

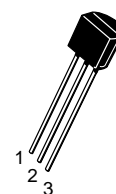
Amplifier Transistors

NPN Silicon

BC237,A,B,C
BC238B,C
BC239,C

MAXIMUM RATINGS

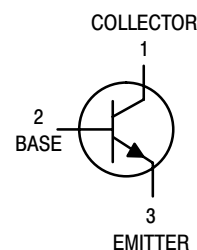
Rating	Symbol	BC237	BC238	BC239	Unit
Collector–Emitter Voltage	V_{CEO}	45	25	25	Vdc
Collector–Emitter Voltage	V_{CES}	50	30	30	Vdc
Emitter–Base Voltage	V_{EBO}	6.0	5.0	5.0	Vdc
Collector Current — Continuous	I_C	100			mAdc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	350			mW
		2.8			mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	1.0			Watts
		8.0			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	$R_{\theta JA}$	357	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	125	$^\circ\text{C}/\text{W}$



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 ($I_C = 2.0\text{ mA}, I_B = 0$)	BC237	$V_{(BR)CEO}$	45	—	—	V
	BC238		25	—	—	
	BC239		25	—	—	
Emitter–Base Breakdown Voltage ($I_E = 100\ \mu\text{A}, I_C = 0$)	BC237	$V_{(BR)EBO}$	6.0	—	—	V
	BC238		5.0	—	—	
	BC239		5.0	—	—	
Collector Cutoff Current ($V_{CE} = 30\text{ V}, V_{BE} = 0$)	BC238	I_{CES}	—	0.2	15	nA
	BC239		—	0.2	15	
	($V_{CE} = 50\text{ V}, V_{BE} = 0$)	BC237	—	0.2	15	
	($V_{CE} = 30\text{ V}, V_{BE} = 0$) $T_A = 125^\circ\text{C}$	BC238	—	0.2	4.0	μA
BC239		—	0.2	4.0		
($V_{CE} = 50\text{ V}, V_{BE} = 0$) $T_A = 125^\circ\text{C}$	BC237	—	0.2	4.0		

BC237,A,B,C BC238B,C BC239,C

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

Characteristic	Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS					
DC Current Gain (I _C = 10 μA, V _{CE} = 5.0 V)	BC237A BC237B/238B BC237C/238C/239C	h _{FE}	— — —	90 150 270	— — —
(I _C = 2.0 mA, V _{CE} = 5.0 V)	BC237 BC239 BC237A BC237B/238B BC237C/238C/239C		120 120 120 200 380	— — 170 290 500	800 800 220 460 800
(I _C = 100 mA, V _{CE} = 5.0 V)	BC237A BC237B/238B BC237C/238C/239C		— — —	120 180 300	— — —
Collector–Emitter On Voltage (I _C = 10 mA, I _B = 0.5 mA)	BC237/BC238/BC239	V _{CE(sat)}	— —	0.07 0.2	0.2 0.6
(I _C = 100 mA, I _B = 5.0 mA)	BC237/BC239 BC238				0.8
Base–Emitter Saturation Voltage (I _C = 10 mA, I _B = 0.5 mA)		V _{BE(sat)}	—	0.6	0.83
(I _C = 100 mA, I _B = 5.0 mA)			—	—	1.05
Base–Emitter On Voltage (I _C = 100 μA, V _{CE} = 5.0 V)		V _{BE(on)}	—	0.5	—
(I _C = 2.0 mA, V _{CE} = 5.0 V)			0.55	0.62	0.7
(I _C = 100 mA, V _{CE} = 5.0 V)			—	0.83	—
DYNAMIC CHARACTERISTICS					
Current–Gain — Bandwidth Product (I _C = 0.5 mA, V _{CE} = 3.0 V, f = 100 MHz)	BC237 BC238 BC239	f _T	— — —	100 120 140	— — —
(I _C = 10 mA, V _{CE} = 5.0 V, f = 100 MHz)	BC237 BC238 BC239		150 150 150	200 240 280	— — —
Collector–Base Capacitance (V _{CB} = 10 V, I _C = 0, f = 1.0 MHz)		C _{obo}	—	—	4.5
Emitter–Base Capacitance (V _{EB} = 0.5 V, I _C = 0, f = 1.0 MHz)		C _{ibo}	—	8.0	—
Noise Figure (I _C = 0.2 mA, V _{CE} = 5.0 V, R _S = 2.0 kΩ, f = 1.0 kHz)	BC239	NF	—	2.0	4.0
(I _C = 0.2 mA, V _{CE} = 5.0 V, R _S = 2.0 kΩ, f = 1.0 kHz, Δf = 200 Hz)	BC237 BC238 BC239		— — —	2.0 2.0 2.0	10 10 4.0

BC237,A,B,C BC238B,C BC239,C

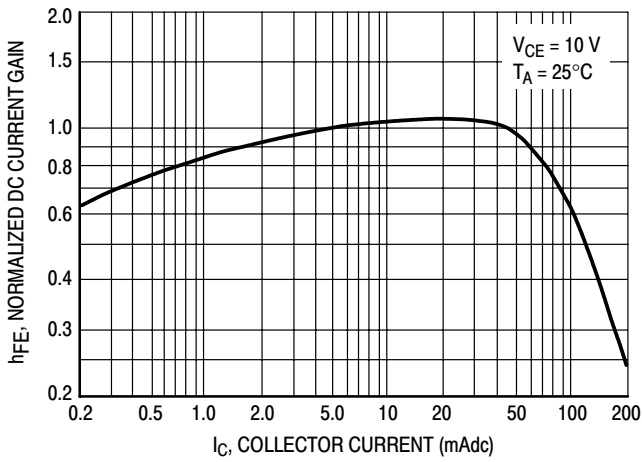


Figure 1. Normalized DC Current Gain

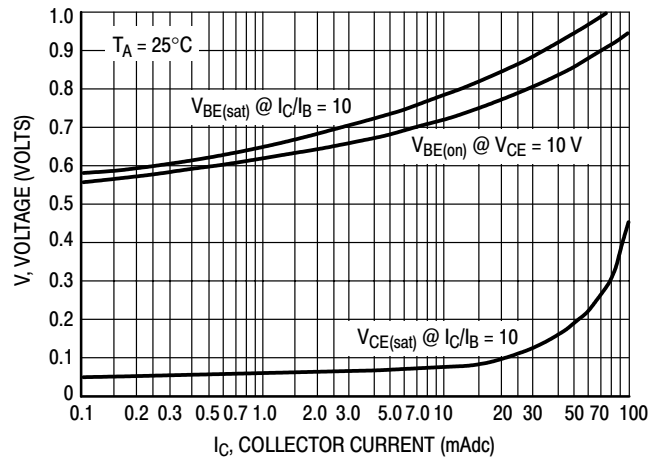


Figure 2. "Saturation" and "On" Voltages

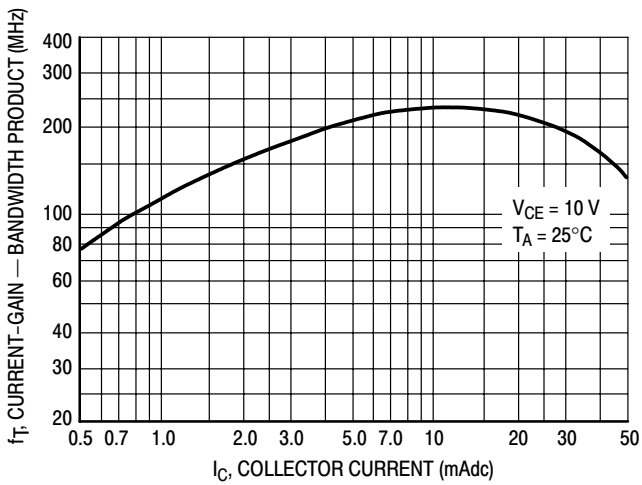


Figure 3. Current-Gain — Bandwidth Product

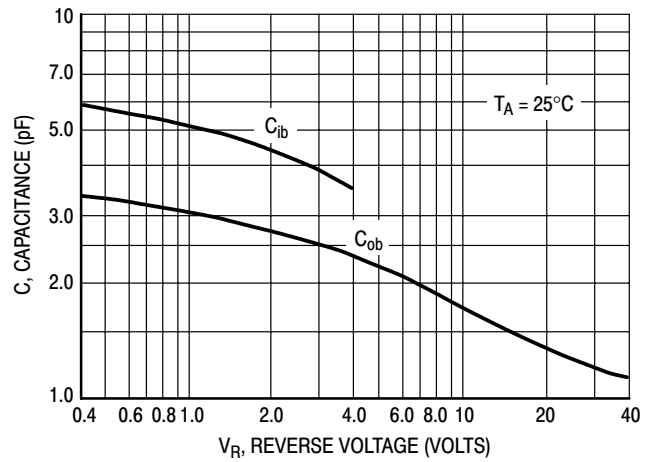


Figure 4. Capacitances

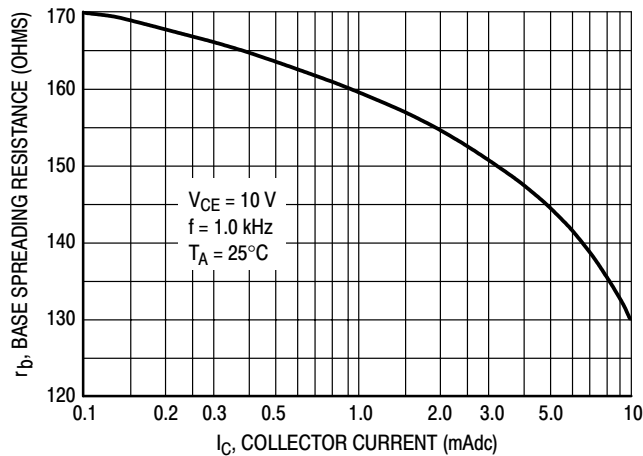
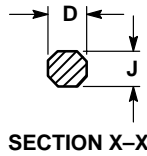
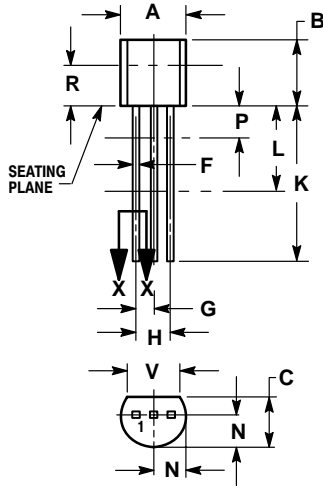


Figure 5. Base Spreading Resistance

BC237,A,B,C BC238B,C BC239,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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