

# 2N3055, MJ2955

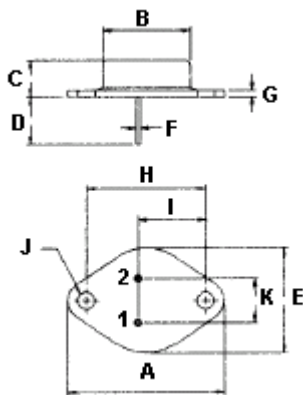
## Complementary Power Transistors



Designed for use in general-purpose amplifier and switching applications.

### Features:

- Power dissipation -  $P_D = 115W$  at  $T_C = 25^\circ C$ .
- DC current gain  $h_{FE} = 20$  to  $70$  at  $I_C = 4.0A$ .
- $V_{CE(sat)} = 1.1V$  (Maximum) at  $I_C = 4.0A$ ,  $I_B = 400mA$ .



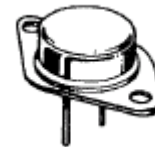
Pin 1. Base  
2. Emitter  
Collector(Case)

Dimensions	Minimum	Maximum
A	38.75	39.96
B	19.28	22.23
C	7.96	9.28
D	11.18	12.19
E	25.20	26.67
F	0.92	1.09
G	1.38	1.62
H	29.90	30.40
I	16.64	17.30
J	3.88	4.36
K	10.67	11.18

Dimensions : Millimetres

NPN 2N3055	PNP MJ2955
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15 Ampere  
Complementary Silicon  
Power Transistors  
60 Volts  
115 Watts



TO-3

### Maximum Ratings

Characteristic	Symbol	Rating	Unit
Collector-Emitter Voltage	$V_{CEO}$	60	V
Collector-Emitter Voltage	$V_{CER}$	70	
Collector-Base Voltage	$V_{CBO}$	100	
Emitter-Base Voltage	$V_{EBO}$	7.0	
Collector Current-Continuous	$I_C$	15	A
Base Current	$I_B$	7.0	
Total Power Dissipation at $T_C = 25^\circ C$ Derate above $25^\circ C$	$P_D$	115 0.657	W W/ $^\circ C$
Operating and Storage Junction Temperature Range	$T_J, T_{STG}$	-65 to +200	$^\circ C$



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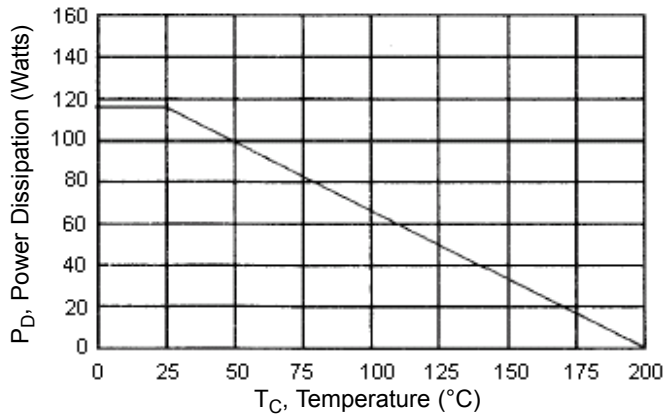
## Complementary Power Transistors



### Thermal Characteristics

Characteristic	Symbol	Maximum	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	1.52	$^{\circ}\text{C/W}$

Figure - 1 Power Derating



### Electrical Characteristics ( $T_C = 25^{\circ}\text{C}$ unless otherwise noted)

Characteristic	Symbol	Minimum	Maximum	Unit
<b>OFF Characteristics</b>				
Collector-Emitter Sustaining Voltage (1) ( $I_C = 200\text{mA}$ , $I_B = 0$ )	$V_{CEO(sus)}$	60	-	V
Collector-Emitter Sustaining Voltage (1) ( $I_C = 200\text{mA}$ , $R_{BE} = 100\Omega$ )	$V_{CER(sus)}$	70	-	
Collector Cut off Current ( $V_{CE} = 30\text{V}$ , $I_B = 0$ )	$I_{CEO}$	-	0.7	mA
Collector Cut off Current ( $V_{CE} = 100\text{V}$ , $V_{BE(off)} = 1.5\text{V}$ ) ( $V_{CE} = 100\text{V}$ , $V_{BE(off)} = 1.5\text{V}$ , $T_C = 150^{\circ}\text{C}$ )	$I_{CEX}$	-	1.0 5.0	
Emitter Cut off Current ( $V_{EB} = 7.0\text{V}$ , $I_C = 0$ )	$I_{EBO}$	-	5.0	
<b>ON Characteristics (1)</b>				
DC Current Gain ( $I_C = 4.0\text{A}$ , $V_{CE} = 4.0\text{V}$ ) ( $I_C = 10\text{A}$ , $V_{CE} = 4.0\text{A}$ )	$h_{FE}$	20 5.0	70	-
Collector-Emitter Saturation Voltage ( $I_C = 4.0\text{A}$ , $I_B = 0.4\text{A}$ ) ( $I_C = 10\text{A}$ , $I_B = 3.3\text{A}$ )	$V_{CE(sat)}$	-	1.1 3.0	V
Base-Emitter On Voltage ( $I_C = 4.0\text{A}$ , $V_{CE} = 4.0\text{V}$ )	$V_{BE(on)}$	-	1.5	
<b>Dynamic Characteristics</b>				
Current Gain-Bandwidth Product (2) ( $I_C = 500\text{mA}$ , $V_{CE} = 10\text{V}$ , $f = 1.0\text{MHz}$ )	$f_T$	2.5	-	MHz
Small-Signal Current Gain ( $I_C = 1.0\text{A}$ , $V_{CE} = 4.0\text{V}$ , $f = 1\text{KHz}$ )	$h_{fe}$	15	120	-

(1) Pulse Test: Pulse Width = 300 $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

(2)  $f_T = |h_{fe}| \cdot f_{test}$ .

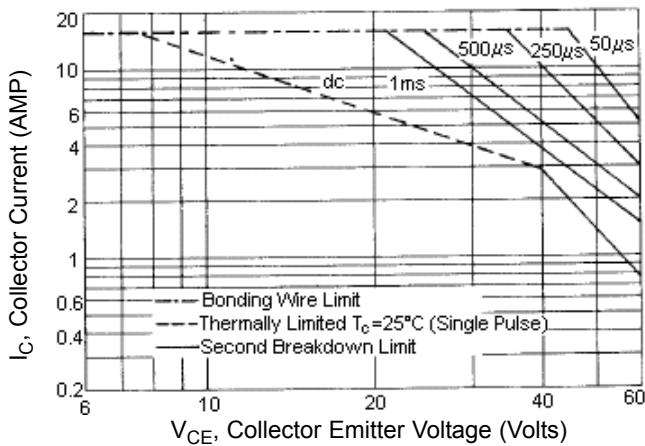


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## Complementary Power Transistors



Active-Region Safe Operating Area (SOA)

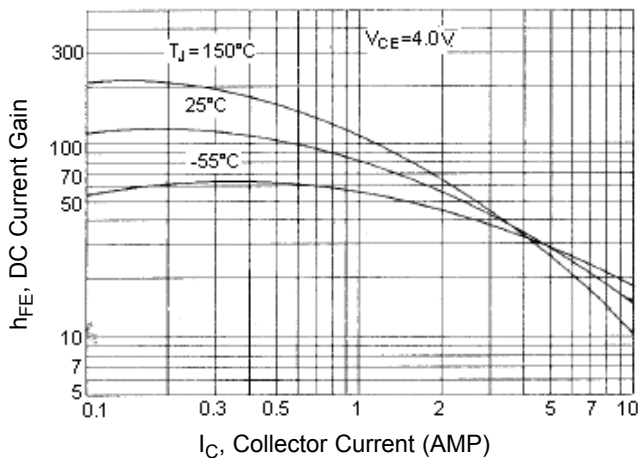


There are two limitations on the power handling ability of a transistor: average junction temperature and second breakdown safe operating area curves indicate  $I_C$ - $V_{CE}$  limits of the transistor that must be observed for reliable operation i.e., the transistor must not be subjected to greater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

The data of SOA curve is based 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.

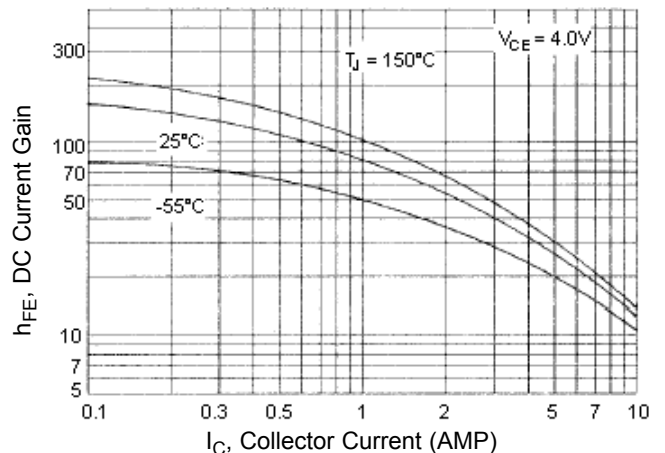
### NPN 2N3055

DC Current Gain

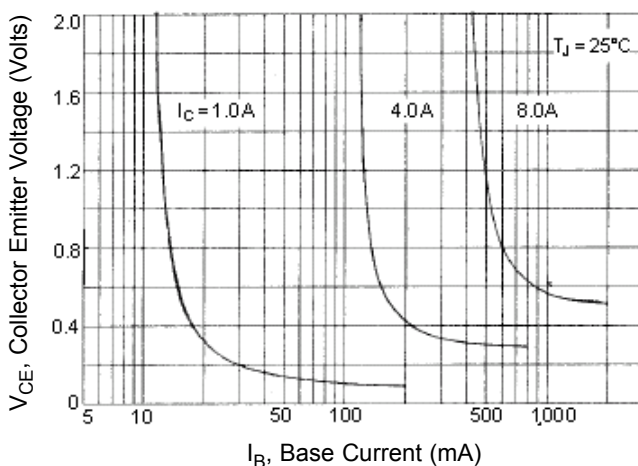


### PNP MJ2955

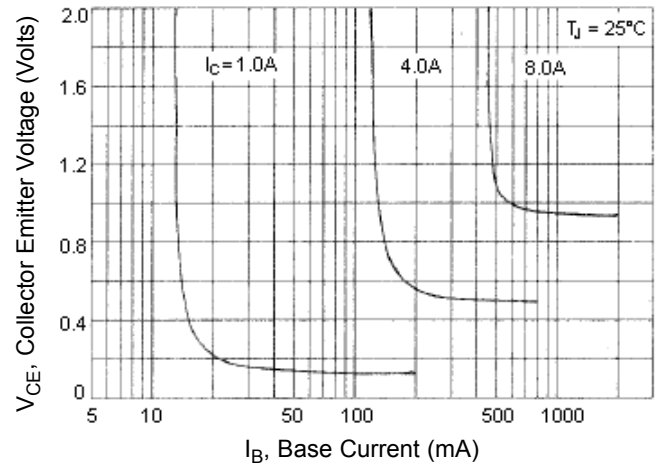
DC Current Gain



Collector Saturation Region



Collector Saturation Region



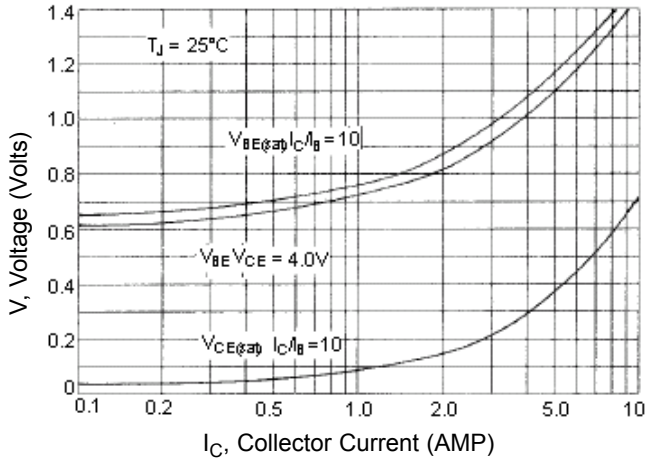
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## Complementary Power Transistors



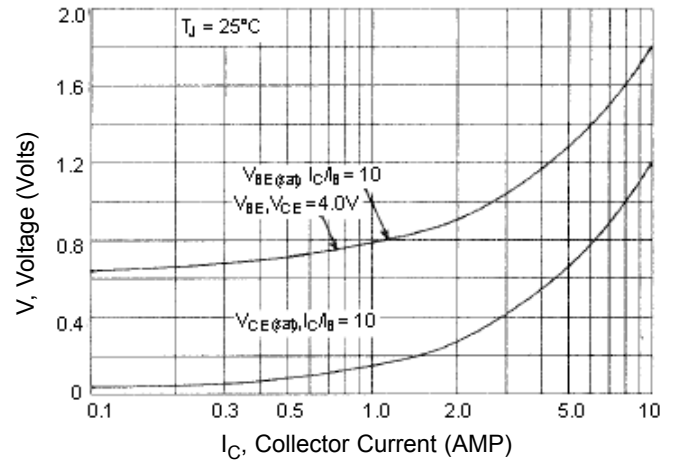
### NPN 2N3055

“ON” Voltages



### PNP MJ2955

“ON” Voltages



### Specifications

$I_{C(av)}$ maximum (A)	$V_{CE0}$ maximum (V)	$h_{FE}$ minimum	$P_{tot}$ at 25°C (W)	Package	Type	Part Number
15	60	20 at $I_C = 4A$	115	TO-3	NPN	2N3055
		5 at $I_C = 10A$			PNP	MJ2955



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## Complementary Power Transistors



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