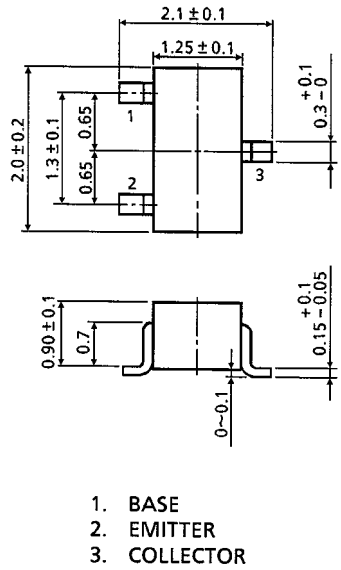
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process)

# RN1310,RN1311

Switching, Inverter Circuit, Interface Circuit
And Driver Circuit Applications

- With built-in bias resistors
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process
- Complementary to RN2310, RN2311

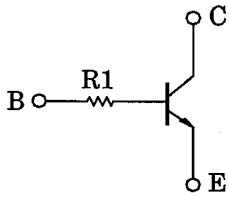
Unit: mm




| | |
|---|---|
| JEDEC | — |
| EIAJ | SC-70 |
| TOSHIBA | 2-2E1A |

Weight: 0.006g

## Equivalent Circuit



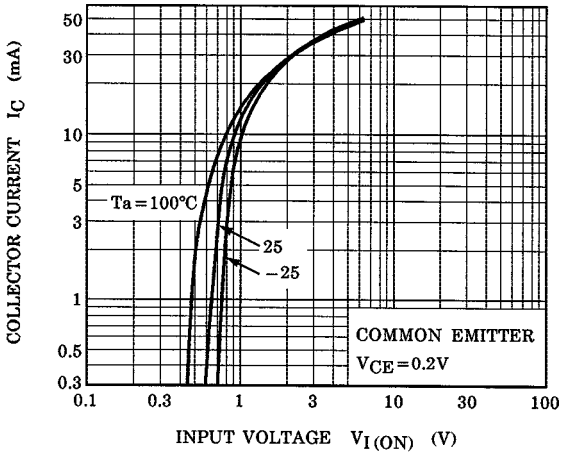

## Maximum Ratings (Ta = 25°C)

| Characterisstic | 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 |
| Collector power dissipation | $P_c$ | 100 | mW |
| Junction temperature | $T_j$ | 150 | °C |
| Storage temperature range | $T_{stg}$ | −55~150 | °C |

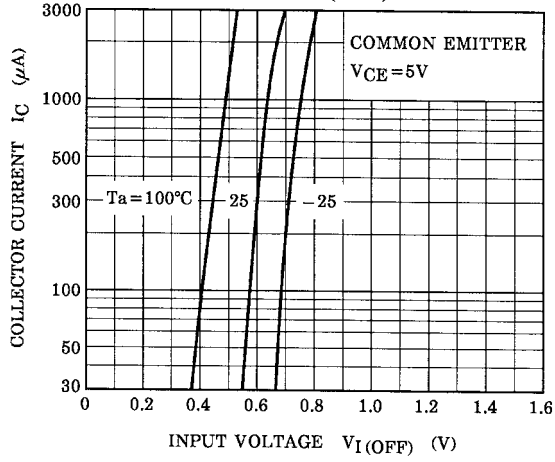
## Electrical Characteristics (Ta = 25°C)

| Characteristic | | Symbol | Test Circuit | Test Condition | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|---|---|
| Collector cut-off current | | $I_{CBO}$ | — | $V_{CB}$ = 50V, $I_E$ = 0 | — | — | 100 | nA |
| Emitter cut-off current | | $I_{EBO}$ | — | $V_{EB}$ = 5V, $I_C$ = 0 | — | — | 100 | nA |
| DC current gain | | $h_{FE}$ | — | $V_{CE}$ = 5V, $I_C$ = 1mA | 120 | — | 700 | — |
| Collector-emitter saturation voltage | | $V_{CE\ (sat)}$ | — | $I_C$ = 5mA, $I_B$ = 0.25mA | — | 0.1 | 0.3 | V |
| Translation 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 |
| Input resistor | RN1310 | R1 | — | — | 3.29 | 4.7 | 6.11 | kΩ |
| | RN1311 | | | | 7 | 10 | 13 | |

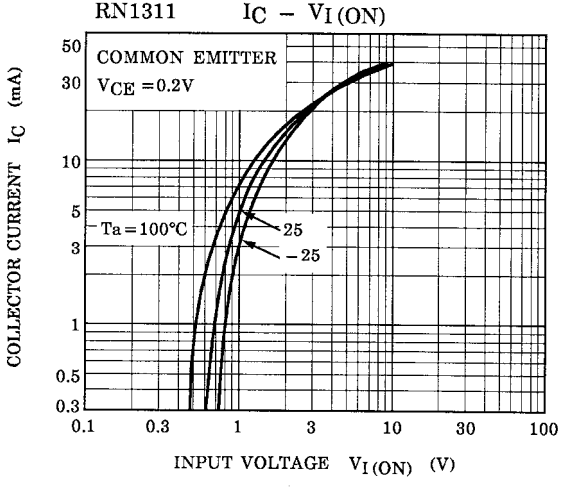
RN1310 $I_C - V_{I(ON)}$




RN1310 $I_C - V_{I(OFF)}$




RN1311 $I_C - V_{I(ON)}$




RN1311 $I_C - V_{I(OFF)}$