

## 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 $\mu$ 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, $T_J$ .....	$-65^\circ$ to $+125^\circ\text{C}$
Storage Temperature Range, $T_{stg}$ .....	$-65^\circ$ 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 $\mu$ 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	$\eta$	$V_{B2B1} = 10\text{V}$ , Note 3	0.68	–	0.82	
Interbase Resistance	$r_{BB}$	$V_{B2B1} = 3\text{V}$ , $I_E = 0$	4.7	7.0	9.1	$\text{k}\Omega$
Interbase Resistance Temperature Coefficient	$\alpha r_{BB}$	$V_{B2B1} = 3\text{V}$ , $I_E = 0$ , $T_A = -55^\circ$ 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	$\mu\text{A}$
Peak Point Emitter Current	$I_P$	$V_{B2B1} = 25\text{V}$	–	1	2	$\mu\text{A}$
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,  $\eta$ , 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.

