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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 employes internal current limiting, thermal shutdown, and safe area compensation making the 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 conservativeompared 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° to +125°C, P_{max} = 25W unless otherwise specified)

Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
Line Regulation	Reg_{line}	3V ≤ V_I–V_O ≤ 35V, Note 3	T_A = +25°C	–	0.005	0.03	%/V
				–	0.02	0.07	%/V
Load Regulation	Reg_{load}	10mA ≤ I_L ≤ 3A, V_O ≤5V, Note 3	T_A = +25°C	–	5.0	25	mV
				–	20	70	mV
		10mA ≤ I_L ≤ 3A, V_O ≥5V, Note 3	T_A = +25°C	–	0.1	0.5	% V_O
				–	0.3	1.5	% V_O
Thermal Regulation	Reg_{therm}	T_A = +25°C, Pulse = 20ms		–	0.002	–	% V_O/W
Adjustment Pin Current	I_{Adj}			–	50	100	µA
Adjustment Pin Current Change	ΔI_{Adj}	3V ≤ V_I–V_O ≤ 35V, 10mA ≤ I_L ≤ 3A, P_D = P_{max}		–	0.2	5.0	µA
Reference Voltage	V_{ref}	3V ≤ V_I–V_O ≤ 35V, 10mA ≤ I_L ≤ 3A, P_D = P_{max}		1.20	1.25	1.30	V
Temperature Stability	T_S	0° ≤ T_J ≤ +125°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 ≤ 10V, P_D ≤ P_{max}		3.0	4.5	–	A
		V_I–V_O = 30V, P_D ≤ P_{max}, T_A = +25°C		0.25	1.0	–	A
RMS Noise, % of V_O	N	10Hz ≤ f ≤ 10kHz, T_A = +25°C		–	0.003	–	% V_O
Ripple Rejection	RR	V_O = 10V, f = 120Hz, Note 4		–	65	–	dB
			C_{Adj} = 10µF	66	80	–	dB
Long–Term Stability	S	T_J = +125°C, Note 5, T_A = +25°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.