



2SA2169/2SC6017 — PNP/NPN Epitaxial Planar Silicon Transistor

High-Current Switching Applications

Applications

- Relay drivers, lamp drivers, motor drivers

Features

- Adoption of MBIT processes
- Large current capacitance
- Low collector-to-emitter saturation voltage
- High-speed switching

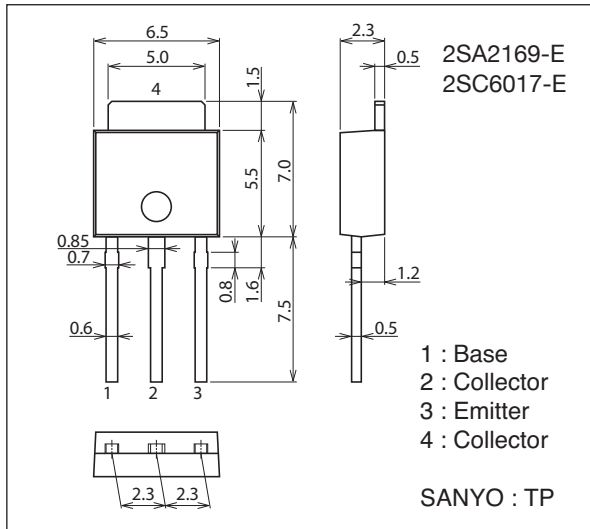
Specifications () : 2SA2169

Absolute Maximum Ratings at Ta=25°C

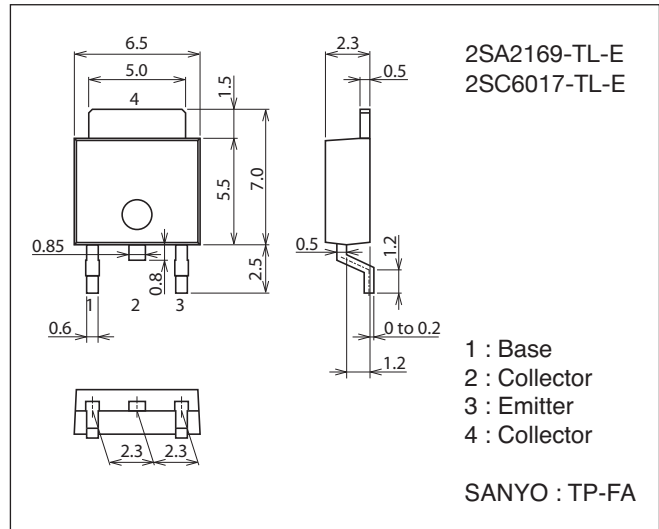
| Parameter | Symbol | Conditions | Ratings | Unit |
|------------------------------|------------------|------------|----------|------|
| Collector-to-Base Voltage | V _{CB0} | | (-50)100 | V |
| Collector-to-Emitter Voltage | V _{CE0} | | (-)50 | V |
| Emitter-to-Base Voltage | V _{EB0} | | (-)6 | V |
| Collector Current | I _C | | (-)10 | A |
| Collector Current (Pulse) | I _{CP} | PW≤100μs | (-)13 | A |

Continued on next page.

Package Dimensions unit : mm (typ.) 7518-003



Package Dimensions unit : mm (typ.) 7003-003

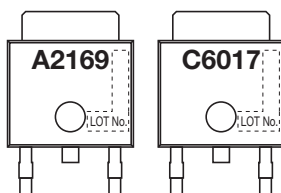


Product & Package Information

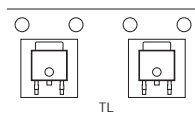
- Package : TP
- JEITA, JEDEC : SC-64, TO-251, SOT-553, DPAK
- Minimum Packing Quantity : 500 pcs./bag

- Package : TP-FA
- JEITA, JEDEC : SC-63, TO-252, SOT-428, DPAK
- Minimum Packing Quantity : 700 pcs./reel

Marking (TP, TP-FA)



Packing Type (TP-FA) : TL



Electrical Connection



2SA2169/2SC6017

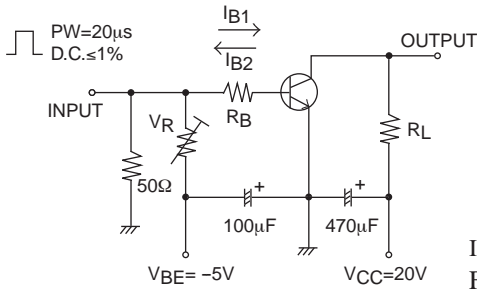
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| Parameter | Symbol | Conditions | Ratings | Unit |
|-----------------------|-----------|------------------------|-----------------|------------------|
| Base Current | I_B | | (-) 2 | A |
| Collector Dissipation | P_C | | 0.95 | W |
| | | $T_C=25^\circ\text{C}$ | 20 | W |
| 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} | $V_{CB}=(-)40\text{V}, I_E=0\text{A}$ | | | $(-)10$ | μA |
| Emitter Cutoff Current | I_{EBO} | $V_{EB}=(-)4\text{V}, I_C=0\text{A}$ | | | $(-)10$ | μA |
| DC Current Gain | h_{FE} | $V_{CE}=(-)2\text{V}, I_C=(-)1\text{A}$ | 200 | | $(560)700$ | |
| Gain-Bandwidth Product | f_T | $V_{CE}=(-)5\text{V}, I_C=(-)1\text{A}$ | | $(130)200$ | | MHz |
| Output Capacitance | C_{ob} | $V_{CB}=(-)10\text{V}, f=1\text{MHz}$ | | $(90)60$ | | pF |
| Collector-to-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C=(-)5\text{A}, I_B=(-)250\text{mA}$ | | $(-290)180$ | $(-580)360$ | mV |
| Base-to-Emitter Saturation Voltage | $V_{BE(sat)}$ | $I_C=(-)5\text{A}, I_B=(-)250\text{mA}$ | | $(-)0.93$ | $(-)1.4$ | V |
| Collector-to-Base Breakdown Voltage | $V_{(BR)CBO}$ | $I_C=(-)100\mu\text{A}, I_E=0\text{A}$ | $(-50)100$ | | | V |
| Collector-to-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | $I_C=(-)1\text{mA}, R_{BE}=\infty$ | $(-)50$ | | | V |
| Emitter-to-Base Breakdown Voltage | $V_{(BR)EBO}$ | $I_E=(-)100\mu\text{A}, I_C=0\text{A}$ | $(-)6$ | | | V |
| Turn-On Time | t_{on} | See specified Test Circuit. | | $(70)40$ | | ns |
| Storage Time | t_{stg} | | | $(650)1000$ | | ns |
| Fall Time | t_f | | | $(60)80$ | | ns |

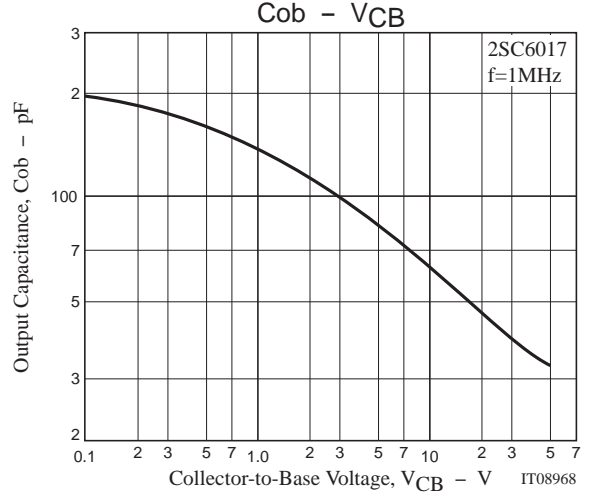
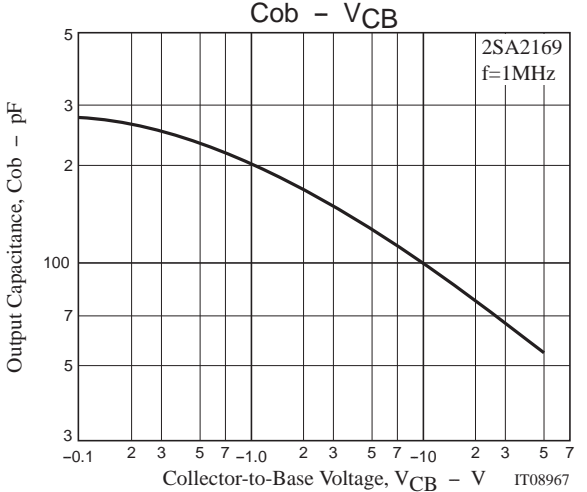
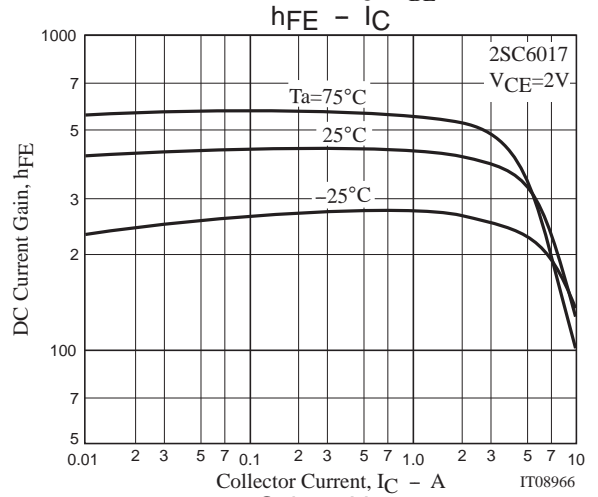
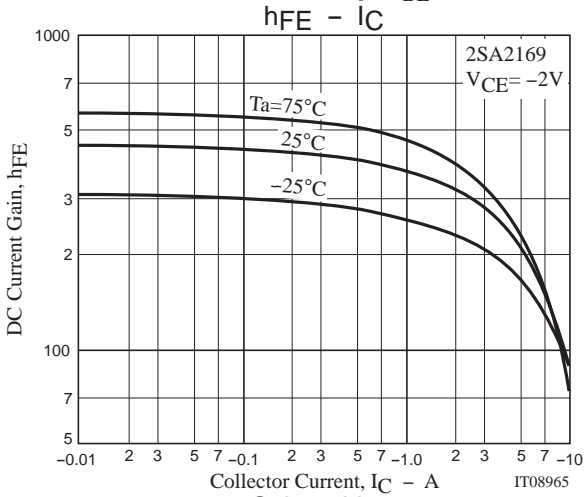
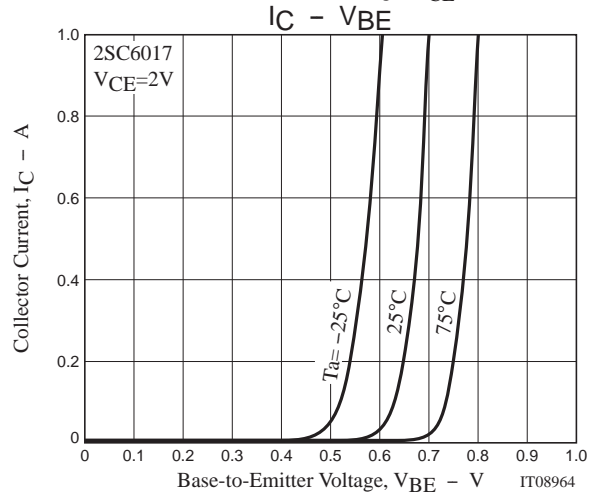
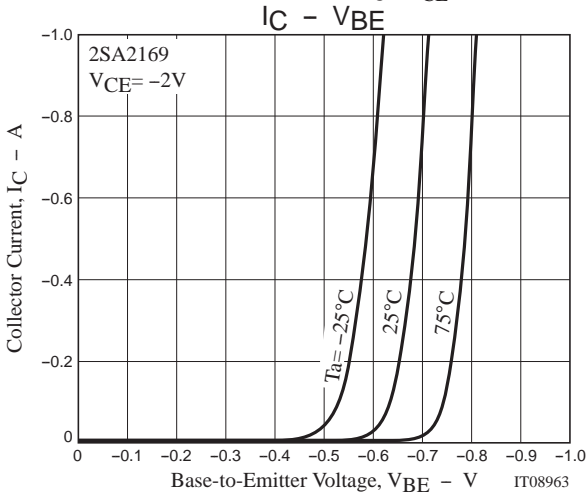
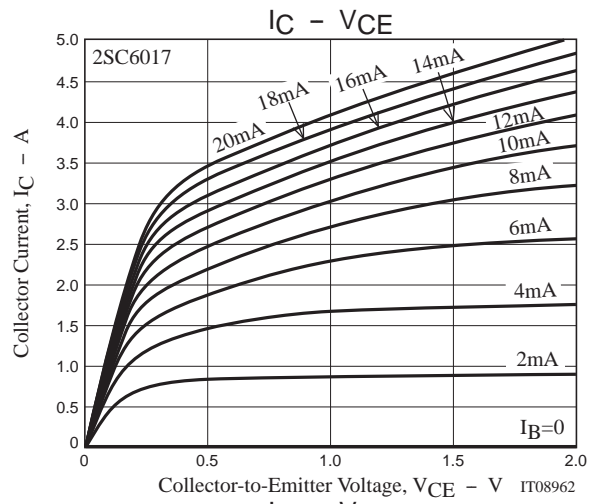
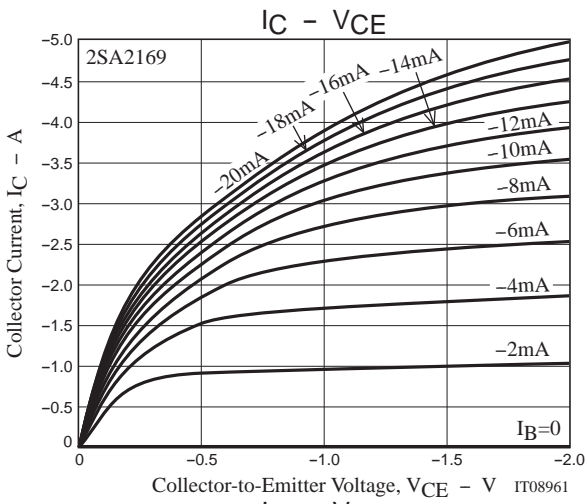
Switching Time Test Circuit

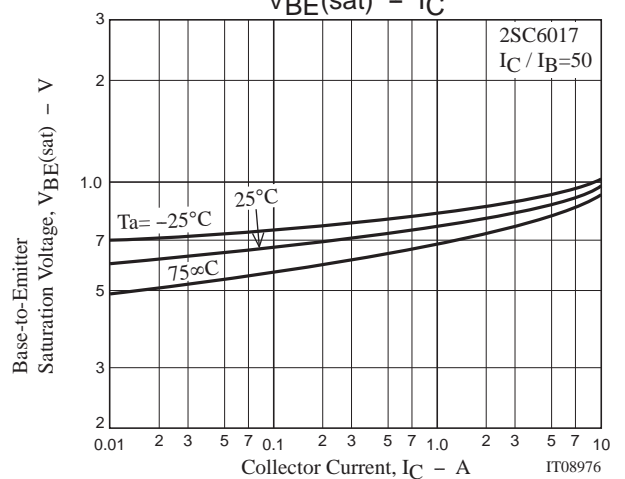
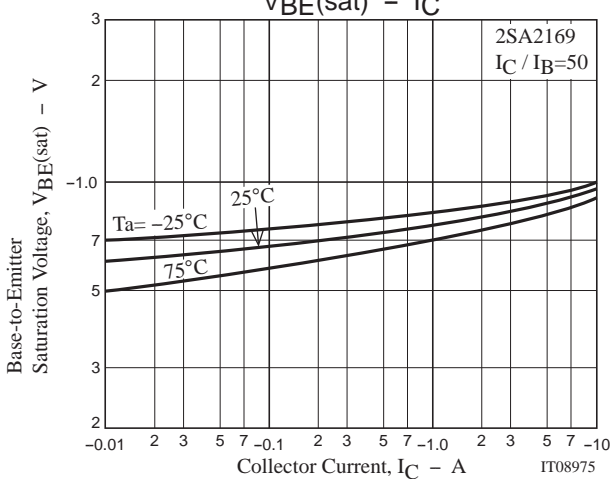
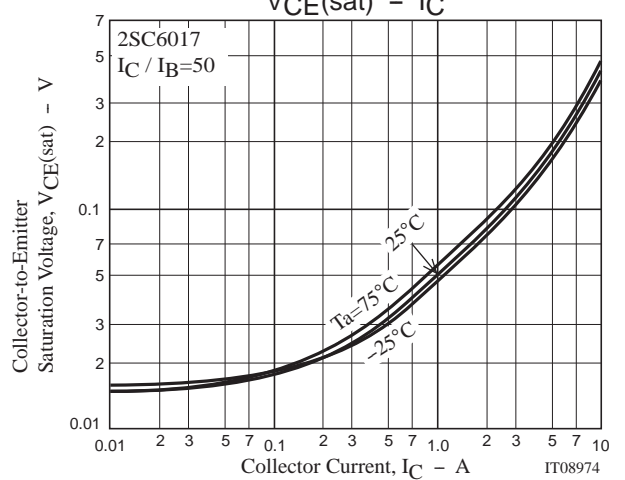
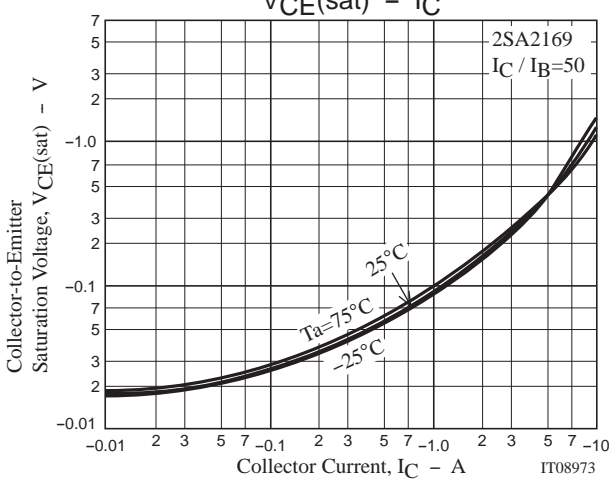
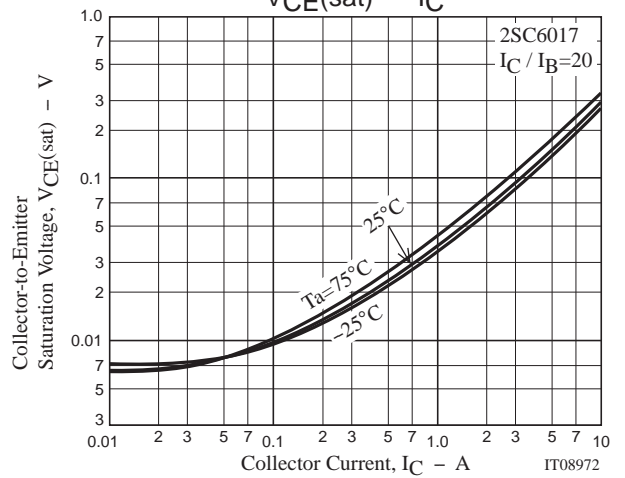
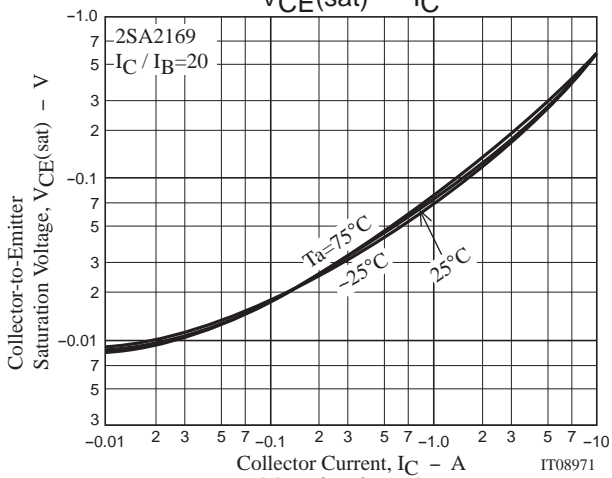
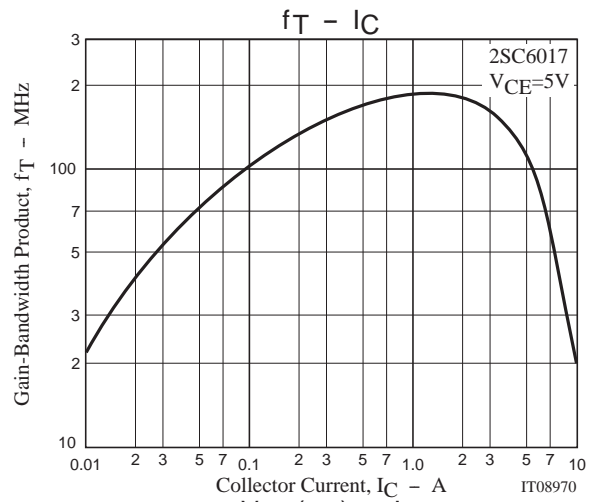
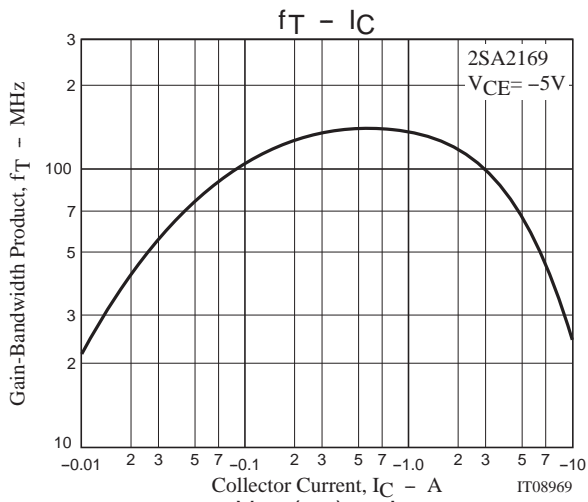


$I_C=20I_{B1} = -20I_{B2}=3\text{A}$
For PNP, the polarity is reversed.

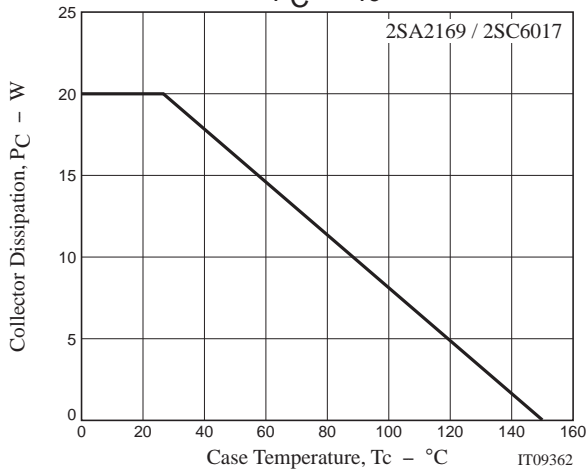
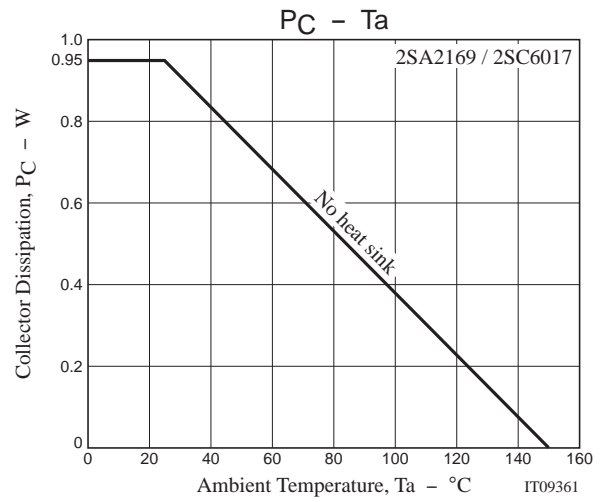
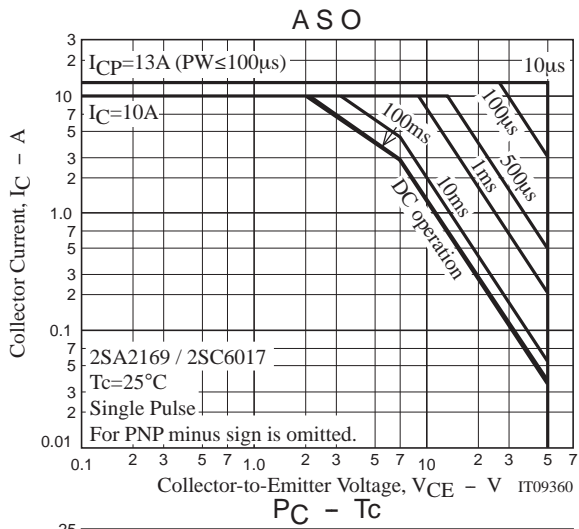
Ordering Information

| Device | Package | Shipping | memo |
|--------------|---------|--------------|---------|
| 2SA2169-E | TP | 500pcs./bag | Pb Free |
| 2SC6017-E | TP | 500pcs./bag | |
| 2SA2169-TL-E | TP-FA | 700pcs./reel | |
| 2SC6017-TL-E | TP-FA | 700pcs./reel | |





2SA2169/2SC6017



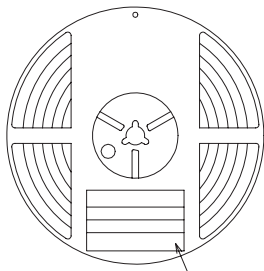
Taping Specification

2SA2169-TL-E, 2SC6017-TL-E

Packing Format

| Package Name | Carrier Tape Type | Maximum Number of devices contained (pcs) | | | Packing format | |
|--------------|-------------------|---|-----------|-----------|---|--|
| | | Reel | Inner box | Outer box | Inner BOX (C-1) | Outer BOX (A-7) |
| TP-FA | TP | 700 | 2,100 | 12,600 | 3 reels contained Dimensions:mm (external) 183×72×185 | 6 inner boxes contained Dimensions:mm (external) 440×195×210 |

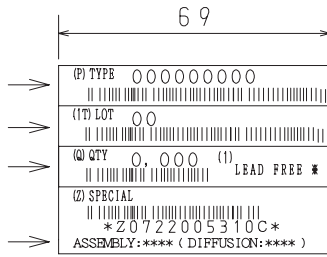
Packing method



Type No.
LOT No.
Quantity
Origin

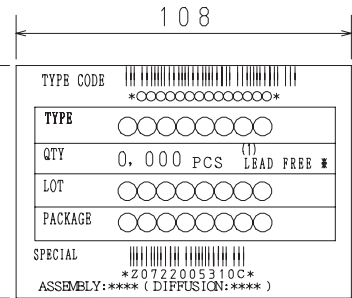
Reel label

Reel label, Inner box label (unit:mm)



Outer box label

It is a label at the time of factory shipments. The form of a label may change in physical distribution process.



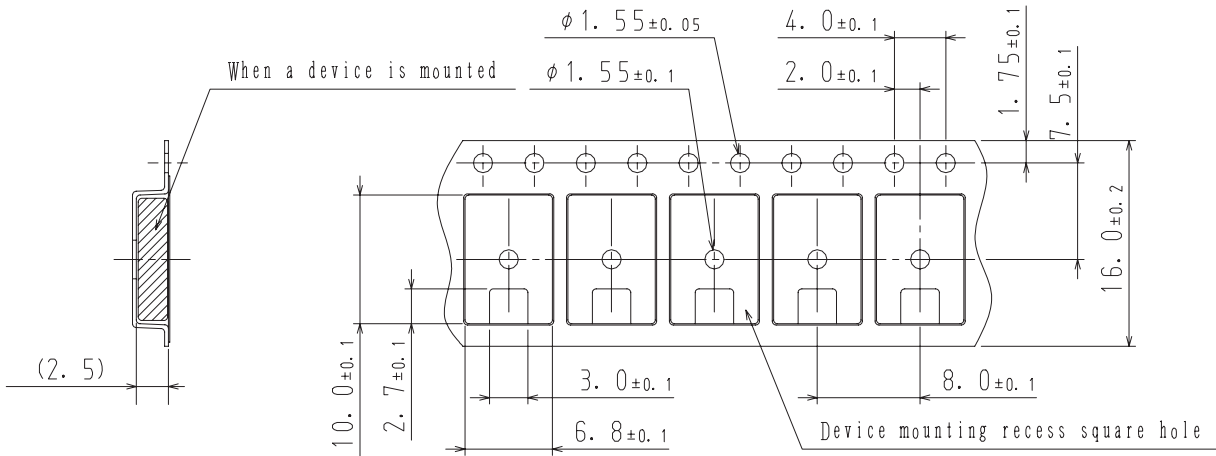
NOTE (1)

The LEAD FREE * description shows that the surface treatment of the terminal is lead free.

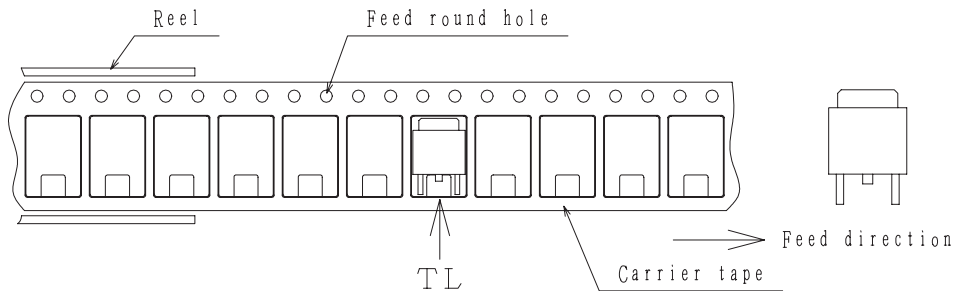
| Label | JEITA Phase |
|-------------|----------------|
| LEAD FREE 3 | JEITA Phase 3A |
| LEAD FREE 4 | JEITA Phase 3 |

Taping configuration

1. Carrier tape size (unit:mm)



2. Device placement direction

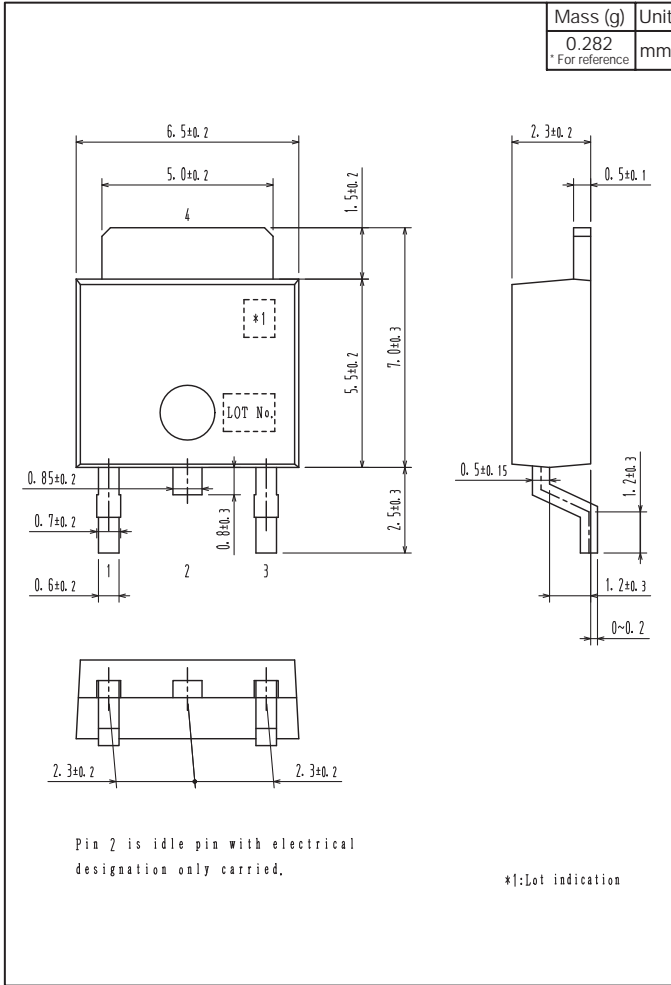


Those with one electrode terminal on the feed hole side.....TL

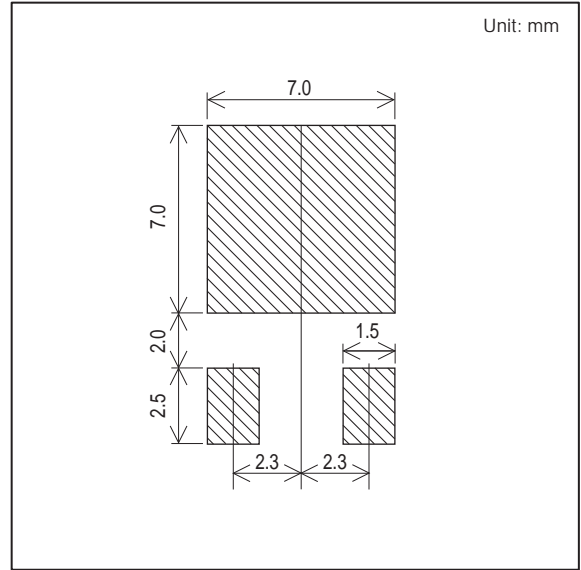
2SA2169/2SC6017

Outline Drawing

2SA2169-TL-E, 2SC6017-TL-E

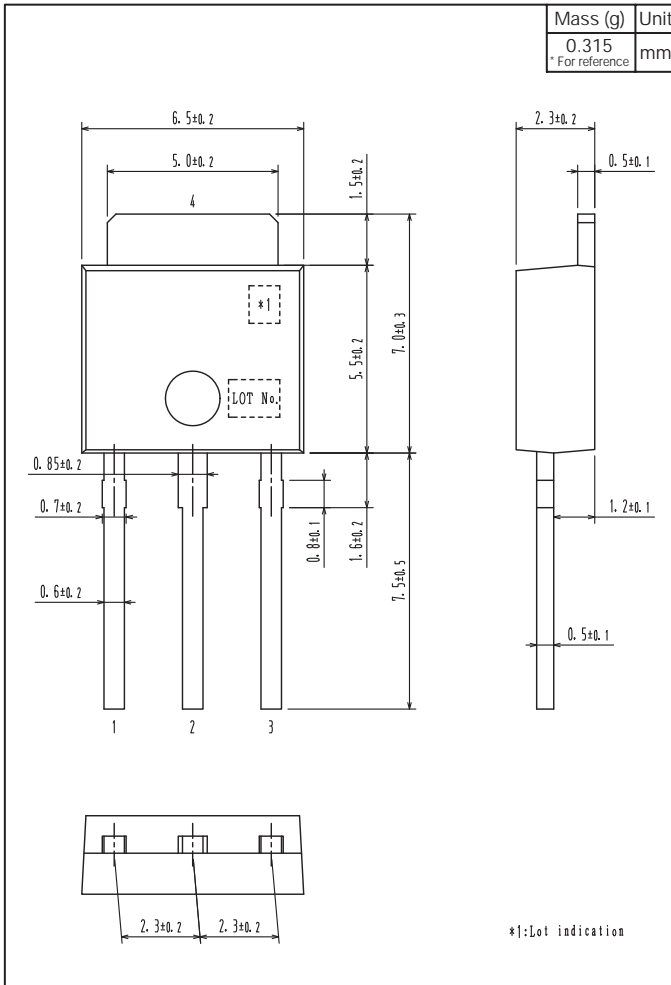


Land Pattern Example



Outline Drawing

2SA2169-E, 2SC6017-E



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- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



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