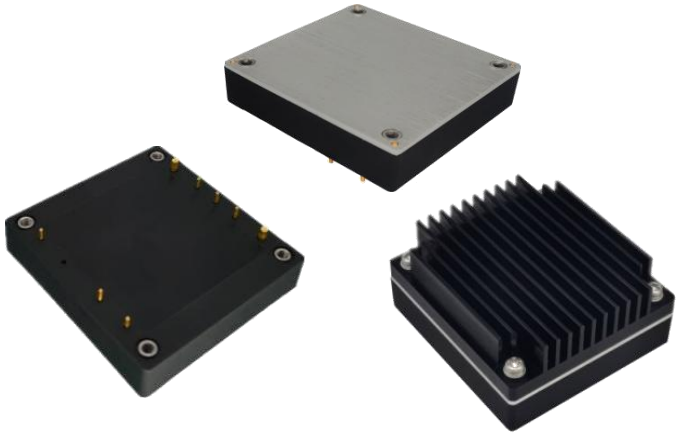


Typical Features

- Wide input voltage range 4:1
- Efficiency 89% (Typ.)
- Low standby power consumption
- Operating Temperature from -40℃ to +105℃
- High isolation voltage 1500VDC(input-output) & 1500VDC(input-case)
- Input under voltage protection, output over current, over voltage, over temp. & short circuit protections
- Standard 1/2 brick size

ZBD300-24S15A is a high-performance half brick size DC-DC converter with the rated input voltage 24VDC (full range from 9V to 40VDC), regulated single output 15V/300W without minimum load limit. It has the advantage of high isolation voltage, Max operating ambient temperature 85°C, with input under-voltage protection, output over-current, over-voltage, over-temperature and short circuit protections, input remote control on/off, output voltage distal end compensation and 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.	Remark
ZBD300-24S15AC	9 - 40	300	15	20	150	87/89	Positive logic Standard
ZBD300-24S15AN							Negative logic Standard
ZBD300-24S15AC-H							Positive logic With heat sink
ZBD300-24S15AN-H							Negative logic With heat sink

Note: The output power could be derated linearly at the input voltage range of 9-18V, the Max output power can be 200W at input voltage 9V.

Input Specifications

Item	Operating conditions	Min.	Typ.	Max.	Unit
Input current Max	Input 9V, output power 200W	--	--	27	A
No-load current	Rated input voltage	--	--	30	mA
Input inrush voltage (1sec. max.)	The unit could be permanently broken over this voltage	-0.7	--	50	VDC
Start-up voltage		--	--	10	
Under-voltage protection	Test with 200W load	--	--	9	
Remote 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 voltage 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	--	±0.1	±0.5	
Load Regulation	Nominal input voltage, 10%-100% load	--	±0.1	±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, test with ≥220uF capacitor	--	100	150	mVp-p
Capacitive Load		--	--	5000	uF
Output voltage TRIM		-10	--	+10	%
Distal end compensation (Sense)		--	--	105	%
Over temperature protection	Maximum temperature of the Metal base	105	115	125	℃
Over voltage protection		125	--	150	%
Over current protection	The limit-current will decline at <18V input	22	--	28	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	VDC
	O/P-Case	Test 1min, leakage current <3mA	--	--	500	VDC
Insulation resistance	I/P-O/P	@ 500VDC	100	--	--	MΩ
Switching frequency			--	200	--	KHz
MTBF			150	--	--	K hours

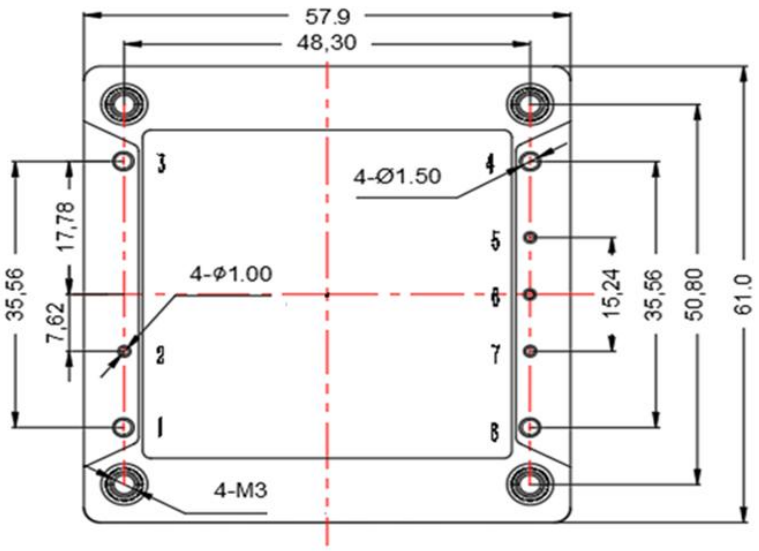
Environmental characteristics

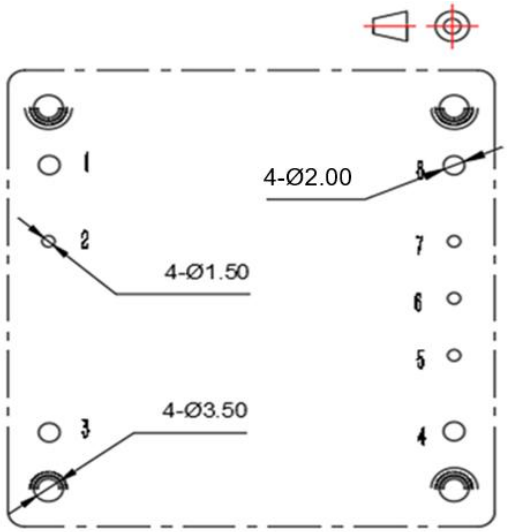
Item	Operating conditions	Min.	Typ.	Max.	Unit
Operating Temperature	Refer to the temperature derating graph	-40	--	+105	℃
Storage Humidity	No condensing	5	--	95	%RH
Storage Temperature		-40	--	+125	℃
Pin Soldering temperature	1.5mm from the case, < 1.5S	--	--	+350	
Cooling requirement		EN60068-2-1			
Dry and heat requirements		EN60068-2-2			
Moisture and heat requirements		EN60068-2-30			
Shock and vibration		IEC/EN 61373 C1/Body Mounted Class B			

EMC Performances				
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	IEC/EN61000-4-2/GB/T 17626.2-2006	Contact ±6KV/Air ±8KV	perf. Criteria A
	RS	IEC/EN61000-4-3/GB/T 17626.3-2006	10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4/GB/T 17626.4-2008	±2kV 5/50ns 5kHz	perf. Criteria A
	Surge	IEC/EN61000-4-5/GB/T 17626.5-2008	Line to line ± 1KV (42Ω, 0.5μF)	perf. Criteria A
	CS	IEC/EN61000-4-6/GB/T 17626.6-2008	0.15MHz-80MHz 10 Vr.m.s	perf. Criteria A

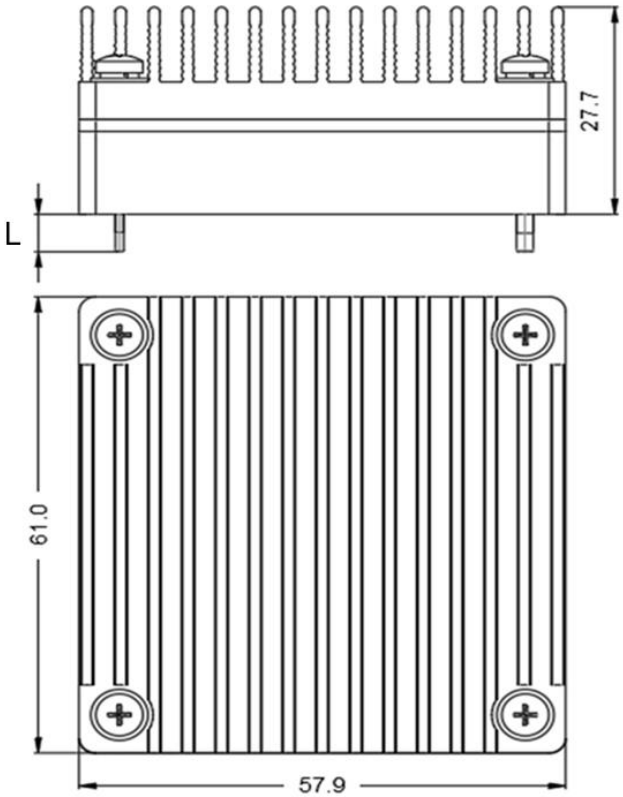
Physical Characteristics	
Case Materials	Metal bottom shell + Plastic case in black with flame class UL94-V0
Heat Sink	Dimension 61.0x57.9x15.0mm, weight 65g, Aluminum alloy, anodized black
Cooling Method	Conduction cooling or forced air cooling with fan
Weight	Standard 125g, with heatsink 203g

Mechanical Dimensions and Pin-out function description

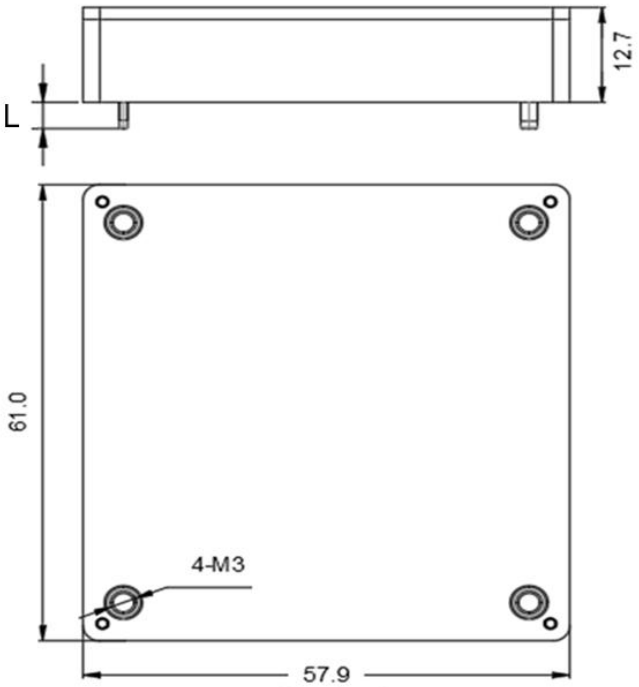




Recommended holes for PCB



Standard + Heat sink
61.0X57.9X27.7mm



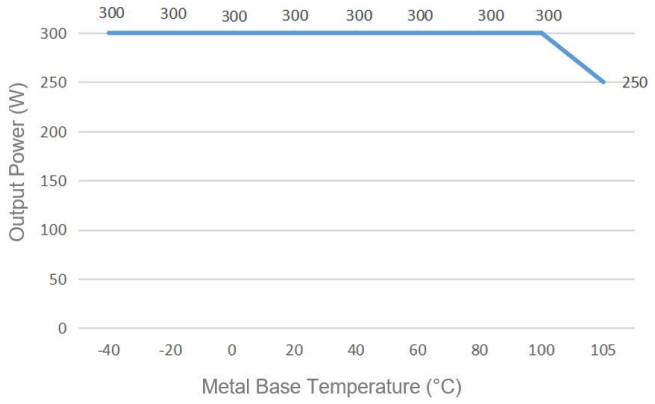
Standard
61.0X57.9X12.7mm

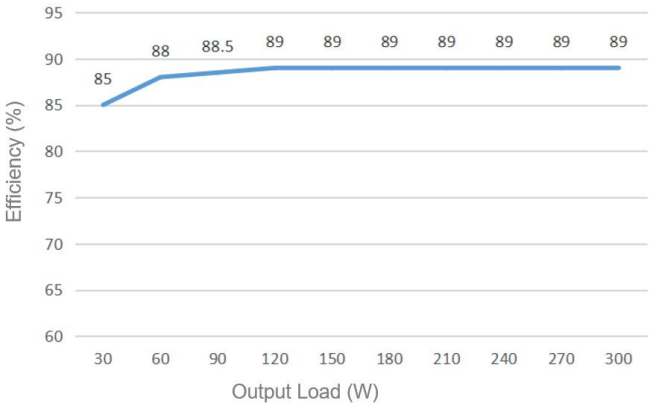
Unit: mm
2,5,6,7 Pin diameter: 1.00
1,3,4,8 Pin diameter: 1.50
Tolerance: X.X ±0.50mm, X.XX±0.10mm
Screwing torque: 0.4 N.m Max

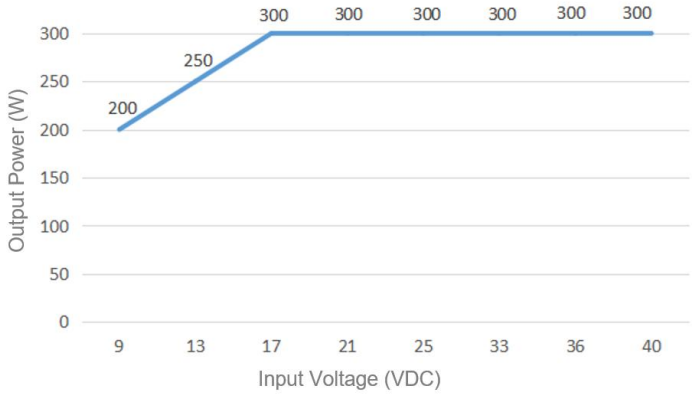
Pin Length L=3.7mm

Pin No.	1	2	3	4	5	6	7	8
Function	Vin+	CNT	Vin-	Vout-	-Sense	TRIM	+Sense	Vout+

Product Characteristics Graphs





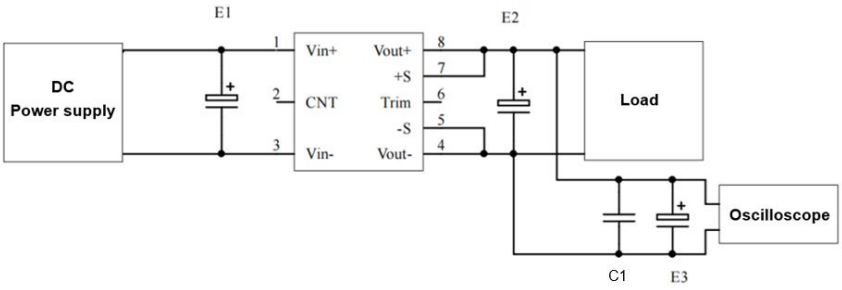


Note:
1. Both the output power and efficiency in the graphs had been tested with typical values.
2. The data in temperature derating graph had been tested at Aipu laboratory test conditions. It is recommended to keep the temperature of the Metal base not more than 105 °C when the converter operates at the rated load for the customer application.

Recommended circuits for application

1. Ripple & Noise

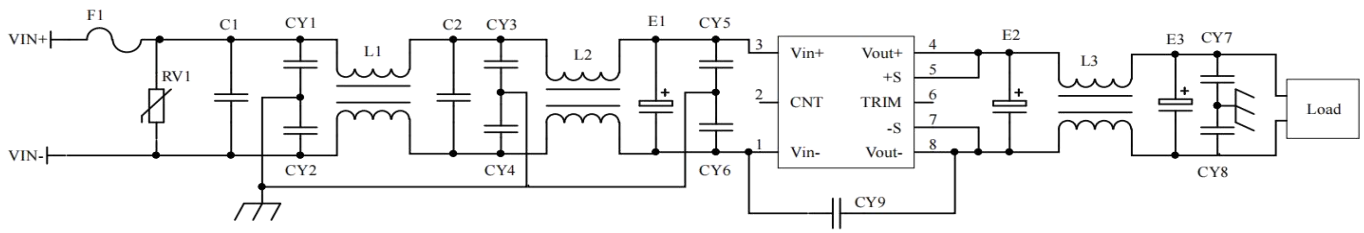
All this series of converters will be tested according to this circuit diagram below before shipping.



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				

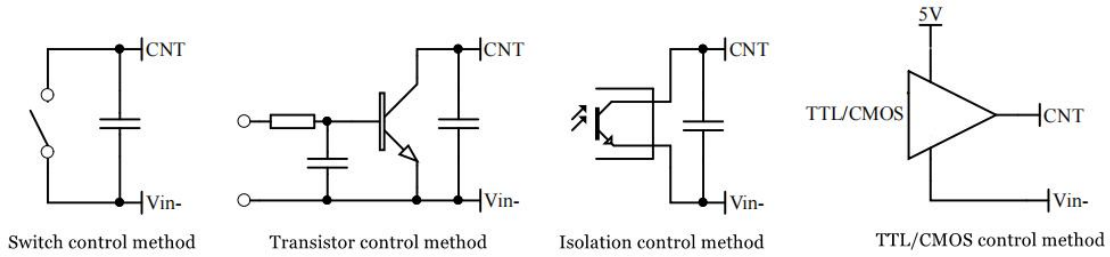
2. Recommended circuit for application

If this circuit recommended below is not adopted, an electrolytic capacitor (≥220 μF) should be connected at the input to suppress the possible surge voltage.



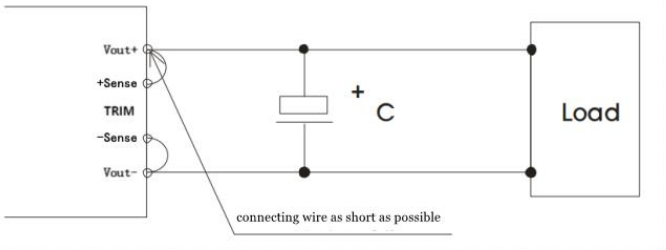
F1	T40A/250V FUSE
RV1	14D 63V Varistor
C1, C2	225/63V Polyester film capacitor
CY1, CY2, CY3, CY4, CY5, CY6	102/250Vac Y2 capacitor
CY7, CY8	103/2KV Ceramic capacitor
CY9	471/250Vac Y2 capacitor
E1	470μF/63V Electrolytic capacitor
E2，E3	470μF/25V Electrolytic capacitor
L1, L2	>3mH/Temperature rise less than 25° @27A
L3	>100uH/Temperature rise less than 25° @20A

3. Recommended circuits for the Remote control (CNT)



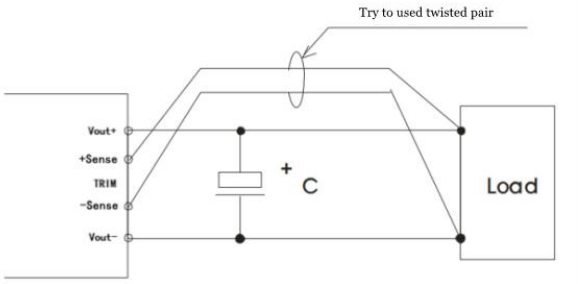
4. Application for Sense

1) With NO distal end compensation



Note:
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



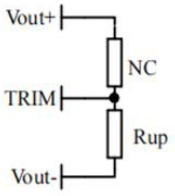
Notes:
1. The output voltage may be unstable if the compensation cables are too long.
2. The twisted pair or shielded cables are recommended, the cable length should be as short as possible.
3. Wide copper path on PCB or thick lead wires between the power supply and the load should be used to achieve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

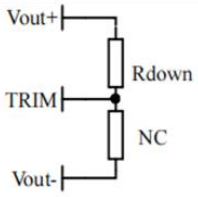
The calculation of △U and Rup & Rdown:

Rup=25/△U-5.1（KΩ）

Rdown=10*(15-2.5-△U)/△U -5.1（KΩ）



Voltage-up: Add Rup between Trim and Vout-



Voltage-down: Add Rdown between Trim and Vout+

6. This 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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