Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

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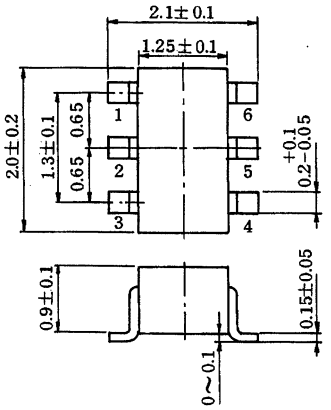
TOSHIBA Transistor
Silicon PNP/NPN Epitaxial Type (PCT Process) (Transistor with Built-in Bias Resistor)

# RN4907

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

Unit: mm



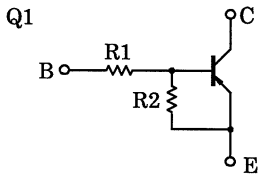

1. EMITTER 1 (E1)
2. BASE 1 (B1)
3. COLLECTOR 2 (C2)
4. EMITTER 2 (E2)
5. BASE 2 (B2)
6. COLLECTOR 1 (C1)

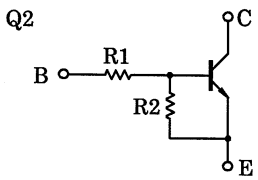
US6

| | |
|---|---|
| JEDEC | — |
| JEITA | — |
| TOSHIBA | 2-2J1A |

Weight: 6.8mg (typ.)

## Equivalent Circuit and Bias Resister Values




R1: 10kΩ
R2: 47kΩ
(Q1, Q2 Common)

## 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 | $V_{EBO}$ | −6 | 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 | $V_{EBO}$ | 6 | V |
| Collector current | $I_C$ | 100 | mA |

Start of commercial production
1990-10

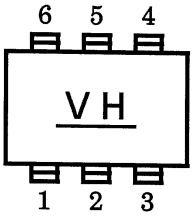
## Q1, Q2 Common Absolute Maximum Ratings (Ta = 25°C)

| Characteristic | Symbol | Rating | Unit |
|---|---|---|---|
| Collector power dissipation | $P_C$ * | 200 | mW |
| Junction temperature | $T_j$ | 150 | °C |
| Storage temperature range | $T_{stg}$ | −55 to 150 | °C |

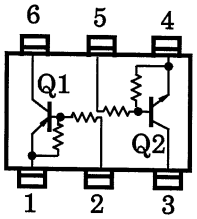
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

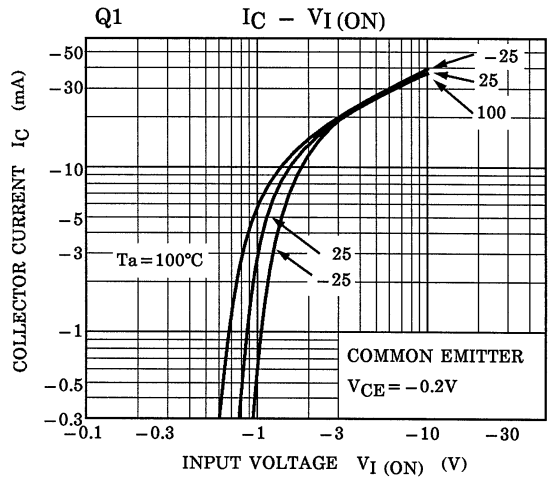
| Characteristic | Symbol | Test Circuit | Test Condition | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|---|
| Collector cut-off current | $I_{CBO}$ | — | $V_{CB}$ = −50V, $I_E$ = 0 | — | — | −100 | nA |
| | $I_{CEO}$ | — | $V_{CE}$ = −50V, $I_B$ = 0 | — | — | −500 | |
| Emitter cut-off current | $I_{EBO}$ | — | $V_{EB}$ = −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 | — | −1.0 | 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 |

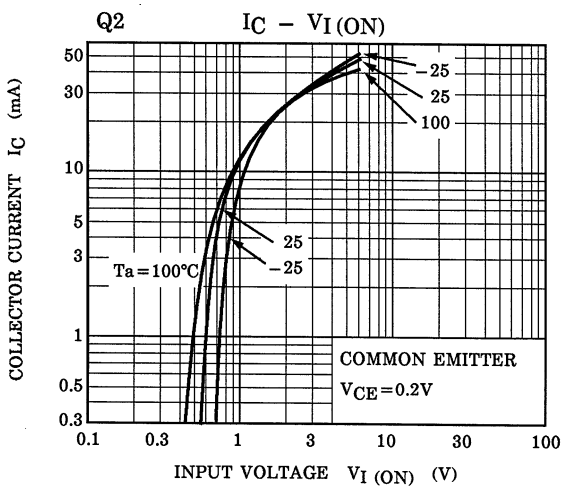
## Q2 Electrical Characteristics (Ta = 25°C)

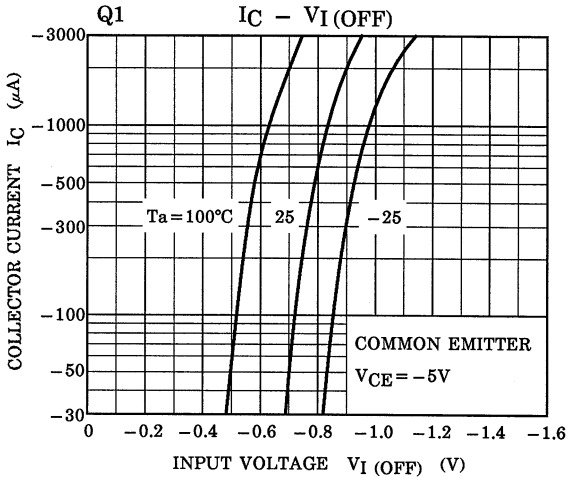
| Characteristic | Symbol | Test Circuit | Test Condition | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|---|
| Collector cut-off current | $I_{CBO}$ | — | $V_{CB}$ = 50V, $I_E$ = 0 | — | — | 100 | nA |
| | $I_{CEO}$ | — | $V_{CE}$ = 50V, $I_B$ = 0 | — | — | 500 | |
| Emitter cut-off current | $I_{EBO}$ | — | $V_{EB}$ = 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 | — | 1.0 | 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 MHz | — | 3 | 6 | pF |

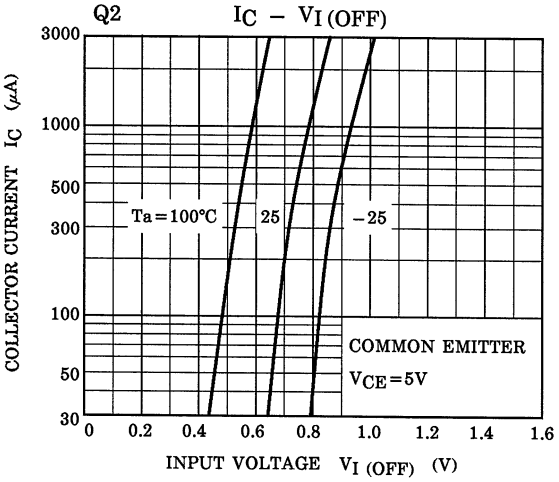
## Q1, Q2 Common Electrical Characteristics (Ta = 25°C)

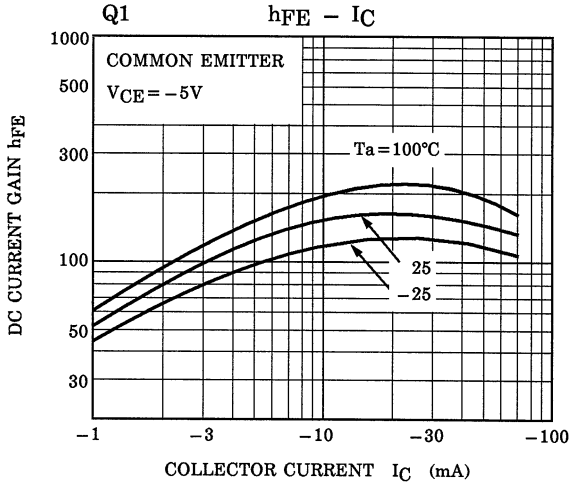
| Characteristic | Symbol | Test Circuit | Test Condition | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|---|
| Input resistor | R1 | — | — | 7 | 10 | 13 | kΩ |
| Resistor ratio | R1/R2 | — | — | 0.191 | 0.213 | 0.232 | — |

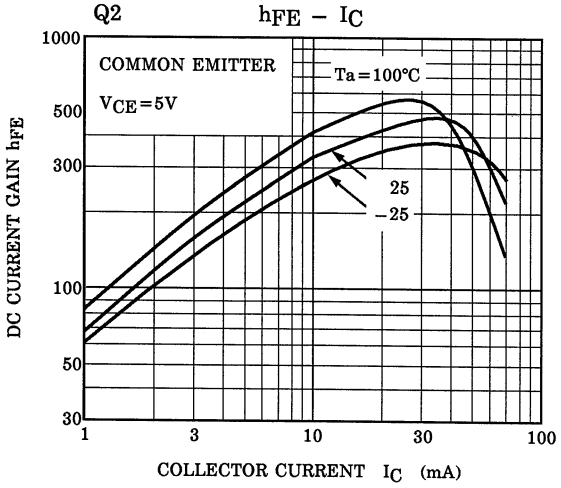

Q1
$I_C$ – $V_{I\,(ON)}$
COLLECTOR CURRENT $I_C$ (mA)
INPUT VOLTAGE $V_{I\,(ON)}$ (V)
Ta = 100°C
25
−25
COMMON EMITTER
$V_{CE}$ = −0.2V


Q2
$I_C$ – $V_{I\,(ON)}$
COLLECTOR CURRENT $I_C$ (mA)
INPUT VOLTAGE $V_{I\,(ON)}$ (V)
Ta = 100°C
25
−25
COMMON EMITTER
$V_{CE}$ = 0.2V


Q1
$I_C$ – $V_{I\,(OFF)}$
COLLECTOR CURRENT $I_C$ (μA)
INPUT VOLTAGE $V_{I\,(OFF)}$ (V)
Ta = 100°C
25
−25
COMMON EMITTER
$V_{CE}$ = −5V


Q2
$I_C$ – $V_{I\,(OFF)}$
COLLECTOR CURRENT $I_C$ (μA)
INPUT VOLTAGE $V_{I\,(OFF)}$ (V)
Ta = 100°C
25
−25
COMMON EMITTER
$V_{CE}$ = 5V


Q1
$h_{FE}$ – $I_C$
DC CURRENT GAIN $h_{FE}$
COLLECTOR CURRENT $I_C$ (mA)
COMMON EMITTER
$V_{CE}$ = −5V
Ta = 100°C
25
−25


Q2
$h_{FE}$ – $I_C$
DC CURRENT GAIN $h_{FE}$
COLLECTOR CURRENT $I_C$ (mA)
COMMON EMITTER
$V_{CE}$ = 5V
Ta = 100°C
25
−25

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