



# EC3SA SERIES

## 3 WATT WIDE INPUT

## DC-DC CONVERTERS



### FEATURES

- \* 3W Isolated Output
- \* Compact SIP-8 Package
- \* Efficiency to 86%
- \* 2:1 Input Range
- \* Regulated Outputs
- \* Remote On/Off Control
- \* 1500VDC Isolation
- \* Continuous Short Circuit Protection
- \* Under Voltage Protection
- \* 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 |        |                     |
| EC3SA-05S33N | 4.5-9.0 VDC   | 3.3 VDC        | 0 mA           | 700 mA  | 60 mA         | 632 mA    | 73     | 700uF               |
| EC3SA-05S05N | 4.5-9.0 VDC   | 5 VDC          | 0 mA           | 600 mA  | 60 mA         | 769 mA    | 78     | 600uF               |
| EC3SA-05S12N | 4.5-9.0 VDC   | 12 VDC         | 0 mA           | 250 mA  | 60 mA         | 759 mA    | 81     | 250uF               |
| EC3SA-05S15N | 4.5-9.0 VDC   | 15 VDC         | 0 mA           | 200 mA  | 60 mA         | 741 mA    | 81     | 200uF               |
| EC3SA-05D05N | 4.5-9.0 VDC   | ±5 VDC         | ±0 mA          | ±300 mA | 60 mA         | 769 mA    | 78     | 300uF               |
| EC3SA-05D12N | 4.5-9.0 VDC   | ±12 VDC        | ±0 mA          | ±125 mA | 60 mA         | 741 mA    | 81     | 125uF               |
| EC3SA-05D15N | 4.5-9.0 VDC   | ±15 VDC        | ±0 mA          | ±100 mA | 60 mA         | 741 mA    | 81     | 100uF               |
| EC3SA-12S33N | 9-18 VDC      | 3.3 VDC        | 0 mA           | 700 mA  | 30 mA         | 253 mA    | 76     | 700uF               |
| EC3SA-12S05N | 9-18 VDC      | 5 VDC          | 0 mA           | 600 mA  | 30 mA         | 309 mA    | 81     | 600uF               |
| EC3SA-12S12N | 9-18 VDC      | 12 VDC         | 0 mA           | 250 mA  | 30 mA         | 301 mA    | 83     | 250uF               |
| EC3SA-12S15N | 9-18 VDC      | 15 VDC         | 0 mA           | 200 mA  | 30 mA         | 298 mA    | 84     | 200uF               |
| EC3SA-12D05N | 9-18 VDC      | ±5 VDC         | ±0 mA          | ±300 mA | 30 mA         | 305 mA    | 82     | 300uF               |
| EC3SA-12D12N | 9-18 VDC      | ±12 VDC        | ±0 mA          | ±125 mA | 30 mA         | 301 mA    | 83     | 125uF               |
| EC3SA-12D15N | 9-18 VDC      | ±15 VDC        | ±0 mA          | ±100 mA | 30 mA         | 298 mA    | 84     | 100uF               |
| EC3SA-24S33N | 18-36 VDC     | 3.3 VDC        | 0 mA           | 700 mA  | 18 mA         | 125 mA    | 77     | 700uF               |
| EC3SA-24S05N | 18-36 VDC     | 5 VDC          | 0 mA           | 600 mA  | 18 mA         | 154 mA    | 81     | 600uF               |
| EC3SA-24S12N | 18-36 VDC     | 12 VDC         | 0 mA           | 250 mA  | 18 mA         | 149 mA    | 84     | 250uF               |
| EC3SA-24S15N | 18-36 VDC     | 15 VDC         | 0 mA           | 200 mA  | 18 mA         | 147 mA    | 85     | 200uF               |
| EC3SA-24D05N | 18-36 VDC     | ±5 VDC         | ±0 mA          | ±300 mA | 18 mA         | 156 mA    | 80     | 300uF               |
| EC3SA-24D12N | 18-36 VDC     | ±12 VDC        | ±0 mA          | ±125 mA | 18 mA         | 149 mA    | 84     | 125uF               |
| EC3SA-24D15N | 18-36 VDC     | ±15 VDC        | ±0 mA          | ±100 mA | 18 mA         | 147 mA    | 85     | 100uF               |
| EC3SA-48S33N | 36-75 VDC     | 3.3 VDC        | 0 mA           | 700 mA  | 9 mA          | 63mA      | 77     | 700uF               |
| EC3SA-48S05N | 36-75 VDC     | 5 VDC          | 0 mA           | 600 mA  | 9 mA          | 77 mA     | 81     | 600uF               |
| EC3SA-48S12N | 36-75 VDC     | 12 VDC         | 0 mA           | 250 mA  | 9 mA          | 73 mA     | 86     | 250uF               |
| EC3SA-48S15N | 36-75 VDC     | 15 VDC         | 0 mA           | 200 mA  | 9 mA          | 73 mA     | 86     | 200uF               |
| EC3SA-48D05N | 36-75 VDC     | ±5 VDC         | ±0 mA          | ±300 mA | 9 mA          | 77 mA     | 81     | 300uF               |
| EC3SA-48D12N | 36-75 VDC     | ±12 VDC        | ±0 mA          | ±125 mA | 9 mA          | 73 mA     | 86     | 125uF               |
| EC3SA-48D15N | 36-75 VDC     | ±15 VDC        | ±0 mA          | ±100 mA | 9 mA          | 73 mA     | 86     | 100uF               |

NOTE: 1. Nominal Input Voltage 5, 12, 24 or 48VDC

# SPECIFICATIONS

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

## INPUT SPECIFICATIONS:

|                                  |     |             |
|----------------------------------|-----|-------------|
| Input Voltage Range              | 5V  | 4.5-9V      |
|                                  | 12V | 9-18V       |
|                                  | 24V | 18-36V      |
|                                  | 48V | 36-75V      |
| Input Surge Voltage (100ms max.) | 5V  | 15Vdc max.  |
|                                  | 12V | 25Vdc max.  |
|                                  | 24V | 50Vdc max.  |
|                                  | 48V | 100Vdc max. |

### Under Voltage Protection (note5):

|                |              |
|----------------|--------------|
| 5Vin Power Up  | 4.2Vdc max.  |
| Power Down     | 3Vdc min.    |
| 12Vin Power Up | 7.3Vdc max.  |
| Power Down     | 5.8Vdc min.  |
| 24Vin Power Up | 15.5Vdc max. |
| Power Down     | 12Vdc min.   |
| 48Vin Power Up | 31Vdc max.   |
| Power Down     | 24Vdc min.   |

Input Filter ..... Capacitive

### Remote on/off control (note6):

Module Off (input idle current) ..... 1mA max.

## OUTPUT SPECIFICATIONS:

Voltage Accuracy .....  $\pm 1.5\%$  max.

Voltage Balance(Dual) .....  $\pm 1.0\%$  max.

Cross regulation (Dual)(note1) ... Asymmetrical load 25%/100% ..  $\pm 5.0\%$  max.

Transient Response: 25% Step Load Change

Error Band .....  $\pm 6\%$  Vout nominal

Recovery Time .....  $< 500\mu s$

Ripple & Noise 20MHz BW ..... 75mV pk-pk max.

Temperature Coefficient .....  $\pm 0.03\%/^{\circ}C$

Line Regulation (note2) .....  $\pm 0.5\%$  max.

Load Regulation (note3) ..... Single .....  $\pm 0.5\%$  max.

Dual .....  $\pm 1.0\%$  max.

Output Short Circuit Protection ..... Continuous

Start up time ..... 1ms typ.

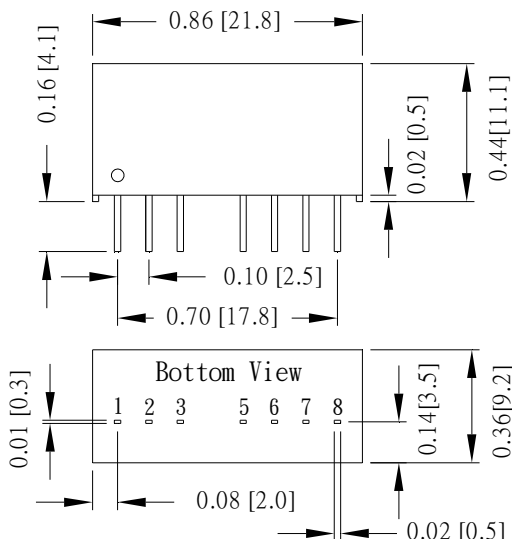
## CASE SIP-8:

All Dimensions In Inches(mm)

Tolerances : Inches millimeters

X.XX $\pm 0.02$  X.X $\pm 0.5$

Pin  $\pm 0.002$   $\pm 0.05$



| PIN CONNECTION |        |        |
|----------------|--------|--------|
| Pin            | Single | Dual   |
| 1              | -Vin   | -Vin   |
| 2              | +Vin   | +Vin   |
| 3              | On/Off | On/Off |
| 5              | NC     | NC     |
| 6              | +Vo    | +Vo    |
| 7              | -Vo    | Common |
| 8              | NC     | -Vo    |

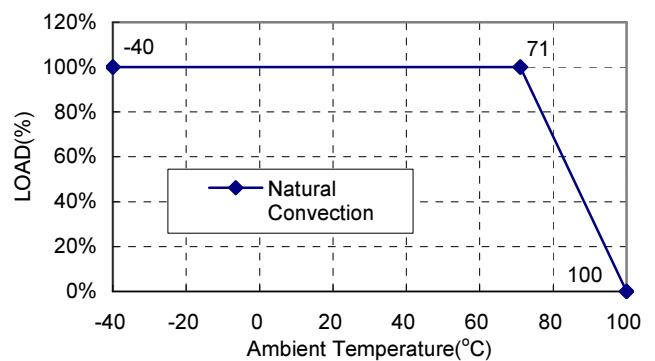
## GENERAL SPECIFICATIONS:

|                               |                                                       |
|-------------------------------|-------------------------------------------------------|
| Efficiency                    | See Table                                             |
| Isolation Voltage             | 1500VDC min.                                          |
| Isolation Resistance          | $10^9$ ohm min.                                       |
| Isolation Capacitance         | 500pF typ.                                            |
| Switching Frequency           | 100KHz min.                                           |
| Operating Ambient Temperature | -40°C to +85°C                                        |
| De-rating, Above 71°C         | Linearly to Zero power at 100°C                       |
| Case Temperature (note4)      | 100°C max.                                            |
| Cooling                       | Natural Convection                                    |
| Storage Temperature           | -55°C to +125°C                                       |
| Humidity                      | 95% RH max. Non condensing                            |
| MTBF                          | MIL-STD-217F, GB, 25°C, Full Load ..... 2500khrs typ. |
| Dimensions                    | 0.86x0.36x0.44 inches(21.8x9.2x11.1 mm)               |
| Case Material                 | Non-Conductive Black Plastic                          |
| Weight                        | 4.8g                                                  |

## NOTE:

- For asymmetric loading both channels must be at 25% load or more.
- Measured from high line to low line.
- Measured from full load to 10% load.
- Maximum case temperature under any operating condition should not be exceeded 100°C.
- Suffix "N" to the model with under voltage protection.
- Suffix "N" Models: Module on .....  $< 0.8VDC$  or open circuit  
Module off ..... 4 to 15VDC  
Other Models: Module on .....  $< 1.2VDC$  or open circuit  
Module off ..... 5.5 to 15VDC

Typical Derating curve for Natural Convection



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