

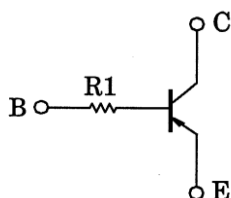
TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT Process) (Bias Resistor built-in Transistor)

RN2312, RN2313

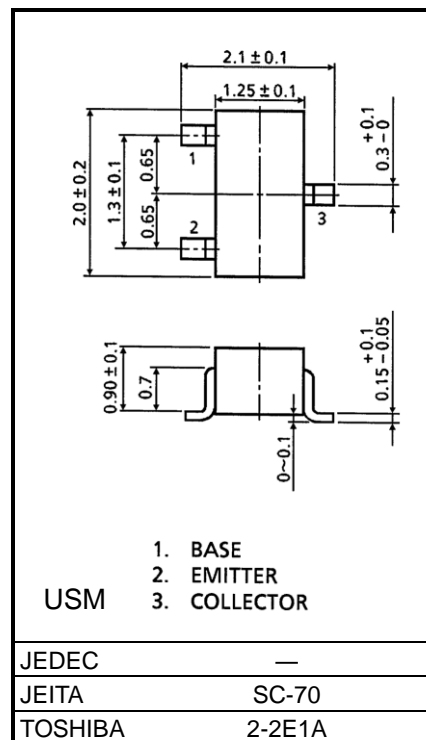
Switching, Inverter Circuit, Interface Circuit and Driver Circuit

- With built-in bias resistors.
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process and miniaturize equipment.
- Various resistance values are available to suit various circuit designs.
- Complementary to RN1312 to RN1313

Equivalent Circuit



Unit: mm



Weight: 0.006g (typ.)

Absolute Maximum Ratings (Ta = 25°C)

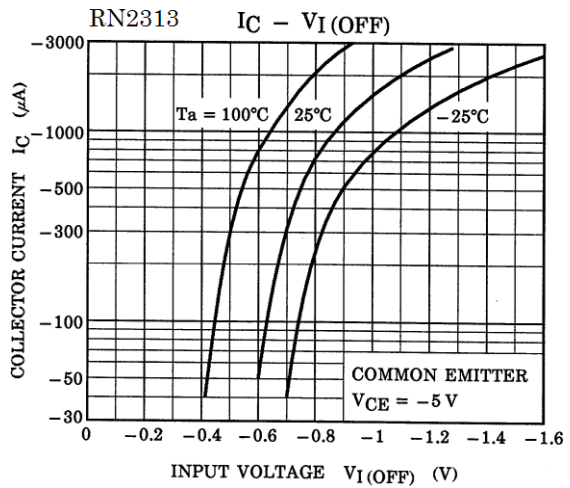
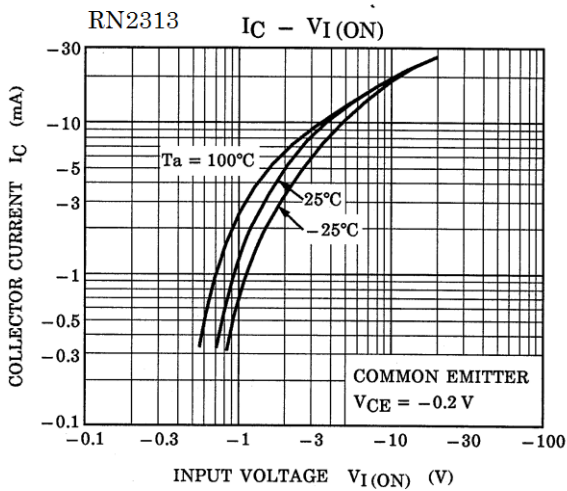
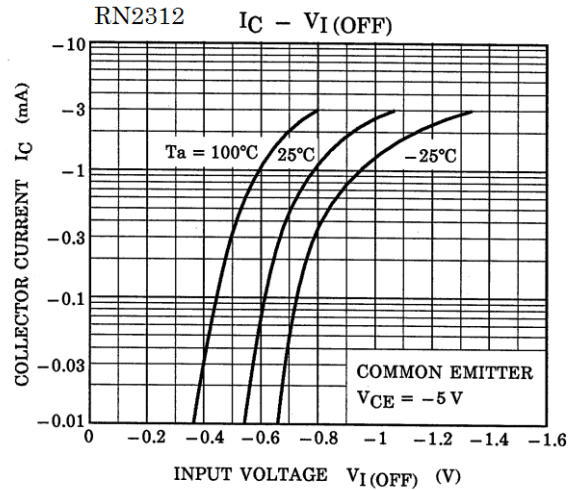
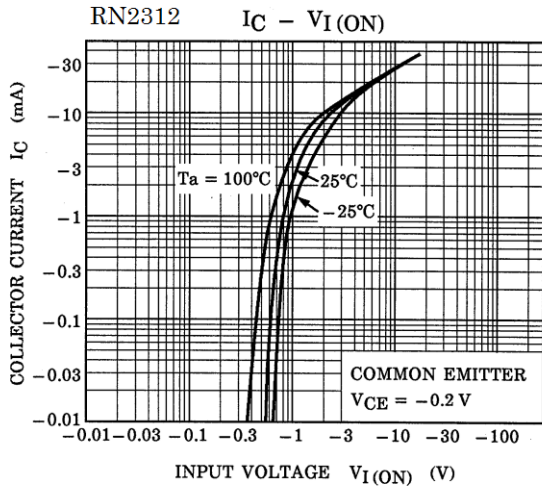
| Characterisitic | Symbol | Rating | Unit |
|-----------------------------|------------------|------------|------|
| Collector-base voltage | V _{CB0} | -50 | V |
| Collector-emitter voltage | V _{CEO} | -50 | V |
| Emitter-base voltage | V _{EBO} | -5 | V |
| Collector current | I _C | -100 | mA |
| Collector power dissipation | P _C | 100 | mW |
| Junction temperature | T _j | 150 | °C |
| Storage temperature range | T _{stg} | -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).

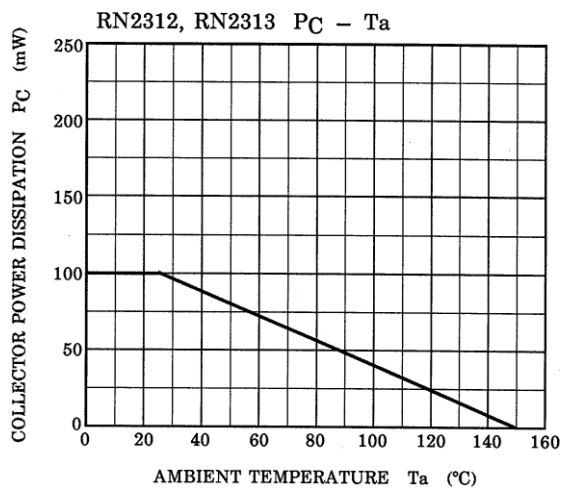
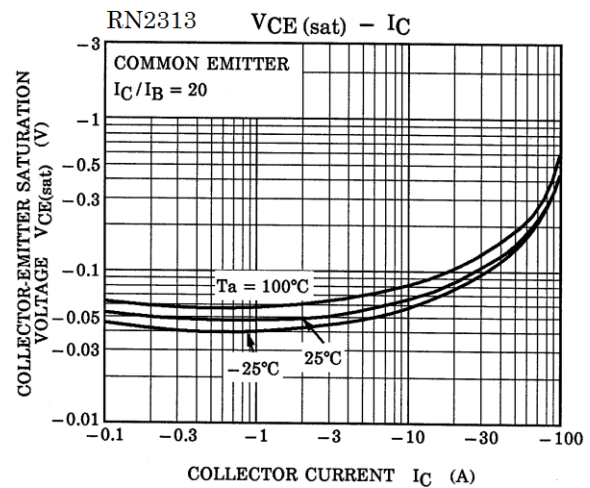
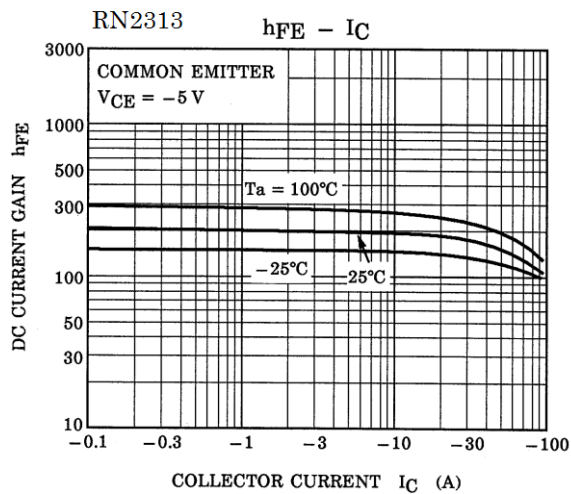
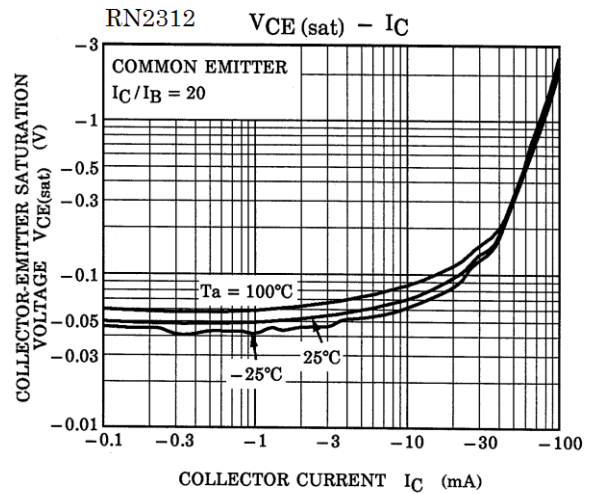
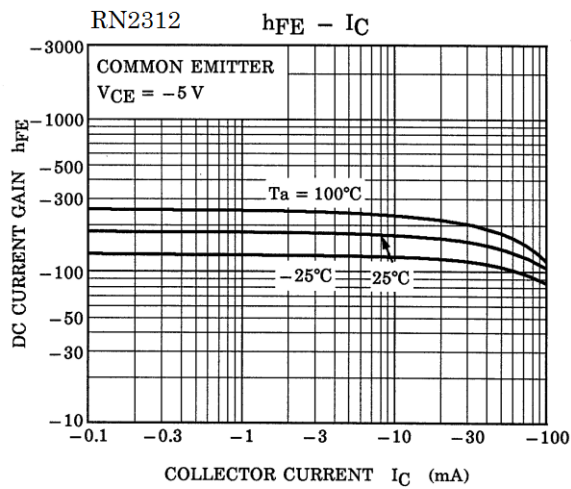
Start of commercial production
1998-02

Electrical Characteristics (Ta = 25°C)

| Characteristic | Symbol | Test Condition | Min | Typ. | Max | Unit | |
|--------------------------------------|-----------------------|---|-----|------|------|------|----|
| Collector cut-off current | ICBO | V _{CB} = -50 V, I _E = 0 mA | — | — | -100 | nA | |
| Emitter cut-off current | IEBO | V _{EB} = -5 V, I _C = 0 mA | — | — | -100 | nA | |
| DC current gain | hFE | V _{CE} = -5 V, I _C = -1 mA | 120 | — | 400 | — | |
| Collector-emitter saturation voltage | V _{CE (sat)} | I _C = -5 mA, I _B = -0.25 mA | — | -0.1 | -0.3 | V | |
| Transition Frequency | f _T | V _{CE} = -10 V, I _C = -5 mA | — | 200 | — | MHz | |
| Collector output capacitance | C _{ob} | V _{CB} = -10 V, I _E = 0 mA, f = 1 MHz | — | 3 | 6 | pF | |
| Input resistor | RN2312 | R1 | — | 15.4 | 22 | 28.6 | kΩ |
| | RN2313 | | | 32.9 | 47 | 61.1 | |

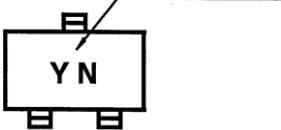
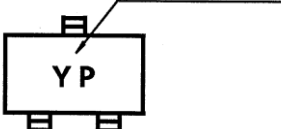


The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.



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Marking

| Part No. | Marking |
|----------|---|
| RN2312 | <p data-bbox="566 365 831 392">Part No.(abbreviation code)</p>  <p>The diagram shows a rectangular component with the letters 'Y N' printed inside. A pointer line originates from the text 'Part No.(abbreviation code)' and points to the top-left corner of the component. There are small square symbols at the top and bottom edges of the component.</p> |
| RN2313 | <p data-bbox="566 571 831 598">Part No.(abbreviation code)</p>  <p>The diagram shows a rectangular component with the letters 'Y P' printed inside. A pointer line originates from the text 'Part No.(abbreviation code)' and points to the top-left corner of the component. There are small square symbols at the top and bottom edges of the component.</p> |

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