

# ON Semiconductor

## Is Now

The logo for onsemi, featuring the word "onsemi" in a dark teal, lowercase, sans-serif font. The letter "i" is stylized with a white dot and a teal vertical bar. A small orange triangle is positioned above the top right of the "i". A trademark symbol (TM) is located to the right of the logo.

To learn more about onsemi™, please visit our website at  
[www.onsemi.com](http://www.onsemi.com)

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# BC490

## High Current Transistors

### PNP Silicon

#### Features

- This is a Pb-Free Device\*

#### 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	W mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-55 to +150	$^\circ\text{C}$

#### THERMAL CHARACTERISTICS

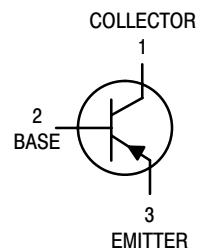
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	200	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	83.3	$^\circ\text{C}/\text{W}$

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

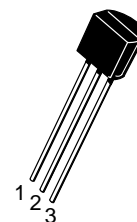


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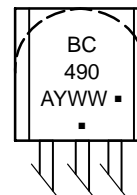


TO-92  
CASE 29  
STYLE 17



STRAIGHT LEAD  
BULK PACK

#### MARKING DIAGRAM



A = Assembly Location  
Y = Year  
WW = Work Week  
■ = Pb-Free Package  
(Note: Microdot may be in either location)

#### ORDERING INFORMATION

Device	Package	Shipping
BC490G	TO-92 (Pb-Free)	5000 Units / Bulk

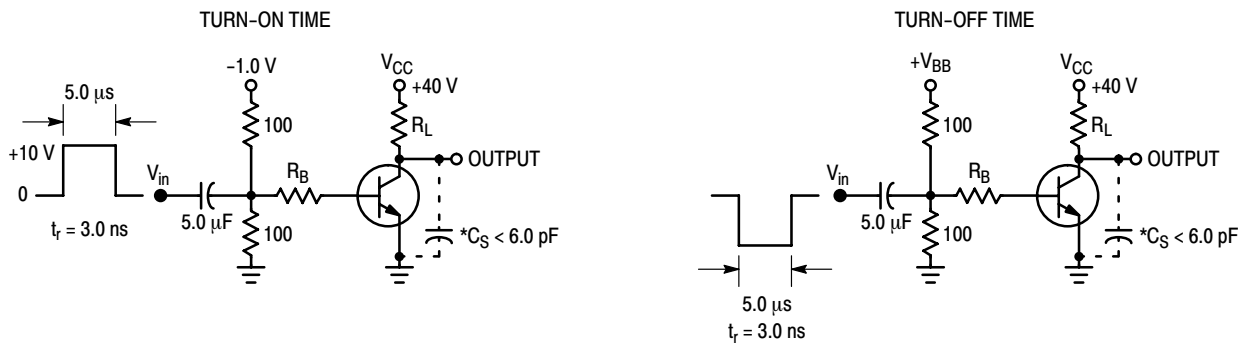
\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

# BC490

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

Characteristic	Symbol	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>					
Collector–Emitter Breakdown Voltage (Note 1) ( $I_C = -10\text{ mA}$ , $I_B = 0$ )	$V_{(BR)CEO}$	-80	-	-	Vdc
Collector–Base Breakdown Voltage ( $I_C = -100\text{ }\mu\text{A}$ , $I_E = 0$ )	$V_{(BR)CBO}$	-80	-	-	Vdc
Emitter–Base Breakdown Voltage ( $I_E = -10\text{ }\mu\text{A}$ , $I_C = 0$ )	$V_{(BR)EBO}$	-4.0	-	-	Vdc
Collector Cutoff Current ( $V_{CB} = -60\text{ Vdc}$ , $I_E = 0$ )	$I_{CBO}$	-	-	-100	nAdc
<b>ON CHARACTERISTICS</b>					
DC Current Gain ( $I_C = -10\text{ mA}$ , $V_{CE} = -2.0\text{ Vdc}$ ) ( $I_C = -100\text{ mA}$ , $V_{CE} = -2.0\text{ Vdc}$ ) ( $I_C = -1.0\text{ A}$ , $V_{CE} = -5.0\text{ Vdc}$ )	$h_{FE}$	40 60 15	- - -	- 400 -	-
Collector–Emitter Saturation Voltage ( $I_C = -500\text{ mA}$ , $I_B = -50\text{ mA}$ ) ( $I_C = -1.0\text{ A}$ , $I_B = -100\text{ mA}$ )	$V_{CE(sat)}$	- -	-0.25 -0.5	-0.5 -	Vdc
Base–Emitter Saturation Voltage ( $I_C = -500\text{ mA}$ , $I_B = -50\text{ mA}$ ) ( $I_C = -1.0\text{ A}$ , $I_B = -100\text{ mA}$ )	$V_{BE(sat)}$	- -	-0.9 -1.0	-1.2 -	Vdc
<b>DYNAMIC CHARACTERISTICS</b>					
Current–Gain – Bandwidth Product ( $I_C = -50\text{ mA}$ , $V_{CE} = -2.0\text{ Vdc}$ , $f = 100\text{ MHz}$ )	$f_T$	-	150	-	MHz
Output Capacitance ( $V_{CB} = -10\text{ Vdc}$ , $I_E = 0$ , $f = 1.0\text{ MHz}$ )	$C_{ob}$	-	9.0	-	pF
Input Capacitance ( $V_{EB} = -0.5\text{ Vdc}$ , $I_C = 0$ , $f = 1.0\text{ MHz}$ )	$C_{ib}$	-	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**

# BC490

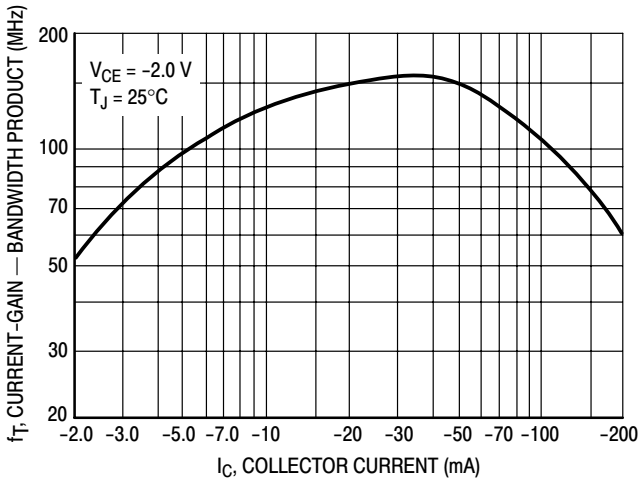


Figure 2. Current-Gain — Bandwidth Product

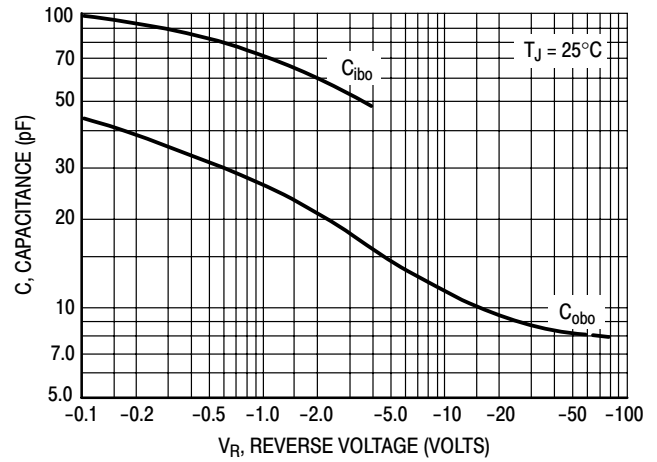


Figure 3. Capacitance

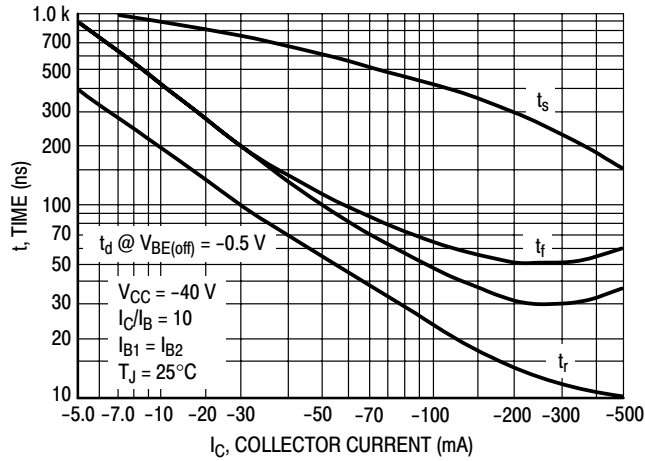


Figure 4. Switching Time

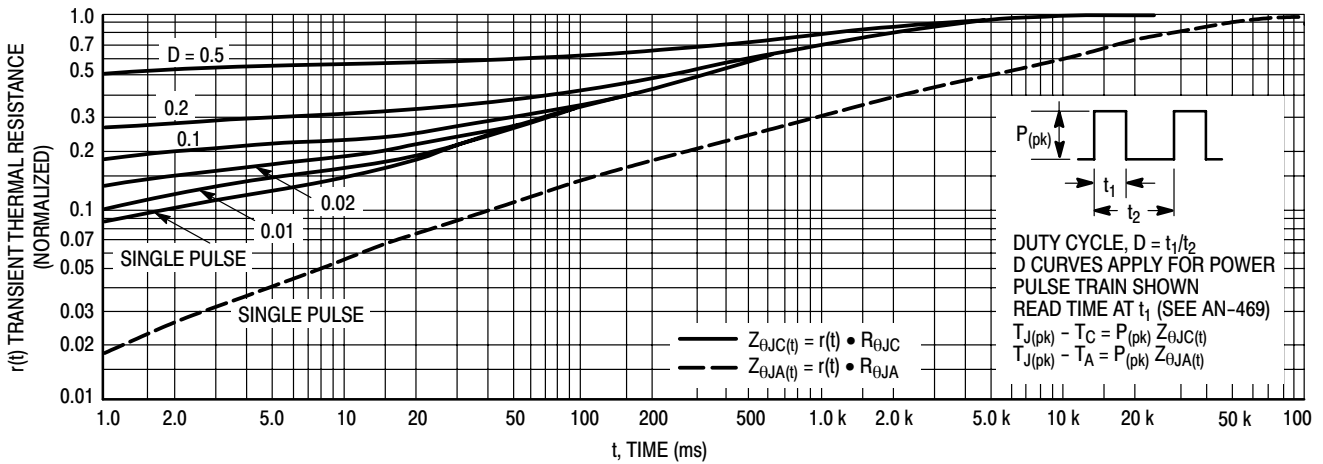


Figure 5. Thermal Response

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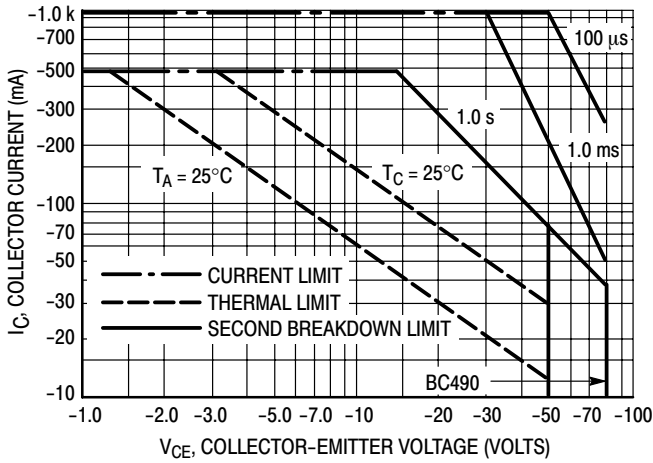


Figure 6. Active Region, Safe Operating Area

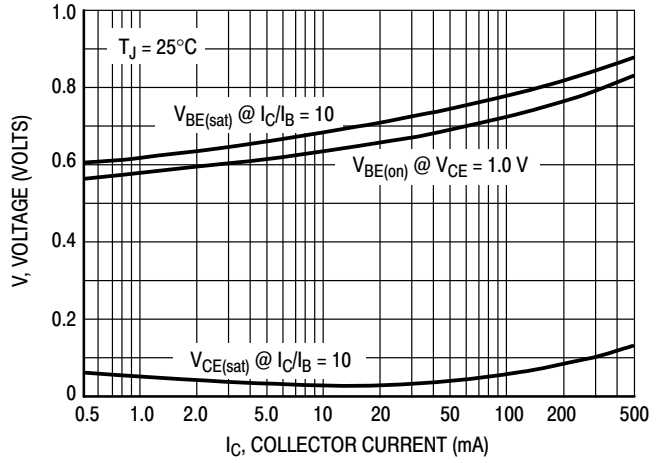


Figure 7. "On" Voltages

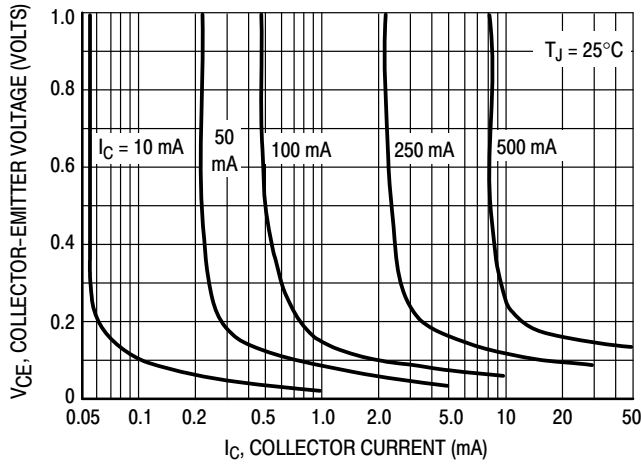


Figure 8. Collector Saturation Region

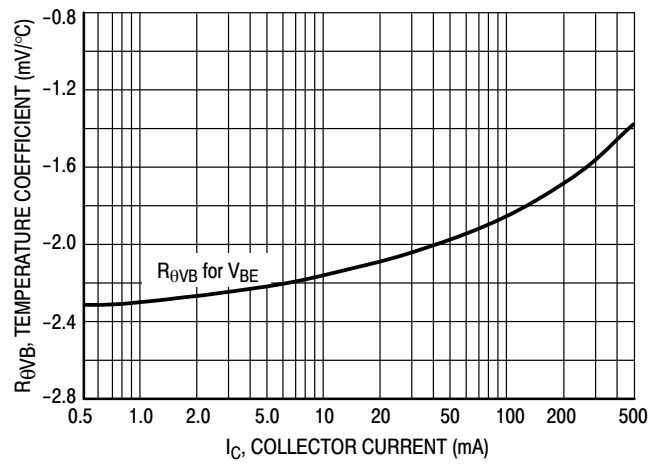


Figure 9. Base-Emitter Temperature Coefficient

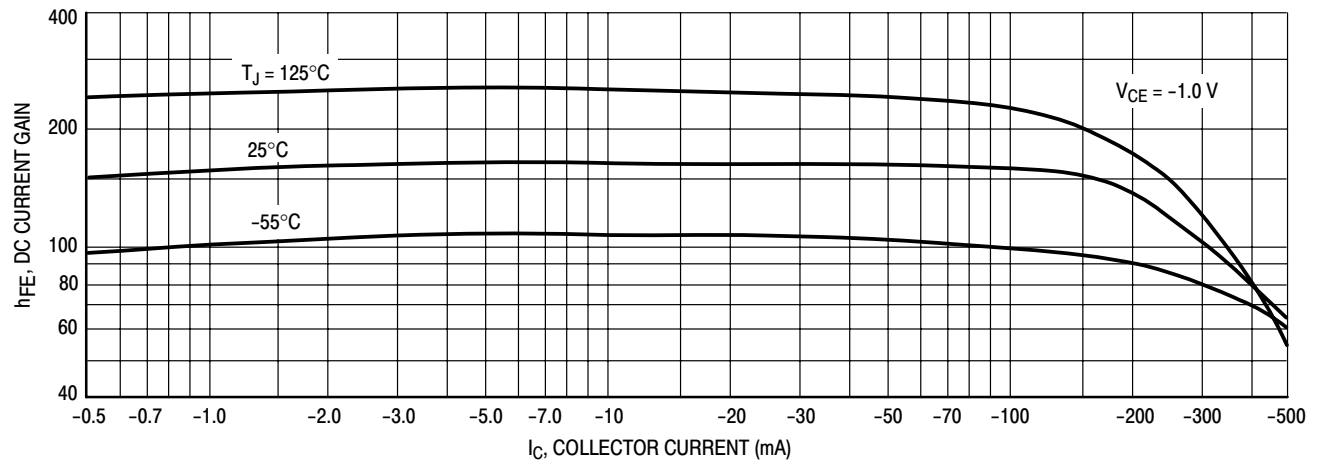


Figure 10. DC Current Gain

# BC490

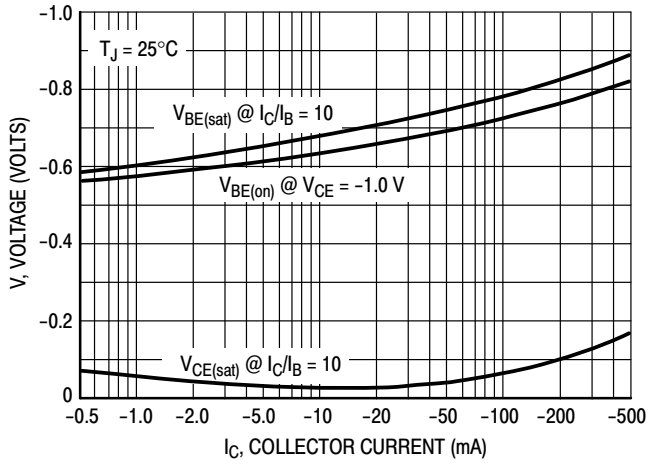


Figure 11. "On" Voltages

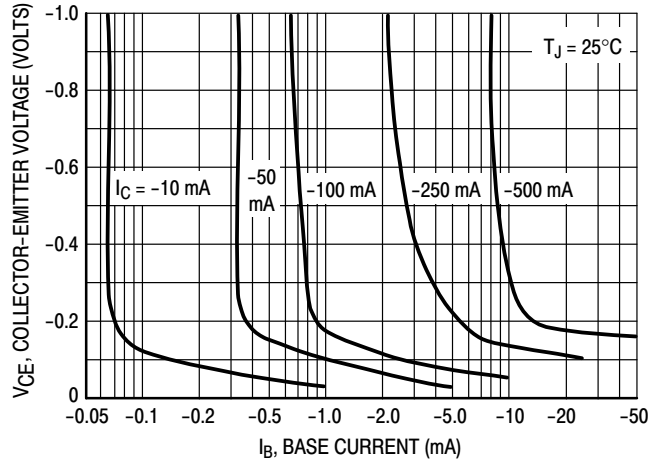


Figure 12. Collector Saturation Region

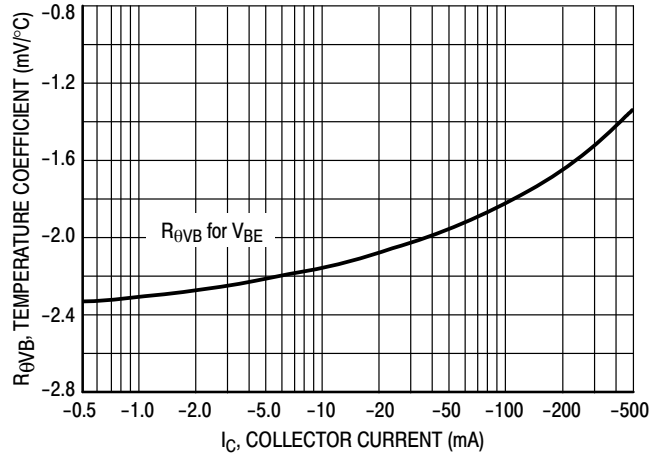
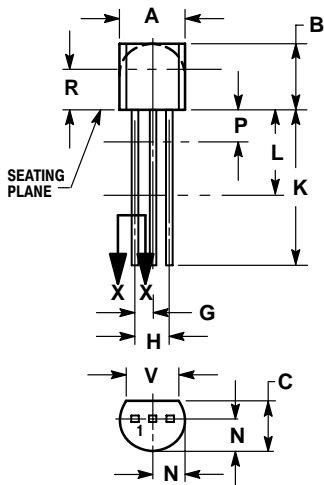


Figure 13. Base-Emitter Temperature Coefficient

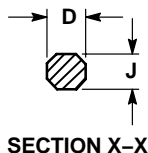
# BC490

## PACKAGE DIMENSIONS

TO-92 (TO-226)  
CASE 29-11  
ISSUE AM



STRAIGHT LEAD  
BULK PACK

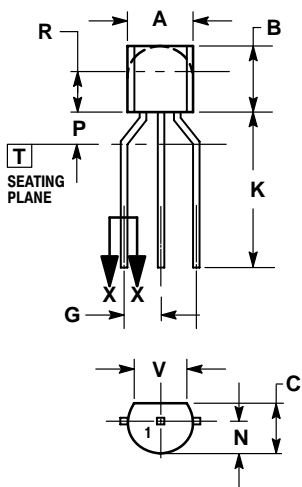


SECTION X-X

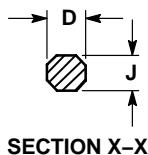
NOTES:

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	---



BENT LEAD  
TAPE & REEL  
AMMO PACK



SECTION X-X

NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

DIM	MILLIMETERS	
	MIN	MAX
A	4.45	5.20
B	4.32	5.33
C	3.18	4.19
D	0.40	0.54
G	2.40	2.80
J	0.39	0.50
K	12.70	---
N	2.04	2.66
P	1.50	4.00
R	2.93	---
V	3.43	---

STYLE 17:

1. COLLECTOR
2. BASE
3. EMITTER

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