AC/DC Bidirectional Power Supply

LMBT12K5-16B15F

MORNSUN®

RoHS

FEATURES

- AC-DC bidirectional full isolation, bidirectional energy conversion
- 3 phaseAC voltage: 323 - 456VAC
- High power factor＞0.99, low harmonic＜5%
- CAN parallel current sharing, no need for manual switching
- Bidirectional seamless switching without voltage difference
- Dual directional soft switch, high efficiency 91%
- Power status LED indicator
- Output short, over-current, over-voltage, over-temperature protection, high reliability protection, reliable islanding protection
- 3 years warranty
- High-reliability, operating altitude up to 3000m
- Comply with UL/EN/BS EN62368, EN62477

LMBT12K5-16B15F is a metal shell type bidirectional power supply provided by Mornsun for customers. The power supply can be bidirectional input to achieve AC-DC bidirectional energy conversion, with cost-effective, high power density, high efficiency, high reliability and double or reinforced insulation. These converters offer excellent EMC performance and meet UL/EN/BS EN62368,EN62477 standards and they are widely used in chemical composition, battery detection, aging, charge and discharge, equalization and other related fields.

Selection Guide

Certification	Part No.	Power Grid	Rated input (Vin/Iin)	Rated Output (Vo/Io)	Power(W)	Efficiency (%) Max	State
--	LMBT12K5-16B15F	3 phase 380VAC	380VAC	15VDC/833.3A	12500	91.0	AC to DC direction
			15VDC/666.7A	380VAC	10000	90.5	DC to AC direction

Input Specifications/AC to DC Direction

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Voltage Range	AC input	Line voltage	323	380	456	VAC
Input Voltage Frequency			45	--	65	Hz
Input Current	380VAC		--	--	30	A
Inrush Current	380VAC	Cold start	--	--	25	
Power Factor	380VAC, full load, 25℃		0.99	--	--	--
Hot Plug			Unavailable			
Current Harmonic	380VAC, full load		＜5%			
Input Under-voltage Protection	Full load range	Line voltage	277	--	295	VAC
Input Over-voltage Protection	Full load range	Line voltage	470	--	485	
Input Frequency Protection	Full input range, full load range		＜45Hz, ＞65Hz			

Output Specifications/AC to DC Direction

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	Full load range	15V	--	±1.0	--	%
Line Regulation	Rated load		--	±1.0	--	
Load Regulation	Rated input voltage	15V	--	±1.0	--	
Ripple & Noise*	25℃, 20MHz bandwidth (peak-to-peak value), power frequency ripple	15V	--	--	200	mV

Temperature Coefficient		--	--	±0.03	%/℃
Minimum Load		0	--	--	%
Load Sharing Accuracy	Supports up to 4 parallel power supplies, CAN1 or CAN2 are interconnected	-5.0	--	+5.0	%
Short Circuit Protection		Hiccup protection, self-recover			
Over-current Protection		⩾105% Io, 500ms	Hiccup protection, self-recover		
		⩾110% Io, 200ms			
Over-voltage Protection	15V	⩽18VDC, output voltage turn off, self-recover after the output voltage drops			
Over-temperature Protection		Output voltage turn off, self-recover after the temperature drops			

Note: *The"Tip and barrel method" is power frequency ripple, it is used for ripple and noise test, output parallel 47uF electrolytic capacitor and 0.1uF ceramic capacitor, please refer to enclosed Switching Power Supply Application Notes for specific information.

Input Specifications/DC to AC Direction

Item	Operating Conditions	Min.	Typ.	Max.	Unit
DC Input Voltage Range	DC input	--	15	--	VDC
Input Current	DC input (rated voltage)	630	666.7	--	A
Input Power			10000		W

Output Specifications/DC to AC Direction

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Range	AC Output	Line voltage	323	380	456	VAC
Output Voltage Frequency			45	--	65	Hz
Output Current			--	--	25	A
Power Factor	380VAC, full load			0.99		
Current Harmonic	380VAC, full load			<5%		
Islanding Protection				<45Hz, >65Hz		

General Specifications

Item		Operating Conditions		Min.	Typ.	Max.	Unit
Insulation Resistance	Input - ⏚	Ambient temperature: 25 ± 5℃ Relative humidity: < 95%RH, no condensation Test voltage: 500VDC		100	--	--	MΩ
	Input - output			100	--	--	
	Output - ⏚			100	--	--	
Operating Temperature				-10	--	+60	℃
Storage Temperature				-40	--	+85	
Operating Humidity		Non-condensing		20	--	90	%RH
Storage Humidity				10	--	95	
Power Derating		Operating temperature derating	-10℃ to +45℃	0	--	--	%/℃
			+45℃ to +55℃	2	--	--	
			+55℃ to +60℃	1	--	--	
		Input voltage derating	323VAC - 456VAC	0	--	--	%/VAC
Indicator Status		Fault		Red			
		AC/DC forward Charging		Blue			
		DC/AC reverse inversion		Green			
Bidirectional Switching Time				Seamless switching			
Communication				CAN			
Fan Fault Protection				Self-recovery after fault clearance			
Fan Speed Measurement		Forced cooling		Intelligent speed regulation			

Online upgrade Function		Available
Safety Standards		Design refer to UL/EN/BS/EN62368-1(OVC II), EN62477(OVC III)
Safety Class		CLASS I

Mechanical Specifications

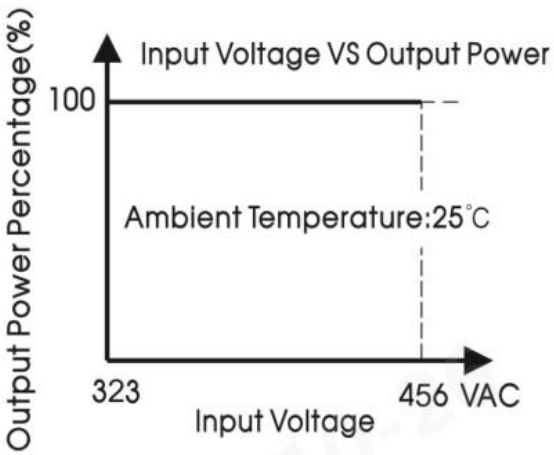
Case Material	Metal (SGCC)
Dimensions	435.00mm x 268.00mm x 86.00mm
Weight	10.5kg (Typ.)
Cooling Method	Forced cooling

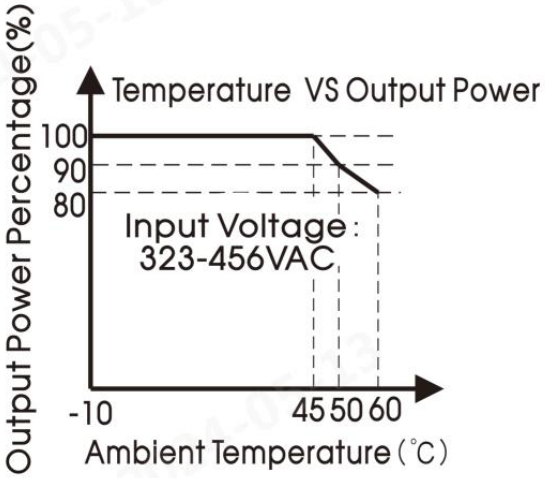
Electromagnetic Compatibility (EMC)

Emissions	Harmonic current	IEC/EN61000-3-12		CLASS A
	THD			5%
Immunity	ESD	IEC61000-6-2/IEC61000-4-2	Contact ±6KV/Air ±8KV	Perf. Criteria B
	RS	IEC61000-6-2/IEC61000-4-3	80MHz – 1GHz 10V/m	Perf. Criteria A
	EFT	IEC61000-6-2/IEC61000-4-4	AC Port：±4kV , 100kHz	Perf. Criteria B
	Surge	IEC61000-6-2/IEC61000-4-5	line to line ±2KV/line to ground ±4KV	Perf. Criteria B
	CS	IEC61000-6-2/IEC61000-4-6	0.15MHz-80MHz 10V r.m.s	Perf. Criteria A
	Voltagedips, short interruptions and voltage variation simmunity	IEC/EN61000-4-11 0% 70%		Perf. Criteria B
	Power frequency magnetic field	IEC61000-6-2/IEC61000-4-8	30A/m	Perf. Criteria A

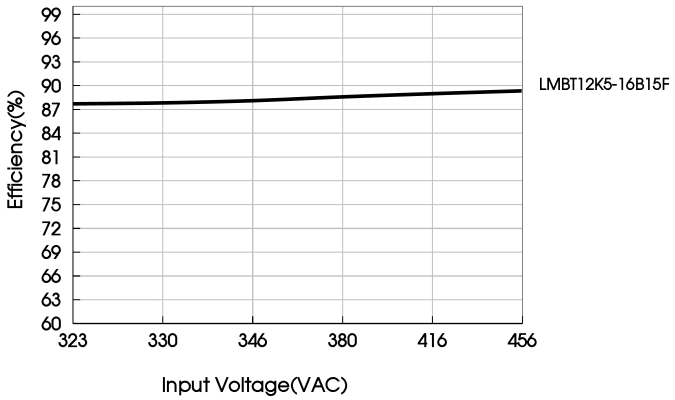
Note: *perf. Criteria:
A: The equipment shall continue to operate as intended without operator intervention;
B: After the test, the equipment shall continue to operate as intended without operator intervention;
C: Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions.

Product Characteristic Curve

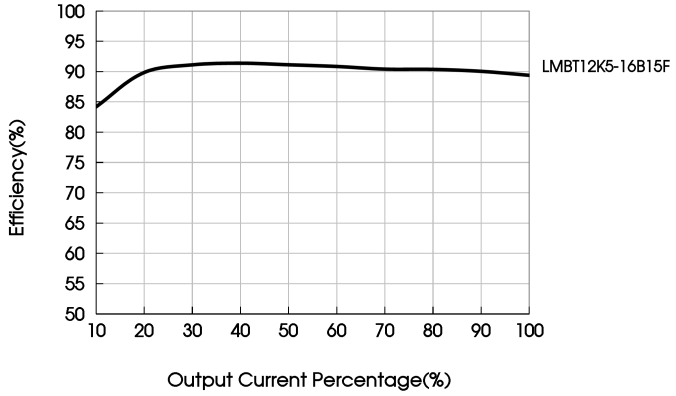




Efficiency Vs Input Voltage (Full Load)

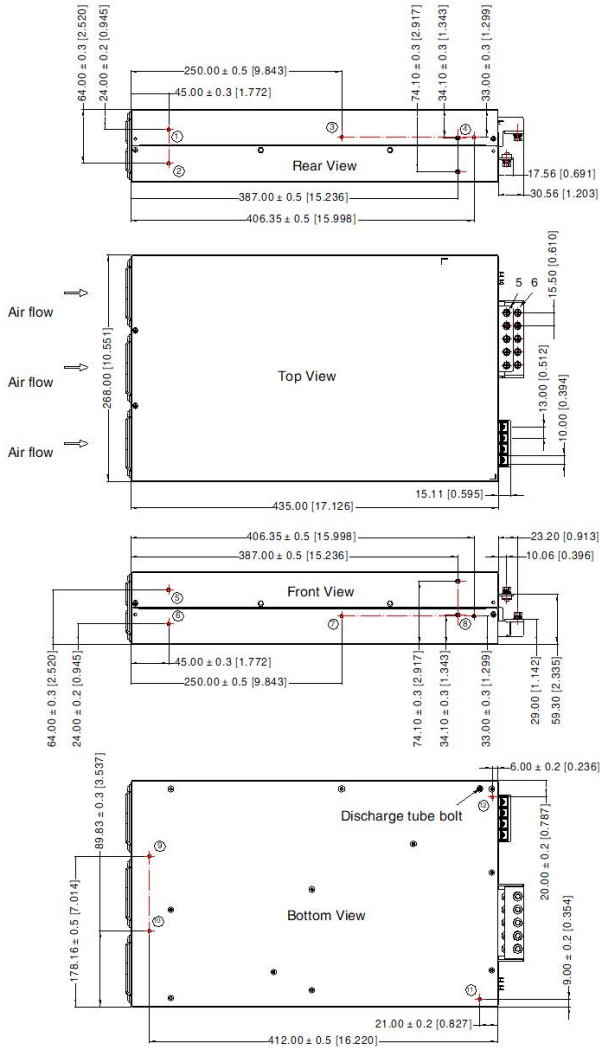


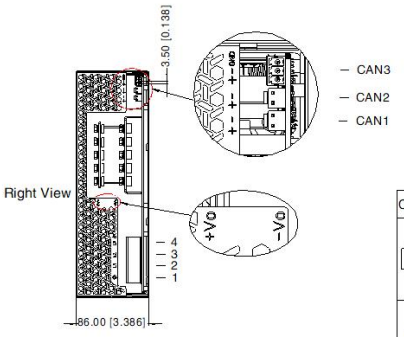
Efficiency Vs Output Load(Vin=380VAC)

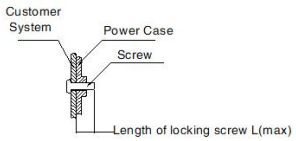


Note: 1. The input voltage described by the above curve is line voltage;
2.This product is suitable for use in natural air-cooled environments. If used in closed environments, please consult MORNSUN FAE.

Dimensions and Recommended Layout







Position	Screw Spec.	Length of locking screw L(max)	Torque(max)
① - ⑫	M4	4mm	0.9N · m

Connector wires range:

Pro. No	Input connector	Output connector
12.5KW	30A (12-10 AWG)	833.3A (000 AWG Four)
Screw/torque	M4, Max 0.9N · m	M6, Max 3.0N · m

THIRD ANGLE PROJECTION

Pin-Out	
Pin	Mark
1	⏚
2	L1
3	L2
4	L3
5	+Vo
6	-Vo

CAN1/CAN2	Pin-Out	
	Pin	Mark
	1	+CAN
	2	-CAN
Customer Connector	Connector: JST VHR-2N or equivalent Terminal: JST SVH-21T-P1.1 or equivalent	

CAN3	Pin-Out	
	Pin	Mark
	1	+CAN
	2	-CAN
	3	GND
Customer Connector	Connector: DEGSON 15EDGKD-3.5-03P or equivalent	

Note:
Unit: mm[inch]
General tolerances: ± 1.00[± 0.039]
Pin1-4 connector tightening torque: M4, 0.9N · m max.

Note:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220679;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, humidity <75%RH with nominal input voltage and rated output load;
3. The room temperature derating of 5℃/1000m is needed for operating altitude greater than 2000m;
4. All index testing methods in this datasheet are based on our company corporate standards;
5. We can provide product customization service, please contact our technicians directly for specific information;
6. Products are related to laws and regulations: see "Features" and "EMC";
7. The out case needs to be connected to PE (⏚)of system when the terminal equipment in operating;
8. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units;
9. The power supply is considered a component which will be installed into a terminal equipment. All EMC tests should be confirmed with the final equipment. Please consult our FAE for EMC test operation instructions.

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