

BC556B, BC557A, B, C, BC558B, C

Amplifier Transistors

PNP 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}	-5.0	Vdc
Collector Current – Continuous – Peak	I _C	-100	mAdc
	I _{CM}	-200	
Base Current – Peak	I _{BM}	-200	mAdc
Total Device Dissipation @ T _A = 25°C Derate above 25°C	P _D	625	mW
		5.0	mW/°C
Total Device Dissipation @ T _C = 25°C Derate above 25°C	P _D	1.5	W
		12	mW/°C
Operating and Storage Junction Temperature Range	T _J , T _{stg}	-55 to +150	°C

THERMAL CHARACTERISTICS

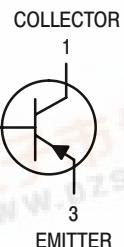
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Ambient	R _{θJA}	200	°C/W
Thermal Resistance, Junction-to-Case	R _{θJC}	83.3	°C/W

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.

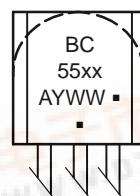


ON Semiconductor®

<http://onsemi.com>



MARKING DIAGRAM



BC55x = 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 6 of this data sheet.

BC556B, BC557A, B, C, BC558B, C

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

Characteristic	Symbol	Min	Typ	Max	Unit
----------------	--------	-----	-----	-----	------

OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage ($I_C = -2.0 \text{ mA}_\text{dc}$, $I_B = 0$)	$V_{(\text{BR})\text{CEO}}$	BC556 BC557 BC558	-65 -45 -30	-	-	V
Collector-Base Breakdown Voltage ($I_C = -100 \mu\text{A}_\text{dc}$)	$V_{(\text{BR})\text{CBO}}$	BC556 BC557 BC558	-80 -50 -30	-	-	V
Emitter-Base Breakdown Voltage ($I_E = -100 \mu\text{A}_\text{dc}$, $I_C = 0$)	$V_{(\text{BR})\text{EBO}}$	BC556 BC557 BC558	-5.0 -5.0 -5.0	-	-	V
Collector-Emitter Leakage Current ($V_{\text{CES}} = -40 \text{ V}$)	I_{CES}	BC556	-	-2.0	-100	nA
($V_{\text{CES}} = -20 \text{ V}$)		BC557	-	-2.0	-100	
($V_{\text{CES}} = -20 \text{ V}$, $T_A = 125^\circ\text{C}$)		BC558	-	-2.0	-100	
		BC556	-	-	-4.0	μA
		BC557	-	-	-4.0	
		BC558	-	-	-4.0	

ON CHARACTERISTICS

DC Current Gain ($I_C = -10 \mu\text{A}_\text{dc}$, $V_{\text{CE}} = -5.0 \text{ V}$)	h_{FE}	A Series Device B Series Devices C Series Devices	- - -	90 150 270	-	-
($I_C = -2.0 \text{ mA}_\text{dc}$, $V_{\text{CE}} = -5.0 \text{ V}$)		BC557	120	-	800	
		A Series Device	120	170	220	
		B Series Devices	180	290	460	
		C Series Devices	420	500	800	
($I_C = -100 \text{ mA}_\text{dc}$, $V_{\text{CE}} = -5.0 \text{ V}$)		A Series Device	-	120	-	
		B Series Devices	-	180	-	
		C Series Devices	-	300	-	
Collector-Emitter Saturation Voltage ($I_C = -10 \text{ mA}_\text{dc}$, $I_B = -0.5 \text{ mA}_\text{dc}$)	$V_{\text{CE}(\text{sat})}$		-	-0.075	-0.3	V
($I_C = -10 \text{ mA}_\text{dc}$, $I_B = \text{see Note 1}$)			-	-0.3	-0.6	
($I_C = -100 \text{ mA}_\text{dc}$, $I_B = -5.0 \text{ mA}_\text{dc}$)			-	-0.25	-0.65	
Base-Emitter Saturation Voltage ($I_C = -10 \text{ mA}_\text{dc}$, $I_B = -0.5 \text{ mA}_\text{dc}$)	$V_{\text{BE}(\text{sat})}$		-	-0.7	-	V
($I_C = -100 \text{ mA}_\text{dc}$, $I_B = -5.0 \text{ mA}_\text{dc}$)			-	-1.0	-	
Base-Emitter On Voltage ($I_C = -2.0 \text{ mA}_\text{dc}$, $V_{\text{CE}} = -5.0 \text{ V}_\text{dc}$)	$V_{\text{BE}(\text{on})}$		-0.55	-0.62	-0.7	V
($I_C = -10 \text{ mA}_\text{dc}$, $V_{\text{CE}} = -5.0 \text{ V}_\text{dc}$)			-	-0.7	-0.82	

SMALL-SIGNAL CHARACTERISTICS

Current-Gain - Bandwidth Product ($I_C = -10 \text{ mA}$, $V_{\text{CE}} = -5.0 \text{ V}$, $f = 100 \text{ MHz}$)	f_T	BC556 BC557 BC558	- - -	280 320 360	-	MHz
Output Capacitance ($V_{\text{CB}} = -10 \text{ V}$, $I_C = 0$, $f = 1.0 \text{ MHz}$)	C_{ob}		-	3.0	6.0	pF
Noise Figure	NF					
($I_C = -0.2 \text{ mA}_\text{dc}$, $V_{\text{CE}} = -5.0 \text{ V}$, $R_S = 2.0 \text{ k}\Omega$, $f = 1.0 \text{ kHz}$, $\Delta f = 200 \text{ Hz}$)		BC556 BC557 BC558	- - -	2.0 2.0 2.0	10 10 10	dB
Small-Signal Current Gain ($I_C = -2.0 \text{ mA}_\text{dc}$, $V_{\text{CE}} = 5.0 \text{ V}$, $f = 1.0 \text{ kHz}$)	h_{fe}	BC557 A Series Device B Series Devices C Series Devices	125 125 240 450	- - - -	900 260 500 900	-

1. $I_C = -10 \text{ mA}_\text{dc}$ on the constant base current characteristics, which yields the point $I_C = -11 \text{ mA}_\text{dc}$, $V_{\text{CE}} = -1.0 \text{ V}$.

BC556B, BC557A, B, C, BC558B, C

BC557/BC558

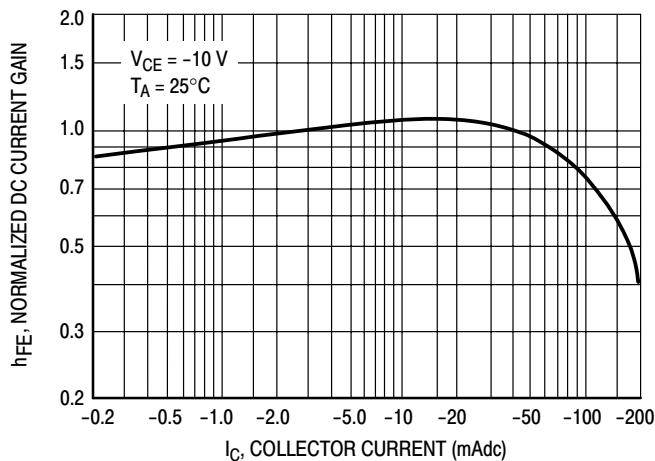


Figure 1. Normalized DC Current Gain

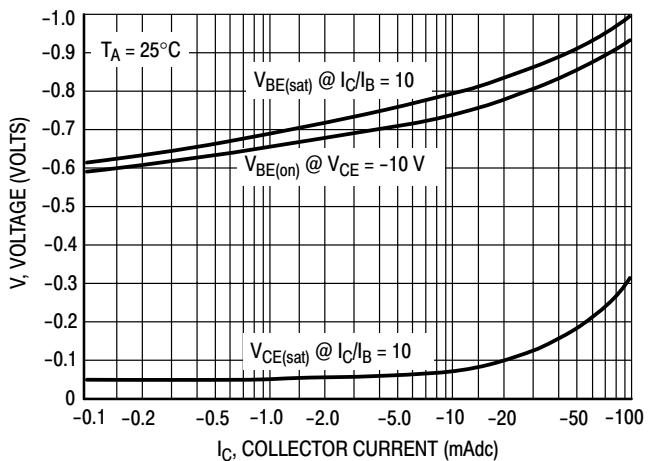


Figure 2. "Saturation" and "On" Voltages

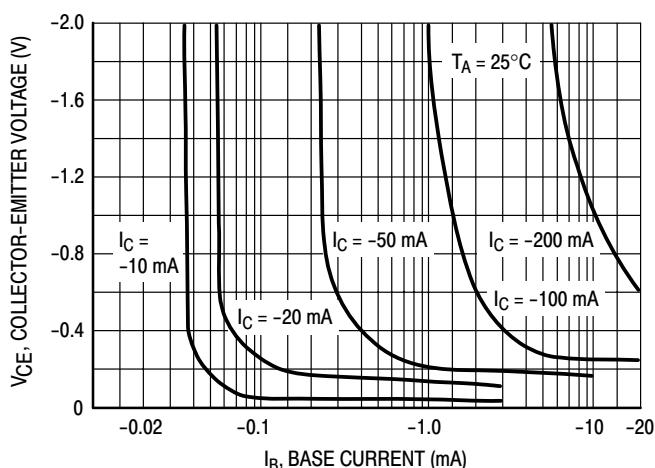


Figure 3. Collector Saturation Region

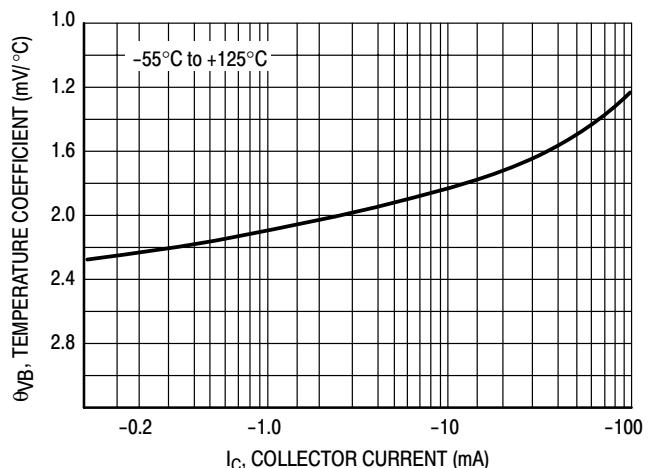


Figure 4. Base-Emitter Temperature Coefficient

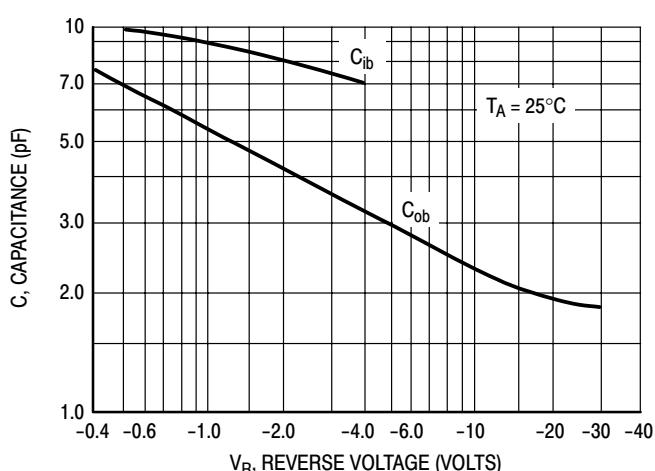


Figure 5. Capacitances

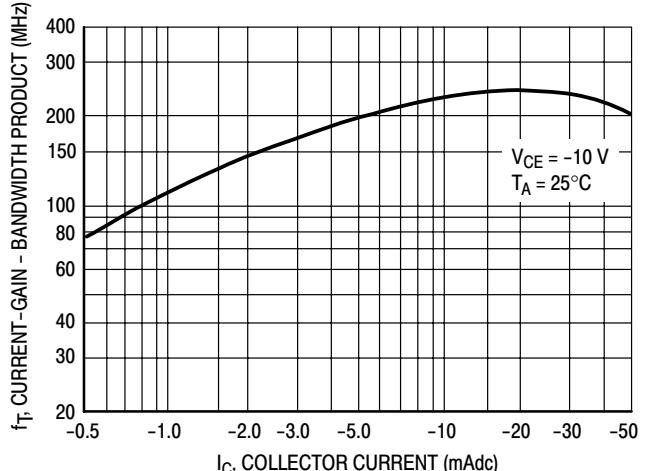


Figure 6. Current-Gain - Bandwidth Product

BC556B, BC557A, B, C, BC558B, C

BC556

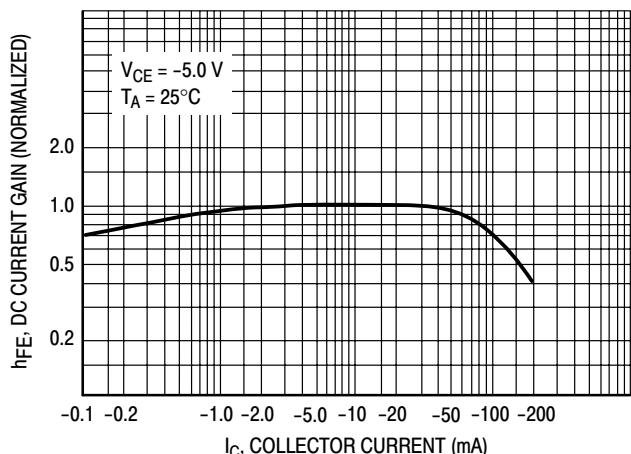


Figure 7. DC Current Gain

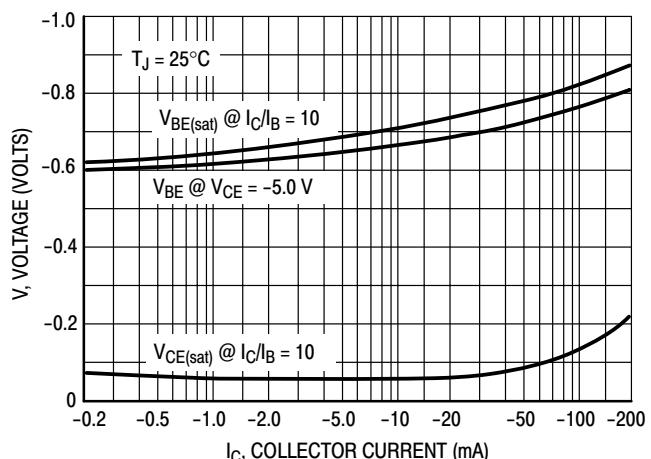


Figure 8. "On" Voltage

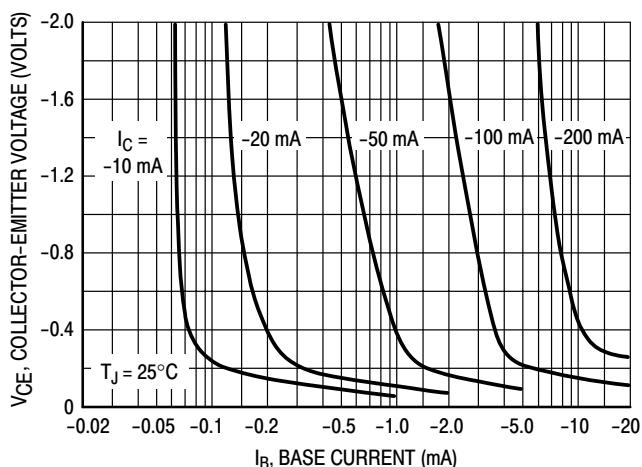


Figure 9. Collector Saturation Region

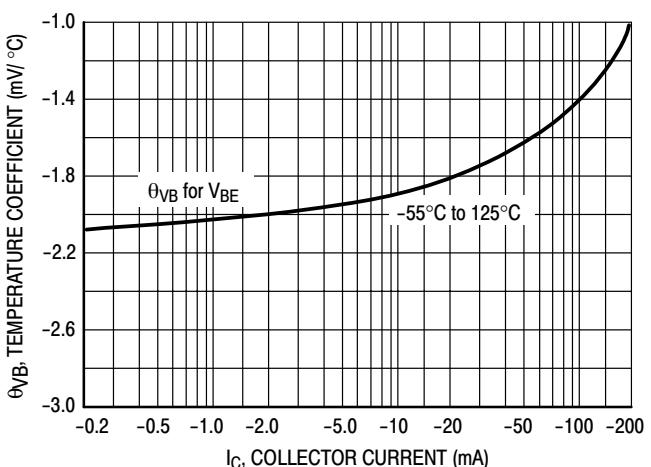


Figure 10. Base-Emitter Temperature Coefficient

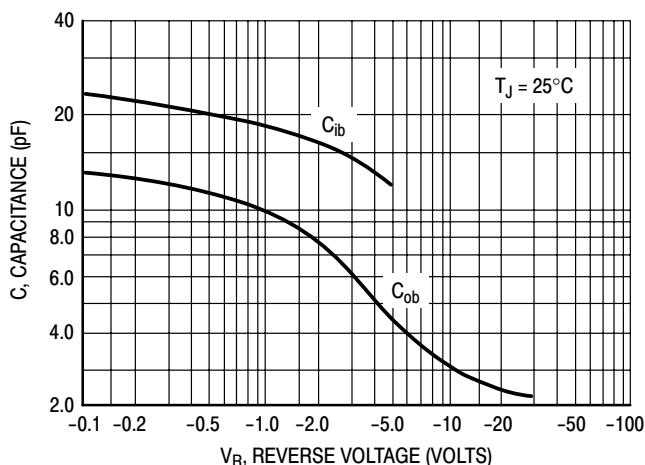


Figure 11. Capacitance

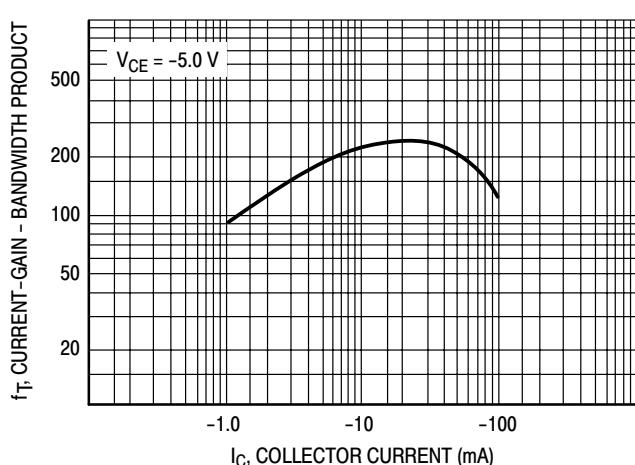


Figure 12. Current-Gain - Bandwidth Product

BC556B, BC557A, B, C, BC558B, C

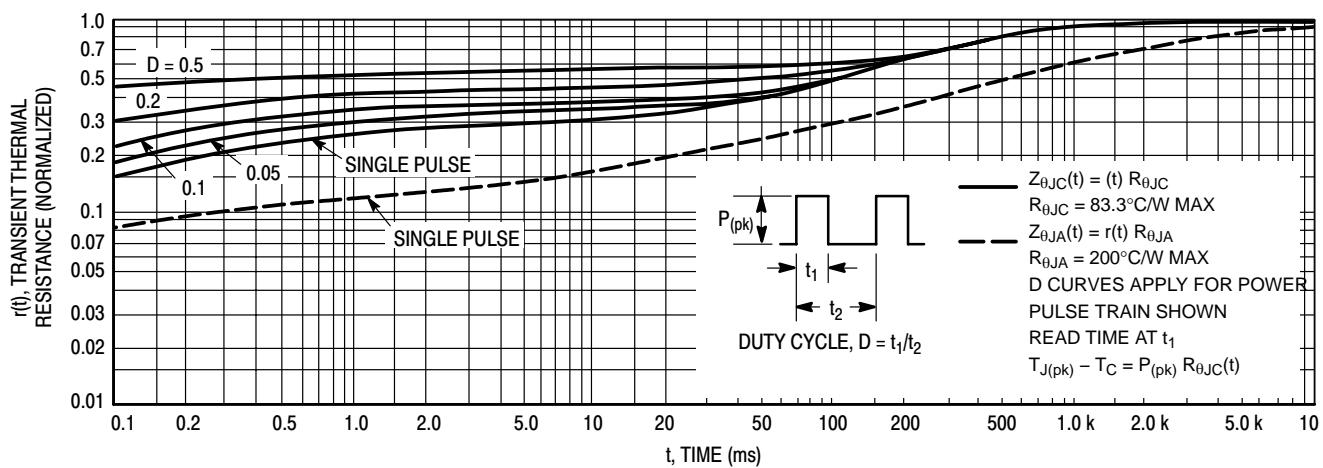
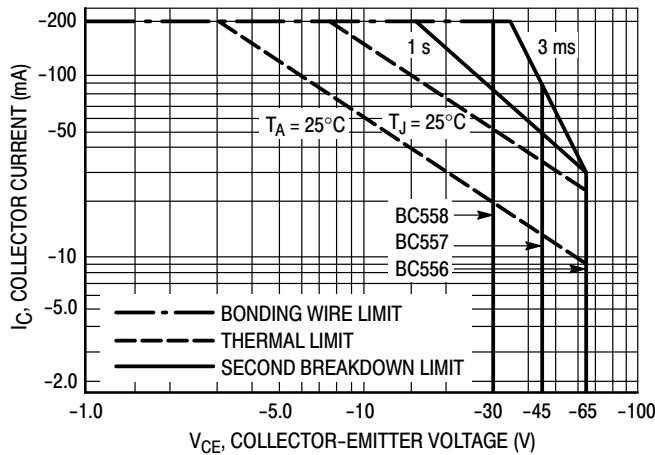


Figure 13. Thermal Response



The safe operating area curves indicate I_C - V_{CE} limits of the transistor that must be observed for reliable operation. Collector load lines for specific circuits must fall below the limits indicated by the applicable curve.

The data of Figure 14 is based upon $T_{J(pk)} = 150^{\circ}\text{C}$; T_C or T_A is variable depending upon conditions. Pulse curves are valid for duty cycles to 10% provided $T_{J(pk)} \leq 150^{\circ}\text{C}$. $T_{J(pk)}$ may be calculated from the data in Figure 13. At high case or ambient temperatures, thermal limitations will reduce the power than can be handled to values less than the limitations imposed by second breakdown.

Figure 14. Active Region – Safe Operating Area

BC556B, BC557A, B, C, BC558B, C

DEVICE ORDERING INFORMATION

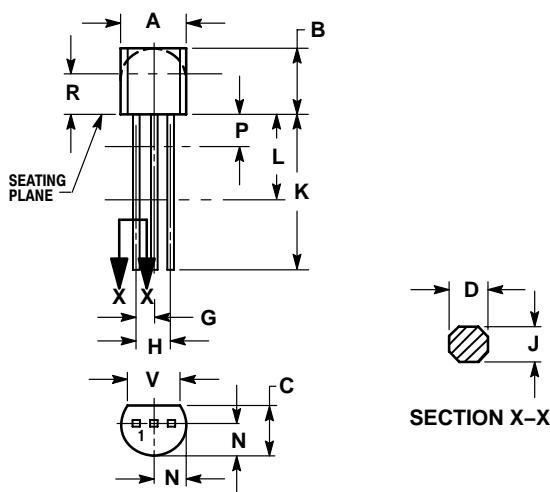
Device	Package	Shipping [†]
BC556B	TO-92	5000 Units / Bulk
BC556BG	TO-92 (Pb-Free)	5000 Units / Bulk
BC556BZL1	TO-92	2000 / Ammo Box
BC556BZL1G	TO-92 (Pb-Free)	2000 / Ammo Box
BC557AZL1	TO-92	2000 / Ammo Box
BC557AZL1G	TO-92 (Pb-Free)	2000 / Ammo Box
BC557B	TO-92	5000 Units / Bulk
BC557BG	TO-92 (Pb-Free)	5000 Units / Bulk
BC557BRL1	TO-92	2000 / Tape & Reel
BC557BRL1G	TO-92 (Pb-Free)	2000 / Tape & Reel
BC557BZL1	TO-92	2000 / Ammo Box
BC557BZL1G	TO-92 (Pb-Free)	2000 / Ammo Box
BC557C	TO-92	5000 Units / Bulk
BC557CG	TO-92 (Pb-Free)	5000 Units / Bulk
BC557CZL1	TO-92	2000 / Ammo Box
BC557CZL1G	TO-92 (Pb-Free)	2000 / Ammo Box
BC558BRL	TO-92	2000 / Tape & Reel
BC558BRLG	TO-92 (Pb-Free)	2000 / Tape & Reel
BC558BRL1	TO-92	2000 / Tape & Reel
BC558BRL1G	TO-92 (Pb-Free)	2000 / Tape & Reel
BC558BZL1	TO-92	2000 / Ammo Box
BC558BZL1G	TO-92 (Pb-Free)	2000 / Ammo Box
BC558CZL1	TO-92	2000 / Ammo Box
BC558CZL1G	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.

BC556B, BC557A, B, C, BC558B, 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:
PIN 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 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.