

Typical Features

- ◆ Wide input voltage range 85-265VAC/120-380VDC
- ◆ No-load power consumption ≤0.15W
- ◆ Efficiency 78% (Typ.)
- ◆ Operating temperature from -40°C to 105°C
- ◆ Switching frequency 65KHz
- ◆ Output short circuit & over current protections
- ◆ Isolation voltage 3000Vac
- ◆ Altitude during operating 4000m Max
- ◆ Compliant with IEC/EN62368/UL62368
- ◆ PCB DIP mounting



Application Field

FA5-220HXXXXXXC2N3 Series ---- Compact size high efficiency modular power supplies with global adapted input voltage range (both AC & DC available), low ripple, low temperature rise, low standby power consumption, high efficiency, high reliability, safety isolated and good EMC performance. This series of products can be widely used in the fields of electric power, industry, instrumentation and smart home devices, etc. The additional circuit for EMC is recommended in this data sheet for the application with high EMC requirement.

Typical Product List

	Part No.	Output Specifications					Max Capacitive Load (uF)	Ripple & Noise (Max) @20MHz (mVp-p)	Efficiency@ Full Load 220Vac
		Power	Vo1	Io1	Vo2	Io2			
		(W)	(V)	(mA)	(V)	(mA)			
-	FA5-220H050505C2N3	5	5	800	±5	100	2000/470	100/100	75
	FA5-220H051212C2N3	5	5	600	±12	100	2000/330	100/120	78
	FA5-220H052424C2N3	5	5	600	±24	50	1000/68	100/150	79

Note 1 - Please contact Aipu sales for other output voltages requirement in this series but not listed in this table.
 Note 2 - The typical value of efficiency is based on the product tested after half an hour burn-in at full load.
 Note 3 - The full load efficiency should be in ±2% of the typical value in this table. The efficiency is calculated by the way that the full output power is divided by the 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	-	-	0.15	A
	220VAC	-	-	0.10	
Surge Current	115VAC	-	-	10	A

	220VAC	-	-	20	
No load power consumption	Input 115VAC	-	-	0.15	W
	Input 220VAC	-	-		
Leakage Current	-	0.5mA TYP/230VAC/50Hz			
External fuse recommended	-	1-2A/250VAC Time-delay fuse			
Hot plug	-	Unavailable			
Remote control terminal	-	Unavailable			

Output Specifications

Item		Operating Condition	Min.	Typ.	Max.	Unit
Voltage Accuracy	Full input voltage range, balanced load	Vo1	-	±2.0	±3.0	%
		Vo2	-	±2.0	±5.0	%
Line Regulation	Rated Load	Vo1	-	-	±0.5	%
		Vo2	-	-	±1.0	%
Load Regulation	Nominal input Voltage 20%~100% load	Vo1	-	-	±3.0	%
		Vo2	-	-	±5.0	%
Minimum load	Vo1 isolated, Vo2 common ground	10	-	-	%	
Turn-on Delay Time	Input 115VAC (full load)	-	1000	-	mS	
	Input 220VAC (full load)	-		-		
Power-off Hold up Time	Input 115VAC (full load)	-	50	-	mS	
	Input 220VAC (full load)	-	100	-		
Dynamic Response	Overshoot range	25%~50%~25%	-5.0	-	+5.0	%
	Recovery time	50%~75%~50%	-	5.0	-	mS
Output Overshoot	Full input voltage range	≤10%Vo			%	
Short Circuit Protection		Continuous, Self-recovery			Hiccup	
Drift Coefficient	-	-	±0.03%	-	%/°C	
Over Current Protection	Nominal input voltage	≥ 120% Io, Self-recovery			Hiccup	
Noise & Ripple	Full input voltage range	-	50	150	mV	
	The ripple and noise are tested by the twisted pair method (Refer to the following test instructions).					

General Specifications

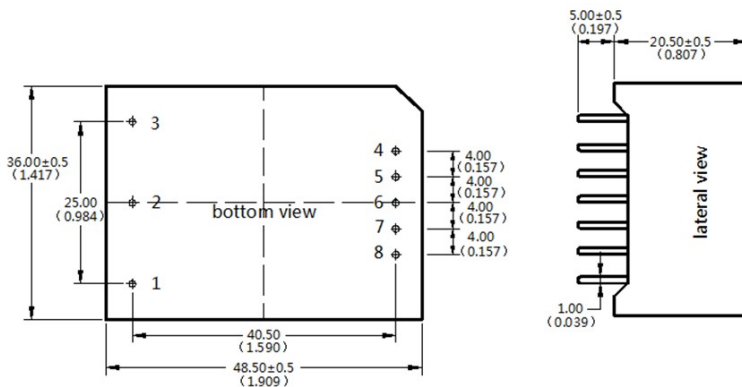
Item	Operating Condition	Min.	Typ.	Max.	Unit
Switching Frequency	-	-	65	-	KHz
Operating Temperature	Refer to the Temperature Derating Curve	-40	-	+105	°C
Storage Temperature	-	-40	-	+110	°C
Soldering Temperature	Wave-soldering	260±4°C, timing 5-10S			
	Manual-soldering	360±8°C, timing 4-7S			

Relative Humidity	-	10	-	90	%RH
Isolation Voltage	I/P-O/P, test 1min, leakage current ≤ 5mA	3000	-	-	VAC
Insulation Resistance	Input-Output, @DC500V	100	-	-	MΩ
Safety Standard	-	IEC/EN62368			
Vibration	-	10-55Hz,10G,30Min, along X,Y,Z			
Safety Class	-	CLASS II			
Flame Class of Case	-	UL94 V-0			
MTBF	-	MIL-HDBK-217F@25°C>300,000H			
Unit Weight	-	50g (Typ.)			

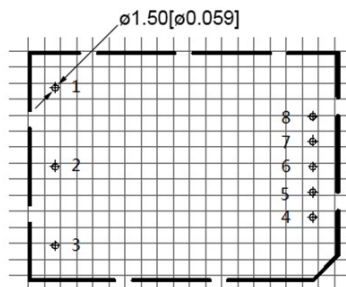
EMC Performances

Total Item	Sub Item	Test Standard	Performance/Class
EMC	EMI	CE	CISPR32/EN55032 CLASS B (with Recommended Circuit 2)
		RE	CISPR32/EN55032 CLASS B (with Recommended Circuit 2)
	EMS	RS	IEC/EN61000-4-3 10V/m Perf.Criteria B
		CS	IEC/EN61000-4-6 3Vr.m.s Perf.Criteria B
		ESD	IEC/EN61000-4-2 Contact ±6KV / Air ±8KV Perf.Criteria B
		Surge	IEC/EN61000-4-5 Line to line ±2KV / line to ground ±4KV (with Recommended Circuit 2) Perf.Criteria B
		EFT	IEC/EN61000-4-4 ±2KV Perf.Criteria B
		Voltage dips & interruptions	IEC/EN61000-4-11 0%~70% Perf.Criteria B

Mechanical Dimensions



Pin No.	Function
1	FG
2	AC(N)
3	AC(L)
4	+Vo2
5	COM
6	-Vo2
7	+Vo1
8	-Vo1



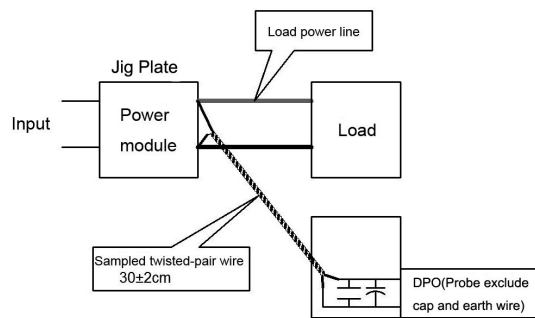
Unit: mm(inch)
 Grid 2.54x2.54(0.10x0.10)
 Pin diameter tolerance ±0.10(±0.004)
 General tolerance ±0.50(±0.020)

Packaging Code	Dimensions L x W x H	
C	48.5X36.0X20.5 mm	1.909X1.417X0.807 inch

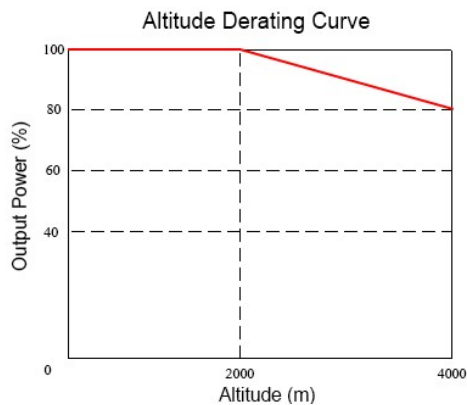
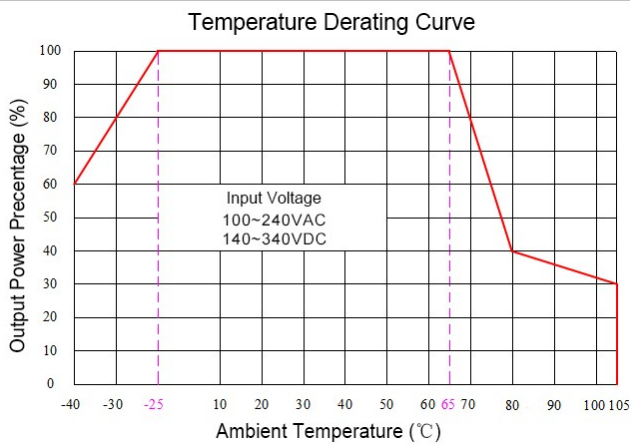
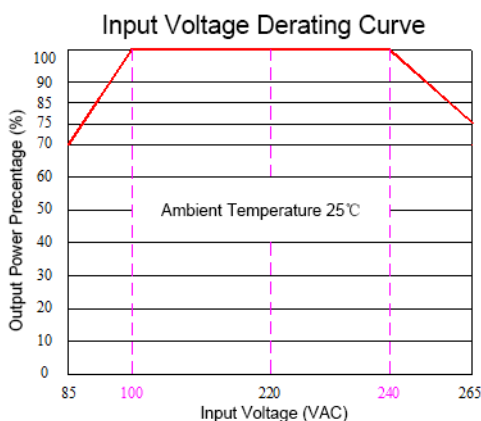
Ripple & Noise Test Instructions (Twisted Pair Method, 20MHz Bandwidth)

1) The Ripple & noise test needs 12# twisted pair cables, an oscilloscope which bandwidth should be set to 20MHz, 0.1uF polypropylene capacitor and 10uF high-frequency low-resistance electrolytic capacitor are connected in parallel with the probes (100M bandwidth). The oscilloscope should be set at the Sample Mode.

2) The test diagram is shown on the right. The converter output connects to the electronic load by the jig with cables which size should be defined according to the output current value. The twisted pair (length 30cm±2 cm) should be connected in parallel with the load, the location is as close as possible to the output pins or terminals. The test can be started after input power on.



Product Performance Curves

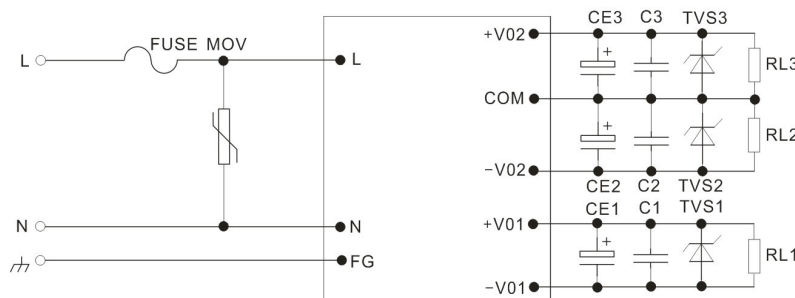


Note 1 - The output power should be derated based on the input voltage derating curve at 85~100VAC /240~265VAC /120~140VDC /340~380VDC.

Note 2 - This product should operate at a natural air condition, please contact us if it need be used at a closed space.

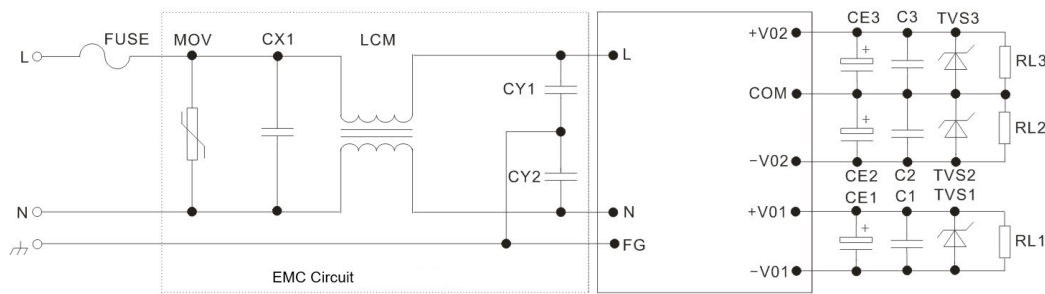
Recommended Circuits for Application

1. Typical Application Circuit



Circuit 1

2. Recommended EMC Circuit (for higher EMC requirements)



Circuit 2

FUSE	1A/250Vac Time-delay fuse (necessary)	CY1, CY2	102M/400VAC
MOV	14D471K/4500A	CE1, CE2, CE3	See Note below
CX1	X2/0.1uF/275Vac	C1, C2, C3	See Note below
LCM	15mH-30mH/0.3A	TVS1, TVS2, TVS3	See Note below

Note

- 1) CE1, CE2, CE3 capacitances should be less than the Max capacitive load, high frequency low ESR electrolytic capacitors are recommended, the withstand voltage should be more than 1.5X of output voltage.
- 2) 0.1uF SMD capacitors are recommended for C1, C2, C3 which withstand voltage should be more than 1.5X of output voltage.
- 3) TVS1, TVS2, TVS3 - SMBJ7.0A is recommended for 5V output, SMBJ12.0A for 9V output, SMBJ20A for 12V & 15V output, SMBJ30.0A for 24V output, SMBJ64A for 48V output.

Application Notice

1. The products should be used according to the specifications in this datasheet, otherwise it could be permanently damaged.
2. A fuse should be connected at input.
3. The product performance in this datasheet cannot be guaranteed if it works at a lower load than the minimum load defined.
4. The product performance in this datasheet cannot be guaranteed if it works under over-load condition.
5. Unless otherwise specified, all values or indicators in this datasheet are tested at Ta=25°C, humidity<75%RH, rated input voltage and rated load (pure resistance load).
6. All values or indicators in this datasheet had been tested based on Aipupower test specifications.
7. The specifications are specially for the parts listed in this datasheet, any other non-standard model performances could be out of the specifications. Please contact our technician for specific requirements.
8. Aipupower can provide customization service.
9. The product specifications may be modified without prior notice. Please refer to the published data sheet at Aipupower website.

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