AC/DC 500W Enclosed Switching Power Supply

LMF500-20Bxx Series

MORNSUN®

CE Report EN62368-1 | CCC GB4943.1 | UKCA BS EN 62368-1 | RoHS

FEATURES

- Universal 80 - 264VAC or 110 - 370VDC Input voltage
- Accepts AC or DC input (dual-use of same terminal)
- Operating ambient temperature range: -30℃ to +70℃
- Low standby power consumption, high efficiency, active PFC
- High I/O isolation test voltage up to 4000VAC
- Output short circuit constant current, over-current, over-voltage, over-temperature protection
- Over-voltage class III (designed to meet EN61558)
- Remote sense compensation, remote ON/OFF function
- Safety according to IEC/UL62368, IEC/EN60601, EN60335, EN61558

LMF500-20Bxx series is one of Mornsun's enclosed AC-DC switching power supply. It features universal AC input and at the same time accepts DC input voltage, cost-effective, low no load power consumption, high efficiency, high reliability and double or reinforced insulation. These converters offer excellent EMC performance and meet IEC/EN/UL62368, IEC/EN60601, EN60335, GB4943, EN61558 standards and they are widely used in areas of industrial, LED, street light control, electricity, security, telecommunications, smart home etc.

Selection Guide

Certification	Part No.*	Output Power (W)	Nominal Output Voltage and Current (Vo/Io)	Output Voltage Adjustable Range (V)	Efficiency at 230VAC (%) Typ.	Max. Capacitive Load (μF)	Remote Sense Compensation (mV)	Remote ON/OFF Function
EN/CCC/BS	LMF500-20B03	297	3.3V/90A	3.13-3.46	84	15000	300	Y
	LMF500-20B05	450	5V/90A	4.75-5.25	87			
EN/CCC/BIS/ BS	LMF500-20B12	500.4	12V/41.7A	11.4-12.6	92	12000		
	LMF500-20B15	501.0	15V/33.4A	14.25-15.75				
	LMF500-20B24	501.6	24V/20.9A	22.8-25.2	93	6000		
	LMF500-20B27	502.2	27V/18.6A	25.65-28.35				
	LMF500-20B36	500.4	36V/13.9A	34.2-37.8		3000		
	LMF500-20B48	499.2	48V/10.4A	45.6-50.4		1800		
	LMF500-20B54	502.2	54V/9.3A	51.3-56.7				

Note: *Under any conditions, the total power of the product should not exceed rated power, and the output current should not exceed the rated output current.

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Voltage Range	AC input		80	--	264	VAC
	DC input		110	--	370	VDC
Input Voltage Frequency			47	--	63	Hz
Input Current	115VAC		--	--	6	A
	230VAC		--	--	3	
Inrush Current	230VAC	Cold start	--	40	--	
Power Factor	115VAC	Full load	0.98	--	--	--
	230VAC		0.95	--	--	
Leakage Current	240VAC		<0.1mA			
Hot Plug			Unavailable			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	Full load range	3.3V/5V	--	±2	--	%
		12V/15V/24V/27V/36V/48V/54V	--	±1	--	
Line Regulation	Rated load	3.3V/5V	--	±0.5	--	
		12V/15V/24V/27V/36V/48V/54V	--	±0.3	--	
Load Regulation	0% - 100% load	3.3V/5V	--	±1	--	
		12V/15V/24V/27V/36V/48V/54V	--	±0.5	--	
Ripple & Noise*	20MHz bandwidth (peak-to-peak value), 25℃	5V	--	--	150	mV
		Others	--	--	120	
Temperature Coefficient			--	±0.03	--	%/℃
Minimum Load			--	0	--	%
Hold-up Time	230VAC		12	18	--	ms
Short Circuit Protection	Recovery time <3s after the short circuit disappear.		Constant current protection, continuous, self-recover			
Over-current Protection	Room temperature, high temperature		110%-160% Io, constant current protection, self-recover			
	Low temperature		>105% Io, constant current protection, self-recover			
Over-voltage Protection	3.3V		≤5VDC	Output voltage turn off, re-power on for recover		
	5V		≤10VDC			
	12V		≤16VDC			
	15V		≤21.8VDC			
	24V		≤32.4VDC			
	27V		≤35VDC			
	36V		≤45VDC			
	48V		≤60VDC			
	54V		≤63VDC			
Over-temperature Protection			Output voltage turn off, self-recover after the temperature drops			

Note: *The "Tip and barrel method" 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.

General Specifications

Item		Operating Conditions		Min.	Typ.	Max.	Unit
Isolation Test	Input - ⏚	Electric strength test for 1min., leakage current <5mA		2000	--	--	VAC
	Input - output			4000	--	--	
	Output - ⏚			2000	--	--	
Insulation Resistance	Input - ⏚	At 500VDC		100	--	--	MΩ
	Input - output			100	--	--	
	Output - ⏚			100	--	--	
Operating Temperature				-30	--	+70	℃
Storage Temperature				-40	--	+85	
Operating Humidity		Non-condensing		--	--	--	%RH
Storage Humidity				10	--	95	
Power Derating		Operating temperature derating	+50℃ to +70℃	2.5	--	--	%/℃
		Input voltage derating	80VAC - 100VAC	1.33	--	--	%/VAC
Safety Standard		3.3V/5V		GB4943.1 safety approved & EN62368-1, BS EN62368-1 (Report) Design refer to IEC/UL62368-1, IEC/EN60601-1, EN60335-1, EN61558-1, EN61558-2-16, IS13252			

		(Part1)
	12V/15V/24V/27V/36V/48V/54V	GB4943.1, IS13252 (Part1) safety approved & EN62368-1, BS EN62368-1 (Report) Design refer to IEC/UL62368-1, IEC/EN60601-1, EN60335-1, EN61558-1, EN61558-2-16
Safety Class		CLASS I
MTBF	MIL-HDBK-217F@25℃	>300,000 h

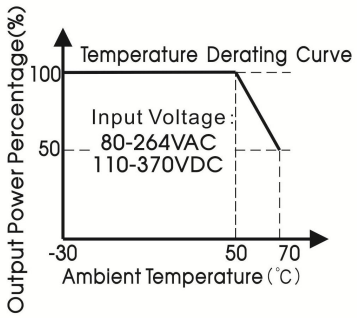
Mechanical Specifications

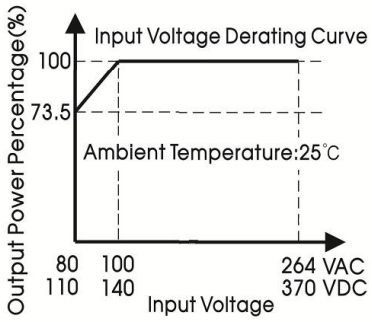
Case Material	Metal (AL1100, SGCC)
Dimensions	203.1 x 101.6 x 40.6 mm
Weight	850g (Typ.)
Cooling Method	Forced air convection

Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032 CLASS B	
	RE	CISPR32/EN55032 CLASS B	
	Harmonic current	IEC/EN61000-3-2 CLASS A	
Immunity	ESD	IEC/EN 61000-4-2 Contact ±8KV/Air ±15KV	perf. Criteria A
	RS	IEC/EN 61000-4-3 10V/m	perf. Criteria A
	EFT	IEC/EN 61000-4-4 ±4KV	perf. Criteria A
	Surge	IEC/EN 61000-4-5 line to line ±2KV/line to ground ±4KV	perf. Criteria A
	CS	IEC/EN61000-4-6 10 Vr.m.s	perf. Criteria A
	Voltage dips, short interruptions and voltage variations immunity	IEC/EN61000-4-11 0%, 70%	perf. Criteria B

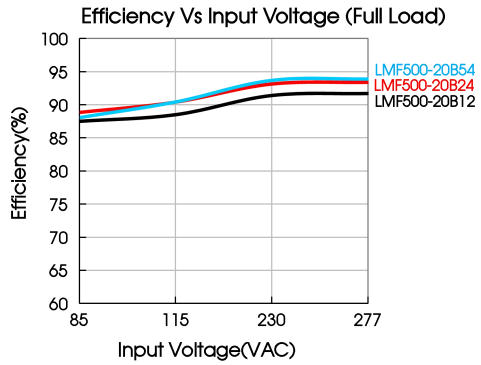
Product Characteristic Curve

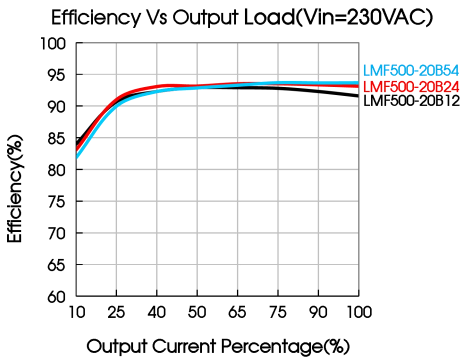




Note: 1. With an AC input voltage between 80-100VAC and a DC input between 110-140VDC the output power must be derated as per the temperature derating curves;

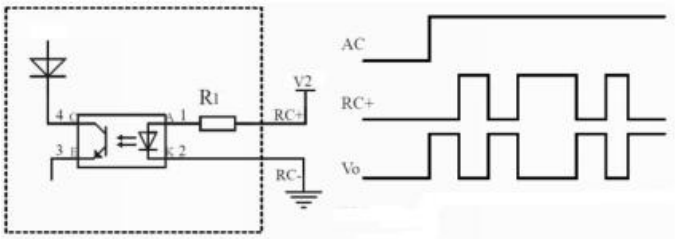
2. This product is suitable for applications using natural air cooling; for applications in closed environment please consult Mornsun FAE.





Typical Application

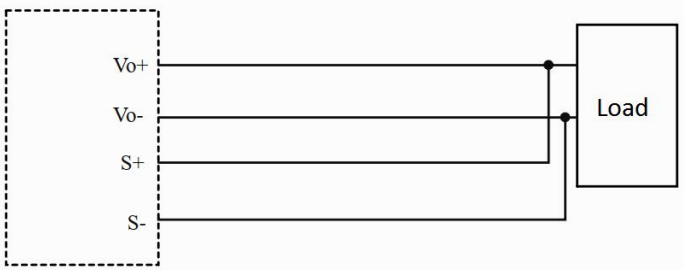
1. Remote ON/OFF



R1 (Product inside)	2KΩ, $\frac{1}{4}$ W
V2 (User side)	5V-15V

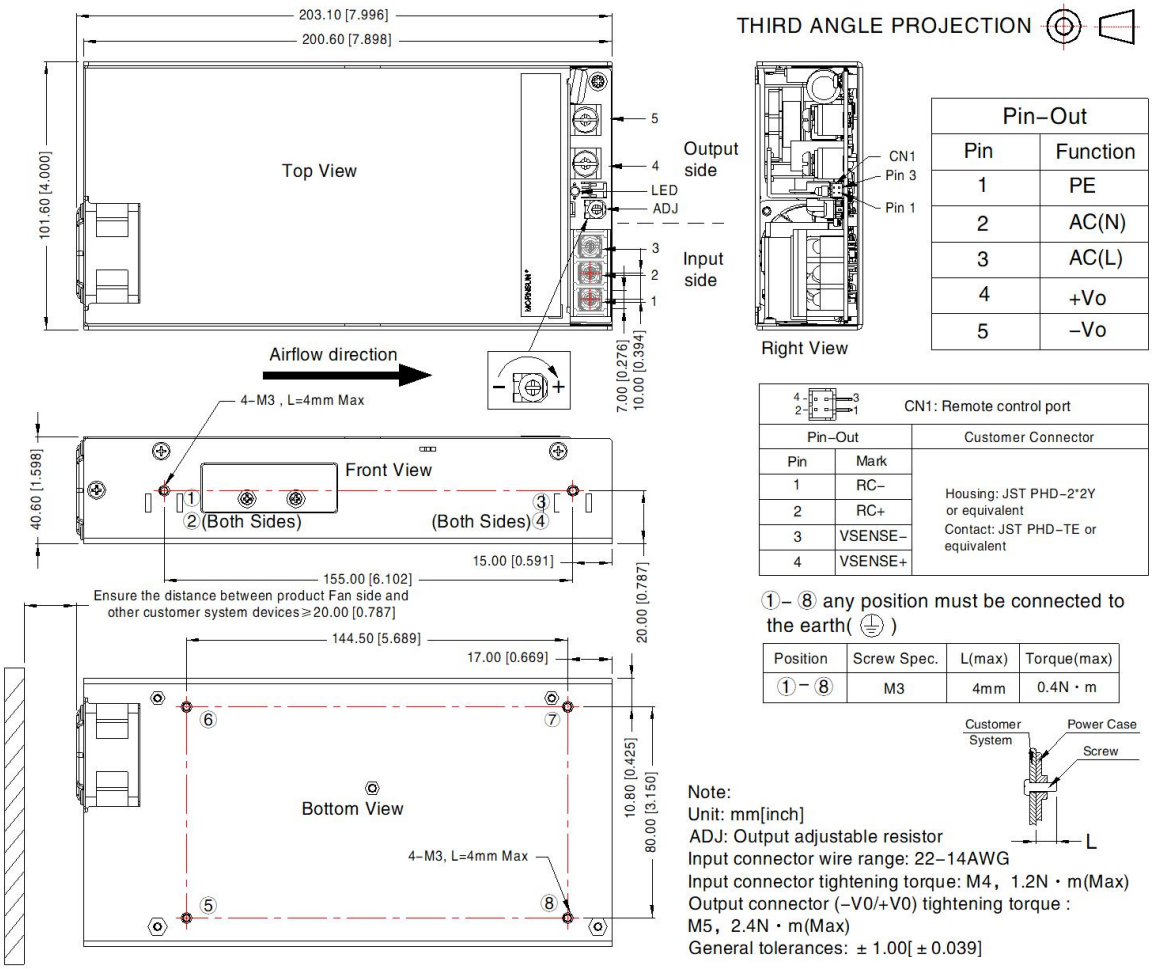
Note: When the product is working normally, apply voltage (5-15V) to RC+ and RC- to trigger the remote ON/OFF function, and the output voltage will be off. Withdraw the voltage, the output voltage will be re-established.

2. Remote Sense Compensation



Note: 1. The left side represents the internal schematic diagram of the product, the right side represents the customer system;
2. Twisted pair wires are needed for S+/S-.

Dimensions and Recommended Layout



Pin-Out	
Pin	Function
1	PE
2	AC(N)
3	AC(L)
4	+Vo
5	-Vo

CN1: Remote control port

Pin-Out		Customer Connector
Pin	Mark	
1	RC-	Housing: JST PHD-2*2Y or equivalent Contact: JST PHD-TE or equivalent
2	RC+	
3	VSENSE-	
4	VSENSE+	

①- ⑧ any position must be connected to the earth(⏚)

Position	Screw Spec.	L(max)	Torque(max)
①- ⑧	M3	4mm	0.4N · m

Note:
Unit: mm[inch]
ADJ: Output adjustable resistor
Input connector wire range: 22-14AWG
Input connector tightening torque: M4, 1.2N · m(Max)
Output connector (-V0/+V0) tightening torque : M5, 2.4N · m(Max)
General tolerances: ± 1.00[± 0.039]

Note:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220209;
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. 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;
6. We can provide product customization service, please contact our technicians directly for specific information;
7. Products are related to laws and regulations: see "Features" and "EMC";
8. The out case needs to be connected to PE (⏚) of system when the terminal equipment in operating;
9. The output voltage can be adjusted by the ADJ, clockwise to increase;
10. CAUTION: Double pole, neutral fusing. Disconnect mains before servicing."/"ATTENTION: Double pôle/fusible sur le neutre. Débrancher lalimentation avant lentretien;
11. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units;
12. 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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