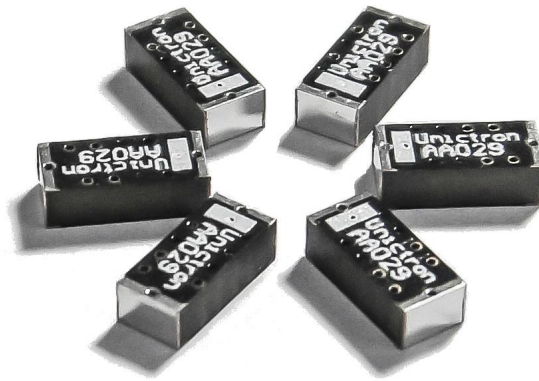


# 5.0 x 2.2 x 1.6 (mm) WiFi / Bluetooth Chip Antenna (AA029) Engineering Specification

## 1. Product Number

H 2 U 2 6 2 G K B A 0 1 0 0



## 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 2400~2500MHz. 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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Prepared by : Xenia

Designed by : Phillip

Checked by : Mike

Approved by : Herbert

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DOCUMENT  
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H2U262GKBA0100

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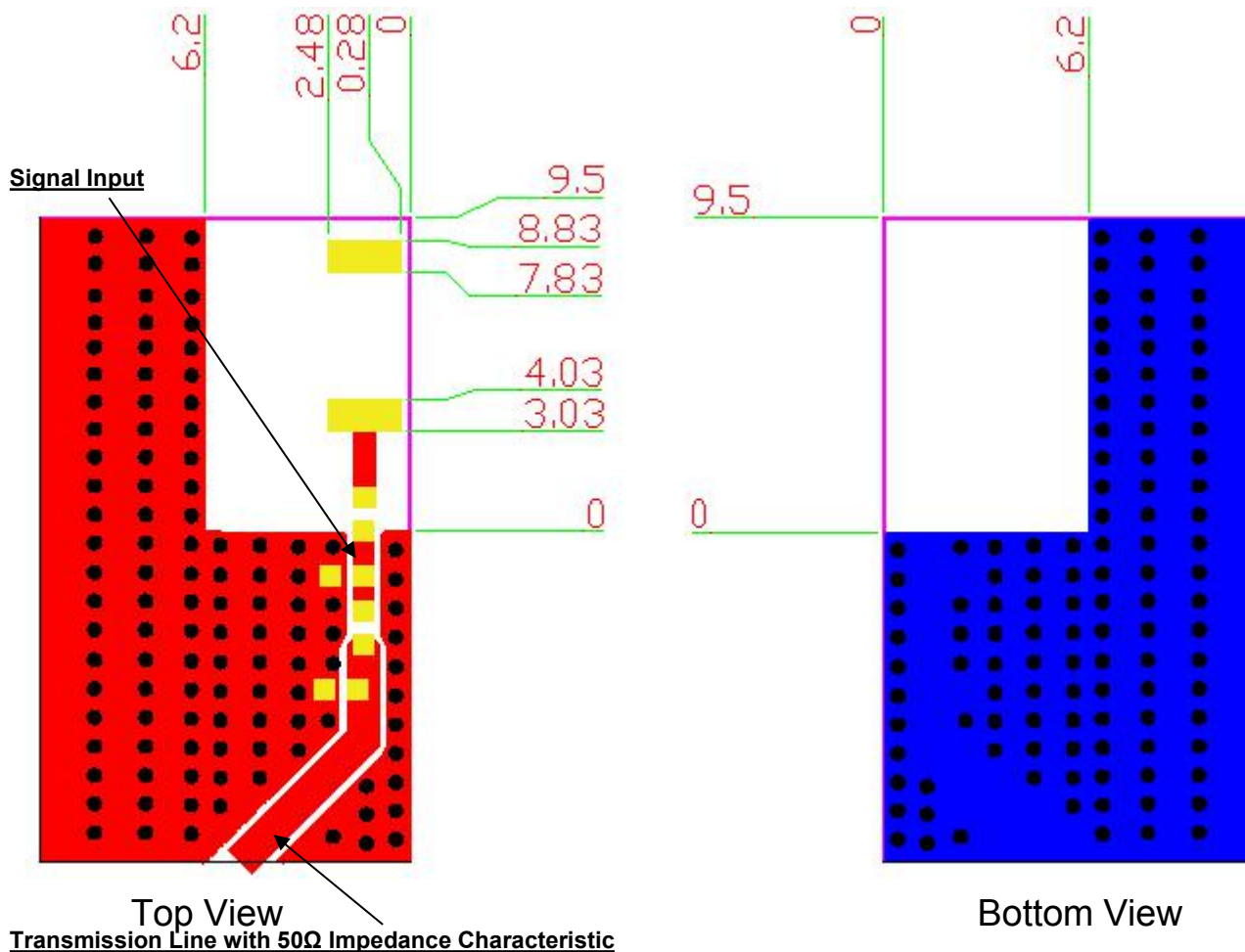
PAGE 1 OF 10

## 5. Layout Guide & Electrical Specifications

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

Solder Land Pattern:

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



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## 5-2. Electrical Specifications (Evaluation Board Dimensions: 40 x 40 mm<sup>2</sup>)

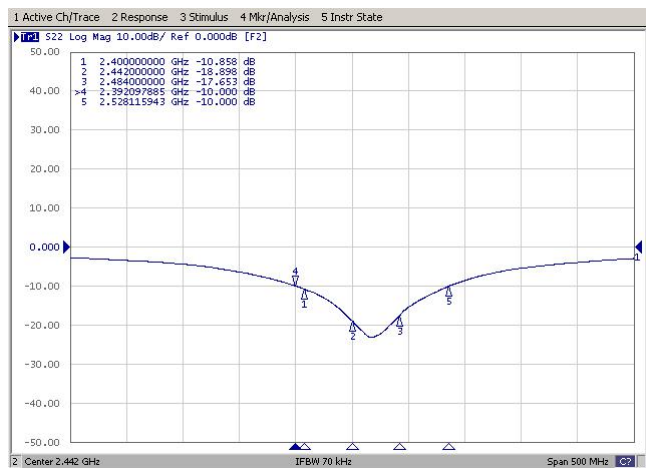
### 5-2-1. Electrical Table

Characteristics		Specifications	Unit
Outline Dimensions		5.0 x 2.2 x 1.6	mm
Working Frequency		2400 ~ 2500	MHz
VSWR(@ center frequency)*		2 Max.	
Characteristic Impedance		50	$\Omega$
Polarization		Linear Polarization	
Peak Gain	(@2442 MHz)	2.2 (typical)	dBi
Efficiency		66 (typical)	%

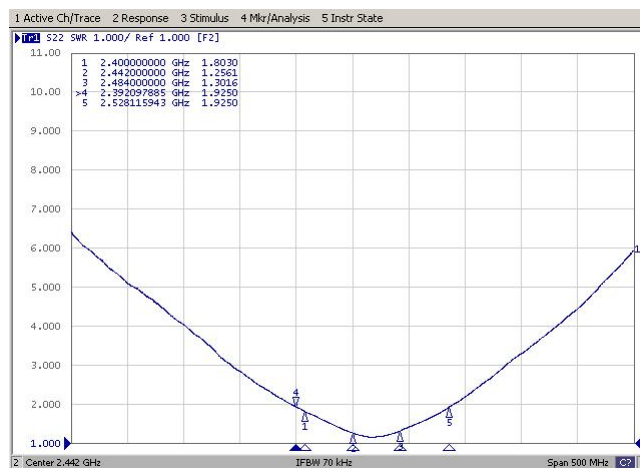
\*Center frequency means the frequency with the lowest value in return loss of the chip antenna on the evaluation board.

## 5-2. Return Loss & VSWR

Return Loss ( $S_{11}$ )



VSWR ( $S_{11}$ )



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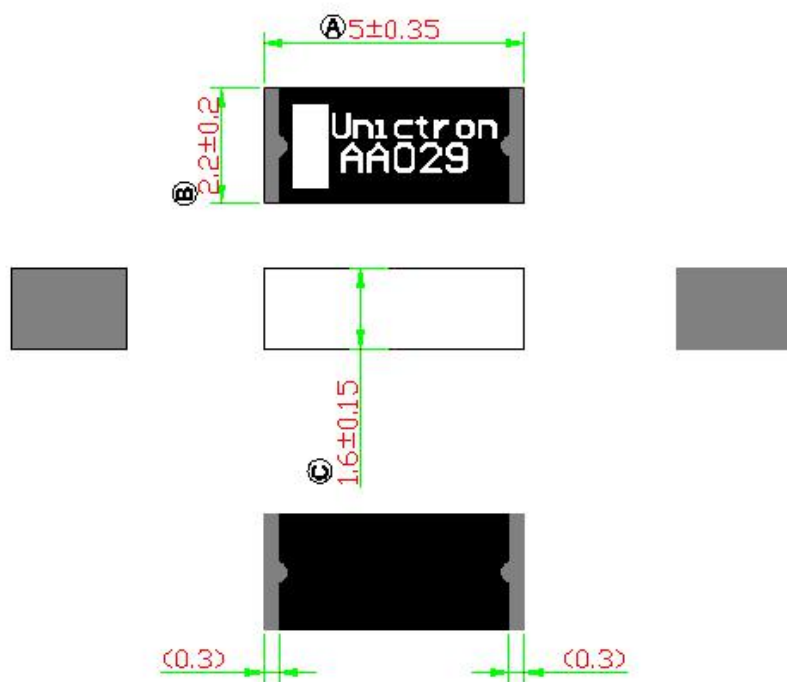
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## 6. Outline Dimensions of Antenna & Evaluation Board (unit: mm)

### 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**

PIN	1	2
Soldering PAD	Signal	N/C



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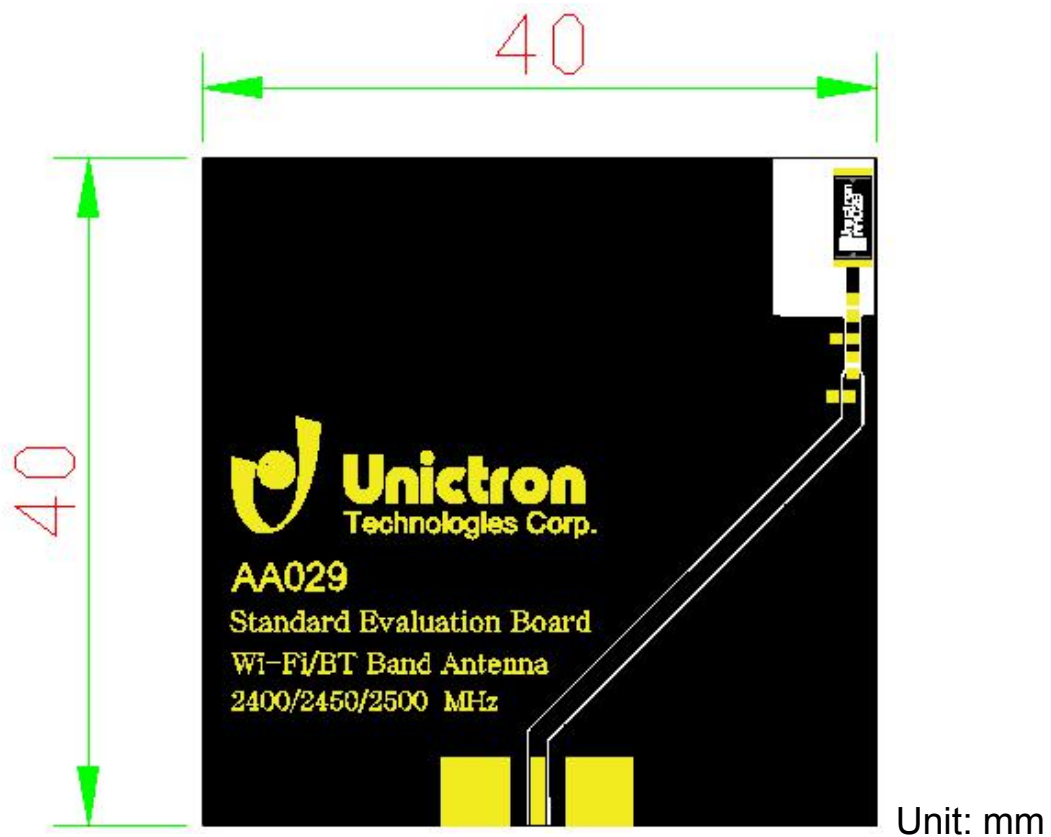
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**PAGE 4 OF 10**

## 6-2. Evaluation Board with Antenna



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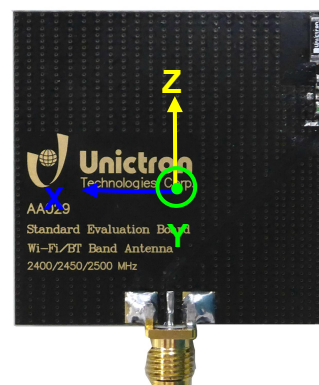
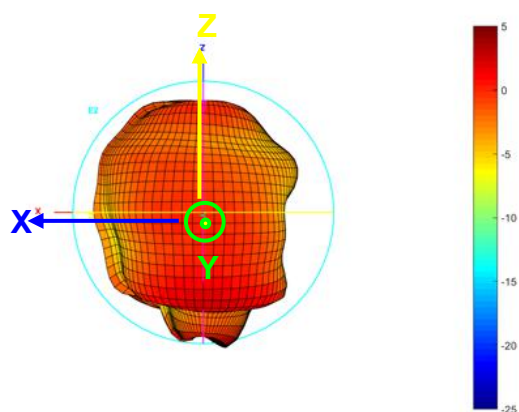
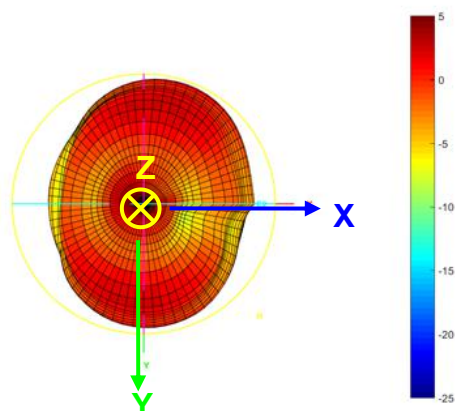
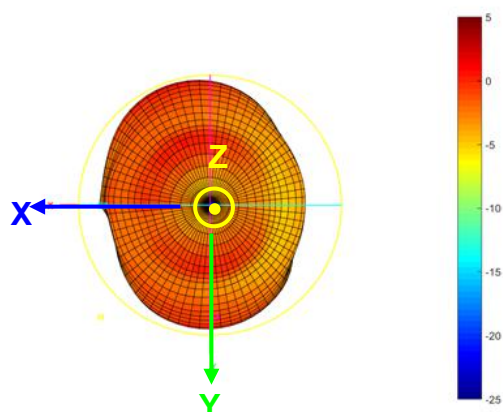
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**PAGE 5 OF 10**

## 7. Radiation Pattern (with 40 x 40 mm<sup>2</sup> Evaluation Board)

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



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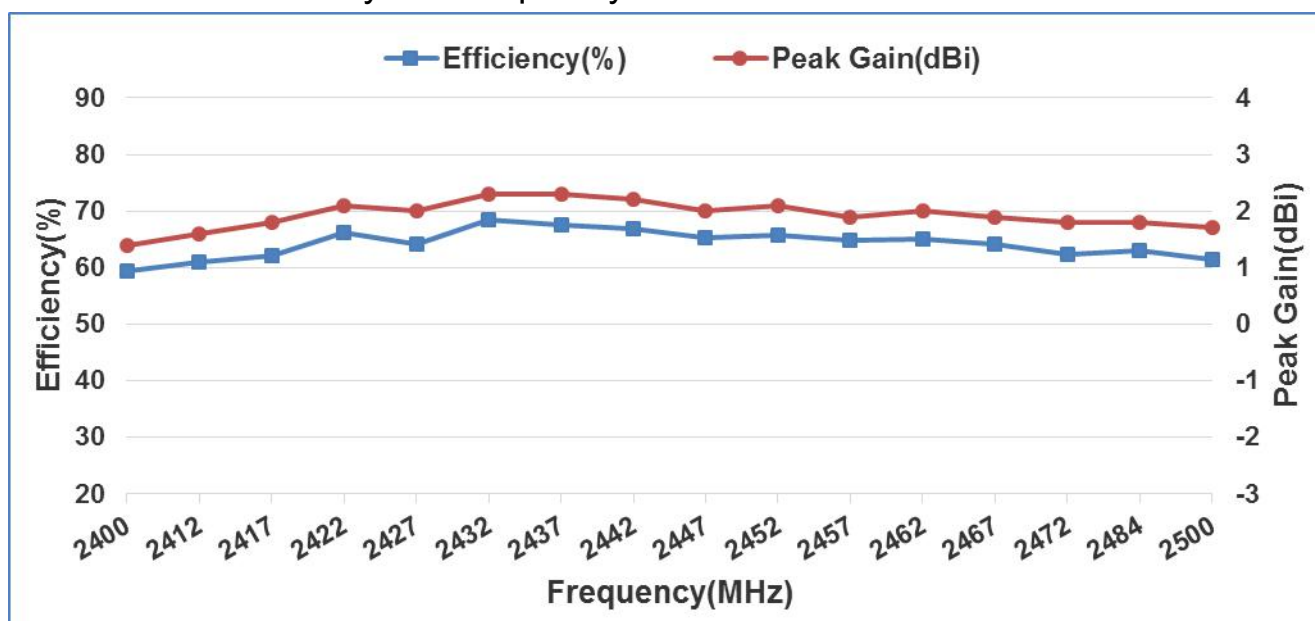
PAGE 6 OF 10



## 7-2. 3D Efficiency Table

Frequency(MHz)	2400	2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472	2484	2500
Efficiency(dB)	-2.3	-2.2	-2.1	-1.8	-1.9	-1.6	-1.7	-1.8	-1.9	-1.8	-1.9	-1.9	-1.9	-2.0	-2.0	-2.1
Efficiency(%)	59.3	60.9	62.2	66.1	64.2	68.4	67.5	66.8	65.2	65.8	64.8	65.1	64.0	62.4	63.0	61.5
Peak Gain(dBi)	1.4	1.6	1.8	2.1	2.0	2.3	2.3	2.2	2.0	2.1	1.9	2.0	1.9	1.8	1.8	1.7

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



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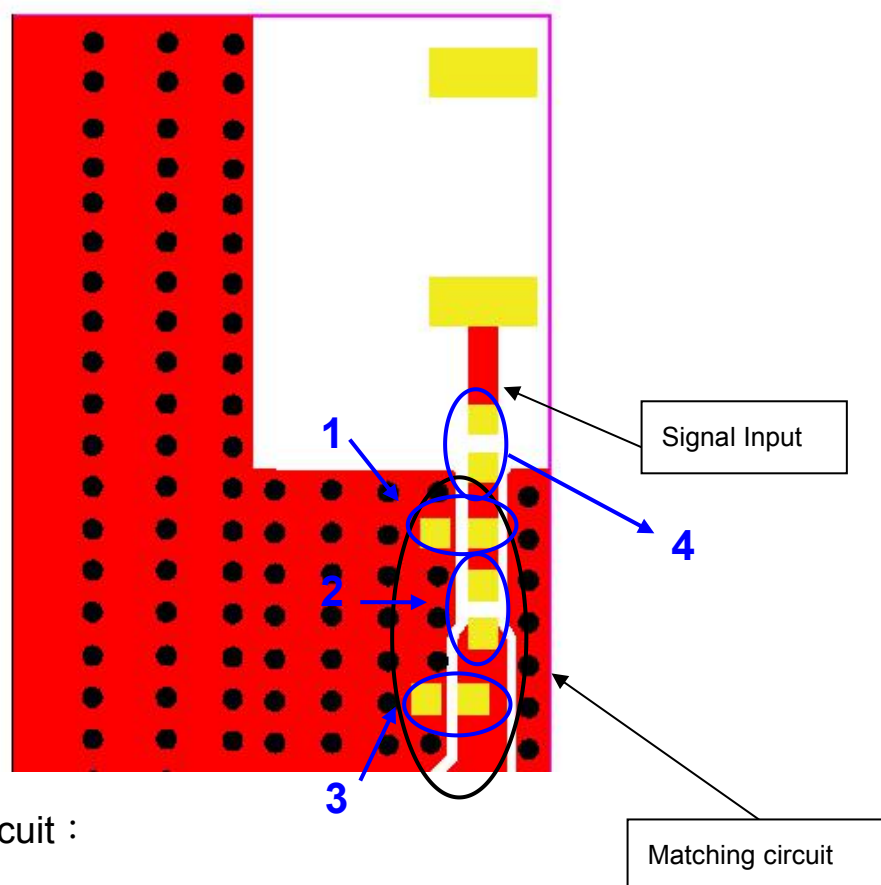
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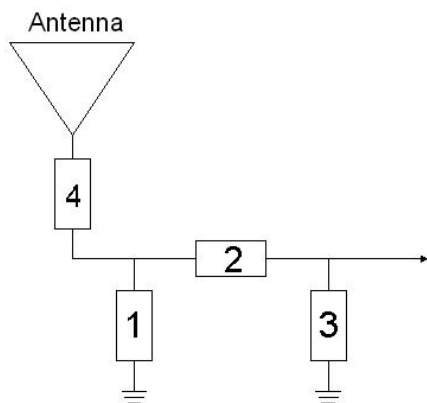
## 8. Frequency tuning and Matching circuit

### 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 40 x 40 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
4	0Ω, (0402)	-	-



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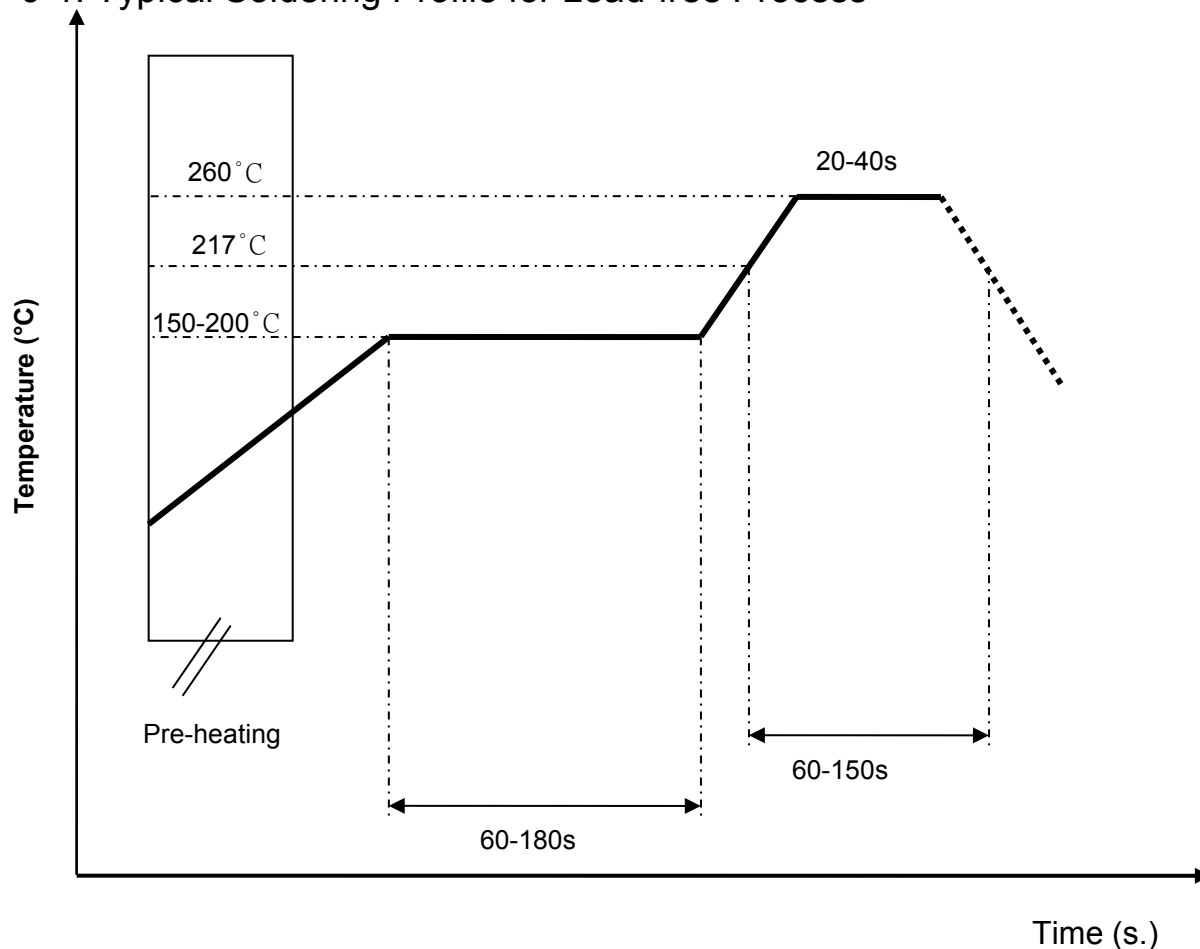
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## 9. Soldering Conditions

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



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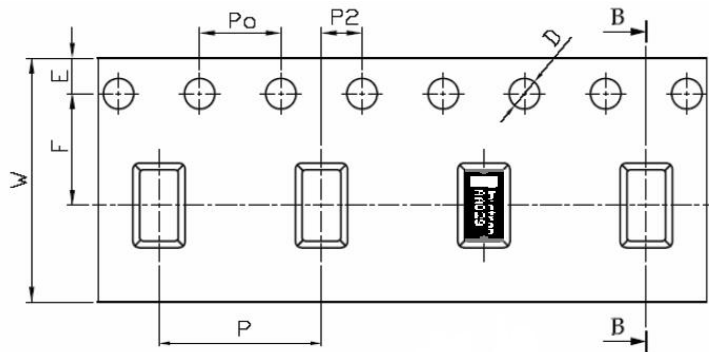
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## 10. Packing

(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 Unicton's application note "General guidelines for the installation of Unicton's chip antennas" for further information.

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



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PAGE 10 OF 10