

# 2SC3938G

## Silicon NPN epitaxial planar type

For high-speed switching

### ■ Features

- Low collector-emitter saturation voltage  $V_{CE(sat)}$
- S-Mini type package, allowing downsizing of the equipment and automatic insertion through the tape packing

### ■ Package

- Code  
SMini3-F2
- Marking Symbol: 2Y
- Pin Name
  1. Base
  2. Emitter
  3. Collector

### ■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

| Parameter                             | Symbol    | Rating      | Unit             |
|---------------------------------------|-----------|-------------|------------------|
| Collector-base voltage (Emitter open) | $V_{CBO}$ | 40          | V                |
| Collector-emitter voltage (E-B short) | $V_{CES}$ | 40          | V                |
| Emitter-base voltage (Collector open) | $V_{EBO}$ | 5           | V                |
| Collector current                     | $I_C$     | 100         | mA               |
| Peak collector current                | $I_{CP}$  | 300         | mA               |
| Collector power dissipation           | $P_C$     | 150         | mW               |
| Junction temperature                  | $T_j$     | 150         | $^\circ\text{C}$ |
| Storage temperature                   | $T_{stg}$ | -55 to +150 | $^\circ\text{C}$ |

### ■ Electrical Characteristics $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$

| Parameter   | Symbol        | Conditions  | Min | Typ  | Max  | Unit          |
|---|---------------|---|-----|------|------|---------------|
| Collector-base cutoff current (Emitter open)                        | $I_{CBO}$     | $V_{CB} = 40\text{ V}, I_E = 0$                                 |     |      | 0.1  | $\mu\text{A}$ |
| Emitter-base cutoff current (Collector open)                        | $I_{EBO}$     | $V_{EB} = 4\text{ V}, I_C = 0$                                  |     |      | 0.1  | $\mu\text{A}$ |
| Forward current transfer ratio *                                    | $h_{FE}$      | $V_{CE} = 1\text{ V}, I_C = 10\text{ mA}$                       | 60  |      | 200  | —             |
| Collector-emitter saturation voltage                                | $V_{CE(sat)}$ | $I_C = 10\text{ mA}, I_B = 1\text{ mA}$                         |     | 0.17 | 0.25 | V             |
| Base-emitter saturation voltage                                     | $V_{BE(sat)}$ | $I_C = 10\text{ mA}, I_B = 1\text{ mA}$                         |     |      | 1    | V             |
| Transition frequency  | $f_T$         | $V_{CB} = 10\text{ V}, I_E = -10\text{ mA}, f = 200\text{ MHz}$ |     | 450  |      | MHz           |
| Collector output capacitance<br>(Common base, input open circuited) | $C_{ob}$      | $V_{CB} = 10\text{ V}, I_E = 0, f = 1\text{ MHz}$               |     | 2    | 6    | pF            |
| Turn-on time  | $t_{on}$      | Refer to the measurement circuit                                |     | 17   |      | ns            |
| Turn-off time   | $t_{off}$     |   |     | 17   |      | ns            |
| Storage time  | $t_{stg}$     |   |     | 10   |      | ns            |

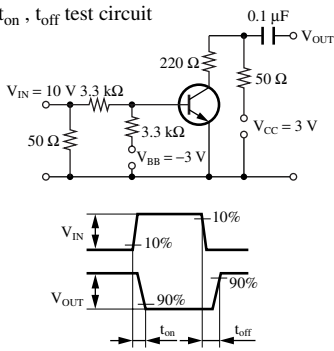
Note) 1. Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

2. \*: Rank classification

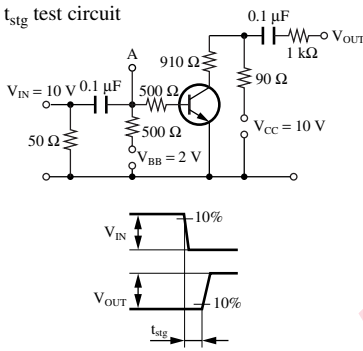
| Rank     | Q         | R         |
|----------|-----------|-----------|
| $h_{FE}$ | 60 to 120 | 90 to 200 |

Measurement circuit

$t_{on}$ ,  $t_{off}$  test circuit

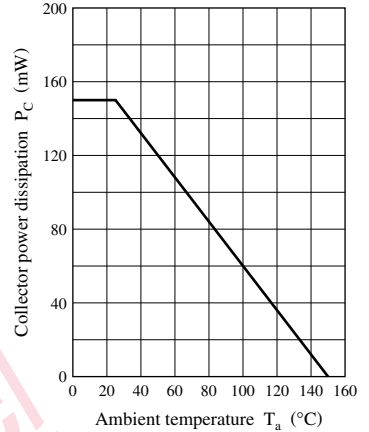


$t_{stg}$  test circuit

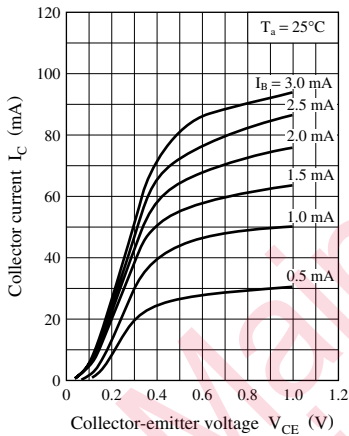


(Waveform at A)

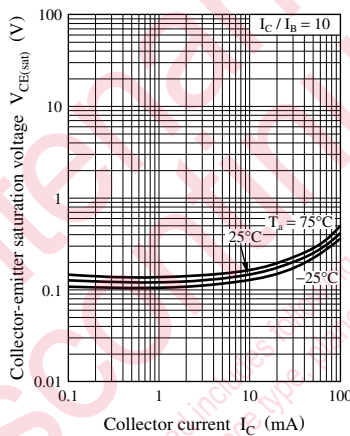
$P_C - T_a$



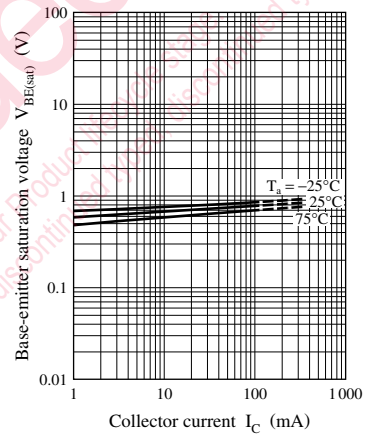
$I_C - V_{CE}$



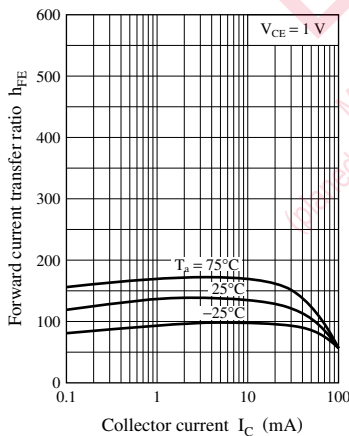
$V_{CE(sat)} - I_C$



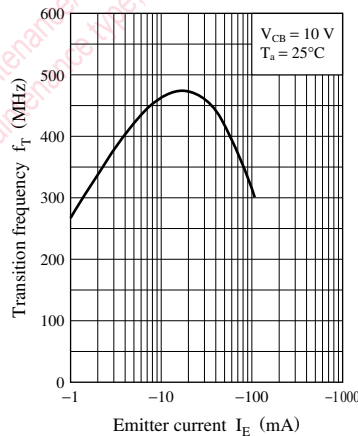
$V_{BE(sat)} - I_C$



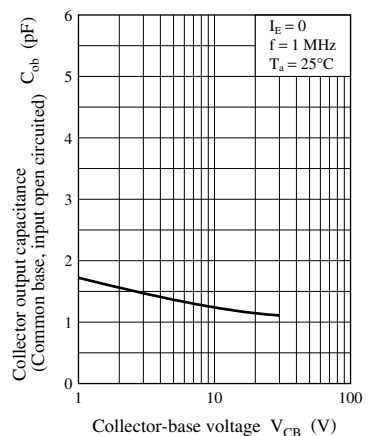
$h_{FE} - I_C$



$f_T - I_E$

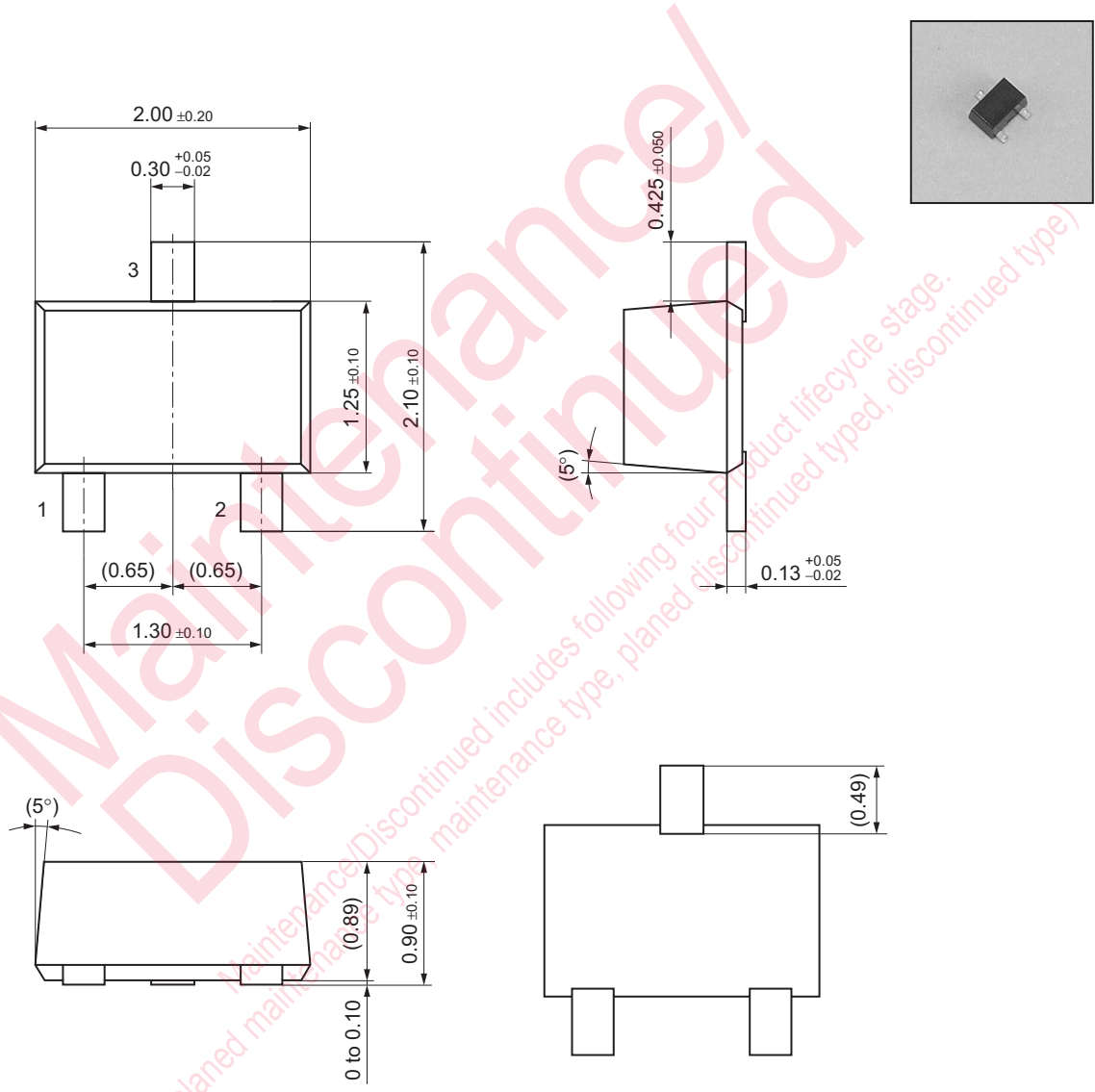


$C_{ob} - V_{CB}$



SMini3-F2

Unit: mm



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