



# THE DATASHEET OF BC369ZL1



# BC368 (NPN), BC369 (PNP)

## Amplifier Transistors

Voltage and Current are Negative for PNP Transistors

### Features

- Pb-Free Packages are Available\*

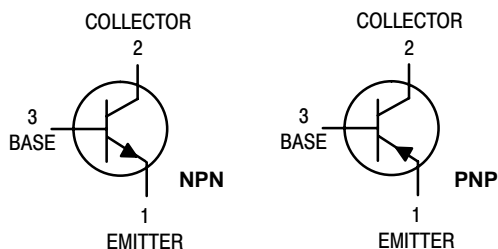
### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector – Emitter Voltage	$V_{CEO}$	20	Vdc
Collector – Emitter Voltage	$V_{CES}$	25	Vdc
Emitter – Base Voltage	$V_{EBO}$	5.0	Vdc
Collector Current – Continuous	$I_C$	1.0	Adc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	625	mW
		5.0	mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	1.5	W
		12	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	$^\circ\text{C}/\text{W}$

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.

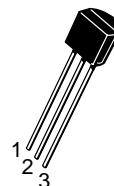


\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



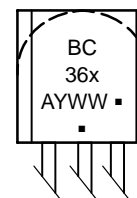
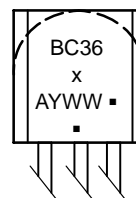
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TO-92  
CASE 29  
STYLE 14

### MARKING DIAGRAMS



BC36x = Device Code  
x = 8 or 9  
A = Assembly Location  
Y = Year  
WW = Work Week  
▪ = Pb-Free Package

(Note: Microdot may be in either location)

### ORDERING INFORMATION

Device	Package	Shipping
BC368	TO-92	5000 Units/Box
BC368G	TO-92 (Pb-Free)	5000 Units/Box
BC368ZL1	TO-92	2000/Ammo Box
BC368ZL1G	TO-92 (Pb-Free)	2000/Ammo Box
BC369	TO-92	5000 Units/Box
BC369G	TO-92 (Pb-Free)	5000 Units/Box
BC369ZL1	TO-92	2000/Ammo Box
BC369ZL1G	TO-92 (Pb-Free)	2000/Ammo Box

## BC368 (NPN), BC369 (PNP)

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

Characteristic	Symbol	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>					
Collector–Emitter Breakdown Voltage ( $I_C = 10\text{ mA}$ , $I_B = 0$ )	$V_{(BR)CEO}$	20	–	–	Vdc
Collector–Base Breakdown Voltage ( $I_C = 100\ \mu\text{A}$ , $I_E = 0$ )	$V_{(BR)CBO}$	25	–	–	Vdc
Emitter–Base Breakdown Voltage ( $I_E = 100\ \mu\text{A}$ , $I_C = 0$ )	$V_{(BR)EBO}$	5.0	–	–	Vdc
Collector Cutoff Current ( $V_{CB} = 25\text{ V}$ , $I_E = 0$ ) ( $V_{CB} = 25\text{ V}$ , $I_E = 0$ , $T_J = 150^\circ\text{C}$ )	$I_{CBO}$	–	–	10 1.0	$\mu\text{A}$ mAdc
Emitter Cutoff Current ( $V_{EB} = 5.0\text{ V}$ , $I_C = 0$ )	$I_{EBO}$	–	–	10	$\mu\text{A}$
<b>ON CHARACTERISTICS</b>					
DC Current Gain ( $V_{CE} = 10\text{ V}$ , $I_C = 5.0\text{ mA}$ ) ( $V_{CE} = 1.0\text{ V}$ , $I_C = 0.5\text{ A}$ )  ( $V_{CE} = 1.0\text{ V}$ , $I_C = 1.0\text{ A}$ )	$h_{FE}$				–
		50	–	–	
BC368, 369		85	–	375	
BC368–25		170	–	375	
		60	–	–	
Bandwidth Product ( $I_C = 10\text{ mA}$ , $V_{CE} = 5.0\text{ V}$ , $f = 20\text{ MHz}$ )	$f_T$	65	–	–	MHz
Collector–Emitter Saturation Voltage ( $I_C = 1.0\text{ A}$ , $I_B = 100\text{ mA}$ )	$V_{CE(sat)}$	–	–	0.5	V
Base–Emitter On Voltage ( $I_C = 1.0\text{ A}$ , $V_{CE} = 1.0\text{ V}$ )	$V_{BE(on)}$	–	–	1.0	V

# BC368 (NPN), BC369 (PNP)

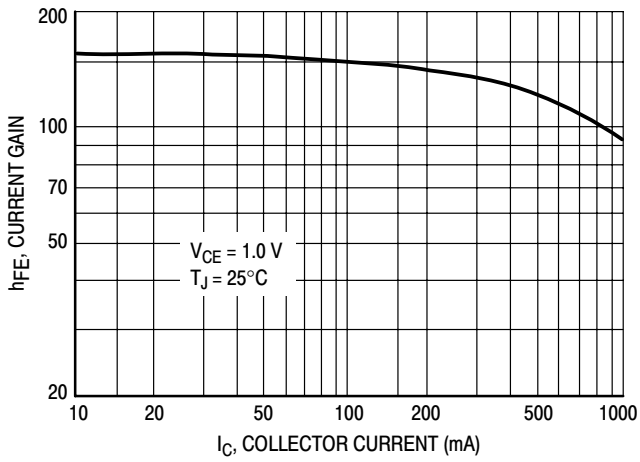


Figure 1. DC Current Gain

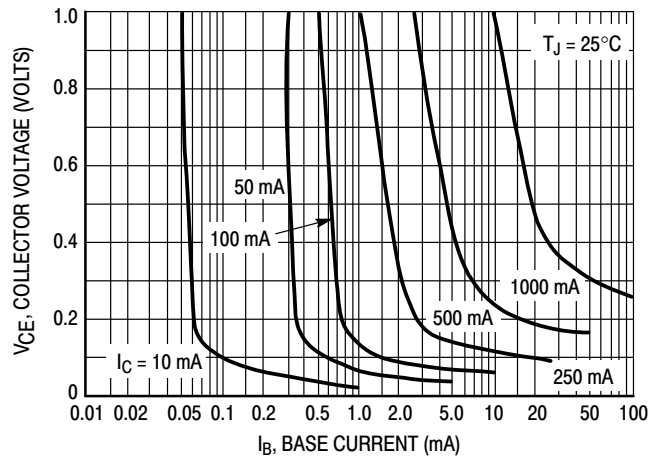


Figure 2. Collector Saturation Region

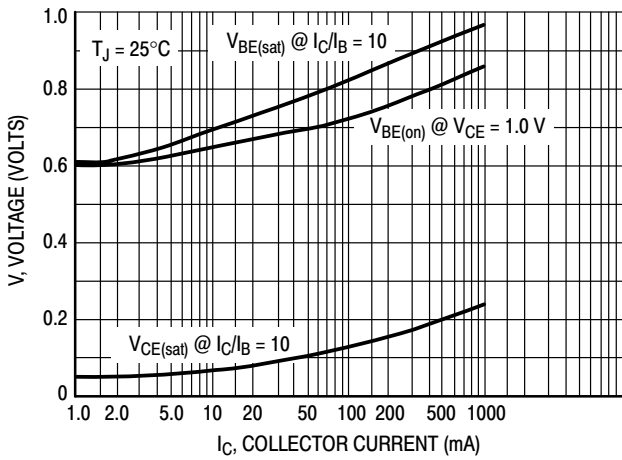


Figure 3. "On" Voltages

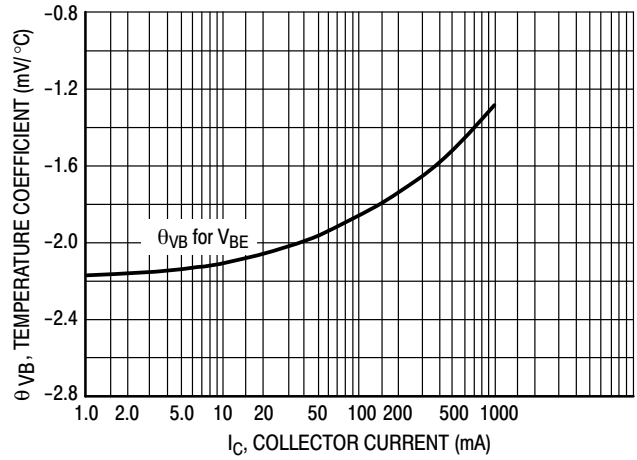


Figure 4. Temperature Coefficient

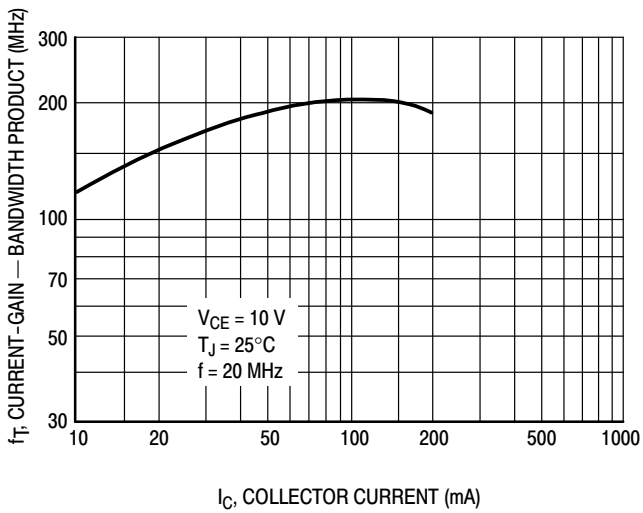


Figure 5. Current-Gain — Bandwidth Product

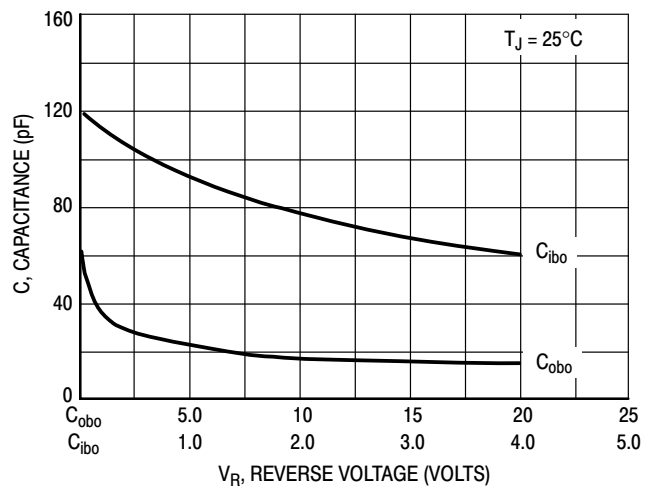
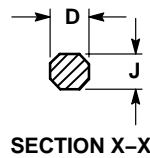
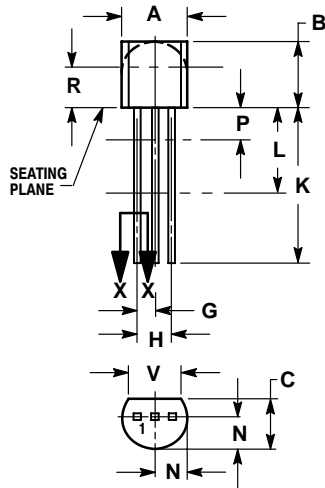


Figure 6. Capacitance

# BC368 (NPN), BC369 (PNP)

## 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 14:

1. EMITTER
2. COLLECTOR
3. BASE

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