



ELECTRONICS, INC.

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## NTE1929 3 Terminal Adjustable Positive Voltage Regulator 1.2V to 33V, 3A

### **Description:**

The NTE1929 is an adjustable 3-terminal positive voltage regulator in a TO220 type package capable of supplying in excess of 3A over an output voltage range of 1.2V to 33V. This device employs internal current limiting, thermal shutdown, and safe area compensation making it essentially blow-out proof.

The NTE1929 serves a wide variety of applications including local, on card regulation. This device also makes an especially simple adjustable switching regulator, a programmable output regulator, and can also be used as a precision current regulator.

### **Features:**

- Guaranteed 3A Output Current
- Output Adjustable Between 1.2V and 33V
- Load Regulation Typically 0.1%
- Line Regulation Typically 0.005%/V
- Internal Thermal Overload Protection
- Internal Short-Circuit Current Limiting Constant with Temperature
- Floating Operation for High Voltage Applications
- Standard 3-Lead TO220 Type Transistor Package
- Eliminates Stocking many Fixed Voltages

### **Absolute Maximum Ratings:**

Input-Output Voltage Differential, $V_I-V_O$ .....	35V
Power Dissipation, $P_D$ .....	Internally Limited
Operating Junction Temperature Range, $T_J$ .....	0° to +125°C
Storage Temperature Range, $T_{stg}$ .....	-65° to +150°C
Lead Temperature (During Soldering, 10sec), $T_L$ .....	+300°C
Thermal Resistance, Junction-to-Case, $R_{thJC}$	
Peak (Note 1) .....	2.3°C/W Max
Average (Note 2) .....	1.5°C/W Typ

Note 1. Thermal Resistance evaluated measuring the hottest temperature on the die using an infrared scanner. This method of evaluation yields very accurate thermal resistance values which are conservative compared to other measurement techniques.

Note 2. The average die temperature is used to derive the value of thermal resistance junction to case (average).

**Electrical Characteristics:** ( $V_I - V_O = 5V$ ,  $I_L = 1.5A$ ,  $T_J = 0^\circ$  to  $+125^\circ C$ ,  $P_{max} = 25W$  unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit	
Line Regulation	Reg <sub>line</sub>	$3V \leq V_I - V_O \leq 35V$ , Note 3	$T_A = +25^\circ C$	–	0.005	0.03	%/V
				–	0.02	0.07	%/V
Load Regulation	Reg <sub>load</sub>	$10mA \leq I_L \leq 3A$ , $V_O \leq 5V$ , Note 3	$T_A = +25^\circ C$	–	5.0	25	mV
				–	20	70	mV
		$10mA \leq I_L \leq 3A$ , $V_O \geq 5V$ , Note 3	$T_A = +25^\circ C$	–	0.1	0.5	% $V_O$
				–	0.3	1.5	% $V_O$
Thermal Regulation	Reg <sub>therm</sub>	$T_A = +25^\circ C$ , Pulse = 20ms	–	0.002	–	% $V_O/W$	
Adjustment Pin Current	$I_{Adj}$		–	50	100	$\mu A$	
Adjustment Pin Current Change	$\Delta I_{Adj}$	$3V \leq V_I - V_O \leq 35V$ , $10mA \leq I_L \leq 3A$ , $P_D = P_{max}$	–	0.2	5.0	$\mu A$	
Reference Voltage	$V_{ref}$	$3V \leq V_I - V_O \leq 35V$ , $10mA \leq I_L \leq 3A$ , $P_D = P_{max}$	1.20	1.25	1.30	V	
Temperature Stability	$T_S$	$0^\circ \leq T_J \leq +125^\circ C$	–	1.0	–	% $V_O$	
Minimum Load Current to Maintain Regulation	$I_{Lmin}$	$V_I - V_O = 35V$	–	3.5	10	mA	
Maximum Output Current	$I_{max}$	$V_I - V_O \leq 10V$ , $P_D \leq P_{max}$	3.0	4.5	–	A	
		$V_I - V_O = 30V$ , $P_D \leq P_{max}$ , $T_A = +25^\circ C$	0.25	1.0	–	A	
RMS Noise, % of $V_O$	N	$10Hz \leq f \leq 10kHz$ , $T_A = +25^\circ C$	–	0.003	–	% $V_O$	
Ripple Rejection	RR	$V_O = 10V$ , $f = 120Hz$ , Note 4		–	65	–	dB
			$C_{Adj} = 10\mu F$	66	80	–	dB
Long-Term Stability	S	$T_J = +125^\circ C$ , Note 5, $T_A = +25^\circ C$ for Endpoint Measurements	–	0.3	1.0	%/1.0k Hrs.	

Note 3. 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.

Note 4.  $C_{Adj}$ , when used, is connected between the adjustment pin and GND.

Note 5. Since Long-Term Stability cannot be measured on each device before shipment, this specification is an engineering estimate of average stability from lot to lot.

