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# EC7C SERIES

## 40 WATT 2:1 INPUT RANGE

### DC-DC CONVERTERS



## FEATURES

- \* 40W Isolated Output
- \* 2" X 2" Six-Sided Shield Metal Case
- \* High Efficiency Up to 93%
- \* Fixed 350KHz Switching Frequency
- \* 2:1 Input Range
- \* Regulated Outputs
- \* Continuous Short Circuit Protection
- \* UL60950-1 Approval (Except EC7C-XXD3305)
- \* Safety Meets IEC/EN/UL 62368-1



| MODEL NUMBER | INPUT VOLTAGE | OUTPUT VOLTAGE | OUTPUT CURRENT |           | INPUT CURRENT |           | % EFF.              | CAPACITOR LOAD MAX. |
|--------------|---------------|----------------|----------------|-----------|---------------|-----------|---------------------|---------------------|
|              |               |                | MIN.           | MAX.      | NO LOAD       | FULL LOAD |                     |                     |
| EC7C-12S25   | 9 -18 VDC     | 2.5 VDC        | 0 mA           | 10000 mA  | 200 mA        | 2354 mA   | 88.5                | 10000uF             |
| EC7C-12S33   | 9 -18 VDC     | 3.3 VDC        | 0 mA           | 10000 mA  | 200 mA        | 3090 mA   | 89                  | 10000uF             |
| EC7C-12S05   | 9 -18 VDC     | 5 VDC          | 0 mA           | 8000 mA   | 200 mA        | 3683 mA   | 90.5                | 8000uF              |
| EC7C-12S12   | 9 -18 VDC     | 12 VDC         | 0 mA           | 3333 mA   | 200 mA        | 3643 mA   | 91.5                | 3300uF              |
| EC7C-12S15   | 9 -18 VDC     | 15 VDC         | 0 mA           | 2666 mA   | 200 mA        | 3642 mA   | 91.5                | 2700uF              |
| EC7C-12D12   | 9 -18 VDC     | ±12 VDC        | 90 mA          | ±1800 mA  | 100 mA        | 4022 mA   | 89.5                | 1800uF              |
| EC7C-12D15   | 9 -18 VDC     | ±15 VDC        | 70 mA          | ±1400 mA  | 100 mA        | 3867 mA   | 90.5                | 1400uF              |
| EC7C-12D3305 | 9 -18 VDC     | 3.3/5.0 VDC    | 0 mA           | 10A/7.5 A | 100 mA        | 3727 mA   | 89 <sup>(3)</sup>   | 7270uF/7270uF       |
| EC7C-12T3312 | 9 -18 VDC     | 3.3/±12 VDC    | 0.6A/±40 mA    | 6A/±0.4 A | 200 mA        | 2768 mA   | 88.5                | 6000uF/400uF        |
| EC7C-12T3315 | 9 -18 VDC     | 3.3/±15 VDC    | 0.6A/±30 mA    | 6A/±0.3 A | 200 mA        | 2712 mA   | 88.5                | 6000uF/330uF        |
| EC7C-12T0512 | 9 -18 VDC     | 5.0/±12 VDC    | 0.6A/±40 mA    | 6A/±0.4 A | 200 mA        | 3729 mA   | 88.5                | 6000uF/400uF        |
| EC7C-12T0515 | 9 -18 VDC     | 5.0/±15 VDC    | 0.6A/±30 mA    | 6A/±0.3 A | 200 mA        | 3611 mA   | 90                  | 6000uF/330uF        |
| EC7C-24S25   | 18 – 36 VDC   | 2.5 VDC        | 0 mA           | 10000 mA  | 100 mA        | 1157 mA   | 90                  | 10000uF             |
| EC7C-24S33   | 18 – 36 VDC   | 3.3 VDC        | 0 mA           | 10000 mA  | 100 mA        | 1519 mA   | 90.5                | 10000uF             |
| EC7C-24S05   | 18 – 36 VDC   | 5 VDC          | 0 mA           | 8000 mA   | 110 mA        | 1812 mA   | 92                  | 8000uF              |
| EC7C-24S12   | 18 – 36 VDC   | 12 VDC         | 0 mA           | 3333 mA   | 100 mA        | 1792 mA   | 93                  | 3300uF              |
| EC7C-24S15   | 18 – 36 VDC   | 15 VDC         | 0 mA           | 2666 mA   | 100mA         | 1792 mA   | 93                  | 2700uF              |
| EC7C-24D12   | 18 – 36 VDC   | ±12 VDC        | 90 mA          | ±1800 mA  | 100 mA        | 1967 mA   | 91.5                | 1800uF              |
| EC7C-24D15   | 18 – 36 VDC   | ±15 VDC        | 70 mA          | ±1400 mA  | 100 mA        | 1902 mA   | 92                  | 1400uF              |
| EC7C-24D3305 | 18 – 36 VDC   | 3.3/5.0 VDC    | 0 mA           | 10A/7.5 A | 50 mA         | 1843 mA   | 90 <sup>(3)</sup>   | 7270uF/7270uF       |
| EC7C-24T3312 | 18 – 36 VDC   | 3.3/±12 VDC    | 0.6A/±40 mA    | 6A/±0.4 A | 100 mA        | 1361 mA   | 90                  | 6000uF/400uF        |
| EC7C-24T3315 | 18 – 36 VDC   | 3.3/±15 VDC    | 0.6A/±30 mA    | 6A/±0.3 A | 100 mA        | 1333 mA   | 90                  | 6000uF/330uF        |
| EC7C-24T0512 | 18 – 36 VDC   | 5.0/±12 VDC    | 0.6A/±40 mA    | 6A/±0.4 A | 100 mA        | 1813 mA   | 91                  | 6000uF/400uF        |
| EC7C-24T0515 | 18 – 36 VDC   | 5.0/±15 VDC    | 0.6A/±30 mA    | 6A/±0.3 A | 100 mA        | 1786 mA   | 91                  | 6000uF/330uF        |
| EC7C-48S25   | 36 – 75 VDC   | 2.5 VDC        | 0 mA           | 10000 mA  | 50 mA         | 585 mA    | 89                  | 10000uF             |
| EC7C-48S33   | 36 – 75 VDC   | 3.3 VDC        | 0 mA           | 10000 mA  | 50 mA         | 764 mA    | 90                  | 10000uF             |
| EC7C-48S05   | 36 – 75 VDC   | 5 VDC          | 0 mA           | 8000 mA   | 60 mA         | 906 mA    | 92                  | 8000uF              |
| EC7C-48S12   | 36 – 75 VDC   | 12 VDC         | 0 mA           | 3333 mA   | 60 mA         | 896 mA    | 93                  | 3300uF              |
| EC7C-48S15   | 36 – 75 VDC   | 15 VDC         | 0 mA           | 2666 mA   | 60 mA         | 906 mA    | 92                  | 2700uF              |
| EC7C-48D12   | 36 – 75 VDC   | ±12 VDC        | 90 mA          | ±1800 mA  | 50 mA         | 989 mA    | 91                  | 1800uF              |
| EC7C-48D15   | 36 – 75 VDC   | ±15 VDC        | 70 mA          | ±1400 mA  | 50 mA         | 962 mA    | 91                  | 1400uF              |
| EC7C-48D3305 | 36 – 75 VDC   | 3.3/5.0 VDC    | 0 mA           | 10A/7.5 A | 50 mA         | 926 mA    | 89.5 <sup>(3)</sup> | 7270uF/7270uF       |
| EC7C-48T3312 | 36 – 75 VDC   | 3.3/±12 VDC    | 0.6A/±40 mA    | 6A/±0.4 A | 50 mA         | 684 mA    | 89.5                | 6000uF/400uF        |
| EC7C-48T3315 | 36 – 75 VDC   | 3.3/±15 VDC    | 0.6A/±30 mA    | 6A/±0.3 A | 50 mA         | 682 mA    | 88                  | 6000uF/330uF        |
| EC7C-48T0512 | 36 – 75 VDC   | 5.0/±12 VDC    | 0.6A/±40 mA    | 6A/±0.4 A | 50 mA         | 932 mA    | 88.5                | 6000uF/400uF        |
| EC7C-48T0515 | 36 – 75 VDC   | 5.0/±15 VDC    | 0.6A/±30 mA    | 6A/±0.3 A | 50 mA         | 903 mA    | 90                  | 6000uF/330uF        |

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

2. The Total Power of EC7C-12D3305, EC7C-24D3305 and EC7C-48D3305 Should not be Exceeded 40W.

3. The Efficiency is Measured with Rated Load Current (3.3V/6A, 5V/4A).

# 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
- Input Surge Voltage (100ms max.)
  - 12V ..... 25Vdc max., 24V ..... 50Vdc max., 48V ..... 100Vdc max.
- Under voltage lockout
  - 12Vin: power up ..... 8.8V, power down ..... 8.0V
  - 24Vin: power up ..... 17V, power down ..... 16V
  - 48Vin: power up ..... 34V, power down ..... 32V
- Positive/Negative Logic Remote On/Off (note 5&6)
- Input Filter ..... PI Type

## OUTPUT SPECIFICATIONS:

- Voltage Accuracy ..... Single/Dual ..... ±1.5% max.
  - Dual positive ..... 3.3V±1.5% max., 5V±3% max.
  - Triple ..... Main ±1.5% max., Auxiliary ±3.0% max.
- Voltage Balance (Dual) ..... ±2.0% max.
- Transient Response: 75% - 100% Step Load Change (Main Output)
  - Error Band ... ±5% Vout nominal, Recovery Time ..... < 300us
- Output Voltage Adjustment Range ... Single/Dual Vo±10%, Dual Positive±5%
- Ripple & Noise, 20MHz BW (Measured with 0.1uF MLCC)
  - 2.5V&3.3V&5V ..... 50mVpp,max., 12V&15V ..... 75mVpp max.
  - Dual ±12V ..... 120mVpk-pk, max., ±15V ..... 150mVpk-pkmax.
  - Dual positive +3.3V /+5V ..... 100mVpk-pk max.
- Temperature Coefficient ..... ±0.02%/°C max.
- Line Regulation (note1) ..... Single/Dual/Dual positive ..... ±0.5% max.
  - Triple ..... Main ..... ±1.0% max., Auxiliary ..... ±3.0% max.
- Load Regulation (note2) ..... Single ±0.5% max., Dual ±1.0% max.
  - Dual positive(note3) ..... 3.3V ±1.5% max., 5V±4% max.
  - Triple ... Main ..... ±1.0% max., Auxiliary ..... ±4.0% max.
- Cross Regulation (note4) ..... +3.3V±1.0% max. +5V±4.0% max.
- Over voltage Protection (Zener Diode Clamp) ..... 2.5V ..... 3.6Vdc typ.
  - 3.3V ..... 3.9Vdc typ., 5V ..... 6.2Vdc typ.
  - 12V ..... 15Vdc typ., 15V ..... 18Vdc typ.
- Output Current Limit, % Nominal Output ..... 110%-140%
- Output Short Circuit Protection ..... Continuous (Hiccup mode)
- Start up Time ..... 10ms typ.

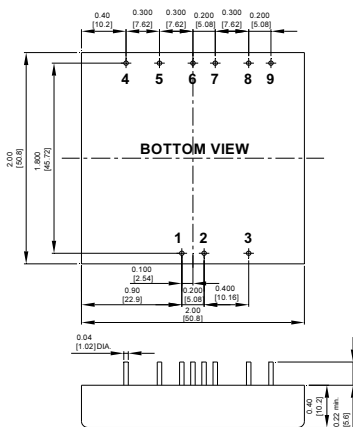
## GENERAL SPECIFICATIONS:

- Efficiency..... See Table
- Isolation Voltage ..... Input/Output ..... 1500VDC max.
- Isolation Resistance ..... 10<sup>9</sup> ohm min.
- Isolation Capacitance ..... 1000pF typ.
- Switching Frequency ..... 350KHz typ.
- Operating Ambient Temperature ..... -40°C to +85°C
- De-rating. Above 60°C ..... Linearly to Zero Power at 100°C
- Case Temperature (note8) ..... 100°C max.
- Cooling ..... Natural Convection
- Storage Temperature ..... -55°C to +125°C
- Humidity ..... 95% RH max. Non Condensing
- MTBF.. MIL-HDBK-217F. GB. 25°C. Full Load ..... XXD3305 ..... 500Khrs typ.
  - Others ..... 700Khrs typ.
- Thermal Shutdown. Case Temperature ..... 110°C Typical
- Dimensions ..... 2.00×2.00×0.40 inches(50.8×50.8×10.2 mm)
- Case Material ..... Black Coated Copper with Non-Conductive Base
- Weight ..... 65g

## NOTE:

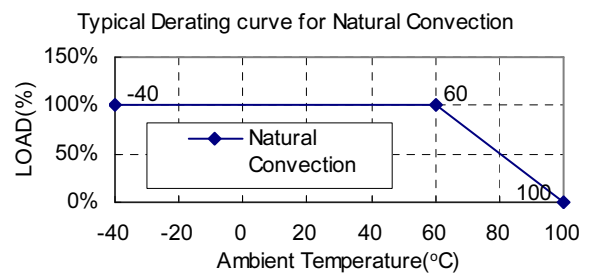
1. Measured from high line to low line (dual positive at rated load).
2. Measured from full load to 10% load.
3. Measured from max. load to zero load, other output at zero load.
4. Measured from max. load to 10% load, other output at 10% load.
5. Logic Compatibility .... CMOS or Open Collector TTL, ref. to -Vin
  - Module On ..... >3.5Vdc to 75Vdc or Open Circuit
  - Module Off ..... 0 to <1.8Vdc.
6. Suffix "N" to the model number with negative logic remote on/off
  - Module On ..... 0 to <1.8Vdc,
  - Module Off ..... >3.5Vdc to 75Vdc or Open Circuit
7. If +/-Sense is not being used, the +sense should be connected to +Vout and likewise the -sense should be connected to -Vout.
8. Maximum case temperature under any operating condition should not be exceeded 100°C.

## Case C Dimensions:

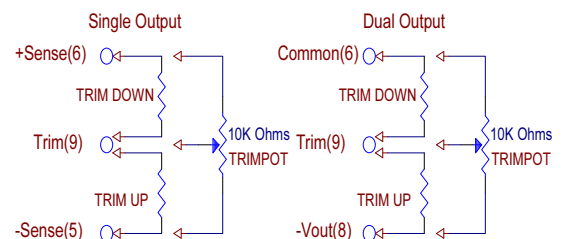


| Pin | PIN CONNECTION |           |               |                |
|-----|----------------|-----------|---------------|----------------|
|     | Single         | Dual      | Dual Positive | Triple         |
| 1   | +V Input       | +V Input  | +V Input      | +V Input       |
| 2   | -V Input       | -V Input  | -V Input      | -V Input       |
| 3   | On / Off       | On / Off  | On / Off      | On / Off       |
| 4   | NC             | No Pin    | +3.3Vout      | +Aux. Out      |
| 5   | -Sense         | +V Output | Com(3.3V RTN) | Common         |
| 6   | +Sense         | Common    | Trim          | -Aux. Out      |
| 7   | +V Output      | Common    | NC            | +V Output      |
| 8   | -V Output      | -V Output | +5V Output    | -V Output(Com) |
| 9   | Trim           | Trim      | Com(5V RTN)   | NC             |

\*NC : NO CONNECTION WITH PIN  
 NOTE: Pin Size is 0.02±0.002 Inch(0.5±0.05mm) DIA  
 All Dimensions In Inches(mm)  
 Tolerances Inches:XX=±0.02,X\_XXX±0.010  
 Millimeters:XX=±0.5,X\_XXX=±0.25



## EXTERNAL OUTPUT TRIM



**ALL PSU Ltd, Unit D6 Laser Quay, Culpeper Close, Medway City Estate, Rochester, Kent, ME2 4HU, Tel : 01634 725527, Fax : 01634 739111 Email : sales@allpsu.co.uk, Web : www.allpsu.co.uk**