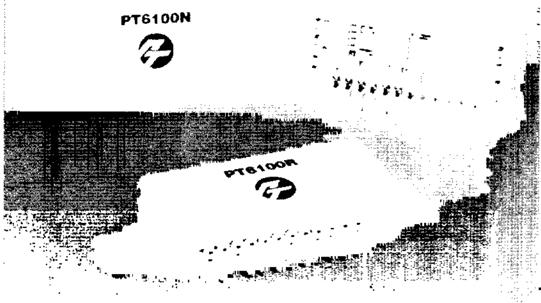
PT6100

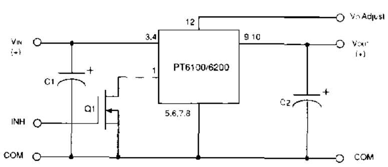
1 AMP HIGH-PERFORMANCE ADJUSTABLE ISR WITH ON/OFF CONTROL



- 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)
- Meets Requirements for FCC Part 15; Class B limits for Radiated Emissions

The PT6100 Series is a line of High-Performance 1 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.

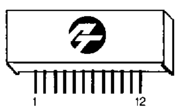
Standard Application



C_1 = Optional electrolytic (10µF)
Q_1 = NFET
C_2 = Required 100µF electrolytic

Pin-Out Information

Pin No.	Function	Pin No.	Function
1	Inhibit	7	GND
2	N/C	8	GND
3	V_{in}	9	V_{out}
4	V_{in}	10	V_{out}
5	GND	11	N/C
6	GND	12	V_{out} Adj



Ordering Information

PT6101□ = +5 Volts
PT6102□ = +3.3 Volts
PT6103□ = +12 Volts
(For dimensions, see page 65.)

PT Series Suffix (PT1234X)

Case/Pin Configuration	Heat Tab Configuration *Uncased*	*None*	*Side*
Vertical Through-Hole	**U**	**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=25°C unless noted)	Symbols	Conditions	PT6100 SERIES Min	Typ	Max	Units
Output Current	I_o	Over V_{in} range	0.1**	—	1.0	Amps
Current Limit	I_{cl}	$V_{in} = V_o + 3V$	—	1.8	3.0	Amps
Short Circuit Current	I_{sc}	$V_{in} = V_o + 3V$	—	3.5	—	Apk
Input Voltage Range	V_{in}	$0.1 \le I_o \le 1.0$ Amp, $V_o = 5V$ $V_o = 3.3V$ $V_o = 12V$	7 7 14.5	— — —	30 26 30	VDC VDC VDC
Static Voltage Tolerance	V_o	Over V_{in} Range, I_o = 1.0 Amp 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}	$0.1 \le I_o \le 1.0$ Amp	—	±0.25	±0.5	$\%V_o$
Ripple/Noise	V_n	$V_{in} = V_o + 3V$, I_o = 1.0 Amp	—	±2	—	$\%V_o$
Transient Response with C_o = 100µF	t_{tr} V_{os}	50% load change V_o over/undershoot	— —	100 3.0	200 5.0	µSec $\%V_o$
Efficiency	η	V_{in}=8V, I_o = 0.5 Amp, V_o = 5V V_{in}=8V, I_o = 0.5 Amp, V_o = 3.3V V_{in}=15V, I_o = 0.5 Amp, V_o = 12V	— — —	90 85 93	— — —	% % %
Switching Frequency	f_o	Over V_{in} and I_o ranges	400	500	600	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 Above V_o	See Application Notes on page 40.			
Operating Temperature	T_A	Free Air Convection, (40-60LFM) Over V_{in} and I_o ranges: 3.3V 5V 12V	-40 -40 -40	— — —	+85* +70* *	°C
Thermal Resistance	θ_{JA}	Free Air Convection (40-60LFM) V_o = 5V V_o = 3.3V V_o = 12V	— — —	40 50 40	— — —	°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	—	—	—	8.3	—	grams
Relative Humidity	—	Non-condensing	0	—	95	%

*See Thermal Derating chart. ** ISR will operate down to no load with reduced specifications.
Note: *The PT6100 Series requires a 100µF electrolytic or tantalum output capacitor for proper operation in all applications.*

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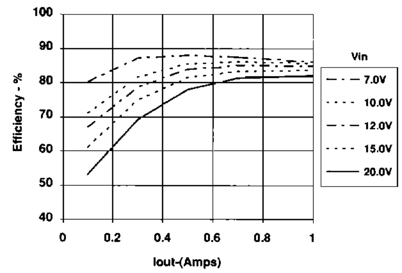
CHARACTERISTIC DATA

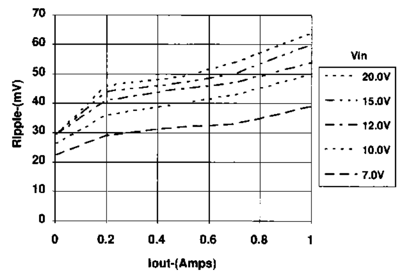
PT6102, 3.3 VDC

(See Note 1)

Efficiency vs Output Current

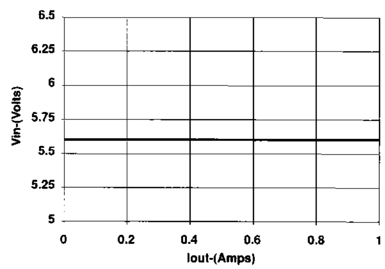


Ripple vs Output Current



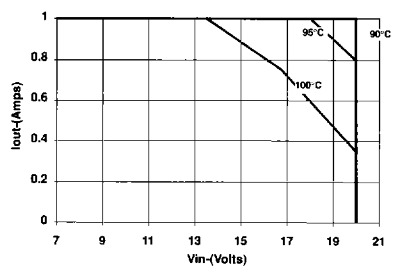
Minimum Input Voltage

(See Note 2)

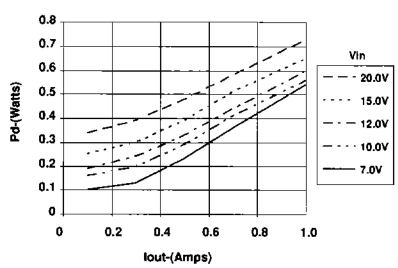


Thermal Derating (T_a)

(See Note 3)



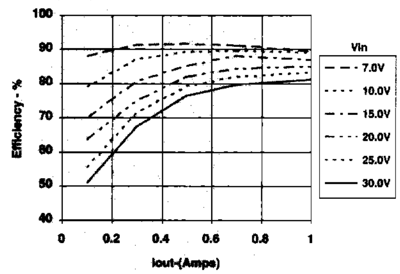
Power Dissipation vs Output Current



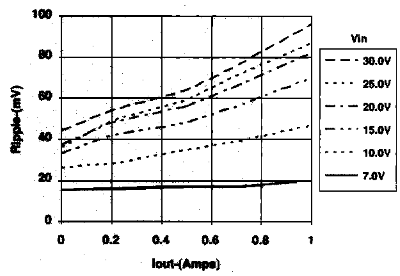
PT6101, 5.0 VDC

(See Note 1)

Efficiency vs Output Current

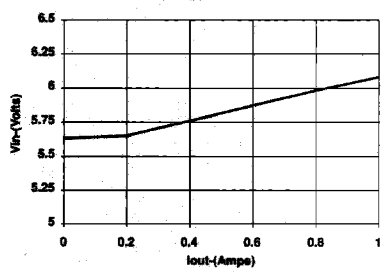


Ripple vs Output Current



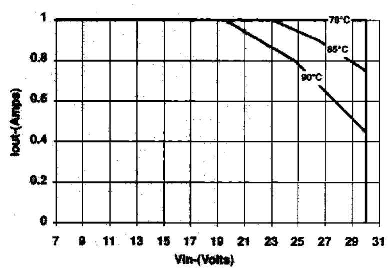
Minimum Input Voltage

(See Note 2)

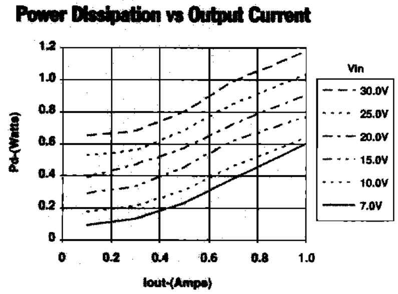


Thermal Derating (T_a)

(See Note 3)



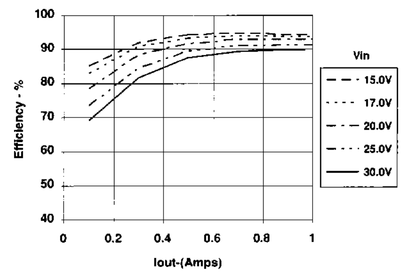
Power Dissipation vs Output Current



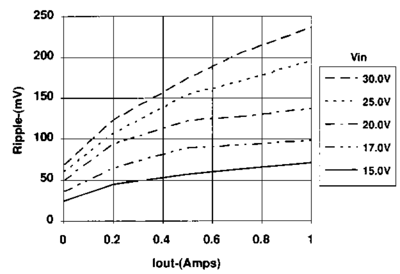
PT6103, 12.0 VDC

(See Note 1)

Efficiency vs Output Current

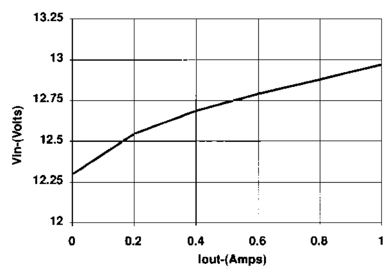


Ripple vs Output Current



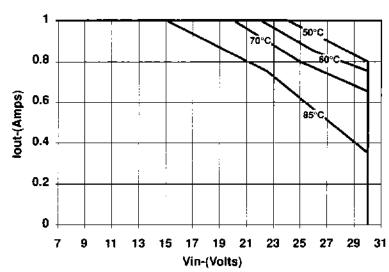
Minimum Input Voltage

(See Note 2)

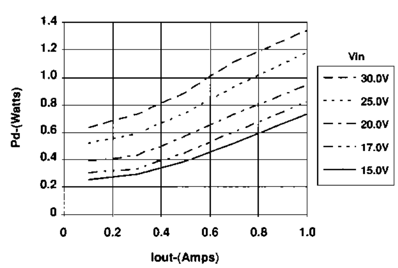


Thermal Derating (T_a)

(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).*