

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

FEATURES

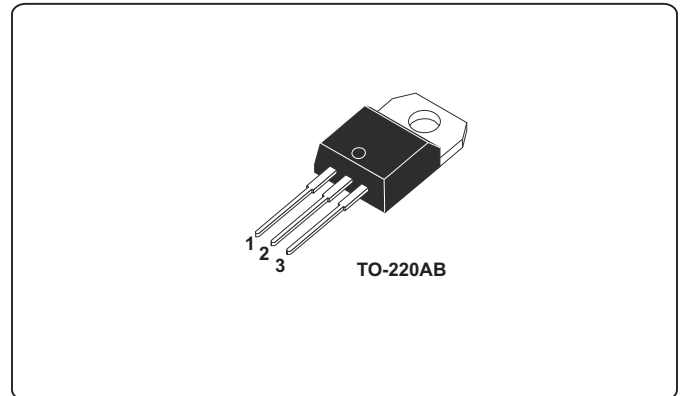
- Designed for general-purpose switching and amplifier applications.
- DC current gain specified to 10A
- High current gain-Band width product:
 $f_T = 2 \text{ MHz (Min.) @ } I_C = 0.5 \text{ Adc}$
- Excellent safe operating area

DESCRIPTION

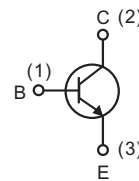
The MJE3055A is a silicon epitaxial-base planar NPN transistor in TO-220AB package.

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

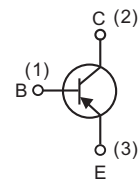
The complementary PNP type is MJE2955A.



INTERNAL SCHEMATIC DIAGRAM



MJE3055A(NPN)



MJE2955A(PNP)

ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$ unless otherwise specified)			
SYMBOL	PARAMETER		UNIT
V_{CBO}	Collector to base voltage ($I_E = 0$)		V
V_{CEO}	Collector to emitter voltage ($I_B = 0$)		
V_{EBO}	Emitter to base voltage		
I_C	Collector current		A
I_B	Base current		
P_C	Total power dissipation	$T_C = 25^\circ\text{C}$	W
	Derate above 25°C		W/ $^\circ\text{C}$
T_j	Junction temperature		$^\circ\text{C}$
T_{stg}	Storage temperature		

*For PNP types voltage and current values are negative.

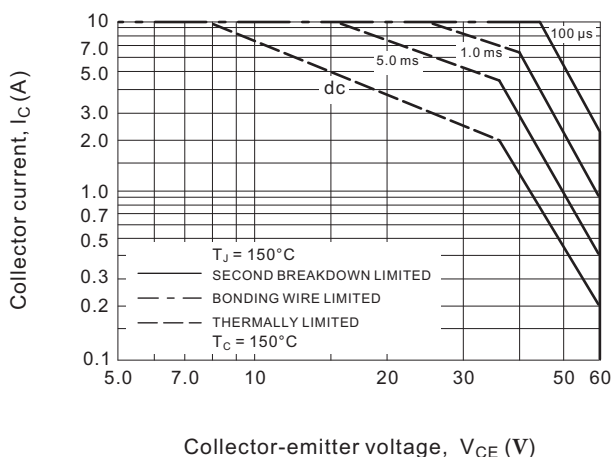
THERMAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise specified)			
SYMBOL	PARAMETER	VALUE	UNIT
$R_{th(j-c)}$	Maximum thermal resistance, junction to case	1.70	$^\circ\text{C/W}$

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

*Pulsed : Pulse duration = 300 μs , duty cycle $\leq 20\%$.

*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 $T_{J(pk)} = 150^\circ\text{C}$. 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.

Fig.2. DC current gain

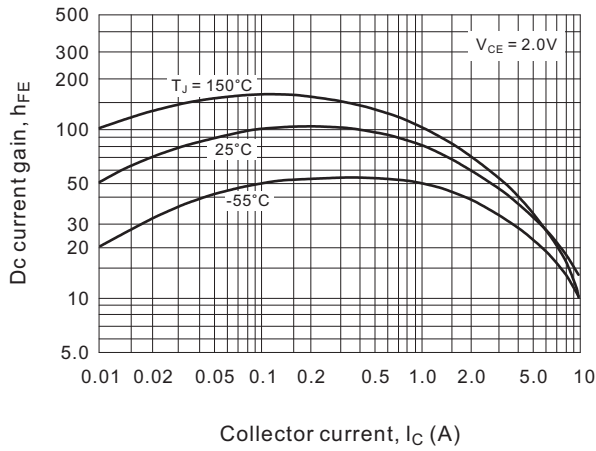


Fig.3 Power derating

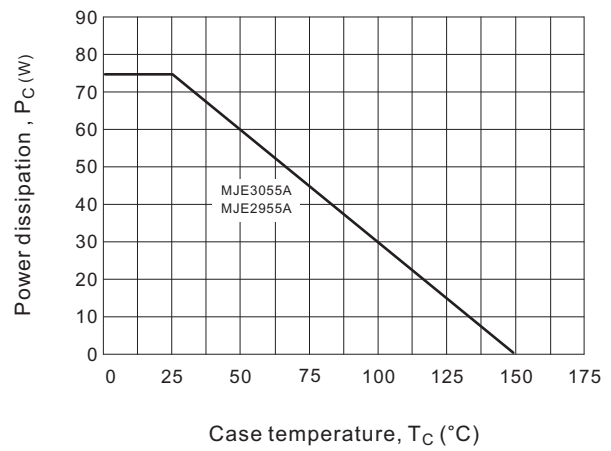


Fig.4 "On" Voltages

