

Typical Features

- ◆ Wide input voltage range 2:1
- ◆ High efficiency up to 91%
- ◆ Low no-load power consumption
- ◆ Operating Temperature: -40°C to +85°C
- ◆ High isolation voltage, input-output 1500VDC
- ◆ Protection: Input under voltage, output over voltage, short circuit, over current, over temp
- ◆ Standard 1/8 brick

Conform to CE Standard

ZDD120-48S12D is a high performance power supply, rated input voltage 48VDC, output 12V/120W, no minimum load, wide input 36-75VDC, regulated single output, 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
ZDD120-48S12DC	36-75	120	12	10	120	89/91	Standard positive logic
ZDD120-48S12DN							Standard negative logic
ZDD120-48S12DC-H							Heatsink positive logic
ZDD120-48S12DN-H							Heatsink negative logic

Input Specification

Item	Operating conditions	Min.	Typ.	Max.	Unit
Max input current	36V input voltage, full load output	--	--	4.5	A
No load input current	Rated input voltage	--	--	20	mA
Input surge voltage (1sec. max.)	Inputs above this range may cause permanent damage	-0.7	--	100	VDC
Start up voltage		--	--	35	
Input under voltage protection	No-load test, full-load test will have overcurrent protection in advance	--	--	34	
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 Negative logic: CNT is suspended 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	Nominal input voltage, 0%-100% load	--	±0.5	±1.0	%
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	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 remote compensation (Sense)		--	--	5	%
Over temp protection	Inspection of resistance temperature inside the product	105	115	125	°C
Output overcurrent protection		11	--	15	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			--	250	--	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(EN55032)

EMI	CE	CISPR32/EN55032	CLASS A		
		CISPR32/EN55032	CLASS A		
	RE	IEC/EN61000-4-2	Contact ±6kV/Air ±8KV		
		IEC/EN61000-4-3	10V/m		
EMS	ESD	IEC/EN61000-4-4	±2kV 100kHz		perf. Criteria A
	RS	IEC/EN61000-4-5	line to line ±2kV		perf. Criteria A
	EFT	IEC/EN61000-4-6	3 Vr.m.s		perf. Criteria A
	Surge	CISPR32/EN55032	CLASS A		perf. Criteria A
	CE	CISPR32/EN55032	CLASS A		perf. Criteria A

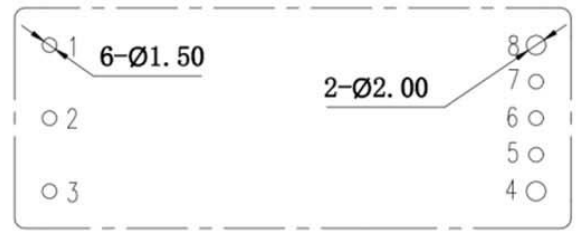
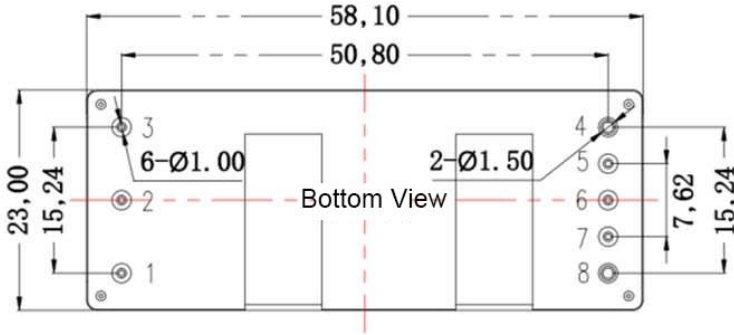
Physical Characteristics

Case Material	Aluminum alloy, anodized black
Product Weight	Standard 50g
Cooling method	Conduction cooling or forced air cooling

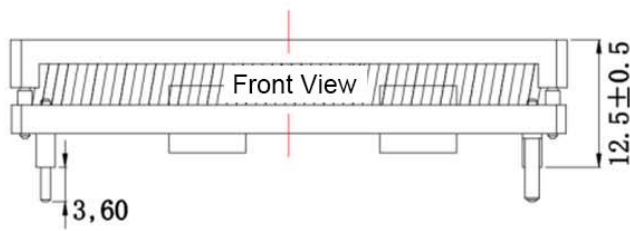
Dimension and Pin-Out

Dimension: 58.1*23.0*12.5mm

First Angle Projection



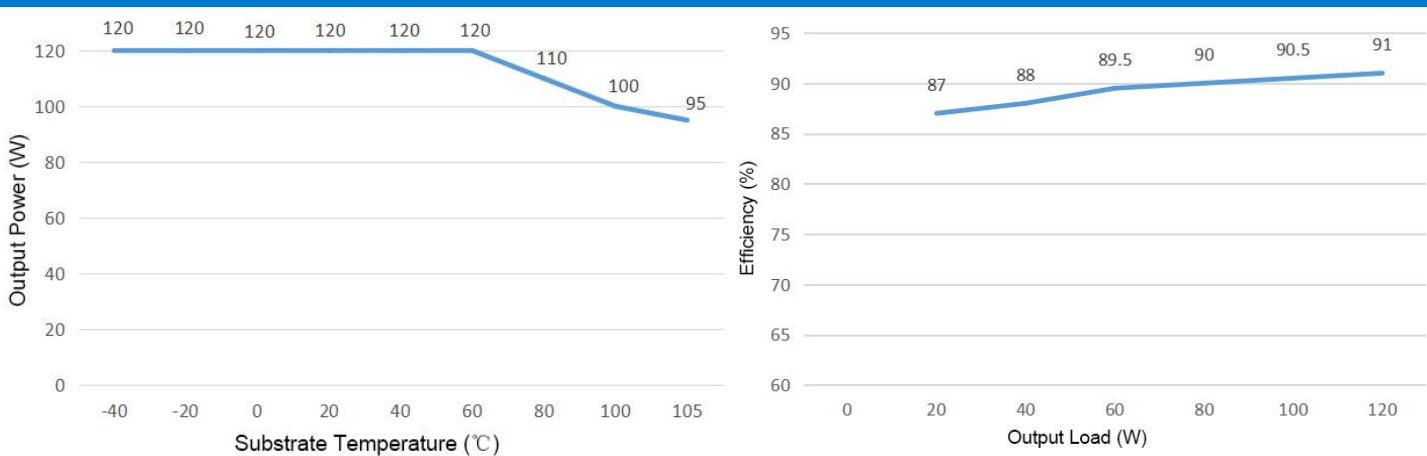
Recommended PCB slot dimension



Note:
Unit: mm
Pin1,2,3,5,6,7 diameter: 1.00
Pin 4,8 diameter: 1.50
Unmarked tolerance: ±0.10

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

Product Characteristic Curve

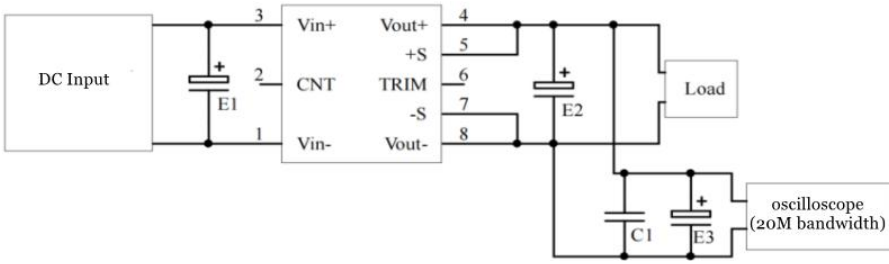


Note:
1. Both the temperature derating curve and the efficiency curve are tested with typical values;
2. The temperature derating curve is tested according to the test conditions of our laboratory. If the actual environmental conditions used by the customer are different, it is necessary to ensure that the product PCB temperature does not exceed 100° C and can be used within any rated load range.

Design Reference

1. Ripple&Noise

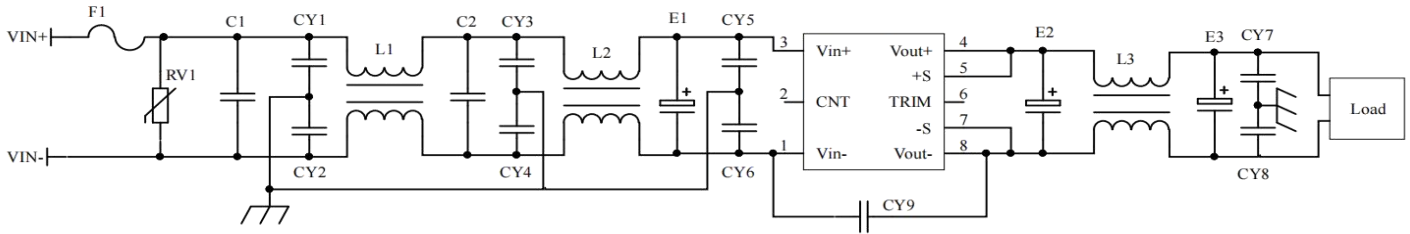
All DC/DC converters of this series are tested according to the test circuit recommended in the following figure before leaving the factory.



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

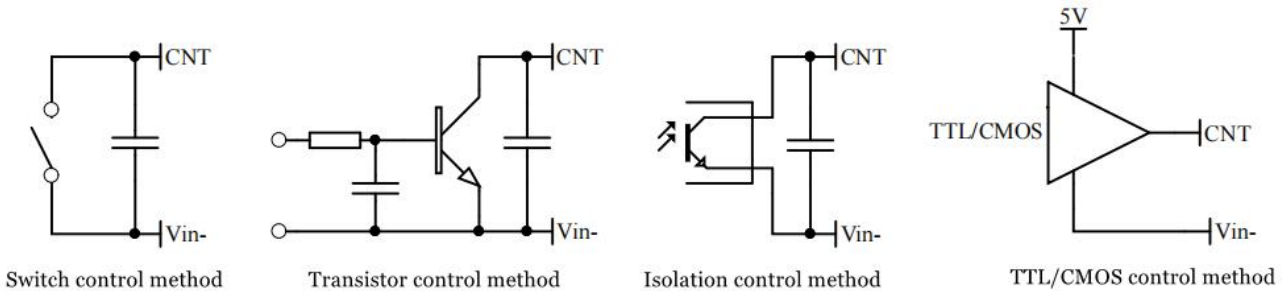
2. Recommended application circuit

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.



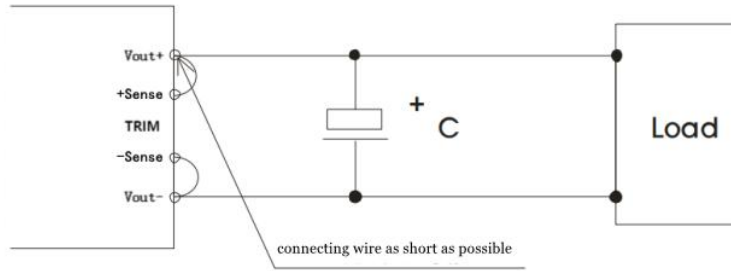
F1	T10A/250V fusing
RV1	14D 100V Varistor
C1,C2	105/250V Polyester Film Capacitor
CY1,CY2,CY3,CY4,CY5,CY6	102/250Vac safety Y2 capacitor
CY7,CY8	103/2KV Ceramic Capacitor
CY9	471/250Vac safety Y2 capacitor
E1	100μF/100V Electrolytic Capacitor
E2, E3	470μF/16V Low ESR Capacitor
L1,L2	inductance is greater than 5mH, and the overcurrent 4.5A temperature rise is less than 25°C
L3	inductance is greater than 100uH, and the overcurrent 10A temperature rise is less than 25°C

3. Remote control terminal (CNT) control method application recommendation



4. Sense usage and precautions

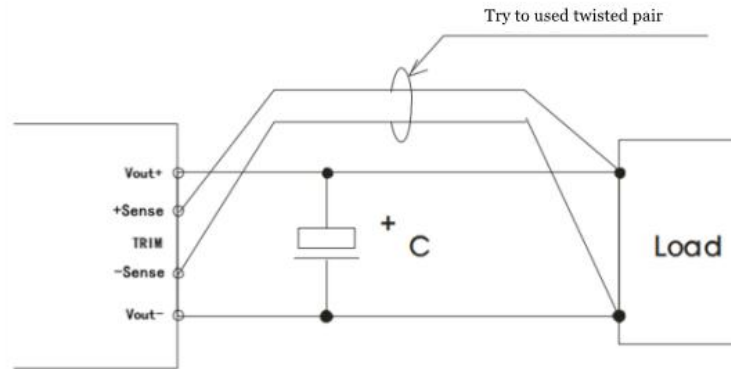
(1) Without far-end compensation:



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

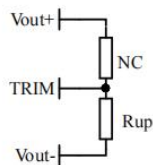


Precautions:

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.

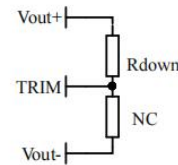
5. Use of TRIM and calculation of TRIM resistance

The relationship between output change voltage ΔU and resistance is as follows:



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

$$R_{up} = 31 / \Delta U - 5.1 \text{ (K}\Omega\text{)}$$



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

$$R_{down} = 12.4 * (9.5 - \Delta U) / \Delta U - 5.1 \text{ (K}\Omega\text{)}$$

6. 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.

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