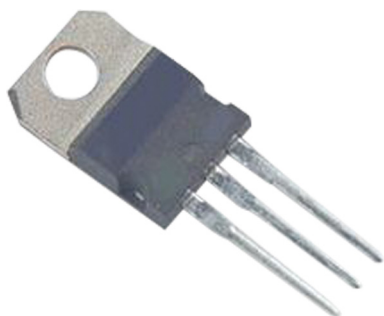


Complementary Power Transistor



Description:

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

Features:

- Power dissipation- $P_D = 75W$ at $T_C = 25^\circ C$
- 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 $T_C = 25^\circ C$ Derate above $25^\circ C$	P_D	75 0.6	W W/ $^\circ C$
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ C$

Thermal Characteristics

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

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 $I_C = 200\text{mA}$, $I_B = 0$	$V_{CEO(sus)}$	60	-	V
Collector Cut off Current $V_{CE} = 30\text{V}$, $I_B = 0$	I_{CEO}	-	0.7	mA
Collector Cut off Current $V_{CE} = 70\text{V}$, $V_{BE(off)} = 1.5\text{V}$ $V_{CE} = 70\text{V}$, $V_{BE(off)} = 1.5\text{V}$, $T_C = 150^\circ\text{C}$	I_{CEX}	-	1 5	
Collector Cut off Current $V_{CB} = 70\text{V}$, $I_E = 0$ $V_{CB} = 70\text{V}$, $I_E = 0$, $T_C = 150^\circ\text{C}$	I_{CBO}	-	1 10	
Emitter Cut off Current $V_{EB} = 5\text{V}$, $I_C = 0$	I_{EBO}	-	5	

On Characteristics (1)

DC Current Gain $I_C = 4\text{A}$, $V_{CE} = 4\text{V}$ $I_C = 10\text{A}$, $V_{CE} = 4\text{V}$	h_{FE}	20 5	100	-
Collector-Emitter Saturation Voltage $I_C = 4\text{A}$, $I_B = 0.4\text{A}$ $I_C = 10\text{A}$, $I_B = 3.3\text{A}$	$V_{CE(sat)}$	-	1.1 8	V
Base-Emitter On Voltage $I_C = 4\text{A}$, $V_{CE} = 4\text{V}$	$V_{BE(on)}$	-	1.8	

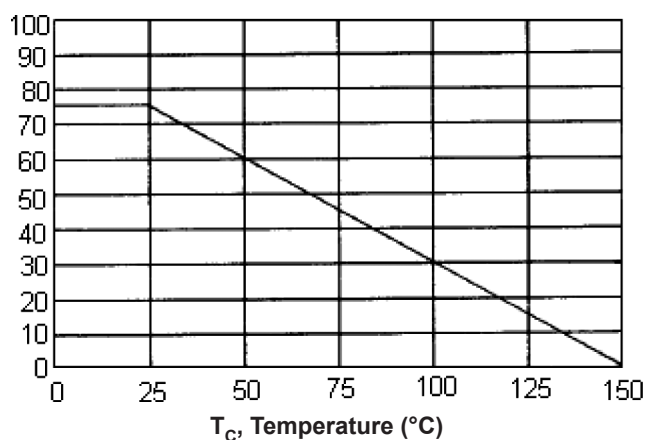
Dynamic Characteristics

Current Gain-Bandwidth Product (2) $I_C = 500\text{mA}$, $V_{CE} = 10\text{V}$, $f = 500\text{kHz}$	f_T	2	-	MHz
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(1) Pulse Test: Pulse Width = $300\mu\text{s}$, Duty Cycle $\leq 2\%$.

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

Figure - 1 Power Derating



Complementary Power Transistor

Figure - 2 "ON" Voltage

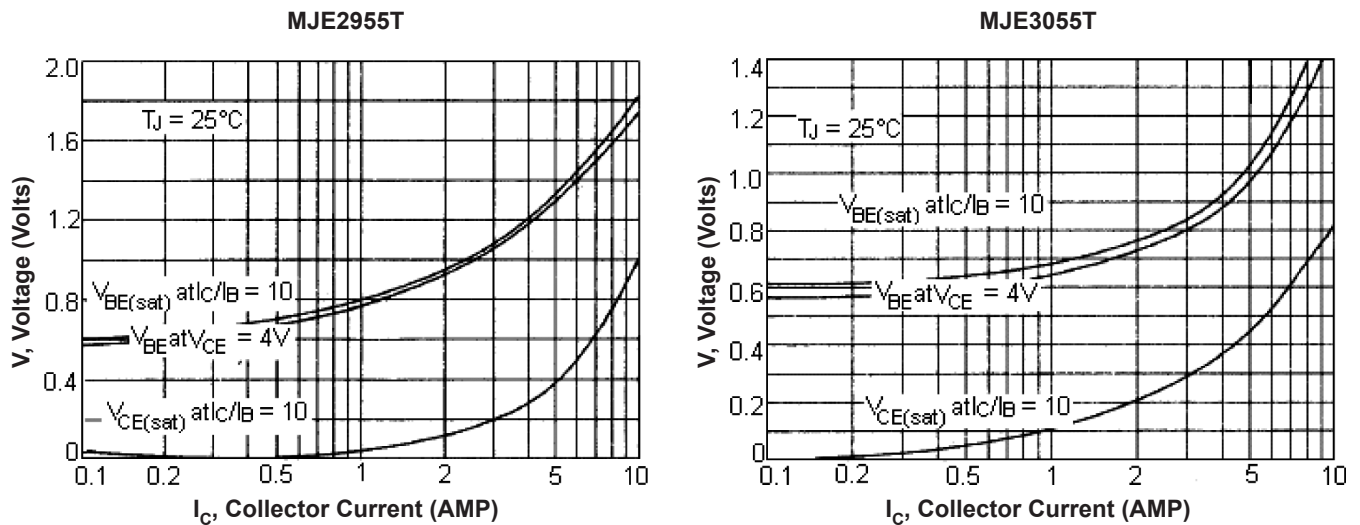
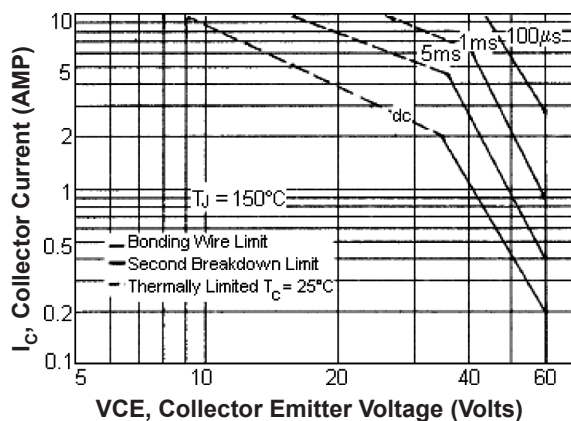


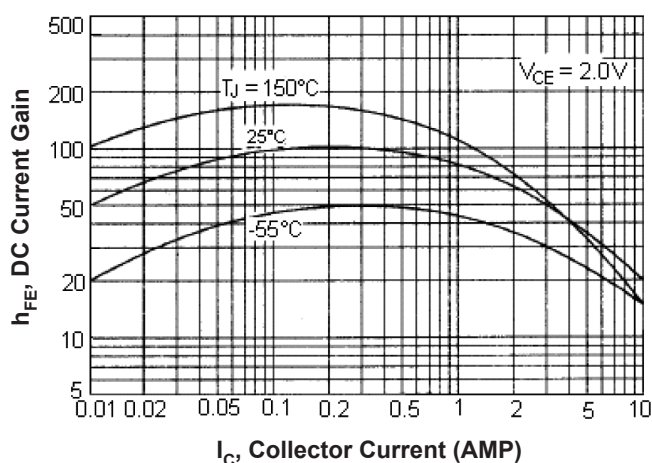
Figure - 3 Active-Region Safe Operating Area



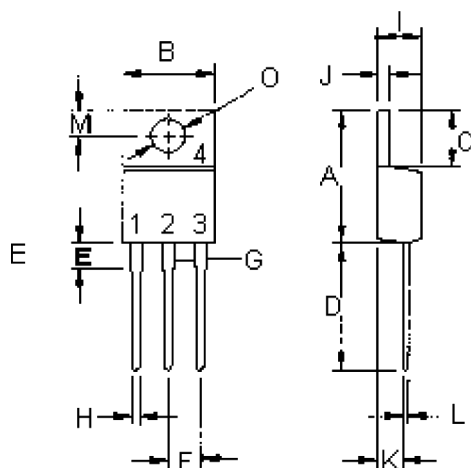
There are two limitations on the power handling ability of a transistor: average junction temperature and second breakdown safe operating area curves indicate I_C - V_{CE} limits of the transistor that must be observed for reliable operation i.e., the transistor must not be subjected to greater dissipation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

The data of Figure - 3 is based on $T_{J(PK)} = 150^\circ\text{C}$; T_C is variable depending on conditions. Second breakdown pulse limits are valid for duty cycles to 10% provided $T_{J(PK)} \leq 150^\circ\text{C}$. 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

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