ELECTRONICS, INC.
44 FARRAND STREET
BLOOMFIELD, NJ 07003
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NTE2320
Silicon NPN/PNP Transistor
Quad, General Purpose Switch, Amp
(Complementary Pair)

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°C, Each Die, Note 1), P_D 0.65W
  Derate Above 25°C . . . . . 5.18mW/°C
Total Device Dissipation (T_A = +25°C, Four Die Equal Power, Note 1), P_D 1.25W
  Derate Above 25°C . . . . . 10mW/°C
Total Device Dissipation (T_C = +25°C, Each Die, Note 1), P_D 1.0W
  Derate Above 25°C . . . . . 8.0mW/°C
Total Device Dissipation (T_C = +25°C, Four Die Equal Power, Note 1), P_D 3.0W
  Derate Above 25°C . . . . . 24mW/°C
Operating Junction Temperature Range, T_J . . . . . –55° to +150°C
Storage Temperature Range, T_{stg} . . . . . –55° to +150°C
Thermal Reistance, Junction–to–Ambient, R_{thJA}
  Each Die . . . . . 193°C/W
  Effective, 4 Die . . . . . 100°C/W
Thermal Reistance, Junction–to–Case, R_{thJC}
  Each Die . . . . . 125°C/W
  Effective, 4 Die . . . . . 41.6°C/W
Coupling Factors, Junction–to–Ambient
  Q1–Q4 or Q2–Q3 . . . . . 60%
  Q1–Q2 or Q3–Q4 . . . . . 24%
Coupling Factors, Junction–to–Case
  Q1–Q4 or Q2–Q3 . . . . . 30%
  Q1–Q2 or Q3–Q4 . . . . . 20%

Note 1. Voltage and current are negative for PNP transistors.

Electrical Characteristics: (T_A = +25°C, Note 1 unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
Collector–Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C = 10mA, I_B = 0, Note 2	30	–	–	V
Collector–Base Breakdown Voltage	$V_{(BR)CBO}$	I_C = 10μA, I_E = 0	60	–	–	V
Emitter–Base Breakdown Voltage	$V_{(BR)EBO}$	I_E = 10μA, I_C = 0	5	–	–	V
Collector Cutoff Current	I_{CBO}	V_{CB} = 50V, I_E = 0	–	–	30	nA
Emitter Cutoff Current	IE_{BO}	V_{EB} = 3V, I_C = 0	–	–	30	nA
ON Characteristics (Note 3)						
DC Current Gain	h_{FE}	V_{CE} = 10V, I_C = 1mA	50	–	–	
		V_{CE} = 10V, I_C = 10mA	75	–	–	
		V_{CE} = 10V, I_C = 150mA	100	–	–	
		V_{CE} = 10V, I_C = 300mA	20	–	–	
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	I_C = 150mA, I_B = 15mA	–	–	0.4	V
		I_C = 300mA, I_B = 30mA	–	–	01.4	V
Base–Emitter Saturation Voltage	$V_{BE(sat)}$	I_C = 150mA, I_B = 15mA	–	–	1.3	V
		I_C = 300mA, I_B = 30mA	–	–	2.0	V
Small–Signal Characteristics						
Current Gain–Bandwidth Product	f_T	V_{CE} = 20V, I_C = 50mA, f = 100MHz, Note 3	200	350	–	MHz
Output Capacitance NPN	C_{obo}	V_{CB} = 10V, I_E = 0, f = 1MHz	–	6.0	8.0	pF
PNP			–	4.5	8.0	pF
Input Capacitance NPN	C_{ibo}	V_{EB} = 2V, I_C = 0, f = 1MHz	–	20	30	pF
PNP			–	17	30	pF
Switching Characteristics						
Turn–On Time	t_{on}	V_{CC} = 30V, V_{EB} = 0.5V, I_C = 150mA, I_{B1} = 15mA	–	30	–	ns
Turn–Off Time	t_{off}	V_{CC} = 30V, I_C = 150mA, I_{B1} = I_{B2} = 15mA	–	225	–	ns

Note 1. Voltage and current are negative for PNP transistors.

Note 2. Second Breakdown occurs at power levels greater than 3 times the power dissipation rating.

Note 3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

Pin Connection Diagram