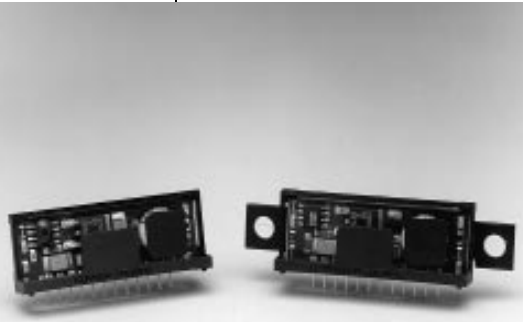


# PT6305 Series

**3 AMP HIGH-PERFORMANCE  
ADJUSTABLE ISR**

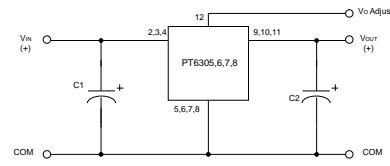


- Single-Device 5V to 3V Power
- 85% Efficiency
- Small SIP Footprint:  
0.36" x 2.00" x 0.60"(H)
- Wide Input Voltage Range:  
+4.5V to +9.0V
- Internal Short Circuit Protection
- Over-Temperature Protection

The PT6305N is Power Trends' new high performance +5V to +3.3V, 3

Amp, 12-Pin SIP (Single In-line-Package) Integrated Switching Regulator (ISR). This high-performance ISR allows easy integration of low-power 3.3V logic IC's into existing 5V systems without redesigning the central power supply. Only one external capacitor is required for proper operation. The PT6306,7,8 can be used to power high-speed data buses (+2.1V), or the new GTL (+1.2V) logic buses.

## Standard Application



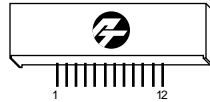
C<sub>1</sub> = Optional electrolytic (100µF)  
C<sub>2</sub> = Required 100µF electrolytic (No tantalum)  
See capacitor application note on page 43.

## Pin-Out Information

Pin No.	Function
1	N/C
2	V <sub>in</sub>
3	V <sub>in</sub>
4	V <sub>in</sub>
5	GND
6	GND

Pin No.	Function
7	GND
8	GND
9	V <sub>out</sub>
10	V <sub>out</sub>
11	V <sub>out</sub>
12	Adjust

(See page 40.)



## Ordering Information

PT6305□ = +3.3 Volts

PT6306□ = +1.8 Volts

PT6307□ = +2.1 Volts

PT6308□ = +1.2 Volts

(For dimensions, see page 66.)

## PT Series Suffix (PT1234X)

Case/Pin Configuration	Heat Tab Configuration	
	None	Side
Vertical Through-Hole	<b>N</b>	<b>R</b>
Horizontal Through-Hole	<b>A</b>	<b>G</b>
Horizontal Surface Mount	<b>C</b>	<b>B</b>

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

## Specifications

Characteristics (T <sub>a</sub> =25°C unless noted)	Symbols	Conditions	PT6305 SERIES				
			Min	Typ	Max	Units	
Output Current	I <sub>o</sub>	4.5 ≤ V <sub>in</sub> ≤ V <sub>in</sub> MAX	0.3	—	3.0**	ADC	
Current Limit	I <sub>cl</sub>	V <sub>in</sub> = +5V	—	3.6	5.0	ADC	
Short Circuit Current	I <sub>sc</sub>	V <sub>in</sub> = +5V	—	5.0	—	Apk	
Input Voltage Range	V <sub>in</sub>	0.3A ≤ I <sub>o</sub> ≤ 3.0A	PT6305N PT6306N PT6307N PT6308N	4.5 4.5 4.5 4.5	— — — —	9 9 9 6.0	VDC VDC VDC VDC
Static Voltage Tolerance	V <sub>o</sub>	V <sub>in</sub> = +5V, I <sub>o</sub> = 3.0A 0°C ≤ T <sub>a</sub> ≤ +70°C	PT6305N PT6306N PT6307N PT6308N	3.2 1.7 2.0 1.1	3.3 1.8 2.1 1.2	3.4 1.9 2.2 1.3	VDC VDC VDC VDC
Line Regulation	Reg <sub>line</sub>	4.5V ≤ V <sub>in</sub> ≤ 5.5V, I <sub>o</sub> = 3.0A	—	±25	±50	—	mV
Load Regulation	Reg <sub>load</sub>	V <sub>in</sub> = +5V, 0.3 ≤ I <sub>o</sub> ≤ 3.0A	—	±25	±50	—	mV
V <sub>o</sub> Ripple/Noise pk-pk	V <sub>n</sub>	V <sub>in</sub> = 5V, I <sub>o</sub> = 3.0A	—	66	—	—	mV
Transient Response with C <sub>2</sub> = 100µF	t <sub>tr</sub> V <sub>os</sub>	I <sub>o</sub> step between 1.5A and 3.0A V <sub>o</sub> over/undershoot	— —	200 200	— —	— —	µSec mV
Efficiency	η	V <sub>in</sub> = +5V, I <sub>o</sub> = 1.5A	PT6305N PT6306N PT6307N PT6308N	— — — —	85 74 77 63	— — — —	% % % %
		V <sub>in</sub> = +5V, I <sub>o</sub> = 3.0A	PT6305N PT6306N PT6307N PT6308N	— — — —	80 68 72 57	— — — —	% % % %
Switching Frequency	f <sub>o</sub>	4.5 ≤ V <sub>in</sub> ≤ V <sub>in</sub> MAX 0.3A ≤ I <sub>o</sub> ≤ 3.0A	—	500	650	800	KHz
Operating Temperature	T <sub>a</sub>	Free Air Convection (40-60 LFM) Over V <sub>in</sub> and I <sub>o</sub> Ranges	—	0	—	+70*	°C
Thermal Resistance	θ <sub>ja</sub>	Free Air Convection (40-60 LFM)	—	25	—	—	°C/W
Storage Temperature	T <sub>s</sub>	—	—	-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	—	—	—	—	11.2	—	grams
Relative Humidity	—	Non-condensing	—	0	—	95	%

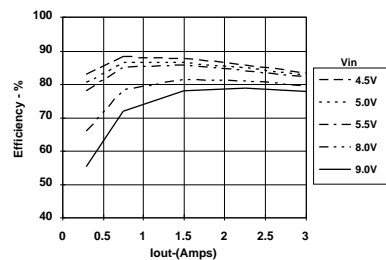
\*See Thermal Derating chart. \*\*The PT6305 Series can be easily paralleled to provide output current in multiples of 3 amps. Please contact a Power Trends' Application Engineer for the appropriate application note. **Note:** The PT6305 Series requires a 100µF electrolytic capacitor for proper operation in all applications.

**CHARACTERISTIC DATA**

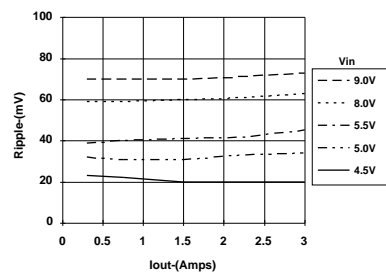
**PT6305, 3.3 VDC**

(See Note 1)

**Efficiency vs Output Current**

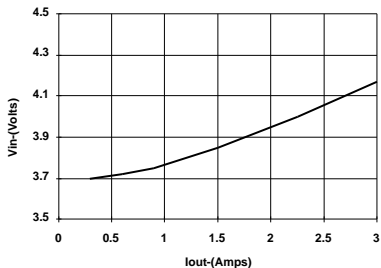


**Ripple vs Output Current**



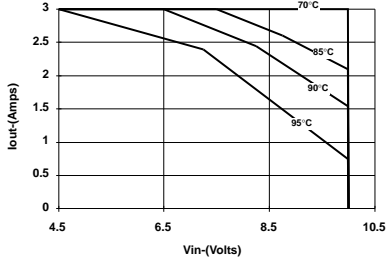
**Minimum Input Voltage**

(See Note 2)

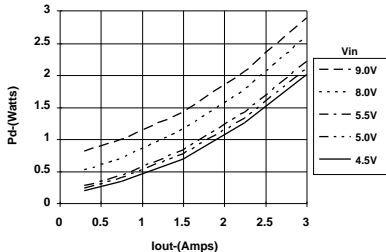


**Thermal Derating (Ta)**

(See Note 3)



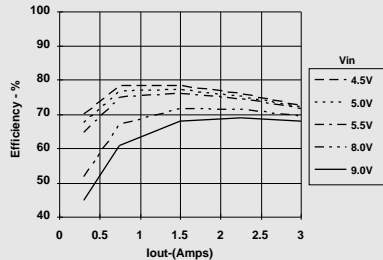
**Power Dissipation vs Output Current**



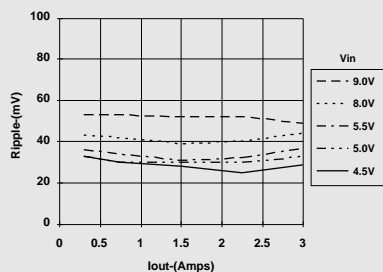
**PT6307, 2.1 VDC**

(See Note 1)

**Efficiency vs Output Current**

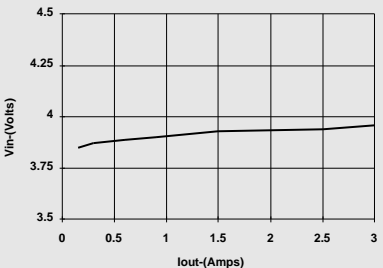


**Ripple vs Output Current**



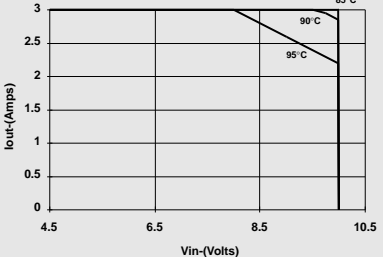
**Minimum Input Voltage**

(See Note 2)

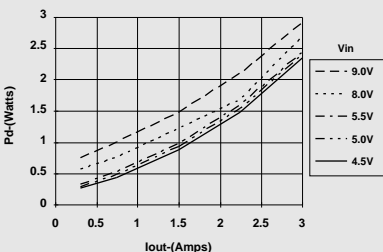


**Thermal Derating (Ta)**

(See Note 3)



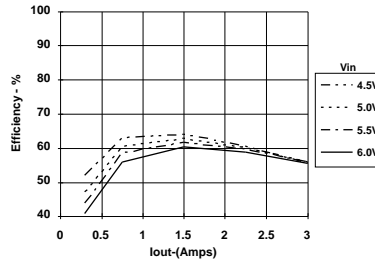
**Power Dissipation vs Output Current**



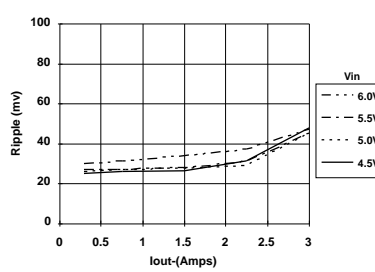
**PT6308, 1.2 VDC**

(See Note 1)

**Efficiency vs Output Current**

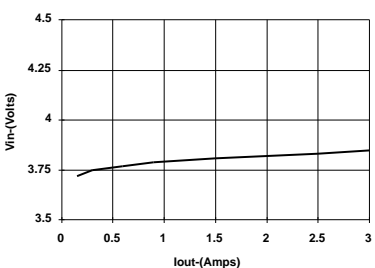


**Ripple vs Output Current**



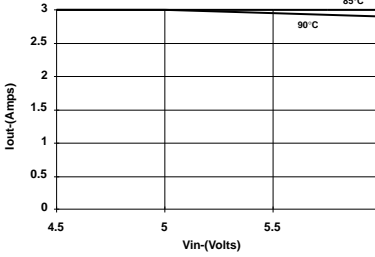
**Minimum Input Voltage**

(See Note 2)

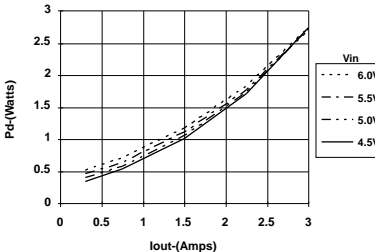


**Thermal Derating (Ta)**

(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 Vin data is typical and is not guaranteed. The data corresponds to a 2% output voltage drop.

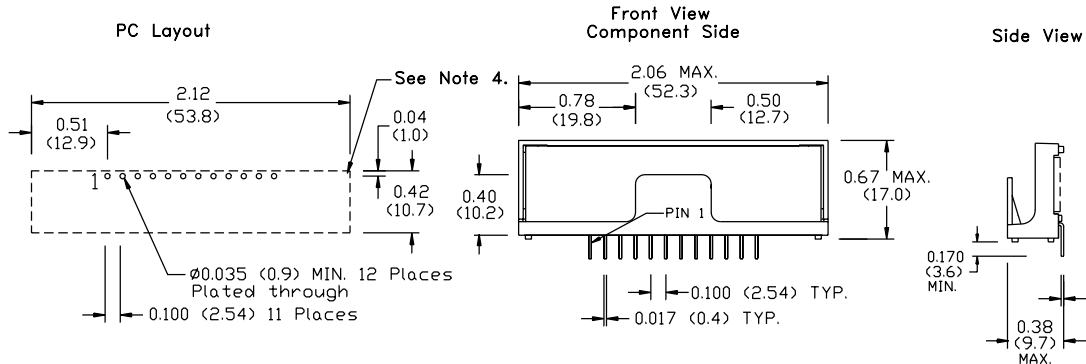
**Note 3:** Thermal derating graphs are developed in free air convection cooling of 40-60 LFM with no optional heat tab soldered in a printed circuit board. (See Thermal Application Notes).

**Package Style 300**  
Suffix A, C, D, E, N, P

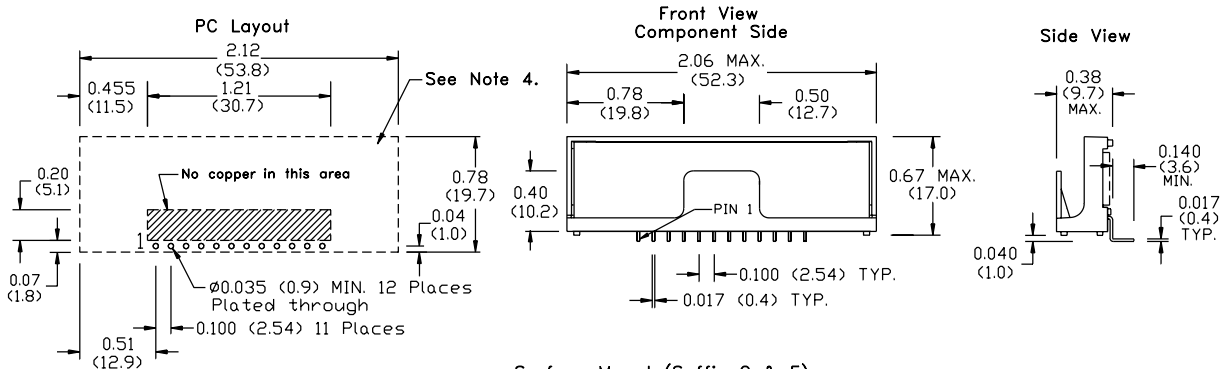
**PACKAGE INFORMATION AND DIMENSIONS**

**Revised 2/11/2000**

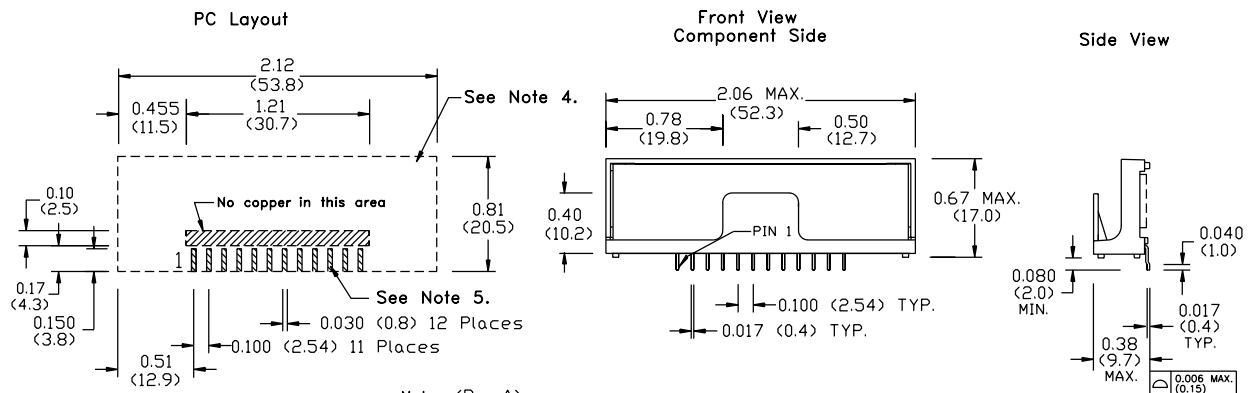
**Vertical Through-Hole Mount (Suffix N & P)**



**Horizontal Through-Hole Mount (Suffix A & D)**



**Surface Mount (Suffix C & E)**



**Notes: (Rev.A)**

- 1: All dimensions are in inches (mm).
- 2: 2 place decimals are  $\pm 0.30$  ( $\pm 0.8$ mm).
- 3: 3 place decimals are  $\pm 0.10$  ( $\pm 0.3$ mm).
- 4: Recommended mechanical keep out area.
- 5: Power pin connections should utilize two or more vias per input, ground and output pin.

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