



Features

- up to 10 watts output power
- 4:1 wide input voltage range
- international safety standard approval
- six-sided continuous shield
- high efficiency up to 84%
- standard 2" x 1" x 0.4" package
- fixed switching frequency

The JRW series of dc/dc converters features units of up to 10 watts in a 1.0" x 2.0" x 0.40" package. These units are PCB mountable, and include an input filter for low reflected ripple, continuous short-circuit protection, up to 1600VDC input/output isolation, and typical efficiencies of 80%.

SPECIFICATIONS

All specifications apply at 25°C unless otherwise noted.

SPECIFICATION	VALUE
<b>INPUT</b>	
Input Voltage (nominal)	24, 48 VDC
Input Filter	Pi Network
Remote ON/OFF	Positive or negative logic
<b>OUTPUT</b>	
Output Current	see table
Voltage Accuracy	±1%
Output Adjustability	
Line Regulation (HL-LL)	±0.2%
Load Regulation (20-100% load)	single: ±0.5%, dual: ±1%
Short Circuit Protection	hiccup, automatic recovery
Ripple/Noise (20MHz BW)	single: 50mVp-p, dual: 75mVp-p
Transient Response (50% load step)	250 uS
<b>GENERAL</b>	
Efficiency	up to 86%
Isolation Voltage (input to output)	1600VDC min.
Isolation Resistance (input to output)	10 <sup>9</sup> Ohm min.
Switching Frequency	300kHz typ.
<b>ENVIRONMENTAL</b>	
Operating Temperature (ambient)	-25°C to +85°C (derating): -40°C to +85°C(non)
Storage Temperature	-55°C to +105°C
Humidity (non-condensing)	5% to 95% RH
Cooling	
<b>PHYSICAL</b>	
Dimensions	1.0" x 2.0" x 0.40"
Weight	27g (0.95 Oz.)
Case Material	Nickel-coated copper with non-conductive baseplate
Shielding	six sided

due to advances in technology, specifications subject to change without notice.

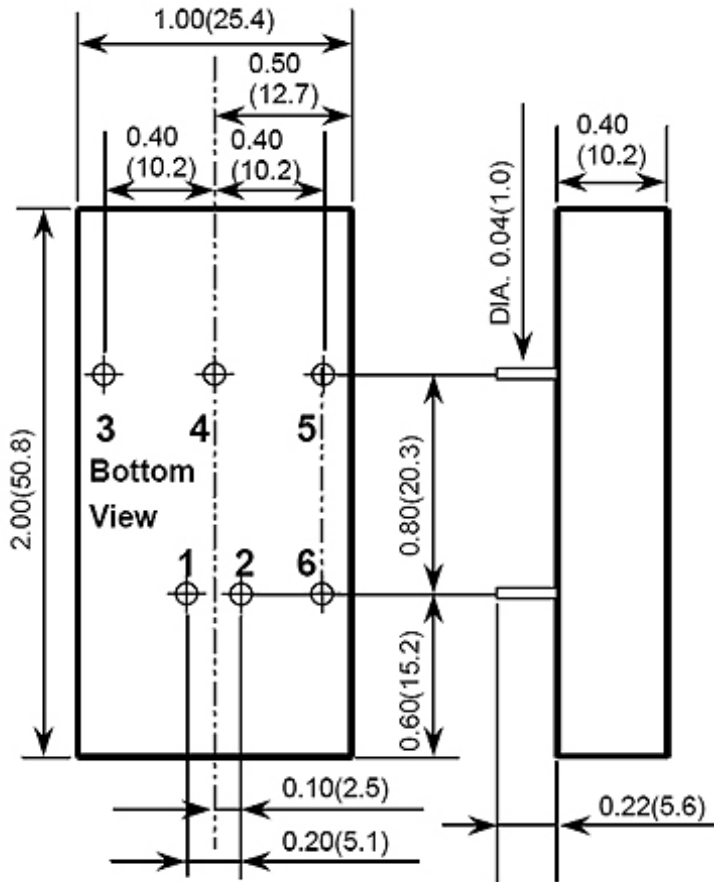
**NOTES**

- 1) The JRW series requires a minimum 10% loading on the output to maintain specified regulation. Operation under no-load condition will not damage these devices, however they may not meet all listed specifications.
- 2) Please add an external filter at converter input terminals when measuring input reflected ripple. L: Simulated source impedance of 12  $\mu$ H C: Nippon chemi-con KMF series 47 $\mu$ F/100V.
- 3) The ON/OFF control pin voltage is referenced to -Vin. To order positive logic add the suffix '-P', to order negative logic add the suffix '-R'.
- 4) BELLCORE TR-NWT-000332. Case I: 50% Stress, Temperature at 40°C. (Ground fixed and controlled environment)
- 5) M1 version is more efficient therefore it can be operated over a more extensive temperature range than standard version. Please add the suffix '-I' for M1 industrial grade temperature range models.
- 6) Heat sink is optional, consult factory.
- 7) The JRW series meets EN55022 class B with external components connected before the input pin to the converter.

MODELS

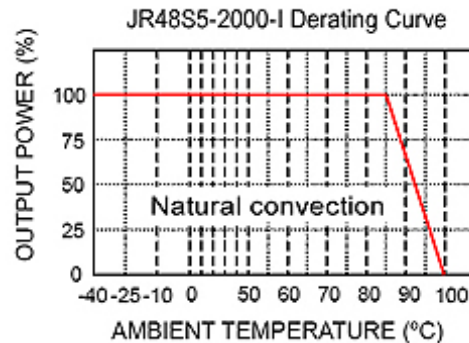
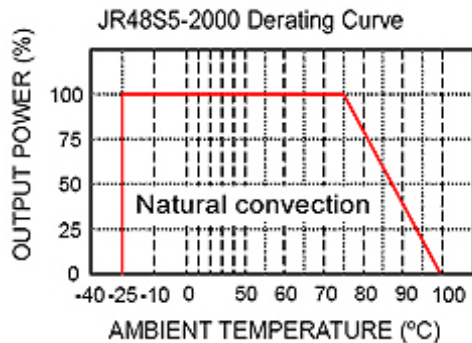
MODEL NUMBER	INPUT VOLTAGE (Range)	OUTPUT VOLTAGE	OUTPUT CURRENT	OUTPUT POWER (Watts)
JRW24S33-2500	24 VDC (9 - 36)	3.3	2.5 A	8.25
JRW24S5-2000	24 VDC (9 - 36)	5	2 A	10
JRW24D5-1000	24 VDC (9 - 36)	5, -5	1 A	10
JRW24S12-830	24 VDC (9 - 36)	12	830 mA	10
JRW24D12-420	24 VDC (9 - 36)	12, -12	420 mA	10
JRW24S15-660	24 VDC (9 - 36)	15	660 mA	10
JRW24D15-330	24 VDC (9 - 36)	15, -15	330 mA	10
JRW48S33-2500	48 VDC (18 - 75)	3.3	2.5 A	8.25
JRW48D5-1000	48 VDC (18 - 75)	5, -5	1 A	10
JRW48S5-2000	48 VDC (18 - 75)	5	2 A	10
JRW48S12-830	48 VDC (18 - 75)	12	830 mA	10
JRW48D12-420	48 VDC (18 - 75)	12, -12	420 mA	10
JRW48S15-660	48 VDC (18 - 75)	15	660 mA	10
JRW48D15-330	48 VDC (18 - 75)	15, -15	330 mA	10

MECHANICAL DRAWING & DERATINGS CURVE



PIN CONNECTIONS		
	Single	Dual
1	+Vin	+Vin
2	-Vin	-Vin
3	+Vout	+Vout
4	No pin	Common
5	-Vout	-Vout
6	Rem On/Off	Rem On/Off (Note 3)

1. All dimensions in Inches (mm)  
Tolerance : x.xx±0.02 (x.x±0.5)
2. Pin pitch tolerance ±0.014(0.35)



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- 10 WATTS OUTPUT POWER
- 4:1 ULTRA WIDE INPUT VOLTAGE RANGE
- INTERNATIONAL SAFETY STANDARD APPROVAL
- SIX-SIDED CONTINUOUS SHIELD
- HIGH EFFICIENCY UP TO 86%
- STANDARD 2" x 1" x 0.4" PACKAGE
- FIXED SWITCHING FREQUENCY

The JRW series offers 10 watts of output power from a 2 x 1 x 0.4 inch package. The JRW series has 4:1 ultra wide input voltage ranges of 9-36 and 18-75VDC. The JRW series features 1600VDC of isolation, short-circuit and over-voltage protection, as well as six sided shielding and EN60950-1 and UL60950-1 safety approval. All models are particularly suited to telecommunications, industrial, mobile telecom and test equipment applications. Extended operation temperature ranges are available as "M1" and "M2" versions for special applications (contact factory).

*All specifications are typical at nominal input, full load and 25°C unless otherwise noted.*

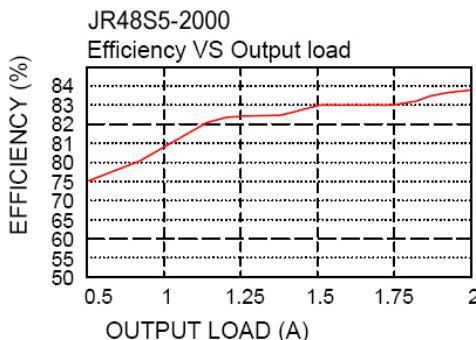
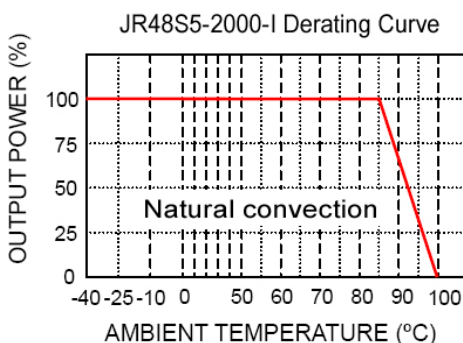
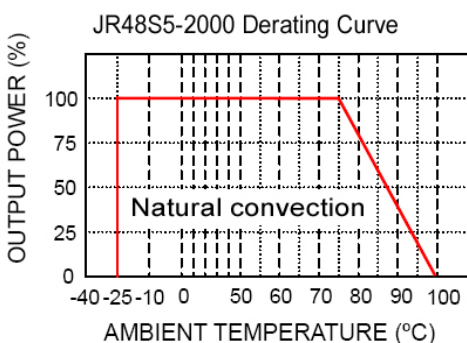
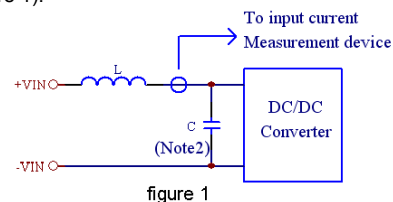
OUTPUT SPECIFICATIONS			
Output power			10 Watts max
Voltage accuracy	Full load and nominal Vin		±1%
Minimum Load (Note 1)			10% of FL
Line regulation	LL to HL at Full Load		±0.2%
Load regulation	10% to 100% FL	Single Dual	±0.5% ±1%
Cross regulation (Dual)	Asymmetrical load 25% / 100% FL		±5%
Ripple and noise	20MHz bandwidth	Single Dual	50mVp-p 75mVp-p
Temperature coefficient			±0.02% / °C, max
Transient response recovery time	25% load step change		250uS
Over voltage protection	5V output		6.2V
Zener diode clamp	12V output		15V
	15V output		18V
Over load protection	% of FL at nominal input		150% max
Short circuit protection			Hiccup, automatic recovery
INPUT SPECIFICATIONS			
Input voltage range	24V nominal input		9 – 36VDC
	48V nominal input		18 – 75VDC
Input filter			Pi type
Input surge voltage	24V input		50VDC
100mS max	48V input		100VDC
Input reflected ripple (Note 2)	Nominal Vin and full load		30mA <sub>p-p</sub>
Start up time	Nominal Vin and constant resistive load	Power up	20mS typ
Remote ON/OFF (Option) (Note 3)			
(Positive logic)	DC-DC ON	Open or 3.5V < Vr < 12V	
	DC-DC OFF	Short or 0V < Vr < 1.2V	
(Negative logic)	DC-DC ON	Short or 0V < Vr < 1.2V	
	DC-DC OFF	Open or 3.5V < Vr < 12V	
Remote off input current	Nominal Vin		20mA

GENERAL SPECIFICATIONS		
Efficiency		See table
Isolation voltage		1600VDC, min
Isolation resistance		10 <sup>9</sup> ohms, min
Isolation capacitance		300pF, max
Switching frequency		300KHz, typ
Approvals and standards		IEC60950-1, UL60950-1, EN60950-1
Case material		Nickel-coated copper
Base material		Non-conductive black plastic
Potting material		Epoxy (UL94-V0)
Dimensions		2.00 X 1.00 X 0.40 Inch (50.8 X 25.4 X 10.2 mm)
Weight		27g (0.95oz)
MTBF (Note 4)		1.976 x 10 <sup>6</sup> hrs
ENVIRONMENTAL SPECIFICATIONS		
Operating temperature range	Standard	-25°C ~ +85°C (with derating)
(Reference derating curve)	M1 (Note 5)	-40°C ~ +85°C (no derating)
	M2	-40°C ~ +85°C (with derating)
Maximum case temperature		100°C
Storage temperature range		-55°C ~ +105°C
Thermal impedance (Note 6)	Natural convection	12°C/Watt
	Natural convection with heat-sink	10°C/Watt
Thermal shock		MIL-STD-810D
Vibration		10~55Hz, 10G, 30 minutes along X, Y and Z
Relative humidity		5% to 95% RH
EMC CHARACTERISTICS		
Conducted emissions	EN55022	Class A
Radiated emissions	EN55022 EN55022 (Note 7)	Class A Class B
ESD	EN61000-4-2	Perf. Criteria B
Radiated immunity	EN61000-4-3	Perf. Criteria A
Fast transient	EN61000-4-4	Perf. Criteria B
Surge	EN61000-4-5	Perf. Criteria B
Conducted immunity	EN61000-4-6	Perf. Criteria A

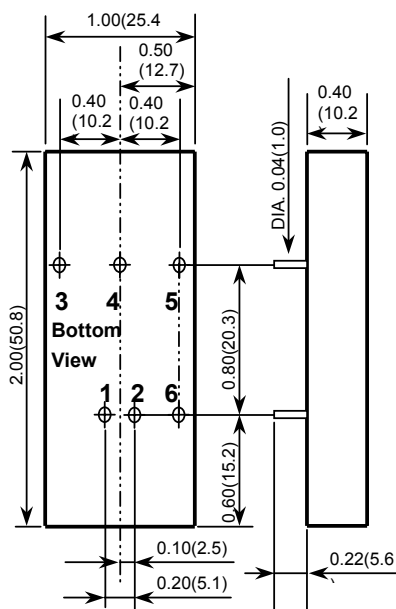
Model Number	Input Range	Output Voltage	Output Current	Input Current <sup>(8)</sup>	Eff <sup>(9)</sup> (%)	Capacitor <sup>(10)</sup> Load max
JRW24S33-2500	9 – 36 VDC	3.3 VDC	2500mA	465mA	78	6800uF
JRW24S5-2000	9 – 36 VDC	5 VDC	2000mA	548mA	80	4700uF
JRW24S12-830	9 – 36 VDC	12 VDC	830mA	519mA	84	690uF
JRW24S15-660	9 – 36 VDC	15 VDC	670mA	544mA	81	470uF
JRW24D5-1000	9 – 36 VDC	±5 VDC	±1000mA	534mA	82	±680uF
JRW24D12-420	9 – 36 VDC	±12 VDC	±416mA	547mA	80	±330uF
JRW24D15-330	9 – 36 VDC	±15 VDC	±333mA	548mA	80	±110uF
JRW48S33-2500	18 – 75 VDC	3.3 VDC	2500mA	239mA	76	6800uF
JRW48S5-2000	18 – 75 VDC	5 VDC	2000mA	270mA	81	4700uF
JRW48S12-830	18 – 75 VDC	12 VDC	830mA	259mA	84	690uF
JRW48S15-660	18 – 75 VDC	15 VDC	670mA	262mA	84	470uF
JRW48D5-1000	18 – 75 VDC	±5 VDC	±1000mA	267mA	82	±680uF
JRW48D12-420	18 – 75 VDC	±12 VDC	±416mA	281mA	78	±330uF
JRW48D15-330	18 – 75 VDC	±15 VDC	±333mA	270mA	81	±110uF

**Note**

- The JRW series requires a minimum 10% loading on the output to maintain specified regulation. Operation under no-load condition will not damage these devices, however they may not meet all listed specifications.
- Please add an external filter at converter input terminals when measuring input reflected ripple (see Figure 1).  
L: Simulated source impedance of 12 uH C: Nippon chemi-con KMF series 47uF/100V
- The ON/OFF control pin voltage is referenced to -Vin.  
To order positive logic On/Off control add the suffix '-P' (Ex: JRW24S5-2000-P)  
To order negative logic On/Off control add the suffix '-R' (Ex: JRW24S5-2000-R)
- BELLCORE TR-NWT-000332. Case I: 50% Stress, Temperature at 40°C.  
(Ground fixed and controlled environment)
- M1 version is more efficient therefore it can be operated over a more extensive temperature range than standard version. Please add the suffix '-I' for M1 industrial grade temperature range models.
- Heat sink is optional, consult factory.
- The JRW series meets EN55022 class B with external components connected before the input pin to the converter.
- Maximum value at nominal input voltage and full load of standard type.
- Typical value at nominal input voltage and full load.
- Tested at minimum Vin and constant resistive load.



PIN CONNECTION		
PIN	SINGLE	DUAL
1	+ INPUT	+ INPUT
2	- INPUT	- INPUT
3	+ OUTPUT	+ OUTPUT
4	NO PIN	COMMON
5	- OUTPUT	- OUTPUT
6	CTRL (Option)	CTRL (Option)



- All dimensions in Inches(mm)  
Tolerance x.xx ±0.02(x.x ±0.5)
- Pin Pitch tolerance ±0.014(0.35)