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NTE7241
Integrated Circuit,
Adjustable Positive 3 Terminal High Voltage Regulator,
1.25V to 125V
TO–220 Type Package

Description:

The NTE7241 is an adjustable 3–terminal high–voltage with an output range of 1.2V to 125V and a DMOS output transistor capable of sourcing more than 700 mA. It is designed for use in high–voltage applications where standard bipolar regulators cannot be used. Excellent performance specifications, superior to those of most bipolar regulators, are achieved through circuit design and advanced layout techniques.

As a state–of–the–art regulator, the NTE7241 combines standard bipolar circuitry with high–voltage double–diffused MOS transistors on one chip to yield a device capable of withstanding voltages for higher than standard bipolar integrated circuits. Because of its lack of secondary–breakdown and thermal–runaway characteristics usually associated with bipolar outputs, the NTE7241 maintains full overload protection while operating at up to 125V from input to output. Other features of the device include current limiting, safe–operating–area (SOA) protection, and thermal shutdown. Even if ADJ is inadvertently disconnected, the protection circuitry remains functional.

The NTE7241 is characterized for operation over the virtual junction temperature range of 0° to +125°C.

Features:

- Output Adjustable From 1.25V to 125V When Used With an External Resistor Divider
- 700–mA Output Current
- Full Short–Circuit, Safe–Operating–Area, and Thermal–Shutdown Protection
- 0.001%/V Typical Input Voltage Regulation
- 0.15% Typical Output Voltage Regulation
- 76–dB Typical Ripple Rejection

Absolute Maximum Ratings: (Note 1, unless otherwise specified)

Input/Output Voltage Differential, $V_I - V_O$ 125V
Operating Free–Air Temperature, T_A . . . . +150°C
Operating Case Temperature, T_C . . . . +150°C
Operating Junction Temperature, T_J . . . . +150°C
Storage Temperature Range, T_{stg} . . . . –65° to +150°C

Note 1. Stresses beyond those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. Theses are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “Recommended Operating Conditions” is not implied. Exposure to absolute–maximum–rated conditions for extended periods may affect reliability.

RoHS 2002/95/EC

Absolute Maximum Ratings (Cont'd): (Note 1, unless otherwise specified)

Thermal Resistance, Junction−to−Case (Note 2), R_{thJC} . . . . 17°C/W

Thermal Resistance, Junction−to−Ambient (Note 2), R_{thJA} . . . . 19°C/W

Lead Temperature 1.6mm (1/16 inch) from case for 10 seconds, T_L . . . . +260°C

Note 1. Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. Theses are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "Recommended Operating Conditions" is not implied. Exposure to absolute−maximum−rated conditions for extended periods may affect reliability.

Note 2. Maximum power dissipation is a function of T_J(max), $R_{thJA,}$ and T_A. The maximum allowable power dissipation at any allowable ambient temperature is $P_D = (T_J(max) - T_A/R_{thJA})$. Operating at the absolute maximum T_J of +150°C can affect reliability. Due to variations in individual device electrical characteristics and thermal resistance, the built−in thermal overload protection may be activated at power levels slightly above or below the rated dissipation.

Recommended Operating Conditions:

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input−to Output Voltage Differential	$V_I - V_O$		–	–	125	V
Output Current	I_O		15	–	700	mA
Operating Virtual Junction Temperature	T_J		0	–	125	°C

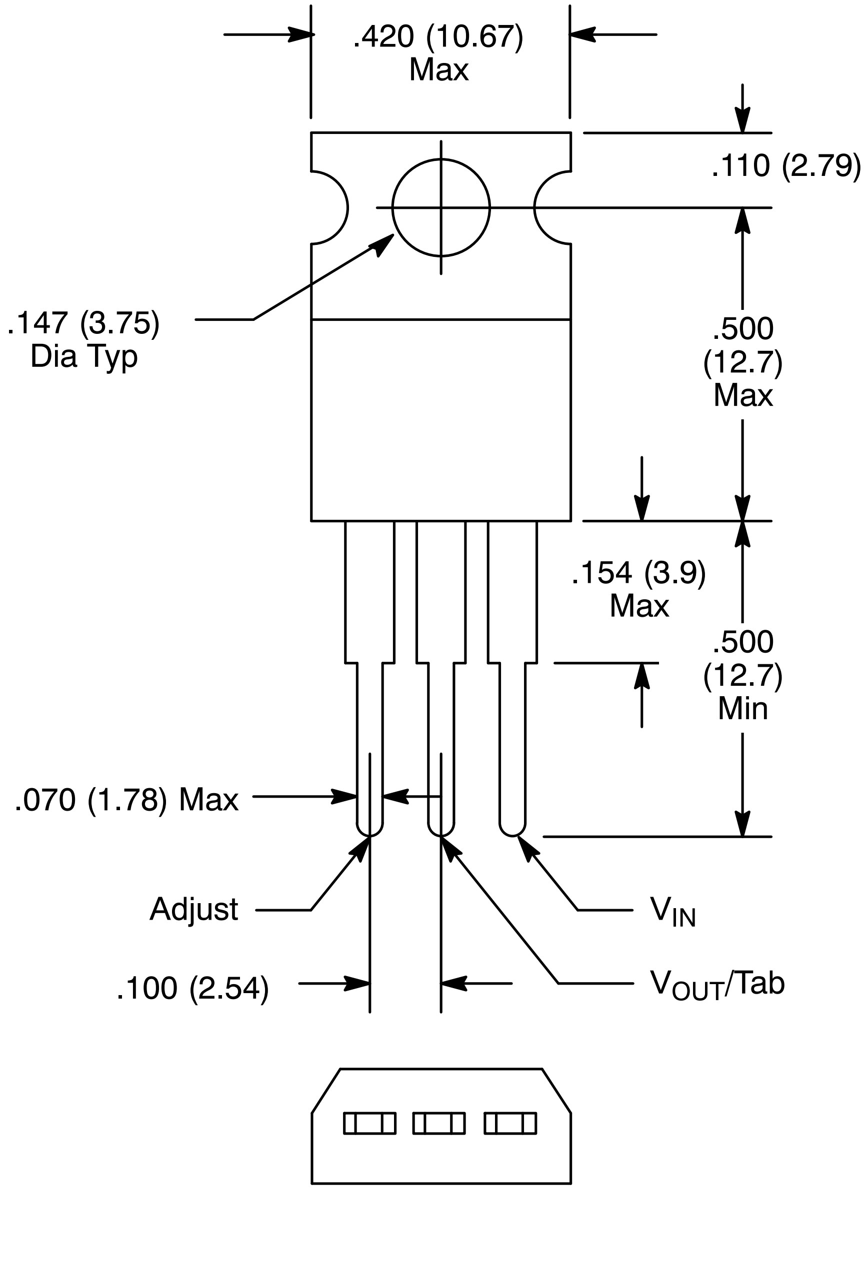
Electrical Characteristics: ($V_I - V_O$ = 25V, I_O = 0.5A, T_J = 0° to +125°C 10mA, Note 3, unless otherwise specified)

Parameter	Test Conditions		Min	Typ	Max	Unit
Input Voltage Regulation	$V_I - V_O$ = 20V to 125V, P ≤ Rated Dissipation, (Note 4)	T_J = +25°C	–	0.001	0.01	%/V
		T_J = 0°C to +125°C	–	0.004	0.02	%/V
Ripple Rejection	$\Delta V_{I(PP)}$ = 10V, V_O = 10V, f = 120H_z		66	76	–	dB
Output Voltage Regulation	I_O = 15 mA to 700 mA, T_j = +25°C	$V_O \leq$ 5V	–	7.5	25	mV
		$V_O \leq$ 5V	–	0.15%	0.5%	
	I_O = 15 mA to 700 mA, P ≤ Rated Dissipation	$V_O \leq$ 5V	–	20	70	mV
		$V_O \leq$ 5V	–	0.3	1.0	%
Output Voltage Change with Temperature			–	0.4%	–	–
Output Voltage Long−Term Drift	1000 hours at T_J = +125°C, $V_I - V_O$ = 125V		–	0.2%	–	–
Output Noise Voltage	f = 10H_z to 10$_kH_z$, T_J = +25°C		–	0.003%	–	–
Minimum Output Current to Maintain Regulation	$V_I - V_O$ = 125V		–	–	15	mA
Peak Output Current	$V_I - V_O$ = 25V, t =1ms		–	1100	–	mA
	$V_I - V_O$ = 15V, t = 30ms		–	715	–	mA
	$V_I - V_O$ = 25V, t = 30ms		700	900	–	mA
	$V_I - V_O$ = 125V, t = 30ms		100	250	–	mA
ADJ Input Current			–	83	110	μA
Change in ADJ Input Current	$V_I - V_O$ = 15V to 125V, I_O = 15mA to 700mA, P ≤ Rated Dissipation		–	0.5	5	μA
Reference Voltage (OUT to ADJ)	$V_I - V_O$ = 10V to 125V, I_O = 15mA to 700mA, P ≤ Rated Dissipation, Note 5		1.2	1.27	1.3	V

Note 3. Pulse−testing techniques maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately.

Note 4. Input voltage regulation is expressed here as the percentage change in output voltage per 1−V change at the input.

Note 5. Due to the dropout voltage and output current−limiting characteristics of this device, output current is limited to less than 700 mA at input−to−output voltage differentials of less than 25V.



.420 (10.67)
Max
.110 (2.79)
.147 (3.75)
Dia Typ
.500
(12.7)
Max
.154 (3.9)
Max
.500
(12.7)
Min
.070 (1.78) Max
Adjust
V_{IN}
.100 (2.54)
V_{OUT}/Tab

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