

# BC237B

## Amplifier Transistors

### NPN Silicon

#### Features

- Pb-Free Packages are Available\*

#### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	$V_{CEO}$	45	Vdc
Collector-Emitter Voltage	$V_{CES}$	50	Vdc
Collector-Emitter Voltage	$V_{EBO}$	6.0	Vdc
Collector Current - Continuous	$I_C$	100	mA dc
Total Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $T_A = 25^\circ\text{C}$	$P_D$	350 2.8	mW mW/ $^\circ\text{C}$
Total Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $T_A = 25^\circ\text{C}$	$P_D$	1.0 8.0	W mW/ $^\circ\text{C}$
Operating and Storage Temperature Range	$T_J, T_{stg}$	-55 to +150	$^\circ\text{C}$

#### THERMAL CHARACTERISTICS

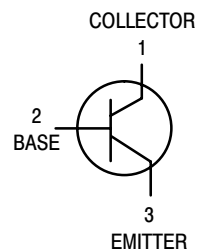
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	357	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	125	$^\circ\text{C/W}$

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.

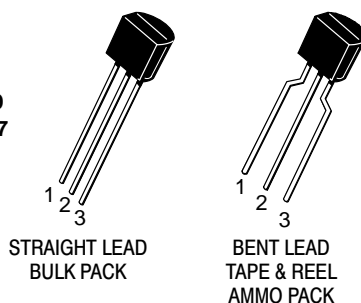


ON Semiconductor®

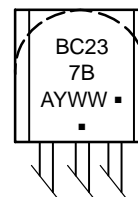
<http://onsemi.com>



TO-92  
CASE 29  
STYLE 17



#### MARKING DIAGRAM



- A = Assembly Location
- Y = Year
- WW = Work Week
- = Pb-Free Package

(Note: Microdot may be in either location)

#### ORDERING INFORMATION

Device	Package	Shipping†
BC237B	TO-92	5000 Units / Bulk
BC237BG	TO-92 (Pb-Free)	5000 Units / Bulk
BC237BRL1G	TO-92 (Pb-Free)	2000 / Tape & Reel

\*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.

# BC237B

## ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>					
Collector–Emitter Breakdown Voltage (I <sub>C</sub> = 2.0 mA, I <sub>B</sub> = 0)	V <sub>(BR)CEO</sub>	45	–	–	V
Emitter–Base Breakdown Voltage (I <sub>E</sub> = 100 μA, I <sub>C</sub> = 0)	V <sub>(BR)EBO</sub>	6.0	–	–	V
Collector Cutoff Current (V <sub>CE</sub> = 50 V, V <sub>BE</sub> = 0) (V <sub>CE</sub> = 50 V, V <sub>BE</sub> = 0) T <sub>A</sub> = 125°C	I <sub>CES</sub>	–	0.2	15	nA
		–	0.2	4.0	μA
<b>ON CHARACTERISTICS</b>					
DC Current Gain (I <sub>C</sub> = 10 μA, V <sub>CE</sub> = 5.0 V)	h <sub>FE</sub>	–	150	–	–
(I <sub>C</sub> = 2.0 mA, V <sub>CE</sub> = 5.0 V)		200	290	460	
(I <sub>C</sub> = 100 mA, V <sub>CE</sub> = 5.0 V)		–	180	–	
Collector–Emitter On Voltage (I <sub>C</sub> = 10 mA, I <sub>B</sub> = 0.5 mA) (I <sub>C</sub> = 100 mA, I <sub>B</sub> = 5.0 mA)	V <sub>CE(sat)</sub>	–	0.07	0.2	V
		–	0.2	0.6	
Base–Emitter Saturation Voltage (I <sub>C</sub> = 10 mA, I <sub>B</sub> = 0.5 mA) (I <sub>C</sub> = 100 mA, I <sub>B</sub> = 5.0 mA)	V <sub>BE(sat)</sub>	–	0.6	0.83	V
		–	–	1.05	
Base–Emitter On Voltage (I <sub>C</sub> = 100 μA, V <sub>CE</sub> = 5.0 V) (I <sub>C</sub> = 2.0 mA, V <sub>CE</sub> = 5.0 V) (I <sub>C</sub> = 100 mA, V <sub>CE</sub> = 5.0 V)	V <sub>BE(on)</sub>	–	0.5	–	V
		0.55	0.62	0.7	
		–	0.83	–	
<b>DYNAMIC CHARACTERISTICS</b>					
Current–Gain — Bandwidth Product (I <sub>C</sub> = 0.5 mA, V <sub>CE</sub> = 3.0 V, f = 100 MHz) (I <sub>C</sub> = 10 mA, V <sub>CE</sub> = 5.0 V, f = 100 MHz)	f <sub>T</sub>	–	100	–	MHz
		150	200	–	
Collector–Base Capacitance (V <sub>CB</sub> = 10 V, I <sub>C</sub> = 0, f = 1.0 MHz)	C <sub>obo</sub>	–	–	4.5	pF
Emitter–Base Capacitance (V <sub>EB</sub> = 0.5 V, I <sub>C</sub> = 0, f = 1.0 MHz)	C <sub>ibo</sub>	–	8.0	–	pF
Noise Figure (I <sub>C</sub> = 0.2 mA, V <sub>CE</sub> = 5.0 V, R <sub>S</sub> = 2.0 kΩ, f = 1.0 kHz, Δf = 200 Hz)	NF	–	2.0	10	dB

# BC237B

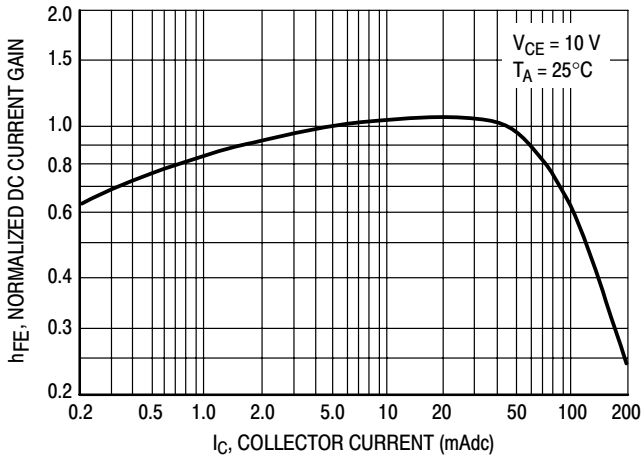


Figure 1. Normalized DC Current Gain

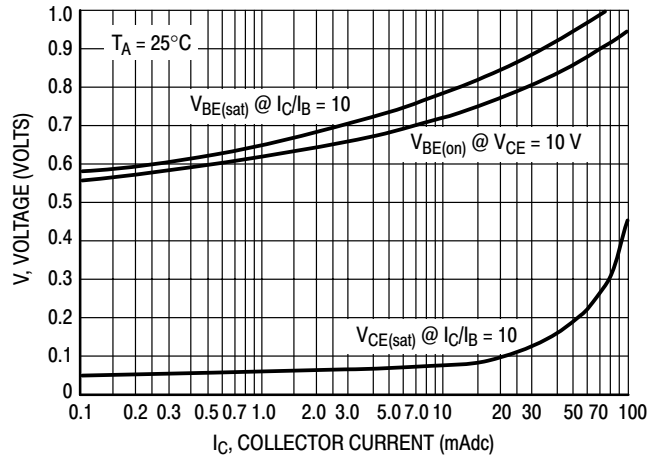


Figure 2. "Saturation" and "On" Voltages

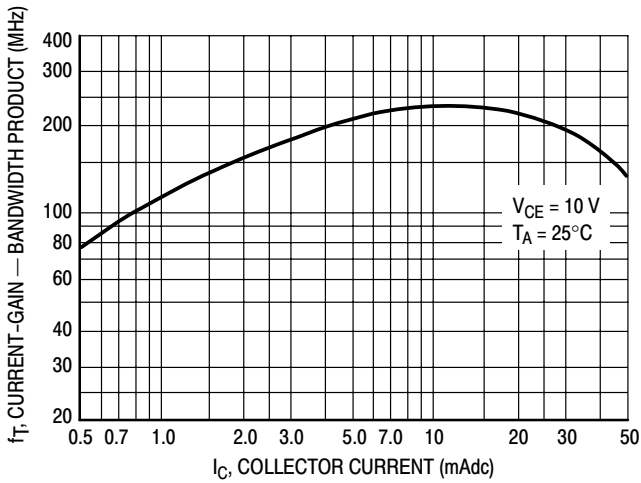


Figure 3. Current-Gain — Bandwidth Product

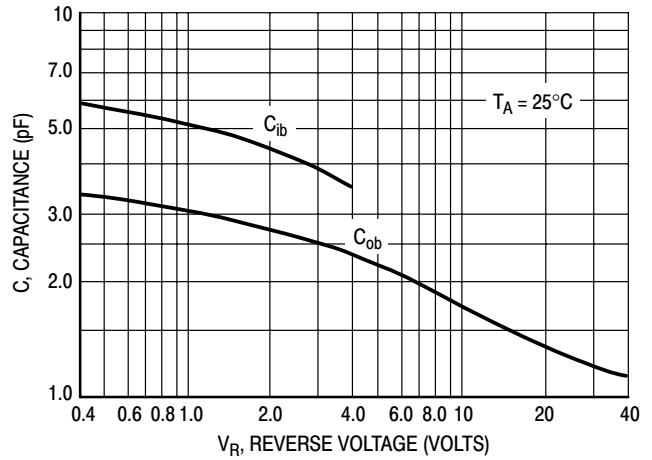


Figure 4. Capacitances

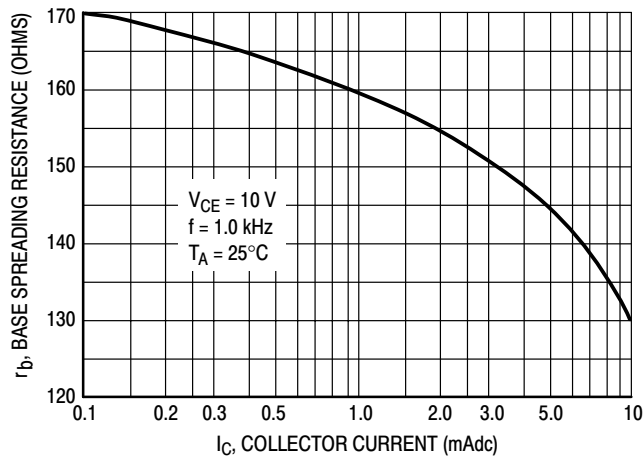


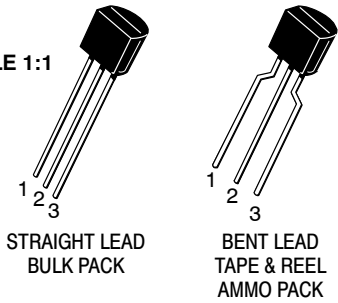
Figure 5. Base Spreading Resistance

# MECHANICAL CASE OUTLINE PACKAGE DIMENSIONS

ON Semiconductor®

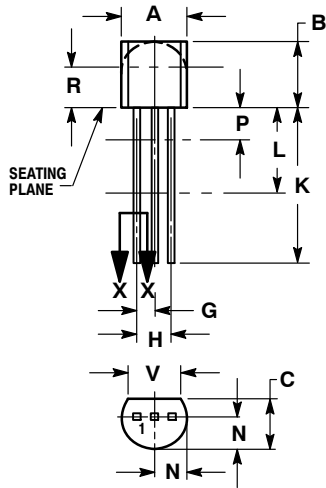


SCALE 1:1

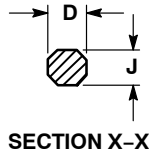


TO-92 (TO-226)  
CASE 29-11  
ISSUE AM

DATE 09 MAR 2007



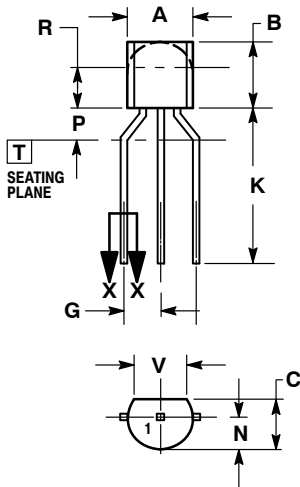
STRAIGHT LEAD  
BULK PACK



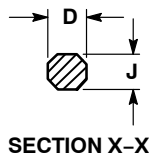
NOTES:

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	---



BENT LEAD  
TAPE & REEL  
AMMO PACK



NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

DIM	MILLIMETERS	
	MIN	MAX
A	4.45	5.20
B	4.32	5.33
C	3.18	4.19
D	0.40	0.54
G	2.40	2.80
J	0.39	0.50
K	12.70	---
N	2.04	2.66
P	1.50	4.00
R	2.93	---
V	3.43	---

STYLES ON PAGE 2

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DESCRIPTION:	TO-92 (TO-226)	PAGE 1 OF 3

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

DATE 09 MAR 2007

- |  |   |   |  |  |
|--|---|---|--|--|
| <p>STYLE 1:<br/>         PIN 1. EMITTER<br/>         2. BASE<br/>         3. COLLECTOR</p>             | <p>STYLE 2:<br/>         PIN 1. BASE<br/>         2. EMITTER<br/>         3. COLLECTOR</p>                | <p>STYLE 3:<br/>         PIN 1. ANODE<br/>         2. ANODE<br/>         3. CATHODE</p>               | <p>STYLE 4:<br/>         PIN 1. CATHODE<br/>         2. CATHODE<br/>         3. ANODE</p>            | <p>STYLE 5:<br/>         PIN 1. DRAIN<br/>         2. SOURCE<br/>         3. GATE</p>            |
| <p>STYLE 6:<br/>         PIN 1. GATE<br/>         2. SOURCE &amp; SUBSTRATE<br/>         3. DRAIN</p>  | <p>STYLE 7:<br/>         PIN 1. SOURCE<br/>         2. DRAIN<br/>         3. GATE</p>                     | <p>STYLE 8:<br/>         PIN 1. DRAIN<br/>         2. GATE<br/>         3. SOURCE &amp; SUBSTRATE</p> | <p>STYLE 9:<br/>         PIN 1. BASE 1<br/>         2. EMITTER<br/>         3. BASE 2</p>            | <p>STYLE 10:<br/>         PIN 1. CATHODE<br/>         2. GATE<br/>         3. ANODE</p>          |
| <p>STYLE 11:<br/>         PIN 1. ANODE<br/>         2. CATHODE &amp; ANODE<br/>         3. CATHODE</p> | <p>STYLE 12:<br/>         PIN 1. MAIN TERMINAL 1<br/>         2. GATE<br/>         3. MAIN TERMINAL 2</p> | <p>STYLE 13:<br/>         PIN 1. ANODE 1<br/>         2. GATE<br/>         3. CATHODE 2</p>           | <p>STYLE 14:<br/>         PIN 1. EMITTER<br/>         2. COLLECTOR<br/>         3. BASE</p>          | <p>STYLE 15:<br/>         PIN 1. ANODE 1<br/>         2. CATHODE<br/>         3. ANODE 2</p>     |
| <p>STYLE 16:<br/>         PIN 1. ANODE<br/>         2. GATE<br/>         3. CATHODE</p>                | <p>STYLE 17:<br/>         PIN 1. COLLECTOR<br/>         2. BASE<br/>         3. EMITTER</p>               | <p>STYLE 18:<br/>         PIN 1. ANODE<br/>         2. CATHODE<br/>         3. NOT CONNECTED</p>      | <p>STYLE 19:<br/>         PIN 1. GATE<br/>         2. ANODE<br/>         3. CATHODE</p>              | <p>STYLE 20:<br/>         PIN 1. NOT CONNECTED<br/>         2. CATHODE<br/>         3. ANODE</p> |
| <p>STYLE 21:<br/>         PIN 1. COLLECTOR<br/>         2. EMITTER<br/>         3. BASE</p>            | <p>STYLE 22:<br/>         PIN 1. SOURCE<br/>         2. GATE<br/>         3. DRAIN</p>                    | <p>STYLE 23:<br/>         PIN 1. GATE<br/>         2. SOURCE<br/>         3. DRAIN</p>                | <p>STYLE 24:<br/>         PIN 1. EMITTER<br/>         2. COLLECTOR/ANODE<br/>         3. CATHODE</p> | <p>STYLE 25:<br/>         PIN 1. MT 1<br/>         2. GATE<br/>         3. MT 2</p>              |
| <p>STYLE 26:<br/>         PIN 1. V<sub>CC</sub><br/>         2. GROUND 2<br/>         3. OUTPUT</p>    | <p>STYLE 27:<br/>         PIN 1. MT<br/>         2. SUBSTRATE<br/>         3. MT</p>                      | <p>STYLE 28:<br/>         PIN 1. CATHODE<br/>         2. ANODE<br/>         3. GATE</p>               | <p>STYLE 29:<br/>         PIN 1. NOT CONNECTED<br/>         2. ANODE<br/>         3. CATHODE</p>     | <p>STYLE 30:<br/>         PIN 1. DRAIN<br/>         2. GATE<br/>         3. SOURCE</p>           |
| <p>STYLE 31:<br/>         PIN 1. GATE<br/>         2. DRAIN<br/>         3. SOURCE</p>                 | <p>STYLE 32:<br/>         PIN 1. BASE<br/>         2. COLLECTOR<br/>         3. EMITTER</p>               | <p>STYLE 33:<br/>         PIN 1. RETURN<br/>         2. INPUT<br/>         3. OUTPUT</p>              | <p>STYLE 34:<br/>         PIN 1. INPUT<br/>         2. GROUND<br/>         3. LOGIC</p>              | <p>STYLE 35:<br/>         PIN 1. GATE<br/>         2. COLLECTOR<br/>         3. EMITTER</p>      |

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