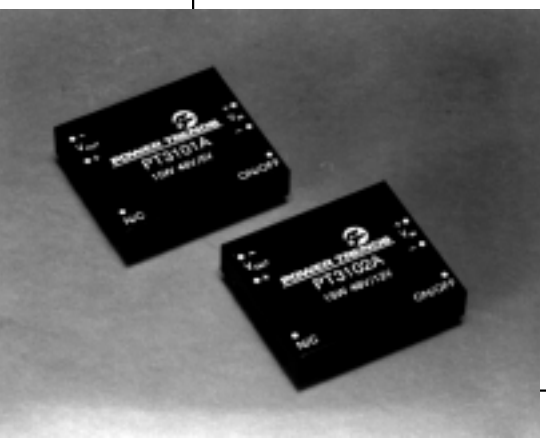
# PT3100 Series 48V

**15 WATT 48V TO 5V/12V/15V ISOLATED DC-DC CONVERTER**

**Revised 8/13/98**



- Power Density 15 Watts/in³
- Wide Input Voltage Range 36V to 75V
- 80% Efficiency
- 500 VDC Isolation
- Industry's Smallest Footprint
- Fast Transient Response
- No External Components Required

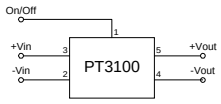
Power Trends' PT3101A (5V), PT3102A (12V) and PT3103A (15V) Isolated DC-DC Converters advance the state-of-the-art for board-mounted converters by employing high switching frequencies greater than 650 KHz and planar magnetics and surface-mount construction. They feature the industry's smallest footprint, a power density of 15 Watts/in³, and operate at 80% efficiency. They are designed for Telecom, Industrial, Computer, Medical, and other distributed power applications requiring input-to-output isolation.

## Specifications

| Characteristics ($T_a$=25°C unless noted) | Symbols | Conditions | PT3100 SERIES Min | Typ | Max | Units |
|---|---|---|---|---|---|---|
| Output Current | $I_o$ | Over $V_{in}$ range $V_o$ = 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 | $I_{ir}$ | $V_{in}$ = 48V @ max $I_o$ | — | 0.6 | 1.0 | A |
| | $t_{ir}$ | On start-up | — | 1.0 | 5.0 | mSec |
| Input Voltage Range | $V_{in}$ | $I_o$ = 0.1 to max $I_o$ | 36.0 | 48.0 | 75.0 | V |
| Output Voltage Tolerance | $\Delta V_o$ | Over $V_{in}$ Range $T_A$= -20°C to 70°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 | — | 79 | — | % |
| | | $V_{in}$=48V, $I_o$=1.25A, $V_o$=12V | — | 80 | — | % |
| | | $V_{in}$=48V, $I_o$=1A, $V_o$=15V | — | 80 | — | % |
| Switching Frequency | $f_o$ | Over $V_{in}$ and $I_o$, $V_o$=5V | 800 | 850 | 900 | kHz |
| | | $V_o$=12V/15V | 600 | 650 | 700 | kHz |
| Recommended Operating Temperature Range | $T_a$ | $V_{in}$ = 48V @ max $I_o$ Free air convection, (40-60LFM) | -20 | — | +70* | °C |
| Thermal Resistance | $\theta_{ja}$ | Free Air Convection, (40-60LFM) | — | 16 | — | °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 | — | — | 500 | — | — | V |
| Capacitance | — | — | — | 1100 | — | pF |
| Resistance | — | — | 10 | — | — | MΩ |
| Flammability | — | Materials meet UL 94V-0 | | | | |
| Remote On/Off | On | Open or 2.5 to 7.0 VDC above -$V_{in}$ | | | | |
| | Off | 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*

**PT3101A** = 5 Volts
**PT3102A** = 12 Volts
**PT3103A** = 15 Volts

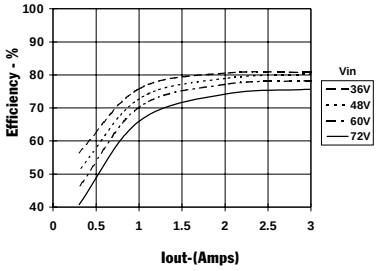
*Surface Mount*

**PT3101C** = 5 Volts
**PT3102C** = 12 Volts
**PT3103C** = 15 Volts

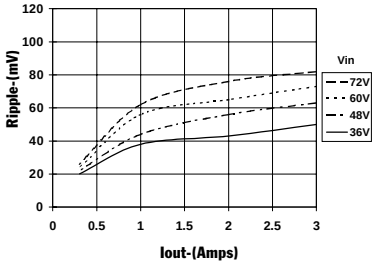
*(For dimensions and PC board layout, see Package Style 700.)*

## PT3101, 5.0 VDC (See Note 1)

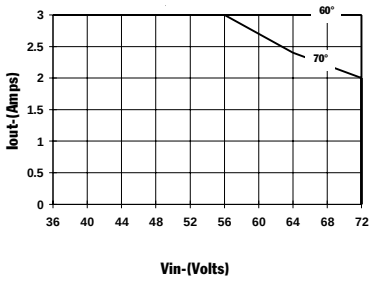
### Efficiency vs Output Current



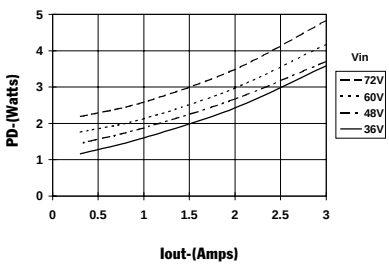

### Ripple vs Output Current




### Thermal Derating ($T_a$) (See Note 2)

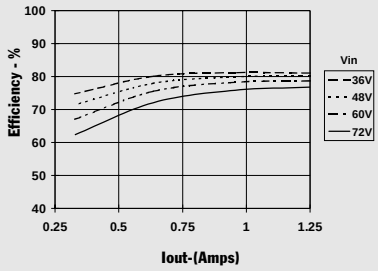



### Power Dissipation vs Output Current

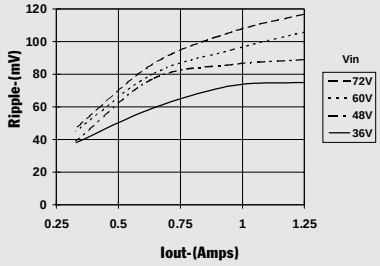



## PT3102, 12.0 VDC (See Note 1)

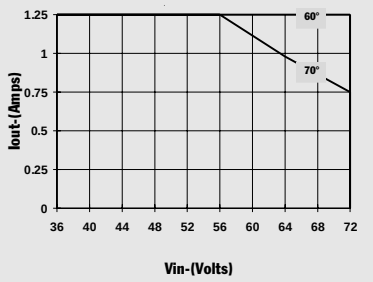
### Efficiency vs Output Current



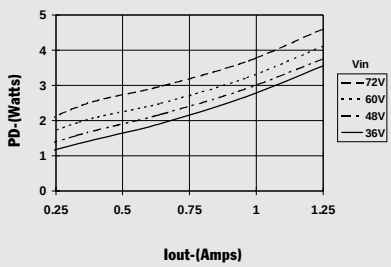

### Ripple vs Output Current




### Thermal Derating ($T_a$) (See Note 2)

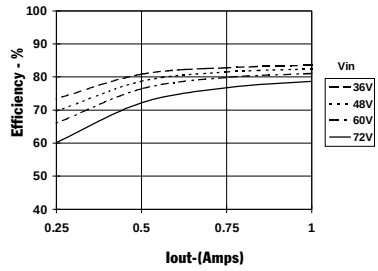



### Power Dissipation vs Output Current

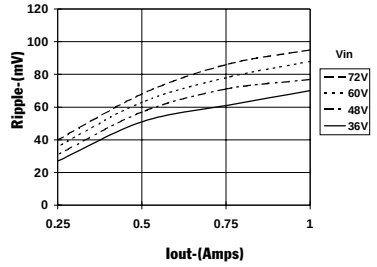



## PT3103, 15.0 VDC (See Note 1)

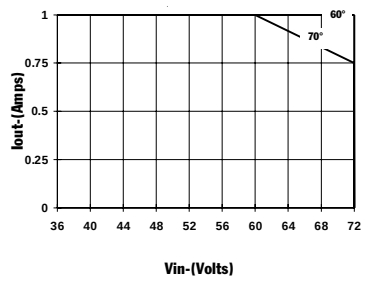
### Efficiency vs Output Current



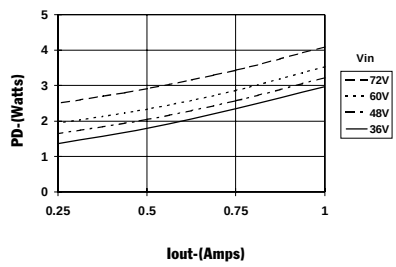

### Ripple vs Output Current




### 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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