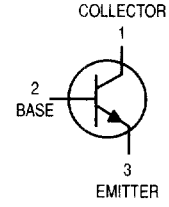
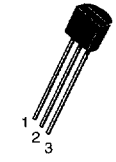
Low Noise Transistors
NPN Silicon

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

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%.

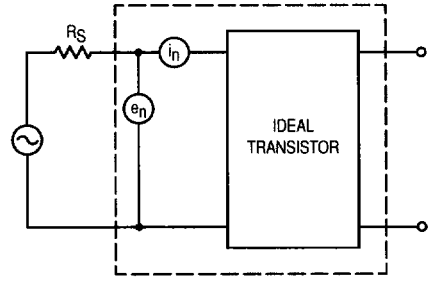


Figure 1. Transistor Noise Model

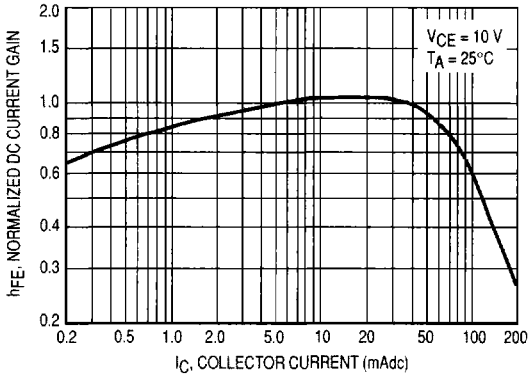


Figure 2. Normalized DC Current Gain

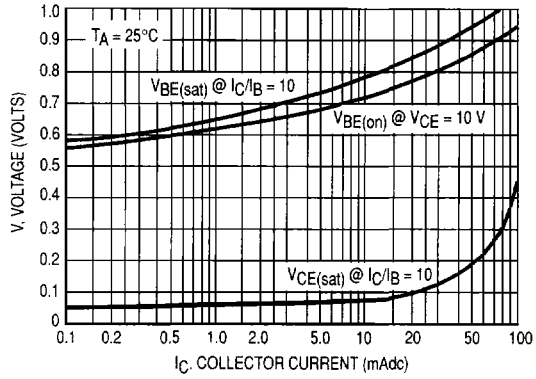


Figure 3. "Saturation" and "On" Voltages

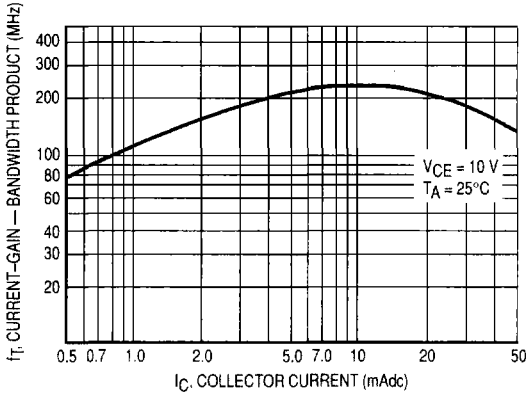


Figure 4. Current–Gain — Bandwidth Product

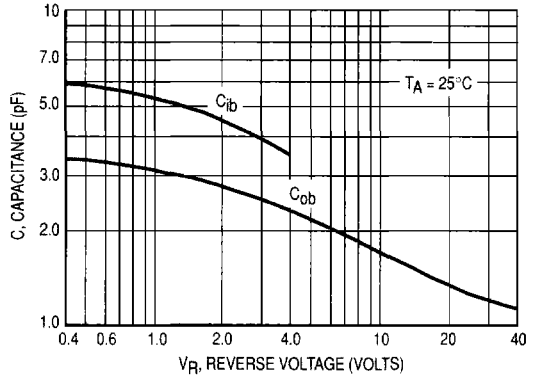


Figure 5. Capacitance

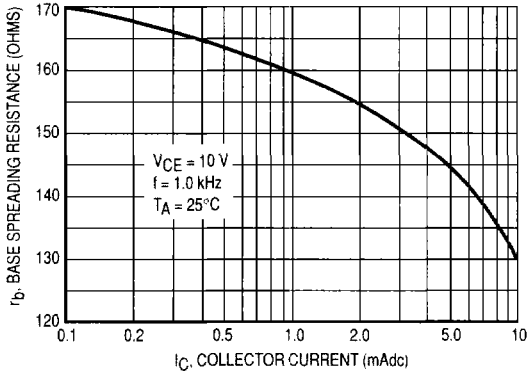


Figure 6. Base Spreading Resistance