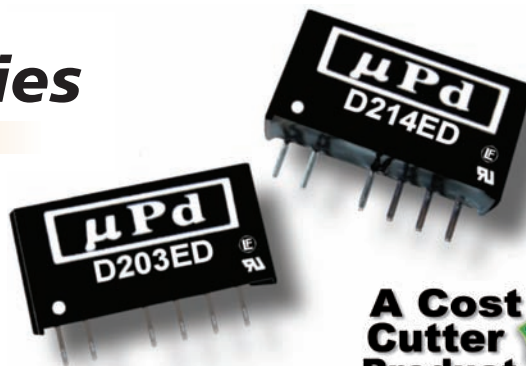


# D200ED Series

## Very Low Cost, 2W SIP Dual Isolated Output DC/DC Converters



**A Cost  
Cutter  
Product** 

### Key Features:

- 2W Output Power
- Miniature SIP Case
- UL Approved (File E245422)
- Dual Isolated Outputs
- 1,000 VDC Isolation
- >3.5 MHour MTBF
- 12 Standard Models
- Industry Standard Pin-Out
- **LOWEST COST!!**



**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 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			±3.0		%
Line Regulation	For Vin Change of 1%		±1.2		%
Load Regulation	I <sub>out</sub> = 10% to 100%		±15.0		%
Ripple (20 MHz)	See Note 2		75	150	mV P - P
Noise (20 MHz)	See Note 2		150	250	mV P - P
Output Power Protection		120			%
Temperature Coefficient			±0.01	±0.02	%/°C
Output Short Circuit	Momentary (0.5 Sec.)				

#### General

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage, Input/Output	60 Seconds	1,000			VDC
Isolation Voltage, Output/Output		1,000			VDC
Isolation Resistance	500 VDC	1,000			MΩ
Isolation Capacitance	100 kHz, 1V		60		pF
Switching Frequency			70		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	0.77 x 0.28 x 0.39 Inches (19.6 x 7.0 x 10.0 mm)				
Case Material	Non-Conductive Black Plastic (UL94-V0)				
Weight	0.09 Oz (2.8g)				

#### Reliability Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	3.5			MHours

#### 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.

## Model Selection Guide

Model Number	Input				Output 1			Output 2			Efficiency (% Typ)	Fuse Rating Slow-Blow (mA)
	Voltage (VDC)		Current (mA)		Voltage (VDC)	Current (mA, Max)	Current (mA, Min)	Voltage (VDC)	Current (mA, Max)	Current (mA, Min)		
	Nominal	Range	Full-Load	No-Load								
D201ED	5	4.5 - 5.5	500	30	5.0	200.0	20.0	5.0	200.0	20.0	80	1,000
D202ED	5	4.5 - 5.5	487	30	9.0	112.0	12.0	9.0	112.0	12.0	82	1,000
D203ED	5	4.5 - 5.5	487	30	12.0	83.0	9.0	12.0	83.0	9.0	82	1,000
D204ED	5	4.5 - 5.5	481	30	15.0	67.0	7.0	15.0	67.0	7.0	83	1,000
D211ED	12	10.8 - 13.2	208	12	5.0	200.0	20.0	5.0	200.0	20.0	80	500
D212ED	12	10.8 - 13.2	201	12	9.0	112.0	12.0	9.0	112.0	12.0	83	500
D213ED	12	10.8 - 13.2	196	12	12.0	83.0	9.0	12.0	83.0	9.0	85	500
D214ED	12	10.8 - 13.2	201	12	15.0	67.0	7.0	15.0	67.0	7.0	83	500
D221ED	24	21.6 - 26.4	102	7	5.0	200.0	20.0	5.0	200.0	20.0	81	250
D222ED	24	21.6 - 26.4	101	7	9.0	112.0	12.0	9.0	112.0	12.0	82	250
D223ED	24	21.6 - 26.4	99	7	12.0	83.0	9.0	12.0	83.0	9.0	84	250
D224ED	24	21.6 - 26.4	99	7	15.0	67.0	7.0	15.0	67.0	7.0	84	250

### Notes:

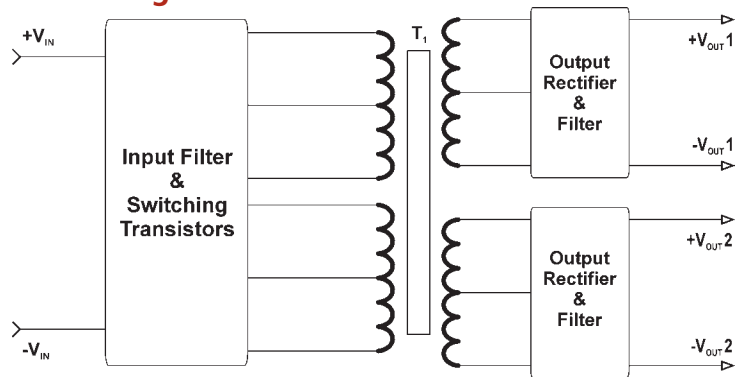
- Output load regulation is specified for a load change of 10% to 100%.
- When measuring output ripple, it is recommended that an external ceramic capacitor (approx approx 1  $\mu\text{F}$  to 10  $\mu\text{F}$ ) be placed from each output to common.
- These units should not be operated with a load under 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:

Vin	Input Capacitor	Vout	Output Capacitor
5 VDC	4.7 $\mu\text{F}$	5 VDC	4.7 $\mu\text{F}$
12 VDC	2.2 $\mu\text{F}$	9 VDC	2.2 $\mu\text{F}$
24 VDC	1.0 $\mu\text{F}$	12 VDC	1.0 $\mu\text{F}$
		15 VDC	0.47 $\mu\text{F}$

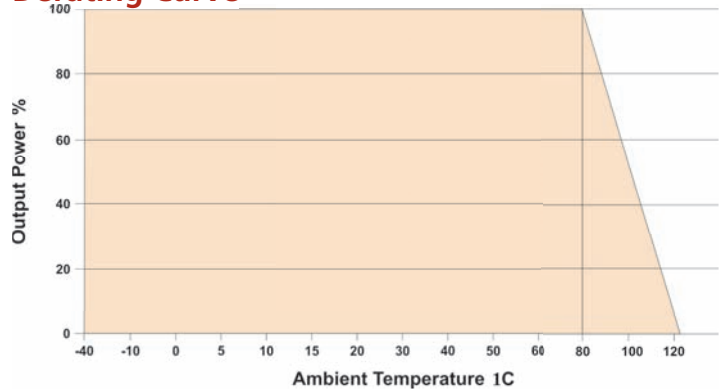
For applications requiring very low output noise levels, a simple LC filter should be effective.

- 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.

## Block Diagram



## Derating Curve



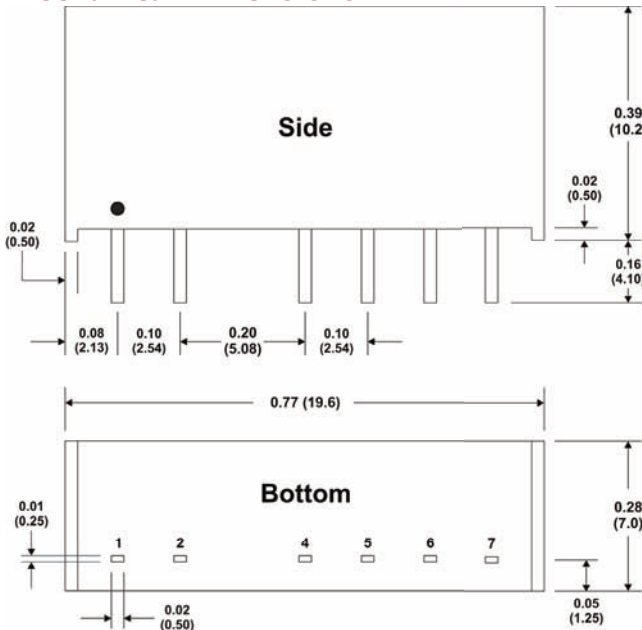
## Pin Connections

Pin	Function
1	+Vin
2	-Vin
4	-Vout 1
5	+Vout 1
6	-Vout 2
7	+Vout 2

### Notes:

- All dimensions are typical in inches (mm)
- Tolerance x.xx =  $\pm 0.01$  ( $\pm 0.25$ )
- Pin 1 is marked by a "dot" or indentation on the side of the unit

## Mechanical Dimensions



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