

NTE971

Linear Integrated Circuit

Voltage Regulator, Negative, -24V, 1A

Description:

The NTE924 fixed-voltage regulator is a monolithic integrated circuit in a TO220 type package designed for use in a wide variety of applications including local, on-card regulation. This regulator employs internal current limiting, thermal shutdown, and safe-area compensation. With adequate heat sinking it can deliver output currents in excess of 1A. Although designed primarily as a fixed regulator, this device can be used with external components to obtain adjustable voltages and currents.

Features:

- No External Components Required
- Internal Thermal Overload Protection
- Internal Short-Circuit Current Limiting
- Output Transistor Safe-Area Compensation

Absolute Maximum Ratings: ($T_A = +25^\circ\text{C}$ unless otherwise specified)

Input Voltage, V_{IN}		-40V
Internal Power Dissipation, P_D		Internally Limited
Derate Above $+25^\circ\text{C}$		15.4mW/ $^\circ\text{C}$
Internal Power Dissipation ($T_C = +25^\circ\text{C}$), P_D		Internally Limited
Derate Above $+75^\circ\text{C}$		200mW/ $^\circ\text{C}$
Maximum 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-Ambient, R_{thJA}		65 $^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case, R_{thJC}		5 $^\circ\text{C/W}$

Electrical Characteristics: ($V_{IN} = -33\text{V}$, $I_O = 500\text{mA}$, $T_J = 0^\circ$ to $+125^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Output Voltage	V_O	$T_J = +25^\circ\text{C}$	-23.0	-24.0	-25.0	V
		$5\text{mA} \leq I_O \leq 1\text{A}$, $P_O \leq 15\text{W}$, $-38\text{V} \leq V_{IN} \leq -27\text{V}$	-22.8	-24.0	-25.2	V
Line Regulation	Reg_{Line}	$T_J = +25^\circ\text{C}$, Note 1	$-38\text{V} \leq V_{IN} \leq -27\text{V}$	—	31	480
			$-36\text{V} \leq V_{IN} \leq -30\text{V}$	—	14	240
Load Regulation	Reg_{Load}	$T_J = +25^\circ\text{C}$, Note 1	$5\text{mA} \leq I_O \leq 1.5\text{A}$	—	60	480
			$250\text{mA} \leq I_O \leq 750\text{mA}$	—	25	240

Electrical Characteristics: ($V_{IN} = -33V$, $I_O = 500mA$, $T_J = 0^{\circ}$ to $+125^{\circ}C$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Quiescent Current	I_B	$T_J = +25^{\circ}C$	–	4.6	8.0	mA
Quiescent Current Change	ΔI_B	$-38V \leq V_{IN} \leq -27V$	–	–	1.0	mA
		$5mA \leq I_O \leq 1A$	–	–	0.5	
Ripple Rejection	RR	$38V \leq V_{IN} \leq 28V$, $f = 120Hz$	–	54	–	dB
Dropout Voltage	$V_{IN} - V_O$	$T_J = +25^{\circ}C$, $I_O = 1A$	–	2.0	–	V
Output Noise Voltage	V_n	$T_A = +25^{\circ}C$, $10Hz \leq f \leq 100kHz$	–	10	–	$\mu V/V_O$
Output Resistance	r_O	$f = 1kHz$	–	20	–	$m\Omega$
Short-Circuit Current Limit	I_{sc}	$T_A = +25^{\circ}C$, $V_{IN} = 35V$	–	0.2	–	A
Peak Output Current	I_{max}	$T_J = +25^{\circ}C$	–	2.2	–	A
Average Temperature Coefficient of Output Voltage	TCV_O		–	–1.5	–	$mV/^{\circ}C$

Note 1. 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.

