



SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

2SB1215/2SD1815 — PNP/NPN Epitaxial Planar Silicon Transistor

High-Current Switching Applications

Applications

- Relay drivers, high-speed inverters, converters, and other general high-current switching applications

Features

- Low collector-to-emitter saturation voltage
- Small-sized package permitting 2SB1215/2SD1815-applied sets to be made small and slim
- High f_T
- Excellent linearity of h_{FE}
- Fast switching time

Specifications () : 2SB1215

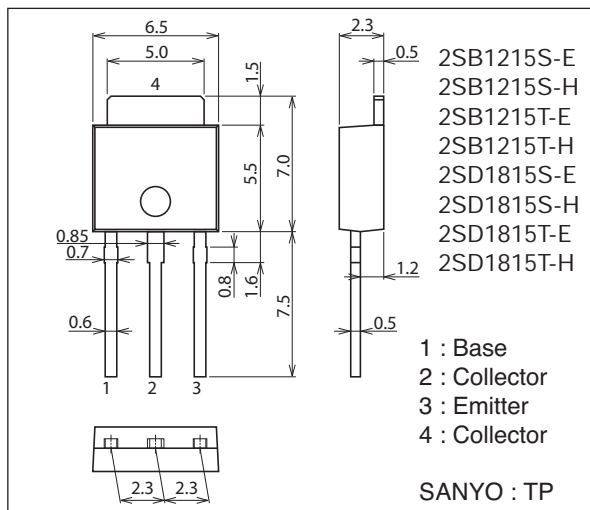
Absolute Maximum Ratings at $T_a=25^\circ\text{C}$

| Parameter | Symbol | Conditions | Ratings | Unit |
|------------------------------|-----------|------------|---------|------|
| Collector-to-Base Voltage | V_{CBO} | | (-)120 | V |
| Collector-to-Emitter Voltage | V_{CEO} | | (-)100 | V |
| Emitter-to-Base Voltage | V_{EBO} | | (-)6 | V |
| Collector Current | I_C | | (-)3 | A |
| Collector Current (Pulse) | I_{CP} | | (-)6 | A |

Continued on next page.

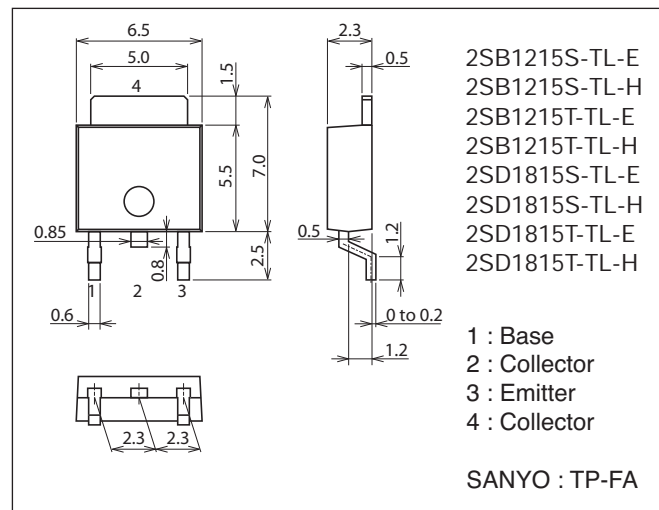
Package Dimensions unit : mm (typ.)

7518-003



Package Dimensions unit : mm (typ.)

7003-003

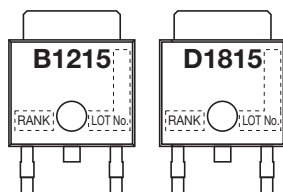


Product & Package Information

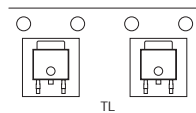
- Package : TP
- JEITA, JEDEC : SC-64, TO-251, SOT-553, DPAK
- Minimum Packing Quantity : 500 pcs./bag

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

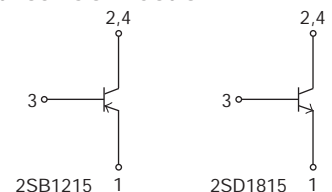
Marking (TP, TP-FA)



Packing Type (TP-FA) : TL



Electrical Connection



SANYO Semiconductor Co., Ltd.

<http://semicon.sanyo.com/en/network>

2SB1215/2SD1815

Continued from preceding page.

| Parameter | Symbol | Conditions | Ratings | Unit |
|-----------------------|------------------|----------------------|-------------|------|
| Collector Dissipation | P _C | | 1 | W |
| | | T _C =25°C | 20 | W |
| Junction Temperature | T _J | | 150 | °C |
| Storage Temperature | T _{stg} | | -55 to +150 | °C |

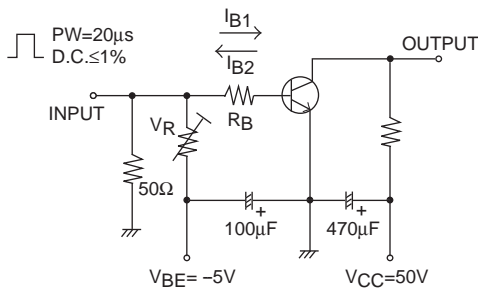
Electrical Characteristics at T_a=25°C

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|----------------------|--|---------|-----------|-----------|------|
| | | | min. | typ. | max. | |
| Collector Cutoff Current | I _{CBO} | V _{CB} =(-)100V, I _E =0A | | | (-)1 | μA |
| Emitter Cutoff Current | I _{EBO} | V _{EB} =(-)4V, I _C =0A | | | (-)1 | μA |
| DC Current Gain | h _{FE1} | V _{CE} =(-)5V, I _C =(-)0.5A | 70* | | 400* | |
| | h _{FE2} | V _{CE} =(-)5V, I _C =(-)2A | 40 | | | |
| Gain-Bandwidth Product | f _T | V _{CE} =(-)10V, I _C =(-)0.5A | | (130)180 | | MHz |
| Output Capacitance | C _{ob} | V _{CB} =(-)10V, f=1MHz | | (40)25 | | pF |
| Collector-to-Emitter Saturation Voltage | V _{CE(sat)} | I _C =(-)1.5A, I _B =(-)0.15A | | (-200)150 | (-500)400 | mV |
| Base-to-Emitter Saturation Voltage | V _{BE(sat)} | V _{CE} =(-)1.5A, I _C =(-)0.15A | | (-)0.9 | (-)1.2 | V |
| Collector-to-Base Breakdown Voltage | V(BR)CBO | I _C =(-)10μA, I _E =0A | (-)120 | | | V |
| Collector-to-Emitter Breakdown Voltage | V(BR)CEO | I _C =(-)1mA, R _{BE} =∞ | (-)100 | | | V |
| Emitter-to-Base Breakdown Voltage | V(BR)EBO | I _E =(-)10μA, I _C =0A | (-)6 | | | V |
| Turn-On Time | t _{on} | See specified Test Circuit. | | 100 | | ns |
| Storage Time | t _{stg} | | | (800)900 | | ns |
| Fall Time | t _f | | | 50 | | ns |

* : The 2SB1215/2SD1815 are classified by 100mA h_{FE} as follows :

| Rank | Q | R | S | T |
|-----------------|-----------|------------|------------|------------|
| h _{FE} | 70 to 140 | 100 to 200 | 140 to 280 | 200 to 400 |

Switching Time Test Circuit



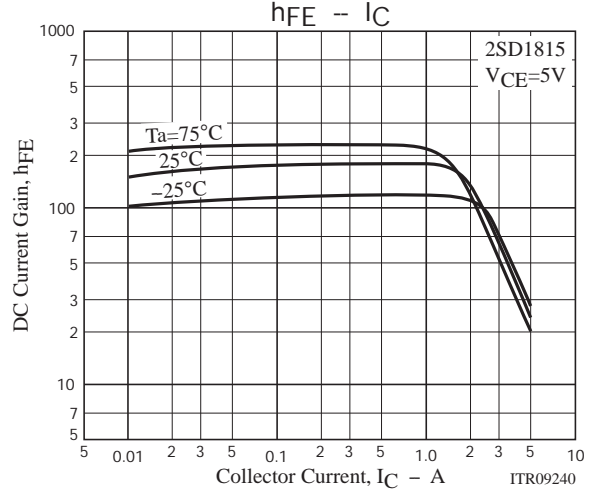
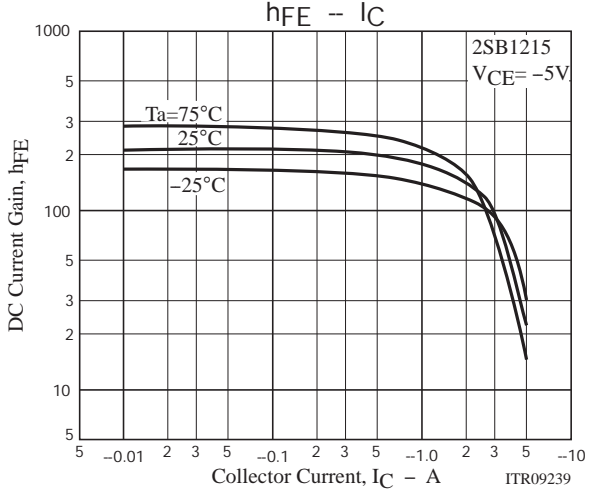
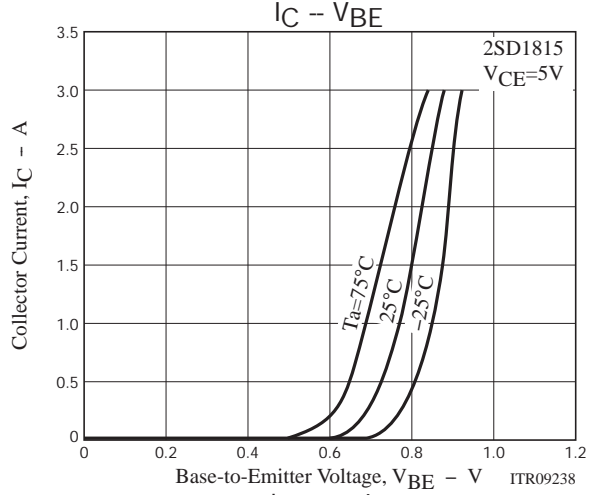
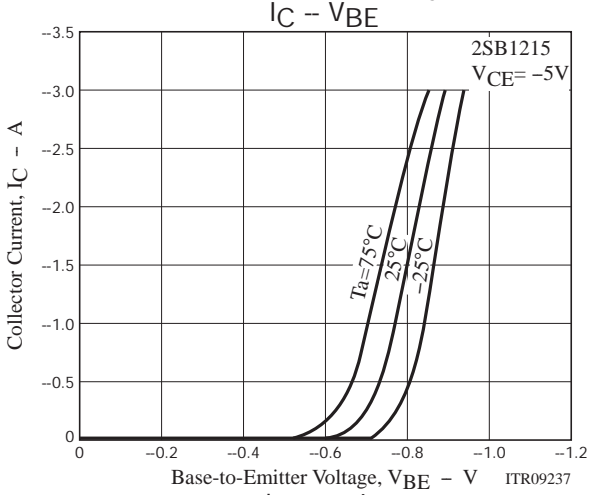
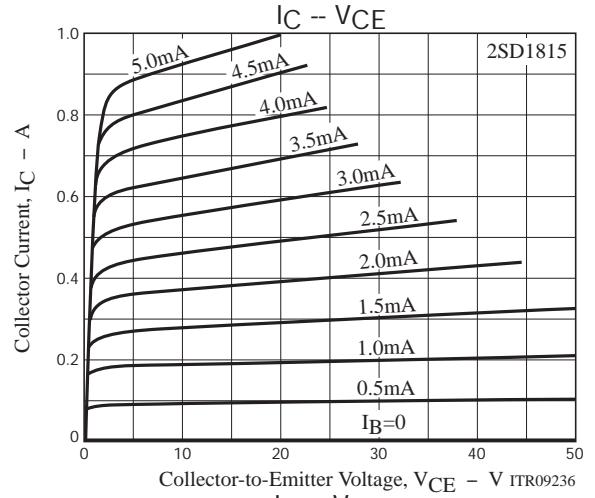
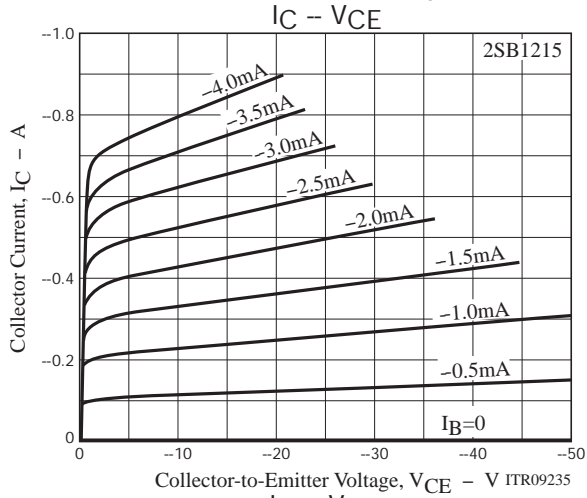
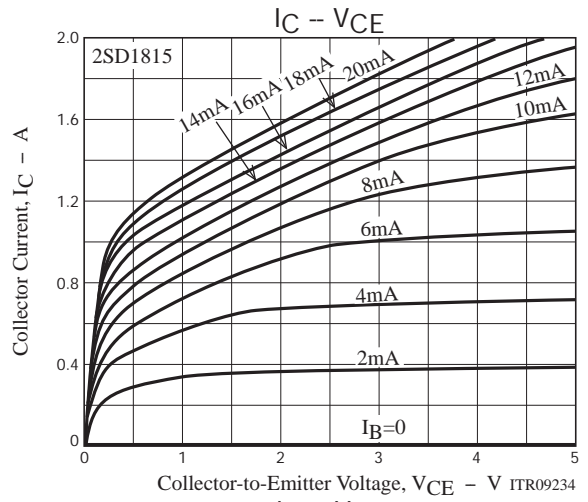
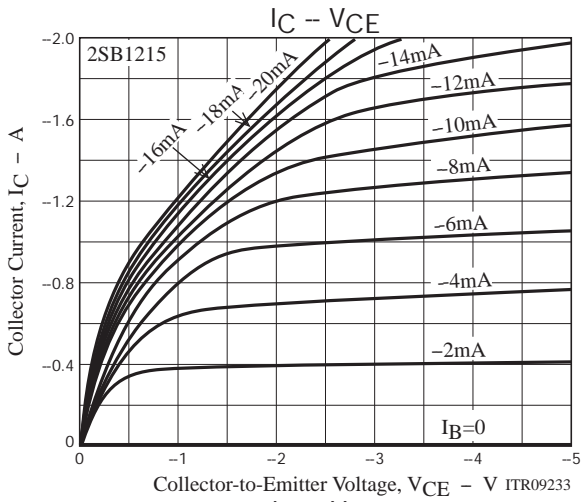
$$I_C = 10I_{B1} = -10I_{B2} = 1.5A$$

For PNP, the polarity is reversed.

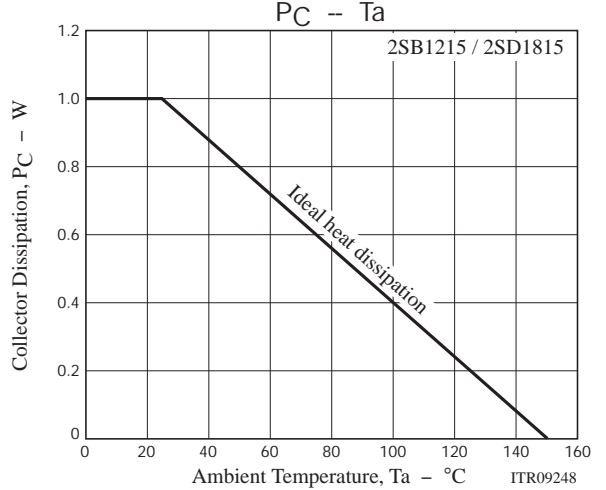
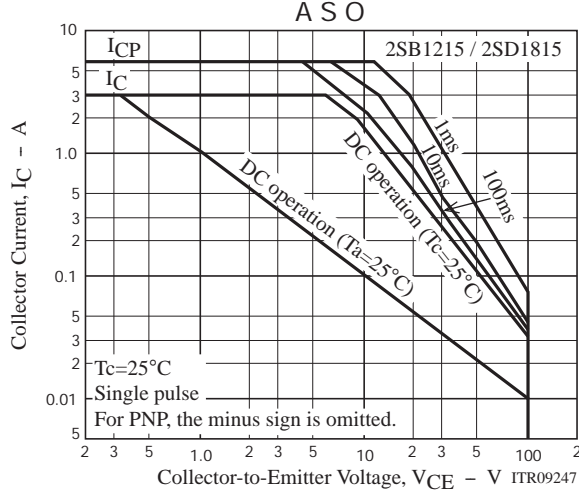
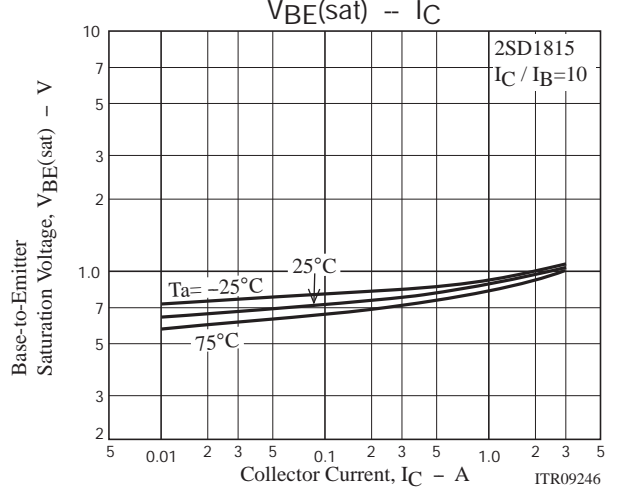
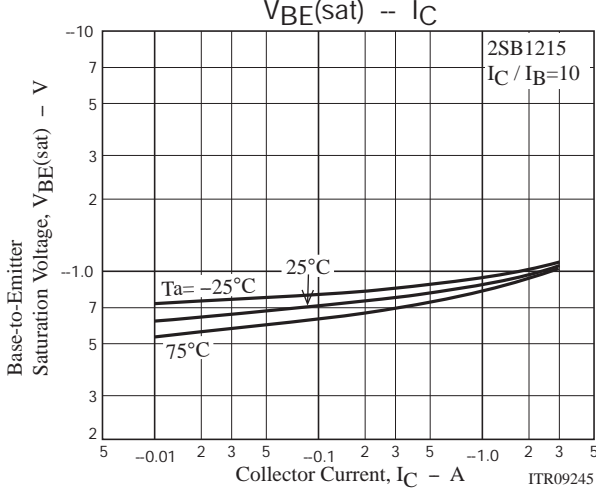
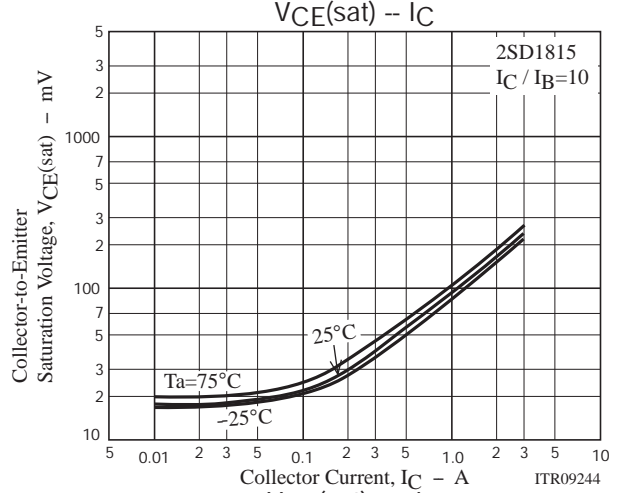
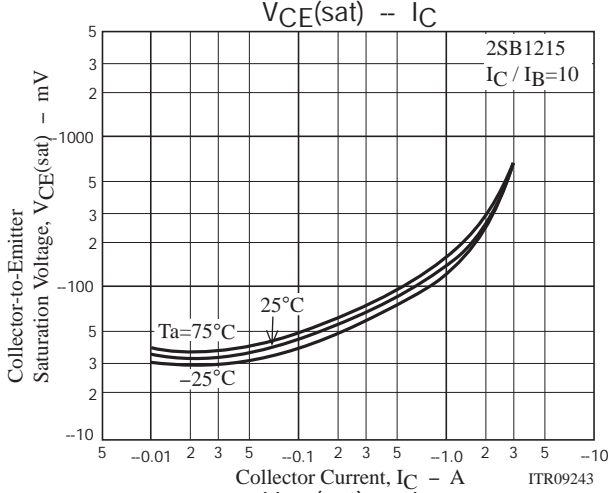
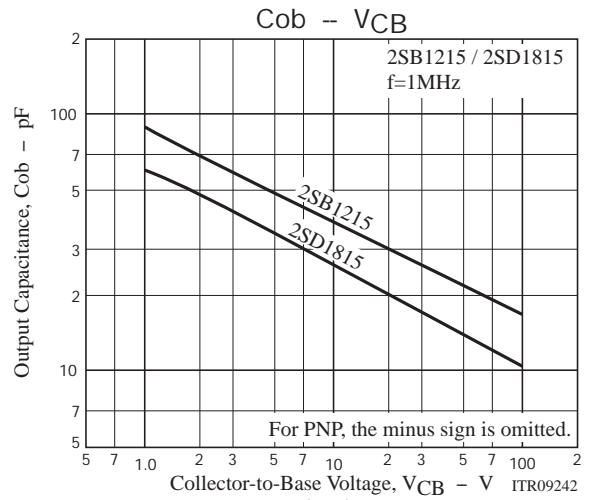
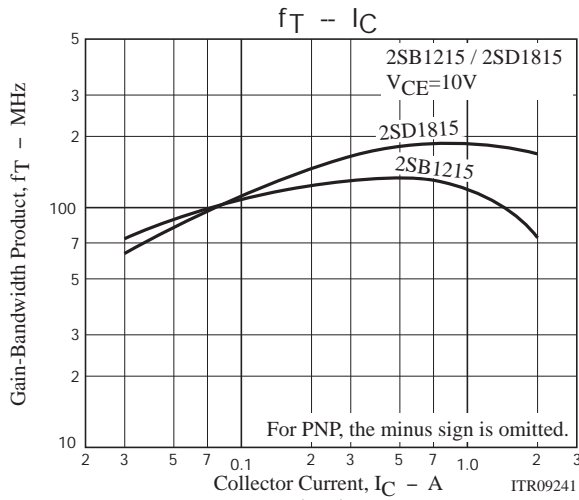
Ordering Information

| Device | Package | Shipping | memo |
|---------------|---------|--------------|--------------------------|
| 2SB1215S-E | TP | 500pcs./bag | Pb Free |
| 2SB1215S-H | TP | 500pcs./bag | Pb Free and Halogen Free |
| 2SB1215T-E | TP | 500pcs./bag | Pb Free |
| 2SB1215T-H | TP | 500pcs./bag | Pb Free and Halogen Free |
| 2SD1815S-E | TP | 500pcs./bag | Pb Free |
| 2SD1815S-H | TP | 500pcs./bag | Pb Free and Halogen Free |
| 2SD1815T-E | TP | 500pcs./bag | Pb Free |
| 2SD1815T-H | TP | 500pcs./bag | Pb Free and Halogen Free |
| 2SB1215S-TL-E | TP-FA | 700pcs./reel | Pb Free |
| 2SB1215S-TL-H | TP-FA | 700pcs./reel | Pb Free and Halogen Free |
| 2SB1215T-TL-E | TP-FA | 700pcs./reel | Pb Free |
| 2SB1215T-TL-H | TP-FA | 700pcs./reel | Pb Free and Halogen Free |
| 2SD1815S-TL-E | TP-FA | 700pcs./reel | Pb Free |
| 2SD1815S-TL-H | TP-FA | 700pcs./reel | Pb Free and Halogen Free |
| 2SD1815T-TL-E | TP-FA | 700pcs./reel | Pb Free |
| 2SD1815T-TL-H | TP-FA | 700pcs./reel | Pb Free and Halogen Free |

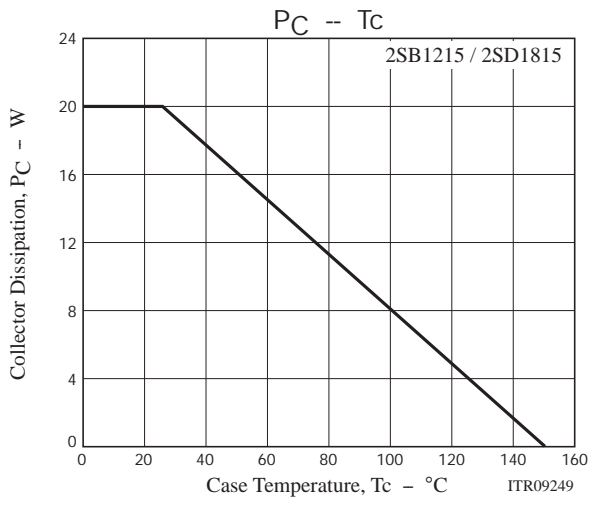
2SB1215/2SD1815



2SB1215/2SD1815



2SB1215/2SD1815



2SB1215/2SD1815

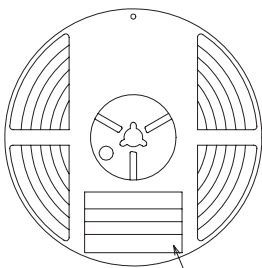
Taping Specification

2SB1215S-TL-E, 2SB1215S-TL-H, 2SB1215T-TL-E, 2SB1215T-TL-H, 2SD1815S-TL-E, 2SD1815S-TL-H, 2SD1815T-TL-E, 2SD1815T-TL-H

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



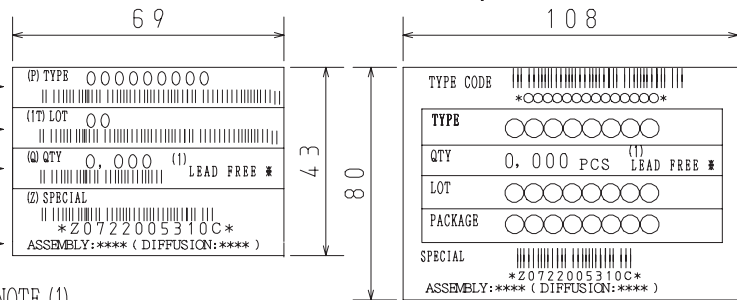
Reel label

Type No.
LOT No.
Quantity
Origin

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.



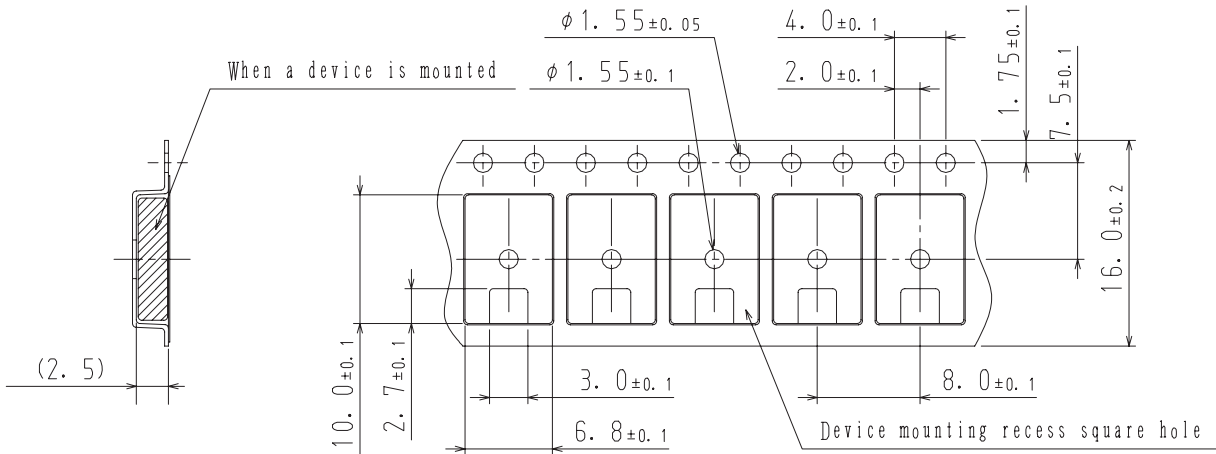
NOTE (1)

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

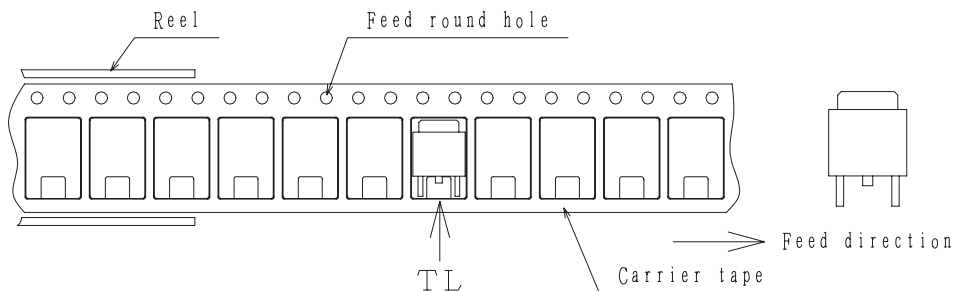
| Label | JEITA Phase |
|-------------|----------------|
| LEAD FREE 3 | JEITA Phase 3A |
| LEAD FREE 4 | JEITA Phase 3 |

Taping configuration

1. Carrier tape size (unit:mm)



2. Device placement direction

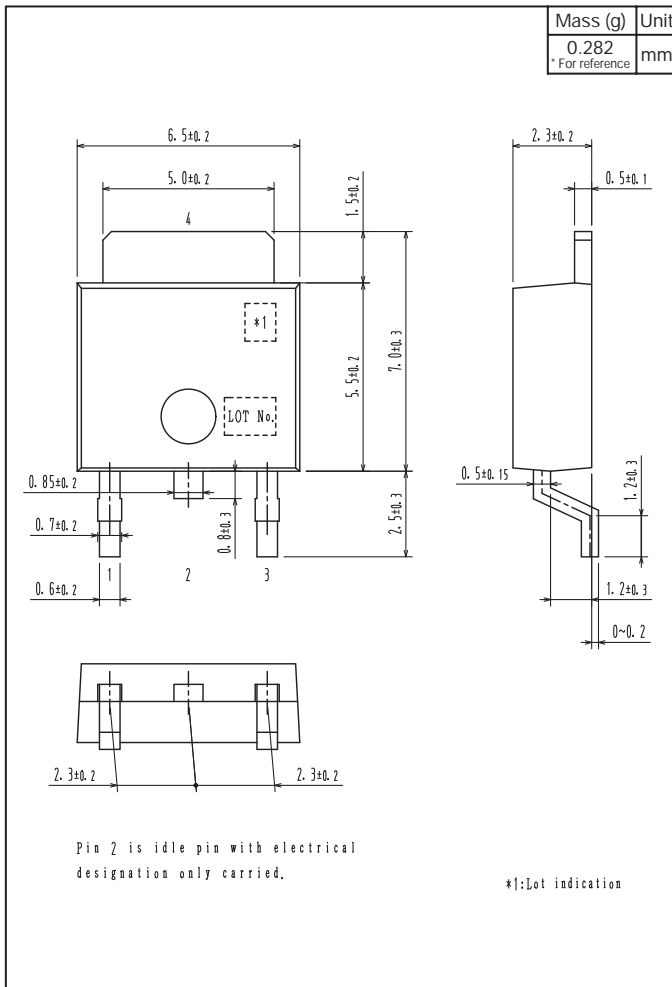


Those with one electrode terminal on the feed hole side.....TL

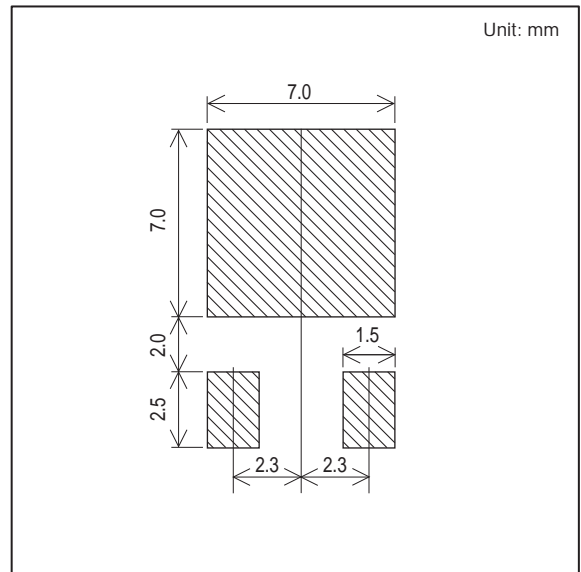
2SB1215/2SD1815

Outline Drawing

2SB1215S-TL-E, 2SB1215S-TL-H, 2SB1215T-TL-E, 2SB1215T-TL-H, 2SD1815S-TL-E, 2SD1815S-TL-H, 2SD1815T-TL-E, 2SD1815T-TL-H



Land Pattern Example



2SB1215/2SD1815

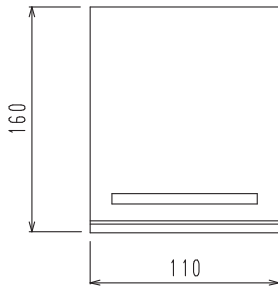
Bag Packing Specification

2SB1215S-E, 2SB1215S-H, 2SB1215T-E/2SB1215T-H, 2SD1815S-E, 2SD1815S-H, 2SD1815T-E, 2SD1815T-H

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 |



2SB1215/2SD1815

Outline Drawing

2SB1215S-E, 2SB1215S-H, 2SB1215T-E, 2SB1215T-H, 2SD1815S-E, 2SD1815S-H, 2SD1815T-E, 2SD1815T-H



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