

**Silicon NPN Power Transistors**

**2SD1271 2SD1271A**

**DESCRIPTION**

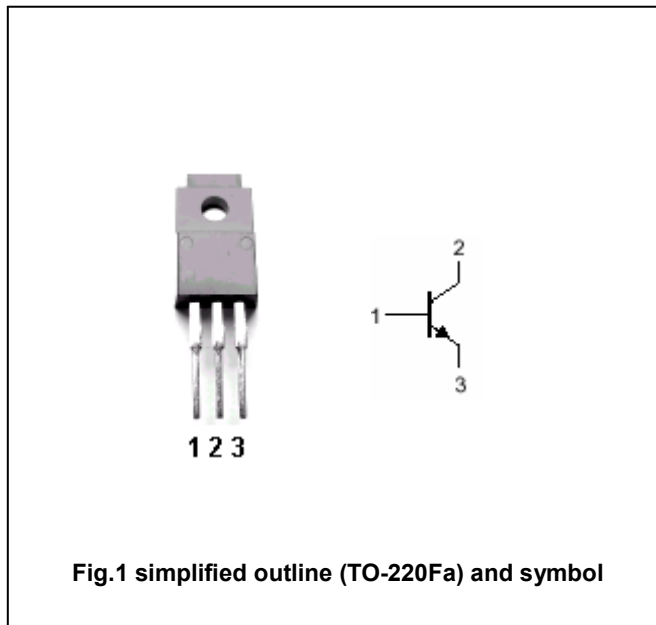
- With TO-220Fa package
- Complement to type 2SB946/946A
- Low collector saturation voltage
- Good linearity of  $h_{FE}$
- Large collector current  $I_C$

**APPLICATIONS**

- For power switching applications

**PINNING**

| PIN | DESCRIPTION |
|-----|-------------|
| 1   | Base        |
| 2   | Collector   |
| 3   | Emitter     |



**ABSOLUTE MAXIMUM RATINGS AT Ta=25°C**

| SYMBOL    | PARAMETER                   | CONDITIONS       | VALUE   | UNIT |
|-----------|-----------------------------|------------------|---------|------|
| $V_{CBO}$ | Collector-base voltage      | 2SD1271          | 130     | V    |
|           |                             | 2SD1271A         | 150     |      |
| $V_{CEO}$ | Collector-emitter voltage   | 2SD1271          | 80      | V    |
|           |                             | 2SD1271A         | 100     |      |
| $V_{EBO}$ | Emitter-base voltage        | Open collector   | 7       | V    |
| $I_C$     | Collector current (DC)      |                  | 7       | A    |
| $I_{CM}$  | Collector current-peak      |                  | 15      | A    |
| $P_C$     | Collector power dissipation | $T_C=25^\circ C$ | 40      | W    |
|           |                             | $T_a=25^\circ C$ | 2       |      |
| $T_j$     | Junction temperature        |                  | 150     | °C   |
| $T_{stg}$ | 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>CEO</sub>   | Collector-emitter voltage            | 2SD1271  | I <sub>C</sub> =10mA, I <sub>B</sub> =0    | 80  |      |     | V    |
|                    |                                      | 2SD1271A |                                            | 100 |      |     |      |
| V <sub>CEsat</sub> | Collector-emitter saturation voltage |          | I <sub>C</sub> =5A; I <sub>B</sub> =0.25A  |     |      | 0.5 | V    |
| V <sub>BEsat</sub> | Base-emitter saturation voltage      |          | I <sub>C</sub> =5A; I <sub>B</sub> =0.25A  |     |      | 1.5 | V    |
| I <sub>CBO</sub>   | Collector cut-off current            |          | V <sub>CB</sub> =100V; I <sub>E</sub> =0   |     |      | 10  | 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    | 60  |      | 260 |      |
| f <sub>T</sub>     | Transition frequency                 |          | I <sub>C</sub> =0.5A; V <sub>CE</sub> =10V |     | 30   |     | MHz  |

## Switching times

|                 |              |                                                                                     |  |     |  |    |
|-----------------|--------------|-------------------------------------------------------------------------------------|--|-----|--|----|
| t <sub>on</sub> | Turn-on time | I <sub>C</sub> =3A; I <sub>B1</sub> =-I <sub>B2</sub> =0.3A<br>V <sub>CC</sub> =50V |  | 0.5 |  | μs |
| t <sub>s</sub>  | Storage time |                                                                                     |  | 1.5 |  | μs |
| t <sub>f</sub>  | Fall time    |                                                                                     |  | 0.1 |  | μs |

◆ h<sub>FE-2</sub> Classifications

| R      | Q      | P       |
|--------|--------|---------|
| 60-120 | 90-180 | 130-260 |

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PACKAGE OUTLINE

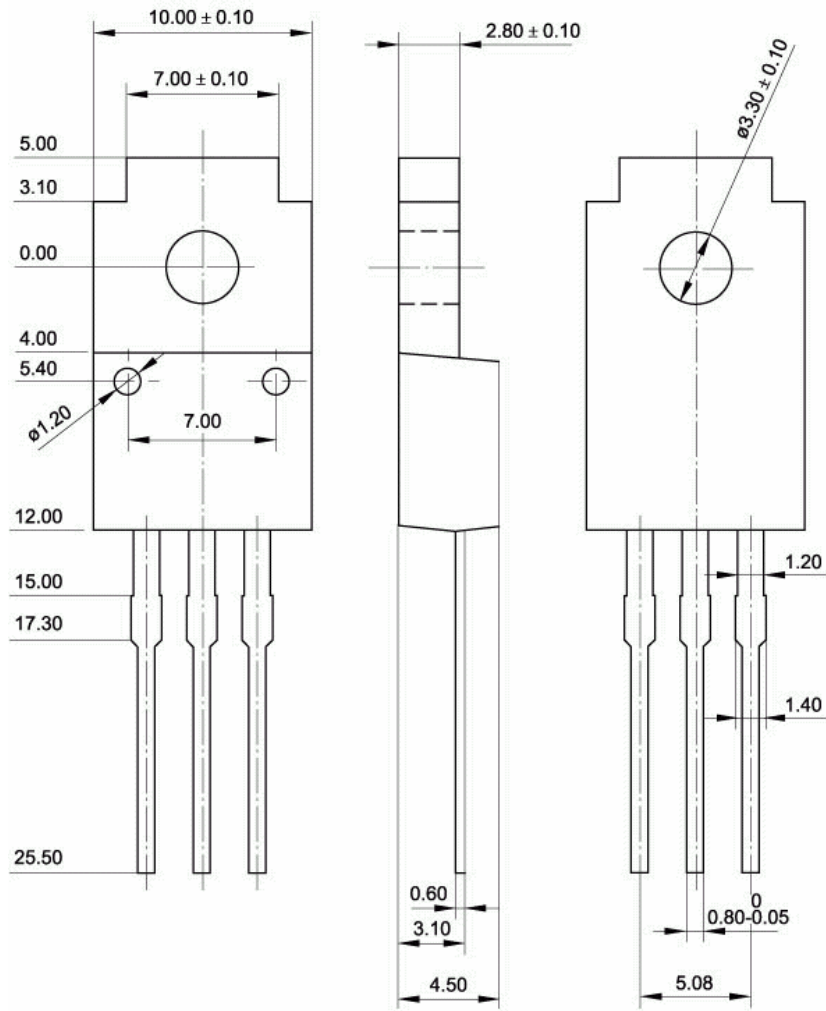


Fig.2 Outline dimensions (unindicated tolerance:  $\pm 0.15$  mm)

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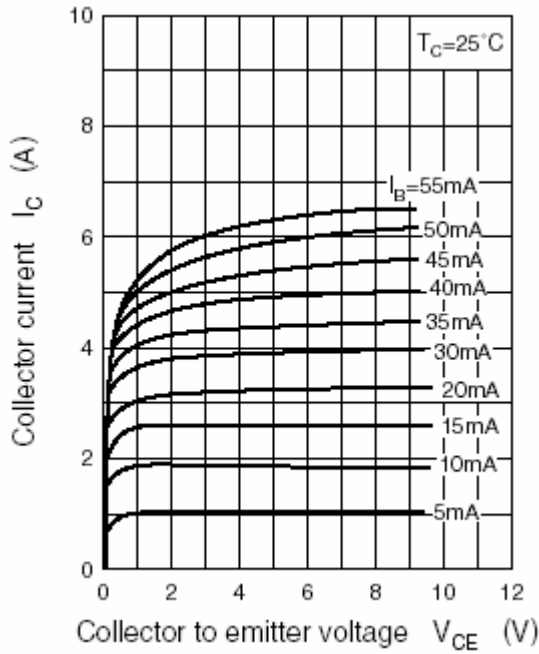


Fig.3 Static Characteristic

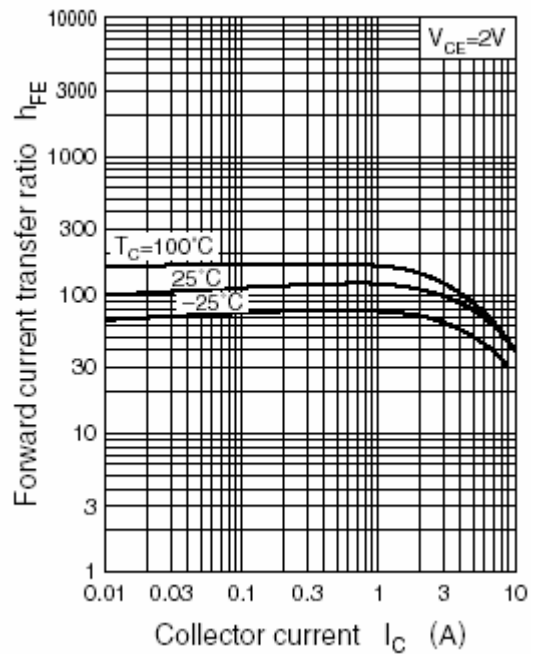


Fig.4 DC current Gain

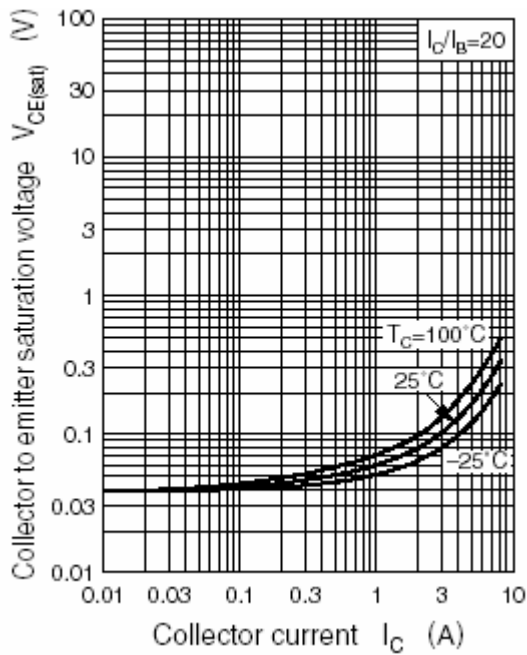


Fig.5 Collector-Emitter Saturation Voltage

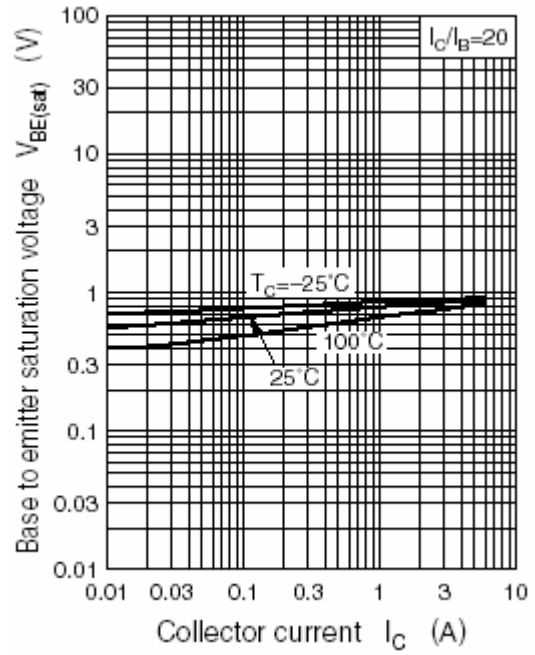


Fig.6 Base-Emitter Saturation Voltage

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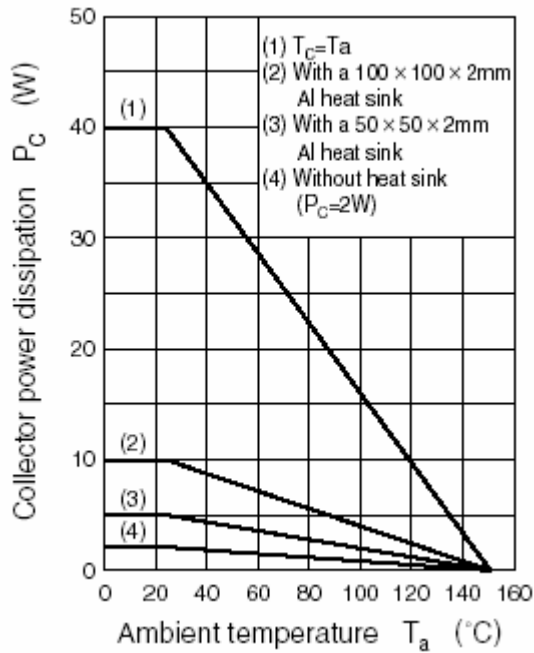


Fig.7 Power Derating

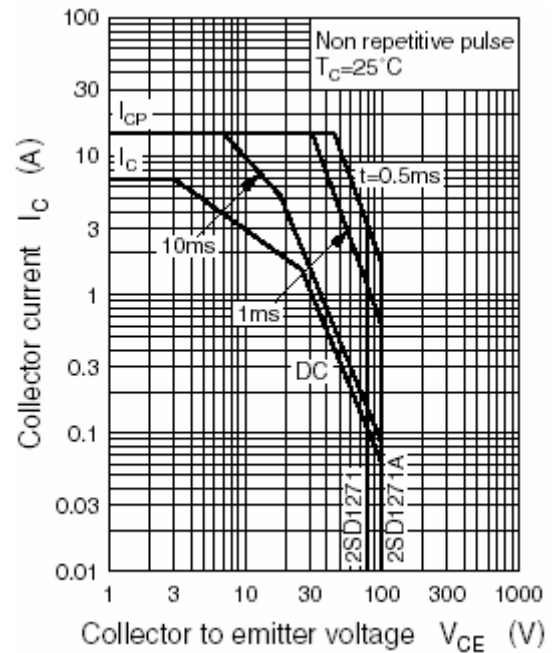


Fig.8 Safe Operating Area