

TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT Process)

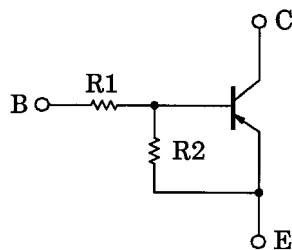
## RN2701,RN2702,RN2703,RN2704,RN2705,RN2706

Switching, Inverter Circuit, Interface Circuit  
And Driver Circuit Applications

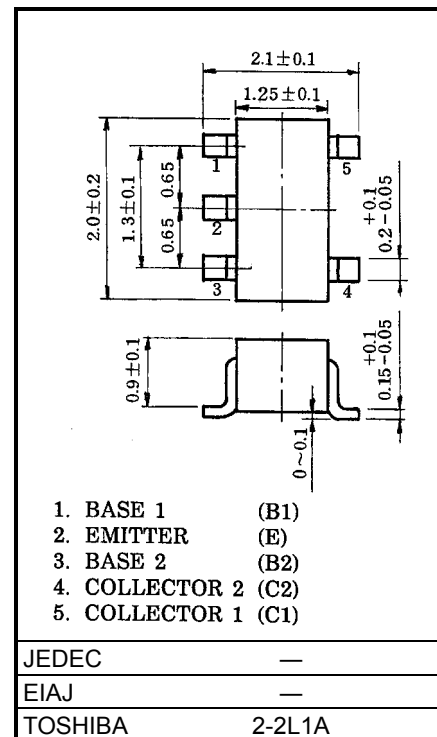
Unit: mm

- Including two devices in USV (ultra super mini type with 5 leads)
- With built-in bias resistors
- Simplify circuit design
- Reduce a quantity of parts and manufacturing process
- Complementary to RN1701~1706

### Equivalent Circuit and Bias Resistor Values

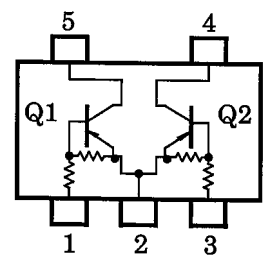


| Type No. | R1 (kΩ) | R2 (kΩ) |
|----------|---------|---------|
| RN2701   | 4.7     | 4.7     |
| RN2702   | 10      | 10      |
| RN2703   | 22      | 22      |
| RN2704   | 47      | 47      |
| RN2705   | 2.2     | 47      |
| RN2706   | 4.7     | 47      |



Weight: 6.2mg

### Equivalent Circuit (Top View)



### Maximum Ratings (Ta = 25°C) (Q1, Q2 Common)

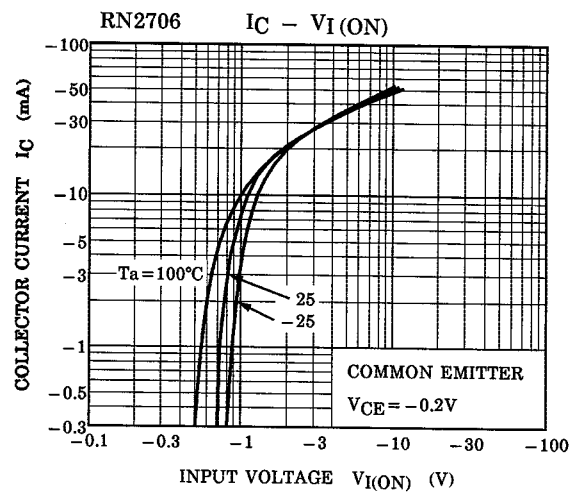
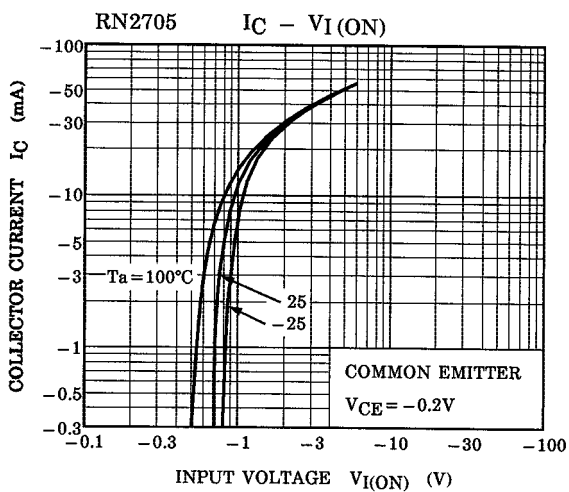
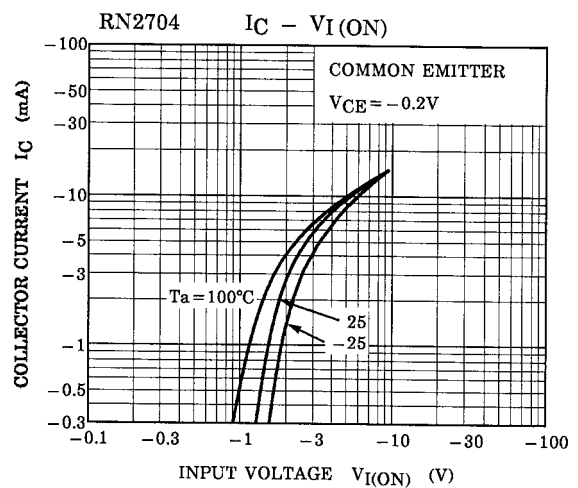
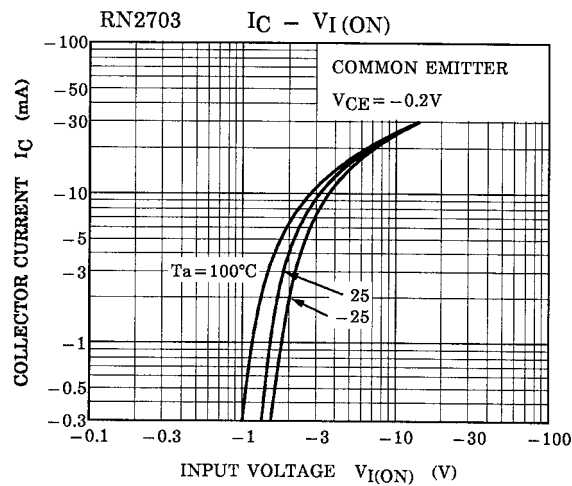
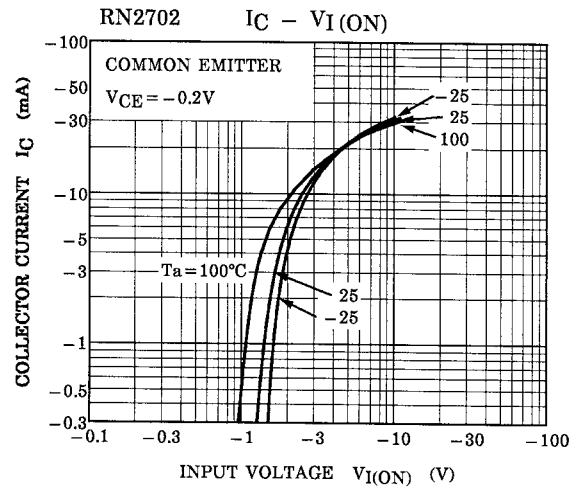
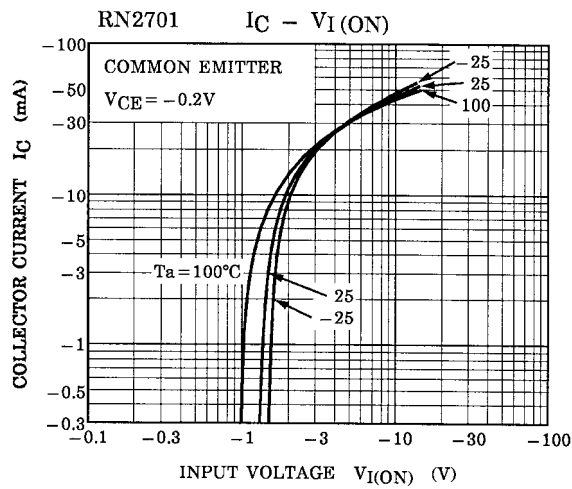
| Characteristic              | Symbol    | Rating  | Unit |
|-----------------------------|-----------|---------|------|
| Collector-base voltage      | $V_{CBO}$ | -50     | V    |
| Collector-emitter voltage   | $V_{CEO}$ | -50     | V    |
|                             |           | -10     |      |
|                             |           | -5      |      |
| Collector current           | $I_C$     | -100    | mA   |
| Collector power dissipation | $P_C$ *   | 200     | mW   |
| Junction temperature        | $T_j$     | 150     | °C   |
| Storage temperature range   | $T_{stg}$ | -55~150 | °C   |

\* : Total rating

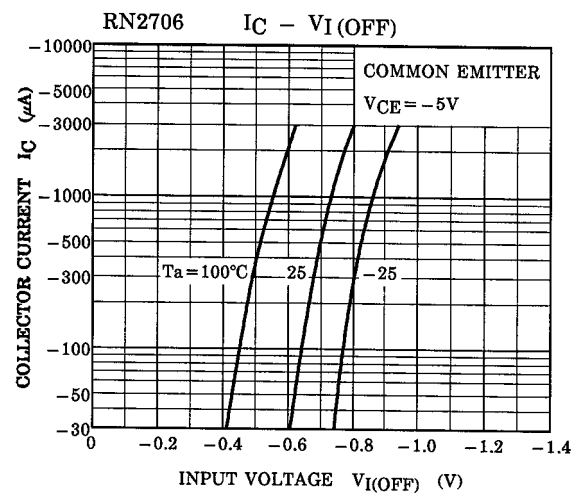
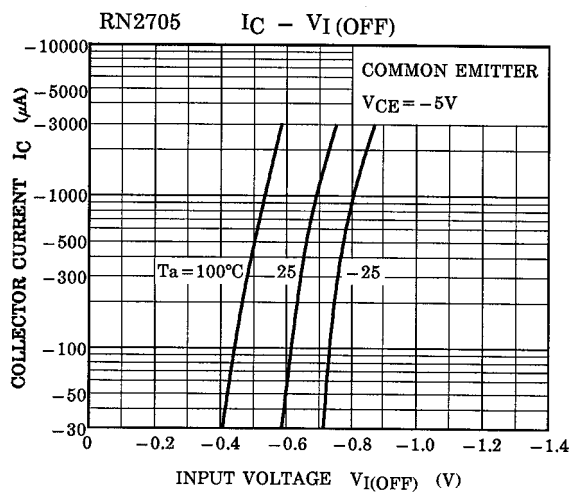
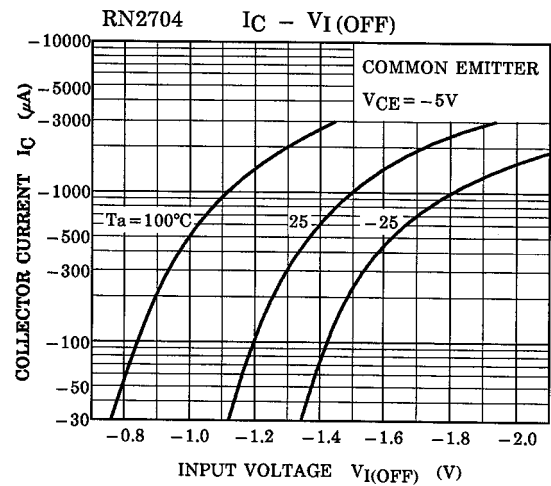
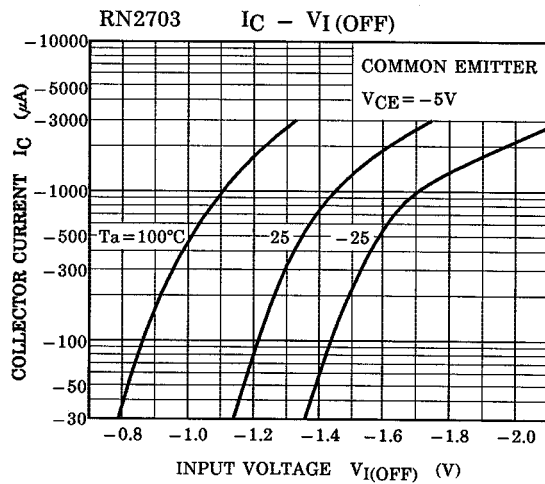
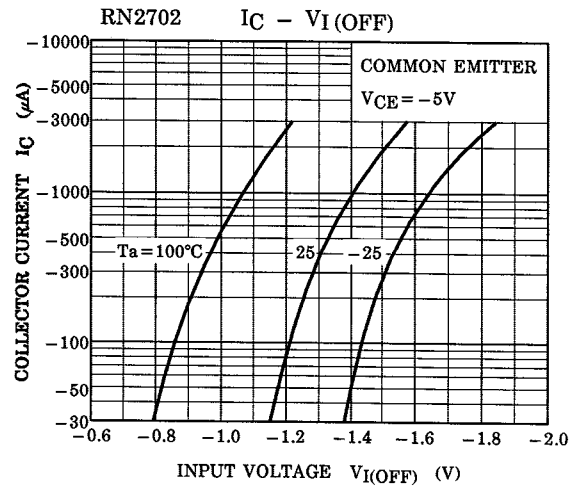
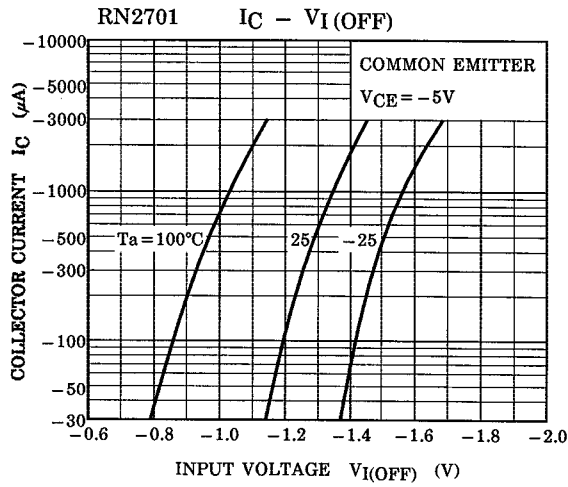
## Electrical Characteristics (Ta = 25°C) (Q1, Q2 Common)

| Characteristic                       |              | Symbol        | Test Circuit | Test Condition                         | Min    | Typ.   | Max    | Unit |
|--------------------------------------|--------------|---------------|--------------|----------------------------------------|--------|--------|--------|------|
| Collector cut-off current            | RN2701~2706  | $I_{CBO}$     | —            | $V_{CB} = -50V, I_E = 0$               | —      | —      | -100   | nA   |
|                                      |              | $I_{CEO}$     | —            | $V_{CE} = -50V, I_B = 0$               | —      | —      | -500   |      |
| Emitter cut-off current              | RN2701       | $I_{EBO}$     | —            | $V_{EB} = -10V, I_C = 0$               | -0.82  | —      | -1.52  | mA   |
|                                      | RN2702       |               | —            |                                        | -0.38  | —      | -0.71  |      |
|                                      | RN2703       |               | —            |                                        | -0.17  | —      | -0.33  |      |
|                                      | RN2704       |               | —            |                                        | -0.082 | —      | -0.15  |      |
|                                      | RN2705       |               | —            | $V_{EB} = -5V, I_C = 0$                | -0.078 | —      | -0.145 |      |
|                                      | RN2706       |               | —            |                                        | -0.074 | —      | -0.138 |      |
| DC current gain                      | RN2701       | $h_{FE}$      | —            | $V_{CE} = -5V$<br>$I_C = -10mA$        | 30     | —      | —      | —    |
|                                      | RN2702       |               | —            |                                        | 50     | —      | —      |      |
|                                      | RN2703       |               | —            |                                        | 70     | —      | —      |      |
|                                      | RN2704       |               | —            |                                        | 80     | —      | —      |      |
|                                      | RN2705       |               | —            |                                        | 80     | —      | —      |      |
|                                      | RN2706       |               | —            |                                        | 80     | —      | —      |      |
| Collector-emitter saturation voltage | RN2701~2706  | $V_{CE(sat)}$ | —            | $I_C = -5mA$<br>$I_B = -0.25mA$        | —      | -0.1   | -0.3   | V    |
| Input voltage (ON)                   | RN2701       | $V_{I(ON)}$   | —            | $V_{CE} = -0.2V$<br>$I_C = -5mA$       | -1.1   | —      | -2.0   | V    |
|                                      | RN2702       |               | —            |                                        | -1.2   | —      | -2.4   |      |
|                                      | RN2703       |               | —            |                                        | -1.3   | —      | -3.0   |      |
|                                      | RN2704       |               | —            |                                        | -1.5   | —      | -5.0   |      |
|                                      | RN2705       |               | —            |                                        | -0.6   | —      | -1.1   |      |
|                                      | RN2706       |               | —            |                                        | -0.7   | —      | -1.3   |      |
| Input voltage (OFF)                  | RN2701~2704  | $V_{I(OFF)}$  | —            | $V_{CE} = -5V,$<br>$I_C = -0.1mA$      | -1.0   | —      | -1.5   | V    |
|                                      | RN2705, 2706 |               | —            |                                        | -0.5   | —      | -0.8   |      |
| Translation frequency                | RN2701~2706  | $f_T$         | —            | $V_{CE} = -10V,$<br>$I_C = -5mA$       | —      | 200    | —      | MHz  |
| Collector output capacitance         | RN2701~2706  | $C_{ob}$      | —            | $V_{CB} = -10V, I_E = 0$<br>$f = 1MHz$ | —      | 3      | 6      | pF   |
| Input resistor                       | RN2701       | R1            | —            | —                                      | 3.29   | 4.7    | 6.11   | kΩ   |
|                                      | RN2702       |               | —            |                                        | 7      | 10     | 13     |      |
|                                      | RN2703       |               | —            |                                        | 15.4   | 22     | 28.6   |      |
|                                      | RN2704       |               | —            |                                        | 32.9   | 47     | 61.1   |      |
|                                      | RN2705       |               | —            |                                        | 1.54   | 2.2    | 2.86   |      |
|                                      | RN2706       |               | —            |                                        | 3.29   | 4.7    | 6.11   |      |
| Resistor ratio                       | RN2701~2704  | R1/R2         | —            | —                                      | 0.9    | 1.0    | 1.1    | —    |
|                                      | RN2705       |               | —            |                                        | 0.0421 | 0.0468 | 0.0515 |      |
|                                      | RN2706       |               | —            |                                        | 0.09   | 0.1    | 0.11   |      |

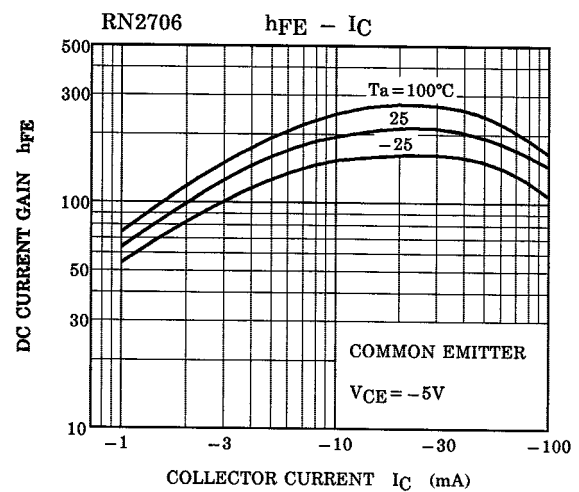
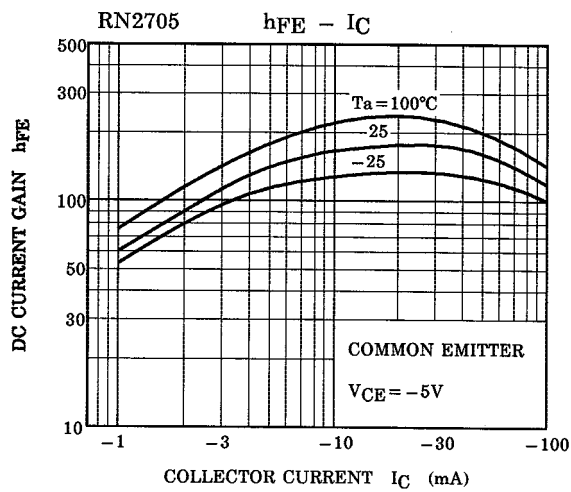
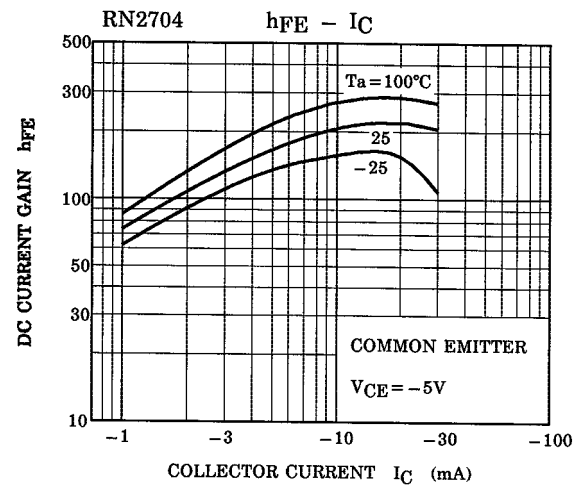
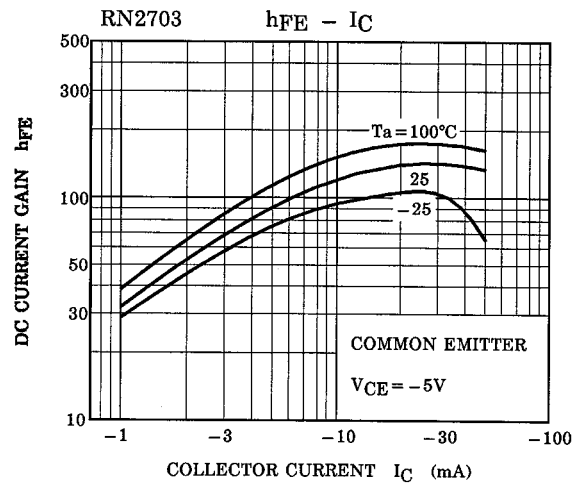
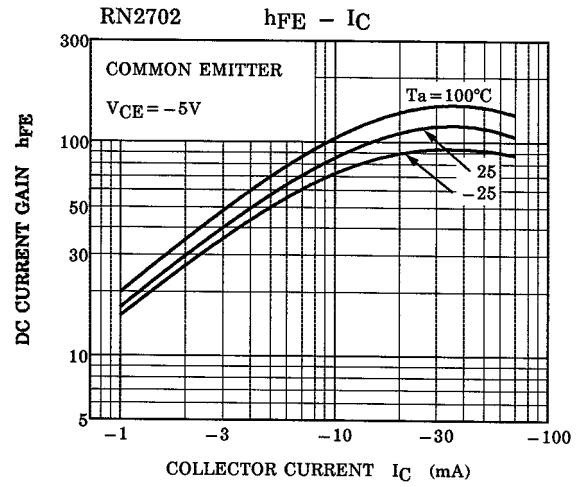
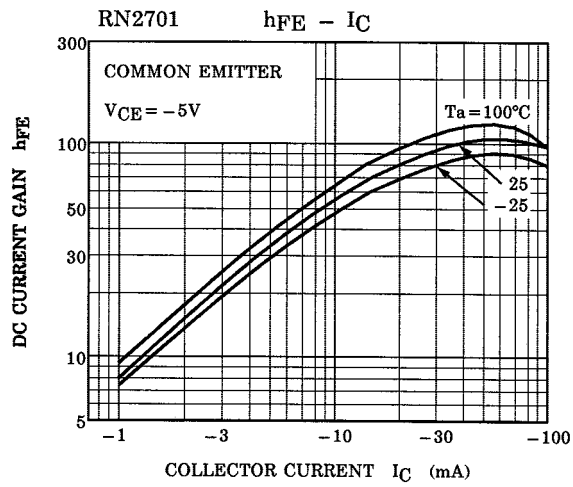
(Q1, Q2 Common)

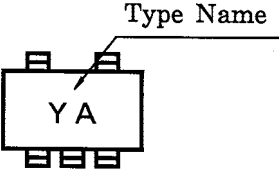
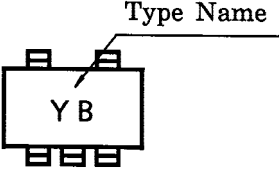
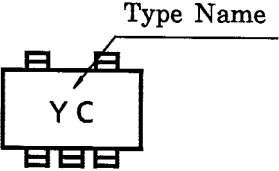
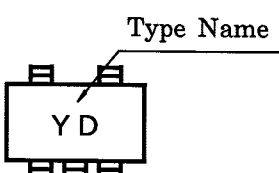
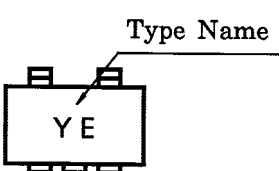
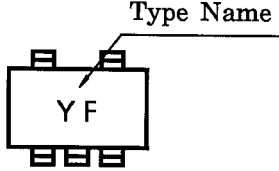


(Q1, Q2 Common)



(Q1, Q2 Common)



| Type Name | Marking                                                                             |
|-----------|-------------------------------------------------------------------------------------|
| RN2701    |    |
| RN2702    |    |
| RN2703    |    |
| RN2704    |  |
| RN2705    |  |
| RN2706    |  |

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