



### FEATURES

- RoHS compliant
- High Isolation - 3000v Rating
- 8000v Isolation Test Voltage
- Barrier 100% Production Tested
- Low Barrier Capacitance - 10pf
- Low Leakage Current - 2ma Max
- Internal Filtering

### Applications

- Biomedical Data Acquisition
- Industrial Process Control
- Analytical Measurements
- Ground Loop Elimination
- Intrinsic Safety Systems

### PRODUCT OVERVIEW

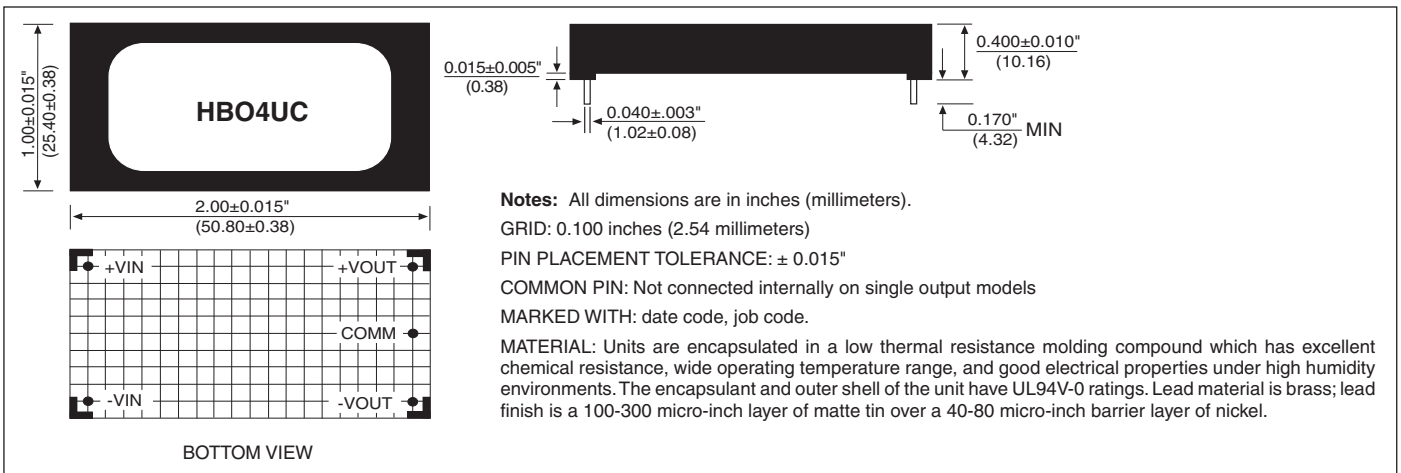
The HB04UC Series is a low-cost, high-isolation voltage, unregulated, single and dual output DC/DC converter. The dielectric withstand characteristics of each converter is tested in production to ensure barrier integrity.

The HB04UC 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. Reduced parts count adds to the reliability of the HB04UC Series.

The high efficiency of the HB04UC Series means less internal power dissipation. With less heat to dissipate, the HB04UC Series can operate over a wider ambient temperature range with no degradation of reliable operation.

The HB04UC 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



More product information and application notes are available on our website at [www.murata-ps.com](http://www.murata-ps.com)

### ELECTRICAL SPECIFICATIONS

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

MODEL	NOMINAL INPUT VOLTAGE (V <sub>DC</sub> )	RATED OUTPUT VOLTAGE (V <sub>DC</sub> )	RATED OUTPUT CURRENT (mA)	INPUT CURRENT		EFFICIENCY (%)
				NO LOAD (mA)	RATED LOAD (mA)	
HB04U05S05QC	5	5	800	60	1000	80
<del>HB04U05S12QC</del>	<del>5</del>	<del>12</del>	<del>333</del>	<del>60</del>	<del>1000</del>	<del>80</del>
<del>HB04U05S15QC</del>	<del>5</del>	<del>15</del>	<del>267</del>	<del>60</del>	<del>1000</del>	<del>80</del>
HB04U12S05QC	12	5	800	25	380	87
HB04U12S12QC	12	12	333	25	380	87
HB04U12S15QC	12	15	267	25	380	87
<del>HB04U15S05QC</del>	<del>15</del>	<del>5</del>	<del>800</del>	<del>20</del>	<del>310</del>	<del>87</del>
<del>HB04U15S12QC</del>	<del>15</del>	<del>12</del>	<del>333</del>	<del>20</del>	<del>310</del>	<del>87</del>
<del>HB04U15S15QC</del>	<del>15</del>	<del>15</del>	<del>267</del>	<del>20</del>	<del>310</del>	<del>87</del>
<del>HB04U05D05QC</del>	<del>5</del>	<del>±5</del>	<del>±400</del>	<del>60</del>	<del>944</del>	<del>85</del>
<del>HB04U05D12QC</del>	<del>5</del>	<del>±12</del>	<del>±167</del>	<del>60</del>	<del>944</del>	<del>85</del>
<del>HB04U05D15QC</del>	<del>5</del>	<del>±15</del>	<del>±134</del>	<del>60</del>	<del>944</del>	<del>85</del>
HB04U12D05QC	12	±5	±400	25	375	88
<del>HB04U12D12QC</del>	<del>12</del>	<del>±12</del>	<del>±167</del>	<del>25</del>	<del>375</del>	<del>88</del>
HB04U12D15QC	12	±15	±134	25	375	88
<del>HB04U15D05QC</del>	<del>15</del>	<del>±5</del>	<del>±400</del>	<del>20</del>	<del>300</del>	<del>88</del>
<del>HB04U15D12QC</del>	<del>15</del>	<del>±12</del>	<del>±167</del>	<del>20</del>	<del>300</del>	<del>88</del>
<del>HB04U15D15QC</del>	<del>15</del>	<del>±15</del>	<del>±134</del>	<del>20</del>	<del>300</del>	<del>88</del>

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

Models with strikethrough have been discontinued.

### COMMON SPECIFICATIONS

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

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
<b>INPUT</b>					
Voltage Range		4.5 10.8 13.5	5 12 15	5.5 13.2 16.5	V <sub>DC</sub>
Reflected Ripple Current			35 <sup>1</sup>		mAp-p
<b>ISOLATION</b>					
Rated Voltage		3000			V <sub>DC</sub>
Test Voltage	60 Hz, 10 Seconds	8000			V <sub>pk</sub>
Resistance			10		GΩ
Capacitance			10		pF
Leakage Current	V <sub>ISO</sub> = 240V <sub>AC</sub> , 60Hz		1.2	2	μArms
<b>OUTPUT</b>					
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		%/% V <sub>in</sub>
Load Regulation	See performance curves				
<b>GENERAL</b>					
Switching Frequency			100		kHz
Package Weight			22		g
MTTF per MIL-HDBK-217, Rev. E Ground Benign	Circuit Stress Method T <sub>A</sub> = +25°C		200,000		Hr
<b>TEMPERATURE</b>					
Specification		-25		+70	°C
Operation		-40		+85	°C
Storage		-40		+110	°C

1. Reflected ripple current is measured at 50% load with a 33μF capacitor across the input of the UUT.

## THROUGH-HOLE SOLDERING INFORMATION

These devices are intended for wave soldering or manual soldering.  
**They are not intended to be subject to surface mount processes under any circumstances.**

The normal wave soldering process can be used with these devices where the device is subjected to a maximum wave temperature of 260°C for a period of no more than 10 seconds. Within this time and temperature range, the integrity of the device's plastic body will not be compromised and internal temperatures within the converter will not exceed 175°C. Care should be taken to control manual soldering limits identical to that of wave soldering.

## ABSOLUTE MAXIMUM RATINGS

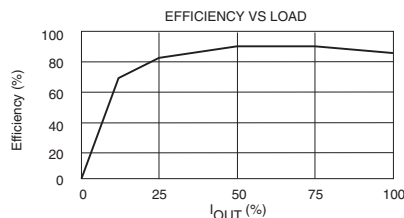
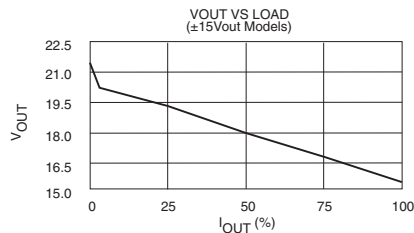
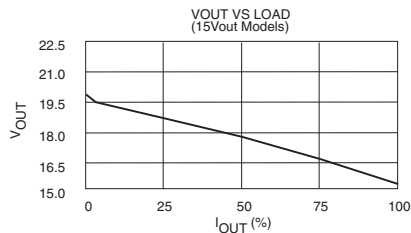
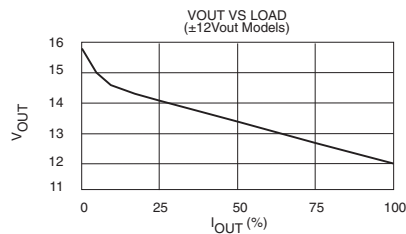
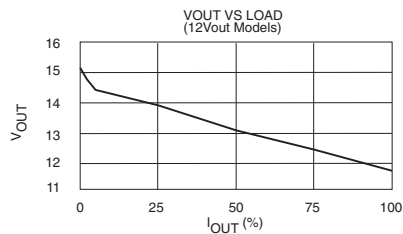
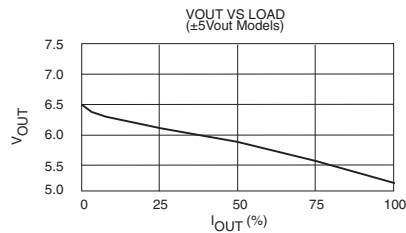
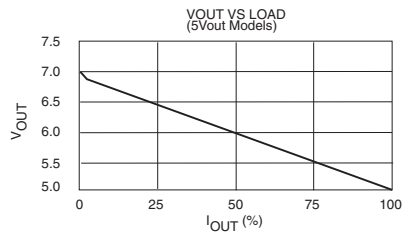
Internal Power Dissipation.....1W  
 Short Circuit Duration.....Momentary  
 Lead Temperature (soldering, 10 seconds max).....+300°C

## ORDERING INFORMATION

HB04U    xxyzz    Q    C

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

## TYPICAL PERFORMANCE CURVES



Murata Power Solutions, Inc.  
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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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