

AC To DC Converter

10W PCB Mount

multicomp^{PRO}

RoHS
Compliant



Applications

These Series are Compact in 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.

Features

- Wide input voltage range 85-305V AC/120-430V DC
- No load power consumption $\leq 0.3W$
- Efficiency 83%(TYP.)
- Operating Temperature from $-40^{\circ}C$ to $+105^{\circ}C$
- Switching Frequency 65KHz
- Short circuit & over current protections
- Isolation voltage 4000V AC
- Altitude during operation 4000m Max
- Compliant with IEC/EN62368/UL62368, IEC61558-1/ IEC61558-2-16
- With TUV/CE, CB & UL Certificates
- PCB DIP Mounting

Typical Product List

Part Number	Output Specifications			Max. Capacitive Load @220V AC	Ripple & Noise @20MHz (Max)	Efficiency @Full load 220V AC (Typ.)
	Power	Voltage	Current			
	P(W)	Vo (V)	Io (m A)			
MPFA10-220S05G2N4	10	5	2000	5000	100	76
MPFA10-220S12G2N4		12	833	3000	120	82
MPFA10-220S24G2N4		24	416	2000	150	83

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Input Specifications

Item	Operating Condition	Min.	Typ.	Max.	Unit
Input voltage range	AC Input	85	220	305	V AC
	DC Input	120	310	430	V DC
Input frequency range	-	47	50	63	Hz
Input current	Input 115V AC	--	--	0.25	A
	Input 220V AC			0.15	
Surge current	Input 115V AC			15	
	Input 220V AC			30	
No-load power consumption	Input 115V AC	0.3	W		
	Input 220V AC				
Leakage current	--	0.25mA TYP/230V AC/50Hz			
Recommended external fuse		2A/300VAC Time-delay fuse			
Hot plug		Unavailable			
ON/OFF Control		Unavailable			

Output Specifications

Item	Operating Condition	Min	Typ.	Max	Unit
Voltage accuracy	Full input voltage range, any load	-	±2.0	±3.0	%
Line regulation	Rated load	-	±0.5	±1.0	%
Load regulation	Nominal input voltage, 20%~100% load	-	±1.0	±2.0	%
Minimum load	Single Output	0	-	-	%
Turn-on delay time	Input 115V AC (full load)	-	1000	-	mS
	Input 220V AC (full load)	-			
Power-off hold up time	Input 115V AC (full load)	-	50	-	mS
	Input 220V AC (full load)	-	80		
Dynamic Response	Overshoot range	-5.0	-	+5.0	%
	Recovery time		50%~75%~50%		-
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	≥120% Io, self-recovery			Hiccup
Ripple & Noise	Full input voltage range	-	80	150	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	-	+105	°C
Storage temperature	-	-40	-	+110	
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
Safety standard	-	EN/IEC62368/UL62368/IEC61558			
Vibration	-	10-55Hz, 10G, 30Min, along X,Y,Z			
Flame Class of Case	-	CLASS II			
MTBF	-	MIL-HDBK-217F@25°C>300,000H			
Unit Weight	Part No.	Weight (Typ.)			
	MPFA10-220S05G2N4	35g			
	MPFA10-220S12G2N4				
	MPFA10-220S24G2N4				

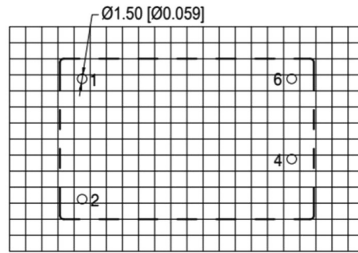
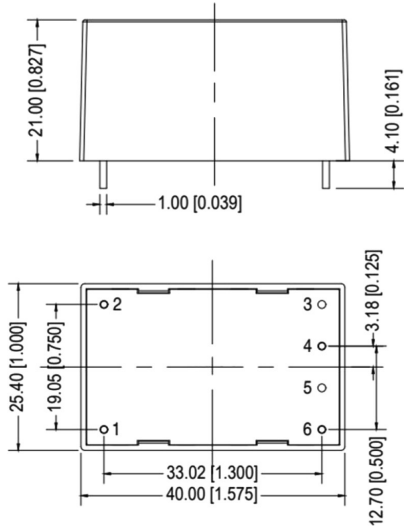
EMC Performance

Total Items	Sub Items	Test Standard	Performance/Class	
EMC	EMI	CE	CISPR32/EN55032 CLASS B (with the Recommended Circuit 2)	
		RE	CISPR32/EN55032 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
		Surge	IEC/EN61000-4-5	Line to line ±1KV Perf. Criteria B Line to line ±2KV / line to ground ±4KV Perf.Criteria A (with the Recommended Circuit 2)
		EFT	IEC/EN61000-4-4	±2KV Perf.Criteria B ±4KV Perf.Criteria A (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



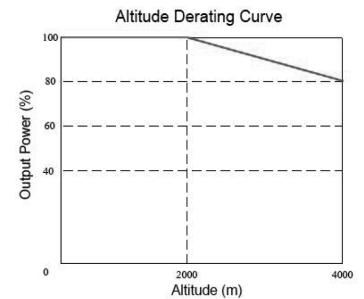
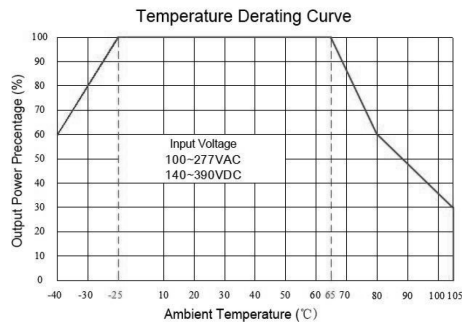
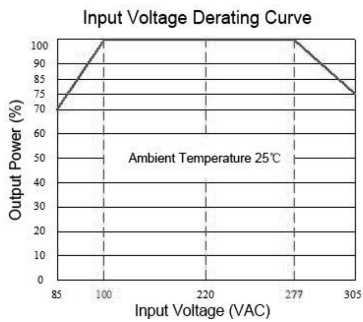
PCB layout vertical view
Grid 2.54x2.54[0.10x0.10]

Pin diameter tolerance: ± 0.10 [± 0.004]
General tolerance: ± 0.50 [± 0.020]

Dimensions : Millimetres (Inches)

Dimensions L x W x H	
40 × 25.4 × 21 mm	1.575 × 1 × 0.827inch

Product Performance Curves



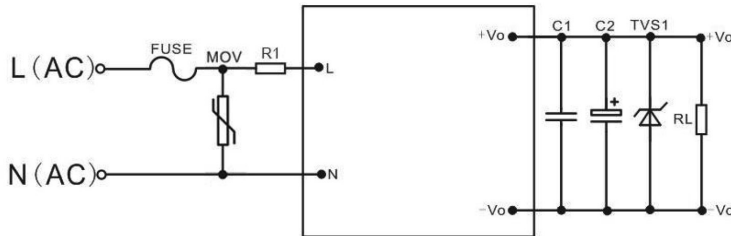
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Recommended Circuits for Application



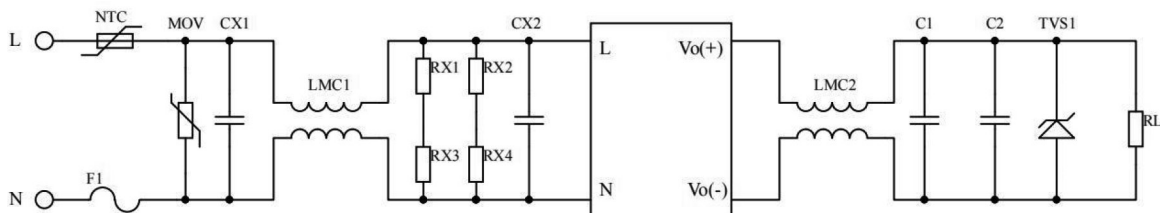
Circuit 1

Part Number	FUSE (necessary)	MOV	R1	C1	C2	TVS1
MPFA10-220S05G2N4	2.0A/300V	14D561K	6.8 Ω/3W (Wire-wound resistor)	1uF/50V	220uF/16V	SMBJ7.0A
MPFA10-220S12G2N4					100uF/25V	SMBJ20A
MPFA10-220S24G2N4					100uF/35V	SMBJ30A

Note:

1. A high-frequency low-resistance electrolytic capacitor is recommended for C2 which capacitance and current should be referred to the manufacturer's technical specification, the withstand voltage should be derated to at least 80%.
2. Ceramic SMD capacitor is recommended for C1 which can suppress the high-frequency noise.
3. TVS is recommended to protect output circuit while the converter operating at abnormal condition.

2. EMC recommended circuit (for higher EMC requirement)



Circuit 2

Part Number Table

Description	Part Number
AC to DC Converter, 10W, Vin 220V AC, Vout 5V DC	MPFA10-220S05G2N4
AC to DC Converter, 10W, Vin 220V AC, Vout 12V DC	MPFA10-220S12G2N4
AC to DC Converter, 10W, Vin 220V AC, Vout 24V DC	MPFA10-220S24G2N4

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