



ELECTRONICS, INC.

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NTE2357 (NPN) & NTE2358 (PNP) Silicon Complementary Transistors Digital ^{w/2} Built-In 22k Bias Resistors

Features:

- Built-In Bias Resistor ($R_1 = 22k\Omega$, $R_2 = 22k\Omega$)
- Small-Sized Package (TO92 type)

Applications:

- Switching Circuit
- Inverter
- Interface Circuit
- Driver

Absolute Maximum Ratings: ($T_A = +25^\circ\text{C}$ unless otherwise specified)

| | |
|---|-------------------------------------|
| Collector to Base Voltage, V_{CB0} | 50V |
| Collector to Emitter Voltage, V_{CEO} | 50V |
| Emitter to Base Voltage, V_{EBO} | 10V |
| Collector Current, I_C | |
| Continuous | 100mA |
| Peak | 200mA |
| Collector Dissipation, P_C | 300mW |
| Operating Junction Temperature, T_J | $+150^\circ\text{C}$ |
| Storage Temperature Range, T_{stg} | -55° to $+160^\circ\text{C}$ |

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

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|------------------------------------|-----------|---------------------------|-----|-----|-----|---------------|
| Collector Cutoff Current | I_{CB0} | $V_{CB} = 40V, I_E = 0$ | – | – | 0.1 | μA |
| | I_{CEO} | $V_{CE} = 40V, I_B = 0$ | – | – | 0.5 | μA |
| Emitter Cutoff Current | I_{EBO} | $V_{EB} = 5V, I_C = 0$ | 70 | 113 | 150 | μA |
| DC Current Gain | h_{FE} | $V_{CE} = 5V, I_C = 5mA$ | 50 | – | – | |
| Gain Band-width Product NTE2357 | f_T | $V_{CE} = 10V, I_C = 5mA$ | – | 250 | – | MHz |
| | | | – | 200 | – | MHz |
| Output Capacitance NTE2357 | C_{ob} | $V_{CB} = 10V, f = 1MHz$ | – | 3.7 | – | pF |
| | | | – | 5.5 | – | pF |

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

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|--------------------------------------|---------------|--|-----|-----|-----|-----------|
| Collector–Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C = 10\text{mA}, I_B = 0.5\text{mA}$ | – | 0.1 | 0.3 | V |
| Collector–Base Breakdown Voltage | $V_{(BR)CBO}$ | $I_C = 10\mu\text{A}, I_E = 0$ | 50 | – | – | V |
| Collector–Emitter Breakdown Voltage | $V_{(BR)CEO}$ | $I_C = 100\mu\text{A}, R_{BE} = \infty$ | 50 | – | – | V |
| Input OFF Voltage | $V_{I(off)}$ | $V_{CE} = 5\text{V}, I_C = 100\mu\text{A}$ | 0.8 | 1.1 | 1.5 | V |
| Input ON Voltage | $V_{I(on)}$ | $V_{CE} = 200\text{mV}, I_C = 5\text{mA}$ | 1.0 | 1.9 | 3.0 | V |
| Input Resistance | R_1 | | 15 | 22 | 29 | $k\Omega$ |
| Input Resistance Ratio | R_1/R_2 | | 0.9 | 1.0 | 1.1 | |

Schematic Diagram

