

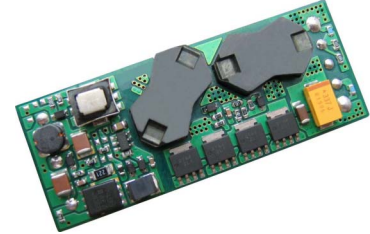
ISOLATED DC/DC CONVERTERS

48V Input 3.3V/25A, 5V/20A, 12V/8.33A Output, 1/8 Brick



07CY-85T Series PRELIMINARY

- Isolated
- High Efficiency
- High Power Density
- Excellent Thermal Performance
- Low Cost
- Input Under Voltage Lockout
- Output Over Voltage Shutdown
- OCP/SCP
- Over Temperature Protection
- Remote On/Off
- Output Voltage Trim
- Positive/Negative Remote Sense



Description

The 07CY-85T Series are isolated DC/DC converters that operate from a nominal 48V source. These units provide up to 100W of output power. These units are designed to be highly efficient and cost-effective. Features include remote on/off, short circuit protection, over current protection, over temperature protection, input under voltage lockout, and output over voltage protection. These converters are provided in a compact, 1/8 brick industry standard package.

Part Selection

| Output Voltage | Input Voltage | Max. Output Current | Max. Output Power | Typical Efficiency | Model Number Active High | Model Number Active Low |
|----------------|---------------|---------------------|-------------------|--------------------|--------------------------|-------------------------|
| 12.0V | 36V – 75V | 8.33A | 100W | 90% | 07CY-85T120 | 07CY-85T12L |
| 5.0V | 36V – 75V | 20A | 100W | 90% | 07CY-85T050 | 07CY-85T05L |
| 3.3V | 36V – 75V | 25A | 85W | 89% | 07CY-85T033 | 07CY-85T03L |

Note: Add “G” suffix at the end of the model number to indicate Tray Packaging.

Absolute Maximum Ratings

| Parameter | Min | Typ | Max | Notes |
|----------------------------|-------|-----|-------|-------|
| Input Voltage (continuous) | -0.3V | - | 80V | |
| Remote On/Off | -0.3V | - | 18V | |
| I/O Isolation Voltage | - | - | 2000V | |
| Ambient Temperature | -40°C | - | 85°C | |
| Storage Temperature | -55°C | - | 125°C | |

Input Specifications

| Parameter | Min | Typ | Max | Notes |
|---|-----|----------------------|----------------------|--|
| Input Voltage | 36V | 48V | 75V | |
| Input Current (full load) | | | | |
| V _o =12.0V | - | - | 3.0A | |
| V _o =5.0V | - | - | 3.0A | |
| V _o =3.3V | - | - | 2.8A | |
| Input Current (no load) | - | 80mA | 120mA | |
| Remote Off Input Current | | 2mA | 5mA | |
| Input Reflected Ripple Current (pk-pk) | - | 12mA | 24mA | Tested with simulated source impedance of 10uH, 5Hz to 20MHz; use a 100uF/100V electrolytic capacitor with ESR = 1 ohm max. at 200KHz at 25°C. |
| Input Reflected Ripple Current (RMS) | - | 2mA | 4mA | |
| I ² t Inrush Current Transient | - | 0.01A ² s | 0.02A ² s | |
| Turn-on Voltage Threshold | 32V | 34V | 35V | |
| Turn-off Voltage Threshold | 30V | 32V | 33V | |

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Output Specifications

| Parameter | Min | Typ | Max | Notes | | |
|--|---------------|-------------------|-------------------|--|-------|--|
| Output Voltage Set Point | | | | Vin=48V, Io=50% full load, Ta=25°C. | | |
| Vo=12.0V | 11.820V | 12.0V | 12.180V | | | |
| Vo=5.0V | 4.925V | 5.0V | 5.075V | | | |
| | Vo=3.3V | 3.250V | 3.350V | | | |
| Line Regulation | | | | | | |
| Vo=12.0V | - | ±12mV | ±24mV | | | |
| Vo=5.0V | - | ±5mV | ±10mV | | | |
| Vo=3.3V | - | ±3mV | ±7mV | | | |
| Load Regulation | | | | | | |
| Vo=12.0V | - | ±30mV | ±60mV | | | |
| Vo=5.0V | - | ±10mV | ±20mV | | | |
| Vo=3.3V | - | ±7mV | ±15mV | | | |
| Regulation Over Temperature (-40°C to +85°C) | | | | | | |
| Vo=12.0V | - | ±60mV | ±100mV | | | |
| Vo=5.0V | - | ±45mV | ±75mV | | | |
| Vo=3.3V | - | ±30mV | ±50mV | | | |
| Output Current | | | | | | |
| Vo=12.0V | 0A | - | 8.33A | | | |
| Vo=5.0V | 0A | - | 20A | | | |
| Vo=3.3V | 0A | - | 25A | | | |
| Current Limit Threshold | | | | | | |
| Vo=12.0V | 10A | 13A | 16A | | | |
| Vo=5.0V | 23A | 29A | 35A | | | |
| Vo=3.3V | 30A | 36A | 42A | | | |
| Short Circuit Surge Transient | - | 3A ² s | 5A ² s | | | |
| Ripple and Noise (RMS) | | | | Test conditions: 0-20MHz BW, with a 1uF ceramic capacitor and a 10uF Tantalum capacitor at the output. | | |
| Vo=12.0V | - | 25mV | 50mV | | | |
| Vo=5.0V | - | 25mV | 50mV | | | |
| | Vo=3.3V | - | 15mV | 30mV | | |
| Ripple and Noise (pk-pk) | | | | | | |
| Vo=12.0V | - | 100mV | 150mV | | | |
| Vo=5.0V | - | 100mV | 150mV | | | |
| Vo=3.3V | - | 55mV | 100mV | | | |
| Turn on Time | - | 15mS | 30mS | | | |
| Overshoot at Turn on | - | 0% | 5% | | | |
| Output Capacitance | | | | | | |
| Vo=12.0V | 0uF | - | 1000uF | | | |
| Vo=5.0V | 0uF | - | 10000uF | | | |
| Vo=3.3V | 0uF | - | 20000uF | | | |
| Transient Response | | | | | | |
| 25% ~ 50% Max Load | Overshoot | Vo=12.0V | - | 300mV | 500mV | Test conditions: di/dt = 0.1A/uS, Vin=48V, with a 1uF ceramic capacitor and a 10uF Tantalum capacitor at the output. |
| | Settling Time | | - | 250uS | 350uS | |
| 50% ~ 25% Max Load | Overshoot | Vo=12.0V | - | 300mV | 500mV | |
| | Settling Time | | - | 250uS | 350uS | |
| 25% ~ 50% Max Load | Overshoot | Vo=5.0V | - | 200mV | 300mV | |
| | Settling Time | | - | 200uS | 300uS | |
| 50% ~ 25% Max Load | Overshoot | Vo=5.0V | - | 200mV | 300mV | |
| | Settling Time | | - | 200uS | 300uS | |
| 25% ~ 50% Max Load | Overshoot | Vo=3.3V | - | 150mV | 200mV | |
| | Settling Time | | - | 150uS | 200uS | |
| 50% ~ 25% Max Load | Overshoot | Vo=3.3V | - | 150mV | 200mV | |
| | Settling Time | | - | 150uS | 200uS | |

Note: All specifications are typical at 25°C unless otherwise stated.

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General Specifications

| Parameter | Min | Typ | Max | Notes |
|-----------------------------|-----------------------|--------|--------|---|
| Efficiency | | | | |
| Vo=12.0V | 87% | 90% | - | Vin=48V, Io=Io,max |
| Vo=5.0V | 87% | 90% | - | |
| Vo=3.3V | 86% | 89% | - | |
| Switching Frequency | 270KHz | 300KHz | 330KHz | |
| Isolation capacitance | - | 1500pF | - | |
| Output Voltage Trim Range | 80%Vo | - | 110%Vo | |
| Over Temperature Protection | - | 125°C | - | |
| Over Voltage Protection | 117%Vo | 122%Vo | 127%Vo | |
| MTBF | TBD | | | Calculated Per Bell Core TR-332 (Io = Nominal; Ta = 25°C) |
| Dimensions | | | | |
| Inches (L x W x H) | 2.30 x 0.896 x 0.395 | | | |
| Millimeters (L x W x H) | 58.42 x 22.76 x 10.03 | | | |
| Weight | - | 27g | - | |

Note: All specifications are typical at 25°C unless otherwise stated.

Control Specifications

| Parameter | Min | Typ | Max | Notes |
|------------------------|-------------|-------|--------|-------|
| Remote On/Off | | | | |
| Signal Low (Unit On) | Active Low | -0.3V | - | 0.8V |
| Signal High (Unit Off) | | 2.4V | - | |
| Signal Low (Unit Off) | Active High | -0.3V | - | 0.8V |
| Signal High (Unit On) | | 2.4V | - | |
| Current Sink | 0mA | - | 0.75mA | |

Output Trim Equations

Equations for calculating the trim resistor are shown below. The Trim Down resistor should be connected between the Trim pin and Ground pin. The Trim Up resistor should be connected between the Trim pin and the Vout. Only one of the resistors should be used for any given application.

$$R_{trimdown} = \frac{511}{|\delta|} - 10.22 [k\Omega]$$

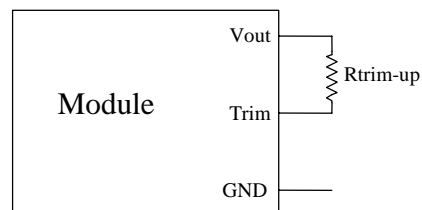
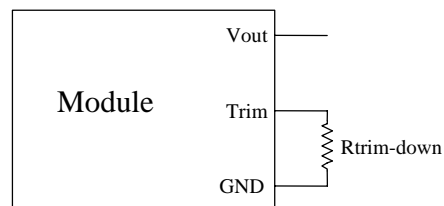
$$R_{trimup} = \frac{(100 + \delta) \cdot V_o \cdot 5.11 - 626}{1.225 \cdot \delta} - 10.22 [k\Omega]$$

Notes:

$$\delta = \frac{(V_o_{req} - V_o)}{V_o} \times 100 [\%]$$

V_{o_req}=Desired (trimmed) output voltage [V]

Output voltage V_o=3.308V for 3.3V output; V_o=5.000V for 5.0V; V_o=12.000V for 12V output

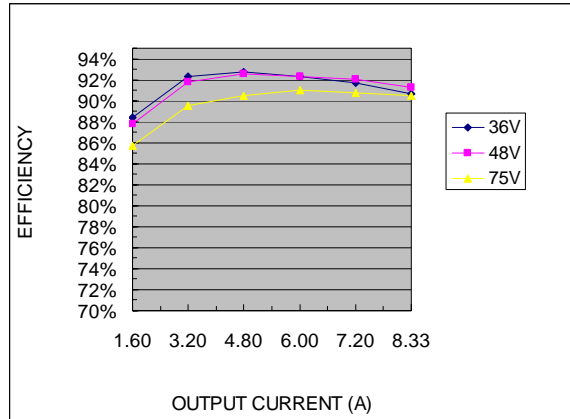


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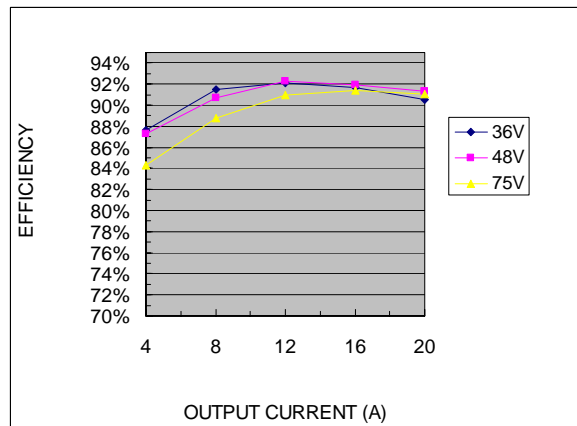
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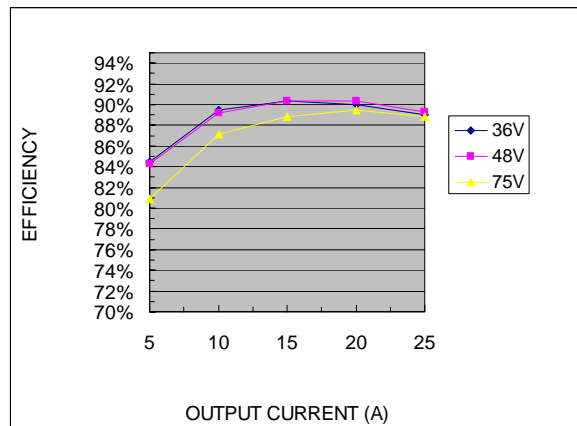
Efficiency Data



Vo=12V



Vo=5V



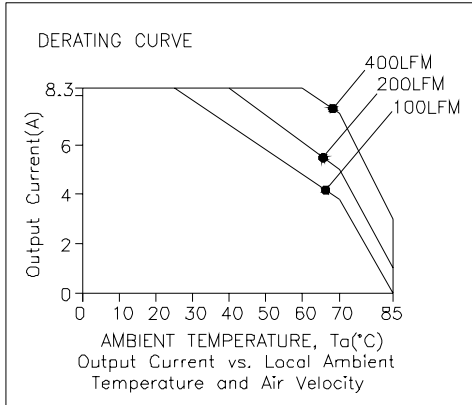
Vo=3.3V

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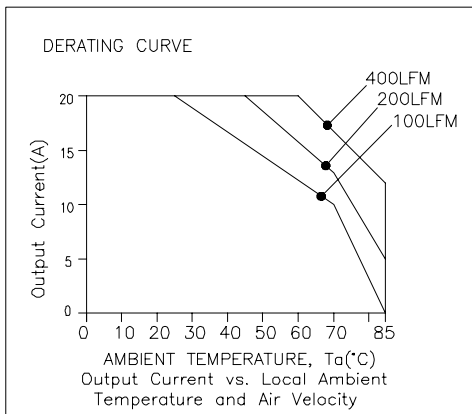
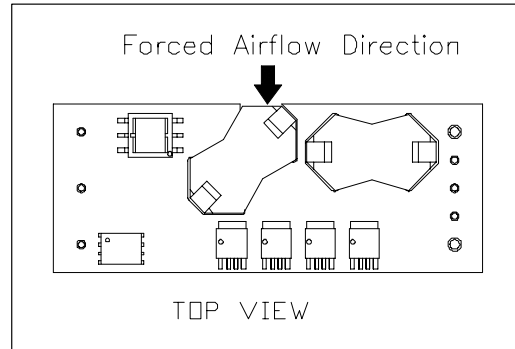
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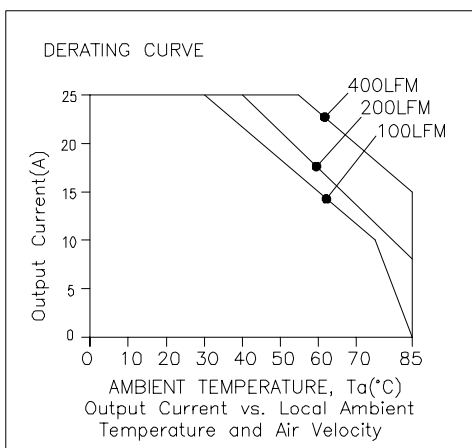
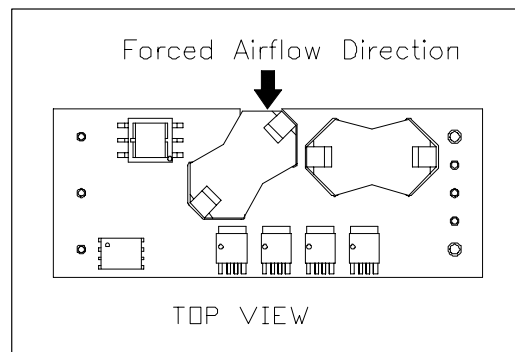
Thermal Derating Curves



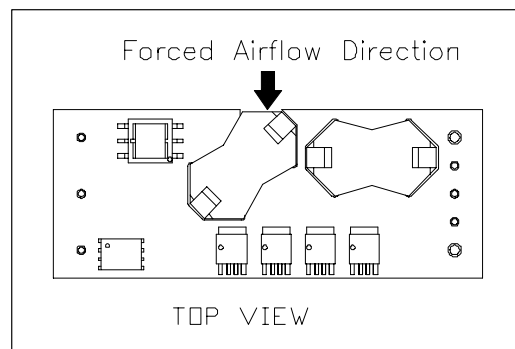
Derating curve of 07CY-85T12x output module



Derating curve of 07CY-85T05x output module

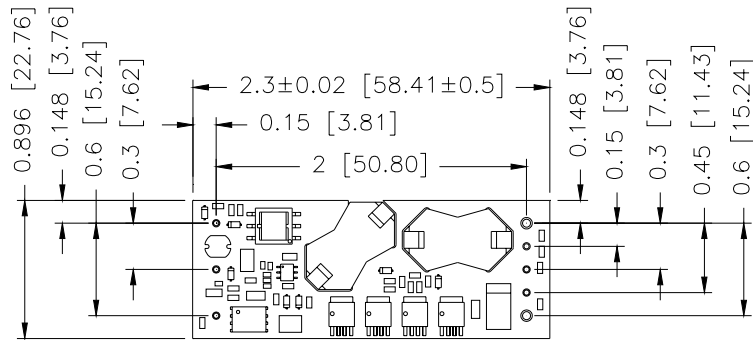


Derating curve of 07CY-85T03x output module

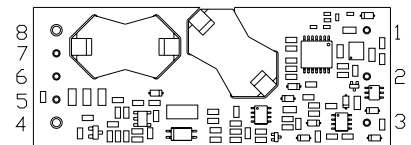


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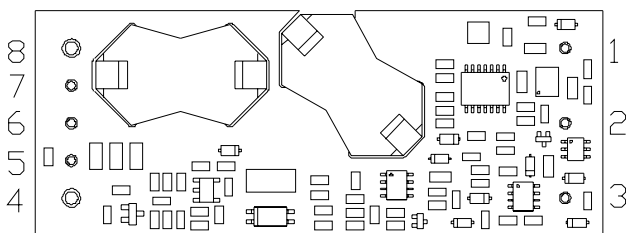
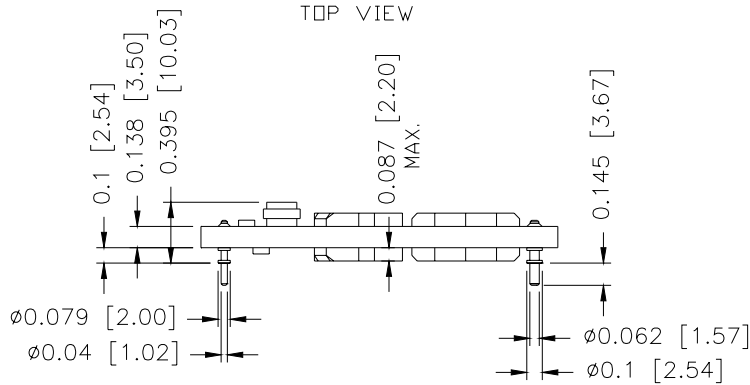
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TOP VIEW



BOTTOM VIEW



Pin Connections

| Pin | Function |
|-----|---------------|
| 1 | Vin+ |
| 2 | Remote On/Off |
| 3 | Vin- |
| 4 | Vout- |
| 5 | Sense- |
| 6 | Trim |
| 7 | Sense+ |
| 8 | Vout+ |

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