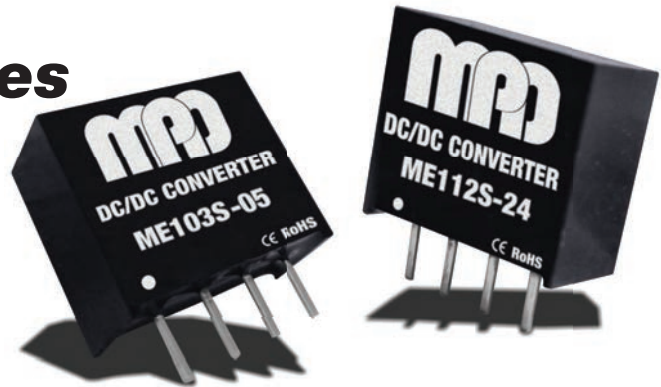


ME100S Series

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



Key Features:

- 1W Output Power
- Ultra-Miniature SIP Case
- 48 Standard Models
- Up To 3,000 VDC Isolation
- >1.12 MHour MTBF
- Meets EN 55032 Class B
- -40°C to +85°C Operation



Also Available In
Ultra-Miniature
DIP Case

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		
	48 VDC Input	43.20	48.0	52.80		
Input Reflected Ripple Current			20		mA P - P	
Input Filter	Internal Capacitors					
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	See Model Selection Guide					
Ripple & Noise (20 MHz)			100		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 Seconds	1,000			VDC	
	Units With "I" Suffix	3,000				
Isolation Resistance		1,000			MΩ	
Isolation Capacitance			60		pF	
Switching Frequency	See Note 2		80		kHz	
EMI Characteristics (See Page 3)						
Parameter	Standard	Criteria		Level		
Radiated Emissions	EN 55032			Class B		
Conducted Emissions	See Note 4 EN 55032			Class B		
ESD	EN 61000-4-2	A			±8 kV Air	
RS	EN 61000-4-3	A			±6 kV Contact	
EFT	See Note 4 EN 61000-4-4	A			10V/m	
Surge	See Note 4 EN 61000-4-5	A			±2 kV	
CS	EN 61000-4-6	A			±0.5 kV	
PFMF	EN 61000-4-8	A			10 Vrms	
					1A/m	
Environmental						
Parameter	Conditions	Min.	Typ.	Max.	Units	
Operating Temperature Range	Ambient	-40		+85	°C	
	Case			+100		
Storage Temperature Range		-40		+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	1.121			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			7.0		
	12 VDC Input			15.0		
	15 VDC Input			18.0		
	24 VDC Input			28.0		
	48 VDC Input			54.0		
Lead Temperature	1.5 mm From Case For 10 Sec			260	°C	

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

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Model Number	Input				Output		Load Regulation (% Typ)	Efficiency (% Typ)	Capacitive Load (µF, Max)	Fuse Rating Slow-Blow (mA)
	Voltage (VDC)		Current (mA)		Voltage (VDC)	Current (mA, Max)				
	Nominal	Range	Full-Load	No-Load						
ME103S-03(I)	3.3	2.97 - 3.63	421	25	3.3	303.0	±20	72	220	1,000
ME103S-05(I)	3.3	2.97 - 3.63	394	25	5.0	200.0	±10	77	220	1,000
ME103S-07(I)	3.3	2.97 - 3.63	384	25	7.2	138.9	±10	79	220	1,000
ME103S-09(I)	3.3	2.97 - 3.63	404	30	9.0	111.1	±10	75	220	1,000
ME103S-12(I)	3.3	2.97 - 3.63	473	45	12.0	100.0	±10	77	220	1,000
ME103S-15(I)	3.3	2.97 - 3.63	384	35	15.0	66.6	±10	79	220	1,000
ME103S-18(I)	3.3	2.97 - 3.63	399	35	18.0	55.5	±10	76	220	1,000
ME103S-24(I)	3.3	2.97 - 3.63	461	53	24.0	50.0	±10	79	220	1,000
ME105S-03(I)	5.0	4.5 - 5.5	257	20	3.3	303.0	±20	78	220	550
ME105S-05(I)	5.0	4.5 - 5.5	247	25	5.0	200.0	±10	81	220	550
ME105S-07(I)	5.0	4.5 - 5.5	241	16	7.2	138.9	±10	83	220	550
ME105S-09(I)	5.0	4.5 - 5.5	250	26	9.0	111.1	±10	80	220	550
ME105S-12(I)	5.0	4.5 - 5.5	300	25	12.0	100.0	±10	80	220	550
ME105S-15(I)	5.0	4.5 - 5.5	244	35	15.0	66.6	±10	82	220	550
ME105S-18(I)	5.0	4.5 - 5.5	247	25	18.0	55.5	±10	81	220	550
ME105S-24(I)	5.0	4.5 - 5.5	289	35	24.0	50.0	±10	83	220	550
ME112S-03(I)	12	10.8 - 13.2	107	15	3.3	303.0	±20	78	220	250
ME112S-05(I)	12	10.8 - 13.2	105	16	5.0	200.0	±10	79	220	250
ME112S-07(I)	12	10.8 - 13.2	100	16	7.2	138.9	±10	83	220	250
ME112S-09(I)	12	10.8 - 13.2	107	15	9.0	111.1	±10	78	220	250
ME112S-12(I)	12	10.8 - 13.2	125	20	12.0	100.0	±10	80	220	250
ME112S-15(I)	12	10.8 - 13.2	105	15	15.0	66.6	±10	79	220	250
ME112S-18(I)	12	10.8 - 13.2	104	20	18.0	55.5	±10	80	220	250
ME112S-24(I)	12	10.8 - 13.2	123	25	24.0	50.0	±10	71	220	250
ME115S-03(I)	15	13.5 - 16.5	89	15	3.3	303.0	±20	75	220	200
ME115S-05(I)	15	13.5 - 16.5	82	9	5.0	200.0	±10	81	220	200
ME115S-07(I)	15	13.5 - 16.5	88	12	7.2	138.9	±10	76	220	200
ME115S-09(I)	15	13.5 - 16.5	90	10	9.0	111.1	±10	74	220	200
ME115S-12(I)	15	13.5 - 16.5	100	13	12.0	100.0	±10	80	220	200
ME115S-15(I)	15	13.5 - 16.5	84	15	15.0	66.6	±10	79	220	200
ME115S-18(I)	15	13.5 - 16.5	85	12	18.0	55.5	±10	78	220	200
ME115S-24(I)	15	13.5 - 16.5	99	10	24.0	50.0	±10	81	220	200
ME124S-03(I)	24	21.6 - 26.4	54	8	3.3	303.0	±20	77	220	125
ME124S-05(I)	24	21.6 - 26.4	52	8	5.0	200.0	±10	80	220	125
ME124S-07(I)	24	21.6 - 26.4	54	10	7.2	138.9	±10	77	220	125
ME124S-09(I)	24	21.6 - 26.4	54	7	9.0	111.1	±10	77	220	125
ME124S-12(I)	24	21.6 - 26.4	62	8	12.0	100.0	±10	80	220	125
ME124S-15(I)	24	21.6 - 26.4	51	8	15.0	66.6	±10	81	220	125
ME124S-18(I)	24	21.6 - 26.4	52	8	18.0	55.5	±10	80	220	125
ME124S-24(I)	24	21.6 - 26.4	60	9	24.0	50.0	±10	83	220	125
ME148S-03(I)	48	43.2 - 52.8	29	6	3.3	303.0	±20	73	220	60
ME148S-05(I)	48	43.2 - 52.8	28	6	5.0	200.0	±10	74	220	60
ME148S-07(I)	48	43.2 - 52.8	27	7	7.2	138.9	±10	77	220	60
ME148S-09(I)	48	43.2 - 52.8	27	5	9.0	111.1	±10	78	220	60
ME148S-12(I)	48	43.2 - 52.8	32	5	12.0	100.0	±10	77	220	60
ME148S-15(I)	48	43.2 - 52.8	27	5	15.0	66.6	±10	76	220	60
ME148S-18(I)	48	43.2 - 52.8	28	8	18.0	55.5	±10	75	220	60
ME148S-24(I)	48	43.2 - 52.8	31	8	24.0	50.0	±10	80	220	60

For the 3 kV isolation models, add suffix "I" to model number (i.e. **ME124S-05I**)

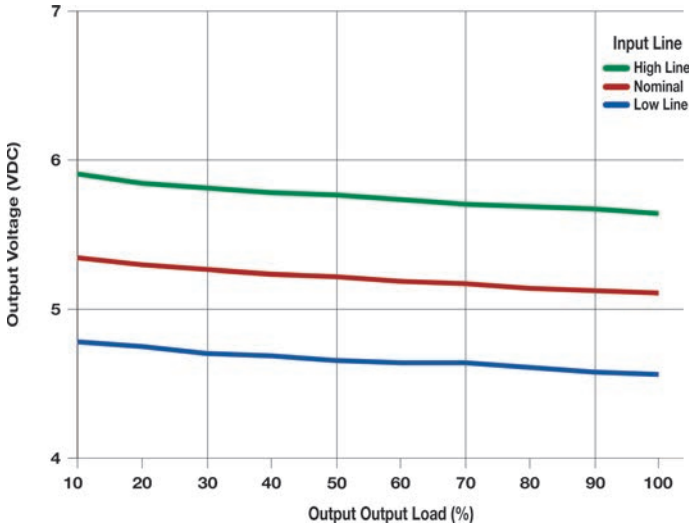
Notes:

- Output load regulation is specified for a load change of 20% to 100%.
- Switching frequency is typically 80 kHz, but may vary with differing operating conditions.
- Operation at no-load will not damage these units. However, they may not meet all specifications.

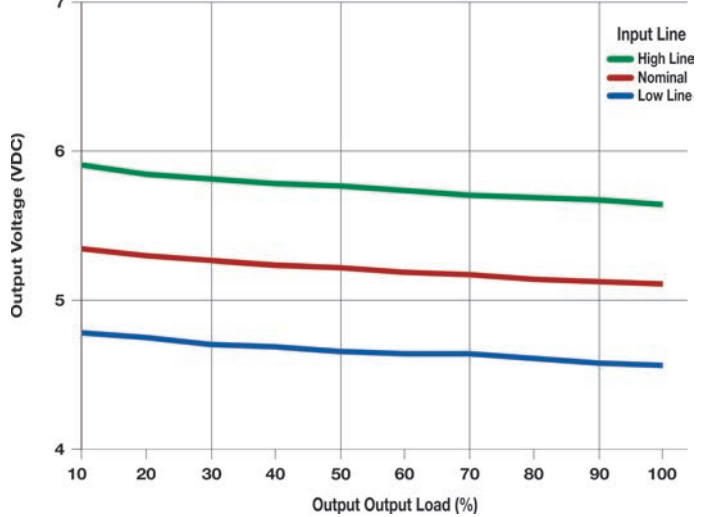
- These converters will operate without external components. However, to meet the specified EMI limits, a simple external input filter is required. See the input filter note on page 3 for more information.
- All units are rated for operation at full output power to +85°C. Operation over +85°C without airflow is not

- recommended. Output power should be derated linearly from 100% at 85°C to 0% at 100°C.
- 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.

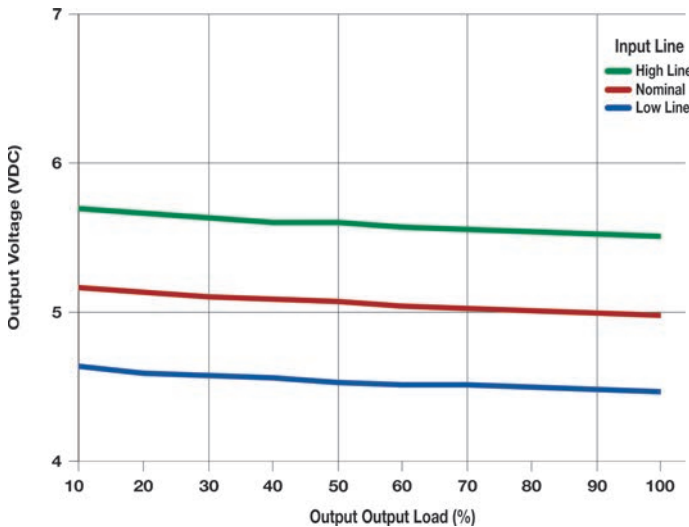
Output Voltage vs Load: ME105S-05



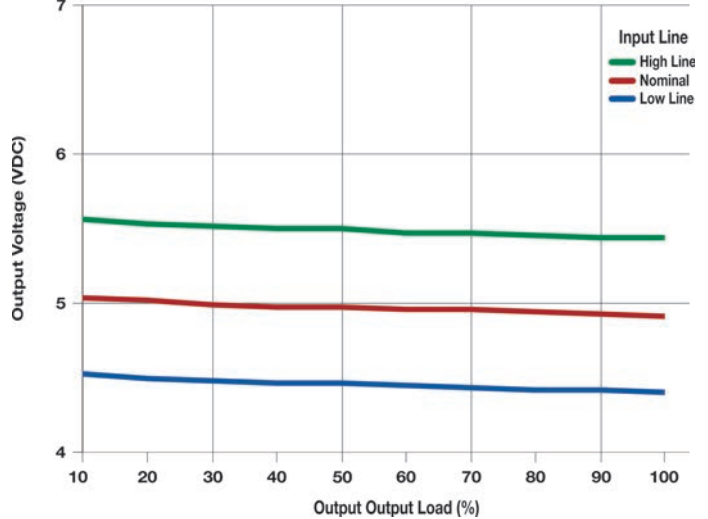
Output Voltage vs Load: ME112S-05



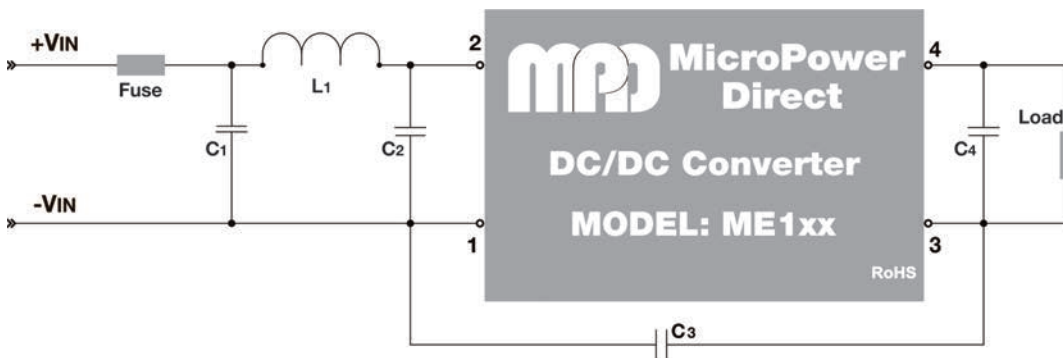
Output Voltage vs Load: ME124S-05



Output Voltage vs Load: ME148S-05



Typical Connection



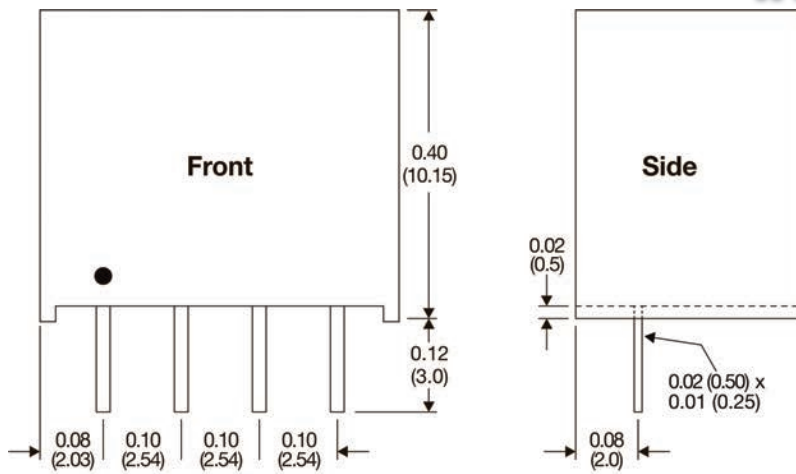
The recommended component values are:

Input V	Fuse	C ₁	L ₁	C ₂	C ₃	C ₄
3.3 V _{IN}	1,000 mA (Slow Blow)	1210, 2.2 μF/100V	18 μH	---	---	4.7 μF to 10 μF
5.0 V _{IN}	550 mA (Slow Blow)	1210, 2.2 μF/100V	18 μH	---	---	4.7 μF to 10 μF
12 V _{IN}	250 mA (Slow Blow)	1210, 2.2 μF/100V	18 μH	---	---	4.7 μF to 10 μF
15 V _{IN}	200 mA (Slow Blow)	1210, 2.2 μF/100V	18 μH	---	---	4.7 μF to 10 μF
24 V _{IN}	125 mA (Slow Blow)	1210, 2.2 μF/100V	18 μH	1210, 2.2 μF/100V	1206, 470 pF/2 kV	4.7 μF to 10 μF
48 V _{IN}	60 mA (Slow Blow)	10 μF/100V	18 μH	1210, 2.2 μF/100V	1206, 470 pF/2 kV	4.7 μF to 10 μF

For many applications, the ME100S 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 C₁, L₁, C₂ and C₃ 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 C₁ 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 C₁ 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 C₄ 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.



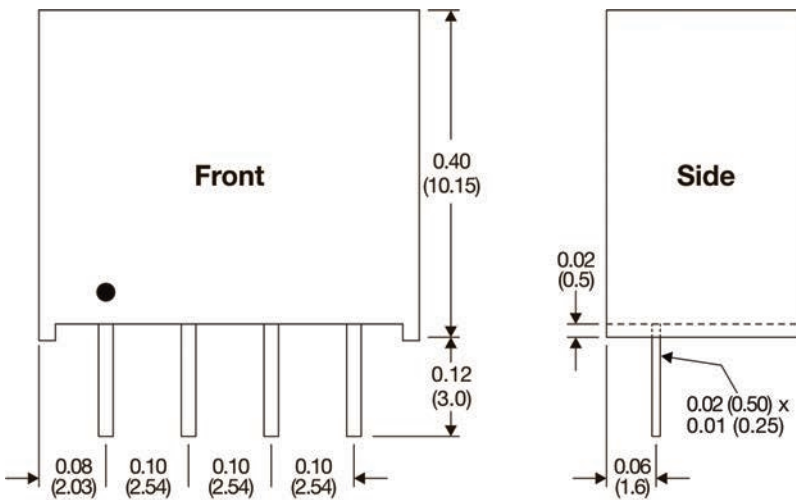
Pin Connections

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: 0.063 Oz (1.9g)

Mechanical Dimensions, All Other Models



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: 0.05 Oz (1.5g)