

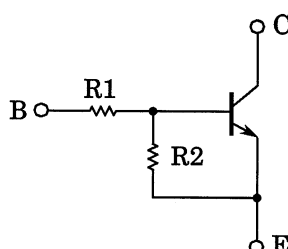
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process)

## RN1130MFV

Switching Applications  
Inverter Circuit Applications  
Interface Circuit Applications  
Driver Circuit Applications

- With built-in bias resistors
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process
- Complementary to RN2130MFV

### Equivalent Circuit



### Absolute Maximum Ratings (Ta = 25°C)

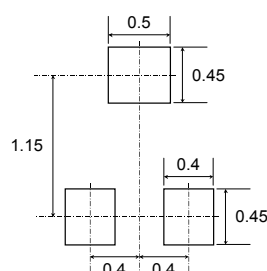
| Characteristic              | Symbol         | Rating     | Unit |
|-----------------------------|----------------|------------|------|
| Collector-base voltage      | $V_{CBO}$      | 50         | V    |
| Collector-emitter voltage   | $V_{CEO}$      | 50         | V    |
| Emitter-base voltage        | $V_{EBO}$      | 10         | V    |
| Collector current           | $I_C$          | 100        | mA   |
| Collector power dissipation | $P_C$ (Note 1) | 150        | 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.

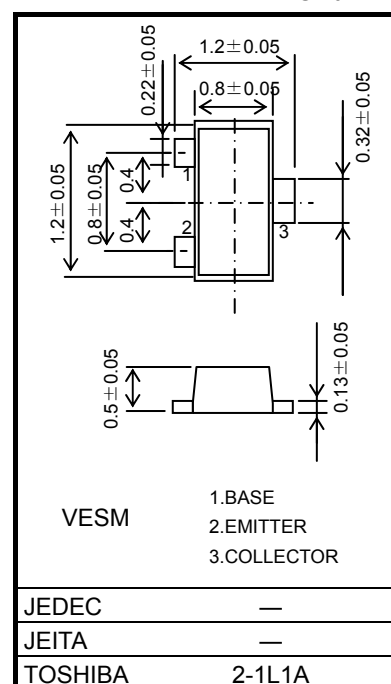
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

Note 1: Mounted on FR4 board (25.4 mm × 25.4 mm × 1.6 mm)

### Land Pattern Example (unit: mm)



Unit: mm

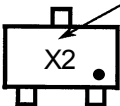


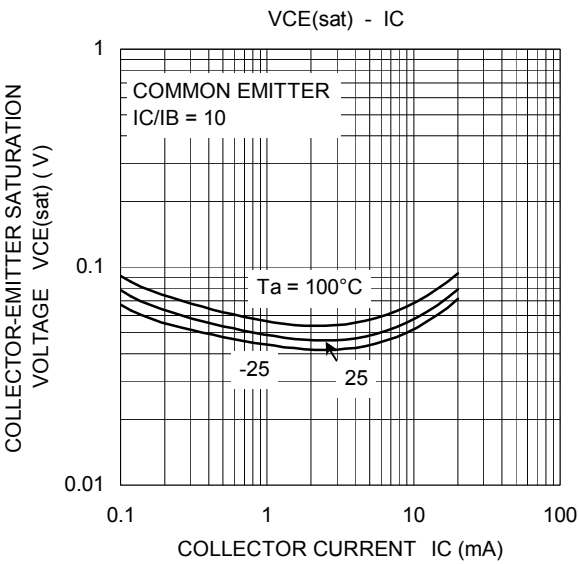
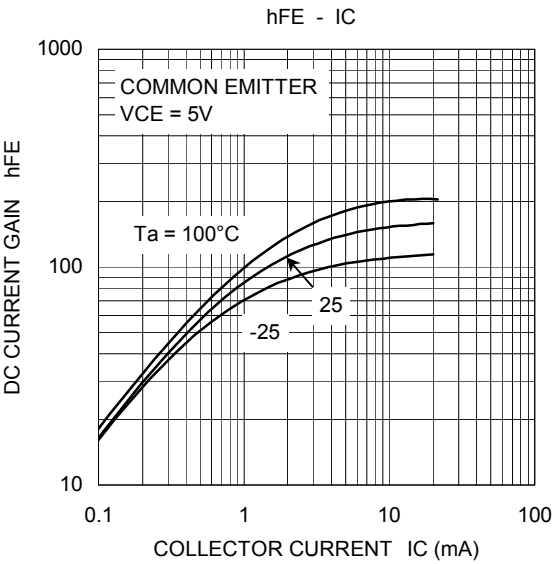
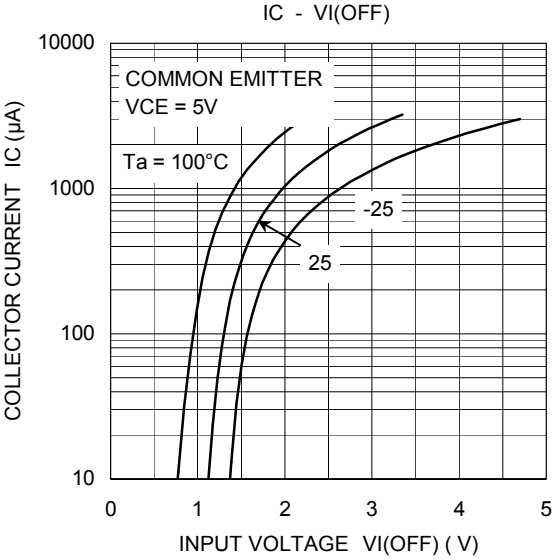
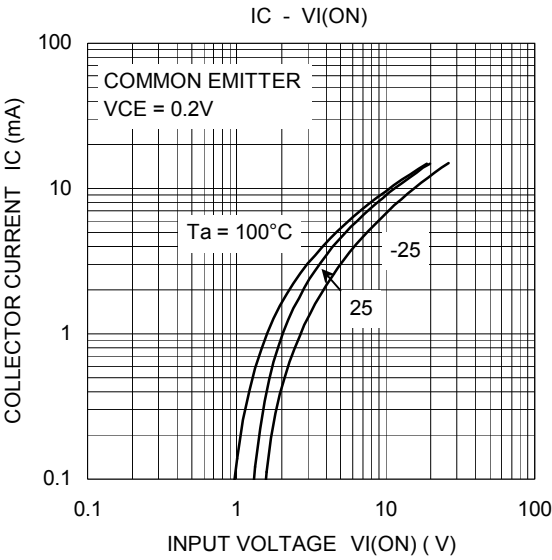
Weight: 1.5 mg (typ.)

Start of commercial production  
2005-04

## Electrical Characteristics (Ta = 25°C)

| Characteristic                       | Symbol        | Test Condition                                    | Min | Typ. | Max | Unit          |
|--------------------------------------|---------------|---------------------------------------------------|-----|------|-----|---------------|
| Collector cut-off current            | $I_{CBO}$     | $V_{CB} = 50\text{ V}, I_E = 0$                   | —   | —    | 100 | nA            |
|                                      | $I_{CEO}$     | $V_{CE} = 50\text{ V}, I_B = 0$                   | —   | —    | 500 | nA            |
| Emitter cut-off current              | $I_{EBO}$     | $V_{EB} = 10\text{ V}, I_C = 0$                   | 38  | —    | 72  | $\mu\text{A}$ |
| DC current gain                      | $h_{FE}$      | $V_{CE} = 5\text{ V}, I_C = 10\text{ mA}$         | 100 | —    | —   |               |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C = 5\text{ mA}, I_B = 0.5\text{ mA}$          | —   | 0.1  | 0.3 | V             |
| Input voltage(ON)                    | $V_{I(ON)}$   | $V_{CE} = 0.2\text{ V}, I_C = 5\text{ mA}$        | 1.7 | —    | 8.2 | V             |
| Input voltage(OFF)                   | $V_{I(OFF)}$  | $V_{CE} = 5\text{ V}, I_C = 0.1\text{ mA}$        | 1.0 | —    | 1.6 | V             |
| Transition Frequency                 | $f_T$         | $V_{CE} = 10\text{ V}, I_C = 5\text{ mA}$         |     | 250  |     | MHz           |
| Collector output capacitance         | $C_{ob}$      | $V_{CB} = 10\text{ V}, I_E = 0, f = 1\text{ MHz}$ | —   | 0.7  | —   | pF            |
| Input resistance                     | $R_1$         | —                                                 | 70  | 100  | 130 | $k\Omega$     |
| Resistance ratio                     | $R_1/R_2$     | —                                                 | 0.8 | 1.0  | 1.2 |               |

| Type Name | Marking                                                                                             |
|-----------|-----------------------------------------------------------------------------------------------------|
| RN1130MFV |  <p>Type Name</p> |



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