

# 2SA1677, 2SC4397

2059

PNP/NPN Epitaxial Planar  
Silicon Transistors

T-37-13

T-35-11

## Switching Applications

(with Bias Resistances  $R1=22k\Omega$ ,  $R2=22k\Omega$ )

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### Applications

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

### Features

- On-chip bias resistance ( $R1=22k\Omega$ ,  $R2=22k\Omega$ )
- Very small-sized package permitting 2SA1677/2SC4397-applied sets to be made smaller and slimmer

( ):2SA1677

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

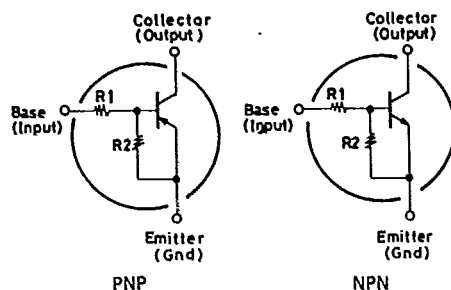
|                              |           |             | unit             |
|------------------------------|-----------|-------------|------------------|
| Collector to Base Voltage    | $V_{CB0}$ | (-)50       | V                |
| Collector to Emitter Voltage | $V_{CEO}$ | (-)50       | V                |
| Emitter to Base Voltage      | $V_{EBO}$ | (-)10       | V                |
| Collector Current            | $I_C$     | (-)100      | mA               |
| Peak Collector Current       | $i_{op}$  | (-)200      | mA               |
| Collector Dissipation        | $P_C$     | 150         | 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 | $I_{CBO}$     | $V_{CB}=(-)40\text{V}, I_E=0$                |        |              | (-)0.1 | $\mu\text{A}$ |
| Collector Cutoff Current | $I_{CEO}$     | $V_{CE}=(-)40\text{V}, I_E=0$                |        |              | (-)0.5 | $\mu\text{A}$ |
| Emitter Cutoff Current   | $I_{EBO}$     | $V_{EB}=(-)5\text{V}, I_C=0$                 | (-)70  | (-)113       | (-)150 | $\mu\text{A}$ |
| DC Current Gain          | $h_{FE}$      | $V_{CE}=(-)5\text{V}, I_C=(-)5\text{mA}$     | 50     |              |        |               |
| Gain-Bandwidth Product   | $f_T$         | $V_{CE}=(-)10\text{V}, I_C=(-)5\text{mA}$    |        | 250<br>(200) |        | MHz           |
| Output Capacitance       | $c_{ob}$      | $V_{CB}=(-)10\text{V}, f=1\text{MHz}$        |        | 3.3<br>(5.1) |        | pF            |
| C-E Saturation Voltage   | $V_{CE(sat)}$ | $I_C=(-)10\text{mA}, I_E=(-)0.5\text{mA}$    |        | (-)0.1       | (-)0.3 | V             |
| C-B Breakdown Voltage    | $V_{(BR)CBO}$ | $I_C=(-)10\mu\text{A}, I_E=0$                | (-)50  |              |        | V             |
| C-E Breakdown Voltage    | $V_{(BR)CEO}$ | $I_C=(-)100\mu\text{A}, R_{BE}=\infty$       | (-)50  |              |        | V             |
| Input OFF-State Voltage  | $V_{I(off)}$  | $V_{CE}=(-)5\text{V}, I_C=(-)100\mu\text{A}$ | (-)0.8 | (-)1.1       | (-)1.5 | V             |
| Input ON-State Voltage   | $V_{I(on)}$   | $V_{CE}=(-)0.2\text{V}, I_C=(-)5\text{mA}$   | (-)1.0 | (-)1.9       | (-)3.0 | V             |
| Input Resistance         | $R_1$         |                                              | 15     | 22           | 29     | kohm          |
| Resistance Ratio         | $R1/R2$       |                                              | 0.9    | 1.0          | 1.1    |               |

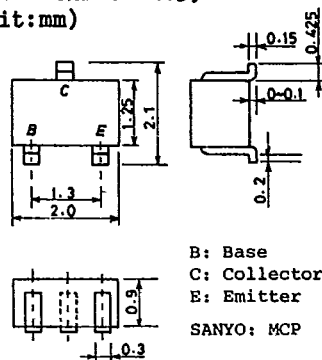
Marking 2SA1677:CL, 2SC4397:CY

### Electrical Connection



### Case Outline 2059

(unit:mm)



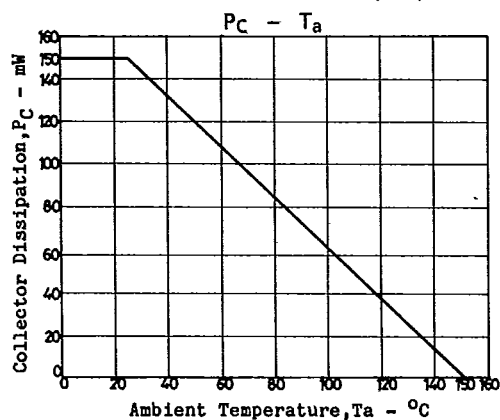
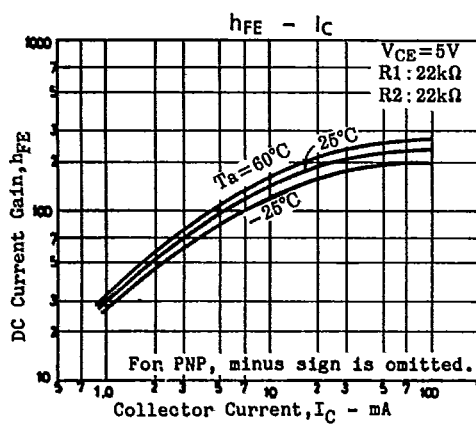
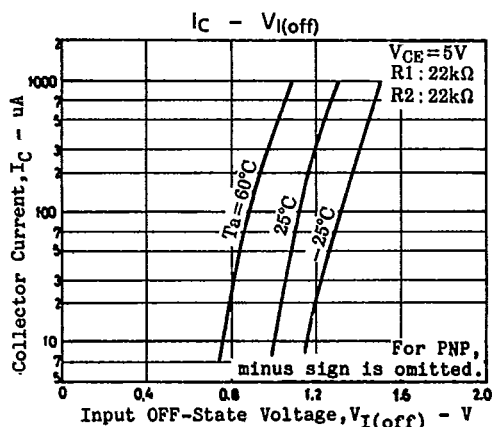
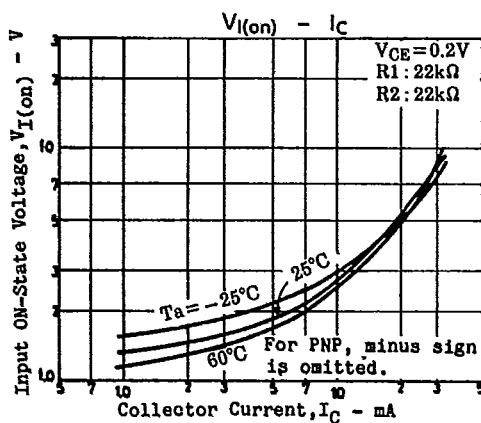
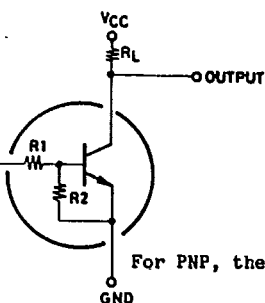
B: Base  
C: Collector  
E: Emitter  
SANYO: MCP

4118YT, TS No.2765-1/2

## Sample Application Circuit

Input ON-State voltage: 3V or more

Input OFF-State voltage: 0.8V or less

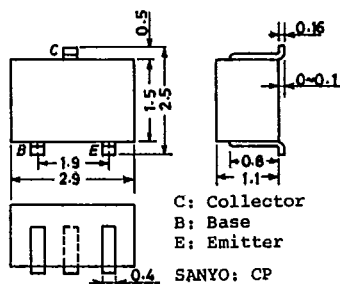


T-91-20

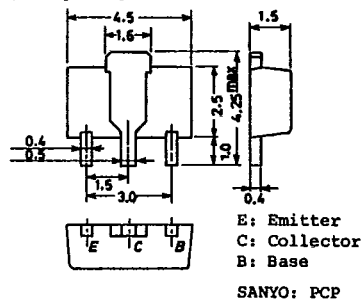
## CASE OUTLINES OF SURFACE MOUNT TRANSISTORS

- All of Sanyo surface mount transistor case outlines are illustrated below.
- All dimensions are in mm, and dimensions which are not followed by min. or max. are represented by typical values.
- No marking is indicated.

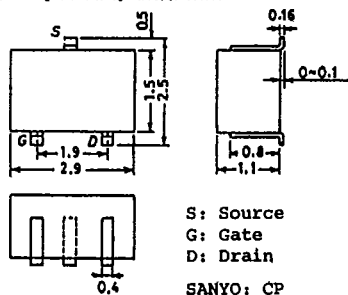
Case Outline—[2018A] unit: mm



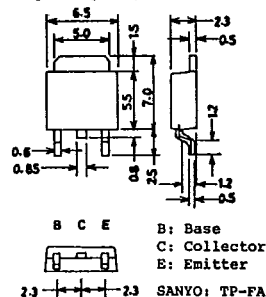
Case Outline—[2038] unit: mm



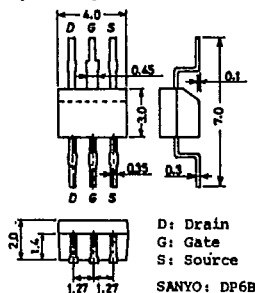
Case Outline—[2024A] unit: mm



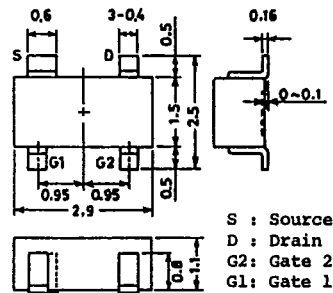
Case Outline—[2044] unit: mm



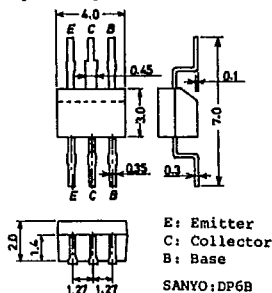
Case Outline—[2028A] unit: mm



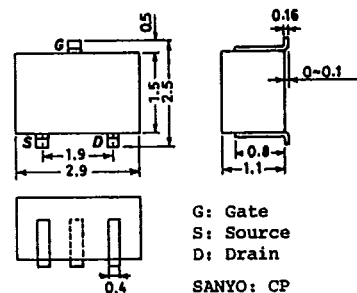
Case Outline—[2046] unit: mm



Case Outline—[2030A] unit: mm

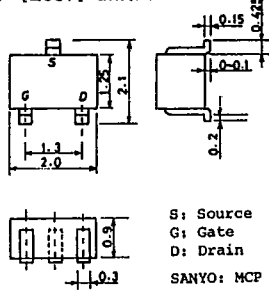


Case Outline—[2050] unit: mm

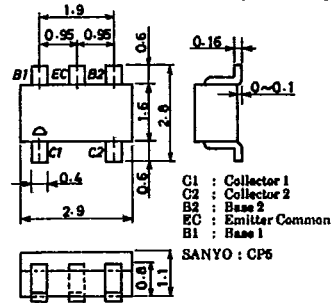


T-91-20

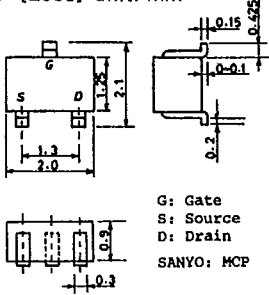
Case Outline—[2057] unit: mm



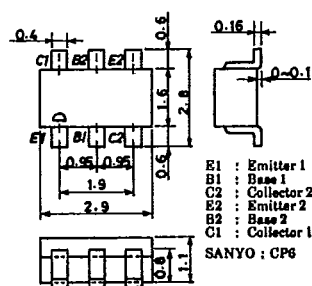
Case Outline—[2066] unit: mm



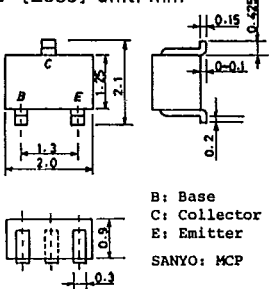
Case Outline—[2058] unit: mm



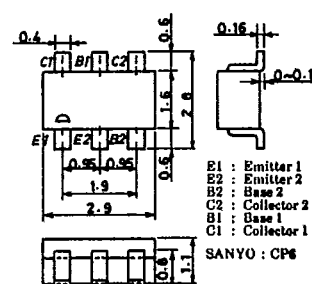
Case Outline—[2067] unit: mm



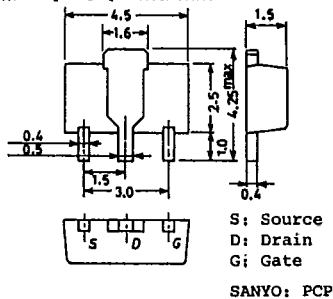
Case Outline—[2059] unit: mm



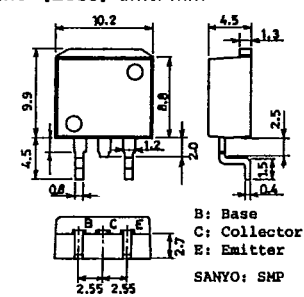
Case Outline—[2068] unit: mm



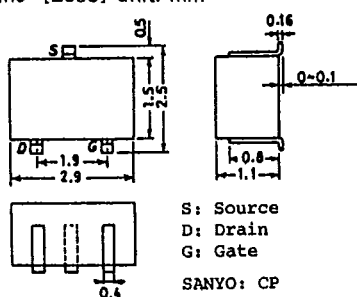
Case Outline—[2062] unit: mm



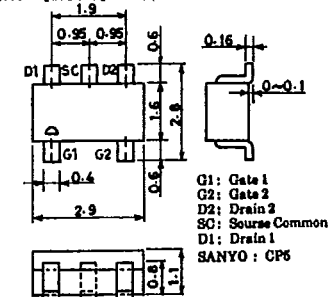
Case Outline—[2069] unit: mm



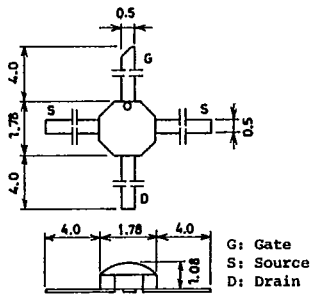
Case Outline—[2065] unit: mm



Case Outline—[2070] unit: mm

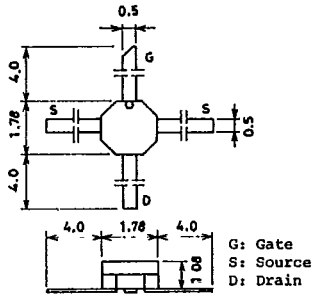


Case Outline—[2071] unit: mm



T-9120

Case Outline—[2072] unit: mm



Case Outline—[2073] unit: mm

