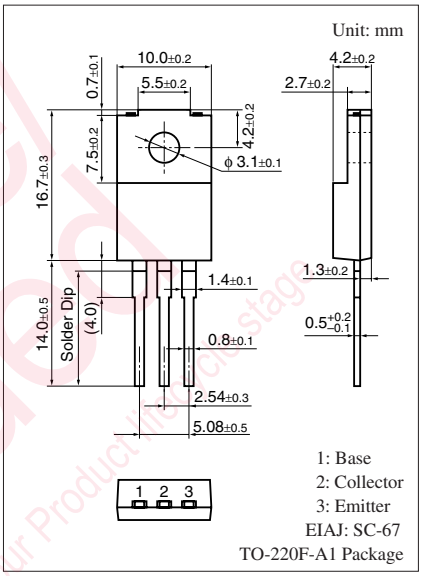
# 2SC3979, 2SC3979A

## Silicon NPN triple diffusion planar type

For high breakdown voltage high-speed switching




### ■ Features

- High-speed switching
- High collector-base voltage (Emitter open) $V_{CBO}$
- Wide safe operation area
- Satisfactory linearity of forward current transfer ratio $h_{FE}$
- Full-pack package which can be installed to the heat sink with one screw

### ■ Absolute Maximum Ratings $T_C = 25°C$

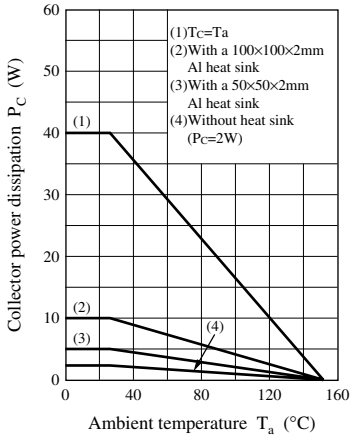
| Parameter | | Symbol | Rating | Unit |
|---|---|---|---|---|
| Collector-base voltage (Emitter open) | 2SC3979 | $V_{CBO}$ | 900 | V |
| | 2SC3979A | | 1 000 | |
| Collector-emitter voltage (E-B short) | 2SC3979 | $V_{CES}$ | 900 | V |
| | 2SC3979A | | 1 000 | |
| Collector-emitter voltage (Base open) | | $V_{CEO}$ | 800 | V |
| Emitter-base voltage (Collector open) | | $V_{EBO}$ | 7 | V |
| Base current | | $I_B$ | 1 | A |
| Collector current | | $I_C$ | 3 | A |
| Peak collector current | | $I_{CP}$ | 5 | A |
| Collector power dissipation | $T_a = 25°C$ | $P_C$ | 40 | W |
| | | | 2.0 | |
| Junction temperature | | $T_j$ | 150 | °C |
| Storage temperature | | $T_{stg}$ | −55 to +150 | °C |

### ■ Electrical Characteristics $T_C = 25°C \pm 3°C$

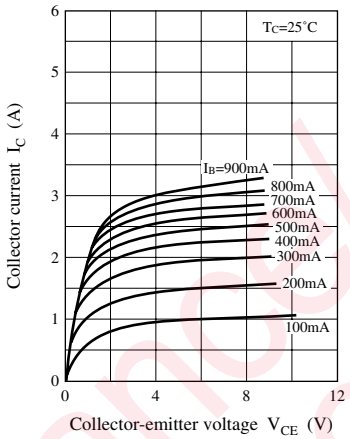
| Parameter | | Symbol | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| Collector-emitter voltage (Base open) | | $V_{CEO}$ | $I_C$ = 10 mA, $I_B$ = 0 | 800 | | | V |
| Collector-base cut-off current (Emitter open) | 2SC3979 | $I_{CBO}$ | $V_{CB}$ = 900 V, $I_E$ = 0 | | | 50 | µA |
| | 2SC3979A | | $V_{CB}$ = 1 000 V, $I_E$ = 0 | | | 50 | |
| Emitter-base cutoff current (Collector open) | | $I_{EBO}$ | $V_{EB}$ = 7 V, $I_C$ = 0 | | | 50 | µA |
| Forward current transfer ratio | | $h_{FE1}$ | $V_{CE}$ = 5 V, $I_C$ = 0.1 A | 8 | | | — |
| | | $h_{FE2}$ | $V_{CE}$ = 5 V, $I_C$ = 0.8 A | 6 | | | |
| Collector-emitter saturation voltage | | $V_{CE(sat)}$ | $I_C$ = 0.8 A, $I_B$ = 0.16 A | | | 1.5 | V |
| Base-emitter saturation voltage | | $V_{BE(sat)}$ | $I_C$ = 0.8 A, $I_B$ = 0.16 A | | | 1.5 | V |
| Transition frequency | | $f_T$ | $V_{CE}$ = 5 V, $I_C$ = 0.15 A, f = 1 MHz | | 10 | | MHz |
| Turn-on time | | $t_{on}$ | $I_C$ = 0.8 A | | | 0.7 | µs |
| Storage time | | $t_{stg}$ | $I_{B1}$ = 0.16 A, $I_{B2}$ = − 0.32 A | | | 2.5 | µs |
| Fall time | | $t_f$ | $V_{CC}$ = 250 V | | | 0.3 | µs |

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

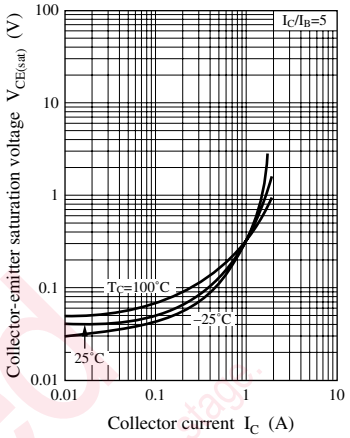
$P_C$ — $T_a$



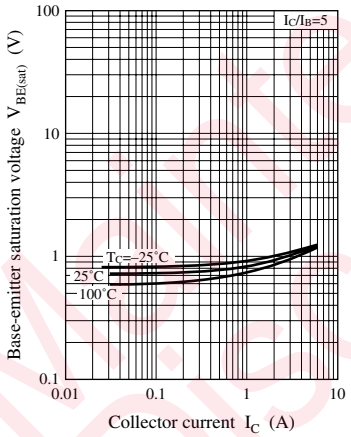

$I_C$ — $V_{CE}$



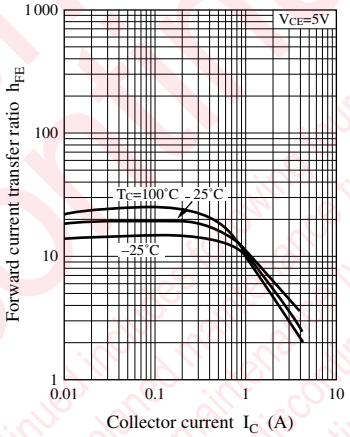

$V_{CE(sat)}$ — $I_C$



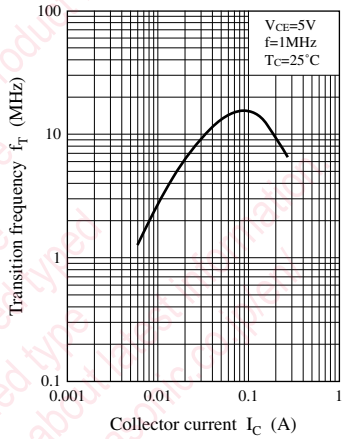

$V_{BE(sat)}$ — $I_C$



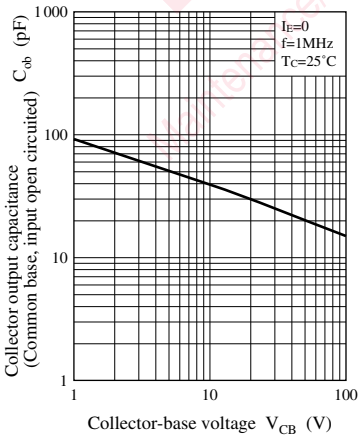

$h_{FE}$ — $I_C$



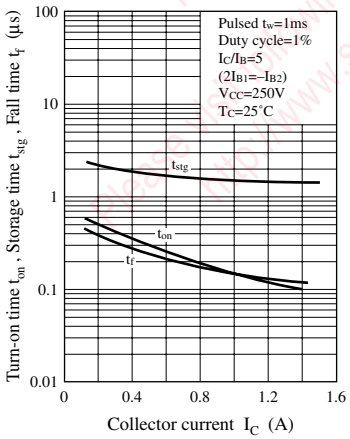

$f_T$ — $I_C$



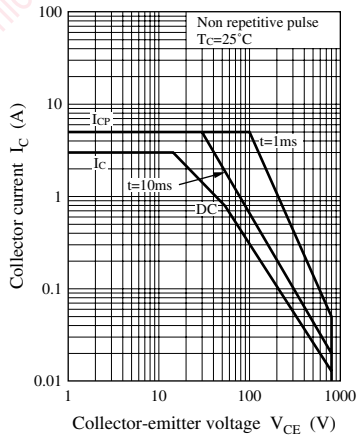

$C_{ob}$ — $V_{CB}$



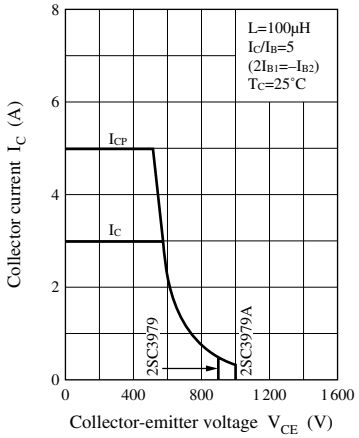

$t_{on}$ , $t_{stg}$ , $t_f$ — $I_C$



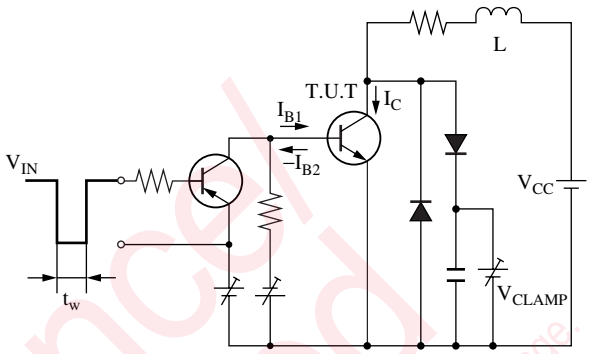

Safe operation area



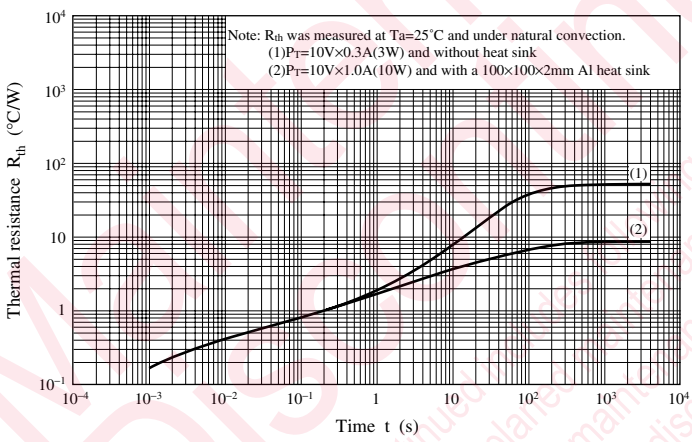
Safe operation area (Reverse bias)




Safe operation area (Reverse bias) measurement circuit




$R_{th}$ — t



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