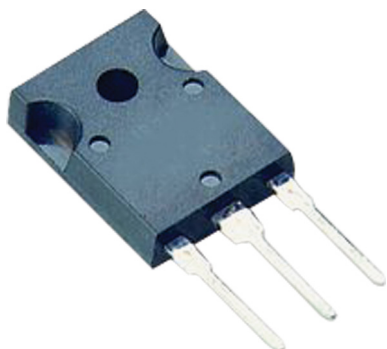


Complementary Power Transistor



Description:

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 $I_C = 4A$
- $V_{CE(sat)} = 1.1V$ (Max.) at $I_C = 4A, I_B = 400mA$

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	
Collector Current-Continuous	I_C	15	A
Base Current	I_B	7	
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	Max.	Unit
Thermal Resistance Junction to Case	$R\theta_{jc}$	1.39	$^\circ C/W$

Complementary Power Transistor

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) $I_C = 30\text{mA}, I_B = 0$	$V_{\text{CEO(SUS)}}$	60	-	V
Collector Cut off Current $V_{\text{CE}} = 70\text{V}, R_{\text{BE}} = 100\Omega$	I_{CER}	-	1	mA
Collector Cut off Current $V_{\text{CE}} = 30\text{V}, I_B = 0$	I_{CEO}	-	0.7	
Collector Cut off Current $V_{\text{CE}} = 100\text{V}, V_{\text{BE(off)}} = 1.5\text{V}$	I_{CEV}	-	5	
Emitter Cut off Current $V_{\text{EB}} = 7\text{V}, I_C = 0$	I_{EBO}	-	-	

ON Characteristics (1)

DC Current Gain $I_C = 4\text{A}, V_{\text{CE}} = 4\text{V}$ $I_C = 10\text{A}, V_{\text{CE}} = 4\text{V}$	h_{FE}	20 5	100	-
Collector-Emitter Saturation Voltage $I_C = 4\text{A}, I_B = 0.4\text{A}$ $I_C = 10\text{A}, I_B = 3.3\text{A}$	$V_{\text{CE(sat)}}$	-	1.1 3	V
Base-Emitter On Voltage $I_C = 4\text{A}, V_{\text{CE}} = 4\text{V}$	$V_{\text{BE(on)}}$	-	1.8	

Dynamic Characteristics

Current Gain Bandwidth Product $I_C = 500\text{mA}, V_{\text{CE}} = 10\text{V}, f = 1\text{MHz}$	f_T	2.5	-	MHz
Small-Signal Current Gain $I_C = 1\text{A}, V_{\text{CE}} = 4\text{V}, f = 1\text{kHz}$	h_{fe}	15	-	-

(1) Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2\%$

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

Figure - 1 Power Derating

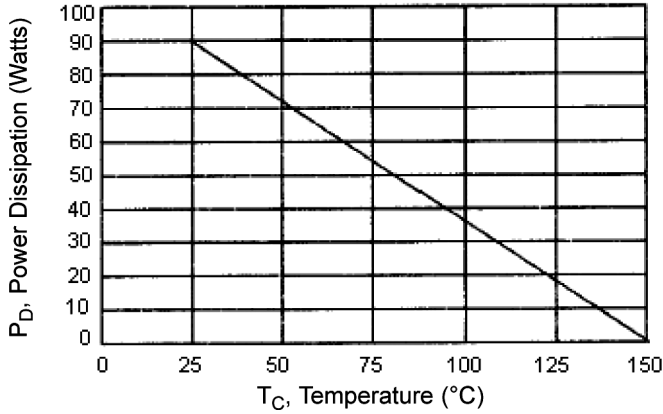


Figure - 2 DC Current Gain

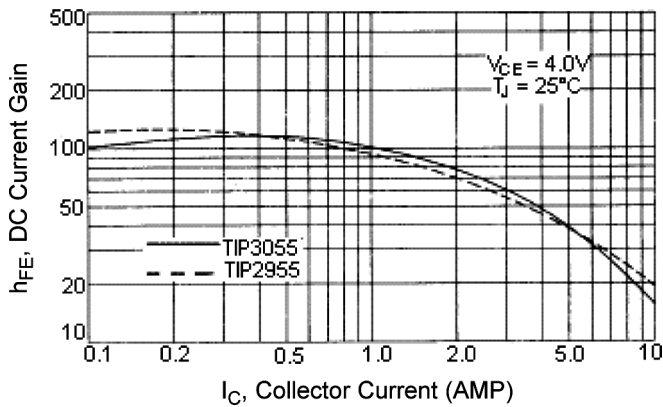
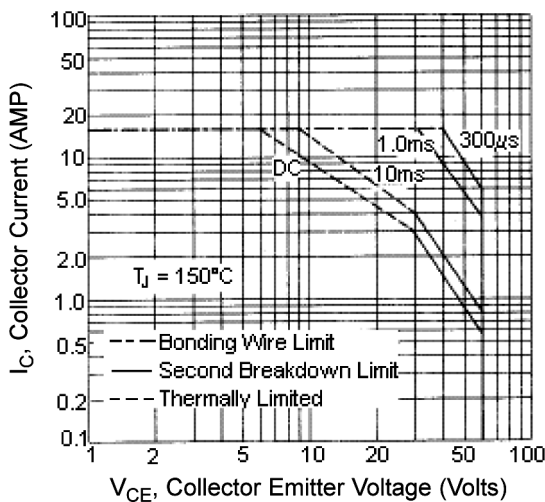
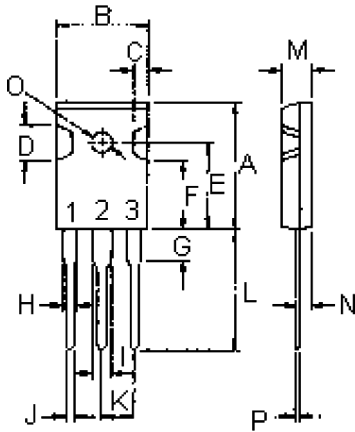


Figure - 3 Active Region Safe Operating Area



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.

Complementary Power Transistor



Pin Configuration:

1. Base
2. Collector
3. Emitter

Dimensions	Min.	Max.
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

Dimensions : Millimetres

Part Number Table

Description	Part Number
Transistor, NPN, TO-247	TIP3055
Transistor, PNP, TO-3P	TIP2955

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