

15W, AC-DC converter



FEATURES

- Universal Input : 85 - 264VAC, 100 - 370VDC, 50/60Hz
- Regulated output , Low ripple & noise
- Low no-load power consumption < 0.1W
- High efficiency up to 86%
- Output short circuit, over-current, over-voltage protection
- Meets EN60601-1, ANSI/AAMI ES60601-1, CAN/CSA-C22.2 No. 60601-1 standards (3rd Edition 2xMOPP)
- Mounting: PCB mounting,
- Meets 5000m altitude requirements



RoHS



LH15-20BxxMU series 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. Meets EN60601-1, ANSI/AAMI ES60601-1, CAN/CSA-C22.2 No. 60601-1 standards (2xMOPP), and widely used in medical, industrial, telecommunication and instrumentation applications.

Selection Guide

RS Stock No.	Part No.	Output Power	Nominal Output Voltage and Current(Vo/Io)	Efficiency (230VAC, %/Typ.)	Max. Capacitive Load(µF)
1446284	LH15-20B05MU	14W	5V/2800mA	78	8000
1446285	LH15-20B12MU	15W	12V/1250mA	83	4000
1446286	LH15-20B24MU		24V/625mA	86	800

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	AC input	85	--	264	VAC
	DC input	100	--	370	VDC
Input frequency*		47	--	440	Hz
Input current	115VAC	--	--	0.37	A
	230VAC	--	--	0.22	
Inrush current	115VAC	--	10	--	
	230VAC	--	20	--	
Leakage current		0.1mA RMS typ./264VAC/60Hz			
Recommended external input fuse		2A/250V, slow blow			

*Medical Certification Input frequency range: 47-63 Hz

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	Main circuit	--	±2	--	%
Line Regulation	Full load	--	±0.5	--	
Load Regulation		--	±1	--	
Ripple & Noise	20MHz bandwidth (peak-peak value)	--	50	100	mV
Temperature Coefficient		--	±0.02	--	%/°C
Short Circuit Protection		Continuous, self-recovery			
Over-current Protection		≥110%Io self-recovery			
Over-voltage Protection	5VDC Output	≤7.5VDC			
	12VDC Output	≤20VDC			
	24VDC Output	≤30VDC			
Min. Load		0	--	--	%
Hold-up Time	115VAC input	--	15	--	ms
	230VAC input	--	80	--	

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-output	4000	--	--	VAC
	Test time: 1min Leakage current $\leq 5\text{mA}$				
Operating Temperature		-40	--	+70	°C
Storage Temperature		-40	--	+85	
Storage Humidity		--	--	95	%RH
Soldering Temperature	Wave-soldering	260 \pm 5°C; time: 5 - 10s			
	Manual-welding	360 \pm 10°C; time: 3 - 5s			
Switching Frequency			65		kHz
Power Derating	-40°C to -25°C	3.3	--	--	% / °C
	+55°C to +70°C	3.3	--	--	
Safety Standard		EN60601-1, ANSI/AAMI ES60601-1, CAN/CSA-C22.2 No. 60601-1			
Safety Certification		EN60601-1, ANSI/AAMI ES60601-1, CAN/CSA-C22.2 No. 60601-1			
Safety Class		CLASS II			
Insulation Level	Primary to Secondary	2xMOPP			
MTBF		MIL-HDBK-217F@25°C \geq 300,000 h			

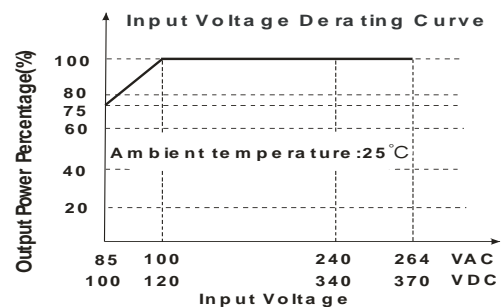
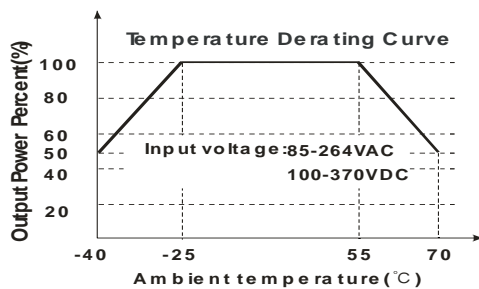
Physical Specifications

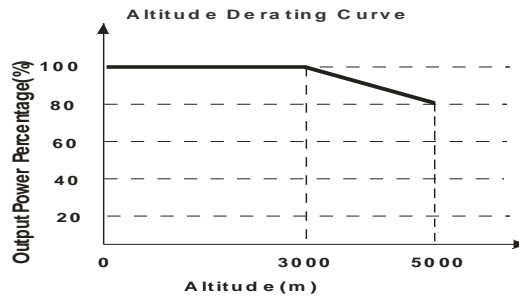
Casing Material	Black flame-retardant and heat-resistant plastic (UL94 V-0)				
Dimension	Horizontal package	62.00*45.00* 22.50mm			
Weight	Horizontal package	85g (Typ.)			
Cooling method	Free air convection				

EMC Specifications

EMI	CE	EN55011(CISPR11) / EN55022(CISPR22) CLASS B			
	RE	EN55011(CISPR11) / EN55022(CISPR22) CLASS B			
EMS	ESD	IEC/EN61000-4-2	Contact $\pm 6\text{KV}$ /Air $\pm 8\text{KV}$	Perf. Criteria B	
	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A	
	EFT	IEC/EN61000-4-4	$\pm 2\text{KV}$	perf. Criteria B	
		IEC/EN61000-4-4	$\pm 4\text{KV}$ (See Fig. 2 for recommended circuit)	perf. Criteria B	
	Surge	IEC/EN61000-4-5	line to line $\pm 1\text{KV}$	perf. Criteria B	
		IEC/EN61000-4-5	line to line $\pm 2\text{KV}$ (See Fig. 2 for recommended circuit)	perf. Criteria B	
	CS	IEC/EN61000-4-6	10 Vr.m.s	perf. Criteria A	
	Voltage dips, short interruptions and voltage variations immunity	IEC/EN61000-4-11	0%,70%	perf. Criteria B	

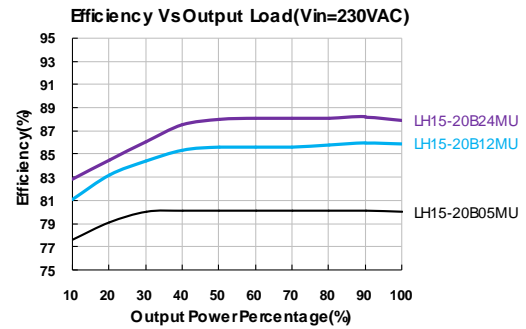
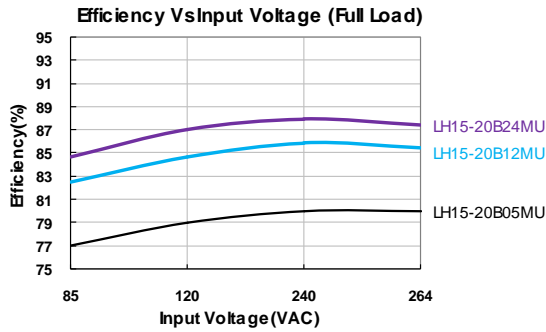
Product Characteristic Curve





Note: When input 85-100VAC/100-120VDC, it need to be voltage derated on basis of temperature derating;
Altitude should be derated based on temperature derating when it is 3000 - 5000m;

This 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 circuit

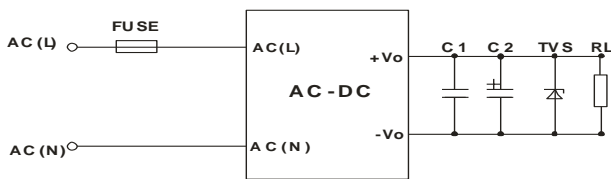


Fig. 1: Typical application circuit

Element model	C2(μF)	TVS1
LH15-10B05MU	680	SMBJ7.0A
LH15-10B12MU	470	SMBJ20A
LH15-10B15MU	220	SMBJ20A
LH15-10B18MU	220	SMBJ30A
LH15-10B24MU	68	SMBJ30A

Note:
Note: Output filtering capacitors C2 is 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. Capacitor withstand voltage derating should be 80% or above. C1 is ceramic capacitor, which is used to filter high-frequency noise, **advice use 1μF**. TVS is a recommended component to protect post-circuits if converter fails. **External input FUSE model is recommended to use 2A/250V slow fusing.**

2. EMC solution-recommended circuit

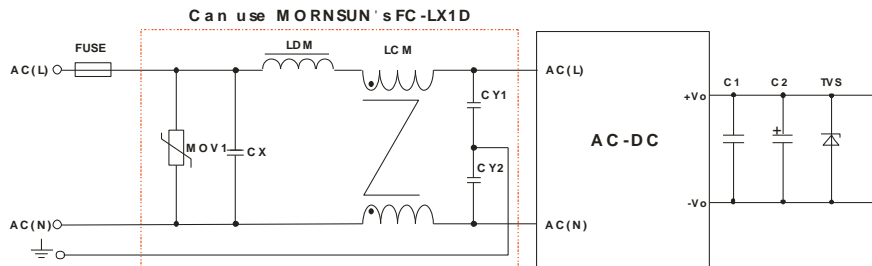
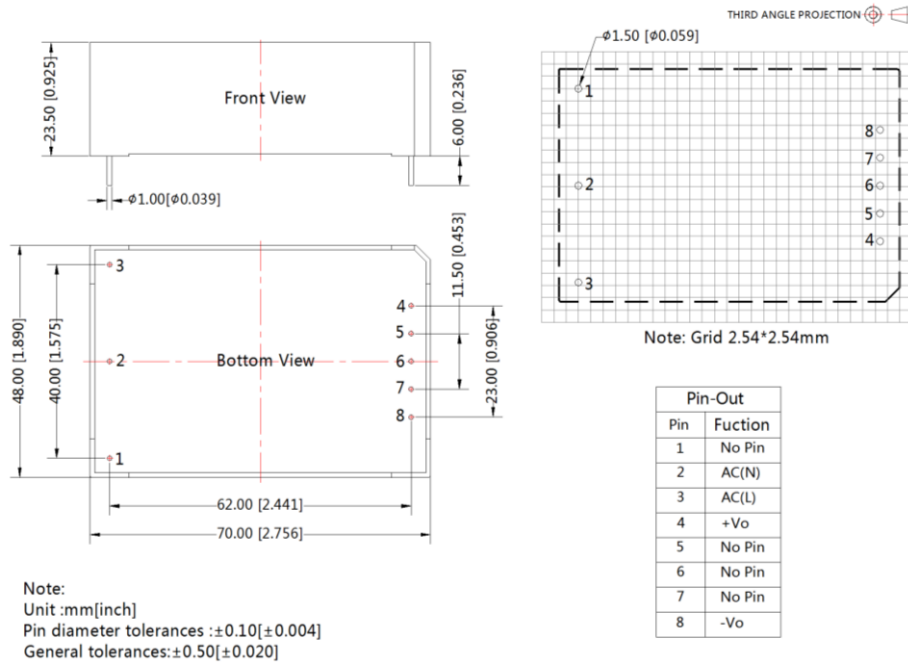


Fig 2: EMC Recommended circuit with higher requirements

Element model	Recommended value
MOV1	S14K300
CY1 , CY2	1nF/400VAC
CX	0.1μF/275VAC
LCM	10mH, recommended to use MORNSUN's FL2D-Z5-103
LDM	4.7μH/2A
FC-LX1D	2KV/4KV EMC filter
FUSE	2A/250V slow fusing, necessary

Dimensions and Recommended Layout



Note:

1. If the product is not operated within the required load range, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of $T_a=25^{\circ}\text{C}$, humidity<75% with nominal input voltage and rated output load;
3. All index testing methods in this datasheet are based on our Company's corporate standards;
4. The performance parameters of the product models listed in this manual are as above, but some parameters of non-standard model products may exceed the requirements mentioned above. Please contact our technicians directly for specific information;
5. We can provide product customization service;
6. Specifications are subject to change without prior notice.