

## PT78NR200 Series

10-12W Plus to Minus Voltage  
Integrated Switching Regulator

 Power Trends Products  
from Texas Instruments

SLTS074A

(Revised 6/30/2000)

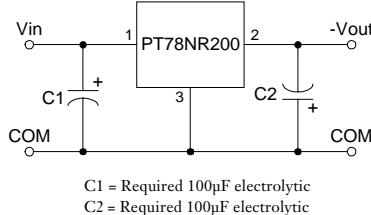
- Negative output from positive input
- Wide Input Range
- Self-Contained Inductor
- Short Circuit Protection
- Over-Temperature Protection
- Fast Transient Response

The PT78NR200 series creates negative output voltage from a posi-

tive input voltage greater than 9V. These easy-to-use, 3-terminal, Integrated Switching Regulators (ISRs) have maximum output power of 10 to 12 watts and a negative output voltage that is laser trimmed. They also have excellent line and load regulation.

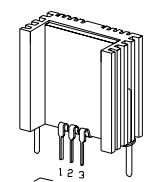
The PT78NR200 requires 100 LFM of airflow at its maximum output current.

### Standard Application



### Pin-Out Information

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



SUGGESTED BOARD LAYOUT  
COMPONENT SIDE VIEW  
Pkg Style 600

### Ordering Information

PT78NR2<sub>XX</sub><sub>YY</sub>

Output Voltage

52 = -5.2 Volts

06 = -6.0 Volts

12 = -12.0 Volts

15 = -15.0 Volts

Package Suffix

H = Horizontal Mount

S = Surface Mount

V = Vertical Mount

(For dimensions and PC board layout, see  
Package Styles 600 and 610.)

### Specifications

Characteristics (T <sub>a</sub> = 25°C unless noted)	Symbols	Conditions	PT78NR200 SERIES			
			Min	Typ	Max	Units
Output Current	I <sub>o</sub>	Over V <sub>in</sub> range V <sub>o</sub> = -5.2V V <sub>o</sub> = -12.0V	0.1*	—	2.0	A
Short Circuit Current	I <sub>sc</sub>	V <sub>in</sub> =10V	—	4 $\times$ I <sub>max</sub>	—	Apk
Inrush Current	I <sub>ir</sub> t <sub>ir</sub>	V <sub>in</sub> =10V On start-up	—	4	—	A
Input Voltage Range	V <sub>in</sub>	0.1 $\leq$ I <sub>o</sub> $\leq$ I <sub>max</sub>	9	—	15	V
Output Voltage Tolerance	$\Delta$ V <sub>o</sub>	Over V <sub>in</sub> range T <sub>a</sub> = 0°C to +70°C	—	$\pm$ 1.0	$\pm$ 3.0	%V <sub>o</sub>
Line Regulation	Reg <sub>line</sub>	Over V <sub>in</sub> range	—	$\pm$ 0.5	$\pm$ 1.0	%V <sub>o</sub>
Load Regulation	Reg <sub>load</sub>	0.3 $\leq$ I <sub>o</sub> $\leq$ I <sub>max</sub>	—	$\pm$ 0.5	$\pm$ 1.0	%V <sub>o</sub>
V <sub>o</sub> Ripple/Noise	V <sub>n</sub>	V <sub>in</sub> =10V, I <sub>o</sub> =I <sub>max</sub>	—	$\pm$ 2	—	%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	250	$\mu$ Sec
Efficiency	$\eta$	V <sub>in</sub> =9V, I <sub>o</sub> =0.5 $\times$ I <sub>max</sub> , V <sub>o</sub> =-12V	—	78	—	%
Switching Frequency	f <sub>o</sub>	Over V <sub>in</sub> and I <sub>o</sub> ranges	600	650	700	kHz
Absolute Maximum Operating Temperaturte Range	T <sub>a</sub>	100 LFM airflow Over V <sub>in</sub> and I <sub>o</sub> Ranges	0	—	+85	°C
Recommended Operating Temperature Range	T <sub>a</sub>	100 LFM airflow Over V <sub>in</sub> and I <sub>o</sub> Ranges	0	—	+60**	°C
Thermal Resistance	$\theta_{ja}$	100 LFM airflow	—	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.

**Note:** The PT78NR200 series requires a 100 $\mu$ F electrolytic or tantalum output capacitor for proper operation in all applications.

\*\*See Thermal Derating chart.

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