Typical Features

- ◆ Wide input voltage range 85-265VAC/120-380VDC
- ◆ No-load power consumption ≤0.30W@220VAC
- ◆ Efficiency up to 82% (Typ.)
- ◆ Operating temperature from -40℃ to +75℃
- ◆ Switching frequency 65KHz
- ◆ Short circuit, over current & over temperature protections
- ◆ Isolation voltage 3000VAC
- ◆ Altitude during operation 2000m Max
- ◆ Compliant with IEC/EN62368/UL62368
- ◆ Enclosed plastic case, flame class UL94-V0
- ◆ PCB DIP mounting

Application Field

FA15-220E05XXF2D3 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, Industrial, Instrument and Smart home devices, etc. The additional circuit diagram for EMC is recommended for the application with high EMC requirement.

Typical Product List

Certificate	Part No.	Input Voltage Range		Output Power/Voltage/Current					Max. Capacitive Load @220VAC	Ripple & Noise 20MHz (Max)	Efficiency @full load 220VAC (Typ.)
		Nom.	Range	Power	Vo1	Io1	Vo2	Io2			
		(VAC)	(VAC)	(W)	(V)	(mA)	(V)	(mA)	(uF)	mVp-p	%
-	FA15-220E0512F2D3	220	85-265	15	5	1000	12	833	2000/680	80/100	81
-	FA15-220E0524F2D3				5	1000	24	416	2000/470	80/100	82

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 requirements of this series but not listed in this table.

Input Specifications

Item	Test 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	Input 115VAC	-	-	0.35	A
	Input 220VAC	-	-	0.20	
Surge current	Input 115VAC	-	-	10	A
	Input 220VAC	-	-	20	
Standby power consumption	Input 115VAC	-	-	0.30	W
	Input 220VAC	-	-		
Leakage current	-	0.5mA TYP/230VAC/50Hz			
Recommended external fuse	-	2A/300VAC Time-delay fuse			
Hot-plug	-	Unavailable			
ON/OFF control	-	Unavailable			

Output Specifications

Item		Test Condition		Min.	Typ.	Max.	Unit
Output voltage accuracy		Full input voltage range, 10-100% load (the unit can work stably at <10% load)	Vo1	-	±2.0	±3.0	%
			Vo2	-	±2.0	±5.0	%
Line regulation		Rated Load	Vo1	-	-	±0.5	%
			Vo2	-	-	±1.5	%
Load regulation		Nominal input voltage, 20%~100% load	Vo1	-	-	±1.0	%
			Vo2	-	-	±5.0	%
Ripple & Noise		5%-100% load, 20MHz bandwidth	Vo1	-	-	80	mVp-p
			Vo2	-	-	100	
Minimum load		Isolated dual outputs		10	-	-	%
Temperature drift coefficient		-		-	-	±0.03	%/℃
Turn-on delay time		Input 115VAC (full load)		-	-	2500	mS
		Input 220VAC (full load)		-	-		
Power-off Hold up time		Input 115VAC (full load)		-	40	-	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 Overshoot		Full input voltage range		≤10			%Vo
Short circuit protection				Continuous, Self-recovery			Hiccup
Over current protection		Input 220VAC		130%Io	-	350%Io	mA
Note: The Ripple & Noise is tested by the Parallel-line method, please refer to the following test instruction.							

General Specifications

Item	Test Condition	Min.	Typ.	Max.	Unit
Switching frequency	-	-	65	-	KHz
Operating temperature	Refer to the temperature derating graph	-40	-	+75	℃
Storage temperature	-	-40	-	+85	
Soldering temperature	Wave-soldering	260±4℃, timing 5-10S			

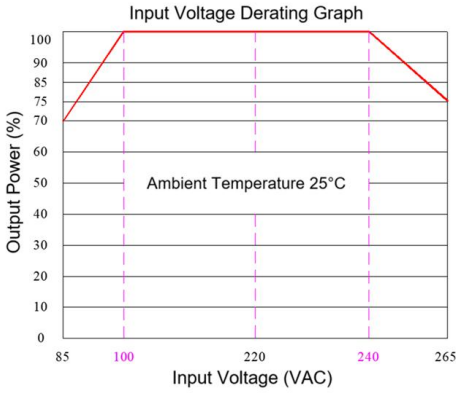
	Manual-soldering		360±8℃, timing 4-7S			
Relative humidity	-		10	-	90	%RH
Isolation voltage	I/P-O/P	Test 1min, leakage current <5mA	3000	-	-	VAC
Insulation resistance	I/P-O/P	@DC500V	100	-	-	MΩ
MTBF	MIL-HDBK-217F@25℃		300	-	-	K Hours
Safety standard	-		IEC/EN62368			
Vibration	-		10-55Hz,10G,30 Min, along X, Y, Z			
Safety class	-		CLASS Ⅱ			
Case flame class	-		UL94-V0			

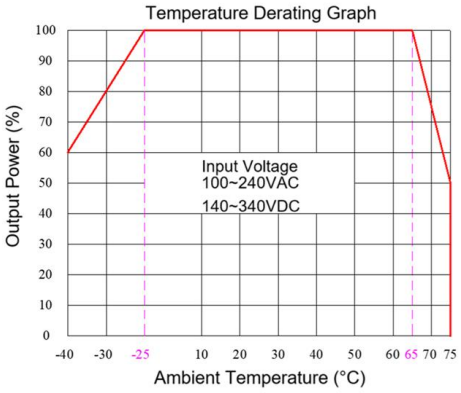
Weight & Dimensions	Part No.	Weight (Typ.)	Dimensions L x W x H	
	FA15-220E05XXF2D3	95g	62.00x45.00x22.50 mm	2.441×1.772×0.886 inch

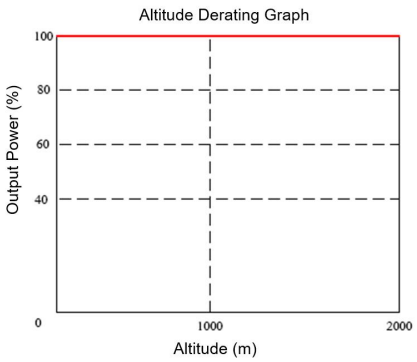
EMC Performance

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

Product Characteristics Graphs







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

Note 2: This product should operate under the condition of nature air, please contact us if it could be used at a closed space.

Recommended Circuit for Application

Recommended circuit diagram for EMC solution

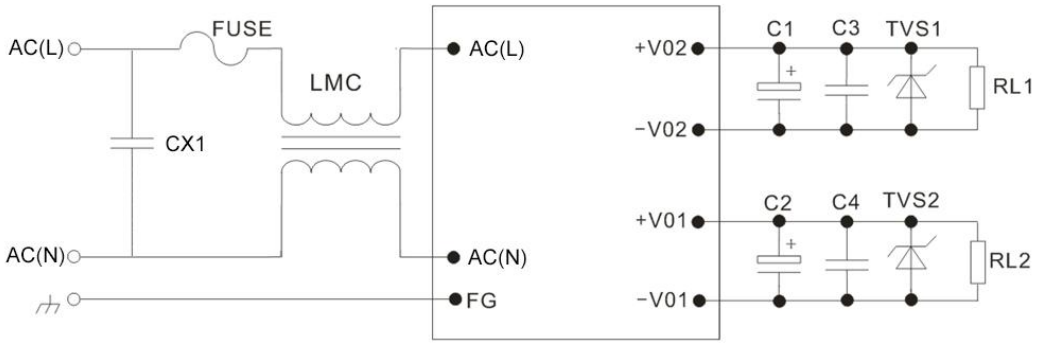
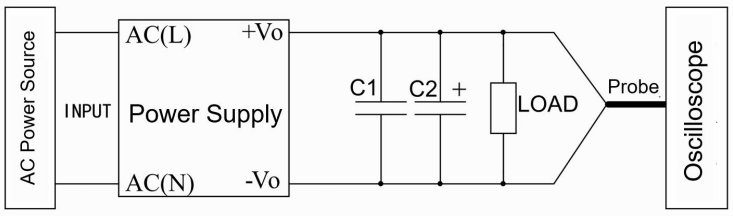


Figure - Circuit 1

Component No.	Description & Recommended values	
FUSE	Time-delay fuse	2A/300VAC, required
LMC	Common mode choke	Green-ring 30mH/2.5A T12X7X6mm
CX1	X capacitor	X2/224K/275VAC
C1	Electrolytic capacitor	470uF/16V
C2	Electrolytic capacitor	330uF/25V
C3, C4	Ceramic capacitor	0.1uF/50V/1206
TVS1, TVS2	TVS diode	SMBJ7.0A (for Vo 5V); SMBJ20A (for Vo 12V); SMBJ30A (for Vo 24V)
RL1, RL2	Load for the application	

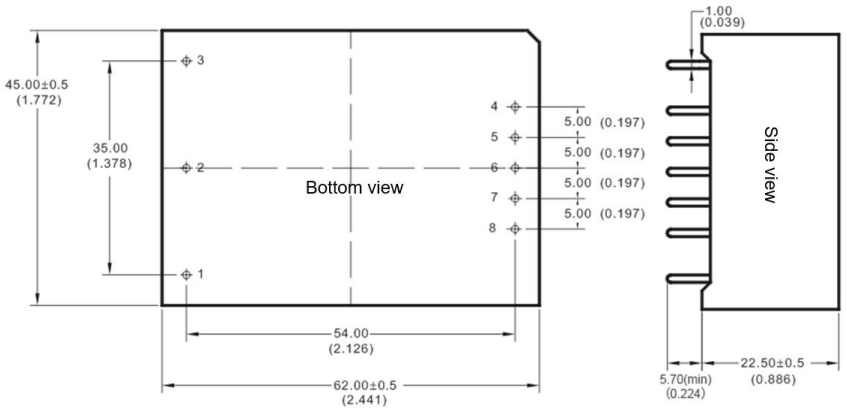
Note: High frequency low impedance electrolytic capacitors are recommended for C1 & C2 which capacitances should be less than the max capacitive load, the withstand voltage should be more than 1.5X of output voltage. 0.1uF/50V/1206 ceramic capacitors are recommended for C3 & C4 to suppress the high frequency ripple. TVS is used to protect the output circuit while operating under abnormal condition.

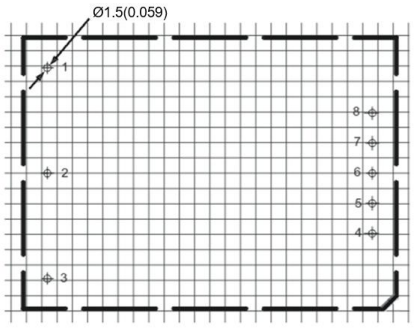
Ripple & Noise Test Instruction (Parallel-line method, 20MHz Bandwidth)



1. The Ripple & Noise test needs the cables in parallel, an oscilloscope that should be set at the Sample Mode, bandwidth 20MHz. 100M bandwidth probe with cap and ground removed. One polypropylene capacitor C1(0.1uF) and one high-frequency low-resistance electrolytic capacitor C2(10uF) are connected in parallel with the probe.
2. Refer to the test diagram, 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 test can start at the converter output terminals after the input power on.

Mechanical Dimensions





PCB layout vertical view
Grid 2.54x2.54(0.10x0.10)

Unit: mm(inch)
General tolerance: ±0.50(±0.020)
Pin diameter tolerance: ±0.10(±0.004)

Pin-out Function Description

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

Application notice

1.The product should be used according to the specifications, otherwise it could be permanently damaged.

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

3. The product performance cannot be guaranteed if it works under over-load condition.

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

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

6.The specifications are specially for the parts listed on 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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