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NTE7234-1
NTE7234-2
NTE7234-3
Integrated Circuit
Positive Voltage Regulator, 100mA
Low Dropout Voltage

Description:

The NTE7234 series consists of positive fixed (NTE7234-1, NTE7234-2) and adjustable (NTE7234-3) output voltage regulators that are specifically designed to maintain proper regulation with an extreme low input-to-output voltage differential. These devices are capable of supplying output currents in excess of 100mA and feature a low bias current of 0.4mA at 10mA output.

The NTE7234 series also includes internal current limiting, thermal shutdown, and additionally, is able to withstand temporary power-up with mirror-image insertion.

Due to the low dropout voltage and bias current specifications, the NTE7234 series is ideally suited for battery powered industrial and consumer equipment where an extension of useful battery life is desirable.

Features:

- Available in 3 Package Types:
 - 5V Fixed Type:
 - TO92 – NTE7234-1
 - TO220 – NTE7234-2
 - 3V to 24V Adjustable:
 - 5-Lead TO220 – NTE7234-3
- Input-to-Output Voltage Differential of < 0.6V @ 100mA
- Output Current in Excess of 100mA
- Low Bias Current
- 60V Load Dump Protection
- -50V Reverse Transient Protection
- Internal Current Limiting with Thermal Shutdown
- Temporary Mirror-Image Protection
- Ideally Suited for Battery Powered Equipment

Applications:

- Battery Powered Consumer Products
- Hand-Held Instruments
- Camcorders and Cameras

Absolute Maximum Ratings: (Note 1)

Continuous Input Voltage, V_I	40V
Peak Transient Input Voltage ($\tau \leq 100\text{ms}$), $V_I(\tau)$	60V
Peak Transient reverse Polarity Input Voltage (1.0% Duty Cycle, $\tau \leq 100\text{ms}$), $-V_I(\tau)$	-50V
Power Dissipation ($T_A = +25^\circ\text{C}$), P_D	
NTE7234-1	Internally Limited
NTE7234-2, NTE7234-3	Internally Limited
Operating Die Junction Temperature, T_J	+150°C
Operating Ambient Temperature Range, T_A	-40° to +125°C
Storage Temperature Range, T_{stg}	-65° to +150°C
Thermal Resistance, Junction-to-Ambient, R_{thJA}	
NTE7234-1	+178°C/W
NTE7234-2, NTE7234-3	+83°C/W
Thermal Resistance, Junction-to-Case, R_{thJC}	
NTE7234-1	+65°C/W
NTE7234-2, NTE7234-3	+5.0°C/W

Note 1. Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

Electrical Characteristics, Fixed Output: ($V_{\text{in}} = 14\text{V}$, $I_O = 10\text{mA}$, $C_O = 100\mu\text{F}$, $C_{O(\text{ESR})} = 0.3\Omega$, $T_A = +25^\circ\text{C}$, Note 2 unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Output Voltage	V_O	$V_{\text{in}} = 14\text{V}$, $I_O = 10\text{mA}$, $T_A = +25^\circ\text{C}$	4.75	5.0	5.25	V
		$V_{\text{in}} = 6\text{V to } 25\text{V}$, $I_O \leq 100\text{mA}$, $T_A = -40^\circ \text{ to } +125^\circ\text{C}$	4.5	-	5.2	V
Line Regulation	Reg_{line}	$V_{\text{in}} = 9\text{V to } 16\text{V}$	-	2.0	10	mV
		$V_{\text{in}} = 6\text{V to } 26\text{V}$	-	4.0	30	mV
Load Regulation	Reg_{load}	$I_O = 5\text{mA to } 100\text{mA}$	-	14	50	mV
Output Impedance	Z_O	$I_O = 10\text{mA}$, $\Delta I_O = 1\text{mA}$, $f = 100\text{Hz to } 10\text{kHz}$	-	200	-	$\text{m}\Omega$
Bias Current	I_B	$V_{\text{in}} = 14\text{V}$, $I_O = 100\text{mA}$, $T_A = +25^\circ\text{C}$	-	5.8	30	mA
		$V_{\text{in}} = 6\text{V to } 25\text{V}$, $I_O = 10\text{mA}$, $T_A = -40^\circ \text{ to } +125^\circ\text{C}$	-	0.4	1.0	mA
Output Noise Voltage	V_n	$f = 10\text{Hz to } 100\text{kHz}$	-	700	-	Vrms
Long Term Stability	S		-	20	-	mV/kHR
Ripple Rejection	RR	$f = 120\text{Hz}$	60	90	-	dB
Dropout Voltage	$V_I - V_O$	$I_O = 10\text{mA}$	-	0.015	0.2	V
		$I_O = 100\text{mA}$	-	0.16	0.6	V
Overvoltage Shutdown Threshold	$V_{\text{th(OV)}}$		26.0	29.5	40.0	V
Output Voltage with Reverse Polarity Input	$-V_O$	$V_{\text{in}} = -15\text{V}$	-0.3	0	-	V

Note 2. Low duty cycle pulse techniques are used during test to maintain junction temperature as close to ambient as possible.

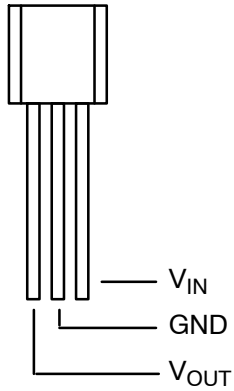
Electrical Characteristics, Adjustable Output: ($V_{in} = 14V$, $I_O = 10mA$, $C_O = 100 F$, $C_{O(ESR)} = 0.3^\circ$, $T_A = +25C$, Note 2 unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Reference Voltage (Note 3)	V_{ref}	$I_O = 10mA$, $T_A = +25^\circ C$	1.14	1.20	1.26	V
		$I_O \leq 100mA$, $T_A = -40^\circ$ to $+125^\circ C$	1.08	-	1.32	V
Output Voltage Range	V_{Orange}		3 to 24	2.7 to 29.5	-	V
Line Regulation	Reg_{line}	$V_{in} = V_O + 0.6V$ to 26V	-	0.2	1.5	mV/V
Load Regulation	Reg_{load}	$I_O = 5mA$ to 100mA	-	0.3	1.0	%/V
Output Impedance	Z_O	$I_O = 10mA$, $\leq I_O = 1mA$, $f = 10Hz$ to 10kHz	-	40	-	$m\Omega/V$
Bias Current	I_B	$I_O = 100mA$	-	6.0	-	mA
		$I_O = 10mA$	-	0.4	1.0	mA
		Output Inhibit ($V_{th(OI)} = 2.5V$)	-	0.2	1.0	mA
Adjustment Pin Current	I_{Adj}		-	0.2	-	A
Output Noise Voltage	V_n	$f = 10Hz$ to 100kHz	-	140	-	V_{rms}/V
Long-Term Stability	S		-	0.4	-	%/kHR
Ripple Rejection	RR	$f = 120Hz$	0.10	0.003	-	%/V
Dropout Voltage	$V_I - V_O$	$I_O = 10mA$	-	0.015	0.2	V
		$I_O = 100mA$	-	0.16	0.6	V
Overvoltage Shutdown Threshold	$V_{th(OV)}$		26.0	29.5	40.0	V
Output Voltage with Reverse Polarity Input	$-V_O$	$V_{in} = -15V$	-0.3	0	-	V
Output Inhibit Threshold Voltage Output "On" <hr/> Output "Off"	$V_{th(OI)}$	$T_A = +25^\circ C$	-	2.15	1.90	V
		$T_A = -40^\circ$ to $+125^\circ C$	-	-	1.20	V
		$T_A = +25^\circ C$	2.50	2.26	-	V
		$T_A = -40^\circ$ to $+125^\circ C$	3.25	-	-	V
Output Inhibit Threshold Current	$I_{th(OI)}$	$V_{th(OI)} = 2.5V$	-	30	50	A

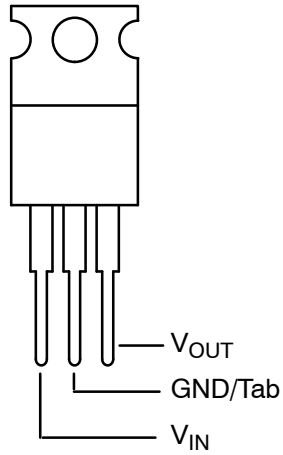
Note 2. Low duty cycle pulse techniques are used during test to maintain junction temperature as close to ambient as possible.

Note 3. The reference voltage on th adjustable device is measured from the output to the adjust pin across R_1 .

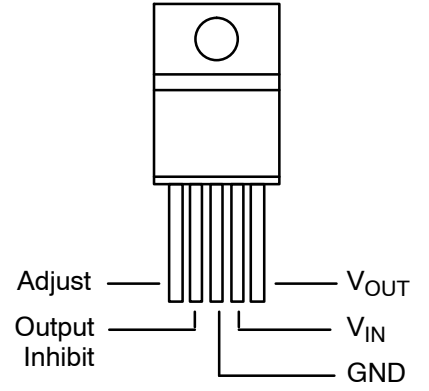
NTE7234-1
(Front View)



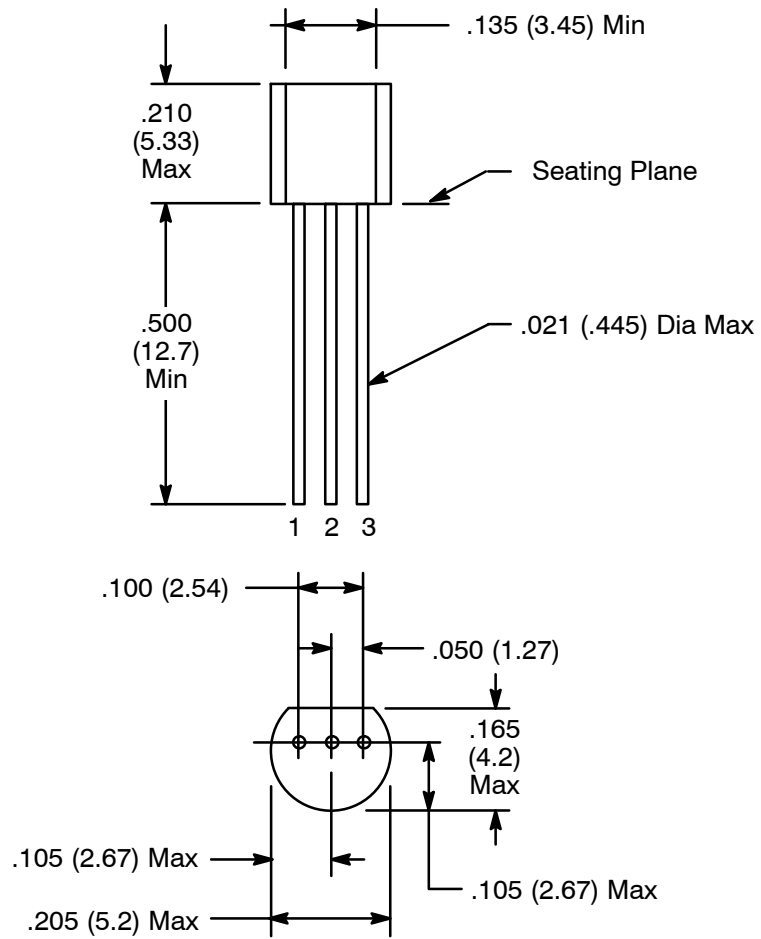
NTE7234-2
(Front View)



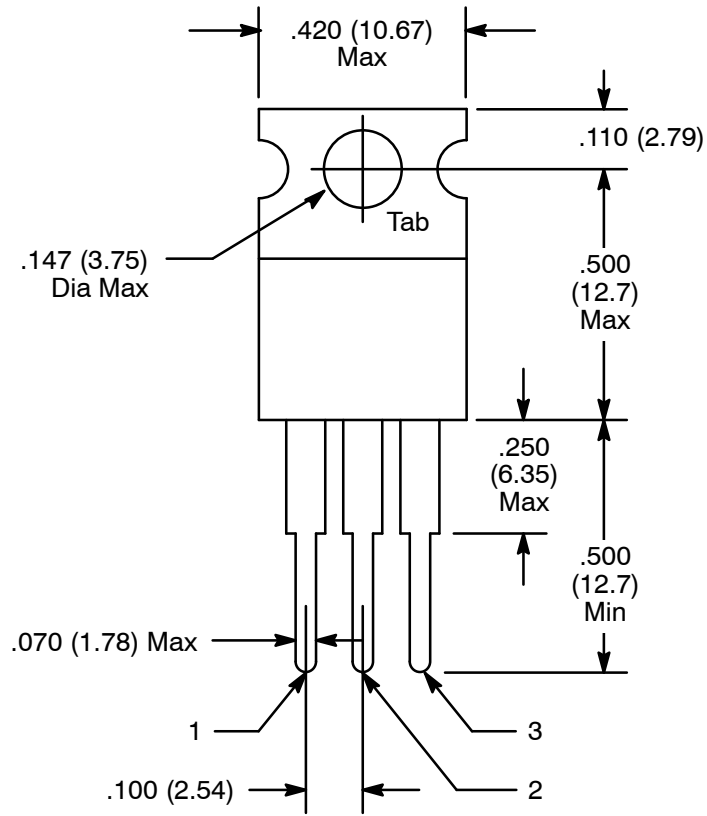
NTE7234-3
(Front View)



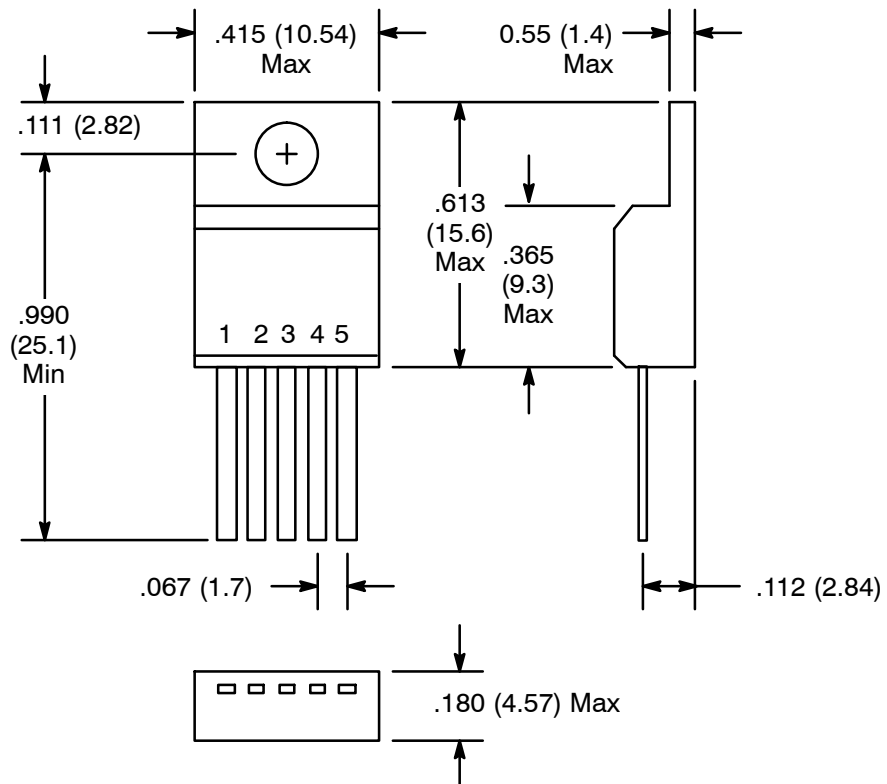
NTE7234-1



NTE7234-2



NTE7234-3



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