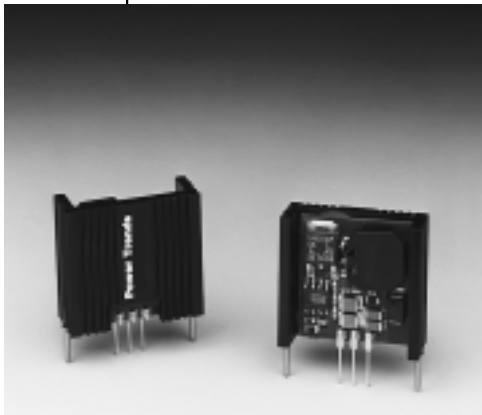


# 78ST300 Series

**3 AMP POSITIVE STEP-DOWN  
INTEGRATED SWITCHING REGULATOR**

**Revised 6/30/98**

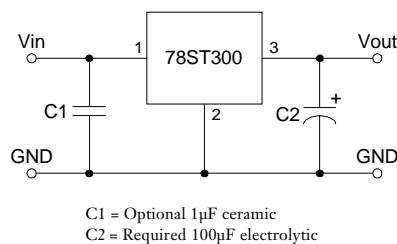


- High Efficiency > 80%
- Wide Input Range
- Self-Contained Inductor
- Short-Circuit Protection
- Over-Temperature Protection
- Fast Transient Response

The 78ST300 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 3A. The output voltage is laser trimmed for high accuracy.

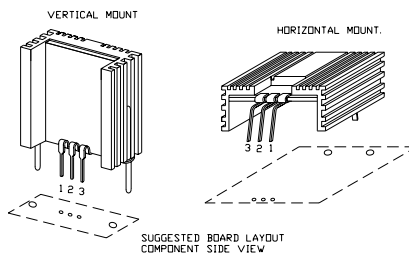
The 78ST300 series regulators have internal short-circuit and over-temperature protection and may be used in a wide variety of applications.

### Standard Application



### Pin-Out Information

Pin No.	Function
1	V <sub>in</sub>
2	GND
3	V <sub>out</sub>



### Ordering Information

78ST3 **XX** **Y** **C**

Output Voltage  
**05** = 5.0 Volts

Package Suffix  
**V** = Vertical Mount  
**H** = Horizontal Mount

(For dimensions and PC board layout see Package Style 600.)

### Specifications

Characteristics (T <sub>a</sub> = 25°C unless noted)	Symbols	Conditions	78ST300 SERIES			Units
			Min	Typ	Max	
Output Current	I <sub>o</sub>	Over V <sub>in</sub> range	0.1*	—	3.0	A
Input Voltage Range	V <sub>in</sub>	I <sub>o</sub> = 0.1 to 3.0A	8	—	20	V
Output Voltage Tolerance	$\Delta V_o$	Over V <sub>in</sub> range 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> ≤ 3.0A	—	±0.2	±0.4	%V <sub>o</sub>
Ripple/Noise	V <sub>n</sub>	V <sub>in</sub> = V <sub>in</sub> min, I <sub>o</sub> = 3.0A	—	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> = 3.0A	—	80	—	%
Switching Frequency	f <sub>o</sub>	Over V <sub>in</sub> and I <sub>o</sub> ranges	0.95	1.0	1.05	MHz
Absolute Maximum Operating Temperature Range	T <sub>a</sub>	—	-40	—	+70	°C
Recommended Operating Temperature Range	T <sub>a</sub>	Free Air Convection, (40-60LFM) Over V <sub>in</sub> and I <sub>o</sub> ranges	-40	—	+70**	°C
Thermal Resistance	$\theta_{ja}$	Free Air Convection, (40-60LFM)	—	35	—	°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	—	10	—	G's
Weight	—	—	—	11	—	Grams

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

\*\* See Thermal Derating chart.

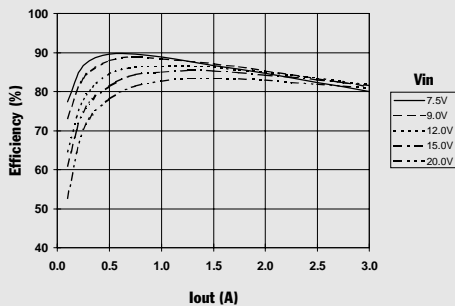
**Note:** The 78ST300 Series requires a 100 $\mu$ F electrolytic or tantalum output capacitor for proper operation in all applications.

**CHARACTERISTIC DATA**

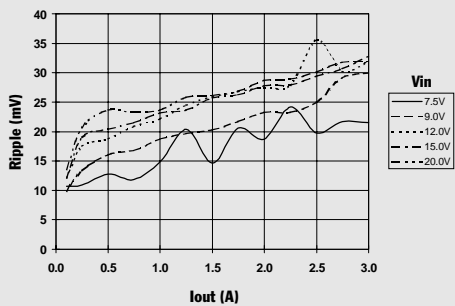
**78ST305\_ 5.0 VDC**

(See Note 1)

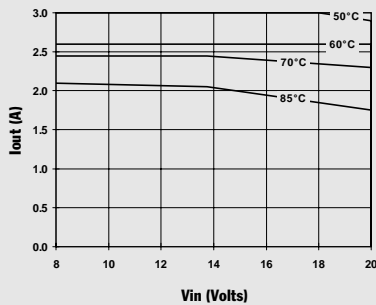
**Efficiency vs Output Current**



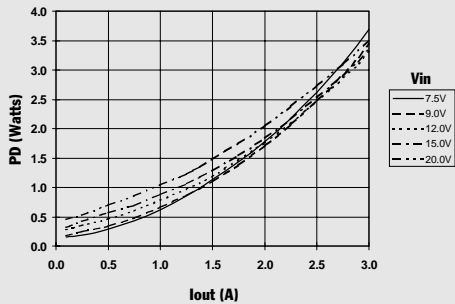
**Ripple vs Output Current**



**Thermal Derating (T<sub>a</sub>)** (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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