



# EC3SB SERIES 15 WATT 2:1 INPUT DC-DC CONVERTERS



## FEATURES

- \* 15W Isolated Output
- \* Efficiency to 90%
- \* 2:1 Input Rang
- \* 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. | CAPACITOR LOAD MAX. |
|--------------|---------------|----------------|----------------|----------|---------------|-----------|--------|---------------------|
|              |               |                | MIN.           | MAX.     | NO LOAD       | FULL LOAD |        |                     |
| EC3SB -12S33 | 9-18 VDC      | 3.3 VDC        | 0 mA           | 4000 mA  | 90 mA         | 1280 mA   | 85     | 4000uF              |
| EC3SB -12S05 | 9-18 VDC      | 5 VDC          | 0 mA           | 3000 mA  | 85 mA         | 1453 mA   | 88     | 3000uF              |
| EC3SB -12S12 | 9-18 VDC      | 12 VDC         | 0 mA           | 1250 mA  | 70 mA         | 1420 mA   | 88     | 1330uF              |
| EC3SB -12S15 | 9-18 VDC      | 15 VDC         | 0 mA           | 1000 mA  | 70 mA         | 1420 mA   | 88     | 1000uF              |
| EC3SB-12D05  | 9-18 VDC      | ±5 VDC         | 0 mA           | ±1500 mA | 45 mA         | 1470 mA   | 85     | 1470uF              |
| EC3SB-12D12  | 9-18 VDC      | ±12 VDC        | 0 mA           | ±625 mA  | 45 mA         | 1436 mA   | 87     | 660uF               |
| EC3SB-12D15  | 9-18 VDC      | ±15 VDC        | 0 mA           | ±500 mA  | 45 mA         | 1420 mA   | 88     | 550uF               |
| EC3SB -24S33 | 18-36 VDC     | 3.3 VDC        | 0 mA           | 4000 mA  | 50 mA         | 640 mA    | 86     | 4000uF              |
| EC3SB -24S05 | 18-36 VDC     | 5 VDC          | 0 mA           | 3000 mA  | 50 mA         | 718 mA    | 89     | 3000uF              |
| EC3SB -24S12 | 18-36 VDC     | 12 VDC         | 0 mA           | 1250 mA  | 20 mA         | 695 mA    | 90     | 1330uF              |
| EC3SB -24S15 | 18-36 VDC     | 15 VDC         | 0 mA           | 1000 mA  | 20 mA         | 695 mA    | 90     | 1000uF              |
| EC3SB-24D05  | 18-36 VDC     | ±5 VDC         | 0 mA           | ±1500 mA | 25 mA         | 726 mA    | 86     | 1470uF              |
| EC3SB-24D12  | 18-36 VDC     | ±12 VDC        | 0 mA           | ±625 mA  | 25 mA         | 710 mA    | 88     | 660uF               |
| EC3SB-24D15  | 18-36 VDC     | ±15 VDC        | 0 mA           | ±500 mA  | 25 mA         | 702 mA    | 89     | 550uF               |
| EC3SB -48S33 | 36-75 VDC     | 3.3 VDC        | 0 mA           | 4000 mA  | 25 mA         | 320 mA    | 86     | 4000uF              |
| EC3SB -48S05 | 36-75 VDC     | 5 VDC          | 0 mA           | 3000 mA  | 30 mA         | 359 mA    | 88     | 3000uF              |
| EC3SB -48S12 | 36-75 VDC     | 12 VDC         | 0 mA           | 1250 mA  | 20 mA         | 347 mA    | 90     | 1330uF              |
| EC3SB -48S15 | 36-75 VDC     | 15 VDC         | 0 mA           | 1000 mA  | 20 mA         | 351 mA    | 90     | 1000uF              |
| EC3SB-48D05  | 36-75 VDC     | ±5 VDC         | 0 mA           | ±1500 mA | 20 mA         | 363 mA    | 86     | 1470uF              |
| EC3SB-48D12  | 36-75 VDC     | ±12 VDC        | 0 mA           | ±625 mA  | 20 mA         | 355 mA    | 88     | 660uF               |
| EC3SB-48D15  | 36-75 VDC     | ±15 VDC        | 0 mA           | ±500 mA  | 20 mA         | 351 mA    | 89     | 550uF               |

NOTE: 1. Nominal Input Voltage 12, 24 or 48 VDC

# SPECIFICATIONS

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

## INPUT SPECIFICATIONS:

|                                       |                                 |                 |
|---------------------------------------|---------------------------------|-----------------|
| Input Voltage Range                   | 12V                             | 9 - 18V         |
|                                       | 24V                             | 18 - 36V        |
|                                       | 48V                             | 36 - 75V        |
| Under voltage lockout                 | 12Vin power up: 8.8V            | power down: 8V  |
|                                       | 24Vin power up: 17V             | power down: 16V |
|                                       | 48Vin power up: 34V             | power down: 32V |
| Input Surge Voltage (100mS max.)      | EC3SB-12Sxx/12DXX               | 25Vdc max.      |
|                                       | EC3SB-24Sxx/24DXX               | 50Vdc max.      |
|                                       | EC3SB-48Sxx/48DXX               | 100Vdc max.     |
| Input Filter                          | Standard                        | PI Type         |
|                                       | SMD                             | LC Type         |
| Positive Logic Remote on/off Control: |                                 |                 |
| Logic Compatibility                   | CMOS or Open Collector          | TTL             |
| Module On                             | >+5.5V to 75VDC or Open Circuit |                 |
| Module Off                            | <1.2VDC                         |                 |

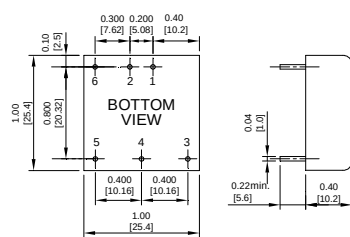
## OUTPUT SPECIFICATIONS:

|                                                              |                                           |
|--------------------------------------------------------------|-------------------------------------------|
| Voltage Accuracy                                             | ±1.5% max.                                |
| Voltage Balance (Dual)                                       | ±2.0% max.                                |
| Transient Response: 25% Step Load Change                     | <500us                                    |
| Ripple and Noise, 20MHz BW (note 3)                          | 50mV pk-pk max.                           |
|                                                              | SMD 120mV pk-pk max.                      |
| Temperature Coefficient                                      | ±0.03%/°C                                 |
| Short Circuit Protection                                     | Continuous                                |
| Line Regulation (note 1)                                     | Single ..... DIP±0.2% max., SMD±0.3% max. |
|                                                              | Dual ..... ±0.5% max.                     |
| Load Regulation (note 2)                                     | Single ..... DIP±0.2% max., SMD±0.5% max. |
|                                                              | Dual ..... ±1.0% max.                     |
| Cross Regulation (Dual output) Load cross variation 10%/100% | ±5% max.                                  |
| Over Voltage Protection                                      | Zener or TVS Clamp                        |
| External Trim Adj. Range                                     | ±10%                                      |
| Current Limit                                                | 110% - 140% Nominal Output                |
| Start up time                                                | 20ms max.                                 |

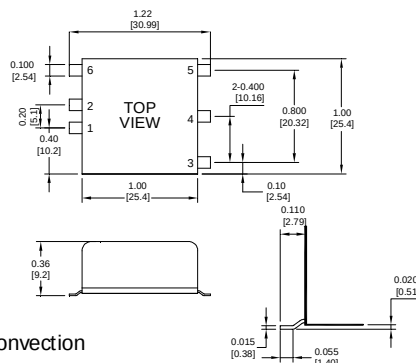
## SIZE SB Dimensions:

NOTE: Pin Size is 0.04±0.004 Inch (1.0±0.1 mm) DIA  
All Dimensions In Inches (mm)  
Tolerances Inches: X.XX= ±0.02, X.XXX= ±0.010  
Millimeters: X.X= ±0.5, X.XX=±0.25

THROUGH-HOLE PACKAGE

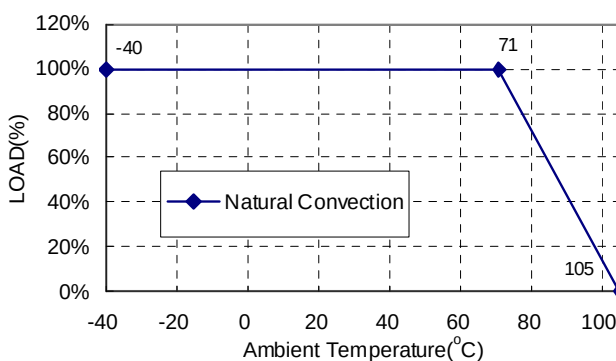


SMD- PACKAGE



| Pin | PIN CONNECTION |           |
|-----|----------------|-----------|
|     | 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



## GENERAL SPECIFICATIONS:

|                                     |                                                      |
|-------------------------------------|------------------------------------------------------|
| Efficiency                          | See Table                                            |
| Isolation Voltage                   | 1500 VDC min.                                        |
| Isolation Resistance                | 10 <sup>9</sup> ohm min.                             |
| Isolation Capacitance               | 1000pF typ.                                          |
| Switching Frequency                 | 350KHz typ.                                          |
| Operating Ambient Temperature Range | -40°C to +85°C                                       |
| Derating, Above 71°C                | Linearly to Zero Power at +105°C                     |
| Case Temperature (note 4)           | 105°C                                                |
| Cooling                             | Natural Convection                                   |
| Storage Temperature Range           | -55°C to +125°C                                      |
| Humidity                            | 95% RH max. Non condensing                           |
| MTBF                                | MIL-STD-217-F, GB, 25°C, Full Load 1200Khrs typ.     |
| Dimensions                          | DIP ..... 1.00x1.00x0.4 inches (25.4x25.4x10.2 mm)   |
|                                     | SMD ... 1.00x1.00x0.36 inches (25.4 x 25.4 x 9.2 mm) |
| 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. Maximum case temperature under any operating condition should not be exceeded 105°C.
5. Suffix "S" to the model number with SMD packages.

## EXTERNAL OUTPUT TRIM

