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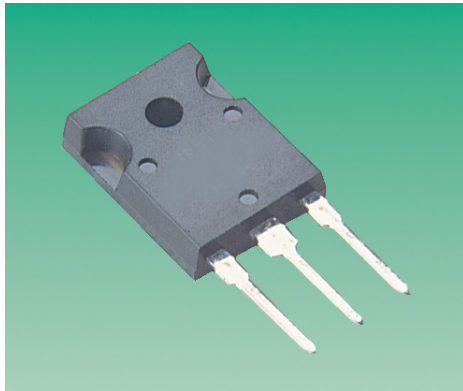
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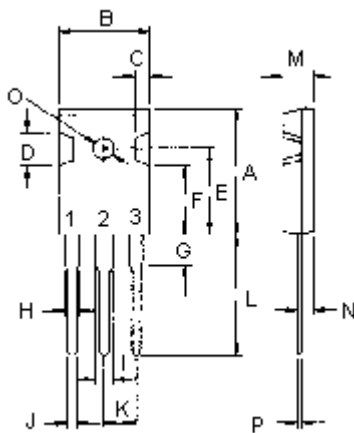
## Complementary Power Transistors



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

### Features:

- Power Dissipation- $P_D = 90W$  at  $T_C = 25^\circ C$ .
- DC Current Gain  $h_{FE} = 20 \sim 100$  at  $I_C = 4.0A$ .
- $V_{CE(sat)} = 1.1V$  (Maximum) at  $I_C = 4.0A$ ,  $I_B = 400mA$ .



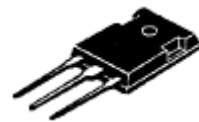
Pin 1. Base  
2. Collector  
3. Emitter

Dimensions	Minimum	Maximum
A	20.63	22.38
B	15.38	16.20
C	1.90	2.70
D	5.10	6.10
E	14.81	15.22
F	11.72	12.84
G	4.20	4.50
H	1.82	2.46
I	2.92	3.23
J	0.89	1.53
K	5.26	5.66
L	18.50	21.50
M	4.68	5.36
N	2.40	2.80
O	3.25	3.65
P	0.55	0.70

Dimensions : Millimetres

<b>NPN</b>	<b>PNP</b>
<b>TIP3055</b>	<b>TIP2955</b>

15 Ampere  
Complementary Silicon  
Power Transistors  
60 Volts  
90 Watts



TO-247(3P)

### Maximum Ratings

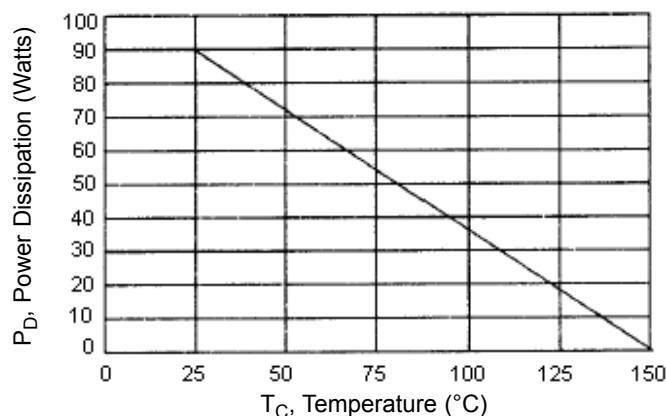
Characteristic	Symbol	Rating	Unit
Collector-Emitter Voltage	$V_{CEO}$	60	V
Collector-Emitter Voltage	$V_{CER}$	70	
Collector-Base Voltage	$V_{CBO}$	100	
Emitter-Base Voltage	$V_{EBO}$	7.0	
Collector Current-Continuous	$I_C$	15	A
Base Current	$I_B$	7.0	
Total Power Dissipation at $T_C = 25^\circ C$ Derate above $25^\circ C$	$P_D$	90 0.72	W W/ $^\circ C$
Operating and Storage Junction Temperature Range	$T_J, T_{STG}$	-65 to +150	$^\circ C$



### Thermal Characteristics

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

Figure - 1 Power Derating



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

Characteristic	Symbol	Minimum	Maximum	Unit
OFF Characteristics				
Collector-Emitter Sustaining Voltage (1) (I <sub>C</sub> = 30mA, I <sub>B</sub> = 0)	V <sub>CEO(SUS)</sub>	60	-	V
Collector Cut off Current (V <sub>CE</sub> = 70V, R <sub>BE</sub> = 100Ω)	I <sub>CER</sub>	-	1.0	mA
Collector Cut off Current (V <sub>CE</sub> = 30V, I <sub>B</sub> = 0)	I <sub>CEO</sub>	-	0.7	
Collector Cut off Current (V <sub>CE</sub> = 100V, V <sub>BE(off)</sub> = 1.5V)	I <sub>CEV</sub>	-	5.0	
Emitter Cut off Current (V <sub>EB</sub> = 7.0V, I <sub>C</sub> = 0)	I <sub>EBO</sub>	-		
ON Characteristics (1)				
DC Current Gain (I <sub>C</sub> = 4.0A, V <sub>CE</sub> = 4.0V) (I <sub>C</sub> = 10A, V <sub>CE</sub> = 4.0V)	h <sub>FE</sub>	20 5.0	100	-
Collector-Emitter Saturation Voltage (I <sub>C</sub> = 4.0A, I <sub>B</sub> = 0.4A) (I <sub>C</sub> = 10A, I <sub>B</sub> = 3.3A)	V <sub>CE(sat)</sub>	-	1.1 3.0	V
Base-Emitter On Voltage (I <sub>C</sub> = 4.0A, V <sub>CE</sub> = 4.0V)	V <sub>BE(on)</sub>	-	1.8	
Dynamic Characteristics				
Current Gain Bandwidth Product (I <sub>C</sub> = 500mA, V <sub>CE</sub> = 10V, f = 1.0MHz)	f <sub>T</sub>	2.5	-	MHz
Small-Signal Current Gain (I <sub>C</sub> = 1.0A, V <sub>CE</sub> = 4V, f = 1kHz)	h <sub>fe</sub>	15	-	-

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

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

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## Complementary Power Transistors



Figure - 2 DC Current Gain

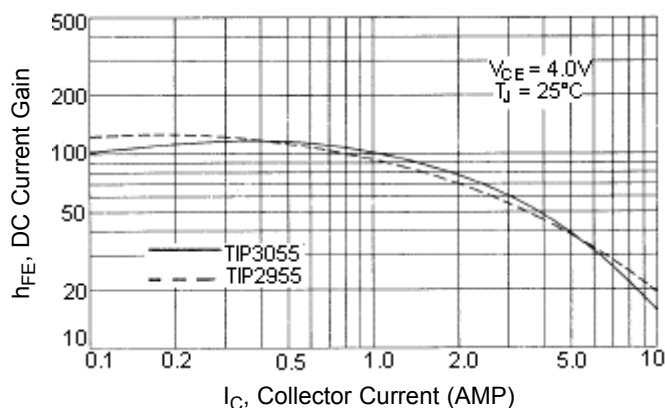
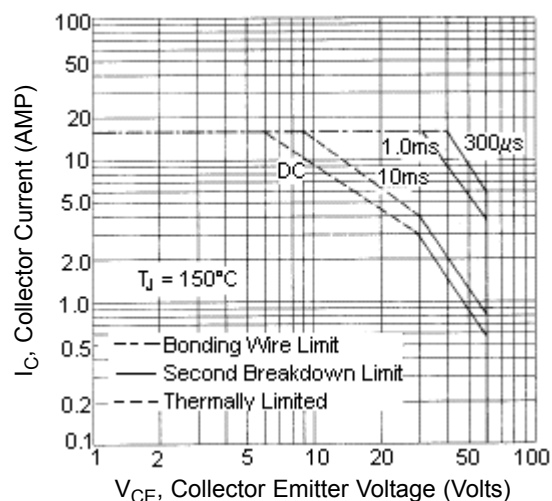


Figure - 3 Active Region Safe Operating Area



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

### Specifications

$I_{C(av)}$ maximum (A)	$V_{CEO}$ maximum (V)	$h_{FE}$ minimum at $I_C = 4A$	$P_{tot}$ at $25^\circ\text{C}$ (W)	Package	Type	Part Number
15	60	20	90	TO-247	PNP	TIP2955
					NPN	TIP3055



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## Complementary Power Transistors



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