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NTE970
Linear Integrated Circuit
3–Terminal Adjustable Positive Voltage Regulator
1.2V to 33V, 3A

Description:

The NTE970 is an adjustable 3–terminal positive voltage regulator in a TO3 type package capable of supplying in excess of 3 Amps over a 1.2V to 33V output range.

Features:

- Adjustable Output Down to 1.2V
- Guaranteed 3A Output Current
- Line Regulation Typically 0.005%/V
- Load Regulation Typically 0.1%
- Thermal Regulation
- Current Limit Constant with Temperature

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
Thermal Resistance, Junction–to–Case, R_{thJC} . . . . . 2.5°C/W
Lead Temperature (During Soldering, 10sec), T_L . . . . . +300°C

Electrical Characteristics: ($V_I – V_O = 5V$, $I_O = 1.5A$, $P_{max} = 30W$, $0° \le T_J \le +125°C$ unless otherwise specified)

Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
Line Regulation	Reg_{line}	$T_A = +25°C$, $3V \le V_I – V_O \le 35V$, Note 1		–	0.005	0.030	%/V
Load Regulation	Reg_{load}	$V_O \le 5V$	$T_A = +25°C$, $0mA \le I_O \le 3A$, Note 1	–	5	25	mV
		$V_O \ge 5V$		–	0.1	0.5	$\%V_O$

Note 1. Regulation is measured at constant junction temperature. Change in output voltage due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

Electrical Characteristics (Cont'd): ($V_I - V_O$ = 5V, I_O = 1.5A, P_{max} = 30W, 0° ≤ T_J ≤ +125°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
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}	10mA ≤ I_L ≤ 3A, 3V ≤ ($V_I - V_O$) ≤ 35V	–	0.2	5.0	µA
Reference Voltage	V_{ref}	10mA ≤ I_O ≤ 3A, 3V ≤ ($V_I - V_O$) ≤ 35V, P ≤ 30W	1.20	1.25	1.30	V
Line Regulation	Reg_{line}	3V ≤ ($V_I - V_O$) ≤ 35V, Note 1	–	0.02	0.07	%/V
Load Regulation	Reg_{load}	V_O ≤ 5V, 10mA ≤ I_O ≤ 3A, Note 1	–	20	70	mV
		V_O ≥ 5V	–	0.3	1.5	$\%V_O$
Temperature Stability	T_S	0° ≤ T_J ≤ +125°C	–	1	–	$\%V_O$
Minimum Load Current	I_{Lmin}	$V_I - V_O$ = 35V	–	3.5	10	mA
Maximum Output Current Limit	I_{max}	$V_I - V_O$ ≤ 10V	3.0	4.5	–	A
		$V_I - V_O$ = 30V	–	1.0	–	A
RMS Noise, % of V_O	N	T_A = +25°C, 10Hz ≤ f ≤ 10kHz	–	0.003	–	$\%V_O$
Ripple Rejection Ratio	RR	V_O = 10V, f = 120Hz	–	65	–	dB
		C_{Adj} = 10µF	66	86	–	dB
Long Term Stability	S	T_A = +125°C	–	0.3	1.0	%/1.0k

Note 1. Regulation is measured at constant junction temperature. Change in output voltage due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

