

NTE6409 Unijunction Transistor

Description:

The NTE6409 is designed for use in pulse and timing circuits, sensing circuits and thyristor trigger circuits.

Features:

- Low Peak Point Current: 2 μ A Max
- Low Emitter Reverse Current: 200nA Max
- Passivated Surface for Reliability & Uniformity

Absolute Maximum Ratings: ($T_A = +25^\circ\text{C}$, unless otherwise specified)

Power Dissipation (Note 1), P_D	300mW
RMS Emitter Current, $I_{E(RMS)}$	50mA
Peak Pulse Emitter Current (Note 2), i_E	2A
Emitter Reverse Voltage, V_{B2E}	30V
Interbase Voltage, V_{B2B1}	35V
Operating Junction Temperature Range, T_J	-65° to $+125^\circ\text{C}$
Storage Temperature Range, T_{stg}	-65° to $+150^\circ\text{C}$

Note 1. Derate 3mW/ $^\circ\text{C}$ increase in ambient temperature. The total power dissipation (available power to Emitter and Base-Two) must be limited by the external circuitry.

Note 2. Capacitor discharge: 10 μ F or less, 30V or less

Electrical Characteristics: ($T_A = +25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Intrinsic Standoff Ratio	η	$V_{B2B1} = 10\text{V}$, Note 3	0.68	—	0.82	
Interbase Resistance	r_{BB}	$V_{B2B1} = 3\text{V}$, $I_E = 0$	4.7	7.0	9.1	$k\Omega$
Interbase Resistance Temperature Coefficient	αr_{BB}	$V_{B2B1} = 3\text{V}$, $I_E = 0$, $T_A = -55^\circ$ to $+125^\circ\text{C}$	0.1	—	0.9	$\%/^\circ\text{C}$
Emitter Saturation Voltage	$V_{EB1(\text{sat})}$	$V_{B2B1} = 10\text{V}$, $I_E = 50\text{mA}$, Note 4	—	3.5	—	V
Modulated Interbase Current	$I_{B2(\text{mod})}$	$V_{B2B1} = 10\text{V}$, $I_E = 50\text{mA}$	—	15	—	mA
Emitter Reverse Current	I_{EB2O}	$V_{B2E} = 30\text{V}$, $I_{B1} = 0$	—	0.005	0.2	μA
Peak Point Emitter Current	I_P	$V_{B2B1} = 25\text{V}$	—	1	2	μA
Valley Point Current	I_V	$V_{B2B1} = 20\text{V}$, $R_{B2} = 100\Omega$, Note 4	8	10	18	mA
Base–One Peak Pulse Voltage	V_{OB1}		6	7	—	V

Note 3. Intrinsic Standoff Ratio, η , is defined by the equation:

$$\eta = \frac{V_P - V_F}{V_{B2B1}}$$

Where: V_P = Peak Point Emitter Voltage

V_{B2B1} = Interbase Voltage

V_F = Emitter to Base–One Junction Diode Drop ($\square 0.45\text{V}$ @ $10\mu\text{A}$)

Note 4. Use pulse techniques: $PW \square 300\mu\text{s}$, Duty Cycle $\leq 2\%$ to avoid internal heating due to interbase modulation which may result in erroneous readings.

