

5.0 x 2.2 x 1.0 (mm) WiFi / Bluetooth Chip Antenna (CW503)

Engineering Specification

1. Product Number

H 2 U 3 6 F 1 K 1 B 0 3 0 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 CW503 chip antenna is designed for ISM 2.4GHz applications, covering frequencies 2400~2500MHz. Fabricated with proprietary design and ~~Unictron Technologies Corp.~~ processes, CW503 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 : Peter

Checked by : Mike

Approved by : Herbert

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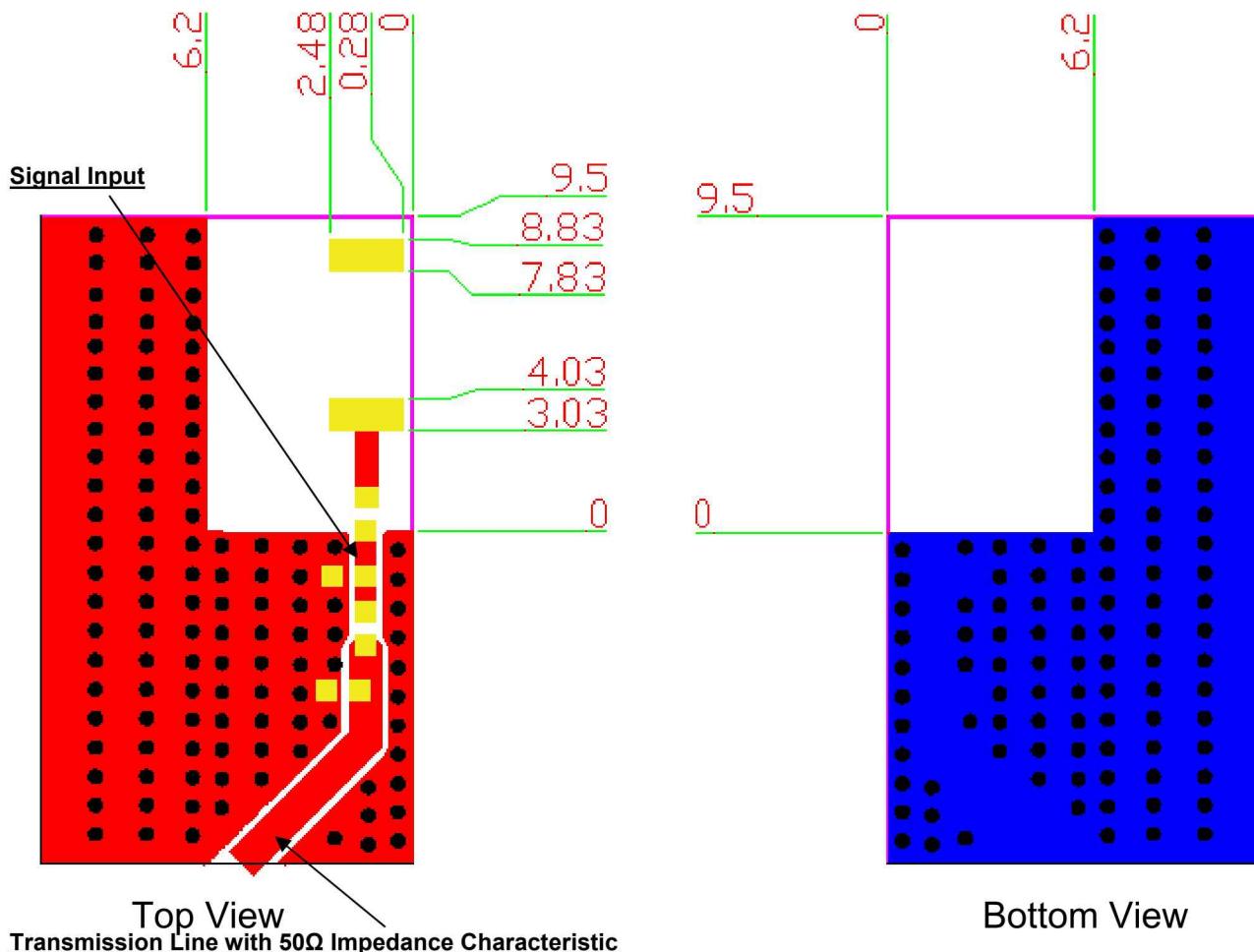
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5. Layout Guide & Electrical Specifications

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.



Bottom View

Transmission Line with 50Ω Impedance Characteristic



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5-2. Electrical Specifications (Evaluation Board Dimensions: 40 x 40 mm²)

5-2-1. Electrical Table (2400~2500 MHz Band)

Characteristics	Specifications	Unit
Outline Dimensions	5.0 x 2.2 x 1.0	mm
Ground Plane Dimensions	40 x 40	mm
Working Frequency	2400~ 2500	MHz
VSWR (@ center frequency)*	< 2:1	
Characteristic Impedance	50	Ω
Polarization	Linear Polarization	
Peak Gain (@2442 MHz)	1.9(typical**) 62.3(typical**)	dBi %
Efficiency		

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

**A typical value is for reference only, not guaranteed.



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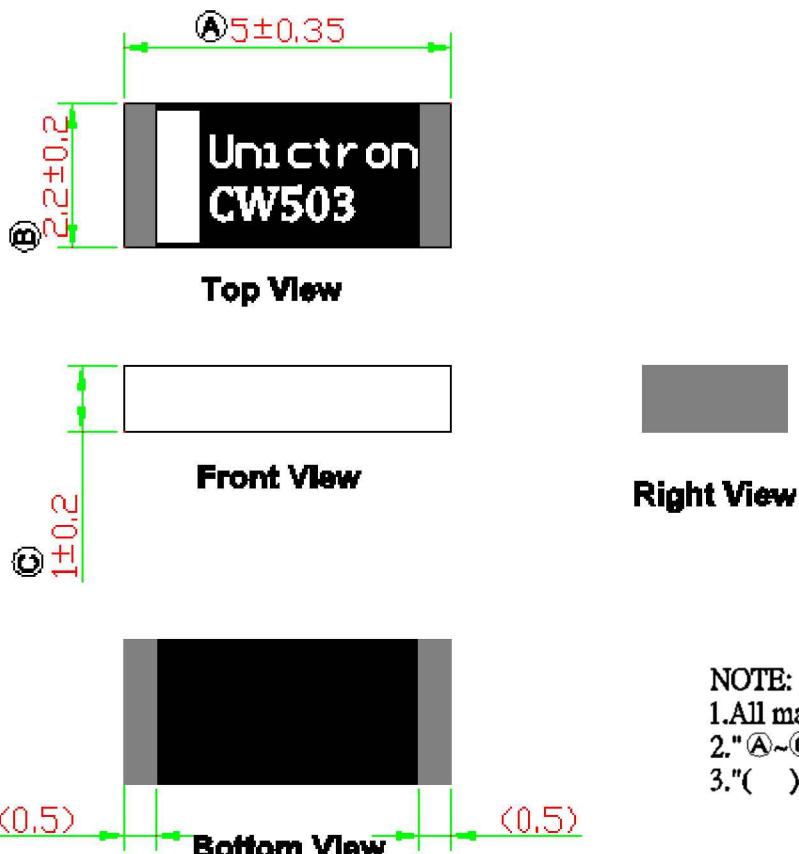
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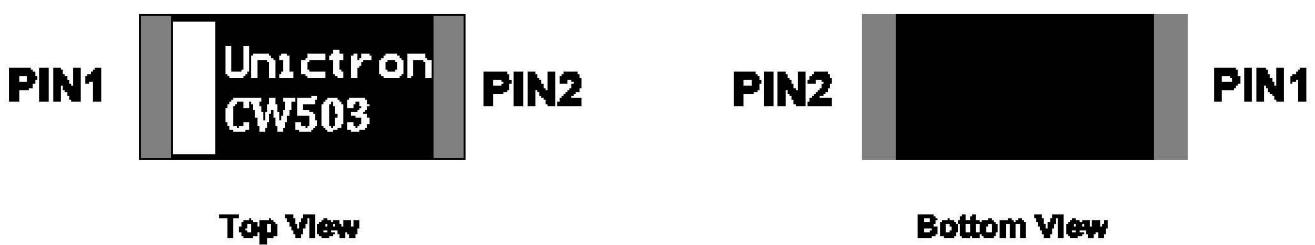
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6. Outline Dimensions of Antenna & Evaluation Board (unit: mm)

6-1. Antenna Dimensions



PIN Definition



PIN	1	2
Soldering PAD	Signal	N/C



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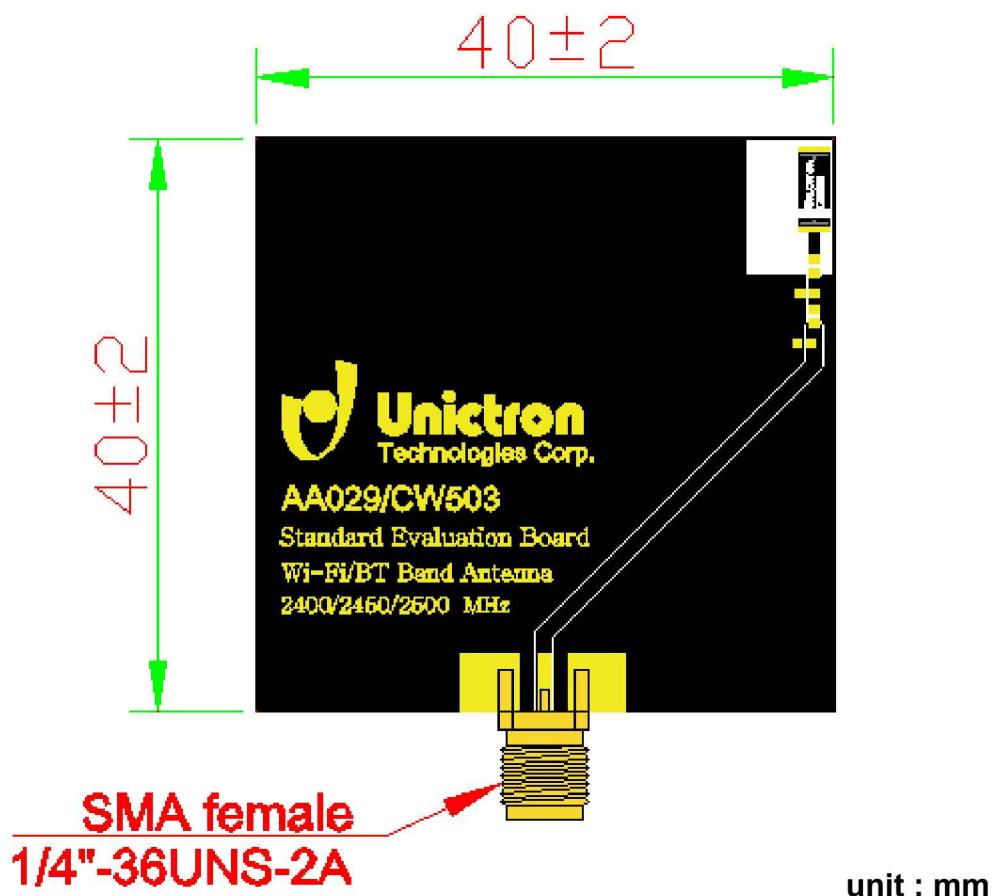
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6-2. Evaluation Board with Antenna



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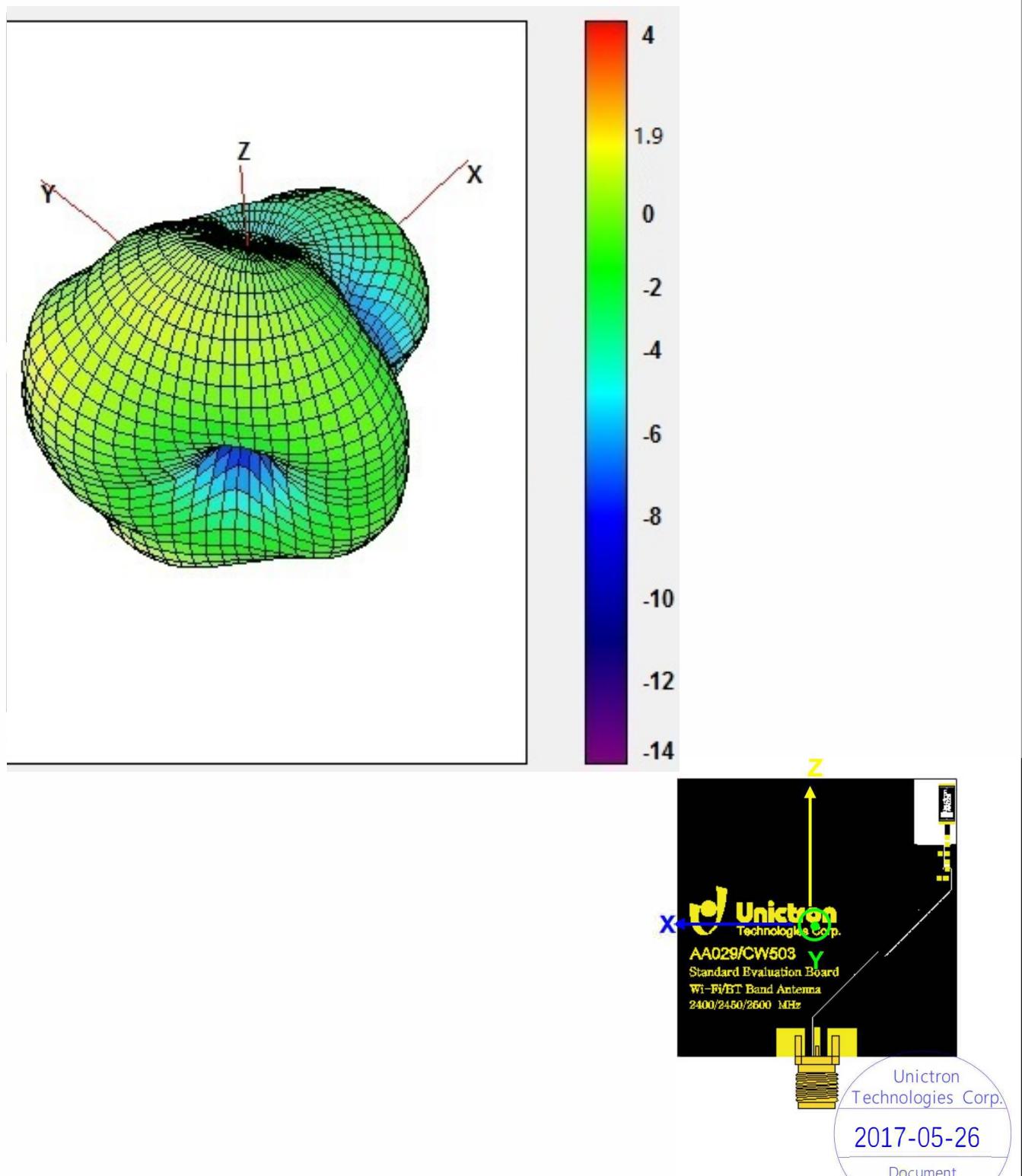
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7. 3D Radiation Gain Pattern (with 40 x 40 mm² Evaluation Board)

3D Radiation Gain Pattern @ 2442 MHz (unit: dBi)



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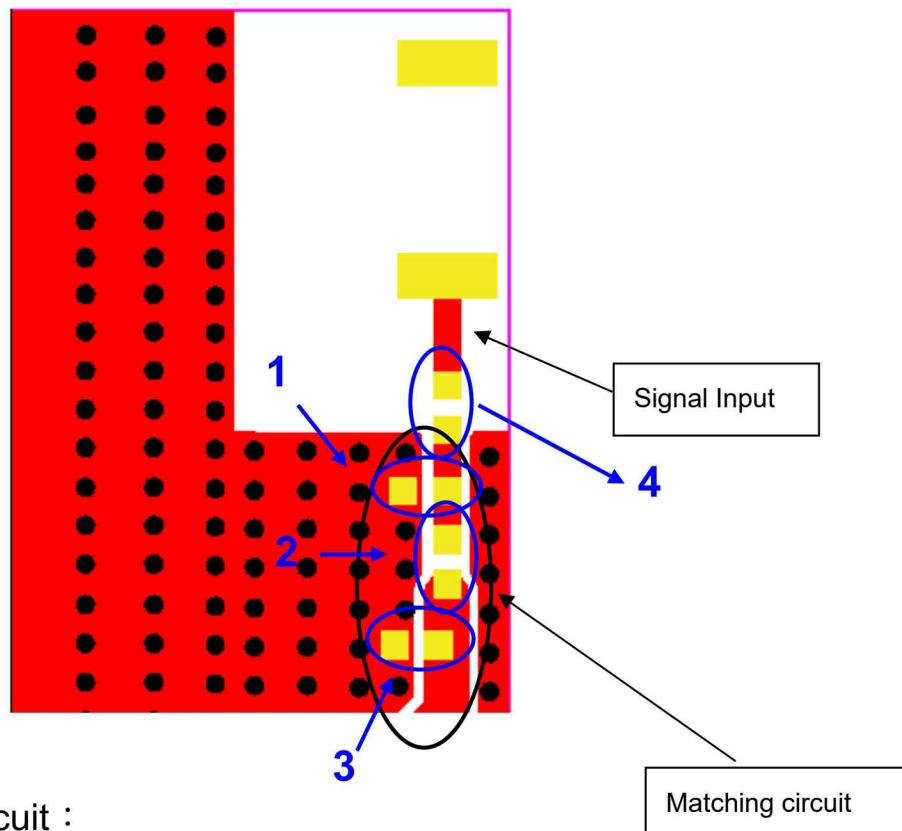
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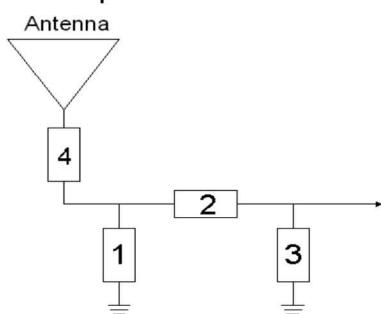
8. Frequency tuning and Matching circuit

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 2450 MHz at our standard 40x40 mm² evaluation board. However, these are reference values, may need to be changed when the circuit boards or part vendors are different.



System Matching Circuit Component			
Location	Description	Vendor	Tolerance
1	N/A*	-	-
2	3.3nH, (0402)	DARFON	$\pm 0.1\text{nH}$
3	1.5pF, (0402)	MURATA	$\pm 0.1\text{pF}$
4	0 Ω , (0402)	-	-

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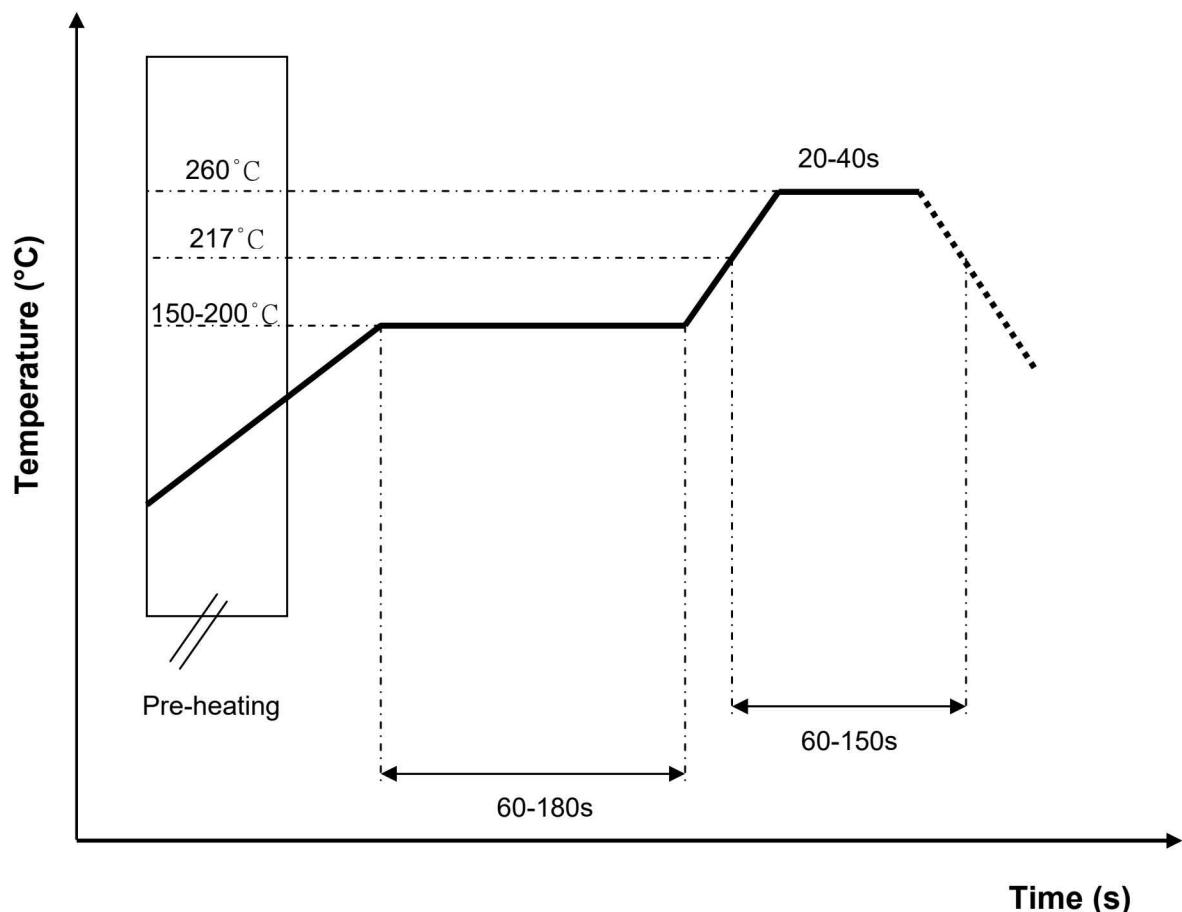
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9. Soldering Conditions

Typical Soldering Profile for Lead-free Process



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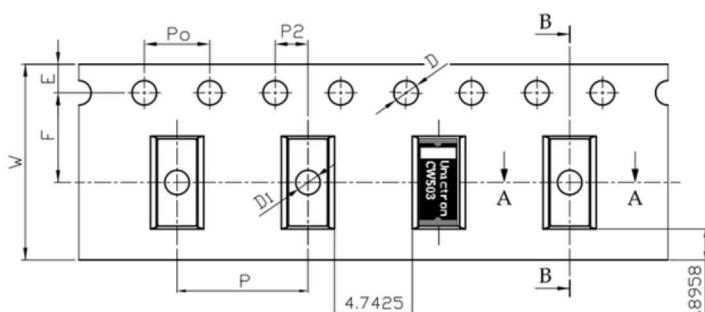
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10. Packing

- (1) Quantity/Reel: 5500 pcs/Reel
- (2) Plastic tape: Black conductive polystyrene

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
Po	4.00	± 0.10
D1	1.50	± 0.10
10Po	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
- (3) Relative Humidity: 10% to 70%

11-2. Storage (sealed)

- (1) Storage Temperature: -5°C to 40°C
- (2) Relative Humidity: 20% to 70%
- (3) Shelf Life: 1 year

11-3. Storage (unsealed)

Meet the criteria of J-STD-033 MSL2a

11-4. Storage (After mounted on customer's PCB with SMT process)

- (1) Storage Temperature: -40°C to 85°C
- (2) Relative Humidity: 10% to 70%



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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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