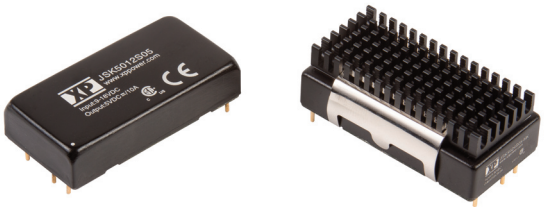
JSK50 Series

DC-DC Converter

XP Power

50 Watts

- Regulated Single Output
- 2:1 Input Range
- 2″ x 1″ Package
- 1500 VDC Isolation
- Operating Temperature -40 °C to +105 °C
- ITE Safety Approvals
- Remote On/Off
- High Power Density
- Optional Heatsink
- Six-sided Metal Case
- 3 Year Warranty



Dimensions:

JSK50:
2.00 x 1.00 x 0.43″ (50.8 x 25.4 x 11.0 mm)

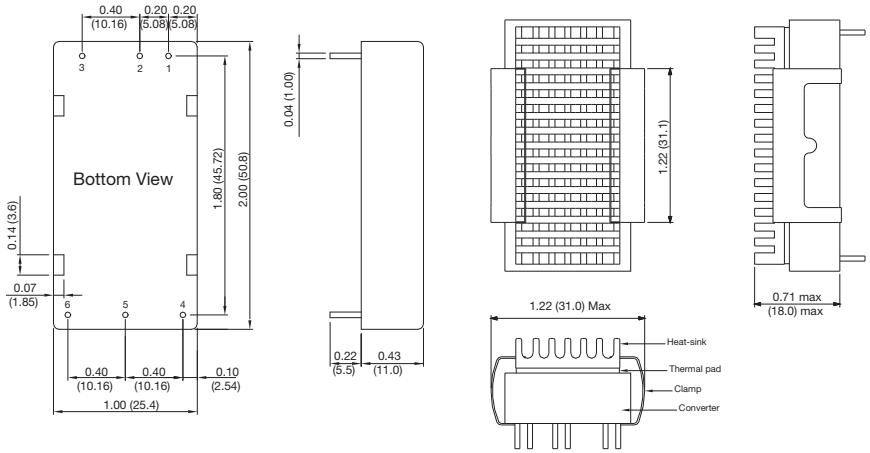
Models & Ratings

Input voltage	Output voltage	Output current	Input current[1,2]		Overvoltage Protection	Maximum capacitive load[3]	Efficiency	Model number[4]
			No load	Full load				
9-18V	3V3	10.00 A	85 mA	3.09 A	3.9 V	25800 µF	89%	JSK5012S3V3
	5 V	10.00 A	110 mA	4.63 A	6.2 V	17000 µF	90%	JSK5012S05
	12 V	4.17 A	160 mA	4.58 A	15.0 V	2900 µF	91%	JSK5012S12
	15 V	3.33 A	160 mA	4.58 A	18.0 V	1900 µF	91%	JSK5012S15
	24 V	2.08 A	250 mA	4.57 A	30 V	750 µF	91%	JSK5012S24
18-36V	3V3	10.00 A	50 mA	1.55 A	3.9 V	25800 µF	89%	JSK5024S3V3
	5 V	10.00 A	70 mA	2.26 A	6.2 V	17000 µF	92%	JSK5024S05
	12 V	4.17 A	85 mA	2.26 A	15.0 V	2900 µF	92%	JSK5024S12
	15 V	3.33 A	85 mA	2.26 A	18.0 V	1900 µF	92%	JSK5024S15
	24 V	2.08 A	110 mA	2.29 A	30 V	750 µF	91%	JSK5024S24
36-75V	3V3	10.00 A	35 mA	0.77 A	3.9 V	25800 µF	89%	JSK5048S3V3
	5 V	10.00 A	45 mA	1.13 A	6.2 V	17000 µF	92%	JSK5048S05
	12 V	4.17 A	50 mA	1.13 A	15.0 V	2900 µF	92%	JSK5048S12
	15 V	3.33 A	50 mA	1.13 A	18.0 V	1900 µF	92%	JSK5048S15
	24 V	2.08 A	60 mA	1.15 A	30 V	750 µF	91%	JSK5048S24

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. Maximum capacitive load is per output.
4. Add suffix "-HK" for optional heatsink.

Mechanical Details



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: 0.066 lbs (30.0g) 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		18	VDC	12 V nominal
	18		36		24 V nominal
	36		75		48 V nominal
Input Filter	Internal Pi type				
Input Surge			25	VDC for 1 s	12 V models
			50		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				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
Isolation Resistance	10^9			Ω	At 500 VDC
Isolation Capacitance			2200	pF	
Switching Frequency		285/320		kHz	24 V output models / other models
Power Density			62.5	W/in³	
Mean Time Between Failure		220		kHrs	MIL-HDBK-217F, +25 °C GB
Weight		0.066 (30.0)		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	
Thermal Protection		110		°C	Measured at centre of case
Humidity			95	%RH	Non-condensing
Cooling					Natural convection
Thermal Impedance to Air			12.1/9.8	°C/W	No heatsink / with heatsink

EMC: Emissions

Phenomenon	Standard	Test Level	Notes & Conditions
Conducted	EN55022	Class A	With external capacitor across input pins; 12V input: 22 µF/25V 1210 MLCC 24V input: 3.3 µF/50V 1210 MLCC 48 V input 2.2 µF/100 V 1210 MLCC

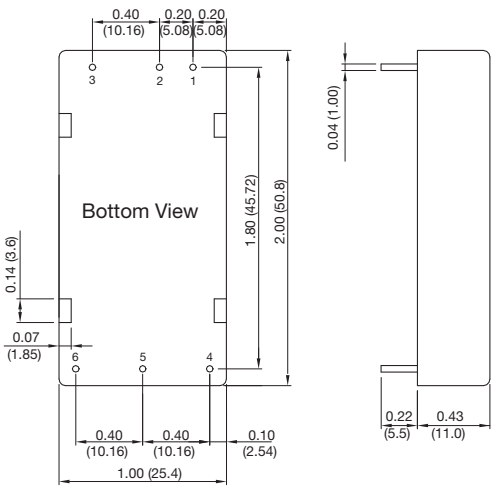
EMC: Immunity

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 330µF/100V
Surge	EN61000-4-5	±1 kV	A	With external capacitor, suggested part is CHEMI-CON KY 330µF/100V
Conducted	EN61000-4-6	10 V rms	A	

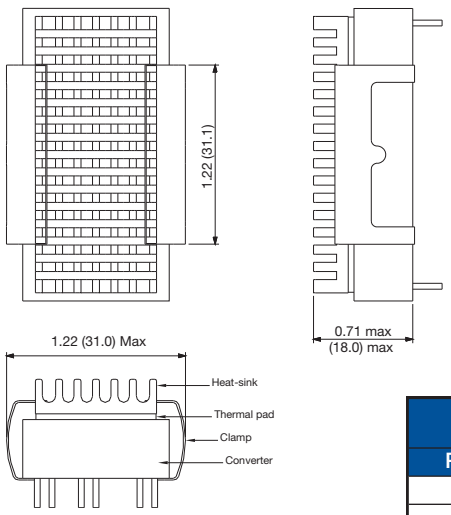
Safety Approvals

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

Mechanical Details



Optional Heatsink (–HK)



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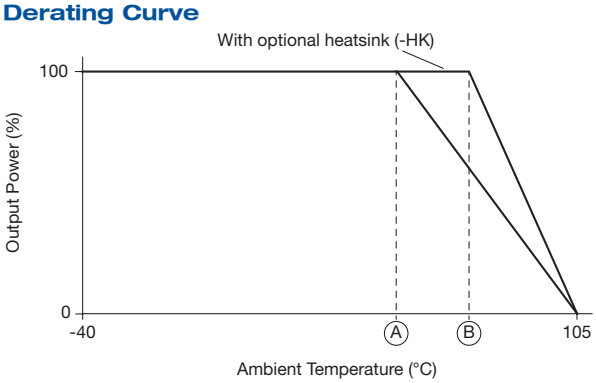
2	-Vin
3	Remote On/Off
4	+Vout
5	-Vout
6	Trim

Notes

1. All dimensions are in inches (mm)
2. Weight: 0.066 lbs (30.0g) 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

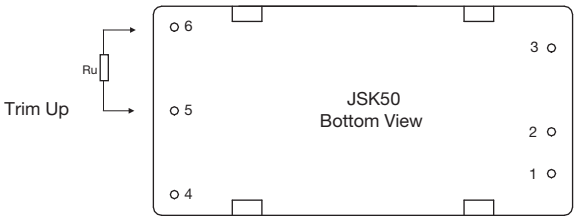
Derating Curve

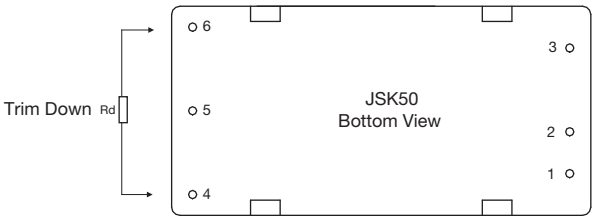


Models - JSK50	Max Temperature	
	No Heatsink (A)	With Heatsink (B)
I2S3V3, 24S3V3, 48S3V3	56°C	64°C
24S05, 24S12, 24S15, 48S05, 48S12, 48S15	53°C	62°C
12S12, 12S15, 12524, 24524, 48S24	46°C	56°C
12S05	38°C	49°C

Application Notes

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