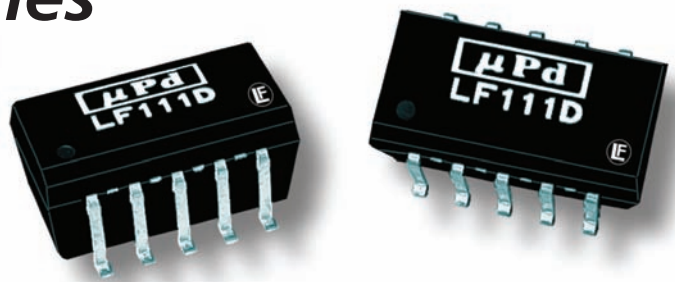


# LF100D Series

## Ultra-Miniature, 1W Dual Output SMT DC/DC Converters



### Key Features:

- 1W Output Power
- Ultra-Miniature SMT Case
- 1,000 VDC Isolation
- 5V, 12V & 24V Inputs
- -40°C to +85°C Operation
- 12 Standard Models
- 2.0 MH MTBF Minimum
- Industry Standard Pin-Out



**RoHS Compliant**

### MicroPower Direct

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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	
Reverse Polarity Input Current				0.3	A
Input Filter	Capacitor				

#### Output

Parameter	Conditions	Min.	Typ.	Max.	Units
Output Voltage Accuracy			±1.0	±3.0	%
Output Voltage Accuracy	Dual Output, Balanced Load		±0.1	±1.0	%
Line Regulation	For Vin Change of 1%		±1.2	±1.5	%
Load Regulation (Note 1)	See Model Selection Guide				
Ripple & Noise (20 MHz) (Note 2)			60	120	mV P - P
Ripple & Noise (20 MHz)	Over Line, Load & Temp.			150	mV P - P
Ripple & Noise (20 MHz)				5	mv rms
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	60 Seconds	1,000			VDC
Isolation Resistance	500 VDC	1,000			MΩ
Isolation Capacitance	100 kHz, 1V		40	100	pF
Switching Frequency		50	100	140	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	0.60 x 0.31 x 0.26 Inches (15.24 x 8.0 x 6.7 mm)				
Case Material	Non-Conductive Black Plastic (UL94-V0)				
Weight	0.05 Oz (1.5g)				

#### 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	
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.

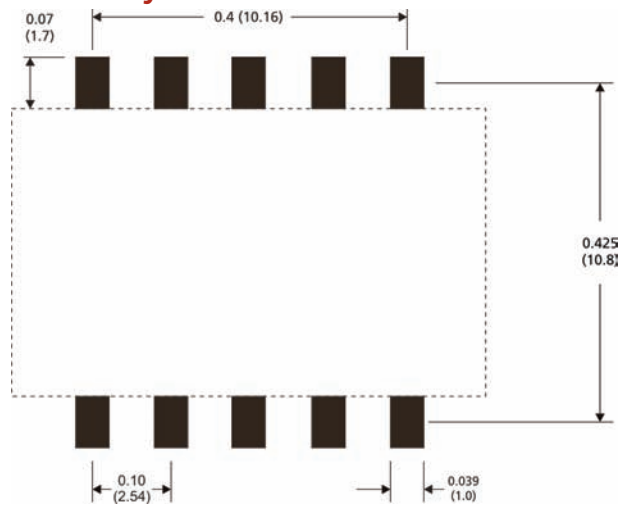
# Model Selection Guide

Model Number	Input				Output			Load Regulation (% , Max)	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						
LF101D	5	4.5 - 5.5	267	30	±5.0	±100.0	±2.0	10	75	500
LF102D	5	4.5 - 5.5	260	30	±9.0	±55.0	±1.0	10	76	500
LF103D	5	4.5 - 5.5	255	30	±12.0	±42.0	±0.8	8	79	500
LF104D	5	4.5 - 5.5	251	30	±15.0	±33.0	±0.7	7	79	500
LF111D	12	10.8 - 13.2	111	15	±5.0	±100.0	±2.0	8	75	200
LF112D	12	10.8 - 13.2	109	15	±9.0	±55.0	±1.0	8	76	200
LF113D	12	10.8 - 13.2	105	15	±12.0	±42.0	±0.8	5	80	200
LF114D	12	10.8 - 13.2	103	15	±15.0	±33.0	±0.7	5	80	200
LF121D	24	21.6 - 26.4	56	9	±5.0	±100.0	±2.0	8	74	100
LF122D	24	21.6 - 26.4	55	9	±9.0	±55.0	±1.0	8	75	100
LF123D	24	21.6 - 26.4	53	9	±12.0	±42.0	±0.8	5	79	100
LF124D	24	21.6 - 26.4	52	9	±15.0	±33.0	±0.7	5	79	100

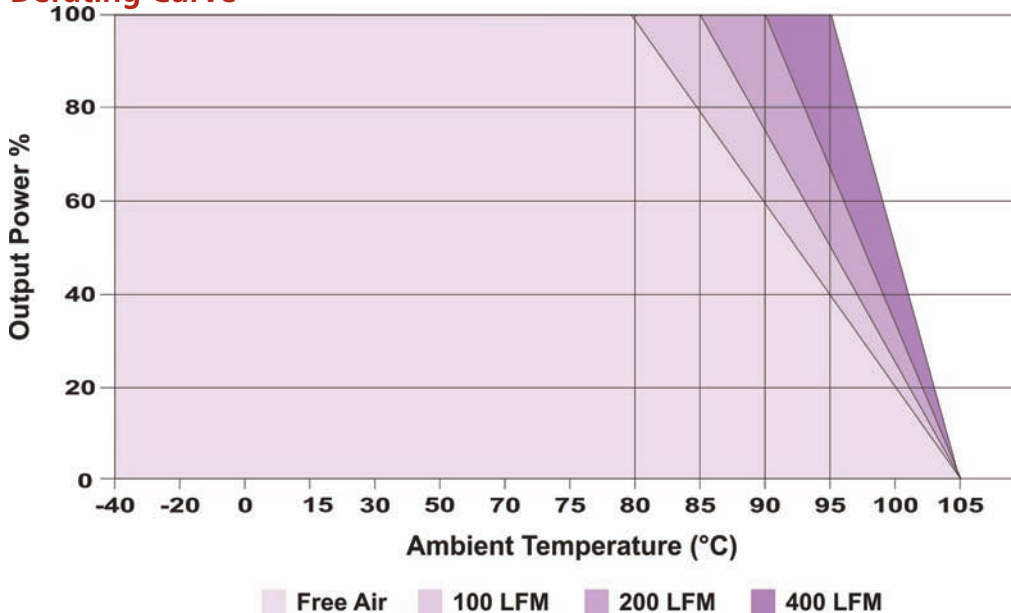
**Notes:**

1. Load regulation is measured for an output change of 20% to 100%.
2. When measuring output ripple, it is recommended that an external 0.33  $\mu\text{F}$  ceramic capacitor be placed from each output to common. For noise sensitive applications, the use of 0.47  $\mu\text{F}$  capacitors will reduce the output ripple.
3. Operation at no-load will not damage these units. However, they may not meet all specifications.
4. 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 ( $\text{ESR} < 1.0\Omega$  at 100 kHz) capacitor be mounted close to the converter. For 5V input units a 2.2  $\mu\text{F}$  is recommended, for 12V input units, a 1.0  $\mu\text{F}$ , and for 24V input units, a 0.47  $\mu\text{F}$ .
5. The outputs of these units may be connected to provide a 10 VDC, 18 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.
6. 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.

## Board Layout



## Derating Curve



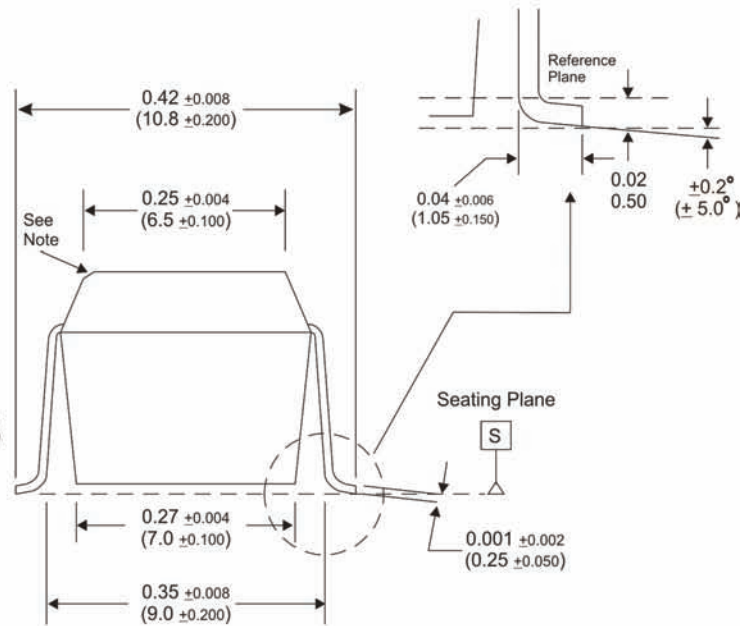
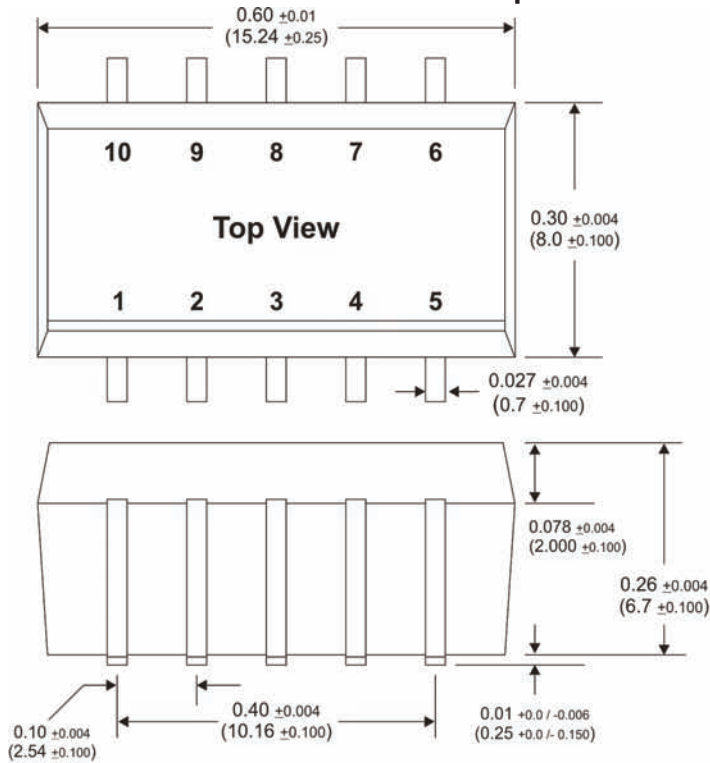
## Capacitive Load

$\mu\text{F}$ Max
33

## Pin Connections

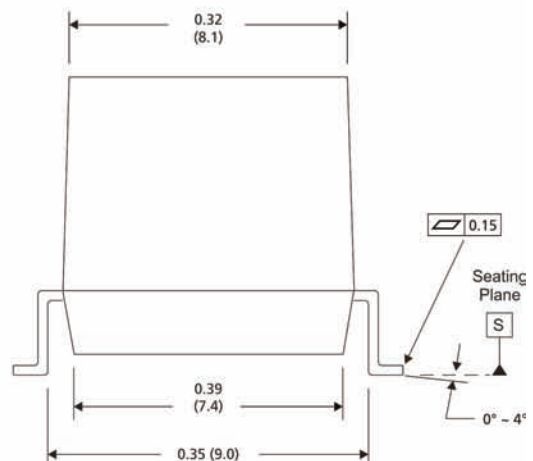
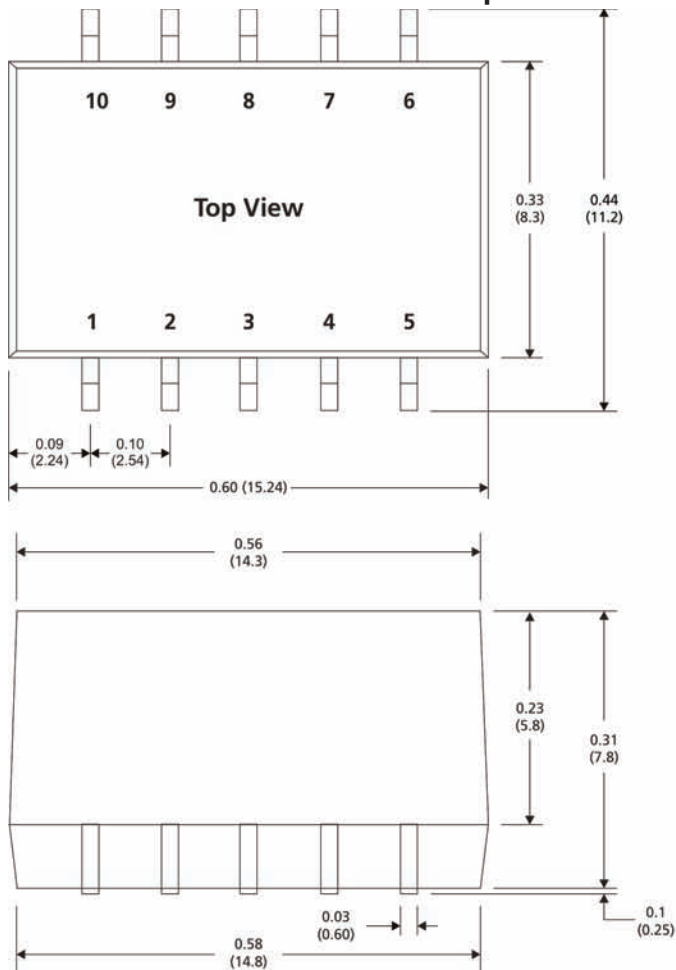
Pin	Description	Pin	Description
1	-Vin	6	NA
2	+Vin	7	+Vout
3	NA	8	NA
4	Common	9	NA
5	-Vout	10	NA

## Mechanical Dimensions - 5/12V Input



Note: The curved edge of the case indicates the Pin 1 side.

## Mechanical Dimensions - 24V Input



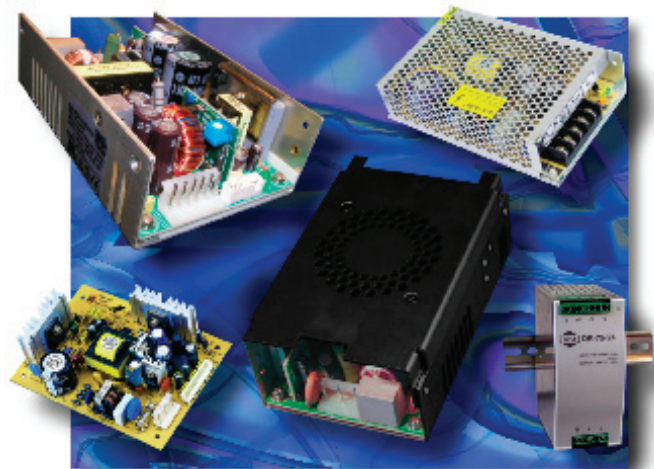
### Notes:






- 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 unit

**MPD** also offers a full range of compact open frame, enclosed, U-chassis and DIN Rail AC/DC power supplies. Our very wide range of models offers:

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	Series	Description	Power	Input	Output	Approvals	Size
	HF-15W-SPL	Miniature, single output open-frame series	15W	Universal 85 - 264 VAC	5V to 48V	UL, cUL, CE	3.9 x 1.8 x 0.9 (100 x 46 x 22)
	RL0402U	Medically approved 400W series in u-chassis or enclosed with built in fan.	400W	Universal 90-264 VAC Active PFC	Single & Dual Models 2V to 58V	UL, cUL, TUV, CE (Medical)	8 x 5 x 1.6 (203.2 x 127 x 40.6)
	AD1072F	Very low cost Single output 72W DIN Rail mount supplies	72W	Universal 100 - 240 VAC	12V to 48V	CE	4.7 x 4.3 x 2.2 (121 x 110 x 56)
	MPA320F	Compact 320W supplies include a cover with built in fan	320W	Auto-Ranging 90-132 VAC 185 - 264 VAC Passive PFC	Single & Dual Models 2V to 60V	UL, cUL, TUV, CE	6 x 4 x 1.5 (152.4 x 101.6 x 38.1)
	HF60W-xL	Very low cost 60W enclosed series.	60W	Universal 85 - 264 VAC	Single, Dual & triple output models 5V to 48V	UL, cUL, CE	6.3 x 3.8 x 1.5 (160 x 98 x 39)

This is a just a small sampling of our AC/DC product range. Whatever your application requirements, give us a call or go to our website at [www.micropowerdirect.com](http://www.micropowerdirect.com). If we don't have a standard product that fits your need, ask about product modifications. And don't forget, we also offer well over 2,000 standard DC/DC converters. Call today.



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