

**COMPLEMENTARY SILICON  
MEDIUM-POWER TRANSISTORS**

... designed for general-purpose power amplifier and application.

**Boca Semiconductor Corp. (BSC)**

**FEATURES:**

\* Low Collector-Emitter Saturation Voltage <http://www.bocasemi.com>

$V_{CE(SAT)} = 1.0 \text{ V (Max) @ } I_C = 4.0 \text{ A}$

\* Excellent DC Current Gain-  $hFE = 20 \text{ (Min) @ } I_C = 2.5 \text{ A}$

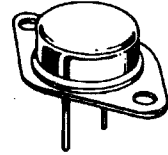
\* Low Leakage Current -  $I_{cex} = 250 \text{ uA (Max)}$

<b>NPN</b>	<b>PNP</b>
<b>2N6315</b>	<b>2N6317</b>
<b>2N6316</b>	<b>2N6318</b>

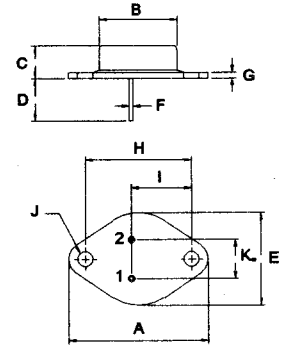
**7.0 AMPERE  
COMPLEMENTARY SILICON  
POWER TRANSISTORS  
60-80 VOLTS  
90 WATTS**

**MAXIMUM RATINGS**

Characteristic	Symbol	2N6315 2N6317	2N6316 2N6318	Unit
Collector-Emitter Voltage	$V_{CEO}$	60	80	V
Collector-Base Voltage	$V_{CBO}$	60	80	V
Emitter-Base Voltage	$V_{EBO}$	5.0		V
Collector Current-Continuous -Peak	$I_C$	7.0 15		A
Base Current	$I_B$	2.0		A
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	90 0.515		W W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{STG}$	- 65 to +200		$^\circ\text{C}$



**TO-66**

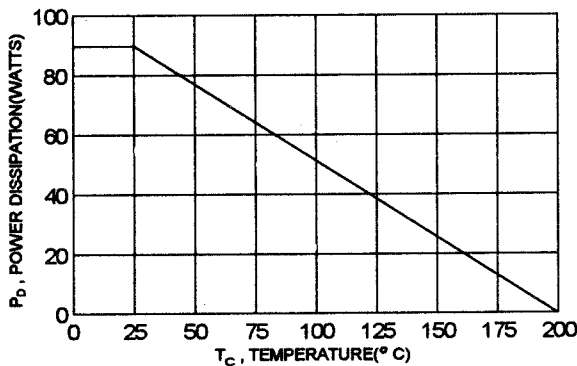


**PIN 1.BASE  
2.EMITTER  
COLLECTOR(CASE)**

**THERMAL CHARACTERISTICS**

Characteristic	Symbol	Max	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	1.94	$^\circ\text{C/W}$

**FIGURE -1 POWER DERATING**



DIM	MILLIMETERS	
	MIN	MAX
A	30.60	32.52
B	13.85	14.16
C	6.54	7.22
D	9.50	10.50
E	17.26	18.46
F	0.76	0.92
G	1.38	1.65
H	24.16	24.78
I	13.84	15.60
J	3.32	3.92
K	4.86	5.34

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

Characteristic	Symbol	Min	Max	Unit
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## OFF CHARACTERISTICS

Collector - Emitter Sustaining Voltage (1) ( $I_c = 100 \text{ mA}$ , $I_B = 0$ )	2N6315,2N6317 2N6316,2N6318	$V_{CE(SUS)}$	60 80	V
Collector Cutoff Current ( $V_{CE} = 30 \text{ V}$ , $I_B = 0$ ) ( $V_{CE} = 40 \text{ V}$ , $I_B = 0$ )	2N6315,2N6317 2N6316,2N6318	$I_{CEO}$	0.5 0.5	mA
Collector Cutoff Current ( $V_{CE} = 60 \text{ V}$ , $V_{BE(OFF)} = 1.5 \text{ V}$ ) ( $V_{CE} = 80 \text{ V}$ , $V_{BE(OFF)} = 1.5 \text{ V}$ ) ( $V_{CE} = 60 \text{ V}$ , $V_{BE(OFF)} = 1.5 \text{ V}$ , $T_c = 150^\circ\text{C}$ ) ( $V_{CE} = 80 \text{ V}$ , $V_{BE(OFF)} = 1.5 \text{ V}$ , $T_c = 150^\circ\text{C}$ )	2N6315,2N6317 2N6316,2N6318 2N6315,2N6317 2N6316,2N6318	$I_{CEX}$	0.25 0.25 2.0 2.0	mA
Collector Cutoff Current ( $V_{CB} = 60 \text{ V}$ , $I_E = 0$ ) ( $V_{CB} = 80 \text{ V}$ , $I_E = 0$ )	2N6315,2N6317 2N6316,2N6318	$I_{CBO}$	0.25 0.25	mA
Emitter Cutoff Current ( $V_{EB} = 5.0 \text{ V}$ , $I_C = 0$ )		$I_{EBO}$	1.0	mA

## ON CHARACTERISTICS (1)

DC Current Gain ( $I_c = 0.5 \text{ A}$ , $V_{CE} = 4.0 \text{ V}$ ) ( $I_c = 2.5 \text{ A}$ , $V_{CE} = 4.0 \text{ V}$ ) ( $I_c = 7.0 \text{ A}$ , $V_{CE} = 4.0 \text{ V}$ )		hFE	35 20 4.0	100	
Collector - Emitter Saturation Voltage ( $I_c = 4.0 \text{ A}$ , $I_B = 0.4 \text{ A}$ ) ( $I_c = 7.0 \text{ A}$ , $I_B = 1.75 \text{ A}$ )		$V_{CE(sat)}$		1.0 2.0	V
Base - Emitter Saturation Voltage ( $I_c = 7.0 \text{ A}$ , $I_B = 1.75 \text{ A}$ )		$V_{BE(sat)}$		2.5	V
Base - Emitter On Voltage ( $I_c = 2.5 \text{ A}$ , $V_{CE} = 4.0 \text{ V}$ )		$V_{BE(on)}$		1.5	V

## DYNAMIC CHARACTERISTICS

Current Gain - Bandwidth Product (2) ( $I_c = 0.25 \text{ A}$ , $V_{CE} = 10 \text{ V}$ , $f = 1.0 \text{ MHz}$ )		$f_T$	4.0		MHz
Small-Signal Current Gain ( $I_c = 0.5 \text{ A}$ , $V_{CE} = 4.0 \text{ V}$ , $f = 1.0 \text{ KHz}$ )		$h_{fe}$	20		

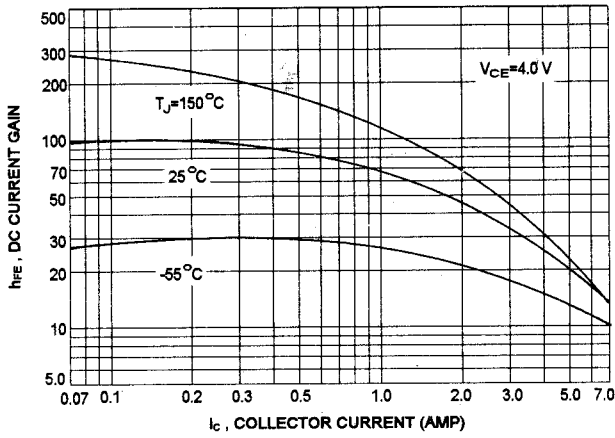
(1) Pulse Test: Pulse width =  $300 \mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ (2)  $f_T = |h_{fe}| \cdot f_{test}$ 

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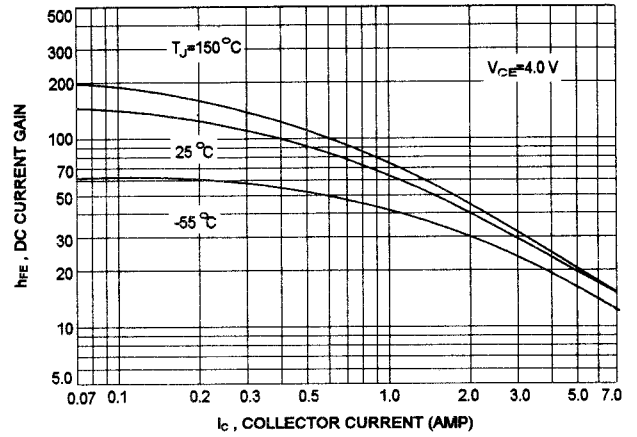
BSC

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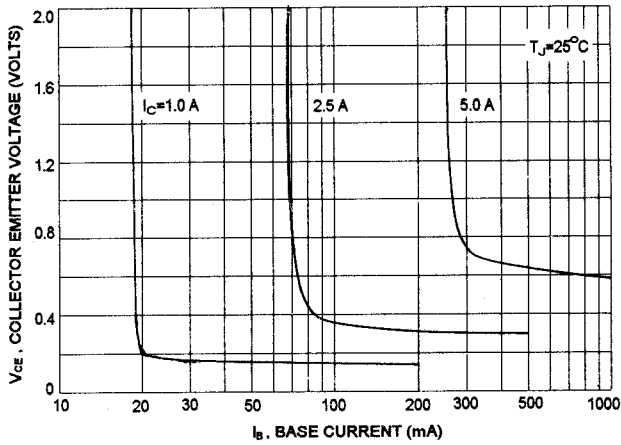
NPN 2N6315, 2N6316  
DC CURRENT GAIN



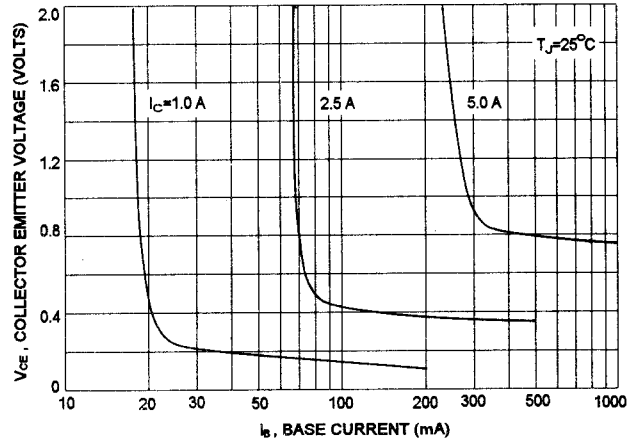
PNP 2N6317, 2N6318  
DC CURRENT GAIN



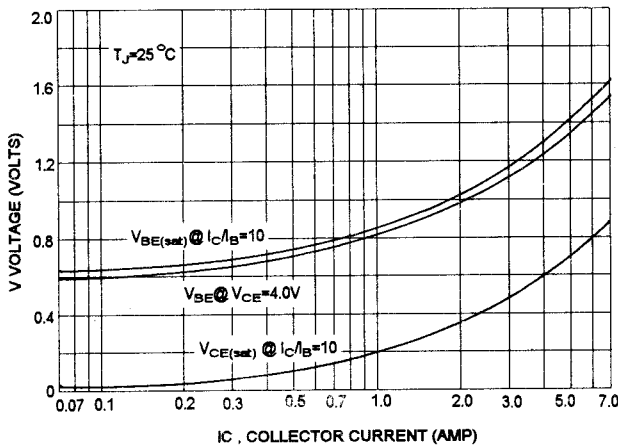
COLLECTOR SATURATION REGION



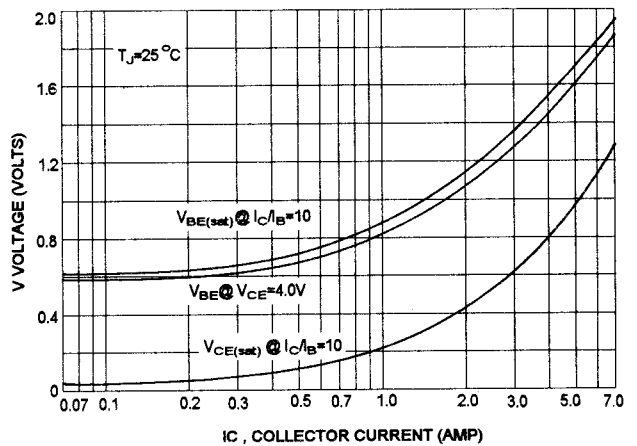
COLLECTOR SATURATION REGION



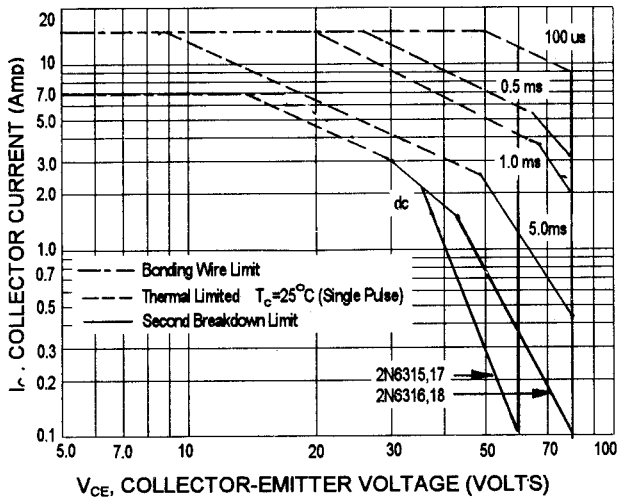
"ON" VOLTAGES



"ON" VOLTAGES



ACTIVE-REGION SAFE OPERATING AREA (SOA)



There are two limitation on the power handling ability of a transistor: average junction temperature and second breakdown safe operating area curves indicate  $I_c$ - $V_{CE}$  limits of the transistor that must be observed for reliable operation i.e., the transistor must not be subjected to greater dissipation than curves indicate.

The data of SOA curve is base on  $T_{J(PK)}=200^\circ\text{C}$ ;  $T_c$  is variable depending on conditions. second breakdown pulse limits are valid for duty cycles to 10% provided  $T_{J(PK)}\leq 200^\circ\text{C}$ . At high case temperatures, thermal limitation will reduce the power that can be handled to values less than the limitations imposed by second breakdown.