MHI1000BRWI8 Series

Compact, 10W Ultra-High Isolation DC/DC Converters



Key Features:

- 10W Output Power
- 8.0 kV Isolation
- 15 kV/μS CMTI
- Reinforced Insulation
- EN 60950 Approved (Pend.)
- Wide 2:1 Input Range
- Compact 1" x 2" Case
- -40°C to +75°C Operation

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	12 VDC Input	9.0	12.0	18.0	VDC
	24 VDC Input	18.0	24.0	36.0	
	48 VDC Input	36.0	48.0	75.0	
Start-Up Threshold Voltage	12 VDC Input	7.0	8.0	9.0	VDC
	24 VDC Input	13.0	15.0	18.0	
	48 VDC Input	30.0	33.0	36.0	
Under Voltage Shutdown	12 VDC Input			8.5	VDC
	24 VDC Input			16.0	
	48 VDC Input			34.0	
Short Circuit Input Power				3,000	mW
Input Filter	π (Pi) Filter				
Conducted EMI	Meets EN 55022 Class A & FCC Level A				

Output

Parameter	Conditions	Min.	Typ.	Max.	Units
Output Voltage Accuracy				±1.0	%
Output Voltage Balance	Dual Output, Balanced Loads		±0.5	±2.0	%
Line Regulation	V_{IN} = Min to Max		±0.3	±0.5	%
Load Regulation	See Note 2		±0.5	±1.0	%
Ripple & Noise (20 MHz)< See Note 3	5 VDC Output Models			100	mV P - P
	All Other Models			150	
Transient Recovery Time, See Note 4	25% Load Step Change		300	600	µSec
Transient Response Deviation			±3.0	±6.0	%
Output Power Protection		120	150		%
Temperature Coefficient			±0.02	±0.05	%/°C
Output Short Circuit	Continuous (Autorecovery)				

General

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage, 60 Sec	Rated For 60 Sec	4,000			VAC rms
	Tested For 1 Sec	8,000			VDC
Isolation Resistance	500 VDC	10			GΩ
Isolation Capacitance	100 kHz, 1V		60	80	pF
Common Mode Transient Immunity		15			kV/µS
Switching Frequency		120	150	180	kHz

Environmental

Parameter	Conditions	Min.	Typ.	Max.	Units
Operating Temperature Range	Ambient	-40	+25	+75	°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 (UL94-V0)
Weight	0.86 Oz (24.5g)

Reliability Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	1.0			MHours
Safety Standards	UL 60950, EN 60950 (Pending)				

Absolute Maximum Ratings

Parameter	Conditions	Min.	Typ.	Max.	Units
Input Voltage Surge (0.1 Sec)	12 VDC Input			25.0	VDC
	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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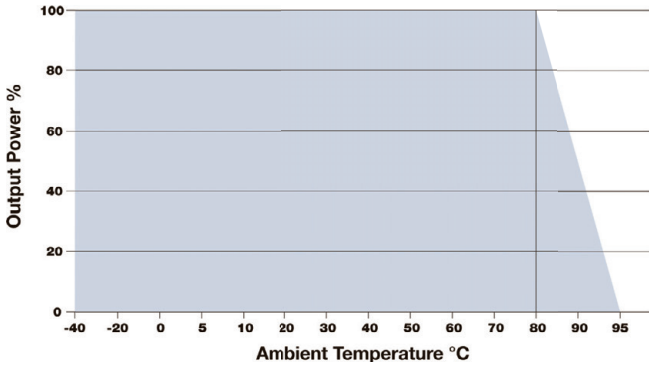
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Model Selection Guide

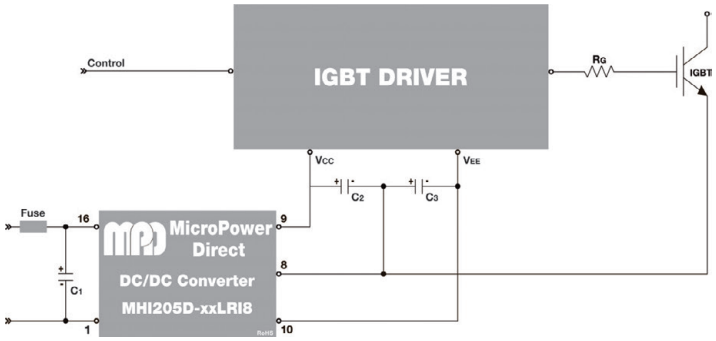
Model Number	Input				Output			Efficiency (%, Typ)	Reflected Ripple (mA)	Capacitive Load (µF, Max)	Fuse Rating Slow-Blow (mA)
	Voltage (VDC)		Current (mA)		Voltage (VDC)	Current (mA, Max)	Current (mA, Min)				
	Nominal	Range	Full-Load	No-Load							
MHI1012S-05BRWI8	12	9.0 - 18.0	889	30	5.0	1,600	0.0	75	12.0	1,000	2,000
MHI1012S-05.1BRWI8	12	9.0 - 18.0	919	30	5.1	1,600	0.0	74	10.0	1,000	2,000
MHI1012S-12BRWI8	12	9.0 - 18.0	1,057	30	12.0	835	0.0	79	10.0	470	2,000
MHI1012D-12BRWI8	12	9.0 - 18.0	1,042	30	±12.0	±417	±0.0	80	10.0	220	2,000
MHI1012D-15BRWI8	12	9.0 - 18.0	1,028	30	±15.0	±333	±0.0	81	10.0	220	2,000
MHI1024S-05BRWI8	24	18.0 - 36.0	548	20	5.0	1,600	0.0	76	12.0	1,000	1,000
MHI1024S-05.1BRWI8	24	18.0 - 36.0	567	20	5.1	1,600	0.0	75	10.0	1,000	1,000
MHI1024S-12BRWI8	24	18.0 - 36.0	522	20	12.0	835	0.0	80	10.0	470	1,000
MHI1012D-12BRWI8	24	18.0 - 36.0	516	20	±12.0	±417	±0.0	81	10.0	220	1,000
MHI1012D-15BRWI8	24	18.0 - 36.0	508	20	±15.0	±333	±0.0	82	10.0	220	1,000
MHI1048S-05BRWI8	48	36.0 - 75.0	274	10	5.0	1,600	0.0	76	12.0	1,000	600
MHI1048S-05.1BRWI8	48	36.0 - 75.0	283	10	5.1	1,600	0.0	75	10.0	1,000	600
MHI1048S-12BRWI8	48	36.0 - 75.0	261	10	12.0	835	0.0	80	10.0	470	600
MHI1048D-12BRWI8	48	36.0 - 75.0	258	10	±12.0	±417	±0.0	81	10.0	220	600
MHI1048D-15BRWI8	48	36.0 - 75.0	254	10	±15.0	±333	±0.0	82	10.0	220	600

Notes:
1. The specified maximum capacitive load is for each output.
2. Load regulation is measured over a range of 15% IOUT to 100% IOUT.
3. When measuring output ripple & noise, it is recommended that an external capacitor (0.47 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. To further reduce output ripple, a 3.3 µF is recommended.
4. Transient recovery is measured to within a 1% error band for a load step change of 75% to 100%.
5. The converter should be connected to a low ac-impedance source. An input source with a highly inductive impedance may affect the stability of the converter. In applications where the converter output loading is high and input power is supplied over long lines, it may be necessary to use a capacitor on the input to insure start-up. In this case, it is recommended that a low ESR (ESR <1.0Ω at 100 kHz) capacitor be mounted close to the converter. For 12V input units a 10 µF is recommended; for 12V input units, a 4.7 µF; and for 24V units a 2.2 µF.
6. Operation at no-load will not damage the unit, but they may not meet all specifications.
7. It is recommended that a fuse be used on the input of a power supply for protection. See the Model Selection tables for the correct rating.

Derating Curve



IGBT Applications

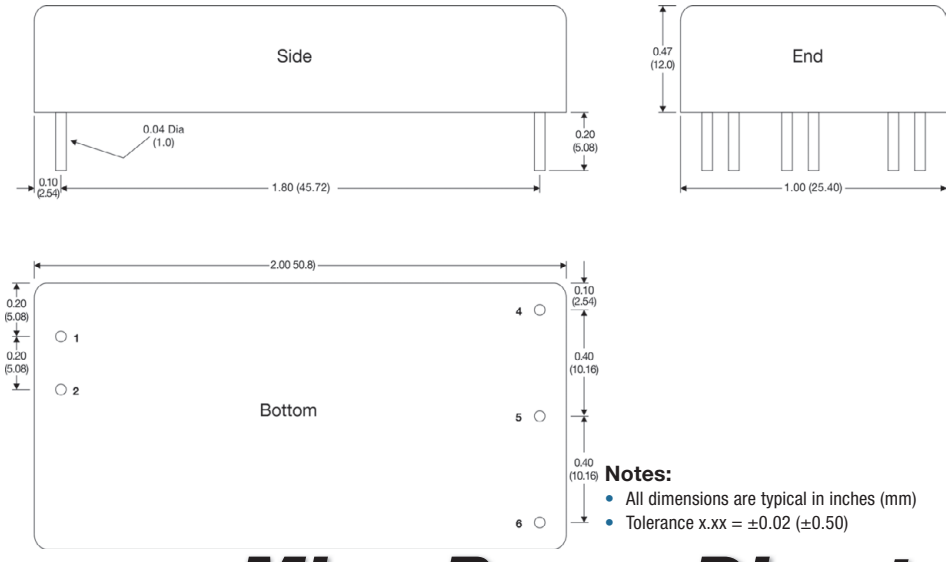


Notes:

The **MHI1000x-xxB** series is a good choice for applications involving high speed switching, such as driving IGBTs. They are designed to withstand the extra stress caused by the high voltage switching transients present in IGBT drive circuits.

All of the **MHIxxx** series have isolation levels that range from 5.2 to 8 kV. Many of these have reinforced insulation. The high isolation levels (and the correspondingly low capacitive coupling rates) allow them to be safely used in applications with highly dynamic switched AC or DC.

Mechanical Dimensions



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

Pin Connections

Pin	Single Output
1	-VIN
7	No Connection
8	No Connection
9	+VOUT
10	-VOUT
16	+VIN

Pin	Dual Output
1	-VIN
7	No Connection
8	Common
9	+VOUT
10	-VOUT
16	+VIN