

# 12/15 Watts

## JCG Series



- High Power Density
- 2:1 Input Range
- Operating Temperature  $-40^{\circ}\text{C}$  to  $+100^{\circ}\text{C}$
- Single & Dual Outputs
- 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)</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 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 36 VDC for 1000 ms</li> <li>• 24 V models 50 VDC for 1000 ms</li> <li>• 48 V models 100 VDC for 1000 ms</li> </ul> |
| Undervoltage Lockout             | <ul style="list-style-type: none"> <li>• None</li> </ul>                                                                                                                |
| Input Reverse Voltage Protection | <ul style="list-style-type: none"> <li>• None</li> </ul>                                                                                                                |

#### Output

|                          |                                                                                                                                                                                                                                                                                                                                                          |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Output Voltage           | <ul style="list-style-type: none"> <li>• See table</li> </ul>                                                                                                                                                                                                                                                                                            |
| Minimum Load             | <ul style="list-style-type: none"> <li>• No minimum load required</li> </ul>                                                                                                                                                                                                                                                                             |
| Initial Set Accuracy     | <ul style="list-style-type: none"> <li>• <math>\pm 1.2\%</math> max for JCG12, <math>\pm 1.0\%</math> for JCG15</li> </ul>                                                                                                                                                                                                                               |
| Start Up Delay           | <ul style="list-style-type: none"> <li>• 20 ms max</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 0.5\%</math> max single, <math>\pm 1.0\%</math> max dual</li> </ul>                                                                                                                                                                                                                                   |
| Cross Regulation         | <ul style="list-style-type: none"> <li>• <math>\pm 5\%</math> on dual output models (see note 2)</li> </ul>                                                                                                                                                                                                                                              |
| Transient Response       | <ul style="list-style-type: none"> <li>• <math>&lt; 3\%</math> deviation, recovery to within 1% in 250 <math>\mu\text{s}</math> for a 25% load change</li> </ul>                                                                                                                                                                                         |
| Ripple & Noise           | <ul style="list-style-type: none"> <li>• 85 mV pk-pk, 20 MHz bandwidth for JCG12,</li> <li>• 60 mV pk-pk, 20 MHz bandwidth for JCG15 (see note 3)</li> </ul>                                                                                                                                                                                             |
| Overload Protection      | <ul style="list-style-type: none"> <li>• <math>&gt; 150\%</math> of full load</li> </ul>                                                                                                                                                                                                                                                                 |
| Overvoltage Protection   | <ul style="list-style-type: none"> <li>• 2.5/3.3 V models: 3.9 V typical</li> <li>• 5 V models: 6.2 V typical</li> <li>• 12 V models: 15.0 V typical</li> <li>• 15 V models: 18.0 V typical</li> <li>• <math>\pm 12</math> V models: <math>\pm 15.0</math> V typical</li> <li>• <math>\pm 15</math> V models: <math>\pm 18.0</math> V typical</li> </ul> |
| Short Circuit Protection | <ul style="list-style-type: none"> <li>• Trip &amp; restart (hiccup) with 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>• <math>\pm 0.02/^{\circ}\text{C}</math> max</li> </ul>                                                                                                                                                                                                                                                           |
| Remote On/Off            | <ul style="list-style-type: none"> <li>• ON <math>&gt; 3.0</math> VDC or open circuit</li> <li>• OFF <math>&lt; 1.2</math> VDC or short circuit pin 1, 2 &amp; 3</li> </ul>                                                                                                                                                                              |

#### General

|                       |                                                                                                                                                   |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Efficiency            | <ul style="list-style-type: none"> <li>• See tables</li> </ul>                                                                                    |
| Isolation Voltage     | <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>• 2000 <math>\mu\text{F}</math> max</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>• 30 W/in<sup>3</sup> for JCG12, 37.5 W/in<sup>3</sup> for JCG15</li> </ul>                                |
| MTBF                  | <ul style="list-style-type: none"> <li>• <math>&gt; 1.0</math> Mhrs 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>+100^{\circ}\text{C}</math>, derate from 100% load at <math>+60^{\circ}\text{C}</math> to no load at <math>+100^{\circ}\text{C}</math></li> </ul> |
| Case Temperature      | <ul style="list-style-type: none"> <li>• <math>+100^{\circ}\text{C}</math> max</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>                                                                                                            |
| Humidity              | <ul style="list-style-type: none"> <li>• Up to 95%, non-condensing</li> </ul>                                                                                                                                                        |
| Cooling               | <ul style="list-style-type: none"> <li>• Natural convection</li> </ul>                                                                                                                                                               |

#### EMC

|                    |                                                                                                                                            |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Emissions          | <ul style="list-style-type: none"> <li>• EN55022 Class A conducted and radiated with external components - see application note</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*</li> </ul>                                                 |
| Surge              | <ul style="list-style-type: none"> <li>• EN61000-4-5, installation class 3, 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>                                                    |

\* A 330  $\mu\text{F}$ , 100 V capacitor is required across input terminals to meet performance criteria A.

## Models and Ratings

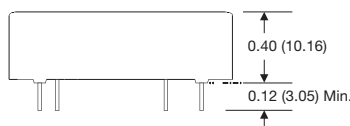
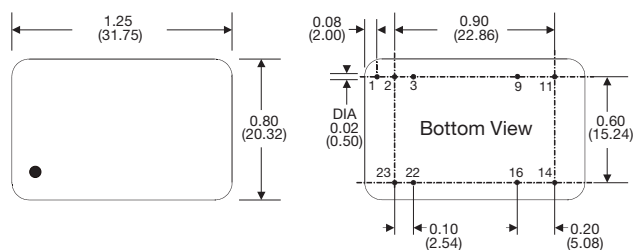
JCG12/15 **XP**

| Input Voltage | Output Voltage | Output Current | Input Current <sup>(1)</sup> |           | Max. Capacitive Load | Efficiency | Model Number |
|---------------|----------------|----------------|------------------------------|-----------|----------------------|------------|--------------|
|               |                |                | No Load                      | Full Load |                      |            |              |
| 9-18 V        | 2.5 V          | 3.5 A          | 15 mA                        | 0.89 A    | 2000 $\mu$ F         | 85%        | JCG1212S2V5  |
|               | 3.3 V          | 3.5 A          | 15 mA                        | 1.15 A    | 2000 $\mu$ F         | 87%        | JCG1212S3V3  |
|               | 5.0 V          | 2.4 A          | 15 mA                        | 1.16 A    | 2000 $\mu$ F         | 89%        | JCG1212S05   |
|               | 12.0 V         | 1.0 A          | 15 mA                        | 1.15 A    | 430 $\mu$ F          | 90%        | JCG1212S12   |
|               | 15.0 V         | 0.8 A          | 15 mA                        | 1.15 A    | 300 $\mu$ F          | 90%        | JCG1212S15   |
|               | $\pm 12.0$ V   | $\pm 0.5$ A    | 15 mA                        | 1.15 A    | $\pm 200$ $\mu$ F    | 90%        | JCG1212D12   |
|               | $\pm 15.0$ V   | $\pm 0.4$ A    | 15 mA                        | 1.14 A    | $\pm 120$ $\mu$ F    | 91%        | JCG1212D15   |
| 18-36 V       | 2.5 V          | 3.5 A          | 15 mA                        | 0.45 A    | 2000 $\mu$ F         | 85%        | JCG1224S2V5  |
|               | 3.3 V          | 3.5 A          | 15 mA                        | 0.57 A    | 2000 $\mu$ F         | 87%        | JCG1224S3V3  |
|               | 5.0 V          | 2.4 A          | 15 mA                        | 0.58 A    | 2000 $\mu$ F         | 89%        | JCG1224S05   |
|               | 12.0 V         | 1.0 A          | 15 mA                        | 0.58 A    | 430 $\mu$ F          | 90%        | JCG1224S12   |
|               | 15.0 V         | 0.8 A          | 15 mA                        | 0.58 A    | 300 $\mu$ F          | 90%        | JCG1224S15   |
|               | $\pm 12.0$ V   | $\pm 0.5$ A    | 15 mA                        | 0.58 A    | $\pm 200$ $\mu$ F    | 90%        | JCG1224D12   |
|               | $\pm 15.0$ V   | $\pm 0.4$ A    | 15 mA                        | 0.56 A    | $\pm 120$ $\mu$ F    | 91%        | JCG1224D15   |
| 36-75 V       | 2.5 V          | 3.5 A          | 15 mA                        | 0.23 A    | 2000 $\mu$ F         | 84%        | JCG1248S2V5  |
|               | 3.3 V          | 3.5 A          | 15 mA                        | 0.28 A    | 2000 $\mu$ F         | 88%        | JCG1248S3V3  |
|               | 5.0 V          | 2.4 A          | 15 mA                        | 0.29 A    | 2000 $\mu$ F         | 89%        | JCG1248S05   |
|               | 12.0 V         | 1.0 A          | 15 mA                        | 0.29 A    | 430 $\mu$ F          | 88%        | JCG1248S12   |
|               | 15.0 V         | 0.8 A          | 15 mA                        | 0.29 A    | 300 $\mu$ F          | 89%        | JCG1248S15   |
|               | $\pm 12.0$ V   | $\pm 0.5$ A    | 15 mA                        | 0.29 A    | $\pm 200$ $\mu$ F    | 88%        | JCG1248D12   |
|               | $\pm 15.0$ V   | $\pm 0.4$ A    | 15 mA                        | 0.29 A    | $\pm 120$ $\mu$ F    | 89%        | JCG1248D15   |
| 9-18 V        | 3.3 V          | 4.0 A          | 15 mA                        | 1309 mA   | 4700 $\mu$ F         | 86%        | JCG1512S3V3  |
|               | 5.1 V          | 3.0 A          | 15 mA                        | 1465 mA   | 3300 $\mu$ F         | 89%        | JCG1512S05   |
|               | 12.0 V         | 1.25 A         | 15 mA                        | 1436 mA   | 600 $\mu$ F          | 89%        | JCG1512S12   |
|               | 15.0 V         | 1.0 A          | 15 mA                        | 1420 mA   | 400 $\mu$ F          | 90%        | JCG1512S15   |
|               | $\pm 5.0$ V    | $\pm 1.5$ A    | 15 mA                        | 1488 mA   | $\pm 1500$ $\mu$ F   | 86%        | JCG1512D05   |
|               | $\pm 12.0$ V   | $\pm 0.625$ A  | 15 mA                        | 1420 mA   | $\pm 288$ $\mu$ F    | 90%        | JCG1512D12   |
|               | $\pm 15.0$ V   | $\pm 0.5$ A    | 15 mA                        | 1420 mA   | $\pm 200$ $\mu$ F    | 90%        | JCG1512D15   |
| 18-36 V       | 3.3 V          | 4.0 A          | 10 mA                        | 647 mA    | 4700 $\mu$ F         | 87%        | JCG1524S3V3  |
|               | 5.1 V          | 3.0 A          | 10 mA                        | 732 mA    | 3300 $\mu$ F         | 89%        | JCG1524S05   |
|               | 12.0 V         | 1.25 A         | 10 mA                        | 710 mA    | 600 $\mu$ F          | 90%        | JCG1524S12   |
|               | 15.0 V         | 1.0 A          | 10 mA                        | 702 mA    | 400 $\mu$ F          | 91%        | JCG1524S15   |
|               | $\pm 5.0$ V    | $\pm 1.5$ A    | 10 mA                        | 744 mA    | $\pm 1500$ $\mu$ F   | 86%        | JCG1524D05   |
|               | $\pm 12.0$ V   | $\pm 0.625$ A  | 10 mA                        | 710 mA    | $\pm 288$ $\mu$ F    | 90%        | JCG1524D12   |
|               | $\pm 15.0$ V   | $\pm 0.5$ A    | 10 mA                        | 710 mA    | $\pm 200$ $\mu$ F    | 90%        | JCG1524D15   |
| 36-75 V       | 3.3 V          | 4.0 A          | 5 mA                         | 327 mA    | 4700 $\mu$ F         | 86%        | JCG1548S3V3  |
|               | 5.1 V          | 3.0 A          | 5 mA                         | 370 mA    | 3300 $\mu$ F         | 88%        | JCG1548S05   |
|               | 12.0 V         | 1.25 A         | 5 mA                         | 359 mA    | 600 $\mu$ F          | 89%        | JCG1548S12   |
|               | 15.0 V         | 1.0 A          | 5 mA                         | 359 mA    | 400 $\mu$ F          | 89%        | JCG1548S15   |
|               | $\pm 5.0$ V    | $\pm 1.5$ A    | 5 mA                         | 372 mA    | $\pm 1500$ $\mu$ F   | 86%        | JCG1548D05   |
|               | $\pm 12.0$ V   | $\pm 0.625$ A  | 5 mA                         | 359 mA    | $\pm 288$ $\mu$ F    | 89%        | JCG1548D12   |
|               | $\pm 15.0$ V   | $\pm 0.5$ A    | 5 mA                         | 355 mA    | $\pm 200$ $\mu$ F    | 90%        | JCG1548D15   |

## Notes

1. Input current measured at nominal input voltage.
2. When one output is set to 100% load & the other varies between 25% & 100% load.
3. Measured with 1  $\mu$ F ceramic capacitor across output rails.

## Mechanical Details



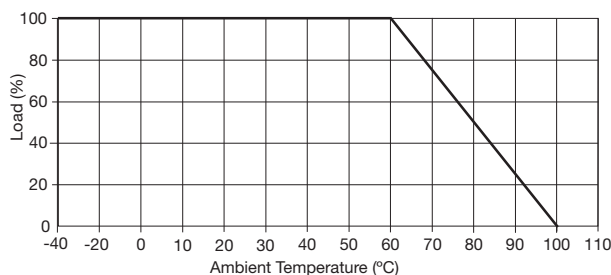
| Pin | Pin Connections |               |
|-----|-----------------|---------------|
|     | Single          | Dual          |
| 1   | Remote On/Off   | Remote On/Off |
| 2   | -Vin            | -Vin          |
| 3   | -Vin            | -Vin          |
| 9   | No Pin          | Common        |
| 11  | Not Connected   | -Vout         |
| 14  | +Vout           | +Vout         |
| 16  | -Vout           | Common        |
| 22  | +Vin            | +Vin          |
| 23  | +Vin            | +Vin          |

## Notes

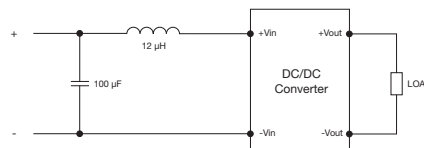
1. All dimensions are in inches (mm)
2. Weight: 0.04 lbs (18 g) approx
3. Pin diameter: 0.02  $\pm$  0.002 (0.5  $\pm$  0.05)
4. Pin pitch tolerance:  $\pm$  0.014 ( $\pm$  0.35)
5. Package: 24 pin DIL nickel-coated copper

## Application Notes

## Derating Curve



## Input Filter



## Remote On/Off

Standard ROF logic is positive  
 Output On >3.0 VDC or open circuit  
 Output Off <1.2 VDC or short circuit pins 1, 2 & 3