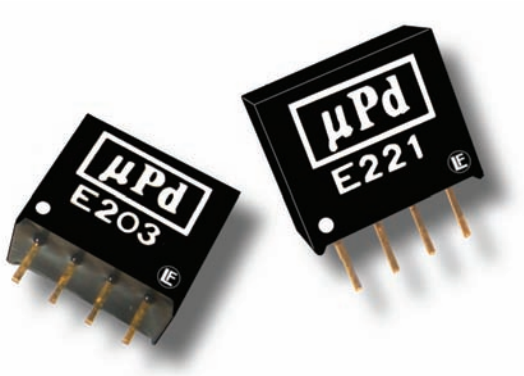
E200 Series

Isolated, Single Output Ultra-Miniature, 2W SIP DC/DC Converters



Key Features:

- 2W Output Power
- Ultra-Miniature SIP Case
- 1,000 VDC Isolation
- >2 MHour MTBF
- 18 Standard Models
- Industry Standard Pin-Out

RoHS Compliant

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	5 VDC Input	4.5	5.0	5.5	VDC
	12 VDC Input	10.8	12.0	13.2	
	24 VDC Input	21.6	24.0	26.4	
	48 VDC Input	44.0	48.0	52.0	
Reverse Polarity Input Current				0.3	A
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 (Note 1)	See Model Selection Guide				
Ripple & Noise (20 MHz) (Note 2)				100	mV P - P
Output Power Protection		120			%
Temperature Coefficient			±0.01	±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	1,000 VDC	1,000			MΩ
Isolation Capacitance	100 kHz, 1V		60		pF
Switching Frequency			125		kHz

Environmental

Parameter	Conditions	Min.	Typ.	Max.	Units
Operating Temperature Range	Ambient	-40	+25	+85	°C
Operating Temperature Range	Case			+90	°C
Storage Temperature Range		-55		+125	°C
Cooling	Free Air Convection				
Humidity	RH, Non-condensing			95	%

Physical

Case Size	0.46 x 0.29 x 0.40 Inches (11.68 x 7.5 x 10.2 mm)
Case Material	Non-Conductive Black Plastic (UL94-V0)
Weight	0.06 Oz (1.8g)

Reliability Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	2.0			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	
	24 VDC Input	-0.7		30.0	
	48 VDC Input	-0.7		55.0	
Lead Temperature	1.5 mm From Case For 10 Sec			260	°C
Internal Power Dissipation	All Models			650	mW

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

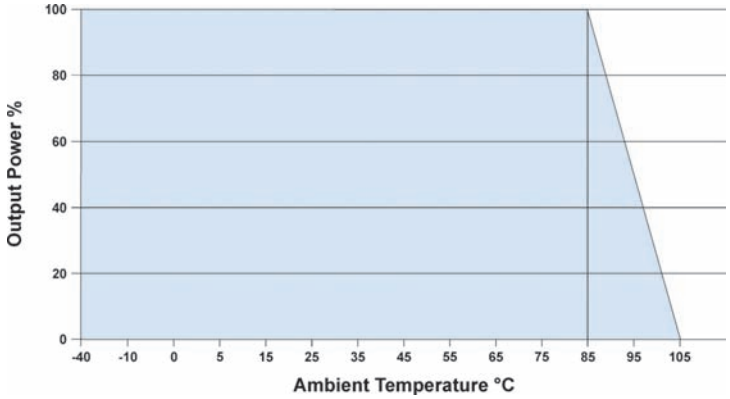
Model Selection Guide

Model Number	Input Voltage (VDC) Nominal	Input Voltage (VDC) Range	Input Current (mA) Full-Load	Input Current (mA) No-Load	Output Voltage (VDC)	Output Current (mA, Max)	Output Current (mA, Min)	Load Regulation (% Max)	Efficiency (%, Typ)	Fuse Rating Slow-Blow (mA)
E201	5	4.5 - 5.5	372	38	3.3	400.0	40.0	12	71	1,000
E202	5	4.5 - 5.5	533	38	5.0	400.0	40.0	12	75	1,000
E203	5	4.5 - 5.5	500	38	9.0	222.0	22.0	8	79	1,000
E204	5	4.5 - 5.5	500	38	12.0	167.0	16.0	8	80	1,000
E205	5	4.5 - 5.5	500	38	15.0	133.0	13.0	8	80	1,000
E211	12	10.8 - 13.2	150	30	3.3	400.0	40.0	8	73	500
E212	12	10.8 - 13.2	200	30	5.0	400.0	40.0	8	77	500
E213	12	10.8 - 13.2	211	30	9.0	222.0	22.0	8	79	500
E214	12	10.8 - 13.2	199	25	12.0	167.0	16.0	8	84	500
E215	12	10.8 - 13.2	208	25	15.0	133.0	13.0	8	80	500
E222	24	21.6 - 26.4	107	12	5.0	400.0	40.0	8	78	200
E223	24	21.6 - 26.4	102	12	9.0	222.0	22.0	8	82	200
E224	24	21.6 - 26.4	104	12	12.0	167.0	16.0	8	80	200
E225	24	21.6 - 26.4	102	12	15.0	133.0	13.0	8	82	200
E232	48	44.0 - 52.0	53	6	5.0	400.0	40.0	8	78	100
E233	48	44.0 - 52.0	52	6	9.0	222.0	22.0	8	80	100
E234	48	44.0 - 52.0	53	6	12.0	167.0	16.0	8	78	100
E235	48	44.0 - 52.0	52	6	15.0	133.0	13.0	8	80	100

Notes:

1. Output load regulation is specified for a load change of 20% 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.
3. Operation at no-load will not damage these units. However, they may not meet all specifications.
4. The 5V, 12V and 24V input units do not require external components to operate, but the use of a low ESR capacitor (approximately 10 μF, ESR <1.0Ω at 100 kHz) mounted close to the converter input pins is recommended.
   For 48 VDC input units, an input capacitor should always be used. Dependent upon the application, a value between 4.7 μF and 47 μF should be sufficient.
5. Out put capacitive load capability of these units is 33 μF max. Exceeding this may cause start up problems.
5. It is recommended that a fuse be used on the input of a power supply for protection. See the table above for the correct rating.

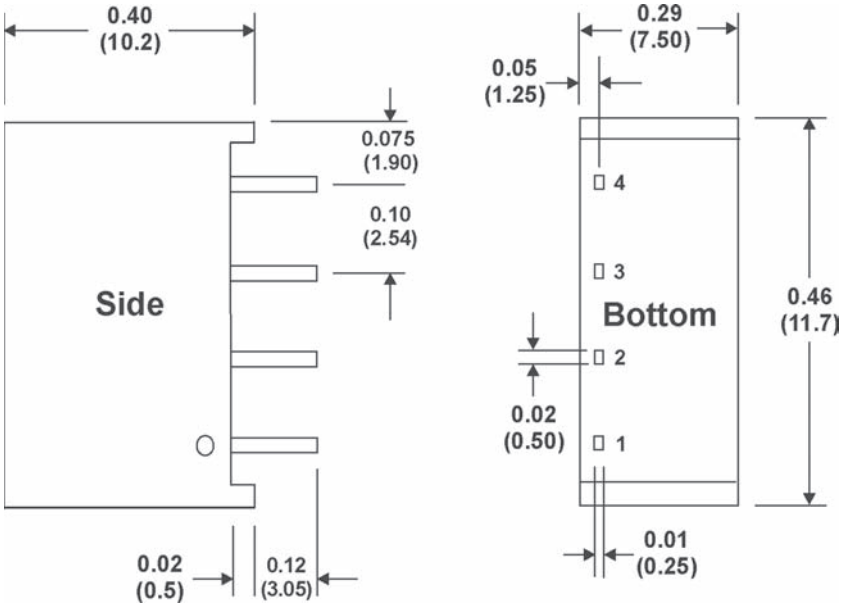
Derating Curve



Pin Connections

Pin	Description
1	-Vin
2	+Vin
3	-Vout
4	+Vout

Mechanical Dimensions



Notes:

- All dimensions are typical in inches (mm)
- Tolerance x.xx = ±0.01 (±0.25)
- Pin 1 is marked by a "dot" or indentation on the side of the unit

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