

# NJT4030P, NJV4030P

## Bipolar Power Transistors

### PNP Silicon

#### Features

- Epoxy Meets UL 94, V-0 @ 0.125 in
- NJV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

#### MAXIMUM RATINGS (T<sub>C</sub> = 25°C unless otherwise noted)

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V <sub>CEO</sub>	40	Vdc
Collector-Base Voltage	V <sub>CB</sub>	40	Vdc
Emitter-Base Voltage	V <sub>EB</sub>	6.0	Vdc
Base Current – Continuous	I <sub>B</sub>	1.0	Adc
Collector Current – Continuous	I <sub>C</sub>	3.0	Adc
Collector Current – Peak	I <sub>CM</sub>	5.0	Adc
ESD – Human Body Model	HBM	3B	V
ESD – Machine Model	MM	C	V

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

#### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Power Dissipation Total P <sub>D</sub> @ T <sub>A</sub> = 25°C (Note 1) Total P <sub>D</sub> @ T <sub>A</sub> = 25°C (Note 2)	P <sub>D</sub>	2.0 0.80	W
Thermal Resistance, Junction-to-Case Junction-to-Ambient (Note 1) Junction-to-Ambient (Note 2)	R <sub>θJA</sub> R <sub>θJA</sub>	64 155	°C/W
Maximum Lead Temperature for Soldering Purposes, 1/8" from case for 5 seconds	T <sub>L</sub>	260	°C
Operating and Storage Junction Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55 to +150	°C

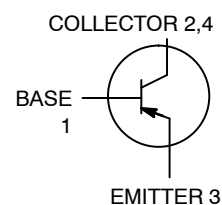
1. Mounted on 1" sq. (645 sq. mm) Collector pad on FR-4 bd material.
2. Mounted on 0.012" sq. (7.6 sq. mm) Collector pad on FR-4 bd material.



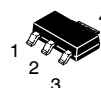
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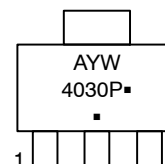
**PNP TRANSISTOR**  
**3.0 AMPERES**  
**40 VOLTS, 2.0 WATTS**



#### MARKING DIAGRAM



**SOT-223**  
**CASE 318E**  
**STYLE 1**



A = Assembly Location  
Y = Year  
W = Work Week  
4030P = Specific Device Code  
▪ = Pb-Free Package

(Note: Microdot may be in either location)

#### ORDERING INFORMATION

Device	Package	Shipping†
NJT4030PT1G	SOT-223 (Pb-Free)	1000 / Tape & Reel
NJV4030PT1G		
NJT4030PT3G	SOT-223 (Pb-Free)	4000 / Tape & Reel
NJV4030PT3G		

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

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

Characteristic	Symbol	Min	Typ	Max	Unit
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### OFF CHARACTERISTICS

Collector–Emitter Sustaining Voltage (I <sub>C</sub> = 10 mA <sub>dc</sub> , I <sub>B</sub> = 0 A <sub>dc</sub> )	V <sub>CEO(sus)</sub>	40	–	–	V <sub>dc</sub>
Emitter–Base Voltage (I <sub>E</sub> = 50 μA <sub>dc</sub> , I <sub>C</sub> = 0 A <sub>dc</sub> )	V <sub>EBO</sub>	6.0	–	–	V <sub>dc</sub>
Collector Cutoff Current (V <sub>CB</sub> = 40 V <sub>dc</sub> )	I <sub>CBO</sub>	–	–	100	nA <sub>dc</sub>
Emitter Cutoff Current (V <sub>BE</sub> = 6.0 V <sub>dc</sub> )	I <sub>EBO</sub>	–	–	100	nA <sub>dc</sub>

### ON CHARACTERISTICS (Note 3)

Collector–Emitter Saturation Voltage (I <sub>C</sub> = 0.5 A <sub>dc</sub> , I <sub>B</sub> = 5.0 mA <sub>dc</sub> ) (I <sub>C</sub> = 1.0 A <sub>dc</sub> , I <sub>B</sub> = 10 mA <sub>dc</sub> ) (I <sub>C</sub> = 3.0 A <sub>dc</sub> , I <sub>B</sub> = 0.3 A <sub>dc</sub> )	V <sub>CE(sat)</sub>	–	–	0.150 0.200 0.500	V <sub>dc</sub>
Base–Emitter Saturation Voltage (I <sub>C</sub> = 1.0 A <sub>dc</sub> , I <sub>B</sub> = 0.1 A <sub>dc</sub> )	V <sub>BE(sat)</sub>	–	–	1.0	V <sub>dc</sub>
Base–Emitter On Voltage (I <sub>C</sub> = 1.0 A <sub>dc</sub> , V <sub>CE</sub> = 2.0 V <sub>dc</sub> )	V <sub>BE(on)</sub>	–	–	1.0	V <sub>dc</sub>
DC Current Gain (I <sub>C</sub> = 0.5 A <sub>dc</sub> , V <sub>CE</sub> = 1.0 V <sub>dc</sub> ) (I <sub>C</sub> = 1.0 A <sub>dc</sub> , V <sub>CE</sub> = 1.0 V <sub>dc</sub> ) (I <sub>C</sub> = 3.0 A <sub>dc</sub> , V <sub>CE</sub> = 1.0 V <sub>dc</sub> )	h <sub>FE</sub>	220 200 100	– – –	– 400 –	–

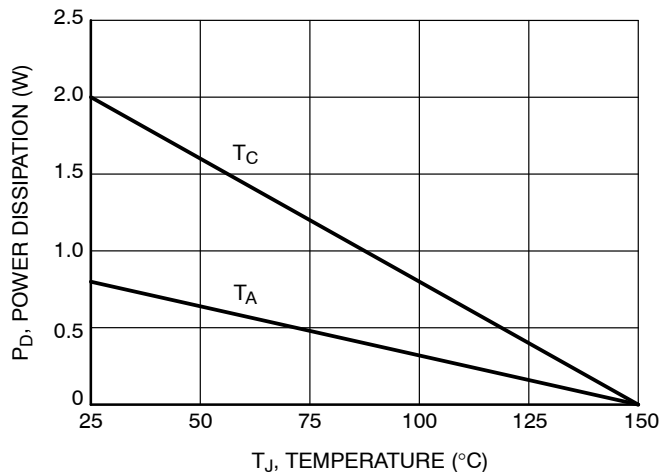
### DYNAMIC CHARACTERISTICS

Output Capacitance (V <sub>CB</sub> = 10 V <sub>dc</sub> , f = 1.0 MHz)	C <sub>ob</sub>	–	40	–	pF
Input Capacitance (V <sub>EB</sub> = 5.0 V <sub>dc</sub> , f = 1.0 MHz)	C <sub>ib</sub>	–	130	–	pF
Current–Gain – Bandwidth Product (Note 4) (I <sub>C</sub> = 500 mA, V <sub>CE</sub> = 10 V, F <sub>test</sub> = 1.0 MHz)	f <sub>T</sub>	–	160	–	MHz

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

3. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2%.

4. f<sub>T</sub> = |h<sub>FE</sub>| • f<sub>test</sub>



**Figure 1. Power Derating**

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## TYPICAL CHARACTERISTICS

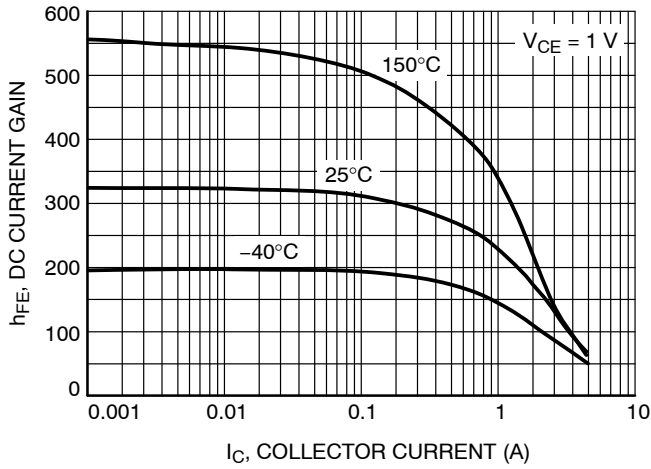


Figure 2. DC Current Gain

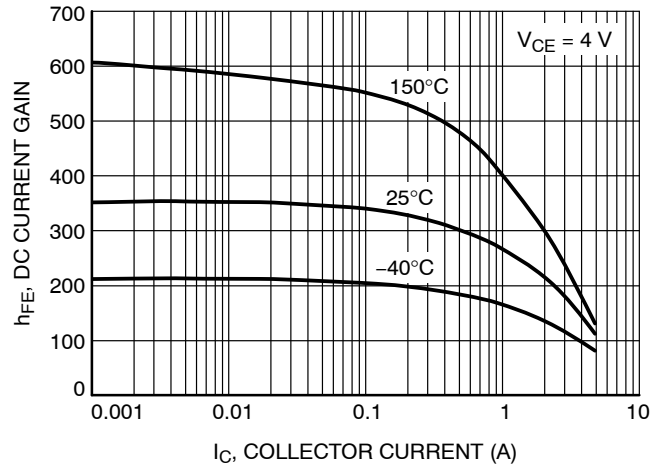


Figure 3. DC Current Gain

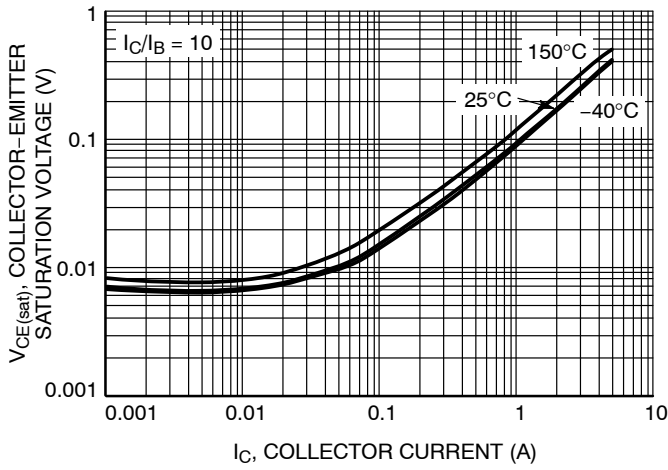


Figure 4. Collector-Emitter Saturation Voltage

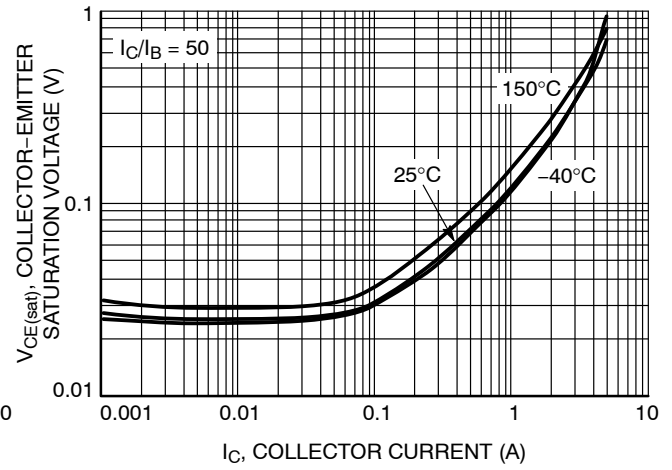


Figure 5. Collector-Emitter Saturation Voltage

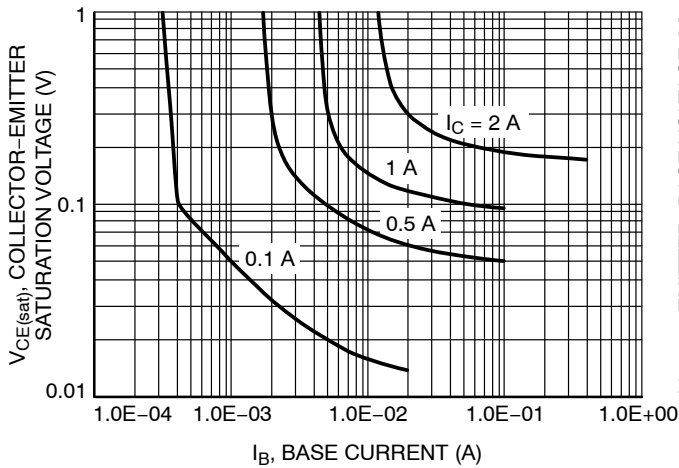


Figure 6. Collector Saturation Region

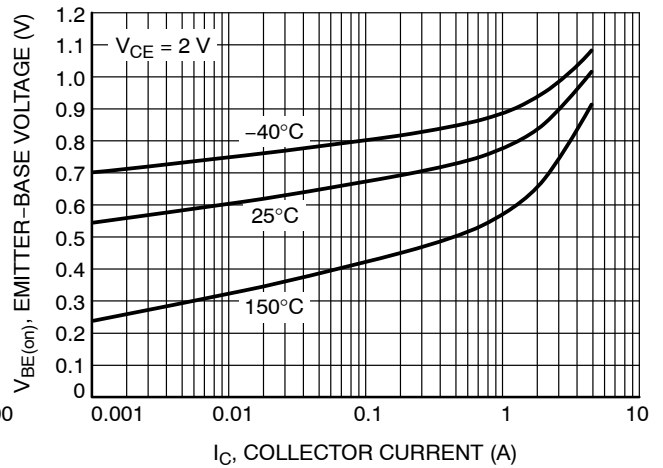


Figure 7.  $V_{BE(on)}$  Voltage

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## TYPICAL CHARACTERISTICS

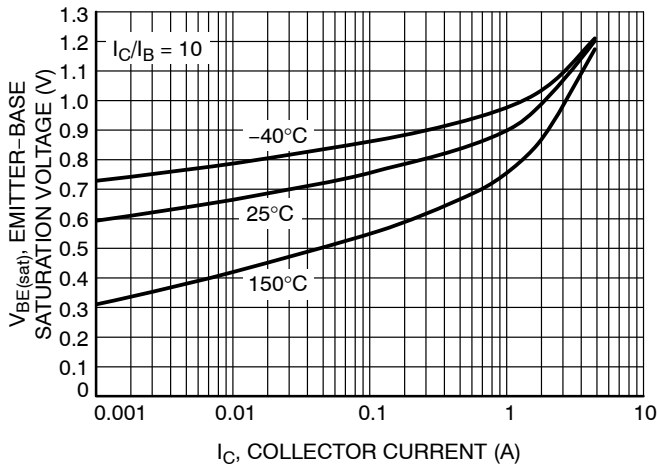


Figure 8. Base-Emitter Saturation Voltage

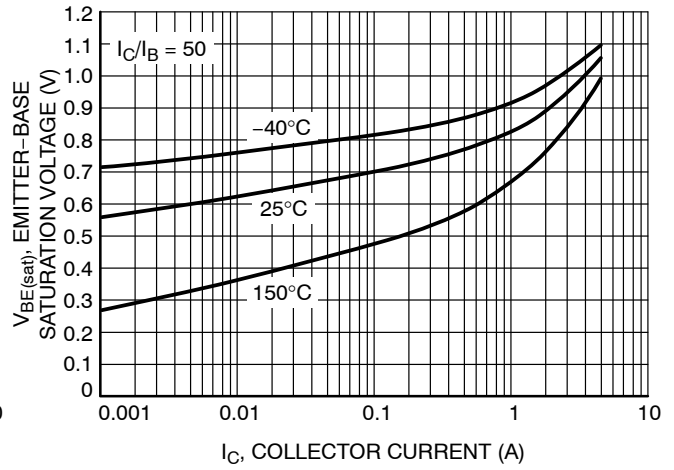


Figure 9. Base-Emitter Saturation Voltage

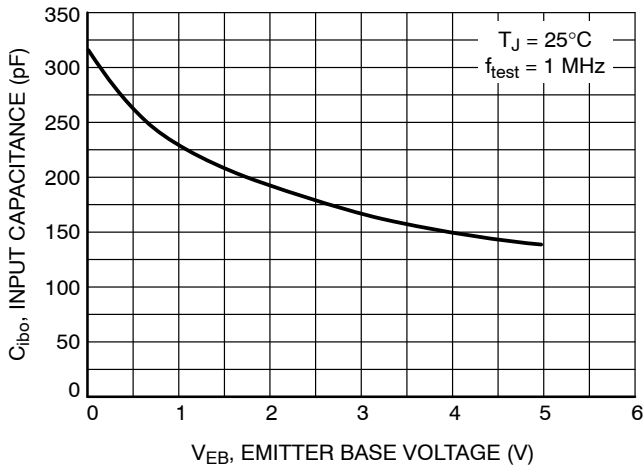


Figure 10. Input Capacitance

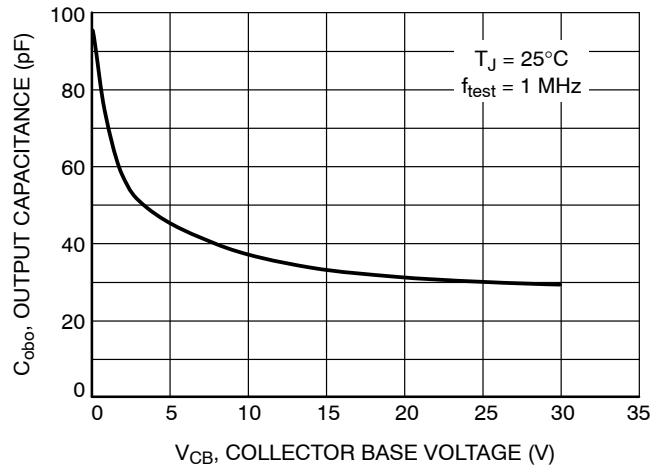


Figure 11. Output Capacitance

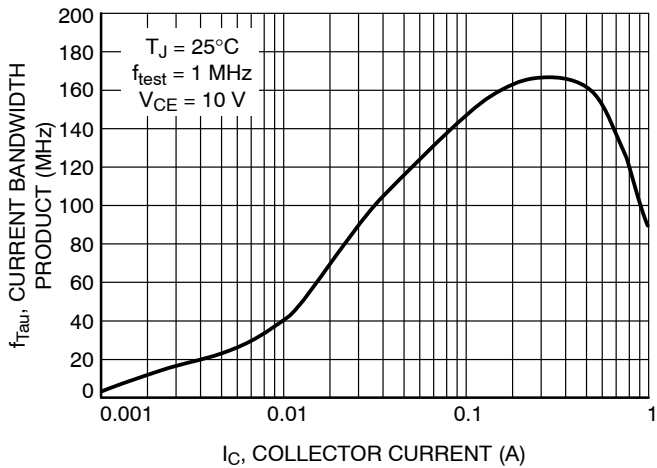


Figure 12. Current-Gain Bandwidth Product

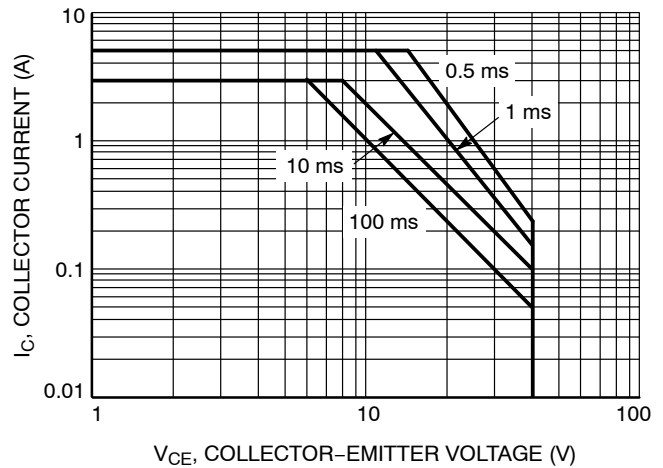
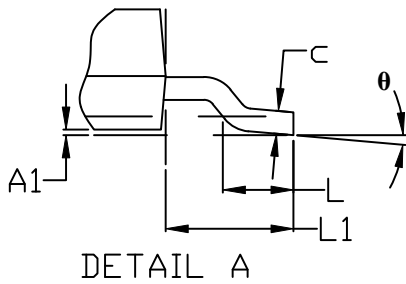
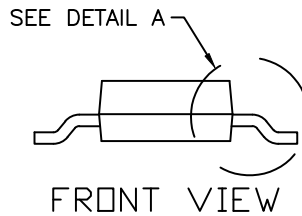
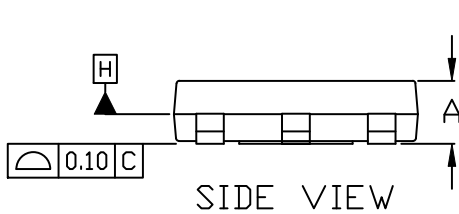
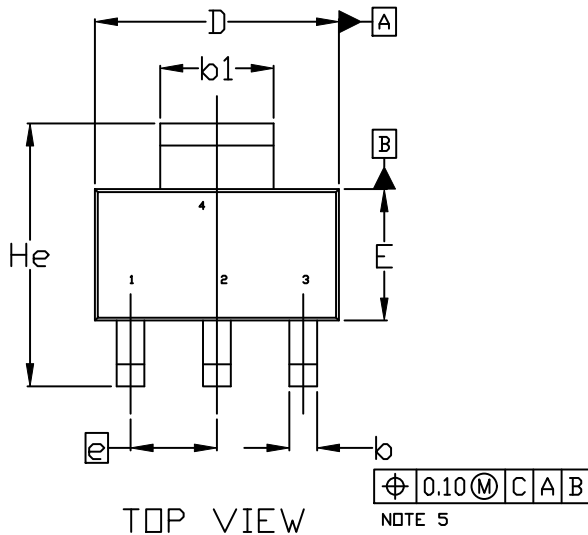


Figure 13. Safe Operating Area

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## PACKAGE DIMENSIONS

SOT-223 (TO-261)  
CASE 318E-04  
ISSUE R

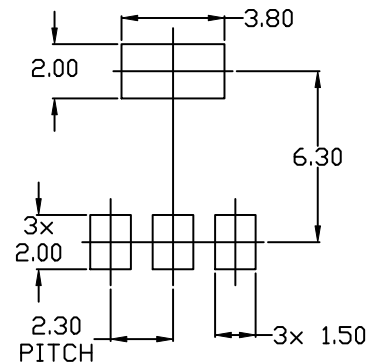


STYLE 1:  
PIN 1. BASE  
2. COLLECTOR  
3. EMITTER  
4. COLLECTOR


### NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS
3. DIMENSIONS D & E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS. MOLD FLASH, PROTRUSIONS OR GATE BURRS SHALL NOT EXCEED 0.200MM PER SIDE.
4. DATUMS A AND B ARE DETERMINED AT DATUM H.
5. A1 IS DEFINED AS THE VERTICAL DISTANCE FROM THE SEATING PLANE TO THE LOWEST POINT OF THE PACKAGE BODY.
6. POSITIONAL TOLERANCE APPLIES TO DIMENSIONS b AND b1.

DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	1.50	1.63	1.75
A1	0.02	0.06	0.10
b	0.60	0.75	0.89
b1	2.90	3.06	3.20
c	0.24	0.29	0.35
D	6.30	6.50	6.70
E	3.30	3.50	3.70
e	2.30 BSC		
L	0.20	---	---
L1	1.50	1.75	2.00
He	6.70	7.00	7.30
$\theta$	0°	---	10°



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