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## 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 <sub>load</sub>	$V_O \leq 5V$ , 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 <sub>therm</sub>	$T_A = +25^\circ\text{C}$ , Pulse = 10ms	–	0.003	0.04	% $V_O/W$	
Adjustment Pin Current	$I_{Adj}$		–	65	100	$\mu\text{A}$	
Adjustment Pin Current Change	$\Delta I_{Adj}$	$T_A = +25^\circ\text{C}$ , $10\text{mA} \leq I_L \leq 1.5\text{A}$ , $2.5\text{V} \leq (V_I - V_O) \leq 40\text{V}$ , $P \leq 20\text{W}$	–	0.2	5.0	$\mu\text{A}$	
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.

