

# BF422

## High Voltage Transistors

### NPN Silicon

#### Features

- This is a Pb-Free Device\*

#### MAXIMUM RATINGS

| Rating                                                                                             | Symbol         | Value       | Unit                       |
|----------------------------------------------------------------------------------------------------|----------------|-------------|----------------------------|
| Collector–Emitter Voltage                                                                          | $V_{CEO}$      | 250         | Vdc                        |
| Collector–Base Voltage                                                                             | $V_{CBO}$      | 250         | Vdc                        |
| Emitter–Base Voltage                                                                               | $V_{EBO}$      | 5.0         | Vdc                        |
| Collector Current – Continuous                                                                     | $I_C$          | 50          | mA dc                      |
| Collector Current – Peak                                                                           | $I_{CM}$       | 100         | mA                         |
| Total Device Dissipation (Note 1)<br>@ $T_A = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$          | 830<br>6.6  | mW<br>mW/ $^\circ\text{C}$ |
| Operating and Storage Junction<br>Temperature Range                                                | $T_J, T_{stg}$ | –55 to +150 | $^\circ\text{C}$           |

#### THERMAL CHARACTERISTICS

| Characteristic                             | Symbol          | Max | Unit               |
|--------------------------------------------|-----------------|-----|--------------------|
| Thermal Resistance,<br>Junction–to–Ambient | $R_{\theta JA}$ | 150 | $^\circ\text{C/W}$ |
| Thermal Resistance,<br>Junction–to–Lead    | $R_{\theta JL}$ | 68  | $^\circ\text{C/W}$ |

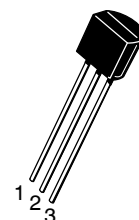
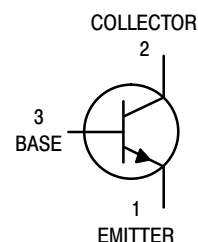
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1. Mounted on a FR4 board with 200 mm<sup>2</sup> of 1 oz copper and lead length of 5 mm.

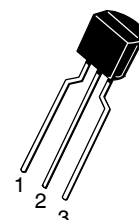


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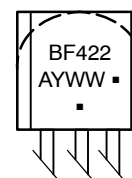
STRAIGHT LEAD  
BULK PACK



BENT LEAD  
TAPE & REEL  
AMMO PACK

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

#### MARKING DIAGRAM



BF422 = Device Code  
A = Assembly Location  
Y = Year  
WW = Work Week  
▪ = Pb-Free Package

(Note: Microdot may be in either location)

#### ORDERING INFORMATION

| Device | Package            | Shipping†      |
|--------|--------------------|----------------|
| BF422G | TO-92<br>(Pb-Free) | 5000 Units/Box |

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

## BF422

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

| Characteristic | Symbol | Min | Max | Unit |
|----------------|--------|-----|-----|------|
|----------------|--------|-----|-----|------|

#### OFF CHARACTERISTICS

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

#### ON CHARACTERISTICS

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

#### SMALL–SIGNAL CHARACTERISTICS

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

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

# BF422

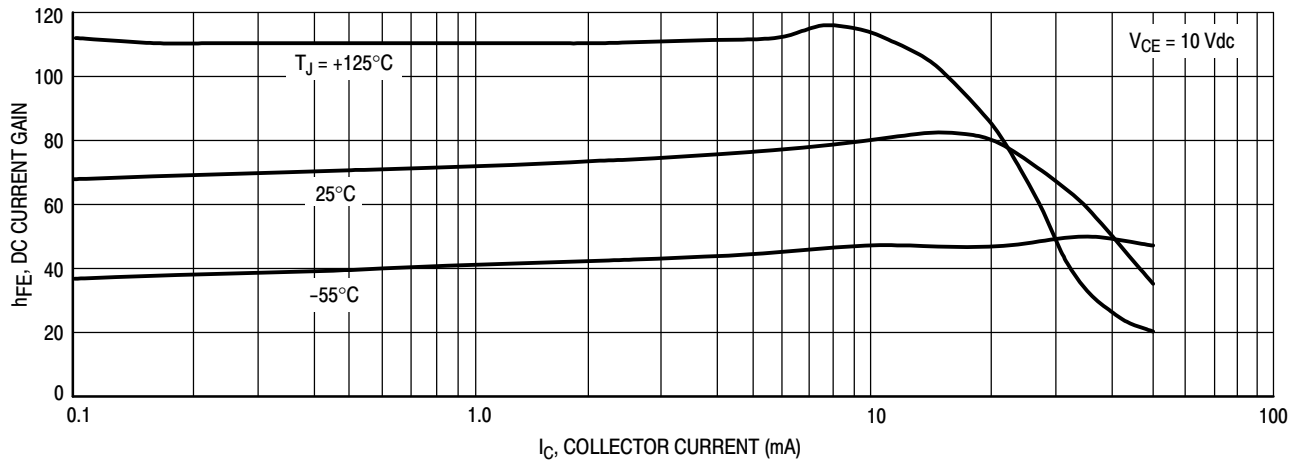


Figure 1. DC Current Gain

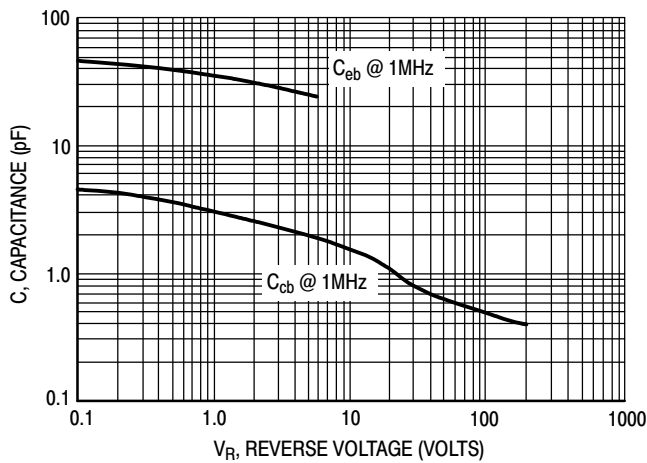


Figure 2. Capacitance

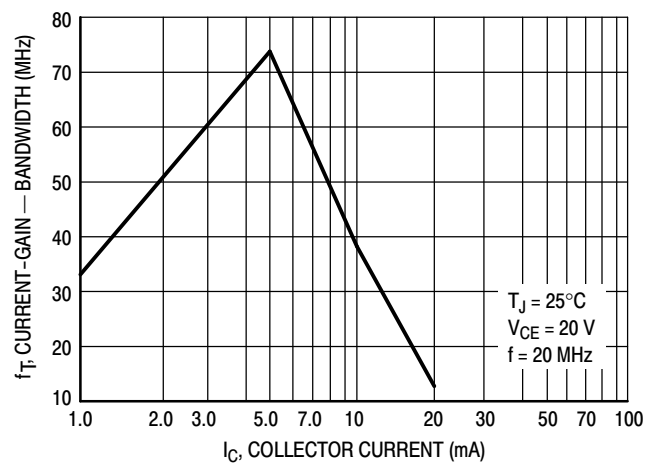


Figure 3. Current-Gain – Bandwidth

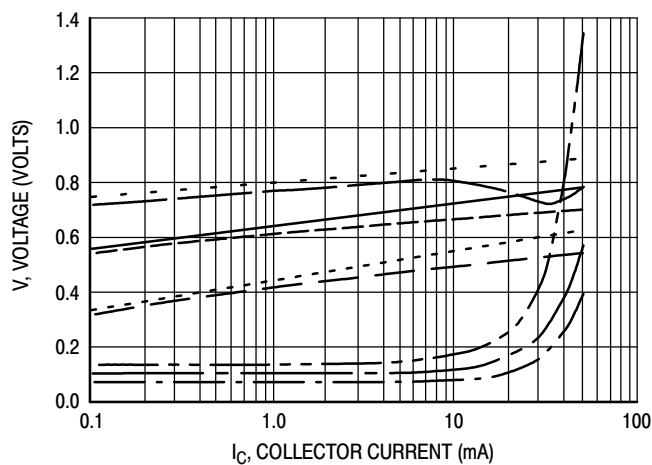


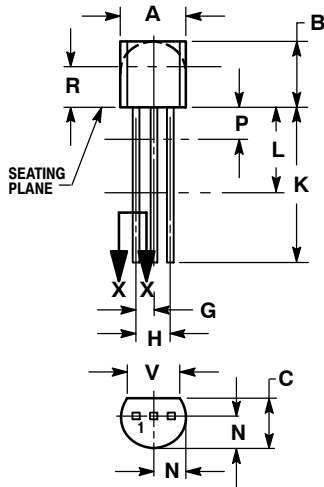
Figure 4. "ON" Voltages

- $V_{CE(sat)}$  @  $25^\circ\text{C}$ ,  $I_C/I_B = 10$
- $V_{CE(sat)}$  @  $125^\circ\text{C}$ ,  $I_C/I_B = 10$
- $V_{CE(sat)}$  @  $-55^\circ\text{C}$ ,  $I_C/I_B = 10$
- $V_{BE(sat)}$  @  $25^\circ\text{C}$ ,  $I_C/I_B = 10$
- $V_{BE(sat)}$  @  $125^\circ\text{C}$ ,  $I_C/I_B = 10$
- $V_{BE(sat)}$  @  $-55^\circ\text{C}$ ,  $I_C/I_B = 10$
- $V_{BE(on)}$  @  $25^\circ\text{C}$ ,  $V_{CE} = 10 \text{ V}$
- $V_{BE(on)}$  @  $125^\circ\text{C}$ ,  $V_{CE} = 10 \text{ V}$
- $V_{BE(on)}$  @  $-55^\circ\text{C}$ ,  $V_{CE} = 10 \text{ V}$

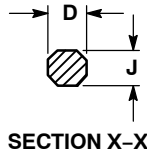
# BF422

## PACKAGE DIMENSIONS

### TO-92 (TO-226) CASE 29-11 ISSUE AM



STRAIGHT LEAD  
BULK PACK



SECTION X-X

#### 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        | ---   |

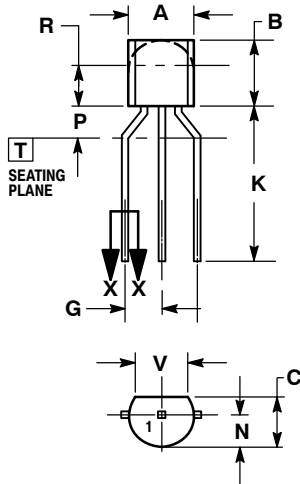
#### STYLE 14:

- PIN 1. EMITTER
- COLLECTOR
- BASE

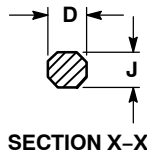
#### NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

| DIM | MILLIMETERS |      |
|-----|-------------|------|
|     | MIN         | MAX  |
| A   | 4.45        | 5.20 |
| B   | 4.32        | 5.33 |
| C   | 3.18        | 4.19 |
| D   | 0.40        | 0.54 |
| G   | 2.40        | 2.80 |
| J   | 0.39        | 0.50 |
| K   | 12.70       | ---  |
| N   | 2.04        | 2.66 |
| P   | 1.50        | 4.00 |
| R   | 2.93        | ---  |
| V   | 3.43        | ---  |



BENT LEAD  
TAPE & REEL  
AMMO PACK



SECTION X-X

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