



Conform to CE

### Typical Features

- ◆ Wide input voltage range 2:1
- ◆ High efficiency up to 90%
- ◆ Low no-load power consumption
- ◆ Operating Temperature from -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

**ZCD150-48S15** is a high efficiency 1/4 brick dc-dc converter, rated input voltage 48VDC, output 15V/150W, no minimum load, ultra-wide input 36-75VDC, regulated single output, high isolation voltage, operating temperature up to 105 °C, with input under-voltage protection, output over-current protection, over-voltage protection, over-temperature protection, short-circuit protection, input remote control, output Trim and Sense(distal end compensation) and other functions, etc.

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
ZCD150-48S15C	36-75	150	15	10	150	88/90	Standard positive logic
ZCD150-48S15N							Standard negative logic
ZCD150-48S15C-H							Heatsink positive logic
ZCD150-48S15N-H							Heatsink negative logic

Input Specifications						
Item	Operating conditions	Min.	Typ.	Max.	Unit	
Max input current	36V input voltage, full load output	--	--	5	A	
No load input current	Rated input voltage	--	--	20	mA	
Input inrush voltage (1sec. max.)	A permanent damage risk when input over this range	-0.7	--	80	VDC	
Start-up voltage		--	--	36		
Input under voltage protection	No-load test(over current protection may start in advance at full load)	--	--	34		
Control (CNT)	Positive logic: CNT no connection or connected to 3.5-15V to turn on, connected to 0-1.2V to shut off					Ref voltage -Vin
	Negative logic: CNT no connection or connected to 3.5-15V to shut off, connected to 0-1.2V to turn on					

Output Specifications						
Item	Operating conditions	Min.	Typ.	Max.	Unit	
Output Voltage Accuracy	Rated input voltage, 10% load	--	±0.5	±1.0	%	

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	
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	--	120	150	mVp-p
Output voltage adjustment (TRIM)		-20	--	+10	%
Output voltage distal end compensation (Sense)		--	--	105	%
Over temp protection	Maximum temperature of metal shell surface	105	115	125	°C
Output overvoltage protection		125	--	150	%
Output overcurrent protection		11	--	14	A
Output 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	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	100	--	--	MΩ
Switching frequency			--	210	--	KHz
MTBF			150	--	--	K hours

### Environmental characteristics

Item	Operating conditions		Min.	Typ.	Max.	Unit
Operating Temperature	Refer to the temperature derating curve		-40	--	+105	°C
Storage Humidity	No condensing		5	--	95	%RH
Storage Temperature			-40	--	+125	°C
Pin soldering temperature	1.5mm 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			

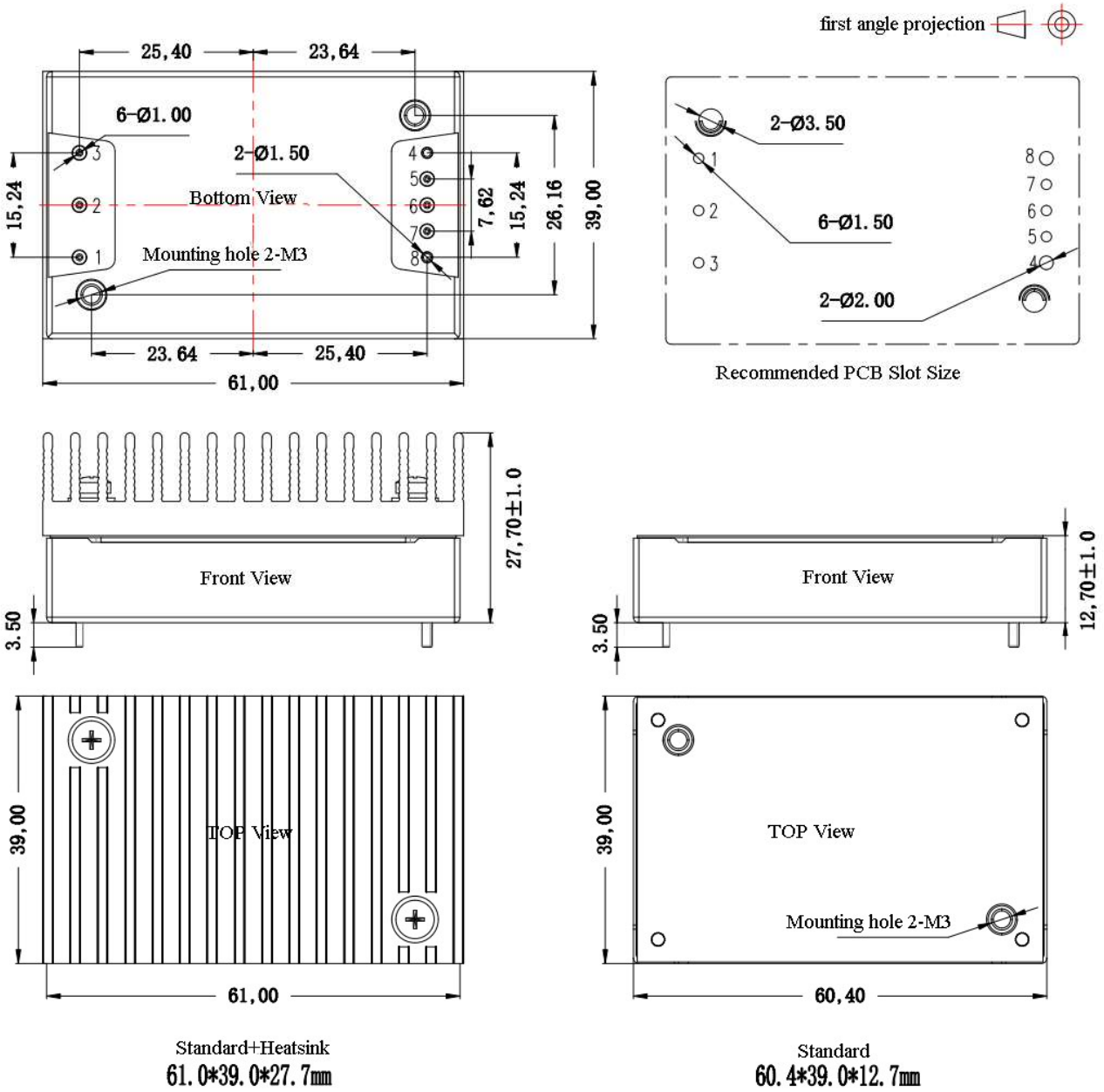
### EMC Performance (EN50155)

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

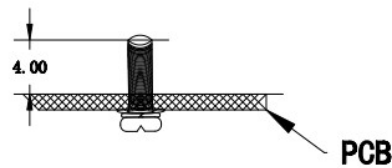
**Physical Characteristics**

Case Materials	Metal bottom shell + plastic case in black with flame class UL94 V-0
Heat sink	Dimension 61.0x39.0x15mm, 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**

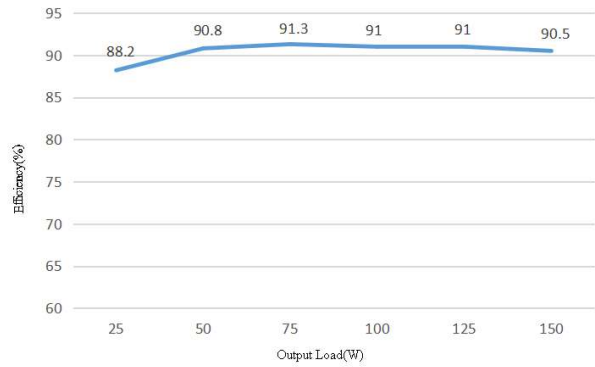
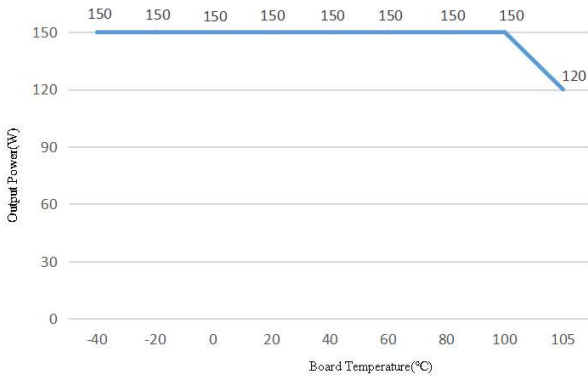


Note:  
unit:mm  
Pin1,2,3,5,6,7 dia:1.00  
Pin4,8 :1.50  
general tolerance:±0.10  
mounting hole tightening torque: Max 0.4N\*m



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

**Product Performance Curve**



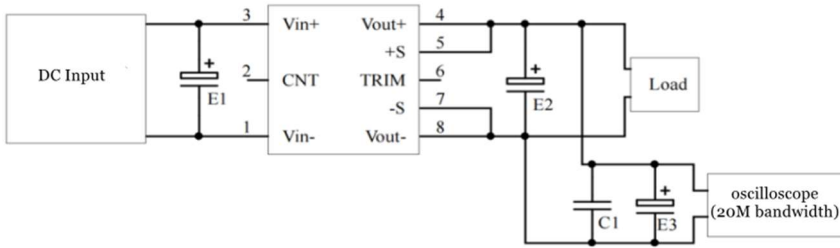
Note:

- Both the temperature derating curve and the efficiency curve are made by the tested typical values.
- The temperature derating is tested at Aipu laboratory test conditions. It is recommended to keep the temperature of the aluminum case not more than 105 °C while the converter operating at the rated load range for customer application.

**Recommended Circuits for Application**

**Typical application circuit**

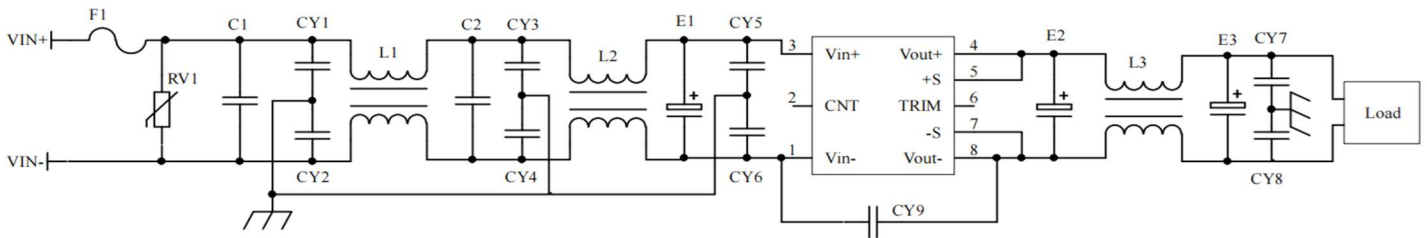
All this series converters will be tested according to this circuit recommended below before shipping.



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

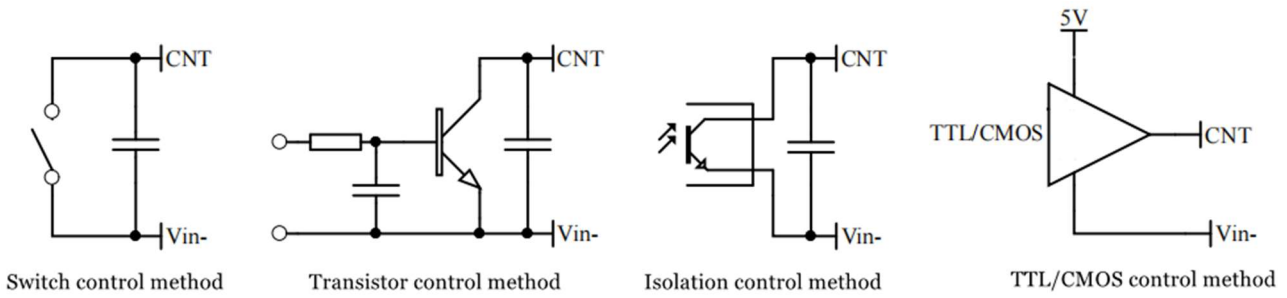
**Recommended EMC circuit**

If this circuit recommended is not adopted, please connect an electrolytic capacitor  $\geq 100 \mu\text{F}$  in parallel at the input to suppress the possible surge voltage at the input.



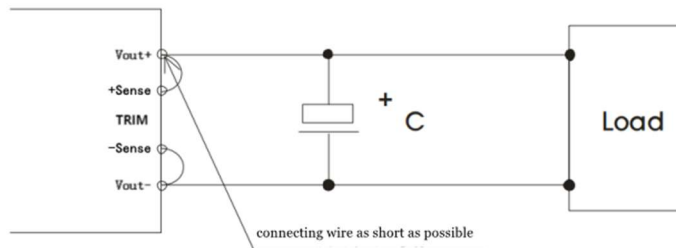
F1	T10A/250Vac fusing
RV1	14D 100V Varistor
C1,C2	105/1000V Polyester Film Capacitor
CY1,CY2,CY3,CY4,CY5,CY6	102/250Vac safety Y2 capacitor
CY7,CY8	103/2KV Ceramic Capacitor
CY9	471/250Vac safety Y1 capacitor
E1	220μF/100V Electrolytic Capacitor
E2, E3	470μF/25V Electrolytic Capacitor
L1,L2	> 3mH, the temperature rise less than 25°K@5A
L3	> 0.3mH, the temperature rise less than 25°K@12.5A

**Remote control (CNT) application recommendation**



**Application for Sense**

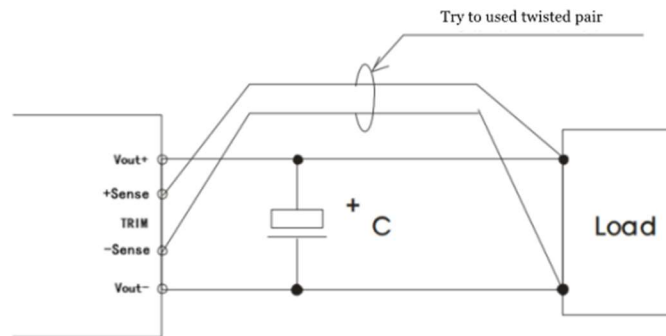
**1) With NO distal end compensation**



Notes:

1. Vout+ & Sense+, Vout- & Sense- should be shorted when distal end 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:

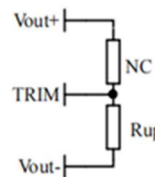
1. The output voltage may be unstable if the compensation cables are too long.
2. Twisted pair or shielded cables are recommended, the cable length should be as short as possible.
3. Wide copper path on PCB or thick lead wires between the power supply and the load should be used to achieve the line voltage 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.

**TRIM and calculation of TRIM resistance**

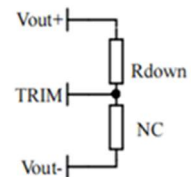
The calculation of ΔU and Rup & Rdown:

$$R_{up} = 37.5 / \Delta U - 5.1 \text{ (K}\Omega\text{)}$$

$$R_{down} = 15 * (15 - 2.5 - \Delta U) / \Delta U - 5.1 \text{ (K}\Omega\text{)}$$



Voltage-up: Add Rup between Trim and Vout-



Voltage-down: Add Rdown between Trim and Vout+

**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 product warranty period 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 under wrong or unreasonable conditions.
2. Aipupower can provide customization design and filter modules for matching, please contact our technician for details.

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