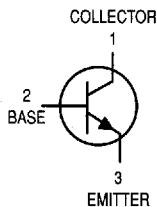


# Amplifier Transistors

## NPN Silicon

**BC182,A,B**  
**BC183**  
**BC184**



CASE 29-04, STYLE 17  
TO-92 (TO-226AA)

### MAXIMUM RATINGS

| Rating   | Symbol         | BC182       | BC183 | BC184 | Unit                 |
|--|----------------|-------------|-------|-------|----------------------|
| Collector-Emitter Voltage  | $V_{CEO}$      | 50          | 30    | 30    | Vdc                  |
| Collector-Base Voltage   | $V_{CBO}$      | 60          | 45    | 45    | Vdc                  |
| Emitter-Base Voltage   | $V_{EBO}$      | 6.0         |       |       | Vdc                  |
| Collector Current — Continuous   | $I_C$          | 100         |       |       | mAdc                 |
| Total Device Dissipation @ $T_A = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$          | 350         |       |       | mW                   |
|  |                | 2.8         |       |       | mW/ $^\circ\text{C}$ |
| Total Device Dissipation @ $T_C = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$          | 1.0         |       |       | Watts                |
|  |                | 8.0         |       |       | 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 | $R_{\theta JA}$ | 357 | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance, Junction to Case    | $R_{\theta JC}$ | 125 | $^\circ\text{C}/\text{W}$ |

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

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

### OFF CHARACTERISTICS

|  |                         |               |                |                   |                |    |
|--|-------------------------|---------------|----------------|-------------------|----------------|----|
| Collector-Emitter Breakdown Voltage<br>( $I_C = 2.0 \text{ mA}, I_B = 0$ )                                     | BC182<br>BC183<br>BC184 | $V_{(BR)CEO}$ | 50<br>30<br>30 | —<br>—<br>—       | —<br>—<br>—    | V  |
| Collector-Base Breakdown Voltage<br>( $I_C = 10 \mu\text{A}, I_E = 0$ )  | BC182<br>BC183<br>BC184 | $V_{(BR)CBO}$ | 60<br>45<br>45 | —<br>—<br>—       | —<br>—<br>—    | V  |
| Emitter-Base Breakdown Voltage<br>( $I_E = 100 \mu\text{A}, I_C = 0$ )   |                         | $V_{(BR)EBO}$ | 6.0            | —                 | —              | V  |
| Collector Cutoff Current<br>( $V_{CB} = 50 \text{ V}, V_{BE} = 0$ )<br>( $V_{CB} = 30 \text{ V}, V_{BE} = 0$ ) | BC182<br>BC183<br>BC184 | $I_{CBO}$     | —<br>—<br>—    | 0.2<br>0.2<br>0.2 | 15<br>15<br>15 | nA |
| Emitter-Base Leakage Current<br>( $V_{EB} = 4.0 \text{ V}, I_C = 0$ )  |                         | $I_{EBO}$     | —              | —                 | 15             | nA |

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**BC182,A,B BC183 BC184**
**ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise noted) (Continued)

| Characteristic  |        | Symbol        | Min  | Typ         | Max         | Unit |
|---|--------|---------------|------|-------------|-------------|------|
| <b>ON CHARACTERISTICS</b>   |        |               |      |             |             |      |
| DC Current Gain<br>( $I_C = 10 \mu\text{A}$ , $V_{CE} = 5.0 \text{ V}$ )  | BC182  | $h_{FE}$      | 40   | —           | —           | —    |
|   | BC183  |               | 40   | —           | —           | —    |
|   | BC184  |               | 100  | —           | —           | —    |
| ( $I_C = 2.0 \text{ mA}$ , $V_{CE} = 5.0 \text{ V}$ )   | BC182  |               | 120  | —           | 500         |      |
|   | BC183  |               | 120  | —           | 800         |      |
|   | BC184  |               | 250  | —           | 800         |      |
| ( $I_C = 100 \text{ mA}$ , $V_{CE} = 5.0 \text{ V}$ )   | BC182  |               | 80   | —           | —           |      |
|   | BC183  |               | 80   | —           | —           |      |
|   | BC184  |               | 130  | —           | —           |      |
| Collector–Emitter On Voltage<br>( $I_C = 10 \text{ mA}$ , $I_B = 0.5 \text{ mA}$ )<br>( $I_C = 100 \text{ mA}$ , $I_B = 5.0 \text{ mA}$ ) <sup>(1)</sup>  |        | $V_{CE(sat)}$ | —    | 0.07<br>0.2 | 0.25<br>0.6 | V    |
| Base–Emitter Saturation Voltage<br>( $I_C = 100 \text{ mA}$ , $I_B = 5.0 \text{ mA}$ ) <sup>(1)</sup>   |        | $V_{BE(sat)}$ | —    | —           | 1.2         | V    |
| Base–Emitter On Voltage<br>( $I_C = 100 \mu\text{A}$ , $V_{CE} = 5.0 \text{ V}$ )<br>( $I_C = 2.0 \text{ mA}$ , $V_{CE} = 5.0 \text{ V}$ )<br>( $I_C = 100 \text{ mA}$ , $V_{CE} = 5.0 \text{ V}$ ) <sup>(1)</sup>  |        | $V_{BE(on)}$  | —    | 0.5         | —           | V    |
|   |        |               | 0.55 | 0.62        | 0.7         |      |
|   |        |               | —    | 0.83        | —           |      |
| <b>DYNAMIC CHARACTERISTICS</b>  |        |               |      |             |             |      |
| Current–Gain — Bandwidth Product<br>( $I_C = 0.5 \text{ mA}$ , $V_{CE} = 3.0 \text{ V}$ , $f = 100 \text{ MHz}$ )   | BC182  | $f_T$         | —    | 100         | —           | MHz  |
|   | BC183  |               | —    | 120         | —           |      |
|   | BC184  |               | —    | 140         | —           |      |
| ( $I_C = 10 \text{ mA}$ , $V_{CE} = 5.0 \text{ V}$ , $f = 100 \text{ MHz}$ )  | BC182  |               | 150  | 200         | —           |      |
|   | BC183  |               | 150  | 240         | —           |      |
|   | BC184  |               | 150  | 280         | —           |      |
| Common Base Output Capacitance<br>( $V_{CB} = 10 \text{ V}$ , $I_C = 0$ , $f = 1.0 \text{ MHz}$ )   |        | $C_{ob}$      | —    | —           | 5.0         | pF   |
| Common Base Input Capacitance<br>( $V_{EB} = 0.5 \text{ V}$ , $I_C = 0$ , $f = 1.0 \text{ MHz}$ )   |        | $C_{ib}$      | —    | 8.0         | —           | pF   |
| Small–Signal Current Gain<br>( $I_C = 2.0 \text{ mA}$ , $V_{CE} = 5.0 \text{ V}$ , $f = 1.0 \text{ kHz}$ )  | BC182  | $h_{fe}$      | 125  | —           | 500         | —    |
|   | BC183  |               | 125  | —           | 900         |      |
|   | BC184  |               | 240  | —           | 900         |      |
|   | BC182A |               | 125  | —           | 260         |      |
|   | BC182B |               | 240  | —           | 500         |      |
| Noise Figure<br>( $I_C = 0.2 \text{ mA}$ , $V_{CE} = 5.0 \text{ V}$ , $R_S = 2.0 \text{ k}\Omega$ ,<br>$f = 1.0 \text{ kHz}$ )<br>( $I_C = 0.2 \text{ mA}$ , $V_{CE} = 5.0 \text{ V}$ , $R_S = 2.0 \text{ k}\Omega$ ,<br>$f = 1.0 \text{ kHz}$ , $f = 200 \text{ Hz}$ ) | BC184  | NF            | —    | 2.0         | 4.0         | dB   |
|   | BC182  |               | —    | 2.0         | 10          |      |
|   | BC183  |               | —    | 2.0         | 10          |      |
|   | BC184  |               | —    | 2.0         | 4.0         |      |
|   |        |               | —    | 2.0         | 4.0         |      |

 1. Pulse Test:  $T_p$  300 s, Duty Cycle 2.0%.

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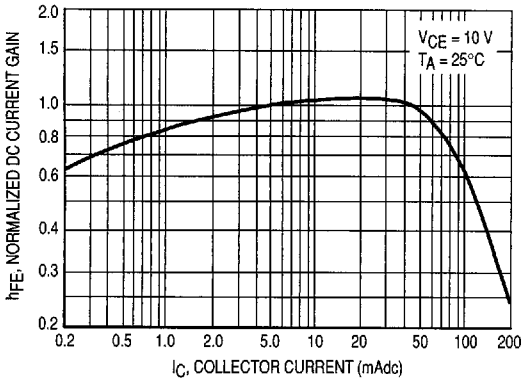


Figure 1. Normalized DC Current Gain

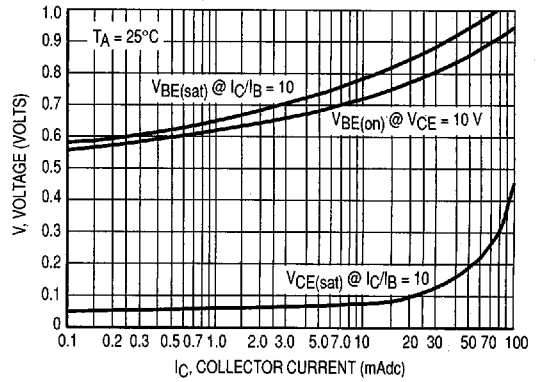


Figure 2. "Saturation" and "On" Voltages

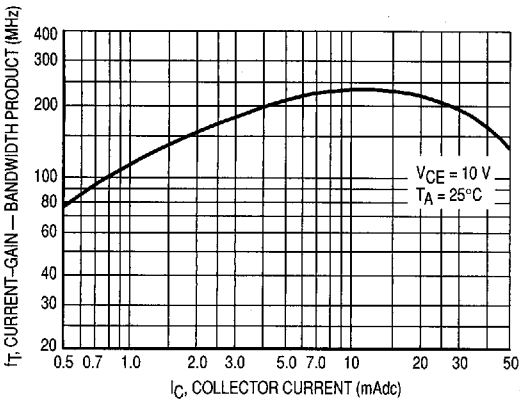


Figure 3. Current-Gain — Bandwidth Product

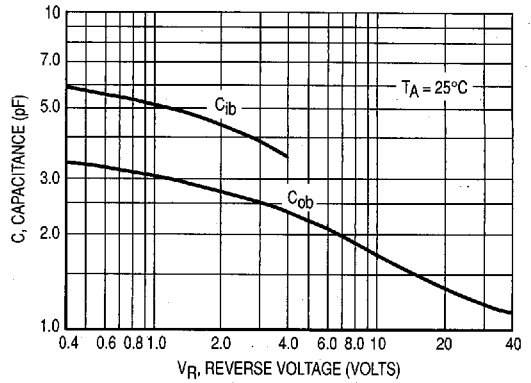


Figure 4. Capacitances

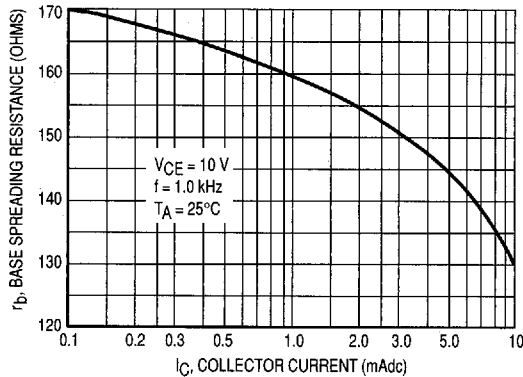


Figure 5. Base Spreading Resistance