

# 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



MicroPower Direct



### 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 $V_{IN}$ 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.

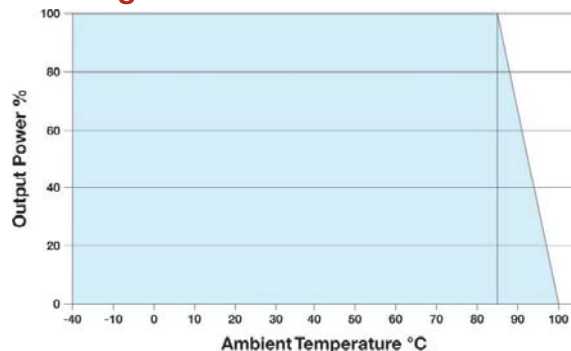
## Model Selection Guide

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:

- Output load regulation is specified for a load change of 20% to 100%.
- 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.
- Free air convection is typically 20 LFM. The units should not be operated in still air (0 LFM).
- Operation at no load will not damage these units, however, they may not meet all specifications.
- 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.

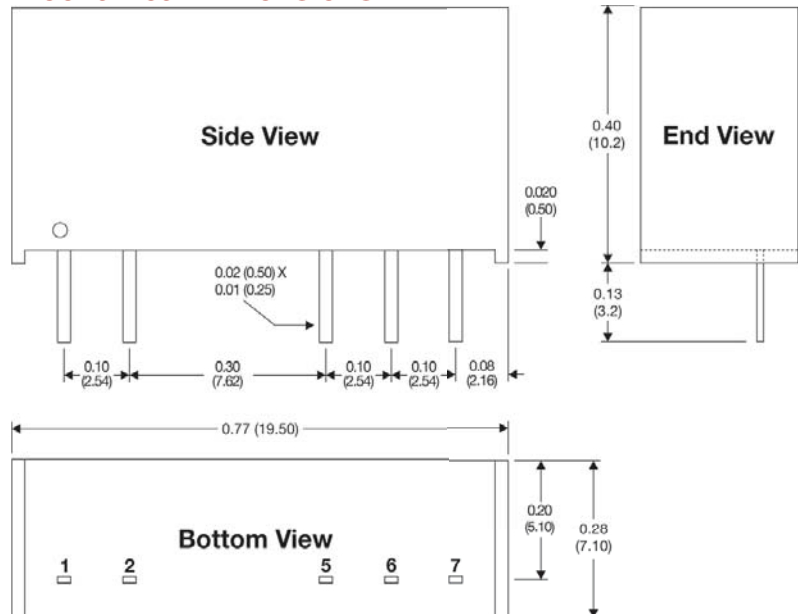
## Derating Curve



## Pin Connections

Pin	Single	Dual	Pin	Single	Dual
1	+VIN	+VIN	6	No Pin	Common
2	-VIN	-VIN	7	+VOUT	+VOUT
5	-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



**MicroPower Direct**  
 We Power Your Success - For Less!