



BC 171 • BC 172 • BC 173

NPN HIGH GAIN LOW NOISE

SILICON PLANAR EPITAXIAL TRANSISTOR

BC171
BC172
BC173

FEATURES

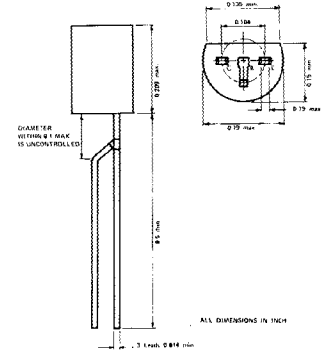
- High Breakdown Voltage $V_{CE0} \dots 50V$ (BC171)
- Available in Different Current Gain Groupings
- Low Noise N.F. $\dots 4dB_{max}$ @ $0.2mA$ (BC173)

APPLICATIONS

- Audio Amplifier Driver Stage
- Television Receiver Circuits
- Low Power General Purpose
- Low Noise Pre-Amplifier (BC173)

MECHANICAL OUTLINE

u - 135
(Lead Code A)
(TO-92 Variant)



THERMAL CHARACTERISTICS

Thermal Resistance from Junction to Ambient $\theta (j-amb)$
Maximum Collector Junction Temperature
Storage Temperature Range
Soldering Temperature (10 sec. time limit)

$0.42^{\circ}C/mW$
 $150^{\circ}C$
 $-65^{\circ}C$ to $+150^{\circ}C$
 $260^{\circ}C$

ABSOLUTE MAXIMUM RATINGS

Continuous Power Dissipation @ $25^{\circ}C$ Ambient
Continuous Collector Current
Collector - Base Voltage
Collector - Emitter Voltage
Base - Emitter Voltage

| BC 171 | BC 172 | BC 173 |
|--------|--------|--------|
| 300 mW | 300 mW | 300 mW |
| 100 mA | 100 mA | 100 mA |
| 50 V | 25 V | 25 V |
| 45 V | 25 V | 25 V |
| 6 V | 5 V | 5 V |

ELECTRICAL CHARACTERISTICS @ $25^{\circ}C$ free air temperature :

| PARAMETER | SYMBOL | BC 171 | | BC 172 | | BC 173 | | UNIT | TEST CONDITIONS |
|--------------------------------------|---------------|--------|------|--------|------|--------|------|------|---|
| | | MIN. | MAX. | MIN. | MAX. | MIN. | MAX. | | |
| Collector-Base Cutoff Current | I_{CBO} | | 15 | | | | | nA | $V_{CB} = 45V$ |
| Collector-Base Cutoff Current | I_{CBO} | | | | 15 | | 15 | nA | $V_{CB} = 20V$ |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | | 0.25 | 0.25 | | 0.25 | | V | $I_c = 10mA$ $I_B = 0.5mA$ |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | | 0.6 | 0.6 | | 0.6 | | V | $I_c = 100mA$ $I_B = 5mA$ |
| Base-Emitter On Voltage | $V_{BE(sat)}$ | 0.55 | 0.7 | 0.55 | 0.7 | 0.55 | 0.7 | V | $V_{CE} = 5V$ $I_c = 2mA$ |
| Forward Current Transfer Ratio | h_{FE} | 110 | 450 | 110 | 800 | 110 | 800 | | $V_{CE} = 5V$ $I_c = 2mA$ |
| Small Signal Current Gain | h_{fe} | 1.5 | | 1.5 | | 1.5 | | | $f = 100MHz$ $I_c = 10mA$ $V_{CE} = 5V$ |
| Collector Output Capacitance | C_{ob} | | 6 | | 6 | | 6 | pF | $V_{CE} = 10V$ $f = 1MHz$ $I_E = 0$ |
| Noise Figure (Narrow Band) | N.F. | | 10 | | 10 | | 4 | dB | $V_{CE} = 5V$ $I_c = 0.2mA$ $R_g = 2K\Omega$ $f = 1KC$ $BW = 200Hz$ |
| Noise Figure (Wide Band) | N.F. | | | | | | 4 | dB | $V_{CE} = 5V$ $I_c = 0.2mA$ $R_g = 2K\Omega$ $f = 30Hz$ to $15KHz$ |

* D. C. CURRENT GAIN GROUPINGS

| TYPE | BC 171A | | BC 172B BC 173B | | BC 172C BC 173C | | BC 171A BC 172A BC 173A | | BC 171B BC 172B BC 173B | | BC 172C BC 173C | |
|------------------------------|---------|------|--------------------|------|--------------------|------|-------------------------------|------|-------------------------------|------|--------------------|------|
| | MIN. | MAX. | MIN. | MAX. | MIN. | MAX. | MIN. | MAX. | MIN. | MAX. | MIN. | MAX. |
| $V_{CE} = 5V$ $I_c = 0.01mA$ | | | 40 | | 40 | | 100 | | | | | |
| $V_{CE} = 5V$ $I_c = 2mA$ | | | | | | | 110 | 220 | 200 | 450 | 420 | 800 |

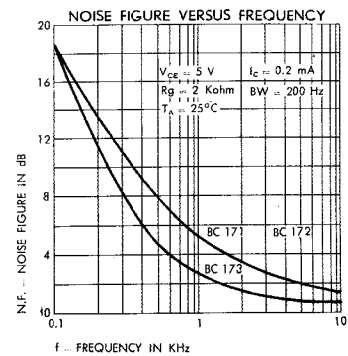
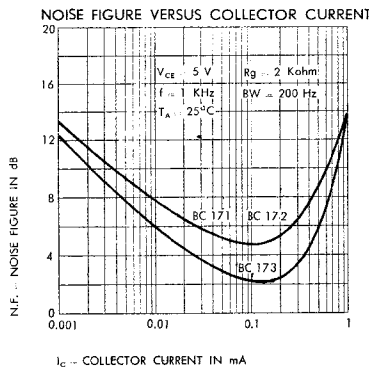
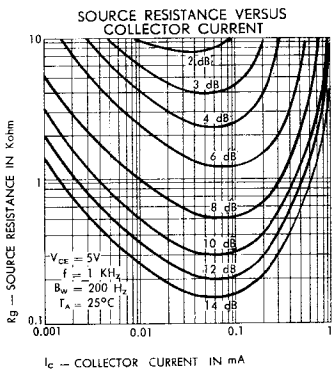
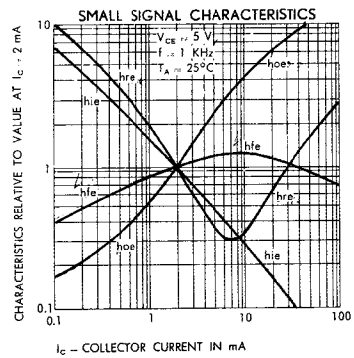
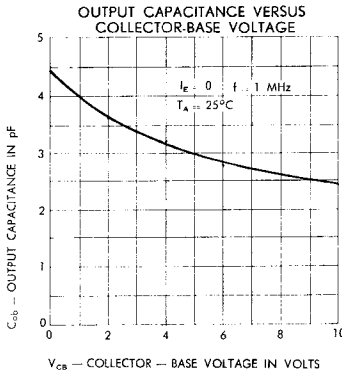
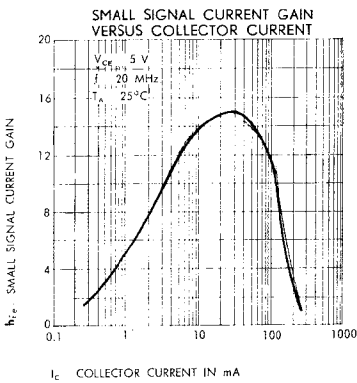
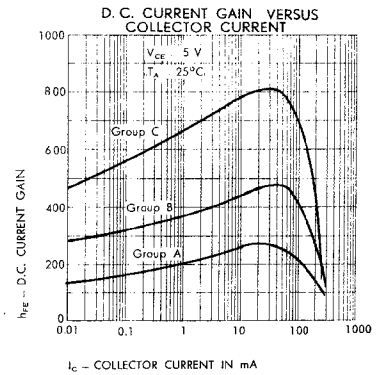
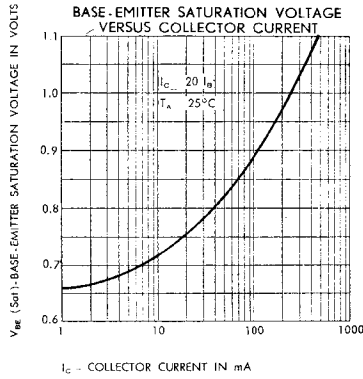
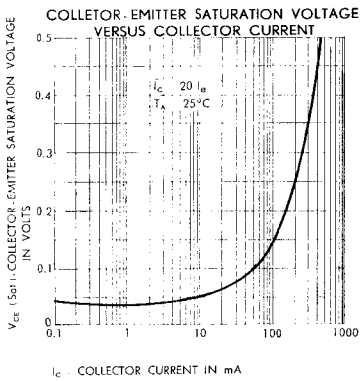
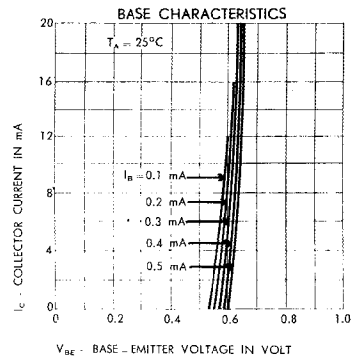
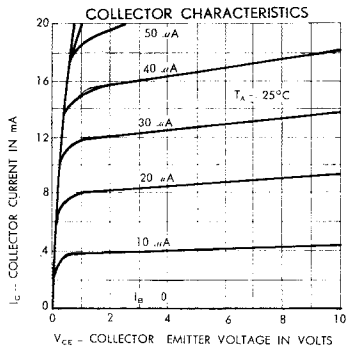
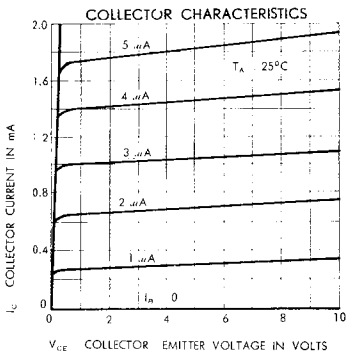
TYPICAL TWO PORT CHARACTERISTICS (h parameters)

| TYPE | BC 171A BC 172A BC 173A | BC 171B BC 172B BC 173B | BC 172C BC 173C | UNIT | TEST CONDITIONS |
|----------|-------------------------------|-------------------------------|--------------------|---------|--------------------------------------|
| h_{fe} | 180 | 300 | 600 | | $V_{CE} = 5V$ $I_c = 2mA$ $f = 1KHz$ |
| h_{ie} | 2.5 | 4 | 8 | Kohm | |
| h_{re} | 3×10^{-4} | 6×10^{-4} | 8×10^{-4} | | |
| h_{oe} | 20 | 26 | 50 | μS | |

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NPN SILICON PLANAR EPITAXIAL TRANSISTOR

TYPICAL ELECTRICAL CHARACTERISTICS BC 171 • BC 172 • BC 173





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