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NTE957
Integrated Circuit
3–Terminal Adjustable Negative Voltage Regulator

Description:

The NTE957 is an adjustable 3–terminal negative voltage regulator in a TO220 type package capable of supplying in excess of –1.5A over a –1.2V to –37V output range. The circuit design has been optimized for excellent regulation and low thermal transients. Further, the NTE957 features internal current limiting, thermal shutdown, and safe–area compensation, making this device virtually blowout–proof against overloads.

The NTE957 serves a wide variety of applications including local on–card regulation, programmable–output voltage regulation or precision current regulation. The NTE957 is the ideal complement to the NTE956 adjustable positive regulator.

Features:

- Output Voltage Adjustable from –1.2V to –37V
- Guaranteed 1.5A Output Current
- Line Regulation Typically 0.01%/V
- Load Regulation Typically 0.3%
- Excellent Thermal Regulation: 0.002%/W
- 77dB Ripple Rejection
- Temperature–Independent Current Limit
- Internal Thermal Overload Protection
- 100% Electrical Burn–In
- Eliminates the Need to Stock Many Voltages

Absolute Maximum Ratings:

Power Dissipation, P_D . . . . . Internally Limited
Input–Output Voltage Differential, $V_I–V_O$ 40V
Operating Junction Temperature Range, T_J . . . . . 0° to +125°C
Storage Temperature Range, T_{stg} . . . . . –65° to +150°C
Typical Thermal Resistance, Junction–to–Case, R_{thJC} . . . . . 4°C/W
Lead Temperature (During Soldering, 10sec), T_L . . . . . +300°C

Electrical Characteristics: ($0° \le T_J \le +125°C$, $V_{IN}–V_{OUT} = 5V$, $I_O = 500mA$, $I_{MAX} = 1.5A$, Note 1 unless otherwise specified)

Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
Line Regulation	Reg_{line}	$T_A = +25°C$, $3V \le (V_{IN}–V_{OUT}) \le 40V$, Note 2		–	0.01	0.04	%/V
		$3V \le (V_{IN}–V_{OUT}) \le 40V$		–	0.02	0.07	%/V
Load Regulation	Reg_{load}	$T_A = +25°C$, $10mA \le I_O \le I_{MAX}$, Note 2	$V_{OUT} \le 5V$	–	15	50	mV
			$V_{OUT} \ge 5V$	–	0.3	1.0	%
		$10mA \le I_O \le 1_{MAX}$, Note 2	$V_{OUT} \le 5V$	–	20	70	mV
			$V_{OUT} \ge 5V$	–	0.3	1.5	%
Thermal Regulation		$T_A = +25°C$, 20ms Pulse		–	0.003	0.04	%/W
Adjustment Pin Current	I_{Adj}			–	65	100	µA
Adjustment Pin Current Change	ΔI_{Adj}	$10mA \le I_L \le I_{MAX}$, $2.5V \le (V_{IN}–V_{OUT}) \le 40V$, $T_A = +25°C$		–	2	5	µA
Reference Voltage	V_{ref}	$T_A = +25°C$		–1.213	–1.250	–1.287	V
		$3V \le (V_{IN}–V_{OUT}) \le 40V$, $10mA \le I_O \le 1_{MAX}$, $P \le P_{MAX}$		–1.200	–1.250	–1.300	V
Temperature Stability	T_S	$0° \le T_J \le +125°C$		–	0.6	–	%
Minimum Load Current	I_{Lmin}	$(V_{IN}–V_{OUT}) \le 40V$		–	2.5	10	mA
		$(V_{IN}–V_{OUT}) \le 10V$		–	1.5	6.0	mA
Maximum Output Current Limit	I_{max}	$V_{IN}–V_{OUT} \le 15V$		1.5	2.2	–	A
		$V_{IN}–V_{OUT} = 40V$		–	0.4	–	A
RMS Output Noise, % of V_{OUT}	N	$T_A = +25°C$, $10Hz \le f \le 10kHz$		–	0.003	–	%
Ripple Rejection Ratio	RR	$V_{OUT} = 10V$, $f = 120Hz$		–	60	–	dB
			$C_{ADJ} = 10µF$	66	77	–	dB
Long Term Stability	S	$T_A = +125°C$, 1000 Hours		–	0.3	1.0	%

Note 1. Although power dissipation is internally limited, these specifications are applicable for power dissipations of 20W.

Note 2. Regulation is measured at constant junction temperature, using pulse testing with a low duty cycle. Changes in output voltage due to heating effects are covered under the specification for thermal regulation.