

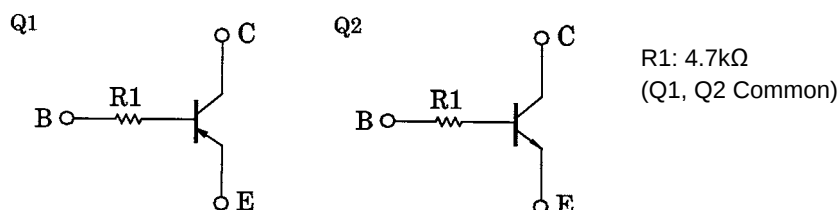
TOSHIBA Transistor Silicon PNP/NPN Epitaxial Type (PCT Process) (Transistor with Built-in Bias Resistor)

# RN4910

Switching, Inverter Circuit, Interface Circuit  
and Driver Circuit Applications

- Including two devices in US6 (ultra super mini type with 6 leads)
- With built-in bias resistors
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process

## Equivalent Circuit and Bias Resistor Values



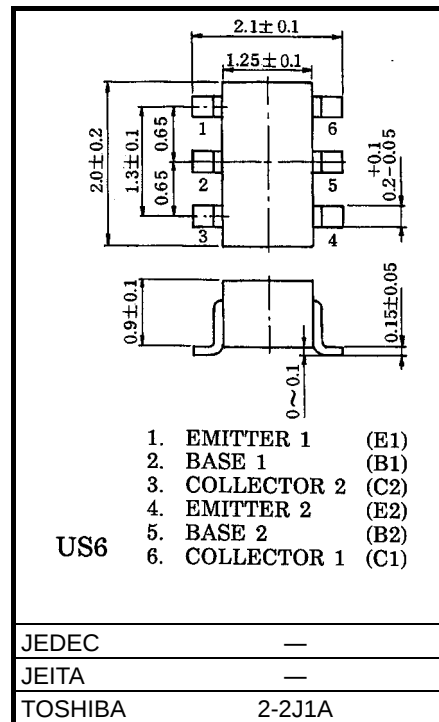
## Q1 Absolute Maximum Ratings (Ta = 25°C)

| Characteristic            | Symbol    | Rating | Unit |
|---------------------------|-----------|--------|------|
| Collector-base voltage    | $V_{CBO}$ | -50    | V    |
| Collector-emitter voltage | $V_{CEO}$ | -50    | V    |
| Emitter-base voltage      | $V_{EBO}$ | -5     | V    |
| Collector current         | $I_C$     | -100   | mA   |

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

| Characteristic            | Symbol    | Rating | Unit |
|---------------------------|-----------|--------|------|
| Collector-base voltage    | $V_{CBO}$ | 50     | V    |
| Collector-emitter voltage | $V_{CEO}$ | 50     | V    |
| Emitter-base voltage      | $V_{EBO}$ | 5      | V    |
| Collector current         | $I_C$     | 100    | mA   |

Unit: mm



Weight: 6.8mg (typ.)

Start of commercial production  
1990-10

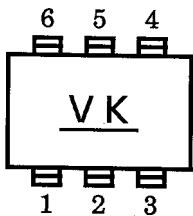
Q1, Q2 Common Absolute Maximum Ratings (Ta = 25°C)

| Characteristic              | Symbol | Rating     | Unit |
|-----------------------------|--------|------------|------|
| Collector power dissipation | PC *   | 200        | mW   |
| Junction temperature        | Tj     | 150        | °C   |
| Storage temperature range   | Tstg   | −55 to 150 | °C   |

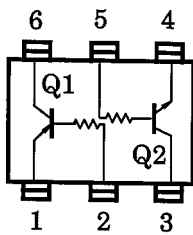
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

\* Total rating

Marking



Equivalent Circuit (Top View)



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

| Characteristic                       | Symbol                | Test Circuit | Test Condition                                        | Min | Typ. | Max  | Unit |
|--------------------------------------|-----------------------|--------------|-------------------------------------------------------|-----|------|------|------|
| Collector cut-off current            | ICBO                  | —            | V <sub>CB</sub> = -50V, I <sub>E</sub> = 0A           | —   | —    | -100 | nA   |
| Emitter cut-off current              | IEBO                  | —            | V <sub>EB</sub> = -5V, I <sub>C</sub> = 0A            | —   | —    | -100 | nA   |
| DC current gain                      | h <sub>FE</sub>       | —            | V <sub>CE</sub> = -5V, I <sub>C</sub> = -1mA          | 120 | —    | 400  | —    |
| Collector-emitter saturation voltage | V <sub>CE (sat)</sub> | —            | I <sub>C</sub> = -5mA, I <sub>B</sub> = -0.25mA       | —   | -0.1 | -0.3 | V    |
| Transition frequency                 | f <sub>T</sub>        | —            | V <sub>CE</sub> = -10V, I <sub>C</sub> = -5mA         | —   | 200  | —    | MHz  |
| Collector output capacitance         | C <sub>ob</sub>       | —            | V <sub>CB</sub> = -10V, I <sub>E</sub> = 0A, f = 1MHz | —   | 3    | 6    | pF   |

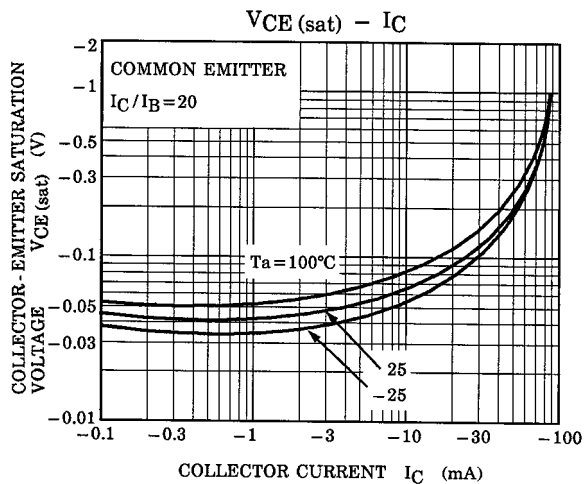
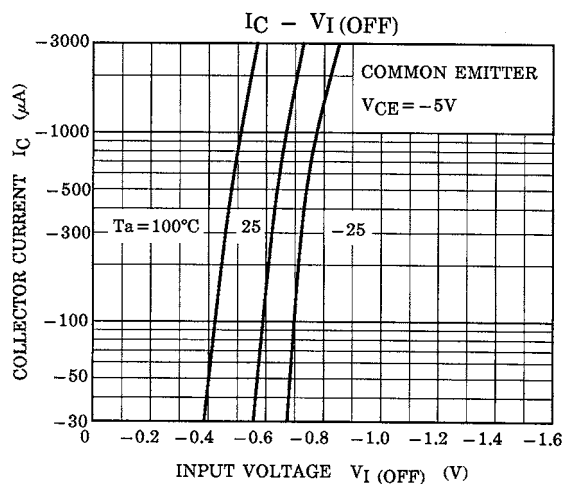
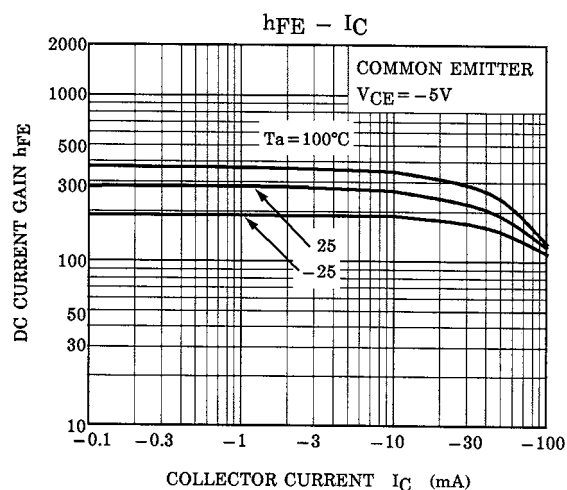
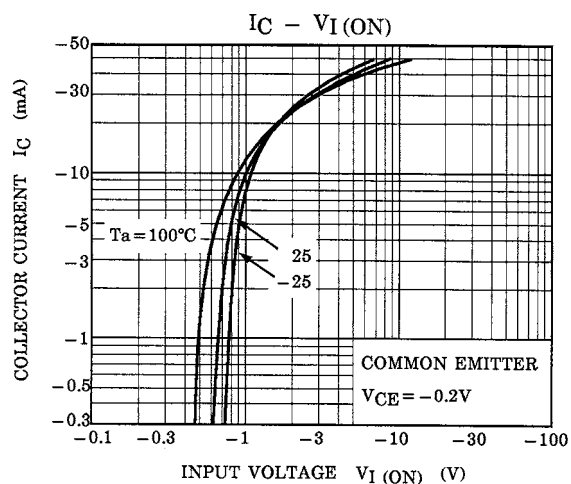
### Q2 Electrical Characteristics (Ta = 25°C)

| Characteristic                       | Symbol                | Test Circuit | Test Condition                                        | Min | Typ. | Max | Unit |
|--------------------------------------|-----------------------|--------------|-------------------------------------------------------|-----|------|-----|------|
| Collector cut-off current            | ICBO                  | —            | V <sub>CB</sub> = 50V, I <sub>E</sub> = 0A            | —   | —    | 100 | nA   |
| Emitter cut-off current              | IEBO                  | —            | V <sub>EB</sub> = 5V, I <sub>C</sub> = 0A             | —   | —    | 100 | nA   |
| DC current gain                      | h <sub>FE</sub>       | —            | V <sub>CE</sub> = 5V, I <sub>C</sub> = 1mA            | 120 | —    | 700 | —    |
| Collector-emitter saturation voltage | V <sub>CE (sat)</sub> | —            | I <sub>C</sub> = 5mA, I <sub>B</sub> = 0.25mA         | —   | 0.1  | 0.3 | V    |
| Transition frequency                 | f <sub>T</sub>        | —            | V <sub>CE</sub> = 10V, I <sub>C</sub> = 5mA           | —   | 250  | —   | MHz  |
| Collector output capacitance         | C <sub>ob</sub>       | —            | V <sub>CB</sub> = 10V, I <sub>E</sub> = 0A, f = 1 MHz | —   | 3    | 6   | pF   |

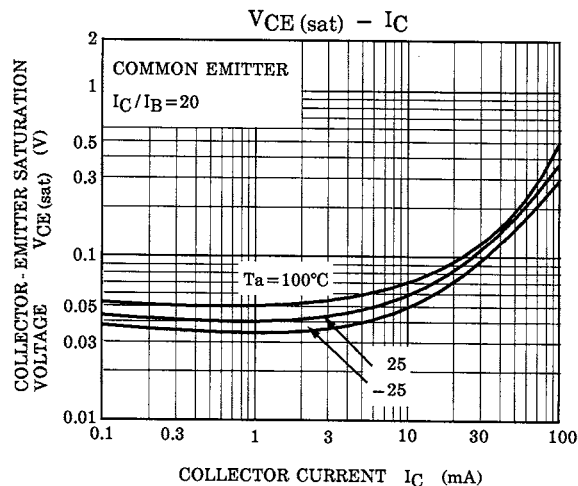
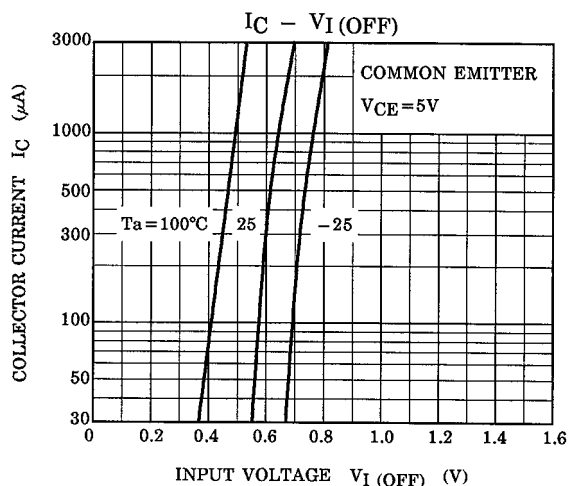
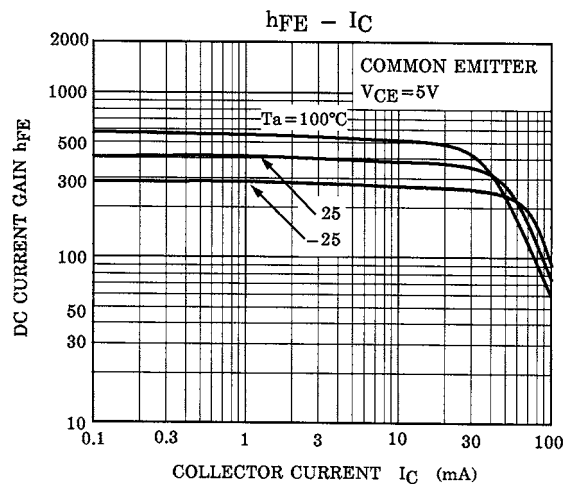
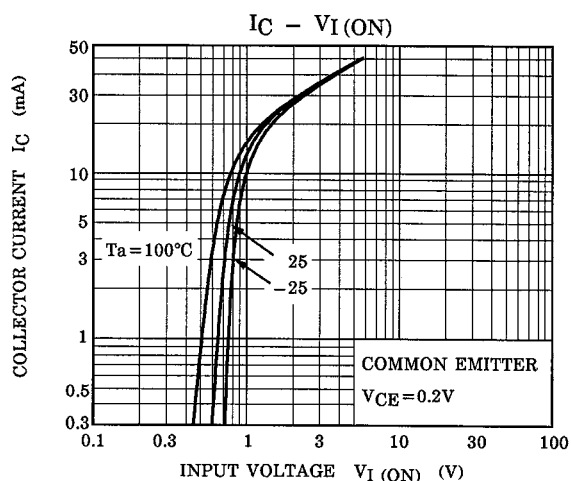
### Q1, Q2 Common Electrical Characteristics (Ta = 25°C)

| Characteristic | Symbol | Test Circuit | Test Condition | Min  | Typ. | Max  | Unit |
|----------------|--------|--------------|----------------|------|------|------|------|
| Input resistor | R1     | —            | —              | 3.29 | 4.7  | 6.11 | kΩ   |

Q1



Q2



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