

## Applications

These converters are well suitable for battery operated equipment, measurement equipment, telecom, wireless network, Industry control system, everywhere where isolated, tightly regulated voltages and compact size are required.

## Features

- Wide 4:1 Input Voltage Range
- Input / Output Isolation: 1500VDC
- Operating Temperature: -40°C to +95°C
- Remote On/Off
- Output Short Circuit Protection
- Over Voltage Protection: Clamp Mode
- Over Temperature Protection
- Adjustable Output Voltage
- Lead Free Design, RoHS Compliant
- Designed according to IEC/EN/UL 62368-1

## Part Number Structure

**BWC40** - **24** **S** **1** **W** **HS**  
(1) (2) (3) (4) (5) (6)

### (1) Series

### (2) Input Voltage Range

**24** - 9 - 36V

**48** - 18 - 75V

### (4) Output Voltage

**0** - 3.3V

**1** - 5V

**2** - 12V

**3** - 15V

### (3) Output Type

**S** - Single Output

**D** - Dual Output

### (5) Input Range

**W** - 4:1

### (6) Heat-sink (Optional)

**Blank** - Without Heat-sink

**HS** - With Heat-sink

## Models and Ratings

| Model Number | Input Voltage Range (VDC) | Output Voltage (VDC) | Output Current (mA) |           | Input Current (mA) typ. |           | Efficiency (%) typ. | Capacitive Load (μF) max. |
|--------------|---------------------------|----------------------|---------------------|-----------|-------------------------|-----------|---------------------|---------------------------|
|              |                           |                      | Min. Load           | Full Load | No Load                 | Full Load |                     |                           |
| BWC40-24S0W  | 9 - 36<br>24V nominal     | 3.3                  | 0                   | 10000     | 88                      | 1677      | 86                  | 28000                     |
| BWC40-24S1W  |                           | 5                    | 0                   | 8000      | 119                     | 2008      | 87                  | 18000                     |
| BWC40-24S2W  |                           | 12                   | 0                   | 3350      | 122                     | 2018      | 87                  | 3800                      |
| BWC40-24S3W  |                           | 15                   | 0                   | 2650      | 112                     | 1972      | 88                  | 3000                      |
| BWC40-24D1W  |                           | ±5                   | 0                   | ±4000     | 108                     | 2032      | 86                  | 18000 / 18000             |
| BWC40-24D2W  |                           | ±12                  | 0                   | ±1650     | 58                      | 2012      | 86                  | 2200 / 2200               |
| BWC40-24D3W  |                           | ±15                  | 0                   | ±1350     | 77                      | 2058      | 86                  | 1200 / 1200               |
| BWC40-48S0W  | 18 - 75<br>48V nominal    | 3.3                  | 0                   | 10000     | 49                      | 838       | 86                  | 28000                     |
| BWC40-48S1W  |                           | 5                    | 0                   | 8000      | 57                      | 992       | 88                  | 18000                     |
| BWC40-48S2W  |                           | 12                   | 0                   | 3350      | 60                      | 997       | 88                  | 3800                      |
| BWC40-48S3W  |                           | 15                   | 0                   | 2650      | 57                      | 974       | 89                  | 3000                      |
| BWC40-48D1W  |                           | ±5                   | 0                   | ±4000     | 50                      | 1004      | 87                  | 18000 / 18000             |
| BWC40-48D2W  |                           | ±12                  | 0                   | ±1650     | 53                      | 994       | 87                  | 2200 / 2200               |
| BWC40-48D3W  |                           | ±15                  | 0                   | ±1350     | 60                      | 1017      | 87                  | 1200 / 1200               |

## Input Specifications

|                                |                                  |                               |
|--------------------------------|----------------------------------|-------------------------------|
| Input voltage                  | See 'Models and Ratings' table   |                               |
|                                | 100ms max.                       |                               |
| Input surge voltage            | 24Vin models                     | 50 VDC                        |
|                                | 48Vin models                     | 100 VDC                       |
| Input filter                   | Pi type                          |                               |
| Input reflected ripple current | Nominal Vin and full load        | 67 mAp-p typ.                 |
| Remote ON/OFF                  | Converter On                     | Open circuit or 3.5 to 12 VDC |
|                                | Converter Off                    | Short circuit or 0 to 0.7 VDC |
|                                | Refer to 'Remote' and '-Vin' pin |                               |
| Off idle input current         | Nominal Vin                      | 20 mA max.                    |
| Remote pin input current       | Nominal Vin                      | 0.2 mA max.                   |

| Output Specifications                          |                                         |                                |
|------------------------------------------------|-----------------------------------------|--------------------------------|
| Voltage accuracy                               | Nominal Vin and full load               | ±1% max.                       |
| Output voltage adjustability (Trim)            |                                         | ±10% max.                      |
| Minimum load                                   |                                         | See 'Models and Ratings' table |
| Line regulation                                | ±5Vout models                           | ±1% max.                       |
|                                                | Other models                            | ±0.5% max.                     |
| Load regulation                                | 25% to 100% load                        |                                |
|                                                | Single output models                    | ±0.5% max.                     |
|                                                | Dual output models                      | ±0.5% max.                     |
| Cross regulation                               | 25% / 100% asym. load                   | ±3% max.                       |
| Ripple and noise                               | 20MHz bandwidth                         | 85 mVp-p max.                  |
| Capacitive load                                |                                         | See 'Models and Ratings' table |
| Short circuit protection                       |                                         | Continuous, Automatic recovery |
| Overload protection                            | Nominal Vin                             | 110% min. of full load         |
| Over voltage protection<br>(Zener Diode Clamp) | 3.3V output                             | 3.9V                           |
|                                                | 5V output                               | 6.2V                           |
|                                                | 12V output                              | 15V                            |
|                                                | 15V output                              | 18V                            |
| Transient recovery time                        | 50% load step change                    | 380µs typ.                     |
| Transient response deviation                   | di/dt = 0.8 A/µs                        | ±5% max.                       |
| Temperature coefficient                        | Full load                               | ±0.02%/°C max.                 |
| General Specifications                         |                                         |                                |
| Efficiency                                     | Nominal Vin and full load               | See 'Models and Ratings' table |
| Start-up time                                  | Nominal Vin and constant resistive load | 69 ms typ.                     |
| Switching frequency                            |                                         | 300 kHz typ.                   |
| Isolation voltage                              | Input to output, 60 s                   | 1500 VDC min.                  |
|                                                | Input/output to case, 60 s              | 1500 VDC min.                  |
| Isolation resistance                           | 500 VDC                                 | 1000 MΩ min.                   |
| Isolation capacitance                          |                                         | 1200 pF typ.                   |
| Reliability, calculated MTBF                   | MIL-HDBK-217F@25°C, Ground Benign       | 9.68 × 10 <sup>5</sup> h       |
| Operating ambient temperature                  | With derating                           | -40°C to +95°C                 |
| Maximum case temperature                       |                                         | +105°C max.                    |
| Over Temperature Protection                    | Case temperature                        | +110°C typ.                    |
| Storage temperature range                      |                                         | -55°C to +125°C                |
| Relative humidity                              |                                         | 95% RH max.                    |
| Cooling                                        |                                         | Natural convection             |

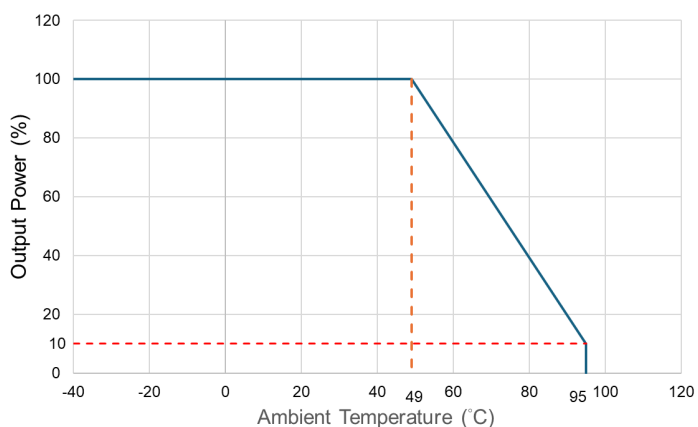
## Physical Specifications

|                        |                       |
|------------------------|-----------------------|
| Case material          | Nickel-coated copper  |
| Base material          | FR4 PCB (UL 94 V-0)   |
| Pin material           | Copper alloy          |
| Pin Foundation Plating | Nickel                |
| Pin Surface Plating    | Tin                   |
| Potting material       | Silicone (UL 94 V-0)  |
| Dimensions             | 2.0 × 2.0 × 0.4 inch  |
|                        | 50.8 × 50.8 × 10.2 mm |
| Weight                 | 60 g typ.             |

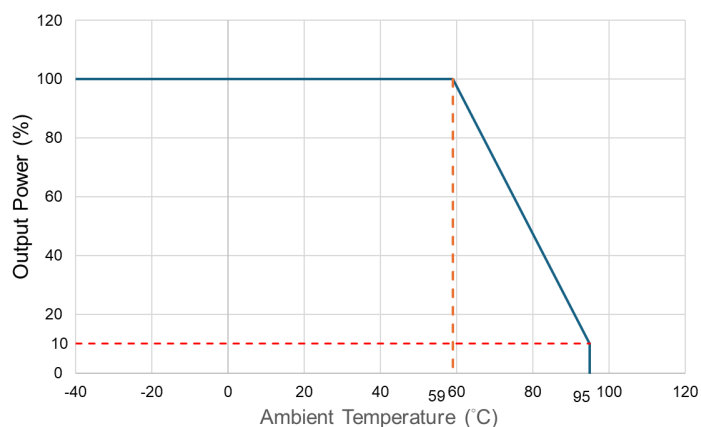
## Characteristic Curves

### Power Derating Curve

Without Heat-sink

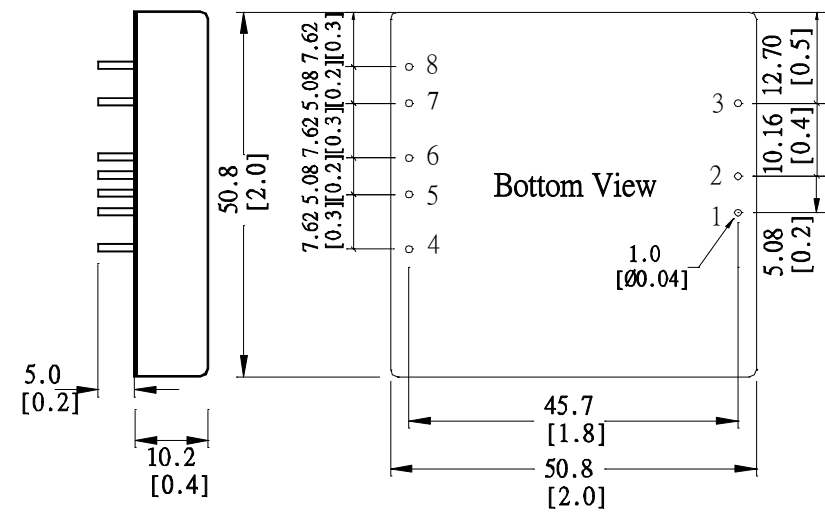


With Heatsink



Mechanical

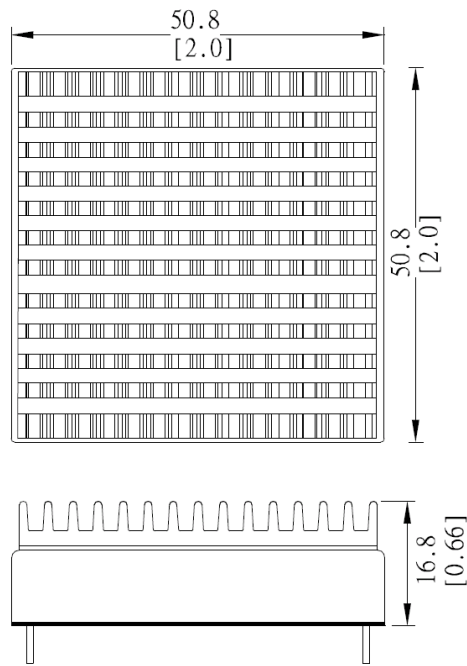
Standard model



| Pinout |               |               |
|--------|---------------|---------------|
| PIN    | Single        | Dual          |
| 1      | +Vin          | +Vin          |
| 2      | -Vin          | -Vin          |
| 3      | Remote On/Off | Remote On/Off |
| 4      | -Sense        | +Vout         |
| 5      | +Sense        | Common        |
| 6      | +Vout         | Common        |
| 7      | -Vout         | -Vout         |
| 8      | Trim          | Trim          |

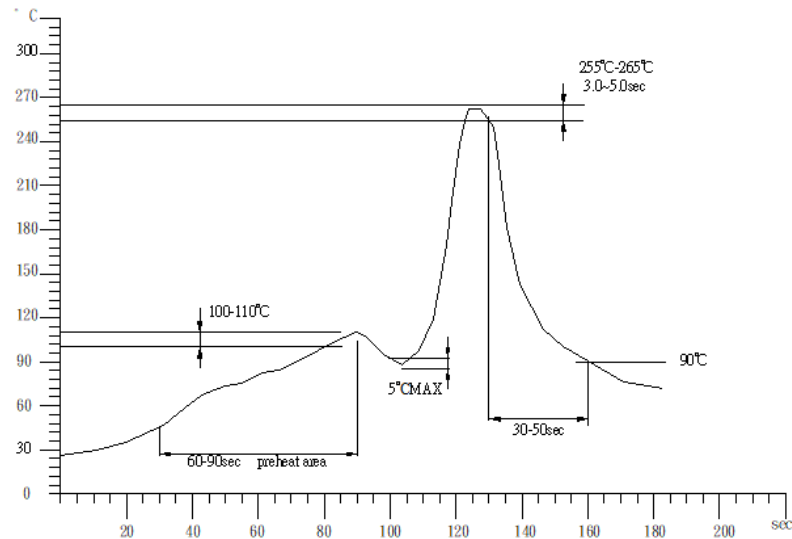
Dimensions in mm [inch]  
Tolerances:  $\pm 0.5$  [ $\pm 0.02$ ]  
Pin dimension tolerances:  $\pm 0.10$  ( $\pm 0.004$ )

Optional model with heatsink



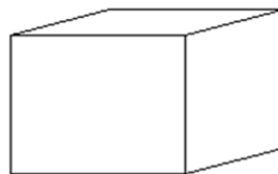
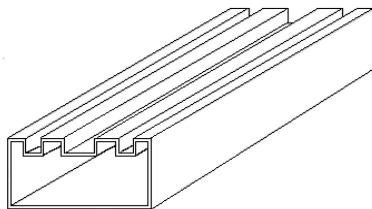
Heatsink  
Material: Anodized aluminum (black)  
Weight: 19g (0.67oz)

## Wave Soldering Temperature Curve

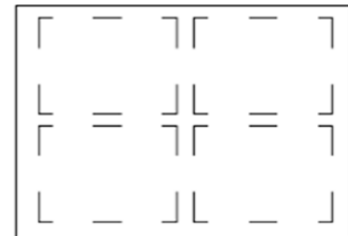


## Carton Package

Standard model



INNER CARTON: 388\*158.5\*115



EXPORT CARTON: 405\*334\*263

TUBE = 5PCS

INNER CARTON = 16 TUBE = 16\*5 = 80PCS

EXPORT CARTON = 4 INNER CARTON = 4\*80 = 320PCS

### For More Information:

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