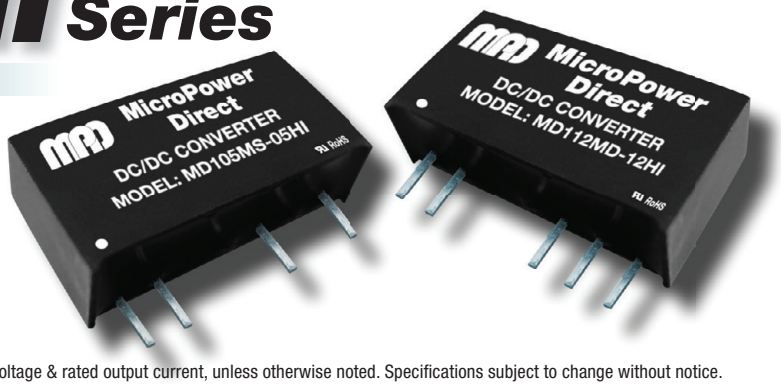
MD100MHI Series

Miniature, 1W SIP Medical Approved DC/DC Converters



Key Features:

- 1W Output Power
- 3 kVAC rms Isolation
- Reinforced Insulation
- Meets 1xMOPP & 2xMOOP
- Miniature SIP Case
- Single & Dual Outputs
- 12 Standard Models
- 2.0 MH MTBF
- Industry Standard Pin-Out
- EN 60601 Approved

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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	4.5	5.0	5.5	VDC
	12 VDC Input	10.8	12.0	13.2	
Input Filter	LC Filter				

Output

Parameter	Conditions	Min.	Typ.	Max.	Units
Output Voltage Accuracy			±1.0	±3.0	%
Output Voltage Balance	Dual Output , Balanced Loads		±0.1	±1.0	%
Line Regulation	For VIN Change of 1%		±1.2	±1.5	%
Load Regulation, See Note 2	See Model Selection Guide				
Ripple & Noise (20 MHz)	See Note 3			150	mV P - P
Temperature Coefficient			±0.01	±0.02	%/°C
Output Short Circuit	Momentary (0.5 Sec.)				

General

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage	60 Seconds	3,000			VAC rms
Reinforced Insulation Working Voltage	300 Vrms				
Isolation Resistance	500 VDC	10			GΩ
Isolation Capacitance	100 kHz, 1V		15	20	pF
Switching Frequency		50	80	100	kHz
EMC	Complies With EN 55011 4th Edition				
EMS	Complies With EN 60601-1-2				

Environmental

Parameter	Conditions	Min.	Typ.	Max.	Units
Operating Temperature Range	Ambient	-25		+85	°C
	Case			+90	°C
Storage Temperature Range		-50		+125	°C
Cooling	Free Air Convection				
Humidity	RH, Non-condensing			95	%

Physical

Case Size	See Mechanical Diagram (Page 2)
Case Material	Non-Conductive Black Plastic (UL94-V0)
Weight	0.13 Oz (3.9g)

Reliability Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	2.0			MHours
Safety Approvals	UL 60601-1, EN 60601-1 3rd Edition, UL 60950, EN 60950				
	ANSI/AAMI ES 60601-1 1xMOPP & 2XMOOP Recognition				

Absolute Maximum Ratings

Parameter	Conditions	Min.	Typ.	Max.	Units
Input Voltage Surge (1 Sec)	5 VDC Input			9.0	VDC
	12 VDC Input			29.0	
Lead Temperature	1.5 mm From Case For 10 Sec			260	°C

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

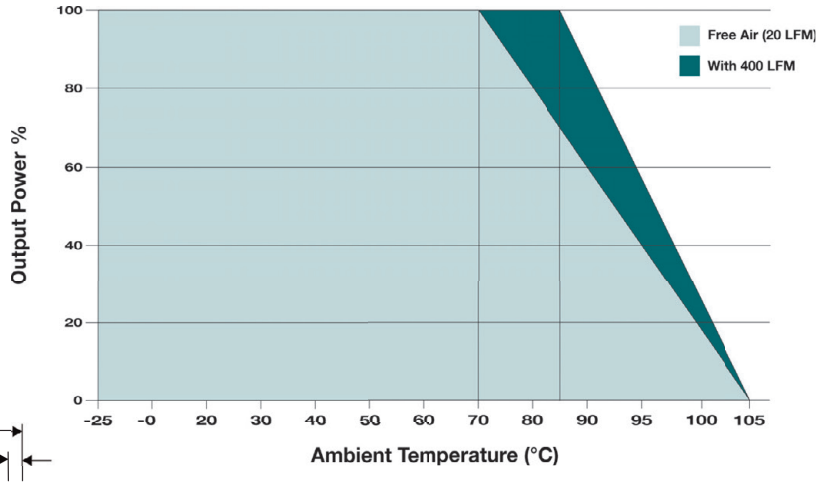
Model Selection Guide

Model Number	Input				Output			Load Regulation (%, Max)	Efficiency (%, Typ)	Capacitive Load (µF, Max)	Fuse Rating Slow-Blow (mA)
	Voltage (VDC)		Current (mA)		Voltage (VDC)	Current (mA, Max)	Current (mA, Min)				
	Nominal	Range	Full-Load	No-Load							
MD105MS-05HI	5	4.5 - 5.5	303	55	5.0	200.0	4.0	10	66	680	600
MD105MS-12HI	5	4.5 - 5.5	291	55	12.0	80.0	2.0	8	66	680	600
MD105MS-15HI	5	4.5 - 5.5	295	55	15.0	65.0	1.0	8	66	680	600
MD105MD-05HI	5	4.5 - 5.5	303	55	±5.0	±100.0	±2.0	10	66	220	600
MD105MD-12HI	5	4.5 - 5.5	267	55	±12.0	±40.0	±1.0	8	72	220	600
MD105MD-15HI	5	4.5 - 5.5	287	55	±15.0	±35.0	±1.0	8	73	220	600
MD112MS-05HI	12	10.8 - 13.2	126	30	5.0	200.0	4.0	10	66	680	250
MD112MS-12HI	12	10.8 - 13.2	121	30	12.0	80.0	2.0	8	66	680	250
MD112MS-15HI	12	10.8 - 13.2	123	30	15.0	65.0	1.0	8	66	680	250
MD112MD-05HI	12	10.8 - 13.2	126	30	±5.0	±100.0	±2.0	10	66	220	250
MD112MD-12HI	12	10.8 - 13.2	108	30	±12.0	±40.0	±1.0	8	74	220	250
MD112MD-15HI	12	10.8 - 13.2	117	30	±15.0	±35.0	±1.0	8	75	220	250

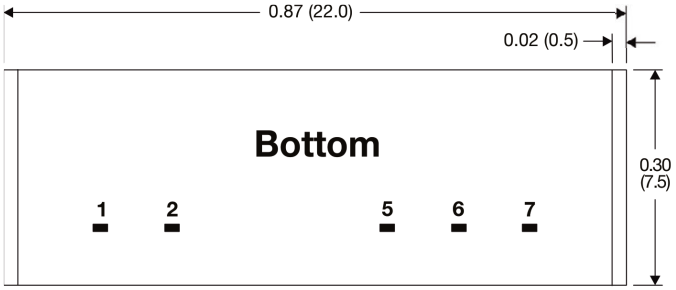
Notes:

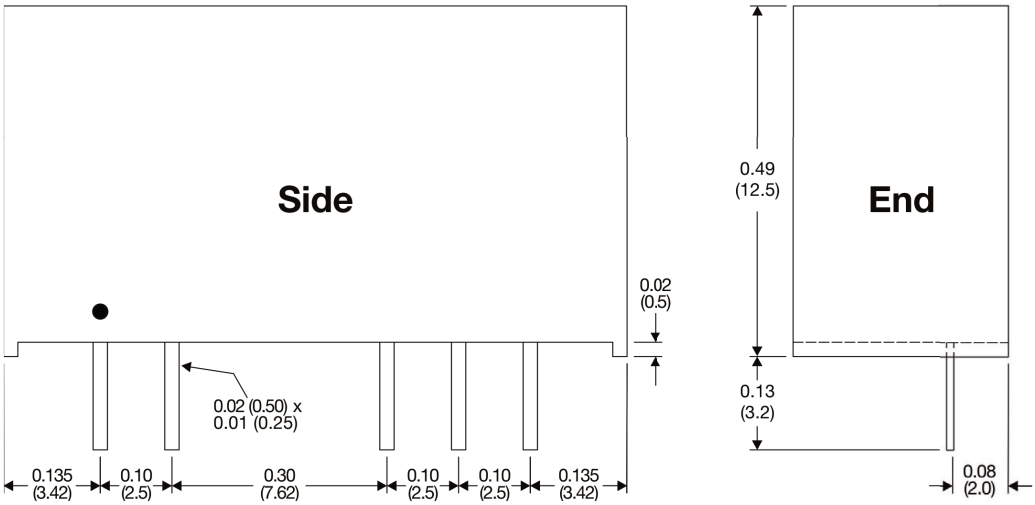
1. The specified maximum capacitive load is for each output.
2. Output load regulation is specified for a load change of 20% to 100%.
3. When measuring output ripple, it is recommended that an external 0.33 µF ceramic capacitor be placed from the +Vout pin to the -Vout pin for single output units and from each output to common for dual output units.
4. Operation at no-load will not damage these units. However, they may not meet all specifications.
5. Dual output units may be connected to provide a 10 VDC, 24 VDC or 30 VDC output. To do this, connect the load across the positive (+Vout) and negative (-Vout) outputs and float the output common.
6. It is recommended that a fuse be used on the input of a power supply for protection. See the table above for the correct rating.

Derating Curve



Mechanical Dimensions





Pin Connections

Pin	Single	Dual
1	+Vin	+Vin
2	-Vin	-Vin
5	-Vout	-Vout
6	No Pin	Common
7	+Vout	+Vout

NC: No Connection

Mechanical Notes:

- All dimensions are typical in inches (mm)
- Tolerance x.xx = ±0.02 (±0.50)

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