New Jersey Semi-Conductor Products, Inc.

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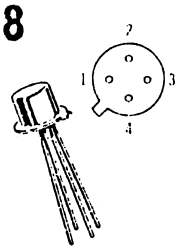
# 2N3307 (SILICON)
# 2N3308




(TO-72)

STYLE 10
PIN 1. EMITTER
2. BASE
3. COLLECTOR
4. CASE

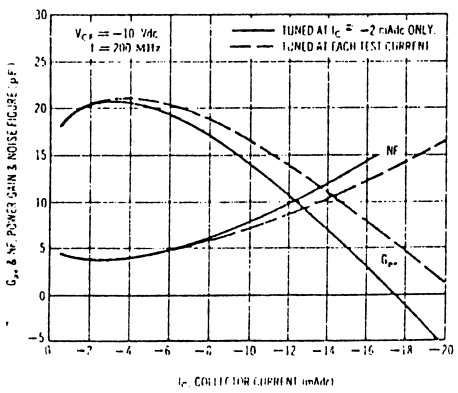
PNP silicon annular transistors for high-gain, low-noise amplifier, oscillator, mixer and frequency multiplier applications.

*MAXIMUM RATINGS

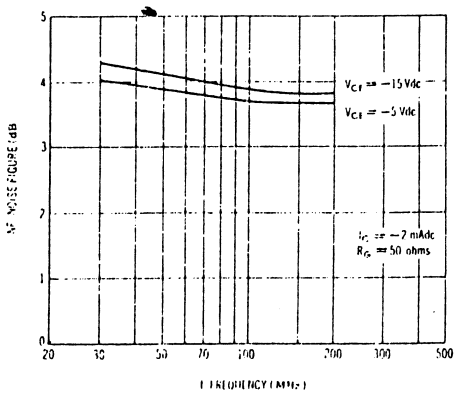
| Rating | Symbol | Value | | Unit |
|---|---|---|---|---|
| | | 2N3307 | 2N3308 | |
| Collector-Base Voltage | $V_{CB}$ | 40 | 30 | Vdc |
| Collector-Emitter Voltage | $V_{CES}$ | 40 | 30 | Vdc |
| Collector-Emitter Voltage | $V_{CEO}$ | 35 | 25 | Vdc |
| Emitter-Base Voltage | $V_{EB}$ | 3.0 | | Vdc |
| Collector Current | $I_C$ | 50 | | mAdc |
| Power Dissipation at $T_C$ = 25°C<br>Derate above 25°C | $P_D$ | 300<br>1.71 | | mW<br>mW/°C |
| Power Dissipation at $T_A$ = 25°C<br>Derate above 25°C | $P_D$ | 200<br>1.14 | | mW<br>mW/°C |
| Junction Temperature | $T_J$ | 200 | | °C |
| Storage Temperature Range | $T_{stg}$ | -65 to +200 | | °C |

*Indicates JEDEC Registered Data

COMMON EMITTER AVERAGE SMALL POWER GAIN & NOISE FIGURE versus COLLECTOR CURRENT




NOISE FIGURE versus FREQUENCY




Quality Semi-Conductors

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## *ELECTRICAL CHARACTERISTICS ($T_A$ = 25°C unless otherwise noted)

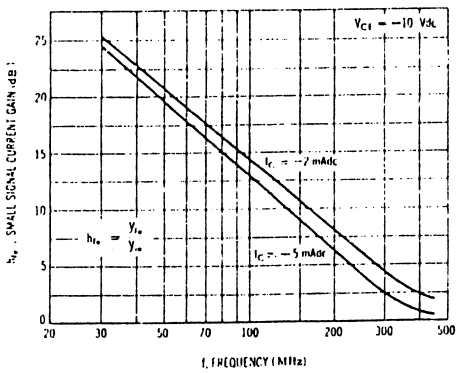
| Characteristic | Symbol | Test Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| Collector-Base Breakdown Voltage | $BV_{CBO}$ | $I_C$ = 10 μAdc, $I_E$ = 0 | 2N3307<br>2N3308 | 40<br>30 | –<br>– | –<br>– | Vdc |
| Collector-Emitter Breakdown Voltage | $BV_{CES}$ | $I_C$ = 10 μAdc, $V_{BE}$ = 0 | 2N3307<br>2N3308 | 40<br>30 | –<br>– | –<br>– | Vdc |
| Collector-Emitter Breakdown Voltage | $BV_{CEO}$ | $I_C$ = 2.0 mAdc, $I_B$ = 0 | 2N3307<br>2N3308 | 35<br>25 | –<br>– | –<br>– | Vdc |
| Emitter-Base Breakdown Voltage | $BV_{EBO}$ | $I_E$ = 10 μAdc, $I_C$ = 0 | Both Types | 3.0 | – | – | Vdc |
| Collector Cutoff Current | $I_{CBO}$ | $V_{CB}$ = 15 Vdc<br>$V_{CB}$ = 15 Vdc, T = 150 °C | Both Types<br>2N3307 | –<br>– | 0.001<br>0.5 | 0.010<br>3.0 | μAdc |
| DC Current Gain | $h_{FE}$ | $V_{CE}$ = 10 Vdc, $I_C$ = 2 mAdc | 2N3307<br>2N3308 | 40<br>25 | –<br>– | 250<br>250 | – |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C$ = 3 mAdc, $I_B$ = 0.6 mAdc | Both Types | – | – | 0.4 | Vdc |
| Base-Emitter Saturation Voltage | $V_{BE(sat)}$ | $I_C$ = 3 mAdc, $I_B$ = 0.6 mAdc | Both Types | – | – | 1.0 | Vdc |
| AC Current Gain | $h_{fe}$ | $V_{CE}$ = 10 Vdc, $I_C$ = 2 mAdc, f = 1 kHz | 2N3307<br>2N3308 | 40<br>25 | –<br>– | 250<br>250 | – |
| Output Capacitance(1) | $C_{ob}$ | $V_{CB}$ = 10 Vdc, $I_E$ = 0, f = 0.1 MHz | 2N3307<br>2N3308 | –<br>– | 1.0<br>1.2 | 1.3<br>1.6 | pF |
| Collector-Base Time Constant | $r_b'C_c$ | $V_{CB}$ = 10 Vdc, $I_C$ = 2 mAdc, f = 31.8 MHz | 2N3307<br>2N3308 | 2.0<br>2.0 | –<br>– | 15<br>20 | ps |
| Current Gain-Bandwidth Product | $f_T$ | $V_{CE}$ = 10 Vdc, $I_C$ = 2 mAdc, f = 100 MHz | Both Types | 300 | – | 1200 | MHz |
| Maximum Frequency of Oscillation | $f_{max}$ | $V_{CE}$ = 10 Vdc, $I_C$ = 2 mAdc | Both Types | – | 2000 | – | MHz |
| Power Gain | $G_e$ | $V_{CE}$ = 10 Vdc, $I_C$ = 2 mAdc, f = 200 MHz | Both Types | 17 | – | 24 | dB |
| Noise Figure | NF | $V_{CE}$ = 10 Vdc, $I_C$ = 2 mAdc, f = 200 MHz | 2N3307<br>2N3308 | –<br>– | 4.0<br>5.0 | 4.5<br>6.0 | dB |
| Power Gain (AGC) (2) | $G_e$ | $V_{CE}$ = 5.0 Vdc, $I_C$ = 20 mAdc, f = 200 MHz | 2N3307<br>2N3308 | –<br>– | –<br>0 | 0<br>– | dB |

(1) $C_{ob}$ is measured in guarded circuit such that the can capacitance is not included.

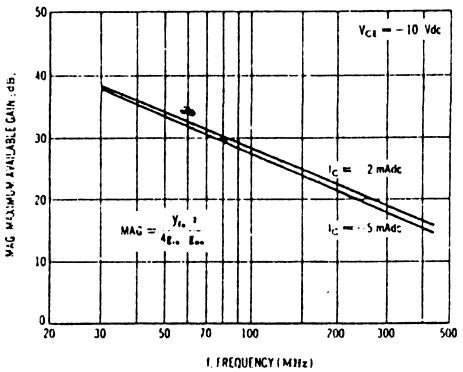
(2) AGC is obtained by increasing $I_C$. The circuit remains adjusted for $V_{CE}$ = -10 Vdc, $I_C$ = -2 mAdc operation.

* Indicates JEDEC Registered Data

**SMALL SIGNAL CURRENT GAIN versus FREQUENCY**




**MAXIMUM AVAILABLE GAIN versus FREQUENCY**

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