



ELECTRONICS, INC.
 44 FARRAND STREET
 BLOOMFIELD, NJ 07003
 (973) 748-5089

NTE2321 Silicon NPN Transistor Quad, General Purpose

Absolute Maximum Ratings:

Collector–Emitter Voltage, V_{CEO}	30V
Collector–Base Voltage, V_{CBO}	60V
Emitter–Base Voltage, V_{EBO}	5V
Continuous Collector Current, I_C	500mA
Total Device Dissipation ($T_A = +25^\circ\text{C}$, Each Transistor), P_D	0.65W
Derate Above 25°C	5.2mW/ $^\circ\text{C}$
Total Device Dissipation ($T_A = +25^\circ\text{C}$, Total Device), P_D	1.9W
Derate Above 25°C	15.2mW/ $^\circ\text{C}$
Operating Junction Temperature Range, T_J	-65° to $+200^\circ\text{C}$
Storage Temperature Range, T_{stg}	-65° to $+200^\circ\text{C}$

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	$V_{(BR)CEO}$	$I_C = 10\text{mA}$, $I_B = 0$, Note 1	40	–	–	V
Collector–Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 10\mu\text{A}$, $I_E = 0$	60	–	–	V
Emitter–Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 10\mu\text{A}$, $I_C = 0$	5	–	–	V
Collector Cutoff Current	I_{CBO}	$V_{CB} = 50\text{V}$, $I_E = 0$	–	–	50	nA
Emitter Cutoff Current	I_{EBO}	$V_{EB} = 3\text{V}$, $I_E = 0$	–	–	50	nA
ON Characteristics						
DC Current Gain	h_{FE}	$V_{CE} = 10\text{V}$, $I_C = 10\text{mA}$	75	–	–	
		$V_{CE} = 10\text{V}$, $I_C = 150\text{mA}$	100	–	–	
		$V_{CE} = 10\text{V}$, $I_C = 300\text{mA}$	30	–	–	
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 150\text{mA}$, $I_B = 15\text{mA}$	–	–	0.4	V
		$I_C = 300\text{mA}$, $I_B = 30\text{mA}$	–	–	1.6	V
Small–Signal Characteristics						
Current Gain–Bandwidth Product	f_T	$V_{CE} = 20\text{V}$, $I_C = 20\text{mA}$, $f = 100\text{MHz}$, Note 1	200	350	–	MHz
Output Capacitance	C_{obo}	$V_{BE} = 19\text{V}$, $I_E = 0$, $f = 1\text{MHz}$	–	4.5	8.0	pF
Input Capacitance	C_{ibo}	$V_{BE} = 0.5\text{V}$, $I_C = 0$, $f = 1\text{MHz}$	–	17	30	pF

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

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Switching Characteristics						
Turn-On Time	t_{on}	$V_{CC} = 30\text{V}$, $V_{BE(off)} = 0.5\text{V}$, $I_C = 150\text{mA}$, $I_{B1} = 15\text{mA}$	–	25	–	ns
Turn-Off Time	t_{off}	$V_{CC} = 30\text{V}$, $I_C = 150\text{mA}$, $I_{B1} = I_{B2} = 15\text{mA}$	–	250	–	ns

Pin Connection Diagram

