60W AC to DC Converter - PCB Mount

multicomp PRO

RoHS Compliant

Features

- Universal 85V AC to 264V AC or 100V AC to 370V DC input voltage
- Operating ambient temperature range: -40°C to +70°C
- High I/O isolation test voltage up to 4000V AC
- High reliability, high power density, high efficiency
- Output short circuit, over-current, over-voltage protection
- Regulated output, low ripple & noise
- Plastic case meets UL94V-0 flammability
- EMI performance meets CISPR32 / EN55032 CLASS B
- Designed to meet IEC/EN/UL62368 safety standards
- (Approval Pending)

This is a compact size power converters. It features universal AC input and at the same time accepts DC input voltage, low power consumption, high efficiency, high reliability, high power density, reinforced isolation. It offers good EMC performance compliant to IEC/EN61000-4 and CISPR32/EN55032 and meets IEC/UL/EN62368 standards. The converters are widely used in industrial, power, instrumentation, communication and civil applications. For extremely harsh EMC environment, we recommend using the application circuit show in Design Reference of this datasheet.

Selection Guide

Certification	Part No.*	Output Power	Nominal Output Voltage and Current	Efficiency at 230V AC (%) Typ.	Capacitive Load (µF) Max.
CE/UL/CB (Pending)	MP-LDE60-20B05	50W	5V/10000mA	84	20000
	MP-LDE60-20B12	60W	12V/5000mA	87	4000
	MP-LDE60-20B24		24V/2500mA	89	1800
	MP-LDE60-20B48		48V/1250mA	90	470

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	-		1.8	A
	230V AC			1	
Inrush Current	115V AC	-	45	-	
	230V AC		90	-	
Leakage Current	240V AC/50Hz	0.25mA RMS Max.			
Recommended External Input Fuse		3.15A/250V, slow-blow, required			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy		-	±2	-	%
Line Regulation	Full load		±0.5		
Load Regulation	0%-100% load		±1		
Ripple & Noise*	20MHz bandwidth (peak-to-peak value)			120	mV
Stand-by Power Consumption				0.5	W
Temperature Coefficient			-	±0.02	%/°C
Short Circuit Protection		Hiccup, continuous, self-recovery			
Over-current Protection		≥110%Io, self-recovery			
Over-voltage Protection	5V DC output	≤ 9V DC (Output voltage clamp or hiccup)			
	12V DC output	≤ 16V DC (Output voltage clamp or hiccup)			
	15V DC output	≤ 25V DC (Output voltage clamp or hiccup)			
	24V DC output	≤ 35V DC (Output voltage clamp or hiccup)			
	48V DC output	≤ 60V DC (Output voltage clamp or hiccup)			
Minimum Load		0	-	-	%
Hold-up Time	115V AC input	-	8	-	ms
	230V AC input		65		
Note: *The “parallel cable” method is used for ripple and noise test, please refer to AC-DC Converter Application Notes for specific information.					

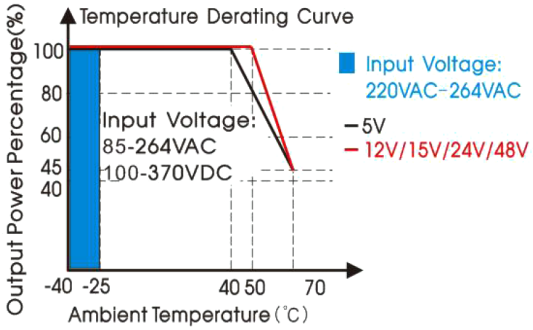
General Specifications

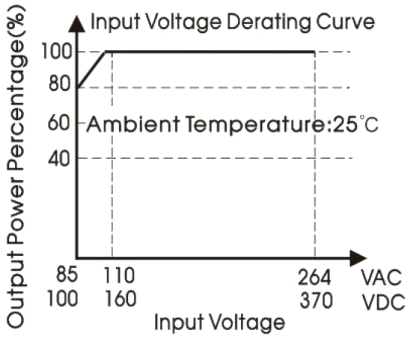
Item		Operating Conditions	Min.	Typ.	Max.	Unit
Isolation	Input-output	Electric Strength Test for 1min., Leakage current <5mA	4000	-	-	V AC
Operating Temperature			-40	-	+70	°C
Storage Temperature					+85	
Storage Humidity			-	-	95	%RH
Soldering Temperature		Wave-Soldering	260 ± 5°C; time: 5 - 10s			
		Manual-Welding	360 ± 10°C; time: 3 - 5s			
Power Derating		+40°C to +70°C (5V Output)	1.83	-	-	%/°C
		+50°C to +70°C (12V, 15V, 24V, 48V Output)	2.75			
		85V AC - 110V AC	0.8			%/V AC
Safety Standard			IEC62368/EN62368/UL62368			
Safety Certification			IEC62368/EN62368/UL62368 (Pending)			
Safety Class			CLASS I I			
MTBF			MIL-HDBK-217F@25°C > 300,000 h			

Mechanical Specifications	
Casing Material	Black plastic, flame-retardant and heat-resistant (UL94V-0)
Dimension	87mm × 52mm × 29.5mm
Weight	210g (Typ.)
Cooling Method	Free air convection

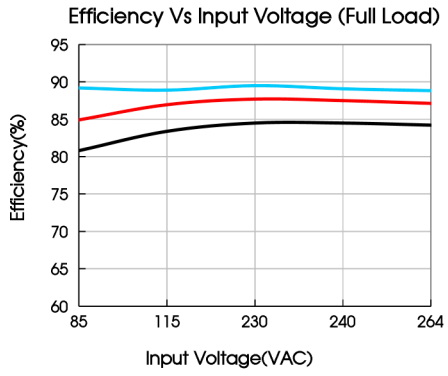
Electromagnetic Compatibility (EMC)				
Emissions	CE	CISPR32/EN55032	CLASS B	
	RE	CISPR32/EN55032	CLASS B	
Immunity	ESD	IEC/EN61000-4-2	Contact ±6KV/ Air ±8KV	perf. Criteria B
	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
	EFT	IEC/EN 61000-4-4	±4KV	perf. Criteria B
	Surge	IEC/EN 61000-4-5	line to line ±1KV	perf. Criteria B
		IEC/EN 61000-4-5	line to line ±2KV/line to ground ±4KV (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

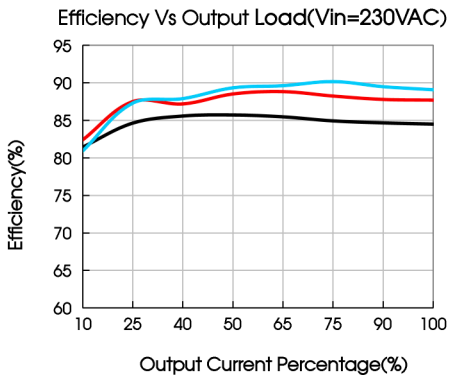
Product Characteristic Curve





Note: ① With an AC input between 85-110VAC and a DC input between 100-160VDC, the output power must be derated as per temperature derating curves;
② This product is suitable for applications using natural air cooling; for applications in closed environment please consult factory or one of our FAE.





Design Reference

1. Typical application

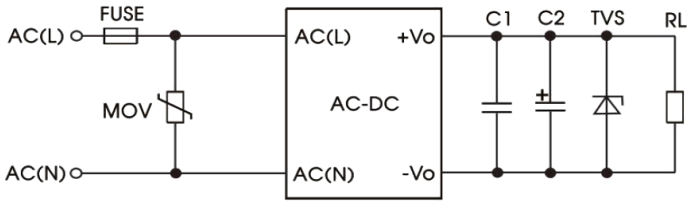


Fig. 1: Typical circuit diagram

Part No.	C1(μF)	C2(μF)	FUSE	MOV	TVS tube
MP-LDE60-20B05	1	680	3.15A/250V, slow-blow	S10K300	SMBJ7A
MP-LDE60-20B12		330			SMBJ20A
MP-LDE60-20B24		200			SMBJ30A
MP-LDE60-20B48		100			SMBJ64A

Output Filter Components:

We recommend using an electrolytic capacitor with high frequency, and low ESR rating for C2 (refer to manufacture's datasheet). Choose a Capacitor voltage rating with at least 20% margin, in other words not exceeding 80%. C1 is a ceramic capacitor used for filtering high-frequency noise and TVS is a recommended suppressor diode to protect the application in case of a converter failure.

2. EMC compliance recommended circuit

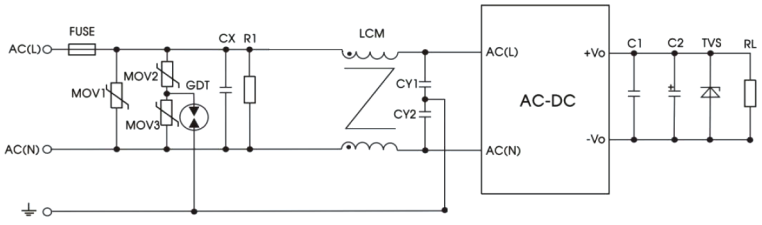
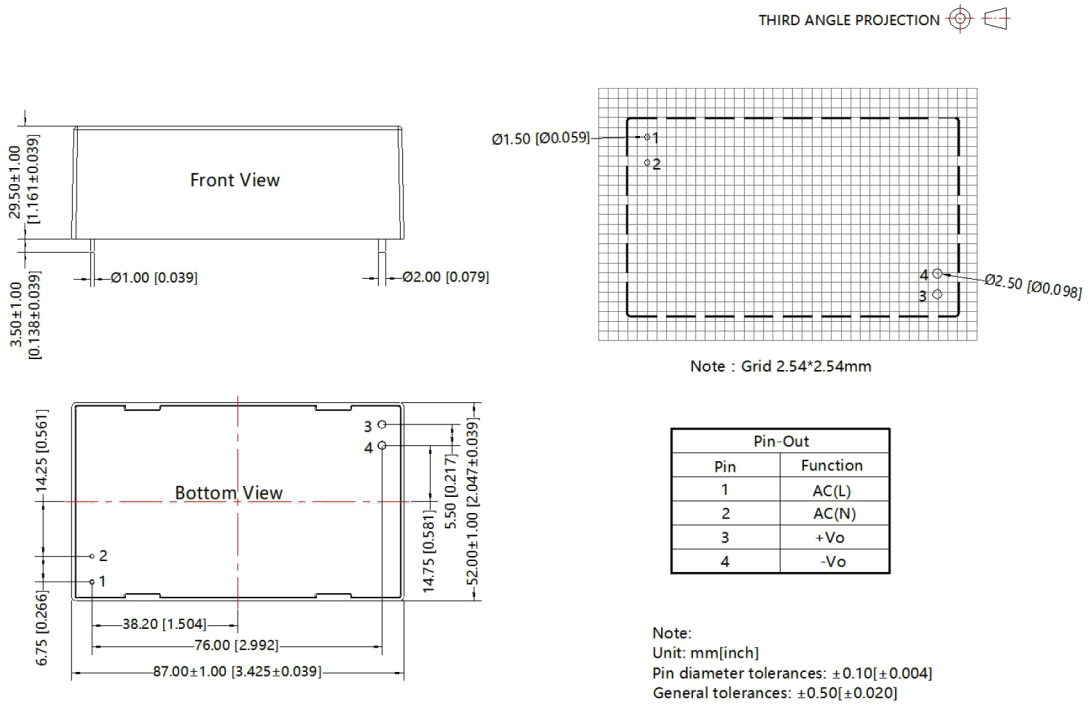


Fig 2: EMC application circuit with higher requirements

Component	Recommended value
MOV1	S20K300
MOV2/MOV3	S14K300
CX	0.22μF/275V AC
CY1/CY2	1nF/400V AC
R1	1MΩ/2W
LDM	4.7uH
LCM	2mH
GDT	EM3600XS
FUSE	3.15A/250V slow-blow required

Dimensions and Recommended Layout



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

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