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## NTE6400 & NTE6400A Unijunction Transistor TO39 Type Package

### **Description:**

The NTE6400 & NTE6400A Silicon Unijunction Transistors are three terminal devices having a stable “N” type negative resistance characteristic over a wide temperature range. A stable peak point voltage, a low peak point current, and a high pulse pulse current make these devices useful in oscillators, timing circuits, trigger circuits, and pulse generators where they can serve the purpose of two conventional silicon or germanium transistors.

These devices are intended for applications where circuit economy is of primary importance.

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

RMS Power Dissipation, $P_D$	
Unstabilized .....	450mW
Stabilized .....	600mW
Derate Above $25^\circ\text{C}$ .....	3.9mW/ $^\circ\text{C}$
RMS Emitter Current, $I_E$ .....	50mA
Peak Emitter Current ( $T_J = +150^\circ\text{C}$ ), $I_{E(\text{peak})}$ .....	2A
Emitter Reverse Voltage ( $T_J = +150^\circ\text{C}$ ) .....	60V
Interbase Voltage, $V_{BB}$	
NTE6400 .....	35V
NTE6400A .....	55V
Operating Temperature Range, $T_{opr}$	
Unstabilized .....	$-65^\circ$ to $+140^\circ\text{C}$
Stabilized .....	$-65^\circ$ to $+175^\circ\text{C}$
Storage Temperature Range, $T_{stg}$ .....	$-65^\circ$ to $+175^\circ\text{C}$
Thermal Resistance, Junction-to-Case, $R_{thJC}$ .....	0.16 $^\circ\text{C}/\text{mW}$

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Intrinsic Standoff Ratio NTE6400 NTE6400A	$\eta$	$V_{BB} = 10\text{V}$ , Note 1	0.4	–	0.80	
			0.54	–	0.67	
Interbase Resistance	$R_{BBO}$	$V_{BB} = 3\text{V}$ , $I_E = 0$ , Note 1	4	–	12	k $\Omega$
Modulated Interbase Current	$I_{B2(\text{MOD})}$	$V_{BB} = 10\text{V}$ , $I_E = 50\text{mA}$	6.8	–	30	mA
Emitter Reverse Current NTE6400 NTE6400A	$I_{EO}$	$V_{B2E} = 30\text{V}$ , $I_{B1} = 0$	–	–	12	$\mu\text{A}$
			–	–	1	
Peak Point Emitter Current	$I_P$	$V_{BB} = 25\text{V}$	–	–	25	$\mu\text{A}$
Valley Point Current	$I_V$	$V_{BB} = 20\text{V}$ , $R_{B2} = 100\Omega$	8	–	–	mA
Base-One Peak Pulse Voltage	$V_{OB1}$		3	–	–	V

Note 1. The intrinsic standoff ratio,  $\eta$ , is essentially constant with temperature and interbase voltage. It is defined by the following equation:

$$V_P = \eta V_{BB} + \frac{200}{T_j}$$

Where  $V_P$  = Peak point emitter voltage

$V_{BB}$  = Interbase voltage

$T_j$  = Junction Temperature (Degrees Kelvin)

Note 2. The interbase resistance is nearly ohmic and increases with temperature in a well-defined manner. The temperature coefficient at +25°C is approximately 0.8%/°C.

