



ELECTRONICS, INC.
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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°C	8.0mW/ $^\circ\text{C}$
Total Device Dissipation ($T_C = +25^\circ\text{C}$), P_D	2.5W
Derate Above 25°C	20mW/ $^\circ\text{C}$
Operating Junction Temperature Range, T_J	-55° to $+150^\circ\text{C}$
Storage Temperature Range, T_{stg}	-55° 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
OFF Characteristics						
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 Current	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
ON Characteristics (Note 1)						
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
Small–Signal Characteristics						
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 $\leq 2\%$

