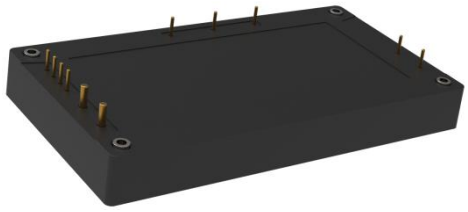
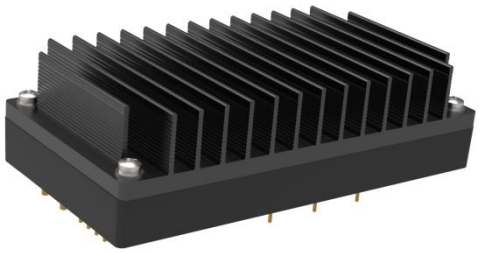




Typical Features

- ◆ Wide input voltage range (3 : 1)
- ◆ Efficiency up to 91%
- ◆ Low no-load power consumption
- ◆ Operating temperature from -40℃ to +105℃
- ◆ High isolation voltage 2500VAC (input-output) & 2100VAC (input-case)
- ◆ Input under voltage & over voltage protections, output over voltage, short circuit, over current and over temperature protections
- ◆ Standard full brick size

ZAA700-220S12C is a high-performance AC-DC modular converter with the rated input voltage 220VAC (full range from 90V to 286VAC), regulated single output 12V/700W without minimum load limit. It has the advantage of high isolation voltage, Max operating temperature up to 105°C, with input under voltage and over voltage protections, output over current, over voltage, over temperature and short circuit protections, output voltage distal end compensation (Sense) and output voltage Trim function, etc.

Typical Product List

Part No.	Input voltage range (VAC)	Output power (W)	Output voltage (VDC)	Output current (A)	Ripple & Noise (mVp-p)	Full load efficiency (%) Min/Typ.	Remarks
ZAA700-220S12C	90 - 286	700	12	58	120	89/91	Standard
ZAA700-220S12C-H							With Heatsink

Note: The output power could be derated linearly at the input <154VAC/200VDC, the output power can be 500W at input 90VAC/140VDC.

Input Specifications

Item	Operating conditions	Min.	Typ.	Max.	Unit
AC input start-up voltage		--	--	90	VAC
AC input under voltage protection		--	--	80	
AC input over voltage protection		290	--	310	
Input inrush voltage (1sec. max.)	The unit could be permanently damaged by the input over this voltage	-0.7	--	315	
DC input start-up voltage		--	--	145	VDC
DC input under voltage protection		--	--	135	
DC input over voltage protection		425	--	435	
Input inrush current Max	NTC(5.6R/Ø20mm) in series with the input, 220VAC input	--	--	40	A
Input voltage frequency		47	--	63	Hz
Start-up time		--	--	5	S
Standby power consumption	Input voltage 220VAC	--	10	20	W
PF value	220VAC input, full load	95	--	--	%

Output Specifications

Item	Operating conditions	Min.	Typ.	Max.	Unit
Output voltage accuracy	Nominal input voltage, 0%-100% load	--	±0.2	±1.0	%
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	%/℃
Ripple & Noise	20M bandwidth, with external capacitor >680uF	--	100	120	mVp-p
Output voltage TRIM		9.6	--	13.2	VDC
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		61	--	70	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	2500	--	--	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	@ 500VDC	100	--	--	MΩ
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			

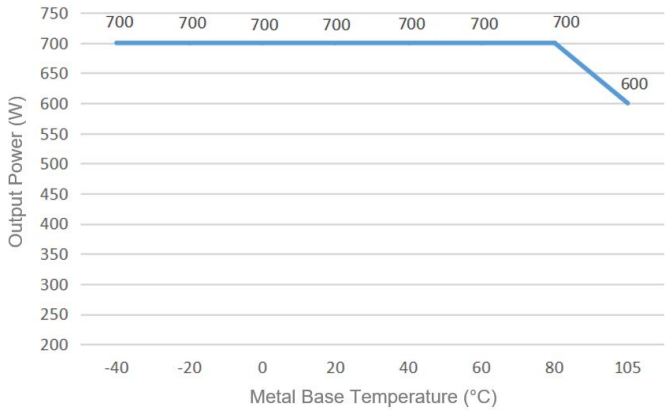
EMC Performances

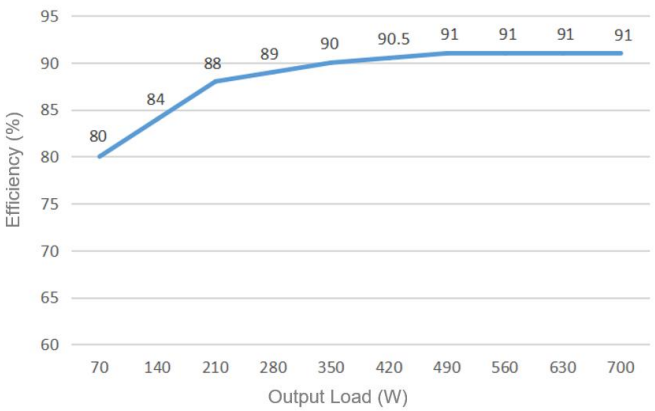
EMI	CE	EN50121-3-2	150kHz-500kHz 79dBuV	
		EN55016-2-1	500kHz-30MHz 73dBuV	
	RE	EN50121-3-2	30MHz-230MHz 40dBuV/m at 10m	
		EN55016-2-1	230MHz-1GHz 47dBuV/m at 10m	
EMS	ESD	IEC/EN61000-4-2/GB/T 17626.2-2006	Contact ±6KV/Air ±8KV	perf. Criteria A
	RS	IEC/EN61000-4-3/GB/T 17626.3-2006	10V/m	perf. Criteria 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

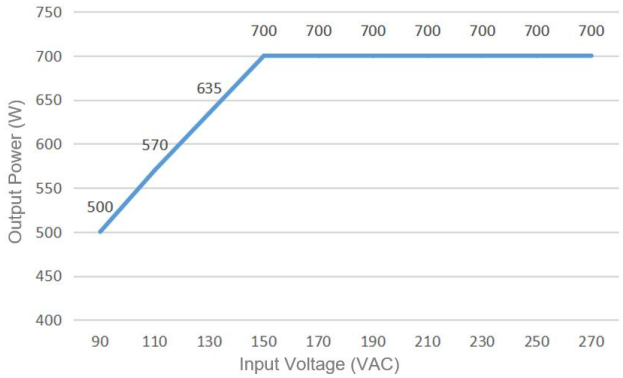
Physical Characteristics

Case materials	Metal base + plastic case in black, flame class UL94-V0
Heat sink	Dimension 116.8x61.0x20.0 mm, weight 135g, aluminum, anodized black
Cooling method	Conduction cooling or forced air cooling
Unit weight	Standard 250g, with heatsink 389g

Product Characteristics Graphs

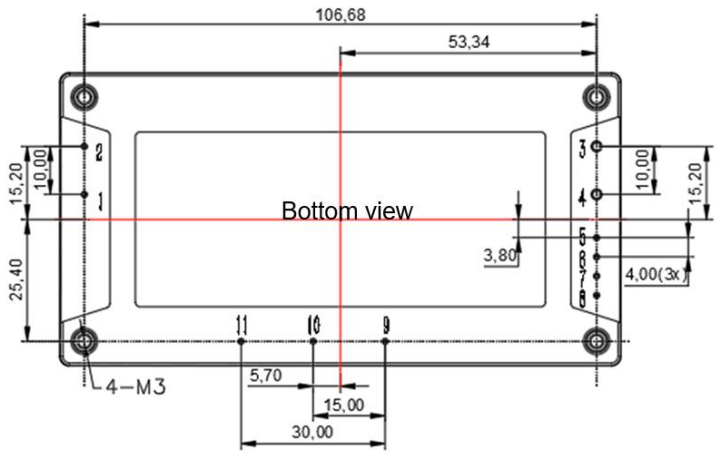


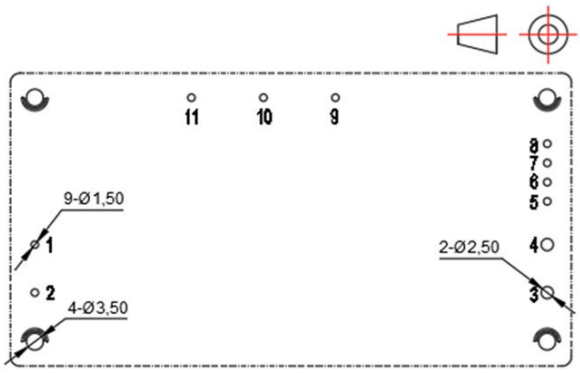




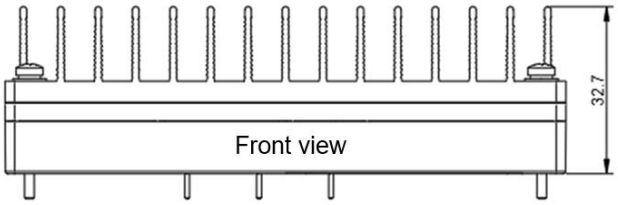
Note 1: The output power and the efficiency in the graphs are tested with typical values.
Note 2: The data in the temperature derating graph is tested at Aipu laboratory test conditions. It is recommended to keep the temperature of the metal base not more than 80 °C when the converter operates at the rated load for the application.

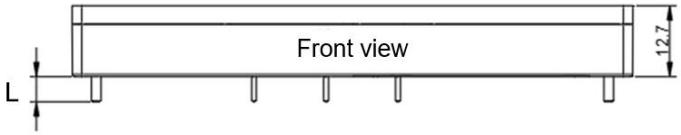
Mechanical Dimensions and Pin-Out Function Description

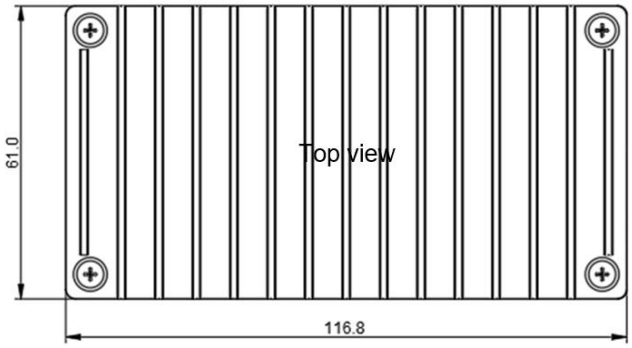




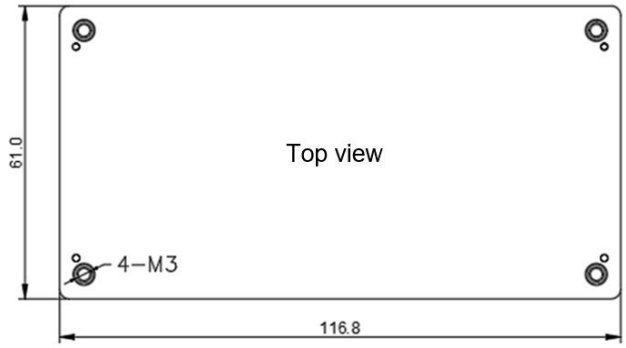
Recommended PCB holes





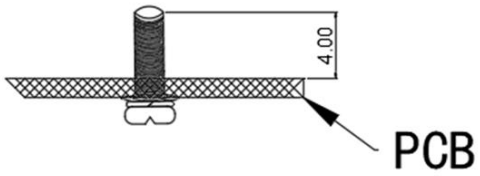


Standard+Heatsink
116.8x61.0x32.7 mm



Standard
116.8x61.0x12.7 mm

Note:
Unit: mm
Pin 1,2,5,6,7,8,9,10,11 diameter: 1.00
Pin 3,4 diameter : 2.00
General tolerance: X.X ±0.5, X.XX: ±0.10
Screwing torque: 0.4 N.m Max.



Pin Length L=5.3mm

Pin No.	1	2	3	4	5	6	7	8	9	10	11
Function	AC(L)	AC(N)	-Vo	+Vo	-S	+S	Trim	CNT	-BC	+BC	R

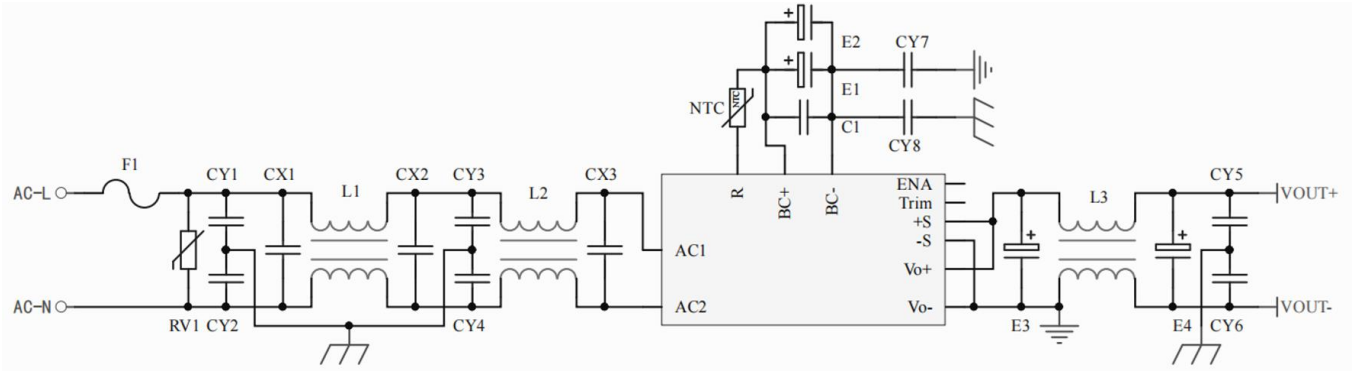
Note:

1. CNT means ON/OFF control by positive logic, CNT terminal no connection or connected to high level 3.5-15V to turn on the converter, CNT connected to GND or low level 0-0.6V to turn off the converter, output -Vo is equivalent to GND.

2. S means Sense (see following output voltage distal end compensation instruction), BC means the PFC output high voltage, R is the PFC rectified output terminal.

Recommended Circuits for Application

1. Typical application circuit diagram

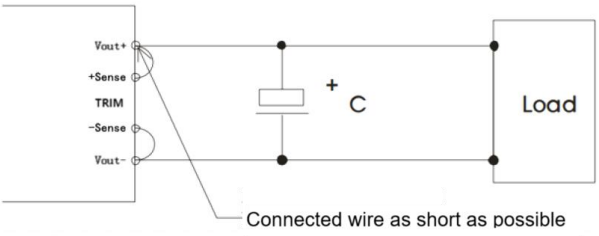


F1	AC250V 15A Fuse
RV1	14D 620V Varistor
CX1, CX2, CX3	250VAC 1uF X2 Capacitor
CY1, CY2, CY3, CY4, CY8	1000pF 250VAC Y2 Capacitor
CY7	470pF 250VAC Y1 Capacitor
L1, L2	6.0mH Common mode choke, rated current ≥7.5A
E1, E2	450V 330uF Electrolytic capacitor
C1	1 uF 630V Polyester Film Capacitor
NTC	5.6Ω 20mm NTC Thermistor
E3, E4	1000uF 16V Low ESR capacitor
CY5, CY6	10nF 2KV Ceramic capacitor
L3	20uH Common mode choke, rated current ≥ 60A

Note: CX3 & C1 capacitance should be more than 1uF, E1 & E2 capacitance in parallel should be more than 440uF, NTC is required for the application. The converter unit could be failed or broken during the operation if these requirements are not met.

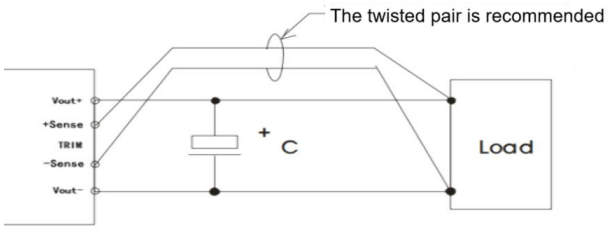
2. Application for Sense

1) **With NO distal end compensation**



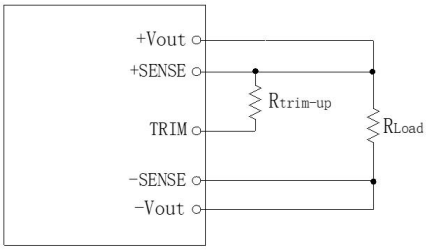
Notes:
1. Vout+ & Sense+, Vout- & Sense- should be shorted when distal compensation function is not needed
2. The lead wire between Vout+ and Sense+, Vout- and Sense- should be as short as possible, and close to the pins, or else the output may be unstable.

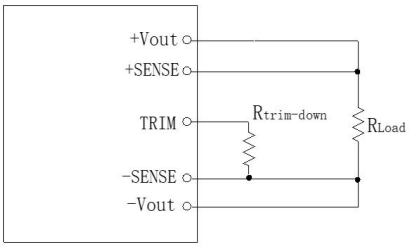
2) **With distal end compensation**



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.

3. Output voltage TRIM & TRIM resistance calculation





The output voltage can be adjusted between 80% and 110% of Vo by an external resistor used between the terminals of TRIM and Vo. The voltage can be increased by the resistor between TRIM and Vo+, and it can be decreased by the resistor between TRIM and Vo-. The resistor should be placed as closely as possible to the converter terminals. TRIM terminal should be No Connection when TRIM is not needed. The resistances of Trim-up and Trim-down calculating formulars are shown below.

$$Rtrim\text{-}up=(5.1*\Delta*Vo-12.75)/(2.5*\Delta-2.5)-10.2\ (K\Omega)$$

$$Rtrim\text{-}down=(10.2*\Delta-5.1)/(1-\Delta)\ (K\Omega)$$

For example, Vo=12V, we need increase it to be 13.2V, Δ=13.2/12=1.1, Rtrim-up=(5.1*1.1*12-12.75)/(2.5*1.1-2.5)-10.2=208.08 KΩ;
If we need decrease the voltage to be 10.8V, Δ=10.8/12=0.9, Rtrim-down=(10.2*0.9-5.1)/(1-0.9)=40.8 KΩ

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.

Guangzhou Aipu Electron Technology Co., Ltd
Address: Building 4, HEDY Park, No.63, Punan Road, Huangpu Dist, Guangzhou, China.
Tel: 86-20-84206763 Fax: 86-20-84206762 HOTLINE: 400-889-8821
E-mail: sales@aipu-elec.com Website: www.aipupower.com