

# LF300RU Series



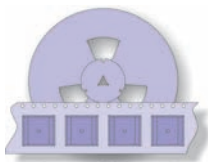
## Very Wide Input, 3W SMT Single & Dual Output DC/DC Converters

### Key Features:

- 3W Output Power
- Wide 4:1 Inputs
- Miniature SMT Case
- Tight Line/Load Regulation
- 1,500 VDC Isolation
- -40°C to +71°C Operation
- 14 Standard Models
- 1.0 MH MTBF Minimum
- Industry Standard Pin-Out



RoHS Compliant



Tape/Reel Available

### 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 Start Voltage	24 VDC Input	4.5	6.0	8.5	VDC
	48 VDC Input	8.5	12.0	17.0	
Reverse Polarity Input Current				1.0	A
Short Circuit Input Power				2,000	mW
Input Filter	π (Pi) Filter (Meets EN55022 Class A)				

#### Output

Parameter	Conditions	Min.	Typ.	Max.	Units
Output Voltage Accuracy			±0.5	±1.0	%
Output Voltage Balance	Dual Output, Balanced Load		±0.5	±2.0	%
Line Regulation	For Vin = Min to Max		±0.2	±1.0	%
Load Regulation	I <sub>out</sub> = 10% to 100%		±0.3	±1.0	%
Ripple & Noise (20 MHz) (Note 1)			50	75	mV P - P
Ripple & Noise (20 MHz)				100	mV P - P
Ripple & Noise (20 MHz)				15	mV rms
Output Power Protection		120			%
Transient Response Time (Note 2)	25% Load Step Change		150	500	μS
Transient Response Deviation			±2	±6	%
Temperature Coefficient			±0.01	±0.02	%/°C
Output Short Circuit	Continuous (Autorecovery)				

#### General

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage	60 Seconds	1,500			VDC
Isolation Resistance	1,000 VDC	1,000			MΩ
Isolation Capacitance	100 kHz, 1V		350	500	pF
Switching Frequency			300		kHz

#### Environmental

Parameter	Conditions	Min.	Typ.	Max.	Units
Operating Temperature Range	Ambient	-40	+25	+71	°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	1.27 x 0.58 x 0.40 Inches (32.3 x 14.8 x 10.2 mm)				
Case Material	Non-Conductive Black Plastic (UL94-V0)				
Weight	0.31 Oz (8.8g)				

#### 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		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.

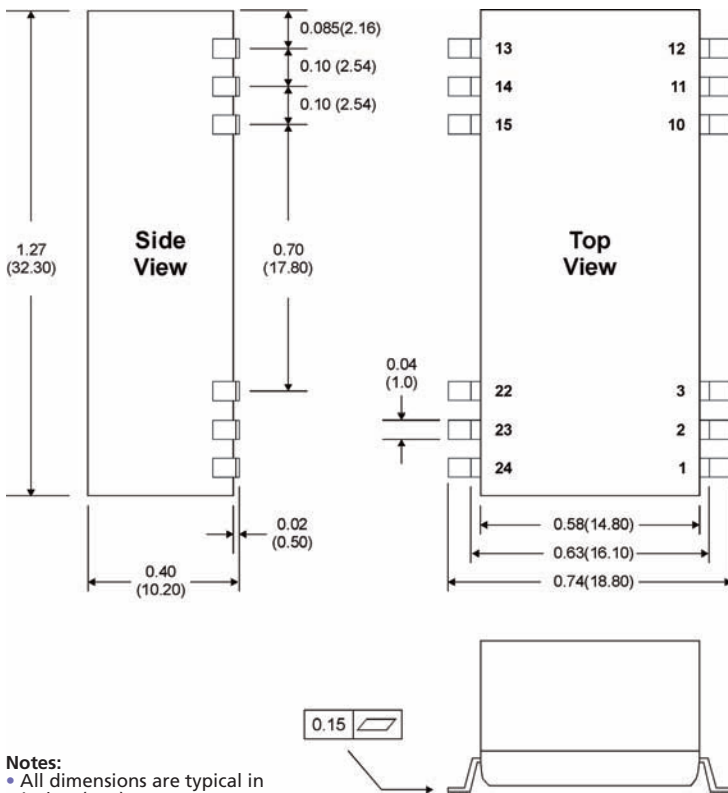
## Model Selection Guide

Model Number	Input				Output			Reflected Ripple Cur. (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						
LF301RU	24	9.0 - 36.0	138	20	3.3	750	75.0	10	75	1,000
LF302RU	24	9.0 - 36.0	158	20	5.0	600	60.0	10	79	1,000
LF303RU	24	9.0 - 36.0	154	20	12.0	250	25.0	10	81	1,000
LF304RU	24	9.0 - 36.0	154	20	15.0	200	27.0	10	81	1,000
LF305RU	24	9.0 - 36.0	160	20	±5.0	±300	±30.0	10	78	1,000
LF306RU	24	9.0 - 36.0	154	20	±12.0	±125	±12.5	10	81	1,000
LF307RU	24	9.0 - 36.0	154	20	±15.0	±100	±10.0	10	81	1,000
LF311RU	48	18.0 - 75.0	68	10	3.3	750	75.0	5	76	500
LF312RU	48	18.0 - 75.0	78	10	5.0	600	60.0	5	80	500
LF313RU	48	18.0 - 75.0	75	10	12.0	250	25.0	5	83	500
LF314RU	48	18.0 - 75.0	75	10	15.0	200	27.0	5	83	500
LF315RU	48	18.0 - 75.0	78	10	±5.0	±300	±30.0	5	80	500
LF316RU	48	18.0 - 75.0	75	10	±12.0	±125	±12.5	5	83	500
LF317RU	48	18.0 - 75.0	75	10	±15.0	±100	±10.0	5	83	500

### 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%.
- No-load operation will not damage these units, however, they may not meet specifications.
- Dual output units may provide a 10V, 24V or 30V 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 24V input units a 4.7  $\mu\text{F}$  is recommended, and for 48V units a 2.2  $\mu\text{F}$ .
- Maximum capacitive load for single output units is 3,000  $\mu\text{F}$ , for dual output models it is 180  $\mu\text{F}$  for each output.
- 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.

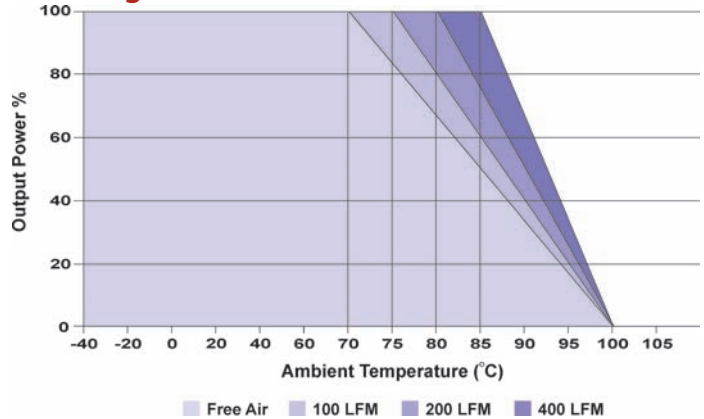
## Mechanical Dimensions



### 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

## Derating Curve



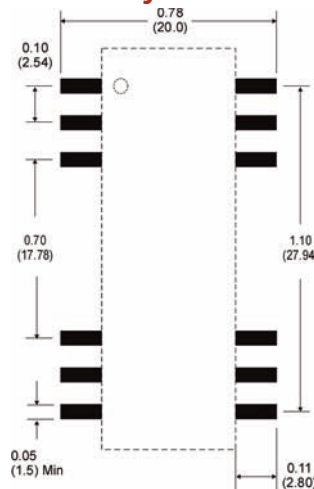
## Remote ON/OFF

Parameter	Condition	Units
Supply On	2.5 to 5.5 or Open Circuit	VDC
Supply Off	-0.7 to 0.8	VDC
Standby Input Current	10	mA
Control Common	Referenced to Negative Input (-Vin)	

### Remote ON/OFF Notes:

- Maximum sink current at the on/off pin (pin 1) during a logic low is 300  $\mu\text{A}$ .
- Maximum allowable leakage current of a switch connected to the on/off terminal (Pin 1) at logic high (2.5V to 100V) is 200  $\mu\text{A}$ .

## Board Layout



## Pin Connections

Pin	Single	Dual
1	-Vin	-Vin
2	-Vin	-Vin
3	On/Off	On/Off
10	NC	Common
11	NC	NC
12	NC	-Vout
13	+Vout	+Vout
14	NC	NC
15	-Vout	Common
22	NC	NC
23	+Vin	+Vin
24	+Vin	+Vin

NC: No Connection



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