

AC To DC Converter

20W PCB Mount

multicomp PRO

**RoHS
Compliant**



Applications

These series are Compact in size & high-efficiency AC-DC 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, Industry, Instrument and Smart home devices, etc. The additional circuit for EMC is recommended for the application with high EMC requirement.

Features

- Wide input voltage range 85-305V AC/100-430V DC
- No load power consumption $\leq 0.15W@220V$ AC
- Operating temperature from $-40^{\circ}C$ to $+85^{\circ}C$
- Efficiency up to 88% (Typ.)
- Switching frequency 65KHz
- Short circuit, over current & over voltage protections
- Isolation voltage 4000V AC
- Altitude during operation 4000m Max
- Compliant with IEC/EN62368/UL62368
- With CE, CB & UL certificates
- Enclosed plastic case, flame class UL94-V0

Typical Product List

Part Number	Input Voltage Range		Output Specifications			Max. Capacitive Load @220V AC	Ripple & Noise @20MHz (Max)	Efficiency @ Full load 220V AC (Typ.)
	Nominal	Range	Power	Voltage	Current			
	(VAC)	(VAC)	P(W)	Vo (V)	Io (mA)			
MPDA20-220S05G2N4	220	85-305	20	+5	4000	8000	80	84
MPDA20-220S12G2N4				+12	1666	5000	80	86
MPDA20-220S24G2N4				+24	833	2000	100	88

Input Specifications

Item	Operating Condition	Min.	Typ.	Max.	Unit	
Input voltage range	AC Input	85	220	305	V AC	
	DC Input	100	310	430	V DC	
Input frequency range	-	47	50	63	Hz	
Input current	Input 115V AC	--	--	0.55	A	
	Input 220V AC			0.35		
Surge current	Input 115V AC			10		
	Input 220V AC			20		
No-load power consumption	Input 115V AC			0.1	0.15	W
	Input 220V AC					

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Leakage current	--	0.5mA TYP/230V AC/50Hz
Recommended external fuse		2A-5A/300V AC time-delay fuse
Hot plug		NA
ON/OFF Control		NA

Output Specifications

Item	Operating Condition	Min	Typ.	Max	Unit	
Voltage accuracy	Full input voltage range, any load	Vo=3.3V	-	±2.0	±6.0	%
		Others	-	±1.0	±2.0	
Line regulation	Rated load	-	-	±0.5	%	
Load regulation	Nominal input voltage, 20%~100% load	Vo=3.3V	-	-	±4.0	%
		Others	-	-	±2.0	
Minimum load	Single Output	0	-	-	%	
Turn-on delay time	Input 115V AC (full load)	-	-	500	mS	
	Input 220V AC (full load)	-	-			
Power-off hold up time	Input 115V AC (full load)	14	-	-	mS	
	Input 220V AC (full load)	70	-	-		
Dynamic Response	Overshoot range	-5.0	-	+5.0	%	
	Recovery time		-		mS	
Output overshoot	Full input voltage range	≤10%Vo			%	
Short circuit protection		Continuous, self-recovery			Hiccup	
Temperature drift coefficient	-	-	±0.03%	-	%/°C	
Over current protection	Input 220V AC	≥130% Io, self-recovery			Hiccup	
Over voltage protection	Output 3.3V/5V/5.2V DC	≤10			V DC	
	Output 9VDC	≤15				
	Output 12VDC/12.5V DC	≤18				
	Output 15V DC	≤20				
	Output 24V DC	≤30				
	Output 48V DC	≤64				
Ripple & Noise	5%-100% load, 20MHz bandwidth	-	80	100	mV	

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General Specifications

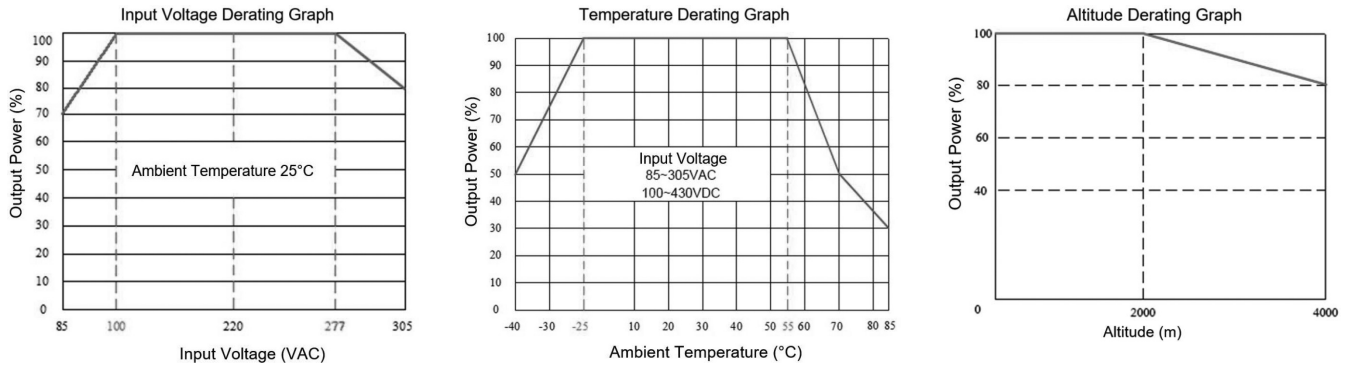
Item	Operating Condition		Min	Typ.	Max	Unit
Switching frequency	-		-	65	-	KHz
Operating temperature	Refer to the temperature derating graph		-40	-	+85	°C
Storage temperature	-		-40	-	+105	
Soldering temperature	Wave soldering		260±4°C, time 5-10S			
	Manual soldering		360±8°C, time 4-7S			
Relative humidity	-		10	-	90	%RH
Isolation voltage	I/P-O/P	Test 1min, leakage current ≤5mA	4000	-	-	V AC
Insulation resistance	I/P-O/P	@ DC500V	100	-	-	MΩ
MTBF	MIL-HDBK-217F @25°C		1500	-	-	K hours
Safety standard	-		IEC/EN62368, UL62368			
Vibration	-		10-55Hz, 10G, 30Min, along X,Y,Z			
Safety class	-		CLASS II			
Case flame class	-		UL 94V-0			
Weight & Dimensions	Part No.	Weight (Typ.)	Dimensions L x W x H			
	MPDA20-220S05G2N4	55g	54.00 × 29.30 × 23.70 mm		2.125 × 1.153 × 0.933 inch	
	MPDA20-220S12G2N4					
	MPDA20-220S24G2N4					

EMC Performance

Total Items	Sub Items	Test Standard	Performance/Class	
EMC	EMI	CE	CLASS B (with the Recommended Circuit 2)	
		RE	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
				±1KV Perf.Criteria B
		Surge	IEC/EN61000-4-5	±2KV Perf.Criteria B (with the Recommended Circuit 2)
		EFT	IEC/EN61000-4-4	±2KV Perf.Criteria B (with the Recommended Circuit 2)
		Voltage dips and interruptions	IEC/EN61000-4-11	0%~70% Perf.Criteria B

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Product Characteristics Graphs



Note 1: The output power should be derated based on the input voltage derating graph at 85~100V AC/277~305V AC/100~140V DC/ 390~430V DC.

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

Recommend Circuit Diagrams for Application

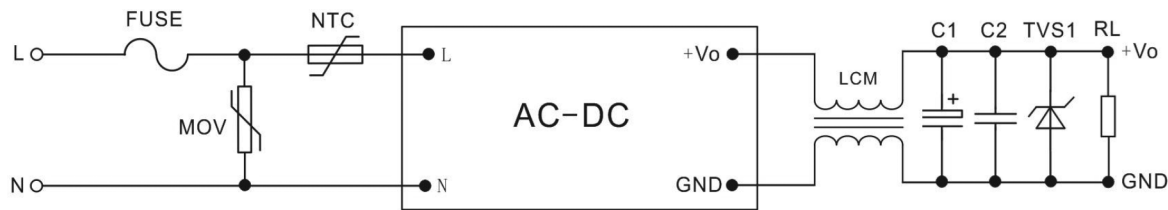


Figure – Circuit 1

FUSE	2A/300VAC Time-delay fuse (necessary)	C2	0.1uF/50V/1206	TVS1	SMBJ20.0A (15V output)
MOV	14D561K/4500A	TVS1	SMBJ7.0A (3.3V, 5V & 5.2V outputs)	TVS1	SMBJ30.0A (24V output)
NTC	5D-9(5Ω,3A,9D)	TVS1	SMBJ12.0A (9V output)	TVS1	SMBJ64.0A (48V output)
C1	220uF Electrolytic capacitor	TVS1	SMBJ20.0A (12V & 12.5V outputs)	LCM	CMC 180uH/5A

Note:

1. A high-frequency low-resistance electrolytic capacitor is recommended for C1 which can decrease the output ripple. It's withstand voltage should be more than 1.2X of the output voltage.
2. TVS1 is a transient voltage absorber, it is recommended to protect the output circuit when the converter output voltage is not normal.

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Recommended circuit diagram for High EMC requirement

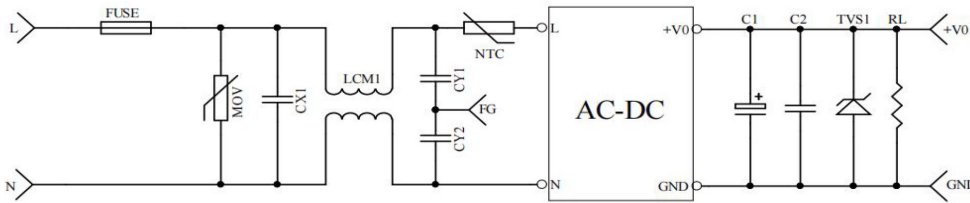
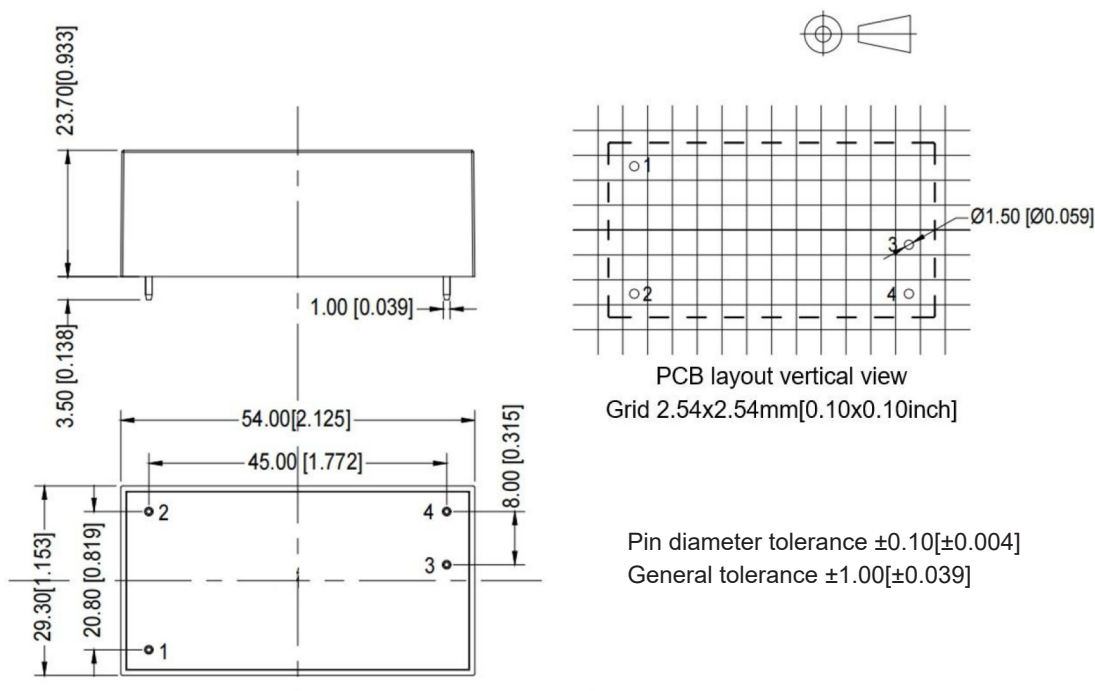


Figure – Circuit 2

Fuse	2A/300V AC Time-delay fuse (necessary)	CY1, CY2	Y1/102M/400V AC
MOV	14D561K/4500A	LCM1	15-25mH/0.7A
NTC	5D-9	-	-
CX1	X2/224K/310V AC	-	-

Mechanical Dimensions



Dimensions : Millimetres (Inches)

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Part Number Table

Description	Part Number
AC to DC Converter, 20W, Vin 220V AC, Vout 5V DC	MPDA20-220S05G2N4
AC to DC Converter, 20W, Vin 220V AC, Vout 12V DC	MPDA20-220S12G2N4
AC to DC Converter, 20W, Vin 220V AC, Vout 24V DC	MPDA20-220S24G2N4

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