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# NTE63
# Silicon NPN Transistor
# High Gain, Low Noise Amp

**Description:**

The NTE63 is a silicon NPN high frequency transistor designed primarily for use in high–gain, low noise tuned and wiseband small–signal amplifiers and applications requiring fast switching times.

**Features:**

- High Current Gain–Bandwidth Product: $f_T$ = 5GHz Typ @ f = 1GHz
- High Power Gain: $G_{pe}$ = 12.5dB Min @ f = 1GHz

**Absolute Maximum Ratings:**

Collector–Emitter Voltage, $V_{CEO}$ . . . . . 12V
Collector–Base Voltage, $V_{CBO}$ . . . . . 20V
Emitter–Base Voltage, $V_{EBO}$ . . . . . 2V
Continuous Collector Current, $I_C$ . . . . . 40mA
Total Device Dissipation ($T_L$ = +50°C), $P_D$ . . . . . 400mW
Derate Above 50°C . . . . . 4.0mW/°C
Storage Temperature Range, $T_{stg}$ . . . . . –65° to +150°C
Thermal Resistance, Junction–to–Lead, $R_{thJL}$ . . . . . 250°C/W

**Electrical Characteristics:** ($T_C$ = +25°C unless otherwise specified)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **OFF Characteristics** | | | | | | |
| Collector–Emitter Breakdown Voltage | $V_{(BR)CEO}$ | $I_C$ = 1mA, $I_B$ = 0 | 12 | – | – | V |
| Collector–Base Breakdown Voltage | $V_{(BR)CBO}$ | $I_C$ = 0.1mA, $I_E$ = 0 | 20 | – | – | V |
| Emitter–Base Breakdown Voltage | $V_{(BR)EBO}$ | $I_E$ = 0.1mA, $I_C$ = 0 | 2 | – | – | V |
| Collector Cutoff Current | $I_{CBO}$ | $V_{CB}$ = 15V, $I_E$ = 0 | – | – | 50 | nA |

**Electrical Characteristics (Cont'd):** ($T_C$ = +25°C unless otherwise specified)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **ON Characteristics** | | | | | | |
| DC Current Gain | $h_{FE}$ | $I_C$ = 30mA, $V_{CE}$ = 10V | 30 | – | 200 | |
| **Dynamic Characteristics** | | | | | | |
| Current Gain–Bandwidth Product | $f_T$ | $I_C$ = 30mA, $V_{CE}$ = 10V, f = 1GHz | – | 5.0 | – | GHz |
| Collector–Base Capacitance | $C_{cb}$ | $V_{CB}$ = 10V, $I_E$ = 0, f = 1MHz | – | 0.6 | 1.0 | pF |
| **Functional Tests** | | | | | | |
| Noise Figure | $NF_{MIN}$ | $I_C$ = 5mA, $V_{CE}$ = 10V, f = 1GHz | – | 2.5 | – | dB |
| | | $I_C$ = 5mA, $V_{CE}$ = 10V, f = 2GHz | – | 4.0 | – | dB |
| Power Gain at Optimum Noise Figure | $G_{NF}$ | $I_C$ = 5mA, $V_{CE}$ = 10V, f = 1GHz | – | 10 | – | dB |
| | | $I_C$ = 5mA, $V_{CE}$ = 10V, f = 2GHz | – | 6 | – | dB |
| Maximum Available Power Gain (Note 1) | $G_{max}$ | $I_C$ = 30mA, $V_{CE}$ = 10V, f = 1GHz | – | 12.5 | – | dB |
| | | $I_C$ = 30mA, $V_{CE}$ = 10V, f = 2GHz | – | 7.5 | – | dB |

Note1. $G_{max} = |S_{21}|^2 / (I - |S_{11}|^2)(I - |S_{22}|^2)$