

**COMPLEMENTARY SILICON PLASTIC  
 POWER TRANSISTORS**

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

- DC Current Gain Specified to 10 Amperes
- High Current Gain - Bandwidth Product -  
 $f_T = 2.0 \text{ MHz (Min) @ } I_C = 500 \text{ mAdc}$
- Choice of Packages - MJE3055, MJE2955 - TO-225AB (TO-127)  
 MJE3055T, MJE2955T - TO-220AB

**10 AMPERE  
 COMPLEMENTARY SILICON  
 POWER TRANSISTORS**  
**60 VOLTS  
 75, 90 WATTS**

**MAXIMUM RATINGS**

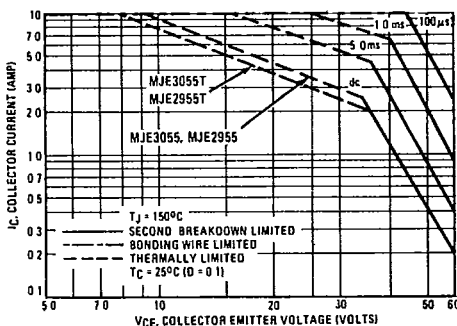
Rating	Symbol	Value	Unit
Collector-Emitter Voltage	$V_{CEO}$	60	Vdc
Collector-Base Voltage	$V_{CB}$	70	Vdc
Emitter-Base Voltage	$V_{EB}$	5.0	Vdc
Collector Current	$I_C$	10	Adc
Base Current	$I_B$	6.0	Adc
Total Power Dissipation @ $T_C = 25^\circ\text{C}$	$P_{D(T)}$		Watts
MJE3055, MJE2955		90	W/°C
MJE3055T, MJE2955T		75	W/°C
Derate above 25°C			
MJE3055, MJE2955		0.72	W/°C
MJE3055T, MJE2955T		0.6	W/°C
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-55 to +150	°C

**THERMAL CHARACTERISTICS**

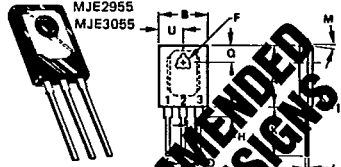
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$\theta_{JC}$	1.39	°C/W
MJE3055, MJE2955		1.67	°C/W
MJE3055T, MJE2955T			

Safe Area Curves are indicated by Figure 1. Both limits are applicable and must be observed

**FIGURE 1 - ACTIVE-REGION SAFE OPERATING AREA**



These 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. The transistor must not be subjected to greater dissipation than the curves indicate. The data of Figure 1 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  $T_{J(pk)} \leq 150^\circ\text{C}$ . At high case temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by second breakdown (See AN 415A).

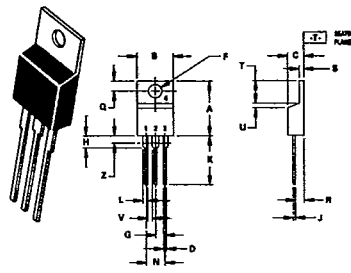


STYLE 2  
 PIN 1 EMITTER  
 2 COLLECTOR  
 3 BASE

**NOT RECOMMENDED  
 FOR NEW DESIGNS**

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.6	2.3	0.635	0.645
B	1.3	1.3	0.495	0.505
C	1.3	1.3	0.125	0.135
D	1.05	1.24	0.043	0.049
E	1.51	1.76	0.139	0.149
F	4.72	6.50	0.164	0.256
G	2.67	2.92	0.105	0.115
H	0.813	0.864	0.032	0.034
K	15.11	16.38	0.595	0.645
M	90	TYPE		
N	4.70	4.95	0.185	0.195
R	1.91	2.16	0.075	0.085
U	6.27	6.48	0.245	0.255
V	2.03	-	0.080	-

**CASE 90-05  
 TO-225AB TYPE  
 (TO-127 TYPE)**



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	14.4	15.72	0.570	0.620
B	3.08	4.28	0.300	0.400
C	4.07	3.87	0.160	0.153
D	6.54	0.00	0.255	0.000
E	3.61	3.73	0.142	0.147
F	2.12	2.68	0.084	0.106
G	7.80	3.83	0.310	0.150
H	0.96	0.91	0.038	0.036
I	12.90	14.27	0.508	0.562
L	1.15	1.30	0.045	0.051
M	4.50	5.00	0.177	0.197
N	2.54	3.00	0.100	0.118
R	20.4	23.9	0.800	0.940
S	0.335	1.20	0.013	0.047
T	5.97	6.47	0.235	0.255
U	8.00	1.2	0.315	0.047
V	1.15	-	0.045	-
W	1.20	-	0.047	-

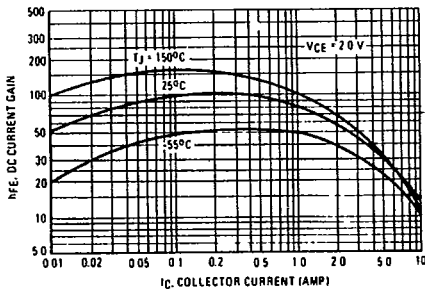
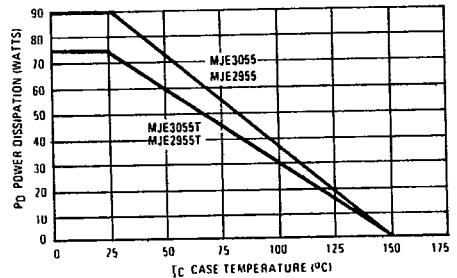
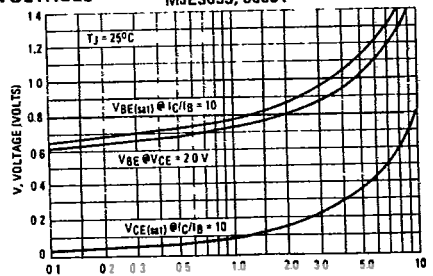
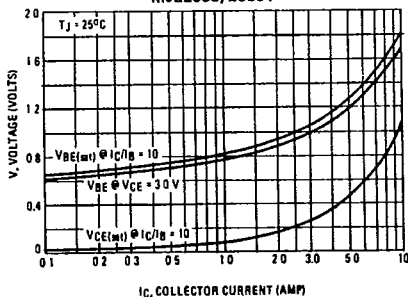
STYLE 1  
 PIN 1 BASE  
 2 COLLECTOR  
 3 EMITTER  
 4 COLLECTOR

NOTES:  
 1. OVERSHOOTS AND TOLERANCES PER ANSI Y14.5M, 1982.  
 2. CONTROLLING DIMENSION IS IN.  
 3. DIM 2 DETERMINES A ZONE WHERE ALL BODY AND LEAD BREAK PARTS ARE ALLOWED.

**ELECTRICAL CHARACTERISTICS ( $T_C = 25^\circ\text{C}$  unless otherwise noted)**

Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>				
Collector-Emitter Sustaining Voltage (1) ( $I_C = 200\text{ mA}$ , $I_B = 0$ )	$V_{CE(sus)}$	60	—	Vdc
Collector Cutoff Current ( $V_{CE} = 30\text{ Vdc}$ , $I_B = 0$ )	$I_{CEO}$	—	700	$\mu\text{Adc}$
Collector Cutoff Current ( $V_{CE} = 70\text{ Vdc}$ , $V_{EB(off)} = 1.5\text{ Vdc}$ ) ( $V_{CE} = 70\text{ Vdc}$ , $V_{EB(off)} = 1.5\text{ Vdc}$ , $T_C = 150^\circ\text{C}$ )	$I_{CEX}$	—	1.0 5.0	mAdc
Collector Cutoff Current ( $V_{CB} = 70\text{ Vdc}$ , $I_E = 0$ ) ( $V_{CB} = 70\text{ Vdc}$ , $I_E = 0$ , $T_C = 150^\circ\text{C}$ )	$I_{CBO}$	—	1.0 10	mAdc
Emitter Cutoff Current ( $V_{BE} = 5.0\text{ Vdc}$ , $I_C = 0$ )	$I_{EBO}$	—	5.0	mAdc
<b>ON CHARACTERISTICS</b>				
DC Current Gain (1) ( $I_C = 4.0\text{ Adc}$ , $V_{CE} = 4.0\text{ Vdc}$ ) ( $I_C = 10\text{ Adc}$ , $V_{CE} = 4.0\text{ Vdc}$ )	$h_{FE}$	20 5.0	100 —	—
Collector-Emitter Saturation Voltage (1) ( $I_C = 4.0\text{ Adc}$ , $I_B = 0.4\text{ Adc}$ ) ( $I_C = 10\text{ Adc}$ , $I_B = 3.3\text{ Adc}$ )	$V_{CE(sat)}$	—	1.1 8.0	Vdc
Base-Emitter On Voltage (1) ( $I_C = 4.0\text{ Adc}$ , $V_{CE} = 4.0\text{ Vdc}$ )	$V_{BE(on)}$	—	1.8	Vdc
<b>DYNAMIC CHARACTERISTICS</b>				
Current-Gain-Bandwidth Product ( $I_C = 500\text{ mA}$ , $V_{CE} = 10\text{ Vdc}$ , $f = 500\text{ kHz}$ )	$f_T$	2.0	—	MHz

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

**FIGURE 2 – DC CURRENT GAIN**

**FIGURE 3 – POWER DERATING**

**MJE2955, 2955T**
**FIGURE 4 – "ON" VOLTAGES**
**MJE3055, 3055T**

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