

ME05S Series

Low Cost, 0.5W Ultra-Miniature SIP DC/DC Converters



Key Features:

- 0.5W Output Power
- Ultra-Miniature SIP Case
- 35 Standard Models
- 1,000 VDC Isolation
- >1.1 MHour MTBF
- -40°C to +85°C Operation



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	
	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 Capacitor				

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
Isolation Resistance	500 VDC	1,000			MΩ
Isolation Capacitance	100 kHz, 1V		60		pF
Switching Frequency			80		kHz

EMI Characteristics, See Note 3

Parameter	Conditions	Min.	Typ.	Max.	Units
Radiated Emissions	EN 55022			Class B	
Conducted Emissions	EN 55022			Class B	
ESD	EN 61000-4-2			Criteria A; ±8 kV Air/±6 kV Contact	
RS	EN 61000-4-3			Criteria A; 10V/m	
EFT	EN 61000-4-4			Criteria A; ±2 kV	
Surge	EN 61000-4-5			Criteria A; ±0.5 kV	
CS	EN 61000-4-6			Criteria A; 10 Vrms	
PFMF	EN 61000-4-8			Criteria A; 1A/m	

Environmental

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

Physical

Case Size	48 VIN Models	0.46 x 0.29 x 0.40 Inches (11.68 x 7.5 x 10.2 mm)
	All Other Models	0.46 x 0.24 x 0.40 Inches (11.68 x 6.0 x 10.2 mm)
Case Material	Non-Conductive Black Plastic (UL-94V0)	
Weight	0.05 Oz (1.5g)	

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	-0.0		6.0	VDC
	5 VDC Input	-0.0		7.0	
	12 VDC Input	-0.0		15.0	
	24 VDC Input	-0.0		28.0	
	48 VDC Input	-0.0		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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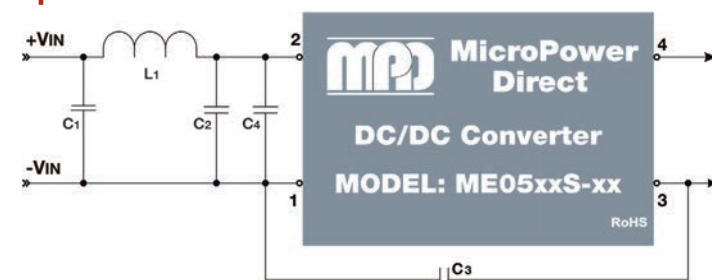


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Model Number	Input				Output		Load Regulation (% Typ)	Efficiency (% Typ)	Capacitive Load (μF, Max)	Fuse Rating Slow-Blow (mA)
	Voltage (VDC)		Current (mA)		Voltage (VDC)	Current (mA, Max)				
	Nominal	Range	Full-Load	No-Load						
ME0503S-03	3.3	2.97 - 3.63	205	20	3.3	152.0	±20	76	100	500
ME0503S-05	3.3	2.97 - 3.63	216	25	5.0	100.0	±10	70	100	500
ME0503S-09	3.3	2.97 - 3.63	216	25	9.0	56.0	±10	70	100	500
ME0503S-12	3.3	2.97 - 3.63	201	25	12.0	42.0	±10	72	100	500
ME0503S-15	3.3	2.97 - 3.63	208	25	15.0	33.0	±10	73	100	500
ME0503S-18	3.3	2.97 - 3.63	208	25	18.0	28.0	±10	73	100	500
ME0503S-24	3.3	2.97 - 3.63	208	25	24.0	21.0	±10	73	100	500
ME0505S-03	5.0	4.5 - 5.5	132	20	3.3	152.0	±20	76	100	250
ME0505S-05	5.0	4.5 - 5.5	121	13	5.0	100.0	±10	83	100	250
ME0505S-09	5.0	4.5 - 5.5	128	15	9.0	56.0	±10	78	100	250
ME0505S-12	5.0	4.5 - 5.5	127	18	12.0	42.0	±10	79	100	250
ME0505S-15	5.0	4.5 - 5.5	130	22	15.0	33.0	±10	77	100	250
ME0505S-18	5.0	4.5 - 5.5	127	20	18.0	28.0	±10	79	100	250
ME0505S-24	5.0	4.5 - 5.5	134	25	24.0	21.0	±10	75	100	250
ME0512S-03	12	10.8 - 13.2	58	15	3.3	152.0	±20	72	100	150
ME0512S-05	12	10.8 - 13.2	54	10	5.0	100.0	±10	78	100	150
ME0512S-09	12	10.8 - 13.2	57	15	9.0	56.0	±10	73	100	150
ME0512S-12	12	10.8 - 13.2	58	20	12.0	42.0	±10	72	100	150
ME0512S-15	12	10.8 - 13.2	61	20	15.0	33.0	±10	69	100	150
ME0512S-18	12	10.8 - 13.2	61	15	18.0	28.0	±10	68	100	150
ME0512S-24	12	10.8 - 13.2	59	15	24.0	21.0	±10	71	100	150
ME0524S-03	24	21.6 - 26.4	31	8	3.3	152.0	±20	69	100	75
ME0524S-05	24	21.6 - 26.4	29	8	5.0	100.0	±10	73	100	75
ME0524S-09	24	21.6 - 26.4	30	10	9.0	56.0	±10	71	100	75
ME0524S-12	24	21.6 - 26.4	30	8	12.0	42.0	±10	71	100	75
ME0524S-15	24	21.6 - 26.4	29	10	15.0	33.0	±10	73	100	75
ME0524S-18	24	21.6 - 26.4	29	10	18.0	28.0	±10	73	100	75
ME0524S-24	24	21.6 - 26.4	29	10	24.0	21.0	±10	72	100	75
ME0548S-03	48	43.2 - 52.8	17	6	3.3	152.0	±20	60	100	50
ME0548S-05	48	43.2 - 52.8	16	6	5.0	100.0	±10	66	100	50
ME0548S-09	48	43.2 - 52.8	17	6	9.0	56.0	±10	62	100	50
ME0548S-12	48	43.2 - 52.8	17	6	12.0	42.0	±10	64	100	50
ME0548S-15	48	43.2 - 52.8	17	6	15.0	33.0	±10	62	100	50
ME0548S-18	48	43.2 - 52.8	17	6	18.0	28.0	±10	62	100	50
ME0548S-24	48	43.2 - 52.8	18	10	24.0	21.0	±10	61	100	50

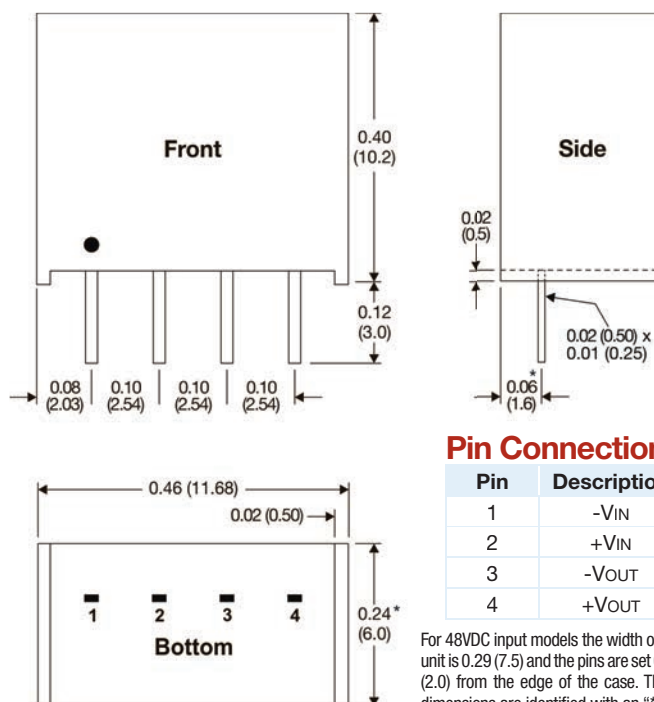
Notes:

1. Output load regulation is specified for a load change of 20% to 100%.
2. Operation at no-load will not damage these units. However, they may not meet all specifications.
3. 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 below for more information.
4. 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.
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.

Input Filter

The filter (C1, C2, C3 & L1) shown in the figure above is required to meet EN 55022 level B. Recommended component values are shown in the table at right. Capacitor C1 is a 1210, 100V/ceramic, except for the 48V input which is a 100V/electrolytic. Capacitor C2 is a 1210 100V/ceramic. Capacitor C3 is a 1206 2 kV/ceramic. Capacitor C4 is added to meet EN 61000-4-4 and EN 61000-4-5. This capacitor is a 470 μF, 100V/electrolytic. All components should be mounted as close to the unit as possible.

V _{IN} (VDC)	C1 (μF)	L1 (μH)	C2 (μF)	C3 (pF)
3.3	2.2	18.0		
5.0	2.2	18.0		
12	2.2	18.0		
24	2.2	18.0	2.2	470
48	10.0	18.0	2.2	470

Mechanical Dimensions**Pin Connections**

Pin	Description
1	-V _{IN}
2	+V _{IN}
3	-V _{OUT}
4	+V _{OUT}

For 48VDC input models the width of the unit is 0.29 (7.5) and the pins are set 0.08 (2.0) from the edge of the case. These dimensions are identified with an "*" on the mechanical drawing

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



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