



EC4A-E SERIES

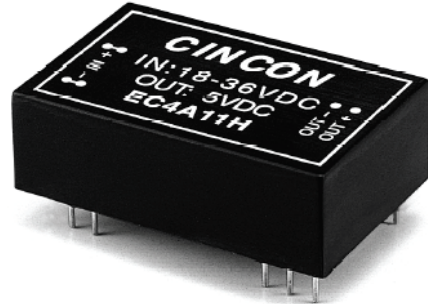
5-6 WATT 2:1 INPUT RANGE

DC-DC CONVERTERS



FEATURES

- * 5-6W Isolated Output
- * 24-Pin DIP Package
- * Efficiency to 87%
- * 2:1 Input Range
- * Regulated Outputs
- * Pi Input Filter
- * Continuous Short Circuit Protection
- * Meet EMI EN55032 Class A
- * No Tantalum Capacitor inside
- * Wide Operating Temperature Range
- * UL60950-1 Approval
- * Safety Meets IEC/EN/UL 62368-1



| MODEL NUMBER ⁽¹⁾ | INPUT VOLTAGE ⁽²⁾ | OUTPUT VOLTAGE | OUTPUT CURRENT | INPUT CURRENT | | % EFF. ⁽³⁾ | CAPACITOR LOAD MAX. |
|-----------------------------|------------------------------|----------------|----------------|---------------|-----------|-----------------------|---------------------|
| | | | | NO LOAD | FULL LOAD | | |
| EC4A01□-E | 9-18 VDC | 5 VDC | 1000 mA | 7.5 mA | 514 mA | 81 | 4700uF |
| EC4A02□-E | 9-18 VDC | 12 VDC | 500 mA | 10 mA | 595 mA | 84 | 4700uF |
| EC4A03□-E | 9-18 VDC | 15 VDC | 400 mA | 15 mA | 588 mA | 85 | 4700uF |
| EC4A04□-E | 9-18 VDC | ±12 VDC | ±250 mA | 12 mA | 588 mA | 85 | 2200uF |
| EC4A05□-E | 9-18 VDC | ±15 VDC | ±200 mA | 18 mA | 588 mA | 85 | 2200uF |
| EC4A06□-E | 9-18 VDC | ±5 VDC | ±500 mA | 12 mA | 514 mA | 81 | 2200uF |
| EC4A07□-E | 9-18 VDC | 3.3 VDC | 1200 mA | 7.5 mA | 429 mA | 77 | 4700uF |
| EC4A11□-E | 18-36 VDC | 5 VDC | 1000 mA | 5 mA | 251 mA | 83 | 4700uF |
| EC4A12□-E | 18-36 VDC | 12 VDC | 500 mA | 8 mA | 291 mA | 86 | 4700uF |
| EC4A13□-E | 18-36 VDC | 15 VDC | 400 mA | 8 mA | 287 mA | 87 | 4700uF |
| EC4A14□-E | 18-36 VDC | ±12 VDC | ±250 mA | 8 mA | 291 mA | 86 | 2200uF |
| EC4A15□-E | 18-36 VDC | ±15 VDC | ±200 mA | 10 mA | 287 mA | 87 | 2200uF |
| EC4A16□-E | 18-36 VDC | ±5 VDC | ±500 mA | 8 mA | 254 mA | 82 | 2200uF |
| EC4A17□-E | 18-36 VDC | 3.3 VDC | 1200 mA | 5 mA | 209 mA | 79 | 4700uF |
| EC4A21□-E | 36-72 VDC | 5 VDC | 1000 mA | 3 mA | 126 mA | 83 | 4700uF |
| EC4A22□-E | 36-72 VDC | 12 VDC | 500 mA | 6 mA | 144 mA | 87 | 4700uF |
| EC4A23□-E | 36-72 VDC | 15 VDC | 400 mA | 6 mA | 144 mA | 87 | 4700uF |
| EC4A24□-E | 36-72 VDC | ±12 VDC | ±250 mA | 6 mA | 144 mA | 87 | 2200uF |
| EC4A25□-E | 36-72 VDC | ±15 VDC | ±200 mA | 6 mA | 144 mA | 87 | 2200uF |
| EC4A26□-E | 36-72 VDC | ±5 VDC | ±500 mA | 5 mA | 126 mA | 83 | 2200uF |
| EC4A27□-E | 36-72 VDC | 3.3 VDC | 1200 mA | 2 mA | 104 mA | 79 | 4700uF |

NOTE:

1. □ can be none, M, H, HM, S, MS, HS or HMS.
2. Nominal Input Voltage is 12, 24 or 48 VDC.
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 | 12V | 9-18V |
| | 24V | 18-36V |
| | 48V | 36-72V |
| Input Surge Voltage (100ms max.) | 12V | 25Vdc max. |
| | 24V | 50Vdc max. |
| | 48V | 100Vdc max. |
| Under Voltage Lockout | 12V power up | 8.8Vdc |
| | 12V power down | 8Vdc |
| | 24V power Up | 17Vdc |
| | 24V power down | 16Vdc |
| | 48V power up | 34Vdc |
| | 48V power down | 31Vdc |

OUTPUT SPECIFICATIONS:

| | |
|----------------------------------|--------------------------------|
| Voltage Accuracy | ±1.5% max. |
| Voltage Balance (Dual) | ±1.0% max. |
| Temperature Coefficient | ±0.05%/°C max. |
| Ripple & Noise, 20MHz BW (note5) | 3.3V/5V 100mV pk-pk, max |
| | 12V/15V 1% pk-pk max. |
| Short Circuit Protection | Continuous |
| Line Regulation | Single/Dual (note1) ±0.5% max. |
| Load Regulation | Single (note2) ±0.5% max. |
| | Dual (note3) ±1.0% max. |
| Start up Time | 5 ms max. |

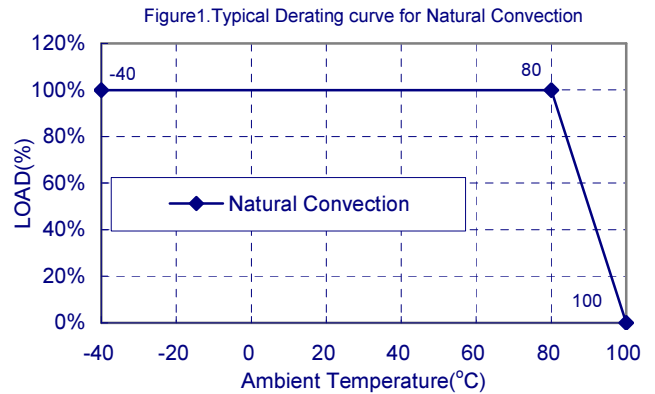
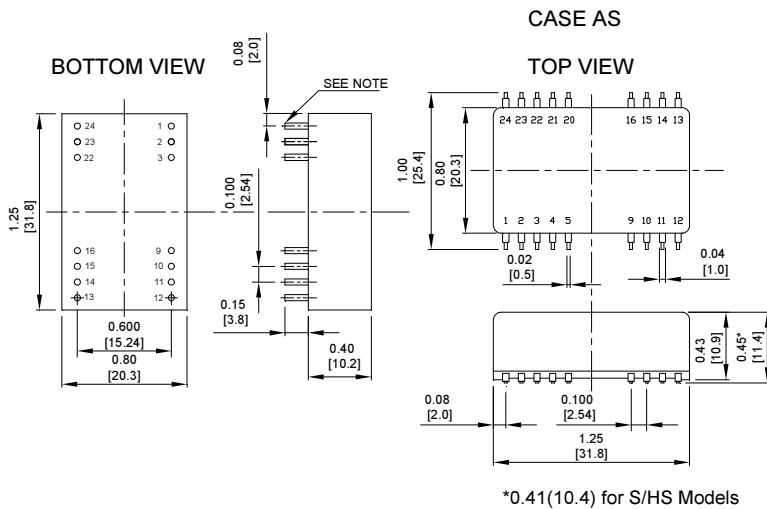
NOTE:

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 100°C.
5. The output noise is measured with 0.1uF MLCC across for SMD package.

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 | -40°C to +85°C |
| De-rating, Above 80°C | Linearly to Zero Power at 100°C |
| Case Temperature | 100°C max. |
| Cooling | Natural Convection |
| Storage Temperature Range | -40°C to +100°C |
| EMI | Conductive EMI Meet EN55032 Class A |
| Humidity | 95% RH max. Non Condensing |
| MTBF | MIL-HDBK-217F 1800Khrs typ. |
| Dimensions | DIP 1.25×0.80×0.40 inches (31.8×20.3×10.2 mm) |
| | MS/HMS Models 1.25×0.80×0.45 inches (31.8×20.3×11.4 mm) |
| | S/HS Models 1.25×0.80×0.41 inches (31.8×20.3×10.4 mm) |
| 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 |

Case A Dimensions:



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

* NP-NO PIN
 * NC-NO CONNECTION WITH PIN
 NOTE: Pin Size is 0.02 ±0.002 Inch (0.5±0.05 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

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