

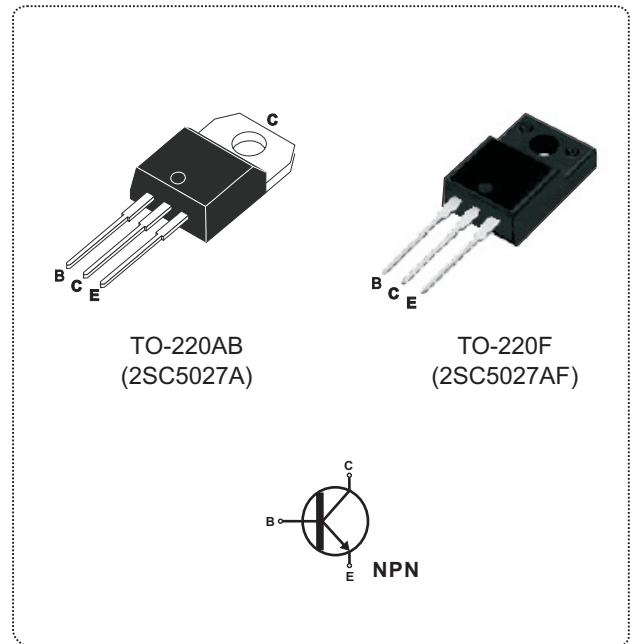
## Silicon NPN triple diffusion planar transistor 3A/ 800V / 50W

### FEATURES

- High-speed switching
- High breakdown voltage and high reliability
- Wide SOA (Safe Operation Area)
- TO-220 package which can be installed to the heat sink with one screw

### APPLICATIONS

- Switching regulator and general purpose



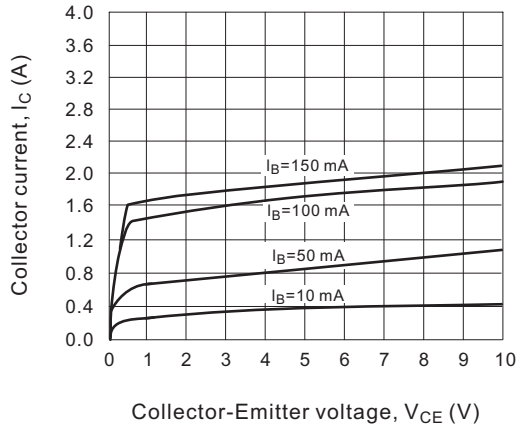
ABSOLUTE MAXIMUM RATINGS ( $T_c = 25^\circ\text{C}$ )			
SYMBOL	PARAMETER	VALUE	UNIT
$V_{CBO}$	Collector to base voltage	850	V
$V_{CEO}$	Collector to emitter voltage	800	
$V_{EBO}$	Emitter to base voltage	7	
$I_{CP}$	Peak collector current ( $PW \leq 300\mu\text{s}$ , duty cycle $\leq 10\%$ )	10	A
$I_C$	Collector current	3	
$I_B$	Base current	1.5	
$P_C$	Collector power dissipation	$T_c = 25^\circ\text{C}$ 50	W
$T_j$	Junction temperature	150	$^\circ\text{C}$
$T_{stg}$	Storage temperature	-55 to 150	

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.  
Absolute maximum ratings are stress ratings only and functional device operation is not implied.

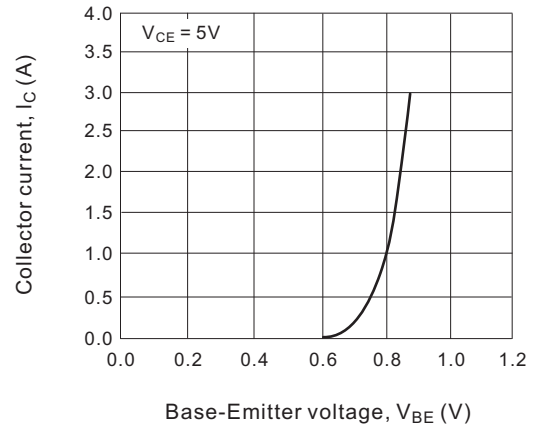
ELECTRICAL CHARACTERISTICS (T <sub>a</sub> = 25°C)						
SYMBOL	PARAMETER	CONDITIONS	VALUE			UNIT
			MIN.	TYP.	MAX.	
V <sub>(BR)CBO</sub>	Collector to base breakdown voltage	I <sub>C</sub> = 1mA, I <sub>E</sub> = 0	850			V
V <sub>(BR)CEO</sub>	Collector to emitter breakdown voltage	I <sub>C</sub> = 5mA, I <sub>B</sub> = 0	800			
V <sub>(BR)EBO</sub>	Emitter to base breakdown voltage	I <sub>E</sub> = 1mA, I <sub>C</sub> = 0	7			
I <sub>CBO</sub>	Collector cutoff current	V <sub>CB</sub> = 800V, I <sub>E</sub> = 0			10	μA
I <sub>EBO</sub>	Emitter cutoff current	V <sub>EB</sub> = 5V, I <sub>C</sub> = 0			10	
V <sub>CEX(SUS)</sub>	Collector to emitter sustaining voltage	I <sub>C</sub> = 1.5A, L = 2mH, I <sub>B1</sub> = 0.3A, I <sub>B2</sub> = -0.3A, clamped	800			V
V <sub>CE(sat)</sub>	Collector to emitter saturation voltage	I <sub>C</sub> = 1.5A, I <sub>B</sub> = 0.3A			2	V
V <sub>BE(sat)</sub>	Base to emitter saturation voltage	I <sub>C</sub> = 1.5A, I <sub>B</sub> = 0.3A			1.5	
f <sub>T</sub>	Transition frequency (Gain-Bandwidth product)	V <sub>CE</sub> = 10V, I <sub>C</sub> = 0.2A		15		MHz
C <sub>ob</sub>	Output capacitance	V <sub>CB</sub> = 10V, f = 1MHz, I <sub>E</sub> = 0		60		pF
t <sub>on</sub>	Turn-on time	I <sub>C</sub> = 2A, I <sub>B1</sub> = 0.4A, I <sub>B2</sub> = -0.8A V <sub>CC</sub> = 400V, R <sub>L</sub> = 200Ω			0.5	μs
t <sub>stg</sub>	Storage time				3.0	
t <sub>f</sub>	Fall time				0.3	
h <sub>FE1</sub>	DC current gain	V <sub>CE</sub> = 5V, I <sub>C</sub> = 0.2A	Rank-N	10		20
			Rank-R	15		30
			Rank-O	20		40
h <sub>FE2</sub>		V <sub>CE</sub> = 5V, I <sub>C</sub> = 1A	10			

ORDERING INFORMATION SCHEME	
<p><b>2SC 5027 A - R</b></p>	
<p><b>Transistor series</b> NPN Type</p>	<p>2SC</p>
<p><b>Current &amp; Voltage rating, I<sub>C</sub> &amp; V<sub>CEO</sub></b> 3A / 800V</p>	<p>5027</p>
<p><b>Package type</b> A = TO-220AB AF = TO-220F</p>	<p>A</p>
<p><b>DC current gain rank, h<sub>FE1</sub></b> N = 10 ~ 20 R = 15 ~ 30 O = 20 ~ 40</p>	<p>R</p>

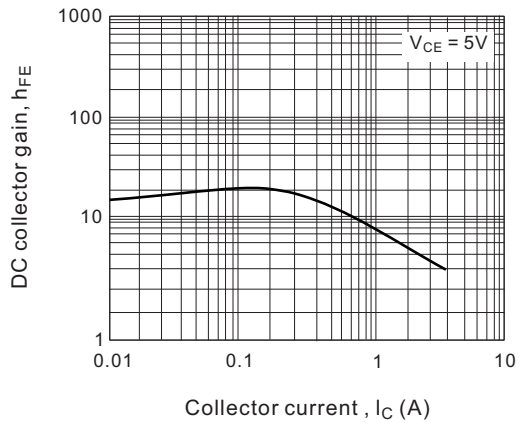
**Fig.1  $I_C - V_{CE}$  characteristics**



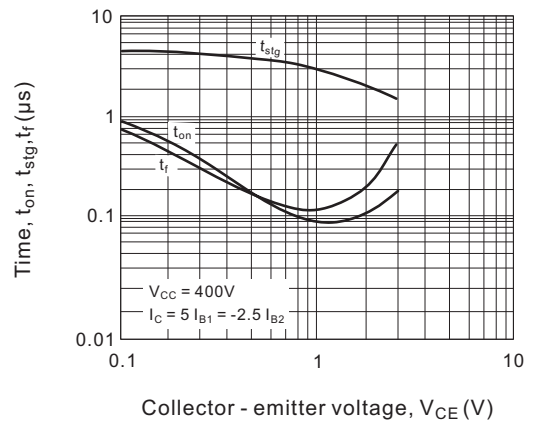
**Fig.2  $I_C - V_{BE}$  characteristics**



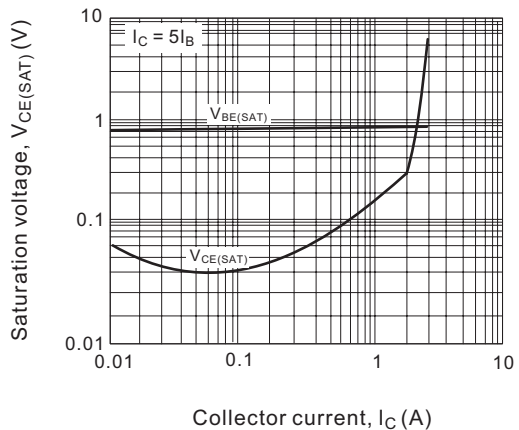
**Fig.3  $h_{FE} - I_C$  characteristics**



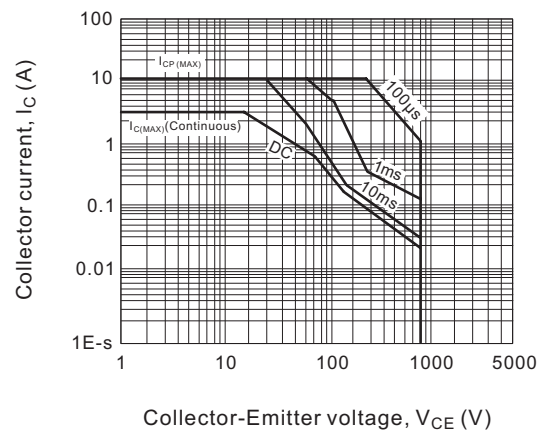
**Fig.4 Switching time -  $V_{CE}$  characteristics**



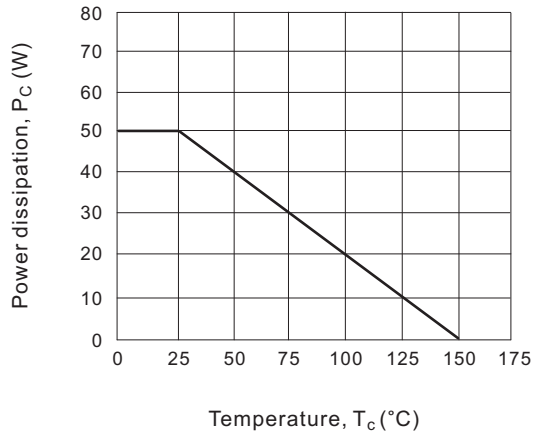
**Fig.5  $V_{BE(sat)} / V_{CE(sat)} - I_C$  characteristics**



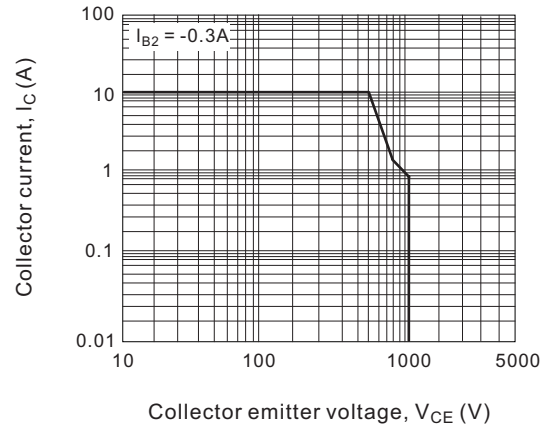
**Fig.6 Safe operating area (SOA)**



**Fig.7 P<sub>C</sub> - T<sub>C</sub> derating**

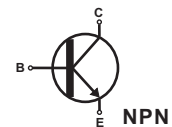
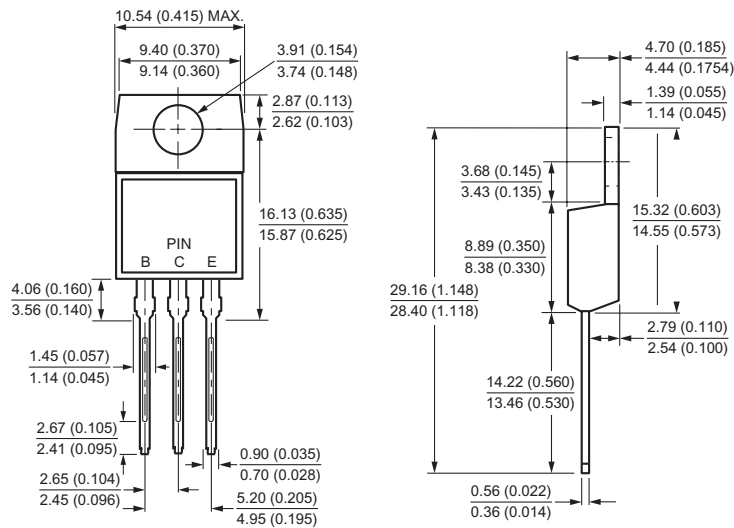


**Fig.8 Reverse bias SOA**



### Case Style

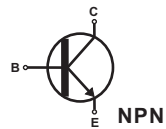
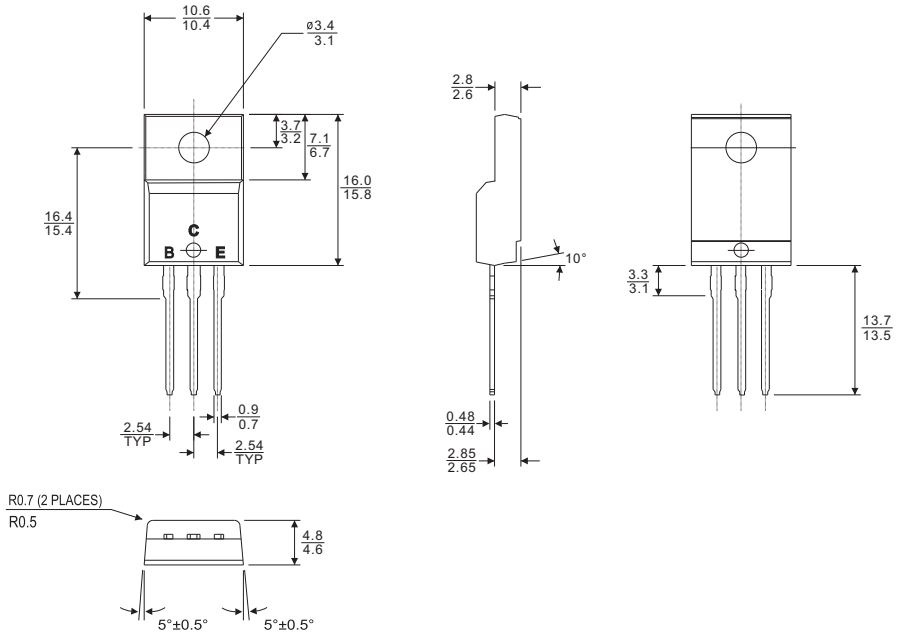
#### TO-220AB



All dimensions in millimeters

**Case Style**

**ITO-220AB**



All dimensions in millimeters