Typical Features

- ◆Wide input voltage range 1.5 : 1
- ◆Efficiency up to 92%
- ◆Low no-load power consumption
- ◆Operating temperature from -40℃ to +105℃
- ◆High isolation voltage 1500VDC(input-output)
- ◆Input under voltage protection, output over current, over voltage, over temp. & short circuit protections
- ◆Standard 1/8 brick size

ZDD180-48S12 is a high-performance DC-DC converter specially designed for communication field, Its rated input voltage 48VDC (full range from 36V to 60VDC), regulated single output 12V/180W without minimum load limit. It has the advantage 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 Trim functions, 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
ZDD180-48S12C	36 - 60	180	12	15	120	90/92	Standard Positive logic
ZDD180-48S12N							Standard Negative logic
ZDD180-48S12C-H							Heatsink Positive logic
ZDD180-48S12N-H							Heatsink Negative logic

Input Specifications

Item	Operating conditions	Min.	Typ.	Max.	Unit
Max input current	Input voltage 36V, full load	--	--	6.5	A
No load input current	Rated input voltage	--	--	150	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	No-load test (over current protection will work in advance at full load)	--	--	34	
ON/OFF Control (CNT)	Positive logic - CNT no connection or connect to 3.5-15V to turn ON, connect to 0-1.2V to turn OFF the converter				Reference voltage -Vin
	Negative logic - CNT no connection or connect to 3.5-15V to turn OFF, connect to 0-1.2V to turn ON the converter				

Output Specifications

Item	Operating conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	Nominal input voltage, 10% 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	%/℃
Ripple & Noise	20M bandwidth, with external capacitor >470uF	--	100	120	mVp-p
Output voltage TRIM		-10	--	+10	%
Output voltage distal end compensation (Sense)		--	--	105	%
Over temperature protection	Internal temperature detecting sensor	105	115	125	℃
Over voltage protection		125	--	150	%
Over current protection		16.5	--	21	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
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	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

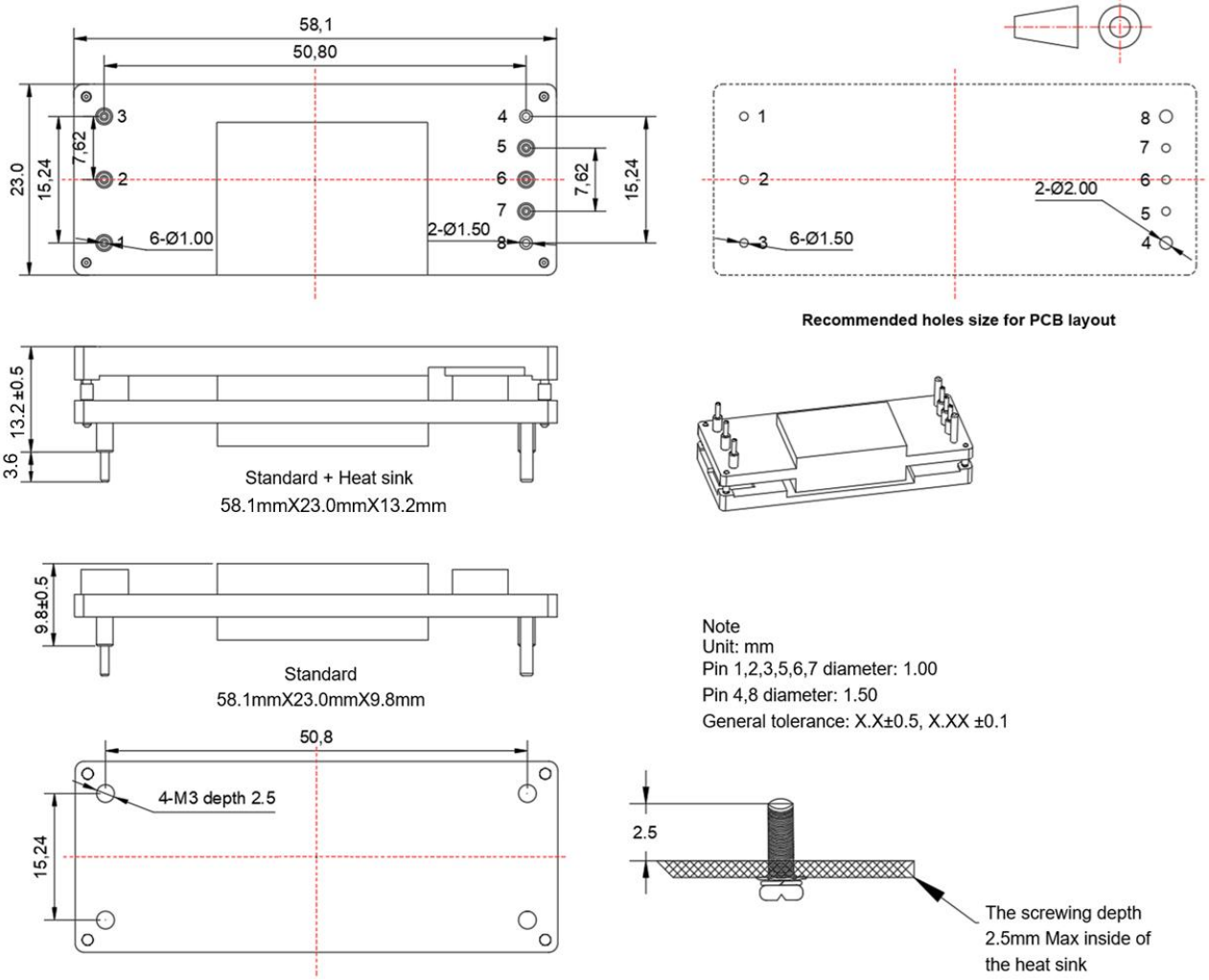
EMI	CE	EN55032-3-2	150kHz-500kHz 66dBuV	
		EN55032-2-1	500kHz-30MHz 60dBuV	

	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
	Surge	IEC/EN61000-4-5	Line to line ± 2KV	perf. Criteria B
	CS	IEC/EN61000-4-6	10 Vr.m.s	perf. Criteria A

Physical Characteristics

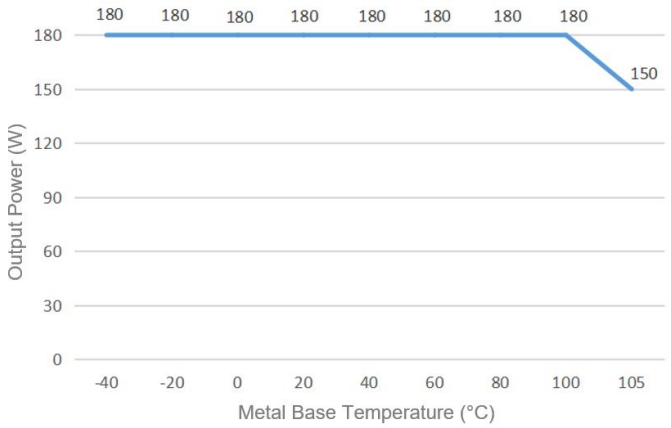
Case Material	No Case
Heat sink	Dimension 58.1x23.0x4.0 mm, aluminum, anodized black
Cooling method	Conduction cooling or forced air cooling with fan
Unit Weight	Standard 27g, With Heat sink 48g

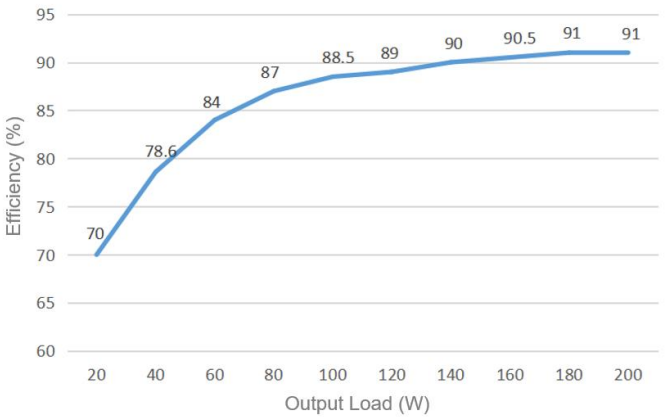
Mechanical Dimensions & Pin-out Function Description



Pin No.	1	2	3	4	5	6	7	8
Function	Vin+	CNT	Vin-	Vout-	-Sense	TRIM	+Sense	Vout+
Description	Input V+	ON/OFF Control	Input V-	Output V-	Output distal end compensation S-	Output Voltage Trim	Output distal end compensation S+	Output V+

Product Performance Graphs



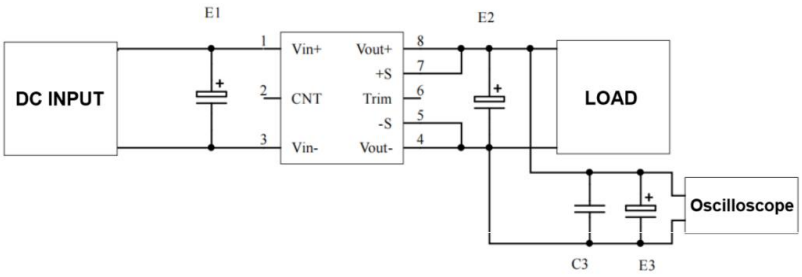


Note:
1. The output power and the efficiency in the graphs had been tested with the typical values.
2. The data in temperature graph had been tested at Aipu laboratory test conditions. It is recommended to keep the temperature of the PCB Metal base not more than 100 °C while the converter operates at the rated load for the customer application.

Recommended circuits for application

1. Ripple and Noise

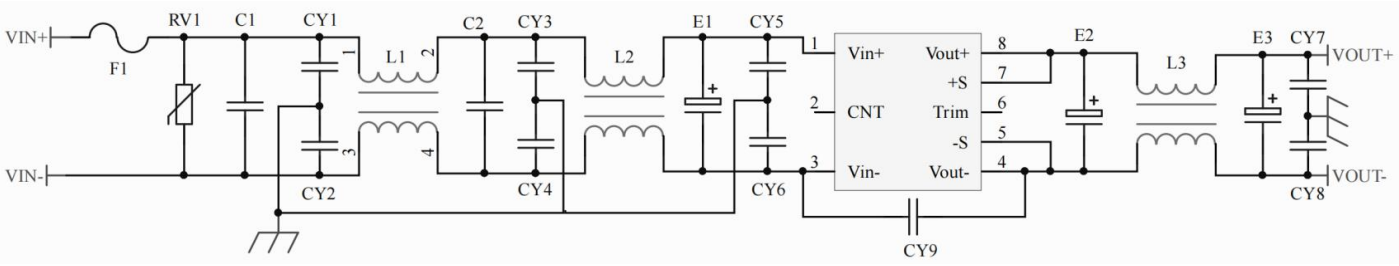
All this series of converters will be tested according to the circuit diagram below before shipping.



Capacitance / Output Volt.	E1(μF)	E2(μF)	C3(μF)	E3(μF)
3.3VDC	100	1000	1	10
5VDC		680		
12VDC		470		
.....				
48VDC				
.....	68	68		
110VDC				

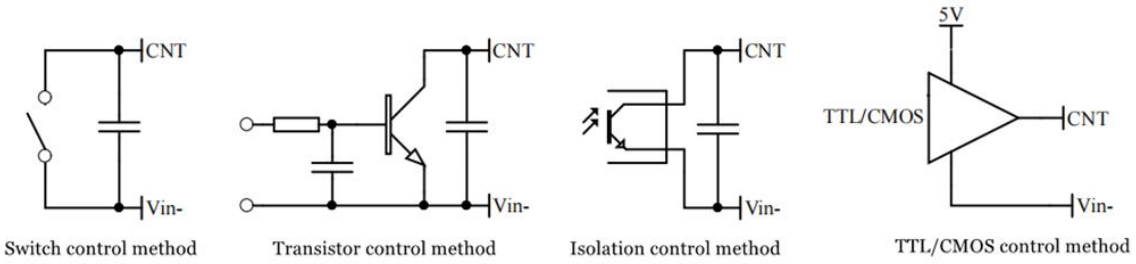
2. Typical circuit for application

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



F1	T10A/100V Time-delay fuse
RV1	14D 100V Varistor
C1, C2	105/100V 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	>3mH, temperature rise less than 25°@6.5A
L3	>47uH, temperature rise less than 25°@15A

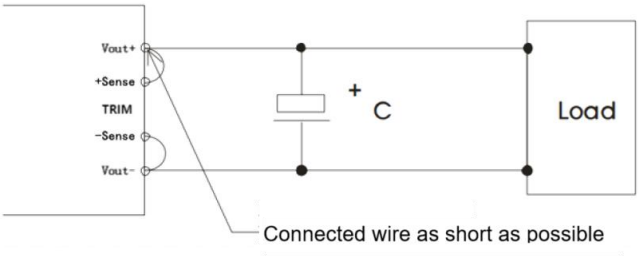
3. ON/OFF control (CNT) application



Switch control method | Transistor control method | Isolation control method | TTL/CMOS control method

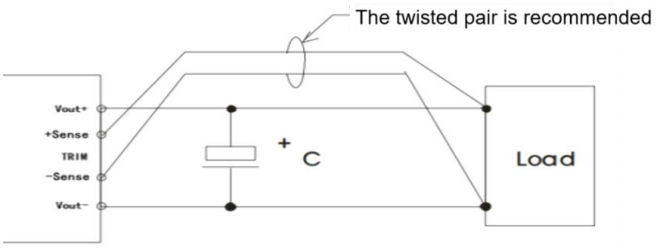
4. Application for Sense

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**



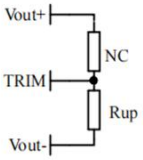
Notes:
1. The output voltage may be unstable if the compensation cables are too long.
2. The Twisted pair or shielded cables are recommended, the cable length should be as short as possible.
3. Wide copper path on PCB or thick lead wires between the power supply and the load should be used to achieve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

5. TRIM & TRIM resistance calculation

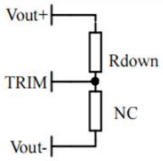
The calculation of △U and Rup & Rdown:

Rup=31/△U-5.1 (KΩ)

Rdown=12.4*(12-2.5-△U)/△U-5.1 (KΩ)



Voltage-up: Add Rup between Trim and Vout-



Voltage-down: Add Rdown between Trim and Vout+

6. This converter is not available for connecting in parallel to increase the output power. Please contact Aipu technician for this kind of application 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 fails 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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