

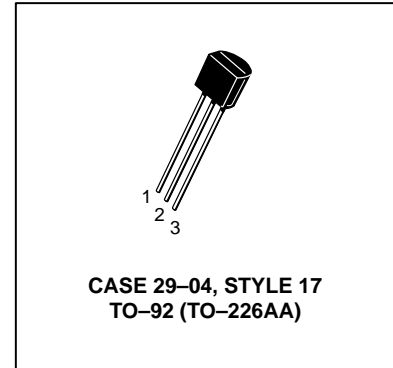
Low Noise Transistors

PNP Silicon

BC559B, C BC560C

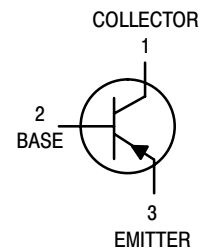
MAXIMUM RATINGS

Rating	Symbol	BC559	BC560	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		$^\circ\text{C}$



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 ($I_C = -10 \text{ mAdc}, I_B = 0$)	BC559 BC560	$V_{(BR)CEO}$	-30 -45	— —	— —	Vdc
Collector–Base Breakdown Voltage ($I_C = -10 \mu\text{Adc}, I_E = 0$)	BC559 BC560	$V_{(BR)CBO}$	-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 ($V_{CB} = -30 \text{ Vdc}, I_E = 0$) ($V_{CB} = -30 \text{ Vdc}, I_E = 0, T_A = +125^\circ\text{C}$)		I_{CBO}	— —	— —	-15 -5.0	nAdc μAdc
Emitter Cutoff Current ($V_{EB} = -4.0 \text{ Vdc}, I_C = 0$)		I_{EBO}	—	—	-15	nAdc

BC559B, C BC560C

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

Characteristic	Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS					
DC Current Gain ($I_C = -10\ \mu\text{Adc}$, $V_{CE} = -5.0\ \text{Vdc}$) ($I_C = -2.0\ \text{mAdc}$, $V_{CE} = -5.0\ \text{Vdc}$)	h_{FE}				—
BC559B		100	150	—	
BC559C/560C		100	270	—	
BC559B		180	290	460	
BC559C/560C		380	500	800	
Collector–Emitter Saturation Voltage ($I_C = -10\ \text{mAdc}$, $I_B = -0.5\ \text{mAdc}$) ($I_C = -10\ \text{mAdc}$, $I_B = \text{see note 1}$) ($I_C = -100\ \text{mAdc}$, $I_B = -5.0\ \text{mAdc}$, see note 2)	$V_{CE(\text{sat})}$	—	-0.075	-0.25	Vdc
		—	-0.3	-0.6	
		—	-0.25	—	
Base–Emitter Saturation Voltage ($I_C = -100\ \text{mAdc}$, $I_B = -5.0\ \text{mAdc}$)	$V_{BE(\text{sat})}$	—	-1.1	—	Vdc
Base–Emitter On Voltage ($I_C = -10\ \mu\text{Adc}$, $V_{CE} = -5.0\ \text{Vdc}$) ($I_C = -100\ \mu\text{Adc}$, $V_{CE} = -5.0\ \text{Vdc}$) ($I_C = -2.0\ \text{mAdc}$, $V_{CE} = -5.0\ \text{Vdc}$)	$V_{BE(\text{on})}$	—	-0.52	—	Vdc
		—	-0.55	—	
		-0.55	-0.62	-0.7	

SMALL–SIGNAL CHARACTERISTICS

Current–Gain — Bandwidth Product ($I_C = -10\ \text{mAdc}$, $V_{CE} = -5.0\ \text{Vdc}$, $f = 100\ \text{MHz}$)	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 ($I_C = -2.0\ \text{mAdc}$, $V_{CE} = -5.0\ \text{V}$, $f = 1.0\ \text{kHz}$)	h_{fe}				—
BC559B		240	330	500	
BC559C/BC560C		450	600	900	
Noise Figure ($I_C = -200\ \mu\text{Adc}$, $V_{CE} = -5.0\ \text{Vdc}$, $R_S = 2.0\ \text{k}\Omega$, $f = 1.0\ \text{kHz}$) ($I_C = -200\ \mu\text{Adc}$, $V_{CE} = -5.0\ \text{Vdc}$, $R_S = 100\ \text{k}\Omega$, $f = 1.0\ \text{kHz}$, $\Delta f = 200\ \text{kHz}$)	NF_1 NF_2	—	0.5	2.0	dB
		—	—	10	

NOTES:

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

BC559B, C BC560C

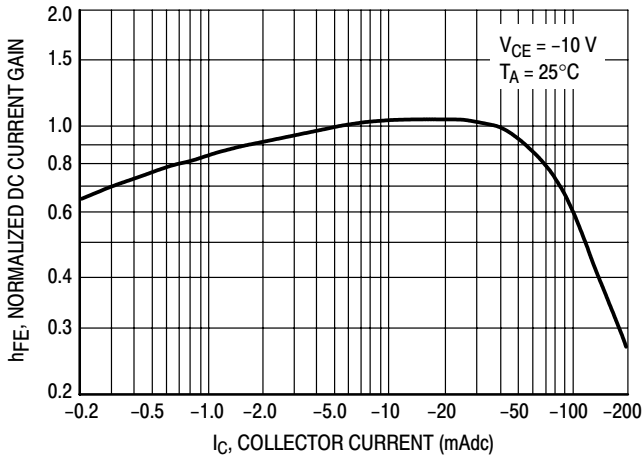


Figure 1. Normalized DC Current Gain

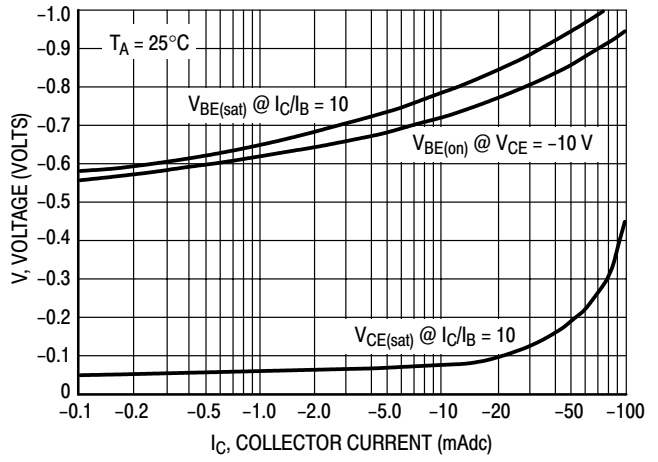


Figure 2. "Saturation" and "On" Voltages

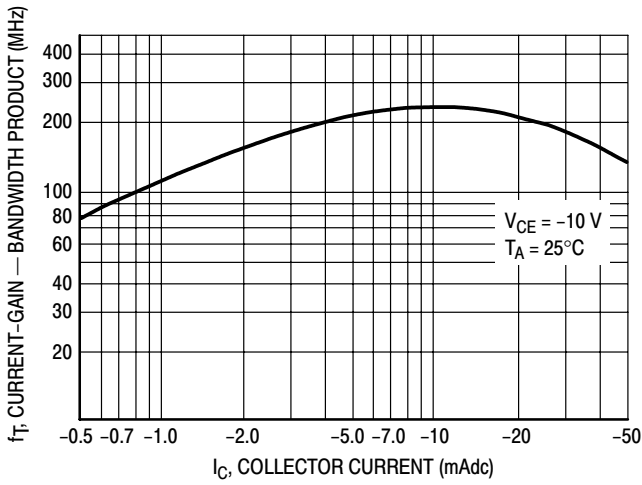


Figure 3. Current-Gain — Bandwidth Product

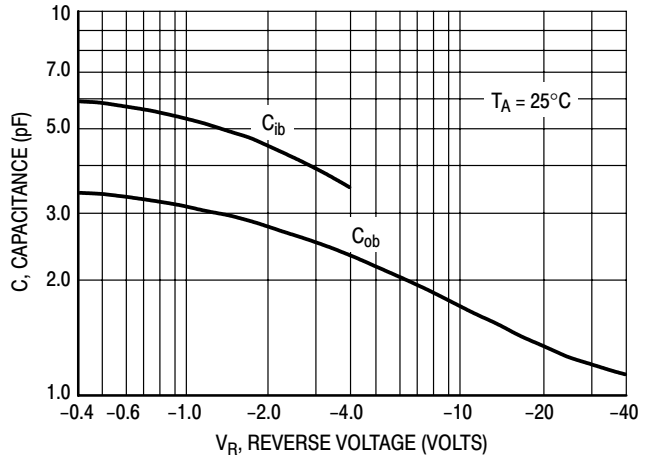


Figure 4. Capacitance

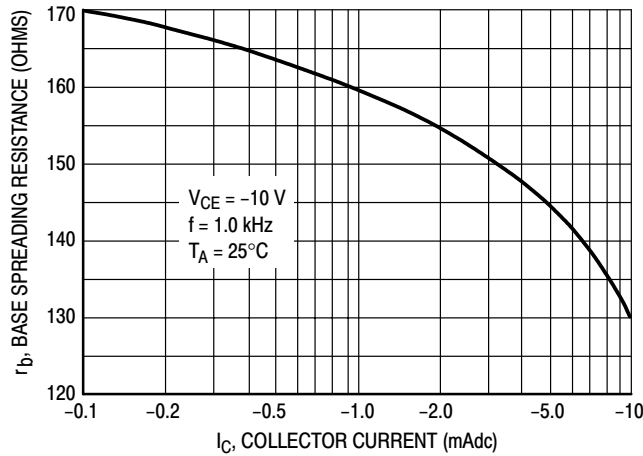


Figure 5. Base Spreading Resistance