

# UNR31A1

## Silicon PNP epitaxial planar type

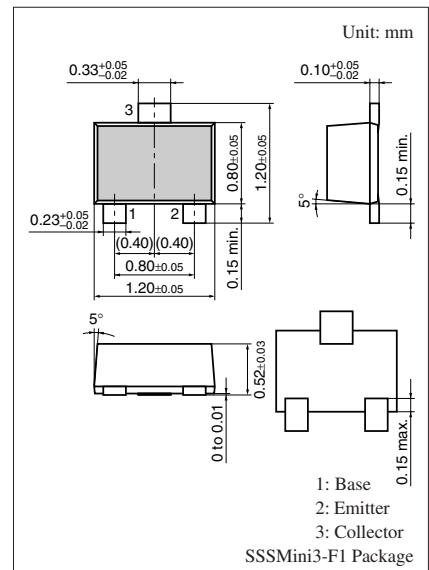
For digital circuits

### ■ Features

- Suitable for high-density mounting and downsizing of the equipment
- Contribute to low power consumption

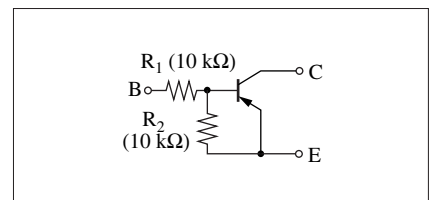
### ■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

| Parameter                             | Symbol           | Rating      | Unit             |
|---------------------------------------|------------------|-------------|------------------|
| Collector-base voltage (Emitter open) | $V_{\text{CBO}}$ | -50         | V                |
| Collector-emitter voltage (Base open) | $V_{\text{CEO}}$ | -50         | V                |
| Collector current                     | $I_{\text{C}}$   | -80         | mA               |
| Total power dissipation               | $P_{\text{T}}$   | 100         | mW               |
| Junction temperature                  | $T_{\text{j}}$   | 125         | $^\circ\text{C}$ |
| Storage temperature                   | $T_{\text{stg}}$ | -55 to +125 | $^\circ\text{C}$ |



Marking Symbol: CE

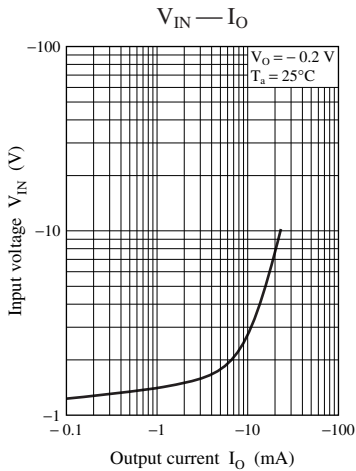
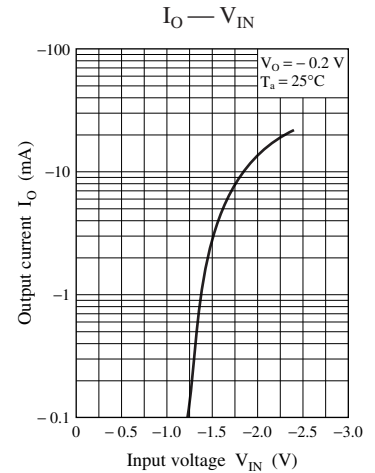
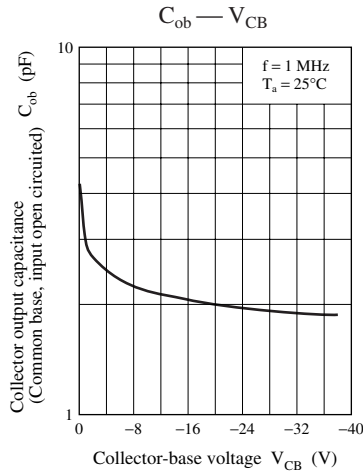
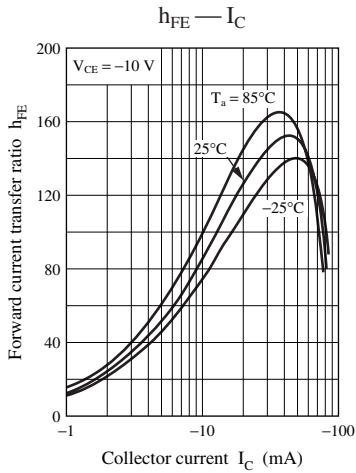
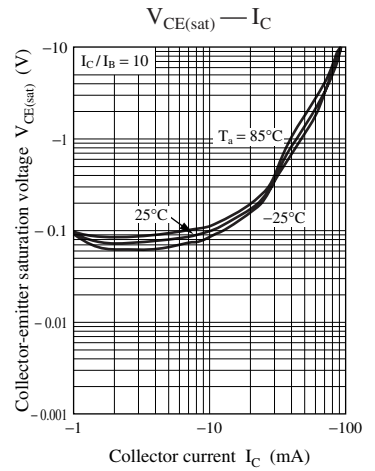
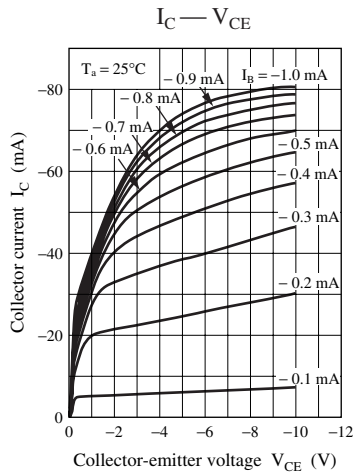
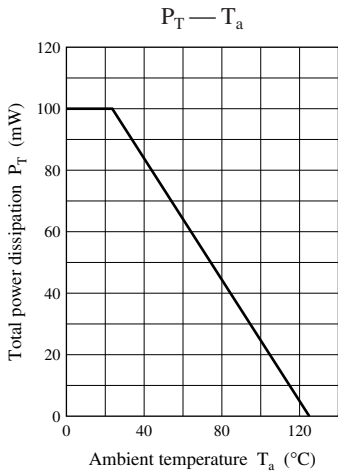
Internal Connection



### ■ 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)        | $V_{\text{CBO}}$              | $I_{\text{C}} = -10 \mu\text{A}$ , $I_{\text{E}} = 0$   | -50  |     |       | V                |
| Collector-emitter voltage (Base open)        | $V_{\text{CEO}}$              | $I_{\text{C}} = -2 \text{ mA}$ , $I_{\text{B}} = 0$   | -50  |     |       | V                |
| Collector-base cutoff current (Emitter open) | $I_{\text{CBO}}$              | $V_{\text{CB}} = -50 \text{ V}$ , $I_{\text{E}} = 0$  |      |     | -0.1  | $\mu\text{A}$    |
| Collector-emitter cutoff current (Base open) | $I_{\text{CEO}}$              | $V_{\text{CE}} = -50 \text{ V}$ , $I_{\text{B}} = 0$  |      |     | -0.5  | $\mu\text{A}$    |
| Emitter-base cutoff current (Collector open) | $I_{\text{EBO}}$              | $V_{\text{EB}} = -6 \text{ V}$ , $I_{\text{C}} = 0$   |      |     | -0.5  | mA               |
| Forward current transfer ratio               | $h_{\text{FE}}$               | $V_{\text{CE}} = -10 \text{ V}$ , $I_{\text{C}} = -5 \text{ mA}$                                      | 35   |     |       | —                |
| Collector-emitter saturation voltage         | $V_{\text{CE(sat)}}$          | $I_{\text{C}} = -10 \text{ mA}$ , $I_{\text{B}} = -0.3 \text{ mA}$                                    |      |     | -0.25 | V                |
| Output voltage high-level                    | $V_{\text{OH}}$               | $V_{\text{CC}} = -5 \text{ V}$ , $V_{\text{B}} = -0.5 \text{ V}$ , $R_{\text{L}} = 1 \text{ k}\Omega$ | -4.9 |     |       | V                |
| Output voltage low-level                     | $V_{\text{OL}}$               | $V_{\text{CC}} = -5 \text{ V}$ , $V_{\text{B}} = -2.5 \text{ V}$ , $R_{\text{L}} = 1 \text{ k}\Omega$ |      |     | -0.2  | V                |
| Input resistance                             | $R_{\text{I}}$                |   | -30% | 10  | +30%  | $\text{k}\Omega$ |
| Resistance ratio                             | $R_{\text{I}} / R_{\text{2}}$ |   | 0.8  | 1.0 | 1.2   | —                |
| Transition frequency                         | $f_{\text{T}}$                | $V_{\text{CB}} = -10 \text{ V}$ , $I_{\text{E}} = 1 \text{ mA}$ , $f = 200 \text{ MHz}$               |      | 80  |       | MHz              |

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



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