

# MJE3055T



## Complementary Power Transistors



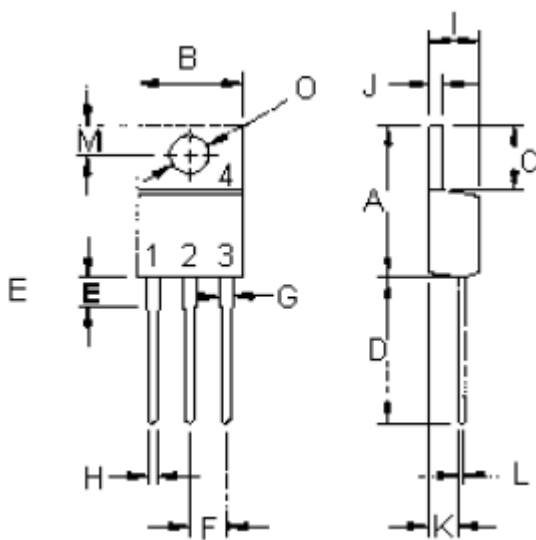
Complementary Silicon Power Transistors are designed for use in general purpose amplifier and switching applications

### Features

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

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

10 Amperes  
Complementary Silicon  
Power Transistors  
60 Volts  
75 Watts



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

Dimensions : Millimetres

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

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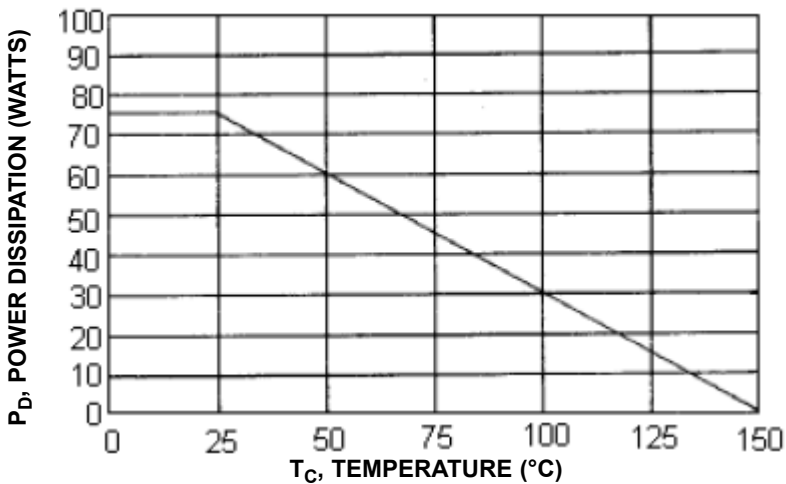


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### Thermal Characteristics

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

Figure-1 Power Derating



### Electrical Characteristics ( $T_C = 25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Minimum	Maximum	Unit
<b>OFF Characteristics</b>				
Collector-Emitter Sustaining Voltage (1) ( $I_C = 200\text{ mA}$ , $I_B = 0$ )	$V_{CEO(sus)}$	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	
<b>ON Characteristics (1)</b>				
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	

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### Electrical Characteristics ( $T_c = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Minimum	Maximum	Unit
<b>Dynamic Characteristics</b>				
Current Gain-Bandwidth Product (2) ( $I_c = 500 \text{ mA}$ , $V_{CE} = 10 \text{ V}$ , $f = 500 \text{ KHz}$ )	$f_T$	2	-	KHz

(1) Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$

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

Figure - 2 "ON" Voltage

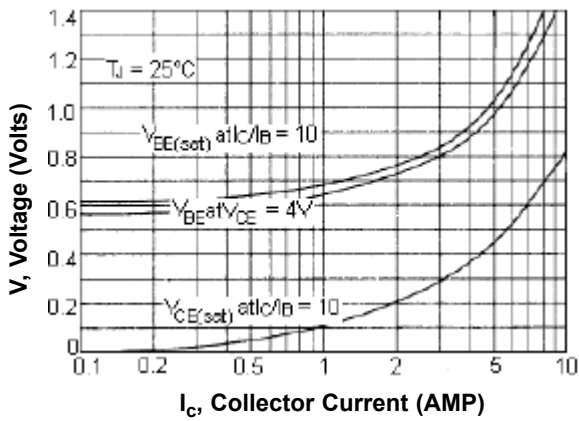


Figure - 4 DC Current Gain

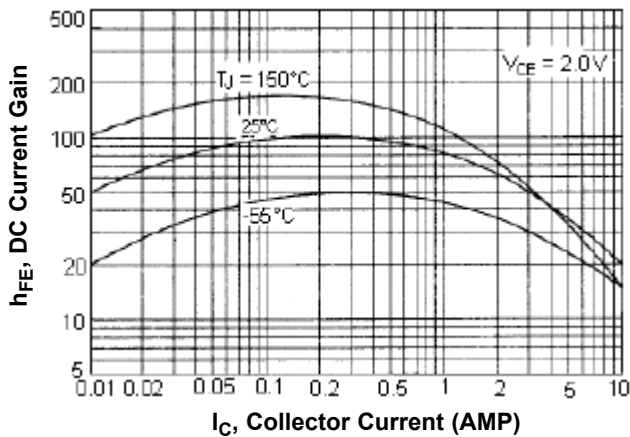
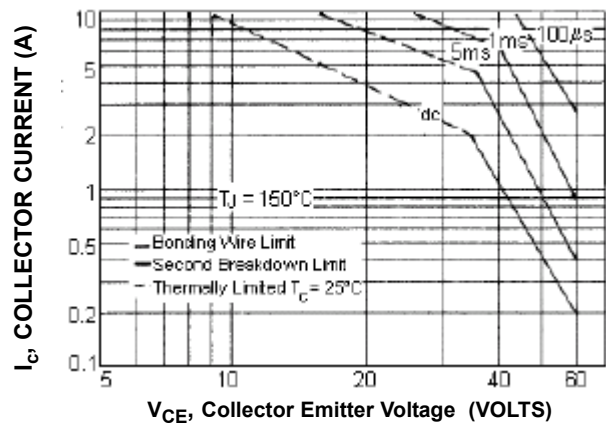


Figure - 3 Active Region Safe Operating Area



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  $T_J(\text{PK}) = 150^\circ\text{C}$ ;  $T_C$  is variable depending on conditions. Second breakdown pulse limits are valid for duty cycles to 10% provided  $T_J(\text{PK}) \leq 150^\circ\text{C}$ . At high case temperatures, thermal limitation will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

### Specification Table

$I_C$ (av) maximum (A)	$V_{CE0}$ maximum V	$h_{FE}$ minimum at $I_c = 5 \text{ A}$	$P_{\text{tot}}$ at $25^\circ\text{C}$ (W)	Package	Type	Part Number
15	60	20	90	TO-247	NPN	MJE3055T

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