

TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process)

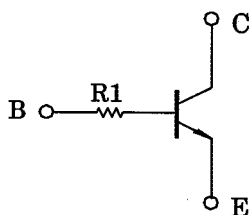
## RN1110F,RN1111F

Switching, Inverter Circuit, Interface Circuit  
And Driver Circuit Applications

Unit: mm

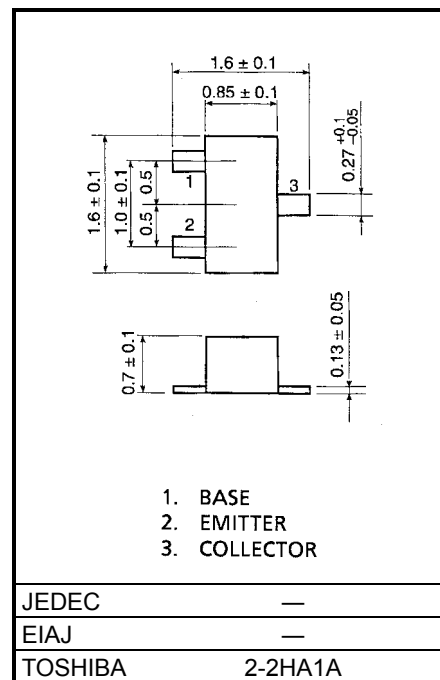
- With built-in bias resistors
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process
- Complementary to RN2110F, RN2111F

### Equivalent Circuit



### Maximum Ratings (Ta = 25°C)

| Characterisitic             | 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                       | RN1110F       | R1           | —                                 | 3.29 | 4.7  | 6.11 | kΩ   |
|                                      | RN1111F       |              |                                   | 7    | 10   | 13   |      |

