

NPN General-Purpose Amplifier

2N5551

Description

This device is designed for general-purpose high-voltage amplifiers and gas discharge display drivers.

Features

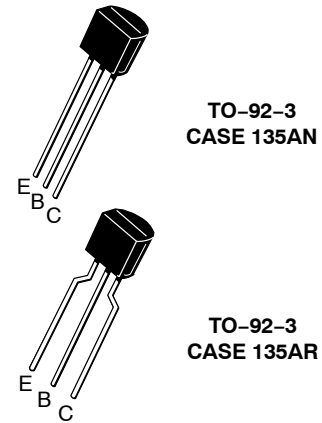
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

ABSOLUTE MAXIMUM RATINGS (Note 1)

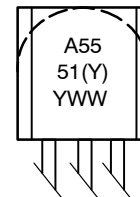
Symbol	Parameter	Value	Unit
V_{CEO}	Collector-Emmitter Voltage	160	V
V_{CBO}	Collector-Base Voltage	180	V
V_{EBO}	Emitter-Base Voltage	6	V
I_C	Collector Current - Continuous	600	mA
T_J, T_{STG}	Operating and Storage Temperature (Note 2)	-55 to + 150	°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.
2. These ratings are based on a maximum junction temperature of 150°C. These are steady-state limits. **onsemi** should be consulted on applications involving pulsed or low-duty cycle operations.



MARKING DIAGRAM



- A = Assembly Location
- 5551(Y) = Specific Device Code
- Y = Year
- WW = Work Week

ORDERING INFORMATION

See detailed ordering and shipping information on page 5 of this data sheet.

2N5551

THEMAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted) (Note 3)

Symbol	Characteristic	Max	Unit
P_D	Total Device Dissipation	625	mW
	Derate Above 25°C	5.0	mW/ $^\circ\text{C}$
$R_{\theta JC}$	Thermal Resistance, Junction to Case	83.3	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	200	$^\circ\text{C}/\text{W}$

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted) (Note 4)

Symbol	Parameter	Test Conditions	Min	Max	Unit
$V_{(BR)CEO}$	Collector–Emitter Breakdown Voltage	$I_C = 1.0\text{ mA}, I_B = 0$	160		V
$V_{(BR)CBO}$	Collector–Base Breakdown Voltage	$I_C = 100\ \mu\text{A}, I_E = 0$	180		V
$V_{(BR)EBO}$	Emitter–Base Breakdown Voltage	$I_E = 10\ \mu\text{A}, I_C = 0$	6.0		V
I_{CBO}	Collector Cut–Off Current	$V_{CB} = 120\text{ V}, I_E = 0$		50	nA
		$V_{CB} = 120\text{ V}, I_E = 0\text{ V}, T_A = 100^\circ\text{C}$		50	μA
I_{EBO}	Emitter Cut–Off Current	$V_{EB} = 4.0\text{ V}, I_C = 0$		50	nA

ON CHARACTERISTICS

h_{FE}	DC Current Gain	$I_C = 1.0\text{ mA}, V_{CE} = 5.0\text{ V}$	80		
		$I_C = 10\text{ mA}, V_{CE} = 5.0\text{ V}$	80	250	
		$I_C = 10\text{ mA}, V_{CE} = 5.0\text{ V}$ (for 2N5551YBU, 2N5551YTA)	180	240	
		$I_C = 50\text{ mA}, V_{CE} = 5.0\text{ V}$	30		
$V_{CE(sat)}$	Collector–Emitter Saturation Voltage	$I_C = 10\text{ mA}, I_B = 1.0\text{ mA}$		0.15	V
		$I_C = 50\text{ mA}, I_B = 5.0\text{ mA}$		0.20	V
$V_{BE(sat)}$	Base–Emitter On Voltage	$I_C = 10\text{ mA}, I_B = 1.0\text{ mA}$		1.0	V
		$I_C = 50\text{ mA}, I_B = 5.0\text{ mA}$		1.0	V

SMALL–SIGNAL CHARACTERISTICS

f_T	Current Gain Bandwidth Product	$I_C = 10\text{ mA}, V_{CE} = 10\text{ V}, f = 100\text{ MHz}$	100		MHz
C_{obo}	Output Capacitance	$V_{CB} = 10\text{ V}, I_E = 0, f = 1.0\text{ MHz}$		6.0	pF
C_{ibo}	Input Capacitance	$V_{BE} = 0.5\text{ V}, I_C = 0, f = 1.0\text{ MHz}$		20	pF
H_{fe}	Small–Signal Current Gain	$I_C = 1.0\text{ mA}, V_{CE} = 10\text{ V}, f = 1.0\text{ kHz}$	50	250	
NF	Noise Figure	$I_C = 250\ \mu\text{A}, V_{CE} = 5.0\text{ V}, R_S = 1.0\text{ k}\Omega, f = 10\text{ Hz to }15.7\text{ kHz}$		8.0	dB

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

3. PCB board size FR–4 $76 \times 114 \times 0.6\text{ T mm}^3$ (3.0 inch x 4.5 inch x 0.062 inch) with minimum land pattern size.

4. Pulse test: pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2.0\%$.

TYPICAL PERFORMANCE CHARACTERISTICS

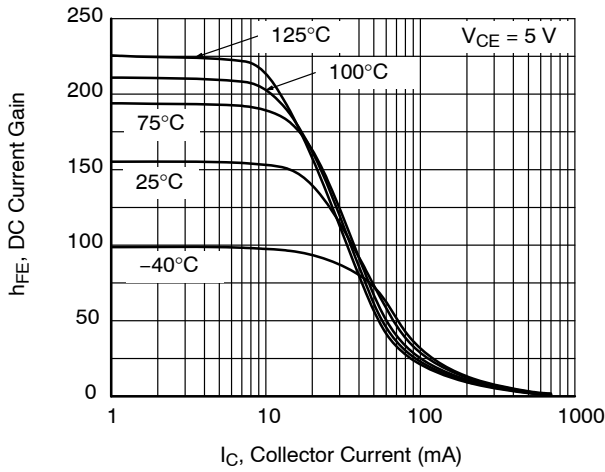


Figure 1. Typical Pulsed Current Gain vs. Collector Current

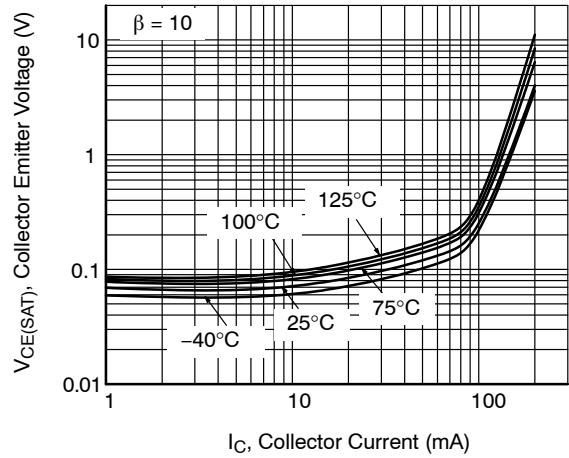


Figure 2. Collector-Emitter Saturation Voltage vs. Collector Current

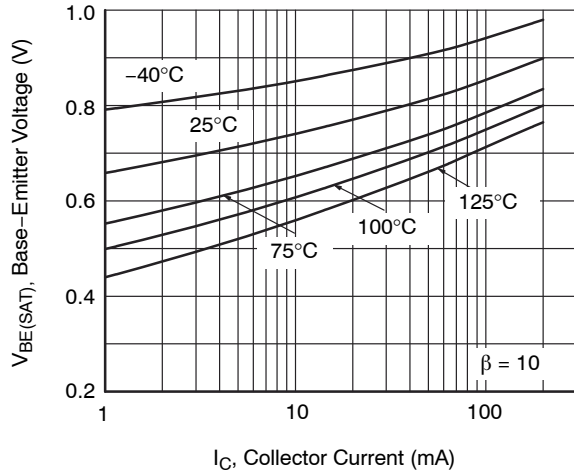


Figure 3. Base-Emitter Saturation Voltage vs. Collector Current

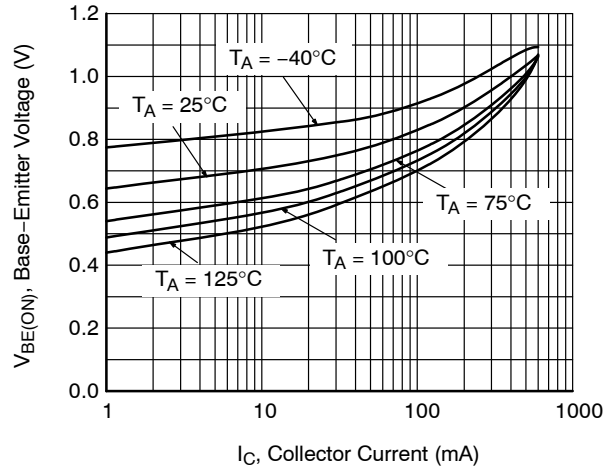


Figure 4. Base-Emitter On Voltage vs. Collector Current

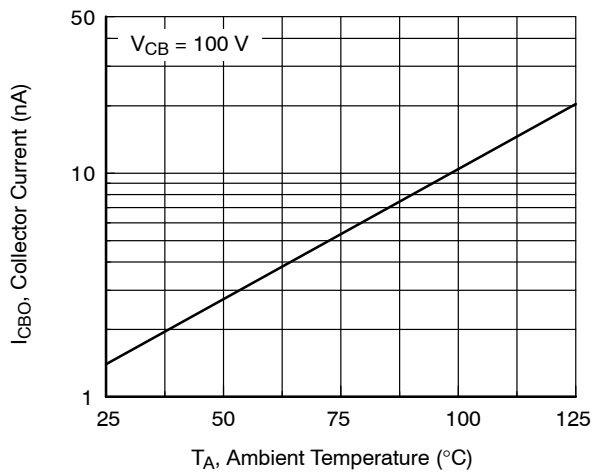


Figure 5. Collector Cut-Off Current vs. Ambient Temperature

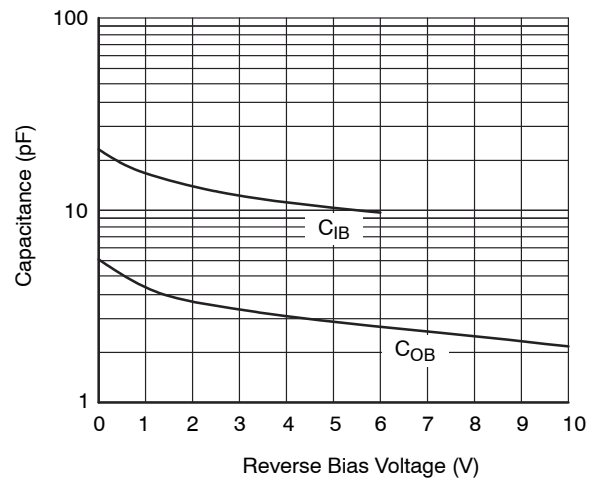


Figure 6. Input and Output Capacitance vs. Reverse Voltage

TYPICAL PERFORMANCE CHARACTERISTICS (continued)

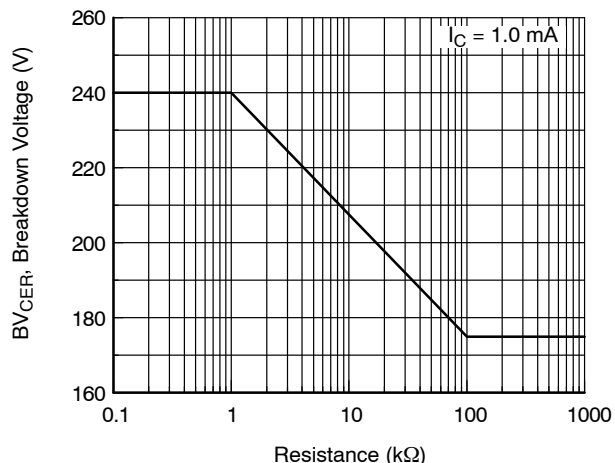


Figure 7. Collector-Emitter Breakdown Voltage with Resistance between Emitter-Base

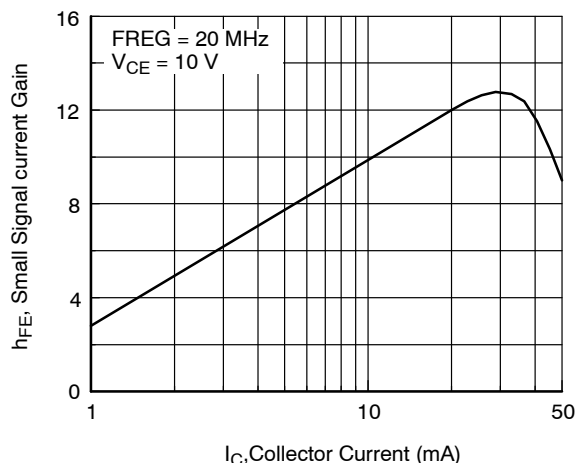


Figure 8. Small Signal Current Gain vs. Collector Current

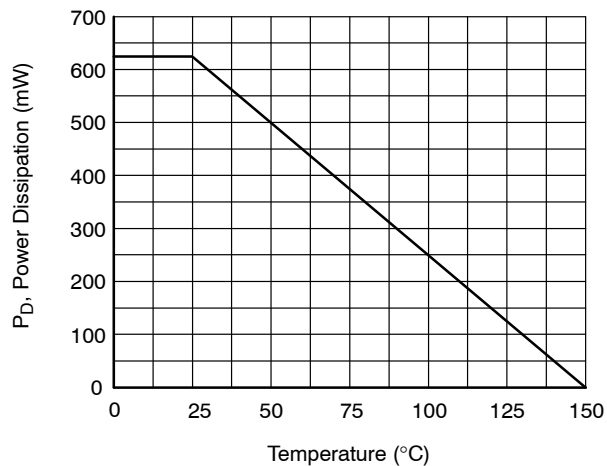


Figure 9. Power Dissipation vs. Ambient Temperature

2N5551

ORDERING INFORMATION (Note 5)

Part Number	Top Mark	Package	Shipping [†]
2N5551TA	5551	TO-92-3 (Pb-Free)	2,000 / Ammo Pack
2N5551TFR	5551	TO-92-3 (Pb-Free)	2,000 / Tape & Reel
2N5551TF	5551	TO-92-3 (Pb-Free)	2,000 / Tape & Reel
2N5551BU	5551	TO-92-3 (Pb-Free)	10,000 / Bulk Bag
2N5551YBU	5551Y	TO-92-3 (Pb-Free)	10,000 / Bulk Bag
2N5551YTA	5551Y	TO-92-3 (Pb-Free)	2,000 / Ammo Pack

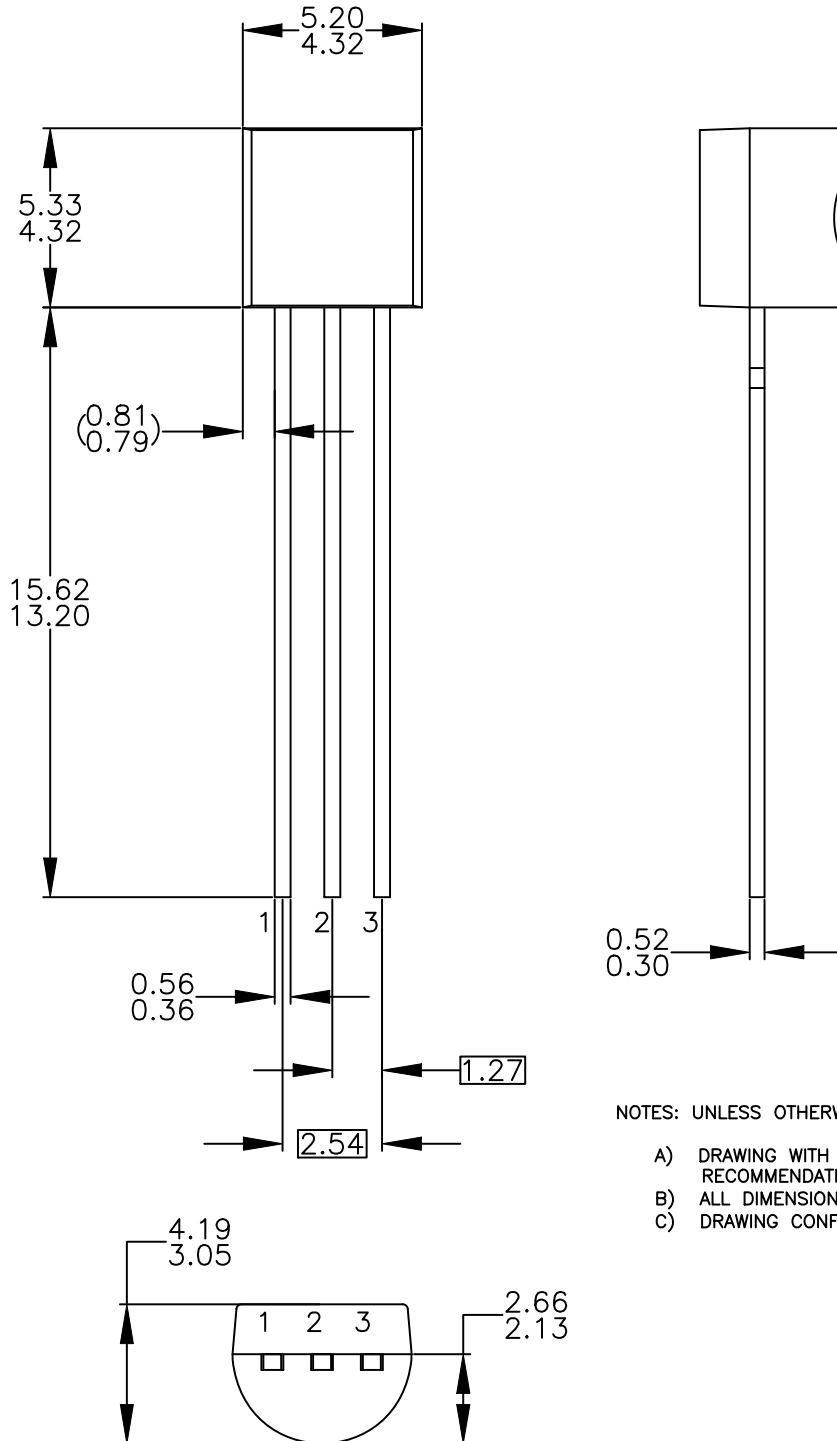
[†]For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

5. Suffix "-Y" means h_{FE} 180-240 in 2N5551 (Test condition: $I_C = 10$ mA, $V_{CE} = 5.0$ V)

MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS

TO-92 3 4.825x4.76
CASE 135AN
ISSUE O

DATE 31 JUL 2016



NOTES: UNLESS OTHERWISE SPECIFIED

- A) DRAWING WITH REFERENCE TO JEDEC TO-92 RECOMMENDATIONS.
- B) ALL DIMENSIONS ARE IN MILLIMETERS.
- C) DRAWING CONFORMS TO ASME Y14.5M-2009.

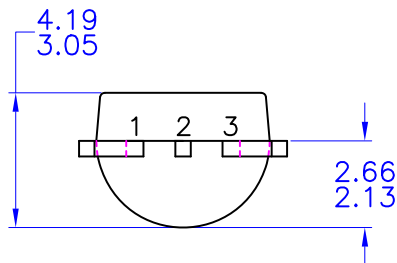
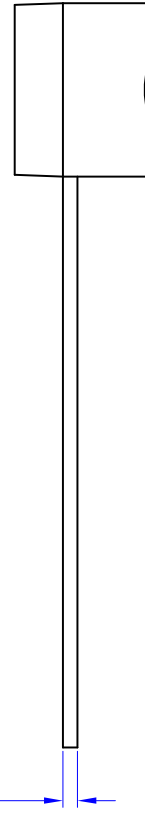
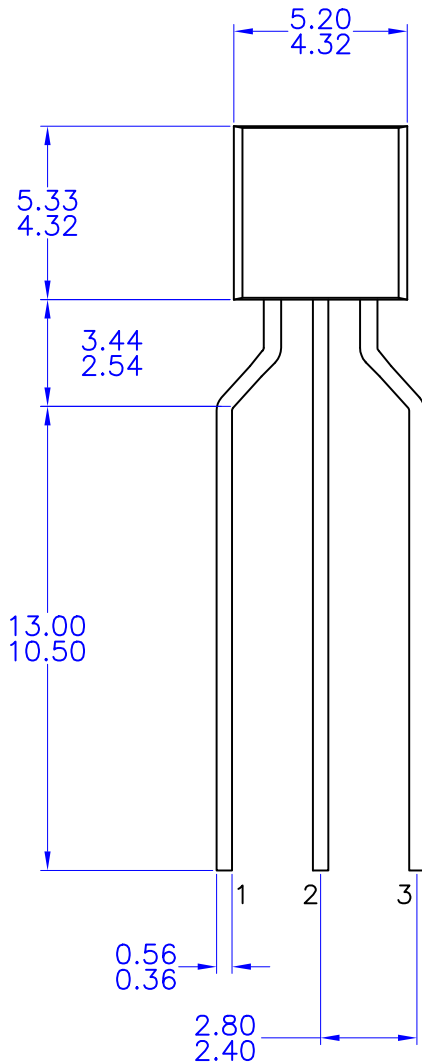
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MECHANICAL CASE OUTLINE
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TO-92 3 4.83x4.76 LEADFORMED
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DATE 30 SEP 2016



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