

BF959

VHF Transistor

NPN Silicon

Features

- Pb-Free Packages are Available*

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 | W 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 | $^\circ\text{C}/\text{W}$ |

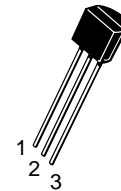
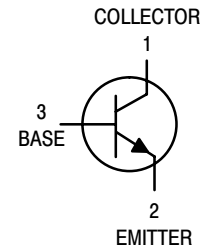
Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



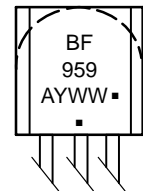
ON Semiconductor®

<http://onsemi.com>



TO-92
CASE 29
STYLE 21

MARKING DIAGRAM



BF959 = Device Code
A = Assembly Location
Y = Year
WW = Work Week
▪ = Pb-Free Package

(Note: Microdot may be in either location)

ORDERING INFORMATION

| Device | Package | Shipping† |
|-----------|--------------------|------------------|
| BF959 | TO-92 | 5000 Units/Box |
| BF959G | TO-92 (Pb-Free) | 5000 Units/Box |
| BF959RL1 | TO-92 | 2000/Tape & Reel |
| BF959RL1G | TO-92 (Pb-Free) | 2000/Tape & Reel |
| BF959ZL1 | TO-92 | 2000/Ammo Pack |
| BF959ZL1G | TO-92 (Pb-Free) | 2000/Ammo Pack |

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

BF959

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

| Characteristic | Symbol | Min | Typ | Max | Unit |
|--|---------------|------------|--------|--------|------|
| OFF CHARACTERISTICS | | | | | |
| Collector–Emitter Breakdown Voltage ($I_C = 1.0 \text{ mAdc}$, $I_B = 0$) | $V_{(BR)CEO}$ | 20 | – | – | Vdc |
| Collector–Base Breakdown Voltage ($I_C = 10 \text{ } \mu\text{Adc}$, $I_E = 0$) | $V_{(BR)CBO}$ | 30 | – | – | Vdc |
| Emitter–Base Breakdown Voltage ($I_E = 10 \text{ } \mu\text{Adc}$, $I_C = 0$) | $V_{(BR)EBO}$ | 3.0 | – | – | Vdc |
| Collector Cutoff Current ($V_{CB} = 20 \text{ Vdc}$, $I_E = 0$) | I_{CBO} | – | – | 100 | nAdc |
| ON CHARACTERISTICS | | | | | |
| DC Current Gain ($I_C = 5.0 \text{ mAdc}$, $V_{CE} = 10 \text{ Vdc}$) ($I_C = 20 \text{ mAdc}$, $V_{CE} = 10 \text{ Vdc}$) | h_{FE} | 35 40 | – – | – – | – |
| Collector–Emitter Saturation Voltage ($I_C = 30 \text{ mAdc}$, $I_B = 2.0 \text{ mAdc}$) | $V_{CE(sat)}$ | – | – | 1.0 | Vdc |
| Base–Emitter Saturation Voltage ($I_C = 30 \text{ mAdc}$, $I_B = 2.0 \text{ mAdc}$) | $V_{BE(sat)}$ | – | – | 1.0 | Vdc |
| SMALL–SIGNAL CHARACTERISTICS | | | | | |
| Current–Gain – Bandwidth Product ($I_C = 20 \text{ mAdc}$, $V_{CE} = 10 \text{ Vdc}$, $f = 100 \text{ MHz}$) ($I_C = 30 \text{ mAdc}$, $V_{CE} = 10 \text{ Vdc}$, $f = 100 \text{ MHz}$) | f_T | 700 600 | – – | – – | MHz |
| Common Emitter Feedback Capacitance ($V_{CB} = 10 \text{ Vdc}$, $P_f = 0$, $f = 10 \text{ MHz}$) | C_{re} | – | 0.65 | – | pF |
| Noise Figure ($I_C = 4.0 \text{ mA}$, $V_{CE} = 10 \text{ V}$, $R_S = 50 \text{ } \Omega$, $f = 200 \text{ MHz}$) | N_f | – | 3.0 | – | dB |

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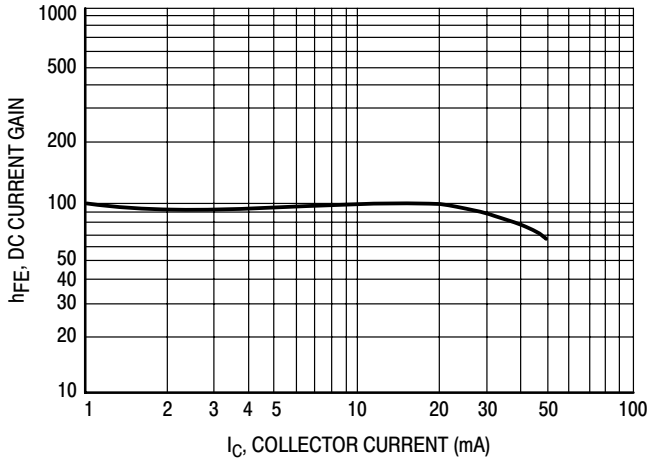


Figure 1. h_{FE} at 10 V

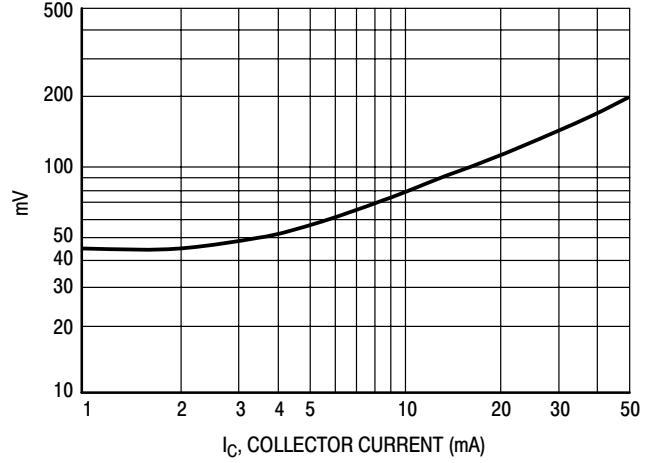


Figure 2. $V_{CE(sat)}$ at $I_C/I_B = 10$

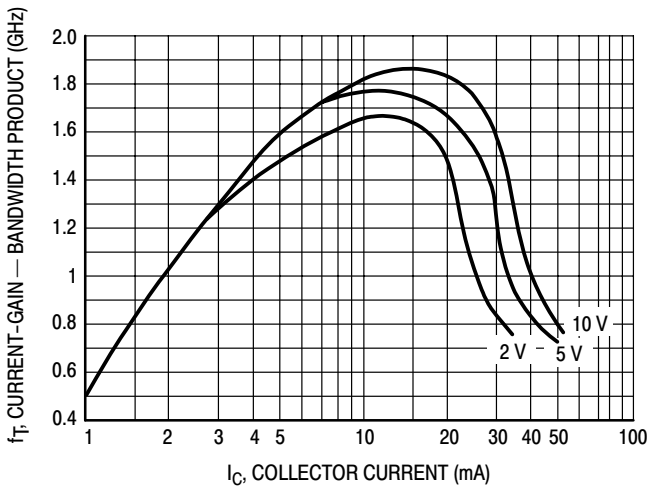


Figure 3. Current-Gain - Bandwidth Product

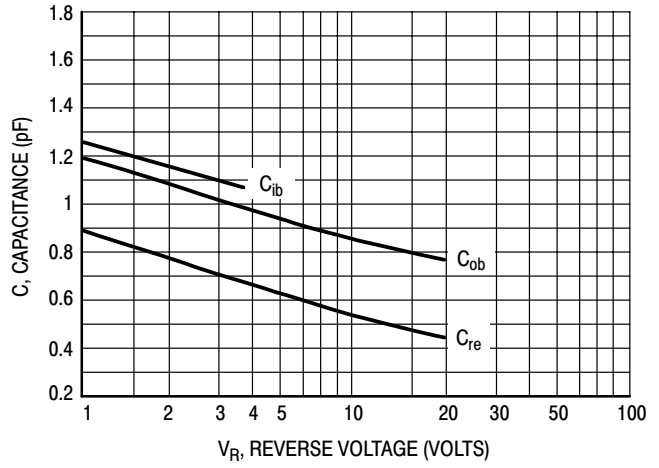


Figure 4. Capacitances

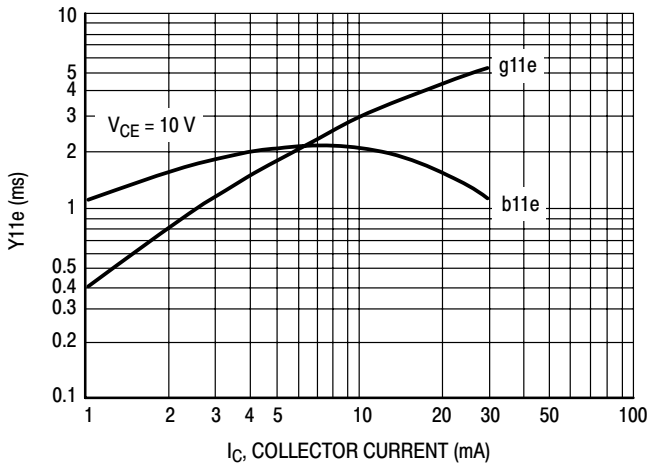


Figure 5. Input Impedance at 30 MHz

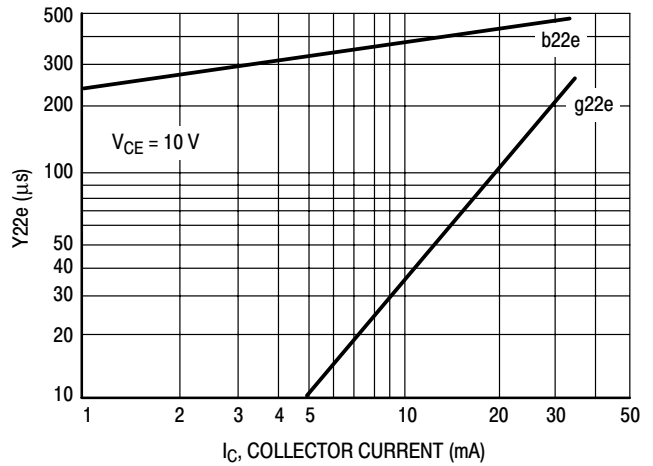
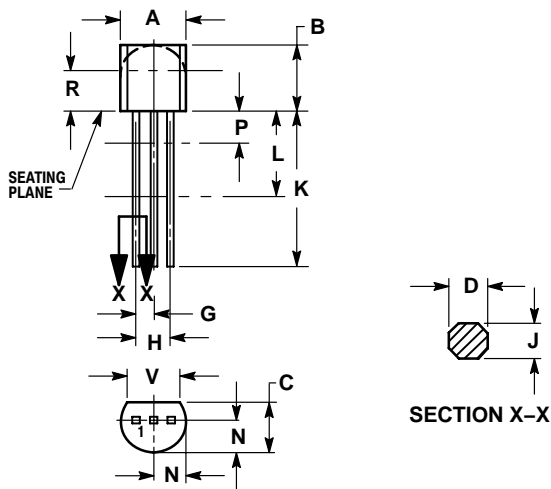


Figure 6. Output Impedance at 30 MHz

BF959

PACKAGE DIMENSIONS

TO-92
TO-226AA
CASE 29-11
ISSUE AL



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. 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 | 0.021 | 0.407 | 0.533 |
| 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 | --- |

STYLE 21:

1. COLLECTOR
2. EMITTER
3. BASE

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