NTE7239
Integrated Circuit
Positive Adjustable Voltage Regulator, 5A, 1.2V to 32V
TO−220 Type Package

Description:

The NTE7239 is an adjustable 3−terminal positive voltage regulator in a TO−200 type package capable of supplying in excess of 5A over a 1.2V to 32V output range. A unique feature of this device is time−dependent current limiting, which allows peak current up to 12A to be drawn from the regulator for short periods of time. his allows the NTE7239 to be used with heavy transient loads and speeds start−up under full−load conditions. Under sustained loading conditions, the current limit decreases to a safe value protecting the regulator. Also included on th chip are thermal overload protection, and safe area protection for the power transistor. Overload protection remains functional even if the adjustment pin is accidentally disconnected.

Normally, no capacitors are needed unless the device is situated more than 6 inches from the input filter capacitors in which case an input bypass is needed. An output capacitor can be added to improve transient response, while bypassing the adjustment pin will increase th regulator's ripple rejection.

Besides replacing fixed regulators o discrete designs, the NTE7239 is useful in a wide variety of other applications. Since the regulator is "floating" and sees only the input−to−output differential voltage, supplies of several hundred volts can be regulated as long as the maximum input to output differential is not exceeded, i.e., do not short−circuit output to ground.

Features:

- Specified 7A Peak Output Current
- Specified 5A Output Current
- Adjustable Output Down to 1.2V
- Specified Thermal Regulation
- Current Limit Constant with Temperature
- Output is Short−Circuit Protected

Applications:

- Adjustable Power Supplies
- Constant Current Regulators
- Battery Chargers

Absolute Maximum Ratings: (Note 1)

Power Dissipation . . . . . Internally Limited
Input/Output Voltage Differential . . . . . +40V, −0.3V

Note 1. Absolute maximum ratings indicate limits beyond which damage to the device may occur. Operating ratings indicate conditions for which the device is intended to be functional, but do not ensure specific performance limits. For ensured specifications and test conditions, see the Electrical Characteristics.

Absolute Maximum Ratings (Cont'd): (Note 1)

Operating Temperature Range . . . . . 0° to +125°C
Storage Temperature Range . . . . . –65° to +150°C
Lead Temperature (During Soldering, 4 sec) . . . . . +260°C
Typical Thermal Resistance, Junction–to–Ambient (No Heat Sink), R_{thJA} . . . . . 50°C/W
Maximum Thermal Resistance, Junction–to–Case, R_{thJC} . . . . . 4°C/W

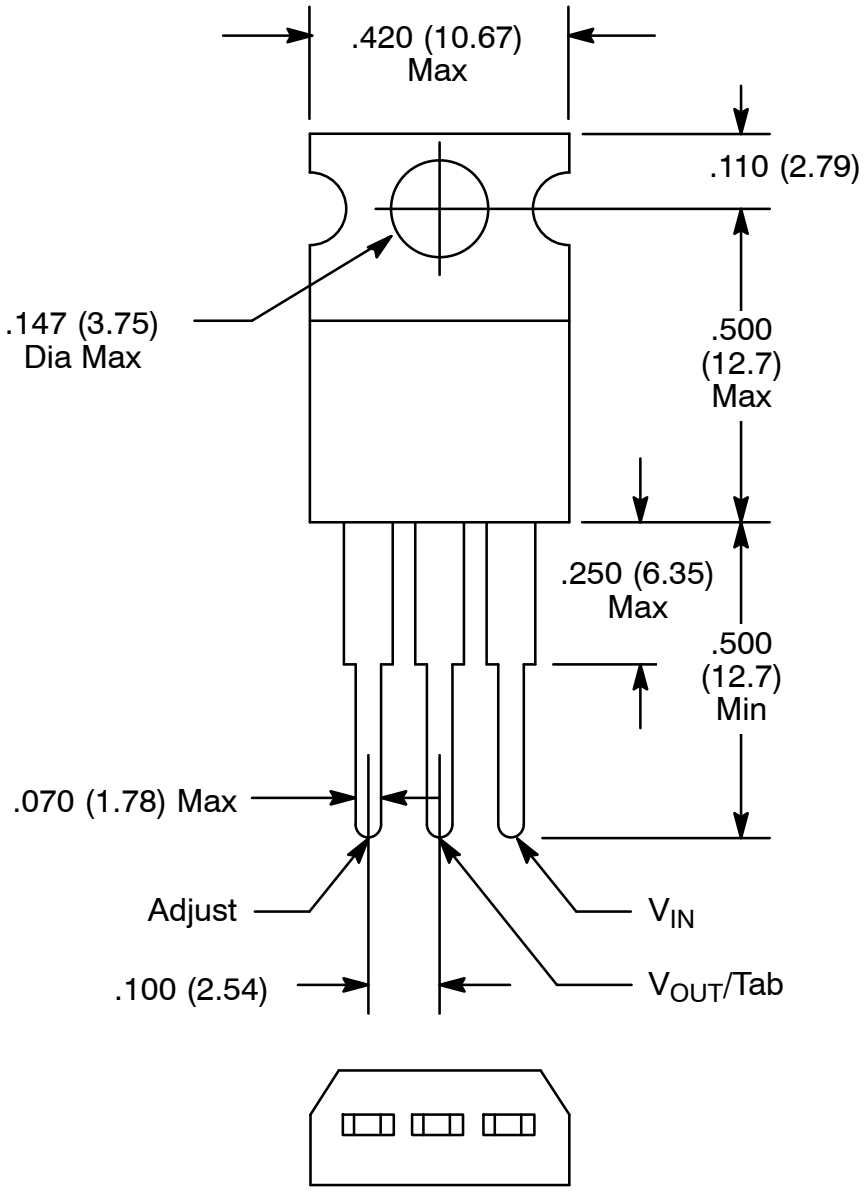
Note 1. Absolute maximum ratings indicate limits beyond which damage to the device may occur. Operating ratings indicate conditions for which the device is intended to be functional, but do not ensure specific performance limits. For ensured specifications and test conditions, see the Electrical Characteristics.

Electrical Characteristics: (T_J = +25°C, V_{IN} = V_{OUT} = 5V, I_{OUT} = 10mA, Note 2 unless otherwise specified)

Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
Reference Voltage	V_{REF}	3V ≤ (V_{IN} – V_{OUT}) ≤ 35V, 10mA ≤ I_{OUT} ≤ 5A, P ≤ 50W, 0° ≤ T_J ≤ +125°C		1.19	1.24	1.29	V
Line Regulation	V_{RLINE}	3V ≤ (V_{IN} – V_{OUT}) ≤ 35V, Note 3		–	0.005	0.03	%/V
			0° ≤ T_J ≤ +125°C	–	0.02	0.06	%/V
Load Regulation	V_{RLOAD}	10mA ≤ I_{OUT} ≤ 5A		–	0.1	0.5	%
			0° ≤ T_J ≤ +125°C	–	0.3	1.0	%
Thermal Regulation		20ms Pulse		–	0.002	0.02	%/W
Adjustment Pin Current	I_{ADJ}	0° ≤ T_J ≤ +125°C		–	45	100	μA
Adjustment Pin Current Change	ΔI_{ADJ}	3V ≤ (V_{IN} – V_{OUT}) ≤ 35V, 10mA ≤ I_{OUT} ≤ 5A, 0° ≤ T_J ≤ +125°C		–	0.2	5.0	μA
Temperature Stability	$\Delta V_{R/T}$	0° ≤ T_J ≤ +125°C		–	1	–	%
Minimum Load Current	I_{LOAD}(Min)	V_{IN} – V_{OUT} = 35V, 0° ≤ T_J ≤ +125°C		–	3.5	10	mA
Current Limit DC	I_{CL}	V_{IN} – V_{OUT} ≤ 10V, 0° ≤ T_J ≤ +125°C		5	8	–	A
0.5ms Peak				7	12	–	A
Current Limit	I_{CL}	V_{IN} – V_{OUT} = 30V		–	–	1	A
RMS Output Noise, %of V_{OUT}	V_N	10Hz ≤ f ≤ 10kHz		–	0.003	–	%
Ripple Rejection Ratio	$\Delta V_R/\Delta V_{IN}$	V_{OUT} = 10V, f = 120Hz, 0° ≤ T_J ≤ +125°C	C_{ADJ} = 0μF	–	60	–	dB
			C_{ADJ} = 10μF	60	75	–	dB
Long–Term Stability		T_J = +125°C, 1000 hrs		–	0.3	1.0	%

Note 2. These specifications are applicable for power dissipation up to 25W. Power dissipation is specified up to 15V input–output differential. Above 15V differential, power dissipation will be limited by internal protection circuitry.

Note 3. Regulation is measured at a 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.


.420 (10.67)
Max
.110 (2.79)
.147 (3.75)
Dia Max
.500
(12.7)
Max
.250 (6.35)
Max
.500
(12.7)
Min
.070 (1.78) Max
Adjust
V_{IN}
.100 (2.54)
V_{OUT}/Tab