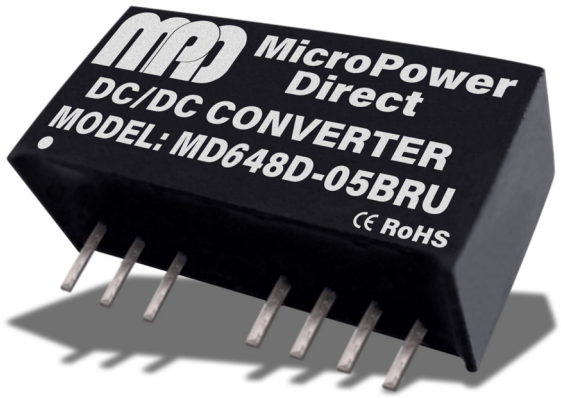
MD600BRU

6W, 4:1 Input Range, Compact SIP8 DC/DC Converters



Key Features:

- 6W Output Power
- Compact SIP8 Case
- 4:1 Wide Input Range
- -40°C to +105°C Operation
- 1600VDC Isolation Voltage
- 18 Standard Models
- Single & Dual Outputs
- Short Circuit Protected
- Low Ripple & Noise
- 1,000 kHour MTBF

CE

RoHS

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	24 VDC Input	9	24	36	VDC
	48 VDC Input	18	48	75	VDC
Reflected Ripple Current			50		mA
Startup Voltage	24 VDC Input			9	VDC
	48 VDC Input			18	
Input Undervoltage Protection	24 VDC Input	5.5	6.5		VDC
	48 VDC Input	12	15.5		
Input Filter			Capacitor		

Output

Parameter	Conditions		Min.	Typ.	Max.	Units
Output Voltage Accuracy	5% - 100% Load			±1.0	±3.0	%
Line Regulation	Full Load			±0.5	±1.0	%
Load Regulation	5% - 100% Of Load			±0.5	±1.5	%
Transient Recovery Time	25% load step change			0.3	0.5	ms
Transient Response Deviation	25% load step change	3.3, 5V Outputs		±5	±8	%
		Other Outputs		±3	±5	
Ripple & Noise, 20MHz Bandwidth	5% - 100% Load			50	100	mVp-p
Temperature Coefficient	Full Load				±0.03	%/°C
Over Curent Protection			110	160	230	%Io
Output Short Circuit				Continuous, Self-Recovery		

General

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage	60 seconds, leakage <1mA	1600			VDC
Isolation Resistance	500 VDC	1000			MΩ
Isolation Capacitance	100 KHz /0. 1V		1000		pF
Switching Frequency	Full load, nominal input voltage	250	312.5	400	kHz

Environmental

Parameter	Conditions	Min.	Typ.	Max.	Units
Operating Temperature Range		-40		+105	°C
Storage Temperature Range		-55		+125	°C
Cooling	Free air convection				
Storage Humidity	Non condensing	5		95	%RH

Physical

Case Size	0.87 x 0.37 x 0.47 in. (See Mechanical Drawings on Page 4)
Case Material	Black plastic; flame retardant and heat resistant (UL94V-0 rated)
Weight	0.17 oz (4.9g) (See Mechanical Drawings on Page 4)

Reliability Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units
MTBF	MIL-HDBK-217F@25 °C	1.0			MHours

Absolute Maximum Ratings

Parameter	Conditions	Min.	Typ.	Max.	Units
Input Voltage Surge (1 Sec)	24 VDC Input	-0.7		50	VDC
	48 VDC Input	-0.7		100	VDC
Lead Temperature	1.5 mm from case for 10 sec.			300	°C

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

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

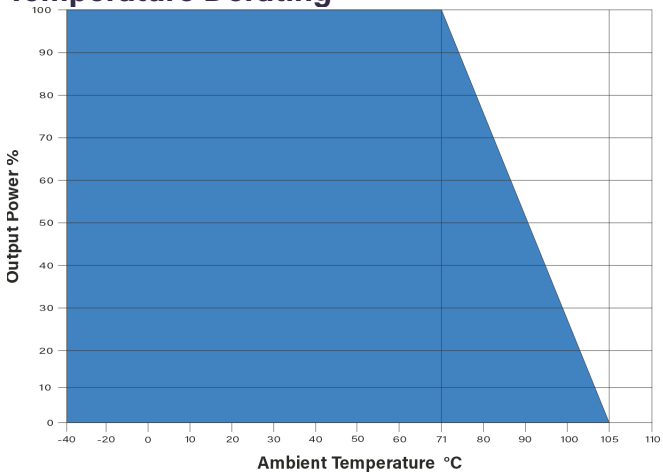
T: (781) 344-8226
F: (781) 344-8481
E: sales@micropowerdirect.com
W: www.micropowerdirect.com

MICROPOWER DIRECT

Model Selection Guide

Model Number	Input				Output			Efficiency (%, Typ)	Reflected Ripple Current (mA Typ)	Capacitive Load (µF, Max)	Fuse Rating Slow-Blow (mA) (See Note1)
	Voltage (VDC)		Current (mA)		Voltage (VDC)	Current (mA, Max)	Current (mA, Min)				
	Nominal	Range	Full-Load	No-Load							
MD624S-03BRU	24	9 - 36	238	5	3.3	1350	0	78	50	1800	1700
MD624S-05BRU	24	9 - 36	305	5	5	1200	0	82	50	1000	1700
MD624S-06BRU	24	9 - 36	305	5	6	1000	0	82	50	680	1700
MD624S-09BRU	24	9 - 36	305	5	9	667	0	84	50	470	1700
MD624S-12BRU	24	9 - 36	305	5	12	500	0	86	50	470	1700
MD624S-15BRU	24	9 - 36	305	5	15	400	0	87	50	220	1700
MD624S-24BRU	24	9 - 36	305	5	24	250	0	85	50	100	1700
MD624D-05BRU	24	9 - 36	305	5	±5	600	0	80	50	±470	1700
MD624D-09BRU	24	9 - 36	305	5	±9	333	0	83	50	±220	1700
MD624D-12BRU	24	9 - 36	305	5	±12	250	0	83	50	±120	1700
MD624D-15BRU	24	9 - 36	305	5	±15	200	0	83	50	±100	1700
MD624D-24BRU	24	9 - 36	305	5	±24	125	0	82	50	±68	1700
MD648S-12BRU	48	18 - 75	146	10	12	500	0	83	50	330	850
MD648S-15BRU	48	18 - 75	146	10	15	400	0	84	50	150	850
MD648S-24BRU	48	18 - 75	146	10	24	250	0	82	50	68	850
MD648D-05BRU	48	18 - 75	156	5	±5	600	0	80	50	±470	850
MD648D-12BRU	48	18 - 75	146	10	±12	250	0	83	50	±120	850
MD648D-15BRU	48	18 - 75	146	10	±15	200	0	83	50	±100	850

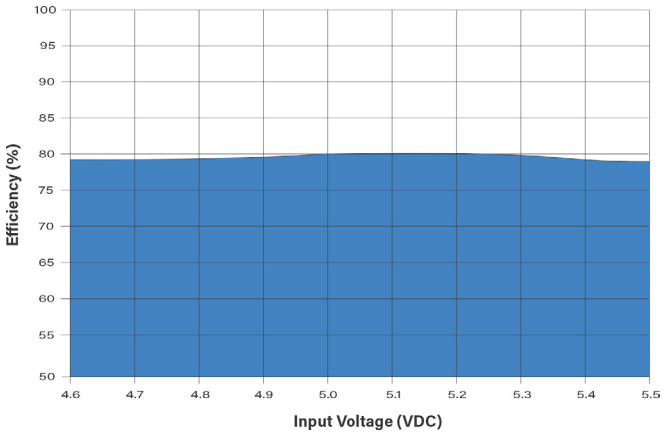
Temperature Derating



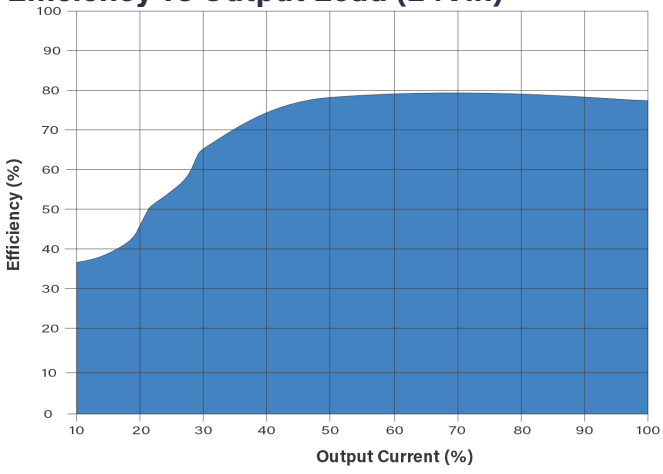
Notes:

1. 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.
2. The input voltage cannot exceed the specified range value, otherwise permanent and irreparable damage may be caused.
3. Unless otherwise specified,the parameters in this datasheet were measured at 25°C , <75%, input nominal voltage and output pure resistance mode under full load.

Efficiency vs Input Voltage (Full Load)



Efficiency vs Output Load (24Vin)



Typical Application Circuit

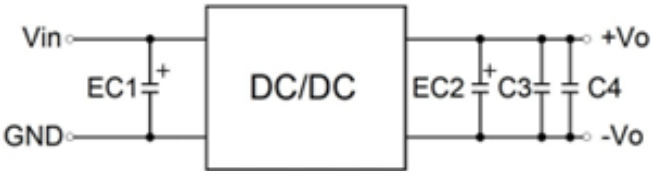


Fig. 1

Vout (VDC)	EC1 (uF)	EC2 (uF)	C3 (uF)	C4 (uF)
5	100uF/50V	100uF/16V	10uF/50V	0.1uF/16V
12/15		47uF/25V		0.1uF/25V
24		47uF/50V		0.1uF/50V

Notes:
1. If it is required to further reduce the input and output ripple, the input and output external capacitors Cin and Cout can be increased or a capacitor with a small series equivalent impedance value can be selected, but the capacitance value cannot be greater than the maximum capacitive load of the product.

EMI Recommended Circuit

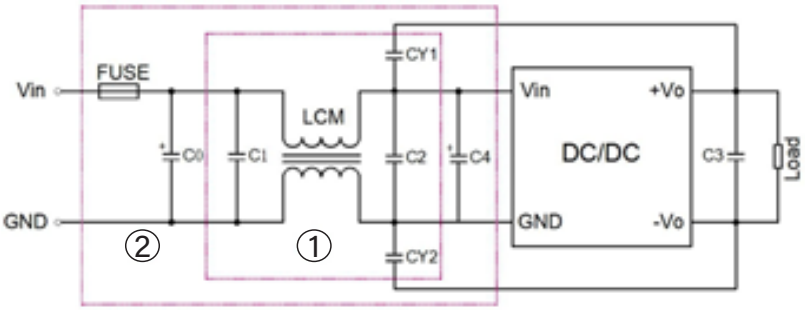


Fig. 2

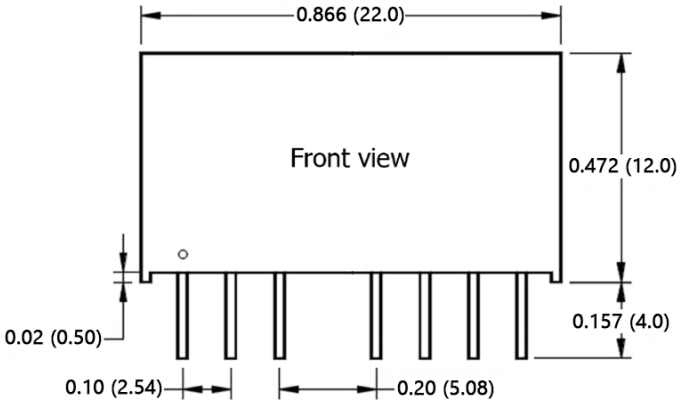
Component	Recommendation
Model	Vin:24V
FUSE	Select according to the actual input current of the application
C0 , C4	330uF/50V
C1, C2	10μF/50V
LCM	1.4-1.7mH
C3	22μF/50V
CY1, CY2	1nF/400VAC

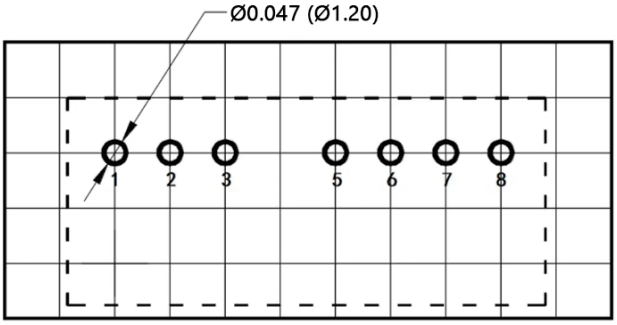
Note: Part 1 in Figure 2 is for EMC testing. Part 2 is used for EMI filtering, which can be selected according to the demand.

EMI Characteristics

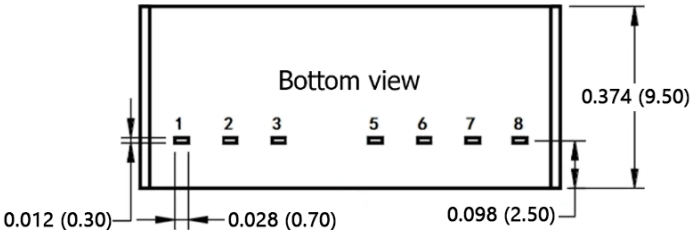
Parameter	Standard		Criteria	Level
Radiated Emissions	See Fig. 2-2	CISPR32/EN 55032		Class B
Conducted Emissions	See Fig. 2-2	CISPR32/EN 55032		Class B
ESD	IEC/EN61000-4-2		B	±4 KV Contact
RS	IEC/EN61000-4-3		A	10V/m
EFT	See Fig. 2-1	IEC/EN61000-4-4	B	±2 KV
Surge	See Fig. 2-1	IEC/EN61000-4-5	B	±1 KV Line to Line
CS	IEC/EN61000-4-6		A	3 Vr.m.s

Mechanical Dimensions





Note: The grid distance is 2.54mm*2.54mm



Notes:

- All dimensions are typical in inches (mm)
- Pin section tolerances: ±0.004 (±0.10)
- General tolerances: ±0.20 (±0.50)
- Weight: 0.17 Oz (4.9g)

Reliability Specifications

Pin	Function (single)	Function (double)
1	GND	GND
2	V in	V in
3	CTRL	CTRL
5	NC	NC
6	+Vo	+Vo
7	-Vo	COM
8	NC	-Vo

MPD has a very wide range of high performance AC/DC power supplies ranging from 600W UChannel units to 1W units in miniature Single-In-Line (SIP) packages. All are designed and certified to international safety and EMC/EMI standards.

We have AC/DC supplies approved for use in medical equipment, DIN rail supplies, "Green" energy supplies and constant power supplies.

We also offer a wide variety of DC/DC converters, POL regulators and IGBT drivers. All products are available with short lead times. Call today for complete information or product samples. Or go to our website:

WWW.MICROPOWERDIRECT.COM

MicroPower Direct
46 Eastman Street, Unit 1, Easton, MA 02375 • TEL: (781) 344-8226 • FAX: (781) 344-8481 • E-Mail: sales@micropowerdirect.com