

DU - 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



The DU series are cost effective 12W single & dual output DC-DC converters. These converters are consisted with nickle-coated copper 24-pin DIL package with high performance features such as synchronous rectification, high efficiency and tight line / load regulation. Devices are encapsulated using flame retardant resin. Input voltages of 12, 24 and 48 with output voltage of 2.5, 3.3, 5, 12, 15, ± 12 , ± 15 Vdc. Features include high efficiency operation up to 91%.

All specifications typical at $T_a = 25^\circ\text{C}$, nominal input voltage and full load unless otherwise specified

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

INPUT SPECIFICATIONS	
Input Voltage Range	See table
Start up Time	20mS, typ.
(Nominal Vin and constant resistive load)	
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	$-40^\circ\text{C} \sim +85^\circ\text{C}$ (See Derating Curve)
	$-40^\circ\text{C} \sim +60^\circ\text{C}$ (For 100% load)
Maximum Case Temperature	100°C
Storage Temperature	$-55^\circ\text{C} \sim +125^\circ\text{C}$
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	CLASS A
Conducted Emissions(5)	EN55022	CLASS A
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

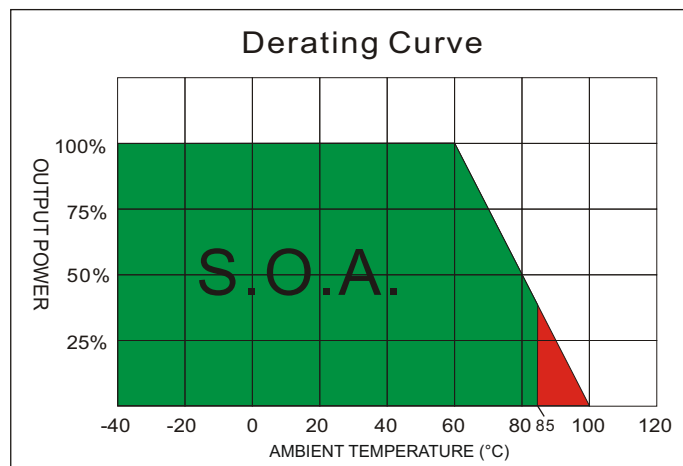
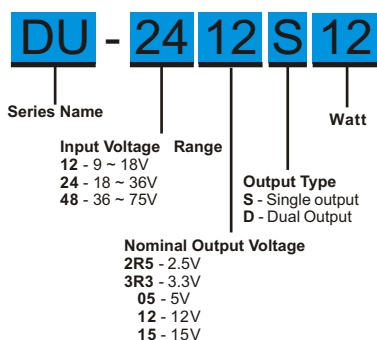
PHYSICAL SPECIFICATIONS	
Case Material	Nickel-coated Copper
Base Material	Non-conductive black plastic (UL94V-0 rated)
Pin Material	0.5mm Brass Solder-coated
Potting Material	Epoxy (UL94V-0 rated)
Weight	18.0g
Dimensions	1.25"x0.8"x0.40"

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		260°C, max.
(1.5mm from case 10 sec. max.)		

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

PART NUMBER STRUCTURE

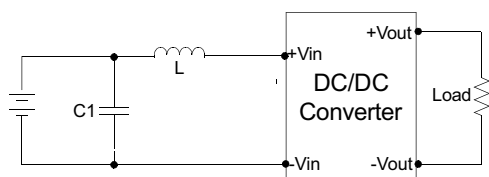


MODEL SELECTION GUIDE

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)		
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

NOTE

- One load is 25% to 100% load, the other load is 100% load, the output voltage variable rate is within ±5%.
- Maximum value at nominal input voltage, Measured with 20MHz bandwidth and 1.0uF ceramic capacitor.
- Tested by minimal Vin and constant resistive load.
- Tested by normal Vin and 25% load step change (75%-50%-25% of Io).
- Input filter components (C1, L) are used to help meet conducted emissions requirement for the module.
These components should be mounted as close as possible to the module; and all leads should be minimized to decrease radiated noise.
- An external filter capacitor is required if the module has to meet EN61000-4-5.
The filter capacitor ZimTec Electronics suggest: Nippon - chemi - con KY series, 330uF/100V.
- Exceeding the absolute ratings of the unit could cause damage.
It is not allowed for continuous operating.



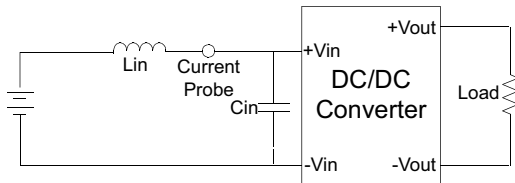
	C1	L
DU-12XXXXX	100uF, 100V	12uH
DU-24XXXXX	100uF, 100V	12uH
DU-48XXXXX	100uF, 100V	12uH

The models listed above is just for standard type. If you need the special specification product, please contact our service member by telephone presented in shortform cover or e-mail to: info@zimtec-electronics.de

TEST CONFIGURATIONS

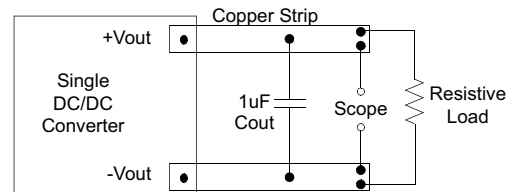
Input Reflected Ripple Current Test Step

Input reflected ripple current is measured through a source inductor L_{in} (12 μ H) and a source capacitor C_{in} (47 μ F, ESR<1.0 Ohm at 100KHz) at nominal input and full load.

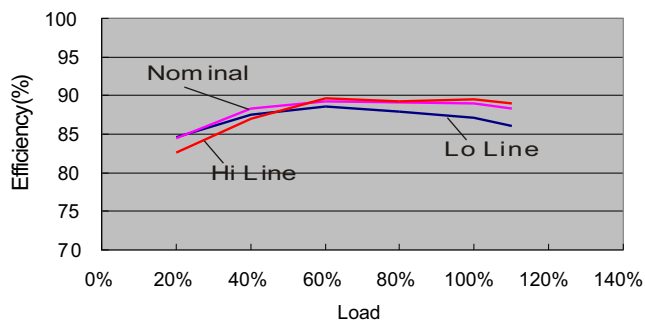


Output Ripple & Noise Measurement Test

Use a capacitor C_{out} (1.0 μ F) measurement. The Scope measurement bandwidth is 0-20MHz.

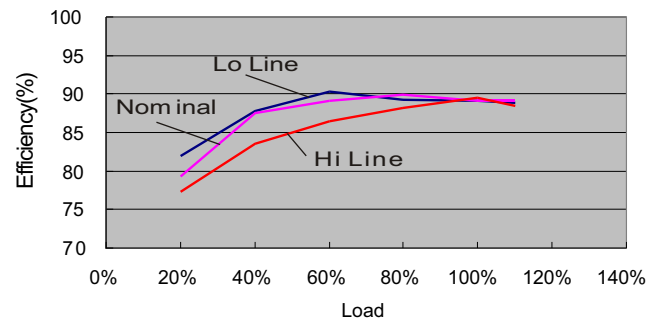


EFFICIENCY VS OUTPUT CURRENT



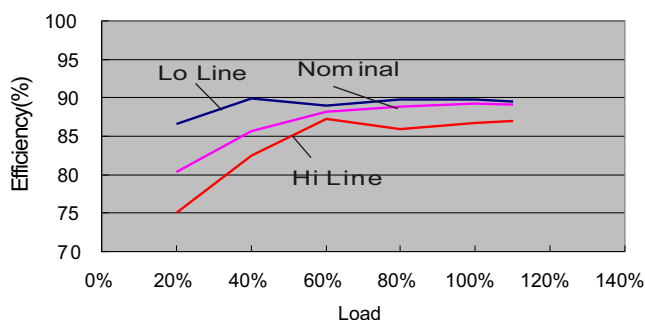
DU-1205S12

EFFICIENCY VS OUTPUT CURRENT



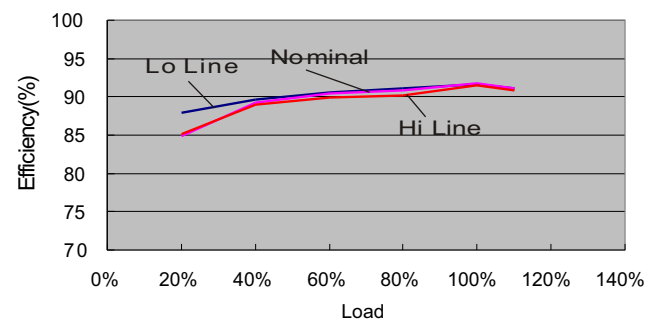
DU-2405S12

EFFICIENCY VS OUTPUT CURRENT



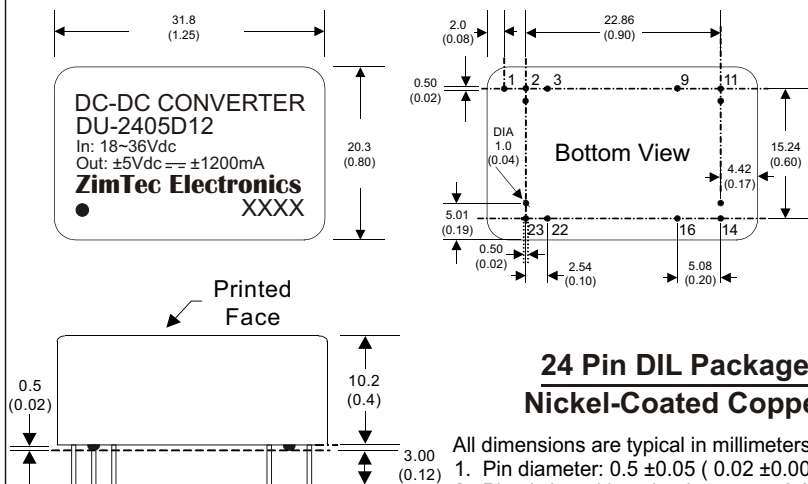
DU-4815S12

EFFICIENCY VS OUTPUT CURRENT



DU-2415D12

MECHANICAL SPECIFICATIONS



- 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