75W, special localized power supply for electricity industry & smart grid

RoHS

FEATURES

- Special for electricity industry smart grid
- Localized power supply
- Universal 85 - 264VAC or 88 - 370VDC input voltage
- Ultra-wide operating ambient temperature range: -40℃ to +85℃
- 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

LO75-20BxxE-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, 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.
/	LO75-20B05E-G	60.0	5V/12.0A	4.5-5.5	86	8500
	LO75-20B09E-G	75.6	9V/8.4A	8.1-9.9	89	7500
	LO75-20B12E-G	76.8	12V/6.4A	10.8-13.2	91	6800
	LO75-20B15E-G	75.0	15V/5.0A	13.5-16.5	91	4700
	LO75-20B24E-G	76.8	24V/3.2A	21.6-26.4	90	2200
	LO75-20B27E-G	75.6	27V/2.8A	24.3-29.7	90	1200
	LO75-20B48E-G	76.8	48V/1.6A	43.2-52.8	90	680

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	--	264	VAC
	DC input	88	--	370	VDC
Input Frequency		47	--	63	Hz
Input Current	115VAC	--	--	1.6	A
	230VAC	--	--	0.95	
Inrush Current	115VAC	--	25	--	
	230VAC	--	45	--	
Leakage Current	240VAC	0.5mA RMS max.			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	All load range	5V/9V	--	±2.0	--	%
		Other output	--	±1.0	--	
Line Regulation	Rated load		--	±0.5	--	
Load Regulation	230VAC		--	±1.0	--	
Minimum Load			0	--	--	

Ripple & Noise*	20MHz bandwidth (peak-to-peak value)	5V	--	--	100	mV
		9V	--	--	80	
		12V/15V/24V	--	--	120	
		27V	--	--	150	
		48V	--	--	200	
Temperature Coefficient			--	±0.02	--	%/℃
Stand-by Power Consumption	230VAC		--	--	0.5	W
Short Circuit Protection			Hiccup, continuous, self-recovery			
Over-voltage Protection	5V		≤7.25V	Output voltage hiccup		
	9V		≤13V			
	12V		≤16V			
	15V		≤25V			
	24V		≤35 V			
	27V		≤39V			
	48V		≤60V			
Over-current Protection			110% - 300% Io, self-recovery			
Start-up Delay Time	85VAC-264VAC input, Io=100%		--	500	--	ms
Hold-up Time	115VAC input, Io=100%		--	12	--	
	230VAC input, Io=100%		--	90	--	

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				2000	--	--	
	Output - PE	Electric Strength Test for 1min., leakage current <10mA			500	--	--	
Insulation Resistance	Input - output	Test voltage: 500VDC			100	--	--	MΩ
	Input - PE							
	Output - PE							
Impulse Withstand Voltage	Input - output	5KV, 1.2/50 us Impulse voltage						
	Input - PE							
Operating Temperature					-40	--	+85	℃
Storage Temperature					-40	--	+105	
Operating Humidity		Non-condensing			--	--	95	%RH
Storage Humidity					--	--	95	
Output Power Derating		Operating temperature derating	-40℃ to -25℃		2.00	--	--	%/℃
			+40℃ to +70℃	5V	1.16	--	--	
			+70℃ to +85℃		1.66	--	--	
			+50℃ to +70℃	Other output	1.75	--	--	
			+70℃ to +85℃		1.66	--	--	
		Input voltage derating	85VAC - 100VAC		1.33	--	--	%/VAC
		Altitude derating	2000m - 5000m		5	--	--	%/Km
Safety Standard					Design refer to UL/EN/IEC62368-1			
Safety Class					CLASS I			
MTBF		MIL-HDBK-217F@25℃			≥300,000 h			

Mechanical Specifications

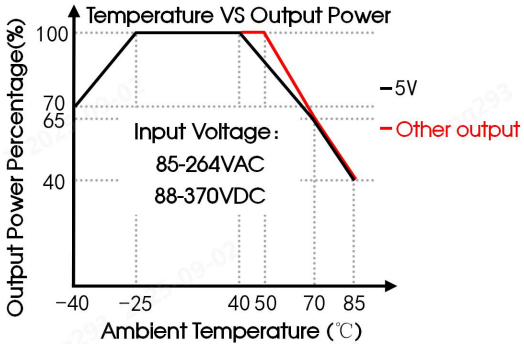
Dimension	101.60 x 50.80 x 26.40mm
Weight	140g (Typ.)
Cooling Method	Free air convection

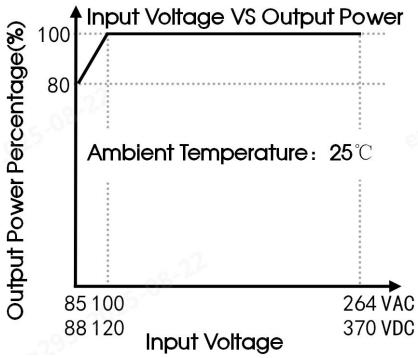
Electromagnetic Compatibility (EMC)

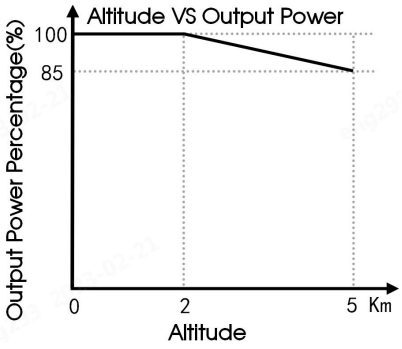
Emissions	CE	CISPR32/EN55032	CLASS B	
	RE	CISPR32/EN55032	CLASS A	
	Harmonic current	IEC/EN61000-3-2	CLASS A	
	Voltage flicker	IEC/EN61000-3-3	CLASS A	
Immunity	ESD	IEC/EN61000-4-2	Contact ±8KV /Air ±15KV	Perf. Criteria A
	RS	IEC/EN61000-4-3	10V/m	Perf. Criteria A
	EFT	IEC/EN61000-4-4	±4.4KV	Perf. Criteria A
	Surge	IEC/EN61000-4-5	Line to line ±2.2KV/ line to ground ±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	±1.25KV/±2.5KV(100kHz & 1MHz)	Perf. Criteria A

Note: *U_n Maximum input nominal voltage.

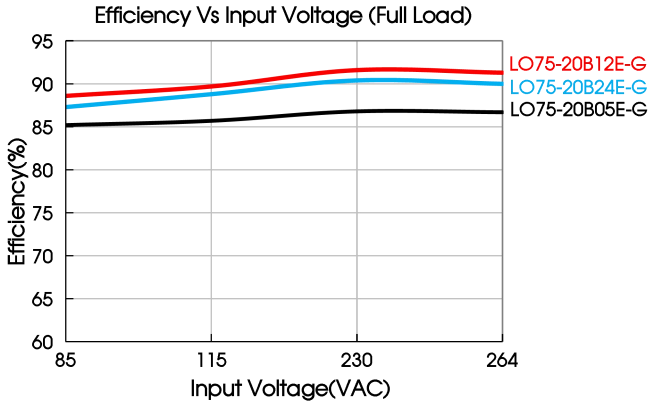
Product Characteristic Curve

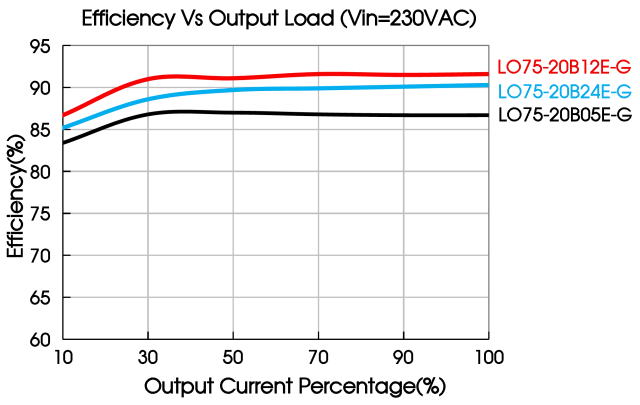






Note: 1.With an AC input between 85-100VAC and a DC input between 88-120VDC, the output power must be derated as per temperature derating curves;
2.This product is suitable for applications using natural free air cooling; for applications in closed environment please consult Mornsun FAE.





Design Reference

1. Typical application

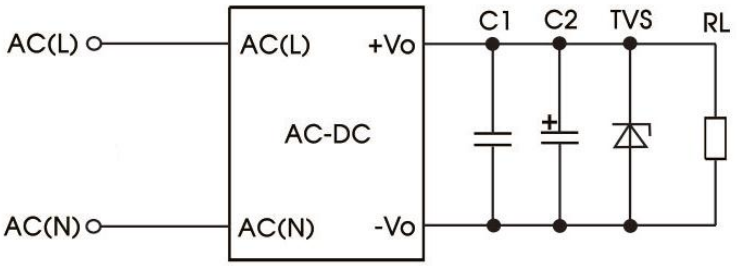


Fig. 1: Typical circuit diagram

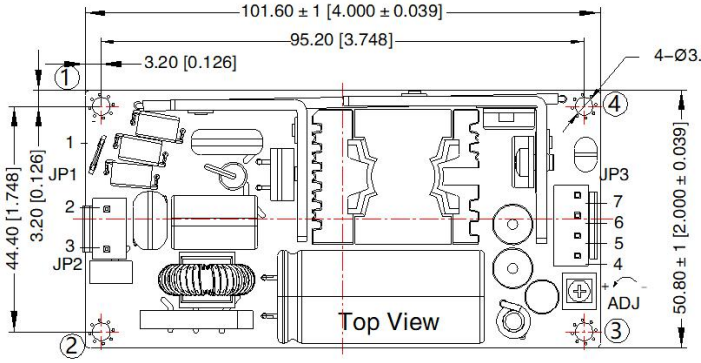
Part no.	C1	C2	TVS
LO75-20B05E-G	0.1μF/16V	100μF/16V	SMBJ7.0A
LO75-20B09E-G			SMBJ12A
LO75-20B12E-G	0.1μF/25V	100μF/25V	SMBJ20A
LO75-20B15E-G			
LO75-20B24E-G	0.1μF/50V	100μF/35V	SMBJ30A
LO75-20B27E-G	0.1μF/100V	100μF/63V	
LO75-20B48E-G			SMBJ64A

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.

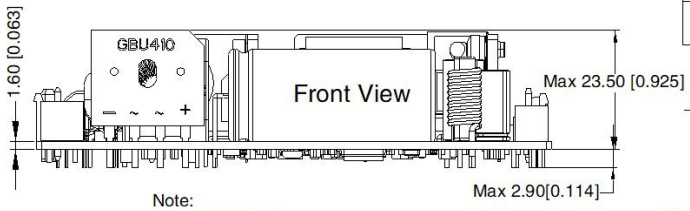
Dimensions and Recommended Layout

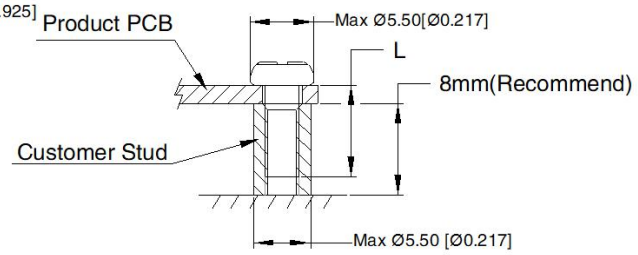
THIRD ANGLE PROJECTION



Pin–Out			
Connector	Pin	Mark	Terminal
JP1	1	PE	KST FDD 5.5–250 or equivalent
JP2	2	AC(N)	Housing: JST VHR Contact: JST SVH–21T–P1.1 or equivalent
	3	AC(L)	
JP3	4	–Vo	Housing: JST VHR Contact: JST SVH–21T–P1.1 or equivalent
	5	–Vo	
	6	+Vo	
	7	+Vo	

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





Note:
1. Unit: mm[inch]
2. General tolerances: ± 0.50[± 0.020]
3. 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: 58220192
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 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.

Mornsun Guangzhou Science & Technology Co., Ltd.
Address: No.8 Nanyun 4th Road, Huangpu District, Guangzhou, China
Tel: 86-20-38601850 Fax: 86-20-38601272 E-mail: info@mornsun.cn www.mornsun-power.com