

# 10 Watts

## JHM10 Series



- International Medical Approvals
- 4000 VAC Reinforced Insulation
- Meets IEC60601-1
- 2  $\mu$ A Patient Leakage Current
- DIP-24 Package
- EN55011 Level A With No External Components
- 3 Year Warranty

### Specification

#### Input

|                         |                                                                                                                                                                                                                |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Input Voltage Range     | <ul style="list-style-type: none"> <li>• 5 V (4.5-9 VDC)</li> <li>• 12 V (9-18 VDC)</li> <li>• 24 V (18-36 VDC)</li> </ul>                                                                                     |
| Input Current           | <ul style="list-style-type: none"> <li>• See table</li> </ul>                                                                                                                                                  |
| Inrush Current          | <ul style="list-style-type: none"> <li>• 20 A max at 36 V</li> </ul>                                                                                                                                           |
| Input Filter            | <ul style="list-style-type: none"> <li>• Pi network</li> </ul>                                                                                                                                                 |
| Patient Leakage Current | <ul style="list-style-type: none"> <li>• 2 <math>\mu</math>A max</li> </ul>                                                                                                                                    |
| Undervoltage Lockout    | <ul style="list-style-type: none"> <li>• 5 V models, on at &gt;4.4 V, off &lt;4.2 V</li> <li>• 12 V models, on at &gt;8.8 V, off &lt;8.3 V</li> <li>• 24 V models, on at &gt;17.5 V, off &lt;17.0 V</li> </ul> |
| Input Surge             | <ul style="list-style-type: none"> <li>• 5 V models 15 V for 3 s</li> <li>• 12 V models 25 V for 3 s</li> <li>• 24 V models 50 V for 3 s</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>                                                                                                         |
| Initial Set Accuracy     | <ul style="list-style-type: none"> <li>• <math>\pm 1\%</math> max on +Vout, <math>\pm 2\%</math> max on -Vout</li> </ul>                                                             |
| Start Up Delay           | <ul style="list-style-type: none"> <li>• 5 ms typical</li> </ul>                                                                                                                     |
| Start Up Rise Time       | <ul style="list-style-type: none"> <li>• 2 ms typical</li> </ul>                                                                                                                     |
| Line Regulation          | <ul style="list-style-type: none"> <li>• <math>\pm 0.3\%</math> max</li> </ul>                                                                                                       |
| Load Regulation          | <ul style="list-style-type: none"> <li>• <math>\pm 2\%</math> max 0% to 10% load, <math>\pm 1\%</math> max 10% to 100% load</li> </ul>                                               |
| Cross Regulation         | <ul style="list-style-type: none"> <li>• <math>\pm 4\%</math> max on dual with one output set to 50% load and the other varied from 10% to 100% load (D05 is 20% to 100%)</li> </ul> |
| Transient Response       | <ul style="list-style-type: none"> <li>• 4% max deviation, recovery to within 1% in &lt;500 <math>\mu</math>s for a 50% load change at 0.25 A/<math>\mu</math>s rate</li> </ul>      |
| Ripple & Noise           | <ul style="list-style-type: none"> <li>• 1% pk-pk max at 20 MHz bandwidth</li> </ul>                                                                                                 |
| Overload Protection      | <ul style="list-style-type: none"> <li>• 120% - 200%, trip and restart</li> </ul>                                                                                                    |
| Overvoltage Protection   | <ul style="list-style-type: none"> <li>• 115% - 140%</li> </ul>                                                                                                                      |
| Temperature Coefficient  | <ul style="list-style-type: none"> <li>• <math>\pm 0.03/^{\circ}\text{C}</math> max</li> </ul>                                                                                       |
| Short Circuit Protection | <ul style="list-style-type: none"> <li>• Trip and Restart (hiccup mode), auto recovery</li> </ul>                                                                                    |

#### General

|                             |                                                                                                                                                                                                                                       |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Efficiency                  | <ul style="list-style-type: none"> <li>• See tables</li> </ul>                                                                                                                                                                        |
| Isolation                   | <ul style="list-style-type: none"> <li>• 4000 VAC for 1 min. double/reinforced with a working voltage of 250 VAC. Meets 2 x MOPP per 3rd edition of IEC60601-1</li> <li>• 5000 VAC for 10 ms in accordance with IEC60664-1</li> </ul> |
| Input to Output Capacitance | <ul style="list-style-type: none"> <li>• 20 pF max</li> </ul>                                                                                                                                                                         |
| Switching Frequency         | <ul style="list-style-type: none"> <li>• 80 kHz to 1.2 MHz variable</li> </ul>                                                                                                                                                        |
| Power Density               | <ul style="list-style-type: none"> <li>• 20.0 W/in<sup>3</sup></li> </ul>                                                                                                                                                             |
| MTBF                        | <ul style="list-style-type: none"> <li>• &gt;1 Mhrs typical to MIL-STD-217F at 25 <math>^{\circ}\text{C}</math>, GB</li> </ul>                                                                                                        |

#### Environmental

|                       |                                                                                                                                                |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Operating Temperature | <ul style="list-style-type: none"> <li>• -40 <math>^{\circ}\text{C}</math> to +80 <math>^{\circ}\text{C}</math>, see derating curve</li> </ul> |
| Case Temperature      | <ul style="list-style-type: none"> <li>• +100 <math>^{\circ}\text{C}</math> max</li> </ul>                                                     |
| Storage Temperature   | <ul style="list-style-type: none"> <li>• -40 <math>^{\circ}\text{C}</math> to +100 <math>^{\circ}\text{C}</math></li> </ul>                    |
| Operating Humidity    | <ul style="list-style-type: none"> <li>• 5-90%, non-condensing</li> </ul>                                                                      |
| Cooling               | <ul style="list-style-type: none"> <li>• Natural convection</li> </ul>                                                                         |

#### EMC & Safety

|                    |                                                                                                                                        |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Emissions          | <ul style="list-style-type: none"> <li>• EN55011 &amp; EN55032 level A conducted &amp; radiated with no external components</li> </ul> |
| Immunity           | <ul style="list-style-type: none"> <li>• IEC60601-1-2, EN61204-3</li> </ul>                                                            |
| ESD Immunity       | <ul style="list-style-type: none"> <li>• EN61000-4-2, level 2, 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 2 Perf Criteria A</li> </ul>                                               |
| Surge              | <ul style="list-style-type: none"> <li>• EN61000-4-5, level 1 Perf Criteria A</li> </ul>                                               |
| Conducted Immunity | <ul style="list-style-type: none"> <li>• EN61000-4-6, 10 Vm, Perf Criteria A</li> </ul>                                                |
| Magnetic Field     | <ul style="list-style-type: none"> <li>• EN61000-4-8, 3 A/m Perf Criteria A</li> </ul>                                                 |
| Safety Approvals   | <ul style="list-style-type: none"> <li>• ANSI/AMMI ES60601-1</li> <li>• CSA-22.2 No.60601-1</li> <li>• IEC60601-1</li> </ul>           |

## Models and Ratings

**JHM10 XP**

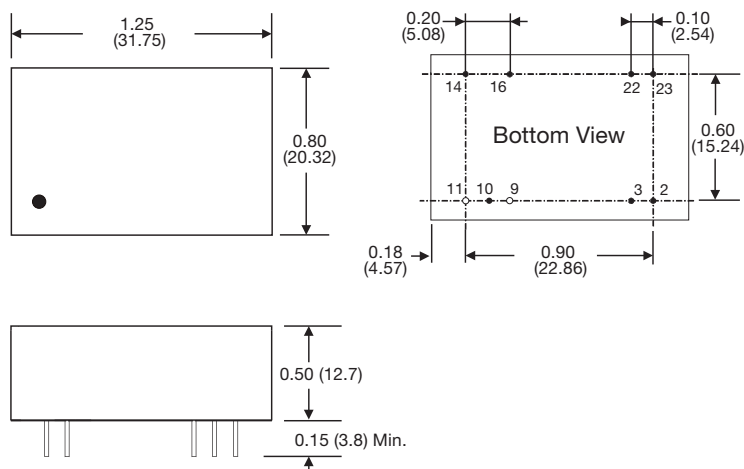
| Input Voltage | Output Voltage | Output Current | Input Current          |                          | Maximum Capacitive Load | Efficiency <sup>®</sup> | Model Number |
|---------------|----------------|----------------|------------------------|--------------------------|-------------------------|-------------------------|--------------|
|               |                |                | No Load <sup>(1)</sup> | Full Load <sup>(2)</sup> |                         |                         |              |
| 4.5-9 V       | 5.0V           | 2000 mA        | 100 mA                 | 2690 mA                  | 2200 $\mu$ F            | 83.5%                   | JHM1005S05   |
|               | 12.0V          | 833 mA         | 115 mA                 | 2640 mA                  | 1000 $\mu$ F            | 85.0%                   | JHM1005S12   |
|               | 15.0V          | 666 mA         | 115 mA                 | 2640 mA                  | 680 $\mu$ F             | 85.0%                   | JHM1005S15   |
|               | $\pm 5.0V$     | $\pm 1000$ mA  | 130 mA                 | 2760 mA                  | $\pm 1000$ $\mu$ F      | 81.5%                   | JHM1005D05   |
|               | $\pm 12.0V$    | $\pm 420$ mA   | 115 mA                 | 2695 mA                  | $\pm 470$ $\mu$ F       | 84.0%                   | JHM1005D12   |
| 9-18 V        | 5.0V           | 2000 mA        | 50 mA                  | 1310 mA                  | 2200 $\mu$ F            | 86.0%                   | JHM1012S05   |
|               | 12.0V          | 833 mA         | 50 mA                  | 1280 mA                  | 1000 $\mu$ F            | 88.0%                   | JHM1012S12   |
|               | 15.0V          | 666 mA         | 50 mA                  | 1265 mA                  | 680 $\mu$ F             | 89.0%                   | JHM1012S15   |
|               | $\pm 5.0V$     | $\pm 1000$ mA  | 50 mA                  | 1345 mA                  | $\pm 1000$ $\mu$ F      | 84.0%                   | JHM1012D05   |
|               | $\pm 12.0V$    | $\pm 420$ mA   | 50 mA                  | 1290 mA                  | $\pm 470$ $\mu$ F       | 88.0%                   | JHM1012D12   |
| 18-36 V       | 5.0V           | 2000 mA        | 25 mA                  | 645 mA                   | 2200 $\mu$ F            | 87.0%                   | JHM1024S05   |
|               | 12.0V          | 833 mA         | 20 mA                  | 630 mA                   | 1000 $\mu$ F            | 89.0%                   | JHM1024S12   |
|               | 15.0V          | 666 mA         | 20 mA                  | 630 mA                   | 680 $\mu$ F             | 89.0%                   | JHM1024S15   |
|               | $\pm 5.0V$     | $\pm 1000$ mA  | 20 mA                  | 660 mA                   | $\pm 1000$ $\mu$ F      | 85.0%                   | JHM1024D05   |
|               | $\pm 12.0V$    | $\pm 420$ mA   | 25 mA                  | 640 mA                   | $\pm 470$ $\mu$ F       | 88.0%                   | JHM1024D12   |
|               | $\pm 15.0V$    | $\pm 333$ mA   | 25 mA                  | 635 mA                   | $\pm 470$ $\mu$ F       | 88.0%                   | JHM1024D15   |

### Notes

1. Input current measured at nominal input voltage.
2. Input current measured at lowest input voltage.

3. Typical values.

## Mechanical Details



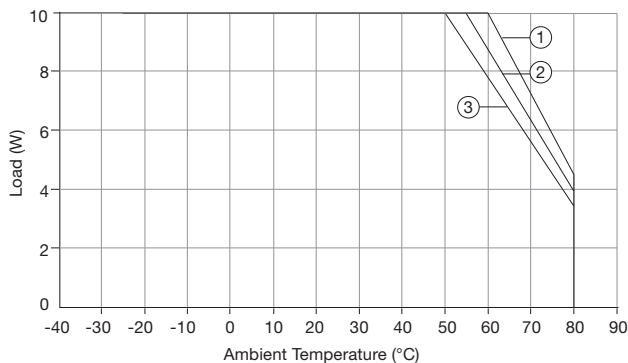
| Pin | Pin Connections |              |
|-----|-----------------|--------------|
|     | Single          | Dual         |
| 2   | -Vin            | -Vin         |
| 3   | -Vin            | -Vin         |
| 9   | No Pin          | Common 0Vout |
| 10  | Trim            | Trim         |
| 11  | No Pin          | -Vout        |
| 14  | +Vout           | +Vout        |
| 16  | -Vout           | Common 0Vout |
| 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:  $\pm$  0.01 ( $\pm$  0.25)
5. Case tolerance:  $\pm$  0.02 ( $\pm$  0.5)

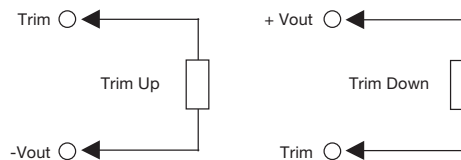
## Application Notes

### Derating Curve



- ① JHM1012/24 S05, S12, S15, D12, D15
- ② JHM1012/24 D05, JHM1005S05, S12, S15, D12, D15
- ③ JHM1005D05

### External Output Trim



For 5 V output:  
Trim +10%, R = 3.4 k typical  
Trim -10%, R = 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 = 8.3 k typical  
Trim -10%, R = 10 k typical

For  $\pm 5$  V output:  
Trim +10%, R = 12.0 k typical  
Trim -10%, R = 8.0 k typical

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

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



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

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