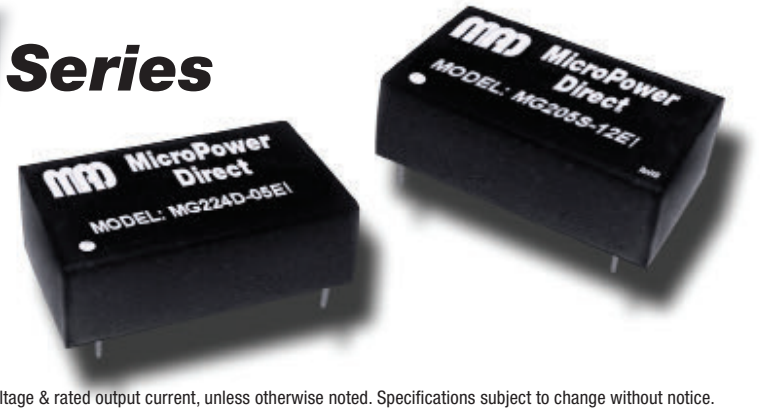
MG200xEI Series

High Isolation, 2W Compact MiniDIP DC/DC Converters



Key Features:

- 2W Output Power
- Compact MiniDIP Case
- 3,000 VDC Isolation
- High Efficiency
- Single and Dual Outputs
- >3.5 MHour MTBF
- -40°C to +85°C Operation
- **LOW COST**

1.5 kV Isolation Models Available

RoHS

Cost Cutter

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	4.50	5.0	5.50	VDC
	12 VDC Input	10.80	12.0	13.20	
	15 VDC Input	13.50	15.0	16.50	
	24 VDC Input	21.60	24.0	26.40	
Input Filter	Internal Capacitor				

Output

Parameter	Conditions	Min.	Typ.	Max.	Units
Output Voltage Accuracy			±2.5		%
Line Regulation	For VIN Change of 1%			±1.2	%
Load Regulation, See Note 1	See Model Selection Guide				
Ripple & Noise (20 MHz), See Note 2	Output Voltage ≤12 VDC		60		mV P - P
	15 VDC, 24 VDC Output		75		
Temperature Coefficient				±0.03	%/°C
Output Short Circuit	5 VDC, 12 VDC & 15 VDC Input	Continuous (Autorecovery)			
	24 VDC Input	Momentary (1.0 Sec.)			

General

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage	60 Seconds	3,000			VDC
Isolation Resistance	500 VDC	1,000			MΩ
Isolation Capacitance	100 kHz, 0.1V		20		pF
Switching Frequency			100	300	kHz

EMI Characteristics

Parameter	Conditions	Min.	Typ.	Max.	Units
EMI Compliance, See Note 4	Conducted	CISPR22/EN 55022 Level B			
	Radiated	CISPR22/EN 55022 Level B			
EMC Compliance, Single Output	Electrostatic Discharge (ESD)	EN 61000-4-2 Level B Contact ±8 kV			
EMC Compliance, Dual Output		EN 61000-4-2 Level B Contact ±6 kV			

Environmental

Parameter	Conditions	Min.	Typ.	Max.	Units
Operating Temperature Range	Ambient	-40	+25	+85	°C
Storage Temperature Range		-55		+125	°C
Cooling	Free Air Convection				
Humidity	RH, Non-condensing			95	%

Physical

Case Size	0.787 x 0.394 x 0.323 Inches (20.0 x 10.0 x 8.2 mm)
Case Material	Non-Conductive Black Plastic (UL-94V0)
Weight	0.08 Oz (2.4g)

Reliability Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	3.5			MHours

Absolute Maximum Ratings

Parameter	Conditions	Min.	Typ.	Max.	Units
Input Voltage Surge (1 Sec)	5 VDC Input	-0.7		9.0	VDC
	12 VDC Input	-0.7		18.0	
	15 VDC Input	-0.7		21.0	
	24 VDC Input	-0.7		30.0	
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.

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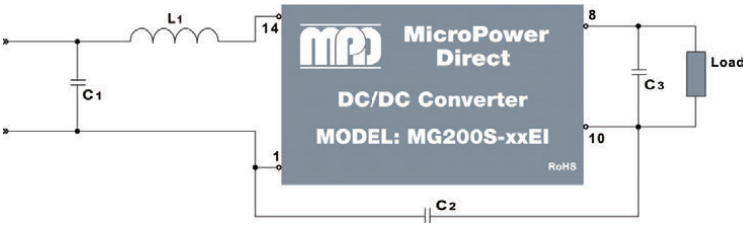
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Model Selection Guide

Model Number	Input				Output			Load Regulation	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				% Typ.			
MG205S-05EI	5	4.5 - 5.5	500	25	5.0	400	40.0	12.0	220	80	1,000
MG205S-12EI	5	4.5 - 5.5	476	25	12.0	167	17.0	8.0	220	84	1,000
MG205S-15EI	5	4.5 - 5.5	476	25	15.0	133	13.0	7.0	220	84	1,000
MG205D-05EI	5	4.5 - 5.5	500	25	±5.0	±200	±20.0	12.0	100	80	1,000
MG205D-12EI	5	4.5 - 5.5	476	25	±12.0	±83	±8.0	8.0	100	84	1,000
MG205D-15EI	5	4.5 - 5.5	476	25	±15.0	±67	±7.0	7.0	100	84	1,000
MG212S-05EI	12	10.8 - 13.2	205	15	5.0	400	40.0	12.0	220	81	500
MG212S-15EI	12	10.8 - 13.2	198	15	15.0	133	13.0	7.0	220	84	500
MG212D-15EI	12	10.8 - 13.2	198	15	±15.0	±67	±7.0	7.0	100	84	500
MG215D-15EI	15	13.5 - 16.5	157	10	±15.0	±67	±7.0	7.0	100	85	300
MG224S-05EI	24	21.6 - 26.4	101	8	5.0	400	40.0	12.0	220	82	250
MG224S-09EI	24	21.6 - 26.4	99	8	9.0	222	22.0	9.0	220	84	250
MG224S-15EI	24	21.6 - 26.4	99	8	15.0	133	13.0	7.0	220	84	250
MG224D-12EI	24	21.6 - 26.4	99	8	±12.0	±83	±8.0	8.0	100	84	250
MG224D-15EI	24	21.6 - 26.4	99	8	±15.0	±67	±7.0	7.0	100	84	250

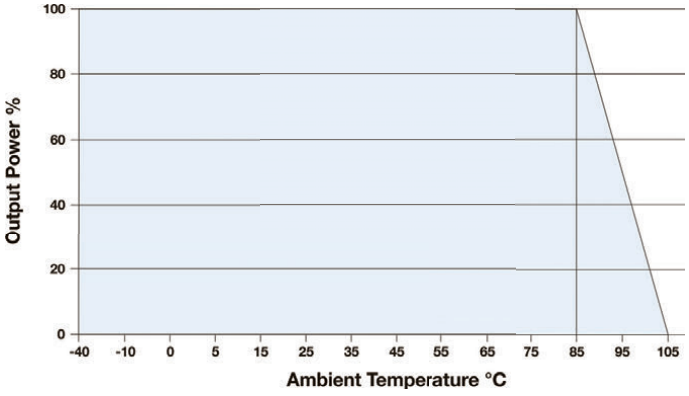
Notes:
1. Output load regulation is specified for a load change of 10% to 100%.
2. When measuring output ripple, it is recommended that an external 1 µF ceramic capacitor & 10 µF electrolytic capacitor be placed in parallel from the +Vout pin to the -Vout pin for single output models, or from each output to common for dual output models.
3. Operation at no load will not damage these units, however, they may not meet all specifications.
4. These converters are specified for operation without external components. However, in some applications the addition of input/output capacitors will enhance stability and reduce output ripple. The simple connection shown below will typically meet EN 55022 Class B. For dual output units, a capacitor should be connected from each output to common.



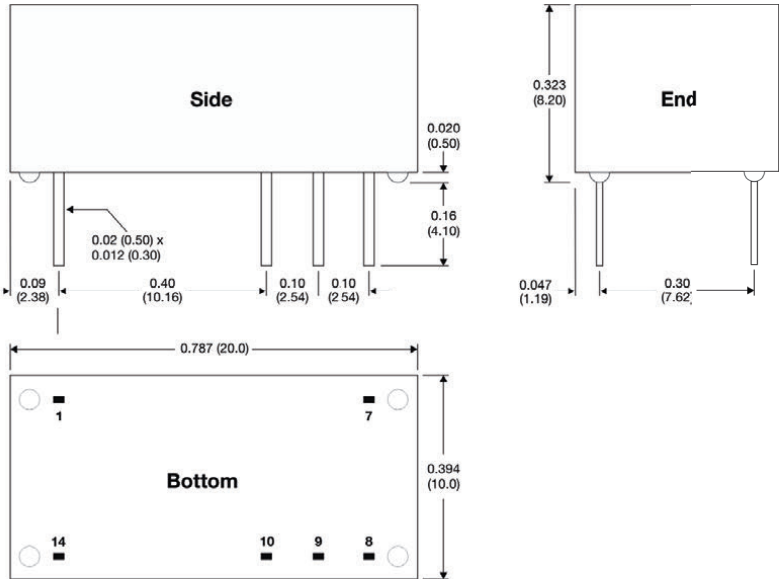
VIN	C1	C2	L1	VOUT	C3
5 VDC	4.7 µF/50V	---	6.8 µH	5 VDC	10 µF
12 VDC	2.2 µF/50V	470 pF/3 kV	6.8 µH	9 VDC	4.7 µF
15 VDC	2.2 µF/50V	470 pF/3 kV	6.8 µH	12 VDC	2.2 µF
24 VDC	1.0 µF/50V	470 pF/3 kV	6.8 µH	15 VDC	1.0 µF
				±5 VDC	4.7 µF
				±12 VDC	1.0 µF
				±15 VDC	0.47 µF

5. 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.

Derating Curve



Mechanical Dimensions



Pin Connections

Pin	Single	Dual
1	-VIN	-VIN
7	NC	NC
8	+VOUT	+VOUT
9	No Pin	Common
10	-VOUT	-VOUT
14	+VIN	+VIN

NC = No Connection

Notes:
- All dimensions are typical in inches (mm)
- Tolerance x.xx = ±0.02 (±0.50)
- Pin 1 is marked by a "dot" or indentation on the unit

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