

### Typical Features

- ◆ Wide input voltage range 4:1
- ◆ High efficiency up to 88%
- ◆ Low no-load power consumption
- ◆ Operating Temperature: -40℃ to +105℃
- ◆ 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

CE certification

**ZCD150-24S12A** high efficiency 1/4 brick dc-dc converter, rated input voltage 24VDC, output 12V/150W, no minimum load, ultra wide input 9-36VDC, regulated single output, high isolation insulation voltage, allowing operating temperature up to 105℃, with input under-voltage protection, output over-current protection, over-voltage protection, over-temperature protection, short-circuit protection, remote control and remote 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
ZCD150-24S12AC	9-36	150	12	12.5	120	86/88	Standard positive logic
ZCD150-24S12AN							Standard negative logic
ZCD150-24S12AC-H							Heatsink positive logic
ZCD150-24S12AN-H							Heatsink negative logic

Note: When the input is below 15Vdc, the output power will be derated linearly. When the input is 9Vdc, the output power is 100W.

### Input Specification

Item	Operating conditions	Min.	Typ.	Max.	Unit
Max input current	9V input voltage, 100W output	--	--	15	A
No load input current	Rated input voltage	--	--	70	mA
Input surge voltage (1sec. max.)	Inputs above this range may cause permanent damage	-0.7	--	50	VDC
Start up voltage		--	--	10	
Input under voltage protection	No-load test, full-load test will have overcurrent protection in advance	--	--	9	
Control Pin(CNT)	Positive logic: CNT is suspended or connected to 3.5-15V to turn on, connected to 0-1.2V to turn off				Reference voltage-VIN
	Negative logic: CNT is suspended or connected to 3.5-15V to turn off, connected to 0-1.2V to turn on				

### Output Specification

Item	Working conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	Nominal input voltage, 10% load	--	±0.5	±1	%

Line Regulation	Full load, input voltage from low to high	--	±0.2	±0.5	%
Load Regulation	Nominal input voltage, 10%-100% load	--	±0.2	±0.5	%
Transient recovery time	Full input voltage range, 0%-100% load	--	200	250	µS
Transient Response Deviation	25% load step change (step rate 1A/50µS)	-5	--	5	%
Temperature Drift Coefficient		-0.02	--	+0.02	%/°C
Ripple & Noise	Full load	--	100	120	mVp-p
Output voltage adjustment ( TRIM )	20M bandwidth, external capacitor above 220µF	-20	--	+10	%
Output voltage remote compensation ( Sense )	--	--	--	105	%
Over temp protection	--	105	115	125	°C
Output over voltage protection	Maximum temperature of product metal substrate surface	125	--	150	%
Output over current protection	--	13	--	16	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	Insulation voltage 500VDC	100	--	--	MΩ
Switching frequency			--	330	--	KHz
MTBF			150	--	--	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	The solder joint is 1.5mm away from the shell, and the 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 Body 1 Class B			

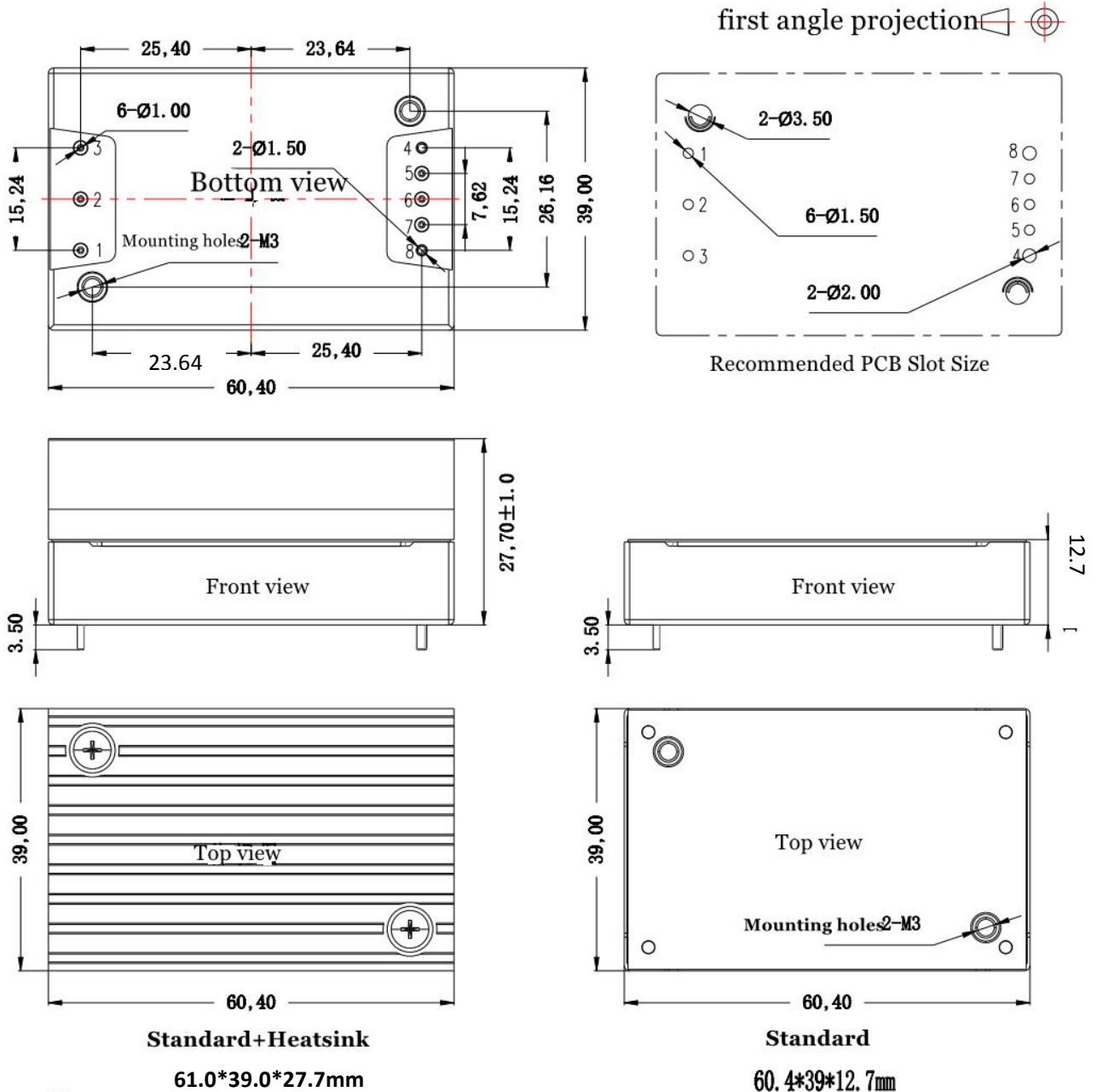
### EMC Characteristics(EN50155)

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 + black flame retardant material shell ( 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

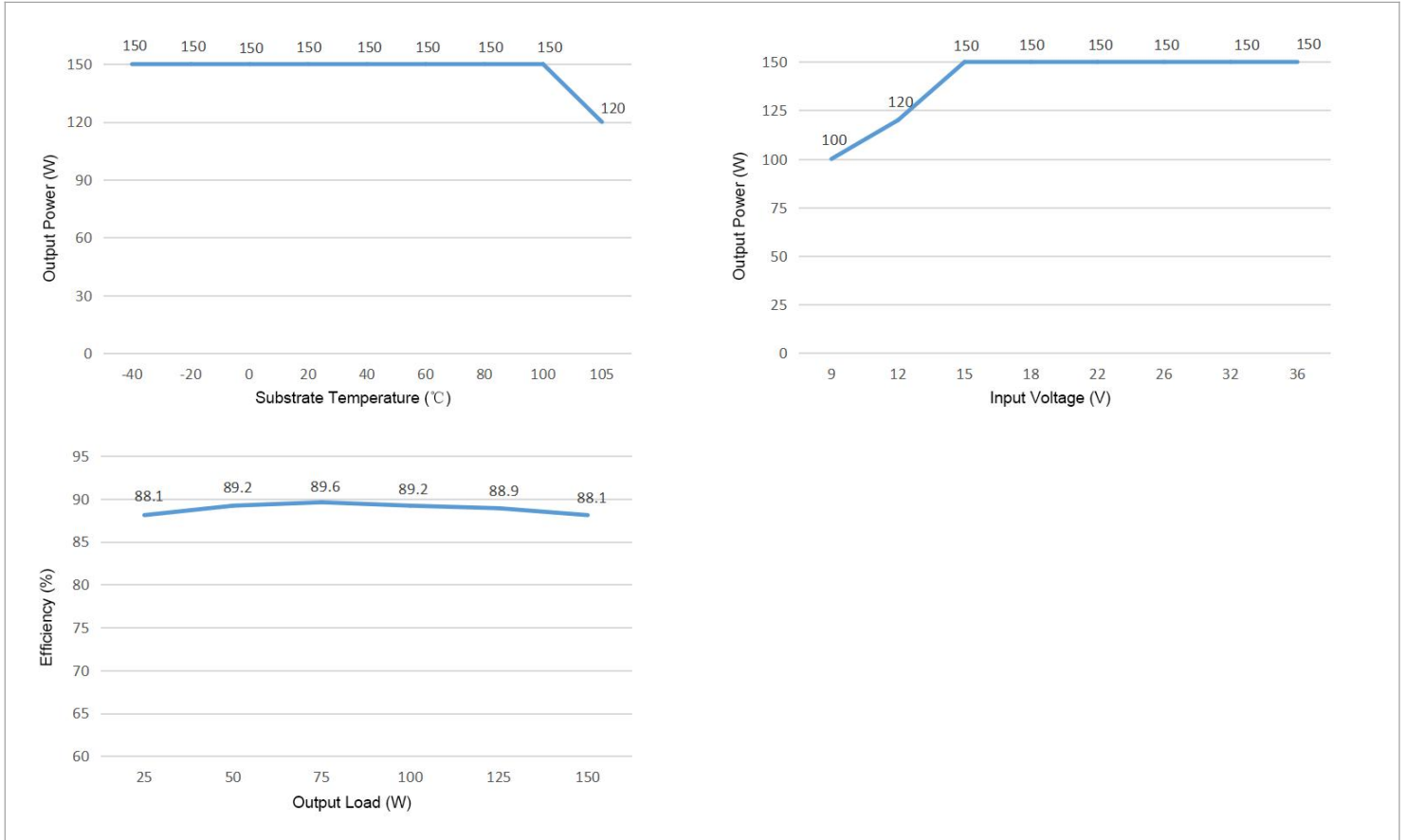
### Dimension and Pin-Out



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: Mar 0.4N\*m

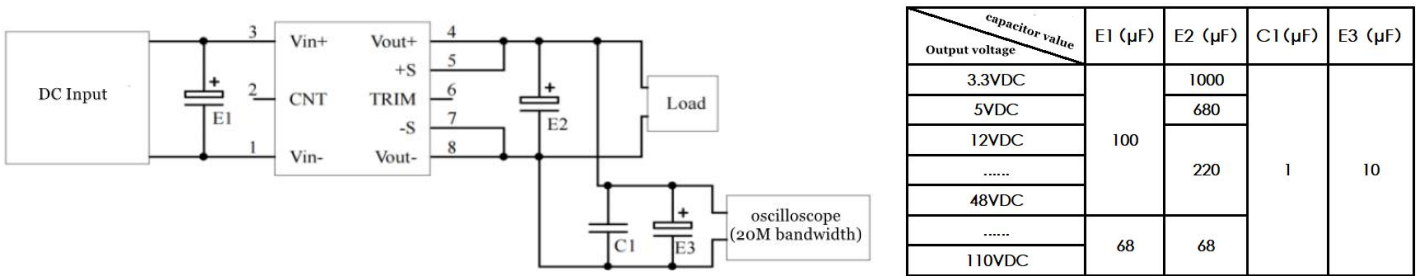
	1	2	3	4	5	6	7	8
Pin-out	Vin+	CNT	Vin-	Vout-	-S	TRIM	+S	Vout+

### Product Characteristic Curve



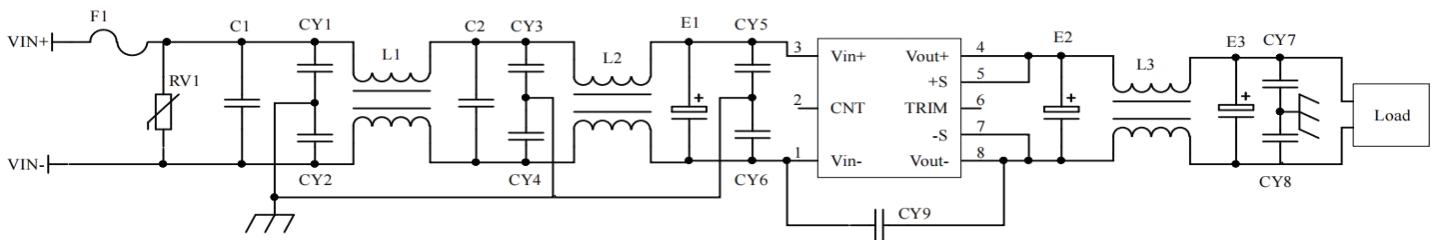
- Note:**
- Both the temperature derating curve and the efficiency curve are tested with typical values;
  - The temperature derating curve is tested according to our laboratory test conditions. If the actual environmental conditions used by customers are inconsistent, it is necessary to ensure that the temperature of the aluminum casing of the product does not exceed 105 °C, and it can be used within any rated load range.

All DC/DC converters of this series are tested according to the test circuit recommended in the following figure before leaving the factory.



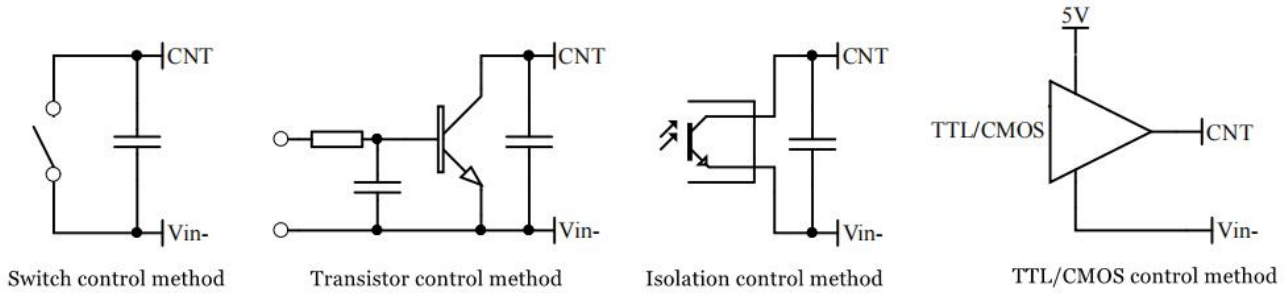
**1. Recommended application circuit**

If customer does not use the circuit recommended by our company, please be sure to connect an electrolytic capacitor of at least 100 μF in parallel at the input end to suppress the possible surge voltage at the input end.



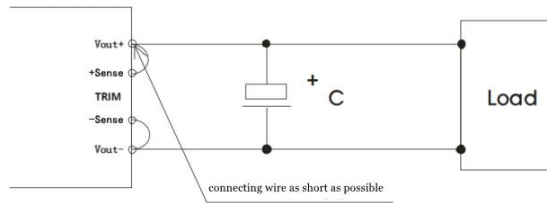
F1	T20A/40Vac fusing
RV1	14D 63V Varistor
C1,C2	105/63V Polyester Film Capacitor
CY1,CY2,CY3,CY4,CY5,CY6	472/250Vac safety Y2 capacitor
CY7,CY8	103/2KV Ceramic Capacitor
CY9	471/250Vac safety Y1 capacitor
E1	220μF/50V Electrolytic Capacitor
E2 , E3	220μF/16V Electrolytic Capacitor
L1,L2	inductance is greater than 1mH, and the over current 15A temperature rise is less than 25℃
L3	inductance is greater than 0.5mH, and the over current 12.5A temperature rise is less than 25℃

**2. Remote control terminal (CNT) control method application recommendation**



**3. Sense usage and precautions**

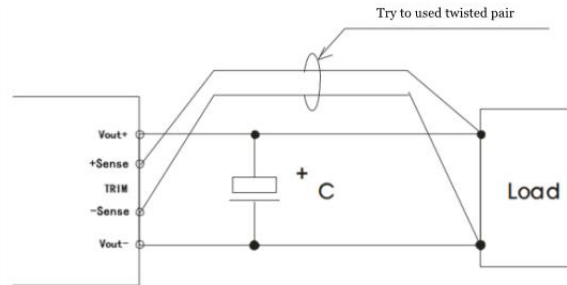
(1) Without far-end compensation:



Precautions:

1. Do not use remote compensation, make sure Vout+ and Sense+, Vout- and Sense- are short-circuited;
2. The connection between Vout+ and Sense+, Vout- and Sense- should be as short as possible and close to the pins, otherwise the module may become unstable.

(2) Using remote compensation

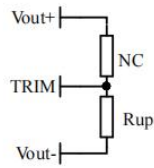


Precautions:

1. When the long-end compensation lead is used, the output voltage may be unstable;
2. If remote compensation is used, please use twisted pair or shielded wire, and keep the lead wire as short as possible;
3. Please use wide PCB leads or thick wires between the power module and the load, and keep the line voltage drop below 0.3V to ensure that the power output voltage remains within the specified range;
4. The impedance of the leads may cause the output voltage to oscillate or have larger ripples. Please verify it before use.

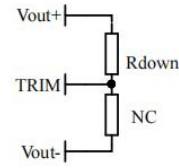
**4. Use of TRIM and calculation of TRIM resistance**

The relationship between output change voltage  $\Delta U$  and resistance is as follows:



Voltage up regulation: add resistor  $R_{up}$  between Trim and output negative

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



Voltage Down: Add resistor  $R_{down}$  between Trim and output positive

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

**5. This product does not support the use of direct parallel connection to increase the power. If you need to use it in parallel, please consult our technical staff.**

**Others**

- 1 The warranty period of this product is two years. During the normal damage, it will be repaired free of charge. Damages caused by errors in the use method or manufacturing technology, a paid service is provided.
- 2 Our company can provide product customization and matching filter modules. For details, please contact our technical staff directly.

**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: <https://www.aipupower.com>