

# High-speed Switching Transistor (-60V, -5A)

## 2SA1952

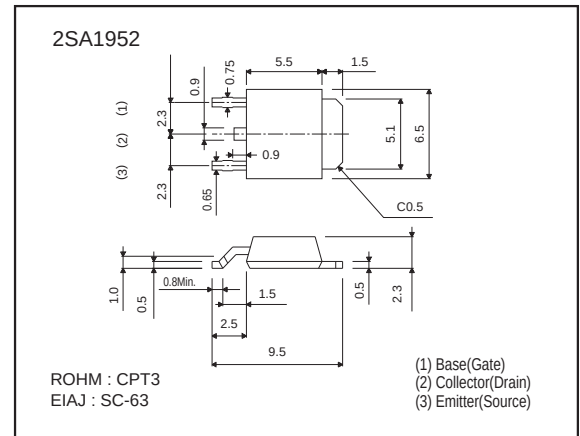
### ●Features

- 1) High speed switching. (tf : Typ. 0.15  $\mu$ s at Ic = -3A)
- 2) Low VCE(sat). (Typ. -0.2V at Ic/Ib = -3/-0.15A)
- 3) Wide SOA. (safe operating area)
- 4) Complements the 2SC5103.

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

| Parameter                   | Symbol           | Limits   | Unit       |
|-----------------------------|------------------|----------|------------|
| Collector-base voltage      | V <sub>CB0</sub> | -100     | V          |
| Collector-emitter voltage   | V <sub>CE0</sub> | -60      | V          |
| Emitter-base voltage        | V <sub>EB0</sub> | -5       | V          |
| Collector current           | I <sub>c</sub>   | -5       | A          |
|                             |                  | -10      | A(Pulse)   |
| Collector power dissipation | P <sub>c</sub>   | 1        | W          |
|                             |                  | 10       | W(Tc=25°C) |
| Junction temperature        | T <sub>j</sub>   | 150      | °C         |
| Storage temperature         | T <sub>stg</sub> | -55~+150 | °C         |

### ●Dimensions (Unit : mm)



### ●Packaging specifications and hFE

|                              |         |
|------------------------------|---------|
| Type                         | 2SA1952 |
| Package                      | CPT3    |
| hFE                          | Q       |
| Code                         | TL      |
| Basic ordering unit (pieces) | 2500    |

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

| Parameter                            | Symbol               | Min. | Typ. | Max. | Unit    | Conditions                                               |
|--------------------------------------|----------------------|------|------|------|---------|----------------------------------------------------------|
| Collector-base breakdown voltage     | BV <sub>CB0</sub>    | -100 | —    | —    | V       | I <sub>c</sub> = -50 $\mu$ A                             |
| Collector-emitter breakdown voltage  | BV <sub>CE0</sub>    | -60  | —    | —    | V       | I <sub>c</sub> = -1mA                                    |
| Emitter-base breakdown voltage       | BV <sub>EB0</sub>    | -5   | —    | —    | V       | I <sub>e</sub> = -50 $\mu$ A                             |
| Collector cutoff current             | I <sub>CB0</sub>     | —    | —    | -10  | $\mu$ A | V <sub>CB</sub> = -100V                                  |
| Emitter cutoff current               | I <sub>EB0</sub>     | —    | —    | -10  | $\mu$ A | V <sub>EB</sub> = -5V                                    |
| Collector-emitter saturation voltage | V <sub>CE(sat)</sub> | —    | —    | -0.3 | V       | I <sub>c</sub> /I <sub>b</sub> = -3A/-0.15A              |
|                                      |                      | —    | —    | -0.5 | V       | I <sub>c</sub> /I <sub>b</sub> = -4A/-0.2A               |
| Base-emitter saturation voltage      | V <sub>BE(sat)</sub> | —    | —    | -1.2 | V       | I <sub>c</sub> /I <sub>b</sub> = -3A/-0.15A              |
|                                      |                      | —    | —    | -1.5 | V       | I <sub>c</sub> /I <sub>b</sub> = -4A/-0.2A               |
| DC current transfer ratio            | h <sub>FE1</sub>     | 120  | —    | 270  | —       | V <sub>CE</sub> = -2V, I <sub>c</sub> = -1A              |
|                                      | h <sub>FE2</sub>     | 40   | —    | —    | —       | V <sub>CE</sub> = -2V, I <sub>c</sub> = -3A              |
| Transition frequency                 | f <sub>r</sub>       | —    | 80   | —    | MHz     | V <sub>CE</sub> = -10V, I <sub>e</sub> = 0.5A, f = 30MHz |
| Output capacitance                   | C <sub>ob</sub>      | —    | 130  | —    | pF      | V <sub>CB</sub> = -10V, I <sub>e</sub> = 0A, f = 1MHz    |
| Turn-on time                         | t <sub>on</sub>      | —    | —    | 0.3  | $\mu$ s | I <sub>c</sub> = -3A, R <sub>L</sub> = 10 $\Omega$       |
| Storage time                         | t <sub>stg</sub>     | —    | —    | 1.5  | $\mu$ s | I <sub>B1</sub> = -I <sub>B2</sub> = -0.15A              |
| Fall time                            | t <sub>f</sub>       | —    | —    | 0.3  | $\mu$ s | V <sub>CC</sub> = -30V                                   |

# ●Electrical characteristics curves

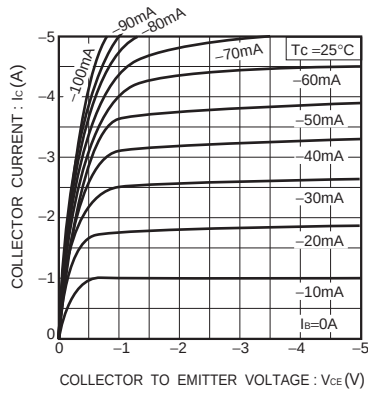


Fig.1 Ground emitter output characteristics

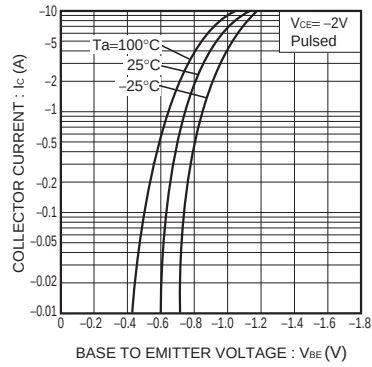


Fig.2 Ground emitter propagation characteristics

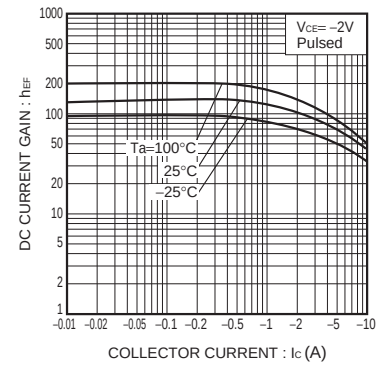


Fig.3 DC current gain vs. collector current

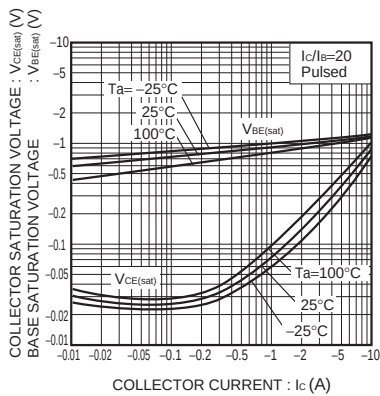
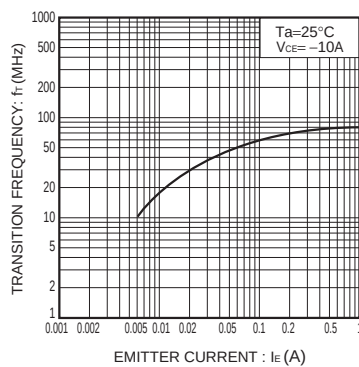
Fig.4 Collector-emitter saturation voltage  
Base-emitter saturation voltage vs. collector current

Fig.5 Resistance ratio vs. emitter current

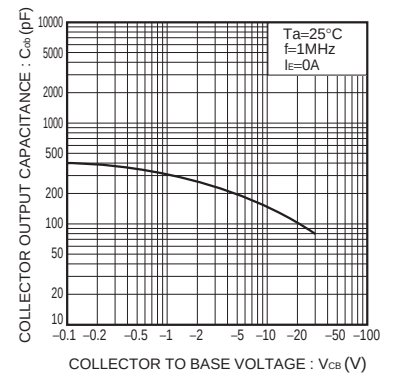
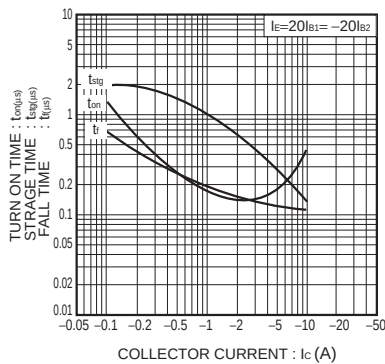
Fig.6 Collector output capacitance  
vs. collector-base voltage

Fig.7 Switching characteristics

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