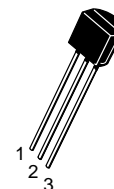
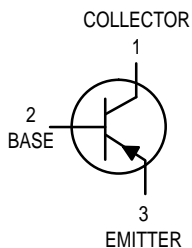


# High Current Transistors

## PNP Silicon

# BC490,A



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

### 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	$I_C$	–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	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> ( $I_C = -10 \text{ mAdc}, I_E = 0$ )	$V_{(BR)CEO}$	–80	—	—	Vdc
Collector–Base Breakdown Voltage ( $I_C = -100 \mu\text{Adc}, I_E = 0$ )	$V_{(BR)CBO}$	–80	—	—	Vdc
Emitter–Base Breakdown Voltage ( $I_E = -10 \mu\text{Adc}, I_C = 0$ )	$V_{(BR)EBO}$	–4.0	—	—	Vdc
Collector Cutoff Current ( $V_{CB} = -60 \text{ Vdc}, I_E = 0$ )	$I_{CBO}$	—	—	–100	nAdc

### ON CHARACTERISTICS\*

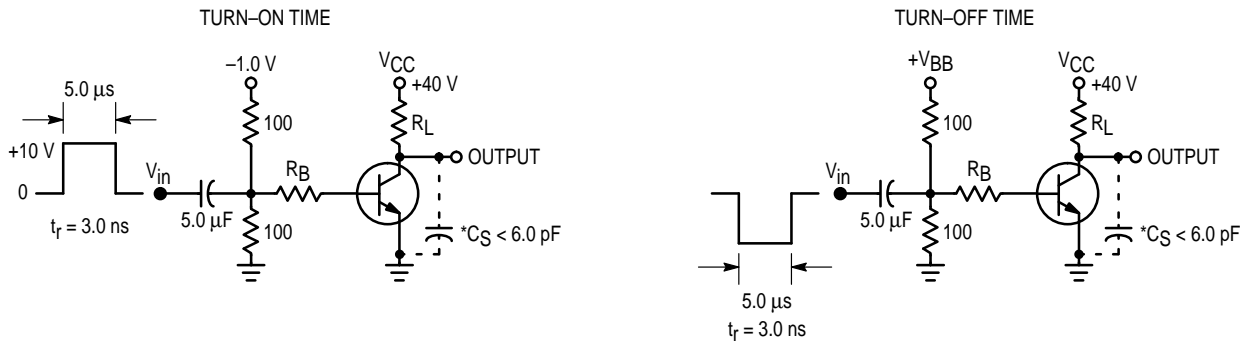
DC Current Gain ( $I_C = -10 \text{ mAdc}, V_{CE} = -2.0 \text{ Vdc}$ ) ( $I_C = -100 \text{ mAdc}, V_{CE} = -2.0 \text{ Vdc}$ ) ( $I_C = -1.0 \text{ Adc}, V_{CE} = -5.0 \text{ Vdc}$ )	$h_{FE}$	40 60 100 15	— — 140 —	— 400 250 —	—
	BC490				
	BC490A				

1. Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle 2%.

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

Characteristic	Symbol	Min	Min	Max	Unit
<b>ON CHARACTERISTICS(1)</b> (Continued)					
Collector–Emitter Saturation Voltage ( $I_C = -500\text{ mA dc}$ , $I_B = -50\text{ mA dc}$ ) ( $I_C = -1.0\text{ A dc}$ , $I_B = -100\text{ mA dc}$ )	$V_{CE(\text{sat})}$	—	-0.25	-0.5	Vdc
Base–Emitter Saturation Voltage ( $I_C = -500\text{ mA dc}$ , $I_B = -50\text{ mA dc}$ ) ( $I_C = -1.0\text{ A dc}$ , $I_B = -100\text{ mA dc}$ )	$V_{BE(\text{sat})}$	—	-0.9	-1.2	Vdc
<b>DYNAMIC CHARACTERISTICS</b>					
Current–Gain — Bandwidth Product ( $I_C = -50\text{ mA dc}$ , $V_{CE} = -2.0\text{ V dc}$ , $f = 100\text{ MHz}$ )	$f_T$	—	150	—	MHz
Output Capacitance ( $V_{CB} = -10\text{ V dc}$ , $I_E = 0$ , $f = 1.0\text{ MHz}$ )	$C_{ob}$	—	9.0	—	pF
Input Capacitance ( $V_{EB} = -0.5\text{ V dc}$ , $I_C = 0$ , $f = 1.0\text{ MHz}$ )	$C_{ib}$	—	110	—	pF

1. Pulse Test: Pulse Width = 300  $\mu\text{s}$ , 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**

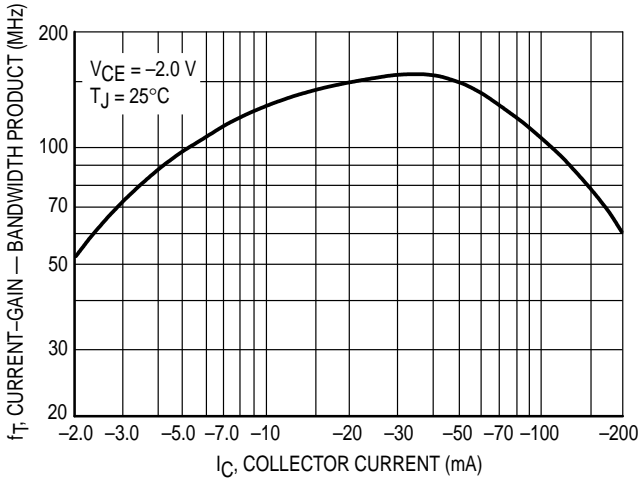


Figure 2. Current-Gain — Bandwidth Product

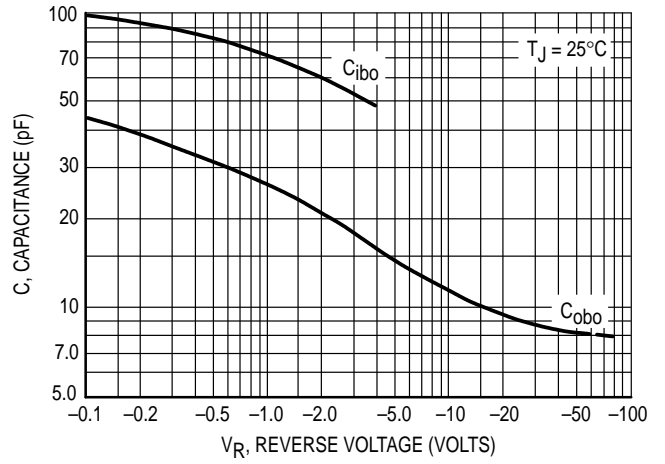


Figure 3. Capacitance

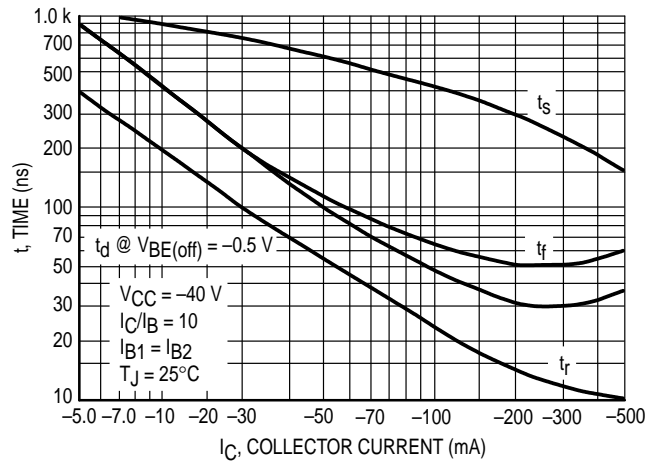


Figure 4. Switching Time

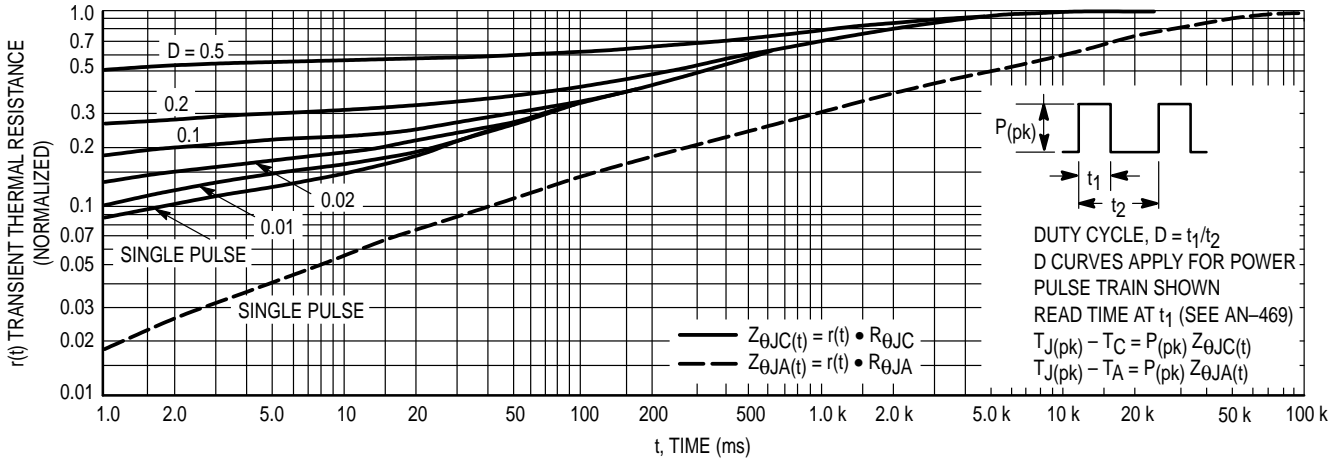


Figure 5. Thermal Response

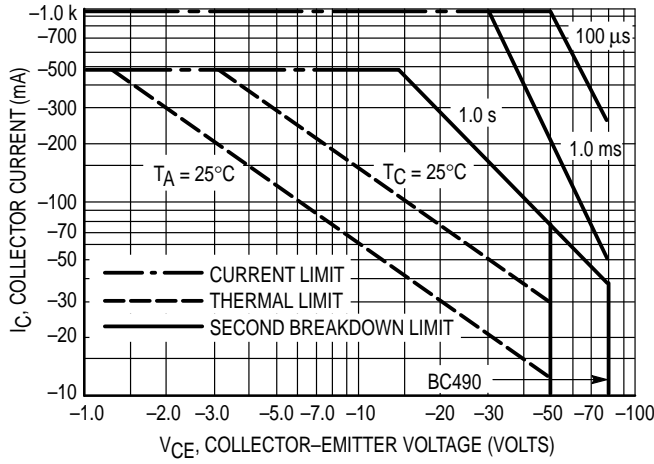


Figure 6. Active Region, Safe Operating Area

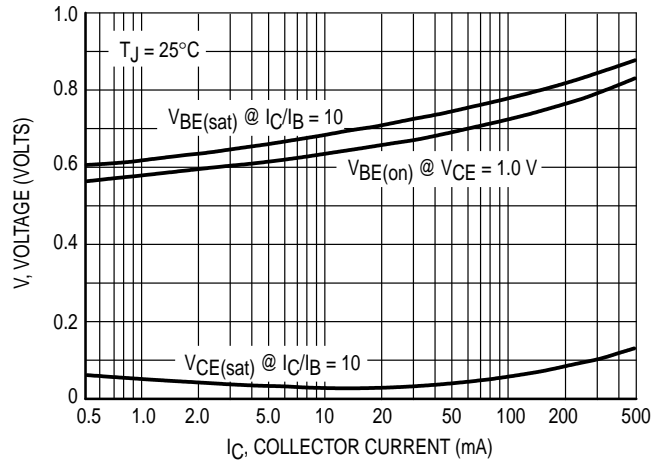


Figure 7. "On" Voltages

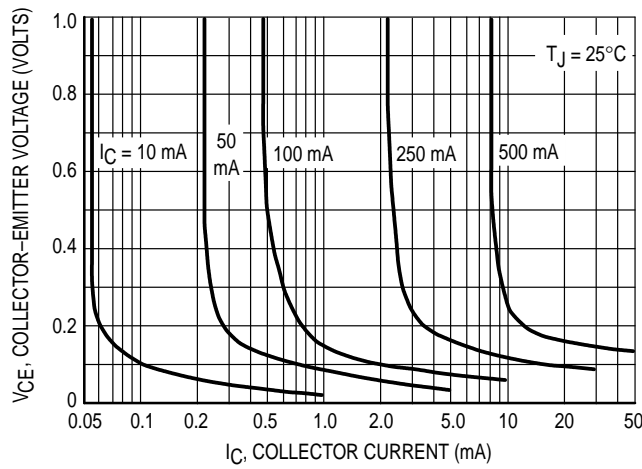


Figure 8. Collector Saturation Region

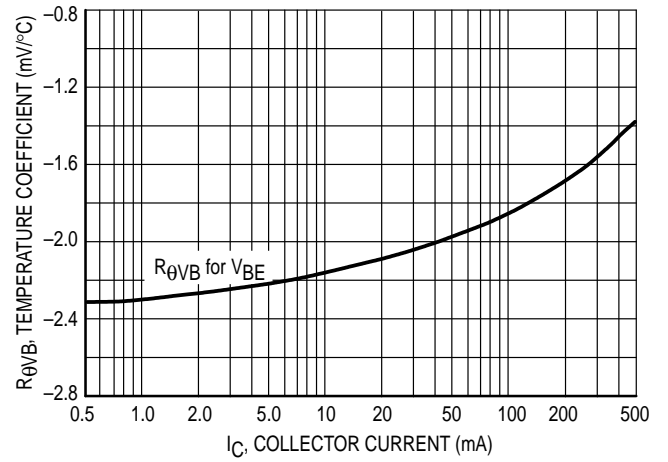


Figure 9. Base-Emitter Temperature Coefficient

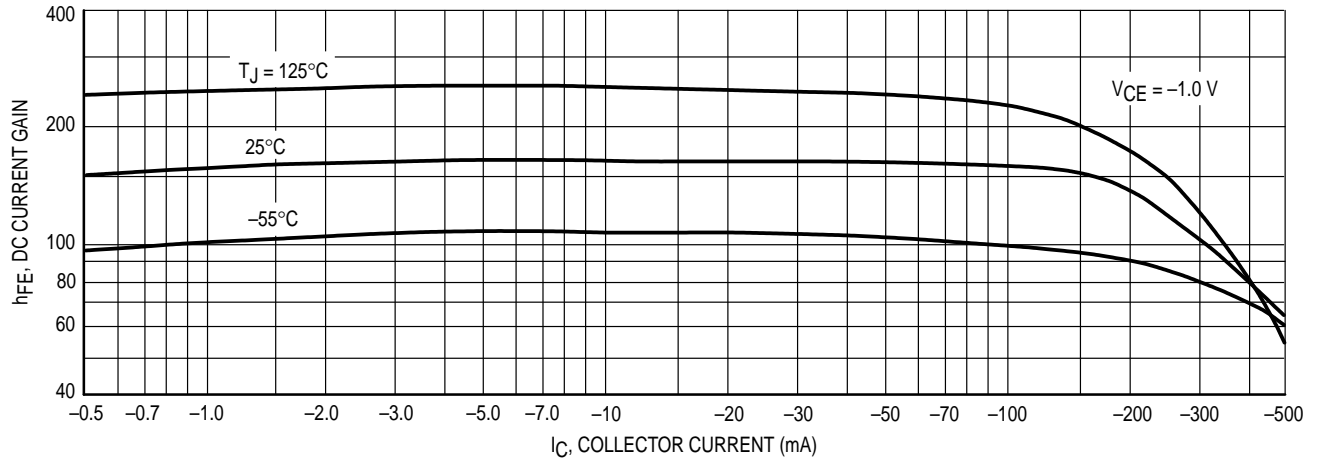


Figure 10. DC Current Gain

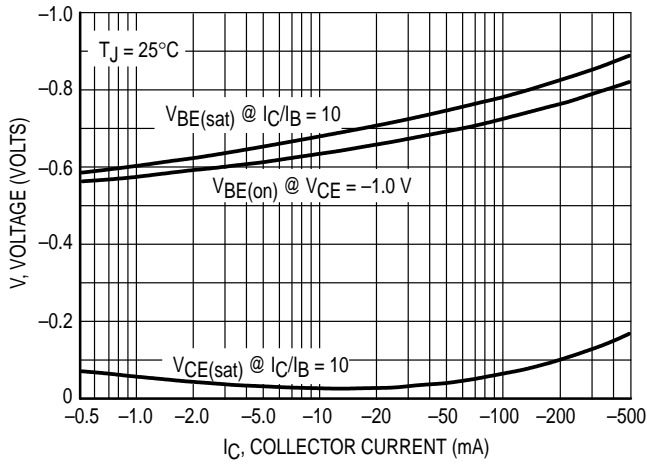


Figure 11. "On" Voltages

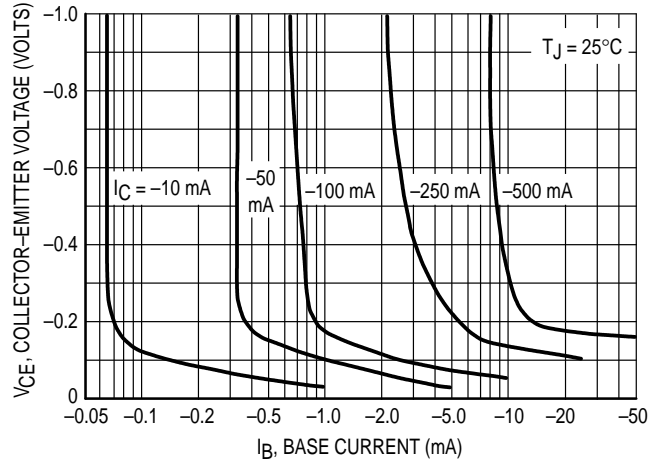


Figure 12. Collector Saturation Region

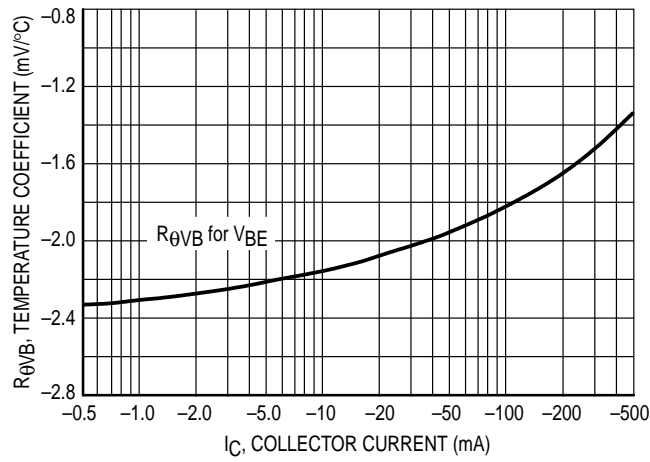
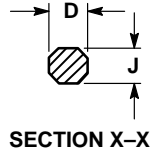
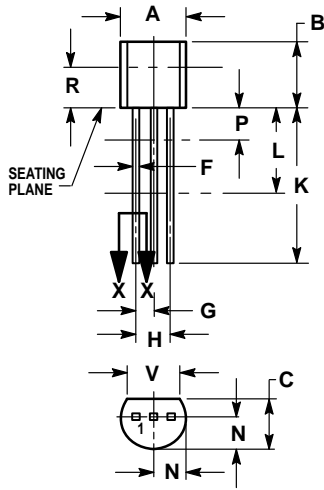


Figure 13. Base-Emitter Temperature Coefficient

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:
1. COLLECTOR
  2. BASE
  3. EMITTER

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