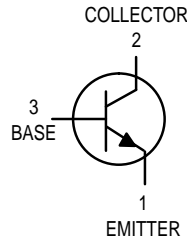
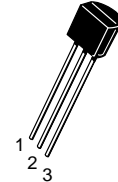


# High Voltage Transistors

## NPN Silicon



**BF420**  
**BF422**



CASE 29-11, STYLE 14  
TO-92 (TO-226AA)

### MAXIMUM RATINGS

Rating	Symbol	BF420	BF422	Unit
Collector–Emitter Voltage	$V_{CEO}$	300	250	Vdc
Collector–Base Voltage	$V_{CBO}$	300	250	Vdc
Emitter–Base Voltage	$V_{EBO}$	5.0		Vdc
Collector Current — Continuous	$I_C$	500		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	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	$R_{\theta JA}$	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	Max	Unit
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### OFF CHARACTERISTICS

Collector–Emitter Breakdown Voltage <sup>(1)</sup> ( $I_C = 1.0 \text{ mAdc}, I_B = 0$ )	BF420 BF422	$V_{(BR)CEO}$	300 250	— —	Vdc
Collector–Base Breakdown Voltage ( $I_C = 100 \mu\text{Adc}, I_E = 0$ )	BF420 BF422	$V_{(BR)CBO}$	300 250	— —	Vdc
Emitter–Base Breakdown Voltage ( $I_E = 100 \mu\text{Adc}, I_C = 0$ )	BF420 BF422	$V_{(BR)EBO}$	5.0 5.0	— —	Vdc
Collector Cutoff Current ( $V_{CB} = 200 \text{ Vdc}, I_E = 0$ )	BF420 BF422	$I_{CBO}$	— —	0.01 —	$\mu\text{Adc}$
Emitter Cutoff Current ( $V_{EB} = 5.0 \text{ Vdc}, I_C = 0$ )	BF420 BF422	$I_{EBO}$	— —	100 —	nAdc

1. Pulse Test: Pulse Width  $\leq 300 \mu\text{s}$ ; Duty Cycle  $\leq 2.0\%$ .



**BF420 BF422****ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise noted) (Continued)

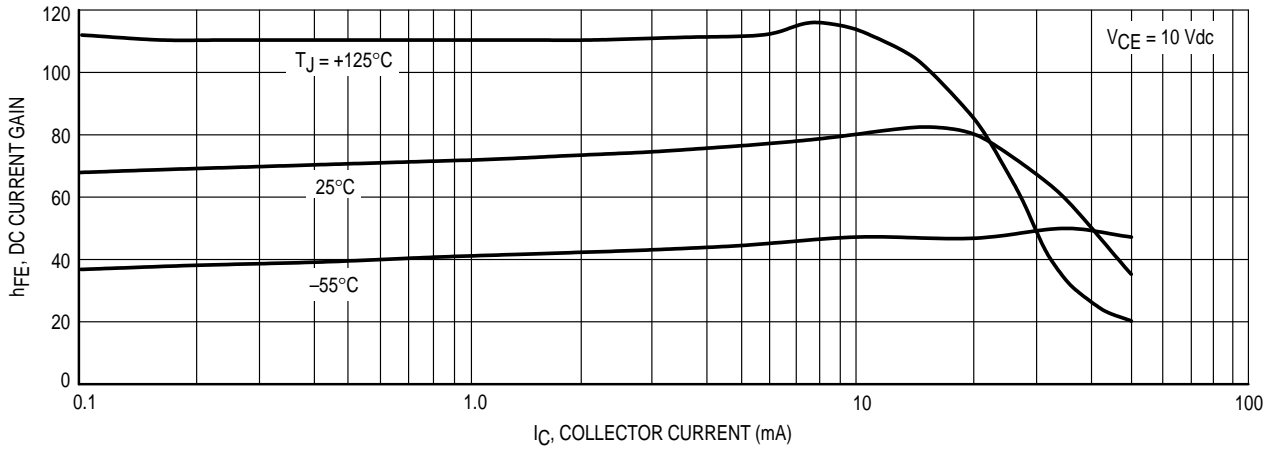
Characteristic	Symbol	Min	Max	Unit
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**ON CHARACTERISTICS**

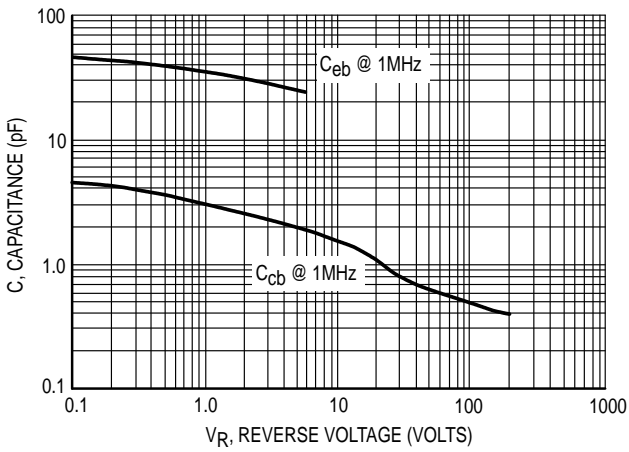
DC Current Gain ( $I_C = 25 \text{ mAdc}$ , $V_{CE} = 20 \text{ Vdc}$ )	$h_{FE}$	50 50	— —	—
Collector–Emitter Saturation Voltage ( $I_C = 20 \text{ mAdc}$ , $I_B = 2.0 \text{ mAdc}$ )	$V_{CE(sat)}$	—	0.5	Vdc
Base–Emitter Saturation Voltage ( $I_C = 20 \text{ mAdc}$ , $I_B = 2.0 \text{ mAdc}$ )	$V_{BE(sat)}$	—	2.0	Vdc

**SMALL–SIGNAL CHARACTERISTICS**

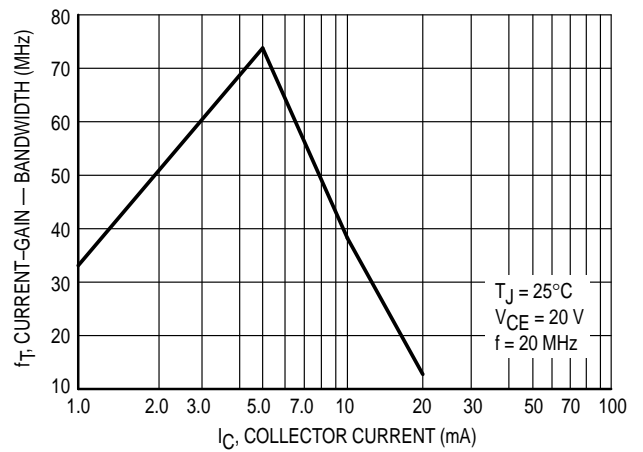
Current Gain — Bandwidth Product ( $I_C = 10 \text{ mAdc}$ , $V_{CE} = 10 \text{ Vdc}$ , $f = 20 \text{ MHz}$ )	$f_T$	60	—	MHz
Common Emitter Feedback Capacitance ( $V_{CB} = 30 \text{ Vdc}$ , $I_E = 0$ , $f = 1.0 \text{ MHz}$ )	$C_{re}$	—	1.6	pF



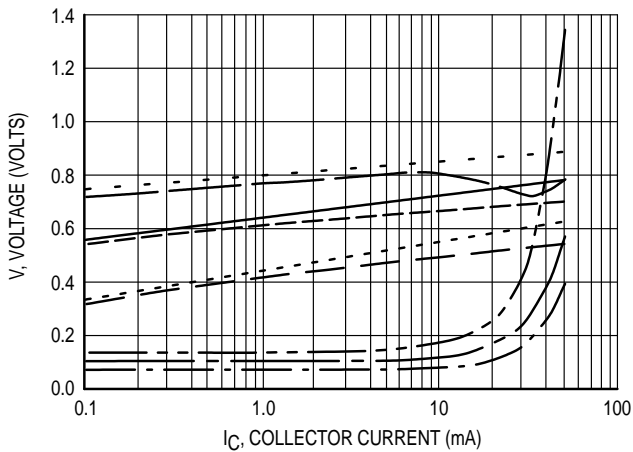
**Figure 1. DC Current Gain**



**Figure 2. Capacitance**



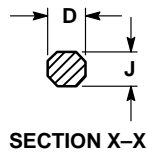
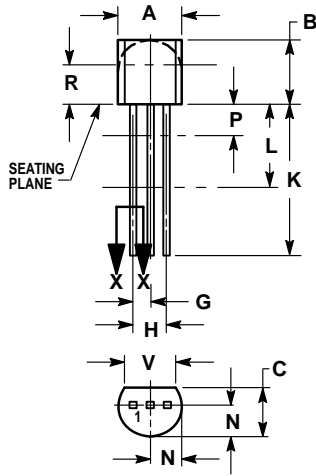
**Figure 3. Current-Gain - Bandwidth**



**Figure 4. "ON" Voltages**

- V<sub>CE(sat)</sub> @ 25°C, I<sub>C</sub>/I<sub>B</sub> = 10
- - - V<sub>CE(sat)</sub> @ 125°C, I<sub>C</sub>/I<sub>B</sub> = 10
- V<sub>CE(sat)</sub> @ -55°C, I<sub>C</sub>/I<sub>B</sub> = 10
- V<sub>BE(sat)</sub> @ 25°C, I<sub>C</sub>/I<sub>B</sub> = 10
- - - V<sub>BE(sat)</sub> @ 125°C, I<sub>C</sub>/I<sub>B</sub> = 10
- V<sub>BE(sat)</sub> @ -55°C, I<sub>C</sub>/I<sub>B</sub> = 10
- - - V<sub>BE(on)</sub> @ 25°C, V<sub>CE</sub> = 10 V
- V<sub>BE(on)</sub> @ 125°C, V<sub>CE</sub> = 10 V
- V<sub>BE(on)</sub> @ -55°C, V<sub>CE</sub> = 10 V

**PACKAGE DIMENSIONS**



**CASE 029-11  
(TO-226AA)  
ISSUE AJ**


**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 14:**

- PIN 1. EMITTER
2. COLLECTOR
3. BASE

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