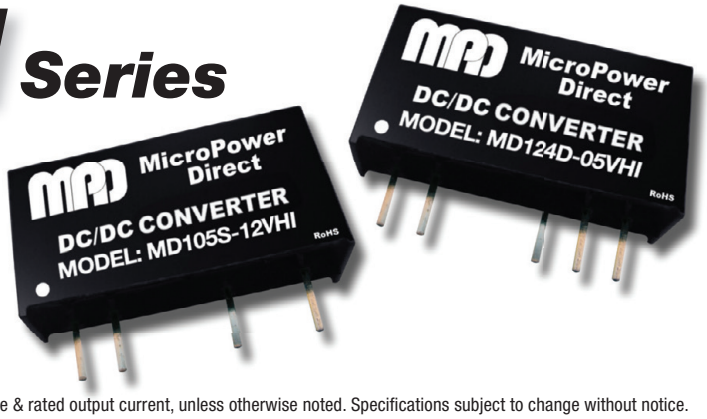
MD100VHI Series

Miniature 1W, SIP, Very High Isolation DC/DC Converters



Key Features:

- 1W Output Power
- Miniature SIP Case
- 5,200 VDC Isolation
- Single & Dual Outputs
- >2.0 MHour MTBF
- -40°C to +85°C Operation
- Industry Standard Pin-Out

RoHS

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	4.50	5.0	5.50	VDC
	12 VDC Input	10.80	12.0	13.20	
	15 VDC Input	13.50	15.0	16.50	
	24 VDC Input	21.60	24.0	26.40	
Input Filter	Internal Capacitor				

Output

Parameter	Conditions	Min.	Typ.	Max.	Units
Output Voltage Accuracy				±5.0	%
Output Voltage Balance	Dual Output, Balanced Loads		±0.1	±1.0	%
Line Regulation	For VIN Change of 1%		±1.2		%
Load Regulation, See Note 1	See Model Selection Guide				
Ripple & Noise (20 MHz), See Note 2				100	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	5,200			VDC
Isolation Resistance	500 VDC	10			GΩ
Isolation Capacitance	100 kHz, 1V		7		pF
Common Mode Transient Immunity		15			kV/μS
Switching Frequency			100		kHz

Environmental

Parameter	Conditions	Min.	Typ.	Max.	Units
Operating Temperature Range	Ambient	-40	+25	+85	°C
Operating Temperature Range	Case			+100	°C
Storage Temperature Range		-55		+125	°C
Cooling, See Note 3	Free Air Convection				
Humidity	RH, Non-condensing			95	%

Physical

Case Size	See Mechanical Drawing (Page 2)
Case Material	Non-Conductive Black Plastic (UL-94V0)
Weight	0.076 Oz (2.4g)

Reliability Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	2.0			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		20.0	
	24 VDC Input	-0.7		30.0	
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.

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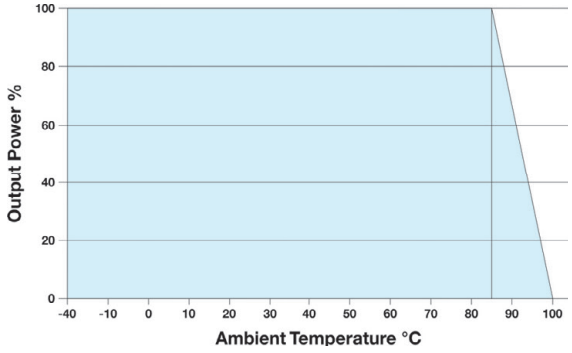
Model Selection Guide

Model Number	Input				Output		Load Regulation (% Typ)	Output Capacitive Load (µF Max)	Efficiency (%, Typ)	Fuse Rating Slow-Blow (mA)
	Voltage (VDC)		Current (mA)		Voltage (VDC)	Current (mA, Max)				
	Nominal	Range	Full-Load	No-Load						
MD105S-03VHI	5	4.5 - 5.5	286	35	3.3	303	20.0	1,000	70	600
MD105S-05VHI	5	4.5 - 5.5	286	35	5.0	200	15.0	470	70	600
MD105S-09VHI	5	4.5 - 5.5	266	35	9.0	111	10.0	470	75	600
MD105S-12VHI	5	4.5 - 5.5	261	35	12.0	84	10.0	220	77	600
MD105S-15VHI	5	4.5 - 5.5	254	35	15.0	66	10.0	220	78	600
MD105D-05VHI	5	4.5 - 5.5	282	35	±5.0	±100	15.0	±220	71	600
MD105D-09VHI	5	4.5 - 5.5	269	35	±9.0	±56	10.0	±220	75	600
MD105D-12VHI	5	4.5 - 5.5	262	35	±12.0	±42	10.0	±100	77	600
MD105D-15VHI	5	4.5 - 5.5	254	35	±15.0	±33	10.0	±100	78	600
MD112S-03VHI	12	10.8 - 13.2	117	17	3.3	303	20.0	1,000	71	250
MD112S-05VHI	12	10.8 - 13.2	117	17	5.0	200	15.0	470	71	250
MD112S-09VHI	12	10.8 - 13.2	110	17	9.0	111	10.0	470	76	250
MD112S-12VHI	12	10.8 - 13.2	108	17	12.0	84	10.0	220	78	250
MD112S-15VHI	12	10.8 - 13.2	104	17	15.0	66	10.0	220	79	250
MD112D-05VHI	12	10.8 - 13.2	116	17	±5.0	±100	15.0	±220	72	250
MD112D-09VHI	12	10.8 - 13.2	111	17	±9.0	±56	10.0	±220	76	250
MD112D-12VHI	12	10.8 - 13.2	108	17	±12.0	±42	10.0	±100	78	250
MD112D-15VHI	12	10.8 - 13.2	104	17	±15.0	±33	10.0	±100	79	250
MD115S-03VHI	15	13.5 - 16.5	95	16	3.3	303	20.0	1,000	70	200
MD115S-05VHI	15	13.5 - 16.5	95	16	5.0	200	15.0	470	70	200
MD115S-09VHI	15	13.5 - 16.5	89	16	9.0	111	10.0	470	75	200
MD115S-12VHI	15	13.5 - 16.5	90	16	12.0	84	10.0	220	75	200
MD115S-15VHI	15	13.5 - 16.5	84	16	15.0	66	10.0	220	79	200
MD115D-05VHI	15	13.5 - 16.5	94	16	±5.0	±100	15.0	±220	71	200
MD115D-09VHI	15	13.5 - 16.5	90	16	±9.0	±56	10.0	±220	75	200
MD115D-12VHI	15	13.5 - 16.5	86	16	±12.0	±42	10.0	±100	78	200
MD115D-15VHI	15	13.5 - 16.5	84	16	±15.0	±33	10.0	±100	79	200
MD124S-03VHI	24	21.6 - 26.4	60	12	3.3	303	20.0	1,000	70	125
MD124S-05VHI	24	21.6 - 26.4	60	12	5.0	200	15.0	470	70	125
MD124S-09VHI	24	21.6 - 26.4	56	12	9.0	111	10.0	470	75	125
MD124S-12VHI	24	21.6 - 26.4	53	12	12.0	84	10.0	220	78	125
MD124S-15VHI	24	21.6 - 26.4	52	12	15.0	66	10.0	220	80	125
MD124D-05VHI	24	21.6 - 26.4	59	12	±5.0	±100	15.0	±220	71	125
MD124D-09VHI	24	21.6 - 26.4	56	12	±9.0	±56	10.0	±220	75	125
MD124D-12VHI	24	21.6 - 26.4	55	12	±12.0	±42	10.0	±100	77	125
MD124D-15VHI	24	21.6 - 26.4	53	12	±15.0	±33	10.0	±100	78	125

Notes:
1. Output load regulation is specified for a load change of 20% to 100%.
2. When measuring output ripple & noise, it is recommended that an external ceramic capacitor (0.33 µF typ.) be placed from the +Vout to the -Vout pins for single output units and from each output to common for dual output models.
3. Free air convection is typically 20 LFM. The units should not be operated in still air (0 LFM).
4. Operation at no load will not damage these units, however, they may not meet all specifications.
5. 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

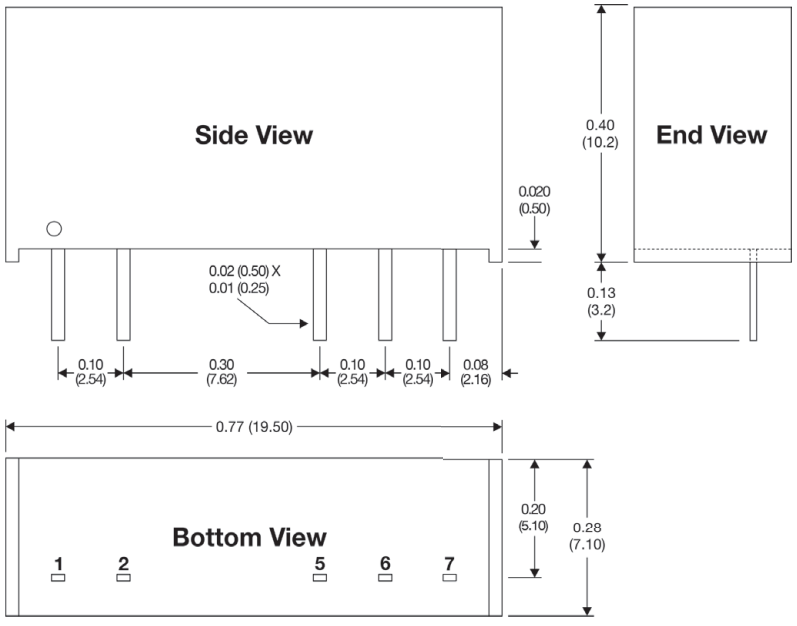


Pin Connections

Pin	Single	Dual
1	+Vin	+Vin
2	-Vin	-Vin
5	-Vout	-Vout

Pin	Single	Dual
6	No Pin	Common
7	+Vout	+Vout

Mechanical Dimensions



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

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