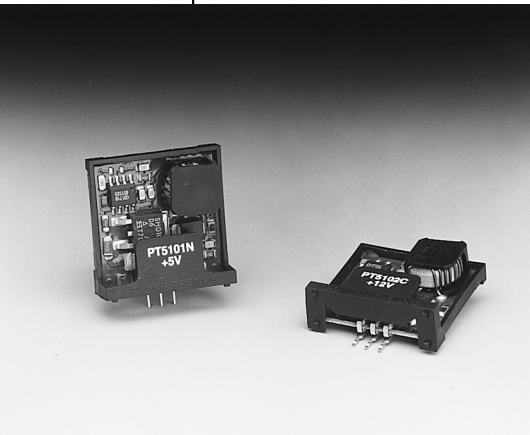


# PT5120 Series

**1 AMP LOW VOLTAGE INPUT  
INTEGRATED SWITCHING REGULATOR**

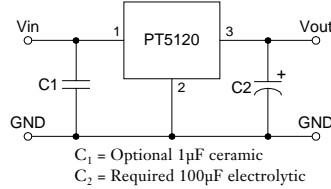
**SLTS080**  
(Revised 6/4/98)



- Low Voltage Input (7V)
- 85% Efficiency
- Internal Short-Circuit Protection
- Over-Temperature Protection
- Laser-Trimmed Output Voltage

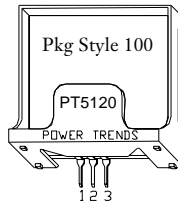
The PT5120 series is a low voltage input (typically 7V) version of Power Trends' easy-to-use, 1A positive step-down, 3-terminal Integrated Switching Regulators (ISRs). These ISRs are designed with premium low-threshold FETs for those power regulation applications requiring very low input/output voltage differentials such as battery powered equipment.

### Standard Application



### Pin-Out Information

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



### Ordering Information

**PT5121** □ = + 5 Volts  
**PT5123** □ = + 3.3 Volts

### PT Series Suffix (PT1234X)

Case/Pin Configuration	Suffix
Vertical Through-Hole	<b>N</b>
Horizontal Through-Hole	<b>A</b>
Horizontal Surface Mount	<b>C</b>

### Specifications

Characteristics ( $T_a = 25^\circ\text{C}$ unless noted)	Symbols	Conditions	PT5120 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	$V_{in}$	$0.1 \leq I_o \leq 1.0\ \text{A}$ $V_o = 3.3\ \text{V}$ $V_o = 5\ \text{V}$	7 7	—	26 38	V V
Output Voltage Tolerance	$\Delta V_o$	Over $V_{in}$ Range, $I_o = 1.0\ \text{A}$ $T_a = 0^\circ\text{C}$ to $+60^\circ\text{C}$	—	$\pm 1.5$	$\pm 3.0$	% $V_o$
Line Regulation	$Reg_{line}$	Over $V_{in}$ range	—	$\pm 0.5$	$\pm 1.0$	% $V_o$
Load Regulation	$Reg_{load}$	$0.1 \leq I_o \leq 1.0\ \text{A}$	—	$\pm 0.5$	$\pm 1.0$	% $V_o$
$V_o$ Ripple/Noise	$V_n$	$V_{in} = V_{in\ min}$ , $I_o = 1.0\ \text{A}$	—	$\pm 2$	—	% $V_o$
Transient Response with $C_o = 100\ \mu\text{F}$	$t_{rr}$ $V_{os}$	25% load change $V_o$ over/undershoot	— —	100 5.0	200 —	$\mu\text{Sec}$ % $V_o$
Efficiency	$\eta$	$V_{in} = 9\ \text{V}$ , $I_o = 0.5\ \text{A}$ , $V_o = 3.3\ \text{V}$ $V_{in} = 9\ \text{V}$ , $I_o = 0.5\ \text{A}$ , $V_o = 5\ \text{V}$	— —	82 85	— —	% %
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) $V_o = 3.3\ \text{V}$ $V_o = 5\ \text{V}$	-20 -20	— —	+80** +80**	$^\circ\text{C}$
Thermal Resistance	$\theta_{ja}$	Free Air Convection (40-60LFM) $V_o = 3.3\ \text{V}$ $V_o = 5\ \text{V}$	— —	45 50	— —	$^\circ\text{C}/\text{W}$
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.

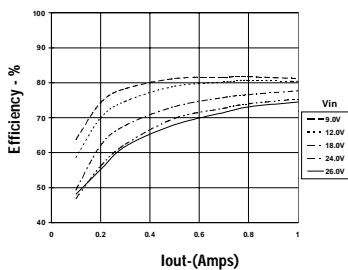
**Note:** The PT5120 Series requires a 100 $\mu\text{F}$  electrolytic or tantalum output capacitor for proper operation in all applications.

CHARACTERISTIC DATA

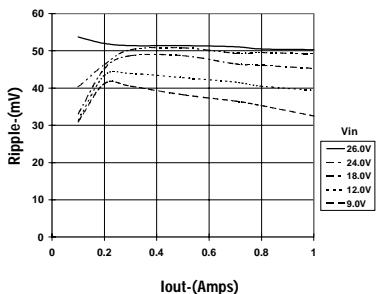
PT5120 Series

PT5123, 3.3 VDC (See Note 1)

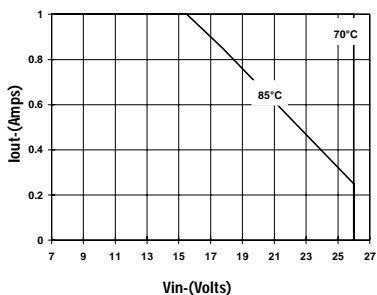
Efficiency vs Output Current



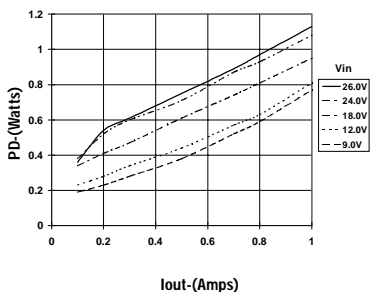
Ripple vs Output Current



Thermal Derating ( $T_a$ ) (See Note 2)

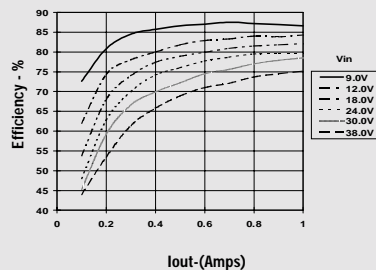


Power Dissipation vs Output Current

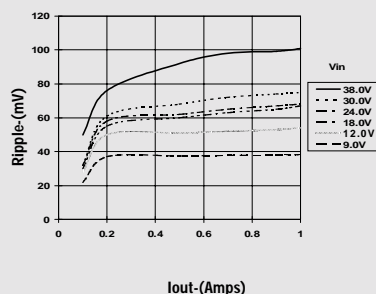


PT5121, 5.0 VDC (See Note 1)

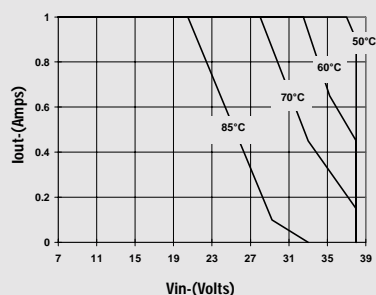
Efficiency vs Output Current



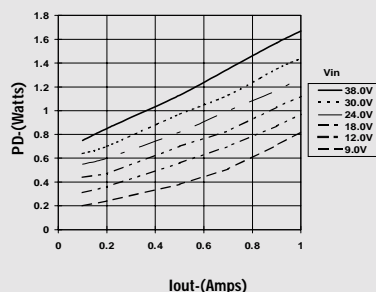
Ripple vs Output Current



Thermal Derating ( $T_a$ ) (See Note 2)



Power Dissipation vs Output Current



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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