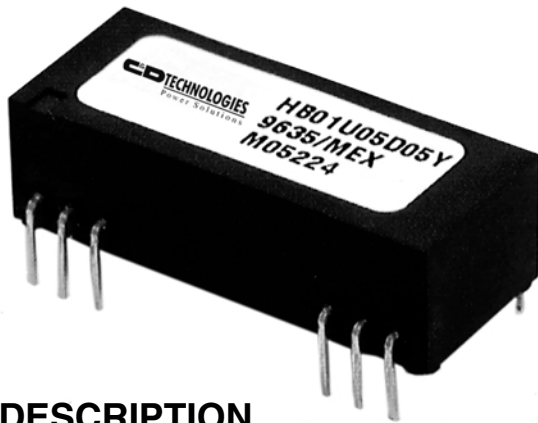


1 WATT UNREGULATED DC/DC CONVERTERS

HB01U



DESCRIPTION

The HB01U Series offers a wide selection of input and output voltages to choose from. Each model is offered in a 24-pin DIP or SMD package and has an input to output isolation rating of 2500Vrms making it ideal for applications requiring high isolation. The dielectric withstand characteristics of each converter are measured in production to ensure barrier integrity.

The HB01U Series is ideal for applications where the output is susceptible to high voltage transients, such as motor drive and industrial process control applications. The low barrier capacitance gives excellent input to output dV/dt characteristics thus protecting the input control circuitry from peak transients appearing on the output.

The HB01U Series uses a self-oscillating circuit design technology to realize low cost and high performance. The inherent current limiting capability of the high isolation design reduces high current stresses during start-up thus increasing the capacitive load capability while maintaining high reliability.

As with all of our DC/DC converters, surface mount construction combined with extensive qualification testing assures low cost without sacrificing quality and reliability.

APPLICATIONS

- INDUSTRIAL PROCESS CONTROL
- DC MOTOR DRIVE
- INTRINSIC SAFETY SYSTEMS
- GROUND LOOP ELIMINATION
- MEDICAL EQUIPMENT
- PORTABLE TEST EQUIPMENT
- DATA ACQUISITION

FEATURES

- HIGH ISOLATION
- 2500Vrms ISOLATION TEST VOLTAGE
- BARRIER 100% PRODUCTION TESTED
- LOW BARRIER CAPACITANCE - 10pF
- LOW LEAKAGE CURRENT - 2μA MAX
- 24-PIN DIP AND SMD
- INTERNAL FILTERING
- NON-CONDUCTIVE CASE
- LOW COST
- LOW PROFILE - .375"

Internet: <http://www.cdpowerelectronics.com>

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ELECTRICAL SPECIFICATIONS

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

| MODEL | NOMINAL INPUT VOLTAGE (V _{DC}) | RATED OUTPUT VOLTAGE (V _{DC}) | RATED OUTPUT CURRENT (mA) | INPUT CURRENT | | EFFICIENCY (%) |
|------------|--|---|---------------------------|---------------|-----------------|----------------|
| | | | | MIN LOAD (mA) | RATED LOAD (mA) | |
| HB01U05S05 | 5 | 5 | 200 | 63 | 290 | 68 |
| HB01U05S12 | 5 | 12 | 83 | 63 | 290 | 70 |
| HB01U05S15 | 5 | 15 | 67 | 63 | 290 | 73 |
| HB01U12S05 | 12 | 5 | 200 | 20 | 120 | 68 |
| HB01U12S12 | 12 | 12 | 83 | 20 | 120 | 70 |
| HB01U12S15 | 12 | 15 | 67 | 20 | 114 | 73 |
| HB01U15S05 | 15 | 5 | 200 | 25 | 98 | 68 |
| HB01U15S12 | 15 | 12 | 83 | 25 | 95 | 70 |
| HB01U15S15 | 15 | 15 | 67 | 25 | 90 | 73 |
| HB01U24S05 | 24 | 5 | 200 | 13 | 61 | 68 |
| HB01U24S12 | 24 | 12 | 83 | 13 | 60 | 70 |
| HB01U24S15 | 24 | 15 | 67 | 13 | 57 | 73 |
| HB01U05D05 | 5 | ±5 | ±100 | 63 | 290 | 68 |
| HB01U05D12 | 5 | ±12 | ±42 | 63 | 285 | 70 |
| HB01U05D15 | 5 | ±15 | ±34 | 63 | 275 | 73 |
| HB01U12D05 | 12 | ±5 | ±100 | 20 | 123 | 68 |
| HB01U12D12 | 12 | ±12 | ±42 | 20 | 118 | 70 |
| HB01U12D15 | 12 | ±15 | ±34 | 20 | 114 | 73 |
| HB01U15D05 | 15 | ±5 | ±100 | 25 | 98 | 68 |
| HB01U15D12 | 15 | ±12 | ±42 | 25 | 95 | 70 |
| HB01U15D15 | 15 | ±15 | ±34 | 25 | 90 | 73 |
| HB01U24D05 | 24 | ±5 | ±100 | 13 | 61 | 68 |
| HB01U24D12 | 24 | ±12 | ±42 | 13 | 60 | 70 |
| HB01U24D15 | 24 | ±15 | ±34 | 13 | 57 | 73 |

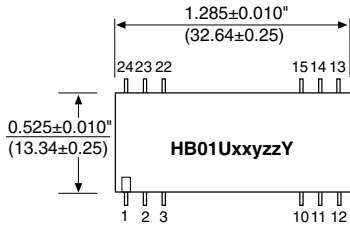
COMMON SPECIFICATIONS

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

| PARAMETER | CONDITIONS | MIN | TYP | MAX | UNITS |
|--|--|---------------------------|---------------------------|---------------------------|---|
| INPUT | | | | | |
| Voltage Range | | 4.5 10.8 13.5 20 | 5 12 15 24 35 | 5.5 13.2 16.5 30 | V _{DC} V _{DC} V _{DC} V _{DC} mAp-p |
| Reflected Ripple Current | | | | | |
| ISOLATION | | | | | |
| Rated Voltage | | 3535 | | | VDC |
| Test Voltage | 60 Hz, 10 Seconds | 2500 | | | V _{rms} |
| Resistance | | | 10 | | GΩ |
| Capacitance | | | 10 | | pF |
| Leakage Current | $V_{ISO} = 240V_{AC}, 60\text{Hz}$ | | 1 | 2 | μArms |
| OUTPUT | | | | | |
| Rated Power | | | 1 | | W |
| Voltage Setpoint Accuracy | | | ±3 | ±5 | % |
| Temperature Coefficient | | | ±0.02 | | %/°C |
| Ripple & Noise | BW = DC to 10MHz BW = 10Hz to 2MHz High Line to Low Line | | 50 25 ±1.5 | | mVp-p mV _{rms} %/V _{in} |
| Line Regulation | See Performance Curves (Min Load = 1mA) | | | | |
| Load Regulation | | | | | |
| GENERAL | | | | | |
| Switching Frequency | | | 160 | | kHz |
| Package Weight | | | 12 | | g |
| MTTF per MIL-HDBK-217, Rev. F Ground Benign | Circuit Stress Method $T_A = +25^\circ\text{C}$ | | 2,000,000 | | Hr |
| TEMPERATURE | | | | | |
| Specification | | -25 | | +70 | °C |
| Operation | | -40 | | +85 | °C |
| Storage | | -40 | | +110 | °C |

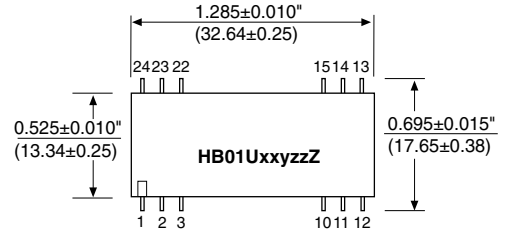
MECHANICAL Package/Pinout "Y" and "Z"

DIP PACKAGE

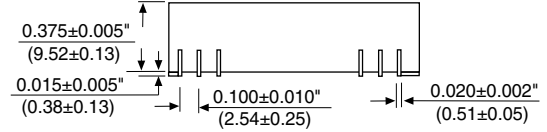
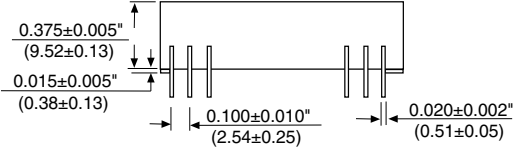


TOP VIEWS

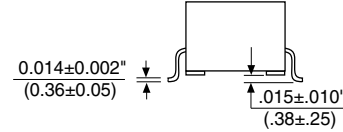
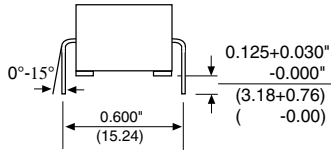
SMD PACKAGE



SIDE VIEWS



END VIEWS



NU = Do Not Use.

NC = No Internal Connection.

Duplicate pin functions are internally connected.

All dimensions are in inches (millimeters).

GRID: 0.100 inches (2.54 millimeters)

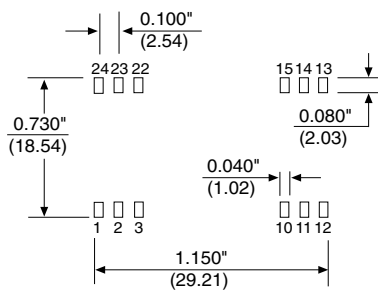
Typically Marked with: specific model ordered, date code, job code and Logo.

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.

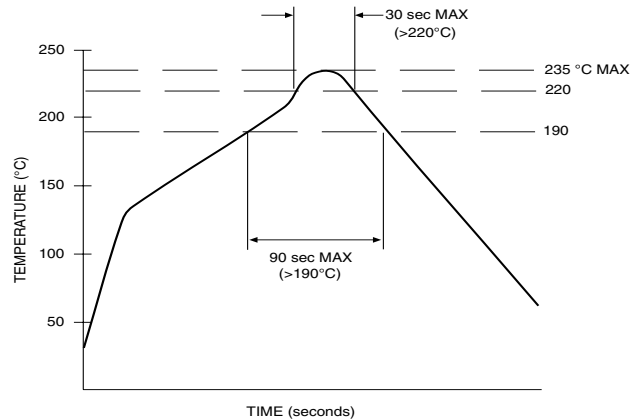
PIN CONNECTIONS

| PIN# | SINGLES | DUALS |
|------|---------|--------|
| 1 | +VOUT | +VOUT |
| 2 | -VOUT | Common |
| 3 | NU | -VOUT |
| 10 | -VIN | -VIN |
| 11 | NC | NC |
| 12 | +VIN | +VIN |
| 13 | +VIN | +VIN |
| 14 | NC | NC |
| 15 | -VIN | -VIN |
| 21 | NC | NC |
| 22 | NU | -VOUT |
| 23 | -VOUT | Common |
| 24 | +VOUT | +VOUT |

RECOMMENDED LAND PATTERN



RECOMMENDED REFLOW PROFILE



ABSOLUTE MAXIMUM RATINGS

| | |
|---|----------|
| Internal Power Dissipation..... | 0.5 Watt |
| Short Circuit Duration..... | 5 Min |
| Lead Temperature (soldering, 10 seconds max)..... | +300°C * |

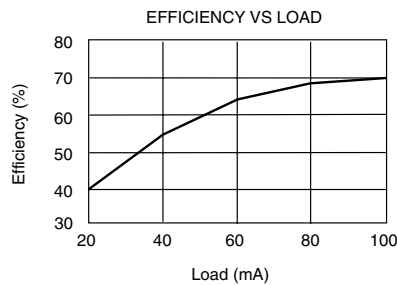
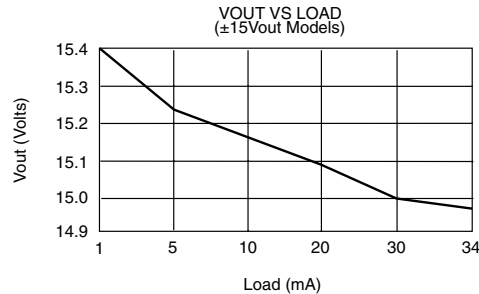
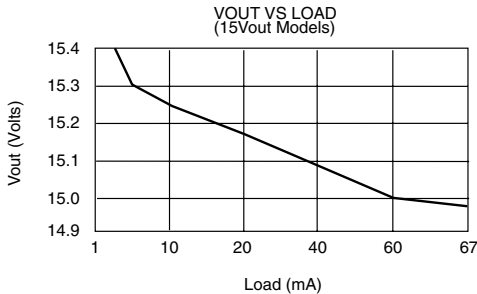
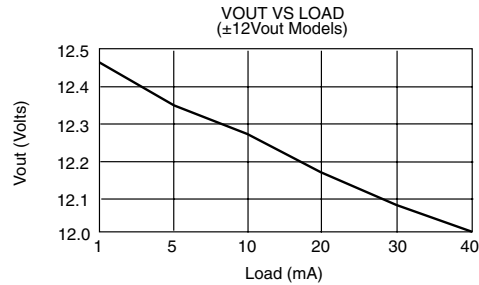
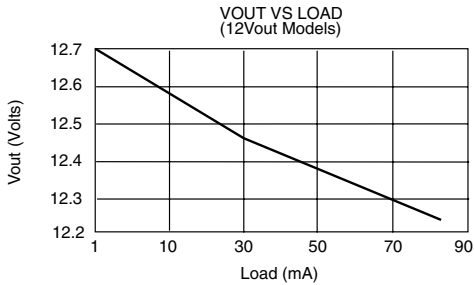
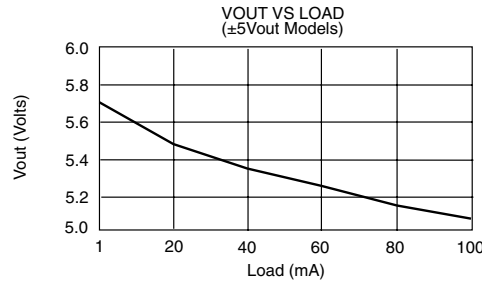
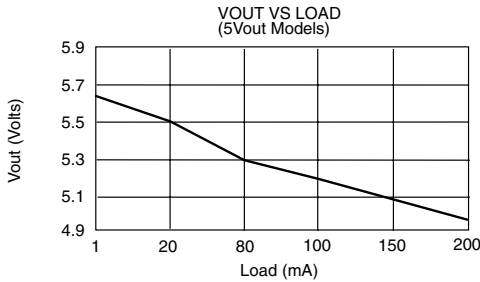
*Note: Refer to Reflow Profile for SMD Models.

ORDERING INFORMATION

| | | | | | |
|--|--------------|-----------|-----------|----------|-----------|
| | HB01U | xx | yy | Z | /H |
| Device Family | HB01U | | | | |
| HB Indicates DC/DC Converter | HB | | | | |
| Model Number | xxyyZ | | | | |
| Where: | | | | | |
| xx = Input Voltage | | | | | |
| y = Number or Outputs (Single "S", Dual "D") | | | | | |
| zz = Output Voltage | | | | | |
| Package Option | /H | | | | |
| Screening Option | | | | | |

TYPICAL PERFORMANCE CURVES

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



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