



Typical Features

- ◆ Wide input voltage range 3:1
- ◆ High efficiency up to 92%
- ◆ Low no-load power consumption
- ◆ Operating Temperature: -40°C to +105°C
- ◆ High isolation voltage, input-output 3000VAC, input-case 2100VAC
- ◆ Protection: Input under voltage, output over voltage, short circuit, over current, over temp
- ◆ Current sharing parallel output
- ◆ Standard brick size

Conform to CE standard

ZAA510-220S48 high efficiency brick dc-dc converter, rated input voltage 220VDC, output 48V/510W, no minimum load, wide input 90-264VDC, regulated single output, high isolation insulation voltage, allowing operating temperature up to 105 °C, with input under-voltage protection, output over-current, over-voltage, over-temperature, 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
ZAA510-220S48	90-264	510	48	10.7	480	90/92	Standard positive logic
ZAA510-220S48-H							Standard negative logic

Input Specification

Item	Operating conditions	Min.	Typ.	Max.	Unit
Max input current	90V input voltage, full load output	--	--	7	A
No load input current	Rated input voltage	--	--	3	mA
Input surge voltage (1sec. max.)	Inputs above this range may cause permanent damage	-0.7	--	315	VDC
Start up voltage		--	--	90	
Input under voltage protection	No-load test, full-load test will have over current protection in advance	--	--	85	
Input under voltage protection	No-load test, full-load test will have over current protection in advance	300	--	--	

Output Specification

Item	Working conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	Nominal input voltage, 0%-100% load	--	±0.2	±1	%
Line Regulation	Full load, input voltage from low to high	--	±0.1	±0.2	
Load Regulation	Nominal input voltage, 10%-100% load	--	±0.1	±0.2	
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	--	300	480	mVp-p
Output voltage adjustment (TRIM)		21	--	32	%
Output voltage remote compensation (Sense)		--	--	105	%
Over temp protection	Maximum temperature of product metal substrate surface	105	115	125	°C
Output over voltage protection		125	--	150	%
Output over current protection		11	--	16	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	3000	--	--	VAC
	I/P-Case	Test 1min, leakage current < 3mA	2100	--	--	VAC
	O/P-Case	Test 1min, leakage current < 3mA	500	--	--	VAC
Insulation resistance	I/P-O/P	Insulation voltage 500VDC	100	--	--	MΩ
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(EN50155)

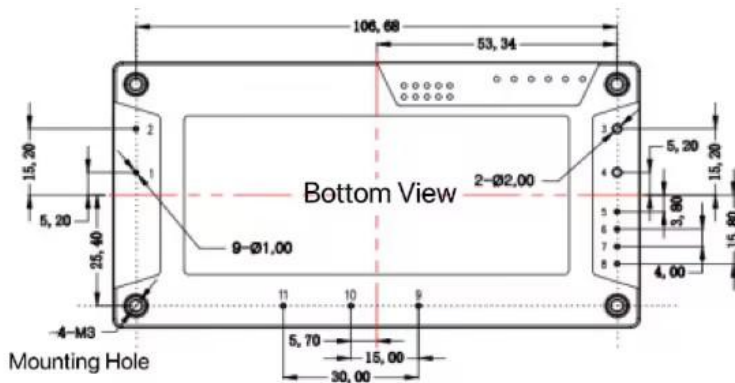
EMI	CE	EN50121-3-2	150kHz-500kHz 79dBuV	
		EN55016-2-1	500kHz-30MHz 73dBuV	
	RE	EN50121-3-2	30MHz-230MHz 40dBuV/m at 10m	
		EN55016-2-1	230MHz-1GHz 47dBuV/m at 10m	
EMS	ESD	EN50121-3-2	Contact ±6KV/Air ±8KV	perf. Criteria A
	RS	EN50121-3-2	10V/m	perf. Criteria A
	EFT	EN50121-3-2	±2kV 5/50ns 5kHz	perf. Criteria A
	Surge	EN50121-3-2	line to line ± 1KV (42Ω, 0.5μF)	perf. Criteria A
	CE	EN50121-3-2	0.15MHz-80MHz 10 Vr.m.s	perf. Criteria A

Physical Characteristics

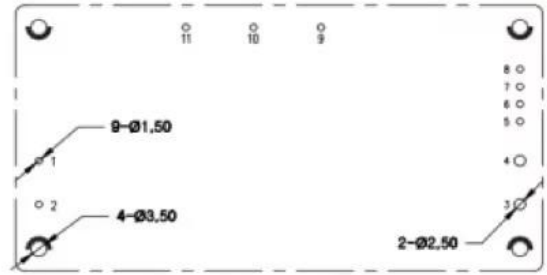
Case Materials	Metal bottom shell + black flame retardant material shell (UL94-V0)
Heat sink	Dimension 116.8*61*20mm, weight 150g, aluminum alloy, anodized black
Cooling method H	Conduction cooling or forced air cooling

Product Weight	Standard 250g, with heatsink 402g
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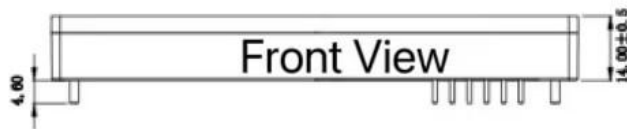
Dimension and Pin-Out



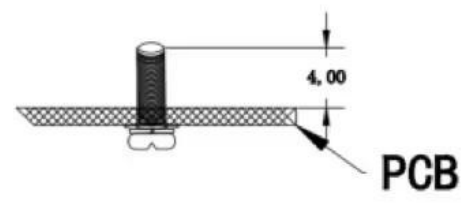
first angle projection



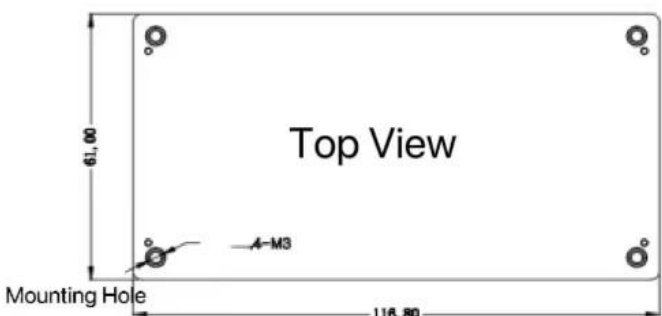
Recommend PCB Slot Size



Front View



PCB



Top View

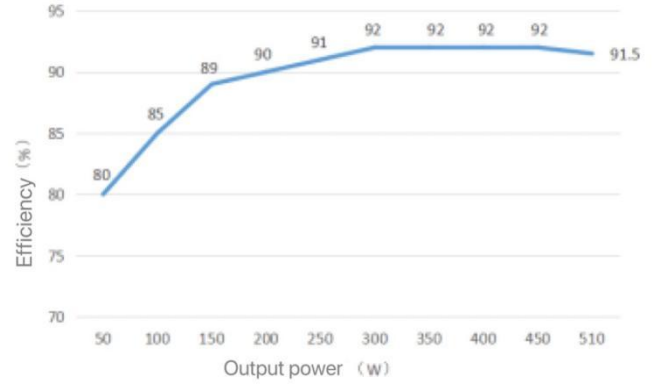
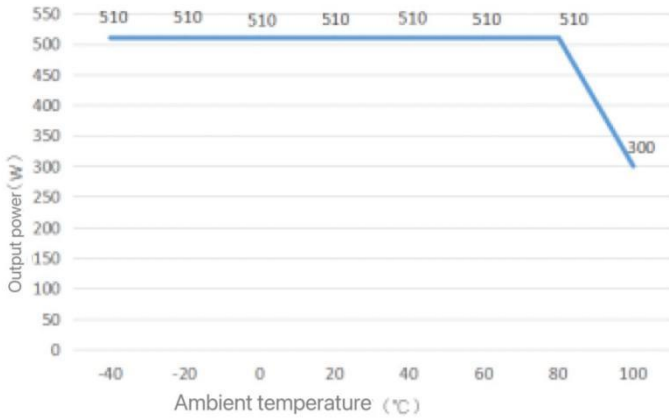
Standard
116.8*61.0*14.0mm

Note:
Unit:mm
Pin 1,2,5,6,7,8,9,10, 11 dia:1.00
Pin 3,4 dia:2.00
general tolerance:±0.10
mounting hole tightening torque: Max 0.4N*m

No	1	2	3	4	5	6
Pin-out	AC(L)	AC(N)	-Vo	+Vo	-S	+S
No	7	8	9	10	11	
Pin-out	TRIM	ENA	-BC	+BC	R	

Note: 1. ENA is the output status signal, and when the power supply is working normally, ENA shows low impedance; When the power supply operates abnormally, ENA exhibits high impedance and the maximum pulling current is 10mA;

Product characteristic curve

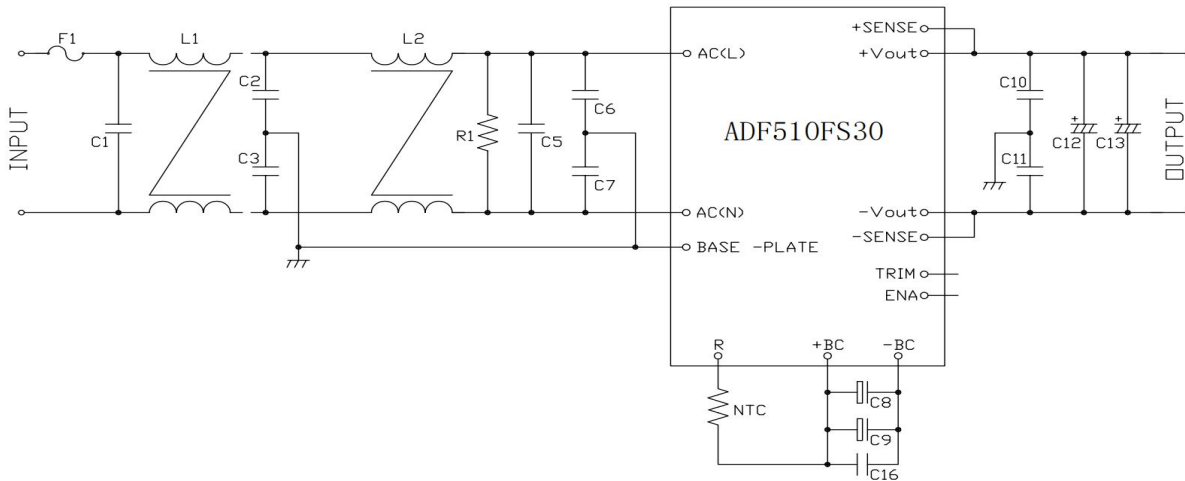


Notes

1. The temperature derating curve and efficiency curve are both typical values tested;
2. The temperature derating curve is tested according to our laboratory testing conditions. If the actual environmental conditions used by the customer are inconsistent, it is necessary to ensure that the temperature of the aluminum shell of the product does not exceed 105 °C and can be used within any rated load range.

Reference

1. Recommended application circuit.

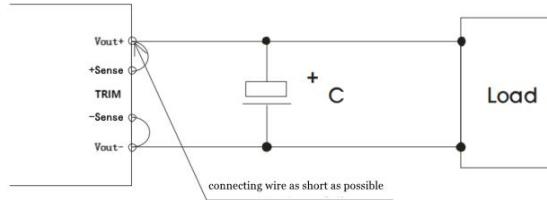


F1	AC250V 10A fuse	C12, C13	470uF 50V
C1, C5	AC250V 1uF X2 capacitance	C16	1 uF 630V Polypropylene capacitor
C2, C3, C6, C7	2200pF 250VAC Y2 capacitance	R1	2W 470K Metal film resistance
C8, C9	450V 220uF Electrolytic capacitor	NTC	10 Ω 5A, NTC resistance
C10, C11	4700pF 250VAC Y2 capacitance	L1, L2	L1, L2 6.0mH common mode inductance rated current not less than 6.5A

Note: There are limited requirements for the selection of capacitors C5, C16, C8, and C9 in the recommended circuits above; C5 and C16 must have a capacitance of 1 uF or greater; The capacity of C8 and C9 after parallel connection must be greater than or equal to 330 uF; NTC resistor must be installed;

2. Sense usage and precautions

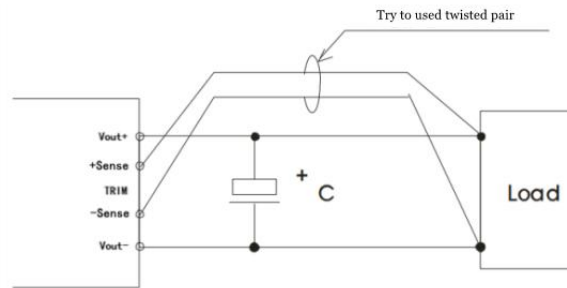
(1) Without far-end compensation:



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

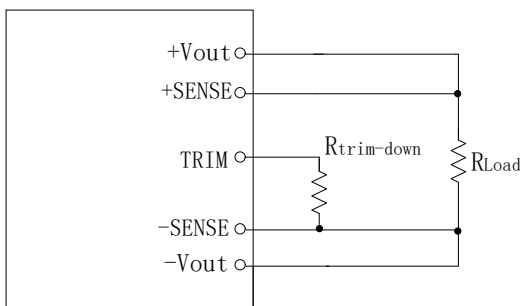


Precautions:

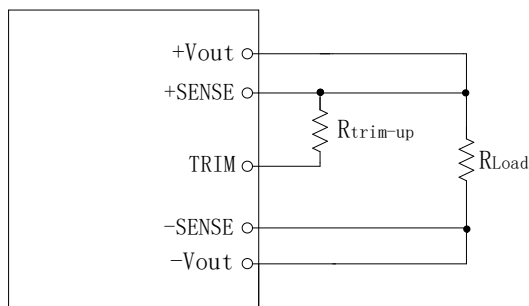
1. When the long-end compensation lead is used, the output voltage may be unstable;
2. If remote compensation is used, please use twisted pair or shielded wire, and keep the lead wire as short as possible;
3. Please use wide PCB leads or thick wires between the power module and the load, and keep the 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.

3. Use of TRIM and calculation of TRIM resistance

Relationship between output variation voltage Δ and regulating resistance:



$$R_{trim-down} = \frac{511}{|\Delta|} - 10.22(k\Omega)$$



$$R_{trim-up} = \frac{5.11 \times V_o \times (100 + \Delta)}{2.5 \times \Delta} - \frac{511}{\Delta} - 10.22(k\Omega)$$

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.