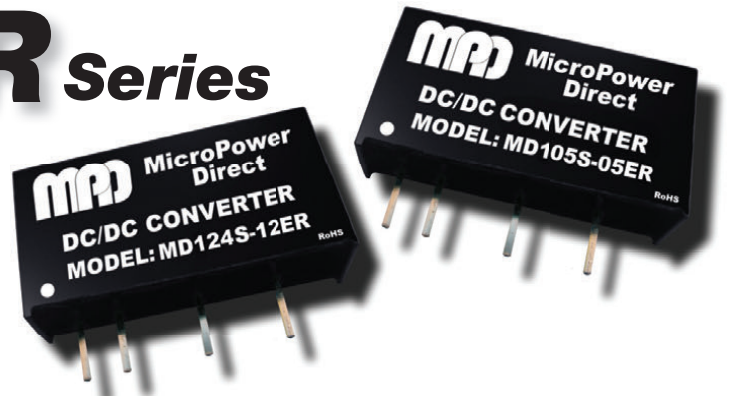


# MD100SER Series

## Low Cost, 1W SIP Tightly Regulated DC/DC Converters



### Key Features:

- 1W Output Power
- Tight Regulation
- Miniature SIP Case
- 1,000 VDC Isolation
- 23 Single Output Models
- >3.5 MHour MTBF
- -40°C to +85°C Operation
- **LOW COST**

**RoHS**



**Cost Cuts**



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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	11.40	12.0	12.60	
	15 VDC Input	14.25	15.0	15.75	
	24 VDC Input	22.80	24.0	25.20	
Input Filter	Internal Capacitor				

#### Output

Parameter	Conditions	Min.	Typ.	Max.	Units
Output Voltage Accuracy				±3.0	%
Line Regulation	For VIN Min to Max			±0.25	%
Load Regulation	For IOUT = 10% to 100%			±1.0	%
Ripple (20 MHz)			10	20	mV P - P
Noise (20 MHz)	See Note 2		50	75	mV P - P
Temperature Coefficient				±0.03	%/°C
Output Short Circuit	12 VDC & 15 VDC Input Models	Continuous (Autorecovery)			
	5 VDC and 24 VDC Input Models	Momentary (1.0 Sec)			

#### 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		60		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	0.772 x 0.236 x 0.394 Inches (19.6 x 6.0 x 10.0 mm)				
Case Material	Non-Conductive Black Plastic (UL-94V0)				
Weight	0.07 Oz (2.1g)				

#### 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		9.0	VDC
	12 VDC Input	-0.7		18.0	
	15 VDC Input	-0.7		21.0	
	24 VDC Input	-0.7		30.0	
Lead Temperature	1.5 mm From Case For 10 Sec			300	°C

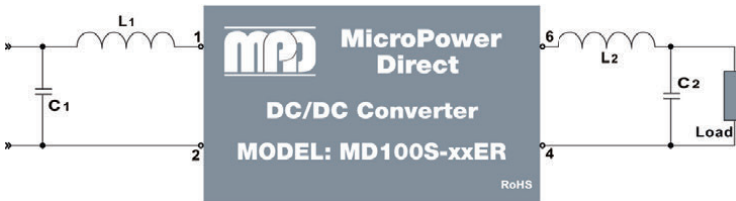
Caution: Exceeding Absolute Maximum Ratings may damage the module. These are not continuous operating ratings.

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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					
MD0705S-05ER	5	4.75 - 5.25	220	30	5.0	150	15.0	68	500
MD105S-05ER	5	4.75 - 5.25	294	30	5.0	200	20.0	66	600
MD105S-09ER	5	4.75 - 5.25	285	30	9.0	111	12.0	70	600
MD105S-12ER	5	4.75 - 5.25	281	30	12.0	83	9.0	71	600
MD105S-15ER	5	4.75 - 5.25	274	30	15.0	67	7.0	73	600
MD105S-24ER	5	4.75 - 5.25	294	30	24.0	42	5.0	68	600
MD0712S-05ER	12	11.4 - 12.6	89	15	5.0	150	15.0	70	200
MD112S-05ER	12	11.4 - 12.6	124	15	5.0	200	20.0	67	250
MD112S-09ER	12	11.4 - 12.6	116	15	9.0	111	12.0	72	250
MD112S-12ER	12	11.4 - 12.6	119	15	12.0	83	9.0	70	250
MD112S-15ER	12	11.4 - 12.6	113	15	15.0	67	7.0	74	250
MD112S-24ER	12	11.4 - 12.6	122	15	24.0	42	5.0	68	250
MD0715S-05ER	15	14.25 - 15.75	74	12	5.0	150	15.0	68	150
MD115S-05ER	15	14.25 - 15.75	99	12	5.0	200	20.0	67	200
MD115S-09ER	15	14.25 - 15.75	94	12	9.0	111	12.0	71	200
MD115S-12ER	15	14.25 - 15.75	94	12	12.0	83	9.0	71	200
MD115S-24ER	15	14.25 - 15.75	98	12	24.0	42	5.0	68	200
MD0724S-05ER	24	22.8 - 25.2	46	8	5.0	150	15.0	68	100
MD124S-05ER	24	22.8 - 25.2	61	8	5.0	200	20.0	68	125
MD124S-09ER	24	22.8 - 25.2	61	8	9.0	111	12.0	68	125
MD124S-12ER	24	22.8 - 25.2	57	8	12.0	83	9.0	73	125
MD124S-15ER	24	22.8 - 25.2	56	8	15.0	67	7.0	75	125
MD124S-24ER	24	22.8 - 25.2	61	8	24.0	42	5.0	68	125

Notes:

- Operation at no load will not damage these units. However, they may not meet all specifications.
- These converters will operate without external components. However, when measuring output ripple, it is recommended that an external ceramic capacitor be placed from the +Vout pin to the -Vout pin for single output units and from each output to common for dual output units. An input capacitor will enhance stability over temperature and input line variations. For applications requiring very low output noise levels, a simple LC filter, as shown in the connection diagram below, should be effective. Recommended component values are given in the table below the diagram.



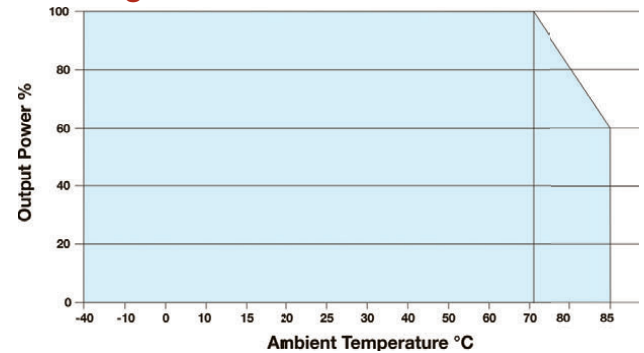
V <sub>IN</sub>	C <sub>1</sub>	L <sub>1</sub>	V <sub>OUT</sub>	L <sub>2</sub>	C <sub>2</sub>
5 VDC	4.7 μF/50V	4.7 - 10 μH	5 VDC	4.7 - 10 μH	10 μF
12 VDC	4.7 μF/50V	4.7 - 10 μH	9 VDC	4.7 - 10 μH	4.7 μF
15 VDC	2.2 μF/50V	4.7 - 10 μH	12 VDC	4.7 - 10 μH	2.2 μF
24 VDC	1.0 μF/50V	4.7 - 10 μH	15 VDC	4.7 - 10 μH	1.0 μF
			24 VDC	4.7 - 10 μH	0.47 μF

- 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.

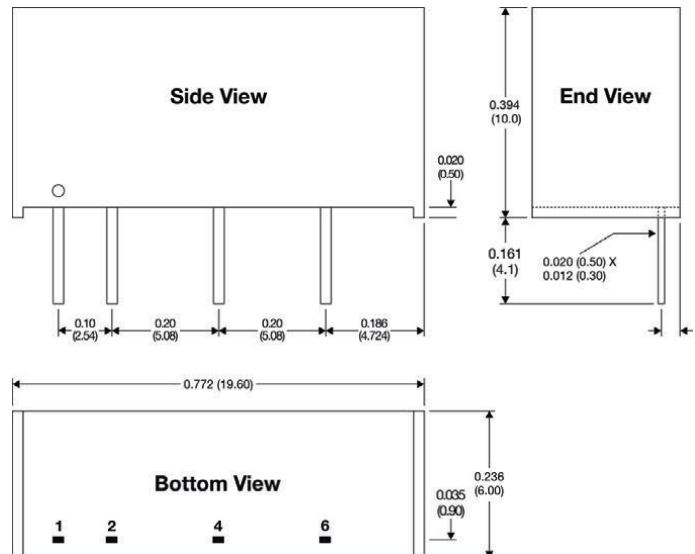
Pin Connections

Pin	Function
1	+V <sub>IN</sub>
2	-V <sub>IN</sub>
4	-V <sub>OUT</sub>
6	+V <sub>OUT</sub>

Derating Curve



Mechanical Dimensions



Notes:

- All dimensions are typical in inches (mm)
- Tolerance x.xx = ±0.02 (±0.50)
- Pin 1 is marked by a "dot" or indentation on the unit



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