BC546B, BC547A, B, C, BC548B, C

Amplifier Transistors

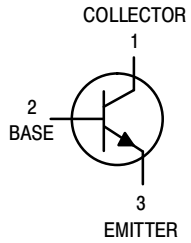
NPN Silicon

Features

- Pb−Free Package is Available*

ON Semiconductor®

http://onsemi.com



MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage BC546 BC547 BC548	V_{CEO}	 65 45 30	Vdc
Collector-Base Voltage BC546 BC547 BC548	V_{CBO}	 80 50 30	Vdc
Emitter-Base Voltage	V_{EBO}	6.0	Vdc
Collector Current − Continuous	I_C	100	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	Watt mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−55 to +150	°C

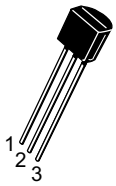
Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

THERMAL CHARACTERISTICS

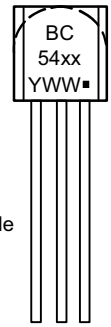
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction−to−Ambient	$R_{\theta JA}$	200	°C/W
Thermal Resistance, Junction−to−Case	$R_{\theta JC}$	83.3	°C/W

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

MARKING DIAGRAM



TO−92
CASE 29
STYLE 17



BC54xx = Specific Device Code
Y = Year
WW = Work Week
▪ = Pb−Free Package

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 5 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	BC546	$V_{(BR)CEO}$	65	−	−	V
(I_C = 1.0 mA, I_B = 0)	BC547		45	−	−	
	BC548		30	−	−	
Collector − Base Breakdown Voltage	BC546	$V_{(BR)CBO}$	80	−	−	V
(I_C = 100 μAdc)	BC547		50	−	−	
	BC548		30	−	−	
Emitter − Base Breakdown Voltage	BC546	$V_{(BR)EBO}$	6.0	−	−	V
(I_E = 10 μA, I_C = 0)	BC547		6.0	−	−	
	BC548		6.0	−	−	
Collector Cutoff Current		I_{CES}				
(V_{CE} = 70 V, V_{BE} = 0)	BC546		−	0.2	15	nA
(V_{CE} = 50 V, V_{BE} = 0)	BC547		−	0.2	15	
(V_{CE} = 35 V, V_{BE} = 0)	BC548		−	0.2	15	
(V_{CE} = 30 V, T_A = 125°C)	BC546/547/548		−	−	4.0	μA
ON CHARACTERISTICS						
DC Current Gain		h_{FE}				−
(I_C = 10 μA, V_{CE} = 5.0 V)	BC547A		−	90	−	
	BC546B/547B/548B		−	150	−	
	BC548C		−	270	−	
(I_C = 2.0 mA, V_{CE} = 5.0 V)	BC546		110	−	450	
	BC547		110	−	800	
	BC548		110	−	800	
	BC547A		110	180	220	
	BC546B/547B/548B		200	290	450	
	BC547C/BC548C		420	520	800	
(I_C = 100 mA, V_{CE} = 5.0 V)	BC547A/548A		−	120	−	
	BC546B/547B/548B		−	180	−	
	BC548C		−	300	−	
Collector − Emitter Saturation Voltage		$V_{CE(sat)}$				V
(I_C = 10 mA, I_B = 0.5 mA)			−	0.09	0.25	
(I_C = 100 mA, I_B = 5.0 mA)			−	0.2	0.6	
(I_C = 10 mA, I_B = See Note 1)			−	0.3	0.6	
Base − Emitter Saturation Voltage		$V_{BE(sat)}$	−	0.7	−	V
(I_C = 10 mA, I_B = 0.5 mA)						
Base − Emitter On Voltage		$V_{BE(on)}$				V
(I_C = 2.0 mA, V_{CE} = 5.0 V)			0.55	−	0.7	
(I_C = 10 mA, V_{CE} = 5.0 V)			−	−	0.77	
SMALL−SIGNAL CHARACTERISTICS						
Current − Gain − Bandwidth Product		f_T				MHz
(I_C = 10 mA, V_{CE} = 5.0 V, f = 100 MHz)	BC546		150	300	−	
	BC547		150	300	−	
	BC548		150	300	−	
Output Capacitance		C_{obo}	−	1.7	4.5	pF
(V_{CB} = 10 V, I_C = 0, f = 1.0 MHz)						
Input Capacitance		C_{ibo}	−	10	−	pF
(V_{EB} = 0.5 V, I_C = 0, f = 1.0 MHz)						
Small − Signal Current Gain		h_{fe}				−
(I_C = 2.0 mA, V_{CE} = 5.0 V, f = 1.0 kHz)	BC546		125	−	500	
	BC547/548		125	−	900	
	BC547A		125	220	260	
	BC546B/547B/548B		240	330	500	
	BC547C/548C		450	600	900	
Noise Figure		NF				dB
(I_C = 0.2 mA, V_{CE} = 5.0 V, R_S = 2 kΩ,	BC546		−	2.0	10	
f = 1.0 kHz, Δf = 200 Hz)	BC547		−	2.0	10	
	BC548		−	2.0	10	

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

BC547/BC548

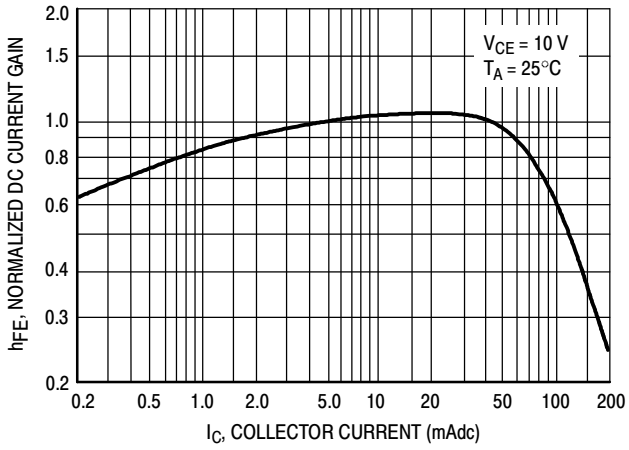


Figure 1. Normalized DC Current Gain

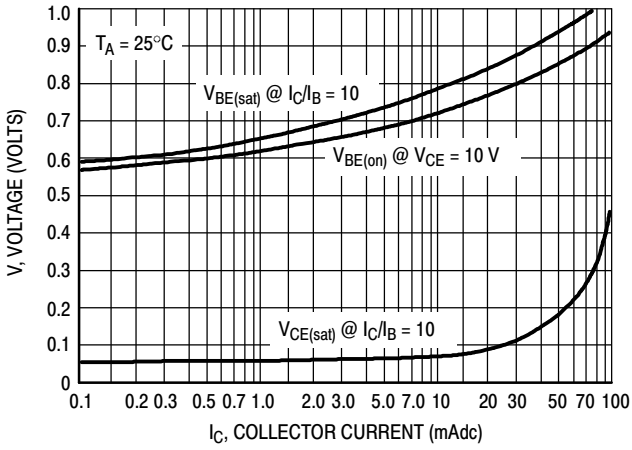


Figure 2. "Saturation" and "On" Voltages

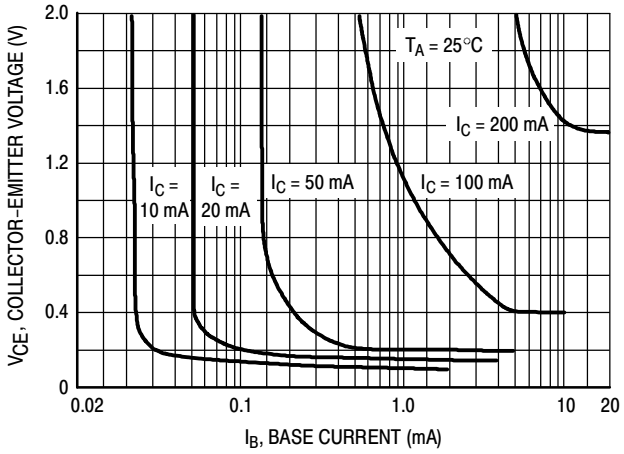


Figure 3. Collector Saturation Region

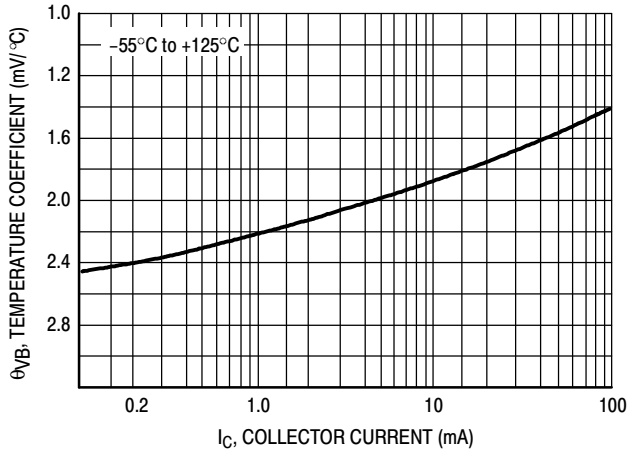


Figure 4. Base−Emitter Temperature Coefficient

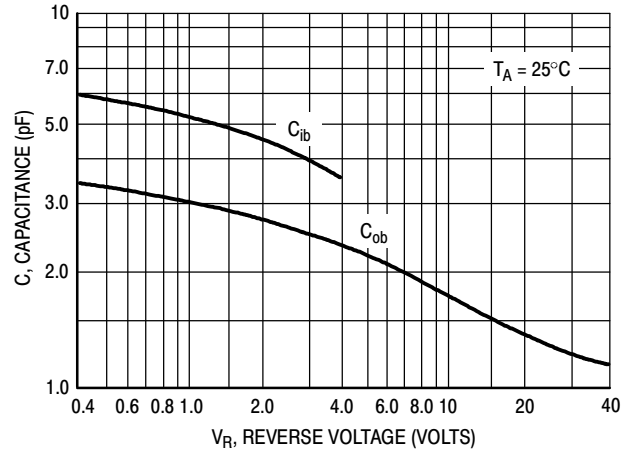


Figure 5. Capacitances

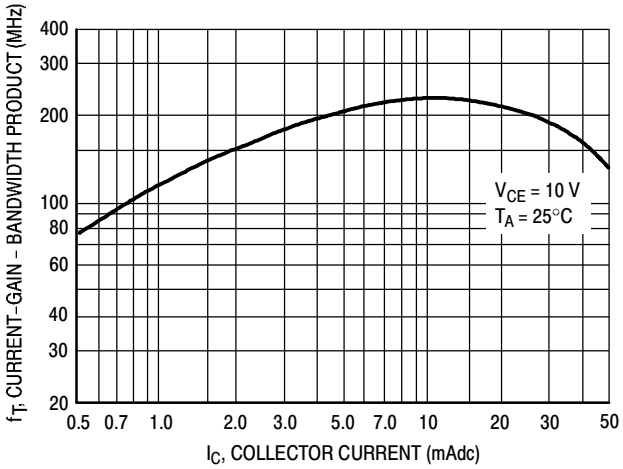


Figure 6. Current−Gain − Bandwidth Product

BC546

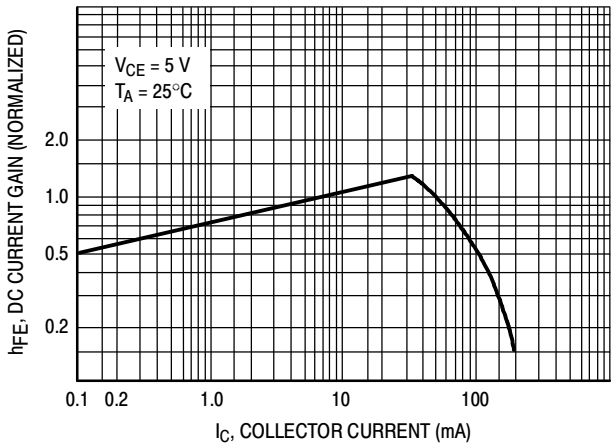


Figure 7. DC Current Gain

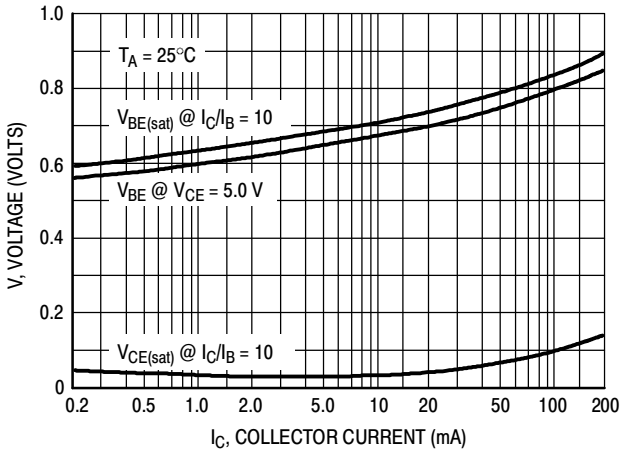


Figure 8. “On” Voltage

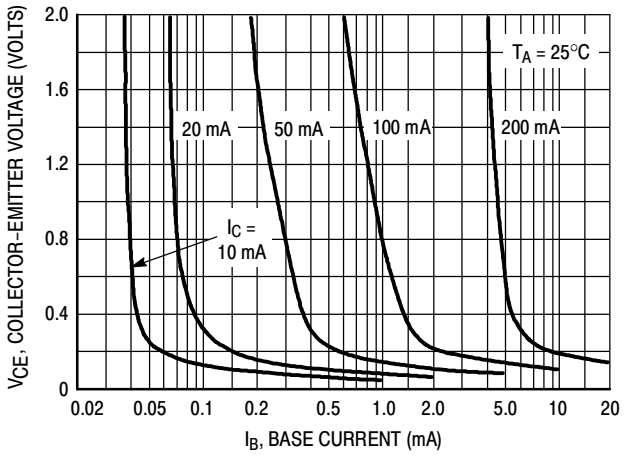


Figure 9. Collector Saturation Region

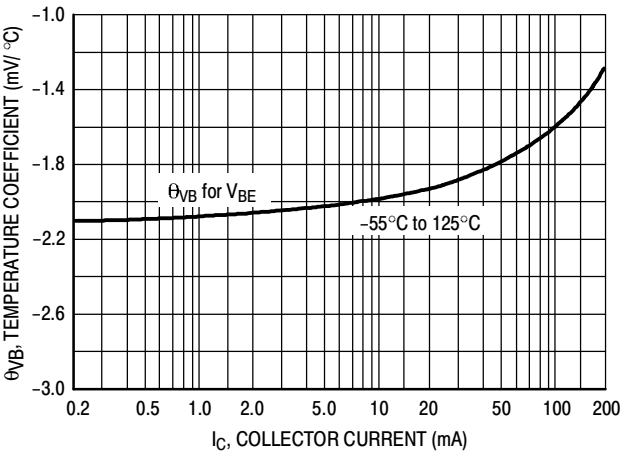


Figure 10. Base−Emitter Temperature Coefficient

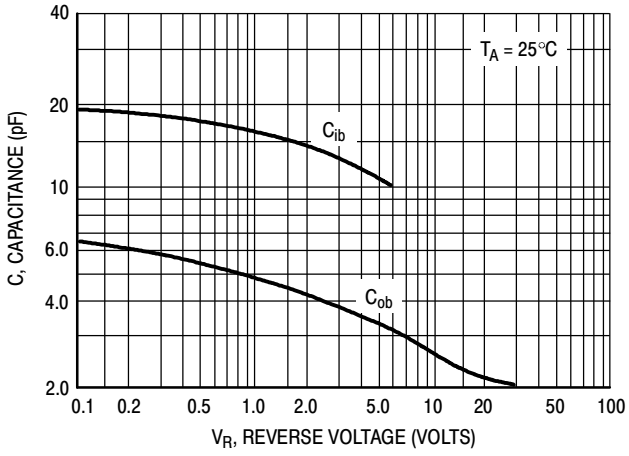


Figure 11. Capacitance

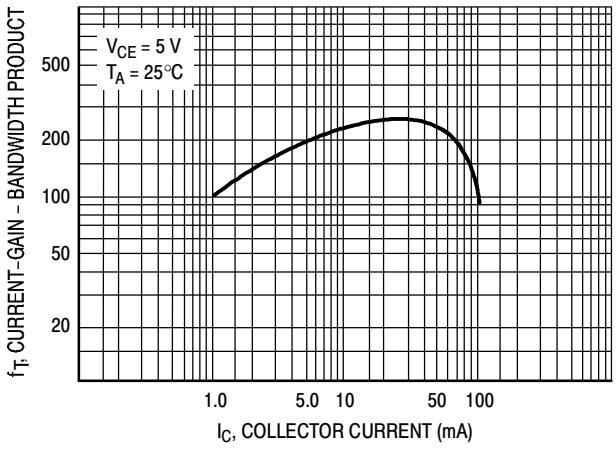


Figure 12. Current−Gain − Bandwidth Product

DEVICE ORDERING INFORMATION

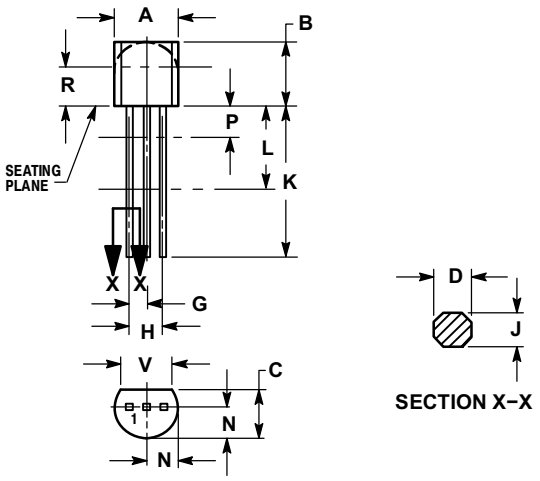
Device	Package	Shipping†
BC546B	TO−92 (TO−226)	5000 Units / Bulk
BC546BRL1		2000 Tape & Reel
BC546BZL1		2000 Tape & Ammo Box
BC547ARL		2000 Tape & Reel
BC547ARL1		2000 Tape & Reel
BC547AZL1		2000 Tape & Ammo Box
BC547B		5000 Units / Bulk
BC547BRL1		2000 Tape & Reel
BC547BZL1		2000 Tape & Ammo Box
BC547C		5000 Units / Bulk
BC547CZL1		2000 Tape & Ammo Box
BC548B		5000 Units / Bulk
BC548BRL1		2000 Tape & Reel
BC548BZL1		2000 Tape & Ammo Box
BC548BZL1G	TO−92 (TO−226) (Pb−Free)	
BC548C	TO−92 (TO−226)	5000 Units / Bulk
BC548CZL1		2000 Tape & 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.

BC546B, BC547A, B, C, BC548B, C

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
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Fax: 303−675−2176 or 800−344−3867 Toll Free USA/Canada
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BC546/D