

# PNP Epitaxial Silicon Transistor

## BC556, BC557, BC558, BC559, BC560

### Features

- Switching and Amplifier
- High-Voltage: BC556,  $V_{CEO} = -65$  V
- Low-Noise: BC559, BC560
- Complement to BC546, BC547, BC548, BC549, and BC550
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Collector - Base Voltage BC556 BC557 / BC560 BC558 / BC559	$V_{CBO}$	-80 -50 -30	V
Collector - Emitter Voltage BC556 BC557 / BC560 BC558 / BC559	$V_{CEO}$	-65 -45 -30	V
Emitter - Base Voltage	$V_{EBO}$	-5	V
Collector Current (DC)	$I_C$	-100	mA
Peak Collector Current (Pulse)	$I_{CP}$	-200	mA
Peak Base Current (Pulse)	$I_{BP}$	-200	mA
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-65 to +150	$^\circ\text{C}$

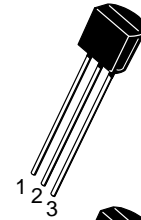
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

### THERMAL CHARACTERISTICS (Note 1)

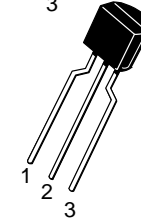
( $T_A = 25^\circ\text{C}$  unless otherwise noted)

Parameter	Symbol	Max.	Unit
Total Device Dissipation Derate above $25^\circ\text{C}$	$P_D$	500 4.0	mW mW/ $^\circ\text{C}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	250	$^\circ\text{C}/\text{W}$

1. PCB size: FR-4, 76 mm x 114 mm x 1.57 mm (3.0 inch x 4.5 inch x 0.062 inch) with minimum land pattern size.



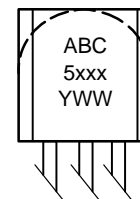
TO-92-3  
CASE 135AN  
Straight Lead  
Bulk Packing



TO-92-3  
CASE 135AR  
Bent Lead  
Tape & Reel  
Fan-Fold

1. Collector
2. Base
3. Emitter

### MARKING DIAGRAM



A = Assembly Location  
BC5xxx = Specific Device Code  
xxx = 56A, 56B, 57A, 57B,  
58B, 59B, 59C, 60C  
Y = Year  
WW = Work Week

### ORDERING INFORMATION

See detailed ordering and shipping information on page 2 of this data sheet.

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## ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I <sub>CBO</sub>	Collector Cut-Off Current	V <sub>CB</sub> = -30 V, I <sub>E</sub> = 0			-15	nA
h <sub>FE</sub>	DC Current Gain	V <sub>CE</sub> = -5 V, I <sub>C</sub> = -2 mA	110		800	
V <sub>CE(sat)</sub>	Collector-Emitter Saturation Voltage	I <sub>C</sub> = -10 mA, I <sub>B</sub> = -0.5 mA		-90	-300	mV
		I <sub>C</sub> = -100 mA, I <sub>B</sub> = -5 mA		-250	-650	
V <sub>BE(sat)</sub>	Collector-Base Saturation Voltage	I <sub>C</sub> = -10 mA, I <sub>B</sub> = -0.5 mA		-700		mV
		I <sub>C</sub> = -100 mA, I <sub>B</sub> = -5 mA		-900		
V <sub>BE(on)</sub>	Base-Emitter On Voltage	V <sub>CE</sub> = -5 V, I <sub>C</sub> = -2 mA	-600	-660	-750	mV
		V <sub>CE</sub> = -5 V, I <sub>C</sub> = -10 mA			-800	
f <sub>T</sub>	Current Gain Bandwidth Product	V <sub>CE</sub> = -5 V, I <sub>C</sub> = -10 mA, f = 10 MHz		150		MHz
C <sub>ob</sub>	Output Capacitance	V <sub>CB</sub> = -10 V, I <sub>E</sub> = 0, f = 1 MHz			6	pF
NF	Noise Figure	BC556 / BC557 / BC558	V <sub>CE</sub> = -5 V, I <sub>C</sub> = -200 μA, f = 1 kHz, R <sub>G</sub> = 2 kΩ	2	10	dB
		BC559 / BC560		1	4	
		BC559		1.2	4.0	
		BC560		1.2	2.0	

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

## h<sub>FE</sub> CLASSIFICATION

Classification	A	B	C
h <sub>FE2</sub>	110 ~ 220	200 ~ 450	420 ~ 800

## ORDERING INFORMATION

Part Number	Marking	Package	Shipping†
BC556ABU	BC556A	TO-92-3, case 135AN (Pb-Free)	10,000 Units/ Bulk Box
BC556ATA	BC556A	TO-92-3, case 135AR (Pb-Free)	2,000 Units/ Fan-Fold
BC556BTA	BC556B	TO-92-3, case 135AR (Pb-Free)	2,000 Units/ Fan-Fold
BC556BTF	BC556B	TO-92-3, case 135AR (Pb-Free)	2,000 Units/ Tape & Reel
BC556BTFR	BC556B	TO-92-3, case 135AR (Pb-Free)	2,000 Units/ Tape & Reel
BC557ATA	BC557A	TO-92-3, case 135AR (Pb-Free)	2,000 Units/ Fan-Fold
BC557BTA	BC557B	TO-92-3, case 135AR (Pb-Free)	2,000 Units/ Fan-Fold
BC557BTF	BC557B	TO-92-3, case 135AR (Pb-Free)	2,000 Units/ Tape & Reel
BC558BTA	BC558B	TO-92-3, case 135AR (Pb-Free)	2,000 Units/ Fan-Fold
BC559BTA	BC559B	TO-92-3, case 135AR (Pb-Free)	2,000 Units/ Fan-Fold
BC559CTA	BC559C	TO-92-3, case 135AR (Pb-Free)	2,000 Units/ Fan-Fold
BC560CTA	BC560C	TO-92-3, case 135AR (Pb-Free)	2,000 Units/ Fan-Fold

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

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## TYPICAL PERFORMANCE CHARACTERISTICS

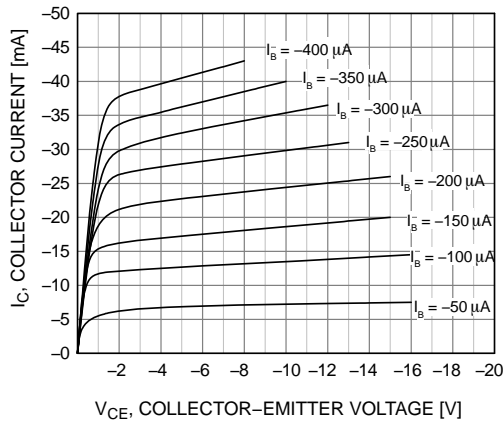


Figure 1. Static Characteristic

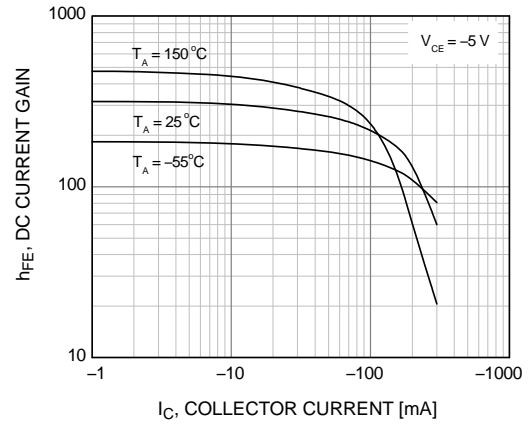


Figure 2. DC Current Gain

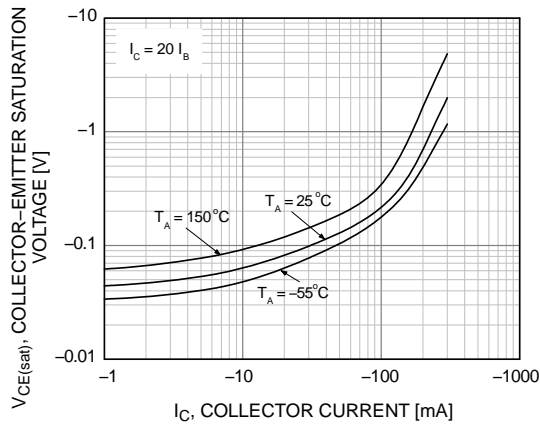


Figure 3. Collector-Emitter Saturation Voltage

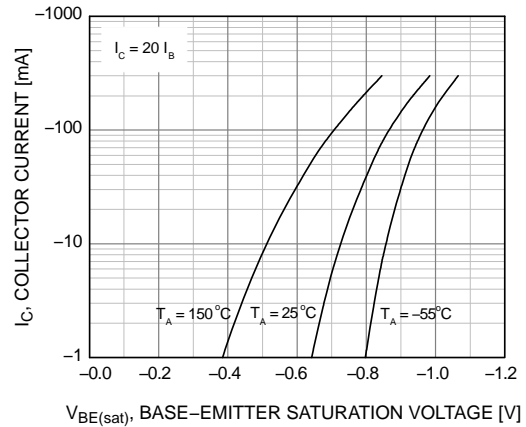


Figure 4. Base-Emitter Saturation Voltage

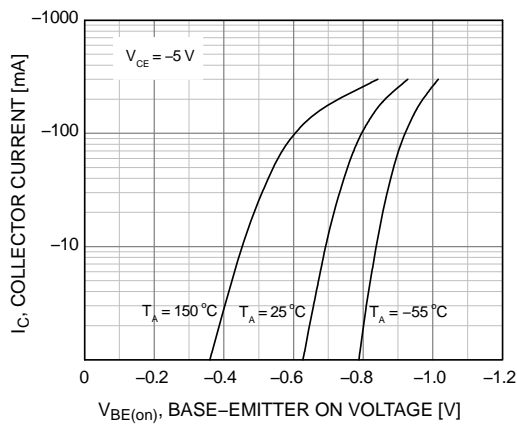


Figure 5. Base-Emitter On Voltage

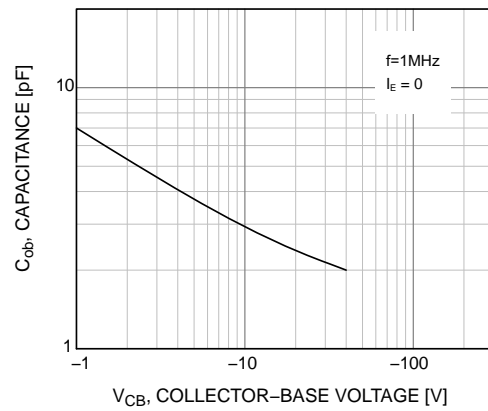
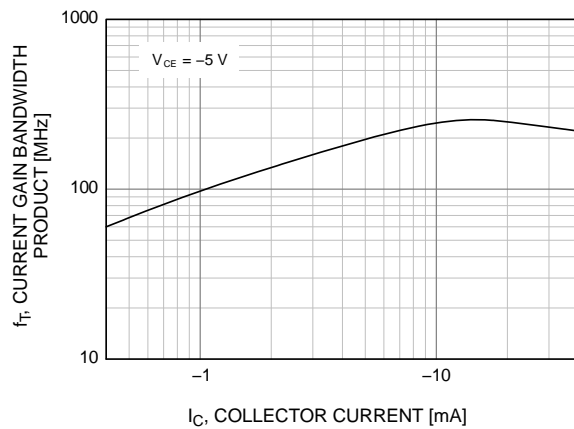


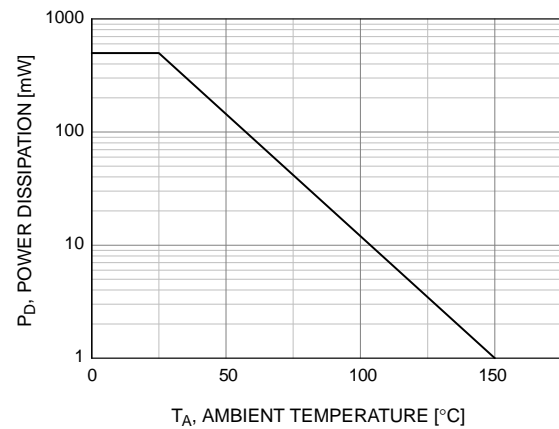
Figure 6. Collector Output Capacitance

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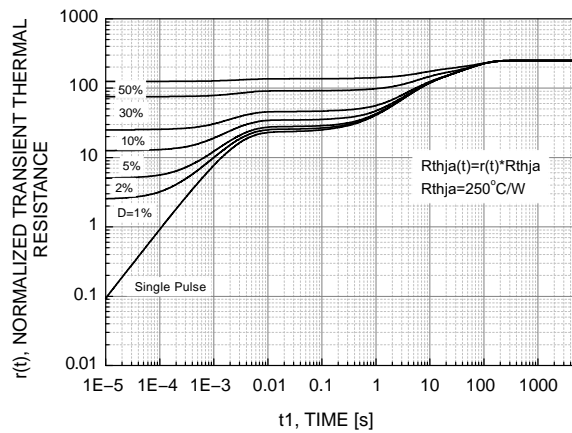
## TYPICAL PERFORMANCE CHARACTERISTICS (continued)



**Figure 7. Current Gain Bandwidth Product**



**Figure 8. Power Deration**



**Figure 9. Normalized Transient Thermal Resistance**

# MECHANICAL CASE OUTLINE

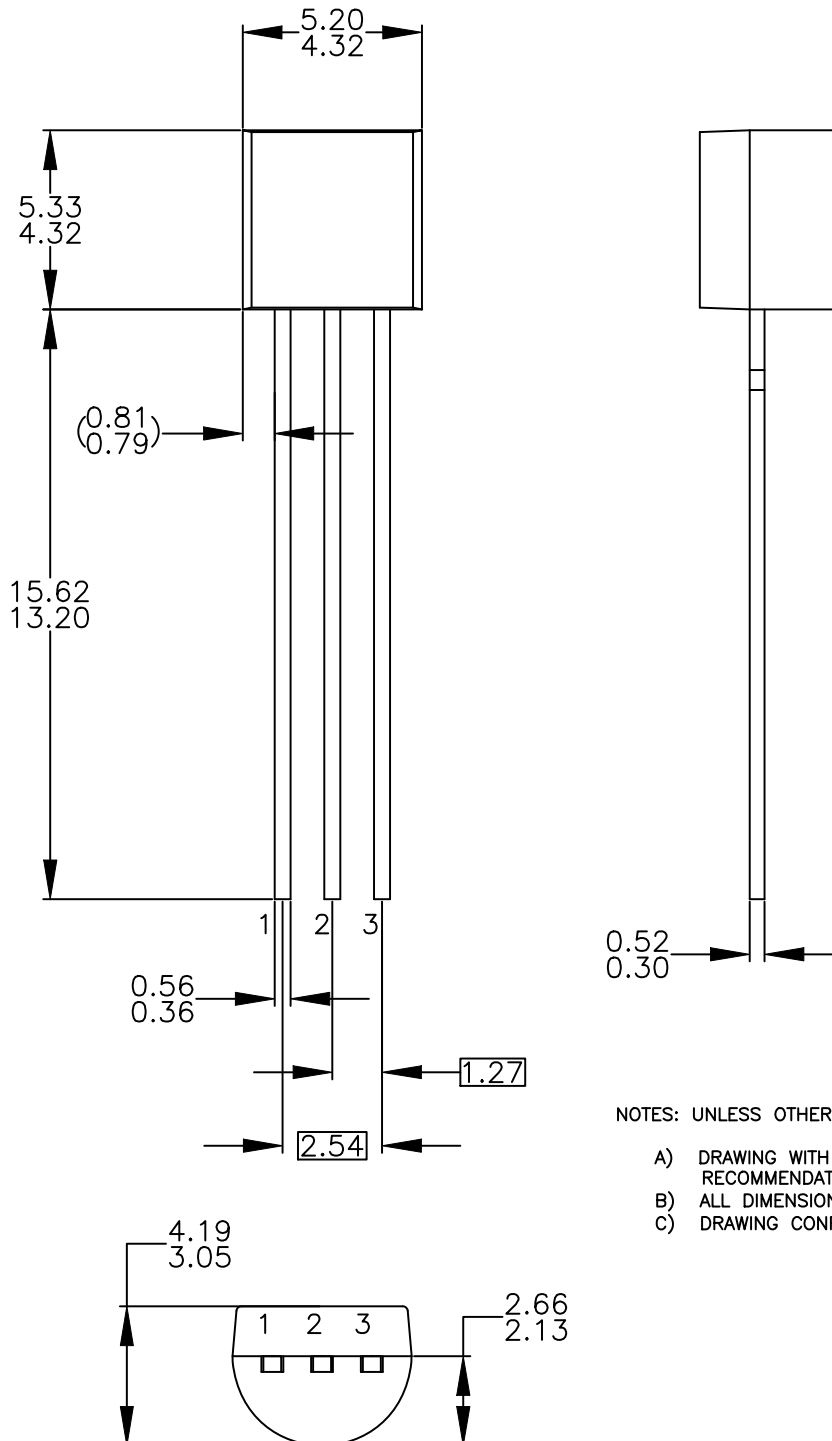
## PACKAGE DIMENSIONS

ON Semiconductor®

ON

TO-92 3 4.825x4.76  
CASE 135AN  
ISSUE O


DATE 31 JUL 2016



NOTES: UNLESS OTHERWISE SPECIFIED

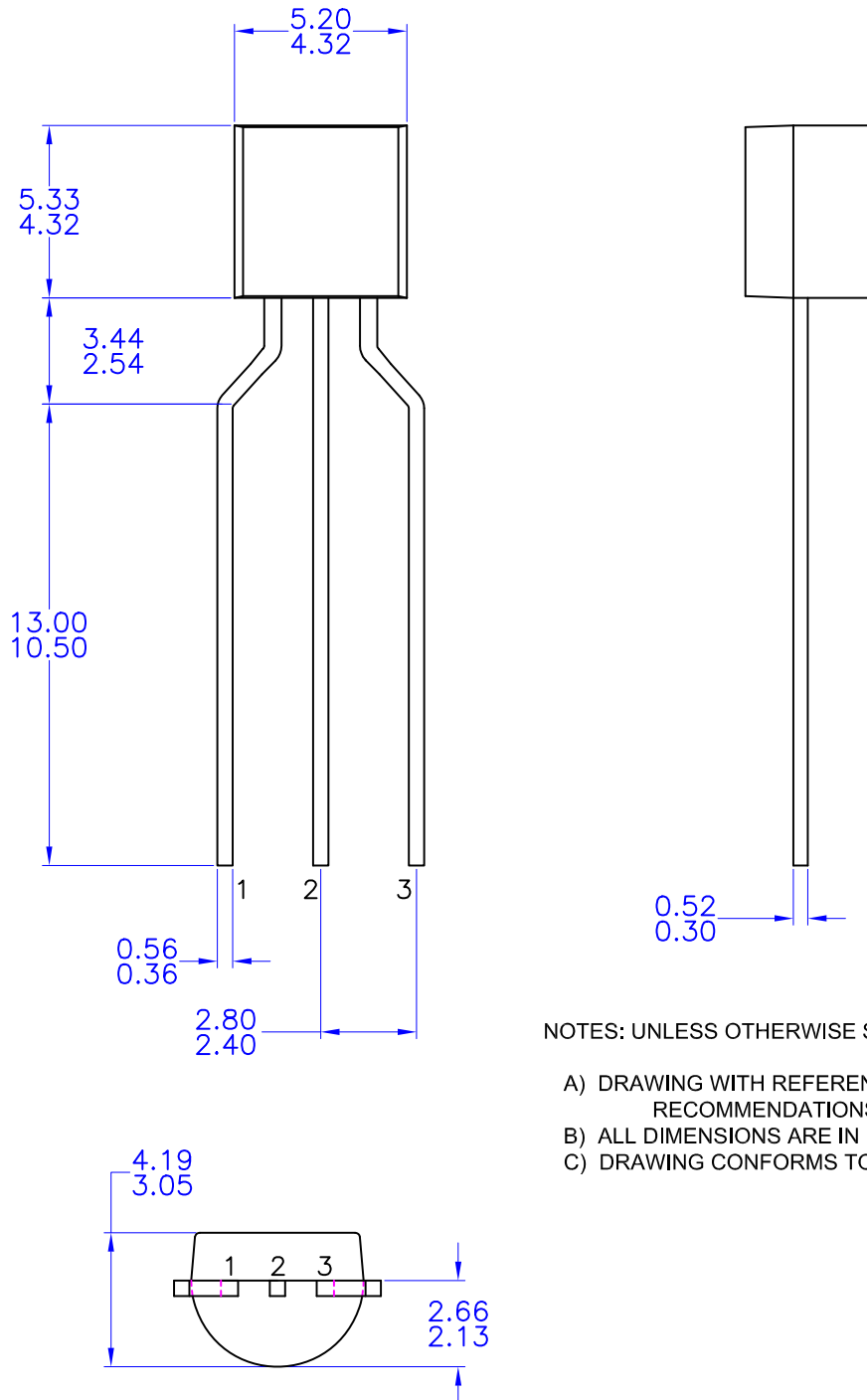
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