



2SD1835

Bipolar Transistor 50V, 2A, Low VCE(sat), NPN Single NP

ON Semiconductor®

<http://onsemi.com>

Applications

- Voltage regulators, relay drivers, lamp drivers, electrical equipment

Features

- Adoption of FBET, MBIT processes
- Low collector-to-emitter saturation voltage
- Large current capacity
- Fast switching time

Specifications

Absolute Maximum Ratings at Ta=25°C

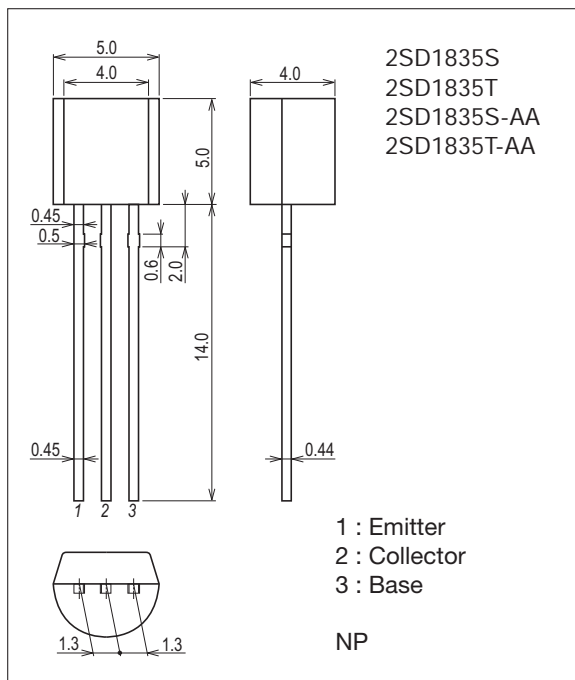
| Parameter | Symbol | Conditions | Ratings | Unit |
|------------------------------|--------|------------|-------------|------|
| Collector-to-Base Voltage | VCBO | | 60 | V |
| Collector-to-Emitter Voltage | VCEO | | 50 | V |
| Emitter-to-Base Voltage | VEBO | | 6 | V |
| Collector Current | IC | | 2 | A |
| Collector Current (Pulse) | ICP | | 3 | A |
| Collector Dissipation | PC | | 0.75 | W |
| Junction Temperature | Tj | | 150 | °C |
| Storage Temperature | Tstg | | -55 to +150 | °C |

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Package Dimensions

unit : mm (typ)

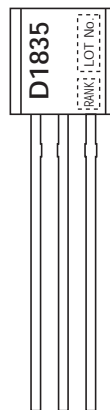
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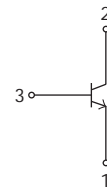
Product & Package Information

- Package : NP
- JEITA, JEDEC : SC-34A, TO-92, TO-226AA, SOT-54
- Minimum Packing Quantity : 1,500 pcs./box, 500pcs./bag

Marking



Electrical Connection



2SD1835

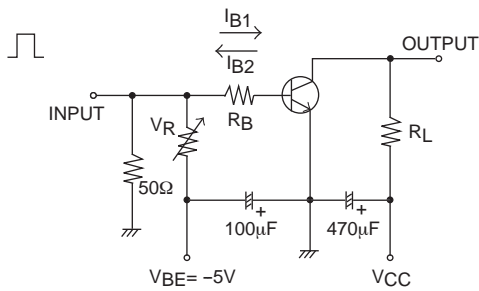
Electrical Characteristics at Ta=25°C

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|----------------------|--|---------|------|------|------|
| | | | min | typ | max | |
| Collector Cutoff Current | ICBO | V _{CB} =50V, I _E =0A | | | 100 | nA |
| Emitter Cutoff Current | I _{EBO} | V _{EB} =4V, I _C =0A | | | 100 | nA |
| DC Current Gain | h _{FE1} | V _{CE} =2V, I _C =100mA | 100* | | 560* | |
| | h _{FE2} | V _{CE} =2V, I _C =1.5A | 40 | | | |
| Gain-Bandwidth Product | f _T | V _{CE} =10V, I _C =50mA | | 150 | | MHz |
| Output Capacitance | C _{ob} | V _{CB} =10V, f=1MHz | | 12 | | pF |
| Collector-to-Emitter Saturation Voltage | V _{CE(sat)} | I _C =1A, I _B =50mA | | 0.15 | 0.4 | V |
| Base-to-Emitter Saturation Voltage | V _{BE(sat)} | I _C =1A, I _B =50mA | | 0.9 | 1.2 | V |
| Collector-to-Base Breakdown Voltage | V _{(BR)CBO} | I _C =10μA, I _E =0A | 60 | | | V |
| Collector-to-Emitter Breakdown Voltage | V _{(BR)CEO} | I _C =1mA, R _{BE} =∞ | 50 | | | 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. | | 60 | | ns |
| Storage Time | t _{stg} | | | 550 | | ns |
| Fall Time | t _f | | | 30 | | ns |

* : The 2SD1835 is classified by 100mA h_{FE} as follows :

| Rank | R | S | T | U |
|-----------------|------------|------------|------------|------------|
| h _{FE} | 100 to 200 | 140 to 280 | 200 to 400 | 280 to 560 |

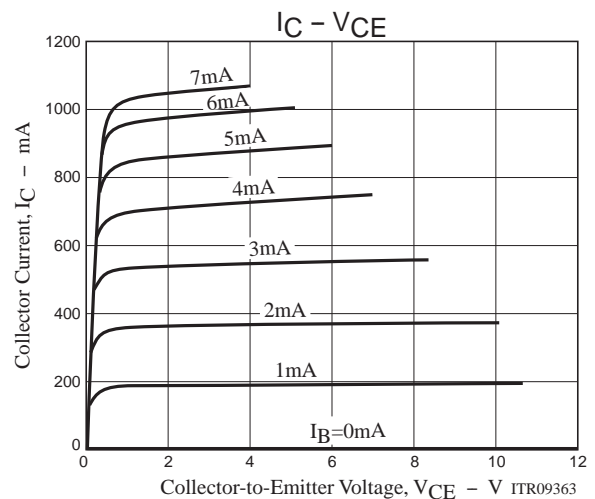
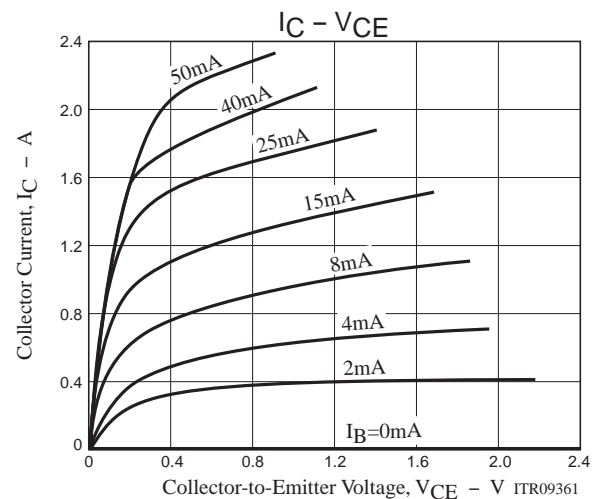
Switching Time Test Circuit

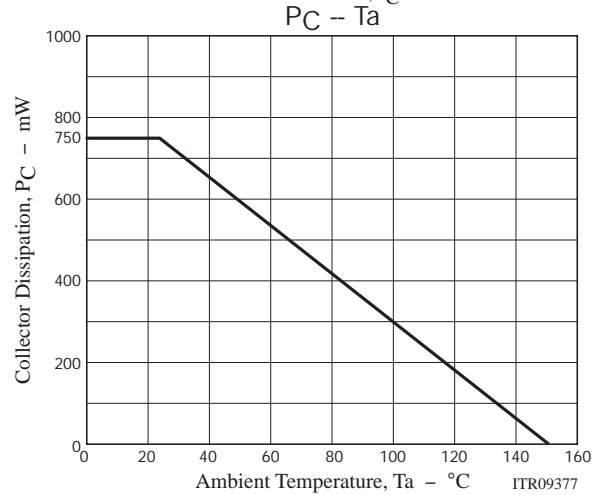
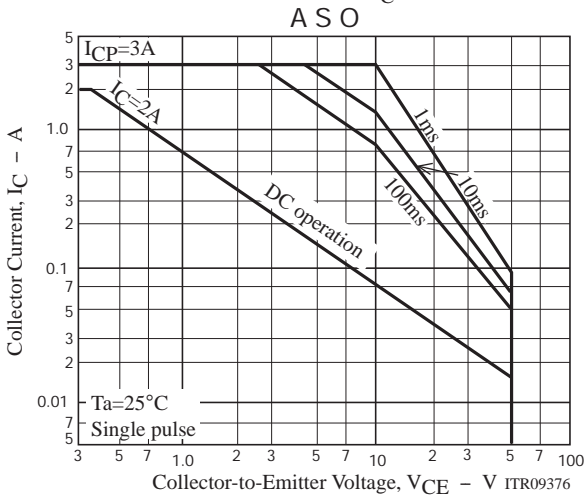
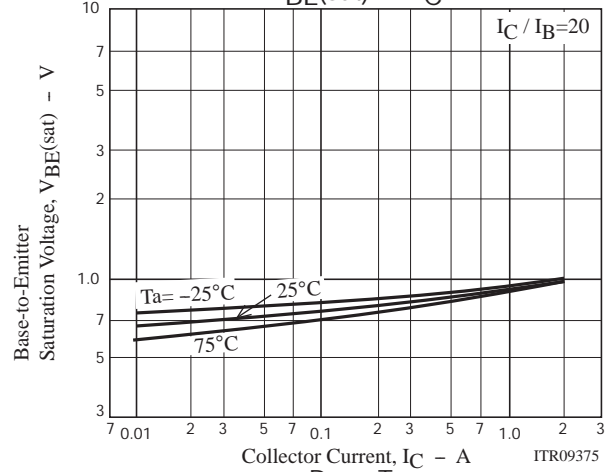
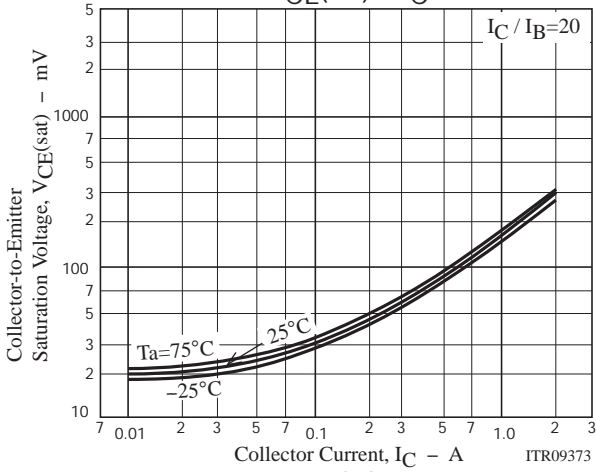
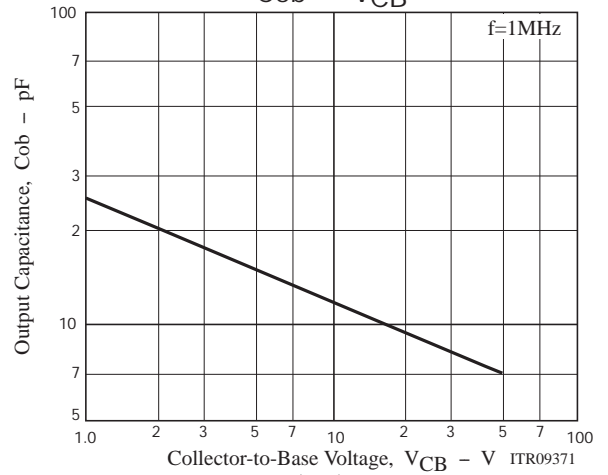
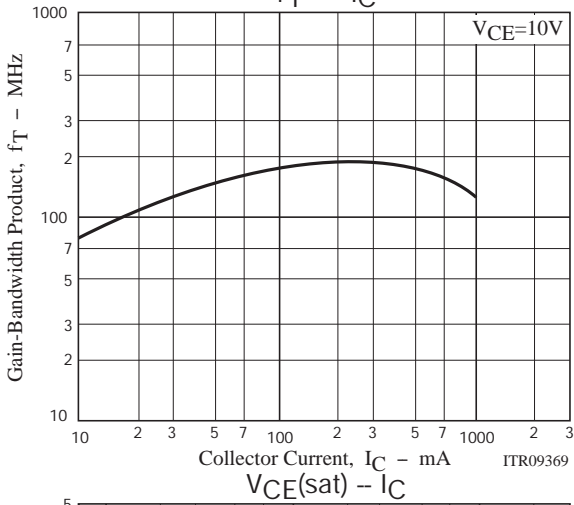
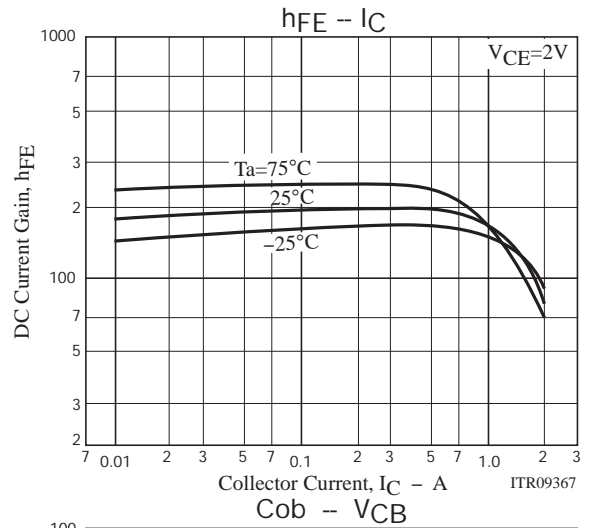
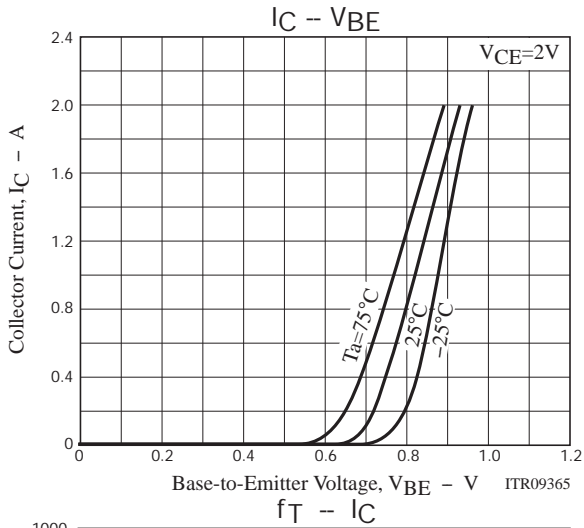


$$I_C = 10I_{B1} = -10I_{B2} = 500\text{mA}, V_{CC} = 25\text{V}$$

Ordering Information

| Device | Package | Shipping | memo |
|-------------|---------|---------------|---------|
| 2SD1835S | NP | 500pcs./bag | Pb Free |
| 2SD1835T | NP | 500pcs./bag | |
| 2SD1835S-AA | NP | 1,500pcs./box | |
| 2SD1835T-AA | NP | 1,500pcs./box | |





Taping Specification

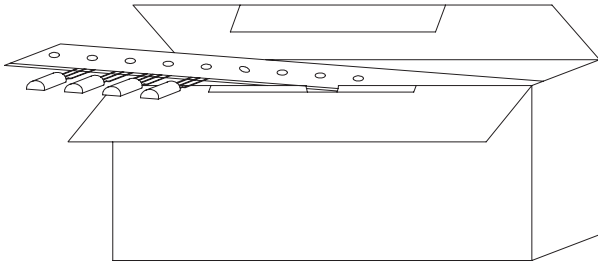
2SD1835S-AA, 2SD1835T-AA

1. Packing Format

| Package Name | Packing Type | Maximum Number of devices contained (pcs) | | Packing format |
|--------------|--------------|---|---------------------|---|
| | | Inner BOX (C-2) | number of contained | |
| N P | A A | Dimensions:mm (external) 330×45×145 | 1,500 | 16 inner boxes contained (24,000pcs) Dimensions:mm (external) 585×345×200 |

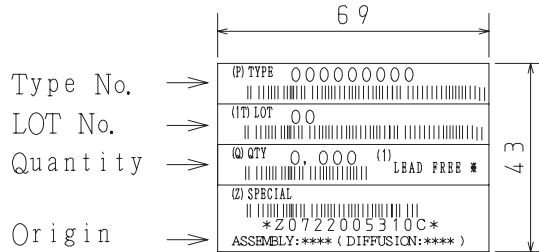
Packing method

Put zigzag folding in an inner box.



Inner box label

(unit:mm)



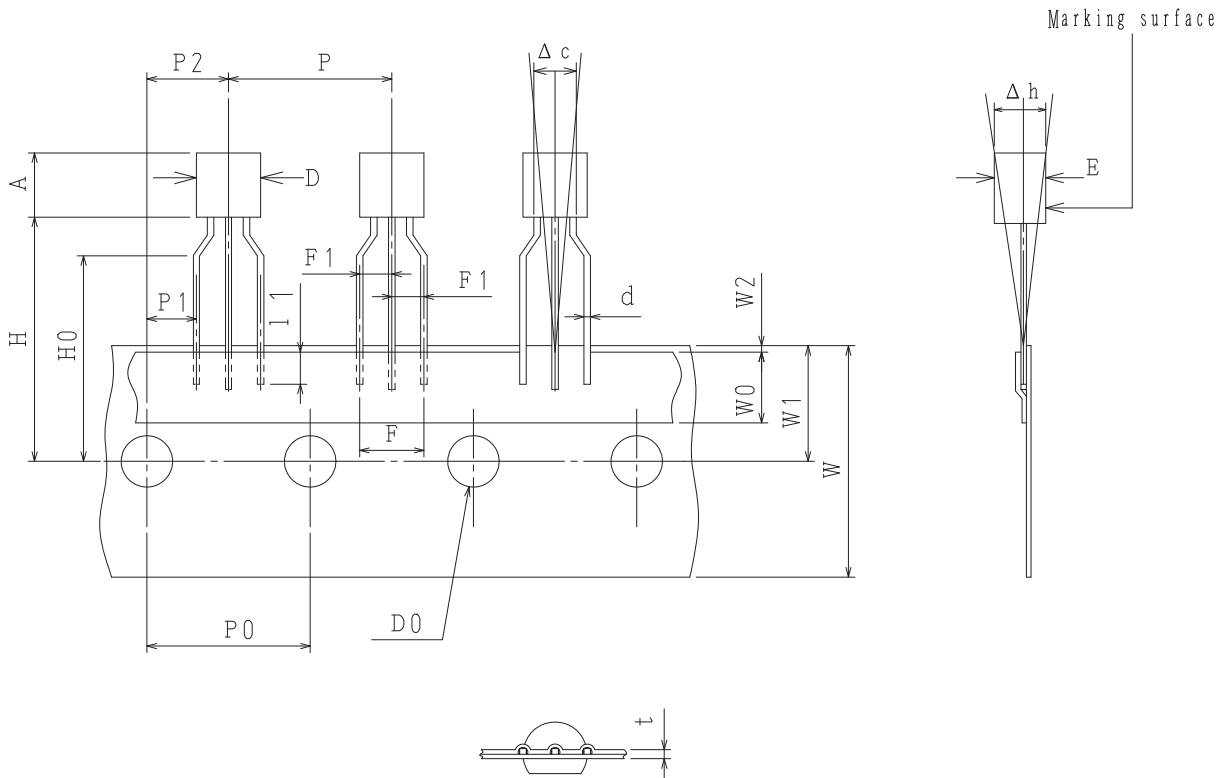
NOTE (1)

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 |

2. Taping specifications

2-1. Carrier tape size



2-2. Taping size standard

unit:mm

| Item | Symbol | Standard | Tolerance | |
|------------------------------------|--------|------------|--------------|--|
| Work piece outside diameter | D | 5.0 | ±0.2 | |
| | E | 4.0 | ±0.2 | |
| Work piece height | A | 5.0 | ±0.2 | |
| Lead wire diameter | d | 0.45×0.44t | ±0.1 | |
| Bonded lead wire | l1 | 2.0MIN | | |
| Pitch between products | P | 12.7 | ±0.5 | |
| Pitch between perforations | P0 | 12.7 | ±0.2 | |
| Distance between lead wire | F | 5.0 | +0.8 -0.2 | |
| Lead wire pitch distance | F1 | 2.5 | +0.2 -0.1 | |
| Product inclination | Δh | 0 | ±2.0 | |
| Displacement of perforations | P1 | 3.85 | ±0.3 | Measurement position is the bottom of the clinch |
| | P2 | 6.35 | ±0.3 | |
| Displacement of tape | W2 | 0.5MAX | | Not to be displaced to the outside of the board |
| Tape width | W | 18.0 | +1.0 -0.5 | |
| Adhesive tape | W0 | 6.0 | ±1.5 | |
| Displacement of perforations | W1 | 9.0 | ±0.5 | |
| Work piece bottom surface position | H | 19.0 | ±1.0 | |
| Insert stopper position | H0 | 16.0 | ±0.5 | |
| Work piece upper limit position | H1 | 24.5 | ±1.5 | |
| Perforations diameter | D0 | φ4.0 | ±0.2 | |
| Tape thickness | t | 0.6 | ±0.2 | |
| Product inclination | Δc | 0 | ±1.0 | |

Bag Packing Specification

2SD1835S, 2SD1835T

1. Packing condition

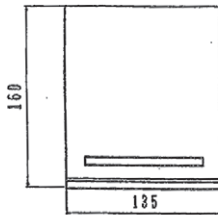
| Storage package outline name | Maximum number of devices contained (pcs.) | | Packing condition | | |
|------------------------------|--|---|-------------------|---|---|
| | Bags | Inner box | Devices contained | Outer box (A-1) | Outer box (A-2) |
| NP | 500 | B-1 Inner box dimensions : mm (external) 445×225×55 | 10,000 | 5 inner boxes contained 50,000 Outer box dimensions : mm (external) 470 × 250 × 300 | 3 inner boxes contained 30,000 Outer box dimensions : mm (external) 470 × 250 × 190 |

3. Bar code label

(Unit : mm)

2. Bag dimensions

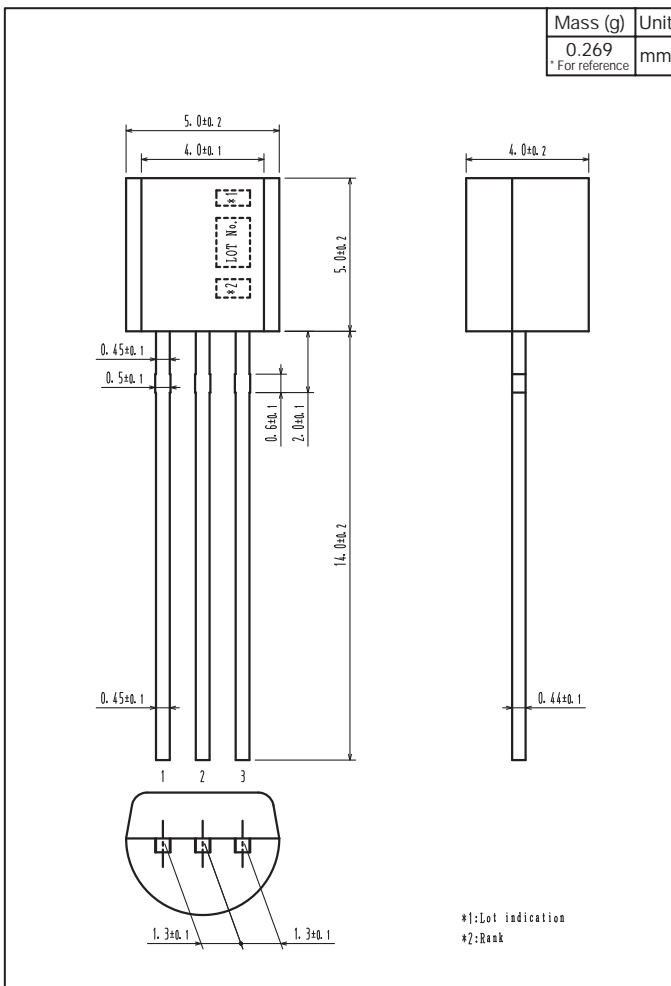
(Unit : mm)



*LEAD FREE 1 :
Lead-free External terminal surface
treatment product.

Outline Drawing

2SD1835S, 2SD1835T



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