

2N5550, 2N5551

Preferred Device

Amplifier Transistors

NPN Silicon

Features

- These are Pb-Free Devices*

MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|--|----------------|-------------|----------------------------|
| Collector – Emitter Voltage 2N5550 2N5551 | V_{CEO} | 140 160 | Vdc |
| Collector – Base Voltage 2N5550 2N5551 | V_{CBO} | 160 180 | Vdc |
| Emitter – Base Voltage | V_{EBO} | 6.0 | Vdc |
| Collector Current – Continuous | I_C | 600 | mAdc |
| 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 @ $T_C = 25^\circ\text{C}$ 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

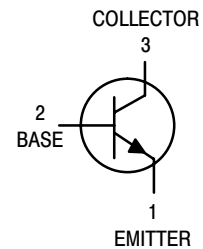
| Characteristic | Symbol | Max | Unit |
|---|-----------------|------|---------------------------|
| Thermal Resistance, Junction-to-Ambient | $R_{\theta JA}$ | 200 | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance, Junction-to-Case | $R_{\theta JC}$ | 83.3 | $^\circ\text{C}/\text{W}$ |

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.

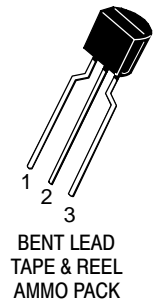
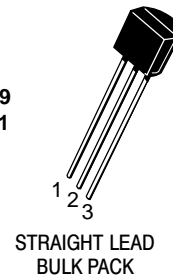


ON Semiconductor®

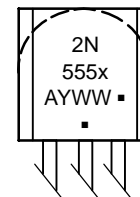
<http://onsemi.com>



TO-92
CASE 29
STYLE 1



MARKING DIAGRAM



- x = 0 or 1
- A = Assembly Location
- Y = Year
- WW = Work Week
- = Pb-Free Package

(Note: Microdot may be in either location)

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 5 of this data sheet.

Preferred devices are recommended choices for future use and best overall value.

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

| Characteristic | Symbol | Min | Max | Unit |
|--|--|---------------|----------------------------------|---|
| OFF CHARACTERISTICS | | | | |
| Collector–Emitter Breakdown Voltage (Note 1) ($I_C = 1.0\text{ mAdc}$, $I_E = 0$) | 2N5550 2N5551 | $V_{(BR)CEO}$ | 140 160 | – – Vdc |
| Collector–Base Breakdown Voltage ($I_C = 100\text{ }\mu\text{Adc}$, $I_E = 0$) | 2N5550 2N5551 | $V_{(BR)CBO}$ | 160 180 | – – Vdc |
| Emitter–Base Breakdown Voltage ($I_E = 10\text{ }\mu\text{Adc}$, $I_C = 0$) | | $V_{(BR)EBO}$ | 6.0 | – Vdc |
| Collector Cutoff Current ($V_{CB} = 100\text{ Vdc}$, $I_E = 0$) ($V_{CB} = 120\text{ Vdc}$, $I_E = 0$) ($V_{CB} = 100\text{ Vdc}$, $I_E = 0$, $T_A = 100^\circ\text{C}$) ($V_{CB} = 120\text{ Vdc}$, $I_E = 0$, $T_A = 100^\circ\text{C}$) | 2N5550 2N5551 2N5550 2N5551 | I_{CBO} | – – – – | 100 50 100 50 nAdc μAdc |
| Emitter Cutoff Current ($V_{EB} = 4.0\text{ Vdc}$, $I_C = 0$) | | I_{EBO} | – | 50 nAdc |
| ON CHARACTERISTICS (Note 1) | | | | |
| DC Current Gain ($I_C = 1.0\text{ mAdc}$, $V_{CE} = 5.0\text{ Vdc}$) ($I_C = 10\text{ mAdc}$, $V_{CE} = 5.0\text{ Vdc}$) ($I_C = 50\text{ mAdc}$, $V_{CE} = 5.0\text{ Vdc}$) | 2N5550 2N5551 2N5550 2N5551 2N5550 2N5551 | h_{FE} | 60 80 60 80 20 30 | – – 250 250 – – |
| Collector–Emitter Saturation Voltage ($I_C = 10\text{ mAdc}$, $I_B = 1.0\text{ mAdc}$) ($I_C = 50\text{ mAdc}$, $I_B = 5.0\text{ mAdc}$) | Both Types 2N5550 2N5551 | $V_{CE(sat)}$ | – – – | 0.15 0.25 0.20 Vdc |
| Base–Emitter Saturation Voltage ($I_C = 10\text{ mAdc}$, $I_B = 1.0\text{ mAdc}$) ($I_C = 50\text{ mAdc}$, $I_B = 5.0\text{ mAdc}$) | Both Types 2N5550 2N5551 | $V_{BE(sat)}$ | – – – | 1.0 1.2 1.0 Vdc |
| SMALL–SIGNAL CHARACTERISTICS | | | | |
| Current–Gain — Bandwidth Product ($I_C = 10\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$, $f = 100\text{ MHz}$) | | f_T | 100 | 300 MHz |
| Output Capacitance ($V_{CB} = 10\text{ Vdc}$, $I_E = 0$, $f = 1.0\text{ MHz}$) | | C_{obo} | – | 6.0 pF |
| Input Capacitance ($V_{EB} = 0.5\text{ Vdc}$, $I_C = 0$, $f = 1.0\text{ MHz}$) | 2N5550 2N5551 | C_{ibo} | – – | 30 20 pF |
| Small–Signal Current Gain ($I_C = 1.0\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$, $f = 1.0\text{ kHz}$) | | h_{fe} | 50 | 200 – |
| Noise Figure ($I_C = 250\text{ }\mu\text{Adc}$, $V_{CE} = 5.0\text{ Vdc}$, $R_S = 1.0\text{ k}\Omega$, $f = 1.0\text{ kHz}$) | 2N5550 2N5551 | NF | – – | 10 8.0 dB |

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

2N5550, 2N5551

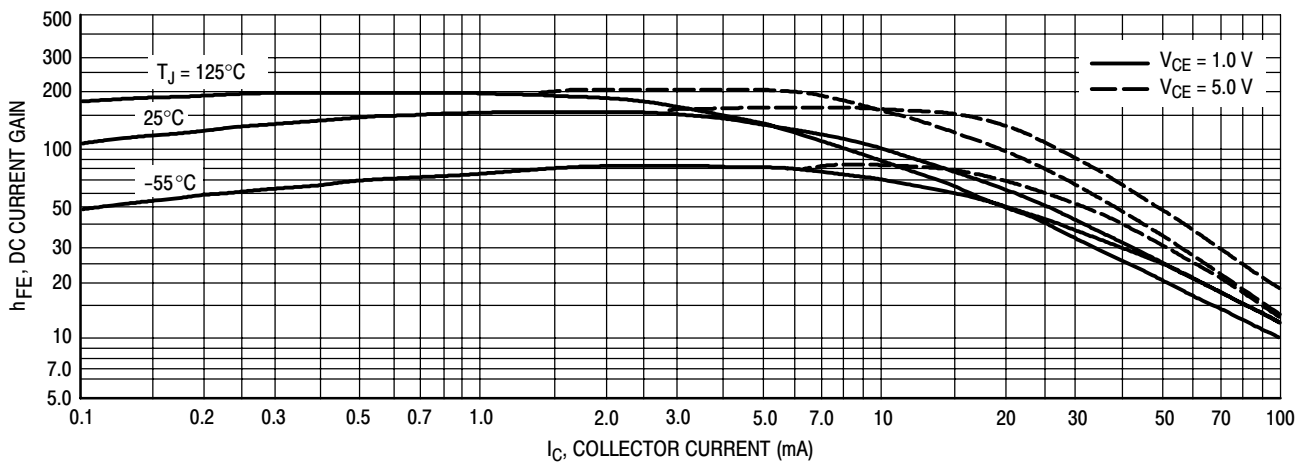


Figure 1. DC Current Gain

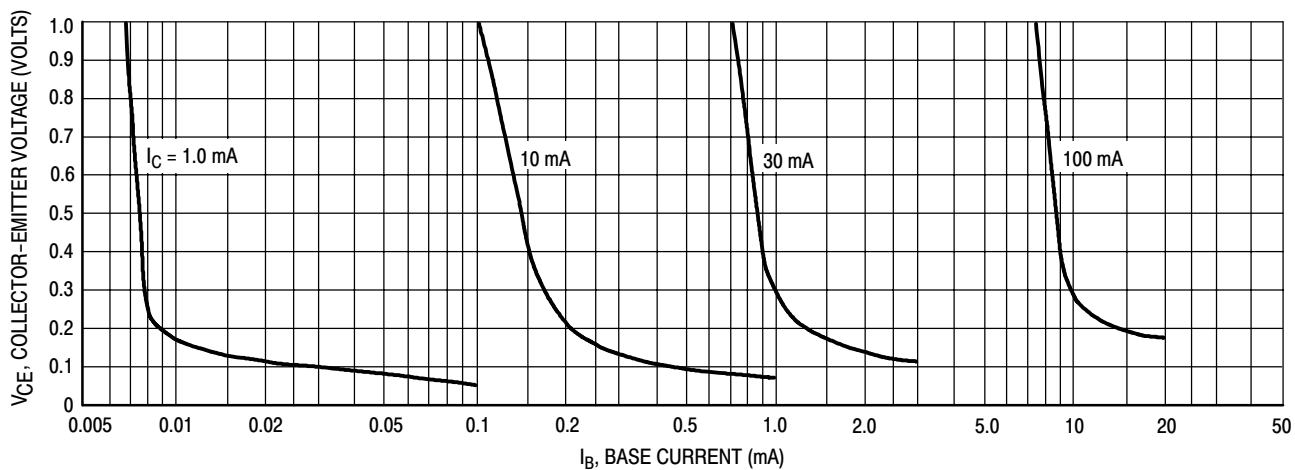


Figure 2. Collector Saturation Region

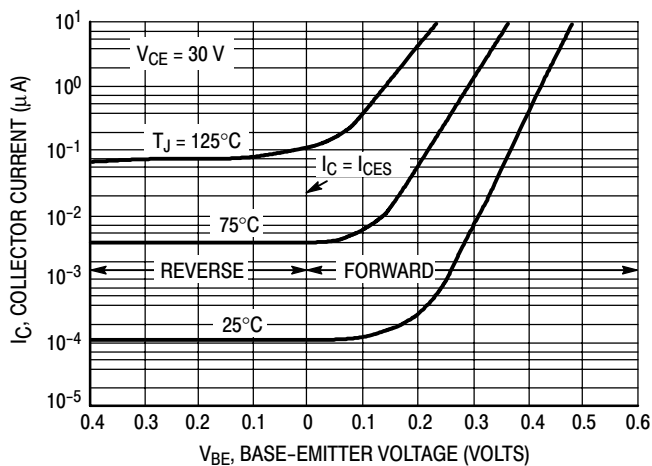


Figure 3. Collector Cut-Off Region

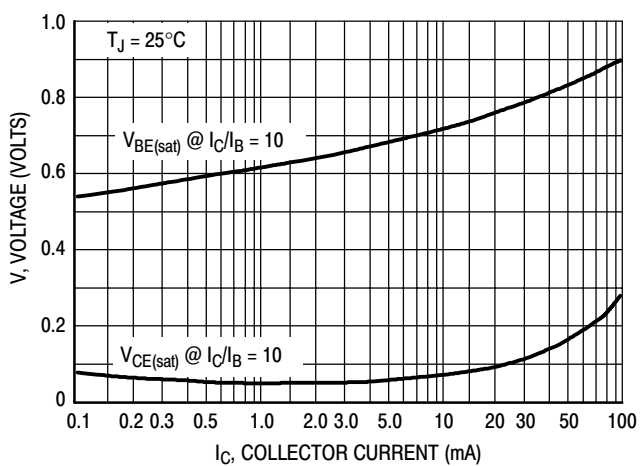


Figure 4. "On" Voltages

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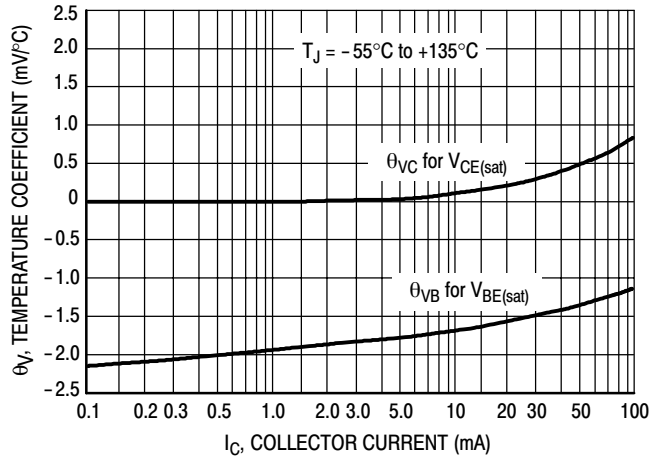


Figure 5. Temperature Coefficients

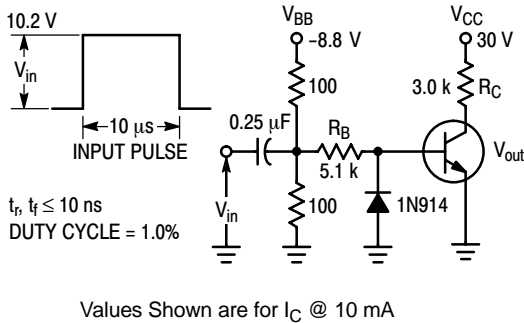


Figure 6. Switching Time Test Circuit

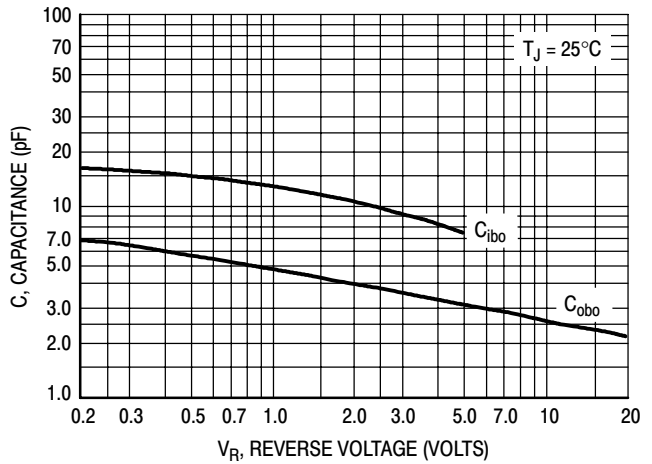


Figure 7. Capacitances

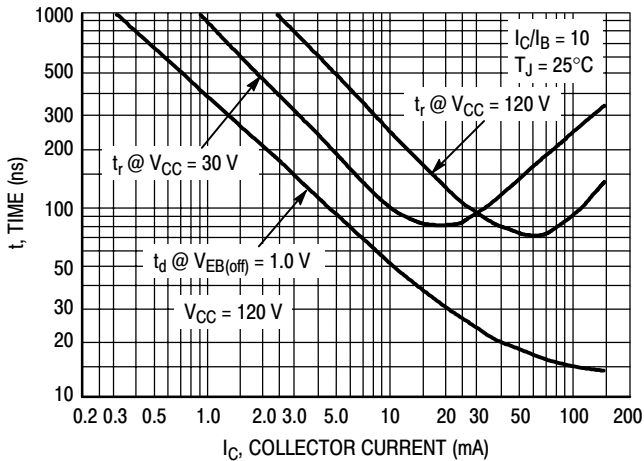


Figure 8. Turn-On Time

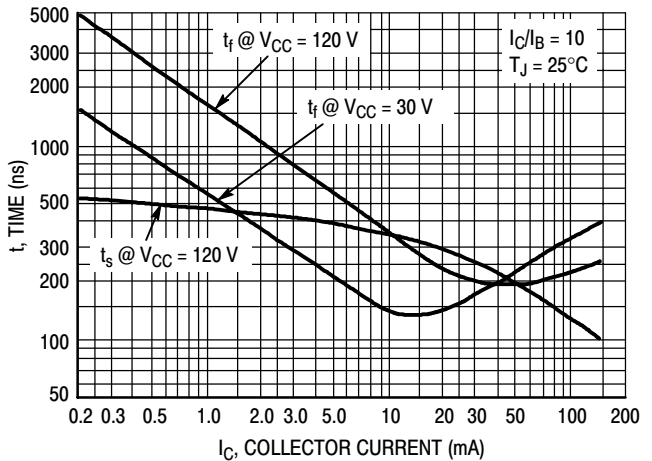


Figure 9. Turn-Off Time

2N5550, 2N5551

ORDERING INFORMATION

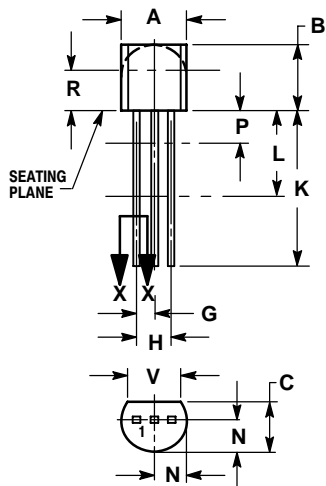
| Device | Package | Shipping† |
|-------------|--------------------|------------------------|
| 2N5550G | TO-92 (Pb-Free) | 5000 Units / Bulk |
| 2N5550RLRPG | TO-92 (Pb-Free) | 2000 / Tape & Ammo Box |
| 2N5551G | TO-92 (Pb-Free) | 5000 Units / Bulk |
| 2N5551RL1G | TO-92 (Pb-Free) | 2000 / Tape & Reel |
| 2N5551RLRAG | TO-92 (Pb-Free) | |
| 2N5551RLRPG | TO-92 (Pb-Free) | 2000 / Tape & Ammo Box |
| 2N5551ZL1G | TO-92 (Pb-Free) | |

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

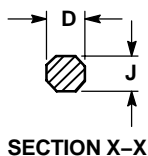
2N5550, 2N5551

PACKAGE DIMENSIONS

TO-92 (TO-226)
CASE 29-11
ISSUE AM



STRAIGHT LEAD
BULK PACK

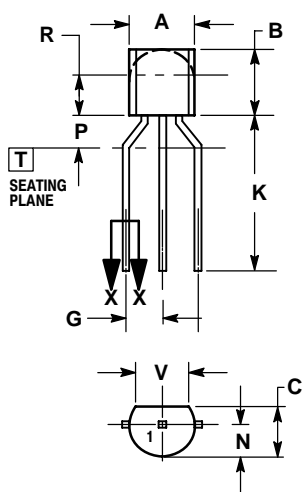


SECTION X-X

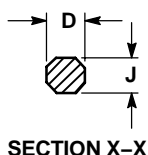
NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. 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 | 0.021 | 0.407 | 0.533 |
| 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 | --- |



BENT LEAD
TAPE & REEL
AMMO PACK



SECTION X-X

NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

| DIM | MILLIMETERS | |
|-----|-------------|------|
| | MIN | MAX |
| A | 4.45 | 5.20 |
| B | 4.32 | 5.33 |
| C | 3.18 | 4.19 |
| D | 0.40 | 0.54 |
| G | 2.40 | 2.80 |
| J | 0.39 | 0.50 |
| K | 12.70 | --- |
| N | 2.04 | 2.66 |
| P | 1.50 | 4.00 |
| R | 2.93 | --- |
| V | 3.43 | --- |

STYLE 1:

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

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