

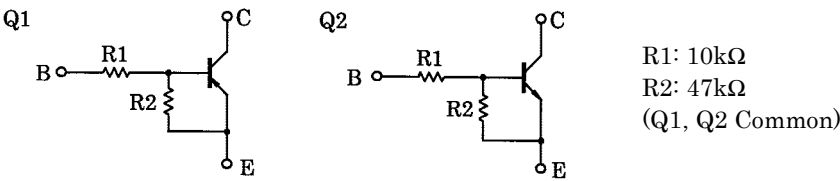
TOSHIBA Transistor  
Silicon PNP Epitaxial Type (PCT Process) Silicon NPN Epitaxial Type (PCT Process)

RN4607

Switching, Inverter Circuit, Interface Circuit  
And Driver Circuit Applications

- Includeing 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



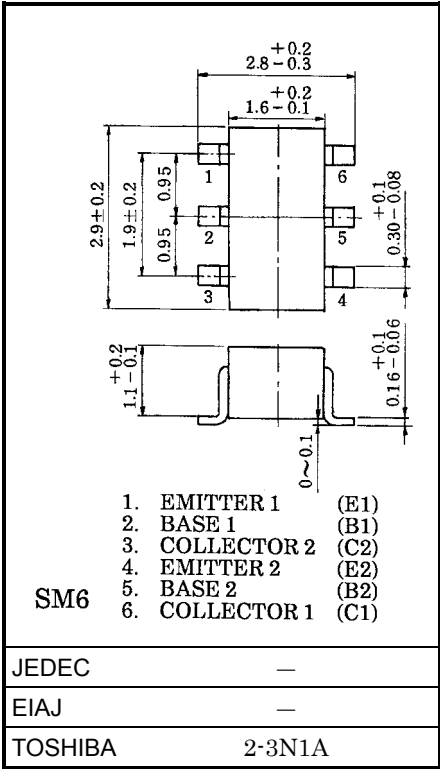
Q1 Maximum Ratings (Ta = 25°C)

| Characteristic            | Symbol           | Rating | Unit |
|---------------------------|------------------|--------|------|
| Collector-base voltage    | V <sub>CBO</sub> | -50    | V    |
| Collector-emitter voltage | V <sub>CEO</sub> | -50    | V    |
| Emitter-base voltage      | V <sub>EBO</sub> | -6     | V    |
| Collector current         | I <sub>C</sub>   | -100   | mA   |

Q2 Maximum Ratings (Ta = 25°C)

| Characteristic            | 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> | 6      | V    |
| Collector current         | I <sub>C</sub>   | 100    | mA   |

Unit in mm



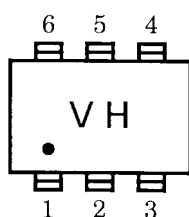
Weight: 0.015g

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

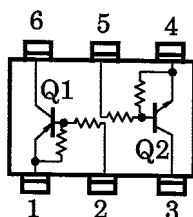
| Characteristic              | Symbol    | Rating  | Unit |
|-----------------------------|-----------|---------|------|
| Collector power dissipation | $P_C$ *   | 300     | mW   |
| Junction temperature        | $T_j$     | 150     | °C   |
| Storage temperature range   | $T_{stg}$ | -55~150 | °C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

\* Total rating

## Marking



## Equivalent Circuit (Top View)



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

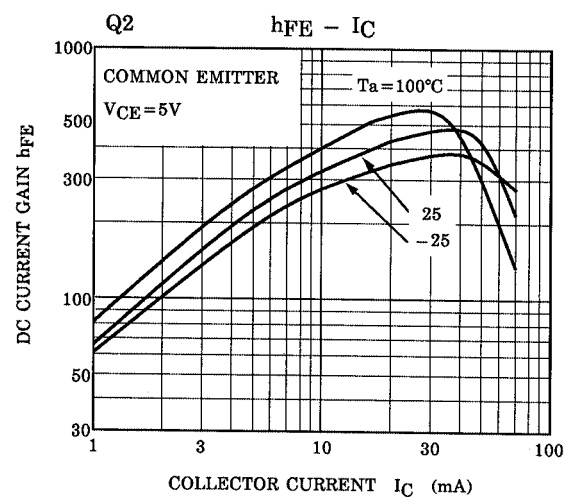
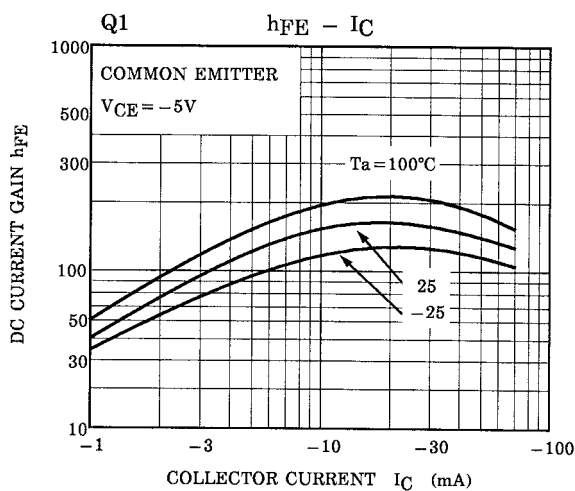
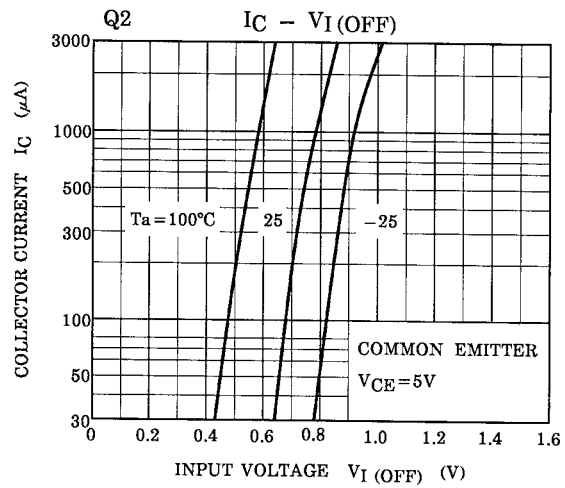
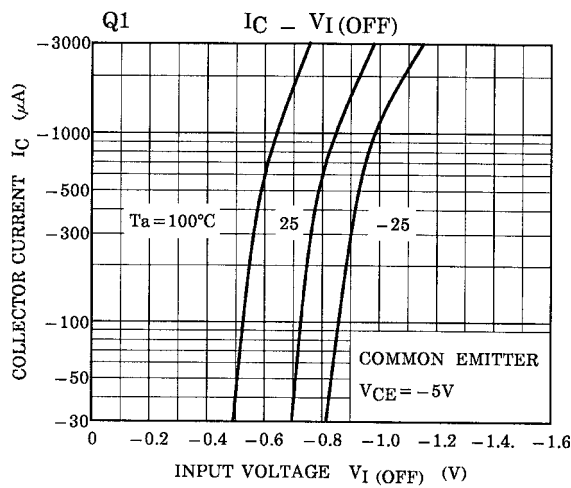
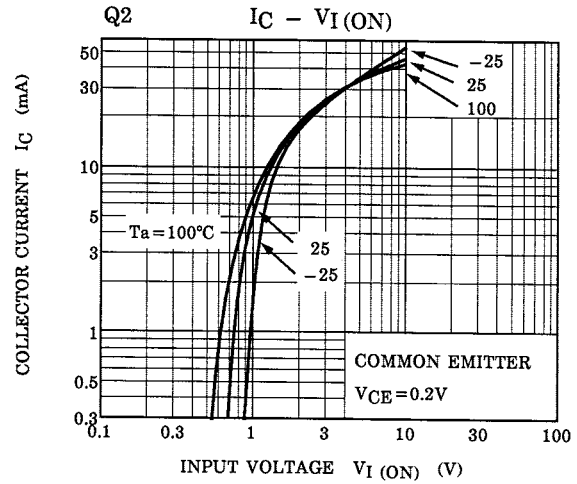
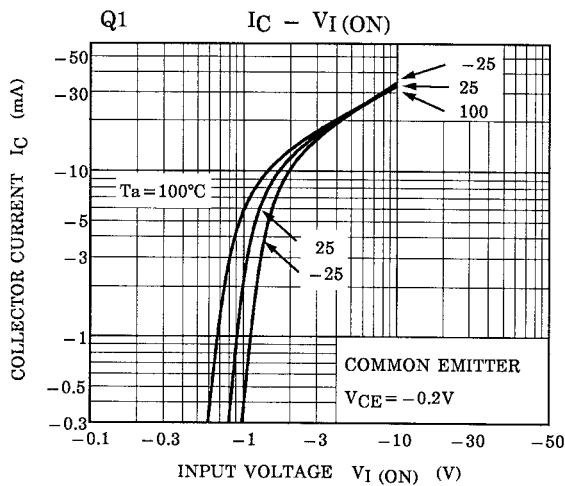
| Characteristic                       | Symbol        | Test Circuit | Test Condition               | Min    | Typ. | Max   | Unit |
|--------------------------------------|---------------|--------------|------------------------------|--------|------|-------|------|
| Collector cut-off current            | $I_{CBO}$     | —            | $V_{CB} = -50V, I_E = 0$     | —      | —    | -100  | nA   |
|                                      | $I_{CEO}$     | —            | $V_{CE} = -50V, I_B = 0$     | —      | —    | -500  |      |
| Emitter cut-off current              | $I_{EBO}$     | —            | $V_{EB} = -6V, I_C = 0$      | -0.081 | —    | -0.15 | mA   |
| DC current gain                      | $h_{FE}$      | —            | $V_{CE} = -5V, I_C = -10mA$  | 80     | —    | —     | —    |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | —            | $I_C = -5mA, I_B = -0.25mA$  | —      | -0.1 | -0.3  | V    |
| Input voltage (ON)                   | $V_I(ON)$     | —            | $V_{CE} = -0.2V, I_C = -5mA$ | -0.7   | —    | -1.8  | V    |
| Input voltage (OFF)                  | $V_I(OFF)$    | —            | $V_{CE} = -5V, I_C = -0.1mA$ | -0.5   | —    | -0.8  | V    |
| Transition frequency                 | $f_T$         | —            | $V_{CE} = -10V, I_C = -5mA$  | —      | 200  | —     | MHz  |
| Collector output capacitance         | $C_{ob}$      | —            | $V_{CB} = -10V, I_E = 0$     | —      | 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              | $I_{EBO}$     | —            | $V_{EB} = 6V, I_C = 0$                    | 0.081 | —    | 0.15 | mA   |
| DC current gain                      | $h_{FE}$      | —            | $V_{CE} = 5V, I_C = 10mA$                 | 80    | —    | —    | —    |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | —            | $I_C = 5mA, I_B = 0.25mA$                 | —     | 0.1  | 0.3  | V    |
| Input voltage (ON)                   | $V_I(ON)$     | —            | $V_{CE} = 0.2V, I_C = 5mA$                | 0.7   | —    | 1.8  | V    |
| Input voltage (OFF)                  | $V_I(OFF)$    | —            | $V_{CE} = 5V, I_C = 0.1mA$                | 0.5   | —    | 0.8  | V    |
| Transition frequency                 | $f_T$         | —            | $V_{CE} = 10V, I_C = 5mA$                 | —     | 250  | —    | MHz  |
| Collector output capacitance         | $C_{ob}$      | —            | $V_{CB} = 10V, I_E = 0, f = 1\text{ MHz}$ | —     | 3    | 6    | pF   |

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

| Characteristic | Symbol | Test Circuit | Test Condition | Min   | Typ.  | Max   | Unit |
|----------------|--------|--------------|----------------|-------|-------|-------|------|
| Input resistor | R1     | —            | —              | 7     | 10    | 13    | kΩ   |
| Resistor ratio | R1/R2  | —            | —              | 0.191 | 0.213 | 0.232 | —    |



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000707EAA

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