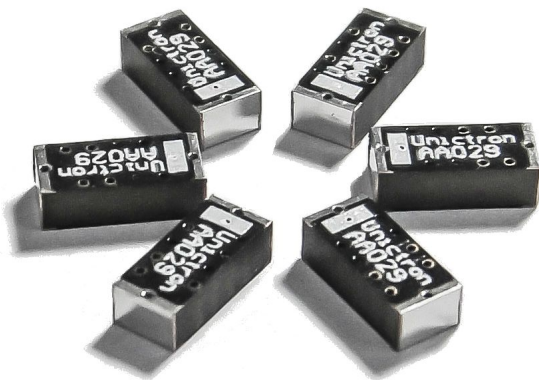


5.0 x 2.2 x 1.6 (mm) WiFi / Bluetooth Chip Antenna (AA029)  
Engineering Specification

1. Explanation of Product Number



2. Features

- \*Stable and reliable in performances
- \*Low profile, compact size
- \*RoHS compliance
- \*SMT processes compatible

3. Applications

- \*ISM 2.4 GHz applications
- \*ZigBee/BLE applications
- \*Bluetooth earphone systems
- \*Hand-held devices when WiFi / Bluetooth functions are needed, e.g., Smart phones
- \*IEEE802.11 b/g/n
- \*Wireless PCMCIA cards or USB dongles

4. Description

Unictron’s AA029 chip antenna is designed for ISM 2.4GHz applications, covering frequencies 2400~2484MHz. Fabricated with proprietary design and processes, AA029 shows excellent performance and is fully compatible with SMT processes which can decrease the assembly cost and improve device’s quality and consistency.



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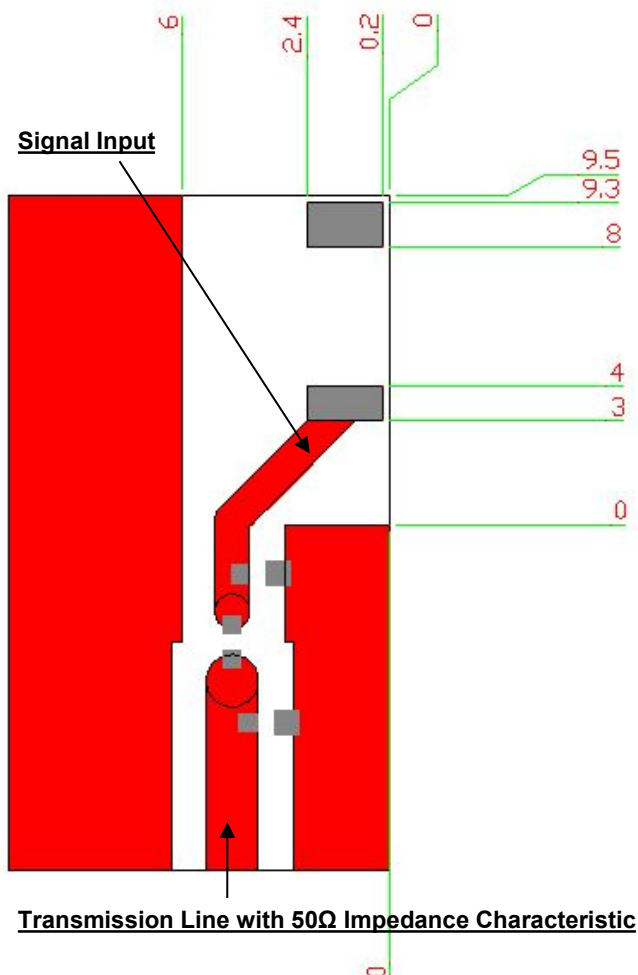
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## 5. Layout Guide & Electrical Specifications

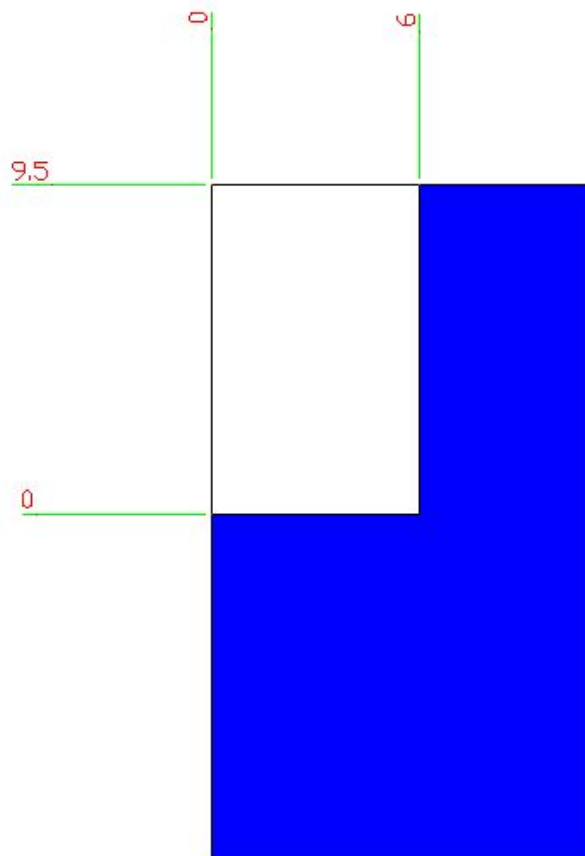
### 5-1. Layout Guide (unit : mm)

Solder Land Pattern:

The solder land pattern (gray marking areas) is shown below. Recommendation on matching circuit will be provided according to customer's installation conditions.



Top View



Bottom View



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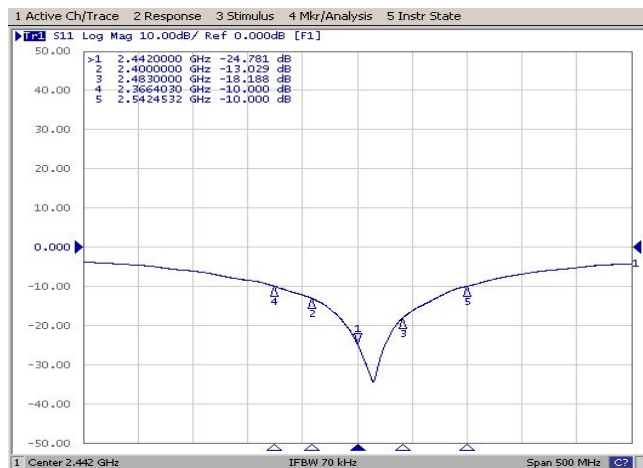
## 5-2. Electrical Specifications (Evaluation Board Dimensions: 100 x 50 mm<sup>2</sup>)

### 5-2-1. Electrical Table

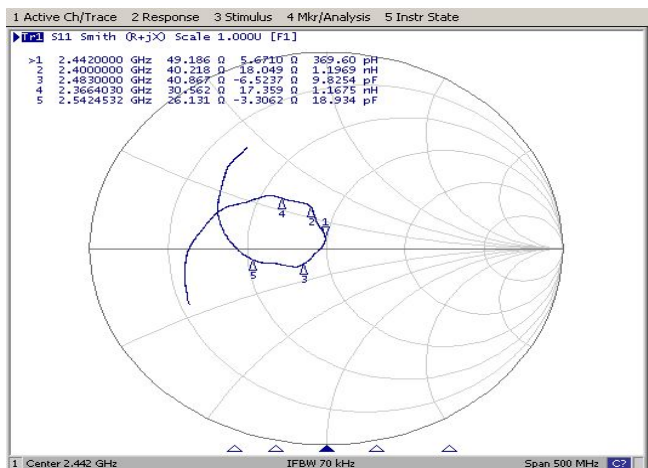
Characteristics	Specifications	Unit
Outline Dimensions	5.0 x 2.2 x 1.6	mm
Working Frequency	2400 ~ 2484	MHz
Bandwidth	140 (typical)	MHz
VSWR	2 Max. (typical)	
Characteristic Impedance	50	$\Omega$
Polarization	Linear Polarization	
Peak Gain	3.8	dBi
Efficiency	65	%

## 5-2. Return Loss & Smith Chart

Return Loss ( $S_{11}$ )



Smith Chart ( $S_{11}$ )



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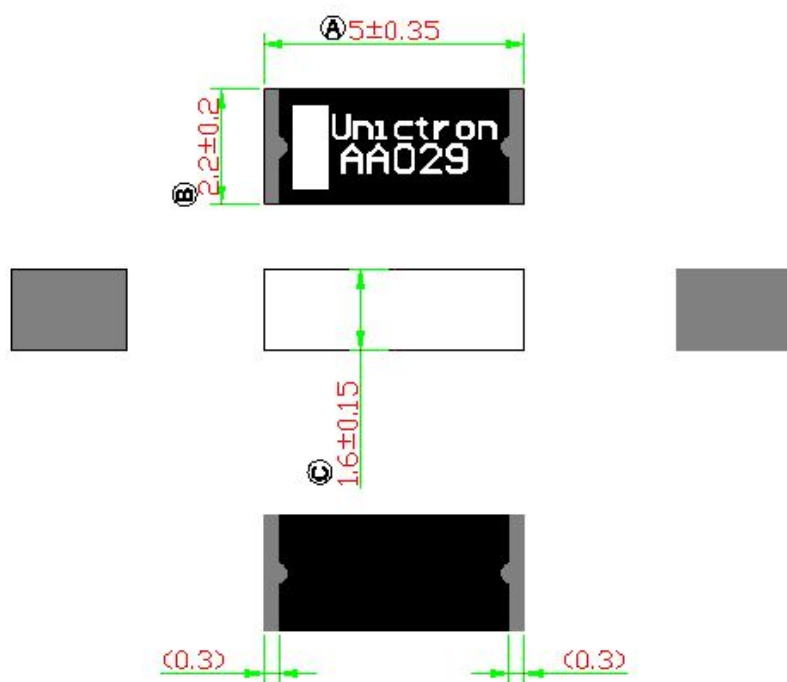
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## 6. Outline Dimensions of Antenna & Evaluation Board (unit: mm)

### 6-1. Antenna Dimensions



#### NOTE:

- 1.All materials are RoHS compliant.
- 2."A~C" Critical Dimensions.
- 3."( )" Reference Dimensions.

### PIN Definitions

**PIN1**



**PIN2**



**Top View**

**Bottom View**

Item	PIN 1	PIN 2
Terminal	Signal	Soldering Pad



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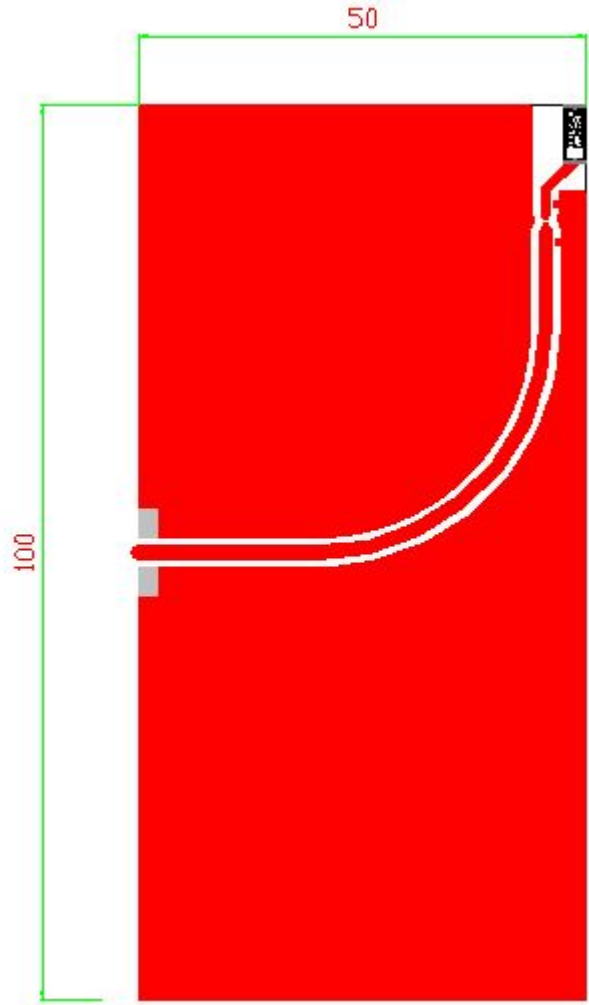
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6-2. Evaluation Board with Antenna



Unit: mm



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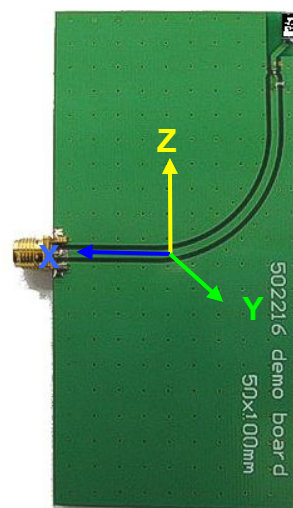
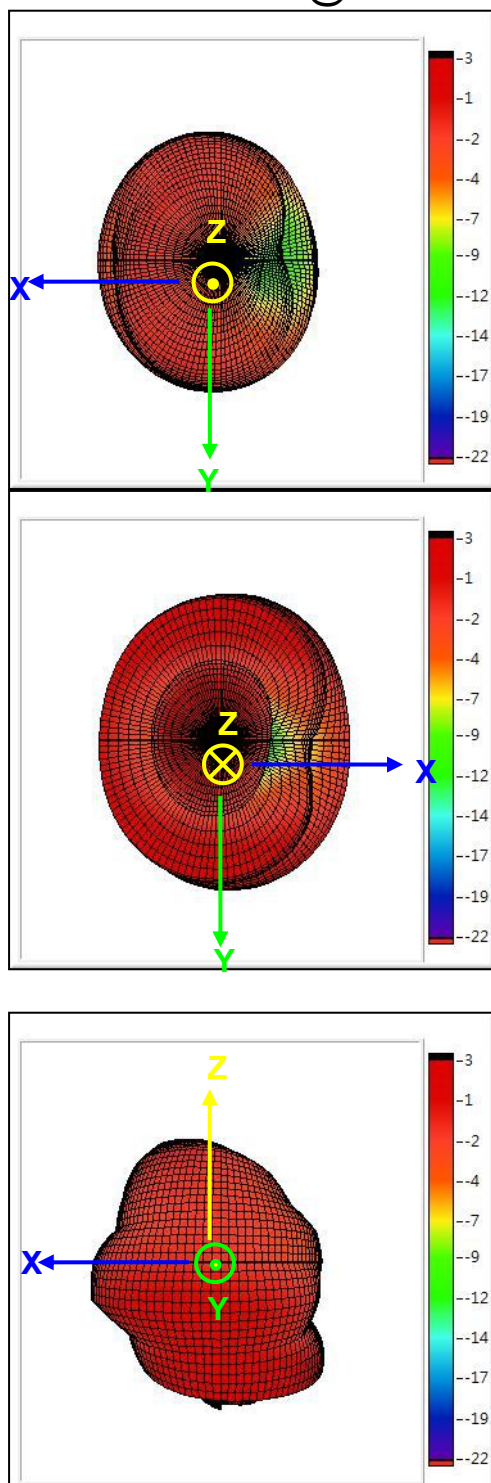
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## 7. Radiation Pattern (with 100 x 50 mm<sup>2</sup> Evaluation Board)

### 7-1. 3D Gain Pattern @ 2442 MHz (unit: dBi)



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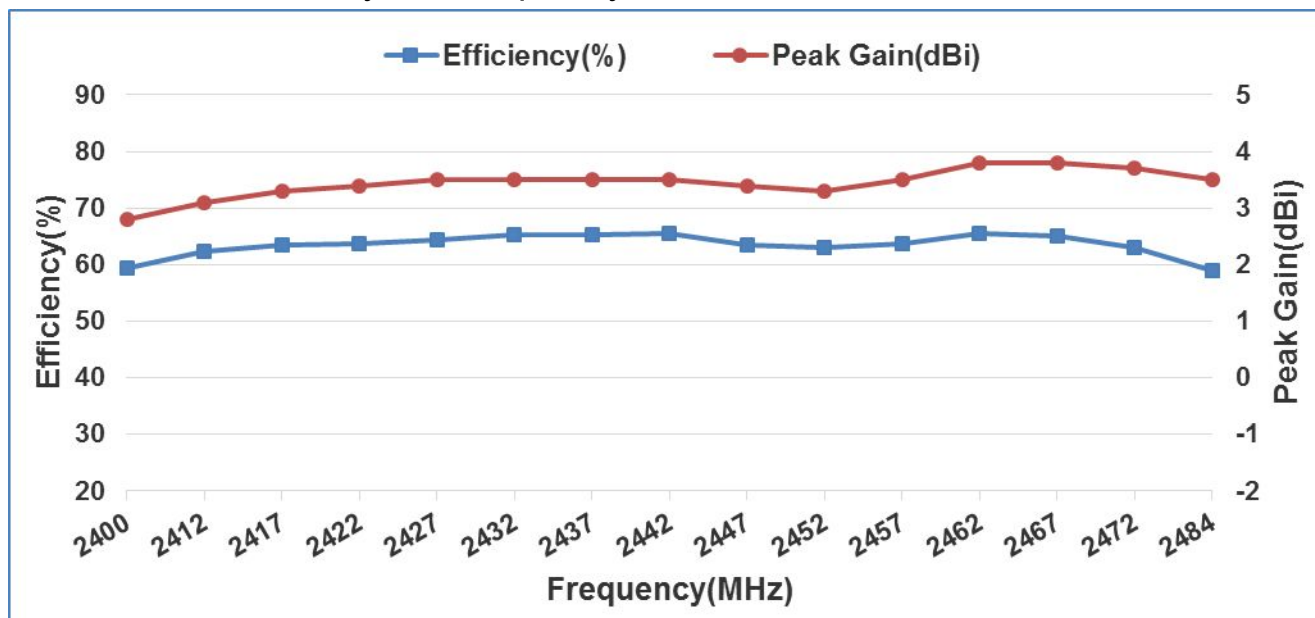
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## 7-2. 3D Efficiency Table

Frequency(MHz)	2400	2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472	2484
Efficiency(dB)	-2.3	-2.0	-2.0	-2.0	-1.9	-1.9	-1.9	-1.8	-2.0	-2.0	-2.0	-1.8	-1.9	-2.0	-2.3
Efficiency (%)	59.3	62.4	63.4	63.8	64.4	65.3	65.2	65.5	63.5	63.1	63.7	65.5	65.0	63.1	59.0
Peak Gain (dBi)	2.8	3.1	3.3	3.4	3.5	3.5	3.5	3.5	3.4	3.3	3.5	3.8	3.8	3.7	3.5

## 7-3. 3D Efficiency vs. Frequency



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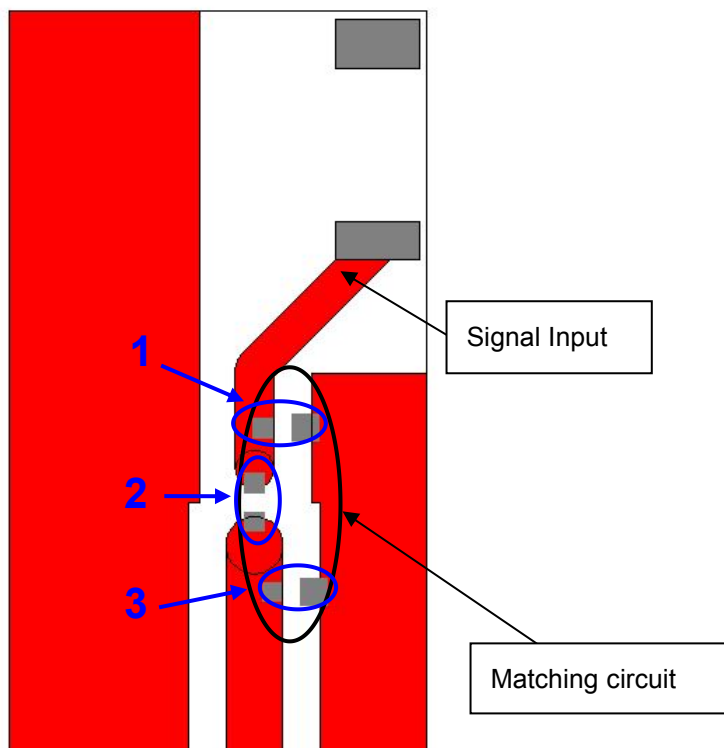
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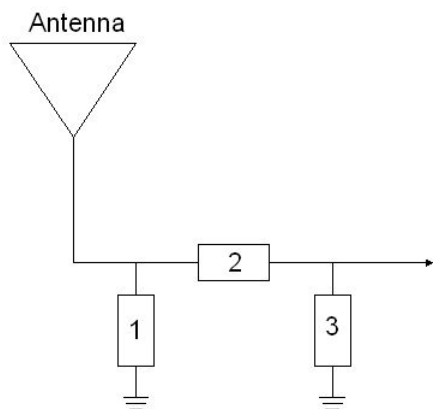
## 8. Frequency tuning and Matching circuit

### 8-1. Chip antenna tuning scenario :



### 8-2. Matching circuit :

With the following recommended values of matching and tuning components, the center frequencies will be about 2442 MHz at our standard 100 x 50 mm<sup>2</sup> evaluation board. However, these are typical reference values which may need to be changed when circuit boards or part vendors are different.



System Matching Circuit Component			
Location	Description	Vendor	Tolerance
1	N/A*	-	-
2	2.2nH, (0402)	DARFON	±0.1nH
3	1pF, (0402)	DARFON	±0.1pF



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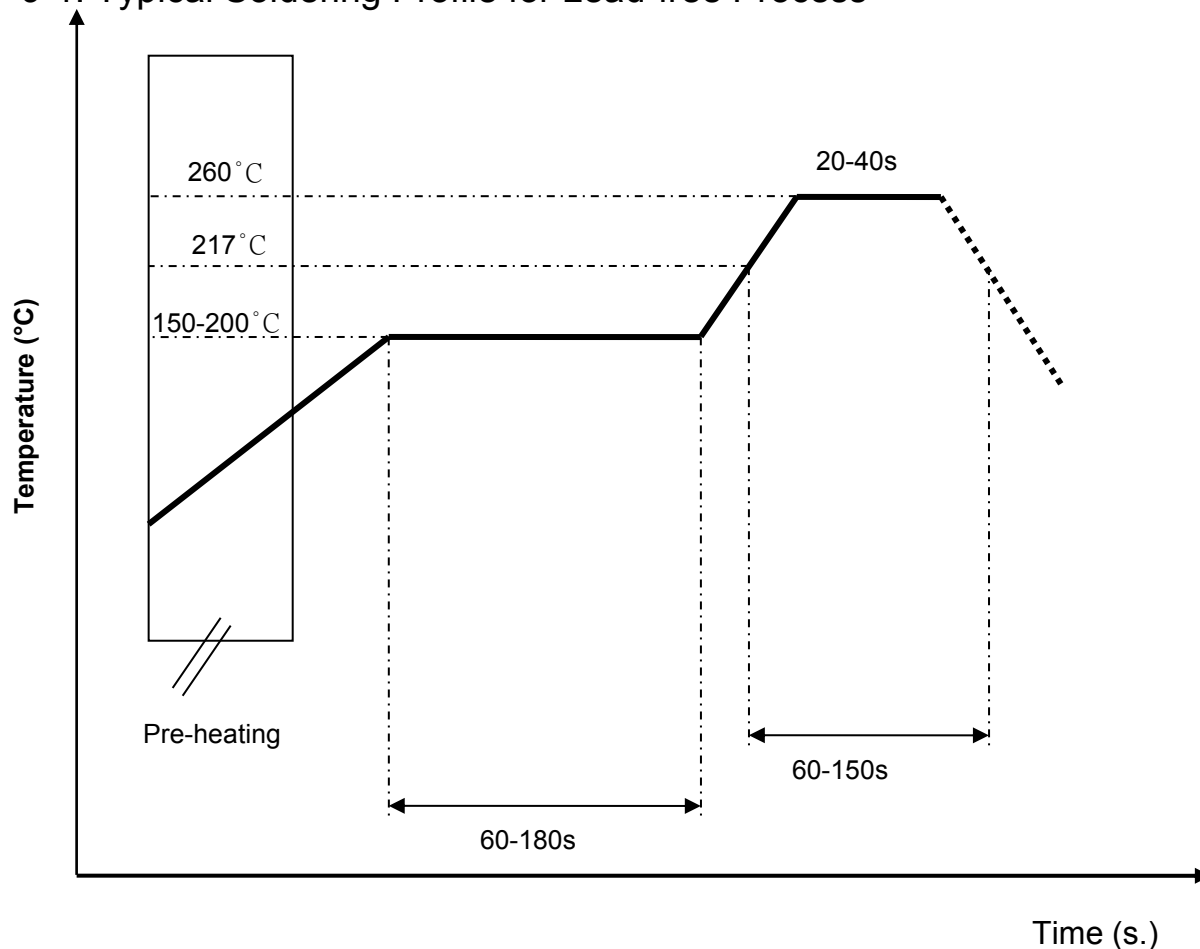
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## 9. Soldering Conditions

### 9-1. Typical Soldering Profile for Lead-free Process



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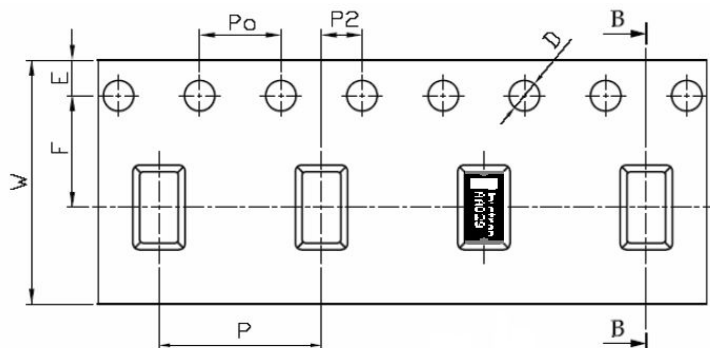
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## 10. Packing

(1) Quantity/Reel: 3000pcs/Reel

(2) Plastic tape:

a. Tape Drawing



b. Tape Dimensions (unit: mm)

Feature	Specifications	Tolerances
W	12.00	±0.30
P	8.00	±0.10
E	1.75	±0.10
F	5.50	±0.10
P2	2.00	±0.10
D	1.50	+0.10 -0.00
P0	4.00	±0.10
10P0	40.00	±0.20

## 11. Operating & Storage Conditions

### 11-1. Operating

(1) Maximum Input Power: 2 W

(2) Operating Temperature: -40°C to 85°C

### 11-2. Storage

(1) Storage Temperature: -5°C to 40°C

(2) Relative Humidity: 20% to 70%

(3) Shelf Life: 1 year

## 12. Notice

(1) Installation Guide:

Please refer to Unictron's application note "General guidelines for the installation of Unictron's chip antennas" for further information.

(2) All specifications are subject to change without notice.



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