FidusPower

LMF150-23B SERIES

AC-DC

150W

DIMENSIONS:

7.047 x 3.898 x 1.18"
(179 x 99 x 30mm)

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

POWER DENSE | **4000 VAC ISOLATION** | **LOW PROFILE**

Part numbers

LMF	150	-	23B	12	-	C
Series	Power (W)		Input voltage	Output voltage		Options
			85-305VAC	12 = 12VDC 15 = 15VDC 24 = 24VDC 48 = 48VDC		-C = terminal cover -Q = conformal coating

Key specifications

Input range	Safety certification	Features	Efficiency	Environmental performance
85-305VAC	IEC/UL/EN 62368-1, 60335-1	Output Voltage Adjust Remote On/Off	85.5-88%	Operational: -30 to 70°C

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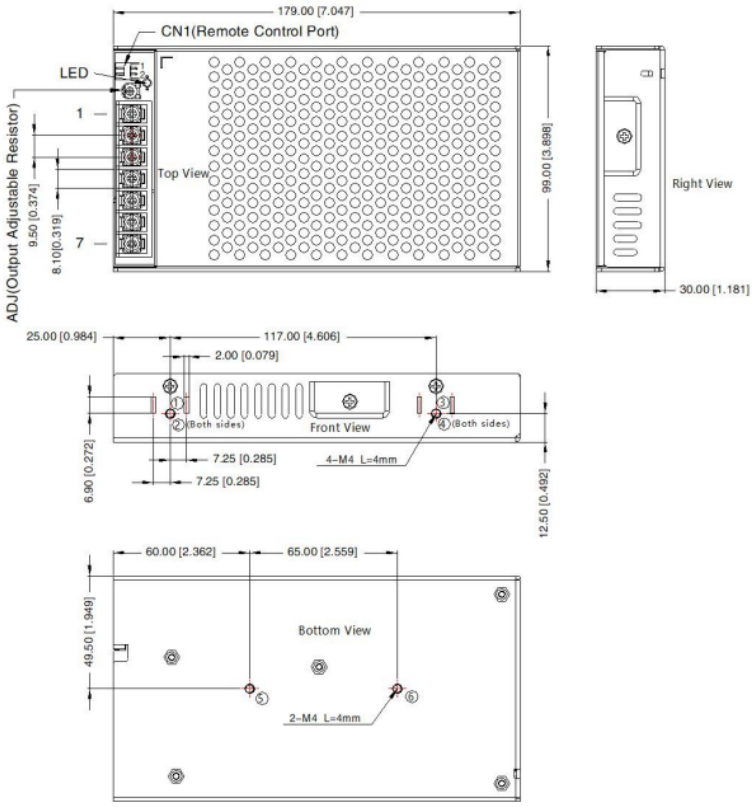
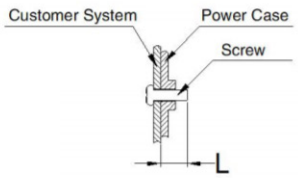
Mechanical

THIRD ANGLE PROJECTION





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

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 1-6 L=4mm

Weight	500g

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Models & Ratings

Model Number(1)	Output power	Output voltage	Output voltage adjustable range	Output current	Efficiency (2)	Capacitive load
LMF150-23B12	150W	12V	10.2-13.8V	12.5A	85.5%	5000uF
LMF150-23B15	150W	15V	13.5-18V	10A	86%	5000uF
LMF150-23B24	151.2W	24V	21.6-28.8V	6.3A	87%	5000uF
LMF150-23B48	153.6W	48V	45.6-55.2V	3.2A	88%	3000uF

1. Add -C for terminal cover and Q for 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, 120 - 430 VDC
Input frequency	47		63	Hz	
Input current (rms)	1	2	2.5	A	1A at 230VAC, 2A at 115VAC, 2.5A at 85VAC
Inrush current		30/45		A	115/230VAC cold start at 25°C
Power factor	0.97	0.99			At full load 115VAC
	0.91	0.98			At full load 230VAC
Leakage current		<2		mA	277VAC

Output

Parameter	Min	Typical	Max	Unit	Notes/Conditions
Output voltage	12		48	VDC	See Models & Ratings table
Set point accuracy	±1		±2	%	
Line regulation		±0.5		%	At rated load
Load regulation		±0.5		%	0-100% load
Ripple & noise	100	150	250	mVpp	20 MHz bandwidth, 47uF, 0.1uF cap 100mV for 12/15V, 150mV for 24V, 250mV for 48V
Hold up time	16			mS	230VAC

Protections

Parameter	Min	Typical	Max	Unit	Notes/Conditions
Overload	105		150	%	Trip and restart
Short circuit					Trip and restart
Overvoltage	12V model - 16.8V 15V model - 24.5V 24V model - 33.6V 48V model - 60V			VDC	Max figures. Hiccup

Controls/Functions

Parameter	Min	Typical	Max	Unit	Notes/Conditions
Voltage adjust		±1		%	
Remote on/off	0/4			0.8/10	Power on / power off

Safety

Parameter	Min	Typical	Max	Unit	Notes/Conditions
Safety standards	IEC/UL/EN 62368-1, 60335-1				CE & CCC
Isolation: Input to output	4000			VAC	
Isolation: Input to ground	2000			VAC	500VAC from output to ground
Insulation resistance	100			MΩ	500VDC

EMC: Immunity

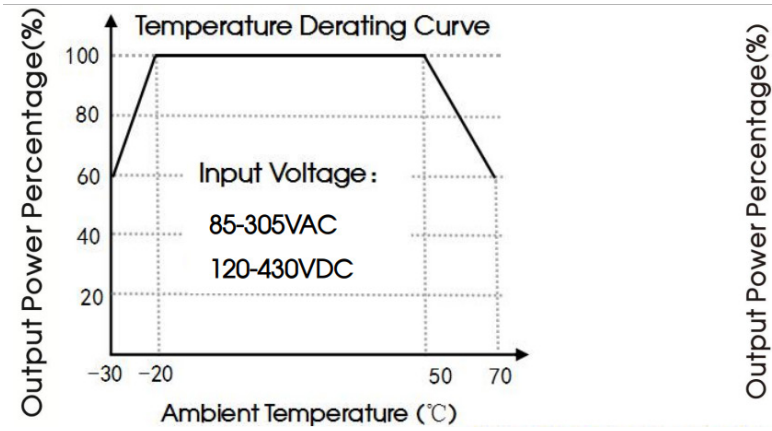
	Standard	Test level	Criteria	Notes/Conditions
ESD	EN61000-4-2	3	A	±6kV contact, ±8kV air
Radiated	EN61000-4-3	3	B	10V/m
EFT	EN61000-4-4	3	A	±2kV
Surges	EN61000-4-5	Installation class 3	A	Line to line ±1kV, common ±2kV
Conducted	EN61000-4-6	3	A	10Vrms
Voltage dips & interruptions	EN61000-4-11	0% 70%	B	

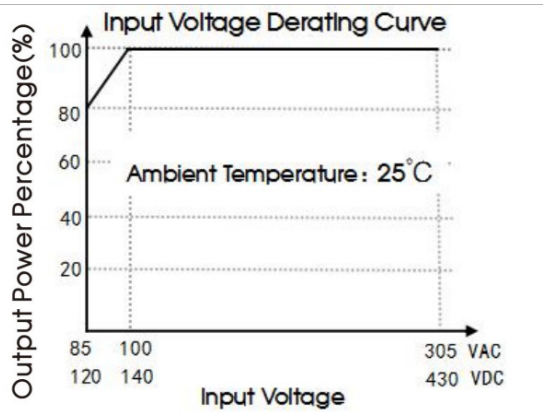
EMC: Emissions

	Standard	Test level	Criteria	Notes/Conditions
Conducted	EN55032	B		
Radiated	EN55032	B		
Harmonic current	EN61000-3-2			Class A and D
Voltage flicker	EN61000-3-3			Compliant

Environmental

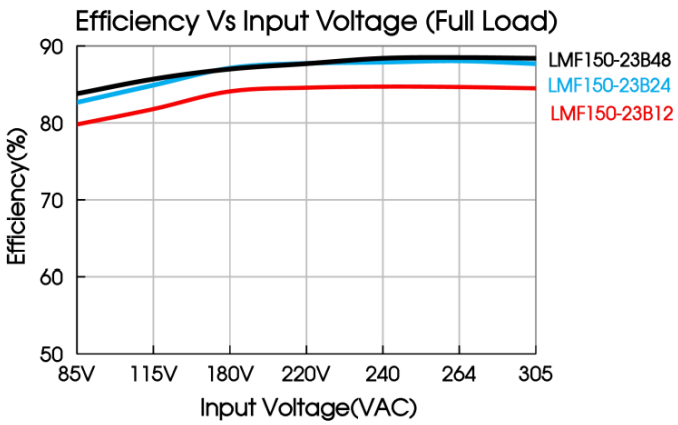
Parameter	Min	Typical	Max	Unit	Notes/Conditions
Operating temperature	-30		70	°C	See derating curve.
Storage temperature	-40		85	°C	
Cooling					convection cooled
Temperature coefficient			0.05	%/°C	
Humidity	20		95	% RH	Non condensing. Storage 0-95% RH storage
Operating altitude			5000	M	5°C/1000m derating above 2000m
MTBF	300			kHrs	As per MIL-HDBK-217F rated load @25°C

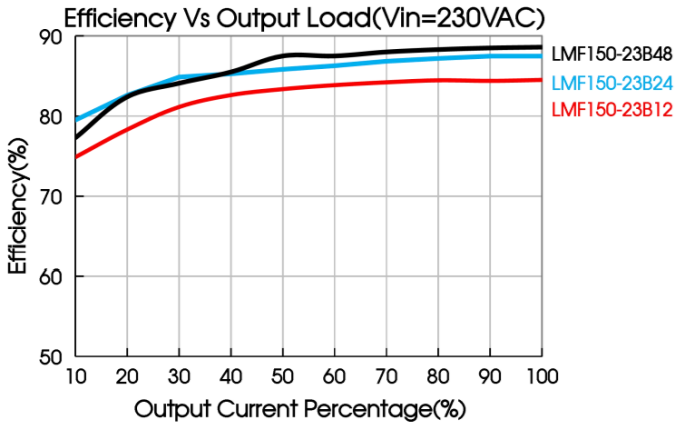




Note: 1. With an AC input voltage between 85-100VAC and a DC input between 120-140VDC the output power must be derated as per the temperature derating curves;

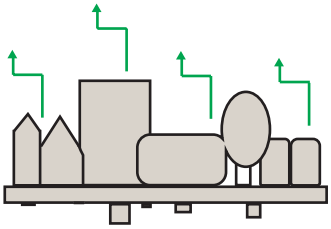
2. This product is suitable for applications using natural air cooling; for applications in closed environment please consult Mornsun FAE.





Installation Advice

EMC

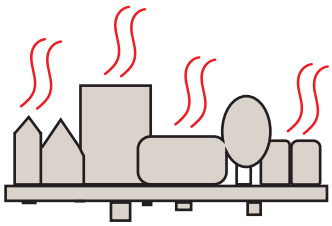


Conducted and radiated emissions compliance is a common application consideration. It is important to remember that even when using a properly filtered PSU, an application may still not achieve compliance if it is not designed to minimise emissions. That being said, there are a number of things that 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.