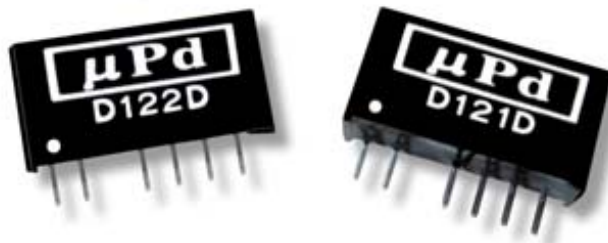


# D1000 Series

## Miniature, 1W SIP Dual Isolated Output DC/DC Converters



### Key Features:

- 1W Output Power
- Miniature SIP Case
- Dual Isolated Outputs
- 1,000 VDC Isolation
- >2 MHour MTBF
- 24 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				
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> = 20% to 100%		±8.0		%
Ripple & Noise (20 MHz)	See Note 2			75	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			125		kHz

#### Environmental

Parameter	Conditions	Min.	Typ.	Max.	Units
Operating Temperature Range	Ambient	-40	+25	+85	°C
Operating Temperature Range	Case	-40		+90	°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 0.37 Inches (19.5 x 6.0 x 9.5 mm)
Case Size (48V input Models)	0.76 x 0.28 x 0.37 Inches (19.5 x 7.2 x 9.5 mm)
Case Material	Non-Conductive Black Plastic (UL94-V0)
Weight	0.07 Oz (2.1g)

#### Reliability Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	2.0			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	
	48 VDC Input	-0.7		55.0	
Lead Temperature	1.5 mm From Case For 10 Sec			260	°C
Internal Power Dissipation	All Models			450	mW

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

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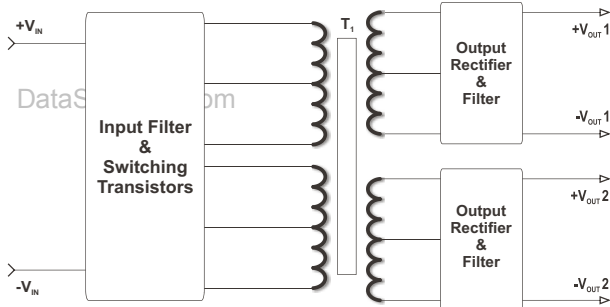
## Model Selection Guide

Model Number	Input				Output 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								
D101D	5	4.5 - 5.5	277	30	5.0	100.0	10.0	5.0	100.0	10.0	72	500
D102D	5	4.5 - 5.5	266	30	5.0	100.0	10.0	3.3	100.0	10.0	71	500
D103D	5	4.5 - 5.5	260	30	5.0	100.0	10.0	12.0	42.0	4.2	77	500
D104D	5	4.5 - 5.5	250	30	12.0	42.0	4.2	12.0	42.0	4.2	80	500
D105D	5	4.5 - 5.5	244	30	5.0	100.0	10.0	15.0	33.0	3.3	82	500
D106D	5	4.5 - 5.5	256	30	15.0	33.0	3.3	15.0	33.0	3.3	78	500
D111D	12	10.8 - 13.2	116	12	5.0	100.0	10.0	5.0	100.0	10.0	72	200
D112D	12	10.8 - 13.2	117	12	5.0	100.0	10.0	3.3	100.0	10.0	71	200
D113D	12	10.8 - 13.2	108	12	5.0	100.0	10.0	12.0	42.0	4.2	77	200
D114D	12	10.8 - 13.2	104	12	12.0	42.0	4.2	12.0	42.0	4.2	80	200
D115D	12	10.8 - 13.2	108	12	5.0	100.0	10.0	15.0	33.0	3.3	77	200
D116D	12	10.8 - 13.2	107	12	15.0	33.0	3.3	15.0	33.0	3.3	78	200
D121D	24	21.6 - 26.4	58	7	5.0	100.0	10.0	5.0	100.0	10.0	72	100
D122D	24	21.6 - 26.4	59	7	5.0	100.0	10.0	3.3	100.0	10.0	71	100
D123D	24	21.6 - 26.4	54	7	5.0	100.0	10.0	12.0	42.0	4.2	77	100
D124D	24	21.6 - 26.4	52	7	12.0	42.0	4.2	12.0	42.0	4.2	80	100
D125D	24	21.6 - 26.4	54	7	5.0	100.0	10.0	15.0	33.0	3.3	77	100
D126D	24	21.6 - 26.4	53	7	15.0	33.0	3.3	15.0	33.0	3.3	78	100
D131D	48	43.2 - 52.8	29	6	5.0	100.0	10.0	5.0	100.0	10.0	72	100
D132D	48	43.2 - 52.8	30	6	5.0	100.0	10.0	3.3	100.0	10.0	71	100
D133D	48	43.2 - 52.8	27	6	5.0	100.0	10.0	12.0	42.0	4.2	77	100
D134D	48	43.2 - 52.8	26	6	12.0	42.0	4.2	12.0	42.0	4.2	80	100
D135D	48	43.2 - 52.8	26	6	5.0	100.0	10.0	15.0	33.0	3.3	82	100
D136D	48	43.2 - 52.8	27	6	15.0	33.0	3.3	15.0	33.0	3.3	78	100

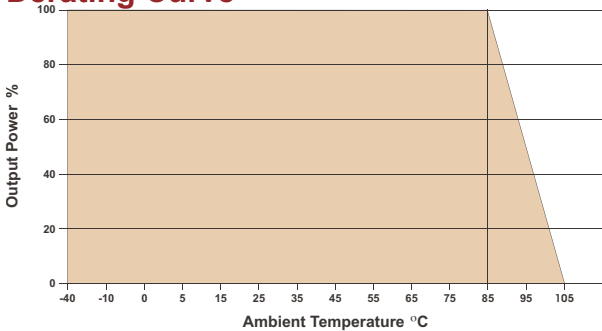
### Notes:

- Output load regulation is specified for a load change of 20% to 100%.
- When measuring output ripple, it is recommended that an external ceramic capacitor (approx 10  $\mu$ F) be placed across the output.
- The 5V, 12V and 24V input units do not require external components to operate, but the use of an input capacitor (10  $\mu$ F) may enhance performance in some applications. An output capacitor (1.0  $\mu$ F to 10  $\mu$ F) may be used to reduce ripple. The 48V input models require an input capacitor of 4.7  $\mu$ F to 47  $\mu$ F (dependent upon the application).
- 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.

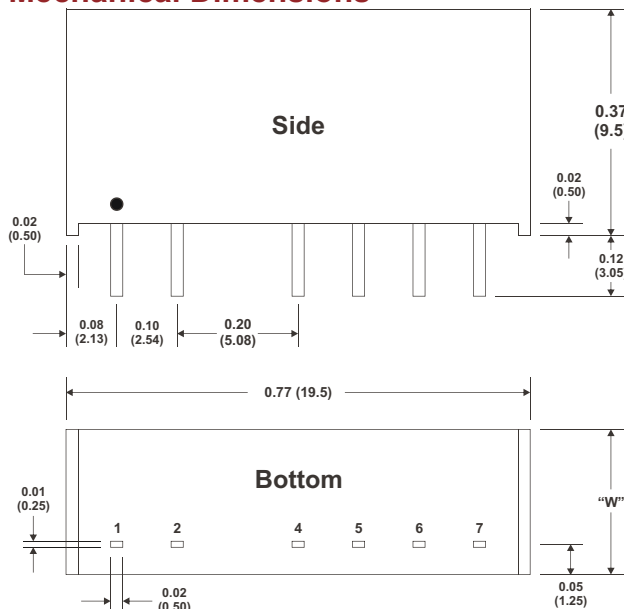
### Block Diagram



### Derating Curve



### Mechanical Dimensions



### Pin Connections

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

### Capacitive Load

Output 1 $\mu$ F Max	Output 2 $\mu$ F Max
100	100

- 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  
 For 5V, 12V & 24V input models, "W" = 0.24 in (6.0 mm)  
 For 48V input models, "W" = 0.28 in (7.2 mm)



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