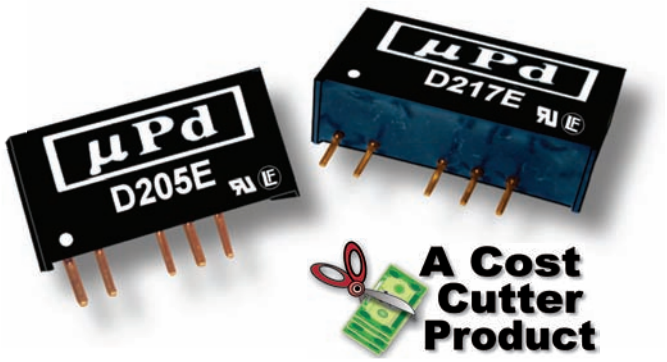
D200E Series

Low Cost, 2W SIP Single & Dual Output DC/DC Converters



Key Features:

- 2W Output Power
- Miniature SIP Case
- UL Approved (File E245422)
- Single & Dual Outputs
- 1,000 VDC Isolation
- >3.5 MHour MTBF
- 24 Standard Models
- ***LOWEST COST!!***

RoHS Compliant

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	
Input Filter	Internal Capacitor				
Reverse Polarity Input Current				0.3	A

Output

Parameter	Conditions	Min.	Typ.	Max.	Units
Output Voltage Accuracy			±1.0	±3.0	%
Output Voltage Balance	Dual Output , Balanced Loads		±0.1	±1.0	%
Line Regulation	For Vin Change of 1%		±1.2		%
Load Regulation	See Model Selection Guide				
Ripple & Noise (20 MHz)			100	150	mV P - P
Output Power Protection		120			%
Temperature Coefficient			±0.02	±0.03	%/°C
Output Short Circuit	Momentary (1.0 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			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 (5V 12V & 24V Input Models)	0.77 x 0.28 x 0.40 Inches (19.6 x 7.0 x 10.2 mm)
Case Material	Non-Conductive Black Plastic (UL94-V0)
Weight	0.07 Oz (2.1g)

Reliability Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	3.5			MHours
Safety Standards	UL 1950, EN 60950, IEC 60950				
Safety Approvals	UL, cUL; File No. E245422				

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	
Lead Temperature	1.5 mm From Case For 10 Sec			300	°C
Internal Power Dissipation	All Models			450	mW

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

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Model Selection Guide

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						
D201E	5	4.5 - 5.5	494	30	5.0	400.0	40.0	15	81	1,000
D202E	5	4.5 - 5.5	488	30	9.0	222.0	23.0	15	82	1,000
D203E	5	4.5 - 5.5	476	30	12.0	167.0	17.0	15	84	1,000
D204E	5	4.5 - 5.5	476	30	15.0	133.0	14.0	15	84	1,000
D205E	5	4.5 - 5.5	488	30	±5.0	±200.0	±20.0	15	82	1,000
D206E	5	4.5 - 5.5	482	30	±9.0	±111.0	±12.0	15	83	1,000
D207E	5	4.5 - 5.5	470	30	±12.0	±83.0	±9.0	15	85	1,000
D208E	5	4.5 - 5.5	470	30	±15.0	±67.0	±7.0	15	85	1,000
D211E	12	10.8 - 13.2	203	15	5.0	400.0	40.0	15	82	500
D212E	12	10.8 - 13.2	201	15	9.0	222.0	23.0	15	83	500
D213E	12	10.8 - 13.2	196	15	12.0	167.0	17.0	15	85	500
D214E	12	10.8 - 13.2	196	15	15.0	133.0	14.0	15	85	500
D215E	12	10.8 - 13.2	201	15	±5.0	±200.0	±20.0	15	83	500
D216E	12	10.8 - 13.2	198	15	±9.0	±111.0	±12.0	15	84	500
D217E	12	10.8 - 13.2	194	15	±12.0	±83.0	±9.0	15	86	500
D218E	12	10.8 - 13.2	194	15	±15.0	±67.0	±7.0	15	86	500
D221E	24	21.6 - 26.4	100	8	5.0	400.0	40.0	15	83	200
D222E	24	21.6 - 26.4	99	8	9.0	222.0	23.0	15	84	200
D223E	24	21.6 - 26.4	97	8	12.0	167.0	17.0	15	86	200
D224E	24	21.6 - 26.4	97	8	15.0	133.0	14.0	15	86	200
D225E	24	21.6 - 26.4	99	8	±5.0	±200.0	±20.0	15	84	200
D226E	24	21.6 - 26.4	98	8	±9.0	±111.0	±12.0	15	85	200
D227E	24	21.6 - 26.4	96	8	±12.0	±83.0	±9.0	15	87	200
D228E	24	21.6 - 26.4	96	8	±15.0	±67.0	±7.0	15	87	200

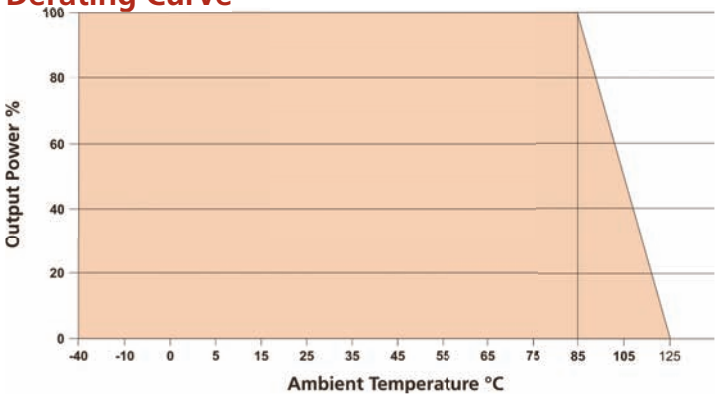
Notes:

1. Output load regulation is specified for a load change of 10% to 100%.
2. These units should not be operated with a load under 10% of full load. Operation at no-load may cause damage to the unit.
3. These converters will operate without external components. However, when measuring output ripple, it is recommended that an external ceramic capacitor be placed from the +Vout pin to the -Vout pin for single output units and from each output to common for dual output units. An input capacitor will enhance stability over temperature and input line variations. Recommended capacitor values are given in the table below. For applications requiring very low output noise levels, a simple LC filter should be effective.

Vin	Input Capacitor	Vout	Output Capacitor	
			Single	Dual
5 VDC	4.7 µF	5 VDC	10.0 µF	4.7 µF
12 VDC	2.2 µF	9 VDC	4.7 µF	2.2 µF
24 VDC	1.0 µF	12 VDC	2.2 µF	1.0 µF
		15 VDC	1.0 µF	0.47 µF

4. Dual output units may be connected to provide a 10V, 18V, 24V or 30 VDC output. To do this, connect the load across the positive (+Vout) and negative (-Vout) outputs and float the output common
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.

Derating Curve



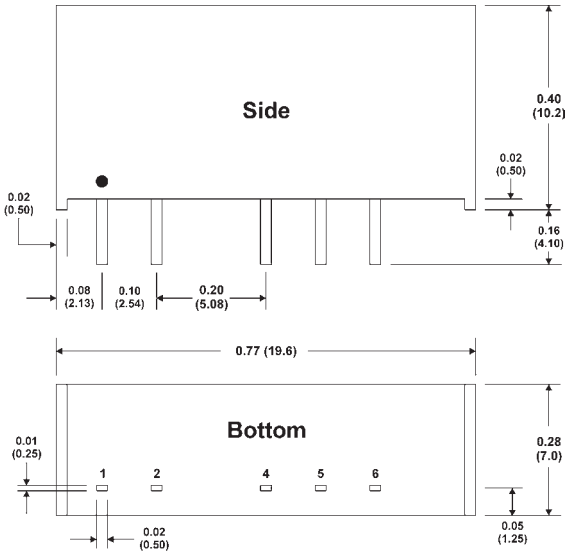
Pin Connections

Pin	Single	Dual
1	+Vin	+Vin
2	-Vin	-Vin
4	-Vout	-Vout
5	No Pin	Common
6	+Vout	+Vout

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

Mechanical Dimensions



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