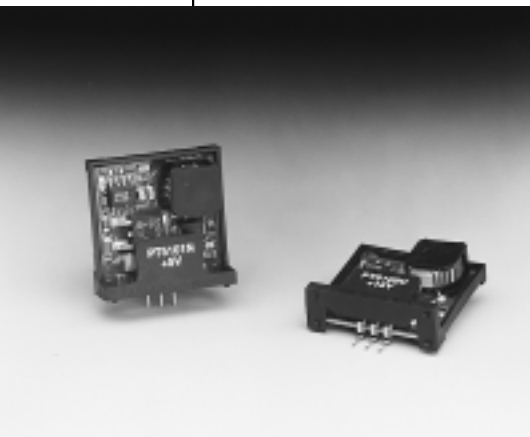


PT5100 Series

1 AMP POSITIVE STEP-DOWN INTEGRATED SWITCHING REGULATOR

Revised 5/15/98

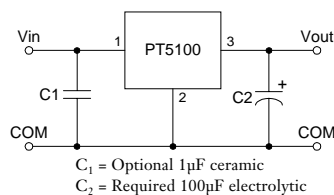


- 85% Efficiency
- Internal Short-Circuit Protection
- Pin-Compatible with 3-Terminal Linear Regulators
- Laser-Trimmed Output Voltage
- Over-Temperature Protection
- Small Footprint
- Wide Input Range

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.

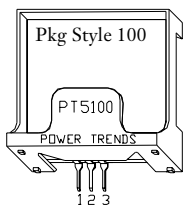
The PT5100 Series is Power Trends' line of economical, easy-to-

Standard Application



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	Suffix
Vertical Through-Hole	N
Horizontal Through-Hole	A
Horizontal Surface Mount	C

Specifications

Characteristics ($T_a = 25^\circ\text{C}$ unless noted)	Symbols	Conditions	PT5100 SERIES			Units
			Min	Typ	Max	
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}	$0.1 \leq I_o \leq 1.0\ \text{A}$ $V_o = 3.3\text{V}$ $V_o = 5\text{V}$ $V_o = 12\text{V}$ $V_o = 15\text{V}$	9 9 16 19	—	26 38 38 38	V V V V
Output Voltage Tolerance	ΔV_o	Over V_{in} Range, $I_o = 1.0\ \text{A}$ $T_a = 0^\circ\text{C}$ to $+60^\circ\text{C}$	—	± 1.5	± 3.0	% V_o
Line Regulation	Reg_{line}	Over V_{in} range	—	± 0.5	± 1.0	% V_o
Load Regulation	Reg_{load}	$0.1 \leq I_o \leq 1.0\ \text{A}$	—	± 0.5	± 1.0	% V_o
V_o Ripple/Noise	V_n	$V_{in} = V_{in\ min}$, $I_o = 1.0\ \text{A}$	—	± 2	—	% V_o
Transient Response with $C_o = 100\mu\text{F}$	t_{tr} V_{os}	25% load change V_o over/undershoot	—	100 5.0	200	μSec % V_o
Efficiency	η	$V_{in} = 9\text{V}$, $I_o = 0.5\text{A}$, $V_o = 3.3\text{V}$ $V_{in} = 9\text{V}$, $I_o = 0.5\text{A}$, $V_o = 5\text{V}$ $V_{in} = 16\text{V}$, $I_o = 0.5\text{A}$, $V_o = 12\text{V}$ $V_{in} = 19\text{V}$, $I_o = 0.5\text{A}$, $V_o = 15\text{V}$	— — — —	82 85 90 92	— — — —	% % % %
Switching Frequency	f_o	Over V_{in} and I_o ranges, $V_o = 3.3\text{V}$ $V_o = >5\text{V}$	575 500	725 650	875 800	kHz
Absolute Maximum Operating Temperature Range	T_a		-20	—	+85	$^\circ\text{C}$
Recommended Operating Temperature Range	T_a	Free Air Convection, (40-60LFM) At $V_{in} = 24\text{V}$, $I_o = 0.75\text{A}$	-20 -20 -20	— — —	+80** +80** +80**	$^\circ\text{C}$
Thermal Resistance	θ_{ja}	Free Air Convection (40-60LFM) $V_o = 3.3\text{V}$ $V_o = 5\text{V}$ $V_o = 12\text{V}/15\text{V}$	— — —	45 50 60	— — —	$^\circ\text{C}/\text{W}$
Storage Temperature	T_s		-40	—	+125	$^\circ\text{C}$
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.

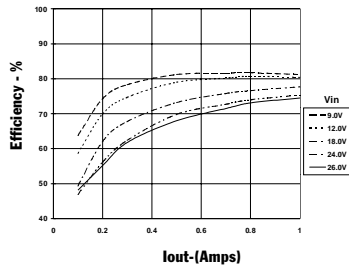
CHARACTERISTIC DATA

PT5100 Series

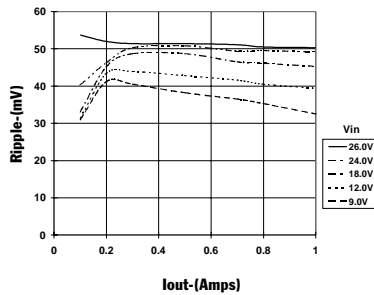
Wide Input Range Products
DATA SHEETS

PT5103, 3.3 VDC (See Note 1)

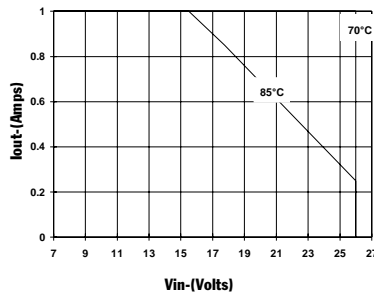
Efficiency vs Output Current



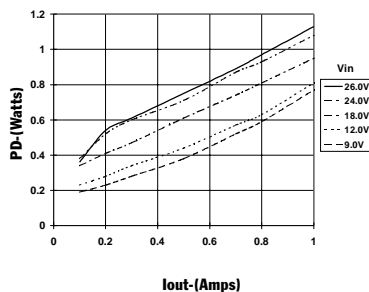
Ripple vs Output Current



Thermal Derating (Ta) (See Note 2)

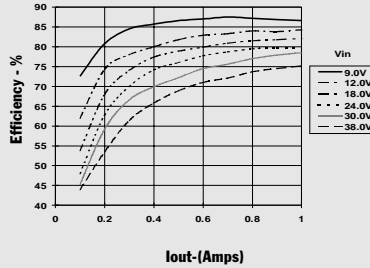


Power Dissipation vs Output Current

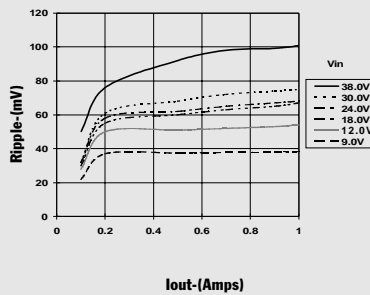


PT5101, 5.0 VDC (See Note 1)

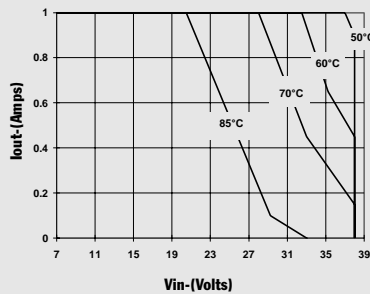
Efficiency vs Output Current



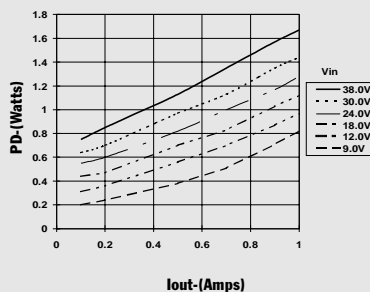
Ripple vs Output Current



Thermal Derating (Ta) (See Note 2)

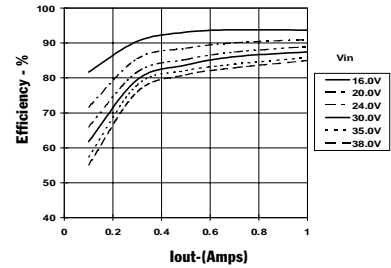


Power Dissipation vs Output Current

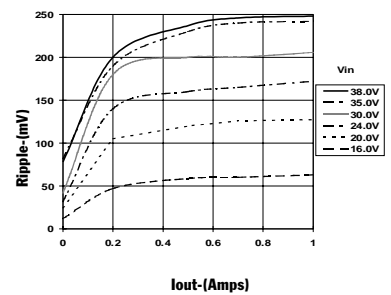


PT5102, 12.0 VDC (See Note 1)

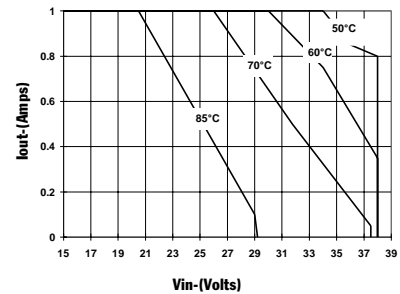
Efficiency vs Output Current



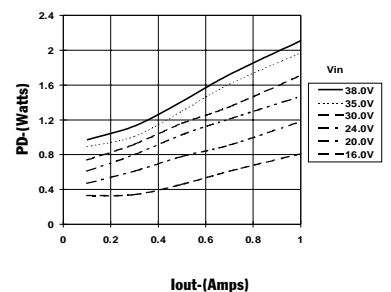
Ripple vs Output Current



Thermal Derating (Ta) (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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