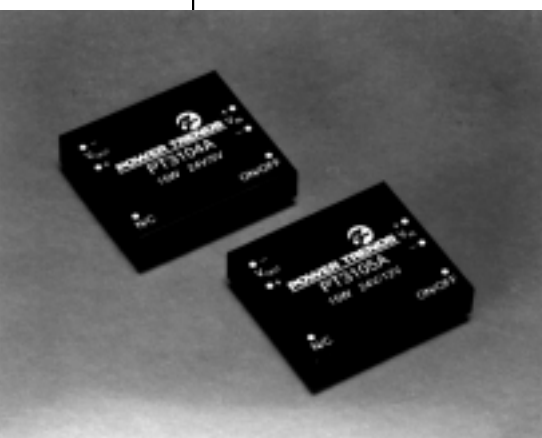
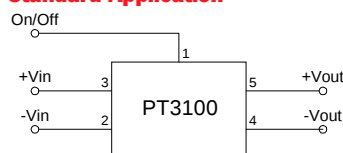


**PT3100 Series****24V****15 WATT 24V TO 5V/12V/15V  
ISOLATED DC-DC CONVERTER****Revised 5/15/98**

- Power Density 15 Watts/in<sup>3</sup>
- Wide Input Voltage Range 18V to 40V
- 81% Efficiency
- 500 VDC Isolation
- Small Footprint
- No External Components Required

Power Trends' PT3104A (5V),  
PT3105A (12V) and PT3106A (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/in<sup>3</sup>, and operate at 80% efficiency. They are designed for Telecom, Industrial, Computer, Medical, and other distributed power applications requiring input-to-output isolation.

**Standard Application****Specifications**

| Characteristics<br>(T <sub>a</sub> =25°C unless noted) | Symbols                            | Conditions                                                                                                                                                                                             | PT3100 SERIES |                    |                    |  | Units                                                    |
|--------------------------------------------------------|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|--------------------|--------------------|--|----------------------------------------------------------|
|                                                        |                                    |                                                                                                                                                                                                        | Min           | Typ                | Max                |  |                                                          |
| Output Current                                         | I <sub>o</sub>                     | Over V <sub>in</sub> range,<br>V <sub>o</sub> = 5V<br>V <sub>o</sub> = 12V<br>V <sub>o</sub> = 15V                                                                                                     | 0<br>0<br>0   | —<br>—<br>—        | 3.0<br>1.25<br>1.0 |  | A                                                        |
| Current Limit                                          | I <sub>cl</sub>                    | V <sub>in</sub> = 18V,<br>V <sub>o</sub> = 5V<br>V <sub>o</sub> = 12V<br>V <sub>o</sub> = 15V                                                                                                          | —<br>—<br>—   | 4.0<br>1.75<br>1.4 | —<br>—<br>—        |  | A                                                        |
| On/Off Standby Current                                 | I <sub>in standby</sub>            | V <sub>in</sub> = 24V, Pin 1 = -V <sub>in</sub>                                                                                                                                                        | —             | 7                  | 10                 |  | mA                                                       |
| Short Circuit Current                                  | I <sub>sc</sub>                    | V <sub>in</sub> = 24V,<br>V <sub>o</sub> = 5V<br>V <sub>o</sub> = 12V<br>V <sub>o</sub> = 15V                                                                                                          | —<br>—<br>—   | 6.25<br>2.5<br>2.0 | —<br>—<br>—        |  | A                                                        |
| Inrush Current                                         | I <sub>ir</sub><br>t <sub>ir</sub> | V <sub>in</sub> = 24V @ max I <sub>o</sub><br>On start-up                                                                                                                                              | —<br>—        | 1.0<br>1.0         | 2.0<br>5.0         |  | A<br>mSec                                                |
| Input Voltage Range                                    | V <sub>in</sub>                    | I <sub>o</sub> = 0.1 to max I <sub>o</sub>                                                                                                                                                             | 18.0          | 24.0               | 40.0               |  | V                                                        |
| Output Voltage Tolerance                               | ΔV <sub>o</sub>                    | Over V <sub>in</sub> Range<br>T <sub>A</sub> = -20°C to +70°C                                                                                                                                          | —             | ±1.0               | ±2.0               |  | %V <sub>o</sub>                                          |
| Ripple Rejection                                       | RR                                 | Over V <sub>in</sub> range @ 120 Hz                                                                                                                                                                    | —             | 60                 | —                  |  | dB                                                       |
| Line Regulation                                        | Reg <sub>line</sub>                | Over V <sub>in</sub> range @ max I <sub>o</sub>                                                                                                                                                        | —             | ±0.2               | ±1.0               |  | %V <sub>o</sub>                                          |
| Load Regulation                                        | Reg <sub>load</sub>                | 10% to 100% of I <sub>o</sub> max                                                                                                                                                                      | —             | ±0.4               | ±1.0               |  | %V <sub>o</sub>                                          |
| V <sub>o</sub> Ripple/Noise                            | V <sub>n</sub>                     | V <sub>in</sub> =24V, I <sub>o</sub> =3.0A, V <sub>o</sub> =5V<br>V <sub>in</sub> =24V, I <sub>o</sub> =1.25A, V <sub>o</sub> =12V<br>V <sub>in</sub> =24V, I <sub>o</sub> =1.25A, V <sub>o</sub> =15V | —<br>—<br>—   | 75<br>75<br>100    | 100<br>150<br>200  |  | mV <sub>pp</sub><br>mV <sub>pp</sub><br>mV <sub>pp</sub> |
| Transient Response                                     | t <sub>tr</sub>                    | 50% load change<br>V <sub>o</sub> over/undershoot                                                                                                                                                      | —<br>—        | 125<br>3.0         | 200<br>5.0         |  | μSec<br>%V <sub>o</sub>                                  |
| Efficiency                                             | η                                  | V <sub>in</sub> =24V, I <sub>o</sub> =3.0A, V <sub>o</sub> =5V<br>V <sub>in</sub> =24V, I <sub>o</sub> =1.25A, V <sub>o</sub> =12V<br>V <sub>in</sub> =24V, I <sub>o</sub> =1A, V <sub>o</sub> =15V    | —<br>—<br>—   | 80<br>80<br>81     | —<br>—<br>—        |  | %<br>%<br>%                                              |
| Switching Frequency                                    | f <sub>o</sub>                     | Over V <sub>in</sub> and I <sub>o</sub> ,<br>V <sub>o</sub> =5V<br>V <sub>o</sub> =12V/15V                                                                                                             | 800<br>600    | 850<br>650         | 900<br>700         |  | kHz<br>kHz                                               |
| Recommended Operating Temperature Range                | T <sub>a</sub>                     | V <sub>in</sub> = 24V @ max I <sub>o</sub><br>Free air convection, (40-60LFM)                                                                                                                          | -20           | —                  | +70*               |  | °C                                                       |
| Thermal Resistance                                     | θ <sub>ja</sub>                    | Free Air Convection, (40-60LFM)                                                                                                                                                                        | —             | 14                 | —                  |  | °C/W                                                     |
| Case Temperature                                       | T <sub>c</sub>                     | @ Thermal shutdown                                                                                                                                                                                     | —             | —                  | 100                |  | °C                                                       |
| Storage Temperature                                    | T <sub>s</sub>                     |                                                                                                                                                                                                        | -40           | —                  | 110                |  | °C                                                       |
| Mechanical Shock                                       | —                                  | Per Mil-STD-202F, Method 213B,<br>6mS, Half-sine, mounted to a PCB                                                                                                                                     | —             | 50                 | —                  |  | G's                                                      |
| Mechanical Vibration                                   | —                                  | Per Mil-STD-202F, Method 204D,<br>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<br>Off                          | Open or 2.5 to 7.0 VDC above -V <sub>in</sub><br>Short or 0 to 0.8 VDC above -V <sub>in</sub>                                                                                                          |               |                    |                    |  |                                                          |

\* See Thermal Derating Curves

**Pin-Out Information**

| Pin | Function          |
|-----|-------------------|
| 1   | Remote ON/OFF     |
| 2   | -V <sub>in</sub>  |
| 3   | +V <sub>in</sub>  |
| 4   | -V <sub>out</sub> |
| 5   | +V <sub>out</sub> |
| 6   | Do not connect    |

**Ordering Information****Through-Hole**

**PT3104A** = 5 Volts  
**PT3105A** = 12 Volts  
**PT3106A** = 15 Volts

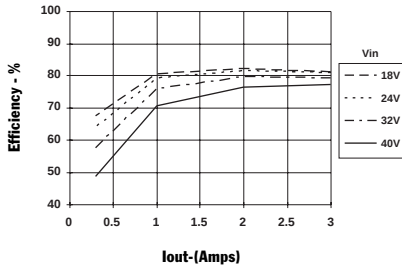
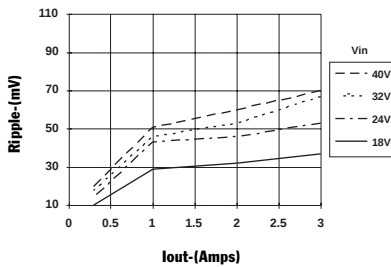
**Surface Mount**

**PT3104C** = 5 Volts  
**PT3105C** = 12 Volts  
**PT3106C** = 15 Volts

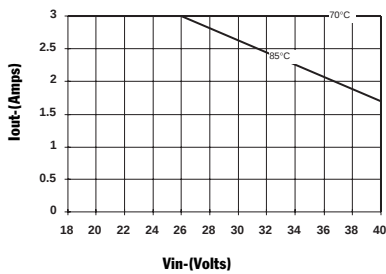
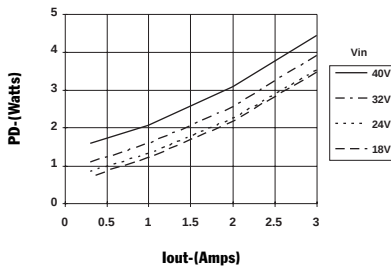
(For dimensions and PC board layout, see Package Style 700.)

**CHARACTERISTIC DATA****PT3100 Series****24V****PT3104, 5.0 VDC**

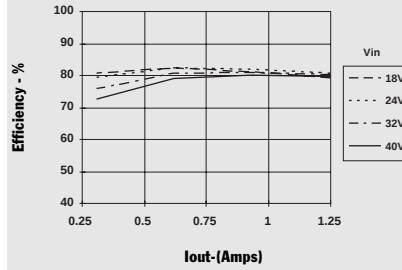
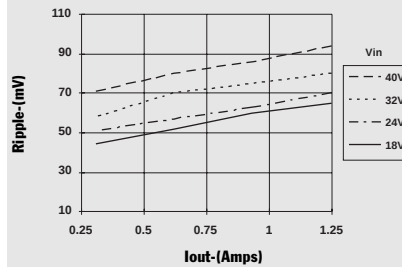
(See Note 1)

**Efficiency vs Output Current****Ripple vs Output Current****Thermal Derating ( $T_a$ )**

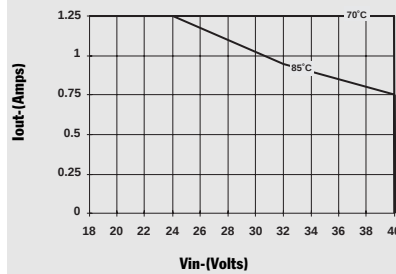
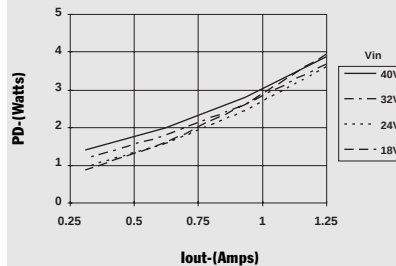
(See Note 2)

**Power Dissipation vs Output Current****PT3105, 12.0 VDC**

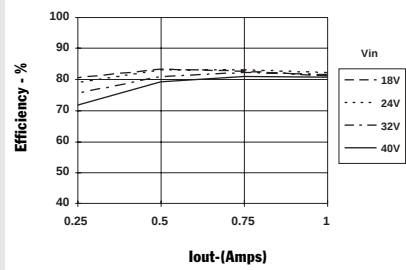
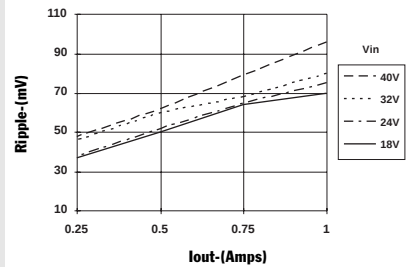
(See Note 1)

**Efficiency vs Output Current****Ripple vs Output Current****Thermal Derating ( $T_a$ )**

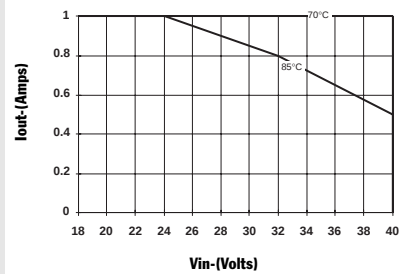
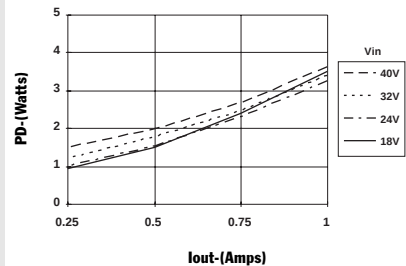
(See Note 2)

**Power Dissipation vs Output Current****PT3106, 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 Converters.**Note 2:** Thermal derating graphs are developed in free air convection cooling of 40-60 LFM.

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