

# 2SD1270

## Silicon NPN epitaxial planar type

For power switching

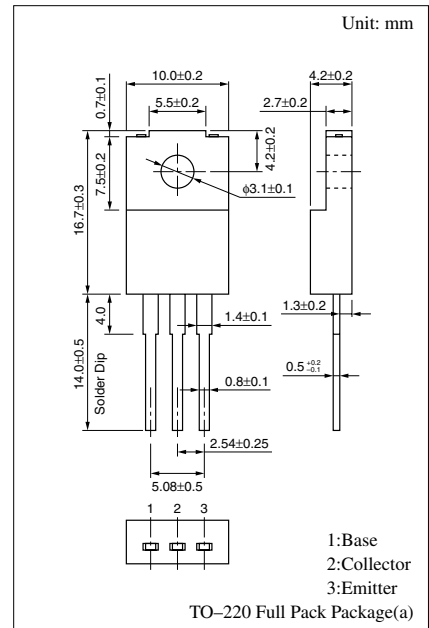
Complementary to 2SB0945 (2SB945)

### Features

- Low collector to emitter saturation voltage  $V_{CE(sat)}$
- Satisfactory linearity of forward current transfer ratio  $h_{FE}$
- Large collector current  $I_C$
- Full-pack package which can be installed to the heat sink with one screw

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

| Parameter                    | Symbol    | Rated                  | 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  | $P_C$     | $T_C=25^\circ\text{C}$ | 40               | W |
|                              |           | $T_a=25^\circ\text{C}$ | 2                |   |
| 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  |      |     |               |
|   | $h_{FE2}^*$   | $V_{CE} = 2\text{V}, I_C = 2\text{A}$   | 60  |      | 260 |               |
| Collector to emitter saturation voltage | $V_{CE(sat)}$ | $I_C = 4\text{A}, I_B = 0.2\text{A}$  |     |      | 0.5 | V             |
| Base to emitter saturation voltage      | $V_{BE(sat)}$ | $I_C = 4\text{A}, I_B = 0.2\text{A}$  |     |      | 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                            | $t_{on}$      | $I_C = 2\text{A}, I_{B1} = 0.2\text{A}, I_{B2} = -0.2\text{A}, V_{CC} = 50\text{V}$ |     | 0.5  |     | $\mu\text{s}$ |
| Storage time                            | $t_{stg}$     |   |     | 1.5  |     | $\mu\text{s}$ |
| Fall time                               | $t_f$         |   |     | 0.15 |     | $\mu\text{s}$ |

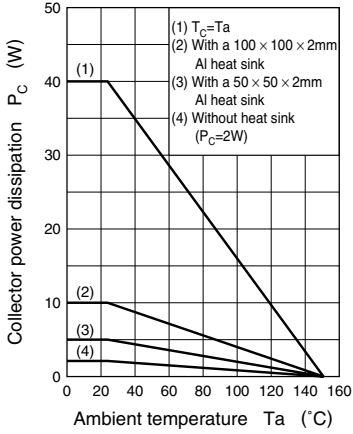
\* $h_{FE2}$  Rank classification

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

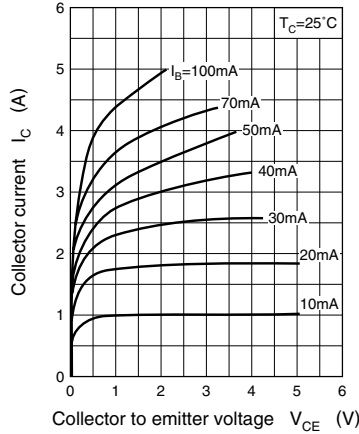
Note: Ordering can be made by the common rank (PQ rank  $h_{FE} = 90$  to 260) in the rank classification.

Note.) The Part number in the Parenthesis shows conventional part number.

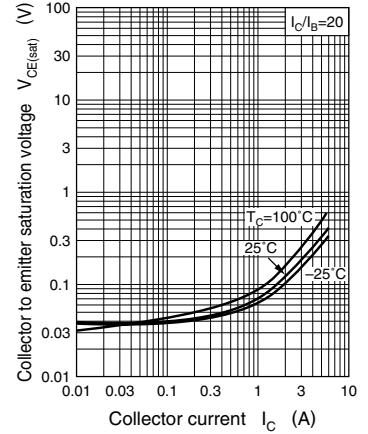
$P_C - T_a$



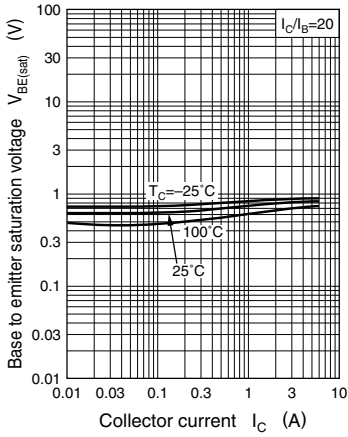
$I_C - V_{CE}$



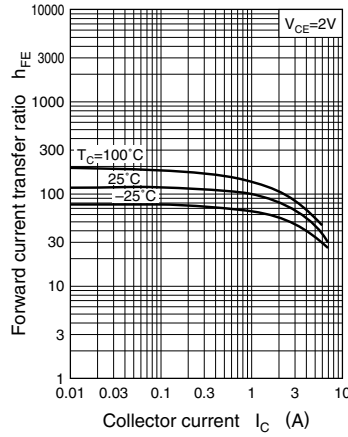
$V_{CE(sat)} - I_C$



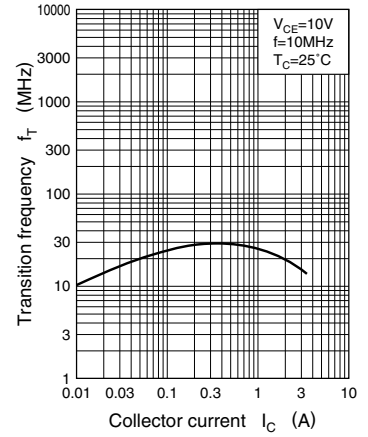
$V_{BE(sat)} - I_C$



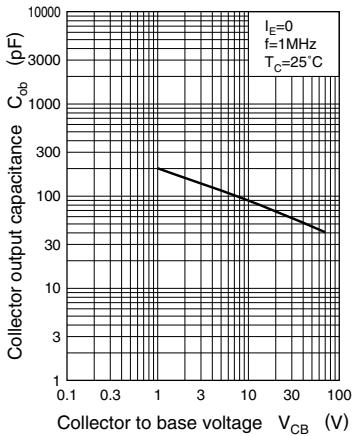
$h_{FE} - I_C$



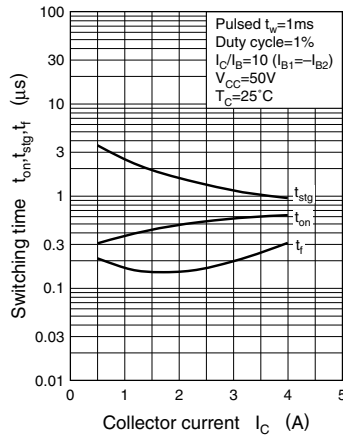
$f_T - I_C$



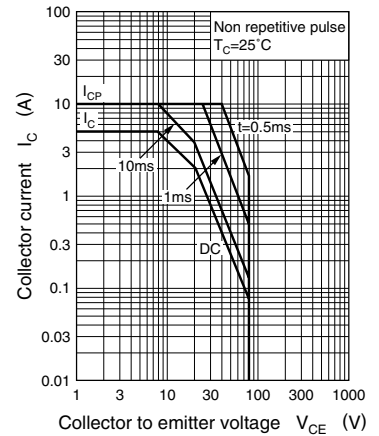
$C_{ob} - V_{CB}$

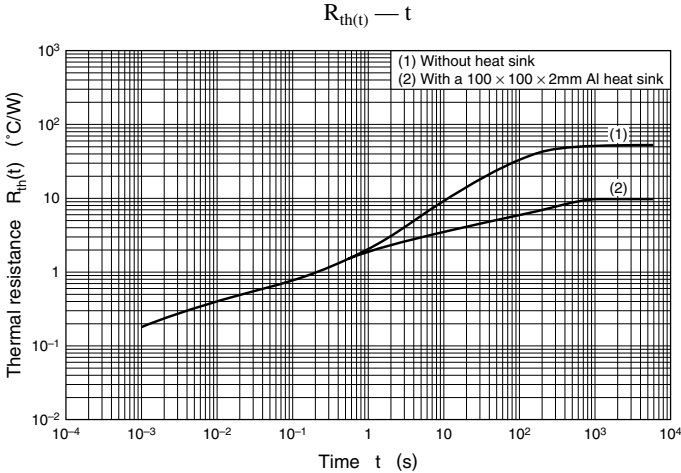


$t_{on}, t_{stg}, t_f - I_C$



Area of safe operation (ASO)





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