78SR100 Series

1.5 AMP POSITIVE STEP-DOWN INTEGRATED SWITCHING REGULATOR

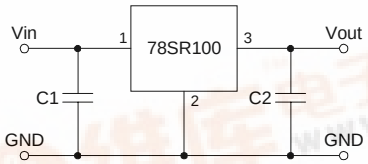
Revised 6/30/98

- Very Small Footprint
- High Efficiency > 85%
- Self-Contained Inductor
- Internal Short-Circuit Protection
- Over-Temperature Protection
- Wide Input Range

The 78SR100 is a series of wide input voltage, 3-terminal Integrated Switching Regulators (ISRs). These ISRs have a maximum output current of 1.5A 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, are very flexible, and may be used in a wide variety of applications.

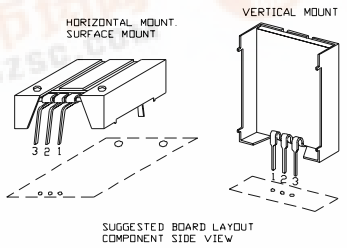
Standard Application



C1 = Optional 1µF ceramic
C2 = Optional 1µF ceramic

Pin-Out Information

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



Pkg Style 500

Ordering Information

78SR1 **XX** **Y** C

Output Voltage

05 = 5.0 Volts
53 = 5.25 Volts
06 = 6.0 Volts
74 = 7.15 Volts
08 = 8.0 Volts
09 = 9.0 Volts
10 = 10.0 Volts
12 = 12.0 Volts
14 = 13.9 Volts
15 = 15.0 Volts

Package Suffix

V = Vertical Mount
S = Surface Mount
H = Horizontal Mount

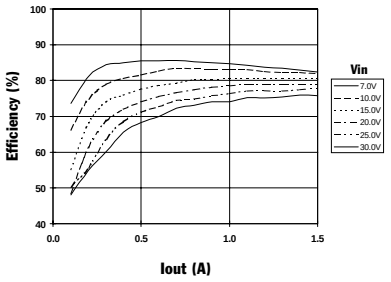
Specifications

Characteristics (T_a = 25°C unless noted)	Symbols	Conditions	78SR100 SERIES Min	Typ	Max	Units
Output Current	I_o	Over V_{in} range	0.1*	—	1.5	A
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= 5V V_o= 12V	7 14.5	— —	30 30	V V
Output Voltage Tolerance	ΔV_o	Over V_{in} range, I_o=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	$\%V_O$
Load Regulation	Reg_{load}	$0.1 \le I_o \le 1.5A$	—	±0.1	±0.2	$\%V_O$
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	—	50 80	—	mV_{pp} mV_{pp}
Transient Response	t_{tr}	50% load change V_o over/undershoot	— —	100 30	— —	µSec $\%V_O$
Efficiency	η	V_{in}= 10V, I_o= 1A V_o= 5V V_{in}= 17V, I_o= 1A V_o= 12V	— —	85 90	— —	% %
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	T_a	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	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	—	5	—	G's
Weight	—	—	—	6.5	—	grams

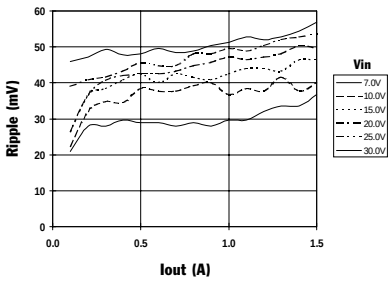
*ISR will operate down to no load with reduced specifications. **See Thermal Derating chart.

78SR133_ 3.3 VDC (See Note 1)

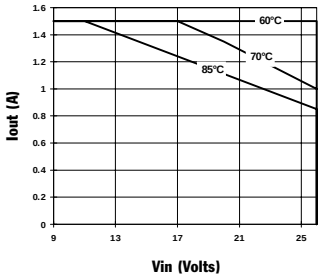
Efficiency vs Output Current



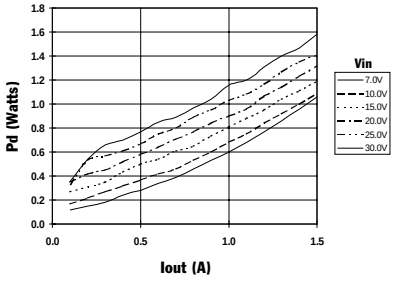
Ripple vs Output Current



Thermal Derating (T_a) (See Note 2)

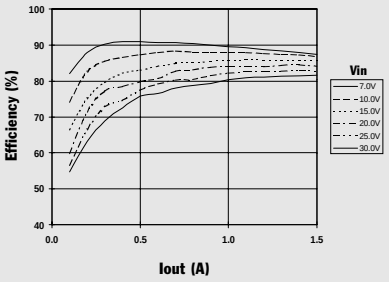


Power Dissipation vs Output Current

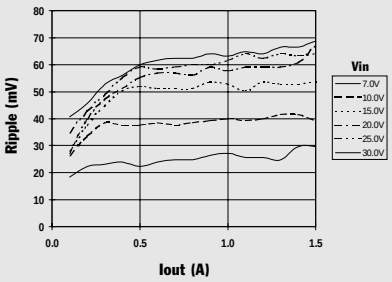


78SR105_ 5.0 VDC (See Note 1)

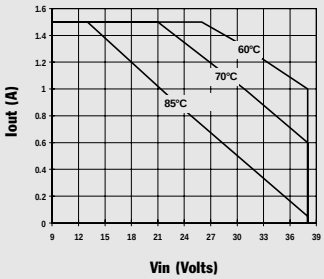
Efficiency vs Output Current



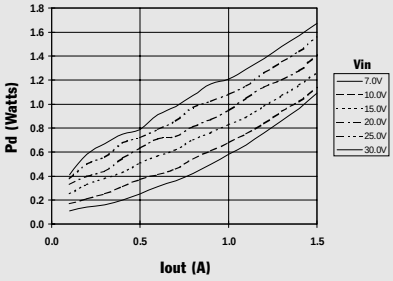
Ripple vs Output Current



Thermal Derating (T_a) (See Note 2)

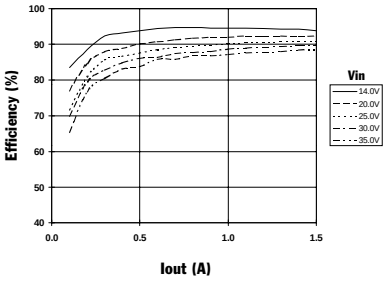


Power Dissipation vs Output Current

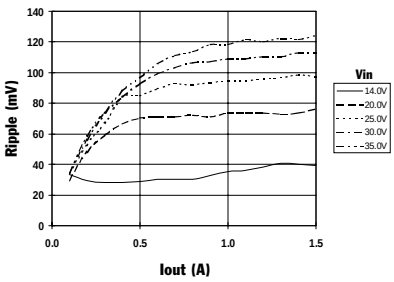


78SR112_ 12.0 VDC (See Note 1)

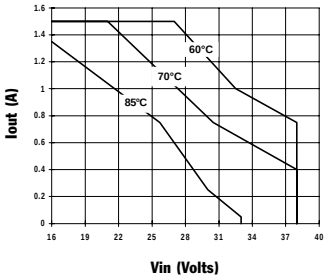
Efficiency vs Output Current



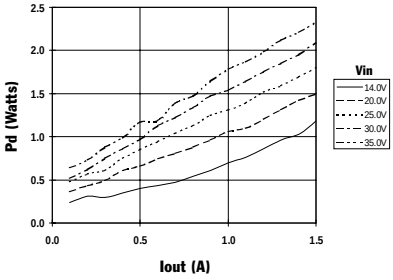
Ripple vs Output Current



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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