JWL50 Series

DC-DC Converter

XP Power

50 Watts

- Regulated Single Output
- Wide 4:1 Input Range
- 2″ x 1″ Package
- 1.5kVDC Input to Output Isolation
- Operating Temperature -40°C to +105°C
- Full Power to +69°C
- ITE Safety Approvals
- Remote On/Off and Output Trim
- High Power Density
- Optional Heatsink
- 6-Sided Metal Case
- 3 Year Warranty



Dimensions:

JWL50:
2.00 x 1.00 x 0.43″ (50.8 x 25.4 x 11.0 mm)

The JWL50 series offers high efficiency power conversion in a compact, industry standard format. Features include remote on/off, trim function and over temperature protection.

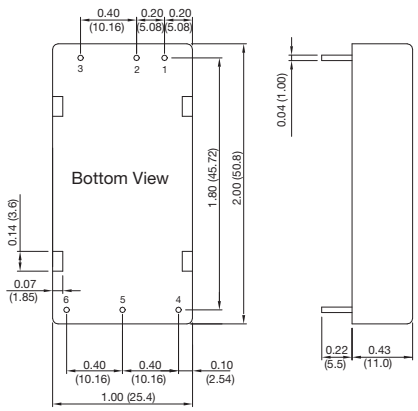
Models & Ratings

Input voltage	Output voltage	Output current	Input current[1,2]		Overvoltage Protection	Maximum capacitive load[3]	Efficiency	Model number[4]
			No load	Full load				
24V (9-36V)	3V3	10.00 A	80 mA	1.53 A	3.9 V	26000 µF	90%	JWL5024S3V3
	5 V	10.00 A	60 mA	2.29 A	6.2 V	17000 µF	91%	JWL5024S05
	12 V	4.17 A	80 mA	2.27 A	15.0 V	3000 µF	92%	JWL5024S12
	15 V	3.33 A	80 mA	2.26 A	18.0 V	2000 µF	92%	JWL5024S15
	24 V	2.08 A	80 mA	2.29 A	30 V	750 µF	91%	JWL5024S24
24V (18-75V)	3V3	10.00 A	40 mA	0.76 A	3.9 V	26000 µF	90%	JWL5048S3V3
	5 V	10.00 A	30 mA	1.15 A	6.2 V	17000 µF	91%	JWL5048S05
	12 V	4.17 A	60 mA	1.13 A	15.0 V	3000 µF	92%	JWL5048S12
	15 V	3.33 A	60 mA	1.13 A	18.0 V	2000 µF	92%	JWL5048S15
	24 V	2.08 A	50 mA	1.14 A	30 V	750 µF	91%	JWL5048S24

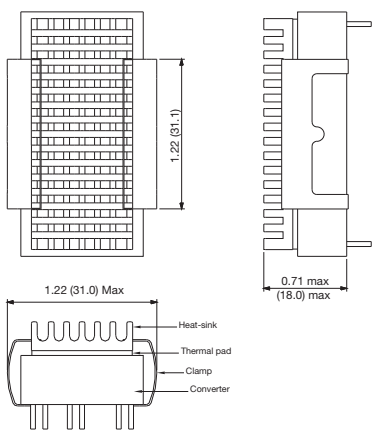
Notes

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

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 inches (mm)
2. Weight: 0.074 lbs (34.0g) approx.
3. Tolerance: X.XX±0.01 (X.X±0.25)
   X.XXX±0.005 (X.XX±0.13)
4. Pin Tolerance: ±0.002 (±0.05)

Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage Range	9		36	VDC	24 V nominal
	18		75	VDC	48 V nominal
Input Filter	Internal Pi type				
Input Surge			50	VDC for 1 s	24 V models
			100		48 V models
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		24	VDC	See Models and Ratings table
Initial Set Accuracy			±1.0	%	At full load
Output Trim			±10	%	See Application Notes
Minimum Load	0			A	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 250 µs for a 25% load change.
Ripple & Noise			100/150	mV pk-pk	3.3 & 5V output / other models. 20 MHz bandwidth. Measured using 1µF MLCC & 10µF tantalum capacitor.
Overload Protection		150		%	
Short Circuit Protection	Continuous trip & restart (hiccup mode), with auto recovery				
Maximum Capacitive Load					See Models and Ratings table
Temperature Coefficient			0.02	%/°C	

General

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency		90		%	See Models and Ratings table
Isolation: Input to Output	1500			VDC	60 s functional
Isolation Resistance	10^9			Ω	At 500 VDC
Isolation Capacitance			2200	pF	
Switching Frequency		285		kHz	
Power Density			58	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				
Potting Material	Epoxy UL94V-0 rated				
Pin Material	Gold plated with copper alloy and nickel base				
Solder Profile	Max 260 °C 1.5mm from case 10s				
Weight		0.074 (34.0)		lb (g)	

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	
Humidity			95	%RH	Non-condensing
Cooling					Natural convection
Thermal impedance to air			12.1/9.8	°C/W	No heatsink / with heatsink
Altitude			6000	m	Operating. Storage to 10,000m

EMC: Emissions

Phenomenon	Standard	Test Level	Notes & Conditions
Conducted	EN55032	Class A	See Application Notes

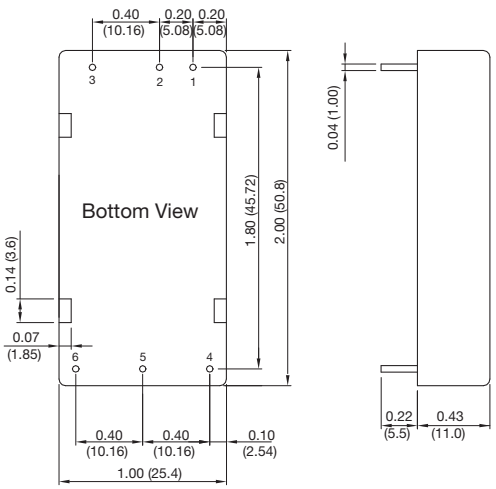
EMC: Immunity

Phenomenon	Standard	Test Level	Criteria	Notes & Conditions
ESD	EN61000-4-2	±8 kV air discharge, ±6 kV contact	A	
Radiated	EN61000-4-3	10 V/m	A	
EFT/Burst	EN61000-4-4	±2 kV	A	With external capacitor, suggested part is CHEMI-CON KY 220µF/100V
Surge	EN61000-4-5	±1 kV	A	With external capacitor, suggested part is CHEMI-CON KY 220µF/100V
Conducted	EN61000-4-6	10 V rms	A	

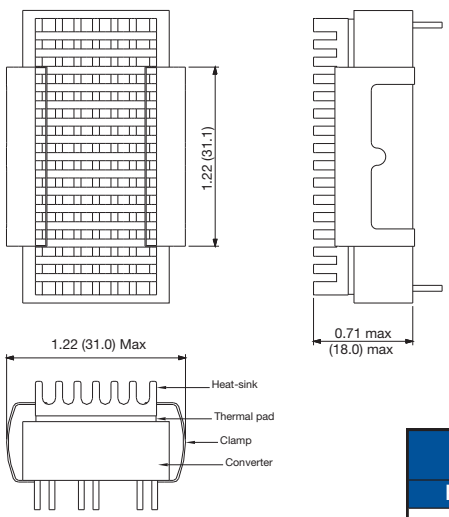
Safety Approvals

Safety Agency	Safety Standard	Notes & Conditions
UL	UL60950-1, UL62368-1	Information Technology
CE	Meets all applicable directives	
UKCA	Meets all applicable legislation	

Mechanical Details



Optional Heatsink (-HK)



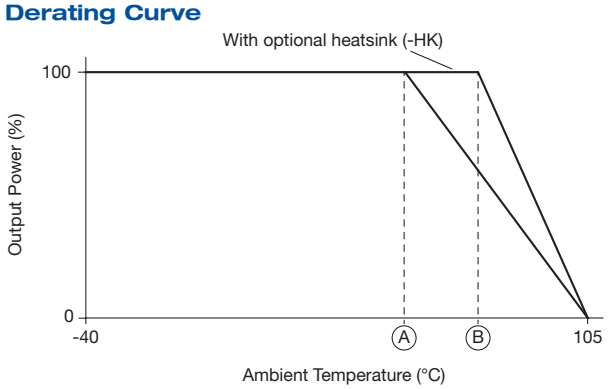
Pin Connections	
Pin	Single
1	+Vin
2	-Vin
3	Remote On/Off
4	+Vout
5	-Vout
6	Trim

Notes

1. All dimensions are in inches (mm)
2. Weight: 0.074 lbs (34.0g) approx.
3. Tolerance: X.XX±0.01 (X.X±0.25)
   X.XXX±0.005 (X.XX±0.13)
4. Pin Tolerance: ±0.002 (±0.05)

Application Notes

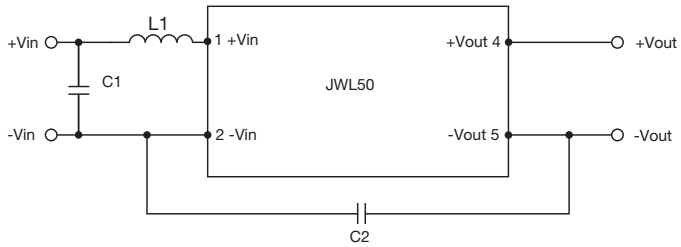
Derating Curve



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

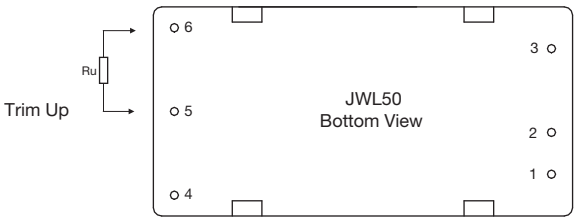
Application Notes

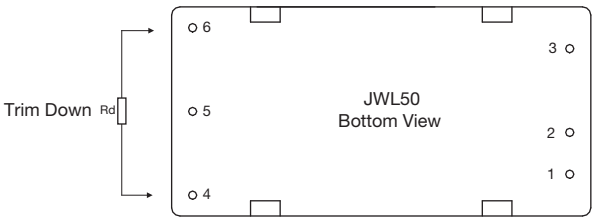
EMI Filter for Conducted Emissions



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

External Output Trimming





Trim Down Resistor Values (Rd)

Models	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	72.61 k	32.55 k	19.20 k	12.52 k	8.51 k	5.84 k	3.94 k	2.51 k	1.39 k	0.50 k
5V	138.88 k	62.41 k	36.92 k	24.18 k	16.53 k	11.44 k	7.79 k	5.06 k	2.94 k	1.24 k
12V	413.55 k	184.55 k	108.22 k	70.05 k	47.15 k	31.88 k	20.98 k	12.80 k	6.44 k	1.35 k
15V	530.73 k	238.61 k	141.24 k	92.56 k	63.35 k	43.87 k	29.96 k	19.53 k	11.41 k	4.92 k
24V	333.39 k	148.80 k	87.26 k	56.50 k	38.04 k	25.73 k	16.94 k	10.35 k	5.22 k	1.12 k

Trim Up Resistor Values (Ru)

Models	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	60.84 k	27.40 k	16.25 k	10.68 k	7.34 k	5.11 k	3.51 k	2.32 k	1.39 k	0.65 k
5V	106.87 k	47.76 k	28.06 k	18.21 k	12.30 k	8.36 k	5.55 k	3.44 k	1.79 k	0.48 k
12V	351.00 k	157.50 k	93.00 k	60.75 k	41.40 k	28.50 k	19.29 k	12.37 k	7.00 k	2.70 k
15V	422.77 k	189.89 k	112.26 k	73.44 k	50.15 k	34.63 k	23.54 k	15.22 k	8.75 k	3.58 k
24V	243.70 k	108.50 k	63.43 k	40.90 k	27.38 k	18.37 k	11.93 k	7.10 k	3.34 k	0.34 k