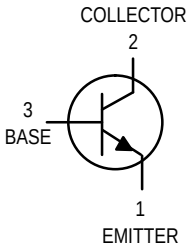
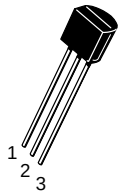
# High Voltage Transistors

## 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°C<br>Derate above 25°C | $P_D$ | 625<br>5.0 | | mW<br>mW/°C |
| Total Device Dissipation @ $T_C$ = 25°C<br>Derate above 25°C | $P_D$ | 1.5<br>12 | | Watts<br>mW/°C |
| Operating and Storage Junction Temperature Range | $T_J$, $T_{stg}$ | –55 to +150 | | °C |

**THERMAL CHARACTERISTICS**

| Characteristic | Symbol | Max | Unit |
|---|---|---|---|
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 200 | °C/W |
| Thermal Resistance, Junction to Case | $R_{\theta JC}$ | 83.3 | °C/W |

**ELECTRICAL CHARACTERISTICS** ($T_A$ = 25°C unless otherwise noted)

| Characteristic | | Symbol | Min | Max | Unit |
|---|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | | |
| Collector–Emitter Breakdown Voltage(1)<br>($I_C$ = 1.0 mAdc, $I_B$ = 0) | BF420<br>BF422 | $V_{(BR)CEO}$ | <br>300<br>250 | <br>—<br>— | Vdc |
| Collector–Base Breakdown Voltage<br>($I_C$ = 100 μAdc, $I_E$ = 0) | BF420<br>BF422 | $V_{(BR)CBO}$ | <br>300<br>250 | <br>—<br>— | Vdc |
| Emitter–Base Breakdown Voltage<br>($I_E$ = 100 μAdc, $I_C$ = 0) | BF420<br>BF422 | $V_{(BR)EBO}$ | <br>5.0<br>5.0 | <br>—<br>— | Vdc |
| Collector Cutoff Current<br>($V_{CB}$ = 200 Vdc, $I_E$ = 0) | BF420<br>BF422 | $I_{CBO}$ | <br>—<br>— | <br>0.01<br>— | μAdc |
| Emitter Cutoff Current<br>($V_{EB}$ = 5.0 Vdc, $I_C$ = 0) | BF420<br>BF422 | $I_{EBO}$ | <br>—<br>— | <br>100<br>— | nAdc |

1. Pulse Test: Pulse Width ≤ 300 μs; Duty Cycle ≤ 2.0%.

REV 1

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**ELECTRICAL CHARACTERISTICS** ($T_A$ = 25°C unless otherwise noted) (Continued)

| Characteristic | | Symbol | Min | Max | Unit |
|---|---|---|---|---|---|
| **ON CHARACTERISTICS** | | | | | |
| DC Current Gain<br>($I_C$ = 25 mAdc, $V_{CE}$ = 20 Vdc) | BF420<br>BF422 | $h_{FE}$ | <br>50<br>50 | <br>—<br>— | — |
| Collector–Emitter Saturation Voltage<br>($I_C$ = 20 mAdc, $I_B$ = 2.0 mAdc) | | $V_{CE(sat)}$ | <br>— | <br>0.5 | Vdc |
| Base–Emitter Saturation Voltage<br>($I_C$ = 20 mAdc, $I_B$ = 2.0 mAdc) | | $V_{BE(sat)}$ | <br>— | <br>2.0 | Vdc |
| **SMALL–SIGNAL CHARACTERISTICS** | | | | | |
| Current Gain — Bandwidth Product<br>($I_C$ = 10 mAdc, $V_{CE}$ = 10 Vdc, f = 20 MHz) | | $f_T$ | <br>60 | <br>— | MHz |
| Common Emitter Feedback Capacitance<br>($V_{CB}$ = 30 Vdc, $I_E$ = 0, f = 1.0 MHz) | | $C_{re}$ | <br>— | <br>1.6 | pF |

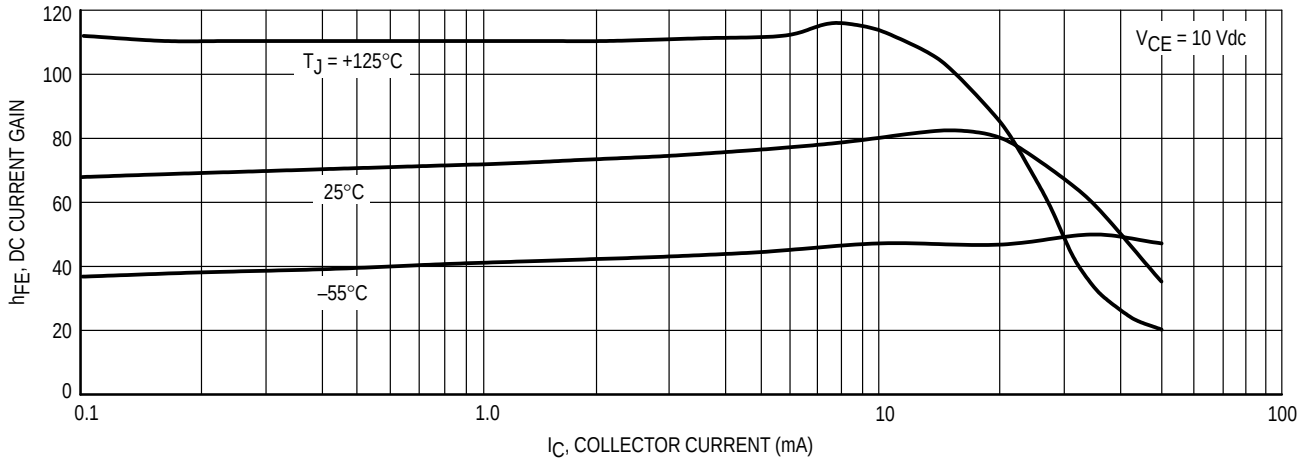



**Figure 1. DC Current Gain**

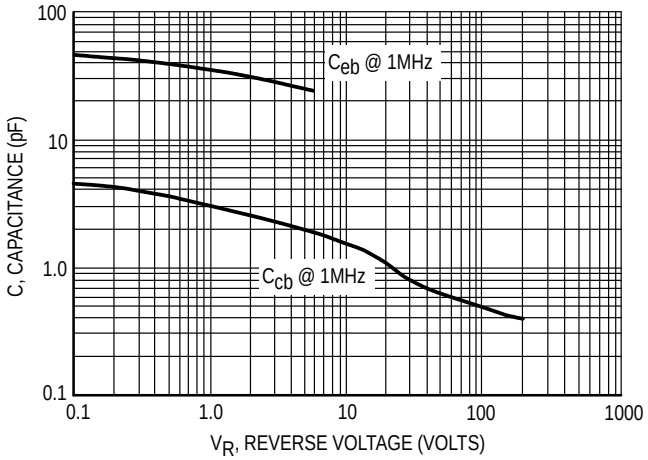



**Figure 2. Capacitance**

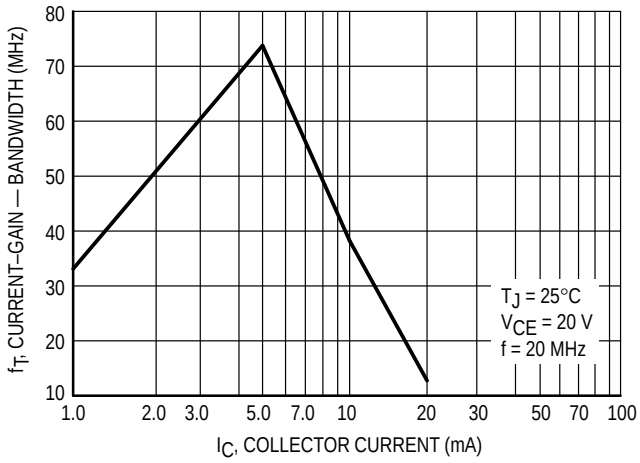
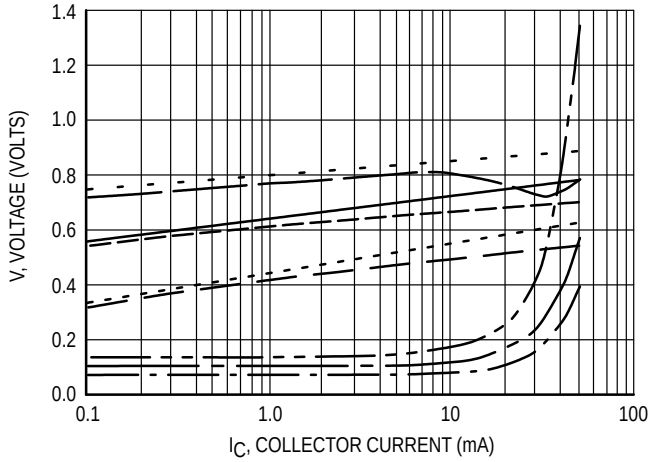



**Figure 3. Current–Gain – Bandwidth**



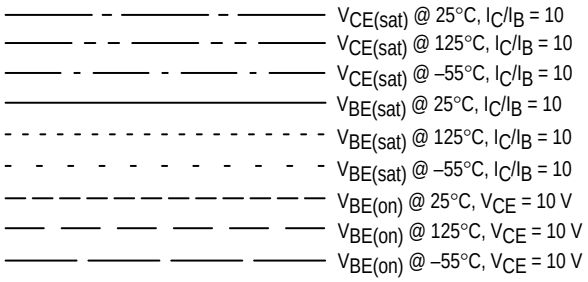
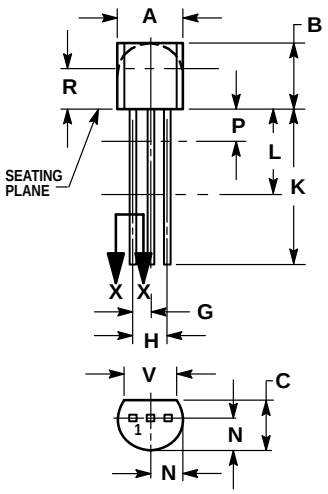
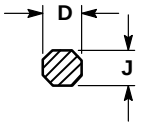




**Figure 4. "ON" Voltages**

## PACKAGE DIMENSIONS




SECTION X–X

**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.

| | INCHES | | MILLIMETERS | |
|---|---|---|---|---|
| DIM | 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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