

UWB: 3.7 – 4.2 GHz Chip Antenna



ACG0502U

Request Samples



Check Inventory



5.2 x 2.0 x 1.0mm
RoHS Compliant
MSL Level = 1

Features

- BW of 500 MHz
- Linear Polarization
- VSWR <2.0
- Extended Operating Temperature of -40/+105 °C

Applications

- UWB (Ultra-Wide Band)
- IoT
- M2M
- Secure car access
- Item Tracking
- Indoor Navigation
- Hands-Free Payment
- Smart Access
- Object Detection

Product Image



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Electrical Specification

| Parameter | Min | Typ | Max | Unit | Notes |
|---------------------|------------------|-------|-------|----------|-------|
| Operating Frequency | 3700 | ----- | 4200 | MHz | ----- |
| Band Width | ----- | 500 | ----- | MHz | ----- |
| VSWR | ----- | ----- | 2.0 | ----- | ----- |
| Polarization | Linear | | | ----- | ----- |
| Azimuth Beam width | Omni-directional | | | ----- | ----- |
| Impedance | ----- | 50 | ----- | Ω | ----- |

Mechanical Specification

| Parameter | Specifications |
|------------------|--------------------|
| Filter Dimension | 5.2 x 2.0 x 1.0 mm |
| Mounting Type | SMD Mount |
| Material Type | Ceramic |

Environmental Specification

| Parameter | Specifications |
|-----------------------------|----------------|
| Operating Temperature Range | -40°C ~ +105°C |
| Storage Temperature Range | -30°C ~ +105°C |
| MSL level | 1 |
| ESD | N/A |
| Relative Humidity range | 90~95% |

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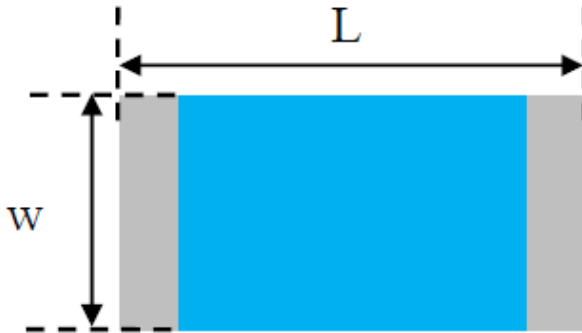
5.2 x 2.0 x 1.0mm
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Package Dimension



(Top View)

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



(Bottom View)



(Side View)



(Side View)

| Symbol | L | W | T | A |
|----------------|---------|---------|---------|---------|
| Dimension (mm) | 5.2±0.2 | 2.0±0.2 | 1.0±0.1 | 0.5±0.1 |

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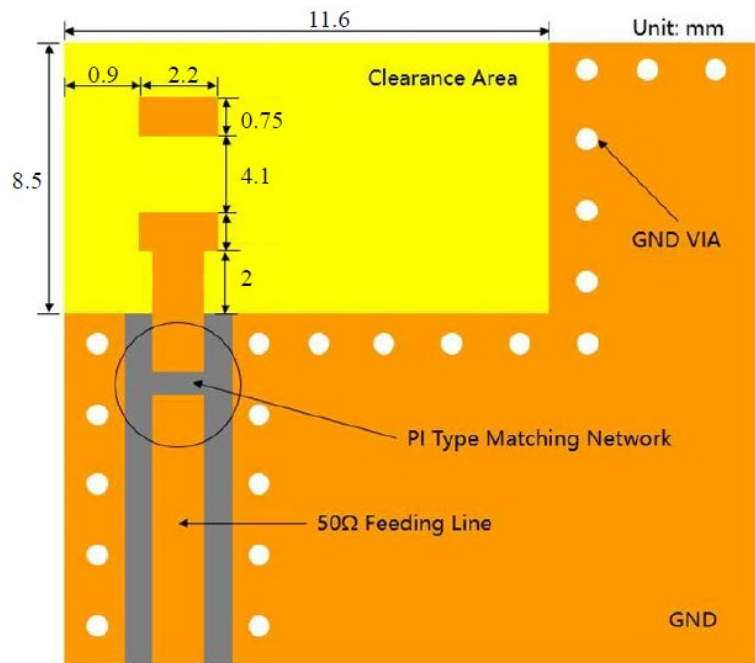


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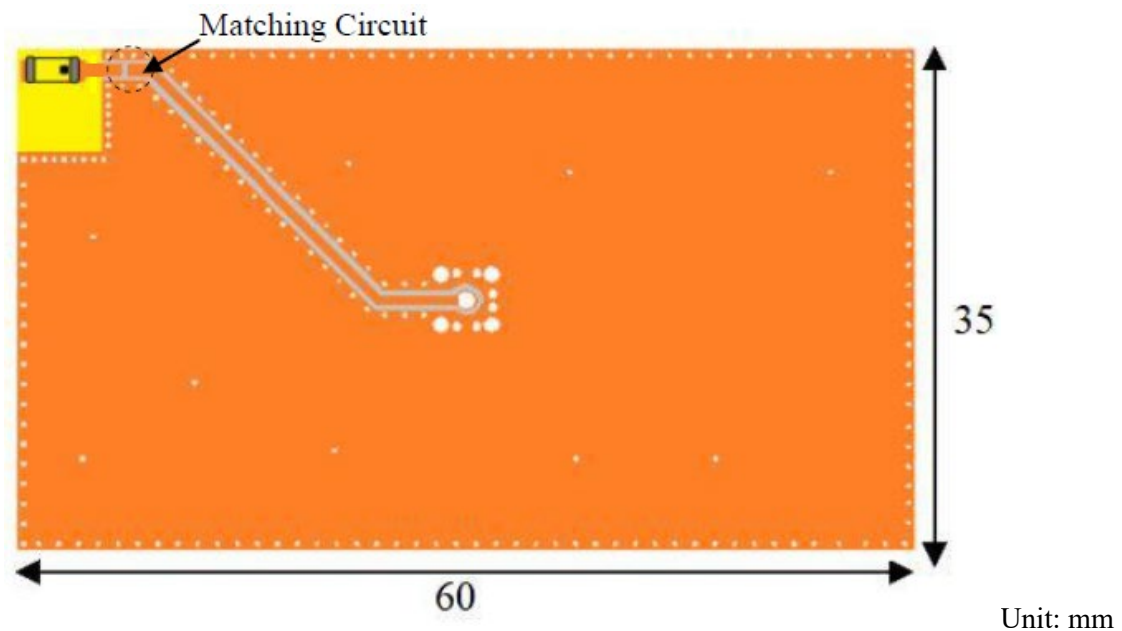


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Footprint



Evaluation Board Dimension



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Measurement Setup

The antenna measurements were all performed in free space with the antenna mounted on its evaluation board of size 36 x 61 mm, see image below.



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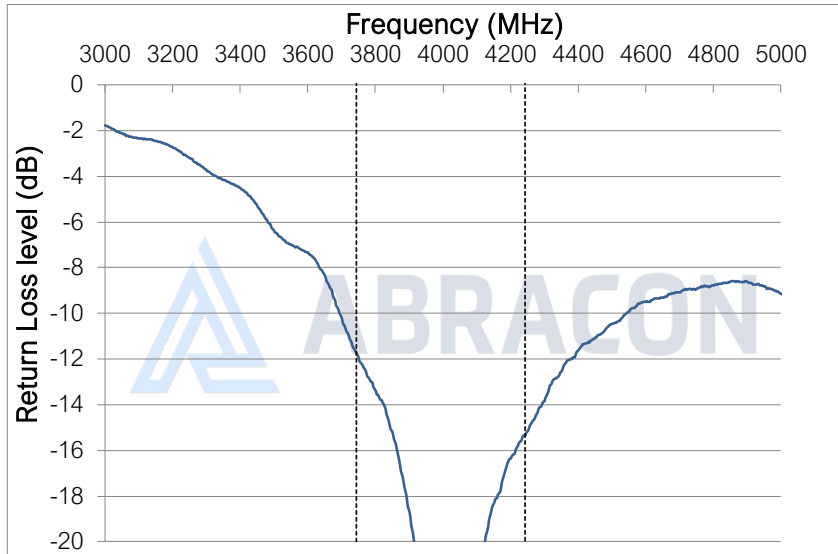
Check Inventory



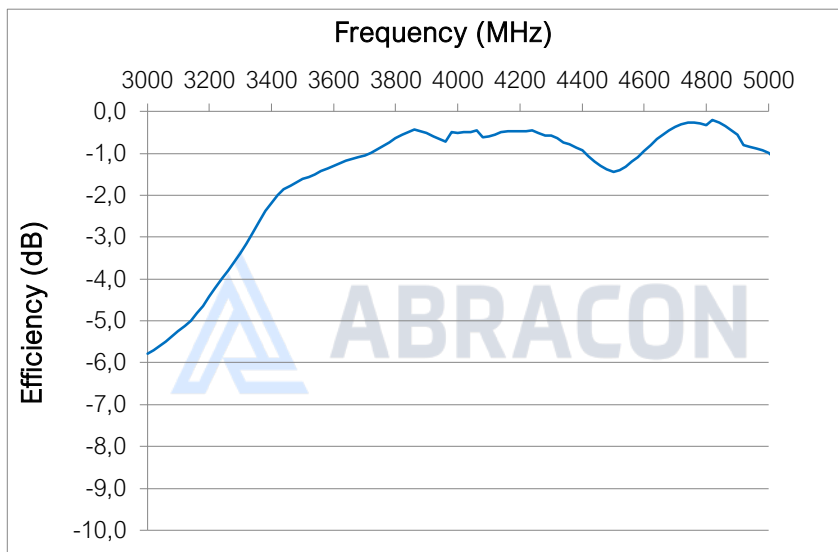
5.2 x 2.0 x 1.0mm
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Impedance Characteristics – Return Loss

The (dashed) vertical lines mark the frequency span for UWB channel 2 (3.74 to 4.24 GHz).



Radiation Characteristics – Total Efficiency



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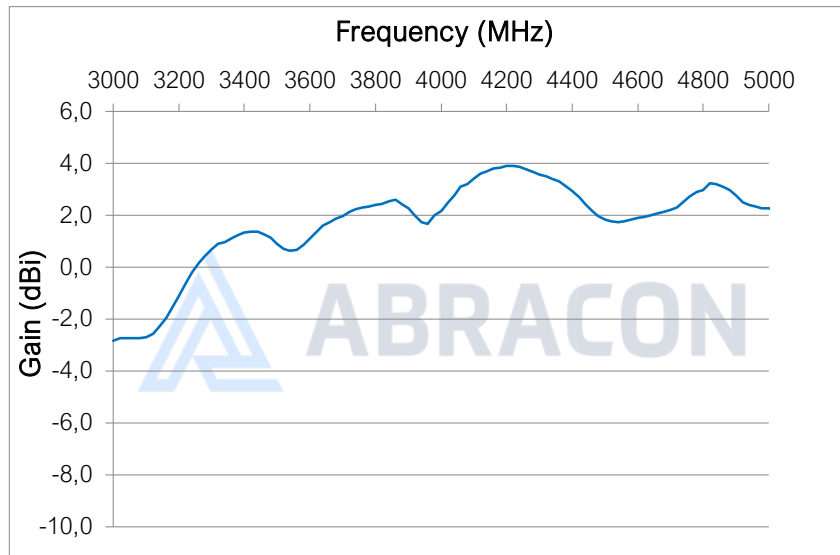


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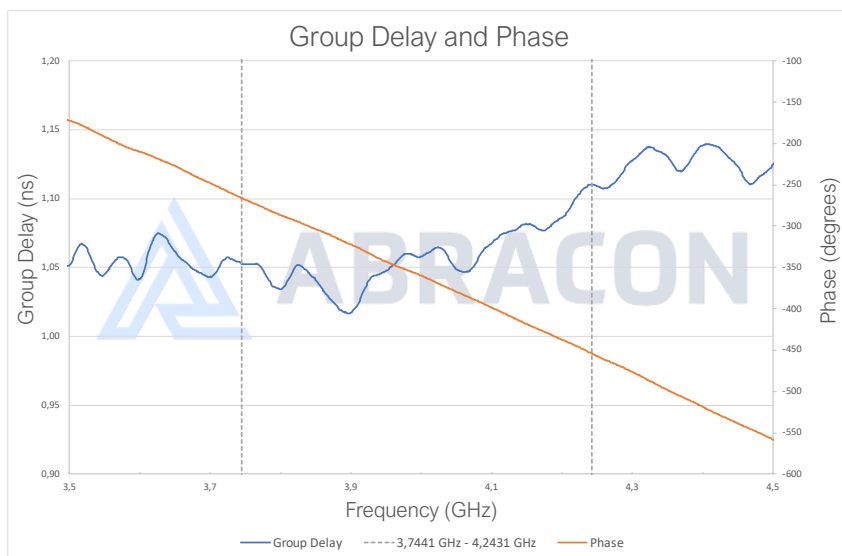
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Radiation Characteristics – Maximum Gain



Radiation Characteristics – Group Delay

Two identical antennas were placed a distance d_{sep} apart in an anechoic chamber. The Group Delay, τ_{GD} , is then calculated from the transmission S-parameter (S12) by $\tau_{GD} = -\frac{1}{2 \cdot 360} \frac{\Delta\phi}{\Delta f}$, where $\Delta\phi$ is the change of phase over an aperture Δf . The maximum variation in group delay per channel, $\Delta_{max}\tau_{GD}$, can be found in the table below.



Maximum Group Delay Variation

| UWB Ch. | Freq. Low (GHz) | Freq. High (GHz) | $\Delta_{max}\tau_{GD}$ (ps) |
|---------|-----------------|------------------|------------------------------|
| 2 | 3,744 | 4,2432 | 93 |

Used Parameters

| Distance d_{sep} (cm) | Aperture Δf (MHz) |
|-------------------------|---------------------------|
| 50 | 220 |



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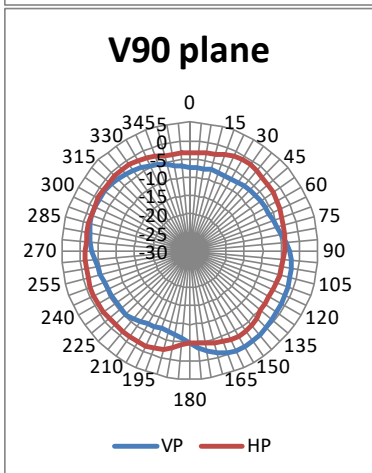
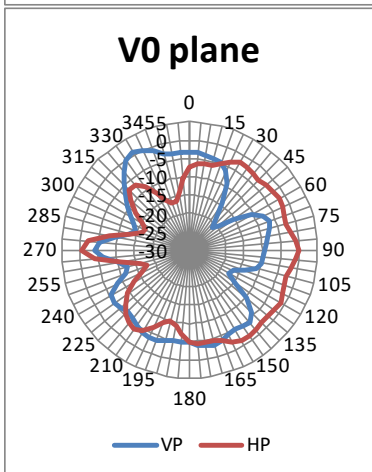
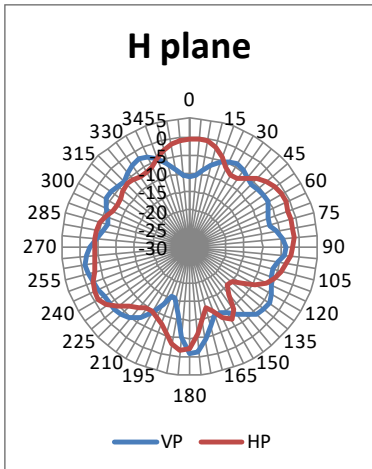


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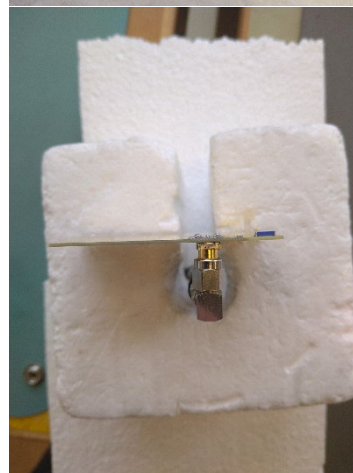
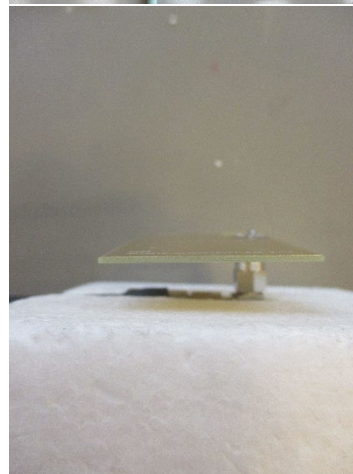
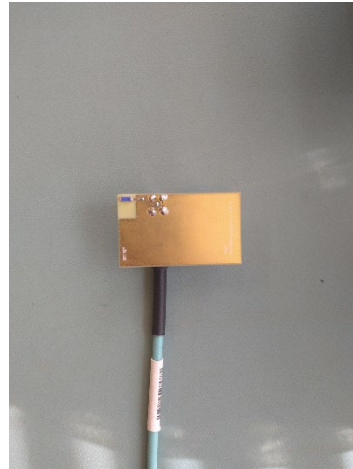


5.2 x 2.0 x 1.0mm
RoHS Compliant
MSL Level = 1

Radiation Characteristics – 2D Pattern (3.74 GHz)



VP: Vertical Polarization
HP: Horizontal Polarization



Unit: dBi

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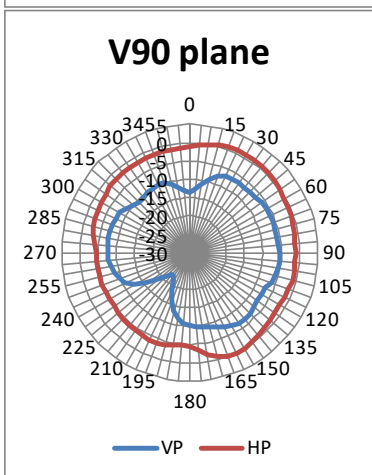
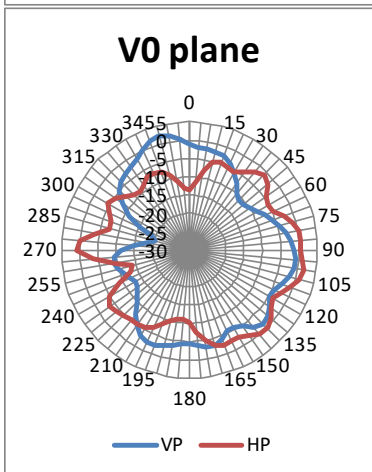
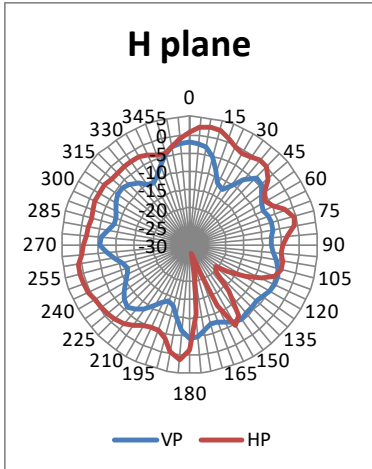


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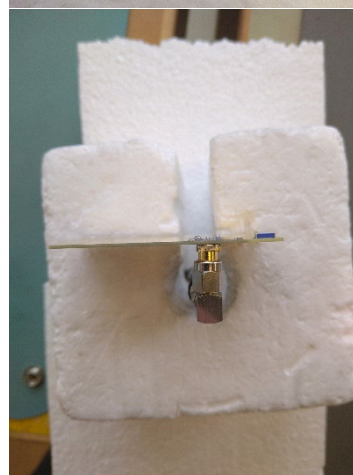
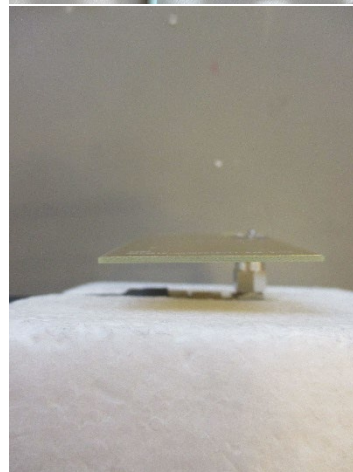
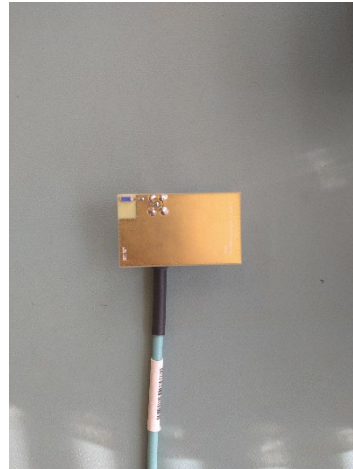


5.2 x 2.0 x 1.0mm
RoHS Compliant
MSL Level = 1

Radiation Characteristics – 2D Pattern (4.24 GHz)



VP: Vertical Polarization
HP: Horizontal Polarization



Unit: dBi

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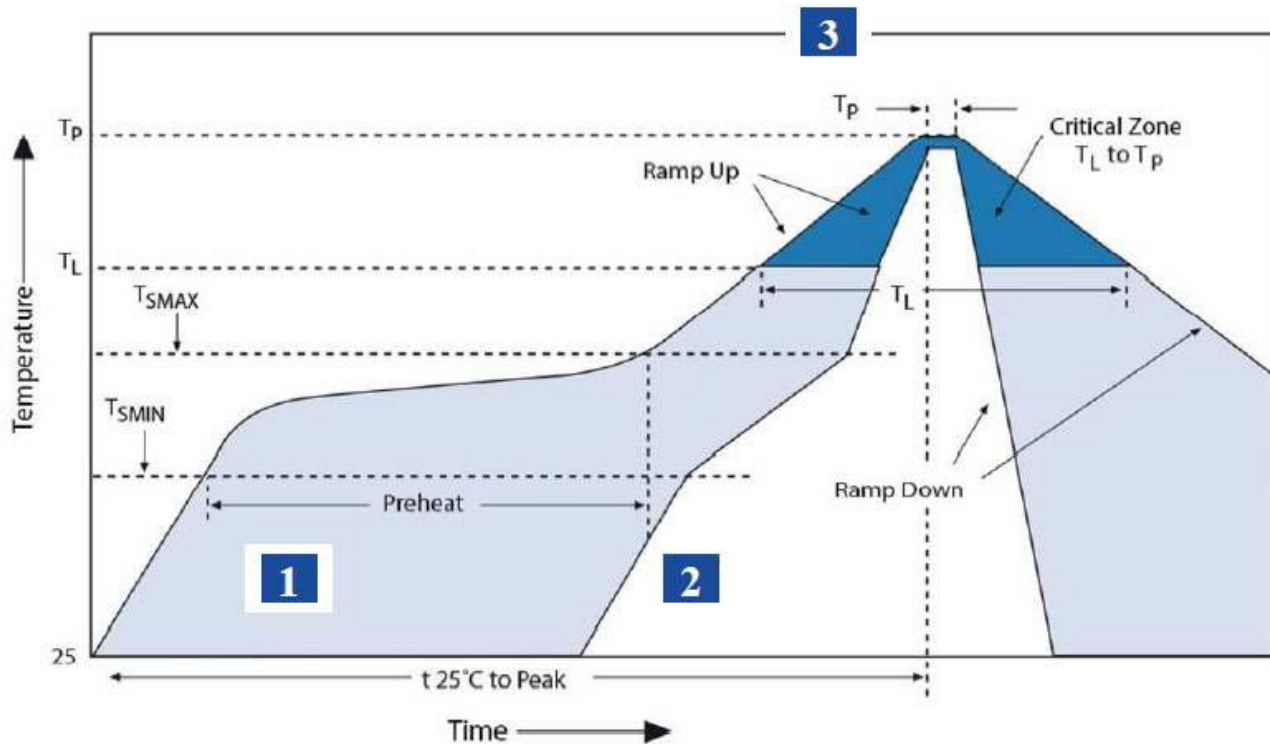


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5.2 x 2.0 x 1.0mm
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Soldering Profile: Reflow



| Zone | Description | Temperature | Time |
|------|----------------|--|--------------|
| 1 | Preheat / Soak | $T_{SMIN} \sim T_{SMAX}$ 160 – 180 °C | 60 ~ 120 sec |
| 2 | Reflow | T_L 220 °C | 60~80 sec |
| 3 | Peak heat | T_P 265 °C | 5 sec (Max) |

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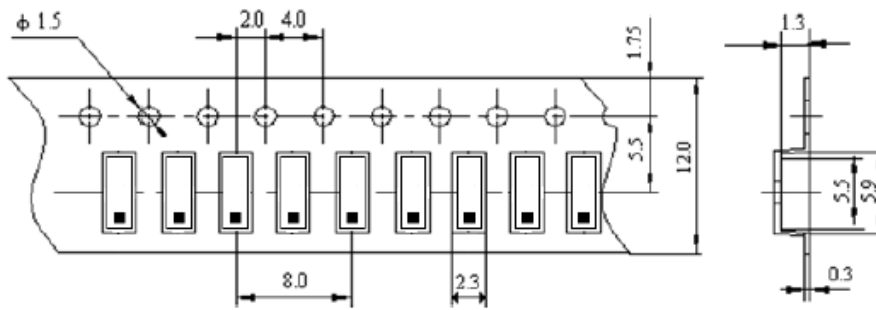
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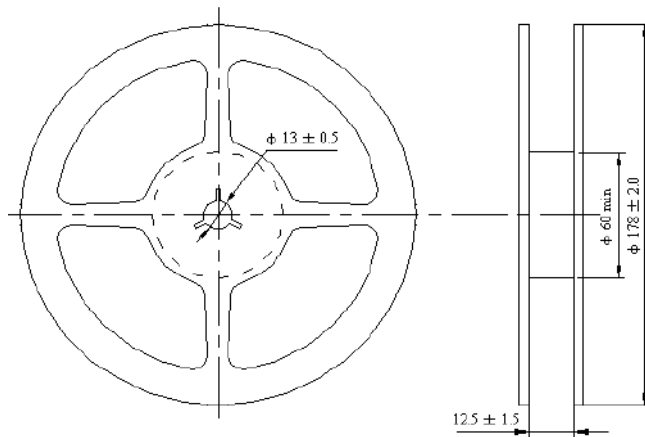
Packaging and Dimensions

1. Plastic Tape



Reserve a length of 150~200mm for the trailer of the carrier and 250~300 mm for the leader of the carrier and further 250mm of cover tape at the leading part of the carrier.

2. Reel (3000 pcs/Reel)



Unit : mm

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