

# DZH60 Series

60W AC/DC Converter



## Features

- Wide input voltage range: 90~264VAC/120~370VDC
- Low standby power consumption: 0.5W, conversion efficiency up to 86%, 4k VAC high safety isolation
- Output short circuit, over-current, over-voltage protection
- Meets IEC61000, UL60950, EN60950 standards
- Can be equipped with wiring package or rail package uses

*DZH60(DT)series is a 60W efficient environmental-protection AC-DC module power supply, which has advantages such as high surge resistance, high efficiency, high reliability, low power consumption and high safety isolation. The series products are widely used in industries such as industrial control 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(Vo/Io)	Efficiency (230VAC, %/Typ.)	Max. Capacitive Load (μF)			
UL/CE	DZH60-20B05	50W	5V/10A	82	80000			
	DZH60-20B05-DT							
	DZH60-20B09	60W	9V/6.6A	84	28000			
	DZH60-20B09-DT							
	DZH60-20B12					12V/5A	86	14000
	DZH60-20B12-DT							
	DZH60-20B15					15V/4A	86	12000
	DZH60-20B15-DT							
	DZH60-20B24					24V/2.5A	86	4000
	DZH60-20B24-DT							
	DZH60-20B48					48V/1.25A	86	1000
	DZH60-20B48-DT							

Note:1.\* There isn't input under voltage protection for „DZH60-20BXX-DT“ series.

2.\* product model with a suffix of „A5“ means chassis mounting and that with a suffix of „A6“ Indicates DIN-RAIL mounting (e.g. DZH60-20B05A5 means chassis mounting; DZH60-20B05A6 means DIN-RAIL mounting).

## INPUT SPECIFICATIONS

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Voltage Range	DZH60-20BXX DZ60-20BXX-DT	AC input	90	–	264	VAC
		DC input	120	–	370	VDC
Input frequency			47	–	63	Hz
Input current		115VAC	–	–	1,4	A
		230VAC	–	–	0,7	
Inrush current		115VAC	–	30	–	
		230VAC	–	50	–	
Input under-voltage protection	Start-up Voltage	AC input	65	–	90	VAC
		DC input	92	–	122	VDC
	Shutdown Voltage	AC input	55	–	75	VAC
		DC input	79	–	105	VDC

Note: \*DZH60-20BXX-DT series has no input under-voltage protection.

The information and specifications contained in this data sheet are believed to be correct at time of publication.

However, ZimTec Electronics accepts no responsibility for consequences arising from printing errors or inaccuracies. Specifications are subject to change without notice.



No rights under any patent accompany the sale of any such product(s) or information contained herein.

## OUTPUT SPECIFICATIONS

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy		-	±2	-	%
Line Regulation	Full load	-	±0,5	-	
Load Regulation	5%-100% load	-	±1	-	
Output Ripple & Noise*	20MHz bandwidth (peak-peak value)	-	-	150	mV
Temperature Drift Coefficient		-	±0,02	-	%/°C
Stand-by Power Consumption		-	-	0,5	W
Short Circuit Protection		Continuous, self-recovery			
Over-current Protection		≥110%Io self-recovery			
Over-voltage Protection		Zener clamp diode			
Min. Load			-	-	%
Trim		-	-	-	
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	4000	-	-	VAC
	Input- 	1500	-	-	
	Output- 	500	-	-	
Operating Temperature		-40	-	+70	°C
Storage Temperature		-40	-	+85	
Storage Humidity		-	-	95	%RH
Welding Temperature	Wave-soldering	260 ± 5°C; time: 5~10s			
	Manual-welding	360 ± 10°C; time: 3~5s			
Switching Frequency		-	100	-	kHz
Power Derating	-40°C to -30°C	4,0	-	-	% / °C
	+45°C to +70°C (5V,9V output)	3,0	-	-	
	+50°C to +70°C (12V,15V output)	2,5	-	-	
	+55°C to +70°C (24V,48V output)				
Safety Standard		IEC60950/EN60950/UL60950			
Safety-regulated Certification		EN60950/UL60950			
Safety Class		CLASS I			
Hot Plug		Unavailable			
MTBF		MIL-HDBK-217F@25°C > 300.000h			

## PHYSICAL SPECIFICATIONS

Casing Material		Black flame-retardant and heat-resistant plastic (UL94-V0)
Package Dimensions	Horizontal package	109,00*58,50*30,00mm
	A5 wiring package	135,00*70,00*38,50mm
	A6 rail package	137,00*70,00*44,00mm
Weight	Horizontal package/A5 wiring package/A6 rail package	310,00g(Typ.)
Cooling Method		Free air convection

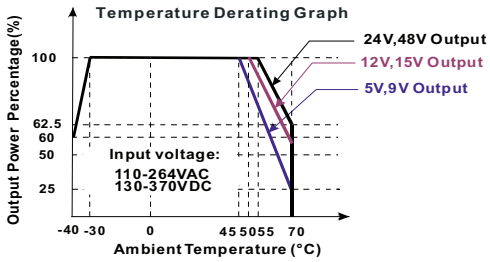
## EMC SPECIFICATIONS

EMI	Conducted Disturbance	CISPR22/EN55022, CLASS B
	Radiated Emission	CISPR22/EN55022, CLASS B

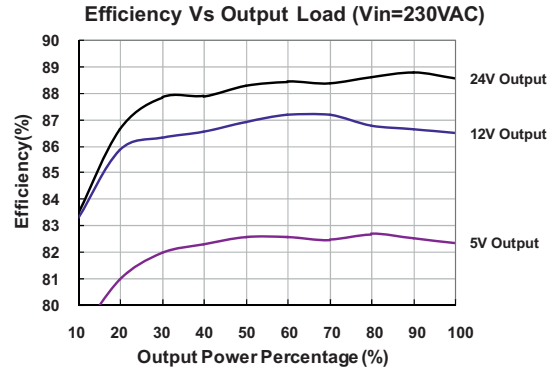
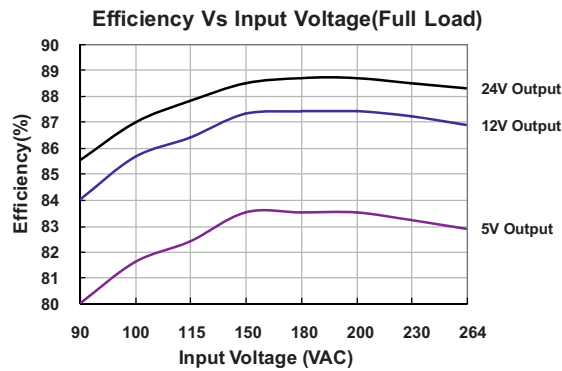
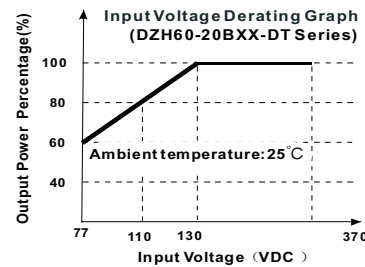
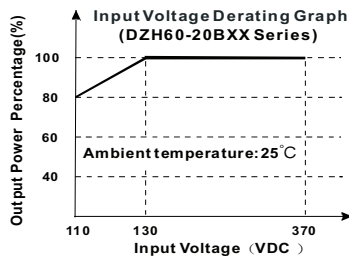
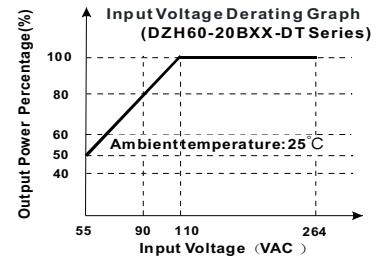
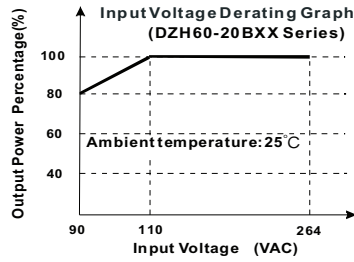
The models listed above is just for standard type. If you need the special specification product, please contact our service member by telephone presented in shortform cover or e-mail to: [info@zimtec-electronics.de](mailto:info@zimtec-electronics.de)

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

## PRODUCT CHARACTERISTIC CURVE



Note: Input voltage should be derated based on temperature derating when it is 90-110VAC/77-130VDC.



## DESIGN REFERENCE

### 1. Typical application circuit

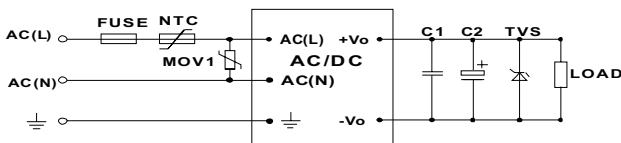


Fig. 1: Typical application circuit

Model	C1(μF)	C2(μF)	TVS tube
DZH60-20B05(-DT)	1	680	SMBJ7.0A
DZH60-20B09(-DT)		470	SMBJ12A
DZH60-20B12(-DT)		330	SMBJ20A
DZH60-20B15(-DT)		330	SMBJ20A
DZH60-20B24(-DT)		200	SMBJ30A
DZH60-20B48(-DT)		100	SMBJ64A

**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.

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## 2. EMC solution-recommended circuit

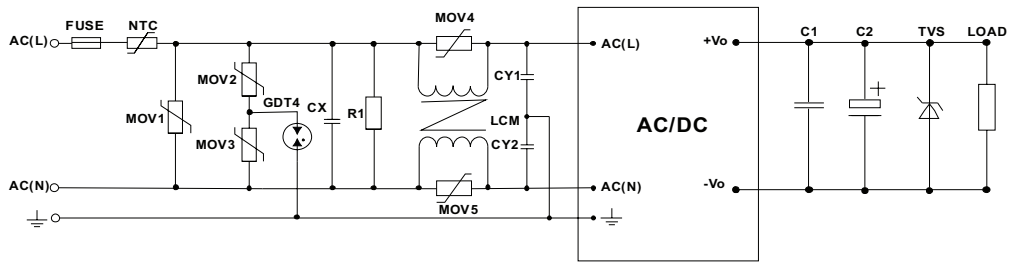


Fig 2: EMC application circuit with higher requirements (external circuit output is the same as figure 1)

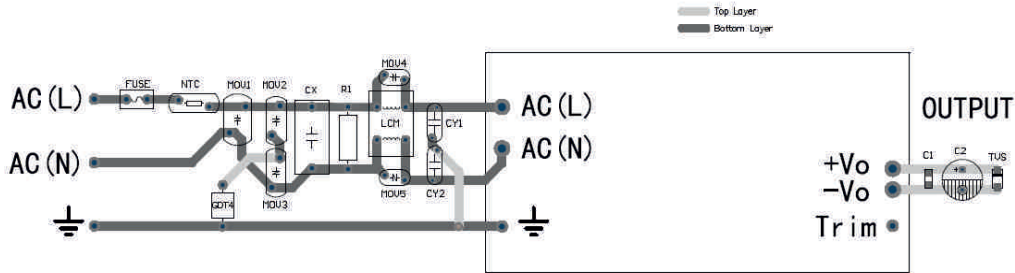
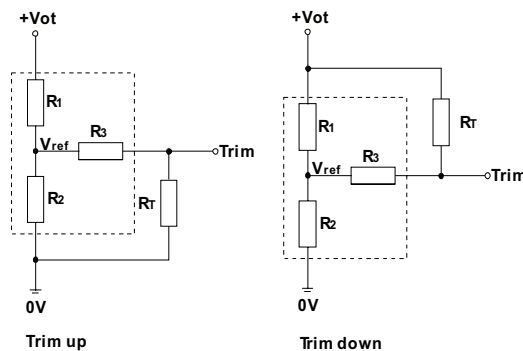


Fig 3: Recommended EMC circuit-PCB layout

Suggestions for safety regulation and wiring width: wire width  $\geq 3\text{mm}$ , distance between wires  $\geq 6\text{mm}$ , and distance between wire and ground  $\geq 6\text{mm}$

Element model	Recommended value	Element model	Recommended value
MOV1	S20K350	CY2	2.2nF /400VAC
MOV2	S14K350	R1	1M $\Omega$ /2W
MOV3	S14K350	LCM	2.2 mH, recommended to use ZimTec's FL2D-30-222;
MOV4	S10K350	GDT4	B5G3600
MOV5	S10K350	NTC	5D-14
CX	0.15 $\mu\text{F}$ /300VAC	FUSE	3.15A/250V, slow fusing, necessary
CY1	2.2nF/400VAC	--	--

## 3. Application of Trim and calculation of Trim resistance



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

Calculation formula of Trim resistance:

$$\begin{aligned} \text{up: } R_T &= \frac{a R_2}{R_2 - a} - R_3 & a &= \frac{V_{\text{ref}}}{V_{\text{ot}} - V_{\text{ref}}} \cdot R_1 \\ \text{down: } R_T &= \frac{a R_1}{R_1 - a} - R_3 & a &= \frac{V_{\text{ot}} - V_{\text{ref}}}{V_{\text{ref}}} \cdot R_2 \end{aligned}$$

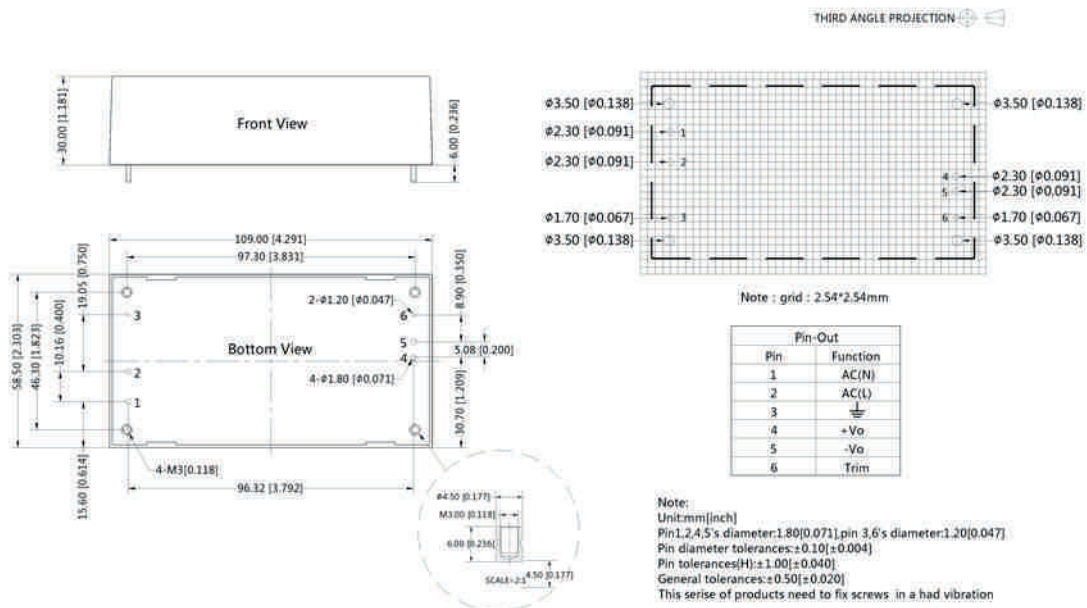
$R_T$  is Trim resistance  
 $a$  is a self-defined parameter, with no real meaning.

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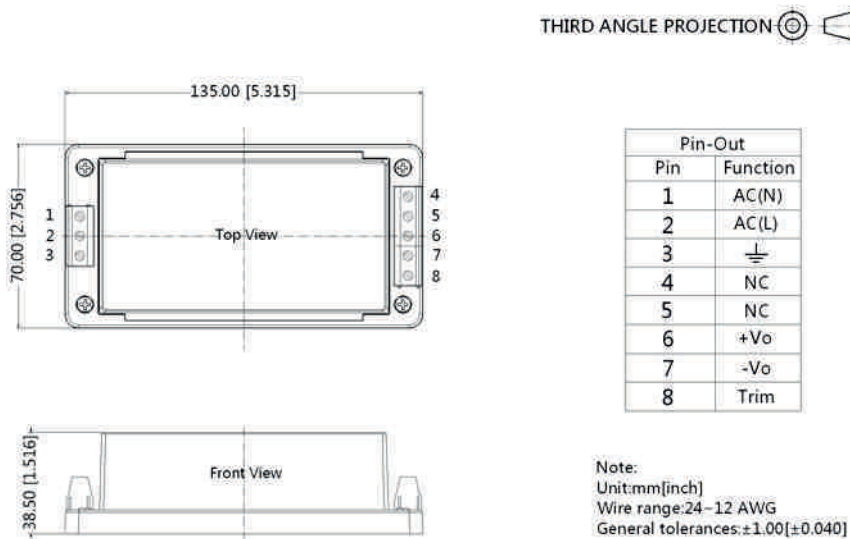
Vout	R1(KΩ)	R2(KΩ)	R3(KΩ)	Vref(V)	Volt(V)
5V	3.3	3.3	1	2.5	Output voltage after regulation, variation ≤ ±10%
9V	4.7	1.8	1	2.5	
12V	3.83	1	1	2.5	
15V	7.5	1.5	1	2.5	
24V	8.66	1	1	2.5	
48V	33	1.8	1	2.5	

4. For more information please find application notes on [www.zimtec-electronics.de](http://www.zimtec-electronics.de)

## DIMENSIONS AND RECOMMENDED LAYOUT



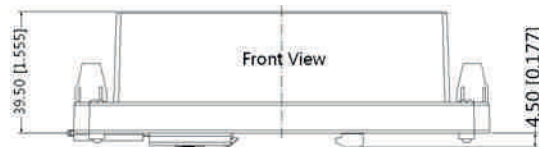
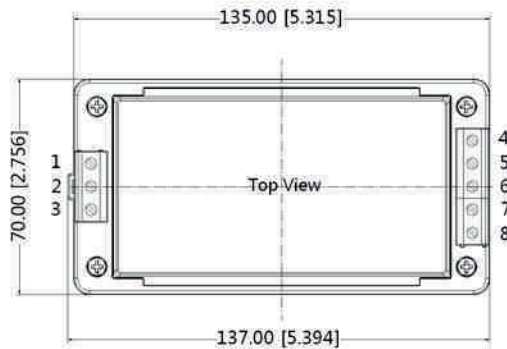
## A5 WIRING PACKAGE DIMENSIONS



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## A6 RAIL PACKAGE DIMENSIONS

THIRD ANGLE PROJECTION 



Pin-Out	
Pin	Function
1	AC(N)
2	AC(L)
3	⏏
4	NC
5	NC
6	+Vo
7	-Vo
8	Trim

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  $T_a=25^{\circ}\text{C}$ , 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.