AC/DC Converter

FA15-220SXXF2D4(-T)(-TS) Series

Typical Features

- ◆ Wide input voltage range 85-265VAC/120-380VDC
- ◆ No-load power consumption ≤0.35W
- ◆ Efficiency 86% (typ.)
- ◆Operating temperature from -40℃ to +75℃
- ◆ Switching frequency 65KHz
- ◆ Short Circuit & Over Current protections
- ◆ Isolation voltage 4000VAC
- ◆ Altitude during operating 4000m Max
- ◆ With CE Certificate & conform to RoHS regulation
- ◆ Compliant with IEC/EN62368/UL62368
- ◆ Encapsulated in plastic case, flame class UL94 V-0
- ◆ PCB DIP mounting

CE RoHS

Application Field

FA15-220SXXF2D4 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, 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

Certificate	Part No.	Output Specification			Max. Capacitive Load	Ripple& Noise 20MHz (Max.)	Efficiency@ Full Load, 220Vac (Typ.)
		Power	Voltage	Current			
		（W）	Vo（V）	Io（mA）	uF	mVp-p	%
CE	FA15-220S3V3F2D4	10	3.3	3000	2000	80	70
CE	FA15-220S05F2D4	15	5	3000	1000	80	74
CE	FA15-220S09F2D4	15	9	1667	1000	80	82
CE	FA15-220S12F2D4	15	12	1250	800	80	84
CE	FA15-220S15F2D4	15	15	1000	800	100	85
-	FA15-220S20F2D4	15	20	750	800	100	85
CE	FA15-220S24F2D4	15	24	625	500	100	86

Note 1 - The suffix -T is for a kind of chassis packaging, -TS is for a kind of packaging of DIN Rail which width is 35mm.

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.

Note 4 - Please contact Aipu sales for other output voltages requirement in this series but not listed in this table.

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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	-	-	0.35	A
	220VAC	-	-	0.25	A
Surge Current	115VAC	-	-	10	A
	220VAC	-	-	20	
Standby power consumption	115VAC	-	-	0.35	W
	220VAC	-	-		
Leakage Current	-	0.5mA TYP/230VAC/50Hz			
Recommended Fuse	-	1A-2A/250VAC Time-delay fuse			
Hot plug	-	Unavailable			
Remote control	-	Unavailable			

Output Specifications

Item		Operating Condition		Min.	Typ.	Max.	Unit
Voltage Accuracy		Full input voltage range, any load	Vo	-	±2.0	±3.0	%
Line Regulation		Rated Load	Vo	-	-	±0.5	%
Load Regulation		Nominal input voltage, 20%~100% load	Vo	-	-	±1.0	%
Minimum load		Single Output		0	-	-	%
Turn-on Delay Time		Input 115VAC (full load)		-	1000	-	mS
		Input 220VAC (full load)		-		-	
Power-off Hold up Time		Input 115VAC (full load)		-	200	-	mS
		Input 220VAC (full load)		-		-	
Dynamic Response	Overshoot range	25%~50%~25% 50%~75%~50%		-10.0	-	+10.0	%
	Recovery time			-5.0	-	+5.0	mS
Output Overshooting		Full input voltage range		≤10%Vo			%
Short Circuit Protection		Full input voltage range		Continuous, Self-recovery			Hiccup
Drift Coefficient		-		-	±0.03%	-	%/℃
Over Current Protection		Full input voltage range		⩾120% Io, Self-recovery			Hiccup
Ripple & Noise		-		-	50	100	mV
		Note - The ripple and noise are tested by the twisted pair method. For details understood, please refer to the following Ripple & Noise Test Instructions.					

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General Specifications

Item		Operating Condition	Min.	Typ.	Max.	Unit
Switching Frequency		-	-	65	-	KHz
Operating Temperature		Refer to the Temperature Derating Curve	-40	-	+75	℃
Storage Temperature		-	-40	-	+85	
Soldering Temperature		Wave-soldering	260±4℃, timing 5-10S			
		Datasheet-soldering	360±8℃, timing 4-7S			
Relative Humidity		-	10	-	90	%RH
Isolation Voltage	I/P-O/P	Test 1min, leakage current ≤5mA	4000	-	-	VAC
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 II			
Flame Class of the Case		-	UL94 V-0			
MTBF		-	MIL-HDBK-217F@25℃＞300,000H			
Unit Weight		Part No.	Weight (TYP)			
		FA15-220SXXF2D4	95g			
		FA15-220SXXF2D4-T	130g			
		FA15-220SXXF2D4-TS	150g			

EMC Performance

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 (with Recommended Circuit 1)
		CS	IEC/EN61000-4-6	3Vr.m.s Perf.Criteria B (with Recommended Circuit 1)
		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 and interruptions	IEC/EN61000-4-11	0%~70% Perf.Criteria B

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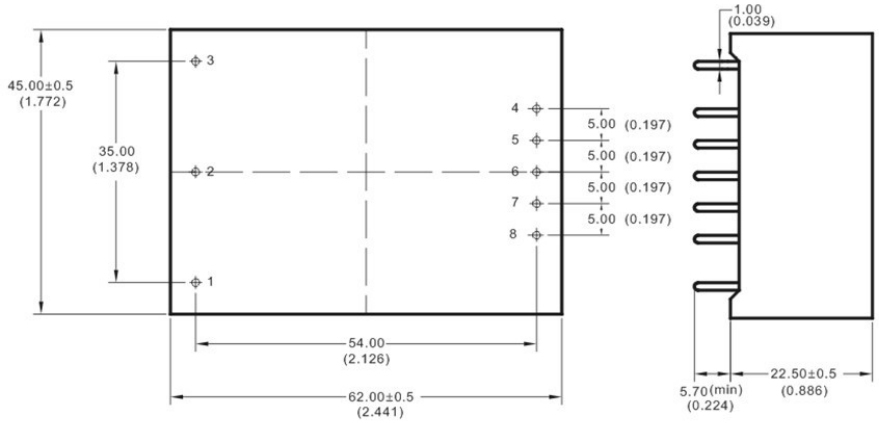
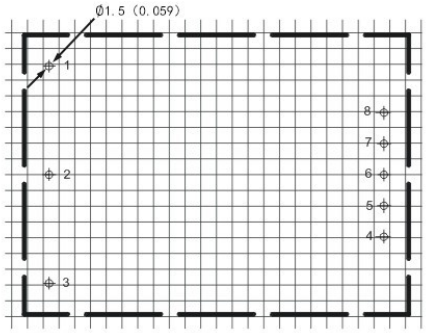
F2 Packaging Dimensions



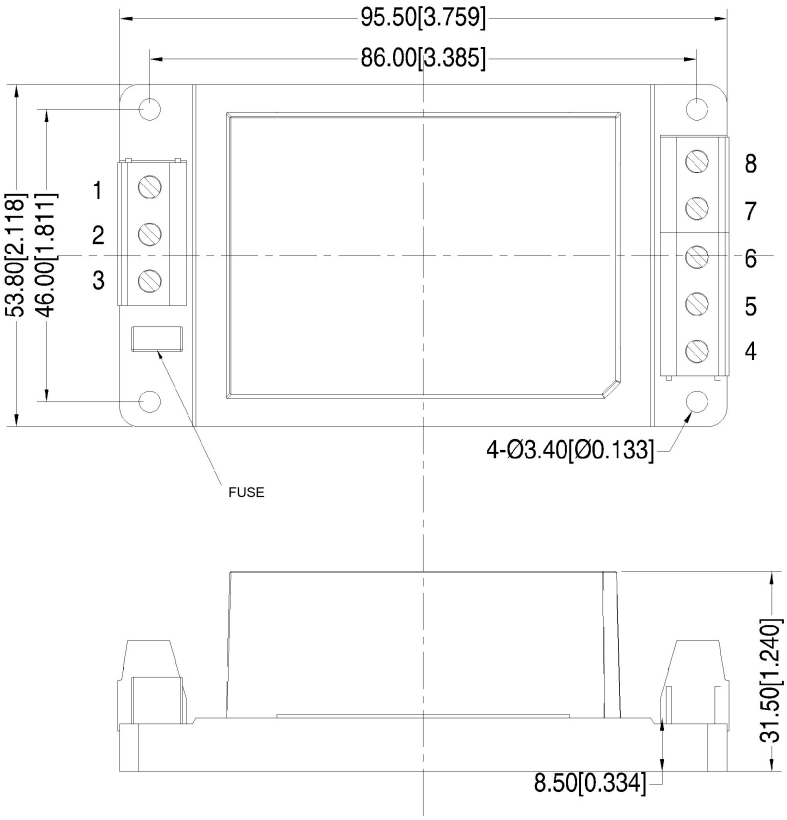


PCB layout vertical view

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

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

F2-T Packaging Dimensions



Terminal No.	Function
1	FG (No function)
2	AC(N)
3	AC(L)
4	+Vout
5	NC
6	NC
7	NC
8	-Vout

Note:
Unit: mm[inch]
Lead Wire 24-12AWG
Screwing torque: 0.4 N.m Max
General tolerance: ±1.00[±0.039]

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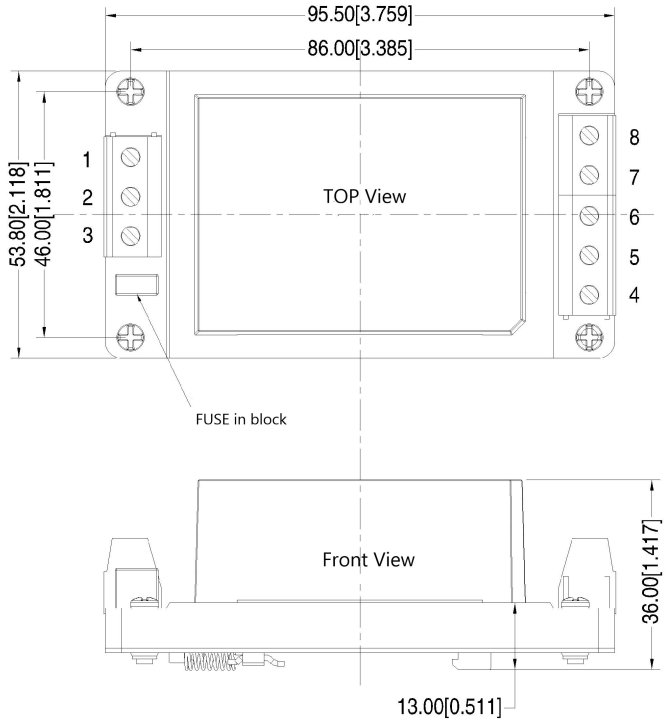
F2-TS Packaging Dimension



Terminal No.	Function
1	FG (No function)
2	AC(N)
3	AC(L)
4	+Vout
5	NC
6	NC
7	NC
8	-Vout

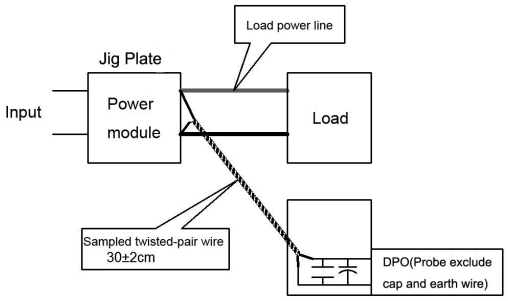
Note:
Unit: mm[inch]
Lead Wire 24-12AWG
Screwing torque: 0.4 N.m Max
General tolerance: ±1.00[±0.039]

Packaging Code	Dimensions L x W x H	
F2	62.0 x 45.0 x 22.5 mm	2.441 × 1.772 × 0.886 inch
F2-T	95.5 x 53.8 x 31.5 mm	3.759 × 2.118 × 1.240 inch
F2-TS	95.5 x 53.8 x 36.0 mm	3.759 × 2.118 × 1.417 inch

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

1) The Ripple & noise test need 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.



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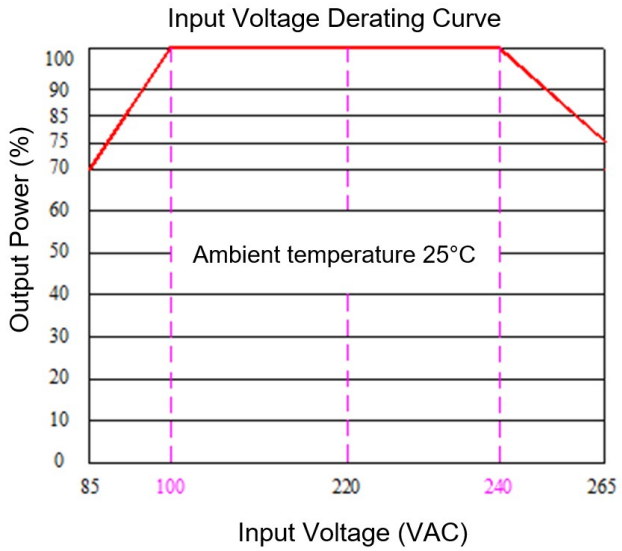
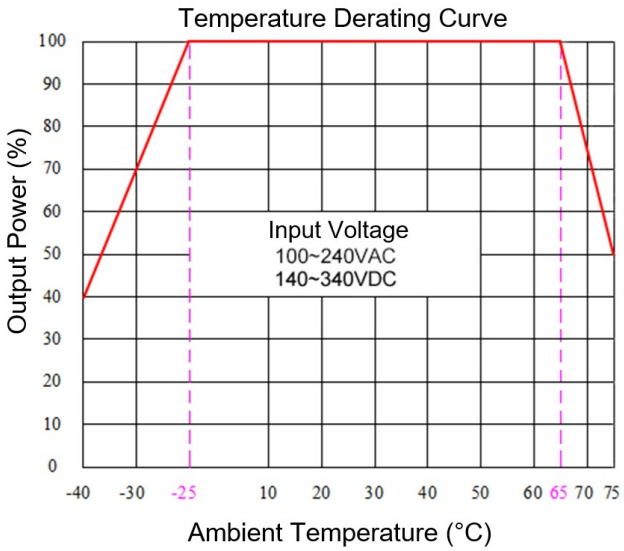
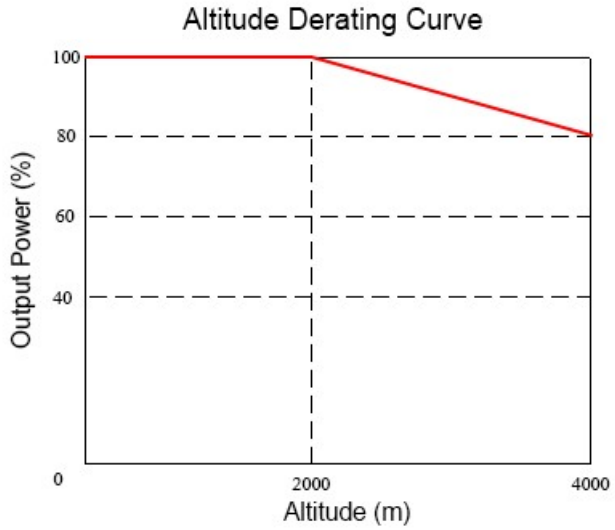
Product Performance Curves



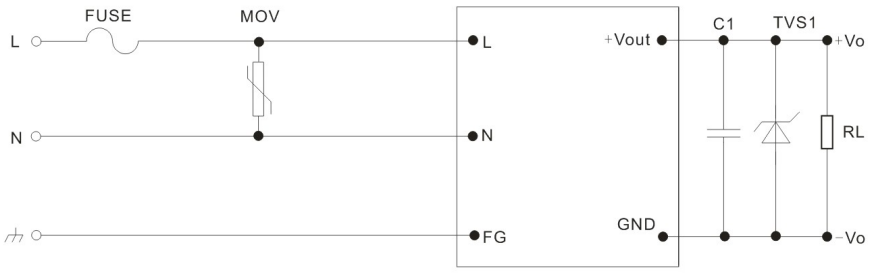




Note 1 - The output power should be derated based on the input voltage derating curve at 85~100VAC/240~265VAC /120~140VDC /340~380VDC.
Note 2 - This product should operate at a natural air condition, please contact us if it need be used at a closed space.

Recommended Circuit for Application

1. Typical Application Circuit



Circuit 1

Output Voltage	3.3V	5V	9V	12V	15V	20V	24V
TVS1	SMBJ7.0A	SMBJ7.0A	SMBJ12A	SMBJ20A	SMBJ20A	SMBJ30A	SMBJ30A

Note:

A ceramic SMD capacitor is recommended for C1 which can suppress the high-frequency noise; TVS is recommended to protect the output circuit at abnormal condition; 2A/250V Time-delay fuse is recommended; 14D511K/4500A is recommended for MOV.

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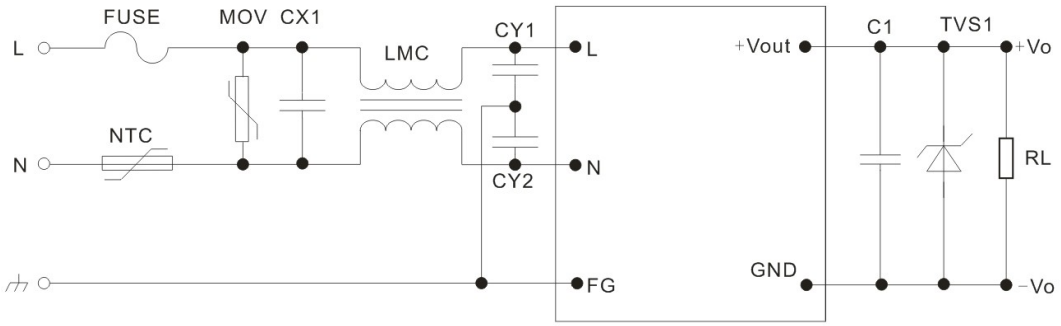
2. Recommended Circuit for EMC



Circuit 2

Component	Recommended Value	Component	Recommended Value
MOV	14D511K/4500A	NTC	5D-9
CX1	X2/104K/275VAC	LMC	15mH/0.5A
FUSE	2A/250V, Time-delay fuse (necessary)	-	-
CY1, CY2	Y1/102M/400VAC	-	-

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℃, humidity<75%RH, nominal 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.

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