

# 2SB947, 2SB947A

## Silicon PNP Epitaxial Planar Type

### Low Voltage Switching

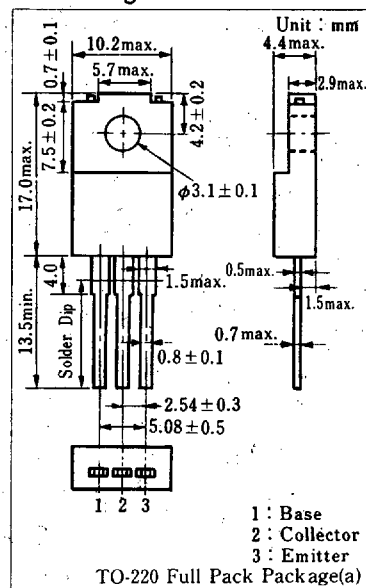
#### ■ Features

- Low collector-emitter saturation voltage ( $V_{CE(sat)}$ )
- High speed switching
- "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      | $V_{CBO}$ | -40        | V                |
|                             |           | -50        |                  |
| Collector-emitter voltage   | $V_{CEO}$ | -20        | V                |
|                             |           | -40        |                  |
| Emitter-base voltage        | $V_{EBO}$ | -5         | V                |
| Peak collector current      | $I_{CP}$  | -15        | A                |
| Collector current           | $I_C$     | -10        | A                |
| Collector power dissipation | $P_C$     | 35         | W                |
|                             |           | 2          |                  |
| Junction temperature        | $T_J$     | 150        | $^\circ\text{C}$ |
| Storage temperature         | $T_{stg}$ | -55 ~ +150 | $^\circ\text{C}$ |

#### ■ Package Dimensions

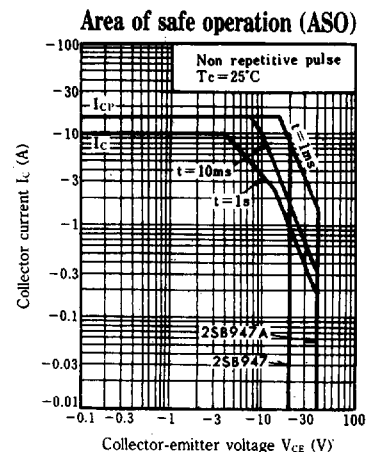
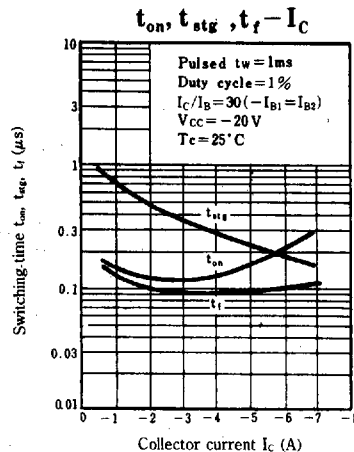
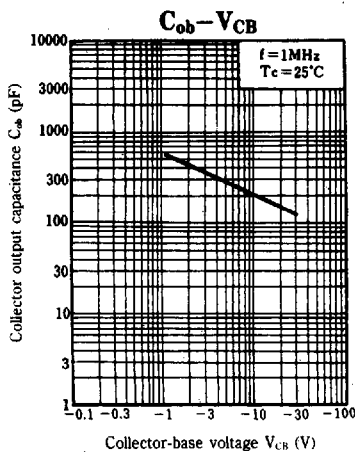
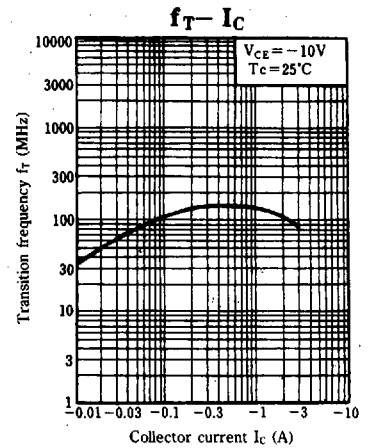
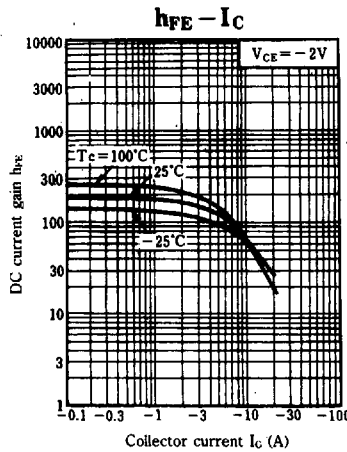
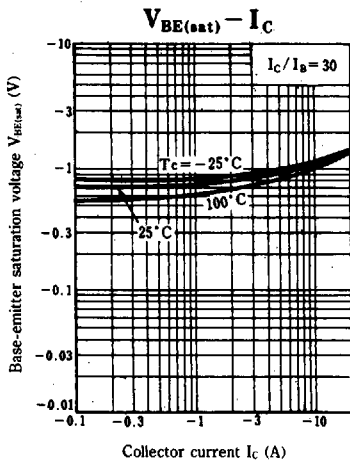
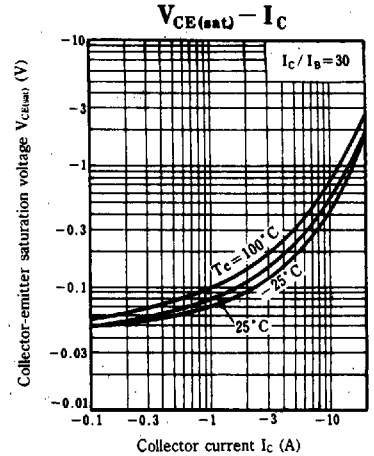
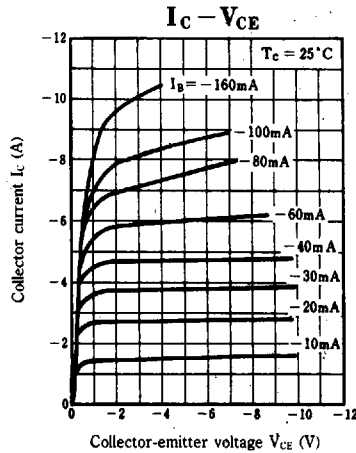
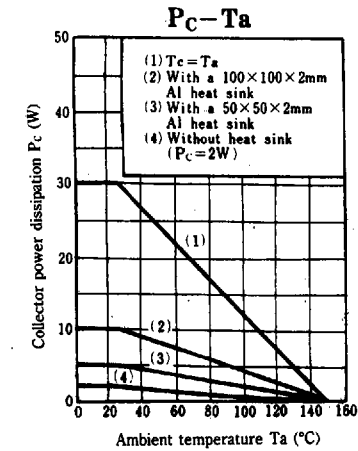


#### ■ Electrical Characteristics ( $T_c=25^\circ\text{C}$ )

| Item                                 | Symbol        | Condition                                                          | min. | typ. | max. | Unit          |
|--------------------------------------|---------------|--------------------------------------------------------------------|------|------|------|---------------|
| Collector cutoff current             | $I_{CBO}$     | $V_{CB} = -40\text{ V}, I_E = 0$                                   |      |      | -50  | $\mu\text{A}$ |
|                                      |               | $V_{CB} = -50\text{ V}, I_E = 0$                                   |      |      | -50  |               |
| Emitter cutoff current               | $I_{EBO}$     | $V_{EB} = -5\text{ V}, I_C = 0$                                    |      |      | -50  | $\mu\text{A}$ |
| Collector-emitter voltage            | $V_{CEO}$     | $I_C = -10\text{ mA}, I_B = 0$                                     | -20  |      |      | V             |
|                                      |               |                                                                    | -40  |      |      |               |
| DC current gain                      | $h_{FE1}$     | $V_{CE} = -2\text{ V}, I_C = -0.1\text{ A}$                        | 45   |      |      |               |
|                                      | $h_{FE2}^*$   | $V_{CE} = -2\text{ V}, I_C = -2\text{ A}$                          | 60   |      | 260  |               |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C = -7\text{ A}, I_B = -0.23\text{ A}$                          |      |      | -0.6 | V             |
| Base-emitter saturation voltage      | $V_{BE(sat)}$ | $I_C = -7\text{ A}, I_B = -0.23\text{ A}$                          |      |      | -1.5 | V             |
| Transition frequency                 | $f_T$         | $V_{CE} = -10\text{ V}, I_C = -0.5\text{ A}, f = 10\text{ MHz}$    |      | 150  |      | MHz           |
| Collector output capacitance         | $C_{ob}$      | $V_{CB} = -10\text{ V}, I_E = 0, f = 1\text{ MHz}$                 |      | 200  |      | pF            |
| Turn-on time                         | $t_{on}$      | $I_C = -2\text{ A}, I_{B1} = -66\text{ mA}, I_{B2} = 66\text{ mA}$ |      | 0.1  |      | $\mu\text{s}$ |
| Storage time                         | $t_{stg}$     |                                                                    |      | 0.5  |      | $\mu\text{s}$ |
| Collector current fall time          | $t_f$         |                                                                    |      | 0.1  |      | $\mu\text{s}$ |

#### \* $h_{FE2}$ Classifications

| Class     | R        | Q        | P         |
|-----------|----------|----------|-----------|
| $h_{FE2}$ | 60 ~ 120 | 90 ~ 180 | 130 ~ 260 |



Note) Refer to P.179 (on 2SB942/A) for  $R_{th(ja)} - t$  characteristics.

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