

AC/DC 35W Enclosed Switching Power Supply

LM35-22Bxx, LM35-22Bxx-C, LM35-22Bxx-Q Series



EN62368-1
EN60335-1
EN61558-1



FEATURES

- 165 - 264VAC or 180 - 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
- OVC III (designed to meet EN61558)
- Operating altitude up to 5000m

LM35-22Bxx series is one of Mornsun's enclosed AC-DC switching power supply. It features 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	Nominal Output Voltage and Current (Vo/Io)	Output Voltage Adjustable Range (V)	Efficiency at 230VAC (%) Typ.	Max. Capacitive Load (uF)
EN/IEC/CCC/BIS	LM35-22B05	35W	5V/7A	4.5-5.5	86	8000
	LM35-22B12	36W	12V/3A	10.2-13.8	87	1500
	LM35-22B15		15V/2.4A	13.5-18	89	1000
	LM35-22B24		24V/1.5A	21.6-28.8	88	750

Note: 1. *Use suffix "C" for terminal with protective cover and suffix "Q" for conformal coating.

2. The product picture is for reference only. For details, please refer to the actual product.

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Voltage Range	AC input		165	--	264	VAC
	DC input		180	--	370	VDC
Input Voltage Frequency			47	--	63	Hz
Input Current	230VAC		--	--	0.6	A
Inrush Current	230VAC	Cold start	--	45	--	
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	--	±1	--	
Line Regulation	Rated load		--	±0.5	--	
Load Regulation	0% - 100% load	5V	--	±1	--	
		12V/15V/24V	--	±0.5	--	
Ripple & Noise*	20MHz bandwidth (peak-to-peak value)	5V	--	80	--	mV
		12V/15V	--	120	--	
		24V	--	150	--	
Temperature Coefficient			--	±0.03	--	%/°C
Minimum Load			0	--	--	%

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Stand-by Power Consumption	230VAC	--	--	0.3	W
Hold-up Time	230VAC	30	--	--	ms
Short Circuit Protection	Recovery time <5s after the short circuit disappear.	Hiccup, continuous, self-recover			
Over-current Protection		110%-200% Io, self-recover			
Over-voltage Protection	5V	≤6.3VDC (Hiccup, self-recover)			
	12V	≤16.2VDC (Hiccup, self-recover)			
	15V	≤21.75VDC (Hiccup, self-recover)			
	24V	≤33.6VDC (Hiccup, self-recover)			
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	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	
Storage Humidity		Non-condensing		--	--	95	%RH
Operating Humidity				20	--	90	
Switching Frequency				--	65	--	kHz
Power Derating		Operating temperature derating	+50°C to +70°C	2	--	--	%/°C
		Input voltage derating	180VDC-200VDC	1	--	--	%/VDC
Safety Standard		IEC/EN/BS EN62368-1, GB4943.1, IS13252 (Part1) & EN60335-1, EN61558-1 safety approved; Design refer to UL62368-1, IEC60335-1, IEC61558-1					
Safety Class		CLASS I					
MTBF		MIL-HDBK-217F@25°C		>300,000 h			

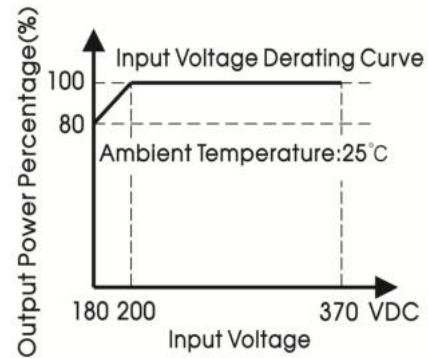
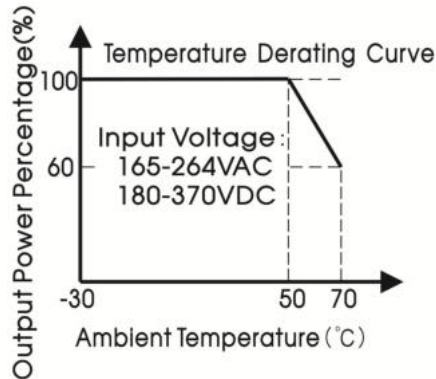
Mechanical Specifications

Case Material	Metal (AL1100, SGCC)
Dimension	99.00 x 82.00 x 30.00 mm
Weight	165g (Typ.)
Cooling Method	Free air convection

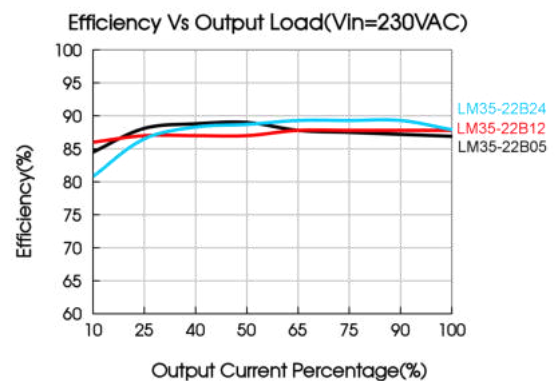
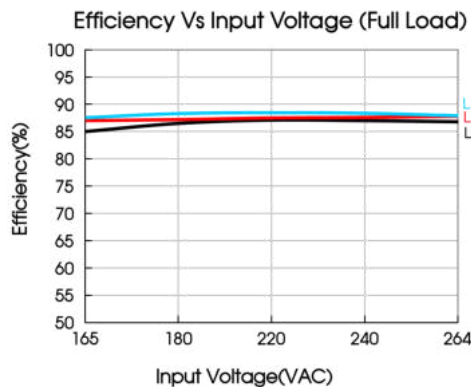
Electromagnetic Compatibility (EMC)

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 ±6KV/Air ±8KV	perf. Criteria A
	RS	IEC/EN 61000-4-3	10V/m	perf. Criteria A
	EFT	IEC/EN 61000-4-4	±2KV	perf. Criteria A
	Surge	IEC/EN 61000-4-5	line to line ±2KV/line to PE ±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

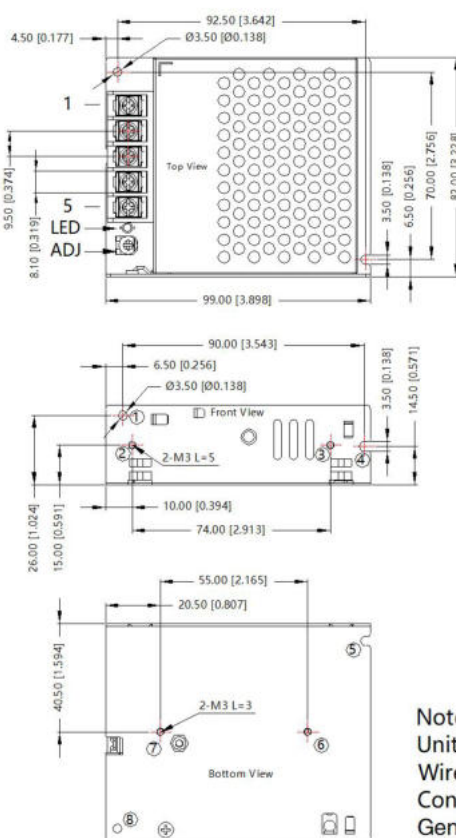


Note: 1. With an AC input voltage between 180-200VDC the output power must be derated as per the temperature derating curves;
2. This product is suitable for applications using natural air cooling; for applications in closed environment please consult Mornsun FAE.



Dimensions and Recommended Layout

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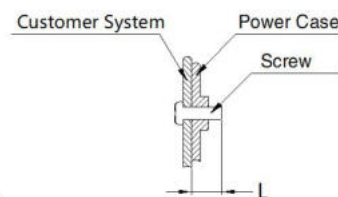


THIRD ANGLE PROJECTION

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

①-⑧ any 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

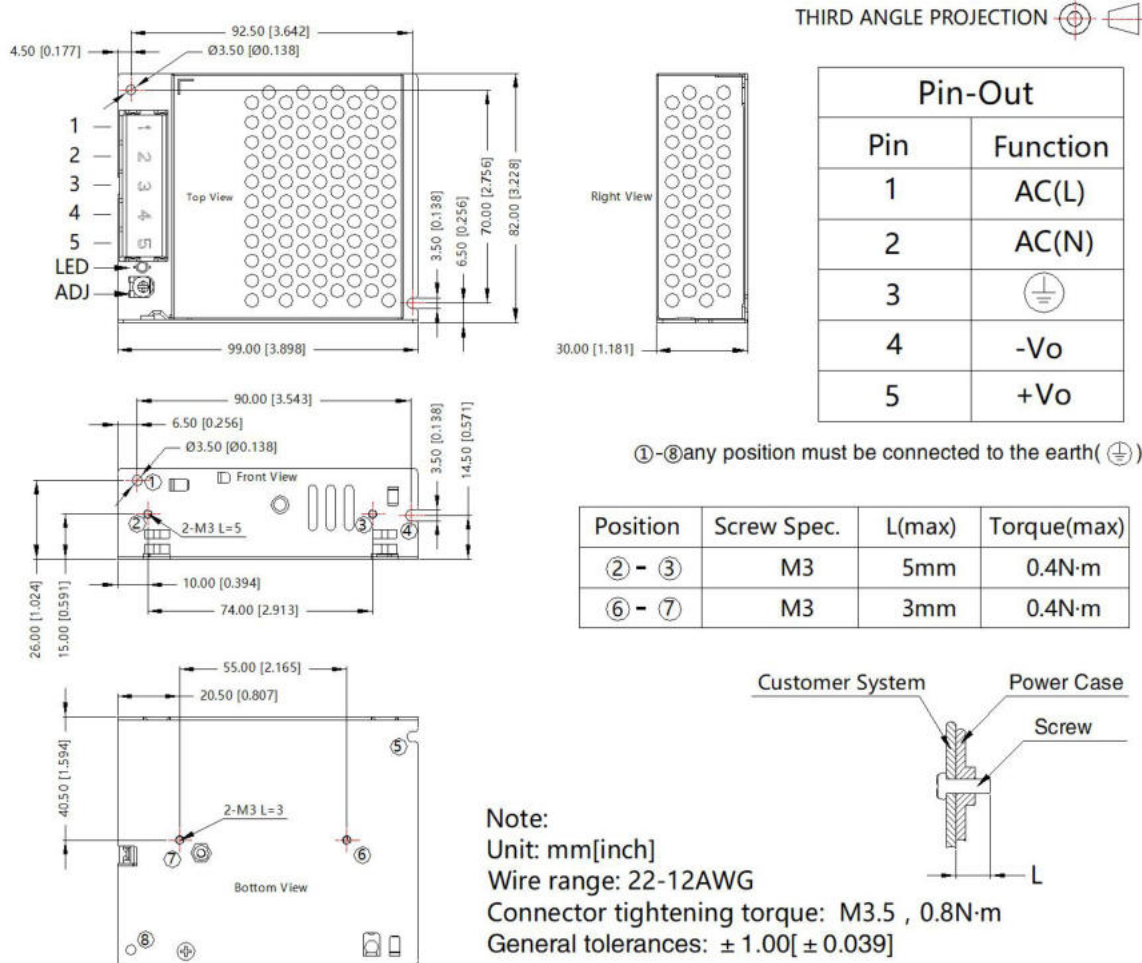


Note:
Unit: mm[inch]
Wire range: 22-12AWG
Connector tightening torque: M3.5, 0.8N·m
General tolerances: $\pm 1.00 [\pm 0.039]$

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Note:

- For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58220118;
- 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;
- The room temperature derating of $5^{\circ}\text{C}/1000\text{m}$ is needed for operating altitude greater than 2000m;
- All index testing methods in this datasheet are based on our company corporate standards;
- 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;
- We can provide product customization service, please contact our technicians directly for specific information;
- Products are related to laws and regulations: see "Features" and "EMC";
- The out case needs to be connected to PE () of system when the terminal equipment in operating;
- 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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