

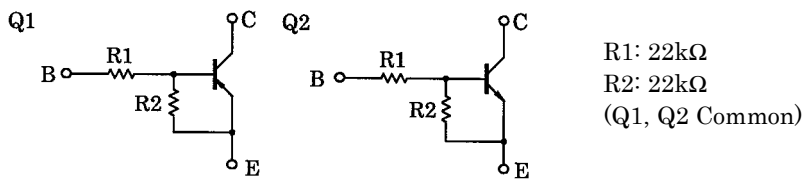
TOSHIBA Transistor  
Silicon PNP Epitaxial Type (PCT Process) Silicon NPN Epitaxial Type (PCT Process)

## RN4603

Switching, Inverter Circuit, Interface Circuit  
And Driver Circuit Applications

- Including two devices in SM6 (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 Resister Values



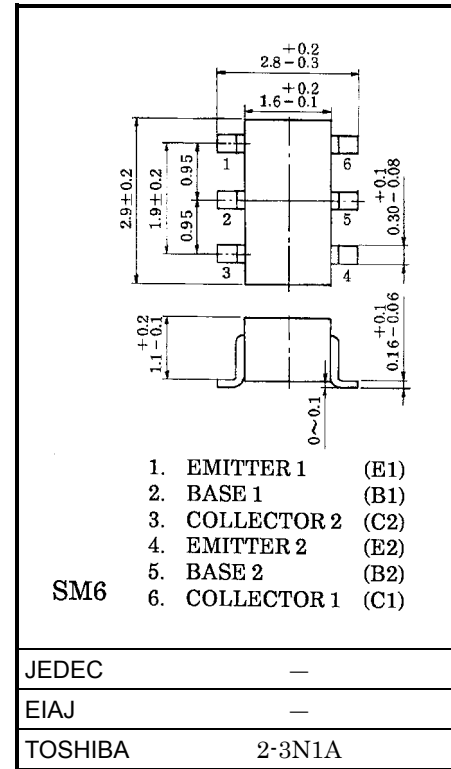
### Q1 Maximum Ratings (Ta = 25°C)

| Characteristic            | Symbol    | Rating | Unit |
|---------------------------|-----------|--------|------|
| Collector-base voltage    | $V_{CBO}$ | -50    | V    |
| Collector-emitter voltage | $V_{CEO}$ | -50    | V    |
| Emitter-base voltage      | $V_{EBO}$ | -10    | V    |
| Collector current         | $I_C$     | -100   | mA   |

### Q2 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      | $V_{EBO}$ | 10     | V    |
| Collector current         | $I_C$     | 100    | mA   |

Unit in mm



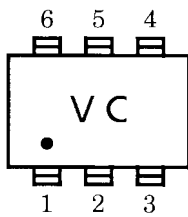
Weight: 0.015g

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

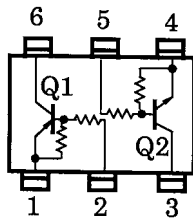
| Characteristic              | Symbol    | Rating  | Unit |
|-----------------------------|-----------|---------|------|
| Collector power dissipation | $P_C$ *   | 300     | mW   |
| Junction temperature        | $T_j$     | 150     | °C   |
| Storage temperature range   | $T_{stg}$ | -55~150 | °C   |

\* : Total rating

**Marking**



**Equivalent Circuit (Top View)**



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

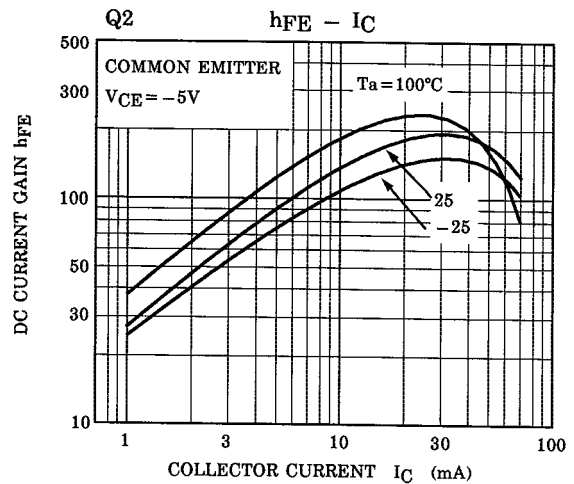
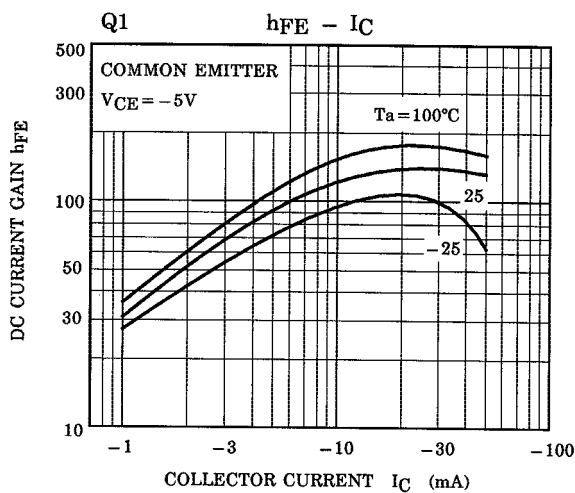
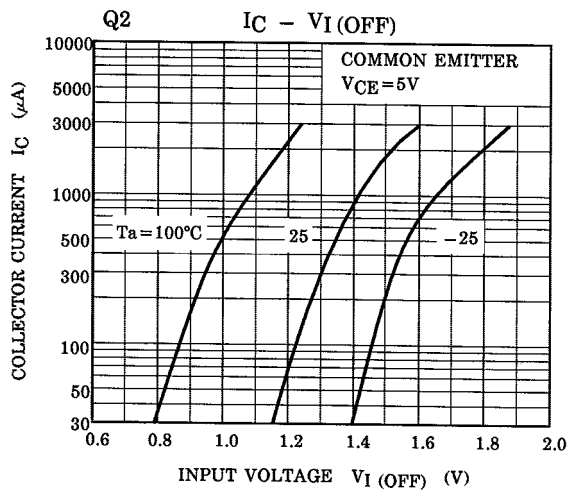
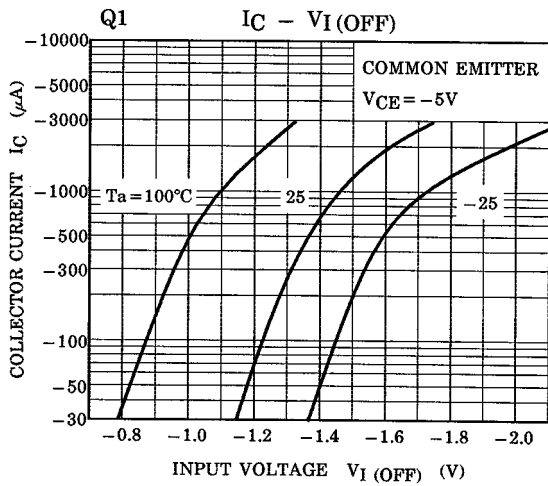
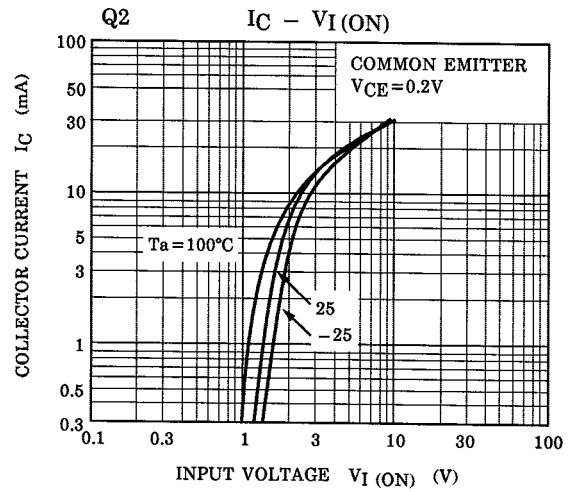
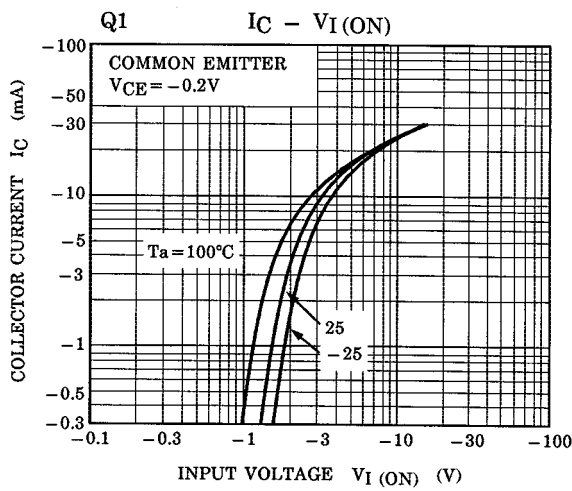
| Characteristic                       | Symbol        | Test Circuit | Test Condition                     | Min   | Typ. | Max   | Unit |
|--------------------------------------|---------------|--------------|------------------------------------|-------|------|-------|------|
| Collector cut-off current            | $I_{CBO}$     | —            | $V_{CB} = -50V, I_E = 0$           | —     | —    | -100  | nA   |
|                                      | $I_{CEO}$     | —            | $V_{CE} = -50V, I_B = 0$           | —     | —    | -500  |      |
| Emitter cut-off current              | $I_{EBO}$     | —            | $V_{EB} = -10V, I_C = 0$           | -0.17 | —    | -0.33 | mA   |
| DC current gain                      | $h_{FE}$      | —            | $V_{CE} = -5V, I_C = -10mA$        | 70    | —    | —     | —    |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | —            | $I_C = -5mA, I_B = -0.25mA$        | —     | -0.1 | -0.3  | V    |
| Input voltage (ON)                   | $V_I(ON)$     | —            | $V_{CE} = -0.2V, I_C = -5mA$       | -1.3  | —    | -3.0  | V    |
| Input voltage (OFF)                  | $V_I(OFF)$    | —            | $V_{CE} = -5V, I_C = -0.1mA$       | -1.0  | —    | -1.5  | V    |
| Transition frequency                 | $f_T$         | —            | $V_{CE} = -10V, I_C = -5mA$        | —     | 200  | —     | MHz  |
| Collector output capacitance         | $C_{ob}$      | —            | $V_{CB} = -10V, I_E = 0, f = 1MHz$ | —     | 3    | 6     | pF   |

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

| Characteristic                       | Symbol        | Test Circuit | Test Condition                    | Min  | Typ. | Max  | Unit |
|--------------------------------------|---------------|--------------|-----------------------------------|------|------|------|------|
| Collector cut-off current            | $I_{CBO}$     | —            | $V_{CB} = 50V, I_E = 0$           | —    | —    | 100  | nA   |
|                                      | $I_{CEO}$     | —            | $V_{CE} = 50V, I_B = 0$           | —    | —    | 500  |      |
| Emitter cut-off current              | $I_{EBO}$     | —            | $V_{EB} = 10V, I_C = 0$           | 0.17 | —    | 0.33 | mA   |
| DC current gain                      | $h_{FE}$      | —            | $V_{CE} = 5V, I_C = 10mA$         | 70   | —    | —    | —    |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | —            | $I_C = 5mA, I_B = 0.25mA$         | —    | 0.1  | 0.3  | V    |
| Input voltage (ON)                   | $V_I(ON)$     | —            | $V_{CE} = 0.2V, I_C = 5mA$        | 1.3  | —    | 3.0  | V    |
| Input voltage (OFF)                  | $V_I(OFF)$    | —            | $V_{CE} = 5V, I_C = 0.1mA$        | 1.0  | —    | 1.5  | V    |
| Transition frequency                 | $f_T$         | —            | $V_{CE} = 10V, I_C = 5mA$         | —    | 250  | —    | MHz  |
| Collector output capacitance         | $C_{ob}$      | —            | $V_{CB} = 10V, I_E = 0, f = 1MHz$ | —    | 3    | 6    | pF   |

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

| Characteristic | Symbol | Test Circuit | Test Condition | Min  | Typ. | Max  | Unit |
|----------------|--------|--------------|----------------|------|------|------|------|
| Input resistor | R1     | —            | —              | 15.4 | 22   | 28.6 | kΩ   |
| Resistor ratio | R1/R2  | —            | —              | 0.9  | 1.0  | 1.1  | —    |



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