AC/DC Converter
FA25-220E05XXH2D4 Series

Typical Features

- Input voltage range 85-265VAC/120-370VDC
- No load power consumption ≤0.5W@220VAC
- Efficiency 80% (Typ.)
- Switching frequency 65KHz
- Short-circuit, over-current & over voltage protections
- Isolation voltage 4000VAC
- Operating temperature from -40°C to +70°C
- Conform to CE regulations
- Enclosed plastic case, flame class UL94-V0
- PCB DIP Mounting

Application Field

FA25-220E05XXH2D4 Series *----- Compact size & high efficiency modular power supplies with global adapted input voltage (both AC & DC available), low ripple, low temperature rise, low no load power consumption, high reliability, safety isolated, regulated dual outputs and good EMC performance. This series of products can be widely used in the fields of Electric power, Industrial, Instrument and Smart home devices, etc. The additional circuit diagram for EMC is recommended for the application with higher EMC requirement.*

Typical Product List

Certificate	Part No	Output Specification					Max Capacitive Load		Ripple & noise 20MHz (MAX)		Full Load Efficiency 220VAC
		Power	Voltage	Current	Voltage	Current					
		(W)	Vo1(V)	Io1(mA)	Vo2(V)	Io2(mA)	Vo1 (uF)	Vo2 (uF)	Vo1	Vo2	% (Typ.)
									mVp-p		
-	FA25-220E0512H2D4	25	5	3000	12	833	6000	600	80	150	80
-	FA25-220E0515H2D4	25	5	3000	15	660	6000	600	80	150	80
-	FA25-220E0524H2D4	25	5	3000	24	416	6000	400	80	200	80

Note 1: The typical value of efficiency is based on the product tested after half an hour burn-in at full load.

Note 2: 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.

Note 3: Please contact Aipu sales for other output voltages requirement in this series but not listed in this table.

Input Specifications

Item	Operating Condition	Min.	Typ.	Max.	Unit
Input Voltage Range	AC Input	85	220	265	VAC
	DC Input	120	310	370	VDC
Input Frequency Range	-	47	50	63	Hz
Input Current	Input 115VAC	-	-	0.6	A
	Input 220VAC	-	-	0.3	

Surge Current	Input 115VAC		-	25	-	A
	Input 220VAC		-	45	-	
No Load Power Consumption	Input 115VAC		-	-	0.50	W
	Input 220VAC		-	-		
Leakage Current	-		0.5mA TYP/230VAC/50Hz			
External Fuse Recommended	-		NO			
Hot Plug	-		Unavailable			
Remote Control	-		Unavailable			

Output Specifications

Item		Operating Condition		Min.	Typ.	Max.	Unit
Voltage Accuracy		Full input voltage range, any load	Vo1	-	-	±1.5	%
			Vo2	-	-	±10.0	
Line Regulation		Rated Load	Vo1	-	-	±1.0	%
			Vo2	-	-	±2.0	
Load Regulation		Nominal input voltage, 20%~100% load	Vo1	-	-	±2.0	%
			Vo2	-	-	±5.0	
Minimum Load		Dual Outputs isolated		0	-	-	%
Turn-on Delay Time		Input 115Vac (full load)		-	2000	-	mS
		Input 220Vac (full load)		-	1000	-	
Holde Up Time		Input 115VAC (full load)		-	10	-	mS
		Input 220VAC (full load)		-	60	-	
Dynamic Response	Overshoot range	25%~50%~25% 50%~75%~50%		-5.0	-	+5.0	%
	Recovery time			-	5.0	-	mS
Output Over-shoot		Full input voltage range		≤10%Vo (Vo1)			%
Short Circuit Protection				Continuous, Self-recovery			Hiccup
Drift Coefficient		-		-	±0.03%	-	%/℃
Over Current Protection		Input 220VAC, Vo2 at rated load		≥110% Io (Vo1), Self-recovery			Hiccup
Over Voltage Protection		Output 5VDC (Vo1)		≤7.5			VDC
Ripple & Noise		Vo1		-	-	80	mV
		Vo2=12V & 15V		-	-	150	
		Vo2=24V		-	-	200	

Note: The Ripple and noise is tested by the twisted pair method, please refer to the following test instruction.

General Specifications

Items	Operating Conditions	Min.	Typ.	Max.	Unit
Switching Frequency	-	-	65	-	KHz
Operating Temperature	Refer to the Temperature Derating Graph	-40	-	+70	℃
Storage Temperature	-	-40	-	+85	
Soldering Temperature	Wave-soldering	260±4℃, timing 5-10S			
	Manual-soldering	360±8℃, timing 4-7S			
Relative Humidity	-	10	-	90	%RH
Isolation Voltage	I/P-O/P, Test 1 min, leakage current ≤5mA	4000	-	-	VAC
	I/P-FG, Test 1 min, leakage current ≤5mA	2500	-	-	
	Vo1-Vo2, Test 1 min, leakage current ≤5mA	500	-	-	VDC
Insulation Resistance	I/P-O/P, @DC500V	100	-	-	MΩ
Safety Standard	-	IEC/EN62368			
Vibration	-	10-55Hz,10G, 30 Min, along X,Y,Z			
Safety Class	-	CLASS I			
Flame Class of Case	-	UL94-V0			
MTBF	-	MIL-HDBK-217F@25℃ > 300,000H			

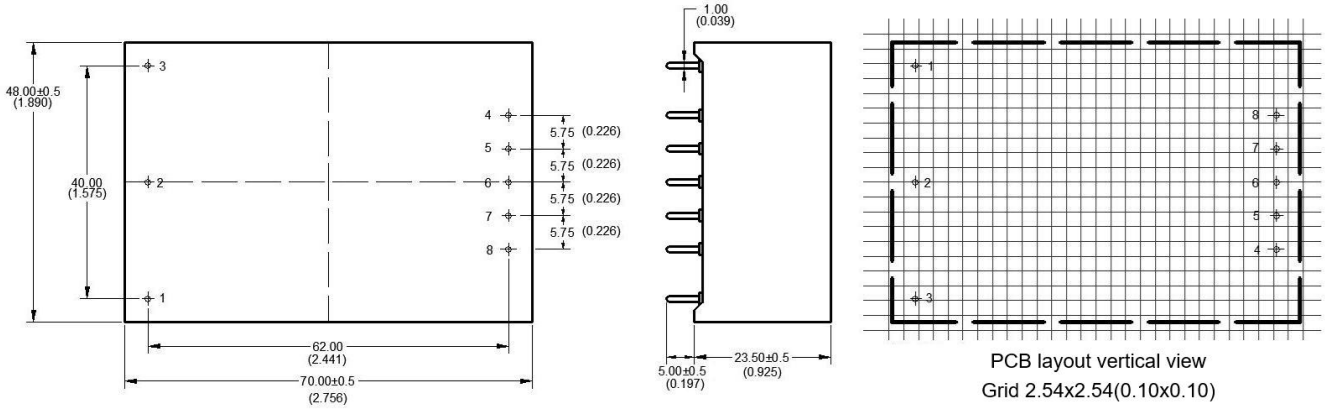
Physical Characteristics

Case Material		Plastic in Black, flame class UL94-V0
Dimensions	Horizontal Package	70.0x48.0x23.5 mm
Unit Weight		142g (Typ.)
Cooling Method		Nature Air

EMC Performances

Total Item		Sub Item	Test Standard	Performance/Class
EMC	EMI	CE	CISPR32/EN55032	CLASS B (with the Recommended Circuit 2)
		RE	CISPR32/EN55032	CLASS B (with the Recommended Circuit 2)
	EMS	RS	IEC/EN61000-4-3	10V/m Perf.Criteria B (with the Recommended Circuit 2)
		CS	IEC/EN61000-4-6	3Vr.m.s Perf.Criteria B (with the Recommended Circuit 2)
		ESD	IEC/EN61000-4-2	Contact ±6KV / Air ±8KV Perf.Criteria B
		Surge	IEC/EN61000-4-5	Line to line ±1KV / line to ground ±2KV Perf.Criteria B
				Line to line ±2KV / line to ground ±4KV Perf.Criteria B (with the Recommended Circuit 2)
		EFT	IEC/EN61000-4-4	±2KV Perf.Criteria B
				±4KV Perf.Criteria B (with the Recommended Circuit 2)
		Voltage dips and interruptions	IEC/EN61000-4-11	0%~70% Perf.Criteria B

Mechanical Dimensions



Unit: mm(inch)
General tolerance: ±0.25(±0.010)
Pin diameter tolerance: ±0.10(±0.004)

Package Code	Dimensions L x W x H	
H2	70.0X 48.0X23.5 mm	2.756X1.890X0.925 inch

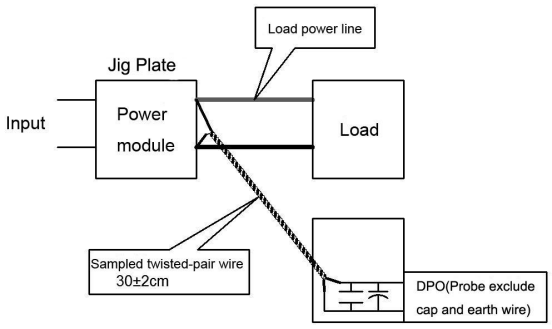
Pin-out Function Description

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

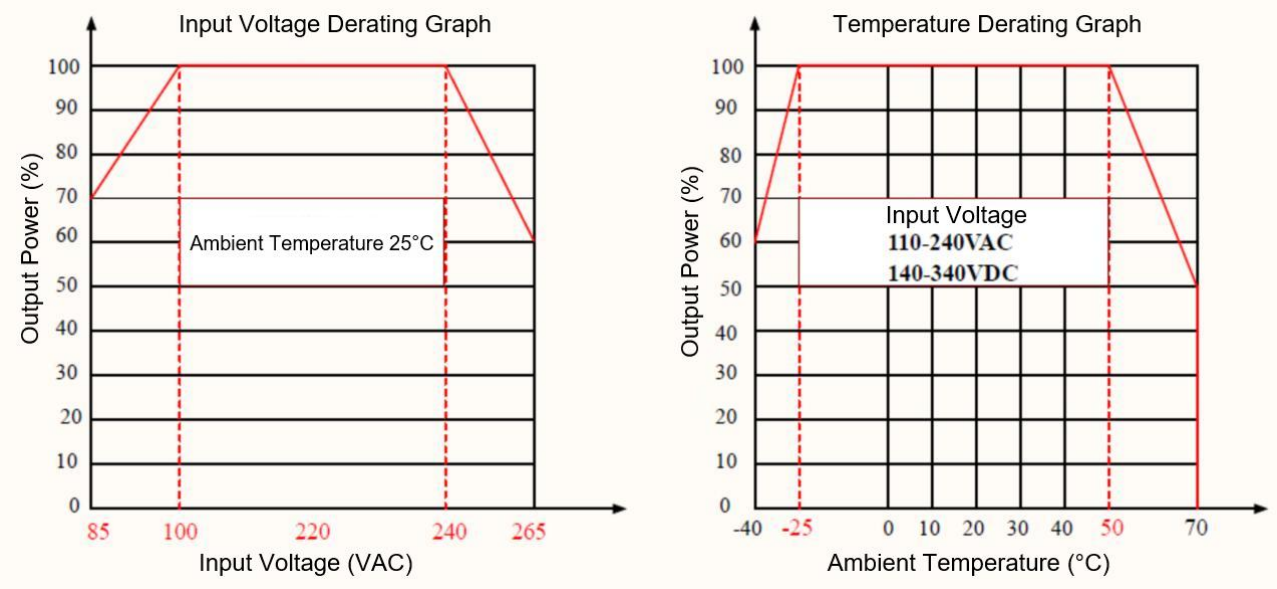
Ripple & Noise Test Instruction (Twisted Pair Method, 20MHz Bandwidth)

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 start after input power on.



Product Characteristics Graphs



Note 1: The output power should be derated based on the input voltage derating graph at 85~100VAC/240~265VAC & 120~140VDC/340~370VDC.

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 diagram

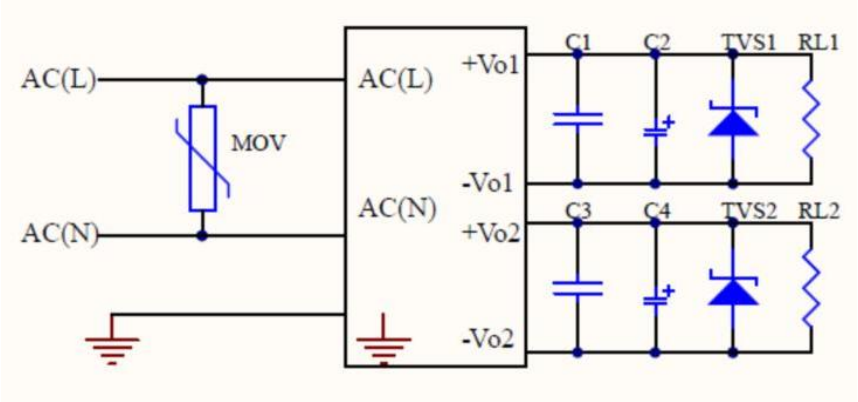


Figure - Circuit 1

Part No.	C1, C3	C2	C4	TVS1	TVS2
FA25-220E0512H2D4	0.1uF	470uF	470uF	SMBJ7.0A	SMBJ20.0A
FA25-220E0515H2D4			470uF		SMBJ20.0A
FA25-220E0524H2D4			220uF		SMBJ30.0A

Note:

High-frequency, low-resistance electrolytic capacitors are recommended for C2 & C4 which capacitance and current should refer to the technical specifications of its manufacturer. The withstand voltage should be derated to be at least 80%. C1 & C3 are used to suppress the high-frequency noise, ceramic capacitor 0.1uF/50V is recommended. TVS1 & TVS2 are recommended to protect the output circuit when the power supply operates at abnormal condition.

2. Recommended circuit diagram for EMC

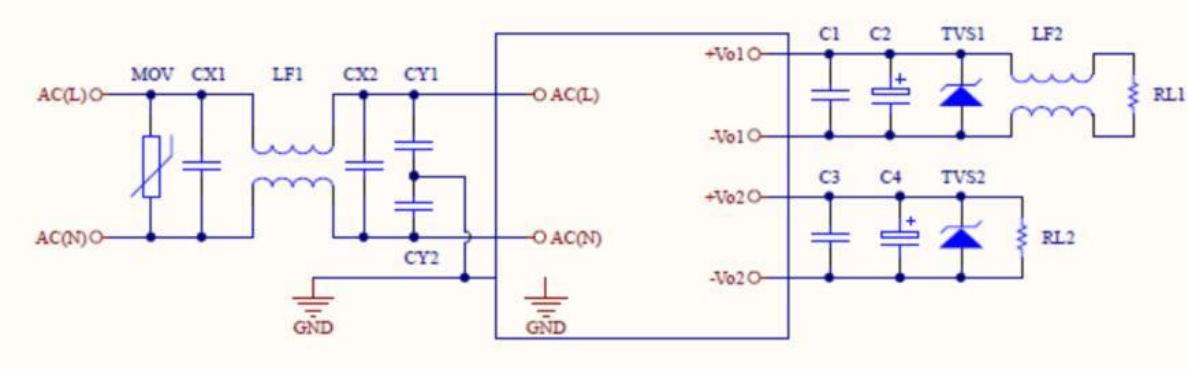


Figure - Circuit 2

Component No.	Description	Recommended Values
MOV	Metal Oxide Varistor	14D561K
CX1	X Capacitor	0.22uF/275VAC
CX2	X Capacitor	0.22uF/275VAC
LF1	Common mode Choke	30mH/2.5A T12X7X6mm
LF2	Common mode Choke	20-100uH/5A
CY1, CY2	Y Capacitor	102M/400V

Application Notice

1.The products should be used according to the specifications in this datasheet, otherwise it could be permanently damaged.

2. The product performance in this datasheet cannot be guaranteed if it works at a lower load than the minimum load defined.

3. The product performance in this datasheet cannot be guaranteed if it works at over-load condition.

4. Unless otherwise specified, all values or indicators in this datasheet are tested at Ta=25℃, humidity<75%RH, nominal input voltage and rated load (pure resistance load).

5. All values or indicators in this datasheet had been tested based on Aipupower test specifications.

6.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.

7. Aipupower can provide customization service.

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