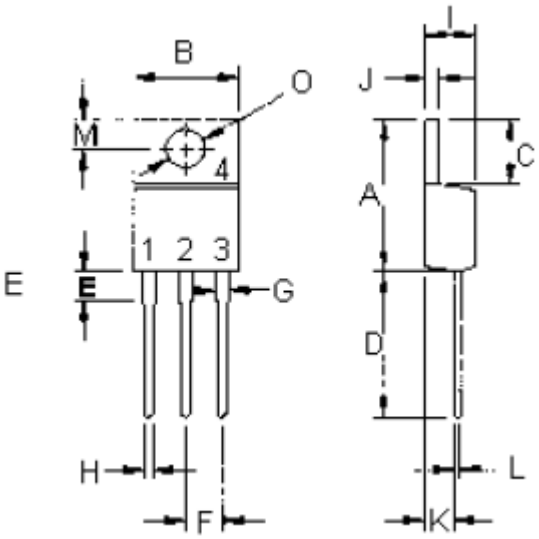
MJE3055T

Complementary Power Transistors

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

Features

- Power dissipation-P_D = 75 W at T_C = 25°C
- DC current gain h_{FE} = 20 (minimum) at I_C = 4 A
- $V_{CE(sat)}$ = 1.1 V (maximum) at I_C = 4 A, I_B = 400 mA



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

Dimensions	Minimum	Maximum
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

10 Amperes
Complementary Silicon
Power Transistors
60 Volts
75 Watts

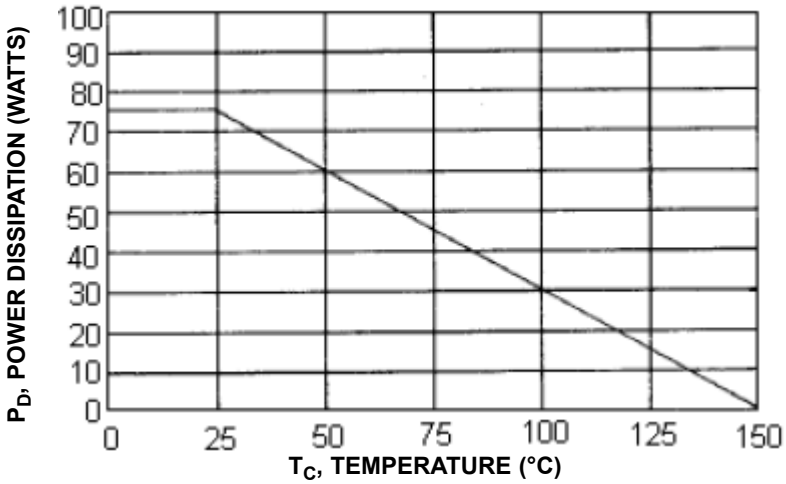
Maximum Ratings

Parameter	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	Maximum	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	1.67	°C/W

Figure-1 Power Derating



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

Parameter	Symbol	Minimum	Maximum	Unit
OFF Characteristics				
Collector-Emitter Sustaining Voltage (1) (I_C = 200 mA, I_B = 0	$V_{CEO\ (sus)}$	60	-	V
Collector Cut off Current (V_{CE} = 30 V, I_B = 0)	I_{CEO}	-	0.7	mA
Collector Cut off Current (V_{CE} = 70 V, $V_{BE\ (off)}$ = 1.5 V) (V_{CE} = 70 V, $V_{BE\ (off)}$ = 1.5 V, T_C = 150°C)	I_{CEX}	-	1 5	
Collector Cut off Current (V_{CB} = 70 V, I_E = 0) (V_{CB} = 70 V, I_E = 0, T_C = 150°C)	I_{CBO}	-	1 10	
Emitter Cut off Current (V_{EB} =5 V, I_C = 0)	I_{EBO}	-	5	
ON Characteristics (1)				
DC Current Gain (I_C = 4 A, V_{CE} = 4 V) (I_C = 10 A, V_{CE} = 4 V)	h_{FE}	20 5	100	-
Collector-Emitter Saturation Voltage (I_C = 4 A, I_B = 0.4 A) (I_C = 10 A, I_B = 3.3 A)	$V_{CE\ (sat)}$	-	1.1 8	V
Base-Emitter on Voltage (I_C = 4 A, V_{CE} = 4 V)	$V_{BE\ (on)}$	-	1.8	

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

Characteristic	Symbol	Minimum	Maximum	Unit
Dynamic Characteristics				
Current Gain-Bandwidth Product (2) (I_C = 500 mA, V_{CE} = 10 V, f = 500 KHz)	f_T	2	-	KHz

(1) Pulse Test: Pulse Width = 300 µs, Duty Cycle ≤2.0%
(2) $f_T = |h_{fe}| \cdot f_{test}$

Figure - 2 "ON" Voltage

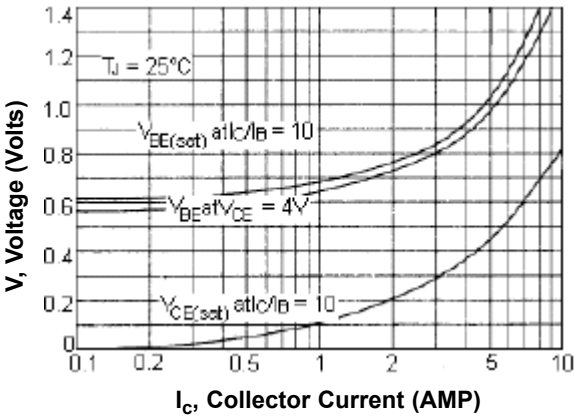


Figure - 3 Active Region Safe Operating Area

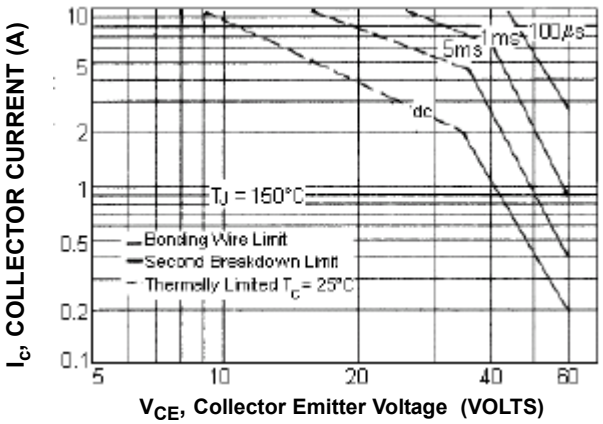
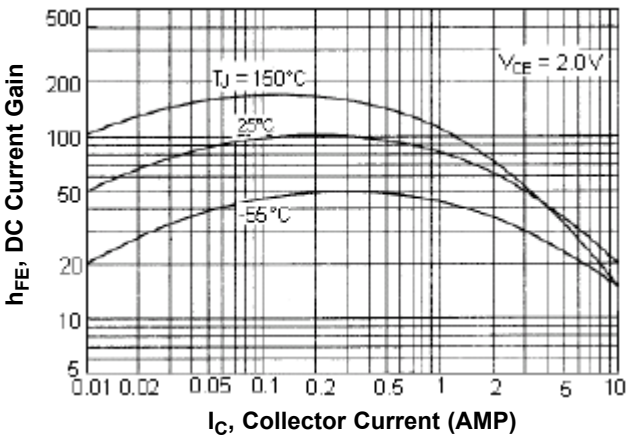


Figure - 4 DC Current Gain



There are two limitations on the power handling ability of a transistor: average junction temperature and second breakdown safe operating area curves indicate IC-VCE 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 TJ(PK) = 150˘‹C; TC is variable depending on conditions. Second breakdown pulse limits are valid for duty cycles to 10% provided TJ(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.

Specification Table

$I_{C\ (av)}$ maximum (A)	V_{CEO} maximum V	h_{FE} minimum at I_c = 5 A	P_{tot} at 25°C (W)	Package	Type	Part Number
15	60	20	90	TO-247	NPN	MJE3055T