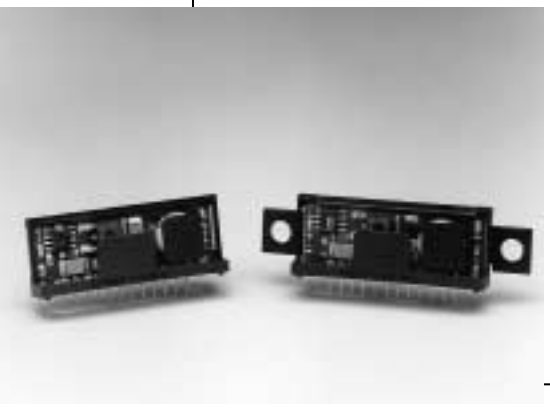
# PT6200 Series

**SLTS063**

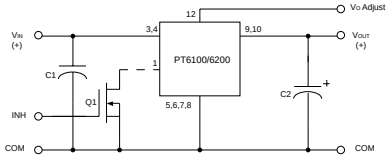
## 2 AMP HIGH-PERFORMANCE ADJUSTABLE ISR WITH ON/OFF CONTROL



- 90% Efficiency
- Adjustable Output Voltage
- Internal Short Circuit Protection
- Over-Temperature Protection
- On/Off Control (Ground Off)
- Small SIP Footprint
  0.36" x 1.64" x 0.60"(H)

The PT6200 Series is a line of High-Performance 2 Amp, 12-Pin SIP (Single In-line Package) Integrated Switching Regulators (ISRs) designed to meet the on-board power conversion needs of battery powered or other equipment requiring high efficiency and small size. This high performance ISR family offers a unique combination of features combining 90% typical efficiency with open-collector on/off control and adjustable output voltage. Quiescent current in the shutdown mode is less than 100µA.

## Standard Application

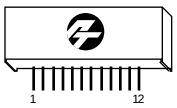



$C_1$ = Optional ceramic (1µF)
$Q_1$ = NFET
$C_2$ = Required 100µF electrolytic

## Pin-Out Information

| Pin No. | Function |
|---|---|
| 1 | Inhibit |
| 2 | N/C |
| 3 | $V_{in}$ |
| 4 | $V_{in}$ |
| 5 | GND |
| 6 | GND |

| Pin No. | Function |
|---|---|
| 7 | GND |
| 8 | GND |
| 9 | $V_{out}$ |
| 10 | $V_{out}$ |
| 11 | N/C |
| 12 | $V_{out}$ Adj |




## Ordering Information

**PT6202□** = +5 Volts
**PT6203□** = +3.3 Volts
**PT6204□** = +12 Volts
(For dimensions, see page 65.)

## PT Series Suffix (PT1234X)

| Case/Pin Configuration | Heat Tab Configuration: *None* | *Side* |
|---|---|---|
| Vertical Through-Hole | N | R |
| Horizontal Through-Hole | A | G |
| Horizontal Surface Mount | C | B |

(See Thermal Application Notes on page 44 for heat tab application data.)

## Specifications

| Characteristics ($T_A$=25C unless note d) | Symbols | Conditions | | PT6200 SERIES Min | Typ | Max | Units |
|---|---|---|---|---|---|---|---|
| Output Current | $I_o$ | Over $V_{in}$ range | | 0.1** | — | 2.0 | Amps |
| Current Limit | $I_{cl}$ | $V_{in} = V_o + 5V$ | | — | 3.5 | 4.5 | Amps |
| Short Circuit Current | $I_{sc}$ | $V_{in} = V_o + 5V$ | | — | 5.0 | — | Apk |
| Input Voltage Range | $V_{in}$ | 0.1 ≤ $I_o$ ≤ 2.0 Amp | $V_o$ = 3.3V<br>$V_o$ = 5V<br>$V_o$ = 12V | 7<br>7.25<br>14.5 | —<br>—<br>— | 26<br>30<br>30 | VDC<br>VDC<br>VDC |
| Static Voltage Tolerance | $V_o$ | Over $V_{in}$ Range, $I_o$ = 2.0 Amp<br>$T_A$ = -40° C to shutdown | | — | ±1.0 | ±2.0 | %$V_o$ |
| Line Regulation | $Reg_{line}$ | Over $V_{in}$ range | | — | ±0.25 | ±0.5 | %$V_o$ |
| Load Regulation | $Reg_{load}$ | 0.1 ≤ $I_o$ ≤ 2.0 Amp | | — | ±0.25 | ±0.5 | %$V_o$ |
| Ripple/Noise | $V_n$ | $V_{in} = V_o + 5V$, $I_o$ = 2.0 Amp | | — | ±2 | — | %$V_o$ |
| Transient Response<br>with $C_o$ = 100µF | $t_{tr}$<br>$V_{os}$ | 50% load change<br>$V_o$ over/undershoot | | —<br>— | 100<br>3.0 | 200<br>5.0 | µSec<br>%$V_o$ |
| Efficiency | η | $V_{in}$=8V, $I_o$ = 0.5 Amp, $V_o$ = 3.3V<br>$V_{in}$=8V, $I_o$ = 0.5 Amp, $V_o$ = 5V<br>$V_{in}$=15V, $I_o$ = 0.5 Amp, $V_o$ = 12V | | —<br>—<br>— | 85<br>90<br>93 | —<br>—<br>— | %<br>%<br>% |
| Switching Frequency | $f_o$ | Over $V_{in}$ and $I_o$ ranges, | $V_o$ = 3.3V<br>$V_o$ = 5V<br>$V_o$ = 12V | 400<br>500<br>500 | 500<br>650<br>650 | 600<br>800<br>800 | KHz<br>KHz<br>KHz |
| Shutdown Current | $I_{sc}$ | $V_{in}$ = 15V | | — | 100 | — | µAmp |
| Quiescent Current | $I_{nl}$ | $I_o$ = 0A, $V_{in}$ =10V | | — | 10 | — | mAmp |
| Output Voltage Adjustment Range | $V_o$ | Below $V_o$<br>Above $V_o$ | | See Application Notes on page 40. | | | |
| Operating Temperature | $T_A$ | Free Air Convection, (40-60LFM)<br>Over $V_{in}$ and $I_o$ ranges | 3.3V<br>5V<br>12V | -40<br>-40<br>-40 | —<br>—<br>— | +85*<br>+60*<br>* | C |
| Thermal Resistance | $\theta_{JA}$ | Free Air Convection (40-60LFM) | $V_o$ = 3.3V<br>$V_o$ = 5V<br>$V_o$ = 12V | —<br>—<br>— | 25<br>30<br>35 | —<br>—<br>— | C/W |
| Storage Temperature | $T_s$ | — | | -40 | — | +125 | C |
| Mechanical Shock | Per Mil-STD-883D, Method 2002.3 Condition A, 1 msec, Half Sine, mounted to a fixture | | | — | — | 500 | G's |
| Mechanical Vibration | Per Mil-STD-883D, Method 2007.2 Condition A, 20-2000 Hz | | | — | — | 15 | G's |
| Weight | — | — | | — | 8.5 | — | grams |
| Relative Humidity | — | Non-condensing | | 0 | — | 95 | % |

*See Thermal Derating chart. ** ISR will operate down to no load with reduced specifications.
***Note:*** *The PT6200 Series requires a 100µF electrolytic or tantalum output capacitor for proper operation in all applications.*



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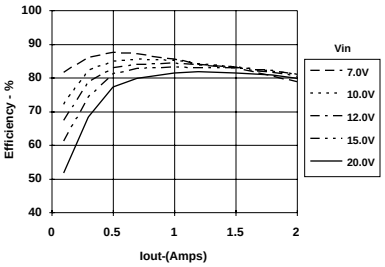
# CHARACTERISTIC DATA

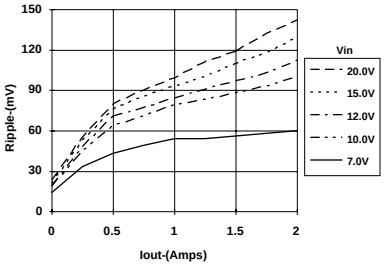
## PT6203, 3.3 VDC

(See Note 1)

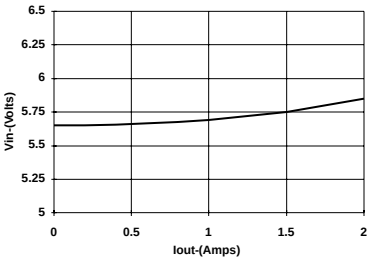
### Efficiency vs Output Current



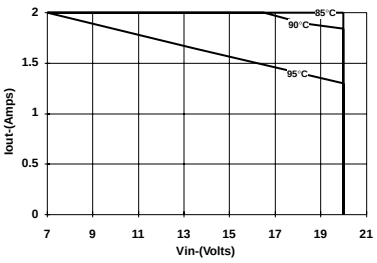

### Ripple vs Output Current



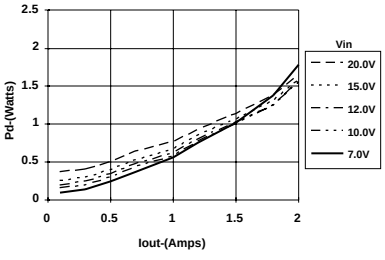

### Minimum Input Voltage (See Note 2)




### Thermal Derating ($T_a$) (See Note 3)



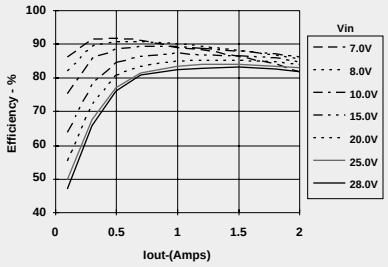

### Power Dissipation vs Output Current



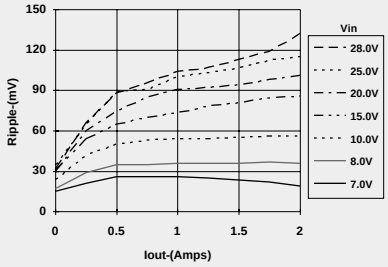

## PT6202, 5.0 VDC

(See Note 1)

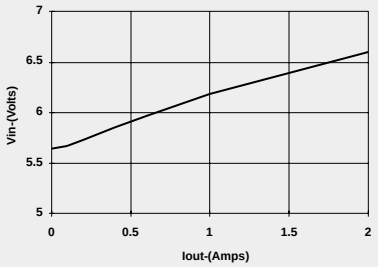
### Efficiency vs Output Current



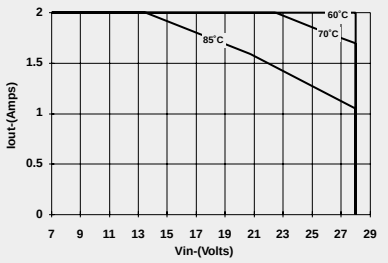

### Ripple vs Output Current



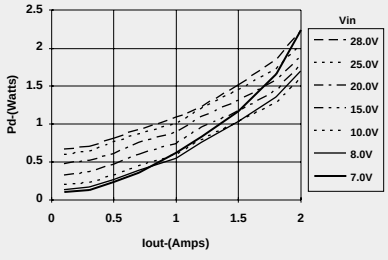

### Minimum Input Voltage (See Note 2)




### Thermal Derating ($T_a$) (See Note 3)



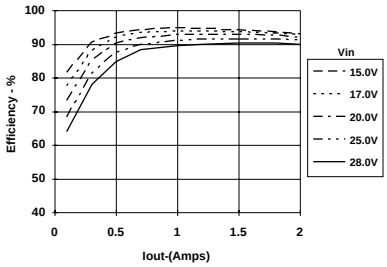

### Power Dissipation vs Output Current



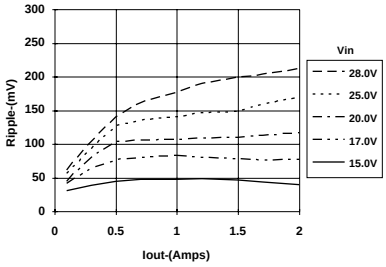

## PT6204, 12.0 VDC

(See Note 1)

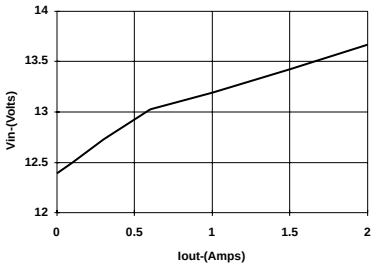
### Efficiency vs Output Current



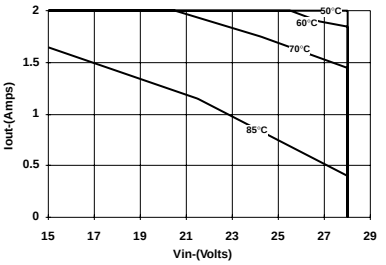

### Ripple vs Output Current



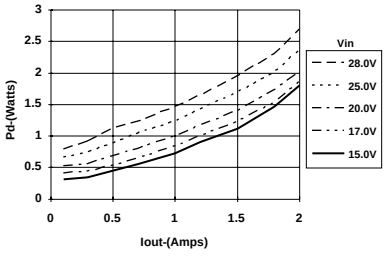

### Minimum Input Voltage (See Note 2)




### Thermal Derating ($T_a$) (See Note 3)




### 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:** *Minimum $V_{in}$ data is typical and is not guaranteed. The data corresponds to a 2% output voltage drop.*
**Note 3:** *Thermal derating graphs are developed in free air convection cooling of 40-60 LFM with no optional heat tab. (See Thermal Application Notes).*

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