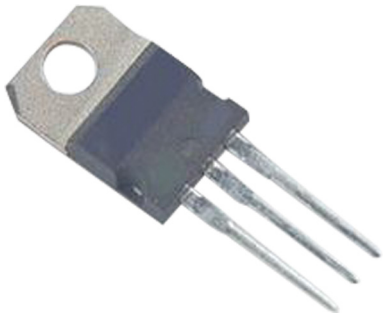
Complementary Power Transistor



Description:

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

Features:

- Power dissipation-P_D = 75W at T_C = 25°C
- DC current gain h_{FE} = 20 (Min.) 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-Base Voltage	V_{CBO}	70	
Emitter-Base Voltage	V_{EBO}	5	
Collector Current-Continuous	I_C	10	A
Base Current	I_B	6	
Total Power Dissipation at T_C = 25°C Derate above 25°C	P_D	75 0.6	W W/°C
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-55 to +150	°C

Thermal Characteristics

Characteristic	Symbol	Max.	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	1.67	°C/W

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

Characteristic	Symbol	Min.	Max.	Unit
Off Characteristics				
Collector-Emitter Sustaining Voltage I_C = 200mA, I_B = 0	$V_{CEO\ (sus)}$	60	-	V
Collector Cut off Current V_{CE} = 30V, I_B = 0	I_{CEO}	-	0.7	mA
Collector Cut off Current V_{CE} = 70V, $V_{BE(off)}$ = 1.5V V_{CE} = 70V, $V_{BE(off)}$ = 1.5V, T_C = 150°C	I_{CEX}	-	1 5	
Collector Cut off Current V_{CB} = 70V, I_E = 0 V_{CB} = 70V, I_E = 0, T_C = 150°C	I_{CBO}	-	1 10	
Emitter Cut off Current V_{EB} = 5V, I_C = 0	I_{EBO}	-	5	
On Characteristics (1)				
DC Current Gain I_C = 4A, V_{CE} = 4V I_C = 10A, V_{CE} = 4V	hFE	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 8	V
Base-Emitter On Voltage I_C = 4A, V_{CE} = 4V	$V_{BE\ (on)}$	-	1.8	
Dynamic Characteristics				
Current Gain-Bandwidth Product (2) I_C = 500mA, V_{CE} = 10V, f = 500kHz	f_T	2	-	MHz

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

(2) $f_T = h_{FE} \bullet f_{test}$.

Figure - 1 Power Derating

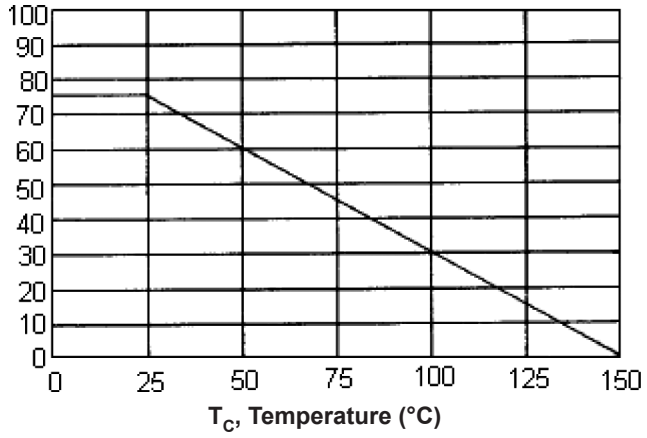
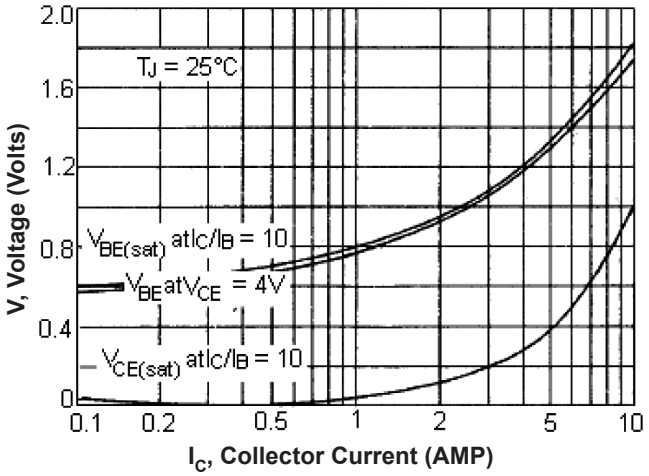


Figure - 2 "ON" Voltage

MJE2955T



MJE3055T

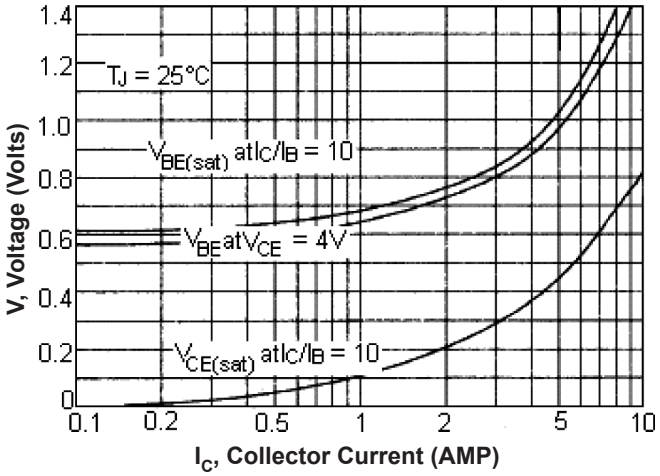
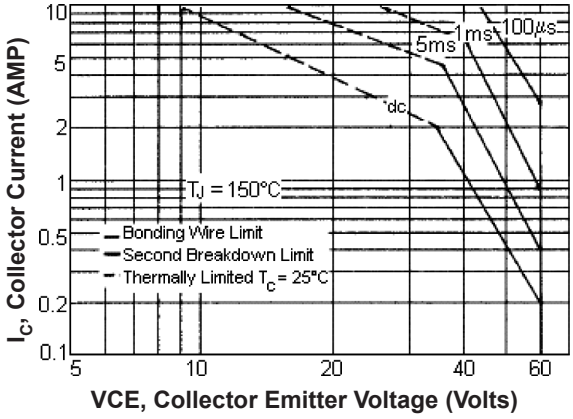


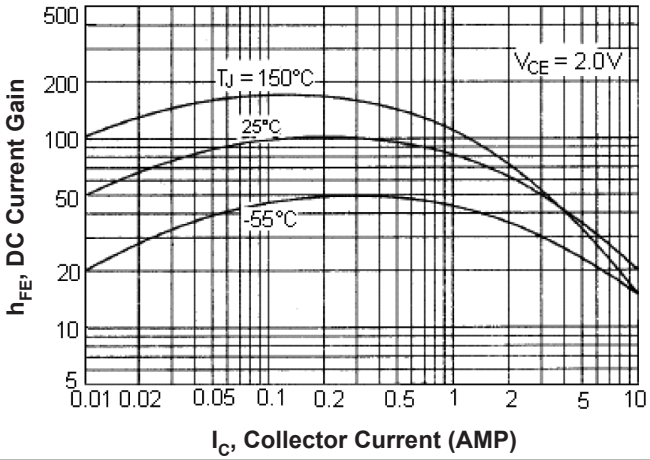
Figure - 3 Active-Region Safe Operating Area



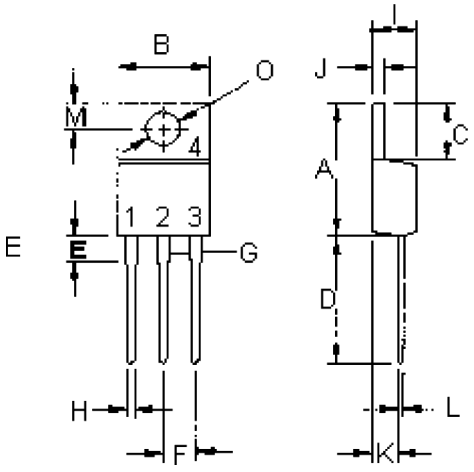
There are two limitations on the power handling ability of a transistor: average junction temperature and second breakdown safe operating area curves indicate I_C-V_{CE} limits of the transistor that must be observed for reliable operation i.e., the transistor must not be subjected to greater dissipation than the curves indicate.

The data of Figure - 3 is based on $T_{J(PK)}$ = 150°C; T_C is variable depending on conditions. Second breakdown pulse limits are valid for duty cycles to 10% provided $T_{J(PK)}$ ≤150°C. At high case temperatures, thermal limitation will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

Figure - 4 DC Current Gain



Complementary Power Transistor



Pin Configuration:

1. Base
2. Collector
3. Emitter
4. Collector(Case)

Dimensions	Min.	Max.
A	14.68	15.31
B	9.78	10.42
C	5.01	6.52
D	13.06	14.62
E	3.57	4.07
F	2.42	3.66
G	1.12	1.36
H	0.72	0.96
I	4.22	4.98
J	1.14	1.38
K	2.2	2.97
L	0.33	0.55
M	2.48	2.98
O	3.7	3.9

Dimensions : Millimetres

Part Number Table

Description	Part Number
Transistor, NPN, TO-220	MJE3055T
Transistor, PNP, TO-220	MJE2955T