

## COMPLEMENTARY SILICON POWER TRANSISTORS

...designed for use in general-purpose amplifier and switching applications

### FEATURES:

- \* Power Dissipation -  $P_D = 75 \text{ W} @ T_C = 25^\circ\text{C}$
- \* DC Current Gain  $h_{FE} = 20 \sim 100 @ I_C = 4.0 \text{ A}$
- \*  $V_{CE(sat)} = 1.1 \text{ V (Max.)} @ I_C = 4.0 \text{ A}, I_B = 400 \text{ mA}$

### MAXIMUM RATINGS

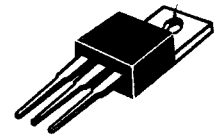
Characteristic	Symbol	Rating	Unit
Collector-Emitter Voltage	$V_{CEO}$	60	V
Collector-Base Voltage	$V_{CBO}$	70	V
Emitter-Base Voltage	$V_{EBO}$	5.0	V
Collector Current-Continuous	$I_C$	10	A
Base Current	$I_B$	6.0	A
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	75 0.6	W W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{STG}$	- 55 to +150	$^\circ\text{C}$

### THERMAL CHARACTERISTICS

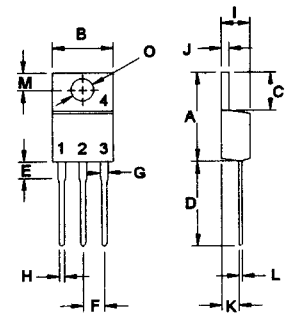
Characteristic	Symbol	Max	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	1.67	$^\circ\text{C/W}$

**PNP NPN**  
**MJE2955T MJE3055T**

**10 AMPERE  
COMPLEMENTARY SILICON  
POWER TRANSISTORS  
60 VOLTS  
75 WATTS**



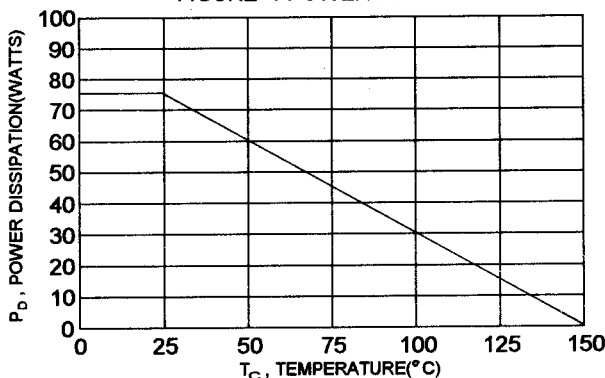
**TO-220**



PIN 1.BASE  
2.COLLECTOR  
3.EMITTER  
4.COLLECTOR(CASE)

DIM	MILLIMETERS	
	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	2.20	2.97
L	0.33	0.55
M	2.48	2.98
O	3.70	3.90

**FIGURE -1 POWER DERATING**



**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 (1) ( $I_C = 200\text{ mA}$ , $I_B = 0$ )	$V_{CE(sus)}$	60		V
Collector Cutoff Current ( $V_{CE} = 30\text{ V}$ , $I_B = 0$ )	$I_{CEO}$		0.7	mA
Collector Cutoff Current ( $V_{CE} = 70\text{ V}$ , $V_{BE(off)} = 1.5\text{ V}$ ) ( $V_{CE} = 70\text{ V}$ , $V_{BE(off)} = 1.5\text{ V}$ , $T_C = 150^\circ\text{C}$ )	$I_{CEX}$		1.0 5.0	mA
Collector Cutoff Current ( $V_{CB} = 70\text{ V}$ , $I_E = 0$ ) ( $V_{CB} = 70\text{ V}$ , $I_E = 0$ , $T_C = 150^\circ\text{C}$ )	$I_{CBO}$		1.0 10	mA
Emitter Cutoff Current ( $V_{EB} = 5.0\text{ V}$ , $I_C = 0$ )	$I_{EBO}$		5.0	mA

**ON CHARACTERISTICS (1)**

DC Current Gain ( $I_C = 4.0\text{ A}$ , $V_{CE} = 4.0\text{ V}$ ) ( $I_C = 10\text{ A}$ , $V_{CE} = 4.0\text{ V}$ )	hFE	20 5.0	100	
Collector - Emitter Saturation Voltage ( $I_C = 4.0\text{ A}$ , $I_B = 0.4\text{ A}$ ) ( $I_C = 10\text{ A}$ , $I_B = 3.3\text{ A}$ )	$V_{CE(sat)}$		1.1 8.0	V
Base - Emitter On Voltage ( $I_C = 4.0\text{ A}$ , $V_{CE} = 4.0\text{ V}$ )	$V_{BE(on)}$		1.8	V

**DYNAMIC CHARACTERISTICS**

Current Gain - Bandwidth Product (2) ( $I_C = 500\text{ mA}$ , $V_{CE} = 10\text{ V}$ , $f_c = 500\text{ KHz}$ )	$f_T$	2.0		MHz
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(1) Pulse Test: Pulse width = 300 us , Duty Cycle  $\leq 2.0\%$

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

MJE2955T

FIG-2 "ON" VOLTAGE

MJE3055T

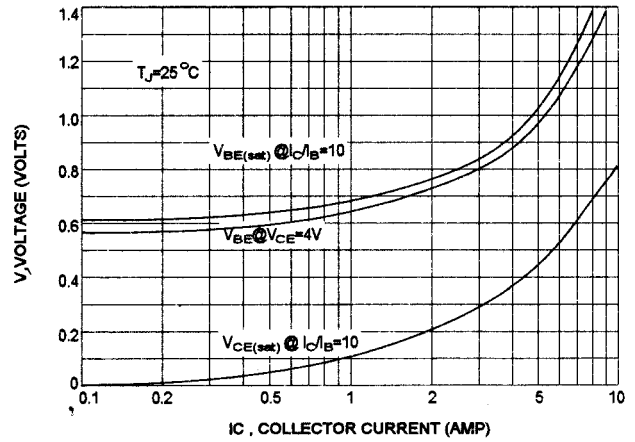
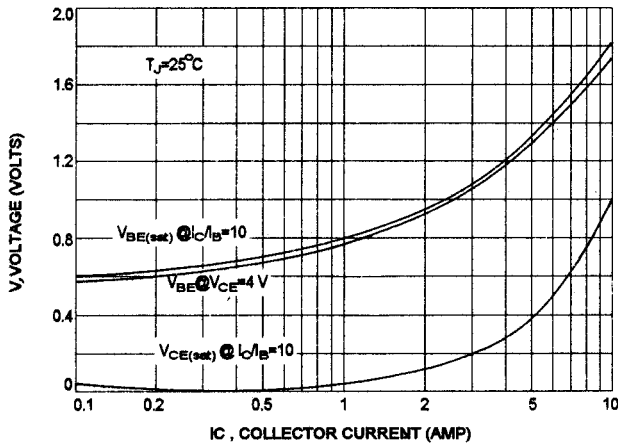
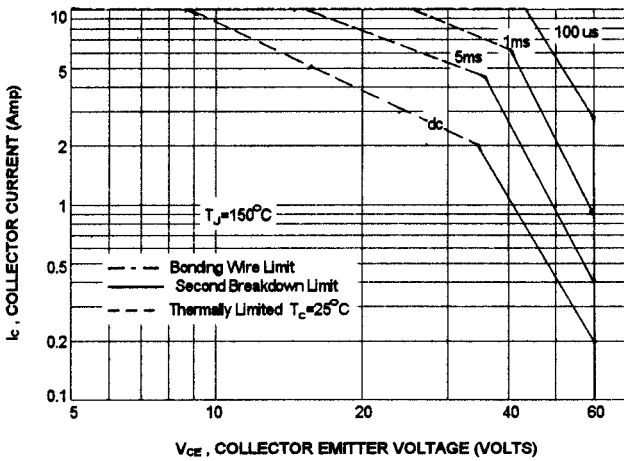


FIG-3 ACTIVE-REGION SAFE OPERATING AREA



There are two limitation 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 curves indicate.

The data of FIG-3 is base 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.

FIG-4 DC CURRENT GAIN

