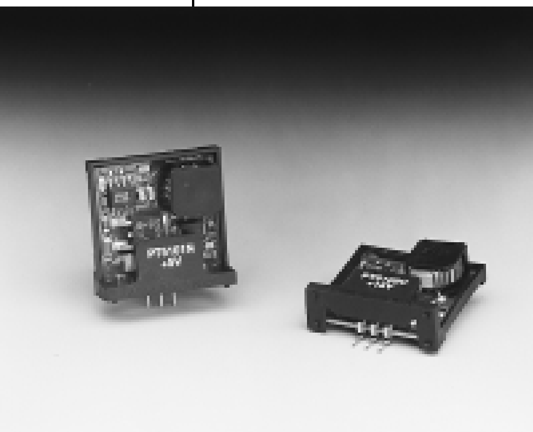
PT5100 Series

1 AMP POSITIVE STEP-DOWN INTEGRATED SWITCHING REGULATOR

Revised 5/15/98

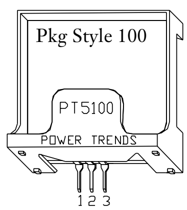


- 85% Efficiency
- Internal Short-Circuit Protection
- Pin-Compatible with 3-Terminal Linear Regulators
- Laser-Trimmed Output Voltage
- Over-Temperature Protection
- Small Footprint
- Wide Input Range

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.

Pin-Out Information

Pin	Function
1	V_{in}
2	GND
3	V_{out}



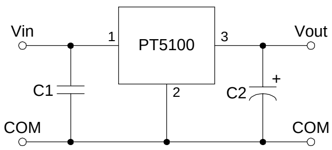
Ordering Information

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	N
Horizontal Through-Hole	A
Horizontal Surface Mount	C

Standard Application



C_1 = Optional 1µF ceramic
C_2 = Required 100µF electrolytic

Specifications

Characteristics (T_a =25°C unless noted)	Symbols	Conditions	PT5100 SERIES Min	Typ	Max	Units
Output Current	I_o	Over V_{in} range	0.1*	—	1.0	A
Short Circuit Current	I_{sc}	V_{in} = V_{in} min	—	3.5	—	Apk
Input Voltage Range	V_{in}	$0.1 \le I_o \le 1.0$ A V_o = 3.3V V_o = 5V V_o = 12V V_o = 15V	9 9 16 19	—	26 38 38 38	V V V V
Output Voltage Tolerance	ΔV_o	Over V_{in} Range, I_o = 1.0 A T_a = 0°C to +60°C	—	±1.5	±3.0	%V_o
Line Regulation	Reg_{line}	Over V_{in} range	—	±0.5	±1.0	%V_o
Load Regulation	Reg_{load}	$0.1 \le I_o \le 1.0$ A	—	±0.5	±1.0	%V_o
V_o Ripple/Noise	V_n	V_{in}=V_{in} min, I_o=1.0 A	—	±2	—	%V_o
Transient Response with C_o = 100µF	t_{tr} V_{os}	25% load change V_o over/undershoot	— —	100 5.0	200 —	µSec %V_o
Efficiency	η	V_{in}=9V, I_o=0.5A, V_o=3.3V V_{in}=9V, I_o=0.5A, V_o=5V V_{in}=16V, I_o=0.5A, V_o=12V V_{in}=19V, I_o=0.5A, V_o=15V	— — — —	82 85 90 92	— — — —	% % % %
Switching Frequency	f_o	Over V_{in} and I_o ranges, V_o= 3.3V V_o = >5V	575 500	725 650	875 800	kHz
Absolute Maximum Operating Temperature Range	T_a		-20	—	+85	°C
Recommended Operating Temperature Range	T_a	Free Air Convection, (40-60LFM) At V_{in}= 24V, I_o=0.75A V_o= 3.3V V_o= 5V V_o= 12V	-20 -20 -20	— — —	+80** +80** +80**	°C
Thermal Resistance	θ_{ja}	Free Air Convection (40-60LFM) V_o = 3.3V V_o = 5V V_o = 12V/15V	— — —	45 50 60	— — —	°C/W
Storage Temperature	T_s		-40	—	+125	°C
Mechanical Shock		Per Mil-STD-883D, Method 2002.3 1 msec, Half Sine, mounted to a fixture	—	500	—	G's
Mechanical Vibration		Per Mil-STD-883D, Method 2007.2 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.*

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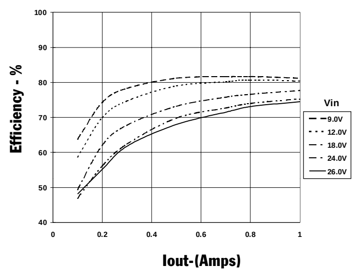
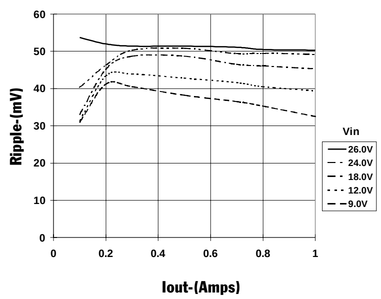
PT5103, 3.3 VDC (See Note 1)

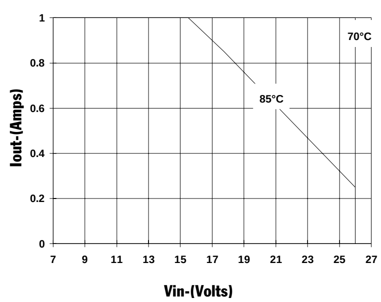
Efficiency vs Output Current



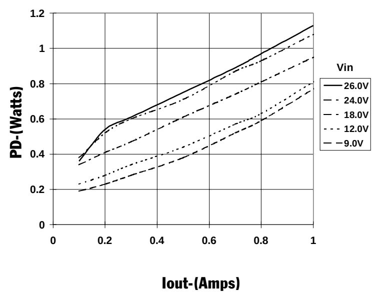
Ripple vs Output Current



Thermal Derating (T_a) (See Note 2)

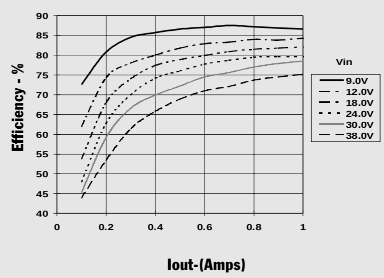


Power Dissipation vs Output Current

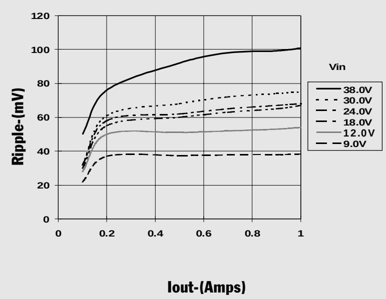


PT5101, 5.0 VDC (See Note 1)

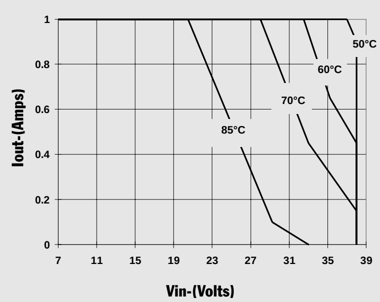
Efficiency vs Output Current



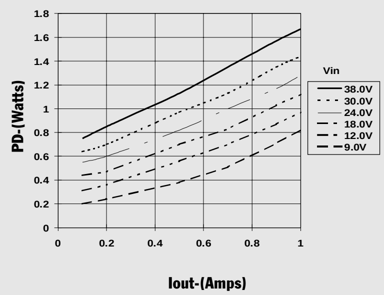
Ripple vs Output Current



Thermal Derating (T_a) (See Note 2)

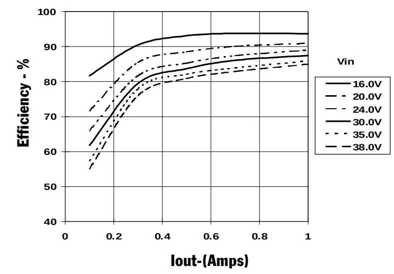


Power Dissipation vs Output Current

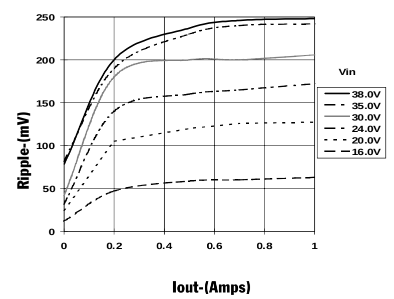


PT5102, 12.0 VDC (See Note 1)

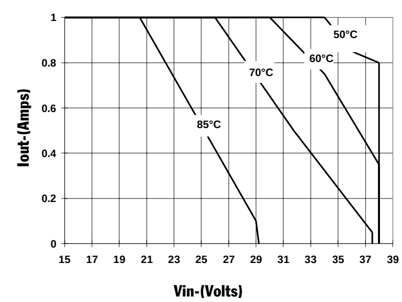
Efficiency vs Output Current



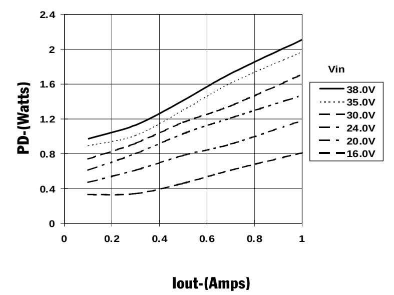
Ripple vs Output Current



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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