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Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

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Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



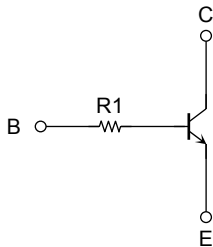
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process) (Bias Resistor Built-in Transistor)

RN1910FE, RN1911FE

Switching, Inverter Circuit, Interface Circuit and Driver Circuit Applications

- Two devices are incorporated into an Extreme-Super-Mini (6-pin) package.
- Incorporating a bias resistor into a transistor reduces parts count. Reducing the parts count enables the manufacture of ever more compact equipment and lowers assembly cost.
- Complementary to RN2910FE, RN2911FE

Equivalent Circuit



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

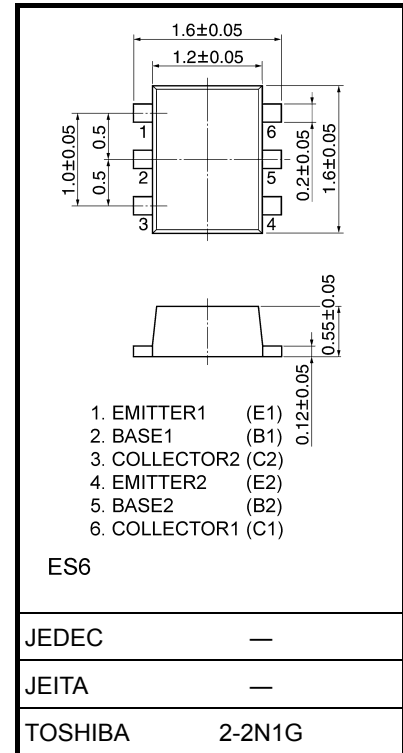
| Characteristics | Symbol | Rating | Unit |
|-----------------------------|----------------|------------|------|
| Collector-base voltage | V_{CBO} | 50 | V |
| Collector-emitter voltage | V_{CEO} | 50 | V |
| Emitter-base voltage | V_{EBO} | 5 | V |
| Collector current | I_C | 100 | mA |
| Collector power dissipation | P_C (Note 1) | 100 | 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).

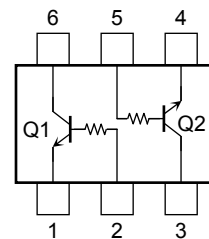
Note 1: Total rating

Unit: mm



Weight: 0.003 g (typ.)

Equivalent Circuit (top view)

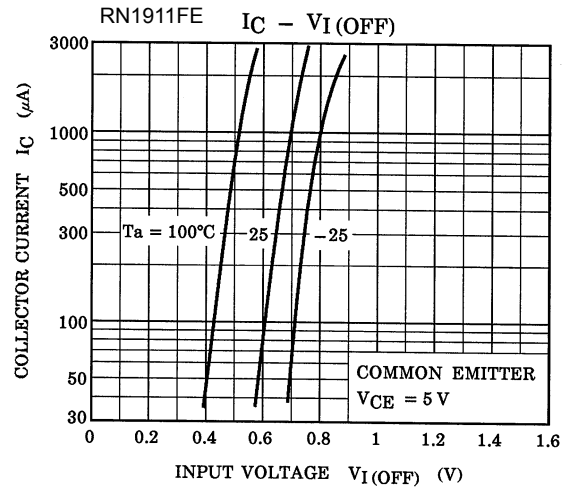
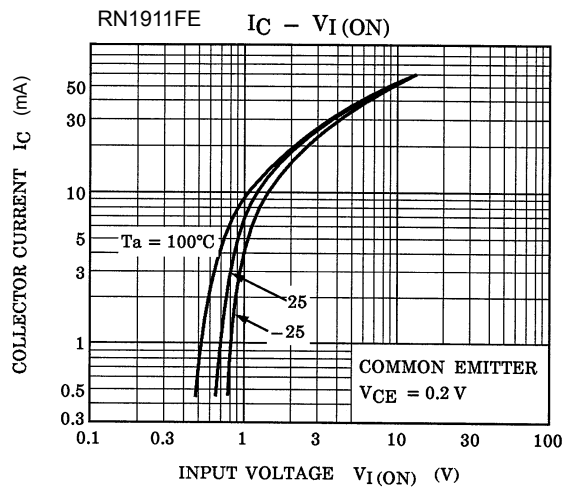
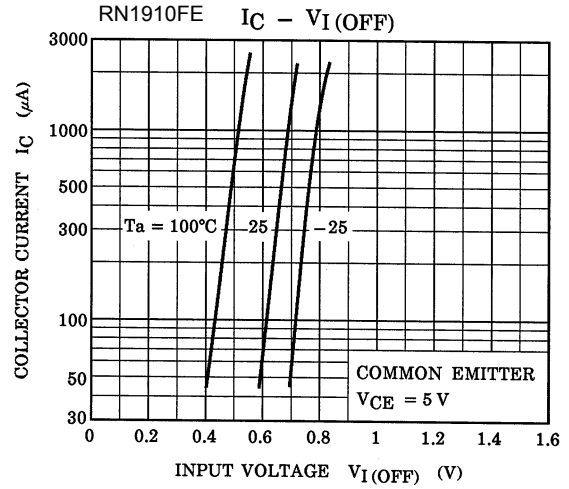
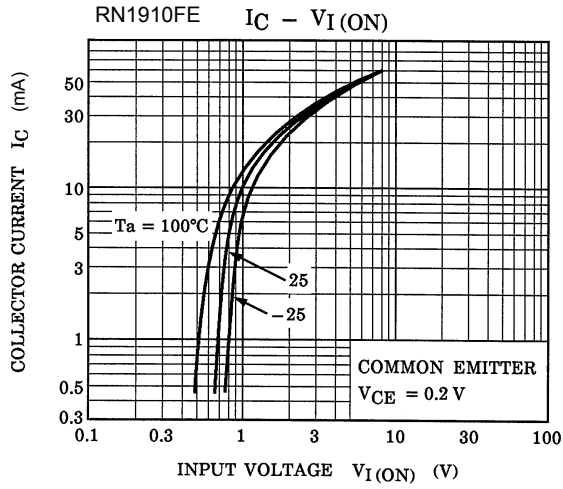


Start of commercial production
2000-05

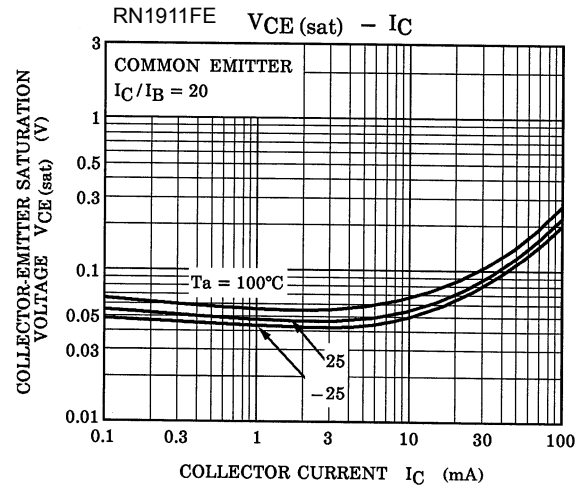
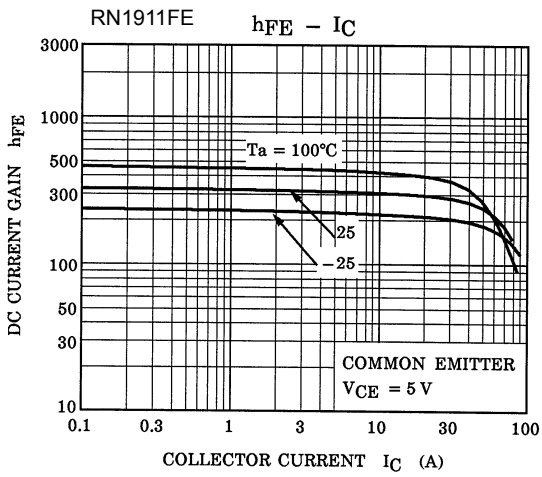
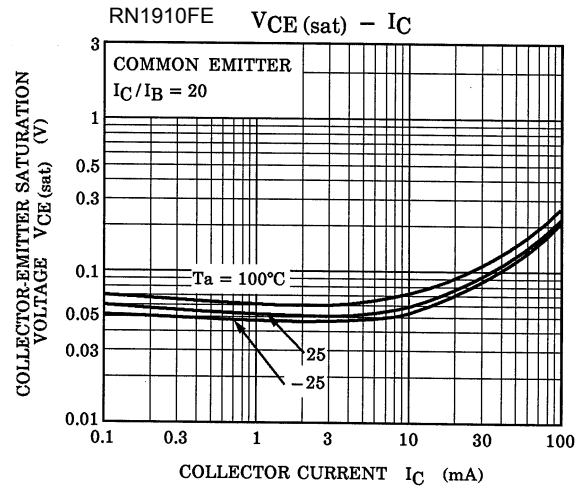
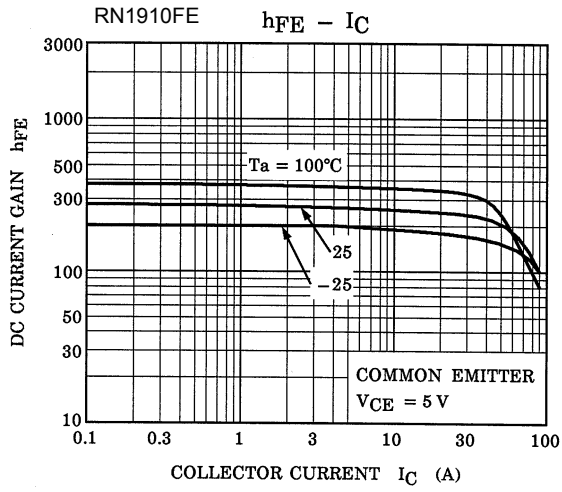
Electrical Characteristics (Ta = 25°C) (Q1, Q2 common)

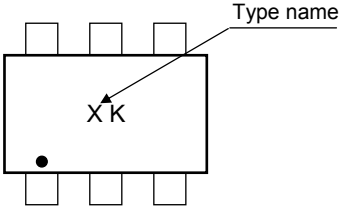
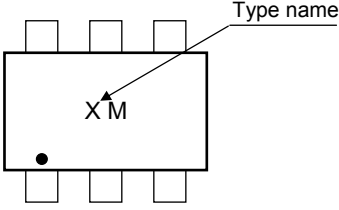
| Characteristics | Symbol | Test Condition | Min | Typ. | Max | Unit |
|--------------------------------------|---------------|---|------|------|------|------|
| Collector cut-off current | I_{CBO} | $V_{CB} = 50\text{ V}, I_E = 0$ | — | — | 100 | nA |
| Emitter cut-off current | I_{EBO} | $V_{EB} = 5\text{ V}, I_C = 0$ | — | — | 100 | nA |
| DC current gain | h_{FE} | $V_{CE} = 5\text{ V}, I_C = 1\text{ mA}$ | 120 | — | 700 | |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C = 5\text{ mA}, I_B = 0.25\text{ mA}$ | — | 0.1 | 0.3 | V |
| Transition frequency | f_T | $V_{CE} = 10\text{ V}, I_C = 5\text{ mA}$ | — | 250 | — | MHz |
| Collector output capacitance | C_{ob} | $V_{CB} = 10\text{ V}, I_E = 0, f = 1\text{ MHz}$ | — | 3 | 6 | pF |
| Input resistor | RN1910FE | — | 3.29 | 4.7 | 6.11 | kΩ |
| | RN1911FE | | 7 | 10 | 13 | |

Q1, Q2 Common



Q1, Q2 Common



| Type Name | Marking |
|-----------|--|
| RN1910FE |  <p>The diagram shows a rectangular component with six pins (three on top, three on bottom). The marking 'XK' is printed in the center. A small black dot is located at the bottom-left corner. An arrow labeled 'Type name' points to the 'X' in 'XK'.</p> |
| RN1911FE |  <p>The diagram shows a rectangular component with six pins (three on top, three on bottom). The marking 'XM' is printed in the center. A small black dot is located at the bottom-left corner. An arrow labeled 'Type name' points to the 'X' in 'XM'.</p> |

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