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NTE1961, NTE1963, NTE1965, NTE1967, NTE1971, NTE1973, NTE1975, NTE1977 Integrated Circuit Negative, 3–Terminal Voltage Regulator

Description:

The NTE1961 through NTE1977 series of monolithic 3–terminal negative voltage regulators employ internal current limiting, thermal shut–down, and safe–area compensation in an isolated TO220 type package making them essentially indestrucible. If adequate heat sinking is provided, they can deliver over 1A output current. These devices are intended for use as fixed voltage regulators in a wide range of applications including local (on card) regulation for elimination of distribution problems associated with single point regulation. In addition to use as fixed voltage regulators, they can be used with external components to obtain adjustable output voltages and currents.

Absolute Maximum Ratings: (T_A = +25°C unless otherwise specified)

Input Voltage, V_{IN}
- NTE1961, NTE1963, NTE1965, NTE1967, NTE1971, NTE1973 . . . . . –35V
- NTE1975, NTE1977 . . . . . –40V

Power Dissipation ($T_C \le +70°C$), P_D 16W
Operating Junction Temperature Range, T_J . . . . . –30° to +150°C
Operating Ambient Temperature Range, T_{opr} . . . . . –30° to +75°C
Storage Temperature Range, T_{stg} . . . . . –40° to +125°C
Thermal Resistance, Junction–to–Ambient, R_{thJA} . . . . . 60°C/W
Thermal Resistance, Junction–to–Case, R_{thJC} . . . . . 5°C/W

Electrical Characteristics: (T_J = +25°C, C_I = 2.2µF, C_O = 0.1µF, Note 1 unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Output Voltage						
NTE1961	V_{OUT}	V_{IN} = –10V, I_O = 0.5A	–4.8	–5.0	–5.25	V
NTE1963		V_{IN} = –11V, I_O = 0.5A	–5.75	–6.0	–6.25	V
NTE1965		V_{IN} = –14V, I_O = 0.5A	–7.7	–8.0	–8.3	V
NTE1967		V_{IN} = –15V, I_O = 0.5A	–8.65	–9.0	–9.35	V
NTE1971		V_{IN} = –19V, I_O = 0.5A	–11.5	–12.0	–12.5	V
NTE1973		V_{IN} = –23V, I_O = 0.5A	–14.4	–15.0	–15.6	V
NTE1975		V_{IN} = –27V, I_O = 0.5A	–17.3	–18.0	–18.7	V
NTE1977		V_{IN} = –33V, I_O = 0.5A	–23.0	–24.0	–25.0	V

Note 1. Measurement is to be conducted in pulse testing.

Electrical Characteristics (Cont'd): (T_J = +25°C, C_I = 0.33µF, C_O = 0.1µF, Note 1 unless otherwise specified)

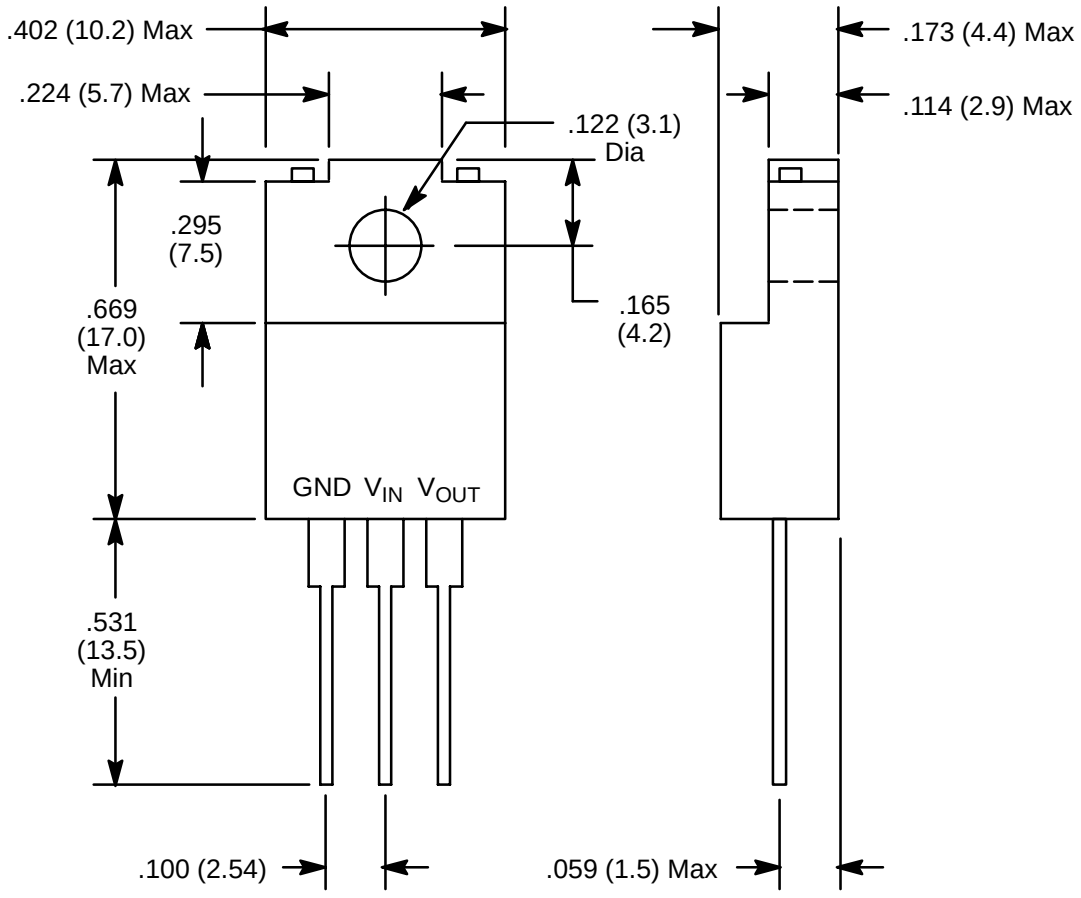
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Quiescent Current						
NTE1961	I_Q	V_{IN} = –10V, I_O = 0mA	–	4.2	6.0	mA
NTE1963		V_{IN} = –11V, I_O = 0mA	–	4.3	6.0	mA
NTE1965		V_{IN} = –14V, I_O = 0mA	–	4.3	6.0	mA
NTE1967		V_{IN} = –15V, I_O = 0mA	–	4.3	6.0	mA
NTE1971		V_{IN} = –19V, I_O = 0mA	–	4.3	6.0	mA
NTE1973		V_{IN} = –23V, I_O = 0mA	–	4.4	6.0	mA
NTE1975		V_{IN} = –27V, I_O = 0mA	–	4.5	6.0	mA
NTE1977		V_{IN} = –33V, I_O = 0mA	–	4.6	6.0	mA
Load Regulation						
NTE1961	$\Delta V_O - I_O$	V_{IN} = –10V, I_O = 0.005 to 1.5A	–	15	50	mV
NTE1963		V_{IN} = –11V, I_O = 0.005 to 1.5A	–	15	60	mV
NTE1965		V_{IN} = –14V, I_O = 0.005 to 1.5A	–	15	80	mV
NTE1967		V_{IN} = –15V, I_O = 0.005 to 1.5A	–	15	90	mV
NTE1971		V_{IN} = –19V, I_O = 0.005 to 1.5A	–	25	120	mV
NTE1973		V_{IN} = –23V, I_O = 0.005 to 1.5A	–	35	150	mV
NTE1975		V_{IN} = –27V, I_O = 0.005 to 1.5A	–	55	180	mV
NTE1977		V_{IN} = –33V, I_O = 0.005 to 1.5A	–	65	240	mV
Line Regulation						
NTE1961	$\Delta V_O - V_{IN}$	V_{IN} = –7V to –25V, I_O = 0.5A	–	3	50	mV
NTE1963		V_{IN} = –8V to –25V, I_O = 0.5A	–	5	60	mV
NTE1965		V_{IN} = –10.5V to –25V, I_O = 0.5A	–	6	80	mV
NTE1967		V_{IN} = –11.5V to –25V, I_O = 0.5A	–	7	90	mV
NTE1971		V_{IN} = –14.5V to –30V, I_O = 0.5A	–	10	120	mV
NTE1973		V_{IN} = –17.5V to –30V, I_O = 0.5A	–	11	150	mV
NTE1975		V_{IN} = –21V to –33V, I_O = 0.5A	–	15	180	mV
NTE1977		V_{IN} = –27V to –38V, I_O = 0.5A	–	18	240	mV
Ripple Rejection						
NTE1961	RR	V_{IN} = –10V, I_O = 0.5A, e_{in} = $2V_{P–P}$, f = 120Hz	68	78	–	dB
NTE1963		V_{IN} = –11V, I_O = 0.5A, e_{in} = $2V_{P–P}$, f = 120Hz	65	75	–	dB
NTE1965		V_{IN} = –14V, I_O = 0.5A, e_{in} = $2V_{P–P}$, f = 120Hz	62	72	–	dB
NTE1967		V_{IN} = –15V, I_O = 0.5A, e_{in} = $2V_{P–P}$, f = 120Hz	62	72	–	dB
NTE1971		V_{IN} = –19V, I_O = 0.5A, e_{in} = $2V_{P–P}$, f = 120Hz	62	71	–	dB
NTE1973		V_{IN} = –23V, I_O = 0.5A, e_{in} = $2V_{P–P}$, f = 120Hz	60	70	–	dB
NTE1975		V_{IN} = –27V, I_O = 0.5A, e_{in} = $2V_{P–P}$, f = 120Hz	59	69	–	dB
NTE1977		V_{IN} = –33V, I_O = 0.5A, e_{in} = $2V_{P–P}$, f = 120Hz	56	66	–	dB
Output Noise Voltage						
NTE1961	V_{NO}	V_{IN} = –10V, BW = 10Hz to 100kHz, I_O = 0.5A	–	45	–	µV
NTE1963		V_{IN} = –11V, BW = 10Hz to 100kHz, I_O = 0.5A	–	45	–	µV
NTE1965		V_{IN} = –14V, BW = 10Hz to 100kHz, I_O = 0.5A	–	55	–	µV
NTE1967		V_{IN} = –15V, BW = 10Hz to 100kHz, I_O = 0.5A	–	60	–	µV
NTE1971		V_{IN} = –19V, BW = 10Hz to 100kHz, I_O = 0.5A	–	75	–	µV
NTE1973		V_{IN} = –23V, BW = 10Hz to 100kHz, I_O = 0.5A	–	90	–	µV
NTE1975		V_{IN} = –27V, BW = 10Hz to 100kHz, I_O = 0.5A	–	100	–	µV
NTE1977		V_{IN} = –33V, BW = 10Hz to 100kHz, I_O = 0.5A	–	120	–	µV

Note 1. Measurement is to be conducted in pulse testing.

Electrical Characteristics (Cont'd): (T_J = +25°C, C_I = 0.33µF, C_O = 0.1µF, Note 1 unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Average Temperature Coefficient of Output Voltage NTE1961	V_{NO}	V_{IN} = –10V, I_O = 0.5A	–	–0.5	–	mV/°C
NTE1963		V_{IN} = –11V, I_O = 0.5A	–	–0.6	–	mV/°C
NTE1965		V_{IN} = –14V, I_O = 0.5A	–	–0.8	–	mV/°C
NTE1967		V_{IN} = –15V, I_O = 0.5A	–	–0.9	–	mV/°C
NTE1971		V_{IN} = –19V, I_O = 0.5A	–	–1.2	–	mV/°C
NTE1973		V_{IN} = –23V, I_O = 0.5A	–	–1.5	–	mV/°C
NTE1975		V_{IN} = –27V, I_O = 0.5A	–	–1.8	–	mV/°C
NTE1977		V_{IN} = –33V, I_O = 0.5A	–	–2.4	–	mV/°C

Note 1. Measurement is to be conducted in pulse testing.



NOTE: Tab is isolated