

Silicon NPN Power Transistors

2SC3693

DESCRIPTION

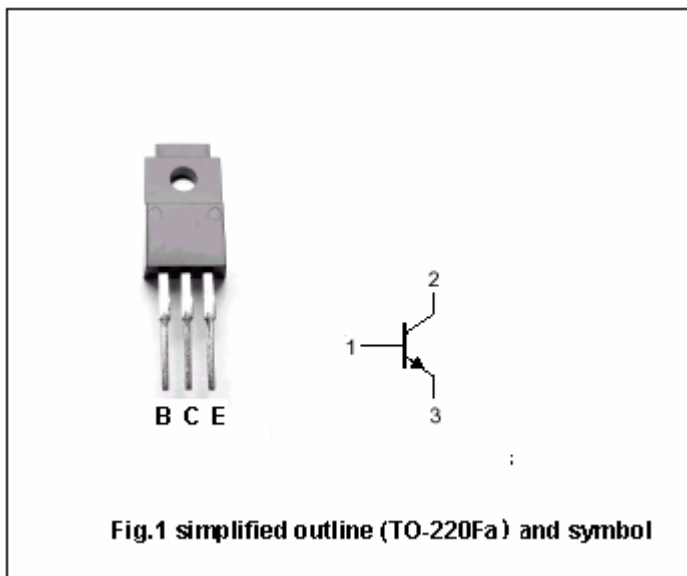
- With TO-220Fa package
- Large current ,high speed
- Low collector saturation voltage

APPLICATIONS

- For use in drivers such as DC/DC converters and actuators

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         | 100     | V    |
| V <sub>CEO</sub> | Collector-emitter voltage | Open base            | 60      | V    |
| V <sub>EBO</sub> | Emitter-base voltage      | Open collector       | 7       | V    |
| I <sub>C</sub>   | Collector current         |                      | 10      | A    |
| I <sub>CM</sub>  | Collector current-peak    |                      | 20      | A    |
| I <sub>B</sub>   | Base current              |                      | 5.0     | A    |
| P <sub>T</sub>   | Total 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>CEO(SUS)</sub> | Collector-emitter sustaining voltage | I <sub>C</sub> =6A; I <sub>B</sub> =0.6A, L=1mH                       | 60  |      |           | V        |
| V <sub>CEsat-1</sub>  | Collector-emitter saturation voltage | I <sub>C</sub> =6A; I <sub>B</sub> =0.3A                              |     |      | 0.3       | V        |
| V <sub>CEsat-2</sub>  | Collector-emitter saturation voltage | I <sub>C</sub> =8A; I <sub>B</sub> =0.4A                              |     |      | 0.5       | V        |
| V <sub>BEsat-1</sub>  | Base-emitter saturation voltage      | I <sub>C</sub> =6A; I <sub>B</sub> =0.3A                              |     |      | 1.2       | V        |
| V <sub>BEsat-2</sub>  | Base-emitter saturation voltage      | I <sub>C</sub> =8A; I <sub>B</sub> =0.4A                              |     |      | 1.5       | V        |
| I <sub>CBO</sub>      | Collector cut-off current            | V <sub>CB</sub> =60V; I <sub>E</sub> =0                               |     |      | 10        | μA       |
| I <sub>CEX</sub>      | Collector cut-off current            | V <sub>CE</sub> =60V; V <sub>BE</sub> =-1.5V<br>T <sub>a</sub> =125°C |     |      | 10<br>1.0 | μA<br>mA |
| I <sub>EBO</sub>      | Emitter cut-off current              | V <sub>EB</sub> =5V; I <sub>C</sub> =0                                |     |      | 10        | μA       |
| h <sub>FE-1</sub>     | DC current gain                      | I <sub>C</sub> =1A; V <sub>CE</sub> =2V                               | 100 |      |           |          |
| h <sub>FE-2</sub>     | DC current gain                      | I <sub>C</sub> =2A; V <sub>CE</sub> =2V                               | 100 | 200  | 400       |          |
| h <sub>FE-3</sub>     | DC current gain                      | I <sub>C</sub> =6A; V <sub>CE</sub> =2V                               | 60  |      |           |          |
| C <sub>OB</sub>       | Output capacitance                   | I <sub>E</sub> =0; V <sub>CB</sub> =10V; f=1MHz                       |     | 150  |           | pF       |
| f <sub>T</sub>        | Transition frequency                 | I <sub>C</sub> =1.0A; V <sub>CE</sub> =10V                            |     | 140  |           | MHz      |

## Switching times

|                 |              |   |  |  |     |    |
|-----------------|--------------|---|--|--|-----|----|
| t <sub>on</sub> | Turn-on time | I <sub>C</sub> =6A; R <sub>L</sub> =8.3Ω<br>I <sub>B1</sub> =-I <sub>B2</sub> =0.3A<br>V <sub>CC</sub> ≈50V |  |  | 0.3 | μs |
| t <sub>s</sub>  | Storage time |   |  |  | 1.5 | μs |
| t <sub>f</sub>  | Fall time    |   |  |  | 0.3 | μs |

◆ h<sub>FE-2</sub> classifications

| M       | L       | K       |
|---------|---------|---------|
| 100-200 | 150-300 | 200-400 |

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PACKAGE OUTLINE

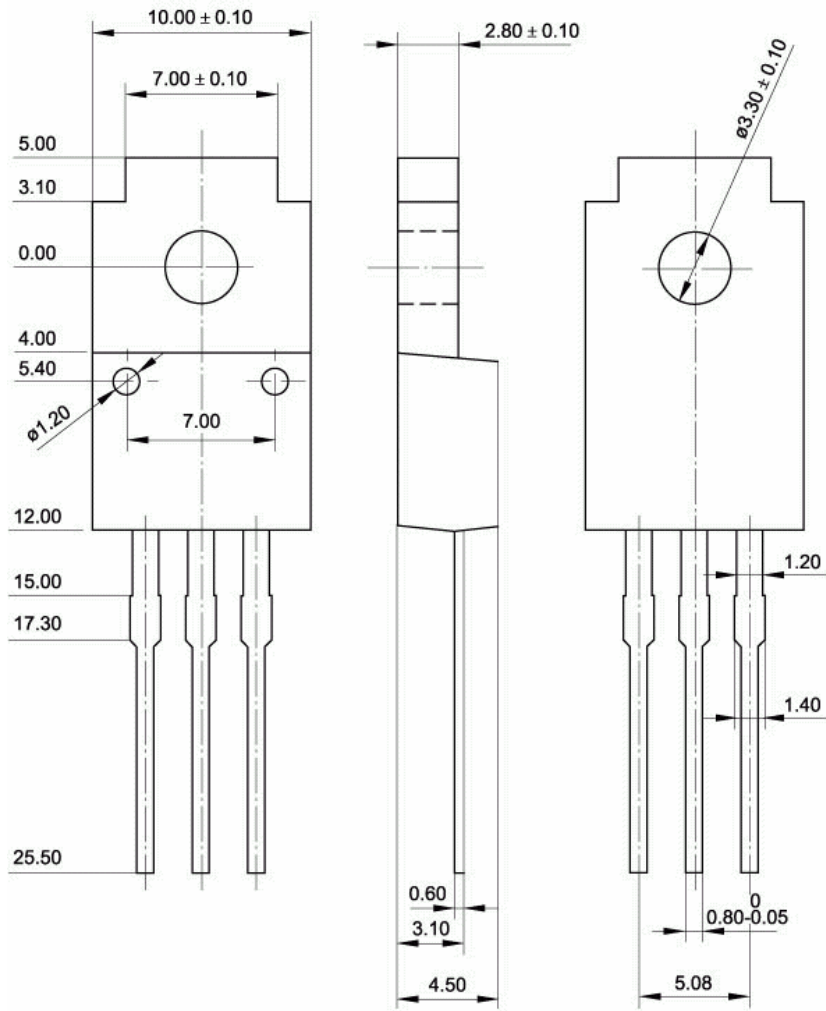


Fig.2 Outline dimensions (unindicated tolerance:  $\pm 0.15$  mm)