

TECHNICAL DATA
DATA SHEET 1101, REV. A

DC-DC Converters
Fixed Input, 3000V Isolation, Unregulated, Single Output

FEATURES:

- Isolation Voltage: 3000Vdc
- Isolation Resistance (1): 1000MΩ
- Short-Circuit Duration: 1 second
- Case Temperature Rise: Max. 25°C, Typ. 15°C
- Cooling Method: Free-Air Cooling
- Standby Power Dissipation: 1W (100mW), 2W (200mW)
- Operating Temp.: -40°C ~ + 85°C
- Storage Temp.: -55°C ~ + 125°C
- Humidity: ≤ 95%
- Soldering Temp. (2): 300°C
- Case Material: Non-Flammable Material (UL94-V0)
- Mean Time Before Failure: > 1,000,000 hours (Operating Temp. 25°C)

B Single Output-1W/2W Series Input Characteristics

| Part Number | Nominal Input Voltage | Input Voltage Range | Maximum Input Voltage* |
|---------------|-----------------------|---------------------|------------------------|
| B05XXHS/D1/2U | 5Vdc | 4.5~5.5Vdc | 7Vdc |
| B12XXHS/D1/2U | 12Vdc | 10.8~13.2Vdc | 15Vdc |
| B24XXHS/D1/2U | 24Vdc | 21.6~26.4Vdc | 28Vdc |

* Voltage above this value may cause permanent damage to the device.

B Single Output-1W/2W Series Output Characteristics

| Parameter | MIN | TYP | MAX | Units |
|-------------------------|------|-----|-------|-------|
| 1W Output Power | 0.25 | | 1 | W |
| 2W Output Power | 0.5 | | 2 | W |
| Line Regulation | | | ± 1.2 | % |
| Efficiency at 100% Load | 65 | 75 | 85 | % |
| Temperature Coefficient | | | 0.03 | %/°C |
| 1W Ripple and Noise | | 50 | 75 | mVp-p |
| 2W Ripple and Noise | | 85 | 150 | |
| Switching Frequency | 80 | 100 | 150 | kHz |

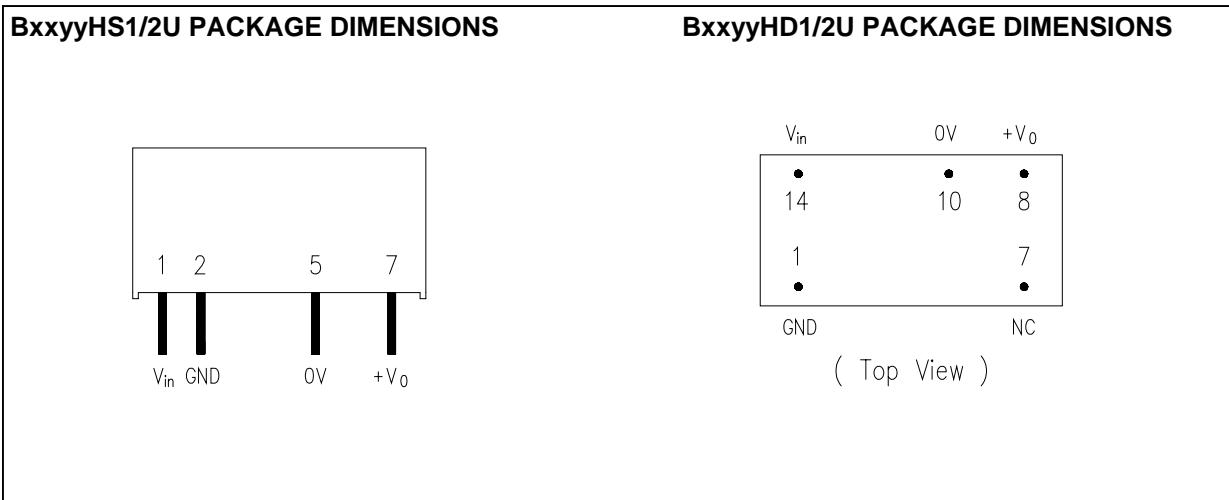
1. All specifications at $T_A=25^\circ\text{C}$, 75% of the humidity, Nominal input voltage, full output load unless otherwise specified.
2. Soldering for 10 seconds at 1.5mm away from the edge.

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B Single Output-1W/2W Series Part Number List

| Input | Output | Power | SIP-1W | SIP-2W | DIP-1W | DIP-2W |
|-------|------------|-----------|-----------|-----------|-----------|-----------|
| 5Vdc | 5V/200m A | 1.00W | B0505HS1U | B0505HS2U | B0505HD1U | B0505HD2U |
| | 9V/111m A | 1.00W | B0509HS1U | B0509HS2U | B0509HD1U | B0509HD2U |
| | 12V/84m A | 1.00W | B0512HS1U | B0512HS2U | B0512HD1U | B0512HD2U |
| | B0515HS1U | B0515HS2U | B0515HD1U | B0515HD2U | | |
| 12Vdc | 15V/67m A | 1.00W | B1205HS1U | B1205HS2U | B1205HD1U | B1205HD2U |
| | 5V/400m A | 2.00W | B1209HS1U | B1209HS2U | B1209HD1U | B1209HD2U |
| | 9V/222m A | 2.00W | B1212HS1U | B1212HS2U | B1212HD1U | B1212HD2U |
| | B1215HS1U | B1215HS2U | B1215HD1U | B1215HD2U | | |
| 24Vdc | 12V/167m A | 2.00W | B2405HS1U | B2405HS2U | B2405HD1U | B2405HD2U |
| | 15V/133m A | 2.00W | B2409HS1U | B2409HS2U | B2409HD1U | B2409HD2U |
| | B2412HS1U | B2412HS2U | B2412HD1U | B2412HD2U | | |
| | B2415HS1U | B2415HS2U | B2415HD1U | B2415HD2U | | |

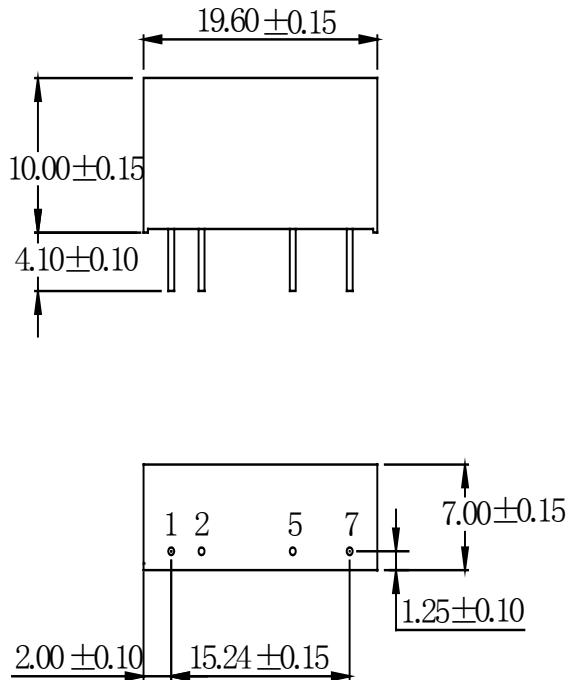
PIN CONFIGURATION



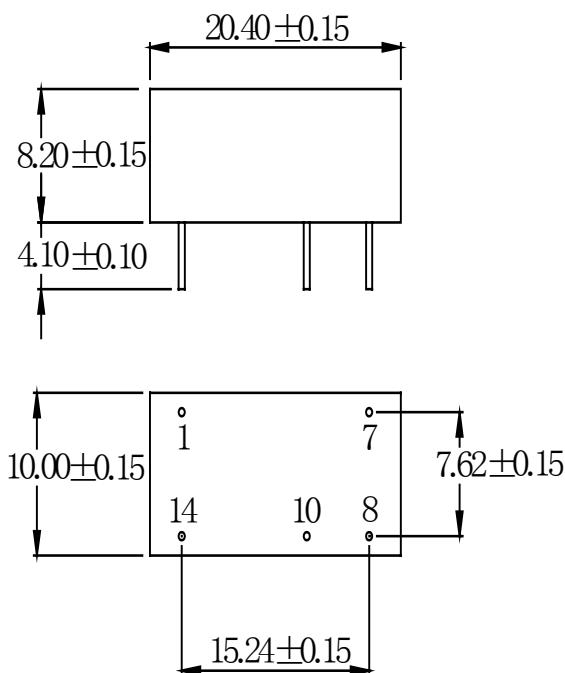
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Mechanical Dimension: mm

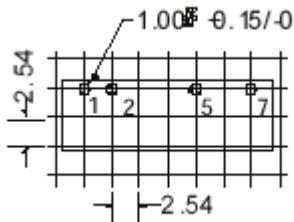
BxxxyHS1/2U PACKAGE DIMENTIONS



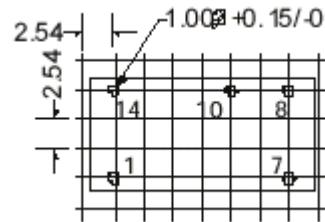
BxxxyHD1/2U PACKAGE DIMENTIONS



DIMENSIONAL RECOMMENDATIONS FOR PCB LAYOUT



SIP PACKAGE DIMENSIONS



DIP PACKAGE DIMENSIONS

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APPLICATION NOTE

Filtering

In some circuits which are sensitive to noise and ripple, a filtering capacitor may be added to the DC/DC output end and input end to reduce the noise and ripple. However, the capacitance of the output filter capacitor must be proper. If the capacitance is too big, a startup problem might arise. For every channel of output, provided the safe and reliable operation is ensured, the greatest capacitance of its filter capacitor sees the external capacitor table. To get an extremely low ripple, an "LC" filtering network may be connected to the input and output ends of the DC/DC converter, which may produce a more significant filtering effect. It should also be noted that the inductance and the frequency of the "LC" filtering network should be staggered with the DC/DC frequency to avoid mutual interference (see figure 1).

Requirement On Output Load

To ensure this module can operate efficiently and reliably, a minimum load is specified for this kind of DC/DC converter in addition to a maximum load (namely full load). During operation, make sure the specified range of input voltage is not exceeded, the minimum output load is **not less than 10%** of the full load, and that this product should never be operated under no load! If the actual output power is very small, please connect a resistor with proper resistance at the output end in parallel to increase the load, or use our company's products with a lower rated output power.

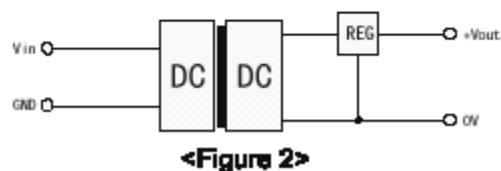
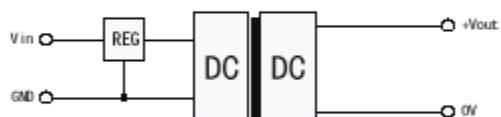
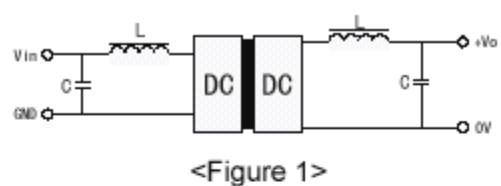
Overload Protection

Under normal operating conditions, the output circuit of these products has no protection against over-current and short-circuits. The simplest method is to connect a self-recovery fuse in series at the input end or add a circuit breaker to the circuit.

Output Voltage Regulation and Over-voltage Protection Circuit

The simplest device for output voltage regulation, over-voltage and over-current protection is a linear voltage regulator with overheat protection that is connected to the input or output end in series (see Figure 2).

BxxxyHS/D1/2U



External Capacitor Table

| V_{in} | External capacitors | V_{out} | External capacitors |
|----------|---------------------|-----------|---------------------|
| 5 VDC | 4.7 μ F | 5 VDC | 10 μ F |
| 12 VDC | 2.2 μ F | 9 VDC | 4.7 μ F |
| 24 VDC | 1 μ F | 12 VDC | 2.2 μ F |
| - | - | 15 VDC | 1 μ F |

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