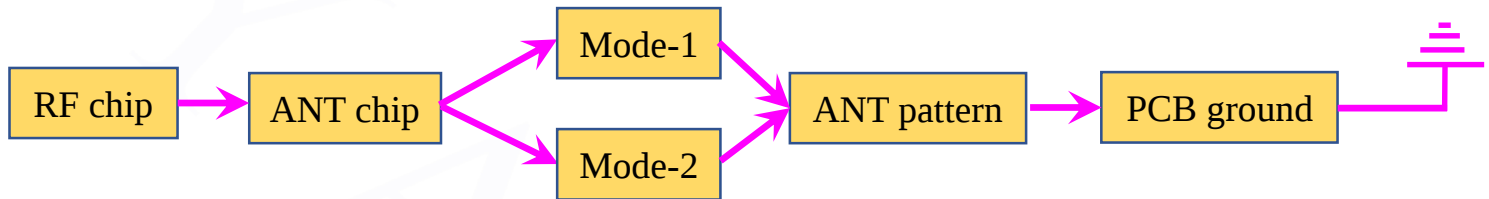




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## ✓ Features:

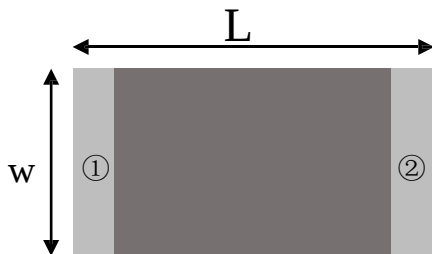
1. Surface mounted element with a small dimension of  $1.6 \times 0.8 \times 0.8$  mm meet future miniaturization trend.
2. Embedded and LTCC (low temperature co-fired ceramic) technology is able to integrate with system design as well as beautifying the housing of final product.
3. Miniaturization, 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:

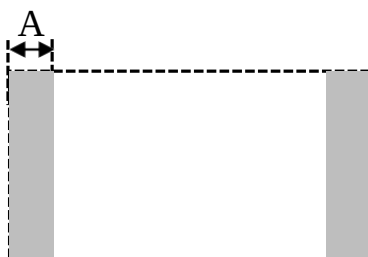
1. Bluetooth
2. Dual-band WLAN
3. ISM and UWB

## ✓ Dimensions (Unit: mm)



( Top View )

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



( Bottom View )



( Side View )

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

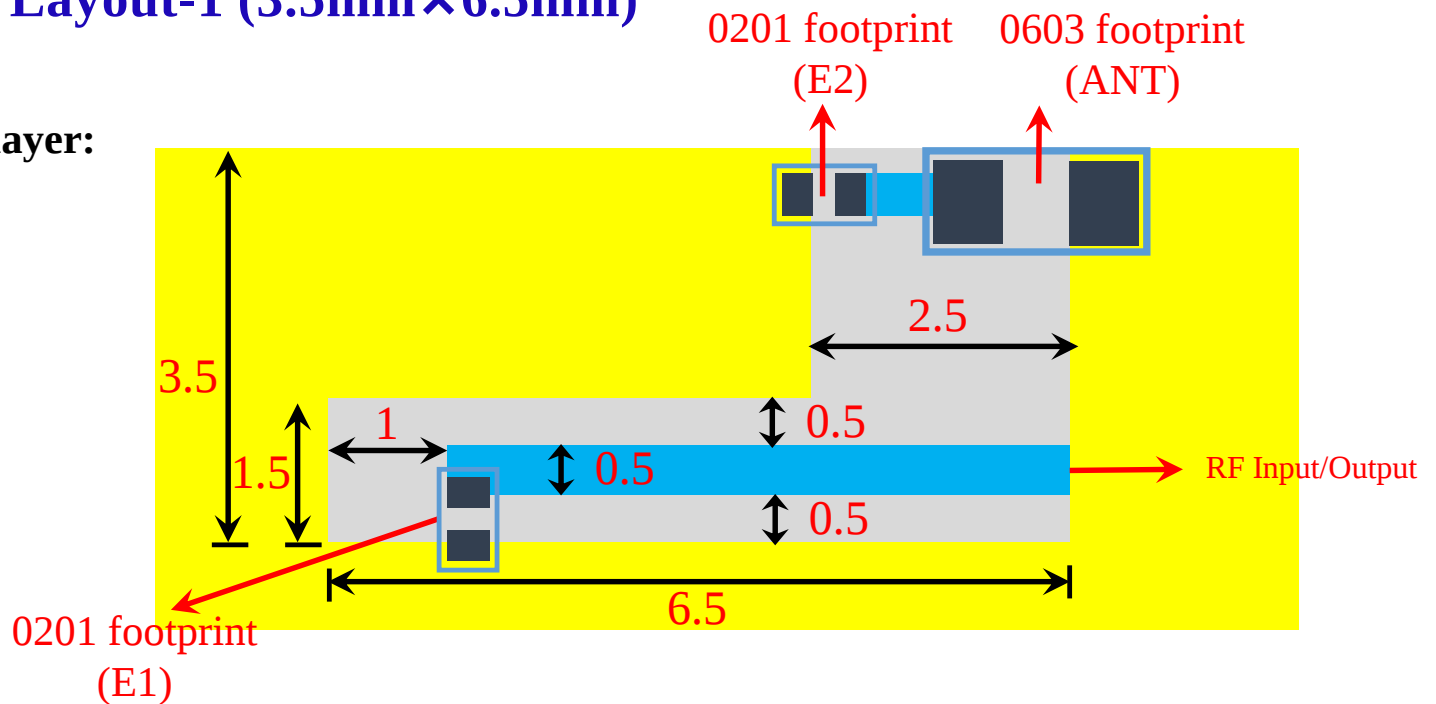
Shenzhen Hanyang Antenna Design Co. Ltd. has possession of proprietary information provided in this report and this proprietary information shall be kept in strict confidence and not disclosed to any person or firm without the prior written consent of Shenzhen Hanyang Antenna Design Co. Ltd.



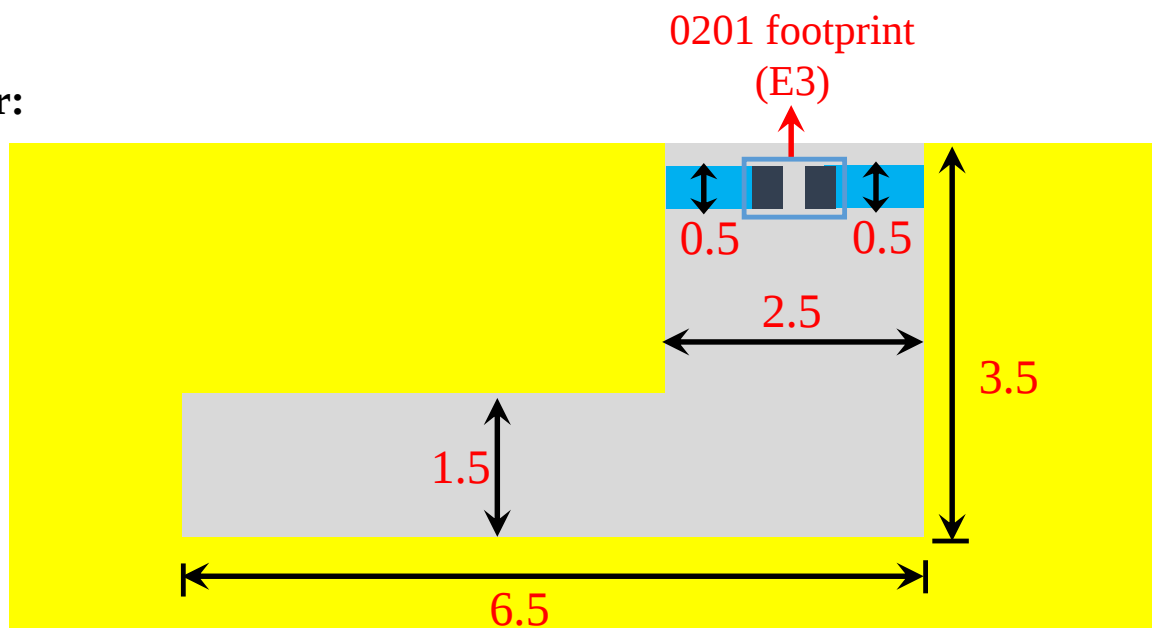
P/N: HY160808 SRF12

✓ Layout-1 (3.5mm×6.5mm)

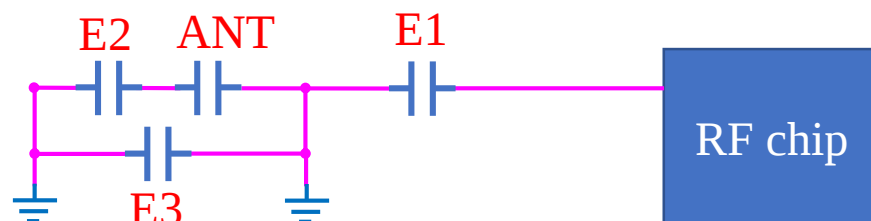
Top layer:



Bottom layer:



Equivalent circuit:

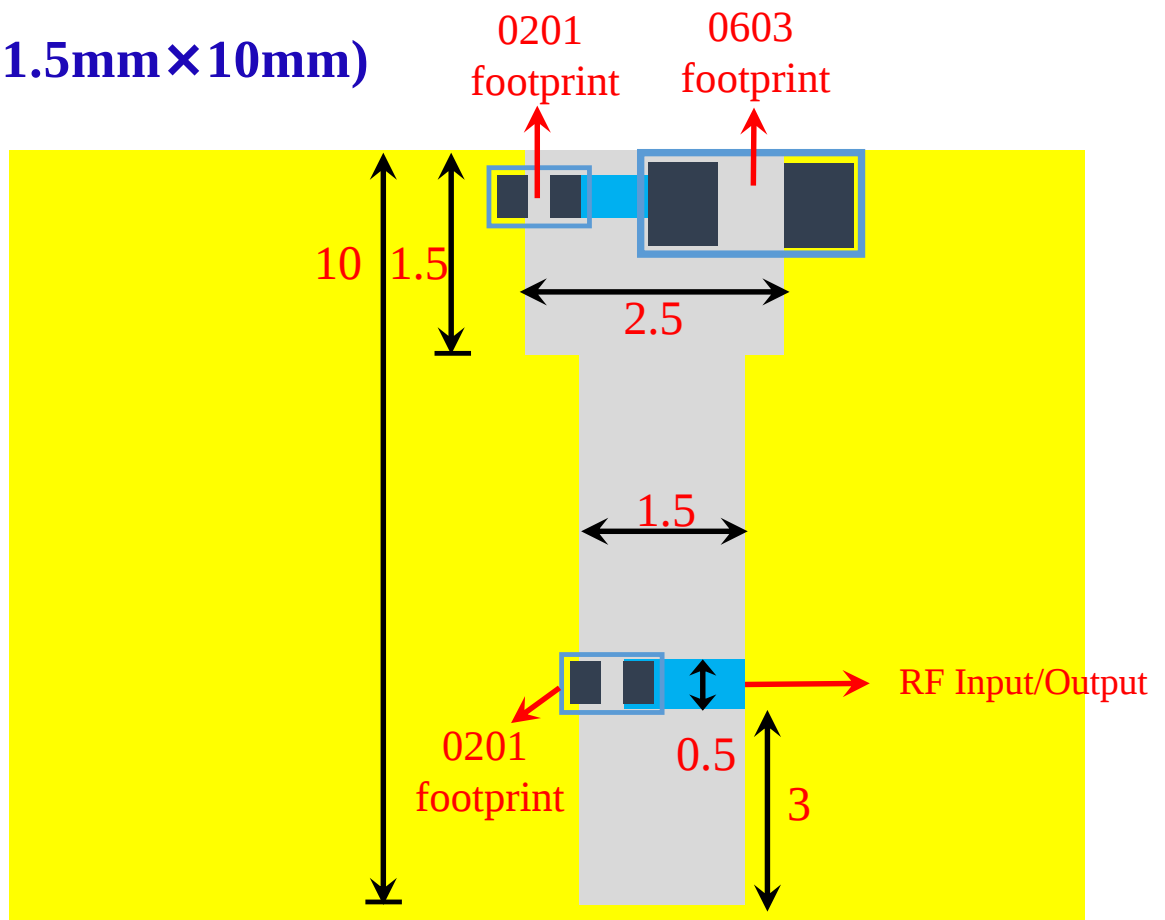




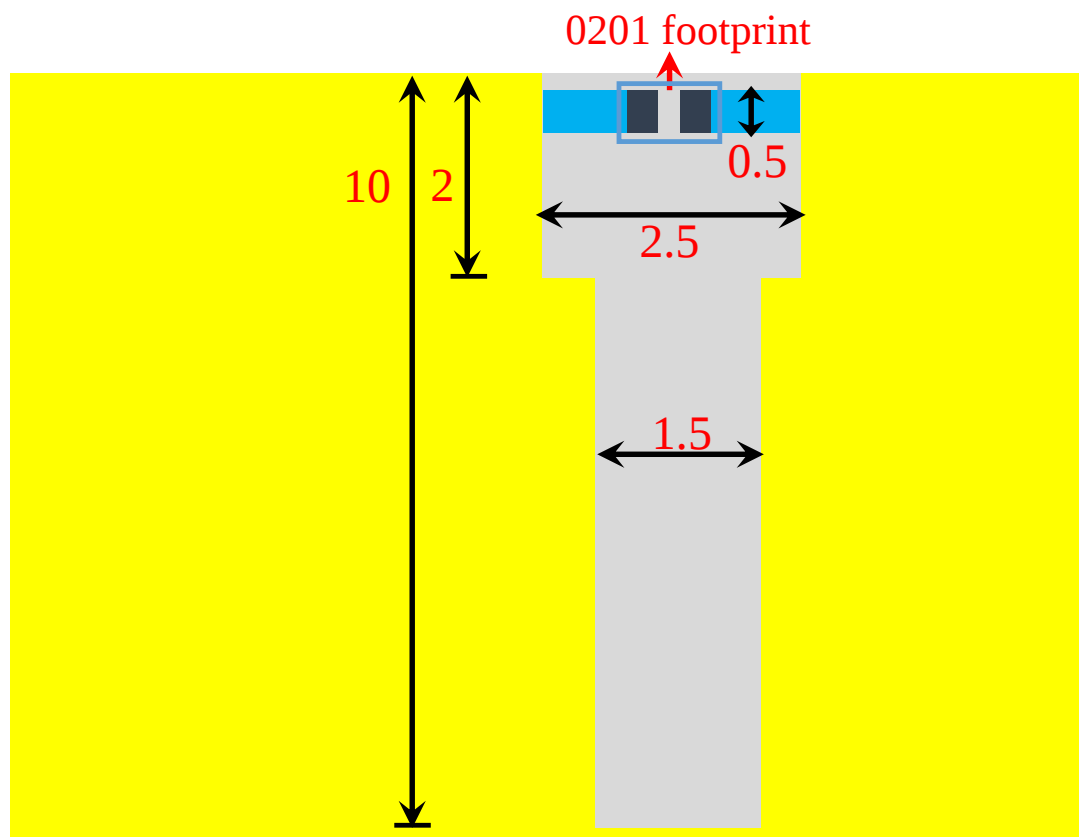
P/N: HY160808 SRF12

✓ Layout-2 (1.5mm×10mm)

Top layer:



Bottom layer:



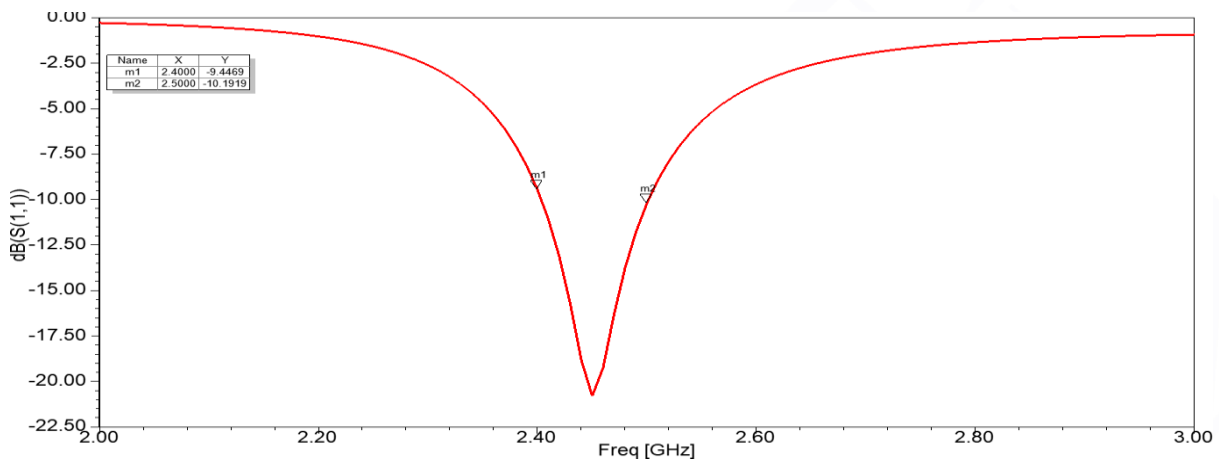


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## ✓ Electrical Characteristics:

|   | Feature           | Specification   |
|---|-------------------|-----------------|
| 1 | Central frequency | 2.45GHz         |
| 2 | Bandwidth         | >150MHz         |
| 3 | Peak gain         | 2.78 dBi        |
| 4 | VSWR              | <2              |
| 5 | Polarization      | Linear          |
| 6 | Azimuth beamwidth | Omnidirectional |
| 7 | Impedance         | 50 $\Omega$     |
| 8 | Antenna           | SMD             |

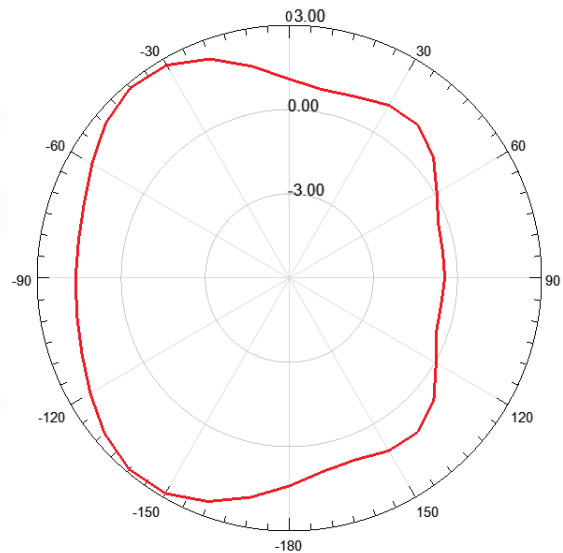
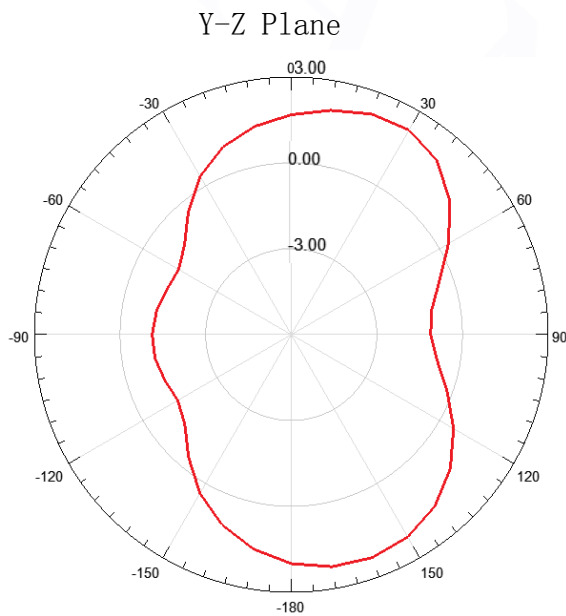
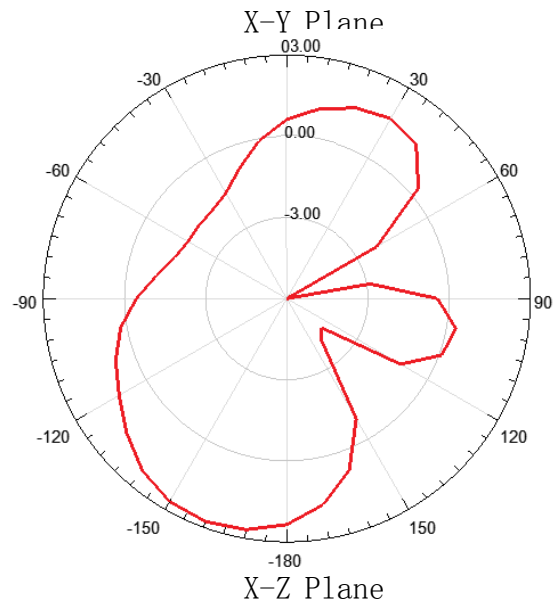
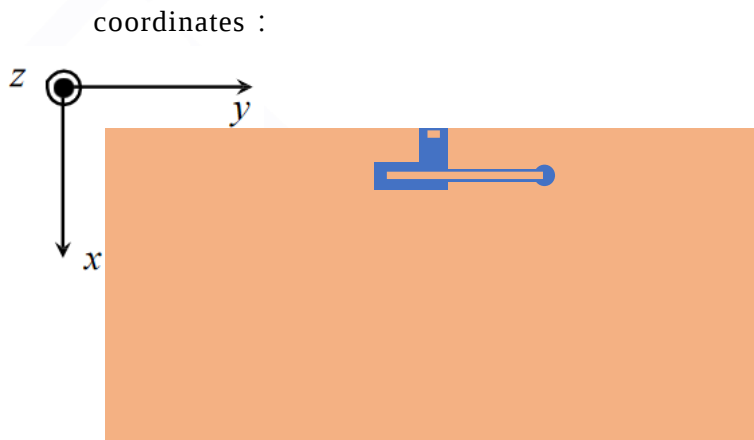
## ✓ Characteristic Curves:





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## ✓ Radiation Pattern:



## ✓ Radiation Performance:

| Frequency  | 2400MHz | 2450MHz | 2500MHz |
|------------|---------|---------|---------|
| Avg. gain  | -1.92   | -1.35   | -1.56   |
| Peak gain  | 1.79    | 2.78    | 2.66    |
| Efficiency | 74.55   | 80.25   | 76.98   |



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## ✓ Dependability Test

|                       |                                                 |
|-----------------------|-------------------------------------------------|
| Test Temperature      | $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$      |
| Operating Temperature | $-25^{\circ}\text{C} \sim +125^{\circ}\text{C}$ |
| Temperature           | $5 \sim 40^{\circ}\text{C}$                     |
| Relative Humidity     | 20~70%                                          |

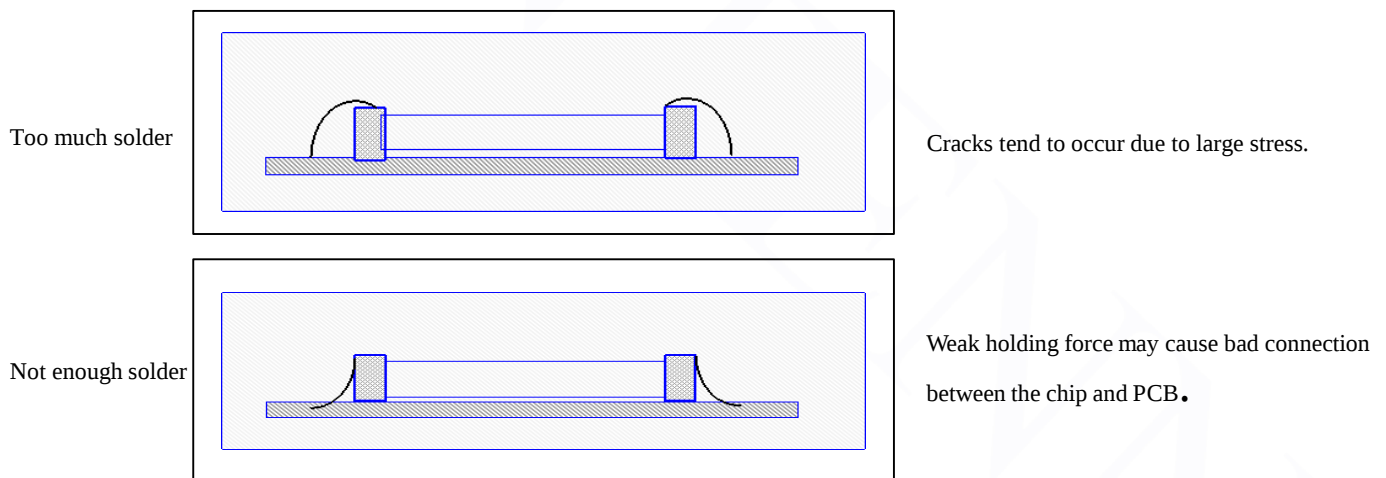
## ✓ Moisture Proof

Temperature:  $40 \pm 2^{\circ}\text{C}$  Humidity: 90~95%RH  
Duration: 500h  
Recovery conditions: Room temperature Recovery Time: 24h (Class1) or 48h (Class2)

## ✓ Solderability

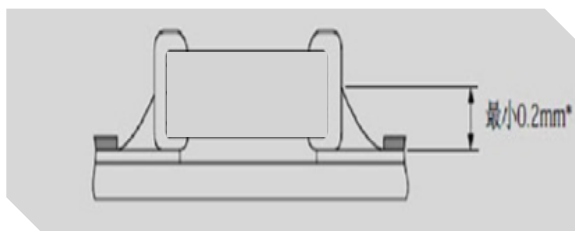
At least 95% of the terminal electrode is covered by new solder.  
Preheating conditions:  $80$  to  $120^{\circ}\text{C}$ ; 10~30s.  
Solder Temperature:  $235 \pm 5^{\circ}\text{C}$  Duration:  $2 \pm 0.5\text{s}$ , Solder Temperature:  $245 \pm 5^{\circ}\text{C}$  Duration:  $2 \pm 0.5\text{s}$

## ✓ Optimum Solder Amount for Reflow Soldering

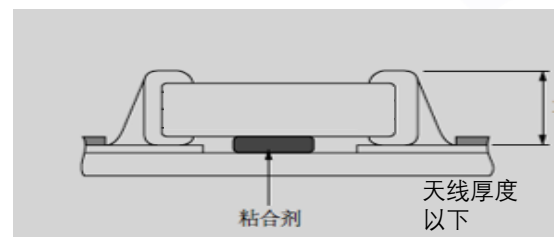


## ✓ Recommended Soldering Amounts

The optimal solder fillet amounts for re-flow soldering



The optimal solder fillet amounts for wave soldering





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## ✓ Temperature Cycle Test

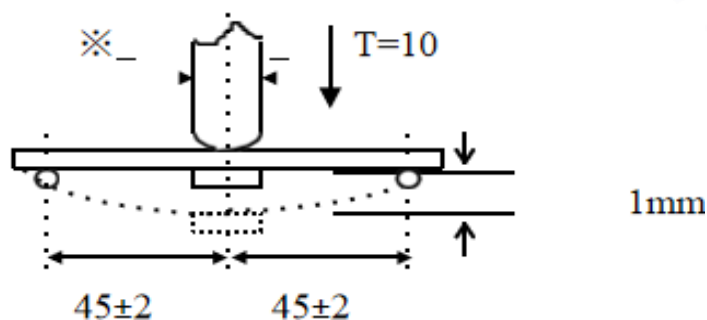
10±1S Applied Force: 5N Duration: 10±1S  
Preheating conditions: up-category temperature, 1h  
Recovery time: 24±1h  
Initial Measurement  
Cycling Times: 5 times, 1 cycle, 4 steps:

| 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

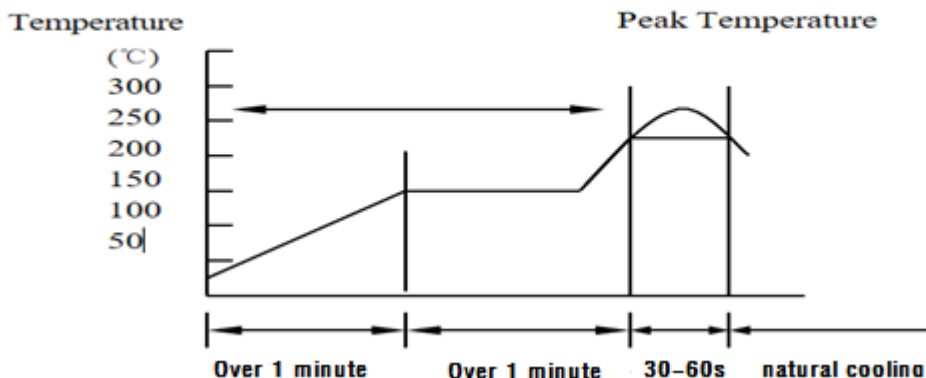
The measurement should be made with the board in the bending position.



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## The temperature profile for soldering

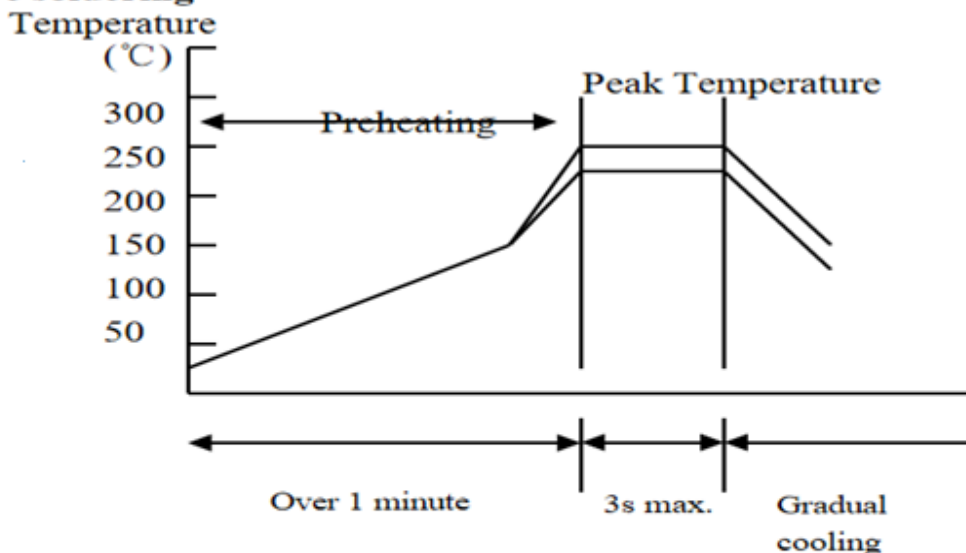
### Re-flow soldering



|                  | 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

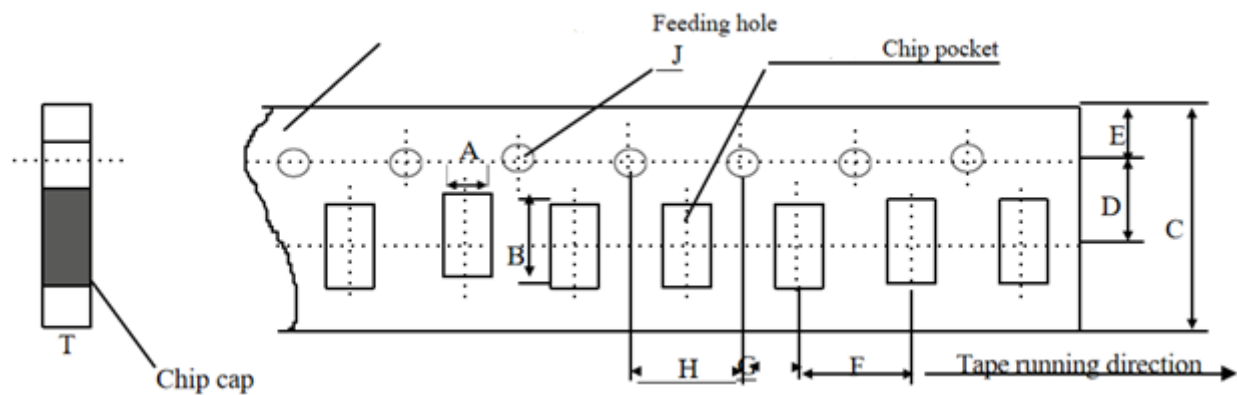


|                  | Pb-Sn soldering | Lead-free soldering |
|------------------|-----------------|---------------------|
| Peak temperature | 230°C~260°C     | 240°C~270°C         |



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✓ Dimensions of paper taping

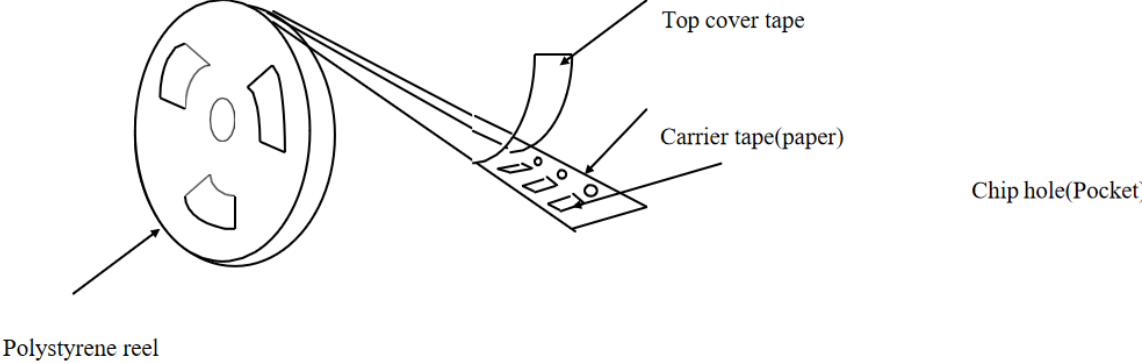


Unit: mm

| 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%