

**isc Silicon NPN Darlington Power Transistor**
**2SD1591**
**DESCRIPTION**

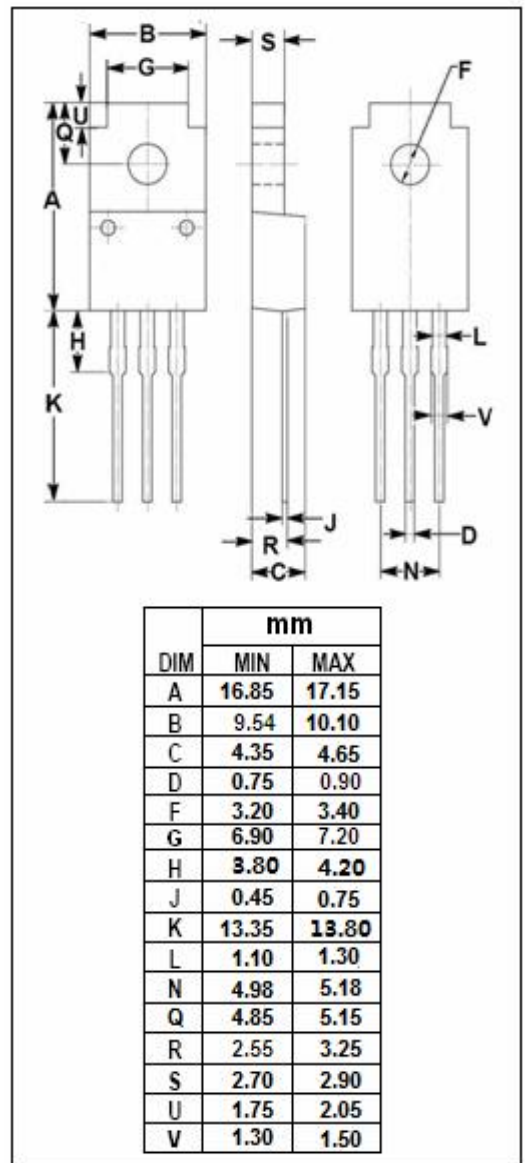
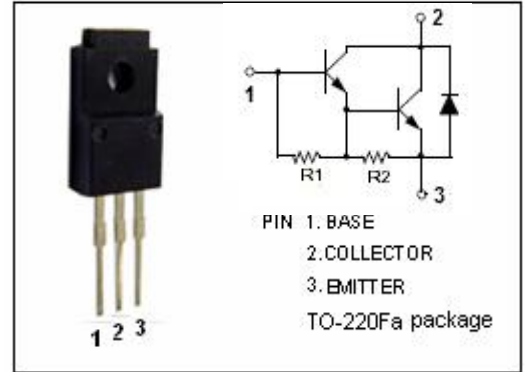
- Collector-Emitter Saturation Voltage-  
:  $V_{CE(sat)} = 1.5V(\text{Max}) @ I_C = 10A$
- High DC Current Gain  
:  $h_{FE} = 1000(\text{Min}) @ I_C = 10A$
- Complement to Type 2SB1100
- Minimum Lot-to-Lot variations for robust device performance and reliable operation

**APPLICATIONS**

- Designed for audio frequency power amplifier and low speed high current switching industrial use.

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

| SYMBOL    | PARAMETER                                            | VALUE   | UNIT             |
|-----------|------------------------------------------------------|---------|------------------|
| $V_{CBO}$ | Collector-Base Voltage                               | 100     | V                |
| $V_{CEO}$ | Collector-Emitter Voltage                            | 100     | V                |
| $V_{EBO}$ | Emitter-Base Voltage                                 | 8       | V                |
| $I_C$     | Collector Current-Continuous                         | 10      | A                |
| $I_{CP}$  | Collector Current-Pulse                              | 20      | A                |
| $I_B$     | Base Current-Continuous                              | 1.0     | A                |
| $P_C$     | Collector Power Dissipation @ $T_a=25^\circ\text{C}$ | 2       | W                |
|           | Collector Power Dissipation @ $T_c=25^\circ\text{C}$ | 30      |                  |
| $T_J$     | Junction Temperature                                 | 150     | $^\circ\text{C}$ |
| $T_{stg}$ | Storage Temperature Range                            | -55~150 | $^\circ\text{C}$ |



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**ELECTRICAL CHARACTERISTICS**

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

| SYMBOL               | PARAMETER                            | CONDITIONS                                  | MIN  | TYP. | MAX   | UNIT |
|----------------------|--------------------------------------|---------------------------------------------|------|------|-------|------|
| V <sub>CE(sat)</sub> | Collector-Emitter Saturation Voltage | I <sub>C</sub> = 10A; I <sub>B</sub> = 25mA |      |      | 1.5   | V    |
| V <sub>BE(sat)</sub> | Base-Emitter Saturation Voltage      | I <sub>C</sub> = 10A; I <sub>B</sub> = 25mA |      |      | 2.0   | V    |
| I <sub>CBO</sub>     | Collector Cutoff Current             | V <sub>CB</sub> = 100V; I <sub>E</sub> = 0  |      |      | 10    | μ A  |
| I <sub>EBO</sub>     | Emitter Cutoff Current               | V <sub>EB</sub> = 5V; I <sub>C</sub> = 0    |      |      | 3.0   | mA   |
| h <sub>FE</sub>      | DC Current Gain                      | I <sub>C</sub> = 10A; V <sub>CE</sub> = 2V  | 1000 |      | 30000 |      |

## Switching times

|                  |              |                                                                                                                |  |     |  |     |
|------------------|--------------|----------------------------------------------------------------------------------------------------------------|--|-----|--|-----|
| t <sub>on</sub>  | Turn-on Time | I <sub>C</sub> = 10A, I <sub>B1</sub> = I <sub>B2</sub> = 25mA;<br>R <sub>L</sub> = 5 Ω; V <sub>CC</sub> ≈ 50V |  | 1.0 |  | μ s |
| t <sub>stg</sub> | Storage Time |                                                                                                                |  | 5.0 |  | μ s |
| t <sub>r</sub>   | Fall Time    |                                                                                                                |  | 2.0 |  | μ s |

**◆ h<sub>FE</sub> Classifications**

| M         | L         | K          | J          |
|-----------|-----------|------------|------------|
| 1000-3000 | 2000-5000 | 4000-10000 | 8000-30000 |

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