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## NTE48 Silicon NPN Transistor Darlington, General Purpose Amplifier, High Current

**Absolute Maximum Ratings:**

Collector–Emitter Voltage, $V_{CES}$ .....	50V
Collector–Base Voltage, $V_{CBO}$ .....	60V
Emitter–Base Voltage, $V_{EBO}$ .....	12V
Continuous Collector Current, $I_C$ .....	1000mA
Total Device Dissipation ( $T_A = +25^\circ\text{C}$ ), $P_D$ .....	1.0W
Derate Above $25^\circ\text{C}$ .....	8.0mW/ $^\circ\text{C}$
Total Device Dissipation ( $T_C = +25^\circ\text{C}$ ), $P_D$ .....	2.5W
Derate Above $25^\circ\text{C}$ .....	20mW/ $^\circ\text{C}$
Operating Junction Temperature Range, $T_J$ .....	$-55^\circ$ to $+150^\circ\text{C}$
Storage Temperature Range, $T_{stg}$ .....	$-55^\circ$ to $+150^\circ\text{C}$
Thermal Resistance, Junction–to–Case, $R_{thJC}$ .....	50 $^\circ\text{C}/\text{W}$
Thermal Resistance, Junction–to–Ambient, $R_{thJA}$ .....	125 $^\circ\text{C}/\text{W}$

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>OFF Characteristics</b>						
Collector–Emitter Breakdown Voltage	$V_{(BR)CES}$	$I_C = 1\text{mA}$ , $I_B = 0$ , Note 1	50	–	–	V
Collector–Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 1.0\mu\text{A}$ , $I_E = 0$	600	–	–	V
Emitter–Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 10\mu\text{A}$ , $I_C = 0$	12	–	–	V
Collector Cutoff Voltage	$I_{CBO}$	$V_{CB} = 40\text{V}$ , $I_E = 0$	–	–	100	nA
Emitter Cutoff Current	$I_{EBO}$	$V_{BE} = 10\text{V}$ , $I_C = 0$	–	–	100	nA

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>ON Characteristics (Note 1)</b>						
DC Current Gain	$h_{FE}$	$I_C = 200\text{mA}, V_{CE} = 5\text{V}$	25,000	–	–	
		$I_C = 1000\text{mA}, V_{CE} = 5\text{V}$	4,000	–	40,000	
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 1000\text{mA}, I_B = 2\text{mA}$	–	–	1.5	V
Base–Emitter ON Voltage	$V_{BE(on)}$	$I_C = 1000\text{mA}, V_{CE} = 5\text{V}$	–	–	2.0	V
<b>Small–Signal Characteristics</b>						
Current Gain–Bandwidth Product	$f_T$	$I_C = 200\text{mA}, V_{CE} = 5\text{V}, f = 100\text{MHz}$	100	–	1000	MHz
Collector–Base Capacitance	$C_{cb}$	$V_{CB} = 10\text{V}, I_E = 0, f = 1\text{MHz}$	–	–	10	pF

Note 1. Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$

