



2SC5374A

RF Transistor 10V, 100mA, $f_T=5.2\text{GHz}$, NPN Single SMCP

ON Semiconductor®

<http://onsemi.com>

Features

- High gain : $|S_{21e}|^2=10.5\text{dB typ (f=1GHz)}$
- High cut-off frequency : $f_T=5.2\text{GHz typ}$

Specifications

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

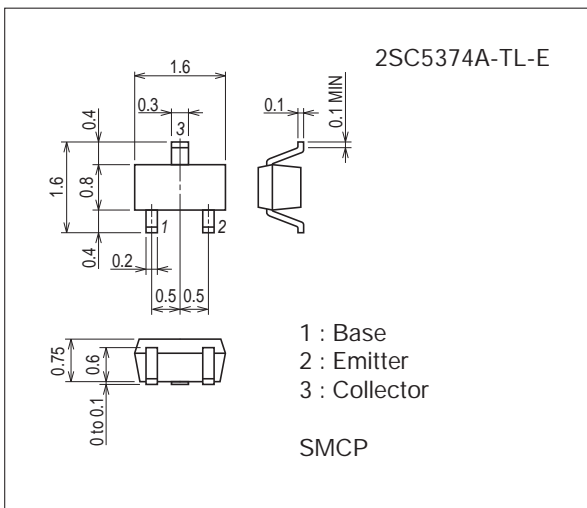
| Parameter | Symbol | Conditions | Ratings | Unit |
|------------------------------|-----------|------------|-------------|------------------|
| Collector-to-Base Voltage | V_{CBO} | | 20 | V |
| Collector-to-Emitter Voltage | V_{CEO} | | 10 | V |
| Emitter-to-Base Voltage | V_{EBO} | | 2 | V |
| Collector Current | I_C | | 100 | mA |
| Collector Dissipation | P_C | | 100 | mW |
| Junction Temperature | T_j | | 150 | $^\circ\text{C}$ |
| 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)

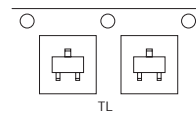
7027A-002



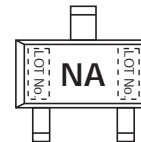
Product & Package Information

- Package : SMCP
- JEITA, JEDEC : SC-75, SOT-416
- Minimum Packing Quantity : 3,000 pcs./reel

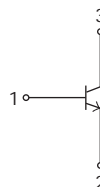
Packing Type: TL



Marking



Electrical Connection



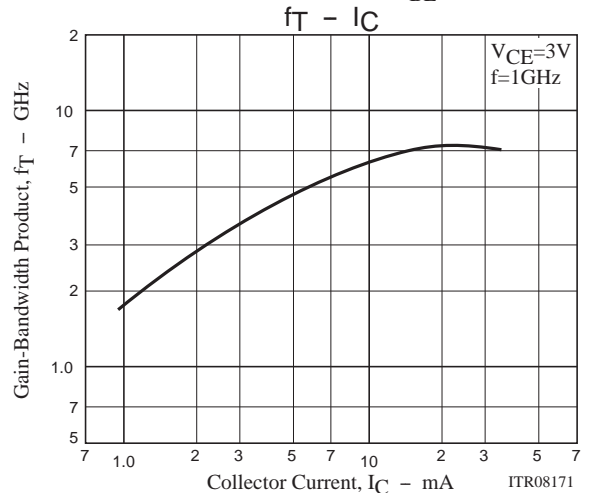
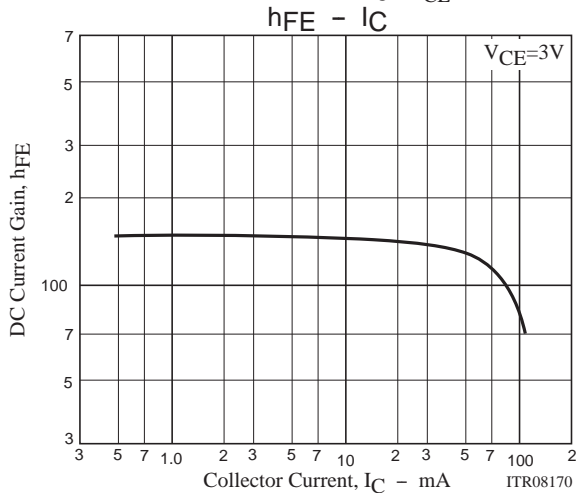
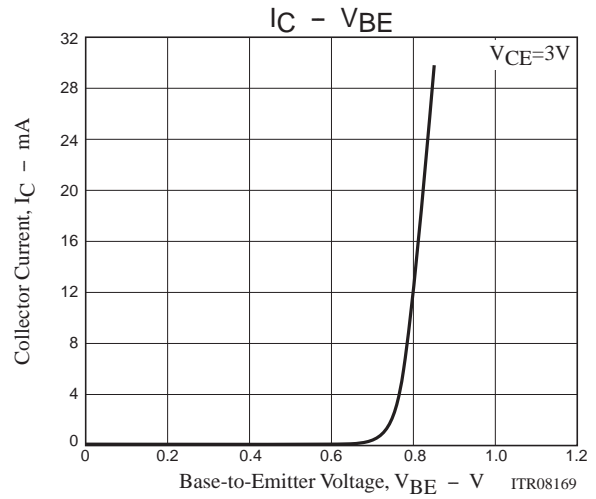
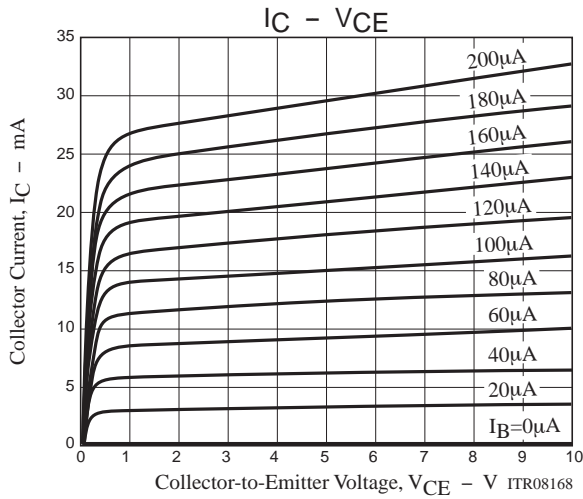
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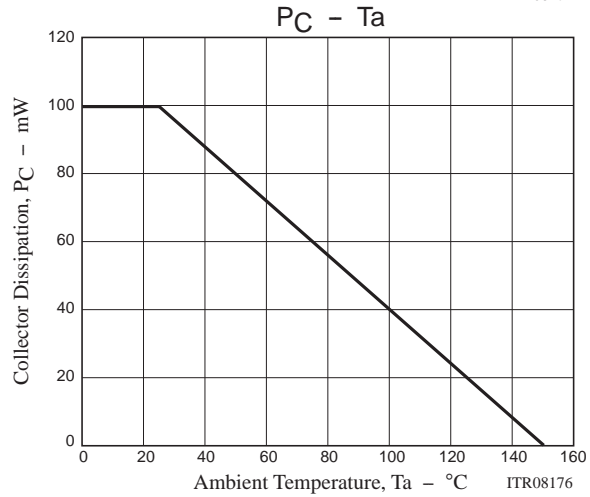
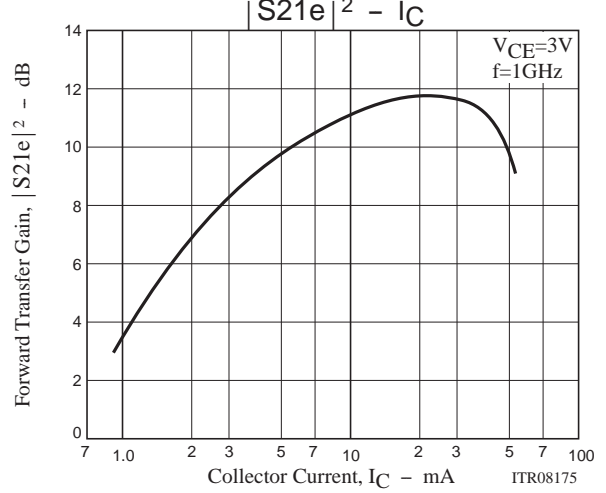
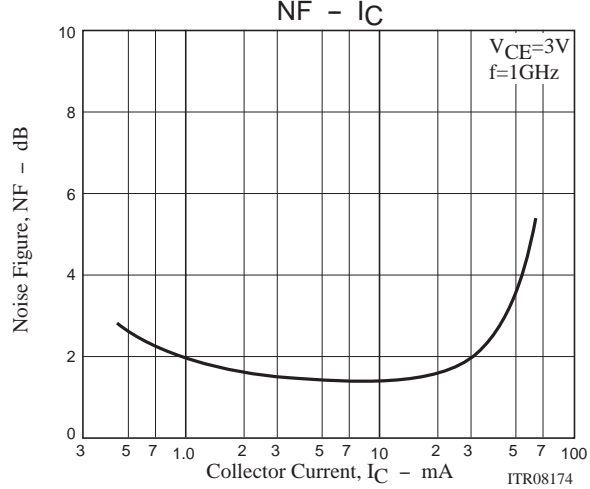
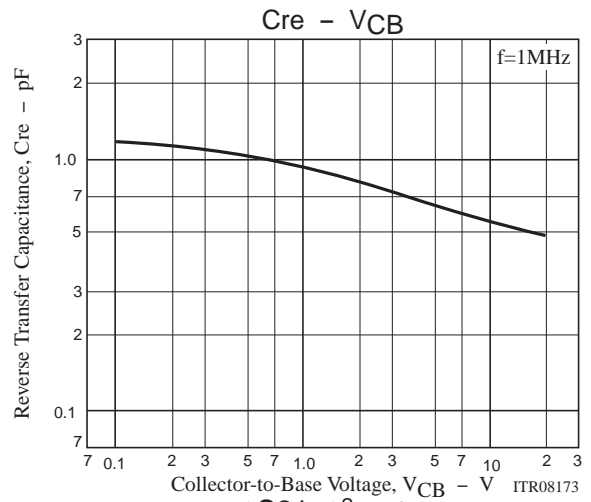
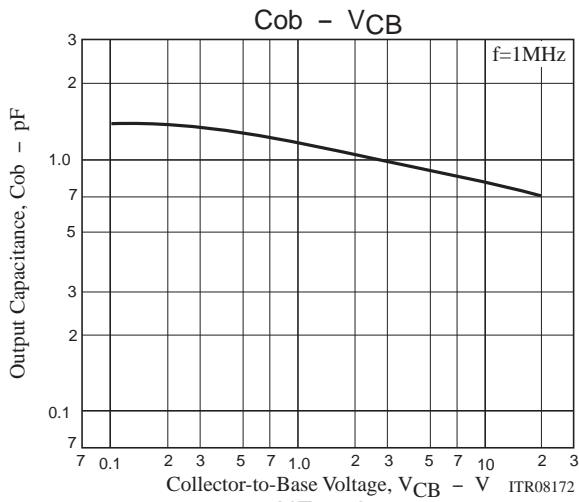
Electrical Characteristics at Ta=25°C

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|------------------------------|---------------|------------------------------|---------|------|-----|---------|
| | | | min | typ | max | |
| Collector Cutoff Current | I_{CBO} | $V_{CB}=10V, I_E=0A$ | | | 1.0 | μA |
| Emitter Cutoff Current | I_{EBO} | $V_{EB}=1V, I_C=0A$ | | | 10 | μA |
| DC Current Gain | h_{FE1} | $V_{CE}=3V, I_C=7mA$ | 110 | | 180 | |
| | h_{FE2} | $V_{CE}=3V, I_C=30mA$ | 100 | | | |
| Gain-Bandwidth Product | f_T | $V_{CE}=3V, I_C=7mA$ | 3 | 5.2 | | GHz |
| Output Capacitance | C_{ob} | $V_{CB}=3V, f=1MHz$ | | 1.0 | 1.5 | pF |
| Reverse Transfer Capacitance | C_{re} | | | | 0.7 | pF |
| Forward Transfer Gain | $ S_{21e} ^2$ | $V_{CE}=3V, I_C=7mA, f=1GHz$ | 8 | 10.5 | | dB |
| Noise Figure | NF | $V_{CE}=3V, I_C=7mA, f=1GHz$ | | 1.4 | 2.5 | dB |

Ordering Information

| Device | Package | Shipping | memo |
|---------------|---------|----------------|---------|
| 2SC5374A-TL-E | SMCP | 3,000pcs./reel | Pb Free |



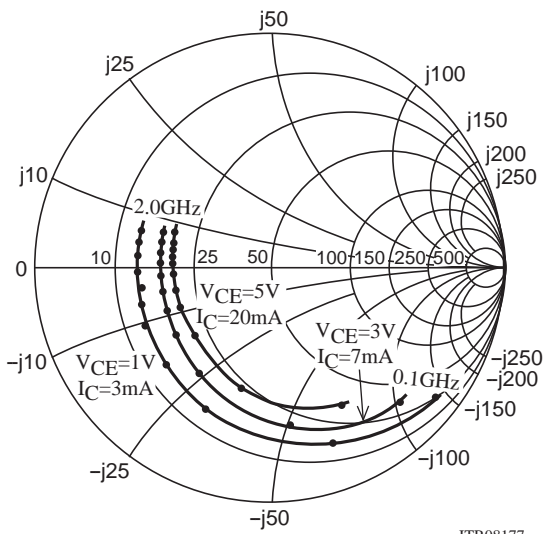


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S Parameter

S11e

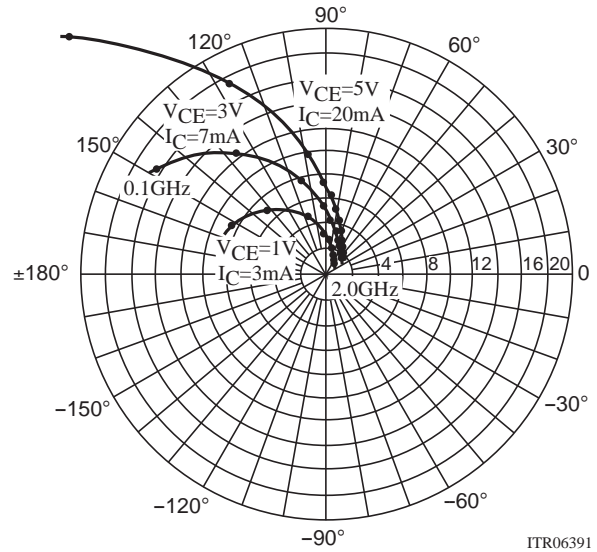
f=100MHz, 200MHz to 2000MHz(200MHz Step)



ITR08177

S21e

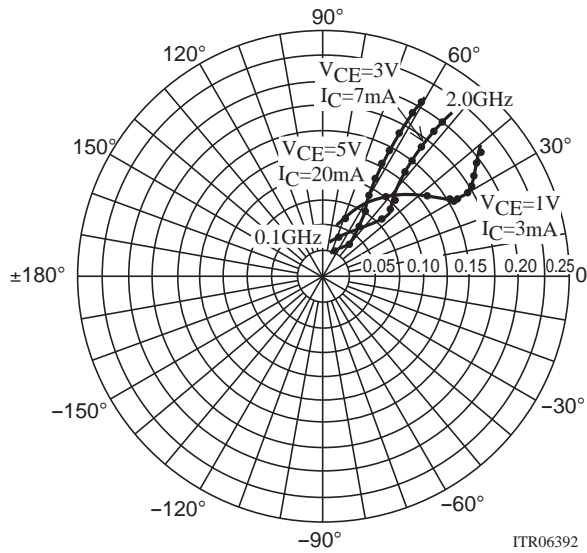
f=100MHz, 200MHz to 2000MHz(200MHz Step)



ITR06391

S12e

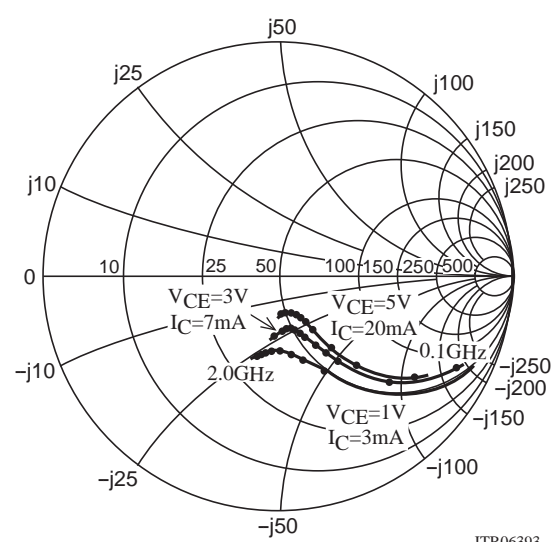
f=100MHz, 200MHz to 2000MHz(200MHz Step)



ITR06392

S22e

f=100MHz, 200MHz to 2000MHz(200MHz Step)



ITR06393

2SC5374A

S Parameters (Common emitter)

$V_{CE}=1V, I_C=3mA, Z_O=50\Omega$

| Freq(MHz) | S11 | $\angle S11$ | S21 | $\angle S21$ | S12 | $\angle S12$ | S22 | $\angle S22$ |
|-----------|-------|--------------|-------|--------------|-------|--------------|-------|--------------|
| 100 | 0.875 | -40.6 | 8.627 | 152.3 | 0.062 | 67.9 | 0.918 | -23.4 |
| 200 | 0.785 | -71.6 | 6.874 | 132.5 | 0.101 | 52.1 | 0.748 | -41.7 |
| 400 | 0.651 | -114.8 | 4.701 | 107.3 | 0.135 | 37.1 | 0.537 | -57.6 |
| 600 | 0.613 | -136.9 | 3.365 | 92.8 | 0.152 | 31.1 | 0.430 | -65.6 |
| 800 | 0.581 | -153.9 | 2.716 | 81.9 | 0.155 | 29.9 | 0.361 | -74.3 |
| 1000 | 0.568 | -164.2 | 2.218 | 73.4 | 0.161 | 30.0 | 0.326 | -80.2 |
| 1200 | 0.556 | -172.0 | 1.863 | 66.2 | 0.170 | 30.5 | 0.300 | -86.1 |
| 1400 | 0.563 | -178.1 | 1.626 | 59.6 | 0.177 | 32.7 | 0.297 | -92.3 |
| 1600 | 0.558 | 175.4 | 1.473 | 53.9 | 0.185 | 35.4 | 0.306 | -96.5 |
| 1800 | 0.560 | 168.9 | 1.345 | 48.1 | 0.196 | 37.4 | 0.313 | -100.6 |
| 2000 | 0.567 | 163.1 | 1.230 | 42.5 | 0.205 | 38.0 | 0.335 | -102.9 |

$V_{CE}=3V, I_C=7mA, Z_O=50\Omega$

| Freq(MHz) | S11 | $\angle S11$ | S21 | $\angle S21$ | S12 | $\angle S12$ | S22 | $\angle S22$ |
|-----------|-------|--------------|--------|--------------|-------|--------------|-------|--------------|
| 100 | 0.789 | -48.3 | 16.232 | 147.7 | 0.039 | 66.1 | 0.862 | -27.2 |
| 200 | 0.670 | -83.7 | 12.431 | 126.4 | 0.061 | 53.0 | 0.673 | -44.6 |
| 400 | 0.552 | -123.8 | 7.607 | 104.7 | 0.081 | 45.2 | 0.438 | -59.1 |
| 600 | 0.522 | -145.3 | 5.401 | 92.7 | 0.094 | 45.9 | 0.333 | -65.1 |
| 800 | 0.504 | -158.5 | 4.155 | 84.1 | 0.106 | 48.2 | 0.290 | -68.7 |
| 1000 | 0.488 | -169.1 | 3.425 | 77.1 | 0.121 | 49.1 | 0.270 | -71.0 |
| 1200 | 0.478 | -176.1 | 2.849 | 71.0 | 0.136 | 51.0 | 0.253 | -74.7 |
| 1400 | 0.481 | 178.4 | 2.511 | 65.6 | 0.152 | 52.2 | 0.239 | -79.6 |
| 1600 | 0.478 | 172.7 | 2.237 | 60.7 | 0.167 | 52.8 | 0.240 | -82.8 |
| 1800 | 0.492 | 167.4 | 2.016 | 55.5 | 0.185 | 53.2 | 0.245 | -86.7 |
| 2000 | 0.489 | 162.0 | 1.844 | 50.5 | 0.200 | 52.7 | 0.248 | -90.0 |

$V_{CE}=5V, I_C=20mA, Z_O=50\Omega$

| Freq(MHz) | S11 | $\angle S11$ | S21 | $\angle S21$ | S12 | $\angle S12$ | S22 | $\angle S22$ |
|-----------|-------|--------------|--------|--------------|-------|--------------|-------|--------------|
| 100 | 0.643 | -66.4 | 26.381 | 137.4 | 0.029 | 62.8 | 0.748 | -36.3 |
| 200 | 0.530 | -104.6 | 17.543 | 116.5 | 0.041 | 54.2 | 0.531 | -52.5 |
| 400 | 0.459 | -140.3 | 9.835 | 98.9 | 0.058 | 55.4 | 0.322 | -62.7 |
| 600 | 0.447 | -157.2 | 6.805 | 89.4 | 0.074 | 59.2 | 0.246 | -65.5 |
| 800 | 0.440 | -168.4 | 5.210 | 82.4 | 0.092 | 61.4 | 0.213 | -68.6 |
| 1000 | 0.434 | -175.9 | 4.194 | 76.6 | 0.110 | 61.9 | 0.199 | -70.2 |
| 1200 | 0.437 | 177.1 | 3.518 | 71.5 | 0.129 | 62.3 | 0.191 | -72.9 |
| 1400 | 0.437 | 173.0 | 3.077 | 66.7 | 0.148 | 61.8 | 0.184 | -76.5 |
| 1600 | 0.438 | 168.4 | 2.730 | 62.5 | 0.166 | 61.6 | 0.181 | -80.9 |
| 1800 | 0.439 | 164.2 | 2.459 | 58.0 | 0.186 | 60.7 | 0.186 | -84.8 |
| 2000 | 0.444 | 159.1 | 2.249 | 53.5 | 0.203 | 59.5 | 0.192 | -87.3 |

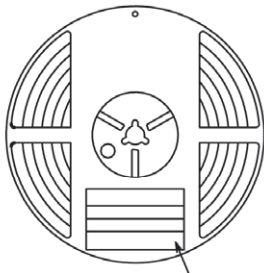
Embossed Taping Specification

2SC5374A-TL-E

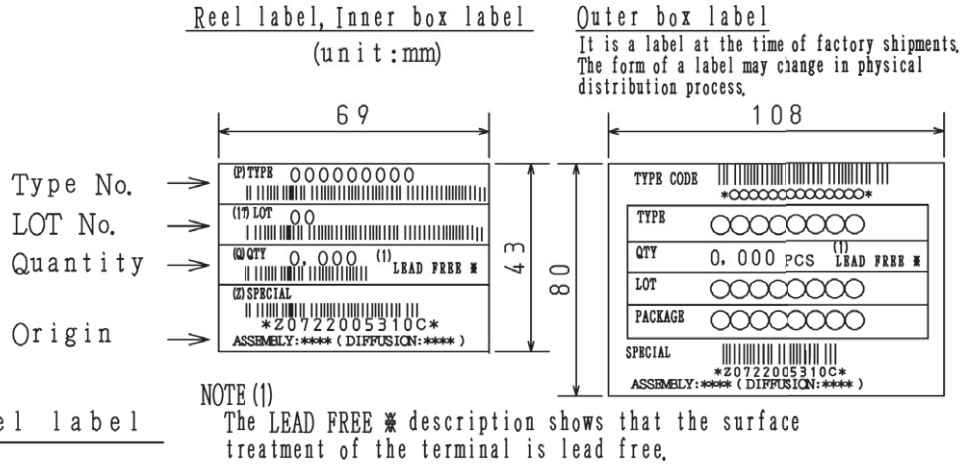
1. Packing Format

| 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) |
| SMCP | SMCP | 3,000 | 15,000 | 90,000 | 5 reels contained Dimensions:mm (external) 183×72×185 | 6 inner boxes contained Dimensions:mm (external) 440×195×210 |

Packing method



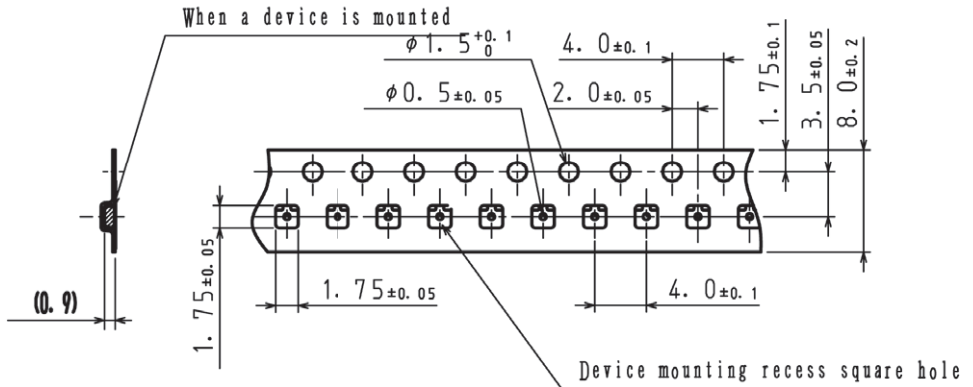
Reel label



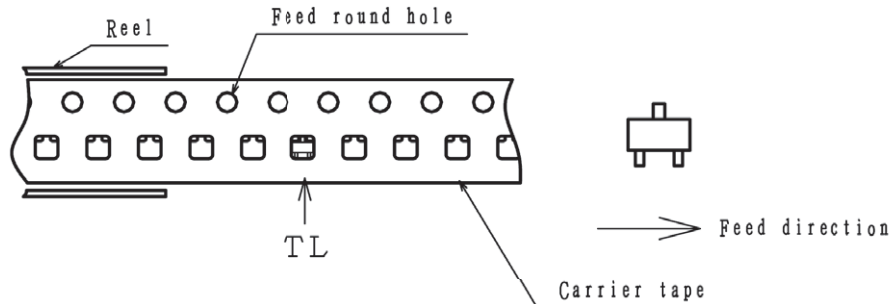
| Label | JEITA Phase |
|-------|---------------|
| | JEITA Phase 3 |

2. Taping configuration

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



2-2. Device placement direction

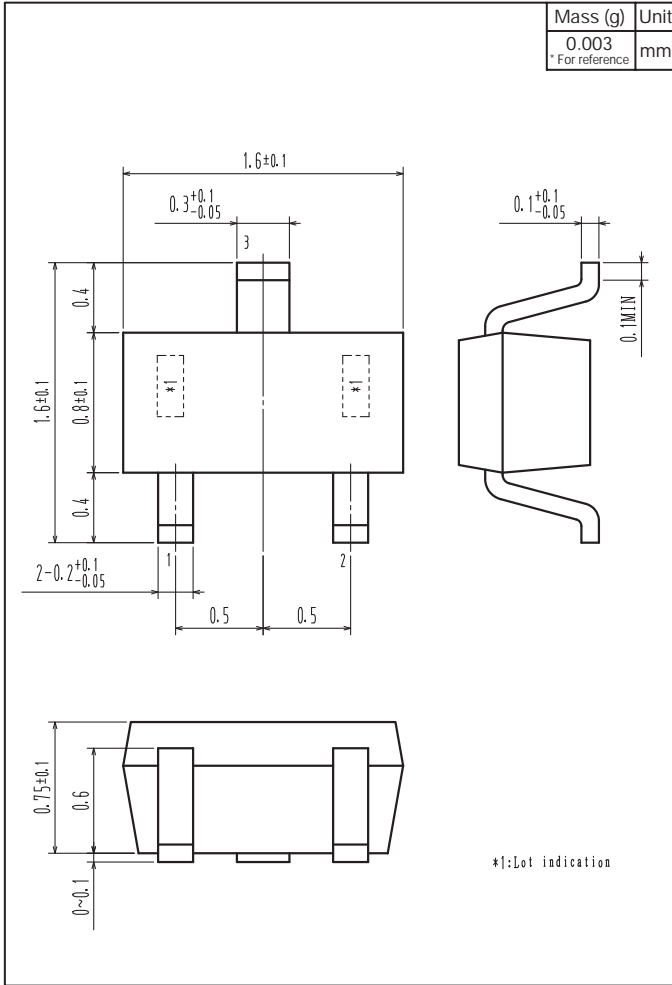


Those with one electrode terminal on the feed hole side.....TL

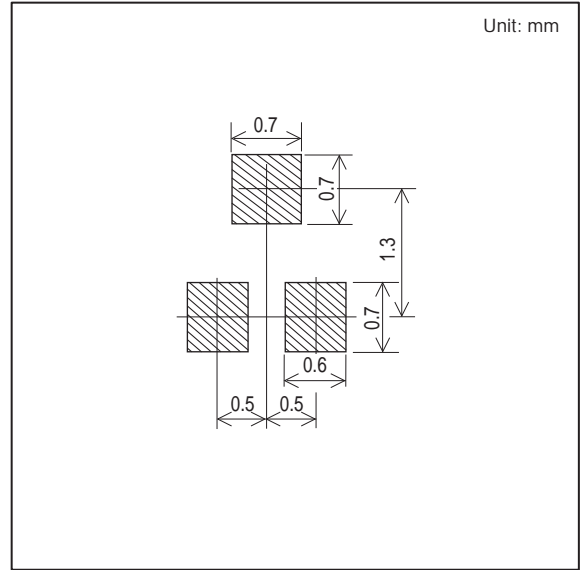
2SC5374A

Outline Drawing

2SC5374A-TL-E



Land Pattern Example



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