

## Silicon NPN Power Transistors

## 2SD1669

## DESCRIPTION

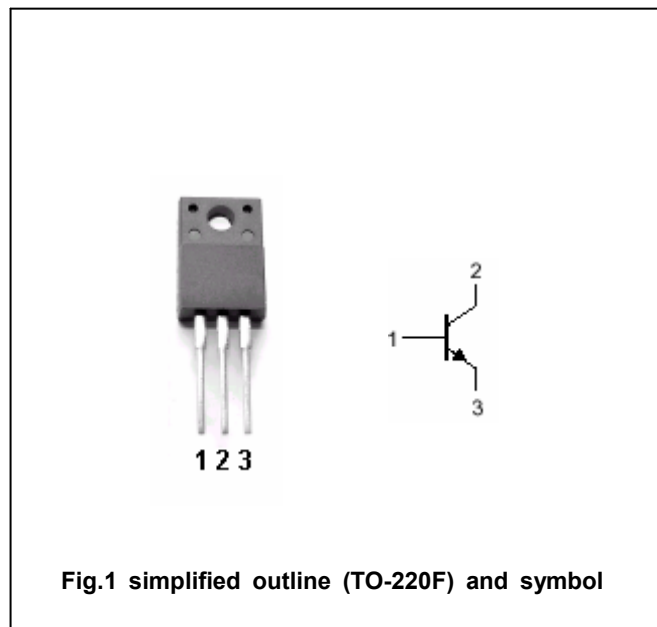
- With TO-220F package
- Complement to type 2SB1136
- Low collector saturation voltage
- Wide safe operating area

## APPLICATIONS

- For relay drivers,high-speed inverters, converters,and other general high-current switching applications

## PINNING

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

Absolute maximum ratings ( $T_a=25^\circ\text{C}$ )

| SYMBOL    | PARAMETER                 | CONDITIONS             | VALUE   | UNIT             |
|-----------|---------------------------|------------------------|---------|------------------|
| $V_{CBO}$ | Collector-base voltage    | Open emitter           | 60      | V                |
| $V_{CEO}$ | Collector-emitter voltage | Open base              | 50      | V                |
| $V_{EBO}$ | Emitter-base voltage      | Open collector         | 6       | V                |
| $I_C$     | Collector current         |                        | 12      | A                |
| $I_{CM}$  | Collector current-peak    |                        | 15      | A                |
| $P_C$     | Collector dissipation     | $T_a=25^\circ\text{C}$ | 2       | W                |
|           |                           | $T_C=25^\circ\text{C}$ | 30      |                  |
| $T_j$     | Junction temperature      |                        | 150     | $^\circ\text{C}$ |
| $T_{stg}$ | Storage temperature       |                        | -55~150 | $^\circ\text{C}$ |

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## CHARACTERISTICS

Tj=25°C unless otherwise specified

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| SYMBOL        | PARAMETER                            | CONDITIONS                | MIN | TYP. | MAX | UNIT    |
|---------------|--------------------------------------|---------------------------|-----|------|-----|---------|
| $V_{(BR)CEO}$ | Collector-emitter breakdown voltage  | $I_C=1mA ; R_{BE}=\infty$ | 50  |      |     | V       |
| $V_{(BR)CBO}$ | Collector-base breakdown voltage     | $I_C=1mA ; I_E=0$         | 60  |      |     | V       |
| $V_{(BR)EBO}$ | Emitter-base breakdown voltage       | $I_E=1mA ; I_C=0$         | 6   |      |     | V       |
| $V_{CEsat}$   | Collector-emitter saturation voltage | $I_C=6A ; I_B=0.6A$       |     |      | 0.4 | V       |
| $I_{CBO}$     | Collector cut-off current            | $V_{CB}=40V ; I_E=0$      |     |      | 100 | $\mu A$ |
| $I_{EBO}$     | Emitter cut-off current              | $V_{EB}=4V ; I_C=0$       |     |      | 100 | $\mu A$ |
| $h_{FE-1}$    | DC current gain                      | $I_C=1A ; V_{CE}=2V$      | 70  |      | 280 |         |
| $h_{FE-2}$    | DC current gain                      | $I_C=5A ; V_{CE}=2V$      | 30  |      |     |         |
| $f_T$         | Transition frequency                 | $I_C=1A ; V_{CE}=5V$      |     | 10   |     | MHz     |

## Switching times

|          |              |                                                                |  |      |  |         |
|----------|--------------|----------------------------------------------------------------|--|------|--|---------|
| $t_{on}$ | Turn-on time | $I_C=2.0A ; I_{B1}=-I_{B2}=0.2A$<br>$V_{CC}=20V ; R_L=4\Omega$ |  | 0.10 |  | $\mu s$ |
| $t_s$    | Storage time |                                                                |  | 1.20 |  | $\mu s$ |
| $t_f$    | Fall time    |                                                                |  | 0.05 |  | $\mu s$ |

◆  $h_{FE-1}$  Classifications

| Q      | R       | S       |
|--------|---------|---------|
| 70-140 | 100-200 | 140-280 |

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