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NTE1927 Integrated Circuit 4-Terminal Negative Adjustable Voltage Regulator

Description:

The NTE1927 is a 4-terminal negative adjustable voltage regulator in a TO3 type package designed to deliver continuous load currents of up to 1A with a maximum input voltage of -40V.

Features:

- Output Current in Excess of 1A
- Negative Output -30V to -2.2V
- Internal Thermal Overload Protection
- Internal Short Circuit Protection
- Output Transistor Safe-Area Protection

Absolute Maximum Ratings:

Input Voltage, V_{IN} -40V
 Control Pin Voltage $-V_{OUT} \leq -V \leq 0$
 Power Dissipation, P_D Internally Limited
 Operating Junction Temperature Range, T_{opr} 0° to 150°C
 Storage Temperature Range, T_{stg} -65° to +150°C
 Lead Temperature (During Soldering, 60sec), T_L +300°C

Electrical Characteristics: ($0^\circ \leq T_J \leq +125^\circ C$, $V_{IN} = -10V$, $I_{OUT} = 500mA$, $C_{IN} = 2\mu F$,
 $C_{OUT} = 1\mu F$, Note 1, Note 2 unless otherwise specified)

| Parameter | Test Conditions | Min | Typ | Max | Unit |
|------------------------------|--|-----|---------------------|-------|-----------------|
| Input Voltage Range | $T_J = +25^\circ C$ | -40 | - | -7.0 | V |
| Nominal Output Voltage Range | $V_{IN} = V_{OUT} - 5V$ | -30 | - | -2.23 | V |
| Output Voltage Tolerance | $V_{OUT} - 15V \leq V_{IN} \leq V_{OUT} - 3V$, $5mA \leq I_{OUT} \leq 1A$, $P_D \leq 15W$, $I_{IN(max)} = -38V$ | | $T_J = +25^\circ C$ | 4.0 | % (V_{OUT}) |
| | | | | 5.0 | % (V_{OUT}) |

Note 1. V_{OUT} is defined as: $V_{OUT} = \frac{R1 + R2}{R2} (-2.23)$

Note 2. The convention for negative regulators in the algebraic value, thus -15V is less than -10V.

Electrical Characteristics (Cont'd): ($0^{\circ} \leq T_J \leq +125^{\circ}\text{C}$, $V_{IN} = -10\text{V}$, $I_{OUT} = 500\text{mA}$, $C_{IN} = 2\mu\text{F}$, $C_{OUT} = 1\mu\text{F}$, Note 1, Note 2 unless otherwise specified)

| Parameter | Test Conditions | Min | Typ | Max | Unit | |
|---|---|---|-------|-------|-----------------------|--------------------------------------|
| Line Regulation | $V_{OUT} \geq -10\text{V}$, $(V_{OUT}-15\text{V}) \leq V_{IN} \leq (V_{OUT}-2.5\text{V})$ | $T_J = +25^{\circ}\text{C}$ | - | - | 1.0 | % (V_{OUT}) |
| | $V_{OUT} \leq -10\text{V}$, $(V_{OUT}-15\text{V}) \leq V_{IN} \leq (V_{OUT}-3\text{V})$ | | - | - | 0.75 | % (V_{OUT}) |
| | $V_{OUT} \leq -10\text{V}$, $(V_{OUT}-7\text{V}) \leq V_{IN} \leq (V_{OUT}-3\text{V})$ | | - | - | 0.67 | % (V_{OUT}) |
| Load Regulation | $250\text{mA} \leq I_{OUT} \leq 750\text{mA}$ | $T_J = +25^{\circ}\text{C}$, $V_{IN} = V_{OUT}-5\text{V}$ | - | - | 1.0 | % (V_{OUT}) |
| | $5\text{mA} \leq I_{OUT} \leq 1.5\text{A}$ | | - | - | 2.0 | % (V_{OUT}) |
| Control Pin Current | $T_J = +25^{\circ}\text{C}$ | - | 0.4 | 2.0 | μA | |
| | | - | - | 3.0 | μA | |
| Quiescent Current | $T_J = +25^{\circ}\text{C}$ | - | 0.5 | 1.5 | μA | |
| | | - | - | 2.0 | μA | |
| Ripple Rejection | $-18\text{V} \leq V_{IN} \leq -8\text{V}$, $V_{OUT} = -5\text{V}$, $f = 120\text{Hz}$ | 50 | 60 | - | dB | |
| Output Noise Voltage | $T_J = +25^{\circ}\text{C}$, $10\text{Hz} \leq f \leq 100\text{kHz}$, $V_{OUT} = -5\text{V}$, $I_{OUT} = 5\text{mA}$ | - | 25 | 80 | $\mu\text{V}/V_{OUT}$ | |
| Dropout Voltage | Note 3 | - | - | 2.3 | V | |
| Short Circuit Current | $T_J = +25^{\circ}\text{C}$, $V_{IN} = -30\text{V}$ | - | 0.25 | 1.2 | A | |
| Peak Output Current | $T_J = +25^{\circ}\text{C}$ | 1.3 | 2.1 | 3.3 | A | |
| Average Temperature Coefficient of Output Voltage | $T_J = -55^{\circ}$ to $+25^{\circ}\text{C}$ | $V_{OUT} = -5\text{V}$, $I_{OUT} = 5\text{mA}$ | - | - | 0.3 | $\text{mV}/^{\circ}\text{C}/V_{OUT}$ |
| | $T_J = +25^{\circ}$ to $+150^{\circ}\text{C}$ | | - | - | 0.3 | $\text{mV}/^{\circ}\text{C}/V_{OUT}$ |
| Control Pin Voltage (Reference) | $T_J = +25^{\circ}\text{C}$ | -2.32 | -2.23 | -2.14 | V | |
| | | -2.35 | - | -2.11 | V | |

Note 1. V_{OUT} is defined as: $V_{OUT} = \frac{R1 + R2}{R2} (-2.23)$

Note 2. The convention for negative regulators in the algebraic value, thus -15V is less than -10V .

Note 3. Dropout Voltage is defined as that input-output voltage differential which causes the output voltage to decrease by 5% of its initial value.

Note 4. All characteristics except noise voltage and ripple rejection ratio are measured using pulse techniques ($t_W \leq 10\text{ms}$, duty cycle $\leq 5\%$). Output voltage changes due to changes in internal temperature must be taken into account separately.

Pin Connection Diagram
(Bottom View)

