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**NTE1928**  
**Integrated Circuit**  
**Positive Adjustable Voltage Regulator,**  
**4.5V to 40V, 45mA**

**Description**

The NTE1928 is an adjustable positive voltage regulator that features fast response to both load and line transients, freedom from oscillations with varying resistive and reactive loads, and the ability to start reliability on any load within rating. This device also contains a biasing circuitry that removes any minimum load current requirement and at the same time reduces standby current drain, permitting higher voltage operation.

**Features:**

- Output Voltage Adjustable from 4.5V to 40V
- Output Currents in Excess of 10A Possible by Adding External Transistors
- Load Regulation Better than 0.1%, Full Load with Current Limiting
- DC Line Regulation Guaranteed at 0.03%/V
- Ripple Rejection on 0.01%V

**Absolute Maximum Ratings:**

Input Voltage, $V_{IN}$ .....	40V
Input–Output Differential, $V_{I-O}$ .....	40V
Power Dissipation (Note 1), $P_D$ .....	800mW
Operating Temperature Range, $T_{opr}$ .....	–0° to +70°C
Storage Temperature Range, $T_{stg}$ .....	–65° to +150°C
Thermal Resistance, Junction–to–Ambient, $R_{thJA}$ .....	230°C/W
Lead Temperature (During Soldering, 10sec), $T_L$ .....	+300°C

Note 1. The maximum junction temperature of the NTE1928 is +85°C. For operation at elevated temperatures, this device must be derated based on a thermal resistance of 230°C/W junction to ambient, or 25°C/W junction–to–case. Peak dissipations to 1W are allowable providing the dissipation rating is not exceeded with the power average over a two second interval.

**Electrical Characteristics:** (Note 2)

Parameter	Conditions	Min	Typ	Max	Units
Input Voltage Range		8.5	–	40	V
Output Voltage Range		4.5	–	30	V
Input–Output Voltage Differential		3.0	–	30	V
Load Regulation (Note 3)	$R_{SC} = 10\Omega, T_A = +25^\circ\text{C}$	–	0.02	0.05	%
	$R_{SC} = 10\Omega, T_A = +70^\circ\text{C}$	–	0.03	0.1	%
	$R_{SC} = 10\Omega, T_A = 0^\circ\text{C}$	–	0.03	0.1	%
		$0 \leq I_O \leq 12\text{mA}$			
Line Regulation	$V_{IN} - V_{OUT} \leq 5\text{V}, T_A = +25^\circ\text{C}$	–	0.025	0.06	%/V
	$V_{IN} - V_{OUT} \geq 5\text{V}, T_A = +25^\circ\text{C}$	–	0.015	0.03	%/V
Temperature Stability	$T_A = 0^\circ\text{C} \leq T_A \leq T_A = +70^\circ\text{C}$	–	0.3	1.0	%
Feedback Sense Voltage		1.63	1.7	1.81	V
Output Noise Voltage	$C_{REF} = 0$	–	0.005	–	%
	$C_{REF} = 0.1\mu\text{F}$	–	0.002	–	%
Standby Current Drain	$V_{IN} = 40\text{V}$	–	0.8	2.0	mA
Current Limit Sense Voltage	$T_A = +25^\circ\text{C}, R_{SC} = 10\Omega,$ $V_{OUT} = 0\text{V},$ (Note 4)	225	300	375	mV
Long Term Stability			0.1		%
Ripple rejection	$C_{REF} = 10\mu\text{F}, f = 120\text{Hz}$	–	0.003	–	%/V

Note 2. Unless otherwise specified, these specifications apply for temperatures within the operating temperature range, for input and output voltages within the range given, and for a divider impedance seen by the feedback terminal of 2k $\Omega$ . Load and line regulation specifications are for a constant junction temperature. Temperature drift effects must be taken into account separately when the unit is operating under conditions of high dissipation.

Note 3. The output currents given, as well as the load regulation, can be increased by the addition of external transistors. The improvement factor will be roughly equal to the composite current gain of the added transistors.

Note 4. With no external pass transistor.



