# BR240 SERIES 240 Watts

## KEY FEATURES

- Input under Voltage Protection
- Over Current Protection (Hiccup Mode)
- Short Circuit Protection (Hiccup Mode)
- Over Voltage Protection (Hiccup Mode)
- Over Temperature Protection (Self-recovery)
- Remote ON/OFF Control
- Activates Hardware and Software *
- Digitally Adjusts the Voltage *
- PMBus Revision 1.1 compliant *
- Secondary ON/OFF Control *
- Pre-Bias Function *
- UL60950-1 and CSA C22.2 No. 60950-1-07
- Meet UL94V-0 Flammability Requirements
- Rohs6 Compliant
- Size: 2.3 x 0.9 x 0.5 Inches
- 3-Years Product Warranty

*BR240-12S without this function

## DESCRIPTION

The BR240 series DC-DC converter are high-efficiency and power density 1/8 brick isolation modules, rating output voltage 12V, output power 240W. This series provide the standard 1/8 brick version and the PMBus compatible version. The latter is compatible with the PMBus1.1 communication protocol, backward compatible with the I²C/SMBus protocol, and providing Pre-bias, output monitoring and current sharing functions. The BR240 series conform to the RoHS6 requirement.

## ELECTRICAL SPECIFICATIONS

Conditions: TA = 25℃ (77℉), Airflow = 1 m/s (200 LFM), Vin = 48 V, unless otherwise notes.

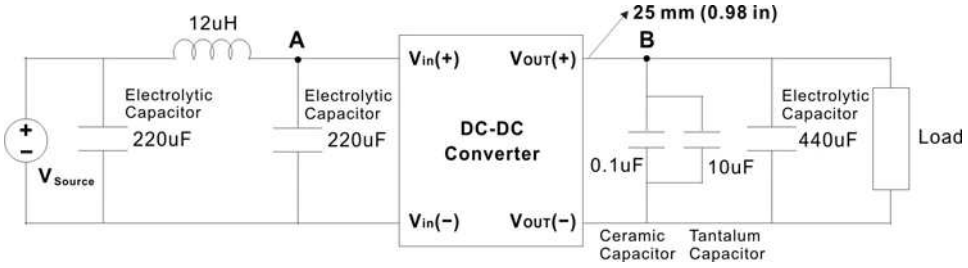
| Model No. | | BR240-12S | BR240-12S-P |
|---|---|---|---|
| Max Output Wattage (W) | | 240W | |
| Input | Voltage (V.DC.) | 48V (36~75V) | |
| | Current (A) (max) | 10A (Vin= 36 - 75 V; Iout = 20 A) | |
| | No-Load Loss (W) (typ.) | 9.6W (Vin= 36 - 75 V; Iout = 0 A) | |
| Output | Voltage (V.DC.) | 12V ($V_{in}$= 48 V; $I_{out}$ = 10 A) | |
| | Voltage Range (V.DC.) | 11.64~12.36V (Vin= 40 - 75 V) | 11.64~12.36V (Vin= 40 - 75 V; Adjust the voltage by PMBus) |
| | | 10.8~12.36V (Vin= 36 - 40 V) | 10.8~12.36V (Vin= 36 - 40 V; Adjust the voltage by PMBus) |
| | Current (A) (max.) | 20A | |
| | Line Regulation (LL-HL) (typ.) | ±0.2% (Vin= 40 - 75 V; Iout = 20 A) / ±10% (Vin= 36 - 40 V; Iout = 20 A | |
| | Load Regulation (0-100%) (typ.) | ±3% (Vin = 48 V; Iout = 0 – 20 A) | |
| | Ripple & Noise (peak to peak) (typ.) | 200 mV (Oscilloscope Bandwidth:20 MHz) | |
| | Efficiency (Vin = 48 V; TA=25℃ (77℉)) (typ.) | 100% Load:95% (Iout = 20 A) | |
| | | 50% Load:94.5% (Iout = 10 A) | |
| | | 30% Load:92.0% (Iout = 6 A) | |
| Protection | Over Power Protection | Hiccup mode | |
| | Over Current Protection | Hiccup mode | |
| | Over Voltage Protection | 15V (14~16V) (Hiccup mode) | |
| | Short Circuit Protection (max.) | 5 Arms (Hiccup mode) | |
| | Over Temperature Protection | Threshold:130℃ (typ.) / Hysteresis:15℃ (typ.) Self-recovery (The values are obtained by measuring the temperature of the hottest power component on the top surface of the converter.) | |
| Isolation | Voltage (V.DC.) | 1500 VDC (Functional Isolation) | |
| Environment | Operating Temperature | -40℃…+85℃ | |
| | Storage Temperature | -55℃…+125℃ | |
| | Temperature Coefficient | ±0.02 % Vout / ℃ (TA = -40℃ to +85℃ (-40℉ to +185℉ )) | |
| | Humidity | 95% RH | |
| | MTBF | 1.5 Million Hours (Telcordia SR332; 80% load; TA = 40℃ (104℉) | |
| Safety | Agency Approvals | CE, UL, TUV | |
| EMC | EMI (Conducted & Radiated Emission) | UL60950-1 and CSA C22.2 No. 60950-1-07 | |
| Physical | Dimension (L x W x H) | 2.3 x 0.9 x 0.5 Inches ( 58.4 x 22.8 x 12.7 mm ) Tolerance ±0.5 mm | |
| | Weight | 40 g | |

## ELECTRICAL SPECIFICATIONS

Conditions: TA = 25℃ (77℉), Airflow = 1 m/s (200 LFM), Vin = 48 V, unless otherwise notes.

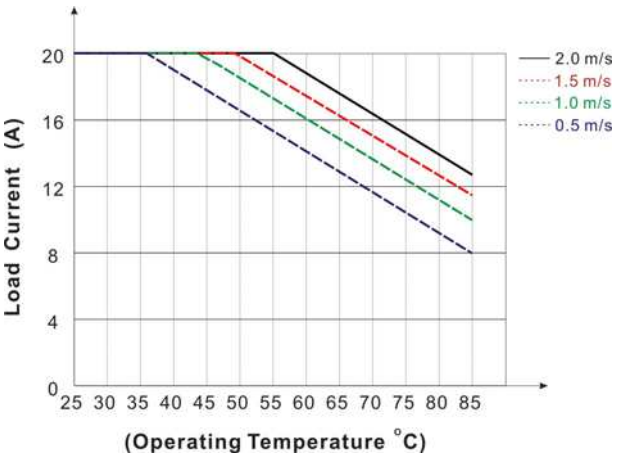
| Model No. | | BR240-12S | BR240-12S-P |
|---|---|---|---|
| Other | | | |
| On/Off Voltage | Low level (V.DC.) | -0.7~1.2V (The primary low electric level is effective) | |
| | High level (V.DC.) | 2.8~8V (The primary low electric level is effective) | |
| On/Off Current | Low level (mA) (max.) | 1mA | |
| Primary On/Off Voltage | Low level (V.DC.) | — | 0.7~1.2V (The low electric level is effective) |
| | High level (V.DC.) | — | 2.8~8V (The low electric level is effective) |
| Primary On/Off Current | Low level (mA) (max.) | — | 1mA |
| Secondary CTL Voltage | Low level (V.DC.) | — | 0~0.8V (The High Electric Level is Effective) |
| | High level (V.DC.) (max.) | — | 3.3~3.6V (The High Electric Level is Effective) |
| Logic Input and Output Pins in the Communications Port | | | |
| | Logic Input Low level (V.DC.) (max.) | — | 1.1V |
| | Logic Input High Level (V.DC.) (max.) | — | 3.6V |
| | Logic Output Low Level (V.DC.) (max.) | — | 0.25V |
| | Logic Output High Level (V.DC.) (max.) | — | 3.6V |
| | PMBus Setting-up Time (ns.) (min.) | — | 100 |
| | PMBus Holding Time (ns.) (min.) | — | 0 |
| PMBus Detected Precision (Vin=36 - 75 V; Iout=0 - 20 A;TA = -40℃ to +85℃ (-40℉ to +185℉ )) | | | |
| | Input Voltage Detected Precision (V.DC.) | — | ±1V |
| | Output Voltage Detected Precision (V.DC.) | — | ±0.2V |
| | Output Current Detected Precision (A) | — | ±1A |
| | Temperature Detected Precision (℃) | — | ±5℃ |

## NOTE



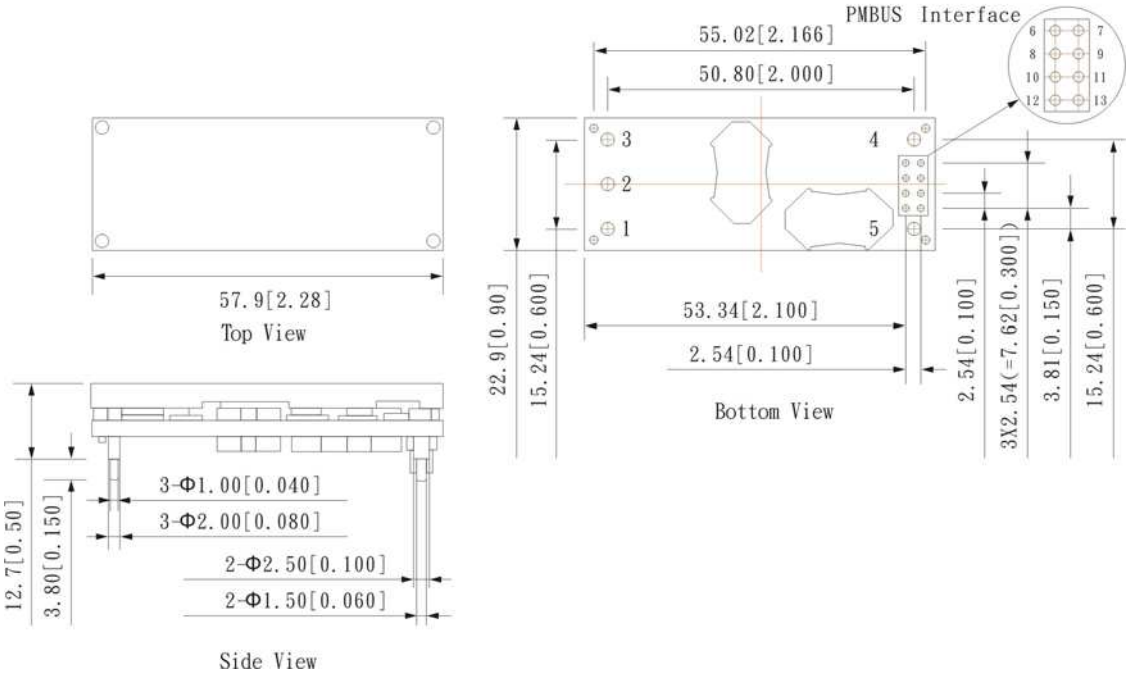

1. During the test of input reflected ripple current, the input terminal must be connected to a 12 uH inductor and a 220 uF electrolytic capacitor.
2. Point B, which is for testing the output voltage ripple, is 25 mm (0.98 in.) away from the Vout(+) pin.

## DERATING



## MECHANICAL DIMENSION

Unit: mm [in.]




| PIN# | Single |
|---|---|
| 1 | +DC IN |
| 2 | ON / OFF CTL |
| 3 | -DC IN |
| 4 | -DC OUT |
| 5 | +DC OUT |
| 6 | SGND |
| 7 | SA0 |
| 8 | PMBus_ALT |
| 9 | SA1 |
| 10 | PMBus_CTL |
| 11 | ISHARE |
| 12 | PMBus_SCL |
| 13 | PMBus_SDA |

**Note**

1. All dimensions in mm [in.]
   Tolerances: x.x ± 0.5 mm [x.xx ± 0.02 in.]
   x.xx± 0.25 mm [x.xxx ± 0.010 in.]
2. Pin 1-3 are 1.00 ± 0.05 mm [0.040 ± 0.002 in.] diameter with 2.00 ± 0.10 mm [0.080 ± 0.004 in.] diameter standoff shoulders.
   Pin4 and pin5 are 1.50 ± 0.05 mm [0.060 ± 0.002 in.] diameter with 2.50 ± 0.10 mm [0.098 ± 0.004 in.] diameter standoff shoulders.