AC/DC Bidirectional Power Supply

LMB2250-12B16F

MORNSUN®

RoHS

FEATURES

- AC-DC two-way full isolation, two-way energy flow
- Low harmonic, high power factor
- Advanced algorithm control, intellectualized design
- Seamless two-way switching
- Support 8 parallel, power expansion to 18kW
- Reliable island protection
- High efficiency, high-reliability
- Power supply state LED indicator light
- Output short, over-current, over-voltage, over-temperature protection
- Operating altitude up to 2000m
- 3 years warranty
- Safety according to UL/EN/BS EN62368, UL62477

LMB2250-12B16F 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 high cost performance, high power density, high efficiency, high reliability and double or reinforced insulation. These converters offer excellent EMC performance and meet UL/EN/BS EN62368、UL62477 standards and they are widely used in the fields of chemical formation, capacity separation, energy storage, etc.

Selection Guide

Certification	Part No.	Work Orientation	Output Power (W)	Rated input (Vin/Iin)	Rated Output (Vo/Io)	Efficiency (%)Typ.	Cooling Method
--	LMB2250-12B16F	AC to DC	2250	220V/11.5A	16V/140.6A	91.5	Forced cooling
		DC to AC	1650	16V/103A	220V/7.5A	91	

AC to DC direction

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Voltage Range	AC input		176	--	264	VAC
Input Voltage Frequency	Rated input		45	--	65	Hz
Input Current	220VAC		--	--	15	A
Inrush Current	220VAC	Cold start	--	17	--	
Power Factor	220VAC, full load		--	0.99	--	--
Current Harmonic	220VAC, full load (power grid THDu ≤2%)		--	3	--	%
Input Fuse	Built-in fuse		--	20	--	A
Input Under-voltage Protection	Under-voltage protection start (Input voltage drops from high to low)		160	--	170	VAC
	Under-voltage protection release (Input voltage rises from low to high)		168	--	178	
Input Over-Voltage Protection	Under-voltage protection start (Input voltage drops from low to high)		270	--	280	
	Under-voltage protection release (Input voltage rises from high to low)		262	--	272	
Hot Plug			Unavailable			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	Full load range	--	±1.0	--	%
Line Regulation	Rated load	--	±1.0	--	
Load Regulation	Rated input voltage	--	±1.0	--	
Ripple & Noise* (Power frequency ripple)	20MHz bandwidth (peak-to-peak value)	--	--	300	mV
Temperature Coefficient		--	--	±0.03	%/℃

Input Current Sharing Accuracy	50 - 100% load range test, {mean mobility = (single supply current - average current)/Average current}		-5	--	+5	%
Parallel Operation	Supports up to 8 parallel power supplies		8			--
Startup Delay Time	All input voltage range, all load range	Normal temperature, high temperature	--	--	5	S
		Low temperature	--	--	8	
Short Circuit Protection	The recovery time is less than 8 seconds		Hiccup, self-recover			
Over-current Protection	220VAC	Normal temperature, high temperature, Low temperature	⩾110% Io, hiccup, self-recover			
Over-voltage Protection			⩽18.5VDC, Output voltage turn off, self-recover after abnormal release			
Over-temperature Protection	220AC, 100% load	Over-temperature protection start	--	70	--	℃
		Over-temperature protection release	50	--	--	

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.

DC to AC direction

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Voltage Range	DC input	15.8	16	16.2	VDC
Input Current	16VDC	--	--	103	A
Input Current Sharing Accuracy	50-100% load range test, {mean mobility = (single supply current - average current)/Average current}	-5	--	+5	%
Input Power	220VAC, full load	--	--	1650	W
Parallel Operation	Supports up to 8 parallel power supplies		8		--

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Range	AC Output	176	220	264	VAC
Output Current	220VAC	--	7.5	--	A
Output Voltage Frequency		45	--	65	Hz
Power Factor	220VAC, Full load	0.99			
Current Harmonic	220VAC, full load (power grid THDu ⩽2%)	3%(Typ.)			
Island Protection	All output voltage range, all load range	Available			

General Specifications

Item		Operating Conditions		Min.	Typ.	Max.	Unit
Isolation Test	Input - ⏚	Electric strength test for 1min., leakage current <5mA		2000	--	--	VAC
	Input - output			3000	--	--	
	Output - ⏚			500	--	--	
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	
Storage Humidity		Non-condensing		10	--	95	%RH
Operating Humidity				20	--	90	
Power Derating		Operating temperature derating	-10℃ to +45℃	0	--	--	%/℃
			+45℃ to +55℃	1	--	--	
			+55℃ to +60℃	2	--	--	

Leakage Current	240VAC, 60Hz	Touch current	<3.5mA
Indicator Status	AC to DC direction operation		Blue
	DC to AC direction operation		Green
	Fault		Red
Bidirectional Switching Time			Seamless switchover
Communication			CAN
Fan Fault Protection			Available
Fan Speed	Blowing type		Intelligent speed regulation
Online Upgrade Function			Available
Safety Standards			Design refer to UL/EN/BS EN62368-1, UL62477
Safety Class			CLASS I
MTBF	MIL-HDBK-217F@25℃		≥300,000 h

Environmental Characteristics

Item	Operating Conditions	Standard
High and Low Temperature Working	+60℃, -10℃	GB2423.1, IEC60068-2-1
Sinusoidal Vibration	10 - 500Hz, 2g, three directions of X, Y, Z axis	GB2423.10, IEC60068-2-6
Low Temperature Storage	-10℃	GB2423.1, IEC60068-2-1
High Temperature Storage	+85℃	GB2423.2, IEC60068-2-2
High Temperature Aging	+60℃	GB2423.2, IEC60068-2-2
Normal Temperature Aging	+25℃	GB2423.1, IEC60068-2-1
Packaging Drop	1m, one corner, three edges and six sides	GB2423.8, IEC68-2-32

Mechanical Specifications

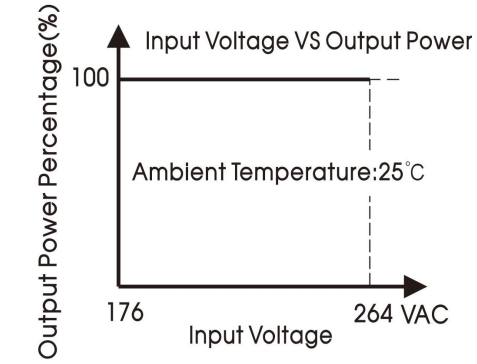
Case Material	Metal (SGCC)
Dimensions	285.00mm x 141.00mm x 44.00mm
Weight	2350g (Typ.)
Cooling Method	Forced cooling

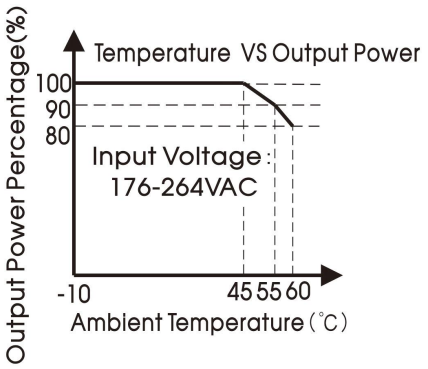
Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32 EN55032 150K - 30MHz	CLASS A
	RE	CISPR32 EN55032 30MHz - 2GHz	CLASS A
	Harmonic current	IEC/EN61000-3-2	CLASS A
	THD		5%
Immunity	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 A
	Surge	IEC/EN61000-4-5 line to line ±2KV/line to ground ±4KV	perf. Criteria B
	MS	IEC/EN61000-4-8 30A/m	perf. Criteria A
	Voltage dips, short interruptions and voltage variations immunity	IEC/EN61000-4-11 0%,70%	perf. Criteria B
	CS	IEC/EN61000-4-6 0.15 - 80MHz 10Vr.m.s	perf. Criteria A

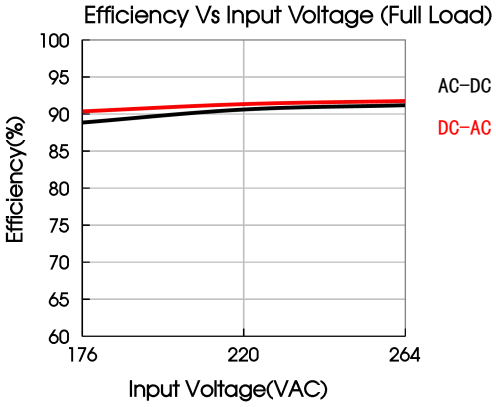
Note: 1. *perf. Criteria:
A: The equipment shall continue to operate as intended without operator intervention;
B: After the test, the equipment shall continue to operate as intended without operator intervention;
C: Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions.

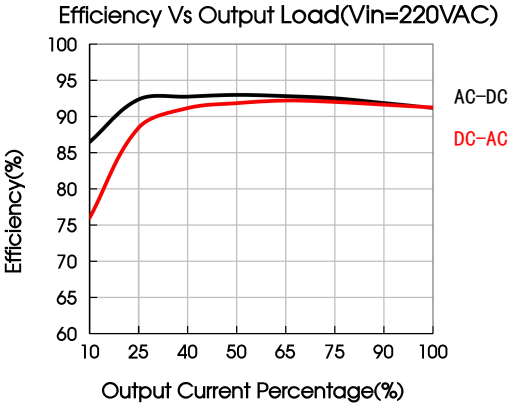
Product Characteristic Curve



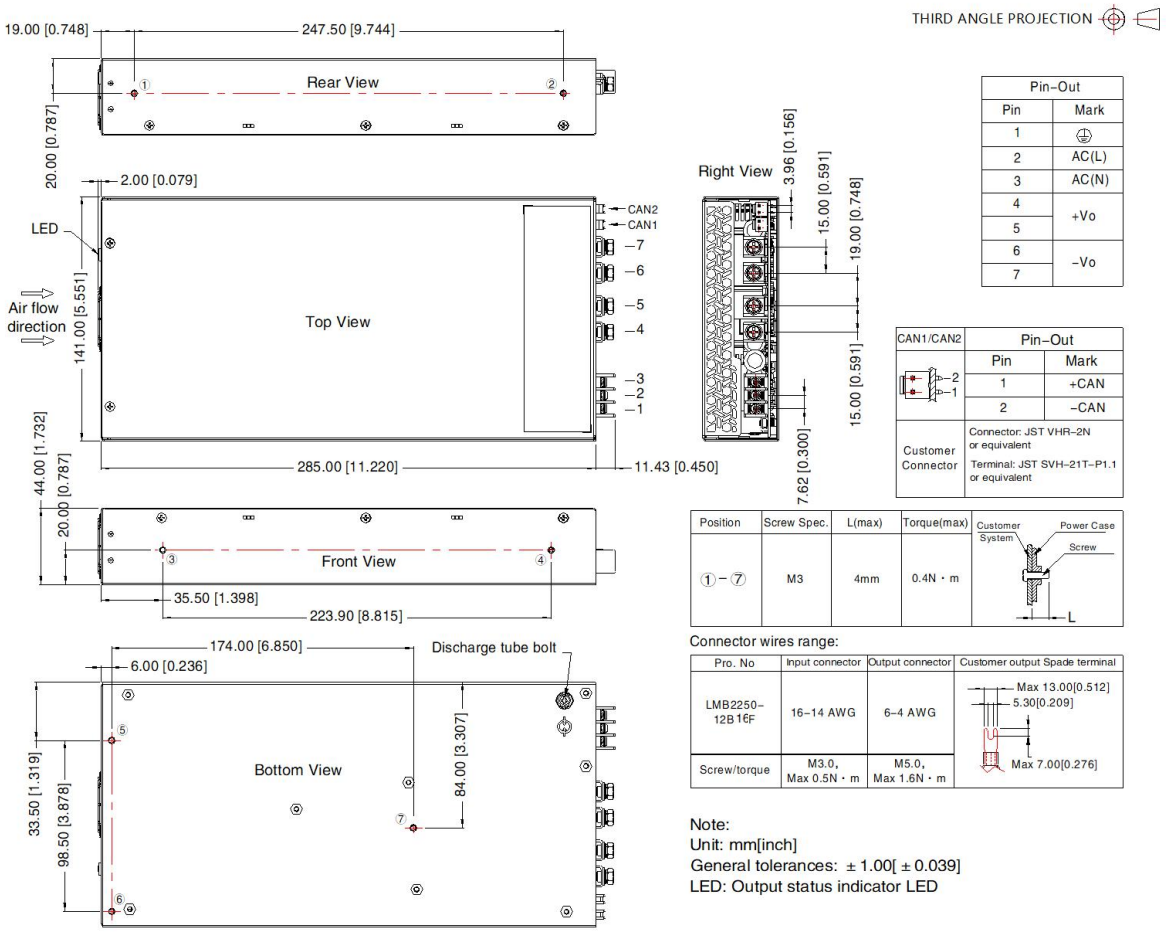


Note: This product is suitable for applications using natural forced cooling; for applications in closed environment please consult Mornsun FAE.





Dimensions and Recommended Layout



Pin-Out	
Pin	Mark
1	⏚
2	AC(L)
3	AC(N)
4	+Vo
5	
6	-Vo
7	

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	

Position	Screw Spec.	L(max)	Torque(max)
①-⑦	M3	4mm	0.4N · m

Connector wires range:

Pro. No	Input connector	Output connector	Customer output Spade terminal
LMB2250-12B16F	16-14 AWG	6-4 AWG	Max 13.00[0.512] 5.30[0.209] Max 7.00[0.276]
Screw/torque	M3.0, Max 0.5N · m	M5.0, Max 1.6N · m	

Note:
Unit: mm[inch]
General tolerances: ±1.00[±0.039]
LED: Output status indicator LED

Note:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220658;
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. All index testing methods in this datasheet are based on our company corporate standards;
4. In order to improve the efficiency at high input voltage, there will be audible noise generated, but it does not affect product performance and reliability;
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.

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