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NTE972
Integrated Circuit
3–Terminal Positive Voltage Regulator, 24V

The NTE972 fixed–voltage regulator is a monolithic integrated circuit in a TO220 type package designed for use in a wide variety of applications including local, on–card regulation. This regulator employs internal current limiting, thermal shutdown, and safe–area compensation. With adequate heatsinking it can deliver output currents in excess of 1.0 ampere. Although designed primarily as a fixed voltage regulator, this device can be used with external components to obtain adjustable voltages and currents.

Features:

- Output Current in Excess of 1.0 Ampere
- No External Components Reguired
- Internal Thermal Overload Protection
- Internal Short–Circuit Current Limiting
- Output Transistor Safe–Area Compensation

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

Input Voltage, V_{in} 40Vdc
Power Dissipation (T_A = +25°C), P_D . . . . . Internally Limited
Derate above +25°C . . . . . 15.4mW/°C
Power Dissipation (T_C = +25°C), P_D . . . . . Internally Limited
Derate above +75°C . . . . . 200mW/°C
Thermal Resistance, Junction–to–Ambient, R_{thJA} . . . . . 65°C/W
Thermal Resistance, Junction–to–Case, R_{thJC} . . . . . 5°C/W
Operating Junction Temperature Range, T_J . . . . . –55° to +150°C
Storage Junction Temperature Range, T_{stg} . . . . . –65° to +150°C

Electrical Characteristics: (V_{in} = 33V, I_O = 500mA, T_J = 0° to +125°C unless otherwise specified)

Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
Output Voltage	V_O	T_J = +25°C		23	24	25	V
		5mA ≤ I_O ≤ 1A, P_O ≤ 15W, 27V ≤ V_{in} ≤ 38V		22.8	24.0	25.2	V
Line Regulation	Reg_{line}	T_J = +25°C, Note 1	27V ≤ V_{in} ≤ 38V	–	31	480	mV
			30V ≤ V_{in} ≤ 36V	–	14	240	mV
Load Regulation	Reg_{load}	T_J = +25°C, Note 1	5mA ≤ I_O ≤ 1.5A	–	60	480	mV
			250mA ≤ I_O ≤ 750mA	–	25	240	mV

Note 1. Load and line regulation are specified at constant junction temperature. Changes in V_O due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

Electrical Characteristics (Cont'd): (V_{in} = 33V, I_O = 500mA, T_J = 0° to +125°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Quiescent Current	I_B	T_J = +25°C	–	4.6	8.0	mA
Quiescent Current Change	ΔI_B	27V ≤ V_{in} ≤ 38V	–	–	1.0	mA
		5mA ≤ I_O ≤ 1A	–	–	0.5	mA
Ripple Rejection	RR	28V ≤ V_{in} ≤ 38V, f = 120Hz	–	54	–	dB
Dropout Voltage	$V_{in} – V_O$	T_J = +25°C, I_O = 1A	–	2	–	V
Output Noise Voltage	V_n	T_A = +25°C, 10Hz ≤ f ≤ 100kHz	–	10	–	$\mu V/V_O$
Output Resistance	r_O	f = 1kHz	–	20	–	mΩ
Short–Circuit Current Limit	I_{sc}	T_A = +25°C, V_{in} = 35V	–	0.2	–	A
Peak Output Current	I_{max}	T_J = +25°C	–	2.2	–	A
Average Temperature Coefficient of Output Voltage	TCV_O		–	–1.5	–	mV/°C