

Silicon NPN Power Transistors

2SD1409

DESCRIPTION

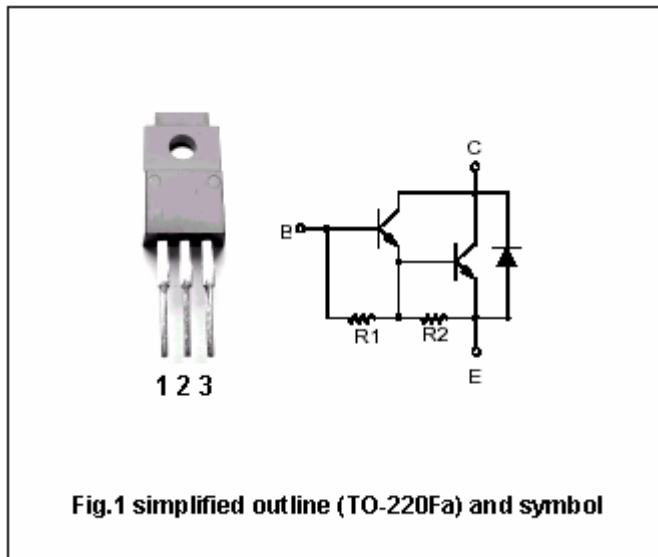
- With TO-220Fa package
- High DC current gain
- DARLINGTON

APPLICATIONS

- Igniter applications
- High voltage switching applications

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         | 600     | V    |
| V <sub>CEO</sub> | Collector -emitter voltage  | Open base            | 400     | V    |
| V <sub>EBO</sub> | Emitter-base voltage        | Open collector       | 5       | V    |
| I <sub>C</sub>   | Collector current           |                      | 6       | A    |
| I <sub>B</sub>   | Base current                |                      | 1       | A    |
| P <sub>C</sub>   | Collector power dissipation | T <sub>C</sub> =25°C | 25      | W    |
|                  |                             | T <sub>a</sub> =25°C | 2.0     |      |
| T <sub>j</sub>   | Junction temperature        |                      | 150     | °C   |
| T <sub>stg</sub> | Storage temperature         |                      | -55~150 | °C   |

## Silicon NPN Power Transistors

## 2SD1409

## CHARACTERISTICS

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

| SYMBOL               | PARAMETER                               | CONDITIONS                                      | MIN | TYP. | MAX | UNIT |
|----------------------|---|---|-----|------|-----|------|
| 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> =4A; I <sub>B</sub> =0.04A       |     |      | 2.0 | V    |
| V <sub>BEsat</sub>   | Base-emitter saturation voltage         | I <sub>C</sub> =4A; I <sub>B</sub> =0.04A       |     |      | 2.5 | V    |
| V <sub>ECF</sub>     | Emitter-collector diode forward voltage | I <sub>E</sub> =4A; I <sub>B</sub> =0           |     |      | 3.0 | V    |
| I <sub>CBO</sub>     | Collector cut-off current               | V <sub>CB</sub> =600V; I <sub>E</sub> =0        |     |      | 0.5 | mA   |
| I <sub>EBO</sub>     | Emitter cut-off current                 | V <sub>EB</sub> =5V; I <sub>C</sub> =0          |     |      | 3   | mA   |
| h <sub>FE-1</sub>    | DC current gain                         | I <sub>C</sub> =2A; V <sub>CE</sub> =2V         | 600 |      |     |      |
| h <sub>FE-2</sub>    | DC current gain                         | I <sub>C</sub> =4A; V <sub>CE</sub> =2V         | 100 |      |     |      |
| C <sub>OB</sub>      | Collector output capacitance            | f=1MHz; V <sub>CB</sub> =50V; I <sub>E</sub> =0 |     | 35   |     | pF   |

## Switching times

|                  |              |  |  |   |  |    |
|------------------|--------------|--|--|---|--|----|
| t <sub>on</sub>  | Turn-on time | I <sub>B1</sub> =-I <sub>B2</sub> =0.04A<br>V <sub>CC</sub> =100V, R <sub>L</sub> =25Ω |  | 1 |  | μs |
| t <sub>stg</sub> | Storage time |  |  | 8 |  | μs |
| t <sub>f</sub>   | Fall time    |  |  | 5 |  | μs |

Silicon NPN Power Transistors

2SD1409

PACKAGE OUTLINE

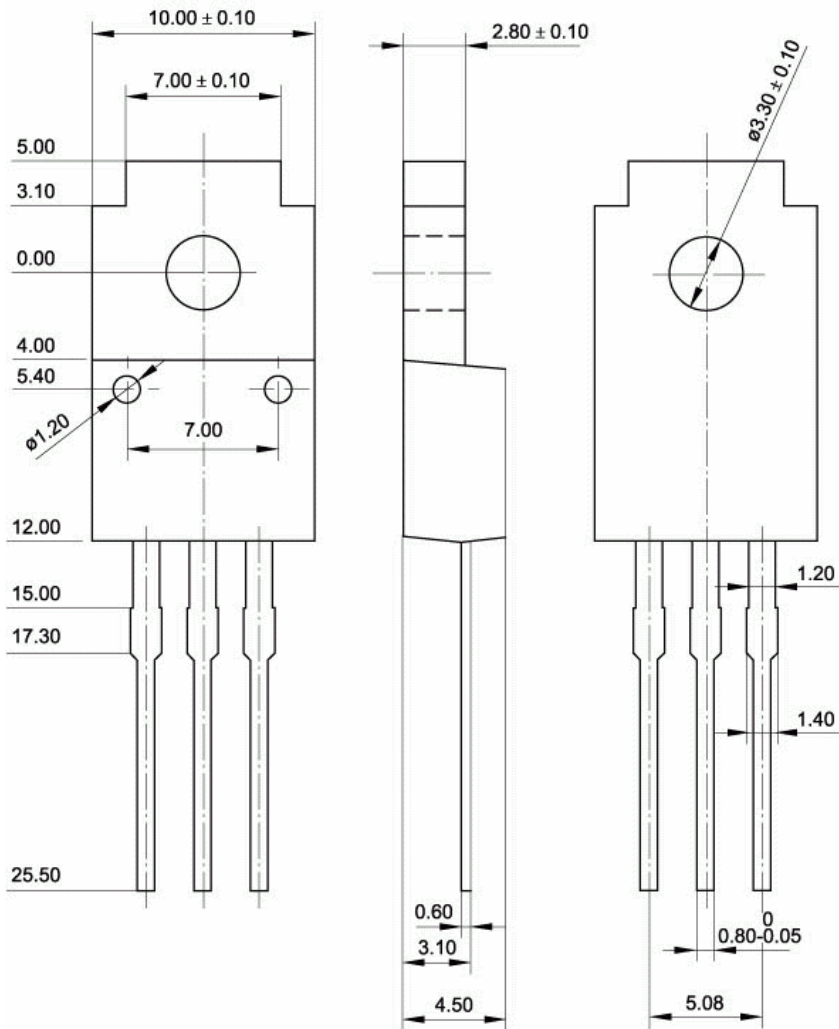


Fig.2 outline dimensions (unindicated tolerance:  $\pm 0.15$  mm)