

JHM Series

- International Medical Approvals
- 3000 VAC Reinforced Insulation
- 60 °C Operation Without Derating
- 2 μ 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"> • 12 V (10-17 VDC) • 24 V (20-30 VDC) |
| Input Current | <ul style="list-style-type: none"> • See table |
| Inrush Current | <ul style="list-style-type: none"> • 25 A max at 30 V |
| Input Filter | <ul style="list-style-type: none"> • Pi network |
| Patient Leakage Current | <ul style="list-style-type: none"> • 2 μA max |
| Undervoltage Lockout | <ul style="list-style-type: none"> • 12 V model, on at <9 V, off >8.5 V • 24 V model on at <18.8 V, off >16 V |
| Input Surge | <ul style="list-style-type: none"> • 12 V models 25 V for 3 s • 24 V model 50 V for 3 s |

Output

| | |
|--------------------------|---|
| Output Voltage | <ul style="list-style-type: none"> • See table |
| Output Voltage Trim | <ul style="list-style-type: none"> • \pm10% |
| Minimum Load | <ul style="list-style-type: none"> • No minimum load required |
| Initial Set Accuracy | <ul style="list-style-type: none"> • \pm1% max |
| Start Up Delay | <ul style="list-style-type: none"> • 5 ms typical |
| Start Up Rise Time | <ul style="list-style-type: none"> • 2 ms typical |
| Line Regulation | <ul style="list-style-type: none"> • \pm0.3% max |
| Load Regulation | <ul style="list-style-type: none"> • \pm2% max 0% to 10% load, • \pm1% max 10% to 100% load |
| Cross Regulation | <ul style="list-style-type: none"> • \pm4% max on dual with one output set to 50% load and the other varied from 0% to 100% load |
| Transient Response | <ul style="list-style-type: none"> • 4% max deviation, recovery to within 1% in <500 μs for a 50% load change at 0.25 A/μs rate |
| Ripple & Noise | <ul style="list-style-type: none"> • 1% pk-pk max 20 MHz bandwidth |
| Overload Protection | <ul style="list-style-type: none"> • 120% - 200% |
| Overvoltage Protection | <ul style="list-style-type: none"> • 120% - 140% |
| Temperature Coefficient | <ul style="list-style-type: none"> • \pm0.03/$^{\circ}$C max |
| Short Circuit Protection | <ul style="list-style-type: none"> • Trip and restart (hiccup mode), auto recovery |

General

| | |
|-----------------------------|---|
| Efficiency | <ul style="list-style-type: none"> • See tables |
| Isolation | <ul style="list-style-type: none"> • 5000 VAC for 10 ms (acc. to IEC60664-1), 3000 VAC reinforced isolation for 1 min. |
| Input to Output Capacitance | <ul style="list-style-type: none"> • 20 pF max |
| Switching Frequency | <ul style="list-style-type: none"> • JHM03: 180 kHz to 1.2 MHz variable • JHM06: 200 kHz to 1.6 MHz variable |
| Power Density | <ul style="list-style-type: none"> • JHM03: 7.5 W/in³, JHM06: 17.0 W/in³ |
| MTBF | <ul style="list-style-type: none"> • >1 Mhrs typical to MIL-STD-217F at 25 $^{\circ}$C, GB |

Environmental

| | |
|-----------------------|---|
| Operating Temperature | <ul style="list-style-type: none"> • -20 $^{\circ}$C to +100 $^{\circ}$C, derate from 100% load at +60 $^{\circ}$C to no load at 100 $^{\circ}$C |
| Case Temperature | <ul style="list-style-type: none"> • +100 $^{\circ}$C max |
| Storage Temperature | <ul style="list-style-type: none"> • -40 $^{\circ}$C to +100 $^{\circ}$C |
| Operating Humidity | <ul style="list-style-type: none"> • 5-90%, non-condensing |
| Cooling | <ul style="list-style-type: none"> • Natural convection |

EMC & Safety

| | |
|--------------------|---|
| Emissions | <ul style="list-style-type: none"> • EN55011 & EN55032 level A conducted & radiated with no external components |
| Immunity | <ul style="list-style-type: none"> • IEC60601-1-2, EN61204-3 |
| ESD Immunity | <ul style="list-style-type: none"> • EN61000-4-2, level 2, Perf Criteria A |
| Radiated Immunity | <ul style="list-style-type: none"> • EN61000-4-3, 10 V/m Perf Criteria A |
| EFT/Burst | <ul style="list-style-type: none"> • EN61000-4-4, level 3 Perf Criteria A |
| Surge | <ul style="list-style-type: none"> • EN61000-4-5, level 1 Perf Criteria A |
| Conducted Immunity | <ul style="list-style-type: none"> • EN61000-4-6, 10 Vm, Perf Criteria A |
| Magnetic Field | <ul style="list-style-type: none"> • EN61000-4-8, 3 A/m Perf Criteria A |
| Safety Approvals | <ul style="list-style-type: none"> • ANSI/AMMI ES60601-1 3rd Edition • CSA-22.2 No.60601-1:2008 • IEC60601-1 3rd Edition, CE & UKCA meets all applicable directives & legislation. |

Models and Ratings

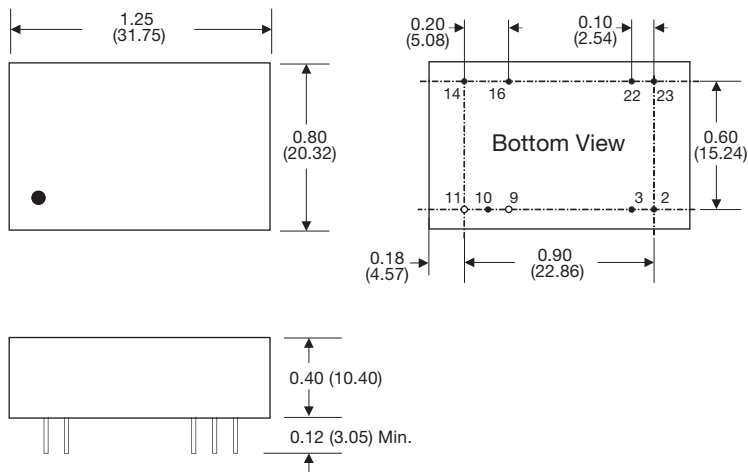
| Input Voltage | Output Voltage | Output Current | Input Current | | Maximum Capacitive Load | Efficiency ⁽³⁾ | Model Number |
|---------------|----------------|----------------|------------------------|--------------------------|-------------------------|---------------------------|--------------|
| | | | No Load ⁽¹⁾ | Full Load ⁽²⁾ | | | |
| 10-17 V | 5.0V | 600 mA | 52 mA | 380 mA | 720 μ F | 75% | JHM0312S05 |
| | 12.0V | 250 mA | 64 mA | 370 mA | 300 μ F | 77% | JHM0312S12 |
| | 15.0V | 200 mA | 64 mA | 370 mA | 240 μ F | 78% | JHM0312S15 |
| | \pm 12.0V | \pm 125 mA | 66 mA | 400 mA | \pm 140 μ F | 80% | JHM0312D12 |
| | \pm 15.0V | \pm 100 mA | 85 mA | 400 mA | \pm 120 μ F | 80% | JHM0312D15 |
| 20-30 V | 5.0V | 600 mA | 47 mA | 210 mA | 720 μ F | 74% | JHM0324S05 |
| | 12.0V | 250 mA | 42 mA | 200 mA | 300 μ F | 77% | JHM0324S12 |
| | 15.0V | 200 mA | 29 mA | 190 mA | 240 μ F | 81% | JHM0324S15 |
| | \pm 12.0V | \pm 125 mA | 40 mA | 200 mA | \pm 140 μ F | 80% | JHM0324D12 |
| | \pm 15.0V | \pm 100 mA | 50 mA | 190 mA | \pm 120 μ F | 80% | JHM0324D15 |
| 10-17 V | 5.0V | 1200 mA | 72 mA | 790 mA | 1200 μ F | 78% | JHM0612S05 |
| | 12.0V | 500 mA | 86 mA | 750 mA | 500 μ F | 80% | JHM0612S12 |
| | 15.0V | 400 mA | 85 mA | 740 mA | 400 μ F | 83% | JHM0612S15 |
| | \pm 12.0V | \pm 250 mA | 60 mA | 730 mA | \pm 250 μ F | 83% | JHM0612D12 |
| | \pm 15.0V | \pm 200 mA | 80 mA | 730 mA | \pm 200 μ F | 84% | JHM0612D15 |
| 20-30 V | 5.0V | 1200 mA | 44 mA | 380 mA | 1200 μ F | 78% | JHM0624S05 |
| | 12.0V | 500 mA | 39 mA | 360 mA | 500 μ F | 83% | JHM0624S12 |
| | 15.0V | 400 mA | 27 mA | 350 mA | 400 μ F | 85% | JHM0624S15 |
| | \pm 12.0V | \pm 250 mA | 37 mA | 360 mA | \pm 250 μ F | 83% | JHM0624D12 |
| | \pm 15.0V | \pm 200 mA | 39 mA | 360 mA | \pm 200 μ F | 83% | JHM0624D15 |

Notes

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

3. Typical values.

Mechanical Details



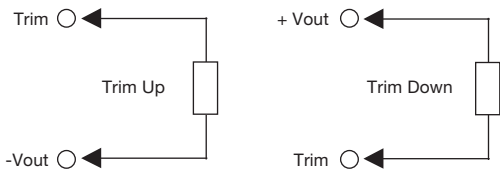
| Pin Connections | | |
|-----------------|--------|--------|
| Pin | Single | Dual |
| 2 | -Vin | -Vin |
| 3 | -Vin | -Vin |
| 9 | No Pin | Common |
| 10 | Trim | Trim |
| 11 | No Pin | -Vout |
| 14 | +Vout | +Vout |
| 16 | -Vout | Common |
| 22 | +Vin | +Vin |
| 23 | +Vin | +Vin |

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)

Application Notes

External Output Trim



For 5V output:
Trim +10%, R = 3.4 k typical
Trim -10%, R = 1 k typical

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

For 15V output:
Trim +10%, R = 8.3 k typical
Trim -10%, R = 10 k typical

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

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