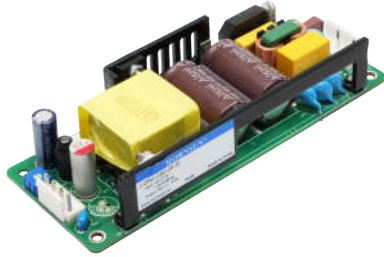


50W, special localized power supply for electricity industry & smart grid



FEATURES

- Special localized power supply for electricity industry & smart grid
- Ultra-wide 85 - 305VAC and 88 - 430VDC input voltage range
- Ultra-wide operating ambient temperature range: -40°C to +85°C
- 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/IEC/BS EN62368

LO50-23BxxE-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 reliability, and high isolation. EMC and safety specifications design refer to IEC/EN61000-4, CISPR32/EN55032, UL/EN/IEC/BS EN62368 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.
/	LO50-23B03E-G	33.0	3.3V/10A	2.97-3.63	84	20000
	LO50-23B05E-G	50.0	5V/10A	4.5-5.5	86	20000
	LO50-23B09E-G	50.4	9V/5.6A	8.1-9.9	86	10000
	LO50-23B12E-G	50.4	12V/4.2A	10.8-13.2	86	8000
	LO50-23B15E-G	51	15V/3.4A	13.5-16.5	86	4000
	LO50-23B24E-G	50.4	24V/2.1A	21.6-26.4	88	2000
	LO50-23B27E-G	51.3	27V/1.9A	24.3-29.7	89	2000
	LO50-23B48E-G	52.8	48V/1.1A	43.2-52.8	90	1000

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; during output voltage adjustment, the product needs to take 50% load.

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	--	--	1.2	A
	230VAC	--	--	0.8	
Inrush Current	115VAC	Cold start	20	--	
	230VAC		40	--	
Leakage Current	277VAC	0.5mA RMS max.			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	0% - 100% load	3V/5V	±2	--	%
		Other output	±1	±2	
Line Regulation	Rated load	--	±0.5	--	
Load Regulation	230VAC	--	±1	--	
Ripple & Noise*	20MHz bandwidth (peak-to-peak value)	--	--	120	mV

Temperature Coefficient		--	±0.02	--	%/°C
Stand-by Power Consumption	230VAC	--	--	0.5	W
Short Circuit Protection		Hiccup, continuous, self-recovery			
Over-current Protection		110% - 350% I _o , self-recovery			
Over-voltage Protection	3.3V	≤5.5V	Output voltage clamp or hiccup		
	5V	≤7.5V			
	9V	≤13.5V			
	12V	≤16V			
	15V	≤21V			
	24V	≤32V			
	27V	≤35V			
	48V	≤60V			
Minimum Load		0	--	--	%
Start-up Delay Time		--	--	500	ms
Hold-up Time	115VAC, I _o =100%	--	28	--	ms
	230VAC, I _o =100%	--	150	--	

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 <10mA	4000	--	--	VAC	
	Input - PE		2000	--	--		
	Output - PE	Electric Strength Test for 1min., leakage current <20mA	500	--	--		
Insulation Resistance	Input - output	Testing voltage: 500VDC	50	--	--	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	--	+105			
Storage Humidity	Non-condensing	--	--	90	%RH		
Switching Frequency		--	65	--	kHz		
Output Power Derating	Operating temperature derating	-40°C to -25°C	Natural air cooling	2.00	--	--	% / °C
				+50°C to +70°C	2.50	--	
		+70°C to +85°C	0.66	--	--		
		+60°C to +70°C	Forced cooling wind speed ≥ 0.7m/s	3.00	--	--	
				+70°C to +85°C	1.33	--	
	Input voltage derating	85VAC - 100VAC	1.33	--	--	% / VAC	
		277VAC - 305VAC	0.72	--	--		
Altitude derating	2000m-5000m	5.00	--	--	% / Km		
Safety Standard		Design refer to UL/EN/IEC/BS EN62368-1					
Safety Class		CLASS I					
MTBF	MIL-HDBK-217F@25°C	>300,000 h					

Mechanical Specifications

Dimension	132.00 x 50.00 x 27.00mm
Weight	145g (Typ.)

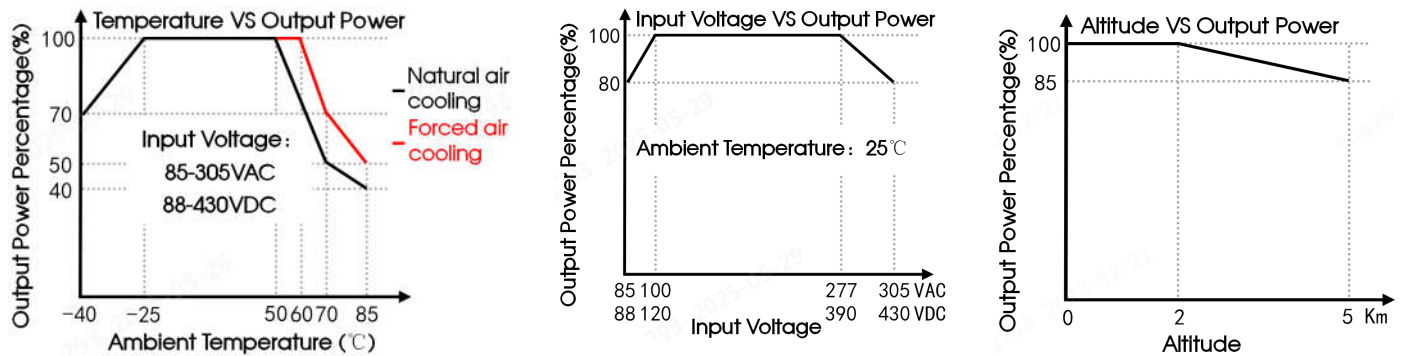
Cooling Method: Free air convection

Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032	CLASS B cycle	
	RE	CISPR32/EN55032	CLASS A	
Immunity	ESD	IEC/EN61000-4-2	Contact $\pm 8\text{KV}$ /Air $\pm 15\text{KV}$	Perf. Criteria A
	RS	IEC/EN61000-4-3	10V/m	Perf. Criteria A
	EFT	IEC/EN61000-4-4	$\pm 4.4\text{KV}$	Perf. Criteria A
	Surge	IEC/EN61000-4-5	Line to line $\pm 2.2\text{KV}$ / line to ground $\pm 4.4\text{KV}$	Perf. Criteria A
	CS	IEC/EN61000-4-6	10Vr.m.s	Perf. Criteria A
	PfMF	IEC/EN61000-4-8	100A/m	Perf. Criteria A
	Voltage dips and voltage interruptions*	IEC61850-3/IEC61000-6-5	40% U_n , 0% U_n , 50 cycle 70% U_n , 1 cycle; 0% U_n , 5 cycle;	Perf. Criteria A
	Damping vibration immunity	IEC/EN61000-4-18	$\pm 1.25\text{KV}/\pm 2.5\text{KV}$ (100kHz & 1MHz)	Perf. Criteria A

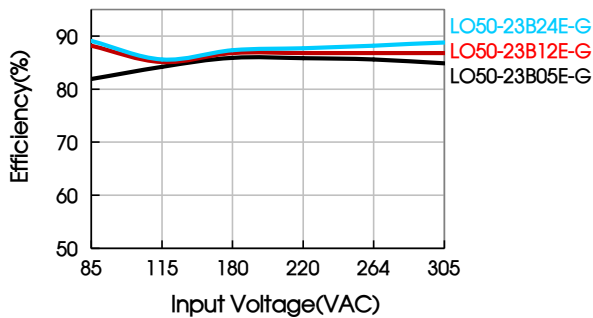
Note: * U_n Maximum input nominal voltage.

Product Characteristic Curve

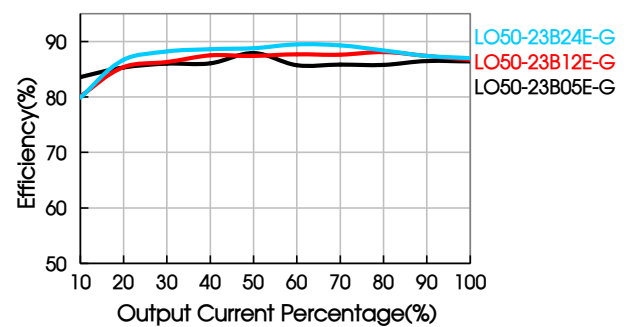


Note: 1. With an AC input between 85-100VAC/277-305VAC and a DC input between 88-120VDC/390-430VDC, the output power must be derated as per temperature derating curves;
 2. This product is suitable for applications using natural free air cooling; for applications in closed environment please consult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

Efficiency Vs Input Voltage (Full Load)



Efficiency Vs Output Load (Vin=230VAC)



Design Reference

1. Typical application

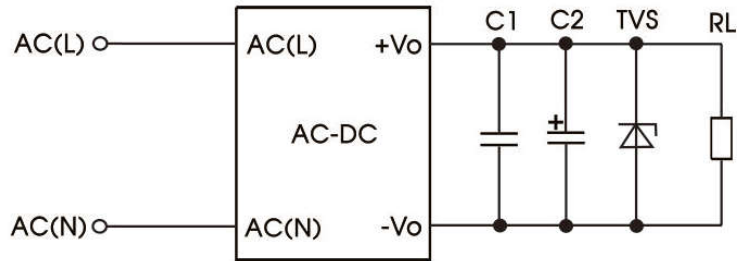


Fig. 1: Typical circuit diagram

Part no.	C1	C2	TVS
LO50-23B03E-G	0.1μF/250V	100μF/63V	SMBJ7.0A
LO50-23B05E-G			
LO50-23B09E-G			SMBJ12A
LO50-23B12E-G			SMBJ20A
LO50-23B15E-G			
LO50-23B24E-G			
LO50-23B27E-G			SMBJ30A
LO50-23B48E-G			SMBJ64A

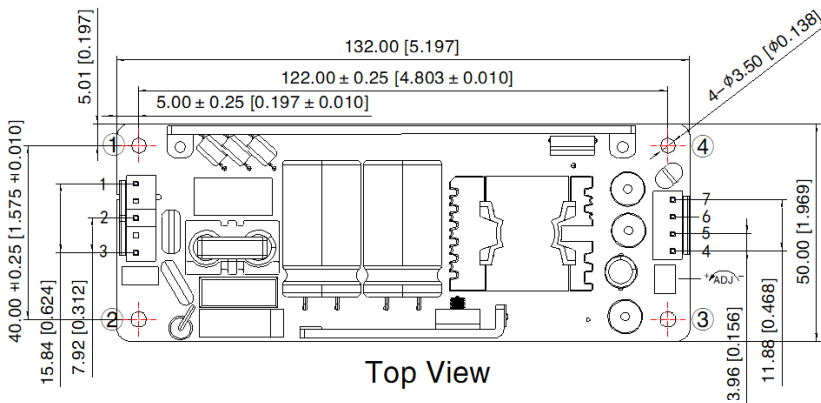
Output Filter Components:

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

Dimensions and Recommended Layout

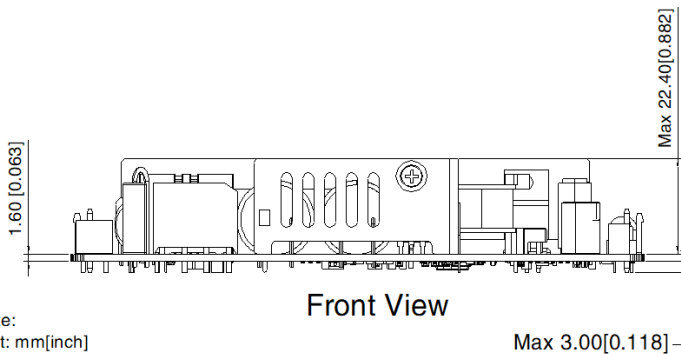
THIRD ANGLE PROJECTION



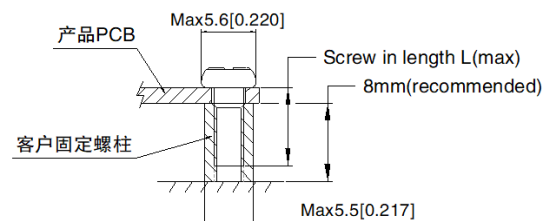
Top View

Pin-Out			
Pin	Mark	Product connector	Client connector
1	PE	JST B5P-VH or equipment	connector: JST VHR connector terminal: JST SVH-21T-P1.1 or equipment
2	AC(N)		
3	AC(L)		
4	+V0	JST B4P-VH or equipment	
5			
6	-V0		
7			

Installation position	Screw specification	Screw in length L(max)	Recommended torque
①-④	M3	6	0.4N · m ± 10%



Front View



Note:
Unit: mm[inch]
General tolerances: ± 1.00 [± 0.039]
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: 58220179;
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. Products are related to laws and regulations: see "Features" and "EMC";
6. The output voltage can be adjusted by the ADJ, clockwise to decrease;
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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