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NTE931
Integrated Circuit
3–Terminal Positive Voltage Regulator
5V, 3A

Description:

The NTE931 is a 3–terminal fixed positive voltage regulator in a TO3 type package capable of driving loads up to 3A. New circuit design and processing techniques are used to provide the high output current without sacrificing the regulation characteristics of lower current devices.

This device is virtually blowout proof. Current limiting and thermal shutdown provide a high level of reliability. No external components are required for operation of the NTE931, however, if the device is more than 4 inches from the filter capacitor a 1μF solid tantalum capacitor should be used on the input. A 0.1μF or larger capacitor may be used on the output to reduce load transient spikes created by fast switching digital logic, or to swamp out stray load capacitance.

An overall worst case specification for the combined effects of input voltage, load current, ambient temperature, and power dissipation ensures that the NTE931 will perform satisfactory as a system element.

Features:

- Output Current in Excess of 3A
- Internal Current and Thermal Limiting
- 0.01Ω Typical Output Impedance
- 7.5 Minimum Input Voltage
- 30W Power Dissipation
- 100% Electrical Burn–In

Absolute Maximum Ratings:

Input Voltage, V_{IN} 20V
Power Dissipation, P_D . . . . . Internally Limited
Operating Junction Temperature Range, T_J . . . . . 0° to +125°C
Storage Temperature Range, T_{stg} . . . . . –65° to +150°C
Typical Thermal Resistance, Junction–to–Case (Note 1), R_{thJC} . . . . . 2°C/W
Lead Temperature (Soldering, 10 sec), T_L . . . . . +300°C
Burn–In In Thermal Limit 100%

Note 1. Without a heatsink, thermal resistance is about 35°C/W. With a heatsink, the effective thermal resistance can only approach the specified value of 2°C/W, depending on the effeciency of the heatsink.

Electrical Characteristics: (T_J = 0° to +125°C, Note 2 unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Output Voltage	V_O	T_J = +25°C, V_{IN} = 7.5V, I_O = 0A	4.8	5.0	5.2	V
		V_{IN} = 7.5V to 15V, I_O = 0A to 3A, P ≤ 30W	4.75	5.00	5.25	V
Line Regulation	Reg_{line}	T_J = +25°C, V_{IN} = 7.5V to 15V, Note 3	–	5	25	mV
Load Regulation	Reg_{load}	T_J = +25°C, V_{IN} = 7.5V, I_O = 0A to 3A, Note 3	–	25	100	mV
Quiescent Current	I_B	V_{IN} = 7.5V to 15V, I_O = 0A to 3A	–	12	20	mA
Output Noise Voltage	V_n	T_J = +25°C, f = 10Hz to 100kHz	–	40	–	μV_{rms}
Short Circuit Current Limit		T_J = +25°C, V_{IN} = 15V	–	3.0	4.5	A
		T_J = +25°C, V_{IN} = 7.5V	–	4.0	5.0	A
Long Term Stability			–	–	35	mW

Note 2. Although power dissipation is internally limited, specifiecations apply only for P ≤ 30W.

Note 3. Load and line regulation are specified at constant junction temperature. Pulse testing is required with a pulse width of ≤ 1ms and a duty cycle of ≤ 5%.

Pin Connection Diagram