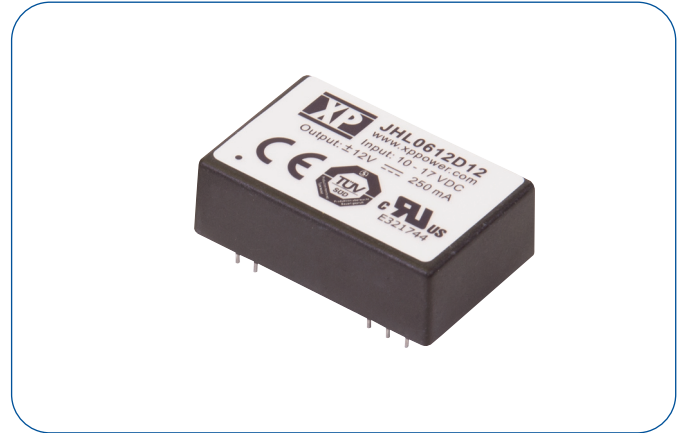


### 6 Watts

- International Medical Approvals
- 4000 VAC Reinforced Insulation
- Meets IEC60601-1, 3rd Edition
- 2 MOPP Isolation at 250 VAC
- 2  $\mu$ A Patient Leakage Current
- DIP24 Package
- EN55011 Level A With No External Components
- 3 Year Warranty



#### Dimensions:

**JHL06:**  
1.25 x 0.80 x 0.40" (31.15 x 20.32 x 10.20 mm)

### Models & Ratings

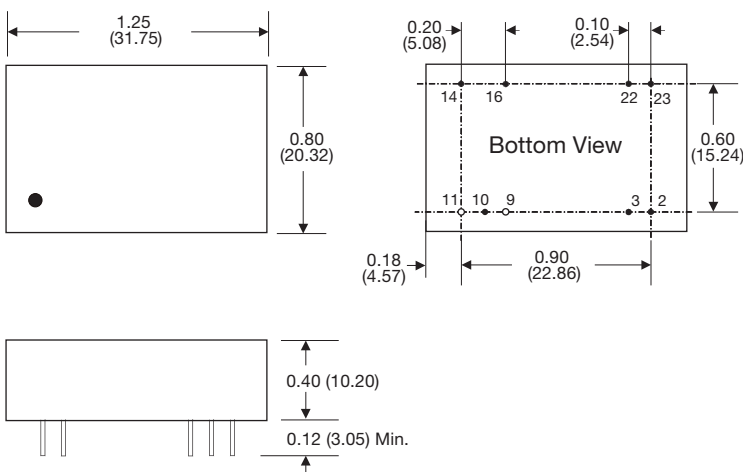
| Input Voltage | Output Voltage | Output Current | Input Current <sup>(1)</sup> |           | Maximum Capacitive Load <sup>(2)</sup> | Efficiency <sup>(3)</sup> | Model Number |
|---------------|----------------|----------------|------------------------------|-----------|--|---------------------------|--------------|
|               |                |                | No Load                      | Full Load |  |                           |              |
| 10-17 V       | 5.0V           | 1200 mA        | 59 mA                        | 640 mA    | 1200 $\mu$ F                           | 78%                       | JHL0612S05   |
|               | 12.0V          | 500 mA         | 92 mA                        | 640 mA    | 500 $\mu$ F                            | 78%                       | JHL0612S12   |
|               | 15.0V          | 400 mA         | 79 mA                        | 605 mA    | 400 $\mu$ F                            | 82%                       | JHL0612S15   |
|               | $\pm$ 12.0V    | $\pm$ 250 mA   | 52 mA                        | 605 mA    | $\pm$ 250 $\mu$ F                      | 83%                       | JHL0612D12   |
|               | $\pm$ 15.0V    | $\pm$ 200 mA   | 68 mA                        | 600 mA    | $\pm$ 250 $\mu$ F                      | 83%                       | JHL0612D15   |
| 20-30 V       | 5.0V           | 1200 mA        | 38 mA                        | 315 mA    | 1200 $\mu$ F                           | 78%                       | JHL0624S05   |
|               | 12.0V          | 500 mA         | 34 mA                        | 300 mA    | 500 $\mu$ F                            | 83%                       | JHL0624S12   |
|               | 15.0V          | 400 mA         | 23 mA                        | 290 mA    | 400 $\mu$ F                            | 85%                       | JHL0624S15   |
|               | $\pm$ 12.0V    | $\pm$ 250 mA   | 29 mA                        | 295 mA    | $\pm$ 250 $\mu$ F                      | 85%                       | JHL0624D12   |
|               | $\pm$ 15.0V    | $\pm$ 200 mA   | 33 mA                        | 295 mA    | $\pm$ 250 $\mu$ F                      | 83%                       | JHL0624D15   |

### Notes

1. Input current measured at nominal input voltage.
2. Maximum capacitive load is per output.

3. Typical values.

### Mechanical Details



| Pin | Pin Connections |        |
|-----|-----------------|--------|
|     | Single          | Dual   |
| 2   | -Vin            | -Vin   |
| 3   | -Vin            | -Vin   |
| 9   | No Pin          | Common |
| 10  | Trim            | Trim   |
| 11  | No Pin          | -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 (20 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. Case tolerance:  $\pm$ 0.02 ( $\pm$ 0.5)

### Input

| Characteristic          | Minimum                    | Typical | Maximum | Units | Notes & Conditions           |
|-------------------------|----------------------------|---------|---------|-------|------------------------------|
| Input Voltage Range     | 10                         |         | 17      | VDC   | 12 V nominal                 |
|                         | 20                         |         | 30      | VDC   | 24 V nominal                 |
| Input Current           |                            |         |         |       | See Models and Ratings table |
| Inrush Current          |                            |         | 25      | A     | At 30VDC input               |
| Input Filter            | Pi type                    |         |         |       |                              |
| Patient Leakage Current |                            |         | 2       | µA    |                              |
| Undervoltage Lockout    | On at >9.3V. Off <8.9V     |         |         |       | 12 V models                  |
|                         | On at >17.8 V. Off <17.4 V |         |         |       | 24 V models                  |
| Input Surge             |                            |         | 25      | VDC   | 12 V models for 3 s          |
|                         |                            |         | 50      | VDC   | 24 V models for 3 s          |

### Output

| Characteristic           | Minimum | Typical | Maximum | Units       | Notes & Conditions   |
|--------------------------|---------|---------|---------|-------------|--|
| Output Voltage           | 5       |         | 30      | V           | See Models and Ratings table   |
| Output Voltage Trim      |         |         | ±10     | %           | Via external resistors, see Application Notes  |
| Initial Set Accuracy     |         |         | ±1      | %           | on V1  |
|                          |         |         | ±2      | %           | on V2 of dual output models  |
| Minimum Load             | 0       |         |         | A           | No minimum load required   |
| Start Up Delay           |         | 5       |         | ms          |  |
| Start Up Rise Time       |         | 2       |         | ms          |  |
| Line Regulation          |         |         | ±0.3    | %           |  |
| Load Regulation          |         |         | ±1      | %           | 0 - 100% load  |
| Cross Regulation         |         |         | ±4      | %           | On dual output models with one output set to 50% load and the other varied from 10% to 100% load (D05 20% to 100%) |
| Transient Response       |         |         | 4       | % deviation | Recovery to within 1% in <500 µs for a 50% load change at 0.25 A/µs rate   |
| Ripple & Noise           |         |         | 1/1.2   | % pk-pk     | For single/dual output 20 MHz bandwidth  |
| Short Circuit Protection |         |         |         |             | Trip & Restart (hiccup mode), auto recovery  |
| Overload Protection      | 120     |         | 200     | %           | Trip & Restart (hiccup mode)   |
| Overvoltage Protection   | 115     |         | 140     | %           |  |
| Temperature Coefficient  |         |         | 0.03    | %/°C        |  |

### General

| Characteristic              | Minimum | Typical     | Maximum | Units             | Notes & Conditions  |
|-----------------------------|---------|-------------|---------|-------------------|---|
| Efficiency                  |         | 80          |         | %                 | See Models and Ratings table  |
| Isolation                   | 4000    |             |         | VAC               | For 1 min. Double/reinforced with a working voltage of 250 VAC. Meets 2 x MOPP per 3rd edition of IEC60601-1 5000 VAC for 10 ms in accordance with IEC60664-1 |
| Patient Leakage Current     |         |             | 2       | µA                |   |
| Input to Output Capacitance |         |             | 20      | pF                |   |
| Switching Frequency         |         | 250         |         | kHz               |   |
| Power Density               |         |             | 15      | W/in <sup>3</sup> |   |
| Mean Time Between Failure   |         | >1          |         | MHrs              | MIL-HDBK-217F, +25 °C GB  |
| Weight                      |         | 0.04 (20.0) |         | lb (g)            |   |

### Environmental

| Characteristic        | Minimum  | Typical | Maximum | Units | Notes & Conditions |
|-----------------------|--|---------|---------|-------|--------------------|
| Operating Temperature | -20  |         | +80     | °C    | See derating curve |
| Storage Temperature   | -40  |         | +100    | °C    |                    |
| Case Temperature      |  |         | +100    | °C    |                    |
| Humidity              | 5  |         | 90      | %RH   | Non-condensing     |
| Cooling               |  |         |         |       | Natural convection |
| Shock                 | ±3 shocks in each plane, total 18 shocks of 30 g : 11 ms halfsine. Conforms to EN60068-2-27 & EN60068-2-47 |         |         |       |                    |
| Vibration             | 10-500 Hz at 2 g sweep and endurance at resonance in all 3 planes. Conforms to EN60068-2-6                 |         |         |       |                    |

### EMC: Emissions

| Phenomenon | Standard | Test Level | Notes & Conditions |
|------------|----------|------------|--------------------|
| Conducted  | EN55011  | Level A    |                    |
| Radiated   | EN55011  | Level A    |                    |

### EMC: Immunity

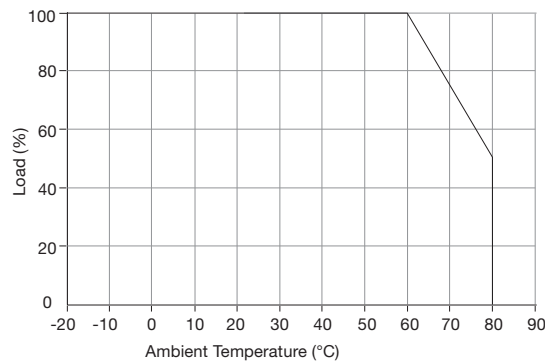
| Phenomenon         | Standard  | Test Level                | Criteria | Notes & Conditions   |
|--------------------|---|---------------------------|----------|--|
| Immunity           | IEC60601-1-2  | Ed 4.0: 2014              | As Below |  |
| ESD Immunity       | EN61000-4-2   | ±8 kv Contact, ±15 kv Air | A        |  |
| Radiated Immunity  | EN61000-4-3   | 10 V/m                    | A        | 80 MHz - 2.7 GHz plus discrete communication proximity field frequencies |
| EFT/Burst          | EN61000-4-4   | 2                         | A        |  |
| Surges             | EN61000-4-5   | 1                         | A        |  |
| Conducted Immunity | EN61000-4-6   | 3 Vm                      | A        |  |
| Magnetic Fields    | EN61000-4-8   | 30 A/m                    | A        |  |
| Safety Approvals   | ANSI/AMMI ES60601-1 3rd Edition, CSA-22.2 No.60601-1:2008, IEC60601-1 3rd Edition |                           |          |  |

### Safety Approvals

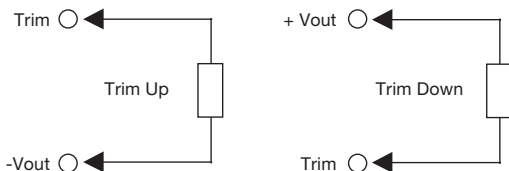
| Safety Agency | Safety Standard  | Notes & Conditions |
|---------------|--|--------------------|
| CB Report     | IEC60601-1 Including Risk Management                     | Medical            |
| UL            | ANSI/AAMI ES60601-1 3rd Ed. & CSA C22.2, No.60601-1:2008 | Medical            |
| EN            | EN60601-1  | Medical            |
| CE            | Meets all applicable directives                          |                    |
| UKCA          | Meets all applicable legislation                         |                    |

### Application Notes

#### Derating Curve



#### External Output Trim



For 5 V output:  
 Trim +10%, R = 3.4 k typical  
 Trim -10%, R = 1.1 k typical

For 12 V output:  
 Trim +10%, R = 5.9 k typical  
 Trim -10%, R = 11.3 k typical

For 15 V output:  
 Trim +10%, R = 8.4 k typical  
 Trim -10%, R = 10.4 k typical

For ±12 V output:  
 Trim +10%, R = 12.8 k typical  
 Trim -10%, R = 9.5 k typical

For ±15 V output:  
 Trim +10%, R = 18 k typical  
 Trim -10%, R = 14.8 k typical