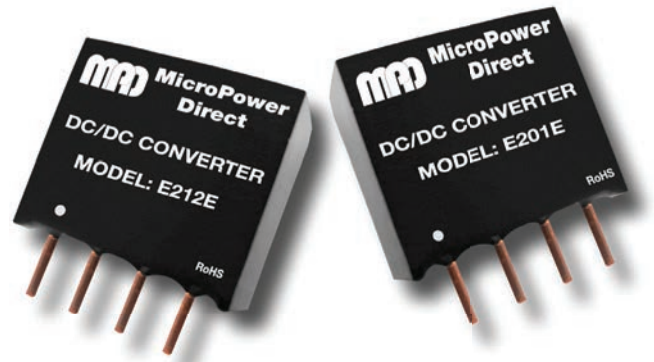


# E200E Series

## Low Cost, 2W Ultra-Miniature SIP DC/DC Converters



### Key Features:

- 2W Output Power
- Ultra-Miniature SIP Case
- Wide Operating Temp.
- 1,000 VDC Isolation
- >3.5 MHour MTBF
- 5V & 12V Inputs
- **LOWEST COST!**



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### 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	5 VDC Input	4.5	5.0	5.5	VDC
	12 VDC Input	10.8	12.0	13.2	
Input Filter	Internal Capacitor				

#### Output

Parameter	Conditions	Min.	Typ.	Max.	Units
Output Voltage Accuracy			±1.0	±3.0	%
Line Regulation	For Vin Change of 1%			±1.2	%
Load Regulation, See Note 1	5 VDC Output		10	15	%
	12 VDC Output		6.8	15	
	15 VDC Output		6.3	15	
Ripple & Noise (20 MHz)	See Note 2		75	150	mV P - P
Temperature Coefficient				±0.03	%/°C
Output Short Circuit	Momentary (0.5 Sec.)				

#### General

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage	60 Seconds	1,000			VDC
Isolation Resistance	1,000 VDC	1,000			MΩ
Isolation Capacitance	100 kHz, 1V		90		pF
Switching Frequency			75		kHz

#### Environmental

Parameter	Conditions	Min.	Typ.	Max.	Units
Operating Temperature Range	Ambient	-40	+25	+85	°C
Storage Temperature Range		-55		+125	°C
Cooling	Free Air Convection				
Humidity	RH, Non-condensing			95	%

#### Physical

Case Size	0.46 x 0.40 x 0.30 Inches (11.6 x 10.2 x 7.5 mm)				
Case Material	Non-Conductive Black Plastic (UL-94V0)				
Weight	0.06 Oz (1.8g)				

#### 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)	5 VDC Input	-0.7		9.0	VDC
	12 VDC Input	-0.7		18.0	
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.

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Model Number	Input				Output			Load Regulation (% 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						
E201E	5	4.5 - 5.5	513	38	5.0	400.0	40.0	15	78	1,000
E202E	5	4.5 - 5.5	506	38	12.0	167.0	17.0	15	79	1,000
E203E	5	4.5 - 5.5	506	38	15.0	133.0	14.0	15	79	1,000
E211E	12	10.8 - 13.2	214	20	5.0	400.0	40.0	15	78	500
E212E	12	10.8 - 13.2	208	20	12.0	167.0	17.0	15	80	500
E213E	12	10.8 - 13.2	206	20	15.0	133.0	14.0	15	82	500

**Notes:**

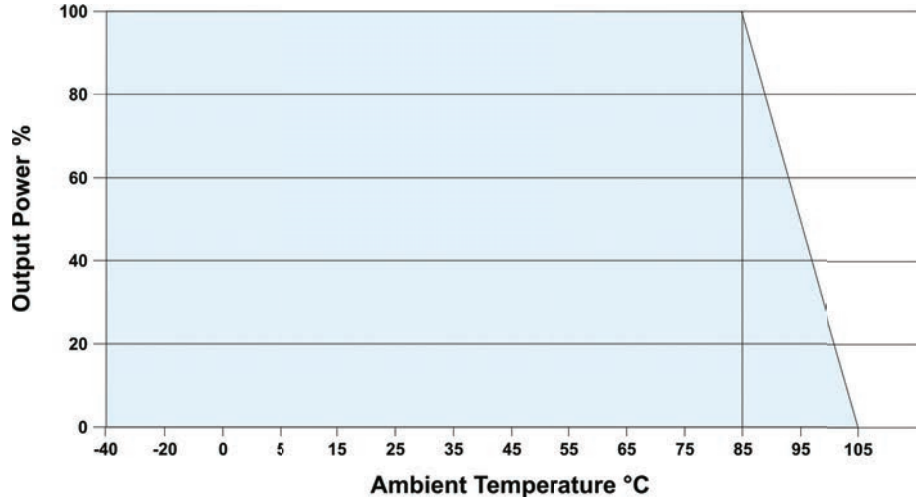
- Output load regulation is specified for a load change of 10% to 100%.
- When measuring output ripple, it is recommended that an external 0.33  $\mu$ F ceramic capacitor be placed from the +Vout pin to the -Vout pin.
- These units should not be operated with a load under 10% of full load. Operation at no-load will not damage the units, but they may not meet all specifications.
- These converters are specified for operation without external components. However, in some applications the addition of input/output capacitors will enhance stability and reduce output ripple. Recommended capacitor values are:

V <sub>IN</sub>	Input Capacitor	V <sub>OUT</sub>	Output Capacitor
5 VDC	4.7 $\mu$ F	5 VDC	10.0 $\mu$ F
12 VDC	2.2 $\mu$ F	12 VDC	2.2 $\mu$ F
		15 VDC	1.0 $\mu$ F

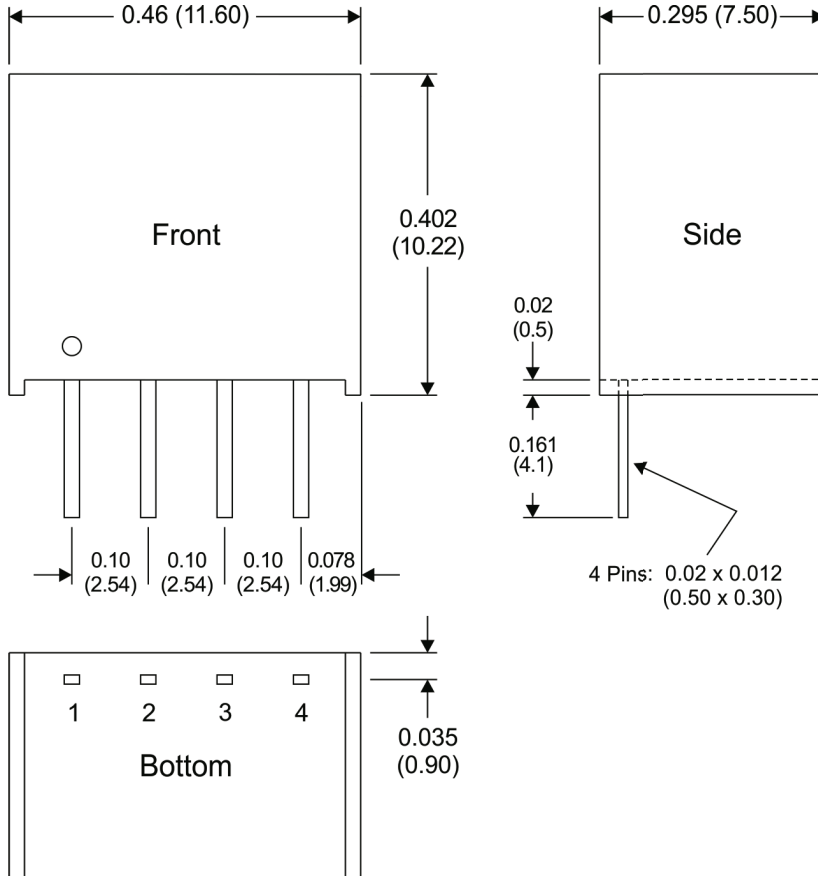
For applications requiring very low output noise levels, a simple LC filter should be effective.

- 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**



**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 =  $\pm 0.01$  ( $\pm 0.25$ )
- Pin 1 is marked by a "dot" or indentation on the front of the unit



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