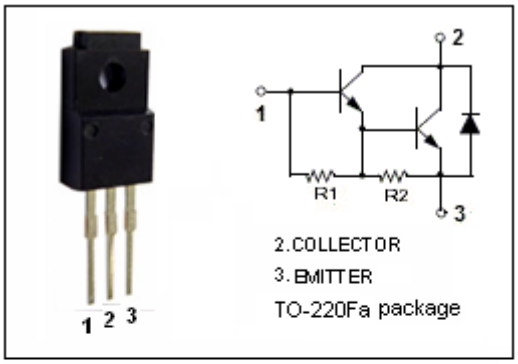
# isc Silicon NPN Darlington Power Transistor 2SD1590

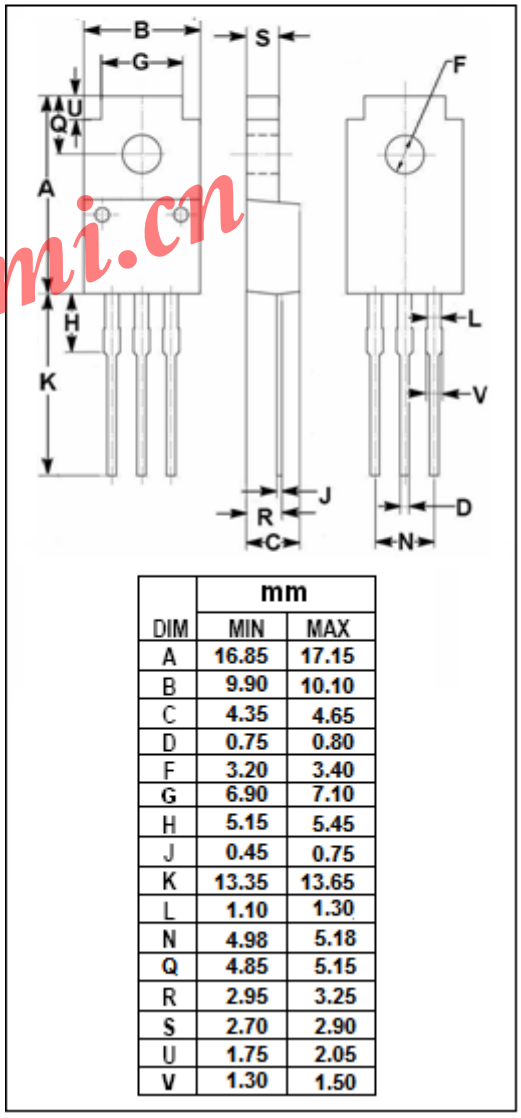
## DESCRIPTION

- Collector-Emitter Saturation Voltage-
  : $V_{CE(sat)}$= 1.5V(Max) @$I_C$= 3A
- High DC Current Gain
  : $h_{FE}$= 2000(Min) @ $I_C$= 3A
- Complement to Type 2SB1099




## APPLICATIONS

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




| DIM | mm MIN | mm 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 |

## ABSOLUTE MAXIMUM RATINGS($T_a$=25℃)

| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $V_{CBO}$ | Collector-Base Voltage | 150 | V |
| $V_{CEO}$ | Collector-Emitter Voltage | 100 | V |
| $V_{EBO}$ | Emitter-Base Voltage | 7 | V |
| $I_C$ | Collector Current-Continuous | 8 | A |
| $I_{CP}$ | Collector Current-Pulse | 12 | A |
| $I_B$ | Base Current-Continuous | 0.8 | A |
| $P_C$ | Collector Power Dissipation @ $T_a$=25℃ | 2 | W |
| | Collector Power Dissipation @ $T_C$=25℃ | 25 | |
| $T_J$ | Junction Temperature | 150 | ℃ |
| $T_{stg}$ | Storage Temperature Range | -55~150 | ℃ |

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## ELECTRICAL CHARACTERISTICS

**$T_C$=25℃ unless otherwise specified**

| SYMBOL | PARAMETER | CONDITIONS | MIN | TYP. | MAX | UNIT |
|---|---|---|---|---|---|---|
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | $I_C$= 3A; $I_B$= 3mA | | | 1.5 | V |
| $V_{BE(sat)}$ | Base-Emitter Saturation Voltage | $I_C$= 3A; $I_B$= 3mA | | | 2.0 | V |
| $I_{CBO}$ | Collector Cutoff Current | $V_{CB}$= 100V; $I_E$= 0 | | | 1.0 | μA |
| $I_{EBO}$ | Emitter Cutoff Current | $V_{EB}$= 5V; $I_C$= 0 | | | 3.0 | mA |
| $h_{FE-1}$ | DC Current Gain | $I_C$= 3A; $V_{CE}$= 2V | 2000 | | 15000 | |
| $h_{FE-2}$ | DC Current Gain | $I_C$= 5A; $V_{CE}$= 2V | 500 | | | |
| Switching times | | | | | | |
| $t_{on}$ | Turn-on Time | $I_C$= 3A, $I_{B1}$= -$I_{B2}$= 3mA; $R_L$= 16.7Ω; $V_{CC}$≈ 50V | | 1.0 | | μs |
| $t_{stg}$ | Storage Time | | | 3.5 | | μs |
| $t_f$ | Fall Time | | | 1.2 | | μs |

◆ **$h_{FE-1}$ Classifications**

| M | L | K |
|---|---|---|
| 2000-5000 | 3000-7000 | 5000-15000 |