6W AC to DC Converter - PCB Mount

multicomp PRO

RoHS Compliant

Features

- Universal Input : 85 - 264V AC/100 - 370V DC
- Operating temperature range: -40°C to +70°C
- High isolation voltage up to 4K V AC
- Regulated output, Low ripple & noise
- Output short circuit, over-current, over-voltage protection
- High efficiency, high reliability
- Plastic case, meets UL94V-0
- EMI performance meets CISPR32 / EN55032 CLASS B
- IEC62368, UL62368, EN62368 approval

This is a compact size power converter. It features universal input voltage, taking both DC and AC input voltage, low power consumption, high efficiency, high reliability, safer isolation. It offers good EMC performance, and is UL & CE certified, and widely used in industrial, electricity, instruments, telecommunication and civil applications.

Note: Please refer to Design Reference when module being used in a bad EMC environment.

Selection Guide

Certification	Part No.*	Output Power	Nominal Output Voltage and Current (Vo/Io)	Efficiency at 230V AC (%) Typ.	Max. Capacitive Load (μF)
UL/CE/CB	MP-LDE06-20B03	4.1W	3.3V/1250mA	70	4000
	MP-LDE06-20B05	6W	5V/1200mA	76	
	MP-LDE06-20B09		9V/660mA	74	1000
	MP-LDE06-20B12		12V/500mA	77	820
	MP-LDE06-20B24		24V/250mA	80	330

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	AC input	85	-	264	V DC
	DC input	100		370	
Input Frequency		47		63	Hz
Input Current	115V AC	-		0.15	A
	230V AC			0.1	
Inrush Current	115V AC	-	10	-	
	230V AC		20	-	
Recommended External Input Fuse		1A/250V, slow fusing, necessary			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	3.3V output	-	±3	-	%
	Other output		±2		
Line Regulation	Full load		±0.5		
Load Regulation	0%-100% load		±1		
Ripple & Noise*	20MHz bandwidth (peak-to-peak value)		50	100	mV
Temperature Drift Coefficient			±0.02	-	%/°C
Short Circuit Protection		Hiccup, Continuous, Self-Recovery			
Over-current Protection		≥110%Io Self-Recovery			
Over-voltage Protection	3.3/5V DC output	≤7.5V DC			
	9V DC output	≤15V DC			
	12/15V DC output	≤20V DC			
	24V DC output	≤30V DC			
Minimum Load		0	-	-	%
Hold-up Time	115V AC input	-	8		ms
	230V AC input		60		

Note: * Ripple and noise are measured by “parallel cable” method, please see AC-DC Converter Application Notes for specific operation.

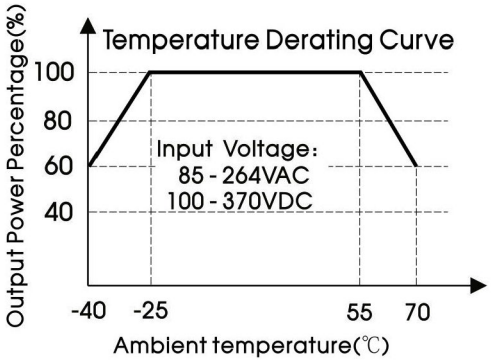
General Specifications

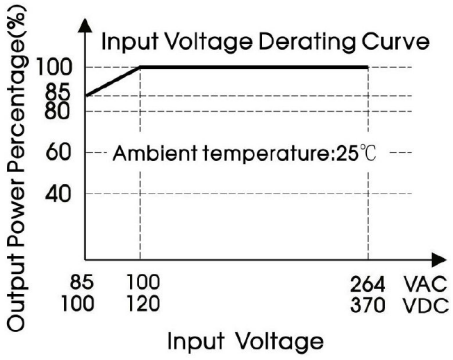
Item		Operating Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-output	Test time: 1min	4000	-	-	V AC
Operating Temperature			-40	-	+70	°C
Storage Temperature					+105	
Storage Humidity			-	-	95	%RH
Welding Temperature		Wave-soldering	260 ± 5°C; time: 5 - 10s			
		Manual-welding	360 ± 10°C; time: 3 - 5s			
Switching Frequency			-	100	-	kHz
Power Derating		-40°C to -25°C	2.66	-	-	%/°C
		+55°C to +70°C				
		85V AC to 100V AC	1			%/V AC
Safety Standard			IEC62368/EN62368/UL62368			
Safety Certification			IEC62368/EN62368/UL62368			
Safety Class			CLASS I I			
MTBF			MIL-HDBK-217F@25°C > 300,000 h			

Physical Specifications		
Casing Material		Black flame-retardant and heat-resistant plastic (UL94 V-0)
Dimensions	DIP	50.8mm × 25.4mm × 15.36mm
	A2S chassis mounting	76mm × 31.5mm × 24.16mm
	A4S Din-Rail mounting	76mm × 31.5mm × 28.76mm
Weight	DIP	31g (Typ.)
	A2S chassis mounting	52 g (Typ.)
	A4S Din-Rail mounting	70 g (Typ.)
Cooling method		Free air convection

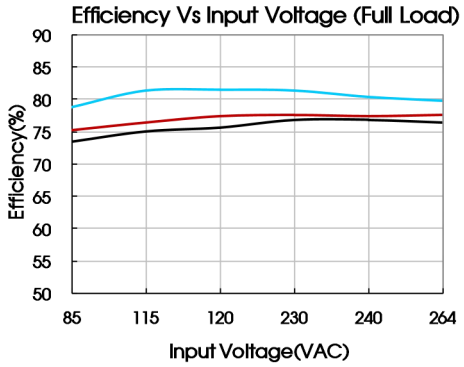
EMC Specifications			
EMI	CE	CISPR32/EN55032 CLASS B	
	RE	CISPR32/EN55032 CLASS B	
EMS	ESD	IEC/EN61000-4-2 Contact ±6KV/ Air ±8KV	perf. Criteria B
	RS	IEC/EN61000-4-3 10V/m	perf. Criteria A
	EFT	IEC/EN 61000-4-4 ± 2KV	perf. Criteria B
		IEC/EN 61000-4-4 ±4KV (See Fig. 2 for recommended circuit)	perf. Criteria B
	Surge	IEC/EN 61000-4-5 line to line ±1 KV	perf. Criteria B
		IEC/EN 61000-4-5 line to line ±2 KV/line to ground ±4 KV (See Fig. 2 for recommended circuit)	perf. Criteria B
	CS	IEC/EN61000-4-6 10Vr.m.s	perf. Criteria A
	Voltage dips, short interruptions and voltage variations	IEC/EN61000-4-11 0%,70%	perf. Criteria B

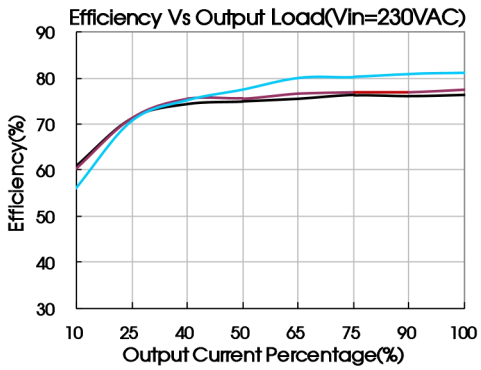
Product Characteristic Curve





Note: ①When input 85-100VAC/100-120VDC, it need to be voltage derated on basis of temperature derating;
②This product is suitable for use in natural air cooling environments, if in a closed environment, please contact our company's FAE.





Design Reference

1. Typical application

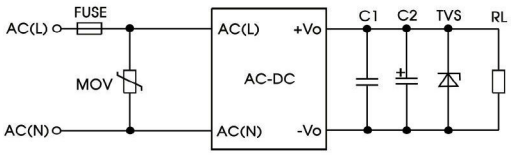


Fig. 1

Part No.	C1(μF)	C2(μF)	FUSE	MOV	TVS tube
MP-LDE06-20B03	1	220	1A/250V, slow fusing, necessary	S14K350	SMBJ7.0A
MP-LDE06-20B05					
MP-LDE06-20B09		100			SMBJ12A
MP-LDE06-20B12					SMBJ20A
MP-LDE06-20B24		47			SMBJ30A

Note:
Output filtering capacitor C2 is a electrolytic capacitor, it is recommended to use high frequency and low impedance electrolytic capacitor. For capacitance and current of capacitor please refer to manufacture's datasheet. Output capacitor voltage reduced to at least 80%. C1 is ceramic capacitor, which is used to filter high-frequency noise. TVS is a recommended component to protect post-circuits if converter fails.

2. EMC solution-recommended circuit

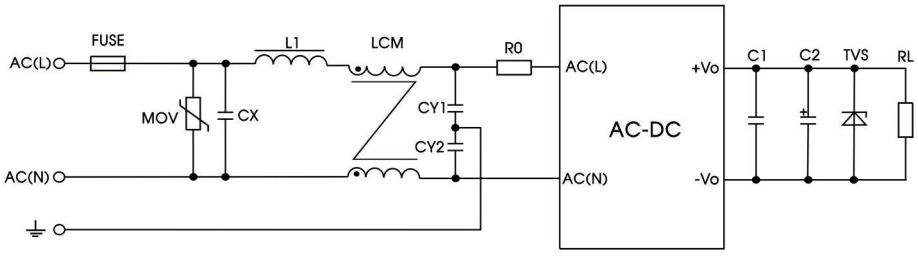
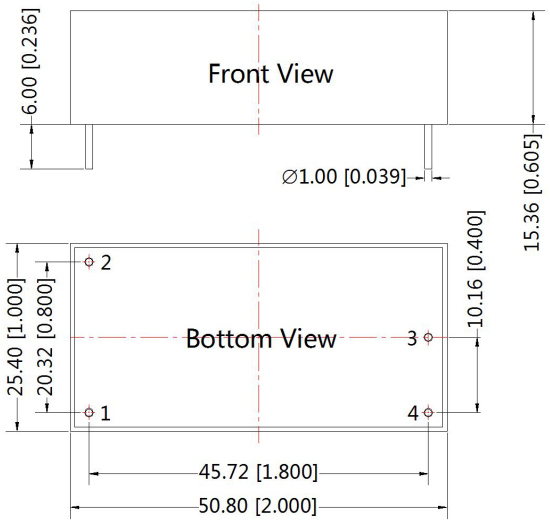
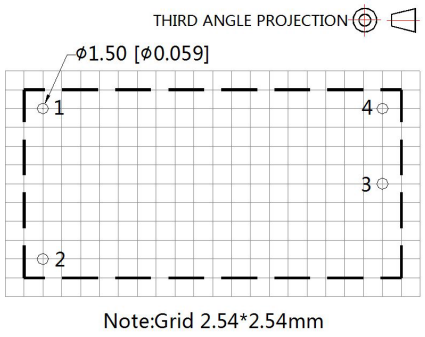


Fig 2

Element model	Recommended value
MOV	S14K350
CX	0.1μF/275V AC
L1	4.7uH/2A
CY1	1nF/400V AC
CY2	1nF /400V AC
LCM	2.2mH, recommended to use MORNSUN's FL2D-10-222
FUSE	2A/250V, slow fusing, necessary
R0	33Ω/3W

Dimensions and Recommended Layout





Note:Grid 2.54*2.54mm

Pin-Out	
Pin	Function
1	AC(N)
2	AC(L)
3	-Vo
4	+Vo

Note:
Unit :mm[inch]
Pin diameter tolerances :±0.10[±0.004]
General tolerances:±0.50[±0.020]