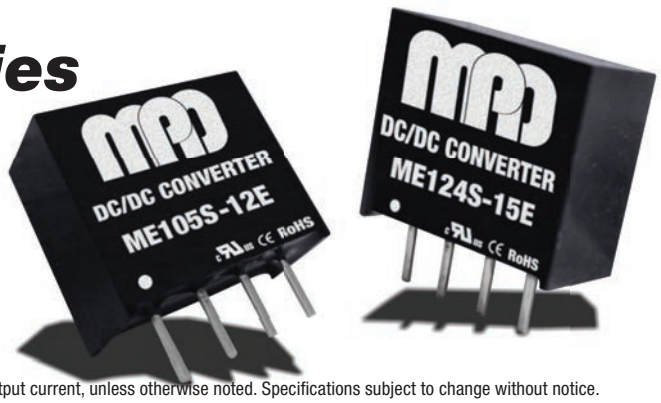
ME100SE Series

Low Cost, 1W Ultra-Miniature SIP DC/DC Converters



Key Features:

- 1W Output Power
- Ultra-Miniature SIP Case
- EN 6950 Approved
- 24 Standard Models
- 1,500 VDC Isolation
- >3.50 MHour MTBF
- Meets EN 55032 Class B
- -40°C to +105°C Operation
- Low Cost!

Also Available In Ultra-Miniature DIP Case

MicroPower Direct
292 Page Street
Suite D
Stoughton, MA 02072
USA

T: (781) 344-8226
F: (781) 344-8481
E: sales@micropowerdirect.com
W: www.micropowerdirect.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	4.50	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 Reflected Ripple Current			15		mA P - P
Input Filter	Internal Capacitor				

Output

Parameter	Conditions	Min.	Typ.	Max.	Units
Output Voltage Accuracy	See Tolerance Graphs on Page 2				
Line Regulation, For VIN Change of 1%	3.3 VOut Models			±1.5	%
	All Other Models			±1.2	
Load Regulation, See Note 1	See Model Selection Guide				
Ripple & Noise (20 MHz)	See Note 2		60	150	mV P - P
Temperature Coefficient				±0.03	%/°C
Output Short Circuit	ME103S-xxE, ME124S-xxE, ME105-24E	Momentary (0.5 Sec.)			
	All Other Models	Continuous (Autorecovery)			

General

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

EMI Characteristics (See Page 3)

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	±8 kV Air
				±6 kV Contact
RS		EN 61000-4-3	A	10V/m
EFT	See Note 3	EN 61000-4-4	A	±2 kV
Surge	See Note 3	EN 61000-4-5	A	±0.5 kV
CS		EN 61000-4-6	A	10 Vrms
PFMF		EN 61000-4-8	A	1A/m

Environmental

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

Physical

Case Size & Weight	See Mechanical Diagrams (Page 4)
Case Material	Non-Conductive Black Plastic (UL-94V0)

Reliability Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	3.50			MHours
Safety Standards (See Note 4)	UL/cUL 60950-1 recognition (UL certificate)				

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.

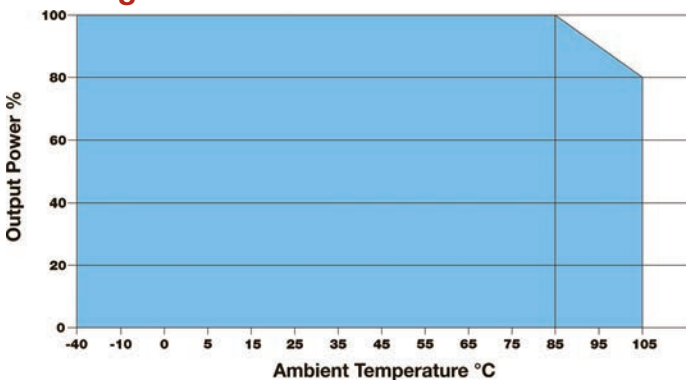
Model Selection Guide

Model Number	Input				Output			Load Regulation (% Typ)	Efficiency (%, Typ)	Capacitive Load (µF, Max)	Certification	Fuse Rating Slow-Blow (mA)
	Voltage (VDC)		Current (mA)		Voltage (VDC)	Current (mA)						
	Nominal	Range	Full-Load	No-Load		Max.	Min.					
ME103S-03E	3.3	2.97 - 3.63	421	30	3.3	303	30	±18	72	220	--	850
ME103S-05E	3.3	2.97 - 3.63	399	30	5.0	200	20	±12	76	220	UL/CE	850
ME103S-12E	3.3	2.97 - 3.63	378	30	12.0	84	9	±7	80	220	UL/CE	850
ME105S-03E	5.0	4.5 - 5.5	278	20	3.3	303	30	±18	72	220	--	550
ME105S-05E	5.0	4.5 - 5.5	250	20	5.0	200	20	±12	80	220	UL/CE	550
ME105S-09E	5.0	4.5 - 5.5	250	20	9.0	111	12	±8	80	220	UL/CE	550
ME105S-12E	5.0	4.5 - 5.5	250	20	12.0	84	9	±7	80	220	UL/CE	550
ME105S-15E	5.0	4.5 - 5.5	250	30	15.0	67	7	±6	80	220	UL/CE	550
ME105S-24E	5.0	4.5 - 5.5	250	30	24.0	42	4	±5	80	220	UL/CE	550
ME112S-03E	12	10.8 - 13.2	116	15	3.3	303	30	±18	72	220	--	240
ME112S-05E	12	10.8 - 13.2	104	15	5.0	200	20	±12	80	220	UL/CE	240
ME112S-09E	12	10.8 - 13.2	104	15	9.0	111	12	±8	80	220	UL/CE	240
ME112S-12E	12	10.8 - 13.2	104	15	12.0	84	9	±7	80	220	UL/CE	240
ME112S-15E	12	10.8 - 13.2	104	15	15.0	67	7	±6	80	220	UL/CE	240
ME112S-24E	12	10.8 - 13.2	104	15	24.0	42	4	±5	80	220	UL/CE	240
ME115S-05E	15	13.5 - 16.5	83	10	5.0	200	20	±12	80	220	--	175
ME115S-12E	15	13.5 - 16.5	83	10	12.0	84	9	±7	80	220	--	175
ME115S-15E	15	13.5 - 16.5	83	10	15.0	67	7	±6	80	220	--	175
ME124S-03E	24	21.6 - 26.4	58	17	3.3	303	30	±18	72	220	--	125
ME124S-05E	24	21.6 - 26.4	52	17	5.0	200	20	±12	80	220	UL/CE	125
ME124S-09E	24	21.6 - 26.4	52	17	9.0	111	12	±8	80	220	UL/CE	125
ME124S-12E	24	21.6 - 26.4	52	17	12.0	84	9	±7	80	220	UL/CE	125
ME124S-15E	24	21.6 - 26.4	52	17	15.0	67	7	±6	80	220	UL/CE	125
ME124S-24E	24	21.6 - 26.4	52	17	24.0	42	4	±5	80	220	UL/CE	125

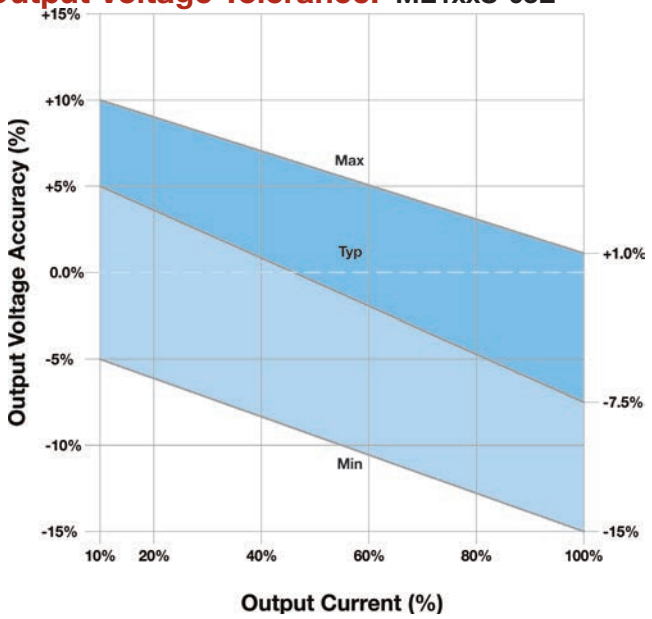
Notes:

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 0.33 µF ceramic capacitor be placed from the +VOUT pin to the -VOUT pin. ing frequency is typically 80 kHz, but may vary with differing operating conditions.
3. Operation at no-load will not damage these units. However, they may not meet all specifications.
4. Models approved to EN 60950 are noted in the "Certification" colomn in the selection guide above.
5. These converters will operate without external components. However, to meet the specified EMI limits, a simple external input filter is required. See the input filter note on page 3 for more information.
6. 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.

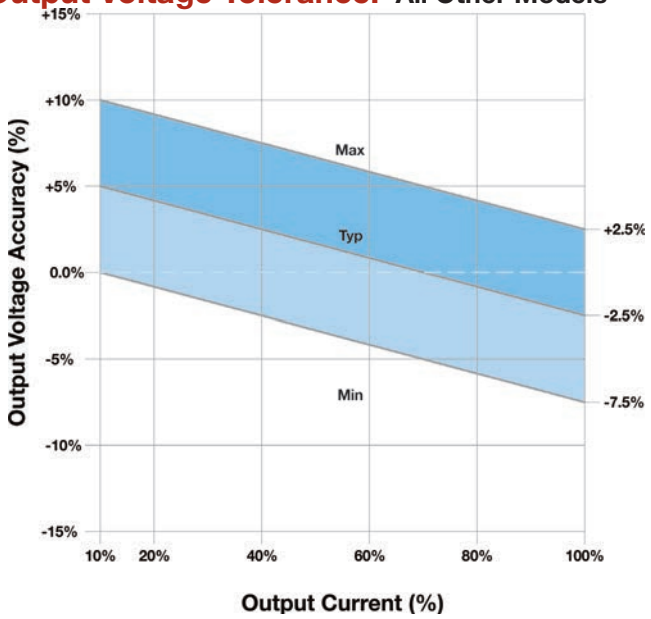
Derating Curve



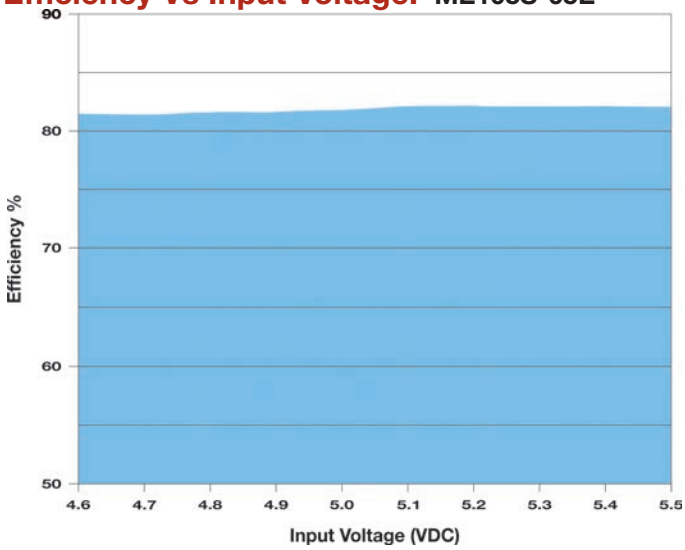
Output Voltage Tolerance: ME1xxS-03E



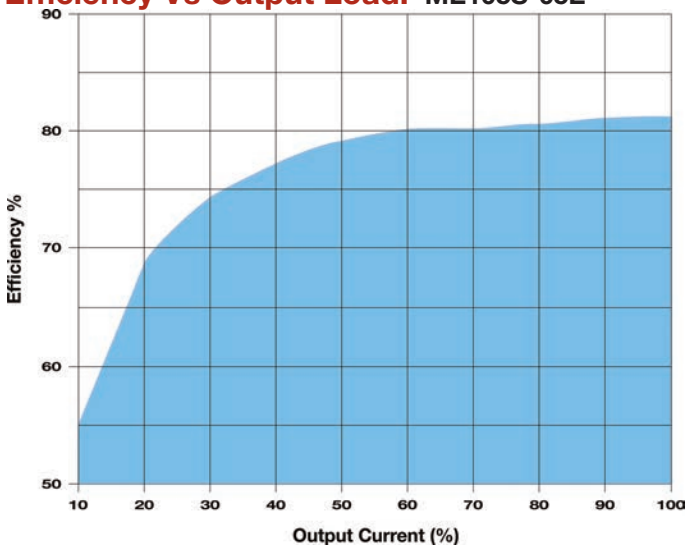
Output Voltage Tolerance: All Other Models



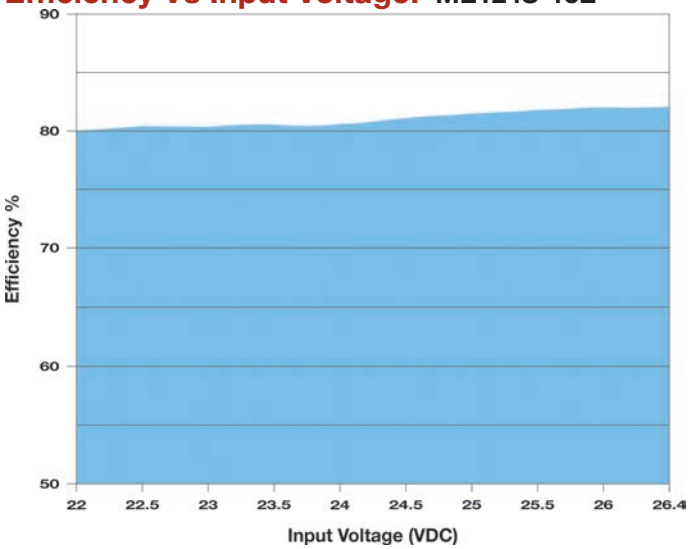
Efficiency Vs Input Voltage: ME105S-05E



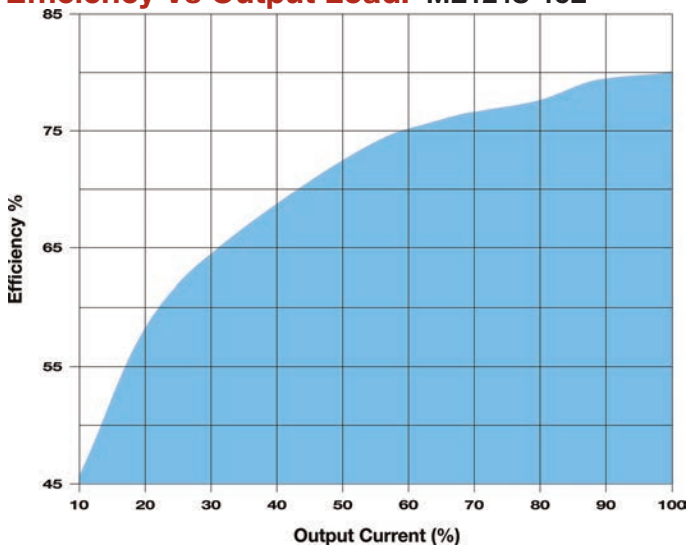
Efficiency Vs Output Load: ME105S-05E



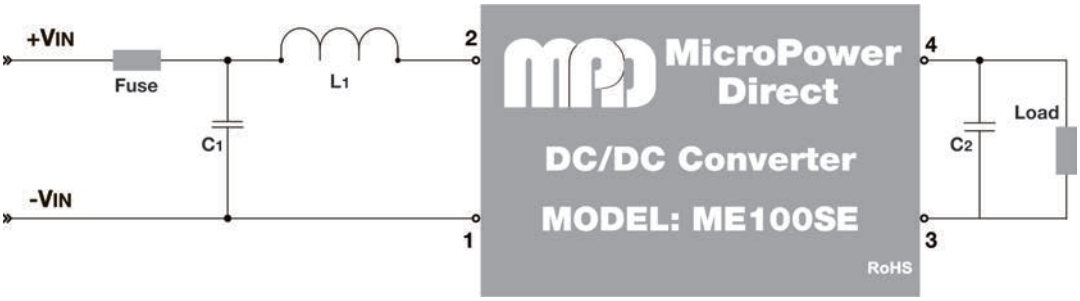
Efficiency Vs Input Voltage: ME124S-15E



Efficiency Vs Output Load: ME124S-15E



Typical Connection



For many applications, the **ME100SE** series will operate fine with minimum external components. However, if meeting the requirements of EMI/EMC standards (such as EN 55032) is required, a simple external filter circuit should be sufficient. This is illustrated in the typical connection diagram at left.

Notes:

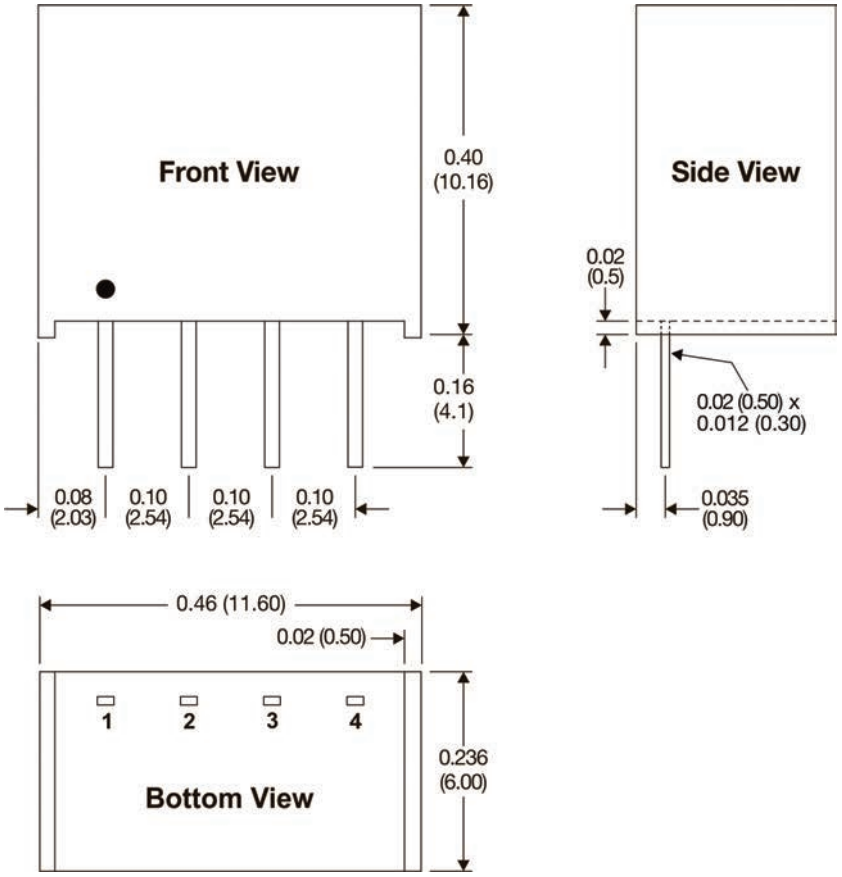
1. All input/output filtering capacitors should have a low equivalent impedance. Voltage derating of all capacitors should be 60% or greater. All components should be mounted as close to the converter as possible.
2. To meet the requirements of EN 55032, the external components C_1, L_1, C_2 and C_3 are required. This is illustrated in the typical connection diagram at left. Values for these components are given in the table below. Contact the factory for more information.
3. To meet the requirements of EN 61000-4-4, a larger external input capacitor is needed. In this case, the value of capacitor C_1 should be changed to 470 µF/100V. Contact the factory for more info.
4. To meet the requirements of EN 61000-4-5, a larger external input capacitor is needed. In this case, the value of capacitor C_1 should be changed to 470 µF/100V. Contact the factory for more info.
5. For noise sensitive applications, it is recommended that the external capacitor C_4 be placed from the +VOUT pin to the -VOUT pin. Recommended values are given in the table. Care must be taken in choosing capacitors not to exceed the capacitive load specification for the unit.

The recommended component values are:

Input V	Fuse	C_1	L_1
3.3 VIN	850 mA (Slow Blow)	4.7 µF/50V	6.8 µH
5.0 VIN	550 mA (Slow Blow)	4.7 µF/50V	6.8 µH
12 VIN	240 mA (Slow Blow)	4.7 µF/50V	6.8 µH
15 VIN	175 mA (Slow Blow)	4.7 µF/50V	6.8 µH
24 VIN	125 mA (Slow Blow)	4.7 µF/50V	6.8 µH

Output V	C_2
3.3 VOUT	10 µF
5.0 VOUT	10 µF
9.0 VOUT	4.7 µF
12.0 VOUT	2.2 µF
15.0 VOUT	1.0 µF
24.0 VOUT	0.47 µF

Mechanical Dimensions



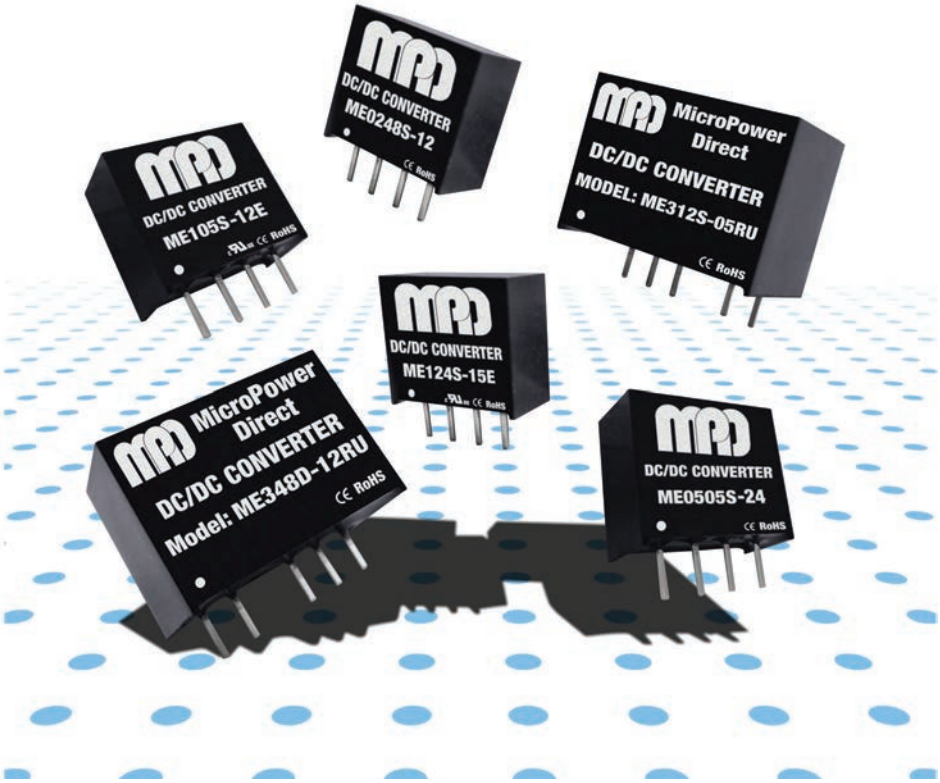
Pin Connections

Pin	Description
1	-VIN
2	+VIN
3	-VOUT
4	+VOUT

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 front of the unit
- Weight: 0.043 Oz (1.3g)

MPD offers a wide range of miniature DC/DC converters. Many of these are in the popular single in-line "SIP" package. Models range from 0.25W to 3W and offer a variety of input/output voltage combinations, I/O isolation and wide temperature operation. Our new 3W series offers wide 2:1 input ranges, tight regulation, single & dual outputs, and up to 3 kV I/O isolation. For full information, go to our website or contact the factory.



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