# 2SC3978, 2SC3978A

## Silicon NPN triple diffusion planar type

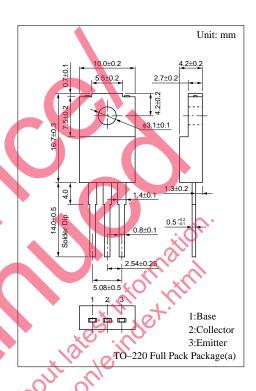
For high breakdown voltage high-speed switching

#### Features

- High-speed switching
- $\bullet \;\;$  High collector to base voltage  $V_{CBO}$
- Wide area of safe operation (ASO)
- Satisfactory linearity of foward current transfer ratio h<sub>FE</sub>
- Full-pack package which can be installed to the heat sink with one screw

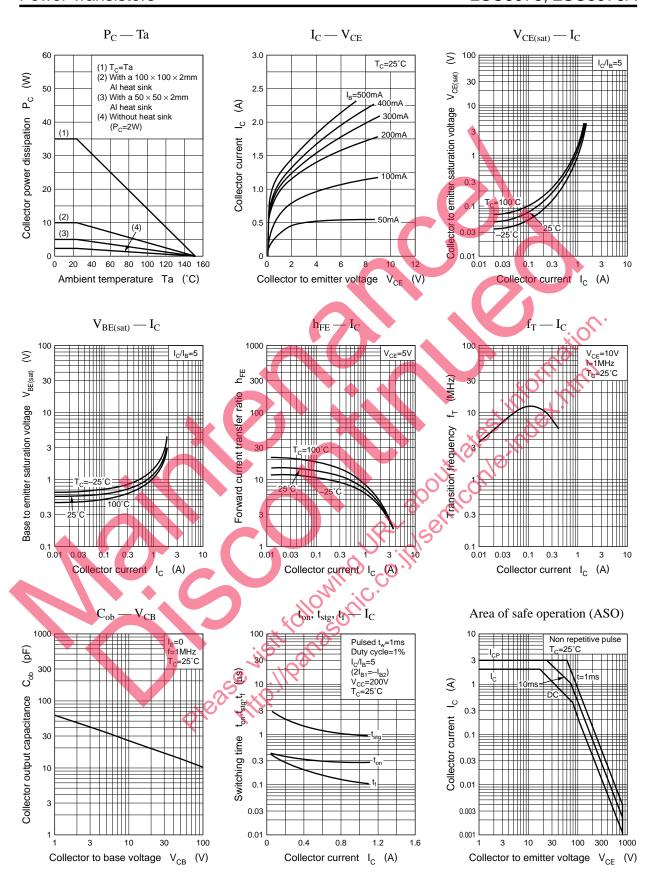
#### Absolute Maximum Ratings (T<sub>C</sub>=25°C)

Parameter		Symbol	Ratings	Unit		
Collector to	2SC3978	V	900			
base voltage	2SC3978A	$V_{CBO}$	1000	V		
Collector to	2SC3978	N/	900	Ay		
emitter voltage	2SC3978A	V <sub>CES</sub>	1000			
Collector to emitter voltage		V <sub>CEO</sub>	800	V		
Emitter to base voltage		$V_{\rm EBO}$	7	V		
Peak collector current		$I_{CP}$	3	A		
Collector current		$I_{C}$	2	A		
Base current		$I_{\rm B}$ 0.5		A		
Collector power	T <sub>C</sub> =25°C	D	35	W		
dissipation	Ta=25°C	P <sub>C</sub>	2	W		
Junction temperature		T <sub>j</sub>	150 N°C			
Storage temperature		T <sub>stg</sub>	−55 to +150 °C			

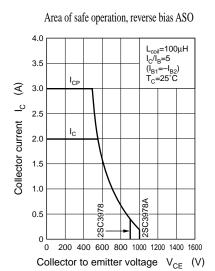


### ■ Electrical Characteristics (T<sub>C</sub>=25°C)

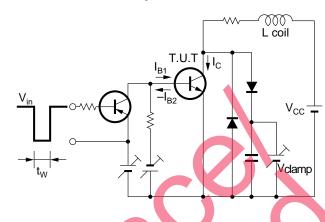
Paramete	er	Symbol	Conditions	min	typ	max	Unit
Collector cutoff	2SC3978	I <sub>CBO</sub>	$V_{\rm CB} = 900  \text{V},  I_{\rm E} = 0$			50	
current	2SC3978A	ICBO	$V_{CB} = 1000V, I_E = 0$			50	μΑ
Emitter cutoff curren	nt	$I_{EBO}$	$V_{EB} = 7V$ , $I_C = 0$			50	μΑ
Collector to emitter v	voltage	V <sub>CEO</sub>	$I_{\rm C} = 10 {\rm mA}, I_{\rm B} = 0$	800			V
Forward current transfer ratio		h <sub>FE1</sub>	$V_{CE} = 5V, I_{C} = 0.1A$	8			
		h <sub>FE2</sub>	$V_{CE} = 5V, I_{C} = 0.5A$	6			
Collector to emitter saturation voltage		V <sub>CE(sat)</sub>	$I_C = 0.5A, I_B = 0.1A$			1.5	V
Base to emitter saturation voltage		V <sub>BE(sat)</sub>	$I_C = 0.5A, I_B = 0.1A$			1.5	V
Transition frequency		$f_{T}$	$V_{CE} = 10V, I_{C} = 0.1A, f = 1MHz$		15		MHz
Turn-on time		t <sub>on</sub>	$I_C = 0.5A, I_{B1} = 0.1A, I_{B2} = -0.2A,$			0.7	μs
Storage time		t <sub>stg</sub>				2.5	μs
Fall time		$t_{\rm f}$	$V_{CC} = 250V$			0.3	μs



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Reverse bias ASO measuring circuit





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