



SANYO Semiconductors

## DATA SHEET

An ON Semiconductor Company

# 2SB1205

— PNP Epitaxial Planar Silicon Transistor

## Strobe High-Current Switching Applications

### Applications

- Flash, voltage regulators, relay drivers, lamp drivers

### Features

- Adoption of FBET, MBIT processes
- Fast switching speed
- Small and slim package making it easy to make 2SB1205-applied sets smaller
- Low saturation voltage
- Large current capacity

### Specifications

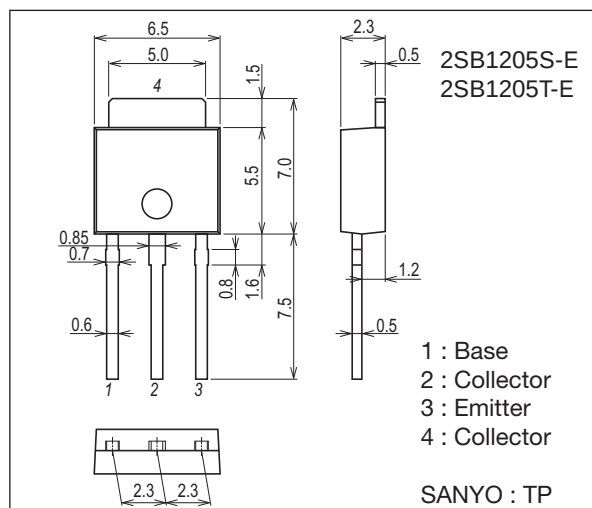
Absolute Maximum Ratings at Ta=25°C

| Parameter                    | Symbol           | Conditions | Ratings | Unit |
|------------------------------|------------------|------------|---------|------|
| Collector-to-Base Voltage    | V <sub>CB0</sub> |            | -25     | V    |
| Collector-to-Emitter Voltage | V <sub>CE0</sub> |            | -20     | V    |
| Emitter-to-Base Voltage      | V <sub>EB0</sub> |            | -5      | V    |
| Collector Current            | I <sub>C</sub>   |            | -5      | A    |
| Collector Current (Pulse)    | I <sub>CP</sub>  |            | -8      | A    |

Continued on next page.

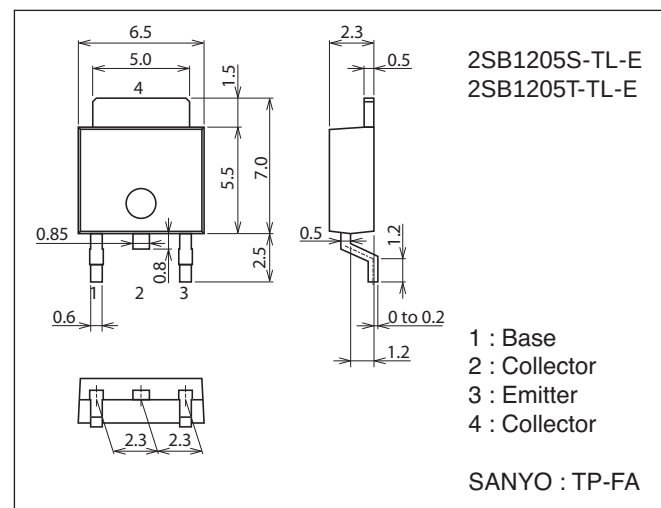
### Package Dimensions unit : mm (typ)

7518-003



### Package Dimensions unit : mm (typ)

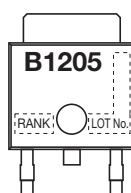
7003-003



### Product & Package Information

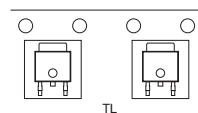
- Package : TP
- JEITA, JEDEC : SC-64, TO-251
- Minimum Packing Quantity : 500 pcs./bag

### Marking (TP, TP-FA)

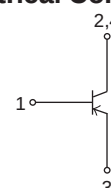


- Package : TP-FA
- JEITA, JEDEC : SC-63, TO-252
- Minimum Packing Quantity : 700 pcs./reel

### Packing Type (TP-FA) : TL



### Electrical Connection



SANYO Semiconductor Co., Ltd.

<http://www.sanyosemi.com/en/network/>

## 2SB1205

Continued from preceding page.

| Parameter             | Symbol    | Conditions               | Ratings     | Unit               |
|-----------------------|-----------|--------------------------|-------------|--------------------|
| Base Current          | $I_B$     |                          | -0.5        | A                  |
| Collector Dissipation | $P_C$     |                          | 1           | W                  |
|                       |           | $T_C=25^{\circ}\text{C}$ | 10          | W                  |
| Junction Temperature  | $T_j$     |                          | 150         | $^{\circ}\text{C}$ |
| Storage Temperature   | $T_{stg}$ |                          | -55 to +150 | $^{\circ}\text{C}$ |

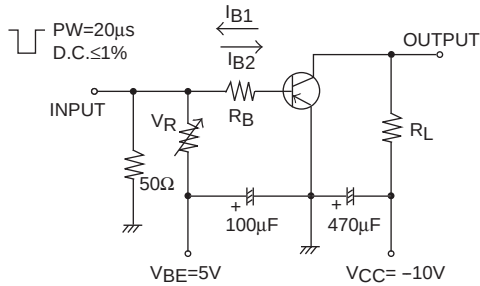
### Electrical Characteristics at $T_a=25^{\circ}\text{C}$

| Parameter                               | Symbol        | Conditions                             | Ratings |      |      | Unit |
|-----------------------------------------|---------------|----------------------------------------|---------|------|------|------|
|                                         |               |                                        | min     | typ  | max  |      |
| Collector Cutoff Current                | $I_{CBO}$     | $V_{CB}=-20\text{V}, I_E=0\text{A}$    |         |      | -500 | nA   |
| Emitter Cutoff Current                  | $I_{EBO}$     | $V_{EB}=-4\text{V}, I_C=0\text{A}$     |         |      | -500 | nA   |
| DC Current Gain                         | $h_{FE1}$     | $V_{CE}=-2\text{V}, I_C=500\text{mA}$  | 100*    |      | 400* |      |
|                                         | $h_{FE2}$     | $V_{CE}=-2\text{V}, I_C=-4\text{A}$    | 60      |      |      |      |
| Gain-Bandwidth Product                  | $f_T$         | $V_{CE}=-5\text{V}, I_C=-200\text{mA}$ |         | 320  |      | MHz  |
| Output Capacitance                      | $C_{ob}$      | $V_{CB}=-10\text{V}, f=1\text{MHz}$    |         | 60   |      | pF   |
| Collector-to-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C=-3\text{A}, I_B=-60\text{mA}$     |         | -250 | -500 | mV   |
| Base-to-Emitter Saturation Voltage      | $V_{BE(sat)}$ | $I_C=-3\text{A}, I_B=-60\text{mA}$     |         | -1.0 | -1.3 | V    |
| Collector-to-Base Breakdown Voltage     | $V_{(BR)CBO}$ | $I_C=-10\mu\text{A}, I_E=0\text{A}$    | -25     |      |      | V    |
| Collector-to-Emitter Breakdown Voltage  | $V_{(BR)CEO}$ | $I_C=-1\text{mA}, R_{BE}=\infty$       | -20     |      |      | V    |
| Emitter-to-Base Breakdown Voltage       | $V_{(BR)EBO}$ | $I_E=-10\mu\text{A}, I_C=0\text{A}$    | -5      |      |      | V    |
| Turn-On Time                            | $t_{on}$      | See specified Test Circuit.            |         | 40   |      | ns   |
| Storage Time                            | $t_{stg}$     |                                        |         | 200  |      | ns   |
| Fall Time                               | $t_f$         |                                        |         | 10   |      | ns   |

\* : The 2SB1205 is classified by 500mA  $h_{FE}$  as follows :

| Rank     | R          | S          | T          |
|----------|------------|------------|------------|
| $h_{FE}$ | 100 to 200 | 140 to 280 | 200 to 400 |

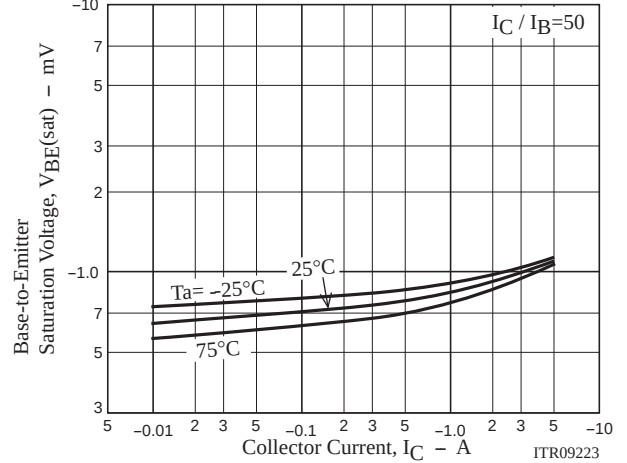
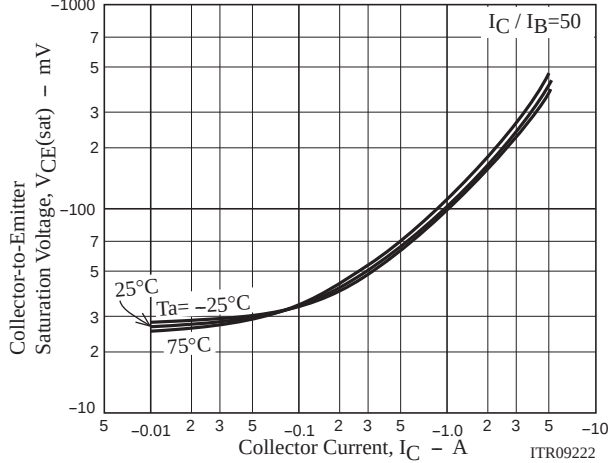
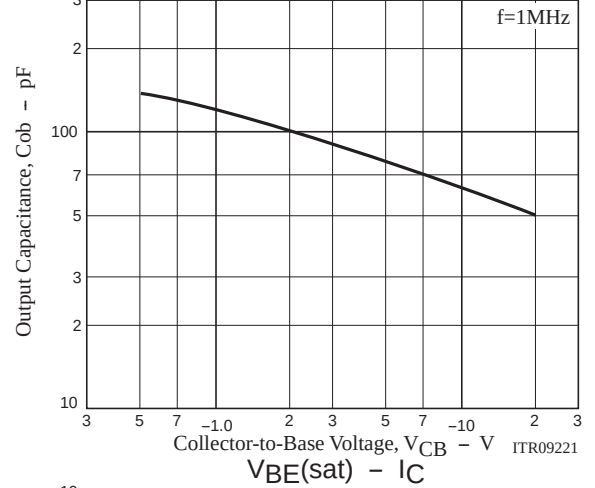
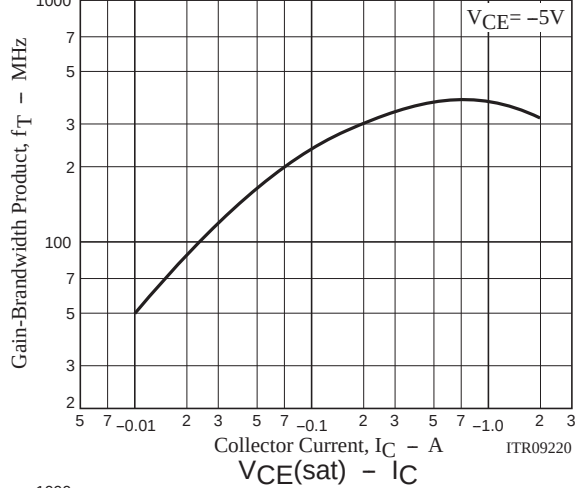
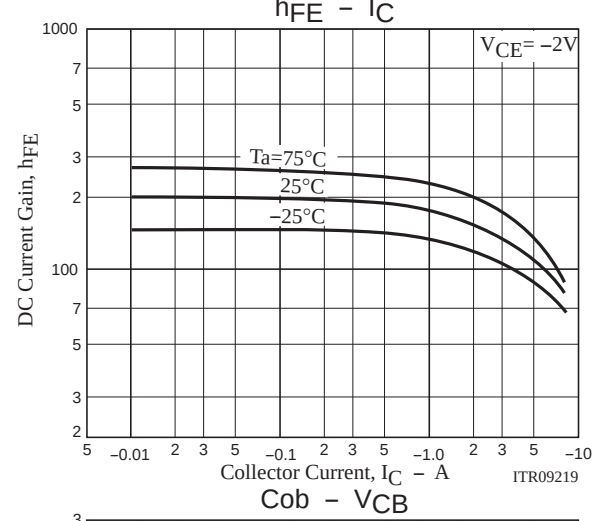
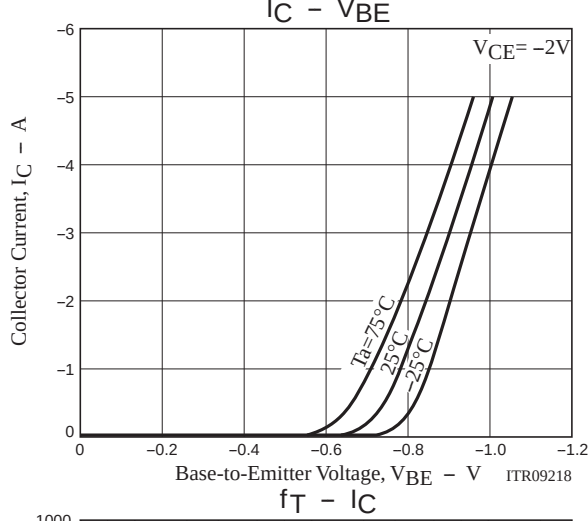
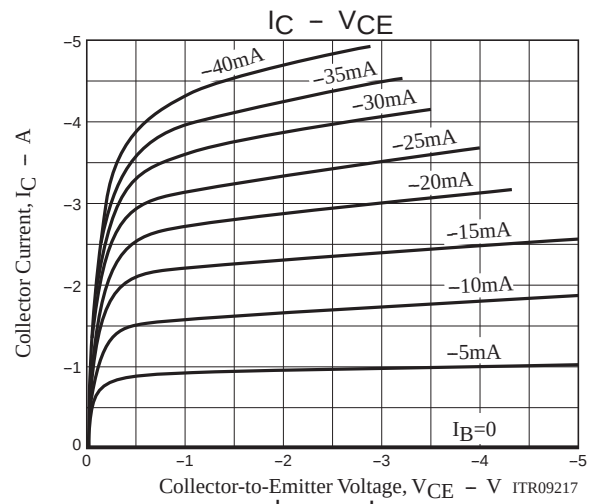
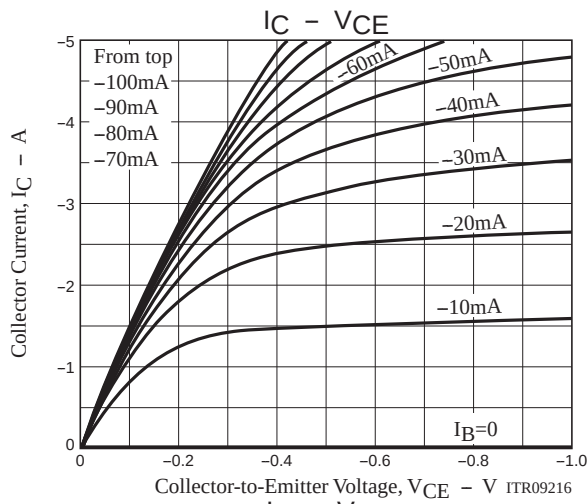
### Switching Time Test Circuit

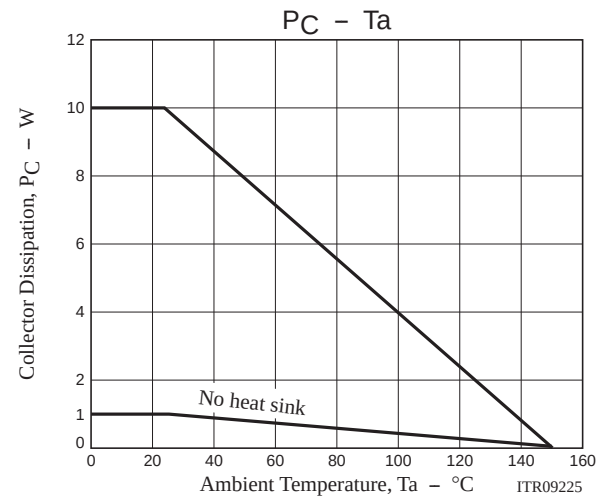
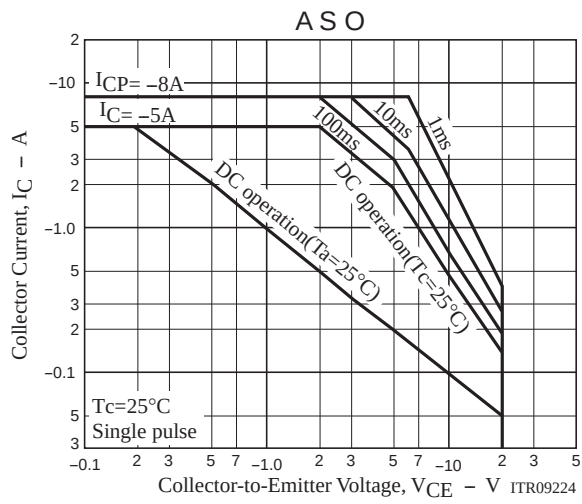


$$I_C=10I_{B1}=-10I_{B2}=-2\text{A}$$

### Ordering Information

| Device        | Package | Shipping     | memo    |
|---------------|---------|--------------|---------|
| 2SB1205S-E    | TP      | 500pcs./bag  | Pb Free |
| 2SB1205T-E    | TP      | 500pcs./bag  |         |
| 2SB1205S-TL-E | TP-FA   | 700pcs./reel |         |
| 2SB1205T-TL-E | TP-FA   | 700pcs./reel |         |





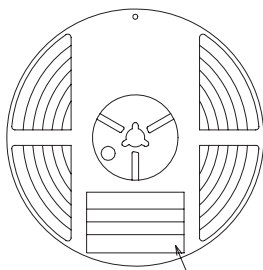
# Taping Specification

2SB1205S-TL-E, 2SB1205T-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<br>Dimensions:mm (external)<br>183×72×185 | 6 inner boxes contained<br>Dimensions:mm (external)<br>440×195×210 |

## Packing method



Reel label

Type No.  
LOT No.  
Quantity  
Origin

Reel label, Inner box label  
(unit:mm)

|               |                       |
|---------------|-----------------------|
| (P) TYPE      | 000000000             |
| (1) LOT       | 00                    |
| (Q) QTY       | 0,000 (1) LEAD FREE * |
| (Z) SPECIAL   | *20722005310C*        |
| ASSEMBLY:**** | (DIFFUSION:****)      |

Outer box label

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

|               |                           |
|---------------|---------------------------|
| TYPE CODE     |                           |
| TYPE          | ○○○○○○○○                  |
| QTY           | 0,000 PCS (1) LEAD FREE * |
| LOT           | ○○○○○○○○                  |
| PACKAGE       | ○○○○○○○○                  |
| SPECIAL       |                           |
| ASSEMBLY:**** | (DIFFUSION:****)          |

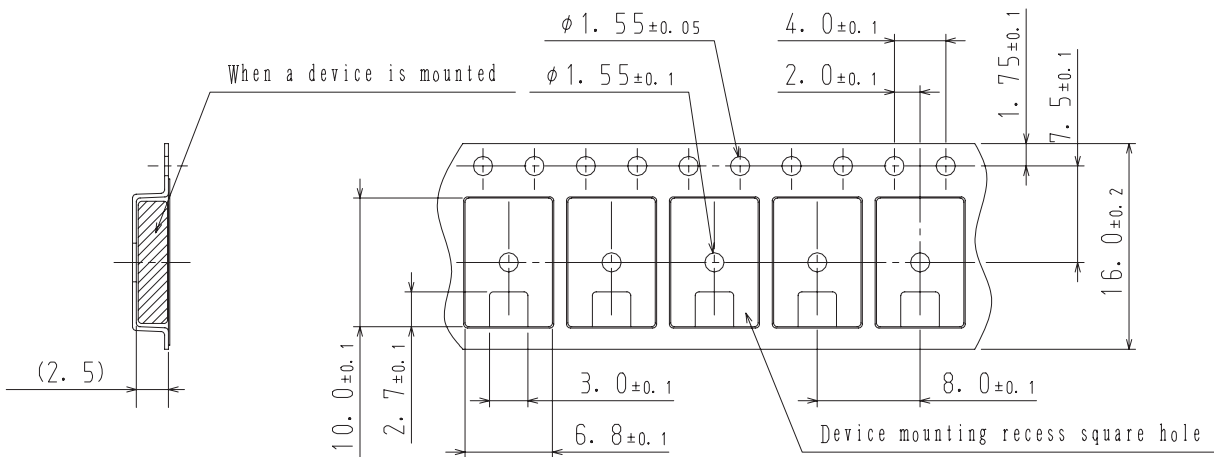
NOTE (1)

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

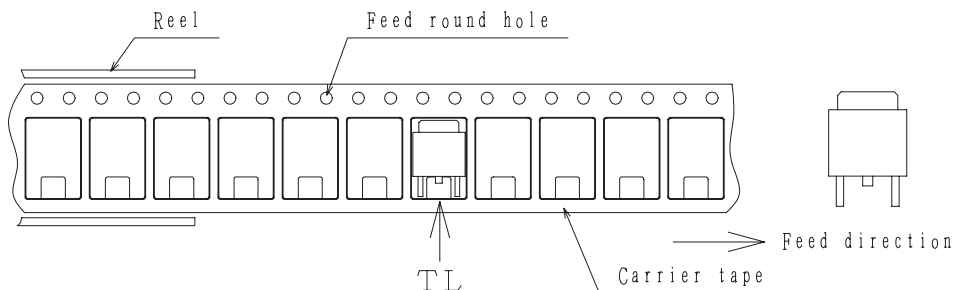
| Label       | JEITA Phase    |
|-------------|----------------|
| LEAD FREE 3 | JEITA Phase 3A |
| LEAD FREE 4 | JEITA Phase 3  |

## Taping configuration

### 1. Carrier tape size (unit:mm)



### 2. Device placement direction

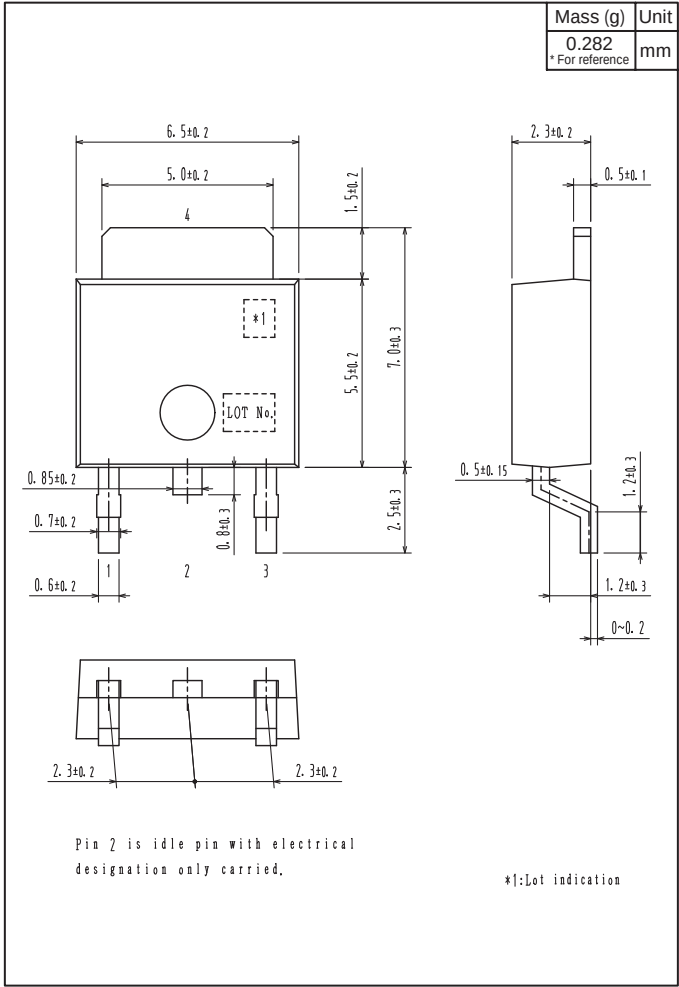


Those with one electrode terminal on the feed hole side.....TL

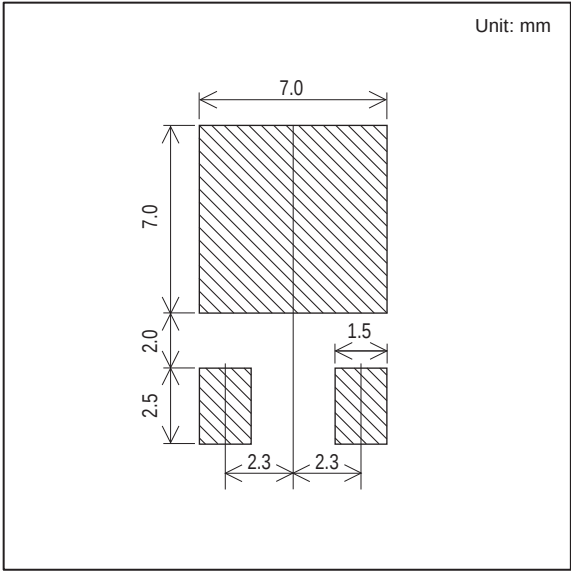
2SB1205

Outline Drawing

2SB1205S-TL-E, 2SB1205T-TL-E



Land Pattern Example

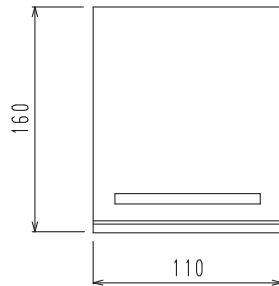
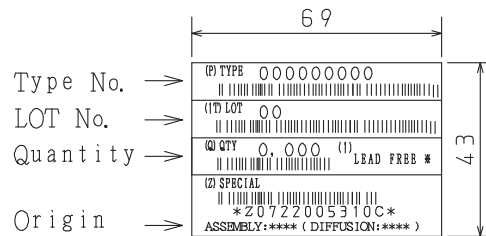


**Bag Packing Specification**

2SB1205S-E, 2SB1205T-E

1. Packing Format

| Package Name | Maximum Number of devices contained (pcs) |                                           |             |             |
|--------------|-------------------------------------------|-------------------------------------------|-------------|-------------|
|              | Bag                                       | Inner box                                 | Outer box   |             |
| TP           | 500                                       | B-1                                       | A-1         | A-2         |
|              |                                           | 10, 000                                   | 50, 000     | 30, 000     |
|              |                                           | Packing format (Dimensions:mm (external)) |             |             |
|              |                                           | Inner box                                 | Outer box   |             |
|              |                                           | B-1                                       | A-1         | A-2         |
|              |                                           | 445×225×55                                | 470×250×300 | 470×250×190 |

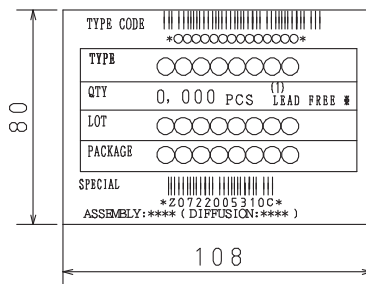
2. Bag dimensions  
(unit:mm)3. Bag label, Inner box label  
(unit:mm)4. Outer box label  
(unit:mm)

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

## NOTE (1)

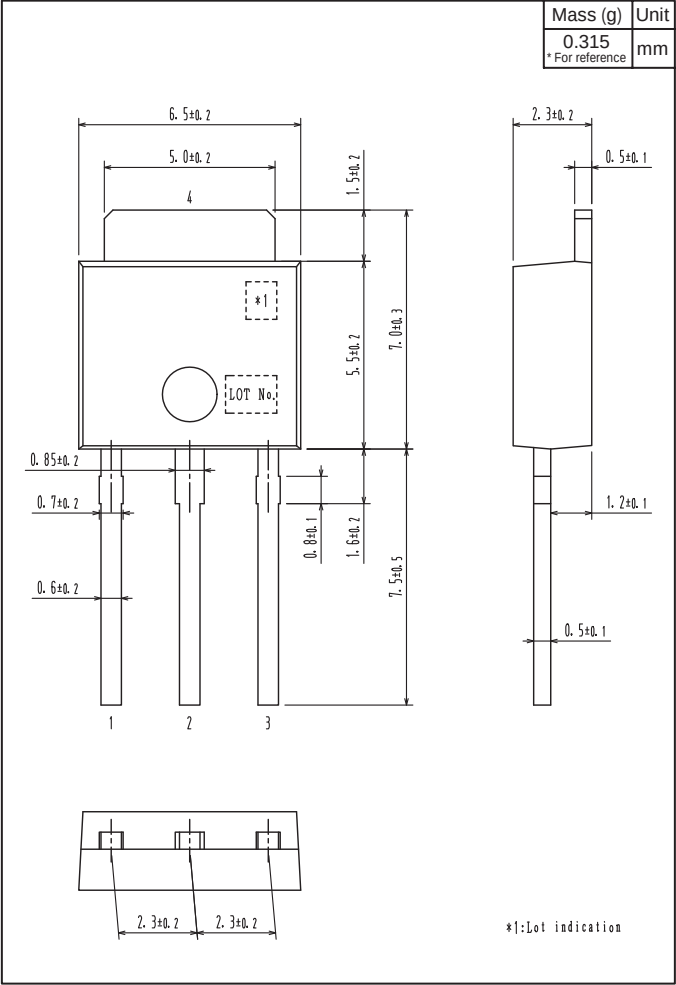
The LEAD FREE \* description shows that the  
surface treatment of the terminal is lead free.

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



Outline Drawing

2SB1205S-E, 2SB1205T-E





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