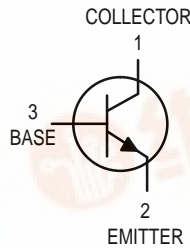


VHF Transistor
NPN Silicon



MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|--|----------------|-------------|------------------------------|
| Collector–Emitter Voltage | V_{CEO} | 20 | Vdc |
| Collector–Base Voltage | V_{CBO} | 30 | Vdc |
| Emitter–Base Voltage | V_{EBO} | 3.0 | Vdc |
| Collector Current — Continuous | I_C | 100 | mAdc |
| Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C | P_D | 625 5.0 | mW mW/ $^\circ\text{C}$ |
| Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C | P_D | 1.5 12 | Watt mW/ $^\circ\text{C}$ |
| Operating and Storage Junction Temperature Range | T_J, T_{stg} | -55 to +150 | $^\circ\text{C}$ |

THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|---|-----------------|------|---------------------------|
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 200 | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance, Junction to Case | $R_{\theta JC}$ | 83.3 | $^\circ\text{C}/\text{W}$ |

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|----------------|--------|-----|-----|-----|------|
|----------------|--------|-----|-----|-----|------|

OFF CHARACTERISTICS

| | | | | | |
|--|---------------|-----|---|-----|------|
| Collector–Emitter Breakdown Voltage ($I_C = 1.0$ mAdc, $I_B = 0$) | $V_{(BR)CEO}$ | 20 | — | — | Vdc |
| Collector–Base Breakdown Voltage ($I_C = 10$ μ Adc, $I_E = 0$) | $V_{(BR)CBO}$ | 30 | — | — | Vdc |
| Emitter–Base Breakdown Voltage ($I_E = 10$ μ Adc, $I_C = 0$) | $V_{(BR)EBO}$ | 3.0 | — | — | Vdc |
| Collector Cutoff Current ($V_{CB} = 20$ Vdc, $I_E = 0$) | I_{CBO} | — | — | 100 | nAdc |

ON CHARACTERISTICS

| | | | | | |
|--|---------------|----------|--------|--------|-----|
| DC Current Gain ($I_C = 5.0$ mAdc, $V_{CE} = 10$ Vdc) ($I_C = 20$ mAdc, $V_{CE} = 10$ Vdc) | h_{FE} | 35 40 | — — | — — | — |
| Collector–Emitter Saturation Voltage ($I_C = 30$ mAdc, $I_B = 2.0$ mAdc) | $V_{CE(sat)}$ | — | — | 1.0 | Vdc |
| Base–Emitter Saturation Voltage ($I_C = 30$ mAdc, $I_B = 2.0$ mAdc) | $V_{BE(sat)}$ | — | — | 1.0 | Vdc |

SMALL–SIGNAL CHARACTERISTICS

| | | | | | |
|--|----------|------------|--------|--------|-----|
| Current–Gain — Bandwidth Product ($I_C = 20$ mAdc, $V_{CE} = 10$ Vdc, $f = 100$ MHz) ($I_C = 30$ mAdc, $V_{CE} = 10$ Vdc, $f = 100$ MHz) | f_T | 700 600 | — — | — — | MHz |
| Common Emitter Feedback Capacitance ($V_{CB} = 10$ Vdc, $P_f = 0$, $f = 10$ MHz) | C_{re} | — | 0.65 | — | pF |
| Noise Figure ($I_C = 4.0$ mA, $V_{CE} = 10$ V, $R_S = 50$ Ω , $f = 200$ MHz) | N_f | — | 3.0 | — | dB |



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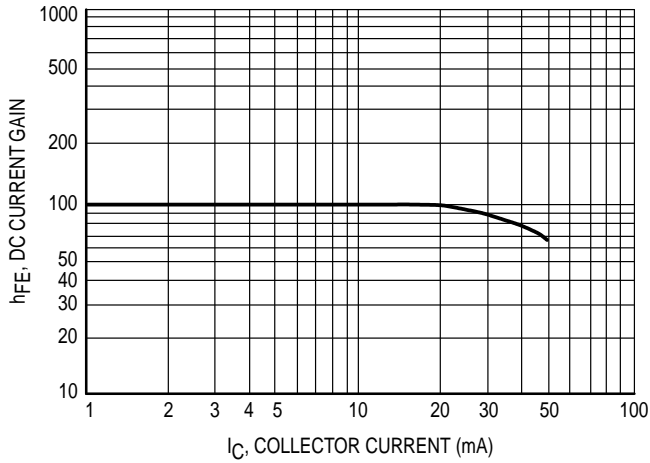


Figure 1. h_{FE} at 10 V

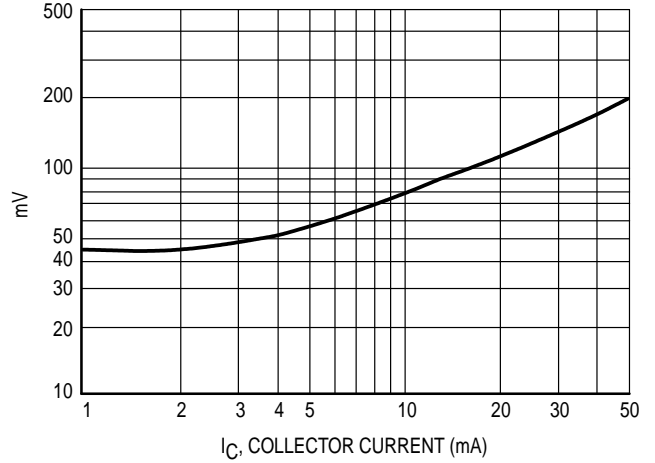


Figure 2. $V_{CE(sat)}$ at $I_C/I_B = 10$

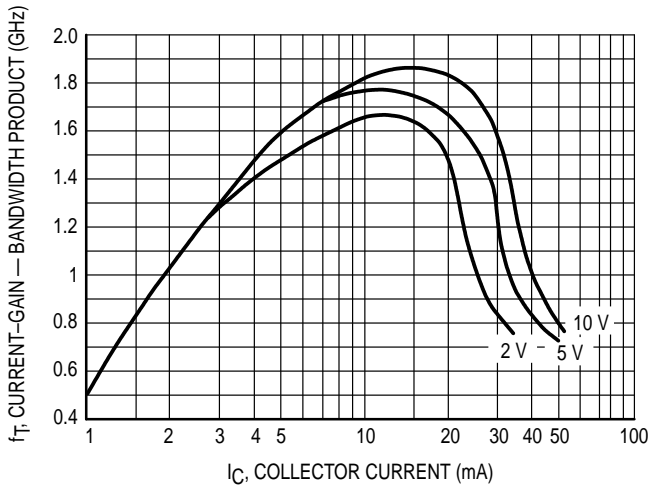


Figure 3. Current-Gain — Bandwidth Product

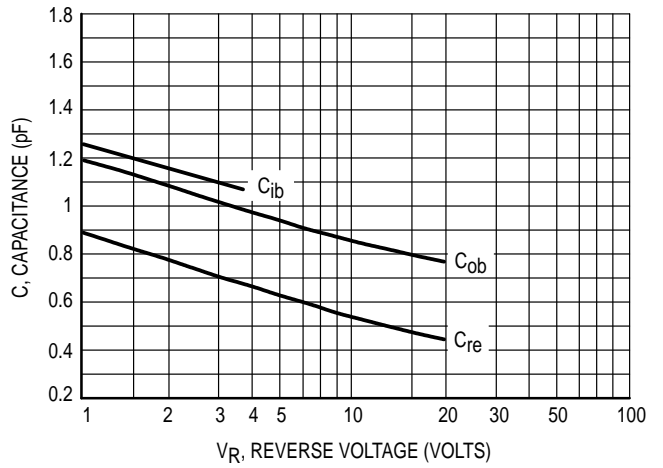


Figure 4. Capacitances

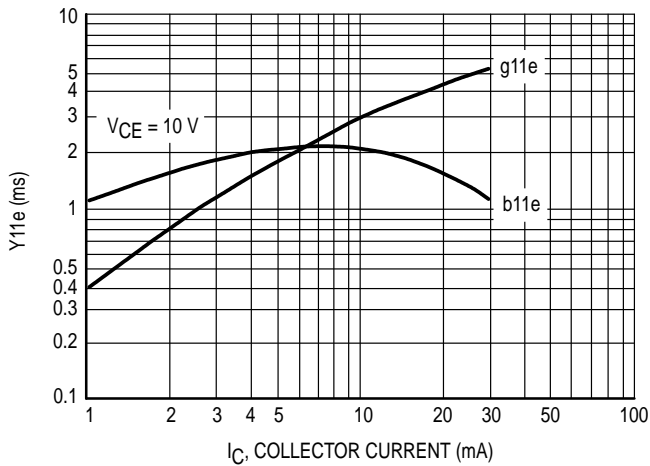


Figure 5. Input Impedance at 30 MHz

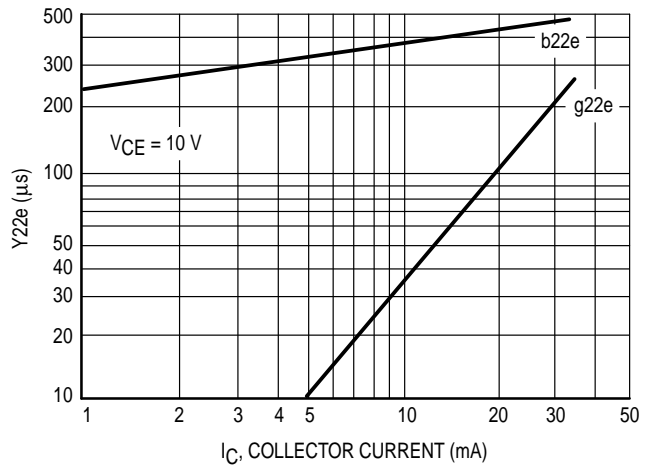
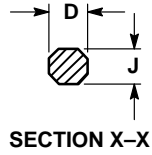
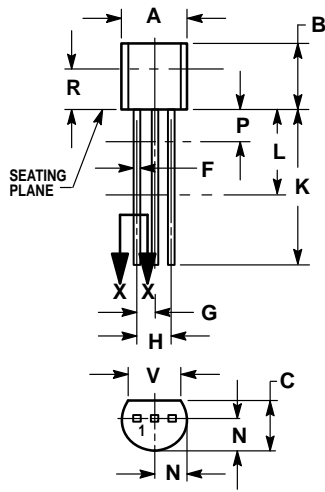


Figure 6. Output Impedance at 30 MHz

PACKAGE DIMENSIONS



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. DIMENSION F APPLIES BETWEEN P AND L. DIMENSION D AND J APPLY BETWEEN L AND K MINIMUM. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.


| DIM | INCHES | | MILLIMETERS | |
|-----|--------|-------|-------------|------|
| | MIN | MAX | MIN | MAX |
| A | 0.175 | 0.205 | 4.45 | 5.20 |
| B | 0.170 | 0.210 | 4.32 | 5.33 |
| C | 0.125 | 0.165 | 3.18 | 4.19 |
| D | 0.016 | 0.022 | 0.41 | 0.55 |
| F | 0.016 | 0.019 | 0.41 | 0.48 |
| G | 0.045 | 0.055 | 1.15 | 1.39 |
| H | 0.095 | 0.105 | 2.42 | 2.66 |
| J | 0.015 | 0.020 | 0.39 | 0.50 |
| K | 0.500 | — | 12.70 | — |
| L | 0.250 | — | 6.35 | — |
| N | 0.080 | 0.105 | 2.04 | 2.66 |
| P | — | 0.100 | — | 2.54 |
| R | 0.115 | — | 2.93 | — |
| V | 0.135 | — | 3.43 | — |

**CASE 029-04
(TO-226AA)
ISSUE AD**

STYLE 21:

- PIN 1. COLLECTOR
2. EMITTER
3. BASE

BF959

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