

# BC636, BC636-16, BC638, BC640, BC640-16

## High Current Transistors

PNP Silicon



ON Semiconductor

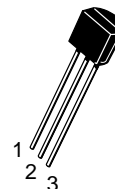
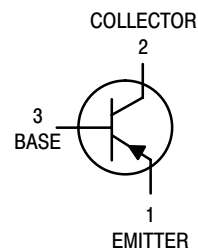
<http://onsemi.com>

### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage BC636 BC638 BC640	$V_{CEO}$	-45 -60 -80	Vdc
Collector-Base Voltage BC636 BC638 BC640	$V_{CBO}$	-45 -60 -80	Vdc
Emitter-Base Voltage	$V_{EBO}$	-5.0	Vdc
Collector Current — Continuous	$I_C$	-0.5	Adc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	625 5.0	mW mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	1.5 12	Watts 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	$^\circ\text{C}/\text{W}$



CASE 29  
TO-92  
STYLE 14

### ORDERING INFORMATION

Device	Package	Shipping
BC636	TO-92	5000 Units/Box
BC636ZL1	TO-92	2000/Ammo Pack
BC636-16ZL1	TO-92	2000/Ammo Pack
BC638	TO-92	5000 Units/Box
BC638ZL1	TO-92	2000/Ammo Pack
BC640	TO-92	5000 Units/Box
BC640ZL1	TO-92	2000/Ammo Pack
BC640-16	TO-92	5000 Units/Box

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## 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)	BC636 BC638 BC640	V <sub>(BR)CEO</sub>	–45 –60 –80	— — —	— — —	V <sub>dc</sub>
Collector–Base Breakdown Voltage (I <sub>C</sub> = –100 μA <sub>dc</sub> , I <sub>E</sub> = 0)	BC636 BC638 BC640	V <sub>(BR)CBO</sub>	–45 –60 –80	— — —	— — —	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>	— —	— —	–100 –10	nA <sub>dc</sub> μA <sub>dc</sub>

## ON CHARACTERISTICS (1)

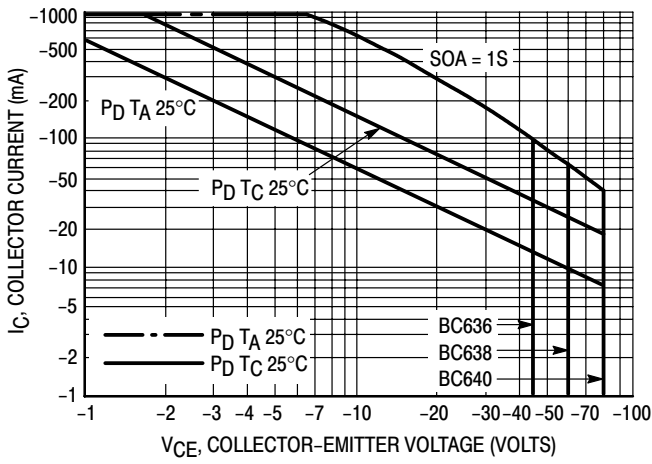
DC Current Gain (I <sub>C</sub> = –5.0 mA <sub>dc</sub> , V <sub>CE</sub> = –2.0 V <sub>dc</sub> ) (I <sub>C</sub> = –150 mA <sub>dc</sub> , V <sub>CE</sub> = –2.0 V <sub>dc</sub> )	BC636 BC636–16 BC638 BC640 BC640–16	h <sub>FE</sub>	25 40 100 40 40 100 25	— — — — — — —	— 250 250 160 160 250 —	—
Collector–Emitter Saturation Voltage (I <sub>C</sub> = –500 mA <sub>dc</sub> , I <sub>B</sub> = –50 mA <sub>dc</sub> )		V <sub>CE(sat)</sub>	— —	–0.25 –0.5	–0.5 —	V <sub>dc</sub>
Base–Emitter On Voltage (I <sub>C</sub> = –500 mA <sub>dc</sub> , V <sub>CE</sub> = –2.0 V <sub>dc</sub> )		V <sub>BE(on)</sub>	—	—	–1.0	V <sub>dc</sub>

## DYNAMIC CHARACTERISTICS

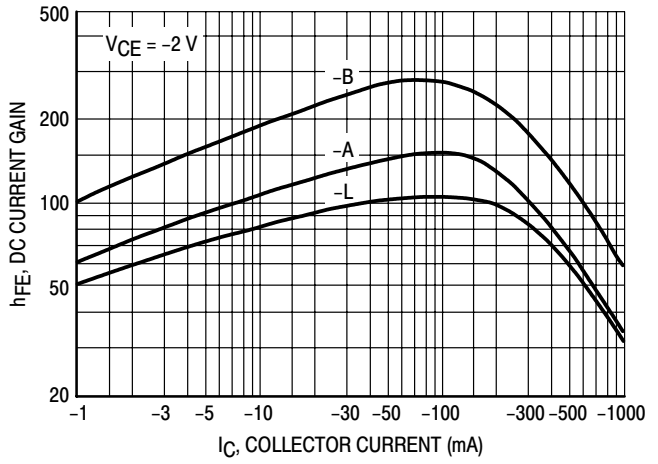
Current–Gain — Bandwidth Product (I <sub>C</sub> = –50 mA <sub>dc</sub> , V <sub>CE</sub> = –2.0 V <sub>dc</sub> , f = 100 MHz)		f <sub>T</sub>	—	150	—	MHz
Output Capacitance (V <sub>CB</sub> = –10 V <sub>dc</sub> , I <sub>E</sub> = 0, f = 1.0 MHz)		C <sub>ob</sub>	—	9.0	—	pF
Input Capacitance (V <sub>EB</sub> = –0.5 V <sub>dc</sub> , I <sub>C</sub> = 0, f = 1.0 MHz)		C <sub>ib</sub>	—	110	—	pF

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

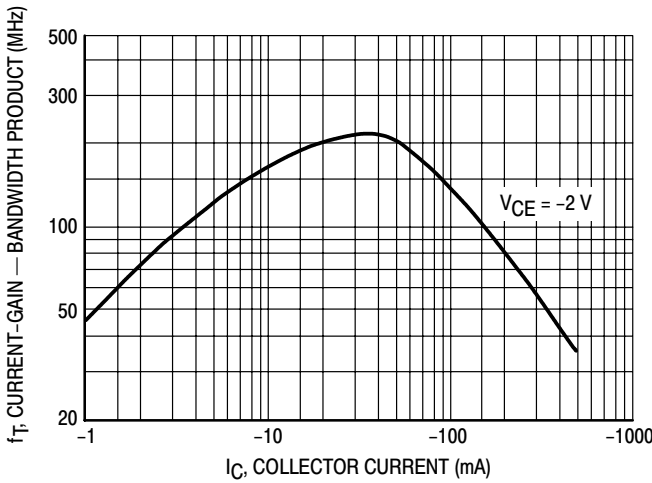
**BC636, BC636-16, BC638, BC640, BC640-16**



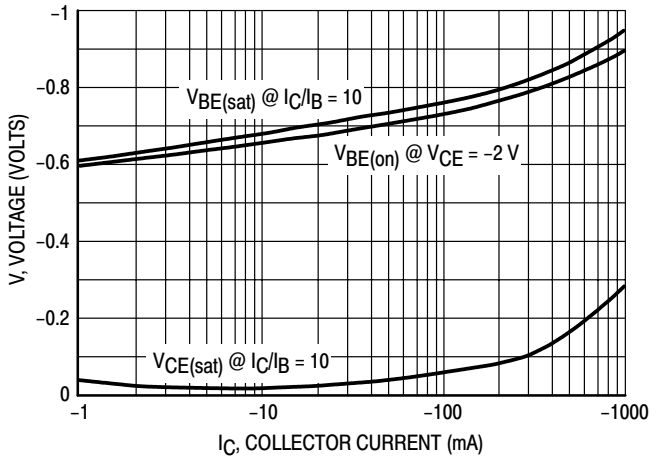
**Figure 1. Active Region Safe Operating Area**



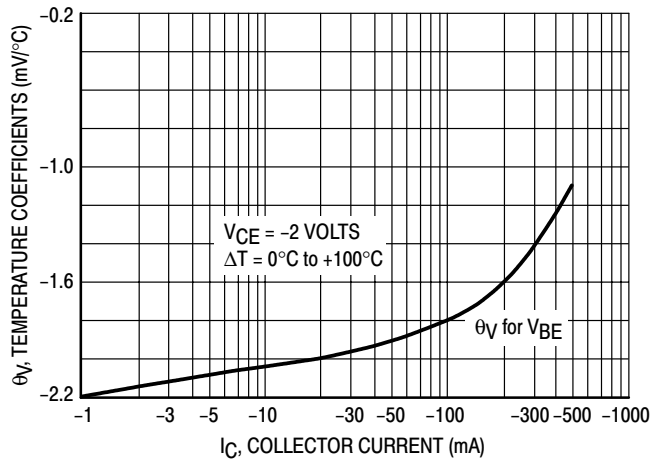
**Figure 2. DC Current Gain**



**Figure 3. Current Gain Bandwidth Product**



**Figure 4. "Saturation" and "On" Voltages**

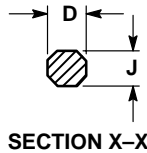
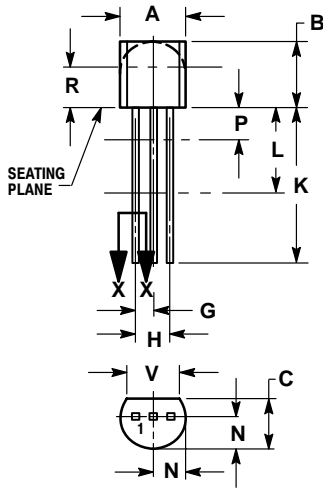


**Figure 5. Temperature Coefficients**

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## PACKAGE DIMENSIONS

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