

Silicon PNP Power Transistors

2SB1393 2SB1393A

DESCRIPTION

- With TO-220Fa package
- Satisfactory linearity of  $h_{FE}$
- Low collector to emitter saturation voltage
- Complement to type 2SD1985/1985A

APPLICATIONS

- For power amplification

PINNING

PIN	DESCRIPTION
1	Base
2	Collector
3	Emitter

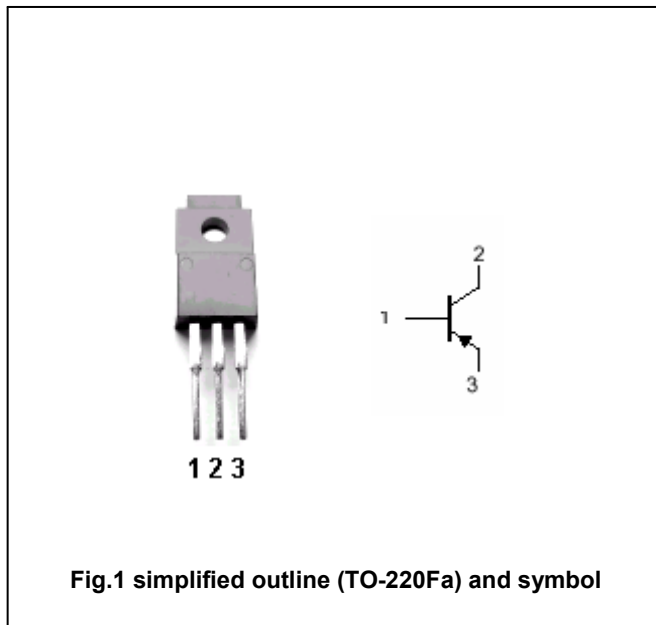


Fig.1 simplified outline (TO-220Fa) and symbol

Absolute maximum ratings( $T_a=25^\circ C$ )

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$V_{CBO}$	Collector-base voltage	2SB1393	-60	V
		2SB1393A	-80	
$V_{CEO}$	Collector-emitter voltage	2SB1393	-60	V
		2SB1393A	-80	
$V_{EBO}$	Emitter-base voltage	Open collector	-5	V
$I_C$	Collector current (DC)		-3	A
$I_{CM}$	Collector current-Peak		-5	A
$P_C$	Collector power dissipation	$T_C=25^\circ C$	25	W
		$T_a=25^\circ C$	2	
$T_j$	Junction temperature		150	$^\circ C$
$T_{stg}$	Storage temperature		-55~150	$^\circ C$

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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	2SB1393	I <sub>C</sub> =-30mA, I <sub>B</sub> =0	-60		V
		2SB1393A		-80		
V <sub>CEsat</sub>	Collector-emitter saturation voltage	I <sub>C</sub> =-3A; I <sub>B</sub> =-0.375A			-1.2	V
V <sub>BE</sub>	Base-emitter voltage	V <sub>CE</sub> =-4V; I <sub>C</sub> =-3A			-1.8	V
I <sub>CES</sub>	Collector cut-off current	2SB1393	V <sub>CE</sub> =-60V; V <sub>BE</sub> =0			μA
		2SB1393A		V <sub>CE</sub> =-80V; V <sub>BE</sub> =0		
I <sub>CEO</sub>	Collector cut-off current	2SB1393	V <sub>CE</sub> =-30V; I <sub>B</sub> =0			μA
		2SB1393A		V <sub>CE</sub> =-60V; I <sub>B</sub> =0		
I <sub>EBO</sub>	Emitter cut-off current	V <sub>EB</sub> =-5V; I <sub>C</sub> =0			-1.0	mA
h <sub>FE-1</sub>	DC current gain	I <sub>C</sub> =-1A; V <sub>CE</sub> =-4V	70		250	
h <sub>FE-2</sub>	DC current gain	I <sub>C</sub> =-3A; V <sub>CE</sub> =-4V	10			
f <sub>T</sub>	Transition frequency	I <sub>C</sub> =-0.1A; V <sub>CE</sub> =-5V; f=1MHz		20		MHz

## Switching times

t <sub>on</sub>	Turn-on time	I <sub>C</sub> =-1A; I <sub>B1</sub> =-0.1A I <sub>B2</sub> =0.1A; V <sub>CE</sub> =-50V		0.5		μs
t <sub>s</sub>	Storage time			1.2		μs
t <sub>f</sub>	Fall time			0.3		μs

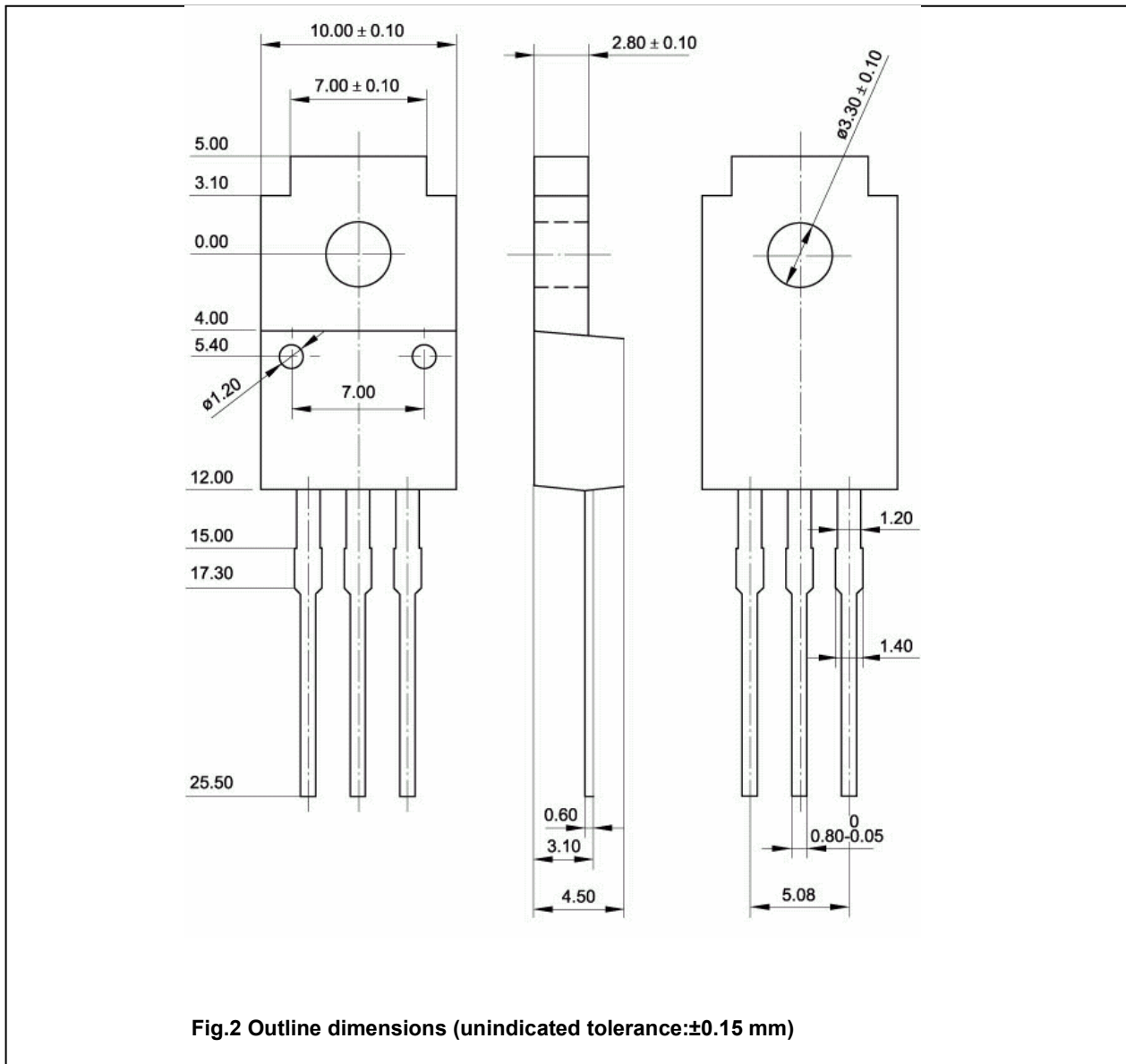
◆ h<sub>FE-1</sub> Classifications

Q	P
70-150	120-250

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PACKAGE OUTLINE



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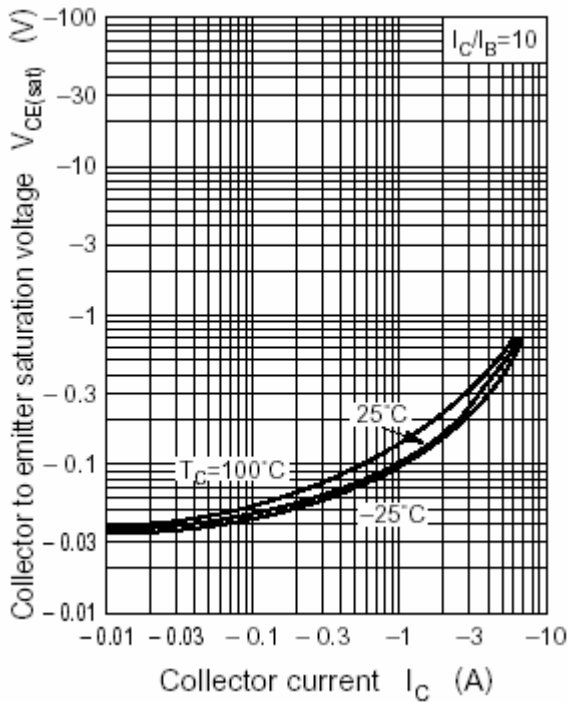


Fig.3 Collector-Emitter Saturation Voltage

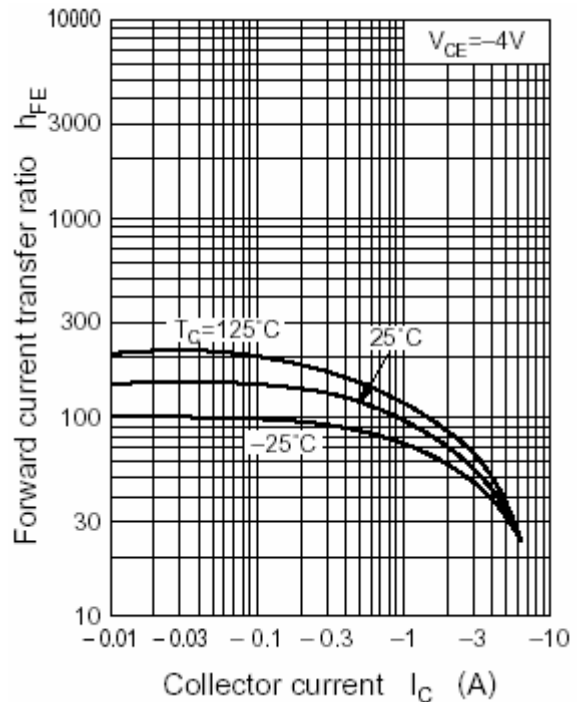


Fig.4 DC current Gain

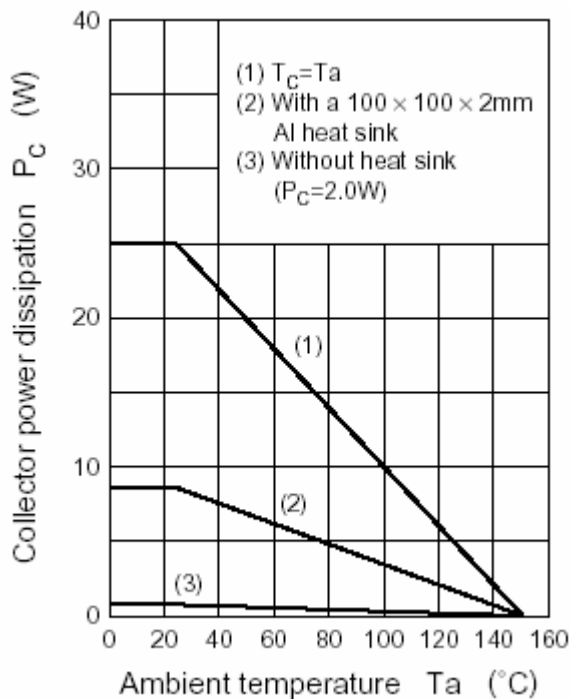


Fig.5  $P_C$ - $T_a$  Derating

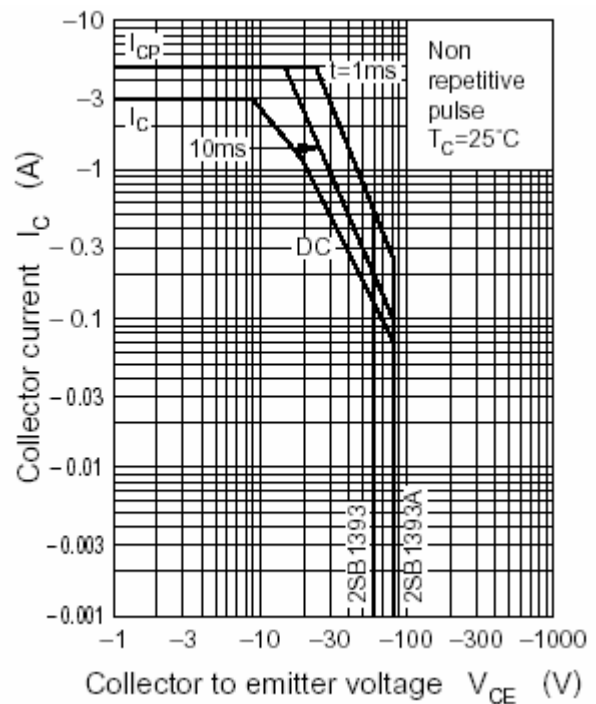


Fig.6 Safe Operating Area