



SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

2SB1143/2SD1683 — PNP/NPN Epitaxial Planar Silicon Transistor 50V/4A Switching Applications

Applications

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

Features

- Adoption of FBET, MBIT processes
- Large current capacity and wide ASO
- Low saturation voltage

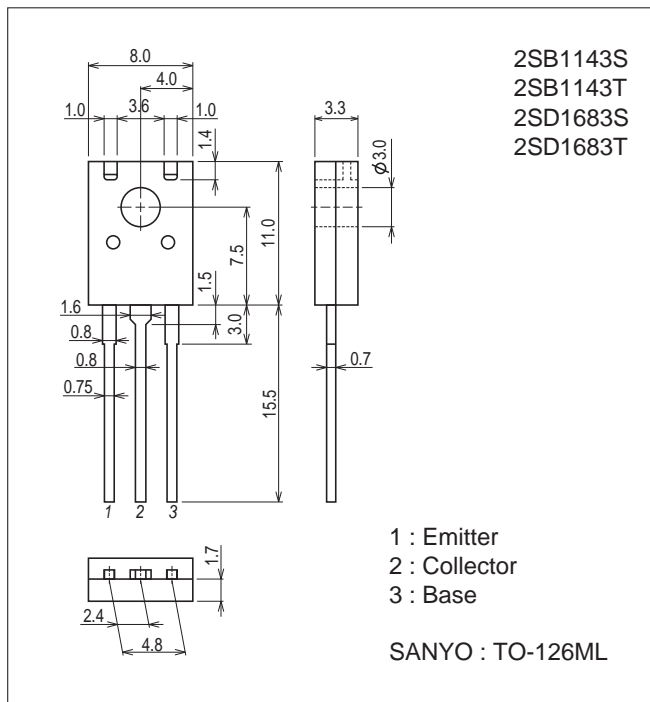
Specifications () : 2SB1143

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 | | (-)4 | A |
| Collector Current (Pulse) | ICP | | (-)6 | A |
| Collector Dissipation | PC | | 1.5 | W |
| | | Tc=25°C | 10 | W |
| Junction Temperature | Tj | | 150 | °C |
| Storage Temperature | Tstg | | -55 to +150 | °C |

Package Dimensions

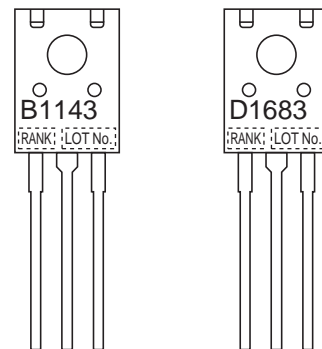
unit : mm (typ)
7516A-002



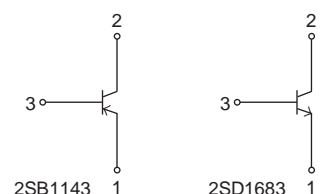
Product & Package Information

- Package : TO-126ML
- JEITA, JEDEC : TO-126
- Minimum Packing Quantity : 200 pcs./bag

Marking



Electrical Connection



2SB1143/2SD1683

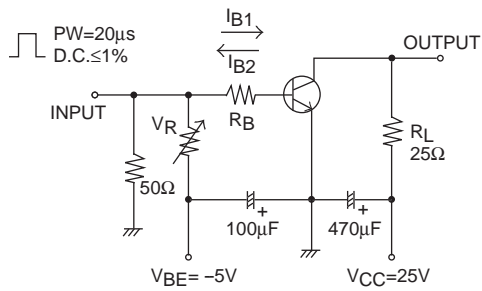
Electrical Characteristics at Ta=25°C

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|----------------------|--|---------|-----------|-----------|------|
| | | | min | typ | max | |
| Collector Cutoff Current | ICBO | V _{CB} =(-)40V, I _E =0A | | | (-)1 | μA |
| Emitter Cutoff Current | IEBO | V _{EB} =(-)4V, I _C =0A | | | (-)1 | μA |
| DC Current Gain | h _{FE1} | V _{CE} =(-)2V, I _C =(-)100mA | 100* | | 560* | |
| | h _{FE2} | V _{CE} =(-)2V, I _C =(-)3A | 40 | | | |
| Gain-Bandwidth Product | f _T | V _{CE} =(-)10V, I _C =(-)50mA | | 150 | | MHz |
| Output Capacitance | C _{ob} | V _{CB} =(-)10V, f=1MHz | | (39)25 | | pF |
| Collector-to-Emitter Saturation Voltage | V _{CE(sat)} | I _C =(-)2A, I _B =(-)100mA | | (-350)190 | (-700)500 | mV |
| Base-to-Emitter Saturation Voltage | V _{BE(sat)} | I _C =(-)2A, I _B =(-)100mA | | (-)0.94 | (-)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. | | (70)70 | | ns |
| Storage Time | t _{stg} | | | (450)650 | | ns |
| Fall Time | t _f | | | (30)35 | | ns |

* : The 2SB1143/2SD1683 are 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

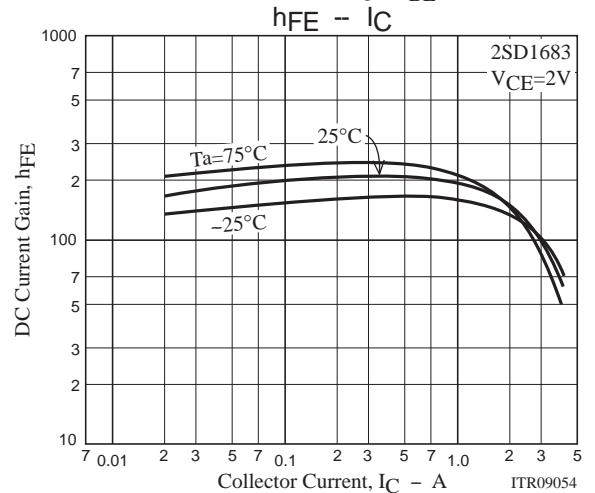
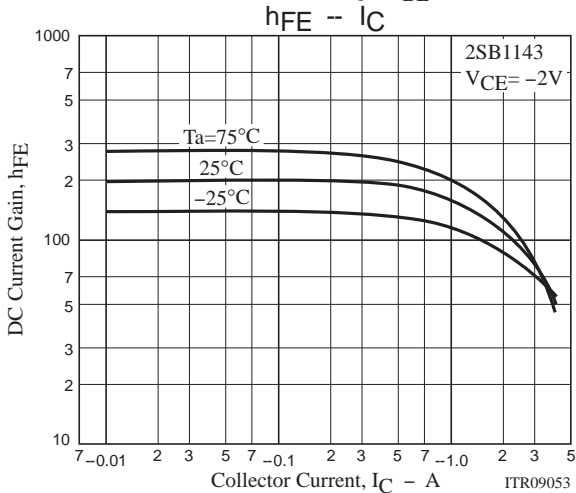
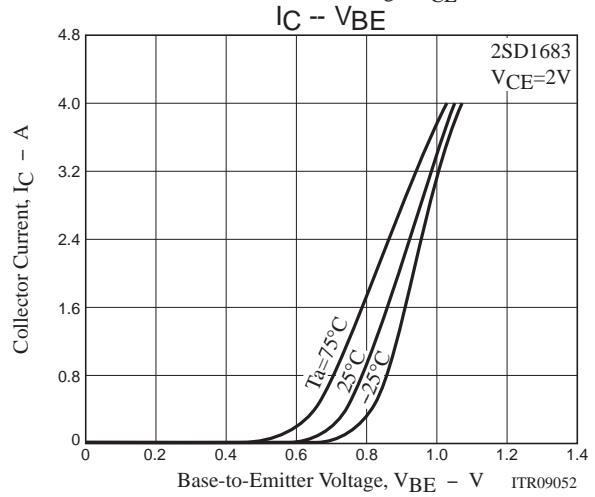
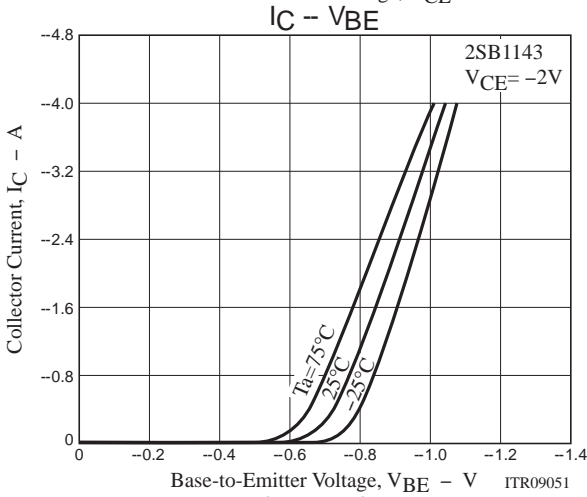
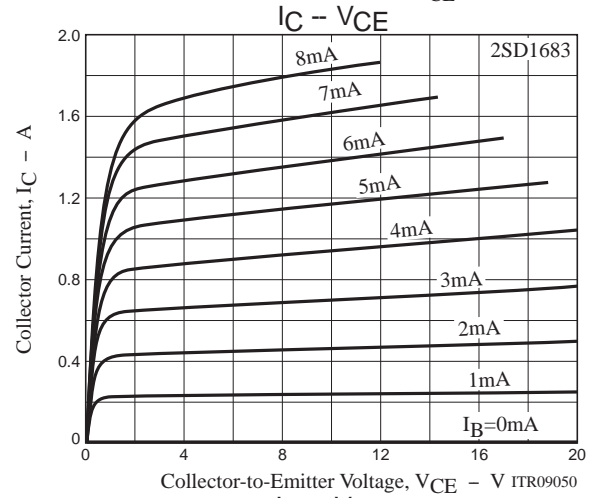
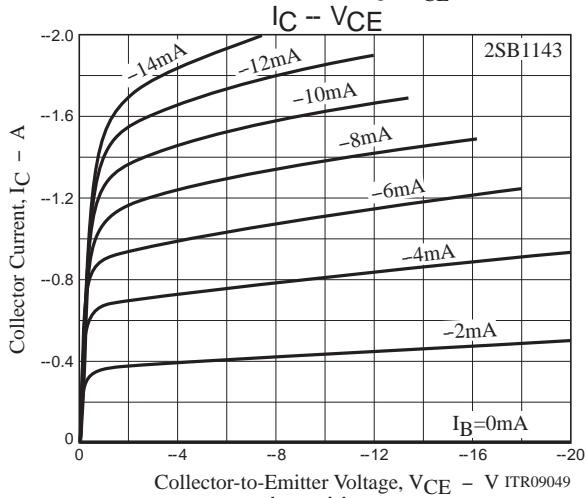
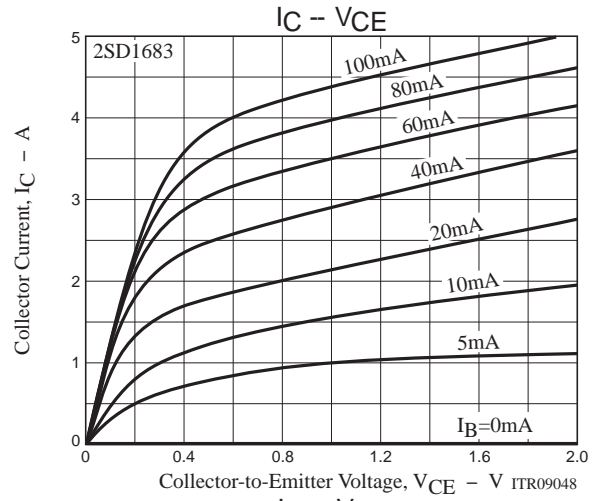
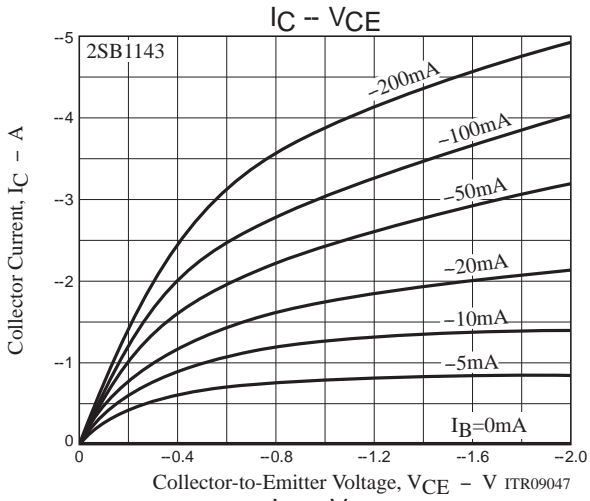


$I_C = 10I_{B1} = -10I_{B2} = 1A$
 (For PNP, the polarity is reversed.)

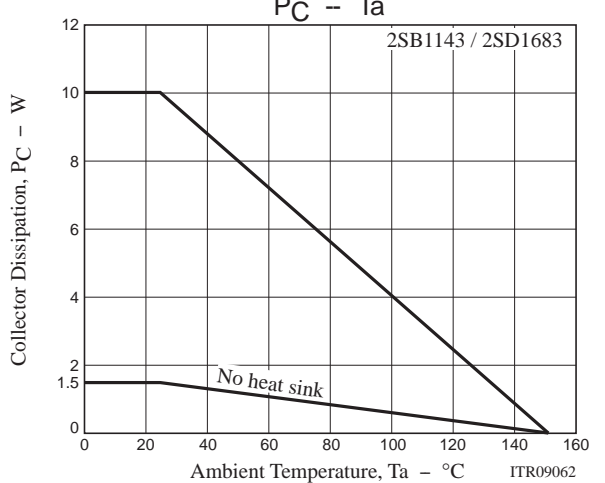
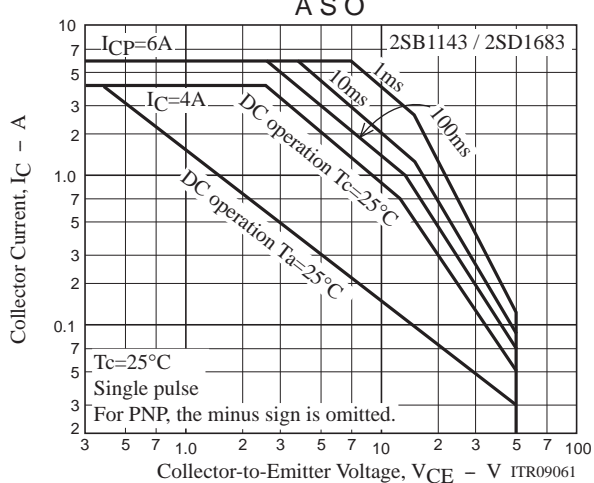
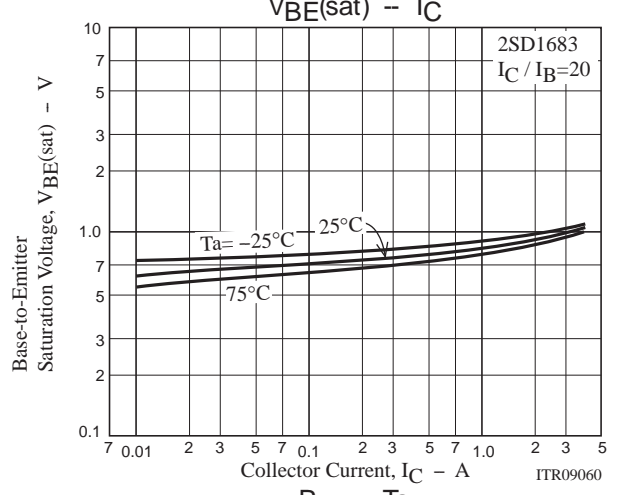
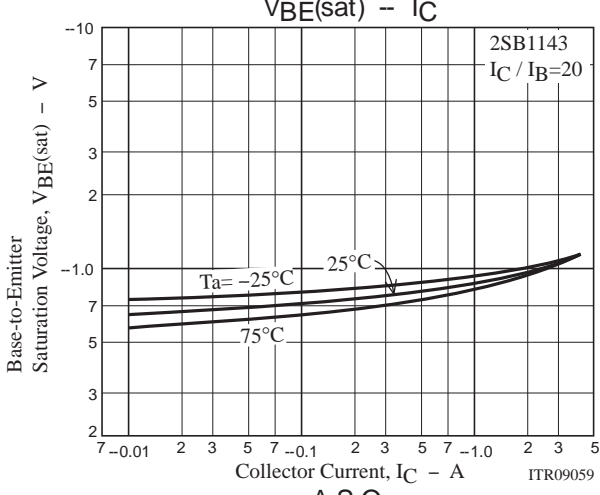
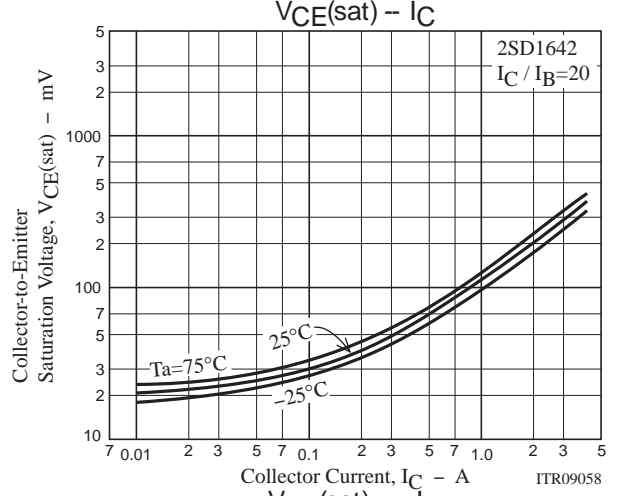
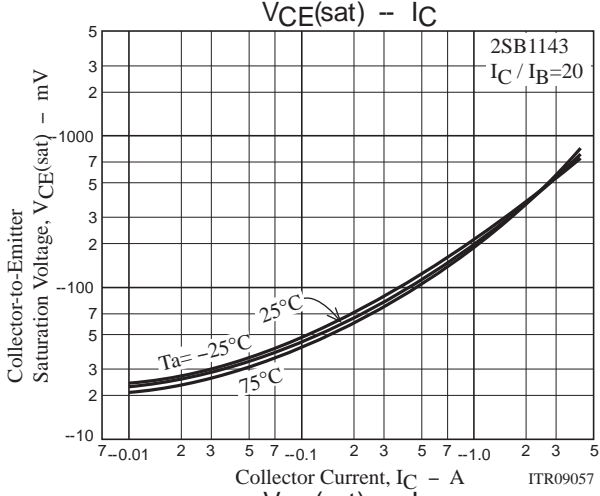
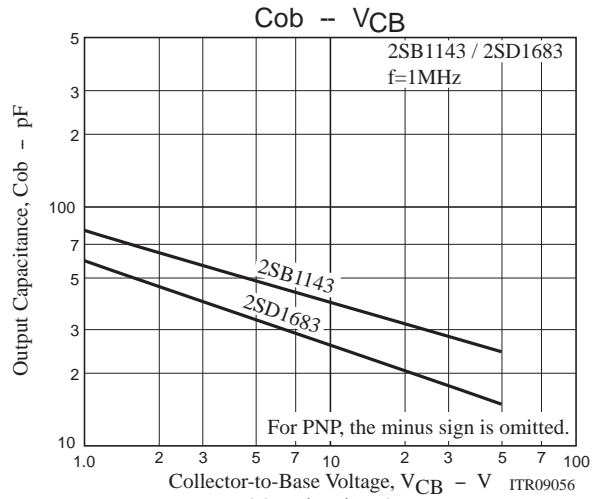
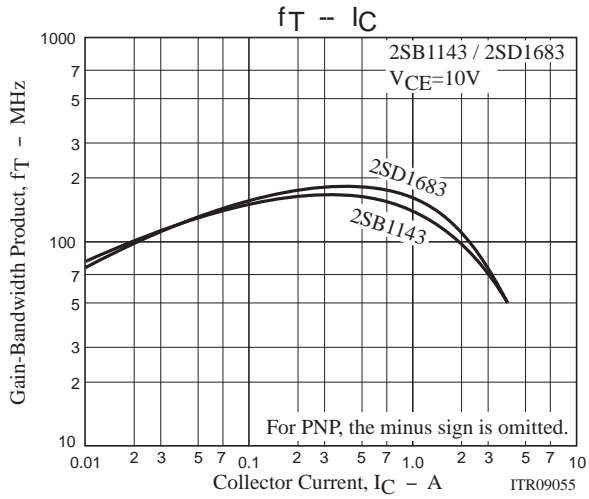
Ordering Information

| Device | Package | Shipping | memo |
|----------|----------|-------------|---------|
| 2SB1143S | TO-126ML | 200pcs./bag | Pb Free |
| 2SB1143T | TO-126ML | 200pcs./bag | |
| 2SD1683S | TO-126ML | 200pcs./bag | |
| 2SD1683T | TO-126ML | 200pcs./bag | |

2SB1143/2SD1683



2SB1143/2SD1683



Bag Packing Specification

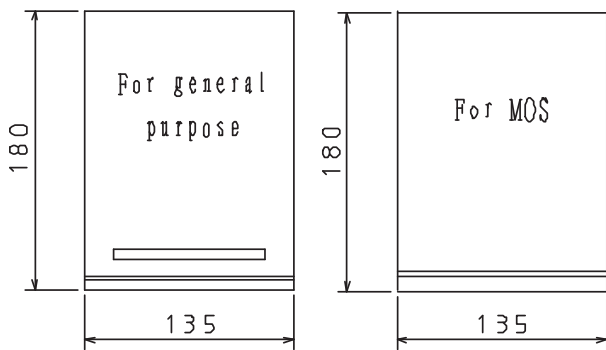
2SB1143S, 2SB1143T, 2SD1683S, 2SD1683T

1. Packing Format

| Package Name | Maximum Number of devices contained (pcs) | | | Packing format | |
|--------------|---|-----------|-----------|--|---|
| | Bag | Inner box | Outer box | Inner BOX | Outer BOX |
| TO-126ML | 200 | 4,000 | 12,000 | B-1 20 bags contained Dimensions:mm (external) 445×225×55 | A-2 3 inner boxes contained Dimensions:mm (external) 470×250×190 |

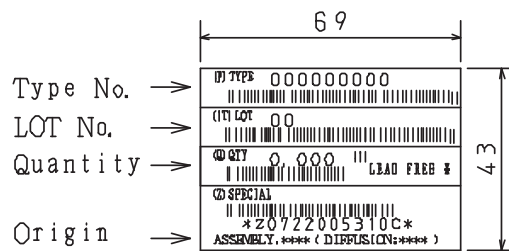
2. Bag dimensions

(unit:mm)



3. Bag label, Inner box label

(unit:mm)



NOTE (1)

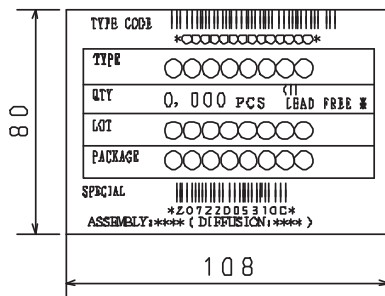
The LEAD FREE * description shows that the surface treatment of the terminal is lead free.

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

4. Outer box label

(unit:mm)

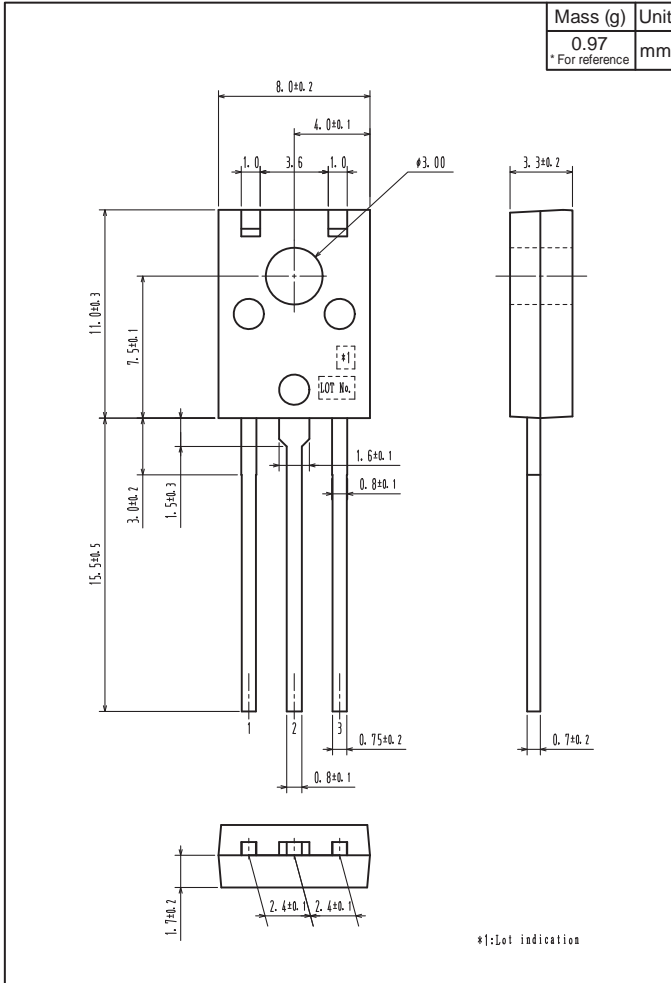
It is a label at the time of factory shipments.
The form of a label may change in physical distribution process.



2SB1143/2SD1683

Outline Drawing

2SB1143S, 2SB1143T, 2SD1683S, 2SD1683T



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