



2SD1805

Bipolar Transistor 20V, 5A, Low VCE(sat), NPN Single TP/TP-FA

ON Semiconductor®

<http://onsemi.com>

Applications

- Strobes, voltage regulators, relay drivers, lamp drivers

Features

- Low saturation voltage
- Fast switching time
- Large current capacity
- Small and slim package making it easy to make 2SD1805-applied sets smaller

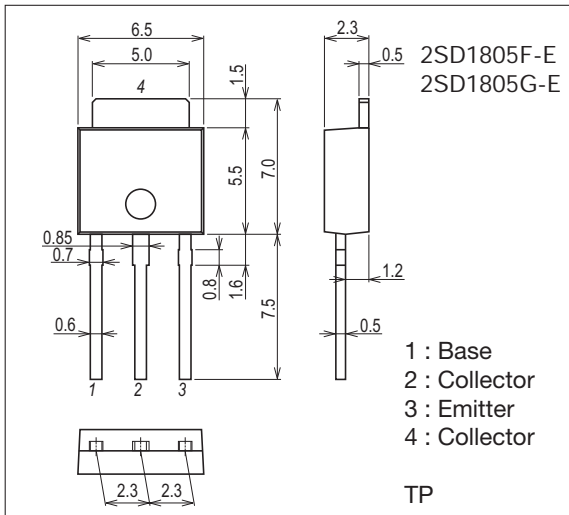
Specifications

Absolute Maximum Ratings at Ta=25°C

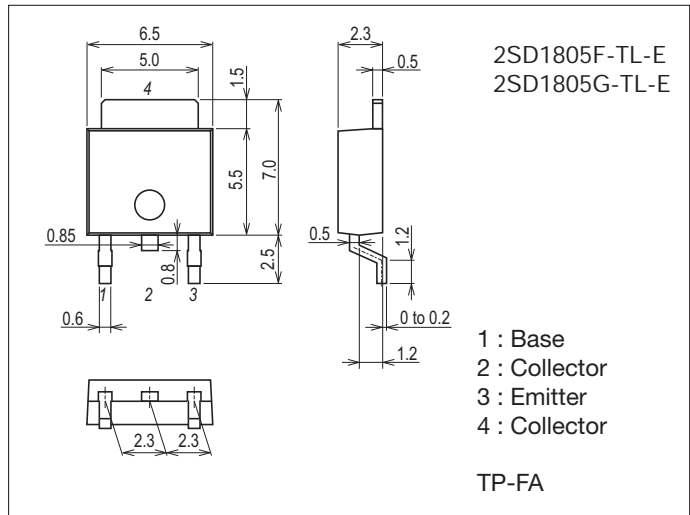
| Parameter | Symbol | Conditions | Ratings | Unit |
|------------------------------|------------------|----------------------|-------------|------|
| Collector-to-Base Voltage | V _{CB0} | | 60 | V |
| Collector-to-Emitter Voltage | V _{CEO} | | 20 | V |
| Emitter-to-Base Voltage | V _{EB0} | | 6 | V |
| Collector Current | I _C | | 5 | A |
| Collector Current (Pulse) | I _{CP} | | 8 | A |
| Collector Dissipation | P _C | T _c =25°C | 1 | W |
| | | | 15 | W |
| Junction Temperature | T _j | | 150 | °C |
| Storage Temperature | T _{stg} | | -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) 7518-003



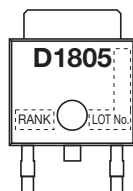
Package Dimensions unit : mm (typ) 7003-003



Product & Package Information

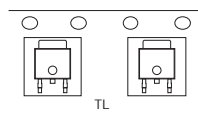
- Package : TP
- JEITA, JEDEC : SC-64, TO-251
- Minimum Packing Quantity : 500 pcs./bag

Marking (TP, TP-FA)

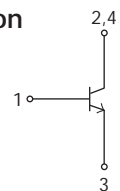


- Package : TP-FA
- JEITA, JEDEC : SC-63, TO-252
- Minimum Packing Quantity : 700 pcs./reel

Packing Type (TP-FA) : TL



Electrical Connection



2SD1805

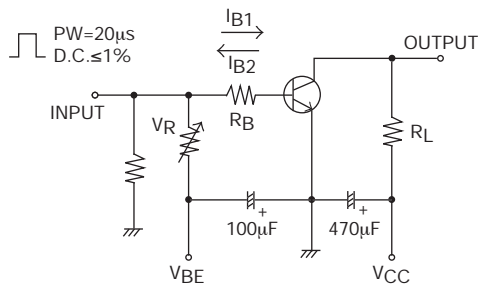
Electrical Characteristics at Ta=25°C

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|----------------------|--|---------|-----|------|------|
| | | | min | typ | max | |
| Collector Cutoff Current | ICBO | V _{CB} =50V, I _E =0A | | | 100 | nA |
| Emitter Cutoff Current | IEBO | V _{EB} =5V, I _C =0A | | | 100 | nA |
| DC Current Gain | h _{FE1} | V _{CE} =2V, I _C =500mA | 120* | | 560* | |
| | h _{FE2} | V _{CE} =2V, I _C =3A | 95 | | | |
| Gain-Bandwidth Product | f _T | V _{CE} =10V, I _C =50mA | | 120 | | MHz |
| Output Capacitance | C _{ob} | V _{CB} =10V, f=1MHz | | 45 | | pF |
| Collector-to-Emitter Saturation Voltage | V _{CE(sat)} | I _C =3A, I _B =60mA | | 220 | 500 | mV |
| Base-to-Emitter Saturation Voltage | V _{BE(sat)} | I _C =3A, I _B =60mA | | | 1.5 | 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} =∞ | 20 | | | 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 | | 30 | | ns |
| Storage Time | t _{stg} | | | 300 | | ns |
| Fall Time | t _f | | | 40 | | ns |

* : The 2SD1805 is classified by 500mA h_{FE} as follows.

| Rank | E | F | G |
|-----------------|------------|------------|------------|
| h _{FE} | 120 to 200 | 160 to 320 | 280 to 560 |

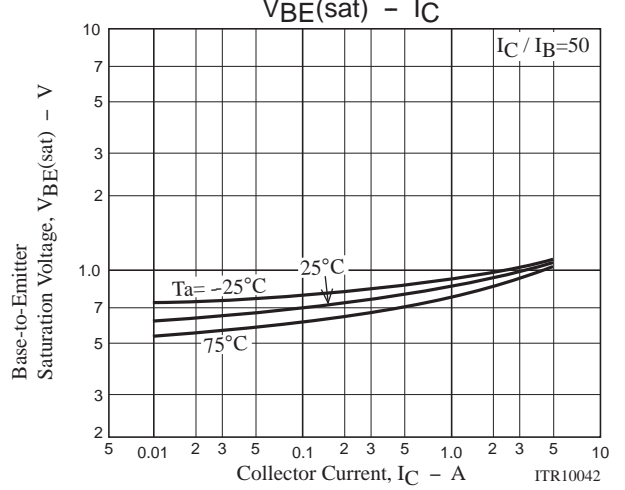
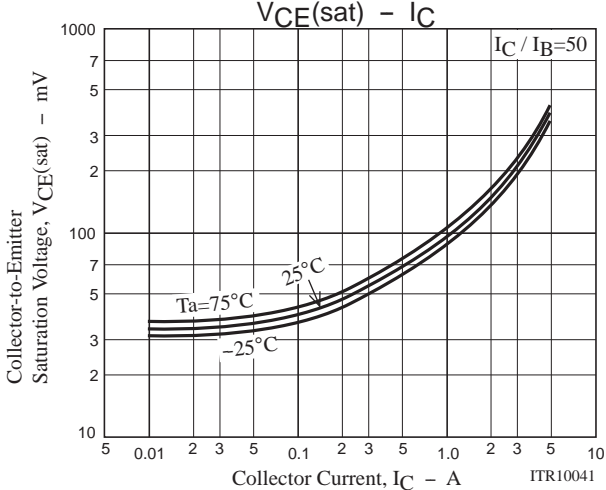
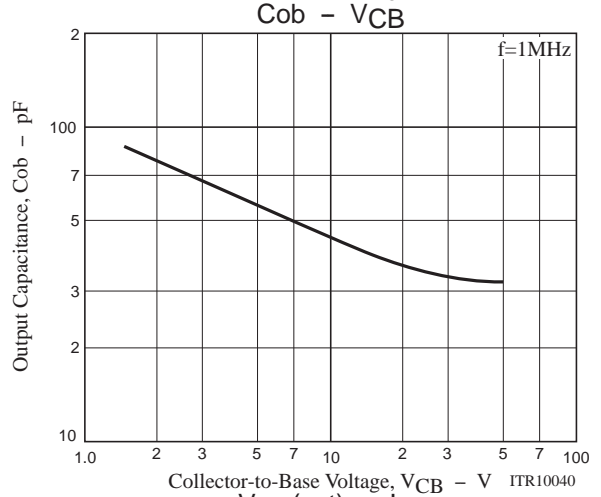
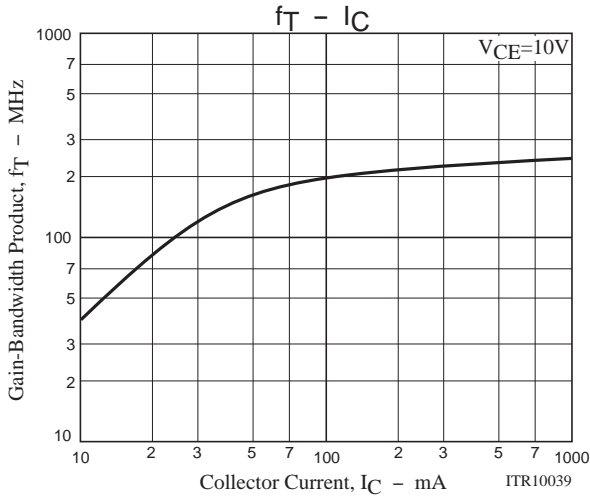
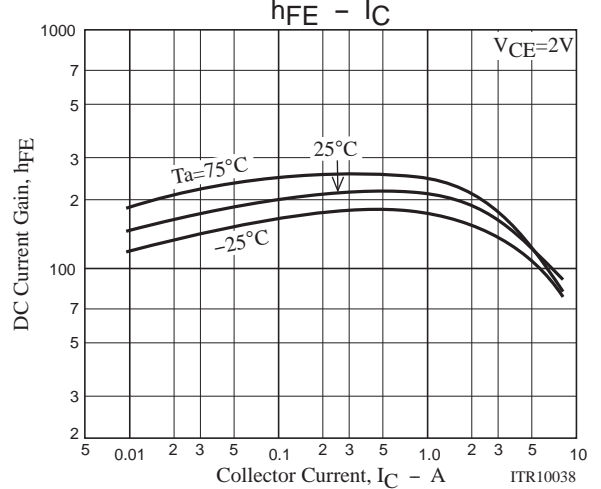
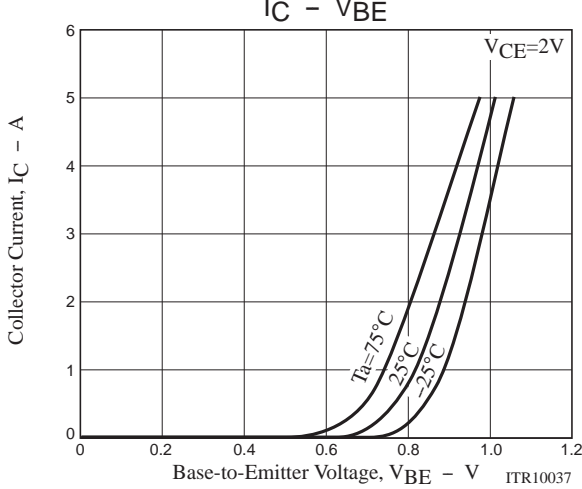
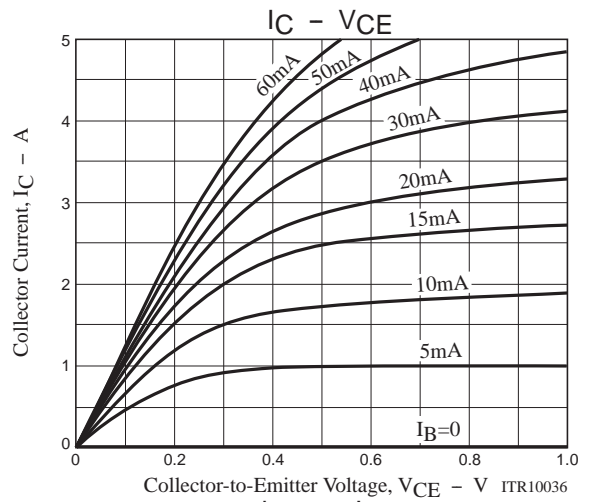
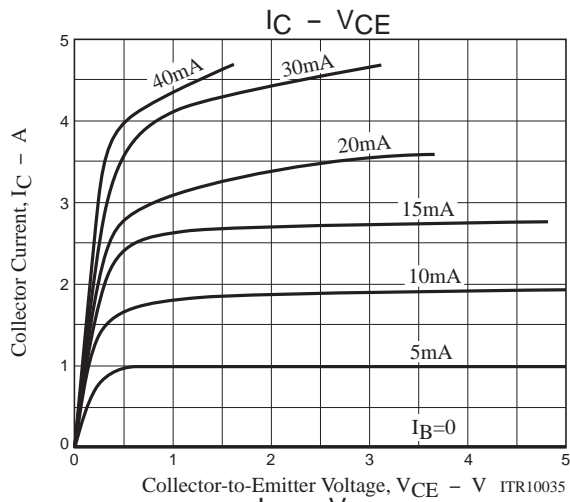
Switching Time Test Circuit



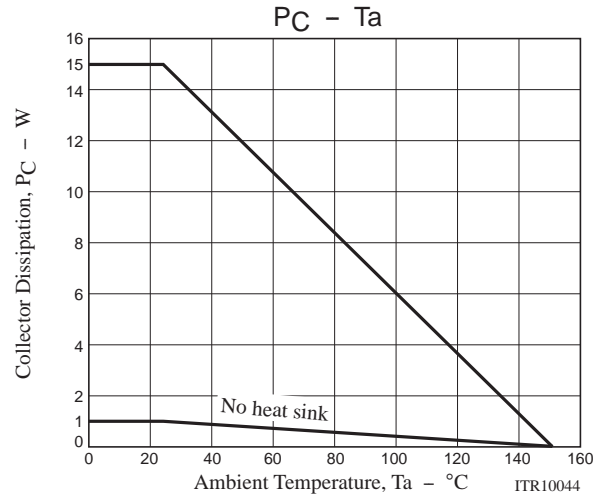
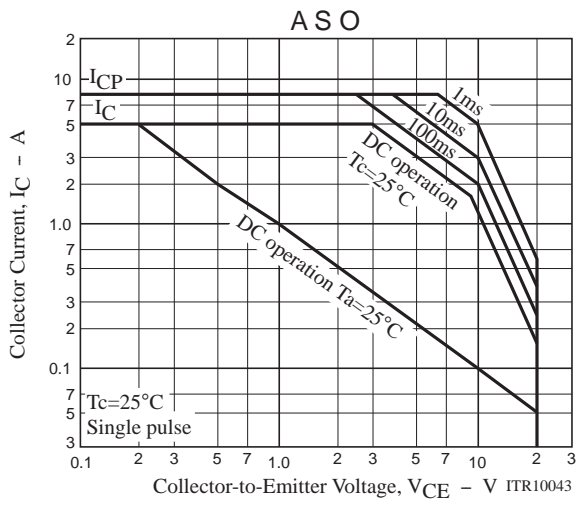
$$I_C = 10I_{B1} = -10I_{B2} = 2A, V_{CC} = 10V$$

Ordering Information

| Device | Package | Shipping | memo |
|---------------|---------|--------------|---------|
| 2SD1805F-E | TP | 500pcs./bag | Pb Free |
| 2SD1805G-E | TP | 500pcs./bag | |
| 2SD1805F-TL-E | TP-FA | 700pcs./reel | |
| 2SD1805G-TL-E | TP-FA | 700pcs./reel | |



2SD1805



Taping Specification

2SD1805F-TL-E, 2SD1805G-TL-E

Packing Format

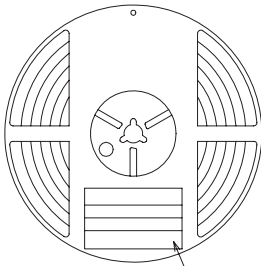
| Package Name | Carrier Tape Type | Maximum Number of devices contained (pcs) | | | Packing format | |
|--------------|-------------------|---|-----------|-----------|---|--|
| | | Reel | Inner box | Outer box | Inner BOX (C-1) | Outer BOX (A-7) |
| TP-FA | TP | 700 | 2,100 | 12,600 | 3 reels contained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

Reel label, Inner box label
(unit:mm)

Outer box label

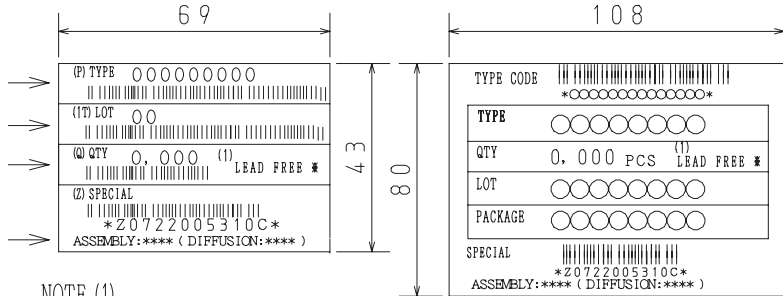
It is a label at the time of factory shipments.
The form of a label may change in physical distribution process.

Packing method



Type No.
LOT No.
Quantity
Origin

Reel label



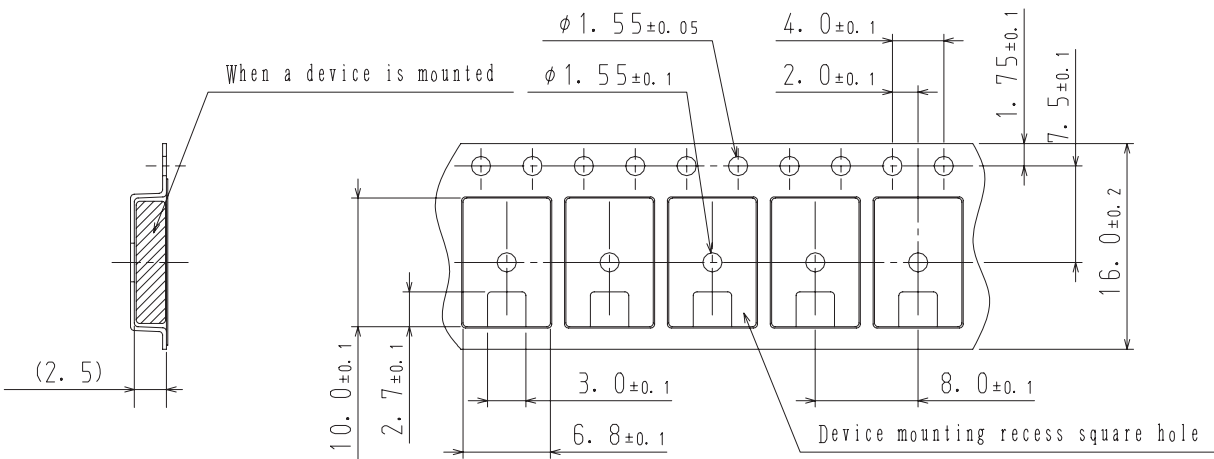
NOTE (1)

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

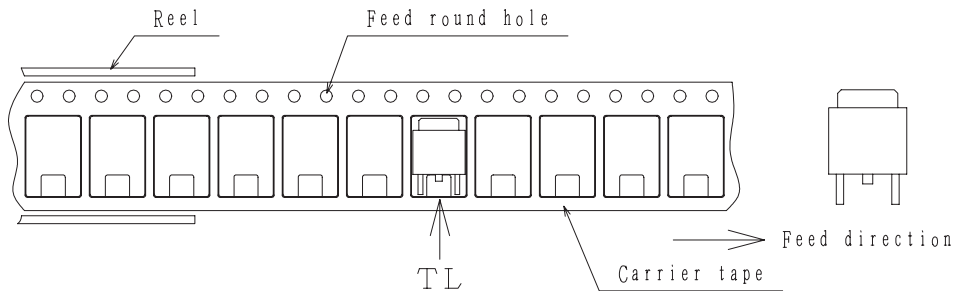
| Label | JEITA Phase |
|-------------|----------------|
| LEAD FREE 3 | JEITA Phase 3A |
| LEAD FREE 4 | JEITA Phase 3 |

Taping configuration

1. Carrier tape size (unit:mm)



2. Device placement direction

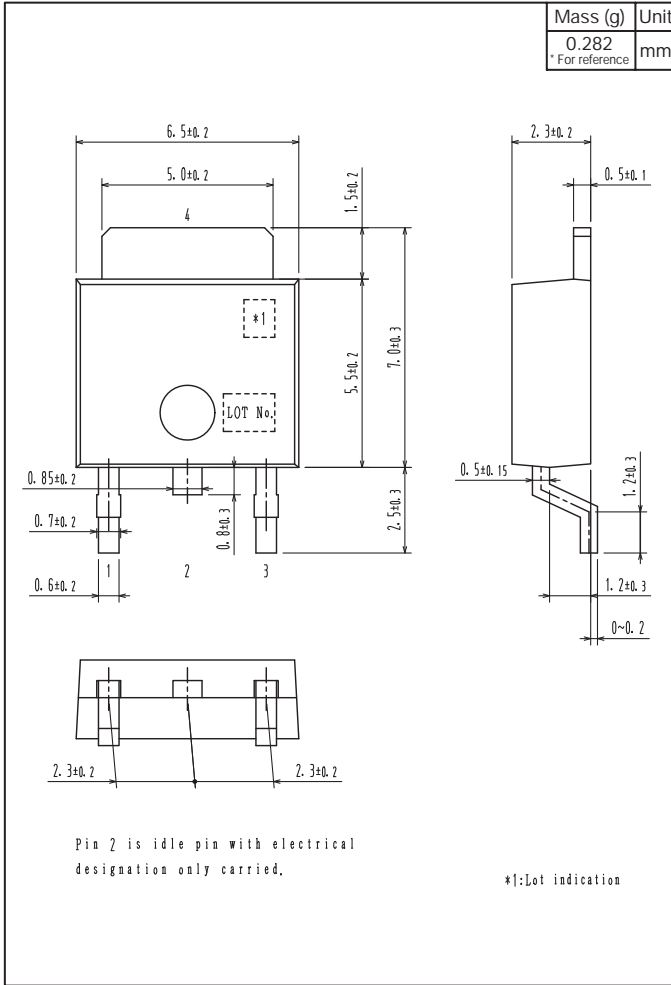


Those with one electrode terminal on the feed hole side.....TL

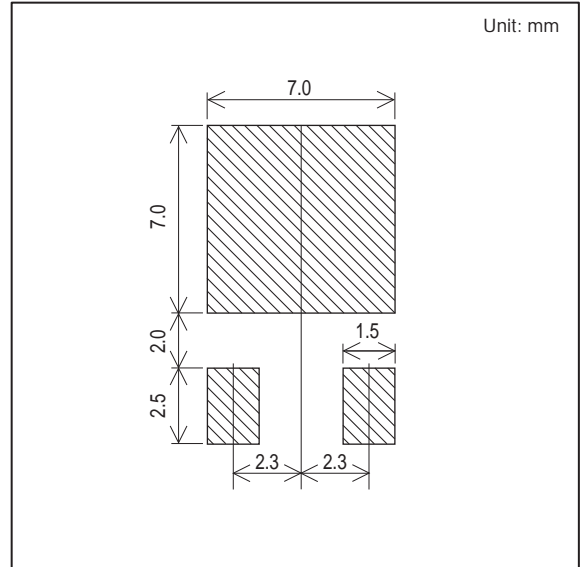
2SD1805

Outline Drawing

2SD1805F-TL-E, 2SD1805G-TL-E



Land Pattern Example



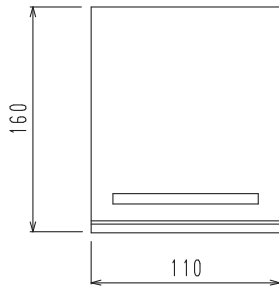
Bag Packing Specification

2SD1805F-E, 2SD1805G-E

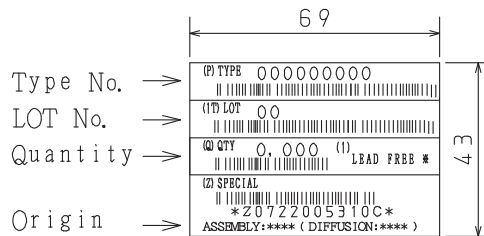
1. Packing Format

| 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)



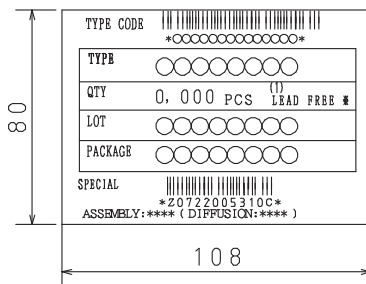
4. Outer box label
(unit:mm)

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 |



2SD1805

Outline Drawing

2SD1805F-E, 2SD1805G-E



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