

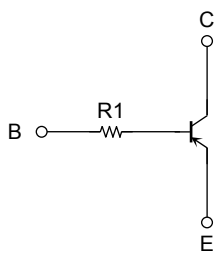
TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT process) (Bias Resistor Built-in Transistor)

# RN2972FS, RN2973FS

Switching, Inverter Circuit, Interface Circuit and Driver Circuit Applications

- Two devices are incorporated into a fine pitch small mold (6-pin) package.
- Incorporating a bias resistor into a transistor reduces parts count. Reducing the parts count enables the manufacture of ever more compact equipment and lowers assembly cost.
- Complementary to RN1972FS, RN1973FS

## Equivalent Circuit and Bias Resistor Values



## Absolute Maximum Ratings (Ta = 25°C) (Q1, Q2 common)

| Characteristics             | Symbol                  | Rating  | Unit |
|-----------------------------|-------------------------|---------|------|
| Collector-base voltage      | V <sub>CB0</sub>        | -20     | V    |
| Collector-emitter voltage   | V <sub>CCEQ</sub>       | -20     | V    |
| Emitter-base voltage        | V <sub>EBO</sub>        | -5      | V    |
| Collector current           | I <sub>C</sub>          | -50     | mA   |
| Collector power dissipation | P <sub>C</sub> (Note 1) | 50      | 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.

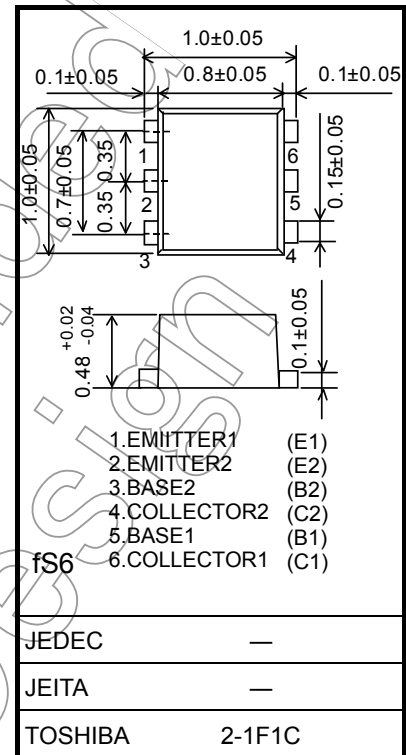
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

Note 1: Total rating

## Electrical Characteristics (Ta = 25°C) (Q1, Q2 common)

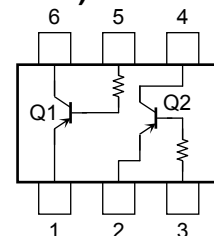
| Characteristics                      |          | Symbol                | Test Condition   | Min  | Typ. | Max   | Unit |
|--------------------------------------|----------|-----------------------|--|------|------|-------|------|
| Collector cut-off current            |          | I <sub>CBO</sub>      | V <sub>CB</sub> = -20 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         | 300  | —    | —     |      |
| Collector-emitter saturation voltage |          | V <sub>CE (sat)</sub> | I <sub>C</sub> = -5 mA, I <sub>B</sub> = -0.25 mA      | —    | —    | -0.15 | V    |
| Collector output capacitance         |          | C <sub>ob</sub>       | V <sub>CB</sub> = -10 V, I <sub>E</sub> = 0, f = 1 MHz | —    | 1.2  | —     | pF   |
| Input resistor                       | RN2972FS | R1                    | —  | 17.6 | 22   | 26.4  | kΩ   |
|                                      | RN2973FS |                       |  | 37.6 | 47   | 56.4  |      |

Unit: mm

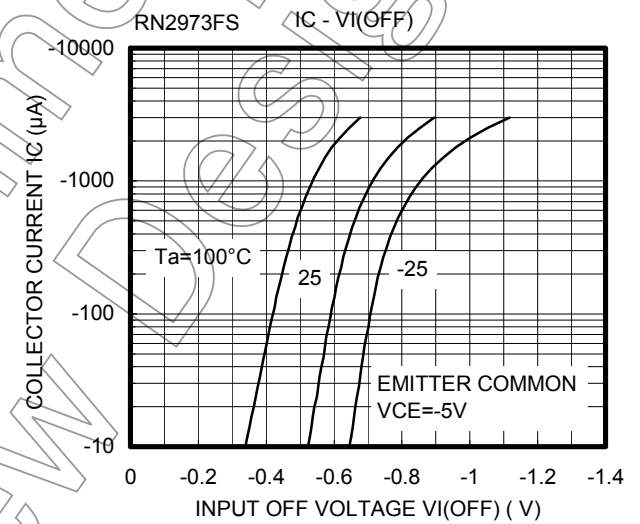
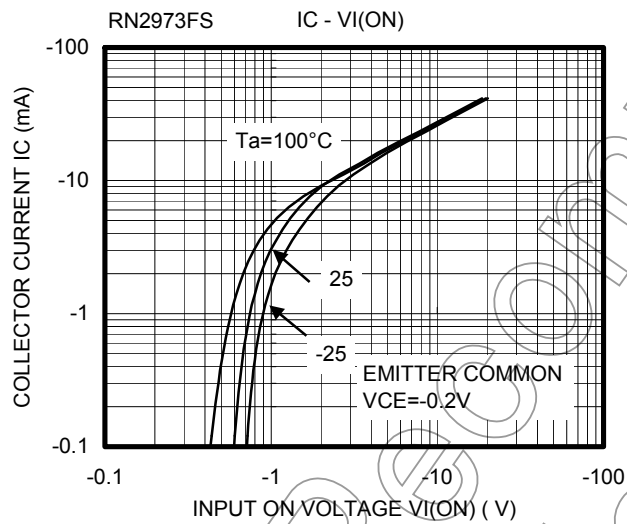
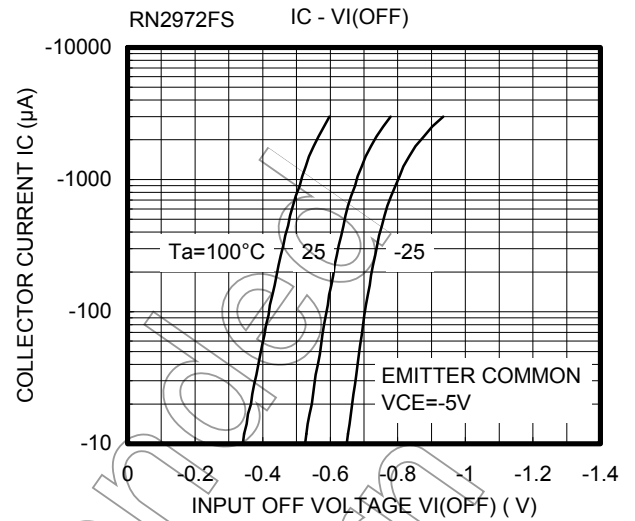
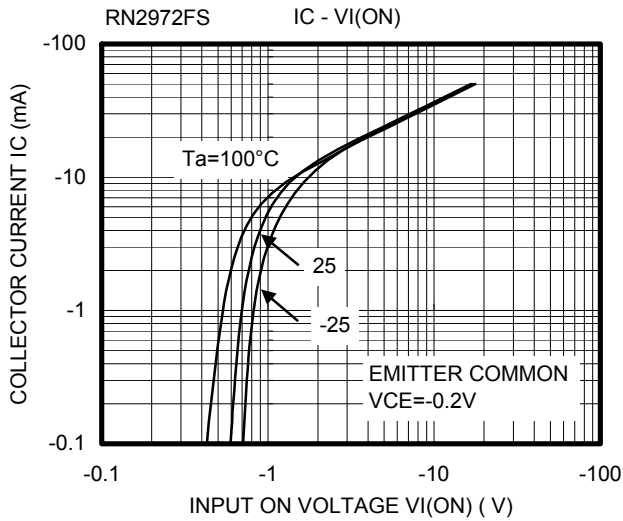


Weight: 0.001g (typ.)

## Equivalent Circuit (top view)

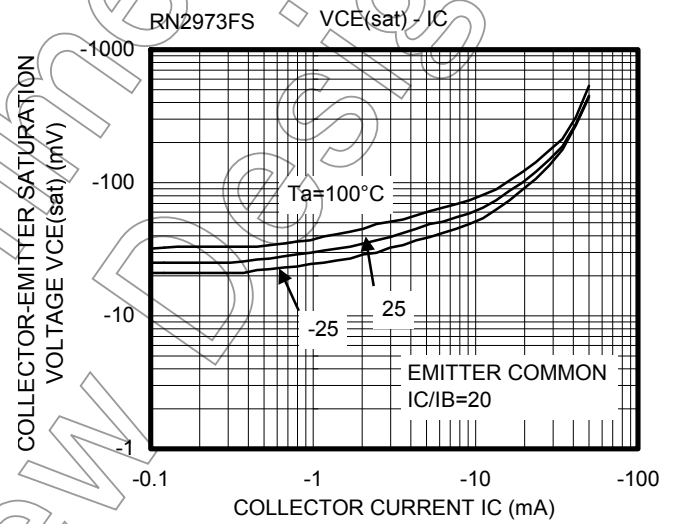
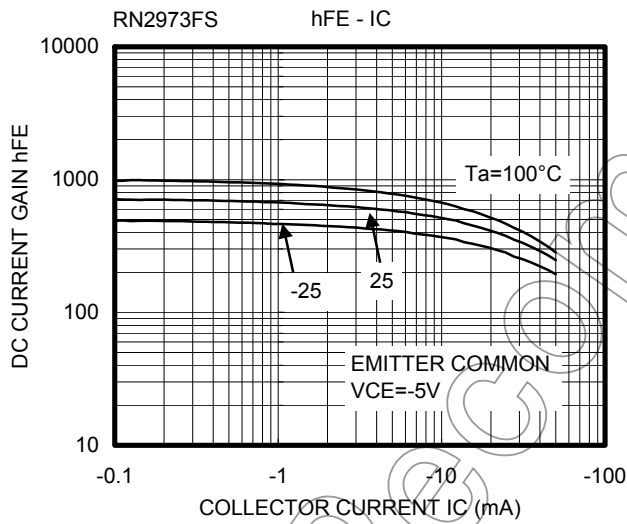
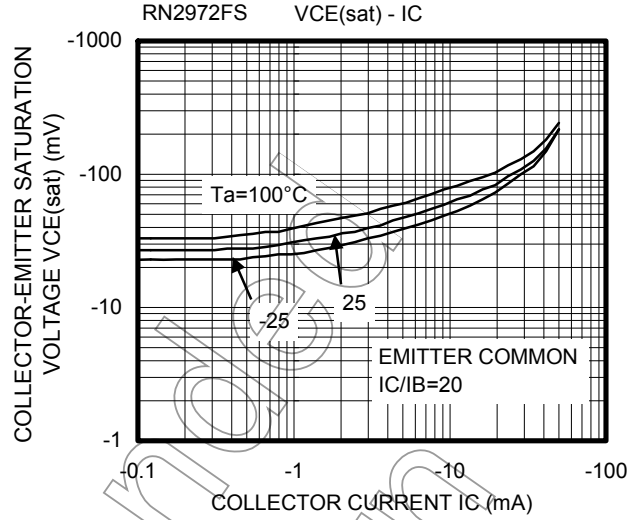
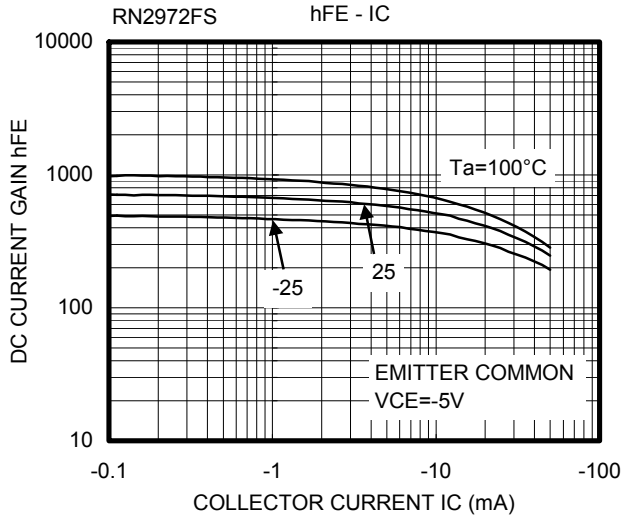


**Q1, Q2 Common**



Not for New

## Q1, Q2 Common



Not for New

| Type Name | Marking |
|-----------|---------|
| RN2972FS  |         |
| RN2973FS  |         |

## Handling Precaution

When handling individual devices (which are not yet mounted on a circuit board), be sure that the environment is protected against electrostatic discharge. Operators should wear anti-static clothing, and containers and other objects that come into direct contact with devices should be made of anti-static materials.

Not Recommended for New Design

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