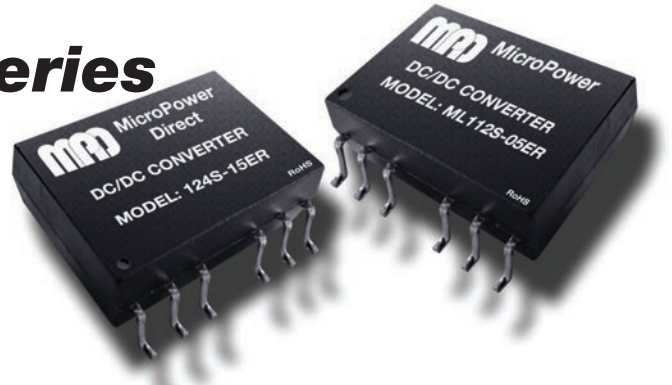


# ML100SER Series

## Low Cost, Regulated 1W SMT, Single Output DC/DC Converters



### Key Features:

- 1W Output Power
- Miniature SMT Case
- Tight Regulation
- -40°C to +85°C Operation
- Short Circuit Protection
- Low 0.24" Profile
- >3.5 MHour MTBF
- Industry Standard Pin-Out
- **LOW COST!**



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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	5 VDC Input	4.75	5.0	5.25	VDC
	12 VDC Input	11.4	12.0	12.6	
	15 VDC Input	14.25	15.0	15.75	
	24 VDC Input	22.80	24.0	25.20	
Input Filter	Capacitor				

#### Output

Parameter	Conditions	Min.	Typ.	Max.	Units
Output Voltage Accuracy				±3.0	%
Line Regulation	For Vin Change of 5%			±0.3	%
Load Regulation	For Iout = 10% to 100%			±1.0	%
Output Ripple (20 MHz)	See Note 1		10	20	mV P - P
Output Noise (20 MHz)	See Note 1		50	150	mV P - P
Temperature Coefficient				±0.03	%/°C
Output Short Circuit	Continuous (Autorecovery)				

#### General

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage	60 Seconds	1,000			VDC
Isolation Resistance	500 VDC	1,000			MΩ
Isolation Capacitance	100 kHz, 1V		70		pF
Switching Frequency			100		kHz

#### Environmental

Parameter	Conditions	Min.	Typ.	Max.	Units
Operating Temperature Range	Ambient	-40	+25	+85	°C
Storage Temperature Range		-55		+125	°C
Cooling	Free Air Convection				
Humidity	RH, Non-condensing			95	%

#### Physical

Case Size	0.70 x 0.70 x 0.236 Inches (17.78 x 17.78 x 6.0 mm)				
Case Material	Non-Conductive Black Plastic (UL94-V0)				
Weight	0.09 Oz (2.9g)				

#### Reliability Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	3.5			MHours

#### Absolute Maximum Ratings

Parameter	Conditions	Min.	Typ.	Max.	Units
Input Voltage Surge (1 Sec)	5 VDC Input	-0.7		7.0	VDC
	12 VDC Input	-0.7		15.0	
	15 VDC Input	-0.7		18.0	
	24 VDC Input	-0.7		28.0	
Lead Temperature	1.5 mm From Case For 10 Sec			260.0	°C

**Caution:** Exceeding Absolute Maximum Ratings may damage the module. These are not continuous operating ratings.

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Model Number	Input				Output			Efficiency (% , Typ)	Fuse Rating Slow-Blow (mA)
	Voltage (VDC)		Current (mA)		Voltage (VDC)	Current (mA, Max)	Current (mA, Min)		
	Nominal	Range	Full-Load	No-Load					
ML105S-05ER	5	4.75 - 5.25	217	20	5.0	150.0	15.0	69	500
ML105S-09ER	5	4.75 - 5.25	285	20	9.0	111.0	12.0	70	500
ML105S-12ER	5	4.75 - 5.25	281	20	12.0	83.0	9.0	71	500
ML105S-15ER	5	4.75 - 5.25	279	20	15.0	67.0	7.0	72	500
ML112S-05ER	12	11.4 - 12.6	91	15	5.0	150.0	15.0	69	250
ML112S-15ER	12	11.4 - 12.6	115	15	15.0	67.0	7.0	72	250
ML115S-05ER	15	14.25 - 15.75	72	10	5.0	150.0	15.0	69	200
ML115S-09ER	15	14.25 - 15.75	95	10	9.0	111.0	12.0	70	200
ML115S-12ER	15	14.25 - 15.75	93	10	12.0	83.0	9.0	71	200
ML115S-15ER	15	14.25 - 15.75	93	10	15.0	67.0	7.0	72	200
ML124S-05ER	24	22.8 - 25.2	45	7	5.0	150.0	15.0	69	150
ML124S-09ER	24	22.8 - 25.2	59	7	9.0	111.0	12.0	70	150
ML124S-05ER	24	22.8 - 25.2	58	7	12.0	83.0	9.0	71	150
ML112S-15ER	24	22.8 - 25.2	58	7	15.0	67.0	7.0	72	150

**Notes:**

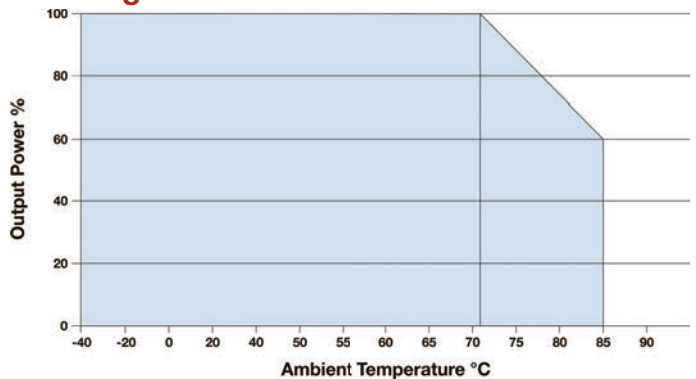
- When measuring output ripple, it is recommended that an external 0.33  $\mu$ F ceramic capacitor be placed from the +Vout pin to the -Vout pin.
- Operating at no load will not damage the converter, however, it may not meet all specifications.
- These converters are specified for operation without external components. However, in some applications the addition of input/output capacitors will enhance stability and reduce output ripple. Recommended capacitor values are:

Vin	Input Capacitor	Vout	Output Capacitor
5 VDC	4.7 $\mu$ F	5 VDC	4.7 $\mu$ F
12 VDC	2.2 $\mu$ F	9 VDC	2.2 $\mu$ F
15 VDC	1.0 $\mu$ F	12 VDC	2.2 $\mu$ F
24 VDC	1.0 $\mu$ F	15 VDC	1.0 $\mu$ F

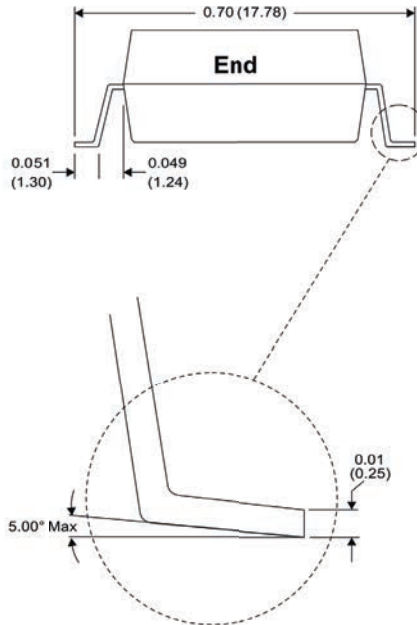
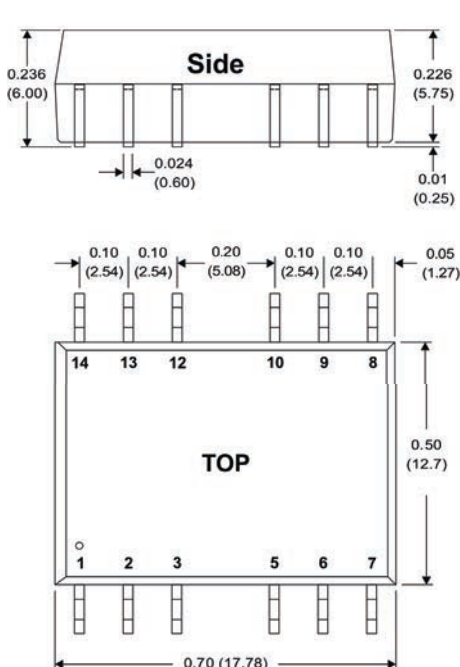
For applications requiring very low output noise levels, a simple LC filter should be effective.

- It is recommended that a fuse be used on the input of a power supply for protection. See the Model Selection table above for the correct rating.

**Derating Curve**



**Mechanical Dimensions**

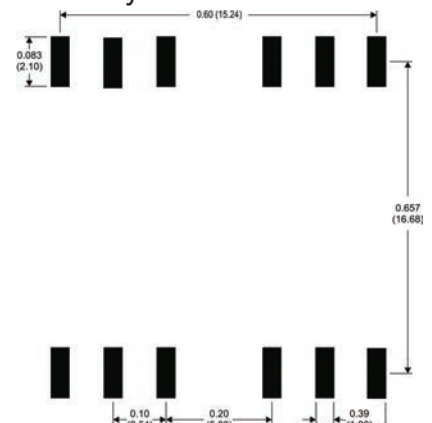


**Pin Connections**

Pin	Function	Pin	Function
1	-Vin	8	NC
2	+Vin	9	NC
3	NC	10	NC
5	NC	12	NC
6	-Vout	13	NC
7	+Vout	14	NC

NC = No Connection

**Board Layout**



**Notes:**

- All dimensions are typical in inches (mm)
- Tolerance x.xx =  $\pm 0.01$  ( $\pm 0.25$ )
- Pin 1 is marked by a "dot" or indentation on the unit



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