

2N5550, 2N5551

Preferred Device

Amplifier Transistors

NPN Silicon

Features

- Pb-Free Packages are Available*
- Device Marking: Device Type, e.g., 2N5550, Date Code

MAXIMUM RATINGS

| Rating | Symbol | 2N5550 | 2N5551 | Unit |
|---|----------------|-------------|--------|----------------------------|
| Collector – Emitter Voltage | V_{CEO} | 140 | 160 | Vdc |
| Collector – Base Voltage | 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 | | $^\circ\text{C}$ |

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

THERMAL CHARACTERISTICS

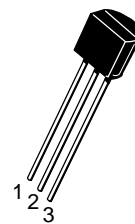
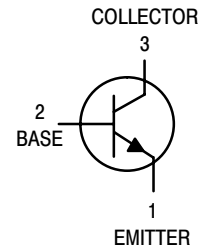
| Characteristic | Symbol | Max | Unit |
|--|-----------------|------|---------------------------|
| Thermal Resistance, Junction-to-Ambient | $R_{\theta JA}$ | 200 | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance, Junction-to-Case | $R_{\theta JC}$ | 83.3 | $^\circ\text{C}/\text{W}$ |

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



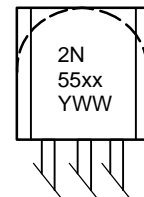
ON Semiconductor®

<http://onsemi.com>



TO-92
CASE 29
STYLE 1

MARKING DIAGRAM



55xx Specific Device Code
Y = Year
WW = Work Week

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 3 of this data sheet.

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

2N5550, 2N5551

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

| Characteristic | Symbol | Min | Max | Unit |
|--|----------------------|------------------|------------------------|--------------------------------------|
| OFF CHARACTERISTICS | | | | |
| Collector–Emitter Breakdown Voltage (Note 1) (I _C = 1.0 mA _{dc} , I _B = 0) | V _{(BR)CEO} | 140 160 | – – | V _{dc} |
| Collector–Base Breakdown Voltage (I _C = 100 μA _{dc} , I _E = 0) | V _{(BR)CBO} | 160 180 | – – | V _{dc} |
| Emitter–Base Breakdown Voltage (I _E = 10 μA _{dc} , I _C = 0) | V _{(BR)EBO} | 6.0 | – | V _{dc} |
| Collector Cutoff Current (V _{CB} = 100 V _{dc} , I _E = 0) (V _{CB} = 120 V _{dc} , I _E = 0) (V _{CB} = 100 V _{dc} , I _E = 0, T _A = 100°C) (V _{CB} = 120 V _{dc} , I _E = 0, T _A = 100°C) | I _{CBO} | – – – – | 100 50 100 50 | nA _{dc} μA _{dc} |
| Emitter Cutoff Current (V _{EB} = 4.0 V _{dc} , I _C = 0) | I _{EBO} | – | 50 | nA _{dc} |
| ON CHARACTERISTICS (Note 1) | | | | |
| DC Current Gain (I _C = 1.0 mA _{dc} , V _{CE} = 5.0 V _{dc}) | h _{FE} | 60 80 | – – | – |
| (I _C = 10 mA _{dc} , V _{CE} = 5.0 V _{dc}) | | 60 80 | 250 250 | |
| (I _C = 50 mA _{dc} , V _{CE} = 5.0 V _{dc}) | | 20 30 | – – | |
| Collector–Emitter Saturation Voltage (I _C = 10 mA _{dc} , I _B = 1.0 mA _{dc}) | V _{CE(sat)} | – | 0.15 | V _{dc} |
| (I _C = 50 mA _{dc} , I _B = 5.0 mA _{dc}) | | – – | 0.25 0.20 | |
| Base–Emitter Saturation Voltage (I _C = 10 mA _{dc} , I _B = 1.0 mA _{dc}) | V _{BE(sat)} | – | 1.0 | V _{dc} |
| (I _C = 50 mA _{dc} , I _B = 5.0 mA _{dc}) | | – – | 1.2 1.0 | |
| SMALL–SIGNAL CHARACTERISTICS | | | | |
| Current–Gain — Bandwidth Product (I _C = 10 mA _{dc} , V _{CE} = 10 V _{dc} , f = 100 MHz) | f _T | 100 | 300 | MHz |
| Output Capacitance (V _{CB} = 10 V _{dc} , I _E = 0, f = 1.0 MHz) | C _{obo} | – | 6.0 | pF |
| Input Capacitance (V _{EB} = 0.5 V _{dc} , I _C = 0, f = 1.0 MHz) | C _{ibo} | – – | 30 20 | pF |
| Small–Signal Current Gain (I _C = 1.0 mA _{dc} , V _{CE} = 10 V _{dc} , f = 1.0 kHz) | h _{fe} | 50 | 200 | – |
| Noise Figure (I _C = 250 μA _{dc} , V _{CE} = 5.0 V _{dc} , R _S = 1.0 kΩ, f = 1.0 kHz) | NF | – – | 10 8.0 | dB |

1. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.

2N5550, 2N5551

ORDERING INFORMATION

| Device | Package | Shipping† |
|-------------|--------------------|-----------------------|
| 2N5550 | TO-92 | 5,000 Unit / Bulk |
| 2N5550RLRA | TO-92 | 2,000 Tape & Reel |
| 2N5550RLRP | TO-92 | 2,000 Tape & Ammo Box |
| 2N5550RLRPG | TO-92 (Pb-Free) | 2,000 Tape & Ammo Box |
| 2N5551 | TO-92 | 5,000 Unit / Bulk |
| 2N5551G | TO-92 (Pb-Free) | 5,000 Unit / Bulk |
| 2N5551RL1 | TO-92 | 2,000 Tape & Reel |
| 2N5551RLRA | TO-92 | 2,000 Tape & Reel |
| 2N5551RLRM | TO-92 | 2,000 Tape & Ammo Box |
| 2N5551RLRP | TO-92 | 2,000 Tape & Ammo Box |
| 2N5551ZL1 | TO-92 | 2,000 Tape & Ammo Box |

†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.

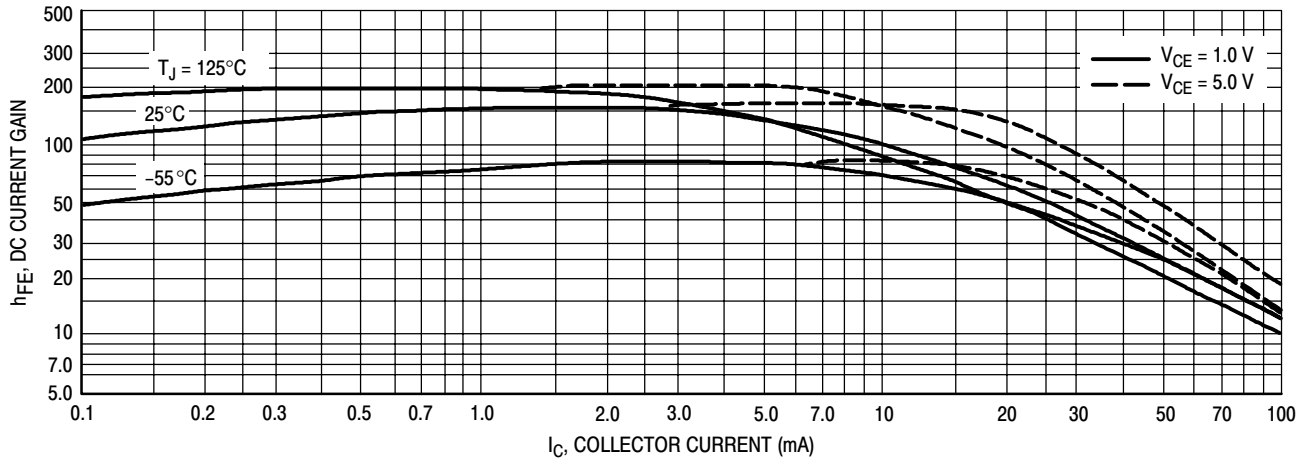


Figure 1. DC Current Gain

2N5550, 2N5551

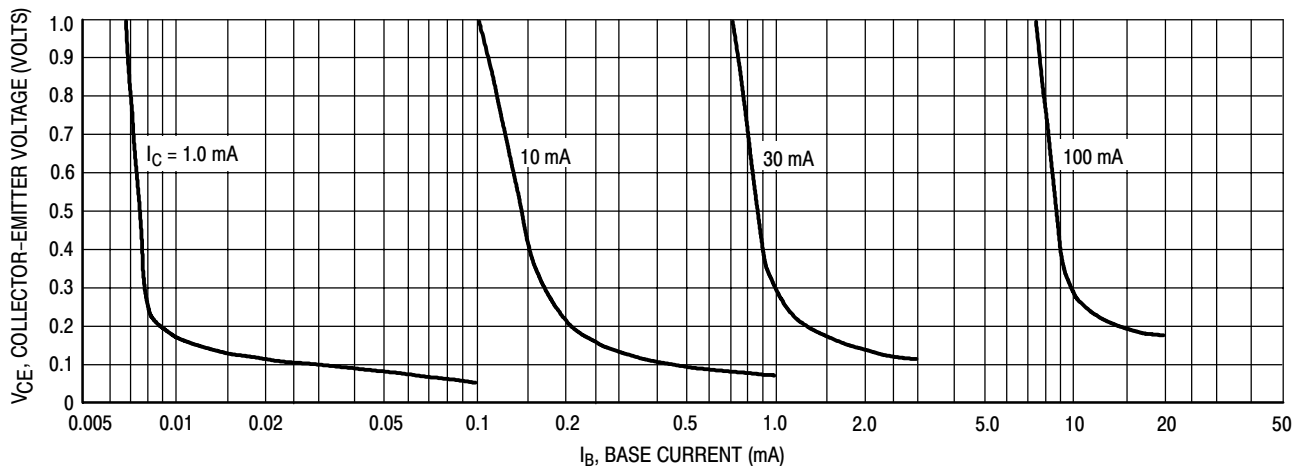


Figure 2. Collector Saturation Region

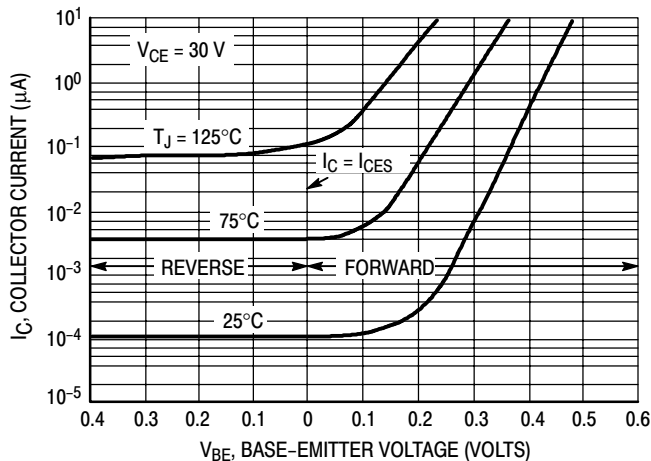


Figure 3. Collector Cut-Off Region

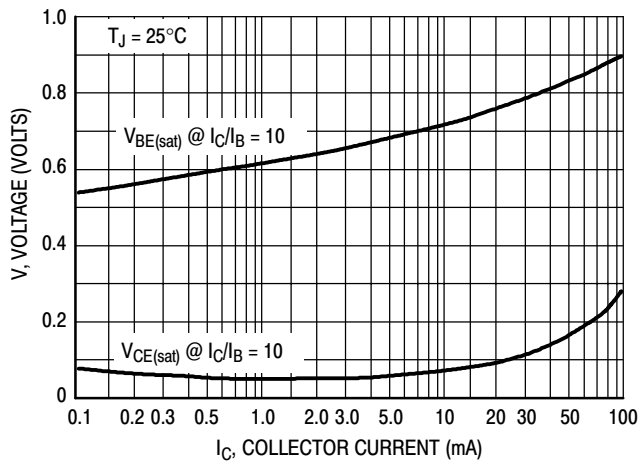


Figure 4. "On" Voltages

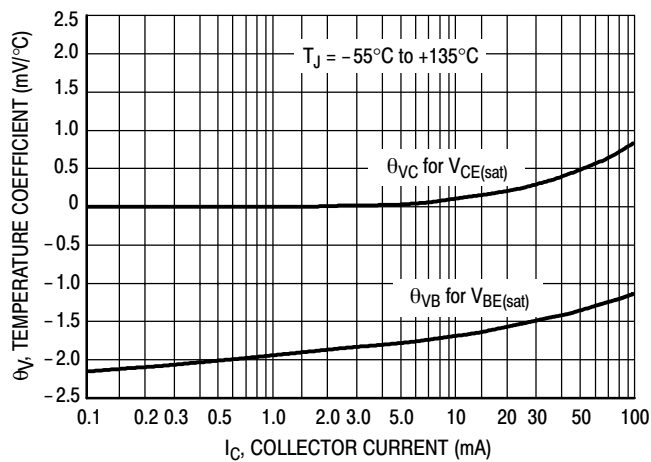
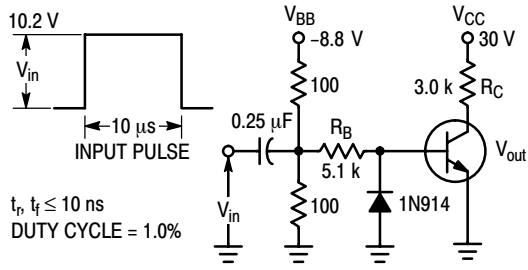


Figure 5. Temperature Coefficients

2N5550, 2N5551



Values Shown are for $I_C @ 10 \text{ mA}$

Figure 6. Switching Time Test Circuit

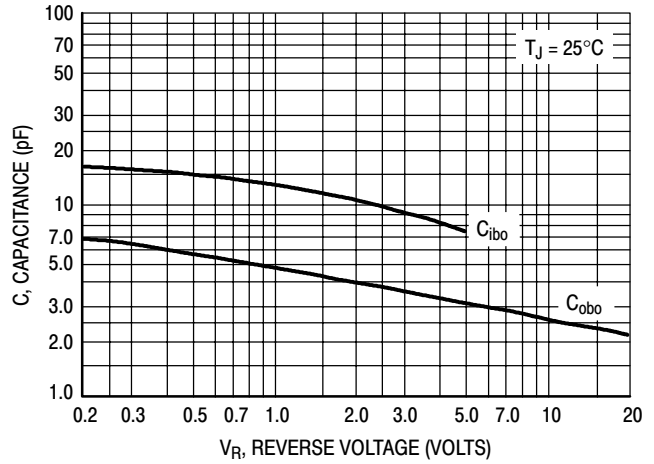


Figure 7. Capacitances

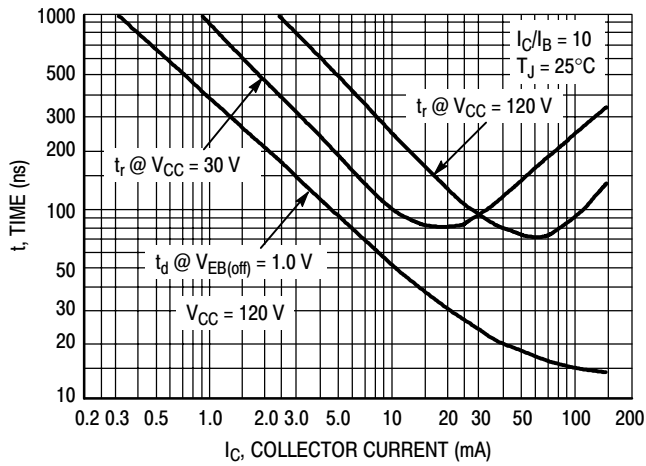


Figure 8. Turn-On Time

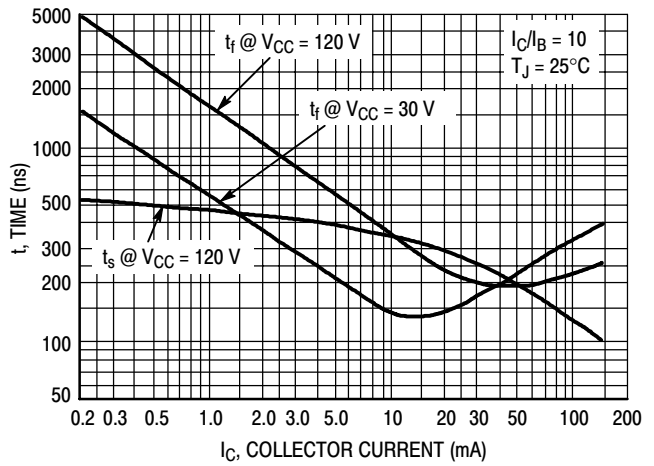
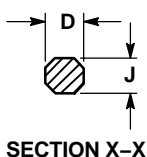
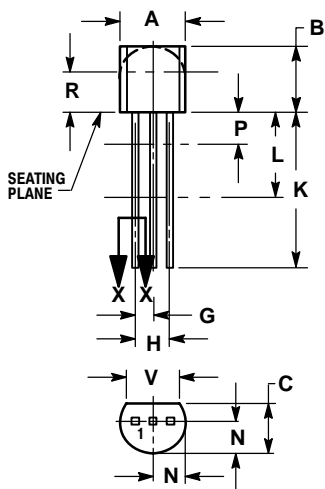


Figure 9. Turn-Off Time

2N5550, 2N5551

PACKAGE DIMENSIONS

TO-92
TO-226AA
CASE 29-11
ISSUE AL




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 | --- |

STYLE 1:

1. EMITTER
2. BASE
3. COLLECTOR

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