

# BC447, BC449, BC449A

## High Voltage Transistors

NPN Silicon



ON Semiconductor®

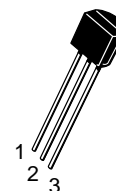
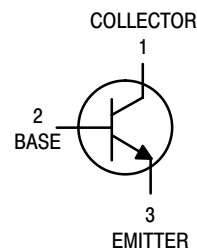
<http://onsemi.com>

### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage BC447 BC449, BC449A	$V_{CEO}$	80 100	Vdc
Collector-Base Voltage BC447 BC449, BC449A	$V_{CBO}$	80 100	Vdc
Emitter-Base Voltage	$V_{EBO}$	5.0	Vdc
Collector Current - Continuous	$I_C$	300	mAdc
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	$^\circ\text{C}$
Moisture Sensitivity Level (MSL) Electrostatic Discharge (ESD)		MSL: 1 NA	

### 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 17

### MARKING DIAGRAM



BC44xx = Specific Device Code  
xx = 7, 9 or 9A  
Y = Year  
WW = Work Week

### ORDERING INFORMATION

Device	Package	Shipping
BC447	TO-92	5000 Units/Box
BC449	TO-92	5000 Units/Box
BC449A	TO-92	5000 Units/Box

# BC447, BC449, BC449A

## 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> = 1.0 mA, I <sub>B</sub> = 0)	V <sub>(BR)CEO</sub>	80 100	- -	- -	Vdc
Collector - Base Breakdown Voltage (I <sub>C</sub> = 100 μA, I <sub>E</sub> = 0)	V <sub>(BR)CBO</sub>	80 100	- -	- -	Vdc
Emitter - Base Breakdown Voltage (I <sub>E</sub> = 10 μA, I <sub>C</sub> = 0)	V <sub>(BR)EBO</sub>	5.0	-	-	Vdc
Collector Cutoff Current (V <sub>CB</sub> = 60 Vdc, I <sub>E</sub> = 0) (V <sub>CB</sub> = 80 Vdc, I <sub>E</sub> = 0)	I <sub>CBO</sub>	- -	- -	100 100	nAdc
<b>ON CHARACTERISTICS (Note 1)</b>					
DC Current Gain (I <sub>C</sub> = 2.0 mA, V <sub>CE</sub> = 5.0 Vdc)	h <sub>FE</sub>	50	-	460	-
(I <sub>C</sub> = 10 mA, V <sub>CE</sub> = 5.0 Vdc)		120	-	220	
(I <sub>C</sub> = 100 mA, V <sub>CE</sub> = 5.0 Vdc)		50	-	-	
		100	-	-	
Collector - Emitter Saturation Voltage (I <sub>C</sub> = 100 mA, I <sub>B</sub> = 10 mA)	V <sub>CE(sat)</sub>	-	0.125	0.25	Vdc
Base - Emitter Saturation Voltage (I <sub>C</sub> = 100 mA, I <sub>B</sub> = 10 mA)	V <sub>BE(sat)</sub>	-	0.85	-	Vdc
Base - Emitter On Voltage (I <sub>C</sub> = 2.0 mA, V <sub>CE</sub> = 5.0 Vdc) (I <sub>C</sub> = 100 mA, V <sub>CE</sub> = 5.0 Vdc) (Note 1)	V <sub>BE(on)</sub>	0.55 -	- 0.76	0.7 1.2	Vdc
<b>DYNAMIC CHARACTERISTICS</b>					
Current - Gain - Bandwidth Product (I <sub>C</sub> = 50 mA, V <sub>CE</sub> = 5.0 Vdc, f = 100 MHz)	f <sub>T</sub>	100	200	-	MHz

1. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle 2%

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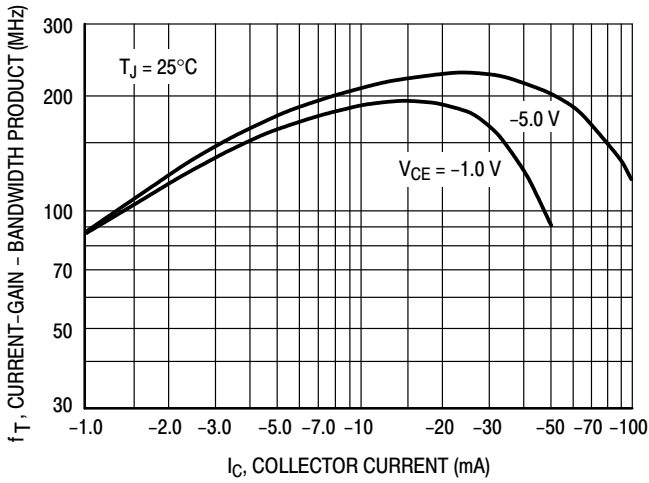


Figure 1. Current-Gain — Bandwidth Product

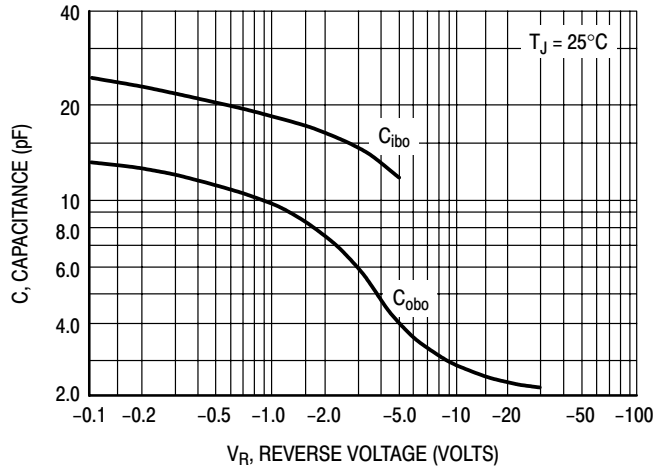


Figure 2. Capacitance

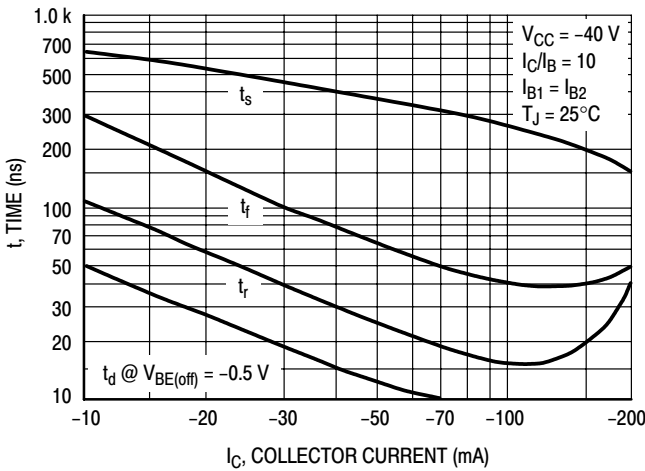


Figure 3. Switching Times

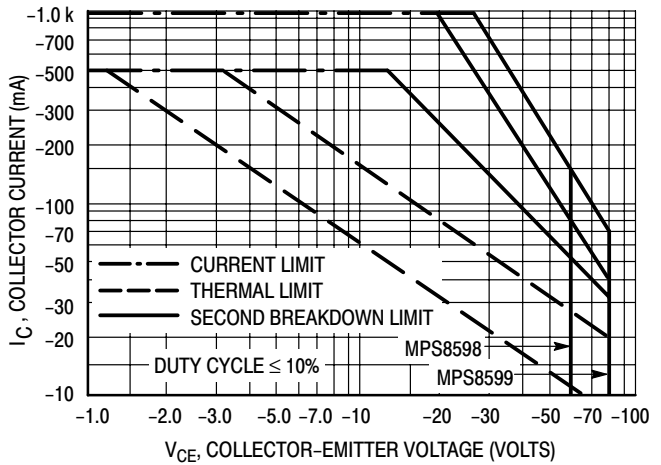


Figure 4. Active-Region Safe Operating Area

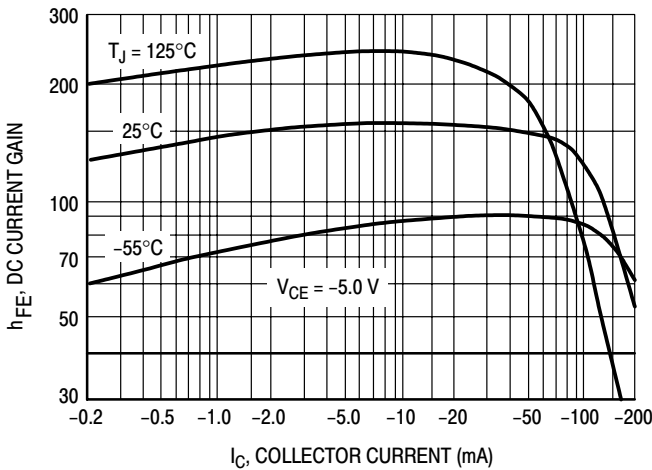


Figure 5. DC Current Gain

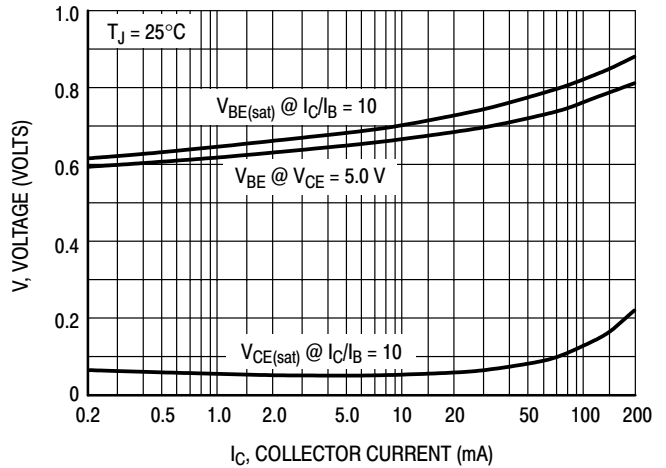


Figure 6. "ON" Voltages

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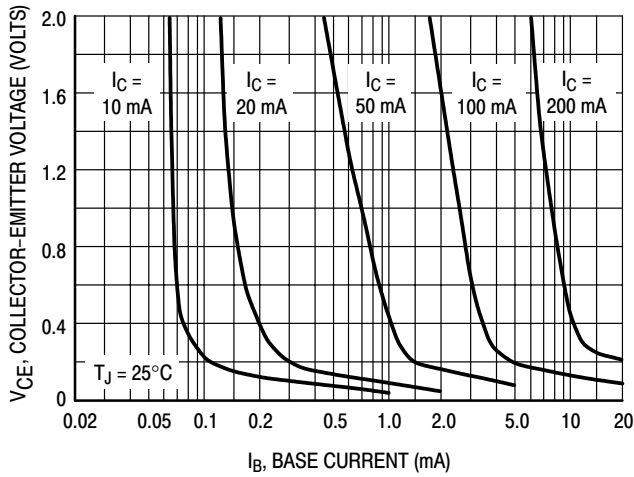


Figure 7. Collector Saturation Region

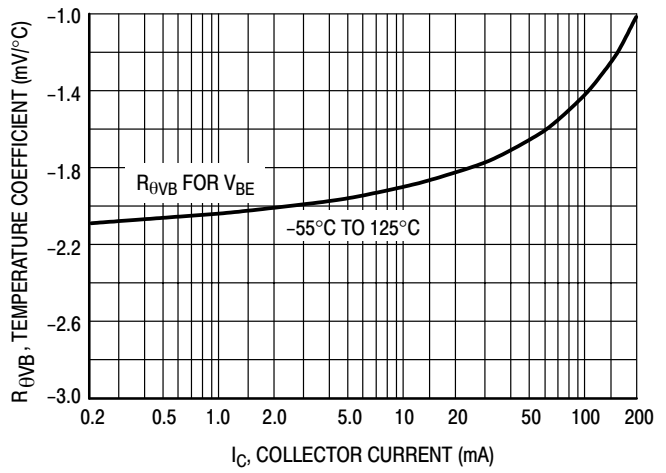


Figure 8. Base-Emitter Temperature Coefficient

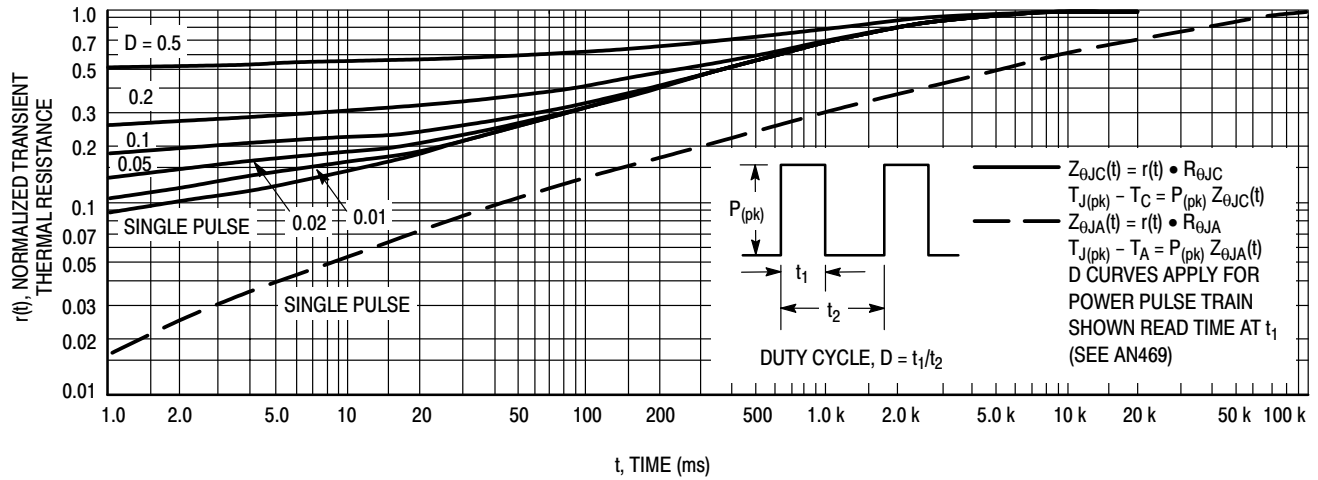
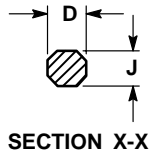
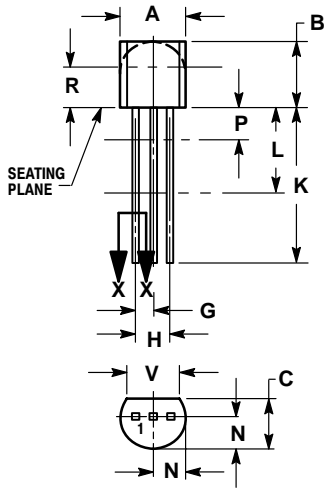


Figure 9. Thermal Response

# BC447, BC449, BC449A

## 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 17:  
PIN 1. COLLECTOR  
2. BASE  
3. EMITTER

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