



# EC5SBW SERIES 30 WATT 4:1 INPUT DC-DC CONVERTERS

## FEATURES

- \* 30W Isolated Output
- \* 1"x1"x0.4" Shielded Metal Case
- \* Very High Efficiency Up to 90%
- \* Low No Load Power Consumption
- \* 4:1 Input Range
- \* Regulated Outputs
- \* Fixed Switching Frequency
- \* Input under-voltage Protection
- \* Over Current Protection
- \* Remote On/Off
- \* Continuous Short Circuit Protection
- \* Without Tantalum Capacitors inside
- \* CE Mark Meets 2004/108/EC
- \* Safety Meets UL60950-1, EN60950-1, and IEC60950-1



| MODEL NUMBER | INPUT VOLTAGE | OUTPUT VOLTAGE | OUTPUT CURRENT |          | INPUT CURRENT |           | % Eff. |     | CAPACITIVE LOAD MAX. |
|--------------|---------------|----------------|----------------|----------|---------------|-----------|--------|-----|----------------------|
|              |               |                | MIN.           | MAX.     | NO LOAD       | FULL LOAD | (2)    | (3) |                      |
| EC5SBW-24S33 | 9-36 VDC      | 3.3 VDC        | 0 mA           | 7500 mA  | 10 mA         | 1172 mA   | 88     | 88  | 7500uF               |
| EC5SBW-24S05 | 9-36 VDC      | 5 VDC          | 0 mA           | 6000 mA  | 10 mA         | 1389 mA   | 89     | 90  | 6000uF               |
| EC5SBW-24S12 | 9-36 VDC      | 12 VDC         | 0 mA           | 2500 mA  | 10 mA         | 1404 mA   | 89     | 89  | 2500uF               |
| EC5SBW-24S15 | 9-36 VDC      | 15 VDC         | 0 mA           | 2000 mA  | 10 mA         | 1404 mA   | 89     | 89  | 2000uF               |
| EC5SBW-24D12 | 9-36 VDC      | ±12 VDC        | 0 mA           | ±1250 mA | 10 mA         | 1404 mA   | 89     | 89  | 1250uF               |
| EC5SBW-24D15 | 9-36 VDC      | ±15 VDC        | 0 mA           | ±1000 mA | 10 mA         | 1404 mA   | 89     | 89  | 1000uF               |
| EC5SBW-48S33 | 18-75 VDC     | 3.3 VDC        | 0 mA           | 7500 mA  | 8 mA          | 586 mA    | 88     | 88  | 7500uF               |
| EC5SBW-48S05 | 18-75 VDC     | 5 VDC          | 0 mA           | 6000 mA  | 8 mA          | 694 mA    | 90     | 90  | 6000uF               |
| EC5SBW-48S12 | 18-75 VDC     | 12 VDC         | 0 mA           | 2500 mA  | 8 mA          | 694 mA    | 90     | 90  | 2500uF               |
| EC5SBW-48S15 | 18-75 VDC     | 15 VDC         | 0 mA           | 2000 mA  | 8 mA          | 702 mA    | 90     | 89  | 2000uF               |
| EC5SBW-48D12 | 18-75 VDC     | ±12 VDC        | 0 mA           | ±1250 mA | 8 mA          | 710 mA    | 89     | 88  | 1250uF               |
| EC5SBW-48D15 | 18-75 VDC     | ±15 VDC        | 0 mA           | ±1000 mA | 8 mA          | 702 mA    | 90     | 89  | 1000uF               |

### NOTE:

1. Nominal Input Voltage 24 or 48 VDC
2. Measure at 12VDC for EC5SBW 24 Vin, 24VDC for EC5SBW 48 Vin
3. Measure at Nominal Input Voltage

# SPECIFICATIONS

All Specifications Typical At Nominal Line, Full Load, and 25°C Unless Otherwise Noted

## INPUT SPECIFICATIONS:

|                                       |                  |  |
|---------------------------------------|------------------|--|
| Input Voltage Range                   | 24V              | 9 – 36V                                  |
|                                       | 48V              | 18 – 75V                                 |
| Input Surge Voltage (100ms max.)      | 24V              | 50Vdc max.                               |
|                                       | 48V              | 100Vdc max.                              |
| Under voltage lockout                 | 24Vin power up   | 8.8V typ.                                |
|                                       | 24Vin power down | 8.0V typ.                                |
|                                       | 48Vin power up   | 17V typ.                                 |
|                                       | 48Vin power down | 16V typ.                                 |
| Input Filter                          |                  | PI Type                                  |
| Positive Logic Remote on/off Control: |                  |  |
| Logic Compatibility                   |                  | CMOS or Open Collector TTL, ref. to -Vin |
| Module On                             |                  | >+3.5 to 75VDC or Open Circuit           |
| Module Off                            |                  | <1.2VDC                                  |

## OUTPUT SPECIFICATIONS:

|  |             |   |
|--|-------------|---|
| Voltage Accuracy                                     |             | ±1.5% max.                              |
| Voltage Balance (Dual)                               |             | ±1.5% max.                              |
| Transient Response: 75% - 100% Step Load Change.     |             |   |
| Error Band   |             | ±5% Vout nominal, Recovery Time < 250us |
| Ripple & Noise, 20MHz BW(note3)                      |             |   |
|  | Vo=3.3 & 5V | 75mVpk-pk max.                          |
|  | Vo=12 & 15V | 100mVpk-pk max.                         |
| Temperature Coefficient                              |             | ±0.03%/°C max.                          |
| Short Circuit Protection                             |             | Continuous                              |
| Line Regulation (note1)                              | Single      | ±0.2% max.                              |
|  | Dual        | ±0.5% max.                              |
| Load Regulation (note2)                              | Single      | ±0.2% max.                              |
|  | Dual        | ±1.0% max.                              |
| Over Voltage Protection                              |             | Zener or TVS Clamp                      |
| External Trim Adj. Range (single output models only) |             | ±10%                                    |
| Current Limit  |             | 110% - 170% Nominal Output              |
| Start up time  |             | 20ms max.                               |

## GENERAL SPECIFICATIONS:

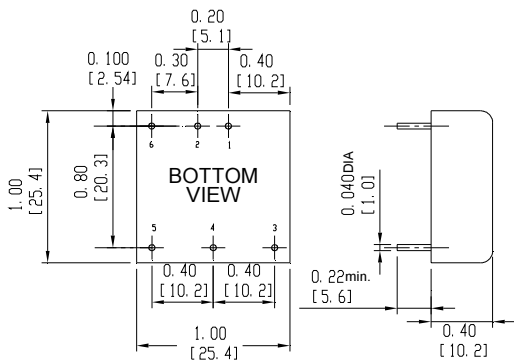
|                                     |                                   |  |
|-------------------------------------|-----------------------------------|--|
| Efficiency                          |                                   | See Table                                    |
| Isolation Voltage                   |                                   | 1500 VDC min.                                |
| Isolation Resistance                |                                   | 10 <sup>9</sup> Ohms min.                    |
| Isolation Capacitance               |                                   | 1500pF typ.                                  |
| Switching Frequency                 | Vo=3.3 & 5V                       | 270KHz typ.                                  |
|                                     | Others                            | 330KHz typ.                                  |
| Operating Ambient Temperature Range |                                   | -40°C to +80°C                               |
| Derating, Above 55°C                |                                   | Linearly to Zero Power at +105°C             |
| Case Temperature (note4)            |                                   | 105°C  |
| Cooling                             |                                   | Natural Convection                           |
| Storage Temperature Range           |                                   | -55°C to +125°C                              |
| Thermal Shutdown, Case Temp.        |                                   | 110°C typ.                                   |
| Humidity                            |                                   | 95% RH max. Non condensing                   |
| MTBF                                | MIL-STD-217F, GB, 25°C, Full Load | T.B.D. hrs                                   |
| Dimensions                          |                                   | 1.00x1.00x0.40 inches (25.4x25.4x10.2mm)     |
| Case Material                       |                                   | Black Coated Copper with Non-Conductive Base |
| Weight                              |                                   | 18g  |

## NOTE:

1. Measured from high line to low line.
2. Measured from full load to min. load.
3. The output ripple and noise is measured with 10uF tantalum and 1uF ceramic capacitor across output.
4. Suffix "N" to the model number with negative logic remote on/off
  - Module on < 1.2VDC
  - Module off > 3.5VDC to 75VDC or open circuit
5. Maximum case temperature under any operating condition should not be exceeded 105°C.

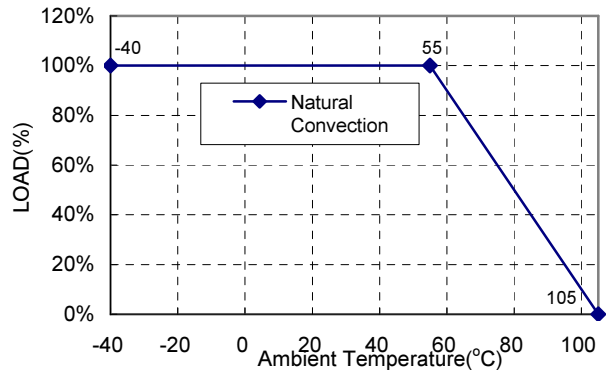
## SIZE SB Dimensions:

Tolerances Inches: X.XX= ±0.04 , X.XXX= ±0.010  
 Millimeters: X.X= ±1.0 , X.XX=±0.25



| Pin | PIN CONNECTION |           |
|-----|----------------|-----------|
|     | DIP Function   |           |
|     | Single         | Dual      |
| 1   | +Input         | +Input    |
| 2   | -Input         | -Input    |
| 3   | +V Output      | +V Output |
| 4   | Trim           | Common    |
| 5   | -V Output      | -V Output |
| 6   | Remote         | Remote    |

Typical Derating curve for Natural Convection



## EXTERNAL OUTPUT TRIM

