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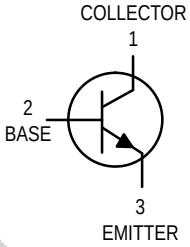
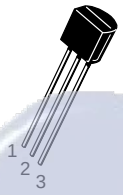
Low Noise Transistors
NPN Silicon

BC549B,C
BC550B,C





CASE 29–04, STYLE 17
TO–92 (TO–226AA)

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°C Derate above 25°C	P_D	625 5.0		mW mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	1.5 12		Watt 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°C unless otherwise noted)

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Collector–Emitter Breakdown Voltage (I_C = 10 mAdc, I_B = 0)	BC549B,C BC550B,C	$V_{(BR)CEO}$	 30 45	 — —	 — —	Vdc
Collector–Base Breakdown Voltage (I_C = 10 μAdc, I_E = 0)	BC549B,C BC550B,C	$V_{(BR)CBO}$	 30 50	 — —	 — —	Vdc
Emitter–Base Breakdown Voltage (I_E = 10 μAdc, I_C = 0)		$V_{(BR)EBO}$	5.0	—	—	Vdc
Collector Cutoff Current (V_{CB} = 30 V, I_E = 0) (V_{CB} = 30 V, I_E = 0, T_A = +125°C)		I_{CBO}	 — —	 — —	15 5.0	nAdc μAdc
Emitter Cutoff Current (V_{EB} = 4.0 Vdc, I_C = 0)		I_{EBO}	—	—	15	nAdc

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

Characteristic		Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS						
DC Current Gain		h_{FE}				—
(I_C = 10 µAdc, V_{CE} = 5.0 Vdc)	BC549B/550B		100	150	—	
	BC549C/550C		100	270	—	
(I_C = 2.0 mAdc, V_{CE} = 5.0 Vdc)	BC549B/550B		200	290	450	
	BC549C/550C		420	500	800	
Collector–Emitter Saturation Voltage		$V_{CE(sat)}$				Vdc
(I_C = 10 mAdc, I_B = 0.5 mAdc)			—	0.075	0.25	
(I_C = 10 mAdc, I_B = see note 1)			—	0.3	0.6	
(I_C = 100 mAdc, I_B = 5.0 mAdc, see note 2)			—	0.25	0.6	
Base–Emitter Saturation Voltage		$V_{BE(sat)}$	—	1.1	—	Vdc
(I_C = 100 mAdc, I_B = 5.0 mAdc)						
Base–Emitter On Voltage		$V_{BE(on)}$				Vdc
(I_C = 10 µAdc, V_{CE} = 5.0 Vdc)			—	0.52	—	
(I_C = 100 µAdc, V_{CE} = 5.0 Vdc)			—	0.55	—	
(I_C = 2.0 mAdc, V_{CE} = 5.0 Vdc)			0.55	0.62	0.7	
SMALL–SIGNAL CHARACTERISTICS						
Current–Gain — Bandwidth Product		f_T	—	250	—	MHz
(I_C = 10 mAdc, V_{CE} = 5.0 Vdc, f = 100 MHz)						
Collector–Base Capacitance		C_{cbo}	—	2.5	—	pF
(V_{CB} = 10 Vdc, I_E = 0, f = 1.0 MHz)						
Small–Signal Current Gain		h_{fe}				—
(I_C = 2.0 mAdc, V_{CE} = 5.0 V, f = 1.0 kHz)	BC549B/BC550B		240	330	500	
	BC549C/BC550C		450	600	900	
Noise Figure						dB
(I_C = 200 µAdc, V_{CE} = 5.0 Vdc, R_S = 2.0 kΩ, f = 1.0 kHz)		NF_1	—	0.6	2.5	
(I_C = 200 µAdc, V_{CE} = 5.0 Vdc, R_S = 100 kΩ, f = 1.0 kHz)		NF_2	—	—	10	

NOTES:
1. I_B is value for which I_C = 11 mA at V_{CE} = 1.0 V.
2. Pulse test = 300 µs – Duty cycle = 2%.

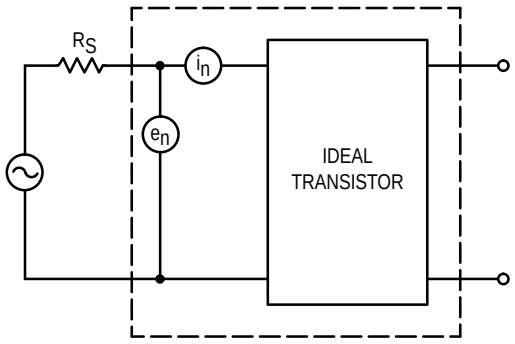

Figure 1. Transistor Noise Model

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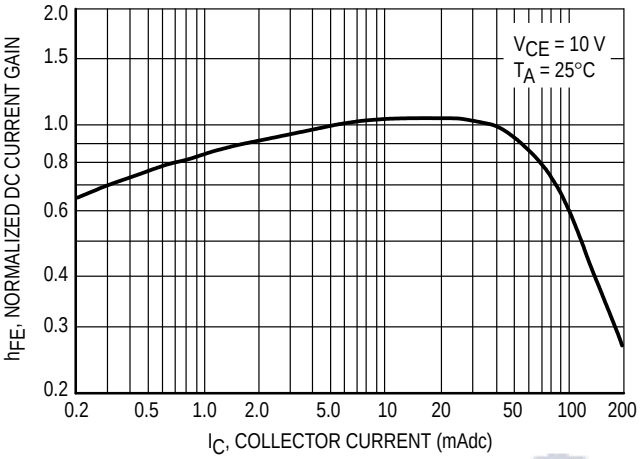

Figure 2. Normalized DC Current Gain

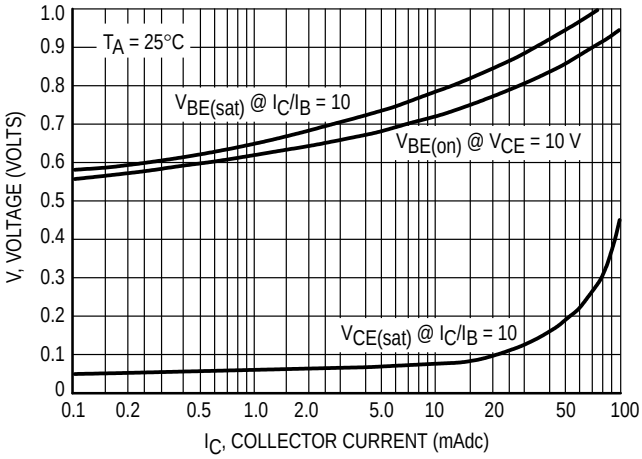

Figure 3. "Saturation" and "On" Voltages

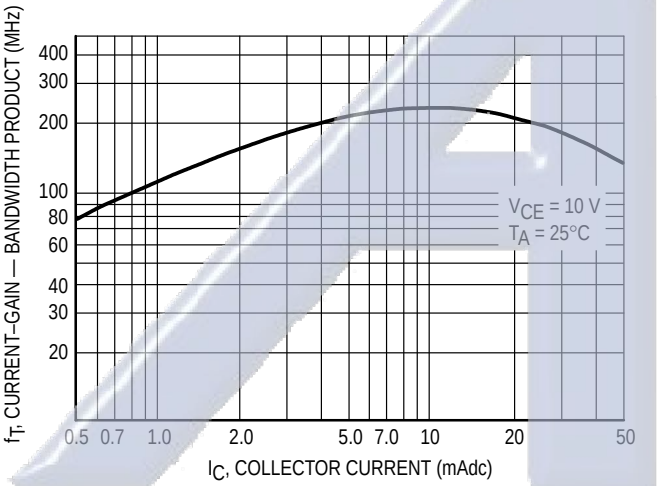

Figure 4. Current–Gain — Bandwidth Product

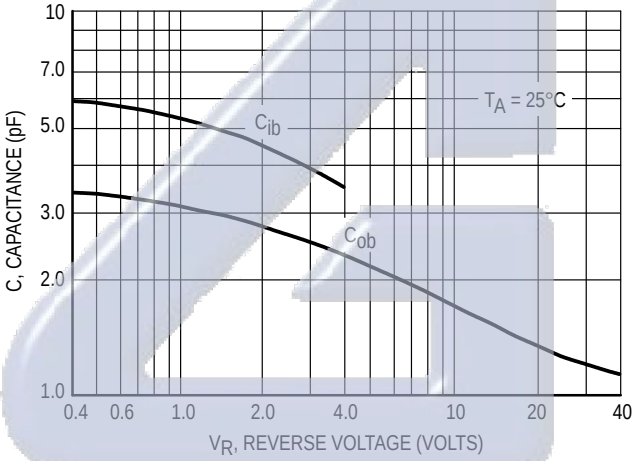

Figure 5. Capacitance

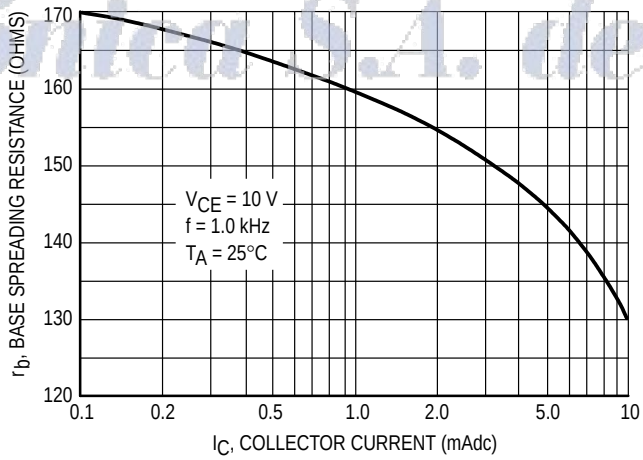

Figure 6. Base Spreading Resistance

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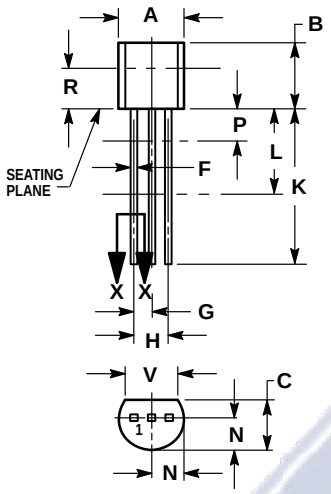
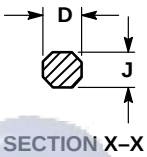
PACKAGE DIMENSIONS





SECTION X–X

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.

	INCHES		MILLIMETERS	
DIM	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	—

CASE 029–04
(TO–226AA)
ISSUE AD

STYLE 17:
PIN 1. COLLECTOR
2. BASE
3. EMITTER

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