

Silicon NPN Power Transistors

2SC3310

DESCRIPTION

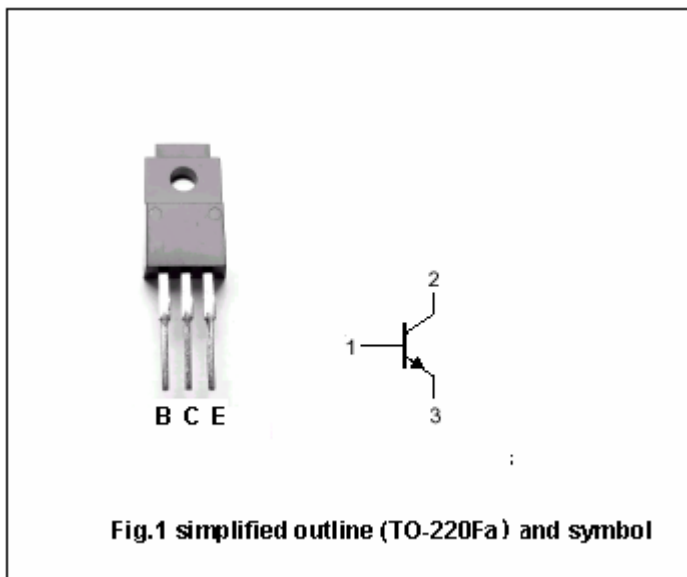
- With TO-220Fa package
- High collector breakdown voltage
- Excellent Switching times

APPLICATIONS

- Switching regulator
- High speed DC-DC converter
- High voltage switching

PINNING

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



Absolute maximum ratings(Ta=25°C)

| SYMBOL           | PARAMETER                   | CONDITIONS           | VALUE   | UNIT |
|------------------|-----------------------------|----------------------|---------|------|
| V <sub>CBO</sub> | Collector-base voltage      | Open emitter         | 500     | V    |
| V <sub>CEO</sub> | Collector-emitter voltage   | Open base            | 400     | V    |
| V <sub>EBO</sub> | Emitter-base voltage        | Open collector       | 7       | V    |
| I <sub>C</sub>   | Collector current (DC)      |                      | 5       | A    |
| I <sub>CM</sub>  | Collector current (pulse)   |                      | 7       | A    |
| I <sub>B</sub>   | Base current (DC)           |                      | 1       | A    |
| P <sub>C</sub>   | Collector power dissipation | T <sub>a</sub> =25°C | 2       | W    |
|                  |                             | T <sub>C</sub> =25°C | 30      |      |
| 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)CBO</sub> | Collector-base breakdown voltage     | I <sub>C</sub> =1mA ; I <sub>E</sub> =0   | 500 |      |     | V    |
| V <sub>(BR)CEO</sub> | Collector-emitter breakdown voltage  | I <sub>C</sub> =10mA ; I <sub>B</sub> =0  | 400 |      |     | V    |
| V <sub>CEsat</sub>   | Collector-emitter saturation voltage | I <sub>C</sub> =5A ; I <sub>B</sub> =1A   |     |      | 1.0 | V    |
| V <sub>BEsat</sub>   | Base-emitter saturation voltage      | I <sub>C</sub> =5A ; I <sub>B</sub> =1A   |     |      | 1.5 | V    |
| I <sub>CBO</sub>     | Collector cut-off current            | V <sub>CB</sub> =400V ; I <sub>E</sub> =0 |     |      | 100 | μA   |
| I <sub>EBO</sub>     | Emitter cut-off current              | V <sub>EB</sub> =7V ; I <sub>C</sub> =0   |     |      | 1   | mA   |
| h <sub>FE-1</sub>    | DC current gain                      | I <sub>C</sub> =3A ; V <sub>CE</sub> =5V  | 12  |      |     |      |
| h <sub>FE-2</sub>    | DC current gain                      | I <sub>C</sub> =5A ; V <sub>CE</sub> =5V  | 8   |      |     |      |

## Switching times

|                |              |   |  |  |     |    |
|----------------|--------------|---|--|--|-----|----|
| T <sub>r</sub> | Rise time    | I <sub>C</sub> =4A ; I <sub>B1</sub> =-I <sub>B2</sub> =0.4A<br>V <sub>CC</sub> ≈200V ; R <sub>L</sub> =10Ω |  |  | 1.0 | μs |
| t <sub>s</sub> | Storage time |   |  |  | 2.5 | μs |
| t <sub>f</sub> | Fall time    |   |  |  | 1.0 | μs |

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PACKAGE OUTLINE

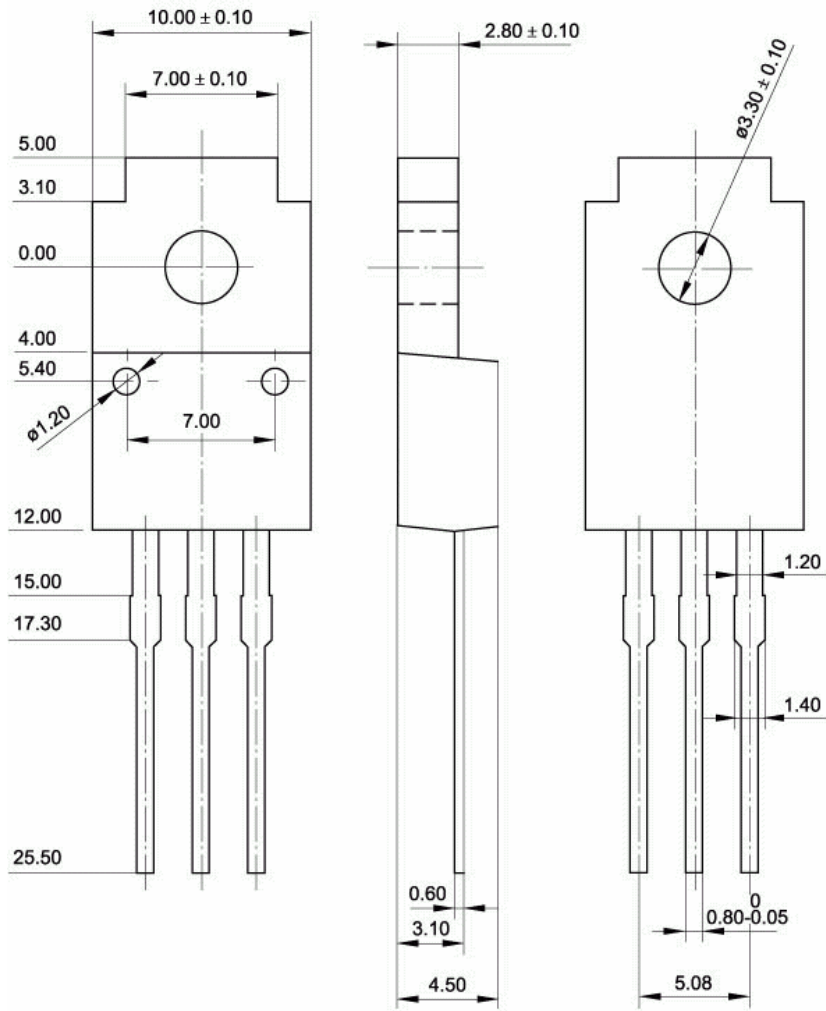


Fig.2 Outline dimensions (unindicated tolerance:  $\pm 0.15$  mm)

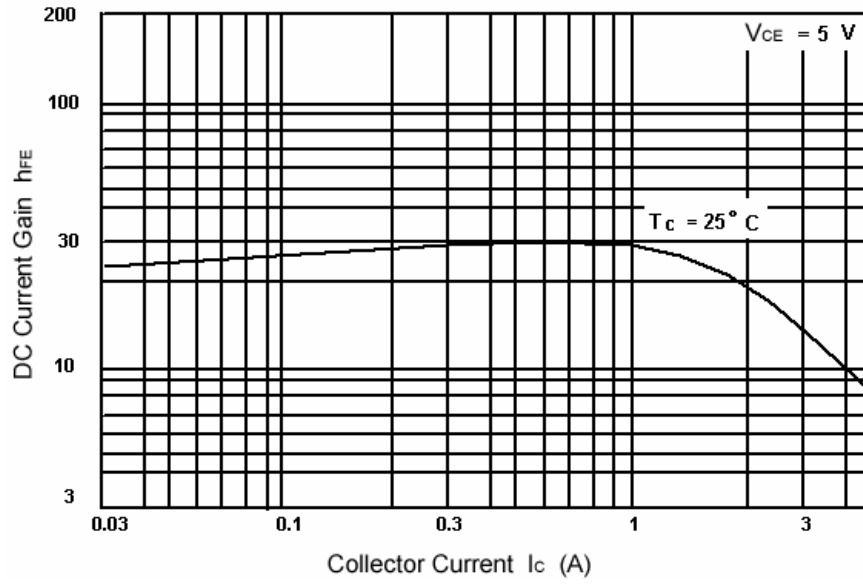


Fig.3 DC current Gain

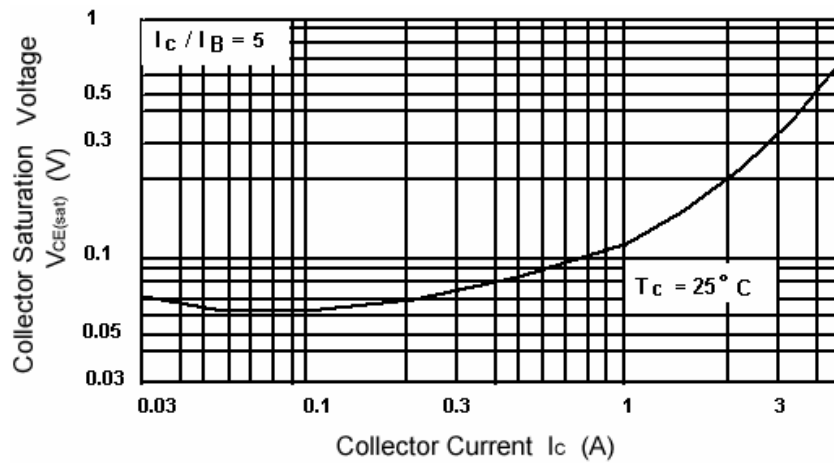


Fig.4 Collector-Emitter Saturation Voltage

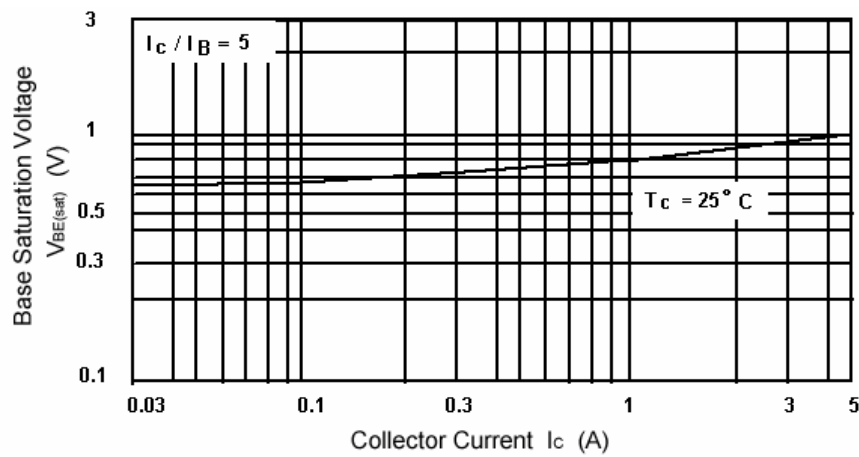


Fig.5 Base-Emitter Saturation Voltage

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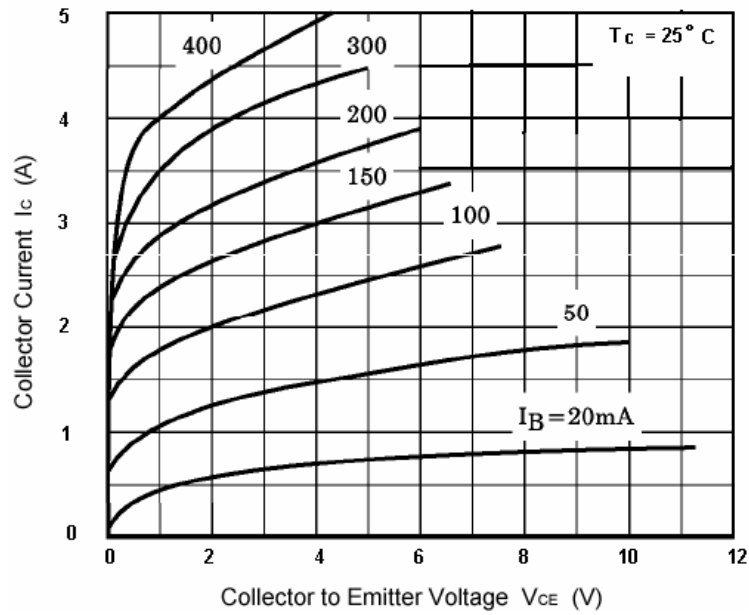


Fig.6 Static Characteristic

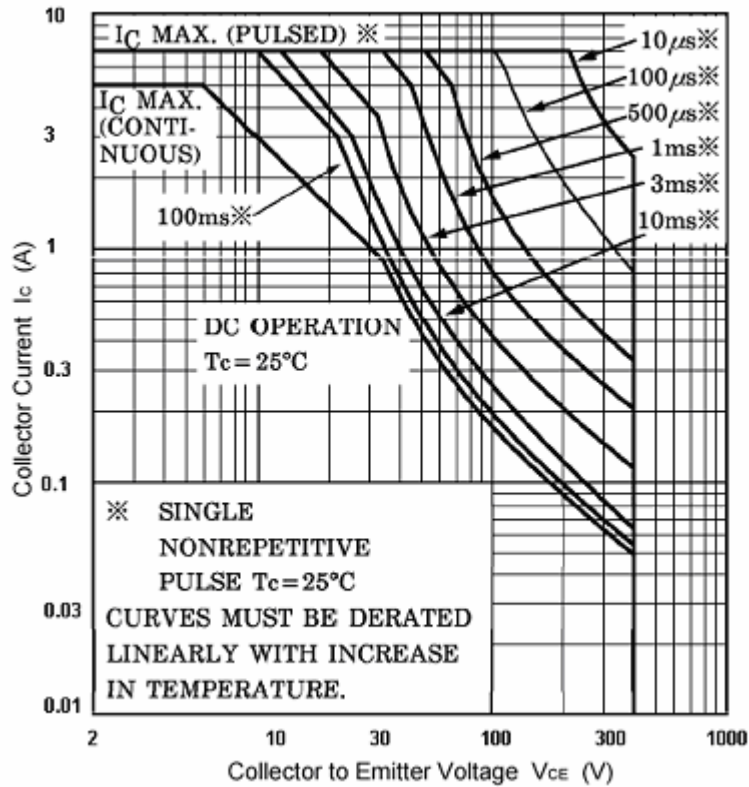


Fig.7 Safe Operating Area