

Silicon PNP Power Transistors

2SB1604 2SB1604A

**DESCRIPTION**

- With TO-220F package
- Low collector saturation voltage
- High speed switching

**APPLICATIONS**

- For low-voltage switching applications

**PINNING**

PIN	DESCRIPTION
1	Base
2	Collector
3	Emitter

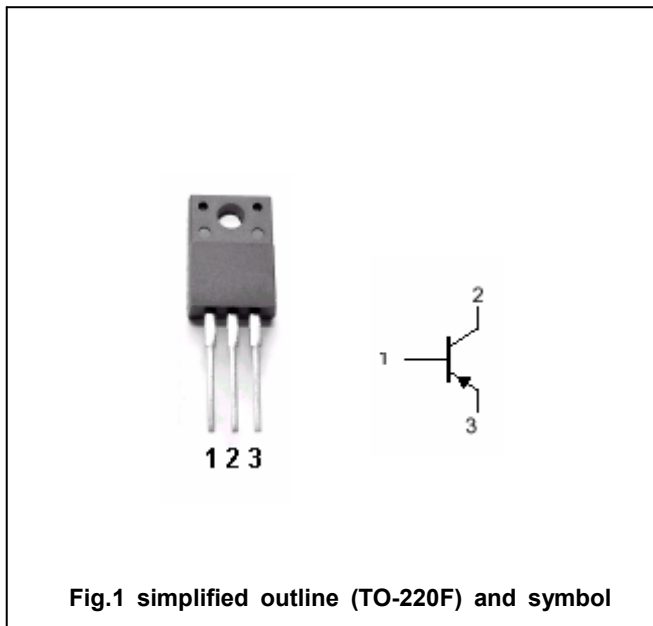


Fig.1 simplified outline (TO-220F) and symbol

**Absolute maximum ratings (Ta=25°C)**

SYMBOL	PARAMETER	CONDITIONS	MAX	UNIT
V <sub>CBO</sub>	Collector-base voltage	2SB1604	-40	V
		2SB1604A	-50	
V <sub>CEO</sub>	Collector-emitter voltage	2SB1604	-20	V
		2SB1604A	-40	
V <sub>EBO</sub>	Emitter-base voltage	Open collector	-5	V
I <sub>C</sub>	Collector current		-10	A
I <sub>CM</sub>	Collector current-peak		-20	A
P <sub>C</sub>	Collector dissipation	T <sub>a</sub> =25°C	2	W
		T <sub>C</sub> =25°C	40	
T <sub>j</sub>	Junction temperature		150	°C
T <sub>stg</sub>	Storage temperature		-55~150	°C

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## CHARACTERISTICS

T<sub>j</sub>=25 °C unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP.	MAX	UNIT
V <sub>(BR)CEO</sub>	Collector-emitter breakdown voltage	2SB1604	-20			V
		2SB1604A	-40			
V <sub>CEsat</sub>	Collector-emitter saturation voltage	I <sub>C</sub> =-10mA ; I <sub>B</sub> =0			-0.6	V
V <sub>BEsat</sub>	Base-emitter saturation voltage	I <sub>C</sub> =-10A ; I <sub>B</sub> =-0.33A			-1.5	V
I <sub>CBO</sub>	Collector cut-off current	V <sub>CB</sub> =-40V ; I <sub>E</sub> =0			-50	μA
I <sub>EBO</sub>	Emitter cut-off current	V <sub>EB</sub> =-5V ; I <sub>C</sub> =0			-50	μA
h <sub>FE-1</sub>	DC current gain	I <sub>C</sub> =-0.1A ; V <sub>CE</sub> =-2V	45			
h <sub>FE-2</sub>	DC current gain	I <sub>C</sub> =-3A ; V <sub>CE</sub> =-2V	90		260	
C <sub>OB</sub>	Output capacitance	I <sub>E</sub> =0 ; V <sub>CB</sub> =-10V ; f=1MHz		400		pF
f <sub>T</sub>	Transition frequency	I <sub>C</sub> =-0.5A ; V <sub>CE</sub> =-10V		100		MHz

## Switching times

t <sub>on</sub>	Turn-on time	I <sub>C</sub> =-3A ; I <sub>B1</sub> =-I <sub>B2</sub> =-0.1A		0.1		μs
t <sub>stg</sub>	Storage time			0.5		μs
t <sub>f</sub>	Fall time			0.1		μs

◆ h<sub>FE-2</sub> Classifications

Q	P
90-180	130-260

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PACKAGE OUTLINE

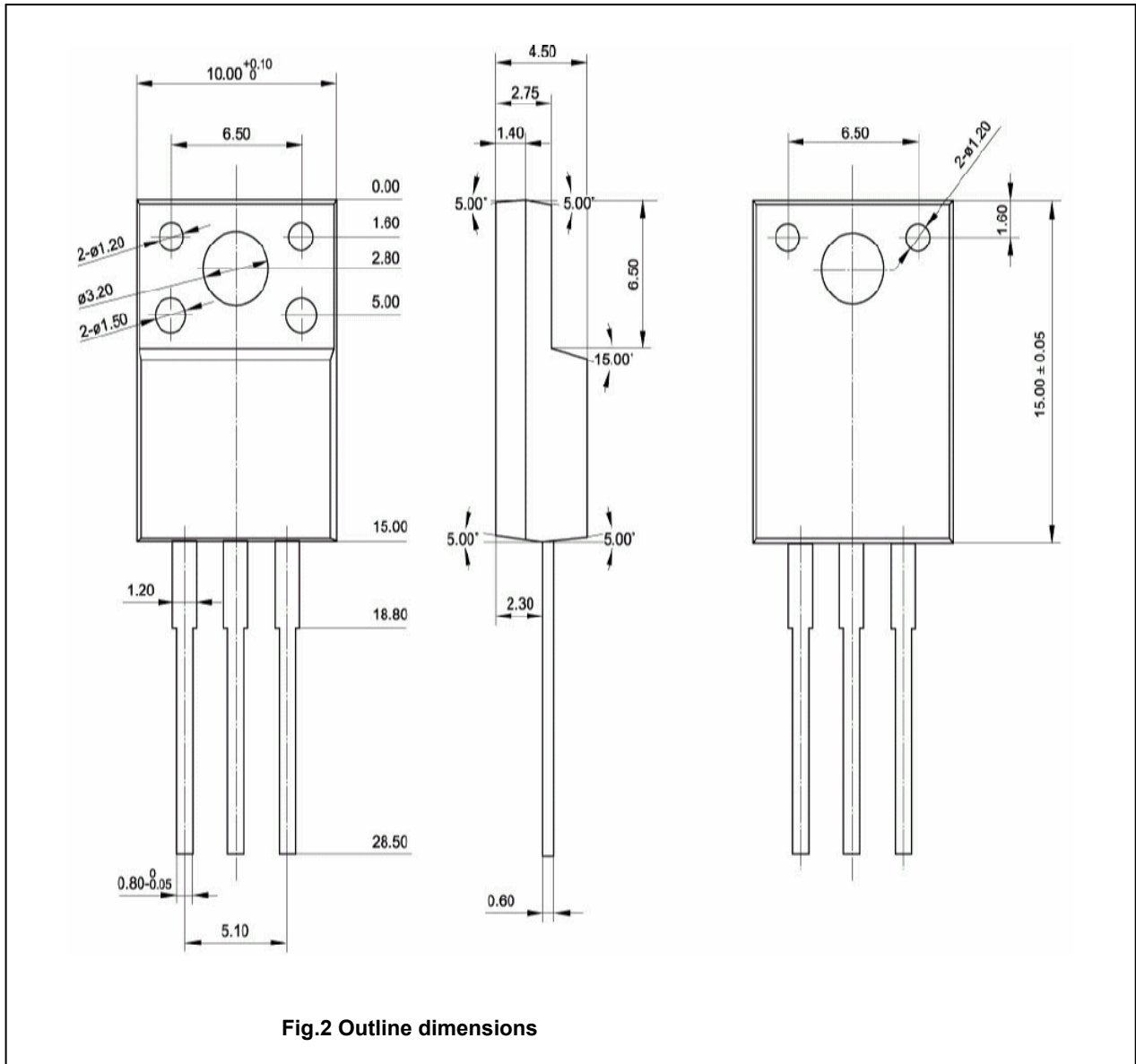


Fig.2 Outline dimensions

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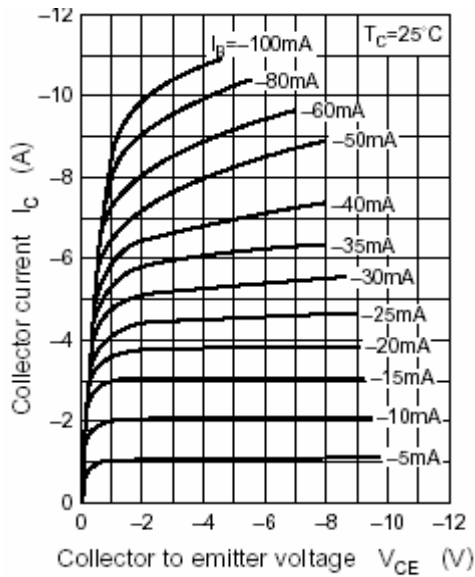


Fig.3 Static Characteristic

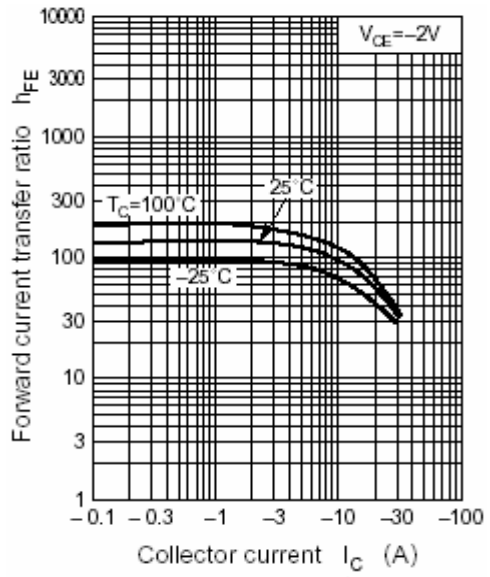


Fig.4 DC current Gain

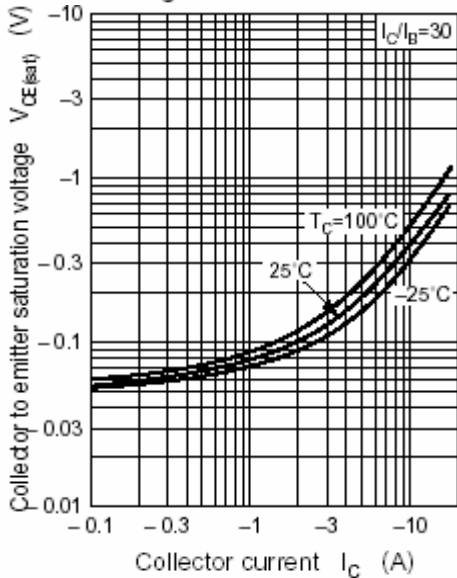


Fig.5 Collector-Emitter Saturation Voltage

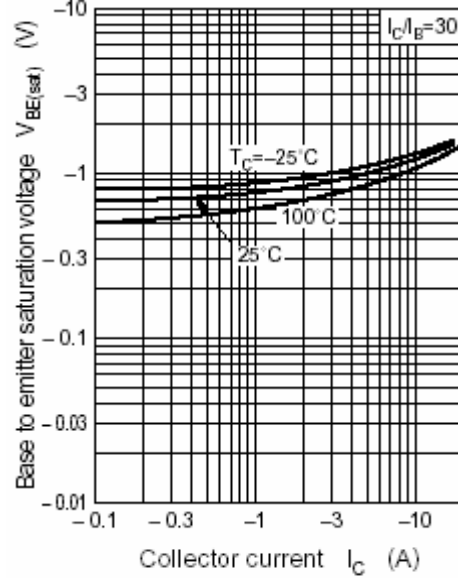


Fig.6 Base-Emitter Saturation Voltage

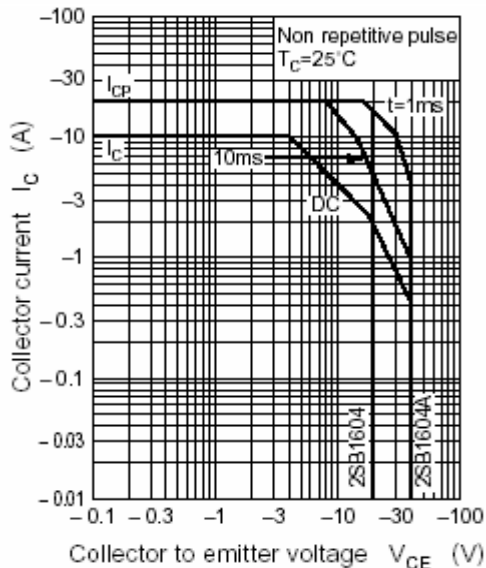


Fig.7 Safe Operating Area