

# BC490, BC490A, BC490B

## High Current Transistors

### PNP Silicon

- Device Marking: 490  
490A  
490B

#### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	$V_{CEO}$	-80	Vdc
Collector-Base Voltage	$V_{CBO}$	-80	Vdc
Emitter-Base Voltage	$V_{EBO}$	-4.0	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 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	$^\circ\text{C}$

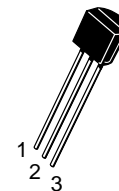
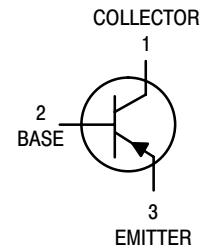
#### THERMAL CHARACTERISTICS

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	$^\circ\text{C}/\text{W}$



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CASE 29  
TO-92  
STYLE 17

#### ORDERING INFORMATION

Device	Package	Shipping
BC490	TO-92	5000 Units/Box
BC490A	TO-92	5000 Units/Box
BC490AZL1	TO-92	2000/Ammo Pack
BC490BZL1	TO-92	2000/Ammo Pack

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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 <sup>(1)</sup> (I <sub>C</sub> = -10 mA <sub>dc</sub> , I <sub>B</sub> = 0)	V <sub>(BR)CEO</sub>	-80	—	—	V <sub>dc</sub>
Collector–Base Breakdown Voltage (I <sub>C</sub> = -100 μA <sub>dc</sub> , I <sub>E</sub> = 0)	V <sub>(BR)CBO</sub>	-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>	-4.0	—	—	V <sub>dc</sub>
Collector Cutoff Current (V <sub>CB</sub> = -60 V <sub>dc</sub> , I <sub>E</sub> = 0)	I <sub>CBO</sub>	—	—	-100	nA <sub>dc</sub>

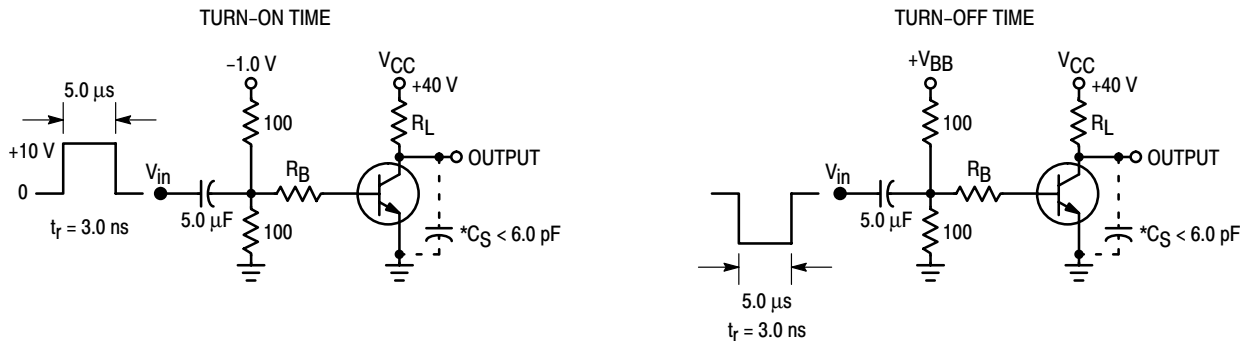
## ON CHARACTERISTICS\*

DC Current Gain (I <sub>C</sub> = -10 mA <sub>dc</sub> , V <sub>CE</sub> = -2.0 V <sub>dc</sub> ) (I <sub>C</sub> = -100 mA <sub>dc</sub> , V <sub>CE</sub> = -2.0 V <sub>dc</sub> )  (I <sub>C</sub> = -1.0 A <sub>dc</sub> , V <sub>CE</sub> = -5.0 V <sub>dc</sub> )	h <sub>FE</sub>	40 60 100 160 15	— — 140 — —	— — 250 400 —	—
Collector–Emitter Saturation Voltage (I <sub>C</sub> = -500 mA <sub>dc</sub> , I <sub>B</sub> = -50 mA <sub>dc</sub> ) (I <sub>C</sub> = -1.0 A <sub>dc</sub> , I <sub>B</sub> = -100 mA <sub>dc</sub> )	V <sub>CE(sat)</sub>	— —	-0.25 -0.5	-0.5 —	V <sub>dc</sub>
Base–Emitter Saturation Voltage (I <sub>C</sub> = -500 mA <sub>dc</sub> , I <sub>B</sub> = -50 mA <sub>dc</sub> ) (I <sub>C</sub> = -1.0 A <sub>dc</sub> , I <sub>B</sub> = -100 mA <sub>dc</sub> )	V <sub>BE(sat)</sub>	— —	-0.9 -1.0	-1.2 —	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%.



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

**Figure 1. Switching Time Test Circuits**

# BC490, BC490A, BC490B

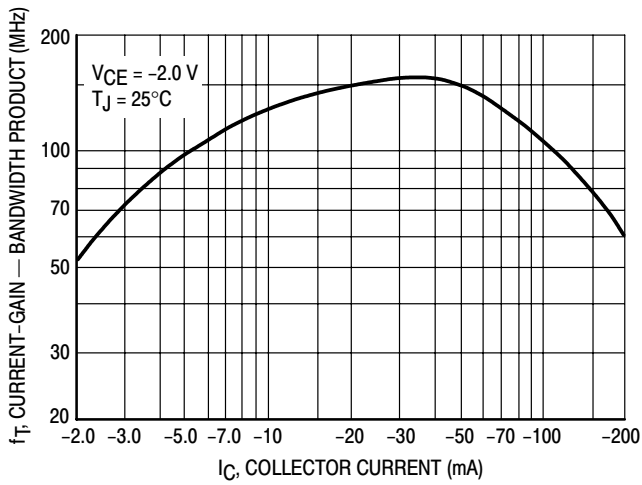


Figure 2. Current-Gain — Bandwidth Product

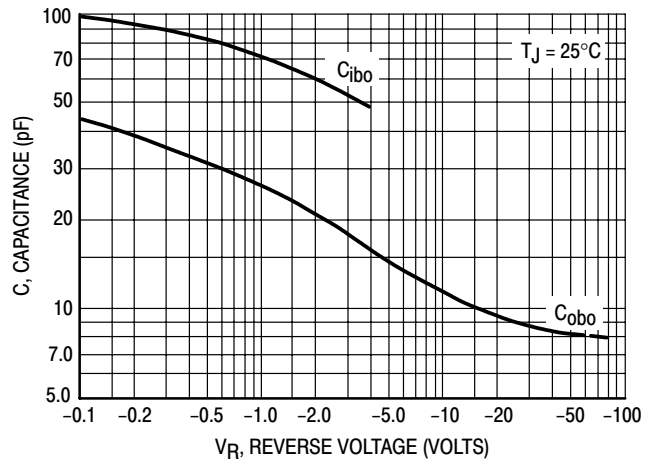


Figure 3. Capacitance

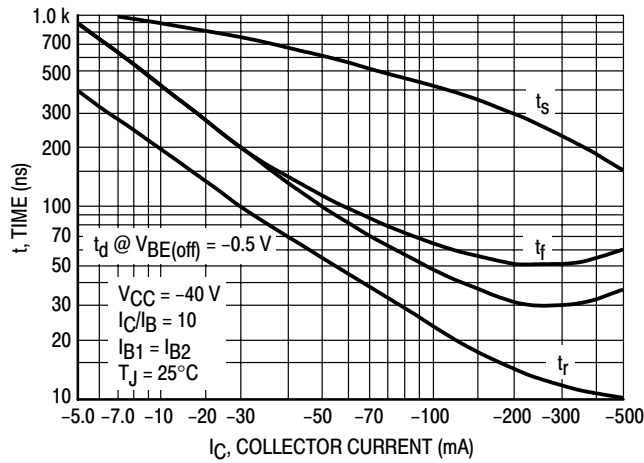


Figure 4. Switching Time

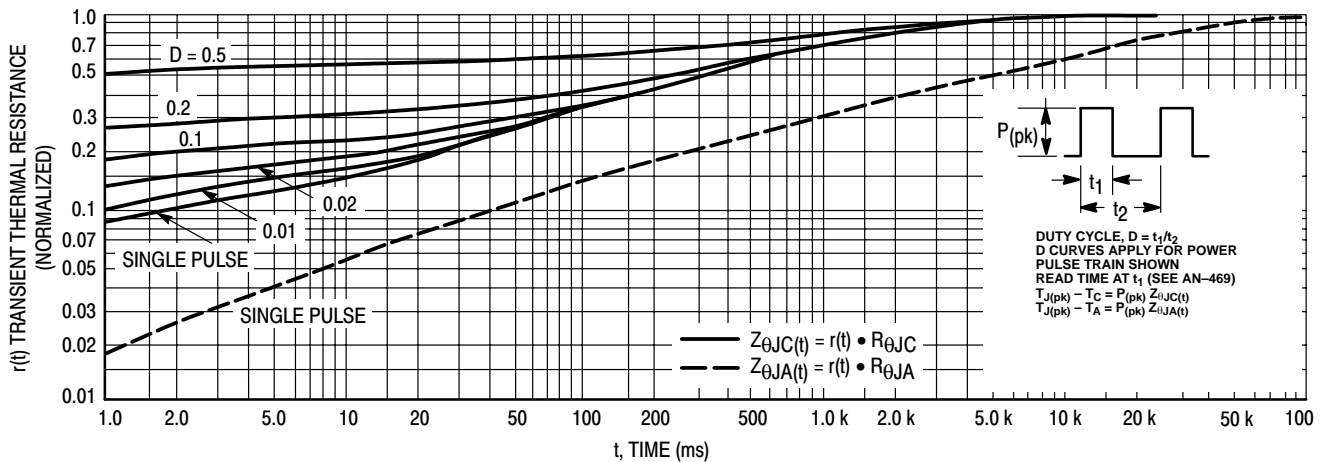


Figure 5. Thermal Response

# BC490, BC490A, BC490B

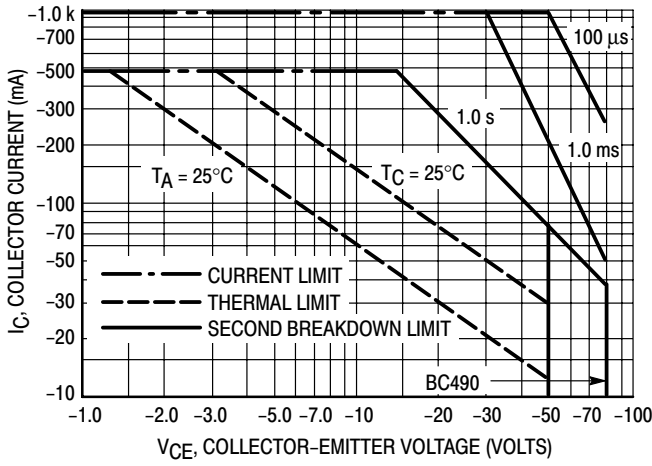


Figure 6. Active Region, Safe Operating Area

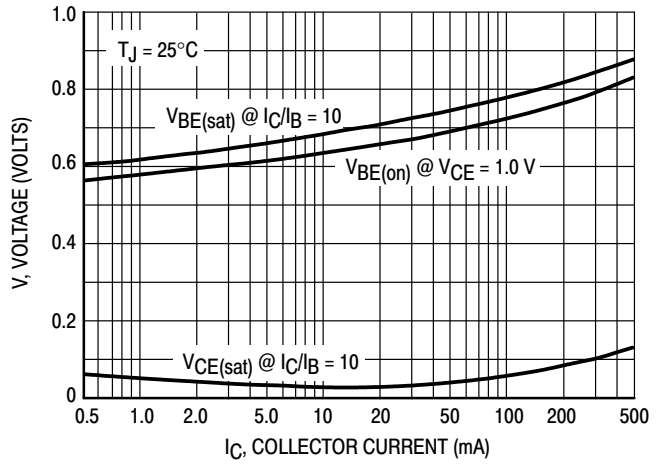


Figure 7. "On" Voltages

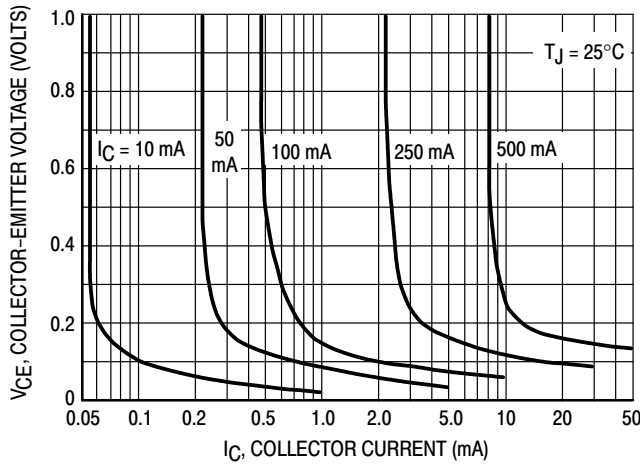


Figure 8. Collector Saturation Region

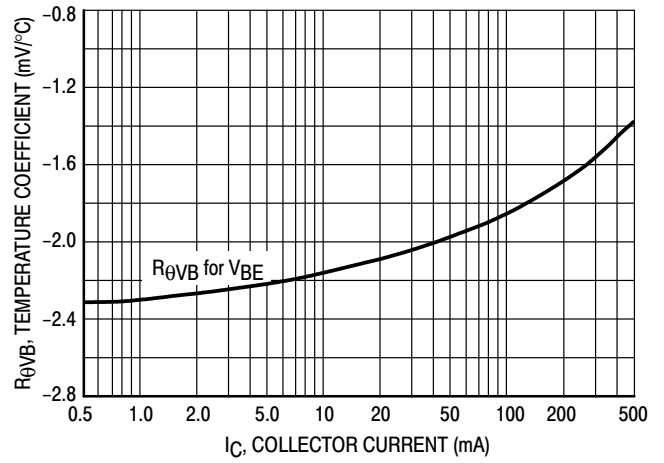


Figure 9. Base-Emitter Temperature Coefficient

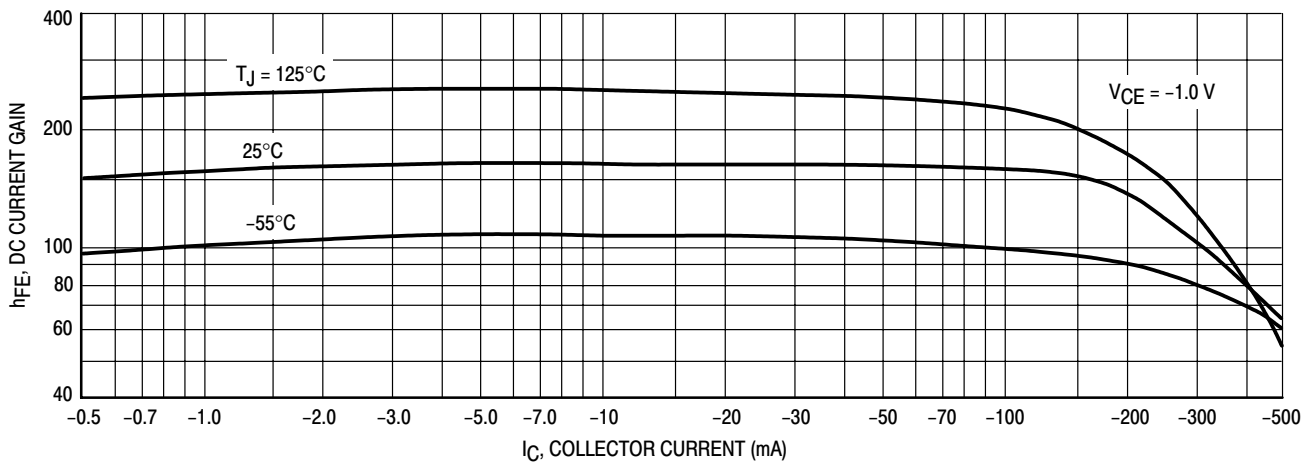


Figure 10. DC Current Gain

# BC490, BC490A, BC490B

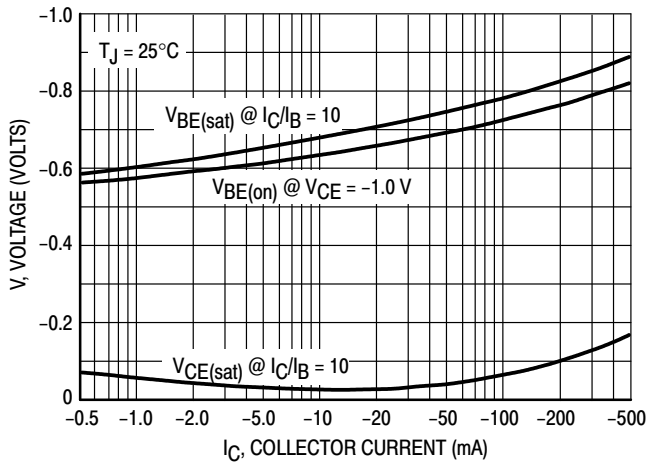


Figure 11. "On" Voltages

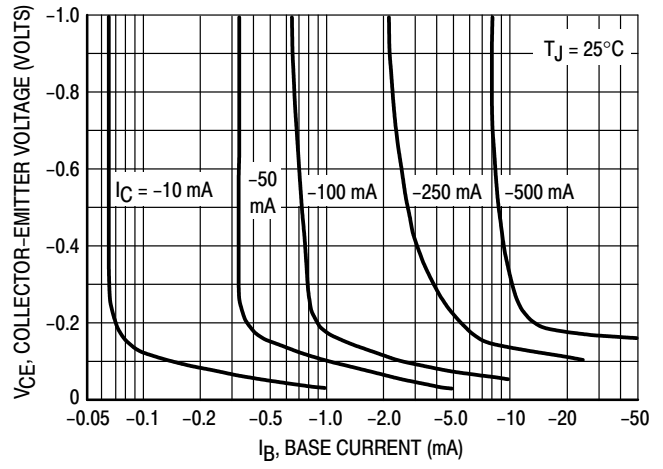


Figure 12. Collector Saturation Region

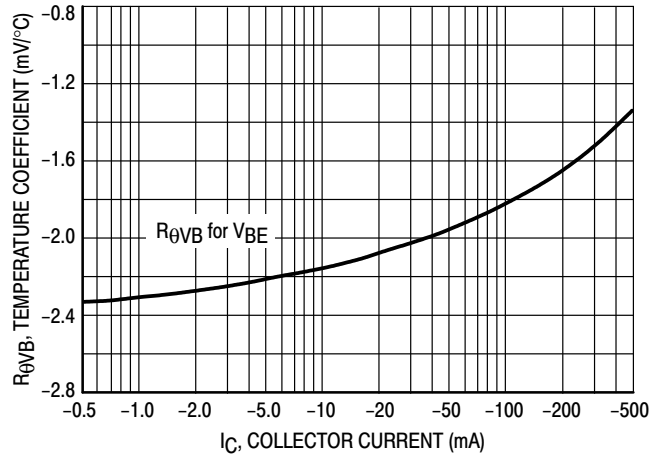
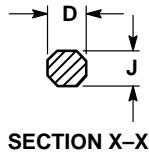
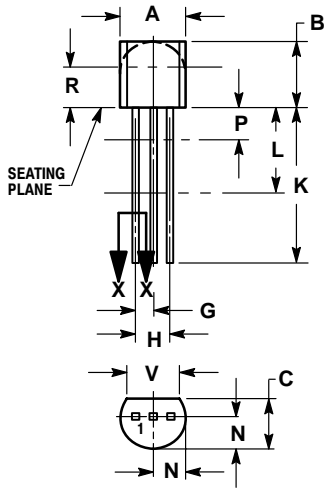


Figure 13. Base-Emitter Temperature Coefficient

# BC490, BC490A, BC490B

## 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

## Notes

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