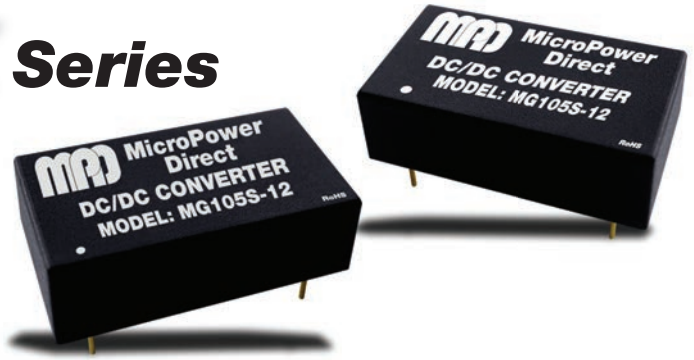


MG100x-XX Series

1 kV To 6 kV Isolation, Compact 1W DIP Case DC/DC Converters



Key Features:

- 1W Output Power
- 1 kV to 6 kV Isolation
- 96 Standard Models
- Miniature DIP Case
- EN 60950 Approved
- Efficiency to 86%
- -40°C to +85°C Operation
- Industry Standard Pin-Out
- Low Cost



MicroPower Direct

292 Page Street
Suite D
Stoughton, MA 02072
USA

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



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	3.3 VDC Input	2.97	3.3	3.63	VDC
	5 VDC Input	4.5	5.0	5.5	
	12 VDC Input	10.8	12.0	13.2	
	15 VDC Input	13.5	15.0	16.5	
	24 VDC Input	21.6	24.0	26.4	
Input Filter	Capacitor Filter				

Output					
Parameter	Conditions	Min.	Typ.	Max.	Units
Output Voltage Accuracy			±3.0		%
Line Regulation	For VIN Change of 1%		±1.2		%
Load Regulation	See Note 1		±10		%
Ripple & Noise (20 MHz)			75		mV P - P
Temperature Coefficient			±0.02		%/°C
Output Short Circuit	Momentary (0.5 Sec)				

General					
Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage, 60 Sec	1xxx-xx Models	1,000			VDC
	1xxx-xxI Models	3,000			
	1xxx-xxI4 Models	4,000			
	1xxx-xxI5 Models	5,200			
	1xxx-xxI6 Models	6,000			
Isolation Resistance			1,000		MΩ
Isolation Capacitance			60		pF
Switching Frequency			80		kHz

Environmental					
Parameter	Conditions	Min.	Typ.	Max.	Units
Operating Temperature Range	Ambient	-40	+25	+85	°C
	Case			+100	
Storage Temperature Range		-40		+125	°C
Cooling	Free Air Convection				
Humidity	RH, Non-condensing			95	%

Physical					
Case Size	See Mechanical Diagram (Page 5)				
Case Material	Non-Conductive Black Plastic (UL94-V0)				
Weight	0.09 Oz (2.6g)				

Reliability Specifications					
Parameter	Conditions	Min.	Typ.	Max.	Units
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	1.121			MHours
Safety Standards	UL/cUL 60950-1 recognition (UL certificate)				

Absolute Maximum Ratings					
Parameter	Conditions	Min.	Typ.	Max.	Units
Input Voltage Surge (0.1 Sec)	3.3 VDC Input			6.0	VDC
	5 VDC Input			7.0	
	12 VDC Input			15.0	
	15 VDC Input			18.0	
	24 VDC Input			28.0	
Lead Temperature	48 VDC Input			54.0	°C
	1.5 mm From Case for 10 Sec			260	

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

www.micropowdirect.com

Model Number	Input				Output			Efficiency (% Typ)	Reflected Ripple Current (mA Pk-Pk)	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							
MG103S-03xx	3.3	2.97 - 3.63	399	28	3.3	303	0.0	76	20.0	220	1,000
MG103S-05xx	3.3	2.97 - 3.63	389	22	5.0	200	0.0	78	20.0	220	1,000
MG103S-07xx	3.3	2.97 - 3.63	389	25	7.2	139	0.0	78	20.0	220	1,000
MG103S-09xx	3.3	2.97 - 3.63	379	35	9.0	111	0.0	80	20.0	220	1,000
MG103S-12xx	3.3	2.97 - 3.63	394	30	12.0	83	0.0	77	20.0	220	1,000
MG103S-15xx	3.3	2.97 - 3.63	389	30	15.0	67	0.0	78	20.0	220	1,000
MG103S-18xx	3.3	2.97 - 3.63	415	30	18.0	56	0.0	73	20.0	220	1,000
MG103S-24xx	3.3	2.97 - 3.63	415	30	24.0	42	0.0	73	20.0	220	1,000
MG103D-03xx	3.3	2.97 - 3.63	459	30	±3.3	±152	±0.0	66	20.0	±100	1,000
MG103D-05xx	3.3	2.97 - 3.63	433	30	±5.0	±100	±0.0	70	20.0	±100	1,000
MG103D-07xx	3.3	2.97 - 3.63	421	30	±7.2	±69	±0.0	72	20.0	±100	1,000
MG103D-09xx	3.3	2.97 - 3.63	404	26	±9.0	±56	±0.0	75	20.0	±100	1,000
MG103D-12xx	3.3	2.97 - 3.63	384	30	±12.0	±42	±0.0	77	20.0	±100	1,000
MG103D-15xx	3.3	2.97 - 3.63	389	25	±15.0	±33	±0.0	78	20.0	±100	1,000
MG103D-18xx	3.3	2.97 - 3.63	404	25	±18.0	±28	±0.0	75	20.0	±100	1,000
MG103D-24xx	3.3	2.97 - 3.63	404	25	±24.0	±21	±0.0	75	20.0	±100	1,000
MG105S-03xx	5	4.5 - 5.5	256	15	3.3	303	0.0	78	20.0	220	500
MG105S-05xx	5	4.5 - 5.5	247	17	5.0	200	0.0	81	20.0	220	500
MG105S-07xx	5	4.5 - 5.5	247	16	7.2	139	0.0	81	20.0	220	500
MG105S-09xx	5	4.5 - 5.5	244	15	9.0	111	0.0	82	20.0	220	500
MG105S-12xx	5	4.5 - 5.5	253	17	12.0	83	0.0	79	20.0	220	500
MG105S-15xx	5	4.5 - 5.5	233	17	15.0	67	0.0	86	20.0	220	500
MG105S-18xx	5	4.5 - 5.5	241	16	18.0	56	0.0	83	20.0	220	500
MG105S-24xx	5	4.5 - 5.5	244	20	24.0	42	0.0	82	20.0	220	500
MG105D-03xx	5	4.5 - 5.5	299	20	±3.3	±152	±0.0	67	20.0	±100	500
MG105D-05xx	5	4.5 - 5.5	270	20	±5.0	±100	±0.0	74	20.0	±100	500
MG105D-07xx	5	4.5 - 5.5	253	15	±7.2	±69	±0.0	79	20.0	±100	500
MG105D-09xx	5	4.5 - 5.5	247	15	±9.0	±56	±0.0	81	20.0	±100	500
MG105D-12xx	5	4.5 - 5.5	250	20	±12.0	±42	±0.0	80	20.0	±100	500
MG105D-15xx	5	4.5 - 5.5	244	20	±15.0	±33	±0.0	82	20.0	±100	500
MG105D-18xx	5	4.5 - 5.5	247	22	±18.0	±28	±0.0	81	20.0	±100	500
MG105D-24xx	5	4.5 - 5.5	247	22	±24.0	±21	±0.0	81	20.0	±100	500
MG112S-03xx	12	10.8 - 13.2	111	12	3.3	303	0.0	75	20.0	220	300
MG112S-05xx	12	10.8 - 13.2	105	14	5.0	200	0.0	79	20.0	220	300
MG112S-07xx	12	10.8 - 13.2	111	14	7.2	139	0.0	75	20.0	220	300
MG112S-09xx	12	10.8 - 13.2	104	9	9.0	111	0.0	80	20.0	220	300
MG112S-12xx	12	10.8 - 13.2	105	13	12.0	83	0.0	79	20.0	220	300
MG112S-15xx	12	10.8 - 13.2	102	10	15.0	67	0.0	82	20.0	220	300
MG112S-18xx	12	10.8 - 13.2	103	11	18.0	56	0.0	81	20.0	220	300
MG112S-24xx	12	10.8 - 13.2	110	20	24.0	42	0.0	76	20.0	220	300
MG112D-03xx	12	10.8 - 13.2	123	13	±3.3	±152	±0.0	68	20.0	±100	300
MG112D-05xx	12	10.8 - 13.2	113	10	±5.0	±100	±0.0	74	20.0	±100	300
MG112D-07xx	12	10.8 - 13.2	110	10	±7.2	±69	±0.0	76	20.0	±100	300
MG112D-09xx	12	10.8 - 13.2	107	13	±9.0	±56	±0.0	78	20.0	±100	300
MG112D-12xx	12	10.8 - 13.2	102	10	±12.0	±42	±0.0	82	20.0	±100	300
MG112D-15xx	12	10.8 - 13.2	102	10	±15.0	±33	±0.0	82	20.0	±100	300
MG112D-18xx	12	10.8 - 13.2	102	10	±18.0	±28	±0.0	82	20.0	±100	300
MG112D-24xx	12	10.8 - 13.2	111	20	±24.0	±21	±0.0	75	20.0	±100	300
MG115S-03xx	15	13.5 - 16.5	83	10	3.3	303	0.0	80	20.0	220	200
MG115S-05xx	15	13.5 - 16.5	82	7	5.0	200	0.0	81	20.0	220	200
MG115S-07xx	15	13.5 - 16.5	85	10	7.2	139	0.0	78	20.0	220	200
MG115S-09xx	15	13.5 - 16.5	85	10	9.0	111	0.0	78	20.0	220	200
MG115S-12xx	15	13.5 - 16.5	83	8	12.0	83	0.0	80	20.0	220	200
MG115S-15xx	15	13.5 - 16.5	84	12	15.0	67	0.0	79	20.0	220	200
MG115S-18xx	15	13.5 - 16.5	83	10	18.0	56	0.0	80	20.0	220	200
MG115S-24xx	15	13.5 - 16.5	80	5	24.0	42	0.0	83	20.0	220	200
MG115D-03xx	15	13.5 - 16.5	89	20	±3.3	±152	±0.0	75	20.0	±100	200
MG115D-05xx	15	13.5 - 16.5	89	20	±5.0	±100	±0.0	75	20.0	±100	200
MG115D-07xx	15	13.5 - 16.5	89	18	±7.2	±69	±0.0	75	20.0	±100	200
MG115D-09xx	15	13.5 - 16.5	87	18	±9.0	±56	±0.0	77	20.0	±100	200
MG115D-12xx	15	13.5 - 16.5	87	20	±12.0	±42	±0.0	77	20.0	±100	200
MG115D-15xx	15	13.5 - 16.5	87	20	±15.0	±33	±0.0	77	20.0	±100	200
MG115D-18xx	15	13.5 - 16.5	89	15	±18.0	±28	±0.0	75	20.0	±100	200
MG115D-24xx	15	13.5 - 16.5	89	15	±24.0	±21	±0.0	75	20.0	±100	200

Model Number	Input				Output			Efficiency (% , Typ)	Reflected Ripple Current (mA Pk-Pk)	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							
MG103S-03xx	3.3	2.97 - 3.63	399	28	3.3	303	0.0	76	20.0	220	1,000
MG103S-05xx	3.3	2.97 - 3.63	389	22	5.0	200	0.0	78	20.0	220	1,000
MG103S-07xx	3.3	2.97 - 3.63	389	25	7.2	139	0.0	78	20.0	220	1,000
MG103S-09xx	3.3	2.97 - 3.63	379	35	9.0	111	0.0	80	20.0	220	1,000
MG103S-12xx	3.3	2.97 - 3.63	394	30	12.0	83	0.0	77	20.0	220	1,000
MG103S-15xx	3.3	2.97 - 3.63	389	30	15.0	67	0.0	78	20.0	220	1,000
MG103S-18xx	3.3	2.97 - 3.63	415	30	18.0	56	0.0	73	20.0	220	1,000
MG103S-24xx	3.3	2.97 - 3.63	415	30	24.0	42	0.0	73	20.0	220	1,000
MG103D-03xx	3.3	2.97 - 3.63	459	30	±3.3	±152	±0.0	66	20.0	±100	1,000
MG103D-05xx	3.3	2.97 - 3.63	433	30	±5.0	±100	±0.0	70	20.0	±100	1,000
MG103D-07xx	3.3	2.97 - 3.63	421	30	±7.2	±69	±0.0	72	20.0	±100	1,000
MG103D-09xx	3.3	2.97 - 3.63	404	26	±9.0	±56	±0.0	75	20.0	±100	1,000
MG103D-12xx	3.3	2.97 - 3.63	384	30	±12.0	±42	±0.0	77	20.0	±100	1,000
MG103D-15xx	3.3	2.97 - 3.63	389	25	±15.0	±33	±0.0	78	20.0	±100	1,000
MG103D-18xx	3.3	2.97 - 3.63	404	25	±18.0	±28	±0.0	75	20.0	±100	1,000
MG103D-24xx	3.3	2.97 - 3.63	404	25	±24.0	±21	±0.0	75	20.0	±100	1,000
MG105S-03xx	5	4.5 - 5.5	256	15	3.3	303	0.0	78	20.0	220	500
MG105S-05xx	5	4.5 - 5.5	247	17	5.0	200	0.0	81	20.0	220	500
MG105S-07xx	5	4.5 - 5.5	247	16	7.2	139	0.0	81	20.0	220	500
MG105S-09xx	5	4.5 - 5.5	244	15	9.0	111	0.0	82	20.0	220	500
MG105S-12xx	5	4.5 - 5.5	253	17	12.0	83	0.0	79	20.0	220	500
MG105S-15xx	5	4.5 - 5.5	233	17	15.0	67	0.0	86	20.0	220	500
MG105S-18xx	5	4.5 - 5.5	241	16	18.0	56	0.0	83	20.0	220	500
MG105S-24xx	5	4.5 - 5.5	244	20	24.0	42	0.0	82	20.0	220	500
MG105D-03xx	5	4.5 - 5.5	299	20	±3.3	±152	±0.0	67	20.0	±100	500
MG105D-05xx	5	4.5 - 5.5	270	20	±5.0	±100	±0.0	74	20.0	±100	500
MG105D-07xx	5	4.5 - 5.5	253	15	±7.2	±69	±0.0	79	20.0	±100	500
MG105D-09xx	5	4.5 - 5.5	247	15	±9.0	±56	±0.0	81	20.0	±100	500
MG105D-12xx	5	4.5 - 5.5	250	20	±12.0	±42	±0.0	80	20.0	±100	500
MG105D-15xx	5	4.5 - 5.5	244	20	±15.0	±33	±0.0	82	20.0	±100	500
MG105D-18xx	5	4.5 - 5.5	247	22	±18.0	±28	±0.0	81	20.0	±100	500
MG105D-24xx	5	4.5 - 5.5	247	22	±24.0	±21	±0.0	81	20.0	±100	500
MG112S-03xx	12	10.8 - 13.2	111	12	3.3	303	0.0	75	20.0	220	300
MG112S-05xx	12	10.8 - 13.2	105	14	5.0	200	0.0	79	20.0	220	300
MG112S-07xx	12	10.8 - 13.2	111	14	7.2	139	0.0	75	20.0	220	300
MG112S-09xx	12	10.8 - 13.2	104	9	9.0	111	0.0	80	20.0	220	300
MG112S-12xx	12	10.8 - 13.2	105	13	12.0	83	0.0	79	20.0	220	300
MG112S-15xx	12	10.8 - 13.2	102	10	15.0	67	0.0	82	20.0	220	300
MG112S-18xx	12	10.8 - 13.2	103	11	18.0	56	0.0	81	20.0	220	300
MG112S-24xx	12	10.8 - 13.2	110	20	24.0	42	0.0	76	20.0	220	300
MG112D-03xx	12	10.8 - 13.2	123	13	±3.3	±152	±0.0	68	20.0	±100	300
MG112D-05xx	12	10.8 - 13.2	113	10	±5.0	±100	±0.0	74	20.0	±100	300
MG112D-07xx	12	10.8 - 13.2	110	10	±7.2	±69	±0.0	76	20.0	±100	300
MG112D-09xx	12	10.8 - 13.2	107	13	±9.0	±56	±0.0	78	20.0	±100	300
MG112D-12xx	12	10.8 - 13.2	102	10	±12.0	±42	±0.0	82	20.0	±100	300
MG112D-15xx	12	10.8 - 13.2	102	10	±15.0	±33	±0.0	82	20.0	±100	300
MG112D-18xx	12	10.8 - 13.2	102	10	±18.0	±28	±0.0	82	20.0	±100	300
MG112D-24xx	12	10.8 - 13.2	111	20	±24.0	±21	±0.0	75	20.0	±100	300
MG115S-03xx	15	13.5 - 16.5	83	10	3.3	303	0.0	80	20.0	220	200
MG115S-05xx	15	13.5 - 16.5	82	7	5.0	200	0.0	81	20.0	220	200
MG115S-07xx	15	13.5 - 16.5	85	10	7.2	139	0.0	78	20.0	220	200
MG115S-09xx	15	13.5 - 16.5	85	10	9.0	111	0.0	78	20.0	220	200
MG115S-12xx	15	13.5 - 16.5	83	8	12.0	83	0.0	80	20.0	220	200
MG115S-15xx	15	13.5 - 16.5	84	12	15.0	67	0.0	79	20.0	220	200
MG115S-18xx	15	13.5 - 16.5	83	10	18.0	56	0.0	80	20.0	220	200
MG115S-24xx	15	13.5 - 16.5	80	5	24.0	42	0.0	83	20.0	220	200
MG115D-03xx	15	13.5 - 16.5	89	20	±3.3	±152	±0.0	75	20.0	±100	200
MG115D-05xx	15	13.5 - 16.5	89	20	±5.0	±100	±0.0	75	20.0	±100	200
MG115D-07xx	15	13.5 - 16.5	89	18	±7.2	±69	±0.0	75	20.0	±100	200
MG115D-09xx	15	13.5 - 16.5	87	18	±9.0	±56	±0.0	77	20.0	±100	200
MG115D-12xx	15	13.5 - 16.5	87	20	±12.0	±42	±0.0	77	20.0	±100	200
MG115D-15xx	15	13.5 - 16.5	87	20	±15.0	±33	±0.0	77	20.0	±100	200
MG115D-18xx	15	13.5 - 16.5	89	15	±18.0	±28	±0.0	75	20.0	±100	200
MG115D-24xx	15	13.5 - 16.5	89	15	±24.0	±21	±0.0	75	20.0	±100	200

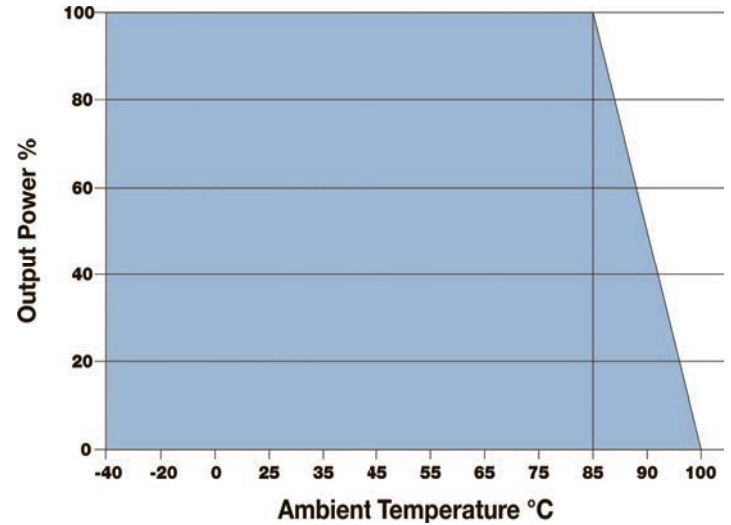
- Notes:
1. Load regulation is measured over a range of 20% IOUT to 100% IOUT. Load regulation for 3.3 VDC output models is specified at ±20% typical.
 2. Operation at no-load will not damage the unit, but they may not meet all specifications.
 3. The specified maximum capacitive load is for each output.
 4. It is recommended that a fuse be used on the input of a power supply for protection. See the Model Selection table for the correct rating.

I/O Isolation

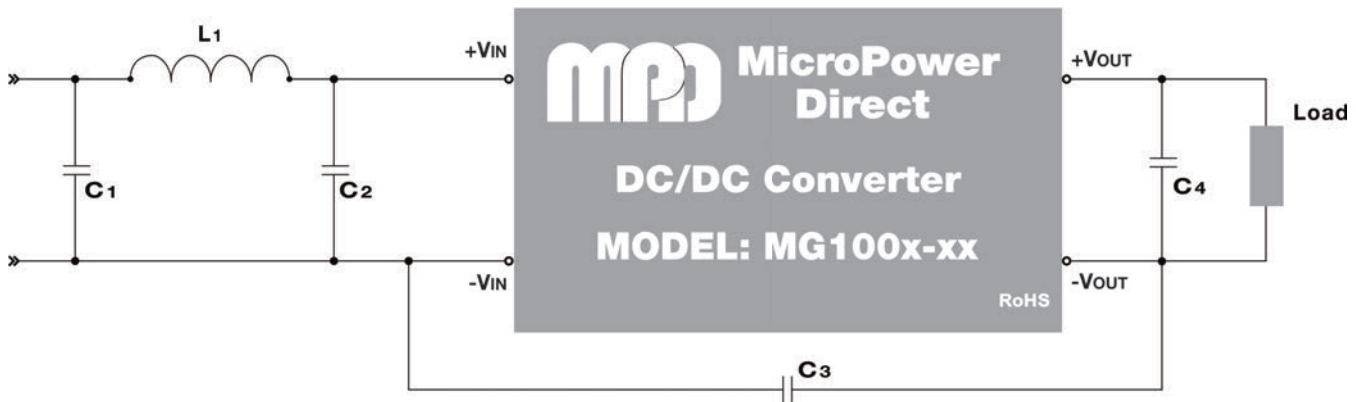
Models are available with input/output isolation levels ranging from 1 kVDC to 6 kVDC. To order units with higher isolation levels an "Ix" is added to the Model number, as shown in the table below.

Model No	I/O Isolation Level
MG1xxx-xx	1 kVDC
MG1xxx-xxI	3 kVDC
MG1xxx-xxI4	4 kVDC
MG1xxx-xxI5	5.2 kVDC
MG1xxx-xxI6	6 kVDC

Derating Curve



Typical Connection



For applications that require meeting EMC standards, the diagram above illustrates a typical connection of the **MG100x-xx** series. The units do not require external components to operate as specified. All components should be mounted as close to the unit as possible.

The voltage rating on capacitor C3 needs to be greater than the isolation voltage rating of the unit. To meet EN 61000-4-4 and EN 61000-4-5 requirements, the value of capacitor C1 should be changed to 470 μ F/100V.

Capacitor C4 is not required to meet specifications, but may be used if a lower level of output ripple is required.

The recommended values for components are:

Component	3.3 VIN	5.0 VIN	12 VIN	15 VIN	24 VIN	48 VIN
C1	2.2 μ F/100V	2.2 μ F/100V	2.2 μ F/100V	2.2 μ F/100V	2.2 μ F/100V	2.2 μ F/100V
L1	18 μ H	18 μ H	18 μ H	18 μ H	18 μ H	2.2 μ F/100V
C2					1210, 2.2 μ F/100V	
C3					1206, 470 pF/2kV	
C4	10 μ F	10 μ F	10 μ F	10 μ F	10 μ F	10 μ F

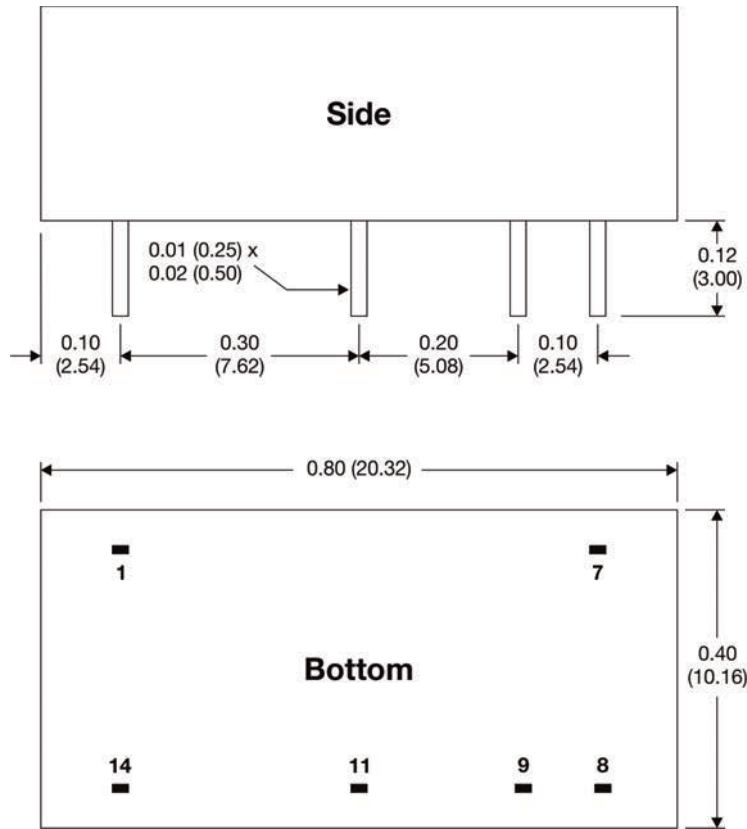
EMC/EMI Characteristics

Parameter	Standard	Criteria	Level
Radiated Emissions	EN 55032		Class B
Conducted Emissions See Note 3	EN 55032		Class B
ESD	EN 61000-4-2	A	\pm 6 kV Contact \pm 8kV Air
RS	EN 61000-4-3	A	10V/m
EFT See Note 4	EN 61000-4-4	A	\pm 2 kV
Surge See Note 4	EN 61000-4-5	A	\pm 2 kV
CS	EN 61000-4-6	A	10 Vrms
PFMF	EN 61000-4-8	A	1A/m

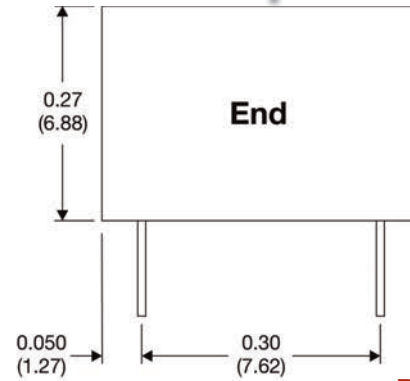
Notes:

1. With the addition of input filter components, all models will meet EN 55022 class B. A suggested circuit is shown in the connection diagram below. Contact the factory for more information.
2. To meet the requirements of EN 61000-4-4 and EN 61000-4-5, external components are needed. The diagram below shows a typical connection. Contact the factory for more information.

Mechanical Dimensions, MG100X-xx Models



www.micropowerdirect.com

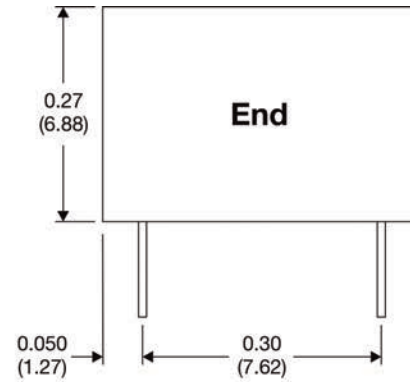
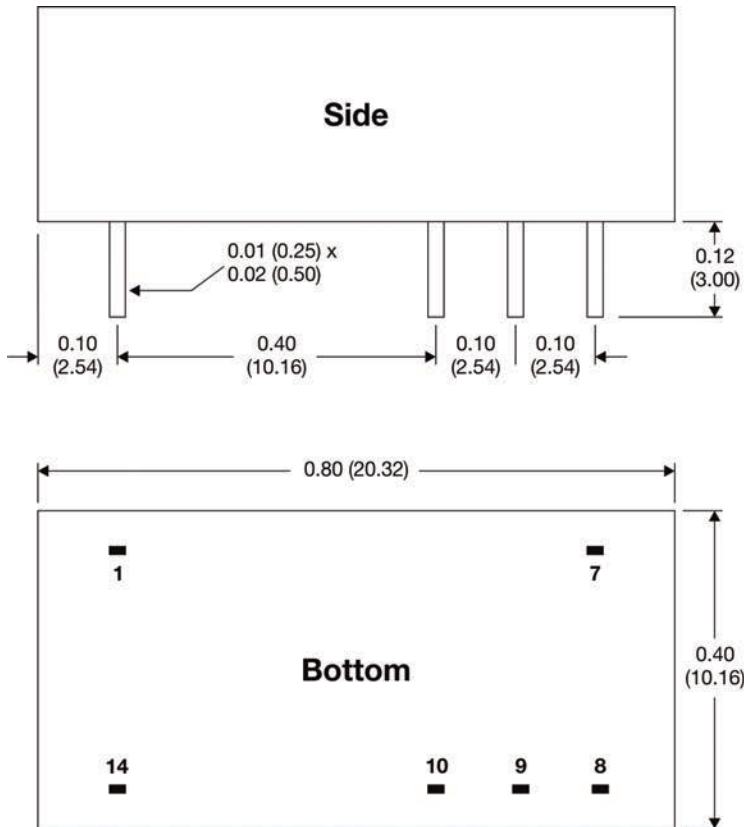


Pin Connections

Pin	Single Output
1	-VIN
7	No Connection
8	No Pin
9	+VOUT
11	-VOUT
14	+VIN

Pin	Dual Output
1	-VIN
7	No Connection
8	Common
9	+VOUT
11	-VOUT
14	+VIN

Mechanical Dimensions, MG100X-xxlx Models



Pin Connections

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

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

Notes:

- All dimensions are typical in inches (mm)
- General Tolerance x.xx = ±0.02 (±0.5)
- Pin 1 is marked by a "dot" or indentation on the unit



MicroPower Direct
We Power Your Success - For Less!