

# Low $V_{CE(sat)}$ transistor (strobe flash)

## 2SD2098 / 2SD2118 / 2SD2097

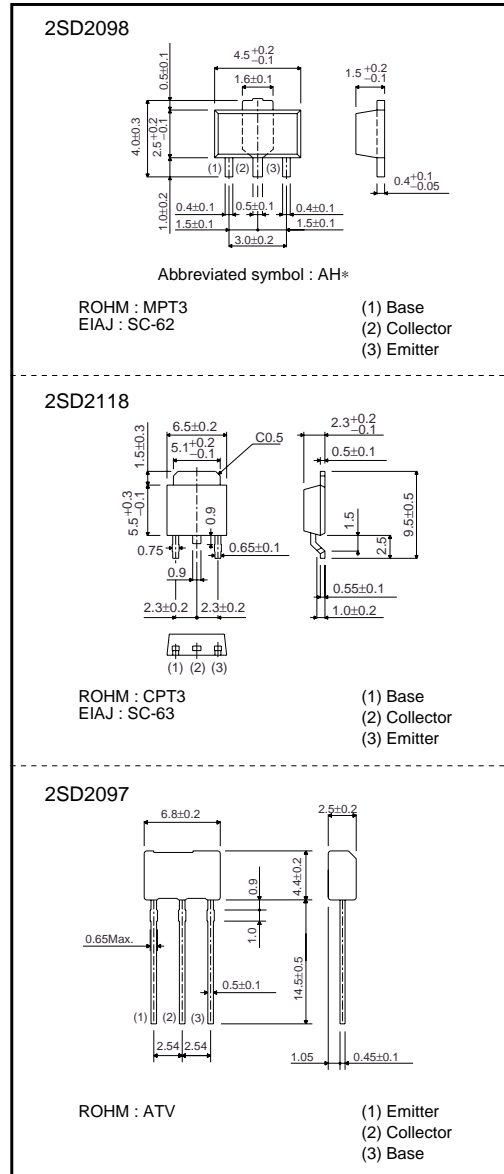
●Features

- 1) Low  $V_{CE(sat)}$ .  
 $V_{CE(sat)} = 0.25V$  (Typ.)  
 $(I_C/I_B = 4A / 0.1A)$
- 2) Excellent DC current gain characteristics.
- 3) Complements the 2SB1386 / 2SB1412 / 2SB1326.

●Structure

Epitaxial planar type  
 NPN silicon transistor

●External dimensions (Units : mm)



\* Denotes hFE

## Transistors

## ●Absolute maximum ratings (Ta=25°C)

| Parameter                   |         | Symbol           | Limits   | Unit                    |
|-----------------------------|---------|------------------|----------|-------------------------|
| Collector-base voltage      |         | V <sub>CB0</sub> | 50       | V                       |
| Collector-emitter voltage   |         | V <sub>CEO</sub> | 20       | V                       |
| Emitter-base voltage        |         | V <sub>EBO</sub> | 6        | V                       |
| Collector current           |         | I <sub>c</sub>   | 5        | A(DC)                   |
|                             |         | I <sub>cP</sub>  | 10       | A(Pulse) *1             |
| Collector power dissipation | 2SD2098 | P <sub>c</sub>   | 0.5      | W *2                    |
|                             |         |                  | 2        |                         |
|                             | 1       |                  |          |                         |
|                             | 2SD2118 |                  | 10       | W(T <sub>c</sub> =25°C) |
| 2SD2097                     | 1       | W *3             |          |                         |
| Junction temperature        |         | T <sub>j</sub>   | 150      | °C                      |
| Storage temperature         |         | T <sub>stg</sub> | -55~+150 | °C                      |

\*1 Single pulse P<sub>w</sub>=10ms

\*2 When mounted on a 40×40×0.7 mm ceramic board.

\*3 Printed circuit board glass epoxy board, 1.6 mm thick with copper plating 100mm<sup>2</sup> or larger.

## ●Electrical characteristics (Ta=25°C)

| Parameter                            | Symbol               | Min. | Typ. | Max. | Unit | Conditions   |
|--------------------------------------|----------------------|------|------|------|------|--|
| Collector-base breakdown voltage     | BV <sub>CB0</sub>    | 50   | –    | –    | V    | I <sub>c</sub> =50μA                                 |
| Collector-emitter breakdown voltage  | BV <sub>CEO</sub>    | 20   | –    | –    | V    | I <sub>c</sub> =1mA                                  |
| Emitter-base breakdown voltage       | BV <sub>EBO</sub>    | 6    | –    | –    | V    | I <sub>E</sub> =50μA                                 |
| Collector cutoff current             | I <sub>cBO</sub>     | –    | –    | 0.5  | μA   | V <sub>CB</sub> =40V                                 |
| Emitter cutoff current               | I <sub>EBO</sub>     | –    | –    | 0.5  | μA   | V <sub>EB</sub> =5V                                  |
| Collector-emitter saturation voltage | V <sub>CE(sat)</sub> | –    | 0.25 | 1.0  | V    | I <sub>c</sub> /I <sub>B</sub> =4A/0.1A *            |
| DC current transfer ratio            | h <sub>FE</sub>      | 120  | –    | 390  | –    | V <sub>CE</sub> =2V, I <sub>c</sub> =0.5A *          |
| Transition frequency                 | f <sub>T</sub>       | –    | 150  | –    | MHz  | V <sub>CE</sub> =6V, I <sub>E</sub> =-50mA, f=100MHz |
| Output capacitance                   | C <sub>ob</sub>      | –    | 30   | –    | pF   | V <sub>CE</sub> =20V, I <sub>E</sub> =0A, f=1MHz     |

\* Measured using pulse current.

●Packaging specifications and h<sub>FE</sub>

| Type    | h <sub>FE</sub> | Package                      | Taping |      |      |
|---------|-----------------|------------------------------|--------|------|------|
|         |                 | Code                         | T100   | TL   | TV2  |
|         |                 | Basic ordering unit (pieces) | 1000   | 2500 | 2500 |
| 2SD2098 | QR              |                              | ○      | –    | –    |
| 2SD2118 | QR              |                              | –      | ○    | –    |
| 2SD2097 | QR              |                              | –      | –    | ○    |

h<sub>FE</sub> values are classified as follows :

| Item            | Q       | R       |
|-----------------|---------|---------|
| h <sub>FE</sub> | 120~270 | 180~390 |

Transistors

● Electrical characteristic curves

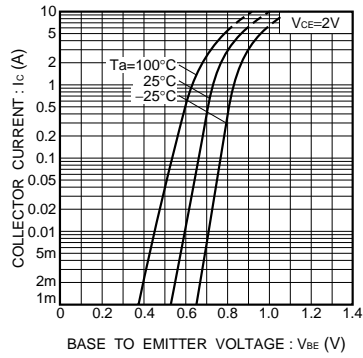


Fig.1 Grounded emitter propagation characteristics

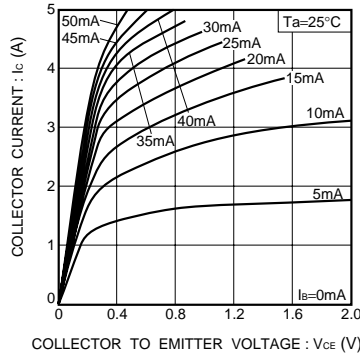


Fig.2 Grounded emitter output characteristics

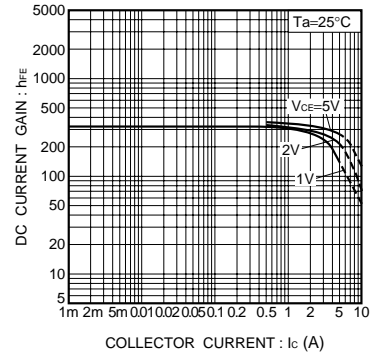


Fig.3 DC current gain vs. collector current ( I )

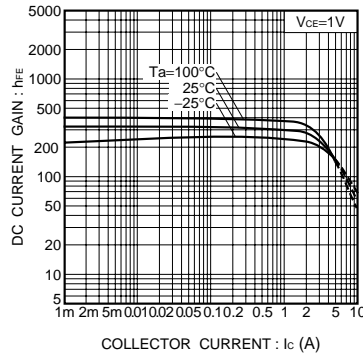


Fig.4 DC current gain vs. collector current ( II )

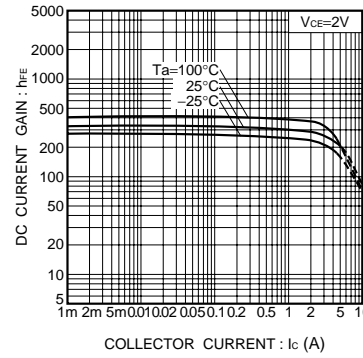


Fig.5 DC current gain vs. collector current ( III )

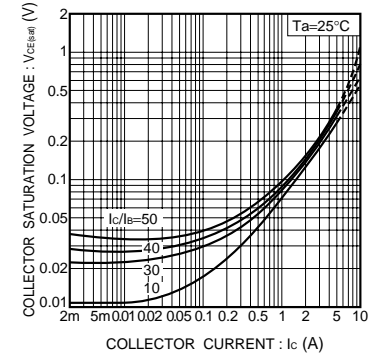


Fig.6 Collector-emitter saturation voltage vs. collector current ( I )

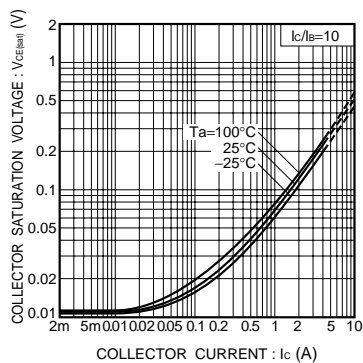


Fig.7 Collector-emitter saturation voltage vs. collector current ( II )

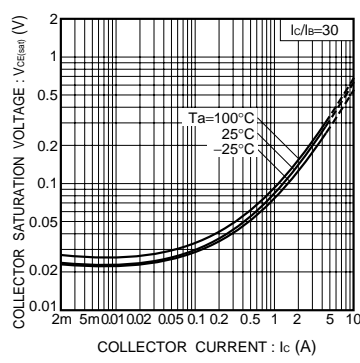


Fig.8 Collector-emitter saturation voltage vs. collector current ( III )

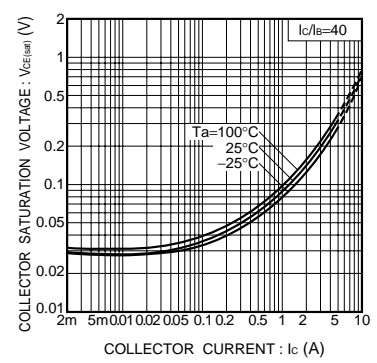


Fig.9 Collector-emitter saturation voltage vs. collector current ( IV )

Transistors

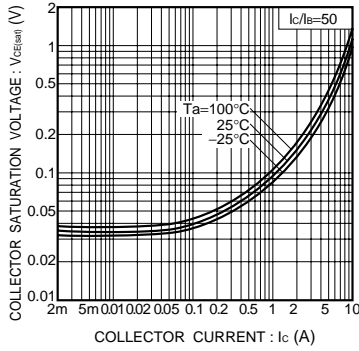


Fig.10 Collector-emitter saturation voltage vs. collector current (V)

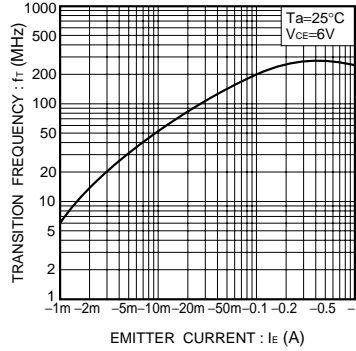


Fig.11 Gain bandwidth product vs. emitter current

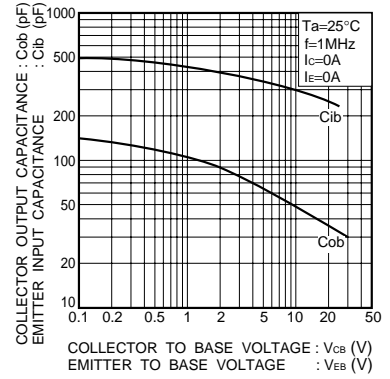


Fig.12 Collector output capacitance vs. collector-base voltage  
Emitter input capacitance vs. emitter-base voltage

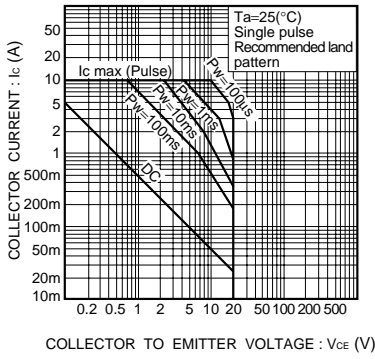


Fig.13 Safe operating area (2SD2098)

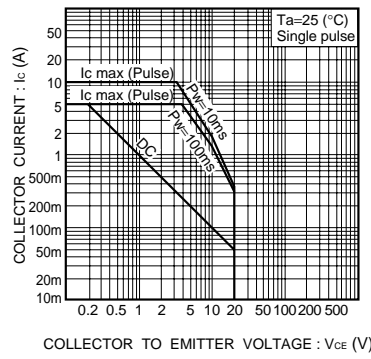


Fig.14 Safe operating area (2SD2118)