AC/DC Converter
FA10-220DXXE2D4 Series

Typical Features

- ◆ Wide input voltage range 85-305VAC/120-430VDC
- ◆ No load power consumption ≤0.4W@220VAC
- ◆ Efficiency 82% (Typ.)
- ◆ Operating temperature from -40℃ to +75℃
- ◆ Switching Frequency 65KHz
- ◆ Short circuit & over current protections
- ◆ Isolation voltage 4000Vac
- ◆ Altitude during operating 4000m Max
- ◆ Compliant with IEC/EN62368/UL62368
- ◆ Plastic housing, flame class UL94 V-0
- ◆ PCB DIP mounting

Application Field

FA10-220DXXE2D4 Series *----- Compact size, high efficiency AC-DC modular power supplies with global input voltage range (both AC & DC available), low ripple, low temperature rise, low standby power consumption, high efficiency, high reliability and safety isolated. This series of products can be widely used in the fields of electric power, industrial, instrument 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

Certificate	Part No.	Output Specification					Max. Capacitive Load	Ripple & Noise 20MHz (MAX)	Efficiency@ Full Load, 220Vac (TYP.)
		Power	Voltage 1	Current 1	Voltage 2	Current 2			
		(W)	Vo1(V)	Io1(mA)	Vo2(V)	Io2(mA)	u F	mVp-p	%
-	FA10-220D05E2D4(-T)(-TS)	10	5	1000	5	1000	1000/1000	80/80	76
	FA10-220D09E2D4(-T)(-TS)	10	9	556	9	556	1000/1000	80/80	79
	FA10-220D12E2D4(-T)(-TS)	10	12	416	12	416	470/470	100/100	80
	FA10-220D15E2D4(-T)(-TS)	10	15	333	15	333	330/330	100/100	80
	FA10-220D24E2D4(-T)(-TS)	10	24	208	24	208	220/220	150/150	82

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.

Note 4 - The suffix -T is for a kind of chassis packaging with terminals, -TS is for a kind of packaging with DIN Rail which width is 53.8mm.

Input Specifications

Item	Operating Condition	Min.	Typ.	Max.	Unit
Input Voltage Range	AC Input	85	220	305	VAC
	DC Input	120	310	430	VDC

Input Frequency Range	-	47	50	63	Hz
Input Current	115VAC input	-	-	0.20	A
	220VAC input	-	-	0.15	
Surge Current	115VAC input	-	-	15	
	220VAC input	-	-	20	
No load power consumption	115VAC input	-	-	0.40	W
	220VAC input	-	-		
Leakage Current	-	0.5mA TYP/ 230VAC/ 50Hz			
External fuse recommended value	-	1A-2A/ 300VAC 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 Any load	Vo1	-	±2.0	±3.0	%
			Vo2	-	±2.0	±4.0	%
Line Regulation		Rated Load	Vo1	-	-	±0.5	%
			Vo2	-	-	±1.5	%
Load Regulation		Rated input voltage 20%~100% load	Vo1	-	-	±2.0	%
			Vo2	-	-	±3.0	%
Minimum load		Single Output		0	-	-	%
		Dual output common ground		-	-	10	%
		Dual output isolated		-	-	10	
Turn-on Delay Time		Input 115VAC (full load)		-	1000	-	mS
		Input 220VAC (full load)		-		-	
Power-off Holding Time		Input 115VAC (full load)		-	150	-	mS
		Input 220VAC (full load)		-	200	-	
Dynamic Respond	Overshoot Range	25%~50%~25% 50%~75%~50%		-5.0	-	+5.0	%
	Recovery Time			-	5.0	-	mS
Output Overshooting		Full input voltage range		≤10%Vo			%
Short Circuit Protection				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
		The ripple & noise is tested by the twisted pair test method (Please refer to the following test instructions in this data sheet)					

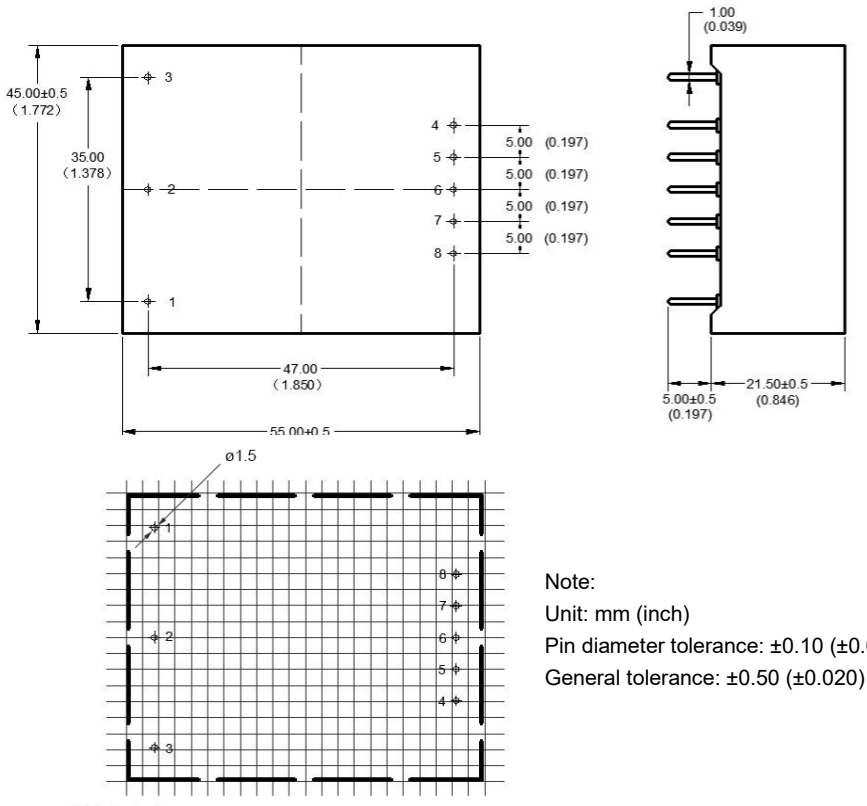
General Specifications

Item		Operating Condition	Min.	Typ.	Max.	Unit
Switching Frequency		-	-	65	-	KHz
Operating Temperature		-	-40	-	+75	℃
		Please refer to Temperature Derating Curve				
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	Input-Output	Test 1min, leakage current ≤5mA	4000	-	-	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		-	UL94V-0			
MTBF		-	MIL-HDBK-217F@25℃＞300,000H			
Product Weight		Packaging Code	Weight (Typ.)			
		E2	90g			
		E2-T	133g			
		E2-TS	175g			

EMC Performance

Total Item		Sub Item	Test Standard	Performance/Class
EMC	EMI	CE	CISPR32/EN55032	CLASS B (with Recommended Circuit 1）
		RE	CISPR32/EN55032	CLASS B (with Recommended Circuit 1）
	EMS	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 & Interruptions	IEC/EN61000-4-11	0%~70% Perf.Criteria B

E2 Mechanical Dimensions

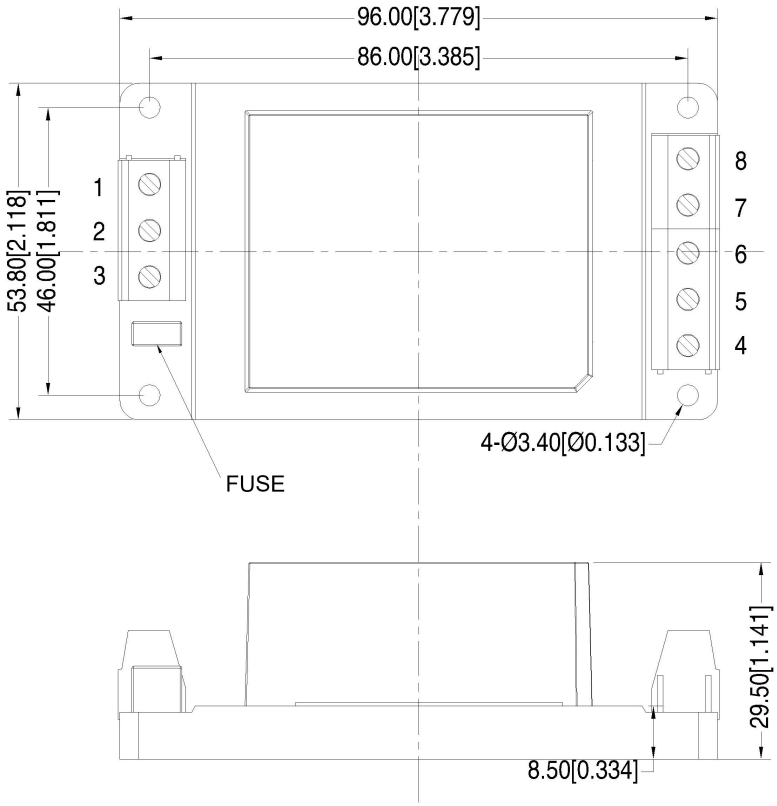


Pin No.	Function	Description
1	FG	No function
2	N	AC(N)
3	L	AC(L)
4	+Vo2	Output +V2
5	NP	No pin
6	COM	Output 0V
7	NP	No pin
8	-Vo1	Output -V1

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

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

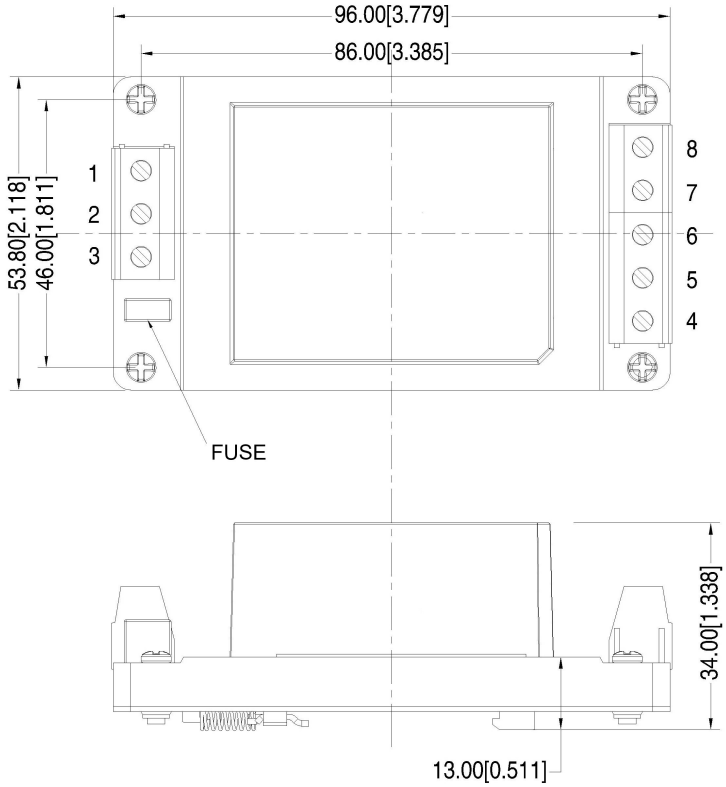
E2-T Mechanical Dimensions



Terminal No.	Function	Description
1	FG	No function
2	N	AC(N)
3	L	AC(L)
4	+Vo2	Output +V2
5	NC	No Connection
6	COM	Output 0V
7	NC	No Connection
8	-Vo1	Output -V1

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

E2-TS Mechanical Dimensions



Terminal No.	Function	Description
1	FG	No function
2	N	AC(N)
3	L	AC(L)
4	+Vo2	Output +V2
5	NC	No Connection
6	COM	Output 0V
7	NC	No Connection
8	-Vo1	Output -V1

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

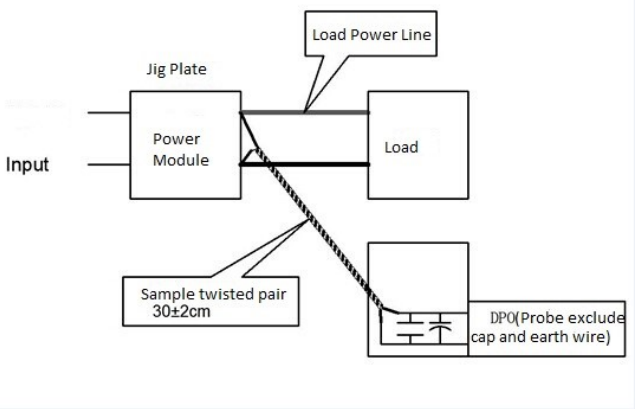
Packaging Code	Dimensions L x W x H	
E2	55.0 x 45.0 x 21.5 mm	2.165 × 1.772 × 0.846 inch
E2-T	96.0 x 53.8 x 29.5 mm	3.779 × 2.118 × 1.161 inch
E2-TS	96.0 x 53.8 x 34.0 mm	3.779 × 2.118 × 1.338 inch

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

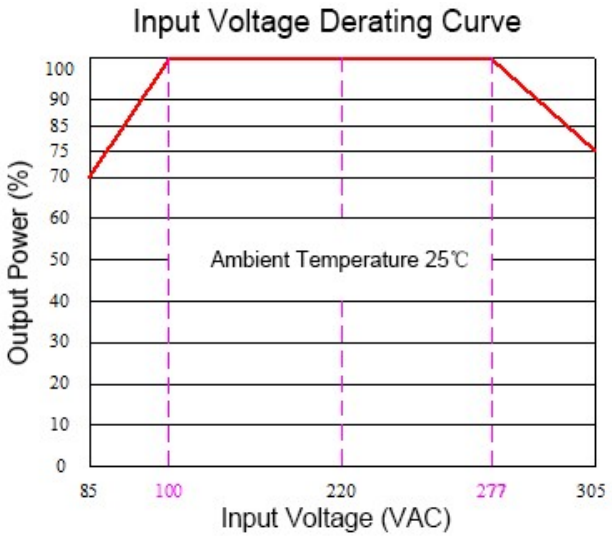
Test Method:

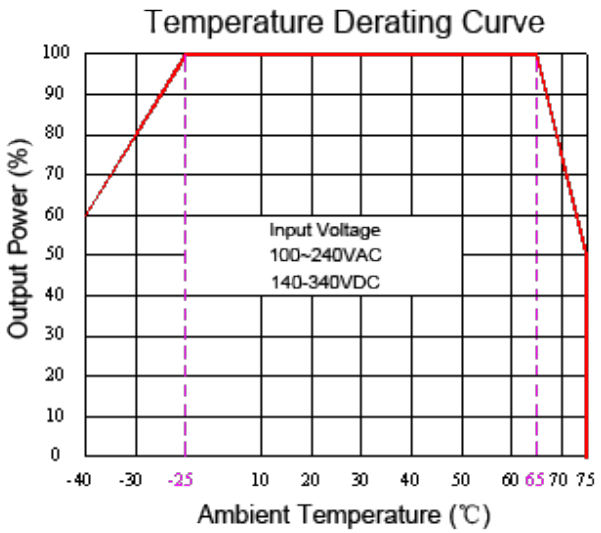
1, The Ripple & noise test need 12# twisted pair cables, an oscilloscope which bandwidth should be set to 20MHz, 0.1uF polypropylene capacitor and 10uF high-frequency low-resistance electrolytic capacitor are connected in parallel with the probes (100M bandwidth). The oscilloscope should be set at the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

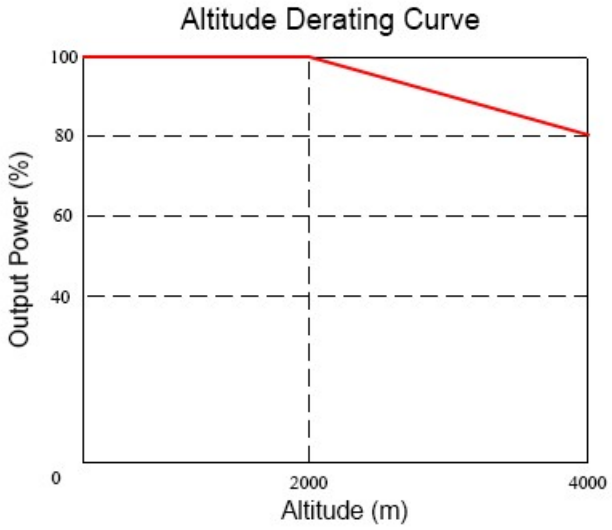
2, The test diagram is shown on the right. The converter output connects to the electronic load by the jig with cables which size should be defined according to the output current value. The twisted pair (length 30cm±2 cm) should be connected in parallel with the load, the location is as close as possible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



Product Performance Curves



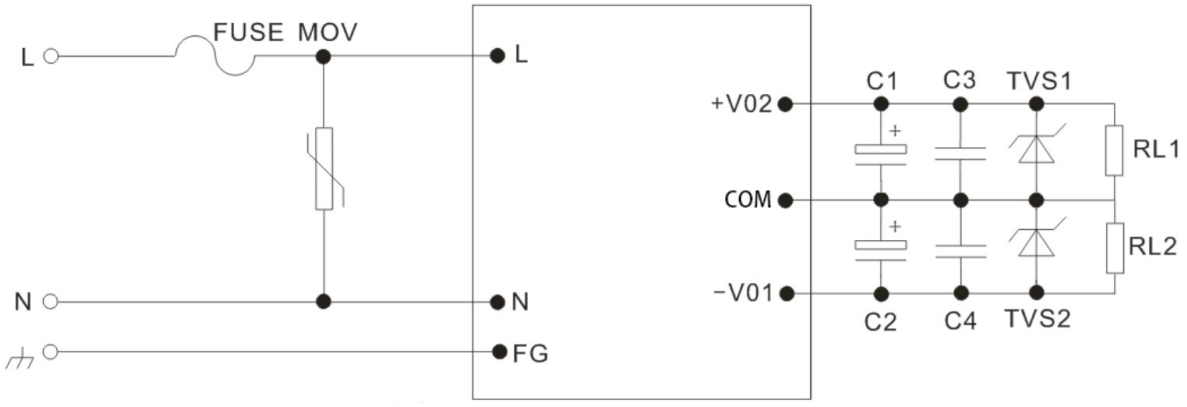




Note 1 - The output power should be derated based on the input voltage derating curve at 85~100VAC/ 277~305VAC/ 120~140VDC/ 390~430VDC.

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



Circuit 1

Note:

1) 2A/300Vac time-delay fuse is recommended.

2) 10D561K/3500A is recommended for MOV.

3) C1, C2 capacitance value should be less than the max capacitive load, high frequency low impedance electrolytic capacitors are recommended, the withstand voltage should be more than 1.5X of output voltage.

4) 0.1uF/ 50V ceramic SMD capacitors are recommended for C3 & C4.

5) TVS1 & TVS2 – 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℃, 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.

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