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# SMA3101

## MMIC

Amplifier, 5V, 10mA, 0.1 to 3GHz, MCPH6

### Features

- High Gain :  $G_p=25\text{dB typ. @1GHz}$
- Wideband response :  $f_u=3.0\text{GHz}$
- Low current :  $I_{CC}=10\text{mA typ.}$
- Port impedance : input/output  $50\Omega$

### Specifications

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

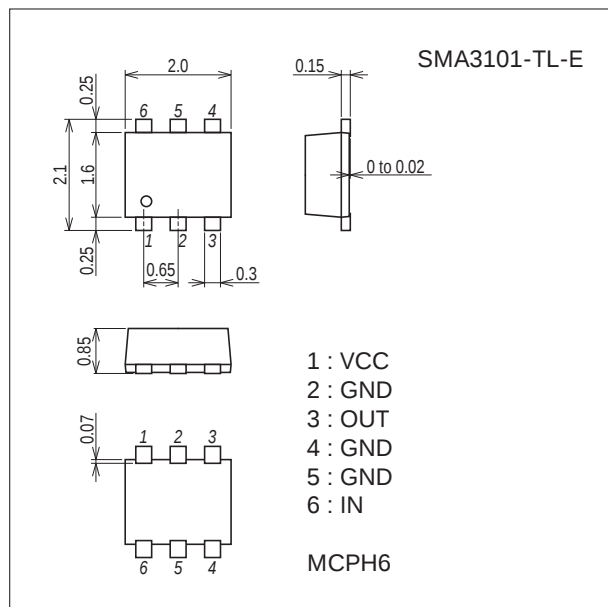
| Parameter                   | Symbol    | Conditions | Ratings     | Unit             |
|-----------------------------|-----------|------------|-------------|------------------|
| Supply Voltage              | $V_{CC}$  |            | 6           | V                |
| Circuit Current             | $I_{CC}$  |            | 25          | mA               |
| Allowable Power Dissipation | $P_D$     |            | 280         | mW               |
| Operating Temperature       | $T_{opr}$ |            | -40 to +85  | $^\circ\text{C}$ |
| Storage Temperature         | $T_{stg}$ |            | -55 to +150 | $^\circ\text{C}$ |

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)

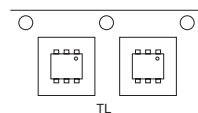
7022A-018



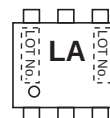
### Product & Package Information

- Package : MCPH6
- JEITA, JEDEC : SC-88, SC-70-6, SOT-363
- Minimum Packing Quantity : 3,000 pcs./reel

### Packing Type : TL



### Marking



# SMA3101

## Recommended Operating Condition at Ta=25°C

| Parameter                     | Symbol | Conditions | Ratings |     |     | Unit |
|-------------------------------|--------|------------|---------|-----|-----|------|
|                               |        |            | min     | typ | max |      |
| Supply Voltage                | VCC    |            | 4.5     | 5   | 5.5 | V    |
| Operating Ambient Temperature | Topr   |            | -40     | +25 | +85 | °C   |

Note) Pay attention to handling since it is liable to be affected by static electricity due to the high frequency process adopted.

## Electrical Characteristics at Ta=25°C, VCC=5V, Zs=ZL=50Ω

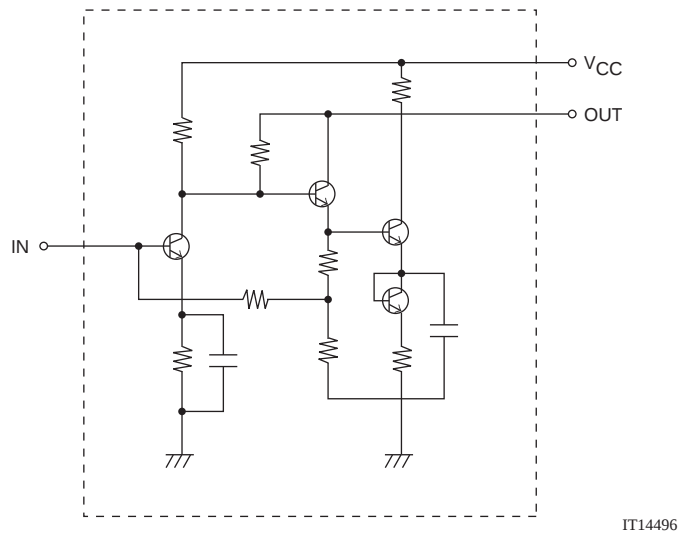
| Parameter                         | Symbol  | Conditions                          | Ratings |      |      | Unit |
|-----------------------------------|---------|-------------------------------------|---------|------|------|------|
|                                   |         |                                     | min     | typ  | max  |      |
| Circuit Current                   | ICC     |                                     | 7.1     | 10.0 | 12.6 | mA   |
| Power Gain                        | Gp      | f=1GHz                              | 21.5    | 25.0 | 28.5 | dB   |
|                                   |         | f=2.2GHz                            | 21.5    | 25.5 | 28.5 |      |
| Isolation                         | ISL     | f=1GHz                              | 33.0    | 38.0 |      | dB   |
|                                   |         | f=2.2GHz                            | 31.0    | 36.0 |      |      |
| Input Return Loss                 | RLin    | f=1GHz                              | 11.0    | 16.0 |      | dB   |
|                                   |         | f=2.2GHz                            | 12.0    | 21.0 |      |      |
| Output Return Loss                | RLout   | f=1GHz                              | 10.0    | 18.5 |      | dB   |
|                                   |         | f=2.2GHz                            | 8.0     | 12.0 |      |      |
| Noise Figure                      | NF      | f=1GHz                              |         | 4.0  | 5.3  | dB   |
|                                   |         | f=2.2GHz                            |         | 4.0  | 5.3  |      |
| Gain 1dB Compression Output Power | Po(1dB) | f=1GHz                              | -5.0    | -2.0 |      | dBm  |
|                                   |         | f=2.2GHz                            | -7.0    | -4.0 |      |      |
| Upper Limit Operating Frequency   | fu      | 3dB down below flat gain at f =1GHz |         | 3.0  |      | GHz  |

## Ordering Information

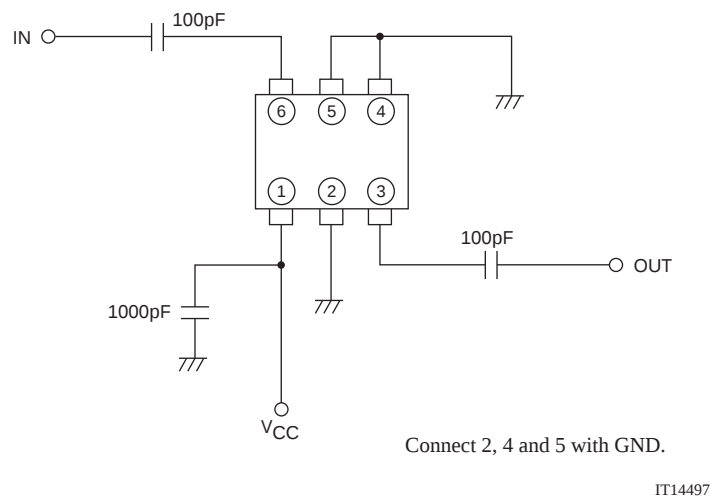
| Device       | Package | Shipping       | memo    |
|--------------|---------|----------------|---------|
| SMA3101-TL-E | MCPH6   | 3,000pcs./reel | Pb Free |

SMA3101

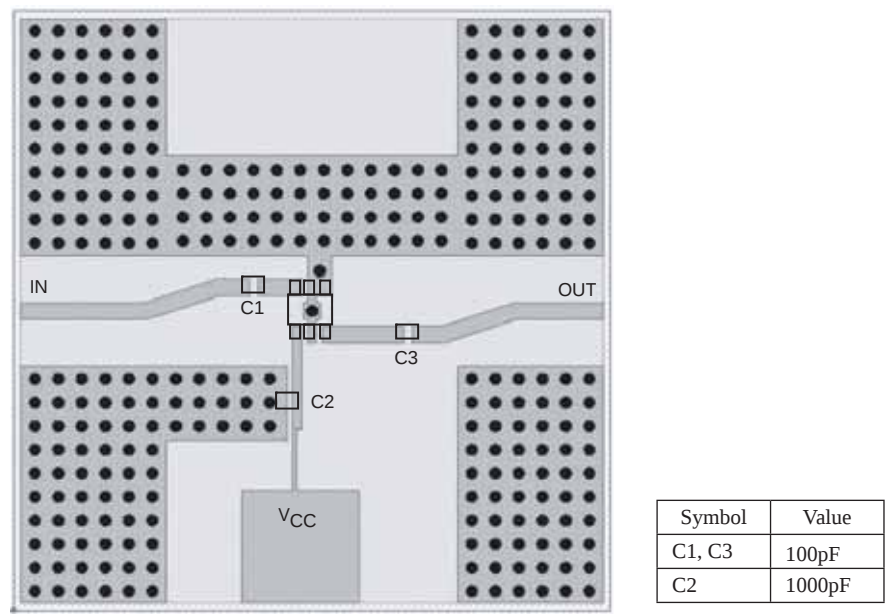
Equivalent Circuit

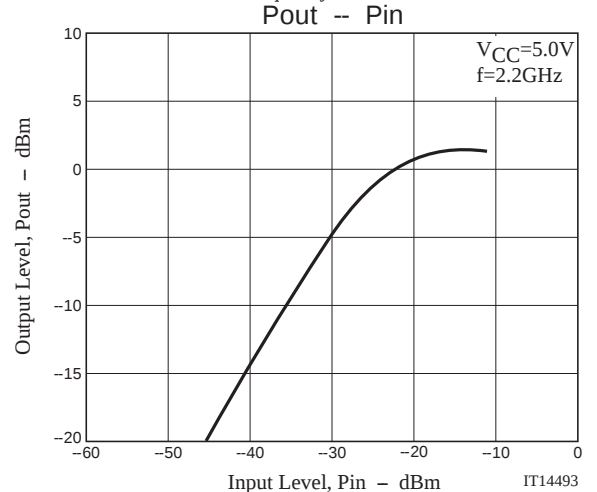
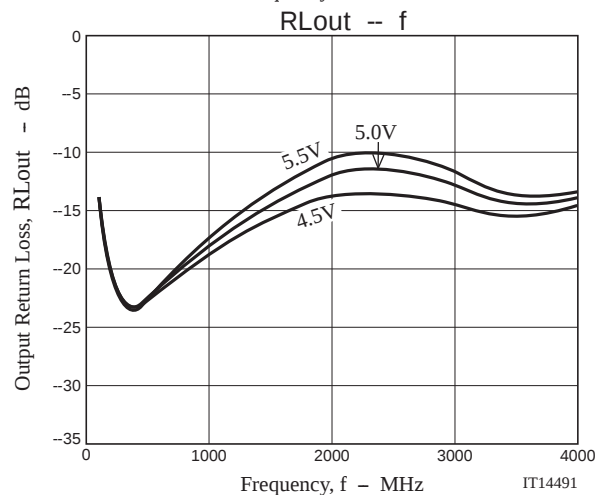
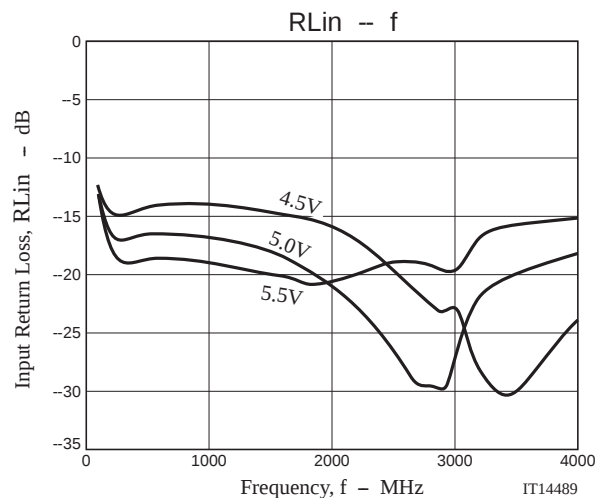
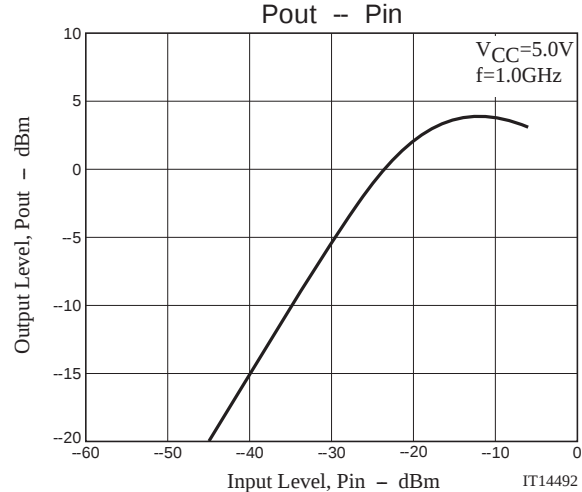
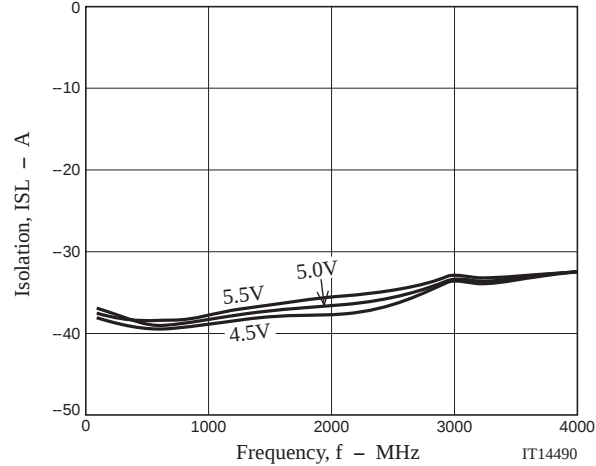
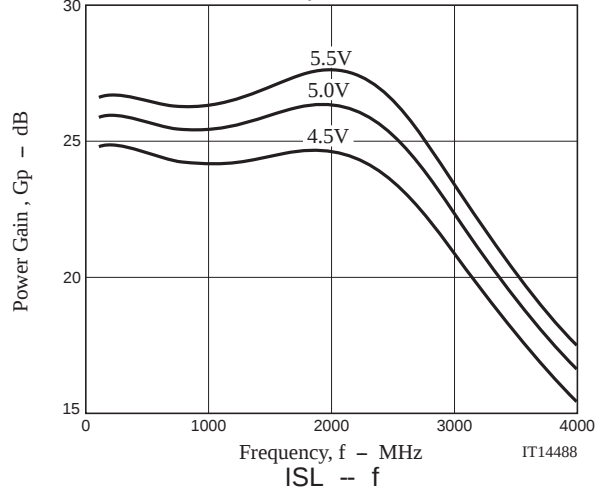
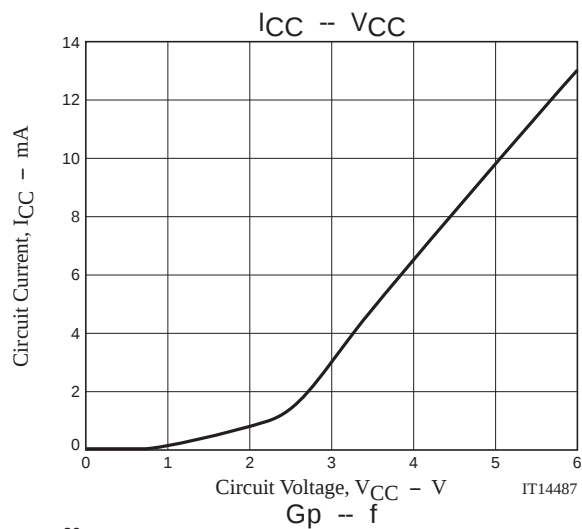


Test Circuit



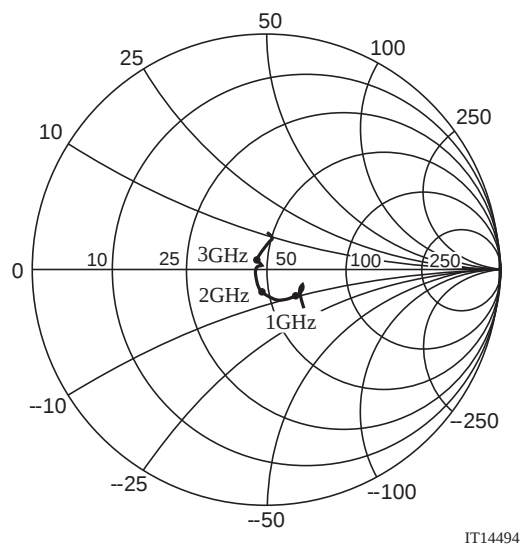
Design of the Evaluation Board



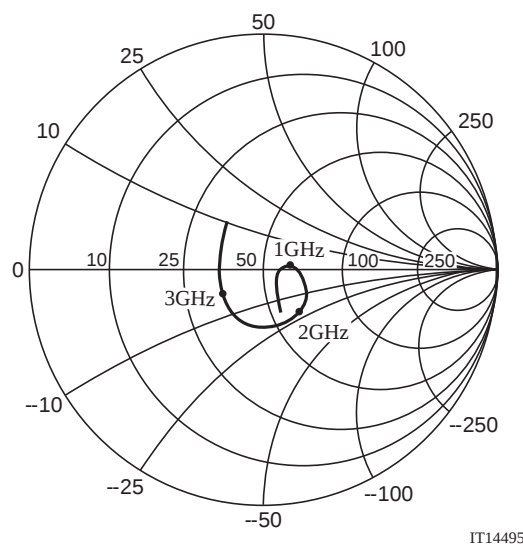


SMA3101

S Parameter  
S11



S22



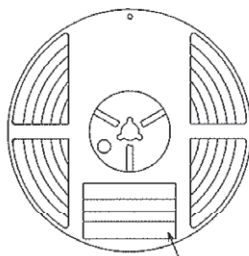
## Embossed Taping Specification

SMA3101-TL-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)                                                    |
| MCPH6        | MCP4              | 3,000                                     | 15,000    | 90,000    | 5 reels contained<br>Dimensions:mm (external)<br>183×72×185 | 6 inner boxes contained<br>Dimensions:mm (external)<br>440×195×210 |

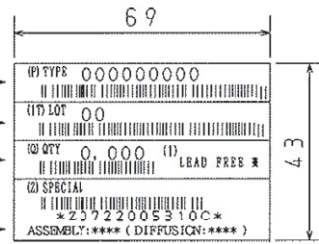
## Packing method



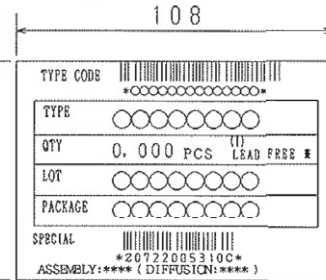
Reel label

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.



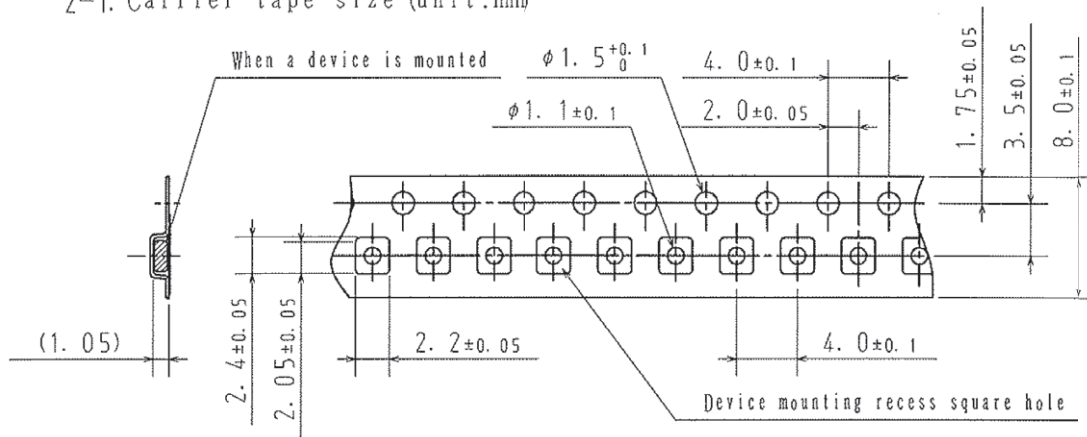
## NOTE (1)

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

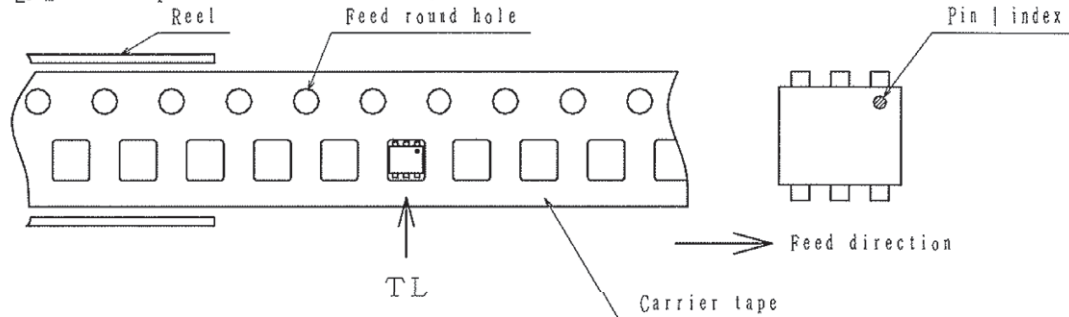
| Label       | JEITA Phase    |
|-------------|----------------|
| LEAD FREE 3 | JEITA Phase 3A |
| LEAD FREE 4 | JEITA Phase 3  |

## 2. Taping configuration

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



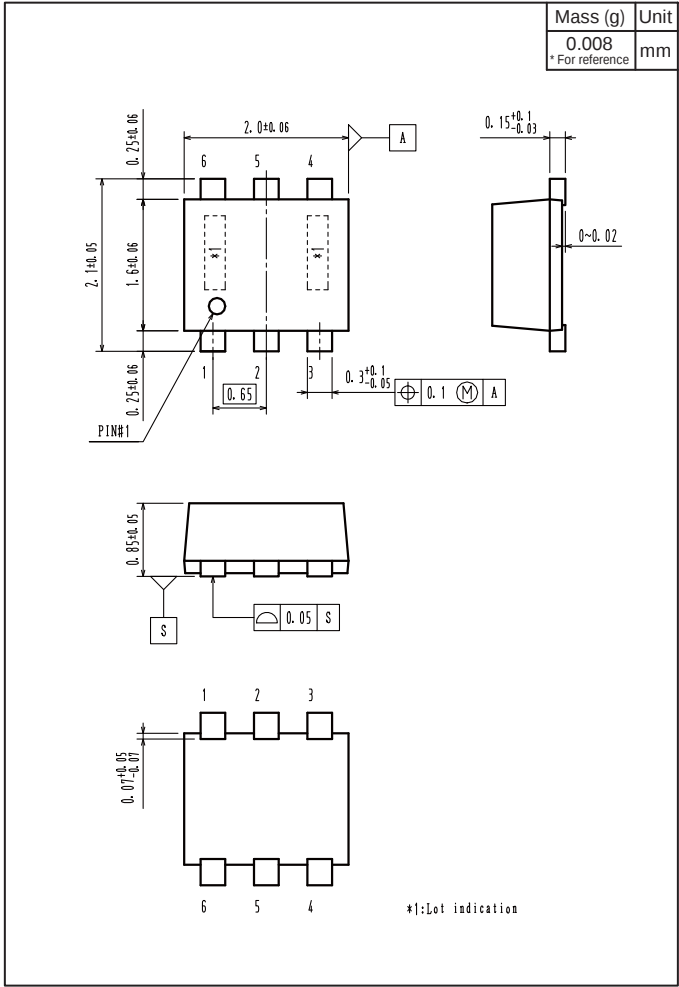
## 2-2. Device placement direction



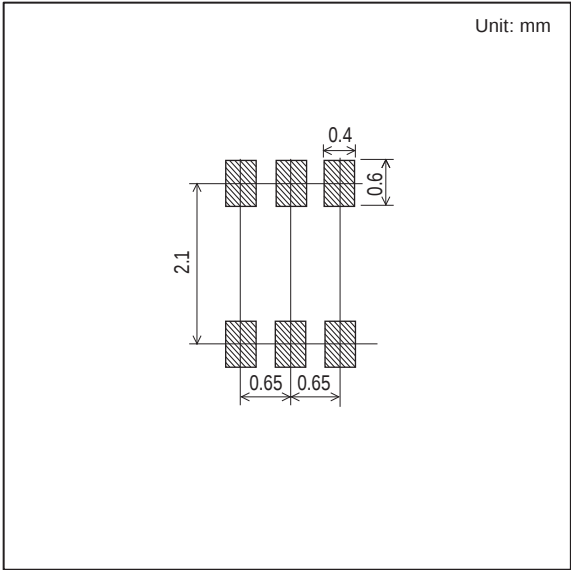
Those with pin 1 index on the feed hole side.....TL

SMA3101

Outline Drawing  
SMA3101-TL-E



Land Pattern Example



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