

## NTE6401 Unijunction Transistor

### **Description:**

The NTE6401 is designed for use in pulse and timing circuits, sensing circuits and thyristor trigger circuits.

### **Features:**

- Low Peak Point Current: 5 $\mu$ A (Max)
- Low Emitter Reverse Current: .005 $\mu$ A (Typ)
- 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, 30 volts 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	0.56	–	0.75	–
Interbase Resistance	$r_{BB}$	$V_{B2B1} = 3\text{V}$ , $I_E = 0$	4.7	7.0	9.1	k $\Omega$
Interbase Resistance Temperature Coefficient	$\alpha r_{BB}$		0.1	–	0.9	%/ $^\circ\text{C}$

Note 3. Intrinsic standoff ratio,  $\eta$  is defined by 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 (~ 0.45V @ 10 $\mu$ A)

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Emitter Saturation Voltage	$V_{EB1(sat)}$	$V_{B2B1} = 10\text{V}$ , $I_E = 50\text{mA}$ , Note 4	—	3.5	—	V
Modulated Interbase Current	$I_{B2(mod)}$	$V_{B2B1} = 10\text{V}$ , $I_E = 50\text{mA}$	—	15	—	mA
Emitter Reverse Current	$I_{EB20}$	$V_{B2E} = 30\text{V}$ , $I_{B1} = 0$	—	0.005	12	$\mu\text{A}$
Peak Point Emitter Current	$I_P$	$V_{B2B1} = 25\text{V}$	—	1	5	$\mu\text{A}$
Valley Point Current	$I_V$	$V_{B2B1} = 20\text{V}$ , $R_{B2} = 100\Omega$	4	6	—	mA
Base—One Peak Pulse Voltage	$V_{OB1}$		3	5	—	V

Note 4. Use pulse techniques: Pulse Width  $\sim 300\mu\text{s}$ , duty cycle  $\leq 2\%$  to avoid internal heating due to interbase modulation which may result in erroneous readings.

