

AC/DC 50W Enclosed Switching Power Supply **MORNSUN**[®]

LM50-20Bxx, LM50-20Bxx-C, LM50-20Bxx-Q Series



FEATURES

- Universal 85 - 264VAC or 120 - 370VDC input voltage
- Accepts AC or DC input (dual-use of same terminal)
- Operating ambient temperature range: -30°C to +70°C
- Low standby power consumption, high efficiency
- High I/O isolation test voltage up to 4000VAC
- Low ripple & noise
- Output short circuit, over-current, over-voltage protection
- Over-voltage class III (designed to meet EN61558)
- Operating altitude up to 5000m



LM50-20Bxx 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/EN61000-4, CISPR32/EN55032, IEC/UL/EN62368, IEC/EN60335, GB4943, IEC/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)
UL/EN/IEC/CCC /BIS/BS	LM50-20B05	50	5V/10A	4.5-5.5	86	8500
	LM50-20B12	50.4	12V/4.2A	10.2-13.8	87	2000
	LM50-20B15	51	15V/3.4A	13.5-18	88	1500
	LM50-20B24	52.8	24V/2.2A	21.6-28.8	89	1000
	LM50-20B36	52.2	36V/1.45A	32.4-39.6	89	800
	LM50-20B48	52.8	48V/1.1A	43.2-52.8	90	680

Note: *Use suffix "C" for terminal with protective cover and suffix "Q" for conformal coating.

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Voltage Range	AC input		85	--	264	VAC
	DC input		120	--	370	VDC
Input Voltage Frequency			47	--	63	Hz
Input Current	115VAC		--	--	1.2	A
	230VAC		--	--	0.8	
Inrush Current	115VAC		Cold start	--	30	--
	230VAC			--	50	
Leakage Current	240VAC		<0.75mA			
Hot Plug			Unavailable			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	Full load range	5V	--	±2	--	%
		12V/15V/24V/36V/48V	--	±1	--	
Line Regulation	Rated load		--	±0.5	--	%
Load Regulation	0% - 100% load	5V	--	±1	--	
		12V/15V/24V/36V/48V	--	±0.5	--	
Ripple & Noise*	20MHz bandwidth	5V	--	80	--	mV
		12V/15V	--	120	--	

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	(peak-to-peak value)	24V	--	150	--	
		36V/48V	--	200	--	
Temperature Coefficient			--	±0.03	--	%/°C
Minimum Load			0	--	--	%
Stand-by Power Consumption			--	--	0.3	W
Hold-up Time	115VAC		8	--	--	ms
	230VAC		30	--	--	
Short Circuit Protection	Recovery time <5s after the short circuit disappear.		Hiccup, continuous, self-recovery			
Over-current Protection			110%-200% I _o , self-recovery			
Over-voltage Protection	5V		≤6.3VDC (Output voltage clamp or hiccup)			
	12V		≤16.2VDC (Output voltage clamp or hiccup)			
	15V		≤21.75VDC (Output voltage clamp or hiccup)			
	24V		≤33.6VDC (Output voltage clamp or hiccup)			
	36V		≤48.6VDC (Output voltage clamp or hiccup)			
	48V		≤60.0VDC (Output voltage clamp or hiccup)			
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 <10mA	2000	--	--	VAC		
	Input - output		4000	--	--			
	Output - ⊕		1250	--	--			
Insulation Resistance	Input - ⊕	At 500VDC	100	--	--	MΩ		
	Input - output		100	--	--			
	Output - ⊕		100	--	--			
Operating Temperature			-30	--	+70	°C		
Storage Temperature			-40	--	+85	°C		
Storage Humidity	Non-condensing		--	--	95	%RH		
Operating Humidity			20	--	90			
Switching Frequency			--	65	--	kHz		
Power Derating	Operating temperature derating	-30°C to -25°C	85VAC-100VAC	5	--	--	% / °C	
		5V	+40°C to +70°C	85VAC-165VAC	1.33	--		--
			+50°C to +70°C	165VAC-264VAC	2	--		--
		Other output	+50°C to +70°C	2	--	--		
Input Voltage derating	85VAC-100VAC		1.33	--	--	%/VAC		
Safety Standard			IEC/UL62368-1, GB4943.1, IS13252 (Part1) safety approved & EN62368-1, EN60335-1, EN61558-1, BS EN 62368-1 (Report) Design refer to IEC60335-1, IEC61558-1					
Safety Class			CLASS I					
MTBF	MIL-HDBK-217F@25°C		>300,000 h					

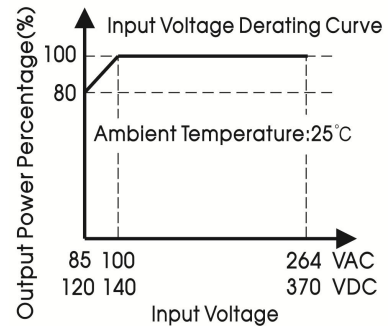
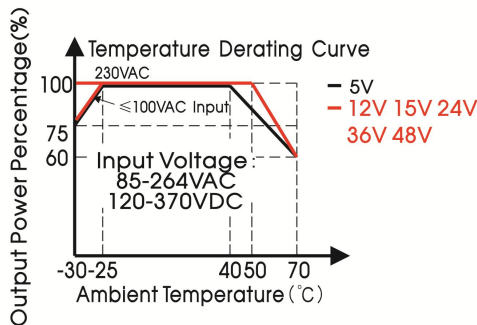
Mechanical Specifications

Case Material	Metal (AL1100, SGCC)
Dimensions	99.00 x 82.00 x 30.00 mm
Weight	180g (Typ.)
Cooling Method	Free air convection

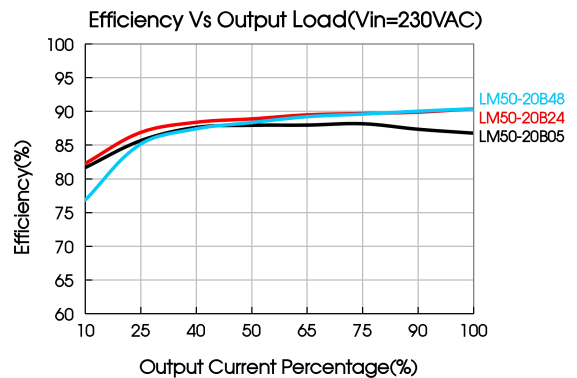
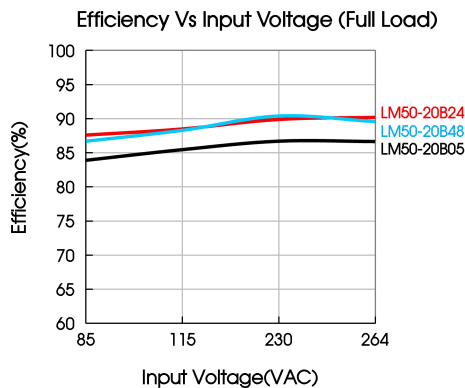
Electromagnetic Compatibility (EMC)

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 $\pm 6KV$ /Air $\pm 8KV$	perf. Criteria A
	RS	IEC/EN 61000-4-3	10V/m	perf. Criteria A
	EFT	IEC/EN 61000-4-4	$\pm 2KV$	perf. Criteria A
	Surge	IEC/EN 61000-4-5	line to line $\pm 2KV$ /line to ground $\pm 4KV$	perf. Criteria A
	CS	IEC/EN61000-4-6	10 Vr.m.s	perf. Criteria A
	Voltage dip, short interruption and voltage variation	IEC/EN61000-4-11	0%, 70%	perf. Criteria B

Product Characteristic Curve

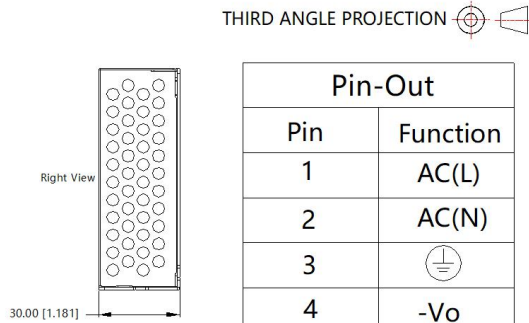
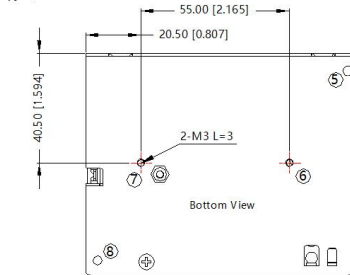
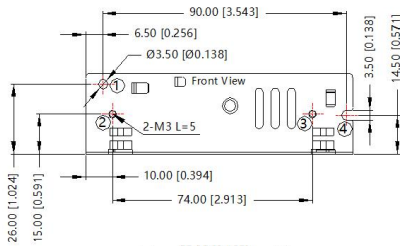
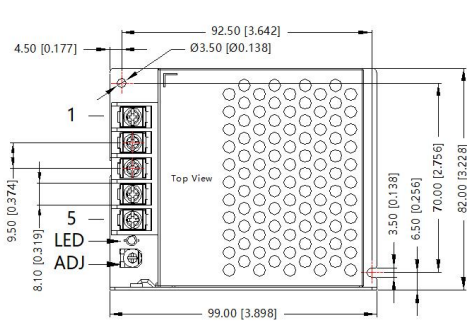


- Note: 1. With an AC input voltage between 85 -100VAC and a DC input between 120-140VDC the output power must be derated as per the temperature derating curves;
2. This product is suitable for applications using natural air cooling; for applications in closed environment please consult factory or one of our FAE.



Dimensions and Recommended Layout

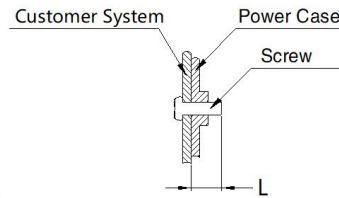
LM50-20Bxx, LM50-20Bxx-Q Series



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

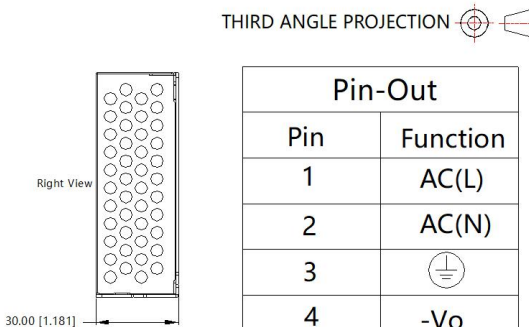
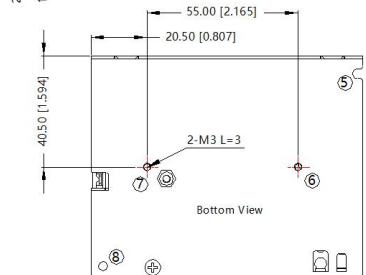
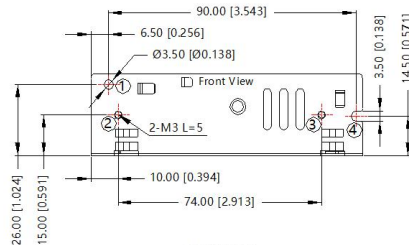
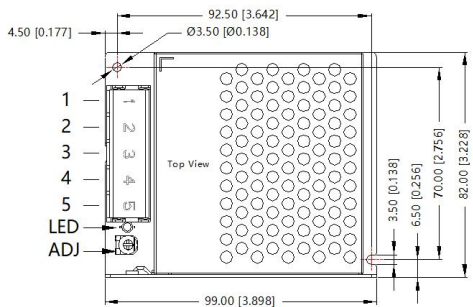
①-⑧any position must be connected to the earth(⊕)

Position	Screw Spec.	L(max)	Torque(max)
② - ③	M3	5mm	0.4N·m
⑥ - ⑦	M3	3mm	0.4N·m



Note:
Unit: mm[inch]
Wire range: 22-12AWG
Connector tightening torque: M3.5 , 0.8N·m
General tolerances: ± 1.00[± 0.039]

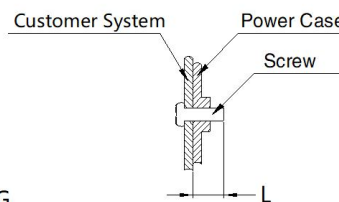
LM50-20Bxx-C Series



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

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

Position	Screw Spec.	L(max)	Torque(max)
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Note:
Unit: mm[inch]
Wire range: 22-12AWG
Connector tightening torque: M3.5 , 0.8N·m
General tolerances: ± 1.00[± 0.039]

Note:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220118;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of $T_a=25^{\circ}\text{C}$, humidity <75% RH with nominal input voltage and rated output load;
3. The room temperature derating of $5^{\circ}\text{C}/1000\text{m}$ 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 the earth (\oplus) of system when the terminal equipment in operating;
9. 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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