



EC3A SERIES

3 WATT 2:1 INPUT RANGE

DC-DC CONVERTERS



FEATURES

- * 3W Isolated Output
- * 24-Pin DIP Package
- * Efficiency to 87%
- * 2:1 Input Range
- * Regulated Outputs
- * Pi Input Filter
- * Continuous Short Circuit Protection
- * Meet EMI EN55022 class A ("-E" model)
- * No Tantalum Capacitor inside ("-E" model)
- * Wide Operating Temperature Range ("-E" model)
- * UL60950-1 Approval for H/HM Versions only and "-E" Model



| MODEL NUMBER ⁽¹⁾ | INPUT VOLTAGE ⁽²⁾ | | OUTPUT VOLTAGE | OUTPUT CURRENT | INPUT CURRENT | | | | % EFF. ⁽³⁾ | | CAPACITOR LOAD MAX. |
|-----------------------------|------------------------------|-----------|----------------|----------------|---------------|--------|-----------|--------|-----------------------|------|---------------------|
| | | | | | NO LOAD | | FULL LOAD | | | "-E" | |
| | | "-E" | | | | "-E" | | "-E" | | | |
| EC3A01 | 4.5-6 VDC | 4.5-9 VDC | 5 VDC | 600 mA | 15 mA | 15 mA | 800 mA | 779 mA | 75 | 77 | 2200uF |
| EC3A02 | 4.5-6 VDC | 4.5-9 VDC | 12 VDC | 250 mA | 15 mA | 15 mA | 759 mA | 750 mA | 79 | 80 | 2200uF |
| EC3A03 | 4.5-6 VDC | 4.5-9 VDC | 15 VDC | 200 mA | 15 mA | 15 mA | 779 mA | 750 mA | 77 | 80 | 2200uF |
| EC3A04 | 4.5-6 VDC | 4.5-9 VDC | ±5 VDC | ±300 mA | 25 mA | 25 mA | 779 mA | 779 mA | 77 | 77 | 1000uF |
| EC3A05 | 4.5-6 VDC | 4.5-9 VDC | ±12 VDC | ±125 mA | 25 mA | 25 mA | 789 mA | 750 mA | 76 | 80 | 1000uF |
| EC3A06 | 4.5-6 VDC | 4.5-9 VDC | ±15 VDC | ±100 mA | 25 mA | 25 mA | 800 mA | 750 mA | 75 | 80 | 1000uF |
| EC3A07 | 4.5-6 VDC | 4.5-9 VDC | 3.3 VDC | 600 mA | 15 mA | 15 mA | 582 mA | 550 mA | 68 | 72 | 2200uF |
| EC3A11 | 9-18 VDC | | 5 VDC | 600 mA | 7.5 mA | 7.5 mA | 325 mA | 309 mA | 77 | 81 | 2200uF |
| EC3A12 | 9-18 VDC | | 12 VDC | 250 mA | 7.5 mA | 10 mA | 313 mA | 298 mA | 80 | 84 | 2200uF |
| EC3A13 | 9-18 VDC | | 15 VDC | 200 mA | 7.5 mA | 10 mA | 316 mA | 294 mA | 79 | 85 | 2200uF |
| EC3A14 | 9-18 VDC | | ±5 VDC | ±300 mA | 12 mA | 15 mA | 325 mA | 305 mA | 77 | 82 | 1000uF |
| EC3A15 | 9-18 VDC | | ±12 VDC | ±125 mA | 12 mA | 12 mA | 325 mA | 298 mA | 77 | 84 | 1000uF |
| EC3A16 | 9-18 VDC | | ±15 VDC | ±100 mA | 12 mA | 15 mA | 316 mA | 294 mA | 79 | 85 | 1000uF |
| EC3A17 | 9-18 VDC | | 3.3 VDC | 600 mA | 7.5 mA | 7.5 mA | 229 mA | 212 mA | 72 | 78 | 2200uF |
| EC3A21 | 18-36 VDC | | 5 VDC | 600 mA | 5 mA | 7.5 mA | 158 mA | 152 mA | 79 | 82 | 2200uF |
| EC3A22 | 18-36 VDC | | 12 VDC | 250 mA | 5 mA | 7.5 mA | 156 mA | 145 mA | 80 | 86 | 2200uF |
| EC3A23 | 18-36 VDC | | 15 VDC | 200 mA | 5 mA | 7.5 mA | 152 mA | 145 mA | 82 | 86 | 2200uF |
| EC3A24 | 18-36 VDC | | ±5 VDC | ±300 mA | 7.5 mA | 7.5 mA | 162 mA | 152 mA | 77 | 82 | 1000uF |
| EC3A25 | 18-36 VDC | | ±12 VDC | ±125 mA | 7.5 mA | 10 mA | 158 mA | 147 mA | 79 | 85 | 1000uF |
| EC3A26 | 18-36 VDC | | ±15 VDC | ±100 mA | 7.5 mA | 10 mA | 154 mA | 145 mA | 81 | 86 | 1000uF |
| EC3A27 | 18-36 VDC | | 3.3 VDC | 600 mA | 5 mA | 5 mA | 111 mA | 106 mA | 74 | 78 | 2200uF |
| EC3A31 | 36-72 VDC | | 5 VDC | 600 mA | 2 mA | 3 mA | 78 mA | 74 mA | 79 | 84 | 2200uF |
| EC3A32 | 36-72 VDC | | 12 VDC | 250 mA | 2 mA | 3 mA | 78 mA | 73 mA | 80 | 86 | 2200uF |
| EC3A33 | 36-72 VDC | | 15 VDC | 200 mA | 2 mA | 5 mA | 78 mA | 73 mA | 80 | 86 | 2200uF |
| EC3A34 | 36-72 VDC | | ±5 VDC | ±300 mA | 3 mA | 5 mA | 80 mA | 74 mA | 78 | 85 | 1000uF |
| EC3A35 | 36-72 VDC | | ±12 VDC | ±125 mA | 3 mA | 5 mA | 80 mA | 72 mA | 78 | 87 | 1000uF |
| EC3A36 | 36-72 VDC | | ±15 VDC | ±100 mA | 3 mA | 5 mA | 80 mA | 72 mA | 78 | 87 | 1000uF |
| EC3A37 | 36-72 VDC | | 3.3 VDC | 600 mA | 3 mA | 3 mA | 57 mA | 52 mA | 72 | 79 | 2200uF |

NOTE:

1. Suffix "-E" of the models are high efficiency and wide operating temperature version.
2. Nominal Input Voltage is 5, 12, 24 or 48VDC.
3. Typical value at nominal input voltage and full load.

SPECIFICATIONS

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

INPUT SPECIFICATIONS:

| | | |
|----------------------------------|---------|----------------|
| Input Voltage Range | 5V | 4.5-6V, 4.5-9V |
| | 12V | 9-18V |
| | 24V | 18-36V |
| | 48V | 36-72V |
| Input Surge Voltage (100ms max.) | 5V | 10Vdc max. |
| | 12V | 25Vdc max. |
| | 24V | 50Vdc max. |
| | 48V | 100Vdc max. |
| Input Filter | Pi Type | |

OUTPUT SPECIFICATIONS:

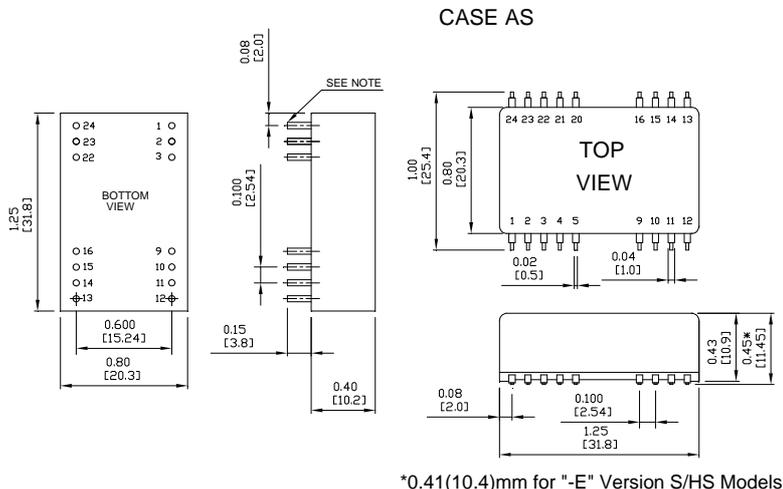
| | |
|-----------------------------------|---------------------------------|
| Voltage Accuracy | ±2.0% max. |
| Voltage Balance (Dual) | ±1.0% max. |
| Temperature Coefficient | ±0.05%/°C |
| Ripple & Noise, 20MHz BW (Note 5) | 3.3V/5V 100mV p-p, max. |
| | 12V/15V 1% p-p max. |
| Short Circuit Protection | Continuous |
| Line Regulation | Single/Dual (Note 1) ±0.5% max. |
| Load Regulation | Single (Note 2) ±0.5% max. |
| | Dual (Note 3) ±1.0% max. |
| Start up time | 10 ms max. |

NOTE:

1. Measured From High Line to Low Line
2. Measured From Full Load to 10% Load
3. Measured From Full Load to 1/4 Load
4. Maximum case temperature under any operating condition should not exceed 95°C (Plastic Case), 100°C (Copper Case).
5. The output noise is measured with 0.1uF MLCC across for SMD package
6. S and HS models for "E" Version Only

Case A Dimensions:

NOTE: Pin Size is 0.02 ±0.002Inch (0.5±0.05mm) 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



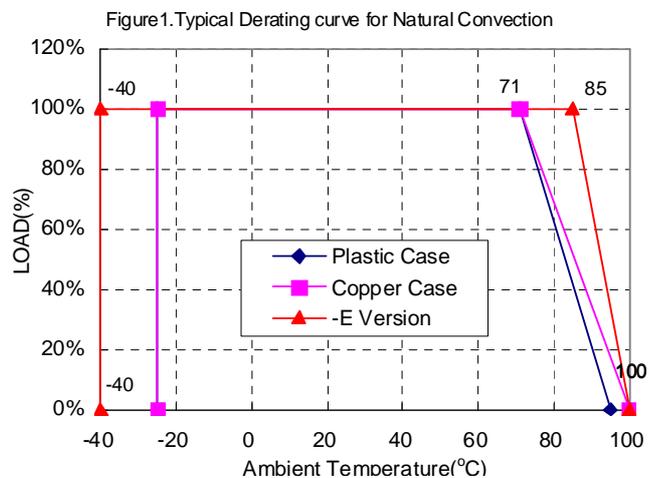
GENERAL SPECIFICATIONS:

| | |
|-------------------------------------|---|
| Efficiency | See Table |
| Isolation Voltage: | |
| 500 VDC min. | Standard Models |
| 3K VDC min. | (Non-Conductive Black Plastic Only) Suffix "H" Models |
| 1.5K VDC min. | Suffix "HM" Models |
| Isolation Resistance | 10 ⁹ ohm min. |
| Isolation Capacitance | 250pF Typ. |
| Switching Frequency | 100KHz, min. |
| Operating Ambient Temperature Range | -25°C to +71°C |
| | "-E" models: -40°C to +85°C |

| | |
|---|--|
| Power de-rating Curve | see Figure1 |
| Case Temperature (Note 4) ... Plastic/Copper case | 95°C/100°C max. |
| Cooling | Natural Convection |
| Storage Temperature Range | -40°C to +100°C |
| Humidity | 95% RH max. Non condensing |
| MTBF | MIL-STD-217F 2000Khrs typ. |
| | "-E" models: 2500Khrs typ. |
| Dimensions | DIP 1.25×0.80×0.40 inches(31.8×20.3×10.2mm) |
| | SMD 1.25×0.80×0.45 inches(31.8×20.3×11.4mm) |
| | S/HS Models (note 6) ... 1.25×0.80×0.41 inches(31.8×20.3×10.4mm) |

Case Material:

| | |
|-------------------|--|
| Standard Models | Non-Conductive Black Plastic |
| Suffix "M" Models | Black Coated Copper with Non-conductive Base |
| Suffix "S" Models | SMD package |
| Weight | 12.5g |



| PIN CONNECTION | | | | | | | | | |
|----------------|---------------|-----------|-------------|-----------|---------------|---------------|-----------|-------------|-----------|
| Pin | 500 VDC | | | | 1.5K & 3K VDC | | | | |
| | Single Output | | Dual Output | | Pin | Single Output | | Dual Output | |
| | DIP | SMD | DIP | SMD | | DIP | SMD | DIP | SMD |
| 1,24 | +V Input | +V Input | +V Input | +V Input | 1,24 | NP | NC | NP | NC |
| 2,23 | NC | -V Output | -V Output | -V Output | 2,3 | -V Input | -V Input | -V Input | -V Input |
| 3,22 | NC | Common | Common | Common | 4,5 | NP | NC | NP | NC |
| 4 | NP | NC | NP | NC | 9 | NC | Common | Common | Common |
| 5 | NP | NC | NP | NC | 10,15 | NC | NC | NC | NC |
| 9 | NP | NC | NP | NC | 11 | NC | -V Output | -V Output | -V Output |
| 10,15 | -V Output | Common | Common | Common | 12,13 | NP | NC | NP | NC |
| 11,14 | +V Output | +V Output | +V Output | +V Output | 14 | +V Output | +V Output | +V Output | +V Output |
| 12,13 | -V Input | -V Input | -V Input | -V Input | 16 | -V Output | Common | Common | Common |
| 16 | NP | NC | NP | NC | 20,21 | NP | NC | NP | NC |
| 20,21 | NP | NC | NP | NC | 22,23 | +V Input | +V Input | +V Input | +V Input |

* NP-NO PIN
 * NC-NO CONNECTION WITH PIN

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