

Low Noise Transistors

NPN Silicon

Features

- These are Pb-Free Devices*

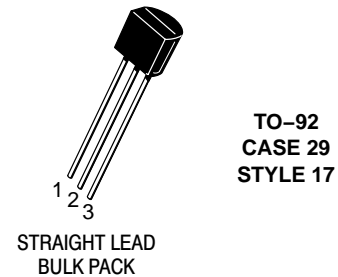
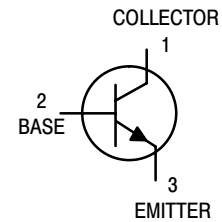
MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector – Emitter Voltage BC549C BC550C	V_{CEO}	30 45	Vdc
Collector – Base Voltage BC549C BC550C	V_{CBO}	30 50	Vdc
Emitter – Base Voltage	V_{EBO}	5.0	Vdc
Collector Current – Continuous	I_C	100	Vdc
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 @ $T_A = 25^\circ\text{C}$ Derate above = 25°C	P_D	1.5 12	W mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

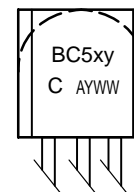
THERMAL CHARACTERISTICS

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

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.



MARKING DIAGRAM



BC5xyC = Device Code
 x = 4 or 5
 y = 9 or 0
 A = Assembly Location
 Y = Year
 WW = Work Week

(Note: Microdot may be in either location)

ORDERING INFORMATION

Device	Package	Shipping
BC549C	TO-92 (Pb-Free)	1000 Units / bulk
BC550C	TO-92 (Pb-Free)	1000 Units /bulk

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Breakdown Voltage ($I_C = 10\text{ mAdc}$, $I_B = 0$)	$V_{(BR)CEO}$	45	–	–	Vdc
Collector–Base Breakdown Voltage ($I_C = 10\text{ }\mu\text{Adc}$, $I_E = 0$)	$V_{(BR)CBO}$	50	–	–	Vdc
Emitter–Base Breakdown Voltage ($I_E = 10\text{ }\mu\text{Adc}$, $I_C = 0$)	$V_{(BR)EBO}$	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

ON CHARACTERISTICS

DC Current Gain ($I_C = 10\text{ }\mu\text{Adc}$, $V_{CE} = 5.0\text{ Vdc}$) ($I_C = 2.0\text{ mAdc}$, $V_{CE} = 5.0\text{ Vdc}$)	h_{FE}	100 420	270 500	– 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)	$V_{CE(sat)}$	– – –	0.075 0.3 0.25	0.25 0.6 0.6	Vdc
Base–Emitter Saturation Voltage ($I_C = 100\text{ mAdc}$, $I_B = 5.0\text{ mAdc}$)	$V_{BE(sat)}$	–	1.1	–	Vdc
Base–Emitter On Voltage ($I_C = 10\text{ }\mu\text{Adc}$, $V_{CE} = 5.0\text{ Vdc}$) ($I_C = 100\text{ }\mu\text{Adc}$, $V_{CE} = 5.0\text{ Vdc}$) ($I_C = 2.0\text{ mAdc}$, $V_{CE} = 5.0\text{ Vdc}$)	$V_{BE(on)}$	– – 0.55	0.52 0.55 0.62	– – 0.7	Vdc

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}	450	600	900	–
Noise Figure ($I_C = 200\text{ }\mu\text{Adc}$, $V_{CE} = 5.0\text{ Vdc}$, $R_S = 2.0\text{ k}\Omega$, $f = 1.0\text{ kHz}$) ($I_C = 200\text{ }\mu\text{Adc}$, $V_{CE} = 5.0\text{ Vdc}$, $R_S = 100\text{ k}\Omega$, $f = 1.0\text{ kHz}$)	NF_1 NF_2	– –	0.6 –	2.5 10	dB

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

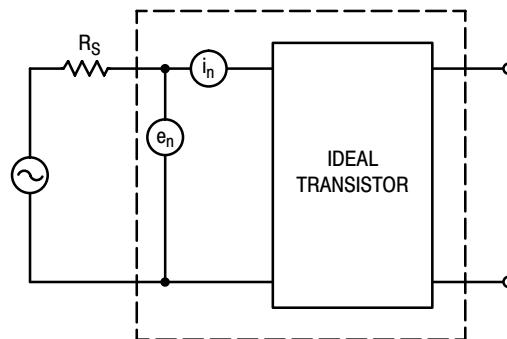
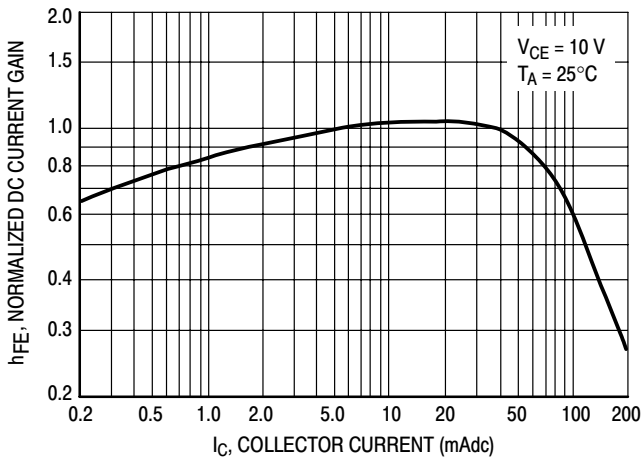
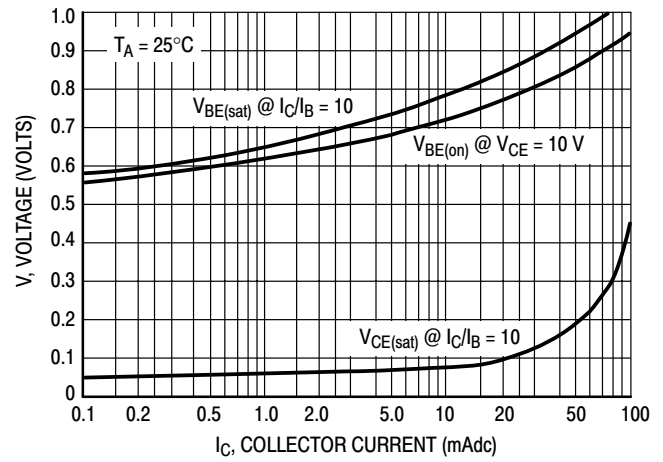
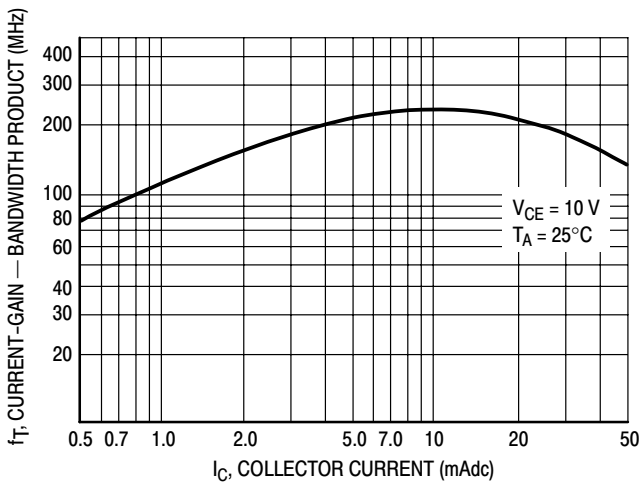
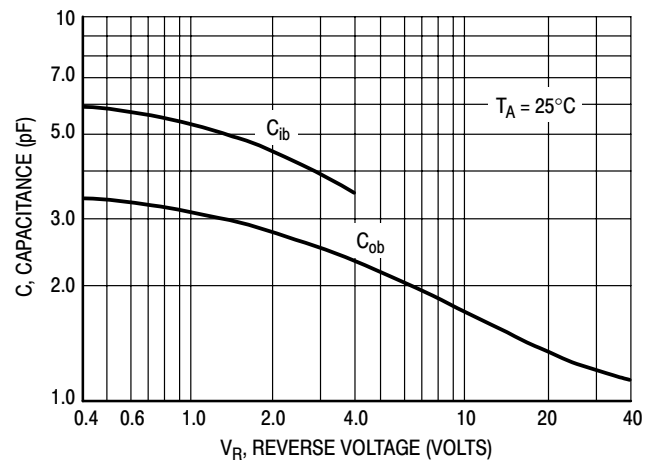
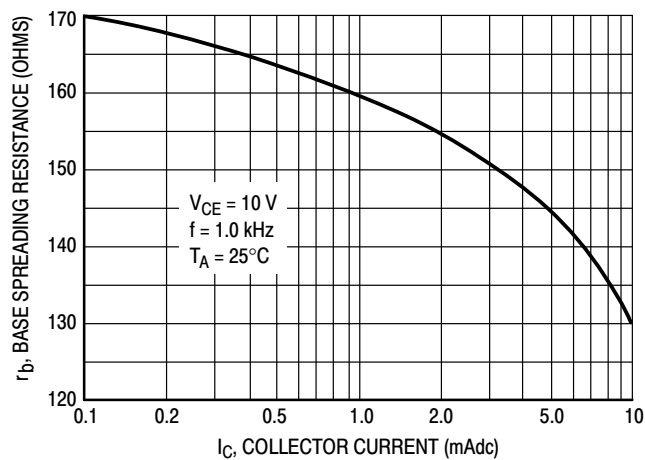
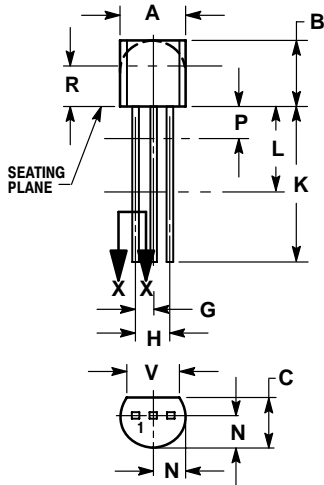
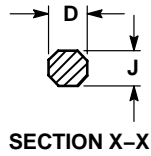


Figure 1. Transistor Noise Model


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

PACKAGE DIMENSIONS
TO-92 (TO-226)
 CASE 29-11
 ISSUE AM

**STRAIGHT LEAD
 BULK PACK**

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	---