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

Amplifier Transistors

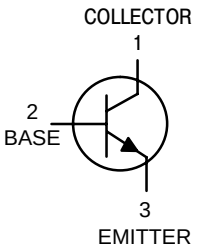
NPN Silicon

ON Semiconductor®

http://onsemi.com

Features

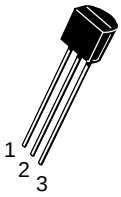
- Pb−Free Packages are Available*



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°C Derate above 25°C	P_D	625 5.0		mW mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	1.5 12		W mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−55 to +150		°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.

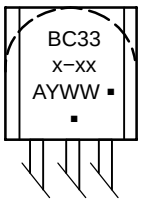


TO−92
CASE 29
STYLE 17

THERMAL CHARACTERISTICS

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

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)

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

ORDERING INFORMATION

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

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

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Collector−Emitter Breakdown Voltage (I_C = 10 mA, I_B = 0)	BC337	$V_{(BR)CEO}$	45	–	–	Vdc
BC338			25	–	–	
Collector−Emitter Breakdown Voltage (I_C = 100 μA, I_E = 0)	BC337	$V_{(BR)CES}$	50	–	–	Vdc
	BC338		30	–	–	
Emitter−Base Breakdown Voltage (I_E = 10 μA, I_C = 0)		$V_{(BR)EBO}$	5.0	–	–	Vdc
Collector Cutoff Current (V_{CB} = 30 V, I_E = 0)	BC337	I_{CBO}	–	–	100	nAdc
(V_{CB} = 20 V, I_E = 0)	BC338		–	–	100	
Collector Cutoff Current (V_{CE} = 45 V, V_{BE} = 0)	BC337	I_{CES}	–	–	100	nAdc
(V_{CE} = 25 V, V_{BE} = 0)	BC338		–	–	100	
Emitter Cutoff Current (V_{EB} = 4.0 V, I_C = 0)		I_{EBO}	–	–	100	nAdc
ON CHARACTERISTICS						
DC Current Gain (I_C = 100 mA, V_{CE} = 1.0 V)	BC337	h_{FE}	100	–	630	–
	BC337−16		100	–	250	
	BC337−25/BC338−25		160	–	400	
	BC337−40		250	–	630	
(I_C = 300 mA, V_{CE} = 1.0 V)			60	–	–	
Base−Emitter On Voltage (I_C = 300 mA, V_{CE} = 1.0 V)		$V_{BE(on)}$	–	–	1.2	Vdc
Collector−Emitter Saturation Voltage (I_C = 500 mA, I_B = 50 mA)		$V_{CE(sat)}$	–	–	0.7	Vdc
SMALL−SIGNAL CHARACTERISTICS						
Output Capacitance (V_{CB} = 10 V, I_E = 0, f = 1.0 MHz)		C_{ob}	–	15	–	pF
Current−Gain − Bandwidth Product (I_C = 10 mA, V_{CE} = 5.0 V, f = 100 MHz)		f_T	–	210	–	MHz

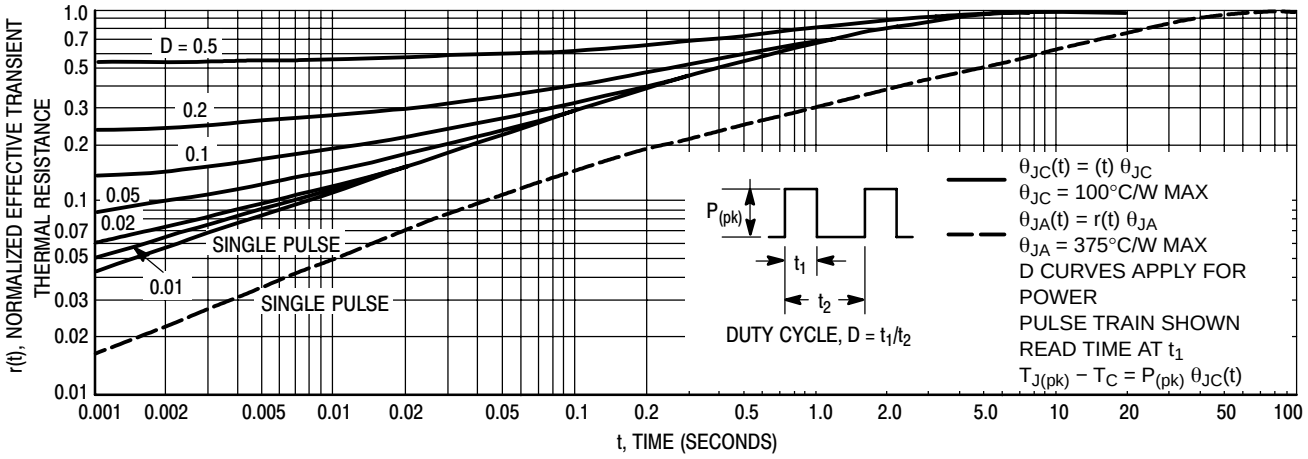


Figure 1. Thermal Response

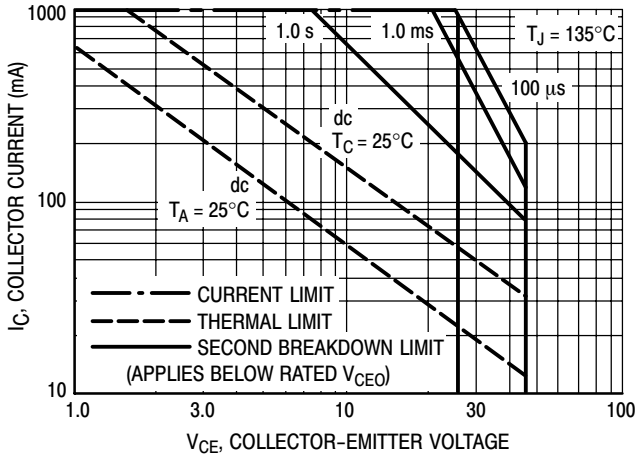


Figure 2. Active Region − Safe Operating Area

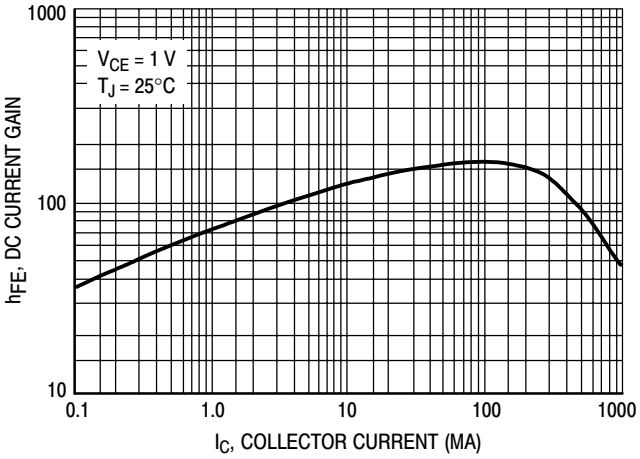


Figure 3. DC Current Gain

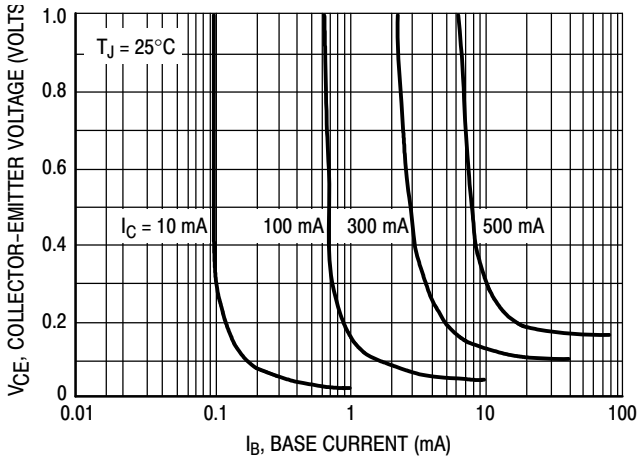


Figure 4. Saturation Region

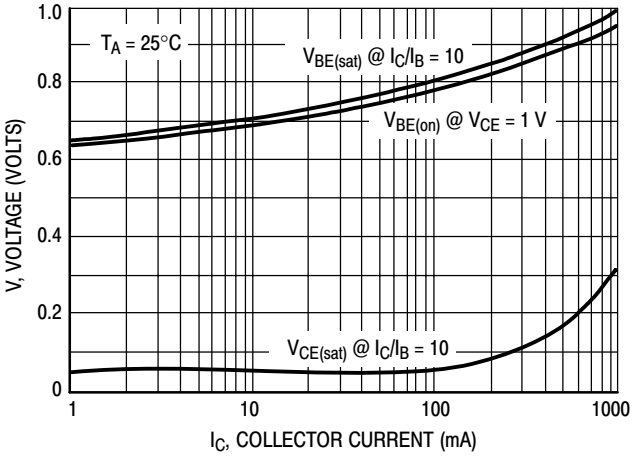


Figure 5. “On” Voltages

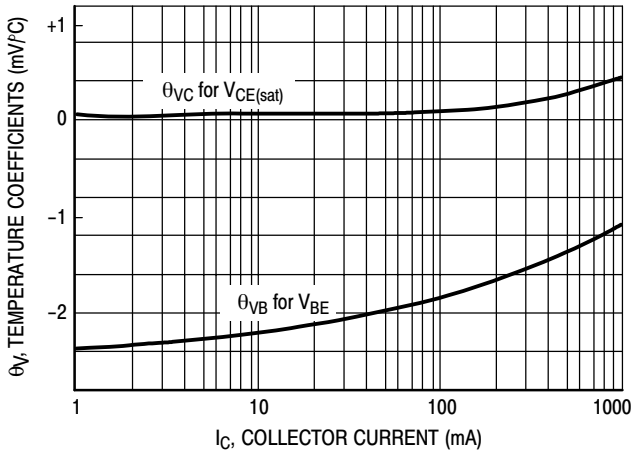


Figure 6. Temperature Coefficients

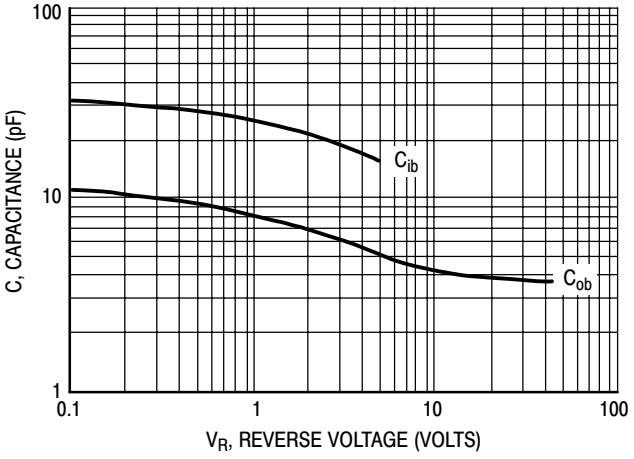


Figure 7. Capacitances

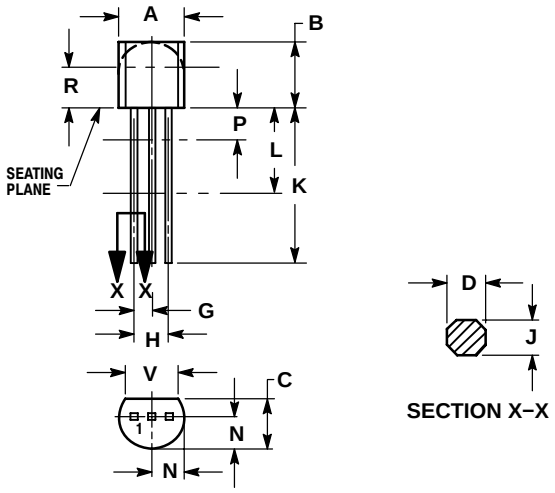
ORDERING INFORMATION

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.

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.

	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
P.O. Box 61312, Phoenix, Arizona 85082−1312 USA
Phone: 480−829−7710 or 800−344−3860 Toll Free USA/Canada
Fax: 480−829−7709 or 800−344−3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800−282−9855 Toll Free USA/Canada

Japan: ON Semiconductor, Japan Customer Focus Center
2−9−1 Kamimeguro, Meguro−ku, Tokyo, Japan 153−0051
Phone: 81−3−5773−3850

ON Semiconductor Website: http://onsemi.com

Order Literature: http://www.onsemi.com/litorder

For additional information, please contact your local Sales Representative.