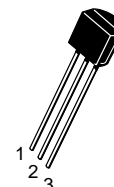


# High Voltage Transistors

## PNP Silicon

# BC450,A



CASE 29-04, STYLE 17  
TO-92 (TO-226AA)

### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	$V_{CEO}$	-100	Vdc
Collector–Base Voltage	$V_{CBO}$	-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	Watt 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	$^\circ\text{C}/\text{W}$

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

Characteristic	Symbol	Min	Typ	Max	Unit
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### OFF CHARACTERISTICS

Collector–Emitter Breakdown Voltage <sup>(1)</sup> ( $I_C = -1.0 \text{ mAdc}, I_E = 0$ )	$V_{(BR)CEO}$	-100	—	—	Vdc
Collector–Base Breakdown Voltage ( $I_C = -100 \mu\text{A}, I_E = 0$ )	$V_{(BR)CBO}$	-100	—	—	Vdc
Emitter–Base Breakdown Voltage ( $I_E = -10 \mu\text{Adc}, I_C = 0$ )	$V_{(BR)EBO}$	-5.0	—	—	Vdc
Collector Cutoff Current ( $V_{CB} = -80 \text{ Vdc}, I_E = 0$ )	$I_{CBO}$	—	—	-100	nAdc

### ON CHARACTERISTICS\*

DC Current Gain ( $I_C = -2.0 \text{ mA}, V_{CE} = -5.0 \text{ V}$ )	BC450 BC450A	$h_{FE}$	50 120	— —	460 220	—
( $I_C = -10 \text{ mA}, V_{CE} = -5.0 \text{ V}$ )	BC450 BC450A		50 100	— —	— —	
( $I_C = -100 \text{ mA}, V_{CE} = -5.0 \text{ V}$ )	BC450 BC450A		50 60	— —	— —	

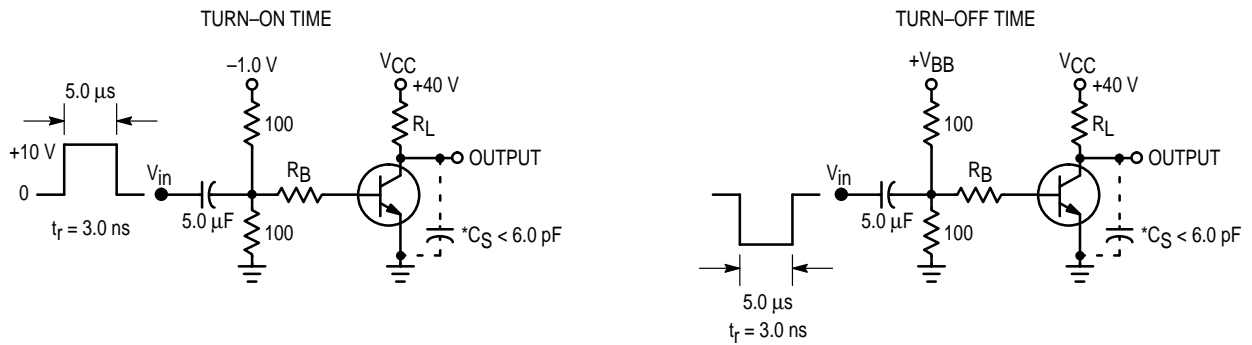
1. Pulse Test: Pulse Width  $\leq 300 \mu\text{s}$ , Duty Cycle 2.0%.

# BC450,A

## ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise noted) (Continued)

Characteristic	Symbol	Min	Typ	Max	Unit
<b>ON CHARACTERISTICS(1)</b> (Continued)					
Collector–Emitter Saturation Voltage (I <sub>C</sub> = -100 mA <sub>dc</sub> , I <sub>B</sub> = -10 mA <sub>dc</sub> )	V <sub>CE(sat)</sub>	—	-0.125	-0.25	V <sub>dc</sub>
Base–Emitter Saturation Voltage (I <sub>C</sub> = -100 mA <sub>dc</sub> , I <sub>B</sub> = -10 mA <sub>dc</sub> )	V <sub>BE(sat)</sub>	—	-0.85	—	V <sub>dc</sub>
Base–Emitter On Voltage (I <sub>C</sub> = -2.0 mA, V <sub>CE</sub> = -5.0 V) (I <sub>C</sub> = -100 mA, V <sub>CE</sub> = -5.0 V)*	V <sub>BE(on)</sub>	-0.55 —	— -0.76	-0.7 -1.2	V <sub>dc</sub>
<b>DYNAMIC CHARACTERISTICS</b>					
Current–Gain — Bandwidth Product (I <sub>C</sub> = -50 mA <sub>dc</sub> , V <sub>CE</sub> = -5.0 V <sub>dc</sub> , f = 100 MHz)	f <sub>T</sub>	100	200	—	MHz

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



\* Total Shunt Capacitance of Test Jig and Connectors  
For PNP Test Circuits, Reverse All Voltage Polarities

**Figure 1. Switching Time Test Circuits**

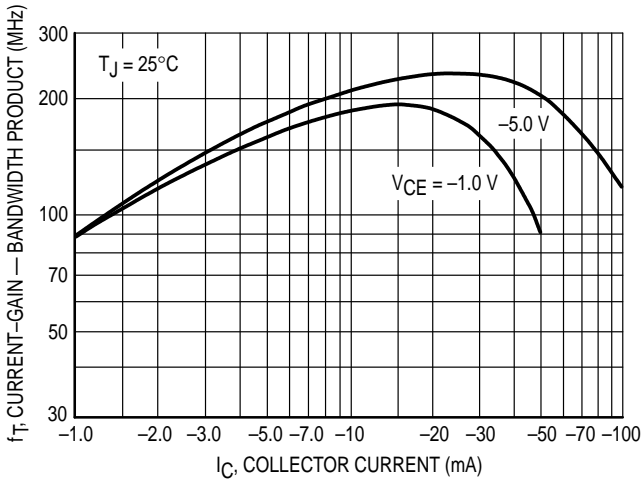


Figure 2. Current-Gain — Bandwidth Product

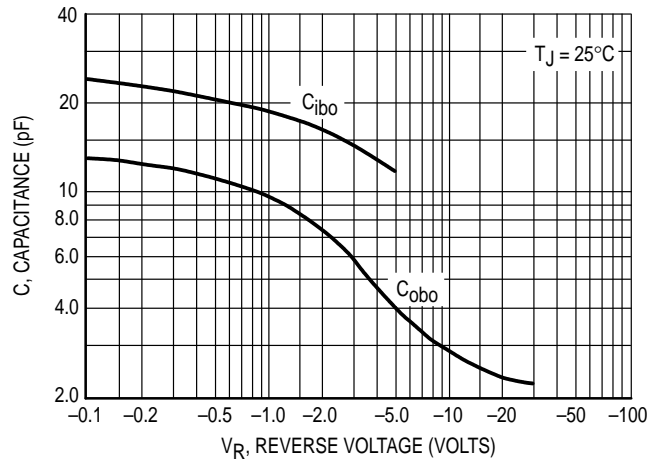


Figure 3. Capacitance

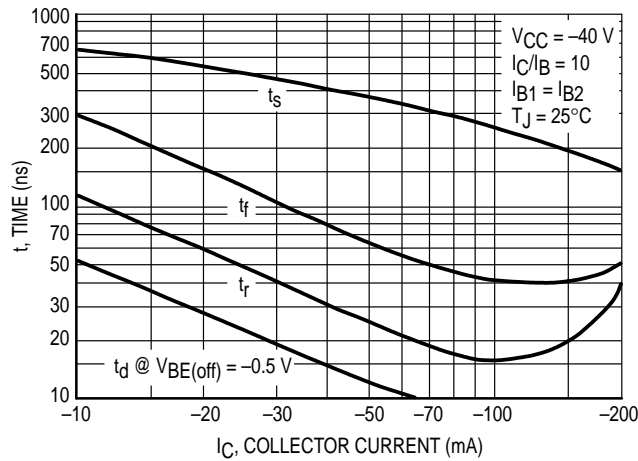


Figure 4. Switching Times

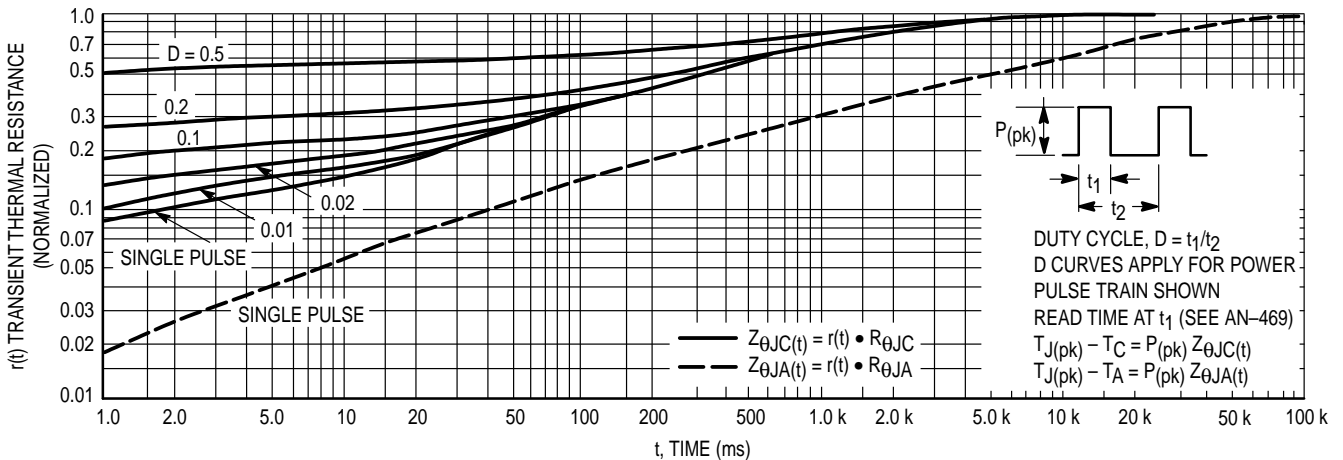


Figure 5. Thermal Response

# BC450,A

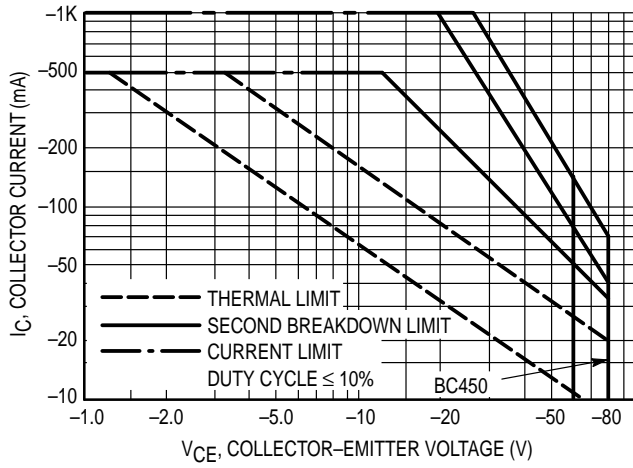


Figure 6. Active Region — Safe Operating Area

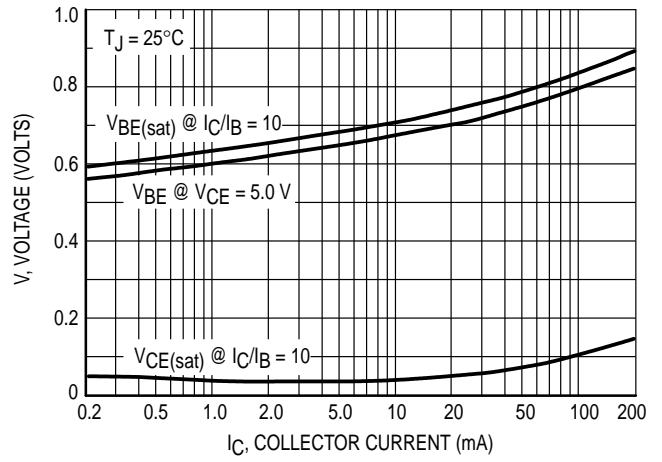


Figure 7. "On" Voltages

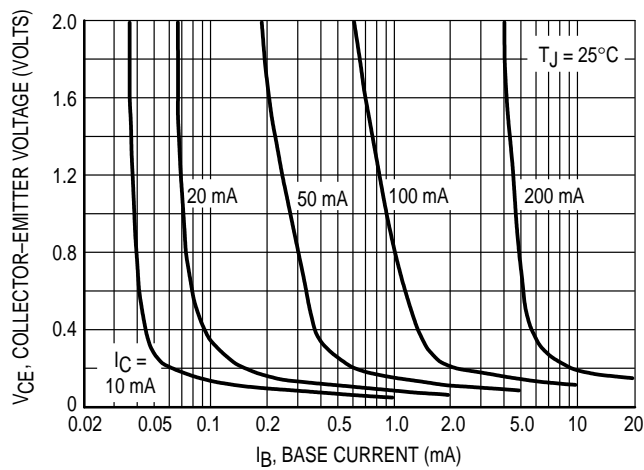


Figure 8. Collector Saturation Region

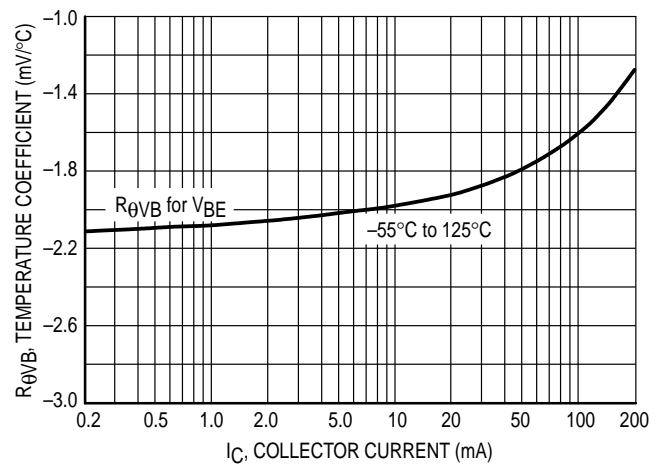


Figure 9. Base-Emitter Temperature Coefficient

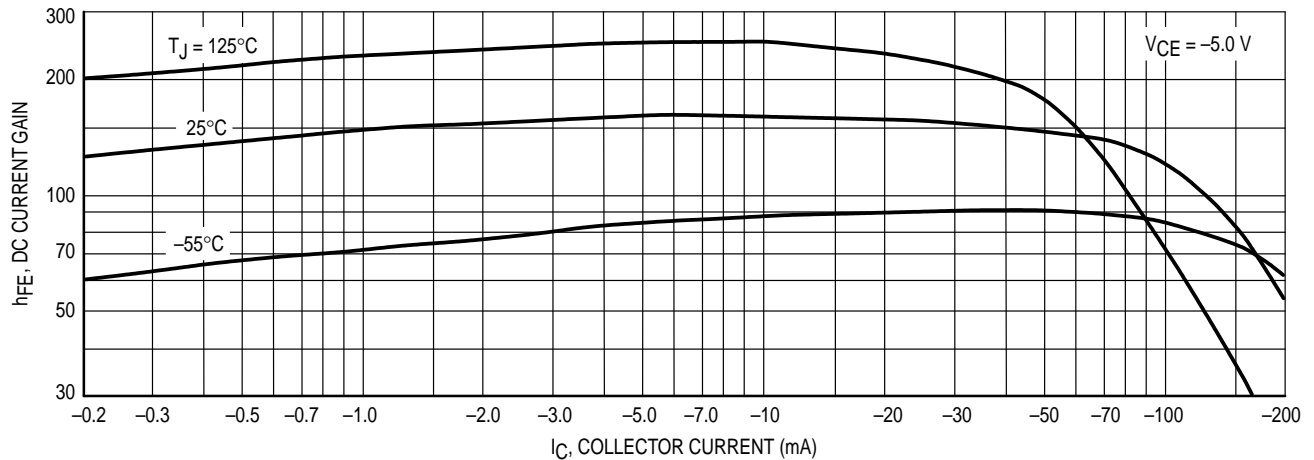


Figure 10. DC Current Gain

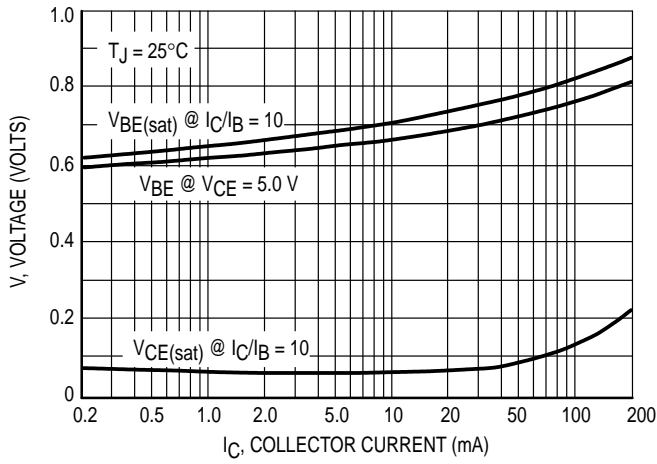


Figure 11. "On" Voltages

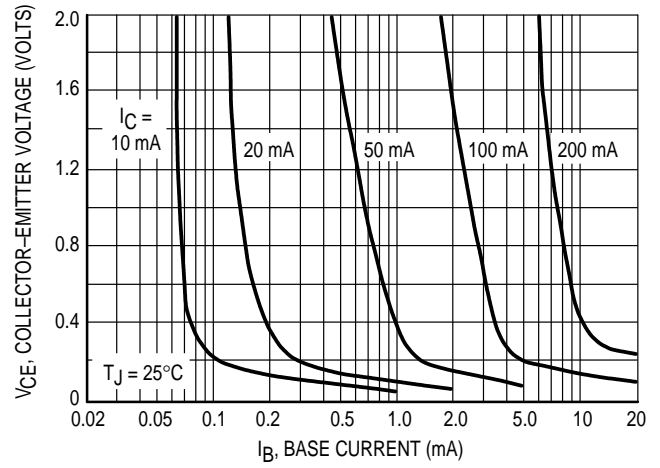


Figure 12. Collector Saturation Region

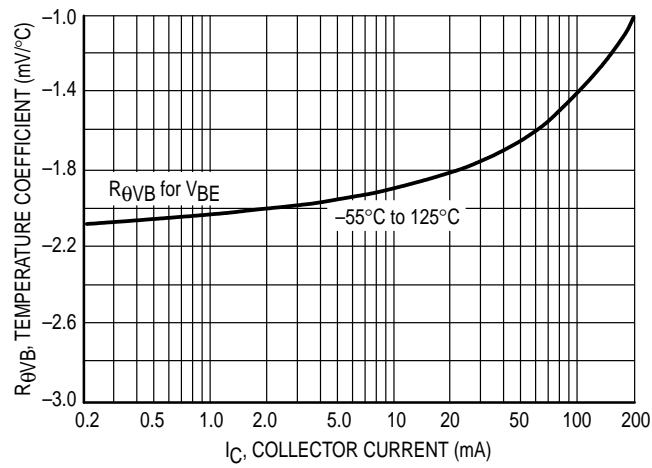


Figure 13. Base-Emitter Temperature Coefficient

PACKAGE DIMENSIONS



CASE 029-04  
(TO-226AA)  
ISSUE AD

NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. DIMENSION F APPLIES BETWEEN P AND L. DIMENSION D AND J APPLY BETWEEN L AND K. MINIMUM 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	0.022	0.41	0.55
F	0.016	0.019	0.41	0.48
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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