Typical Features

- Wide input voltage range 4: 1
- Efficiency up to 90%
- Low no-load power consumption
- Operating temperature from -40℃ to +105℃
- High isolation voltage 1500VAC (input-output) & 1500VAC (input-case)
- Input under voltage protection, output over current, short circuit and over temperature protections
- Standard 2″X1″ Package (Wide Pins)

ZHD40-110S12A is a high-performance DC-DC modular converter with rated input voltage 110VDC (full range from 43V to 160VDC), regulated single output 12V/40W without minimum load limit. It has the advantage of high isolation voltage, Max operating temperature up to 105°C, with input under voltage protection, output over current, over temperature and short circuit protections, input ON/OFF control and output voltage Trim, etc.

Typical Product List

Part No.	Input voltage range (VDC)	Output power (W)	Output voltage (VDC)	Output current (A)	Ripple & Noise (mVp-p)	Full load efficiency (%) Min/Typ.	Remarks
ZHD40-110S12AC	43-160	40	12	3.33	120	88/90	Standard Positive logic
ZHD40-110S12AN							Standard Negative logic
ZHD40-110S12AC-H							Heatsink Positive logic
ZHD40-110S12AN-H							Heatsink Negative logic

Input Specifications

Item	Operating conditions	Min.	Typ.	Max.	Unit
Max input current	Input voltage 43V, full load	--	--	1.5	A
No load input current	Rated input voltage	--	--	20	mA
Input Inrush voltage (1sec. max.)	The unit could be permanently broken by input over this voltage	-0.7	--	185	VDC
Start-up voltage		--	--	43	
Under voltage protection	With No-load (the over current protection could work in advance at full load)	--	--	42	
ON/OFF Control (CNT)	Positive logic: CNT no connection or connected to 3.5-15V to turn ON, connected to 0-1.2V to turn OFF the converter				Reference voltage -Vin
	Negative logic: CNT no connection or connected to 3.5-15V to turn OFF, connected to 0-1.2V to turn ON the converter				

Output Specifications

Item	Operating conditions	Min.	Typ.	Max.	Unit
Output voltage accuracy	Nominal input voltage, 10% -100% load	--	±0.2	±1.0	%

Line regulation	Full load, input voltage from low to high	--	±0.2	±0.2	
Load regulation	Nominal input voltage, 10%-100% load	--	±0.2	±0.5	
Transient recovery time	25% load step change (step rate 1A/50μS)	--	200	250	uS
Transient response deviation		-5	--	5	%
Temperature drift coefficient	Full load	-0.02	--	+0.02	%/℃
Ripple & Noise	20M bandwidth, with external capacitor >220μF	--	100	120	mVp-p
Output voltage TRIM		-20	--	+10	%
Over temperature protection	Maximum temperature of the metal base	105	115	125	℃
Output Over-voltage Protection		125	--	140	%
Over current protection		3.6	--	5	A
Short circuit protection		Hiccup, continuous, self-recovery			

General Specifications

Item	Operating conditions		Min.	Typ.	Max.	Unit
Isolation voltage	I/P-O/P	Test 1min, leakage current <3mA	1500	--	--	VAC
	I/P-Case	Test 1min, leakage current <3mA	1500	--	--	VAC
	O/P-Case	Test 1min, leakage current <3mA	500	--	--	VDC
Insulation resistance	I/P-O/P	@ 500VDC	100	--	--	MΩ
Switching frequency			--	270	--	KHz
MTBF	MIL-HDBK-217F @25℃		150	--	--	K hours

Environmental Specifications

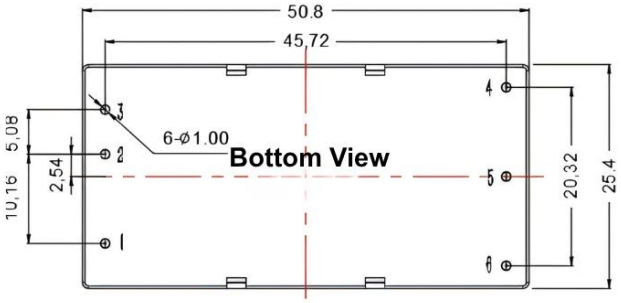
Item	Operating conditions	Min.	Typ.	Max.	Unit
Operating temperature	Refer to the temperature derating graph	-40	--	+105	℃
Storage humidity	No condensing	5	--	95	%RH
Storage temperature		-40	--	+125	℃
Pin soldering temperature	1.5mm from the case, soldering time <1.5S	--	--	+350	
Cooling requirement		EN60068-2-1			
Dry heat requirement		EN60068-2-2			
Damp heat requirement		EN60068-2-30			
Shock and vibration		IEC/EN 61373 C1/Body Mounted Class B			

EMC Performances (EN50155)

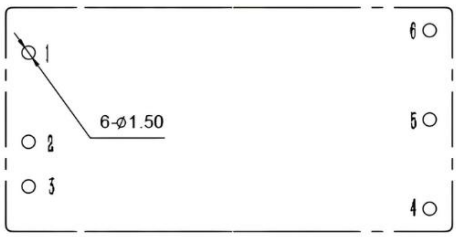
EMI	CE	EN50121-3-2	150kHz-500kHz 79dBuV	
		EN55016-2-1	500kHz-30MHz 73dBuV	
	RE	EN50121-3-2	30MHz-230MHz 40dBuV/m at 10m	
		EN55016-2-1	230MHz-1GHz 47dBuV/m at 10m	
EMS	ESD	IEC/EN61000-4-2/GB/T 17626.2-2006	Contact ±6KV/Air ±8KV	perf. Criteria A
	RS	IEC/EN61000-4-3/GB/T 17626.3-2006	10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4/GB/T 17626.4-2008	±2kV 5/50ns 5kHz	perf. Criteria A
	Surge	IEC/EN61000-4-5/GB/T 17626.5-2008	Line to line ± 1KV（42Ω, 0.5μF）	perf. Criteria A
	CS	IEC/EN61000-4-6/GB/T 17626.6-2008	0.15MHz-80MHz 10 Vr.m.s	perf. Criteria A

Physical Specifications	
Case materials	Metal base + plastic case in black, flame class UL94-V0
Heatsink	Dimensions: 50.0 x 24.2 x 10.5 mm, Net Weight: 12g (Approx.),Aluminum Alloy,Black Anodized
Cooling method	Conduction cooling or forced air cooling with fan
Unit weight	Standard 30g, With Heatsink: 43g

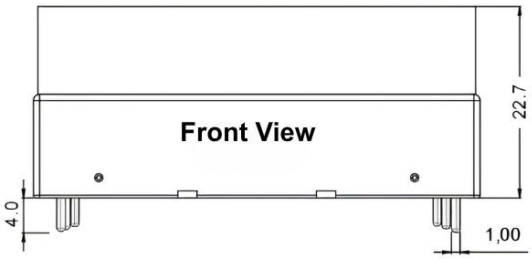
Mechanical Dimensions and Pin-out Function Description

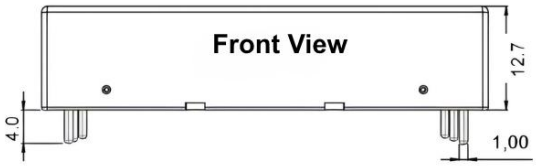


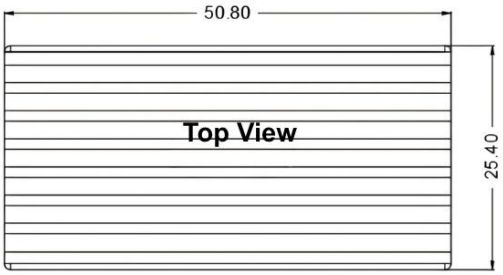
First Angle Projection



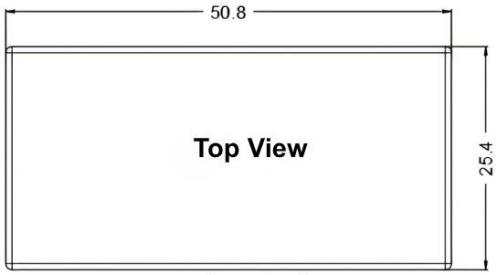
Recommended PCB Slot Dimensions







Standard + Heat sink
50.8*25.4*22.7mm



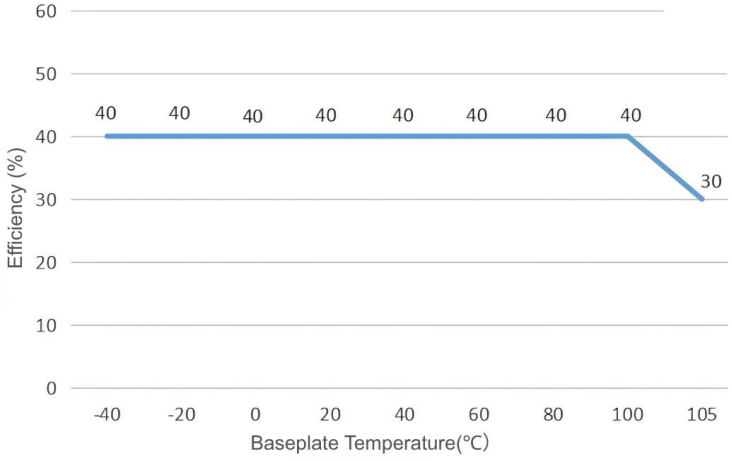
Standard
50.8*25.4*12.7mm

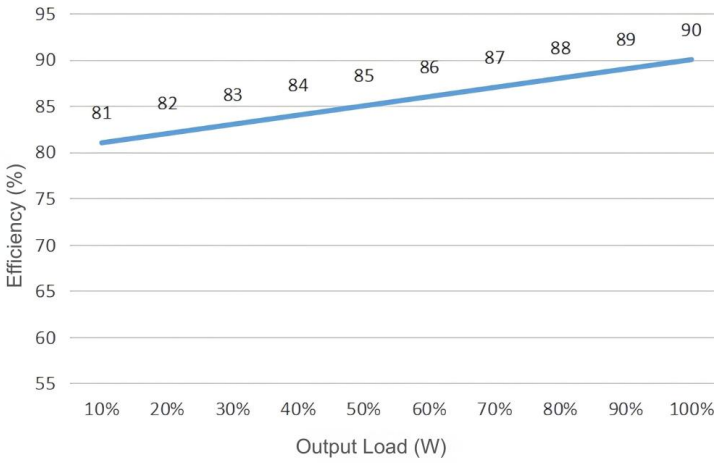
Note:

- **Unit: mm**
- **Pin 1, 2, 3, 5, 6 diameter: 1.00mm**
- **Pin 4, 8 diameter: 1.50mm**
- **Tolerance: X.X ±0.50 mm, X.XX ±0.10 mm**
- **Mounting Torque: 0.4 N·m (Max.)**

Pin No.	1	2	3	4	5	6
Pin Definition	CNT	Vin-	Vin+	Vout+	Vout-	TRIM
Function	Remote ON/OFF	Negative Input	Positive Input	Positive Output	Negative Output	Output Trim

Product Characteristic Curves



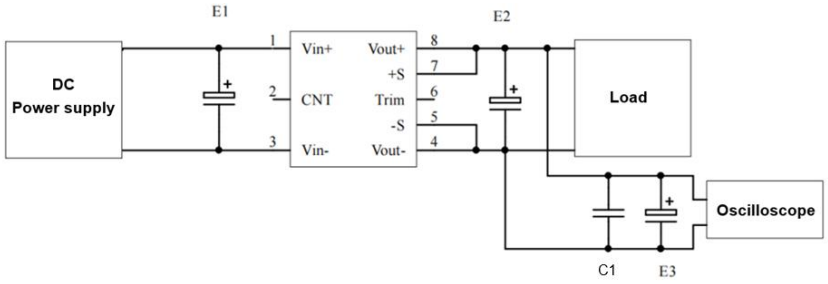


Note:
1. The output power and the efficiency in the graphs have been tested with typical values.
2. The data in temperature derating graph has been tested at Aipu laboratory test conditions. It is recommended to keep the temperature of the Metal base not more than 100 °C when the converter operates at the rated load for the application.

Recommended Circuits for Application

1. Ripple & Noise

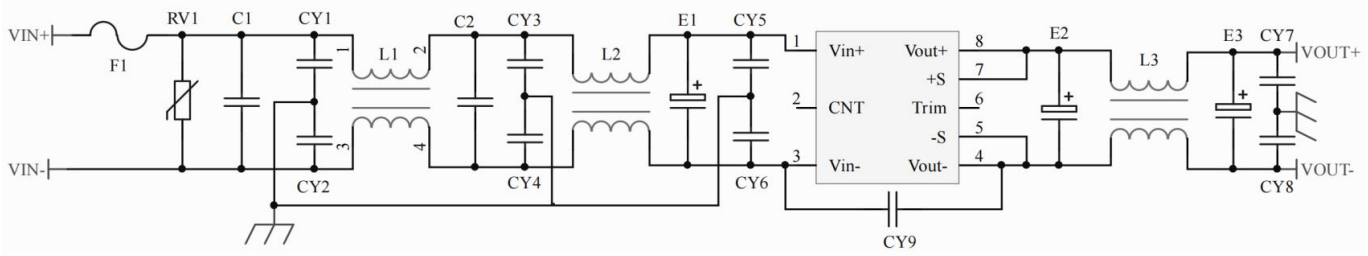
All this series of converters will be tested according to the circuit diagram below before shipping.



Capacitance / Output Volt.	E1 (μF)	E2 (μF)	C1 (μF)	E3 (μF)
3.3VDC	100	1000	1	10
5VDC		680		
12VDC		220		
.....				
48VDC				
.....	68	68		
110VDC				

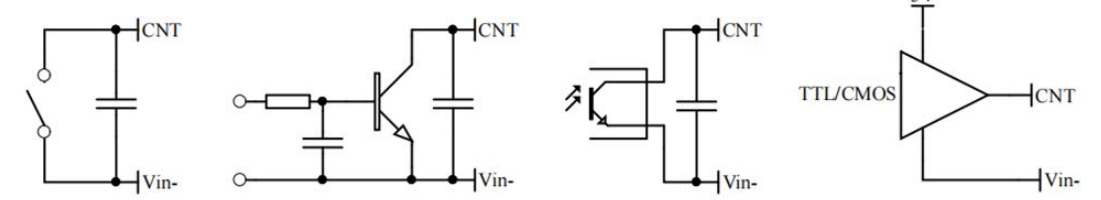
2. Typical application circuit

If this circuit recommended below is not adopted, please connect an electrolytic capacitor ⩾100 μF at the input to suppress the possible surge voltage.



F1	T2A/250V Time-delay fuse
RV1	10D 200V Varistor
C1, C2	105/250V Polyester Film Capacitor
CY1, CY2, CY3, CY4, CY5, CY6	102/250Vac Y2 capacitor
CY7, CY8	103/2KV Ceramic Capacitor
CY9	471/250Vac Y1 capacitor
E1	47μF/200V Electrolytic Capacitor
E2, E3	470μF/16V Low ESR Capacitor
L1, L2	>5mH, temperature rise less than 25°@1.2A
L3	>0.2mH, temperature rise less than 25°@3.4A

3. ON/OFF control (CNT) application



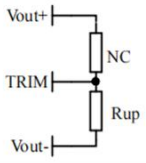
Switch control method | Transistor control method | Isolation control method | TTL/CMOS control method

4. TRIM & TRIM resistance calculation

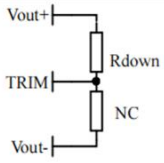
The calculation of △U and Rup & Rdown:

Rup=31/△U-5.1(KΩ)

Rdown=12.4*(9.5-△U)/△U-5.1(KΩ)



Voltage-up: Add Rup between Trim and Vout-



Voltage-down: Add Rdown between Trim and Vout+

5. This product does not support direct parallel connection for power expansion. For parallel applications, please consult our technical team.

Others

1.The product warranty period is two years. We offer free repair for any damage under normal use. Paid services are available for damage caused by improper application or technical mishandling.

2.Customized products and matching filter modules are available. Please contact Aipupower technical team for specific details

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