

MHI300ARI6 Series

Compact, 3W DIP Ultra-High Isolation DC/DC Converters



Key Features:

- 3W Output Power
- 6.0 kV Isolation
- 15 kV/ μ S CMTI
- Reinforced Insulation
- EN 60950 Approved (Pend.)
- Compact DIP Case
- -25°C to +75°C Operation
- Industry Standard Pin-Out



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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	
	24 VDC Input	21.6	24.0	26.4	
Short Circuit Input Power				2,500	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				\pm 4.0	%
Output Voltage Balance	Dual Output, Balanced Loads		\pm 2.0	\pm 4.0	%
Line Regulation	V_{IN} = Min to Max		\pm 0.3	\pm 0.5	%
Load Regulation	See Note 2		\pm 0.5	\pm 1.0	%
Ripple & Noise (20 MHz)	See Note 3			50	mV P - P
Temperature Coefficient			\pm 0.01	\pm 0.02	%/°C
Output Short Circuit	Continuous (Autorecovery)				

General

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage, 60 Sec	Rated For 60 Sec	3,000			VAC rms
	Tested For 1 Sec	6,000			VDC
Isolation Resistance	500 VDC	10			G Ω
Isolation Capacitance	100 kHz, 1V		20		pF
Common Mode Transient Immunity		15			kV/ μ S
Switching Frequency		25	60		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	0.41 Oz (12.4g)				

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)	5 VDC Input			7.5	VDC
	12 VDC Input			15.0	
	24 VDC Input			30.0	
Lead Temperature	1.5 mm From Case for 10 Sec			260	°C

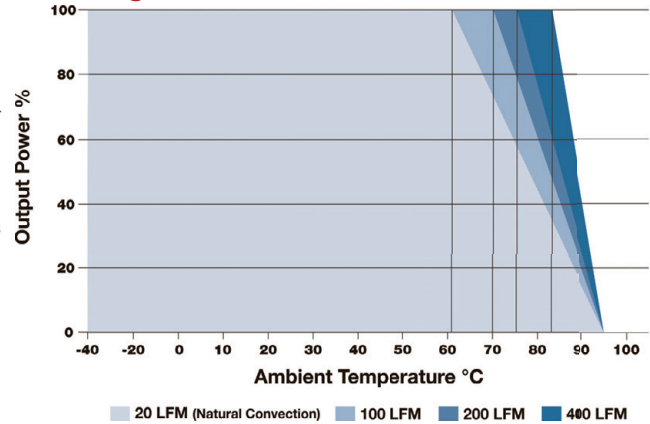
Caution: Exceeding Absolute Maximum Ratings may damage the module. These are not continuous operating ratings.

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Model Number	Input				Output			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						
MHI305S-05ARI6	5	4.5 - 5.5	1,017	130	5.0	600	90.0	59	470	2,000
MHI305S-12ARI6	5	4.5 - 5.5	984	130	12.0	250	37.5	61	470	2,000
MHI305S-15ARI6	5	4.5 - 5.5	960	130	15.0	200	18.8	62	470	2,000
MHI305D-12ARI6	5	4.5 - 5.5	1,000	130	± 12.0	± 125	± 18.8	60	220	1,200
MHI305D-15ARI6	5	4.5 - 5.5	1,000	130	± 15.0	± 100	± 15.0	60	220	1,200
MHI312S-05ARI6	12	10.8 - 13.2	424	60	5.0	600	90.0	59	470	1,000
MHI312S-12ARI6	12	10.8 - 13.2	410	60	12.0	250	37.5	61	470	1,000
MHI312S-15ARI6	12	10.8 - 13.2	400	60	15.0	200	18.8	62	470	1,000
MHI312D-12ARI6	12	10.8 - 13.2	420	60	± 12.0	± 125	± 18.8	60	220	1,000
MHI312D-15ARI6	12	10.8 - 13.2	420	60	± 15.0	± 100	± 15.0	60	220	750
MHI324S-05ARI6	24	21.6 - 26.4	212	40	5.0	600	90.0	59	470	400
MHI324S-12ARI6	24	21.6 - 26.4	198	40	12.0	250	37.5	63	470	400
MHI324S-15ARI6	24	21.6 - 26.4	195	40	15.0	200	18.8	64	470	400
MHI324D-12ARI6	24	21.6 - 26.4	210	40	± 12.0	± 125	± 18.8	60	220	400
MHI324D-15ARI6	24	21.6 - 26.4	210	40	± 15.0	± 100	± 15.0	60	220	400

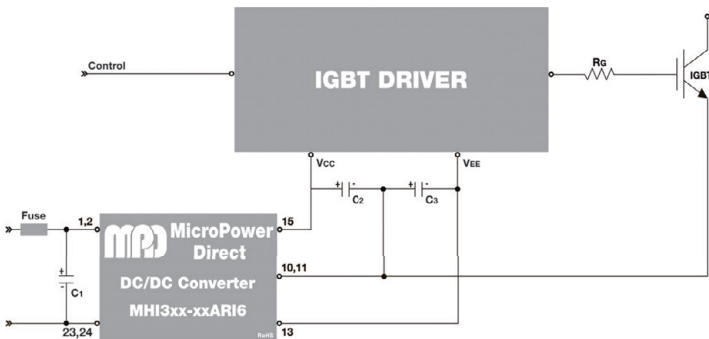
- Notes:
- The specified maximum capacitive load is for each output.
 - Load regulation is measured over a range of 10% load to 100% load.
 - When measuring output ripple & noise, it is recommended that an external capacitor (3.3 μF typ.) be placed from the +Vout to the -Vout pins for single output units and from each output to common for dual output models.
 - The converter should be connected to a low ac-impedance source. A 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 (<1.0 Ω at 100 kHz) capacitor be mounted close to the converter. For 5V input units a 4.7 μF is recommended; for 12V input units, a 2.2 μF ; and for 24V units a 2.2 μF .
 - Operation at no-load will not damage the unit, but 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 Model Selection tables for the correct rating.

Derating Curve

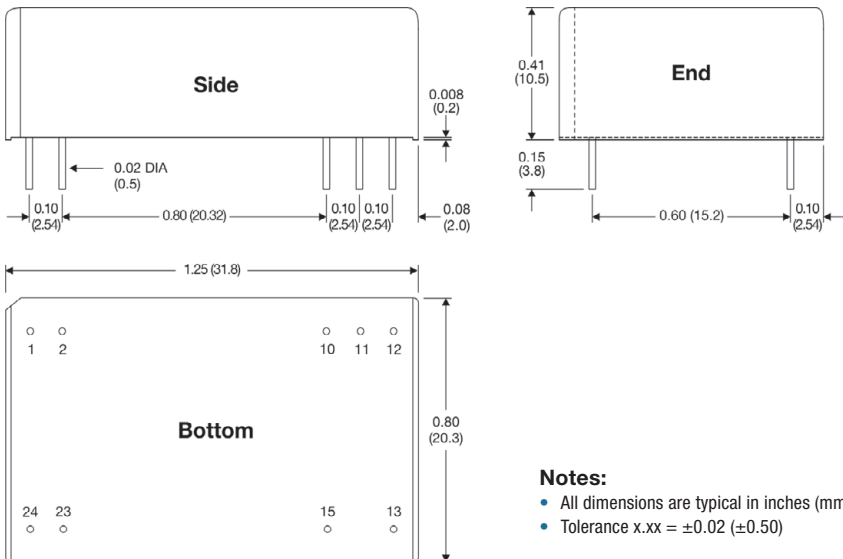


- Notes:
- The MHI300x-xxAR series is a good choice for applications involving high speed switching, such as driving IGBTs. They are designed to withstand the extra stress caused by the high voltage switching transients present in IGBT drive circuits.
- All of the MHIxxx series have isolation levels 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.

IGBT Applications



Mechanical Dimensions



Pin Connections

Pin	Single Output	Pin	Dual Output
1	+VIN	1	+VIN
2	+VIN	2	+VIN
10	No Pin	10	Common
11	No Pin	11	Common
12	-VOUT	12	No Pin
13	+VOUT	13	-VOUT
15	No Pin	15	+VOUT
23	-VIN	23	-VIN
24	-VIN	24	-VIN