

# BC337, BC337-16, BC337-25, BC337-40, BC338-25

## Amplifier Transistors

### NPN Silicon

#### Features

- Pb-Free Packages are Available\*

#### MAXIMUM RATINGS

Rating	Symbol	BC337	BC338	Unit
Collector – Emitter Voltage	$V_{CEO}$	45	25	Vdc
Collector – Base Voltage	$V_{CBO}$	50	30	Vdc
Emitter – Base Voltage	$V_{EBO}$	5.0		Vdc
Collector Current – Continuous	$I_C$	800		mAdc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	625	5.0	mW mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	1.5	12	W mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-55 to +150		$^\circ\text{C}$

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.

#### THERMAL CHARACTERISTICS

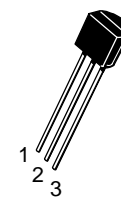
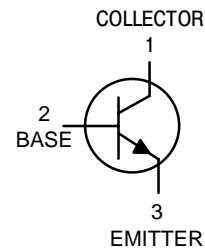
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	200	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	83.3	$^\circ\text{C}/\text{W}$

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



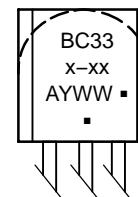
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TO-92  
CASE 29  
STYLE 17

#### MARKING DIAGRAM



BC33x-xx = Device Code

(Refer to page 4)

A = Assembly Location

Y = Year

WW = Work Week

▪ = Pb-Free Package

(Note: Microdot may be in either location)

#### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 4 of this data sheet.

# BC337, BC337-16, BC337-25, BC337-40, BC338-25

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

Characteristic	Symbol	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>					
Collector-Emmitter Breakdown Voltage (I <sub>C</sub> = 10 mA, I <sub>B</sub> = 0) BC338	BC337 V <sub>(BR)CEO</sub>	45 25	- -	- -	Vdc
Collector-Emmitter Breakdown Voltage (I <sub>C</sub> = 100 μA, I <sub>E</sub> = 0)	BC337 BC338 V <sub>(BR)CES</sub>	50 30	- -	- -	Vdc
Emitter-Base Breakdown Voltage (I <sub>E</sub> = 10 μA, I <sub>C</sub> = 0)	V <sub>(BR)EBO</sub>	5.0	-	-	Vdc
Collector Cutoff Current (V <sub>CB</sub> = 30 V, I <sub>E</sub> = 0) (V <sub>CB</sub> = 20 V, I <sub>E</sub> = 0)	BC337 BC338 I <sub>CBO</sub>	- -	- -	100 100	nAdc
Collector Cutoff Current (V <sub>CE</sub> = 45 V, V <sub>BE</sub> = 0) (V <sub>CE</sub> = 25 V, V <sub>BE</sub> = 0)	BC337 BC338 I <sub>CES</sub>	- -	- -	100 100	nAdc
Emitter Cutoff Current (V <sub>EB</sub> = 4.0 V, I <sub>C</sub> = 0)	I <sub>EBO</sub>	-	-	100	nAdc

## ON CHARACTERISTICS

DC Current Gain (I <sub>C</sub> = 100 mA, V <sub>CE</sub> = 1.0 V)	BC337 BC337-16 BC337-25/BC338-25 BC337-40	h <sub>FE</sub>	100 100 160 250 60	- - - - -	630 250 400 630 -	-
Base-Emmitter On Voltage (I <sub>C</sub> = 300 mA, V <sub>CE</sub> = 1.0 V)	V <sub>BE(on)</sub>	-	-	1.2	Vdc	
Collector-Emmitter Saturation Voltage (I <sub>C</sub> = 500 mA, I <sub>B</sub> = 50 mA)	V <sub>CE(sat)</sub>	-	-	0.7	Vdc	

## SMALL-SIGNAL CHARACTERISTICS

Output Capacitance (V <sub>CB</sub> = 10 V, I <sub>E</sub> = 0, f = 1.0 MHz)	C <sub>ob</sub>	-	15	-	pF
Current-Gain-Bandwidth Product (I <sub>C</sub> = 10 mA, V <sub>CE</sub> = 5.0 V, f = 100 MHz)	f <sub>T</sub>	-	210	-	MHz

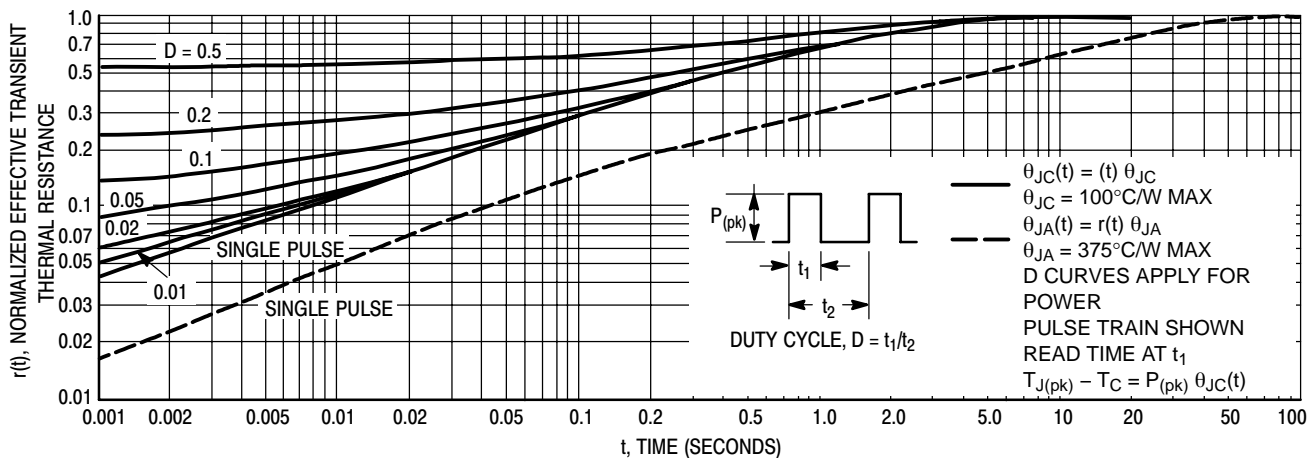


Figure 1. Thermal Response

BC337, BC337-16, BC337-25, BC337-40, BC338-25

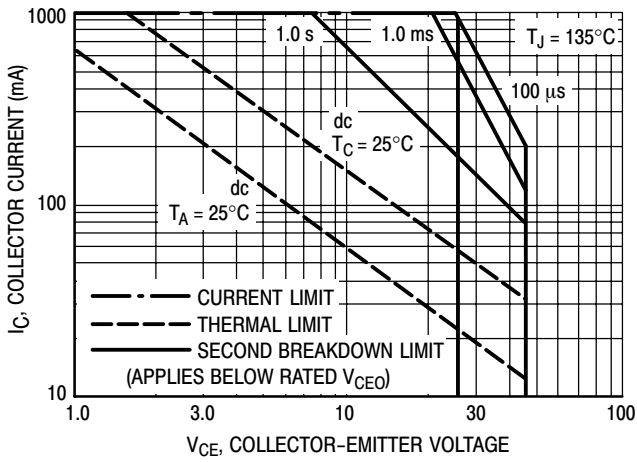


Figure 2. Active Region - Safe Operating Area

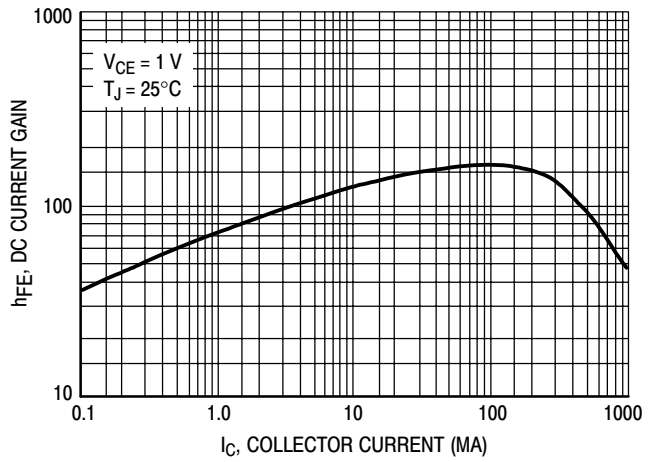


Figure 3. DC Current Gain

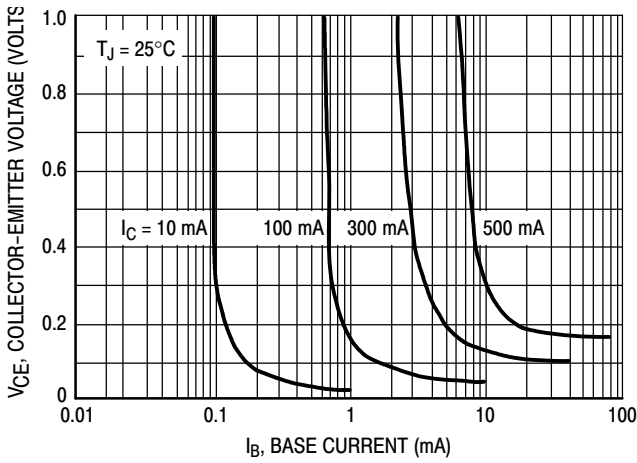


Figure 4. Saturation Region

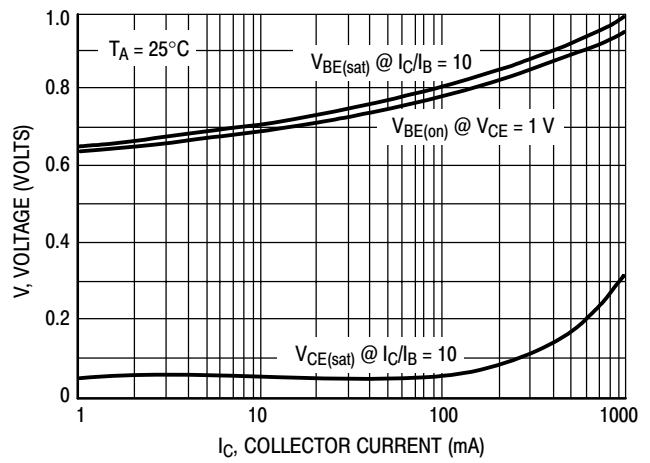


Figure 5. "On" Voltages

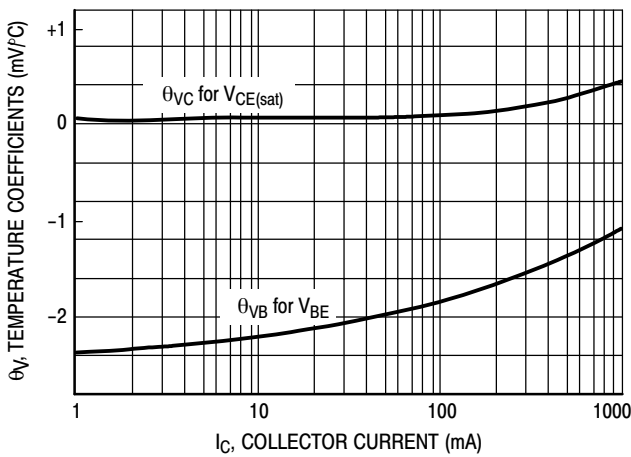


Figure 6. Temperature Coefficients

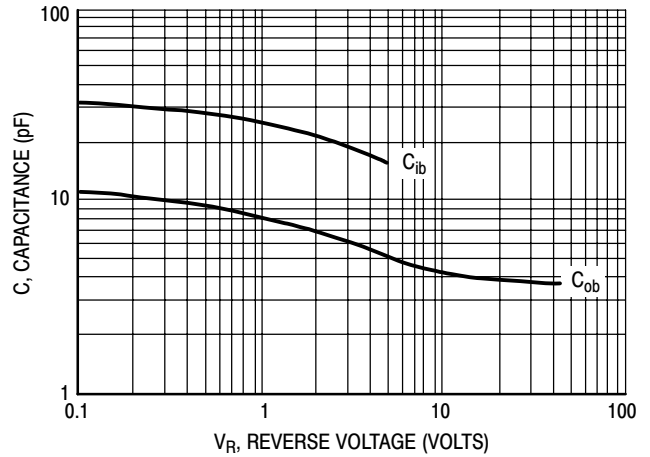


Figure 7. Capacitances

## BC337, BC337-16, BC337-25, BC337-40, BC338-25

### ORDERING INFORMATION

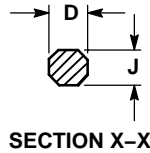
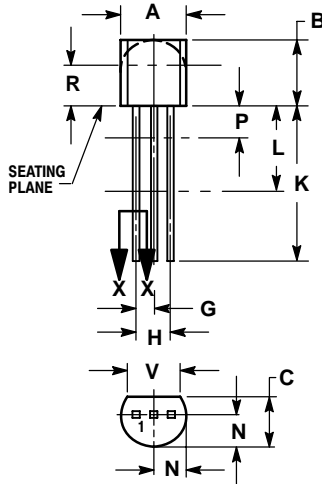
Device	Package	Marking	Shipping†
BC337	TO-92	7	5000 Units / Box
BC337G	TO-92 (Pb-Free)	7	5000 Units / Box
BC337RL1	TO-92	7	2000 / Tape & Reel
BC337RL1G	TO-92 (Pb-Free)	7	2000 / Tape & Reel
BC337ZL1	TO-92	7	2000 / Ammo Box
BC337ZL1G	TO-92 (Pb-Free)	7	2000 / Ammo Box
BC337-16	TO-92	7-16	5000 Units / Box
BC337-16G	TO-92 (Pb-Free)	7-16	5000 Units / Box
BC337-16RL1	TO-92	7-16	2000 / Tape & Reel
BC337-16RL1G	TO-92 (Pb-Free)	7-16	2000 / Tape & Reel
BC337-16ZL1	TO-92	7-16	2000 / Ammo Box
BC337-16ZL1G	TO-92 (Pb-Free)	7-16	2000 / Ammo Box
BC337-25	TO-92	7-25	5000 Units / Box
BC337-25G	TO-92 (Pb-Free)	7-25	5000 Units / Box
BC337-25RL1	TO-92	7-25	2000 / Tape & Reel
BC337-25RL1G	TO-92 (Pb-Free)	7-25	2000 / Tape & Reel
BC337-25ZL1	TO-92	7-25	2000 / Ammo Box
BC337-25ZL1G	TO-92 (Pb-Free)	7-25	2000 / Ammo Box
BC337-40	TO-92	7-40	5000 Units / Box
BC337-40G	TO-92 (Pb-Free)	7-40	5000 Units / Box
BC337-40RL1	TO-92	7-40	2000 / Tape & Reel
BC337-40RL1G	TO-92 (Pb-Free)	7-40	2000 / Tape & Reel
BC337-40ZL1	TO-92	7-40	2000 / Ammo Box
BC337-40ZL1G	TO-92 (Pb-Free)	7-40	2000 / Ammo Box
BC338-25ZL1	TO-92	8-25	2000 / Ammo Box
BC338-25ZL1G	TO-92 (Pb-Free)	8-25	2000 / Ammo Box

†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.

# BC337, BC337-16, BC337-25, BC337-40, BC338-25

## PACKAGE DIMENSIONS

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



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	---

STYLE 17:

1. COLLECTOR
2. BASE
3. EMITTER

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**BC337/D**