

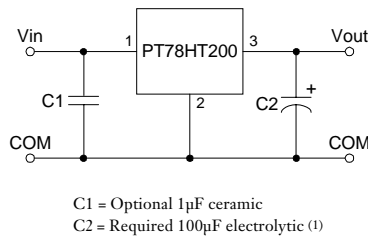
- High Efficiency: Up to 90%
- Wide Input Range
- Self-Contained Inductor
- Short-Circuit Protection
- Over-Temperature Protection
- Fast Transient Response

The PT78HT200 is a series of fixed output, wide-input range, 3-terminal Integrated Switching Regulators (ISRs). These ISRs have a maximum output

current of 2A. The output voltage is also laser trimmed for high accuracy. Features include excellent line and load regulation, internal short-circuit and over-temperature protection.

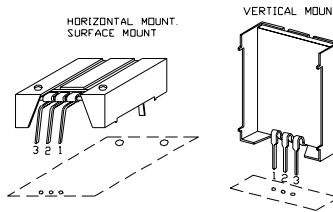
The PT78HT200 series is available in three package outlines, including horizontal SMD. Their small size and output voltage selection makes these regulators ideal for use in a variety of applications.

### Standard Application



### Pin-Out Information

Pin	Function
1	V <sub>in</sub>
2	GND
3	V <sub>out</sub>



SUGGESTED BOARD LAYOUT COMPONENT SIDE VIEW  
Pkg Style 500

### Ordering Information

PT78HT2	XX	Y
Output Voltage		Package Suffix
33	= 3.3 Volts	V = Vertical Mount
05	= 5.0 Volts	S = Surface Mount
53	= 5.25 Volts	H = Horizontal Mount
65	= 6.5 Volts	
08	= 8.0 Volts	

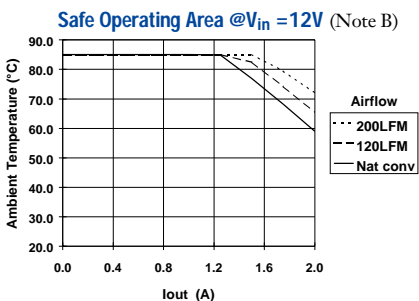
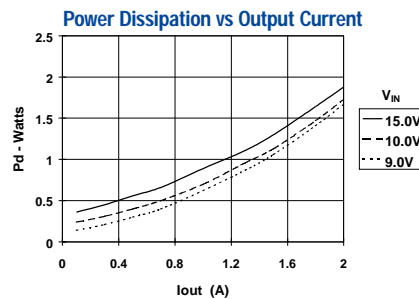
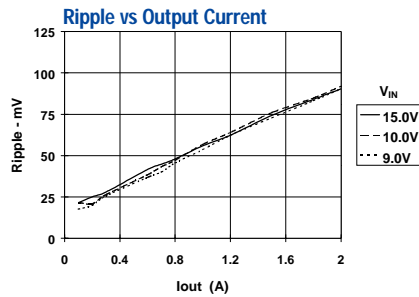
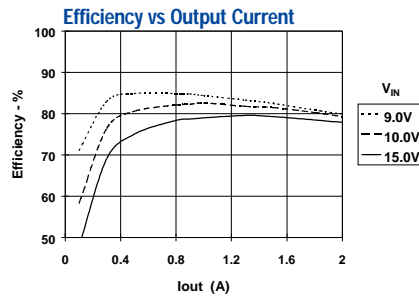
### Specifications

Characteristics (T <sub>a</sub> = 25°C unless noted)	Symbols	Conditions	PT78HT200 SERIES			
			Min	Typ	Max	Units
Output Current	I <sub>O</sub>	Over V <sub>in</sub> range	0.1 (2)	—	2.0	A
Short Circuit Current	I <sub>sc</sub>	V <sub>in</sub> = V <sub>in</sub> min	—	6.0	—	Apk
Input Voltage Range	V <sub>in</sub>	0.1 ≥ I <sub>O</sub> ≥ 2.0A	V <sub>O</sub> = 3.3V 9 V <sub>O</sub> = 5.0V 9 V <sub>O</sub> = 6.5V 10.5 V <sub>O</sub> = 8.0V 12	—	15 28 28 28	V
Output Voltage Tolerance	ΔV <sub>O</sub>	Over V <sub>in</sub> range, I <sub>O</sub> = 2.0A T <sub>a</sub> = 0°C to +60°C	—	±1.0	±2.0	%V <sub>O</sub>
Line Regulation	Reg <sub>line</sub>	Over V <sub>in</sub> range	—	±0.4	±0.8	%V <sub>O</sub>
Load Regulation	Reg <sub>load</sub>	0.1 ≤ I <sub>O</sub> ≤ 2.0A	—	±0.2	±0.4	%V <sub>O</sub>
V <sub>O</sub> Ripple/Noise	V <sub>n</sub>	V <sub>in</sub> = V <sub>in</sub> min, I <sub>O</sub> = 2.0A	—	±1	—	%V <sub>O</sub>
Transient Response (with 100 $\mu$ F output cap)	t <sub>tr</sub>	50% load change V <sub>O</sub> over/undershoot	—	100 5.0	—	$\mu$ Sec %V <sub>O</sub>
Efficiency	$\eta$	V <sub>in</sub> = 9V, I <sub>O</sub> = 2.0A V <sub>in</sub> = 12V, I <sub>O</sub> = 2.0A V <sub>in</sub> = 15V, I <sub>O</sub> = 2.0A	V <sub>O</sub> = 3.3V — V <sub>O</sub> = 5.0V — V <sub>O</sub> = 8.0V —	— 80 85 90	— — —	%
Switching Frequency	f <sub>o</sub>	Over V <sub>in</sub> and I <sub>O</sub> ranges	V <sub>O</sub> ≥ 5.0V 950 V <sub>O</sub> = 3.3V	750 1,000	800 1,050	kHz
Absolute Maximum Operating Temperature Range	T <sub>a</sub>	Over V <sub>in</sub> range	-40	—	+85 (3)	°C
Thermal Resistance	$\theta_{ja}$	Free Air Convection, (40-60LFM)	—	40	—	°C/W
Storage Temperature	T <sub>s</sub>	—	-40	—	+125	°C
Mechanical Shock	—	Per Mil-STD-883D, Method 2002.3	—	500	—	G's
Mechanical Vibration	—	Per Mil-STD-883D, Method 2007.2, 20-2000 Hz, soldered in a PC board	—	5	—	G's
Weight	—	—	—	6.5	—	Grams

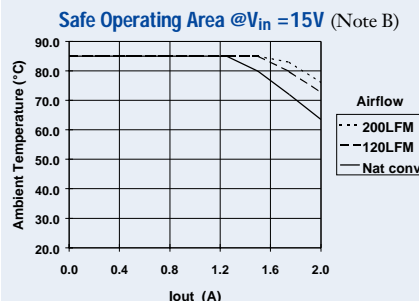
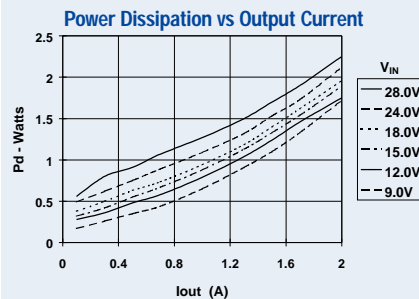
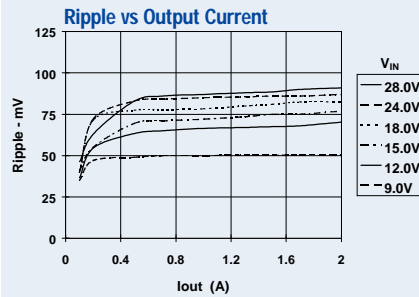
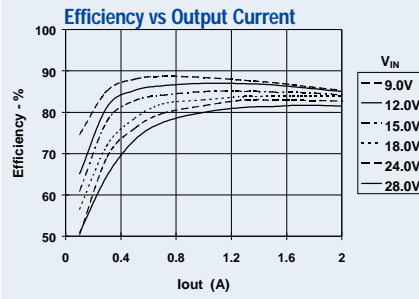
Notes: (1) The PT78HT200 Series requires a 100 $\mu$ F electrolytic or tantalum output capacitor for proper operation in all applications.  
(2) ISR will operate down to no load with reduced specifications.  
(3) See Safe Operating Area curves for derating

2 Amp Positive Step-Down  
Integrated Switching Regulator

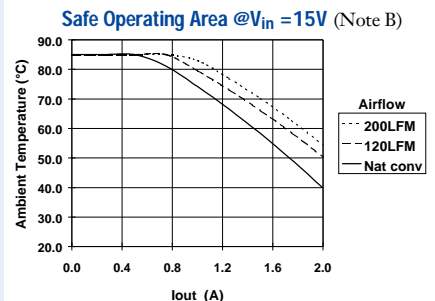
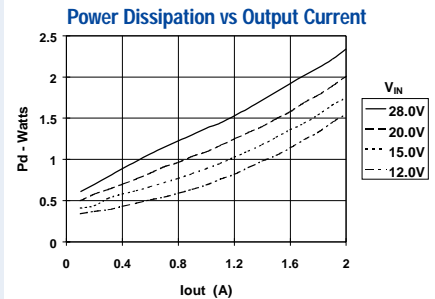
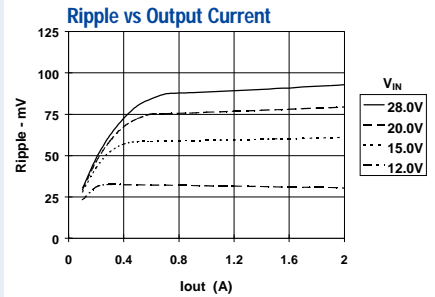
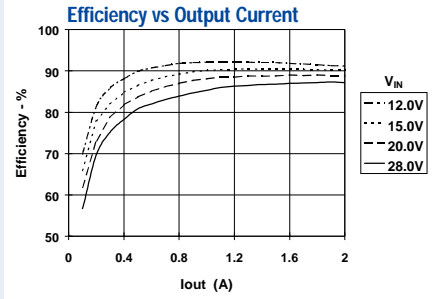
PT78HT233 3.3 VDC (See Note A)



PT78HT205 5.0 VDC (See Note A)



PT78HT208 8.0 VDC (See Note A)



Note A: All characteristic data has been developed from actual products tested at 25°C. This data is considered typical data for the ISR.

Note B: SOA curves represent operating conditions at which internal components are at or below manufacturer's maximum rated operating temperatures.

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