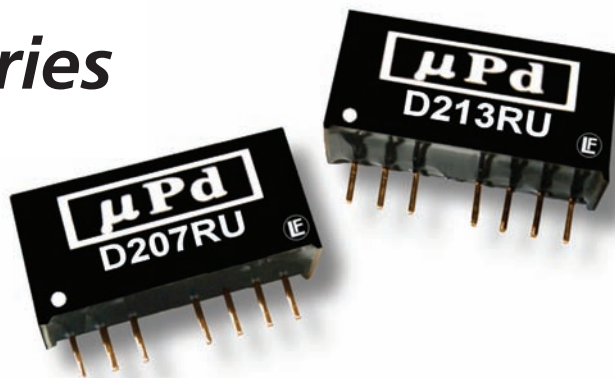


# D200RU Series

## Miniature SIP, 2W Ultra-Wide 4:1 Input DC/DC Converters



### Key Features:

- 2W Output Power
- 4:1 Input Voltage Range
- 1,000 VDC Isolation
- Short Circuit Protected
- Miniature SIP Case
- Single & Dual Outputs
- 1.0 MH MTBF
- Industry Standard Pin-Out



RoHS Compliant

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### 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 Start Voltage	24 VDC Input	4.5	6.0	8.5	VDC
	48 VDC Input	8.5	12.0	17.0	
Input Filter	Capacitor Filter				
Reverse Polarity Input Current				0.5	A
Short Circuit Input Power				1,500	mW

#### Output

Parameter	Conditions	Min.	Typ.	Max.	Units
Output Voltage Accuracy			±1.0	±2.0	%
Output Voltage Balance			±1.0	±2.0	%
Line Regulation	Vin = Min to Max		±0.3	±0.5	%
Load Regulation	Iout = 25% to 100%		±0.5	±0.75	%
Ripple & Noise (20 MHz) (Note 1)			30	50	mV P - P
Ripple & Noise (20 MHz)	Over Line, Load & Temp.			75	mV P - P
Ripple & Noise (20 MHz)				15	mV rms
Output Power Protection		120			%
Transient Response Time (Note 2)	25% Load Step Change		100	300	μSec
Transient Response Deviation			±3.0	±5.0	%
Temperature Coefficient			±0.01	±0.02	%/°C
Output Short Circuit	Continuous				

#### General

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage	60 Seconds	1,000			VDC
Isolation Test Voltage	Flash Tested For 1 Sec	1,100			VDC
Isolation Resistance	500 VDC	1,000			MΩ
Isolation Capacitance	100 kHz, 1V		250	500	pF
Switching Frequency			300		kHz

#### Environmental

Parameter	Conditions	Min.	Typ.	Max.	Units
Operating Temperature Range	Ambient	-40	+25	+65	°C
Operating Temperature Range	Case	-40	+25	+65	°C
Storage Temperature Range		-55		+105	°C
Cooling	Free Air Convection				
Humidity	RH, Non-condensing			95	%

#### Physical

Case Size	1.02 x 0.36 x 0.49 Inches (25.95 x 9.25 x 12.45 mm)				
Case Material	Non-Conductive Black Plastic (UL94-V0)				
Weight	0.23 Oz (6.5g)				

#### Reliability Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	1,000			kHours

#### Absolute Maximum Ratings

Parameter	Conditions	Min.	Typ.	Max.	Units
Input Voltage Surge (1 Sec)	24 VDC Input	-0.7		50.0	VDC
	48 VDC Input	-0.7		100.0	
Lead Temperature	1.5 mm From Case For 10 Sec			260	°C
Internal Power Dissipation	All Models			2,500	mW

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

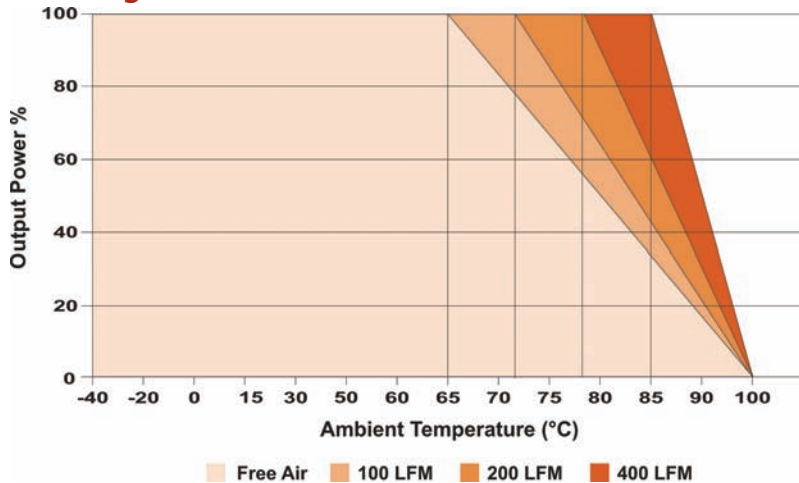
## Model Selection Guide

Model Number	Input				Output			Reflected Ripple Current (mA)	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						
D201RU	24	9.0 - 36.0	97	20	3.3	500.0	125.0	300	71	350
D202RU	24	9.0 - 36.0	110	20	5.0	400.0	100.0	300	76	350
D203RU	24	9.0 - 36.0	106	20	12.0	167.0	42.0	300	79	350
D204RU	24	9.0 - 36.0	105	20	15.0	134.0	33.0	300	80	350
D205RU	24	9.0 - 36.0	114	20	±5.0	±200.0	±50.0	300	73	350
D206RU	24	9.0 - 36.0	108	20	±12.0	±83.0	±21.0	300	77	350
D207RU	24	9.0 - 36.0	106	20	±15.0	±67.0	±17.0	300	79	350
D211RU	48	18.0 - 75.0	49	15	3.3	500.0	125.0	600	70	135
D212RU	48	18.0 - 75.0	58	15	5.0	400.0	100.0	600	72	135
D213RU	48	18.0 - 75.0	54	15	12.0	167.0	42.0	600	78	135
D214RU	48	18.0 - 75.0	54	15	15.0	134.0	33.0	600	78	135
D215RU	48	18.0 - 75.0	60	15	±5.0	±200.0	±50.0	600	70	135
D216RU	48	18.0 - 75.0	55	15	±12.0	±83.0	±21.0	600	76	135
D217RU	48	18.0 - 75.0	55	15	±15.0	±67.0	±17.0	600	76	135

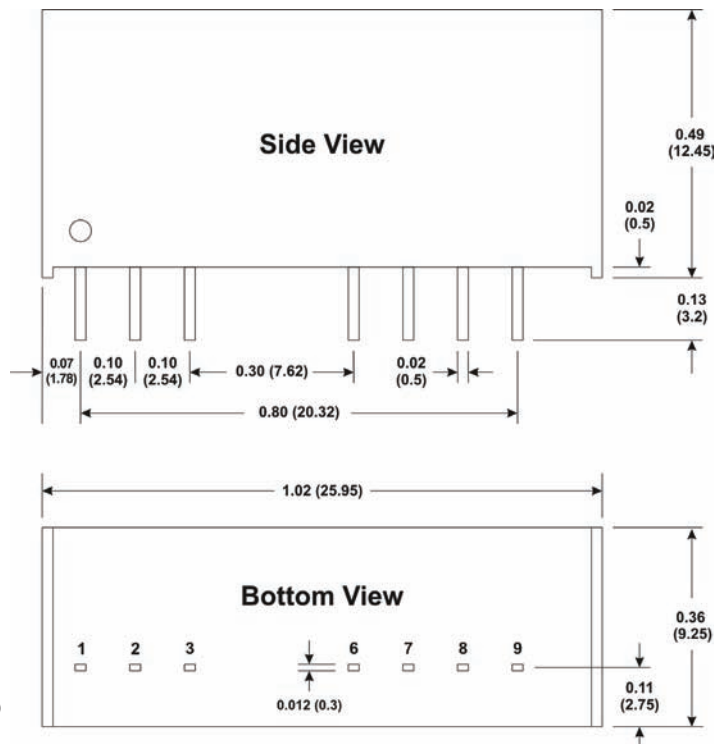
### Notes:

- When measuring output ripple, it is recommended that an external 0.47  $\mu\text{F}$  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. For noise sensitive applications, the use of 3.3  $\mu\text{F}$  capacitors will reduce the output ripple.
- Transient recovery is measured to within a 1% error band for a load step change of 75% to 100%.
- Operation at no-load will not damage these units. However, they may not meet all specifications.
- Dual output units may be connected to provide a 10 VDC, 24 VDC, or 30 VDC output. To do this, connect the load across the positive (+Vout) and negative (-Vout) outputs and float the output common.
- The converter should be connected to a low ac-impedance source. An input source with a highly inductive impedance may affect the stability of the converter. In applications where the converter output loading is high and input power is supplied over long lines, it may be necessary to use a capacitor on the input to insure start-up. In this case, it is recommended that a low ESR (ESR < 1.0  $\Omega$  at 100 kHz) capacitor be mounted close to the converter. For all models, it is recommended a 1.5  $\mu\text{F}$  be used.
- The optional remote on/off control pin is referenced to the -Vin pin. The standby input current is typically 0.1 mA (0.2 mA maximum).
- 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



### Capacitive Load

Output (VDC)	$\mu\text{F}$ Max
3.3	2,200
5.0	1,000
12.0	170
15.0	110
±5.0	470
±12.0	100
±15.0	47

Note: For dual output units, Cap load is given for each output.

### Pin Connections

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

NF = No Connection

### Mechanical Notes:

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



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