

## ELECTRICAL SPECIFICATIONS

## 1 Watt Unregulated DC/DC Converters

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

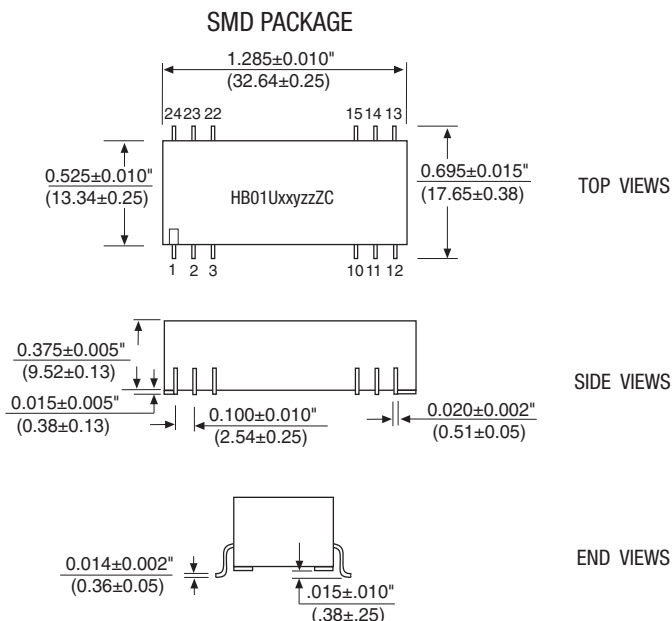
| MODEL          | NOMINAL<br>INPUT<br>VOLTAGE<br>(V <sub>DC</sub> ) | RATED<br>OUTPUT<br>VOLTAGE<br>(V <sub>DC</sub> ) | RATED<br>OUTPUT<br>CURRENT<br>(mA) | INPUT CURRENT    |                    | EFFICIENCY<br>(%) |
|----------------|---------------------------------------------------|--------------------------------------------------|------------------------------------|------------------|--------------------|-------------------|
|                |                                                   |                                                  |                                    | MIN LOAD<br>(mA) | RATED LOAD<br>(mA) |                   |
| HB01U05S05ZC/R | 5                                                 | 5                                                | 200                                | 63               | 290                | 68                |
| HB01U05S05ZC   | 5                                                 | 5                                                | 200                                | 63               | 290                | 68                |
| HB01U05S12ZC   | 5                                                 | 12                                               | 83                                 | 63               | 290                | 70                |
| HB01U05S15ZC   | 5                                                 | 15                                               | 67                                 | 63               | 290                | 73                |
| HB01U12S05ZC   | 12                                                | 5                                                | 200                                | 20               | 120                | 68                |
| HB01U12S12ZC   | 12                                                | 12                                               | 83                                 | 20               | 120                | 70                |
| HB01U12S15ZC   | 12                                                | 15                                               | 67                                 | 20               | 114                | 73                |
| HB01U15S05ZC   | 15                                                | 5                                                | 200                                | 25               | 98                 | 68                |
| HB01U15S12ZC   | 15                                                | 12                                               | 83                                 | 25               | 95                 | 70                |
| HB01U15S15ZC   | 15                                                | 15                                               | 67                                 | 25               | 90                 | 73                |
| HB01U24S05ZC   | 24                                                | 5                                                | 200                                | 13               | 61                 | 68                |
| HB01U24S12ZC   | 24                                                | 12                                               | 83                                 | 13               | 60                 | 70                |
| HB01U24S15ZC   | 24                                                | 15                                               | 67                                 | 13               | 57                 | 73                |
| HB01U05D05ZC   | 5                                                 | ±5                                               | ±100                               | 63               | 290                | 68                |
| HB01U05D12ZC   | 5                                                 | ±12                                              | ±42                                | 63               | 285                | 70                |
| HB01U05D15ZC*  | 5                                                 | ±15                                              | ±34                                | 63               | 275                | 73                |
| HB01U12D05ZC   | 12                                                | ±5                                               | ±100                               | 20               | 123                | 68                |
| HB01U12D12ZC   | 12                                                | ±12                                              | ±42                                | 20               | 118                | 70                |
| HB01U12D15ZC   | 12                                                | ±15                                              | ±34                                | 20               | 114                | 73                |
| HB01U15D05ZC   | 15                                                | ±5                                               | ±100                               | 25               | 98                 | 68                |
| HB01U15D12ZC   | 15                                                | ±12                                              | ±42                                | 25               | 95                 | 70                |
| HB01U15D15ZC   | 15                                                | ±15                                              | ±34                                | 25               | 90                 | 73                |
| HB01U24D05ZC   | 24                                                | ±5                                               | ±100                               | 13               | 61                 | 68                |
| HB01U24D12ZC   | 24                                                | ±12                                              | ±42                                | 13               | 60                 | 70                |
| HB01U24D15ZC   | 24                                                | ±15                                              | ±34                                | 13               | 57                 | 73                |

\*Available in tape and reel only  
(package quantity 1000).

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



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)

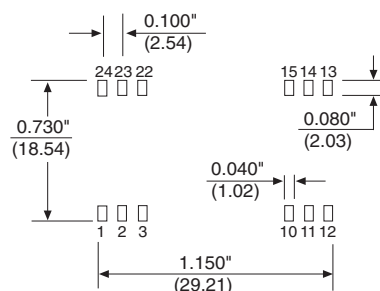
Typically Marked with: specific model ordered, date code, job code and logo.

**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 phosphor bronze; lead finish is 100-300 microinches of matte tin over a barrier layer of 5-40 microinches nickel.

## 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



## SMT SOLDERING INFORMATION

The surface mount versions of the HB01UZC series are designed for SMT reflow soldering.

During this standard process devices should be heated at a rate not to exceed 3°C per second. The peak reflow temperature is 215°C. The device should not be exposed to the peak temperature ±5°C for more than 12 seconds. The cool down rate for this device should not exceed 3°C per second.

### ABSOLUTE MAXIMUM RATINGS

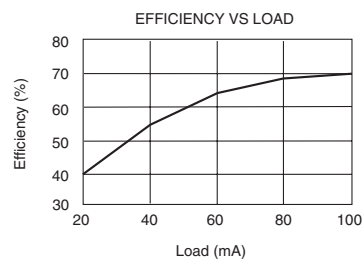
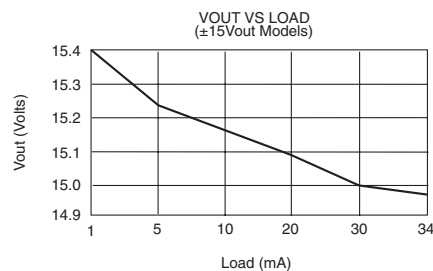
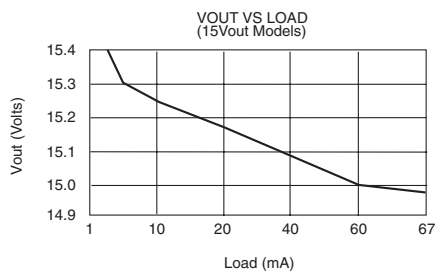
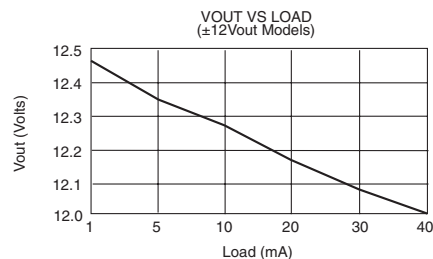
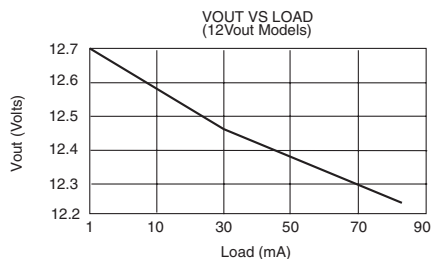
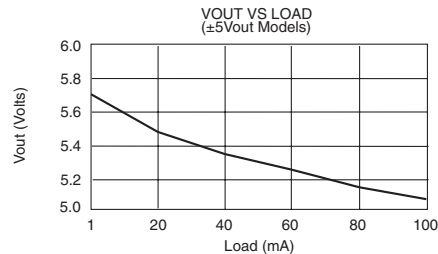
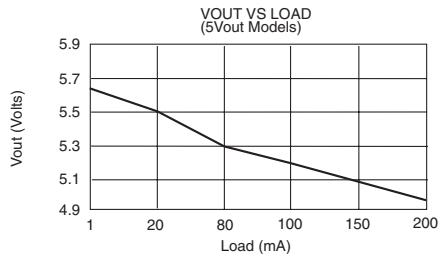
Internal Power Dissipation.....0.5 Watt  
 Short Circuit Duration.....5 Min  
 Lead Temperature (soldering, 10 seconds max).....+300°C\*  
 \*Note: Refer to Reflow Profile for SMD Models.

### ORDERING INFORMATION

Device Family HB01U xxyyzz Z C / R  
 HB Indicates DC/DC Converter  
 Model Number  
 Where:  
 xx = Input Voltage  
 yy = Number of Outputs (Single "S", Dual "D")  
 zz = Output Voltage  
 Package Option \_\_\_\_\_  
 RoHS Compliant \_\_\_\_\_  
 Tape and Reel Packaging \_\_\_\_\_

### 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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 ISO 9001 and 14001 REGISTERED



This product is subject to the following **operating requirements** and the **Life and Safety Critical Application Sales Policy**:  
 Refer to: <http://www.murata-ps.com/requirements/>

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