

## JCK20 Series



- 2:1 Input Range
- -40 °C to +100 °C Operating Temperature
- Single & Dual Outputs
- Overvoltage & Overcurrent Protection
- High Efficiency - up to 93%
- 1500 VDC Isolation
- 3 Year Warranty

## Specification

## Input

Input Voltage Range	<ul style="list-style-type: none"> <li>• 12 V (9-18 VDC)</li> <li>• 24 V (18-36 VDC)</li> <li>• 48 V (36-75 VDC)</li> </ul>
Input Current	<ul style="list-style-type: none"> <li>• See table</li> </ul>
Undervoltage Lockout	<ul style="list-style-type: none"> <li>• 12 V models: ON 8.6 V, OFF 7.9 V typical</li> <li>• 24 V models: ON 17.8 V, OFF 16 V typical</li> <li>• 48 V models: ON 33.5 V, OFF 30.5 V typical</li> </ul>
Input Surge	<ul style="list-style-type: none"> <li>• 12 V models 36 VDC for 100 ms</li> <li>• 24 V models 50 VDC for 100 ms</li> <li>• 48 V models 100 VDC for 100 ms</li> </ul>

## Output

Output Voltage	<ul style="list-style-type: none"> <li>• See table</li> </ul>
Output Voltage Trim	<ul style="list-style-type: none"> <li>• <math>\pm 10\%</math></li> </ul>
Minimum Load	<ul style="list-style-type: none"> <li>• No minimum load required</li> </ul>
Line Regulation	<ul style="list-style-type: none"> <li>• <math>\pm 0.2\%</math> max</li> </ul>
Load Regulation	<ul style="list-style-type: none"> <li>• Single output models: <math>\pm 0.5\%</math> max</li> <li>• Dual output models: <math>\pm 1\%</math> max balanced outputs</li> </ul>
Cross Regulation	<ul style="list-style-type: none"> <li>• <math>\pm 5\%</math> for dual outputs, see note 2</li> </ul>
Setpoint Accuracy	<ul style="list-style-type: none"> <li>• <math>\pm 1\%</math> max</li> </ul>
Start Up Delay	<ul style="list-style-type: none"> <li>• &lt;20 ms</li> </ul>
Start Up Rise Time	<ul style="list-style-type: none"> <li>• &lt;5 ms</li> </ul>
Ripple & Noise	<ul style="list-style-type: none"> <li>• 75 mV pk-pk, see note 3</li> </ul>
Transient Response	<ul style="list-style-type: none"> <li>• <math>\pm 3\%</math> max deviation, recovery to within 1% in 250 <math>\mu</math>s for a 25% load change</li> </ul>
Temperature Coefficient	<ul style="list-style-type: none"> <li>• 0.02%/°C</li> </ul>
Overvoltage Protection	<ul style="list-style-type: none"> <li>• 3.3 V models: 3.9 V typical</li> <li>• 5 V models: 6.2 V typical</li> <li>• 12 V models: 15 V typical</li> <li>• 15 V models: 18 V typical</li> <li>• <math>\pm 12</math> V models: <math>\pm 15</math> V typical</li> <li>• <math>\pm 15</math> V models: <math>\pm 18</math> V typical</li> </ul>
Overload Protection	<ul style="list-style-type: none"> <li>• &gt;140% of full load at nominal input</li> </ul>
Short Circuit Protection	<ul style="list-style-type: none"> <li>• Trip &amp; restart (Hiccup mode), auto recovery</li> </ul>
Remote On/Off	<ul style="list-style-type: none"> <li>• On = Logic High (&gt;3.0 V) or Open</li> <li>• Off = Logic Low (&lt;1.2 V) or short pin 2 to 6</li> </ul>
Capacitive Load	<ul style="list-style-type: none"> <li>• See table</li> </ul>

## General

Efficiency	<ul style="list-style-type: none"> <li>• See table</li> </ul>
Isolation	<ul style="list-style-type: none"> <li>• 1500 VDC Input to Output</li> <li>• 1500 VDC Input to Case</li> <li>• 1500 VDC Output to Case</li> </ul>
Isolation Capacitance	<ul style="list-style-type: none"> <li>• 1200 pF typical</li> </ul>
Switching Frequency	<ul style="list-style-type: none"> <li>• 330 kHz typical</li> </ul>
MTBF	<ul style="list-style-type: none"> <li>• &gt;680 kHrs minimum to MIL-HDBK-217F at 25 °C, GB</li> </ul>

## Environmental

Operating Temperature	<ul style="list-style-type: none"> <li>• -40 °C to +100 °C, derate from 100% load at +70 °C to 0% load at +100 °C</li> </ul>
Case Temperature	<ul style="list-style-type: none"> <li>• +100 °C max</li> </ul>
Cooling	<ul style="list-style-type: none"> <li>• Convection-cooled</li> </ul>
Operating Humidity	<ul style="list-style-type: none"> <li>• Up to 95% RH, non-condensing</li> </ul>
Storage Temperature	<ul style="list-style-type: none"> <li>• -40 °C to +125 °C</li> </ul>

## EMC &amp; Safety

Emissions	<ul style="list-style-type: none"> <li>• EN55022, Class A conducted &amp; radiated with external components, see application note</li> </ul>
ESD Immunity	<ul style="list-style-type: none"> <li>• EN61000-4-2, 8 kV air, 6 kV contact, Perf Criteria A</li> </ul>
Radiated Immunity	<ul style="list-style-type: none"> <li>• EN61000-4-3 10 V/m, Perf Criteria A</li> </ul>
EFT/Burst	<ul style="list-style-type: none"> <li>• EN61000-4-4 level 3, Perf Criteria B*</li> </ul>
Surge	<ul style="list-style-type: none"> <li>• EN61000-4-5 level 2, Perf Criteria B*</li> </ul>
Conducted Immunity	<ul style="list-style-type: none"> <li>• EN61000-4-6 10 V/rms, Perf Criteria A</li> </ul>
Magnetic Field	<ul style="list-style-type: none"> <li>• EN61000-4-8 1 A/m, Perf Criteria A</li> </ul>
Safety Approvals	<ul style="list-style-type: none"> <li>• EN60950-1, IEC60950-1</li> </ul>

\*External input capacitor required 220  $\mu$ F/100 V.

## Models and Ratings

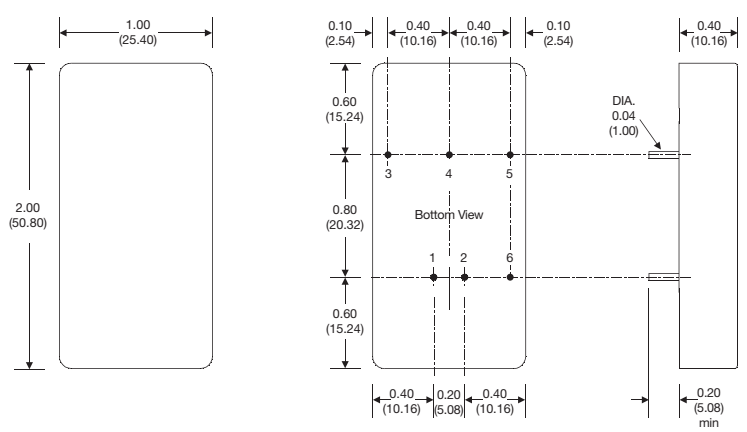
Input Voltage	Output Voltage	Output Current	Input Current <sup>(1)</sup>		Maximum Capacitive Load	Efficiency	Model Number
			No Load	Full Load			
9-18 VDC	3.3 VDC	5.500 A	60 mA	1.74 A	10,000 $\mu$ F	90%	JCK2012S3V3
	5.0 VDC	4.000 A	60 mA	1.87 A	6,800 $\mu$ F	92%	JCK2012S05
	12.0 VDC	1.670 A	30 mA	1.92 A	1,000 $\mu$ F	90%	JCK2012S12
	15.0 VDC	1.330 A	30 mA	1.92 A	680 $\mu$ F	90%	JCK2012S15
	$\pm$ 12.0 VDC	$\pm$ 0.835 A	30 mA	1.94 A	$\pm$ 470 $\mu$ F	89%	JCK2012D12
	$\pm$ 15.0 VDC	$\pm$ 0.665 A	30 mA	1.94 A	$\pm$ 330 $\mu$ F	89%	JCK2012D15
18-36 VDC	3.3 VDC	5.500 A	35 mA	0.86 A	10,000 $\mu$ F	91%	JCK2024S3V3
	5.0 VDC	4.000 A	35 mA	0.93 A	6,800 $\mu$ F	93%	JCK2024S05
	12.0 VDC	1.670 A	25 mA	0.95 A	1,000 $\mu$ F	91%	JCK2024S12
	15.0 VDC	1.330 A	25 mA	0.95 A	680 $\mu$ F	91%	JCK2024S15
	$\pm$ 12.0 VDC	$\pm$ 0.835 A	30 mA	0.96 A	$\pm$ 470 $\mu$ F	90%	JCK2024D12
	$\pm$ 15.0 VDC	$\pm$ 0.665 A	30 mA	0.96 A	$\pm$ 330 $\mu$ F	90%	JCK2024D15
36-75 VDC	3.3 VDC	5.500 A	25 mA	0.43 A	10,000 $\mu$ F	91%	JCK2048S3V3
	5.0 VDC	4.000 A	25 mA	0.46 A	6,800 $\mu$ F	93%	JCK2048S05
	12.0 VDC	1.670 A	15 mA	0.47 A	1,000 $\mu$ F	91%	JCK2048S12
	15.0 VDC	1.330 A	15 mA	0.47 A	680 $\mu$ F	91%	JCK2048S15
	$\pm$ 12.0 VDC	$\pm$ 0.835 A	20 mA	0.48 A	$\pm$ 470 $\mu$ F	90%	JCK2048D12
	$\pm$ 15.0 VDC	$\pm$ 0.665 A	20 mA	0.48 A	$\pm$ 330 $\mu$ F	89%	JCK2048D15

### Notes

- Input current specified at nominal 12, 24 V or 48 V input.
- Cross regulation is  $\pm$ 5% when one output is at 100% and the other is varied between 25% and 100%.
- Measured with 20 MHz bandwidth and 1  $\mu$ F ceramic capacitor across output rails.

## Mechanical Details

Weight: 0.07 lbs (30 g)



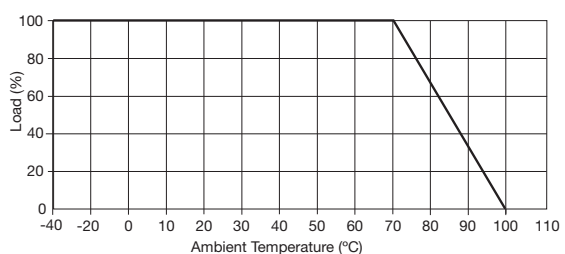
PIN CONNECTIONS		
Pin	Single	Dual
1	+Vin	+Vin
2	-Vin	-Vin
3	+Vout	+Vout
4	Trim	Com
5	-Vout	-Vout
6	Remote On/Off	Remote On/Off

### Notes

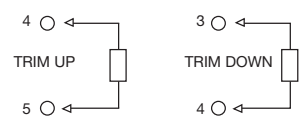
- All dimensions are in inches (mm).
- Pin diameter: 0.04  $\pm$ 0.002 (1.0  $\pm$ 0.05)
- Pin pitch tolerance:  $\pm$ 0.014 ( $\pm$ 0.35)
- Case tolerance:  $\pm$ 0.02 ( $\pm$ 0.5)

## Application Notes

### Derating Curve

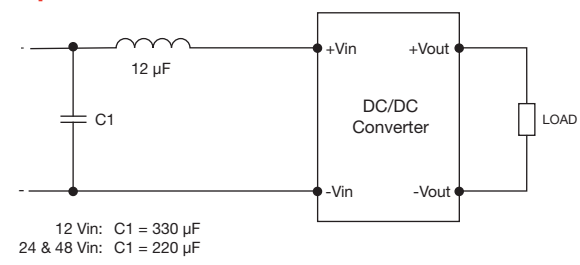


### External Output Trim



- |   |   |
|---|---|
| <b>For 3.3 V output:</b><br>Trim +10%, R = 10 k $\Omega$ typical<br>Trim - 10%, R = 15 k $\Omega$ typical | <b>For 12 V output:</b><br>Trim +10%, R = 22 k $\Omega$ typical<br>Trim - 10%, R = 5 k $\Omega$ typical |
| <b>For 5 V output:</b><br>Trim +10%, R = 10 k $\Omega$ typical<br>Trim - 10%, R = 5 k $\Omega$ typical    | <b>For 15 V output:</b><br>Trim +10%, R = 20 k $\Omega$ typical<br>Trim - 10%, R = 5 k $\Omega$ typical |

### Input Filter



### Remote On/Off Control

- Output On >3.0 VDC or open circuit
- Output Off <1.2 VDC or short circuit pins 2 & 6