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NTE929
Integrated Circuit
General Purpose, High Current, NPN Transistor Array

Description:

The NTE929 is a versatile array of five high–current (to 100mA) NPN transistors on a common monolithic substrate. In addition, two of these transistors (Q1 and Q2) are matched at low currents (i.e. 1mA) for applications in which offset parameters are of special importance.

Independent connections for each transistors plus a separate terminal for the substrate permit maximum flexibility in circuit design.

Features:

- High I_C 100mA max
- Low V_{CEsat} (at 50mA) 0.7V max.
- Matched pair (Q1 and Q2)
  - V_{10} (V_{BE} matched): ±5mV max.
  - I_{10} (at 1mA): 2.5µA max.
- 5 independent transistors plus separate substrate connection.

Applications:

- Signal processing and switching systems operating from DC to VHF
- Lamp and relay driver
- Differential amplifier
- Temperature–compensated amplifier
- Thyristor firing

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

Power Dissipation, P_D
- Any One Transistor 500mW
- Total Package 750mW
  - Derate Above 55°C . . . . . Derate Linearly 6.67mW/°C

Operating Ambient Temperature Range, T_{opr} . . . . . –55 to +125°C
Storage Temperature range, T_{stg} . . . . . –65 to +150°C
Lead Temperature (During Soldering, 1/16” ±1/32” from case, 10sec max), T_L . . . . . +265°C

The following ratings apply for each transistor in the device:

Collector–Emitter Voltage, V_{CEO} 15V
Collector–Base Voltage, V_{CBO} 20V
Collector–Substrate Voltage, V_{CIO} 20V
Emitter–Base Voltage, V_{EBO} 5V
Collector Current, I_C 20mA
Base Current, I_B 20mA

Note 1. The collector of each transistor of the NTE929 is isolated from the substrate by an integral diode. The substrate must be connected to a voltage which is more negative than any collector voltage in order to maintain isolation between transistors and provide normal transistor action. To avoid undesired coupling between transistors, the substrate terminal (Pin5) should be maintained at either DC or signal (AC) ground. A suitable bypass capacitor can be used to establish a signal ground.

Electrical Characteristics: (T_A = +25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
For Each Transistor						
Collector–Base Breakdown Voltage	$V_{(BR)CBO}$	I_C = 100µA, I_E = 0	20	60	–	V
Collector–Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C = 1mA, I_B = 0	15	24	–	V
Collector–Substrate Breakdown Voltage	$V_{(BR)CIO}$	I_{CI} = 100µA, I_B = 0, I_E = 0	20	60	–	V
Emitter–Base Breakdown Voltage	$V_{(BR)EBO}$	I_E = 500µA, I_C = 0	5.0	6.9	–	V
Collector Cutoff Current	I_{CEO}	V_{CE} = 10V, I_B = 0	–	–	10	µA
	I_{CBO}	V_{CE} = 10V, I_E = 0	–	–	1	µA
DC Forward Current	h_{FE}	V_{CE} = 3V, I_C = 10mA	40	76	–	
		V_{CE} = 3V, I_C = 50mA	40	75	–	
Base–Emitter Voltage	V_{BE}	V_{CE} = 3V, I_C = 10mA	0.65	0.74	0.85	V
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	I_C = 50mA, I_B = 5mA	–	0.4	0.7	V
Gain–Bandwidth Product	f_T	V_{CE} = 3V, I_C = 10mA	–	450	–	MHz
Absolute Input Offset Voltage	V_{IO}	V_{CE} = 3V, I_C = 1mA	–	1.2	5.0	mV
Absolute Input Offset Current	I_{IO}	V_{CE} = 3V, I_C = 1mA	–	0.7	2.5	µA

Pin Connection Diagram