

Conform to CE

### Typical Features

- ◆ Wide input voltage range 4:1
- ◆ Efficiency up to 90% (Typ.)
- ◆ Low no-load power consumption
- ◆ Operating Temperature: -40°C to +105°C
- ◆ High isolation voltage, input-output 1500VDC, input-case 1500VDC
- ◆ Protection: Input under voltage, output over voltage, short circuit, over current, over temp
- ◆ Standard 1/4 brick size

**ZCD150-48S12** is a high efficiency 1/4 brick dc-dc converter, rated input voltage 48VDC, output 12V/150W, no minimum load, ultra-wide input 18-75VDC, regulated single output, high isolation voltage, operating temperature up to 105 °C, with input under-voltage protection, output over-current, over-voltage, over-temperature and short-circuit protections, remote control and voltage distal end compensation, output voltage regulation and other functions.

### Typical Product List

Part no	Input voltage range (VDC)	Output power (W)	Output voltage (VDC)	Output current (A)	Ripple & Noise (mV)	Full load efficiency (%) Min/Typ.	Note
ZCD150-48S12C	18-75	150	12	12.5	120	88/90	Standard positive logic
ZCD150-48S12N							Standard negative logic
ZCD150-48S12C-H							Heatsink positive logic
ZCD150-48S12N-H							Heatsink negative logic

### Input Specification

Item	Operating conditions	Min.	Typ.	Max.	Unit
Max input current	18V input voltage, full load output	--	--	10	A
No load input current	Rated input voltage	--	--	30	mA
Input surge voltage (1sec. max.)	Inputs above this range may cause permanent damage	-0.7	--	100	VDC
Start-up voltage		--	--	18	
Input under voltage protection	No-load (Overcurrent protected in advance at full load)	--	--	17	
Control (CNT)	Positive logic: No connection or connected to 3.5-15V to turn on, connected to 0-1.2V to turn off Negative logic: No connection or connected to 3.5-15V to turn off, connected to 0-1.2V to turn on				Reference voltage-VIN

### Output Specification

Item	Working conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	Rated input voltage, 0%-100% load	--	±0.5	±1	%
Line Regulation	Full load, input voltage from low to high	--	±0.2	±0.5	
Load Regulation	Rated input voltage, 10%-100% load	--	±0.2	±0.5	

Output voltage setting accuracy	Full input voltage range, 0%-100% load	--	±1.0	±2.0	
Transient recovery time	25% load step change (step rate 1A/50uS)	--	200	250	uS
Transient Response Deviation		-5	--	5	%
Temperature Drift Coefficient	Full load	-0.02	--	+0.02	%/°C
Ripple & Noise	20M bandwidth, external capacitor above 220uF	--	100	120	mVp-p
Output voltage adjustment (TRIM)		-20	--	+10	%
Output voltage distal end compensation (Sense)		--	--	105	%
Over temp protection	Maximum temperature of product metal case surface	105	115	125	°C
Output overvoltage protection		125	--	150	%
Output overcurrent protection		13	--	18	A
Output short circuit protection		Hiccup, continuous, self-recovery			

**General Specification**

Item	Operating conditions		Min.	Typ.	Max.	Unit
Isolation Voltage	I/P-O/P	Test 1min, leakage current < 3mA	1500	--	--	VDC
	I/P-Case	Test 1min, leakage current < 3mA	1500	--	--	VDC
	O/P-Case	Test 1min, leakage current < 3mA	500	--	--	VDC
Insulation resistance	I/P-O/P	@ 500VDC	10	--	--	MΩ
Switching frequency			--	300	--	KHz
MTBF			15	--	--	K hours

**Environmental characteristics**

Item	Operating conditions	Min.	Typ.	Max.	Unit
Operating Temperature	See temperature derating curve	-40	--	+105	°C
Storage Humidity	No condensing	5	--	95	%RH
Storage Temperature		-40	--	+125	°C
Soldering resistance of pins	1.5mm distance from the shell, soldering time < 1.5S	--	--	+350	
Cooling requirements		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 Performance (EN50155)**

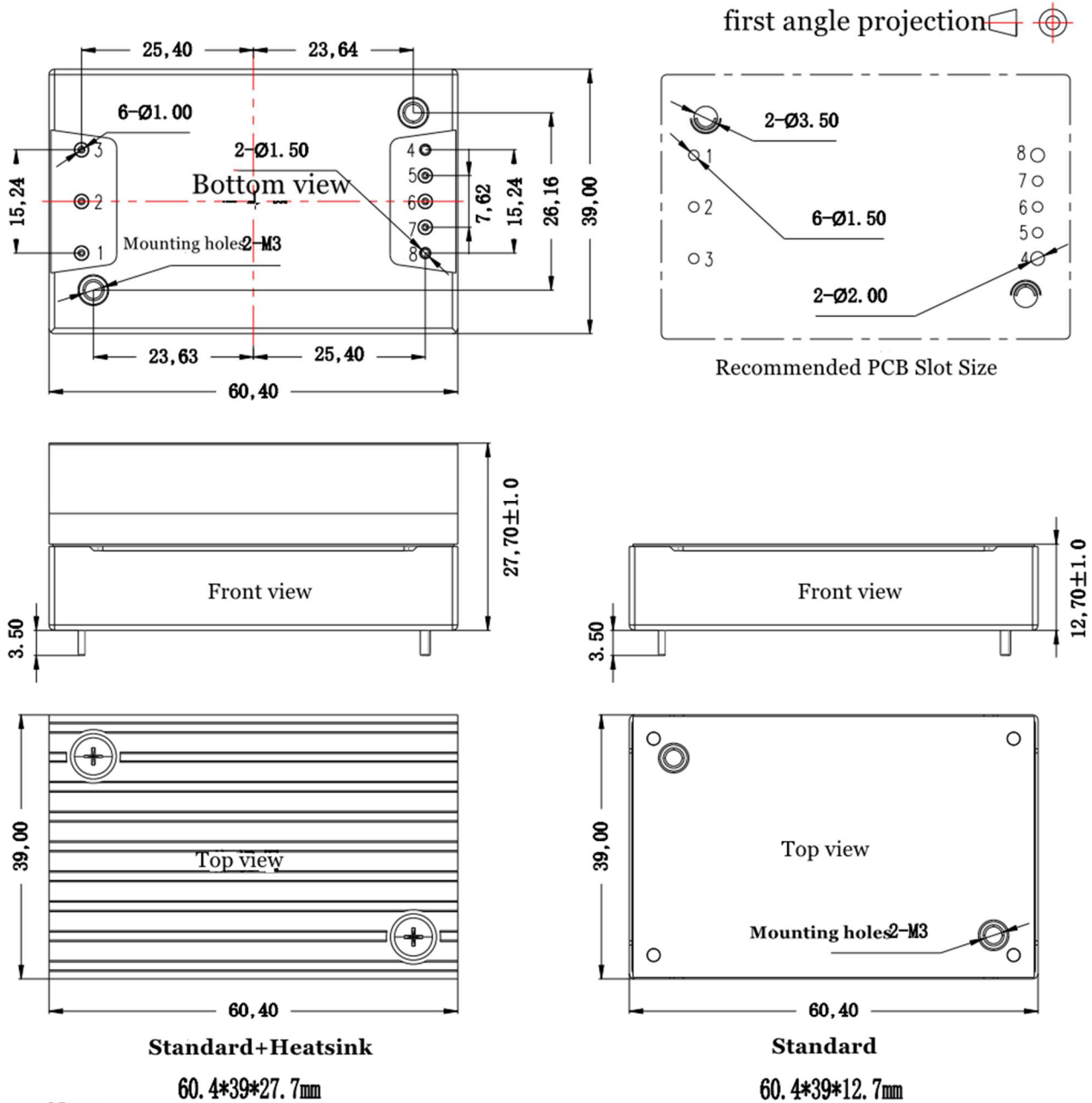
EMI	CE	EN50121-3-2	150kHz-500kHz 79dBuV		
		EN55016-2-1	500kHz-30MHz 73dBuV		
	RE	EN50121-3-2	30MHz-230MHz 40dBuV/m at 10m		
		EN55016-2-1	230MHz-1GHz 47dBuV/m at 10m		
EMS	ESD	EN50121-3-2	Contact ±6KV/Air ±8KV		perf. Criteria A
	RS	EN50121-3-2	10V/m		perf. Criteria A
	EFT	EN50121-3-2	±2kV 5/50ns 5kHz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

**Physical Characteristics**

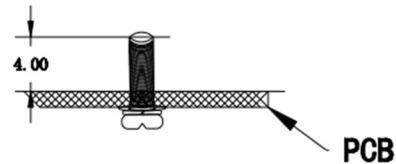
Case Materials	Metal bottom shell + Plastic case in black with flame class UL94 V-0
Heat sink	Dimension 60.4*39.0*15mm, weight 52g, aluminum alloy, anodized black

Cooling method H	Conduction cooling or forced air cooling
Product Weight	Standard 70g, with heatsink 125g

### Dimension and Pin-Out

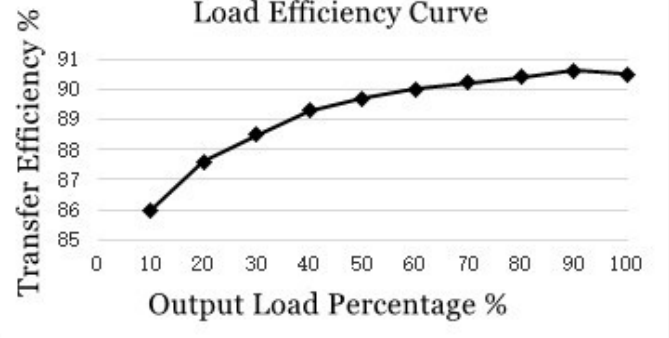
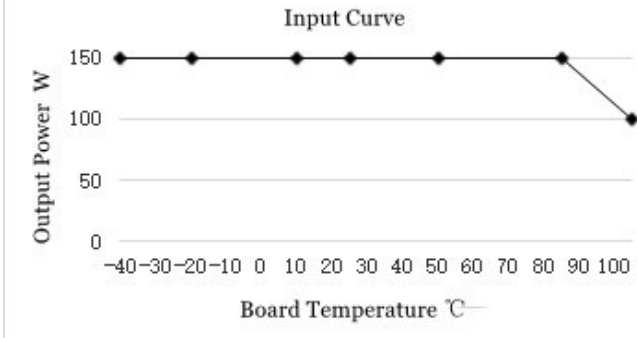


Note:  
 Unit:mm  
 Pin 1,2,3,5,6,7 dia:1.00  
 Pin 4,8 dia:1.50  
 General tolerance:±0.10  
 Mounting hole tightening torque: Max 0.4N\*m



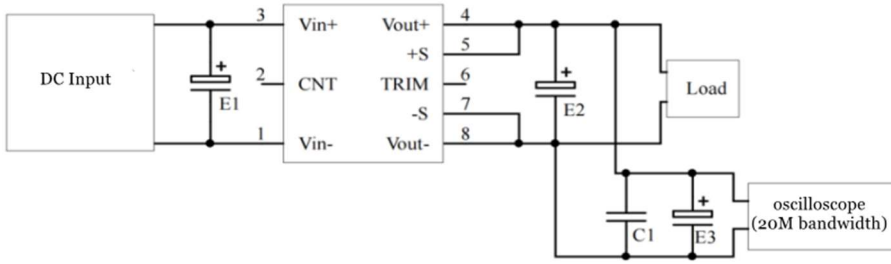
	1	2	3	4	5	6	7	8
Pin-out	Vin+	CNT	Vin-	Vout-	-S	TRIM	+S	Vout+

**Product Performance Curve**



- Note:
- Both the temperature derating curve and the efficiency curve are tested with typical values.
  - The temperature derating curve is tested at Aipu laboratory test conditions. The product can be used at rated load with the condition the aluminum case temperature lower than 105 °C.

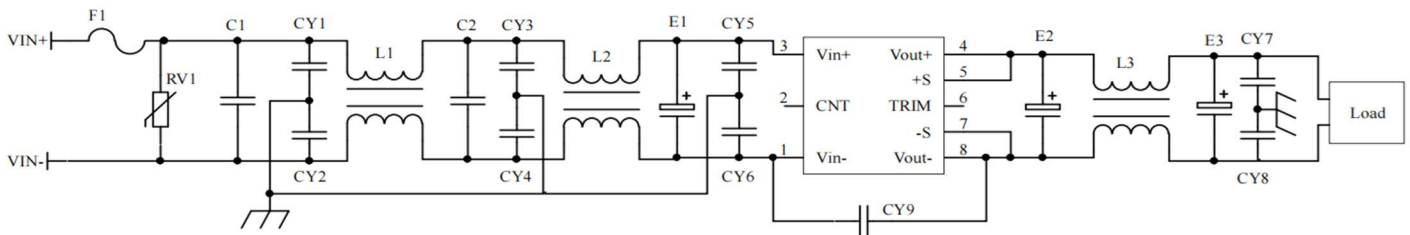
All DC/DC converters of this series are tested according to the test circuit recommended below before shipping.



capacitor value	E1 (μF)	E2 (μF)	C1 (μF)	E3 (μF)
Output voltage				
3.3VDC	100	1000	1	10
5VDC		680		
12VDC		220		
.....				
48VDC	68	68		
.....				
110VDC				

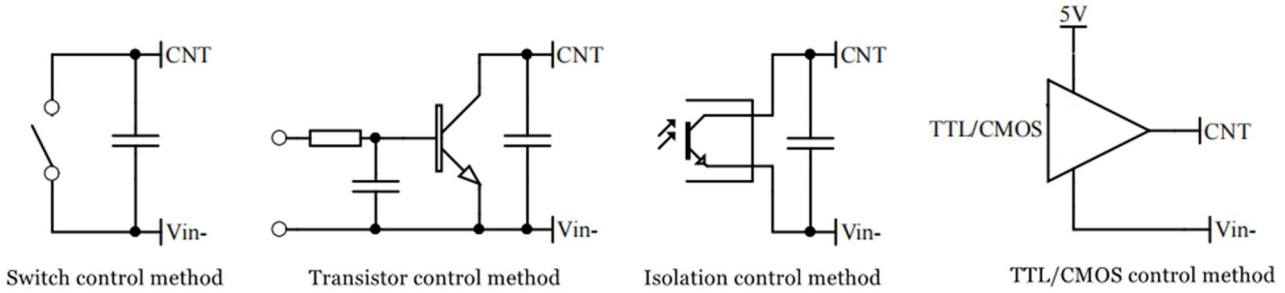
**1. Recommended application circuit**

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



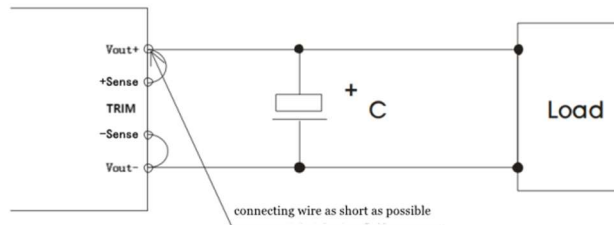
F1	T10A/250Vac fusing
RV1	14D 82V Varistor
C1,C2	105/250V Polyester Film Capacitor
CY1,CY2,CY3,CY4,CY5,CY6	472/250Vac safety Y2 capacitor
CY7,CY8	103/2KV Ceramic Capacitor
CY9	471/250Vac safety Y1 capacitor
E1	100μF/100V Electrolytic Capacitor
E2, E3	220μf/25V Electrolytic Capacitor
L1,L2	≥10mH, temperature rise less than 25°K@10A
L3	≥1mH, temperature rise less than 25°K@13A

**2. Remote control (CNT) Application**



**3. Application for Sense**

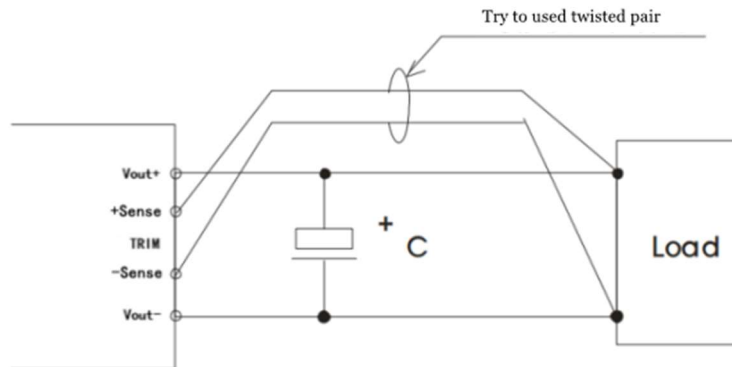
1) With NO distal end compensation



Notes:

1. Vout+ & Sense+, Vout- & Sense- should be shorted when distal compensation is not needed
2. The lead wire between Vout+ and Sense+, Vout- and Sense- should be as short as possible, and close to the pins, or else the output may be unstable.

2) With distal end compensation



Notes:

1. The output voltage may be unstable if the compensation cables are too long.
2. Twisted pair or shielded cables are recommended, the cable length should be as short as possible.
3. Wide copper path on PCB or thick lead wires between the power supply and the load should be used to achieve the line voltage drop <0.3V. The target is to keep output voltage within the specified range.
4. The leads wire resistance may create the output voltage oscillation or larger ripples. Please verify it before to use.

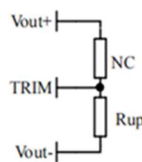
**4. TRIM and calculation of TRIM resistance**

The calculation of  $\Delta U$  and  $R_{up}$  &

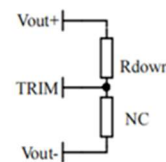
$R_{down}$ :

$$R_{up} = 25 / \Delta U - 5.1 \text{ (K}\Omega\text{)}$$

$$R_{down} = 10 * (12 - 2.5 - \Delta U) / \Delta U - 5.1 \text{ (K}\Omega\text{)}$$



Voltage-up: Add  $R_{up}$  between Trim and Vout-



Voltage-down: Add  $R_{down}$  between Trim and Vout+

**5. This product is not available for connection in parallel to increase the output power. Please contact Aipu technician for this kind of requirement.**

## Others

- 1.The warranty period of this product is two years. The failed product can be repaired/replaced free of charge if it operates at normal condition. A paid service shall be also provided if the product failed after operating at wrong or unreasonable conditions.
2. Aipupower can provide customization design and filter modules for matching, please contact our technician for details.

### **Guangzhou Aipu Electron Technology Co., Ltd**

Address: Building 4, HEDY Park, No.63, Punan Road, Huangpu Dist, Guangzhou, China.

Tel: 86-20-84206763 Fax: 86-20-84206762 HOTLINE: 400-889-8821

E-mail: sales@aipu-elec.com Website: www.aipupower.com