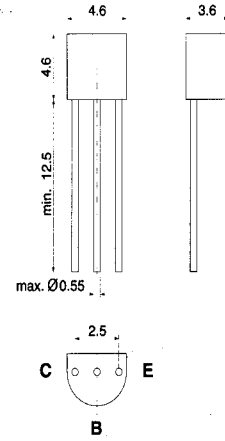


NPN Silicon Expitaxial Planar Transistor

These transistors are subdivided into three groups A, B and C according to their current gain. The type BC546 is available in groups A and B, however, the types BC547 and BC548 can be supplied in all three groups. The BC549 is a low-noise type and available in groups B and C. As complementary types, the PNP transistors BC556...BC559 are recommended.

On special request, these transistors can be manufactured in different pin configurations. Please refer to the "TO-92 TRANSISTOR PACKAGE OUTLINE" on page 80 for the available pin options.



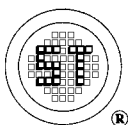
TO-92 Plastic Package
Weight approx. 0.18 g
Dimensions in mm

Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

| | | Symbol | Value | Unit |
|---|--------------------------|-----------|-------------------|------------------|
| Collector-Base Voltage | HN / BC 546 | V_{CBO} | 80 | V |
| | HN / BC 547 | V_{CBO} | 50 | V |
| | HN / BC 548, HN / BC 549 | V_{CBO} | 30 | V |
| Collector-Emitter Voltage | HN / BC 546 | V_{CES} | 85 | V |
| | HN / BC 547 | V_{CES} | 50 | V |
| | HN / BC 548, HN / BC 549 | V_{CES} | 30 | V |
| Collector-Emitter Voltage | HN / BC 546 | V_{CEO} | 65 | V |
| | HN / BC 547 | V_{CEO} | 45 | V |
| | HN / BC 548, HN / BC 549 | V_{CEO} | 30 | V |
| Emitter-Base Voltage | HN / BC 546, HN / BC 547 | V_{EBO} | 6 | V |
| | HN / BC 548, HN / BC 549 | V_{EBO} | 5 | V |
| Collector Current | | I_C | 100 | mA |
| Peak Collector Current | | I_{CM} | 200 | mA |
| Peak Base Current | | I_{BM} | 200 | mA |
| Peak Emitter Current | | $-I_{EM}$ | 200 | mA |
| Power Dissipation at $T_{amb} = 25^\circ\text{C}$ | | P_{tot} | 500 ¹⁾ | mW |
| Junction Temperature | | T_j | 150 | $^\circ\text{C}$ |
| Storage Temperature Range | | T_s | -65 to + 150 | $^\circ\text{C}$ |

¹⁾ Valid provided that leads are kept at ambient temperature at a distance of 2 mm from case

G S P FORM A AVAILABLE



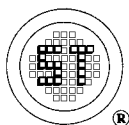
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Characteristics at $T_{amb} = 25\text{ }^\circ\text{C}$

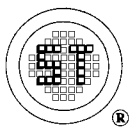
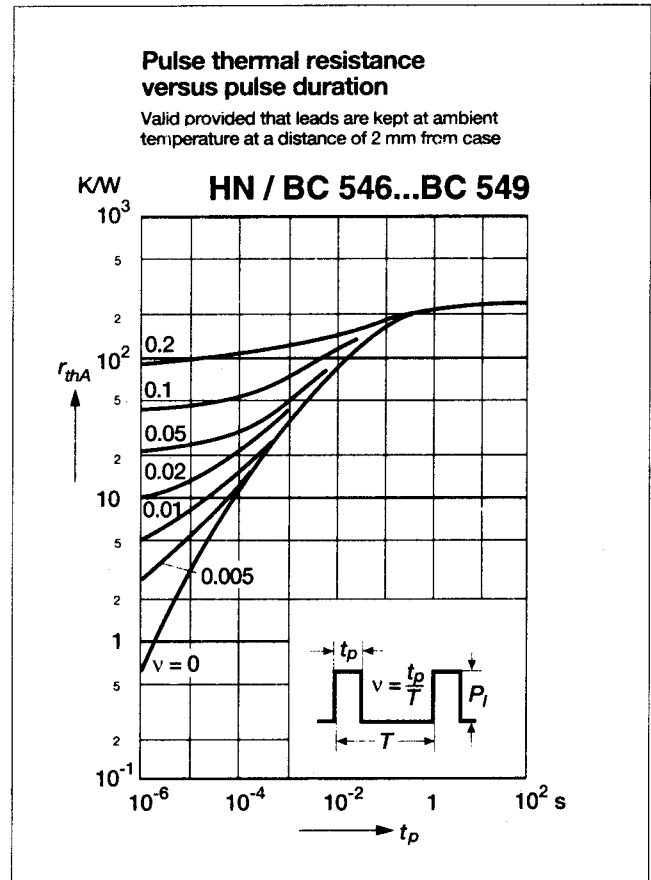
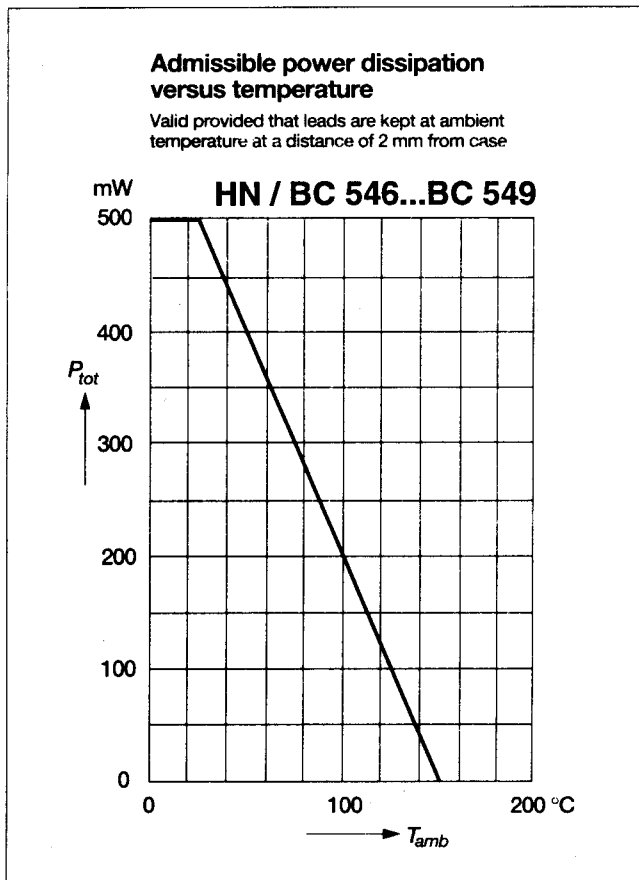
| | Symbol | Min. | Typ. | Max. | Unit |
|--|----------------------|----------|------|---------------------|---------------|
| h-Parameters at $V_{CE} = 5\text{V}$, $I_C = 2\text{ mA}$, $f = 1\text{ kHz}$, | | | | | |
| Small Signal Current Gain | Current Gain Group A | h_{fe} | - | 220 | - |
| | B | h_{fe} | - | 330 | - |
| | C | h_{fe} | - | 600 | - |
| Input Impedance | Current Gain Group A | h_{ie} | 1.6 | 2.7 | 4.5 |
| | B | h_{ie} | 3.2 | 4.5 | 8.5 |
| | C | h_{ie} | 6 | 8.7 | 15 |
| Output Admittance | Current Gain Group A | h_{oe} | - | 18 | 30 |
| | B | h_{oe} | - | 30 | 60 |
| | C | h_{oe} | - | 60 | 110 |
| Reverse Voltage Transfer Ratio | Current Gain Group A | h_{re} | - | $1.5 \cdot 10^{-4}$ | - |
| | B | h_{re} | - | $2 \cdot 10^{-4}$ | - |
| | C | h_{re} | - | $3 \cdot 10^{-4}$ | - |
| DC Current Gain. | | | | | |
| at $V_{CE} = 5\text{V}$, $I_C = 10\text{ }\mu\text{A}$ | Current Gain Group A | h_{FE} | - | 90 | - |
| | B | h_{FE} | - | 150 | - |
| | C | h_{FE} | - | 270 | - |
| at $V_{CE} = 5\text{V}$, $I_C = 2\text{ mA}$ | Current Gain Group A | h_{FE} | 110 | 180 | 220 |
| | B | h_{FE} | 200 | 290 | 450 |
| | C | h_{FE} | 420 | 500 | 800 |
| at $V_{CE} = 5\text{V}$, $I_C = 100\text{ mA}$ | Current Gain Group A | h_{FE} | - | 120 | - |
| | B | h_{FE} | - | 200 | - |
| | C | h_{FE} | - | 400 | - |
| Thermal Resistance Junction to Ambient Air | R_{thA} | - | - | 250 ¹⁾ | K/W |
| Collector Saturation Voltage | | | | | |
| at $I_C = 10\text{ mA}$, $I_B = 0.5\text{ mA}$ | V_{CEsat} | - | 80 | 200 | mV |
| | V_{CEsat} | - | 200 | 600 | mV |
| Base Saturation Voltage | | | | | |
| at $I_C = 10\text{ mA}$, $I_B = 0.5\text{ mA}$ | V_{BEsat} | - | 700 | - | mV |
| | V_{BEsat} | - | 900 | - | mV |
| Base Emitter Voltage | | | | | |
| at $V_{CE} = 5\text{ V}$, $I_C = 2\text{ mA}$ | V_{BE} | 580 | 660 | 700 | mV |
| at $V_{CE} = 5\text{ V}$, $I_C = 10\text{ mA}$ | V_{BE} | - | - | 720 | mV |
| Collector Emitter Cutoff Current | | | | | |
| at $V_{CE} = 80\text{ V}$ | I_{CES} | - | 0.2 | 15 | nA |
| at $V_{CE} = 50\text{ V}$ | I_{CES} | - | 0.2 | 15 | nA |
| at $V_{CE} = 30\text{ V}$ | I_{CES} | - | 0.2 | 15 | nA |
| at $V_{CE} = 80\text{ V}$, $T_j = 125\text{ }^\circ\text{C}$ | I_{CES} | - | - | 4 | μA |
| at $V_{CE} = 50\text{ V}$, $T_j = 125\text{ }^\circ\text{C}$ | I_{CES} | - | - | 4 | μA |

¹⁾ Valid provided that leads are kept at ambient temperature at a distance of 2 mm from case.



Characteristics, continuation

| | Symbol | Min. | Typ. | Max. | Unit |
|---|-----------|------|------|--------|--------------------|
| at $V_{CE} = 30V, T_j = 125^\circ C$ HN / BC 548, HN / BC 549 | I_{CES} | - | - | 4 4 | μA μA |
| Gain-Bandwidth Product at $V_{CE} = 5V, I_C = 10 mA, f = 100MHz$ | f_T | - | 300 | - | MHz |
| Collector-Base Capacitance at $V_{CB} = 10 V, f = 1MHz$ | C_{CBO} | - | 3.5 | 6 | pF |
| Emitter-Base Capacitance at $V_{EB} = 0.5 V, f = 1MHz$ | C_{EBO} | - | 9 | - | pF |
| Noise Figure at $V_{CE} = 5 V, I_C = 200 \mu A, R_G = 2 k\Omega,$ $f = 1kHz, \Delta f = 200 Hz$ HN / BC 546, HN / BC 547 | F | - | 2 | 10 | dB |
| HN / BC 548 HN / BC 549 | F | - | 1.2 | 4 | dB |

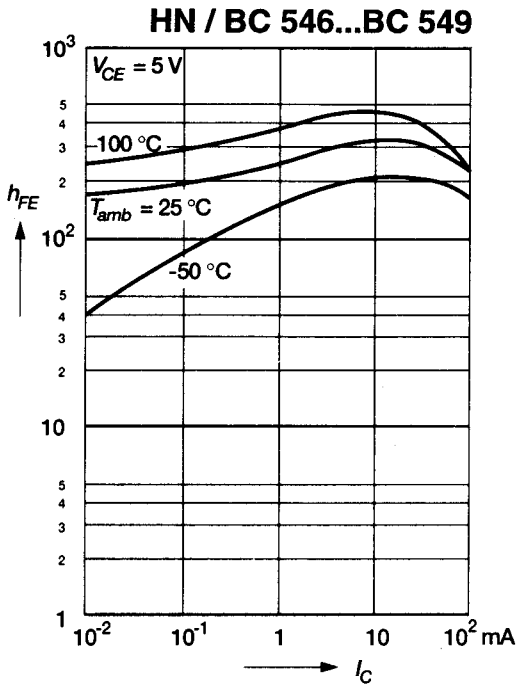


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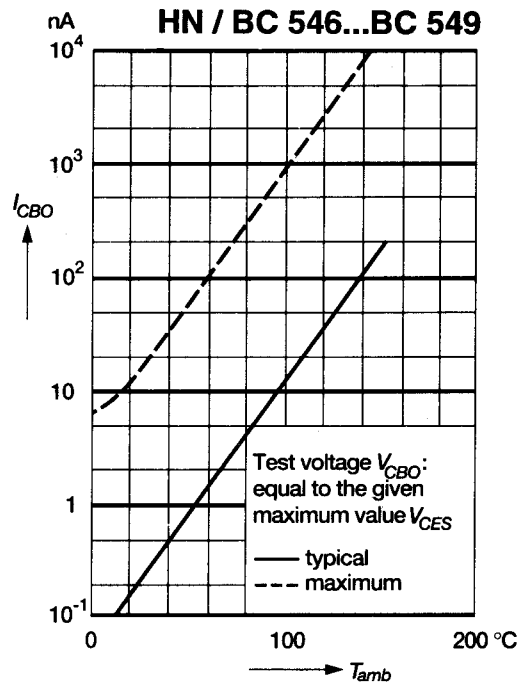
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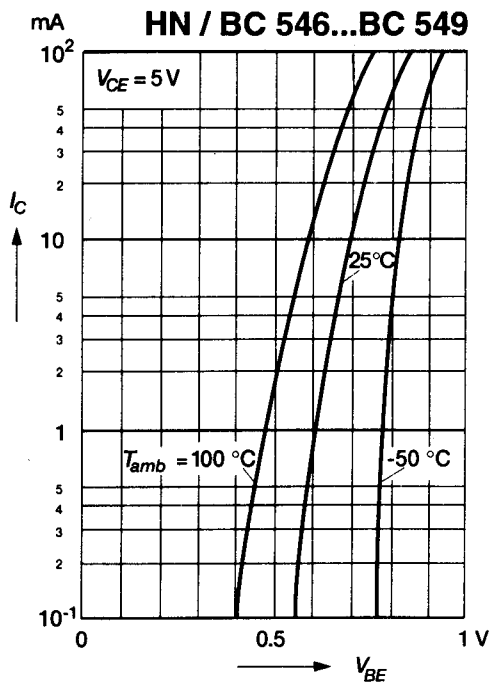
DC current gain versus collector current



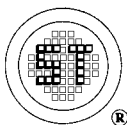
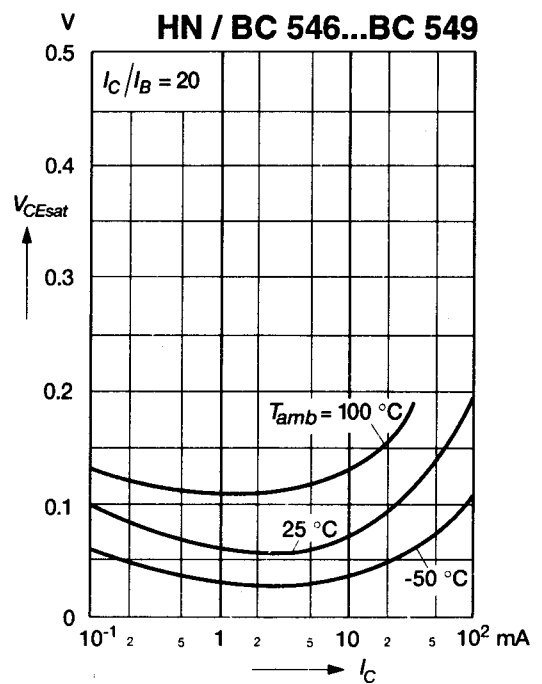
Collector-base cutoff current versus ambient temperature



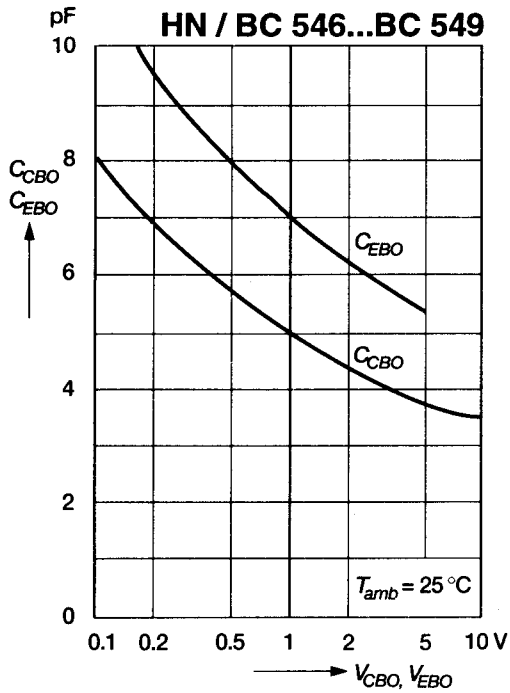
Collector current versus base-emitter voltage



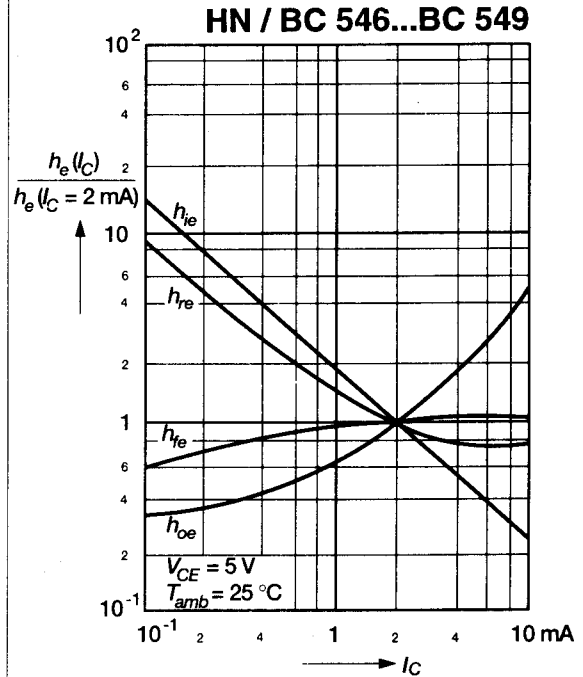
Collector saturation voltage versus collector current



Collector-base capacitance,
Emitter-base capacitance
versus reverse bias voltage



Relative h-parameters
versus collector current



Gain-bandwidth product
versus collector current

