

B3000RW Series

Compact 1 x 2 Inch 30W Wide Input Range DC/DC Converters



Key Features:

- 30W Output Power
- Compact 1 x 2 Inch Case
- 2:1 Input Voltage Range
- 1,500 VDC Isolation
- Optional Remote ON/OFF
- Overvoltage Protection
- Industry Standard Pin-Out



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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	17.0	17.5	18.0	VDC	
	48 VDC Input	34.0	35.0	36.0		
Input Undervoltage Shutdown	24 VDC Input	16.0	16.5	17.0	VDC	
	48 VDC Input	32.0	33.0	34.0		
Input Overvoltage Shutdown	24 VDC Input	40.0	42.0	44.0	VDC	
	48 VDC Input	80.0	82.0	84.0		
Input Filter, See Note 1	π (Pi) Filter					
Reverse Polarity Input Current				2.0	A	
Short Circuit Input Power				4,500	mW	

Output						
Parameter	Conditions	Min.	Typ.	Max.	Units	
Output Voltage Accuracy			±0.5	±1.0	%	
Line Regulation	Vin = Min to Max		±0.1	±0.3	%	
Load Regulation, 2.5, 3.3, 5 Vout	Iout = 0% to 100%		±0.5	±1.0	%	
Load Regulation, 12, 15 Vout	Iout = 10% to 100%		±0.5	±1.0	%	
Ripple & Noise (20 MHz), See Note 2			75	100	mV P - P	
Ripple & Noise (20 MHz)	Over Line, Load & Temp.			120	mV P - P	
Ripple & Noise (20 MHz)				10	mV rms	
Output Power Protection		110		160	%	
Transient Recovery Time, See Note 3			200	500	µSec	
Transient Response Deviation	25% Load Step Change		±2.0	±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	500 VDC	1,000			MΩ	
Isolation Capacitance	100 kHz, 1V		1,200	1,500	pF	
Switching Frequency		280	350	400	kHz	

Remote On/Off See Note 4

Parameter	Conditions	Min.	Typ.	Max.	Units
Supply On		2.5		100.0	VDC
Supply Off		-1.0		1.0	VDC
Standby Input Current				5	mA
Control Common	Referenced to Negative Input (pin 2)				

Environmental

Parameter	Conditions	Min.	Typ.	Max.	Units
Operating Temperature Range	Ambient	-40	+25	+50	°C
Operating Temperature Range	Case			+105	°C
Storage Temperature Range		-50		+125	°C
Cooling	Free Air Convection				
Humidity	RH, Non-condensing			95	%
RFI	Six-Side Shielded Metal Case				

Physical

Case Size	2.0 x 1.0 x 0.40 Inches (50.8 x 25.4 x 10.2 mm)					
Case Material	Metal with Non-Conductive Base (Anodized Black Aluminum)					
Weight	1.13 Oz (32g)					

Reliability Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units	
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	600			kHours	

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			260.0	°C	
Internal Power Dissipation	All Models			5,500	mW	

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

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Model Number	Input				Reflected Ripple Current (mA, Typ)	Output			Over Voltage Protection (VDC)	Efficiency (%, Typ)	Capacitive Load (μF Max)	Fuse Rating Slow-Blow (mA)
	Voltage (VDC)		Current (mA)			Voltage (VDC)	Current (mA, Max)	Current (mA, Min)				
	Nominal	Range	Full-Load	No-Load								
B3001RW	24	18.0 - 36.0	744	50	100	2.5	6,000.0	0.0	3.0	84	6,800	3,000
B3002RW	24	18.0 - 36.0	959	50	100	3.3	6,000.0	0.0	3.9	86	6,800	3,000
B3003RW	24	18.0 - 36.0	1,185	70	100	5.0	5,000.0	0.0	6.8	88	6,800	3,000
B3004RW	24	18.0 - 36.0	1,420	20	100	12.0	2,500.0	166.0	15.0	88	680	3,000
B3005RW	24	18.0 - 36.0	1,420	20	100	15.0	2,000.0	133.0	18.0	88	680	3,000
B3011RW	48	36.0 - 75.0	372	40	30	2.5	6,000.0	0.0	3.0	84	6,800	1,500
B3012RW	48	36.0 - 75.0	480	40	30	3.3	6,000.0	0.0	3.9	86	6,800	1,500
B3013RW	48	36.0 - 75.0	604	50	30	5.0	5,000.0	0.0	6.8	88	6,800	1,500
B3014RW	48	36.0 - 75.0	710	10	30	12.0	2,500.0	166.0	15.0	88	680	1,500
B3015RW	48	36.0 - 75.0	710	10	30	15.0	2,000.0	133.0	18.0	88	680	1,500

For Class "A" filter option, add suffix "F" to model number (i.e. B3003RU-F)

For heatsink option, add suffix "H" to model number (i.e. B3003RU-H)

For Remote Control option, add suffix "R" to model number (i.e. B3003RU-R)

Notes:

1. An internal filter that complies with EN55022 Class "A" is available. Add a suffix "F" to the model number.
2. When measuring output ripple, it is recommended that an external 1.0 μF ceramic capacitor be placed from the +Vout pin to the -Vout pin. An internal filter complies with EN55022 Class "A".
3. The maximum recovery is measured to within a 1% error band for a load step change of 75% to 100%.
4. The maximum control current at the on/off pin (pin 3) during a logic high is 5 μA. The maximum control current to the on/off pin at logic low is -100 μA. If the on/off pin is left open, the unit operates. If it is grounded, the unit will shut off.
5. Operation at no-load will not damage these units. However, they may not meet all specifications.
6. 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 (such as a low ESR 10.0 μF) on the input to insure start-up.
7. 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.

External Trim

For continuous UP/Down trimming capability, connect a 10 kW potentiometer between the plus and minus outputs with the wiper arm connected to the V_{OUT} trim pin. The trim pin may be left floating if it is not used.

An external resistor may also be used to adjust the converter output. To adjust the output UP, connect a 5%, 3W resistor between the minus output pin and the Vout trim pin. The output voltage is increased per the equation:

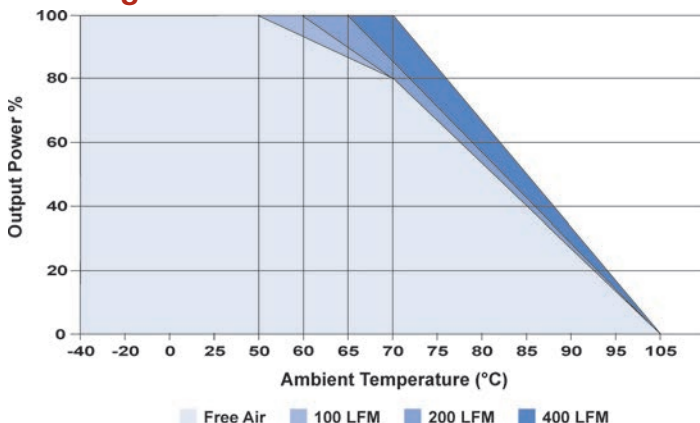
$$R_{UP} = \frac{(33 \times V_{OUT}) - (30 \times V_{ADJ})}{V_{ADJ} - V_{OUT}}$$

To adjust the output DOWN, connect a 5%, 3W resistor between the plus output pin and the V_{OUT} trim pin. The output voltage is decreased per the equation:

$$R_{Dn} = \frac{(36.667 \times V_{ADJ}) - (33 \times V_{OUT})}{V_{OUT} - V_{ADJ}}$$

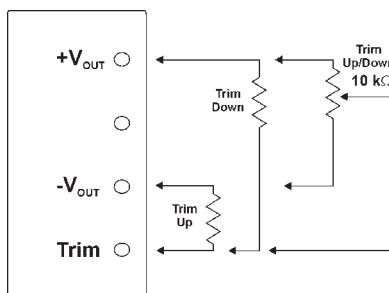
Where:
 V_{OUT} = Nominal Output Voltage
 V_{ADJ} = Adjusted Output Voltage
 Units = VDC / kΩ

Derating Curve

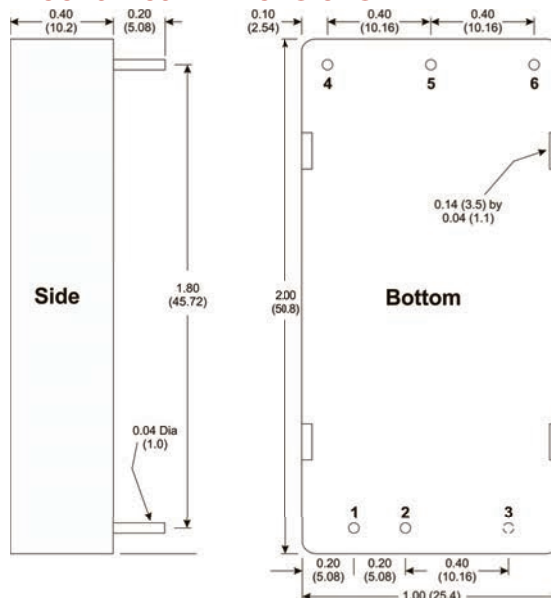


Pin Connections

Pin	Function
1	+Vin
2	-Vin
3	ON/OFF
4	+Vout
5	-Vout
6	Trim



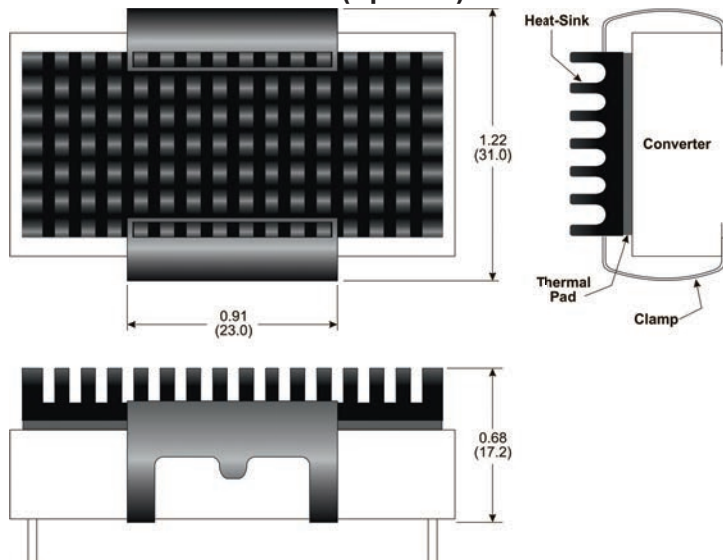
Mechanical Dimensions



Mechanical Notes:

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

Heatsink Dimensions (Optional)



Heatsink Notes:

- Use of the heatsink will extend the units operating temperature range by approximately 10°C.
- The heatsink is black anodized aluminum.



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