# Silicon NPN Power Transistors 2SD1159

## DESCRIPTION

·With TO-220 package

## APPLICATIONS

·TV horizontal deflection output,

·High-current switching applications

### PINNING

| PIN | DESCRIPTION |
|---|---|
| 1 | Base |
| 2 | Collector;connected to mounting base |
| 3 | Emitter |

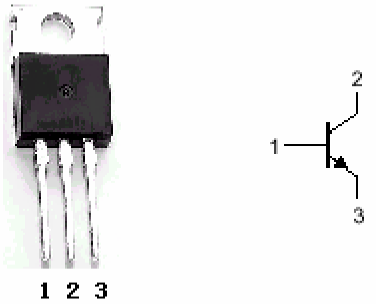

Fig.1 simplified outline (TO-220C) and symbol

### Absolute maximum ratings (Ta=25□)

| SYMBOL | PARAMETER | CONDITIONS | VALUE | UNIT |
|---|---|---|---|---|
| $V_{CBO}$ | Collector-base voltage | Open emitter | 200 | V |
| $V_{CEO}$ | Collector-emitter voltage | Open base | 60 | V |
| $V_{EBO}$ | Emitter-base voltage | Open collector | 6 | V |
| $I_C$ | Collector current (DC) | | 4.5 | A |
| $I_{CM}$ | Collector current-peak | | 10 | A |
| $P_C$ | Collector power dissipation | $T_C$=25□ | 40 | W |
| $T_j$ | Junction temperature | | 150 | □ |
| $T_{stg}$ | Storage temperature | | -55~150 | □ |

## CHARACTERISTICS

**Tj=25℃ unless otherwise specified**

| SYMBOL | PARAMETER | CONDITIONS | MIN | TYP. | MAX | UNIT |
|---|---|---|---|---|---|---|
| $V_{(BR)CEO}$ | Collector-emitter breakdown voltage | $I_C$=5mA ;$R_{BE}$=∞ | 60 | | | V |
| $V_{(BR)CBO}$ | Collector-base breakdown voltage | $I_C$=5mA ;$I_E$=0 | 200 | | | V |
| $V_{(BR)EBO}$ | Emitter-base breakdown voltage | $I_E$=5mA ;$I_C$=0 | 6 | | | V |
| $V_{CEsat}$ | Collector-emitter saturation voltage | $I_C$=4A, $I_B$=0.4A | | 0.5 | 1.0 | V |
| $V_{BEsat}$ | Base-emitter saturation voltage | $I_C$=4A, $I_B$=0.4A | | | 1.5 | V |
| $I_{CBO}$ | Collector cut-off current | $V_{CB}$=40V;$I_E$=0 | | | 0.1 | mA |
| $I_{EBO}$ | Emitter cut-off current | $V_{EB}$=5V; $I_C$=0 | | | 0.1 | mA |
| $h_{FE-1}$ | DC current gain | $I_C$=1A ; $V_{CE}$=5V | 30 | | 160 | |
| $h_{FE-2}$ | DC current gain | $I_C$=4A ; $V_{CE}$=5V | 25 | | | |
| $f_T$ | Transition frequency | $I_C$=1A ; $V_{CE}$=5V | | 10 | | MHz |
| Switching times | | | | | | |
| $t_f$ | Fall time | $I_C$=5A;$I_{B1}$=-$I_{B2}$=0.5A;<br>$V_{CC}$=50V | | 0.2 | 0.5 | μs |

**PACKAGE OUTLINE**

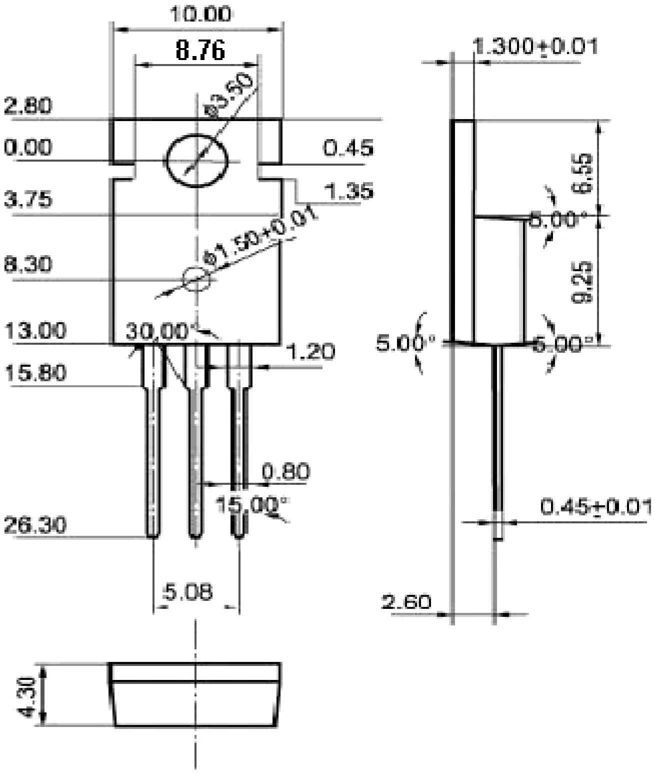

Fig.2 outline dimensions (unindicated tolerance:±0.10 mm)

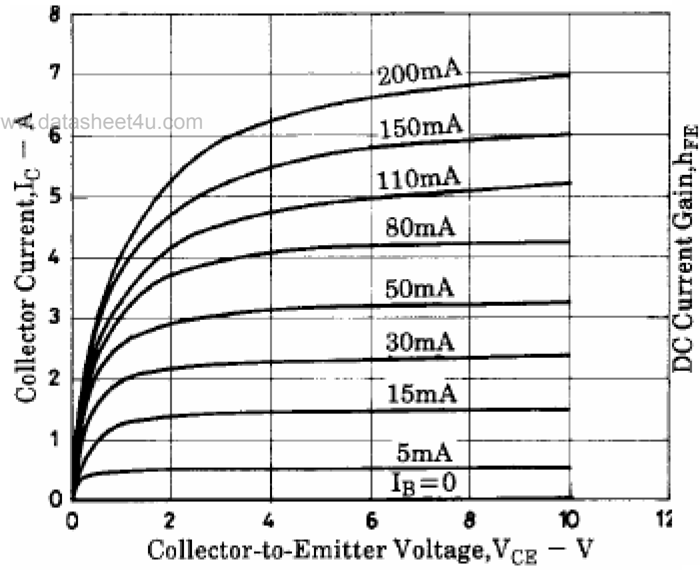

Fig.3 Static Characteristic

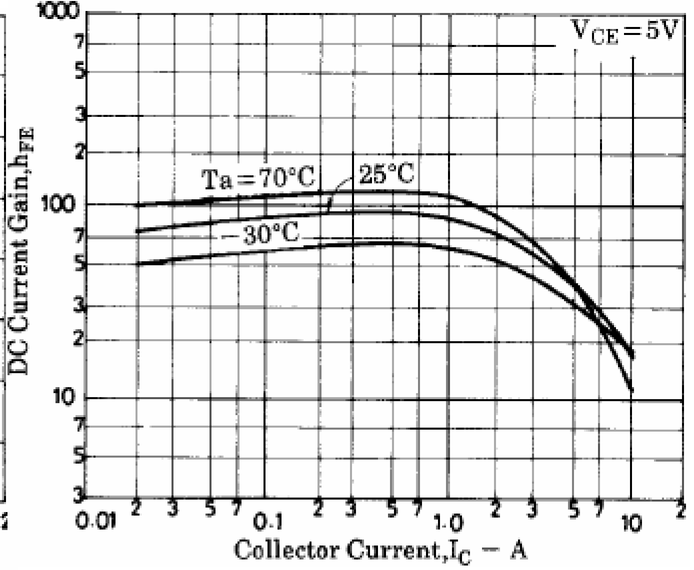

Fig.4 DC current Gain

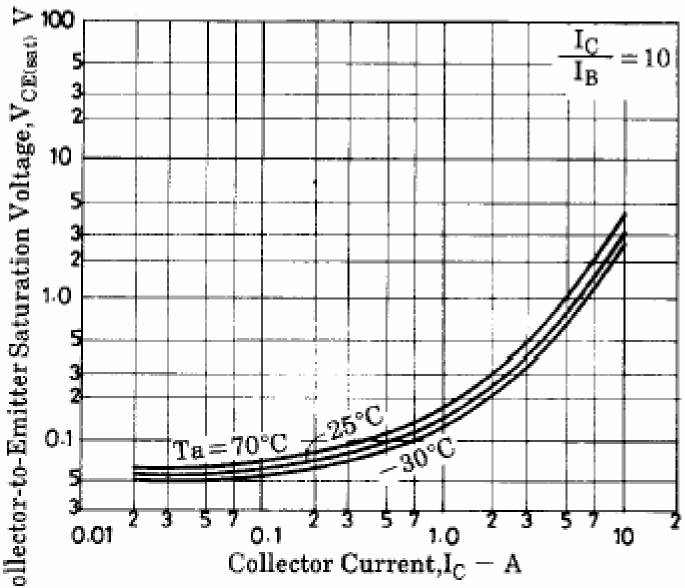

Fig.5 Collector-Emitter Saturation Voltage

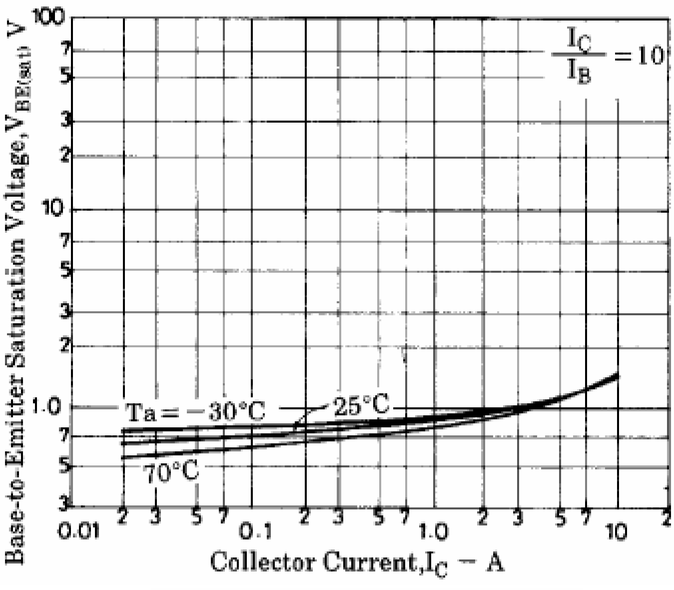

Fig.6 Base-Emitter Saturation Voltage

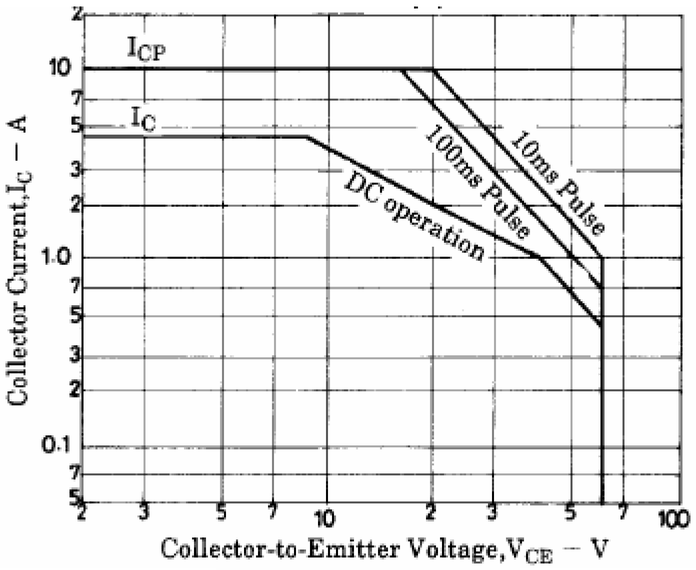

Fig.7 Safe Operating Area