AC/DC Converter

RoHS 3 years Warranty

FEATURES

- Input voltage range: 85 - 264VAC/100 - 370VDC
- AC and DC dual-use(input from the same terminal)
- Active PFC
- High efficiency
- 4KVAC high isolation voltage
- Low ripple & noise
- Output short circuit, over-current, over–voltage protection

LH85-20B12 is 84W efficient environmental-protection AC-DC module power supplies which have advantages of high surge resistance, high efficiency, high reliability, low power consumption and high safety isolation, etc. The series products are widely used in industrial control, switch and other power industries.

Selection Guide

Part No.	Output Power	Nominal Output Voltage and Current(Vo/Io)	Efficiency (230VAC, %/Typ.)	Max. Capacitive Load (μF)
LH85-20B12	84W	12V/7A	87	10000

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	--	63	Hz
Input Current	115VAC	--	--	1.4	A
	230VAC	--	--	0.7	
Inrush Current	115VAC	--	50	--	
	230VAC	--	70	--	
Power Factor	115VAC	--	0.96	--	--
	230VAC	--	0.90	--	
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy		--	±2	--	%
Line Regulation	Full load	--	±0.5	--	
Load Regulation		--	±1	--	
Ripple & Noise*	20MHz bandwidth (peak-peak value)	--	--	150	mV
Temperature Coefficient		--	±0.02	--	%/℃
Short Circuit Protection		Hiccup,Continuous, self-recovery			
Over-current Protection		≥110%Io self-recovery			
Over-voltage Protection		≤16VDC			
Min. Load		0	--	--	%
Trim		-10	--	+10	

Note: * Rely test method is adopted test the ripple and noise, please see AC-DC Converter Application Notes for specific operation methods.

General Specifications

Item		Operating Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-output	Test time: 1min, Leakage current <5mA	4000	--	--	VAC
	Input- ⏚		1500	--	--	
	Output- ⏚		500	--	--	

Operating Temperature		-40	--	+85	℃
Storage Temperature		-40	--	+85	
Storage Humidity		--	--	95	%RH
Welding Temperature	Wave-soldering	260 ± 5℃; time: 5 - 10s			
	Manual-welding	360 ± 10℃; time: 3 - 5s			
Switching Frequency		--	100	--	KHz
Power Derating	+37℃ to +70℃	2.6	--	--	%/℃
Safety Class		CLASS I			

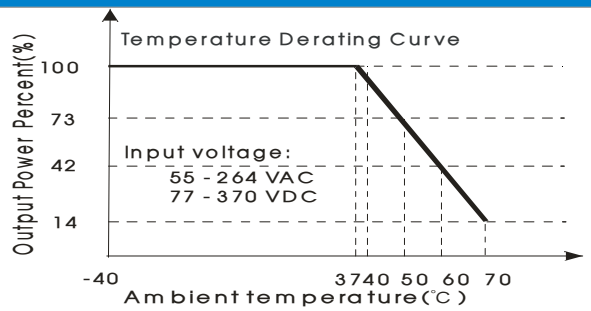
Physical Specifications

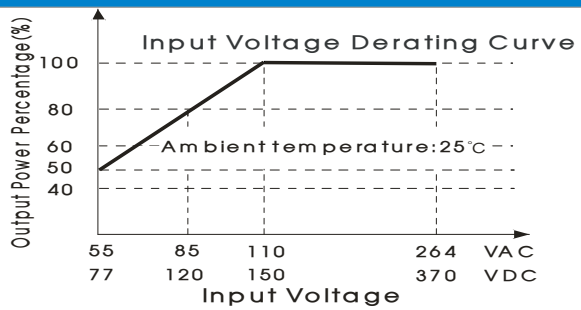
Casing Material	Black flame-retardant and heat-resistant plastic (UL94V-0)
Dimension	109.00*58.50*30.00 mm
Weight	300g (Typ.)
Cooling Method	Free air convection

EMC Specifications

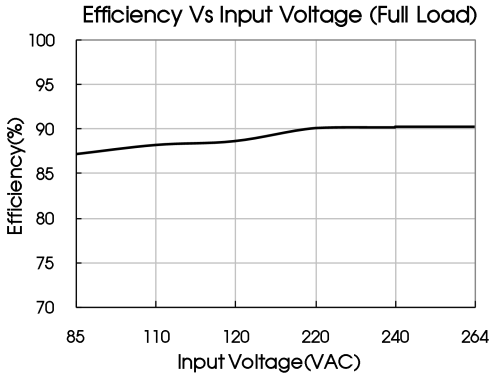
EMI	CE	CISPR32/EN55032 CLASS B	
	RE	CISPR32/EN55032 CLASS A	
EMS	ESD	IEC/EN61000-4-2 Contact ±6KV/Air ±8KV	Perf. Criteria B
	RS	IEC/EN61000-4-3 10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4 ±4KV	perf. Criteria B
	Surge	IEC/EN61000-4-5 line to line ±2KV/line to ground ±4KV	perf. Criteria B
	CS	IEC/EN61000-4-6 10 Vr.m.s	perf. Criteria A
	Voltage dips, short interruptions and voltage variations immunity	IEC/EN61000-4-11 0%,70%	perf. Criteria B

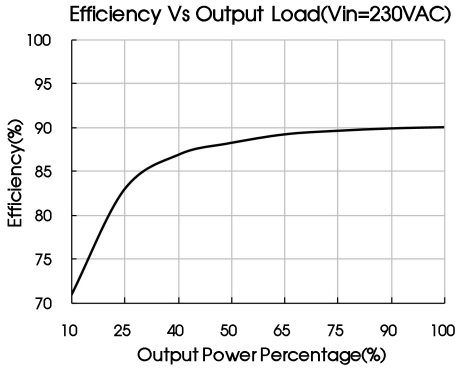
Product Characteristic Curve





Note: ①Input voltage should be derated based on temperature derating when it is 55 - 110VAC/77 - 150VDC;
②55 VAC - 110VAC input voltage range for transient voltage
③This 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

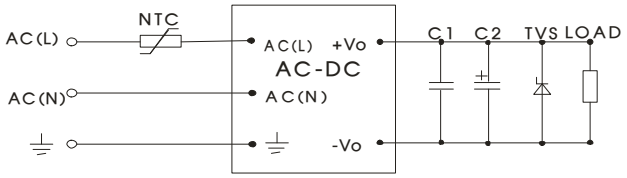


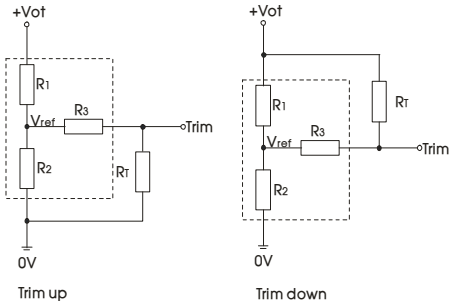
Fig. 1

Model	C1(μF)	C2(μF)	NTC	VS
LH85-20B12	1	330	5D-9	SMBJ20A

Note:

Output filtering capacitor 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.Capacitance withstand 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. Application of Trim and calculation of Trim resistance



Applied circuits of Trim (Part in broken line is the interior of models)

Calculation formula of Trim resistance:

$$\text{up: } R_T = \frac{aR_2}{R_2 - a} - R_3 \qquad a = \frac{V_{ref}}{V_{ot} - V_{ref}} \cdot R_1$$

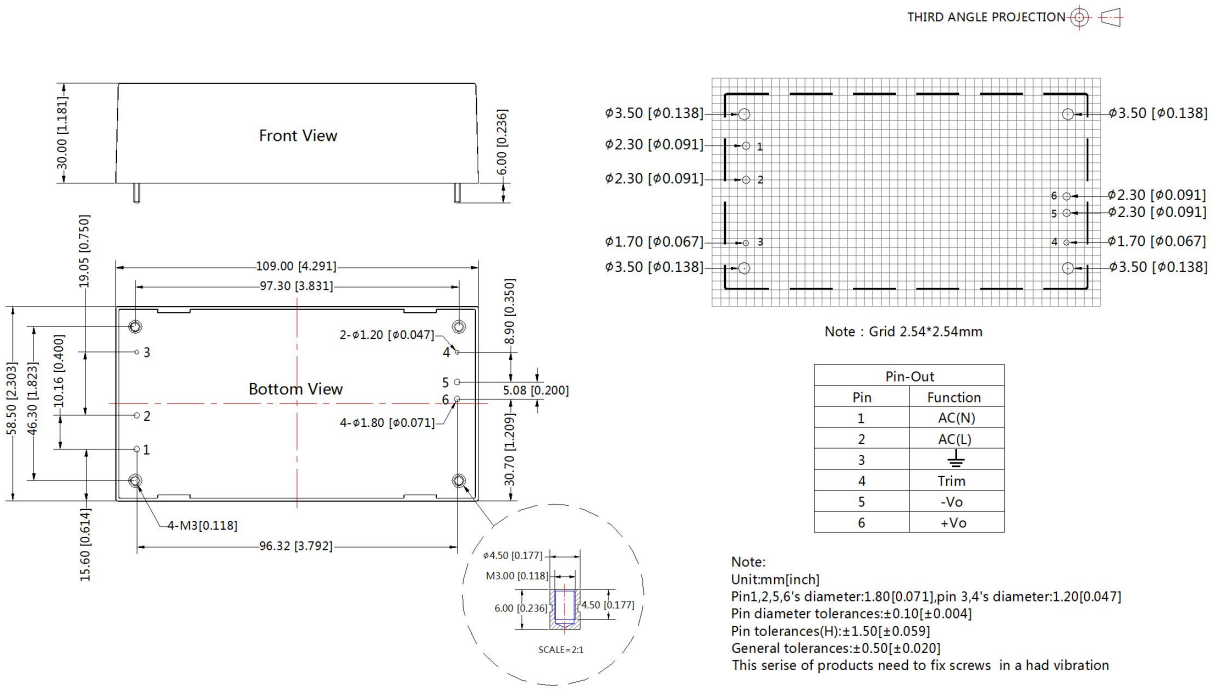
$$\text{down: } R_T = \frac{aR_1}{R_1 - a} - R_3 \qquad a = \frac{V_{ot} - V_{ref}}{V_{ref}} \cdot R_2$$

R_T is Trim resistance
a is a self-defined parameter, with no real meaning.

Vout	R1(KΩ)	R2(KΩ)	R3(KΩ)	Vref(V)	Vot(V)
12V	33	8.66	10	2.5	Output voltage after regulation, variation ≤ ±10%

3.For more information Please find the application note on www.mornsun-power.com

Dimensions and Recommended Layout



Pin-Out	
Pin	Function
1	AC(N)
2	AC(L)
3	⏚
4	Trim
5	-Vo
6	+Vo

Note:
Unit:mm[inch]
Pin1,2,5,6's diameter:1.80[0.071],pin 3,4's diameter:1.20[0.047]
Pin diameter tolerances:±0.10[±0.004]
Pin tolerances(H):±1.50[±0.059]
General tolerances:±0.50[±0.020]
This serise of products need to fix screws in a had vibration

Note:

1. Packing information please refer to Product Packing Information which can be downloaded from www.mornsun-power.com. Packing bag number: 58220020;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, 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. We can provide product customization service, please contact our technicians directly for specific information;
5. Products are related to laws and regulations: see "Features" and "EMC";
6. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

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