# 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

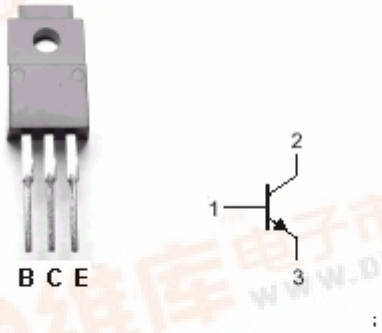


Fig.1 simplified outline (TO-220Fa) and symbol

## PINNING

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

## Absolute maximum ratings(Ta=25℃)

| SYMBOL | PARAMETER | CONDITIONS | VALUE | UNIT |
|---|---|---|---|---|
| $V_{CBO}$ | Collector-base voltage | Open emitter | 500 | V |
| $V_{CEO}$ | Collector-emitter voltage | Open base | 400 | V |
| $V_{EBO}$ | Emitter-base voltage | Open collector | 7 | V |
| $I_C$ | Collector current (DC) | | 5 | A |
| $I_{CM}$ | Collector current (pulse) | | 7 | A |
| $I_B$ | Base current (DC) | | 1 | A |
| $P_C$ | Collector power dissipation | $T_a$=25℃ | 2 | W |
| | | $T_C$=25℃ | 30 | |
| $T_j$ | Junction temperature | | 150 | ℃ |
| $T_{stg}$ | Storage temperature | | -55~150 | ℃ |

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## CHARACTERISTICS

**Tj=25℃ unless otherwise specified**

| SYMBOL | PARAMETER | CONDITIONS | MIN | TYP. | MAX | UNIT |
|---|---|---|---|---|---|---|
| $V_{(BR)CBO}$ | Collector-base breakdown voltage | $I_C$=1mA ;$I_E$=0 | 500 | | | V |
| $V_{(BR)CEO}$ | Collector-emitter breakdown voltage | $I_C$=10mA ;$I_B$=0 | 400 | | | V |
| $V_{CEsat}$ | Collector-emitter saturation voltage | $I_C$=5A ;$I_B$=1A | | | 1.0 | V |
| $V_{BEsat}$ | Base-emitter saturation voltage | $I_C$=5A ;$I_B$=1A | | | 1.5 | V |
| $I_{CBO}$ | Collector cut-off current | $V_{CB}$=400V; $I_E$=0 | | | 100 | μA |
| $I_{EBO}$ | Emitter cut-off current | $V_{EB}$=7V; $I_C$=0 | | | 1 | mA |
| $h_{FE-1}$ | DC current gain | $I_C$=3A ; $V_{CE}$=5V | 12 | | | |
| $h_{FE-2}$ | DC current gain | $I_C$=5A ; $V_{CE}$=5V | 8 | | | |
| Switching times | | | | | | |
| $T_r$ | Rise time | $I_C$=4A ;$I_{B1}$=-$I_{B2}$=0.4A<br>$V_{CC}$≈200V;$R_L$=10Ω | | | 1.0 | μs |
| $t_s$ | Storage time | | | | 2.5 | μs |
| $t_f$ | Fall time | | | | 1.0 | μs |

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**PACKAGE OUTLINE**

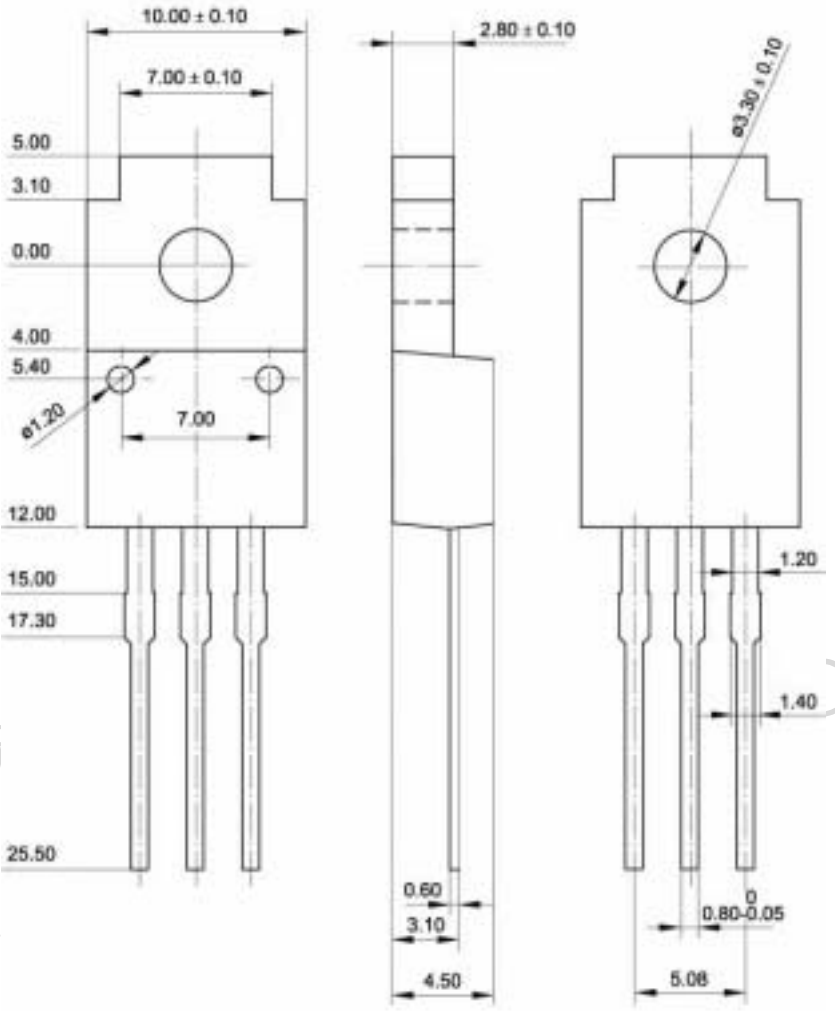


**Fig.2 Outline dimensions (unindicated tolerance:±0.15 mm)**

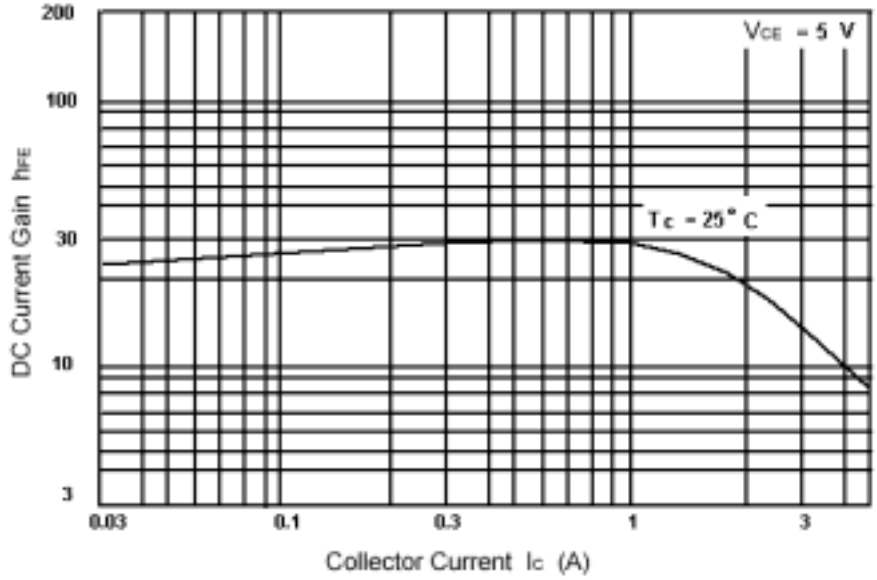


**Fig.3** DC current Gain

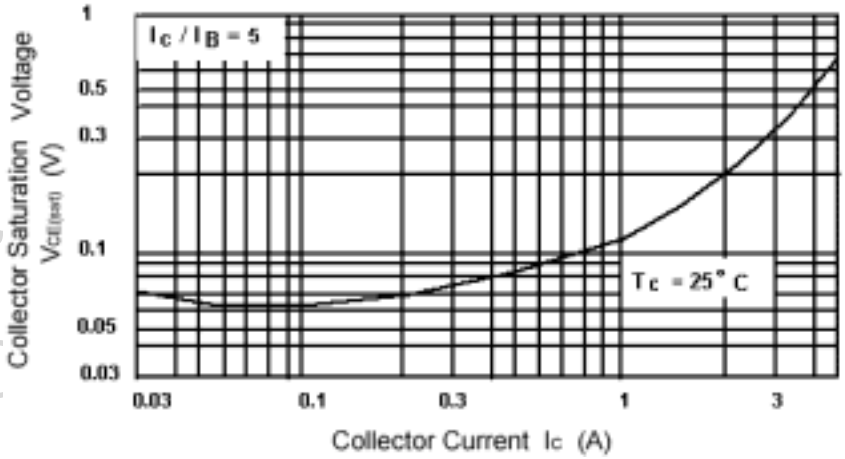


**Fig.4** Collector-Emitter Saturation Voltage

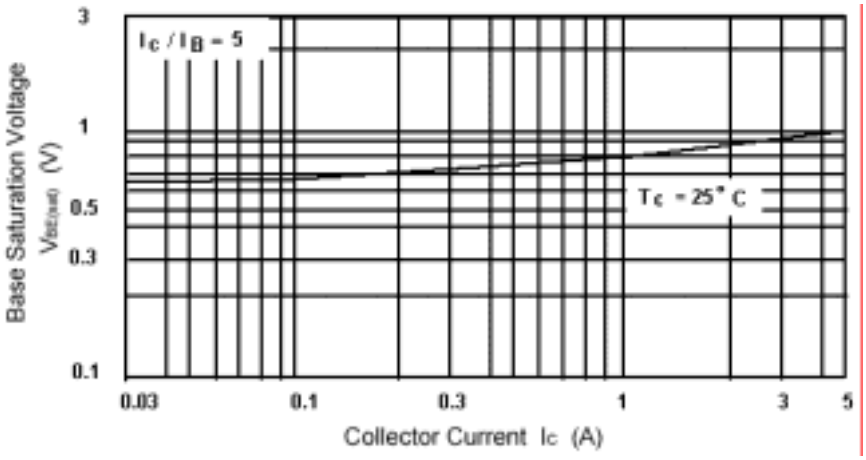


**Fig.5** Base-Emitter Saturation Voltage

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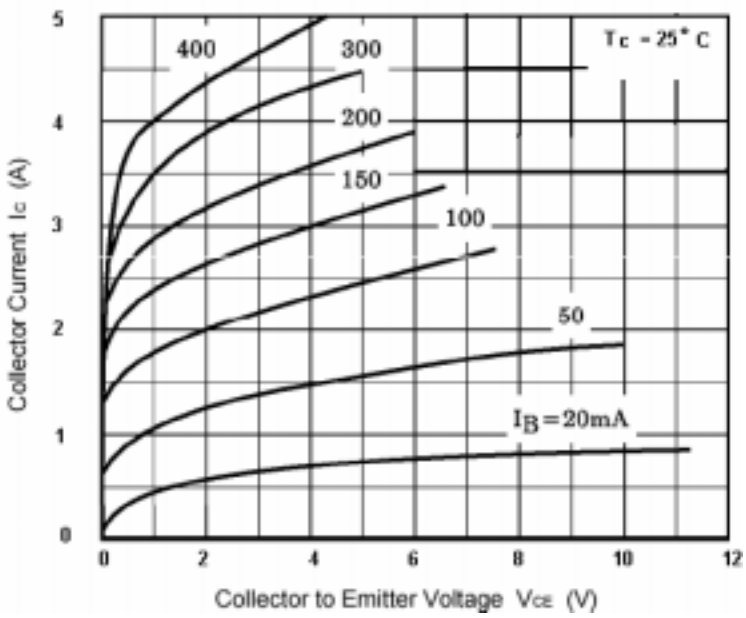


Fig.6 Static Characteristic

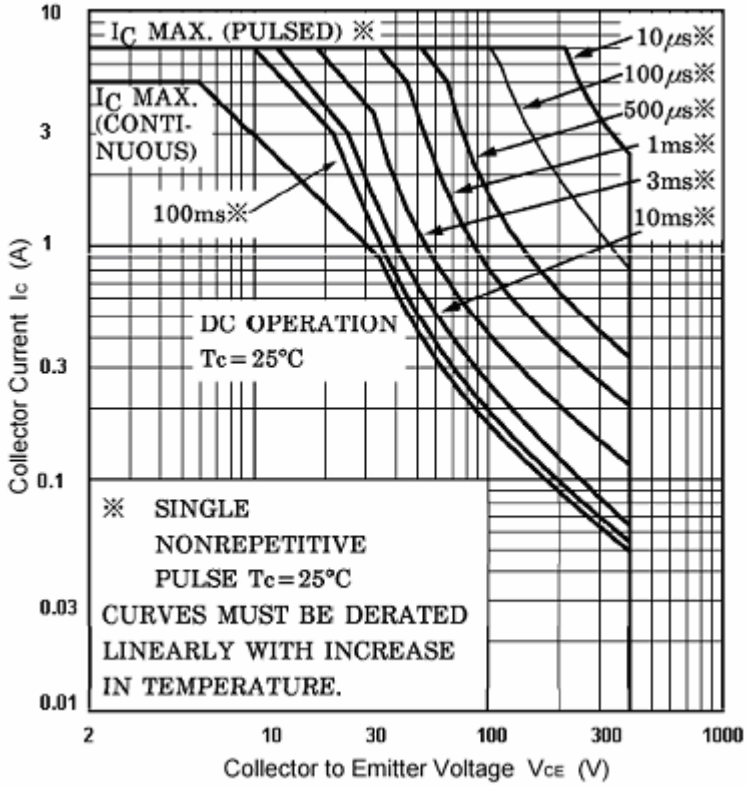


Fig.7 Safe Operating Area