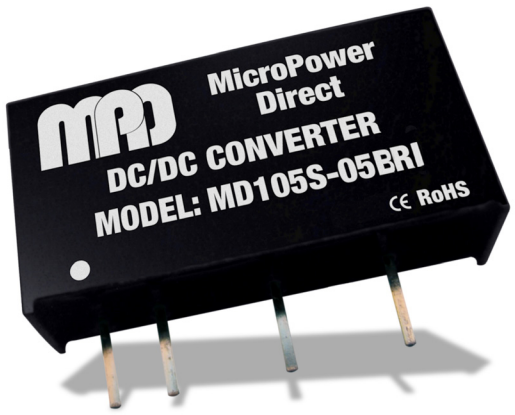
MD100BRI

1W, SIP6, Tightly Regulated, High Isolation DC/DC Converters



Key Features:

- 1W Output Power
- Miniature SIP Case
- Fixed Input
- Tight Regulation
- 3000 VDC Isolation
- -40°C to +85°C Temp
- >3.5 MHour MTBF
- Short Circuit Protected
- Industry Standard Pin-Out

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	5VDC Input	4.75	5	5.25	VDC
	12VDC Input	11.4	12	12.6	
	24VDC Input	22.8	24	25.2	
Reflected Ripple Current			15		mA
Input Filter			Capacitance Filter		

Output

Parameter	Conditions		Min.	Typ.	Max.	Units
Output Voltage Accuracy				±3		%
Line Regulation	Input Voltage Variation ±1%			±0.25		%
Load Regulation	10%-100% Load	3.3VDC Output		±3		%
		Others		±2		
Ripple & Noise	20MHz Bandwidth			50	100	mVp-p
Temperature Coefficient	Full load			±0.02		%/°C
Output Short Circuit	Continuous, self-recovery					

General

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage	60 seconds, leakage <1mA	3000			VDC
Isolation Resistance	500 VDC	1000			MΩ
Isolation Capacitance	100 KHz /0.1V		20		pF
Switching Frequency	Full load, nominal input voltage		250		kHz

Environmental

Parameter	Conditions	Min.	Typ	Max.	Units
Operating Temperature Range	Derating when ≥85°C	-40		+85	°C
Storage Temperature Range		-55		+125	°C
Case Temperature Rise	Ta = 25°C, nominal Vin, full load		25		
Cooling	Free Air Convection				
Storage Humidity, See Note 5	Non-Condensing			95	%RH

Physical

Case Size	0.77 x 0.24 x 0.40 in (See mechanical drawing on page 3)
Case Material	Black plastic; flame retardant and heat resistant (UL94V-0)
Weight	0.074 oz (2.1g) (See mechanical drawing on page 3)

Reliability Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units
MTBF	MIL-HDBK-217F@25°C	3.5			MHours
Pin Soldering Resistance Temperature	1.5mm away from case for 10 sec		300		°C

EMI Characteristics

Parameter	Conditions	Criteria	Level
Radiated Emissions	CISPR/EN 55032		Class B
Conducted Emissions	CISPR/EN 55032		Class B
ESD	EN 61000-4-2		±8 kV Contact

MicroPower Direct
46 Eastman Street
Unit 1
Easton, MA 02375
USA

T: (781) 344-8226
F: (781) 344-8481
E: sales@micropowerdirect.com
W: www.micropowerdirect.com

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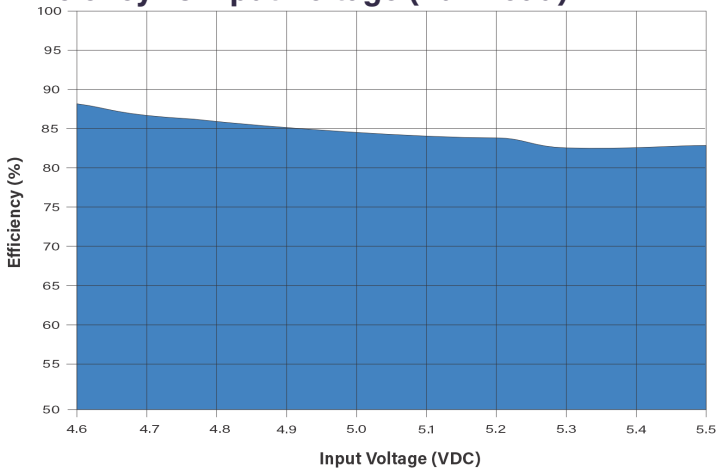
Model Selection Guide

UL	Model Number	Input				Output		Full Load Efficiency (%, Typ)	Reflected Ripple Current (mA Typ)	Capacitive Load (uF Max) (See Note 1)	Fuse Rating Slow-Blow (mA)
		Voltage (VDC)		Current (mA)		Voltage (VDC)	Current (mA, Max)				
		Nominal	Range See Note 4	Full-Load (Typ)	No-Load						
	MD105S-03BRI	5	4.75 - 5.25	260	15	3.3	250	69	15	2400	600
▪	MD105S-05BRI	5	4.75 - 5.25	260	15	5	200	72	15	2400	600
	MD105S-12BRI	5	4.75 - 5.25	260	15	12	84	73	15	560	600
	MD105S-15BRI	5	4.75 - 5.25	260	15	15	67	74	15	560	600
	MD112S-03BRI	12	11.4-12.6	110	8	3.3	250	69	15	2400	240
	MD112S-05BRI	12	11.4-12.6	110	8	5	200	72	15	2400	240
	MD112S-12BRI	12	11.4-12.6	110	8	12	83	73	15	560	240
	MD124S-03BRI	24	22.8-25.2	57	4	3.3	250	69	15	2400	120
	MD124S-05BRI	24	22.8-25.2	57	4	5	200	72	15	2400	120
	MD124S-12BRI	24	22.8-25.2	57	4	12	83	73	15	560	120
	* MD105S-05BRI has UL/cUL 62368 recognition (UL certificate). Contact factory for safety standard status of other models.										

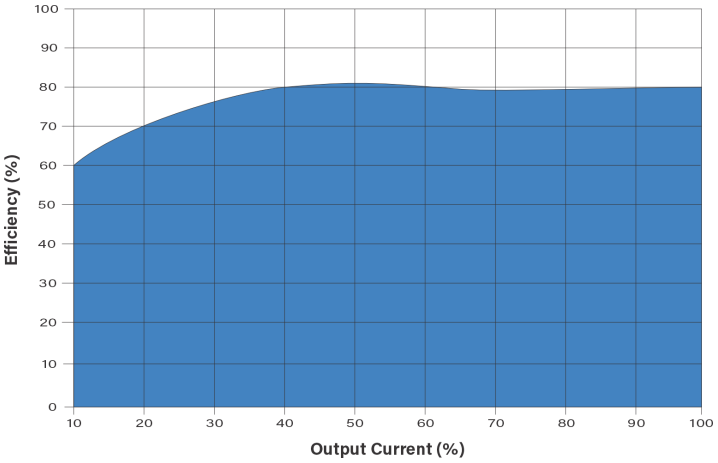
Notes:

1. In order to ensure that the module can work efficiently and reliably, the minimum output load should not be less than 10% of the rated load when used. If the power required is really small, connect a resistor in parallel to the output end (the sum of the power consumed by the resistance and the power actually used is greater than or equal to 10% of the rated power).
2. The input voltage should not exceed the specified range value, otherwise it may cause permanent and irreparable damage.
3. It is recommended to use at a load of over 5%. If the load is below 5%, the ripple index of the product may exceed the specifications, but it does not affect the reliability of the product.
4. The maximum capacitive load is tested within the input voltage range and under full load conditions.
5. Unless otherwise specified, all indicators in this manual are measured at Ta=25 °C, humidity from 40% to 75% RH, nominal input voltage, and output rated load.

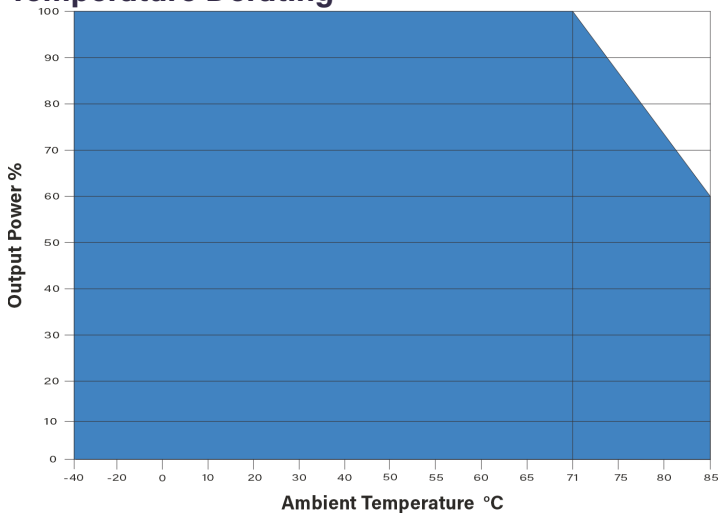
Efficiency vs Input Voltage (Full Load)



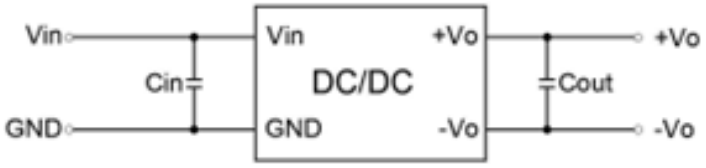
Efficiency vs Output Load (Vin=5V)



Temperature Derating

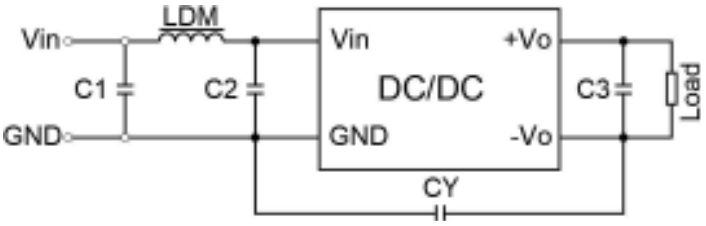


Typical Application Circuit



Recommended Capacitive Load Values			
Vin(VDC)	Cin(μF)	Vo(VDC)	Cout (μF)
5	4.7uF/16V	3.3/5	10
--	--	9/12	2.2
--	--	15/24	1.0

EMI Application Recommended Circuit

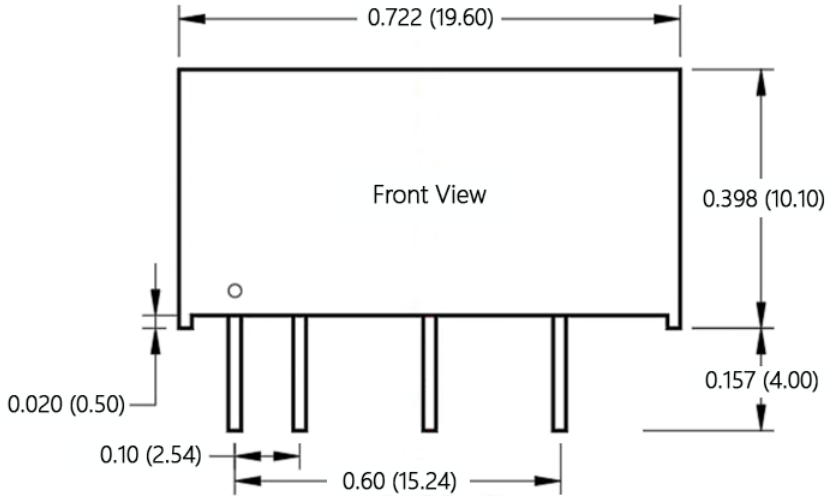


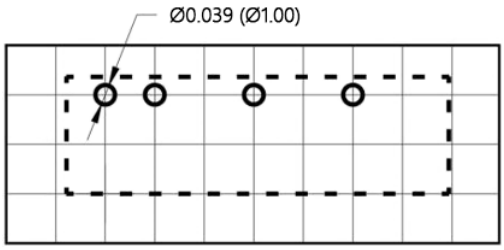
EMI Recommended Values			
Input Voltage 5VDC	Output Voltage (VDC)	3.3/5	12/15
	EMI C1/C2	4.7μF /25V	
	EMI CY	--	1nF/4KV
	EMI C3	Refer to the Cout parameter above	
	EMI LDM	6.8μH	

Notes:

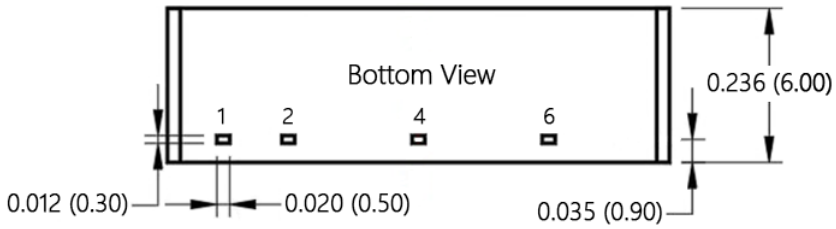
1. To further reduce input and output ripple, a capacitor filtering network can be connected at the input and output terminals. However, care should be taken to select a suitable filter capacitor. If the capacitance is too large, it is likely to cause start-up problems. For each output, the recommended capacitive load values are shown in "Recommended Capacitive Load Value Table" for safe and reliable operation.

Mechanical Dimensions





Note: Grid distance is 2.54 * 2.54 mm



Pin	Function
1	Vin
2	GND
4	-Vo
6	+Vo

Note:

- Unit: inches (mm)
- Pin section tolerances: ±0.004 (±0.10)
- General tolerances: ±0.020 (±0.50)