

Silicon NPN Power Transistors

2SD1023

DESCRIPTION

- With TO-220 package
- High DC current gain
- DARLINGTON

PINNING

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

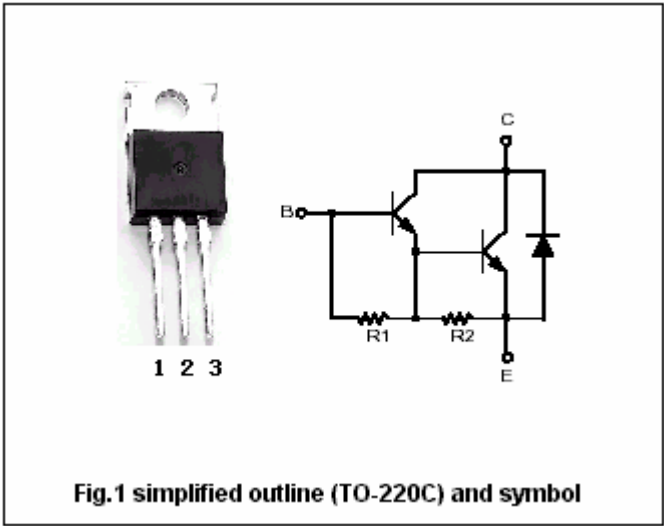


Fig.1 simplified outline (TO-220C) and symbol

Absolute maximum ratings (Ta=25 )

| SYMBOL           | PARAMETER                    | CONDITIONS         | VALUE   | UNIT |
|------------------|------------------------------|--------------------|---------|------|
| V <sub>CBO</sub> | Collector-base voltage       | Open emitter       | 200     | V    |
| V <sub>CEO</sub> | Collector-emitter voltage    | Open base          | 200     | V    |
| V <sub>EBO</sub> | Emitter-base voltage         | Open collector     | 7       | V    |
| I <sub>C</sub>   | Collector current-Continuous |                    | 5       | A    |
| I <sub>CM</sub>  | Collector current-Peak       |                    | 8       | A    |
| I <sub>B</sub>   | Base current                 |                    | 0.5     | A    |
| I <sub>BM</sub>  | Base current-Peak            |                    | 1       | A    |
| P <sub>T</sub>   | Total power dissipation      | T <sub>C</sub> =25 | 30      | W    |
| T <sub>j</sub>   | Junction temperature         |                    | 150     |      |
| T <sub>stg</sub> | Storage temperature          |                    | -55~150 |      |

THERMAL CHARACTERISTICS

| SYMBOL              | PARAMETER                           | VALUE | UNIT |
|---------------------|-------------------------------------|-------|------|
| R <sub>th j-c</sub> | Thermal resistance junction to case | 4.17  | /W   |

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## CHARACTERISTICS

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

| SYMBOL             | PARAMETER                            | CONDITIONS                                                                             | MIN  | TYP. | MAX   | UNIT |
|--------------------|--------------------------------------|----------------------------------------------------------------------------------------|------|------|-------|------|
| V <sub>CEsat</sub> | Collector-emitter saturation voltage | I <sub>C</sub> =3A; I <sub>B</sub> =5mA                                                |      |      | 1.5   | V    |
| V <sub>BEsat</sub> | Base-emitter saturation voltage      | I <sub>C</sub> =3A ; I <sub>B</sub> =5mA                                               |      |      | 2.0   | V    |
| I <sub>CEO</sub>   | Collector cut-off current            | V <sub>CE</sub> =200V; I <sub>B</sub> =0                                               |      |      | 0.1   | mA   |
| I <sub>CBO</sub>   | Collector cut-off current            | V <sub>CB</sub> =200V; I <sub>E</sub> =0                                               |      |      | 0.1   | mA   |
| I <sub>EBO</sub>   | Emitter cut-off current              | V <sub>EB</sub> =7V; I <sub>C</sub> =0                                                 |      |      | 5     | mA   |
| h <sub>FE</sub>    | DC current gain                      | I <sub>C</sub> =3A ; V <sub>CE</sub> =3V                                               | 1500 |      | 30000 |      |
| f <sub>T</sub>     | Transition frequency                 | I <sub>C</sub> =0.5A ; V <sub>CE</sub> =10V                                            |      | 20   |       | MHz  |
| t <sub>on</sub>    | Turn-on time                         | I <sub>C</sub> =3A; I <sub>B</sub> =5mA<br>R <sub>L</sub> =10Ω<br>V <sub>BB2</sub> =4V |      |      | 2     | μs   |
| t <sub>s</sub>     | Storage time                         |                                                                                        |      |      | 8     | μs   |
| t <sub>f</sub>     | Fall time                            |                                                                                        |      |      | 5     | μs   |

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## PACKAGE OUTLINE

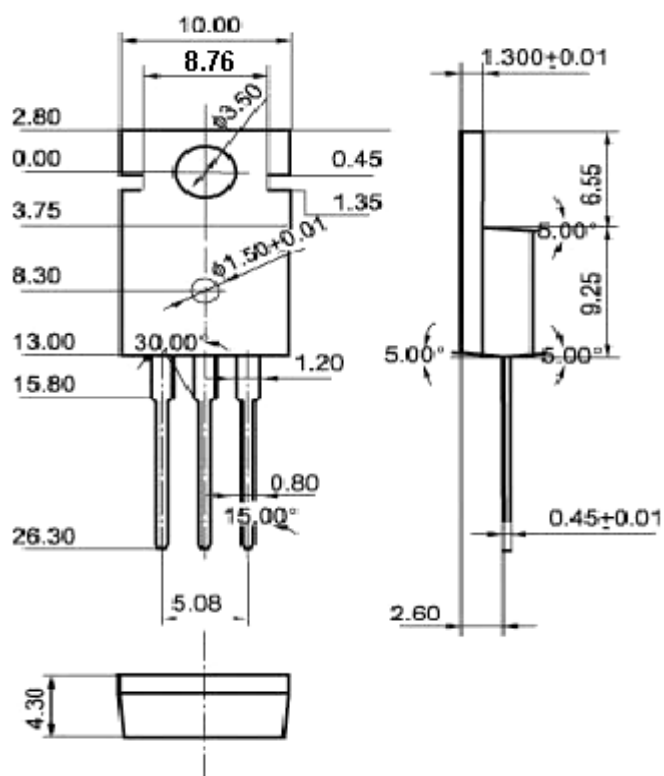


Fig.2 Outline dimensions (unindicated tolerance: 0.1mm)