

# B2000RW Series

## Compact 1 x 2 Inch 20W Wide Input Range DC/DC Converters



### Key Features:

- 20W Output Power
- 2:1 Input Voltage Range
- 1,500 VDC Isolation
- Compact 1 x 2 Inch Case
- Single & Dual Outputs
- Optional Remote ON/OFF
- 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	12 VDC Input	8.6	8.8	9.0	VDC	
	24 VDC Input	17.0	17.5	18.0		
	48 VDC Input	34.0	35.0	36.0		
Input Filter	π (Pi) Filter (Complies with EN55022 Class "A")					
Reverse Polarity Input Current				2.0	A	
Short Circuit Input Power				3,500	mW	
Output						
Parameter	Conditions	Min.	Typ.	Max.	Units	
Output Voltage Accuracy			±0.5	±1.0	%	
Output Voltage Balance	Dual Output, Balanced Loads		±0.5	±2.0	%	
Line Regulation	Vin = Min to Max		±0.1	±0.3	%	
Load Regulation	I <sub>out</sub> = 10% to 100%		±0.1	±0.5	%	
Ripple & Noise (20 MHz) (Note 1)			55	80	mV P - P	
Ripple & Noise (20 MHz)	Over Line, Load & Temp.			100	mV P - P	
Ripple & Noise (20 MHz)				10	mV rms	
Output Power Protection		110		160	%	
Transient Recovery Time (Note 2)	25% Load Step Change		150	300	μSec	
Transient Response Deviation			±2.0	±4.0	%	
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 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		290	330	360	kHz	
Remote On/Off (Note 3)						
Parameter	Conditions	Min.	Typ.	Max.	Units	
Supply On		2.5		100.0	VDC	
Supply Off		0.0		1.0	VDC	
Standby Input Current			2	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					
Conducted EMI	EN55022 Class "A"					
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					
Weight	1.06 Oz (30g)					
Reliability Specifications						
Parameter	Conditions	Min.	Typ.	Max.	Units	
MTBF	MIL HDBK 217F, 25°C, Gnd Benign	800			kHours	
Absolute Maximum Ratings						
Parameter	Conditions	Min.	Typ.	Max.	Units	
Input Voltage Surge (1 Sec)	12 VDC Input	-0.7		25.0	VDC	
	24 VDC Input	-0.7		50.0		
	48 VDC Input	-0.7		100.0		
Lead Temperature	1.5 mm From Case For 10 Sec			260.0	°C	
Internal Power Dissipation	All Models			4,500	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								
B2001RW	12	9.0 - 18.0	1,358	30	50	3.3	4,000.0	240.0	3.9	81	470	4,000
B2002RW	12	9.0 - 18.0	1,984	30	50	5.0	4,000.0	240.0	6.8	84	470	4,000
B2003RW	12	9.0 - 18.0	1,898	30	50	12.0	1,670.0	100.0	15.0	88	470	4,000
B2004RW	12	9.0 - 18.0	1,903	30	50	15.0	1,340.0	80.0	18.0	88	470	4,000
B2005RW	12	9.0 - 18.0	1,898	30	50	±12.0	±835.0	±50.0	±15.0	88	±220	4,000
B2006RW	12	9.0 - 18.0	1,903	30	50	±15.0	±670.0	±40.0	±18.0	88	±220	4,000
B2011RW	24	18.0 - 36.0	671	17	30	3.3	4,000.0	240.0	3.9	82	470	2,000
B2012RW	24	18.0 - 36.0	980	17	30	5.0	4,000.0	240.0	6.8	85	470	2,000
B2013RW	24	18.0 - 36.0	938	17	30	12.0	1,670.0	100.0	15.0	89	470	2,000
B2014RW	24	18.0 - 36.0	941	17	30	15.0	1,340.0	80.0	18.0	89	470	2,000
B2015RW	24	18.0 - 36.0	938	17	30	±12.0	±835.0	±50.0	±15.0	89	±220	2,000
B2016RW	24	18.0 - 36.0	941	17	30	±15.0	±670.0	±40.0	±18.0	89	±220	2,000
B2021RW	48	36.0 - 75.0	335	10	20	3.3	4,000.0	240.0	3.9	82	470	1,000
B2022RW	48	36.0 - 75.0	490	10	20	5.0	4,000.0	240.0	6.8	85	470	1,000
B2023RW	48	36.0 - 75.0	469	10	20	12.0	1,670.0	100.0	15.0	89	470	1,000
B2024RW	48	36.0 - 75.0	471	10	20	15.0	1,340.0	80.0	18.0	89	470	1,000
B2025RW	48	36.0 - 75.0	469	10	20	±12.0	±835.0	±50.0	±15.0	89	±220	1,000
B2026RW	48	36.0 - 75.0	471	10	20	±15.0	±670.0	±40.0	±18.0	89	±220	1,000

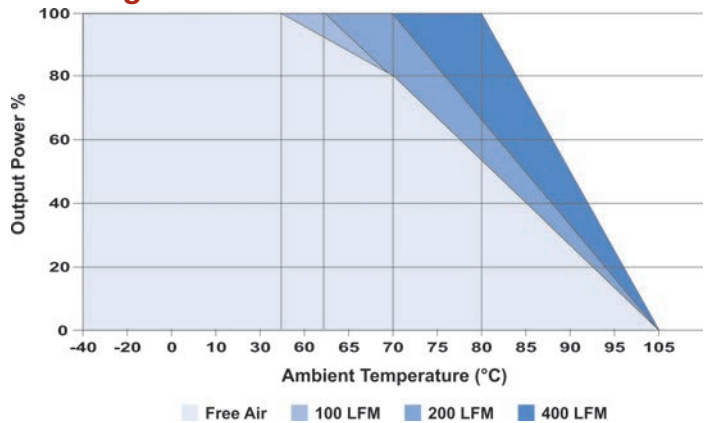
For heatsink option, add suffix "H" to model number (i.e. B2003RW-H)

For Remote Control option, add suffix "R" to model number (i.e. B2003RW-R)

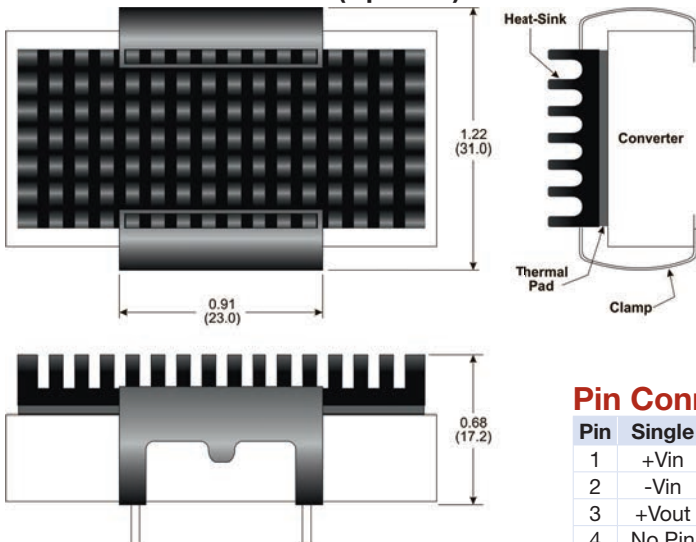
**Notes:**

- 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 for single output units and from each output to common for dual output units.
- Transient recovery is measured to within a 1% error band for a load step change of 75% to 100%.
- The maximum control current at the on/off pin (pin 6) 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.
- Operation at no-load will not damage these units. However, they may not meet all specifications.
- Dual output units may be connected to provide a 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.
- 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 12V input units, a 22.0 µF is recommended; for 24V & 48V units a 6.8 µF.
- 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**



**Heatsink Dimensions (Optional)**



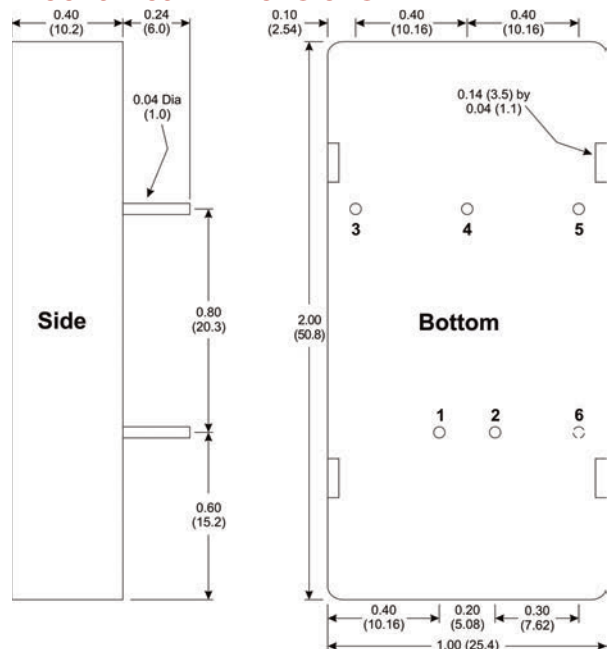
**Heatsink Notes:**

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

**Pin Connections**

Pin	Single	Dual
1	+Vin	+Vin
2	-Vin	-Vin
3	+Vout	+Vout
4	No Pin	Comm.
5	-Vout	-Vout
6	ON/OFF	ON/OFF

**Mechanical Dimensions**



**Mechanical Notes:**

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



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