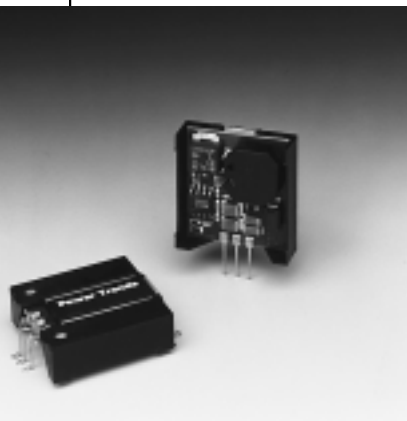
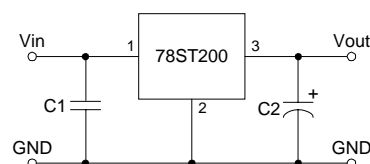


78ST200 Series**2 AMP POSITIVE STEP-DOWN
INTEGRATED SWITCHING REGULATOR****Revised 6/30/98**

- High Efficiency > 82%
- Wide Input Range
- Self-Contained Inductor
- Short-Circuit Protection
- Over-Temperature Protection
- Fast Transient Response

The 78ST200 is a series of wide input voltage, 3 terminal Integrated Switching Regulators (ISRs). Employing a ceramic substrate, these ISRs have a maximum output current of 2A. The output voltage is laser trimmed for high accuracy.

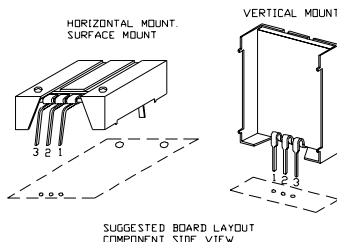
The 78ST200 series regulators have internal short-circuit and over-temperature protection and may be used in a wide variety of applications.

Standard Application

C1 = Optional 1 μ F ceramic
C2 = Required 100 μ F electrolytic

Pin-Out Information

Pin No.	Function
1	V_{in}
2	GND
3	V_{out}

**Ordering Information****78ST2 XX Y C**

Output Voltage

33 = 3.3 Volts
35 = 3.45 Volts
05 = 5.0 Volts

Package Suffix

V = Vertical Mount
S = Surface Mount
H = Horizontal Mount

(For dimensions and PC board layout see Package Style 500.)

Specifications

Characteristics ($T_a = 25^\circ\text{C}$ unless noted)	Symbols	Conditions	78ST200 SERIES			
			Min	Typ	Max	Units
Output Current	I_o	Over V_{in} range	0.1*	—	2.0	A
Input Voltage Range	V_{in}	$I_o = 0.1$ to 3.0A $V_o < 3.5\text{V}$ $V_o = 5.0\text{V}$	7 8	—	15 20	V V
Output Voltage Tolerance	ΔV_o	Over V_{in} range, $I_o = 2.0\text{A}$ $T_a = 0^\circ\text{C}$ to $+60^\circ\text{C}$	—	± 1.0	± 2.0	% V_o
Line Regulation	Reg_{line}	Over V_{in} range	—	± 0.4	± 0.8	% V_o
Load Regulation	Reg_{load}	$0.1 \leq I_o \leq 2.0\text{A}$	—	± 0.2	± 0.4	% V_o
Ripple/Noise	V_n	$V_{in} = V_{in\text{ min}}$, $I_o = 2.0\text{A}$	—	1	—	% V_o
Transient Response (with 100 μF output cap)	t_{tr}	50% load change V_o over/undershoot	—	100 5.0	—	μSec % V_o
Efficiency	η	$V_{in} = 9\text{V}$, $I_o = 2.0\text{A}$, $V_o = 5\text{V}$	—	82	—	%
Switching Frequency	f_o	Over V_{in} and I_o ranges	0.95	1.0	1.05	MHz
Absolute Maximum Operating Temperature Range	T_a	—	-40	—	+85	$^\circ\text{C}$
Recommended Operating Temperature Range	T_a	Free Air Convection, (40-60LFM) Over V_{in} and I_o ranges	-40	—	+85**	$^\circ\text{C}$
Thermal Resistance	θ_{ja}	Free Air Convection, (40-60LFM)	—	38	—	$^\circ\text{C}/\text{W}$
Storage Temperature	T_s	—	-40	—	+125	$^\circ\text{C}$
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	—	—	—	7	—	Grams

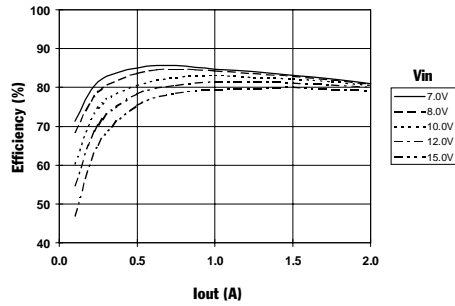
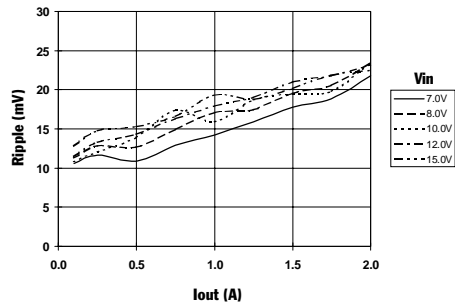
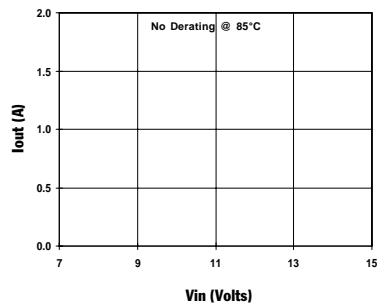
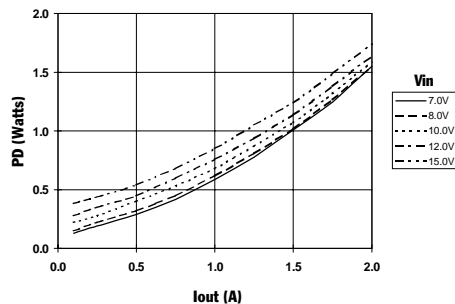
* ISR will operate down to no load with reduced specifications.

** See Thermal Derating chart.

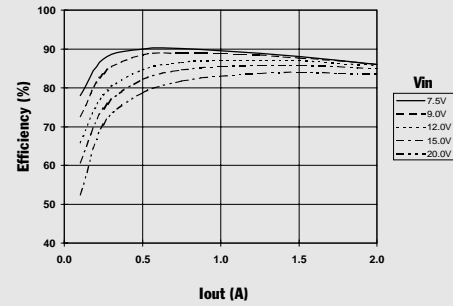
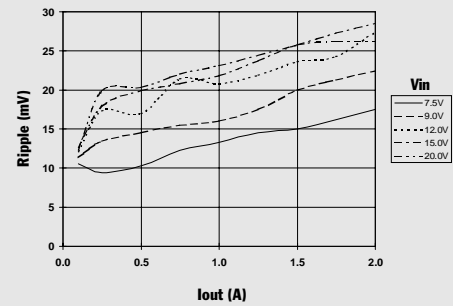
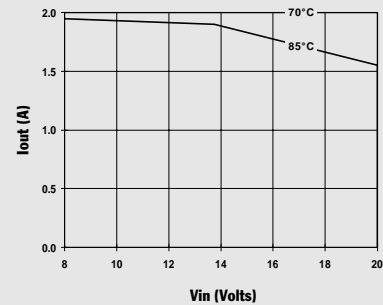
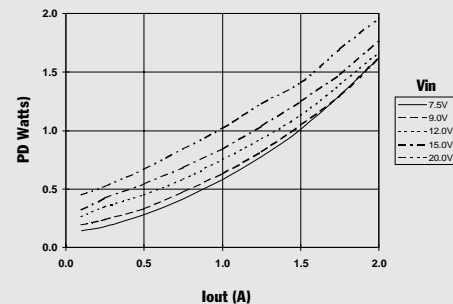
Note: The 78ST200 Series requires a 100 μF electrolytic or tantalum output capacitor for proper operation in all applications.

CHARACTERISTIC DATA**78ST200 Series****78ST233_ 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****78ST205_ 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 Note)

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