

**isc Silicon NPN Power Transistor**
**2SC4559**
**DESCRIPTION**

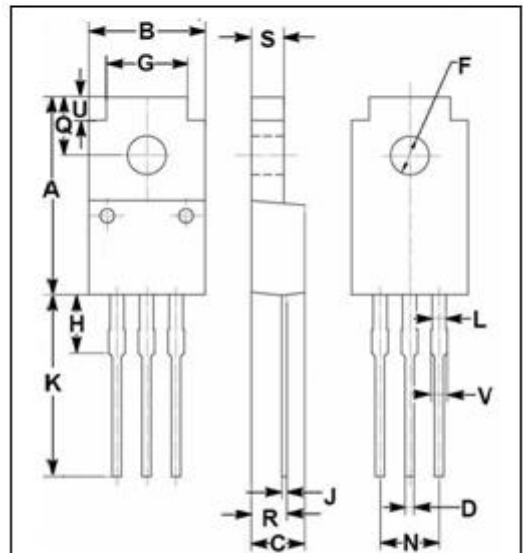
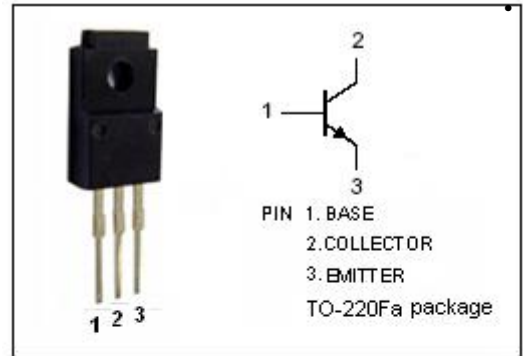
- Collector-Base Breakdown Voltage-  
:  $V_{(BR)CBO} = 500V(\text{Min.})$
- High Speed Switching
- 100% avalanche tested
- Minimum Lot-to-Lot variations for robust device performance and reliable operation

**APPLICATIONS**

- Designed for high speed switching applications.

**ABSOLUTE MAXIMUM RATINGS ( $T_a=25^\circ\text{C}$ )**

| SYMBOL    | PARAMETER   | VALUE   | UNIT             |
|-----------|---|---------|------------------|
| $V_{CBO}$ | Collector-Base Voltage                                  | 500     | V                |
| $V_{CES}$ | Collector-Emitter Voltage                               | 500     | V                |
| $V_{CEO}$ | Collector-Emitter Voltage                               | 400     | V                |
| $V_{EBO}$ | Emitter-Base Voltage                                    | 7       | V                |
| $I_C$     | Collector Current-Continuous                            | 7       | A                |
| $I_{CM}$  | Collector Current-Peak                                  | 15      | A                |
| $I_B$     | Base Current-Continuous                                 | 3       | A                |
| $P_C$     | Collector Power Dissipation<br>@ $T_a=25^\circ\text{C}$ | 2       | W                |
|           | Collector Power Dissipation<br>@ $T_c=25^\circ\text{C}$ | 40      |                  |
| $T_j$     | Junction Temperature                                    | 150     | $^\circ\text{C}$ |
| $T_{stg}$ | Storage Temperature Range                               | -55~150 | $^\circ\text{C}$ |



| DIM | mm    |       |
|-----|-------|-------|
|     | MIN   | MAX   |
| A   | 16.85 | 17.15 |
| B   | 9.90  | 10.10 |
| C   | 4.35  | 4.65  |
| D   | 0.75  | 0.80  |
| F   | 3.20  | 3.40  |
| G   | 6.90  | 7.10  |
| H   | 5.15  | 5.45  |
| J   | 0.45  | 0.75  |
| K   | 13.35 | 13.65 |
| L   | 1.10  | 1.30  |
| N   | 4.98  | 5.18  |
| Q   | 4.85  | 5.15  |
| R   | 2.95  | 3.25  |
| S   | 2.70  | 2.90  |
| U   | 1.75  | 2.05  |
| V   | 1.30  | 1.50  |

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**ELECTRICAL CHARACTERISTICS**
**T<sub>c</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>CE(sat)</sub> | Collector-Emitter Saturation Voltage | I <sub>C</sub> = 3A; I <sub>B</sub> = 0.6A            |     |      | 1.0 | V    |
| V <sub>BE(sat)</sub> | Base-Emitter Saturation Voltage      | I <sub>C</sub> = 3A; I <sub>B</sub> = 0.6A            |     |      | 1.5 | V    |
| I <sub>CBO</sub>     | Collector Cutoff Current             | V <sub>CB</sub> = 500V; I <sub>E</sub> = 0            |     |      | 100 | μ A  |
| I <sub>EBO</sub>     | Emitter Cutoff Current               | V <sub>EB</sub> = 5V; I <sub>C</sub> = 0              |     |      | 100 | μ A  |
| h <sub>FE-1</sub>    | DC Current Gain                      | I <sub>C</sub> = 0.1A; V <sub>CE</sub> = 5V           | 10  |      |     |      |
| h <sub>FE-2</sub>    | DC Current Gain                      | I <sub>C</sub> = 3A; V <sub>CE</sub> = 5V             | 8   |      |     |      |
| f <sub>T</sub>       | Current-Gain—Bandwidth Product       | I <sub>C</sub> = 0.5A; V <sub>CE</sub> = 10V; f= 1MHz |     | 5.5  |     | MHz  |

**Switching Times**

|                 |              |   |  |  |     |     |
|-----------------|--------------|---|--|--|-----|-----|
| t <sub>on</sub> | Turn-on Time | I <sub>C</sub> = 3A; I <sub>B1</sub> = 0.6A; I <sub>B2</sub> = -1.2A;<br>V <sub>CC</sub> = 150V |  |  | 1.0 | μ s |
| t <sub>s</sub>  | Storage Time |   |  |  | 3.0 | μ s |
| t <sub>f</sub>  | Fall Time    |   |  |  | 0.3 | μ s |

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