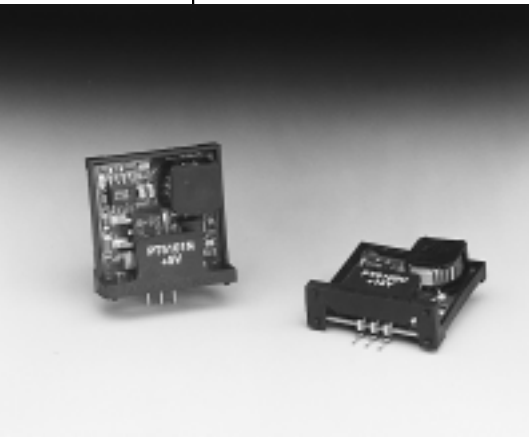
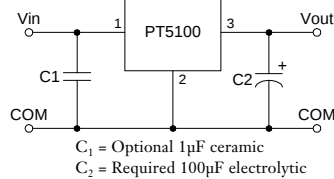


**PT5100 Series****1 AMP POSITIVE STEP-DOWN  
INTEGRATED SWITCHING REGULATOR****Revised 5/15/98**

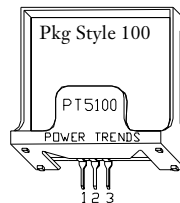
- 85% Efficiency
- Internal Short-Circuit Protection
- Pin-Compatible with 3-Terminal Linear Regulators
- Laser-Trimmed Output Voltage
- Over-Temperature Protection
- Small Footprint
- Wide Input Range

The PT5100 Series is Power Trends' line of economical, easy-to-

use, 1 Amp positive step-down, 3-terminal Integrated Switching Regulators (ISRs) designed for pin compatibility with linear regulators. These ISRs can be used in a wide variety of on-board power regulation applications including computer, data storage, industrial controls, medical, and battery powered equipment. The series of ISRs has excellent line and load regulation and laser-trimmed output voltage.

**Standard Application****Pin-Out Information**

| Pin | Function         |
|-----|------------------|
| 1   | V <sub>in</sub>  |
| 2   | GND              |
| 3   | V <sub>out</sub> |

**Ordering Information**

PT5101□ = + 5 Volts  
 PT5102□ = + 12 Volts  
 PT5103□ = + 3.3 Volts  
 PT5105□ = + 6.5 Volts  
 PT5107□ = + 15 Volts  
 PT5109□ = + 5.6 Volts  
 PT5110□ = + 9 Volts  
 PT5111□ = + 10 Volts  
 PT5112□ = + 8 Volts

**PT Series Suffix (PT1234X)****Case/Pin Configuration**

|                          |          |
|--------------------------|----------|
| Vertical Through-Hole    | <b>N</b> |
| Horizontal Through-Hole  | <b>A</b> |
| Horizontal Surface Mount | <b>C</b> |

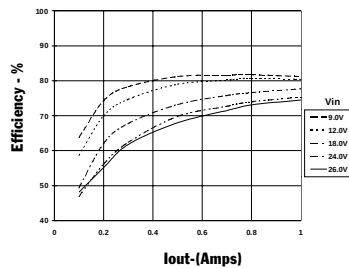
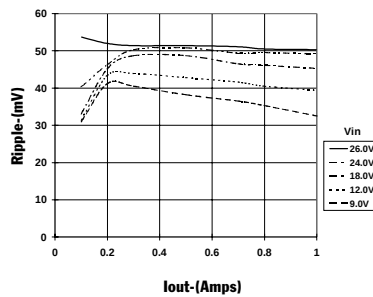
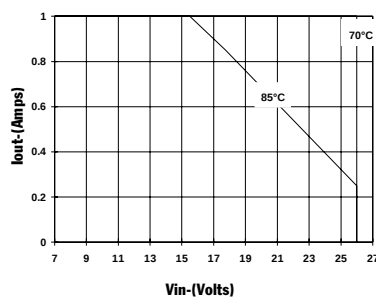
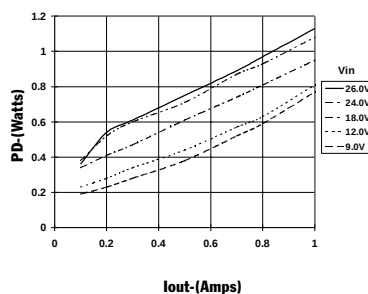
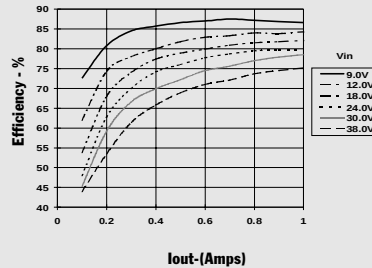
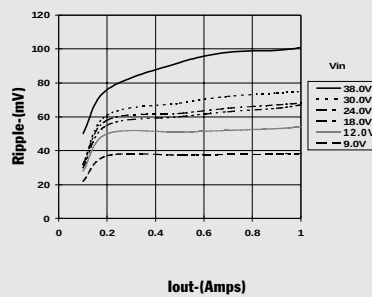
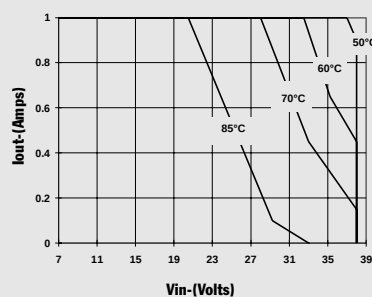
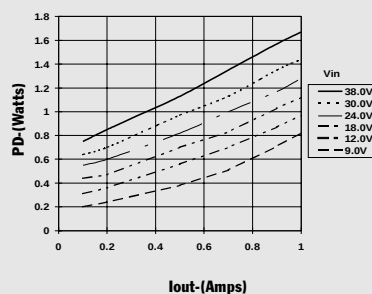
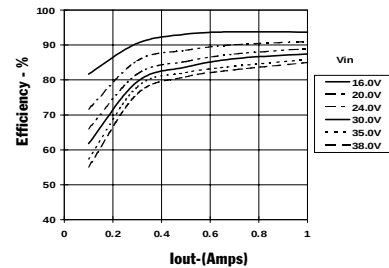
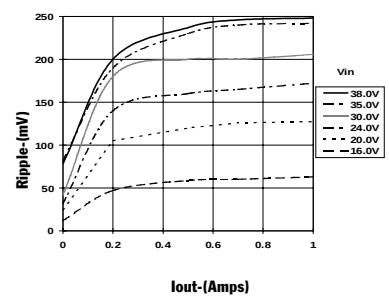
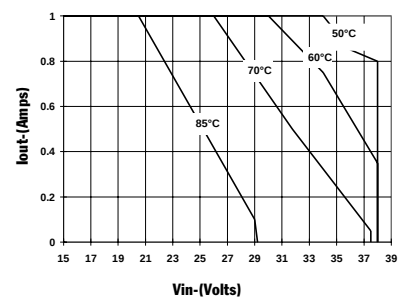
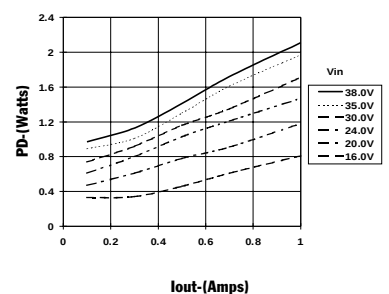
**Specifications**

| Characteristics<br>(T <sub>a</sub> = 25°C unless noted) | Symbols                            | Conditions                                                                                                                                                                                                                                                                         | PT5100 SERIES      |                      |                         | Units                   |
|---------------------------------------------------------|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------------|-------------------------|-------------------------|
|                                                         |                                    |                                                                                                                                                                                                                                                                                    | Min                | Typ                  | Max                     |                         |
| Output Current                                          | I <sub>O</sub>                     | Over V <sub>in</sub> range                                                                                                                                                                                                                                                         | 0.1*               | —                    | 1.0                     | A                       |
| Short Circuit Current                                   | I <sub>sc</sub>                    | V <sub>in</sub> = V <sub>in</sub> min                                                                                                                                                                                                                                              | —                  | 3.5                  | —                       | Apk                     |
| Input Voltage Range                                     | V <sub>in</sub>                    | 0.1 ≤ I <sub>O</sub> ≤ 1.0 A<br>V <sub>O</sub> = 3.3V<br>V <sub>O</sub> = 5V<br>V <sub>O</sub> = 12V<br>V <sub>O</sub> = 15V                                                                                                                                                       | 9<br>9<br>16<br>19 | —                    | 26<br>38<br>38<br>38    | V<br>V<br>V<br>V        |
| Output Voltage Tolerance                                | ΔV <sub>O</sub>                    | Over V <sub>in</sub> Range, I <sub>O</sub> = 1.0 A<br>T <sub>a</sub> = 0°C to +60°C                                                                                                                                                                                                | —                  | ±1.5                 | ±3.0                    | %V <sub>O</sub>         |
| Line Regulation                                         | Reg <sub>line</sub>                | Over V <sub>in</sub> range                                                                                                                                                                                                                                                         | —                  | ±0.5                 | ±1.0                    | %V <sub>O</sub>         |
| Load Regulation                                         | Reg <sub>load</sub>                | 0.1 ≤ I <sub>O</sub> ≤ 1.0 A                                                                                                                                                                                                                                                       | —                  | ±0.5                 | ±1.0                    | %V <sub>O</sub>         |
| V <sub>O</sub> Ripple/Noise                             | V <sub>n</sub>                     | V <sub>in</sub> = V <sub>in</sub> min, I <sub>O</sub> = 1.0 A                                                                                                                                                                                                                      | —                  | ±2                   | —                       | %V <sub>O</sub>         |
| Transient Response<br>with C <sub>O</sub> = 100μF       | t <sub>tr</sub><br>V <sub>os</sub> | 25% load change<br>V <sub>O</sub> over/undershoot                                                                                                                                                                                                                                  | —<br>—             | 100<br>5.0           | 200<br>—                | μSec<br>%V <sub>O</sub> |
| Efficiency                                              | η                                  | V <sub>in</sub> = 9V, I <sub>O</sub> = 0.5A, V <sub>O</sub> = 3.3V<br>V <sub>in</sub> = 9V, I <sub>O</sub> = 0.5A, V <sub>O</sub> = 5V<br>V <sub>in</sub> = 16V, I <sub>O</sub> = 0.5A, V <sub>O</sub> = 12V<br>V <sub>in</sub> = 19V, I <sub>O</sub> = 0.5A, V <sub>O</sub> = 15V | —<br>—<br>—<br>—   | 82<br>85<br>90<br>92 | —<br>—<br>—<br>—        | %<br>%<br>%<br>%        |
| Switching Frequency                                     | f <sub>O</sub>                     | Over V <sub>in</sub> and I <sub>O</sub> ranges, V <sub>O</sub> = 3.3V<br>V <sub>O</sub> = >5V                                                                                                                                                                                      | 575<br>500         | 725<br>650           | 875<br>800              | kHz                     |
| Absolute Maximum<br>Operating Temperature Range         | T <sub>a</sub>                     |                                                                                                                                                                                                                                                                                    | -20                | —                    | +85                     | °C                      |
| Recommended Operating<br>Temperature Range              | T <sub>a</sub>                     | Free Air Convection, V <sub>O</sub> = 3.3V<br>(40-60LFM) V <sub>O</sub> = 5V<br>At V <sub>in</sub> = 24V, I <sub>O</sub> = 0.75A V <sub>O</sub> = 12V                                                                                                                              | -20<br>-20<br>-20  | —<br>—<br>—          | +80**<br>+80**<br>+80** | °C                      |
| Thermal Resistance                                      | θ <sub>ja</sub>                    | Free Air Convection V <sub>O</sub> = 3.3V<br>(40-60LFM) V <sub>O</sub> = 5V<br>V <sub>O</sub> = 12V/15V                                                                                                                                                                            | —<br>—<br>—        | 45<br>50<br>60       | —<br>—<br>—             | °C/W                    |
| Storage Temperature                                     | T <sub>s</sub>                     |                                                                                                                                                                                                                                                                                    | -40                | —                    | +125                    | °C                      |
| Mechanical Shock                                        |                                    | Per Mil-STD-883D, Method 2002.3<br>1 msec, Half Sine, mounted to a fixture                                                                                                                                                                                                         | —                  | 500                  | —                       | G's                     |
| Mechanical Vibration                                    |                                    | Per Mil-STD-883D, Method 2007.2<br>20-2000 Hz, Soldered in a PC board                                                                                                                                                                                                              | —                  | 5                    | —                       | G's                     |
| Weight                                                  |                                    |                                                                                                                                                                                                                                                                                    | —                  | 4.5                  | —                       | grams                   |

\* ISR will operate down to no load with reduced specifications.

\*\*See Thermal Derating chart.

**Note:** The PT5100 Series requires a 100μF electrolytic or tantalum output capacitor for proper operation in all applications.

**CHARACTERISTIC DATA****PT5100 Series****PT5103, 3.3 VDC** (See Note 1)**Efficiency vs Output Current****Ripple vs Output Current****Thermal Derating ( $T_a$ )** (See Note 2)**Power Dissipation vs Output Current****PT5101, 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****PT5102, 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**

**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 ISR.

**Note 2:** Thermal derating graphs are developed in free air convection cooling of 40-60 LFM. (See Thermal Application Notes.)

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