

# TIP3055, TIP2955



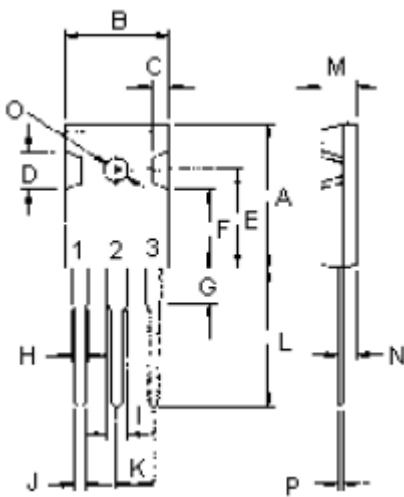
## Complementary Power Transistors



Complementary Silicon Power Transistors are designed for use in general purpose power amplifier and switching applications

### Features

- Power dissipation- $P_D = 90 \text{ W}$  at  $T_C = 25^\circ\text{C}$
- DC current gain  $h_{FE} = 20$  to  $100$  at  $I_C = 4 \text{ A}$
- $V_{CE(sat)} = 1.1 \text{ V}$  (maximum) at  $I_C = 4 \text{ A}$ ,  $I_B = 400 \text{ mA}$



Pin 1. Base  
2. Collector  
3. Emitter

Dimensions	Minimum	Maximum
A	20.63	22.38
B	15.38	16.2
C	1.9	2.7
D	5.1	6.1
E	14.81	15.22
F	11.72	12.84
G	4.2	4.5
H	1.82	2.46
I	2.92	3.23
J	0.89	1.53
K	5.26	5.66
L	18.5	21.5
M	4.68	5.36
N	2.4	2.8
O	3.25	3.65
P	0.55	0.7

**NPN**    **PNP**  
**TIP3055**   **TIP2955**  
15 Amperes  
Complementary Silicon  
Power Transistors  
60 Volts  
90 Watts

Dimensions : Millimetres

### 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	A
Collector Current-Continuous	$I_C$	15	
Base Current	$I_B$	7	W W/°C
Total Power Dissipation at $T_C = 25^\circ\text{C}$ Derate Above $25^\circ\text{C}$	$P_D$	90 0.72	
Operating and Storage Junction Temperature Range	$T_J, T_{STG}$	-65 to +150	°C

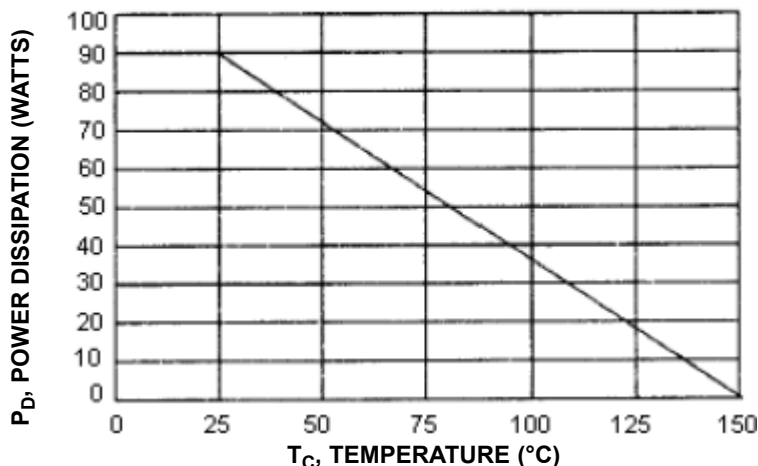
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### Thermal Characteristics

Characteristic	Symbol	Maximum	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	1.39	$^{\circ}\text{C}/\text{W}$

Figure1 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) ( $I_C = 30\text{ mA}$ , $I_B = 0$ )	$V_{CEO(sus)}$	60	-	V
Collector Cut off Current ( $V_{CE} = 70\text{ V}$ , $R_{BE} = 100\ \Omega$ )	$I_{CER}$	-	1	mA
Collector Cut off Current ( $V_{CE} = 30\text{ V}$ , $I_B = 0$ )	$I_{CEO}$	-	0.7	
Collector Cut off Current ( $V_{CE} = 100\text{ V}$ , $V_{BE(off)} = 1.5\text{ V}$ )	$I_{CEV}$	-	5	
Emitter Cut off Current ( $V_{EB} = 7\text{ V}$ , $I_C = 0$ )	$I_{EBO}$	-	-	
<b>ON Characteristics (1)</b>				
DC Current Gain ( $I_C = 4\text{ A}$ , $V_{CE} = 4\text{ V}$ ) ( $I_C = 10\text{ A}$ , $V_{CE} = 4\text{ V}$ )	$h_{FE}$	20 5	100	-
Collector-Emitter Saturation Voltage ( $I_C = 4\text{ A}$ , $I_B = 0.4\text{ A}$ ) ( $I_C = 10\text{ A}$ , $I_B = 3.3\text{ A}$ )	$V_{CE(sat)}$	-	1.1 3	V
Base-Emitter on Voltage ( $I_C = 4\text{ A}$ , $V_{CE} = 4\text{ V}$ )	$V_{BE(on)}$	-	1.8	

# TIP3055, TIP2955



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

Characteristic	Symbol	Minimum	Maximum	Unit
<b>Dynamic Characteristics</b>				
Current Gain Bandwidth Product ( $I_C = 500\text{ mA}$ , $V_{CE} = 10\text{ V}$ , $f = 1\text{ MHz}$ )	$f_T$	2.5	-	MHz
Small-Signal Current Gain ( $I_C = 1\text{ A}$ , $V_{CE} = 4\text{ V}$ , $f = 1\text{ kHz}$ )	$h_{fe}$	15	-	-

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

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

Figure - 2 DC Current Gain

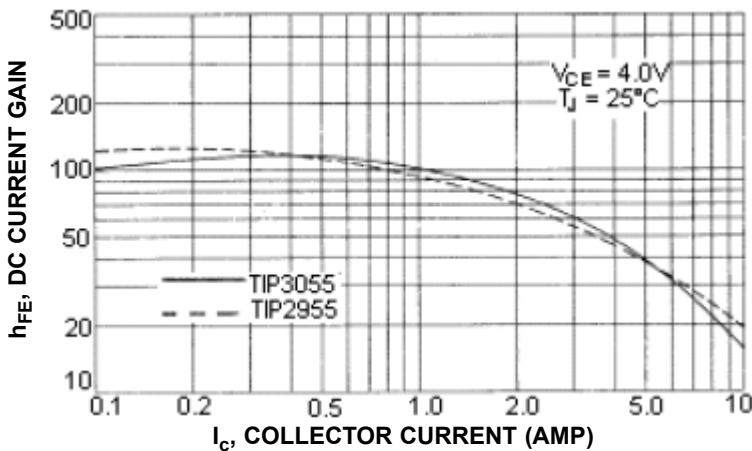
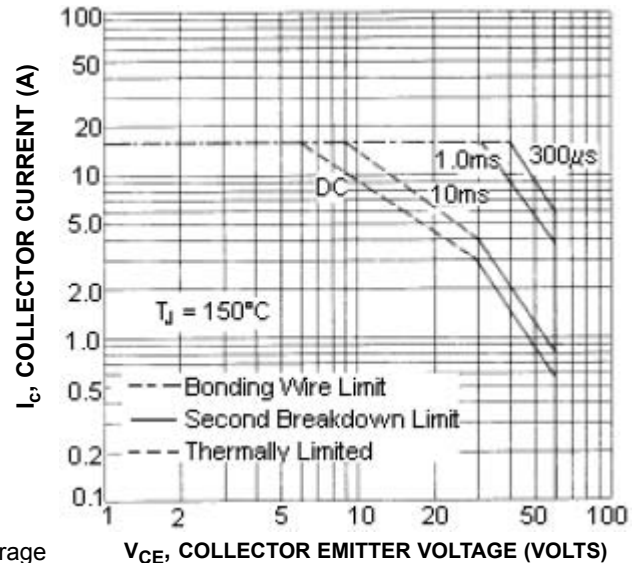


Figure - 3 Active Region Safe Operating Area



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 Figure - 3 is based on  $T_C = 150^\circ\text{C}$ ;  $T_J(\text{PK})$  is variable depending on power level. Second breakdown pulse limits are valid for duty cycles to 10% but must be derated for temperature.

### Specification Table

$I_C$ (av) maximum (A)	$V_{CEO}$ maximum V	$h_{FE}$ minimum at $I_C = 5\text{ A}$	$P_{tot}$ at $25^\circ\text{C}$ (W)	Package	Type	Part Number
15	60	20	90	TO-247	PNP	TIP2955
					NPN	TIP3055

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