Wall Industries, Inc.

JR Series
Single and Dual Outputs
10 Watt DC/DC Converter
2:1 Wide Input Voltage Range

FEATURES

- 10 Watts Output Power
- High Efficiency up to 86%
- Fixed Switching Frequency
- Six-Sided Continuous Shield
- 2:1 Wide Input Voltage Range
- Standard 2 x 1 x 0.4 inch Package
- International Safety Standard Approval
- Options: Add suffix "-I" for Extended Operating Temperature Range

UL
TUV
CB
CE MARK

SPECIFICATIONS: *JR Series*

All specifications apply @ 25°C ambient unless otherwise noted

INPUT SPECIFICATIONS

Input Voltage Range	5V nominal input	4.5 - 9VDC
	12V nominal input	9 - 18VDC
	24V nominal input	18 - 36VDC
	48V nominal input	36 - 75VDC
Input Filter		Pi Type
Input Surge Voltage (100ms max)	5V input	15VDC
	12V input	36VDC
	24V input	50VDC
	48V input	100VDC
Input Reflected Ripple Current (See Note 2) (nominal Vin and full load)		30mAp-p
Start Up Time (nominal Vin and constant resistive load)		20ms typ.
Remote ON/OFF (Option) (See 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

OUTPUT SPECIFICATIONS

Output Voltage		see table
Voltage Accuracy (nominal Vin and full load)		±1%
Output Current		see table
Output Power		10 watts max.
Line Regulation (LL to HL at FL)		±0.2%
Load Regulation (10% - 100 % FL)	Single Output	±0.5%
	Dual Output	±1%
Cross Regulation (Dual) (Asymmetrical load 25% / 100% FL)		±5%
Minimum Load (See Note 1)		10% of full load
Ripple/Noise (20 MHz BW)	Single Output	50mVp-p
	Dual Output	75mVp-p
Temperature Coefficient		±0.02% / °C max.
Transient Response Recovery Time (25% load step)		250us

PROTECTION SPECIFICATIONS

Over Voltage Protection (zener diode clamp)	3.3V output	3.9V
	5V output	6.2V
	12V output	15V
	15V output	18V
Over Load Protection (% of full load at nominal input)		150% max.
Short Circuit Protection.		Hiccup, automatic recovery

GENERAL SPECIFICATIONS

Efficiency	see table
Switching Frequency	300KHz typ.
Isolation Voltage (Input to Output)	1600VDC min.
Isolation Resistance	10^9 ohms min.
Isolation Capacitance	300pF max.

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature (See derating curves)	
Standard	-25°C ~ +85°C (with derating)
"I" (See Note 5)	-40°C ~ +85°C (no derating) (except for 5V input models)
Storage Temperature	-55°C ~ +105°C
Maximum Case Temperature	100°C
Relative Humidity	5% to 95% RH
Thermal Impedance (See 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
MTBF (See Note 4)	1.976 x 10^6 hours

PHYSICAL SPECIFICATIONS

Weight	27g (0.95 oz)
Dimensions	2.0 x 1.0 x 0.40 inches (50.8 x 25.4 x 10.2 mm)
Case Material	Nickel-coated copper
Base Material	Non-conductive black plastic
Potting material	Epoxy (UL94-V0)
Shielding	six-sided

SAFETY & EMC

Approvals and Standards	IEC60950-1, UL60950-1, EN60950-1 (except for 5V input models)	
Conducted Emissions	EN55022	Class A
Radiated Emissions	EN55022	Class A
	EN55022 (See Note 7)	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

Due to advances in technology, specifications subject to change without notice

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OUTPUT VOLTAGE / CURRENT RATING CHART

Model Number	Input Range	Output Voltage	Output Current	Output Ripple & Noise	Input Current [8]	Efficiency [9]	Capacitor Load max [10]
JR5S5-2000	5 VDC (4.5 – 9 VDC)	5 VDC	2000mA	50mVp-p	2500mA	79%	7900µF
JR5S12-830		12 VDC	830mA	50mVp-p	2350mA	82%	2200µF
JR5S15-660		15 VDC	670mA	50mVp-p	2348mA	82%	1470µF
JR5D5-1000		± 5 VDC	±1000mA	75mVp-p	2461mA	80%	±5060µF
JR5D12-420		± 12 VDC	±416mA	75mVp-p	2503mA	80%	±1034µF
JR5D15-330		± 15 VDC	±333mA	75mVp-p	2393mA	81%	±660µF
JR12S33-2000	12 VDC (9 – 18 VDC)	3.3 VDC	2000mA	50mVp-p	724mA	80%	6800µF
JR12S5-2000		5 VDC	2000mA	50mVp-p	1082mA	81%	4700µF
JR12S12-830		12 VDC	830mA	50mVp-p	1037mA	84%	690µF
JR12S15-660		15 VDC	670mA	50mVp-p	1046mA	84%	470µF
JR12D5-1000		± 5 VDC	±1000mA	75mVp-p	1042mA	84%	±680µF
JR12D12-420		± 12 VDC	±416mA	75mVp-p	1053mA	83%	±330µF
JR12D15-330		± 15 VDC	±333mA	75mVp-p	1041mA	84%	±110µF
JR24S33-2000	24 VDC (18 – 36 VDC)	3.3 VDC	2000mA	50mVp-p	362mA	80%	6800µF
JR24S5-2000		5 VDC	2000mA	50mVp-p	534mA	82%	4700µF
JR24S12-830		12 VDC	830mA	50mVp-p	519mA	84%	690µF
JR24S15-660		15 VDC	670mA	50mVp-p	523mA	84%	470µF
JR24D5-1000		± 5 VDC	±1000mA	75mVp-p	527mA	83%	±680µF
JR24D12-420		± 12 VDC	±416mA	75mVp-p	513mA	85%	±330µF
JR24D15-330		± 15 VDC	±333mA	75mVp-p	520mA	84%	±110µF
JR48S33-2000	48 VDC (36 – 75 VDC)	3.3 VDC	2000mA	50mVp-p	181mA	80%	6800µF
JR48S5-2000		5 VDC	2000mA	50mVp-p	260mA	84%	4700µF
JR48S12-830		12 VDC	830mA	50mVp-p	253mA	86%	690µF
JR48S15-660		15 VDC	670mA	50mVp-p	252mA	87%	470µF
JR48D5-1000		± 5 VDC	±1000mA	75mVp-p	260mA	84%	±680µF
JR48D12-420		± 12 VDC	±416mA	75mVp-p	254mA	86%	±330µF
JR48D15-330		± 15 VDC	±333mA	75mVp-p	256mA	85%	±110µF

NOTES

1. The JR 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 current (See Figure 1).
   L: Simulated source impedance of 12uH C: Nippon chemi-con KMF Series 47uF/100V.
3. The ON/OFF control pin voltage is referenced to –Vin.
   To order negative logic On/Off control add the suffix "R" (Ex: JR12S5-2000R).
4. BELLCORE TR-NWT-000332. Case 1: 50% Stress, Temperature at 40ºC. (Ground fixed and controlled environment).
5. "I" Version is more efficient; therefore, it can be operated over a more extensive temperature range than the standard version. Please add the suffix "-I" for industrial grade temperature range models.
6. Heat sink is optional, please consult factory for ordering details.
7. The JR Series meets 55022 class B with external components connected before the input pin to the converter.
8. Maximum value at nominal input voltage and full load of standard type.
9. Typical value at nominal input voltage and no load.
10. Tested at minimum Vin and constant resistive load.

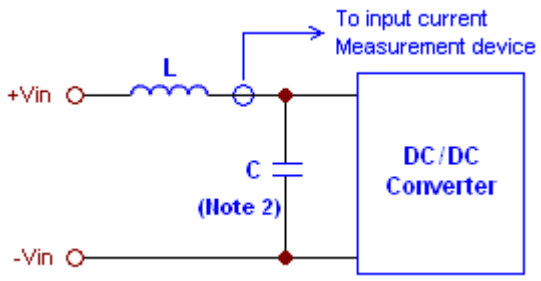
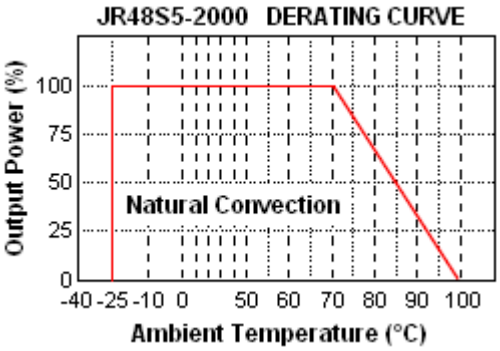
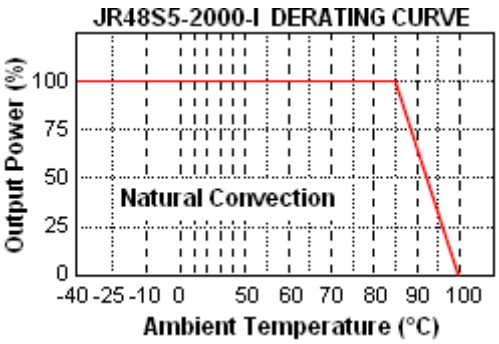
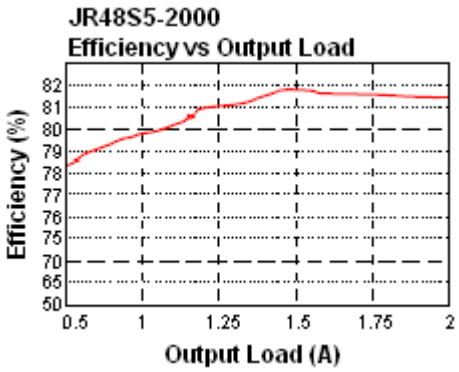


Figure 1

DERATING CURVES & EFFICIENCY GRAPHS

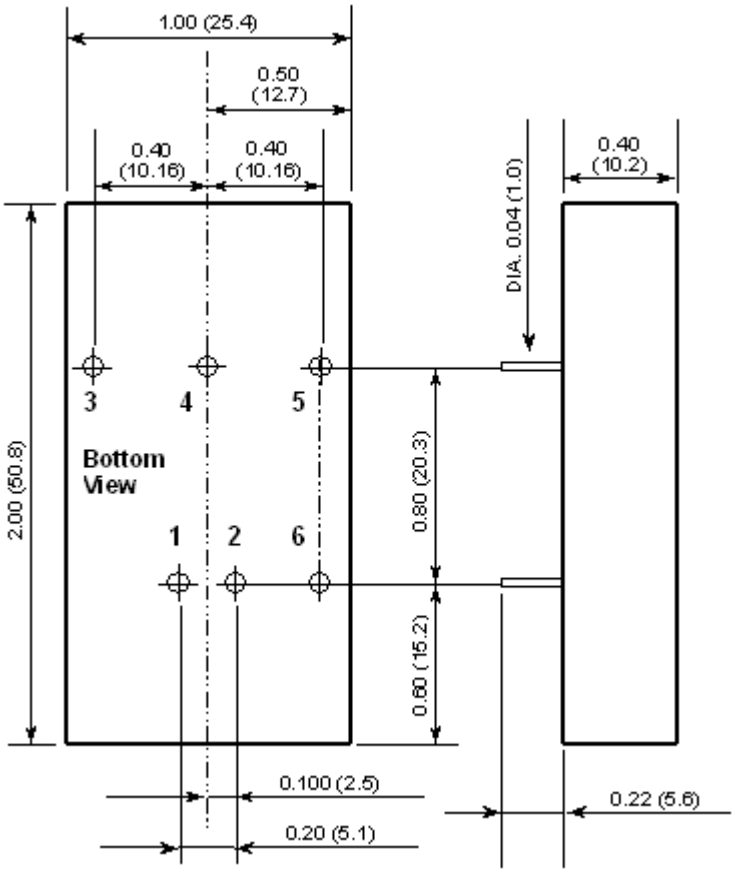






MECHANICAL DRAWING

UNIT: inches (mm)



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)

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