

# 2SD1257, 2SD1257A

Silicon NPN Epitaxial Planar Type

Power Switching  
Complementary Pair with 2SB934

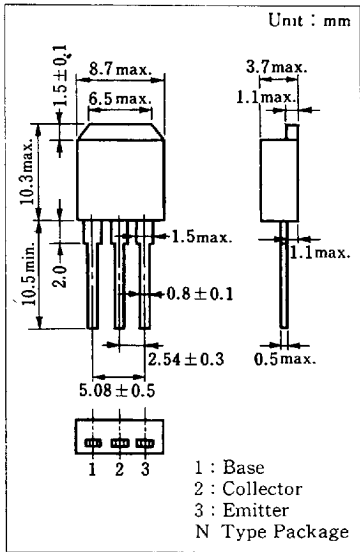
■ Features

- Low collector-emitter saturation voltage ( $V_{CE(sat)}$ )
- Good linearity of DC current gain ( $h_{FE}$ )
- High collector current ( $I_C$ )
- “N Type” package configuration with a cooling fin for direct soldering on PC board of a small-size electronic equipment

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

| Item                        |                   | Symbol    | Value         | Unit        |
|-----------------------------|-------------------|-----------|---------------|-------------|
| Collector-base voltage      | 2SD1257           | $V_{CB0}$ | 130           | V           |
|                             | 2SD1257A          |           | 150           |             |
| Collector-emitter voltage   | 2SD1257           | $V_{CE0}$ | 80            | V           |
|                             | 2SD1257A          |           | 100           |             |
| Emitter-base voltage        |                   | $V_{EB0}$ | 7             | V           |
| Peak collector current      |                   | $I_{CP}$  | 15            | A           |
| Collector current           |                   | $I_C$     | 7             | A           |
| Collector power dissipation | $T_c=25^{\circ}C$ | $P_C$     | 40            | W           |
|                             | $T_a=25^{\circ}C$ |           | 1.3           |             |
| Junction temperature        |                   | $T_j$     | 150           | $^{\circ}C$ |
| Storage temperature         |                   | $T_{sig}$ | $-55\sim+150$ | $^{\circ}C$ |

■ Package Dimensions



\*Surface-mount type is also available.  
(Refer to p.82.)

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

| Item                                 |          | Symbol        | Condition                                                                           | min. | typ. | max. | Unit          |
|--------------------------------------|----------|---------------|-------------------------------------------------------------------------------------|------|------|------|---------------|
| Collector cutoff current             |          | $I_{CB0}$     | $V_{CB}=100\text{ V}, I_E=0$                                                        |      |      | 10   | $\mu\text{A}$ |
| Emitter cutoff current               |          | $I_{EB0}$     | $V_{EB}=5\text{ V}, I_C=0$                                                          |      |      | 50   | $\mu\text{A}$ |
| Collector-emitter voltage            | 2SD1257  | $V_{CE0}$     | $I_C=10\text{ mA}, I_B=0$                                                           | 80   |      |      | V             |
|                                      | 2SD1257A |               |                                                                                     | 100  |      |      |               |
| DC current gain                      |          | $h_{FE1}$     | $V_{CE}=2\text{ V}, I_C=0.1\text{ A}$                                               | 45   |      |      |               |
|                                      |          | $h_{FE2}^*$   | $V_{CE}=2\text{ V}, I_C=3\text{ A}$                                                 | 60   |      | 260  |               |
| Collector-emitter saturation voltage |          | $V_{CE(sat)}$ | $I_C=5\text{ A}, I_B=0.25\text{ A}$                                                 |      |      | 0.5  | V             |
| Base-emitter saturation voltage      |          | $V_{BE(sat)}$ | $I_C=5\text{ A}, I_B=0.25\text{ A}$                                                 |      |      | 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                         |          | $t_{on}$      | $I_C=3\text{ A}, I_{B1}=0.3\text{ A}, I_{B2}=-0.3\text{ A}$<br>$V_{CC}=50\text{ V}$ |      | 0.5  |      | $\mu\text{s}$ |
| Storage time                         |          | $t_{sig}$     |                                                                                     |      | 1.5  |      | $\mu\text{s}$ |
| Fall time                            |          | $t_f$         |                                                                                     |      | 0.1  |      | $\mu\text{s}$ |

\* $h_{FE2}$  Classifications

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

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