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## NTE6410 Unijunction Transistor (UJT)

### **Description:**

The NTE6410 is a PN unijunction transistor in a TO92 type package designed for use in pulse and timing circuits, sensing circuits and thyristor trigger circuits.

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

RMS Power Dissipation, $P_D$ .....	300mW
Derate Above $25^\circ\text{C}$ .....	3.0mW/ $^\circ\text{C}$
RMS Emitter Current, $I_E$ .....	50mA
Peak-Pulse Emitter Current (Note 1), $I_E$ .....	1.5A
Emitter Reverse Voltage, $V_{B2E}$ .....	30V
Interbase Voltage (Note 2), $V_{B2B1}$ .....	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. Duty cycle  $\leq 1\%$ , PRR = 10 PPS

Note 2. Based upon power dissipation at  $T_A = +25^\circ\text{C}$

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Intrinsic Standoff Ratio	$\eta$	$V_{B2B1} = 10\text{V}$ , Note 3	0.70	–	0.85	
Interbase Resistance	$R_{BB}$		4.0	6.0	9.1	k $\Omega$
Interbase Resistance Temperature Coefficient	$\alpha R_{BB}$		0.1	–	0.9	%/ $^\circ\text{C}$
Emitter Saturation Voltage	$V_{BE1(sat)}$	$V_{B2B1} = 10\text{V}$ , $I_E = 50\text{mA}$ , Note 4	–	2.5	–	V
Modulated Interbase Current	$I_{B2(Mod)}$	$V_{B2B1} = 10\text{V}$ , $I_E = 50\text{mA}$	–	15	–	mA
Emitter Reverse Current	$I_{EB2O}$	$V_{B2E} = 30\text{V}$ , $I_{B1} = 0$	–	0.005	1.0	$\mu\text{A}$
Peak-Point Emitter Current	$I_P$	$V_{B2B1} = 25\text{V}$	–	1.0	5.0	$\mu\text{A}$
Valley-Point Current	$I_V$	$V_{B2B1} = 20\text{V}$ , $R_{B2} = 100\Omega$ , Note 4	4.0	7.0	–	mA
Base-One Peak Pulse Voltage	$V_{OB1}$		5.0	8.0	–	V

Note 3. Intrinsic standoff ratio, is defined in terms of peak-point voltage,  $V_P$ , by means of the equation:  $V_P = \eta V_{B2B1} V_F$ , where  $V_F$  is approximately 0.49 volts at  $+25^\circ\text{C}$  @  $I_F = 10\mu\text{A}$  and decreases with temperature at approximately  $2.5\text{mV}/^\circ\text{C}$ . Components  $R_1$ ,  $C_1$ , and the UJT form a relaxation oscillator, the remaining circuitry serves as a peak-voltage detector. The forward drop of Diode  $D_1$  compensates for  $V_F$ . To use, the “call” button is pushed, and  $R_3$  is adjusted to make the current meter,  $M_1$ , read full scale. When the “call” button is released, the value of  $\eta$  is read directly from the meter, if full scale on the meter reads 1.0.

Note 4. Use pulse techniques:  $PW \sim 300\mu\text{s}$ , duty cycle  $\leq 2.0\%$  to avoid internal heating, which may result in erroneous readings.

