

# PNP Epitaxial Silicon Transistor

## BC640

### Features

- Switching and Amplifier Applications
- Complement to BC639
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

### ABSOLUTE MAXIMUM RATINGS

(Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted)

Parameter	Symbol	Value	Unit
Collector-Emitter Voltage at $R_{BE} = 1\text{ k}\Omega$	$V_{CER}$	-100	V
Collector-Emitter Voltage	$V_{CES}$	-100	V
Collector-Emitter Voltage	$V_{CEO}$	-80	V
Emitter-Base Voltage	$V_{EBO}$	-5	V
Collector Current	$I_C$	-1	A
Peak Collector Current	$I_{CP}$	-1.5	A
Base Current	$I_B$	-100	mA
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-65 to 150	$^\circ\text{C}$

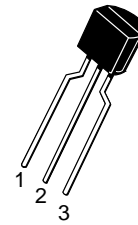
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

### THERMAL CHARACTERISTICS (Note 1)

(Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted)

Parameter	Symbol	Value	Unit
Power Dissipation	$P_D$	1	W
Dissipation Derate Above $25^\circ\text{C}$	$P_D$	8	mW/ $^\circ\text{C}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	125	$^\circ\text{C}/\text{W}$

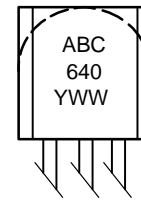
1. PCB size: FR-4, 76 mm x 114 mm x 1.57 mm (3.0 inch x 4.5 inch x 0.062 inch) with minimum land pattern size.



TO-92-3  
CASE 135AR  
Bent Lead

1. Emitter
2. Collector
3. Base

### MARKING DIAGRAM



A = Assembly Code  
BC640 = Device Code  
YWW = Date Code

### ORDERING INFORMATION

See detailed ordering and shipping information on page 2 of this data sheet.

# BC640

## ELECTRICAL CHARACTERISTICS

(Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$BV_{CEO}$	Collector–Emitter Breakdown Voltage	$I_C = -10\text{ mA}, I_B = 0$	-80			V
$I_{CBO}$	Collector Cut–Off Current	$V_{CB} = -30\text{ V}, I_E = 0$			-0.1	$\mu\text{A}$
$I_{EBO}$	Emitter Cut–Off Current	$V_{EB} = -5\text{ V}, I_C = 0$			-10	$\mu\text{A}$
$h_{FE1}$	DC Current Gain	$V_{CE} = -2\text{ V}, I_C = -5\text{ mA}$	25			
$h_{FE2}$		$V_{CE} = -2\text{ V}, I_C = -150\text{ mA}$	40		160	
$h_{FE3}$		$V_{CE} = -2\text{ V}, I_C = -500\text{ mA}$	25			
$V_{CE(sat)}$	Collector–Emitter Saturation Voltage	$I_C = -500\text{ mA}, I_B = -50\text{ mA}$			-0.5	V
$V_{BE(on)}$	Base–Emitter On Voltage	$V_{CE} = -2\text{ V}, I_C = -500\text{ mA}$			-1	V
$f_T$	Current Gain Bandwidth Product	$V_{CE} = -5\text{ V}, I_C = -10\text{ mA}, f = 50\text{ MHz}$		100		MHz

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

## ORDERING INFORMATION

Part Number	Top Mark	Package	Shipping
BC640TA	BC640	TO–92–3, case 135AR (Pb–Free)	2,000 Units / Fan Fold

TYPICAL PERFORMANCE CHARACTERISTICS

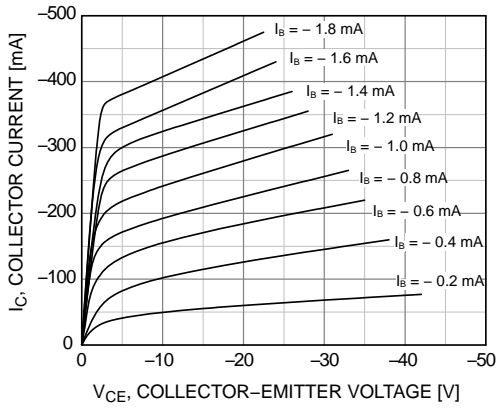


Figure 1. Static Characteristic

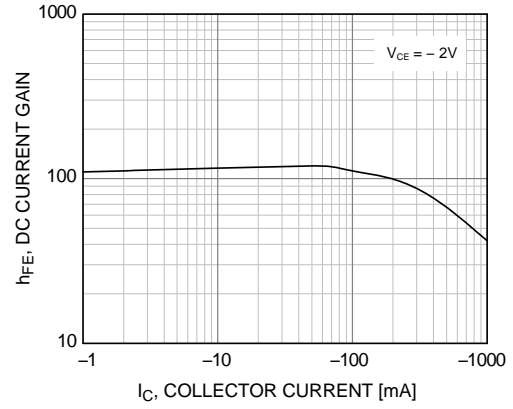


Figure 2. DC Current Gain

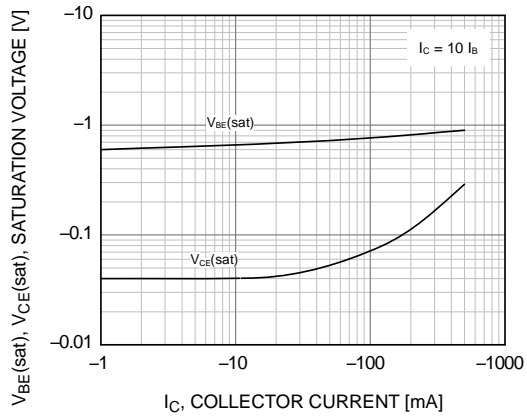


Figure 3. Base-Emitter Saturation Voltage and Collector-Emitter Saturation Voltage

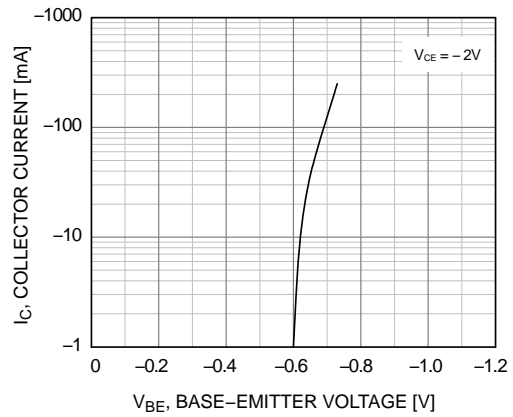


Figure 4. Base-Emitter On Voltage

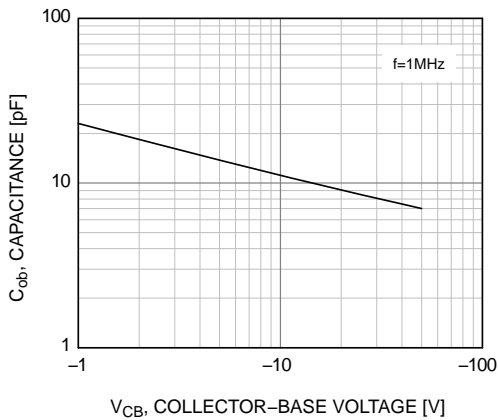
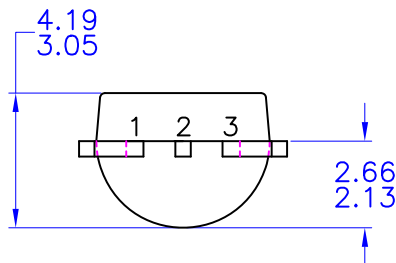
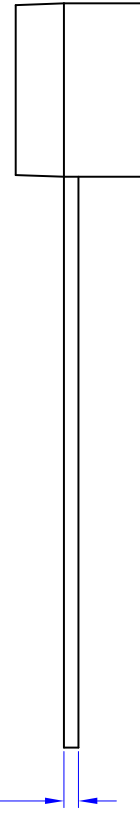
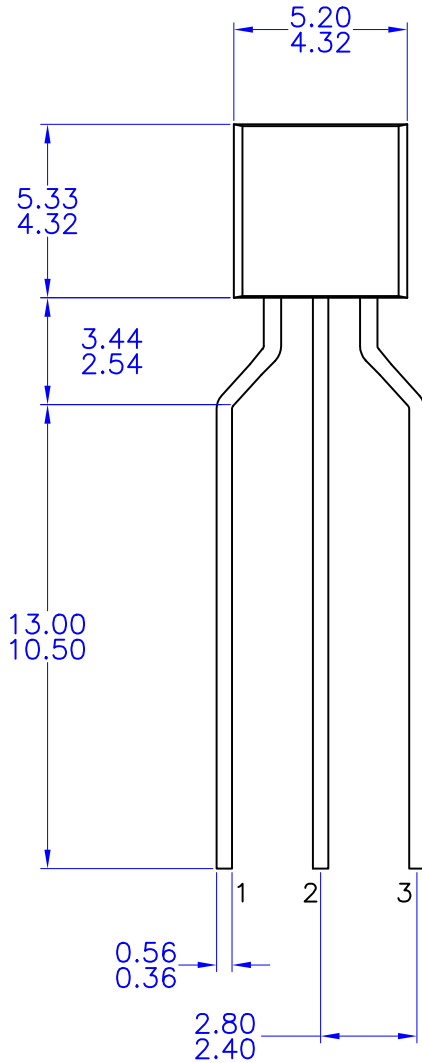


Figure 5. Collector Output Capacitance

**TO-92 3 4.83x4.76 LEADFORMED**  
CASE 135AR  
ISSUE O

DATE 30 SEP 2016



NOTES: UNLESS OTHERWISE SPECIFIED

- A) DRAWING WITH REFERENCE TO JEDEC TO-92 RECOMMENDATIONS.
- B) ALL DIMENSIONS ARE IN MILLIMETERS.
- C) DRAWING CONFORMS TO ASME Y14.5M-1994

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