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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°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.

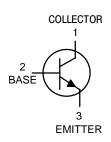
THERMAL CHARACTERISTICS

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



ON Semiconductor®

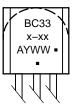
http://onsemi.com





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.

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

ELECTRICAL CHARACTERISTICS ($T_A = 25^{\circ}C$ unless otherwise noted)

Characteris	tic	Symbol	Min	Тур	Max	Unit
OFF CHARACTERISTICS		•			•	
Collector – Emitter Breakdown Voltage (I _C = 10 mA, I _B = 0) BC338	BC337	V _(BR) CEO	45 25	_ _	- -	Vdc
Collector – Emitter Breakdown Voltage ($I_C = 100 \mu A, I_E = 0$)	BC337 BC338	V _{(BR)CES}	50 30	- -	- -	Vdc
Emitter – Base Breakdown Voltage ($I_E = 10 \mu A, I_C = 0$)		V _{(BR)EBO}	5.0	-	-	Vdc
Collector Cutoff Current $(V_{CB} = 30 \text{ V}, I_E = 0)$ $(V_{CB} = 20 \text{ V}, I_E = 0)$	BC337 BC338	I _{CBO}	- -	- -	100 100	nAdc
Collector Cutoff Current $(V_{CE} = 45 \text{ V}, V_{BE} = 0)$ $(V_{CE} = 25 \text{ V}, V_{BE} = 0)$	BC337 BC338	I _{CES}		- -	100 100	nAdc
Emitter Cutoff Current $(V_{EB} = 4.0 \text{ V}, I_{C} = 0)$		I _{EBO}	-	-	100	nAdc
ON CHARACTERISTICS						
DC Current Gain ($I_C = 100 \text{ mA}, V_{CE} = 1.0 \text{ V}$) ($I_C = 300 \text{ mA}, V_{CE} = 1.0 \text{ V}$)	BC337 BC337-16 BC337-25/BC338-25 BC337-40	h _{FE}	100 100 160 250 60	- - - -	630 250 400 630	_
Base–Emitter On Voltage (I _C = 300 mA, V _{CE} = 1.0 V)		V _{BE(on)}	-	_	1.2	Vdc
Collector – Emitter Saturation Voltage ($I_C = 500 \text{ mA}, I_B = 50 \text{ mA}$)		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 ($I_C = 10 \text{ mA}, V_{CE} = 5.0 \text{ V}, f = 100 \text{ MHz}$)		f⊤	-	210	-	MHz

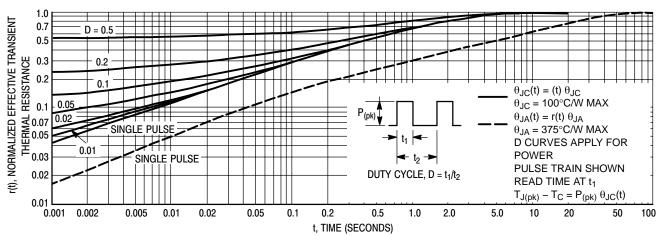


Figure 1. Thermal Response

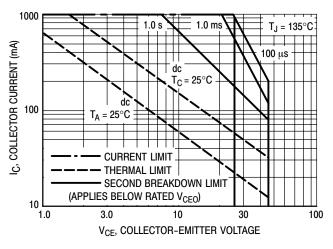


Figure 2. Active Region - Safe Operating Area

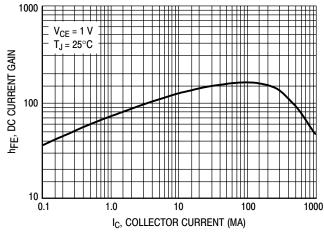


Figure 3. DC Current Gain

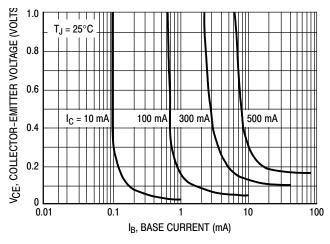


Figure 4. Saturation Region

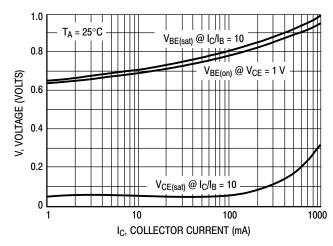


Figure 5. "On" Voltages

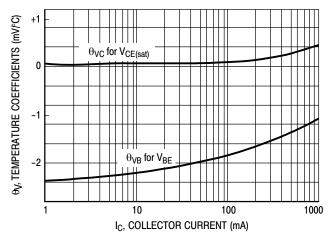


Figure 6. Temperature Coefficients

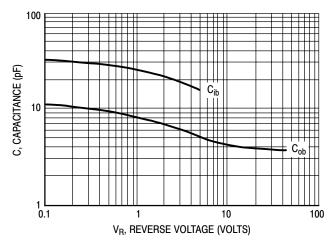


Figure 7. Capacitances

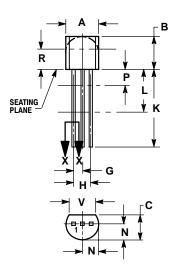
ORDERING INFORMATION

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:

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

	INCHES		MILLIN	IETERS
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
P		0.100		2.54
R	0.115		2.93	
v	0.135		3.43	

STYLE 17:

PIN 1. COLLECTOR

2. BASE

3. EMITTER

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