

# 2N5550, 2N5551

Preferred Device

## Amplifier Transistors

### NPN Silicon

#### Features

- Pb-Free Packages are Available\*

#### 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	mA <sub>dc</sub>
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	625 5.0	mW mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	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

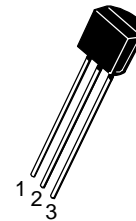
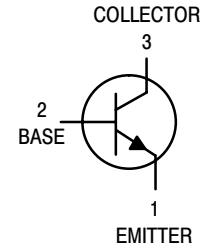
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	200	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	83.3	$^\circ\text{C}/\text{W}$

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.



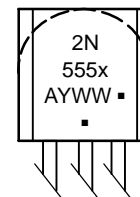
**ON Semiconductor**<sup>®</sup>

<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.

## 2N5550, 2N5551

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

Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>				
Collector–Emitter Breakdown Voltage (Note 1) ( $I_C = 1.0\text{ mA}$ , $I_B = 0$ )	2N5550 2N5551	$V_{(BR)CEO}$	140 160	– – Vdc
Collector–Base Breakdown Voltage ( $I_C = 100\text{ }\mu\text{A}$ , $I_E = 0$ )	2N5550 2N5551	$V_{(BR)CBO}$	160 180	– – Vdc
Emitter–Base Breakdown Voltage ( $I_E = 10\text{ }\mu\text{A}$ , $I_C = 0$ )		$V_{(BR)EBO}$	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 $\mu\text{Adc}$
Emitter Cutoff Current ( $V_{EB} = 4.0\text{ Vdc}$ , $I_C = 0$ )		$I_{EBO}$	–	50 nAdc
<b>ON CHARACTERISTICS (Note 1)</b>				
DC Current Gain ( $I_C = 1.0\text{ mA}$ , $V_{CE} = 5.0\text{ Vdc}$ )  ( $I_C = 10\text{ mA}$ , $V_{CE} = 5.0\text{ Vdc}$ )  ( $I_C = 50\text{ mA}$ , $V_{CE} = 5.0\text{ Vdc}$ )	2N5550 2N5551 2N5550 2N5551 2N5550 2N5551	$h_{FE}$	60 80 60 80 20 30	– – 250 250 – –
Collector–Emitter Saturation Voltage ( $I_C = 10\text{ mA}$ , $I_B = 1.0\text{ mA}$ ) ( $I_C = 50\text{ mA}$ , $I_B = 5.0\text{ mA}$ )	Both Types 2N5550 2N5551	$V_{CE(sat)}$	– – –	0.15 0.25 0.20 Vdc
Base–Emitter Saturation Voltage ( $I_C = 10\text{ mA}$ , $I_B = 1.0\text{ mA}$ ) ( $I_C = 50\text{ mA}$ , $I_B = 5.0\text{ mA}$ )	Both Types 2N5550 2N5551	$V_{BE(sat)}$	– – –	1.0 1.2 1.0 Vdc
<b>SMALL–SIGNAL CHARACTERISTICS</b>				
Current–Gain — Bandwidth Product ( $I_C = 10\text{ mA}$ , $V_{CE} = 10\text{ Vdc}$ , $f = 100\text{ MHz}$ )		$f_T$	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 ( $I_C = 1.0\text{ mA}$ , $V_{CE} = 10\text{ Vdc}$ , $f = 1.0\text{ kHz}$ )		$h_{fe}$	50	200 –
Noise Figure ( $I_C = 250\text{ }\mu\text{A}$ , $V_{CE} = 5.0\text{ Vdc}$ , $R_S = 1.0\text{ k}\Omega$ , $f = 1.0\text{ kHz}$ )	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

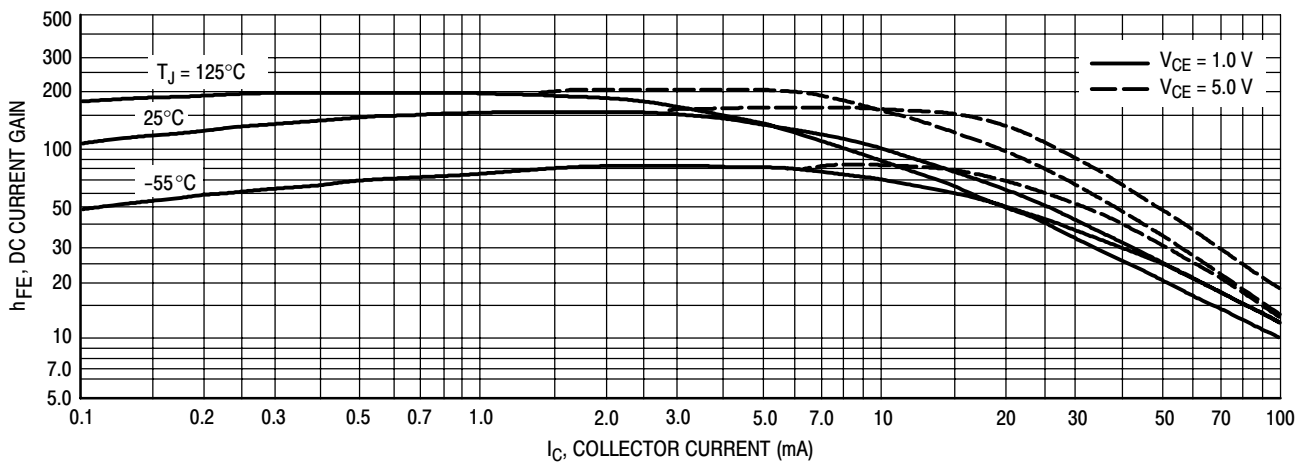


Figure 1. DC Current Gain

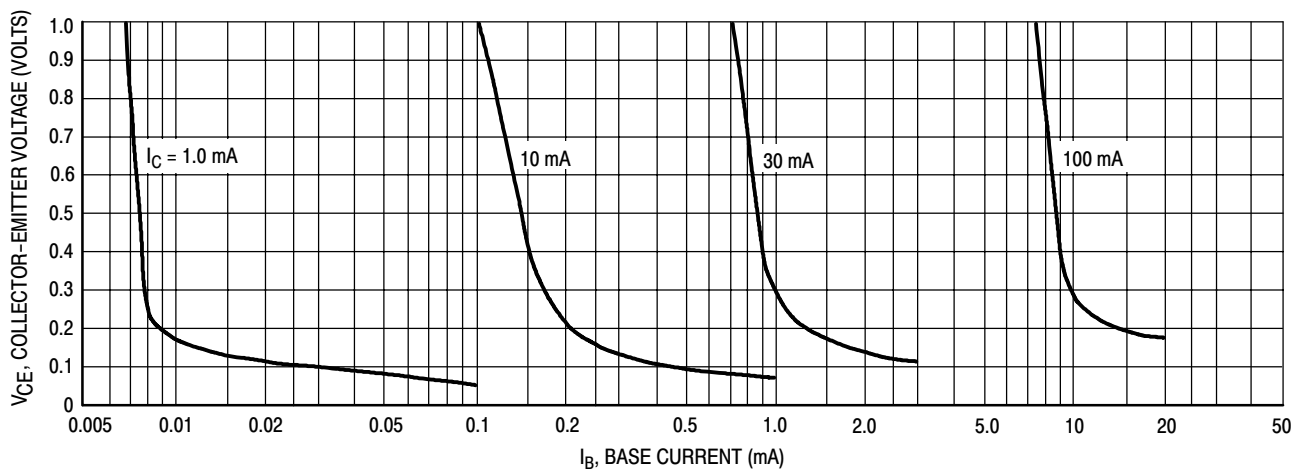


Figure 2. Collector Saturation Region

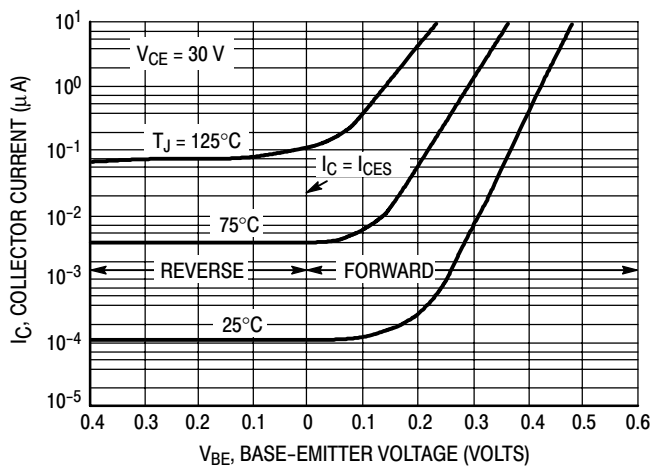


Figure 3. Collector Cut-Off Region

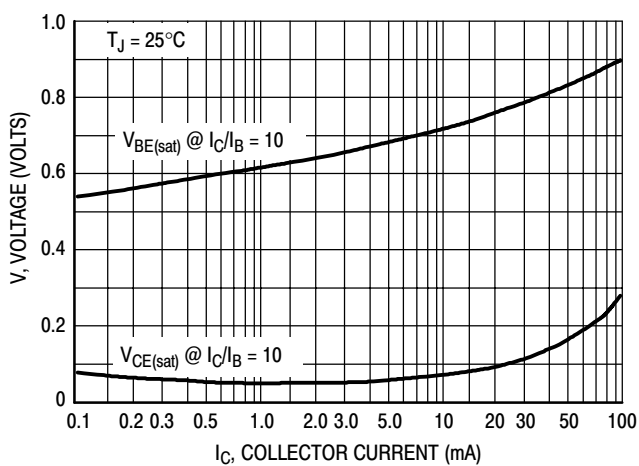


Figure 4. "On" Voltages

# 2N5550, 2N5551

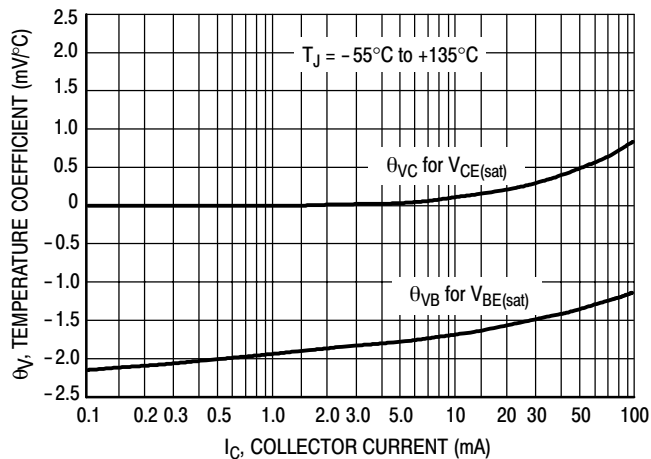


Figure 5. Temperature Coefficients

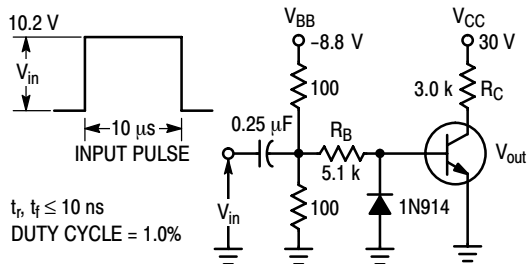


Figure 6. Switching Time Test Circuit

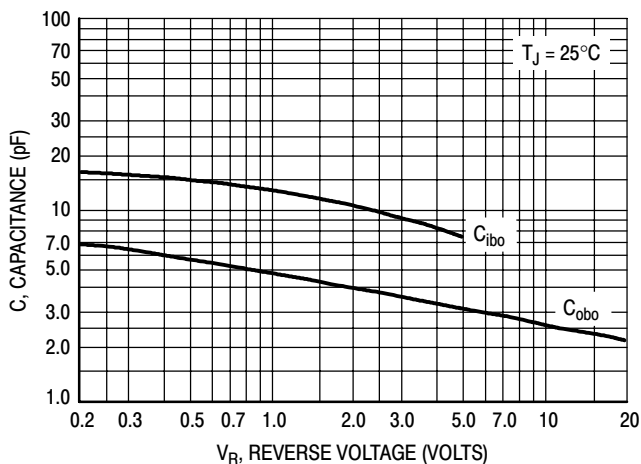


Figure 7. Capacitances

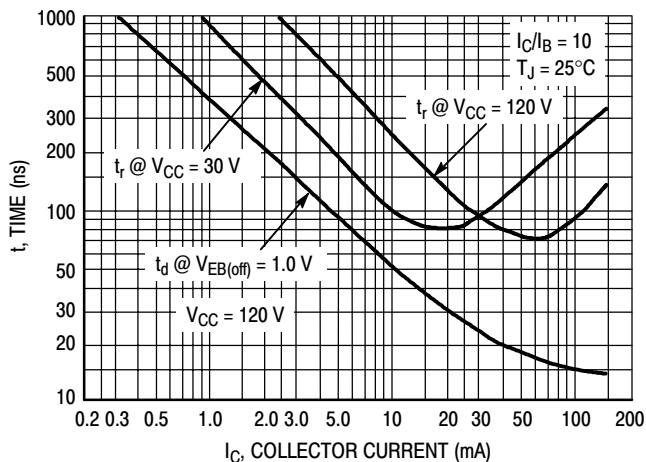


Figure 8. Turn-On Time

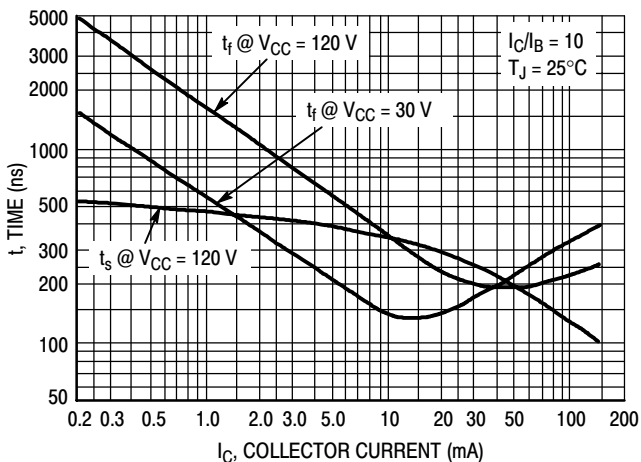


Figure 9. Turn-Off Time

## 2N5550, 2N5551

### ORDERING INFORMATION

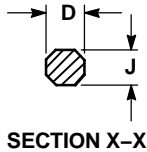
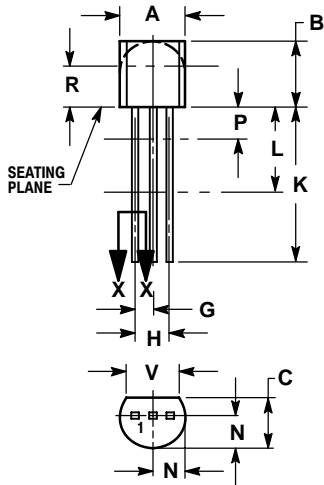
Device	Package	Shipping†
2N5550	TO-92	5000 Units / Box
2N5550G	TO-92 (Pb-Free)	
2N5550RLRA	TO-92	2000 / Tape & Reel
2N5550RLRAG	TO-92 (Pb-Free)	
2N5550RLRP	TO-92	2000 / Tape & Ammo Box
2N5550RLRPG	TO-92 (Pb-Free)	
2N5551	TO-92	5000 Units / Box
2N5551G	TO-92 (Pb-Free)	
2N5551RL1	TO-92	2000 / Tape & Reel
2N5551RL1G	TO-92 (Pb-Free)	
2N5551RLRA	TO-92	
2N5551RLRAG	TO-92 (Pb-Free)	
2N5551RLRM	TO-92	2000 / Tape & Ammo Box
2N5551RLRMG	TO-92 (Pb-Free)	
2N5551RLRP	TO-92	
2N5551RLRPG	TO-92 (Pb-Free)	
2N5551ZL1	TO-92	
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-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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