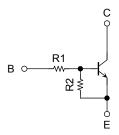
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process) (Transistor with Built-in Bias Resistor)

RN1907AFS, RN1908AFS, RN1909AFS

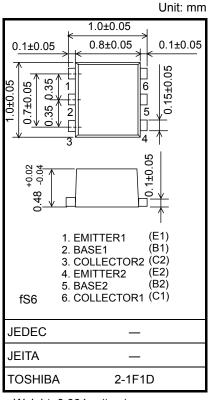
Switching, Inverter Circuit, Interface Circuit and Driver Circuit Applications

- Two devices are incorporated into a fine-pitch, small-mold (6-pin) package.
- Incorporating a bias resistor into a transistor reduces the parts count.
 Reducing the parts count enables the manufacture of ever more compact equipment and lowers the assembly cost.
- Complementary to the RN2907AFS~RN2909AFS

Equivalent Circuit and Bias Resistor Values



| Type No. | R1 (kΩ) | R2 (kΩ) |
|-----------|---------|---------|
| RN1907AFS | 10 | 47 |
| RN1908AFS | 22 | 47 |
| RN1909AFS | 47 | 22 |

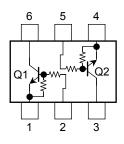


Weight: 0.001 g (typ.)

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

| Characteristic | | Symbol | Rating | Unit | |
|-----------------------------|-------------------------|-------------------------|---------|------|--|
| Collector-base voltage | RN1907AFS~RN1909AFS | V_{CBO} | 50 | ٧ | |
| Collector-emitter voltage | KINT907AI O KINT909AI O | V _{CEO} | 50 | V | |
| | RN1907AFS | | 6 | | |
| Emitter-base voltage | RN1908AFS | V_{EBO} | 7 | V | |
| | RN1909AFS | | 15 | | |
| Collector current | | IC | 80 | mA | |
| Collector power dissipation | RN1907AFS~RN1909AFS | P _C (Note 1) | 50 | mW | |
| Junction temperature | KINT907AI 3°KINT909AI 3 | Tj | 150 | °C | |
| Storage temperature range | | T _{stg} | -55~150 | °C | |

Equivalent Circuit (top view)



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).

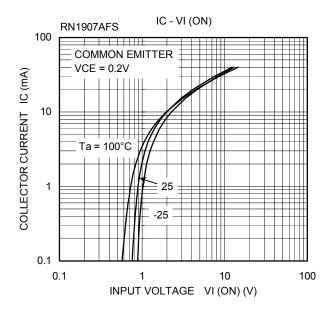
Note 1: Total rating

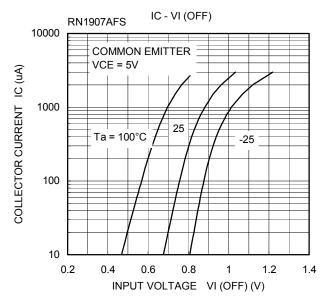


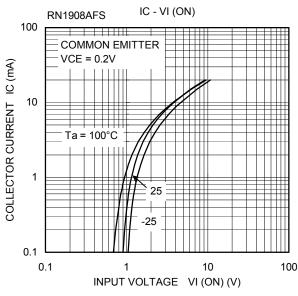
Electrical Characteristics (Ta = 25°C) (Q1, Q2 common)

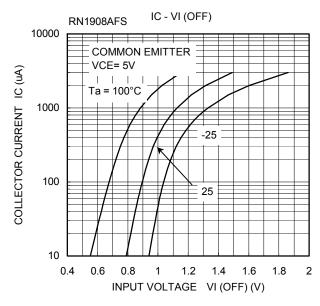
| Characteristic | | Symbol | Test Condition | Min | Тур. | Max | Unit |
|--------------------------------------|-------------------|-----------------------|--|-------|-------|-------|------|
| Collector cutoff current | RN1907AFS~1909AFS | I _{CBO} | $V_{CB} = 50 \text{ V}, I_{E} = 0$ | _ | _ | 100 | nA |
| | | I _{CEO} | V _{CE} = 50 V, I _B = 0 | _ | _ | 500 | |
| | RN1907AFS | | V _{EB} = 6 V, I _C = 0 | 0.088 | _ | 0.131 | |
| Emitter cutoff current | RN1908AFS | I _{EBO} | V _{EB} = 7 V, I _C = 0 | 0.085 | _ | 0.126 | mA |
| | RN1909AFS | | V _{EB} = 15 V, I _C = 0 | 0.182 | _ | 0.271 | |
| | RN1907AFS | | | 80 | _ | _ | |
| DC current gain | RN1908AFS | h _{FE} | $V_{CE} = 5 \text{ V}, I_{C} = 10 \text{ mA}$ | 80 | _ | _ | |
| | RN1909AFS | | | 70 | _ | _ | |
| Collector-emitter saturation voltage | RN1907AFS~1909AFS | V _{CE} (sat) | $I_C = 5 \text{ mA},$ $I_B = 0.25 \text{ mA}$ | _ | _ | 0.15 | ٧ |
| | RN1907AFS | | | 0.8 | _ | 1.8 | |
| Input voltage (ON) | RN1908AFS | V _{I (ON)} | $V_{CE} = 0.2 \text{ V}, I_{C} = 5 \text{ mA}$ | 1.0 | _ | 3.0 | V |
| | RN1909AFS | | | 2.0 | _ | 6.4 | |
| Input voltage (OFF) | RN1907AFS | V _I (OFF) | V _{CE} = 5 V, I _C = 0.1 mA | 0.6 | _ | 0.9 | V |
| | RN1908AFS | | | 0.7 | _ | 1.2 | |
| | RN1909AFS | | | 1.5 | _ | 2.6 | |
| Collector output capacitance | RN1907AFS~1909AFS | C _{ob} | V _{CB} = 10 V, I _E = 0, f = 1 MHz | _ | 0.7 | _ | pF |
| | RN1907AFS | | | 8 | 10 | 12 | |
| Input resistor | RN1908AFS | R1 | _ | 17.6 | 22 | 26.4 | kΩ |
| | RN1909AFS | | | 37.6 | 47 | 56.4 | |
| | RN1907AFS | | | 0.17 | 0.213 | 0.255 | |
| Resistor ratio | RN1908AFS | R1/R2 | _ | 0.374 | 0.468 | 0.562 | |
| | RN1909AFS | | | 1.71 | 2.14 | 2.56 | |

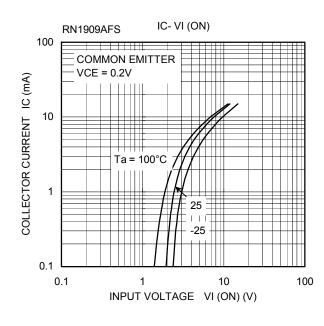
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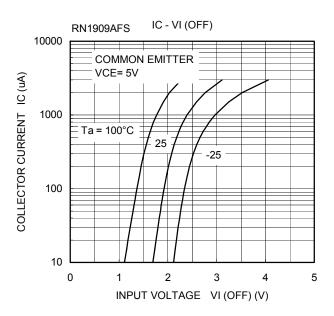


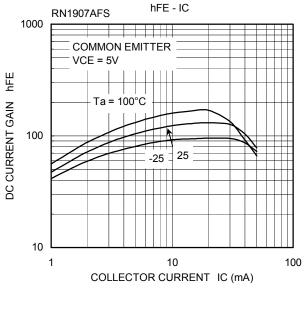


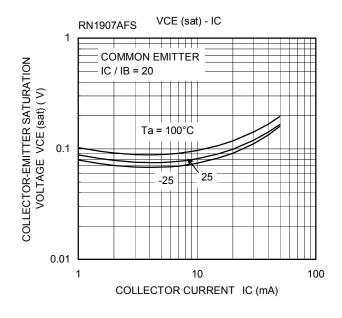


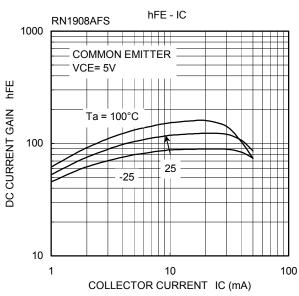


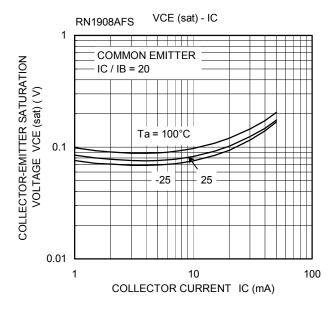


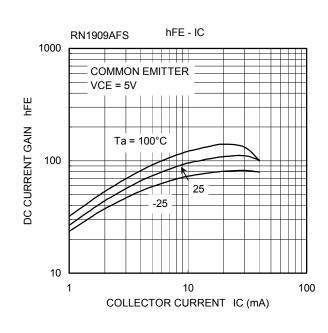


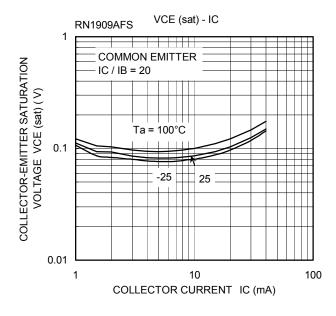












| Type Name | Marking |
|-----------|----------------------------|
| RN1907AFS | 6 5 4 Type Name C6 1 2 3 |
| RN1908AFS | 6 5 4 Type Name C7 1 2 3 |
| RN1909AFS | 6 5 4 Type Name C8 1 2 3 |

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