdc, max.
24 Models	40 Vdc, max.
48 Models	80 Vdc, max.
Soldering Temperature (1.5mm from case 10 sec. max.)	260°C, max.

MECHANICAL SPECIFICATIONS





24 Pin DIL Package
Nickel-Coated Copper

Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

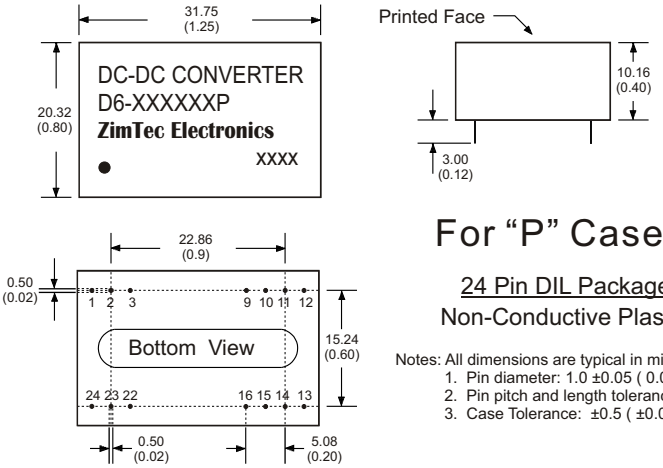
PIN CONNECTIONS

PIN NUMBER	SINGLE	DUAL	SINGLE-H	DUAL-H
1	+V Input	+V Input	N.P.	N.P.
2	N.C.	−V Output	-V Input	−V Input
3	N.C.	Common	-V Input	−V Input
9	N.P.	N.P.	N.P.	Common
10	−V Output	Common	N.P.	N.P.
11	+V Output	+V Output	N.C.	−V Output
12	−V Input	−V Input	N.P.	N.P.
13	−V Input	−V Input	N.P.	N.P.
14	+V Output	+V Output	+V Output	+V Output
15	−V Output	Common	N.P.	N.P.
16	N.P.	N.P.	−V Output	Common
22	N.C.	Common	+V Input	+V Input
23	N.C.	−V Output	+V Input	+V Input
24	+V Input	+V Input	N.P.	N.P.

(The Pin Connection of high isolation one is the same with normal one.)

D6 - 5W 2:1 Regulated Single & Dual output

MECHANICAL SPECIFICATIONS



For "P" Case

24 Pin DIL Package

Non-Conductive Plastic

Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 1.0 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS				
PIN NUMBER	SINGLE	DUAL	SINGLE-H	DUAL-H
1	+V Input	+V Input	N.P.	N.P.
2	N.C.	−V Output	-V Input	−V Input
3	N.C.	Common	-V Input	−V Input
9	N.P.	N.P.	N.P.	Common
10	−V Output	Common	N.P.	N.P.
11	+V Output	+V Output	N.C.	−V Output
12	−V Input	−V Input	N.P.	N.P.
13	−V Input	−V Input	N.P.	N.P.
14	+V Output	+V Output	+V Output	+V Output
15	−V Output	Common	N.P.	N.P.
16	N.P.	N.P.	−V Output	Common
22	N.C.	Common	+V Input	+V Input
23	N.C.	−V Output	+V Input	+V Input
24	+V Input	+V Input	N.P.	N.P.

(The Pin Connection of high isolation one is the same with normal one.)

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
D6-123R3S5	9-18	30	490	3.3	0	1300	73	1000
D6-1205S5	9-18	30	542	5	0	1000	77	1000
D6-1209S5	9-18	30	534	9	0	555	78	680
D6-1212S5	9-18	30	514	12	0	417	81	330
D6-1215S5	9-18	30	520	15	0	333	80	220
D6-1224S5	9-18	30	520	24	0	208	80	68
D6-123R3D5	9-18	30	565	±3.3	0	±750	73	±680
D6-1205D5	9-18	30	542	±5	0	±500	77	±330
D6-1209D5	9-18	30	520	±9	0	±278	80	±220
D6-1212D5	9-18	30	520	±12	0	±208	80	±100
D6-1215D5	9-18	30	528	±15	0	±167	79	±47
D6-1224D5	9-18	30	520	±24	0	±104	80	±33
D6-243R3S5	18-36	20	239	3.3	0	1300	75	1000
D6-2405S5	18-36	20	261	5	0	1000	80	1000
D6-2409S5	18-36	20	254	9	0	555	82	680
D6-2412S5	18-36	20	261	12	0	417	80	330
D6-2415S5	18-36	20	255	15	0	333	82	220
D6-2424S5	18-36	20	255	24	0	208	82	68
D6-243R3D5	18-36	20	275	±3.3	0	±750	75	±680
D6-2405D5	18-36	20	267	±5	0	±500	78	±330
D6-2409D5	18-36	20	251	±9	0	±278	83	±220
D6-2412D5	18-36	20	261	±12	0	±208	80	±100
D6-2415D5	18-36	20	261	±15	0	±167	80	±47
D6-2424D5	18-36	20	261	±24	0	±104	80	±33
D6-483R3S5	36-72	12	120	3.3	0	1300	75	1000
D6-4805S5	36-72	12	131	5	0	1000	80	1000
D6-4809S5	36-72	12	127	9	0	555	82	680
D6-4812S5	36-72	12	131	12	0	417	80	330
D6-4815S5	36-72	12	126	15	0	333	83	220
D6-4824S5	36-72	12	126	24	0	208	83	68
D6-483R3D5	36-72	12	142	±3.3	0	±750	73	±680
D6-4805D5	36-72	12	132	±5	0	±500	79	±330
D6-4809D5	36-72	12	132	±9	0	±278	79	±220
D6-4812D5	36-72	12	131	±12	0	±208	80	±100
D6-4815D5	36-72	12	131	±15	0	±167	80	±47
D6-4824D5	36-72	12	131	±24	0	±104	80	±33

Suffix "H" means 3.5KVdc isolation
Suffix "P" means Plastic case instead of standard Metal Case

D6-6W Series

6W 2:1 Regulated Single & Dual output

Features

- Wide 2:1 Input Range
- Full SMD Technology
- 1500 VDC Isolation, Up to 3500 VDC
- Continuous Short Circuit Protection
- Efficiency up to 83%
- -40 ~ 85°C Operation Temperature Range
- Metal Case Standard, Optional Plastic Case

PART NUMBER STRUCTURE

D6 - 24 05 S 6 H P

- **Series Name**
- **Input Voltage Range**: **12** - 9 ~ 18V; **24** - 18 ~ 36V; **48** - 36 ~ 72V
- **Output Voltage**: **3R3** - 3.3V; **5** - 5V; **9** - 9V; **12** - 12V; **15** - 15V; **24** - 24V
- **Output Type**: **S** - Single output; **D** - Dual Output
- **6 Watt**
- **3.5KVdc Isolation.** Optional, if no suf fix "H" mean1.5KVdc Isolation
- **Plastic Case** . Optional, if no suffix "P" mean metal Case

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage accuracy	±1%
Line regulation	±0.5%
Load regulation	±0.5%
(Output 3.3V / ±3.3V Model)	±1.5%
Ripple & noise (20 MHz bandwidth)(1)	60mV pk-pk
Short circuit protection	Indefinite(Automatic Recovery)
Temperature coefficient	±0.02%/°C
Capacitor load(2)	See table

INPUT SPECIFICATIONS

Voltage Range	See table
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	PI Type
Input Reflected Ripple Current (3)	35mA pk-pk

GENERAL SPECIFICATIONS

Efficiency	See table, typ.
I/O Isolation Voltage(3 sec)	
Input/Output	1500~3500Vdc
Metal Case/Input & Output	1000Vdc
I/O Isolation Capacitance	470 pF, typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	Typical 266kHz
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1.121 Mhrs
Safety Standard : (designed to meet)	IEC 60950-1

PHYSICAL SPECIFICATIONS

Case Material	Nickel-coated Copper
	Non-conductive Black Plastic(UL94V -0 rated)
Base Material	Non-conductive Black Plastic(UL94V -0 rated)
Pin Material	¨ 0.5mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0rated)
Weight	17.0g (Metal Case)/ 13.5g(Plastic Case)
Dimensions	1.25 "x0.8 "x0.4 "

ENVIRONMENT SPECIFICATIONS

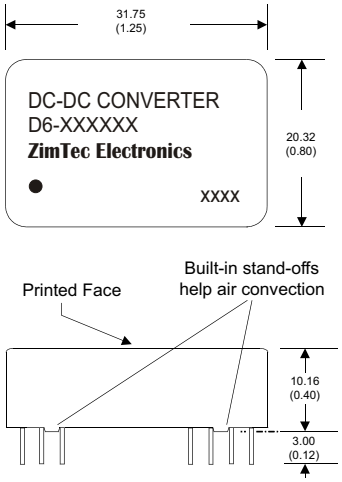
Operating Temperature	-40 °C~85 °C(See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

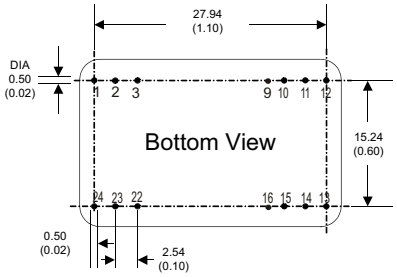
ABSOLUTE MAXIMUM RATINGS(4)

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge Voltage(100mS)	
12 Models	24 Vdc, max.
24 Models	40 Vdc, max.
48 Models	80 Vdc, max.
Soldering Temperature (1.5mm from case 10 sec. max.)	260°C, max.

MECHANICAL SPECIFICATIONS





24 Pin DIL Package
Nickel-Coated Copper

Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

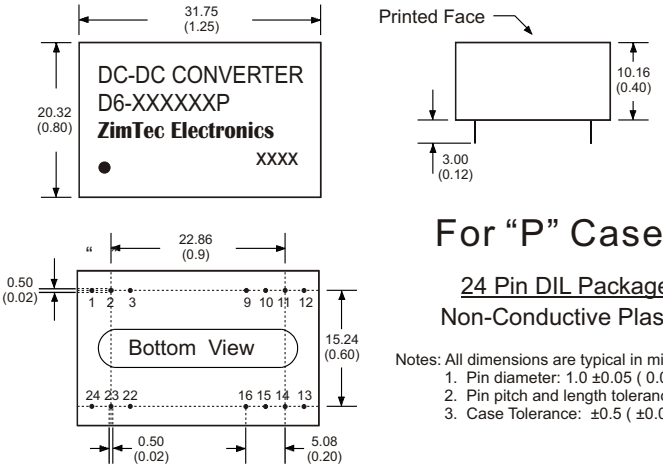
PIN CONNECTIONS

PIN NUMBER	SINGLE	DUAL	SINGLE-H	DUAL-H
1	+V Input	+V Input	N.P.	N.P.
2	N.C.	−V Output	-V Input	−V Input
3	N.C.	Common	-V Input	−V Input
9	N.P.	N.P.	N.P.	Common
10	−V Output	Common	N.P.	N.P.
11	+V Output	+V Output	N.C.	−V Output
12	−V Input	−V Input	N.P.	N.P.
13	−V Input	−V Input	N.P.	N.P.
14	+V Output	+V Output	+V Output	+V Output
15	−V Output	Common	N.P.	N.P.
16	N.P.	N.P.	−V Output	Common
22	N.C.	Common	+V Input	+V Input
23	N.C.	−V Output	+V Input	+V Input
24	+V Input	+V Input	N.P.	N.P.

(The Pin Connection of high isolation one is the same with normal one.)

D6 - 6W 2:1 Regulated Single & Dual output

MECHANICAL SPECIFICATIONS



For "P" Case

24 Pin DIL Package

Non-Conductive Plastic

Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 1.0 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS				
PIN NUMBER	SINGLE	DUAL	SINGLE-H	DUAL-H
1	+V Input	+V Input	N.P.	N.P.
2	N.C.	−V Output	-V Input	−V Input
3	N.C.	Common	-V Input	−V Input
9	N.P.	N.P.	N.P.	Common
10	−V Output	Common	N.P.	N.P.
11	+V Output	+V Output	N.C.	−V Output
12	−V Input	−V Input	N.P.	N.P.
13	−V Input	−V Input	N.P.	N.P.
14	+V Output	+V Output	+V Output	+V Output
15	−V Output	Common	N.P.	N.P.
16	N.P.	N.P.	−V Output	Common
22	N.C.	Common	+V Input	+V Input
23	N.C.	−V Output	+V Input	+V Input
24	+V Input	+V Input	N.P.	N.P.

(The Pin Connection of high isolation one is the same with normal one.)

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
D6-123R3S6	9-18	30	527	3.3	0	1400	73	1000
D6-1205S6	9-18	30	649	5	0	1200	77	1000
D6-1209S6	9-18	30	641	9	0	666	78	680
D6-1212S6	9-18	30	617	12	0	500	81	330
D6-1215S6	9-18	30	625	15	0	400	80	220
D6-1224S6	9-18	30	625	24	0	250	80	68
D6-123R3D6	9-18	30	527	±3.3	0	±909	73	±680
D6-1205D6	9-18	30	649	±5	0	±600	77	±330
D6-1209D6	9-18	30	625	±9	0	±333	80	±220
D6-1212D6	9-18	30	625	±12	0	±250	80	±100
D6-1215D6	9-18	30	632	±15	0	±200	79	±47
D6-1224D6	9-18	30	625	±24	0	±125	80	±33
D6-243R3S6	18-36	20	256	3.3	0	1400	75	1000
D6-2405S6	18-36	20	313	5	0	1200	80	1000
D6-2409S6	18-36	20	304	9	0	666	82	680
D6-2412S6	18-36	20	313	12	0	500	80	330
D6-2415S6	18-36	20	304	15	0	400	82	220
D6-2424S6	18-36	20	305	24	0	250	82	68
D6-243R3D6	18-36	20	333	±3.3	0	±909	75	±680
D6-2405D6	18-36	20	321	±5	0	±600	78	±330
D6-2409D6	18-36	20	301	±9	0	±333	83	±220
D6-2412D6	18-36	20	312	±12	0	±250	80	±100
D6-2415D6	18-36	20	312	±15	0	±200	80	±47
D6-2424D6	18-36	20	312	±24	0	±125	80	±33
D6-483R3S6	36-72	12	128	3.3	0	1400	75	1000
D6-4805S6	36-72	12	156	5	0	1200	80	1000
D6-4809S6	36-72	12	152	9	0	666	82	680
D6-4812S6	36-72	12	156	12	0	500	80	330
D6-4815S6	36-72	12	151	15	0	400	83	220
D6-4824S6	36-72	12	151	24	0	250	83	68
D6-483R3D6	36-72	12	171	±3.3	0	±909	73	±680
D6-4805D6	36-72	12	158	±5	0	±600	79	±330
D6-4809D6	36-72	12	158	±9	0	±333	79	±220
D6-4812D6	36-72	12	156	±12	0	±250	80	±100
D6-4815D6	36-72	12	156	±15	0	±200	80	±47
D6-4824D6	36-72	12	156	±24	0	±125	80	±33

Suffix "H" means 3.5KVdc isolation
Suffix "P" means Plastic case instead of standard Metal Case

DK-4W Series

4W 4:1 Regulated Single & Dual output

Features

- Wide 4:1 Input Range
- Full SMD Technology
- 1500 VDC Isolation, Up to 3500 VDC
- Continuous Short Circuit Protection
- Efficiency up to 84%
- -40 ~ 85°C Operation Temperature Range
- Metal Case Standard, Optional Plastic Case
- EMI Complies With EN55022 Class A

PART NUMBER STRUCTURE

DK - 24 05 S 4 H P

- **Series Name**
- **Input Voltage Range**
  24 - 9 ~ 36V
  48 - 18 ~ 72V
- **Output Voltage**
  3R3 - 3.3V
  05 - 5V
  7R2 - 7.2V
  09 - 9V
  12 - 12V
  15 - 15V
  18 - 18V
  24 - 24V
- **Output Type**
  S - Single output
  D - Dual Output
- **4 Watt**
- **Plastic Case** .
  Optional, if no suffix "P" mean metal Case
- **3.5KVdc Isolation.**
  Optional, if no suf fix "H" mean1.5KVdc Isolation

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage accuracy	±1%
Line regulation	±0.5%
Load regulation	±0.5%
	(Output 3.3V / ±3.3V Model) ±1.5%
Ripple & noise (20 MHz bandwidth)(1)	60mV pk-pk
Short circuit protection	Indefinite(Automatic Recovery)
Temperature coefficient	±0.02%/°C
Capacitor load(2)	See table

INPUT SPECIFICATIONS

Voltage Range	See table
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	PI Type
Input Reflected Ripple Current (3)	35mA pk-pk

GENERAL SPECIFICATIONS

Efficiency	See table, typ
I/O Isolation Voltage(3 sec)	
Input/Output	1500~3500Vdc
Metal Case/Input & Output	1000Vdc
I/O Isolation Capacitance	500 pF Typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	Typical 266kHz
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1.121 Mhrs
Safety Standard : (designed to meet)	IEC 60950-1

EMC SPECIFICATIONS

Radiated Emissions	EN55022	CLASS A
Conducted Emissions (4)	EN55022	CLASS A
ESD	IEC 61000-4-2	Perf. Criteria A
RS	IEC 61000-4-3	Perf. Criteria A
EFT	IEC 61000-4-4	Perf. Criteria A
Surge (5)	IEC 61000-4-5	Perf. Criteria A
CS	IEC 61000-4-6	Perf. Criteria A
PFMF	IEC 61000-4-8	Perf. Criteria A

PHYSICAL SPECIFICATIONS

Case Material	Nickel-coated Copper
	Non-conductive Black Plastic(UL94V-0 rated)
Base Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	¨ 0.5mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	17.0g (Metal Case)/ 13.5g(Plastic Case)
Dimensions	1.25 "x0.8 "x0.4 "

ENVIRONMENT SPECIFICATIONS

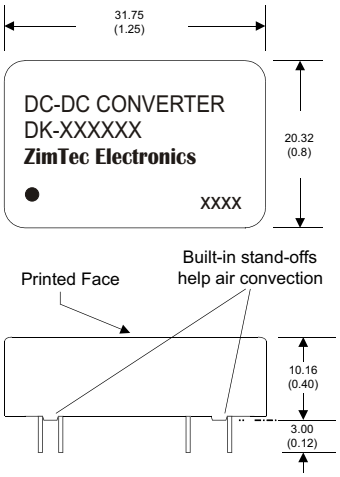
Operating Temperature	-40 °C~85 °C (See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

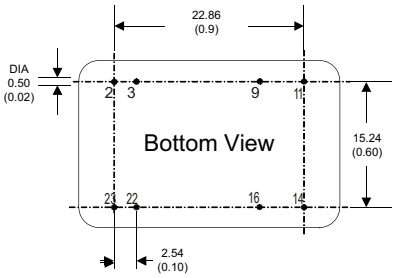
ABSOLUTE MAXIMUM RATINGS (6)

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge Voltage(100mS)	
24 Models	40 Vdc max.
48 Models	80 Vdc max.
Soldering Temperature (1.5mm from case 10 sec. max.)	260°C ,max.

MECCHANICAL SPECIFICATIONS





24 Pin DIL Package

Nickel-Coated Copper

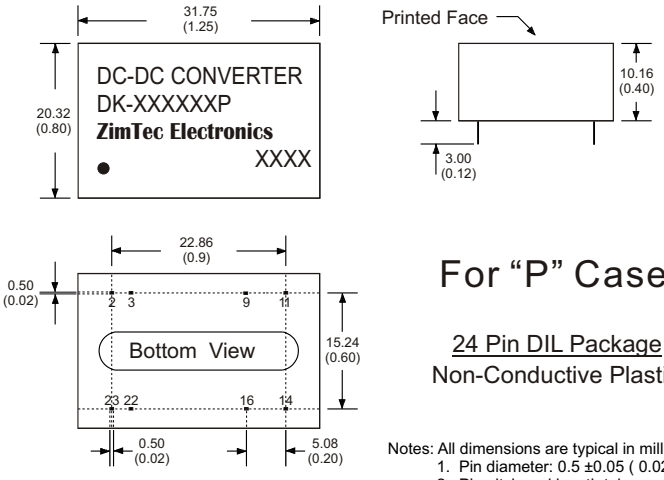
Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
2	−V Input	−V Input
3	−V Input	−V Input
9	N.P.	Common
11	N.C.	−V Output
14	+V Output	+V Output
16	−V Output	Common
22	+V Input	+V Input
23	+V Input	+V Input

(High isolation one is the same with normal one.)

DK - 4W 4:1 Regulated Single & Dual output

MECHANICAL SPECIFICATIONS



For "P" Case

24 Pin DIL Package
Non-Conductive Plastic

Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
2	−V Input	−V Input
3	−V Input	−V Input
9	N.P.	Common
11	N.C.	−V Output
14	+V Output	+V Output
16	−V Output	Common
22	+V Input	+V Input
23	+V Input	+V Input

(The Pin Connection of high isolation one is the same with normal one.)

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
DK-243R3S4	9-36	12	220	3.3	0	1200	75	1000
DK-2405S4	9-36	15	210.9	5	0	800	79	1000
DK-247R2S4	9-36	18	210.9	7.2	0	555	79	100
DK-2409S4	9-36	12	200.8	9	0	444	83	220
DK-2412S4	9-36	15	203.25	12	0	333	82	100
DK-2415S4	9-36	15	203.3	15	0	266	82	220
DK-2418S4	9-36	15	203.3	18	0	222	82	10
DK-2424S4	9-36	18	203.25	24	0	166	82	220
DK-243R3D4	9-36	12	222	±3.3	0	±606	75	±470
DK-2405D4	9-36	15	210.9	±5	0	±400	79	±100
DK-247R2D4	9-36	18	210.9	±7.2	0	±277	79	±47
DK-2409D4	9-36	18	208.3	±9	0	±222	80	±47
DK-2412D4	9-36	15	203.25	±12	0	±166	82	±47
DK-2415D4	9-36	20	208.3	±15	0	±133	80	±10
DK-2418D4	9-36	25	208.3	±18	0	±111	80	±100
DK-2424D4	9-36	18	208.3	±24	0	±83	80	±22
DK-483R3S4	18-72	10	109.6	3.3	0	1200	76	1000
DK-4805S4	18-72	8	105.5	5	0	800	79	470
DK-487R2S4	18-72	10	101.6	7.2	0	555	82	470
DK-4809S4	18-72	10	100.4	9	0	444	83	330
DK-4812S4	18-72	12	104.16	12	0	333	80	1000
DK-4815S4	18-72	10	99.2	15	0	266	84	47
DK-4818S4	18-72	10	99.2	18	0	222	84	10
DK-4824S4	18-72	15	101.6	24	0	166	82	22
DK-483R3D4	18-72	10	106.8	±3.3	0	±606	78	±680
DK-4805D4	18-72	15	105.5	±5	0	±400	79	±330
DK-487R2D4	18-72	15	105.5	±7.2	0	±277	79	±47
DK-4809D4	18-72	15	104.2	±9	0	±222	80	±47
DK-4812D4	18-72	12	101.6	±12	0	±166	82	±100
DK-4815D4	18-72	15	104.1	±15	0	±133	80	±100
DK-4818D4	18-72	15	102.8	±18	0	±111	81	±33
DK-4824D4	18-72	15	104.2	±24	0	±83	80	±10

Suffix "H" means 3.5KVdc isolation
Suffix "P" means Plastic case instead of standard Metal Case

DK-5W Series

5W 4:1 Regulated Single & Dual output

Features

- Wide 4:1 Input Range
- Full SMD Technology
- 1500 VDC Isolation, Up to 3500 VDC
- Continuous Short Circuit Protection
- Efficiency up to 84%
- -40 ~ 85°C Operation Temperature Range
- Metal Case Standard, Optional Plastic Case
- EMI Complies With EN55022 Class A

PART NUMBER STRUCTURE

DK - 24 05 S 5 H P

- **Series Name**
- **Input Voltage Range**
  - **24** - 9 ~ 36V
  - **48** - 18 ~ 72V
- **Output Voltage**
  - **3R3** - 3.3V
  - **05** - 5V
  - **7R2** - 7.2V
  - **09** - 9V
  - **12** - 12V
  - **15** - 15V
  - **18** - 18V
  - **24** - 24V
- **Output Type**
  - **S** - Single output
  - **D** - Dual Output
- **5 Watt**
- **Plastic Case** . Optional, if no suffix "P" mean metal Case
- **3.5KVdc Isolation.** Optional, if no suf fix "H" mean1.5KVdc Isolation

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage accuracy	±1%
Line regulation	±0.5%
Load regulation	±0.5%
	(Output 3.3V / ±3.3V Model) ±1.5%
Ripple & noise (20 MHz bandwidth)(1)	60mV pk-pk
Short circuit protection	Indefinite(Automatic Recovery)
Temperature coefficient	±0.02%/°C
Capacitor load(2)	See table

INPUT SPECIFICATIONS

Voltage Range	See table
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	PI Type
Input Reflected Ripple Current (3)	35mA pk-pk

GENERAL SPECIFICATIONS

Efficiency	See table, typ
I/O Isolation Voltage(3 sec)	
Input/Output	1500~3500Vdc
Metal Case/Input & Output	1000Vdc
I/O Isolation Capacitance	500 pF Typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	Typical 266kHz
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1.121 Mhrs
Safety Standard : (designed to meet)	IEC 60950-1

EMC SPECIFICATIONS

Radiated Emissions	EN55022	CLASS A
Conducted Emissions (4)	EN55022	CLASS A
ESD	IEC 61000-4-2	Perf. Criteria A
RS	IEC 61000-4-3	Perf. Criteria A
EFT	IEC 61000-4-4	Perf. Criteria A
Surge (5)	IEC 61000-4-5	Perf. Criteria A
CS	IEC 61000-4-6	Perf. Criteria A
PFMF	IEC 61000-4-8	Perf. Criteria A

PHYSICAL SPECIFICATIONS

Case Material	Nickel-coated Copper
	Non-conductive Black Plastic(UL94V -0 rated)
Base Material	Non-conductive Black Plastic(UL94V -0 rated)
Pin Material	¨ 0.5mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	17.0g (Metal Case)/ 13.5g(Plastic Case)
Dimensions	1.25 "x0.8 "x0.4 "

ENVIRONMENT SPECIFICATIONS

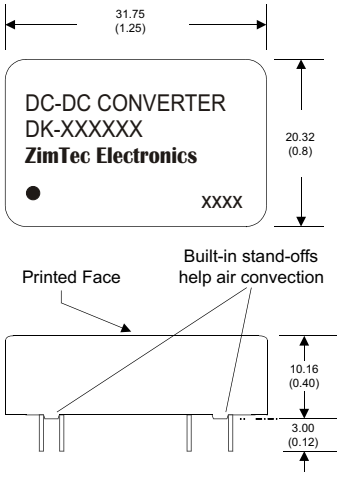
Operating Temperature	-40 °C~85 °C(See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

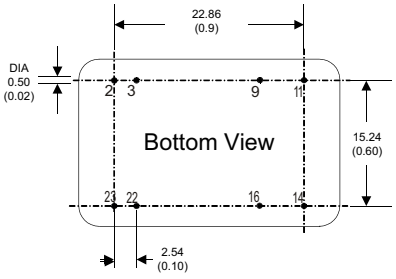
ABSOLUTE MAXIMUM RATINGS (6)

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge Voltage(100mS)	
24 Models	40 Vdc max.
48 Models	80 Vdc max.
Soldering Temperature (1.5mm from case 10 sec. max.)	260°C ,max.

MECCHANICAL SPECIFICATIONS





24 Pin DIL Package

Nickel-Coated Copper

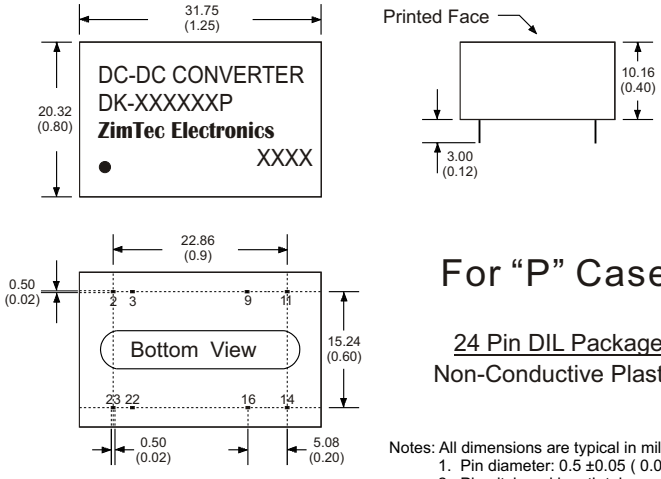
Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
2	-V Input	-V Input
3	-V Input	-V Input
9	N.P.	Common
11	N.C.	-V Output
14	+V Output	+V Output
16	-V Output	Common
22	+V Input	+V Input
23	+V Input	+V Input

(The Pin Connection of high isolation one is the same with normal one.)

DK - 5W 4:1 Regulated Single & Dual output

MECCHANICAL SPECIFICATIONS



For "P" Case

24 Pin DIL Package
Non-Conductive Plastic

Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
2	−V Input	−V Input
3	−V Input	−V Input
9	N.P.	Common
11	N.C.	−V Output
14	+V Output	+V Output
16	−V Output	Common
22	+V Input	+V Input
23	+V Input	+V Input

(The Pin Connection of high isolation one is the same with normal one.)

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
DK-243R3S5	9-36	18	238.3	3.3	0	1300	75	1000
DK-2405S5	9-36	18	260.4	5	0	1000	80	680
DK-247R2S5	9-36	18	260.4	7.2	0	694	80	470
DK-2409S5	9-36	18	257.2	9	0	555	81	220
DK-2412S5	9-36	18	254.1	12	0	416	82	100
DK-2415S5	9-36	18	251	15	0	333	83	100
DK-2418S5	9-36	18	260.4	18	0	277	80	68
DK-2424S5	9-36	18	260.4	24	0	208	80	47
DK-243R3D5	9-36	18	281.5	±3.3	0	±757	74	±470
DK-2405D5	9-36	18	260.4	±5	0	±500	80	±330
DK-247R2D5	9-36	18	260.4	±7.2	0	±347	80	±100
DK-2409D5	9-36	18	257.2	±9	0	±277	81	±68
DK-2412D5	9-36	18	254.1	±12	0	±208	82	±47
DK-2415D5	9-36	18	254.1	±15	0	±166	82	±47
DK-2418D5	9-36	18	260.4	±18	0	±138	80	±22
DK-2424D5	9-36	18	260.4	±24	0	±104	80	±22
DK-483R3S5	18-72	15	119.2	3.3	0	1300	75	1000
DK-4805S5	18-72	15	130.2	5	0	1000	80	680
DK-487R2S5	18-72	15	130.2	7.2	0	694	80	470
DK-4809S5	18-72	15	128.6	9	0	555	81	220
DK-4812S5	18-72	15	124	12	0	416	84	100
DK-4815S5	18-72	15	125.5	15	0	333	83	100
DK-4818S5	18-72	15	130.2	18	0	277	80	68
DK-4824S5	18-72	15	130.2	24	0	208	80	47
DK-483R3D5	18-72	15	140.7	±3.3	0	±757	74	±470
DK-4805D5	18-72	15	130.2	±5	0	±500	80	±330
DK-487R2D5	18-72	15	130.2	±7.2	0	±347	80	±100
DK-4809D5	18-72	15	128.6	±9	0	±277	81	±68
DK-4812D5	18-72	15	125.5	±12	0	±208	83	±47
DK-4815D5	18-72	15	125.5	±15	0	±166	83	±47
DK-4818D5	18-72	15	130.2	±18	0	±138	80	±22
DK-4824D5	18-72	15	130.2	±24	0	±104	80	±22

Suffix "H" means 3.5KVdc isolation
Suffix "P" means Plastic case instead of standard Metal Case

DD-3W Series

3W 2:1 Regulated Single & Dual output

Features

- Wide 2:1 Input Range
- Full SMD Technology
- 1500 VDC Isolation, Up to 3500 VDC
- Continuous Short Circuit Protection
- Efficiency up to 82%
- -40 ~ 85°C Operation Temperature Range
- Metal Case Standard, Optional Plastic Case

PART NUMBER STRUCTURE

DD - 24 05 S 3 H P

- DD: Series Name
- 24: **Input Voltage Range** — **12** - 9 ~ 18V; **24** - 18 ~ 36V; **48** - 36 ~ 72V
- 05: **Output Voltage** — **3R3** - 3.3V; **5** - 5V; **9** - 9V; **12** - 12V; **15** - 15V; **24** - 24V
- S: **Output Type** — **S** - Single output; **D** - Dual Output
- 3: 3 Watt
- H: **3.5KVdc Isolation.** Optional, if no suffix "H" mean1.5KVdc Isolation
- P: **Plastic Case** Optional, if no suffix "P" mean metal Case

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage accuracy	±1%
Line regulation	±0.5%
Load regulation	±0.5%
(Output 3.3V / ±3.3V Model)	±1.5%
Ripple & noise (20 MHz bandwidth)(1)	60mV pk-pk
Short circuit protection	Indefinite(Automatic Recovery)
Temperature coefficient	±0.02%/°C
Capacitor load(2)	See table

INPUT SPECIFICATIONS

Voltage Range	See table
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	PI Type
Input Reflected Ripple Current (3)	35mA pk-pk

GENERAL SPECIFICATIONS

Efficiency	See table, typ.
I/O Isolation Voltage(3 sec)	
Input/Output	1500~3500Vdc
Metal Case/Input & Output	1000Vdc
I/O Isolation Capacitance	500 pF, typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	266kHz, typ.
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1.121 Mhrs
Safety Standard : (designed to meet)	IEC 60950-1

PHYSICAL SPECIFICATIONS

Case Material	Nickel-coated Copper
	Non-conductive Black Plastic(UL94V-0 rated)
Base Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	¨ 0.5mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	17.0g (Metal Case)/ 13.5g(Plastic Case)
Dimensions	1.25 "x0.8 "x0.4 "

ENVIRONMENT SPECIFICATIONS

Operating Temperature	-40 °C~85 °C(See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

ABSOLUTE MAXIMUM RATINGS(4)

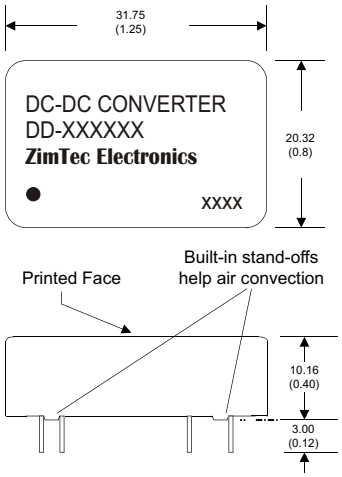
These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

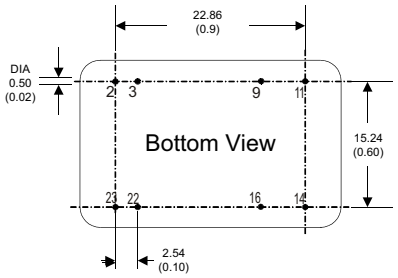
Input Surge Voltage(100mS)	
12 Models	24 Vdc, max.
24 Models	40 Vdc, max.
48 Models	80 Vdc, max.
Soldering Temperature (1.5mm from case 10 sec. max.)	260°C, max.

EMC SPECIFICATIONS

Radiated Emissions	EN55022	CLASS A
Conducted Emissions (5)	EN55022	CLASS A
ESD	IEC 61000-4-2	Perf. Criteria A
RS	IEC 61000-4-3	Perf. Criteria A
EFT (6)	IEC 61000-4-4	Perf. Criteria A
Surge (6)	IEC 61000-4-5	Perf. Criteria A
CS	IEC 61000-4-6	Perf. Criteria A
PFMF	IEC 61000-4-8	Perf. Criteria A

MECHANICAL SPECIFICATIONS





24 Pin DIL Package

Nickel-Coated Copper

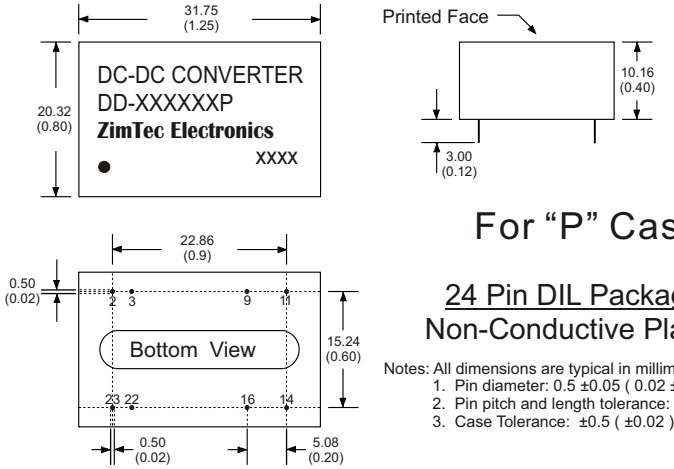
PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
2	−V Input	−V Input
3	−V Input	−V Input
9	N.P.	Common
11	N.C.	−V Output
14	+V Output	+V Output
16	−V Output	Common
22	+V Input	+V Input
23	+V Input	+V Input

(The Pin Connection of high isolation one is the same with normal one.)

Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

DD - 3W 2:1 Regulated Single & Dual output

MECHANICAL SPECIFICATIONS



For "P" Case

24 Pin DIL Package
Non-Conductive Plastic

Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
2	−V Input	−V Input
3	−V Input	−V Input
9	N.P.	Common
11	N.C.	−V Output
14	+V Output	+V Output
16	−V Output	Common
22	+V Input	+V Input
23	+V Input	+V Input

(The Pin Connection of high isolation one is the same with normal one.)

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
DD-123R3S3	9-18	22	343	3.3	0	900	72	470
DD-1205S3	9-18	22	328	5	0	600	76	470
DD-1209S3	9-18	22	320	9	0	333	78	68
DD-1212S3	9-18	22	312	12	0	250	80	47
DD-1215S3	9-18	22	312	15	0	200	80	47
DD-1224S3	9-18	22	313	24	0	125	80	22
DD-123R3D3	9-18	22	343	±3.3	0	±450	72	±220
DD-1205D3	9-18	22	328	±5	0	±300	76	±220
DD-1209D3	9-18	22	312	±9	0	±167	80	±33
DD-1212D3	9-18	22	312	±12	0	±125	80	±22
DD-1215D3	9-18	22	312	±15	0	±100	80	±22
DD-1224D3	9-18	22	313	±24	0	±63	80	±10
DD-243R3S3	18-36	12	171	3.3	0	900	72	470
DD-2405S3	18-36	12	164	5	0	600	76	470
DD-2409S3	18-36	12	160	9	0	333	78	68
DD-2412S3	18-36	12	156	12	0	250	80	47
DD-2415S3	18-36	12	152	15	0	200	82	47
DVD-2424S3	18-36	12	153	24	0	125	82	22
DD-243R3D3	18-36	12	171	±3.3	0	±450	72	±220
DD-2405D3	18-36	12	160	±5	0	±300	78	±220
DD-2409D3	18-36	12	156	±9	0	±167	80	±33
DD-2412D3	18-36	12	152	±12	0	±125	82	±22
DD-2415D3	18-36	12	152	±15	0	±100	82	±22
DD-2424D3	18-36	12	153	±24	0	±63	82	±10
DD-483R3S3	36-72	8	86	3.3	0	900	72	470
DD-4805S3	36-72	8	82	5	0	600	76	470
DD-4809S3	36-72	8	80	9	0	333	78	68
DD-4812S3	36-72	8	78	12	0	250	80	47
DD-4815S3	36-72	8	78	15	0	200	80	47
DD-4824S3	36-72	8	78	24	0	125	80	22
DD-483R3D3	36-72	8	86	±3.3	0	±450	72	±220
DD-4805D3	36-72	8	82	±5	0	±300	76	±220
DD-4809D3	36-72	8	80	±9	0	±167	78	±33
DD-4812D3	36-72	8	78	±12	0	±125	80	±22
DD-4815D3	36-72	8	78	±15	0	±100	80	±22
DD-4824D3	36-72	8	78	±24	0	±63	80	±10

Suffix "H" means 3.5KVdc isolation
Suffix "P" means Plastic case instead of standard Metal Case

DD-5W Series

5W 2:1 Regulated Single & Dual output

Features

- Wide 2:1 Input Range
- Full SMD Technology
- 1500 VDC Isolation, Up to 3500 VDC
- Continuous Short Circuit Protection
- Efficiency up to 83%
- -40 ~ 85°C Operation Temperature Range
- Metal Case Standard, Optional Plastic Case

PART NUMBER STRUCTURE

DD - 24 05 S 5 H P

- DD: Series Name
- 24: **Input Voltage Range** — **12** - 9 ~ 18V; **24** - 18 ~ 36V; **48** - 36 ~ 72V
- 05: **Output Voltage** — **3R3** - 3.3V; **5** - 5V; **9** - 9V; **12** - 12V; **15** - 15V; **24** - 24V
- S: **Output Type** — **S** - Single output; **D** - Dual Output
- 5: 5 Watt
- H: **3.5KVdc Isolation.** Optional, if no suf fix "H" mean1.5KVdc Isolation
- P: **Plastic Case** . Optional, if no suffix "P" mean metal Case

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage accuracy	±1%
Line regulation	±0.5%
Load regulation	±0.5%
	(Output 3.3V / ±3.3V Model) ±1.5%
Ripple & noise (20 MHz bandwidth)(1)	60mV pk-pk
Short circuit protection	Indefinite(Automatic Recovery)
Temperature coefficient	±0.02%/°C
Capacitor load(2)	See table

INPUT SPECIFICATIONS

Voltage Range	See table
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	PI Type
Input Reflected Ripple Current (3)	35mA pk-pk

GENERAL SPECIFICATIONS

Efficiency	See table, typ.
I/O Isolation Voltage(3 sec)	
Input/Output	1500~3500Vdc
Metal Case/Input & Output	1000Vdc
I/O Isolation Capacitance	500 pF, typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	266kHz, typ.
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1.121 Mhrs
Safety Standard : (designed to meet)	IEC 60950-1

PHYSICAL SPECIFICATIONS

Case Material	Nickel-coated Copper
	Non-conductive Black Plastic(UL94V-0 rated)
Base Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	0.5mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	17.0g (Metal Case)/ 13.5g(Plastic Case)
Dimensions	1.25 "x0.8 "x0.4 "

ENVIRONMENT SPECIFICATIONS

Operating Temperature	-40 °C~85 °C(See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

ABSOLUTE MAXIMUM RATINGS(4)

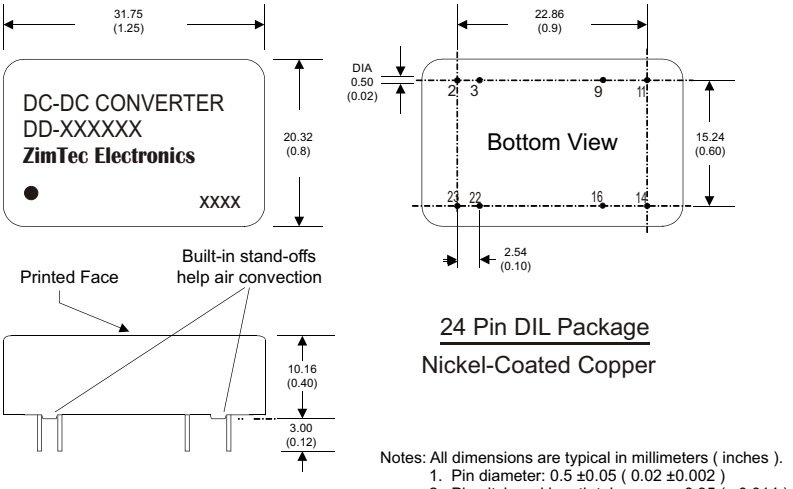
These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge Voltage(100mS)	
12 Models	24 Vdc, max.
24 Models	40 Vdc, max.
48 Models	80 Vdc, max.
Soldering Temperature (1.5mm from case 10 sec. max.)	260°C, max.

EMC SPECIFICATIONS

Radiated Emissions	EN55022	CLASS A
Conducted Emissions (5)	EN55022	CLASS A
ESD	IEC 61000-4-2	Perf. Criteria A
RS	IEC 61000-4-3	Perf. Criteria A
EFT (6)	IEC 61000-4-4	Perf. Criteria A
Surge (6)	IEC 61000-4-5	Perf. Criteria A
CS	IEC 61000-4-6	Perf. Criteria A
PFMF	IEC 61000-4-8	Perf. Criteria A

MECHANICAL SPECIFICATIONS



24 Pin DIL Package

Nickel-Coated Copper

Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

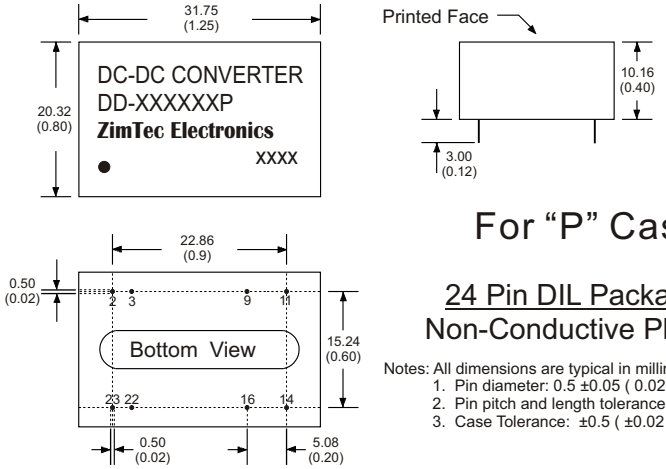
PIN CONNECTIONS

PIN NUMBER	SINGLE	DUAL
2	−V Input	−V Input
3	−V Input	−V Input
9	N.P.	Common
11	N.C.	−V Output
14	+V Output	+V Output
16	−V Output	Common
22	+V Input	+V Input
23	+V Input	+V Input

(The Pin Connection of high isolation one is the same with normal one.)

DD - 5W 2:1 Regulated Single & Dual output

MECHANICAL SPECIFICATIONS



For "P" Case

24 Pin DIL Package
Non-Conductive Plastic

Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
2	−V Input	−V Input
3	−V Input	−V Input
9	N.P.	Common
11	N.C.	−V Output
14	+V Output	+V Output
16	−V Output	Common
22	+V Input	+V Input
23	+V Input	+V Input

(The Pin Connection of high isolation one is the same with normal one.)

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
DD-123R3S5	9-18	30	490	3.3	0	1300	73	1000
DD-1205S5	9-18	30	542	5	0	1000	77	1000
DD-1209S5	9-18	30	534	9	0	555	78	680
DD-1212S5	9-18	30	514	12	0	417	81	330
DD-1215S5	9-18	30	520	15	0	333	80	220
DD-1224S5	9-18	30	520	24	0	208	80	68
DD-123R3D5	9-18	30	565	±3.3	0	±750	73	±680
DD-1205D5	9-18	30	542	±5	0	±500	77	±330
DD-1209D5	9-18	30	520	±9	0	±278	80	±220
DD-1212D5	9-18	30	520	±12	0	±208	80	±100
DD-1215D5	9-18	30	528	±15	0	±167	79	±47
DD-1224D5	9-18	30	520	±24	0	±104	80	±33
DD-243R3S5	18-36	20	239	3.3	0	1300	75	1000
DD-2405S5	18-36	20	261	5	0	1000	80	1000
DD-2409S5	18-36	20	254	9	0	555	82	680
DD-2412S5	18-36	20	261	12	0	417	80	330
DD-2415S5	18-36	20	255	15	0	333	82	220
DD-2424S5	18-36	20	255	24	0	208	82	68
DD-243R3D5	18-36	20	275	±3.3	0	±750	75	±680
DD-2405D5	18-36	20	267	±5	0	±500	78	±330
DD-2409D5	18-36	20	251	±9	0	±278	83	±220
DD-2412D5	18-36	20	261	±12	0	±208	80	±100
DD-2415D5	18-36	20	261	±15	0	±167	80	±47
DD-2424D5	18-36	20	261	±24	0	±104	80	±33
DD-483R3S5	36-72	12	120	3.3	0	1300	75	1000
DD-4805S5	36-72	12	131	5	0	1000	80	1000
DD-4809S5	36-72	12	127	9	0	555	82	680
DD-4812S5	36-72	12	131	12	0	417	80	330
DD-4815S5	36-72	12	126	15	0	333	83	220
DD-4824S5	36-72	12	126	24	0	208	83	68
DD-483R3D5	36-72	12	142	±3.3	0	±750	73	±680
DD-4805D5	36-72	12	132	±5	0	±500	79	±330
DD-4809D5	36-72	12	132	±9	0	±278	79	±220
DD-4812D5	36-72	12	131	±12	0	±208	80	±100
DD-4815D5	36-72	12	131	±15	0	±167	80	±47
DD-4824D5	36-72	12	131	±24	0	±104	80	±33

Suffix "H" means 3.5KVdc isolation
Suffix "P" means Plastic case instead of standard Metal Case

DD-6W Series

6W 2:1 Regulated Single & Dual output

Features

- Wide 2:1 Input Range
- Full SMD Technology
- 1500 VDC Isolation, Up to 3500 VDC
- Continuous Short Circuit Protection
- Efficiency up to 83%
- -40 ~ 85°C Operation Temperature Range
- Metal Case Standard, Optional Plastic Case

PART NUMBER STRUCTURE

DD - 24 05 S 6 H P

- DD: Series Name
- 24: Input Voltage / Range — **12** - 9 ~ 18V; **24** - 18 ~ 36V; **48** - 36 ~ 72V
- 05: Output Voltage — **3R3** - 3.3V; **5** - 5V; **9** - 9V; **12** - 12V; **15** - 15V; **24** - 24V
- S: Output Type — **S** - Single output; **D** - Dual Output
- 6: 6 Watt
- H: **3.5KVdc Isolation.** Optional, if no suf fix "H" mean1.5KVdc Isolation
- P: **Plastic Case** . Optional, if no suffix "P" mean metal Case

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage accuracy	±1%
Line regulation	±0.5%
Load regulation	±0.5%
(Output 3.3V / ±3.3V Model)	±1.5%
Ripple & noise (20 MHz bandwidth)(1)	60mV pk-pk
Short circuit protection	Indefinite(Automatic Recovery)
Temperature coefficient	±0.02%/°C
Capacitor load(2)	See table

INPUT SPECIFICATIONS

Voltage Range	See table
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	PI Type
Input Reflected Ripple Current (3)	35mA pk-pk

GENERAL SPECIFICATIONS

Efficiency	See table, typ.
I/O Isolation Voltage(3 sec)	
Input/Output	1500~3500Vdc
Metal Case/Input & Output	1000Vdc
I/O Isolation Capacitance	500 pF, typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	266kHz, typ.
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1.121 Mhrs
Safety Standard : (designed to meet)	IEC 60950-1

PHYSICAL SPECIFICATIONS

Case Material	Nickel-coated Copper
	Non-conductive Black Plastic(UL94V-0 rated)
Base Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	0.5mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0rated)
Weight	17.0g (Metal Case)/ 13.5g(Plastic Case)
Dimensions	1.25 "x0.8 "x0.4 "

ENVIRONMENT SPECIFICATIONS

Operating Temperature	-40 °C~85 °C(See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

ABSOLUTE MAXIMUM RATINGS(4)

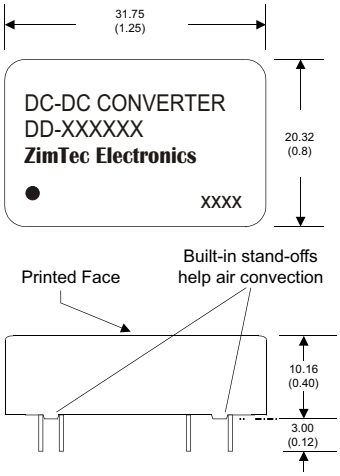
These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

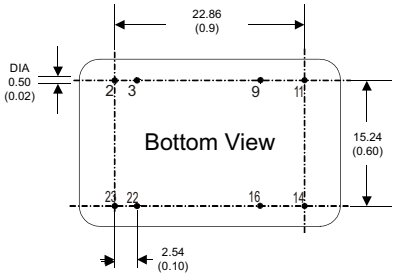
Input Surge Voltage(100mS)	
12 Models	24 Vdc, max.
24 Models	40 Vdc, max.
48 Models	80 Vdc, max.
Soldering Temperature (1.5mm from case 10 sec. max.)	260°C, max.

EMC SPECIFICATIONS

Radiated Emissions	EN55022	CLASS A
Conducted Emissions (5)	EN55022	CLASS A
ESD	IEC 61000-4-2	Perf. Criteria A
RS	IEC 61000-4-3	Perf. Criteria A
EFT (6)	IEC 61000-4-4	Perf. Criteria A
Surge (6)	IEC 61000-4-5	Perf. Criteria A
CS	IEC 61000-4-6	Perf. Criteria A
PFMF	IEC 61000-4-8	Perf. Criteria A

MECHANICAL SPECIFICATIONS





24 Pin DIL Package

Nickel-Coated Copper

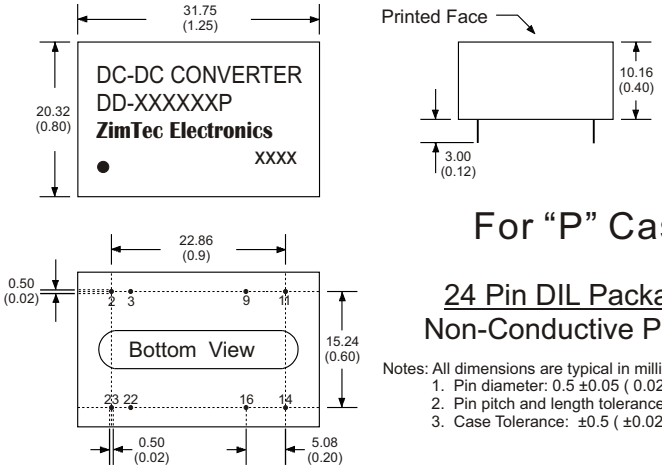
Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
2	−V Input	−V Input
3	−V Input	−V Input
9	N.P.	Common
11	N.C.	−V Output
14	+V Output	+V Output
16	−V Output	Common
22	+V Input	+V Input
23	+V Input	+V Input

(The Pin Connection of high isolation one is the same with normal one.)

DD - 6W 2:1 Regulated Single & Dual output

MECHANICAL SPECIFICATIONS



For "P" Case

24 Pin DIL Package
Non-Conductive Plastic

Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
2	−V Input	−V Input
3	−V Input	−V Input
9	N.P.	Common
11	N.C.	−V Output
14	+V Output	+V Output
16	−V Output	Common
22	+V Input	+V Input
23	+V Input	+V Input

(The Pin Connection of high isolation one is the same with normal one.)

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
DD-123R3S6	9-18	30	527	3.3	0	1400	73	1000
DD-1205S6	9-18	30	649	5	0	1200	77	1000
DD-1209S6	9-18	30	641	9	0	666	78	680
DD-1212S6	9-18	30	617	12	0	500	81	330
DD-1215S6	9-18	30	625	15	0	400	80	220
DD-1224S6	9-18	30	625	24	0	250	80	68
DD-123R3D6	9-18	30	527	±3.3	0	±909	73	±680
DD-1205D6	9-18	30	649	±5	0	±600	77	±330
DD-1209D6	9-18	30	625	±9	0	±333	80	±220
DD-1212D6	9-18	30	625	±12	0	±250	80	±100
DD-1215D6	9-18	30	632	±15	0	±200	79	±47
DD-1224D6	9-18	30	625	±24	0	±125	80	±33
DD-243R3S6	18-36	20	256	3.3	0	1400	75	1000
DD-2405S6	18-36	20	313	5	0	1200	80	1000
DD-2409S6	18-36	20	304	9	0	666	82	680
DD-2412S6	18-36	20	313	12	0	500	80	330
DD-2415S6	18-36	20	304	15	0	400	82	220
DD-2424S6	18-36	20	305	24	0	250	82	68
DD-243R3D6	18-36	20	333	±3.3	0	±909	75	±680
DD-2405D6	18-36	20	321	±5	0	±600	78	±330
DD-2409D6	18-36	20	301	±9	0	±333	83	±220
DD-2412D6	18-36	20	312	±12	0	±250	80	±100
DD-2415D6	18-36	20	312	±15	0	±200	80	±47
DD-2424D6	18-36	20	312	±24	0	±125	80	±33
DD-483R3S6	36-72	12	128	3.3	0	1400	75	1000
DD-4805S6	36-72	12	156	5	0	1200	80	1000
DD-4809S6	36-72	12	152	9	0	666	82	680
DD-4812S6	36-72	12	156	12	0	500	80	330
DD-4815S6	36-72	12	151	15	0	400	83	220
DD-4824S6	36-72	12	151	24	0	250	83	68
DD-483R3D6	36-72	12	171	±3.3	0	±909	73	±680
DD-4805D6	36-72	12	158	±5	0	±600	79	±330
DD-4809D6	36-72	12	158	±9	0	±333	79	±220
DD-4812D6	36-72	12	156	±12	0	±250	80	±100
DD-4815D6	36-72	12	156	±15	0	±200	80	±47
DD-4824D6	36-72	12	156	±24	0	±125	80	±33

Suffix "H" means 3.5KVdc isolation
Suffix "P" means Plastic case instead of standard Metal Case

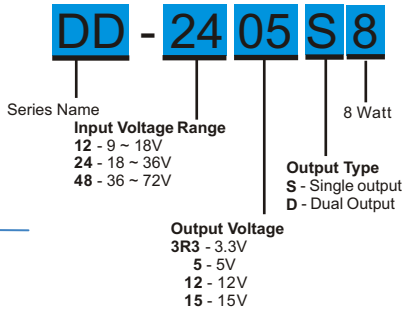
DD-8W Series

8W 2:1 Regulated Single & Dual output

Features

- Wide 2:1 Input Range
- Full SMD Technology
- 1500 VDC Isolation
- Continuous Short Circuit Protection
- Efficiency up to 85%
- -40 ~ 85°C Operation Temperature Range
- High Power Density: 8W in DIL-24 Package

PART NUMBER STRUCTURE



All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage accuracy	±1%
Line Regulation	±0.5%
Load Regulation (Single , Io=0% to 100%)	±0.5%
(Dual , Io=0% to 100%)	±1.0%
(Io=0% to 100%,only 3.3V)	±1.5%
Cross Regulation (Dual Output) (1)	±5%
Over Current Protection	150% of FL, typ.
Ripple & noise (20 MHz bandwidth)(2)	75mV pk-pk
Short circuit protection	Indefinite(hiccup) (Automatic Recovery)
Temperature coefficient	±0.02%/°C
Capacitor load(3)	See table

INPUT SPECIFICATIONS

Voltage Range	See table
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	PI Type
Input Reflected Ripple Current (4)	35mA pk-pk

GENERAL SPECIFICATIONS

Efficiency	See table, typ.
I/O Isolation Voltage(3 sec)	
Input/Output	1500Vdc
Metal Case/Input & Output	1000Vdc
I/O Isolation Capacitance	1000 pF, typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	330kHz, typ.
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>0.91 Mhrs
Safety Standard : (designed to meet)	IEC 60950

EMC CHARACTERISTICS

Radiated Emissions	EN55022	CLASS A
Conducted Emissions(7)	EN55022	CLASS A
ESD	EN61000-4-2	Perf. Criteria A
RS	EN61000-4-3	Perf. Criteria A
EFT(8)	EN61000-4-4	Perf. Criteria A
Surge (8)	EN61000-4-5	Perf. Criteria A
CS	EN61000-4-6	Perf. Criteria A
PFMF	EN61000-4-8	Perf. Criteria A

PHYSICAL SPECIFICATIONS

Case Material	Nickel-coated Copper
Pin Material	0.5mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0rated)
Weight	17.0g
Dimensions	1.25 "x0.8 "x0.4 "

ENVIRONMENT SPECIFICATIONS

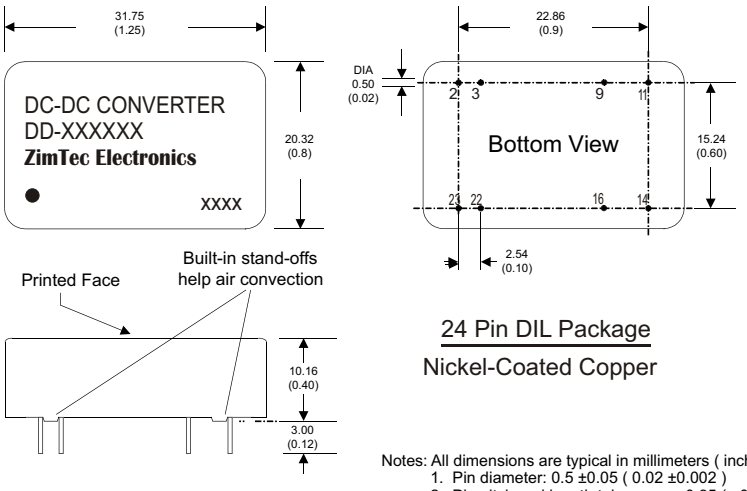
Operating Temperature	-40 °C~85 °C(See Derating Curve) 40°C~60°C(For 100% load)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

ABSOLUTE MAXIMUM RATINGS (9)

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge Voltage(100mS)	
12 Models	25 Vdc, max.
24 Models	50 Vdc, max.
48 Models	100 Vdc, max.
Soldering Temperature (1.5mm from case 10 sec. max.)	260°C, max.

MECHANICAL SPECIFICATIONS



24 Pin DIL Package

Nickel-Coated Copper

Notes: All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
2	−V Input	−V Input
3	−V Input	−V Input
9	N.P.	Common
11	N.C.	−V Output
14	+V Output	+V Output
16	−V Output	Common
22	+V Input	+V Input
23	+V Input	+V Input

DD - 8W 2:1 Regulated Single & Dual output

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
DD-123R3S8	9-18	20	687	3.3	0	2000	80	3300
DD-1205S8	9-18	20	762	5	0	1500	82	2200
DD-1212S8	9-18	20	784	12	0	665	85	470
DD-1215S8	9-18	20	803	15	0	535	83	220
DD-1205D8	9-18	20	813	±5	0	±800	82	±1000
DD-1212D8	9-18	20	794	±12	0	±335	84	±220
DD-1215D8	9-18	20	794	±15	0	±265	84	±100
DD-243R3S8	18-36	15	344	3.3	0	2000	80	3300
DD-2405S8	18-36	15	381	5	0	1500	82	2200
DD-2412S8	18-36	15	392	12	0	665	85	470
DD-2415S8	18-36	15	397	15	0	535	84	220
DD-2405D8	18-36	15	407	±5	0	±800	82	±1000
DD-2412D8	18-36	15	402	±12	0	±335	83	±220
DD-2415D8	18-36	15	392	±15	0	±265	85	±100
DD-483R3S8	36-72	15	172	3.3	0	2000	80	3300
DD-4805S8	36-72	15	191	5	0	1500	82	2200
DD-4812S8	36-72	15	198	12	0	665	84	470
DD-4815S8	36-72	15	198	15	0	535	84	220
DD-4805D8	36-72	15	203	±5	0	±800	82	±1000
DD-4812D8	36-72	15	196	±12	0	±335	85	±220
DD-4815D8	36-72	15	196	±15	0	±265	85	±100

D7 - 7.5W Series

7.5W 2:1 Regulated Single & Dual output

Features

- Wide 2:1 Input Range
- Full SMD Technology
- 1500 - 3500 VDC Isolation
- Continuous Short Circuit Protection
- Efficiency up to 86%
- -40 ~ 85°C Operation Temperature Range
- EMI Complies With En55022 Class A

PART NUMBER STRUCTURE

D7 - 24 05 S 7 H

- **Series Name**
- **Input Voltage Range**
  12 - 9 ~ 18V
  24 - 18 ~ 36V
  48 - 36 ~ 72V
- **Nominal Output Voltage**
  3R3 - 3.3V
  05 - 5V
  7R2 - 7.2V
  09 - 9V
  12 - 12V
  15 - 15V
  18 - 18V
  24 - 24V
- **Output Type**
  S - Single output
  D - Dual Output
- **Watt**
  7 - 7.5W
- **3.5KVdc Isolation.**
  Optional, if no suffix "H" mean1.5KVdc Isolation

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage accuracy	±1%
Line regulation	±0.5%
Load regulation (0% to 100% Load)	(Single Output) ±0.5%
	(Dual Output) ±1.0%
Ripple & noise (20 MHz bandwidth)(1)	100mV pk-pk
Over-current protection	140% of max. Iout
Short circuit protection	Indefinite(Automatic Recovery)
Temperature coefficient	±0.02%/°C
Capacitor load(2)	See table
Transient Recovery Time(3)	250us, typ.
Transient Response Deviation(3)	±3%, max.

INPUT SPECIFICATIONS

Voltage Range	See table
Start up Time (Nominal Vin and constant resistive load)	20mS, typ.
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	Pi Type
Input Reflected Ripple Current(4)	35mA pk-pk

GENERAL SPECIFICATIONS

Efficiency	See table
I/O Isolation Voltage(3 sec)	
Input/Output	1500~3500Vdc
Case/Input & Output	1000Vdc
I/O Isolation Capacitance	500 pF Typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	Typical 200kHz
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1.121 Mhrs
Safety Standard : (designed to meet)	IEC 60950-1

EMC SPECIFICATIONS

Radiated Emissions	EN55022	CLASS A
Conducted Emissions(5)	EN55022	CLASS A
ESD	IEC61000-4-2	Perf. Criteria A
RS	IEC61000-4-3	Perf. Criteria A
EFT(6)	IEC61000-4-4	Perf. Criteria A
Surge (6)	IEC61000-4-5	Perf. Criteria A
CS	IEC61000-4-6	Perf. Criteria A
PFMF	IEC61000-4-8	Perf. Criteria A

PHYSICAL SPECIFICATIONS

Case Material	Nickel-coated Brass
Pin Material	1.0mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0rated)
Weight	30.0g
Dimensions	2.00 "x1.00 "x0.40 "

ENVIRONMENT SPECIFICATIONS

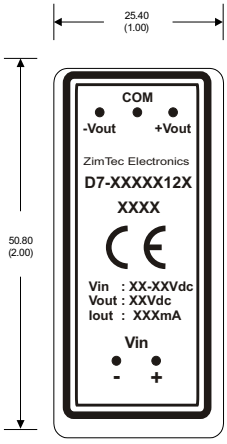
Operating Temperature	-40 °C~85 °C(See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

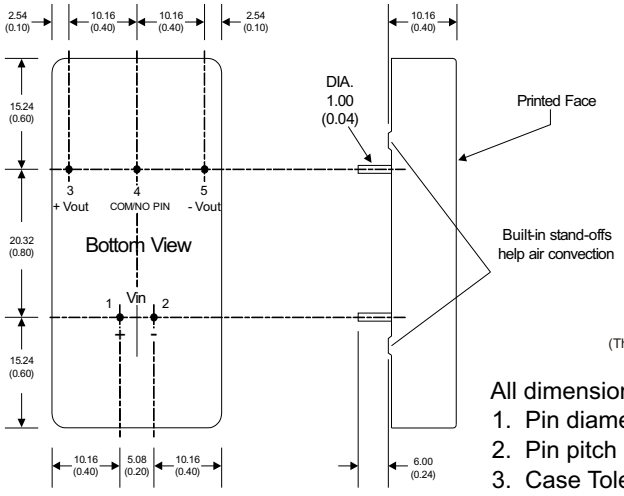
ABSOLUTE MAXIMUM RATINGS(7)

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge Voltage(100mS)	
12 Models	25 Vdc max.
24 Models	50 Vdc max.
48 Models	100 Vdc max.
Soldering Temperature (1.5mm from case 10 sec max.)	260 °C

MECHANICAL SPECIFICATIONS





PIN CONNECTIONS

PIN NUMBER	SINGLE	DUAL
1	+V Input	+V Input
2	-V Input	-V Input
3	+V Output	+V Output
4	N.P.	Common
5	−V Output	−V Output

(The Pin Connection of high isolation one is the same with normal one.)

All dimensions are typical in millimeters (inches).

1. Pin diameter: 1.0 ±0.05 (0.04 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

D7 - 7.5W 2:1 Regulated Single & Dual output

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min Load (mA)	OUTPUT Current Full Load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
D7-123R3S7	9-18	30	515	3.3	0	1500	80	2200
D7-1205S7	9-18	30	771	5	0	1500	81	2200
D7-127R2S7	9-18	30	762	7.2	0	1041	82	1000
D7-1209S7	9-18	30	762	9	0	833	82	1000
D7-1212S7	9-18	30	753	12	0	625	83	680
D7-1215S7	9-18	30	753	15	0	500	83	470
D7-1218S7	9-18	30	744	18	0	416	84	470
D7-1224S7	9-18	30	735	24	0	312	85	330
D7-123R3D7	9-18	30	781	±3.3	0	±750	80	±1000
D7-1205D7	9-18	30	771	±5	0	±750	81	±1000
D7-127R2D7	9-18	30	762	±7.2	0	±520	82	±680
D7-1209D7	9-18	30	762	±9	0	±416	82	±470
D7-1212D7	9-18	30	762	±12	0	±312	82	±470
D7-1215D7	9-18	30	753	±15	0	±250	83	±330
D7-1218D7	9-18	30	753	±18	0	±208	83	±220
D7-1224D7	9-18	30	744	±24	0	±156	84	±220
D7-243R3S7	18-36	25	254	3.3	0	1500	81	2200
D7-2405S7	18-36	25	381	5	0	1500	82	2200
D7-247R2S7	18-36	25	376	7.2	0	1041	83	1000
D7-2409S7	18-36	25	372	9	0	833	84	1000
D7-2412S7	18-36	25	372	12	0	625	84	680
D7-2415S7	18-36	25	367	15	0	500	85	470
D7-2418S7	18-36	25	363	18	0	416	86	470
D7-2424S7	18-36	25	363	24	0	312	86	330
D7-243R3D7	18-36	25	254	±3.3	0	±750	81	±1000
D7-2405D7	18-36	25	381	±5	0	±750	82	±1000
D7-247R2D7	18-36	25	376	±7.2	0	±520	83	±680
D7-2409D7	18-36	25	376	±9	0	±416	83	±470
D7-2412D7	18-36	25	372	±12	0	±312	84	±470
D7-2415D7	18-36	25	372	±15	0	±250	84	±330
D7-2418D7	18-36	25	367	±18	0	±208	85	±220
D7-2424D7	18-36	25	367	±24	0	±156	85	±220
D7-483R3S7	36-72	20	128	3.3	0	1500	80	2200
D7-4805S7	36-72	20	192	5	0	1500	81	2200
D7-487R2S7	36-72	20	190	7.2	0	1041	82	1000
D7-4809S7	36-72	20	190	9	0	833	82	1000
D7-4812S7	36-72	20	188	12	0	625	83	680
D7-4815S7	36-72	20	188	15	0	500	83	470
D7-4818S7	36-72	20	186	18	0	416	84	470
D7-4824S7	36-72	20	186	24	0	312	84	330
D7-483R3D7	36-72	20	128	±3.3	0	±750	80	±1000
D7-4805D7	36-72	20	192	±5	0	±750	81	±1000
D7-487R2D7	36-72	20	190	±7.2	0	±520	82	±680
D7-4809D7	36-72	20	190	±9	0	±416	82	±470
D7-4812D7	36-72	20	188	±12	0	±312	83	±470
D7-4815D7	36-72	20	186	±15	0	±250	84	±330
D7-4818D7	36-72	20	186	±18	0	±208	84	±220
D7-4824D7	36-72	20	183	±24	0	±156	85	±220

Suffix “H” means 3.5KVdc isolation

D7 - 12W Series

12W 2:1 Regulated Single & Dual output

Features

- Wide 2:1 Input Range
- Full SMD Technology
- 1500 - 3500 VDC Isolation
- Continuous Short Circuit Protection
- Efficiency up to 86%
- -40 ~ 85°C Operation Temperature Range
- EMI Complies With En55022 Class A

PART NUMBER STRUCTURE

D7 - 24 05 S 12 H

- **Series Name**
- **Input Voltage Range**
  - **12** - 9 ~ 18V
  - **24** - 18 ~ 36V
  - **48** - 36 ~ 72V
- **Nominal Output Voltage**
  - **3R3** - 3.3V
  - **05** - 5V
  - **7R2** - 7.2V
  - **09** - 9V
  - **12** - 12V
  - **15** - 15V
  - **18** - 18V
  - **24** - 24V
- **Output Type**
  - **S** - Single output
  - **D** - Dual Output
- **Watt**
  - 12 - 12W
- **3.5KVdc Isolation.**
  - Optional, if no suffix "H" mean1.5KVdc Isolation

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage accuracy	±1%
Line regulation	±0.5%
Load regulation (0% to 100% Load)	(Single Output) ±0.5%
	(Dual Output) ±1.0%
Ripple & noise (20 MHz bandwidth)(1)	100mV pk-pk
Over-current protection	140% of max. Iout
Short circuit protection	Indefinite(Automatic Recovery)
Temperature coefficient	±0.02%/°C
Capacitor load(2)	See table
Transient Recovery Time(3)	250us, typ.
Transient Response Deviation(3)	±3%, max.

INPUT SPECIFICATIONS

Voltage Range	See table
Start up Time (Nominal Vin and constant resistive load)	20mS, typ.
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	Pi Type
Input Reflected Ripple Current(4)	35mA pk-pk

GENERAL SPECIFICATIONS

Efficiency	See table
I/O Isolation Voltage(3 sec)	
Input/Output	1500~3500Vdc
Case/Input & Output	1000Vdc
I/O Isolation Capacitance	500 pF Typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	Typical 200kHz
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1.121 Mhrs
Safety Standard : (designed to meet)	IEC 60950-1

EMC SPECIFICATIONS

Radiated Emissions	EN55022	CLASS A
Conducted Emissions(5)	EN55022	CLASS A
ESD	IEC61000-4-2	Perf. Criteria A
RS	IEC61000-4-3	Perf. Criteria A
EFT(6)	IEC61000-4-4	Perf. Criteria A
Surge (6)	IEC61000-4-5	Perf. Criteria A
CS	IEC61000-4-6	Perf. Criteria A
PFMF	IEC61000-4-8	Perf. Criteria A

PHYSICAL SPECIFICATIONS

Case Material	Nickel-coated Brass
Pin Material	1.0mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	30.0g
Dimensions	2.00 "x1.00 "x0.40"

ENVIRONMENT SPECIFICATIONS

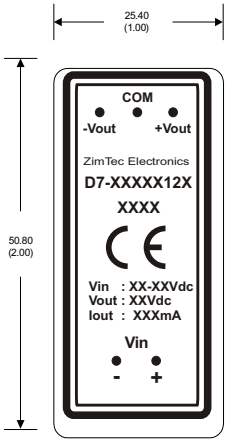
Operating Temperature	-40 °C~85 °C(See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

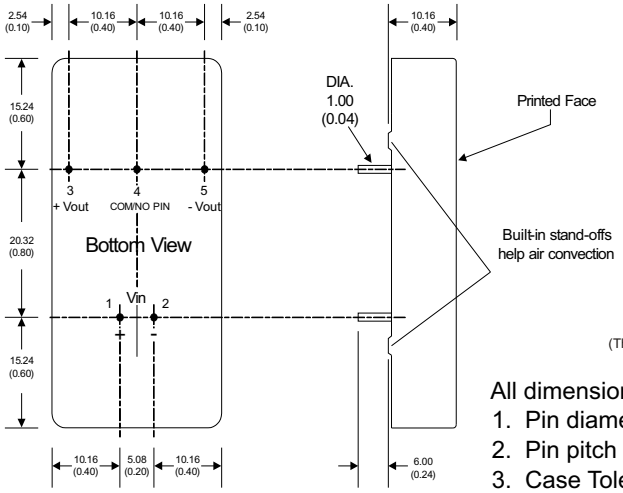
ABSOLUTE MAXIMUM RATINGS(7)

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge Voltage(100mS)	
12 Models	25 Vdc max.
24 Models	50 Vdc max.
48 Models	100 Vdc max.
Soldering Temperature (1.5mm from case 10 sec.max.)	260°C

MECHANICAL SPECIFICATIONS





PIN CONNECTIONS

PIN NUMBER	SINGLE	DUAL
1	+V Input	+V Input
2	-V Input	-V Input
3	+V Output	+V Output
4	N.P.	Common
5	−V Output	−V Output

(The Pin Connection of high isolation one is the same with normal one.)

All dimensions are typical in millimeters (inches).

1. Pin diameter: 1.0 ±0.05 (0.04 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

D7 - 12W 2:1 Regulated Single & Dual output

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min Load (mA)	OUTPUT Current Full Load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
D7-123R3S12	9-18	30	835	3.3	0	2400	79	3300
D7-1205S12	9-18	30	1219	5	0	2400	82	3300
D7-127R2S12	9-18	30	1204	7.2	0	1666	83	2200
D7-1209S12	9-18	30	1204	9	0	1333	83	1000
D7-1212S12	9-18	30	1190	12	0	1000	84	1000
D7-1215S12	9-18	30	1190	15	0	800	84	680
D7-1218S12	9-18	30	1176	18	0	666	85	470
D7-1224S12	9-18	30	1176	24	0	500	85	470
D7-123R3D12	9-18	30	835	±3.3	0	±1200	79	±1000
D7-1205D12	9-18	30	1219	±5	0	±1200	82	±1000
D7-127R2D12	9-18	30	1204	±7.2	0	±833	83	±680
D7-1209D12	9-18	30	1190	±9	0	±666	84	±470
D7-1212D12	9-18	30	1190	±12	0	±500	84	±470
D7-1215D12	9-18	30	1176	±15	0	±400	85	±330
D7-1218D12	9-18	30	1176	±18	0	±333	85	±220
D7-1224D12	9-18	30	1176	±24	0	±250	85	±220
D7-243R3S12	18-36	25	417	3.3	0	2400	79	3300
D7-2405S12	18-36	25	609	5	0	2400	82	3300
D7-247R2S12	18-36	25	602	7.2	0	1666	83	2200
D7-2409S12	18-36	25	595	9	0	1333	84	1000
D7-2412S12	18-36	25	595	12	0	1000	84	1000
D7-2415S12	18-36	25	588	15	0	800	85	680
D7-2418S12	18-36	25	588	18	0	666	85	470
D7-2424S12	18-36	25	581	24	0	500	86	470
D7-243R3D12	18-36	25	417	±3.3	0	±1200	79	±1000
D7-2405D12	18-36	25	609	±5	0	±1200	82	±1000
D7-247R2D12	18-36	25	602	±7.2	0	±833	83	±680
D7-2409D12	18-36	25	602	±9	0	±666	83	±470
D7-2412D12	18-36	25	595	±12	0	±500	84	±470
D7-2415D12	18-36	25	595	±15	0	±400	84	±330
D7-2418D12	18-36	25	588	±18	0	±333	85	±220
D7-2424D12	18-36	25	588	±24	0	±250	85	±220
D7-483R3S12	36-72	20	208	3.3	0	2400	79	3300
D7-4805S12	36-72	20	301	5	0	2400	83	3300
D7-487R2S12	36-72	20	301	7.2	0	1666	83	2200
D7-4809S12	36-72	20	297	9	0	1333	84	1000
D7-4812S12	36-72	20	297	12	0	1000	84	1000
D7-4815S12	36-72	20	297	15	0	800	84	680
D7-4818S12	36-72	20	294	18	0	666	85	470
D7-4824S12	36-72	20	294	24	0	500	86	470
D7-483R3D12	36-72	20	208	±3.3	0	±1200	79	±1000
D7-4805D12	36-72	20	304	±5	0	±1200	82	±1000
D7-487R2D12	36-72	20	297	±7.2	0	±833	84	±680
D7-4809D12	36-72	20	297	±9	0	±666	84	±470
D7-4812D12	36-72	20	294	±12	0	±500	85	±470
D7-4815D12	36-72	20	294	±15	0	±400	85	±330
D7-4818D12	36-72	20	290	±18	0	±333	86	±220
D7-4824D12	36-72	20	290	±24	0	±250	86	±220

Suffix “H” means 3.5KVdc isolation

D7W - 10W Series

10W 4:1 Regulated Single & Dual output

Features

- Wide 4:1 Input Range
- Full SMD Technology
- 1500 VDC Isolation
- Continuous Short Circuit Protection
- Efficiency up to 85%
- -40 ~ 85°C Operation Temperature Range
- Remote on/off Control (Optional)
- EMI Complies With En55022 Class A

PART NUMBER STRUCTURE

D7W - 24 05 S 10 C

- D7W - Series Name
- 24 - Input Voltage Range: **24** - 9 ~ 36V; **48** - 18 ~ 72V
- 05 - Nominal Output Voltage: **3R3** - 3.3V; **05** - 5V; **7R2** - 7.2V; **09** - 9V; **12** - 12V; **15** - 15V
- S - Output Type: **S** - Single output; **D** - Dual Output
- 10 - Watt
- C - Control Pin Optional

All specifications typical at Ta=25 °C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage accuracy	±1%
Line regulation	±0.5%
Load regulation	±0.5%(10% to 100% Loading) ±1%(below 10% load)
Cross Regulation (Dual Output) (1)	±5%
Ripple & noise (20 MHz bandwidth)(2)	75mV pk-pk
Over-current protection	140% of max. Iout
Short circuit protection	Indefinite(Automatic Recovery)
Temperature coefficient	±0.02%/°C
Capacitor load(3)	See table

INPUT SPECIFICATIONS

Input Voltage Range	See table
Under Voltage Lockout	
24V Models Module ON / OFF	8.6Vdc / 8Vdc, typ.
48V Models Module ON / OFF	16Vdc / 14Vdc, typ.
Start up Time (Nominal Vin and constant resistive load)	20mS, typ.
Input Filter	Pi Type
Input Current(No-Load)	See table, typ.
Input Current(Full-Load)	See table, max.
Input Reflected Ripple Current(4)	35mAp-p, typ.
CTRL(5) Module ON	2.5 to 5.5 Vdc or Open
Module OFF	-0.7 to 0.8Vdcor Short circuit pin 2 and pin 6
CTRL OFF Input Current	2.5mA,typ.

GENERAL SPECIFICATIONS

Efficiency	See table, typ.
I/O Isolation Voltage(3 sec)	
Input/Output	1500Vdc
Case/Input & Output	1000Vdc
Isolation Resistance	1000 MΩ, min.
Isolation Capacitance	1200 pF, typ.
Switching frequency	300kHz, typ.
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1.121 Mhrs
Safety Standard (designed to meet)	IEC/EN 60950-1

EMC SPECIFICATIONS

Radiated Emissions	EN55022	CLASS A
Conducted Emissions (6)	EN55022	CLASS A
ESD	IEC 61000-4-2	Perf. Criteria B
RS	IEC 61000-4-3	Perf. Criteria A
EFT	IEC 61000-4-4	Perf. Criteria A
Surge(7)	IEC 61000-4-5	Perf. Criteria A
CS	IEC 61000-4-6	Perf. Criteria A
PFMF	IEC 61000-4-8	Perf. Criteria A

PHYSICAL SPECIFICATIONS

Case Material	Nickel-coated Brass
Pin Material	¨ 1.0mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	30.0g
Dimensions	2.00"x1.00"x0.40"

ENVIRONMENT SPECIFICATIONS

Operating Temperature	-40 °C~85 °C(See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

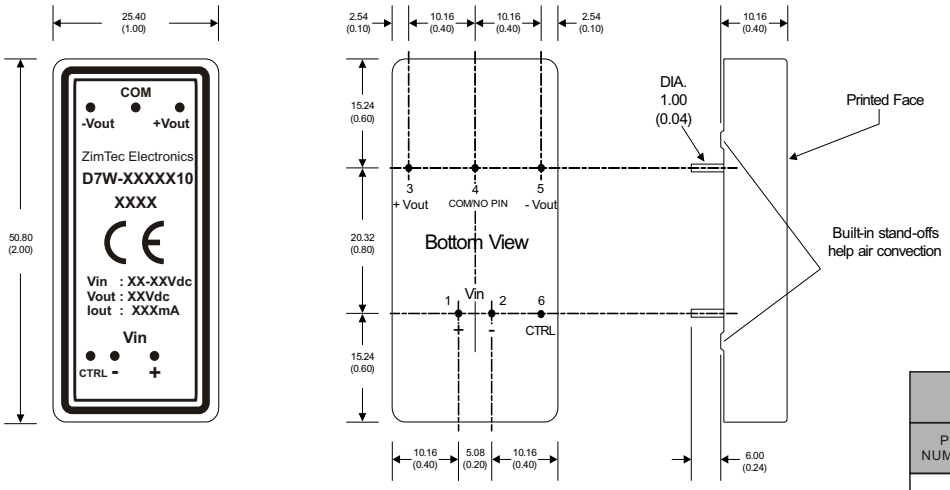
ABSOLUTE MAXIMUM RATINGS(8)

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge Voltage (100mS)	
24 Models	50 Vdc max.
48 Models	100 Vdc max.
Lead Soldering Temperature (1.5mm from case 10 sec.max.)	260°C

D7W - 10W 4:1 Regulated Single & Dual output

MECHANICAL SPECIFICATIONS



All dimensions are typical in millimeters (inches).
1. Pin diameter: 1.0 ±0.05 (0.04 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS				
PIN NUMBER	Standard		Remote Control(Optional)	
	SINGLE	DUAL	SINGLE	DUAL
1	+V Input	+V Input	+V Input	+V Input
2	-V Input	-V Input	-V Input	-V Input
3	+V Output	+V Output	+V Output	+V Output
4	N.P.	Common	N.P.	Common
5	−V Output	−V Output	−V Output	−V Output
6	N.P.	N.P.	CTRL	CTRL

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
D7W-243R3S10	9-36	25	348	3.3	0	2000	80	3300
D7W-2405S10	9-36	25	508	5	0	2000	82	3300
D7W-247R2S10	9-36	25	502	7.2	0	1388	83	1000
D7W-2409S10	9-36	25	502	9	0	1111	83	680
D7W-2412S10	9-36	25	490	12	0	833	85	680
D7W-2415S10	9-36	25	490	15	0	666	85	470
D7W-2405D10	9-36	25	508	±5	0	±1000	82	±2200
D7W-247R2D10	9-36	25	502	±7.2	0	±694	83	±470
D7W-2409D10	9-36	25	502	±9	0	±555	83	±470
D7W-2412D10	9-36	25	490	±12	0	±416	85	±470
D7W-2415D10	9-36	25	490	±15	0	±333	85	±330
D7W-483R3S10	18-72	20	174	3.3	0	2000	79	3300
D7W-4805S10	18-72	20	254	5	0	2000	82	3300
D7W-487R2S10	18-72	20	251	7.2	0	1388	83	1000
D7W-4809S10	18-72	20	251	9	0	1111	83	680
D7W-4812S10	18-72	20	245	12	0	833	85	680
D7W-4815S10	18-72	20	245	15	0	666	85	470
D7W-4805D10	18-72	20	254	±5	0	±1000	82	±2200
D7W-487R2D10	18-72	20	251	±7.2	0	±694	83	±470
D7W-4809D10	18-72	20	251	±9	0	±555	83	±470
D7W-4812D10	18-72	20	245	±12	0	±416	85	±470
D7W-4815D10	18-72	20	245	±15	0	±333	85	±330

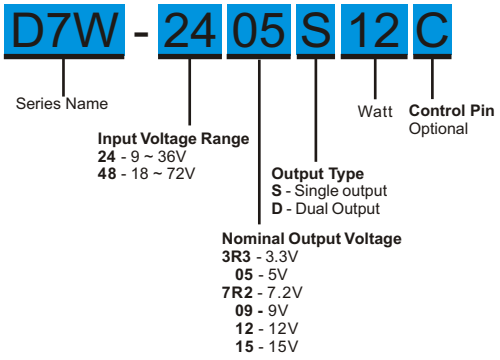
D7W - 12W Series

12W 4:1 Regulated Single & Dual output

Features

- Wide 4:1 Input Range
- Full SMD Technology
- 1500 VDC Isolation
- Continuous Short Circuit Protection
- Efficiency up to 85%
- -40 ~ 85°C Operation Temperature Range
- Remote on/off Control (Optional)
- EMI Complies With En55022 Class A

PART NUMBER STRUCTURE



All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage accuracy	±1%
Line regulation	±0.5%
Load regulation	±0.5%(10% to 100% Loading) ±1%(below 10% load)
Cross Regulation (Dual Output) (1)	±5%
Ripple & noise (20 MHz bandwidth)(2)	75mV pk-pk
Over-current protection	140% of max. Iout
Short circuit protection	Indefinite(Automatic Recovery)
Temperature coefficient	±0.02%/°C
Capacitor load(3)	See table

INPUT SPECIFICATIONS

Input Voltage Range	See table
Under Voltage Lockout	
24V Models Module ON / OFF	8.6Vdc / 8Vdc, typ.
48V Models Module ON / OFF	16Vdc / 14Vdc, typ.
Start up Time (Nominal Vin and constant resistive load)	20mS, typ.
Input Filter	Pi Type
Input Current(No-Load)	See table, typ.
Input Current(Full-Load)	See table, max.
Input Reflected Ripple Current(4)	35mAp-p, typ.
CTRL(5) Module ON	2.5 to 5.5 Vdc or Open
Module OFF	-0.7 to 0.8Vdcor Short circuit pin 2 and pin 6
CTRL OFF Input Current	2.5mA,typ.

GENERAL SPECIFICATIONS

Efficiency	See table, typ.
I/O Isolation Voltage(3 sec)	
Input/Output	1500Vdc
Case/Input & Output	1000Vdc
Isolation Resistance	1000 MΩ, min.
Isolation Capacitance	1200 pF, typ.
Switching frequency	300kHz, typ.
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1.121 Mhrs
Safety Standard (designed to meet)	IEC/EN 60950-1

EMC SPECIFICATIONS

Radiated Emissions	EN55022	CLASS A
Conducted Emissions (6)	EN55022	CLASS A
ESD	IEC 61000-4-2	Perf. Criteria B
RS	IEC 61000-4-3	Perf. Criteria A
EFT	IEC 61000-4-4	Perf. Criteria A
Surge(7)	IEC 61000-4-5	Perf. Criteria A
CS	IEC 61000-4-6	Perf. Criteria A
PFMF	IEC 61000-4-8	Perf. Criteria A

PHYSICAL SPECIFICATIONS

Case Material	Nickel-coated Brass
Pin Material	1.0mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	30.0g
Dimensions	2.00"x1.00"x0.40"

ENVIRONMENT SPECIFICATIONS

Operating Temperature	-40 °C~85 °C(See Derating Curve) -40°C~70°C(For 100% load)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

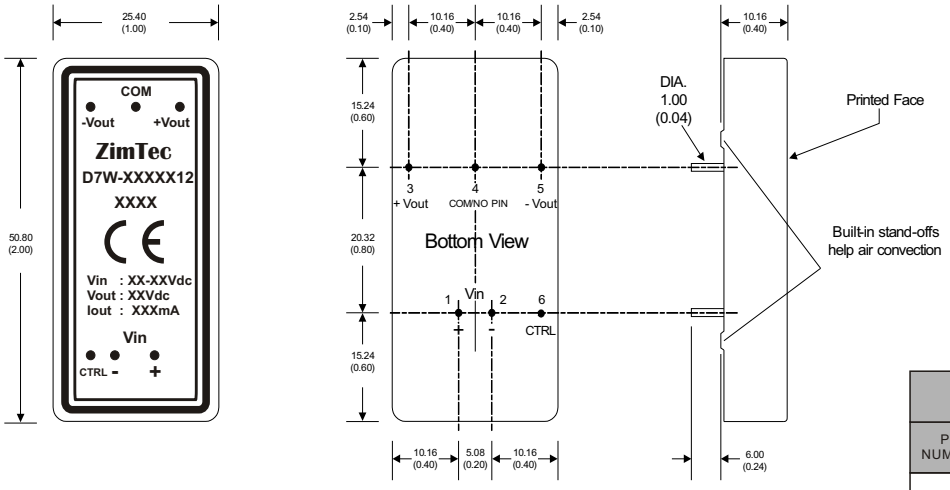
ABSOLUTE MAXIMUM RATINGS(8)

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge Voltage (100mS)	
24 Models	50 Vdc max.
48 Models	100 Vdc max.
Lead Soldering Temperature (1.5mm from case 10 sec.max.)	260°C

D7W - 12W 4:1 Regulated Single & Dual output

MECHANICAL SPECIFICATIONS



All dimensions are typical in millimeters (inches).
1. Pin diameter: 1.0 ±0.05 (0.04 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS				
PIN NUMBER	Standard		Remote Control(Optional)	
	SINGLE	DUAL	SINGLE	DUAL
1	+V Input	+V Input	+V Input	+V Input
2	-V Input	-V Input	-V Input	-V Input
3	+V Output	+V Output	+V Output	+V Output
4	N.P.	Common	N.P.	Common
5	−V Output	−V Output	−V Output	−V Output
6	N.P.	N.P.	CTRL	CTRL

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
D7W-243R3S12	9-36	25	412	3.3	0	2400	80	3300
D7W-2405S12	9-36	25	609	5	0	2400	82	3300
D7W-247R2S12	9-36	25	602	7.2	0	1666	83	1000
D7W-2409S12	9-36	25	602	9	0	1333	83	680
D7W-2412S12	9-36	25	588	12	0	1000	85	680
D7W-2415S12	9-36	25	588	15	0	800	85	470
D7W-2405D12	9-36	25	609	±5	0	±1200	82	±2200
D7W-247R2D12	9-36	25	602	±7.2	0	±833	83	±470
D7W-2409D12	9-36	25	602	±9	0	±666	83	±470
D7W-2412D12	9-36	25	588	±12	0	±500	85	±470
D7W-2415D12	9-36	25	588	±15	0	±400	85	±330
D7W-483R3S12	18-72	20	206	3.3	0	2400	80	3300
D7W-4805S12	18-72	20	304	5	0	2400	82	3300
D7W-487R2S12	18-72	20	301	7.2	0	1666	83	1000
D7W-4809S12	18-72	20	301	9	0	1333	83	680
D7W-4812S12	18-72	20	294	12	0	1000	85	680
D7W-4815S12	18-72	20	294	15	0	800	85	470
D7W-4805D12	18-72	20	304	±5	0	±1200	82	±2200
D7W-487R2D12	18-72	20	301	±7.2	0	±833	83	±470
D7W-4809D12	18-72	20	301	±9	0	±666	83	±470
D7W-4812D12	18-72	20	294	±12	0	±500	85	±470
D7W-4815D12	18-72	20	294	±15	0	±400	85	±330

D7W - 15W Series

15W 4:1 Regulated Single & Dual output

Features

- Wide 4:1 Input Range
- Full SMD Technology
- 1500 VDC Isolation
- Continuous Short Circuit Protection
- Efficiency up to 86%
- -40 ~ 85°C Operation Temperature Range
- Remote on/off Control (Optional)
- EMI Complies With En55022 Class A

PART NUMBER STRUCTURE

D7W - 24 05 S 15 C

- D7W — Series Name
- 24 — Input Voltage Range: **24** - 9 ~ 36V; **48** - 18 ~ 72V
- 05 — Nominal Output Voltage: **3R3** - 3.3V; **05** - 5V; **7R2** - 7.2V; **09** - 9V; **12** - 12V; **15** - 15V
- S — Output Type: **S** - Single output; **D** - Dual Output
- 15 — Watt
- C — Control Pin Optional

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage accuracy	±1%
Line regulation	±0.5%
Load regulation	±0.5%(10% to 100% Loading) ±1%(below 10% load)
Cross Regulation (Dual Output) (1)	±5%
Ripple & noise (20 MHz bandwidth)(2)	75mV pk-pk
Over-current protection	140% of max. Iout
Short circuit protection	Indefinite(Automatic Recovery)
Temperature coefficient	±0.02%/°C
Capacitor load(3)	See table

INPUT SPECIFICATIONS

Input Voltage Range	See table
Under Voltage Lockout	
24V Models Module ON / OFF	8.6Vdc / 8Vdc, typ.
48V Models Module ON / OFF	16Vdc / 14Vdc, typ.
Start up Time (Nominal Vin and constant resistive load)	20mS, typ.
Input Filter	Pi Type
Input Current(No-Load)	See table, typ.
Input Current(Full-Load)	See table, max.
Input Reflected Ripple Current(4)	35mAp-p, typ.
CTRL(5) Module ON	2.5 to 5.5 Vdc or Open
Module OFF	-0.7 to 0.8Vdcor Short circuit pin 2 and pin 6
CTRL OFF Input Current	2.5mA,typ.

GENERAL SPECIFICATIONS

Efficiency	See table, typ.
I/O Isolation Voltage(3 sec)	
Input/Output	1500Vdc
Case/Input & Output	1000Vdc
Isolation Resistance	1000 MΩ, min.
Isolation Capacitance	1200 pF, typ.
Switching frequency	300kHz, typ.
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1.121 Mhrs
Safety Standard (designed to meet)	IEC/EN 60950-1

EMC SPECIFICATIONS

Radiated Emissions	EN55022	CLASS A
Conducted Emissions (6)	EN55022	CLASS A
ESD	IEC 61000-4-2	Perf. Criteria B
RS	IEC 61000-4-3	Perf. Criteria A
EFT	IEC 61000-4-4	Perf. Criteria A
Surge(7)	IEC 61000-4-5	Perf. Criteria A
CS	IEC 61000-4-6	Perf. Criteria A
PFMF	IEC 61000-4-8	Perf. Criteria A

PHYSICAL SPECIFICATIONS

Case Material	Nickel-coated Brass
Pin Material	1.0mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0rated)
Weight	30.0g
Dimensions	2.00 "x1.00 "x0.40 "

ENVIRONMENT SPECIFICATIONS

Operating Temperature	-40 °C~85 °C(See Derating Curve) -40°C~60°C(For 100% load)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

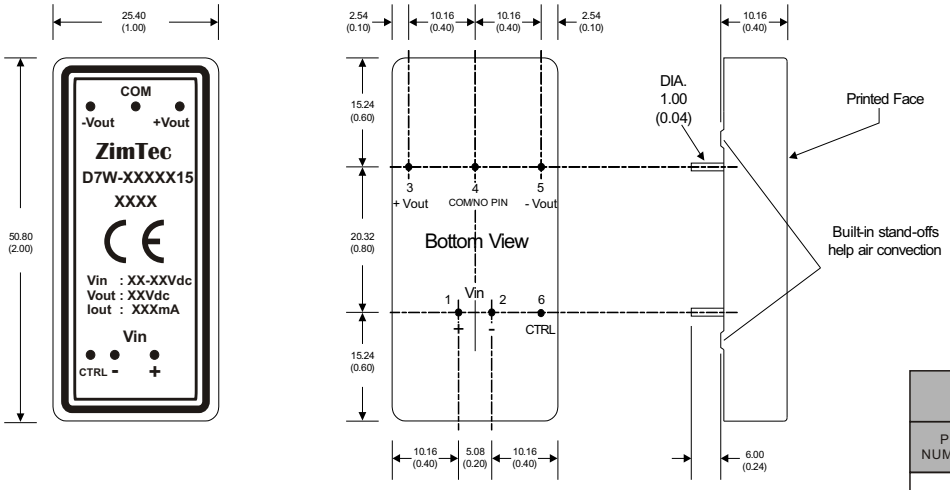
ABSOLUTE MAXIMUM RATINGS(8)

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge V oltage (100mS)	
24 Models	50 Vdc max.
48 Models	100 Vdc max.
Lead Soldering Temperature (1.5mm from case 10 sec.max.)	260 °C

D7W - 15W 4:1 Regulated Single & Dual output

MECHANICAL SPECIFICATIONS



All dimensions are typical in millimeters (inches).
1. Pin diameter: 1.0 ±0.05 (0.04 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS				
PIN NUMBER	Standard		Remote Control(Optional)	
	SINGLE	DUAL	SINGLE	DUAL
1	+V Input	+V Input	+V Input	+V Input
2	-V Input	-V Input	-V Input	-V Input
3	+V Output	+V Output	+V Output	+V Output
4	N.P.	Common	N.P.	Common
5	−V Output	−V Output	−V Output	−V Output
6	N.P.	N.P.	CTRL	CTRL

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
D7W-243R3S15	9-36	25	515	3.3	0	3000	80	3300
D7W-2405S15	9-36	25	753	5	0	3000	83	3300
D7W-247R2S15	9-36	25	744	7.2	0	2083	84	1000
D7W-2409S15	9-36	25	744	9	0	1666	84	680
D7W-2412S15	9-36	25	735	12	0	1250	85	680
D7W-2415S15	9-36	25	726	15	0	1000	86	470
D7W-2405D15	9-36	25	753	±5	0	±1500	83	±2200
D7W-247R2D15	9-36	25	744	±7.2	0	±1041	84	±470
D7W-2409D15	9-36	25	744	±9	0	±833	84	±470
D7W-2412D15	9-36	25	735	±12	0	±625	85	±470
D7W-2415D15	9-36	25	726	±15	0	±500	86	±330
D7W-483R3S15	18-72	20	257	3.3	0	3000	80	3300
D7W-4805S15	18-72	20	376	5	0	3000	83	3300
D7W-487R2S15	18-72	20	372	7.2	0	2083	84	1000
D7W-4809S15	18-72	20	372	9	0	1666	84	1000
D7W-4812S15	18-72	20	367	12	0	1250	85	680
D7W-4815S15	18-72	20	363	15	0	1000	86	470
D7W-4805D15	18-72	20	376	±5	0	±1500	83	±2200
D7W-487R2D15	18-72	20	372	±7.2	0	±1041	84	±470
D7W-4809D15	18-72	20	372	±9	0	±833	84	±470
D7W-4812D15	18-72	20	367	±12	0	±625	85	±470
D7W-4815D15	18-72	20	363	±15	0	±500	86	±330

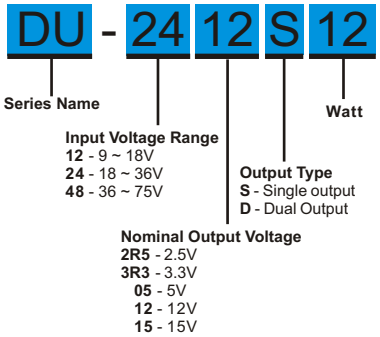
DU - 12W Series

12W 2:1 Regulated Single & Dual output

Features

- Wide 2:1 Input Range
- Full SMD Technology
- 1600 VDC Isolation
- Efficiency up to 91%
- -40 ~ 85°C Operation Temperature Range
- Continuous Short Circuit Protection
- No Minimum Load Required
- Over Voltage Protection
- Low no load Input Current
- Soft Start
- High Power Density:12W in DIL-24 Package
- Remote On/Off

PART NUMBER STRUCTURE



All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Output Voltage Accuracy		±1.2%
Maximum Output Current		See table
Line Regulation		±0.5%, max.
Load Regulation (0% Load to Full Load)	Singe	±0.5%, max.
Load Regulation (0% Load to Full Load)	Dual	±1.0%, max.
Cross Regulation (Dual Output) (1)		±5%
Ripple&Noise (2)		85mVpk-pk, max.
Over Voltage Protection (Zener diode clamp)	2.5V,3.3V output	3.9V
	5V output	6.2V
	12V output	15V
	15V output	18V
	±12V output	±15V
	±15V output	±18V
Over Current Protection		150% of FL, typ.
Short Circuit Protection		Indefinite(hiccup) (Automatic Recovery)
Temperature Coefficient		±0.02%/°C
Capacitive Load (3)		See table
Transient Recovery Time (4)		250us, typ.
Transient Response Deviation(4)		±3%, max.

INPUT SPECIFICATIONS

Input Voltage Range	See table
Start up Time (Nominal Vin and constant resistive load)	20mS, typ.
Input Filter	Pi Type
Input Current(No-Load)	See table, max.
Input Current(Full-Load)	See table, typ.
Input Reflected Ripple Current	20mApk-pk
Remote On/Off (CTRL)	
ON:	3.0 ... 12Vdc or open circuit
OFF:	0 ... 1.2Vdc or Short circuit pin1 and pin 2/3
OFF idle current:	5.0 mA typ.

ENVIRONMENTAL SPECIFICATIONS

Operating Ambient Temperature	-40°C ~ +85°C(See Derating Curve) -40°C ~ +60°C(For 100% load)
Maximum Case Temperature	100°C
Storage Temperature	-55°C ~ +125°C
Cooling	Nature Convection

GENERAL SPECIFICATIONS

Efficiency	See table, typ.
I/O Isolation Voltage(3 sec)	
Input/Output	1600Vdc
Case/Input & Output	1600Vdc
Isolation Resistance	1000 M Ohm, min.
Isolation Capacitance	1200 pF, max.
Switching frequency	330kHz, typ.
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1 Mhrs
Safety Standard : (designed to meet)	IEC 60950-1

EMC CHARACTERISTICS

Radiated Emissions	EN55022	CLASSA
Conducted Emissions(5)	EN55022	CLASSA
ESD	EN61000-4-2	Perf. Criteria B
RS	EN61000-4-3	Perf. Criteria A
EFT	EN61000-4-4	Perf. Criteria A
Surge (6)	EN61000-4-5	Perf. Criteria A
CS	EN61000-4-6	Perf. Criteria A
PFMF	EN61000-4-8	Perf. Criteria A

PHYSICAL SPECIFICATIONS

Case Material	Nickel-coated Copper
Base Material	Non-conductive black plastic (UL94V-0 rated)
Pin Material	¨ 0.5mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	18.0g
Dimensions	1.25"x0.8"x0.40"

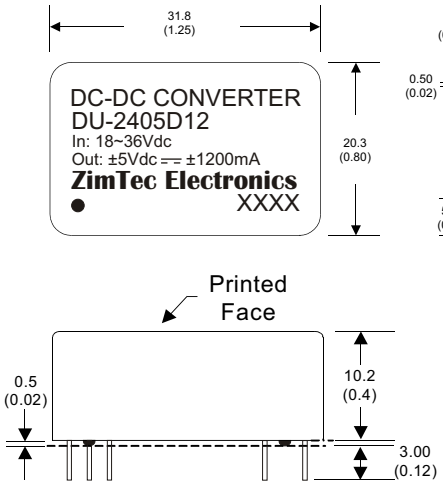
ABSOLUTE SPECIFICATIONS (7)

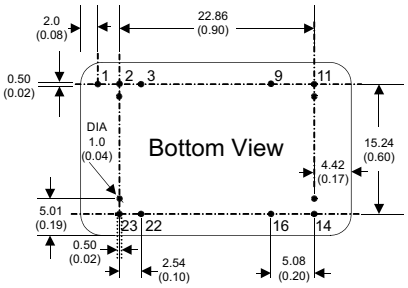
These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge Voltage(1000mS)	12 Models	36Vdc, max.
	24 Models	50Vdc, max.
	48 Models	100Vdc, max.
Soldering Temperature (1.5mm from case 10 sec. max.)		260°C, max.

DU - 12W 2:1 Regulated Single & Dual output

MECHANICAL SPECIFICATIONS





24 Pin DIL Package
Nickel-Coated Copper

All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ±0.05 (0.02 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)
4. Stand-off tolerance: ±0.1 (±0.004)

PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
1	Remote On/Off	Remote On/Off
2	-V Input	-V Input
3	-V Input	-V Input
9	N.P.	Common
11	N.C.	-V Output
14	+V Output	+V Output
16	-V Output	Common
22	+V Input	+V Input
23	+V Input	+V Input

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
DU-122R5S12	9-18	15	889	2.5	0	3500	85	2000
DU-123R3S12	9-18	15	1146	3.3	0	3500	87	2000
DU-1205S12	9-18	15	1163	5	0	2400	89	2000
DU-1212S12	9-18	15	1149	12	0	1000	90	430
DU-1215S12	9-18	15	1149	15	0	800	90	300
DU-1212D12	9-18	15	1149	±12	0	±500	90	±200
DU-1215D12	9-18	15	1136	±15	0	±400	91	±120
DU-242R5S12	18-36	15	445	2.5	0	3500	85	2000
DU-243R3S12	18-36	15	573	3.3	0	3500	87	2000
DU-2405S12	18-36	15	581	5	0	2400	89	2000
DU-2412S12	18-36	15	575	12	0	1000	90	430
DU-2415S12	18-36	15	575	15	0	800	90	300
DU-2412D12	18-36	15	575	±12	0	±500	90	±200
DU-2415D12	18-36	15	562	±15	0	±400	91	±120
DU-482R5S12	36-75	15	225	2.5	0	3500	84	2000
DU-483R3S12	36-75	15	283	3.3	0	3500	88	2000
DU-4805S12	36-75	15	291	5	0	2400	89	2000
DU-4812S12	36-75	15	294	12	0	1000	88	430
DU-4815S12	36-75	15	291	15	0	800	89	300
DU-4812D12	36-75	15	294	±12	0	±500	88	±200
DU-4815D12	36-75	15	291	±15	0	±400	89	±120

Z7-10W Series

10W 4:1 Regulated Single & Dual output

Features

- 4:1 wide input voltage range
- Efficiency up to 88%
- 1.5KVDC isolation
- Short circuit protection
- Output over voltage protection
- Operating Temperature range: -40°C ~ +85°C
- Six-sided metal shielding package
- Industry standard pinout
- Low ripple & noise
- Meet CISPR22/EN55022 CLASS A
- Inverse polarity protection for A2S（chassis mounting）and A4S（DIN-Rail mounting）

PART NUMBER STRUCTURE

Z7Y-2405-(X)D10P

- Rated Power
- Package
- No Ctrl
- Output Voltage
- Input Voltage
- Product Series

Z7X-(X)D10P & Z7Y-(X)D10P Series

10W,ULTRA-WIDE INPUT ISOLATED & REGULATED DUAL/SINGLE OUTPUT DIP PACKAGING, DC-DC CONVERTER

INPUT SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Input Surge Voltage (1sec. max.)	24VDC input	-0.7	--	50	VDC
	48VDC input	-0.7	--	100	
Start-up Voltage	24VDC input	--	--	9	
	48VDC input	--	--	18	
Input Filter		Pi Filter			
Ctrl *	Models ON	Ctrl open or connect high level (3.5-12VDC)			
	Models OFF	Ctrl connect GND or low level (0-1.2VDC)			
	Input current (Models OFF)	--	1	3	mA

Note: *The Ctrl pin voltage is referenced to GND.

OUTPUT SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy		--	±1	±2	%
Output Voltage Balance	Dual output, balanced Loads	--	±0.5	±1.5	
Line Regulation	Full load, Input voltage from low to high	--	±0.2	±0.5	
Load Regulation	5% to 100% load	--	±0.5	±1	
Cross Regulation	Dual output, main output 50% load, secondary output from 10% to 100% load	--	--	±5	
Transient Recovery Time	25% load step change	--	300	500	μs
Transient Response Deviation		--	±3	±5	%
Temperature coefficient	100% load	--	--	±0.03	%/°C
Ripple*	20MHz bandwidth	--	15	35	mVp-p
Noise*		--	40	80	
Output Over Voltage Protection	Input voltage range	110	120	140	%Vo
Output Short Circuit Protection		Continuous, automatic recovery			

Note:* Ripple and noise tested with "parallel cable" method. See detailed operation instructions at *DC-DC application notes* .

ENVIRONMENTAL SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Storage Humidity	Non condensing	5	--	95	%
Operating Temperature	Power derating (above 71℃, see Figure 5)	-40	--	85	°C
Storage Temperature		-55	--	125	
Max. Case Temperature	Operating Temperature curve range	--	--	105	
Lead Temperature	1.5mm from case for 10 seconds	--	--	300	
Cooling		Free air convection			
Vibration		10-55Hz,10G,30 Min. along X, Y and Z			

Z7X-(X)D10P & Z7Y-(X)D10P Series - 10W 4:1 Regulated Single & Dual output

COMMON SPECIFICATIONS

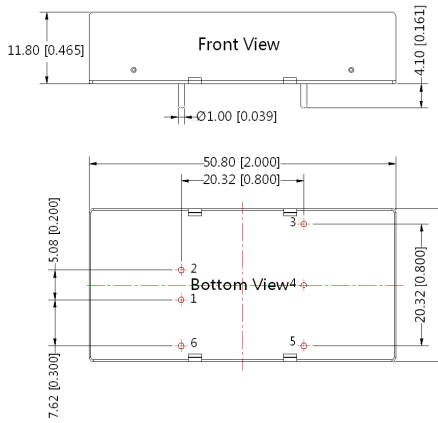
Item	Test Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-Output, tested for 1 minute, leakage current less than 1 mA	1500	--	--	VDC
Isolation Resistance	Input-Output, test at 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-Output,100KHz/0.1V	--	1000	--	pF
Switching Frequency	PWM mode	--	350	--	KHz
MTBF	MIL-HDBK-217F@25℃	1000	--	--	K hours
Case Material		Aluminum Alloy			
Size	PCB mounting	50.8x25.4x11.8			mm
	A2S chassis mounting	76.0x31.5x21.2			
	A4S DIN-Rail mounting	76.0x31.5x25.8			
Weight	PCB mounting	--	22	--	g
	A2S chassis mounting	--	44	--	
	A4S DIN-Rail mounting	--	64	--	

EMC SPECIFICATIONS

EMI	CE	CISPR22/EN55022	CLASS A（Without External Circuit）/ CLASS B（External Circuit Refer to Figure1-② or Figure 3）	
	RE	CISPR22/EN55022	CLASS A（Without External Circuit）/ CLASS B（External Circuit Refer to Figure1-② or Figure 3）	
EMS	ESD	IEC/EN61000-4-2	Contact ±4KV	perf. Criteria B
	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4	±2KV	perf. Criteria B（External Circuit Refer to Figure1-①）
		IEC/EN61000-4-4	±4KV	perf. Criteria B（External Circuit Refer to Figure 3）
	Surge	IEC/EN61000-4-5	±2KV	perf. Criteria B（External Circuit Refer to Figure1-①or Figure 3）
EMS	CS	IEC/EN61000-4-6	3 Vr.m.s	perf. Criteria A
	Voltage dips, short and interruptions immunity	IEC/EN61000-4-29	0%-70%	perf. Criteria B

MECHANICAL SPECIFICATIONS

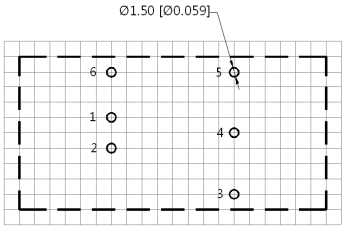
MECHANICAL DIMENSIONS



Note:
Unit :mm[inch]
Pin diameter tolerances :±0.10[±0.004]
Pin height tolerances :±0.50[±0.020]
General tolerances:±0.30[±0.012]

THIRD ANGLE PROJECTION

RECOMMENDED FOOTPRINT DETAILS



Note : Grid 2.54*2.54mm

PIN CONNECTION		
Pin	Single	Dual
1	GND	GND
2	Vin	Vin
3	+Vo	+Vo
4	No Pin	0V
5	0V	-Vo
6*	Ctrl	Ctrl

*Z7X(Y)-(X)D10P series have no pin.

Z7X-(X)D10P & Z7Y-(X)D10P Series - 10W 4:1 Regulated Single & Dual output

MODEL SELECTION GUIDE

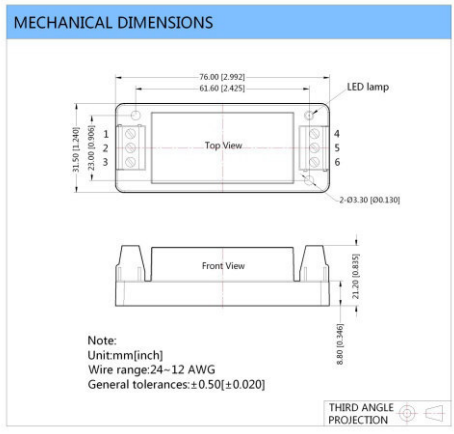
Model ①	Input Voltage(VDC)		Output Voltage (VDC)	Output Current (mA)		Input Current (mA)(Typ.)		Reflected Ripple Current (mA,Typ.)	Max. Capacitive Load ③ (μF)	Efficiency (%,Typ.) ④ @Max. Load
	Nominal (Range)	Max. ②		Max.	Min.	@Max. Load	@No Load			
Z7X-2405-(X)D10P	24 (9-36)	40	±5	±1000	±50	502	12	40	680	83
Z7X-2412-(X)D10P			±12	±416	±21	484			220	86
Z7X-2415-(X)D10P			±15	±333	±16	473			100	88
Z7Y-2403-(X)D10P			3.3	2400	120	418			2200	79
Z7Y-2405-(X)D10P			5	2000	100	508			2200	82
Z7Y-2412-(X)D10P			12	833	42	484			470	86
Z7Y-2415-(X)D10P			15	667	33	479			330	87
Z7Y-2424-(X)D10P			24	416	21	479			100	87
Z7X-4805-(X)D10P	48 (18-75)	80	±5	±1000	±50	251	6	30	680	83
Z7X-4812-(X)D10P			±12	±416	±21	242			150	86
Z7X-4815-(X)D10P			±15	±333	±16	237			100	88
Z7Y-4803-(X)D10P			3.3	2400	120	209			2200	79
Z7Y-4805-(X)D10P			5	2000	100	254			2200	82
Z7Y-4812-(X)D10P			12	833	42	242			330	86
Z7Y-4815-(X)D10P			15	667	33	239			220	87
Z7Y-4824-(X)D10P			24	416	21	239			100	87

Note:
①"X" means the model without Ctrl pin, series with suffix "A2S" are chassis mounting, with suffix "A4S" are DIN-Rail mounting, for example Z7Y-2405-XD10PA2S is chassis mounting without Ctrl pin, Z7Y-2405-D10PA4S is DIN-Rail mounting with Ctrl pin;
②Absolute maximum rating without damage on the converter;
③For dual-output-converters the given value is for one output (for both outputs the same value);
④The efficiency of "A2S" and "A4S" is approx. 2% lower.

Z7X-(X)D10PA2S & Z7Y-(X)D10PA2S CHASSIS MOUNTING OUTLINE DIMENSIONS

Footprint Details						
Pin	1*	2	3	4	5	6
Z7X-XD	Ctrl	GND	Vin	-Vo	0V	+Vo
Z7Y-XD	Ctrl	GND	Vin	0V	NC	+Vo

*Z7X/Y-(X)D10PA2S series have no connection

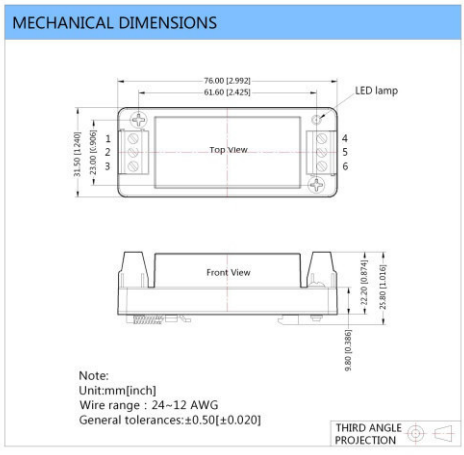


Z7X-(X)D10PA4S & Z7Y-(X)D10PA4S DIN-RAIL MOUNTING OUTLINE DIMENSIONS

DIN-rail modules are fitting to TS35 rails

Footprint Details						
Pin	1*	2	3	4	5	6
Z7X-XD	Ctrl	GND	Vin	-Vo	0V	+Vo
Z7Y-XD	Ctrl	GND	Vin	0V	NC	+Vo

*Z7X/Y-(X)D10PA4S series have no connection



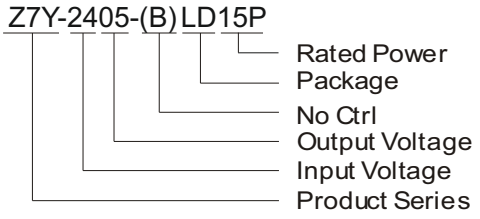
Z7-15&20W Series

15W & 20W 4:1 Regulated Single & Dual output

Features

- Wide range of input voltage (4:1)
- Efficiency up to 90%
- 1.5KVDC isolation
- Short circuit protection
- Output over voltage protection
- Operating Temperature range: -40°C ~ +85°C
- Six-sided metal shielding package
- Industry standard pin-out
- Meet CISPR22/EN55022 CLASS A
- A2S (wring mounting) and A4S (35mm rail mounting) products featuring anti-reverse connection for input
- Meet UI60950 and EN60950

PART NUMBER STRUCTURE



Z7X-(B)LD15P & Z7Y-(B)LD15P Series
Z7X-(B)LD20P & Z7Y-(B)LD20P Series

15W & 20W,ULTRA-WIDE INPUT ISOLATED & REGULATED DUAL/SINGLE OUTPUT DC-DC CONVERTER

INPUT SPECIFICATIONS

Item	Operating Conditions			Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	15W	24VDC input	3.3/5 VDC output	--	695/45	--	mA
			Others output	--	703/15	--	
		48VDC input	3.3/5 VDC output	--	351/35	--	
			Others output	--	347/10	--	
	20W	24VDC input	3.3/5 VDC output	--	916/60	--	
			Others output	--	937/15	--	
		48VDC input	3.3/5 VDC output	--	463/35	--	
			Others output	--	463/10	--	
Reflected Ripple Current	24VDC/48VDC input			--	30	--	
Input impulse Voltage (1sec. max.)	24VDC input			-0.7	--	50	VDC
	48VDC input			-0.7	--	100	
Input Filter				Pi filter			
Starting Time	Nominal input & constant resistance load			--	10	--	ms
Ctrl*	Module switch on			Ctrl suspended or connected to TTL high level (2.5-12VDC)			
	Module switch off			Ctrl pin connected to GND or low level (0-1.2VDC)			
	Input current when switched off			--	1	--	mA

Note: * the voltage of Ctrl pin is relative to input pin GND.

GENERAL SPECIFICATIONS

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Isolation Voltage	Input-output, with the test time of 1 minute and the leak current lower than 1mA		1500	--	--	VDC
Isolation Resistance	Input-output, isolation voltage 500VDC		1000	--	--	MΩ
Isolation Capacitance	Input-output, 100KHz/0.1V	24VDC output	--	2000	--	pF
		Others	--	1000	--	
Operating Temperature	Derating if the temperature is≥71℃ (see Fig. 1)		-40	--	85	℃
Storage Temperature			-55	--	125	
Storage Humidity	Non-condensing		5	--	95	%RH
Max. Operating Temperature for casing	Within the operating temperature curve		--	--	105	℃
Pin Welding Resistance Temperature	Welding spot is 1.5mm away from the casing, 10 seconds		--	--	300	
Vibration			10-55Hz, 10G, 30 Min. along X, Y and Z			
Switching Frequency	PWM mode		--	300	--	KHz
MTBF	MIL-HDBK-217F@25°C		1000	--	--	K hours

Z7X-(B)LD15P & Z7Y-(B)LD15P Series / Z7X-(B)LD20P & Z7Y-(B)LD20P Series

OUTPUT SPECIFICATIONS

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Positive Voltage Accuracy		--	±1	±3	%
Negative Voltage Accuracy					
Balance of Output Voltage	Dual output, balanced load	--	±0.5	±1	
Line Regulation	Full load, the input voltage is from low voltage to high voltage	--	±0.2	±0.5	
Load Regulation	5%-100% load	--	±0.5	±1	%
Cross Regulation	Dual output, main circuit with 50% load, auxiliary circuit with 10%-100% load	--	--	±5	
Transient Recovery Time	25% load step change	--	300	500	μs
Transient Response Deviation		--	±3	±5	%
Temperature Drift Coefficient	Full load	--	±0.02	--	%/℃
Ripple & Noise *	20MHz bandwidth	--	70	100	mV p-p
Trim		--	±10%Vo	--	VDC
Output Over-voltage Protection	3.3VDC output	--	3.9	--	
	5VDC output	--	6.2	--	
	9VDC output	--	10.8	--	
	12VDC output	--	15	--	
	15VDC output	--	18	--	
	24VDC output	--	30	--	
Output Over-current Protection	Input voltage range	--	160	--	%
Output Short circuit Protection		Hiccup, Continuous, self-recovery			

Note: * Ripple and noise tested with "parallel cable" method, please see *DC-DC Converter Application Notes* for specific operation methods.

PHYSICAL SPECIFICATIONS

Casing Material		Aluminum alloy	
Package Dimensions	Without heat sink	Horizontal package	50.80*25.40*11.80mm
		A2S wiring package	76.00*31.50*21.20 mm
		A4S rail package	76.00*31.50*25.80 mm
	With heat sink	Horizontal package	50.80*25.40*16.30mm
		A2S wiring package	76.00*31.50*25.10 mm
		A4S rail package	76.00*31.50*29.70 mm
Weight	Without heat sink	Horizontal package/A2S wiring package/A4S rail package	28.00g/50.00g/70.00g(Typ.)
	With heat sink	Horizontal package/A2S wiring package/A4S rail package	36.00g/58.00g/78.00g(Typ.)
Cooling Method			Free air convection

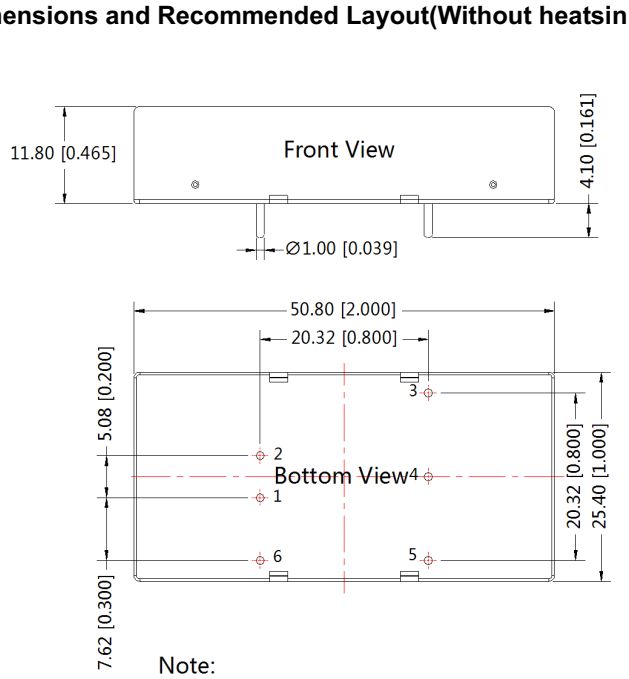
EMC SPECIFICATIONS

EMI	Conducted disturbance	CISPR22/EN55022 CLASS A (Bare component)/ CLASS B (see Fig.3-②for recommended circuit)	
	Radiated emission	CISPR22/EN55022 CLASS A (Bare component)/ CLASS B (see Fig.3-②for recommended circuit)	
EMS	Electrostatic discharge	IEC/EN61000-4-2 Contact ±4KV	perf. Criteria B
	Radiation immunity	IEC/EN61000-4-3 10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4 ±2KV (see Fig.3-①fo r recommended circuit)	perf. Criteria B
	Surge immunity	IEC/EN61000-4-5 ±2KV (see Fig.3-①for recommended circuit)	perf. Criteria B
	Conducted disturbance immunity	IEC/EN61000-4-6 3 Vr.m.s	perf. Criteria A
	Immunities of voltage dip, drop and short interruption	IEC/EN61000-4-29 0-70%	perf. Criteria B

Z7X-(B)LD15P & Z7Y-(B)LD15P Series / Z7X-(B)LD20P & Z7Y-(B)LD20P Series

MECHANICAL SPECIFICATIONS

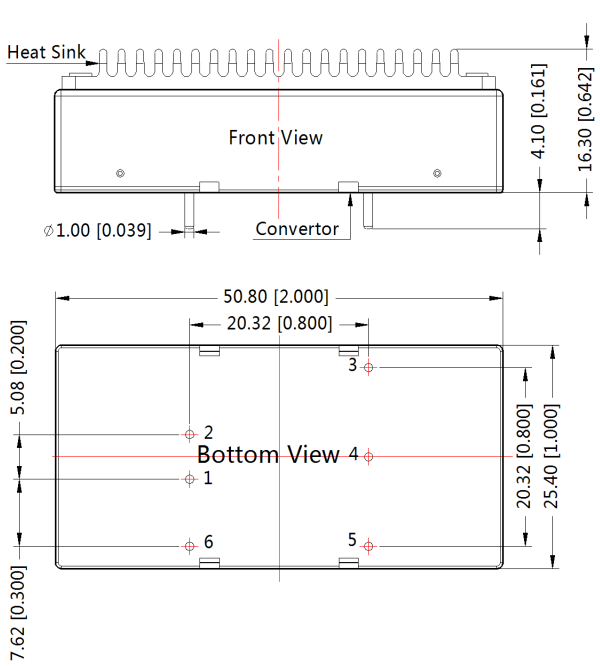
Dimensions and Recommended Layout(Without heatsink)



Note:
Unit :mm[inch]
Pin diameter tolerances :±0.10[±0.004]
General tolerances:±0.50[±0.020]

Pin-Out		
Pin	Single	Dual
1	GND	GND
2	Vin	Vin
3	+Vo	+Vo
4	Trim	0V
5	0V	-Vo
6	Ctrl	Ctrl

Dimensions (With heatsink)



Pin-Out		
Pin	Single	Dual
1	GND	GND
2	Vin	Vin
3	+Vo	+Vo
4	Trim	0V
5	0V	-Vo
6	Ctrl	Ctrl

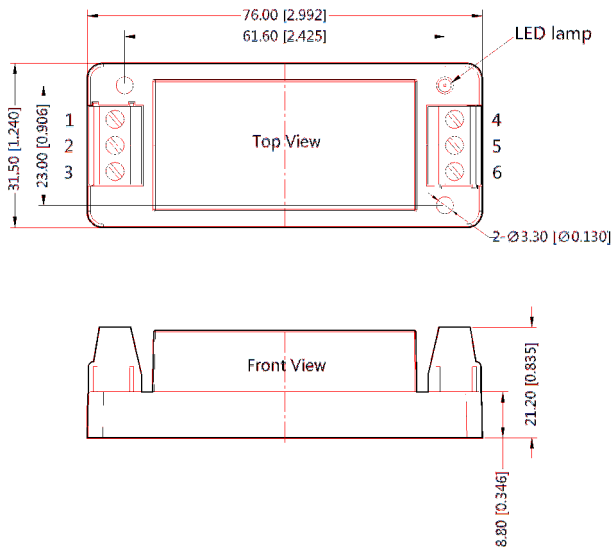
Note:
Unit :mm[inch]
General tolerances:±0.50[±0.020]
If use heatsinks,make sure there is enough space for a special size in ther above graph

Z7X-(B)LD15P & Z7Y-(B)LD15P Series / Z7X-(B)LD20P & Z7Y-(B)LD20P Series

MECHANICAL SPECIFICATIONS

A2S Wiring Package Dimensions (Without heatsink)

THIRD ANGLE PROJECTION



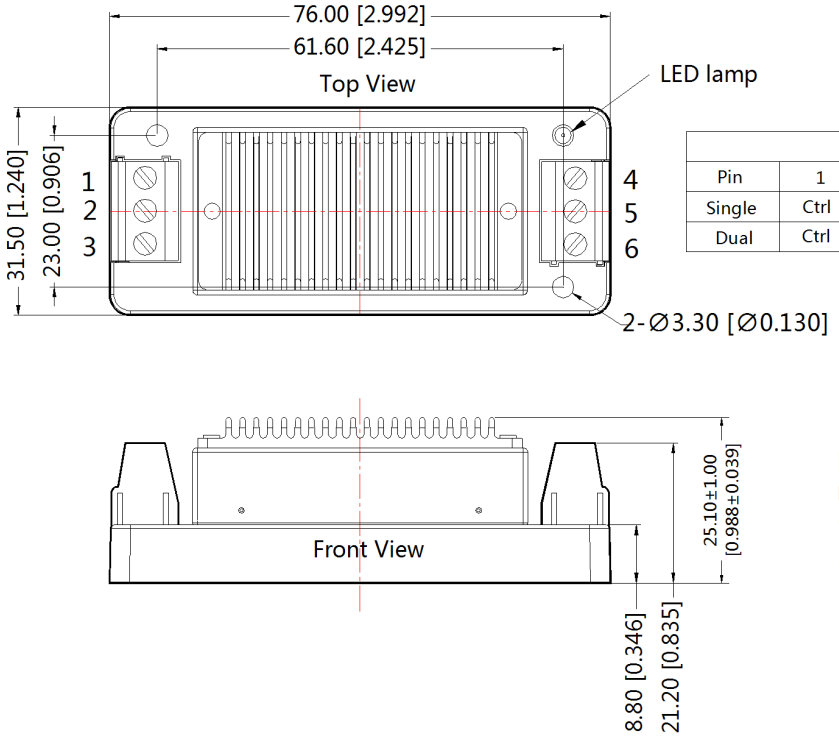
Pin-Out						
Pin	1	2	3	4	5	6
Dual	Ctrl	GND	Vin	-Vo	0V	+Vo
Single	Ctrl	GND	Vin	0V	Trim	+Vo

Note:
Unit:mm[inch]
Wire range : 24
General tolerances:±0.50[±0.020]

1102000914-B0

A2S Wiring Package Dimensions (With heatsink)

THIRD ANGLE PROJECTION



Pin-Out						
Pin	1	2	3	4	5	6
Single	Ctrl	GND	Vin	0V	Trim	+Vo
Dual	Ctrl	GND	Vin	-Vo	0V	+Vo

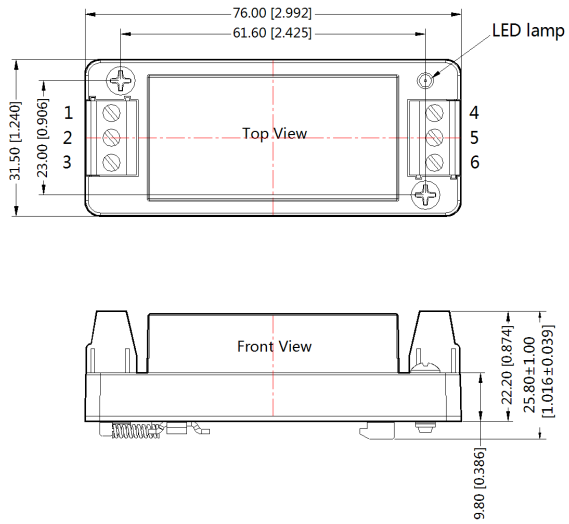
Note:
Unit:mm[inch]
Wire range:24~12 AWG
General tolerances:±0.50[±0.020]

Z7X-(B)LD15P & Z7Y-(B)LD15P Series / Z7X-(B)LD20P & Z7Y-(B)LD20P Series

MECHANICAL SPECIFICATIONS

A4S Rail Package Dimensions (Without heatsink)

THIRD ANGLE PROJECTION



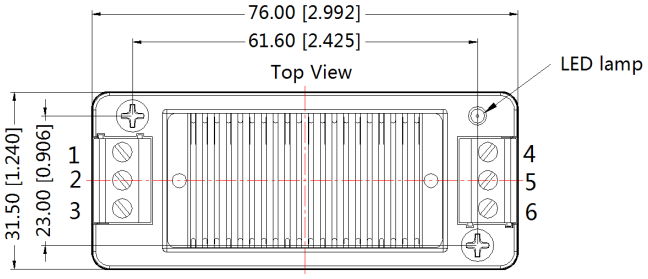
Pin-Out						
Pin	1	2	3	4	5	6
Dual	Ctrl	GND	Vin	-Vo	0V	+Vo
Single	Ctrl	GND	Vin	0V	Trim	+Vo

Note:
Unit:mm[inch]
Wire range : 24~12 AWG
General tolerances:±0.50[±0.020]

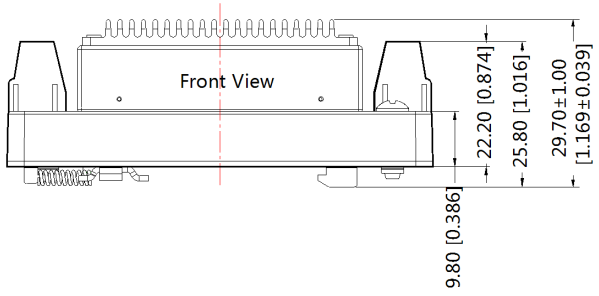
1102000913-B0

A4S Rail Package Dimensions (With heatsink)

THIRD ANGLE PROJECTION



Pin-Out						
Pin	1	2	3	4	5	6
Single	Ctrl	GND	Vin	0V	Trim	+Vo
Dual	Ctrl	GND	Vin	-Vo	0V	+Vo



Note:
Unit:mm[inch]
Wire range:24~12 AWG
General tolerances:±0.50[±0.020]

1102001706-B0

Z7X-(B)LD15P & Z7Y-(B)LD15P Series / Z7X-(B)LD20P & Z7Y-(B)LD20P Series

MODEL SELECTION GUIDE

Certification	Part No. ①	Input Voltage (VDC)		Output		Efficiency③(%,Typ.) @ Full Load	Max. Capacitive Load④(μF)
		Nominal (Range)	Max.②	Output Voltage (VDC)	Output Current (mA)(Max./Min.)		
CE	Z7X-2405-LD15P	24 (9-36)	40	±5	±1500/±75	86	4800
	Z7X-2412-LD15P			±12	±625/±32	88	800
	Z7X-2415-LD15P			±15	±500/±25	88	500
	Z7Y-2403-LD15P			3.3	4000/200	87	10200
	Z7Y-2405-LD15P			5	3000/150	90	4020
	Z7Y-2412-LD15P			12	1250/63	89	1035
	Z7Y-2415-LD15P			15	1000/50	89	705
	Z7Y-2424-LD15P			24	625/31	90	470
UL/CE	Z7X-4805-LD15P	48 (18-75)	80	±5	±1500/±75	86	4800
	Z7X-4812-LD15P			±12	±625/±32	88	800
	Z7X-4815-LD15P			±15	±500/±25	89	500
	Z7Y-4803-LD15P			3.3	4000/200	87	10200
	Z7Y-4805-LD15P			5	3000/150	89	4020
	Z7Y-4812-LD15P			12	1250/63	88	1035
	Z7Y-4815-LD15P			15	1000/50	90	705
CE	Z7X-2405-LD20P	24 (9-36)	40	±5	±2000/±100	86	4800
	Z7X-2412-LD20P			±12	±834/±42	88	800
	Z7X-2415-LD20P			±15	±667/±33	88	625
	Z7Y-2403-LD20P			3.3	5000/250	86	18700
	Z7Y-2405-LD20P			5	4000/200	90	9600
CE	Z7Y-2409-LD20P	24 (9-36)	40	9	2222/111	88	4700
	Z7Y-2412-LD20P			12	1667/84	89	1600
	Z7Y-2415-LD20P			15	1333/67	90	1000
	Z7Y-2424-LD20P			24	834/42	90	500
UL/CE	Z7X-4805-LD20P	48 (18-75)	80	±5	±2000/±100	86	4800
	Z7X-4812-LD20P			±12	±834/±42	88	800
	Z7X-4815-LD20P			±15	±667/±33	89	625
	Z7Y-4803-LD20P			3.3	5000/250	86	18700
	Z7Y-4805-LD20P			5	4000/200	90	9600
	Z7Y-4812-LD20P			12	1667/84	89	1600
	Z7X-4815-LD20P			15	1333/67	90	1000
	Z7X-4824-LD20P			24	834/42	90	500

Note:

①Series with suffix "H" are heat sink mounting; series with suffix "A2S" are chassis mounting, with suffix "A4S" are DIN-Rail mounting, for example Z7Y-2405-LD15PA2S is chassis mounting of with heat sink, Z7Y-2405-LD15PA4S is DIN-Rail mounting of without heat sink; If the application has a higher requirement for heat dissipation, you can choose modules with heat sink;

②Absolute maximum rating without damage on the converter, but it isn't recommended;

③The efficiency of A2S (wiring type) and A4S (rail type) products is 2% lower than the above-mentioned value due to the reverse connection protection for input;

④ The capacitive loads of positive and negative outputs are identical.

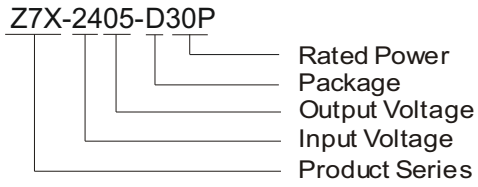
Z7-30W Series

30W 4:1 Regulated Single & Dual output

Features

- Wide range of input voltage (4:1)
- Efficiency up to 90%
- 1.5KVDC isolation
- Operating Temperature range: -40°C ~ +85°C
- Output Short circuit protection
- Six-sided metal shielding package
- Industry standard pin-out
- Meet CISPR22/EN55022 CLASS A

PART NUMBER STRUCTURE



Z7X-D30P & Z7Y-D30P Series

30W,ULTRA-WIDE INPUT ISOLATED & REGULATED DUAL/SINGLE OUTPUT DC-DC CONVERTER

INPUT SPECIFICATIONS

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Current (fullload / no-load)	24VDC input	5VDC output	--	1420/120	--	mA
		Others	--	1420/30	--	
	48VDC input	5VDC output	--	710/100	--	
		Others	--	710/30	--	
Reflected Ripple Current	24VDC/48VDC input		--	30	--	
Input impulse Voltage (1sec. max.)	24VDC input		-0.7	--	50	VDC
	48VDC input		-0.7	--	100	
Starting Time			--	10	--	ms
Input Filter			Pi filter			
Ctrl①	Module switch on		Ctrl suspended or connected to TTL high level (2.5-12VDC)			
	Module switch off		Ctrl pin connected to GND or low level (0-1.2VDC)			
	Input current when switched off		--	1	--	mA

Note: ① the voltage of Ctrl pin is relative to input pin GND.

OUTPUT SPECIFICATIONS

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy		--	±1	±3	%
Line Regulation	Full load, the input voltage is from low voltage to high voltage	--	±0.2	±0.5	
Load Regulation	5%-100% load	--	±0.5	±1	
Cross Regulation	From 10% to 100% load input (Dual output)	--	--	±5	
Transient Recovery Time	25% load step change	--	300	500	μs
Transient Response Deviation		--	±3	±5	%
Temperature Drift Coefficient	Full load	--	±0.02	--	%/℃
Ripple & Noise*	20MHz bandwidth	--	85	100	mV p-p
Trim		--	±10%Vo	--	VDC
Output Over-voltage Protection	5VDC output	--	6.1	--	
	12VDC output	--	15	--	
	15VDC output	--	18	--	
Output Over-current Protection	Input voltage range	--	150	--	%Io
Output Short circuit Protection		Hiccup, continuous, self-recovery			

Note:* Ripple and noise tested with "parallel cable" method, please see *DC-DC Converter Application Notes* for specific operation methods.

Z7X-D30P & Z7Y-D30P Series - 30W 4:1 Regulated Single & Dual output

GENERAL SPECIFICATIONS

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-output, with the test time of 1 minute and the leak current lower than 1mA	1500	--	--	VDC
Isolation Resistance	Input-output, insulation voltage 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output, 100KHz/0.1V	--	2000	--	pF
Operating Temperature	see Fig. 1	-40	--	85	℃
Storage Temperature		-55	--	125	
Storage Humidity	Non-condensing	5	--	95	%RH
Max. Operating Temperature for casing	Within the operating temperature curve	--	--	105	℃
Pin Welding Resistance Temperature	Welding spot is 1.5mm away from the casing, 10 seconds	--	--	300	
Switching Frequency	PWM mode	--	400	--	KHz
MTBF	MIL-HDBK-217F@25°C	1000	--	--	K hours

PHYSICAL SPECIFICATIONS

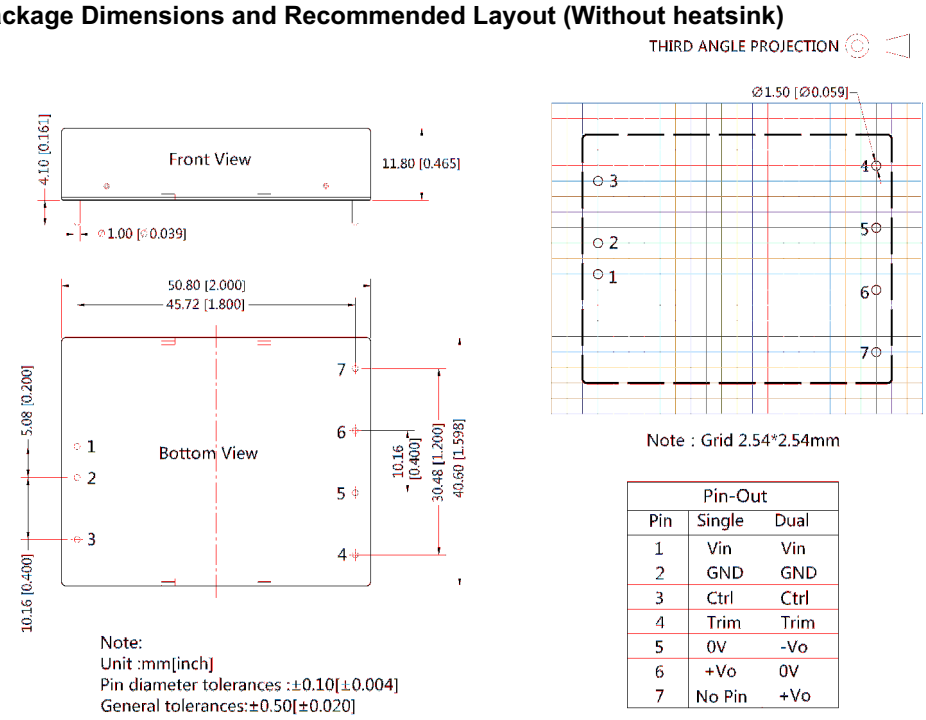
Casing Material	Aluminum alloy	
Package Dimensions	without heat sink	50.80*40.60*11.80 mm
	with heat sink	50.80*40.60*16.30 mm
Weight	without heat sink	50g (Typ.)
	with heat sink	70g (Typ.)
Cooling Method	Free air convection	

EMC SPECIFICATIONS

EMI	Conducted disturbance	CISPR22/EN55022 CLASS A (Bare component)/ CLASS B (see Fig.3-②for recommended circuit)	
	Radiated emission	CISPR22/EN55022 CLASS A (Bare component)/ CLASS B (see Fig.3-②for recommended circuit)	
EMS	Electrostatic discharge	IEC/EN61000-4-2 Contact ±4KV	perf. Criteria B
	Radiation immunity	IEC/EN61000-4-3 10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4 ±2KV (see Fig.3-①for recommended circuit)	perf. Criteria B
	Surge immunity	IEC/EN61000-4-5 ±2KV (see Fig.3-①for recommended circuit)	perf. Criteria B
	Conducted disturbance immunity	IEC/EN61000-4-6 3 Vr.m.s	perf. Criteria A
	Immunities of voltage dip, drop and short interruption	IEC/EN61000-4-29 0-70%	perf. Criteria B

MECHANICAL SPECIFICATIONS

Horizontal Package Dimensions and Recommended Layout (Without heatsink)



Note:
Unit :mm[inch]
Pin diameter tolerances :±0.10[±0.004]
General tolerances:±0.50[±0.020]

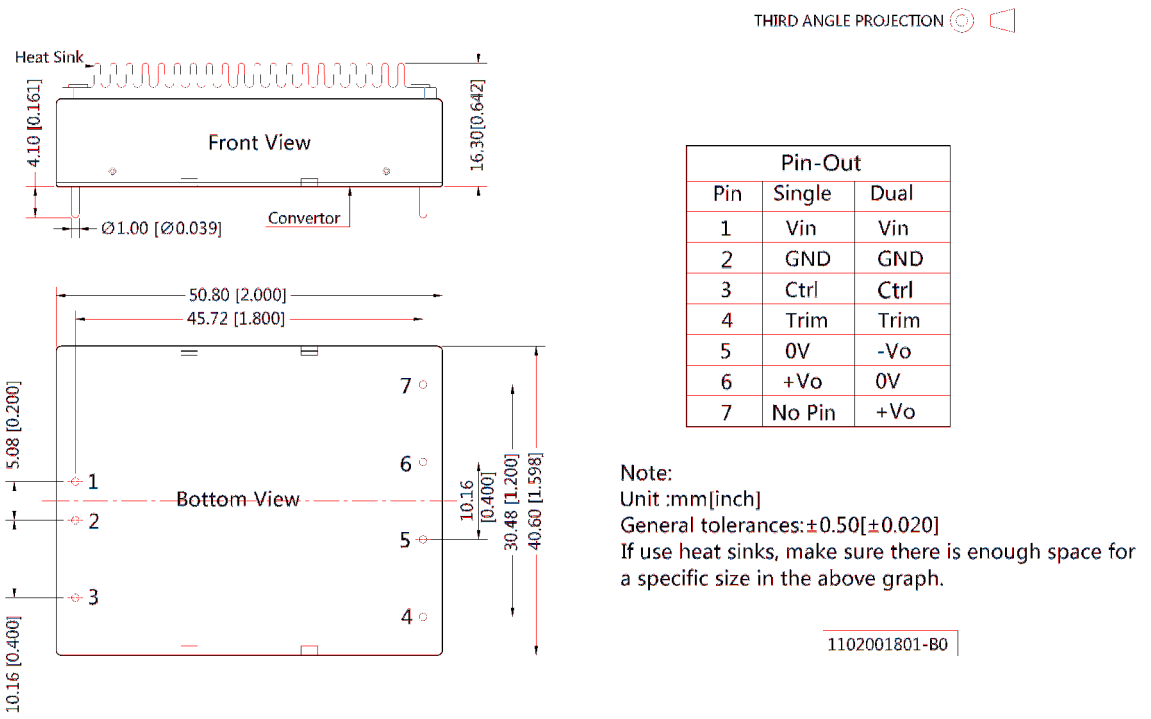
Pin-Out		
Pin	Single	Dual
1	Vin	Vin
2	GND	GND
3	Ctrl	Ctrl
4	Trim	Trim
5	0V	-Vo
6	+Vo	0V
7	No Pin	+Vo

1102001402-B0

Z7X-D30P & Z7Y-D30P Series - 30W 4:1 Regulated Single & Dual output

MECHANICAL SPECIFICATIONS

Horizontal Package Dimensions and Recommended Layout (With heatsink)



Pin-Out		
Pin	Single	Dual
1	Vin	Vin
2	GND	GND
3	Ctrl	Ctrl
4	Trim	Trim
5	0V	-Vo
6	+Vo	0V
7	No Pin	+Vo

Note:
Unit :mm[inch]
General tolerances:±0.50[±0.020]
If use heat sinks, make sure there is enough space for a specific size in the above graph.

MODEL SELECTION GUIDE

Part No.①	Input Voltage (VDC)		Output		Efficiency (%,Typ.) @ Full Load	Max. Capacitive Load③ (μF)
	Nominal (Range)	Max.②	Output Voltage (VDC)	Output Current (mA)(Max./Min.)		
Z7X-2405-D30P	24 (9-36)	40	±5	±3000/±150	86	2000
Z7X-2412-D30P			±12	±1250/±63	89	1250
Z7X-2415-D30P			±15	±1000/±50	90	680
Z7Y-2405-D30P			5	6000/300	88	6000
Z7Y-2412-D30P			12	2500/125	88	2500
Z7Y-2415-D30P			15	2000/100	90	1100
Z7X-4805-D30P	48 (18-75)	80	±5	±3000/±150	86	2000
Z7X-4812-D30P			±12	±1250/±63	87	1250
Z7X-4815-D30P			±15	±1000/±50	87	680
Z7Y-4805-D30P			5	6000/300	88	6000
Z7Y-4812-D30P			12	2500/125	88	2500
Z7Y-4815-D30P			15	2000/100	89	1100

Note:
① Series with Suffix „H“ are heat sink mounting, such as Z7Y-2405-D30PH (with heat sink), Z7Y-2405-D30P (without heat sink);
② Absolute maximum rating without damage on the converter,but it isn‘t recommended;
③ The capacitive loads of positive and negative outputs are identical.

D7L - 15W Series

15W 2:1 Regulated Single & Dual output

Features

- Wide 2:1 Input Range
- Full SMD Technology
- 1500 VDC Isolation
- Continous Short Circuit Protection
- Efficiency up to 87%
- -40 ~ 85°C Operating Temperature

PART NUMBER STRUCTURE

D7 - 24 05 S 15 L

- **Series Name**
- **Input Voltage Range**
  - **12** - 9 ~ 18V
  - **24** - 18 ~ 36V
  - **48** - 36 ~ 72V
- **Nominal Output Voltage**
  - **3R3** - 3.3V
  - **05** - 5V
  - **7R2** - 7.2V
  - **09** - 9V
  - **12** - 12V
  - **15** - 15V
  - **18** - 18V
  - **24** - 24V
- **Output Type**
  - **S** - Single output
  - **D** - Dual Output
- **Watt**
- **2"X2" Case**

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage accuracy		±1%
Line regulation		±0.5%
Load regulation	Single (0% to 100% Load)	±0.5%
	Dual (10% to 100% Load)	±0.5%
Ripple & noise (20 MHz bandwidth)(1)		100mV pk-pk
Over-current protection		140% of max. Iout
Short circuit protection		Indefinite(Automatic Recovery)
Temperature coefficient		±0.02%/°C
Capacitor load(2)		See table

INPUT SPECIFICATIONS

Voltage Range	See table
Start up Time (Nominal Vin and constant resistive load)	20mS, typ.
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	Capacitors
Input Reflected Ripple Current(3)	35mA pk-pk

GENERAL SPECIFICATIONS

Efficiency	See table
I/O Isolation Voltage (3 sec)	
Input/Output	1500Vdc
Case/Input & Output	1000Vdc
I/O Isolation Capacitance	1000 pF typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	Typical 125kHz
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1.121 Mhrs
Safety Standard : (designed to meet)	IEC 60950-1

PHYSICAL SPECIFICATIONS

Case Material	Nickel-coated Brass
Pin Material	1.0mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0rated)
Weight	60.0g
Dimensions	2.00 "x2.00 "x0.40 "

ENVIRONMENT SPECIFICATIONS

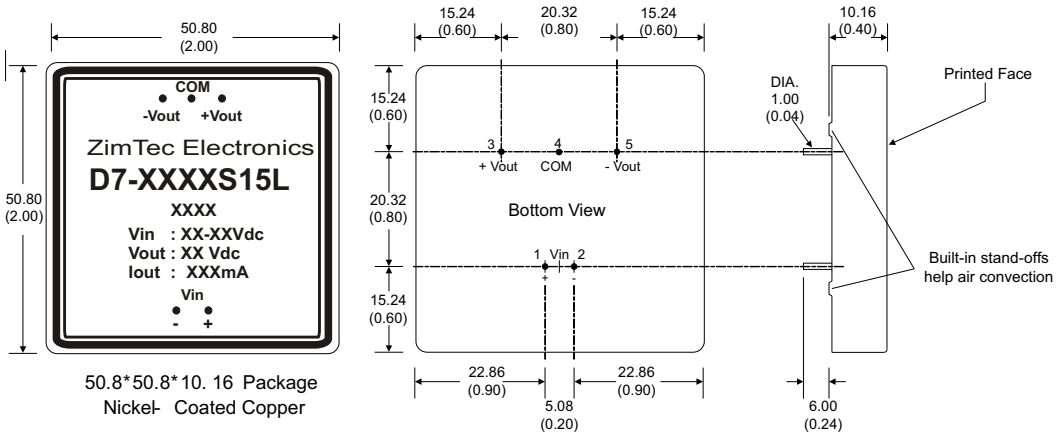
Operating Temperature	-40 °C~85 °C(See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

ABSOLUTE MAXIMUM RATINGS (4)

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge Voltage (100mS)	
12 Models	25 Vdc max.
24 Models	50 Vdc max.
48 Models	100 Vdc max.
Soldering Temperature (1.5mm from case 10 sec.max)	260°C

MECHANICAL SPECIFICATIONS



50.8*50.8*10. 16 Package
Nickel- Coated Copper

PIN CONNECTIONS

PIN NUMBER	SINGLE	DUAL
1	+V Input	+V Input
2	-V Input	-V Input
3	+V Output	+V Output
4	N.P.	Common
5	−V Output	−V Output

All dimensions are typical in millimeters (inches).

1. Pin diameter: 1.0 ±0.05 (0.04 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

D7L - 15W 2:1 Regulated Single & Dual output

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
D7-123R3S15L	9-18	30	1031	3.3	0	3000	80	3300
D7-1205S15L	9-18	30	1524	5	0	3000	82	3300
D7-127R2S15L	9-18	30	1506	7.2	0	2083	83	2200
D7-1209S15L	9-18	30	1470	9	0	1666	85	1000
D7-1212S15L	9-18	30	1470	12	0	1250	85	1000
D7-1215S15L	9-18	30	1470	15	0	1000	85	680
D7-1218S15L	9-18	30	1470	18	0	833	85	470
D7-1224S15L	9-18	30	1453	24	0	625	86	470
D7-123R3D15L	9-18	30	1031	±3.3	±0	±1500	80	±1000
D7-1205D15L	9-18	30	1524	±5	±0	±1500	82	±1000
D7-127R2D15L	9-18	30	1506	±7.2	±0	±1041	83	±680
D7-1209D15L	9-18	30	1488	±9	±0	±833	84	±470
D7-1212D15L	9-18	30	1488	±12	±0	±625	84	±470
D7-1215D15L	9-18	30	1488	±15	±0	±500	84	±330
D7-1218D15L	9-18	30	1470	±18	±0	±416	85	±220
D7-1224D15L	9-18	30	1470	±24	±0	±312	85	±220
D7-243R3S15L	18-36	25	515	3.3	0	3000	80	3300
D7-2405S15L	18-36	25	744	5	0	3000	84	3300
D7-247R2S15L	18-36	25	744	7.2	0	2083	84	2200
D7-2409S15L	18-36	25	735	9	0	1666	85	1000
D7-2412S15L	18-36	25	735	12	0	1250	85	1000
D7-2415S15L	18-36	25	726	15	0	1000	86	680
D7-2418S15L	18-36	25	726	18	0	833	86	470
D7-2424S15L	18-36	25	726	24	0	625	86	470
D7-243R3D15L	18-36	25	515	±3.3	±0	±1500	80	±1000
D7-2405D15L	18-36	25	753	±5	±0	±1500	83	±1000
D7-247R2D15L	18-36	25	744	±7.2	±0	±1041	84	±680
D7-2409D15L	18-36	25	735	±9	±0	±833	85	±470
D7-2412D15L	18-36	25	726	±12	±0	±625	86	±470
D7-2415D15L	18-36	25	726	±15	±0	±500	86	±330
D7-2418D15L	18-36	25	726	±18	±0	±416	86	±220
D7-2424D15L	18-36	25	718	±24	±0	±312	87	±220
D7-483R3S15L	36-72	20	257	3.3	0	3000	80	3300
D7-4805S15L	36-72	20	372	5	0	3000	84	3300
D7-487R2S15L	36-72	20	372	7.2	0	2083	84	2200
D7-4809S15L	36-72	20	367	9	0	1666	85	1000
D7-4812S15L	36-72	20	363	12	0	1250	86	1000
D7-4815S15L	36-72	20	359	15	0	1000	87	680
D7-4818S15L	36-72	20	359	18	0	833	87	470
D7-4824S15L	36-72	20	359	24	0	625	87	470
D7-483R3D15L	36-72	20	257	±3.3	±0	±1500	80	±1000
D7-4805D15L	36-72	20	372	±5	±0	±1500	84	±1000
D7-487R2D15L	36-72	20	372	±7.2	±0	±1041	84	±680
D7-4809D15L	36-72	20	367	±9	±0	±833	85	±470
D7-4812D15L	36-72	20	363	±12	±0	±625	86	±470
D7-4815D15L	36-72	20	359	±15	±0	±500	87	±330
D7-4818D15L	36-72	20	359	±18	±0	±416	87	±220
D7-4824D15L	36-72	20	359	±24	±0	±312	87	±220

D7L - 20W Series

20W 2:1 Regulated Single & Dual output

Features

- Wide 2:1 Input Range
- Full SMD Technology
- 1500 VDC Isolation
- Continous Short Circuit Protection
- Efficiency up to 87%
- -40 ~ 85°C Operating Temperature

PART NUMBER STRUCTURE

D7 - 24 05 S 20 L

- **Series Name**
- **Input Voltage Range**
  - **12** - 9 ~ 18V
  - **24** - 18 ~ 36V
  - **48** - 36 ~ 72V
- **Nominal Output Voltage**
  - **3R3** - 3.3V
  - **05** - 5V
  - **7R2** - 7.2V
  - **09** - 9V
  - **12** - 12V
  - **15** - 15V
  - **18** - 18V
  - **24** - 24V
- **Output Type**
  - **S** - Single output
  - **D** - Dual Output
- **Watt**
- **2"X2" Case**

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage accuracy		±1%
Line regulation		±0.5%
Load regulation	Single (0% to 100% Load)	±0.5%
	Dual (10% to 100% Load)	±0.5%
Ripple & noise (20 MHz bandwidth)(1)		100mV pk-pk
Over-current protection		140% of max. Iout
Short circuit protection		Indefinite(Automatic Recovery)
Temperature coefficient		±0.02%/°C
Capacitor load(2)		See table

INPUT SPECIFICATIONS

Voltage Range	See table
Start up Time (Nominal Vin and constant resistive load)	20mS, typ.
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	Capacitors
Input Reflected Ripple Current(3)	35mA pk-pk

GENERAL SPECIFICATIONS

Efficiency	See table
I/O Isolation Voltage (3 sec)	
Input/Output	1500Vdc
Case/Input & Output	1000Vdc
I/O Isolation Capacitance	1000 pF typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	Typical 125kHz
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1.121 Mhrs
Safety Standard : (designed to meet)	IEC 60950-1

PHYSICAL SPECIFICATIONS

Case Material	Nickel-coated Brass
Pin Material	1.0mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0rated)
Weight	60.0g
Dimensions	2.00 "x2.00 "x0.40 "

ENVIRONMENT SPECIFICATIONS

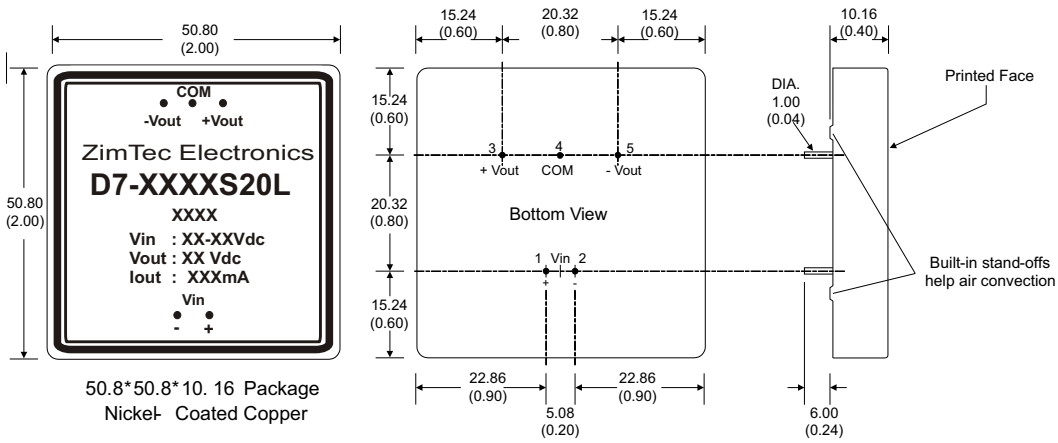
Operating Temperature	-40°C~85°C(See Derating Curve)
Temperature	-40°C~75°C(For 100% load)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

ABSOLUTE MAXIMUM RATINGS (4)

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge Voltage (100mS)	
12 Models	25 Vdc max.
24 Models	50 Vdc max.
48 Models	100 Vdc max.
Soldering Temperature (1.5mm from case 10 sec.max.)	260°C

MECHANICAL SPECIFICATIONS



50.8*50.8*10. 16 Package
Nickel- Coated Copper

PIN CONNECTIONS

PIN NUMBER	SINGLE	DUAL
1	+V Input	+V Input
2	-V Input	-V Input
3	+V Output	+V Output
4	N.P.	Common
5	−V Output	−V Output

All dimensions are typical in millimeters (inches).

1. Pin diameter: 1.0 ±0.05 (0.04 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

D7L - 20W 2:1 Regulated Single & Dual output

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
D7-123R3S20L	9-18	20	1375	3.3	0	4000	80	3300
D7-1205S20L	9-18	20	2008	5	0	4000	83	3300
D7-127R2S20L	9-18	20	1984	7.2	0	2777	84	2200
D7-1209S20L	9-18	20	1984	9	0	2222	84	1000
D7-1212S20L	9-18	30	1960	12	0	1666	85	1000
D7-1215S20L	9-18	30	1937	15	0	1333	86	680
D7-1218S20L	9-18	30	1937	18	0	1111	86	470
D7-1224S20L	9-18	30	1915	24	0	833	87	470
D7-123R3D20L	9-18	20	1375	±3.3	±0	±2000	80	±1000
D7-1205D20L	9-18	20	2032	±5	±0	±2000	82	±1000
D7-127R2D20L	9-18	25	2008	±7.2	±0	±1388	83	±680
D7-1209D20L	9-18	25	1984	±9	±0	±1111	84	±470
D7-1212D20L	9-18	30	1984	±12	±0	±833	84	±330
D7-1215D20L	9-18	30	1960	±15	±0	±666	85	±330
D7-1218D20L	9-18	35	1960	±18	±0	±555	85	±330
D7-1224D20L	9-18	35	1960	±24	±0	±416	85	±330
D7-243R3S20L	18-36	25	687	3.3	0	4000	80	3300
D7-2405S20L	18-36	25	992	5	0	4000	84	3300
D7-247R2S20L	18-36	25	992	7.2	0	2777	84	2200
D7-2409S20L	18-36	25	968	9	0	2222	86	1000
D7-2412S20L	18-36	25	957	12	0	1666	87	1000
D7-2415S20L	18-36	25	957	15	0	1333	87	680
D7-2418S20L	18-36	25	957	18	0	1111	87	470
D7-2424S20L	18-36	25	957	24	0	833	87	470
D7-243R3D20L	18-36	25	687	±3.3	±0	±2000	80	±1000
D7-2405D20L	18-36	25	992	±5	±0	±2000	84	±1000
D7-247R2D20L	18-36	25	992	±7.2	±0	±1388	84	±680
D7-2409D20L	18-36	25	957	±9	±0	±1111	87	±470
D7-2412D20L	18-36	25	957	±12	±0	±833	87	±330
D7-2415D20L	18-36	25	957	±15	±0	±666	87	±330
D7-2418D20L	18-36	25	957	±18	±0	±555	87	±330
D7-2424D20L	18-36	30	957	±24	±0	±416	87	±330
D7-483R3S20L	36-72	20	343	3.3	0	4000	80	3300
D7-4805S20L	36-72	20	502	5	0	4000	83	3300
D7-487R2S20L	36-72	20	490	7.2	0	2777	85	2200
D7-4809S20L	36-72	20	478	9	0	2222	87	1000
D7-4812S20L	36-72	20	478	12	0	1666	87	1000
D7-4815S20L	36-72	20	478	15	0	1333	87	680
D7-4818S20L	36-72	20	478	18	0	1111	87	470
D7-4824S20L	36-72	25	478	24	0	833	87	470
D7-483R3D20L	36-72	20	343	±3.3	±0	±2000	80	±1000
D7-4805D20L	36-72	20	496	±5	±0	±2000	84	±1000
D7-487R2D20L	36-72	20	490	±7.2	±0	±1388	85	±680
D7-4809D20L	36-72	20	478	±9	±0	±1111	87	±470
D7-4812D20L	36-72	20	478	±12	±0	±833	87	±330
D7-4815D20L	36-72	20	478	±15	±0	±666	87	±330
D7-4818D20L	36-72	20	478	±18	±0	±555	87	±330
D7-4824D20L	36-72	20	478	±24	±0	±416	87	±330

D7L - 25W Series

25W 2:1 Regulated Single & Dual output

Features

- Wide 2:1 Input Range
- Full SMD Technology
- 1500 VDC Isolation
- Continous Short Circuit Protection
- Efficiency up to 88%
- -40 ~ 85°C Operating Temperature

PART NUMBER STRUCTURE

D7 - 24 05 S 25 L

- **Series Name**
- **Input Voltage Range**
  - **12** - 9 ~ 18V
  - **24** - 18 ~ 36V
  - **48** - 36 ~ 72V
- **Nominal Output Voltage**
  - **3R3** - 3.3V
  - **05** - 5V
  - **7R2** - 7.2V
  - **09** - 9V
  - **12** - 12V
  - **15** - 15V
  - **18** - 18V
  - **24** - 24V
- **Output Type**
  - **S** - Single output
  - **D** - Dual Output
- **Watt**
- **2"X2" Case**

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage accuracy		±1%
Line regulation		±0.5%
Load regulation	Single (0% to 100% Load)	±0.5%
	Dual (10% to 100% Load)	±0.5%
Ripple & noise (20 MHz bandwidth)(1)		100mV pk-pk
Over-current protection		140% of max. Iout
Short circuit protection		Indefinite(Automatic Recovery)
Temperature coefficient		±0.02%/°C
Capacitor load(2)		See table

INPUT SPECIFICATIONS

Voltage Range	See table
Start up Time (Nominal Vin and constant resistive load)	20mS, typ.
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	Capacitors
Input Reflected Ripple Current(3)	35mA pk-pk

GENERAL SPECIFICATIONS

Efficiency	See table
I/O Isolation V oltage (3 sec)	
Input/Output	1500Vdc
Case/Input & Output	1000Vdc
I/O Isolation Capacitance	1000 pF typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	Typical 125kHz
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1.121 Mhrs
Safety Standard : (designed to meet)	IEC 60950-1

PHYSICAL SPECIFICATIONS

Case Material	Nickel-coated Brass
Pin Material	1.0mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0rated)
Weight	60.0g
Dimensions	2.00 "x2.00 "x0.40 "

ENVIRONMENT SPECIFICATIONS

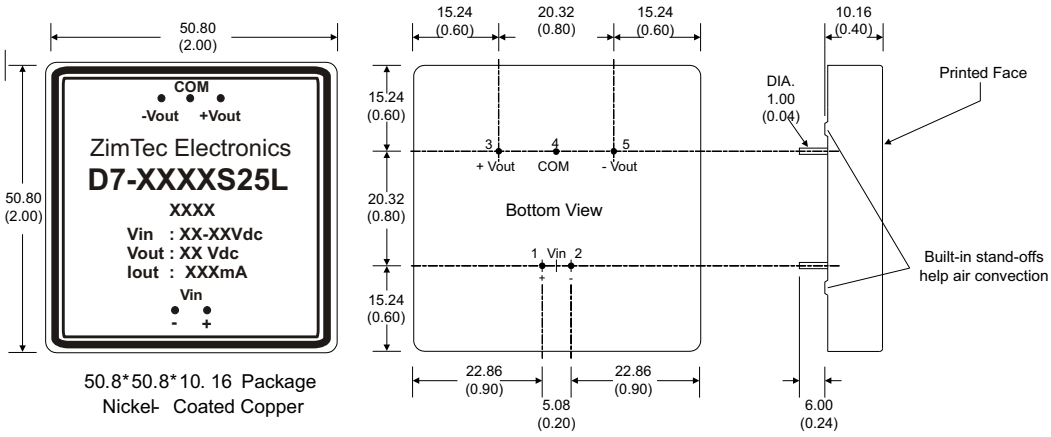
Operating Temperature	-40°C~85°C(See Derating Curve)
Temperature	-40°C~65°C(For 100% load)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

ABSOLUTE MAXIMUM RATINGS (4)

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge V oltage (100mS)	
12 Models	25 Vdc max.
24 Models	50 Vdc max.
48 Models	100 Vdc max.
Soldering Temperature (1.5mm from case 10 sec.max.)	260°C

MECHANICAL SPECIFICATIONS



50.8*50.8*10. 16 Package
Nickel- Coated Copper

PIN CONNECTIONS

PIN NUMBER	SINGLE	DUAL
1	+V Input	+V Input
2	-V Input	-V Input
3	+V Output	+V Output
4	N.P.	Common
5	−V Output	−V Output

All dimensions are typical in millimeters (inches).

1. Pin diameter: 1.0 ±0.05 (0.04 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

D7L - 25W 2:1 Regulated Single & Dual output

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
D7-1205S25L	9-18	20	2510	5	0	5000	83	3300
D7-127R2S25L	9-18	20	2480	7.2	0	3472	84	2200
D7-1209S25L	9-18	20	2480	9	0	2777	84	1000
D7-1212S25L	9-18	20	2480	12	0	2083	84	1000
D7-1215S25L	9-18	30	2450	15	0	1666	85	680
D7-1218S25L	9-18	30	2450	18	0	1388	85	470
D7-1224S25L	9-18	30	2450	24	0	1041	85	470
D7-123R3D25L	9-18	20	1718	±3.3	±0	±2500	80	±1500
D7-1205D25L	9-18	25	2540	±5	±0	±2500	82	±1500
D7-127R2D25L	9-18	25	2510	±7.2	±0	±1736	83	±1000
D7-1209D25L	9-18	25	2480	±9	±0	±1388	84	±680
D7-1212D25L	9-18	30	2480	±12	±0	±1041	84	±470
D7-1215D25L	9-18	30	2450	±15	±0	±833	85	±330
D7-1218D25L	9-18	35	2450	±18	±0	±694	85	±220
D7-1224D25L	9-18	35	2450	±24	±0	±520	85	±220
D7-243R3S25L	18-36	25	838	3.3	0	5000	82	3300
D7-2405S25L	18-36	25	1240	5	0	5000	84	3300
D7-247R2S25L	18-36	25	1240	7.2	0	3472	84	2200
D7-2409S25L	18-36	25	1240	9	0	2777	84	1000
D7-2412S25L	18-36	25	1225	12	0	2083	85	1000
D7-2415S25L	18-36	25	1225	15	0	1666	85	680
D7-2418S25L	18-36	25	1225	18	0	1388	85	470
D7-2424S25L	18-36	25	1211	24	0	1041	86	470
D7-243R3D25L	18-36	25	859	±3.3	±0	±2500	80	±1500
D7-2405D25L	18-36	25	1240	±5	±0	±2500	84	±1500
D7-247R2D25L	18-36	25	1240	±7.2	±0	±1736	84	±1000
D7-2409D25L	18-36	25	1240	±9	±0	±1388	84	±680
D7-2412D25L	18-36	25	1225	±12	±0	±1041	85	±470
D7-2415D25L	18-36	25	1211	±15	±0	±833	86	±330
D7-2418D25L	18-36	25	1211	±18	±0	±694	86	±220
D7-2424D25L	18-36	30	1197	±24	±0	±520	87	±220
D7-483R3S25L	36-72	20	429	3.3	0	5000	80	3300
D7-4805S25L	36-72	20	627	5	0	5000	83	3300
D7-487R2S25L	36-72	20	620	7.2	0	3472	84	2200
D7-4809S25L	36-72	20	620	9	0	2777	84	1000
D7-4812S25L	36-72	20	612	12	0	2083	85	1000
D7-4815S25L	36-72	20	605	15	0	1666	86	680
D7-4818S25L	36-72	20	605	18	0	1388	86	470
D7-4824S25L	36-72	25	592	24	0	1041	88	470
D7-483R3D25L	36-72	20	429	±3.3	±0	±2500	80	±1500
D7-4805D25L	36-72	20	620	±5	±0	±2500	84	±1500
D7-487R2D25L	36-72	20	620	±7.2	±0	±1736	84	±1000
D7-4809D25L	36-72	20	620	±9	±0	±1388	84	±680
D7-4812D25L	36-72	20	612	±12	±0	±1041	85	±470
D7-4815D25L	36-72	20	598	±15	±0	±833	87	±330
D7-4818D25L	36-72	20	598	±18	±0	±694	87	±220
D7-4824D25L	36-72	25	598	±24	±0	±520	87	±220

D7L - 30W Series

30W 2:1 Regulated Single & Dual output

Features

- Wide 2:1 Input Range
- Full SMD Technology
- 1500 VDC Isolation
- Continous Short Circuit Protection
- Efficiency up to 88%
- -40 ~ 85°C Operating Temperature

PART NUMBER STRUCTURE

D7 - 24 05 S 30 L

- **Series Name**
- **Input Voltage Range**
  - **12** - 9 ~ 18V
  - **24** - 18 ~ 36V
  - **48** - 36 ~ 72V
- **Nominal Output Voltage**
  - **3R3** - 3.3V
  - **05** - 5V
  - **7R2** - 7.2V
  - **09** - 9V
  - **12** - 12V
  - **15** - 15V
  - **18** - 18V
  - **24** - 24V
- **Output Type**
  - **S** - Single output
  - **D** - Dual Output
- **Watt**
- **2"X2" Case**

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage accuracy		±1%
Line regulation		±0.5%
Load regulation	Single (0% to 100% Load)	±0.5%
	Dual (10% to 100% Load)	±0.5%
Ripple & noise (20 MHz bandwidth)(1)		100mV pk-pk
Over-current protection		140% of max. Iout
Short circuit protection		Indefinite(Automatic Recovery)
Temperature coefficient		±0.02%/°C
Capacitor load(2)		See table

INPUT SPECIFICATIONS

Voltage Range	See table
Start up Time (Nominal Vin and constant resistive load)	20mS, typ.
Max. Input Current	See table
No-Load Input Current	See table
Input Filter	Capacitors
Input Reflected Ripple Current(3)	35mA pk-pk

GENERAL SPECIFICATIONS

Efficiency	See table
I/O Isolation V oltage (3 sec)	
Input/Output	1500Vdc
Case/Input & Output	1000Vdc
I/O Isolation Capacitance	1000 pF typ.
I/O Isolation Resistance	1000M Ohm
Switching Frequency	Typical 125kHz
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1.121 Mhrs
Safety Standard : (designed to meet)	IEC 60950-1

PHYSICAL SPECIFICATIONS

Case Material	Nickel-coated Brass
Pin Material	1.0mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	60.0g
Dimensions	2.00 "x2.00 "x0.40 "

ENVIRONMENT SPECIFICATIONS

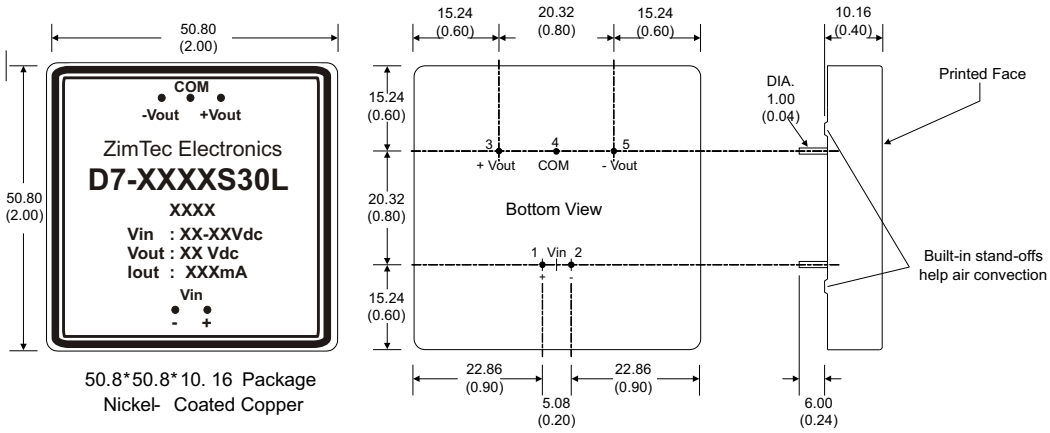
Operating Temperature	-40°C~85°C(See Derating Curve)
Temperature	-40°C~55°C(For 100% load)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

ABSOLUTE MAXIMUM RATINGS (4)

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge V oltage (100mS)	
12 Models	25 Vdc max.
24 Models	50 Vdc max.
48 Models	100 Vdc max.
Soldering Temperature (1.5mm from case 10 sec.max.)	260°C

MECHANICAL SPECIFICATIONS



50.8*50.8*10. 16 Package
Nickel- Coated Copper

PIN CONNECTIONS

PIN NUMBER	SINGLE	DUAL
1	+V Input	+V Input
2	-V Input	-V Input
3	+V Output	+V Output
4	N.P.	Common
5	−V Output	−V Output

All dimensions are typical in millimeters (inches).

1. Pin diameter: 1.0 ±0.05 (0.04 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

D7L - 30W 2:1 Regulated Single & Dual output

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
D7-1205S30L	9-18	30	3048	5	0	6000	82	3300
D7-127R2S30L	9-18	30	3012	7.2	0	4166	83	2200
D7-1209S30L	9-18	30	2976	9	0	3333	84	1000
D7-1212S30L	9-18	30	2976	12	0	2500	84	1000
D7-1215S30L	9-18	30	2941	15	0	2000	85	1000
D7-1218S30L	9-18	30	2941	18	0	1666	85	680
D7-1224S30L	9-18	30	2941	24	0	1250	85	470
D7-123R3D30L	9-18	25	2115	±3.3	±0	±3000	78	±2200
D7-1205D30L	9-18	25	3048	±5	±0	±3000	82	±2200
D7-127R2D30L	9-18	25	3012	±7.2	±0	±2083	83	±1000
D7-1209D30L	9-18	25	2976	±9	±0	±1666	84	±1000
D7-1212D30L	9-18	25	2976	±12	±0	±1250	84	±1000
D7-1215D30L	9-18	35	2941	±15	±0	±1000	85	±470
D7-1218D30L	9-18	35	2941	±18	±0	±833	85	±330
D7-1224D30L	9-18	35	2941	±24	±0	±625	85	±220
D7-243R3S30L	18-36	25	1031	3.3	0	6000	80	3300
D7-2405S30L	18-36	25	1488	5	0	6000	84	3300
D7-247R2S30L	18-36	25	1488	7.2	0	4166	84	2200
D7-2409S30L	18-36	25	1436	9	0	3333	87	1000
D7-2412S30L	18-36	25	1436	12	0	2500	87	1000
D7-2415S30L	18-36	25	1436	15	0	2000	87	1000
D7-2418S30L	18-36	25	1436	18	0	1666	87	680
D7-2424S30L	18-36	25	1436	24	0	1250	87	470
D7-243R3D30L	18-36	25	1057	±3.3	±0	±3000	78	±2200
D7-2405D30L	18-36	25	1488	±5	±0	±3000	84	±2200
D7-247R2D30L	18-36	25	1488	±7.2	±0	±2083	84	±1000
D7-2409D30L	18-36	25	1470	±9	±0	±1666	85	±1000
D7-2412D30L	18-36	25	1470	±12	±0	±1250	85	±1000
D7-2415D30L	18-36	25	1436	±15	±0	±1000	87	±470
D7-2418D30L	18-36	25	1436	±18	±0	±833	87	±330
D7-2424D30L	18-36	30	1436	±24	±0	±625	87	±220
D7-483R3S30L	36-72	20	522	3.3	0	6000	79	3300
D7-4805S30L	36-72	20	753	5	0	6000	83	3300
D7-487R2S30L	36-72	20	744	7.2	0	4166	84	2200
D7-4809S30L	36-72	20	744	9	0	3333	84	1000
D7-4812S30L	36-72	20	726	12	0	2500	86	1000
D7-4815S30L	36-72	20	710	15	0	2000	88	1000
D7-4818S30L	36-72	20	710	18	0	1666	88	680
D7-4824S30L	36-72	20	710	24	0	1250	88	470
D7-483R3D30L	36-72	20	515	±3.3	±0	±3000	80	±2200
D7-4805D30L	36-72	20	735	±5	±0	±3000	85	±2200
D7-487R2D30L	36-72	20	735	±7.2	±0	±2083	85	±1000
D7-4809D30L	36-72	20	735	±9	±0	±1666	85	±1000
D7-4812D30L	36-72	20	718	±12	±0	±1250	87	±1000
D7-4815D30L	36-72	20	710	±15	±0	±1000	88	±470
D7-4818D30L	36-72	20	710	±18	±0	±833	88	±330
D7-4824D30L	36-72	20	710	±24	±0	±625	88	±220

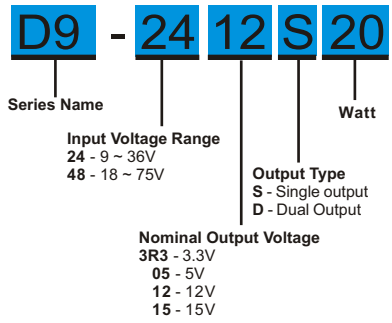
D9 - 20W Series

20W 4:1 Regulated Single & Dual output

Features

- Ultra Wide 4:1 Input Range
- Full SMD Technology
- 1600 VDC Isolation
- No Minimum Load Required
- Efficiency up to 91%
- Extended Operating Temperature Range -40 ~ 85°C max.
- Adjustable Output Voltage
- Remote On/Off Control (CTRL)
- Continuous Short Circuit Protection
- Over Current Protection
- Over Voltage Protection
- Soft Start

PART NUMBER STRUCTURE



All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Output Voltage Accuracy		±1%
Output Voltage Adjustability(Trim)		Single output: ±10%, max.
Maximum Output Current		See table
Line Regulation		±0.5%, max.
Load Regulation(Io=0% to 100%)		Single: ±0.5%, max. Dual:±1%, max(balanced load)
Cross Regulation (Dual Output) (1)		±5%
Ripple&Noise (2)		75mVp-p, max.
Over Voltage Protection (Zener diode clamp)	3.3V output	3.9V
	5V output	6.2V
	12V output	15V
	15V output	18V
	±5V output	±6.2V
	±12V output	±15V
	±15V output	±18V
Over Current Protection		120% of FL, typ.
Short Circuit Protection		Indefinite(hiccup) (Automatic Recovery)
Temperature Coefficient		±0.02%/°C
Capacitive Load (3)		See table
Transient Recovery Time (4)		250us, typ.
Transient Response Deviation(4)		±3%, max.

INPUT SPECIFICATIONS

Input Voltage Range		See table
Under Voltage Lockout		
24V Models	Module ON / OFF	8.6Vdc / 7.9Vdc, typ.
48V Models	Module ON / OFF	17.8Vdc / 16Vdc, typ.
Start up Time (Nominal Vin and constant resistive load)		20mS, typ.
Input Filter		Pi Type
Input Current(No-Load)		See table, typ.
Input Current(Full-Load)		See table, max.
Input Reflected Ripple Current(5)		20mAp-p, typ.
Remote On/Off (CTRL)(6)		
ON:	3.0 ... 12Vdc or open circuit	
OFF:	0 ... 1.2Vdc or Short circuit pin2 and pin 6	
OFF idle current:	5 mA, typ	

ENVIRONMENTAL SPECIFICATIONS

Operating Ambient Temperature	-40°C ~ +85°C(See Derating Curve) -40°C ~ +66°C(For 100% load)
Maximum Case Temperature	105°C
Storage Temperature	-55°C ~ +125°C
Cooling	Nature Convection

GENERAL SPECIFICATIONS

Efficiency	See table, typ.
I/O Isolation Voltage(3 sec)	
Input/Output	1600Vdc
Case/Input & Output	1600Vdc
Isolation Resistance	1000 M Ohm , min.
Isolation Capacitance	1200 pF, typ.
Switching frequency	330kHz, typ.
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>560 khrs
Safety Standard	IEC/EN 60950-1
Safety Approvals	CB

EMC CHARACTERISTICS

Radiated Emissions	EN55022	CLASS A
Conducted Emissions(7)	EN55022	CLASS A
ESD	IEC61000-4-2	Perf. Criteria A
RS	IEC61000-4-3	Perf. Criteria A
EFT(8)	IEC61000-4-4	Perf. Criteria A
Surge (8)	IEC61000-4-5	Perf. Criteria A
CS	IEC61000-4-6	Perf. Criteria A
PFMF	IEC61000-4-8	Perf. Criteria A

PHYSICAL SPECIFICATIONS

Case Material	Nickel-coated Copper
Base Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	¨ 1.0mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	30.0g
Dimensions	2.00"x1.00"x0.40"

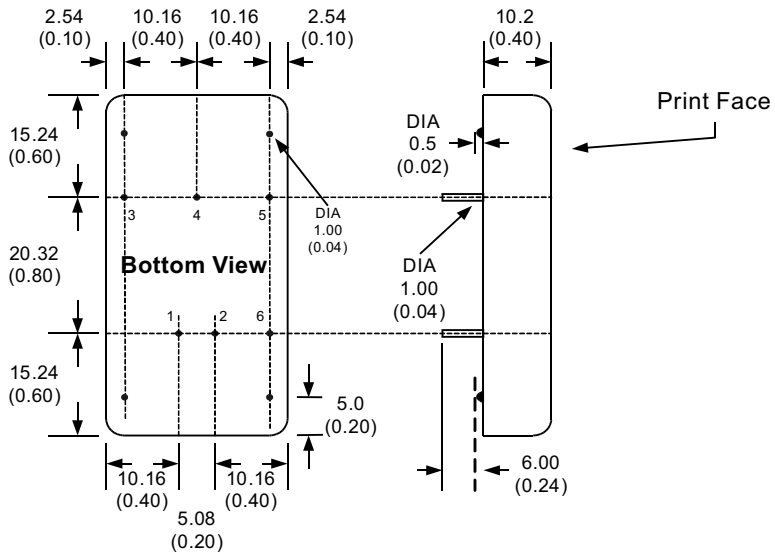
ABSOLUTE SPECIFICATIONS (9)

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge Voltage(100mS)	
24 Models	50 Vdc max.
48 Models	100 Vdc max.
Soldering Temperature (1.5mm from case 10 sec. Max.)	260°C max.

D9 - 20W 4:1 Regulated Single & Dual output

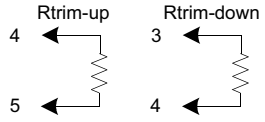
MECHANICAL SPECIFICATIONS



PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
1	+Vin	+Vin
2	-Vin	-Vin
3	+Vout	+Vout
4	Trim	Com
5	-Vout	-Vout
6	CTRL	CTRL

EXTERNAL OUTPUT TRIMMING

Output can be externally trimmed by using the method as below. (single output models only)



All dimensions are typical in millimeters (inches).
1. Pin diameter: 1.0 ±0.05 (0.04 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)
4. Stand-off tolerance: ±0.1 (±0.004)

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
D9-243R3S20	9-36	50	879	3.3	0	5500	89	10000
D9-2405S20	9-36	50	957	5	0	4000	91	6800
D9-2412S20	9-36	22	980	12	0	1670	89	1000
D9-2415S20	9-36	22	968	15	0	1330	89	680
D9-483R3S20	18-75	30	440	3.3	0	5500	89	10000
D9-4805S20	18-75	30	473	5	0	4000	91	6800
D9-4812S20	18-75	15	484	12	0	1670	89	1000
D9-4815S20	18-75	15	484	15	0	1330	89	680
D9-2405D20	9-36	65	969	±5	0	±2000	89	±2200
D9-2412D20	9-36	25	980	±12	0	±835	88	±470
D9-2415D20	9-36	25	980	±15	0	±665	89	±330
D9-4805D20	18-75	40	484	±5	0	±2000	89	±2200
D9-4812D20	18-75	15	490	±12	0	±835	88	±470
D9-4815D20	18-75	15	490	±15	0	±665	89	±330

DT - 30W Series

30W 2:1 Regulated Single & Dual output

Features

- Ultra Wide 2:1 Input Range
- Full SMD Technology
- 1600 VDC Isolation
- Efficiency up to 92%
- Extended Operating Temperature Range -40 ~ 75°C max.
- Adjustable Output Voltage
- Remote On/Off Control (CTRL)
- Continuous Short Circuit Protection
- Over Current Protection
- Over Voltage Protection
- Over Temperature Protection
- Soft Start

PART NUMBER STRUCTURE

DT - 24 05 S 30

- DT — Series Name
- 24 — Input Voltage Range: 12 - 9 ~ 18V; 24 - 18 ~ 36V; 48 - 36 ~ 75V
- 05 — Single Output Voltage: 3R3 - 3.3V; 05 - 5.0V; 5R1 - 5.1V; 12 - 12V; 15 - 15V; Dual Output Voltage: 05 - ±5V; 12 - ±12V; 15 - ±15V
- S — Output Type: S - Single Output; D - Dual Output
- 30 — Watt

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Output Voltage Accuracy	**Single&Dual:** ±1%
Output Voltage Adjustability **(Single Output Only)**	±10%, max.
Maximum Output Current	See table
Line Regulation	**Single&Dual:** ±0.5%, max.
Load Regulation	**Single (0% to 100%):** ±0.5%, max. **Dual (0% to 100%):** ±1%, max(balanced load)
Cross Regulation **(1)**	**Dual:** ±5%
Ripple&Noise **(2)**	**Single&Dual** : 100mVp-p,max.

Over Voltage Protection (Zener diode clamp)	
3.3V output	3.9V
5V output	6.2V
5.1V output	6.2V
12V output	15V
15V output	18V
±5V output	±6.2V
±12V output	±15V
±15V output	±18V

Over Load Protection	150% of FL, typ.
Short Circuit Protection	Indefinite(hiccup) (Automatic Recovery)
Temperature Coefficient	±0.02%/°C
Capacitive Load **(3)**	See table
Transient Recovery Time **(4)**	250us, typ.
Transient Response Deviation **(4)**	±3%, max.

INPUT SPECIFICATIONS

Input Voltage Range		See table
Under Voltage Lockout		
12V Models	Module ON / OFF	8.6Vdc / 7.9Vdc, typ.
24V Models	Module ON / OFF	17.8Vdc / 16Vdc, typ.
48V Models	Module ON / OFF	33.5Vdc / 30.5Vdc, typ.
Start up Time (Nominal Vin and constant resistive load)		30mS, typ.
Input Filter		Pi Type
Input Current **(No-Load)**		See table, max.
Input Current **(Full-Load)**		See table, typ.
Input Reflected Ripple Current **(5)**		20mAp-p, typ.

Remote On/Off **(CTRL) (6)**

ON: 3.0 ... 12Vdc or open circuit

OFF: 0 ... 1.2Vdc or Short circuit pin2 and pin 3

OFF idle current: 5 mA, typ.

GENERAL SPECIFICATIONS

Efficiency	See table, typ.
I/O Isolation Voltage **(3 sec)**	
Input/Output	1600Vdc
Case/Input & Output	1600Vdc
Isolation Resistance	1000 M Ohm, min.
Isolation Capacitance	1000 pF, typ.
Switching frequency	330kHz, typ.
Humidity	95% rel H
Reliability Calculated MTBF **(MIL-HDBK-217 F)**	**Single&Dual:** >435 khrs
Safety Standard (designed to meet)	IEC/EN 60950-1

EMC CHARACTERISTICS

Radiated Emissions	EN55022	CLASSA
Conducted Emissions**(7)**	EN55022	CLASSA
ESD	EN61000-4-2	Perf. Criteria A
RS	EN61000-4-3	Perf. Criteria A
EFT**(8)**	EN61000-4-4	Perf. Criteria A
Surge **(8)**	EN61000-4-5	Perf. Criteria A
CS	EN61000-4-6	Perf. Criteria A
PFMF	EN61000-4-8	Perf. Criteria A

PHYSICAL SPECIFICATIONS

Case Material	Nickel-coated Copper
Base Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	¨ 1.0mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	31.0g
Dimensions	2.00"x1.00"x0.40"

ABSOLUTE SPECIFICATIONS (9)

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

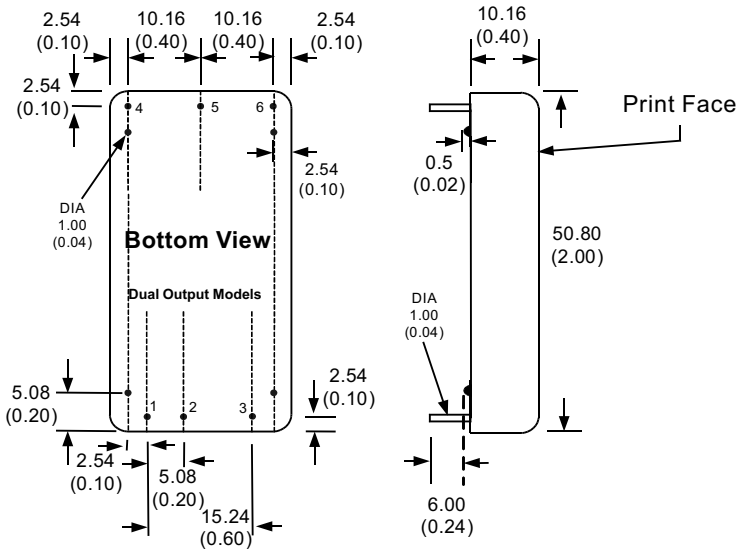
Input Surge Voltage (100mS)	
12 Models	25 Vdc max.
24 Models	50 Vdc max.
48 Models	100 Vdc max.
Soldering Temperature (1.5mm from case 10 sec. max.)	260°C max.

ENVIRONMENTAL SPECIFICATIONS

Operating Ambient Temperature	-40°C ~ +75°C(See Derating Curve) -40°C ~ +50°C(For 100% load)
Maximum Case Temperature	105°C
Storage Temperature	-55°C ~ +125°C
Over Temperature Protection **(Case)**	115°C, typ.
Cooling	Nature Convection

DT - 30W 2:1 Regulated Single & Dual output

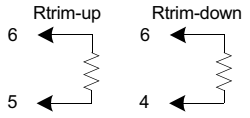
MECHANICAL SPECIFICATIONS



PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
1	+Vin	+Vin
2	-Vin	-Vin
3	CTRL	CTRL
4	+Vout	+Vout
5	-Vout	Com
6	Trim	-Vout

EXTERNAL OUTPUT TRIMMING

Output can be externally trimmed by using the method as below. (single output models only)



All dimensions are typical in millimeters (inches).
1. Pin diameter: 1.0 ±0.05 (0.04 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)
4. Stand-off Tolerance: ±0.1 (±0.004)

MODEL SELECTION GUIDE

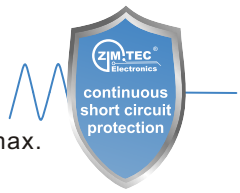
MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min-Load (mA)	OUTPUT Current Full Load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
DT-123R3S30	9-18	80	2426	3.3	0	8000	89	20000
DT-1205S30	9-18	180	2874	5	0	6000	91	14000
DT-125R1S30	9-18	160	2874	5.1	0	6000	92	14000
DT-1212S30	9-18	30	2809	12	0	2500	91	2000
DT-1215S30	9-18	30	2809	15	0	2000	92	2000
DT-243R3S30	18-36	70	1185	3.3	0	8000	91	20000
DT-2405S30	18-36	100	1420	5	0	6000	92	14000
DT-245R1S30	18-36	100	1448	5.1	0	6000	92	14000
DT-2412S30	18-36	20	1436	12	0	2500	92	2000
DT-2415S30	18-36	40	1420	15	0	2000	92	2000
DT-483R3S30	36-75	50	593	3.3	0	8000	90	20000
DT-4805S30	36-75	70	702	5	0	6000	91	14000
DT-485R1S30	36-75	70	724	5.1	0	6000	91	14000
DT-4812S30	36-75	30	718	12	0	2500	91	2000
DT-4815S30	36-75	30	710	15	0	2000	91	2000
DT-1205D30	9-18	180	2874	±5	0	±3000	89	±3000
DT-1212D30	9-18	50	2874	±12	0	±1250	90	±1300
DT-1215D30	9-18	50	2874	±15	0	±1000	91	±1300
DT-2405D30	18-36	100	1437	±5	0	±3000	90	±3000
DT-2412D30	18-36	40	1453	±12	0	±1250	91	±1300
DT-2415D30	18-36	50	1437	±15	0	±1000	91	±1300
DT-4805D30	36-75	70	710	±5	0	±3000	90	±3000
DT-4812D30	36-75	50	718	±12	0	±1250	90	±1300
DT-4815D30	36-75	40	718	±15	0	±1000	90	±1300

DT-40W Series

40W 2:1 Regulated Single & Dual output

Features

- Wide 2:1 Input Range
- 1600 VDC Isolation
- Efficiency up to 92%
- Extended Operating Temperature Range -40 ~ 71°C max.
- Adjustable Output Voltage
- Remote On/Off Control (CTRL)
- Continuous Short Circuit Protection
- Over Load Protection
- Over Voltage Protection
- Soft Start
- High Power Density:40W in 2"x1"x0.4" package
- No Minimum Load Required



PART NUMBER STRUCTURE

DT - 24 05 S 40

- DT — Series Name
- 24 — Input Voltage Range: **12** - 9 ~ 18V; **24** - 18 ~ 36V; **48** - 36 ~ 75V
- 05 — Single Output Voltage: **3R3** - 3.3V; **05** - 5.0V; **12** - 12V; **15** - 15V; Dual Output Voltage: **12** - ±12V; **15** - ±15V
- S — Output Type: S - Single Output; D - Dual Output
- 40 — Watt

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Output Voltage Accuracy		Single&Dual: ±1%
Output Voltage Adjustability (Single Output Only)		±10%, max.
Maximum Output Current		See table
Line Regulation		Single&Dual: ±0.5%, max.
Load Regulation		Single (0% to 100%): ±0.5%, max.
		Dual (0% to 100%): ±1%, max(balanced load)
Cross Regulation (1)		Dual: ±5%
Ripple&Noise (2)		3.3V&5.0V : 100mVpk-pk,max.
		other : 150mVpk-pk,max.
Over Voltage Protection (Zener diode clamp)	3.3V output	3.9V
	5V output	6.2V
	12V output	15V
	15V output	18V
	±12V output	±15V
	±15V output	±18V
Over Load Protection		115%~140% of Iout max.
Short Circuit Protection		Indefinite(hiccup) (Automatic Recovery)
Temperature Coefficient		±0.02%/°C
Capacitive Load (3)		See table
Transient Recovery Time (4)		250us, typ.
Transient Response Deviation (4)		±3%, max.

INPUT SPECIFICATIONS

Input Voltage Range		See table
Under Voltage Lockout		
12V Models	Module ON / OFF	8.6Vdc / 7.9Vdc, typ.
24V Models	Module ON / OFF	17.8Vdc / 16Vdc, typ.
48V Models	Module ON / OFF	33.5Vdc / 30.5Vdc, typ.
Start up Time (Nominal Vin and constant resistive load)		30mS, typ.
Input Filter		Pi Type
Input Current (No-Load)		See table, max.
Input Current (Full-Load)		See table, typ.
Input Reflected Ripple Current (5)		20mAp-p, typ.
Remote On/Off (CTRL) (6)		
	ON:	3.0 ... 12Vdc or open circuit
	OFF:	0 ... 1.2Vdc or Short circuit pin2 and pin 3
	OFF idle current:	5 mA, typ

GENERAL SPECIFICATIONS

Efficiency	See table, typ.
I/O Isolation Voltage (3 sec)	
Input/Output	1600Vdc
Case/Input & Output	1600Vdc
Isolation Resistance	1000 M Ohm, min.
Isolation Capacitance	1000 pF, typ.
Switching frequency	270kHz, typ.
Humidity	95% rel H
Reliability Calculated MTBF (MIL-HDBK-217 F)	Single&Dual: >328 khrs
Safety Standard (designed to meet)	IEC/EN 60950-1

EMC CHARACTERISTICS

Radiated Emissions(7)	EN55022	CLASS B
Conducted Emissions(7)	EN55022	CLASS B
ESD	IEC61000-4-2	Perf. Criteria A
RS	IEC61000-4-3	Perf. Criteria A
EFT(8)	IEC61000-4-4	Perf. Criteria A
Surge (8)	IEC61000-4-5	Perf. Criteria A
CS	IEC61000-4-6	Perf. Criteria A
PFMF	IEC61000-4-8	Perf. Criteria A

PHYSICAL SPECIFICATIONS

Case Material	Nickel-coated Copper
Base Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	¨ 1.0mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	32.0g
Dimensions	2.00"x1.00"x0.40"

ABSOLUTE SPECIFICATIONS (9)

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

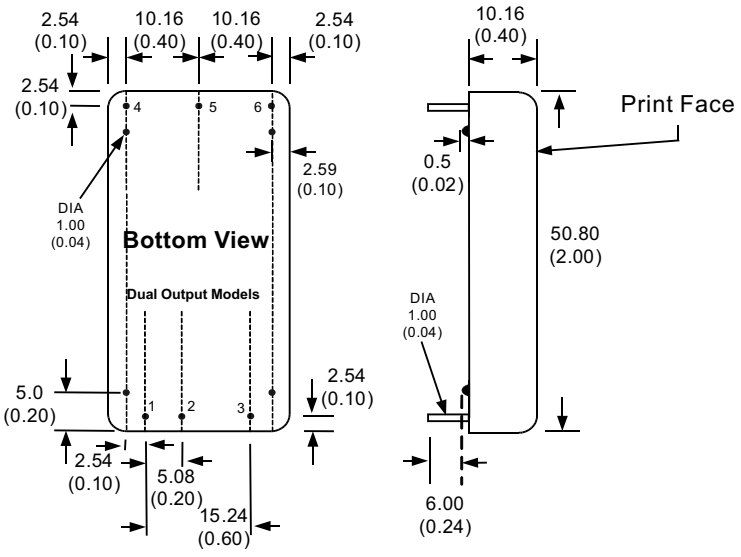
Input Surge Voltage (100mS)	
12 Models	25 Vdc max.
24 Models	50 Vdc max.
48 Models	100 Vdc max.
Soldering Temperature (1.5mm from case 10 sec. Max.)	260°C max.

ENVIRONMENTAL SPECIFICATIONS

Operating Ambient Temperature	-40°C ~ +71°C(See Derating Curve)
12 Models	-40°C ~ +45°C(For 100% load)
24 / 48 Models	-40°C ~ +50°C(For 100% load)
Maximum Case Temperature	105°C
Storage Temperature	-55°C ~ +125°C

DT - 40W 2:1 Regulated Single & Dual output

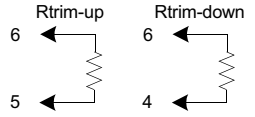
MECHANICAL SPECIFICATIONS



PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
1	+Vin	+Vin
2	-Vin	-Vin
3	CTRL	CTRL
4	+Vout	+Vout
5	-Vout	Com
6	Trim	-Vout

EXTERNAL OUTPUT TRIMMING

Output can be externally trimmed by using the method as below. (single output models only)



All dimensions are typical in millimeters (inches).
1. Pin diameter: 1.0 ±0.05 (0.04 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)
4. Stand-off Tolerance: ±0.1 (±0.004)

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min-Load (mA)	OUTPUT Current Full Load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
DT-123R3S40	9-18	100	2444	3.3	0	8000	90	21800
DT-1205S40	9-18	160	3663	5	0	8000	91	13600
DT-1212S40	9-18	40	3663	12	0	3333	91	2300
DT-1215S40	9-18	50	3663	15	0	2666	91	1500
DT-243R3S40	18-36	60	1208	3.3	0	8000	91	21800
DT-2405S40	18-36	90	1811	5	0	8000	92	13600
DT-2412S40	18-36	30	1831	12	0	3333	91	2300
DT-2415S40	18-36	40	1811	15	0	2666	92	1500
DT-483R3S40	36-75	40	604	3.3	0	8000	91	21800
DT-4805S40	36-75	60	905	5	0	8000	92	13600
DT-4812S40	36-75	20	915	12	0	3333	91	2300
DT-4815S40	36-75	20	905	15	0	2666	92	1500
DT-1212D40	9-18	50	3663	±12	0	±1666	91	±1200
DT-1215D40	9-18	50	3623	±15	0	±1333	92	±750
DT-2412D40	18-36	50	1831	±12	0	±1666	91	±1200
DT-2415D40	18-36	40	1811	±15	0	±1333	92	±750
DT-4812D40	36-75	30	906	±12	0	±1666	92	±1200
DT-4815D40	36-75	40	906	±15	0	±1333	92	±750

DM - Series

25/30W 2:1 Regulated Single & Dual output

Features

- Wide 2:1 Input Range
- Full SMD Technology
- 1500 VDC Isolation
- Efficiency up to 91%
- -40 ~ 85°C Operation Temperature Range
- Adjustable Output Voltage
- Remote On/Off Control (CTRL)
- Continuous Short Circuit Protection
- Over Current Protection
- Over Voltage Protection
- Over Temperature Protection
- Soft Start

PART NUMBER STRUCTURE

DM - 24 12 S 30

- DM — Series Name
- 24 — Input Voltage Range: **12** - 9 ~ 18V; **24** - 18 ~ 36V; **48** - 36 ~ 75V
- 12 — Nominal Output Voltage: **3R3** - 3.3V; **05** - 5V; **12** - 12V; **15** - 15V
- S — Output Type: **S** - Single output; **D** - Dual Output
- 30 — Watt

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Output Voltage Accuracy		±1%
Output Voltage Adjustability(Trim)		±10%, max.
Maximum Output Current		See table
Line Regulation		±0.5%, max.
Load Regulation(Io=10% to 100%) (1)		±0.5%, max.
Cross Regulation (Dual Output) (2)		±5%
Ripple&Noise (3)		75mVpk-pk, max.
Over Voltage Protection (Zener diode clamp)	3.3V output	3.9V
	5V output	6.2V
	12V output	15V
	15V output	18V
	±12V output	±15V
	±15V output	±18V
Over Current Protection		120% of FL, typ.
Short Circuit Protection		Indefinite(hiccup) (Automatic Recovery)
Temperature Coefficient		±0.02%/°C
Capacitive Load (4)		See table
Transient Recovery Time (5)		200us, typ.
Transient Response Deviation(5)		±3%, max.

INPUT SPECIFICATIONS

Input Voltage Range		See table
Under Voltage Lockout		
12V Models	Module ON / OFF	8.6Vdc / 7.9Vdc, typ.
24V Models	Module ON / OFF	17.6Vdc / 16Vdc, typ.
48V Models	Module ON / OFF	33.5Vdc / 30.5Vdc, typ.
Start up Time (Nominal Vin and constant resistive load)		20mS, typ.
Input Filter		Pi Type
Input Current(No-Load)		See table, typ.
Input Current(Full-Load)		See table, max.
Input Reflected Ripple Current(6)		20mApk-pk, typ.

Remote On/Off (CTRL)

ON: 2.5 ... 5.5Vdc or open circuit

OFF: -0.7 ... 0.8Vdc or Short circuit pin2 and pin 3

OFF idle current: 2.5 mA, typ

PHYSICAL SPECIFICATIONS

Case Material	Nickel-coated Copper
Pin Material	¨ 1.0mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	48.0g
Dimensions	2.00"x1.60"x0.40"

GENERAL SPECIFICATIONS

Efficiency	See table, typ.
I/O Isolation Voltage(3 sec)	
Input/Output	1500Vdc
Case/Input & Output	1000Vdc
Isolation Resistance	1000 M Ohm, min.
Isolation Capacitance	1200 pF, typ.
Switching frequency	270kHz, typ.
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>1 Mhrs
Safety Standard	IEC/EN 60950-1
Safety Approvals	TUV,CB

EMC CHARACTERISTICS

Radiated Emissions	EN55022	CLASS A
Conducted Emissions(7)	EN55022	CLASS A
ESD	IEC61000-4-2	Perf. Criteria A
RS	IEC61000-4-3	Perf. Criteria A
EFT(8)	IEC61000-4-4	Perf. Criteria A
Surge (8)	IEC61000-4-5	Perf. Criteria A
CS	IEC61000-4-6	Perf. Criteria A
PFMF	IEC61000-4-8	Perf. Criteria A

ENVIRONMENTAL SPECIFICATIONS

Operating Ambient Temperature	-40°C ~ +85°C(See Derating Curve) -40°C ~ +60°C(For 100% load)
Maximum Case Temperature	100°C
Storage Temperature	-55°C ~ +125°C
Over Temperature Protection (Case)	110 °C, typ.
Cooling	Nature Convection

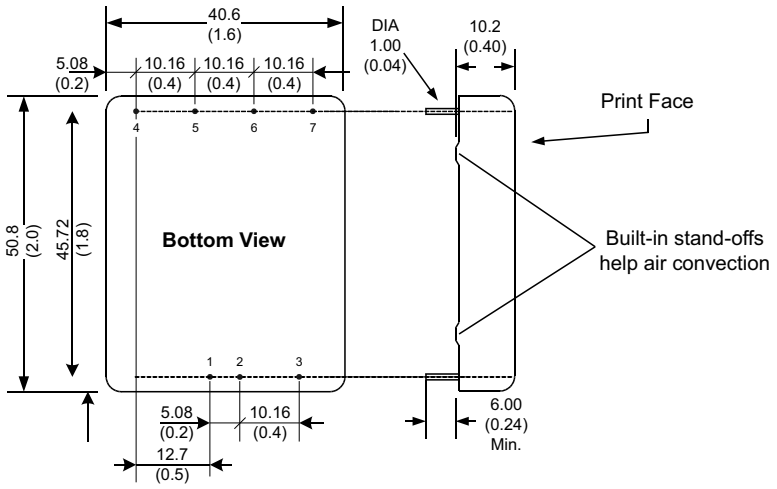
ABSOLUTE SPECIFICATIONS (9)

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge V oltage (100mS)	
12 Models	25 Vdc ,max.
24 Models	50 Vdc ,max.
48 Models	100 Vdc ,max.
Soldering Temperature (1.5mm from case 10 sec. Max.)	260 °C max

DM - 25/30W 2:1 Regulated Single & Dual output

MECHANICAL SPECIFICATIONS

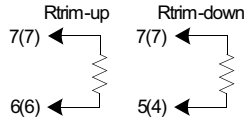


All dimensions are typical in millimeters (inches).
1. Pin diameter: 1.0 ±0.05 (0.04 ±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
1	+Vin	+Vin
2	-Vin	-Vin
3	CTRL	CTRL
4	No pin	+Vout
5	+Vout	Com
6	-Vout	-Vout
7	Trim	Trim

EXTERNAL OUTPUT TRIMMING

Output can be externally trimmed by using the method as below. ( ) for dual output trim.



MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current No-Load (mA)	INPUT Current Full Load (mA)	OUTPUT Voltage (Vdc)	OUTPUT Current Min. load (mA)	OUTPUT Current Full load (mA)	EFFICIENCY @FL(%)	Capacitor Load(uF)
DM-123R3S25	9-18	30	1867	3.3	0	5500	83	15000
DM-1205S25	9-18	30	2480	5	0	5000	86	10000
DM-1212S30	9-18	30	2841	12	0	2500	90	2200
DM-1215S30	9-18	30	2841	15	0	2000	90	1000
DM-243R3S25	18-36	25	922	3.3	0	5500	84	15000
DM-2405S25	18-36	25	1225	5	0	5000	87	10000
DM-2412S30	18-36	25	1404	12	0	2500	91	2200
DM-2415S30	18-36	25	1404	15	0	2000	91	1000
DM-483R3S25	36-75	20	461	3.3	0	5500	84	15000
DM-4805S25	36-75	20	613	5	0	5000	87	10000
DM-4812S30	36-75	20	702	12	0	2500	91	2200
DM-4815S30	36-75	20	702	15	0	2000	91	1000
DM-1212D30	9-18	30	2841	±12	0	±1250	90	±1000
DM-1215D30	9-18	30	2841	±15	0	±1000	90	±680
DM-2412D30	18-36	25	1404	±12	0	±1250	91	±1000
DM-2415D30	18-36	25	1404	±15	0	±1000	91	±680
DM-4812D30	36-75	20	710	±12	0	±1250	90	±1000
DM-4815D30	36-75	20	710	±15	0	±1000	90	±680

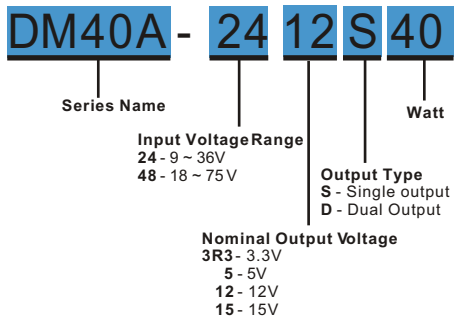
DM40A Series

40W 4:1 Regulated Single & Dual output

Features

- Wide 4:1 Input Range
- Full SMD Technology
- 1600 VDC Isolation
- Efficiency up to 92%
- -40 ~ 85°C Operation Temperature Range
- Adjustable Output Voltage
- Remote On/Off Control (CTRL)
- Continuous Short Circuit Protection
- Over Current Protection
- Over Voltage Protection
- Over Temperature Protection
- Soft Start

PART NUMBER STRUCTURE



All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Output Voltage Accuracy		±1%
Output Voltage Adjustability **(Trim) (1)**		±10%, max.
Maximum Output Current		See table
Line Regulation		±0.5%, max.
Load Regulation**(Single, Io=0% to 100%)**		±0.5%, max.
Load Regulation**(Dual,Io=1% to 100%)**		±1.0%, max.
Cross Regulation **(Dual Output) (2)**		±5%
Ripple&Noise **(3)**	**3.3V&5.0V output:**	50mVpk-pk, max.
	Dual output:	150mVpk-pk, max.
	All other output:	75mVpk-pk, max.
Over Voltage Protection (Zener diode clamp)	3.3V output	3.9V
	5V output	6.2V
	12V output	15V
	15V output	18V
	±12V output	±15V
	±15V output	±18V
Over Load Protection		130% of FL, typ.
Short Circuit Protection		Indefinite(hiccup) (Automatic Recovery)
Temperature Coefficent		±0.02%/°C
Capacitive Load **(4)**		See table
Transient Recovery Time **(5)**		250us, typ.
Transient Response Deviation**(5)**		±3%, max.

INPUT SPECIFICATIONS

Input Voltage Range		See table
Under Voltage Lockout		
24V Modes	Module ON / OFF	8.6Vdc / 7.9Vdc, typ.
48V Modes	Module ON / OFF	17.8Vdc / 16Vdc, typ.
Start up Time (Nominal Vin and constant resistive load)		25mS, typ.
Input Filter		Pi Type
Input Current(No-Load)		See table, typ.
Input Current(Full-Load)		See table, max.
Input Reflected Ripple Current**(6)**		20mApk-pk, typ.
Remote On/Off (CTRL)**(7)**		
	ON: 3.0 ... 12Vdc or open circuit	
	OFF: 0 ... 1.2Vdc or Short circuit pin2 and pin 3	
	OFF idle current: 5.0 mA, typ.	

GENERAL SPECIFICATIONS

Efficiency	See table, typ.
I/O Isolation Voltage(3 sec)	
Input/Output	1600Vdc
Case/Input & Output	1600Vdc
Isolation Resistance	1000 Ohm, min.
Isolation Capacitance	2500 pF, max.
Switching frequency	270kHz, typ.
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>151 khrs
Safety Standard (design to meet)	IEC/EN 60950-1

EMC CHARACTERISTICS

Radiated Emissions**(8)**	EN55022	CLASSA
Conducted Emissions**(8)**	EN55022	CLASSA
ESD	EN61000-4-2	Perf. Criteria A
RS	EN61000-4-3	Perf. Criteria A
EFT**(9)**	EN61000-4-4	Perf. Criteria A
Surge **(9)**	EN61000-4-5	Perf. Criteria A
CS	EN61000-4-6	Perf. Criteria A
PFMF	EN61000-4-8	Perf. Criteria A

ENVIRONMENT SPECIFICATIONS

Operating Ambient Temperature	-40°C ~ +85°C(See Derating Curve) -40°C ~ +55°C(For 100% load)
Maximum Case Temperature	105°C
Storage Temperature	-55°C ~ +125°C
Over Temperature Protection (Case)	110°C, typ.
Cooling	Nature Convection

ABSOLUTE SPECIFICATIONS (10)

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

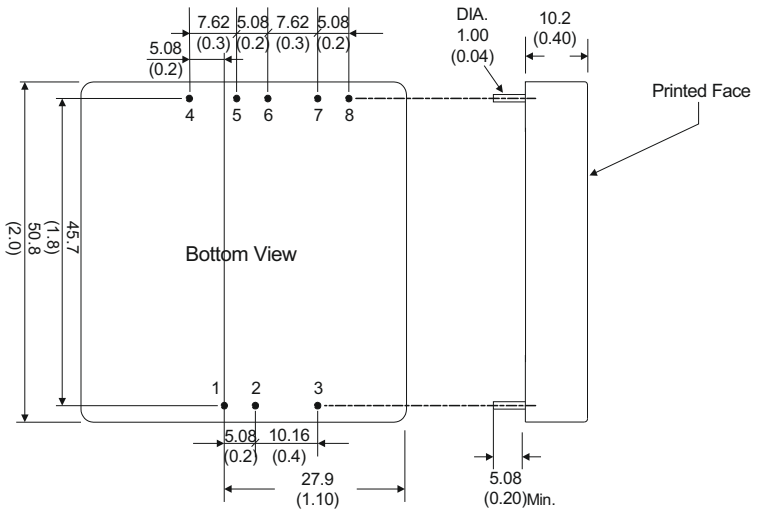
Input Surge Voltage(100mS)	
24 Models	50 Vdc, max.
48 Models	100 Vdc, max.
Soldering Temperature (1.5mm from case 10sec. max.)	260°C, max

PHYSICAL SPECIFICATIONS

Case Material	Nickel-coated Copper
Pin Material	¨ 1.0mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	60.0g
Dimensions	2.00"x2.00"x0.40"

DM40A - 40W 4:1 Regulated Single & Dual output

MECHANICAL SPECIFICATIONS

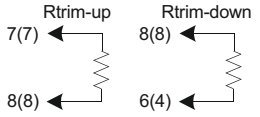


All dimensions are typical in millimeters (inches).
1. Pin diameter: 1.0 ±0.05 (0.04 ±0.002)
2. Pin pitch and length tolerance:: ±0.35 (±0.014)
3. Case Tolerance: ±0.5 (±0.02)

PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
1	+Vin	+Vin
2	-Vin	-Vin
3	CTRL	CTRL
4	-Sense	+Vout
5	+Sense	Com
6	+Vout	Com
7	-Vout	-Vout
8	Trim	Trim

EXTERNAL OUTPUT TRIMMING

Output can be externally trimmed by using the method as below. ( ) for dual output trim.



MODEL SELECTION GUIDE

MODEL NUMBER	Voltage Range (Vdc)	INPUT Current		OUTPUT Voltage (Vdc)	OUTPUT Current		EFFICIENCY @FL(%)	Capacitor Load(uF)
		No-Load (mA)	Full-Load (mA)		Min-Load (mA)	Full-Load (mA)		
DM40A-243R3S40	9-36	80	1598	3.3	0	10000	89	25000
DM40A-2405S40	9-36	100	1893	5	0	8000	91	13000
DM40A-2412S40	9-36	50	1925	12	0	3350	90	2300
DM40A-2415S40	9-36	50	1904	15	0	2650	90	1500
DM40A-483R3S40	18-75	60	799	3.3	0	10000	89	25000
DM40A-4805S40	18-75	60	936	5	0	8000	92	13000
DM40A-4812S40	18-75	30	963	12	0	3350	90	2300
DM40A-4815S40	18-75	30	941	15	0	2650	91	1500
DM40A-2412D40	9-36	60	1919	±12	0	±1650	89	±1200
DM40A-2415D40	9-36	60	1962	±15	0	±1350	89	±750
DM40A-4812D40	18-75	30	948	±12	0	±1650	90	±1200
DM40A-4815D40	18-75	30	970	±15	0	±1350	90	±750

DR-78M Series

0.5A Output Current,Non-Isolated DC/DC converter

Features

- 3 Pin SIL
- Non isolated,No need for heatsinks
- Wide Input Range,Step-down switching dc-dc converter
- Full SMD Technology
- Continuous Short Circuit Protection
- Pin-out compatible with LM78MXX three terminals positive Regulator
- Efficiency up to 97%
- -40 ~ 85°C Operation Temperature Range

PART NUMBER STRUCTURE

DR - 78M 3R3

- DR: Series Name
- 78M: For 78M Series Regulator I.C.
  - Output Current - 0.5A
- 3R3: Output Voltage
  - **1R5** - 1.5V
  - **1R8** - 1.8V
  - **2R5** - 2.5V
  - **3R3** - 3.3V
  - **05** - 5V
  - **6R5** - 6.5V
  - **7R2** - 7.2V
  - **09** - 9V
  - **12** - 12V
  - **15** - 15V

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage accuracy	±2%
Line regulation	±0.5%
Load regulation	(From 10% to 100% Load) ±0.6%
Ripple & noise (20 MHz bandwidth)(1)	60mV pk-pk, max.
Short Circuit Protection	Indefinite(Automatic Recovery)
Temperature coefficient	±0.02%/°C
Capacitor load(2)	See table

INPUT SPECIFICATIONS

Input Voltage Range	See table
Input Current (No-Load)	See table
Input Current (Full-Load)	See table
Input Filter	Capacitors
Input Reflected Ripple Current(3)	35mA pk-pk

GENERAL SPECIFICATIONS

Efficiency	See table
Switching Frequency	330kHz, typ.
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>4.5Mhrs

ENVIRONMENT SPECIFICATIONS

Operating Temperature	-40°C~85°C(See Derating Curve)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

PHYSICAL SPECIFICATIONS

Case Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	0.5mm Alloy42 Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	1.8g
Dimensions	0.46"x0.29"x0.40"

EMC CHARACTERISTICS

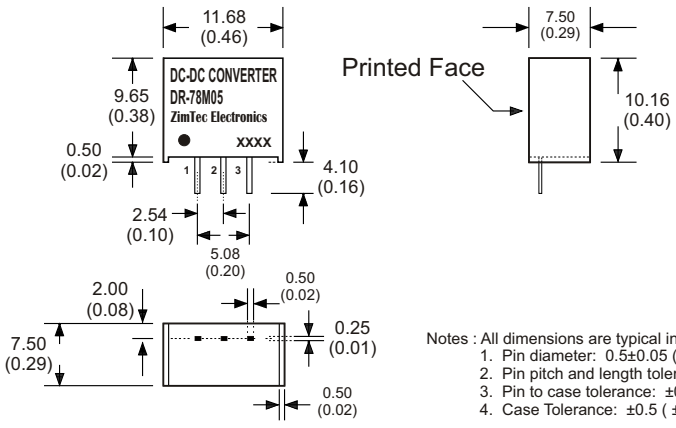
Radiated Emissions	EN55022	CLASS B
Conducted Emissions(4)	EN55022	CLASS B
ESD	IEC61000-4-2	Perf. Criteria A
RS	IEC61000-4-3	Perf. Criteria A
EFT(5)	IEC61000-4-4	Perf. Criteria A
CS	IEC61000-4-6	Perf. Criteria A
PFMF	IEC61000-4-8	Perf. Criteria A

ABSOLUTE MAXIMUM RATINGS(6)

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Voltage	34 Vdc, max.
Soldering Temperature (1.5mm from case 10 sec. max.)	260°C, max.

MECHANICAL SPECIFICATIONS



PIN CONNECTIONS	
PIN NUMBER	SINGLE
1	+V Input
2	GND
3	+V Output

Notes : All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5±0.05 (0.02±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Pin to case tolerance: ±0.5 (±0.02)
4. Case Tolerance: ±0.5 (±0.02)

DR-78M 0.5A Output Current, Non-Isolated DC/DC converter

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT	INPUT Current (mA)			OUTPUT	OUTPUT Current (mA)		EFFICIENCY		Capacitor Load(uF)
	Voltage Range (Vdc)	No-Load (Max)	Full Load		Voltage (Vdc)	Min. Load (mA)	Full Load (mA)	Vin (Min) @FL(%)	Vin (Max) @FL(%)	
			Vin(Min)	Vin(Max)						
DR-78M1R5	4.75-30	8.0	202.00	38.00	1.5	50.0	500	78	65	220
DR-78M1R8	4.75-34	8.0	231.00	38.00	1.8	50.0	500	82	70	220
DR-78M2R5	4.75-34	8.0	302.00	48.00	2.5	50.0	500	87	76	220
DR-78M3R3	4.75-34	8.0	381.00	60.00	3.3	50.0	500	91	81	220
DR-78M05	6.5-34	8.0	409.00	86.00	5.0	50.0	500	94	85	220
DR-78M6R5	8.0-34	8.0	427.00	108.00	6.5	50.0	500	95	88	220
DR-78M7R2	9.0-34	8.0	421.00	118.00	7.2	50.0	500	95	89	220
DR-78M09	11-34	8.0	426.00	144.00	9.0	50.0	500	96	92	220
DR-78M12	15-34	8.0	412.00	188.00	12	50.0	500	97	94	220
DR-78M15	18-34	8.0	430.00	232.00	15	50.0	500	97	95	220

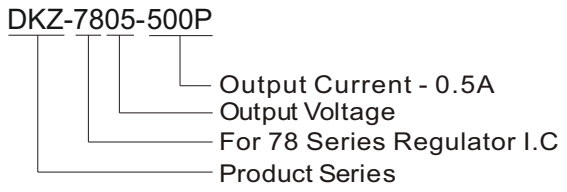
DKZ-78-500P Series

0.5A Non-Isolated, Regulated Singel Output

FEATURES

- Efficiency upto 96%
- Operating temperature range: -40°C to +85°C
- Low ripple & noise
- Supporting negative output perfectly
- Short circuit protection and overheat protection
- Subminiature SIP package, meeting requirements of UL94-V0
- Pin-out compatible with LM78XX series
- EN60950 approved

PART NUMBER STRUCTURE



INPUT SPECIFICATIONS

Item	Operating Conditions	Min.	Typ.	Max.	Unit
No-load Power Consumption	Input voltage range	--	0.12	0.256	W
Reverse Polarity Input		Forbidden			
Input Filter		Capacitor filter			

OUTPUT SPECIFICATIONS

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	100% load, input voltage range		--	±2	±3	%
Line Regulation	Input voltage range		--	±0.2	±0.4	
Load Regulation	10%-100% load		--	±0.4	±0.6	
Ripple & Noise*	20MHz bandwidth (refer to Fig. 2)	Positive output	--	20	30	mVp-p
		Negative output	--	20	35	
Temperature Drift Coefficient	-40℃ to +85℃		--	--	±0.02	%/°C
Over temperature Protection	IC built-in		--	--	160	°C
Output short circuit protection			Continuous, self-recovery			
Transient response deviation	Nominal input, 25% load step change		--	55	250	mV
Transient recovery time			--	0.5	1	ms
Thermal impedance			--	85	--	°C / W

Note: * Ripple and noise tested with “parallel cable” method, please see *DC-DC Converter Application Notes* for specific operation methods.

GENERAL SPECIFICATIONS

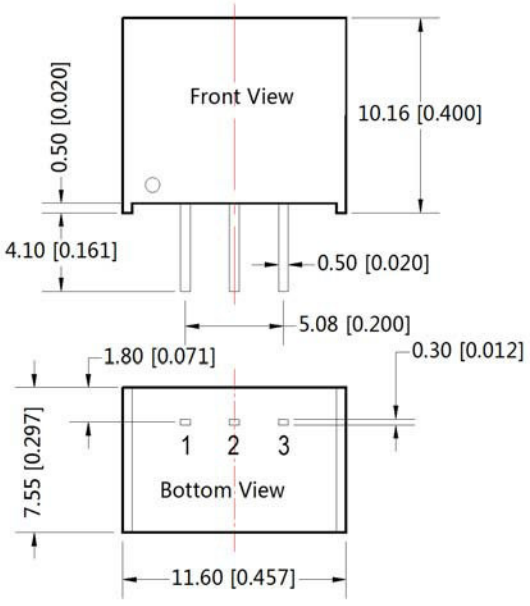
Item	Operating Condition	Min.	Typ.	Max.	Unit
Operating Temperature	Derating if the temperature ≥71℃ (see Fig. 1)	-40	--	85	°C
Storage Temperature		-55	--	125	
Max. Operating Temperature for casing	Within the operating temperature curve	--	--	100	
Pin Welding Resistance Temperature	Welding spot is 1.5mm away from the casing, 10 seconds	--	--	300	
Storage Humidity	Non-condensing	--	--	95	%RH
Switching Frequency	100% load, input voltage range	280	330	450	KHz
MTBF	MIL-HDBK-217F@25	2000	--	--	K hours
Safety-regulated Certification		EN60950			

DKZ-78-500P 0.5A Output Current, Non-Isolated DC/DC converter

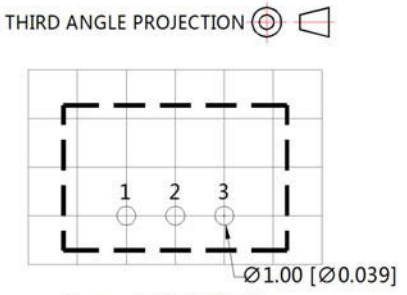
PHYSICAL SPECIFICATIONS	
Casing Material	Black flame-retardant and heat-resistant plastic (UL94-V0)
Package Dimensions	11.60*7.55*10.16 mm
Weight	2.00g (Typ.)
Cooling Method	Free air convection

EMC SPECIFICATIONS				
EMI	Conducted Disturbance	CISPR22/EN55022	CLASS B (see Fig. 6-② for recommended circuit)	
	Radiated Emission	CISPR22/EN55022	CLASS B (see Fig. 6-② for recommended circuit)	
EMS	Electrostatic Discharge	IEC/EN 61000-4-2	Contact ±4KV	perf. Criteria B
	Radiation Immunity	IEC/EN 61000-4-3	10V/m	perf. Criteria A
	EFT	IEC/EN 61000-4-4	±1KV (see Fig. 6-① for recommended circuit)	perf. Criteria B
	Surge Immunity	IEC/EN 61000-4-5	±1KV (see Fig. 6-① for recommended circuit)	perf. Criteria B
	Conducted Disturbance Immunity	IEC/EN 61000-4-6	3Vr.m.s	perf. Criteria A
	Voltage dip, drop and short interruption	IEC/EN 61000-4-29	0%-70%	perf. Criteria B

MECHANICAL SPECIFICATIONS



Note:
Unit :mm[inch]
Pin section tolerances:±0.10[±0.004]
General tolerances:±0.25[±0.010]



Note : Grid 2.54*2.54mm

Pin-Out		
Pin	Positive Output	Nagetive Output
1	Vin	Vin
2	GND	-Vo
3	+Vo	GND

DKZ-78-500P 0.5A Output Current, Non-Isolated DC/DC converter

MODEL SELECTION GUIDE

Certification	Part No.	Input Voltage (VDC)		Output		Efficiency (%/Typ.) (Min. Vin)/ (Max. Vin)	Max. Capacitive Load(μF)
		Nominal	Range	Output Voltage (VDC)	Output Current (mA)		
CE	DKZ-7801-500P	12	4.75-28	1.5	500	77/66	1000
		12	*4.75-25	-1.5	-400	66/64	470
	DKZ-78X2-500P	12	4.75-28	1.8	500	81/69	1000
		12	*4.75-25	-1.8	-400	70/68	470
	DKZ-7802-500P	12	4.75-28	2.5	500	87/76	1000
		12	*4.75-25	-2.5	-400	73/73	470
	DKZ-7803-500P	24	4.75-28	3.3	500	91/81	1000
		12	*4.75-25	-3.3	-400	74/78	470
	DKZ-7805-500P	24	6.5-32	5.0	500	94/86	1000
		12	6.5-27	-5.0	-400	78/83	470
--	DKZ-78X5-500P	24	7-32	5.2	500	94/86	1000
CE	DKZ-78X6-500P	24	8-32	6.5	500	94/87	1000
		12	6.5-25	-6.5	-300	82/84	470
	DKZ-7809-500P	24	11-32	9.0	500	95/91	1000
		12	7.0-23	-9.0	-200	85/86	470
	DKZ-7812-500P	24	15-32	12	500	95/92	1000
		12	7-20	-12	-200	83/87	470
	DKZ-7815-500P	24	18-32	15	500	96/93	1000
		12	7-17	-15	-200	81/87	470

DR-78-1A Series

1A Output Current,Non-Isolated DC/DC converter

Features

- 3 Pin SIL
- Non isolated,No need for heatsinks
- Wide Input Range,Step-down switching dc-dc converter
- Full SMD Technology
- Continuous Short Circuit Protection
- Pin-out compatible with LM78XX three terminals positive Regulator
- Efficiency up to 94%
- -40 ~ 85°C Operation Temperature Range

continuous short circuit protection

PART NUMBER STRUCTURE

DR - 78 3R3 - 1.0

- DR: Series Name
- 78: For 78M Series Regulator I.C.
- 3R3: Output Voltage
  - 1R5 - 1.5V
  - 1R8 - 1.8V
  - 2R5 - 2.5V
  - 3R3 - 3.3V
  - 05 - 5V
- 1.0: Output Current - 1A

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS

Voltage accuracy	±2%
Line regulation	±0.5%
Load regulation	(From 10% to 100% Load) ±0.6%
Ripple & noise (20 MHz bandwidth)(1)	60mV pk-pk, max.
Short Circuit Protection	Indefinite(Automatic Recovery)
Temperature coefficient	±0.02%/°C
Capacitor load(2)	See table

INPUT SPECIFICATIONS

Voltage Range	See table
Input Current	See table
No-Load Input Current	See table
Input Filter	Capacitors
Input Reflected Ripple Current(3)	40mA pk-pk

GENERAL SPECIFICATIONS

Efficiency	See table
Switching Frequency	330kHz, typ.
Humidity	95% rel H
Reliability Calculated MTBF(MIL-HDBK-217 F)	>4.3Mhrs

ENVIRONMENT SPECIFICATIONS

Operating Temperature	-40°C~85°C(See Derating Curve) -40°C~60°C(For 100% load)
Maximum Case Temperature	100°C
Storage Temperature	-40°C~125°C
Cooling	Nature Convection

PHYSICAL SPECIFICATIONS

Case Material	Non-conductive Black Plastic(UL94V-0 rated)
Pin Material	C5191R-H Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	2.0g
Dimensions	0.46"x0.29"x0.40"

EMC CHARACTERISTICS

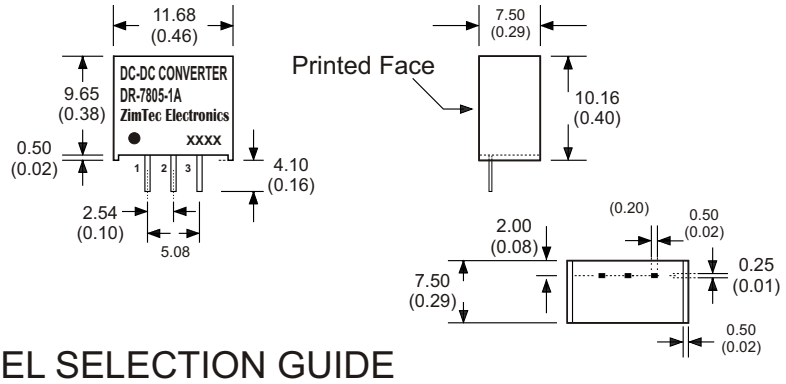
Radiated Emissions	EN55022	CLASS B
Conducted Emissions(4)	EN55022	CLASS B
ESD	IEC61000-4-2	Perf. Criteria A
RS	IEC61000-4-3	Perf. Criteria A
EFT(5)	IEC61000-4-4	Perf. Criteria A
CS	IEC61000-4-6	Perf. Criteria A
PFMF	IEC61000-4-8	Perf. Criteria A

ABSOLUTE MAXIMUM RATINGS(6)

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.

Input Surge Voltage(100mS)	20 Vdc, max.
Soldering Temperature (1.5mm from case 10 sec. max.)	260°C, max.

MECHANICAL SPECIFICATIONS



PIN CONNECTIONS	
PIN NUMBER	SINGLE
1	+V Input
2	GND
3	+V Output

Notes : All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5±0.05 (0.02±0.002)
2. Pin pitch and length tolerance: ±0.35 (±0.014)
3. Pin to case tolerance: ±0.5 (±0.02)
4. Case Tolerance: ±0.5 (±0.02)

MODEL SELECTION GUIDE

MODEL NUMBER	INPUT	INPUT Current (mA)		OUTPUT	OUTPUT Current (mA)		EFFICIENCY		Capacitor Load(uF)
	Voltage Range (Vdc)	No-Load (Max)	Full Load Vin(Min)	Full Load Vin(Max)	Voltage (Vdc)	Min. Load (mA)	Full Load (mA)	Vin (Min) @FL(%)	Vin (Max) @FL(%)	
DR-781R5-1A	4.75-18	10.0	416.00	119.00	1.5	100.0	1000	78	72	220
DR-781R8-1A	4.75-18	10.0	474.00	135.00	1.8	100.0	1000	82	76	220
DR-782R5-1A	4.75-18	10.0	619.00	176.00	2.5	100.0	1000	87	81	220
DR-783R3-1A	4.75-18	10.0	790.00	221.00	3.3	100.0	1000	90	85	220
DR-7805-1A	6.5-18	10.0	836.00	319.00	5.0	100.0	1000	94	89	220

DKZ-78-1000 (L) Series

1A Non-Isolated, Regulated Singel Output

FEATURES

- **Efficiency upto 97%**
- **Operating temperature range: -40°C to +85°C**
- **Pin-out compatible with LM78XX Linear**
- **Short circuit protection, thermal shutdown**
- **Low ripple & noise**
- **Micro miniature SIP package**
- **No heatsink requred**
- **Industry standard pinout**
- **MTBF>2,000,000 hours**

PART NUMBER STRUCTURE

DKZ-7805-1000(L)

- Add suffix"L" for 90° bend pins
- Output Current - 1A
- Output Voltage
- For 78 Series Regulator I.C
- Product Series

OUTPUT SPECIFICATIONS

Item	Test conditions		Min.	Typ.	Max.	Units
Output voltage accuracy	100% full load			±2	±3	%
Line regulation	Vin=min. to max. at full load			±0.2	±0.4	
Load regulation*	10% to 100% load			±0.4	±0.6	
Ripple & Noise	20MHz bandwidth (refer to figure 3)			25	35	mVp-p
Short circuit input power**				0.5	1.8	W
Short circuit protection				Continuous, automatic recovery		
Thermal shutdown	Internal IC junction			150		°C
Switching frequency	100% full load		280	330	450	KHz
Output current limit	Vin= min. to max. (at full load)	Vout:1.5V~3.3V			3000	mA
		Vout:5V~15V			2000	
Quiescent current				5	8	mA
Temperature coefficient	-40°C ~ +85°C ambient				±0.02	%/°C
Max capacitance load					1000	μF

*DKZ78X2-1000 is ±0.75%(Max), **DKZ7801-1000 is 4W(Max).

COMMONSPECIFICATIONS

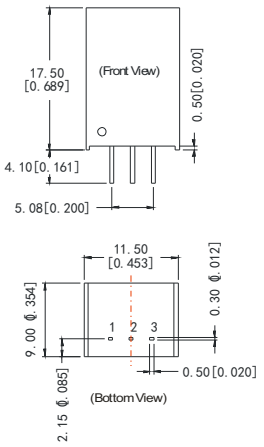
Item	Test conditions	Min.	Typ.	Max.	Units
Storage humidity				95	%
Operating temperature	Power derating (above 71°C)	-40		85	°C
Operating case temp.				100	
Storage temperature		-55		125	
Lead temperature	1.5mm from case for 10 seconds			300	
Cooling					
Case material					
MTBF	25℃ (MIL-HDBK-217F)	2000			k hours
Weight			3.7		g

DKZ-78-1000(L) 1A Output Current, Non-Isolated DC/DC converter

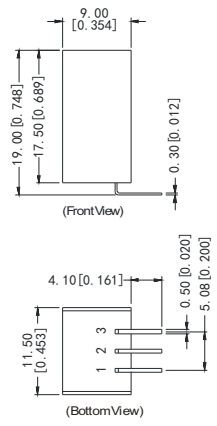
MECHANICAL SPECIFICATIONS

MECHANICAL DIMENSIONS

DKZ78XX



DKZ78XX-L

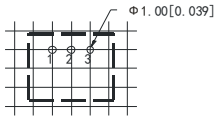


FOOTPRINT DETAILS	
Pin	Function
1	+Vin
2	GND
3	+Vout

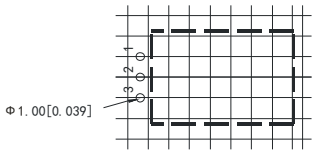
Note:
Unit:mm[inch]
Pin section tolerances:±0.10mm[±0.004inch]
General tolerances:±0.25mm[±0.010inch]

RECOMMENDED FOOTPRINT

DKZ78XX

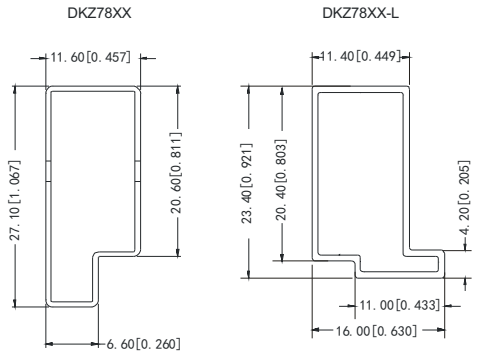


DKZ78XX-L



Note: grid 2.54*2.54mm.

TUBE OUTLINE DIMENSIONS



Note:
Unit:mm[inch]
General tolerances:±0.50mm[±0.020inch]
L=530mm[20.866inch] Devices per tube quantity: 44pcs
L=220mm[8.661inch] Devices per tube quantity: 17pcs
Short tube inner packaging dimensions: L*W*H=255*170*80mm
Short tube outer packaging dimensions(with six inner packaging boxes): L*W*H=375*280*270mm
Long tube inner packaging dimensions: L*W*H=580*200*100mm
Long tube outer packaging dimensions(with two inner packaging boxes): L*W*H=600*215*220mm
Long tube outer packaging dimensions(with three inner packaging boxes): L*W*H=600*215*325mm

MODEL SELECTION GUIDE

Part No.	Input Voltage (VDC)		Output		Efficiency (%/Typ.)	
	Nominal	Range	Output Voltage (VDC)	Output Current (mA)	Vin (min.)	Vin (max.)
DKZ-7801-1000(L)	12	4.75-26	1.5	1000	80	71
DKZ-78X2-1000(L)	12	4 75-26	1 8	1000	83	74
DKZ-7802-1000(L)	12	4 75 28	2 5	1000	88	80
DKZ-7803-1000(L)	24	4.75~28	3.3	1000	90	83
DKZ-7805-1000(L)	24	6.5~32	5.0	1000	93	88
DKZ-78X6-1000(L)	24	9 0~32	6 5	1000	94	90
DKZ-7809-1000(L)	24	12~32	9.0	1000	95	92
DKZ-7812-1000(L)	24	16~32	12	1000	96	94
DKZ-7815-1000(L)	24	20~32	15	1000	97	94
Add suffix "L" for 90° bend pins, for example: DKZ-7805-1000L						

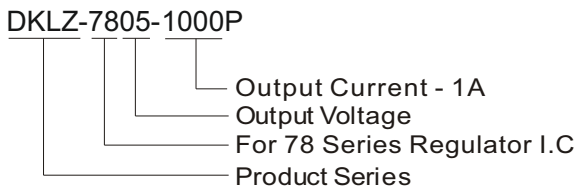
DKLZ-78-1000P Series

1A Non-Isolated, Regulated Singel Output

FEATURES

- Efficiency upto 91%
- Low ripple & noise
- Without heatsink
- Short circuit protection and overheat protection
- Pin-out compatible with LM78XX Linear
- Operating temperature range: -40°C to +85°C
- Subminiature SIP package meeting requirements of UL94-V0
- Low cost
- Industry standard pinout

PART NUMBER STRUCTURE



INPUT SPECIFICATIONS

Item	Operating Conditions	Min.	Typ.	Max.	Unit
No-load Power Consumption	Input voltage range	--	--	0.27	W
Reverse Polarity Input		Forbidden			
Input Filter		Capacitor filter			

OUTPUT SPECIFICATIONS

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	100% load, input voltage range	–	±2	±3	%
Line Regulation	Input voltage range	–	±0.4	±0.75	
Load Regulation	10%-100% load	–	±0.5	±1.0	
Ripple & Noise*	20MHz bandwidth (refer to Fig. 2)	–	20	35	mVp-p
Temperature Drift Coefficient	-40℃ to +85℃	–	–	±0.025	% /℃
Over temperature Protection	IC built-in	–	–	160	℃
Output short circuit protection		Continuous, self-recovery			
Transient response deviation	Nominal input, 25% load step change	--	55	250	mV
Transient recovery time		--	0.5	3	mS
Thermal impedance		--	85	--	℃/ W

Note: * Ripple and noise tested with “parallel cable” method, please see *DC-DC Converter Application Notes* for specific operation methods.

GENERAL SPECIFICATIONS

Item	Operating Condition	Min.	Typ.	Max.	Unit
Operating Temperature	Derating if the temperature ≥71℃ (see Fig. 1)	-40	--	85	℃
Storage Temperature		-55	--	125	
Max. Operating Temperature for casing	Within the operating temperature curve	--	--	100	
Pin Welding Resistance Temperature	Welding spot is 1.5mm away from the casing, 10 seconds	--	--	300	
Storage Humidity	Non-condensing	--	--	95	%RH
Switching Frequency	100% load, input voltage range	350	400	450	KHz
MTBF	MIL-HDBK-217F@25℃	1000	--	--	K hours

Physical Specifications

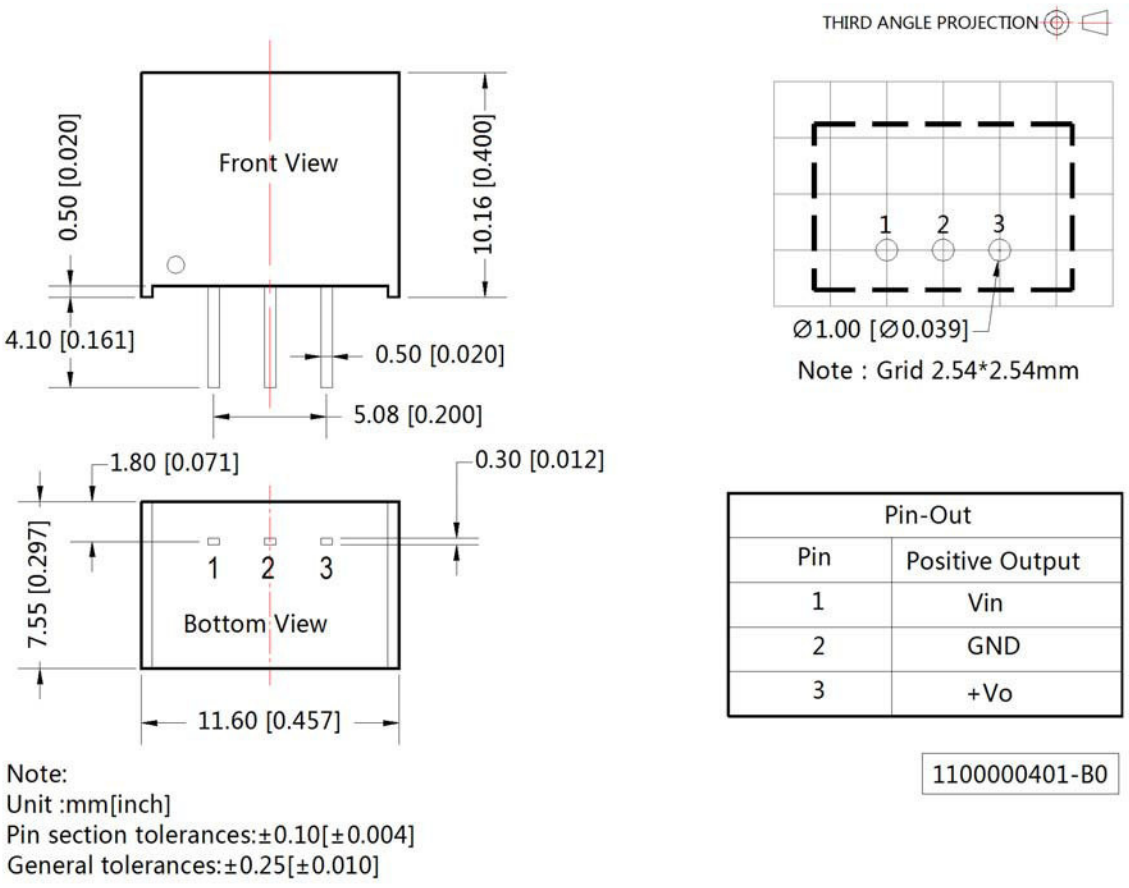
Casing Material	Black flame-retardant and heat-resistant plastic (UL94-V0)
Package Dimensions	11.60*7.55*10.16 mm
Weight	2.00g (Typ.)
Cooling Method	Free air convection

DKLZ-78-1000P 1A Output Current, Non-Isolated DC/DC converter

EMC SPECIFICATIONS

EMI	Conducted Disturbance	CISPR22/EN55022	CLASS B	(see Fig. 4-② for recommended circuit)	
	Radiated Emission	CISPR22/EN55022	CLASS B	(see Fig. 4-② for recommended circuit)	
EMS	Electrostatic Discharge	IEC/EN 61000-4-2	Contact ±4KV		perf. Criteria B
	Radiation Immunity	IEC/EN 61000-4-3	10V/m		perf. Criteria A
	EFT	IEC/EN 61000-4-4	±1KV	(see Fig. 4-① for recommended circuit)	perf. Criteria B
	Surge Immunity	IEC/EN 61000-4-5	±1KV	(see Fig. 4-① for recommended circuit)	perf. Criteria B
	Conducted Disturbance Immunity	IEC/EN 61000-4-6	3Vr.m.s		perf. Criteria A
	Voltage dip, drop and short interruption	IEC/EN 61000-4-29	0%-70%		perf. Criteria B

MECHANICAL SPECIFICATIONS



Pin-Out	
Pin	Positive Output
1	Vin
2	GND
3	+Vo

1100000401-B0

Note:
Unit :mm[inch]
Pin section tolerances:±0.10[±0.004]
General tolerances:±0.25[±0.010]

MODEL SELECTION GUIDE

Part No.	Input Voltage (VDC)	Output		Efficiency (%/Typ.) (Min. Vin)/ (Max. Vin)	Max. Capacitive Load(μF)
	Nominal (Range)	Output Voltage (VDC)	Output Current (mA)		
DKLZ-7801-1000P	12 (4.75-18)	1.5	1000	75/71	1000
DKLZ-78X2-1000P		1.8	1000	78/75	
DKLZ-7802-1000P		2.5	1000	84/80	
DKLZ-7803-1000P		3.3	1000	86/83	
DKLZ-7805-1000P	12 (6.5-18)	5.0	1000	91/88	

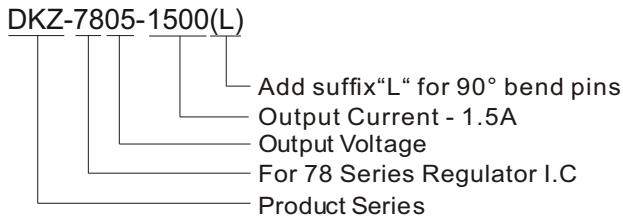
DKZ-78-1500(L) Series

1.5A Non-Isolated, Regulated Singel Output

FEATURES

- **Efficiency up to 95%, No heatsink required**
- **1.5A large current output**
- **Operating temperature range: -40°C to +85°C**
- **Short circuit protection, thermal shutdown**
- **Low ripple & noise**
- **Micro miniature SIP package, meet UL94-V0 requiremnt**
- **Ultra low power loss**
- **Industry standard pinout**
- **Pin-out compatible with LM78XX Linear**
- **MTBF>2,000,000 hours**

PART NUMBER STRUCTURE



OUTPUT SPECIFICATIONS

Item	Test conditions	Min.	Typ.	Max.	Units
Output voltage accuracy	100% full load, input voltage range		±2	±3	%
Line regulation	Vin=min. to max. at full load		±0.5	±0.75	
Load regulation*	10% to 100% load		±0.5	±1.0	
Ripple & Noise	20MHz bandwidth (refer to figure 3)		20	45	mVp-p
Short circuit input power**			0.5	1.8	W
Short circuit protection		Continuous, automatic recovery			
Thermal shutdown	Internal IC junction		150		°C
Switching frequency	Full load, input voltage range	300	340	380	KHz
Output current limit			5000		mA
Quiescent current			5	10	mA
Temperature coefficient	-40°C ~ +85°C ambient			±0.02	%/°C
Max capacitance load				1000	μF

*Test ripple and noise by "parallel cable" method.

COMMON SPECIFICATIONS

Operating temp. range	-40~+85 ℃(above 71°C power derating)
Operating case temp.	+100 ℃(max)
Storage temp. range	-55~+125 ℃
Cooling	Free air convection
Lead temperature**	300 ℃(max)
Storage humidity range	≤ 95%
Case material	Plastic(UL94-V0)
MTBF	> 2000k hours (25℃,MIL-HDBK-217F)
Weight	4.0g
Conducted emissions (Refer to Figure 5)	EN55022 CLASS B
Radiated emissions	EN55022 CLASS B
ESD	EN61000-4-2 Level 3 6kV/8kV perf. Criteria B

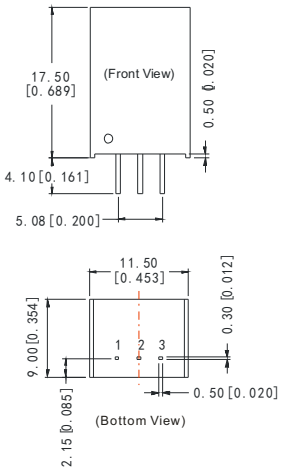
**1.5mm from case for 10 seconds

DKZ-78-1500(L) 1.5A Output Current, Non-Isolated DC/DC converter

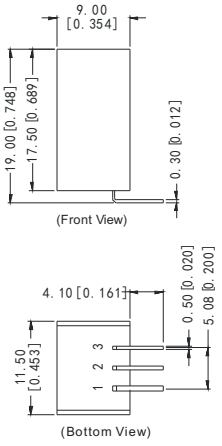
MECHANICAL SPECIFICATIONS

MECHANICAL DIMENSIONS

DKZ-78XX



DKZ-78XX-L

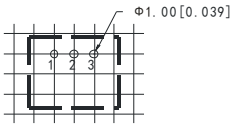


FOOTPRINT DETAILS	
Pin	Function
1	+Vin
2	GND
3	+Vout

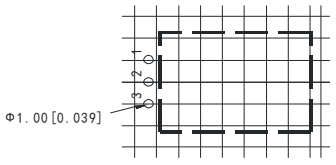
Note:
Unit:mm[inch]
Pin section tolerances:±0.10mm[±0.004inch]
General tolerances:±0.25mm[±0.010inch]

RECOMMENDED FOOTPRINT

DKZ-78XX



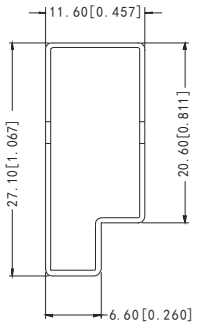
DKZ-78XX-L



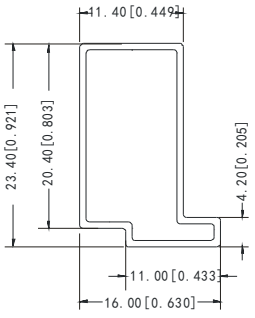
Note: grid 2.54*2.54mm.

TUBE OUTLINE DIMENSIONS

DKZ-78XX



DKZ-78XX-L



Note:
Unit:mm[inch]
General tolerances:±0.50mm[±0.020inch]
L=530mm[20.866inch] Devices per tube quantity: 44pcs
L=220mm[8.661inch] Devices per tube quantity: 17pcs
Short tube inner packaging dimensions: L*W*H=255*170*80mm
Short tube outer packaging dimensions(with six inner packaging boxes): L*W*H=375*280*270mm
Long tube inner packaging dimensions: L*W*H=580*200*100mm
Long tube outer packaging dimensions(with two inner packaging boxes): L*W*H=600*215*220mm
Long tube outer packaging dimensions(with three inner packaging boxes): L*W*H=600*215*325mm

MODEL SELECTION GUIDE

Part No.	Input Voltage (VDC)		Output		Efficiency (%/Typ.)	
	Nominal	Range	Output Voltage (VDC)	Output Current (mA)	Vin (min.)	Vin (max.)
DKZ-7801-1500(L)	12	4.75~18	1.5	1500	83	78
DKZ-78X2-1500(L)	12	4.75~18	1 8	1500	85	81
DKZ-7802-1500(L)	12	4.75~18	2 5	1500	88	85
DKZ-7803-1500(L)	12	4.75~18	3.3	1500	91	88
DKZ-7805-1500(L)	12	6.5~18	5.0	1500	93	91
DKZ-78X6-1500(L)	12	8~18	6 5	1500	95	93

Add suffix “L” for 90° bend pins, for example: DKZ-7805-1500L

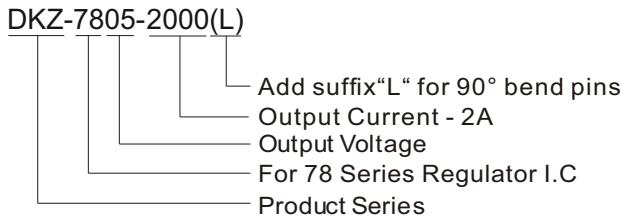
DKZ-78-2000(L) Series

2A Non-Isolated, Regulated Singel Output

FEATURES

- **Efficiency up to 92%, No heatsink required**
- **2A large current output**
- **Operating temperature range: -40°C to +85°C**
- **Short circuit protection, thermal shutdown**
- **Low ripple & noise**
- **Micro miniature SIP package, meet UL94-V0 requiremnt**
- **Ultra low power loss**
- **Industry standard pinout**
- **Pin-out compatible with LM78XX Linear**
- **MTBF>2,000,000 hours**

PART NUMBER STRUCTURE



OUPUT SPECIFICATIONS

Item	Test conditions	Min.	Typ.	Max.	Units
Output voltage accuracy	100% full load, input voltage range		±2	±3	%
Line regulation	Vin=min. to max. at full load		±0.5	±0.75	
Load regulation*	10% to 100% load		±0.5	±1.0	
Ripple & Noise	20MHz bandwidth (refer to figure 3)		20	45	mVp-p
Short circuit input power**			0.5	1.8	W
Short circuit protection		Continuous, automatic recovery			
Thermal shutdown	Internal IC junction		150		°C
Switching frequency	Full load, input voltage range	300	340	380	KHz
Output current limit			5000		mA
Quiescent current			5	10	mA
Temperature coefficient	-40°C ~ +85°C ambient			±0.03	%/°C
Max capacitance load				1000	μF

*Test ripple and noise by "parallel cable" method.

COMMONSPECIFICATIONS

Operating temp. range	-40~+85 ℃(above 71°C power derating)
Operating case temp.	+100 ℃(max)
Storage temp. range	-55~+125 ℃
Cooling	Free air convection
Lead temperature**	300 ℃(max)
Storage humidity range	≤ 95%
Case material	Plastic(UL94-V0)
MTBF	> 2000k hours (25℃,MIL-HDBK-217F)
Weight	4.0g
Conducted emissions (Refer to Figure 5)	EN55022 CLASS B
Radiated emissions	EN55022 CLASS B
ESD	EN61000-4-2 Level 3 6kV/8kV perf. Criteria B

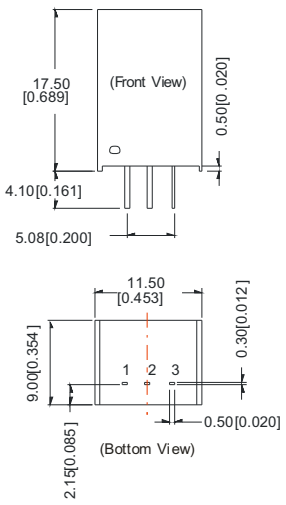
**1.5mm from case for 10 seconds

DKZ-78-2000(L) 2A Output Current, Non-Isolated DC/DC converter

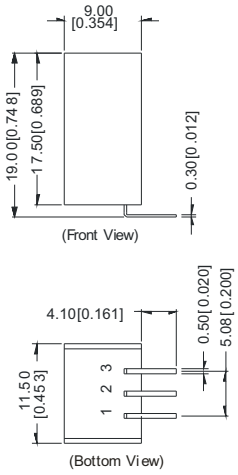
MECHANICAL SPECIFICATIONS

MECHANICAL DIMENSIONS

DKZ-78XX



DKZ-78XX-L

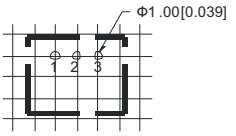


FOOTPRINT DETAILS	
Pin	Function
1	+Vin
2	GND
3	+Vout

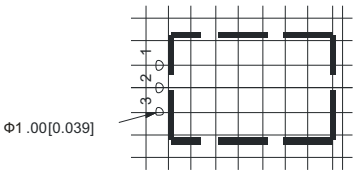
Note:
Unit:mm[inch]
Pin section tolerances:±0.10mm[±0.004inch]
General tolerances:±0.25mm[±0.010inch]

RECOMMENDED FOOTPRINT

DKZ-78XX



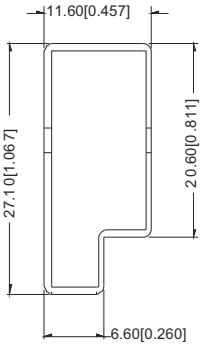
DKZ-78XX-L



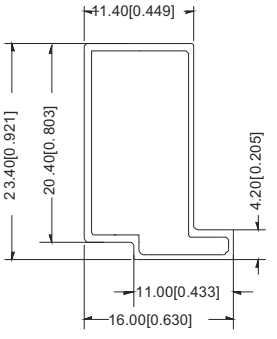
Note: grid 2.54 * 2.54mm.

TUBE OUTLINE DIMENSIONS

DKZ-78XX



DKZ-78XX-L



Note:
Unit:mm[inch]
General tolerances:±0.50mm[±0.020inch]
L=530mm[20.866inch] Devices per tube quantity: 44pcs
L=220mm[8.661inch] Devices per tube quantity: 17pcs
Short tube inner packaging dimensions: L*W*H=255*170 *80mm
Short tube outer packaging dimensions(with six inner packaging boxes):
L*W*H=375*280*270mm
Long tube inner packaging dimensions: L*W*H=580*200*1 00mm
Long tube outer packaging dimensions(with two inner p ackaging boxes):
L*W*H=600*215*220mm
Long tube outer packaging dimensions(with three inner packaging boxes):
L*W*H=600*215*325mm

MODEL SELCTION GUIDE

Part No.	Input Voltage (VDC)		Output		Efficiency (%/Typ.)	
	Nominal	Range	Output Voltage (VDC)	Output Current (mA)	Vin (min.)	Vin (max.)
DKZ-7801-2000(L)	12	4.75~18	1.5	2000	79	76
DKZ-78X2-2000(L)	12	4.75~18	1 8	2000	81	79
DKZ-7802-2000(L)	12	4.75~18	2 5	2000	85	83
DKZ-7803-2000(L)	12	4.75~18	3.3	2000	87	86
DKZ-7805-2000(L)	12	7~18	5.0	2000	91	88
DKZ-78X6-2000(L)	12	8.5~18	6 5	2000	92	92

Add suffix “L” for 90° bend pins, for example: DKZ-7805-2000L

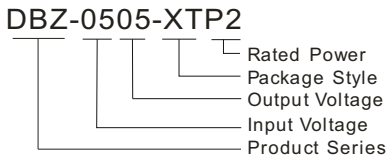
DBZ-XTP2 Series

0.25W Fixed Input, Unregulated Singel Output

FEATURES

- **1500VDC isolation**
- **Efficiency up to 80%**
- **Operating temperature range: -40°C to +105°C**
- **Ultra-Low ripple & noise: 10&20 mVp-p**
- **Miniature SMD package**
- **Internal SMD construction**
- **Industry standard pinout**

PART NUMBER STRUCTURE



DBZ_XTP2 Series

0.25W, FIXED INPUT, ISOLATED & UNREGULATED SINGLE OUTPUT

INPUT SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Input Surge Voltage (1 Sec. Max.)	5VDC Input	-0.7	--	9	VDC
	12VDC Input	-0.7	--	18	
Input Filter		Capacitance Filter			

OUTPUT SPECIFICATIONS

Item	Test Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy			See tolerance envelope curve			
Line Regulation	For Vin change of±1%		--	--	±1.2	%
Load Regulation	10% to 100% load	5V output	--	12	15	
		12V output	--	7	10	
Temperature Drift	100% load		--	--	±0.03	%/°C
Ripple & Noise*	20MHz Bandwidth		--	10&20	--	mVp-p
Short Circuit Protection			Continuous, automatic recovery			

Note:* Ripple and noise tested with "parallel cable" method. See detailed operation instructions at *DC-DC application notes*.

COMMON SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-Output, tested for 1 minute and leakage current less than 1 mA	1500	--	--	VDC
Isolation Resistance	Input-Output, test at 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-Output,100KHz/0.1V	--	20	--	pF
Switching Frequency	100%load,nominal input	--		300	KHz
MTBF	MIL-HDBK-217F@25℃	3500	--	--	K hours
Case Material		Epoxy Resin (UL94-V0)			
Weight		--	1.5	--	g

ENVIRONMENTAL SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Storage Humidity	Non condensing	--	--	95	%
Operating Temperature	Power derating (above100℃)	-40	--	105	°C
Storage Temperature Coefficient		-55	--	125	
Temp. rise at full load	Ta=25°C	--	15	--	
Soldering Temperature	1.5mm from case for 10 seconds	--	--	300	
Cooling		Free air convection			

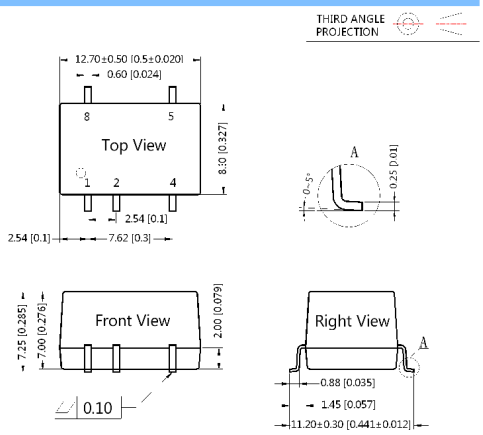
EMC SPECIFICATIONS

EMI	CE	CISPR22/EN55022 CLASS B（Typical Recommended Circuit to Figure1）
	RE	CISPR22/EN55022 CLASS B（Typical Recommended Circuit to Figure1）
EMS	ESD	IEC/EN61000-4-2 Contact ±8KV perf. Criteria B

DBZ-XTP2 0.25W SMD, Fixed Input, Unregulated Single Output, DC/DC converter

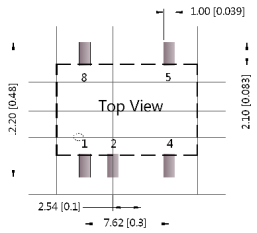
MECHANICAL SPECIFICATIONS

MECHANICAL DIMENSIONS



Note:
Unit: mm[inch]
Pin section tolerances: ± 0.10mm[± 0.004inch]
General tolerances: ± 0.25mm[± 0.010inch]

RECOMMENDED FOOTPRINT DETAILS

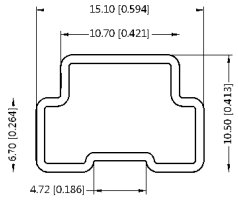


Note : Grid 2.54*2.54mm

PIN CONNECTION	
Pin	Function
1	GND
2	Vin
4	0V
5	+Vo
8	NC

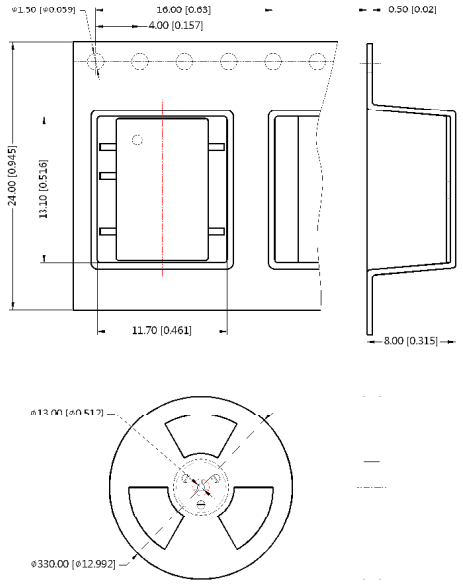
NC:No Connection

TUBE PACKAGING DIMENSIONS



Note:
Unit: mm[inch]
General tolerances:±0.50mm[±0.020inch]
L=530mm[20.866inch] Quantity:40pcs;
L=220mm[8.661inch] Quantity:15pcs;
Inner carton(S):L*W*H=255*170*80mm;
Outer carton(S):L*W*H=375*280*270mm;
Inner carton(L):L*W*H=580*200*100mm;
Outer carton(L): L*W*H=600*215*220mm,2 inner cartons(L);
Outer carton(L): L*W*H=600*215*325mm,3 inner cartons(L).

REEL PACKAGING DIMENSIONS



Note:
Unit: mm[inch]
General tolerances:±0.50mm[±0.020inch]
Per reel of packing quantity:500pcs;
Inner carton:L*W*H=365*350*105mm
Quantity:2000pcs;
Outer carton:L*W*H=390*360*245 mm
Quantity:4000pcs.

MODEL SELECTION GUIDE

Model	Input Voltage(VDC)	Output Voltage (VDC)	Output Current (mA)		Input Current (mA)(Typ.)		Reflected Ripple Current (mA,Typ.)	Max. Capacitive Load(μF)	Efficiency (%, Typ.) @Max. Load	Approval
	Nominal (Range)		Max.	Min.	@Max. Load	@No Load				
DBZ-0505-XTP2	5(4.5-5.5)	5	50	5	70	15	20	220	80	
DBZ-1205-XTP2	12(10.8-13.2)	5	50	5	40	10	5		80	
DBZ-1212-XTP2		12	21	2	40				80	

DAZ-XT1P Series

1W Fixed Input, Unregulated Dual Output

FEATURES

- **Ultra-Miniature SMD package**
- **1500VDC isolation**
- **Operating temperature range: -40°C to +105°C**
- **Efficiency up to 82%**
- **Internal SMD construction**
- **No external component required**
- **Industry standard pinout**
- **Continuous short circuit protection**

PART NUMBER STRUCTURE

DAZ-0505-XT1P

- Rated Power
- Package
- Output Voltage
- Input Voltage
- Product Series

DAZ_XT1P Series

1W, FIXED INPUT, ISOLATED & UNREGULATED DUAL OUTPUT

INPUT SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Input Surge Voltage (1 sec. max.)	3.3VDC Input	-0.7	--	5	VDC
	5VDC Input	-0.7	--	9	
	12VDC Input	-0.7	--	18	
	24VDC Input	-0.7	--	30	
Input Filter		Capacitor			

OUTPUT SPECIFICATIONS

Item	Test Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy			See tolerance envelope curve			
Line Regulation	For Vin change of ±1%		--	--	±1.2	%
Load Regulation	10% to 100% load	5VDC output	--	12	--	%
		9VDC output	--	8	--	
		12VDC output	--	7	--	
		15VDC output	--	6	--	
		24VDC output	--	5	--	
Temperature coefficient	100% load		--	--	±0.03	%/°C
Ripple & Noise*	20MHz Bandwidth		--	60	--	mVp-p
Short Circuit Protection			Continuous, automatic recovery			

Note:* Ripple and noise tested with “parallel cable” method. See detailed operation instructions at *DC-DC Application Notes*.

COMMON SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-Output, tested for 1 minute and leakage current less than 1 mA	1500	--	--	VDC
Isolation Resistance	Input-Output, test at 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-Output,,100KHz/0.1V	--	20	--	pF
Switching Frequency	Full load, nominal input	--	100	300	KHz
MTBF	MIL-HDFK-217F@25℃	3500	--	--	K hours
Case Material		Epoxy Resin (UL94-V0)			
Weight		--	1.8	--	g

ENVIRONMENTAL SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Storage Humidity	Non condensing	--	--	95	%
Operating Temperature	Power derating (≥100℃, see Figure 2)	-40	--	105	°C
Storage Temperature		-55	--	125	
Case Temperature rise	Ta=25°C	--	25	--	
Lead Temperature	1.5mm from case for 10 seconds	--	--	300	
Cooling		Free air convection			

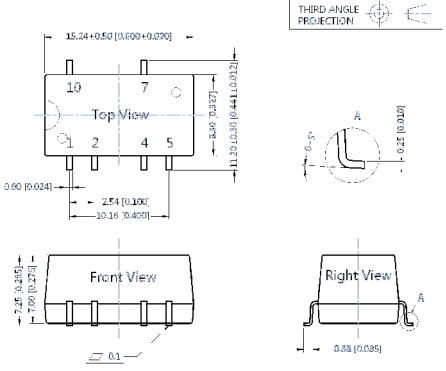
DAZ-XT1P 1W SMD, Fixed Input, Unregulated Dual Output, DC/DC converter

EMC SPECIFICATIONS

EMI	CE	CISPR22/EN55022 CLASS B(Recommended Circuit Refer to Figure1)	
	RE	CISPR22/EN55022 CLASS B(Recommended Circuit Refer to Figure1)	
EMS	ESD	IEC/EN61000-4-2 Contact ±6KV	perf. Criteria B

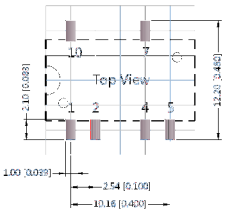
MECHANICAL SPECIFICATIONS

MECHANICAL DIMENSIONS



Note:
Unit: mm[inch]
Pin section tolerances: ±0.10[±0.004]
General tolerances: ±0.25[±0.010]

RECOMMENDED FOOTPRINT DETAILS



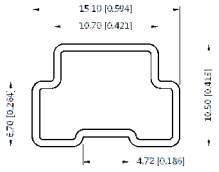
Note: Grid 2.54*2.54mm

PIN CONNECTION

Pin	Function
1	GND
2	Vin
4	0V
5	-Vo
7	+Vo
10	NC

NC: No Connection

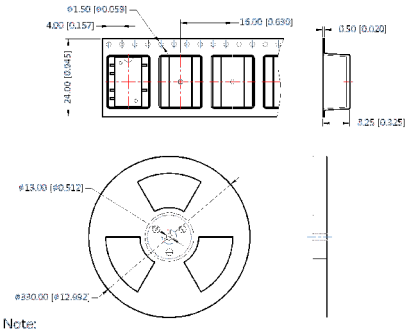
TUBE PACKAGING DIMENSIONS



Note:
Unit: mm[inch]
General tolerances: ±0.50[±0.020]
L=530[20.866] Quantity: 33pcs
L=220[8.661] Quantity: 13pcs
Inner carton(S): L*W*H=255*170*80
Outer carton(S): L*W*H=375*280*270
Inner carton(L): L*W*H=580*200*100
Outer carton(L): L*W*H=600*215*220, 2 inner cartons(L)
Outer carton(L): L*W*H=600*215*325, 3 inner cartons(L)

2EXT1WAI

REEL PACKAGING DIMENSIONS



Note:
Unit: mm[inch]
General tolerances: ±0.50[±0.020]
Per reel of packing quantity: 500pcs
Inner carton: L*W*H=385*350*105
Quantity: 2000pcs
Outer carton: L*W*H=390*360*245
ntity: 4000pcs

DAZ-XT1P 1W SMD, Fixed Input, Unregulated Dual Output, DC/DC converter

MODEL SELECTION GUIDE

Model	Input Voltage(VDC)	Output Voltage (VDC)	Output Current (mA)		Input Current (mA,Typ.)		Reflected Ripple Current (mA,Typ.)	Max. Capacitive Load (μF)	Efficiency (%) @Max. Load	
	Nominal (Range)		Max.	Min.	@Max. Load	@No Load			Min.	Typ.
DAZ-0305-XT1P	3.3 (2.97-3.63)	±5	±100	±10	388	25	15	100	74	78
DAZ-0312-XT1P		±12	±42	±5	379				76	80
DAZ-0315-XT1P		±15	±33	±3	379				76	80
DAZ-0505-XT1P	5 (4.5-5.5)	±5	±100	±10	250	20			76	80
DAZ-0509-XT1P		±9	±56	±6	250				76	80
DAZ-0512-XT1P		±12	±42	±5	247				77	81
DAZ-0515-XT1P		±15	±33	±3	247				77	81
DAZ-0524-XT1P		±24	±21	±2	247				77	81
DAZ-1205-XT1P	12 (10.8-13.2)	±5	±100	±10	104	15			76	80
DAZ-1209-XT1P		±9	±56	±6	104				76	80
DAZ-1212-XT1P		±12	±42	±5	103				77	81
DAZ-1215-XT1P		±15	±33	±3	103				77	81
DAZ-1224-XT1P		±24	±21	±2	103				77	81
DAZ-2405-XT1P	24 (21.6-26.4)	±5	±100	±10	51	7			78	82
DAZ-2409-XT1P		±9	±56	±6	51				78	82
DAZ-2412-XT1P		±12	±42	±5	51				78	82
DAZ-2415-XT1P		±15	±33	±3	51				78	82
DAZ-2424-XT1P		±24	±21	±2	51				78	82

DBZ-XT1P Series

1W Fixed Input, Unregulated Single Output

FEATURES

- **Miniature SMD package**
- **1500VDC isolation**
- **Operating temperature range: -40°C to +105°C**
- **Internal SMD construction**
- **Industry standard pinout**
- **Continuous short circuit protection**

PART NUMBER STRUCTURE

DBZ-0505-XT1P

- Rated Power
- Package
- Output Voltage
- Input Voltage
- Product Series

DBZ_XT1P Series

1W, FIXED INPUT, ISOLATED & UNREGULATED SINGLE OUTPUT

INPUT SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Input Surge Voltage (1 sec. max.)	3.3VDC Input	-0.7	--	5	VDC
	5VDC Input	-0.7	--	9	
	12VDC Input	-0.7	--	18	
	15VDC Input	-0.7	--	21	
	24VDC Input	-0.7	--	30	
Input Filter		Capacitance Filter			

OUTPUT SPECIFICATIONS

Item	Test Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy			See tolerance envelope curve			
Line Regulation	For Vin change of±1%	3.3V output	--	--	±1.5	%
		Others	--	--	±1.2	
Load Regulation	10% to 100% load	3.3V output	--	18	--	
		5V output	--	12	--	
		9V output	--	8	--	
		12V output	--	7	--	
		15V output	--	6	--	
		24V output	--	5	--	
Temperature Drift	100% load		--	--	±0.03	%/°C
Ripple & Noise*	20MHz Bandwidth	Output Voltage ≤12V	--	30	--	mVp-p
		Output Voltage: 15V, 24V	--	60	--	
Short Circuit Protection			Continuous, automatic recovery			
Note:* Ripple and noise tested with “parallel cable” method. See detailed operation instructions at DC-DC Application Notes.						

COMMON SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-Output, tested for 1 minute and leakage current less than 1 mA	1500	--	--	VDC
Isolation Resistance	Input-Output, test at 500VDC	1000	--	--	MΩ
Isolation Capacitance	Inpu-Output,100KHz/0.1V	--	20	--	pF
Switching Frequency	Full load, nominal input	--	100	300	KHz
MTBF	MIL-HDBK-217F@25℃	3500	--	--	K hours
Case Material		Epoxy Resin (UL94-V0)			
Weight		--	1.5	--	g

ENVIRONMENTAL SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Storage Humidity	Non condensing	--	--	95	%
Operating Temperature	Power derating (above100℃, see Figure 2)	-40	--	105	°C
Storage Temperature		-55	--	125	
Temp. rise at full load	Ta=25°C	--	25	--	
Lead Temperature	1.5mm from case for 10 seconds	--	--	300	
Cooling		Free air convection			

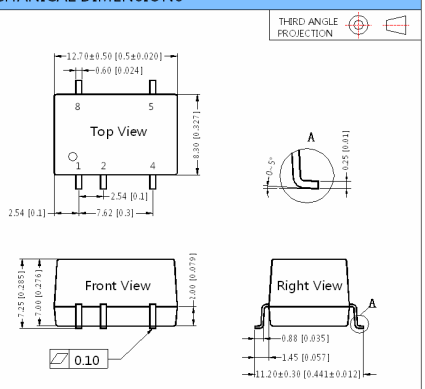
DBZ-XT1P 1W SMD, Fixed Input, Unregulated Single Output, DC/DC converter

EMC SPECIFICATIONS

EMI	CE	CISPR22/EN55022 CLASS B（Recommended Circuit Refer to Figure1）
	RE	CISPR22/EN55022 CLASS B（Recommended Circuit Refer to Figure1）
EMS	ESD	IEC/EN61000-4-2 Contact ±8KV perf. Criteria B

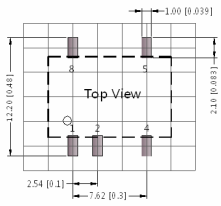
MECHANICAL SPECIFICATIONS

MECHANICAL DIMENSIONS



Note:
Unit: mm[inch]
Pin section tolerances: ± 0.10[± 0.004]
General tolerances: ± 0.25[± 0.010]

RECOMMENDED FOOTPRINT DETAILS

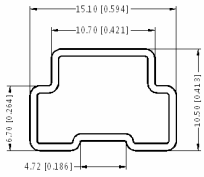


Note : Grid 2.54*2.54mm

PIN CONNECTION	
Pin	Function
1	GND
2	Vin
4	0V
5	+Vo
8	NC

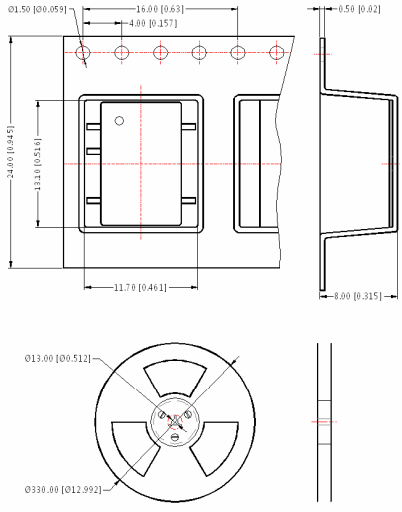
NC:No Connection

TUBE PACKAGING DIMENSIONS



Note:
Unit: mm[inch]
General tolerances:±0.50mm[±0.020inch]
L=530[20.866inch] Quantity:40pcs
L=220[8.661] Quantity:15pcs
Inner carton(S):L*W*H=255*170*80
Outer carton(S):L*W*H=375*280*270
Inner carton(L):L*W*H=580*200*100
Outer carton(L): L*W*H=600*215*220,2 inner cartons(L)
Outer carton(L): L*W*H=600*215*325,3 inner cartons(L)

REEL PACKAGING DIMENSIONS



Note:
Unit: mm[inch]
General tolerances:±0.50[±0.020]
Per reel of packing quantity:500pcs
Inner carton:L*W*H=365*350*105
Quantity:2000pcs
Outer carton:L*W*H=390*360*245
Quantity:4000pcs

DBZ-XT1P 1W SMD, Fixed Input, Unregulated Single Output, DC/DC converter

MODEL SELECTION GUIDE

Model	Input Voltage(VDC)	Output Voltage (VDC)	Output Current (mA)		Input Current (mA)(Typ.)		Reflected Ripple Current (mA.Typ.)	Max.Capacitive Load(μF)	Efficiency (%, Typ.) @Max. Load
	Nominal (Range)		Max.	Min.	@Max. Load	@No Load			
DBZ-0303-XT1P	3.3 (2.97-3.63)	3.3	303	30	415	25	15	220	73
DBZ-0305-XT1P		5	200	20	388				78
DBZ-0503-XT1P	5 (4.5-5.5)	3.3	303	30	263	20			76
DBZ-0505-XT1P		5	200	20	250				80
DBZ-0509-XT1P		9	111	12	250				80
DBZ-0512-XT1P		12	84	9	250				80
DBZ-0515-XT1P		15	67	7	250				80
DBZ-0524-XT1P		24	42	4	250				80
DBZ-1203-XT1P	12 (10.8-13.2)	3.3	303	30	111	15			75
DBZ-1205-XT1P		5	200	20	104				80
DBZ-1209-XT1P		9	111	12	104				80
DBZ-1212-XT1P		12	84	9	103				81
DBZ-1215-XT1P		15	67	7	103				81
DBZ-1515-XT1P	15 (13.5-16.5)	15	67	7	82	10			81
DBZ-2405-XT1P	24 (21.6-26.4)	5	200	20	52	7			80
DBZ-2409-XT1P		9	110	11	52				80
DBZ-2415-XT1P		15	67	7	51				81
DBZ-2424-XT1P		24	42	4	51				81

DEZ-XT1P Series

1W Fixed Input, Unregulated Dual Output

FEATURES

- **Ultra-Miniature SMD package**
- **3000VDC isolation**
- **Operating temperature range: -40°C to +105°C**
- **Efficiency up to 82%**
- **Internal SMD construction**
- **No external component required**
- **Industry standard pinout**
- **Continuous short circuit protection**

PART NUMBER STRUCTURE

DEZ-0505-XT1P

- Rated Power
- Package
- Output Voltage
- Input Voltage
- Product Series

DEZ_XT1P Series

1W, FIXED INPUT, ISOLATED & UNREGULATED DUAL OUTPUT

INPUT SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Input Surge Voltage (1 sec. max.)	5VDC Input	-0.7	--	9	VDC
	12VDC Input	-0.7	--	18	
	24VDC Input	-0.7	--	30	
Input Filter		Capacitor			

OUTPUT SPECIFICATIONS

Item	Test Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy			See tolerance envelope curve			
Line Regulation	For Vin change of ±1%		--	--	±1.2	%
Load Regulation	10% to 100% load	5VDC output	--	12	--	%
		9VDC output	--	8	--	
		12VDC output	--	7	--	
		15VDC output	--	6	--	
		24VDC output	--	5	--	
Temperature coefficient	100% load		--	--	±0.03	%/°C
Ripple & Noise*	20MHz Bandwidth		--	60	--	mVp-p
Short Circuit Protection			Continuous, automatic recovery			

Note:* Ripple and noise tested with “parallel cable” method. See detailed operation instructions at *DC-DC Application Notes*.

COMMON SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-Output, tested for 1 minute and leakage current less than 1 mA	3000	--	--	VDC
Isolation Resistance	Input-Output, test at 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-Output,,100KHz/0.1V	--	20	--	pF
Switching Frequency	Full load, nominal input	--	100	300	KHz
MTBF	MIL-HDFK-217F@25℃	3500	--	--	K hours
Case Material		Epoxy Resin (UL94-V0)			
Weight		--	1.8	--	g

ENVIRONMENTAL SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Storage Humidity	Non condensing	--	--	95	%
Operating Temperature	Power derating (≥100℃, see Figure 2)	-40	--	105	°C
Storage Temperature		-55	--	125	
Case Temperature rise	Ta=25°C	--	25	--	
Lead Temperature	1.5mm from case for 10 seconds	--	--	300	
Cooling		Free air convection			

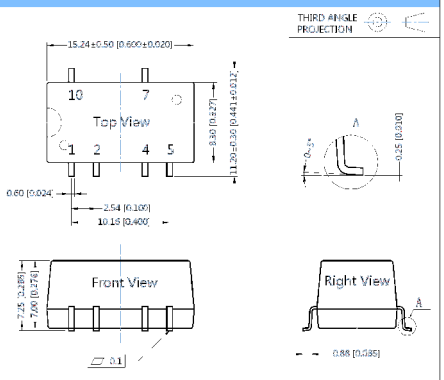
DEZ-XT1P 1W SMD, Fixed Input, Unregulated Dual Output, DC/DC converter

EMC SPECIFICATIONS

EMI	CE	CISPR22/EN55022 CLASS B(Recommended Circuit Refer to Figure1)	
	RE	CISPR22/EN55022 CLASS B(Recommended Circuit Refer to Figure1)	
EMS	ESD	IEC/EN61000-4-2 Contact ±6KV	perf. Criteria B

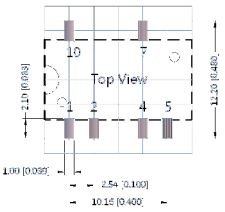
MECHANICAL SPECIFICATIONS

MECHANICAL DIMENSIONS



Note:
Unit: mm[inch]
Pin section tolerances: ±0.10[±0.004]
General tolerances: ±0.25[±0.010]

RECOMMENDED FOOTPRINT DETAILS

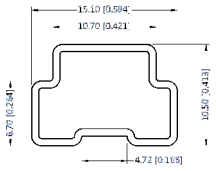


Note: Grid 2.54*2.54mm

PIN CONNECTION	
Pin	Function
1	GND
2	Vin
4	0V
5	-Vo
7	+Vo
10	NC

NC: No Connection

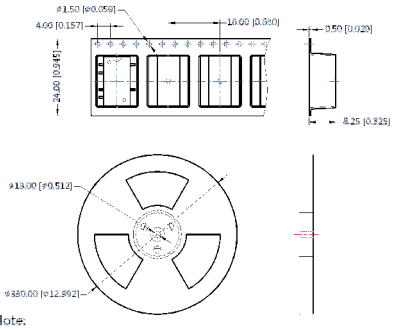
TUBE PACKAGING DIMENSIONS



Note:
Unit: mm[inch]
General tolerances: ±0.50[±0.020]
L=530[20.866] Quantity: 33pcs
L=220[8.661] Quantity: 13pcs
Inner carton(S): L*W*H=255*170*80
Outer carton(S): L*W*H=375*280*270
Inner carton(L): L*W*H=580*200*100
Outer carton(L): L*W*H=600*215*220, 2 inner cartons(L)
Outer carton(L): L*W*H=600*215*325, 3 inner cartons(L)

2EXT1WAR201-A0

REEL PACKAGING DIMENSIONS



Note:
Unit: mm[inch]
General tolerances: ±0.50[±0.020]
Per reel of packing quantity: 500pcs
Inner carton: L*W*H=365*350*105
Quantity: 2000pcs
Outer carton: L*W*H=390*360*245
Quantity: 4000pcs

DEZ-XT1P 1W SMD, Fixed Input, Unregulated Dual Output, DC/DC converter

MODEL SELECTION GUIDE

Model	Input Voltage(VDC)	Output Voltage (VDC)	Output Current (mA)		Input Current (mA,Typ.)		Reflected Ripple Current (mA,Typ.)	Max. Capacitive Load (μF)	Efficiency (%) @Max. Load	
	Nominal (Range)		Max.	Min.	@Max. Load	@No Load			Min.	Typ.
DEZ-0505-XT1P	5 (4.5-5.5)	±5	±100	±10	250	20	15	100	76	80
DEZ-0509-XT1P		±9	±56	±6	250				76	80
DEZ-0512-XT1P		±12	±42	±5	247				77	81
DEZ-0515-XT1P		±15	±33	±3	247				77	81
DEZ-0524-XT1P		±24	±21	±2	247				77	81
DEZ-1205-XT1P	12 (10.8-13.2)	±5	±100	±10	104	15	5		76	80
DEZ-1209-XT1P		±9	±56	±6	104				76	80
DEZ-1212-XT1P		±12	±42	±5	103				77	81
DEZ-1215-XT1P		±15	±33	±3	103				77	81
DEZ-1224-XT1P		±24	±21	±2	103				77	81
DEZ-2405-XT1P	24 (21.6-26.4)	±5	±100	±10	51	7	5		78	82
DEZ-2409-XT1P		±9	±56	±6	51				78	82
DEZ-2412-XT1P		±12	±42	±5	51				78	82
DEZ-2415-XT1P		±15	±33	±3	51				78	82
DEZ-2424-XT1P		±24	±21	±2	51				78	82

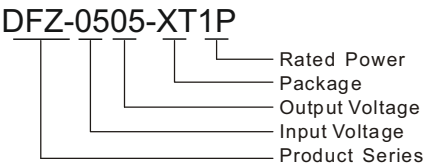
DFZ-XT1P Series

1W Fixed Input, Unregulated Single Output

FEATURES

- **Miniature SMD package**
- **3000VDC isolation**
- **Operating temperature range: -40°C to +105°C**
- **Efficiency up to 81%**
- **Internal SMD construction**
- **No external component required**
- **Industry standard pinout**
- **Continuous short circuit protection**

PART NUMBER STRUCTURE



DFZ_XT1P Series

1W, FIXED INPUT, ISOLATED & UNREGULATED SINGLE OUTPUT

INPUT SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Input Surge Voltage (1 Sec. Max.)	3.3VDC Input	-0.7	--	5	VDC
	5VDC Input	-0.7	--	9	
	12VDC Input	-0.7	--	18	
	15VDC Input	-0.7	--	21	
	24VDC Input	-0.7	--	30	
Input Filter		Capacitor			

OUTPUT SPECIFICATIONS

Item	Test Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy			See tolerance envelope curve			
Line Regulation	For Vin change of ±1%	3.3VDC output	--	--	±1.5	%
		Others	--	--	±1.2	
Load Regulation	10% to 100% load	3.3VDC output	--	18	--	%
		5VDC output	--	12	--	
		9VDC output	--	8	--	
		12VDC output	--	7	--	
		15VDC output	--	6	--	
		24VDC output	--	5	--	
Temperature coefficient	100% load		--	--	±0.03	%/°C
Ripple & Noise*	20MHz Bandwidth	Output Voltage ≤12VDC	--	30	--	mVp-p
		Output Voltage :15VDC, 24VDC	--	60	--	
Short Circuit Protection			Continuous, automatic recovery			
Note:* Ripple and noise tested with “parallel cable” method. See detailed operation instructions at DC-DC Application Notes.						

COMMON SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-Output, tested for 1 minute and leakage current less than 1mA	3000	--	--	VDC
Isolation Resistance	Input-Output, test at 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-Output, 100KHz/0.1V	--	20	--	pF
Switching Frequency	Full load, nominal input	--	100	300	KHz
MTBF	MIL-HDBK-217F@25℃	3500	--	--	K hours
Case Material		Epoxy Resin (UL94-V0)			
Weight		--	1.5	--	g

ENVIRONMENTAL SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Storage Humidity	Non condensing	--	--	95	%
Operating Temperature	Power derating (≥100℃, see Figure 2)	-40	--	105	°C
Storage Temperature		-55	--	125	
Temperature rise	Ta=25°C,100% Load	--	25	--	
Lead Temperature	1.5mm from case for 10 seconds	--	--	300	
Cooling		Free air convection			

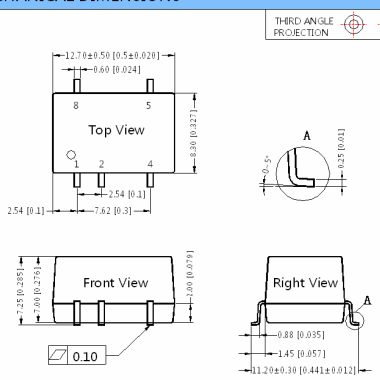
DFZ-XT1P 1W SMD, Fixed Input, Unregulated Single Output, DC/DC converter

EMC SPECIFICATIONS

EMI	CE	CISPR22/EN55022 CLASS B（Recommended Circuit Refer to Figure1）
	RE	CISPR22/EN55022 CLASS B（Recommended Circuit Refer to Figure1）
EMS	ESD	IEC/EN61000-4-2 Contact ±8KV perf. Criteria B

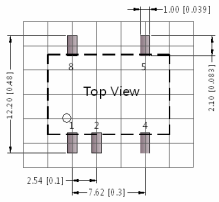
MECHANICAL SPECIFICATIONS

MECHANICAL DIMENSIONS



Note:
Unit: mm[inch]
Pin section tolerances: ± 0.10[± 0.004]
General tolerances: ± 0.25[± 0.010]

RECOMMENDED FOOTPRINT DETAILS

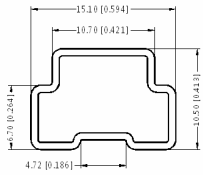


Note : Grid 2.54*2.54mm

PIN CONNECTION	
Pin	Function
1	GND
2	Vin
4	0V
5	+Vo
8	NC

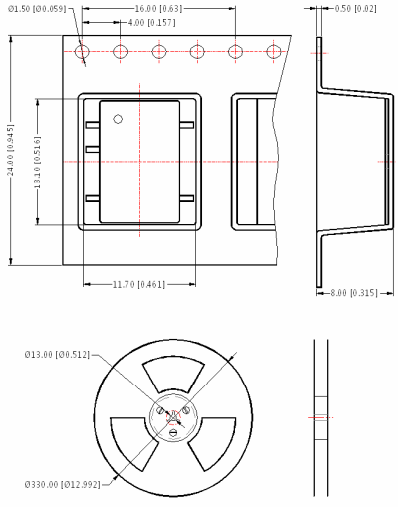
NC:No Connection

TUBE PACKAGING DIMENSIONS



Note:
Unit: mm[inch]
General tolerances:±0.50mm[±0.020inch]
L=530[20.866inch] Quantity:40pcs
L=220[8.661] Quantity:15pcs
Inner carton(S):L*W*H=255*170*80
Outer carton(S):L*W*H=375*280*270
Inner carton(L):L*W*H=580*200*100
Outer carton(L): L*W*H=600*215*220,2 inner cartons(L)
Outer carton(L): L*W*H=600*215*325,3 inner cartons(L)

REEL PACKAGING DIMENSIONS



Note:
Unit: mm[inch]
General tolerances:±0.50[±0.020]
Per reel of packing quantity:500pcs
Inner carton:L*W*H=365*350*105
Quantity:2000pcs
Outer carton:L*W*H=390*360*245
Quantity:4000pcs

DFZ-XT1P 1W SMD, Fixed Input, Unregulated Single Output, DC/DC converter

MODEL SELECTION GUIDE

Model	Input Voltage(VDC) Nominal (Range)	Output Voltage (VDC)	Output Current (mA) Max.	Output Current (mA) Min.	Input Current (mA,Typ.) @Max. Load	Input Current (mA,Typ.) @No Load	Reflected Ripple Current (mA,Typ.)	Max. Capacitive Load(μF)	Efficiency (%, Typ.)
DFZ-0303-XT1P	3.3 (2.97-3.63)	3.3	303	30	415	25	15	220	73
DFZ-0305-XT1P		5	200	20	388				78
DFZ-0503-XT1P	5 (4.5-5.5)	3.3	303	30	263	20			76
DFZ-0505-XT1P		5	200	20	250				80
DFZ-0509-XT1P		9	111	12	250				80
DFZ-0512-XT1P		12	84	9	250				80
DFZ-0515-XT1P		15	67	7	250				80
DFZ-0524-XT1P		24	42	4	250				80
DFZ-1203-XT1P	12 (10.8-13.2)	3.3	303	30	111	15			75
DFZ-1205-XT1P		5	200	20	104				80
DFZ-1209-XT1P		9	111	12	104				80
DFZ-1212-XT1P		12	84	9	103				81
DFZ-1215-XT1P		15	67	7	103				81
DFZ-1515-XT1P	15 (13.5-16.5)	15	67	7	82	10			81
DFZ-2405-XT1P	24 (21.6- 26.4)	5	200	20	52	7			80
DFZ-2409-XT1P		9	110	11	52				80
DFZ-2415-XT1P		15	67	7	51				81
DFZ-2424-XT1P		24	42	4	51				81

DSA1-LF Series

1W Fixed Input, Unregulated Single & Dual Output

FEATURES

- **Low ripple and noise**
- **1000VDC or 3000VDC isolation**
- **Operating temperature range: -40°C to +85°C**
- **Efficiency up to 83%**
- **Internal SMD construction**
- **Input Filter with Internal Capacitor**
- **Industry standard pinout**

PART NUMBER STRUCTURE

DSA1-05S05H LF

- RoHS Converter Certified By SGS
- Suffix"H"for Isolation Voltage 3KVdc; Nothing for Isolation Voltage 1KVdc
- Output Voltage
- "S"for Single Output;"D"for Dual Output
- Input Voltage
- Product Series

DSA1-LF Series

1W, FIXED INPUT, ISOLATED & UNREGULATED SINGLE & DUAL OUTPUT

INPUT SPECIFICATIONS

Item	Test Condition	Min.	Typ.	Max.	Unit
Input Voltage Range	3.3V Input Model	2.97	3.3	3.63	Vdc
	5V Input Model	4.5	5	5.5	
	12V Input Model	10.8	12	13.2	
	15V Input Model	13.5	15	15.5	
	24V Input Model	21.6	24	26.4	
Output Voltage Accuracy	Nominal Input	---	3.0	5.0	%
Output Voltage Balance		---	---	±1.0	---
Switching Frequency		60	100	150	KHz
Temperature Coefficient		---	±0.01	±0.02	%/ ℃
Isolation Voltage	60 Second	1000	---	---	Vdc
	60 Second	3000	---	---	Vdc
Isolation Resistance	500Vdc	1000	---	---	MΩ
Isolation Capacitance	3.3V Input Model	---	12	---	pF
	5V Input Model	---	16	---	
	12V Input Model	---	16	---	
	15V Input Model	---	16	---	
	24V Input Model	---	16	---	
Max. Line Regulation (Per1.0% change in input chang e)	---	---	---	1.5	%

ABSOLUTE MAXIMUM RATINGS

Item	Test Condition	Min.	Typ.	Max.	Unit
Input Absolute Voltage Range	3.3V Input Model	-0.7	3.3	4.2	Vdc
	5V Input Model	-0.7	5	7	
	12V Input Model	-0.7	12	15	
	15V Input Model	-0.7	15	18	
	24V Input Model	-0.7	24	28	
Max. Output Power		---	---	1.0	W
Operation Temperature (Ambient Temperature)	Output Full Load	-40	---	+85	℃
Storage Temperature		-55	---	+125	
Lead Temperature 1.5 mm From Case For 10 Seconds	---	--		+260	
Peak Airflow Temperature With CECC 00802 Profile	---	--		+245	

DSA1-LF 1W SMD, Fixed Input, Unregulated Single & Dual Output, DC/DC converter

OUTPUT SPECIFICATIONS

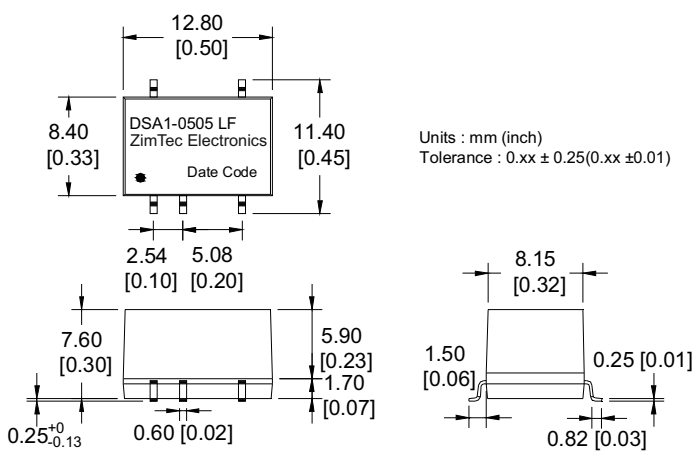
Item	Test Condition	Min.	Typ.	Max.	Unit
Input Voltage Range	3.3V Input Model	2.97	3.3	3.63	Vdc
	5V Input Model	4.5	5	5.5	
	12V Input Model	10.8	12	13.2	
	15V Input Model	13.5	15	15.5	
	24V Input Model	21.6	24	26.4	
Output Voltage Accuracy	Nominal Input	---	3.0	5.0	%
Output Voltage Balance		---	---	±1.0	---
Switching Frequency		60	100	150	KHz
Temperature Coefficient		---	±0.01	±0.02	%/ ℃
Isolation Voltage	60 Second	1000	---	---	Vdc
	60 Second	3000	---	---	Vdc
Isolation Resistance	500Vdc	1000	---	---	MΩ
Isolation Capacitance	3.3V Input Model	---	12	---	pF
	5V Input Model	---	16	---	
	12V Input Model	---	16	---	
	15V Input Model	---	16	---	
	24V Input Model	---	16	---	
Max. Line Regulation (Per1.0% change in input chang e)	---	---	---	1.5	%

GENERAL SPECIFICATIONS

Item	Specification	Condition
Isolation Voltage	1000 Vdc	Test Duration 60 Seconds / 0.5 mA
Isolation Resistance	1000 MΩ Min.	@ 500 Vdc
Operating Temperature (1)	-40℃ ~ +85℃	@ Ambient Temperature With Natural Convention
Operating Temperature (2)	-40℃ ~ +95℃	@ Case Surface Temperature
Storage Temperature	-55℃ ~ +125℃	---
Humidity	Up To 90 %	---
Cooling	Free Air Convection	---

MECHANICAL SPECIFICATIONS

Single Output Series (For Isolation Voltage 1KVdc)

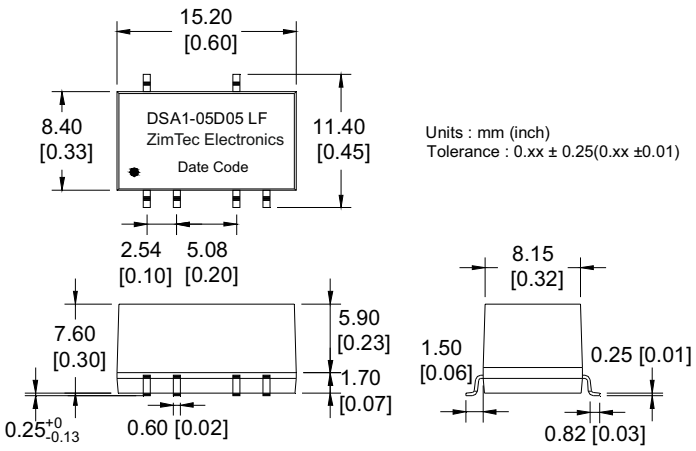


Pin	1K Vdc - Single		Pin
1	-Vin	NC	14
3	+Vin	No Pin	12
5	No Pin		10
7	-Vo	+Vo	8

DSA1-LF 1W SMD, Fixed Input, Unregulated Single & Dual Output, DC/DC converter

MECHANICAL SPECIFICATIONS

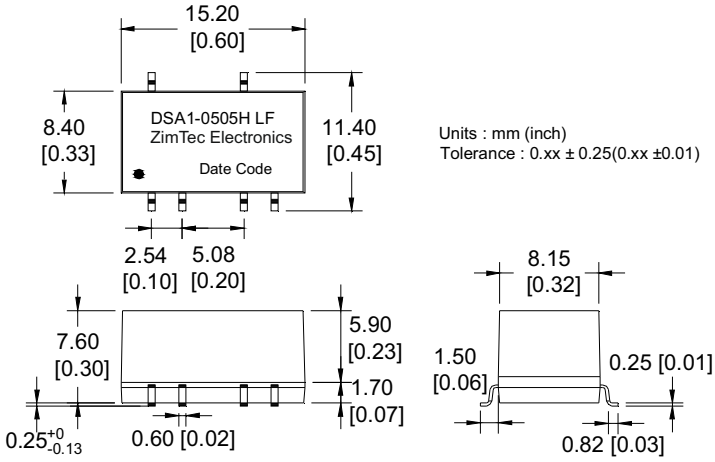
Dual Output Series (For Isolation Voltage 1KVdc)



Units : mm (inch)
Tolerance : 0.xx ± 0.25(0.xx ±0.01)

Pin	1K Vdc - Dual		Pin
1	-Vin	NC	18
3	+Vin	No Pin	16
5	No Pin		14
7	com	+Vo	12
9	-Vo	No Pin	10

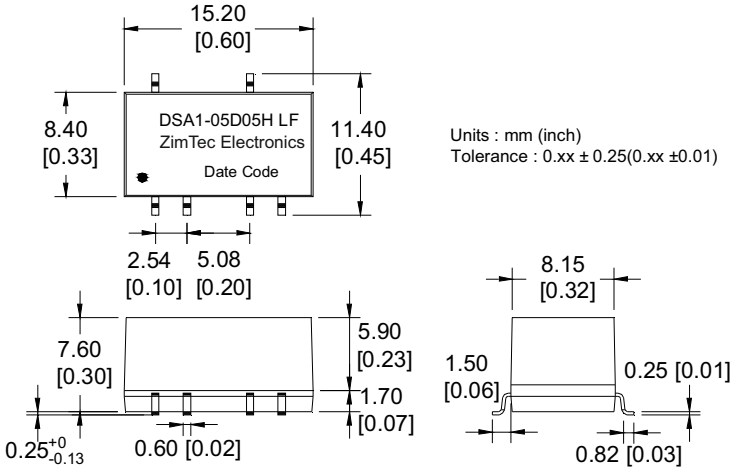
Single Output Series (For Isolation Voltage 3KVdc)



Units : mm (inch)
Tolerance : 0.xx ± 0.25(0.xx ±0.01)

Pin	3K Vdc - Single		Pin
1	-Vin	NC	18
3	+Vin	No Pin	16
5	No Pin		14
7	-Vo	+Vo	12
9	NC	No Pin	10

Dual Output Series (For Isolation Voltage 3KVdc)



Units : mm (inch)
Tolerance : 0.xx ± 0.25(0.xx ±0.01)

Pin	3K Vdc - Dual		Pin
1	-Vin	NC	18
3	+Vin	No Pin	16
5	No Pin		14
7	com	+Vo	12
9	-Vo	No Pin	10

DSA1-LF 1W SMD, Fixed Input, Unregulated Single & Dual Output, DC/DC converter

MODEL SELECTION GUIDE								
Model No.	Input Voltage (Vdc)	Output Voltage (Vdc)	Output Current (mA) Max	Input Current @No Load (mA) Typ.	Input Current @Max. Load (mA) Typ.	Output Ripple (mV) Max.	Load Regulation (%) Max.	Efficiency (%)Typ.
Single Output Series (1 KVdc)								
DSA1-3R33R3 LF	3.3	3.3	300	62	459	50	15	70
DSA1-3R305 LF		5	200	68	446	60	15	72
DSA1-3R309 LF		9	110	61	433	80	12	74
DSA1-3R312 LF		12	84	59	421	100	10	76
DSA1-3R315 LF		15	67	61	421	120	10	76
DSA1-053R3 LF	5	3.3	300	41	290	50	15	73
DSA1-0505 LF		5	200	40	282	60	15	75
DSA1-0509 LF		9	110	39	270	80	12	78
DSA1-0512 LF		12	84	25	263	100	10	80
DSA1-0515 LF		15	67	44	270	120	10	78
DSA1-123R3 LF	12	3.3	300	14	117	50	15	75
DSA1-1205 LF		5	200	15	108	60	15	81
DSA1-1209 LF		9	110	15	113	80	12	78
DSA1-1212 LF		12	84	15	108	100	10	81
DSA1-1215 LF		15	67	14	105	120	10	83
DSA1-153R3 LF	15	3.3	300	11	88	50	15	76
DSA1-1505 LF		5	200	11	85	60	15	79
DSA1-1509 LF		9	110	10	88	80	12	76
DSA1-1512 LF		12	84	10	85	100	10	79
DSA1-1515 LF		15	67	10	84	120	10	80
DSA1-243R3 LF	24	3.3	300	6	66	50	15	67
DSA1-2405 LF		5	200	7	62	60	15	71
DSA1-2409 LF		9	110	6	60	80	12	73
DSA1-2412 LF		12	84	8	58	100	10	76
DSA1-2415 LF		15	67	8	58	120	10	77
Dual Output Series (1 KVdc)								
DSA1-3R3D3R3 LF	3.3	±3.3	±150	48	446	50	15	68
DSA1-3R3D05 LF		±5	±100	48	433	60	15	70
DSA1-3R3D09 LF		±9	±55	47	410	80	12	74
DSA1-3R3D12 LF		±12	±42	46	400	100	10	76
DSA1-3R3D15 LF		±15	±34	46	410	120	10	74
DSA1-05D3R3 LF	5	±3.3	±150	35	270	50	15	74
DSA1-05D05 LF		±5	±100	35	257	60	15	78
DSA1-05D09 LF		±9	±55	33	267	80	12	75
DSA1-05D12 LF		±12	±42	48	286	100	10	74
DSA1-05D15 LF		±15	±34	33	257	120	10	78

DSA1-LF 1W SMD, Fixed Input, Unregulated Single & Dual Output, DC/DC converter

MODEL SELECTION GUIDE								
Model No.	Input Voltage (Vdc)	Output Voltage (Vdc)	Output Current (mA) Max	Input Current @No Load (mA) Typ.	Input Current @Max. Load (mA) Typ.	Output Ripple (mV) Max.	Load Regulation (%) Max.	Efficiency (%)Typ.
Dual Output Series (1 KVdc)								
DSA1-12D3R3 LF	12	±3.3	±150	16	117	50	15	72
DSA1-12D05 LF		±5	±100	15	108	60	15	78
DSA1-12D09 LF		±9	±55	15	113	80	12	75
DSA1-12D12 LF		±12	±42	15	108	100	10	78
DSA1-12D15 LF		±15	±34	14	105	120	10	80
DSA1-15D3R3 LF	15	±3.3	±150	12	93	50	15	72
DSA1-15D05 LF		±5	±100	11	88	60	15	76
DSA1-15D09 LF		±9	±55	11	88	80	12	76
DSA1-15D12 LF		±12	±42	11	86	100	10	78
DSA1-15D15 LF		±15	±34	10	86	120	10	78
DSA1-24D3R3 LF	24	±3.3	±150	8	58	50	15	72
DSA1-24D05 LF		±5	±100	8	58	60	15	72
DSA1-24D09 LF		±9	±55	7	58	80	12	73
DSA1-24D12 LF		±12	±42	7	55	100	10	76
DSA1-24D15 LF		±15	±34	7	56	120	10	75
Single Output Series (3 KVdc)								
DSA1-3R33R3H LF	3.3	3.3	300	47	446	50	15	68
DSA1-3R305H LF		5	200	47	421	60	15	72
DSA1-3R309H LF		9	110	47	400	80	12	76
DSA1-3R312H LF		12	84	45	410	100	10	74
DSA1-3R315H LF		15	67	45	410	120	10	74
DSA1-053R3H LF	5	3.3	300	25	274	50	15	77
DSA1-0505H LF		5	200	25	260	60	15	81
DSA1-0509H LF		9	110	23	270	80	12	78
DSA1-0512H LF		12	84	25	263	100	10	80
DSA1-0515H LF		15	67	28	260	120	10	81
DSA1-123R3H LF	12	3.3	300	14	117	50	15	75
DSA1-1205H LF		5	200	20	117	60	15	75
DSA1-1209H LF		9	110	15	113	80	12	78
DSA1-1212H LF		12	84	15	108	100	10	81
DSA1-1215H LF		15	67	14	109	120	10	83
DSA1-153R3H LF	15	3.3	300	11	88	50	15	76
DSA1-1505H LF		5	200	11	85	60	15	79
DSA1-1509H LF		9	110	10	88	80	12	76
DSA1-1512H LF		12	84	10	85	100	10	79
DSA1-1515H LF		15	67	10	84	120	10	80

DSA1-LF 1W SMD, Fixed Input, Unregulated Single & Dual Output, DC/DC converter

MODEL SELECTION GUIDE								
Model No.	Input Voltage (Vdc)	Output Voltage (Vdc)	Output Current (mA) Max	Input Current @No Load (mA) Typ.	Input Current @Max. Load (mA) Typ.	Output Ripple (mV) Max.	Load Regulation (%) Max.	Efficiency (%)Typ.
Single Output Series (3 KVdc)								
DSA1-153R3H LF	15	3.3	300	11	88	50	15	76
DSA1-1505H LF		5	200	11	85	60	15	79
DSA1-1509H LF		9	110	10	88	80	12	76
DSA1-1512H LF		12	84	10	85	100	10	79
DSA1-1515H LF		15	67	10	84	120	10	80
DSA1-243R3H LF	24	3.3	300	6	66	50	15	67
DSA1-2405H LF		5	200	7	62	60	15	71
DSA1-2409H LF		9		6	60	80	12	73
DSA1-2412H LF		12	84	8	58	100	10	76
DSA1-2415H LF		15	67	8	58	120	10	77
Dual Output Series (3 KVdc)								
DSA1-3R3D3R3H LF	3.3	±3.3	±150	48	446	50	15	68
DSA1-3R3D05H LF		±5	±100	48	433	60	15	70
DSA1-3R3D09H LF		±9	±55	47	410	80	12	74
DSA1-3R3D12H LF		±12	±42	46	400	100	10	76
DSA1-3R3D15H LF		±15	±34	46	410	120	10	74
DSA1-05D3R3H LF	5	±3.3	±150	35	270	50	15	74
DSA1-05D05H LF		±5	±100	35	257	60	15	78
DSA1-05D09H LF		±9	±55	33	267	80	12	75
DSA1-05D12H LF		±12	±42	33	259	100	10	77
DSA1-05D15H LF		±15	±34	33	257	120	10	78
DSA1-12D3R3H LF	12	±3.3	±150	16	117	50	15	72
DSA1-12D05H LF		±5	±100	15	108	60	15	78
DSA1-12D09H LF		±9	±55	15	113	80	12	75
DSA1-12D12H LF		±12	±42	15	108	100	10	78
DSA1-12D15H LF		±15	±34	14	105	120	10	80
DSA1-15D3R3H LF	15	±3.3	±150	12	93	50	15	72
DSA1-15D05H LF		±5	±100	11	88	60	15	76
DSA1-15D09H LF		±9	±55	11	88	80	12	76
DSA1-15D12H LF		±12	±42	11	86	100	10	78
DSA1-15D15H LF		±15	±34	10	86	120	10	78
DSA1-24D3R3H LF	24	±3.3	±150	8	58	50	15	72
DSA1-24D05H LF		±5	±100	8	58	60	15	72
DSA1-24D09H LF		±9	±55	7	58	80	12	73
DSA1-24D12H LF		±12	±42	7	55	100	10	76
DSA1-24D15H LF		±15	±34	7	56	120	10	75

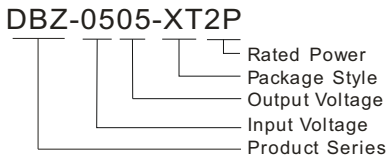
DBZ-XT2P Series

2W Fixed Input, Unregulated Singel Output

FEATURES

- Efficiency up to 86%
- 3000VDC isolation
- Operating temperature range: -40°C to +105°C
- Miniature SMD package
- Internal surface mounted design
- No external component required
- Industry standard pinout
- Continuous short circuit protection

PART NUMBER STRUCTURE



DBZ_XT2P Series

2W, FIXED INPUT, ISOLATED & UNREGULATED SINGLE OUTPUT

INPUT SPECIFICATIONS

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	5V input	--	506/30	--	mA
	12V input	--	212/25	--	
	15V input	--	169/18	--	
	24V input	--	105/15	--	
Surge Voltage (1sec. max.)	5V input	-0.7	--	9	VDC
	12V input	-0.7	--	18	
Surge Voltage (1sec. max.)	15V input	-0.7	--	21	VDC
	24V input	-0.7	--	30	
Reflected Ripple Current		--	15	--	mA
Input Filter		Capacitor filter			

OUTPUT SPECIFICATIONS

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy			See tolerance envelope graph (Fig. 1)			
Line Regulation	Inputvoltage change: ±1%	3.3VDC output	--	--	±1.5	--
		Other output	--	--	±1.2	
Load Regulation	10%-100% load	3.3VDC output	--	18	--	%
		5VDC output	--	12	--	
		9VDC output	--	9	--	
		12VDC output	--	8	--	
		15VDC output	--	7	--	
		24VDC output	--	6	--	
Ripple & Noise*	20MHz bandwidth		--	100	--	mVp-p
Temperature Drift Coefficient	100% load		--	--	±0.03	%/°C
Output Short Circuit Protection**	5/12/15VDC input		Con tinuous, self-recovery			
	24VDC input		--	--	1	s

Notes:
* Ripple and noise tested with "parallel cable" method, please see *DC-DC Converter Application Notes* for specific operation methods.
**For the products of 24V Input voltage, supply voltage must be discontinued at the end of short circuit duration.

PHYSICAL SPECIFICATIONS

Casing Material	Black flame-retardant heat-proof epoxy resin (UL94-V0)
Package Dimensions	12.70*11.20*7.25 mm
Weight	1.5g (Typ.)
Cooling Method	Free air convection

EMC SPECIFICATIONS

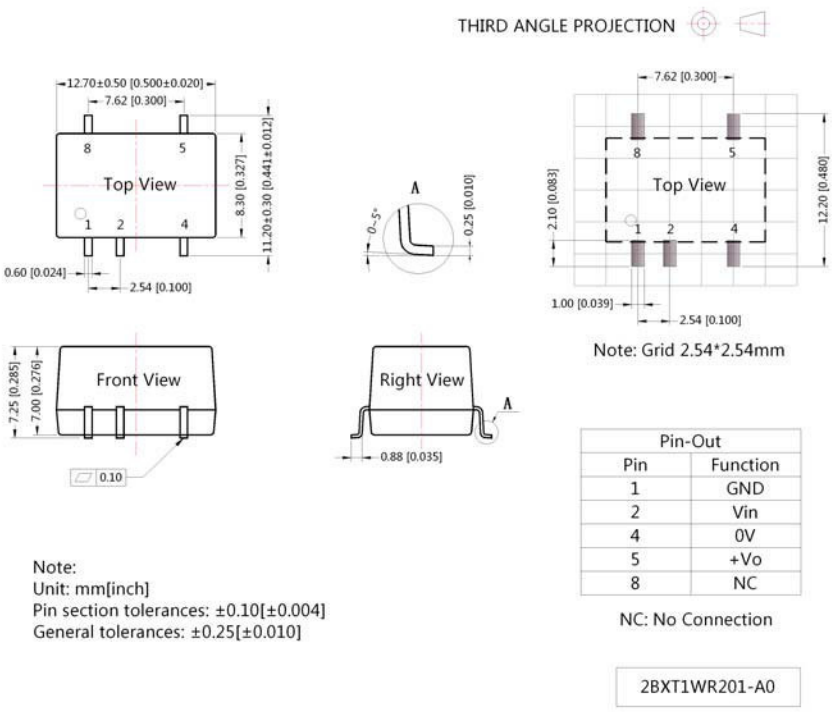
EMI	Conducted disturbance	CISPR22/EN55022 CLASS B (see Fig. 4 for recommended circuit)
	Radiated emission	CISPR22/EN55022 CLASS B (see Fig. 4 for recommended circuit)
EMS	Electrostatic discharge	IEC/EN61000-4-2 Contact ±6KV perf. Criteria B

DBZ-XT2P 2W SMD, Fixed Input, Unregulated Single Output, DC/DC converter

GENERAL SPECIFICATIONS

Item	Operating Conditions		Min.	Typ.	Max.	Unit
IsolationVoltage	Input-output, with the test time of 1 minute and the leak current lower than 1mA		1500	--	--	VDC
Isolation Resistance	Input-output, isolation voltage 500VDC		1000	--	--	MΩ
Isolation Capacitance	Input-output, 100KHz/0.1V		--	20	--	pF
Operating Temperature	3.3V/5V output	Derating if the temperature ≥71°C, (see Fig. 2)	-40	--	105	°C
	Other output	Derating if the temperature ≥85°C, (see Fig. 2)				
Storage Temperature			-55	--	125	
Casing Temperature Rise	Ta=25°C		--	25	–	
Pin Welding Resistance Temperature	Welding spot is 1.5mm away fromthe casing, 10 seconds		--	--	300	
Reflow Soldering Temperature			Peak temp. ≤245℃, maximum duration time≤60s at 217℃. For actual application, please refer to IPC/JEDECJ-STD-020D.1.			
Storage Humidity	Non-condensing		--	--	95	%
Switching Frequency	100% load, nominal input voltage		--	100	300	KHz
MTBF	MIL-HDFK-217F@25		3500	--	--	Khours

MECHANICAL SPECIFICATIONS



Note:
Unit: mm[inch]
Pin section tolerances: ±0.10[±0.004]
General tolerances: ±0.25[±0.010]

Pin-Out	
Pin	Function
1	GND
2	Vin
4	0V
5	+Vo
8	NC

NC: No Connection

2BXT1WR201-A0

DBZ-XT2P 2W SMD, Fixed Input, Unregulated Single Output, DC/DC converter

MODEL SELECTION GUIDE

Part No.	Input Voltage (VDC)	Output		Efficiency (%,Min./Typ.) @ Full Load	Max. Capacitive Load (µF)
	Nominal (Range)	Output Voltage (VDC)	Output Current (mA) (Max./Min.)		
DBZ-0503-XT2P	5 (4.5-5.5)	3.3	400/40	68/72	220
DBZ-0505-XT2P		5	400/40	75/79	
DBZ-0509-XT2P		9	222/22	78/82	
DBZ-0512-XT2P		12	167/17	78/82	
DBZ-0515-XT2P		15	133/13	79/83	
DBZ-1205-XT2P	12 (10.8-13.2)	5	400/40	75/79	
DBZ-1209-XT2P		9	222/22	78/82	
DBZ-1212-XT2P		12	167/17	78/82	
DBZ-1215-XT2P		15	133/13	79/83	
DBZ-1224-XT2P		24	83/8	80/84	
DBZ-1515-XT2P	15 (13.5-16.5)	15	133/13	79/83	
DBZ-2405-XT2P	24 (21.6-26.4)	5	400/40	75/79	
DBZ-2412-XT2P		12	167/17	78/82	
DBZ-2415-XT2P		15	133/13	79/83	
DBZ-2424-XT2P		24	83/8	82/86	

DFZ-XT2P Series

2W Fixed Input, Unregulated Singel Output

FEATURES

- Ultra Compact SMD package
- 3000VDC isolation
- Operating temperature range: -40°C to +105°C
- Efficiency up to 86%
- Internal SMD construction
- No external component required
- Industry standard pinout
- Continuous short circuit protection

PART NUMBER STRUCTURE

DFZ-0505-XT2P

- Rated Power
- Package Style
- Output Voltage
- Input Voltage
- Product Series

DFZ_XT2P Series

2W, FIXED INPUT, ISOLATED & UNREGULATED SINGLE OUTPUT

INPUT SPECIFICATIONS

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	5V input	--	506/30	--	mA
	12V input	--	212/25	--	
	15V input	--	169/18	--	
	24V input	--	105/15	--	
Surge Voltage (1sec. max.)	5V input	-0.7	--	9	VDC
	12V input	-0.7	--	18	
	15V input	-0.7	--	21	
	24V input	-0.7	--	30	
Reflected Ripple Current		--	15	--	mA
Input Filter		Capacitance Filter			

OUTPUT SPECIFICATIONS

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy			See tolerance envelope graph (Fig. 1)			
Linear Regulation	Input voltage change: ±1%	3.3VDC output	--	--	±1.5	%
		Other output	--	--	±1.2	
Load Regulation	10%-100%load	3.3VDC output	--	18	--	
		5VDC output	--	12	--	
		9VDC output	--	9	--	
		12VDC output	--	8	--	
		15VDC output	--	7	--	
		24VDC output	--	6	--	
Ripple & Noise*	20MHz bandwidth		--	100	--	mVp-p
Temperature Coefficient	100% load		--	--	±0.03	%/°C
Short Circuit Protection			Continuous, self-recovery			

*Note: * Ripple and noise are measured by „parallel cable" method, please see DC-DC Converter Application Notes for specific operation.*

PHYSICAL SPECIFICATIONS

Casing Material	Epoxy resin (UL94-V0)
Dimensions	12.70*11.20*7.25mm
Weight	1.5g (Typ.)
Cooling	Free convection

EMC SPECIFICATIONS

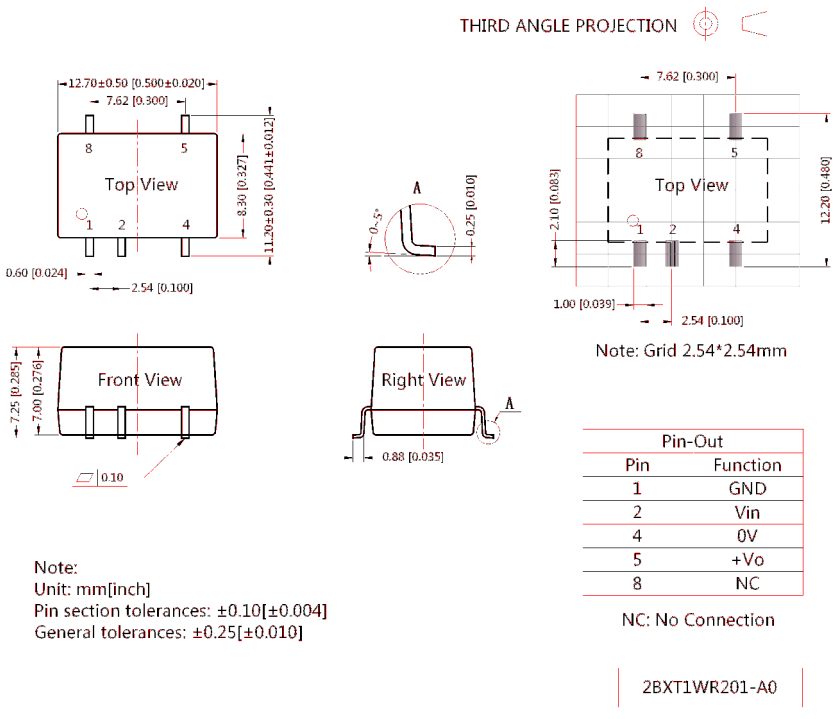
EMI	Conducted emission	CISPR22/EN55022 CLASS B (see Fig. 4 for recommended circuit)
	Radiated emission	CISPR22/EN55022 CLASS B (see Fig. 4 for recommended circuit)
EMS	Electrostatic discharge	IEC/EN61000-4-2 Contact ±8KV perf. Criteria B

DFZ-XT2P 2W SMD, Fixed Input, Unregulated Single Output, DC/DC converter

GENERAL SPECIFICATIONS

Item	Operating Conditions		Min.	Typ.	Max.	Unit
InsulationVoltage	Input-output, with the test time of 1 minute and the leak current lower than 1mA.		3000	--	--	VDC
Insulation Resistance	Input-output, Isolationvoltage 500VDC.		1000	--	--	MΩ
Isolation Capacitance	Input-output, 100KHz/0.1V		--	20	--	pF
Operating Temperature	3.3V/ 5V output	Derating when operating temperature up to 71°C, (see Fig.2).	-40	--	105	°C
	Other output	Derating when operating temperature up to 85°C, (see Fig.2).				
Storage Temperature			-55	--	125	
Casing Temperature Rise During Operating	Ta=25°C		--	25	--	
Hand Soldering	Welding spot is1.5mm away from the casing, 10 seconds.		--	--	300	
Storage Humidity	Non-condensing		--	--	95	%
SwitchingFrequency	100%load, nominal input voltage .		--	100	300	KHz
MTBF	MIL-HDFK-217F@25°C		3500	--	--	Khours

MECHANICAL SPECIFICATIONS



Note: Grid 2.54*2.54mm

Pin-Out	
Pin	Function
1	GND
2	Vin
4	0V
5	+Vo
8	NC

NC: No Connection

Note:
Unit: mm[inch]
Pin section tolerances: ±0.10[±0.004]
General tolerances: ±0.25[±0.010]

2BXT1WR201-A0

DFZ-XT2P 2W SMD, Fixed Input, Unregulated Single Output, DC/DC converter

MODEL SELECTION GUIDE

Part No.	Input Voltage (VDC)	Output		Efficiency (%,Min./Typ.) @ Full Load	Max. Capacitive Load (µF)
		Output Voltage (VDC)	Output Current (mA) (Max./Min.)		
DFZ-0503-XT2P	4.5-5.5 (5VDC nominal)	3.3	400/40	74/78	220
DFZ-0505-XT2P		5	400/40	75/79	
DFZ-0509-XT2P		9	222/22	78/82	
DFZ-0512-XT2P		12	167/17	78/82	
DFZ-0515-XT2P		15	133/13	79/83	
DFZ-0524-XT2P		24	83/8	80/84	
DFZ-1203-XT2P	10.8-13.2 (12VDC nominal))	3.3	400/40	74/78	
DFZ-1205-XT2P		5	400/40	75/79	
DFZ-1209-XT2P		9	222/22	78/82	
DFZ-1212-XT2P		12	167/17	78/82	
DFZ-1215-XT2P		15	133/13	79/83	
DFZ-1224-XT2P		24	83/8	80/84	
DFZ-1505-XT2P	13.5-16.5 (15VDC nominal)	5	400/40	75/79	
DFZ-1512-XT2P		12	167/17	78/82	
DFZ-1515-XT2P		15	133/13	79/83	
DFZ-1524-XT2P		24	83/8	80/84	
DFZ-2403-XT2P	21.6-26.4 (24VDC nominal)	3.3	400/40	74/78	
DFZ-2405-XT2P		5	400/40	75/79	
DFZ-2409-XT2P		9	222/22	78/82	
DFZ-2412-XT2P		12	167/17	78/82	
DFZ-2415-XT2P		15	133/13	79/83	
DFZ-2424-XT2P		24	83/8	82/86	

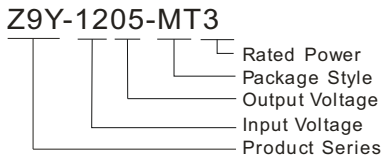
Z9Y-MT3 Series

3W Wide Input, Regulated Singel Output

FEATURES

- **Efficiency up to 83%**
- **2:1 wide input voltage range**
- **Operating temperature range: -40°C to +85°C**
- **No Power derating (≤85°C)**
- **1500VDC isolation**
- **Ultra-Miniature, SMD package**
- **Short circuit protection (automatic recovery)**
- **Low no-load power consumption**
- **External on/off control**

PART NUMBER STRUCTURE



Z9Y_MT3 Series

3W, WIDE INPUT, ISOLATED & REGULATED SINGLE OUTPUT

INPUT SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Input Surge Voltage (1sec. max.)	12VDC input	-0.7	--	25	VDC
	24VDC input	-0.7	--	50	
	48VDC input	-0.7	--	100	
Start-up Voltage	12VDC input	4.5	--	9	
	24VDC input	11	--	18	
	48VDC input	24	--	36	
Input Filter		Capacitor			
Ctrl*	Models ON	Ctrl open or be insulated			
	Models OFF	Connect high level voltage,and ensure the current into Ctrl to be 5-10mA			
Note: *Please refer to "DESIGN CONSIDERATIONS" as the direction for use of Ctrl .					

OUTPUT SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	5% to 100% load	--	±1	±3	%
No-load Output Voltage Accuracy	Input voltage range	--	±1.5	±5	
Line Regulation	Full load, Input voltage from low to high	--	±0.2	±0.5	
Load Regulation	5% to 100% load	--	±0.2	±0.8	
Transient Recovery Time	25% load step change	--	0.5	3	ms
Transient Response Deviation		--	±2.5	±5	%
Temperature coefficient	100% load	--	±0.02	±0.03	%/°C
Ripple*	20MHz Bandwidth	--	30	45	mVp-p
Noise*		--	45	100	
Output Short Circuit Protection	Input voltage range	Continuous, automatic recovery			
Note:* Ripple and noise tested with “parallel cable” method. See detailed operation instructions at *DC-DC application notes*.					

COMMON SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-Output, Tested for 1 minute, leakage current less than 1 mA	1500	--	--	VDC
Isolation Resistance	Input-Output, Test at 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-Output,100KHz/0.1V	--	35	45	pF
Switching Frequency(PFM Mode)	100% load, Nominal Input voltage	--	250	--	KHz
MTBF	MIL-HDBK-217F@25℃	1000	--	--	K hours
Case Material		Epoxy Resin (UL94-V0)			
Weight		--	4.8	--	g

Z9Y-MT3 3W SMD, Wide Input, Regulated Single Output, DC/DC converter

ENVIRONMENTAL SPECIFICATIONS

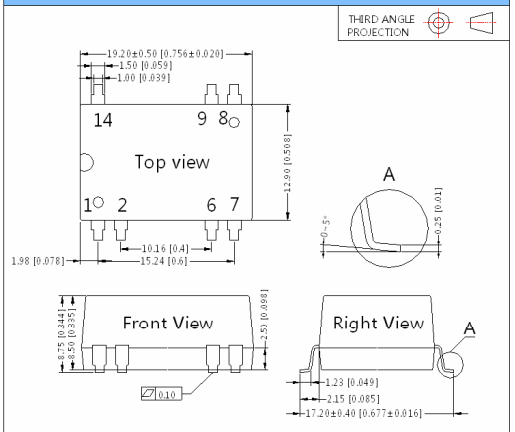
Item	Test Conditions	Min.	Typ.	Max.	Unit
Storage Humidity	Non condensing	--	--	95	%
Operating Temperature	Power derating (above85℃,see Figure 5)	-40	--	85	°C
Storage Temperature		-55	--	125	
Temp. rise at full load	Ta=25°C	--	25	--	
Lead Temperature	1.5mm from case for 10 seconds	--	--	300	
Cooling		Free air convection			

EMC SPECIFICATIONS

EMI	CE	CISPR22/EN55022 CLASS B (Recommended Circuit Refer to Figure1-② or Figure 3)	
	RE	CISPR22/EN55022 CLASS B (Recommended Circuit Refer to Figure1-② or Figure 3)	
EMS	ESD	IEC/EN61000-4-2 Contact ±4KV/ Air ±8KV	perf. Criteria B
	RS	IEC/EN61000-4-3 10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4 ±2KV (Recommended Circuit Refer to Figure1-①)	perf. Criteria B
		IEC/EN61000-4-4 ±4KV (Recommended Circuit Refer to Figure 3)	perf. Criteria B
	Surge	IEC/EN61000-4-5 ±2KV (Recommended Circuit Refer to Figure1-① or Figure 3)	perf. Criteria B
	CS	IEC/EN61000-4-6 3 Vr.m.s	perf. Criteria A
	Voltage dips, short and interruptions immunity	IEC/EN61000-4-29 0%-70%	perf. Criteria B

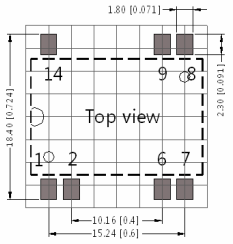
MECHANICAL SPECIFICATIONS

MECHANICAL DIMENSIONS



Note:
Unit: mm[inch]
Pin section tolerances: ± 0.10[± 0.004]
General tolerances: ± 0.25[± 0.010]

RECOMMENDED FOOTPRINT DETAILS

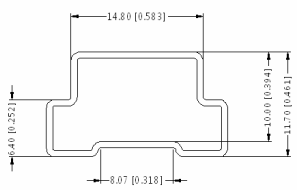


Note : Grid 2.54*2.54mm

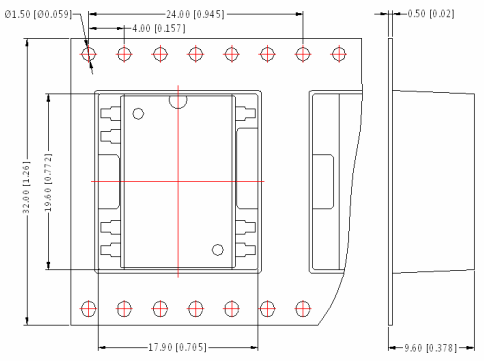
PIN CONNECTION	
Pin	Function
1	GND
2	Ctrl
6	NC
7	NC
8	+Vo
9	0V
14	Vin

NC:No Connection

TUBE PACKAGING DIMENSIONS



REEL PACKAGING DIMENSIONS



Z9Y-MT3 3W SMD, Wide Input, Regulated Single Output, DC/DC converter

MODEL SELECTION GUIDE

Model	Input Voltage(VDC)		Output Voltage (VDC)	Output Current (mA)		Input Current (mA)(Typ.)		Reflected Ripple Current (mA,Typ.)	Max. Capacitive Load (μF)	Efficiency (%, Typ.) @Max. Load
	Nominal (Range)	Max.①		Max.	Min.	@Max. Load	@No Load			
Z9Y-1203-MT3	12 (9-18)	20	3.3	909	45	342	20	30	2700	74
Z9Y-1205-MT3			5	600	30	323			2200	77
Z9Y-1212-MT3			12	250	12	316			680	79
Z9Y-1215-MT3			15	200	10	316			470	79
Z9Y-2403-MT3	24 (18-36)	40	3.3	909	45	166	7	110	2700	74
Z9Y-2405-MT3			5	600	30	156			2200	81
Z9Y-2412-MT3			12	250	12	152			680	82
Z9Y-2415-MT3			15	200	10	152			470	82
Z9Y-2424-MT3			24	125	6	157			330	80
Z9Y-4803-MT3	48 (36-75)	80	3.3	909	45	84	7	45	2700	74
Z9Y-4805-MT3			5	600	30	78			2200	80
Z9Y-4812-MT3			12	250	12	74			680	83
Z9Y-4815-MT3			15	200	10	74			470	83

Note:①.Absolute maximum rating without damage on the converter.

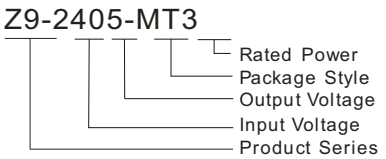
Z9K-MT3 Series

3W Wide Input, Regulated Singel Output

FEATURES

- Efficiency up to 83%
- 2:1 wide input voltage range
- Operating temperature range: -40°C to +85°C
- No Power derating (≤85°C)
- 3000VDC isolation
- Ultra-Miniature, SMD package
- Short circuit protection (automatic recovery)
- Low no-load power consumption
- External on/off control

PART NUMBER STRUCTURE



Z9K_MT3 Series

3W, WIDE INPUT, ISOLATED & REGULATED SINGLE OUTPUT

INPUT SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Input Surge Voltage (1sec. max.)	12VDC input	-0.7	--	25	VDC
	24VDC input	-0.7	--	50	
	48VDC input	-0.7	--	100	
Start-up Voltage	12VDC input	4.5	--	9	
	24VDC input	11	--	18	
	48VDC input	24	--	36	
Input Filter		Capacitor			
Ctrl*	Models ON	Ctrl open or be insulated			
	Models OFF	Connect high level voltage,and ensure the current into Ctrl to be 5-10mA			

Note: *Please refer to "DESIGN CONSIDERATIONS" as the direction for use of Ctrl .

OUTPUT SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	5% to 100% load	--	±1	±3	%
No-load Output Voltage Accuracy	Input voltage range	--	±1.5	±5	
Line Regulation	Full load, Input voltage from low to high	--	±0.2	±0.5	
Load Regulation	5% to 100% load	--	±0.2	±0.8	
Transient Recovery Time	25% load step change	--	0.5	3	ms
Transient Response Deviation		--	±2.5	±5	%
Temperature coefficient	100% load	--	±0.02	±0.03	%/°C
Ripple*	20MHz Bandwidth	--	30	45	mVp-p
Noise*		--	45	100	
Output Short Circuit Protection	Input voltage range	Continuous, automatic recovery			

Note:* Ripple and noise tested with “parallel cable” method. See detailed operation instructions at DC-DC Application Notes.

COMMON SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-Output, Tested for 1 minute, leakage current less than 1 mA	3000	--	--	VDC
Isolation Resistance	Input-Output, Test at 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-Output,100KHz / 0.1V	--	35	45	pF
Switching Frequency(PFM Mode)	100% load, Nominal Input voltage	--	250	--	KHz
MTBF	MIL-HDBK-217F@25℃	1000	--	--	K hours
Case Material		Epoxy Resin (UL94-V0)			
Weight		--	4.8	--	g

Z9K-MT3 3W SMD, Wide Input, Regulated Single Output, DC/DC converter

ENVIRONMENTAL SPECIFICATIONS

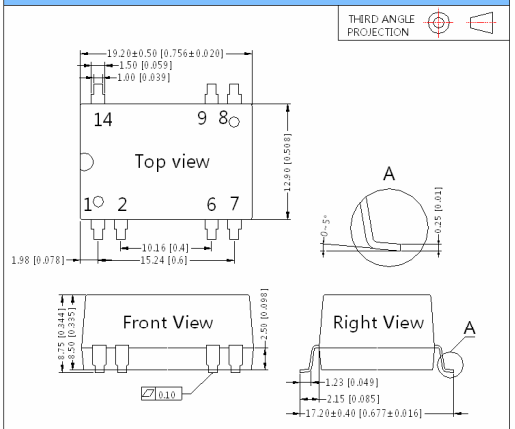
Item	Test Conditions	Min.	Typ.	Max.	Unit
Storage Humidity	Non condensing	--	--	95	%
Operating Temperature	Power derating (above 85℃,see Figure 5)	-40	--	85	℃
Storage Temperature		-55	--	125	
Temp. rise at full load	Ta=25°C	--	25	--	
Lead Temperature	1.5mm from case for 10 seconds	--	--	300	
Cooling		Free air convection			

EMC SPECIFICATIONS

EMI	CE	CISPR22/EN55022 CLASS B(Recommended Circuit Refer to Figure1-② or Figure 3)	
	RE	CISPR22/EN55022 CLASS B(Recommended Circuit Refer to Figure1-② or Figure 3)	
EMS	ESD	IEC/EN61000-4-2 Contact ±4KV/ Air ±8KV	perf. Criteria B
	RS	IEC/EN61000-4-3 10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4 ±2KV (Recommended Circuit Refer to Figure1-①)	perf. Criteria B
		IEC/EN61000-4-4 ±4KV (Recommended Circuit Refer to Figure 3)	perf. Criteria B
	Surge	IEC/EN61000-4-5 ±2KV (Recommended Circuit Refer to Figure1-① or Figure 3)	perf. Criteria B
	CS	IEC/EN61000-4-6 3 Vr.m.s	perf. Criteria A
	Voltage dips, short and interruptions immunity	IEC/EN61000-4-29 0%-70%	perf. Criteria B

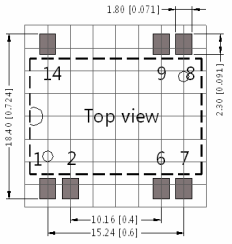
MECHANICAL SPECIFICATIONS

MECHANICAL DIMENSIONS



Note:
Unit: mm[inch]
Pin section tolerances: ± 0.10[± 0.004]
General tolerances: ± 0.25[± 0.010]

RECOMMENDED FOOTPRINT DETAILS

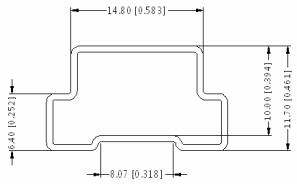


Note : Grid 2.54*2.54mm

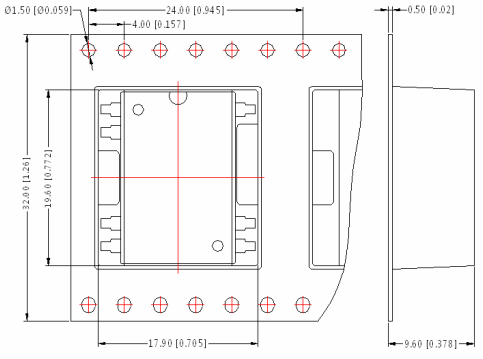
PIN CONNECTION	
Pin	Function
1	GND
2	Ctrl
6	NC
7	NC
8	+Vo
9	0V
14	Vin

NC:No Connection

TUBE PACKAGING DIMENSIONS



REEL PACKAGING DIMENSIONS



Z9K-MT3 3W SMD, Wide Input, Regulated Single Output, DC/DC converter

MODEL SELECTION GUIDE

Model	Input Voltage(VDC)		Output Voltage (VDC)	Output Current (mA)		Input Current (mA)(Typ.)		Reflected Ripple Current (mA,Typ.)	Max. Capacitive Load (μF)	Efficiency (%, Typ.) @Max. Load
	Nominal (Range)	Max.①		Max.	Min.	@Max. Load	@No Load			
Z9K-1203-MT3	12 (9-18)	20	3.3	909	45	342	20	30	2700	74
Z9K-1205-MT3			5	600	30	323			2200	77
Z9K-1212-MT3			12	250	12	316			680	79
Z9K-1215-MT3			15	200	10	316			470	79
Z9K-2403-MT3	24 (18-36)	40	3.3	909	45	166	7	110	2700	74
Z9K-2405-MT3			5	600	30	156			2200	81
Z9K-2412-MT3			12	250	12	152			680	82
Z9K-2415-MT3			15	200	10	152			470	82
Z9K-2424-MT3			24	125	6	157			330	80
Z9K-4803-MT3	48 (36-75)	80	3.3	909	45	84	7	45	2700	74
Z9K-4805-MT3			5	600	30	78			2200	80
Z9K-4812-MT3			12	250	12	74			680	83
Z9K-4815-MT3			15	200	10	74			470	83

Note:①.Absolute maximum rating without damage on the converter.