

## NTE2309 Silicon NPN Transistor High Voltage, High Current Switch

**Features:**

- High Breakdown Voltage
- Fast Switching Speed
- Wide ASO

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

Collector–Base Voltage, $V_{CBO}$ .....	900V
Collector–Emitter Voltage, $V_{CEO}$ .....	800V
Emitter–Base Voltage, $V_{EBO}$ .....	7V
Collector Current, $I_C$	
Continuous .....	12A
Peak (Note 1) .....	25A
Base Current, $I_B$ .....	4A
Collector Dissipation ( $T_A = +25^\circ\text{C}$ ), $P_C$ .....	2.5W
Collector Dissipation ( $T_C = +25^\circ\text{C}$ ), $P_C$ .....	100W
Operating Junction Temperature, $T_J$ .....	+150°C
Storage Temperature Range, $T_{stg}$ .....	–55° to +150°C

Note 1. Pules test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 10\%$ .

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector Cutoff Current	$I_{CBO}$	$V_{CB} = 400\text{V}, I_E = 0$	–	–	10	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = 5\text{V}, I_C = 0$	–	–	10	$\mu\text{A}$
DC Current Gain	$h_{FE}$	$V_{CE} = 5\text{V}, I_C = 0.4\text{A}$	10	–	–	
		$V_{CE} = 5\text{V}, I_C = 2\text{A}$	8	–	–	
Current Gain–Bandwidth Product	$f_T$	$V_{CE} = 10\text{V}, I_C = 0.4\text{A}$	–	15	–	MHz
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 3\text{A}, I_B = 0.6\text{A}$	–	–	2.0	V
Base–Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 3\text{A}, I_B = 0.6\text{A}$	–	–	1.5	V
Output Capacitance	$C_{ob}$	$V_{CB} = 10\text{V}, f = 1\text{MHz}$	–	120	–	pF

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 1\text{mA}, I_E = 0$	900	-	-	V
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 5\text{mA}, R_{BE} = \infty$	800	-	-	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 1\text{mA}, I_C = 0$	7	-	-	V
Collector-Emitter Sustaining Voltage	$V_{CEO(sus)}$	$I_C = 6\text{A}, I_B = 2\text{A}, L = 200\mu\text{H}$	800	-	-	V
	$V_{CEX(sus)}$	$I_C = 2\text{A}, I_{B1} = 0.4\text{A}, L = 1\text{mH}, I_{B2} = -0.4\text{A}, \text{Clamped}$	800	-	-	V
		$I_C = 1\text{A}, I_{B1} = 0.2\text{A}, L = 2\text{mH}, I_{B2} = -0.2\text{A}, \text{Clamped}$	900	-	-	V
Turn-On Time	$t_{on}$	$V_{CC} = 400\text{V}, I_C = 4\text{A}, I_{B1} = 0.8\text{A}, I_{B2} = -1.6\text{A}, R_L = 100\Omega$	-	-	1.0	$\mu\text{s}$
Storage Time	$t_{stg}$		-	-	3.0	$\mu\text{s}$
Fall Time	$t_f$		-	-	0.7	$\mu\text{s}$

