JWL50 series

XP Power

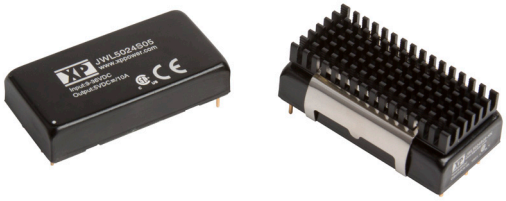
50W Convection cooled

DC-DC converters

The 50W JWL50 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.

Regulated single outputs are 3.3, 5, 12, 15 or 24VDC. The JWL50 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 +46°C. An optional heatsink (suffix -HK) extends the full power operating temperature when fitted.



Features

- Regulated single outputs 3.3 to 24VDC
- 4:1 input range
- 50.8 x 25.4mm (2" x 1") footprint, 11.5mm (0.45") profile
- 1.5kVDC isolation
- Remote On/Off
- Optional heatsink
- -40°C to +105°C operating temperature
- Full power to +46°C
- 3 year warranty

Applications

Autonomous equipment

Industrial electronics & robotics

Technology

Dimensions

50.8 x 25.4 x 11.0mm (2.0 x 1.0 x 0.45")

Documentation

For further information click the link or scan the code

→ xppower.com

Models & ratings

Model number[3]	Input voltage	Output voltage	Output current	Efficiency	Input current[1,2]		Overvoltage Protection	Maximum capacitive load
					No load	Full load		
JWL5024S3V3	9-36VDC	3V3VDC	10.00A	90%	80mA	1.53A	3.9VDC	26000µF
JWL5024S05		5.0VDC	10.00A	91%	60mA	2.29A	6.2VDC	17000µF
JWL5024S12		12.0VDC	4.17A	92%	80mA	2.27A	15.0VDC	3000µF
JWL5024S15		15.0VDC	3.33A	92%	80mA	2.26A	18.0VDC	2000µF
JWL5024S24		24.0VDC	2.08A	91%	80mA	2.29A	30.0VDC	750µF

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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. Add suffix "-HK" for optional heatsink.

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Models & ratings

Model number[3]	Input voltage	Output voltage	Output current	Efficiency	Input current[1,2]		Overvoltage Protection	Maximum capacitive load
					No load	Full load		
JWL5048S3V3	18-75VDC	3V3VDC	10.00A	90%	40mA	0.76A	3.9VDC	26000µF
JWL5048S05		5.0VDC	10.00A	91%	30mA	1.15A	6.2VDC	17000µF
JWL5048S12		12.0VDC	4.17A	92%	60mA	1.13A	15.0VDC	3000µF
JWL5048S15		15.0VDC	3.33A	92%	60mA	1.13A	18.0VDC	2000µF
JWL5048S24		24.0VDC	2.08A	91%	50mA	1.14A	30.0VDC	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. 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 (3.5-12V) or open circuit OFF: Logic low (<1.2V) or short pin 2 to pin 3				

Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Output voltage	3.3		24	VDC	See models and ratings table
Output voltage trim			±10	%	See application notes
Initial set accuracy			±1	%	At full load
Minimum load	0			%	No minimum load required
Line regulation			±0.5	%	From minimum to maximum input at full load
Load regulation			±0.5	%	From 0 to full load
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 1µF MLCC & 10µF tantalum capacitor.
Short circuit protection	Continuous trip and restart (hiccup mode), with auto recovery				
Temperature coefficient			0.02	%/˚C	
Overload protection		150		%	

JWL50 series

General

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Efficiency		90		%	See models & ratings table
Isolation: input to output	1500			VDC	60s functional
Isolation capacitance			2200	pF	
Isolation resistance	10^9			Ω	At 500VDC
Switching frequency		285		kHz	
Power density			3.53 (58.0)	W/cm³ (W/in³)	
Mean time between failure		230		khrs	MIL-HDBK-217F, +25°C GB
Case material	Black anodised aluminium with plastic base UL94V-0 rated				
Pin material	Gold plated with copper alloy and nickel base				
Potting material	Epoxy UL94V-0 rated				
Solder profile	Max 260°C 1.5mm from case 10s				
Weight		34.0 (0.074)		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			12.1/9.8	°C/W	No heatsink / with heatsink
Altitude			6000	m	Operating. Storage to 10,000m

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

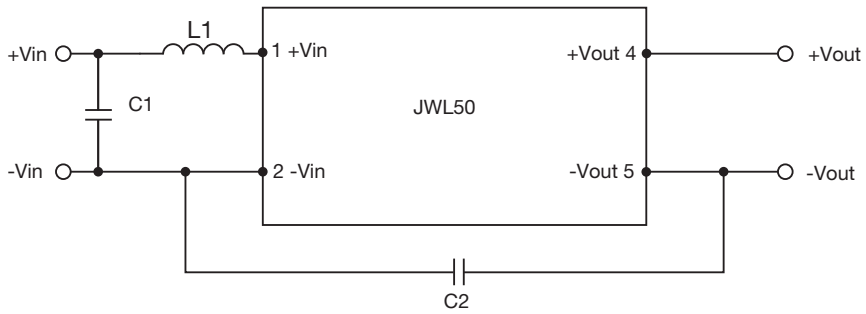
Phenomenon	Standard	Test level	Notes & conditions
Conducted	EN55032	Class A	See application note

Immunity - EMC

Phenomenon	Standard	Test level	Criteria	Notes & conditions
ESD immunity	EN61000-4-2	±6kV/±8kV	A	Contact discharge/air 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	

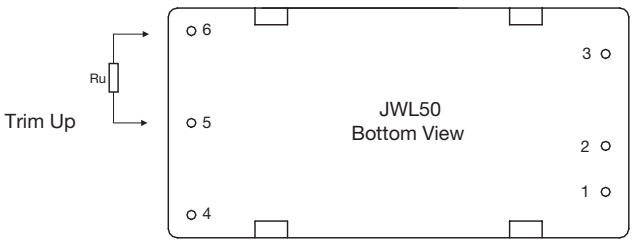
Application notes

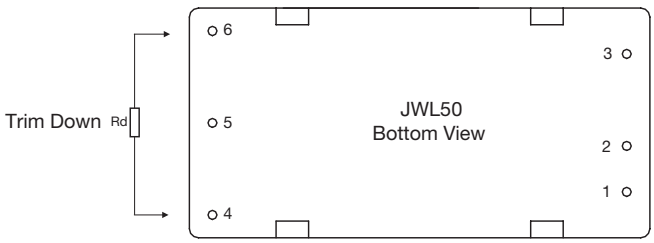
EMI filter for conducted emissions



Class	Model	C1	C2	L1
Class A	24VDC	10µF/50V 1210 X7S MLCC	1000 pF/2kV 1206 MLCC	1.5µH
	48VDC	3.3µF/100V 1210 X7S MLCC	1000 pF/2kV 1206 MLCC	6.8µH

External output trimming





Trim down resistor values (Rd)

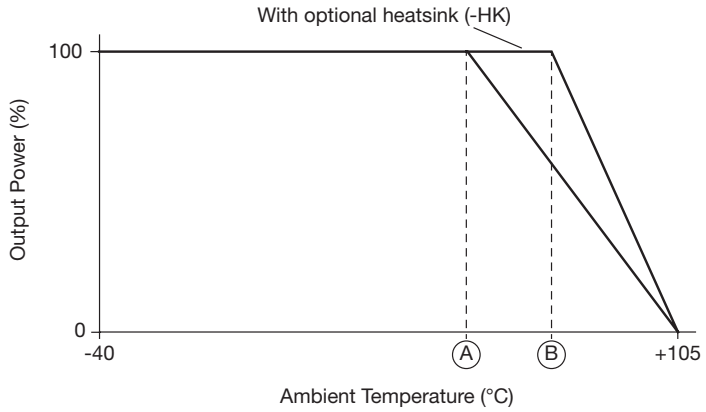
Model	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
	Voutx0.99	Voutx0.98	Voutx0.97	Voutx0.96	Voutx0.95	Voutx0.94	Voutx0.93	Voutx0.92	Voutx0.91	Voutx0.90
3V3	72.61kΩ	32.55kΩ	19.20kΩ	12.52kΩ	8.51kΩ	5.84kΩ	3.94kΩ	2.51kΩ	1.39kΩ	0.50kΩ
5V	138.88kΩ	62.41kΩ	36.92kΩ	24.18kΩ	16.53kΩ	11.44kΩ	7.79kΩ	5.06kΩ	2.94kΩ	1.24kΩ
12V	413.55kΩ	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

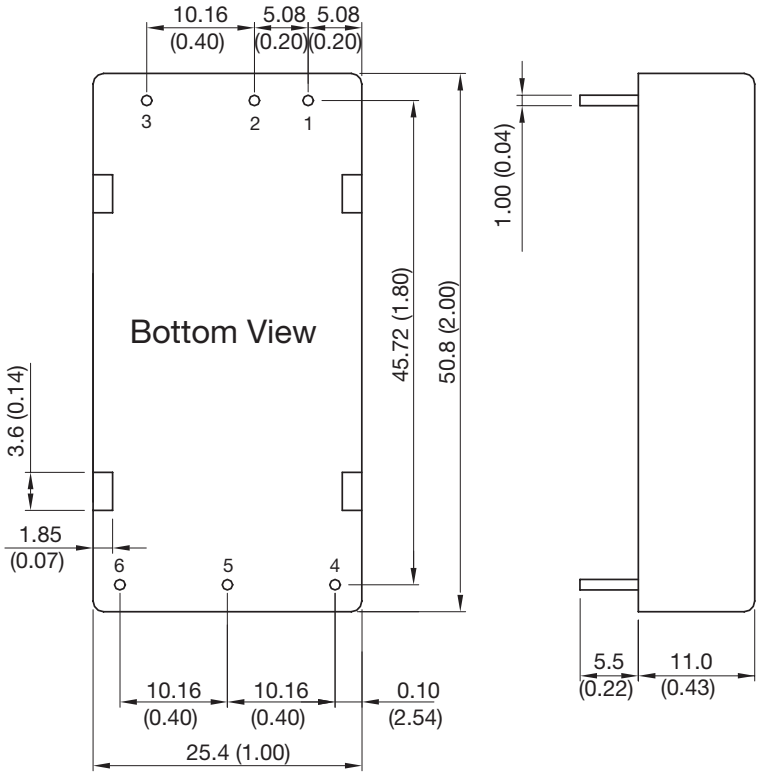
Application notes

Derating curve

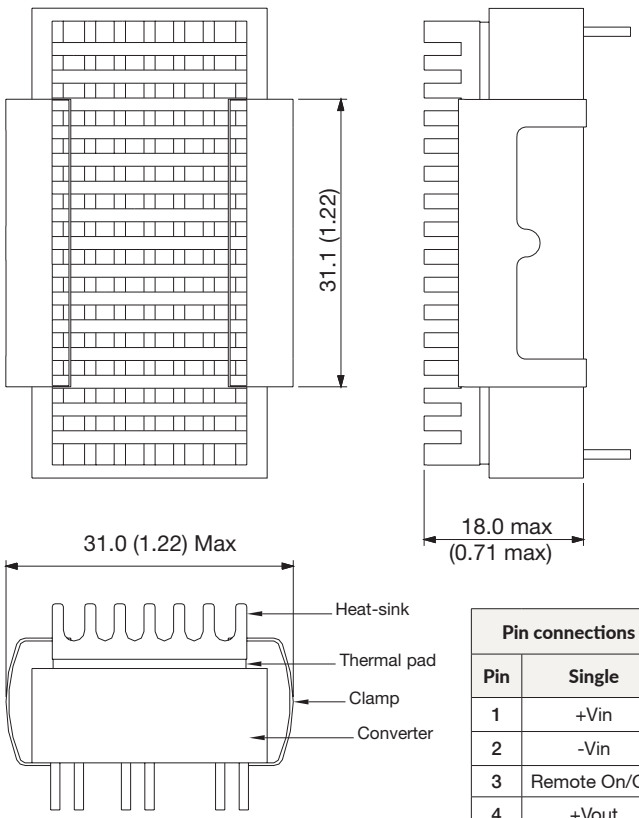


Models - JWL50	Max Ambient Temperature	
	No Heatsink (A)	With Heatsink (B)
24S3V3, 48S3V3	61°C	69°C
24S12, 24S15, 48S12, 48S15	53°C	62°C
24S05, 24S24, 48S05, 48S24	46°C	57°C

Mechanical details



Optional Heatsink (-HK)



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

Notes:

1. All dimensions are in mm (inches).
2. Pin diameter: 1.0 ±0.05 (0.04 ±0.002)
3. Pin pitch tolerance: ±0.05 (±0.002)
4. Weight: 34.0g (0.074lb) approx