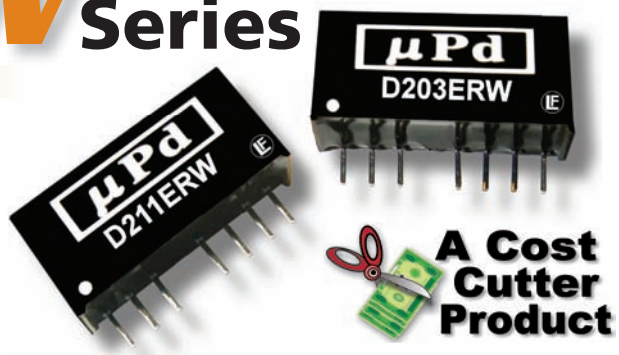
D200ERW Series

Low Cost, Miniature 2W SIP, Wide Input DC/DC Converters



A Cost Cutter Product

Key Features:

- 2W Output Power
- 2:1 Input Voltage Range
- 1,500 VDC Isolation
- Short Circuit Protected
- Miniature SIP Case
- Single & Dual Outputs
- 1.0 MH MTBF
- Industry Standard Pin-Out
- ***Low Low 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	9.0	VDC
	12 VDC Input	9.0	12.0	18.0	
	24 VDC Input	18.0	24.0	36.0	
	48 VDC Input	36.0	48.0	72.0	
Reverse Polarity Input Current				1.0	A
Short Circuit Input Power				1,500	mW

Output

Parameter	Conditions	Min.	Typ.	Max.	Units
Output Voltage Accuracy			±1.0	±3.0	%
Output Voltage Balance			±1.0	±2.0	%
Line Regulation	Vin = Min to Max		±0.2	±0.5	%
Load Regulation , Single Output	Iout = 10% to 100%		±0.5	±0.75	%
Load Regulation , Dual Output	Iout = 10% to 100%		±0.5	±1.0	%
Ripple & Noise (20 MHz)	See Note 1		35	100	mV P - P
Output Power Protection		120			%
Temperature Coefficient				±0.03	%/°C
Output Short Circuit	Continuous (Autorecovery)				

General

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage	60 Seconds	1,500			VDC
Isolation Resistance	500 VDC	1,000			MΩ
Isolation Capacitance	100 kHz, 1V		80		pF
Switching Frequency	Iout = 100%	180		500	kHz

Environmental

Parameter	Conditions	Min.	Typ.	Max.	Units
Operating Temperature Range	Ambient	-40	+25	+85	°C
Storage Temperature Range		-50		+125	°C
Cooling	Free Air Convection				
Humidity	RH, Non-condensing			95	%

Physical

Case Size	0.87 x 0.47 x 0.37 Inches (22.0 x 12.0 x 9.50 mm)
Case Material	Non-Conductive Black Plastic (UL94-V0)
Weight	0.19 Oz (5.5g)

Reliability Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	1.0			MHours

Absolute Maximum Ratings

Parameter	Conditions	Min.	Typ.	Max.	Units
Input Voltage Surge (1 Sec)	5 VDC Input	-0.7		11.0	VDC
	12 VDC Input	-0.7		22.0	
	24 VDC Input	-0.7		40.0	
	48 VDC Input	-0.7		80.0	
Lead Temperature	1.5 mm From Case For 10 Sec			300	°C
Internal Power Dissipation	All Models			1,800	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			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					
D201ERW	5	4.5 - 9.0	508	40	3.3	500.0	50.0	65	1,500
D202ERW	5	4.5 - 9.0	588	40	5.0	400.0	40.0	68	1,500
D203ERW	5	4.5 - 9.0	555	40	9.0	222.0	22.0	72	1,500
D204ERW	5	4.5 - 9.0	547	40	12.0	166.0	16.0	73	1,500
D205ERW	5	4.5 - 9.0	555	40	15.0	133.0	13.0	72	1,500
D206ERW	5	4.5 - 9.0	547	40	24.0	83.0	8.0	73	1,500
D207ERW	5	4.5 - 9.0	597	40	±5.0	±200.0	±20.0	67	1,500
D208ERW	5	4.5 - 9.0	555	40	±12.0	±83.0	±8.0	72	1,500
D209ERW	5	4.5 - 9.0	547	40	±15.0	±66.0	±7.0	73	1,500
D211ERW	12	9.0 - 18.0	191	20	3.3	500.0	50.0	72	700
D212ERW	12	9.0 - 18.0	216	20	5.0	400.0	40.0	77	700
D213ERW	12	9.0 - 18.0	211	20	9.0	222.0	22.0	79	700
D214ERW	12	9.0 - 18.0	206	20	12.0	166.0	16.0	81	700
D215ERW	12	9.0 - 18.0	208	20	15.0	133.0	13.0	80	700
D216ERW	12	9.0 - 18.0	208	20	24.0	83.0	8.0	80	700
D217ERW	12	9.0 - 18.0	222	20	±5.0	±200.0	±20.0	75	700
D218ERW	12	9.0 - 18.0	214	20	±12.0	±83.0	±8.0	78	700
D219ERW	12	9.0 - 18.0	214	20	±15.0	±66.0	±7.0	78	700
D221ERW	24	18.0 - 36.0	96	10	3.3	500.0	50.0	72	350
D222ERW	24	18.0 - 36.0	108	10	5.0	400.0	40.0	77	350
D223ERW	24	18.0 - 36.0	105	10	9.0	222.0	22.0	79	350
D224ERW	24	18.0 - 36.0	103	10	12.0	166.0	16.0	81	350
D225ERW	24	18.0 - 36.0	104	10	15.0	133.0	13.0	80	350
D226ERW	24	18.0 - 36.0	104	10	24.0	83.0	8.0	80	350
D227ERW	24	18.0 - 36.0	109	10	±5.0	±200.0	±20.0	76	350
D228ERW	24	18.0 - 36.0	105	10	±12.0	±83.0	±8.0	79	350
D229ERW	24	18.0 - 36.0	107	10	±15.0	±66.0	±7.0	78	350
D231ERW	48	36.0 - 72.0	48	5	3.3	500.0	50.0	71	135
D232ERW	48	36.0 - 72.0	55	5	5.0	400.0	40.0	75	135
D233ERW	48	36.0 - 72.0	53	5	9.0	222.0	22.0	79	135
D234ERW	48	36.0 - 72.0	52	5	12.0	166.0	16.0	80	135
D235ERW	48	36.0 - 72.0	53	5	15.0	133.0	13.0	79	135
D236ERW	48	36.0 - 72.0	52	5	24.0	83.0	8.0	80	135
D237ERW	48	36.0 - 72.0	55	5	±5.0	±200.0	±20.0	75	135
D238ERW	48	36.0 - 72.0	52	5	±12.0	±83.0	±8.0	80	135
D239ERW	48	36.0 - 72.0	52	5	±15.0	±66.0	±7.0	80	135

Notes:

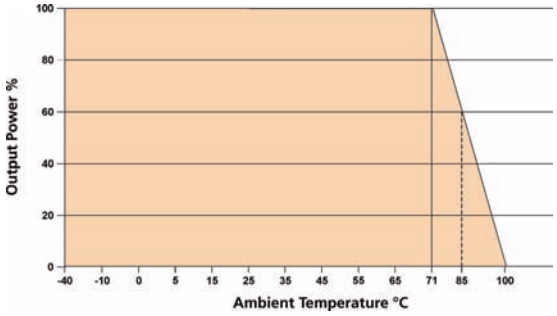
1. When measuring output ripple, it is recommended that an external ceramic capacitor (approx. 1 µF to 10 µF) be placed from the +Vout pin to the -Vout pin for single output units and from each output to common for dual output units.
2. These units should not be operated with a load under 10% of full load. Operation at no-load may cause damage to the unit.
3. These converters 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 given at right.
   Output ripple on single output units may be further enhanced by using the CS terminal (single output units operated at 50% load or below should use this function). A low ESR capacitor is connected between the CS pin and the -Vout pin (the capcitor anode connected to the -Vout pin). Recommended capacitor values are given in the table at right. If not used, the CS pin should be left open.
4. Dual output units may be connected to provide a 10V, 24V or 30 VDC output. To do this, connect the load across the +Vout and -Vout outputs and float the output common.
5. The remote on/off control pin is referenced to the -Vin pin. Input current to the pin should be between 5 - 10 mA with a maximum of 20 mA.
6. 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.

Vin	Input Capacitor	Vout	Output Capacitor	
			0 - 70°C (Electrolitic)	-40 - 85°C (Tantalum)
5 VDC	100 µF	5 VDC	100 µF	47 µF
12 VDC	100 µF	9 VDC	100 µF	47 µF
24 VDC	10 µF	12 VDC	100 µF	47 µF
48 VDC	10 µF	15 VDC	100 µF	47 µF

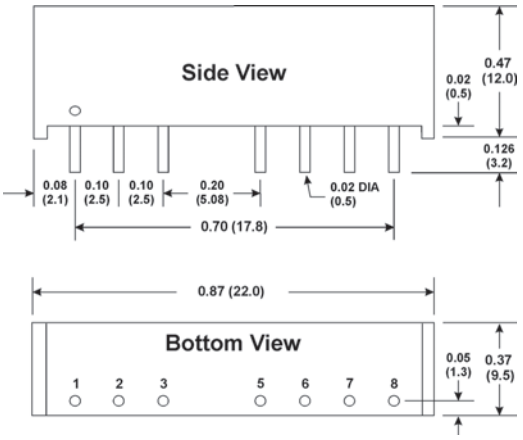
	Output Voltage					
	3.3V	5V	9V	12V	15V	24V
CS	47 µF - 100 µF			22 µF - 47 µF		

	Min	Max
On	<0.6 VDC to Open Circuit	
Off	2.7 VDC	15.0 VDC

Derating Curve



Mechanical Dimensions



Mechanical Notes:

- All dimensions are typical in inches (mm)
- Tolerance x.xx = ±0.01 (±0.25)

Pin Connections

Pin	Single	Dual
1	-Vin	-Vin
2	+Vin	+Vin
3	Remote ON/OFF	
5	NF	NF

NF = No Function

Pin	Single	Dual
6	+Vout	+Vout
7	-Vout	Common
8	CS	-Vout

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