



### Typical Features

- ◆ Wide input voltage range: 85-265VAC/120-380VDC
- ◆ No load power consumption ≤ 0.15W
- ◆ Transfer efficiency (typ. 80%)
- ◆ Switching Frequency: 65KHz
- ◆ Protections: short circuit, over-current, over-voltage, over-temperature
- ◆ Isolation voltage: 3000Vac
- ◆ Conform to IEC60950/UL60950/EN60950 test standard
- ◆ Meet CE, RoHS
- ◆ Full enclosed plastic case, UL94 V-0
- ◆ PCB mounting



### Application Field

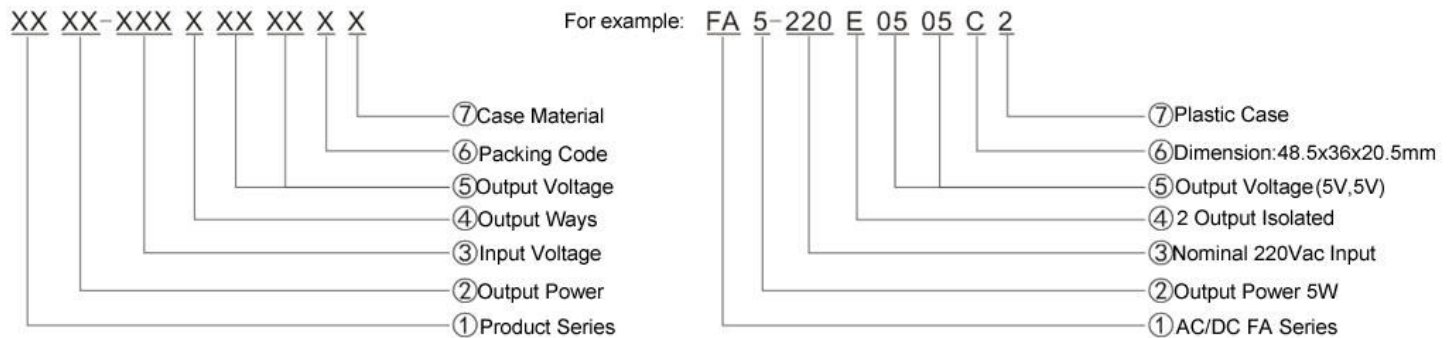
**FA5-220E05XXC2 Series**----- a compact size, high efficient, meet CE standard power module offered by Aipu.

It features universal input voltage range, DC and AC dual-use, low ripple, low temperature rise, low power consumption, high efficiency, high reliability, safer isolation. with good EMC performance, meet international EN55032、IEC/EN61000 standard.

This series have wide application for power, industrial, instrument, smart home field.

The application circuit in the datasheet is strongly recommended for harsh EMC environment.

### Product Named Method



### Typical Product List

Certificate	Part No	Output Specifications					Max. Capacitive Load	Ripple & Noise 20MHz (Max)	Efficiency @ Full Load, 220Vac (Typical)
		Power	Voltage1	Current1	Voltage2	Current2			
		(W)	Vo1(V)	Io1(mA)	Vo2(V)	Io2(mA)			
CE	*FA5-220E0505C2A	5	5	900	5	100	3200/370	50	72
	*FA5-220E0512C2A	5	5	750	12	100	2400/220	50	73
	FA5-220E0515C2A	5	5	700	15	100	2200/150	50	73
	*FA5-220E0524C2A	5	5	500	24	100	2000/100	50	75
	*FA5-220E0505C2	5	5	500	5	500	1000/1000	50	72



*FA5-220E1212C2	5	12	208	12	208	220/100	50	79
*FA5-220E1515C2	5	15	166	15	166	150/150	50	80

Note 1: Due to space limitations, above is only a part of our product list, please contact our sales team for more items.

Note 2: “\*\*” are models being developing.

Note 3: The typical value of output efficiency is based on full load and burn-in after half an hour.

Note 4: The fluctuation range of full load efficiency at table(% , TYP) is  $\pm 2\%$ , full load efficiency = total output power/module's input power.

### Input Specifications

Item	Operating Condition	Min	Typ.	Max	Unit
Input Voltage Range	AC input	85	220	265	VAC
	DC input	120	310	380	VDC
Input Frequency Range	-	47	50	63	Hz
Input Current	115VAC	/	/	0.13	A
	220VAC	/	/	0.07	
Surge Current	115VAC	/	/	10	
	220VAC	/	/	20	
Leakage Current	-	0.5mA TYP/230VAC/50Hz			
External Fuse Recommended Value	-	1A-2A/250VAC slow-fusing			
Hot-plug	-	unavailable			
Remote Control Terminal	-	unavailable			

### Output Specifications

Item	Operating Condition	Min	Typ.	Max	Unit
Voltage Accuracy	Full input voltage range, any load	Vo1	$\pm 1.0$	$\pm 2.0$	%
		Vo2	$\pm 3.0$	$\pm 5.0$	%
Line Regulation	Nominal load	Vo1	-	$\pm 0.5$	%
		Vo2	-	$\pm 1.5$	%
Load Regulation	Nominal input voltage 20%~100%	Vo1	-	$\pm 1.0$	%
		Vo2	-	$\pm 3.0$	%
No Load Power Consumption	Input 115VAC	-	-	0.15	W
	Input 220VAC	-	-		
Minimum Load	Single Output	0	-	-	%
	Dual output Common Ground	10	-	-	
	Dual output Isolated	10	-	-	

Start-up Delay Time	Nominal input voltage (full load)	-	100	-	mS
Power-off Holding Time	Input 115VAC (full load)		10		mS
	Input 220VAC (full load)	--	60	-	
Dynamic Response	25%~50%~25%	Overshoot range(%): $\leq\pm 5.0$			%
	50%~75%~50%	Recovery time(mS): $\leq 5.0$			mS
Output Overshoot	Full input voltage range	$\leq 10\%V_o$			%
Short Circuit Protection		Continuous, Self-recovery			Hiccup
Temperature Coefficient	-	-	$\pm 0.03\%$	-	%/ $^{\circ}C$
Over Current Protection	Full input voltage range	$\geq 150\% I_o$ self-recovery			Hiccup
Over Voltage Protection	Output 5.0VDC	$\leq 7.5$			VDC
	Output 12VDC	$\leq 18$			
	Output 15VDC	$\leq 20$			
	Output 24VDC	$\leq 30$			
Ripple & Noise	-	-	50	100	mV
	Note: Ripple & Noise is tested by twisted pair method, for details please see(Ripple& Noise Test) at back.				

### General Specifications

Item	Operating Condition	Min	Typ.	Max	Unit
Switching Frequency	-	-	65	-	KHz
Operating Temperature	-	-40	-	+75	$^{\circ}C$
Storage Temperature	-	-40	-	+85	
Soldering Temperature	Wave-soldering	$260\pm 4^{\circ}C$ , timing 5-10S			
	Manual-soldering	$360\pm 8^{\circ}C$ , timing 4-7S			
Relative Humidity	-	10	-	90	%RH
Isolation Voltage	Input-Output Test 1min, leakage current $\leq 5mA$	3000	-		VAC
Insulation Resistor	Input-Output@DC500V	100	-		M $\Omega$
Safety Standard	-	EN60950,IEC60950			
Vibration	-	10-55Hz,10G,30Min,alongX,Y,Z			
Safety Class	-	CLASS II			



Class of Case Material	-	UL94 V-0
MTBF	-	MIL-HDBK-217F@25°C > 300,000H

### Material Characteristics

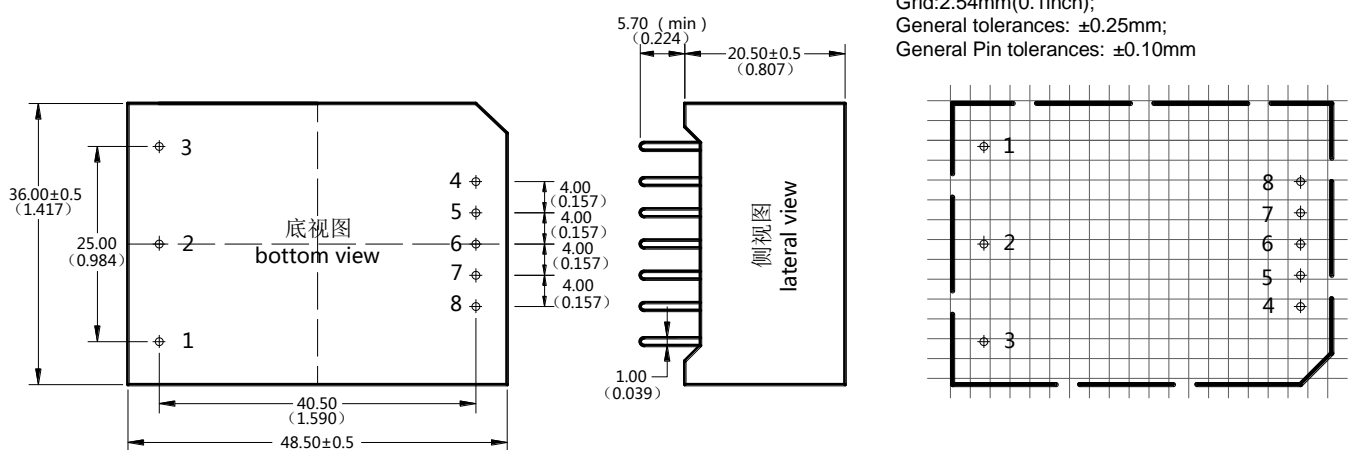
Case Material	Black flame-retardant heat-resistant plastic (UL94 V-0)	
Packing Dimension	Horizontal package	48.5X36.0X20.5 mm
Product Weight		65g(TYP)
Cooling Method	Natural air cooling	

### EMC Characteristics

Total Item	Sub Item	Test Standard	Class	
EMC	EMI	CE	CISPR22/EN55032 CLASS B	
		RE	CISPR22/EN55032 CLASS B	
	EMS	RS	IEC/EN61000-4-3	10V/m Perf.Criteria B(recommend circuit see photo1)
		CS	IEC/EN61000-4-6	3Vr.m.s Perf.Criteria B (recommend circuit see photo1)
		ESD	IEC/EN61000-4-2	Contact ±6KV / Air ±8KV Perf.Criteria B
		Surge	IEC/EN61000-4-5	±1KV Perf.Criteria B
		EFT	IEC/EN61000-4-4	±2KV Perf.Criteria B
		Voltage dips, short interruptions and voltage variations immunity	IEC/EN61000-4-11	0%~70% Perf.Criteria B

### Dimension

Unit: mm(inch);  
 Printed board vertical view;  
 Grid:2.54mm(0.1inch);  
 General tolerances: ±0.25mm;  
 General Pin tolerances: ±0.10mm



The drawings show the following dimensions:  
 - Bottom view: Overall width 48.50±0.5 (1.909), overall height 36.00±0.5 (1.417). Pin 1 is 25.00 (0.984) from the left edge. Pin 3 is 4.00 (0.157) from the top edge. Pins 4-8 are spaced 4.00 (0.157) apart.  
 - Lateral view: Pin height 5.70 (min) (0.224), pin pitch 20.50±0.5 (0.807), and a 1.00 (0.039) offset from the bottom edge.  
 - Grid reference: Shows the relative positions of pins 1, 2, 3, 4, 5, 6, 7, and 8 on a 2.54mm grid.

Packing Code	L x W x H	
C2A	48.5 x 36.0 x 20.5 mm	1.909 x 1.417 x 0.807inch

### Pin Definition

Pin	1	2	3	4	5	7	8
Single(S)	FG	AC(N)	AC(L)	+Vo2	-Vo2	+Vo1	-Vo1

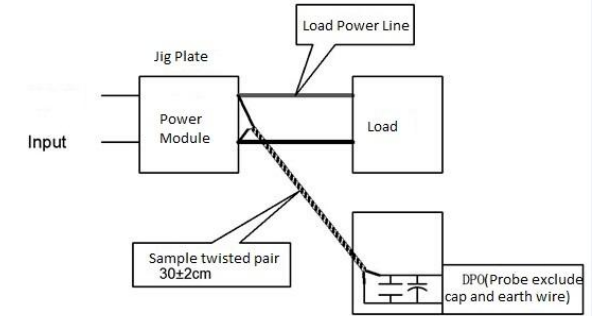
Note: If the definition of pin is not in accordance with the model selection manual, please refer to the label on actual item.

### Ripple & Noise Test: (Twisted Pair Method 20MHZ bandwidth)

Test Method:

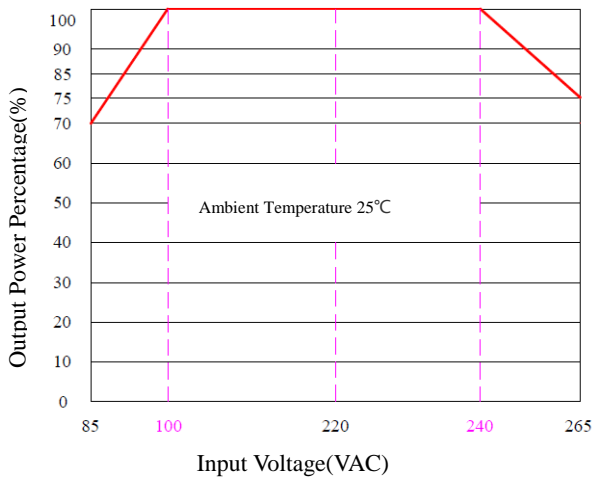
(1) 12# twisted pair to connect, Oscilloscope bandwidth set as 20MHz, 100M bandwidth probe, terminated with 0.1uF polypropylene capacitor and 10uF high frequency low resistance electrolytic capacitor in parallel, oscilloscope set as Sample pattern.

(2) Input terminal connect to power supply, output terminal connect to electronic load through jig plate, Use 30cm±2 cm sampling line, Power line selected from corresponding diameter wire with insulation according to the flow of output current.

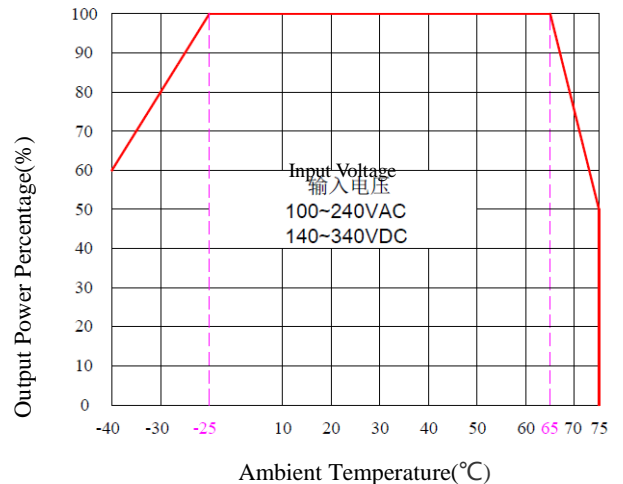


### Product Characteristic Curve

Input Voltage Derating Curve



Temperature Derating Curve



Note 1: Input Voltage should be derated based on input voltage derating curve when it is 85~100VAC/240~265VAC/120~140VDC/340~380VDC.

Note 2: Our product is suitable to use under natural air cooling environment, if use it under closed condition, please contact with us.

### Typical EMC Application Circuit and Recommended Parameters

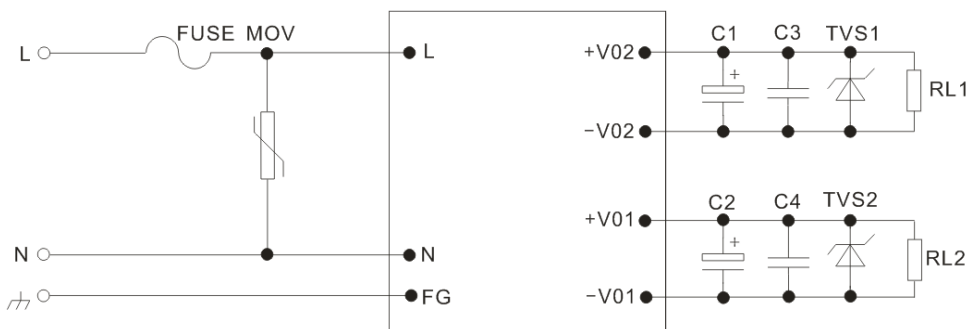


Photo 1



### 2. EMC Recommended Circuit (If has higher request for EMC)

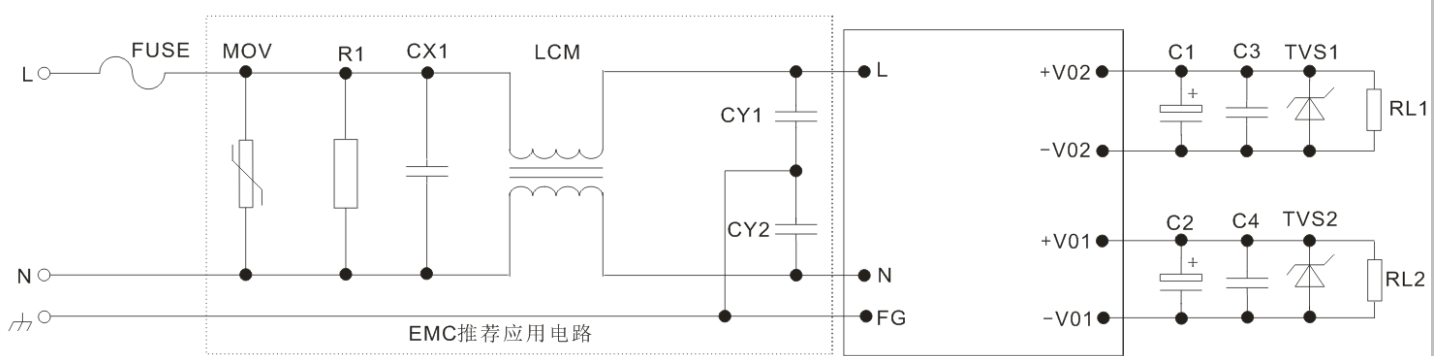


Photo 2: EMC recommended circuit

FUSE	Recommended 1A,250Vac(necessary)	CY1,CY2	1nF/400VAC	TVS1	Note 1
MOV	14D511K	C1	47uF	TVS2	Note 1
CX1	0.1uF/275Vac	C2	220uF		
LCM	15mH-30mH	C3,C4	0.1uF/50v		

Note 1:

- 1) C1,C2 choose high frequency low impedance electrolytic capacitor, withstand voltage is 1.5 times more than output voltage;
- 2) C3,C4 choose 0.1uF ceramic chip capacitor, withstand voltage is 1.5 times more than output voltage;
- 3) TVS1,TVS2 are TVS tube: 5V output recommend:SMBJ7.0A, 9V output recommend: SMBJ12.0A; 12V output recommend: SMBJ20.0A; 15V output recommend: SMBJ20.0A; 24V output recommend: SMBJ30.0A; 48V output recommend: SMBJ64.0A;

Note:

1. The product should be used within the specification range, or it will cause permanent damage to it;
2. The input terminal should connect to fuse;
3. If the product is operated under the minimum load, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
4. If the product is not operated within the required load range, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
5. Unless otherwise specified, parameters in this datasheet were measured under the conditions of  $T_a=25^{\circ}\text{C}$ , humidity<75% with nominal input voltage and rated output load(pure resistance load);
6. All index testing methods in this datasheet are based on our Company's corporate standards;
7. The performance indexes of the product models listed in this manual are as above, but some indexes of non-standard model products will exceed the above-mentioned requirements, please directly contact our technician for specific information;
8. We can provide product customization service,
9. Specifications are subject to change without prior notice.