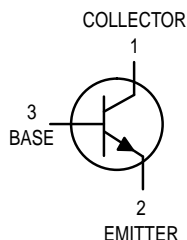
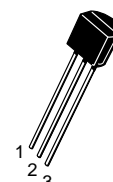


# VHF Transistor

## NPN Silicon



**BF959**



CASE 29-04, STYLE 121  
TO-92 (TO-226AA)

### 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 $25^\circ\text{C}$	$P_D$	625 5.0	mW mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	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
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### OFF CHARACTERISTICS

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

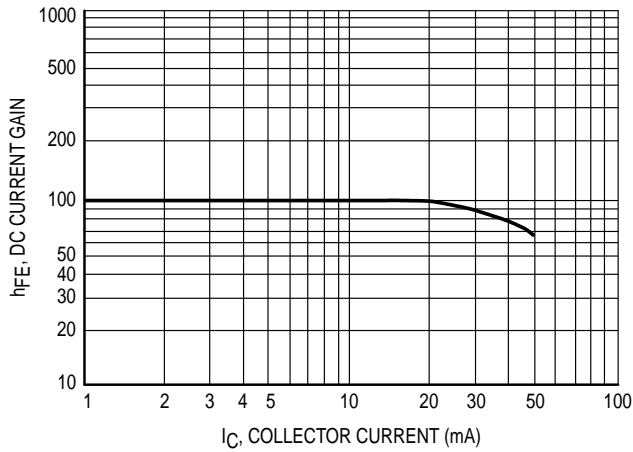
### ON CHARACTERISTICS

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

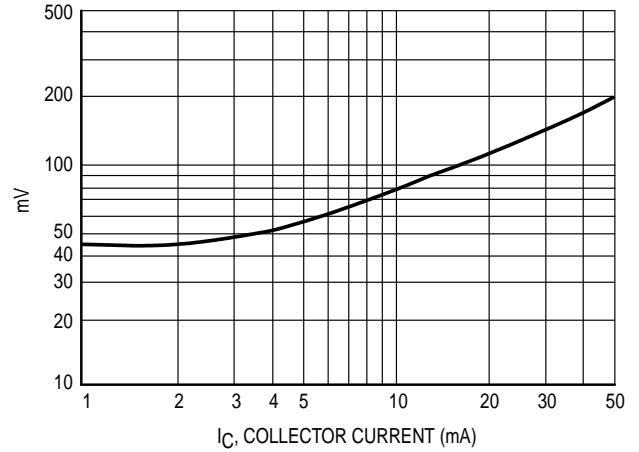
### SMALL-SIGNAL CHARACTERISTICS

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 ( $I_C = 4.0 \text{ mA}, V_{CE} = 10 \text{ V}, R_S = 50 \Omega, f = 200 \text{ MHz}$ )	$N_f$	—	3.0	—	dB

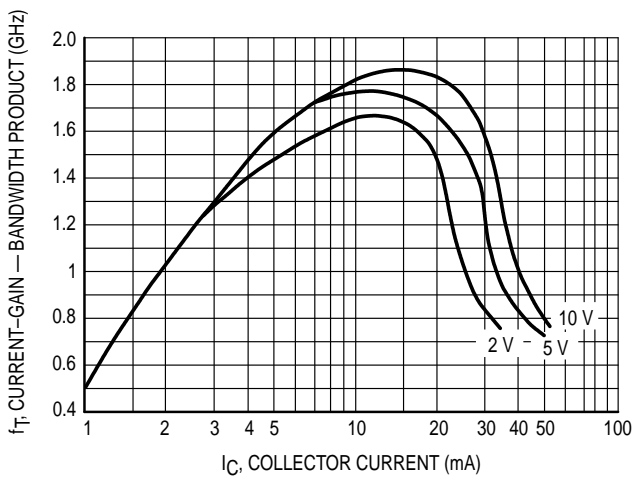
**BF959**



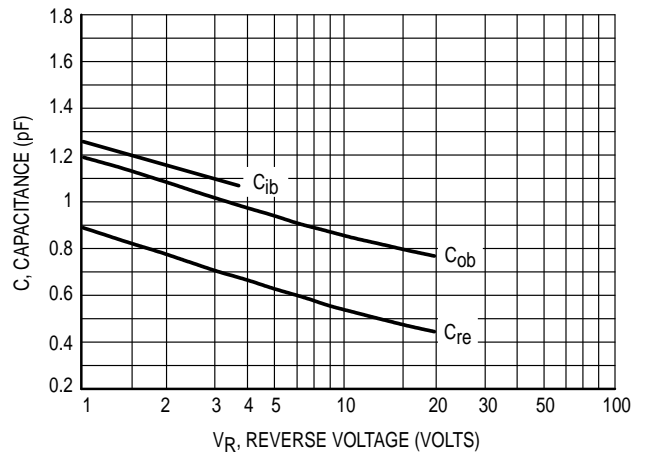
**Figure 1.  $h_{FE}$  at 10 V**



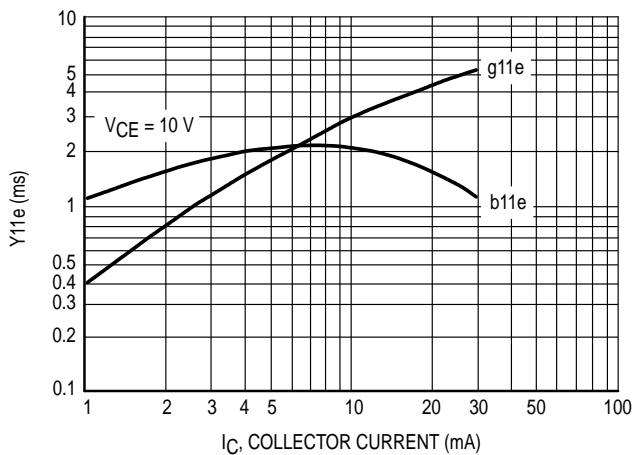
**Figure 2.  $V_{CE(sat)}$  at  $I_C/I_B = 10$**



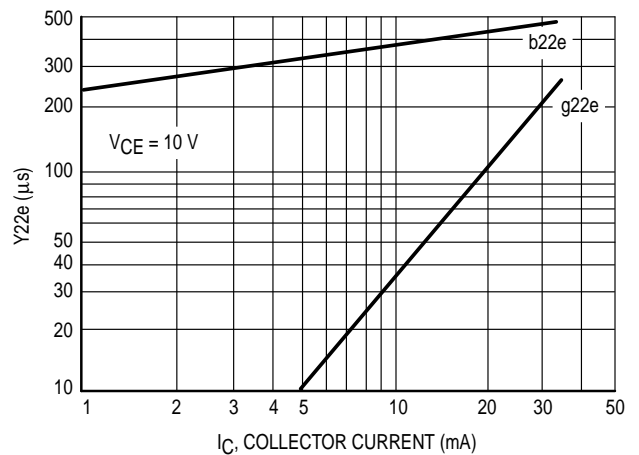
**Figure 3. Current-Gain — Bandwidth Product**



**Figure 4. Capacitances**

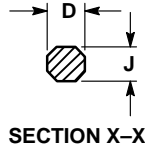
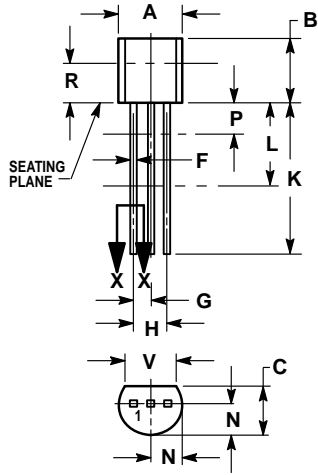


**Figure 5. Input Impedance at 30 MHz**



**Figure 6. Output Impedance at 30 MHz**

PACKAGE DIMENSIONS




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

- 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	—

- STYLE 21:
1. COLLECTOR
  2. EMITTER
  3. BASE

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