

# 6 Watts

## JCE Series



- 2:1 Input Range
- DIP-24 Plastic Case
- Operating Temperature -40 °C to +100 °C
- Single & Dual Outputs
- Optional Metal Case
- 1500 VDC Isolation, 3000 VDC Option
- 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>                                                                                                                                         |
| Input Filter           | <ul style="list-style-type: none"> <li>• Pi network</li> </ul>                                                                                                                                        |
| Input Reflected Ripple | <ul style="list-style-type: none"> <li>• 20 mA pk-pk through 12 <math>\mu</math>H inductor and 4.7 <math>\mu</math>F capacitor</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>                                  |
| Under Voltage Lockout  | <ul style="list-style-type: none"> <li>• 12 V models on &gt;8.5 V, off &lt;8.0 V</li> <li>• 24 V models on &gt;16.5 V, off &lt;15.5 V</li> <li>• 48 V models on &gt;34.5 V, off &lt;33.5 V</li> </ul> |

#### Output

|                          |                                                                                                                                                                                |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Output Voltage           | <ul style="list-style-type: none"> <li>• See table</li> </ul>                                                                                                                  |
| Output Voltage Balance   | <ul style="list-style-type: none"> <li>• <math>\pm 2\%</math> max, dual output models</li> </ul>                                                                               |
| Initial Set Accuracy     | <ul style="list-style-type: none"> <li>• <math>\pm 2\%</math> 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>• <math>\pm 1.2\%</math> max, for single output and <math>\pm 5\%</math> max for dual output from 10-100%</li> </ul>                    |
| Cross Regulation         | <ul style="list-style-type: none"> <li>• <math>\pm 5\%</math> max, on dual output models (see note 1)</li> </ul>                                                               |
| Start Up Delay           | <ul style="list-style-type: none"> <li>• 20 ms typical</li> </ul>                                                                                                              |
| Ripple & Noise           | <ul style="list-style-type: none"> <li>• 80 mV pk-pk (100 mV for D24 models), 20 MHz bandwidth. See note 2</li> </ul>                                                          |
| Transient Response       | <ul style="list-style-type: none"> <li>• 3% max deviation, recovery to within 1% in 300 <math>\mu</math>s for a 25% load change (4% max. deviation for S3V3 models)</li> </ul> |
| Overload Protection      | <ul style="list-style-type: none"> <li>• 135% - 185% of full load</li> </ul>                                                                                                   |
| Short Circuit Protection | <ul style="list-style-type: none"> <li>• Trip and restart (hiccup mode), auto recovery</li> </ul>                                                                              |
| Maximum Capacitive Load  | <ul style="list-style-type: none"> <li>• See table</li> </ul>                                                                                                                  |
| Temperature Coefficient  | <ul style="list-style-type: none"> <li>• 0.02%/°C max</li> </ul>                                                                                                               |

#### General

|                       |                                                                                                                                                                                                                                                          |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Efficiency            | <ul style="list-style-type: none"> <li>• See table</li> </ul>                                                                                                                                                                                            |
| Isolation Voltage     | <ul style="list-style-type: none"> <li>• 1500 VDC Input to Output</li> <li>• For optional high isolation versions 3000 VDC Input to Output add suffix -H to model number</li> <li>• 1000 VDC Input to Case</li> <li>• 1000 VDC Output to Case</li> </ul> |
| Isolation Capacitance | <ul style="list-style-type: none"> <li>• 1000 pF typical input to output</li> </ul>                                                                                                                                                                      |
| Isolation Resistance  | <ul style="list-style-type: none"> <li>• <math>10^9 \Omega</math></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>• 15 W/in<sup>3</sup></li> </ul>                                                                                                                                                                                  |
| MTBF                  | <ul style="list-style-type: none"> <li>• &gt;800 KHrs to MIL-STD-217F at 25 °C, GB</li> </ul>                                                                                                                                                            |

#### Environmental

|                       |                                                                                            |
|-----------------------|--------------------------------------------------------------------------------------------|
| Operating Temperature | <ul style="list-style-type: none"> <li>• -40 °C to +100 °C (see derating curve)</li> </ul> |
| Case Temperature      | <ul style="list-style-type: none"> <li>• +100 °C max</li> </ul>                            |
| Storage Temperature   | <ul style="list-style-type: none"> <li>• -55 °C to +125 °C</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>           |

#### EMC

|                    |                                                                                            |
|--------------------|--------------------------------------------------------------------------------------------|
| Emissions          | <ul style="list-style-type: none"> <li>• EN55022 Class A conducted</li> </ul>              |
| ESD Immunity       | <ul style="list-style-type: none"> <li>• EN61000-4-2, level 3, Perf Criteria B</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 A</li> </ul>   |
| Surge              | <ul style="list-style-type: none"> <li>• EN61000-4-5, level 2, Perf Criteria A*</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>    |

\* External input capacitor required, 220 $\mu$ F/100V (See note 7)

## Models and Ratings

JCE06 XP

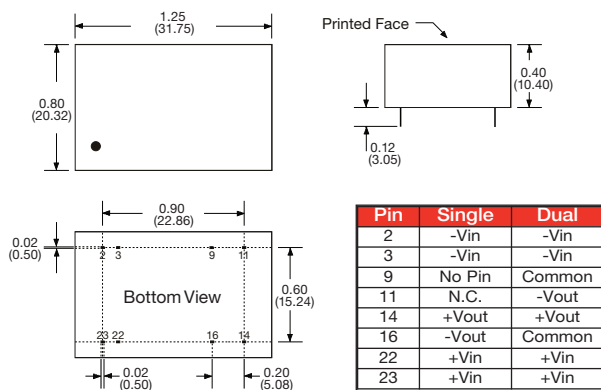
| Input Voltage | Output Voltage | Output Current | Input Current <sup>(1)</sup> |           | Maximum Capacitive Load <sup>(2)</sup> | Efficiency | Model Number <sup>(4,5)</sup> |
|---------------|----------------|----------------|------------------------------|-----------|----------------------------------------|------------|-------------------------------|
|               |                |                | No Load                      | Full Load |                                        |            |                               |
| 9-18 VDC      | 3.3 V          | 1400 mA        | 7 mA                         | 513 mA    | 470 $\mu$ F                            | 75%        | JCE0612S3V3                   |
|               | 5.0 V          | 1200 mA        | 7 mA                         | 633 mA    | 470 $\mu$ F                            | 79%        | JCE0612S05                    |
|               | 12.0 V         | 500 mA         | 10 mA                        | 602 mA    | 100 $\mu$ F                            | 83%        | JCE0612S12                    |
|               | 15.0 V         | 400 mA         | 10 mA                        | 595 mA    | 100 $\mu$ F                            | 84%        | JCE0612S15                    |
|               | 24.0 V         | 250 mA         | 20 mA                        | 610 mA    | 47 $\mu$ F                             | 82%        | JCE0612S24                    |
|               | $\pm 3.3$ V    | $\pm 909$ mA   | 10 mA                        | 658 mA    | $\pm 220$ $\mu$ F                      | 76%        | JCE0612D03                    |
|               | $\pm 5.0$ V    | $\pm 600$ mA   | 10 mA                        | 625 mA    | $\pm 220$ $\mu$ F                      | 80%        | JCE0612D05                    |
|               | $\pm 12.0$ V   | $\pm 250$ mA   | 15 mA                        | 602 mA    | $\pm 100$ $\mu$ F                      | 83%        | JCE0612D12                    |
|               | $\pm 15.0$ V   | $\pm 200$ mA   | 20 mA                        | 595 mA    | $\pm 100$ $\mu$ F                      | 84%        | JCE0612D15                    |
| 18-36 VDC     | 3.3 V          | 1400 mA        | 7 mA                         | 260 mA    | 470 $\mu$ F                            | 74%        | JCE0624S3V3                   |
|               | 5.0 V          | 1200 mA        | 7 mA                         | 316 mA    | 470 $\mu$ F                            | 79%        | JCE0624S05                    |
|               | 12.0 V         | 500 mA         | 7 mA                         | 301 mA    | 100 $\mu$ F                            | 83%        | JCE0624S12                    |
|               | 15.0 V         | 400 mA         | 7 mA                         | 301 mA    | 100 $\mu$ F                            | 83%        | JCE0624S15                    |
|               | 24.0 V         | 250 mA         | 10 mA                        | 305 mA    | 47 $\mu$ F                             | 82%        | JCE0624S24                    |
|               | $\pm 3.3$ V    | $\pm 909$ mA   | 7 mA                         | 329 mA    | $\pm 220$ $\mu$ F                      | 76%        | JCE0624D03                    |
|               | $\pm 5.0$ V    | $\pm 600$ mA   | 7 mA                         | 312 mA    | $\pm 220$ $\mu$ F                      | 80%        | JCE0624D05                    |
|               | $\pm 12.0$ V   | $\pm 250$ mA   | 10 mA                        | 301 mA    | $\pm 100$ $\mu$ F                      | 83%        | JCE0624D12                    |
|               | $\pm 15.0$ V   | $\pm 200$ mA   | 15 mA                        | 298 mA    | $\pm 100$ $\mu$ F                      | 84%        | JCE0624D15                    |
| 36-75 VDC     | 3.3 V          | 1400 mA        | 7 mA                         | 128 mA    | 470 $\mu$ F                            | 76%        | JCE0648S3V3                   |
|               | 5.0 V          | 1200 mA        | 7 mA                         | 154 mA    | 470 $\mu$ F                            | 82%        | JCE0648S05                    |
|               | 12.0 V         | 500 mA         | 7 mA                         | 151 mA    | 100 $\mu$ F                            | 84%        | JCE0648S12                    |
|               | 15.0 V         | 400 mA         | 7 mA                         | 151 mA    | 100 $\mu$ F                            | 84%        | JCE0648S15                    |
|               | 24.0 V         | 250 mA         | 7 mA                         | 151 mA    | 47 $\mu$ F                             | 84%        | JCE0648S24                    |
|               | $\pm 3.3$ V    | $\pm 909$ mA   | 7 mA                         | 162 mA    | $\pm 220$ $\mu$ F                      | 78%        | JCE0648D03                    |
|               | $\pm 5.0$ V    | $\pm 600$ mA   | 7 mA                         | 154 mA    | $\pm 220$ $\mu$ F                      | 82%        | JCE0648D05                    |
|               | $\pm 12.0$ V   | $\pm 250$ mA   | 7 mA                         | 151 mA    | $\pm 100$ $\mu$ F                      | 84%        | JCE0648D12                    |
|               | $\pm 15.0$ V   | $\pm 200$ mA   | 7 mA                         | 151 mA    | $\pm 100$ $\mu$ F                      | 84%        | JCE0648D15                    |
|               | $\pm 24.0$ V   | $\pm 125$ mA   | 15 mA                        | 158 mA    | $\pm 47$ $\mu$ F                       | 80%        | JCE0648D24                    |

## Notes

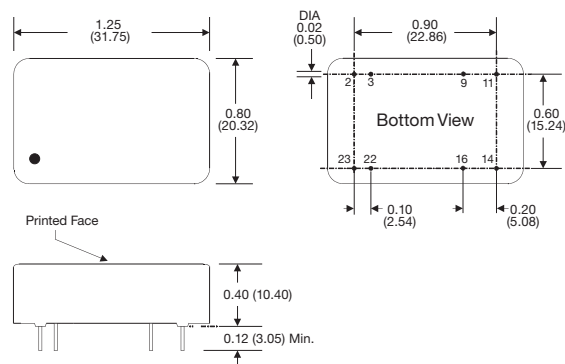
- When one output is set at 100% load and the other varies between 25% & 100% load.
- Measured with 20 MHz bandwidth and 1  $\mu$ F ceramic capacitor across output rails.
- Input current specified at nominal 12 V, 24 V or 48 V input.
- For optional 3000 VDC isolation add suffix -H to part number e.g. JCE0624S12-H
- For optional metal case version add suffix -M to part number e.g. JCE0612S24-M
- Maximum capacitive load is per output
- For surge immunity, external input capacitor required, 220  $\mu$ F/100 V. 24 V & 48 V input models are Perf Criteria A, 12 V input models are Perf Criteria B.

## Mechanical Details

## Plastic Case



## Optional Metal Case



## Notes

- All dimensions are in inches (mm)
- Weight: 0.03 lbs (13 g) for plastic case, 0.04 lbs (16.5 g) for metal case
- Pin diameter: 0.02  $\pm$  0.002 (0.5  $\pm$  0.005)
- Pin pitch and length tolerance:  $\pm$ 0.014 ( $\pm$ 0.35)
- Case tolerance:  $\pm$ 0.02 ( $\pm$ 0.5)
- Package: 24 pin DIL black plastic (UL94V-0) or optional nickel-coated copper.

## Application Notes

## Derating Curve

