

NTE1927 Integrated Circuit 4-Terminal Negative Adjustable Voltage Regulator

Description:

The NTE1927 is a 4-terminal negative adjustable voltage regulator in a TO3 type package designed to deliver continuous load currents of up to 1A with a maximum input voltage of -40V.

Features:

- Output Current in Excess of 1A
- Negative Output -30V to -2.2V
- Internal Thermal Overload Protection
- Internal Short Circuit Protection
- Output Transistor Safe-Area Protection

Absolute Maximum Ratings:

Input Voltage, V_{IN}	-40V
Control Pin Voltage	$-V_{OUT} \leq -V \leq 0$
Power Dissipation, P_D	Internally Limited
Operating Junction Temperature Range, T_{opr}	0° to 150°C
Storage Temperature Range, T_{stg}	-65° to $+150^\circ\text{C}$
Lead Temperature (During Soldering, 60sec), T_L	$+300^\circ\text{C}$

Electrical Characteristics: ($0^\circ \leq T_J \leq +125^\circ\text{C}$, $V_{IN} = -10\text{V}$, $I_{OUT} = 500\text{mA}$, $C_{IN} = 2\mu\text{F}$, $C_{OUT} = 1\mu\text{F}$, Note 1, Note 2 unless otherwise specified)

Parameter	Test Conditions	Min	Typ	Max	Unit
Input Voltage Range	$T_J = +25^\circ\text{C}$	-40	-	-7.0	V
Nominal Output Voltage Range	$V_{IN} = V_{OUT} - 5\text{V}$	-30	-	-2.23	V
Output Voltage Tolerance	$V_{OUT} - 15\text{V} \leq V_{IN} \leq V_{OUT} - 3\text{V}$, $5\text{mA} \leq I_{OUT} \leq 1\text{A}$, $P_D \leq 15\text{W}$, $I_{IN(max)} = -38\text{V}$	$T_J = +25^\circ\text{C}$		4.0	% (V_{OUT})
		-	-	5.0	% (V_{OUT})

Note 1. V_{OUT} is defined as: $V_{OUT} = \frac{R1 + R2}{R2} (-2.23)$

Note 2. The convention for negative regulators in the algebraic value, thus -15V is less than -10V.

Electrical Characteristics (Cont'd): ($0^{\circ} \leq T_J \leq +125^{\circ}\text{C}$, $V_{IN} = -10\text{V}$, $I_{OUT} = 500\text{mA}$, $C_{IN} = 2\mu\text{F}$, $C_{OUT} = 1\mu\text{F}$, Note 1, Note 2 unless otherwise specified)

Parameter	Test Conditions	Min	Typ	Max	Unit	
Line Regulation	$V_{OUT} \geq -10\text{V}$, $(V_{OUT}-15\text{V}) \leq V_{IN} \leq (V_{OUT}-2.5\text{V})$	$T_J = +25^{\circ}\text{C}$	-	-	1.0	% (V_{OUT})
	$V_{OUT} \leq -10\text{V}$, $(V_{OUT}-15\text{V}) \leq V_{IN} \leq (V_{OUT}-3\text{V})$		-	-	0.75	% (V_{OUT})
	$V_{OUT} \leq -10\text{V}$, $(V_{OUT}-7\text{V}) \leq V_{IN} \leq (V_{OUT}-3\text{V})$		-	-	0.67	% (V_{OUT})
Load Regulation	$250\text{mA} \leq I_{OUT} \leq 750\text{mA}$	$T_J = +25^{\circ}\text{C}$, $V_{IN} = V_{OUT}-5\text{V}$	-	-	1.0	% (V_{OUT})
	$5\text{mA} \leq I_{OUT} \leq 1.5\text{A}$		-	-	2.0	% (V_{OUT})
Control Pin Current	$T_J = +25^{\circ}\text{C}$	-	0.4	2.0	μA	
		-	-	3.0	μA	
Quiescent Current	$T_J = +25^{\circ}\text{C}$	-	0.5	1.5	μA	
		-	-	2.0	μA	
Ripple Rejection	$-18\text{V} \leq V_{IN} \leq -8\text{V}$, $V_{OUT} = -5\text{V}$, $f = 120\text{Hz}$	50	60	-	dB	
Output Noise Voltage	$T_J = +25^{\circ}\text{C}$, $10\text{Hz} \leq f \leq 100\text{kHz}$, $V_{OUT} = -5\text{V}$, $I_{OUT} = 5\text{mA}$	-	25	80	$\mu\text{V}/V_{OUT}$	
Dropout Voltage	Note 3	-	-	2.3	V	
Short Circuit Current	$T_J = +25^{\circ}\text{C}$, $V_{IN} = -30\text{V}$	-	0.25	1.2	A	
Peak Output Current	$T_J = +25^{\circ}\text{C}$	1.3	2.1	3.3	A	
Average Temperature Coefficient of Output Voltage	$T_J = -55^{\circ}$ to $+25^{\circ}\text{C}$	$V_{OUT} = -5\text{V}$, $I_{OUT} = 5\text{mA}$	-	-	0.3	$\text{mV}/^{\circ}\text{C}/V_{OUT}$
	$T_J = +25^{\circ}$ to $+150^{\circ}\text{C}$		-	-	0.3	$\text{mV}/^{\circ}\text{C}/V_{OUT}$
Control Pin Voltage (Reference)	$T_J = +25^{\circ}\text{C}$	-2.32	-2.23	-2.14	V	
		-2.35	-	-2.11	V	

Note 1. V_{OUT} is defined as: $V_{OUT} = \frac{R1 + R2}{R2} (-2.23)$

Note 2. The convention for negative regulators in the algebraic value, thus -15V is less than -10V .

Note 3. Dropout Voltage is defined as that input-output voltage differential which causes the output voltage to decrease by 5% of its initial value.

Note 4. All characteristics except noise voltage and ripple rejection ratio are measured using pulse techniques ($t_W \leq 10\text{ms}$, duty cycle $\leq 5\%$). Output voltage changes due to changes in internal temperature must be taken into account separately.

Pin Connection Diagram
(Bottom View)

