

# AC To DC Converter 15W PCB Mount

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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 and safety isolated. This series of products can be widely used in the fields of Industry, Office devices, Electric power and Household appliances, etc. The additional circuit diagram 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  $\leq 0.3W@220V$  AC
- Efficiency up to 86% (Typ.)
- Operating temperature from  $-40^{\circ}C$  to  $+85^{\circ}C$
- Switching frequency 65KHz (Typ.)
- Short Circuit, Over Current & Over Voltage protections
- Isolation voltage 4000V AC
- Altitude during operation 4000m Max
- With UL/CB/CE certificates
- Safety Class II

## 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)			
MPFA15-220S05G2N4	15	5	3000	5000	70	85
MPFA15-220S12G2N4		12	1250	2000	120	85
MPFA15-220S24G2N4		24	625	1000	120	86

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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	100	310	430	V DC
Input frequency range	-	47	50	63	Hz
Input current	Input 115V AC	--	--	0.45	A
	Input 230V AC			0.3	
Surge current	Input 115V AC			30	
	Input 230V AC			60	
No-load power consumption	Input 115V AC	--	--	0.3	W
	Input 230V AC				
Leakage current	--	0.5mA TYP/230VAC/50Hz			
External fuse recommended		2A/300V AC 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	-	-	±3.0	%
Line regulation	Rated load			±0.5	%
Load regulation	Nominal input voltage, 20%~100% load			±3.0	%
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)	-	1000	-	mS
	Input 220V AC (full load)				
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
Drift Coefficient	-	-	±0.03%	-	%/°C
Over current protection	Input 220V AC	≥120% Io, Self-recovery			Hiccup
Over Voltage Protection	Output 5V DC	≤7.5			V DC
	Output 12V/12.5V DC	≤18			
	Output 15V DC	≤20			
	Output 24V DC	≤30			

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### General Specifications

Item	Operating Condition	Min	Typ.	Max	Unit
Switching frequency	-	61	65	73	KHz
Operating temperature	Refer to the temperature derating graph	-40	-	+85	°C
Storage temperature	-	-40	-	+90	
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
Vibration	-	10-55Hz, 10G, 30Min, along X, Y, Z			
Safety Class	-	CLASS II			
Flame Class of Case	-	UL 94-V0			
MTBF	-	MIL-HDBK-217F@25°C>300,000H			
Unit Weight	Part No.	Weight (Typ.)			
	MPFA15-220S05G2N4	50g			
	MPFA15-220S12G2N4				
	MPFA15-220S24G2N4				

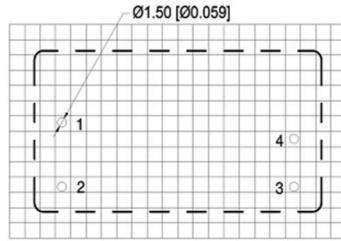
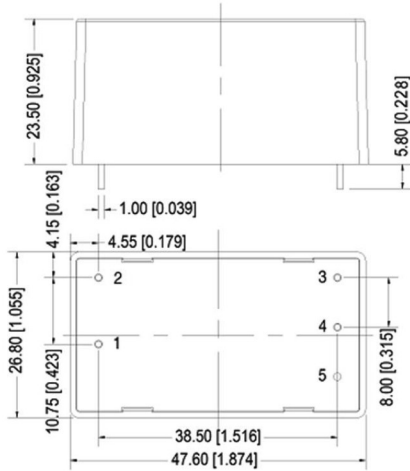
### EMC Performance

Total Items	Sub Items	Test Standard	Performance/Class	
EMC	EMI	CE	CISPR32/EN55032 CLASS B (with the Recommended Circuit 1)	
		RE	CISPR32/EN55032 CLASS B (with the Recommended Circuit 1)	
	EMS	ESD	IEC/EN61000-4-2	Contact ±6KV / Air ±8KV Perf.Criteria B
		RS	IEC/EN61000-4-3	10V/m Perf.Criteria A
			EFT	IEC/EN61000-4-4
		IEC/EN61000-4-4		±4KV Perf.Criteria A (with the Recommended Circuit 1)
		Surge	IEC/EN61000-4-5	Line to line ±1KV Perf.Criteria B
			IEC/EN61000-4-5	Line to line ±2KV / line to ground ±4KV Perf.Criteria A (with the Recommended Circuit 1)
		CS	IEC/EN61000-4-6	10Vr.m.s Perf.Criteria A
		PFMF	IEC/EN61000-4-8	10A/m Perf.Criteria A
		Voltage dips and interruptions	IEC/EN61000-4-11	0%-70% Perf.Criteria B

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## Product Characteristics Graphs

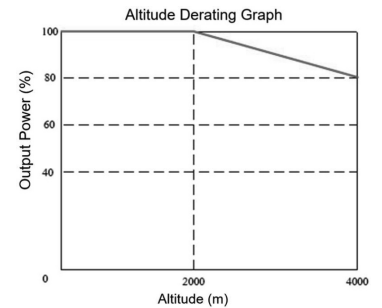
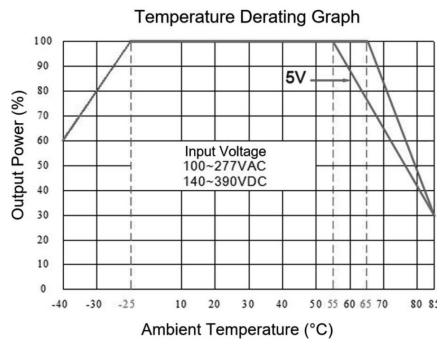
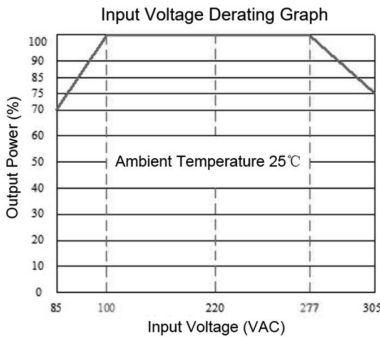


Pin diameter tolerance  $\pm 0.10[\pm 0.004]$   
General tolerance  $\pm 0.50[\pm 0.020]$

Dimensions : Millimetres (Inches)

Dimensions L x W x H	
47.6 × 26.8 × 23.5 mm	1.575 × 1 × 0.827inch

## Product Performance Curves



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 natural air condition, please contact us if it need be used at a closed space.

## 1, EMC Solution and Recommended Circuit Diagram

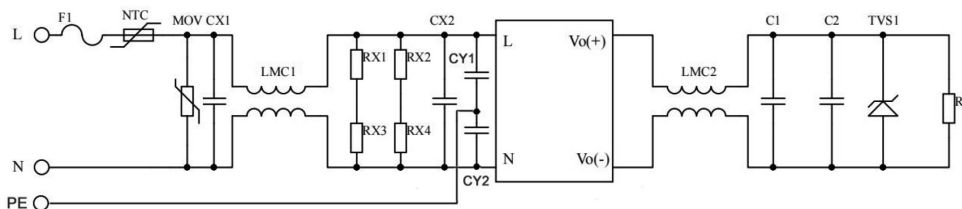


Figure – Circuit 1

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## 2, External Circuit diagram for MPFA15-220S05G2N4 to achieve low Ripple & Noise 70mV Max

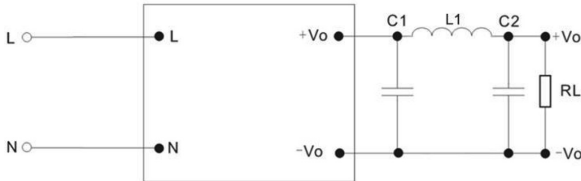


Figure - Circuit 2

**Note:**

- 1) Electrolytic capacitors 330uF/10V is recommended for C1 and 220uF/10V for C2
- 2) 2.2uH Drum choke is recommended for L1, which wound wire diameter should be at least Ø0.7mm.

### Part Number Table

Description	Part Number
AC to DC Converter, 15W, Vin 220V AC, Vout 5 VDC	MPFA15-220S05G2N4
AC to DC Converter, 15W, Vin 220V AC, Vout 12V DC	MPFA15-220S12G2N4
AC to DC Converter, 15W, Vin 220V AC, Vout 24V DC	MPFA15-220S24G2N4

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