

NTE971

Linear Integrated Circuit Voltage Regulator, Negative, -24V, 1A

Description:

The NTE924 fixed-voltage regulator is a monolithic integrated circuit in a TO220 type package designed for use in a wide variety of applications including local, on-card regulation. This regulator employs internal current limiting, thermal shutdown, and safe-area compensation. With adequate heat sinking it can deliver output currents in excess of 1A. Although designed primarily as a fixed regulator, this device can be used with external components to obtain adjustable voltages and currents.

Features:

- No External Components Required
- Internal Thermal Overload Protection
- Internal Short-Circuit Current Limiting
- Output Transistor Safe-Area Compensation

Absolute Maximum Ratings: ($T_A = +25^\circ\text{C}$ unless otherwise specified)

| | |
|---|-------------------------------------|
| Input Voltage, V_{IN} | -40V |
| Internal Power Dissipation, P_D | Internally Limited |
| Derate Above $+25^\circ\text{C}$ | 15.4mW/ $^\circ\text{C}$ |
| Internal Power Dissipation ($T_C = +25^\circ\text{C}$), P_D | Internally Limited |
| Derate Above $+75^\circ\text{C}$ | 200mW/ $^\circ\text{C}$ |
| Maximum Junction Temperature Range, T_J | -55° to $+150^\circ\text{C}$ |
| Storage Temperature Range, T_{stg} | -65° to $+150^\circ\text{C}$ |
| Thermal Resistance, Junction-to-Ambient, R_{thJA} | 65 $^\circ\text{C}/\text{W}$ |
| Thermal Resistance, Junction-to-Case, R_{thJC} | 5 $^\circ\text{C}/\text{W}$ |

Electrical Characteristics: ($V_{IN} = -33\text{V}$, $I_O = 500\text{mA}$, $T_J = 0^\circ$ to $+125^\circ\text{C}$ unless otherwise specified)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit | |
|-----------------|---------------------|--|--|-------|-------|------|----|
| Output Voltage | V_O | $T_J = +25^\circ\text{C}$ | -23.0 | -24.0 | -25.0 | V | |
| | | $5\text{mA} \leq I_O \leq 1\text{A}$, $P_O \leq 15\text{W}$, $-38\text{V} \leq V_{IN} \leq -27\text{V}$ | -22.8 | -24.0 | -25.2 | V | |
| Line Regulation | Reg_{Line} | $T_J = +25^\circ\text{C}$, Note 1 | $-38\text{V} \leq V_{IN} \leq -27\text{V}$ | - | 31 | 480 | mV |
| | | | $-36\text{V} \leq V_{IN} \leq -30\text{V}$ | - | 14 | 240 | |
| Load Regulation | Reg_{Load} | $T_J = +25^\circ\text{C}$, Note 1 | $5\text{mA} \leq I_O \leq 1.5\text{A}$ | - | 60 | 480 | mV |
| | | | $250\text{mA} \leq I_O \leq 750\text{mA}$ | - | 25 | 240 | |

Electrical Characteristics: ($V_{IN} = -33V$, $I_O = 500mA$, $T_J = 0^\circ$ to $+125^\circ C$ unless otherwise specified)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|----------------|---|-----|------|-----|---------------|
| Quiescent Current | I_B | $T_J = +25^\circ C$ | - | 4.6 | 8.0 | mA |
| Quiescent Current Change | ΔI_B | $-38V \leq V_{IN} \leq -27V$ | - | - | 1.0 | mA |
| | | $5mA \leq I_O \leq 1A$ | - | - | 0.5 | |
| Ripple Rejection | RR | $38V \leq V_{IN} \leq 28V$, $f = 120Hz$ | - | 54 | - | dB |
| Dropout Voltage | $V_{IN} - V_O$ | $T_J = +25^\circ C$, $I_O = 1A$ | - | 2.0 | - | V |
| Output Noise Voltage | V_n | $T_A = +25^\circ C$, $10Hz \leq f \leq 100kHz$ | - | 10 | - | $\mu V/V_O$ |
| Output Resistance | r_O | $f = 1kHz$ | - | 20 | - | $m\Omega$ |
| Short-Circuit Current Limit | I_{sc} | $T_A = +25^\circ C$, $V_{IN} = 35V$ | - | 0.2 | - | A |
| Peak Output Current | I_{max} | $T_J = +25^\circ C$ | - | 2.2 | - | A |
| Average Temperature Coefficient of Output Voltage | TCV_O | | - | -1.5 | - | $mV/^\circ C$ |

Note 1. Load and line regulation are specified at constant junction temperature. Changes in V_O due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

