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NTE935
Integrated Circuit
3–Terminal Adjustable Positive Voltage Regulator
1.2V to 32V, 5A

Description:

The NTE935 is an adjustable 3–terminal positive voltage regulator in a TO3 type package capable of supplying in excess of 5A over a 1.2V to 32V output range. This device is exceptionally easy to use.

A unique feature of the NTE935 is its time dependent current limiting. The current limit circuitry allows peak currents of up to 12A to be drawn from the regulator for short periods of time.

Also included on the chip are thermal overload protection and safe area protection for the power transistor.

Overload protection remains functional even if the adjustment pin is accidently disconnected.

Normally, no capacitors are needed unless the device is situated far from the input filter capacitors in which case an input bypass is needed. An optional output capacitor can be added to improve transient response. The adjustment terminal can be bypassed to achieve very high ripple rejections ratios which are difficult to achieve with standard 3–terminal regulators.

Features:

- Guaranteed 7A Peak Output Current
- Guaranteed 5A Output Current
- Adjustable Output Down to 1.2V
- Line Regulation Typically 0.005%/V
- Load Regulation Typically 0.1%
- Guaranteed Thermal Regulation
- Output is Short Circuit Protected
- Current Limit Constant with Temperature
- Standard 3–Lead Transistor Package.

Absolute Maximum Ratings:

Power Dissipation, P_D . . . . . Internally limited
Input–Output Voltage Differential, $V_{I–O}$ 35V
Operating Junction Temperature Range, T_J . . . . . 0° to +125°C
Storage Temperature Range, T_{stg} . . . . . –65° to +150°C
Lead Temperature (During Soldering, 10 seconds), T_L . . . . . +300°C
Thermal Resistance, Junction–to–Case, R_{thJC} . . . . . 1.0°C/W
Thermal Resistance, Junction–to–Ambient, R_{thJA} . . . . . 35°C/W

Electrical Characteristics: (+25°C ≤ TJ ≤ +150°C, $V_{IN} - V_{OUT}$ = 5V and I_{OUT} = 2.5A, Note 1 unless otherwise specified)

Parameter	Test Conditions	Min	Typ	Max	Unit
Line Regulation	3V ≤ ($V_{IN} - V_{OUT}$) ≤ 35V, I_L = 0.01A, Note 2	–	0.02	0.06	%/V
	3V ≤ ($V_{IN} - V_{OUT}$) ≤ 35V, I_L = 0.01A, T_A = +25°C, Note 2	–	0.005	0.03	%/V
Load Regulation	10mA ≤ I_{OUT} ≤ 5A, Note 2	–	0.3	1.0	%
	10mA ≤ I_{OUT} ≤ 5A, T_A = +25°C, Note 2	–	0.1	0.5	%
Thermal Regulation	Pulse = 20ms, T_J = +25°C	–	0.002	0.02	%/W
Adjustment Pin Current		–	45	100	µA
Adjustment Pin Current Change	10mA ≤ I_L ≤ 5A, 3V ≤ ($V_{IN} - V_{OUT}$) ≤ 35V	–	0.2	5.0	µA
Reference Voltage	3 ≤ ($V_{IN} - V_{OUT}$) ≤ 35V, 10mA ≤ I_{OUT} ≤ 5A, P ≤ 50W, Note 3	1.19	1.24	1.29	V
Temperature Stability	$T_{MIN} \le T_J \le T_{MAX}$	–	1	–	%
Minimum Load Current	($V_{IN} - V_{OUT}$) = 35V	–	3.5	10	mA
Current Limit	($V_{IN} - V_{OUT}$) ≤10V	5.0	8.0	–	A
	($V_{IN} - V_{OUT}$) ≤ 30V	–	1.0	–	A
RMS Output Noise, % of V_{OUT}	T_J = +25°C, 10Hz ≤ f ≤ 10kHz	–	0.003	–	%
Ripple Rejection Ratio	V_{OUT}= 10V, f = 120Hz	–	60	–	dB
	C_{ADJ} = 10µF	60	75	–	dB
Long Term Stability	T_J = +125°C	–	0.3	1.0	%

Note 1. Power dissipation is internally limited, these specifications are applicable for power dissipations up to 50W.

Note 2. Regulation is measured at constant junction temperature. Changes in output voltage due to heating effects are taken into account separately by thermal regulation.

Note 3. Selected devices with tightened tolerance reference voltage.

