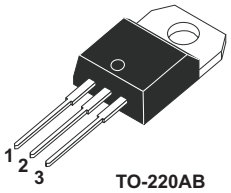
Complementary Silicon power transistors
(10A / 60V / 75W)

FEATURES

- Designed for general-purpose switching and amplifier applications.
- DC current gain specified to 10A
- High current gain-Band width product:
  f_T = 2 MHz (Min.) @ I_C = 0.5 Adc
- Excellent safe operating area



TO-220AB

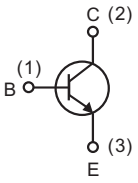
DESCRIPTION

The MJE3055A is a silicon epitaxial-base planar NPN transistor in TO-220AB package.

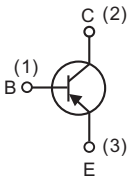
It is intended for use in general-purpose amplifier and switding applications.

The complementary PNP type is MJE2955A.

INTERNAL SCHEMATIC DIAGRAM



MJE3055A(NPN)



MJE2955A(PNP)

ABSOLUTE MAXIMUM RATINGS (T_C = 25°C unless otherwise specified)				
SYMBOL	PARAMETER		VALUE	UNIT
V_{CBO}	Collector to base voltage (I_E = 0)		70	V
V_{CEO}	Collector to emitter voltage (I_B = 0)		60	
V_{EBO}	Emitter to base voltage		5.0	
I_C	Collector current		10	A
I_B	Base current		6	
P_C	Total power dissipation	T_C= 25°C	75	W
	Derate above 25ºC		0.6	W/ºC
T_j	Junction temperature		150	ºC
T_{stg}	Storage temperature		-55 to 150	

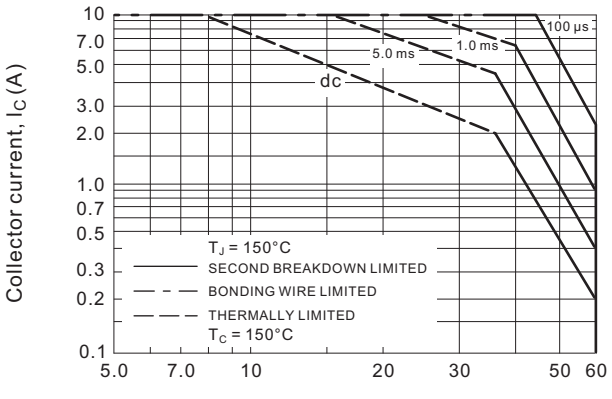
*For PNP types voltage and current values are negative.

THERMAL CHARACTERISTICS (T_C = 25°C unless otherwise specified)			
SYMBOL	PARAMETER	VALUE	UNIT
$R_{th(j-c)}$	Maximum thermal resistance, junction to case	1.70	ºC/W

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise specified)					
SYMBOL	**PARAMETER**	**CONDITIONS**	**MIN**	**MAX**	**UNIT**
◎ OFF CHARACTERISTICS					
I_{CEX}	Collector cutoff current	V_{CE} = 70V, V_{BE} = 1.5V		1.0	mA
		V_{CE} = 70V, V_{BE} = 1.5V, T_C = 150°C		5.0	
I_{CEO}	Collector cutoff current	V_{CE} = 30V, I_B = 0		0.7	
I_{CBO}	Collector cutoff current	V_{CB} = 70V, I_E = 0		1.0	
		V_{CB} = 70V, I_E = 0, T_C = 150°C		10	
I_{EBO}	Emitter cutoff current	V_{EBO} = 5V, I_C = 0		5.0	
$V_{CEO(SUS)}$*	Collector to emitter sustaining voltage	I_C = 200mA, I_B = 0	60		V
$V_{(BR)CBO}$	Collector to base breakdown voltage	I_E = 0, I_C = 100mA	70		
$V_{(BR)EBO}$	Emitter to base breakdown voltage	I_C = 0, I_E = 100mA	5		
◎ ON CHARACTERISTICS					
h_{FE}	Forward current transfer ratio (DC current gain)	I_C = 4A, V_{CE} = 4V	20	100	
		I_C = 10A, V_{CE} = 4V	5		
$V_{CE(sat)}$*	Collector to emitter saturation voltage	I_C = 4A, I_B = 400mA		1.1	V
		I_C = 10A, I_B = 3.3A		8.0	
$V_{BE(on)}$*	Base to emitter on voltage	I_C = 4A, V_{CE} = 4V		1.8	
◎ DYNAMIC CHARACTERISTICS					
f_T	Transition frequency (Current gain- Bandwidth product)	I_C = 0.5A, V_{CE} = 10V, f = 500KHz	2.0		MHz
$I_{s/b}$*	Second breakdown collector current with base forward baised	V_{CE} = 40V, t = 1.0s	2.87		A

*Pulsed : Pulse duration = 300 μs, duty cycle ≤ 20%.
*For PNP types voltage and current values are negative.

Fig.1 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 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 $T_{J(pk)}$ ≤ 150°C. At high case temperatures, thermal limitations wil l reduce the power that can be handled to values less than the limitations imposed by second breakdown.

Fig.2. DC current gain

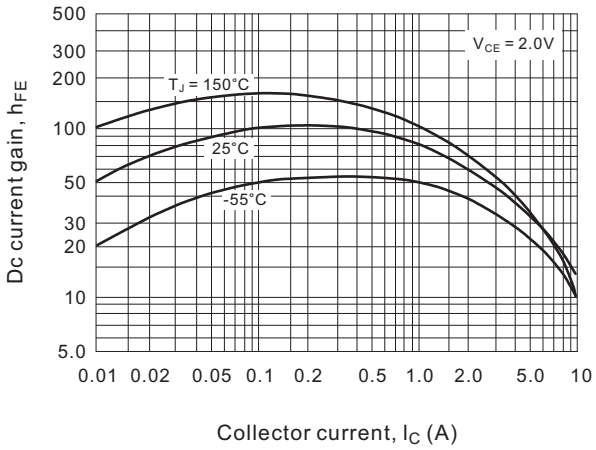


Fig.3 Power derating

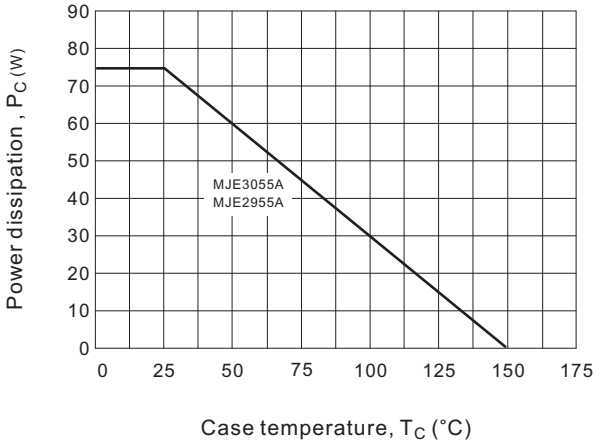
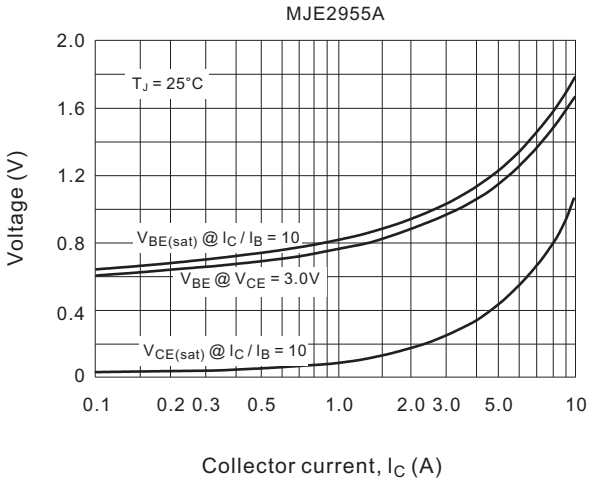
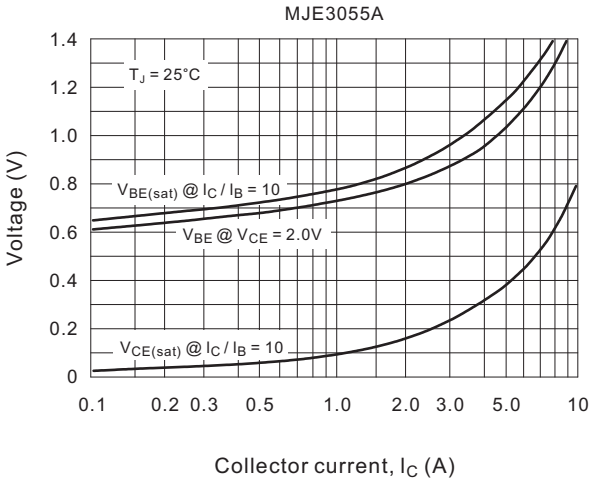


Fig.4 "On" Voltages





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