BC237, BC237B, BC237C, BC239C

Amplifier Transistors

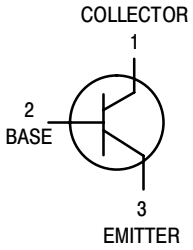
NPN Silicon

ON Semiconductor®

http://onsemi.com

Features

- Pb−Free Packages are Available*



MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector−Emitter Voltage BC237 BC239	V_{CEO}	 45 25	Vdc
Collector−Emitter Voltage BC237 BC239	V_{CES}	 50 30	Vdc
Collector−Emitter Voltage BC237 BC239	V_{EBO}	 6.0 5.0	Vdc
Collector Current − Continuous	I_C	100	mAdc
Total Power Dissipation @ T_A = 25°C Derate above T_A = 25°C	P_D	350 2.8	mW mW/°C
Total Power Dissipation @ T_A = 25°C Derate above T_A = 25°C	P_D	1.0 8.0	W mW/°C
Operating and Storage Temperature Range	T_J, T_{stg}	−55 to +150	°C

THERMAL CHARACTERISTICS

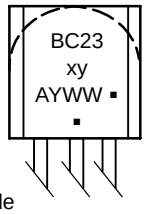
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction−to−Ambient	$R_{\theta JA}$	357	°C/W
Thermal Resistance, Junction−to−Case	$R_{\theta JC}$	125	°C/W

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

TO−92
CASE 29
STYLE 17

MARKING DIAGRAM



BC23xy = Device Code
x = 7 or 9
y = B or C
A = Assembly Location
Y = Year
WW = Work Week
▪ = Pb−Free Package

(Note: Microdot may be in either location)

ORDERING INFORMATION

Device	Package	Shipping†
BC237	TO−92	5000 Units / Bulk
BC237G	TO−92 (Pb−Free)	5000 Units / Bulk
BC237B	TO−92	5000 Units / Bulk
BC237BG	TO−92 (Pb−Free)	5000 Units / Bulk
BC237BRL1	TO−92	2000/Tape & Reel
BC237BRL1G	TO−92 (Pb−Free)	2000/Tape & Reel
BC237BZL1	TO−92	2000/Ammo Pack
BC237BZL1G	TO−92 (Pb−Free)	2000/Ammo Pack
BC237C	TO−92	5000 Units / Bulk
BC237CG	TO−92 (Pb−Free)	5000 Units / Bulk

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

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

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Collector−Emitter Breakdown Voltage (I_C = 2.0 mA, I_B = 0)	BC237	$V_{(BR)CEO}$	45	–	–	V
	BC239		25	–	–	
Emitter−Base Breakdown Voltage (I_E = 100 μA, I_C = 0)	BC237	$V_{(BR)EBO}$	6.0	–	–	V
	BC239		5.0	–	–	
Collector Cutoff Current		I_{CES}				
(V_{CE} = 30 V, V_{BE} = 0)	BC239		–	0.2	15	nA
(V_{CE} = 50 V, V_{BE} = 0)	BC237		–	0.2	15	
(V_{CE} = 30 V, V_{BE} = 0) T_A = 125°C	BC239		–	0.2	4.0	μA
(V_{CE} = 50 V, V_{BE} = 0) T_A = 125°C	BC237		–	0.2	4.0	
ON CHARACTERISTICS						
DC Current Gain		h_{FE}				–
(I_C = 10 μA, V_{CE} = 5.0 V)	BC237B		–	150	–	
	BC237C/239C		–	270	–	
(I_C = 2.0 mA, V_{CE} = 5.0 V)	BC237		120	–	800	
	BC237B		200	290	460	
	BC237C/239C		380	500	800	
(I_C = 100 mA, V_{CE} = 5.0 V)	BC237B		–	180	–	
	BC237C/239C		–	300	–	
Collector−Emitter On Voltage		$V_{CE(sat)}$				V
(I_C = 10 mA, I_B = 0.5 mA)	BC237/BC239		–	0.07	0.2	
(I_C = 100 mA, I_B = 5.0 mA)	BC237/BC239		–	0.2	0.6	
Base−Emitter Saturation Voltage		$V_{BE(sat)}$				V
(I_C = 10 mA, I_B = 0.5 mA)			–	0.6	0.83	
(I_C = 100 mA, I_B = 5.0 mA)			–	–	1.05	
Base−Emitter On Voltage		$V_{BE(on)}$				V
(I_C = 100 μA, V_{CE} = 5.0 V)			–	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		f_T				MHz
(I_C = 0.5 mA, V_{CE} = 3.0 V, f = 100 MHz)	BC237		–	100	–	
	BC239		–	140	–	
(I_C = 10 mA, V_{CE} = 5.0 V, f = 100 MHz)	BC237		150	200	–	
	BC239		150	280	–	
Collector−Base Capacitance (V_{CB} = 10 V, I_C = 0, f = 1.0 MHz)		C_{obo}	–	–	4.5	pF
Emitter−Base Capacitance (V_{EB} = 0.5 V, I_C = 0, f = 1.0 MHz)		C_{ibo}	–	8.0	–	pF
Noise Figure		NF				dB
(I_C = 0.2 mA, V_{CE} = 5.0 V, R_S = 2.0 kΩ, f = 1.0 kHz)	BC239		–	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		–	2.0	10	
	BC239		–	2.0	4.0	

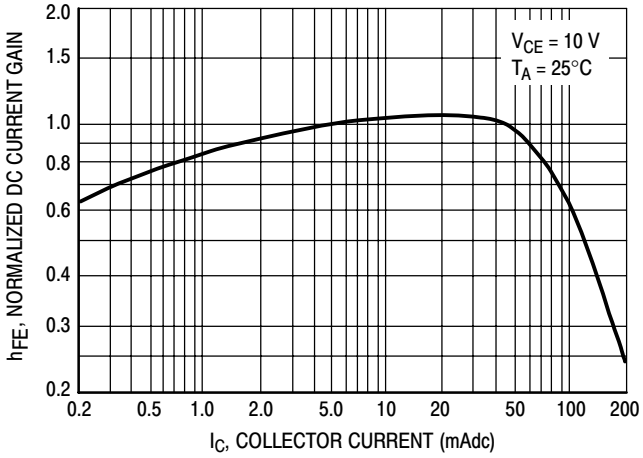


Figure 1. Normalized DC Current Gain

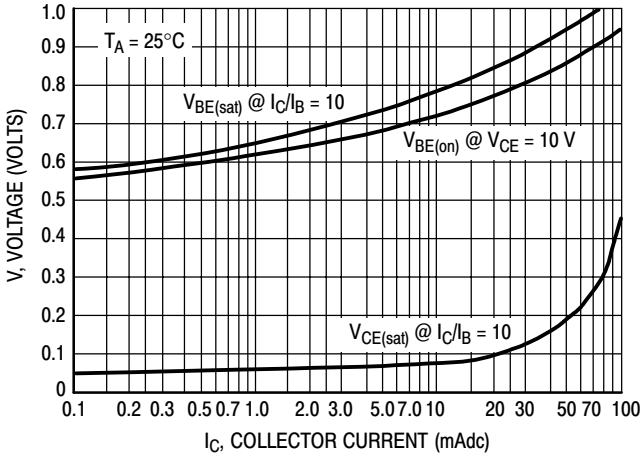


Figure 2. “Saturation” and “On” Voltages

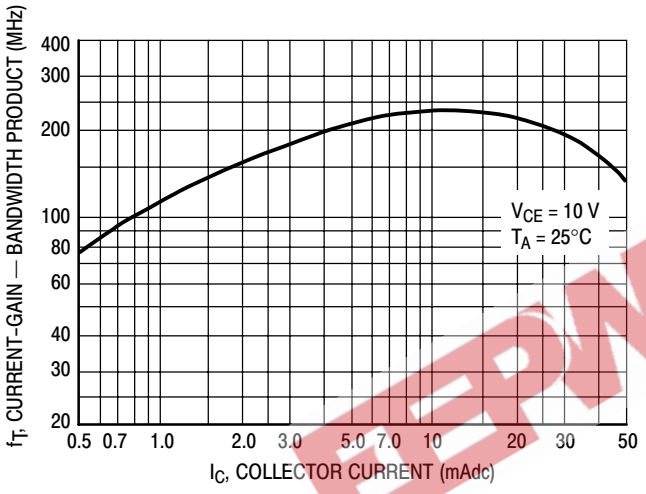


Figure 3. Current−Gain — Bandwidth Product

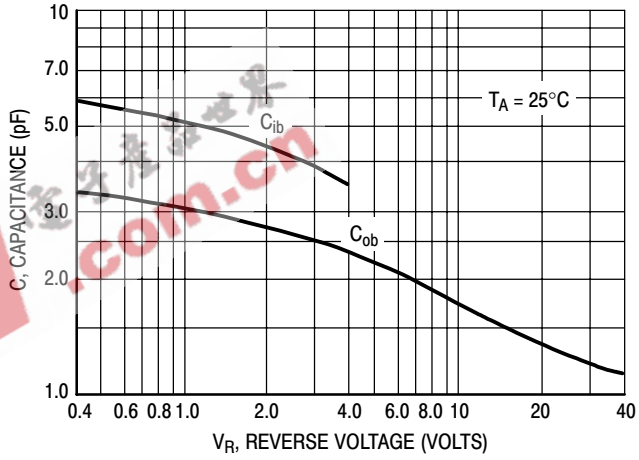


Figure 4. Capacitances

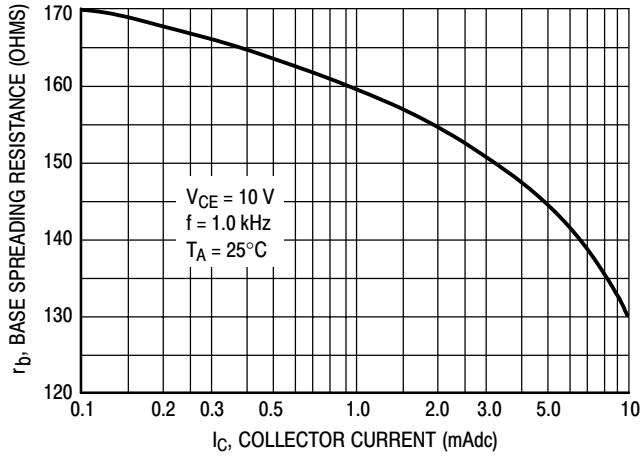
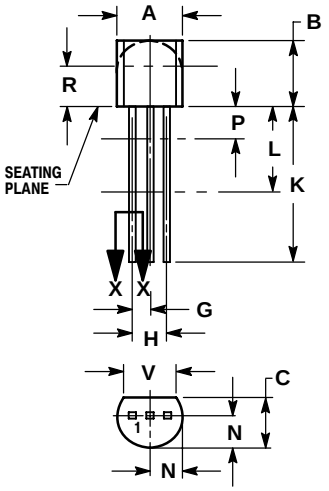


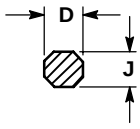
Figure 5. Base Spreading Resistance

BC237, BC237B, BC237C, BC239C

PACKAGE DIMENSIONS

TO−92 (TO−226)
CASE 29−11
ISSUE AL





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. 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	0.021	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	---

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

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
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ON Semiconductor Website: http://onsemi.com

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BC237/D