

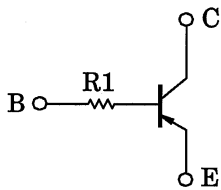
TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT Process) (Bias Resistor built-in Transistor)

# RN2112, RN2113

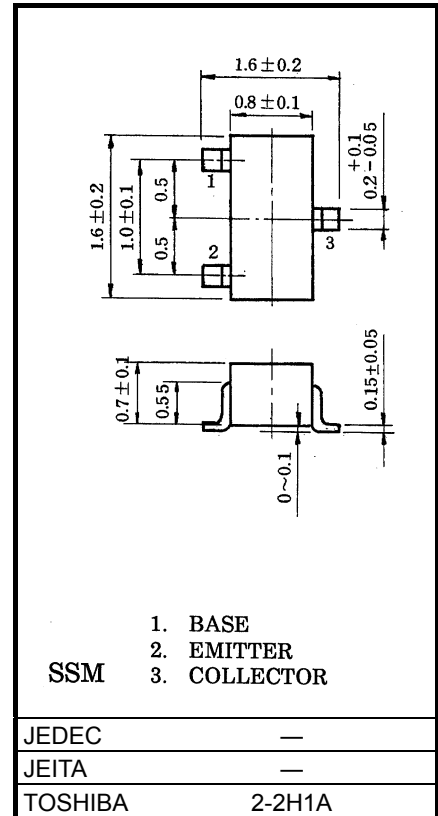
Switching, Inverter Circuit, Interface Circuit and Driver Circuit Applications

- Built-in bias resistors
- Simplified circuit design
- Fewer parts and simplified manufacturing process
- Complementary to RN1112, RN1113

## Equivalent Circuit



Unit: mm



## 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>EBO</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 to 150 | °C   |

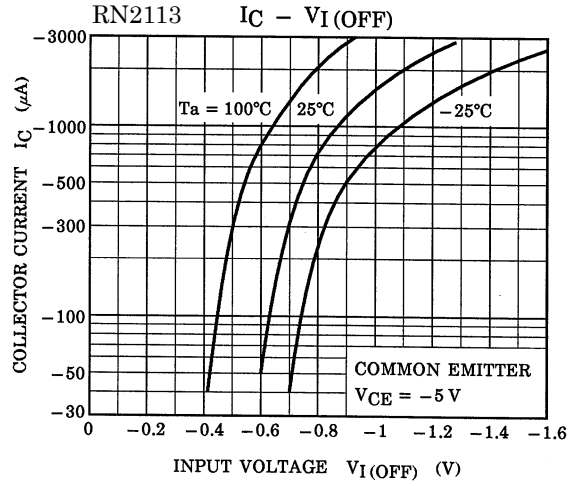
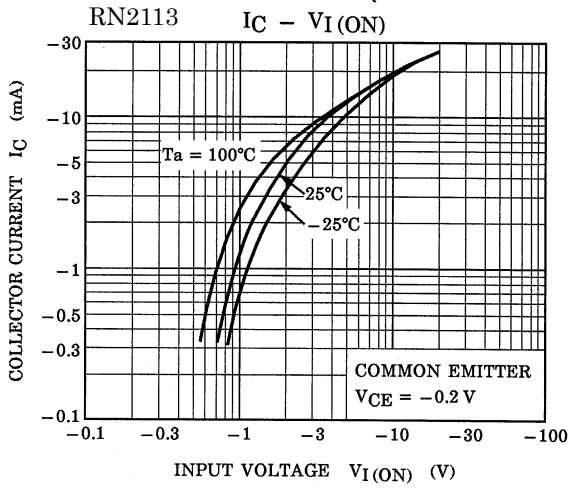
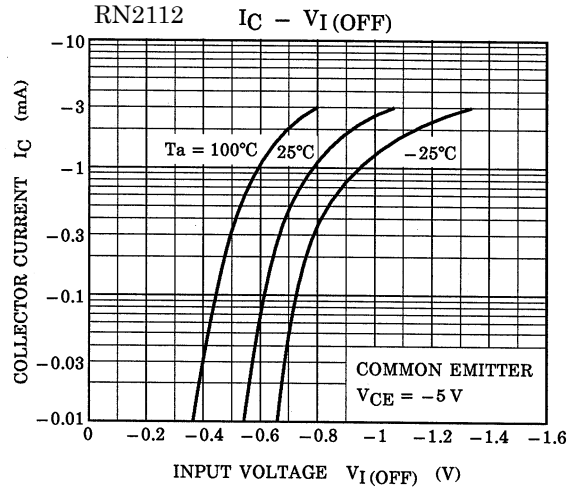
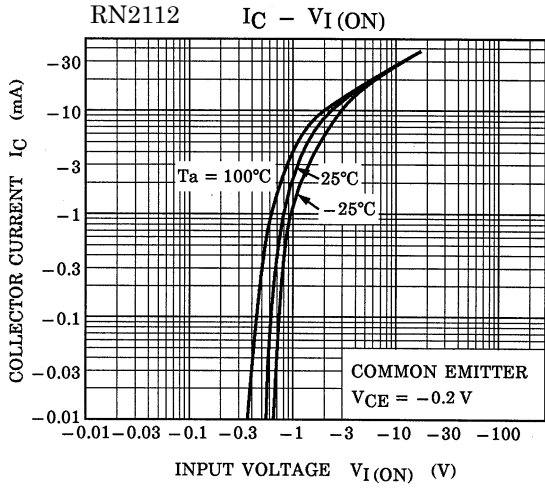
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

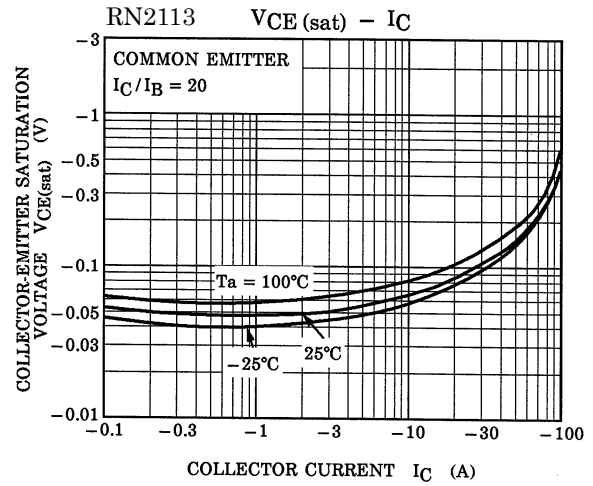
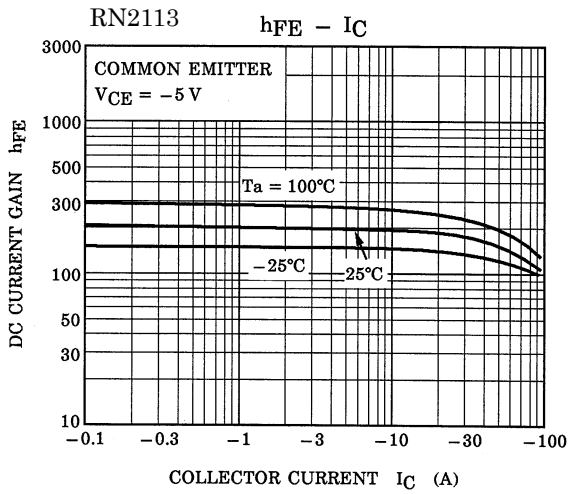
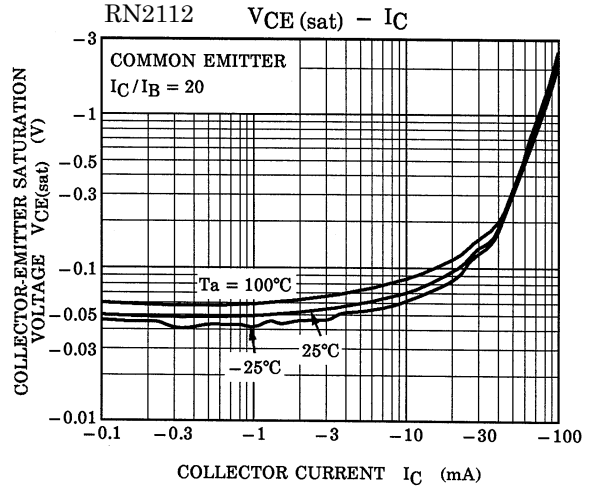
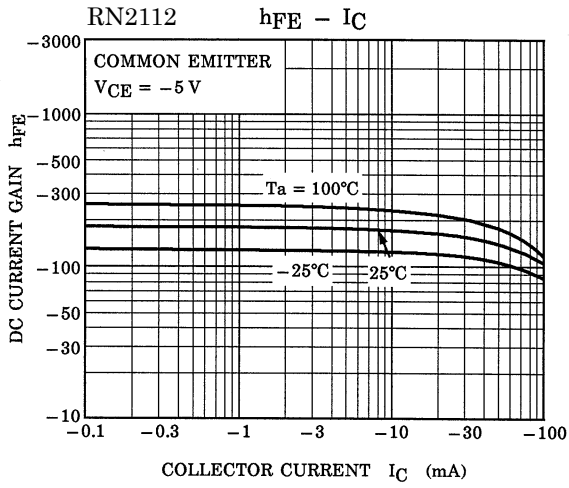
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

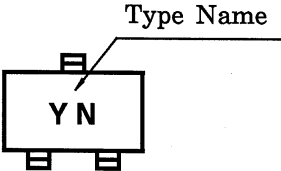
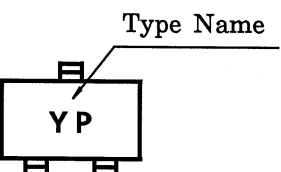
## Electrical Characteristics (Ta = 25°C)

| Characteristic                       | Symbol                | Test Circuit | Test Condition                                         | Min  | Typ. | Max  | Unit |
|--------------------------------------|-----------------------|--------------|--------------------------------------------------------|------|------|------|------|
| Collector cut-off current            | I <sub>CBO</sub>      | —            | V <sub>CB</sub> = -50 V, I <sub>E</sub> = 0            | —    | —    | -100 | nA   |
| Emitter cut-off current              | I <sub>EBO</sub>      | —            | V <sub>EB</sub> = -5 V, I <sub>C</sub> = 0             | —    | —    | -100 | nA   |
| DC current gain                      | h <sub>FE</sub>       | —            | V <sub>CE</sub> = -5 V, I <sub>C</sub> = -1 mA         | 120  | —    | 400  | —    |
| Collector-emitter saturation voltage | V <sub>CE (sat)</sub> | —            | I <sub>C</sub> = -5 mA, I <sub>B</sub> = -0.25 mA      | —    | -0.1 | -0.3 | V    |
| Transition frequency                 | f <sub>T</sub>        | —            | V <sub>CE</sub> = -10 V, I <sub>C</sub> = -5 mA        | —    | 200  | —    | MHz  |
| Collector output capacitance         | C <sub>ob</sub>       | —            | V <sub>CB</sub> = -10 V, I <sub>E</sub> = 0, f = 1 MHz | —    | 3    | 6    | pF   |
| Input resistor                       | RN2112                | R1           | —                                                      | 15.4 | 22   | 28.6 | kΩ   |
|                                      | RN2113                |              |                                                        | 32.9 | 47   | 61.1 |      |

Start of commercial production  
1990-12





| Type Name | Marking                                                                                                                                                                                                                                                                                                                                |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| RN2112    |  <p>The diagram shows a rectangular component with the letters 'Y N' inside. A small square symbol is positioned above the 'Y'. A line points from the text 'Type Name' to this symbol. Two small square symbols are located below the component.</p> |
| RN2113    |  <p>The diagram shows a rectangular component with the letters 'Y P' inside. A small square symbol is positioned above the 'Y'. A line points from the text 'Type Name' to this symbol. Two small square symbols are located below the component.</p> |

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