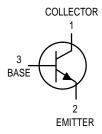
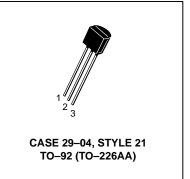
# **RF Transistor**

## **NPN Silicon**



## **BF199**



#### **MAXIMUM RATINGS**

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	VCEO	25	Vdc
Collector-Base Voltage	Vсво	40	Vdc
Emitter-Base Voltage	VEBO	4.0	Vdc
Collector Current — Continuous	IC	100	mAdc
Total Device Dissipation @ T <sub>A</sub> = 25°C Derate above 25°C	PD	350 2.8	mW mW/°C
Total Device Dissipation @ T <sub>C</sub> = 25°C Derate above 25°C	PD	1.0 8.0	Watts mW/°C
Operating and Storage Junction Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55 to +150	°C

#### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Ambient	$R_{ heta JA}$	357	°C/W
Thermal Resistance, Junction to Case	$R_{ heta JC}$	125	°C/W

### **ELECTRICAL CHARACTERISTICS** (T<sub>A</sub> = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Тур	Max	Unit	
OFF CHARACTERISTICS						
Collector-Emitter Breakdown Voltage $(I_C = 1.0 \text{ mAdc}, I_B = 0)$	V(BR)CEO	25		_	Vdc	
Collector-Base Breakdown Voltage (IC = 100 $\mu$ Adc, IE = 0)	V(BR)CBO	40	_	_	Vdc	
Emitter-Base Breakdown Voltage (I <sub>E</sub> = 10 μAdc, I <sub>C</sub> = 0)	V(BR)EBO	4.0	_	_	Vdc	
Collector Cutoff Current (V <sub>CB</sub> = 20 Vdc, I <sub>E</sub> = 0)	ICBO	_	_	100	nAdc	

### **BF199**

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

Characteristic	Symbol	Min	Тур	Max	Unit
ON CHARACTERISTICS					
DC Current Gain (I <sub>C</sub> = 7.0 mAdc, V <sub>CE</sub> = 10 Vdc)	hFE	40	85	_	_
Base–Emitter On Voltage (I <sub>C</sub> = 7.0 mAdc, V <sub>CE</sub> = 10 Vdc)	VBE(on)	_	770	900	mVdc
SMALL-SIGNAL CHARACTERISTICS					
Current Gain — Bandwidth Product (I <sub>C</sub> = 5.0 mAdc, V <sub>CE</sub> = 10 Vdc, f = 100 MHz)	fΤ	400	750	_	MHz
Common Emitter Feedback Capacitance (V <sub>CB</sub> = 10 Vdc, I <sub>E</sub> = 0, f = 1.0 MHz)	C <sub>re</sub>	_	0.25	0.35	pF
Noise Figure (IC = 4.0 mAdc, $V_{CE}$ = 10 Vdc, $R_S$ = 50 $\Omega$ , f = 35 MHz)	N <sub>f</sub>	_	2.5	_	dB

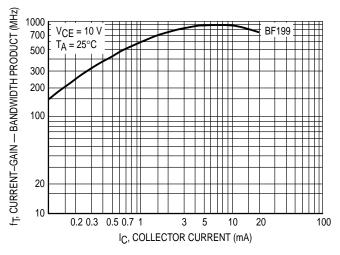


Figure 1. Current-Gain — Bandwidth Product

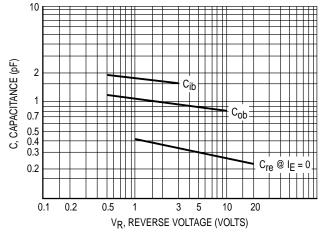


Figure 2. Capacitances

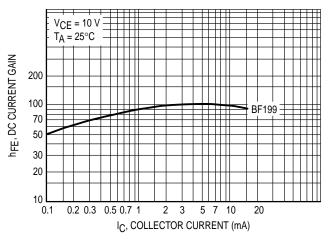


Figure 3. DC Current Gain

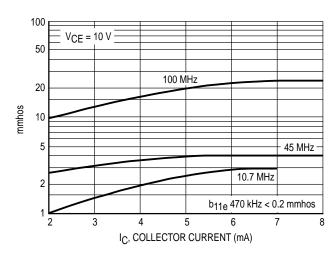


Figure 4. b11e

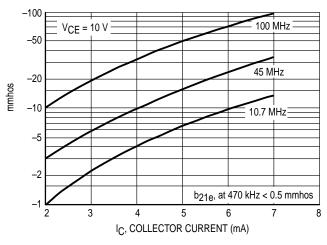


Figure 5. b21e

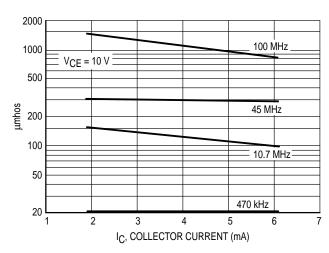
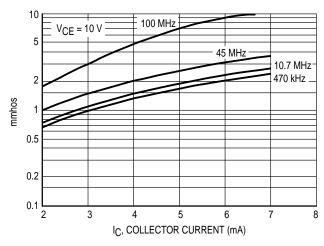


Figure 6. b22e (boe)

### **BF199**



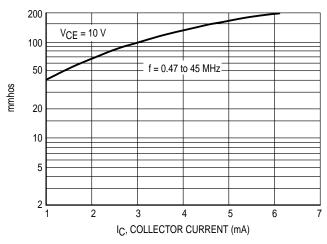


Figure 7. g11e (gie)

Figure 8. g21e (Yfe)

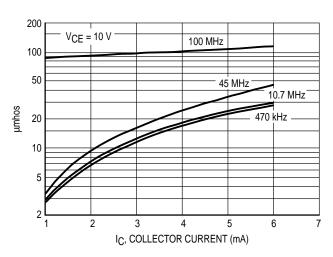
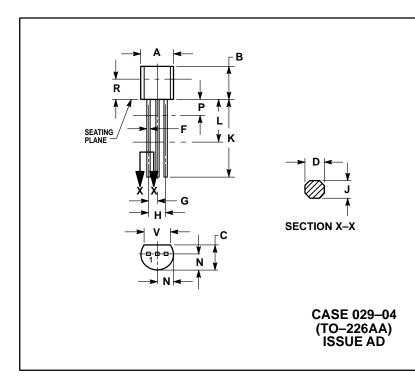


Figure 9. g22e (goe)

#### **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.

	INCHES		MILLIN	IETERS
DIM	MIN	MAX	MIN	MAX
Α	0.175	0.205	4.45	5.20
В	0.170	0.210	4.32	5.33
С	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
Н	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
Р		0.100		2.54
R	0.115		2.93	
V	0.135		3 43	

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

Motorola reserves the right to make changes without further notice to any products herein. Motorola makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Motorola assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. "Typical" parameters which may be provided in Motorola data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. Motorola does not convey any license under its patent rights nor the rights of others. Motorola products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Motorola product could create a situation where personal injury or death may occur. Should Buyer purchase or use Motorola products for any such unintended or unauthorized application, Buyer shall indemnify and hold Motorola and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Motorola was negligent regarding the design or manufacture of the part. Motorola and are registered trademarks of Motorola, Inc. Motorola, Inc. is an Equal Opportunity/Affirmative Action Employer.

#### How to reach us:

**USA/EUROPE/Locations Not Listed**: Motorola Literature Distribution; P.O. Box 20912; Phoenix, Arizona 85036. 1–800–441–2447 or 602–303–5454

**MFAX**: RMFAX0@email.sps.mot.com – TOUCHTONE 602–244–6609 **INTERNET**: http://Design-NET.com

JAPAN: Nippon Motorola Ltd.; Tatsumi–SPD–JLDC, 6F Seibu–Butsuryu–Center, 3–14–2 Tatsumi Koto–Ku, Tokyo 135, Japan. 03–81–3521–8315

ASIA/PACIFIC: Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park, 51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852–26629298



BF199/D