

BC549C, BC550C

Low Noise Transistors

NPN Silicon

Features

- These are Pb-Free Devices*

MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|--|----------------|-------------|----------------------------|
| Collector – Emitter Voltage BC549C BC550C | V_{CEO} | 30 45 | Vdc |
| Collector – Base Voltage BC549C BC550C | V_{CBO} | 30 50 | Vdc |
| Emitter – Base Voltage | V_{EBO} | 5.0 | Vdc |
| Collector Current – Continuous | I_C | 100 | Vdc |
| Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above = 25°C | P_D | 625 5.0 | mW mW/ $^\circ\text{C}$ |
| Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above = 25°C | P_D | 1.5 12 | W 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 | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance, Junction-to-Case | $R_{\theta JC}$ | 83.3 | $^\circ\text{C}/\text{W}$ |

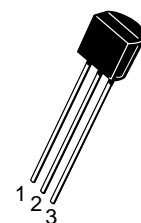
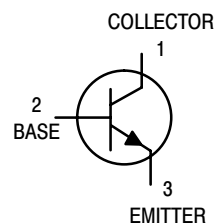
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



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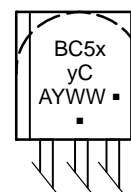
<http://onsemi.com>



TO-92
CASE 29
STYLE 17

STRAIGHT LEAD
BULK PACK

MARKING DIAGRAM



BC5xyC = Device Code
x = 4 or 5
y = 9 or 0

A = Assembly Location

Y = Year

WW = Work Week

▪ = Pb-Free Package

(Note: Microdot may be in either location)

ORDERING INFORMATION

| Device | Package | Shipping |
|---------|--------------------|-------------------|
| BC549CG | TO-92 (Pb-Free) | 5000 Units / Bulk |
| BC550CG | TO-92 (Pb-Free) | 5000 Units / Bulk |

BC549C, BC550C

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

| Characteristic | Symbol | Min | Typ | Max | Unit |
|---|---------------|-----|-----|-----------|-------------------------|
| OFF CHARACTERISTICS | | | | | |
| Collector–Emitter Breakdown Voltage ($I_C = 10\text{ mAdc}$, $I_B = 0$) | $V_{(BR)CEO}$ | 45 | – | – | Vdc |
| Collector–Base Breakdown Voltage ($I_C = 10\text{ }\mu\text{Adc}$, $I_E = 0$) | $V_{(BR)CBO}$ | 50 | – | – | Vdc |
| Emitter–Base Breakdown Voltage ($I_E = 10\text{ }\mu\text{Adc}$, $I_C = 0$) | $V_{(BR)EBO}$ | 5.0 | – | – | Vdc |
| Collector Cutoff Current ($V_{CB} = 30\text{ V}$, $I_E = 0$) ($V_{CB} = 30\text{ V}$, $I_E = 0$, $T_A = +125^\circ\text{C}$) | I_{CBO} | – | – | 15 5.0 | nAdc μAdc |
| Emitter Cutoff Current ($V_{EB} = 4.0\text{ Vdc}$, $I_C = 0$) | I_{EBO} | – | – | 15 | nAdc |

| | | | | | |
|---|---------------|----------------|----------------------|--------------------|-----|
| ON CHARACTERISTICS | | | | | |
| DC Current Gain ($I_C = 10\text{ }\mu\text{Adc}$, $V_{CE} = 5.0\text{ Vdc}$) ($I_C = 2.0\text{ mAdc}$, $V_{CE} = 5.0\text{ Vdc}$) | h_{FE} | 100 420 | 270 500 | – 800 | – |
| Collector–Emitter Saturation Voltage ($I_C = 10\text{ mAdc}$, $I_B = 0.5\text{ mAdc}$) ($I_C = 10\text{ mAdc}$, $I_B = \text{see note 1}$) ($I_C = 100\text{ mAdc}$, $I_B = 5.0\text{ mAdc}$, see note 2) | $V_{CE(sat)}$ | – – – | 0.075 0.3 0.25 | 0.25 0.6 0.6 | Vdc |
| Base–Emitter Saturation Voltage ($I_C = 100\text{ mAdc}$, $I_B = 5.0\text{ mAdc}$) | $V_{BE(sat)}$ | – | 1.1 | – | Vdc |
| Base–Emitter On Voltage ($I_C = 10\text{ }\mu\text{Adc}$, $V_{CE} = 5.0\text{ Vdc}$) ($I_C = 100\text{ }\mu\text{Adc}$, $V_{CE} = 5.0\text{ Vdc}$) ($I_C = 2.0\text{ mAdc}$, $V_{CE} = 5.0\text{ Vdc}$) | $V_{BE(on)}$ | – – 0.55 | 0.52 0.55 0.62 | – – 0.7 | Vdc |

| | | | | | |
|--|------------------|--------|----------|-----------|-----|
| SMALL–SIGNAL CHARACTERISTICS | | | | | |
| Current–Gain — Bandwidth Product ($I_C = 10\text{ mAdc}$, $V_{CE} = 5.0\text{ Vdc}$, $f = 100\text{ MHz}$) | f_T | – | 250 | – | MHz |
| Collector–Base Capacitance ($V_{CB} = 10\text{ Vdc}$, $I_E = 0$, $f = 1.0\text{ MHz}$) | C_{cbo} | – | 2.5 | – | pF |
| Small–Signal Current Gain ($I_C = 2.0\text{ mAdc}$, $V_{CE} = 5.0\text{ V}$, $f = 1.0\text{ kHz}$) | h_{fe} | 450 | 600 | 900 | – |
| Noise Figure ($I_C = 200\text{ }\mu\text{Adc}$, $V_{CE} = 5.0\text{ Vdc}$, $R_S = 2.0\text{ k}\Omega$, $f = 1.0\text{ kHz}$) ($I_C = 200\text{ }\mu\text{Adc}$, $V_{CE} = 5.0\text{ Vdc}$, $R_S = 100\text{ k}\Omega$, $f = 1.0\text{ kHz}$) | NF_1 NF_2 | – – | 0.6 – | 2.5 10 | dB |

- I_B is value for which $I_C = 11\text{ mA}$ at $V_{CE} = 1.0\text{ V}$.
- Pulse test = $300\text{ }\mu\text{s}$ – Duty cycle = 2%.

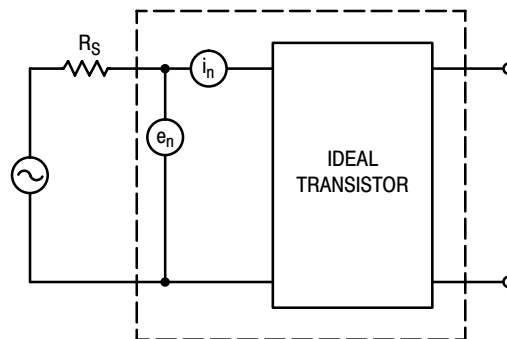


Figure 1. Transistor Noise Model

BC549C, BC550C

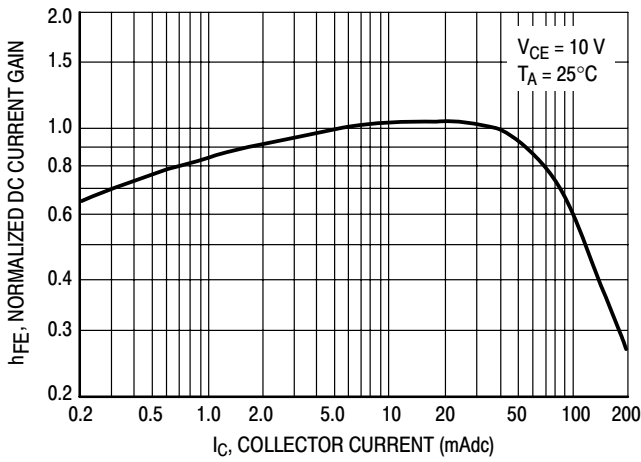


Figure 2. Normalized DC Current Gain

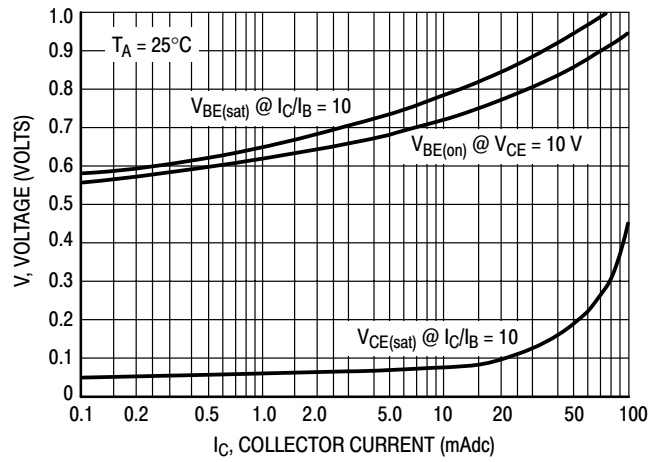


Figure 3. "Saturation" and "On" Voltages

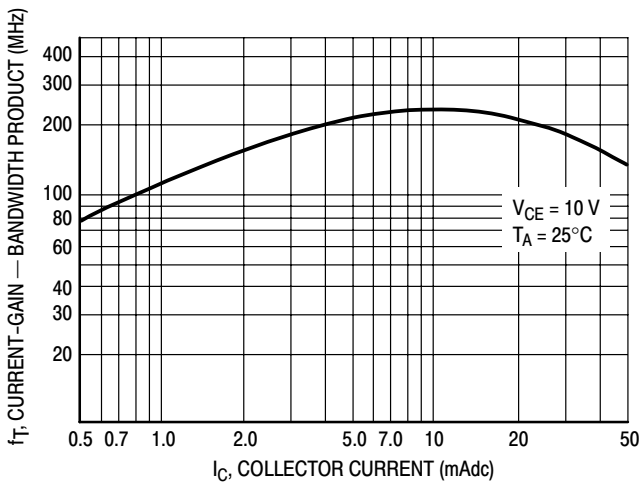


Figure 4. Current-Gain — Bandwidth Product

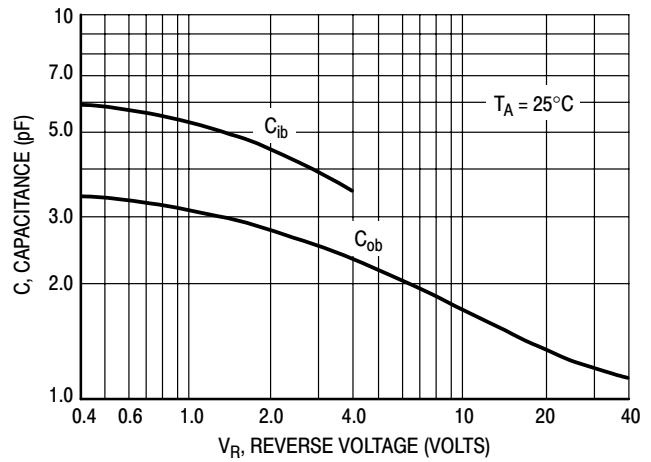


Figure 5. Capacitance

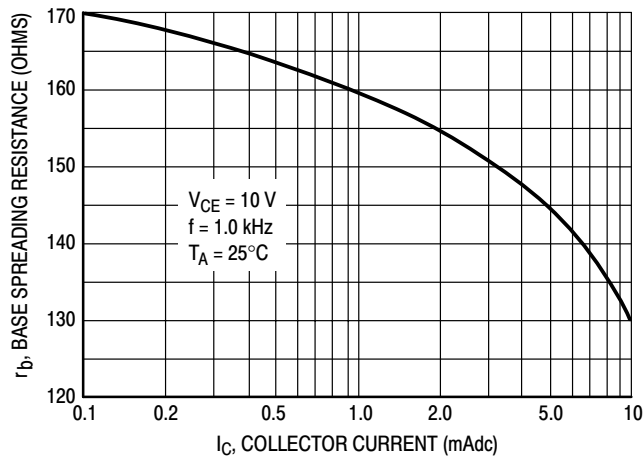
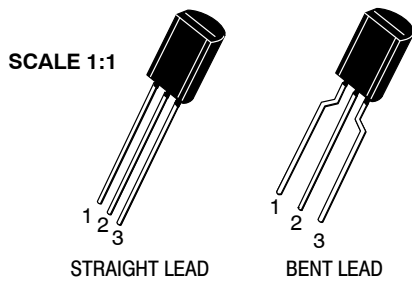


Figure 6. Base Spreading Resistance

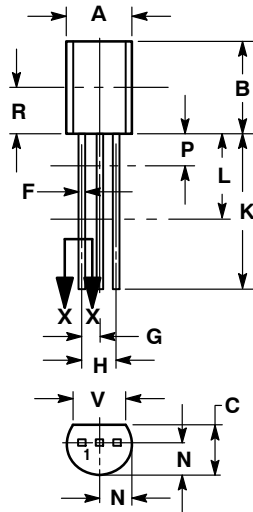
MECHANICAL CASE OUTLINE PACKAGE DIMENSIONS

ON Semiconductor®

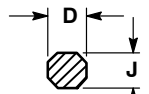


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CASE 29-10
ISSUE A

DATE 08 MAY 2012



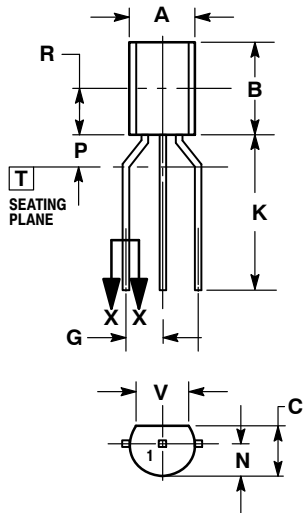
STRAIGHT LEAD



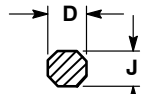
SECTION X-X

- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1994.
 2. CONTROLLING DIMENSION: INCHES.
 3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
 4. DIMENSION F APPLIES BETWEEN DIMENSIONS P AND L. DIMENSIONS D AND J APPLY BETWEEN DIMENSIONS L AND K MINIMUM. THE LEAD DIMENSIONS ARE UNCONTROLLED IN DIMENSION P AND BEYOND DIMENSION K MINIMUM.

| DIM | INCHES | | MILLIMETERS | |
|-----|--------|-------|-------------|------|
| | MIN | MAX | MIN | MAX |
| A | 0.175 | 0.205 | 4.44 | 5.21 |
| B | 0.290 | 0.310 | 7.37 | 7.87 |
| C | 0.125 | 0.165 | 3.18 | 4.19 |
| D | 0.018 | 0.021 | 0.46 | 0.53 |
| 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 | 0.018 | 0.024 | 0.46 | 0.61 |
| 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 | 0.135 | --- | 3.43 | --- |
| V | 0.135 | --- | 3.43 | --- |



BENT LEAD



SECTION X-X

- NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
 2. CONTROLLING DIMENSION: INCHES.
 3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
 4. DIMENSION F APPLIES BETWEEN DIMENSIONS P AND L. DIMENSIONS D AND J APPLY BETWEEN DIMENSIONS L AND K MINIMUM. THE LEAD DIMENSIONS ARE UNCONTROLLED IN DIMENSION P AND BEYOND DIMENSION K MINIMUM.

| DIM | INCHES | | MILLIMETERS | |
|-----|--------|-------|-------------|------|
| | MIN | MAX | MIN | MAX |
| A | 0.175 | 0.205 | 4.44 | 5.21 |
| B | 0.290 | 0.310 | 7.37 | 7.87 |
| C | 0.125 | 0.165 | 3.18 | 4.19 |
| D | 0.018 | 0.021 | 0.46 | 0.53 |
| G | 0.094 | 0.102 | 2.40 | 2.80 |
| J | 0.018 | 0.024 | 0.46 | 0.61 |
| K | 0.500 | --- | 12.70 | --- |
| N | 0.080 | 0.105 | 2.04 | 2.66 |
| P | --- | 0.100 | --- | 2.54 |
| R | 0.135 | --- | 3.43 | --- |
| V | 0.135 | --- | 3.43 | --- |

STYLES ON PAGE 2

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CASE 29-10
ISSUE A**

DATE 08 MAY 2012

STYLE 1:
PIN 1. EMITTER
2. BASE
3. COLLECTOR

STYLE 2:
PIN 1. BASE
2. EMITTER
3. COLLECTOR

STYLE 3:
PIN 1. ANODE
2. ANODE
3. CATHODE

STYLE 4:
PIN 1. CATHODE
2. CATHODE
3. ANODE

STYLE 5:
PIN 1. DRAIN
2. SOURCE
3. GATE

STYLE 6:
PIN 1. GATE
2. SOURCE & SUBSTRATE
3. DRAIN

STYLE 7:
PIN 1. SOURCE
2. DRAIN
3. GATE

STYLE 8:
PIN 1. DRAIN
2. GATE
3. SOURCE & SUBSTRATE

STYLE 9:
PIN 1. BASE 1
2. EMITTER
3. BASE 2

STYLE 10:
PIN 1. CATHODE
2. GATE
3. ANODE

STYLE 11:
PIN 1. ANODE
2. CATHODE & ANODE
3. CATHODE

STYLE 12:
PIN 1. MAIN TERMINAL 1
2. GATE
3. MAIN TERMINAL 2

STYLE 13:
PIN 1. ANODE 1
2. GATE
3. CATHODE 2

STYLE 14:
PIN 1. EMITTER
2. COLLECTOR
3. BASE

STYLE 15:
PIN 1. ANODE 1
2. CATHODE
3. ANODE 2

STYLE 16:
PIN 1. ANODE
2. GATE
3. CATHODE

STYLE 17:
PIN 1. COLLECTOR
2. BASE
3. EMITTER

STYLE 18:
PIN 1. ANODE
2. CATHODE
3. NOT CONNECTED

STYLE 19:
PIN 1. GATE
2. ANODE
3. CATHODE

STYLE 20:
PIN 1. NOT CONNECTED
2. CATHODE
3. ANODE

STYLE 21:
PIN 1. COLLECTOR
2. EMITTER
3. BASE

STYLE 22:
PIN 1. SOURCE
2. GATE
3. DRAIN

STYLE 23:
PIN 1. GATE
2. SOURCE
3. DRAIN

STYLE 24:
PIN 1. EMITTER
2. COLLECTOR/ANODE
3. CATHODE

STYLE 25:
PIN 1. MT 1
2. GATE
3. MT 2

STYLE 26:
PIN 1. V_{CC}
2. GROUND 2
3. OUTPUT

STYLE 27:
PIN 1. MT
2. SUBSTRATE
3. MT

STYLE 28:
PIN 1. CATHODE
2. ANODE
3. GATE

STYLE 29:
PIN 1. NOT CONNECTED
2. ANODE
3. CATHODE

STYLE 30:
PIN 1. DRAIN
2. GATE
3. SOURCE

STYLE 31:
PIN 1. GATE
2. DRAIN
3. SOURCE


STYLE 32:
PIN 1. BASE
2. COLLECTOR
3. EMITTER

STYLE 33:
PIN 1. RETURN
2. INPUT
3. OUTPUT

STYLE 34:
PIN 1. INPUT
2. GROUND
3. LOGIC

STYLE 35:
PIN 1. GATE
2. COLLECTOR
3. EMITTER

| | | |
|-------------------------|------------------------------|---|
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