

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

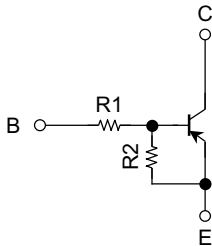
RN4908FE

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

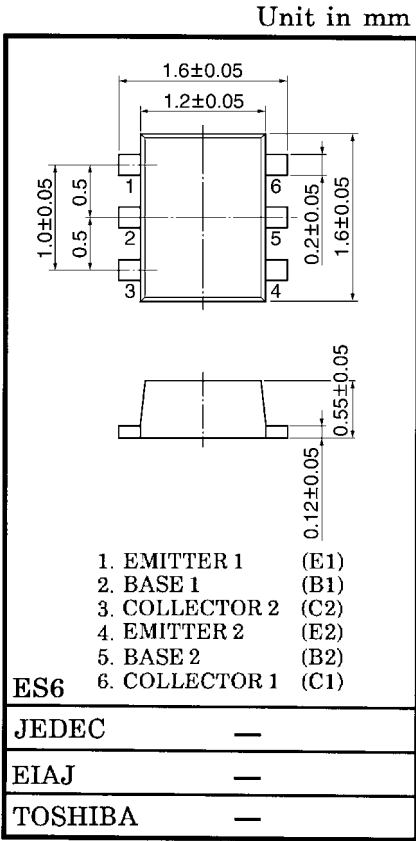
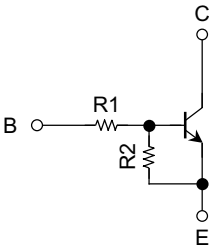


R1: 22 kΩ

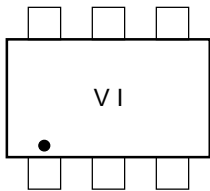
R2: 47 kΩ

(Q1, Q2 common)

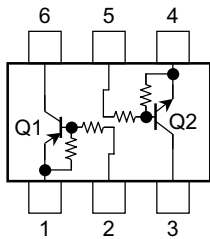
Q2



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>CBO</sub> | –50    | V    |
| Collector-emitter voltage | V <sub>CEO</sub> | –50    | V    |
| Emitter-base voltage      | V <sub>EBO</sub> | –7     | V    |
| Collector current         | I <sub>C</sub>   | –100   | mA   |

**Maximum Ratings (Ta = 25°C) (Q2)**

| Characteristics           | Symbol           | Rating | Unit |
|---------------------------|------------------|--------|------|
| Collector-base voltage    | V <sub>CBO</sub> | 50     | V    |
| Collector-emitter voltage | V <sub>CEO</sub> | 50     | V    |
| Emitter-base voltage      | V <sub>EBO</sub> | 7      | 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 <sub>CBO</sub>     | V <sub>CB</sub> = -50 V, I <sub>E</sub> = 0            | —      | —    | -100   | nA   |
|                                      | I <sub>CEO</sub>     | V <sub>CE</sub> = -50 V, I <sub>B</sub> = 0            | —      | —    | -500   |      |
| Emitter cut-off current              | I <sub>EBO</sub>     | V <sub>EB</sub> = -7 V, I <sub>C</sub> = 0             | -0.078 | —    | -0.145 | mA   |
| DC current gain                      | h <sub>FE</sub>      | V <sub>CE</sub> = -5 V, I <sub>C</sub> = -10 mA        | 80     | —    | —      |      |
| 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    |
| Input voltage (ON)                   | V <sub>I(ON)</sub>   | V <sub>CE</sub> = -0.2 V, I <sub>C</sub> = -5 mA       | -1.0   | —    | -2.6   | V    |
| Input voltage (OFF)                  | V <sub>I(OFF)</sub>  | V <sub>CE</sub> = -5 V, I <sub>C</sub> = -0.1 mA       | -0.6   | —    | -1.16  | 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   |

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

| Characteristics                      | Symbol               | 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   |
|                                      | I <sub>CEO</sub>     | V <sub>CE</sub> = 50 V, I <sub>B</sub> = 0            | —     | —    | 500   |      |
| Emitter cut-off current              | I <sub>EBO</sub>     | V <sub>EB</sub> = 7 V, I <sub>C</sub> = 0             | 0.078 | —    | 0.145 | mA   |
| DC current gain                      | h <sub>FE</sub>      | V <sub>CE</sub> = 5 V, I <sub>C</sub> = 10 mA         | 80    | —    | —     |      |
| 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    |
| Input voltage (ON)                   | V <sub>I(ON)</sub>   | V <sub>CE</sub> = 0.2 V, I <sub>C</sub> = 5 mA        | 1.0   | —    | 2.6   | V    |
| Input voltage (OFF)                  | V <sub>I(OFF)</sub>  | V <sub>CE</sub> = 5 V, I <sub>C</sub> = 0.1 mA        | 0.6   | —    | 1.16  | V    |
| Transition frequency                 | f <sub>T</sub>       | V <sub>CE</sub> = 10 V, I <sub>C</sub> = 5 mA         | —     | 250  | —     | 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   |

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

| Characteristics | Symbol | Test Condition | Min   | Typ.  | Max   | Unit |
|-----------------|--------|----------------|-------|-------|-------|------|
| Input resistor  | R1     | —              | 15.4  | 22    | 28.6  | kΩ   |
| Resistor ratio  | R1/R2  | —              | 0.421 | 0.468 | 0.515 |      |