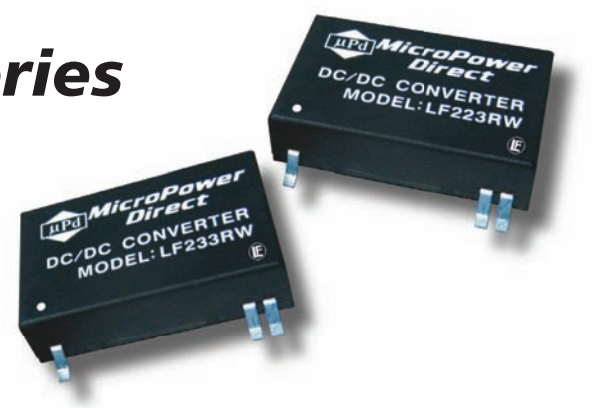
LF200RW Series

Miniature SMT, 2W Wide Input Range DC/DC Converters



Key Features:

- 2W Output Power
- 2:1 Input Voltage Range
- 1,500 VDC Isolation
- Short Circuit Protected
- Miniature SMT Package
- Single & Dual Outputs
- 1.0 MH MTBF
- Industry Standard Pin-Out

RoHS Compliant

Tape/Reel Available

MicroPower Direct
292 Page Street
Suite D
Stoughton, MA 02072
USA

T: (781) 344-8226
F: (781) 344-8481
E: sales@micropowerdirect.com
W: www.micropowerdirect.com

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	5 VDC Input	3.5	4.0	4.5	VDC
	12 VDC Input	4.5	7.0	9.0	
	24 VDC Input	8.0	12.0	18.0	
	48 VDC Input	16.0	24.0	36.0	
Input Filter	π (Pi) Filter				
Reverse Polarity Input Current				1.0	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)	50% 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	1,500			VDC
Isolation Test Voltage	Flash Tested For 1 Sec	1,650			VDC
Isolation Resistance	1,000 VDC	1,000			MΩ
Isolation Capacitance	100 kHz, 1V		250	420	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	+90	°C
Storage Temperature Range		-40		+125	°C
Cooling	Free Air Convection				
Humidity	RH, Non-condensing			95	%

Physical

Case Size	0.94 x 0.54 x 0.30 Inches (23.8 x 13.7 x 7.62 mm)
Case Material	Non-Conductive Black Plastic (UL94-V0)
Weight	0.18 Oz (5.1g)

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)	5 VDC Input	-0.7		11.0	VDC
	12 VDC Input	-0.7		25.0	
	24 VDC Input	-0.7		50.0	
	48 VDC Input	-0.7		100.0	
Lead Temperature	1.5 mm From Case For 10 Sec			260	°C
Internal Power Dissipation	All Models			1,800	mW

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

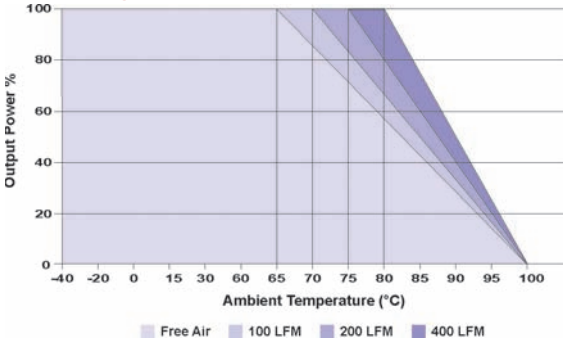
Model Selection Guide

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						
LF201RW	5	4.5 - 9.0	471	40	3.3	500.0	125.0	100	70	1,000
LF202RW	5	4.5 - 9.0	548	40	5.0	400.0	100.0	100	73	1,000
LF203RW	5	4.5 - 9.0	534	40	12.0	167.0	42.0	100	75	1,000
LF204RW	5	4.5 - 9.0	582	40	15.0	134.0	33.0	100	73	1,000
LF205RW	5	4.5 - 9.0	667	40	±5.0	±200.0	±50.0	100	64	1,000
LF206RW	5	4.5 - 9.0	615	40	±12.0	±83.0	±21.0	100	69	1,000
LF207RW	5	4.5 - 9.0	598	40	±15.0	±67.0	±17.0	100	71	1,000
LF211RW	12	9.0 - 18.0	184	20	3.3	500.0	125.0	25	73	500
LF212RW	12	9.0 - 18.0	217	20	5.0	400.0	100.0	25	77	500
LF213RW	12	9.0 - 18.0	209	20	12.0	167.0	42.0	25	80	500
LF214RW	12	9.0 - 18.0	220	20	15.0	134.0	33.0	25	80	500
LF215RW	12	9.0 - 18.0	242	20	±5.0	±200.0	±50.0	25	73	500
LF216RW	12	9.0 - 18.0	224	20	±12.0	±83.0	±21.0	25	78	500
LF217RW	12	9.0 - 18.0	226	20	±15.0	±67.0	±17.0	25	78	500
LF221RW	24	18.0 - 36.0	96	10	3.3	500.0	125.0	15	72	250
LF222RW	24	18.0 - 36.0	109	10	5.0	400.0	100.0	15	77	250
LF223RW	24	18.0 - 36.0	109	10	12.0	167.0	42.0	15	80	250
LF224RW	24	18.0 - 36.0	108	10	15.0	134.0	33.0	15	81	250
LF225RW	24	18.0 - 36.0	119	10	±5.0	±200.0	±50.0	15	74	250
LF226RW	24	18.0 - 36.0	112	10	±12.0	±83.0	±21.0	15	78	250
LF227RW	24	18.0 - 36.0	110	10	±15.0	±67.0	±17.0	15	80	250
LF231RW	48	36.0 - 72.0	49	8	3.3	500.0	125.0	10	71	120
LF232RW	48	36.0 - 72.0	57	8	5.0	400.0	100.0	10	73	120
LF233RW	48	36.0 - 72.0	53	8	12.0	167.0	42.0	10	79	120
LF234RW	48	36.0 - 72.0	55	8	15.0	134.0	33.0	10	79	120
LF235RW	48	36.0 - 72.0	62	8	±5.0	±200.0	±50.0	10	71	120
LF236RW	48	36.0 - 72.0	57	8	±12.0	±83.0	±21.0	10	77	120
LF237RW	48	36.0 - 72.0	57	8	±15.0	±67.0	±17.0	10	77	120

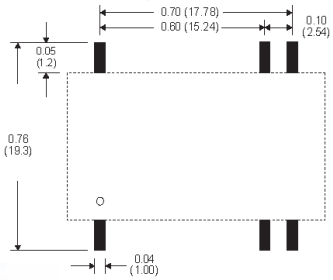
Notes:

1. When measuring output ripple, it is recommended that an external 0.47 µF 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 µF capacitors will reduce the output ripple.
2. Transient recovery is measured to within a 1% error band for a load step change of 75% to 100%.
3. Operation at no-load will not damage these units. However, they may not meet all specifications.
4. 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.
5. 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 <1.0Ω at 100 kHz) capacitor be mounted close to the converter. For 5V input units a 8.2 µF is recommended, for 12V input units, a 3.3 µF; and for 24V & 48V units a 1.5 µF.
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.

Derating Curve



Solder Layout



Capacitive Load

Output (VDC)	µF Max
3.3	2,200
5.0	1,000
12.0	170
15.0	110
±5.0	470
±12.0	100
±15.0	47

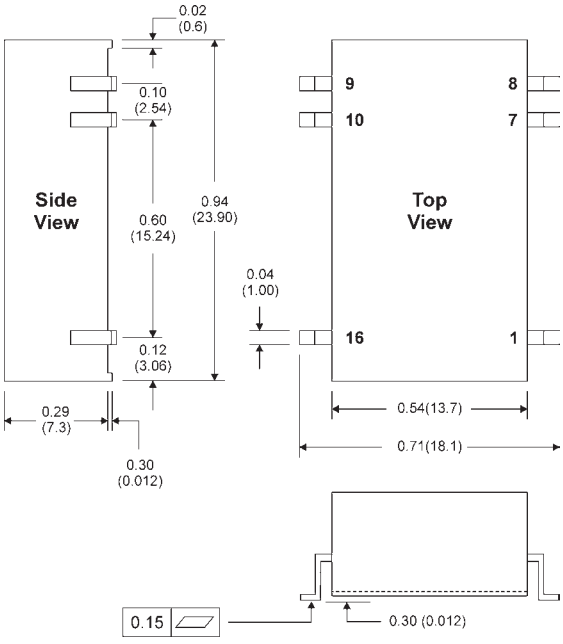
Note: For dual output Units, Cap load is given for each output.

Pin Connections

Pin	Single	Dual
1	-Vin	-Vin
7	NC	NC
8	NC	Common
9	+Vout	+Vout
10	-Vout	-Vout
16	+Vin	+Vin

NC = No Connection

Mechanical Dimensions



Mechanical Notes:

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

µPd

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292 Page Street Ste D Stoughton, MA 02072 • TEL: (781) 344-8226 • FAX: (781) 344-8481 • E-Mail: sales@micropowerdirect.com