

50W Convection cooled

DC-DC converters 

The JCK50 series is housed in a 50.8 x 25.4 x 11.5mm (2" x 1" x 0.45) PCB mount metal case. Featuring a 2:1 input voltage range of 9 to 18VDC, 18 to 36VDC or 36 to 75VDC with regulated single outputs of 3.3, 5, 12 & 15VDC adjustable $\pm 10\%$ with a trim resistor.

The 50W JCK50 has 1.6kVDC isolation between input and output, over voltage, overload & short circuit protection is standard as is remote On/Off, an optional heatsink (suffix -HK) can be specified. The operating temperature range is from -40°C to +95°C, with derating above +50°C.



Features

- ▶ Regulated single outputs 3.3, 5, 12 & 15VDC
- ▶ Outputs trimmable $\pm 10\%$
- ▶ 2:1 input range
- ▶ 50.8 x 25.4mm (2" x 1") footprint, 11.5mm (0.45") package
- ▶ 1.6kVDC isolation
- ▶ Remote On/Off
- ▶ Continuous short circuit protection
- ▶ Optional heatsink
- ▶ -40°C to +95°C operating temperature
- ▶ Full power to +50°C
- ▶ 3 year warranty

Applications



Autonomous equipment



Industrial electronics & robotics



Technology

Dimensions

50.8 x 25.4 x 11.5mm (2.0" x 1.0" x 0.45")

Documentation

For further information click the link or scan the code

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Models & ratings

Model number ⁽⁴⁾	Input voltage	Output voltage	Output current	Efficiency	Input current ^(1,2)		Maximum capacitive load ⁽³⁾
					No load	Full load	
JCK5012S3V3	9-18VDC	3V3VDC	10.00A	90%	110 mA	3.06 A	26000 μ F
JCK5012S05		5VDC	10.00A	89%	200 mA	4.68 A	17000 μ F
JCK5012S12		12VDC	4.17A	89%	60 mA	4.68 A	3300 μ F
JCK5012S15		15VDC	3.33A	89%	60 mA	4.68 A	2200 μ F

Continued on page 2

Notes:

1. Input currents measured at nominal input voltage.
2. Input current is typically 5.0mA 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.

Models & ratings

Model number ⁽⁴⁾	Input voltage	Output voltage	Output current	Efficiency	Input current ^(1,2)		Maximum capacitive load ⁽³⁾
					No load	Full load	
JCK5024S3V3	18-36VDC	3V3VDC	10.00A	91%	70 mA	1.51 A	26000μF
JCK5024S05		5VDC	10.00A	91%	90 mA	2.29 A	17000μF
JCK5024S12		12VDC	4.17A	91%	40 mA	2.29 A	3300μF
JCK5024S15		15VDC	3.33A	91%	40 mA	2.29 A	2200μF
JCK5048S3V3	36-75VDC	3V3VDC	10.00A	91%	50 mA	0.76 A	26000μF
JCK5048S05		5VDC	10.00A	92%	60 mA	1.13 A	17000μF
JCK5048S12		12VDC	4.17A	91%	40 mA	1.14 A	3300μF
JCK5048S15		15VDC	3.33A	92%	40 mA	1.17 A	2200μF

Notes:

- Input currents measured at nominal input voltage.
- Input current is typically 5.0mA at nominal input voltage when output is turned off using remote on/off.
- Maximum capacitive load is per output.
- Add suffix "-HK" for optional heatsink.

Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Input voltage range	9		18	VDC	12VDC nominal
	18		36		24VDC nominal
	36		75		48VDC nominal
Input filter	Internal Pi type				
Input surge			25	VDC	12VDC models (for 100ms)
			50		24VDC models (for 100ms)
			100		48VDC models (for 100ms)
Remote on/off	ON: Logic high (3.0-12V) 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		15	VDC	See models & ratings table
Initial set accuracy			±1.0	%	At full load
Output trim			±10	%	See application notes
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			±3.0	%	Recovery within 1% in less than 250μs for a 25% load change.
Ripple & noise			100	mV pk-pk	20 MHz bandwidth. Measured using 1μF MLCC
Short circuit protection	Continuous trip & restart (hiccup mode), with auto recovery				
Temperature coefficient		0.02		%/°C	
Overload protection	120		140	%	
Maximum capacitive load	See models & ratings table				
Temperature coefficient			0.02	%/°C	

General

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Efficiency		91		%	See models and ratings table
Isolation: input to output	1600			VDC	60s
Isolation: input to case	1600			VDC	60s
Isolation: output to case	1600			VDC	60s
Isolation Resistance	10 ⁹			Ω	At 500VDC
Isolation capacitance			2000	pF	
Switching frequency		250/270		kHz	12V input models / other models
Power density			3.81 (62.5)	W/cm ³ (W/in ³)	
Mean time between failure		220		khrs	MIL-HDBK-217F, +25°C GB
Weight		45.0 (0.1)		g (lb)	

Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Operating temperature	-40		+95	°C	See derating curve
Storage temperature	-40		+125	°C	
Case temperature			+110	°C	
Thermal protection		115		°C	Measured at centre of case
Humidity			95	%RH	Non-condensing
Cooling	Natural convection				
Thermal impedance to air	9.5/8.5			°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

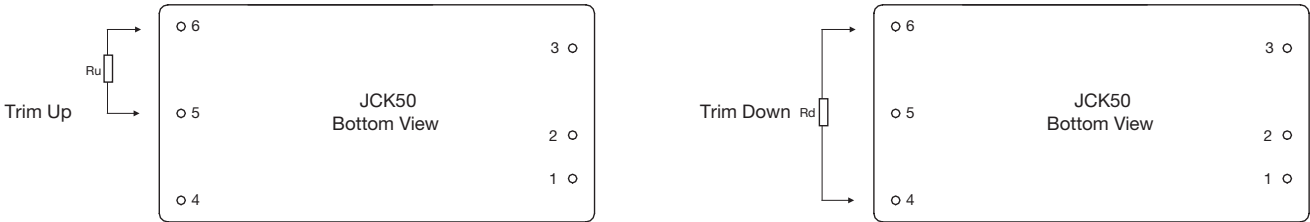
Phenomenon	Standard	Test level	Notes & conditions
Conducted	EN55022	Class A	

Immunity - EMC

Phenomenon	Standard	Test level	Criteria	Notes & conditions
ESD immunity	EN61000-4-2	±8kV air discharge, ±6kV contact	A	
Radiated immunity	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 immunity	EN61000-4-6	10 V rms	A	

Application notes

External output trimming



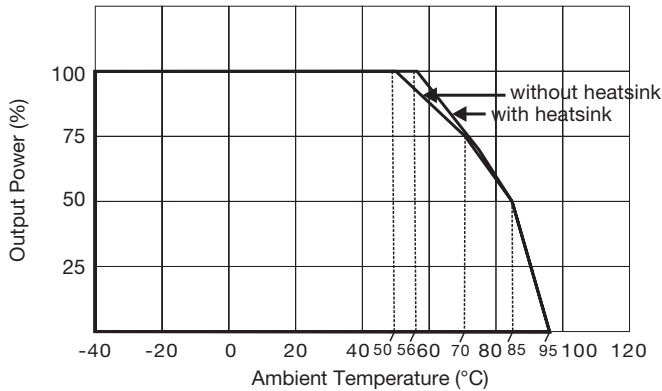
Trim down resistor values (Rd)

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	315.932k Ω	172.257k Ω	112.528k Ω	79.806k Ω	59.153k Ω	44.930k Ω	34.539k Ω	26.616k Ω	20.374k Ω	15.330k Ω
5V	230.566k Ω	106.182k Ω	64.301k Ω	43.281k Ω	30.643k Ω	22.207k Ω	16.177k Ω	11.651k Ω	8.129k Ω	5.310k Ω
12V	327.351k Ω	142.100k Ω	83.928k Ω	55.470k Ω	38.591k Ω	27.418k Ω	19.477k Ω	13.542k Ω	8.939k Ω	5.264k Ω
15V	433.811k Ω	174.916k Ω	100.946k Ω	65.907k Ω	45.468k Ω	32.077k Ω	29.96k Ω	15.596k Ω	10.165k Ω	5.842k Ω

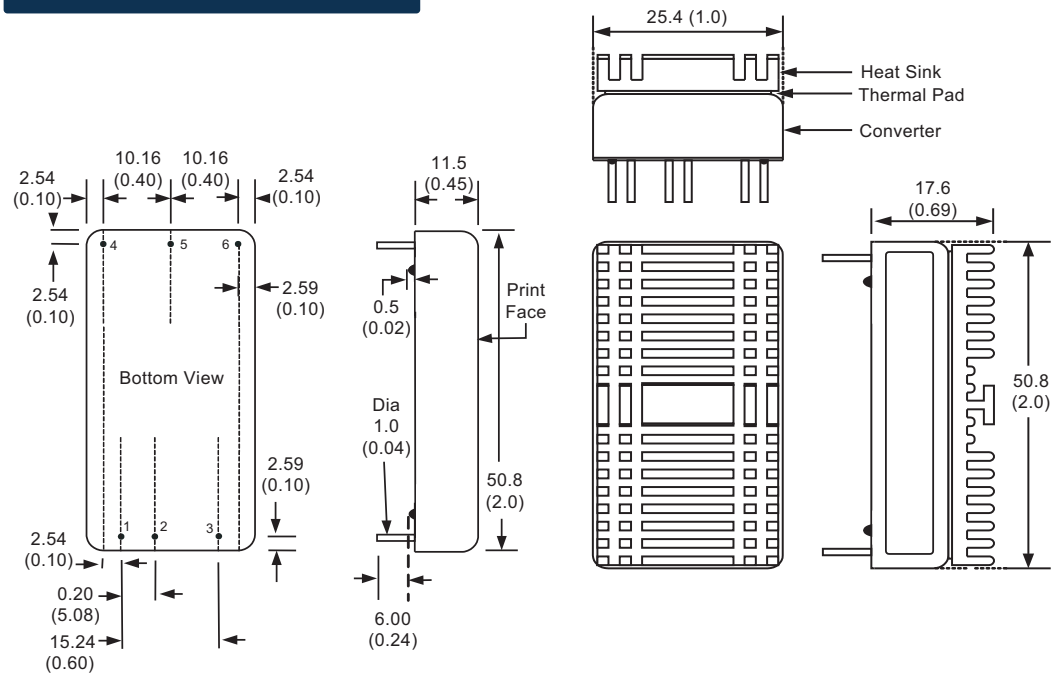
Trim up resistor values (Ru)

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	544.612k Ω	184.034k Ω	103.305k Ω	67.715k Ω	47.676k Ω	34.824k Ω	25.880k Ω	19.297k Ω	14.249k Ω	10.255k Ω
5V	244.527k Ω	113.776k Ω	70.631k Ω	49.142k Ω	36.274k Ω	27.707k Ω	21.592k Ω	17.010k Ω	13.447k Ω	10.598k Ω
12V	371.425k Ω	183.645k Ω	117.623k Ω	83.929k Ω	63.489k Ω	49.767k Ω	39.919k Ω	32.508k Ω	26.728k Ω	22.094k Ω
15V	347.293k Ω	178.523k Ω	115.235k Ω	82.084k Ω	61.683k Ω	47.863k Ω	37.863k Ω	30.336k Ω	24.430k Ω	19.682k Ω

Derating curve



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 mm (inches).
2. Weight: 45g (0.1lb) approx
3. Tolerance: x.x (x.xx) = ± 0.5 (± 0.02). x.xx (x.xxx) = ± 0.25 (± 0.01)
4. Pin Tolerance: ± 0.05 (± 0.002)