

NTE1911

3 Terminal Adjustable Negative Voltage Regulator –1.2V to –37V, 1.5A

Description:

The NTE1911 is an adjustable 3-terminal negative voltage regulator capable of supplying in excess of 1.5A over an output voltage range of –1.2V to 37V. This regulator is exceptionally easy to apply, requiring only 2 external resistors to set the output voltage and 1 output capacitor for frequency compensation. The circuit design has been optimized for excellent regulation and low thermal transients. Further, it features internal current limiting, thermal shutdown and safe-area compensation, making the, virtually blowout-proof against overloads.

The NTE1911 serves a wide variety of applications including local on-card regulation, programmable-output voltage regulation or precision current regulation.

Features:

- Output Voltage Adjustable from –1.2V to –37V
- 1.5A Output Current Guaranteed, –55°C to +150°C
- Line Regulation Typically 0.01%/V
- Load Regulation Typically 0.3%
- Excellent Thermal Regulation, 0.002%/W
- 77dB Ripple Rejection
- Excellent Rejection of Thermal Transients
- 50ppm/°C Temperature Coefficient
- Temperature-Independent Current Limit
- Internal Thermal Overload Protection

Absolute Maximum Ratings:

Power Dissipation, P_D 20W
 Input-Output Voltage Differential, V_{I-O} 40V
 Operating Junction Temperature Range, T_J 0° to +125°C
 Storage Temperature Range, T_{stg} –65° to +150°C
 Lead Temperature (Soldering, 10 sec), T_L 300°C

Electrical Characteristics: (Note 1)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Line Regulation	Reg_{line}	$T_A = +25^\circ C, 3V \leq V_I - V_O \leq 40V, \text{ Note 2}$	–	0.01	0.04	%/V
		$3V \leq V_I - V_O \leq 40V, \text{ Note 2}$	–	0.02	0.07	%/V

Note 1. Unless otherwise noted, these specifications apply: $0^\circ \leq T_J \leq +125^\circ C$, $(V_I - V_O) = 5V$, $P_{max} = 20W$, and $I_{MAX} = 1.5A$.

Note 2. Load and line regulation are specified at constant junction temperature. Pulse testing with a low duty cycle is used. Change in V_O because of heating effects is covered under the Thermal Regulation specification.

Electrical Characteristics (Cont'd): (Note 1)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit	
Load Regulation	Reg _{load}	$V_O \leq 5V$, Note 2	$T_A = +25^\circ\text{C}$, $10\text{mA} \leq I_O \leq 1.5\text{A}$	–	15	50	mV
			$10\text{mA} \leq I_O \leq 3\text{A}$	–	20	70	mV
		$V_O \geq 5V$, Note 2	$T_A = +25^\circ\text{C}$, $10\text{mA} \leq I_O \leq 1.5\text{A}$	–	0.3	1.0	%
			$10\text{mA} \leq I_O \leq 3\text{A}$	–	0.3	1.5	%
Thermal Regulation	Reg _{therm}	$T_A = +25^\circ\text{C}$, Pulse = 10ms	–	0.003	0.04	% V_O/W	
Adjustment Pin Current	I_{Adj}		–	65	100	μA	
Adjustment Pin Current Change	ΔI_{Adj}	$T_A = +25^\circ\text{C}$, $10\text{mA} \leq I_L \leq 1.5\text{A}$, $2.5\text{V} \leq (V_I - V_O) \leq 40\text{V}$, $P \leq 20\text{W}$	–	0.2	5.0	μA	
Reference Voltage	V_{ref}	$10\text{mA} \leq I_O \leq 1.5\text{A}$, $3\text{V} \leq (V_I - V_O) \leq 40\text{V}$, $P \leq 20\text{W}$, $T_A = +25^\circ\text{C}$, Note 3	1.20	1.25	1.30	V	
		$10\text{mA} \leq I_O \leq 1.5\text{A}$, $3\text{V} \leq (V_I - V_O) \leq 40\text{V}$, $P \leq 20\text{W}$, Note 3	1.213	1.250	1.287	V	
Temperature Stability	T_S	$0^\circ \leq T_J \leq +125^\circ\text{C}$	–	0.6	–	% V_O	
Minimum Load Current	I_{Lmin}	$V_I - V_O \leq 10\text{V}$	–	1.5	6.0	mA	
		$V_I - V_O \leq 40\text{V}$	–	2.5	10	mA	
Maximum Output Current Limit	I_{max}	$V_I - V_O \leq 15\text{V}$, $P \leq 20\text{W}$	1.5	2.2	–	A	
		$V_I - V_O \leq 40\text{V}$, $P \leq 20\text{W}$, $T_A = +25^\circ\text{C}$	0.15	0.4	–	A	
RMS Noise, % of V_O	N	$T_A = +25^\circ\text{C}$, $10\text{Hz} \leq f \leq 10\text{kHz}$	–	0.003	–	% V_O	
Ripple Rejection Ratio	RR	$V_O = 10\text{V}$, $f = 120\text{Hz}$, $C_{Adj} = 0$	–	60	–	dB	
		$V_O = 10\text{V}$, $f = 120\text{Hz}$, $C_{Adj} = 10\mu\text{F}$	66	77	–	dB	
Long Term Stability	S	$T_A = +125^\circ\text{C}$, 1000 Hours	–	0.3	1.0	%/1.0k	

Note 1. Unless otherwise noted, these specifications apply: $0^\circ \leq T_J \leq +125^\circ\text{C}$, $(V_I - V_O) = 5\text{V}$, $P_{max} = 20\text{W}$, and $I_{MAX} = 1.5\text{A}$.

Note 2. Load and line regulation are specified at constant junction temperature. Pulse testing with a low duty cycle is used. Change in V_O because of heating effects is covered under the Thermal Regulation specification.

Note 3. C_{Adj} , when used, is connected between the adjustment pin and GND.

