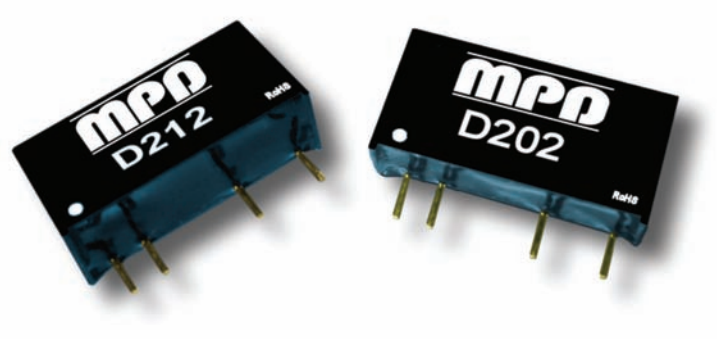
D200 Series

Single & Dual Output Miniature, 2W SIP DC/DC Converters



Key Features:

- 2W Output Power
- Miniature SIP Case
- Single & Dual Outputs
- 1,000 VDC Isolation
- >1.12 MHour MTBF
- 28 Standard Models
- Industry Standard Pin-Out

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	43.2	48.0	52.8	
Input Filter	Internal Capacitor				
Reflected Ripple Current	12 µH Source Inductance		20		mA P - P

Output

Parameter	Conditions	Min.	Typ.	Max.	Units
Output Voltage Accuracy			±3.0		%
Output Voltage Balance	Dual Output , Balanced Loads		±1.0		%
Line Regulation	For Vin Change of 1%		±1.2		%
Load Regulation	See Model Selection Guide				
Ripple & Noise (20 MHz)			75		mV P - P
Output Power Protection		120			%
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

Environmental

Parameter	Conditions	Min.	Typ.	Max.	Units
Operating Temperature Range	Ambient	-40	+25	+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 (5V, 12V & 24V Input Models)	0.76 x 0.24 x 0.39 Inches (19.5 x 6.0 x 10.0 mm)
Case Size (48V Input Models)	0.76 x 0.28 x 0.39 Inches (19.5 x 7.2 x 10.0 mm)
Case Material	Non-Conductive Black Plastic (UL94-V0)
Weight	0.08 Oz (2.3g)

Reliability Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	1.12			MHours

Absolute Maximum Ratings

Parameter	Conditions	Min.	Typ.	Max.	Units
Input Voltage Surge (1 Sec)	5 VDC Input	-0.7		7.0	VDC
	12 VDC Input	-0.7		15.0	
	24 VDC Input	-0.7		28.0	
	48 VDC Input	-0.7		54.0	
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.

RoHS

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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						
D201	5	4.5 - 5.5	367	30	3.3	400.0	10.0	20	72	1,000
D202	5	4.5 - 5.5	512	30	5.0	400.0	8.0	10	78	1,000
D203	5	4.5 - 5.5	500	30	12.0	165.0	3.5	10	82	1,000
D204	5	4.5 - 5.5	500	30	15.0	133.0	2.7	10	82	1,000
D205	5	4.5 - 5.5	555	30	±5.0	±200.0	±4.0	10	72	1,000
D206	5	4.5 - 5.5	512	30	±12.0	±83.3	±1.7	10	78	1,000
D207	5	4.5 - 5.5	500	30	±15.0	±66.6	±1.4	10	80	1,000
D211	12	10.8 - 13.2	169	20	3.3	400.0	10.0	20	65	500
D212	12	10.8 - 13.2	216	20	5.0	400.0	8.0	10	77	500
D213	12	10.8 - 13.2	203	20	12.0	165.0	3.5	10	82	500
D214	12	10.8 - 13.2	203	20	15.0	133.0	2.7	10	82	500
D215	12	10.8 - 13.2	222	20	±5.0	±200.0	±4.0	10	75	500
D216	12	10.8 - 13.2	203	20	±12.0	±83.3	±1.7	10	82	500
D217	12	10.8 - 13.2	203	20	±15.0	±66.6	±1.4	10	82	500
D221	24	21.6 - 26.4	76	10	3.3	400.0	10.0	20	72	200
D222	24	21.6 - 26.4	105	10	5.0	400.0	8.0	10	79	200
D223	24	21.6 - 26.4	102	10	12.0	165.0	3.5	10	80	200
D224	24	21.6 - 26.4	101	10	15.0	133.0	2.7	10	82	200
D225	24	21.6 - 26.4	111	10	±5.0	±200.0	±4.0	10	75	200
D226	24	21.6 - 26.4	101	10	±12.0	±83.3	±1.7	10	82	200
D227	24	21.6 - 26.4	101	10	±15.0	±66.6	±1.4	10	82	200
D231	48	43.2 - 52.8	45	6	3.3	400.0	10.0	20	60	100
D232	48	43.2 - 52.8	54	6	5.0	400.0	8.0	10	77	100
D233	48	43.2 - 52.8	53	6	12.0	165.0	3.5	10	78	100
D234	48	43.2 - 52.8	53	6	15.0	133.0	2.7	10	78	100
D235	48	43.2 - 52.8	57	6	±5.0	±200.0	±4.0	10	73	100
D236	48	43.2 - 52.8	52	6	±12.0	±83.3	±1.7	10	80	100
D237	48	43.2 - 52.8	52	6	±15.0	±66.6	±1.4	10	80	100

Other input/output combinations are available (i.e. 24.0 VDC). Contact the factory for details at: **sales@micropowerdirect.com**

Capacitive Load

Single Output (μF Max)	Dual Output (μF Max)
470	±220

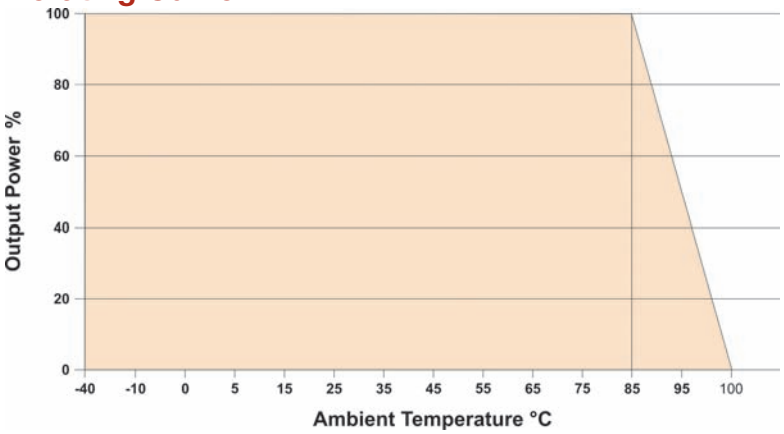
Pin Connections

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

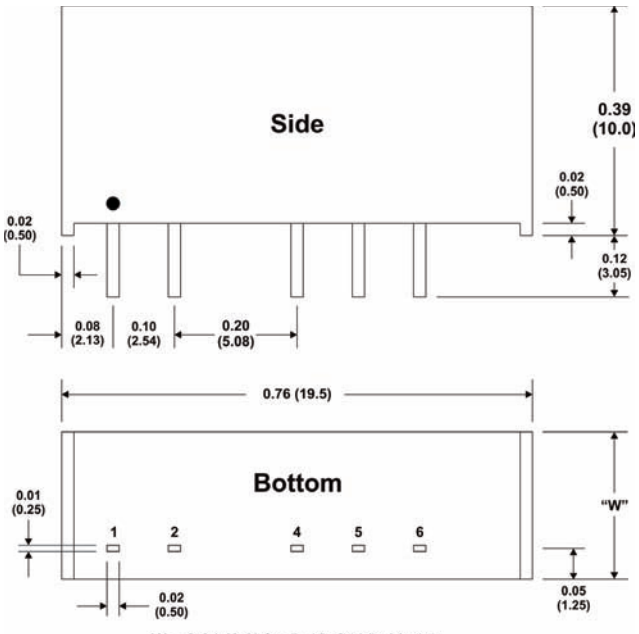
Notes:

1. Output load regulation is specified for a load change of 20% to 100%.
2. These units do not require external components to operate, but the use of an input capacitor (10 μF) may enhance performance in some applications. It is recommended that an input capacitor of 4.7 μF to 47μF (dependent upon the application) be used on 48V input model.
   An output capacitor (4.7 μF to 220 μF or ±4.7 μF to ±100 μF) may be used to reduce ripple. To improve EMI performance, a simple filter network consisting of a 10 μF to 100 μF capacitor and 12 μH inductor should be effective.
3. These units will operate at no load without damage, but may not meet all specifications.
4. Dual output units may be connected to provide a 10V, 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 table above for the correct rating.

Derating Curve



Mechanical Dimensions



W = 0.24 (6.0) for 5, 12, 24 Vin Models
0.28 (7.2) for 48 Vin Models

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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