

# 78ST212 Series

**12V 2 AMP POSITIVE STEP-DOWN  
INTEGRATED SWITCHING REGULATOR**

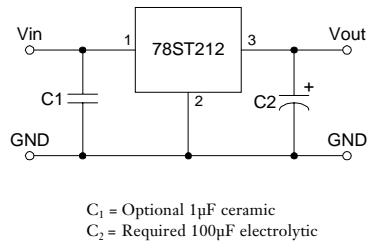
**Revised 6/30/98**



- High Efficiency > 87%
- Wide Input Range
- Aluminum Heatsink for Applications with Airflow
- Self-Contained Inductor
- Short Circuit Protection
- Over-Temperature Protection

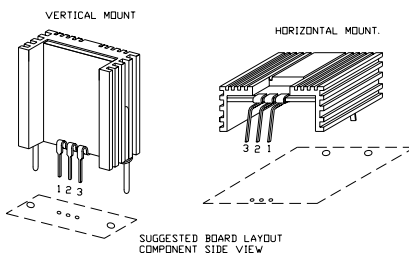
The 78ST212 is a series of wide input voltage, 3-terminal Integrated Switching Regulators (ISRs). With a surge capability of 3A and an output voltage that is laser trimmed, it is ideal for inductive load applications such as disk drive motors.

### Standard Application

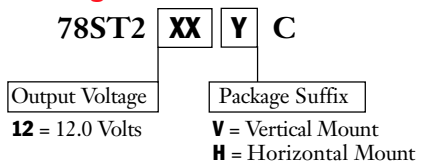


### Pin-Out Information

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



### Ordering Information



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

### Specifications

Characteristics (T <sub>a</sub> = 25°C unless noted)	Symbols	Conditions	78ST212 SERIES			Units
			Min	Typ	Max	
Output Current	I <sub>o</sub>	Over V <sub>in</sub> range With forced air cooling	0.1*	—	2.0	A
Input Voltage Range	V <sub>in</sub>	0.1 ≤ I <sub>o</sub> ≤ 2.0A	14.5	—	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 +55°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> = 17V, I <sub>o</sub> = 2.0A, V <sub>o</sub> = 12V	—	1.0	—	%V <sub>o</sub>
Transient Response (with 100µF output cap)	t <sub>tr</sub>	50% load change V <sub>o</sub> over/undershoot	—	100	—	µSec
Efficiency	η	V <sub>in</sub> = 17V, I <sub>o</sub> = 2.0A	—	87	—	%
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	—	+65	°C
Recommended Operating Temperature Range	T <sub>a</sub>	Free Air Convection, (40-60LFM) at V <sub>in</sub> = 24V, I <sub>o</sub> = 2A	-40	—	+55**	°C
Thermal Resistance	θ <sub>ja</sub>	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.

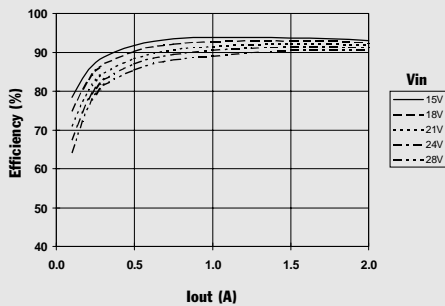
**Note:** The 78ST212 Series requires a 100µF electrolytic or tantalum output capacitor for proper operation in all applications.

**CHARACTERISTIC DATA**

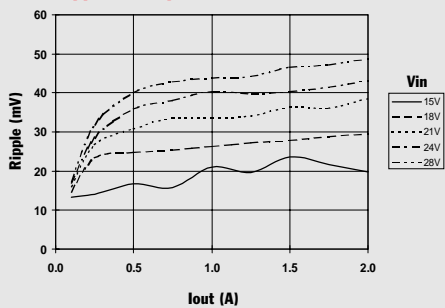
**78ST212 Series**

**78ST212\_ 12.0 VDC** (See Note 1)

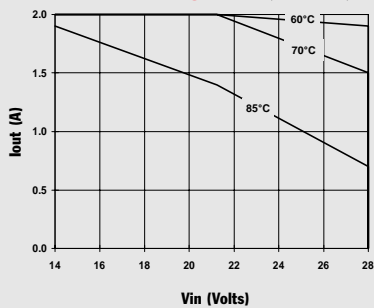
**Efficiency vs Output Current**



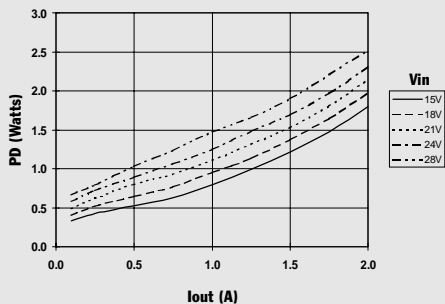
**Ripple vs Output Current**



**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 Notes.)

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