

Product Data Sheet

4.0 WATT UNREGULATED HIGH ISOLATION DC/DC CONVERTER

HB04U



FEATURES

- HIGH ISOLATION 3000V RATING
- 8000V ISOLATION TEST VOLTAGE
- BARRIER 100% PRODUCTION TESTED
- **LOW BARRIER CAPACITANCE 10PF**
- LOW LEAKAGE CURRENT 2µA MAX
- INTERNAL FILTERING

APPLICATIONS

- BIOMEDICAL DATA ACQUISITION
- INDUSTRIAL PROCESS CONTROL
- ANALYTICAL MEASUREMENTS
- GROUND LOOP ELIMINATION
- INTRINSIC SAFETY SYSTEMS

DESCRIPTION

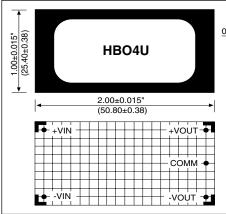
The HB04U Series is a low-cost, high-isolation voltage, unregulated, single and dual output DC/DC converter. The dielectric withstand characteristics of each converter is tested in production to ensure barrier integrity.

The HB04U Series uses advanced circuit design and packaging technology to realize superior reliability and performance. A 100kHz driven push-pull oscillator is used to ensure stable frequency and non-saturating operation of the input stage. This means there are no high peak voltages or currents like other design topologies, which can reduce unit reliability. Reliability is further enhanced by the use of MOSPOWER transistors. These rugged devices permit higher frequency operation with less complicated drive circuitry than is possible with bipolar power transistors. Reduced parts count adds to the reliability of the HB04U Series.

The high efficiency of the HB04U Series means less internal power dissipation. With less heat to dissipate, the HB04U Series can operate over a wider ambient temperature range with no degradation of reliable operation.

The HB04U Series offers the user low cost without sacrificing reliability. The use of surface mounted devices and manufacturing technologies make it possible to offer premium performance at low cost.

MECHANICAL





Notes: All dimensions are in inches (millimeters).

GRID: 0.100 inches (2.54 millimeters)

PIN PLACEMENT TOLERANCE: ± 0.015"

COMMON PIN: Not connected internally on single output models

MARKED WITH: date code, job code.

MATERIAL: Units are encapsulated in a low thermal resistance molding compound which has excellent chemical resistance, wide operating temperature range, and good electrical properties under high humidity environments. The encapsulant and outer shell of the unit have UL94V-0 ratings. Lead material is brass with a solder plated surface to allow ease of solderability.

More product information and application notes are available on our website at www.cdpowerelectronics.com

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ELECTRICAL SPECIFICATIONS

Specifications typical at $T_A = +25$ °C, nominal input voltage, rated output current unless otherwise noted.

| | NOMINAL INPUT | RATED OUTPUT | RATED OUTPUT | INPUT CURRENT | | |
|------------|------------------|-----------------|-----------------|---------------|------------|------------|
| MODEL | VOLTAGE | VOLTAGE | CURRENT | NO LOAD | RATED LOAD | EFFICIENCY |
| | (VDC) | (Vpc) | (mA) | (mA) | (mA) | (%) |
| HB04U05S05 | 5 | 5 | 800 | 60 | 1000 | 80 |
| HB04U05S12 | 5 | 12 | 333 | 60 | 1000 | 80 |
| HB04U05S15 | 5 | 15 | 267 | 60 | 1000 | 80 |
| HB04U12S05 | 12 | 5 | 800 | 25 | 380 | 87 |
| HB04U12S12 | 12 | 12 | 333 | 25 | 380 | 87 |
| HB04U12S15 | 12 | 15 | 267 | 25 | 380 | 87 |
| HB04U15S05 | 15 | 5 | 800 | 20 | 310 | 87 |
| HB04U15S12 | 15 | 12 | 333 | 20 | 310 | 87 |
| HB04U15S15 | 15 | 15 | 267 | 20 | 310 | 87 |
| HB04U05D05 | 5 | ±5 | ±400 | 60 | 944 | 85 |
| HB04U05D12 | 5 | ±12 | ±167 | 60 | 944 | 85 |
| HB04U05D15 | 5 | ±15 | ±134 | 60 | 944 | 85 |
| HB04U12D05 | 12 | ±5 | ±400 | 25 | 375 | 88 |
| HB04U12D12 | 12 | ±12 | ±167 | 25 | 375 | 88 |
| HB04U12D15 | 12 | ±15 | ±134 | 25 | 375 | 88 |
| HB04U15D05 | 15 | ±5 | ±400 | 20 | 300 | 88 |
| HB04U15D12 | 15 | ±12 | ±167 | 20 | 300 | 88 |
| HB04U15D15 | 15 | ±15 | ±134 | 20 | 300 | 88 |

Note: Other input to output voltage options may be available. Please consult factory.

COMMON SPECIFICATIONS

Specifications typical at $T_A = +25^{\circ}C$, nominal input voltage, rated output current unless otherwise noted.

| PARAMETER | CONDITIONS | MIN | TYP | MAX | UNITS |
|-------------------------------|------------------------|------|---------|------|---------|
| INPUT | | | | | |
| Voltage Range | | 4.5 | 5 | 5.5 | VDC |
| | | 10.8 | 12 | 13.2 | |
| | | 13.5 | 15 | 16.5 | |
| Reflected Ripple Current | | | 35 | | mAp-p |
| ISOLATION | | | | | |
| Rated Voltage | | 3000 | | | VDC |
| Test Voltage | 60 Hz, 10 Seconds | 8000 | | | Vpk |
| Resistance | , | | 10 | | GΩ |
| Capacitance | | | 10 | | pF |
| Leakage Current | Viso= 240Vac, 60Hz | | 1.2 | 2 | μArms |
| OUTPUT | | | | | |
| Rated Power | | | 4 | | w |
| Voltage Setpoint Accuracy | | | ±3 | ±5 | % |
| Temperature Coefficient | | | ±0.02 | | %/°C |
| Ripple & Noise | BW = DC to 10MHz | | 100 | | mVp-p |
| BW = 10Hz to 2MHz | | | 20 | | mVrms |
| Line Regulation | High Line to Low Line | | ±1.5 | | %/% Vin |
| Load Regulation | See performance curves | | | | |
| GENERAL | | | | | |
| Switching Frequency | | | 100 | | kHz |
| Package Weight | | | 22 | | g g |
| MTTF per MIL-HDBK-217, Rev. E | Circuit Stress Method | | | | |
| Ground Benign | Ta = +25°C | | 200,000 | | Hr |
| TEMPERATURE | | | | | |
| Specification | | -25 | | +70 | °c |
| Operation | | -40 | | +85 | l ∘c |
| Storage | | -40 | | +110 | l ∘c̃ |
| | | | 1 | 1 | |

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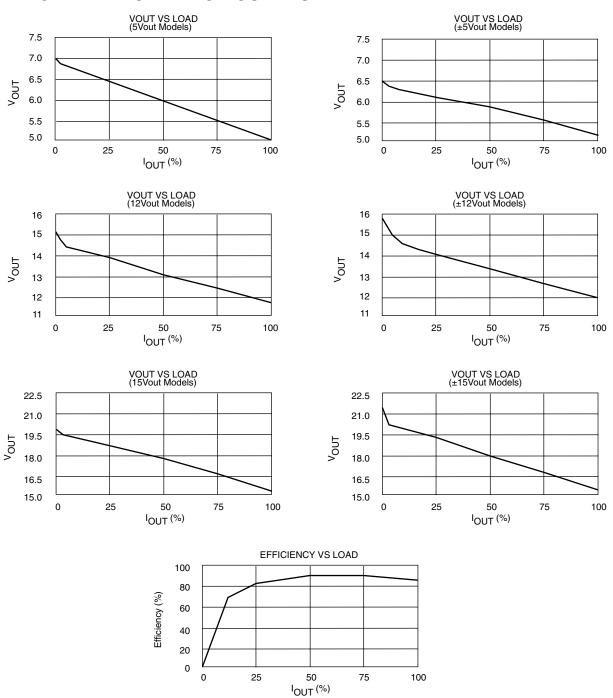
ABSOLUTE MAXIMUM RATINGS

| Internal Power Dissipation | 1W |
|--|--------|
| Short Circuit Duration | |
| Lead Temperature (soldering, 10 seconds max) | +300°Ć |

ORDERING INFORMATION

Device Family—
HB04U Indicates DC/DC Converter
Model Number—
Where:
xx = Input Voltage
y = Number or Outputs (Single "S", Dual "D")
zz = Output Voltage
Package Option—

TYPICAL PERFORMANCE CURVES



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ENGINEERING NOTES

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