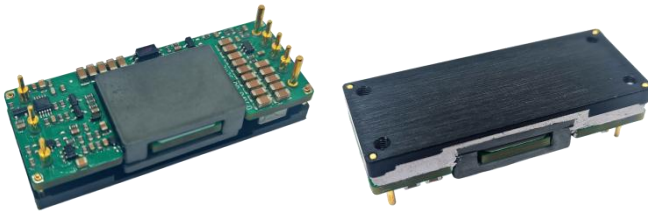


Typical Features

- Wide input voltage range 2:1
- Efficiency up to 91%
- Low no-load power consumption
- Operating Temperature from -40℃ to +85℃
- High isolation voltage 1500VDC (input-output)
- Input under voltage protection, output over current, over voltage, over temperature & short circuit protections
- Standard 1/8 brick size

ZDD120-48S12 is a high-performance DC-DC modular converter with the rated input voltage 48VDC (full range from 36V to 75VDC), regulated single output 12V/120W without minimum load limit. It has the multi-function of input under-voltage protection, output over-current, over-voltage, over-temperature and short circuit protections, input ON/OFF control, output voltage distal end compensation 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
ZDD120-48S12C	36 - 75	120	12	10	120	89/91	Standard Positive logic
ZDD120-48S12N							Standard Negative logic
ZDD120-48S12C-H							Heatsink Positive logic
ZDD120-48S12N-H							Heatsink Negative logic

Input Specifications

Item	Operating conditions	Min.	Typ.	Max.	Unit
Max input current	Input voltage 36V, full load	--	--	5	A
No load input current	Rated input voltage	--	--	20	mA
Input Inrush voltage (1sec. max.)	The unit could be permanently damaged by input over this Voltage	-0.7	--	100	VDC
Start-up voltage		--	--	36	
Input under voltage protection	With No-load (The over current protection will work in advance at full load)	--	--	34	
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, 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/50μS)	--	200	250	uS
Transient Response Deviation		-5	--	+5	%
Temperature Drift Coefficient	Full load	-0.02	--	+0.02	%/℃
Ripple & Noise	20MHz bandwidth, with external capacitor >220μF	--	100	120	mVp-p
Output voltage adjustment（TRIM）		-20	--	+10	%
Output Voltage Remote Sense (Sense)		--	--	105	%
Over-temperature Protection (OTP)	Internal Thermistor Temperature	105	115	125	℃
Over current protection		11	--	15	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	--	--	VDC
	I/P-Case	Test 1min, leakage current <3mA	1500	--	--	
	O/P-Case	Test 1min, leakage current <3mA	500	--	--	
Insulation resistance	I/P-O/P	@ 500VDC	100	--	--	MΩ
Switching frequency			--	250	--	KHz
MTBF			150	--	--	K hours

Environmental characteristics

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			

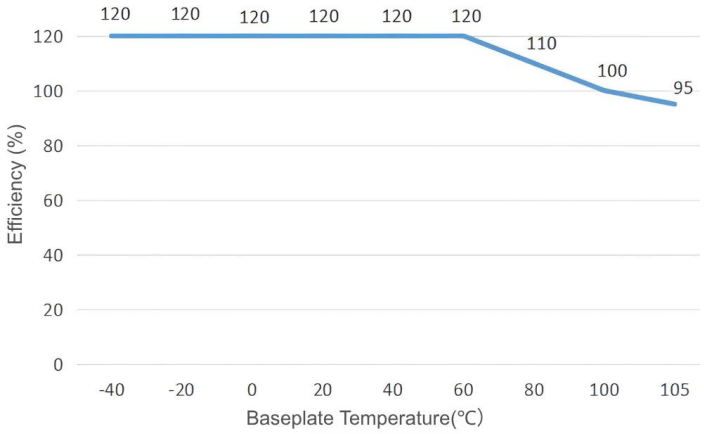
EMC Performances（EN55032）

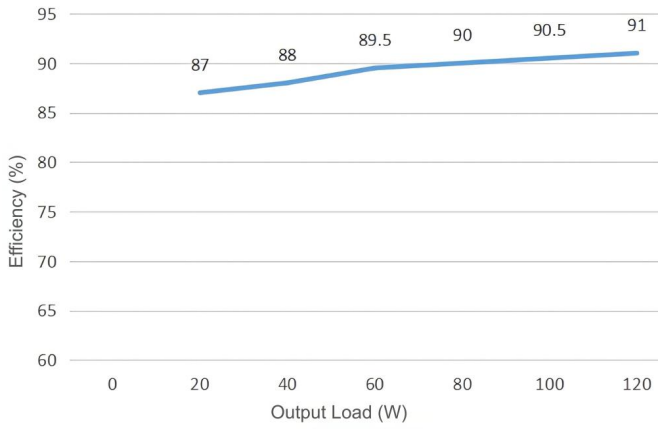
EMI	CE	EN55032-3-2	150kHz-500kHz 66dBuV	
		EN55032-2-1	500kHz-30MHz 60dBuV	
	RE	EN55032-3-2	30MHz-230MHz 50dBuV/m at 3m	
		EN55032-2-1	230MHz-1GHz 57dBuV/m at 3m	
EMS	ESD	IEC/EN61000-4-2	Contact ±6KV/Air ±8KV	perf. Criteria B
	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4	±2kV 5/50ns 5kHz	perf. Criteria A

Physical Characteristics

Case material	Metal base
Heat sink	N/A
Cooling method	Conduction cooling or forced air cooling with fan
Unit weight	Standard 27g, with Heatsink 42g

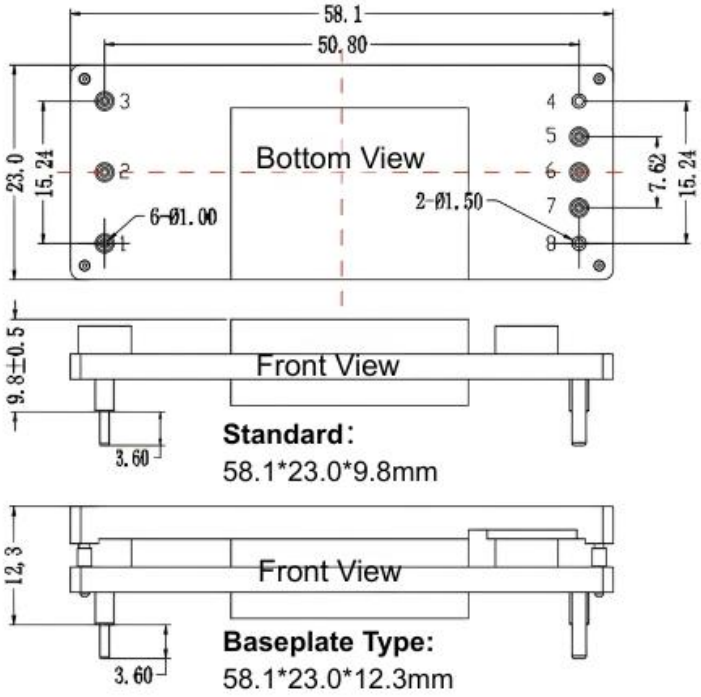
Product Characteristics Curves





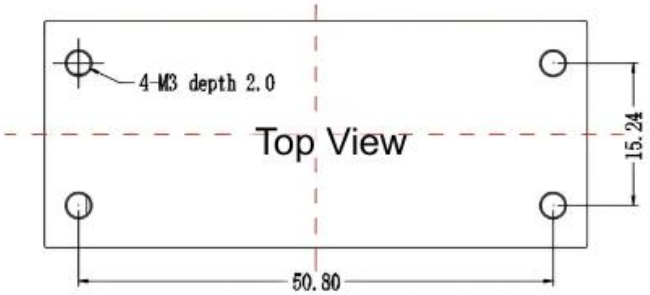
Notes:
1. Both Temperature Derating and Efficiency curves represent typical test results.
2. Temperature Derating curves are based on our laboratory test conditions.For different operating environments, ensure the PCB temperature stays below 100° C for safe operation within the rated load.

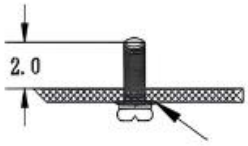
Mechanical Dimensions



Standard:
58.1*23.0*9.8mm

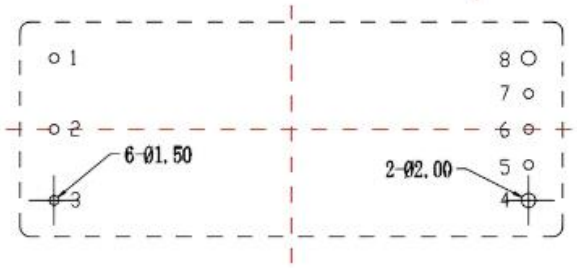
Baseplate Type:
58.1*23.0*12.3mm



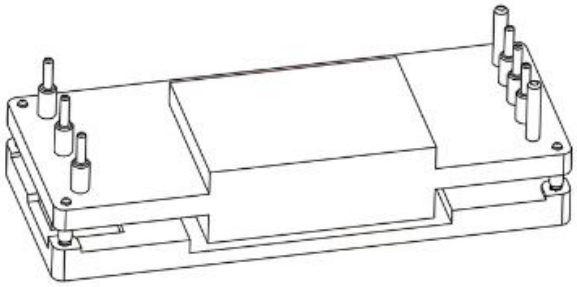


Max. effective screw depth into the baseplate: 2.00mm.

First Angle Projection



Recommended PCB Slot Size



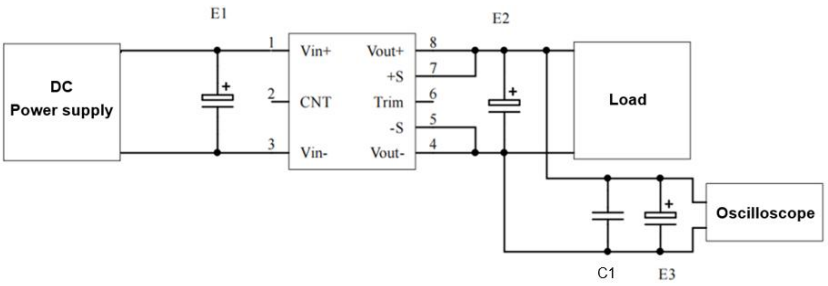
Note:
Unit: mm
Pin: 1,2,3,5,6,7 Diameter: 1.00
Pin: 4,8 Diameter: 1.5
General Tolerance: X.X ±0.5, X.XX ±0.1
Mounting Hole Tightening Torque:0.4 N·m max.

No.	1	2	3	4	5	6	7	8
Pin Symbol	Vin+	CNT	Vin-	Vout-	-Sense	TRIM	+Sense	Vout+
Description	Input Positive	Remote Control	Input Negative	Output Negative	Remote Sense Negative	Output Voltage Trim	Remote Sense Positive	Output Positive

Recommended circuits for application

1. Ripple and Noise

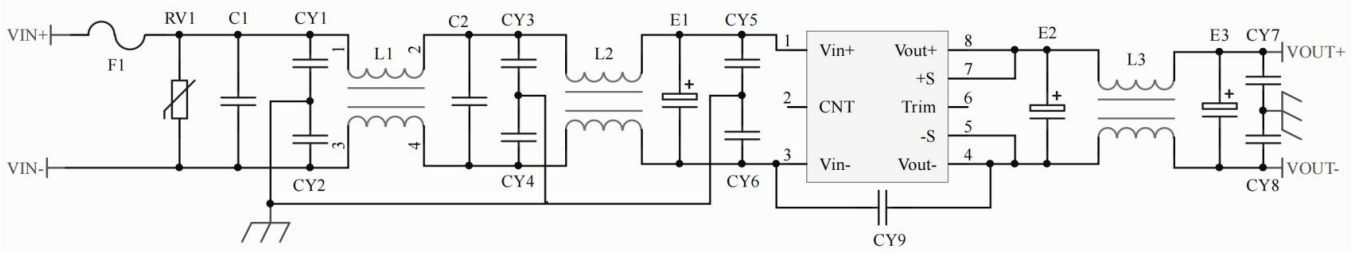
All this series of converters will be tested according to the circuit diagram below before shipping.



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

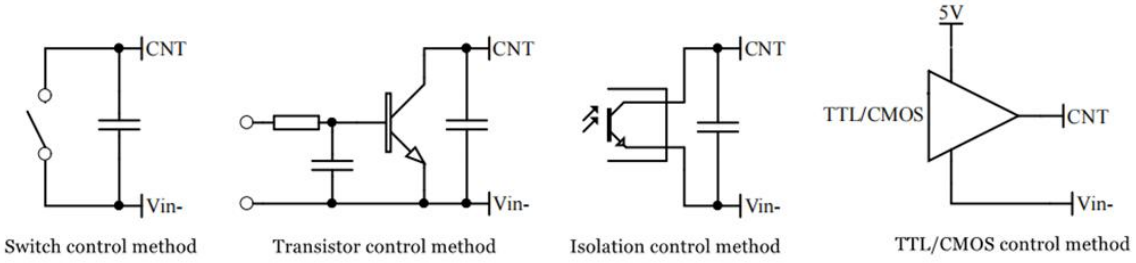
2. Typical circuit diagram for application

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



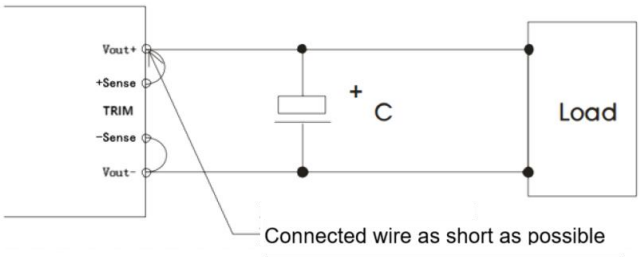
F1	T6.3A/250V Time-delay fuse
RV1	14D 100V Varistor
C1, C2	105/250V Polyester Film Capacitor
CY1, CY2, CY3, CY4, CY5, CY6	102/250Vac Y2 capacitor
CY7, CY8	103/2KV Ceramic Capacitor
CY9	471/250Vac Y2 capacitor
E1	100μF/100V Electrolytic Capacitor
E2, E3	470μF/16V Low ESR Capacitor
L1, L2	>5mH, temperature rise less than 25°@4A
L3	>100μH, temperature rise less than 25°@10A

3. ON/OFF control (CNT) application



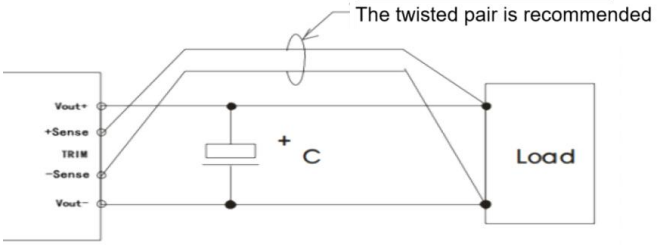
4. Application for Sense

1) **If remote sense is not used:**



Notes:
1. Short the +Vout to +Sense, -Vout to -Sense if remote sense if not used.
2. Keep sense connections as short as possible and close to the pins to ensure stability.

2) **If remote sense is used:**



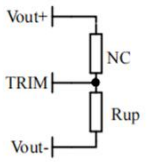
Notes:
1. Long remote sense leads may cause output voltage instability.
2. When using remote sense, use twisted-pair or shielded cables and keep the leads as short as possible.
3. Use wide PCB traces or thick wires between the power module and the load; ensure the line voltage drop is below 0.3V to maintain the output voltage within the specified range.
4. Lead impedance may cause output voltage oscillation or excessive ripple; please verify the performance before final application.

5. TRIM & TRIM resistance calculation

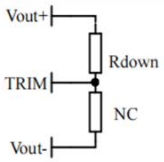
The calculation of △U and Rup & Rdown:

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+

6. 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.
3. Revision Date: March 12, 2026

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