Ordering number : ENA1076A

# 2SC4853A

## RF Transistor
## 6V, 15mA, $f_T$=5GHz, NPN Single MCP

ON Semiconductor®
http://onsemi.com

### Features

- Low-voltage, low-current operation : $f_T$=5GHz typ
  ($V_{CE}$=1V, $I_C$=1mA) : $|S21e|^2$=7dB typ (f=1GHz)
  : NF=2.6dB typ (f=1GHz)

### Specifications

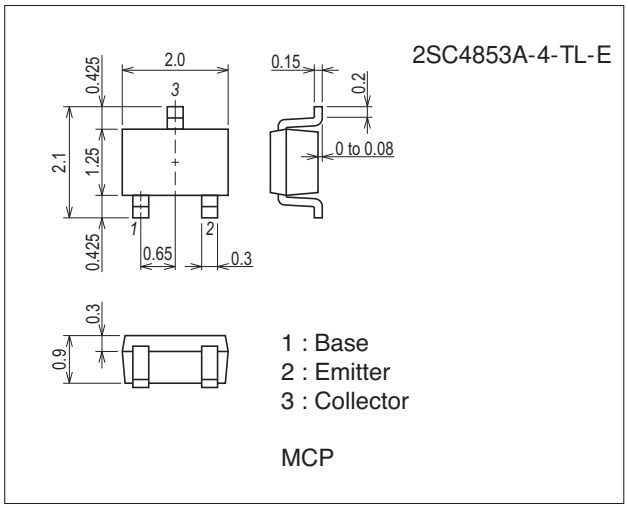
#### Absolute Maximum Ratings at Ta=25°C

| Parameter | Symbol | Conditions | Ratings | Unit |
|---|---|---|---|---|
| Collector-to-Base Voltage | $V_{CBO}$ | | 12 | V |
| Collector-to-Emitter Voltage | $V_{CEO}$ | | 6 | V |
| Emitter-to-Base Voltage | $V_{EBO}$ | | 1.5 | V |
| Collector Current | $I_C$ | | 15 | mA |
| Collector Dissipation | $P_C$ | | 90 | mW |
| 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

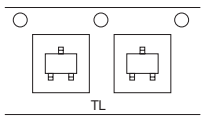
unit : mm (typ)
7023A-009



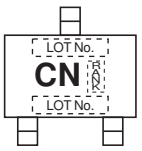

### Product & Package Information

- Package : MCP
- JEITA, JEDEC : SC-70, SOT-323
- Minimum Packing Quantity : 3,000 pcs./reel

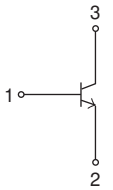
### Packing Type: TL




### Marking




### Electrical Connection



## Electrical Characteristics at Ta=25°C

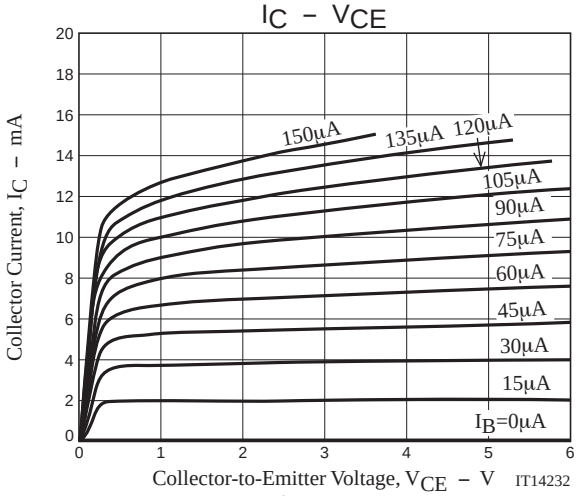
| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|---|---|---|---|---|---|
| | | | min | typ | max | |
| Collector Cutoff Current | $I_{CBO}$ | $V_{CB}$=5V, $I_E$=0A | | | 1.0 | μA |
| Emitter Cutoff Current | $I_{EBO}$ | $V_{EB}$=1V, $I_C$=0A | | | 10 | μA |
| DC Current Gain | $h_{FE}$ | $V_{CE}$=1V, $I_C$=1mA | 60* | | 270* | |
| Gain-Bandwidth Product | $f_T$ | $V_{CE}$=1V, $I_C$=1mA | | 5 | | GHz |
| Output Capacitance | Cob | $V_{CB}$=1V, f=1MHz | | 0.6 | 1.0 | pF |
| Forward Transfer Gain | $\|S21e\|^2$1 | $V_{CE}$=1V, $I_C$=1mA, f=1GHz | 4.5 | 7 | | dB |
| | $\|S21e\|^2$2 | $V_{CE}$=2V, $I_C$=3mA, f=1GHz | | 10.5 | | dB |
| Noise Figure | NF1 | $V_{CE}$=1V, $I_C$=1mA, f=1GHz | | 2.6 | 4.5 | dB |
| | NF2 | $V_{CE}$=2V, $I_C$=3mA, f=1GHz | | 1.9 | | dB |

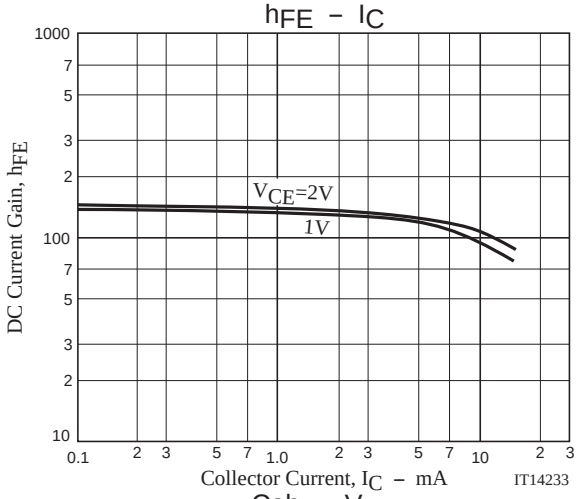
* : The 2SC4853A is classified by 1mA $h_{FE}$ as follows :

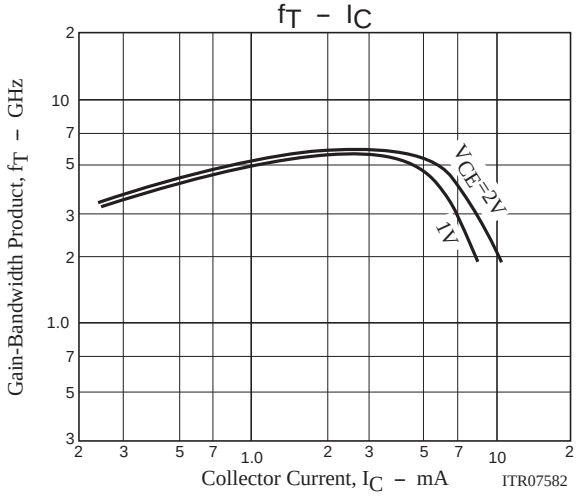
| Rank | 3 | 4 | 5 |
|---|---|---|---|
| $h_{FE}$ | 60 to 120 | 90 to 180 | 135 to 270 |

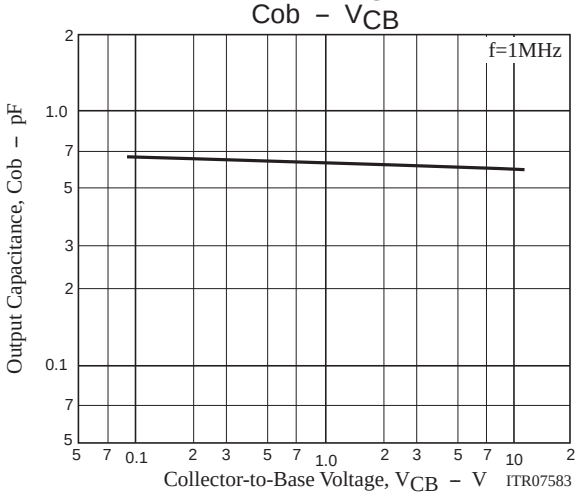
## Ordering Information

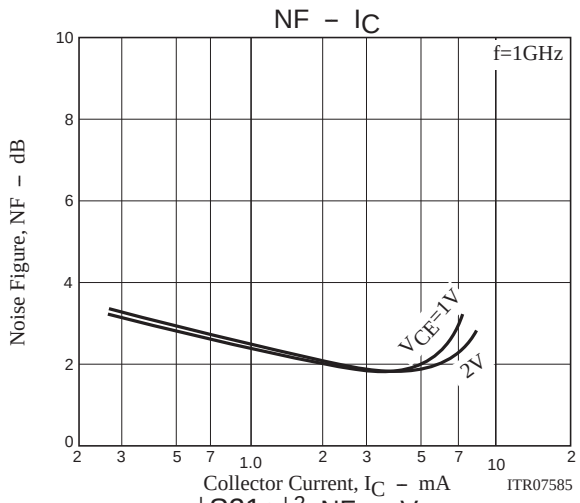
| Device | Package | Shipping | memo |
|---|---|---|---|
| 2SC4853A-4-TL-E | MCP | 3,000pcs./reel | Pb Free |

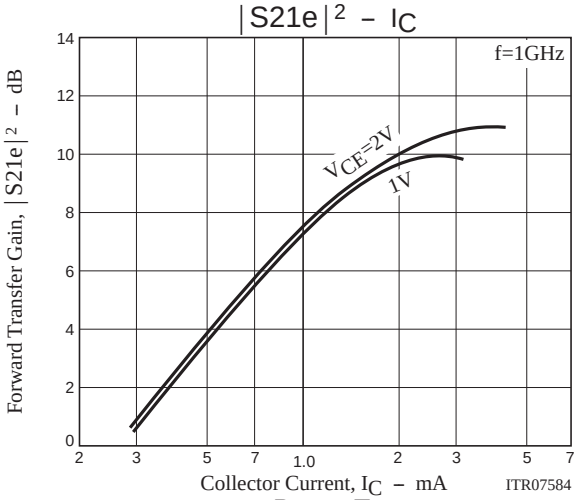


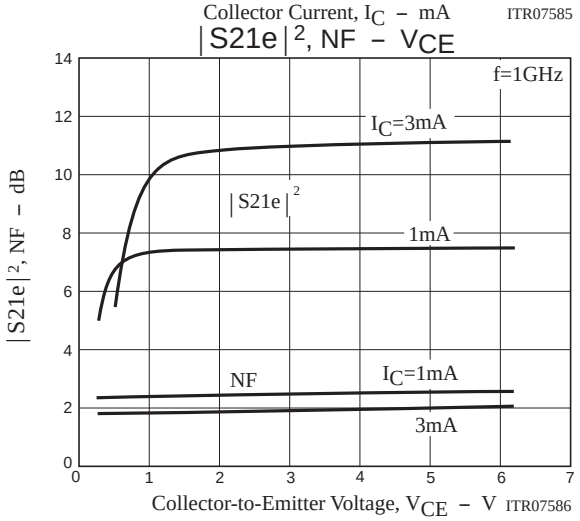



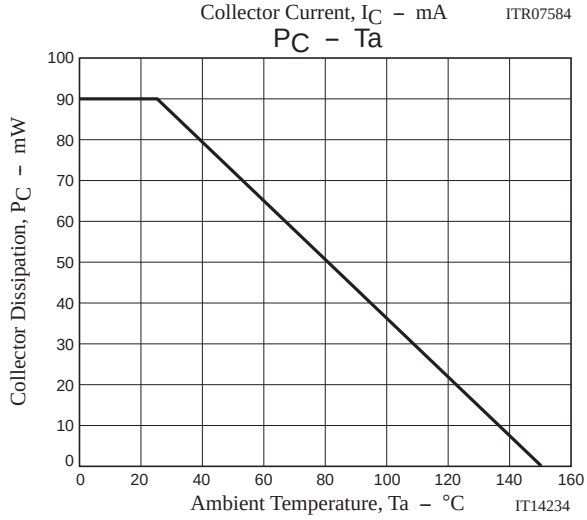




NF – IC
f=1GHz
VCE=1V
2V
Noise Figure, NF – dB
Collector Current, IC – mA
ITR07585

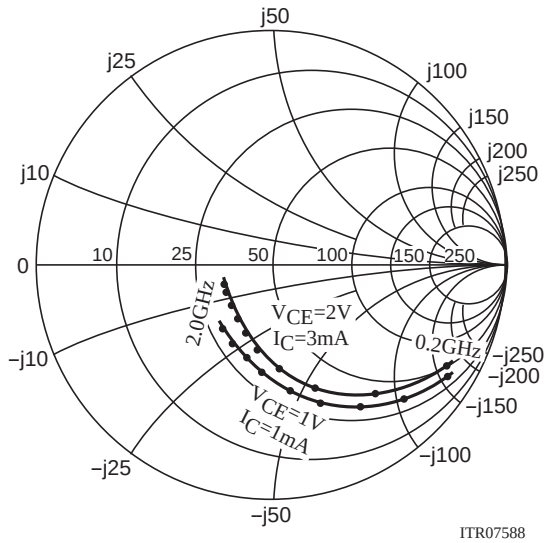

|S21e|2 – IC
f=1GHz
VCE=2V
1V
Forward Transfer Gain, |S21e|2 – dB
Collector Current, IC – mA
ITR07584


|S21e|2, NF – VCE
f=1GHz
IC=3mA
|S21e|2
1mA
NF
IC=1mA
3mA
|S21e|2, NF – dB
Collector-to-Emitter Voltage, VCE – V
ITR07586

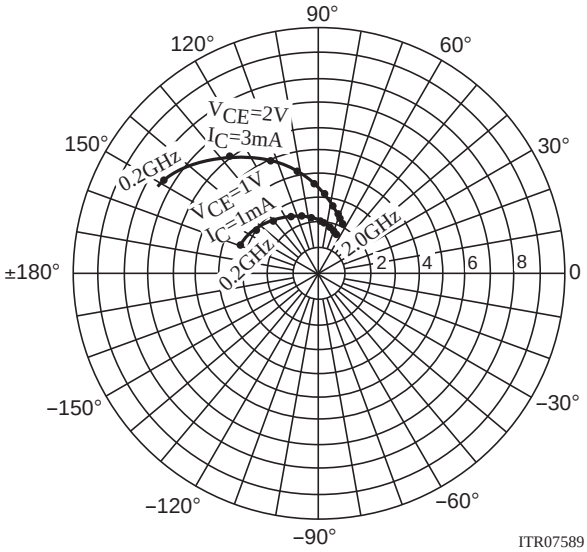

PC – Ta
Collector Dissipation, PC – mW
Ambient Temperature, Ta – °C
IT14234

## S Parameters

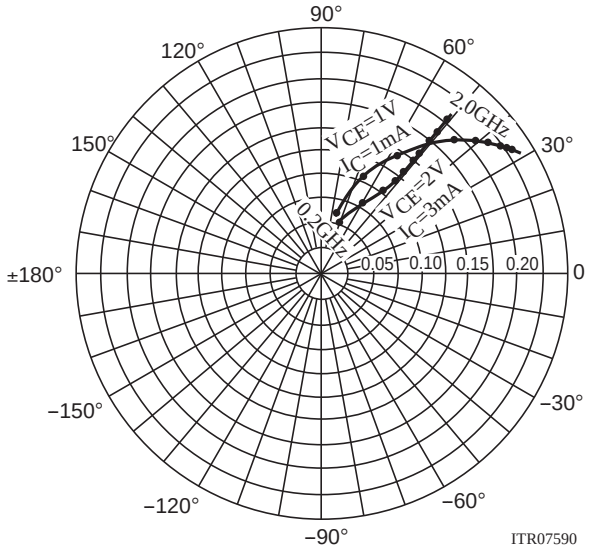
S11e
f=200MHz to 2000MHz(200MHz Step)



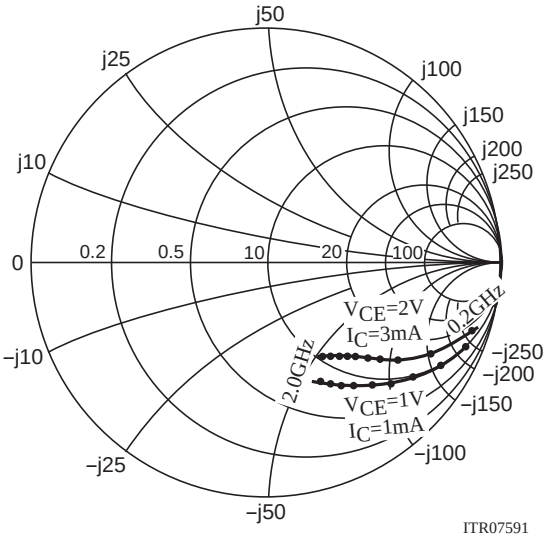

S21e
f=200MHz to 2000MHz(200MHz Step)




S12e
f=200MHz to 2000MHz(200MHz Step)




S22e
f=200MHz to 2000MHz(200MHz Step)



**S Parameters (Common emitter)**

$V_{CE}$=1V, $I_C$=1mA, $Z_O$=50Ω

| Freq(MHz) | \|S11\| | ∠S11 | \|S21\| | ∠S21 | \|S12\| | ∠S12 | \|S22\| | ∠S22 |
|---|---|---|---|---|---|---|---|---|
| 200 | 0.940 | -17.9 | 3.228 | 159.6 | 0.058 | 77.1 | 0.972 | -12.2 |
| 400 | 0.863 | -33.7 | 2.983 | 143.7 | 0.107 | 66.6 | 0.914 | -22.7 |
| 600 | 0.778 | -48.0 | 2.732 | 129.9 | 0.145 | 58.1 | 0.844 | -31.7 |
| 800 | 0.698 | -60.5 | 2.469 | 117.7 | 0.173 | 50.9 | 0.773 | -39.6 |
| 1000 | 0.608 | -73.5 | 2.320 | 106.2 | 0.195 | 45.4 | 0.717 | -46.0 |
| 1200 | 0.546 | -84.7 | 2.106 | 96.3 | 0.210 | 40.9 | 0.668 | -51.7 |
| 1400 | 0.470 | -96.2 | 1.977 | 87.1 | 0.129 | 37.6 | 0.624 | -56.5 |
| 1600 | 0.418 | -106.4 | 1.826 | 78.8 | 0.224 | 35.3 | 0.590 | -60.6 |
| 1800 | 0.388 | -117.3 | 1.700 | 72.2 | 0.230 | 33.8 | 0.562 | -64.3 |
| 2000 | 0.354 | -127.0 | 1.615 | 65.9 | 0.234 | 32.9 | 0.546 | -67.5 |

$V_{CE}$=2V, $I_C$=3mA, $Z_O$=50Ω

| Freq(MHz) | \|S11\| | ∠S11 | \|S21\| | ∠S21 | \|S12\| | ∠S12 | \|S22\| | ∠S22 |
|---|---|---|---|---|---|---|---|---|
| 200 | 0.839 | -30.6 | 7.428 | 149.3 | 0.050 | 71.4 | 0.916 | -18.3 |
| 400 | 0.672 | -53.7 | 6.016 | 128.5 | 0.083 | 60.6 | 0.778 | -30.2 |
| 600 | 0.536 | -71.7 | 4.908 | 113.6 | 0.105 | 55.1 | 0.672 | -37.1 |
| 800 | 0.431 | -85.7 | 4.073 | 101.9 | 0.121 | 52.5 | 0.597 | -41.9 |
| 1000 | 0.360 | -99.0 | 3.494 | 92.7 | 0.135 | 51.4 | 0.548 | -45.7 |
| 1200 | 0.310 | -111.4 | 3.033 | 84.4 | 0.150 | 50.9 | 0.514 | -49.2 |
| 1400 | 0.265 | -122.6 | 2.694 | 77.4 | 0.162 | 50.9 | 0.492 | -52.3 |
| 1600 | 0.242 | -134.7 | 2.422 | 70.9 | 0.175 | 51.0 | 0.475 | -55.6 |
| 1800 | 0.228 | -148.0 | 2.205 | 65.9 | 0.189 | 51.1 | 0.461 | -59.0 |
| 2000 | 0.217 | -157.2 | 2.061 | 60.8 | 0.205 | 51.0 | 0.456 | -61.8 |

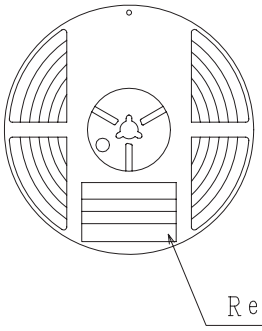
**Embossed Taping Specification**

2SC4853A-4-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) |
| MCP | MCP | 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 |

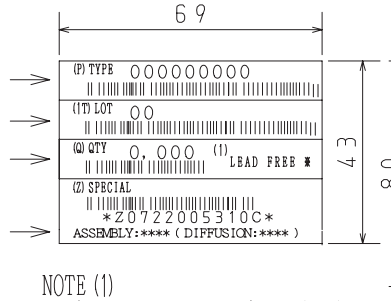
Packing method



Reel label

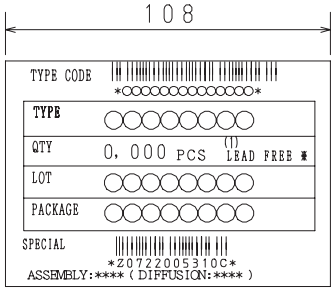
Reel label, Inner box label

(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.



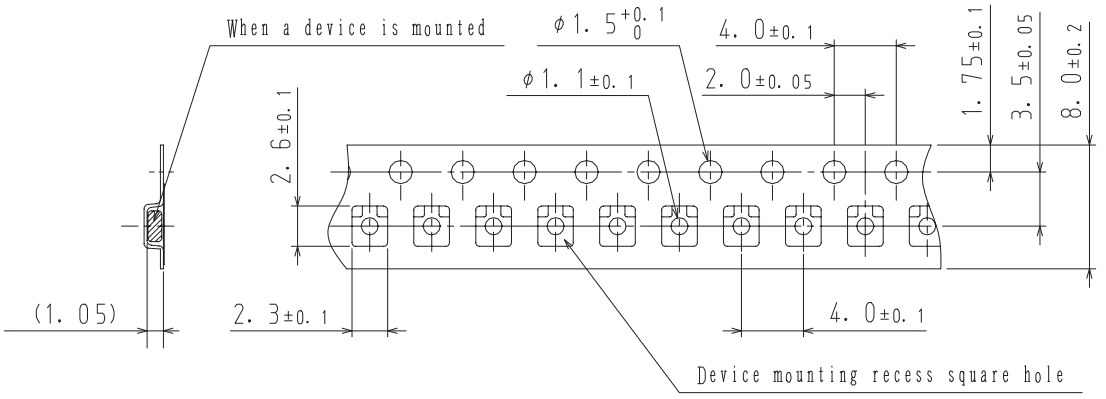

NOTE (1)

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

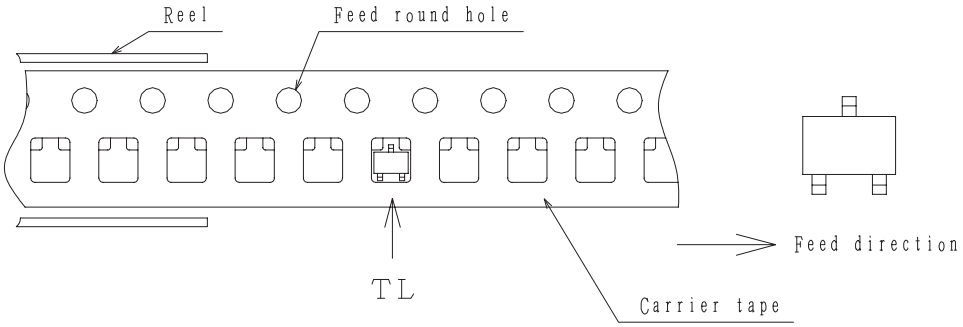
| Label | JEITA Phase |
|---|---|
| LEAD FREE 3 | JEITA Phase 3A |
| LEAD FREE 4 | JEITA Phase 3 |

## 2. Taping configuration

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



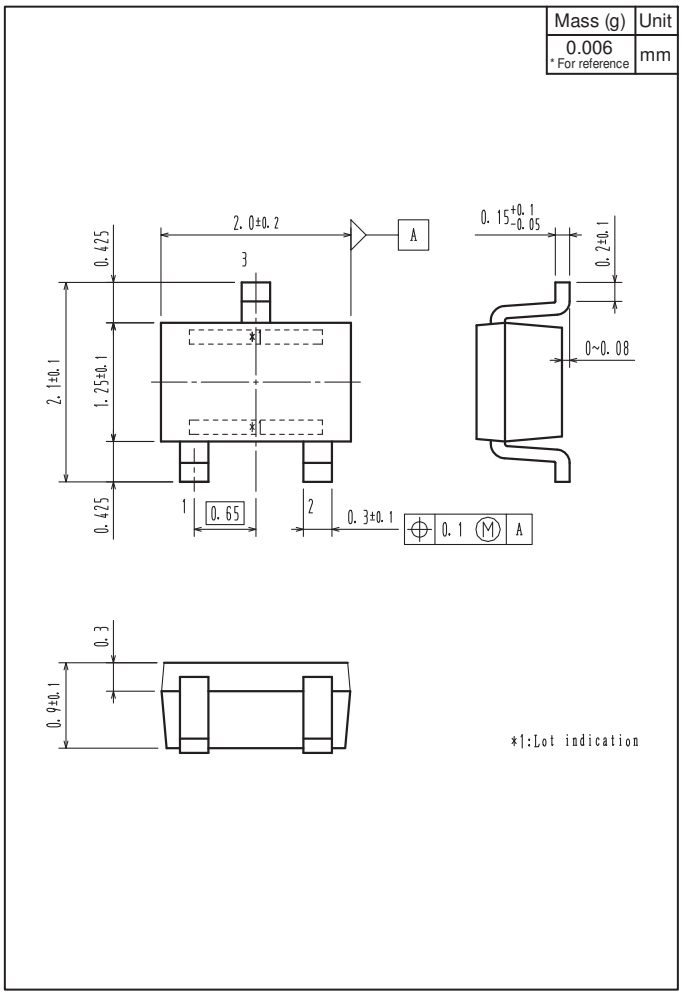

### 2-2. Device placement direction



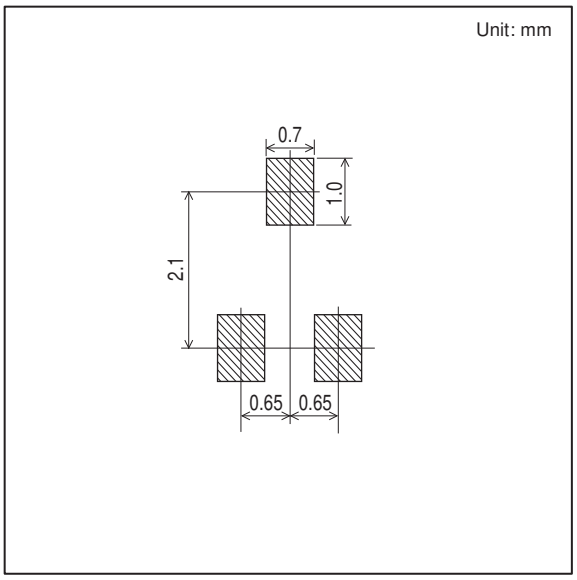

Those with oen electrode terminal on the feed hole side·····TL

## Outline Drawing

2SC4853A-4-TL-E




## Land Pattern Example



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