

## JCK Series



- 2:1 Input Range
- Operating Temperature  $-40^{\circ}\text{C}$  to  $+75^{\circ}\text{C}$
- Single and Dual Outputs
- High Efficiency – Up to 92%
- Remote On/Off
- 1600 VDC Isolation
- 3 Year Warranty

### Specification

#### Input

|                                |                                                                                                                                                                                                        |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Input Voltage Range            | <ul style="list-style-type: none"> <li>• 12 V (9-18 VDC), 24 V (18-36 VDC), 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 Reflected Ripple Current | <ul style="list-style-type: none"> <li>• 20 mA pk-pk through 12 <math>\mu\text{H}</math> inductor</li> </ul>                                                                                           |
| Input Surge                    | <ul style="list-style-type: none"> <li>• 12 V models 25 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>                                   |
| Input Filter                   | <ul style="list-style-type: none"> <li>• Pi network</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> on single outputs models only</li> </ul>                                                                                                                                                                                                                                                                                                                                                       |
| Start Up Delay           | <ul style="list-style-type: none"> <li>• 30 ms max</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 0.5\%</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> (see note 2)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                         |
| Setpoint Accuracy        | <ul style="list-style-type: none"> <li>• <math>\pm 1\%</math></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                      |
| Ripple & Noise           | <ul style="list-style-type: none"> <li>• 100 mV pk-pk, 20 MHz bandwidth (see note 3)</li> </ul>                                                                                                                                                                                                                                                                                                                                                               |
| Transient Response       | <ul style="list-style-type: none"> <li>• 3% max deviation, recovery to within 1% in <math>&lt;250 \mu\text{s}</math> for a 25% load change</li> </ul>                                                                                                                                                                                                                                                                                                         |
| Temperature Coefficient  | <ul style="list-style-type: none"> <li>• <math>0.02\%/^{\circ}\text{C}</math></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 5\text{ V}</math> models: <math>\pm 6.2\text{ V}</math> typical</li> <li>• <math>\pm 12\text{ V}</math> models: <math>\pm 15\text{ V}</math> typical</li> <li>• <math>\pm 15\text{ V}</math> models: <math>\pm 18\text{ V}</math> typical</li> </ul> |
| Overload Protection      | <ul style="list-style-type: none"> <li>• <math>&gt;150\%</math> of full load</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>• See application notes</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                     |
| Maximum 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>• 1600 VDC Input to Output</li> <li>• 1600 VDC Input to Case</li> <li>• 1600 VDC Output to Case</li> </ul> |
| Isolation Capacitance | <ul style="list-style-type: none"> <li>• 1500 pF typical</li> </ul>                                                                               |
| Switching Frequency   | <ul style="list-style-type: none"> <li>• 330 kHz typical</li> </ul>                                                                               |
| Power Density         | <ul style="list-style-type: none"> <li>• <math>37.5 \text{ W/in}^3</math></li> </ul>                                                              |
| MTBF                  | <ul style="list-style-type: none"> <li>• 430 kHrs min to MIL-HDBK-217F at <math>25^{\circ}\text{C}</math>, GB</li> </ul>                          |

#### Environmental

|                       |                                                                                                                                             |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Operating Temperature | <ul style="list-style-type: none"> <li>• <math>-40^{\circ}\text{C}</math> to <math>75^{\circ}\text{C}</math>, see derating curve</li> </ul> |
| Case Temperature      | <ul style="list-style-type: none"> <li>• <math>+105^{\circ}\text{C}</math> max</li> </ul>                                                   |
| Cooling               | <ul style="list-style-type: none"> <li>• Convection-cooled</li> </ul>                                                                       |
| Operating Humidity    | <ul style="list-style-type: none"> <li>• 5-95% RH, non-condensing</li> </ul>                                                                |
| Storage Temperature   | <ul style="list-style-type: none"> <li>• <math>-40^{\circ}\text{C}</math> to <math>+125^{\circ}\text{C}</math></li> </ul>                   |

#### EMC

|                    |                                                                                                                                              |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| Emissions          | <ul style="list-style-type: none"> <li>• EN55022 level A conducted &amp; radiated with external components, see application notes</li> </ul> |
| ESD Immunity       | <ul style="list-style-type: none"> <li>• EN61000-4-2, level 3, Perf Criteria A</li> </ul>                                                    |
| EFT/Burst          | <ul style="list-style-type: none"> <li>• EN61000-4-4, level 3, Perf Criteria A<sup>(4)</sup></li> </ul>                                      |
| Surge              | <ul style="list-style-type: none"> <li>• EN61000-4-5, installation class 3, Perf Criteria A<sup>(4)</sup></li> </ul>                         |
| Conducted Immunity | <ul style="list-style-type: none"> <li>• EN61000-4-6, 10 Vrms, 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

|                  |                                                                                                                                   |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Safety Approvals | <ul style="list-style-type: none"> <li>• CE (Meets all applicable directives), UKCA (Meets all applicable legislation)</li> </ul> |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------|

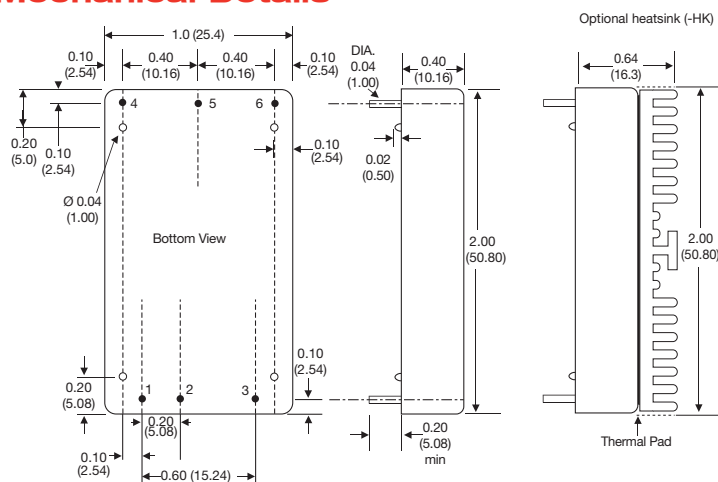
## Models and Ratings

| 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 V          | 8.00 A         | 80 mA                        | 2426 mA   | 20000 $\mu$ F           | 89%        | JCK3012S3V3  |
|               | 5.0 V          | 6.00 A         | 180 mA                       | 2874 mA   | 14000 $\mu$ F           | 91%        | JCK3012S05   |
|               | 5.1 V          | 6.00 A         | 160 mA                       | 2874 mA   | 14000 $\mu$ F           | 92%        | JCK3012S5V1  |
|               | 12.0 V         | 2.50 A         | 30 mA                        | 2809 mA   | 2000 $\mu$ F            | 91%        | JCK3012S12   |
|               | 15.0 V         | 2.00 A         | 30 mA                        | 2809 mA   | 2000 $\mu$ F            | 92%        | JCK3012S15   |
|               | $\pm 5.0$ V    | $\pm 3.00$ A   | 180 mA                       | 2874 mA   | $\pm 3000$ $\mu$ F      | 89%        | JCK3012D05   |
|               | $\pm 12.0$ V   | $\pm 1.25$ A   | 50 mA                        | 2874 mA   | $\pm 1250$ $\mu$ F      | 90%        | JCK3012D12   |
| 18-36 VDC     | 3.3 V          | 8.00 A         | 70 mA                        | 1185 mA   | 20000 $\mu$ F           | 91%        | JCK3024S3V3  |
|               | 5.0 V          | 6.00 A         | 100 mA                       | 1420 mA   | 14000 $\mu$ F           | 92%        | JCK3024S05   |
|               | 5.1 V          | 6.00 A         | 100 mA                       | 1448 mA   | 14000 $\mu$ F           | 92%        | JCK3024S5V1  |
|               | 12.0 V         | 2.50 A         | 20 mA                        | 1436 mA   | 2000 $\mu$ F            | 92%        | JCK3024S12   |
|               | 15.0 V         | 2.00 A         | 40 mA                        | 1420 mA   | 2000 $\mu$ F            | 92%        | JCK3024S15   |
|               | $\pm 5.0$ V    | $\pm 3.00$ A   | 100 mA                       | 1437 mA   | $\pm 3000$ $\mu$ F      | 90%        | JCK3024D05   |
|               | $\pm 12.0$ V   | $\pm 1.25$ A   | 40 mA                        | 1453 mA   | $\pm 1250$ $\mu$ F      | 91%        | JCK3024D12   |
| 36-75 VDC     | 3.3 V          | 8.00 A         | 50 mA                        | 593 mA    | 20000 $\mu$ F           | 90%        | JCK3048S3V3  |
|               | 5.0 V          | 6.00 A         | 70 mA                        | 702 mA    | 14000 $\mu$ F           | 91%        | JCK3048S05   |
|               | 5.1 V          | 6.00 A         | 70 mA                        | 724 mA    | 14000 $\mu$ F           | 91%        | JCK3048S5V1  |
|               | 12.0 V         | 2.50 A         | 30 mA                        | 718 mA    | 2000 $\mu$ F            | 91%        | JCK3048S12   |
|               | 15.0 V         | 2.00 A         | 30 mA                        | 710 mA    | 2000 $\mu$ F            | 91%        | JCK3048S15   |
|               | $\pm 5.0$ V    | $\pm 3.00$ A   | 70 mA                        | 710 mA    | $\pm 3000$ $\mu$ F      | 90%        | JCK3048D05   |
|               | $\pm 12.0$ V   | $\pm 1.25$ A   | 50 mA                        | 718 mA    | $\pm 1250$ $\mu$ F      | 90%        | JCK3048D12   |
|               | $\pm 15.0$ V   | $\pm 1.00$ A   | 40 mA                        | 718 mA    | $\pm 1000$ $\mu$ F      | 90%        | JCK3048D15   |

### Notes

- Input current specified at nominal input.
- Cross regulation for duals is  $\pm 5\%$  when one output is at 100% and the other is varied between 25% and 100%.
- Measured with 1  $\mu$ F ceramic capacitor across output rails.
- A 220  $\mu$ F/250 V capacitor across the input is required in order to meet EN61000-4-4 and EN61000-4-5.
- For heatsink option add '-HK' to the end of the part number.

## Mechanical Details



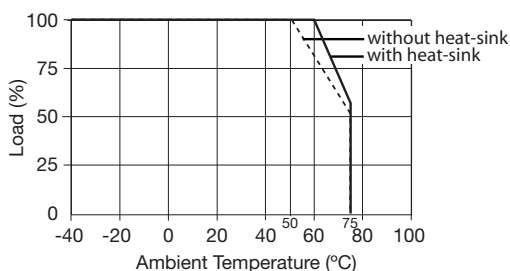
| PIN CONNECTIONS |               |               |
|-----------------|---------------|---------------|
| Pin             | Single        | Dual          |
| 1               | +Vin          | +Vin          |
| 2               | -Vin          | -Vin          |
| 3               | Remote On/Off | Remote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

### Notes

- All dimensions are in inches (mm).
- Weight: 0.07 lbs (31 g) approx
- 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

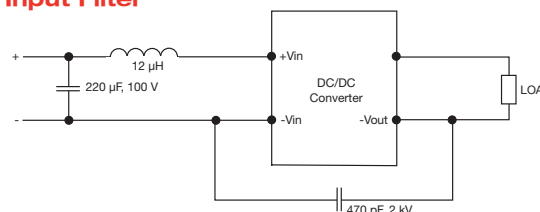
### Derating Curve



### Remote On/Off Control

Output On >3.0 VDC or open circuit  
Output Off <1.2 VDC or short circuit pins 2 & 3

### Input Filter



### External Output Trim

