NTE1960, NTE1962, NTE1964, NTE1966, NTE1968, NTE1970, NTE1972, NTE1974, NTE1976
Integrated Circuit
Positive, 3−Terminal Voltage Regulator

Description:

The NTE1960 through NTE1976 series of monolithic 3−terminal positive voltage regulators employ internal current limiting, thermal shut−down, and safe−area compensation in a TO220 full pack type package making them essentially indestructible. 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.

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

Input Voltage, V_{IN}
    NTE1960, NTE1962, NTE1964, NTE1966, NTE1968, NTE1970, NTE1972 .... 35V
    NTE1974, NTE1976 .... 40V
Power Dissipation ($T_C \leq$ +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 = 0.33μF, C_O = 0.1μF, Note 1 unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Output Voltage NTE1960	V_{OUT}	V_{IN} = 10V, I_O = 0.5A	4.8	5.0	5.25	V
NTE1962		V_{IN} = 11V, I_O = 0.5A	5.75	6.0	6.25	V
NTE1964		V_{IN} = 14V, I_O = 0.5A	7.7	8.0	8.3	V
NTE1966		V_{IN} = 15V, I_O = 0.5A	8.65	9.0	9.35	V
NTE1968		V_{IN} = 16V, I_O = 0.5A	9.6	10.0	10.4	V
NTE1970		V_{IN} = 19V, I_O = 0.5A	11.5	12.0	12.5	V
NTE1972		V_{IN} = 23V, I_O = 0.5A	14.4	15.0	15.6	V
NTE1974		V_{IN} = 27V, I_O = 0.5A	17.3	18.0	18.7	V
NTE1976		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): $(T_J = +25°C, C_I = 0.33\mu F, C_O = 0.1\mu F$, Note 1 unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Quiescent Current NTE1960	I_Q	$V_{IN} = 10V, I_O = 0mA$	–	4.2	6.0	mA
NTE1962		$V_{IN} = 11V, I_O = 0mA$	–	4.3	6.0	mA
NTE1964		$V_{IN} = 14V, I_O = 0mA$	–	4.3	6.0	mA
NTE1966		$V_{IN} = 15V, I_O = 0mA$	–	4.3	6.0	mA
NTE1968		$V_{IN} = 16V, I_O = 0mA$	–	4.3	6.0	mA
NTE1970		$V_{IN} = 19V, I_O = 0mA$	–	4.3	6.0	mA
NTE1972		$V_{IN} = 23V, I_O = 0mA$	–	4.4	6.0	mA
NTE1974		$V_{IN} = 27V, I_O = 0mA$	–	4.5	6.0	mA
NTE1976		$V_{IN} = 33V, I_O = 0mA$	–	4.6	6.0	mA
Load Regulation NTE1960	$\Delta V_O - I_O$	$V_{IN} = 10V, I_O = 0.005$ to $1.5A$	–	15	50	mV
NTE1962		$V_{IN} = 11V, I_O = 0.005$ to $1.5A$	–	15	60	mV
NTE1964		$V_{IN} = 14V, I_O = 0.005$ to $1.5A$	–	15	80	mV
NTE1966		$V_{IN} = 15V, I_O = 0.005$ to $1.5A$	–	15	90	mV
NTE1968		$V_{IN} = 16V, I_O = 0.005$ to $1.5A$	–	15	100	mV
NTE1970		$V_{IN} = 19V, I_O = 0.005$ to $1.5A$	–	25	120	mV
NTE1972		$V_{IN} = 23V, I_O = 0.005$ to $1.5A$	–	35	150	mV
NTE1974		$V_{IN} = 27V, I_O = 0.005$ to $1.5A$	–	55	180	mV
NTE1976		$V_{IN} = 33V, I_O = 0.005$ to $1.5A$	–	65	240	mV
Line Regulation NTE1960	$\Delta V_O - V_{IN}$	$V_{IN} = 7V$ to $25V, I_O = 0.5A$	–	3	50	mV
NTE1962		$V_{IN} = 8V$ to $25V, I_O = 0.5A$	–	5	60	mV
NTE1964		$V_{IN} = 10.5V$ to $25V, I_O = 0.5A$	–	6	80	mV
NTE1966		$V_{IN} = 11.5V$ to $25V, I_O = 0.5A$	–	7	90	mV
NTE1968		$V_{IN} = 12.5V$ to $25V, I_O = 0.5A$	–	8	100	mV
NTE1970		$V_{IN} = 14.5V$ to $30V, I_O = 0.5A$	–	10	120	mV
NTE1972		$V_{IN} = 17.5V$ to $30V, I_O = 0.5A$	–	11	150	mV
NTE1974		$V_{IN} = 21V$ to $33V, I_O = 0.5A$	–	15	180	mV
NTE1976		$V_{IN} = 27V$ to $38V, I_O = 0.5A$	–	18	240	mV
Ripple Rejection NTE1960	RR	$V_{IN} = 10V, I_O = 0.5A, e_{in} = 2V_{P-P}, f = 120Hz$	68	78	–	dB
NTE1962		$V_{IN} = 11V, I_O = 0.5A, e_{in} = 2V_{P-P}, f = 120Hz$	65	75	–	dB
NTE1964		$V_{IN} = 14V, I_O = 0.5A, e_{in} = 2V_{P-P}, f = 120Hz$	62	72	–	dB
NTE1966		$V_{IN} = 15V, I_O = 0.5A, e_{in} = 2V_{P-P}, f = 120Hz$	62	72	–	dB
NTE1968		$V_{IN} = 16V, I_O = 0.5A, e_{in} = 2V_{P-P}, f = 120Hz$	62	72	–	dB
NTE1970		$V_{IN} = 19V, I_O = 0.5A, e_{in} = 2V_{P-P}, f = 120Hz$	62	71	–	dB
NTE1972		$V_{IN} = 23V, I_O = 0.5A, e_{in} = 2V_{P-P}, f = 120Hz$	60	70	–	dB
NTE1974		$V_{IN} = 27V, I_O = 0.5A, e_{in} = 2V_{P-P}, f = 120Hz$	59	69	–	dB
NTE1976		$V_{IN} = 33V, I_O = 0.5A, e_{in} = 2V_{P-P}, f = 120Hz$	56	66	–	dB
Output Noise Voltage NTE1960	V_{NO}	$V_{IN} = 10V, BW = 10Hz$ to $100kHz, I_O = 0.5A$	–	45	–	μV
NTE1962		$V_{IN} = 11V, BW = 10Hz$ to $100kHz, I_O = 0.5A$	–	45	–	μV
NTE1964		$V_{IN} = 14V, BW = 10Hz$ to $100kHz, I_O = 0.5A$	–	55	–	μV
NTE1966		$V_{IN} = 15V, BW = 10Hz$ to $100kHz, I_O = 0.5A$	–	60	–	μV
NTE1968		$V_{IN} = 16V, BW = 10Hz$ to $100kHz, I_O = 0.5A$	–	65	–	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
Output Noise Voltage NTE1970	V_{NO}	V_{IN} = 19V, BW = 10Hz to 100kHz, I_O = 0.5A	–	75	–	μV
NTE1972		V_{IN} = 23V, BW = 10Hz to 100kHz, I_O = 0.5A	–	90	–	μV
NTE1974		V_{IN} = 27V, BW = 10Hz to 100kHz, I_O = 0.5A	–	100	–	μV
NTE1976		V_{IN} = 33V, BW = 10Hz to 100kHz, I_O = 0.5A	–	120	–	μV
Average Temperature Coefficient of Output Voltage NTE1960	$\Delta V_O/\Delta T$	V_{IN} = 10V, I_O = 0.5A	–	–0.5	–	mV/°C
NTE1962		V_{IN} = 11V, I_O = 0.5A	–	–0.6	–	mV/°C
NTE1964		V_{IN} = 14V, I_O = 0.5A	–	–0.8	–	mV/°C
NTE1966		V_{IN} = 15V, I_O = 0.5A	–	–0.9	–	mV/°C
NTE1968		V_{IN} = 16V, I_O = 0.5A	–	–1.0	–	mV/°C
NTE1970		V_{IN} = 19V, I_O = 0.5A	–	–1.2	–	mV/°C
NTE1972		V_{IN} = 23V, I_O = 0.5A	–	–1.5	–	mV/°C
NTE1974		V_{IN} = 27V, I_O = 0.5A	–	–1.8	–	mV/°C
NTE1976		V_{IN} = 33V, I_O = 0.5A	–	–2.4	–	mV/°C

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

.402 (10.2) Max
.224 (5.7) Max
.122 (3.1) Dia
.173 (4.4) Max
.114 (2.9) Max
.295 (7.5)
.669 (17.0) Max
.165 (4.2)
V_{IN} GND V_O
.531 (13.5) Min
.100 (2.54)
.059 (1.5) Max

NOTE: Tab is isolated