

BC546B, BC547A, B, C, BC548B, C

Amplifier Transistors

NPN Silicon

Features

- Pb-Free Package is Available*

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CE0}	65	Vdc
	BC546	45	
	BC547	30	
	BC548		
Collector-Base Voltage	V_{CBO}	80	Vdc
	BC546	50	
	BC547	30	
	BC548		
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	Watt
		12	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

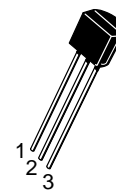
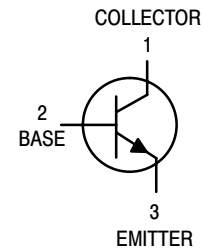
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	200	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	83.3	$^\circ\text{C}/\text{W}$

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



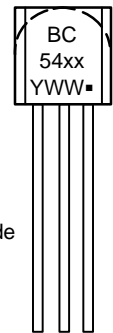
ON Semiconductor®

<http://onsemi.com>



TO-92
CASE 29
STYLE 17

MARKING DIAGRAM



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.

BC546B, BC547A, B, C, BC548B, C

ELECTRICAL CHARACTERISTICS (T_A = 25°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	V _{(BR)CEO}	65	–	–	V
	BC547		45	–	–	
	BC548		30	–	–	
Collector – Base Breakdown Voltage (I _C = 100 μAdc)	BC546	V _{(BR)CBO}	80	–	–	V
	BC547		50	–	–	
	BC548		30	–	–	
Emitter – Base Breakdown Voltage (I _E = 10 μA, I _C = 0)	BC546	V _{(BR)EBO}	6.0	–	–	V
	BC547		6.0	–	–	
	BC548		6.0	–	–	
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	I _{CES}	–	0.2	15	nA
	BC547		–	0.2	15	
	BC548		–	0.2	15	
	BC546/547/548		–	–	4.0	μA

ON CHARACTERISTICS

DC Current Gain (I _C = 10 μA, V _{CE} = 5.0 V)	BC547A	h _{FE}	–	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		
(I _C = 100 mA, V _{CE} = 5.0 V)	BC547C/BC548C	420	520	800		
	BC547A/548A	–	120	–		
	BC546B/547B/548B	–	180	–		
BC548C	–	300	–			
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	0.25	V
			–	0.2	0.6	
			–	0.3	0.6	
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	V
			–	–	0.77	

SMALL-SIGNAL CHARACTERISTICS

Current – Gain – Bandwidth Product (I _C = 10 mA, V _{CE} = 5.0 V, f = 100 MHz)	BC546	f _T	150	300	–	MHz
	BC547		150	300	–	
	BC548		150	300	–	
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	h _{fe}	125	–	500	–
	BC547/548		125	–	900	
	BC547A		125	220	260	
	BC546B/547B/548B		240	330	500	
	BC547C/548C		450	600	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	NF	–	2.0	10	dB
	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.

BC546B, BC547A, B, C, BC548B, C

BC547/BC548

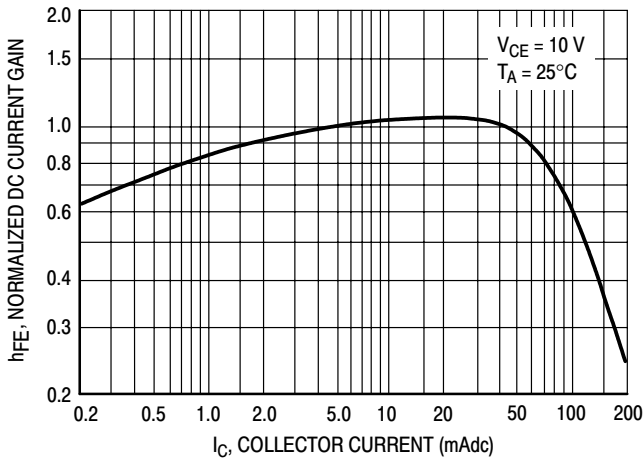


Figure 1. Normalized DC Current Gain

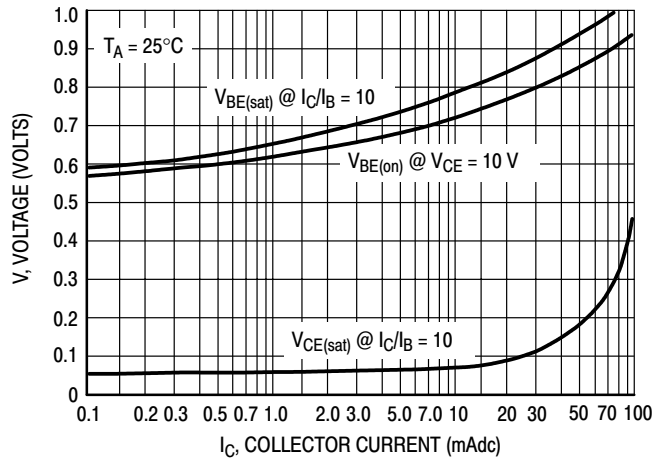


Figure 2. "Saturation" and "On" Voltages

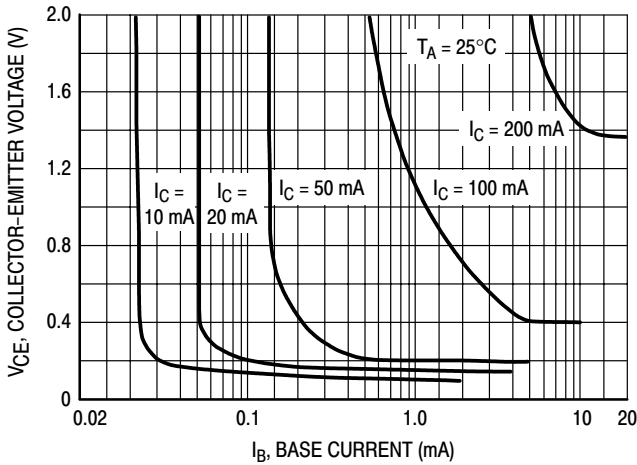


Figure 3. Collector Saturation Region

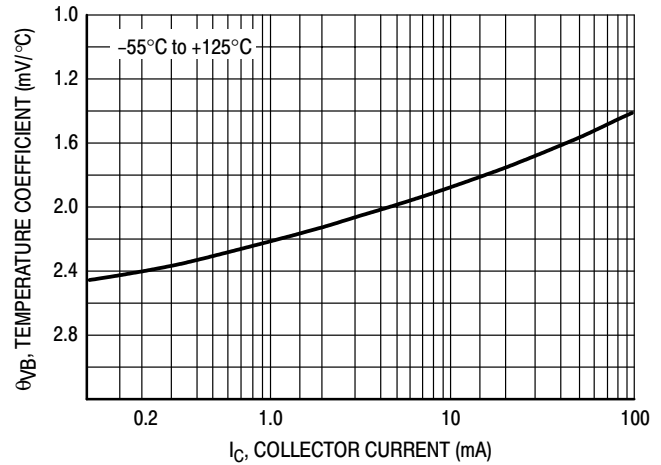


Figure 4. Base-Emitter Temperature Coefficient

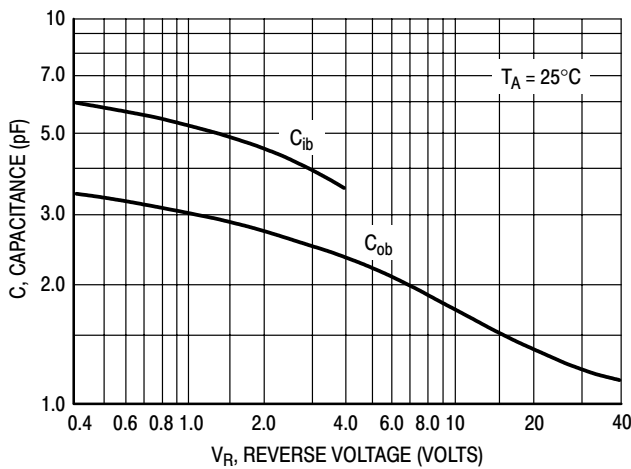


Figure 5. Capacitances

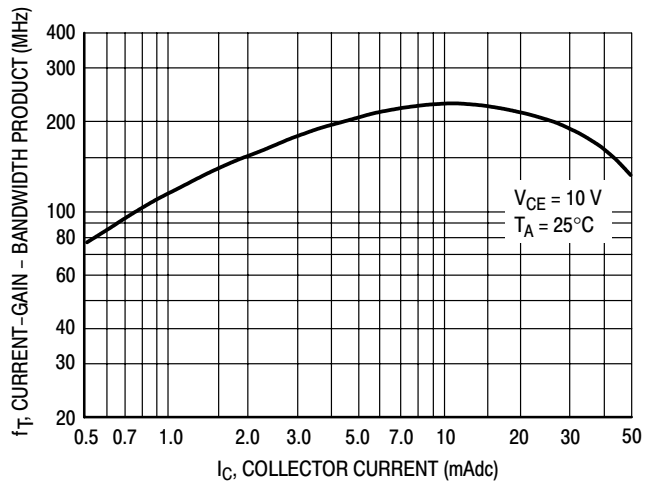


Figure 6. Current-Gain - Bandwidth Product

BC546B, BC547A, B, C, BC548B, C

BC546

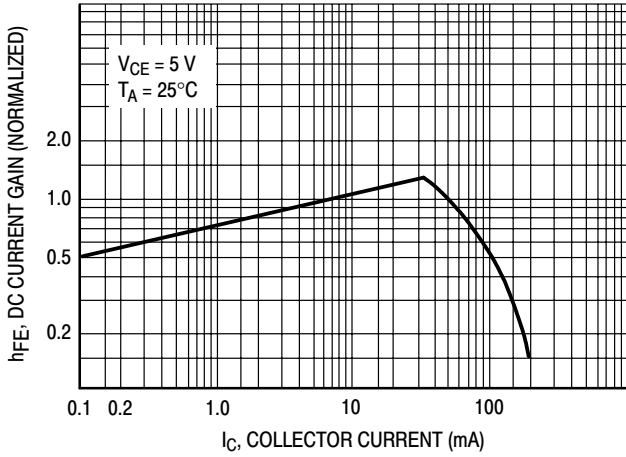


Figure 7. DC Current Gain

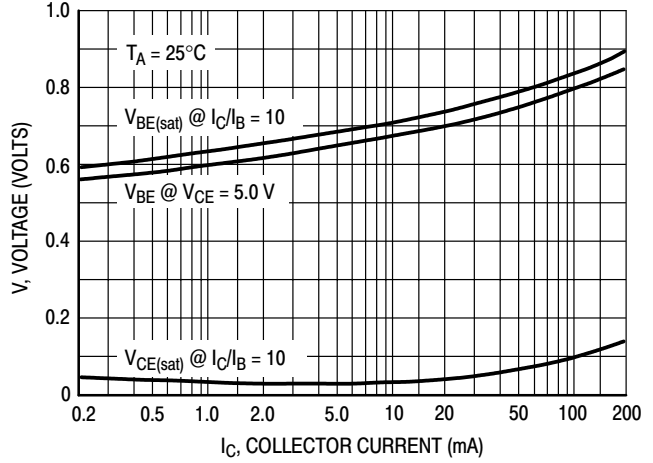


Figure 8. "On" Voltage

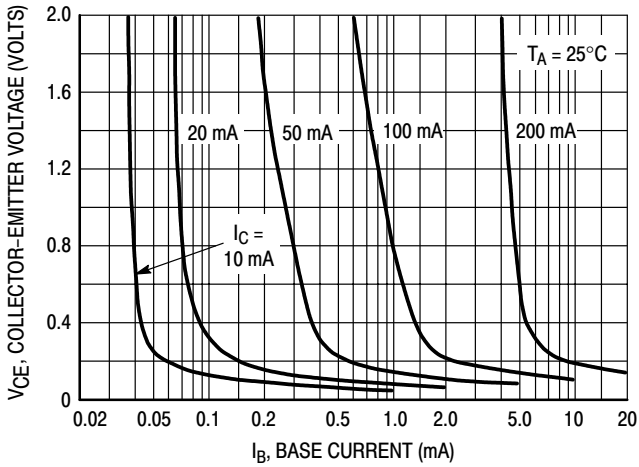


Figure 9. Collector Saturation Region

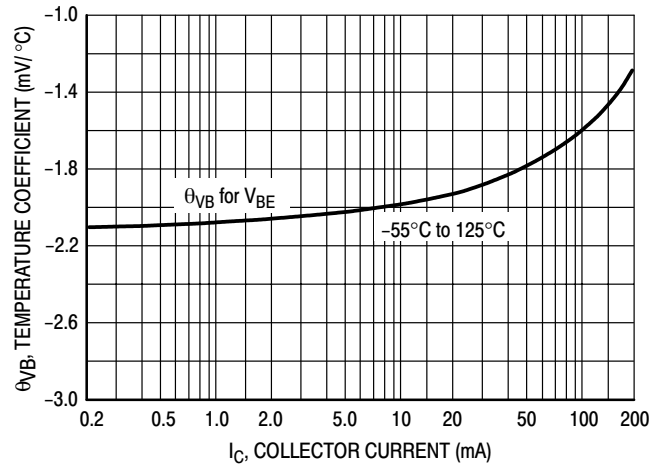


Figure 10. Base-Emitter Temperature Coefficient

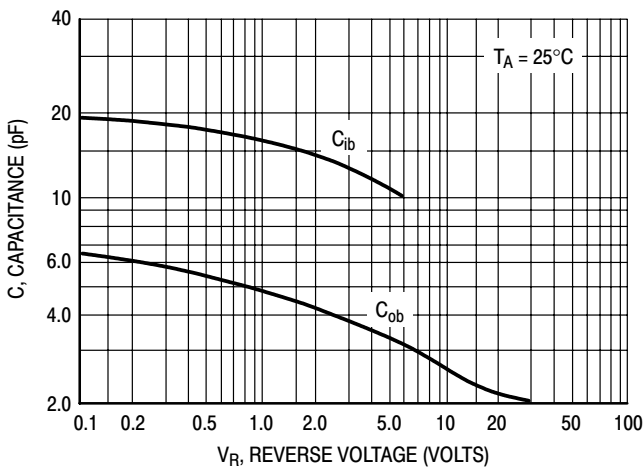


Figure 11. Capacitance

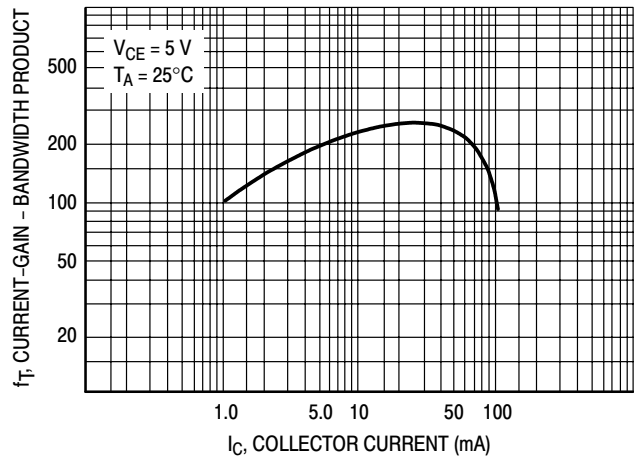


Figure 12. Current-Gain - Bandwidth Product

BC546B, BC547A, B, C, BC548B, C

DEVICE ORDERING INFORMATION

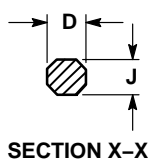
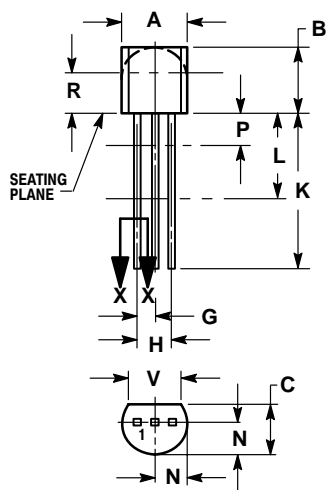
Device	Package	Shipping†
BC546B	TO-92 (TO-226)	5000 Units / Bulk
BC546BRL1		2000 Tape & Reel
BC546BZL1		2000 Tape & Ammo Box
BC547ARL		2000 Tape & Reel
BC547ARL1		2000 Tape & Reel
BC547AZL1		2000 Tape & Ammo Box
BC547B		5000 Units / Bulk
BC547BRL1		2000 Tape & Reel
BC547BZL1		2000 Tape & Ammo Box
BC547C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

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

ON Semiconductor and are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor
P.O. Box 5163, Denver, Colorado 80217 USA
Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada
Fax: 303-675-2176 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.