

MG100xEI Series

High Isolation, 1W Compact MiniDIP DC/DC Converters



Key Features:

- 1W Output Power
- Compact MiniDIP Case
- 3,000 VDC Isolation
- High Efficiency
- Single and Dual Outputs
- >3.5 MHour MTBF
- -40°C to +105°C Operation
- LOW COST

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	4.50	5.0	5.50		
	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 V_{IN} Change of 1%	3.3 V_{OUT} Models			±1.5	%	
	All Other Models			±1.2		
Load Regulation, See Note 2	See Model Selection Guide					
Ripple & Noise (20 MHz)	See Note 3		60	150	mV P - P	
Temperature Coefficient				±0.03	% / °C	
Output Short Circuit	3.3V And 24V Input Models	1S (Momentary)				
	All Other Models	Continuous (Autorecovery)				

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	Standard	Criteria	Level			
Radiated Emissions, See Note 5	EN 55022		Class B			
Conducted Emissions, See Note 5	EN 55022		Class B			
ESD, Single Output Models	EN 61000-4-2	B	Contact ±8 kV			
ESD, Dual Output Models	EN 61000-4-2	B	Contact ±6 kV			

Environmental						
Parameter	Conditions	Min.	Typ.	Max.	Units	
Operating Temperature Range	Ambient	-40	+25	+105	°C	
Storage Temperature Range		-55		+125	°C	
Cooling	Free Air Convection					
Humidity	RH, Non-condensing			95	%	

Physical						
Parameter	Conditions					
Case Size	See Mechanical Diagram, Page 2)					
Case Material	Non-Conductive Black Plastic (UL-94V0)					
Weight	0.07 Oz (2.1g)					

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)	3.3 VDC Input			5.0	VDC	
	5 VDC Input			9.0		
	12 VDC Input			18.0		
	15 VDC Input			21.0		
	24 VDC Input			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.

RoHS



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Model Selection Guide

Model Number	Input				Output			Load Regulation % Typ.	Output Capacitive Load (μ F 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							
MG103S-03EI	3.3	2.97 - 3.63	415	30	3.3	303	31.0	18.0	220	73	750
MG105S-03EI	5	4.50 - 5.50	267	20	3.3	303	31.0	18.0	220	75	750
MG105S-05EI	5	4.50 - 5.50	250	20	5.0	200	20.0	12.0	220	80	750
MG105S-12EI	5	4.50 - 5.50	250	20	12.0	83	9.0	8.0	220	80	750
MG105S-15EI	5	4.50 - 5.50	247	20	15.0	67	7.0	7.0	220	81	750
MG105D-05EI	5	4.50 - 5.50	253	20	\pm 5.0	\pm 100	\pm 10.0	12.0	100	79	750
MG105D-12EI	5	4.50 - 5.50	252	20	\pm 12.0	\pm 42	\pm 5.0	8.0	100	80	750
MG105D-15EI	5	4.50 - 5.50	252	20	\pm 15.0	\pm 34	\pm 4.0	7.0	100	81	750
MG112S-05EI	12	10.8 - 13.2	104	15	5.0	200	20.0	12.0	220	80	250
MG112S-12EI	12	10.8 - 13.2	104	15	12.0	83	9.0	8.0	220	80	250
MG112S-15EI	12	10.8 - 13.2	103	15	15.0	67	7.0	7.0	220	81	250
MG112D-05EI	12	10.8 - 13.2	105	15	\pm 5.0	\pm 100	\pm 10.0	12.0	100	80	250
MG115S-15EI	15	13.5 - 16.5	84	10	15.0	67	7.0	7.0	220	81	200
MG124S-05EI	24	21.6 - 26.4	53	7	5.0	200	20.0	12.0	220	79	100
MG124D-12EI	24	21.6 - 26.4	51	7	\pm 12.0	\pm 42	\pm 5.0	8.0	100	81	100
MG124D-15EI	24	21.6 - 26.4	52	7	\pm 15.0	\pm 34	\pm 4.0	7.0	100	81	100

- Notes:
- Output capacitive load is specified for each output
 - Output load regulation is specified for a load change of 10% to 100%.
 - When measuring output ripple, it is recommended that an external 1 μ F ceramic capacitor & 10 μ F 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.
 - Operation at no load will not damage these units, however, they may not meet all specifications.
 - To meet the requirements of EN 55022 Class B, a connection such as the one shown at right must be used. The addition these input/output components will enhance stability and reduce output ripple. For dual output units, a capacitor should be connected from each output to common.

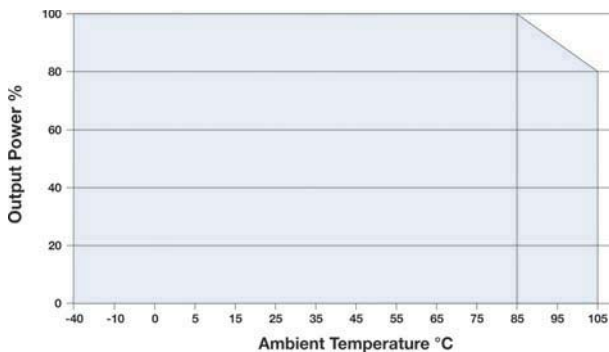
Typical Connection



V _{IN}	C ₁	L ₁	C _Y	V _{OUT}	C ₂
3.3 VDC	4.7 μ F/50V	6.8 μ H		3.3 VDC	10 μ F
5 VDC	4.7 μ F/50V	6.8 μ H		5 VDC	10 μ F
12 VDC	4.7 μ F/50V	6.8 μ H		12 VDC	2.2 μ F
15 VDC	4.7 μ F/50V	6.8 μ H	1nF/3kV	15 VDC	1.0 μ F
24 VDC	4.7 μ F/50V	6.8 μ H	1nF/3kV	24 VDC	1.0 μ F
				\pm 5 VDC	4.7 μ F
				\pm 12 VDC	1.0 μ F
				\pm 15 VDC	0.47 μ F

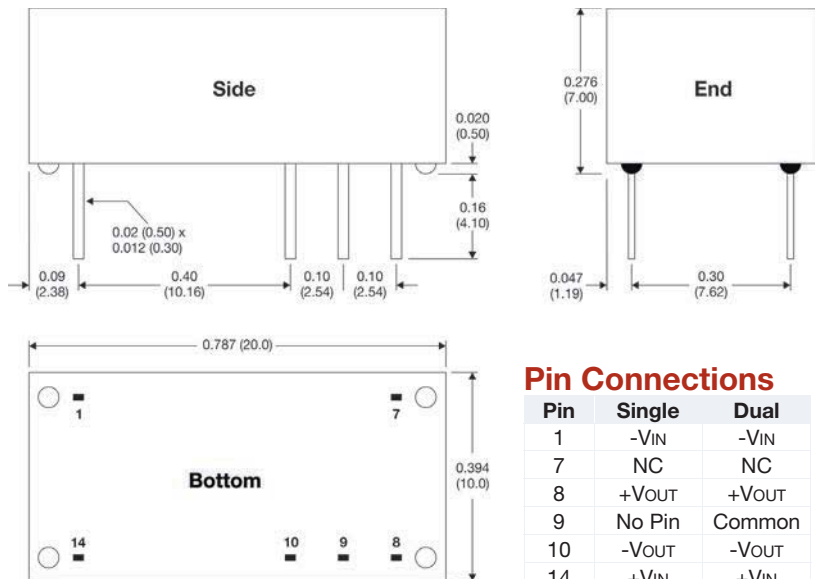
- It is recommended that a fuse be used on the input of a power supply for protection. See the Model Selection table above for the correct rating.

Derating Curve



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

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



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