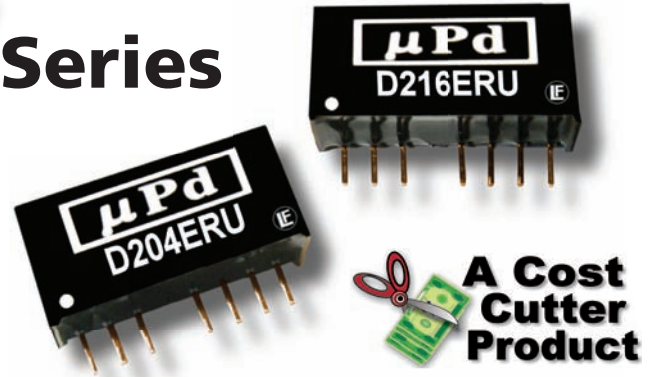


# D200ERU Series

## Low Cost, 4:1 Input Miniature, 2W SIP DC/DC Converters



### Key Features:

- 2W Output Power
- 4:1 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**

### 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	24 VDC Input	9.0	24.0	36.0	VDC
	48 VDC Input	18.0	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	±0.75	%
Load Regulation	Iout = 10% to 100%		±0.5	±1.5	%
Ripple (20 MHz)	See Note 1		15	30	mV P - P
Noise (20 MHz)			50	150	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		65		pF
Switching Frequency, Single Output	Iout = 100%	100		650	kHz
Switching Frequency, Dual Output	Iout = 100%	200		400	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	1.02 x 0.37 x 0.49 Inches (26.0 x 9.50 x 12.50 mm)
Case Material	Non-Conductive Black Plastic (UL94-V0)
Weight	0.24 Oz (7.0g)

#### 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)	24 VDC Input	-0.7		40.0	VDC
	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.

## 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					
D201ERU	24	9.0 - 36.0	114	35	3.3	500.0	50.0	73	500
D202ERU	24	9.0 - 36.0	111	35	5.0	400.0	40.0	75	500
D203ERU	24	9.0 - 36.0	107	35	9.0	222.0	22.0	78	500
D204ERU	24	9.0 - 36.0	102	35	12.0	167.0	16.0	82	500
D205ERU	24	9.0 - 36.0	103	35	15.0	133.0	13.0	81	500
D206ERU	24	9.0 - 36.0	110	35	±5.0	±200.0	±20.0	76	500
D207ERU	24	9.0 - 36.0	107	35	±9.0	±111.0	±11.0	78	500
D208ERU	24	9.0 - 36.0	102	35	±12.0	±83.0	±8.0	82	500
D209ERU	24	9.0 - 36.0	103	35	±15.0	±67.0	±7.0	81	500
D211ERU	48	18.0 - 72.0	58	15	3.3	500.0	50.0	72	200
D212ERU	48	18.0 - 72.0	55	15	5.0	400.0	40.0	76	200
D213ERU	48	18.0 - 72.0	53	15	9.0	222.0	22.0	78	200
D214ERU	48	18.0 - 72.0	51	15	12.0	167.0	16.0	81	200
D215ERU	48	18.0 - 72.0	52	15	15.0	133.0	13.0	80	200
D216ERU	48	18.0 - 72.0	55	15	±5.0	±200.0	±20.0	75	200
D217ERU	48	18.0 - 72.0	54	15	±9.0	±111.0	±11.0	77	200
D218ERU	48	18.0 - 72.0	51	15	±12.0	±83.0	±8.0	81	200
D219ERU	48	18.0 - 72.0	52	15	±15.0	±67.0	±7.0	80	200

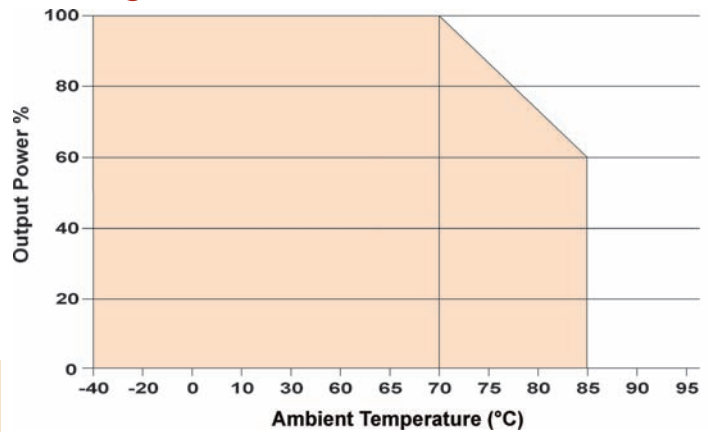
### Notes:

- When measuring output ripple, it is recommended that an external ceramic capacitor (approx. 1  $\mu\text{F}$  to 10  $\mu\text{F}$ ) be placed from the +Vout pin to the -Vout pin for single output units and from each output to common for dual output units.
- These units should not be operated with a load under 10% of full load. Operation at no-load may cause damage to the unit.
- 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 capacitor 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.
- 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.
- 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.
- 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
12 VDC	100 $\mu\text{F}$	5 VDC	47 $\mu\text{F}$
15 VDC	100 $\mu\text{F}$	9 VDC	47 $\mu\text{F}$
24 VDC	10 $\mu\text{F}$	12 VDC	47 $\mu\text{F}$
48 VDC	10 $\mu\text{F}$	15 VDC	47 $\mu\text{F}$

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

## Derating Curve



## Max. Capacitive Load

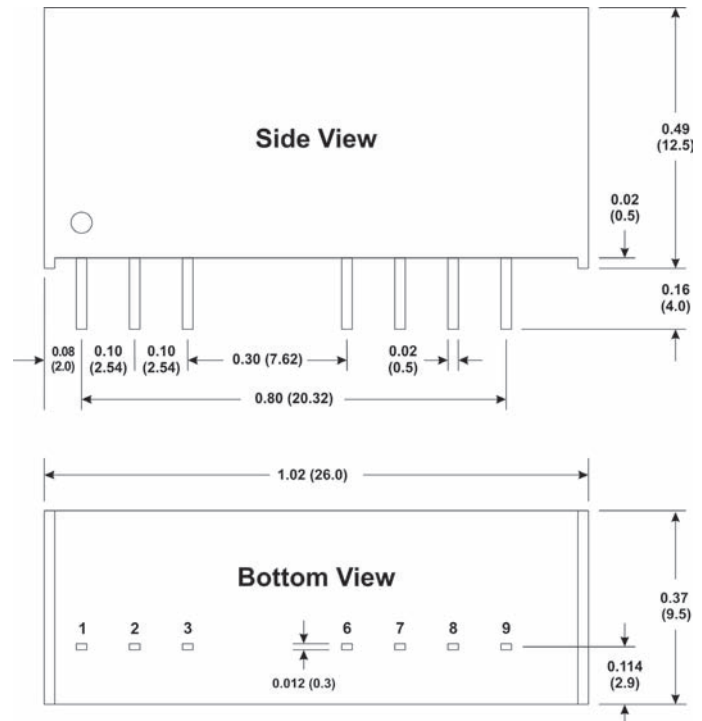
Output Voltage				
3.3	5	9	12	15
820 $\mu\text{F}$	660 $\mu\text{F}$	470 $\mu\text{F}$	330 $\mu\text{F}$	220 $\mu\text{F}$
±5	±9	±12	±15	
±330 $\mu\text{F}$	±220 $\mu\text{F}$	±150 $\mu\text{F}$	±120 $\mu\text{F}$	

## Pin Connections

Pin	Single	Dual	Pin	Single	Dual
1	-Vin	-Vin	7	NC	Common
2	+Vin	+Vin	8	NC	NC
3	Remote ON/OFF		9	-Vout	-Vout
6	+Vout	+Vout			

NC = No Connection

## Mechanical Dimensions



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292 Page Street Ste D Stoughton, MA 02072 • TEL: (781) 344-8226 • FAX: (781) 344-8481 • E-Mail: [sales@micropowerdirect.com](mailto:sales@micropowerdirect.com)

### Mechanical Notes:

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