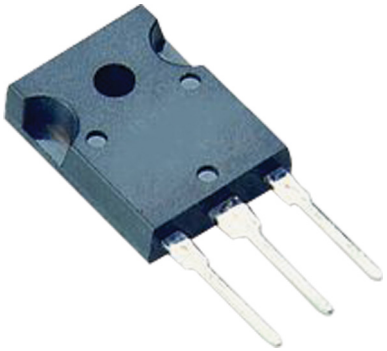
Complementary Power Transistor



Description:

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

Features:

- Power Dissipation-PD = 90W at T_C = 25°C
- • DC Current Gain h_{FE} = 20 ~ 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°C Derate above 25°C	P_D	90 0.72	W W/°C
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-65 to +150	°C

Thermal Characteristics

Characteristic	Symbol	Max.	Unit
Thermal Resistance Junction to Case	Rθjc	1.39	°C/W

Electrical Characteristics (T_C = 25°C unless otherwise noted)

Characteristic	Symbol	Min.	Max.	Unit
OFF Characteristics				
Collector-Emitter Sustaining Voltage (1) I_C = 30mA, I_B = 0	$V_{CEO(SUS)}$	60	-	V
Collector Cut off Current V_{CE} = 70V, R_{BE}= 100Ω	I_{CER}	-	1	mA
Collector Cut off Current V_{CE} = 30V, I_B = 0	I_{CEO}	-	0.7	
Collector Cut off Current V_{CE} = 100V, $V_{BE(off)}$ = 1.5V	I_{CEV}	-	5	
Emitter Cut off Current V_{EB} = 7V, I_C = 0	I_{EBO}	-		
ON Characteristics (1)				
DC Current Gain I_C = 4A, V_{CE} = 4V I_C = 10A, V_{CE} = 4V	h_{FE}	20 5	100	-
Collector-Emitter Saturation Voltage I_C = 4A, I_B = 0.4A I_C = 10A, I_B = 3.3A	$V_{CE(sat)}$	-	1.1 3	V
Base-Emitter On Voltage I_C = 4A, V_{CE} = 4V	$V_{BE(on)}$	-	1.8	
Dynamic Characteristics				
Current Gain Bandwidth Product I_C = 500mA, V_{CE} = 10V, f = 1MHz	f_T	2.5	-	MHz
Small-Signal Current Gain I_C = 1A, V_{CE} = 4V, f = 1kHz	h_{fe}	15	-	-

(1) Pulse Test: Pulse Width = 300μs, Duty Cycle ≤2%

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

Figure - 1 Power Derating

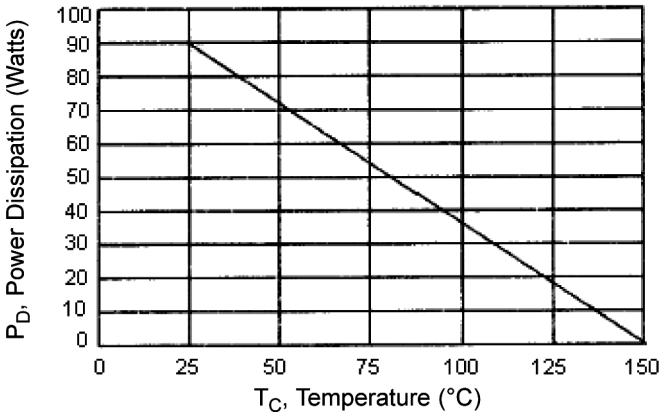


Figure - 2 DC Current Gain

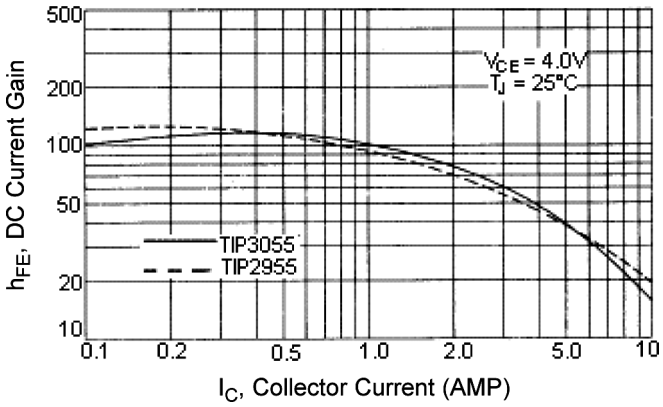
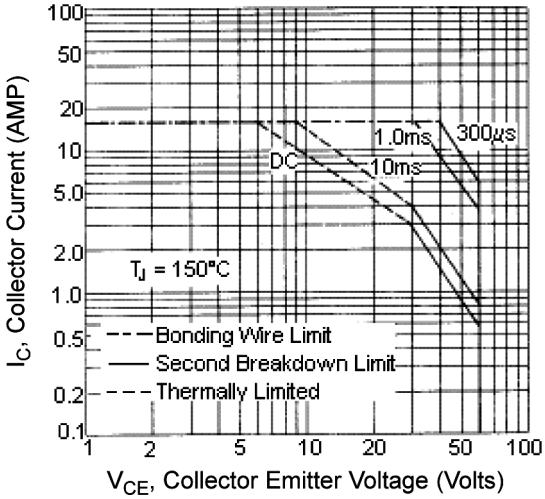


Figure - 3 Active Region Safe Operating Area



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°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.

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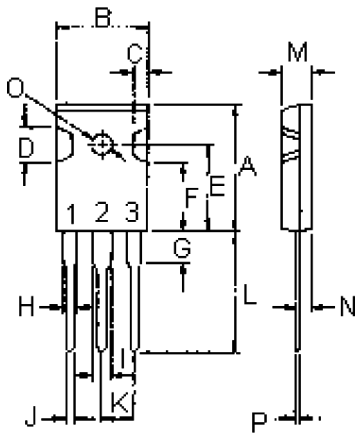

Pin Configuration:

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