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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 . . . . . $-V_{OUT} \le -V \le 0$
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:** ($0° \le T_J \le +125°C$, $V_{IN} = -10V$, $I_{OUT} = 500mA$, $C_{IN} = 2\mu F$, $C_{OUT} = 1\mu F$, Note 1, Note 2 unless otherwise specified)

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

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

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

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

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

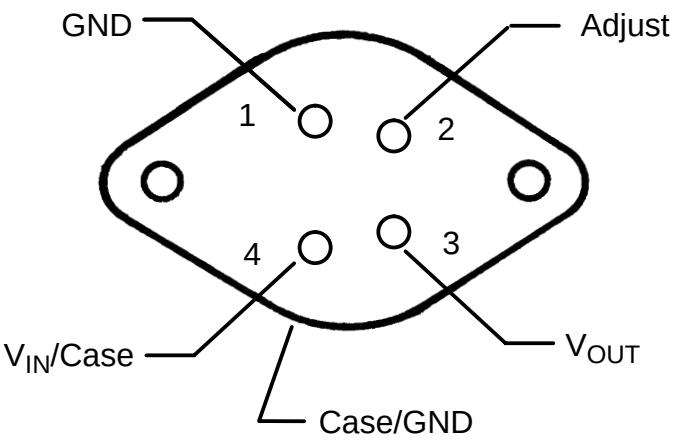
Note 1. $V_{OUT}$ is defined as: $V_{OUT} = \dfrac{R1 + R2}{R2}$ (–2.23)

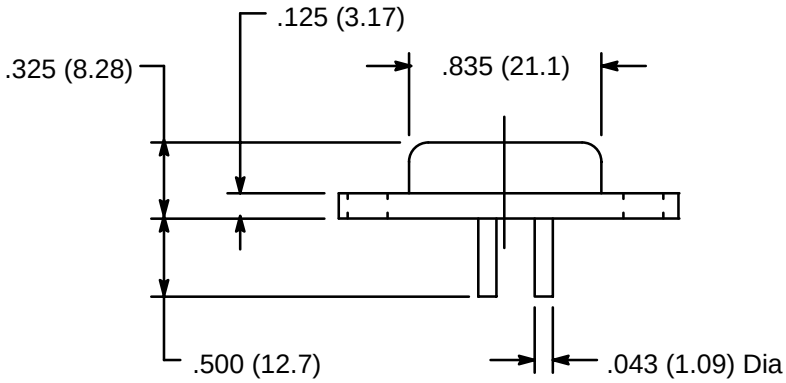
Note 2. The convention for negative regulators in the algabraic value, thus –15V is less than –10V.

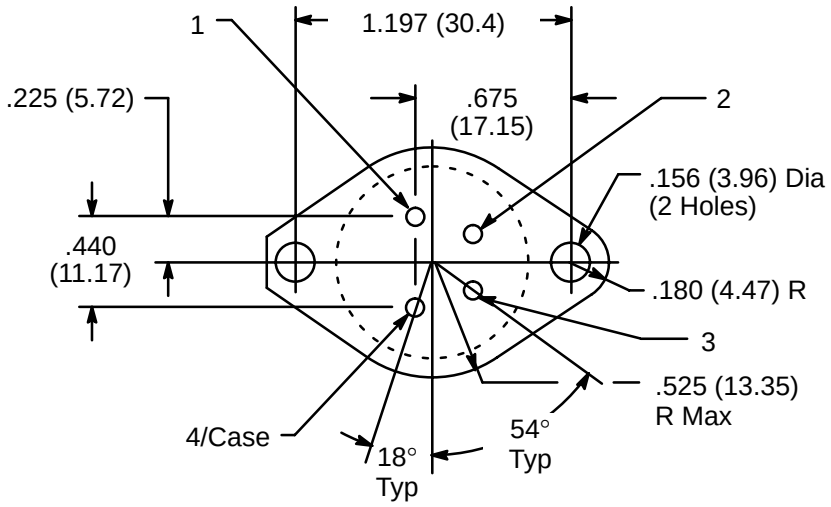
Note 3. Dropout Voltage is defined as that input–output voltage differential which causes the output voltage to decrease by 5% of its initial value.

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

**Pin Connection Diagram**
(Bottom View)



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