

## PT78NR200 Series

10-12W Plus to Minus Voltage  
Integrated Switching Regulator

**Power Trends Products**  
from Texas Instruments

**SLTS074A**

(Revised 6/30/2000)

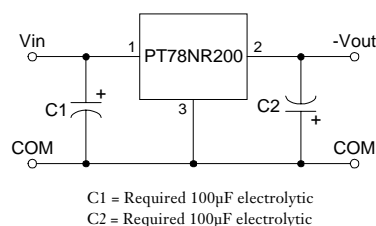
- Negative output from positive input
- Wide Input Range
- Self-Contained Inductor
- Short Circuit Protection
- Over-Temperature Protection
- Fast Transient Response

The PT78NR200 series creates negative output voltage from a positive

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.

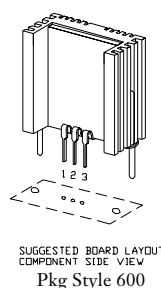
The PT78NR200 requires 100 LFM of airflow at its maximum output current.

### Standard Application



### Pin-Out Information

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



### Ordering Information

PT78NR2 XX Y

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* 0.1*	—	2.0 1.0	A A
Short Circuit Current	I <sub>sc</sub>	V <sub>in</sub> = 10V	—	4×I <sub>max</sub>	—	A <sub>pk</sub>
Inrush Current	I <sub>ir</sub> t <sub>ir</sub>	V <sub>in</sub> = 10V On start-up	— —	4 0.5	—	A mSec
Input Voltage Range	V <sub>in</sub>	0.1 ≤ I <sub>o</sub> ≤ I <sub>max</sub>	9	—	15	V
Output Voltage Tolerance	ΔV <sub>o</sub>	Over V <sub>in</sub> range T <sub>a</sub> = 0°C to +70°C	—	±1.0	±3.0	%V <sub>o</sub>
Line Regulation	Reg <sub>line</sub>	Over V <sub>in</sub> range	—	±0.5	±1.0	%V <sub>o</sub>
Load Regulation	Reg <sub>load</sub>	0.3 ≤ I <sub>o</sub> ≤ I <sub>max</sub>	—	±0.5	±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>	—	±2	—	%V <sub>o</sub>
Transient Response (with 100µF output cap)	t <sub>tr</sub>	50% load change V <sub>o</sub> over/undershoot	— —	100 5.0	250 —	µSec %V <sub>o</sub>
Efficiency	η	V <sub>in</sub> = 9V, I <sub>o</sub> = 0.5×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 Temperature 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	θ <sub>ja</sub>	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.

\*\*See Thermal Derating chart.

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

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