DZH40 Series

40W AC/DC Converter

Features

- Wide Input voltage range: 85~264VAC/120~370VDC
- Low standby power consumption: 0.5W, conversion efficiency up to 84%
- Output short circuit, over-current, over-voltage protection
- Meet IEC61000, UL60950 and EN60950 standards
- Can be equipped with wiring package or rail package uses

DZH40 series is a 40W efficient environmental-protection AC-DC module power supply, which has advantages such as universal input voltage, accept either AC or DC input, high efficiency, high reliability, low power consumption and high safety isolation. The series products are widely used in industries such as industrial control, office and electricity Application circuits should be referred to the conditions with weak electromagnetic compatibility.

SELECTION GUIDE

Certification	Part No.*	Output Power	Nominal Output Voltage and Current		Efficiency (230VAC, %/Typ.)	Max. Capacitive Load(μF)
			(Vo1/Io1)	(Vo2/Io2)		
UL/CE	DZH40-10B03	40W	3,3VDC/8000mA	–	78	60000
	DZH40-10B05		5VDC/8000mA	–	82	40000
	DZH40-10B09		9VDC/4444mA	–	84	12000
	DZH40-10B12		12VDC/3333mA	–	84	9000
	DZH40-10B15		15VDC/2666mA	–	84	7000
	DZH40-10B24		24VDC/1667mA	–	84	20000
--	DZH40-10D0512-13		5VDC/5000mA	12VDC/1250mA	82	10000/470
	DZH40-10D0524-06		5VDC/5000mA	24VDC/625mA	82	10000/400
	DZH40-10A05		+5VDC/4000mA	-5VDC/4000mA	82	±12000
	DZH40-10A12		+12VDC/1666mA	-12VDC/1666mA	84	±4400
	DZH40-10A15		+15VDC/1333mA	-15VDC/1333mA	84	±1000
	DZH40-10C0512-06		5VDC/5000mA	±12VDC/600mA	82	10000/±900
	DZH40-10C0515-05		5VDC/5000mA	±15VDC/500mA	82	10000/±780

Note:*product model with a suffix of „A5" means chassis mounting and that with a suffix of „A6" Indicates DIN-RAIL mounting (e.g. DZH40-10B05A5 means chassis mounting; DZH40-10B05A6 means DIN-RAIL mounting).

INPUT SPECIFICATIONS

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	AC input	85	--	264	VAC
	DC input	120	--	370	VDC
Input frequency		47	--	440	Hz
Input current	115VAC	--	--	1.0	A
	230VAC	--	--	0.6	
Inrush current	115VAC	--	30	--	
	230VAC	--	50	--	

OUTPUT SPECIFICATIONS

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	DZH40-10BXX	Main output	–	±2	–	%
	DZH40-10AXX	Main output / Secondary output	–	±2	–	
	DZH40-10DXX	Main output	–	±2	–	
	DZH40-10CXX	Secondary output		±5		
Line Regulation	DZH40-10BXX		–	±0.5	–	%
	DZH40-10AXX					
	DZH40-10DXX(Main output)					
	DZH40-10CXX(Main output)					
	DZH40-10DXX(Secondary output)		–	±1.5	–	
	DZH40-10CXX(Secondary output)					
Load Regulation	DZH40-10BXX		–	±1	–	
	DZH40-10AXX(Balance load)		–	± 2	–	
	DZH40-10DXX(Balance load)	Main output	–	± 2	–	
		Secondary output	–	±5	–	
	DZH40-10CXX(Balance load)	Main output	–	±3	–	
		Secondary output	–	±5	–	
Output Ripple & Noise*	20MHz bandwidth (peak-peak value)		–	50	100	mV
Temperature Drift	Main output		–	±0.02	–	%/°C
Stand-by Power			–	–	0.5	W
Short Circuit Protection			Continuous, self-recovery			
Over-current Protection			≥110%Io self-recovery			
Over-voltage Protection	3.3V Output		–	–	5.5	V
	5V Output		–	–	9	
	9V Output		–	–	14	
	12V Output		–	–	20	
	15V Output		–	–	24	
	24V Output		–	–	35	
Min. Load	DZH40-10BXX		0	–	–	%
	DZH40-10AXX (Balance load)		10	–	–	
	DZH40-10DXX (Balance load)		25	–	–	
	DZH40-10CXX (Balance load)		25	–	–	
Cross Regulation	DZLH40-10AXX		–	±5	–	
	DZLH40-10DXX	Main output	–	±1	–	
		Secondary output	–	±7	–	
	DZH40-10CXX	Main output	–	±3	–	
		Secondary output	–	±7	–	
Trim	DZLH40-10BXX		–	–	±10	
Hold-up Time	115VAC input		–	15	–	ms
	230VAC input		–	80	–	

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

GENERAL SPECIFICATIONS

Item		Operating Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-output	Test time: 1min	3000	–	–	VAC
Operating Temperature			-40	–	+70	°C
Storage Temperature			-40	–	+85	
Storage Humidity			–	–	95	%RH

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

Welding Temperature	Wave-soldering	260 ±5°C; time:5~10s			
	Manual-welding	360 ±10°C; time: 3~5s			
Switching Frequency		--	65	--	kHz
Power Derating	-40°C to -30°C (LH40-10B03/05)	4.0	--	--	%/°C
	-40°C to -30°C (LH40-10B09/12/15)	3.0	--	--	
	-40°C to -30°C (LH40-10Dxx,LH40-10Axx,LH40-10Cxx)	5.0	--	--	%/°C
	+45°C to +70°C (LH40-10B03/05)	3.0	--	--	
	+55°C to +70°C (LH40-10B09/12/15)	3.7	--	--	
	+55°C to +70°C (LH40-10B24)	2.7	--	--	
	+50°C to +70°C (LH40-10Dxx,LH40-10Axx,LH40-10Cxx)	3	--	--	
Safety Standard	IEC60950/EN60950/UL60950				
Safety-regulated Certification	EN60950/UL60950				
Safety Class	CLASS II				
Hot Plug	Unavailable				
MTBF	MIL-HDBK-217F@25°C ＞300,000 h				

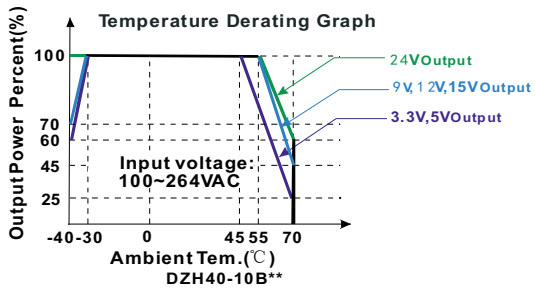
PHYSICAL SPECIFICATIONS

Casing Material		Black flame-retardant and heat-resistant plastic (UL94-V0)
Package Dimensions	Horizontal package	109.00*58.50*30.00 mm
	A5 wiring package	135.00*70.00*33.50 mm
	A6 rail package	137.00*70.00*39.00 mm
Weight	Horizontal package/A5 wiring package/A6rail package	225.00g/310.00g/370.00g(Typ.)
Cooling Method		Free air convection

EMC SPECIFICATIONS

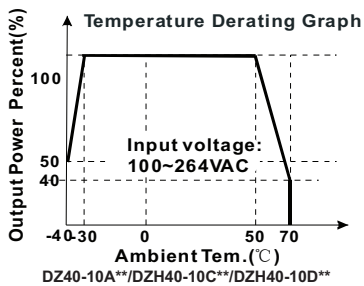
EMI	Conducted Disturbance	CISPR22/EN55022, CLASS B	
	Radiated Emission	CISPR22/EN55022, CLASS B	
EMS	Electrostatic Discharge	IEC/EN61000-4-2 ±6KV/8KV	perf. Criteria B
	Radiation Immunity	IEC/EN61000-4-3 10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4 ±4KV (Bare component)	perf. Criteria B
		IEC/EN61000-4-4 ±4KV (See Fig. 5 for recommended circuit)	
	Surge Immunity	IEC/EN61000-4-5 ±1KV/2KV (Bare component)	perf. Criteria B
		IEC/EN61000-4-5 ±2KV/4KV (See Fig. 5 for recommended circuit)	
	Conducted Disturbance immunity	IEC/EN61000-4-6 10 Vr.m.s	perf. Criteria A
	Immunity for Power frequency magnetic field	IEC/EN61000-4-8 10A/m	perf. Criteria A
	Immunities of voltage dip, drop and short interruption	IEC/EN61000-4-11 0%-70%	perf. Criteria B

PRODUCT CHARACTERISTIC CURVE



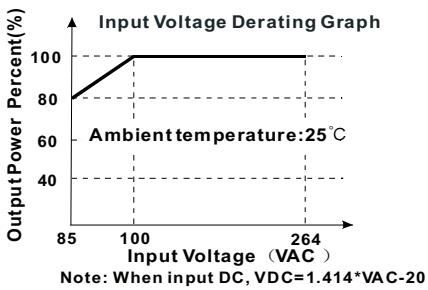
DZH40-10B**

Note: When input 85~100VAC it need to be voltage derated on basis of temperature derating



DZ40-10A**/DZH40-10C**/DZH40-10D**

Note: When input 85~100VAC it need to be voltage derated on basis of temperature derating



Note: When input DC, VDC=1.414*VAC-20

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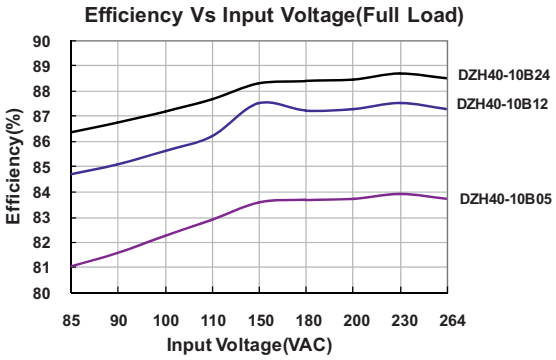
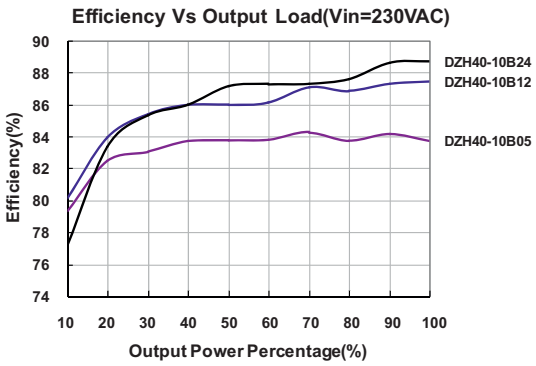




DESIGN REFERENCE

1. Typical application circuit

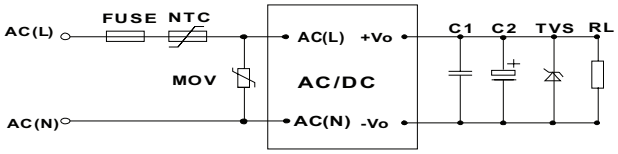


Fig. 1: DZH40-10B**Typical application circuit

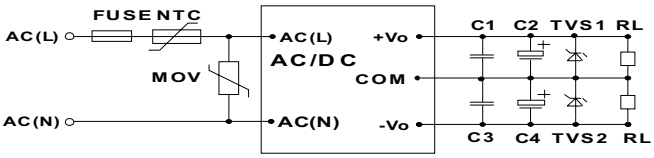


Fig. 2: DZH40-10A**Typical application circuit

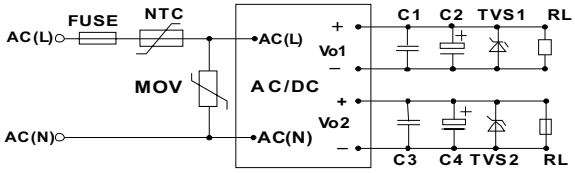


Fig. 3: DZH40-10D**Typical application circuit

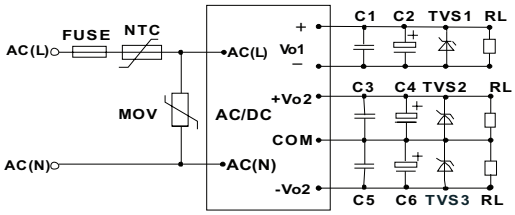


Fig. 4: DZH40-10C**Typical application circuit

Model	C2(uF)	C4(uF)	C6(uF)	C1, C3, C5 (uF)	TVS 1	TVS 2	TVS 3
DZH40-10B03	680	\	\	1	SMBJ7.0A	\	\
DZH40-10B05	680	\	\	1	SMBJ7.0A	\	\
DZH40-10B09	330	\	\	1	SMBJ12A	\	\
DZH40-10B12	220	\	\	1	SMBJ20A	\	\
DZH40-10B15	220	\	\	1	SMBJ20A	\	\
DZH40-10B24	120	\	\	1	SMBJ30A	\	\
DZH40-10D0512-13	680	220	\	1	SMBJ7.0A	SMBJ20A	\
DZH40-10D0524-06	680	120	\	1	SMBJ7.0A	SMBJ30A	\
DZH40-10A05	680	680	\	1	SMBJ7.0A	SMBJ7.0A	\
DZH40-10A12	220	220	\	1	SMBJ20A	SMBJ20A	\
DZH40-10A15	220	220	\	1	SMBJ20A	SMBJ20A	\
DZH40-10C0512-06	680	220	220	1	SMBJ7.0A	SMBJ20A	SMBJ20A
DZH40-10C0515-05	680	220	220	1	SMBJ7.0A	SMBJ20A	SMBJ20A

Note:
Output filtering capacitor C2 is electrolytic capacitor, it is recommended to apply electrolytic capacitor with high frequency and low resistance. For capacitance and current of capacitor please refer to manufacture's datasheet. Capacitance withstand voltage derating should be 80% or above. C1 is ceramic capacitor, which is used to filter high-frequency noise. TVS is a recommended component to protect post-circuits if converter fails.

2. EMC solution-recommended circuit

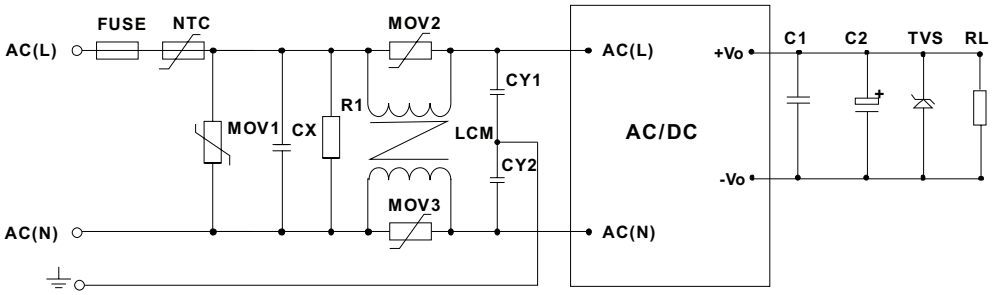


Fig 5: EMC application circuit with higher requirements

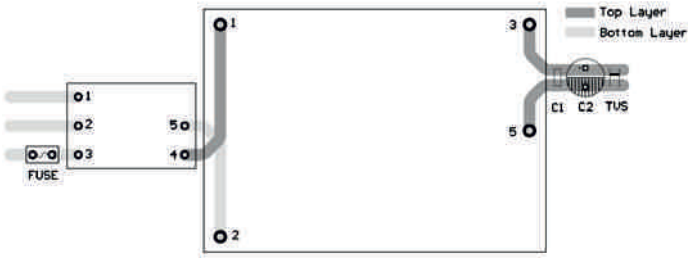
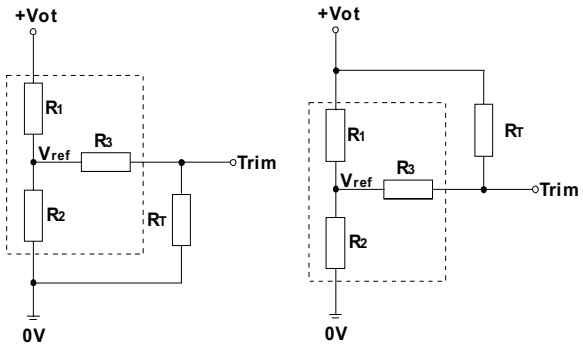


Fig 6: Recommended EMC circuit-PCB layout

Suggestions for safety regulation and wiring width ≥ 3mm, distance between wires ≥ 6mm, and distance between wire and ground≥6mm

Element model	Recommended value
MOV1	S14K350
MOV2, MOV3	S07K350
CX	0.15μF/300VAC
CY1	2.2nF/400VAC
CY2	2.2nF /400VAC
R1	1MΩ/2W
LCM	2.2 mH, recommended to use ZimTec's FL2D-10-222;
NTC	5D-14
FUSE	3.15A/250V, slow fusing, necessary

3. Application of Trim and calculation of Trim resistance



Trim up Trim down

Applied circuits of Trim (Part in broken line is the interior of models)

Calculation formula of Trim resistance:

$$up:\ R_T = \frac{a R_2}{R_2 - a} - R_3 \qquad a = \frac{Vref}{Vot - Vref} \cdot R_1$$

$$down:\ R_T = \frac{a R_1}{R_1 - a} - R_3 \qquad a = \frac{Vot - Vref}{Vref} \cdot R_2$$

R_T is Trim resistance
a is a self-defined parameter, with no real meaning.

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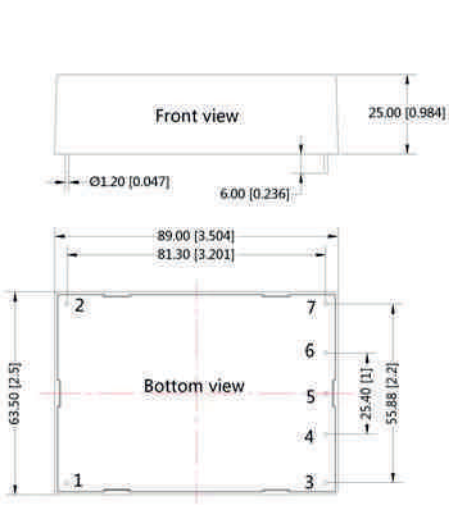
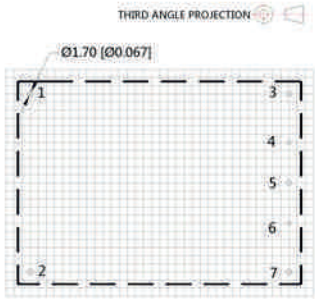
Vout	R1(KΩ)	R2(KΩ)	R3(KΩ)	Vref(V)	Vot(V)
3.3V	2	1.2	1	1.24	Output voltage after regulation, variation≤ ±10%
5V	3.3	3.3	1	2.5	
9V	4.7	1.8	1	2.5	
12V	3.83	1	1	2.5	
15V	4.99	1	1	2.5	
24V	8.66	1	1	2.5	

4. For more information please find application notes on www.zimtec-electronics.de

DIMENSIONS AND RECOMMENDED LAYOUT



Note:
Unit :mm[inch]
Pin diameter tolerances :±0.10[±0.004]
General tolerances:±0.50[±0.020]

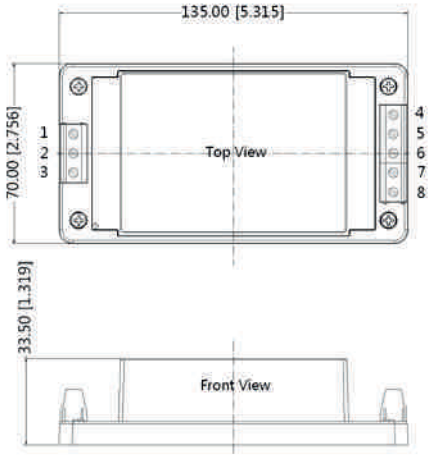


Note : Grid 2.54*2.54mm

Pin-Out				
Pin	LH40-10A	LH40-10B	LH40-10C	LH40-10D
1	AC(L)	AC(L)	AC(L)	AC(L)
2	AC(N)	AC(N)	AC(N)	AC(N)
3	+Vo	+Vo	+Vo2	+Vo2
4	No Pin	No Pin	+Vo1	+Vo1
5	COM	-Vo	COM(Vo2)	-Vo2
6	No Pin	No Pin	-Vo1	-Vo1
7	-Vo	Trim	-Vo2	No Pin

A5 WIRING PACKAGE DIMENSIONS

THIRD ANGLE PROJECTION



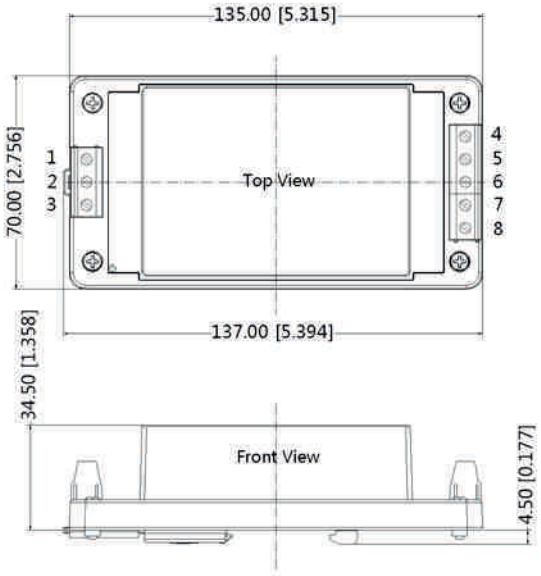
Pin-Out				
Pin	LH40-10A	LH40-10B	LH40-10C	LH40-10D
1	AC(L)	AC(L)	AC(L)	AC(L)
2	AC(N)	AC(N)	AC(N)	AC(N)
3	NC	NC	NC	NC
4	+Vo	+Vo	+Vo2	+Vo2
5	NC	NC	+Vo1	+Vo1
6	COM	-Vo	COM(Vo2)	-Vo2
7	NC	NC	-Vo1	-Vo1
8	-Vo	Trim	-Vo2	NC

Note:
Unit:mm[inch]
Wire range:24-12 AWG
General tolerances:±1.00[±0.040]

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

A6 RAIL PACKAGE DIMENSIONS

THIRD ANGLE PROJECTION



Pin-Out				
Pin	LH40-10A	LH40-10B	LH40-10C	LH40-10D
1	AC(L)	AC(L)	AC(L)	AC(L)
2	AC(N)	AC(N)	AC(N)	AC(N)
3	NC	NC	NC	NC
4	+Vo	+Vo	+Vo2	+Vo2
5	NC	NC	+Vo1	+Vo1
6	COM	-Vo	COM(Vo2)	-Vo2
7	NC	NC	-Vo1	-Vo1
8	-Vo	Trim	-Vo2	NC

Note:
Unit:mm[inch]
Installed on DIN RAIL TS35
Wire range:24~12 AWG
General tolerances:±1.00[±0.040]

Notes:

1. **Unless otherwise specified, data in this datasheet should be tested under the conditions of Ta=25°C, humidity <75% when inputting nominal voltage and outputting rated load;**
2. **All index testing methods in this datasheet are based on our Company's corporate standards;**
3. **The performance indexes of the product models listed in this manual are as above, but some indexes of non-standard model products will exceed the above-mentioned requirements, and please directly contact our technician for specific information;**
4. **We can provide product customization service;**
5. **Specifications of this product are subject to changes without prior notice.**

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