

**SANYO**

No.2381

**2SA1564/2SC4048**

PNP/NPN Epitaxial Planar Silicon Transistors

Switching Applications  
(with Bias Resistance)**Applications**

- Switching circuit, inverter circuit, interface circuit, driver circuit

**Features**

- On-chip bias resistance:  $R_1=10k\Omega$ ,  $R_2=47k\Omega$
- Small-sized package: SPA

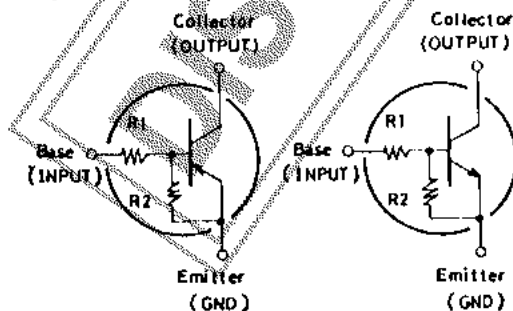
( ): 2SA1564

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

|                              |           |             | unit             |
|------------------------------|-----------|-------------|------------------|
| Collector to Base Voltage    | $V_{CB0}$ | (-)50       | V                |
| Collector to Emitter Voltage | $V_{CE0}$ | (-)50       | V                |
| Emitter to Base Voltage      | $V_{EB0}$ | (-)6        | 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  $T_a=25^\circ\text{C}$** 

|                          |               |                                              | min    | typ          | max    | unit          |
|--------------------------|---------------|----------------------------------------------|--------|--------------|--------|---------------|
| Collector Cutoff Current | $I_{CB0}$     | $V_{CB}=(-)40\text{V}, I_E=0$                |        |              | (-)0.1 | $\mu\text{A}$ |
| Collector Cutoff Current | $I_{CE0}$     | $V_{CE}=(-)40\text{V}, I_B=0$                |        |              | (-)0.5 | $\mu\text{A}$ |
| Emitter Cutoff Current   | $I_{EB0}$     | $V_{EB}=(-)5\text{V}, I_C=0$                 | (-)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<br>(200) |        | MHz           |
| Output Capacitance       | $C_{ob}$      | $V_{CB}=(-)10\text{V}, f=1\text{MHz}$        |        | 3.7<br>(5.5) |        | pF            |
| C-E Saturation Voltage   | $V_{CE(sat)}$ | $I_C=(-)10\text{mA}, I_B=(-)0.5\text{mA}$    |        | (-)0.1       | (-)0.3 | V             |
| C-B Breakdown Voltage    | $V_{(BR)CB0}$ | $I_C=(-)10\mu\text{A}, I_E=0$                | (-)50  |              |        | V             |
| C-E Breakdown Voltage    | $V_{(BR)CE0}$ | $I_C=(-)100\mu\text{A}, R_{BE}=\infty$       | (-)50  |              |        | V             |
| Input OFF-State Voltage  | $V_{I(off)}$  | $V_{CB}=(-)5\text{V}, I_C=(-)100\mu\text{A}$ | (-)0.5 | (-)0.7       | (-)0.9 | V             |
| Input ON-State Voltage   | $V_{I(on)}$   | $V_{CE}=(-)0.2\text{V}, I_C=(-)5\text{mA}$   | (-)0.7 | (-)1.0       | (-)2.0 | V             |
| Input Resistance         | $R_1$         |                                              | 7      | 10           | 13     | $k\Omega$     |
| Resistance Ratio         | $R_1/R_2$     |                                              | 0.193  | 0.213        | 0.234  |               |

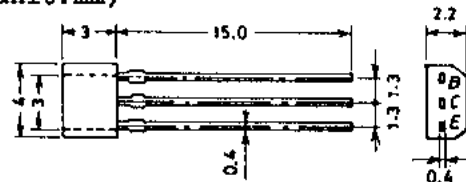
**Electrical Connection**

PNP

NPN

**Case Outline 2033**

(unit:mm)



B: Base  
C: Collector  
E: Emitter

SANYO: SPA

Specifications and information herein are subject to change without notice.

**SANYO Electric Co., Ltd. Semiconductor Business Headquarters**

TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110 JAPAN

