BC237, BC237B, BC237C, **BC239C**

Amplifier Transistors

NPN Silicon

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

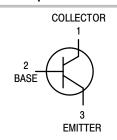
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	357	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	125	°C/W

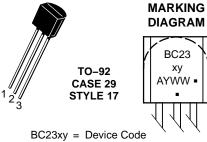
Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur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



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x = 7 or 9y = B or C

= Assembly Location

= Work Week WW = 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 additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

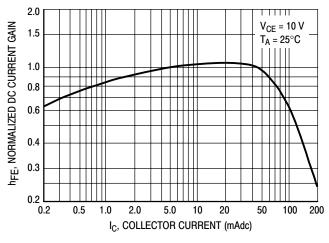
[†]For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

BC237, BC237B, BC237C, BC239C

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

Characteristic		Symbol	Min	Тур	Max	Unit
OFF CHARACTERISTICS						
Collector – Emitter Breakdown Voltage (I _C = 2.0 mA, I _B = 0)	BC237 BC239	V _{(BR)CEO}	45 25	_ _		V
Emitter – Base Breakdown Voltage $(I_E = 100 \mu A, I_C = 0)$	BC237 BC239	$V_{(BR)EBO}$	6.0 5.0	_ _	_ _	V
Collector Cutoff Current $(V_{CE} = 30 \text{ V}, V_{BE} = 0)$ $(V_{CE} = 50 \text{ V}, V_{BE} = 0)$ $(V_{CE} = 30 \text{ V}, V_{BE} = 0)$ $T_{A} = 125^{\circ}\text{C}$ $T_{A} = 125^{\circ}\text{C}$ $T_{A} = 125^{\circ}\text{C}$	BC239 BC237 BC239 BC237	I _{CES}	- - - -	0.2 0.2 0.2 0.2	15 15 4.0 4.0	nA μA
ON CHARACTERISTICS			•		•	•
DC Current Gain $(I_C = 10 \ \mu\text{A}, \ V_{CE} = 5.0 \ \text{V})$ $(I_C = 2.0 \ \text{mA}, \ V_{CE} = 5.0 \ \text{V})$ $(I_C = 100 \ \text{mA}, \ V_{CE} = 5.0 \ \text{V})$	BC237B BC237C/239C BC237 BC237B BC237C/239C BC237B BC237C/239C	h _{FE}	- 120 200 380 - -	150 270 - 290 500 180 300	- 800 460 800 - -	-
Collector – Emitter On Voltage ($I_C = 10 \text{ mA}$, $I_B = 0.5 \text{ mA}$) ($I_C = 100 \text{ mA}$, $I_B = 5.0 \text{ mA}$)	BC237/BC239 BC237/BC239	V _{CE(sat)}	_ _	0.07 0.2	0.2 0.6	V
Base – Emitter Saturation Voltage (I_C = 10 mA, I_B = 0.5 mA) (I_C = 100 mA, I_B = 5.0 mA)		V _{BE(sat)}	_ _	0.6	0.83 1.05	V
Base–Emitter On Voltage (I _C = 100 μA, V _{CE} = 5.0 V) (I _C = 2.0 mA, V _{CE} = 5.0 V) (I _C = 100 mA, V _{CE} = 5.0 V)		V _{BE(on)}	_ 0.55 _	0.5 0.62 0.83	- 0.7 -	V
DYNAMIC CHARACTERISTICS					•	•
Current – Gain — Bandwidth Product ($I_C = 0.5 \text{ mA}, V_{CE} = 3.0 \text{ V}, f = 100 \text{ MHz}$) ($I_C = 10 \text{ mA}, V_{CE} = 5.0 \text{ V}, f = 100 \text{ MHz}$)	BC237 BC239 BC237 BC239	f _⊤	- - 150 150	100 140 200 280	- - - -	MHz
Collector-Base Capacitance (V _{CB} = 10 V, I _C = 0, f = 1.0 MHz)		C _{obo}	-	-	4.5	pF
Emitter–Base Capacitance ($V_{EB} = 0.5 \text{ V}, I_{C} = 0, f = 1.0 \text{ MHz}$)		C _{ibo}	_	8.0	-	pF
Noise Figure (I _C = 0.2 mA, V _{CE} = 5.0 V, R _S = 2.0 k Ω , f = 1.0 kHz) (I _C = 0.2 mA, V _{CE} = 5.0 V, R _S = 2.0 k Ω , f = 1.0 kHz, Ω	BC239 \(\Delta f = 200 \text{ Hz} \) BC237 BC239	NF	- - -	2.0 2.0 2.0	4.0 10 4.0	dB

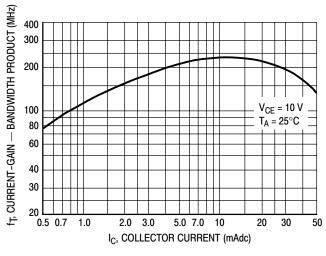
BC237, BC237B, BC237C, BC239C



1.0 0.9 0.8 $V_{BE(sat)} @ I_C/I_B = 10$ V, VOLTAGE (VOLTS) 0.7 V_{BE(on)} @ V_{CE} = 10 V 0.6 0.5 0.4 0.3 0.2 $V_{CE(sat)} @ I_C/I_B = 10$ 0.1 $0.2\;\; 0.3\;\; 0.5\, 0.7\, 1.0$ 2.0 3.0 5.07.010 20 30 50 70 100 0.1 IC, COLLECTOR CURRENT (mAdc)

Figure 1. Normalized DC Current Gain

Figure 2. "Saturation" and "On" Voltages



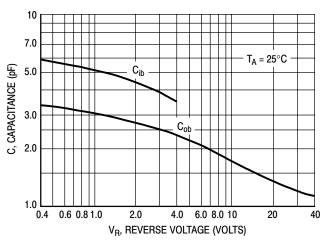


Figure 3. Current-Gain — Bandwidth Product

Figure 4. Capacitances

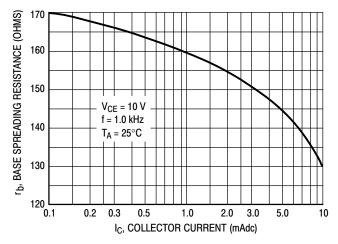
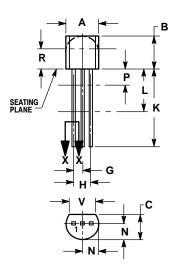


Figure 5. Base Spreading Resistance

BC237, BC237B, BC237C, BC239C

PACKAGE DIMENSIONS

TO-92 (TO-226) CASE 29-11 **ISSUE AL**





- NOTES:
 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982. CONTROLLING DIMENSION: INCH.
- CONTOUR OF PACKAGE BEYOND DIMENSION R
 IS UNCONTROLLED.
- LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

	INCHES		MILLIMETERS		
DIM	MIN	MAX	MIN	MAX	
Α	0.175	0.205	4.45	5.20	
В	0.170	0.210	4.32	5.33	
С	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	
Н	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	
Р		0.100		2.54	
R	0.115		2.93		
٧	0.135		3.43		

STYLE 17:

PIN 1. COLLECTOR

- BASE 2.

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