

# 2SD1330

## Silicon NPN epitaxial planar type

For low-voltage output amplification

For muting

For DC-DC converter

### ■ Features

- Low collector-emitter saturation voltage  $V_{CE(sat)}$
- Low ON resistance  $R_{on}$
- High forward current transfer ratio  $h_{FE}$
- M type package allowing easy automatic and manual insertion as well as stand-alone fixing to the printed circuit board.

### ■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

| Parameter                             | Symbol    | Rating      | Unit             |
|---------------------------------------|-----------|-------------|------------------|
| Collector-base voltage (Emitter open) | $V_{CBO}$ | 25          | V                |
| Collector-emitter voltage (Base open) | $V_{CEO}$ | 20          | V                |
| Emitter-base voltage (Collector open) | $V_{EBO}$ | 12          | V                |
| Collector current                     | $I_C$     | 0.5         | A                |
| Peak collector current                | $I_{CP}$  | 1           | A                |
| Collector power dissipation           | $P_C$     | 600         | mW               |
| Junction temperature                  | $T_j$     | 150         | $^\circ\text{C}$ |
| Storage temperature                   | $T_{stg}$ | -55 to +150 | $^\circ\text{C}$ |

### ■ Electrical Characteristics $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$

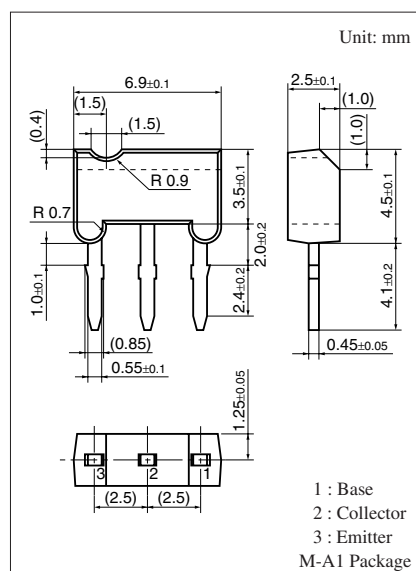
| Parameter                                                        | Symbol                  | Conditions                                                               | Min | Typ  | Max | Unit     |
|------------------------------------------------------------------|-------------------------|--------------------------------------------------------------------------|-----|------|-----|----------|
| Collector-base voltage (Emitter open)                            | $V_{CBO}$               | $I_C = 10\ \mu\text{A}$ , $I_E = 0$                                      | 25  |      |     | V        |
| Collector-emitter voltage (Base open)                            | $V_{CEO}$               | $I_C = 1\ \text{mA}$ , $I_B = 0$                                         | 20  |      |     | V        |
| Emitter-base voltage (Collector open)                            | $V_{EBO}$               | $I_E = 10\ \mu\text{A}$ , $I_C = 0$                                      | 12  |      |     | V        |
| Collector-base cutoff current (Emitter open)                     | $I_{CBO}$               | $V_{CB} = 25\ \text{V}$ , $I_E = 0$                                      |     |      | 100 | nA       |
| Forward current transfer ratio <sup>*1</sup>                     | $h_{FE1}$ <sup>*2</sup> | $V_{CE} = 2\ \text{V}$ , $I_C = 0.5\ \text{A}$                           | 200 |      | 800 | —        |
|                                                                  | $h_{FE2}$               | $V_{CE} = 2\ \text{V}$ , $I_C = 1\ \text{A}$                             | 60  |      |     |          |
| Collector-emitter saturation voltage                             | $V_{CE(sat)}$           | $I_C = 0.5\ \text{A}$ , $I_B = 20\ \text{mA}$                            |     | 0.13 | 0.4 | V        |
| Base-emitter saturation voltage                                  | $V_{BE(sat)}$           | $I_C = 0.5\ \text{A}$ , $I_B = 50\ \text{mA}$                            |     |      | 1.2 | V        |
| Transition frequency                                             | $f_T$                   | $V_{CB} = 10\ \text{V}$ , $I_E = -50\ \text{mA}$ , $f = 200\ \text{MHz}$ |     | 200  |     | MHz      |
| Collector output capacitance (Common base, input open circuited) | $C_{ob}$                | $V_{CB} = 10\ \text{V}$ , $I_E = 0$ , $f = 1\ \text{MHz}$                |     | 10   |     | pF       |
| ON resistance <sup>*3</sup>                                      | $R_{on}$                |                                                                          |     | 1    |     | $\Omega$ |

Note) 1. Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

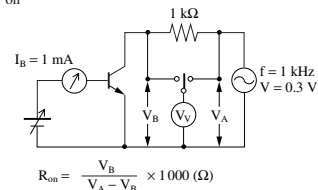
2. \*1: Pulse measurement

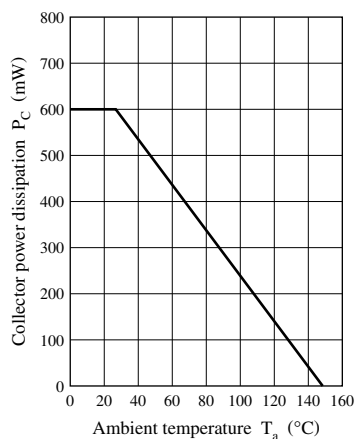
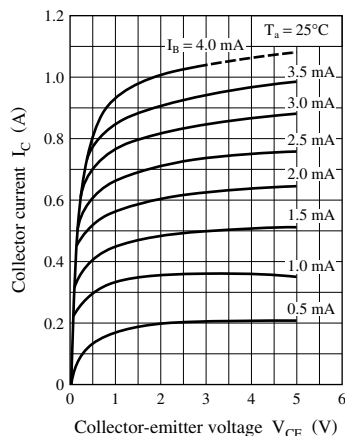
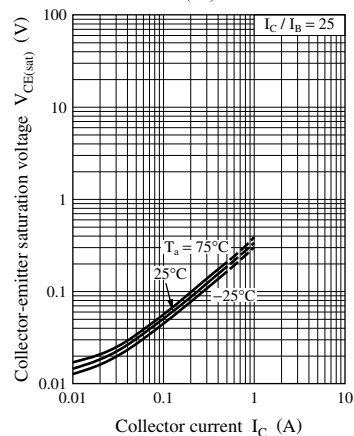
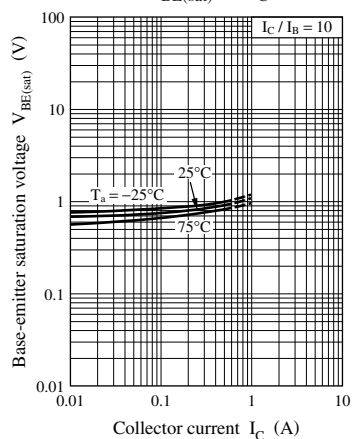
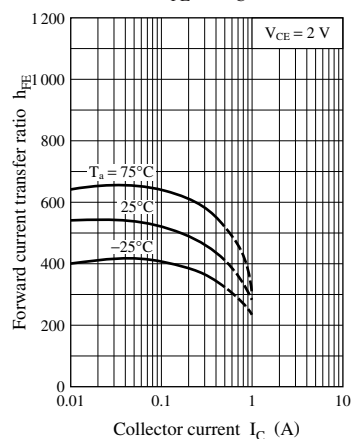
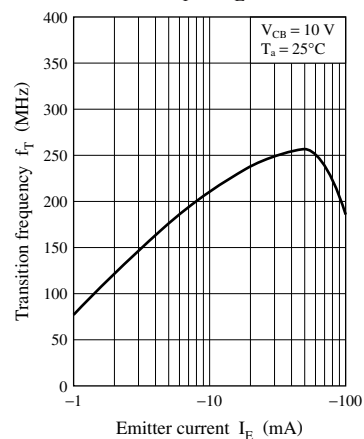
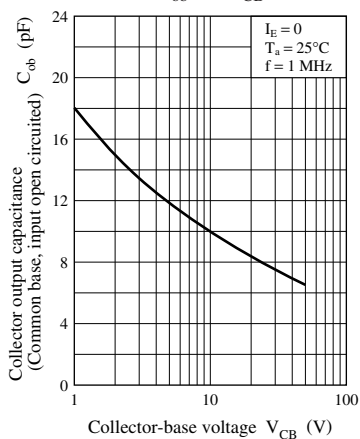
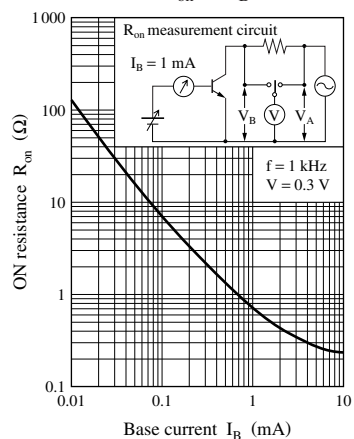
\*2: Rank classification

| Rank      | R          | S          | T          |
|-----------|------------|------------|------------|
| $h_{FE1}$ | 200 to 350 | 300 to 500 | 400 to 800 |



\*3:  $R_{on}$  Measurement circuit



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

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