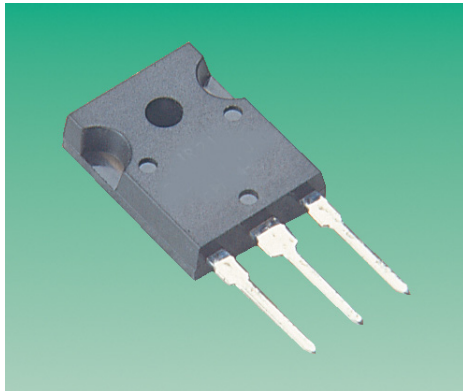


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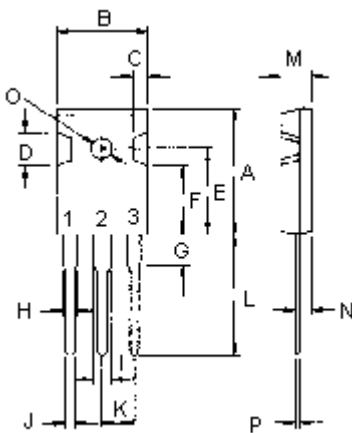
Complementary Power Transistors



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 $I_C = 4.0A$, $I_B = 400mA$.



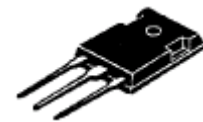
Pin 1. Base
2. Collector
3. Emitter

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

NPN	PNP
TIP3055	TIP2955

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	A
Collector Current-Continuous	I_C	15	
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	$^\circ C$



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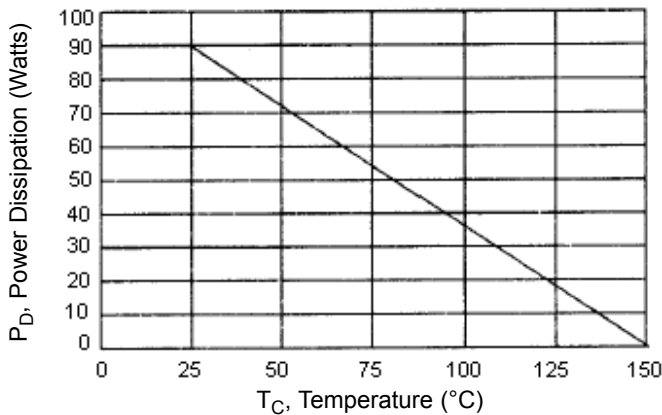
Complementary Power Transistors



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) ($I_C = 30\text{mA}$, $I_B = 0$)	$V_{CEO(SUS)}$	60	-	V
Collector Cut off Current ($V_{CE} = 70\text{V}$, $R_{BE} = 100\Omega$)	I_{CER}	-	1.0	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}	-	5.0	
Emitter Cut off Current ($V_{EB} = 7.0\text{V}$, $I_C = 0$)	I_{EBO}	-	-	
ON Characteristics (1)				
DC Current Gain ($I_C = 4.0\text{A}$, $V_{CE} = 4.0\text{V}$) ($I_C = 10\text{A}$, $V_{CE} = 4.0\text{V}$)	h_{FE}	20 5.0	100	-
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 ($I_C = 4.0\text{A}$, $V_{CE} = 4.0\text{V}$)	$V_{BE(on)}$	-	1.8	
Dynamic Characteristics				
Current Gain Bandwidth Product ($I_C = 500\text{mA}$, $V_{CE} = 10\text{V}$, $f = 1.0\text{MHz}$)	f_T	2.5	-	MHz
Small-Signal Current Gain ($I_C = 1.0\text{A}$, $V_{CE} = 4\text{V}$, $f = 1\text{kHz}$)	h_{fe}	15	-	-

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

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



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Complementary Power Transistors



Figure - 2 DC Current Gain

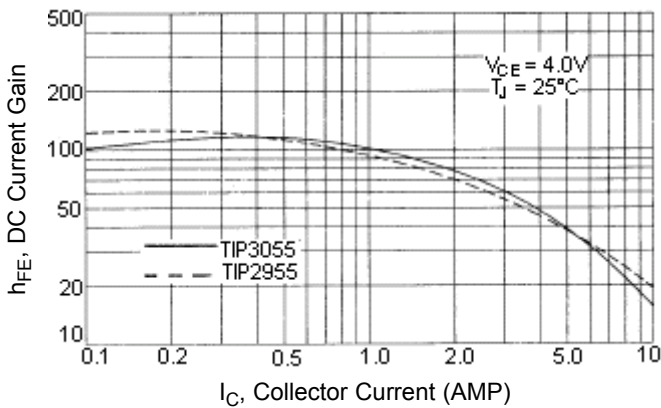
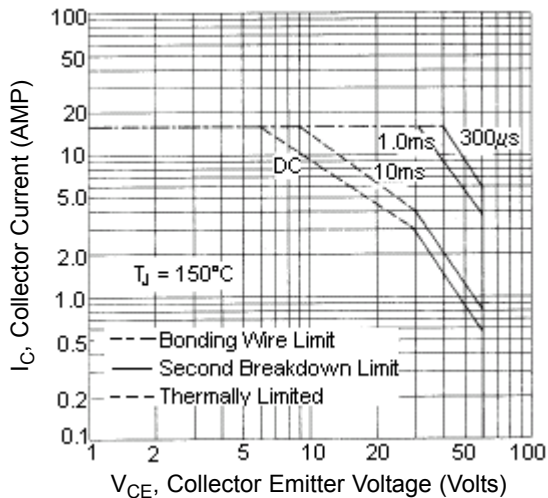


Figure - 3 Active Region Safe Operating Area



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 $T_C = 150^\circ C$; $T_{J(PK)}$ 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_{CE0} maximum (V)	h_{FE} minimum at $I_C = 4A$	P_{tot} at $25^\circ C$ (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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