

ML100B

1W, Ultra Miniature SMT DC/DC Converters

Key Features:

- 1w Output Power
- Ultra Mini SMT Case
- 1500VDC Isolation
- Up to 88% Efficient
- -40°C to +105°C Temp
- 25 Standard Models
- Short Circuit Protection
- Tape & Reel Available



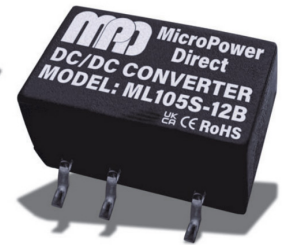
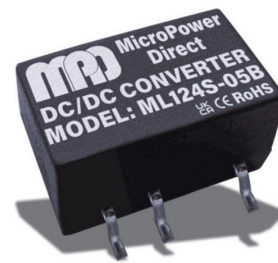
RoHS



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Electrical Specifications

Specifications typical @ +25°C, nominal input voltage & rated output current, unless otherwise noted. Specifications subject to change without notice.

Input						
Parameter	Conditions	Min.	Typ.	Max.	Units	
Input Voltage Range	3.3 VDC Input	2.97	3.3	3.63	VDC	
	5 VDC Input	4.5	5	5.5		
	12 VDC Input	10.8	12	13.2		
	15 VDC Input	13.5	15	16.5		
	24 VDC Input	21.6	24	26.4		
Input Filter	Capacitance Filter					
Reflected Ripple Current			15		mA	
Impulse Voltage	3.3VDC Input	-0.7		5	VDC	
	5VDC Input	-0.7		9		
	12VDC Input	-0.7		18		
	24VDC Input	-0.7		30		

Output						
Parameter	Conditions		Min.	Typ.	Max.	Units
Output Voltage Accuracy	See Fig. 1					
Line Regulation	Input Voltage Variation $\pm 1\%$	3.3VDC Output			± 1.5	%
		Others			± 1.2	
Load Regulation	10% - 100% Loading	3.3VDC Output		15		%
		5VDC Output		10		
		9VDC Output		9		
		12VDC Output		8		
		15VDC Output		7		
		24VDC Output		6		
Ripple & Noise	20MHz Bandwidth(Peak-Peak)			60	120	mV
Temperature Coefficient	Full Load				± 0.03	%/ $^{\circ}\text{C}$
Output Short Circuit	Continuous, Self-Recovery					

General						
Parameter	Conditions	Min.	Typ.	Max.	Units	
Isolation Voltage	Input-Output, Test Time 1 Minute, Leakage Current < 1mA	1500			VDC	
Isolation Resistance	Input-Output, Insul. Voltage 500VDC	100			M Ω	
Isolation Capacitance	Input-Output, 100KHz/0.1V		20		pF	
Switching Frequency	Full load, Nominal Input Voltage		220		kHz	

Environmental					
Parameter	Conditions	Min.	Typ	Max.	Units
Operating Temperature Range	Derating above 85 °C, See Fig. 2	-40		+105	°C
Storage Temperature Range		-55		+125	°C
Cooling	Free Air Convection				
Humidity, See Note 2	Non-Condensing			95	%RH

Physical						
Case Size	See Mechanical Diagrams (Page 4)					
Case Material	Black Plastic; Flame-Retardant And Heat-Resistant (UL94 V-0 Rated)					
Weight			0.06(1.7)		oz(g)	

Reliability Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units	
MTBF	MIL-HDBK-217F@25°C	3500			k hours	

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Model Selection Guide

UL	Model Number	Input			Output			Full Load Efficiency (% , Typ.)	Capacitive Load (μF, Max)
		Voltage (VDC)		Full Load/No-Load	Voltage (VDC)	Current (mA, Min)	Current (mA, Max)		
		Nominal	Range						
	ML103S-03B	3.3	2.97 - 3.63	370/3	3.3	30	303	80	2400
	ML103S-05B	3.3	2.97 - 3.63	370/3	5.0	20	200	82	2400
	ML103S-09B	3.3	2.97 - 3.63	370/3	9.0	11	111	83	1200
	ML103S-12B	3.3	2.97 - 3.63	370/3	12.0	8	84	84	820
	ML105S-03B	5	4.50 - 5.50	230/3	3.3	30	303	82	3000
▪	ML105S-05B	5	4.50 - 5.50	230/3	5.0	20	200	85	3000
	ML105S-09B	5	4.50 - 5.50	230/3	9.0	11	111	86	1200
▪	ML105S-12B	5	4.50 - 5.50	230/3	12.0	8	84	86	820
	ML105S-15B	5	4.50 - 5.50	230/3	15.0	7	67	86	680
	ML105S-24B	5	4.50 - 5.50	230/3	24.0	4	42	87	330
	ML112S-03B	12	10.80 - 13.20	99/3	3.3	30	303	82	3000
	ML112S-05B	12	10.80 - 13.20	99/3	5.0	20	200	85	3000
	ML112S-09B	12	10.80 - 13.20	99/3	9.0	11	111	86	1200
	ML112S-12B	12	10.80 - 13.20	99/3	12.0	8	84	86	820
	ML112S-15B	12	10.80 - 13.20	99/3	15.0	7	67	86	680
	ML112S-24B	12	10.80 - 13.20	99/3	24.0	4	42	88	330
	ML115S-05B	15	13.50 - 16.50	78/3	5.0	20	200	86	3000
	ML115S-12B	15	13.50 - 16.50	78/3	12.0	8	84	87	820
	ML115S-15B	15	13.50 - 16.50	78/3	15.0	7	67	88	680
	ML124S-03B	24	21.60 - 26.40	51/3	3.3	30	303	82	3000
	ML124S-05B	24	21.60 - 26.40	51/3	5.0	20	200	85	3000
	ML124S-09B	24	21.60 - 26.40	51/3	9.0	11	111	86	1200
	ML124S-12B	24	21.60 - 26.40	51/3	12.0	8	84	87	820
	ML124S-15B	24	21.60 - 26.40	51/3	15.0	7	67	87	680
	ML124S-24B	24	21.60 - 26.40	51/3	24.0	4	42	88	330
* ML105S-05B, -12B have UL/cUL 62368 (UL certificate). Contact factory for safety standard status of other models.									

Notes:

1. The input voltage should not exceed the specified range; otherwise, permanent and irreversible damage may be caused.
2. Unless otherwise specified, the parameters of this manual are measured at 25°C, humidity 40%-75%, input nominal voltage and output pure resistance mode under full load.
3. All index testing methods are based on the company's enterprise standards.
4. To further reduce input and output ripple, a capacitor filtering network can be connected at the input and output terminals. The application circuit is shown in Fig.3.

However, care should be taken to select a suitable filter capacitor. If the capacitance is too large, it is likely to cause start-up problems. For each output, the recommended capacitive load values are shown in "Recommended Capacitive Load Value Table 1" for safe and reliable operation.

5. EMC typical recommended circuit See Fig.4.
6. In order to ensure that the module can work efficiently and reliably, the minimum output load should not be less than 10% of the rated load when used. If the power required is really small, connect a resistor in parallel to the output end (the sum of the power consumed by the resistance and the power actually used is greater than or equal to 10% of the rated power).

Power Derating Curves

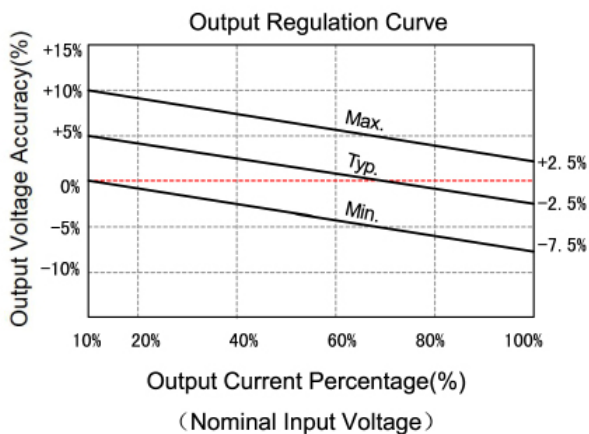


Fig. 1.1

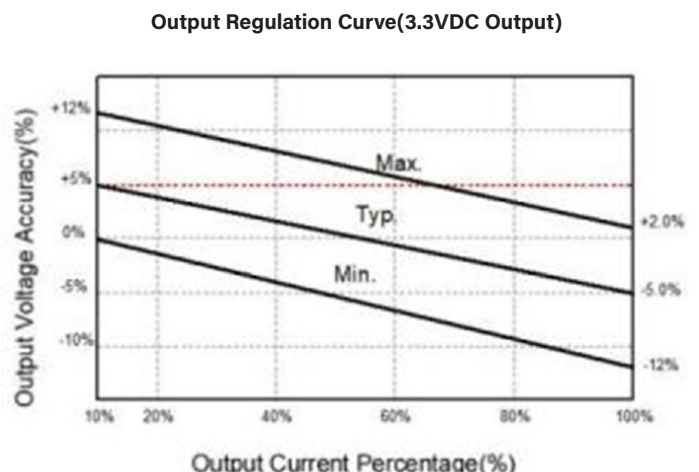
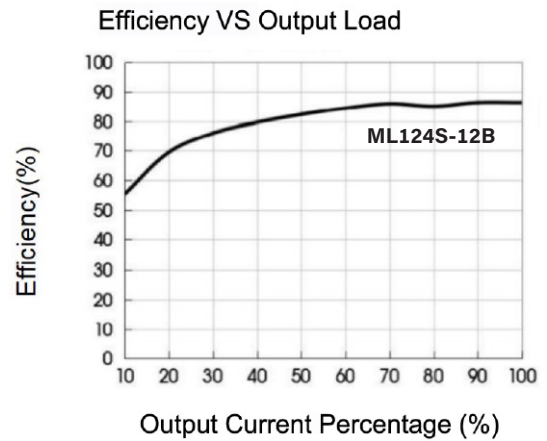
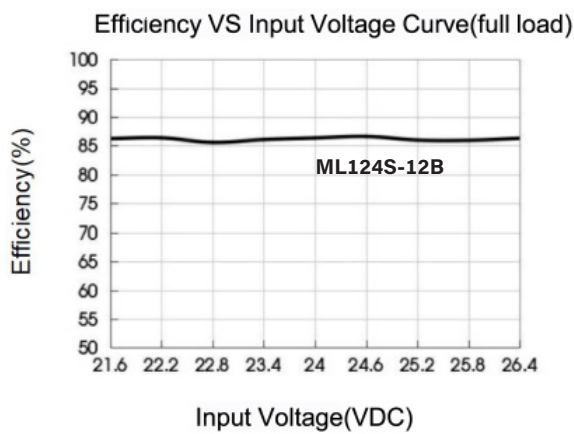
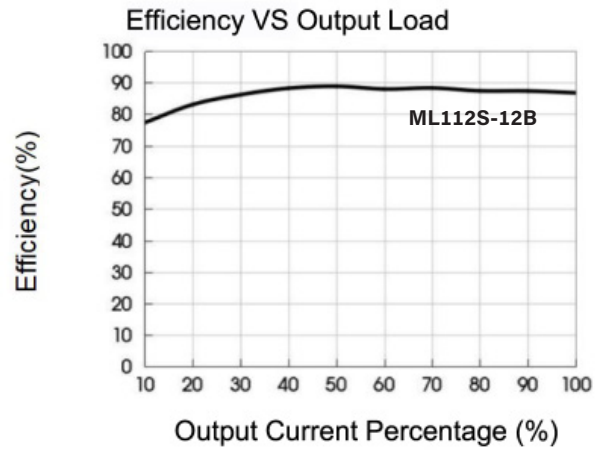
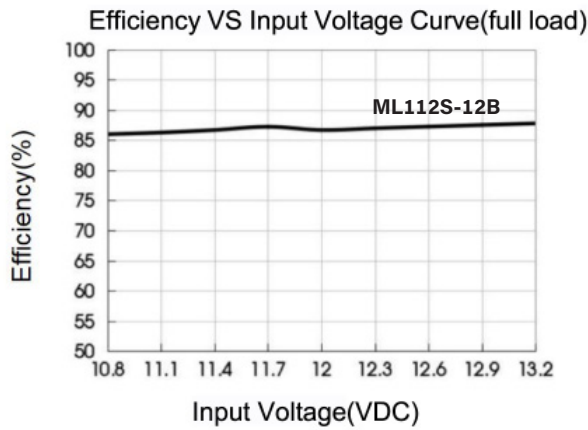


Fig. 1.2



Temperature Derating Curve

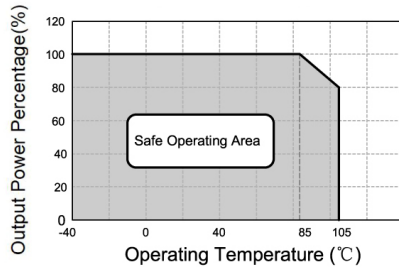


Fig. 2

Capacitive Load Value Table 1

Vin(VDC)	Cin(μF)	Vo(VDC)	Cout(μF)
3.3/5	4.7	3.3/5	10
12	2.2	9	4.7
15	2.2	12	2.2
24	1	15	1

EMI Parameter Table 2

C1,C2	4.7μF / 50μF
C2	Refer to the Cout parameter in Fig.3
CY	270pF / 2kV
LDM	6.8μH

EMI/EMC Characteristics

Parameter	Standard	Criteria	Level
Radiated Emissions (RE)	CISPR32/EN55032 (Fig. 4)		B
Conducted Emissions (CE)	CISPR32/EN55032 (Fig. 4)		B
ESD	IEC/EN 61000-4-2	B	±8KV Air ±4KV Contact

Typical Application Circuits

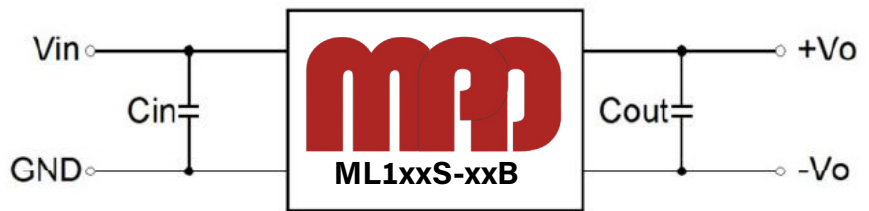


Fig. 3

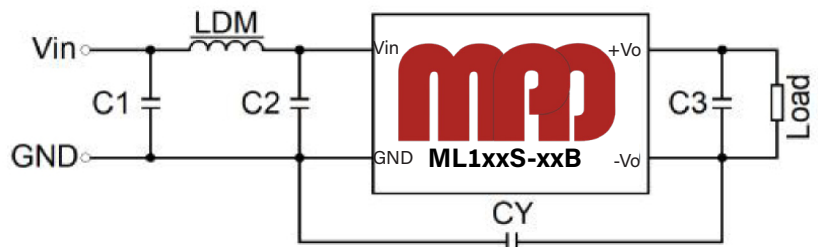
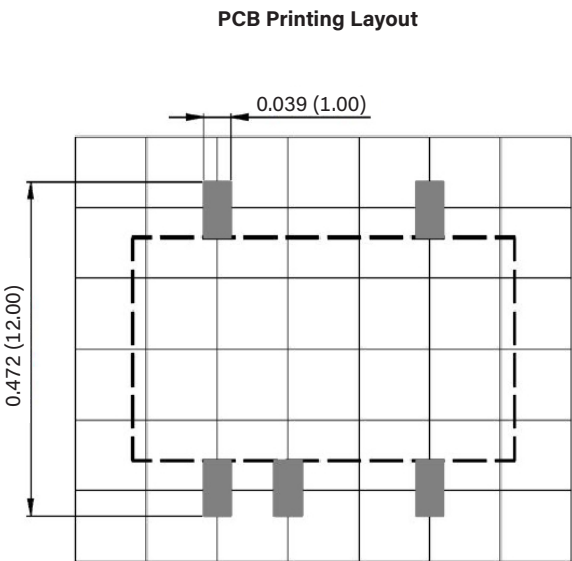
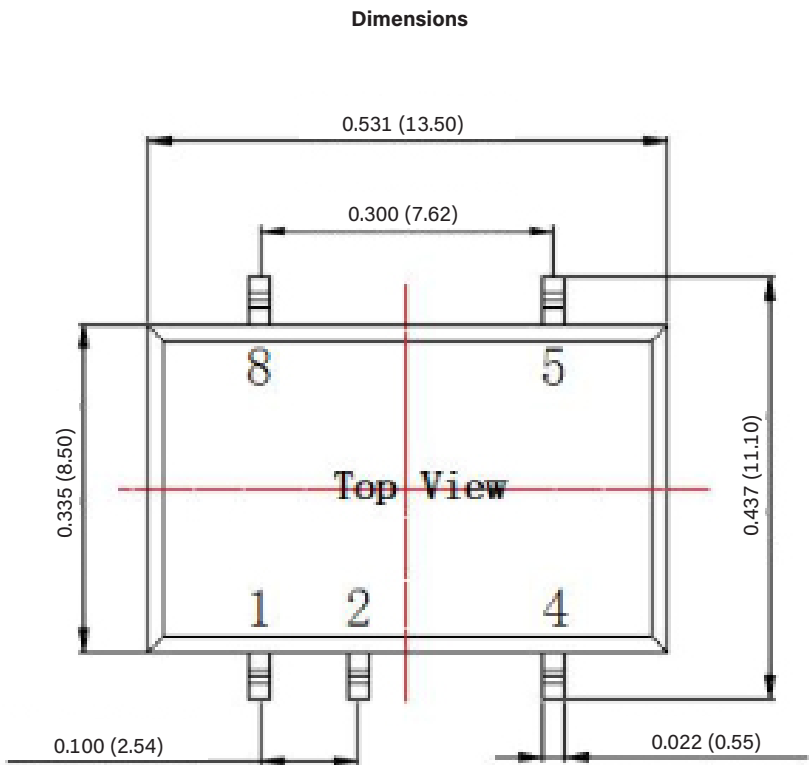


Fig. 4

Mechanical Dimensions

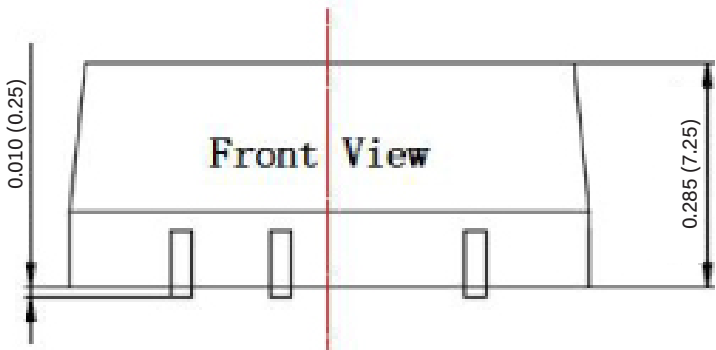


Note: The grid distance is 2.54mm x 2.54mm

Pin Connections

Pin	Function
1	GND
2	Vin
4	-Vo
5	+Vo
8	NC

NC: Cannot Be Connected
To Any External Circuit



Note:
Unit: Inch (mm)
Pin section tolerances: $\pm .004$ (± 0.10)
General tolerances: $\pm .020$ ($\pm .50$)

Reel & Tape Dimensions

