

PT78ST200 Series

12V 2 AMP POSITIVE STEP-DOWN INTEGRATED SWITCHING REGULATOR

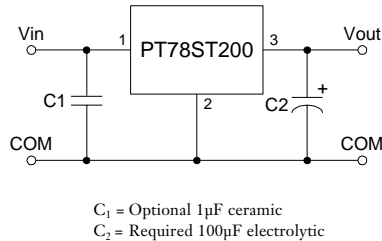
Revised 5/15/98



- High Efficiency > 87%
- Wide Input Range
- Aluminum Heatsink for Applications with Airflow
- Self-Contained Inductor
- Short Circuit Protection
- Over-Temperature Protection
- Pin Compatible with Linear 3-Terminal, "78" Series Regulators
- Small Footprint

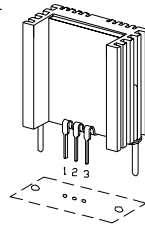
The Power Trends' PT78ST200 is a new 3-terminal Integrated Switching Regulator (ISR) that can supply up to 24 watts of regulated 12V power. With a surge capability of 3 Amps and an output voltage that is laser trimmed, it is ideal for inductive load applications such as disk drive motors.

Standard Application



Pin-Out Information

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



SUGGESTED BOARD LAYOUT COMPONENT SIDE VIEW

Pkg Style 600

Ordering Information

PT78ST2 **XX** **Y**

Output Voltage
12 = 12.0 Volts

Package Suffix
V = Vertical Mount

Specifications

Characteristics ($T_a = 25^\circ\text{C}$ unless noted)	Symbols	Conditions	PT78ST200 SERIES			Units
			Min	Typ	Max	
Output Current	I_o	Over V_{in} range With forced air cooling	0.1*	—	2.0	A
Short Circuit Current	I_{sc}	$V_{in} = V_{in\ min}$	—	5.0	—	Apk
Input Voltage Range	V_{in}	$0.1 \leq I_o \leq 2.0\text{A}$	16	—	28	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
V_o Ripple/Noise	V_n	$V_{in} = 17\text{V}$, $I_o = 2.0\text{A}$, $V_o = 12\text{V}$	—	120	—	mV _{pp}
Transient Response (with 100 μ F output cap)	t_{tr}	50% load change V_o over/undershoot	—	100	—	μ Sec
Efficiency	η	$V_{in} = 17\text{V}$, $I_o = 2.0\text{A}$	—	87	—	%
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	—	+65	$^\circ\text{C}$
Recommended Operating Temperature Range	T_a	Free Air Convection, (40-60LFM) at $V_{in} = 24\text{V}$, $I_o = 2\text{A}$	-40	—	+55**	$^\circ\text{C}$
Thermal Resistance	θ_{ja}	Free Air Convection, (40-60LFM)	—	35	—	$^\circ\text{C}/\text{W}$
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	—	10	—	G's
Weight	—	—	—	11	—	Grams

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

**See Thermal Derating chart.

Note: The PT78ST200 Series requires a 100 μ F electrolytic or tantalum output capacitor for proper operation in all applications.

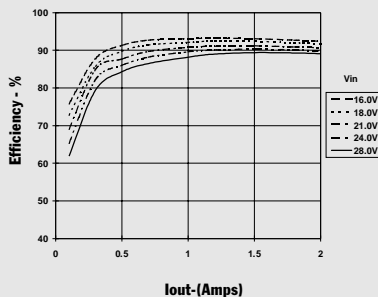
PT78ST200 Series

CHARACTERISTIC DATA

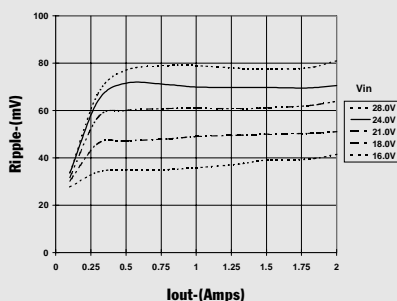
Wide Input Range Products
DATA SHEETS

PT78ST212 12.0 VDC (See Note 1)

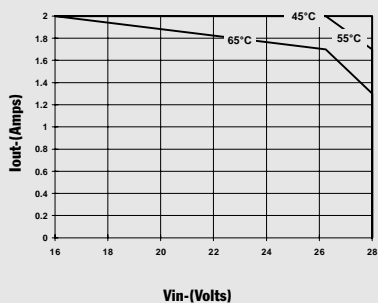
Efficiency vs Output Current



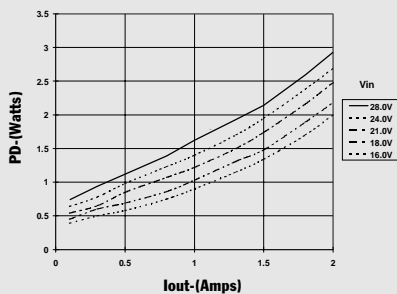
Ripple vs Output Current



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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