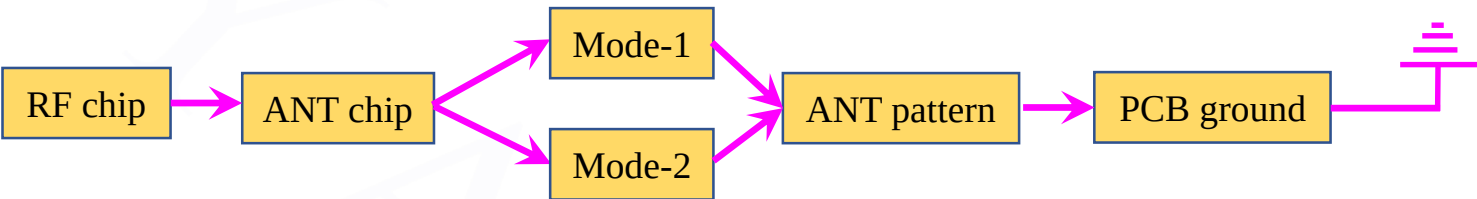


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✓ Features:

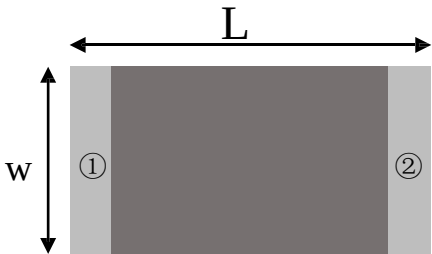
- 1. Surface mounted element with a small dimension of  $1.6 \times 0.8 \times 0.8$  mm meet future miniaturization trend.
- 2. Embedded and LTCC (low temperature co-fired ceramic) technology is able to integrate with system design as well as beatifying the housing of final product.
- 3. Miniaturization, wideband, high stability, low ESR, and low tolerance.
- 4. Dual-band resonances in the dominant and harmonic modes enables multiband operations.
- 5. Novel ground-radiation technique enables radiation from both the antenna and the ground plane.



✓ Applications:

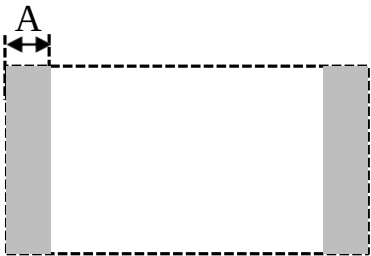
- 1. Bluetooth
- 2. Dual-band WLAN
- 3. ISM and UWB

✓ Dimensions (Unit: mm)

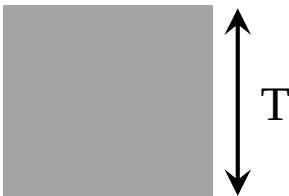


( Top View )

| Number | Terminal Name |
|--------|---------------|
| ①      | INPUT         |
| ②      | NC            |



( Bottom View )

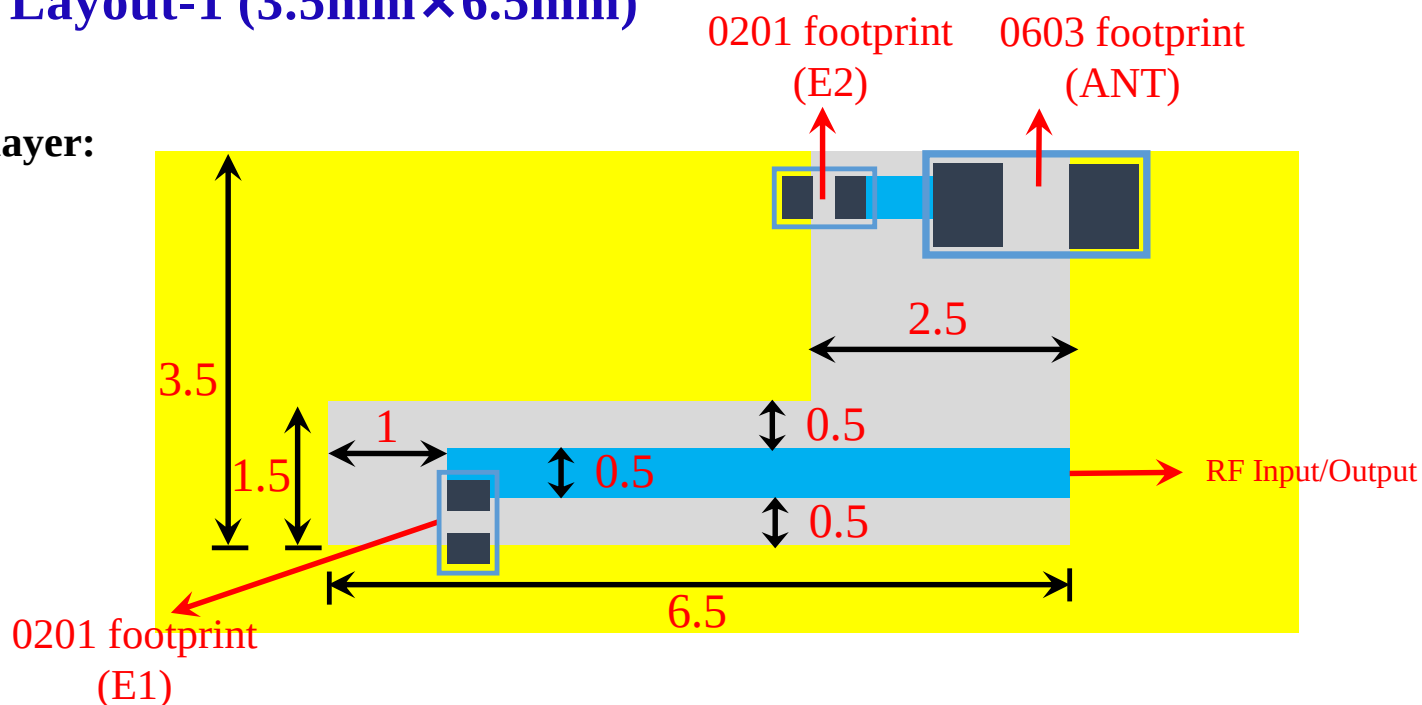


( Side View )

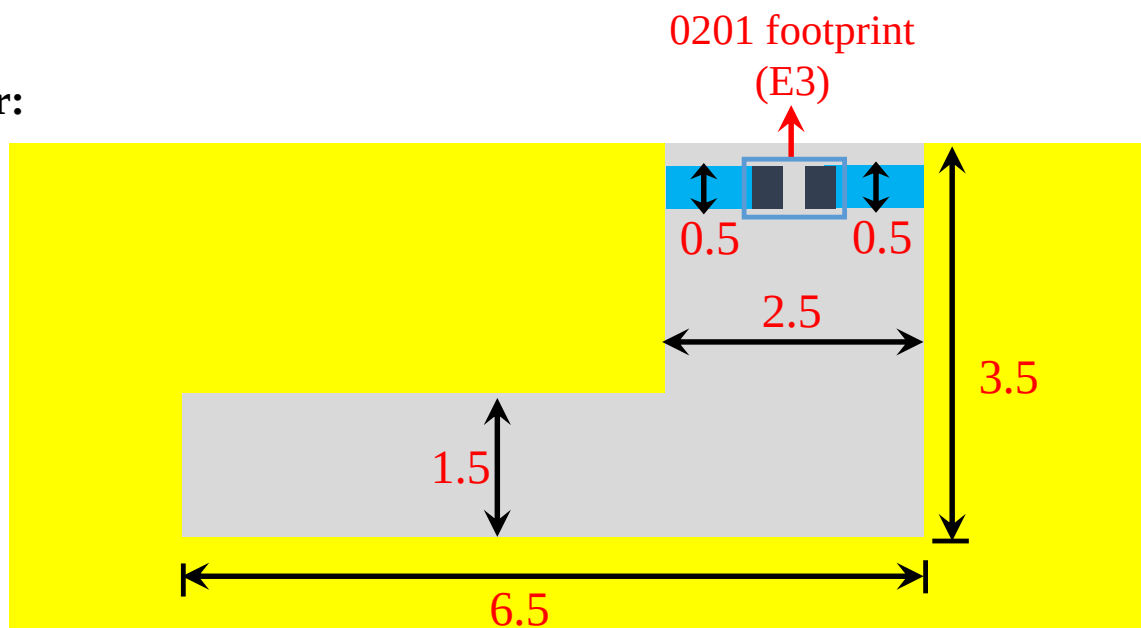
| Symbols    | L               | W               | T               | A               |
|------------|-----------------|-----------------|-----------------|-----------------|
| Dimensions | $1.60 \pm 0.20$ | $0.80 \pm 0.20$ | $0.80 \pm 0.20$ | $0.30 \pm 0.10$ |

✓ **Layout-1 (3.5mm×6.5mm)**

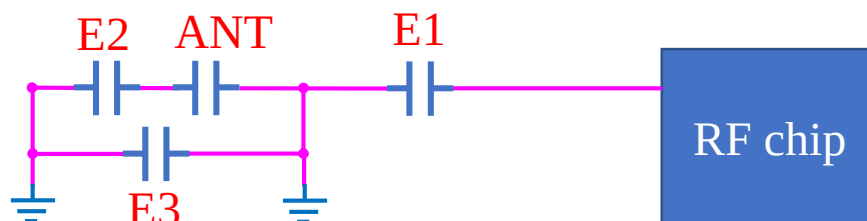
**Top layer:**



**Bottom layer:**

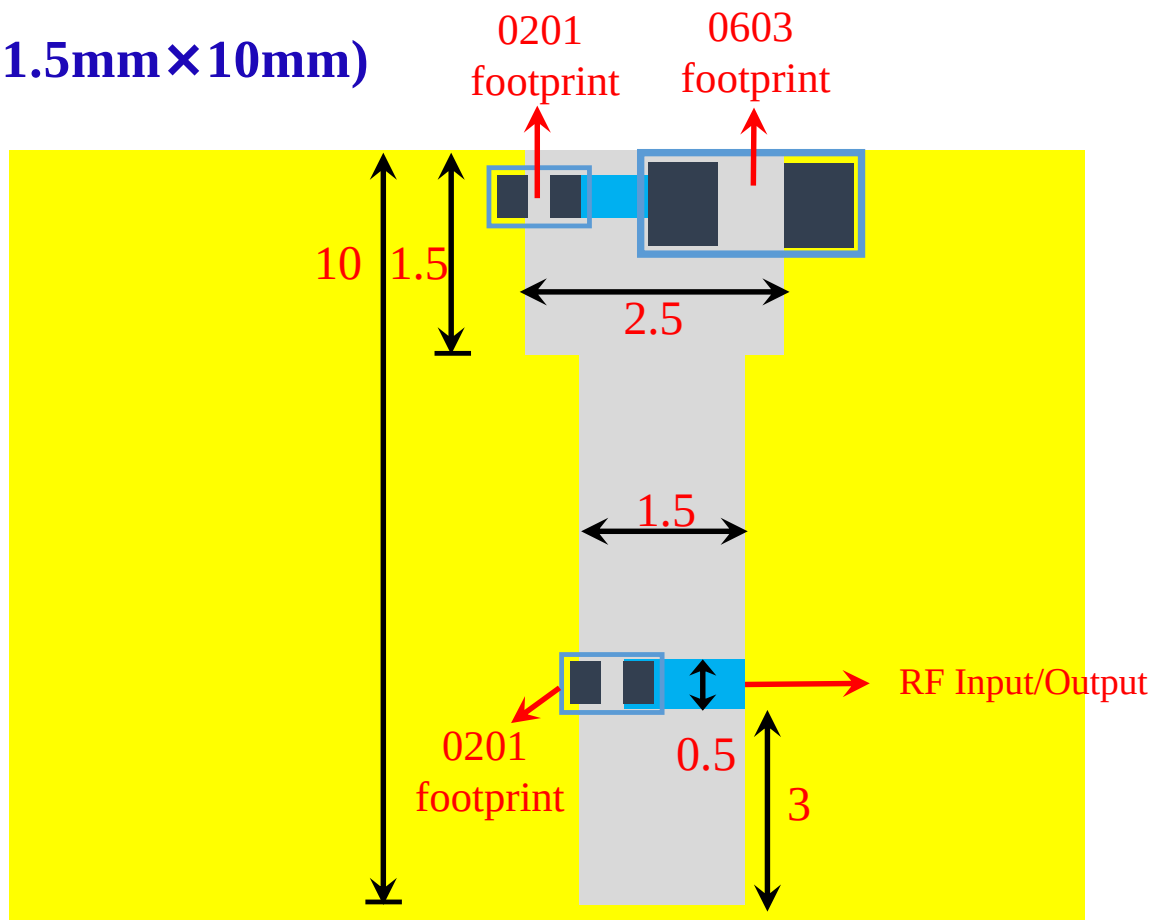


**Equivalent circuit:**

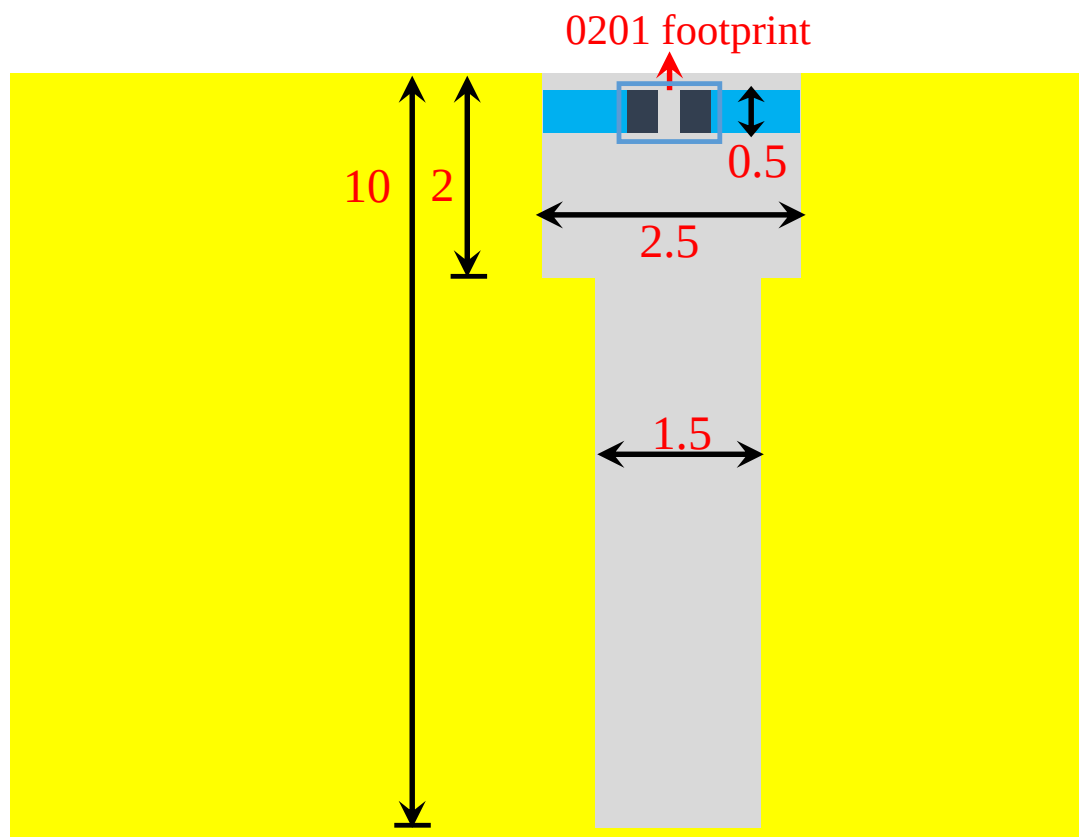


✓ **Layout-2 (1.5mm×10mm)**

**Top layer:**



**Bottom layer:**



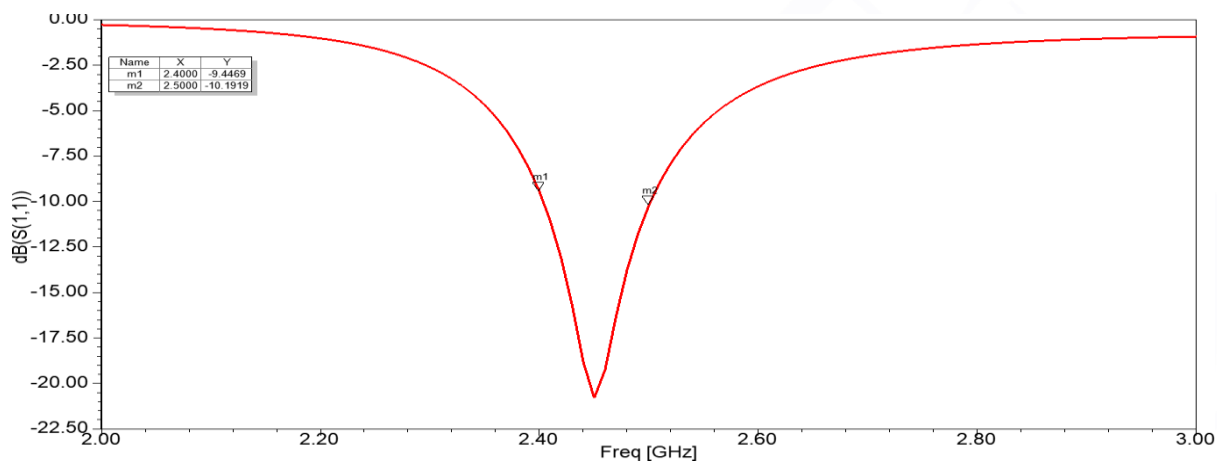
**P/N: HT-1608-V1**

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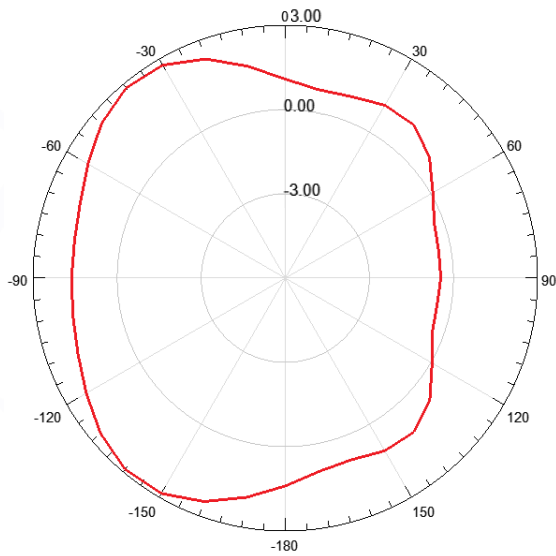
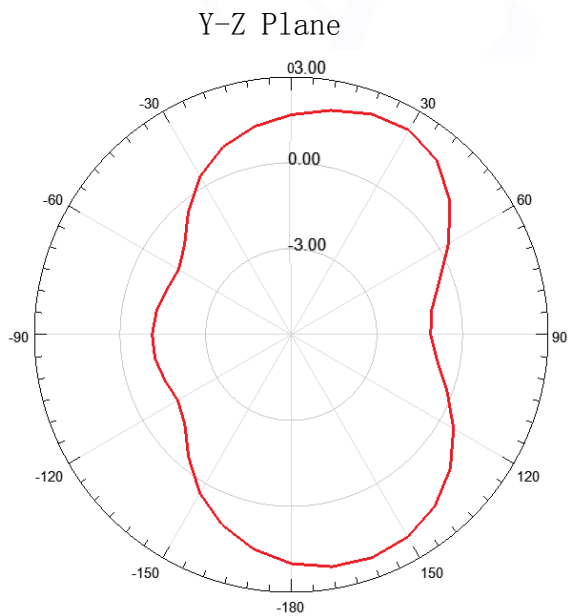
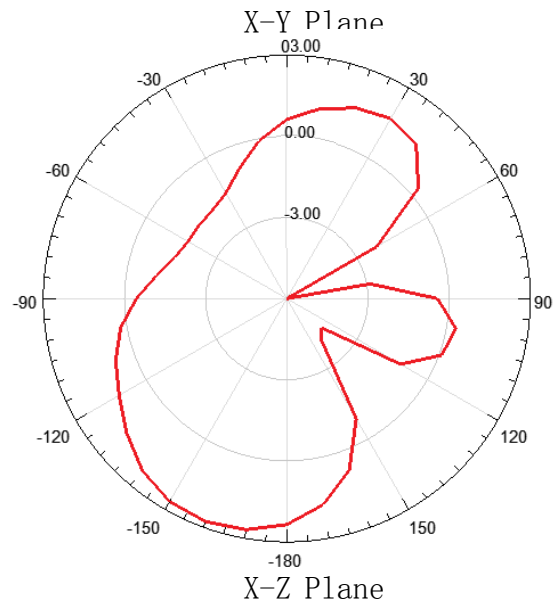
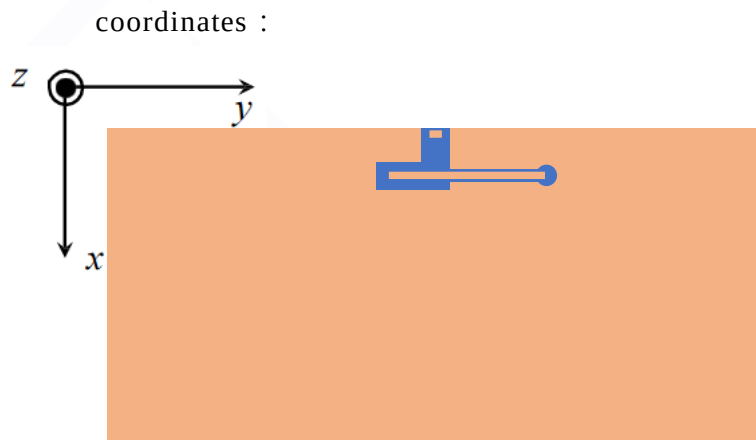
## ✓ Electrical Characteristics:

|   | Feature           | Specification   |
|---|-------------------|-----------------|
| 1 | Central frequency | 2.45GHz         |
| 2 | Bandwidth         | >150MHz         |
| 3 | Peak gain         | 1.8 dBi         |
| 4 | VSWR              | <2              |
| 5 | Polarization      | Linear          |
| 6 | Azimuth beamwidth | Omnidirectional |
| 7 | Impedance         | 50 $\Omega$     |

## ✓ Characteristic Curves:



## ✓ Radiation Pattern:



## ✓ Radiation Performance:

| Frequency  | 2400MHz | 2450MHz | 2500MHz |
|------------|---------|---------|---------|
| Avg. gain  | -1.92   | -1.35   | -1.56   |
| Peak gain  | 1.79    | 1.8     | 1.66    |
| Efficiency | 74.55   | 80.25   | 76.98   |

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## ✓ Dependability Test

|                       |                |
|-----------------------|----------------|
| Test Temperature      | 25°C ± 5°C     |
| Operating Temperature | -25°C ~ +125°C |
| Temperature           | 5~40°C         |
| Relative Humidity     | 20~70%         |

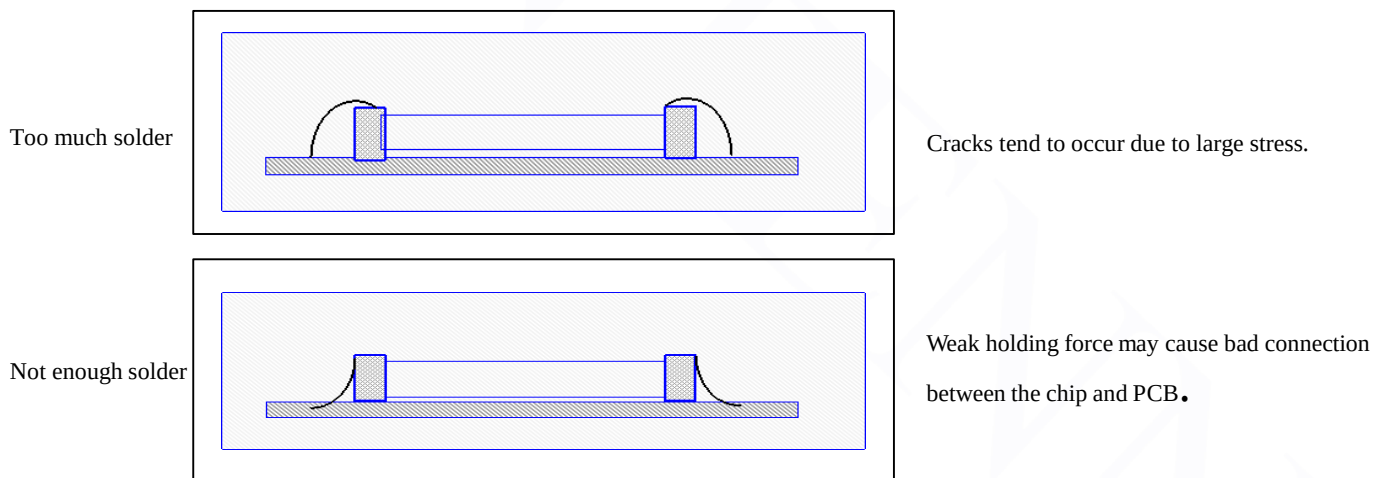
## ✓ Moisture Proof

Temperature: 40 ± 2°C Humidity: 90~95%RH  
Duration: 500h  
Recovery conditions: Room temperature Recovery Time: 24h (Class1) or 48h (Class2)

## ✓ Solderability

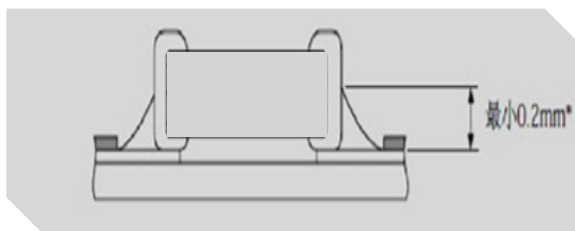
At least 95% of the terminal electrode is covered by new solder.  
Preheating conditions: 80 to 120°C; 10~30s.  
Solder Temperature: 235 ± 5°C Duration: 2 ± 0.5s, Solder Temperature: 245 ± 5°C Duration: 2 ± 0.5s

## ✓ Optimum Solder Amount for Reflow Soldering

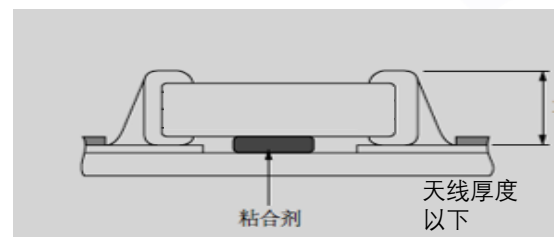


## ✓ Recommended Soldering Amounts

The optimal solder fillet amounts for re-flow soldering



The optimal solder fillet amounts for wave soldering



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## ✓ Temperature Cycle Test

10±1S Applied Force: 5N Duration: 10±1S

Preheating conditions: up-category temperature, 1h

Recovery time: 24±1h

Initial Measurement

Cycling Times: 5 times, 1 cycle, 4 steps:

| Stage  | Temperature(°C)                                                         | Time (minutes) |
|--------|-------------------------------------------------------------------------|----------------|
| Step 1 | Lower temperature limit (NPO/X7R/X7S/X6S/X5R:-55<br>Y5V:-25 Z5U:-10 )   | 30             |
| Step 2 | normal atmospheric temperature(+20)                                     | 2-3            |
| Step 3 | Upper line temperature (NPO/X7R/X7S: +125<br>Y5V/Z5U/X5R:-85 X6S:-105 ) | 30             |
| Step 4 | normal atmospheric temperature(+20)                                     | 2-3            |

## ✓ Resistance to Soldering Heat

Preheating 80 to 120°C; 10~30s. Solder Temperature: 235±5°C; Duration: 2±0.5s; Solder Temperature: 245±5°C  
Duration: 2±0.5s; Preheating 100 to 200°C; 10±2min.

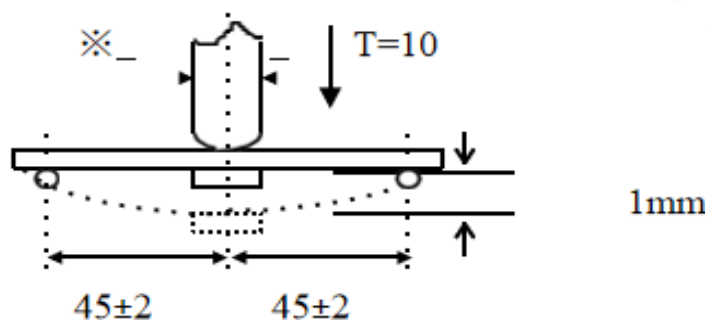
Solder Temperature: 265±5°C; Duration: 10±1s

Clean the capacitor with solvent and examine it with a 10X(min.) microscope.

Recovery Time: 24±2h

Recovery condition: Room temperature

## ✓ Resistance to Flexure of Substrate



Test Board: Al<sub>2</sub>O<sub>3</sub> or PCB Warp: 1mm Speed: 0.5mm/sec.

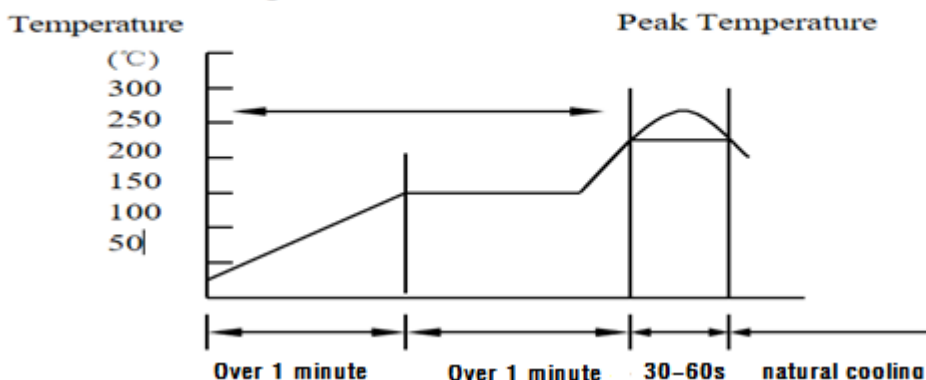
Unit: mm

The measurement should be made with the board in the bending position.

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## The temperature profile for soldering

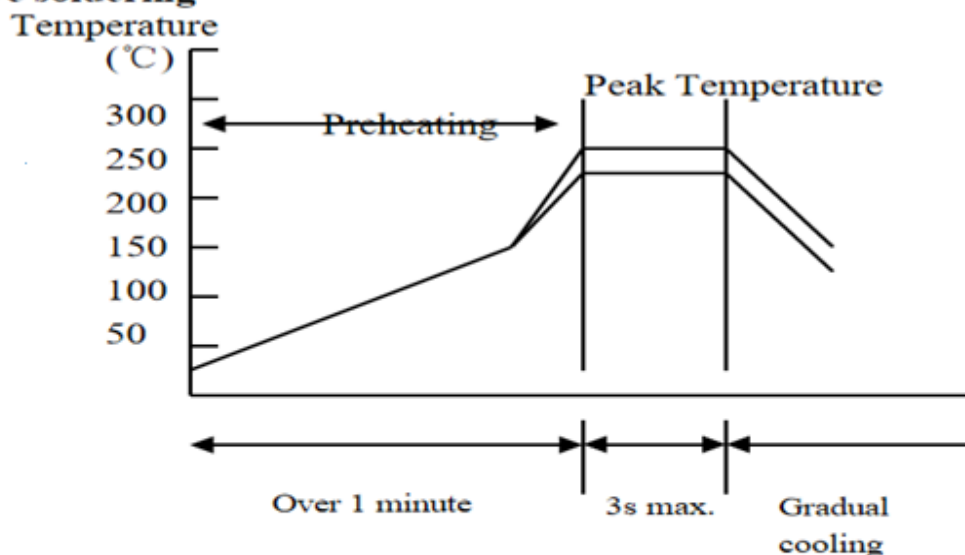
### Re-flow soldering



|                  | Pb-Sn soldering | Lead-free soldering |
|------------------|-----------------|---------------------|
| Peak temperature | 230°C~250°C     | 240°C ~ 260°C       |

While in preheating, please keep the temperature difference between soldering temperature and surface temperature of chips as:  $T \leq 150^{\circ}\text{C}$ .

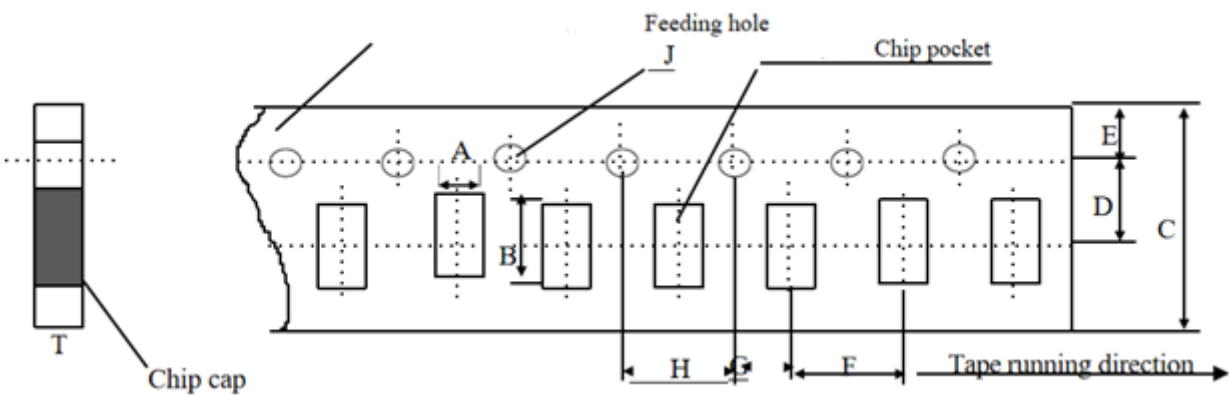
### Wave soldering



|                  | Pb-Sn soldering | Lead-free soldering |
|------------------|-----------------|---------------------|
| Peak temperature | 230°C~260°C     | 240°C~270°C         |

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✓ **Dimensions of paper taping**

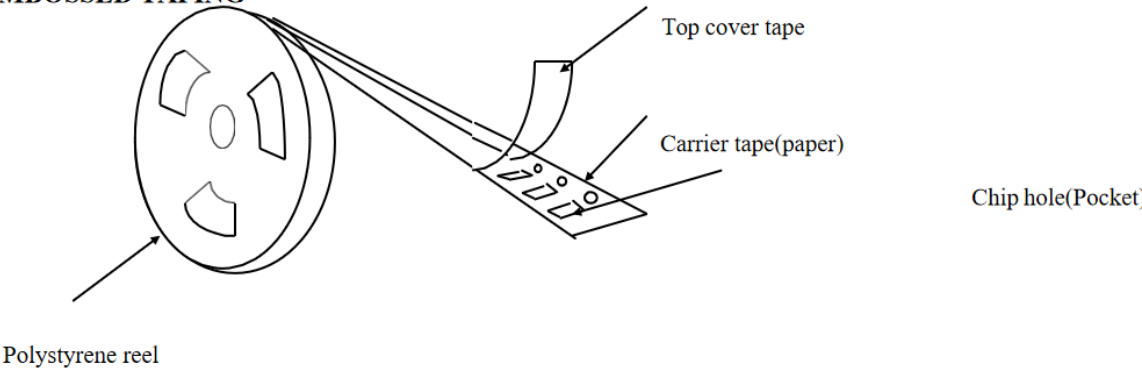


Unit: mm

| Code      | A             | B             | C             | D*            | E             | F             | G*            | H             | J                | T           |
|-----------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|------------------|-------------|
| papersize |               |               |               |               |               |               |               |               |                  |             |
| Size      | 1.10<br>±0.10 | 1.90<br>±0.10 | 8.00<br>±0.10 | 3.50<br>±0.05 | 1.75<br>±0.10 | 4.00<br>±0.10 | 2.00<br>±0.10 | 4.00<br>±0.10 | 1.50<br>-0/+0.10 | 1.10<br>Max |

Reel (4000 pcs/Reel)

**EMBOSED TAPING**



✓ **Storage Period**

The guaranteed period for solderability is 6 months (Under deliver package condition).  
Temperature:5~40℃ /Relative Humidity:20~70%