

## NTE323 (PNP) & NTE324 (NPN) Silicon Complementary Transistors General Purpose

### **Description:**

The NTE323 (PNP) and NTE324 (NPN) are complementary silicon epitaxial planer transistors in a TO39 type package designed for use as drivers for high power transistors in general purpose amplifier and switching circuits.

### **Absolute Maximum Ratings:**

Collector–Base Voltage ( $I_E = 0$ ), $V_{CBO}$	120V
Collector–Emitter Voltage, $V_{CEO}$	120V
Emitter–Base Voltage ( $I_C = 0$ ), $V_{EBO}$	4V
Collector Current, $I_C$	1A
Base Current, $I_B$	500mA
Total Power Dissipation, $P_{tot}$	
$T_C = +25^\circ\text{C}$	10W
$T_A = +25^\circ\text{C}$	1W
Operating Junction Temperature, $T_J$	+200°C
Storage Temperature Range, $T_{stg}$	–65° to +200°C
Thermal Resistance, Junction–to–Case, $R_{thJC}$	17.4°C/W
Thermal Resistance, Junction–to–Ambient, $R_{thJA}$	175°C/W

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector Cutoff Current	$I_{CBO}$	$V_{CB} = 120\text{V}, I_E = 0$	–	–	1	$\mu\text{A}$
	$I_{CEO}$	$V_{CE} = 80\text{V}, I_B = 0$	–	–	10	$\mu\text{A}$
	$I_{CEV}$	$V_{CE} = 120\text{V}, V_{BE} = -1.5\text{V}$	–	–	1	$\mu\text{A}$
		$V_{CE} = 120\text{V}, V_{BE} = -1.5\text{V}, T_C = +150^\circ\text{C}$	–	–	1	mA
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = 4\text{V}, I_C = 0$	–	–	1	$\mu\text{A}$
Collector–Emitter Sustaining Voltage	$V_{CEO(sus)}$	$I_C = 10\text{mA}, I_B = 0$ , Note 1	120	–	–	V
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 250\text{mA}, I_B = 25\text{mA}$ , Note 1	–	–	0.6	V
		$I_C = 500\text{mA}, I_B = 50\text{mA}$ , Note 1	–	–	1.0	V
		$I_C = 1\text{A}, I_B = 200\text{mA}$ , Note 1	–	–	2.0	V

Note 1. Pulse Duration = 300 $\mu\text{s}$ , Duty Cycle  $\leq$  2%.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Base–Emitter Voltage	$V_{BE}$	$V_{CE} = 2\text{V}, I_C = 250\text{mA}$	–	–	1.0	V
DC Current Gain	$h_{FE}$	$V_{CE} = 2\text{V}, I_C = 250\text{mA}, \text{Note 1}$	40	–	150	–
		$V_{CE} = 2\text{V}, I_C = 1\text{A}, \text{Note 1}$	5	–	–	–
Transition Frequency	$f_T$	$V_{CE} = 10\text{V}, I_C = 100\text{mA}, f = 10\text{MHz}$	30	–	–	MHz
Collector–Base Capacitance	$C_{cbo}$	$V_{CB} = 20\text{V}, I_E = 0, f = 1\text{MHz}$	–	–	50	pF
Small–Signal Current Gain	$h_{fe}$	$V_{CE} = 1.5\text{V}, I_C = 200\text{mA}, f = 1\text{kHz}$	40	–	–	–

Note 1. Pulse Duration = 300 $\mu\text{s}$ , Duty Cycle  $\leq 2\%$ .

