

30W, special localized power supply for electricity industry & smart grid



RoHS



FEATURES

- Special for electricity industry smart grid
- Localized power supply
- Ultra-wide 85 - 305VAC and 88- 430VDC input voltage range
- Ultra-wide operating ambient temperature range: -40°C to +85°C
- High I/O isolation voltage up to 4000VAC
- High reliability, low output ripple & noise
- Immunity meets electricity standard Level 4
- Meets impulse voltage requirements of 1.2/50us 5KV
- Design refer to UL/EN/IEC62368

LO30-23BxxE-G series is a special localized power supply design for electricity industry and smart grid industry that meets the power industry standards. It features AC input and at the same time accepts DC input voltage, with ultra-wide input voltage range, wide operating temperature range, high EMS level, high reliability, and high isolation. EMC and safety specifications meet IEC/EN61000-4, CISPR32/EN55032, UL/EN/IEC62368 standards. It is suitable for smart grid occasions with poor power quality and high reliability requirements, such as smart power transmission and substations. It also can be used in microcomputer protection equipment, bus voltage protection equipment or equipment with high reliability requirements that require 110VDC input voltage.

Selection Guide

Certification	Part No.	Output Power (W)	Nominal Output Voltage and Current (Vo/Io)	Output Voltage Adjustable Range ADJ (V)*	Efficiency at 230VAC(%) Typ.	Capacitive Load (μF) Max.
/	LO30-23B03E-G	19.8	3.3V/6.0A	2.97-3.63	83	30000
	LO30-23B05E-G	30.0	5V/6.0A	4.5-5.5	85	30000
	LO30-23B12E-G	30.0	12V/2.5A	10.8-13.2	86	15000
	LO30-23B15E-G	30.0	15V/2.0A	13.5-16.5	87	12000
	LO30-23B24E-G	31.2	24V/1.3A	21.6-26.4	88	2000

Note: *The actual adjustment range may extend outside the values stated, care should be exercised to ensure that the output voltage and power levels remain within the published maximum values.

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	AC input	85	--	305	VAC
	DC input	88	--	430	VDC
Input Frequency		47	--	63	Hz
Input Current	115VAC	--	--	0.75	A
	230VAC	--	--	0.45	
Inrush Current	115VAC	--	15	--	A
	230VAC	--	30	--	
Leakage Current	277VAC	0.3mA RMS max.			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit	
Output Voltage Accuracy	All load range	3.3V/5V	--	--	±2.0	
		Other output	--	--	±1.0	
Line Regulation	Rated load	3.3V/5V	--	±0.8	--	%
		Other output	--	±0.4	--	
Load Regulation	230VAC	--	±1.0	--		
Minimum Load		0	--	--		
Ripple & Noise*	100MHz bandwidth (peak-to-peak value)	--	50	120	mV	
Stand-by Power Consumption	230VAC	--	--	0.5	W	

Temperature Coefficient		--	±0.02	--	%/°C
Short Circuit Protection		Hiccup, continuous, self-recovery			
Over-current Protection		120% - 300% I _o , self-recovery			
Over-voltage Protection	3.3V	≤5.25V	Output voltage hiccup		
	5V	≤7.0V			
	12V	≤16.0V			
	15V	≤20.3V			
	24V	≤32.4V			
Start-up Delay Time		--	0.5	1	s
Hold-up Time	115VAC input, I _o =100%	--	40	--	ms
	230VAC input, I _o =100%	--	160	--	

Note: *The "Tip and barrel method" is used for ripple and noise test, with a 0.1uf ceramic capacitor & 100uf parallel capacitor, 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 <8mA	4000	--	--	VAC
	Input - PE	Electric Strength Test for 1min., leakage current <5mA	2000	--	--	
	Output - PE	Electric Strength Test for 1min., leakage current <10mA	500	--	--	
Insulation Resistance	Input - output	Testing voltage: 500VDC	100	--	--	MΩ
	Input - PE					
	Output - PE					
Impulse Withstand Voltage	Input - output Input - PE	5KV, 1.2/50 us Impulse voltage				
Operating Temperature		-40	--	+85	°C	
Storage Temperature		-40	--	+85		
Operating Humidity	Non-condensing	--	--	90	%RH	
Storage Humidity		--	--	90		
Output Power Derating	Operating temperature derating	-40°C to -25°C	2.00	--	--	% / °C
		+50°C to +70°C	1.75	--	--	
		+70°C to +85°C	1.70	--	--	
	Input voltage derating	85VAC - 100VAC	1.33	--	--	% / VAC
		277VAC - 305VAC	0.72	--	--	
Altitude derating	2000m-5000m	5.00	--	--	% / Km	
Safety Certification		Design refer to UL/EN/IEC62368-1				
Safety Class		CLASS I				
MTBF	MIL-HDBK-217F@25°C	≥300,000 h				

Mechanical Specifications

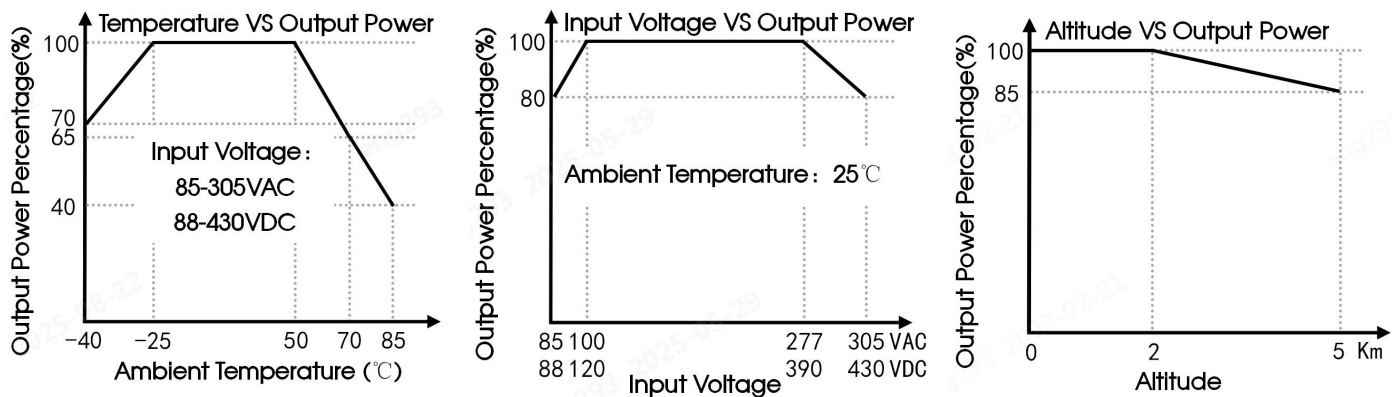
Dimension	105.00 x 50.00 x 30.00mm
Weight	110g (Typ.)
Cooling Method	Free air convection

Electromagnetic Compatibility (EMC)

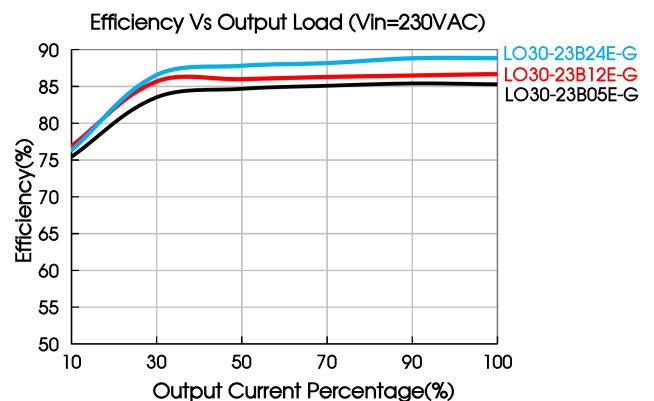
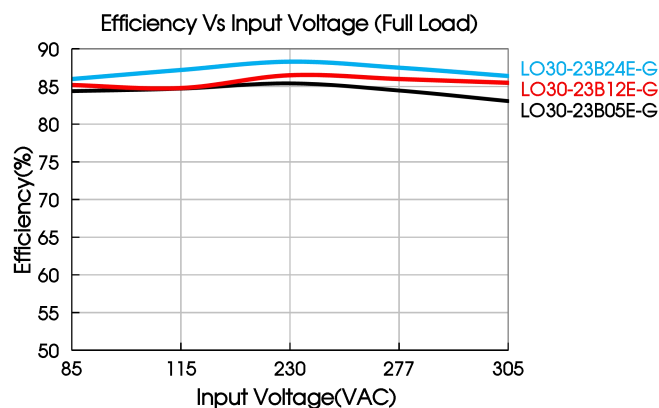
Emissions	CE	CISPR32/EN55032	CLASS B	
	RE	CISPR32/EN55032	CLASS B	
	Harmonic current	IEC/EN61000-3-2	CLASS A	
	Voltage flicker	IEC/EN61000-3-3	CLASS A	
Immunity	ESD	IEC/EN61000-4-2	Contact $\pm 8KV$ / Air $\pm 15KV$	Perf. Criteria A
	RS	IEC/EN61000-4-3	10V/m	Perf. Criteria A
	EFT	IEC/EN61000-4-4	$\pm 4.4KV$	Perf. Criteria A
	Surge	IEC/EN61000-4-5	Line to line $\pm 2.2KV$ / line to ground $\pm 4.4KV$	Perf. Criteria A
	CS	IEC/EN61000-4-6	10Vr.m.s	Perf. Criteria A
	PFMF	IEC61850-3/IEC61000-6-5	100A/m	Perf. Criteria A
	Voltage variations*	IEC/EN61000-4-11	70% U_n , 25/30 cycle(50/60Hz); 40% U_n , 10/12 cycle(50/60Hz); 0% U_n , 1 cycle	Perf. Criteria A
	Voltage interruptions*	IEC/EN61000-4-11	0% U_n , 250/300 cycle(50/60Hz)	Perf. Criteria C
	Damping vibration immunity	IEC/EN61000-4-18	$\pm 1.25KV/\pm 2.5KV(100kHz \& 1MHz)$	Perf. Criteria A

Note: * U_n , Maximum input nominal voltage.

Product Characteristic Curve



Note: 1. With an AC input between 85-100VAC/277-305VAC and a DC input between 88-120VDC/390-430VDC, the output power must be derated as per temperature derating curves;
2. This product is suitable for applications using natural free air cooling; for applications in closed environment please consult Mornsun FAE.



Design Reference

1. Typical application

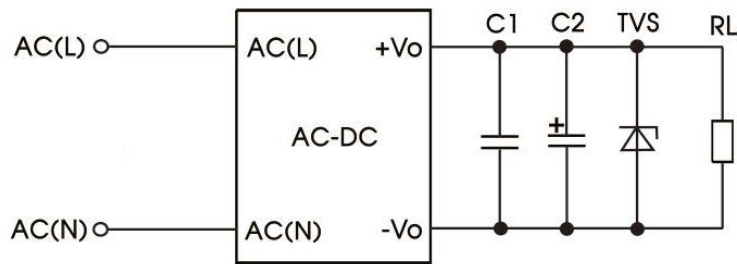


Fig. 1: Typical circuit diagram

Part no.	C1	C2	TVS
LO30-23B03E-G	0.1μF/50V	100μF/50V	SMBJ7.0A
LO30-23B05E-G			
LO30-23B12E-G			SMBJ20A
LO30-23B15E-G			
LO30-23B24E-G			

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. For additional information please refer to application notes on www.mornsun-power.com.

Dimensions and Recommended Layout

THIRD ANGLE PROJECTION

Pin-Out			
Connectors	Pin	Mark	Client Connectors
JP1	1	PE	Housing: JST VHR Contact: JSTSVH-21T-P1.1 or equivalent
	2	No Pin	
	3	AC(N)	
	4	No Pin	
	5	AC(L)	
JP2	6	+Vo	Housing: JST VHR Contact: JSTSVH-21T-P1.1 or equivalent
	7	+Vo	
	8	-Vo	
	9	-Vo	

Position	Screw Spec.	L(Recommend)	Torque(Recommend)
① - ④	M3	6mm	0.65N · m ± 10%

Note:
Unit: mm[inch]
General tolerances: ± 0.50[± 0.020]
The layout of the device is for reference only, please refer to the actual product

Note:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220151;
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 corporate standards;
4. We can provide product customization service, please contact our technicians directly for specific information;
5. The output voltage can be adjusted by the ADJ, clockwise to decrease;
6. Products are related to laws and regulations: see "Features" and "EMC";
7. 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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