

BC546B, BC547A, B, C, BC548B, C

Amplifier Transistors

NPN Silicon

Features

- Pb-Free Packages are Available*

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector - Emitter Voltage	V_{CEO}	65	Vdc
		45	
		30	
Collector - Base Voltage	V_{CBO}	80	Vdc
		50	
		30	
Emitter - Base Voltage	V_{EBO}	6.0	Vdc
Collector Current - Continuous	I_C	100	mAdc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	625	mW
		5.0	mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	1.5	W
		12	mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

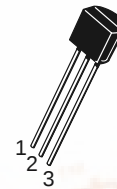
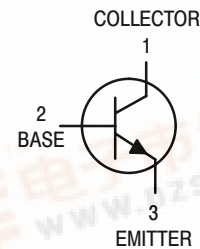
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	200	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	83.3	$^\circ\text{C/W}$

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.



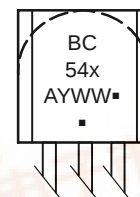
ON Semiconductor®

<http://onsemi.com>



TO-92
CASE 29
STYLE 17

MARKING DIAGRAM



BC54x = Device Code
x = 6, 7, or 8
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 5 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.



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

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Collector – Emitter Breakdown Voltage (I _C = 1.0 mA, I _B = 0)	BC546 BC547 BC548	V _{(BR)CEO}	65 45 30	– – –	– – –	V
Collector – Base Breakdown Voltage (I _C = 100 µA _{dc})	BC546 BC547 BC548	V _{(BR)CBO}	80 50 30	– – –	– – –	V
Emitter – Base Breakdown Voltage (I _E = 10 µA, I _C = 0)	BC546 BC547 BC548	V _{(BR)EBO}	6.0 6.0 6.0	– – –	– – –	V
Collector Cutoff Current (V _{CE} = 70 V, V _{BE} = 0) (V _{CE} = 50 V, V _{BE} = 0) (V _{CE} = 35 V, V _{BE} = 0) (V _{CE} = 30 V, T _A = 125°C)	BC546 BC547 BC548 BC546/547/548	I _{CES}	– – – –	0.2 0.2 0.2 –	15 15 15 4.0	nA µA
ON CHARACTERISTICS						
DC Current Gain (I _C = 10 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)	BC547A BC546B/547B/548B BC548C BC546 BC547 BC548 BC547A BC546B/547B/548B BC547C/BC548C BC547A/548A BC546B/547B/548B BC548C	h _{FE}	– – – 110 110 110 110 200 420 – – –	90 150 270 – – – 180 290 520 120 180 300	– – – 450 800 800 220 450 800 – – –	–
Collector – Emitter Saturation Voltage (I _C = 10 mA, I _B = 0.5 mA) (I _C = 100 mA, I _B = 5.0 mA) (I _C = 10 mA, I _B = See Note 1)		V _{CE(sat)}	– – –	0.09 0.2 0.3	0.25 0.6 0.6	V
Base – Emitter Saturation Voltage (I _C = 10 mA, I _B = 0.5 mA)		V _{BE(sat)}	–	0.7	–	V
Base – Emitter On Voltage (I _C = 2.0 mA, V _{CE} = 5.0 V) (I _C = 10 mA, V _{CE} = 5.0 V)		V _{BE(on)}	0.55 –	– –	0.7 0.77	V
SMALL-SIGNAL CHARACTERISTICS						
Current – Gain – Bandwidth Product (I _C = 10 mA, V _{CE} = 5.0 V, f = 100 MHz)	BC546 BC547 BC548	f _T	150 150 150	300 300 300	– – –	MHz
Output Capacitance (V _{CB} = 10 V, I _C = 0, f = 1.0 MHz)		C _{obo}	–	1.7	4.5	pF
Input Capacitance (V _{EB} = 0.5 V, I _C = 0, f = 1.0 MHz)		C _{ibo}	–	10	–	pF
Small – Signal Current Gain (I _C = 2.0 mA, V _{CE} = 5.0 V, f = 1.0 kHz)	BC546 BC547/548 BC547A BC546B/547B/548B BC547C/548C	h _{fe}	125 125 125 240 450	– – 220 330 600	500 900 260 500 900	–
Noise Figure (I _C = 0.2 mA, V _{CE} = 5.0 V, R _S = 2 kΩ, f = 1.0 kHz, Δf = 200 Hz)	BC546 BC547 BC548	NF	– – –	2.0 2.0 2.0	10 10 10	dB

1. I_B is value for which $I_C = 11\text{ mA}$ at $V_{CE} = 1.0\text{ V}$.

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BC547/BC548

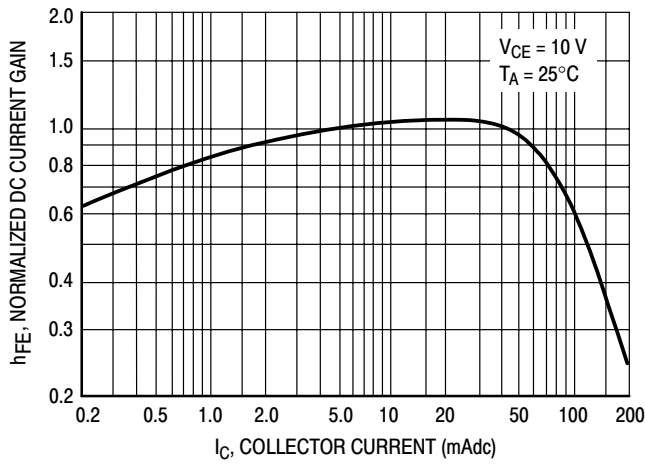


Figure 1. Normalized DC Current Gain

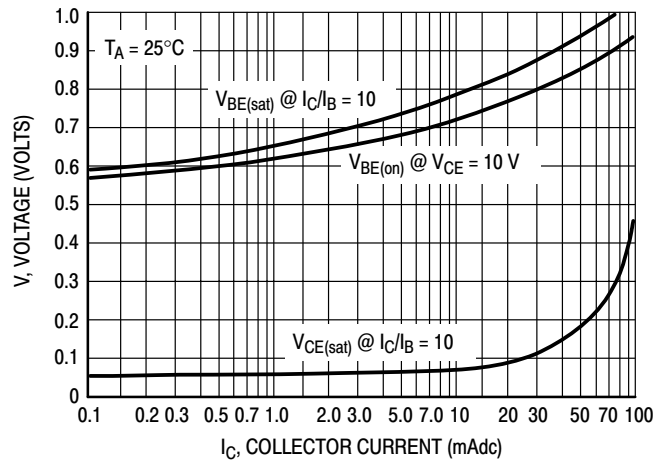


Figure 2. "Saturation" and "On" Voltages

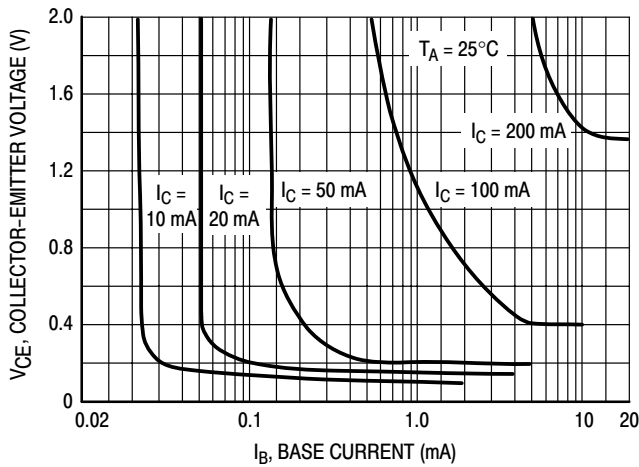


Figure 3. Collector Saturation Region

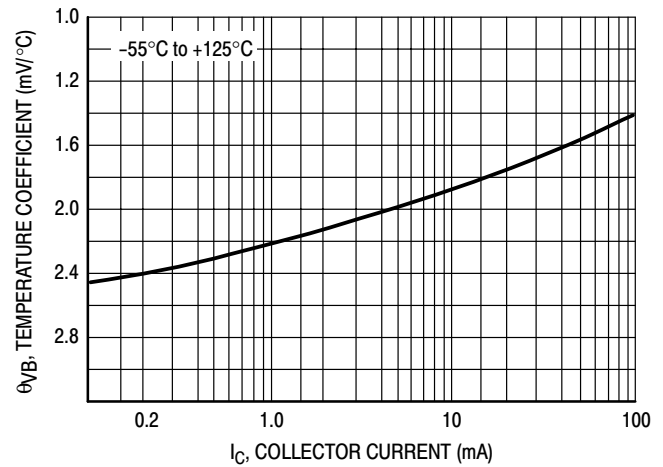


Figure 4. Base-Emitter Temperature Coefficient

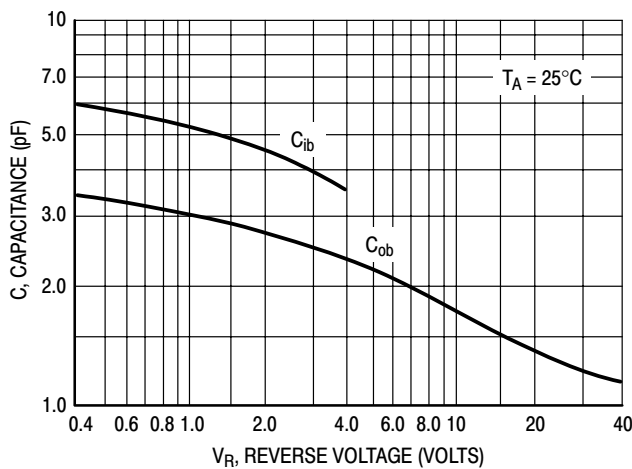


Figure 5. Capacitances

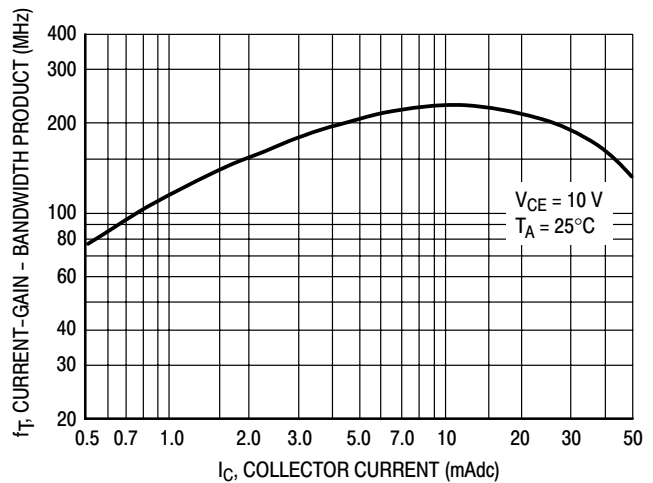


Figure 6. Current-Gain - Bandwidth Product

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BC546

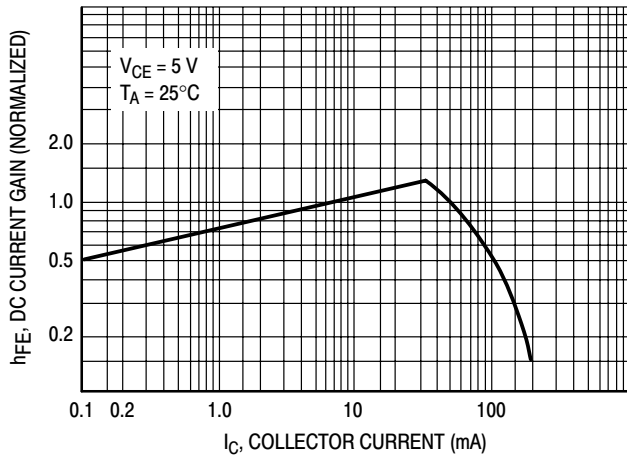


Figure 7. DC Current Gain

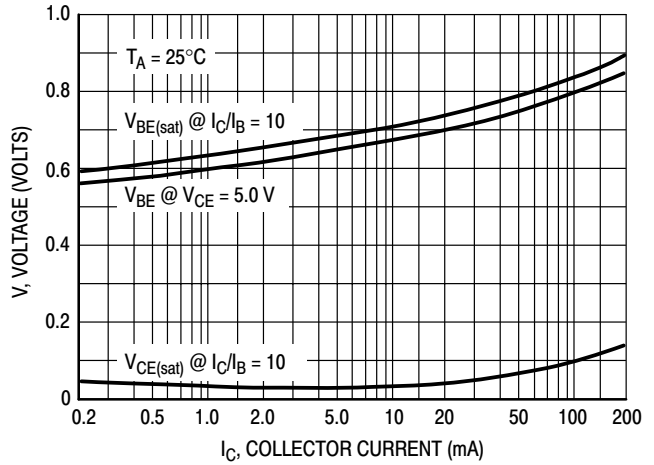


Figure 8. "On" Voltage

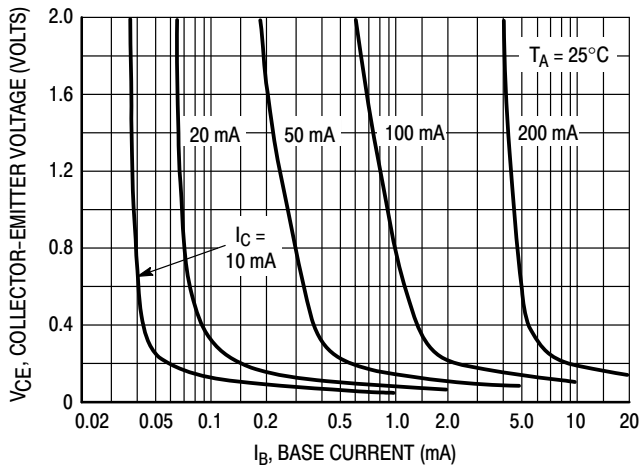


Figure 9. Collector Saturation Region

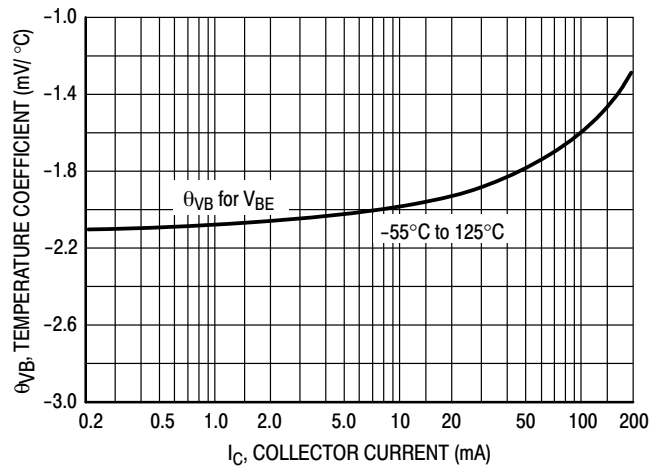


Figure 10. Base-Emitter Temperature Coefficient

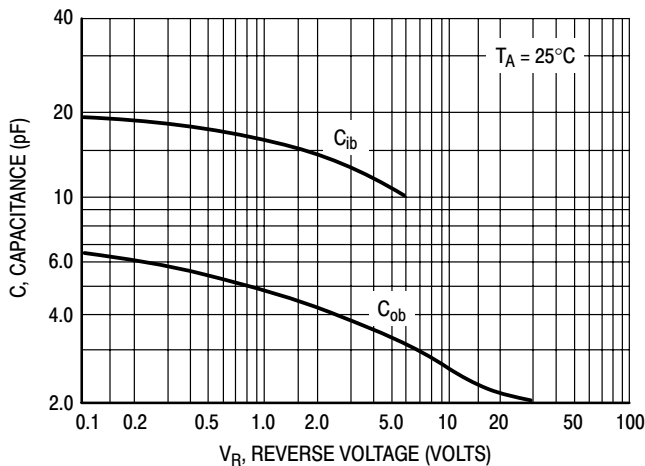


Figure 11. Capacitance

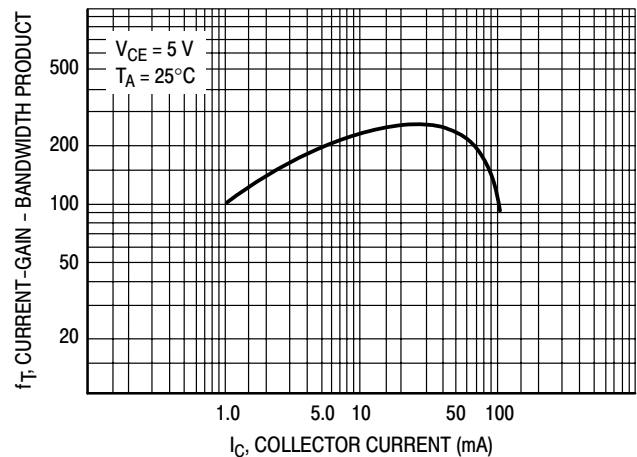


Figure 12. Current-Gain - Bandwidth Product

BC546B, BC547A, B, C, BC548B, C

DEVICE ORDERING INFORMATION

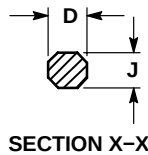
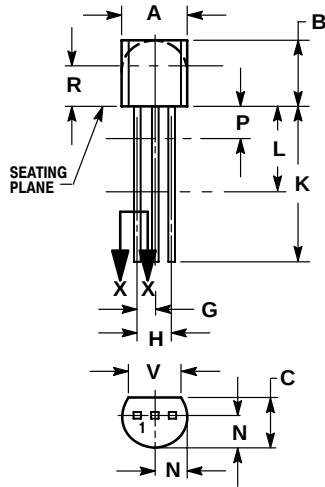
Device	Package	Shipping [†]
BC546B	TO-92	5000 Units / Bulk
BC546BG	TO-92 (Pb-Free)	5000 Units / Bulk
BC546BRL1	TO-92	2000 / Tape & Reel
BC546BRL1G	TO-92 (Pb-Free)	2000 / Tape & Reel
BC546BZL1	TO-92	2000 / Ammo Box
BC546BZL1G	TO-92 (Pb-Free)	2000 / Ammo Box
BC547ARL	TO-92	2000 / Tape & Reel
BC547ARLG	TO-92 (Pb-Free)	2000 / Tape & Reel
BC547ARL1	TO-92	2000 / Tape & Reel
BC547ARL1G	TO-92 (Pb-Free)	2000 / Tape & Reel
BC547AZL1	TO-92	2000 / Ammo Box
BC547AZL1G	TO-92 (Pb-Free)	2000 / Ammo Box
BC547B	TO-92	5000 Units / Bulk
BC547BG	TO-92 (Pb-Free)	5000 Units / Bulk
BC547BRL1	TO-92	2000 / Tape & Reel
BC547BRL1G	TO-92 (Pb-Free)	2000 / Tape & Reel
BC547BZL1	TO-92	2000 / Ammo Box
BC547BZL1G	TO-92 (Pb-Free)	2000 / Ammo Box
BC547C	TO-92	5000 Units / Bulk
BC547CG	TO-92 (Pb-Free)	5000 Units / Bulk
BC547CZL1	TO-92	2000 / Ammo Box
BC547CZL1G	TO-92 (Pb-Free)	2000 / Ammo Box
BC548B	TO-92	5000 Units / Bulk
BC548BG	TO-92 (Pb-Free)	5000 Units / Bulk
BC548BRL1	TO-92	2000 / Tape & Reel
BC548BRL1G	TO-92 (Pb-Free)	2000 / Tape & Reel
BC548BZL1	TO-92	2000 / Ammo Box
BC548BZL1G	TO-92 (Pb-Free)	2000 / Ammo Box
BC548C	TO-92	5000 Units / Bulk
BC548CG	TO-92 (Pb-Free)	5000 Units / Bulk
BC548CZL1	TO-92	2000 / Ammo Box
BC548CZL1G	TO-92 (Pb-Free)	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.

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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:

- PIN 1. COLLECTOR
2. BASE
3. EMITTER

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