

# BC560C

## Low Noise Transistors

### PNP Silicon

#### Features

- These are Pb-Free Devices\*

#### MAXIMUM RATINGS

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

#### THERMAL CHARACTERISTICS

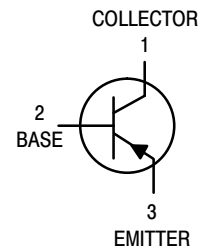
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	200	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	83.3	$^\circ\text{C}/\text{W}$

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

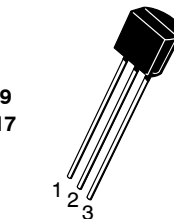


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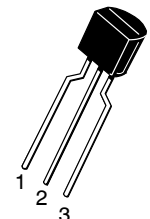
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TO-92  
CASE 29  
STYLE 17

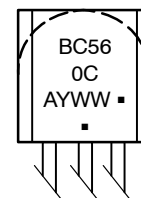


STRAIGHT LEAD  
BULK PACK



BENT LEAD  
TAPE & REEL  
AMMO PACK

#### MARKING DIAGRAM



A = Assembly Location  
Y = Year  
WW = Work Week  
■ = Pb-Free Package

(Note: Microdot may be in either location)

#### ORDERING INFORMATION

Device	Package	Shipping
BC560CG	TO-92 (Pb-Free)	5000 Units / Bulk
BC560CZL1G	TO-92 (Pb-Free)	2000 / Ammo Pack

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

# BC560C

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

Characteristic	Symbol	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>					
Collector – Emitter Breakdown Voltage (I <sub>C</sub> = -10 mA <sub>dc</sub> , I <sub>B</sub> = 0)	V <sub>(BR)CEO</sub>	-45	-	-	V <sub>dc</sub>
Collector – Base Breakdown Voltage (I <sub>C</sub> = -10 μA <sub>dc</sub> , I <sub>E</sub> = 0)	V <sub>(BR)CBO</sub>	-50	-	-	V <sub>dc</sub>
Emitter – Base Breakdown Voltage (I <sub>E</sub> = -10 μA <sub>dc</sub> , I <sub>C</sub> = 0)	V <sub>(BR)EBO</sub>	-5.0	-	-	V <sub>dc</sub>
Collector Cutoff Current (V <sub>CB</sub> = -30 V <sub>dc</sub> , I <sub>E</sub> = 0) (V <sub>CB</sub> = -30 V <sub>dc</sub> , I <sub>E</sub> = 0, T <sub>A</sub> = +125°C)	I <sub>CBO</sub>	-	-	-15 -5.0	nA <sub>dc</sub> μA <sub>dc</sub>
Emitter Cutoff Current (V <sub>EB</sub> = -4.0 V <sub>dc</sub> , I <sub>C</sub> = 0)	I <sub>EBO</sub>	-	-	-15	nA <sub>dc</sub>
<b>ON CHARACTERISTICS</b>					
DC Current Gain (I <sub>C</sub> = -10 μA <sub>dc</sub> , V <sub>CE</sub> = -5.0 V <sub>dc</sub> ) (I <sub>C</sub> = -2.0 mA <sub>dc</sub> , V <sub>CE</sub> = -5.0 V <sub>dc</sub> )	h <sub>FE</sub>	100 380	270 500	- 800	-
Collector – Emitter Saturation Voltage (I <sub>C</sub> = -10 mA <sub>dc</sub> , I <sub>B</sub> = -0.5 mA <sub>dc</sub> ) (I <sub>C</sub> = -10 mA <sub>dc</sub> , I <sub>B</sub> = (Note 1)) (I <sub>C</sub> = -100 mA <sub>dc</sub> , I <sub>B</sub> = -5.0 mA <sub>dc</sub> , (Note 2))	V <sub>CE(sat)</sub>	- - -	-0.075 -0.3 -0.25	-0.25 -0.6 -	V <sub>dc</sub>
Base – Emitter Saturation Voltage (I <sub>C</sub> = -100 mA <sub>dc</sub> , I <sub>B</sub> = -5.0 mA <sub>dc</sub> )	V <sub>BE(sat)</sub>	-	-1.1	-	V <sub>dc</sub>
Base – Emitter On Voltage (I <sub>C</sub> = -10 μA <sub>dc</sub> , V <sub>CE</sub> = -5.0 V <sub>dc</sub> ) (I <sub>C</sub> = -100 μA <sub>dc</sub> , V <sub>CE</sub> = -5.0 V <sub>dc</sub> ) (I <sub>C</sub> = -2.0 mA <sub>dc</sub> , V <sub>CE</sub> = -5.0 V <sub>dc</sub> )	V <sub>BE(on)</sub>	- - -0.55	-0.52 -0.55 -0.62	- - -0.7	V <sub>dc</sub>
<b>SMALL-SIGNAL CHARACTERISTICS</b>					
Current – Gain – Bandwidth Product (I <sub>C</sub> = -10 mA <sub>dc</sub> , V <sub>CE</sub> = -5.0 V <sub>dc</sub> , f = 100 MHz)	f <sub>T</sub>	-	250	-	MHz
Collector – Base Capacitance (V <sub>CB</sub> = -10 V <sub>dc</sub> , I <sub>E</sub> = 0, f = 1.0 MHz)	C <sub>cbo</sub>	-	2.5	-	pF
Small – Signal Current Gain (I <sub>C</sub> = -2.0 mA <sub>dc</sub> , V <sub>CE</sub> = -5.0 V, f = 1.0 kHz)	h <sub>fe</sub>	450	600	900	-
Noise Figure (I <sub>C</sub> = -200 μA <sub>dc</sub> , V <sub>CE</sub> = -5.0 V <sub>dc</sub> , R <sub>S</sub> = 2.0 kΩ, f = 1.0 kHz) (I <sub>C</sub> = -200 μA <sub>dc</sub> , V <sub>CE</sub> = -5.0 V <sub>dc</sub> , R <sub>S</sub> = 100 kΩ, f = 1.0 kHz, Δf = 200 kHz)	NF <sub>1</sub> NF <sub>2</sub>	- -	0.5 -	2.0 10	dB

- I<sub>B</sub> is value for which I<sub>C</sub> = -11 mA at V<sub>CE</sub> = -1.0 V.
- Pulse test = 300 μs – Duty cycle = 2%.

# BC560C

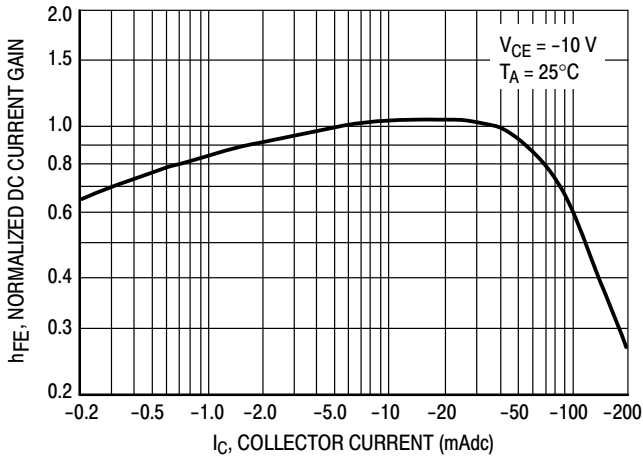


Figure 1. Normalized DC Current Gain

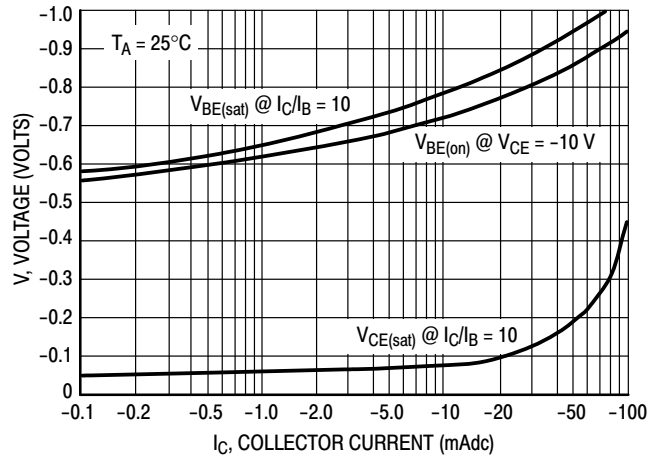


Figure 2. "Saturation" and "On" Voltages

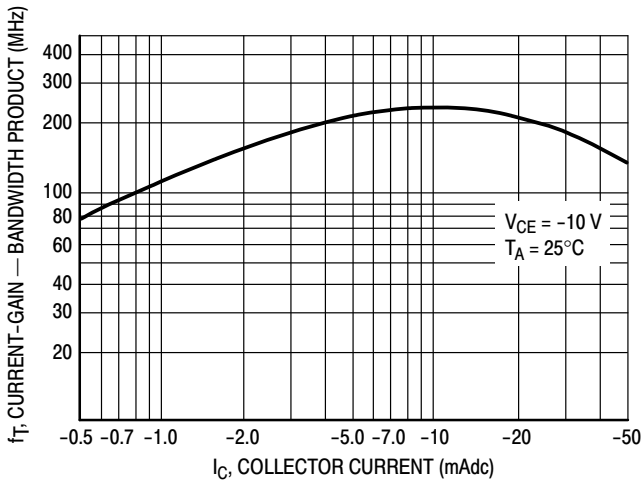


Figure 3. Current-Gain — Bandwidth Product

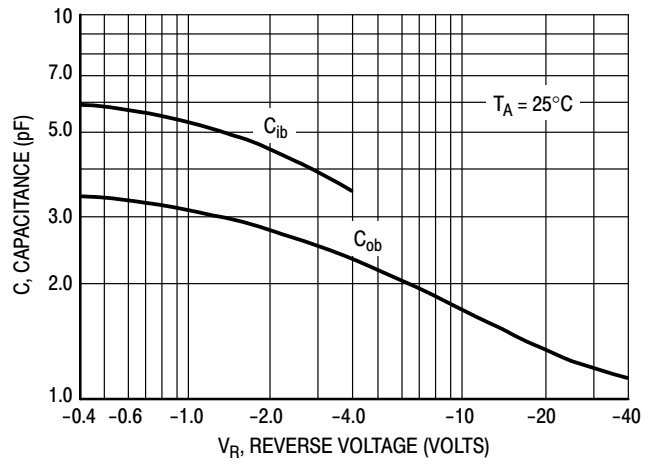


Figure 4. Capacitance

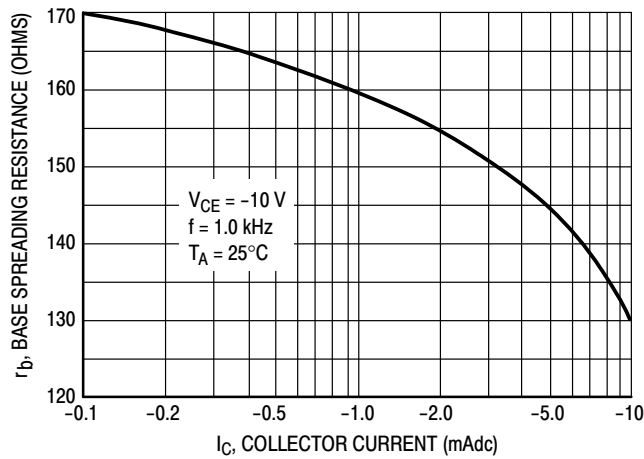
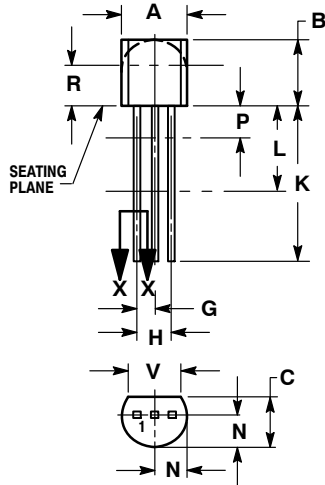


Figure 5. Base Spreading Resistance

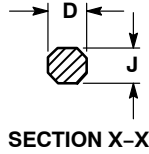
# BC560C

## PACKAGE DIMENSIONS

TO-92 (TO-226)  
CASE 29-11  
ISSUE AM



STRAIGHT LEAD  
BULK PACK

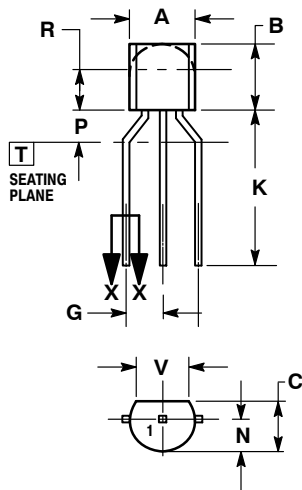


SECTION X-X

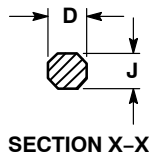
NOTES:

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	---



BENT LEAD  
TAPE & REEL  
AMMO PACK



SECTION X-X

NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

DIM	MILLIMETERS	
	MIN	MAX
A	4.45	5.20
B	4.32	5.33
C	3.18	4.19
D	0.40	0.54
G	2.40	2.80
J	0.39	0.50
K	12.70	---
N	2.04	2.66
P	1.50	4.00
R	2.93	---
V	3.43	---

STYLE 17:

1. COLLECTOR
2. BASE
3. EMITTER

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