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JWL40 series

XP Power

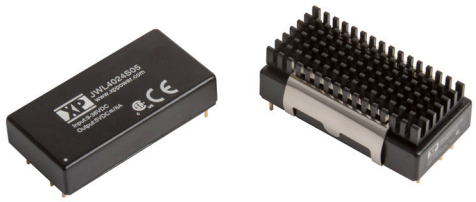
40W Convection cooled

DC-DC converters

The 40W JWL40 series is housed in a 50.8 x 25.4 x 11.0mm (2" x 1" x 0.43") metal cased package. Featuring a 4:1 input voltage range of 9 to 36VDC for nominal 24VDC or 18 to 75VDC for a nominal 48VDC, ideal for many applications that demand multiple input voltages or where the input voltage varies widely.

Single output models provide 3.3, 5, 12, 15 or 24VDC and dual outputs of ±12VDC, or ±15VDC that can be configured as a single 30VDC. The JWL40 has a regulated output and provides 1.5kVDC isolation between input and output. Remote on/off is standard.

Operating temperature range is from -40°C to +105°C, with derating above +40°C. An optional heatsink (suffix -HK) extends the full power operating temperature when fitted.



Features

- Regulated single outputs 3.3 to 24VDC
- Regulated dual outputs ±12 & ±15VDC
- 4:1 input range
- 50.8 x 25.4mm (2" x 1") footprint, 11.0mm profile
- 1.5kVDC isolation
- Remote On/Off
- Optional Heatsink
- -40°C to +105°C operating temperature
- Full power to +40°C
- 3 year warranty

Applications

Autonomous equipment

Industrial electronics & robotics

Technology

Dimensions

JWL40 (24V output)
50.8 x 25.4 x 11.0mm (2.00 x 1.00 x 0.43")

JWL40 (All other models)
50.8 x 25.4 x 10.2mm (2.00 x 1.00 x 0.40")

Documentation

For further information click the link or scan the code

→ xppower.com

Models & ratings

Model number[4]	Input voltage	Output voltage	Output current	Efficiency	Input current[1,2]		Overvoltage Protection	Maximum capacitive load[3]
					No load	Full load		
JWL4024S3V3	9-36VDC	3V3VDC	8.00A	89%	90mA	1.24A	3.9VDC	21000µF
JWL4024S05		5.0VDC	8.00A	90%	90mA	1.85A	6.2VDC	13600µF
JWL4024S12		12.0VDC	3.33A	89%	95mA	1.87A	15.0VDC	2400µF
JWL4024S15		15.0VDC	2.67A	89%	105mA	1.87A	18.0VDC	1500µF
JWL4024S24		24.0VDC	1.67A	91%	115mA	1.84A	30VDC	600µF
JWL4024D12		±12.0VDC	±1.67A	88%	65mA	1.89A	±15.0VDC	±1200µF
JWL4024D15		±15.0VDC	±1.33A	88%	65mA	1.89A	±18.0VDC	±750µF

Continued on page 2

Notes:

1. Input currents measured at nominal input voltage.
2. Input current is typically 2.5mA at nominal input voltage when output is turned off using remote on/off.
3. Maximum capacitive load is per output.
4. Add suffix "-HK" for optional heatsink.

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DC-DC converters

Models & ratings

Model number[4]	Input voltage	Output voltage	Output current	Efficiency	Input current[1,2]		Overvoltage Protection	Maximum capacitive load[3]
					No load	Full load		
JWL4048S3V3	18-75VDC	3V3VDC	8.00A	89%	55mA	0.62A	3.9VDC	21000µF
JWL4048S05		5.0VDC	8.00A	90%	55mA	0.93A	6.2VDC	13600µF
JWL4048S12		12.0VDC	3.33A	90%	69mA	0.93A	15.0VDC	2400µF
JWL4048S15		15.0VDC	2.67A	90%	65mA	0.93A	18.0VDC	1500µF
JWL4048S24		24.0VDC	1.67A	91%	75mA	0.92A	30VDC	600µF
JWL4048D12		±12.0VDC	±1.67A	88%	45mA	0.95A	±15.0VDC	±1200µF
JWL4048D15		±15.0VDC	±1.33A	88%	45mA	0.95A	±18.0VDC	±750µF

Notes:

1. Input currents measured at nominal input voltage.
2. Input current is typically 2.5mA at nominal input voltage when output is turned off using remote on/off.
3. Maximum capacitive load is per output.
4. Add suffix "-HK" for optional heatsink.

Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Input voltage range	9		36	VDC	24VDC nominal
	18		75		48VDC nominal
Input filter	Internal Pi type				
Input surge			50	VDC	24VDC models (for 1s)
			100		48VDC models (for 1s)
Remote On/Off	ON: Logic high (3.5-12 V) or open circuit OFF: Logic low (<1.2 V) or short pin 2 to pin 3				

Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Output voltage	3.3		30	VDC	See models and ratings table
Output voltage trim			±10	%	See application notes
Initial set accuracy			±1	%	At full load
Output voltage balance			±2	%	For dual output with balanced loads
Minimum load	0			A	No minimum load required
Line regulation			±0.5	%	From minimum to maximum input at full load
Load regulation			±0.5/±1.0	%	Single/dual output, from 0 to full load
Cross regulation			±5	%	On dual output models when one load is varied between 25% and 100% and other is fixed at 100%
Transient Response		3	5	% deviation	Recovery within 1% in less than 250µs for a 25% load change.
Ripple & noise			100/150	mV pk-pk	3.3 & 5VDC output / other models. 20MHz bandwidth. Measured using 0.47µF ceramic capacitor.
Short circuit protection	Continuous trip and restart (hiccup mode), with auto recovery				
Maximum capacitive load	See models and ratings table				
Temperature coefficient			0.02	%/˚C	
Overload protection		150		%	

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DC-DC converters

General

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Efficiency		90		%	See models & ratings table
Isolation: input to output	1500/1800			VDC	60s/1s functional
Isolation capacitance			1500	pF	
Isolation resistance	10^9			Ω	At 500VDC
Switching frequency		285		kHz	
Power density			3.05 (50.0)	W/cm³ (W/in³)	
Mean time between failure		320		khrs	MIL-HDBK-217F, +25°C GB
Weight		30.0 (0.066)		g (lb)	

Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Operating temperature	-40		+105	°C	See derating curve
Storage temperature	-50		+125	°C	
Case temperature			+105	°C	
Cooling	Natural convection				
Humidity			95	%	RH, non condensing
Thermal impedance to air			12/10	°C/W	No heatsink/with heatsink

Safety approvals

Safety agency	Standard	Notes & conditions
UL	UL60950-1, UL62368-1	Information technology
CE	Meets all applicable directives	
UKCA	Meets all applicable legislation	

Emissions - EMC

Phenomenon	Standard	Test level	Notes & conditions
Conducted	EN55022	Class A	See application note

Immunity - EMC

Phenomenon	Standard	Test level	Criteria	Notes & conditions
ESD immunity	EN61000-4-2	±6kV/±8kV	A	Air discharge/contact discharge
Radiated immunity	EN61000-4-3	10V/m	A	
EFT/burst	EN61000-4-4	±2kV	A	With external capacitor, suggested part is CHEMI-CON KY 220µF/100V
Surge	EN61000-4-5	±1kV	A	With external capacitor, suggested part is CHEMI-CON KY 220µF/100V
Conducted immunity	EN61000-4-6	10Vrms	A	

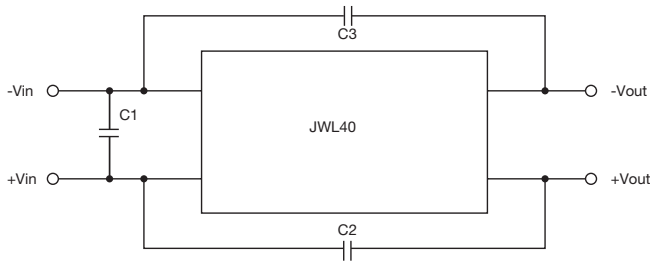
JWL40 series

DC-DC converters

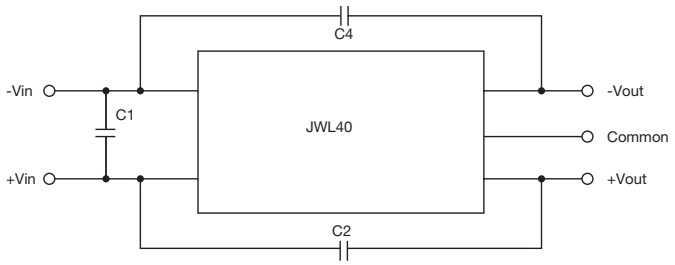
Application notes

EMI filter for conducted emissions

Single output

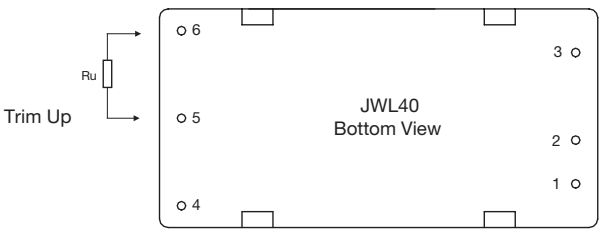


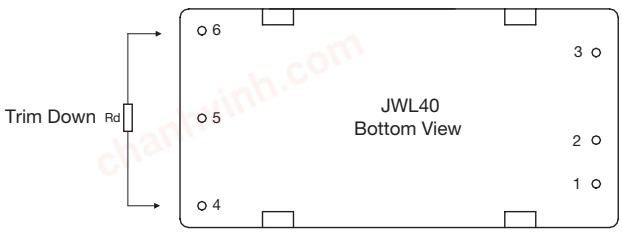
Dual output



Class	Model	C1	C2	C3	C4
Single output	24VDC	4.7µF/50V 1812 MLCC	1000pF/2kV 1808 MLCC	1000pF/2kV 1808 MLCC	None
	48VDC	2.2µF/50V 1812 MLCC	1000pF/2kV 1808 MLCC	1000pF/2kV 1808 MLCC	
Dual output	24VDC	4.7µF/50V 1812 MLCC	1000pF/2kV 1808 MLCC	None	1000pF/2kV 1808 MLCC
	48VDC	2.2µF/50V 1812 MLCC	1000pF/2kV 1808 MLCC		1000pF/2kV 1808 MLCC

External output trimming





Trim down resistor values (Rd)

Model	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
	Voutx0.99	Voutx0.98	Voutx0.97	Voutx0.96	Voutx0.95	Voutx0.94	Voutx0.93	Voutx0.92	Voutx0.91	Voutx0.90
3V3	72.61kΩ	32.55kΩ	19.20kΩ	12.52kΩ	8.51kΩ	5.84kΩ	3.94kΩ	2.51kΩ	1.39kΩ	0.50kΩ
5V	138.88kΩ	62.41kΩ	36.92kΩ	24.18kΩ	16.53kΩ	11.44kΩ	7.79kΩ	5.06kΩ	2.94kΩ	1.24kΩ
12V	413.55kΩ	184.55kΩ	108.22kΩ	70.05kΩ	47.15kΩ	31.88kΩ	20.98kΩ	12.80kΩ	6.44kΩ	1.35kΩ
15V	530.73kΩ	238.61kΩ	141.24kΩ	92.56kΩ	63.35kΩ	43.87kΩ	29.96kΩ	19.53kΩ	11.41kΩ	4.92kΩ
24V	333.39kΩ	148.80kΩ	87.26kΩ	56.50kΩ	38.04kΩ	25.73kΩ	16.94kΩ	10.35kΩ	5.22kΩ	1.12kΩ

Trim up resistor values (Ru)

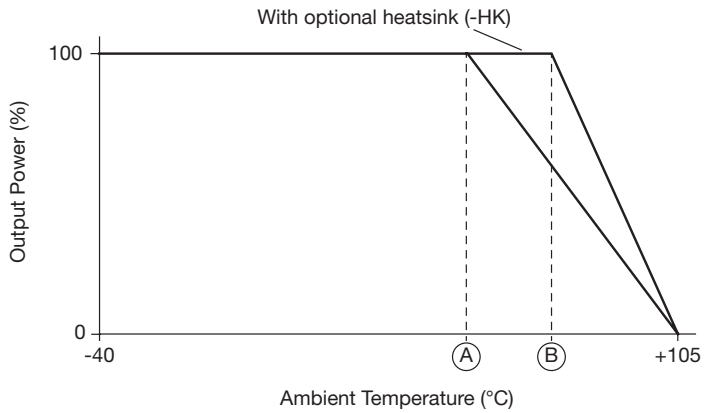
Model	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
	Voutx1.01	Voutx1.02	Voutx1.03	Voutx1.04	Voutx1.05	Voutx1.06	Voutx1.07	Voutx1.08	Voutx1.09	Voutx1.10
3V3	60.84kΩ	27.40kΩ	16.25kΩ	10.68kΩ	7.34kΩ	5.11kΩ	3.51kΩ	2.32kΩ	1.39kΩ	0.65kΩ
5V	106.87kΩ	47.76kΩ	28.06kΩ	18.21kΩ	12.30kΩ	8.36kΩ	5.55kΩ	3.44kΩ	1.79kΩ	0.48kΩ
12V	351.00kΩ	157.50kΩ	93.00kΩ	60.75kΩ	41.40kΩ	28.50kΩ	19.29kΩ	12.37kΩ	7.00kΩ	2.70kΩ
15V	422.77kΩ	189.89kΩ	112.26kΩ	73.44kΩ	50.15kΩ	34.63kΩ	23.54kΩ	15.22kΩ	8.75kΩ	3.58kΩ
24V	243.70kΩ	108.50kΩ	63.43kΩ	40.90kΩ	27.38kΩ	18.37kΩ	11.93kΩ	7.10kΩ	3.34kΩ	0.34kΩ

JWL40 series

DC-DC converters

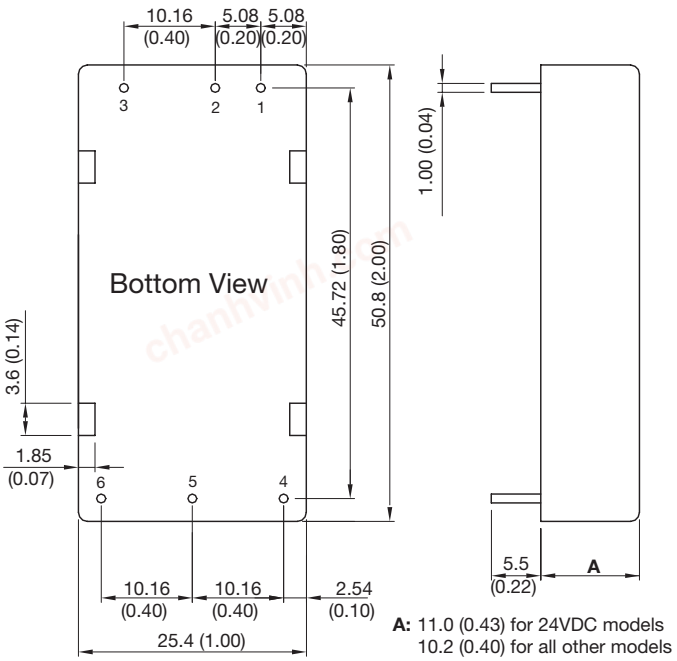
Application notes

Derating curve



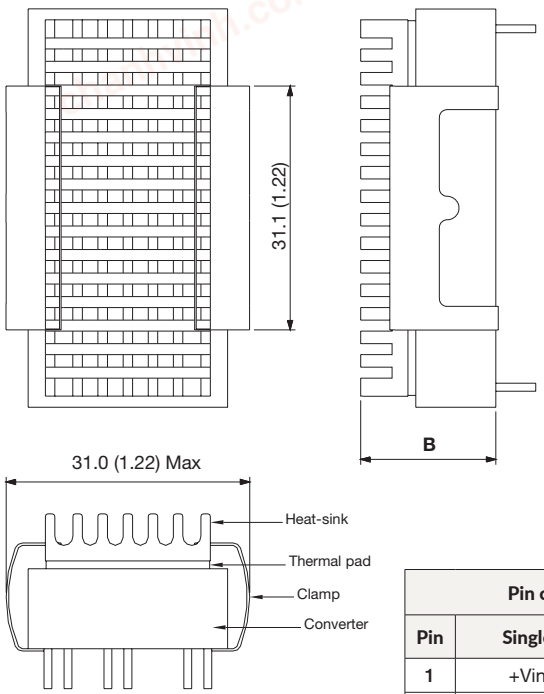
Models - JWL40	Max Ambient Temperature	
	No Heatsink (A)	With Heatsink (B)
24S3V3, 48S3V3	+66°C	+73°C
24S05, 48S05, 48S12, 48S15	+51°C	+61°C
24S12, 24S15	+45°C	+57°C
24S24, 48S24	+57°C	+66°C
24D12, 24D15, 48D12, 48D15	+40°C	+52°C

Mechanical details



A: 11.0 (0.43) for 24VDC models
10.2 (0.40) for all other models
B: 18.0 (0.71) for 24VDC models
17.2 (0.68) for all other models

Optional Heatsink (-HK)



Pin connections		
Pin	Single	Dual
1	+Vin	+Vin
2	-Vin	-Vin
3	Remote On/Off	Remote On/Off
4	+Vout	+Vout
5	-Vout	Common
6	Trim	-Vout

Notes:

1. All dimensions are in mm (inches).
2. Weight: 30.0g (0.066lb) approx
2. Tolerance: x.x (x.xx) = ±0.5 (±0.02). x.xx (x.xxx) = ±0.25 (±0.01)
3. Pin tolerance: ±0.05 (±0.002)