



NTE1924
Integrated Circuit
Positive 3 Terminal Voltage Regulator,
24V, 1.5A

Description:

The NTE1924 is a monolithic voltage regulator integrated circuit in a TO3 type package designed for use in applications requiring a well regulated positive output voltage. Outstanding features include full power usage up to 1.5A 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 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 performance and load regulation.

Features:

- Guaranteed Power Dissipation: 15W @ $T_C = +87.5^{\circ}\text{C}$
- Guaranteed Thermal Resistance, Junction-to-Case: 2.5°C/W
- Guaranteed Input-Output Differential: +2.4V
- Low Noise, Band Gap Reference
- Remote Sense Capability
- Sample Power Cycled Burn-in

Absolute Maximum Ratings:

Input Voltage (Note 1), V_{IN}	40V
Power Dissipation (Note 2), P_D	Internally Limited
Operating Junction Temperature Range, T_J	-55° to $+150^{\circ}\text{C}$
Storage Temperature Range, T_{stg}	-65° to $+150^{\circ}\text{C}$
Thermal Resistance, Junction-to-Case, R_{thJC}	2.5°C/W
Lead Temperature (During Soldering, 60sec max), T_L	$+300^{\circ}\text{C}$

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.

Note 2. For operation above $T_C = +87.5^{\circ}\text{C}$, derate @ $400\text{mW}/^{\circ}\text{C}$.

Electrical Characteristics: ($T_J = +25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Output Voltage	V_O	$V_{IN} = 27\text{V to } 34\text{V}$, $I_O = 10\text{mA to } 1.5\text{A}$, Note 3	23.05	24.0	25.05	V
Input-Output Differential	$V_{IN}-V_O$	$I_O = 1.5\text{A}$, $T_J = 0^{\circ}$ to $+125^{\circ}\text{C}$	2.4	—	—	V
Line Regulation	REG_{LINE}	$V_{IN} = 27\text{V to } 39\text{V}$, $I_O = 1.5\text{A}$, Note 3	—	—	1.5	% V_O
Load Regulation	REG_{LOAD}	$V_{IN} = 29\text{V}$, $I_O = 10\text{mA to } 1.5\text{A}$, Note 3	—	—	0.6	% V_O
Quiescent Current	I_Q	$V_{IN} = 27\text{V}$, $I_O = 10\text{mA}$	—	—	18	mA
Quiescent Current Line	$I_Q (\text{LINE})$	$V_{IN} = 27\text{V to } 34\text{V}$, $I_O = 10\text{mA}$	—	—	5	mA
Quiescent Current Load	$I_Q (\text{LOAD})$	$V_{IN} = 27\text{V}$, $I_O = 10\text{mA to } 1.5\text{A}$	—	—	5	mA
Current Limit	I_{LIM}	$V_{IN} = 29\text{V}$, Note 3	—	—	5.2	A
Temperature Coefficient	T_C	$V_{IN} = 27\text{V}$, $I_O = 0.1\text{A}$, $T_J = 0^{\circ}$ to $+125^{\circ}\text{C}$	—	—	0.02	% $V_O/^{\circ}\text{C}$
Output Noise Voltage	V_N	$V_{IN} = 27\text{V}$, $I_O = 0.1\text{A}$, $T_J = 0^{\circ}$ to $+125^{\circ}\text{C}$, Note 4	—	—	10	$\mu\text{V}_{\text{rms}}/\text{V}$
Ripple Attenuation	R_A	$V_{IN} = 29\text{V}$, $I_O = 1\text{A}$, $T_J = 0^{\circ}$ to $+125^{\circ}\text{C}$, Note 5	60	—	—	dB
Power Dissipation	P_D	$V_{IN} - V_{\text{OUT}}$ (2.4V to 10.0V), $I_O = 10\text{mA to } 1.5\text{A}$, $T_J = 0^{\circ}$ to $+125^{\circ}\text{C}$	—	—	15	W

Note 3. Low duty cycle pulse testing with Kelvin connectors required. Die temperature changes must be accounted for separately.

Note 4. BW = 10Hz to 100kHz.

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

