PT78ST100 Series

1.5 Amp Positive Step-Down **Integrated Switching Regulator**



Power Trends Products from Texas Instruments

SLTS059A (Revised 6/30/2000)

Very Small Footprint

- High Efficiency > 85%
- Self-Contained Inductor
- Internal Short-Circuit Protection
- Over-Temperature Protection
- Fast Transient Response
- Wide Input Range •

The PT78ST100 is a series of wideinput range, 3-terminal regulators.

These ISRs have a maximum output current of 1.5 Amps and an output voltage that is laser trimmed to a variety of industry standard voltages

These 78 series regulators have excellent line and load regulation with internal short- circuit and over-temperature protection, and are offered in a variety of standard output voltages. These ISRs are very flexible and may be used in a wide variety of applications.

Package Suffix

H = Horizontal

Mount

V = Vertical Mount

S = Surface Mount

Ordering Information PT78ST1 XX || Y

Output Voltage

33 = 3.3 Volts

36 = 3.6 Volts

05 = 5.0 Volts

51 = 5.1 Volts

06 = 6.0 Volts

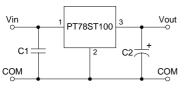
65 = 6.5 Volts

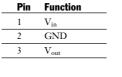
07 = 7.0 Volts **08** = 8.0 Volts **09** = 9.0 Volts

10 = 10.0 Volts

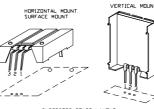
53 = 5.25 Volts

Weight





Pin-Out Information



Specifications			12 = 12.0 Volts 14 = 13.9 Volts 15 = 15.0 Volts			
Characteristics			PT78ST100 SERIES			
(T _a = 25°C unless noted)	Symbols	Conditions	Min	Тур	Max	Units
Output Current	Io	Over V _{in} range	0.1*	—	1.5	А
Short Circuit Current	I _{sc}	V _{in} = V _{in} min	_	3.5	_	Apk
Input Voltage Range	V_{in}	$0.1 \le I_o \le 1.5A$ $V_o = 3.3V$ $V_o = 5V$ $V_o = 12V$	9 9 16	Ξ	26 38 38	V V V
Output Voltage Tolerance	ΔV_{o}	Over V_{in} range, I_0 =1.5A T_a = 0°C to +60°C	—	±1.0	±2.0	%V _o
Line Regulation	Reg _{line}	Over V _{in} range	_	±0.2	±0.4	%Vo
Load Regulation	Reg _{load}	$0.1 \le I_o \le 1.5 A$	_	±0.1	±0.2	%Vo
V _o Ripple/Noise	V_n	V_{in} = 9V, I_o = 1.5A V_o = 5V V_{in} = 16V, I_o = 1.5A V_o = 12V	—	65 90	—	${ m mV_{pp}} { m mV_{pp}}$
Transient Response (with 100µF output cap)	t _{tr}	50% load change V_o over/undershoot	_	100 5	_	μSec %Vo
Efficiency	η	$\begin{array}{lll} V_{in}{=}\;10V,I_{o}{=}\;1A & V_{o}{=}\;3.3V \\ V_{in}{=}\;10V,I_{o}{=}\;1A & V_{o}{=}\;5V \\ V_{in}{=}\;17V,I_{o}{=}\;1A & V_{o}{=}\;12V \end{array}$	_	80 85 90	Ξ	% % %
Switching Frequency	f_{o}	Over V _{in} range, I _o =1.5A	600	650	700	kHz
Absolute Maximum Operating Temperature Range	T _a	—	-40	—	+85	°C
Recommended Operating Temperature Range	Ta	Free Air Convection, (40-60LFM) At V _{in} = 24V, I _o =1.0A	-40	—	+80**	°C
Thermal Resistance	θ_{ja}	Free Air Convection, (40-60LFM)	_	45	_	°C/W
Storage Temperature	Ts	—	-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	_	5	—	G's

**See Thermal Derating chart. *ISR will operate down to no load with reduced specifications.

Note: The PT78ST100 Series requires a 100µF electrolytic or tantalum output capacitor for proper operation in all applications.

Standard Application





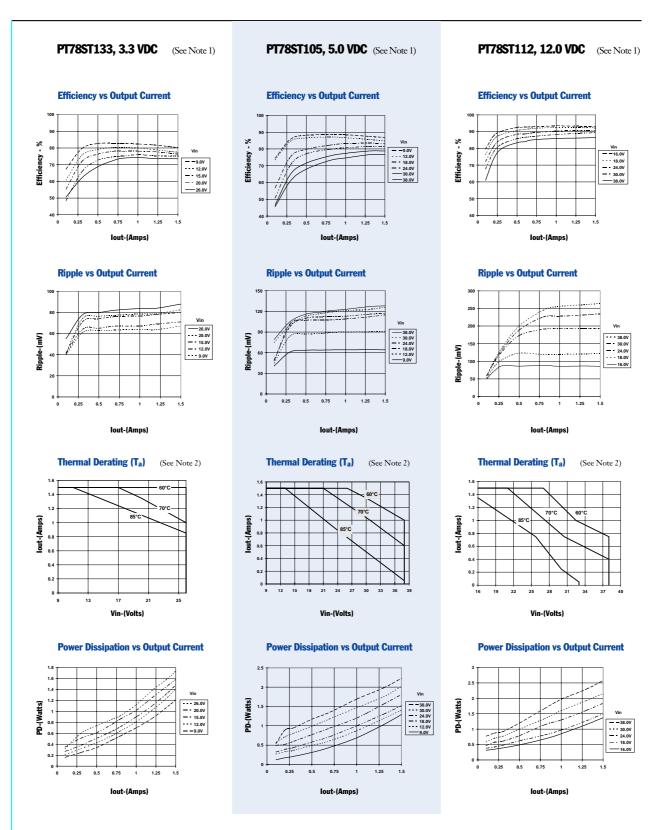
grams

6.5

PT78ST100 Series

Typical Characteristics

1.5 Amp Positive Step-Down Integrated Switching Regulator



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.)

TEXAS INSTRUMENTS

IMPORTANT NOTICE

Texas Instruments and its subsidiaries (TI) reserve the right to make changes to their products or to discontinue any product or service without notice, and advise customers to obtain the latest version of relevant information to verify, before placing orders, that information being relied on is current and complete. All products are sold subject to the terms and conditions of sale supplied at the time of order acknowledgment, including those pertaining to warranty, patent infringement, and limitation of liability.

TI warrants performance of its semiconductor products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are utilized to the extent TI deems necessary to support this warranty. Specific testing of all parameters of each device is not necessarily performed, except those mandated by government requirements.

Customers are responsible for their applications using TI components.

In order to minimize risks associated with the customer's applications, adequate design and operating safeguards must be provided by the customer to minimize inherent or procedural hazards.

TI assumes no liability for applications assistance or customer product design. TI does not warrant or represent that any license, either express or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right of TI covering or relating to any combination, machine, or process in which such semiconductor products or services might be or are used. TI's publication of information regarding any third party's products or services does not constitute TI's approval, warranty or endorsement thereof.

Copyright © 2000, Texas Instruments Incorporated

IMPORTANT NOTICE

Texas Instruments and its subsidiaries (TI) reserve the right to make changes to their products or to discontinue any product or service without notice, and advise customers to obtain the latest version of relevant information to verify, before placing orders, that information being relied on is current and complete. All products are sold subject to the terms and conditions of sale supplied at the time of order acknowledgment, including those pertaining to warranty, patent infringement, and limitation of liability.

TI warrants performance of its semiconductor products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are utilized to the extent TI deems necessary to support this warranty. Specific testing of all parameters of each device is not necessarily performed, except those mandated by government requirements.

Customers are responsible for their applications using TI components.

In order to minimize risks associated with the customer's applications, adequate design and operating safeguards must be provided by the customer to minimize inherent or procedural hazards.

TI assumes no liability for applications assistance or customer product design. TI does not warrant or represent that any license, either express or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right of TI covering or relating to any combination, machine, or process in which such semiconductor products or services might be or are used. TI's publication of information regarding any third party's products or services does not constitute TI's approval, warranty or endorsement thereof.

Copyright © 2000, Texas Instruments Incorporated