



# RA104S/RC104S

## Switching Applications (with Bias Resistances)

### Applications

- Switching circuits, inverter circuits, interface circuits, driver circuits.

### Features

- On-chip bias resistances ( $R_1=10k\Omega$ ,  $R_2=47k\Omega$ ).
- Compact package (SPA).

( ) : RA104S

### Specifications

#### Absolute Maximum Ratings at $T_a = 25^\circ\text{C}$

| Parameter                    | Symbol    | Conditions | Ratings     | Unit             |
|------------------------------|-----------|------------|-------------|------------------|
| Collector-to-Base Voltage    | $V_{CBO}$ |            | (-)50       | V                |
| Collector-to-Emitter Voltage | $V_{CEO}$ |            | (-)50       | V                |
| Emitter-to-Base Voltage      | $V_{EBO}$ |            | (-)6        | V                |
| Input Voltage                | $V_{IN}$  |            | (-)30       | V                |
| Collector Current            | $I_C$     |            | (-)100      | mA               |
| Collector Current (Pulse)    | $I_{CP}$  |            | (-)200      | mA               |
| Collector Dissipation        | $P_C$     |            | 300         | mW               |
| Junction Temperature         | $T_J$     |            | 150         | $^\circ\text{C}$ |
| Storage Temperature          | $T_{stg}$ |            | -55 to +150 | $^\circ\text{C}$ |

#### Electrical Characteristics at $T_a = 25^\circ\text{C}$

| Parameter                | Symbol    | Conditions                                   | Ratings |       |        | Unit          |
|--------------------------|-----------|--|---------|-------|--------|---------------|
|                          |           |  | min     | typ   | max    |               |
| Collector Cutoff Current | $I_{CBO}$ | $V_{CB}=(-)40\text{V}$ , $I_E=0$             |         |       | (-)0.1 | $\mu\text{A}$ |
|                          | $I_{CEO}$ | $V_{CE}=(-)40\text{V}$ , $I_B=0$             |         |       | (-)0.5 | $\mu\text{A}$ |
| Emitter Cutoff Current   | $I_{EBO}$ | $V_{EB}=(-)5\text{V}$ , $I_C=0$              | (-)67   | (-)88 | (-)125 | $\mu\text{A}$ |
| DC Current Gain          | $h_{FE}$  | $V_{CE}=(-)5\text{V}$ , $I_C=(-)5\text{mA}$  | 70      |       |        |               |
| Gain-Bandwidth Product   | $f_T$     | $V_{CE}=(-)10\text{V}$ , $I_C=(-)5\text{mA}$ |         | 250   |        | MHz           |
|                          |           |  |         | (200) |        | MHz           |
| Output Capacitance       | $C_{ob}$  | $V_{CB}=(-)10\text{V}$ , $f=1\text{MHz}$     |         | 3.5   |        | pF            |
|                          |           |  |         | (5.3) |        | pF            |

Marking : RA104S : A104, RC104S : C104

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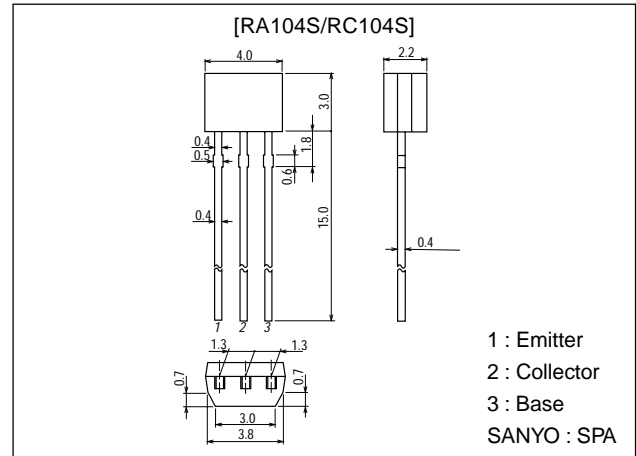
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### Package Dimensions

unit:mm

2033A

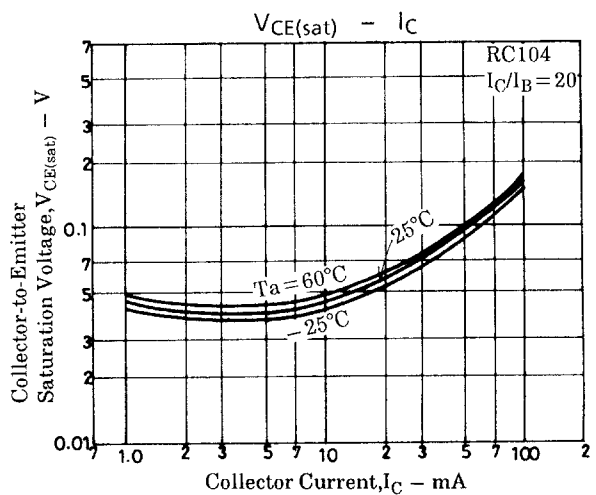
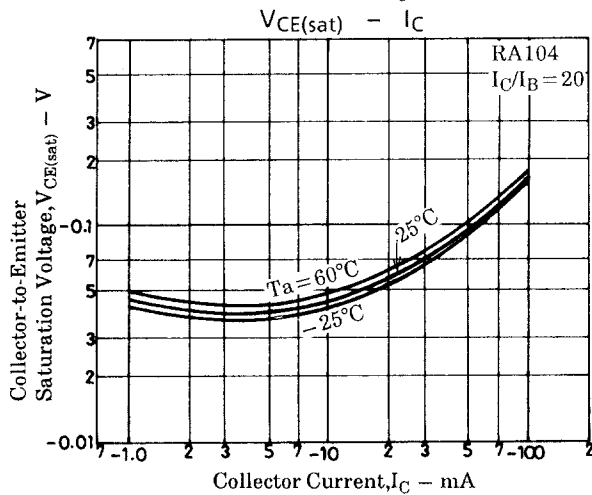
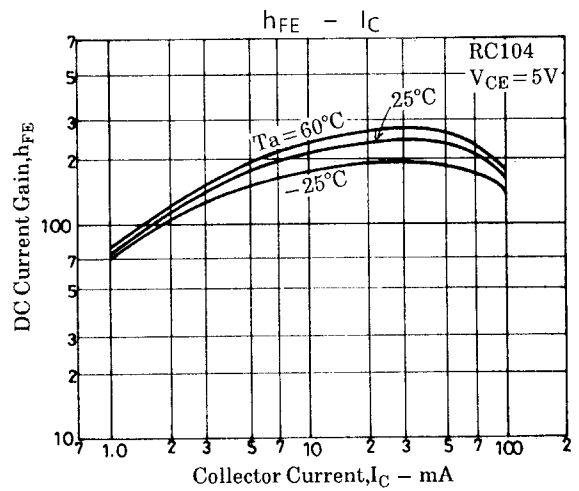
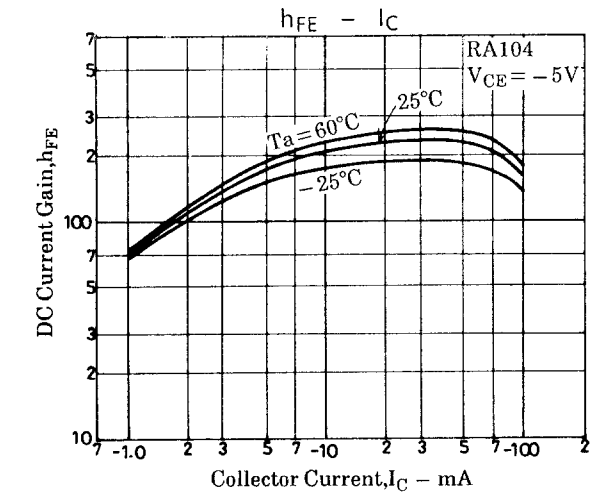
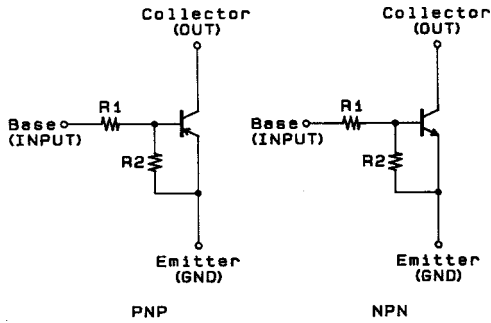


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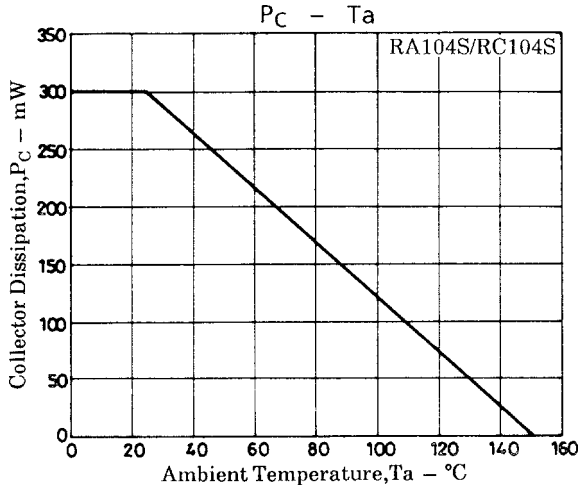
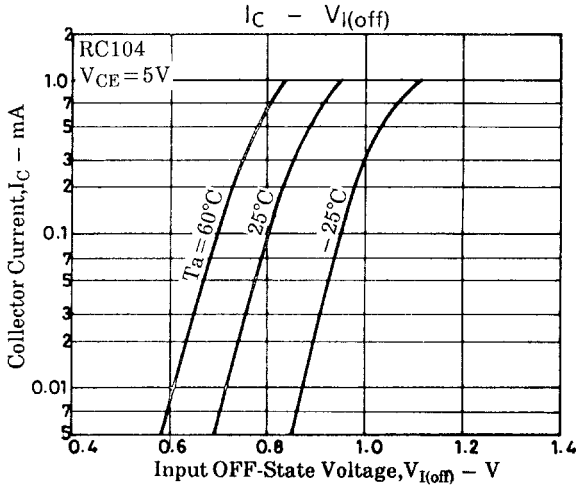
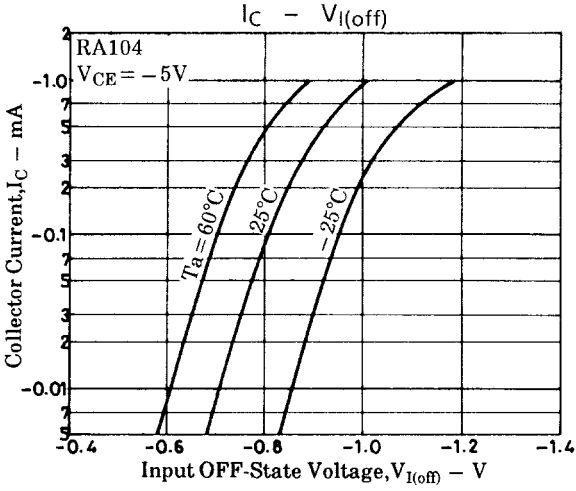
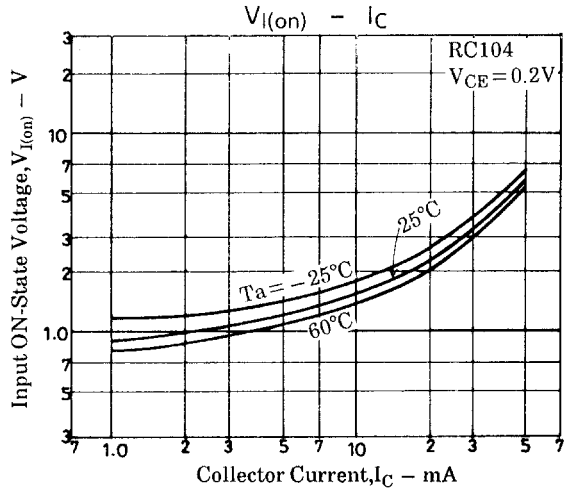
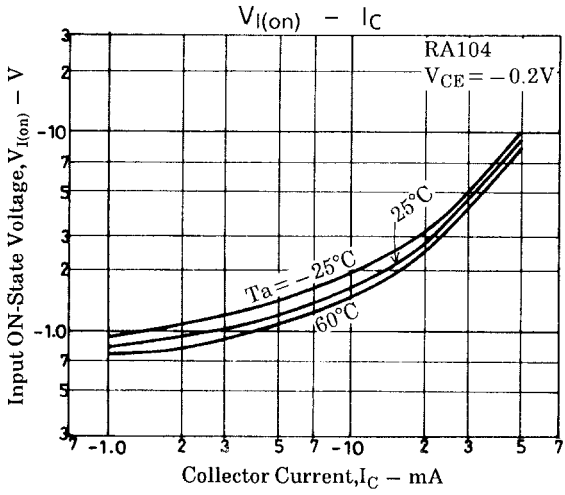
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| Parameter                               | Symbol        | Conditions                                   | Ratings |        |        | Unit       |
|---|---------------|--|---------|--------|--------|------------|
|   |               |  | min     | typ    | max    |            |
| Collector-to-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C=(-)10\text{mA}, I_B=(-)0.5\text{mA}$    |         | (-)0.1 | (-)0.3 | V          |
| Collector-to-Base Breakdown Voltage     | $V_{(BR)CBO}$ | $I_C=(-)10\mu\text{A}, I_E=0$                | (-)50   |        |        | V          |
| Collector-to-Emitter Breakdown Voltage  | $V_{(BR)CEO}$ | $I_C=(-)100\mu\text{A}, R_{BE}=\infty$       | (-)50   |        |        | V          |
| Input OFF-State Voltage                 | $V_{IN(off)}$ | $V_{CE}=(-)5\text{V}, I_C=(-)100\mu\text{A}$ | (-)0.6  | (-)0.8 | (-)1.0 | V          |
| Input ON-State Voltage                  | $V_{IN(on)}$  | $V_{CE}=(-)0.2\text{V}, I_C=(-)5\text{mA}$   | (-)0.7  | (-)1.0 | (-)2.0 | V          |
| Input Resistance                        | R1            |  | 7       | 10     | 13     | k $\Omega$ |
| Resistance Ratio                        | R1/R2         |  |         | 0.213  |        |            |

## Electrical Connection



# RA104S/RC104S



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