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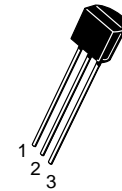
Low Noise Transistors

NPN Silicon

BC549B,C
BC550B,C

MAXIMUM RATINGS

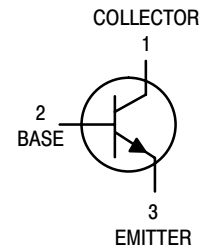
Rating	Symbol	BC549	BC550	Unit
Collector–Emitter Voltage	V_{CEO}	30	45	Vdc
Collector–Base Voltage	V_{CBO}	30	50	Vdc
Emitter–Base Voltage	V_{EBO}	5.0		Vdc
Collector Current — Continuous	I_C	100		mAdc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	625	5.0	mW mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	1.5	12	Watt mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	–55 to +150		$^\circ\text{C}$



CASE 29–04, STYLE 17
TO–92 (TO–226AA)

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	$^\circ\text{C}/\text{W}$



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

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Collector–Emitter Breakdown Voltage ($I_C = 10 \text{ mAdc}, I_B = 0$)	BC549B,C BC550B,C	$V_{(BR)CEO}$	30 45	— —	— —	Vdc
Collector–Base Breakdown Voltage ($I_C = 10 \mu\text{Adc}, I_E = 0$)	BC549B,C BC550B,C	$V_{(BR)CBO}$	30 50	— —	— —	Vdc
Emitter–Base Breakdown Voltage ($I_E = 10 \mu\text{Adc}, I_C = 0$)		$V_{(BR)EBO}$	5.0	—	—	Vdc
Collector Cutoff Current ($V_{CB} = 30 \text{ V}, I_E = 0$) ($V_{CB} = 30 \text{ V}, I_E = 0, T_A = +125^\circ\text{C}$)		I_{CBO}	— —	— —	15 5.0	nAdc μAdc
Emitter Cutoff Current ($V_{EB} = 4.0 \text{ Vdc}, I_C = 0$)		I_{EBO}	—	—	15	nAdc

BC549B,C BC550B,C

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

Characteristic	Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS					
DC Current Gain ($I_C = 10 \mu\text{A}$, $V_{CE} = 5.0 \text{ Vdc}$)	h_{FE}	100	150	—	—
BC549B/550B		100	270	—	—
($I_C = 2.0 \text{ mA}$, $V_{CE} = 5.0 \text{ Vdc}$)		200	290	450	—
BC549B/550B		420	500	800	—
BC549C/550C					
Collector–Emitter Saturation Voltage ($I_C = 10 \text{ mA}$, $I_B = 0.5 \text{ mA}$)	$V_{CE(sat)}$	—	0.075	0.25	Vdc
($I_C = 10 \text{ mA}$, $I_B = \text{see note 1}$)		—	0.3	0.6	
($I_C = 100 \text{ mA}$, $I_B = 5.0 \text{ mA}$, see note 2)		—	0.25	0.6	
Base–Emitter Saturation Voltage ($I_C = 100 \text{ mA}$, $I_B = 5.0 \text{ mA}$)	$V_{BE(sat)}$	—	1.1	—	Vdc
Base–Emitter On Voltage ($I_C = 10 \mu\text{A}$, $V_{CE} = 5.0 \text{ Vdc}$)	$V_{BE(on)}$	—	0.52	—	Vdc
($I_C = 100 \mu\text{A}$, $V_{CE} = 5.0 \text{ Vdc}$)		—	0.55	—	
($I_C = 2.0 \text{ mA}$, $V_{CE} = 5.0 \text{ Vdc}$)		0.55	0.62	0.7	

SMALL–SIGNAL CHARACTERISTICS

Current–Gain — Bandwidth Product ($I_C = 10 \text{ mA}$, $V_{CE} = 5.0 \text{ Vdc}$, $f = 100 \text{ MHz}$)	f_T	—	250	—	MHz
Collector–Base Capacitance ($V_{CB} = 10 \text{ Vdc}$, $I_E = 0$, $f = 1.0 \text{ MHz}$)	C_{cbo}	—	2.5	—	pF
Small–Signal Current Gain ($I_C = 2.0 \text{ mA}$, $V_{CE} = 5.0 \text{ V}$, $f = 1.0 \text{ kHz}$)	h_{fe}	240	330	500	—
BC549B/BC550B		450	600	900	—
BC549C/BC550C					
Noise Figure ($I_C = 200 \mu\text{A}$, $V_{CE} = 5.0 \text{ Vdc}$, $R_S = 2.0 \text{ k}\Omega$, $f = 1.0 \text{ kHz}$)	NF_1	—	0.6	2.5	dB
($I_C = 200 \mu\text{A}$, $V_{CE} = 5.0 \text{ Vdc}$, $R_S = 100 \text{ k}\Omega$, $f = 1.0 \text{ kHz}$)	NF_2	—	—	10	

NOTES:

- I_B is value for which $I_C = 11 \text{ mA}$ at $V_{CE} = 1.0 \text{ V}$.
- Pulse test = $300 \mu\text{s}$ – Duty cycle = 2%.

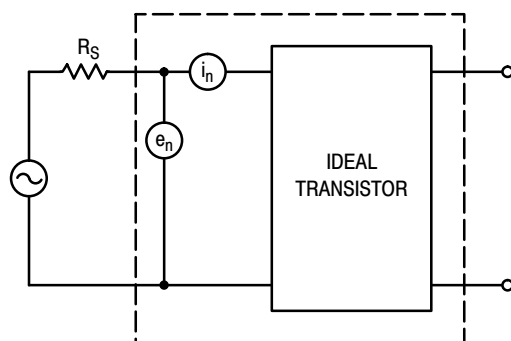


Figure 1. Transistor Noise Model

BC549B,C BC550B,C

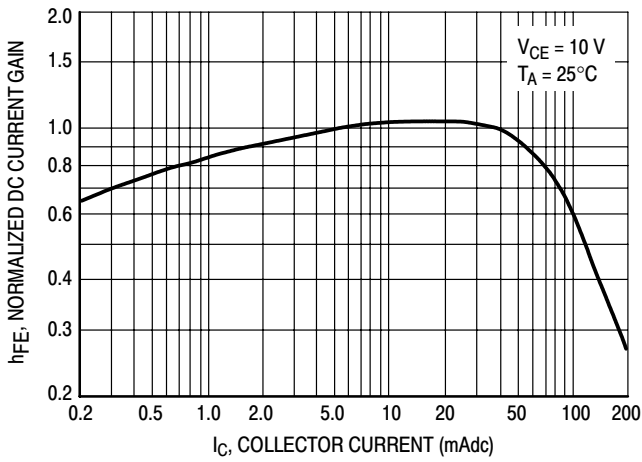


Figure 2. Normalized DC Current Gain

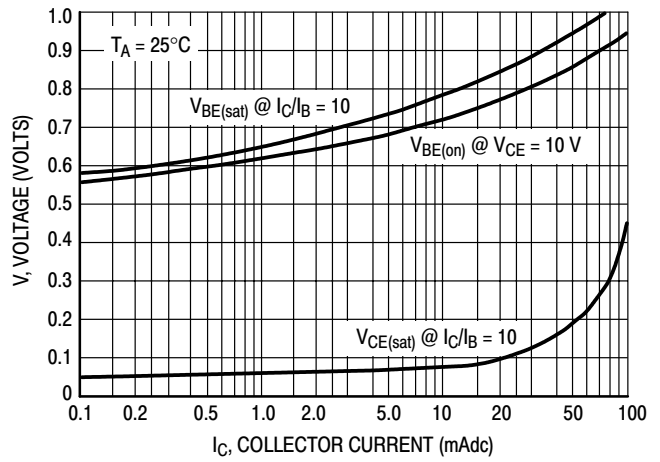


Figure 3. "Saturation" and "On" Voltages

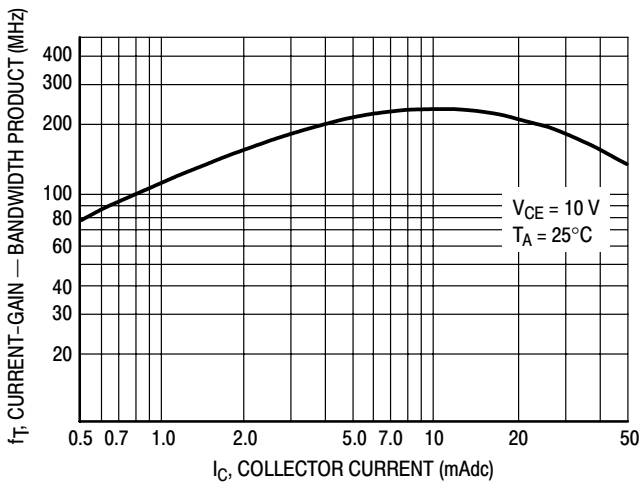


Figure 4. Current-Gain — Bandwidth Product

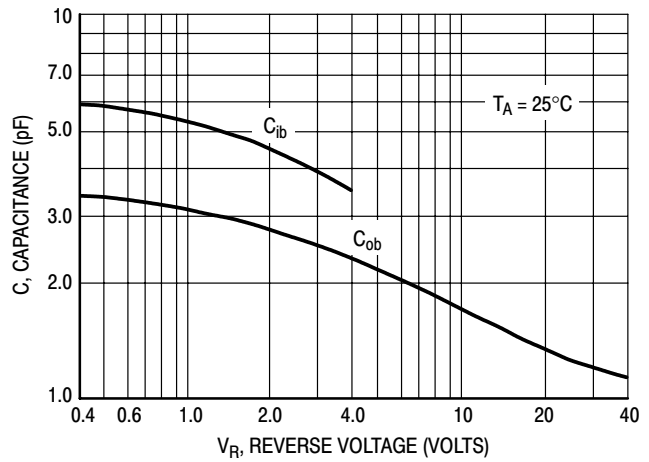


Figure 5. Capacitance

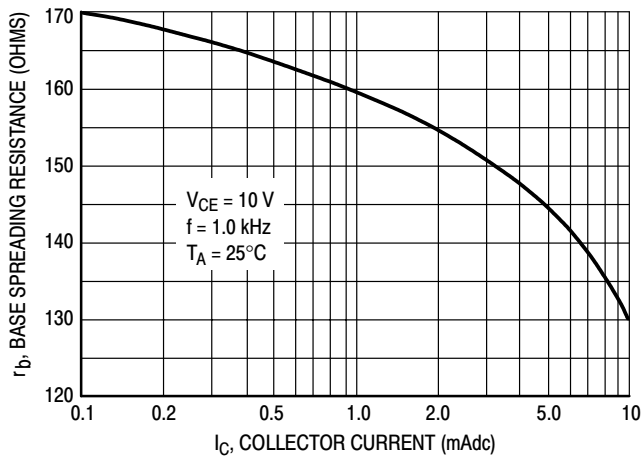
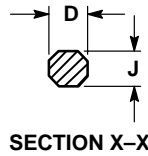
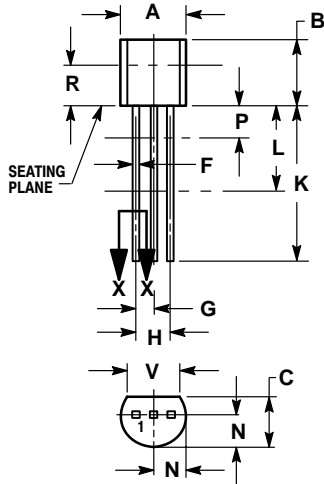


Figure 6. Base Spreading Resistance

BC549B,C BC550B,C

PACKAGE DIMENSIONS

CASE 029-04 (TO-226AA) ISSUE AD




NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. DIMENSION F APPLIES BETWEEN P AND L. DIMENSION D AND J APPLY BETWEEN L AND K MINIMUM. 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	0.022	0.41	0.55
F	0.016	0.019	0.41	0.48
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 17:

1. COLLECTOR
2. BASE
3. EMITTER

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