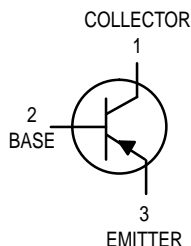
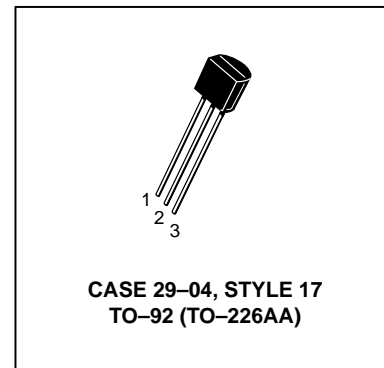


# High Voltage Transistors

## PNP Silicon



### MAXIMUM RATINGS

| Rating   | Symbol         | Value       | Unit                          |
|--|----------------|-------------|-------------------------------|
| Collector–Emitter Voltage  | $V_{CEO}$      | –300        | Vdc                           |
| Collector–Base Voltage   | $V_{CBO}$      | –300        | Vdc                           |
| Emitter–Base Voltage   | $V_{EBO}$      | –5.0        | Vdc                           |
| Collector Current — Continuous   | $I_C$          | –500        | mAdc                          |
| Total Device Dissipation @ $T_A = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$          | 625<br>5.0  | mW<br>mW/ $^\circ\text{C}$    |
| Total Device Dissipation @ $T_C = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$          | 1.5<br>12   | Watts<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, 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 |
|----------------|--------|-----|-----|------|
|----------------|--------|-----|-----|------|

### OFF CHARACTERISTICS

|   |               |      |       |                 |
|---|---------------|------|-------|-----------------|
| Collector–Emitter Breakdown Voltage<br>( $I_C = -1.0$ mAdc, $I_B = 0$ )         | $V_{(BR)CEO}$ | –300 | —     | Vdc             |
| Collector–Base Breakdown Voltage<br>( $I_C = -10$ $\mu\text{Adc}$ , $I_E = 0$ ) | $V_{(BR)CBO}$ | –300 | —     | Vdc             |
| Emitter–Base Breakdown Voltage<br>( $I_E = -100$ $\mu\text{Adc}$ , $I_C = 0$ )  | $V_{(BR)EBO}$ | –5.0 | —     | Vdc             |
| Collector Cutoff Current<br>( $V_{CB} = -200$ Vdc, $I_E = 0$ )                  | $I_{CBO}$     | —    | –0.25 | $\mu\text{Adc}$ |
| Emitter Cutoff Current<br>( $V_{EB} = -3.0$ Vdc)                                | $I_{EBO}$     | —    | –20   | nAdc            |
| Collector Cutoff Current<br>( $V_{CE} = -10$ Vdc)                               | $I_{CEO}$     | —    | –250  | nAdc            |

(Replaces PBF493R/D)

**PBF493RS****ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise noted) (Continued)

| Characteristic  | Symbol                             | Min      | Max            | Unit        |
|---|------------------------------------|----------|----------------|-------------|
| <b>ON CHARACTERISTICS</b>   |                                    |          |                |             |
| DC Current Gain<br>( $I_C = -0.1 \text{ mAdc}$ , $V_{CE} = -1.0 \text{ Vdc}$ )<br>( $I_C = -1.0 \text{ mAdc}$ , $V_{CE} = -10 \text{ Vdc}$ )<br>( $I_C = -30 \text{ mAdc}$ , $V_{CE} = -10 \text{ Vdc}$ ) | PBF493RS<br>All Types<br>All Types | $h_{FE}$ | 40<br>40<br>25 | —<br>—<br>— |
| 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>( $I_C = -20 \text{ mAdc}$ , $I_B = -2.0 \text{ mAdc}$ )   | $V_{BE(sat)}$                      | —        | -0.9           | Vdc         |
| <b>SMALL–SIGNAL CHARACTERISTICS</b>   |                                    |          |                |             |
| Current–Gain — Bandwidth Product<br>( $I_C = -10 \text{ mAdc}$ , $V_{CE} = -20 \text{ Vdc}$ , $f = 20 \text{ MHz}$ )  | $f_T$                              | 50       | —              | MHz         |
| Output Capacitance<br>( $V_{CB} = -20 \text{ Vdc}$ , $I_E = 0$ , $f = 1.0 \text{ MHz}$ )  | $C_{obo}$                          | —        | 6.0            | pF          |

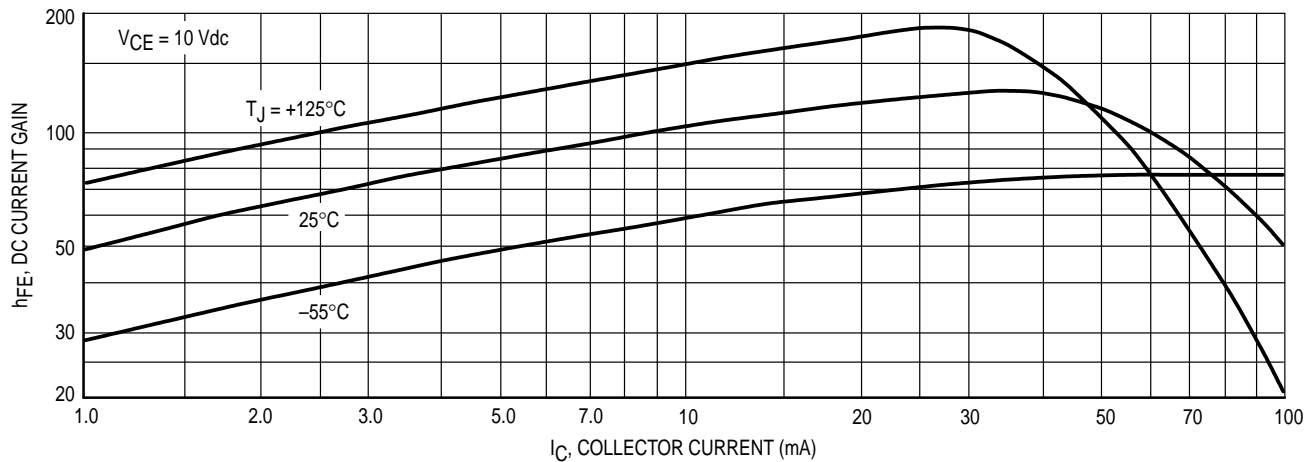


Figure 1. DC Current Gain

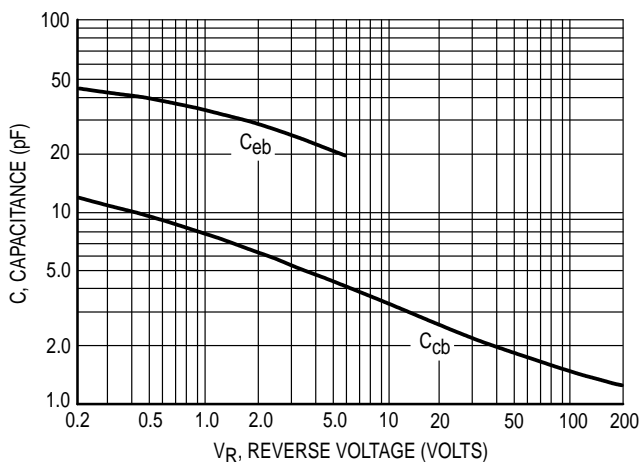


Figure 2. Capacitances

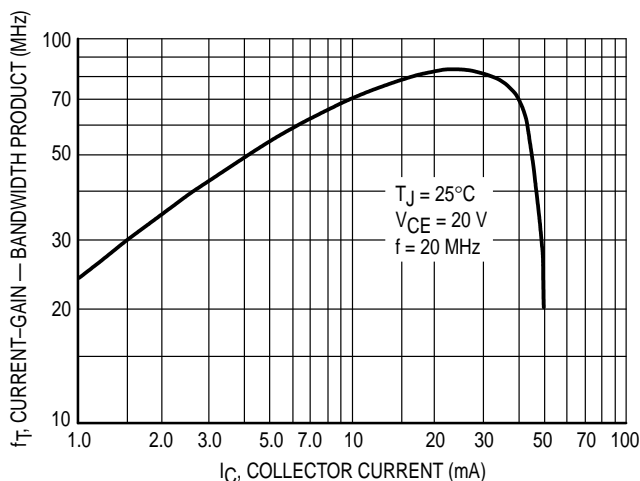


Figure 3. Current-Gain — Bandwidth Product

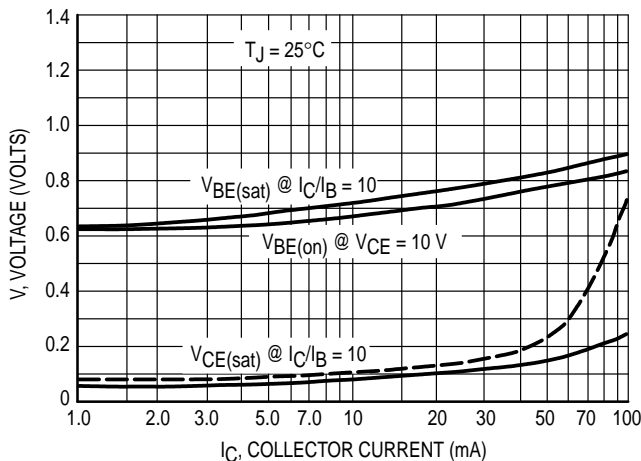


Figure 4. "On" Voltages

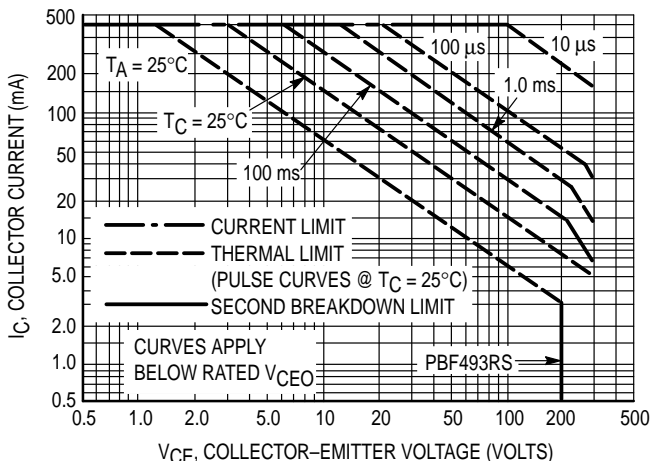
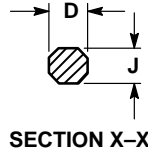
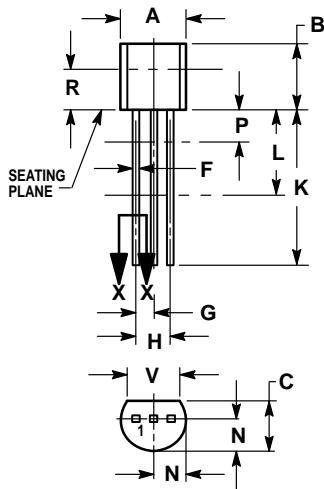


Figure 5. Maximum Forward Bias Safe Operating Area

PACKAGE DIMENSIONS



CASE 029-04  
(TO-226AA)  
ISSUE AD


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.

| 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  | 0.022 | 0.41        | 0.55 |
| F   | 0.016  | 0.019 | 0.41        | 0.48 |
| 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 17:

1. COLLECTOR
2. BASE
3. EMITTER

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