

PT4100 Series

48V

**48V 15 WATT ISOLATED
DC-DC CONVERTER**

[Application Notes](#)
[Mechanical Outline](#)
[Product Selector Guide](#)



- -40°C to +85°C Operating Temperature Range
- 1500 VDC Isolation
- Power Density 15 Watts/in³
- Wide Input Voltage Range 36V to 75V
- 82% Efficiency
- Small Footprint
- Fast Transient Response
- UL Approved

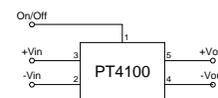
Power Trends' PT4100 series of Isolated 48V DC-DC Converters advance the state-of-the-art for board-mounted converters by employing high switching frequencies greater than 650 KHz and planar magnetics and surface-mount construction. They feature the industry's smallest footprint, a power density of 15 Watts/in³, and operate at 82% efficiency. They are designed for Telecom, Industrial, Computer, Medical, and other distributed power applications requiring input-to-output isolation and an industrial temperature range.

Specifications

| Characteristics (T _a =25°C unless noted) | Symbols | Conditions | PT4100 SERIES | | | Units | |
|--|------------------------------------|--|-----------------------|------------|------------|------------------|---|
| | | | Min | Typ | Max | | |
| Output Current | I _o | Over V _{in} range | V _o = 3.3V | 0 | — | 4.0 | A |
| | | | V _o = 5V | 0 | — | 3.0 | A |
| | | | V _o = 12V | 0 | — | 1.25 | A |
| | | | V _o = 15V | 0 | — | 1.0 | A |
| Current Limit | I _{cl} | V _{in} = 36V | V _o = 5V | — | 4.00 | — | A |
| | | | V _o = 12V | — | 1.75 | — | A |
| | | | V _o = 15V | — | 1.4 | — | A |
| On/Off Standby Current | I _{in standby} | V _{in} = 48V, Pin 1 = -V _{in} | — | 7 | 10 | mA | |
| Short Circuit Current | I _{sc} | V _{in} = 48V | V _o = 5V | — | 5.5 | — | A |
| | | | V _o = 12V | — | 3.5 | — | A |
| | | | V _o = 15V | — | 2.0 | — | A |
| Inrush Current | I _{ir} t _{ir} | V _{in} = 48V @ max I _o On start-up | — | 0.6 1.0 | 1.0 5.0 | A mSec | |
| Input Voltage Range | V _{in} | I _o = 0.1 to max I _o | 36.0 | 48.0 | 75.0 | V | |
| Output Voltage Tolerance | ΔV _o | Over V _{in} Range T _A = -40°C to +85°C | — | ±1.0 | ±2.0 | %V _o | |
| Ripple Rejection | RR | Over V _{in} range @ 120 Hz | — | 60 | — | dB | |
| Line Regulation | Reg _{line} | Over V _{in} range @ max I _o | — | ±0.2 | ±1.0 | %V _o | |
| Load Regulation | Reg _{load} | 10% to 100% of I _o max | — | ±0.4 | ±1.0 | %V _o | |
| V _o Ripple/Noise | V _n | V _{in} =48V, I _o =3.0A, V _o =5V | — | 75 | 100 | mV _{pp} | |
| | | V _{in} =48V, I _o =1.25A, V _o =12V | — | 120 | 150 | mV _{pp} | |
| | | V _{in} =48V, I _o =1.0A, V _o =15V | — | 100 | 200 | mV _{pp} | |
| Transient Response | t _{tr} | 50% load change | — | 100 | 200 | μSec | |
| | | V _o over/undershoot | — | 3.0 | 5.0 | %V _o | |
| Efficiency | η | V _{in} =48V, I _o =3.0A, V _o =5V | — | 80 | — | % | |
| | | V _{in} =48V, I _o =1.25A, V _o =12V | — | 81 | — | % | |
| | | V _{in} =48V, I _o =1A, V _o =15V | — | 82 | — | % | |
| Switching Frequency | f _o | Over V _{in} and I _o , V _o =5V V _o =12V/15V | 800 | 850 | 900 | kHz | |
| | | | 600 | 650 | 700 | kHz | |
| Recommended Operating Temperature Range | T _a | V _{in} = 48V @ max I _o Free air convection, (40-60LFM) 200 LFM PT4110 | -40 | — | +85* | °C | |
| | | | 0 | — | +70 | °C | |
| Thermal Resistance | θ _{ja} | Free Air Convection, (40-60LFM) | — | 14 | — | °C/W | |
| Case Temperature | T _c | @ Thermal shutdown | — | — | 100 | °C | |
| Storage Temperature | T _s | — | -40 | — | 110 | °C | |
| Mechanical Shock | — | Per Mil-STD-202F, Method 213B, 6mS, Half-sine, mounted to a PCB | — | 50 | — | G's | |
| Mechanical Vibration | — | Per Mil-STD-202F, Method 204D, 10-500Hz, Soldered in a PCB | — | 10 | — | G's | |
| Weight | — | — | — | 28 | — | grams | |
| Isolation | — | — | 1500 | — | — | V | |
| Capacitance | — | — | — | 1100 | — | pF | |
| Resistance | — | — | 10 | — | — | MΩ | |
| Flammability | — | Materials meet UL 94V-0 | — | — | — | — | |
| Remote On/Off | On Off | Open or 2.5 to 7.0 VDC above -V _{in} Short or 0 to 0.8 VDC above -V _{in} | — | — | — | — | |
| | | | — | — | — | — | |

* See thermal derating curves

Standard Application



Pin-Out Information

| Pin | Function |
|-----|-------------------|
| 1 | Remote ON/OFF |
| 2 | -V _{in} |
| 3 | +V _{in} |
| 4 | -V _{out} |
| 5 | +V _{out} |
| 6 | Do not connect |

Ordering Information

Through-Hole

- PT4101A = 5 Volts
- PT4102A = 12 Volts
- PT4103A = 15 Volts
- PT4110A = 3.3 Volts
- PT4117A = 5.2 Volts

Surface Mount

- PT4101C = 5 Volts
 - PT4102C = 12 Volts
 - PT4103C = 15 Volts
 - PT4110C = 3.3 Volts
 - PT4117C = 5.2 Volts
- (For dimensions and PC board layout, see Package Style 700.)

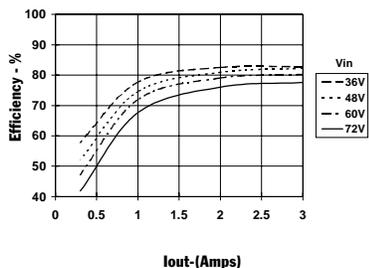
PT4100 Series

48V

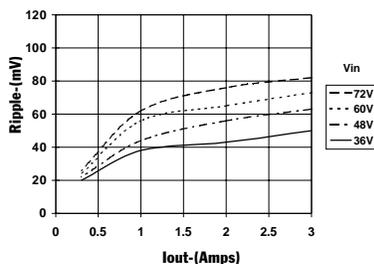
CHARACTERISTIC DATA

PT4101, 5.0 VDC (See Note 1)

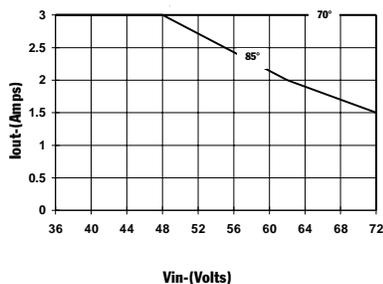
Efficiency vs Output Current



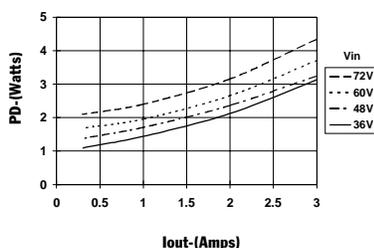
Ripple vs Output Current



Thermal Derating (T_a) (See Note 2)

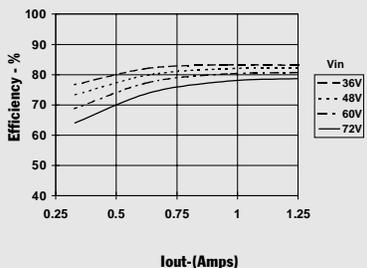


Power Dissipation vs Output Current

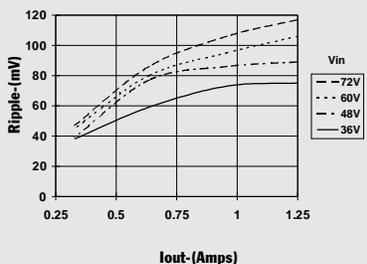


PT4102, 12.0 VDC (See Note 1)

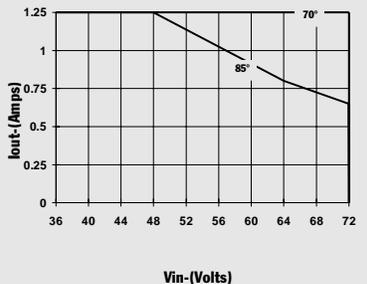
Efficiency vs Output Current



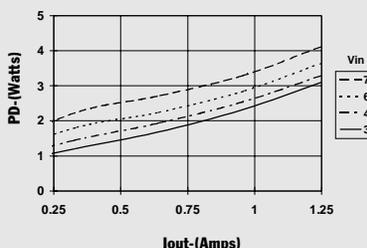
Ripple vs Output Current



Thermal Derating (T_a) (See Note 2)

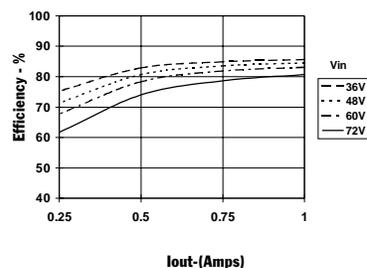


Power Dissipation vs Output Current

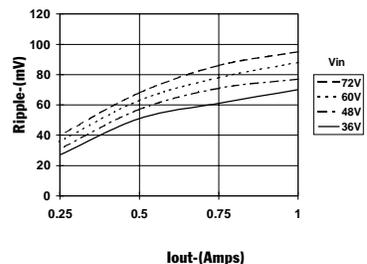


PT4103, 15.0 VDC (See Note 1)

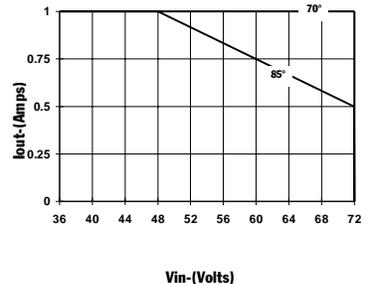
Efficiency vs Output Current



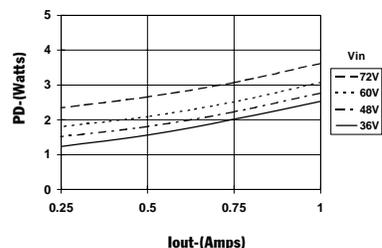
Ripple vs Output Current



Thermal Derating (T_a) (See Note 2)



Power Dissipation vs Output Current



Note 1: All data listed in the above graphs, except for derating data, has been developed from actual products tested at 25°C. This data is considered typical data for the DC-DC Converter.
Note 2: Thermal derating graphs are developed in free air convection cooling of 40-60 LFM.

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