LM50-23B SERIES

AC-DC

50W

DIMENSIONS:

3.90 x 3.22 x 1.18"
(99 x 82 x 30mm)

EN55032 LEVEL B | **85 to 305 VAC** | **-30 to 70°C OPERATION**

Part numbers

LM	50	-	23B	12	-	C
Series	Power (W)		Input voltage	Output voltage		Options
			85-305VAC	05 = 05VDC 12 = 12VDC 15 = 15VDC 24 = 24VDC 36 = 36VDC 48 = 48VDC		-C = terminal cover -Q = bottom conformal coating -QQ = both sides conformal coating

Key specifications

Input range	Safety certification	Features	Efficiency	Environmental performance
85-305VAC	IEC/UL/EN 62368-1, CE/EN 60335-1	Output Voltage Adjust	83-90%	Operational: -30 to 70°C

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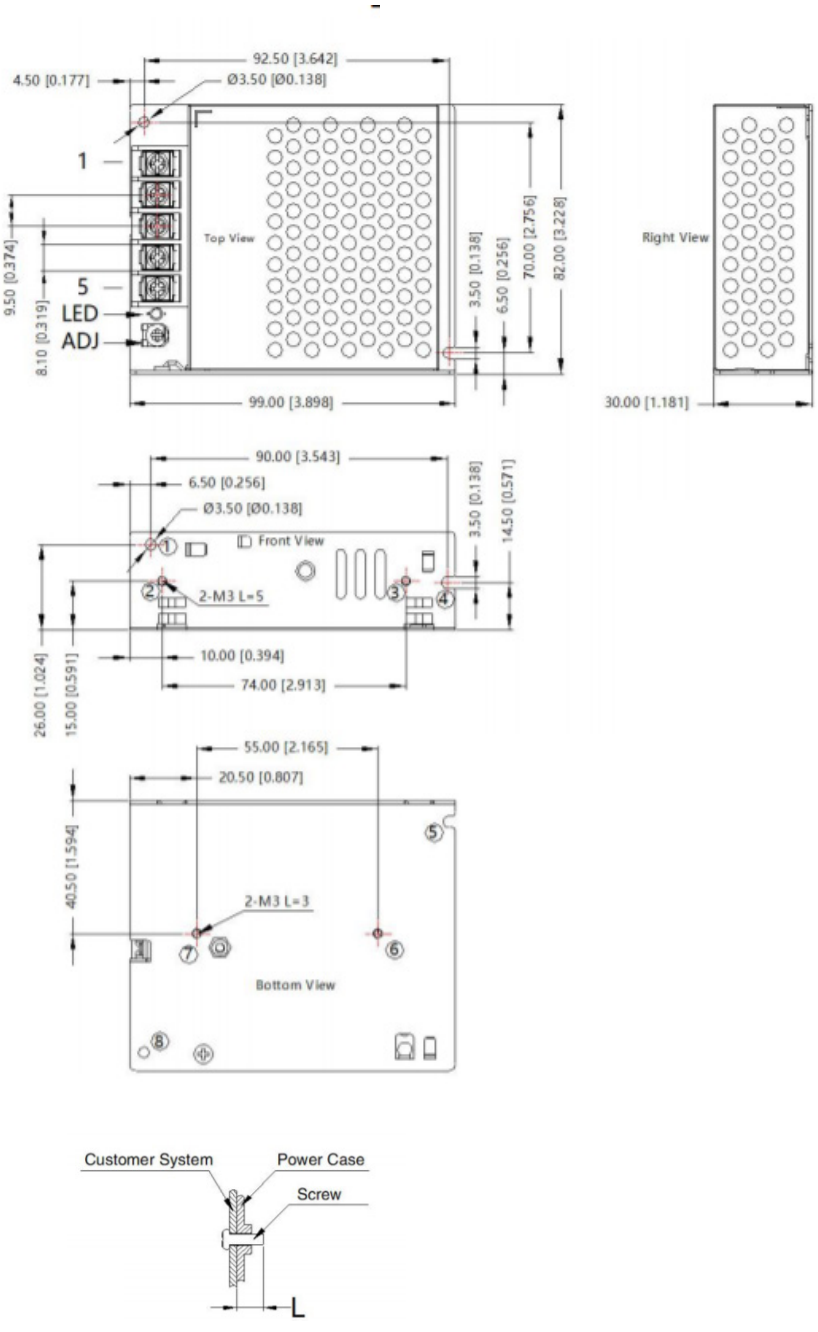
Mechanical

THIRD ANGLE PROJECTION



Connector	Pin/Function
1	AC(L)
2	AC(N)
3	GND
4	-VO
5	+VO

Notes
1. All dimensions shown in mm [Inch] 2. General tolerance ±1.00 [±0.039] 3. Wire range: 22-12AWG 4. Connector lightening torque: M3.5, 0.8N-m 5. Pos 2&3 L=5mm, pos 6&7 L=3mm

Weight	190g

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Models & Ratings

Model Number(1)	Output power	Output voltage	Output voltage adjustable range	Output current	Efficiency (2)	Capacitive load
LM50-23B05	50W	5V	4.5-5.5V	10A	83%	8500uF
LM50-23B12	50.4W	12V	10.2-13.8V	4.2A	86%	2000uF
LM50-23B15	51W	15V	13.5-18V	3.4A	87%	1500uF
LM50-23B24	52.8W	24V	21.6-28.8V	2.2A	86%	750uF
LM50-23B36	52.2W	36V	32.4-39.6V	1.45A	89%	470uF
LM50-23B48	52.8W	48V	43.2-52.8V	1.1A	90%	220uF

1. Add -C for terminal cover, add -Q for conformal coating and add -QQ for both sides conformal coating
2. Typical at 100% load 230VAC

Input

Parameter	Min	Typical	Max	Unit	Notes/Conditions
Input voltage	85		305	VAC	See page 5 for derating curve
Input frequency	47		63	Hz	
Input current (rms)		0.8/1.2		A	230VAC/115VAC
Inrush current		30/60		A	115/230VAC cold start at 25°C
No load input power			0.5	W	
Leakage current		<750		uA	277VAC

Output

Parameter	Min	Typical	Max	Unit	Notes/Conditions
Output voltage	5		48	VDC	See Models & Ratings table
Set point accuracy	±1		±2	%	5V ±2%, all others ±1%
Line regulation			±0.5	%	
Load regulation	±0.5		±1	%	5V ±1%, all others ±0.5%
Minimum load	0			%	
Ripple & noise	80	120	240	mVpp	20 MHz bandwidth, 47uF, 0.1uF cap. 80mV for 5V, 150mV for 24V & 240mV for all others
Hold up time	8		30	ms	8ms at 115VAC, 30ms at 240VAC

Protections

Parameter	Min	Typical	Max	Unit	Notes/Conditions
Overload	110		200	%	Trip and restart. 110% at low temperature
Short circuit					Trip and restart.
Overvoltage	5V model - 6.3V 12V model - 16.2V 15V model - 21.75V 24V model - 36.6V 36V model - 49V 48V model - 60V			VDC	Max figures. Hiccup

Safety

Parameter	Min	Typical	Max	Unit	Notes/Conditions
Safety standards	IEC/UL/EN 62368-1				CE/EN60335-1, EN61558-1, EN61558-2-16, CCC
Isolation: Input to output	4000			VAC	
Isolation: Input / output to ground	1250		2000	VAC	2000VAC from input to ground.
Insulation resistance	100			MΩ	500VDC

EMC: Immunity

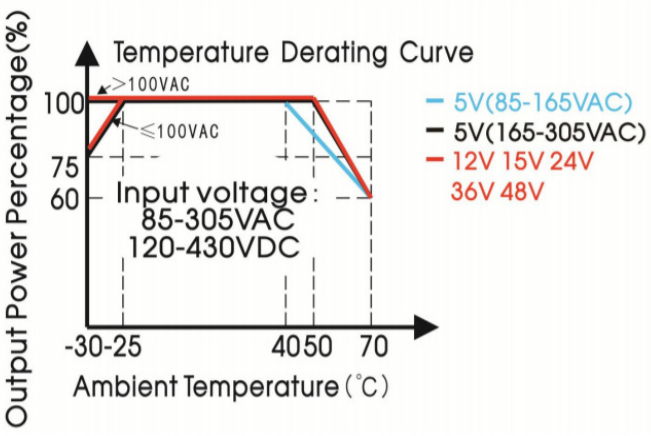
	Standard	Test level	Criteria	Notes/Conditions
ESD	EN61000-4-2	3	A	±6kV contact, ±8kV air.
Radiated	EN61000-4-3	3	A	10V/m
EFT	EN61000-4-4	3	A	±2kV
Surges	EN61000-4-5	Installation class 3	A	Line to line ±2kV, common ±4kV
Conducted	EN61000-4-6	3	A	10Vrms
Voltage dips & interruptions	EN61000-4-11	0% 70%	B	

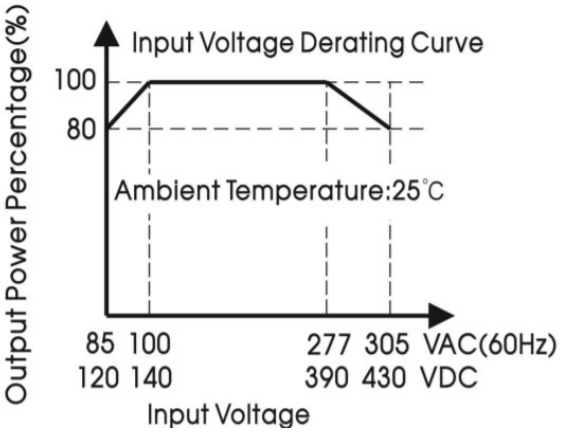
EMC: Emissions

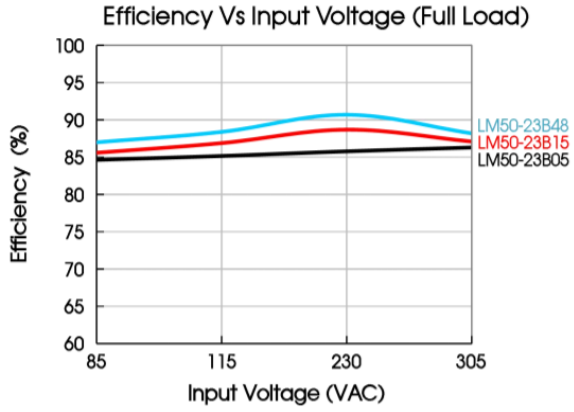
	Standard	Test level	Criteria	Notes/Conditions
Conducted	EN55032	B		
Radiated	EN55032	B		

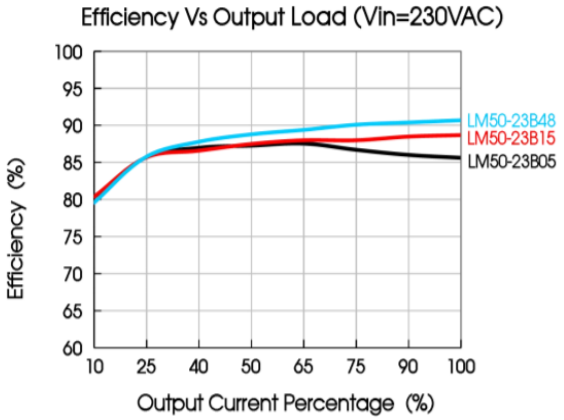
Environmental

Parameter	Min	Typical	Max	Unit	Notes/Conditions
Operating temperature	-30		70	°C	See derating curve.
Storage temperature	-40		85	°C	
Cooling					convection cooled
Temperature coefficient			0.03	%/°C	
Humidity	20		95	% RH	Non condensing. Storage 10-95% RH
Operating altitude			5000	M	5°C/1000m derating above 2000m
MTBF	300			kHrs	As per MIL-HDBK-217F rated load @25°C



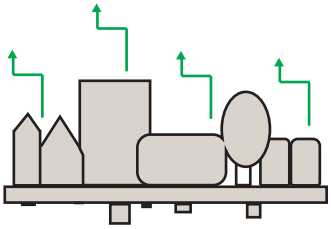






Installation Advice

EMC

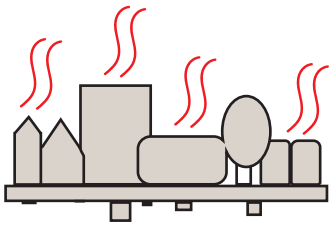


Conducted and radiated emissions compliance is a common application consideration. It is important to remember that even when using a properly filtered PSU, an application may still not achieve compliance if it is not designed to minimise emissions. That being said, there are a number of things that can be done to optimise EMC performance either as best practice, or if you are struggling for compliance:

1) Connect all marked EMI ground points to earth. Often these are combined with the safety earth point (in class I installations), but on some power supplies there may be additional earth tags or mounting points.
2) Minimise the length of input/output wiring where possible and try to maintain max distance of the conductors from the PSU, to prevent noise pick up. Avoid bundling input and output cables together. A common component to avoid placing wiring near is the PFC inductor in power factor corrected power supplies.
3) Apply additional filtering before the PSU input (ensure consideration of which frequencies there are issues with before selecting a filter).
4) When using an open frame PSU, mount the supply on a metal plate and connect EMI mounting points.
5) In multi circuit systems, decouple the circuits locally.
6) Ferrites added between the PSU and system input connector and/or the DC output cables can help in reducing radiated noise issues in systems. If seen, issues are commonly in the 30-150MHz area.

For more detailed assistance, if you still have any concerns with compliance, please get in contact with our Engineering department who are on hand to assist with any queries.

Thermal



Thermal management is an important consideration when thinking about equipment service life. Electrolytic capacitors within the PSU wear with time and are typically the first end-of-life failure. Keeping the operation temperature of key components within the PSU, such as the electrolytic capacitors, as low as possible is paramount. As a general rule, for every 10°C drop in the operating temperature of the electrolytic capacitators you double their lifetime, and thus the lifetime of the power supply. When looking at thermal performance it is helpful to test under a worst-case set of conditions, to ensure component temperatures are in an acceptable range for the required service life. Then consider the impact of operational time, load and temperature profile to estimate a more realistic lifetime for your PSU.

Also, many Fidus power supplies offer a Peak Power rating to provide for customers with pulsing loads. When using a peak power capability customers must consider:
1) Peak duration rating: the maximum length of time the peak can be drawn for
2) Duty cycle: the frequency with which the peak can be drawn. (e.g. 10% duty cycle, 1 second on:9 seconds off)
3) Average power value: datasheets will state the maximum average power acceptable with peak power PSUs. If any of these elements are exceeded the supply may overheat, with performance and lifetime suffering as a result.