

# 2SD1746

Silicon NPN epitaxial planar type

For power switching

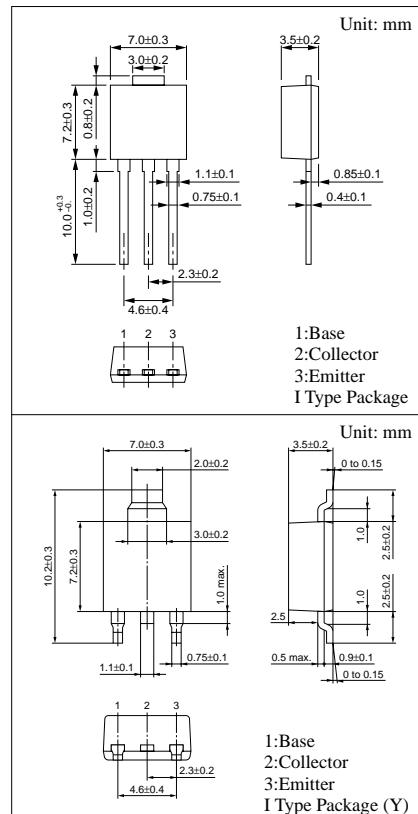
Complementary to 2SB1176

## ■ Features

- Low collector to emitter saturation voltage  $V_{CE(sat)}$
- Satisfactory linearity of forward current transfer ratio  $h_{FE}$
- Large collector current  $I_C$
- I type package enabling direct soldering of the radiating fin to the printed circuit board, etc. of small electronic equipment.

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

| Parameter                    | Symbol    | Ratings     | Unit             |
|------------------------------|-----------|-------------|------------------|
| Collector to base voltage    | $V_{CBO}$ | 130         | V                |
| Collector to emitter voltage | $V_{CEO}$ | 80          | V                |
| Emitter to base voltage      | $V_{EBO}$ | 7           | V                |
| Peak collector current       | $I_{CP}$  | 10          | A                |
| Collector current            | $I_C$     | 5           | A                |
| Collector power dissipation  | $P_C$     | 15          | W                |
|                              |           | 1.3         |                  |
| Junction temperature         | $T_j$     | 150         | $^\circ\text{C}$ |
| Storage temperature          | $T_{stg}$ | -55 to +150 | $^\circ\text{C}$ |

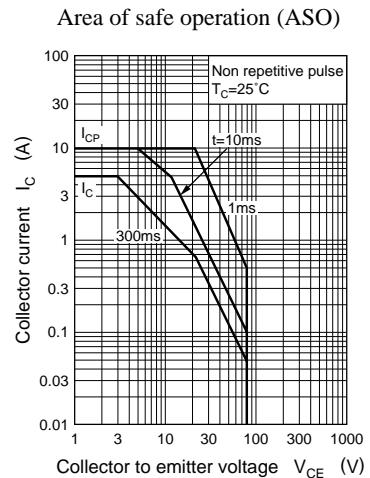
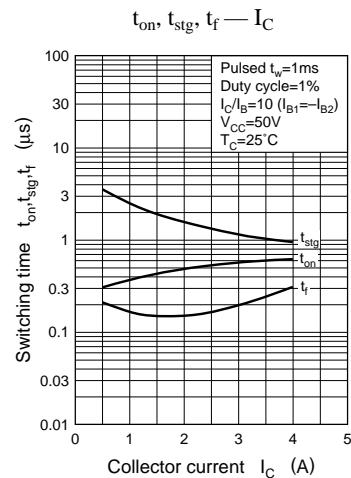
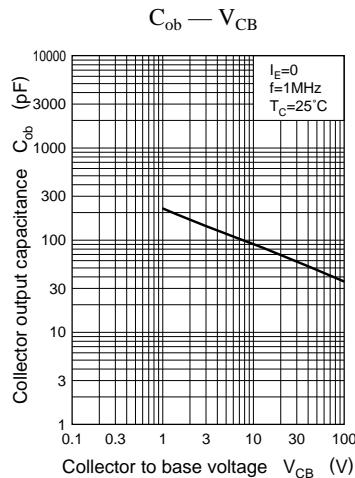
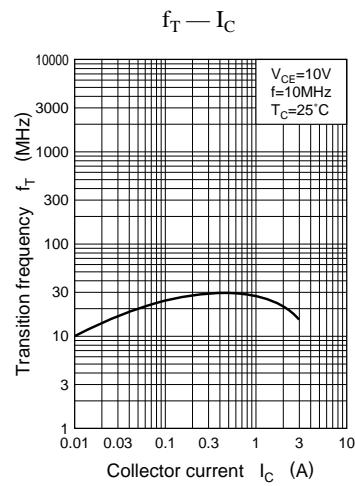
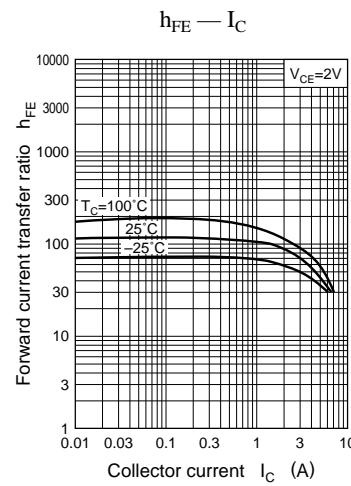
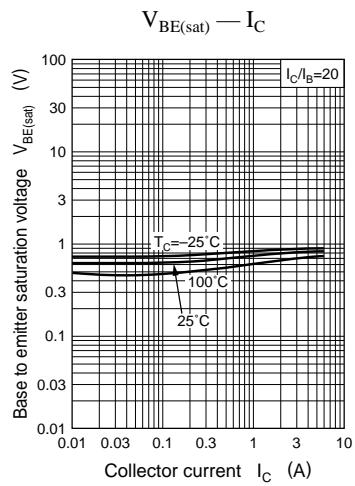
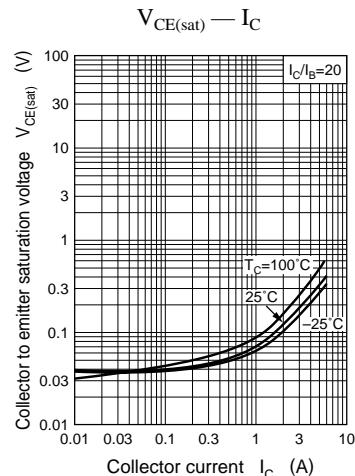
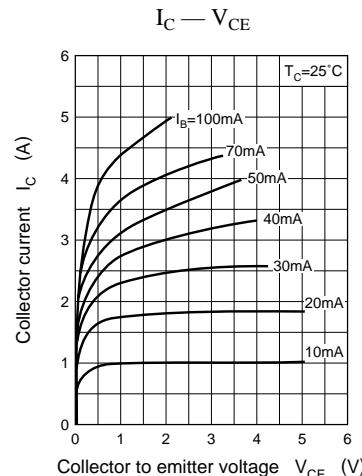
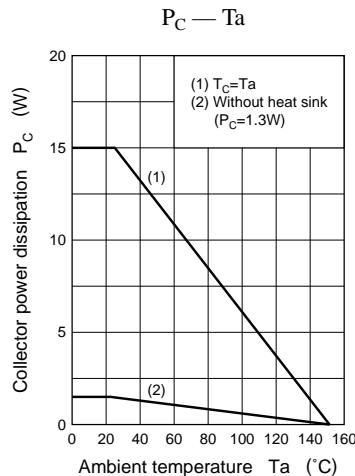


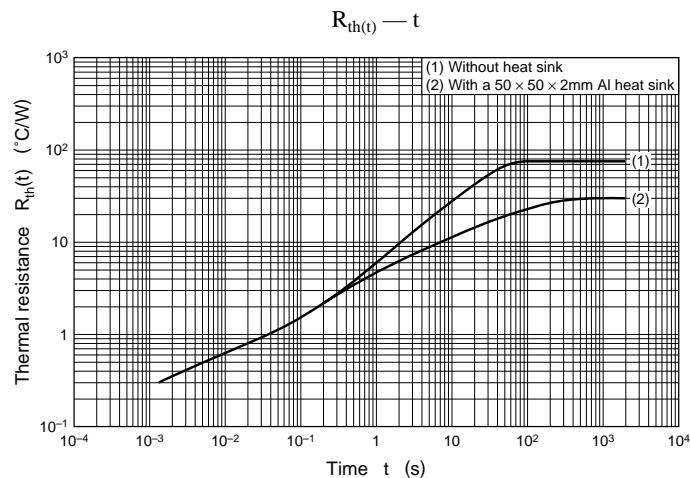
## ■ Electrical Characteristics ( $T_C=25^\circ\text{C}$ )

| Parameter                               | Symbol        | Conditions                                                                                      | min  | typ | max | Unit          |
|-----------------------------------------|---------------|-------------------------------------------------------------------------------------------------|------|-----|-----|---------------|
| Collector cutoff current                | $I_{CBO}$     | $V_{CB} = 100\text{V}$ , $I_E = 0$                                                              |      |     | 10  | $\mu\text{A}$ |
| Emitter cutoff current                  | $I_{EBO}$     | $V_{EB} = 5\text{V}$ , $I_C = 0$                                                                |      |     | 50  | $\mu\text{A}$ |
| Collector to emitter voltage            | $V_{CEO}$     | $I_C = 10\text{mA}$ , $I_B = 0$                                                                 | 80   |     |     | V             |
| Forward current transfer ratio          | $h_{FE1}$     | $V_{CE} = 2\text{V}$ , $I_C = 0.1\text{A}$                                                      | 45   |     |     |               |
|                                         | $h_{FE2}^*$   | $V_{CE} = 2\text{V}$ , $I_C = 2\text{A}$                                                        | 90   |     | 260 |               |
| Collector to emitter saturation voltage | $V_{CE(sat)}$ | $I_C = 2\text{A}$ , $I_B = 0.2\text{A}$                                                         |      |     | 0.5 | V             |
| Base to emitter saturation voltage      | $V_{BE(sat)}$ | $I_C = 2\text{A}$ , $I_B = 0.2\text{A}$                                                         |      |     | 1.5 | V             |
| Transition frequency                    | $f_T$         | $V_{CE} = 10\text{V}$ , $I_C = 0.5\text{A}$ , $f = 10\text{MHz}$                                | 30   |     |     | MHz           |
| Turn-on time                            | $t_{on}$      | $I_C = 2\text{A}$ , $I_{B1} = 0.2\text{A}$ , $I_{B2} = -0.2\text{A}$ ,<br>$V_{CC} = 50\text{V}$ | 0.5  |     |     | $\mu\text{s}$ |
| Storage time                            | $t_{stg}$     |                                                                                                 | 1.5  |     |     | $\mu\text{s}$ |
| Fall time                               | $t_f$         |                                                                                                 | 0.15 |     |     | $\mu\text{s}$ |

\* $h_{FE2}$  Rank classification

| Rank      | Q         | P          |
|-----------|-----------|------------|
| $h_{FE2}$ | 90 to 180 | 130 to 260 |





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