

# BC637, BC639, BC639-16

## High Current Transistors

### NPN Silicon

#### Features

- These are Pb-Free Devices\*

#### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector - Emitter Voltage	BC637	$V_{CEO}$	Vdc
	BC639	60	80
Collector - Base Voltage	BC637	$V_{CBO}$	Vdc
	BC639	60	80
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 $25^\circ\text{C}$	$P_D$	800	mW
		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	$^\circ\text{C}/\text{W}$

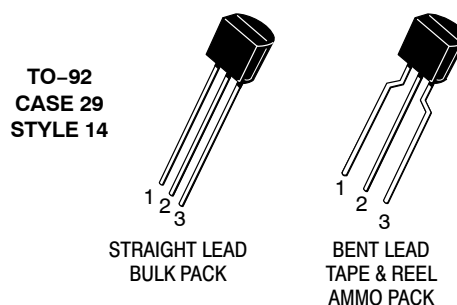
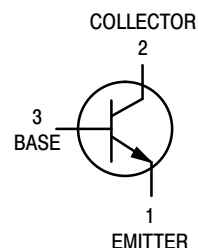
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

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

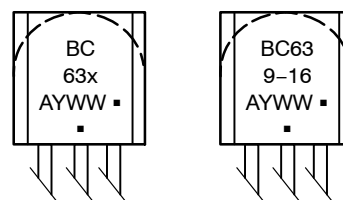


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#### MARKING DIAGRAMS



- x = 7 or 9
- 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 2 of this data sheet.

## BC637, BC639, BC639-16

### 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 (Note 1) (I <sub>C</sub> = 10 μAdc, I <sub>B</sub> = 0)	BC637 BC639	V <sub>(BR)CEO</sub>	60 80	– –	– –	Vdc
Collector – Emitter Zero–Gate Breakdown Voltage (Note 1) (I <sub>C</sub> = 100 μAdc, I <sub>B</sub> = 0)	BC639–16	V <sub>(BR)CES</sub>	120	–	–	Vdc
Collector – Base Breakdown Voltage (I <sub>C</sub> = 100 μAdc, I <sub>E</sub> = 0)	BC637 BC639	V <sub>(BR)CBO</sub>	60 80	– –	– –	Vdc
Emitter – Base Breakdown Voltage (I <sub>E</sub> = 10 μAdc, I <sub>C</sub> = 0)		V <sub>(BR)EBO</sub>	5.0	–	–	Vdc
Collector Cutoff Current (V <sub>CB</sub> = 30 Vdc, I <sub>E</sub> = 0) (V <sub>CB</sub> = 30 Vdc, I <sub>E</sub> = 0, T <sub>A</sub> = 125°C)		I <sub>CBO</sub>	– –	– –	100 10	nAdc μAdc

### ON CHARACTERISTICS (Note 1)

DC Current Gain (I <sub>C</sub> = 5.0 mAdc, V <sub>CE</sub> = 2.0 Vdc) (I <sub>C</sub> = 150 mAdc, V <sub>CE</sub> = 2.0 Vdc)  (I <sub>C</sub> = 500 mA, V <sub>CE</sub> = 2.0 V)	BC637 BC639 BC639–16ZLT1	h <sub>FE</sub>	25 40 40 100 25	– – – – –	– 160 160 250 –	–
Collector – Emitter Saturation Voltage (I <sub>C</sub> = 500 mAdc, I <sub>B</sub> = 50 mAdc)		V <sub>CE(sat)</sub>	–	–	0.5	Vdc
Base – Emitter On Voltage (I <sub>C</sub> = 500 mAdc, V <sub>CE</sub> = 2.0 Vdc)		V <sub>BE(on)</sub>	–	–	1.0	Vdc

### DYNAMIC CHARACTERISTICS

Current Gain – Bandwidth Product (I <sub>C</sub> = 50 mAdc, V <sub>CE</sub> = 2.0 Vdc, f = 100 MHz)		f <sub>T</sub>	–	200	–	MHz
Output Capacitance (V <sub>CB</sub> = 10 Vdc, I <sub>E</sub> = 0, f = 1.0 MHz)		C <sub>ob</sub>	–	7.0	–	pF
Input Capacitance (V <sub>EB</sub> = 0.5 Vdc, I <sub>C</sub> = 0, f = 1.0 MHz)		C <sub>ib</sub>	–	50	–	pF

1. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle 2.0%.

### ORDERING INFORMATION

Device	Package	Shipping <sup>†</sup>
BC637G	TO–92 (Pb–Free)	5000 Units / Bulk
BC637RL1G	TO–92 (Pb–Free)	2000 / Tape & Reel
BC639G	TO–92 (Pb–Free)	5000 Units / Bulk
BC639RL1G	TO–92 (Pb–Free)	2000 / Tape & Reel
BC639ZL1G	TO–92 (Pb–Free)	2000 / Ammo Box
BC639–16ZL1G	TO–92 (Pb–Free)	2000 / Ammo Box

<sup>†</sup>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.

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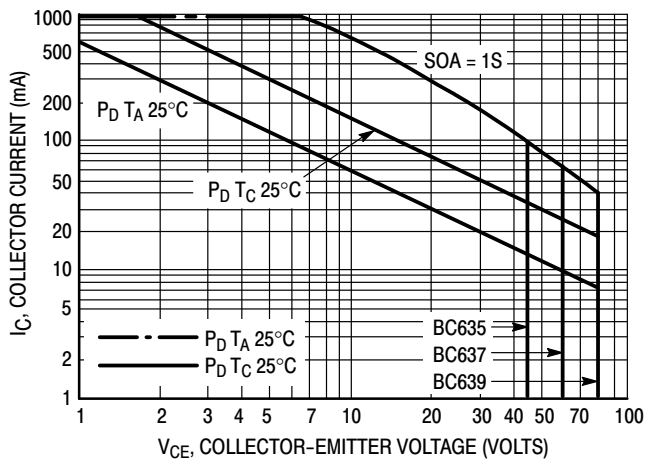


Figure 1. Active Region Safe Operating Area

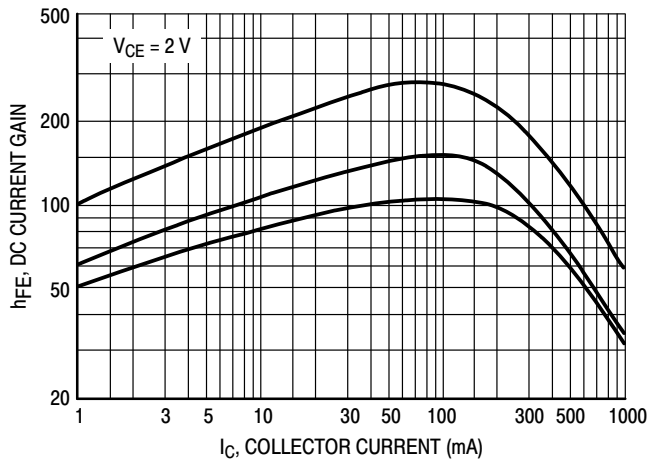


Figure 2. DC Current Gain

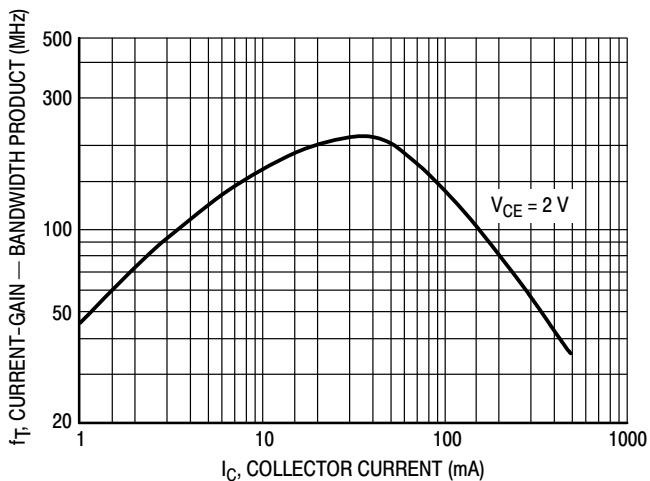


Figure 3. Current-Gain — Bandwidth Product

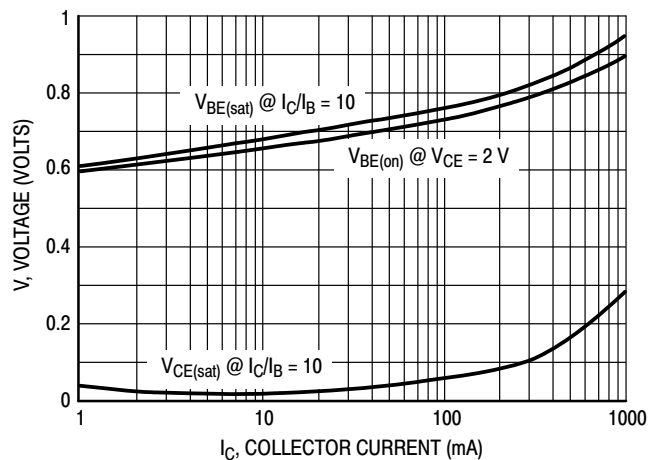


Figure 4. "Saturation" and "On" Voltages

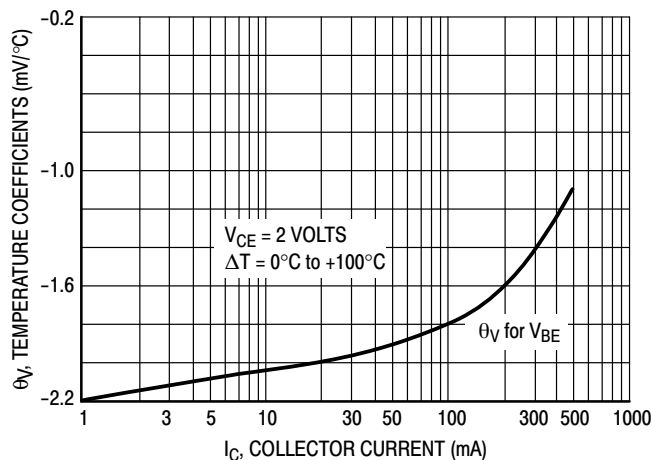
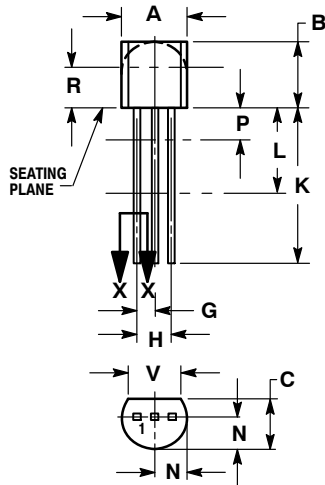


Figure 5. Temperature Coefficients

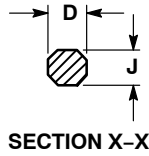
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## PACKAGE DIMENSIONS

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



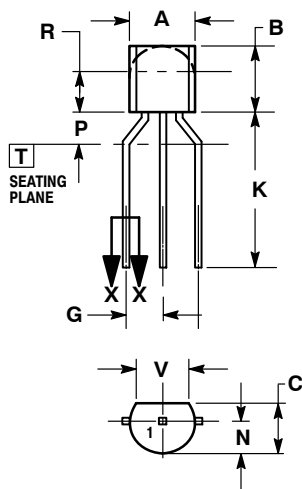
STRAIGHT LEAD  
BULK PACK



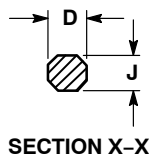
NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
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



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 14:

1. EMITTER
2. COLLECTOR
3. BASE

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