

TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT Process)

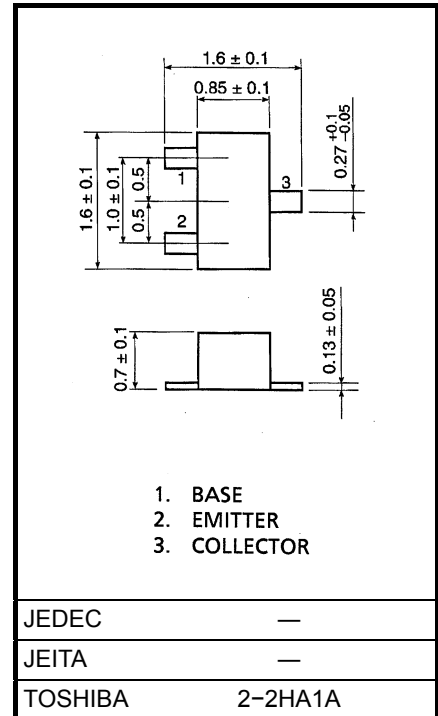
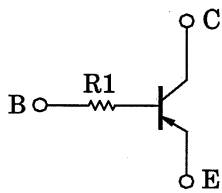
# RN2112F, RN2113F

Switching, Inverter Circuit, Interface Circuit and Driver Circuit Applications

Unit in mm

- With built-in bias resistors
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process
- Complementary to RN1112F, RN1113F

## Equivalent Circuit



Weight: 2.3 mg (typ.)

## Absolute Maximum Ratings (Ta = 25°C)

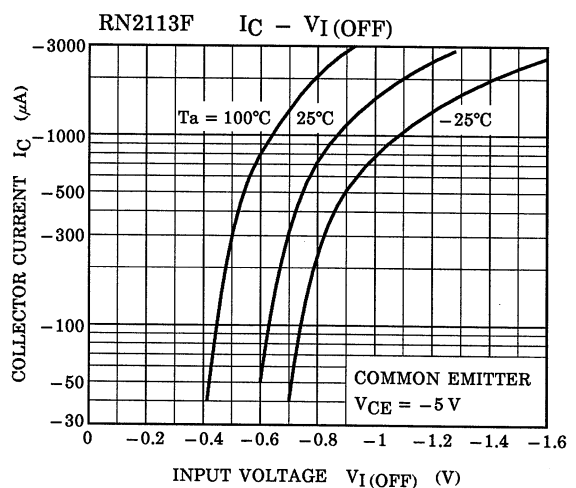
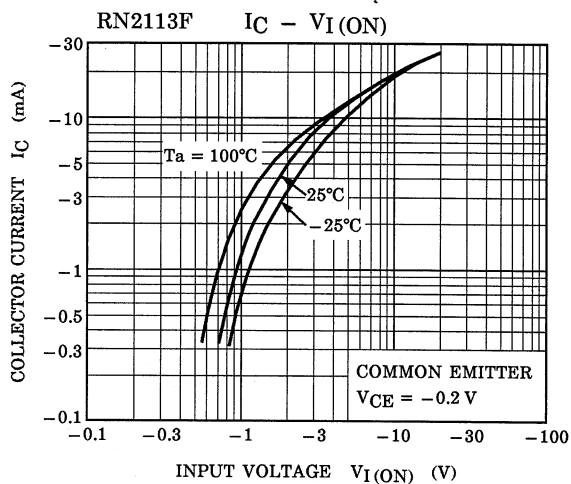
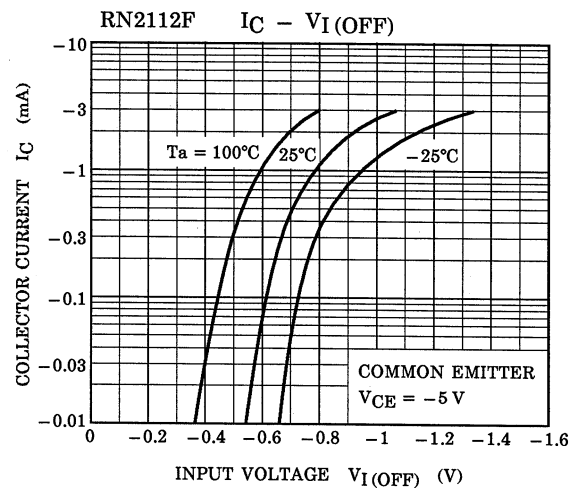
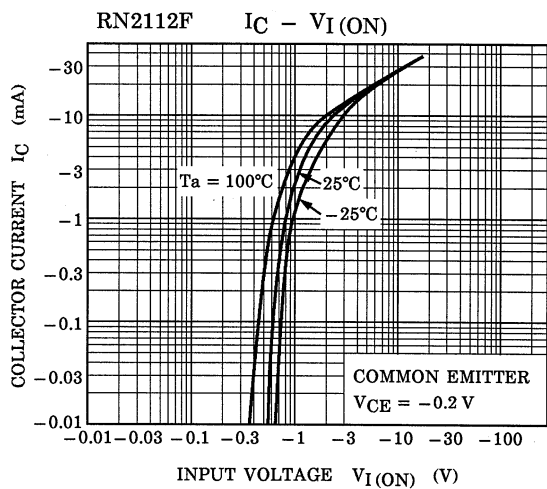
| Characteristic              | Symbol           | Rating  | Unit |
|-----------------------------|------------------|---------|------|
| Collector-base voltage      | V <sub>CB0</sub> | -50     | V    |
| Collector-emitter voltage   | V <sub>CEO</sub> | -50     | V    |
| Emitter-base voltage        | V <sub>EB0</sub> | -5      | V    |
| Collector current           | I <sub>C</sub>   | -100    | mA   |
| Collector power dissipation | P <sub>C</sub>   | 100     | mW   |
| Junction temperature        | T <sub>j</sub>   | 150     | °C   |
| Storage temperature range   | T <sub>stg</sub> | -55~150 | °C   |

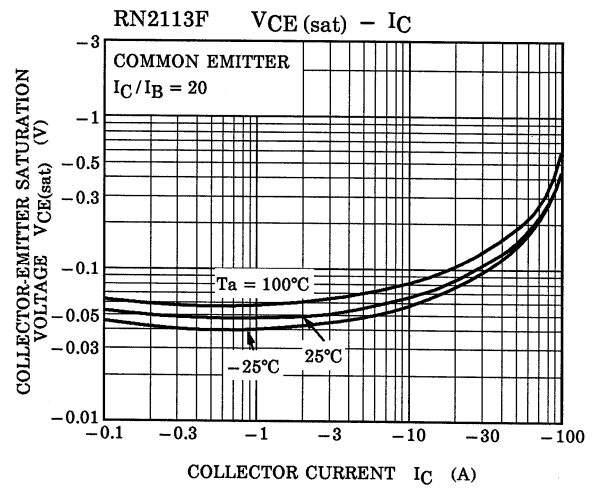
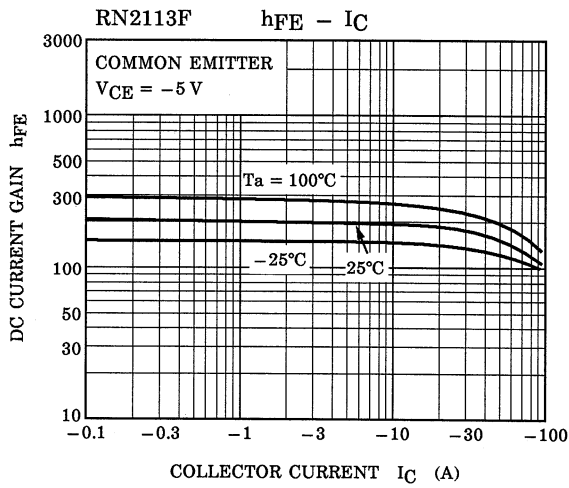
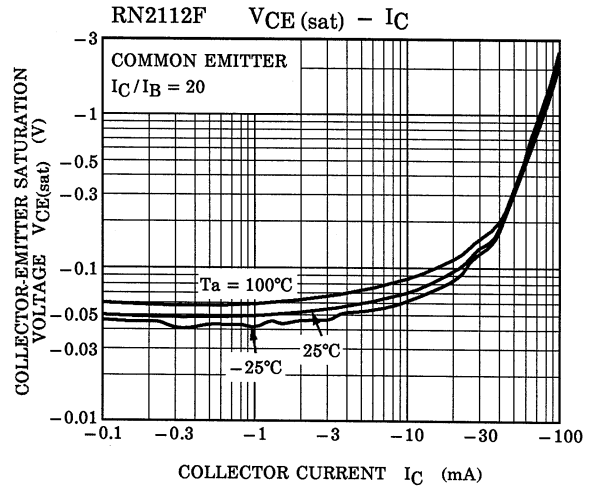
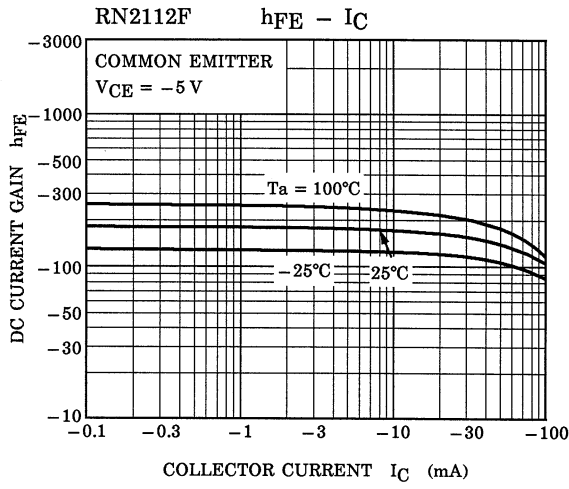
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

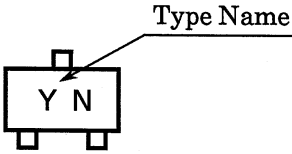
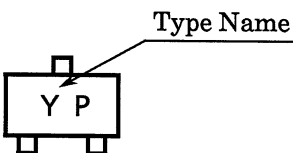
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

## Electrical Characteristics (Ta = 25°C)

| Characteristic                       | Symbol        | Test Circuit | Test Condition                     | Min  | Typ. | Max  | Unit       |
|--------------------------------------|---------------|--------------|------------------------------------|------|------|------|------------|
| Collector cut-off current            | $I_{CBO}$     | —            | $V_{CB} = -50V, I_E = 0$           | —    | —    | -100 | nA         |
| Emitter cut-off current              | $I_{EBO}$     | —            | $V_{EB} = -5V, I_C = 0$            | —    | —    | -100 | nA         |
| DC current gain                      | $h_{FE}$      | —            | $V_{CE} = -5V, I_C = -1mA$         | 120  | —    | 400  | —          |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | —            | $I_C = -5mA, I_B = -0.25mA$        | —    | -0.1 | -0.3 | V          |
| Transition frequency                 | $f_T$         | —            | $V_{CE} = -10V, I_C = -5mA$        | —    | 200  | —    | MHz        |
| Collector output capacitance         | $C_{ob}$      | —            | $V_{CB} = -10V, I_E = 0, f = 1MHz$ | —    | 3    | 6    | pF         |
| Input resistor                       | RN2112F       | R1           | —                                  | 15.4 | 22   | 28.6 | k $\Omega$ |
|                                      | RN2113F       |              |                                    | 32.9 | 47   | 61.1 |            |





| Type Name | Marking   |
|-----------|---|
| RN2112F   |  A schematic diagram of a component marking. It shows a rectangular box with a small square protrusion at the top center and two small square protrusions at the bottom corners. Inside the box, the letters 'Y N' are printed. An arrow points from the text 'Type Name' to the top protrusion. |
| RN2113F   |  A schematic diagram of a component marking. It shows a rectangular box with a small square protrusion at the top center and two small square protrusions at the bottom corners. Inside the box, the letters 'Y P' are printed. An arrow points from the text 'Type Name' to the top protrusion. |

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