



SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

2SA1418/2SC3648 — PNP / NPN Epitaxial Planar Silicon Transistor

High-Voltage Switching, Preriver Applications

Applications

- Color TV audio output, inverter

Features

- Adoption of FBET, MBIT processes
- High breakdown voltage and large current capacity
- Fast switching speed
- Ultrasmall size making it easy to provide high-density, small-sized hybrid IC's

Specifications () : 2SA1418

Absolute Maximum Ratings at Ta=25°C

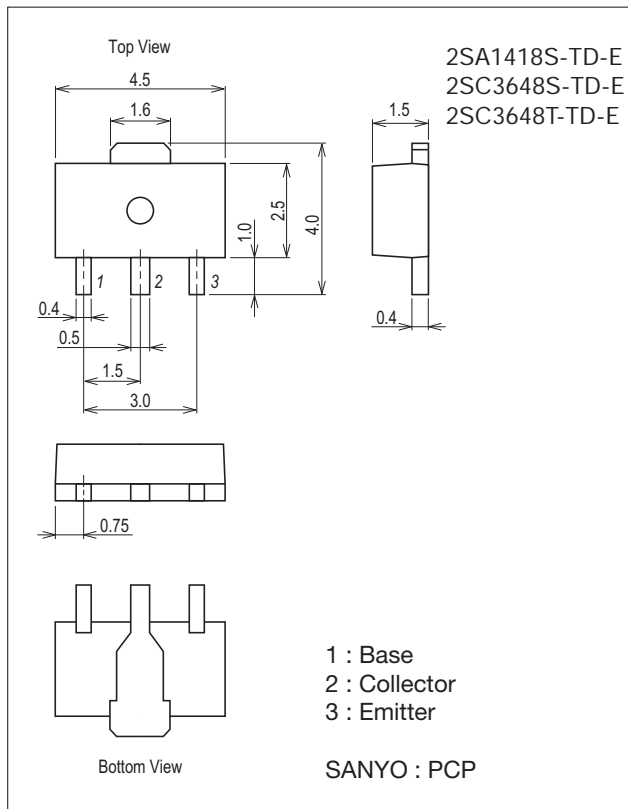
| Parameter | Symbol | Conditions | Ratings | Unit |
|------------------------------|------------------|------------|---------|------|
| Collector-to-Base Voltage | V _{CBO} | | (-)180 | V |
| Collector-to-Emitter Voltage | V _{CEO} | | (-)160 | V |
| Emitter-to-Base Voltage | V _{EBO} | | (-)6 | V |
| Collector Current | I _C | | (-)0.7 | A |
| Collector Current (Pulse) | I _{CP} | | (-)1.5 | A |

Continued on next page.

Package Dimensions

unit : mm (typ)

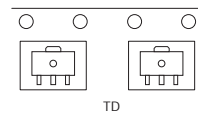
7007B-004



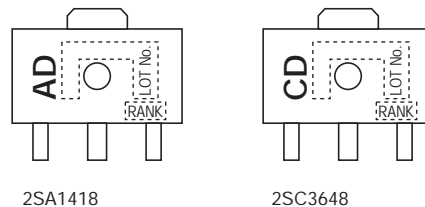
Product & Package Information

- Package : PCP
- JEITA, JEDEC : SC-62, SOT-89, TO-243
- Minimum Packing Quantity : 1,000 pcs./reel

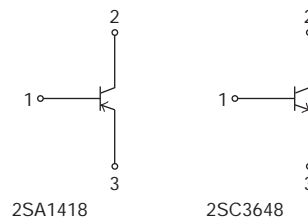
Packing Type: TD



Marking



Electrical Connection



2SA1418 / 2SC3648

Continued from preceding page.

| Parameter | Symbol | Conditions | Ratings | Unit |
|-----------------------|------------------|---|-------------|------|
| Collector Dissipation | PC | | 500 | mW |
| | | When mounted on ceramic substrate (250mm ² ×0.8mm) | 1.3 | W |
| Junction Temperature | T _j | | 150 | °C |
| Storage Temperature | T _{stg} | | -55 to +150 | °C |

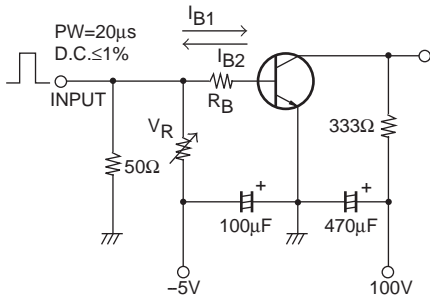
Electrical Characteristics at T_a=25°C

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|----------------------|---|------------|-----------|-----------|------|
| | | | min | typ | max | |
| Collector Cutoff Current | I _{CBO} | V _{CB} =(-)120V, I _E =0A | | | (-)0.1 | μA |
| Emitter Cutoff Current | I _{EBO} | V _{EB} =(-)4V, I _C =0A | | | (-)0.1 | μA |
| DC Current Gain | h _{FE1} | V _{CE} =(-)5V, I _C =(-)100mA | 100* | | 400* | |
| | h _{FE2} | V _{CE} =(-)5V, I _C =(-)10mA | 90 | | | |
| Gain-Bandwidth Product | f _T | V _{CE} =(-)10V, I _C =(-)50mA | | 120 | | MHz |
| Output Capacitance | C _{ob} | V _{CB} =(-)10V, f=1MHz | | (1)8 | | pF |
| Collector-to-Emitter Saturation Voltage | V _{CE(sat)} | I _C =(-)250mA, I _B =(-)25mA | (-0.2)0.12 | | (-0.5)0.4 | V |
| Base-to-Emitter Saturation Voltage | V _{BE(sat)} | I _C =(-)250mA, I _B =(-)25mA | (-)0.85 | | (-)1.2 | V |
| Collector-to-Base Breakdown Voltage | V _{(BR)CBO} | I _C =(-)10μA, I _E =0A | (-)180 | | | V |
| Collector-to-Emitter Breakdown Voltage | V _{(BR)CEO} | I _C =(-)1mA, R _{BE} =∞ | (-)160 | | | 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)50 | | ns |
| Storage Time | t _{stg} | | | (900)1000 | | ns |
| Fall Time | t _f | | | (60)60 | | ns |

* : The 2SA1418 / 2SC3648 are classified by 100mA h_{FE} as follows :

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

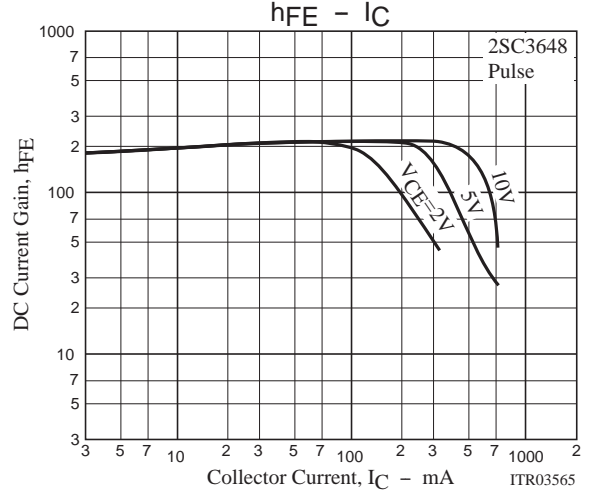
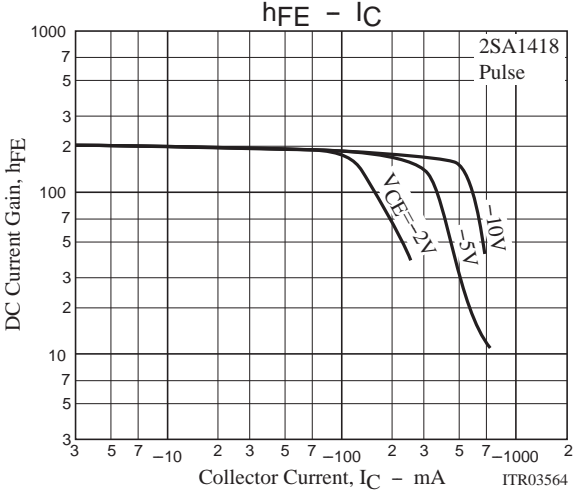
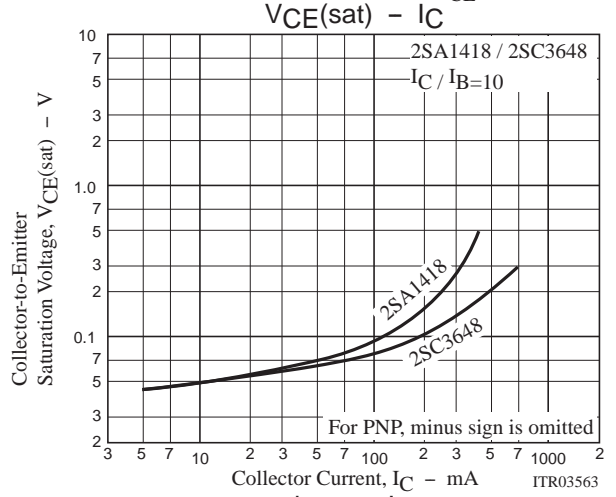
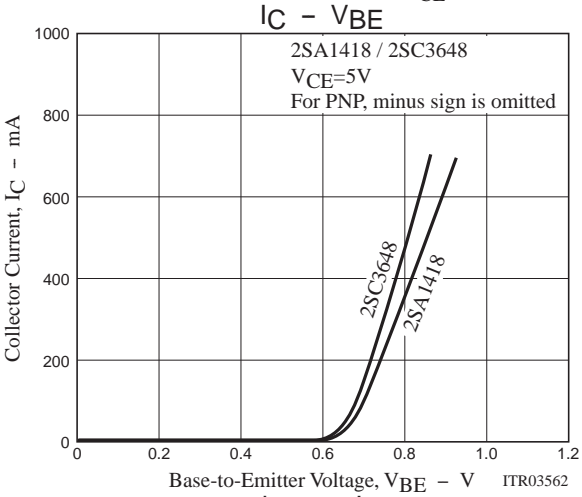
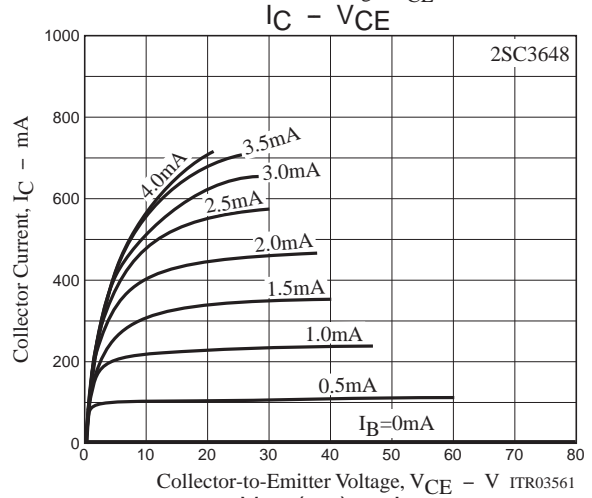
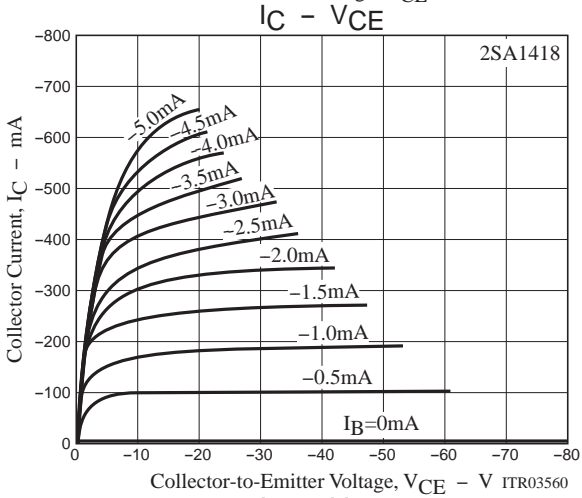
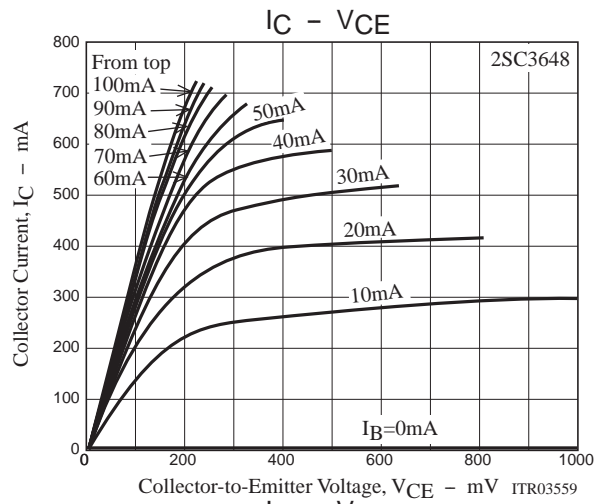
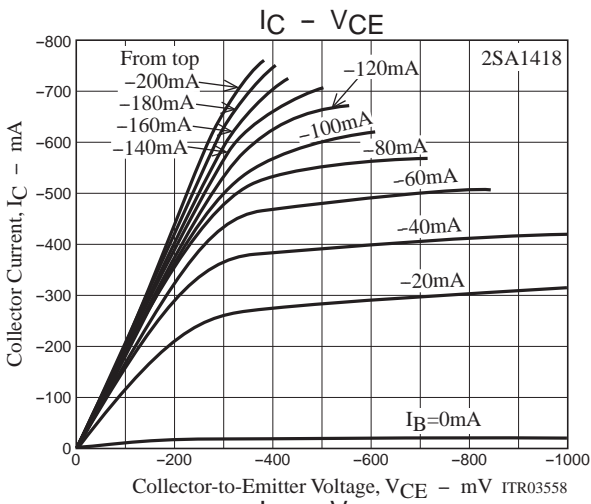
Switching Time Test Circuit

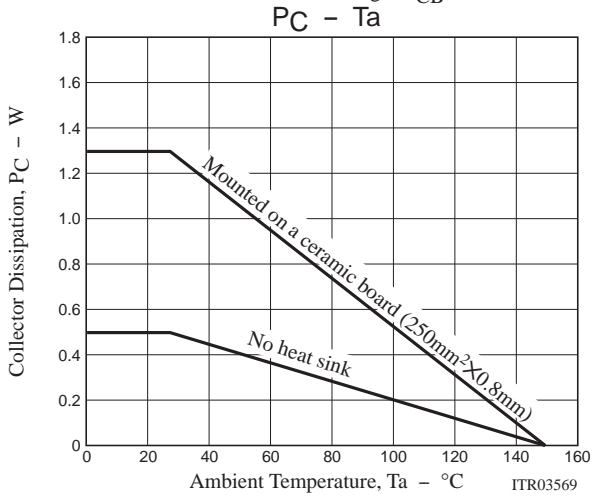
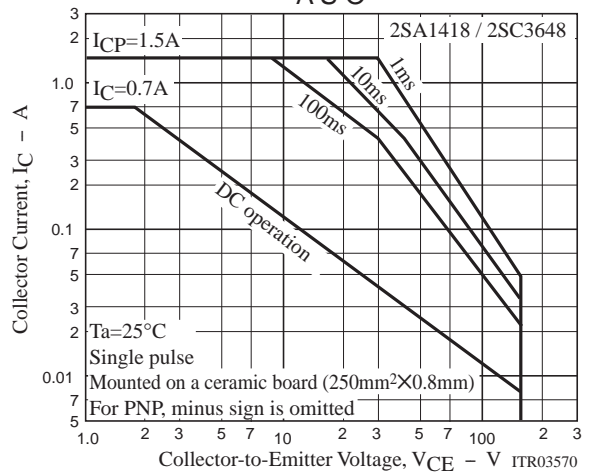
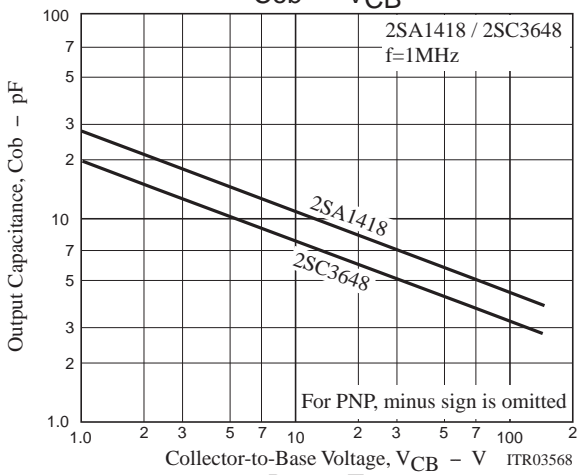
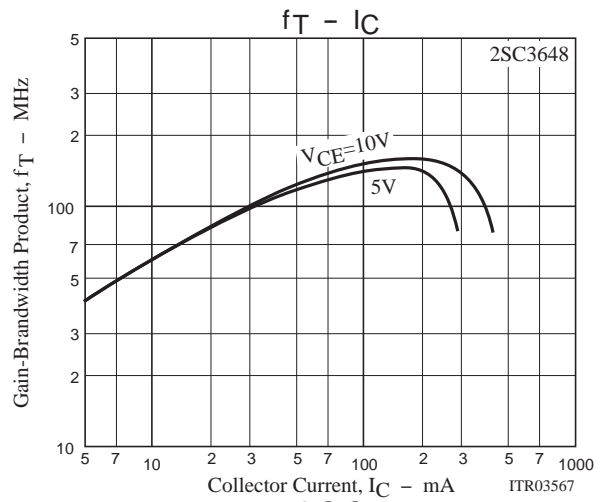
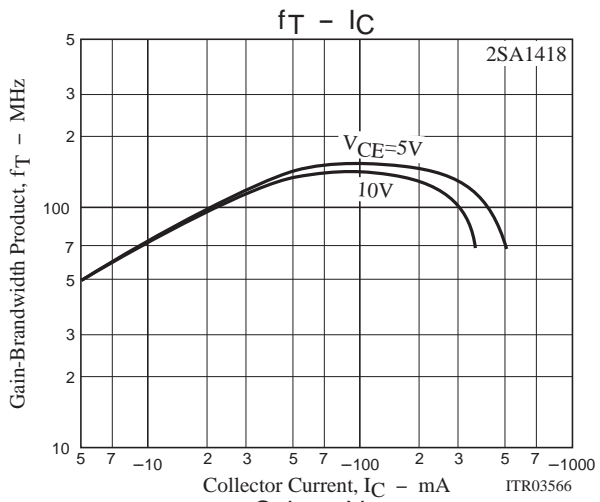


I_C=20I_{B1}=-20I_{B2}=300mA
(For PNP, the polarity is reversed)

Ordering Information

| Device | Package | Shipping | memo |
|---------------|---------|----------------|---------|
| 2SA1418S-TD-E | PCP | 1,000pcs./reel | Pb Free |
| 2SC3648S-TD-E | PCP | 1,000pcs./reel | |
| 2SC3648T-TD-E | PCP | 1,000pcs./reel | |





Bag Packing Specification

2SA1418S-TD-E, 2SC3648S-TD-E, 2SC3648T-TD-E

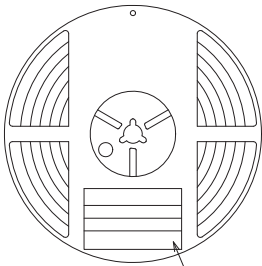
1. Packing Format

| 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) |
| PCP | PCP | 1,000 | 4,000 | 24,000 | 4 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)

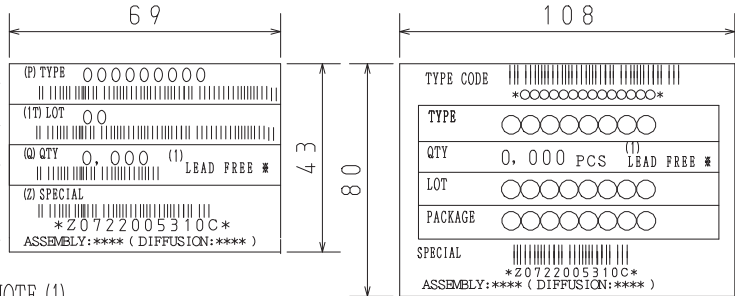
Outer box label
It is a label at the time of factory shipments.
The form of a label may change in physical distribution process.

Packing method



Type No.
LOT No.
Quantity
Origin

Reel label



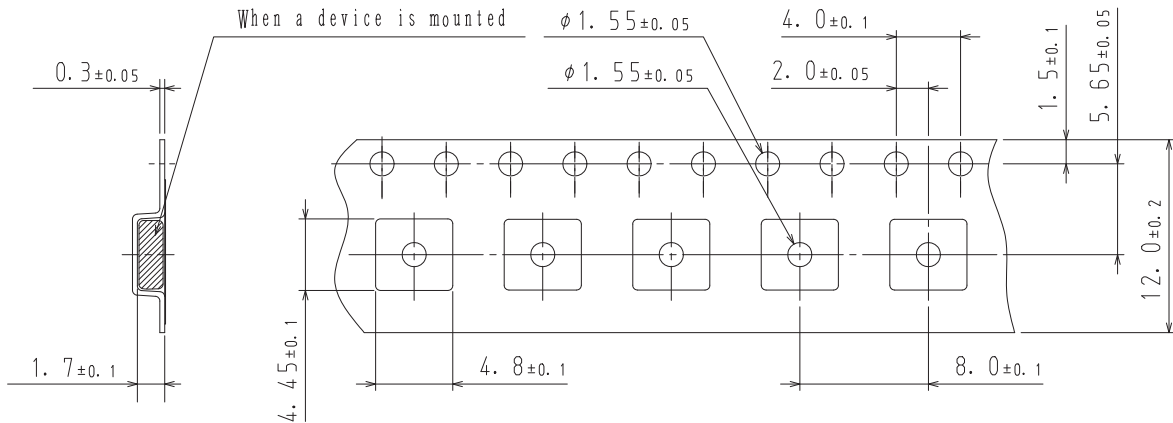
NOTE (1)

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

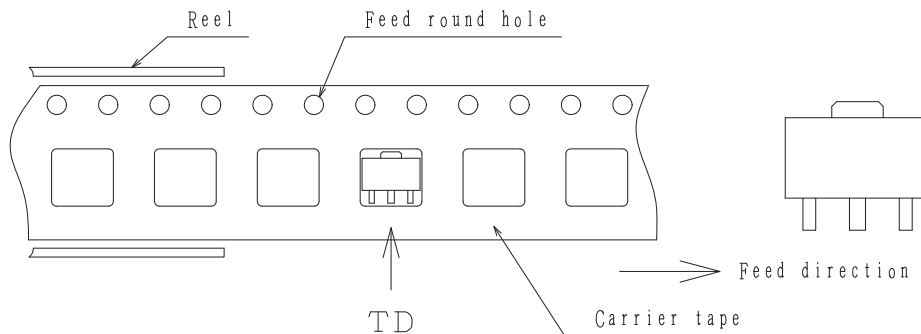
| Label | JEITA Phase |
|-------------|----------------|
| LEAD FREE 3 | JEITA Phase 3A |
| LEAD FREE 4 | JEITA Phase 3 |

2. Taping configuration

2-1. Carrier tape size (unit:mm)



2-2. Device placement direction

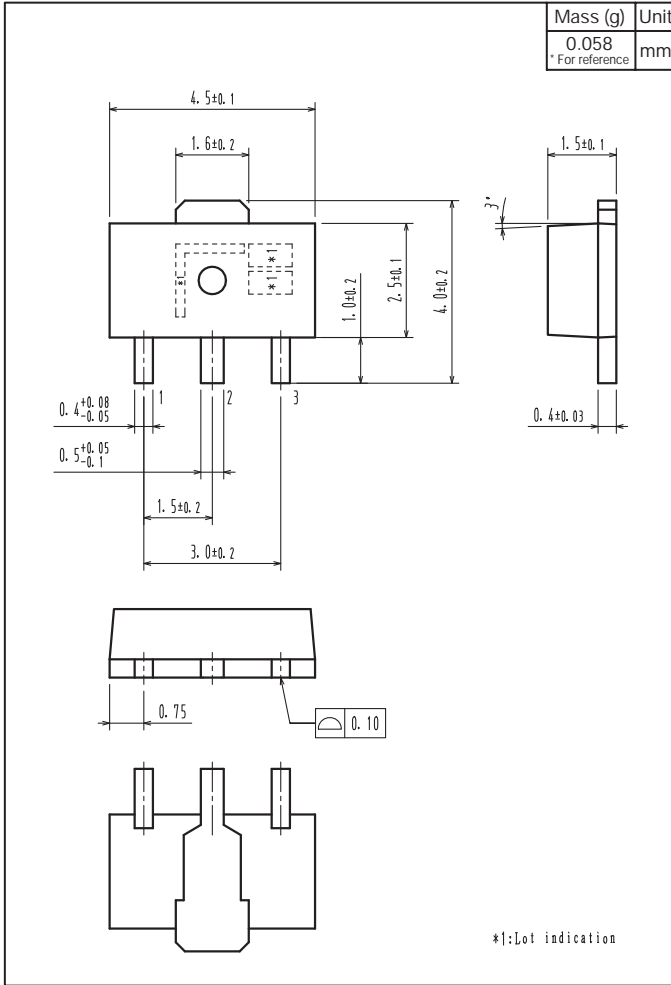


Those with pin 1 index on the feed hole side.....TD

2SA1418 / 2SC3648

Outline Drawing

2SA1418S-TD-E, 2SC3648S-TD-E, 2SC3648T-TD-E



Land Pattern Example



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Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: ocean@oceanchips.ru

Web: <http://oceanchips.ru/>

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А