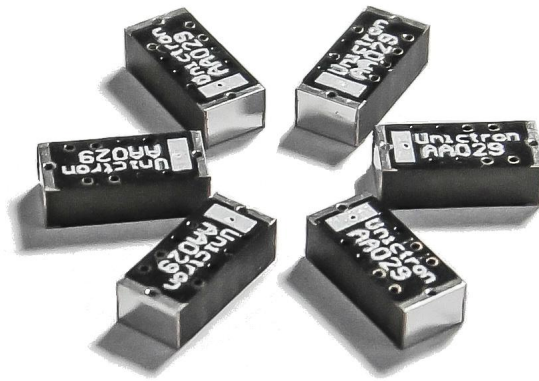


5.0 x 2.2 x 1.6 (mm) WiFi / Bluetooth Chip Antenna (AA029) Engineering Specification

1. Product Number

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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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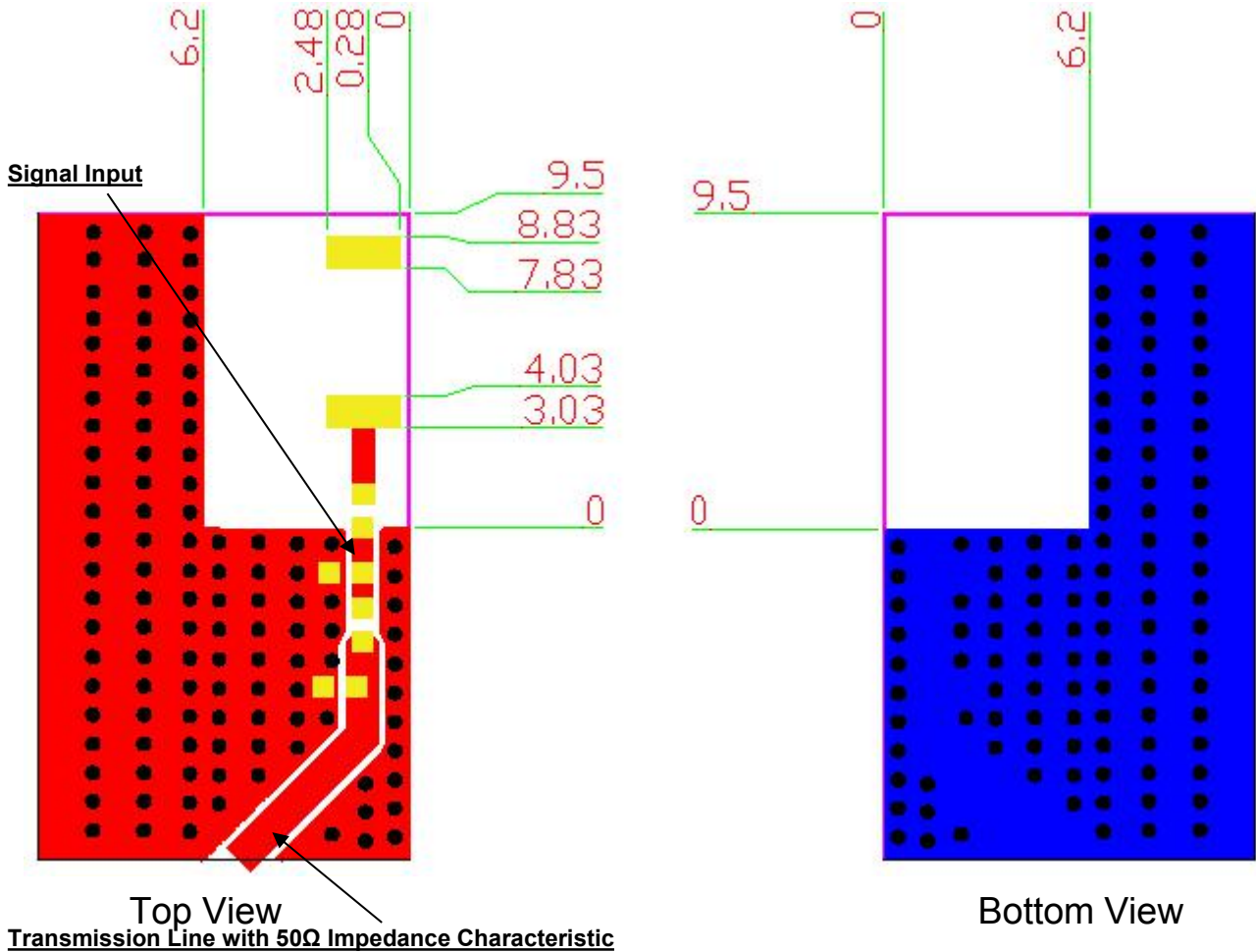
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5. Layout Guide & Electrical Specifications

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 mm²)

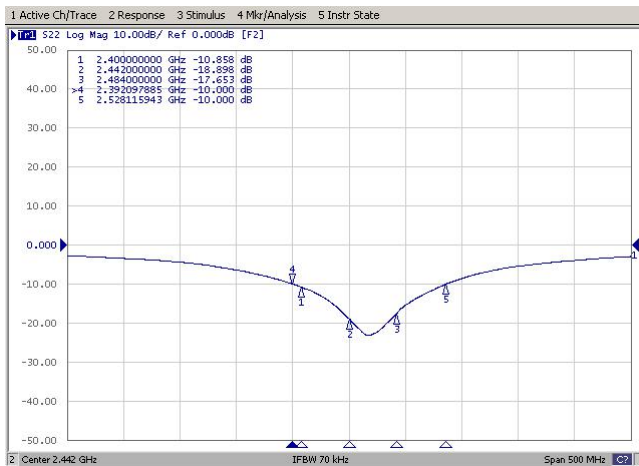
5-2-1. Electrical Table

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	Ω
Polarization		Linear Polarization	
Peak Gain	(@2442 MHz)	2.2 (typical)	dBi
Efficiency		66 (typical)	%

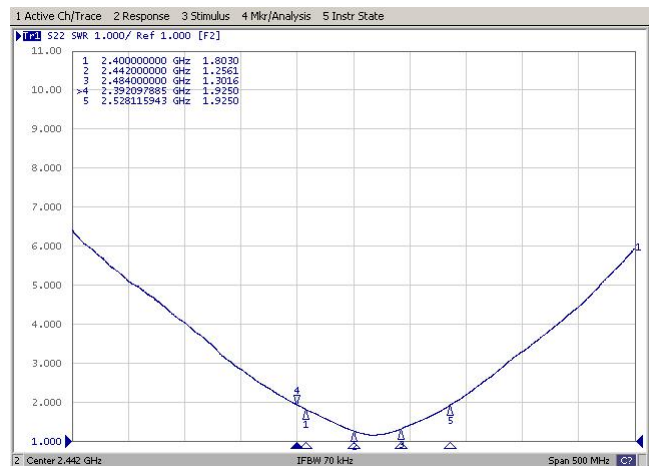
*Center frequency means the frequency with the lowest value in return loss of the chip antenna on the evaluation board.

5-2. Return Loss & VSWR

Return Loss (S_{11})



VSWR (S_{11})



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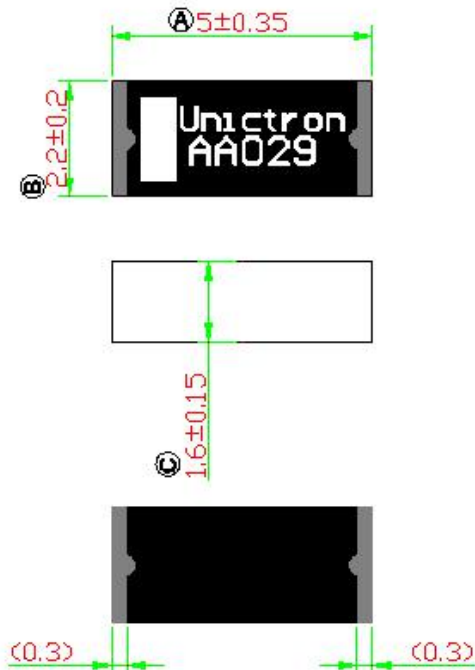
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6. Outline Dimensions of Antenna & Evaluation Board (unit: mm)

6-1. Antenna Dimensions



NOTE:

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

PIN Definitions



Top View

PIN2



Bottom View

PIN	1	2
Soldering PAD	Signal	N/C



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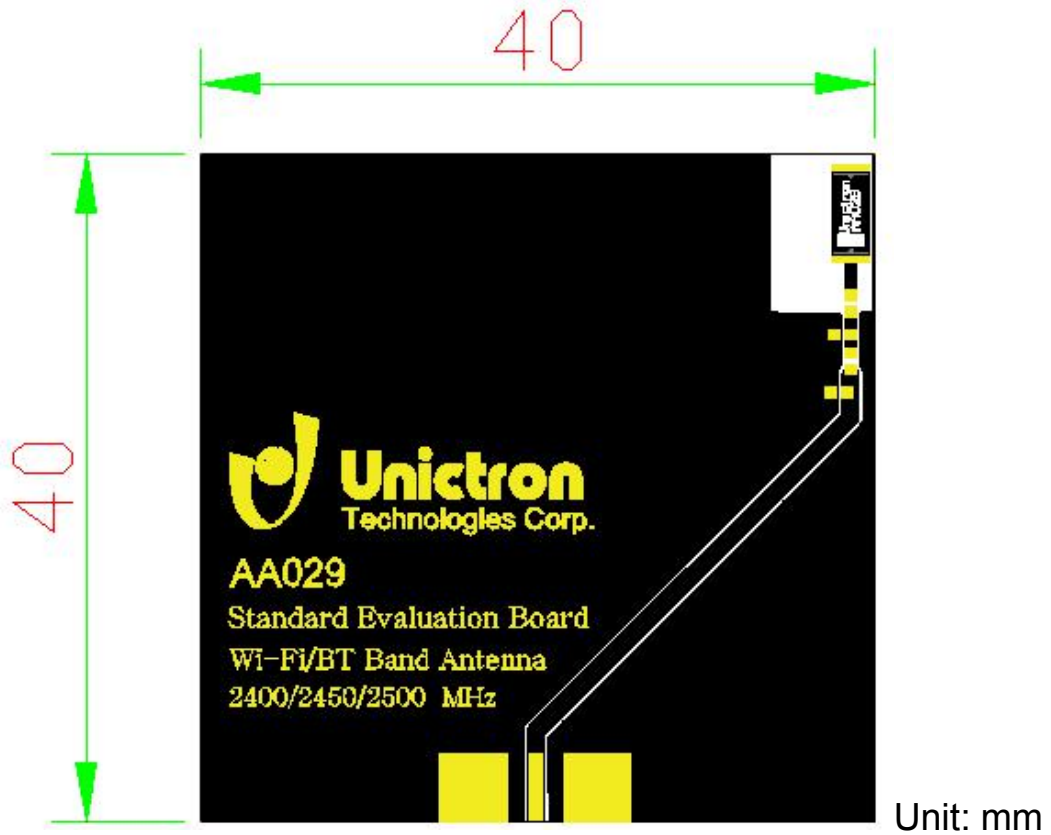
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6-2. Evaluation Board with Antenna



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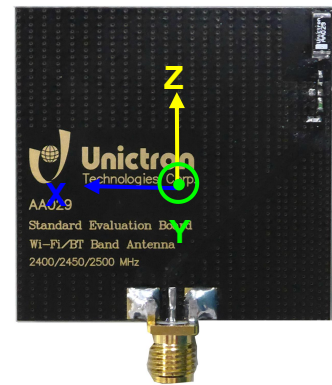
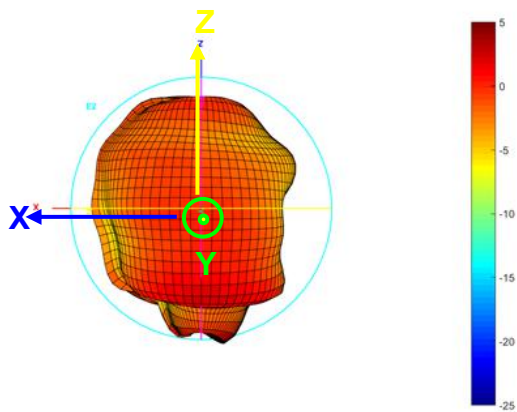
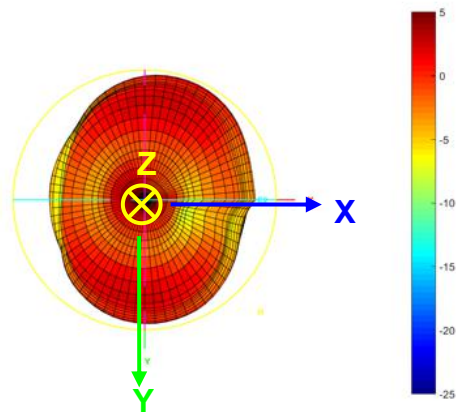
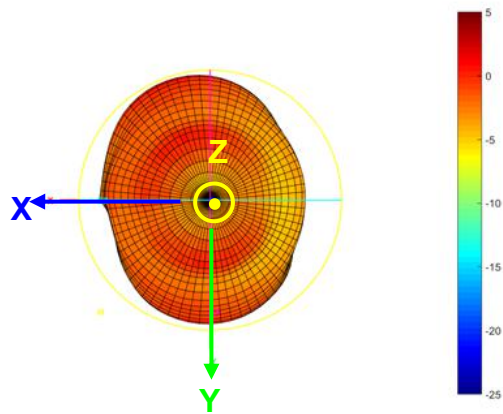
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7. Radiation Pattern (with 40 x 40 mm² Evaluation Board)

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



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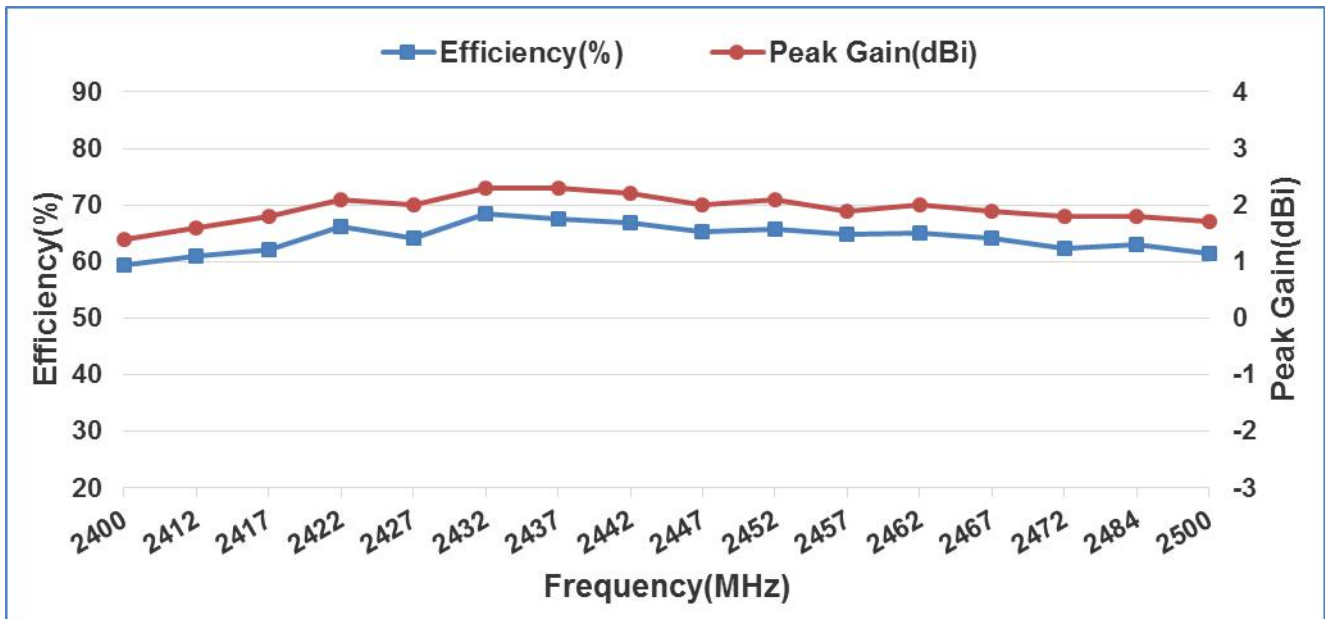
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7-2. 3D Efficiency Table

Frequency(MHz)	2400	2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472	2484	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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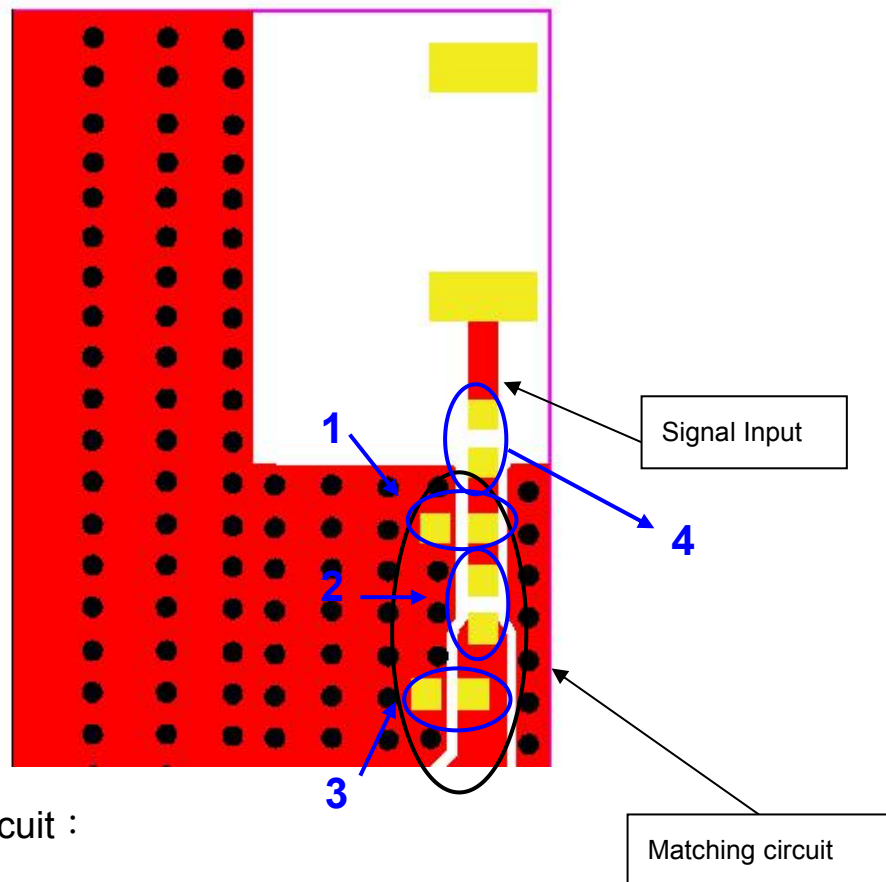
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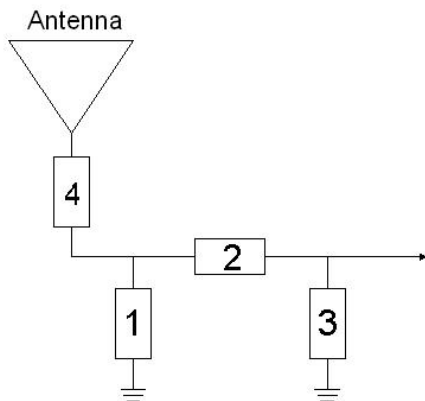
8. Frequency tuning and Matching circuit

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 mm² 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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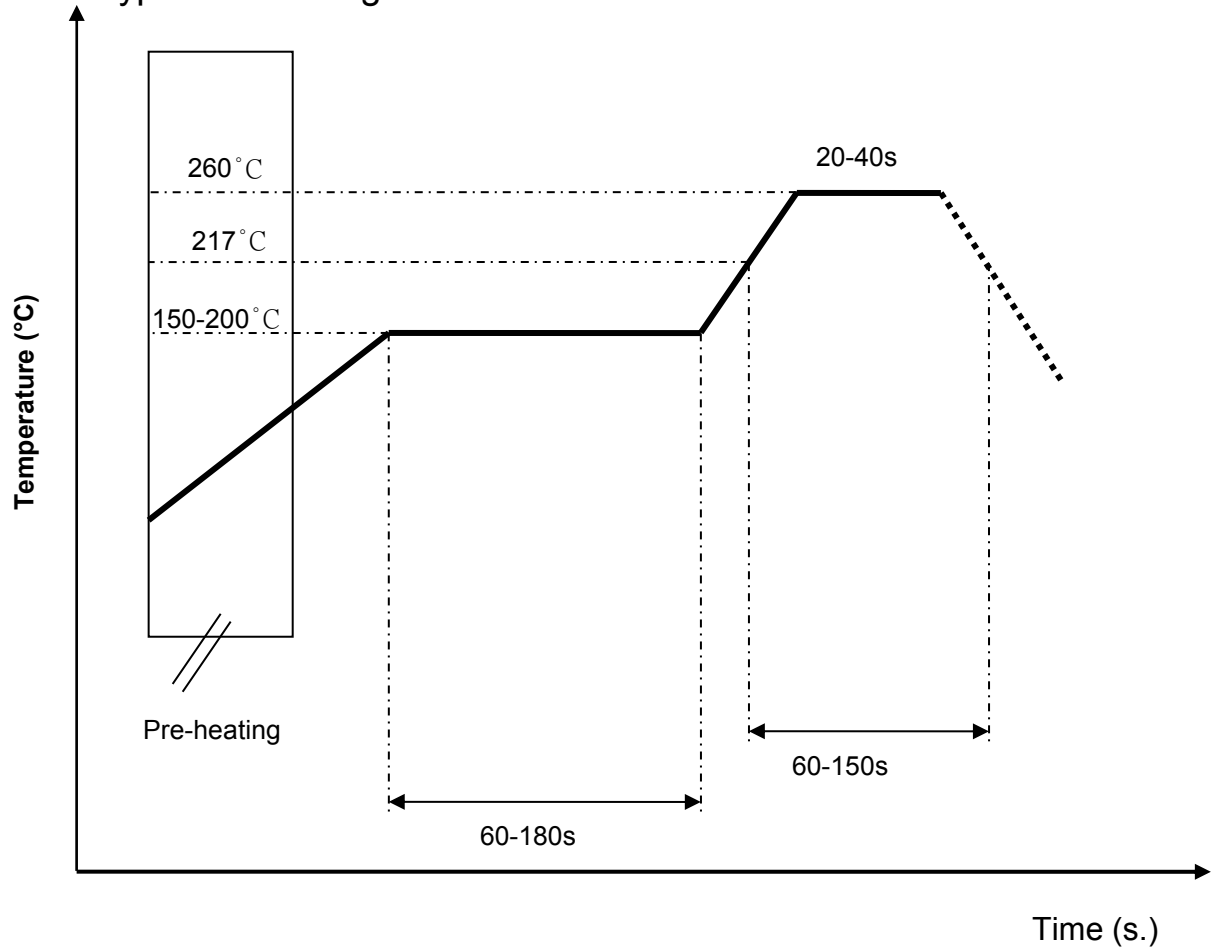
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9. Soldering Conditions

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



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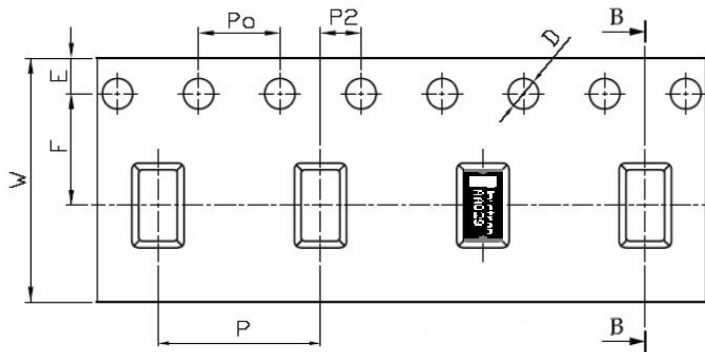
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10. Packing

(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 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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