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NTE934
Integrated Circuit
Positive 3 Terminal Voltage Regulator
13.8V ±5%, 5A

Description:

The NTE934 positive 3 terminal voltage regulator is a monolithic integrated circuit in a TO3 type package designed for use in applcations requiring a well regulated positive output voltage. Outstanding features include full power usage up to 5A of load current, internal current limiting, thermal shutdown, and safe area protection on the chip, providing protection of the series pass Darlington, under most operating conditions. A hermetically sealed steel TO3 package is utilized for high reliability and low thermal resistance. A low–noise temperature stable band–gap reference is the key design factor insuring excellent temperature regulation. This coupled to a very low output impedance insures superior load regulation.

Features:

- Guaranteed Power Dissipation: 30W @ T_C = +57.5°C
- Guaranteed Input–Output Differential: +2.5V
- Low Noise, Band Gap Reference
- Remote Sense Capability
- Sample Power Cycled Burn–In
- Guaranteed Thermal Resistance, Junction–to–Case: 2.25°C/W

Absolute Maximum Ratings:

Input Voltage (Note 1), V_{IN} 35V
Power Dissipation, P_D . . . . . Internally Limited
Derate Above T_C = +57.5°C . . . . . 444mW/°C
Operating Junction Temperature Range, T_J . . . . . –55° to +150°C
Storage Temperature Range, T_{stg} . . . . . –65° to +150°C
Thermal Resistance, Junction–to–Case, R_{thJC} . . . . . 2.25°C/W
Lead Temperature (During Soldering, 60sec Max), T_L . . . . . +300°C

Note 1. Short circuit protection is only assured to V_{IN}max. In case of short circuit, with input–output voltages approaching V_{IN}max, regulator may require the removal of the input voltage to restart.

Electrical Characteristics: (T_J = +25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Output Voltage	V_O	V_{IN} = 16.8V to 23.8V, I_O = 10mA to 5A, Note 2	13.11	13.8	14.49	V
Input–Output Differential	$V_{IN} - V_O$	I_O = 5A, T_J = 0° to +125°C	2.5	–	–	V
Line Regulation	$REG_{(LINE)}$	V_{IN} = 16.8V to 28.8V, I_O = 2A, Note 2	–	–	1.0	$\%V_O$
Load Regulation	$REG_{(LOAD)}$	V_{IN} = 18.8V, I_O = 10mA to 5A, Note 2	–	–	0.6	$\%V_O$
Quiescent Current	I_Q	V_{IN} = 16.8V, I_O = 10mA	–	–	20	mA
Quiescent Current Line	$I_{Q(LINE)}$	V_{IN} = 16.8V to 23.8V, I_O = 10mA	–	–	5	mA
Quiescent Current Load	$I_{Q(LOAD)}$	V_{IN} = 16.8V, I_O = 10mA to 5A	–	–	5	mA
Current Limit	I_{LIM}	V_{IN} = 18.8V, Note 2	–	–	6.5	A
Temperature Coefficient	T_C	V_{IN} = 16.8V, I_O = 0.1A, T_J = 0° to +125°C	–	–	0.02	$\%V_O$/°C
Output Noise Voltage	V_N	V_{IN} = 16.8V, I_O = 0.1A, T_J = 0° to +125°C, Note 3	–	–	10	$\mu V_{rms}/V$
Ripple Attenuation	R_A	V_{IN} = 18.8V, I_O = 2A, T_J = 0° to +125°C, Note 4	60	–	–	dB
Power Dissipation	P_D	V_{IN}–V_{OUT} = 2.5V to 10.0V, I_O = 10mA to 5A, T_J = 0° to +125°C	–	–	30	W

Note 2. Low duty cycle pulse testing with Kelvin connections required. Die temperature changes must be accounted for separately.

Note 3. BW = 10Hz to 100kHz.

Note 4. Ripple attenuation is specified for a $1V_{rms}$, 120Hz, input ripple. Ripple attenuation is minimum of 60dB at 5V output and is 1dB less for each volt increase in the output voltage.

Note 5. $V_O = V_C (1 + R1/R2)$
R1 = Resistance from output to control
R2 = Resistance from control to common