

PT78ST200 Series

12V 2 Amp Positive Step-Down
Integrated Switching Regulator

Power Trends Products
from Texas Instruments

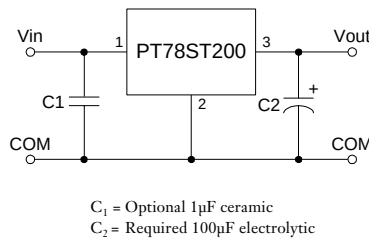
SLTS060A

(Revised 6/30/2000)

- 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

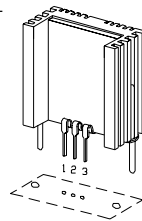
The Power Trends' PT78ST200 is a series of 3-terminal Integrated Switching Regulators (ISRs) that can supply up to 24 watts of regulated 12V power. With a surge capability of 3 Amps and an output voltage that is laser trimmed, it is ideal for inductive load applications such as disk drive motors.

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°C unless noted)	Symbols	Conditions	PT78ST200 SERIES			
			Min	Typ	Max	Units
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	—	A _{pk}
Input Voltage Range	V _{in}	0.1 ≤ I _O ≤ 2.0A	16	—	28	V
Output Voltage Tolerance	ΔV _O	Over V _{in} range, I _O = 2.0A T _a = 0°C to +60°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 ≤ I _O ≤ 2.0A	—	±0.2	±0.4	%V _O
V _O Ripple/Noise	V _n	V _{in} = 17V, I _O = 2.0A, V _O = 12V	—	120	—	mV _{pp}
Transient Response (with 100µF output cap)	t _{tr}	50% load change V _O over/undershoot	—	100 5.0	—	µSec %V _O
Efficiency	η	V _{in} = 17V, I _O = 2.0A	—	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	°C
Recommended Operating Temperature Range	T _a	Free Air Convection, (40-60LFM) at V _{in} = 24V, I _O = 2A	-40	—	+55**	°C
Thermal Resistance	θ _{ja}	Free Air Convection, (40-60LFM)	—	35	—	°C/W
Storage Temperature	T _s	—	-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	—	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 100µF electrolytic or tantalum output capacitor for proper operation in all applications.

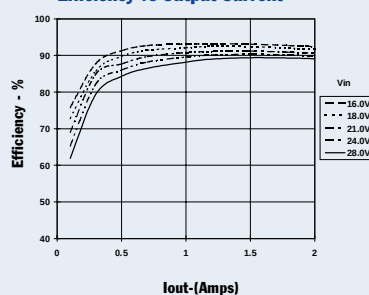
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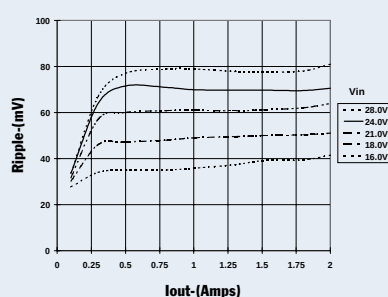
Typical Characteristics

PT78ST212 12.0 VDC (See Note 1)

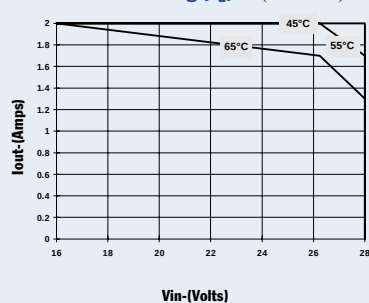
Efficiency vs Output Current



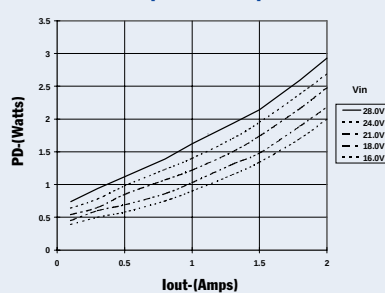
Ripple vs Output Current



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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