

High Voltage Transistor

PNP Silicon

BF493S

MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|--|----------------|-------------|-------------------------------|
| Collector–Emitter Voltage | V_{CEO} | –350 | Vdc |
| Collector–Base Voltage | V_{CBO} | –350 | Vdc |
| Emitter–Base Voltage | V_{EBO} | –6.0 | Vdc |
| Collector Current — Continuous | I_C | –500 | mAdc |
| Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C | P_D | 625 5.0 | Watts mW/ $^\circ\text{C}$ |
| Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°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 | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction to Case | $R_{\theta JC}$ | 83.3 | $^\circ\text{C/W}$ |

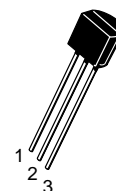
ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

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

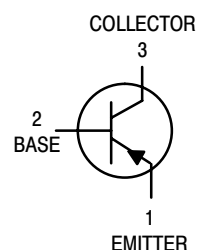
OFF CHARACTERISTICS

| | | | | |
|---|---------------|--------|----------------|-----------------|
| Collector–Emitter Breakdown Voltage ⁽¹⁾ ($I_C = -1.0 \text{ mAdc}$, $I_E = 0$) | $V_{(BR)CEO}$ | –350 | — | Vdc |
| Collector–Base Breakdown Voltage ($I_C = -100 \mu\text{Adc}$, $I_E = 0$) | $V_{(BR)CBO}$ | –350 | — | Vdc |
| Emitter–Base Breakdown Voltage ($I_E = -100 \mu\text{Adc}$, $I_C = 0$) | $V_{(BR)EBO}$ | –6.0 | — | Vdc |
| Collector Cutoff Current ($V_{CE} = -250 \text{ Vdc}$) | I_{CES} | — | –10 | nAdc |
| Emitter Cutoff Current ($V_{EB} = -6.0 \text{ Vdc}$, $I_C = 0$) | I_{EBO} | — | 0.1 | μAdc |
| Collector Cutoff Current ($V_{CB} = -250 \text{ Vdc}$, $I_E = 0$, $T_A = 25^\circ\text{C}$) ($V_{CB} = -250 \text{ Vdc}$, $I_E = 0$, $T_A = 100^\circ\text{C}$) | I_{CBO} | — — | –0.005 –1.0 | μAdc |

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



CASE 29–04, STYLE 1
TO–92 (TO–226AA)



BF493S

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

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

ON CHARACTERISTICS

| | | | | |
|--|---------------|----------|--------|-----|
| DC Current Gain ($I_C = -1.0\text{ mA}$, $V_{CE} = -10\text{ Vdc}$) ($I_C = -10\text{ mA}$, $V_{CE} = -10\text{ Vdc}$) | h_{FE} | 25 40 | — — | — |
| Collector–Emitter Saturation Voltage ($I_C = -20\text{ mA}$, $I_B = -2.0\text{ mA}$) | $V_{CE(sat)}$ | — | -2.0 | Vdc |
| Base–Emitter On Voltage ($I_C = -20\text{ mA}$, $I_B = -2.0\text{ mA}$) | $V_{BE(sat)}$ | — | -2.0 | Vdc |

DYNAMIC CHARACTERISTICS

| | | | | |
|---|----------|----|-----|-----|
| Current–Gain — Bandwidth Product ($I_C = -10\text{ mA}$, $V_{CE} = -20\text{ Vdc}$, $f = 20\text{ MHz}$) | f_T | 50 | — | MHz |
| Common–Emitter Feedback Capacitance ($V_{CB} = -100\text{ Vdc}$, $I_E = 0$, $f = 1.0\text{ MHz}$) | C_{re} | — | 1.6 | pF |

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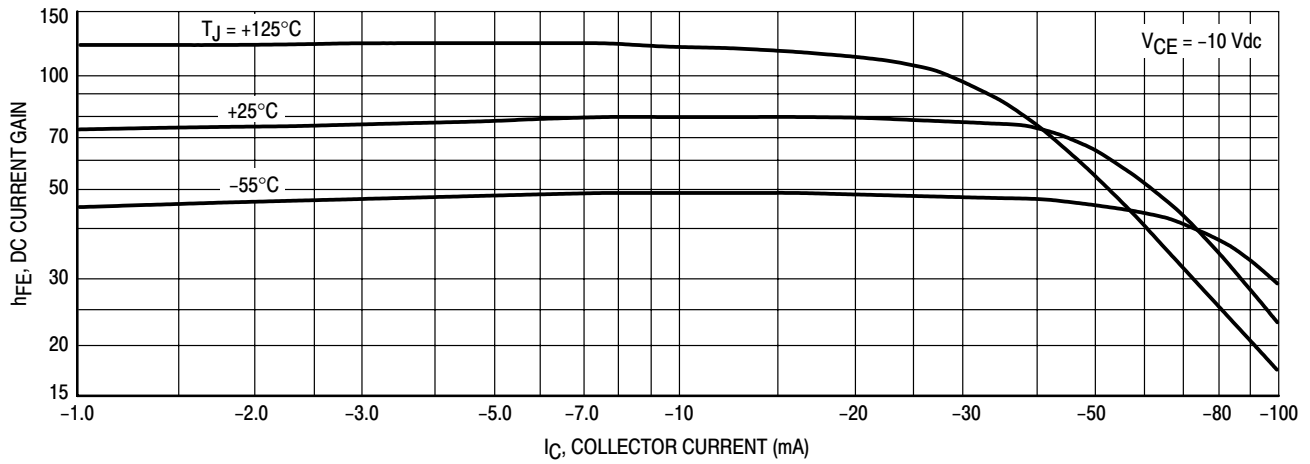


Figure 1. DC Current Gain

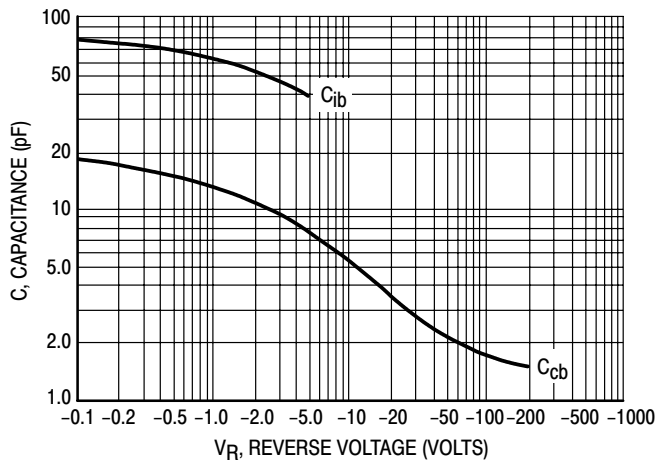


Figure 2. Capacitances

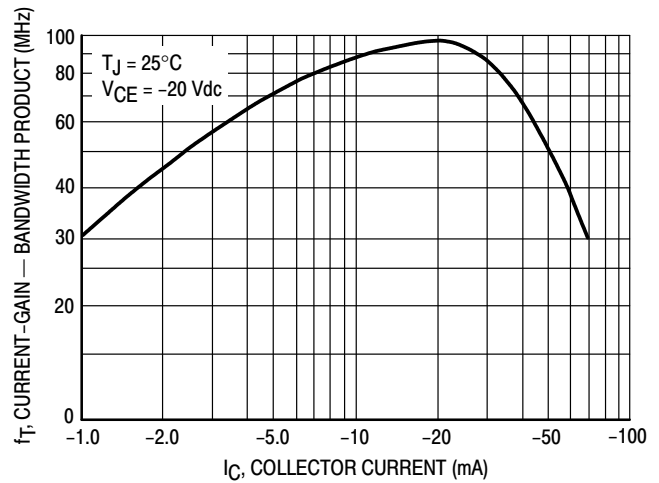


Figure 3. Current-Gain — Bandwidth Product

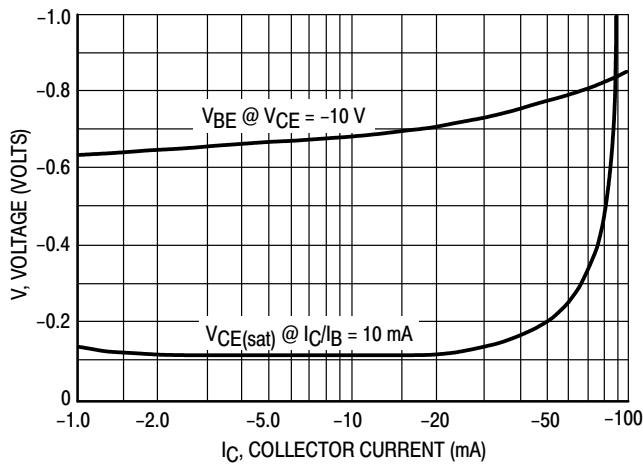


Figure 4. "On" Voltages

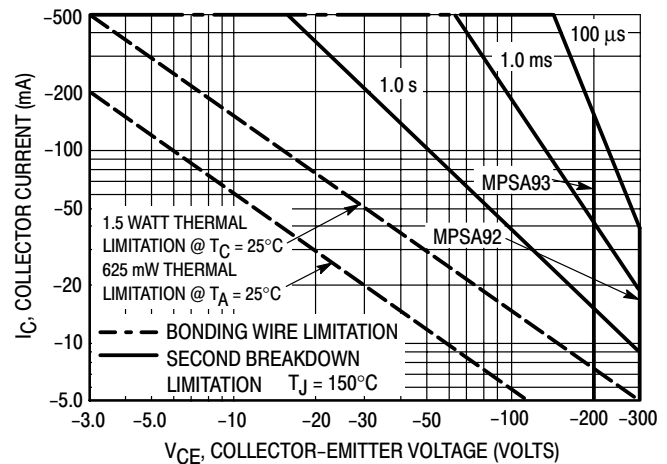
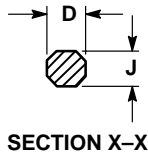
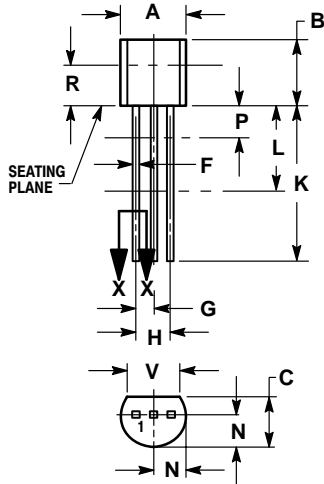


Figure 5. Active Region — Safe Operating Area

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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 1:

1. EMITTER
2. BASE
3. COLLECTOR

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