AC/DC Converter
FA20-300SXXH2D4(-T)(-TS) Series

Typical Features

- ◆ Wide input voltage range:90-528VAC/100-745VDC
- ◆ No-load power consumption≤0.5W
- ◆ Transfer efficiency 84%
- ◆ Switching frequency: 65KHz
- ◆ Output Short Circuit, Over Current, Over Voltage Protection
- ◆ Isolation voltage: 4000Vac
- ◆Conform to IEC62368/UL62368/EN62368
- ◆Certified by CE, RoHS
- ◆ Plastic case, meets flammability UL94 V-0
- ◆ PCB mounting

Application Field

FA20-300SXXH2D4(-T) (-TS) Series**----- *a compact size, high efficient power converter offered by Aipu. It features universal input voltage, DC and AC dual-use, low ripple, low temperature rise, low power consumption, high efficiency, high reliability, safer isolation, good EMC performance. EMC and safety specifications meet EN55032, IEC/EN61000 standard. It widely used in power, industrial, instrument, smart home applications. For harsh EMC environment, the application circuit in the datasheet is strongly recommended.*

Typical Product List

Certificate	Item No	Output Specification			Max. Capacitive Load	Ripple& Noise 20MHz (Max)	Efficiency @ Full Load 230Vac (Typical)
		Power	Voltage	Current			
		(W)	(V)	(mA)	uF	mVp-p	%
CE, RoHS	FA20-300S05H2D4	20	5	4000	7000	90	78
CE, RoHS	FA20-300S12H2D4	20	12	1660	5000	120	83
CE, RoHS	FA20-300S15H2D4	20	15	1333	2000	120	83
CE, RoHS	FA20-300S24H2D4	20	24	833	1000	150	84

Note 1: Suffix"-T" means chassis mounting, "-TS" for Din-rail mounting, rail width 35mm.

Note 2:.The typical output efficiency is based on that product is full loaded and burned-in after half an hour.

Note 3: Fluctuation range of full load efficiency(%,TYP) is ±2%, full load output efficiency= total output power/module's input power.

Note 4: Ripple and Noise is tested by Twisted Pair Method, please refer to "Ripple & Noise Test" at back of datasheet.

Input Specification

Item	Operating Condition	Min.	Typ.	Max.	Unit
Input Voltage Range	AC Input	90	230	528	VAC
	DC Input	100	325	745	VDC
Input Frequency Range	-	47	50	63	Hz
Input Current	115VAC	-	-	0.6	A

	230VAC	/	/	0.3	
Surge Current	115VAC	/	35	/	
	230VAC	/	60	/	
No Load Power Consumption	Input 115VAC	/	/	0.5	W
	Input 230VAC	/	/		
Leakage Current	230VAC/50Hz	0.5mA RMS TYP			
External fuse recommended value	-	2.5-3.15A/500VAC slow-fusing, necessary			
Hot plug	-	Unavailable			
Remote control terminal	-	Unavailable			

Output Specification

Item	Operating Condition	Min.	Typ.	Max.	Unit
Voltage Accuracy	Full input voltage Range, Any load	-	±2.0	±3.0	%
Line Regulation	Nominal Load	-	-	±0.5	%
Load Regulation	Nominal input Voltage 20%~100% load	-	-	±1.0	%
Minimum load	-	0	-	-	%
Turn-on Delay Time	Input 230Vac	-	2000	-	mS
	Input 400Vac	-		-	
Power-off Holding Time	Input 230VAC	-	35	-	mS
	Input 400VAC	-	100	-	
Dynamic Response	25%~50%~25% 50%~75%~50%	Overshoot range(%):≤±10.0			%
		Recovery time(mS):≤5.0			mS
Output Overshooting	Full input voltage range	≤10%Vo			%
Short Circuit Protection		Continuous, Self-recovery			Hiccup
Drift Coefficient	-	-	±0.02%	-	%/℃
Over Current Protection	Input 230VAC	⩾130% Io, Self-recovery			Hiccup
Over Voltage Protection	5VDC Output	⩽7.5			VDC
	12VDC Output	⩽20			
	15VDC Output	⩽20			
	24VDC Output	⩽30			

General Specifications

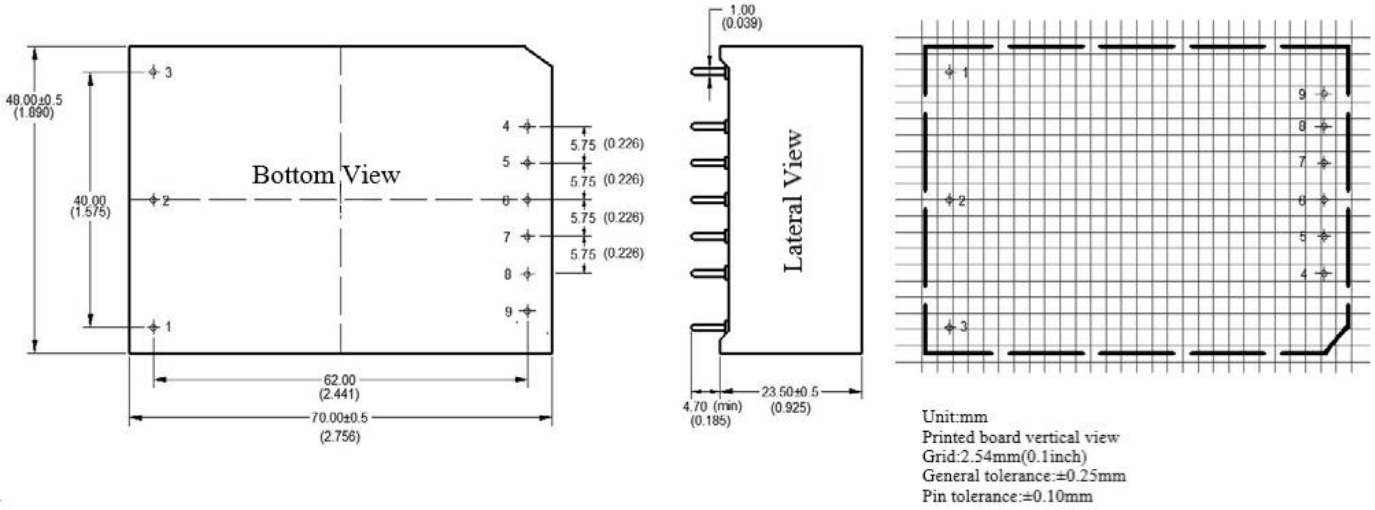
Item	Operating Condition	Min.	Typ.	Max.	Unit
Switching Frequency	-	-	65	-	KHz

Operating Temperature	-		-40	-	+70	℃
	Derating based on Temperature Derating Curve, see “Product Characteristic Curve” at back.					
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	4000	-	-	VAC
	I/P-O/P @DC500V		100	-	-	VDC
Safety Standard	-		IEC62368/EN62368/UL62368			
Vibration	-		10-55Hz,10G,30Min,alongX,Y,Z			
Safety Class	-		CLASS Ⅰ			
Class of Case Material	-		UL94 V-0			
MTBF	-		MIL-HDBK-217F@25℃＞300,000H			

EMC Characteristics

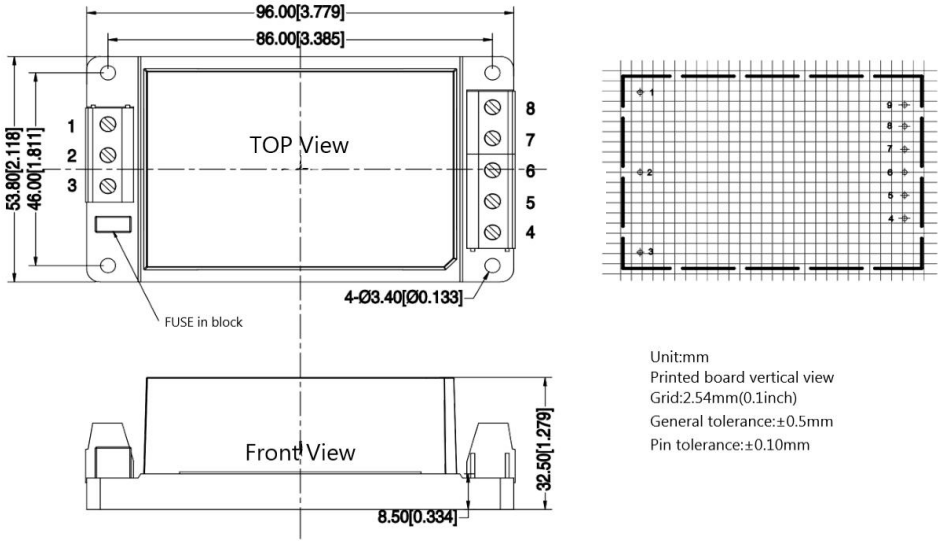
Total Item		Sub Item	Test Standard	Class
EMC	EMI	CE	CISPR22/EN55032	CLASS B
		RE	CISPR22/EN55032	CLASS B
	EMS	RS	IEC/EN61000-4-3	10V/m Perf.Criteria A
		CS	IEC/EN61000-4-6	3Vr.m.s Perf.Criteria A
		ESD	IEC/EN61000-4-2	Contact ±6KV / Air ±8KV Perf.Criteria B
		Surge	IEC/EN61000-4-5	Line to line ±2KV Perf.Criteria B
				Line to line ±4KV Perf.Criteria B (see recommended circuit 2,3)
		EFT	IEC/EN61000-4-4	±2KV Perf.Criteria B
				±4KV Perf.Criteria B (see recommended circuit 2,3)
		Voltage dips, short interruptions and voltage variations immunity	IEC/EN61000-4-11	0%~70% Perf.Criteria B

H2 Packing Dimension



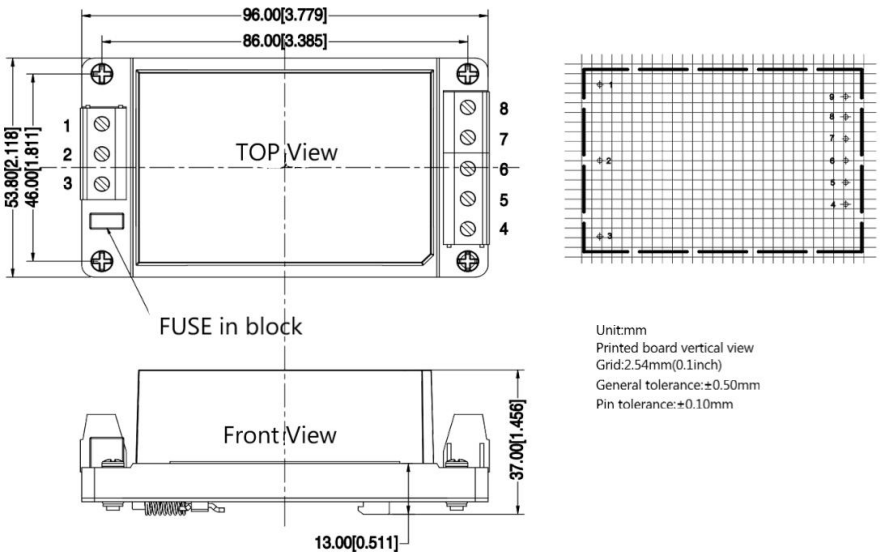
Unit:mm
Printed board vertical view
Grid:2.54mm(0.1inch)
General tolerance:±0.25mm
Pin tolerance:±0.10mm

H2-T Packing Dimension



Unit:mm
Printed board vertical view
Grid:2.54mm(0.1inch)
General tolerance:±0.5mm
Pin tolerance:±0.10mm

H2-TS Packing Dimension



Unit:mm
Printed board vertical view
Grid:2.54mm(0.1inch)
General tolerance:±0.50mm
Pin tolerance:±0.10mm

Packing Code	L x W x H	
H2	70.0X48.0X24.0 mm	2.756X1.890X0.945inch
H2-T	96.0X53.8X32.5 mm	3.780X2.118X1.280inch
H2-TS	96.0X53.8X37.0 mm	3.780X2.118X1.457inch

Pin Definition

Pin-out	1	2	3	4	5	6	7	8
H2	FG	AC(N)	AC(L)	+Vo	NP	NP	NP	-Vo
H2-T	FG	AC(N)	AC(L)	+Vo	NC	NC	NC	-Vo
H2-TS	FG	AC(N)	AC(L)	+Vo	NC	NC	NC	-Vo

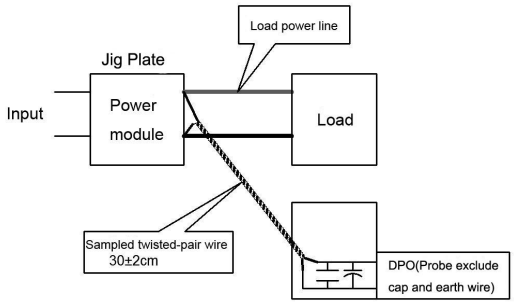
Note: If the definition of pin is not in accordance with the model selection manual, please refer to the label on actual item.

Ripple& Noise Test: (Twisted Pair Method 20MHZ bandwidth)

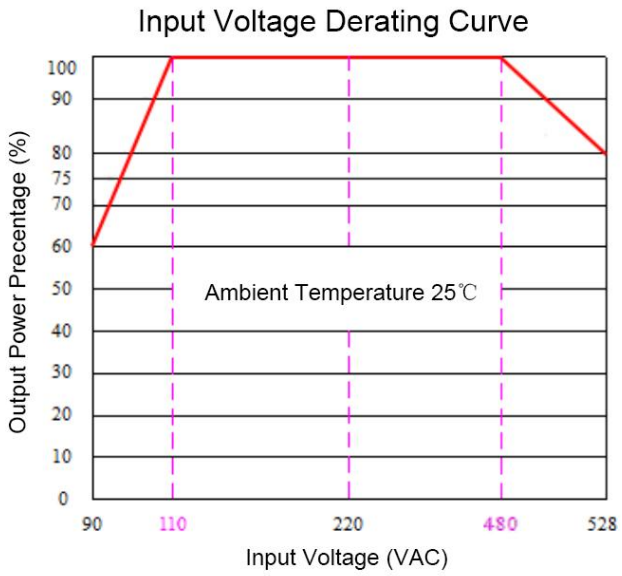
Test Method:

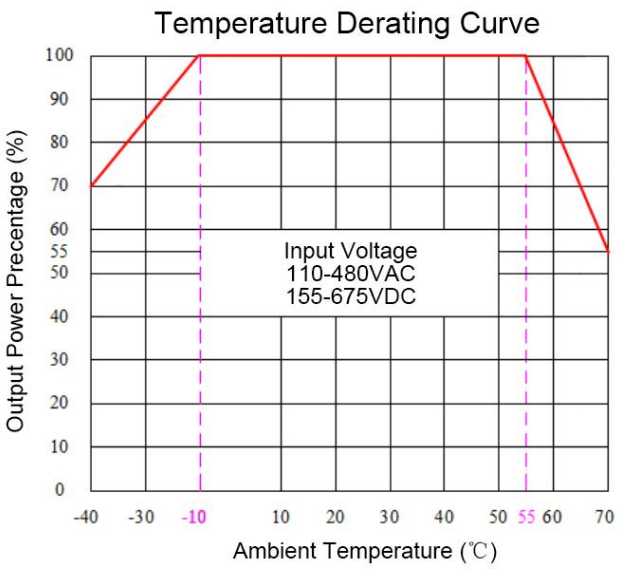
(1) 12# twisted pair to connect, Oscilloscope bandwidth set as 20MHz, 100M bandwidth probe, terminated with 0.1uF polypropylene capacitor and 10uF high frequency low resistance electrolytic capacitor in parallel, oscilloscope set as Sample pattern.

(2) Input terminal connect to power supply, output terminal connect to electronic load through jig plate, Use 30cm±2 cm sampling line. Power line selected from corresponding diameter wire with insulation according to the flow of output current.



Product Characteristic Curve





Note

1: Input Voltage should be derated base on Input Voltage Derating Curve when it is 90~110VAC /480~528VAC /100~155VDC /675~745VDC.

2: Our product is suitable to use under natural air cooling environment, if use it under closed condition, please contact with us.

Typical EMC Circuit and Recommended Spec

1. Typical Application Circuit

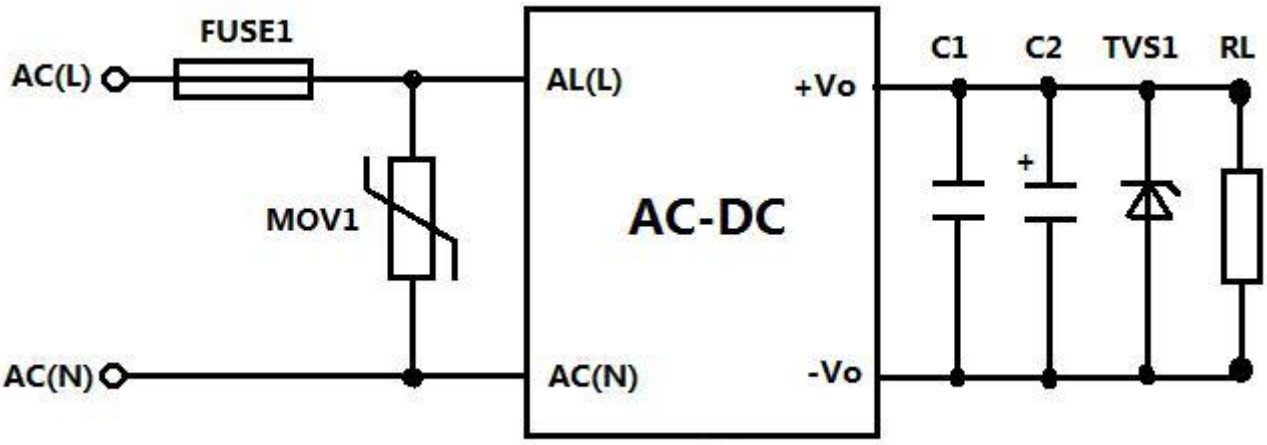
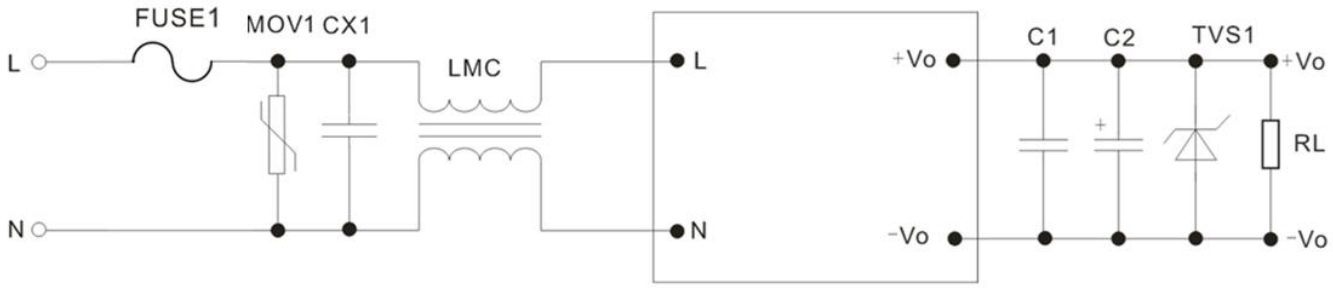


Photo 1 Typical Application Circuit

2. ECM Recommended Circuit



Item	FUSE	MOV	C1(uF)	C2(uF)	TVS1
FA20-300S05H2D4	2.5A/500VAC Slow fusing, necessary	20D102K	1	330uF	SMBJ7.0A
FA20-300S12H2D4				220uF	SMBJ20A
FA20-300S15H2D4				220uF	SMBJ30A
FA20-300S24H2D4				220uF	SMBJ30A

Note:

1.CX1 is an X capacitor, the recommended model is 0.22uF/275Vac;

2.LMC is a common mode inductor, the recommended inductance is 25mH;

3.The output filter capacitor C2 is an electrolytic capacitor, it is recommended to use a high-frequency low-resistance electrolytic capacitor. For the capacity and current flowing through, please refer to the technical specifications provided by each manufacturer. The withstand voltage of C2 capacitor is at least reduced to 80%. C1 is a ceramic capacitor to remove high-frequency noise;

4.TVS1 tube protects the subsequent circuit when the module is abnormal, it is recommended to use it.

3. Recommended circuit for general system in strong lightning surge environment

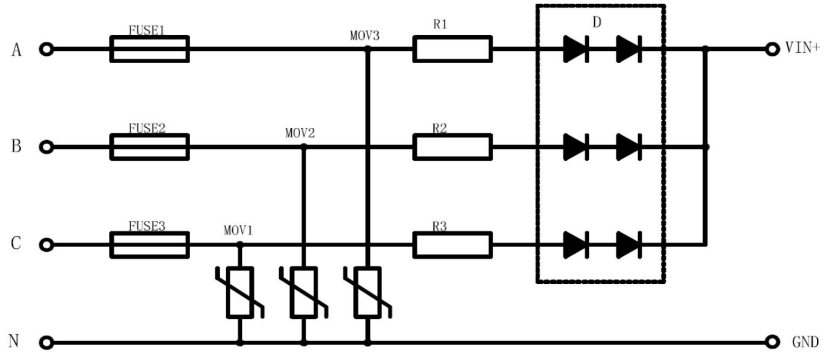


Photo 3: 4KV Differential Mode Surge High Requirements Recommended External Circuit -Full Wave Rectification

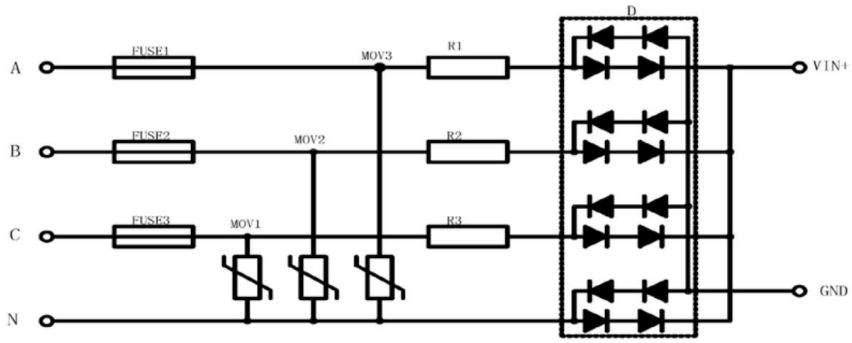


Photo 4: 4KV Differential Mode Surge High Requirements Recommended External Circuit -Half Wave Rectification

Recommended values for application circuits with higher EMC requirements	
Components	Recommended Value
MOV1, MOV2, MOV3	20D821K
D	2A/1000V
R1, R2, R3	10Ω/5W
FUSE1, FUSE2, FUSE3	2.5A/500VAC, slow fusing, necessary

Note :

1.The product should be used under the specification range, otherwise it will cause permanent damage to it.

2.Product's input terminal should connect to fuse;

3.If the product is not worked under the load range(below the minimum load or beyond the load range), we cannot ensure that the performance of product is in accordance with all the indexes in this manual;

4.Unless otherwise specified, data in this datasheet are tested under conditions of Ta=25℃, humidity<75% when inputting nominal voltage and outputting rated load(pure resistance load);

5.All index testing methods in this datasheet are based on our Company's corporate standards

6.The performance indexes of the product models listed in this manual are as above, but some indexes of non-standard model products will exceed the above-mentioned requirements, please directly contact our technician for specific information;

7.We can provide customized product service;

8.The product specification may be changed at any time without prior notice.

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