Typical Features

- Wide input voltage range 4:1
- Efficiency up to 92%
- Low no-load power consumption
- Operating temperature from -40℃ to +105℃
- High isolation voltage 1500VDC(input-output) & 1500VDC(input-case)
- Input under voltage, output over current, over voltage, over temp. & short circuit protections
- Standard 1/4 brick size

ZCD75-48S24A-TS is a high-performance DC-DC modular converter with rated input voltage 48VDC (full range 18-75VDC), regulated single output 24V/75W without minimum load limit. It has the advantage of high isolation voltage, Max operating temperature up to 105°C, with 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 function, 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.	Note
ZCD75-48S24AC-TS	18-75	75	24	3.13	240	90/92	Standard Positive logic
ZCD75-48S24AN-TS							Standard Negative logic

Input Specifications

Item	Operating conditions	Min.	Typ.	Max.	Unit
Max input current	18V input voltage, full load output	--	--	5	A
No load input current	Rated input voltage	--	--	20	mA
Input inrush voltage (1sec. max.)	The unit could be permanently damaged by the input over this voltage	-0.7	--	100	VDC
Start-up voltage		--	--	18	
Under voltage protection	With No-load (the over current protection will work in advance at full load)	--	--	17	
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, 10%~100% load	--	±0.5	±1.0	%
Line regulation	Full load, input voltage from low to high voltage	--	±0.1	±0.2	%

Load regulation	Nominal input voltage, 10%-100% load	--	±0.2	±0.5	%
Dynamic recovery time	25% load step change (step rate 1A/50uS)	--	200	250	uS
Dynamic response deviation		-5	--	+5	%
Temperature drift coefficient	Full load	-0.02	--	+0.02	%/℃
Ripple & Noise	20M bandwidth, with external capacitor >220uF	--	150	240	mVp-p
Output voltage adjustment (TRIM)		-20	--	+10	%
Output voltage distal end compensation (Sense)		--	--	5	%
Over temperature protection	Maximum temperature of the metal base	105	115	125	℃
Over voltage protection		125	--	140	%
Over current protection		3.4	--	4.4	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			--	210	--	KHz
MTBF			150	--	--	K hours

Environmental Characteristics

Item	Operating conditions	Min.	Typ.	Max.	Unit
Case temperature	Refer to the temperature derating graph of metal base	-40	--	+105	℃
Ambient temperature	Refer to the temperature derating graph of ambient	-40	--	+85	℃
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 requirements		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 Performance (EN55032)

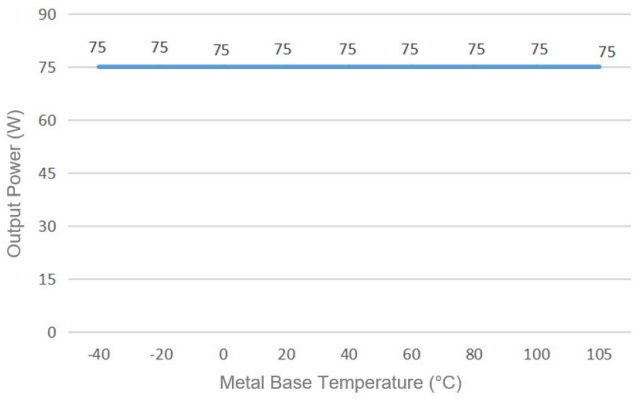
EMI	CE	EN55032-3-2	150kHz-500kHz 66dBuV	
		EN55032-2-1	500kHz-30MHz 60dBuV	

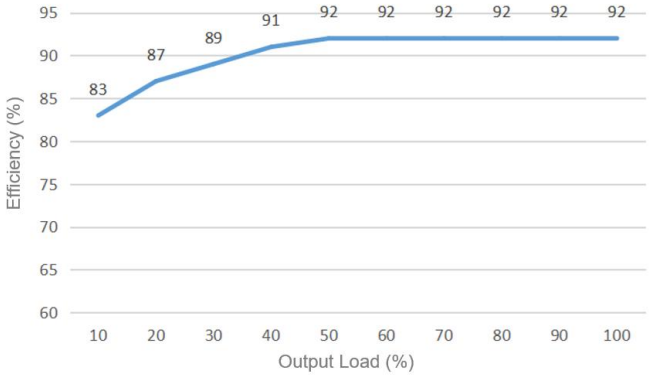
	RE	EN55032-3-2	30MHz-230MHz 50dBuV/m at 3m	
		EN55032-2-1	230MHz-1GHz 57dBuV/m at 3m	
EMS	ESD	IEC/EN61000-4-2	Contact ±6KV/Air ±8KV	perf. Criteria B
	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4	±2kV 5/50ns 5kHz	perf. Criteria A
	Surge	IEC/EN61000-4-5	Line to line ± 2KV	perf. Criteria B
	CS	IEC/EN61000-4-6	10 Vr.m.s	perf. Criteria A

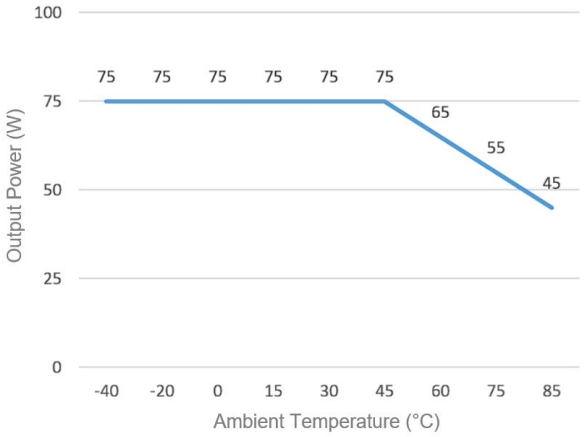
Physical Characteristics

Case materials	Metal base + plastic case in black, flame class UL94-V0
Cooling method	Conduction cooling or forced air cooling
Unit weight	150g (with Chassis)
Unit dimension	Dimension 134x69x22.4mm

Product Characteristics Graphs



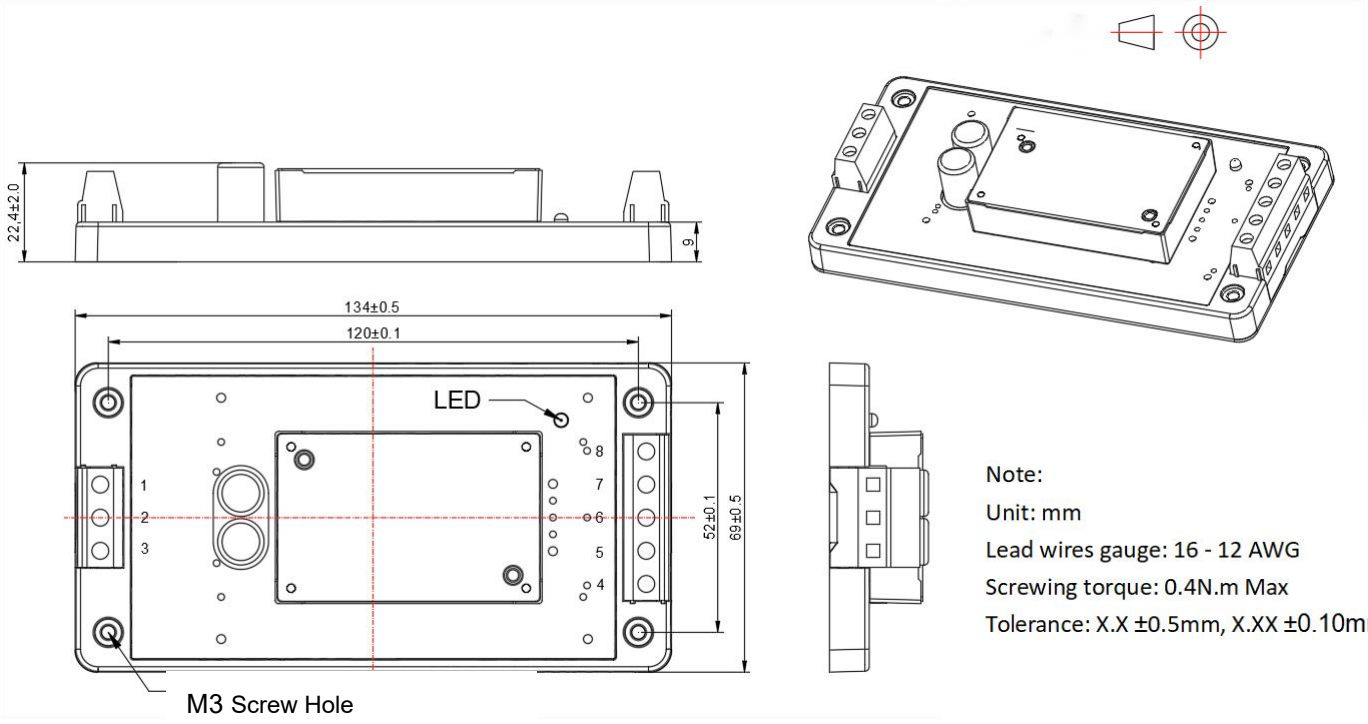




Note 1: Both the output power and efficiency in the graphs are tested with the typical values.

Note 2: The temperature derating power is tested under Aipu laboratory test conditions. It is recommended to keep the temperature of the Metal base not more than 100 °C when the converter operates at the rated load for the application.

Mechanical Dimensions and Pin-out Function Description

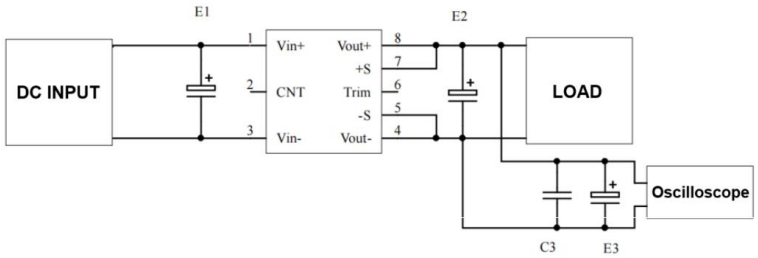


Pin No.	1	2	3	4	5	6	7	8
Function	Vin+	CNT	Vin-	Vout-	-S	TRIM	+S	Vout+
Description	Input V+	ON/OFF Control	Input V-	Output V-	Output distal end compensation S-	Output voltage Trim	Output distal end compensation S+	Output V+

Recommended Circuits for Application

1. Ripple & Noise

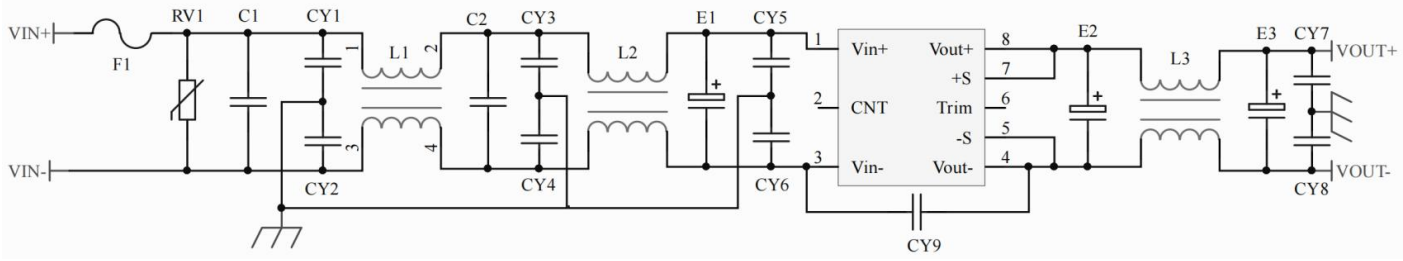
All this series of converters will be tested according to the circuit diagram below before shipping.



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				

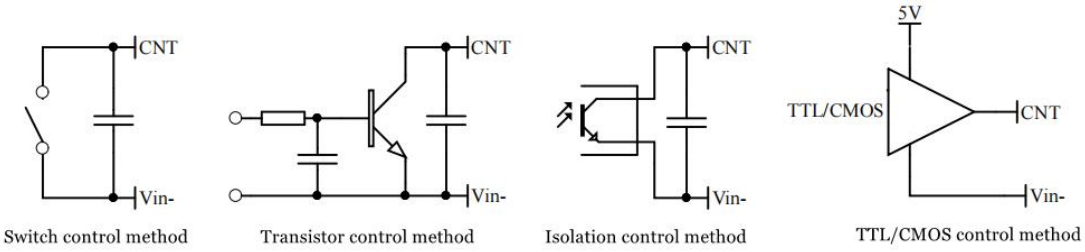
2. Recommended application circuit diagram

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



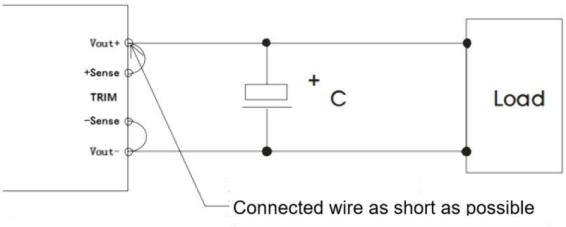
F1	T10A/250V Fuse
RV1	14D 100V Varistor
C1, C2	105/250V Polyester Film Capacitor
CY1, CY2, CY3, CY4, CY5, CY6	102/250Vac Y2 Capacitor
CY7, CY8	103/2KV Ceramic Capacitor
CY9	471/250Vac Y1 capacitor
E1	100μF/100V Electrolytic Capacitor
E2, E3	220μF/35V Electrolytic Capacitor
L1, L2	>3mH, temperature rise less than 25°@5A
L3	>220uH, temperature rise less than 25°@3.2A

3. ON/OFF Control (CNT) application diagrams



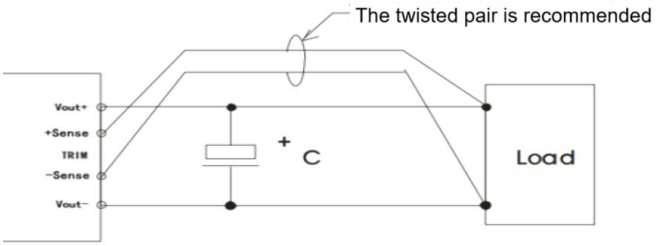
4. Application for Sense

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**



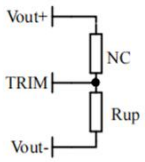
Notes:
1. The output voltage may be unstable if the compensation cables are too long.
2. The Twisted pair or shielded cables are recommended, the cable length should be as short as possible.
3. Wide copper path on PCB or thick lead wires between the power supply and the load should be used to achieve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

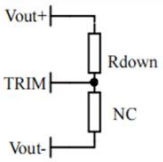
The calculation of △U and Rup & Rdown:

Rup=70/△U-5.1 (KΩ)

Rdown=28*(24-2.5-△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 to be used 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 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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