



ELECTRONICS, INC.
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NTE2323 Silicon NPN Transistor Quad, Amplifier

Absolute Maximum Ratings:

Collector–Emitter Voltage, V_{CEO}	200V
Collector–Base Voltage, V_{CBO}	200V
Emitter–Base Voltage, V_{EBO}	5V
Continuous Collector Current, I_C	500mA
Total Device Dissipation ($T_A = +25^\circ\text{C}$, Each Die), P_D	0.75W
Derate Above 25°C	5.98mW/ $^\circ\text{C}$
Total Device Dissipation ($T_A = +25^\circ\text{C}$, Four Die Equal Power), P_D	1.7W
Derate Above 25°C	13.6mW/ $^\circ\text{C}$
Operating Junction Temperature Range, T_J	-55° to $+150^\circ\text{C}$
Storage Temperature Range, T_{stg}	-55° to $+150^\circ\text{C}$
Thermal Reistance, Junction–to–Ambient, R_{thJA}	
Each Die	167 $^\circ\text{C}/\text{W}$
Effective, 4 Die	73.5 $^\circ\text{C}/\text{W}$
Thermal Reistance, Junction–to–Case, R_{thJC}	
Each Die	100 $^\circ\text{C}/\text{W}$
Effective, 4 Die	39 $^\circ\text{C}/\text{W}$
Coupling Factors, Junction–to–Ambient	
Q1–Q4 or Q2–Q3	56%
Q1–Q2 or Q3–Q4	10%
Coupling Factors, Junction–to–Case	
Q1–Q4 or Q2–Q3	46%
Q1–Q2 or Q3–Q4	5%

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	$V_{(BR)CEO}$	$I_C = 1\text{mA}, I_B = 0$	200	–	–	V
Collector–Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 100\mu\text{A}, I_E = 0$	20	–	–	V
Emitter–Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 100\mu\text{A}, I_C = 0$	5	–	–	V
Collector Cutoff Current	I_{CBO}	$V_{CB} = 150\text{V}, I_E = 0$	–	–	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						
DC Current Gain	h_{FE}	$V_{CE} = 10\text{V}, I_C = 1\text{mA}$	25	45	–	
		$V_{CE} = 10\text{V}, I_C = 10\text{mA}$	40	60	–	
		$V_{CE} = 10\text{V}, I_C = 30\text{mA}$	40	80	–	
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 20\text{mA}, I_B = 2\text{mA}$	–	0.3	0.5	V
Base–Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 20\text{mA}, I_B = 2\text{mA}$	–	0.7	0.9	V
Current Gain–Bandwidth Product	f_T	$V_{CE} = 20\text{V}, I_C = 10\text{mA}, f = 100\text{MHz}$	50	80	–	MHz
Output Capacitance	C_{obo}	$V_{CB} = 20\text{V}, I_E = 0, f = 1\text{MHz}$	–	2.5	5.0	pF
Input Capacitance	C_{ibo}	$V_{EB} = 3\text{V}, I_C = 0, f = 1\text{MHz}$	–	40	50	pF

Pin Connection Diagram

