

Amplifier Transistors

NPN Silicon

2N5550

2N5551*

*ON Semiconductor Preferred Device

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/°C
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	1.5 12		Watts mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-55 to +150		°C

THERMAL CHARACTERISTICS

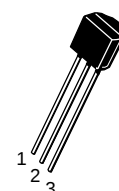
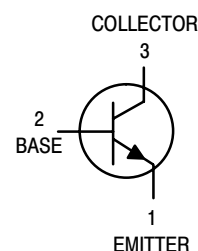
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	200	°C/W
Thermal Resistance, Junction to Case	$R_{\theta JC}$	83.3	°C/W

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

Characteristic	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage ⁽¹⁾ ($I_C = 1.0 \text{ mAdc}$, $I_E = 0$)	2N5550 2N5551	$V_{(BR)CEO}$	140 160	—	Vdc
Collector-Base Breakdown Voltage ($I_C = 100 \mu\text{Adc}$, $I_E = 0$)	2N5550 2N5551	$V_{(BR)CBO}$	160 180	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 10 \mu\text{Adc}$, $I_C = 0$)		$V_{(BR)EBO}$	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

1. Pulse Test: Pulse Width = 300 μs , Duty Cycle = 2.0%.CASE 29-11, STYLE 1
TO-92 (TO-226AA)

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

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

Characteristic		Symbol	Min	Max	Unit
ON CHARACTERISTICS(1)					
DC Current Gain ($I_C = 1.0\text{ mA}$, $V_{CE} = 5.0\text{ Vdc}$)	2N5550	h_{FE}	60	—	—
	2N5551		80	—	
($I_C = 10\text{ mA}$, $V_{CE} = 5.0\text{ Vdc}$)	2N5550		60	250	
	2N5551		80	250	
($I_C = 50\text{ mA}$, $V_{CE} = 5.0\text{ Vdc}$)	2N5550		20	—	
	2N5551		30	—	
Collector–Emitter Saturation Voltage ($I_C = 10\text{ mA}$, $I_B = 1.0\text{ mA}$)	Both Types	$V_{CE(sat)}$	—	0.15	Vdc
			—	0.25	
			—	0.20	
($I_C = 50\text{ mA}$, $I_B = 5.0\text{ mA}$)	2N5550		—	1.0	
	2N5551		—	1.2	
Base–Emitter Saturation Voltage ($I_C = 10\text{ mA}$, $I_B = 1.0\text{ mA}$)	Both Types	$V_{BE(sat)}$	—	1.0	Vdc
			—	1.2	
			—	1.0	
($I_C = 50\text{ mA}$, $I_B = 5.0\text{ mA}$)	2N5550		—	1.2	
	2N5551		—	1.0	

SMALL–SIGNAL CHARACTERISTICS

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	C_{ibo}	—	30	pF
	2N5551		—	20	
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	NF	—	10	dB
	2N5551		—	8.0	

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

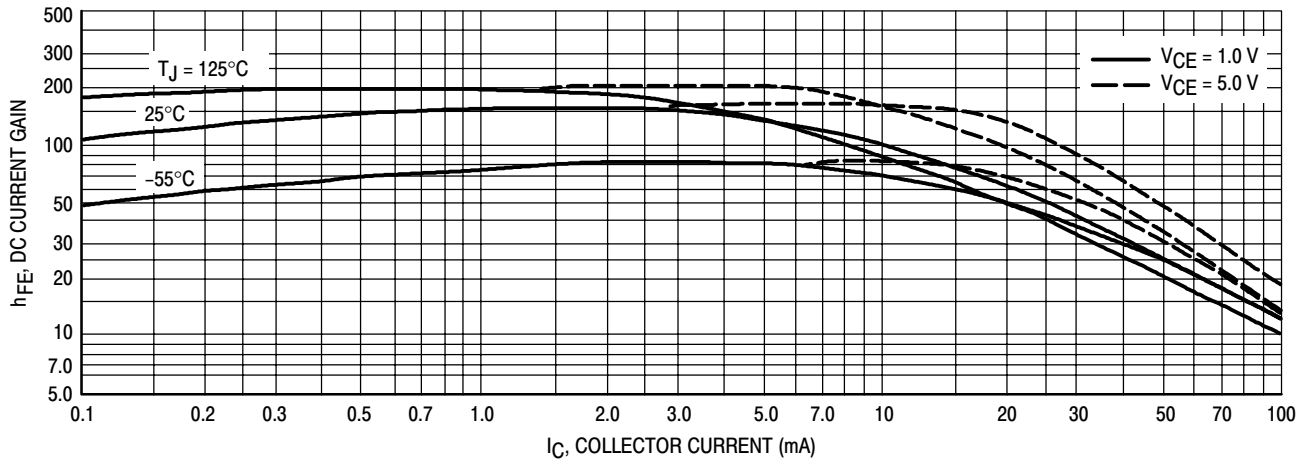


Figure 1. DC Current Gain

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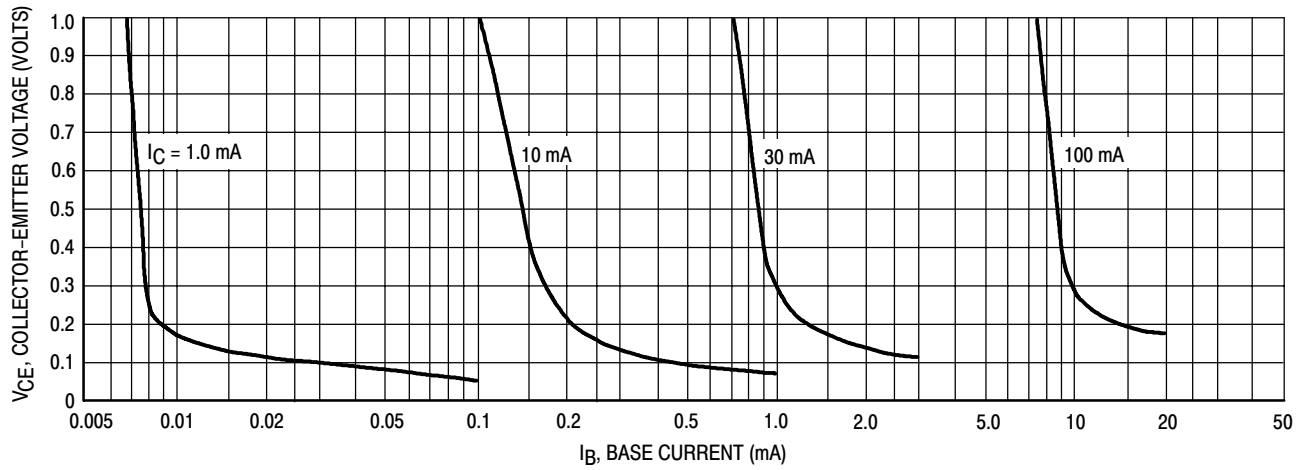


Figure 2. Collector Saturation Region

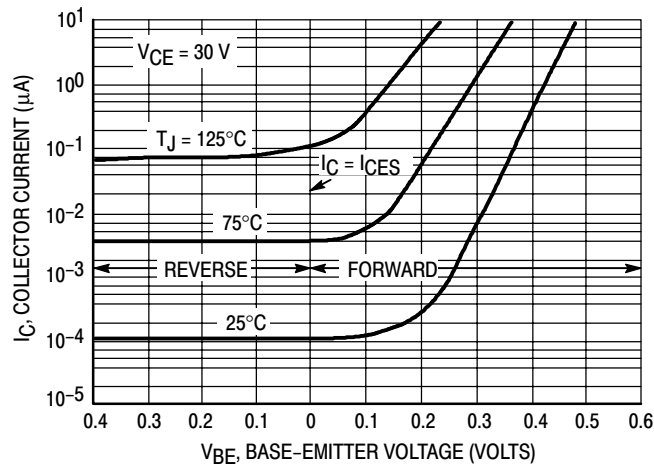


Figure 3. Collector Cut-Off Region

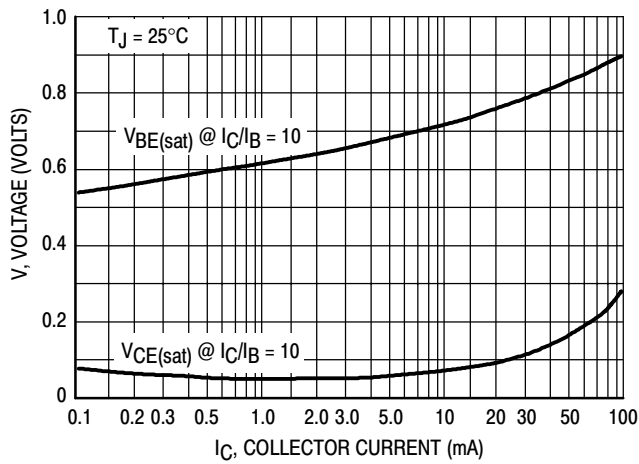


Figure 4. "On" Voltages

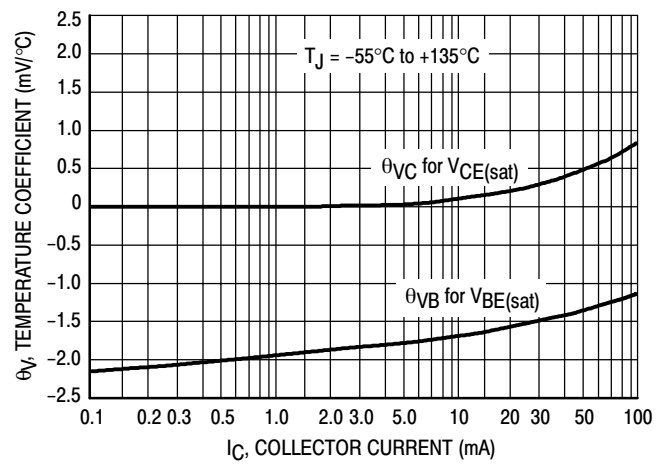
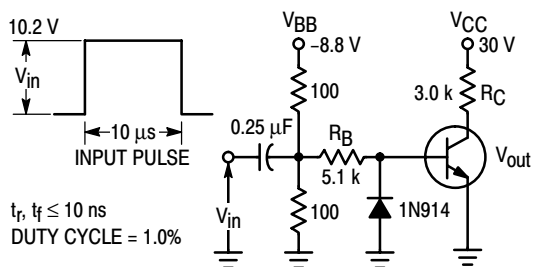


Figure 5. Temperature Coefficients



Values Shown are for I_C @ 10 mA

Figure 6. Switching Time Test Circuit

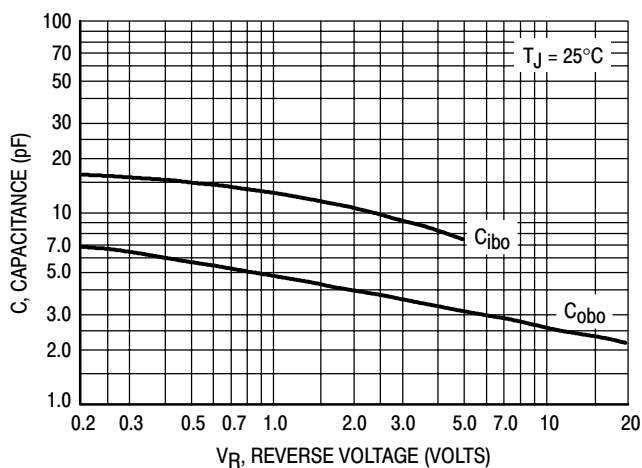


Figure 7. Capacitances

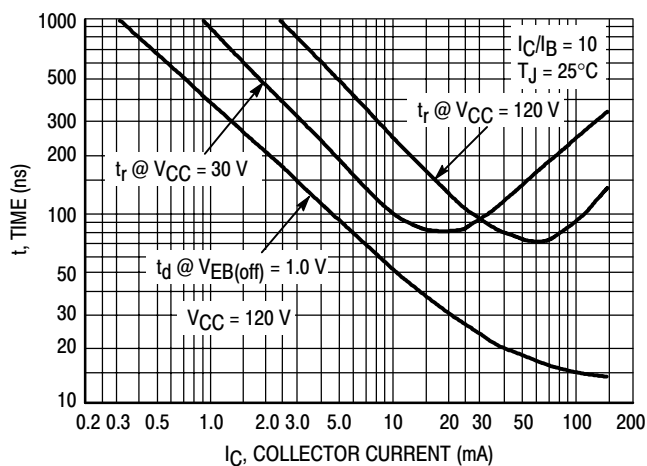


Figure 8. Turn-On Time

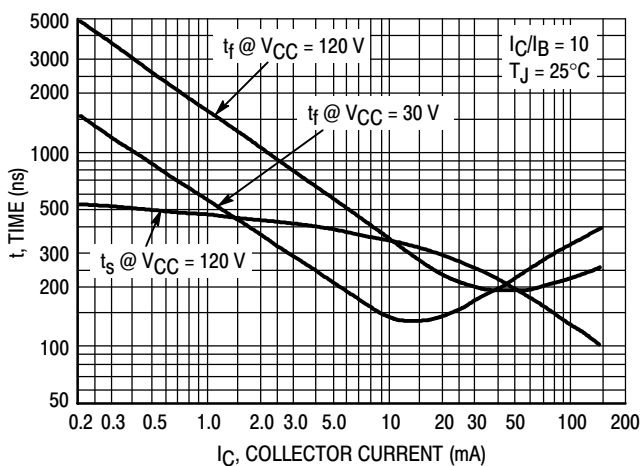
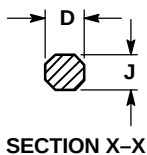
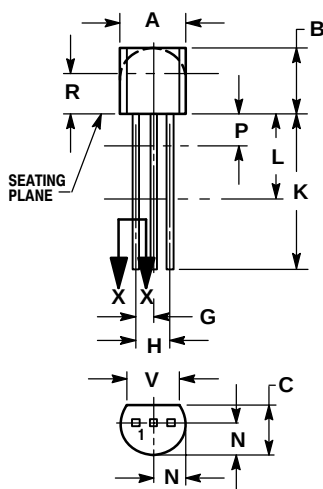


Figure 9. Turn-Off Time

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PACKAGE DIMENSIONS

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



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

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	---

Notes

Notes

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