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NTE1956
Integrated Circuit
Positive 3 Terminal Voltage Regulator, Low Dropout Voltage, 24V, 1A

Description:

The NTE1956 is a positive voltage regulator in a TO220 type package with a low input/output voltage. This device is suitable for low–voltage, battery–driven equipment, and home appliances and industrial equipment with great fluctuation of the supply voltage.

Features:

- Minimum Input/Output Voltage Difference: 0.5V Typ
- On–Chip Overcurrent Limiter
- On–Chip Thermal Protection Circuit
- On–Chip Inrush Current Protection Circuit at the time of Input Voltage Start–Up
- On–Chip Input Short–Circuit Protection Circuit (When the Input Pin is Short–Circuited to the Ground, the Circuit Between Pin1 and Pin3 is Shut Down to Prevent Current Flow)

Applications:

- Power Supply Equipment

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

Supply Voltage (Note 1), V_{IN} 30V
Supply Current (Note 2), I_{IN} 2.4A
Power Dissipation (Note 3), P_D 15W
Operating Ambient Temperature Range, T_{opr} . . . . . –30° to +85°C
Storage Junction Temperature Range, T_{stg} . . . . . –55° to +150°C
Thermal Resistance, Junction–to–Ambient, R_{thJA} . . . . . 65°C/W
Thermal Resistance, Junction–to–Case, R_{thJC} . . . . . 5°C/W

Note 1. At the application of V_{IN} = 30V, the overvoltage protection may be operated by the ASO protection circuit, leading to the output shut down.
Note 2. The current value does not exceed this criterion because of the on–chip current limiter.
Note 3. The internal circuit shuts off the output when $T_J \leq +150°C$ (design value).

Recommended Operating Conditions: (I_O = 500mA, T_A = +25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Operating Supply Voltage Range	V_{IN}		21.5	–	29.5	V

Electrical Characteristics: (V_{IN} = 25.5V, I_O = 500mA, T_A = +25°C unless otherwise specified)

Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
Output Voltage	V_{OUT}	T_J = +25°C		23.28	24.0	24.72	V
Line Regulation	REG_{IN}	V_{IN} = 25.5V to 29.5V, T_J = +25°C		–	9.6	96	mV
Load Regulation	REG_{LOA}	V_{IN} = 25.5V, I_O = 0 to 1200mA, T_J = +25°C		–	120	480	mV
Input Dependency of Bias Current	$\Delta I_{Bias(IN)}$	V_{IN} = 25.5V to 29.5V, T_J = +25°C		–	1	10	mA
Load Dependency of Bias Current	$\Delta I_{Bias(LOA)}$	I_O = 0 to 1200mA, T_J = +25°C		–	10	50	mA
Bias Current at No Load	I_{Bias}	I_O = 0mA		–	2.6	5.0	mA
Bias Current Before the Regulation Starts	I_{rush}	V_{IN} = 21.6V, I_O = 0mA		–	3	5	mA
Minimum I/O Voltage Difference	$V_{DIF(min)}$	V_{IN} = 21.6V, T_J = +25°C	I_O = 500mA	–	0.4	0.6	V
			I_O = 1200mA	–	0.5	1.0	V
Peak Output Current	$I_{O(Peak)}$	V_{IN} = 25.5V, T_J = +25°C, Note 4		1.2	1.8	2.4	A
Ripple Rejection Ratio	RR	V_{IN} = 25.5V to 27.5V, I_O = 100mA, f= 120Hz		36	56	–	dB
Design Reference Data (Note 5)							
Output Short–Circuit Current	$I_{O(Short)}$	V_{IN} = 30V, T_J = +25°C, Shorted Load		–	10	–	mA
Thermal Protection Operating Temperature	$T_{J(TH)}$	V_{IN} = 25.5V		–	150	–	°C
Output Voltage Temperature Coefficient	a	T_J = +25° to +125°C		–	–40	–	ppm/°C

Note 4. This current exceeds $P_D$max because it is a parameter during abnormal (overcurrent) operation.
Note 5. The characteristice listed are theoretical values based on the IC design and are not guaranteed.