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	Ic	-100	mAdc
Total Power Dissipation @ T _A = 25°C Derate above T _A = 25°C	P _D	625 5.0	mW mW/°C
Total Power Dissipation @ T _A = 25°C Derate above T _A = 25°C	P _D	1.5 12	W mW/°C
Operating and Storage Junction Temperature Range	T _J , T _{stg}	-55 to +150	°C

THERMAL CHARACTERISTICS

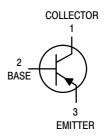
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	200	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	83.3	°C/W

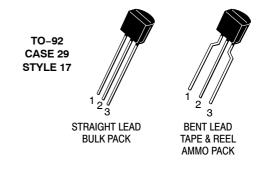
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.



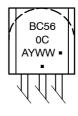
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MARKING DIAGRAM



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.

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Тур	Max	Unit
OFF CHARACTERISTICS	•	•	-		
Collector – Emitter Breakdown Voltage $(I_C = -10 \text{ mAdc}, I_B = 0)$	V _{(BR)CEO}	-45	_	-	Vdc
Collector – Base Breakdown Voltage ($I_C = -10 \mu Adc$, $I_E = 0$)	V _{(BR)CBO}	-50	_	-	Vdc
Emitter – Base Breakdown Voltage ($I_E = -10 \mu Adc$, $I_C = 0$)	V _{(BR)EBO}	-5.0	-	_	Vdc
Collector Cutoff Current $(V_{CB} = -30 \text{ Vdc}, I_E = 0)$ $(V_{CB} = -30 \text{ Vdc}, I_E = 0, T_A = +125^{\circ}\text{C})$	I _{CBO}	<u>-</u>	- -	-15 -5.0	nAdc μAdc
Emitter Cutoff Current (V _{EB} = -4.0 Vdc, I _C = 0)	I _{EBO}	-	_	-15	nAdc
ON CHARACTERISTICS					
DC Current Gain $ \begin{array}{l} \text{(I}_C = -10 \ \mu \text{Adc, V}_{CE} = -5.0 \ \text{Vdc)} \\ \text{(I}_C = -2.0 \ \text{mAdc, V}_{CE} = -5.0 \ \text{Vdc)} \end{array} $	h _{FE}	100 380	270 500	- 800	-
	V _{CE(sat)}	- - -	-0.075 -0.3 -0.25	-0.25 -0.6 -	Vdc
Base – Emitter Saturation Voltage (I _C = –100 mAdc, I _B = –5.0 mAdc)	V _{BE(sat)}	-	-1.1	-	Vdc
Base–Emitter On Voltage $ \begin{array}{l} (I_C=-10~\mu Adc,~V_{CE}=-5.0~Vdc)\\ (I_C=-100~\mu Adc,~V_{CE}=-5.0~Vdc)\\ (I_C=-2.0~m Adc,~V_{CE}=-5.0~Vdc) \end{array} $	V _{BE(on)}	- - -0.55	-0.52 -0.55 -0.62	- - -0.7	Vdc
SMALL-SIGNAL CHARACTERISTICS					
Current-Gain – Bandwidth Product (I _C = -10 mAdc, V _{CE} = -5.0 Vdc, f = 100 MHz)	f _T	-	250	-	MHz
Collector–Base Capacitance $(V_{CB} = -10 \text{ Vdc}, I_E = 0, f = 1.0 \text{ MHz})$	C _{cbo}	-	2.5	-	pF
Small–Signal Current Gain ($I_C = -2.0 \text{ mAdc}, V_{CE} = -5.0 \text{ V}, f = 1.0 \text{ kHz}$)	h _{fe}	450	600	900	-
Noise Figure $ \begin{array}{l} \text{Noise Figure} \\ \text{(I}_{C} = -200 \ \mu Adc, \ V_{CE} = -5.0 \ Vdc, \ R_{S} = 2.0 \ k\Omega, \ f = 1.0 \ kHz)} \\ \text{(I}_{C} = -200 \ \mu Adc, \ V_{CE} = -5.0 \ Vdc, \ R_{S} = 100 \ k\Omega, \ f = 1.0 \ kHz, \ \Delta f = 200 \ kHz)} \end{array} $	NF ₁ NF ₂	_ _	0.5 -	2.0 10	dB

^{1.} I_B is value for which I_C = -11 mA at V_{CE} = -1.0 V. 2. Pulse test = 300 μ s - Duty cycle = 2%.

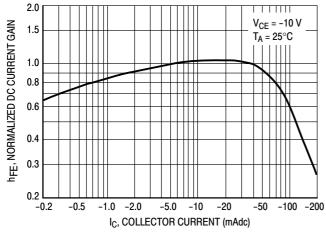


Figure 1. Normalized DC Current Gain

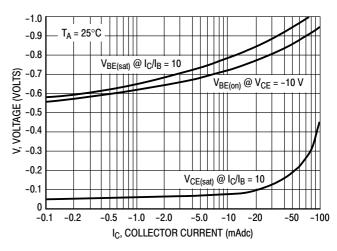


Figure 2. "Saturation" and "On" Voltages

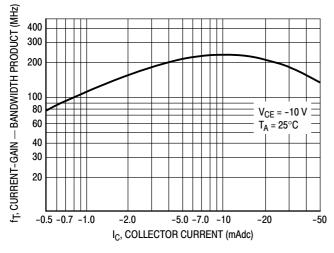


Figure 3. Current-Gain — Bandwidth Product

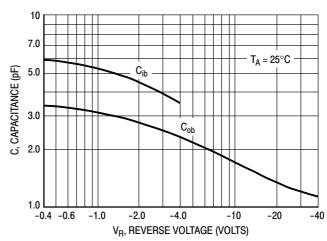


Figure 4. Capacitance

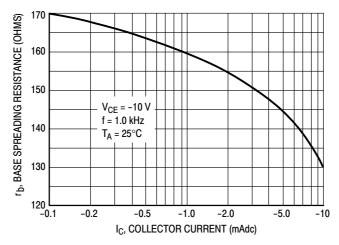
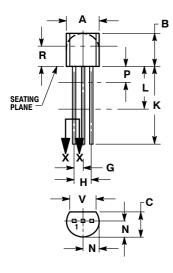


Figure 5. Base Spreading Resistance

PACKAGE DIMENSIONS

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



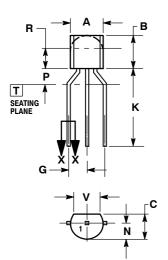
STRAIGHT LEAD **BULK PACK**



NOTES:

- 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982. CONTROLLING DIMENSION: INCH.
- CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED
- LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM

	INCHES		MILLIN	IETERS
DIM	MIN	MAX	MIN	MAX
Α	0.175	0.205	4.45	5.20
В	0.170	0.210	4.32	5.33
С	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
Н	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
Р		0.100		2.54
R	0.115		2.93	
٧	0.135		3.43	



BENT LEAD TAPE & REEL AMMO PACK



NOTES:

- DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
- CONTROLLING DIMENSION: MILLIMETERS.
 CONTOUR OF PACKAGE BEYOND
- DIMENSION R IS UNCONTROLLED
- LEAD DIMENSION IS UNCONTROLLED IN PAND BEYOND DIMENSION K MINIMUM.

	MILLIMETERS		
DIM	MIN	MAX	
Α	4.45	5.20	
В	4.32	5.33	
С	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:

COLLECTOR PIN 1.

BASE

EMITTER

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