

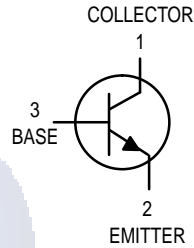
MOTOROLA

SEMICONDUCTOR TECHNICAL DATA

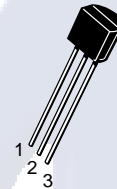
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RF Transistor

NPN Silicon



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CASE 29-04, STYLE 21
TO-92 (TO-226AA)

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	V_{CE0}	25	Vdc
Collector–Base Voltage	V_{CB0}	40	Vdc
Emitter–Base Voltage	V_{EB0}	4.0	Vdc
Collector Current — Continuous	I_C	100	mAdc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	350 2.8	mW mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	1.0 8.0	Watts 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	$R_{\theta JA}$	357	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	125	$^\circ\text{C}/\text{W}$

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 ($I_C = 1.0 \text{ mAdc}$, $I_B = 0$)	$V_{(BR)CEO}$	25	—	—	Vdc
Collector–Base Breakdown Voltage ($I_C = 100 \mu\text{Adc}$, $I_E = 0$)	$V_{(BR)CBO}$	40	—	—	Vdc
Emitter–Base Breakdown Voltage ($I_E = 10 \mu\text{Adc}$, $I_C = 0$)	$V_{(BR)EBO}$	4.0	—	—	Vdc
Collector Cutoff Current ($V_{CB} = 20 \text{ Vdc}$, $I_E = 0$)	I_{CBO}	—	—	100	nAdc



BF199**ELECTRICAL CHARACTERISTICS** ($T_A = 25^\circ\text{C}$ unless otherwise noted) (Continued)

Characteristic	Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS					
DC Current Gain ($I_C = 7.0\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$)	h_{FE}	40	85	—	—
Base–Emitter On Voltage ($I_C = 7.0\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$)	$V_{BE(on)}$	—	770	900	mVdc
SMALL–SIGNAL CHARACTERISTICS					
Current Gain — Bandwidth Product ($I_C = 5.0\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$, $f = 100\text{ MHz}$)	f_T	400	750	—	MHz
Common Emitter Feedback Capacitance ($V_{CB} = 10\text{ Vdc}$, $I_E = 0$, $f = 1.0\text{ MHz}$)	C_{re}	—	0.25	0.35	pF
Noise Figure ($I_C = 4.0\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$, $R_S = 50\ \Omega$, $f = 35\text{ MHz}$)	N_f	—	2.5	—	dB

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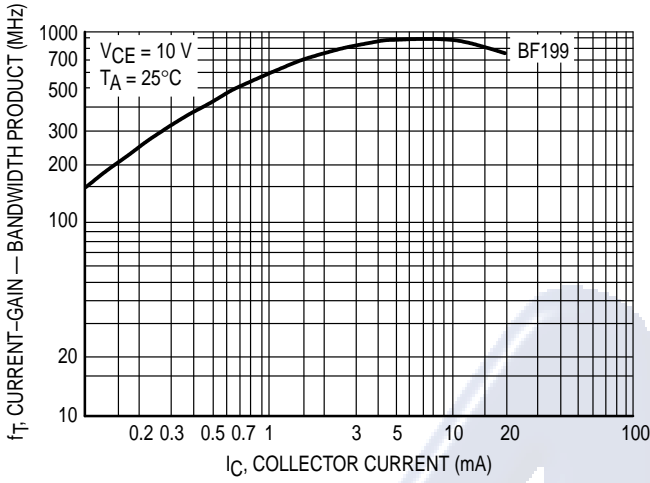


Figure 1. Current-Gain — Bandwidth Product

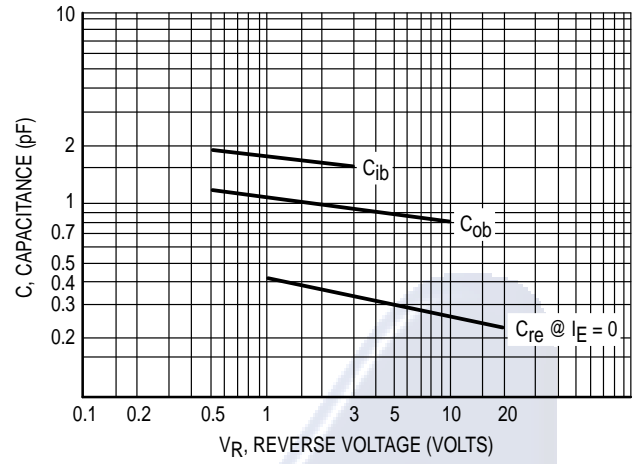


Figure 2. Capacitances

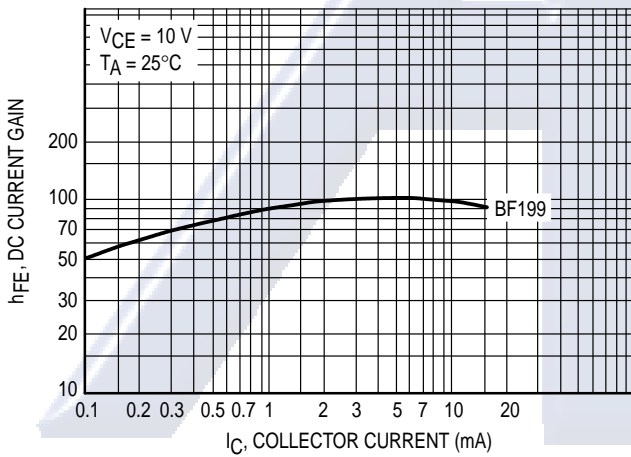


Figure 3. DC Current Gain

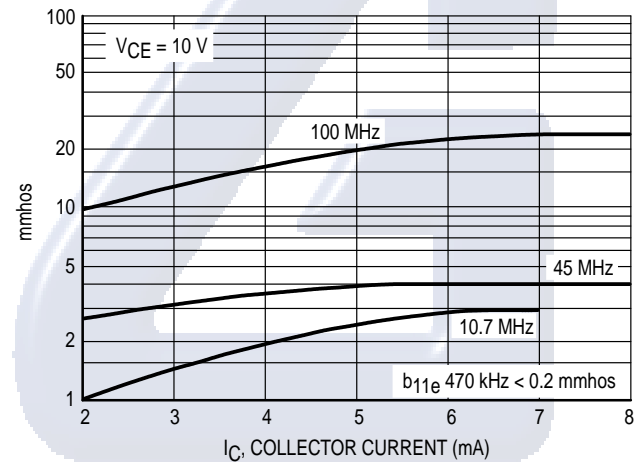


Figure 4. b_{11e}

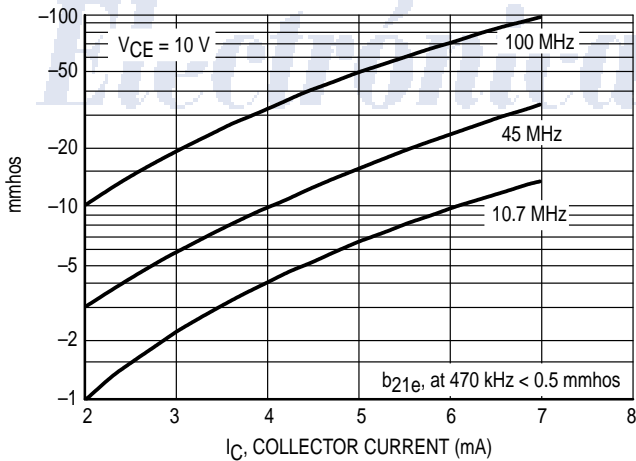


Figure 5. b_{21e}

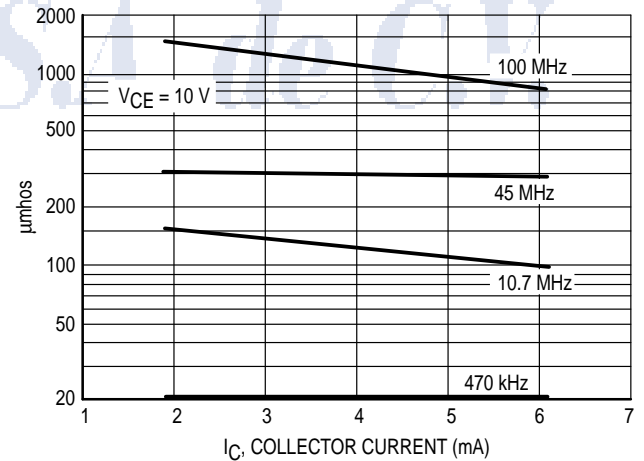


Figure 6. b_{22e} (boe)

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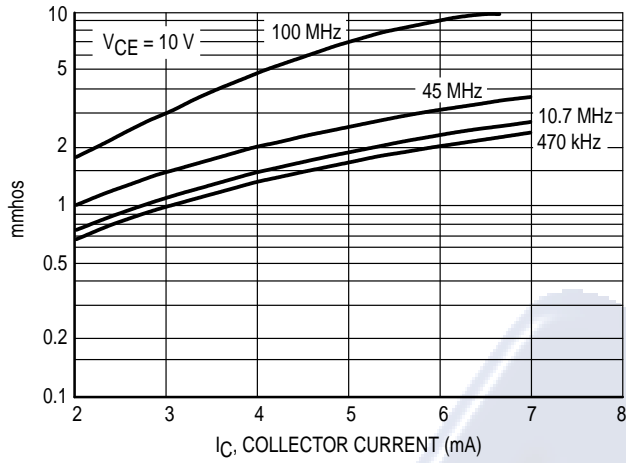


Figure 7. g_{m11e} (gie)

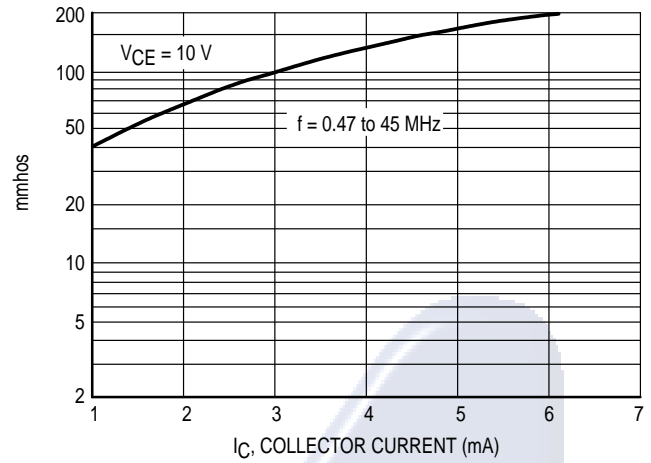


Figure 8. g_{21e} (Yfe)

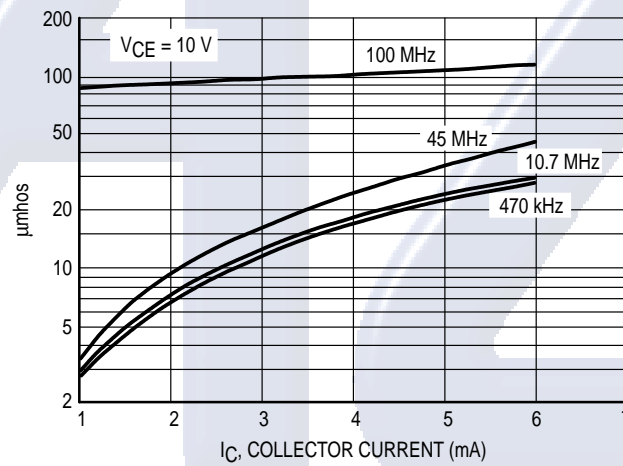
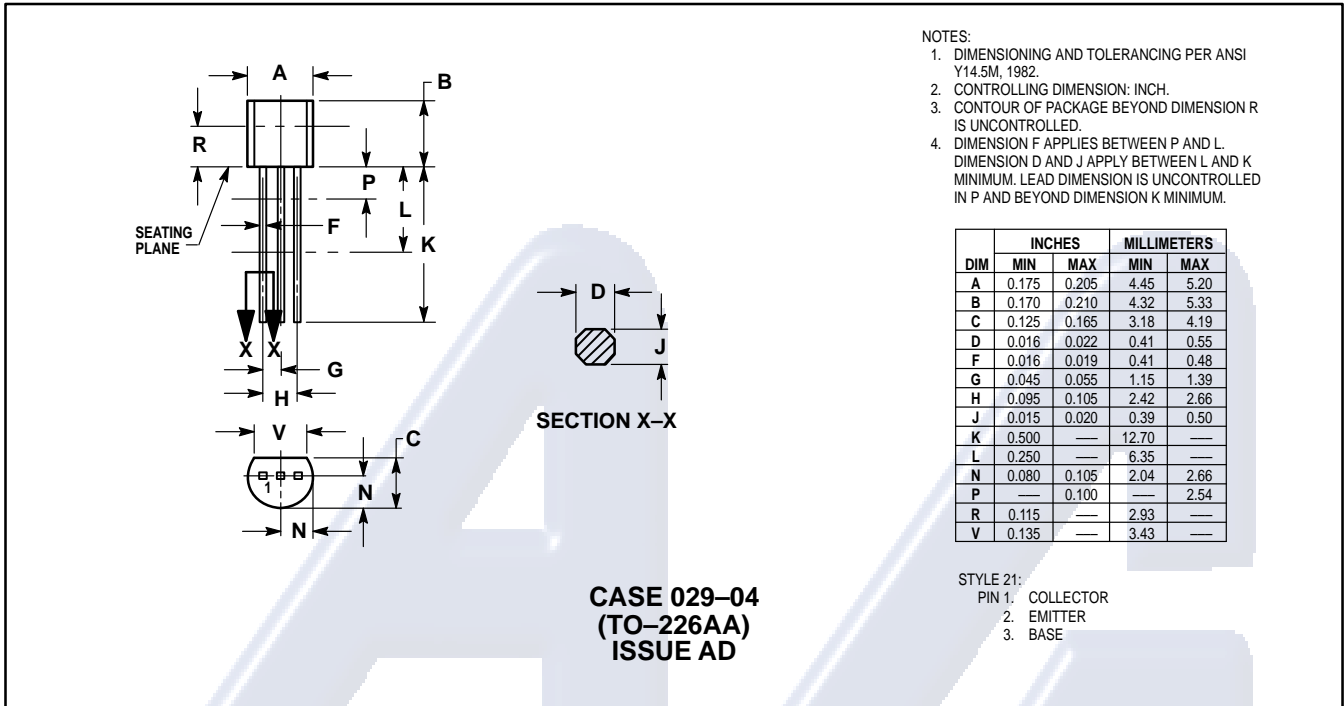


Figure 9. g_{22e} (goe)

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PACKAGE DIMENSIONS




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