

## Silicon NPN Power Transistors

2SD2000

## DESCRIPTION

- With TO-220Fa package
- High-speed switching
- Large collector power dissipation

## APPLICATIONS

- For power switching applications

## PINNING

PIN	DESCRIPTION
1	Base
2	Collector
3	Emitter

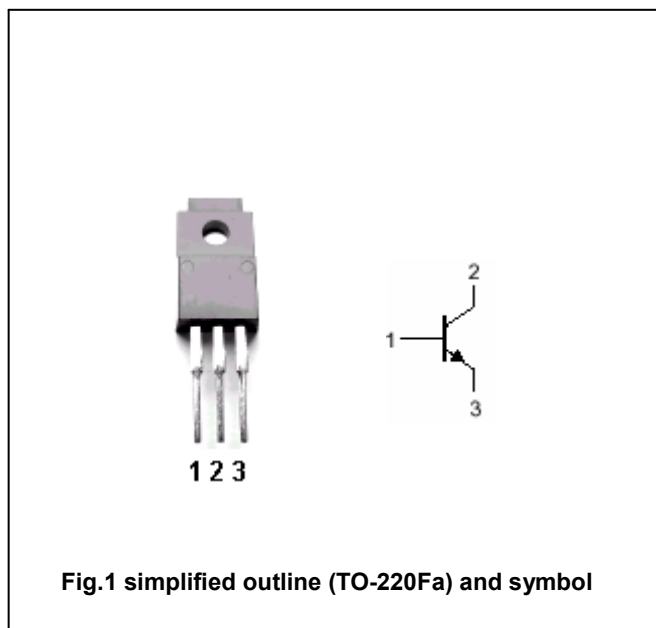


Fig.1 simplified outline (TO-220Fa) and symbol

ABSOLUTE MAXIMUM RATINGS AT  $T_c=25^\circ\text{C}$ 

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$V_{CBO}$	Collector-base voltage	Open emitter	80	V
$V_{CEO}$	Collector-emitter voltage	Open base	60	V
$V_{EBO}$	Emitter-base voltage	Open collector	6	V
$I_C$	Collector current		4	A
$I_{CM}$	Collector current-peak		8	A
$I_B$	Base current		1	A
$P_C$	Collector power dissipation	$T_c=25^\circ\text{C}$	35	W
		$T_a=25^\circ\text{C}$	2	
$T_j$	Junction temperature		150	$^\circ\text{C}$
$T_{stg}$	Storage temperature		-55~150	$^\circ\text{C}$

## Silicon NPN Power Transistors

## 2SD2000

## CHARACTERISTICS

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 $T_j=25^\circ\text{C}$  unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP.	MAX	UNIT
$V_{(BR)CEO}$	Collector-emitter breakdown voltage	$I_C=25\text{mA}$ , $I_B=0$	60			V
$V_{CEsat}$	Collector-emitter saturation voltage	$I_C=4\text{A}$ ; $I_B=0.4\text{A}$			1.5	V
$V_{BEsat}$	Base-emitter saturation voltage	$I_C=4\text{A}$ ; $I_B=0.4\text{A}$			2.0	V
$I_{CBO}$	Collector cut-off current	$V_{CB}=80\text{V}$ ; $I_E=0$			100	$\mu\text{A}$
$I_{EBO}$	Emitter cut-off current	$V_{EB}=6\text{V}$ ; $I_C=0$			100	$\mu\text{A}$
$h_{FE-1}$	DC current gain	$I_C=1\text{A}$ ; $V_{CE}=4\text{V}$	70		250	
$h_{FE-2}$	DC current gain	$I_C=4\text{A}$ ; $V_{CE}=4\text{V}$	20			
$f_T$	Transition frequency	$I_C=0.2\text{A}$ ; $V_{CE}=12\text{V}$ ; $f=10\text{MHz}$		80		MHz

## Switching times

$t_{on}$	Turn-on time	$I_C=4\text{A}$ ; $I_{B1}=0.4\text{A}$ $I_{B2}=-0.4\text{A}$ ; $V_{CC}=50\text{V}$		0.3		$\mu\text{s}$
$t_s$	Storage time			1.0		$\mu\text{s}$
$t_f$	Fall time			0.2		$\mu\text{s}$

◆  $h_{FE-1}$  Classifications

Q	P
70-150	120-250

PACKAGE OUTLINE

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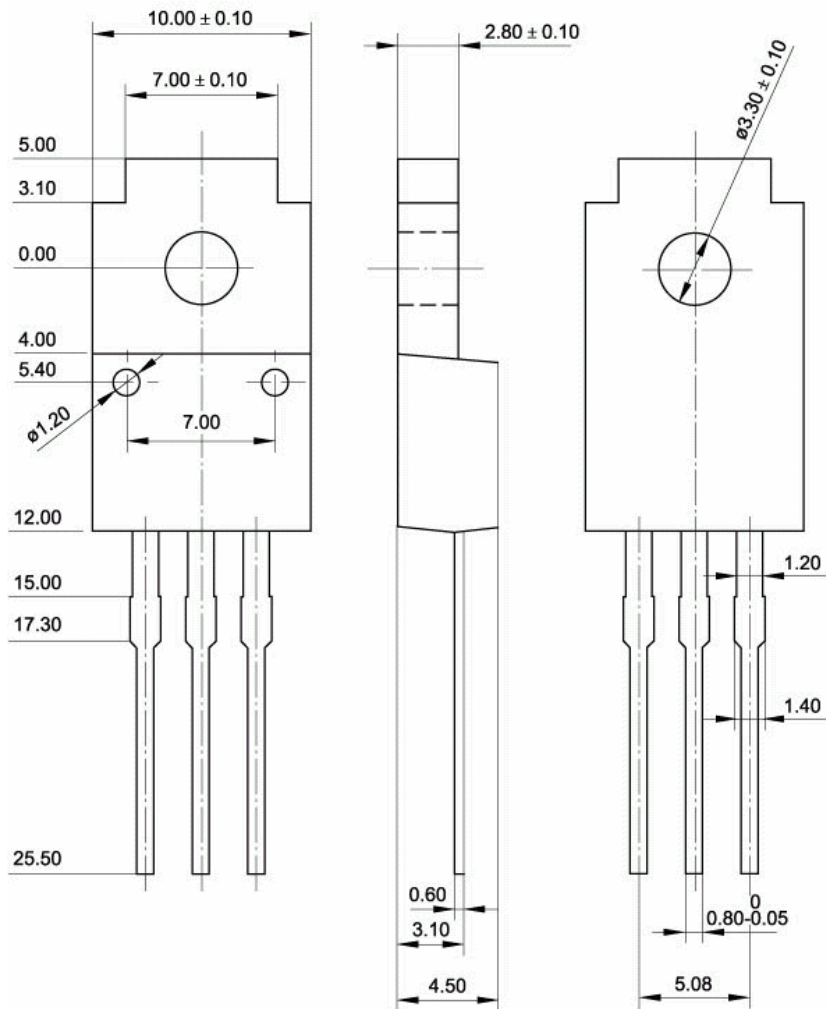


Fig.2 Outline dimensions (unindicated tolerance:  $\pm 0.15$  mm)

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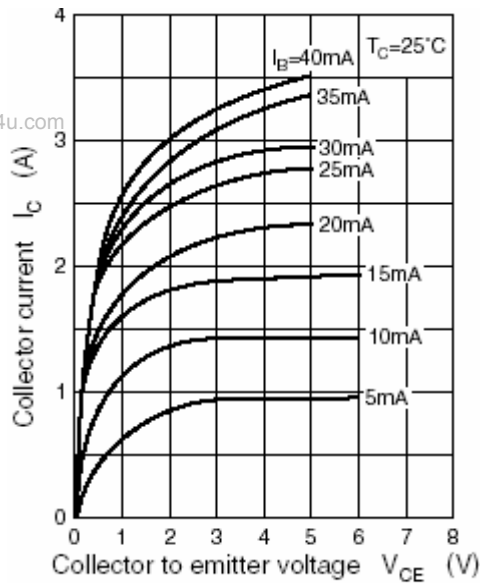


Fig.3 Static Characteristic

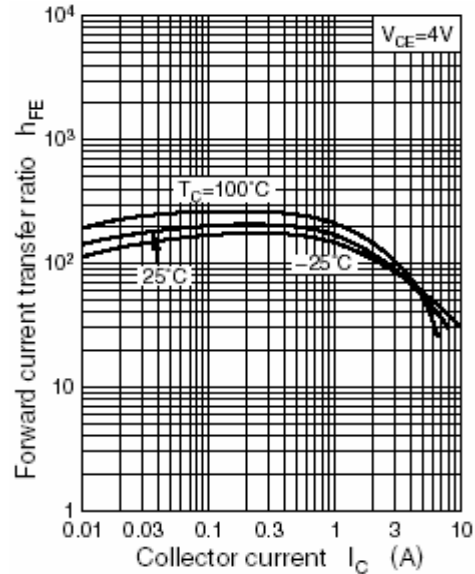


Fig.4 DC current Gain

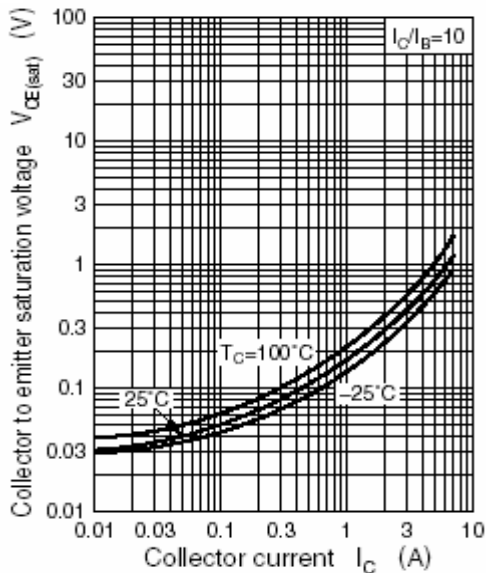


Fig.5 Collector-Emitter Saturation Voltage

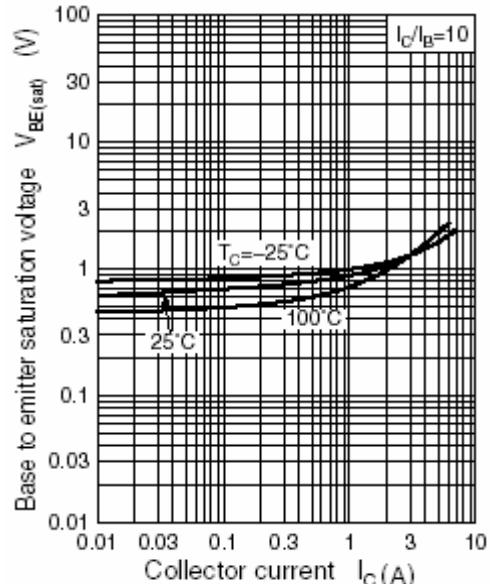


Fig.6 Base-Emitter Saturation Voltage

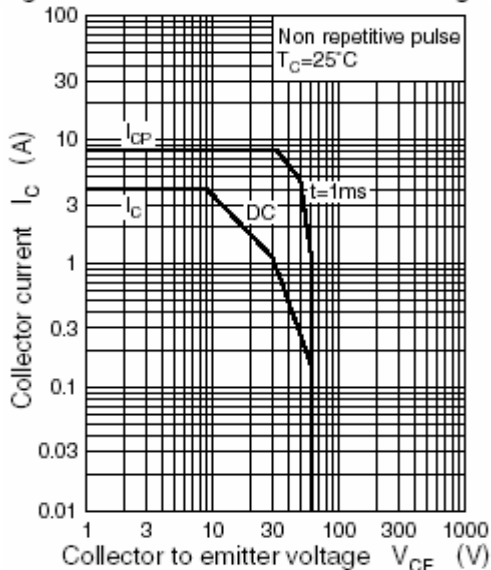


Fig.7 Safe Operating Area