

## Silicon PNP Power Transistors

## 2SA963

## DESCRIPTION

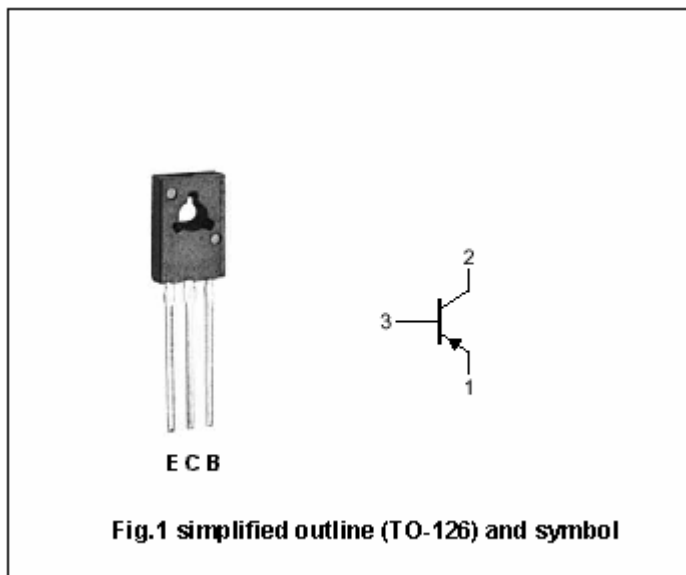
- With TO-126 package
- Complement to type 2SC2209
- High collector power dissipation

## APPLICATIONS

- For low-frequency power amplification

## PINNING

| PIN | DESCRIPTION                          |
|-----|--------------------------------------|
| 1   | Emitter                              |
| 2   | Collector;connected to mounting base |
| 3   | Base                                 |



## Absolute Maximun Ratings (Ta=25 )

| SYMBOL    | PARAMETER                   | CONDITIONS     | VALUE   | UNIT |
|-----------|-----------------------------|----------------|---------|------|
| $V_{CBO}$ | Collector-base voltage      | Open emitter   | -50     | V    |
| $V_{CEO}$ | Collector-emitter voltage   | Open base      | -40     | V    |
| $V_{EBO}$ | Emitter-base voltage        | Open collector | -5      | V    |
| $I_C$     | Collector current (DC)      |                | -1.5    | A    |
| $I_{CM}$  | Collector current-peak      |                | -3      | A    |
| $P_C$     | Collector power dissipation | $T_C=25$       | 10      | W    |
| $T_j$     | Junction temperature        |                | 150     |      |
| $T_{stg}$ | Storage temperature         |                | -55~150 |      |

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## CHARACTERISTICS

T<sub>j</sub>=25 unless otherwise specified

| SYMBOL               | PARAMETER                            | CONDITIONS                                           | MIN | TYP. | MAX  | UNIT |
|----------------------|--------------------------------------|------------------------------------------------------|-----|------|------|------|
| V <sub>(BR)CEO</sub> | Collector-emitter breakdown voltage  | I <sub>C</sub> =-2mA; I <sub>B</sub> =0              | -40 |      |      | V    |
| V <sub>(BR)CBO</sub> | Collector-base breakdown voltage     | I <sub>C</sub> =-1mA; I <sub>E</sub> =0              | -50 |      |      | V    |
| V <sub>CEsat</sub>   | Collector-emitter saturation voltage | I <sub>C</sub> =-1.5A; I <sub>B</sub> =-150mA        |     |      | -1.0 | V    |
| V <sub>BEsat</sub>   | Base-emitter saturation voltage      | I <sub>C</sub> =-2A; I <sub>B</sub> =-0.2A           |     |      | -1.5 | V    |
| I <sub>CBO</sub>     | Collector cut-off current            | V <sub>CB</sub> =-20V; I <sub>E</sub> =0             |     |      | -1   | μA   |
| I <sub>CEO</sub>     | Collector cut-off current            | V <sub>CE</sub> =-10V; I <sub>B</sub> =0             |     |      | -100 | μA   |
| I <sub>EBO</sub>     | Emitter cut-off current              | V <sub>EB</sub> =-5V; I <sub>C</sub> =0              |     |      | -10  | μA   |
| h <sub>FE</sub>      | DC current gain                      | I <sub>C</sub> =-1A; V <sub>CE</sub> =-5V            | 80  |      | 220  |      |
| C <sub>OB</sub>      | Output capacitance                   | I <sub>E</sub> =0; V <sub>CB</sub> =-5V; f=1MHz      |     | 70   |      | pF   |
| f <sub>T</sub>       | Transition frequency                 | I <sub>E</sub> =0.5A; V <sub>CB</sub> =-5V; f=200MHz |     | 150  |      | MHz  |

◆ h<sub>FE</sub> Classifications

| Q      | R       |
|--------|---------|
| 80-160 | 120-220 |

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## PACKAGE OUTLINE

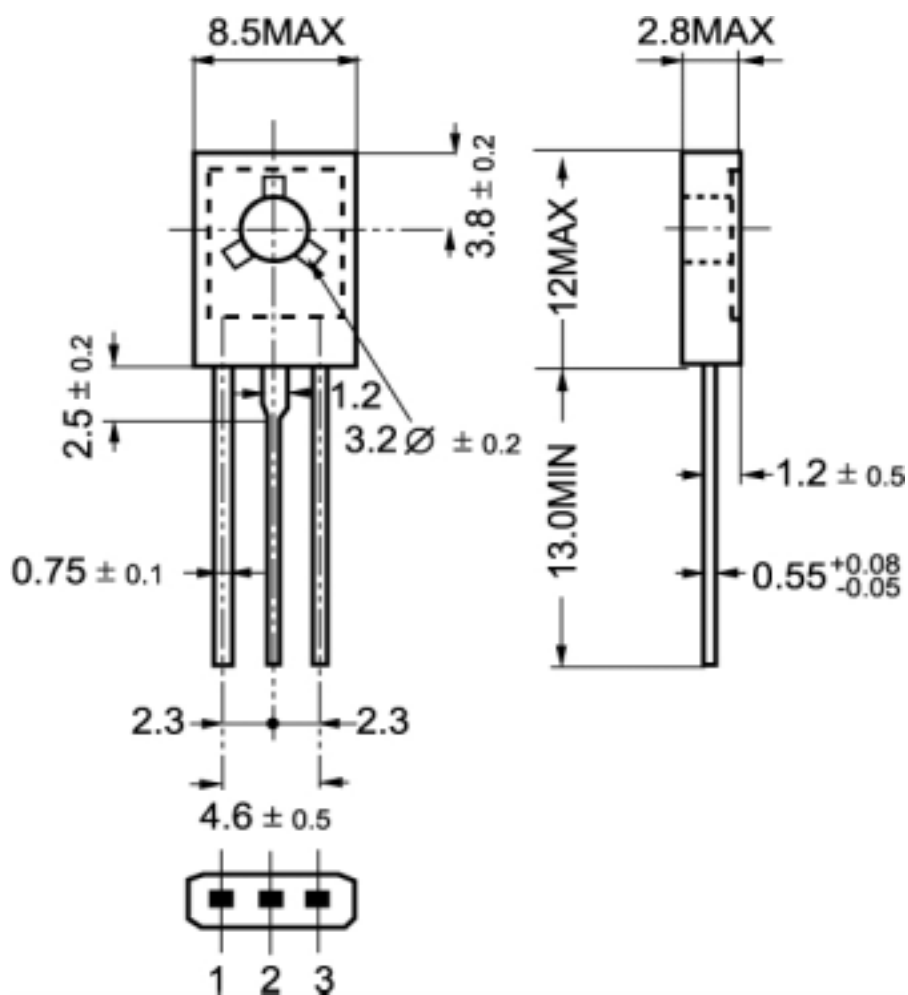


Fig.2 Outline dimensions

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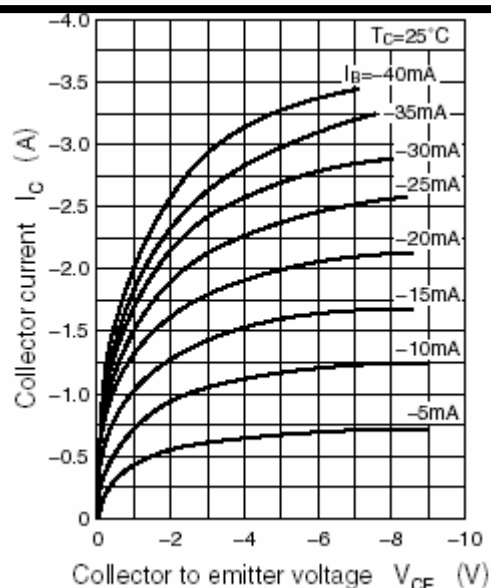


Fig.3 Static Characteristic

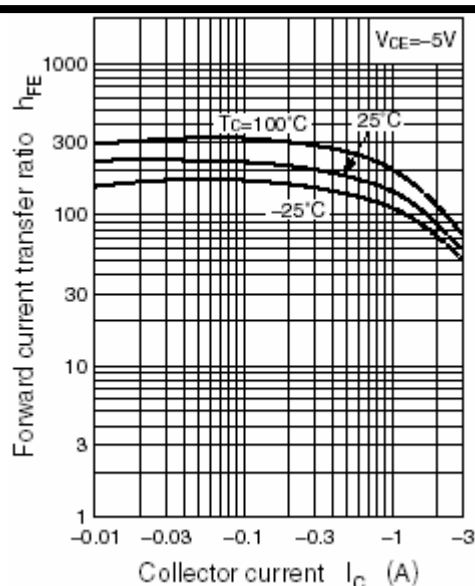


Fig.4 DC current Gain

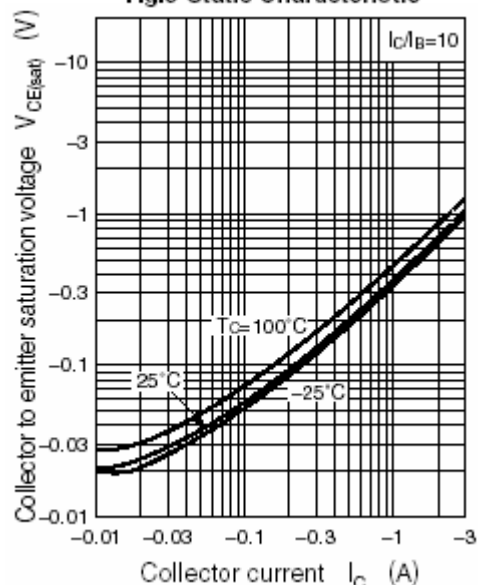


Fig.5 Collector-Emitter Saturation Voltage

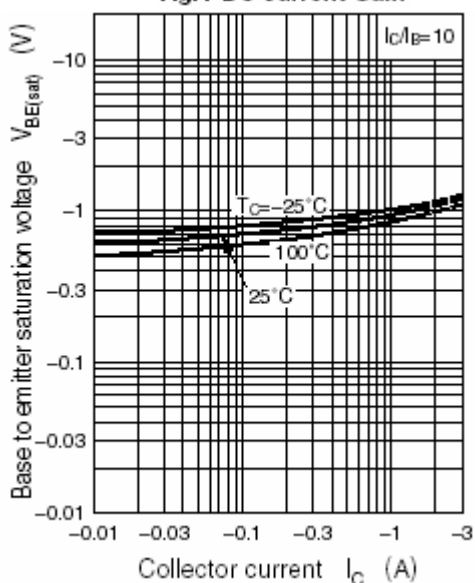


Fig.6 Base-Emitter Saturation Voltage

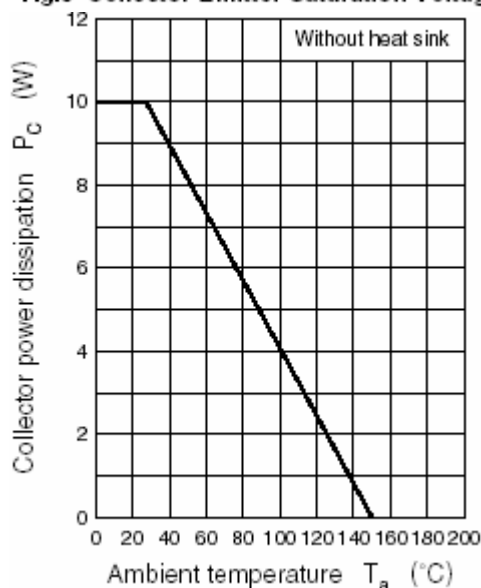


Fig.7 Power Derating

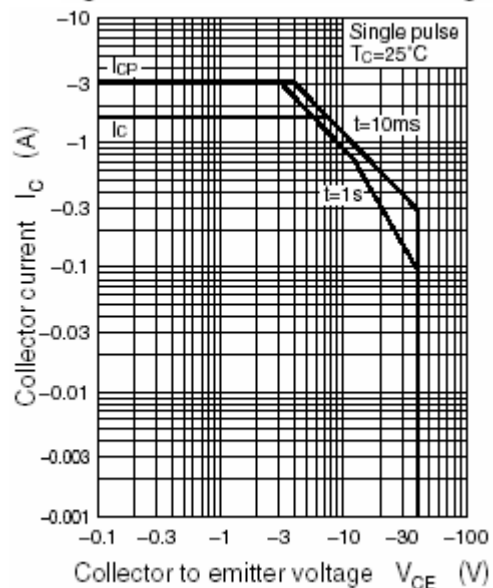


Fig.8 Safe Operating Area