

TOSHIBA Transistor Silicon NPN · PNP Epitaxial Type  
(PCT process) (Bias Resistor built-in Transistor)

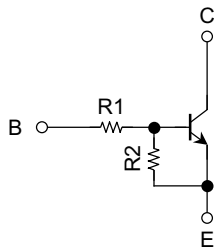
# RN4982FE

Switching, Inverter Circuit, Interface Circuit and Driver Circuit Applications.

- Two devices are incorporated into an Extreme-Super-Mini (6 pin) package.
- Incorporating a bias resistor into a transistor reduces parts count. Reducing the parts count enable the manufacture of ever more compact equipment and save assembly cost.

## Equivalent Circuit and Bias Resistor Values

**Q1**

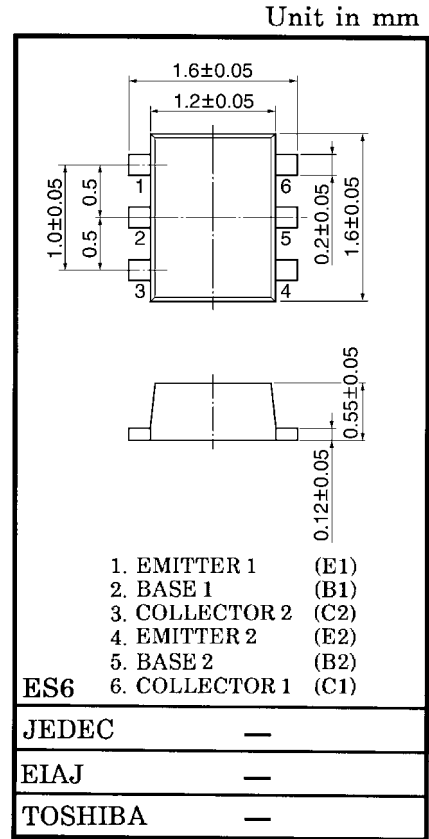
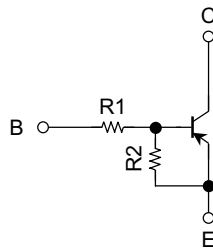


R1: 10 kΩ

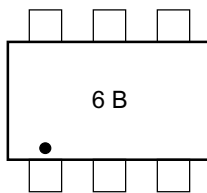
R2: 10 kΩ

(Q1, Q2 common)

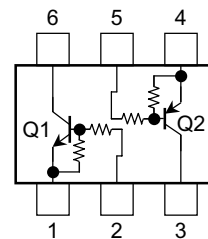
**Q2**



## Marking



## Equivalent Circuit (top view)



000707EAA1

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**Maximum Ratings (Ta = 25°C) (Q1)**

| Characteristics           | 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> | 10     | V    |
| Collector current         | I <sub>C</sub>   | 100    | mA   |

**Maximum Ratings (Ta = 25°C) (Q2)**

| Characteristics           | 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> | -10    | V    |
| Collector current         | I <sub>C</sub>   | -100   | mA   |

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

| Characteristics             | Symbol                | Rating  | Unit |
|-----------------------------|-----------------------|---------|------|
| Collector power dissipation | P <sub>C</sub> (Note) | 100     | mW   |
| Junction temperature        | T <sub>j</sub>        | 150     | °C   |
| Storage temperature range   | T <sub>stg</sub>      | -55~150 | °C   |

Note: Total rating

## Electrical Characteristics (Ta = 25°C) (Q1)

| Characteristics                      | Symbol        | Test Condition                                    | Min  | Typ. | Max  | Unit |
|--------------------------------------|---------------|---|------|------|------|------|
| Collector cut-off current            | $I_{CBO}$     | $V_{CB} = 50\text{ V}, I_E = 0$                   | —    | —    | 100  | nA   |
|                                      | $I_{CEO}$     | $V_{CE} = 50\text{ V}, I_B = 0$                   | —    | —    | 500  |      |
| Emitter cut-off current              | $I_{EBO}$     | $V_{EB} = 10\text{ V}, I_C = 0$                   | 0.38 | —    | 0.71 | mA   |
| DC current gain                      | $h_{FE}$      | $V_{CE} = 5\text{ V}, I_C = 10\text{ mA}$         | 50   | —    | —    |      |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C = 5\text{ mA}, I_B = 0.25\text{ mA}$         | —    | 0.1  | 0.3  | V    |
| Input voltage (ON)                   | $V_I(ON)$     | $V_{CE} = 0.2\text{ V}, I_C = 5\text{ mA}$        | 1.2  | —    | 2.4  | V    |
| Input voltage (OFF)                  | $V_I(OFF)$    | $V_{CE} = 5\text{ V}, I_C = 0.1\text{ mA}$        | 1.0  | —    | 1.5  | V    |
| Transition frequency                 | $f_T$         | $V_{CE} = 10\text{ V}, I_C = 5\text{ mA}$         | —    | 250  | —    | MHz  |
| Collector output capacitance         | $C_{ob}$      | $V_{CB} = 10\text{ V}, I_E = 0, f = 1\text{ MHz}$ | —    | 3    | 6    | pF   |

## Electrical Characteristics (Ta = 25°C) (Q2)

| Characteristics                      | Symbol        | Test Condition                                     | Min   | Typ. | Max   | Unit |
|--------------------------------------|---------------|--|-------|------|-------|------|
| Collector cut-off current            | $I_{CBO}$     | $V_{CB} = -50\text{ V}, I_E = 0$                   | —     | —    | -100  | nA   |
|                                      | $I_{CEO}$     | $V_{CE} = -50\text{ V}, I_B = 0$                   | —     | —    | -500  |      |
| Emitter cut-off current              | $I_{EBO}$     | $V_{EB} = -10\text{ V}, I_C = 0$                   | -0.38 | —    | -0.71 | mA   |
| DC current gain                      | $h_{FE}$      | $V_{CE} = -5\text{ V}, I_C = -10\text{ mA}$        | 50    | —    | —     |      |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C = -5\text{ mA}, I_B = -0.25\text{ mA}$        | —     | -0.1 | -0.3  | V    |
| Input voltage (ON)                   | $V_I(ON)$     | $V_{CE} = -0.2\text{ V}, I_C = -5\text{ mA}$       | -1.2  | —    | -2.4  | V    |
| Input voltage (OFF)                  | $V_I(OFF)$    | $V_{CE} = -5\text{ V}, I_C = -0.1\text{ mA}$       | -1.0  | —    | -1.5  | V    |
| Transition frequency                 | $f_T$         | $V_{CE} = -10\text{ V}, I_C = -5\text{ mA}$        | —     | 200  | —     | MHz  |
| Collector output capacitance         | $C_{ob}$      | $V_{CB} = -10\text{ V}, I_E = 0, f = 1\text{ MHz}$ | —     | 3    | 6     | pF   |

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

| Characteristics | Symbol | Test Condition | Min | Typ. | Max | Unit |
|-----------------|--------|----------------|-----|------|-----|------|
| Input resistor  | R1     | —              | 7   | 10   | 13  | kΩ   |
| Resistor ratio  | R1/R2  | —              | 0.9 | 1.0  | 1.1 |      |