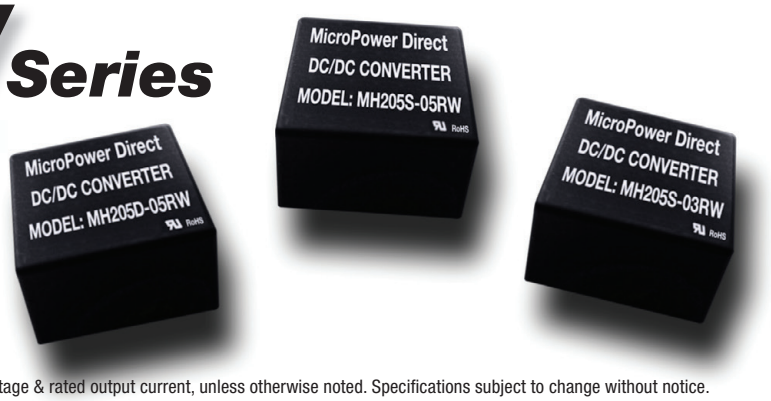
MH200RW Series

Wide Input, 2W Ultra-Miniature DC/DC Converters



Key Features:

- 2W Output Power
- Miniature 0.55 x 0.55" Case
- Wide 2:1 Input Range
- EN 60950 Approval
- 1,500 VDC Isolation
- >4.2 MHour MTBF
- -40°C to +80°C Operation
- 28 Standard Models

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 Start Voltage	5 VDC Input			4.5	VDC
	12 VDC Input			9.0	
	24 VDC Input			18.0	
	48 VDC Input			36.0	
Short Circuit Input Power				0.50	W
Input Filter	Internal Capacitor				

Output

Parameter	Conditions	Min.	Typ.	Max.	Units
Output Voltage Accuracy				±1.5	%
Output Voltage Balance	Dual Output, Balanced Loads			±2.0	%
Line Regulation	VIN = MIN to MAX			±0.2	%
Load Regulation	IOUT = 0% to 100%			±1.0	%
Cross Regulation	See Note 2			±5.0	%
Ripple & Noise (20 MHz)	See Note 3		70		mV P - P
Temperature Coefficient			±0.01	±0.02	%/°C
Transient Recovery Time	See Note 4		250	500	µSec
Transient Response Deviation			±3.0	±5.0	%
Overload Protection	See Note 5		180		%
Output Short Circuit	Continuous (Autorecovery)				

General

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage	60 Seconds	1,500			VDC
	1 Second	1,800			
Isolation Resistance	500 VDC	1,000			MΩ
Isolation Capacitance	100 kHz, 1.0V		100		pF
Switching Frequency		100			kHz

EMI Characteristics

Parameter	Standard	Criteria	Level
Radiated Emissions	EN 55022		Class A
Conducted Emissions	EN 55022		Class A
ESD	EN 61000-4-2	A	±8 kV Air
			±6 kV Contact
RS	EN 61000-4-3	A	10V/m
EFT, See Note 6	EN 61000-4-4	A	±2 kV
Surge, See Note 6	EN 61000-4-5	A	±1 kV
CS	EN 61000-4-6	A	10 Vrms
PFMF	EN 61000-4-8	A	3A/M

Environmental

Parameter	Conditions	Min.	Typ.	Max.	Units
Operating Temperature Range	Ambient	-40		+80	°C
	Case			+95	
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 (UL-94V0)
Weight	0.14 Oz (3.9g)

Reliability Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	4.226			MHours
Safety Standards	UL 60950, EN 60950				

Absolute Maximum Ratings

Parameter	Conditions	Min.	Typ.	Max.	Units
Input Voltage Surge (1 Sec)	5 VDC Input			12.0	VDC
	12 VDC Input			25.0	
	24 VDC Input			50.0	
	48 VDC Input			100.0	
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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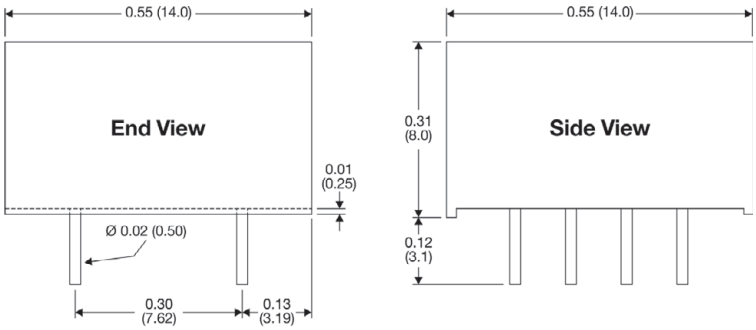
Model Selection Guide

Model Number	Input				Output			Capacitive Load (µF Max)	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						
MH205S-03RW	5	4.5 - 10.0	334	40	3.3	400.0	0.0	100	79	1,000
MH205S-05RW	5	4.5 - 10.0	494	40	5.0	400.0	0.0	100	81	1,000
MH205S-12RW	5	4.5 - 10.0	472	40	12.0	167.0	0.0	100	85	1,000
MH205S-15RW	5	4.5 - 10.0	462	40	15.0	134.0	0.0	100	87	1,000
MH205D-05RW	5	4.5 - 10.0	482	40	±5.0	±200.0	0.0	100	83	1,000
MH205D-12RW	5	4.5 - 10.0	469	40	±12.0	±83.0	0.0	100	85	1,000
MH205D-15RW	5	4.5 - 10.0	473	40	±15.0	±67.0	0.0	100	85	1,000
MH212S-03RW	12	9.0 - 18.0	138	27	3.3	400.0	0.0	100	80	600
MH212S-05RW	12	9.0 - 18.0	201	27	5.0	400.0	0.0	100	83	600
MH212S-12RW	12	9.0 - 18.0	192	27	12.0	167.0	0.0	100	87	600
MH212S-15RW	12	9.0 - 18.0	193	27	15.0	134.0	0.0	100	87	600
MH212D-05RW	12	9.0 - 18.0	198	27	±5.0	±200.0	0.0	100	84	600
MH212D-12RW	12	9.0 - 18.0	193	27	±12.0	±83.0	0.0	100	86	600
MH212D-15RW	12	9.0 - 18.0	195	27	±15.0	±67.0	0.0	100	86	600
MH224S-03RW	24	18.0 - 36.0	70	15	3.3	400.0	0.0	100	79	300
MH224S-05RW	24	18.0 - 36.0	99	15	5.0	400.0	0.0	100	84	300
MH224S-12RW	24	18.0 - 36.0	97	15	12.0	167.0	0.0	100	86	300
MH224S-15RW	24	18.0 - 36.0	96	15	15.0	134.0	0.0	100	87	300
MH224D-05RW	24	18.0 - 36.0	99	15	±5.0	±200.0	0.0	100	84	300
MH224D-12RW	24	18.0 - 36.0	97	15	±12.0	±83.0	0.0	100	86	300
MH224D-15RW	24	18.0 - 36.0	97	15	±15.0	±67.0	0.0	100	86	300
MH248S-03RW	48	36.0 - 75.0	35	8	3.3	400.0	0.0	100	79	200
MH248S-05RW	48	36.0 - 75.0	50	8	5.0	400.0	0.0	100	83	200
MH248S-12RW	48	36.0 - 75.0	49	8	12.0	167.0	0.0	100	85	200
MH248S-15RW	48	36.0 - 75.0	49	8	15.0	134.0	0.0	100	86	200
MH248D-05RW	48	36.0 - 75.0	51	8	±5.0	±200.0	0.0	100	82	200
MH248D-12RW	48	36.0 - 75.0	49	8	±12.0	±83.0	0.0	100	84	200
MH248D-15RW	48	36.0 - 75.0	50	8	±15.0	±67.0	0.0	100	84	200

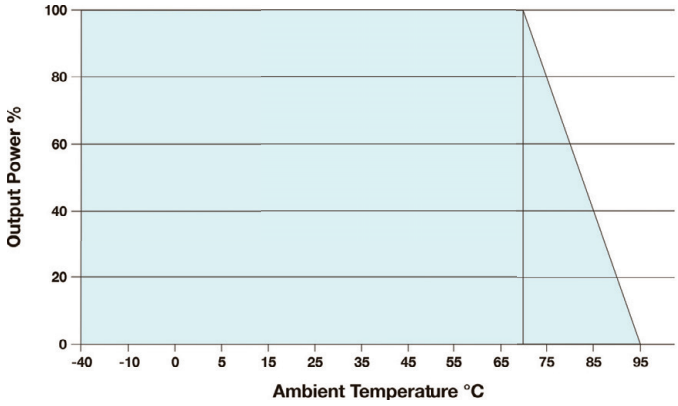
Notes:
1. The specified maximum capacitive load is for each output.
2. Cross regulation is measured with the main output set at 100% load. The second output is varied from 75% to 100% load.
3. When measuring output ripple, it is recommended that an external 0.47 µF ceramic capacitor is connected from the +VOUT to the -VOUT pins. If the application is noise sensitive; connecting a low ESR 3.3 µF capcitor should be used. This capacitor should be mounted as close to the converter as possible.
4. Transient recovery is measured to within a 1% error band for a load step change of 25%.
5. Output overload protection is provided by a fold back current limiting circuit with auto-recovery. A long-term overload could damage the unit.
6. To meet the specified EN 61000-4-4 and EN 61000-4-5 limits, an external capacitor must be connected across the input pins of the module. A 220 µF/100V capacitor is recommended. This capacitor should be mounted as close to the module as possible.
7. Operation at no load will not damage these units.
8. 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.

A 3W version of this module is also available
For more information see the **MH300RW** series datasheet.
Or call the factory at 781-344-8226

Mechanical Dimensions



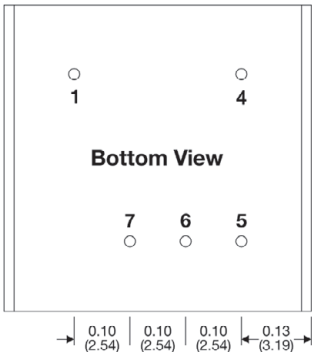
Derating Curve



Pin Connections

Pin	Single
1	-VIN
4	+VIN
5	+VOUT
6	No Pin
7	-VOUT

Pin	Dual
1	-VIN
4	+VIN
5	+VOUT
6	Common
7	-VOUT



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Notes:
- All dimensions are typical in inches (mm)
- Tolerance x.xx = ±0.02 (±0.5)
- Pin 1 is marked by a "dot" or indentation on the unit