

# UNR7231 (UN7231)

## Silicon NPN epitaxial planar type

For low-frequency amplification

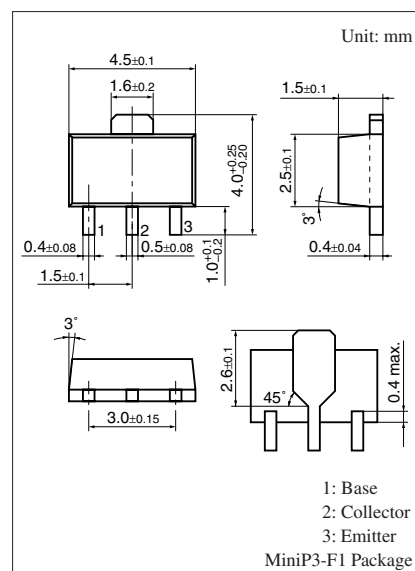
### ■ Features

- High forward current transfer ratio  $h_{FE}$
- Costs can be reduced through downsizing of the equipment and reduction of the number of parts.

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

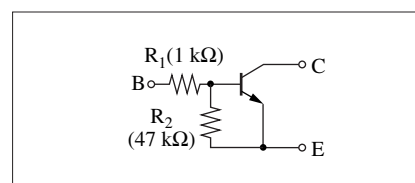
| Parameter                             | Symbol    | Rating      | Unit             |
|---------------------------------------|-----------|-------------|------------------|
| Collector-base voltage (Emitter open) | $V_{CBO}$ | 20          | V                |
| Collector-emitter voltage (Base open) | $V_{CEO}$ | 20          | V                |
| Collector current                     | $I_C$     | 0.7         | A                |
| Peak collector current                | $I_{CP}$  | 1.5         | A                |
| Total power dissipation *             | $P_T$     | 1.0         | W                |
| Junction temperature                  | $T_j$     | 150         | $^\circ\text{C}$ |
| Storage temperature                   | $T_{stg}$ | -55 to +150 | $^\circ\text{C}$ |

Note) \*: Printed circuit board: Copper foil area of 1 cm<sup>2</sup> or more, and the board thickness of 1.7 mm for the collector portion



Marking Symbol: IC

Internal Connection



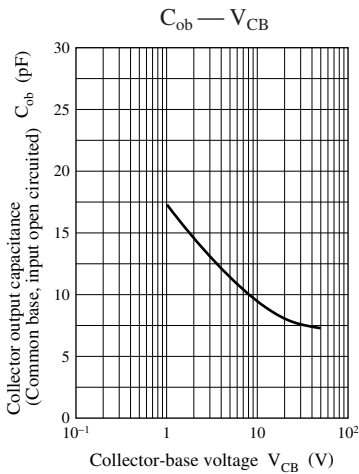
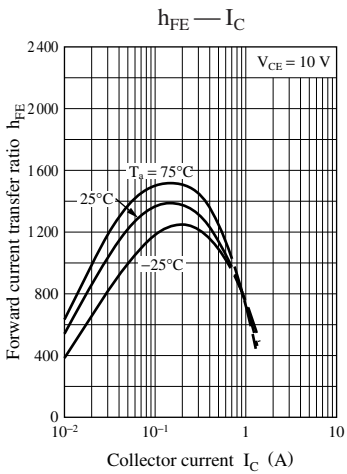
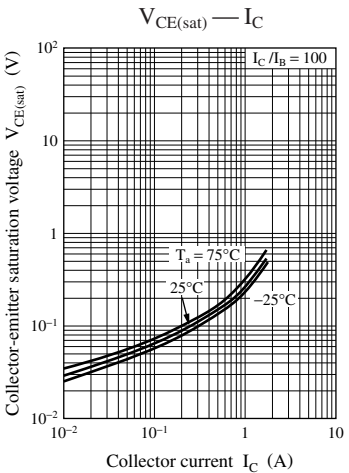
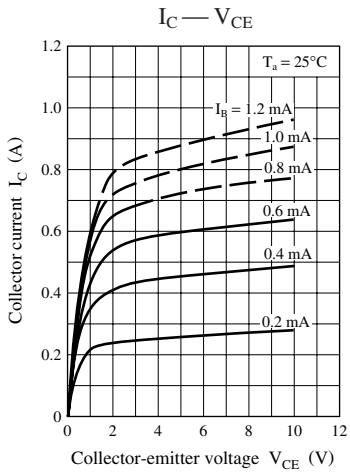
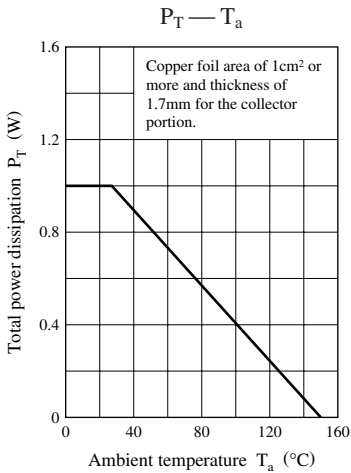
### ■ Electrical Characteristics $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$

| Parameter                                    | Symbol        | Conditions                                                               | Min   | Typ   | Max   | Unit          |
|----------------------------------------------|---------------|--------------------------------------------------------------------------|-------|-------|-------|---------------|
| Collector-base voltage (Emitter open)        | $V_{CBO}$     | $I_C = 10 \mu\text{A}$ , $I_E = 0$                                       | 20    |       |       | V             |
| Collector-emitter voltage (Base open)        | $V_{CEO}$     | $I_C = 1 \text{ mA}$ , $I_B = 0$                                         | 20    |       |       | V             |
| Collector-base cutoff current (Emitter open) | $I_{CBO}$     | $V_{CB} = 15 \text{ V}$ , $I_E = 0$                                      |       |       | 1     | $\mu\text{A}$ |
| Collector-emitter cutoff current (Base open) | $I_{CEO}$     | $V_{CE} = 15 \text{ V}$ , $I_B = 0$                                      |       |       | 10    | $\mu\text{A}$ |
| Emitter-base cutoff current (Collector open) | $I_{EBO}$     | $V_{EB} = 14 \text{ V}$ , $I_C = 0$                                      |       |       | 0.5   | mA            |
| Forward current transfer ratio *             | $h_{FE}$      | $V_{CE} = 10 \text{ V}$ , $I_C = 150 \text{ mA}$                         | 800   |       | 2 100 | —             |
| Collector-emitter saturation voltage *       | $V_{CE(sat)}$ | $I_C = 500 \text{ mA}$ , $I_B = 5 \text{ mA}$                            |       |       | 0.4   | V             |
| Input resistance                             | $R_1$         |                                                                          | 0.7   | 1.0   | 1.3   | k $\Omega$    |
| Resistance ratio                             | $R_1/R_2$     |                                                                          | 0.016 | 0.021 | 0.025 | —             |
| Transition frequency                         | $f_T$         | $V_{CB} = 20 \text{ V}$ , $I_E = -20 \text{ mA}$ , $f = 200 \text{ MHz}$ |       | 55    |       | MHz           |

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

2. \*: Pulse measurement

Note) The part number in the parenthesis shows conventional part number.



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