

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 —
 $f_T = 2.0 \text{ MHz (Min) @ } I_C = 500 \text{ mAdc}$

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 @ $T_C = 25^\circ\text{C}$ Derate above 25°C MJE3055T, MJE2955T	$P_{D\ddagger}$	75 0.6	Watts 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	θ_{JC}	1.67	$^\circ\text{C/W}$

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

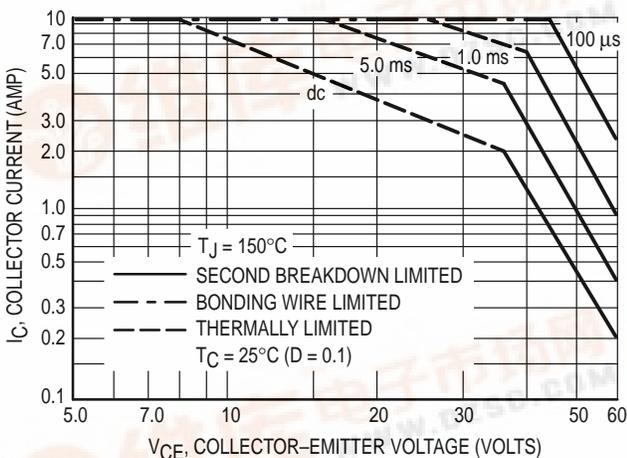
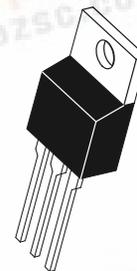


Figure 1. Active-Region Safe Operating Area

PNP
MJE2955T*
NPN
MJE3055T*

*Motorola Preferred Device

10 AMPERE
COMPLEMENTARY
SILICON
POWER TRANSISTORS
60 VOLTS
75 WATTS



CASE 221A-06
TO-220AB

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 1 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 limitations will reduce the power that can be handled to values less than the limitations imposed by second breakdown. (See AN415A)

MJE2955T MJE3055T

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector–Emitter Sustaining Voltage (1) (I _C = 200 mAdc, I _B = 0)	V _{CEO(sus)}	60	—	Vdc
Collector Cutoff Current (V _{CE} = 30 Vdc, I _B = 0)	I _{CEO}	—	700	μAdc
Collector Cutoff Current (V _{CE} = 70 Vdc, V _{EB(off)} = 1.5 Vdc) (V _{CE} = 70 Vdc, V _{EB(off)} = 1.5 Vdc, T _C = 150°C)	I _{CEX}	—	1.0 5.0	mAdc
Collector Cutoff Current (V _{CB} = 70 Vdc, I _E = 0) (V _{CB} = 70 Vdc, I _E = 0, T _C = 150°C)	I _{CBO}	—	1.0 10	mAdc
Emitter Cutoff Current (V _{BE} = 5.0 Vdc, I _C = 0)	I _{EBO}	—	5.0	mAdc
ON CHARACTERISTICS				
DC Current Gain (1) (I _C = 4.0 Adc, V _{CE} = 4.0 Vdc) (I _C = 10 Adc, V _{CE} = 4.0 Vdc)	h _{FE}	20 5.0	100 —	—
Collector–Emitter Saturation Voltage (1) (I _C = 4.0 Adc, I _B = 0.4 Adc) (I _C = 10 Adc, I _B = 3.3 Adc)	V _{CE(sat)}	—	1.1 8.0	Vdc
Base–Emitter On Voltage (1) (I _C = 4.0 Adc, V _{CE} = 4.0 Vdc)	V _{BE(on)}	—	1.8	Vdc
DYNAMIC CHARACTERISTICS				
Current–Gain–Bandwidth Product (I _C = 500 mAdc, V _{CE} = 10 Vdc, f = 500 kHz)	f _T	2.0	—	MHz

(1) Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 20%.

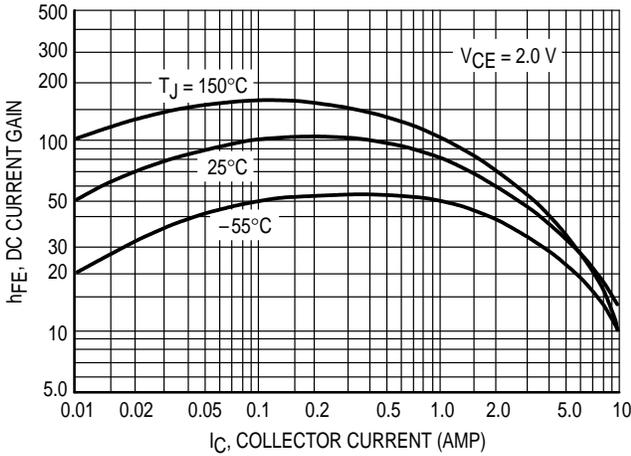


Figure 2. DC Current Gain

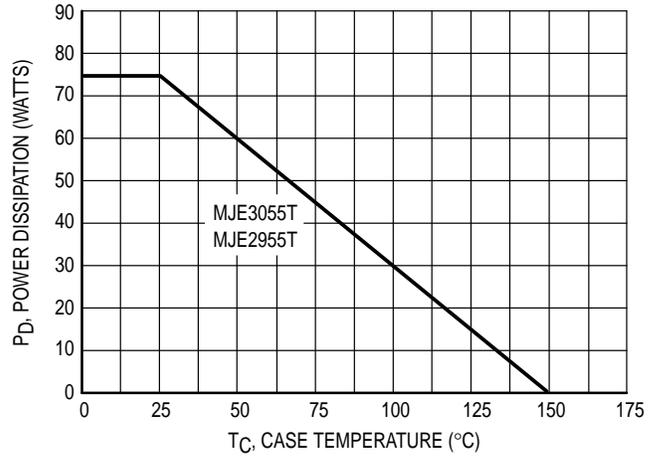


Figure 3. Power Derating

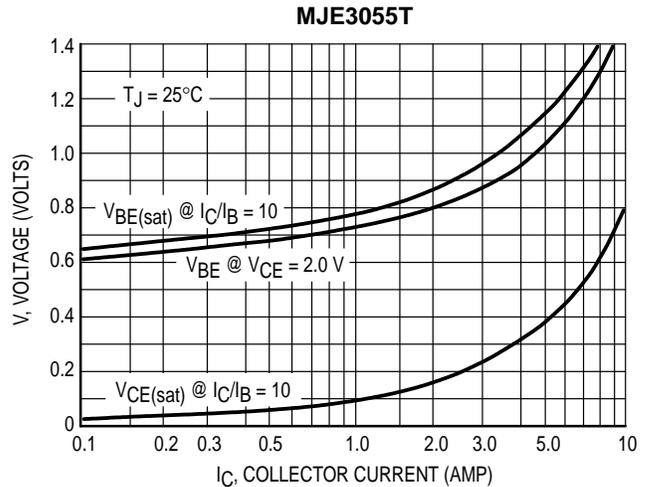
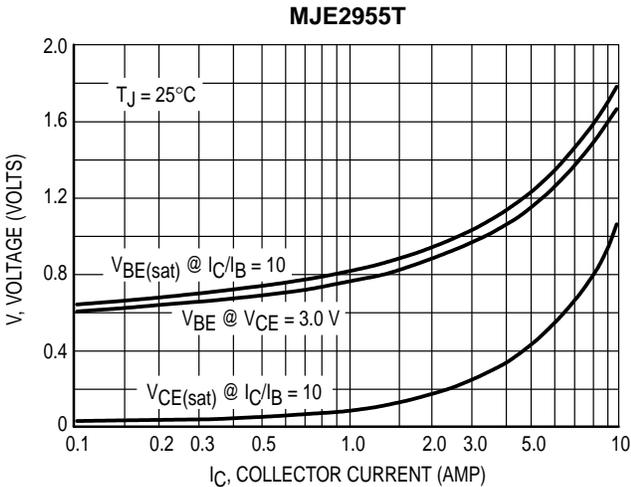
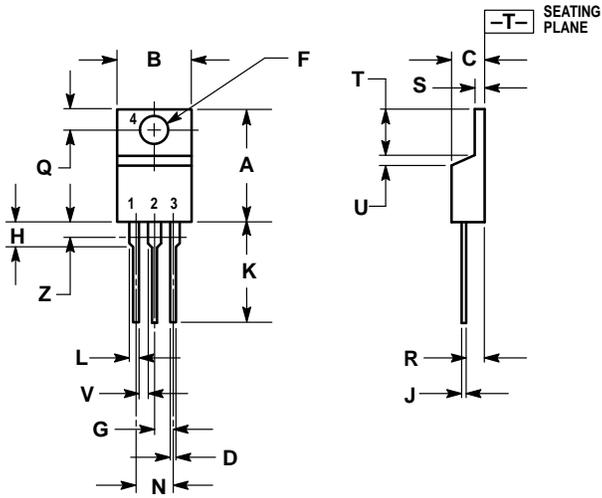


Figure 4. "On" Voltages

PACKAGE DIMENSIONS



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.
 3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.570	0.620	14.48	15.75
B	0.380	0.405	9.66	10.28
C	0.160	0.190	4.07	4.82
D	0.025	0.035	0.64	0.88
F	0.142	0.147	3.61	3.73
G	0.095	0.105	2.42	2.66
H	0.110	0.155	2.80	3.93
J	0.018	0.025	0.46	0.64
K	0.500	0.562	12.70	14.27
L	0.045	0.060	1.15	1.52
N	0.190	0.210	4.83	5.33
Q	0.100	0.120	2.54	3.04
R	0.080	0.110	2.04	2.79
S	0.045	0.055	1.15	1.39
T	0.235	0.255	5.97	6.47
U	0.000	0.050	0.00	1.27
V	0.045	—	1.15	—
Z	—	0.080	—	2.04

- STYLE 1:
1. BASE
 2. COLLECTOR
 3. EMITTER
 4. COLLECTOR

**CASE 221A-06
TO-220AB
ISSUE Y**

MJE2955T MJE3055T

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