

# 2SD1257, 2SD1257A

Silicon NPN epitaxial planar type

For power switching

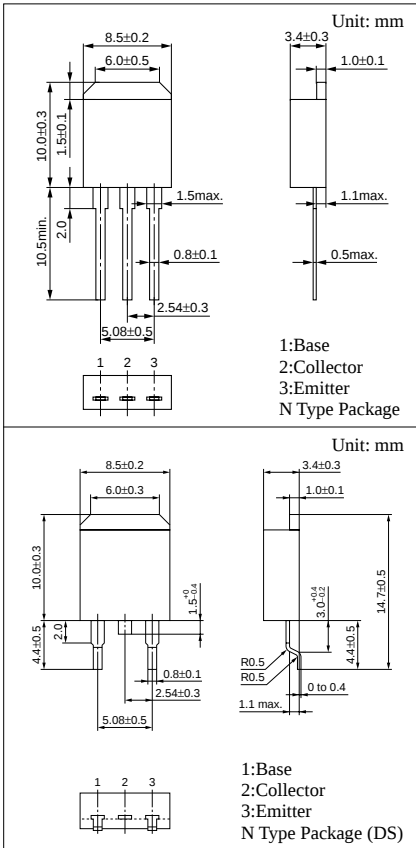
Complementary to 2SB934

## Features

- Low collector to emitter saturation voltage  $V_{CE(sat)}$
- Satisfactory linearity of forward current transfer ratio  $h_{FE}$
- Large collector current  $I_C$
- N 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                |
| 2SD1257A                     |           | 150         |                  |
| Collector to emitter voltage | $V_{CEO}$ | 80          | V                |
| 2SD1257A                     |           | 100         |                  |
| Emitter to base voltage      | $V_{EBO}$ | 7           | V                |
| Peak collector current       | $I_{CP}$  | 15          | A                |
| Collector current            | $I_C$     | 7           | A                |
| Collector power dissipation  | $P_C$     | 40          | W                |
|                              |           | 1.3         |                  |
| Junction temperature         | $T_j$     | 150         | $^\circ\text{C}$ |
| Storage temperature          | $T_{stg}$ | -55 to +150 | $^\circ\text{C}$ |

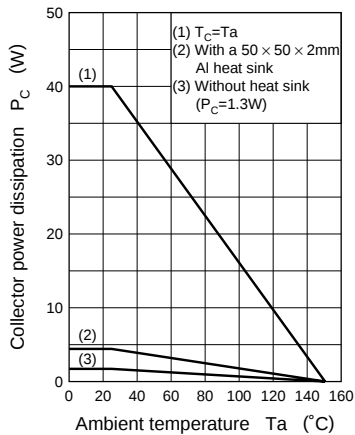
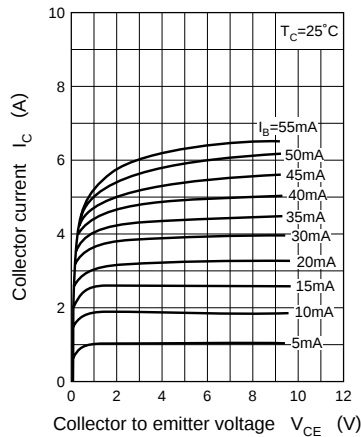
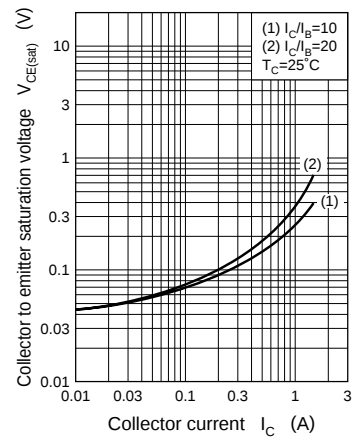
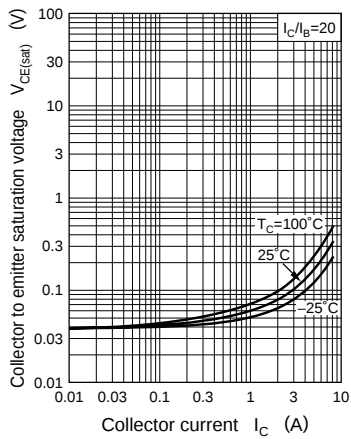
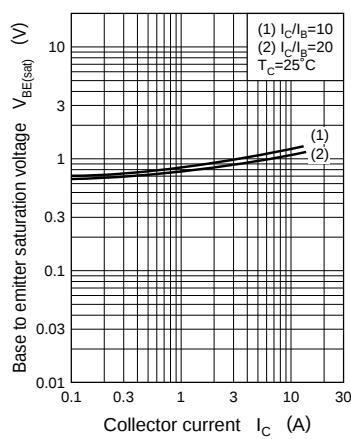
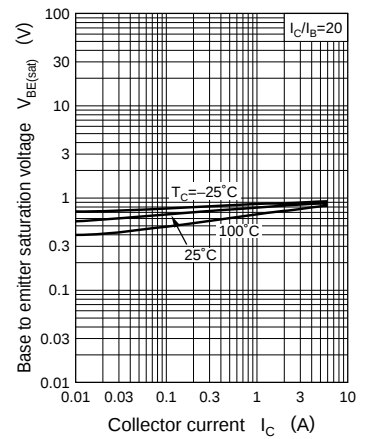
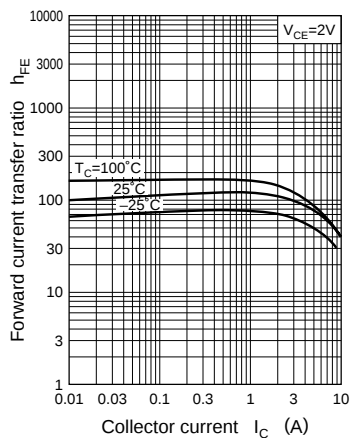
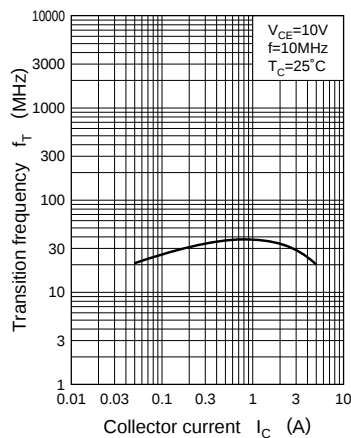
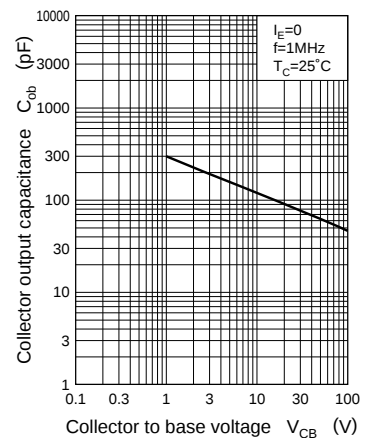


## Electrical Characteristics ( $T_C=25^\circ\text{C}$ )

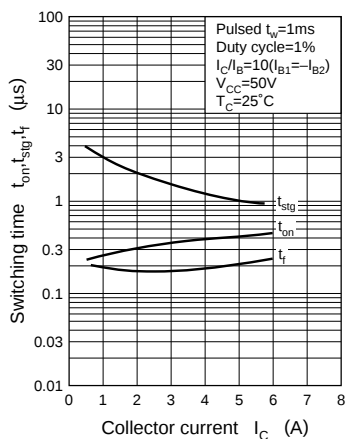
| Parameter                               | Symbol        | Conditions                                              | min | typ | max | Unit          |
|-----------------------------------------|---------------|---------------------------------------------------------|-----|-----|-----|---------------|
| Collector cutoff current                | $I_{CBO}$     | $V_{CB} = 100V, I_E = 0$                                |     |     | 10  | $\mu\text{A}$ |
| Emitter cutoff current                  | $I_{EBO}$     | $V_{EB} = 5V, I_C = 0$                                  |     |     | 50  | $\mu\text{A}$ |
| Collector to emitter voltage            | $V_{CEO}$     | $I_C = 10\text{mA}, I_B = 0$                            | 80  |     |     | V             |
|                                         |               |                                                         | 100 |     |     |               |
| Forward current transfer ratio          | $h_{FE1}$     | $V_{CE} = 2V, I_C = 0.1A$                               | 45  |     |     |               |
|                                         | $h_{FE2}^*$   | $V_{CE} = 2V, I_C = 3A$                                 | 60  |     | 260 |               |
| Collector to emitter saturation voltage | $V_{CE(sat)}$ | $I_C = 5A, I_B = 0.25A$                                 |     |     | 0.5 | V             |
| Base to emitter saturation voltage      | $V_{BE(sat)}$ | $I_C = 5A, I_B = 0.25A$                                 |     |     | 1.5 | V             |
| Transition frequency                    | $f_T$         | $V_{CE} = 10V, I_C = 0.5A, f = 10\text{MHz}$            |     | 30  |     | MHz           |
| Turn-on time                            | $t_{on}$      | $I_C = 3A, I_{B1} = 0.3A, I_{B2} = -0.3A, V_{CC} = 50V$ |     | 0.5 |     | $\mu\text{s}$ |
| Storage time                            | $t_{stg}$     |                                                         |     | 1.5 |     | $\mu\text{s}$ |
| Fall time                               | $t_f$         |                                                         |     | 0.1 |     | $\mu\text{s}$ |

\* $h_{FE2}$  Rank classification

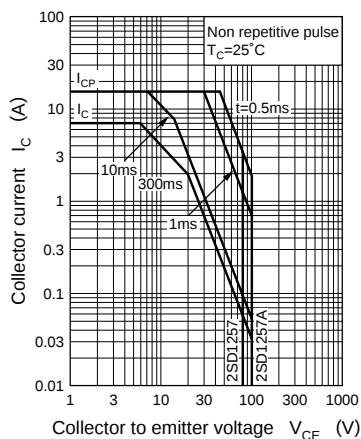
| Rank      | R         | Q         | P          |
|-----------|-----------|-----------|------------|
| $h_{FE2}$ | 60 to 120 | 90 to 180 | 130 to 260 |

$P_C - T_a$  $I_C - V_{CE}$  $V_{CE(sat)} - I_C$  $V_{CE(sat)} - I_C$  $V_{BE(sat)} - I_C$  $V_{BE(sat)} - I_C$  $h_{FE} - I_C$  $f_T - I_C$  $C_{ob} - V_{CB}$ 

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



Area of safe operation (ASO)



$R_{th(t)} - t$

