

# 2SC3211, 2SC3211A

## Silicon NPN Triple-Diffused Junction Mesa Type

High Breakdown Voltage, High Speed Switching

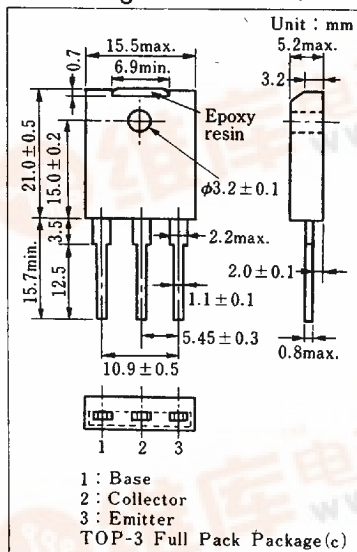
### ■ Features

- High speed switching
- High collector-base voltage ( $V_{CB0}$ )
- Low collector-emitter saturation voltage ( $V_{CE(sat)}$ )
- "Full Pack" package for simplified mounting on a heat sink with one screw

### ■ Absolute Maximum Ratings ( $T_c=25^\circ\text{C}$ )

| Item                        | Symbol    | Value           | Unit             |
|-----------------------------|-----------|-----------------|------------------|
| Collector-base voltage      | $V_{CB0}$ | 800             | V                |
|                             |           | 900             |                  |
| Collector-emitter voltage   | $V_{CE0}$ | 500             | V                |
| Emitter-base voltage        | $V_{EB0}$ | 8               | V                |
| Peak collector current      | $I_{CP}$  | 10              | A                |
| Collector current           | $I_C$     | 5               | A                |
| Base current                | $I_B$     | 3               | A                |
| Collector power dissipation | $P_C$     | 70              | W                |
|                             |           | 3               |                  |
| Junction temperature        | $T_j$     | 150             | $^\circ\text{C}$ |
| Storage temperature         | $T_{stg}$ | $-55 \sim +150$ | $^\circ\text{C}$ |

### ■ Package Dimensions

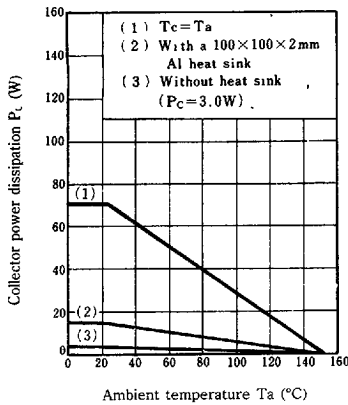


### ■ Electrical Characteristics ( $T_c=25^\circ\text{C}$ )

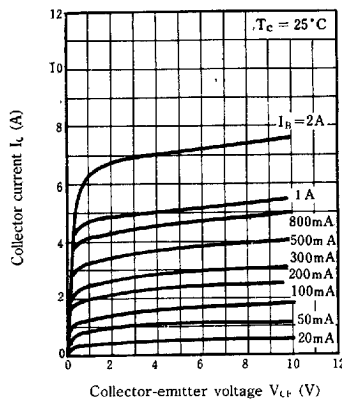
| Item                                 | Symbol         | Condition                                                                        | min. | typ. | max. | Unit          |
|--------------------------------------|----------------|----------------------------------------------------------------------------------|------|------|------|---------------|
| Collector cutoff current             | $I_{CBO}$      | $V_{CB}=800\text{ V}, I_E=0$                                                     |      |      | 100  | $\mu\text{A}$ |
|                                      |                | $V_{CB}=900\text{ V}, I_E=0$                                                     |      |      | 100  |               |
| Emitter cutoff current               | $I_{EBO}$      | $V_{EB}=5\text{ V}, I_C=0$                                                       |      |      | 100  | $\mu\text{A}$ |
| Collector-emitter voltage            | $V_{CE0(sus)}$ | $I_C=0.2\text{ A}, L=25\text{ mH}$                                               | 500  |      |      | V             |
| DC current gain                      | $h_{FE1}$      | $V_{CE}=5\text{ V}, I_C=0.1\text{ A}$                                            | 15   |      |      |               |
|                                      | $h_{FE2}$      | $V_{CE}=5\text{ V}, I_C=3\text{ A}$                                              | 8    |      |      |               |
| Collector-emitter saturation voltage | $V_{CE(sat)}$  | $I_C=3\text{ A}, I_B=0.6\text{ A}$                                               |      |      | 1    | V             |
| Base-emitter saturation voltage      | $V_{BE(sat)}$  | $I_C=3\text{ A}, I_B=0.6\text{ A}$                                               |      |      | 1.5  | V             |
| Transition frequency                 | $f_T$          | $V_{CE}=10\text{ V}, I_C=0.5\text{ A}, f=1\text{ MHz}$                           |      | 3    |      | MHz           |
| Turn-on time                         | $t_{on}$       | $I_C=3\text{ A}, I_{B1}=0.6\text{ A}, I_{B2}=-0.6\text{ A}, V_{CC}=200\text{ V}$ |      |      | 1    | $\mu\text{s}$ |
|                                      |                |                                                                                  |      |      | 1.2  |               |
| Storage time                         | $t_{stg}$      |                                                                                  |      |      | 3    | $\mu\text{s}$ |
| Collector current                    | $t_f$          |                                                                                  |      |      | 1    | $\mu\text{s}$ |
|                                      |                |                                                                                  |      |      | 1.2  |               |

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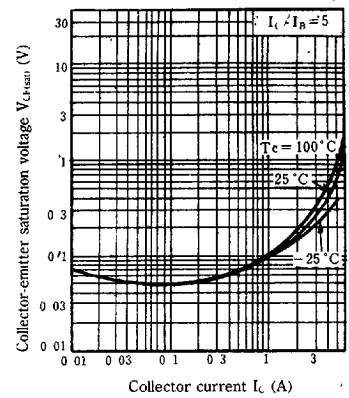
$P_C - T_a$



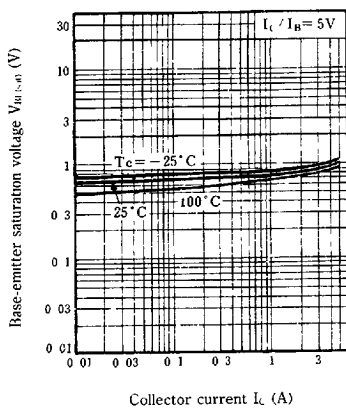
$I_C - V_{CE}$



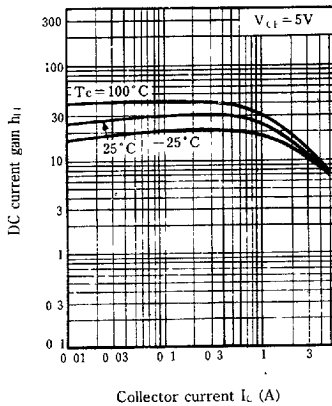
$V_{CE(sat)} - I_C$



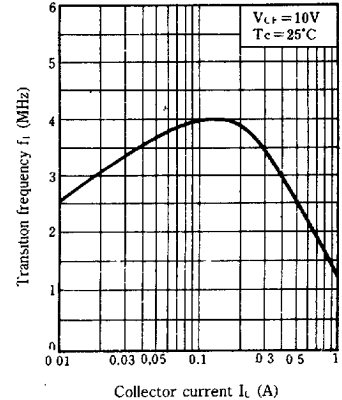
$V_{BE(sat)} - I_C$



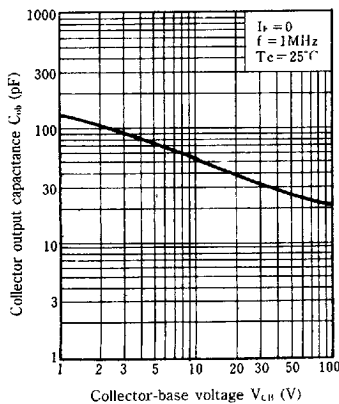
$h_{FE} - I_C$



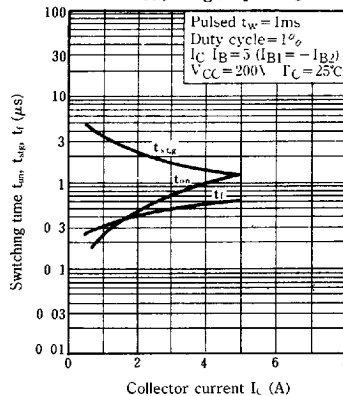
$f_T - I_C$



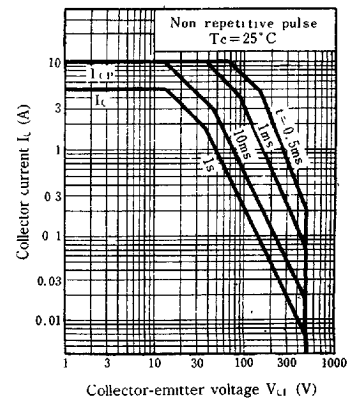
$C_{ob} - V_{CB}$



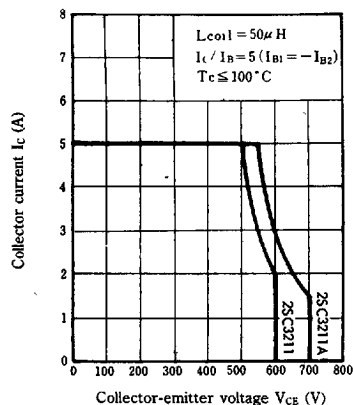
$t_{on}, t_{stg}, t_f - I_C$



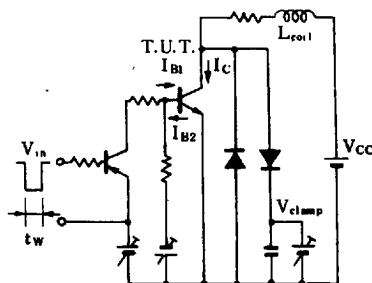
Safety operation area-forward bias (ASO)



## Safety operation area—reverse bias (ASO)



## Measurement circuit of reverse bias ASO

 $R_{th(t)} - t$ 