

BC490, BC490A

High Current Transistors

PNP Silicon

Features

- Pb-Free Packages are Available*

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°C | P_D | 625 5.0 | mW mW/ $^\circ\text{C}$ |
| Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C | P_D | 1.5 12 | W mW/ $^\circ\text{C}$ |
| Operating and Storage Junction Temperature Range | T_J, T_{stg} | -55 to +150 | $^\circ\text{C}$ |

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

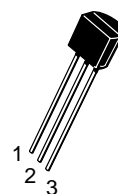
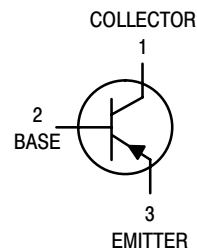
THERMAL CHARACTERISTICS

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



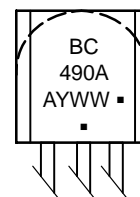
ON Semiconductor®

<http://onsemi.com>



TO-92
CASE 29
STYLE 17

MARKING DIAGRAM



BC490A = Device Code
A = Assembly Location
Y = Year
WW = Work Week
▪ = Pb-Free Package

(Note: Microdot may be in either location)

ORDERING INFORMATION

| Device | Package | Shipping |
|------------|--------------------|------------------|
| BC490 | TO-92 | 5000 Units / Box |
| BC490G | TO-92 (Pb-Free) | 5000 Units / Box |
| BC490A | TO-92 | 5000 Units / Box |
| BC490AG | TO-92 (Pb-Free) | 5000 Units / Box |
| BC490AZL1 | TO-92 | 2000 / Ammo Box |
| BC490AZL1G | TO-92 (Pb-Free) | 2000 / Ammo Box |

*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|--|----------------------|------|-----|------|------------------|
| OFF CHARACTERISTICS | | | | | |
| Collector–Emitter Breakdown Voltage (Note 1) (I _C = -10 mA _{dc} , I _B = 0) | V _{(BR)CEO} | -80 | - | - | V _{dc} |
| Collector–Base Breakdown Voltage (I _C = -100 μA _{dc} , I _E = 0) | V _{(BR)CBO} | -80 | - | - | V _{dc} |
| Emitter–Base Breakdown Voltage (I _E = -10 μA _{dc} , I _C = 0) | V _{(BR)EBO} | -4.0 | - | - | V _{dc} |
| Collector Cutoff Current (V _{CB} = -60 V _{dc} , I _E = 0) | I _{CBO} | - | - | -100 | nA _{dc} |

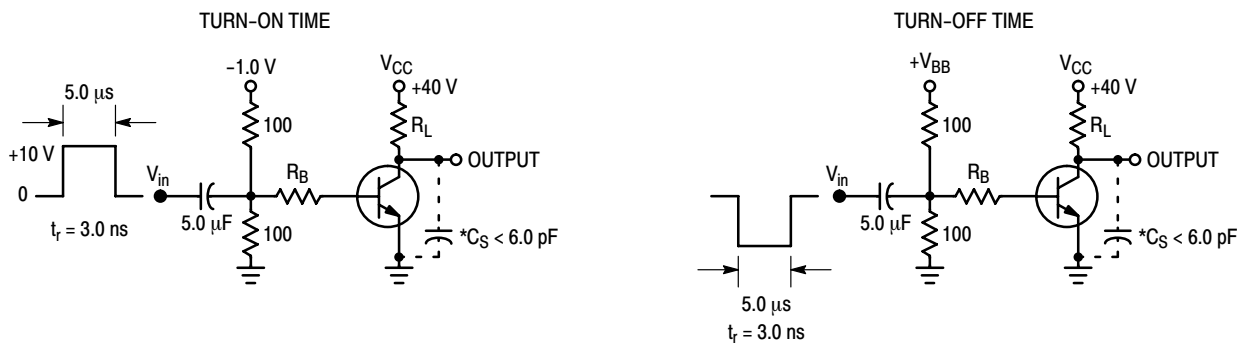
ON CHARACTERISTICS

| | | | | | |
|---|----------------------|-----------------------|--------------------|----------------------|-----------------|
| DC Current Gain (I _C = -10 mA _{dc} , V _{CE} = -2.0 V _{dc}) (I _C = -100 mA _{dc} , V _{CE} = -2.0 V _{dc}) (I _C = -1.0 A _{dc} , V _{CE} = -5.0 V _{dc}) | h _{FE} | 40 60 100 15 | - - 140 - | - 400 250 - | - |
| Collector–Emitter Saturation Voltage (I _C = -500 mA _{dc} , I _B = -50 mA _{dc}) (I _C = -1.0 A _{dc} , I _B = -100 mA _{dc}) | V _{CE(sat)} | - - | -0.25 -0.5 | -0.5 - | V _{dc} |
| Base–Emitter Saturation Voltage (I _C = -500 mA _{dc} , I _B = -50 mA _{dc}) (I _C = -1.0 A _{dc} , I _B = -100 mA _{dc}) | V _{BE(sat)} | - - | -0.9 -1.0 | -1.2 - | V _{dc} |

DYNAMIC CHARACTERISTICS

| | | | | | |
|--|-----------------|---|-----|---|-----|
| Current–Gain – Bandwidth Product (I _C = -50 mA _{dc} , V _{CE} = -2.0 V _{dc} , f = 100 MHz) | f _T | - | 150 | - | MHz |
| Output Capacitance (V _{CB} = -10 V _{dc} , I _E = 0, f = 1.0 MHz) | C _{ob} | - | 9.0 | - | pF |
| Input Capacitance (V _{EB} = -0.5 V _{dc} , I _C = 0, f = 1.0 MHz) | C _{ib} | - | 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

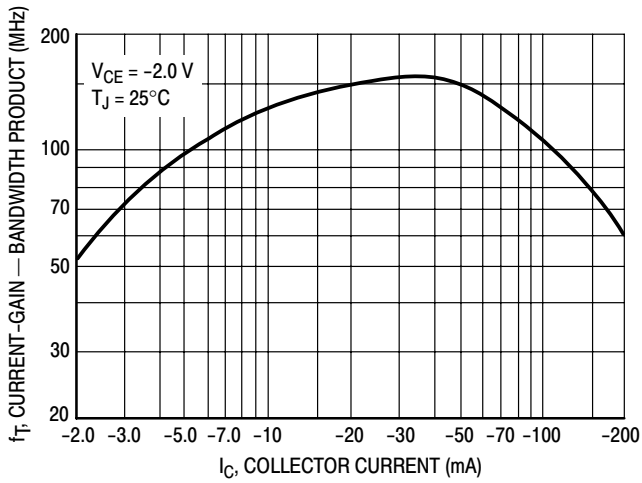


Figure 2. Current-Gain — Bandwidth Product

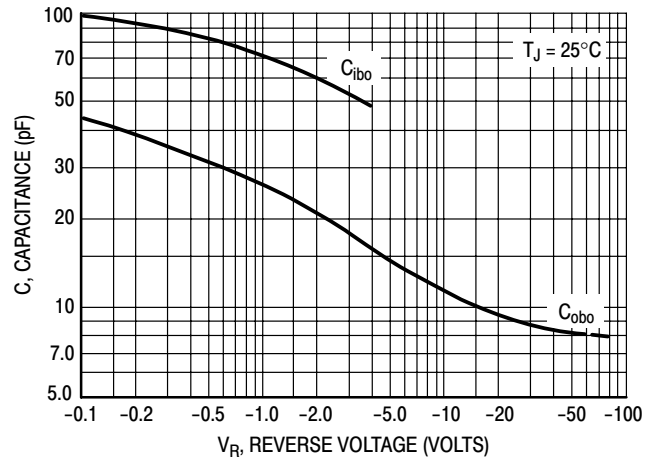


Figure 3. Capacitance

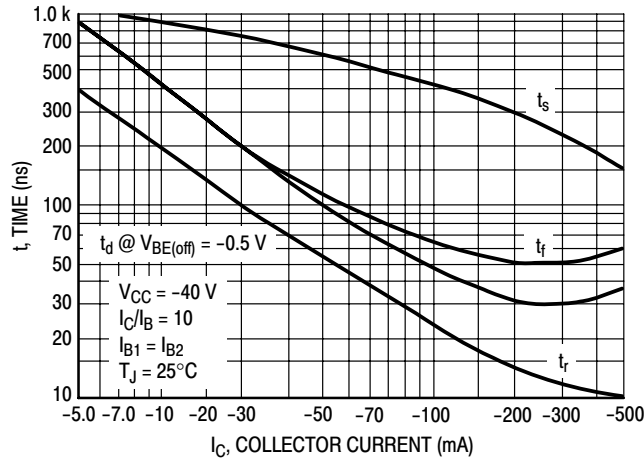


Figure 4. Switching Time

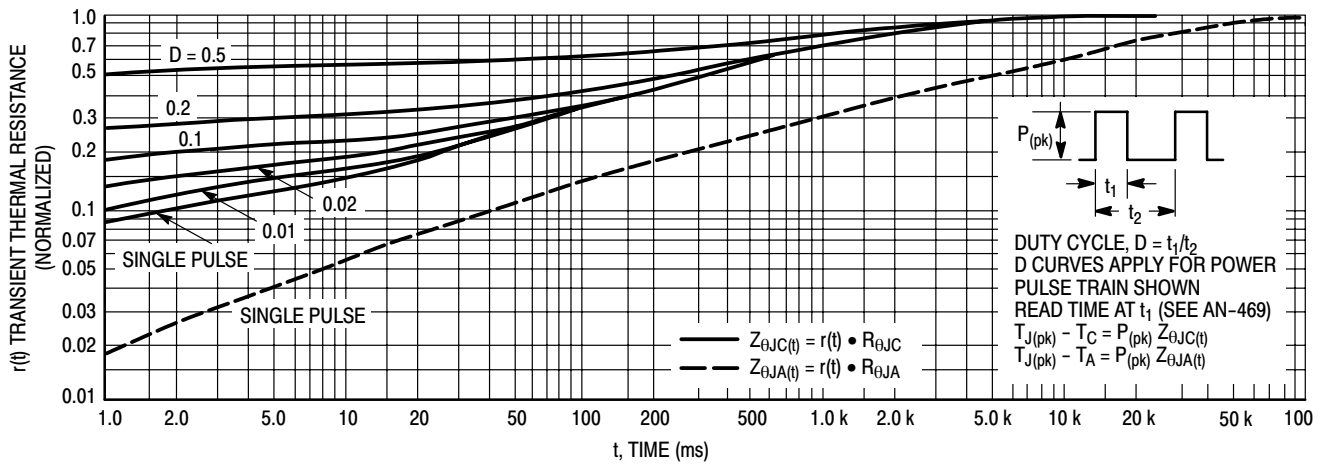


Figure 5. Thermal Response

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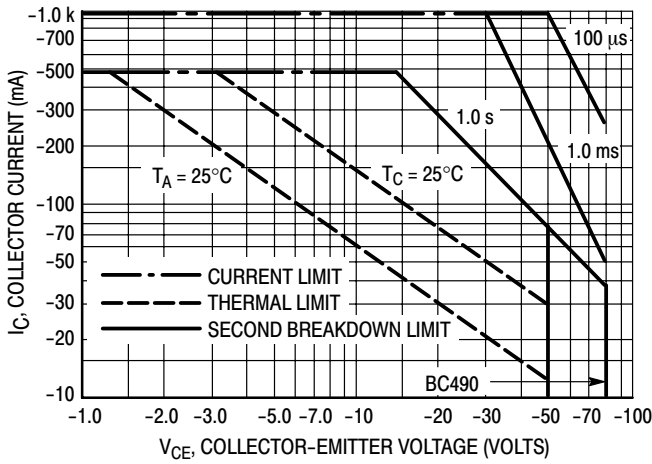


Figure 6. Active Region, Safe Operating Area

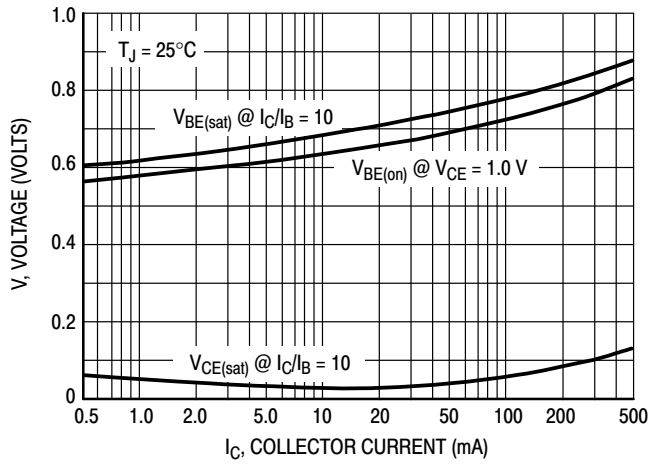


Figure 7. "On" Voltages

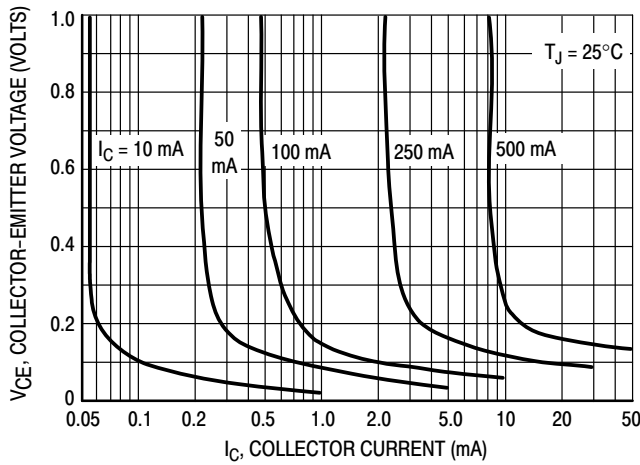


Figure 8. Collector Saturation Region

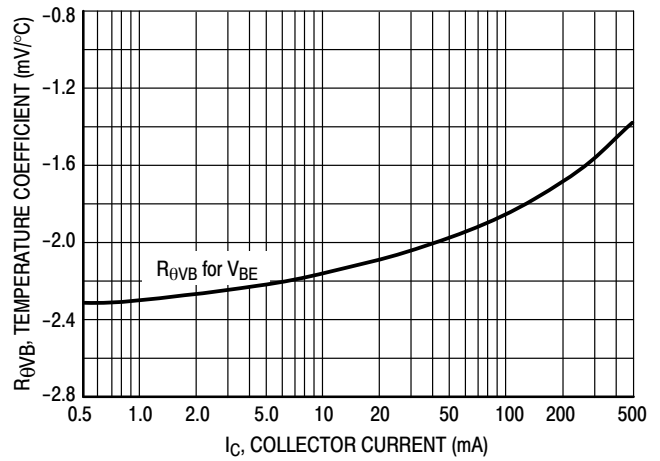


Figure 9. Base-Emitter Temperature Coefficient

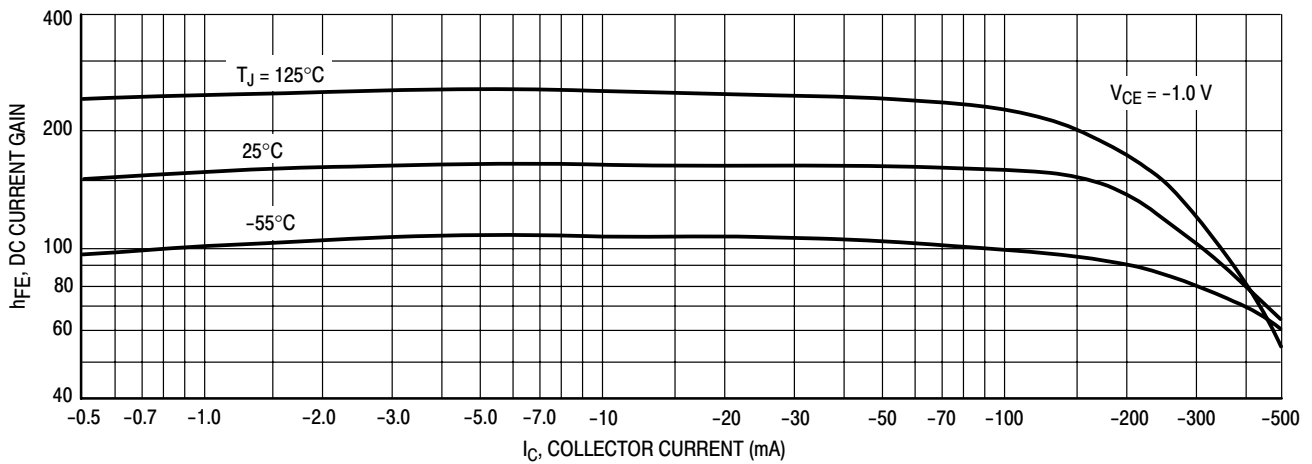


Figure 10. DC Current Gain

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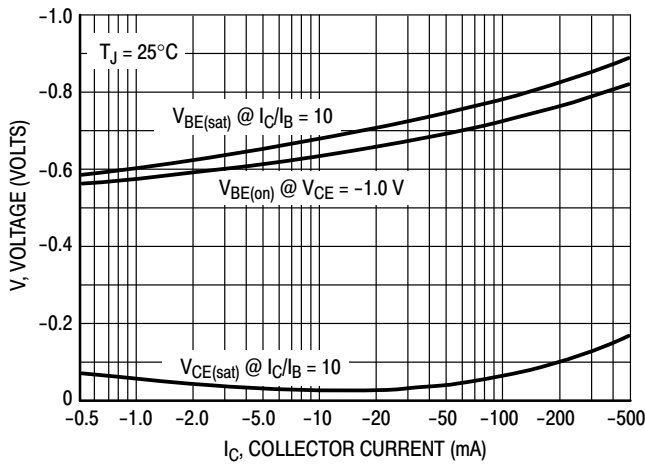


Figure 11. "On" Voltages

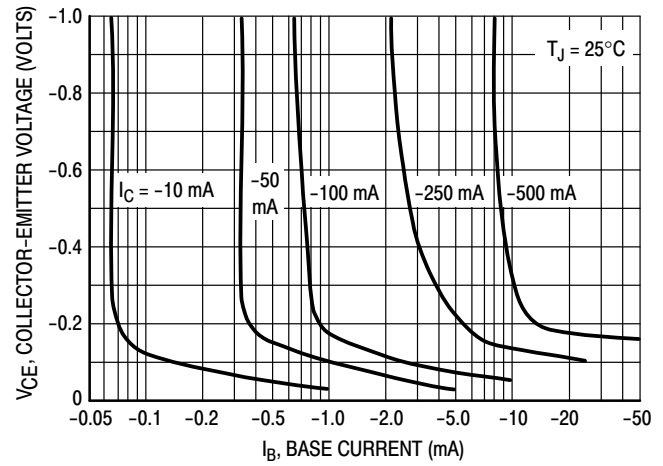


Figure 12. Collector Saturation Region

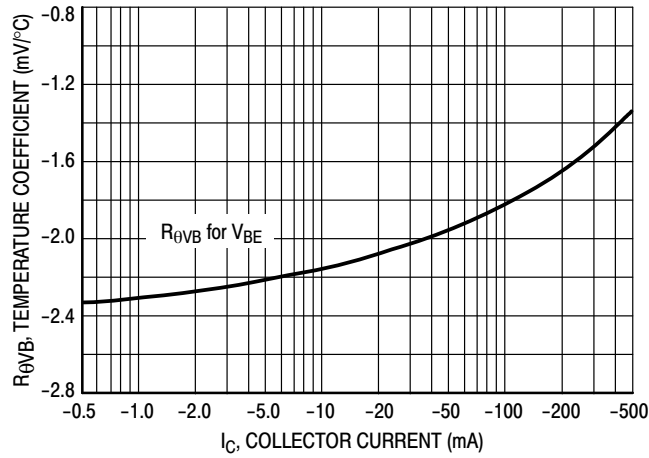
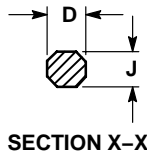
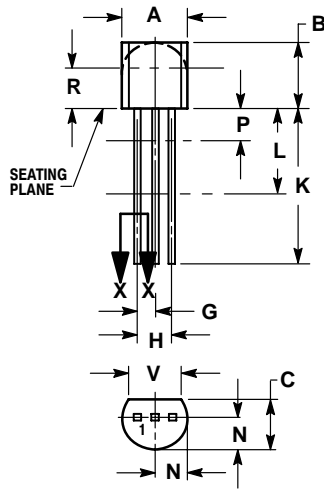


Figure 13. Base-Emitter Temperature Coefficient

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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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