

# 3.2 x 1.6 x 1.6 (mm) WiFi / Bluetooth Chip Antenna (CW325) 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 CW325 chip antenna is designed for ISM 2.4GHz applications, covering frequencies 2400~2500 MHz. Fabricated with proprietary design and processes, CW325 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 : **Mina**      Designed by : **Allen**      Checked by : **Mike**      Approved by : **Herbert**

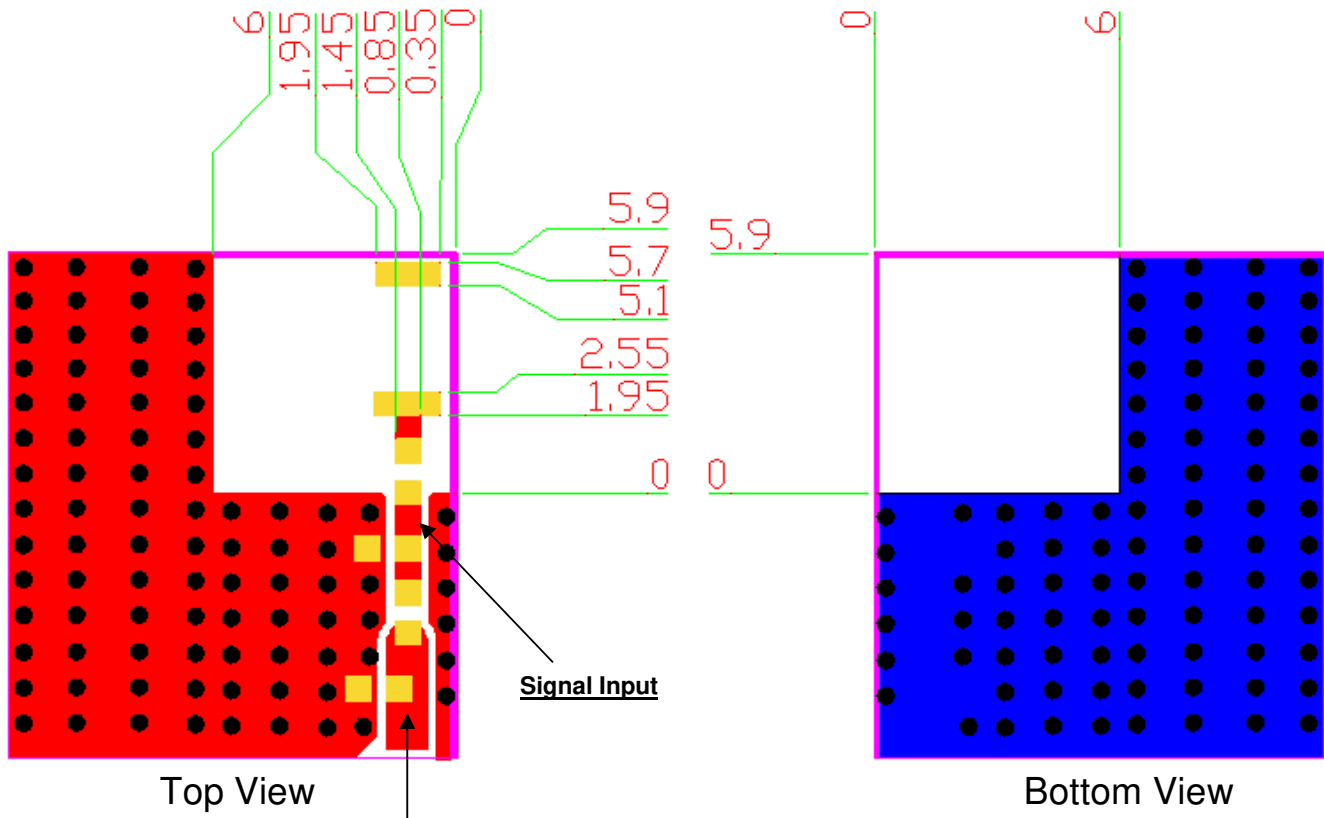
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## 5. Layout Guide & Electrical Specifications

### 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 mm<sup>2</sup>)

### 5-2-1. Electrical Table

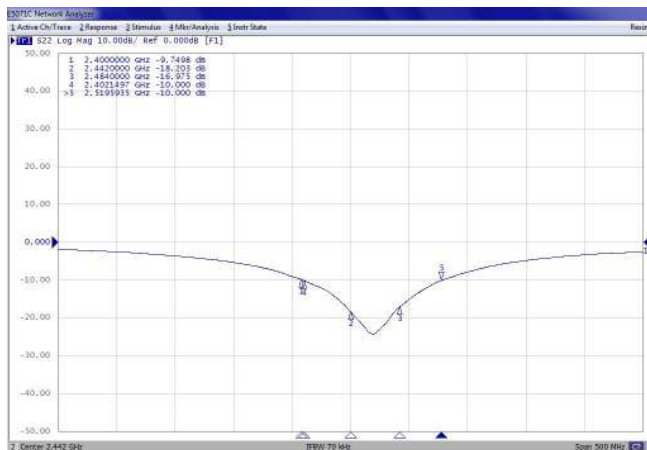
Characteristics		Specifications	Unit
Outline Dimensions		3.2 x 1.6 x 1.6	mm
Working Frequency		2400 ~ 2500	MHz
VSWR(@ center frequency)*		2 Max.	
Characteristic Impedance		50	Ω
Polarization		Linear Polarization	
Peak Gain	(@2442 MHz)	1.9 (typical**)	dBi
Efficiency		61 (typical**)	%

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

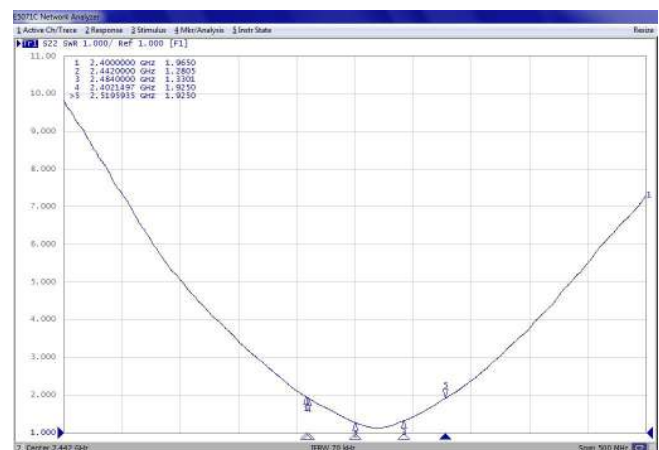
\*\*A typical value is for reference only, not guaranteed.

### 5-2-2. Return Loss & VSWR

Return Loss (S<sub>11</sub>)



VSWR (S<sub>11</sub>)



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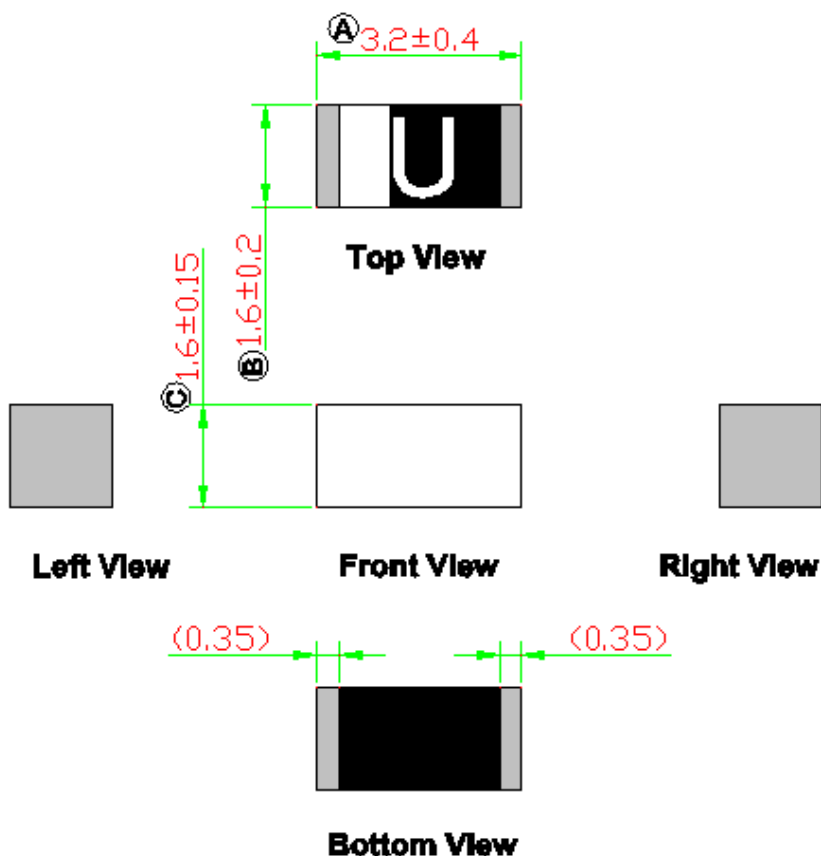
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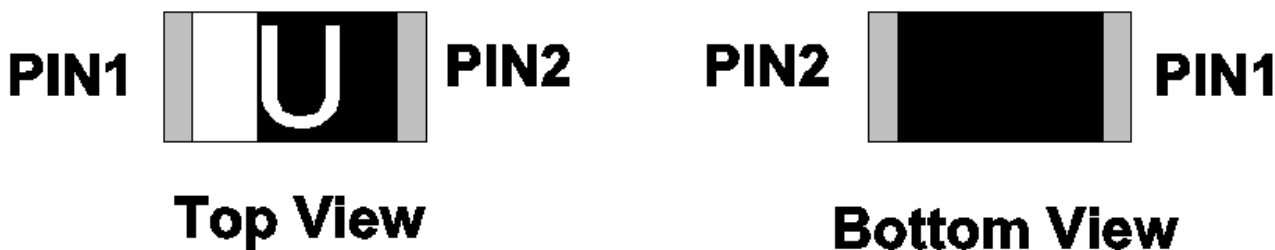
## 6. Outline Dimensions of Antenna & Evaluation Board (unit: mm)

### 6-1. Antenna Dimensions

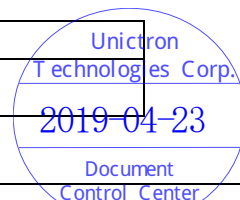


**NOTE:**  
 1. All materials are RoHS compliant.  
 2. "A~C" Critical Dimensions.  
 3. "( )" Reference Dimensions.

### PIN Definitions



PIN	1	2
Soldering PAD	Signal	N/C



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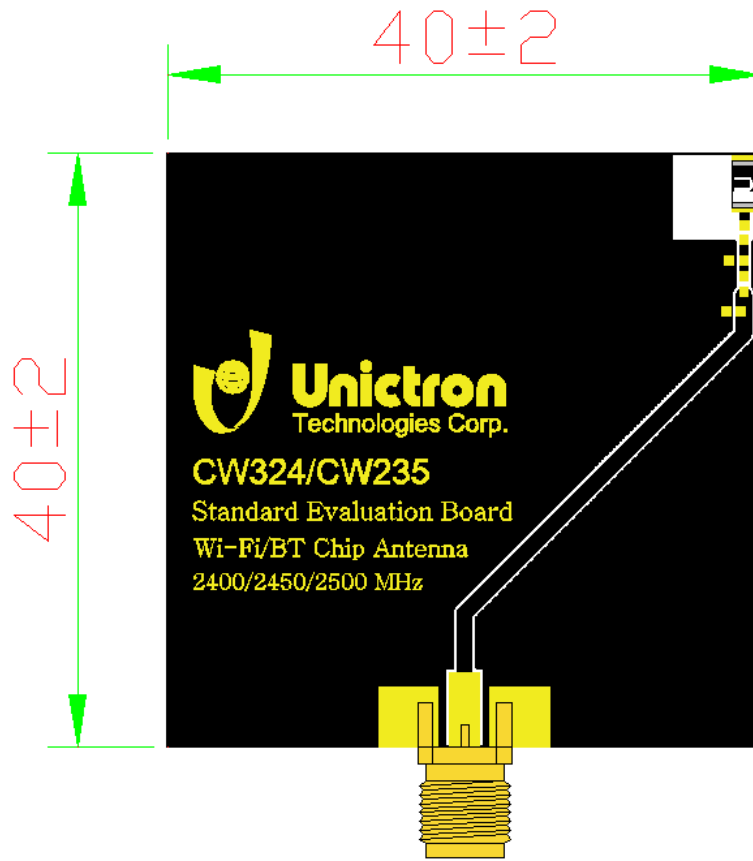
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6-2. Evaluation Board with Antenna



Unit: mm



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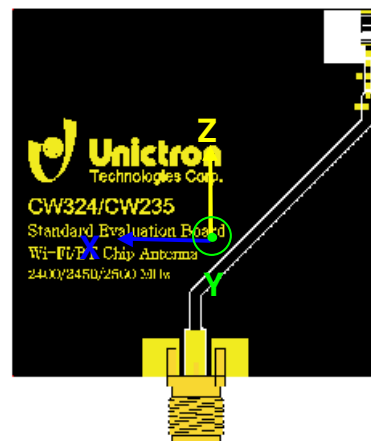
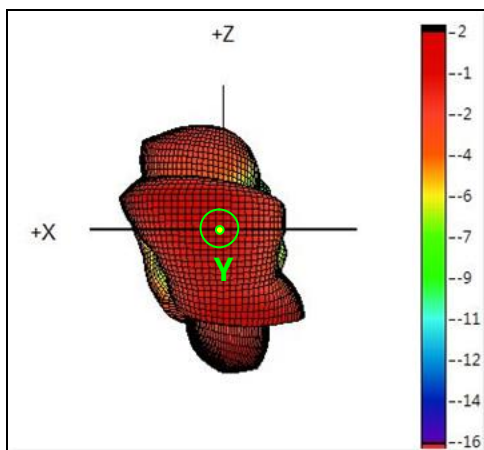
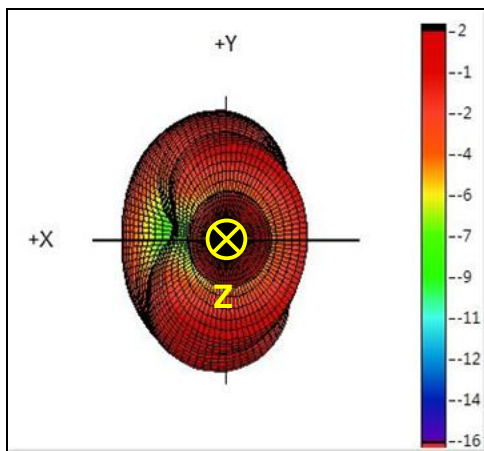
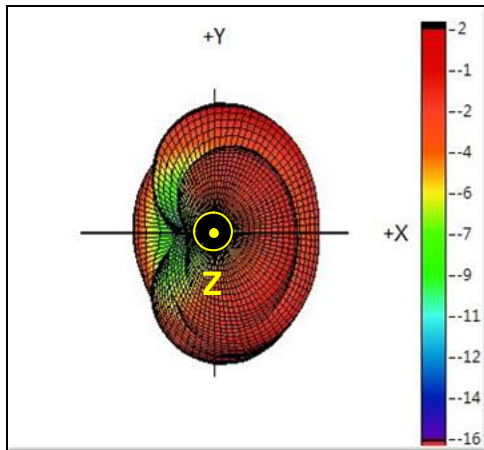
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## 7. Radiation Pattern (with 40 x 40 mm<sup>2</sup> Evaluation Board)

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



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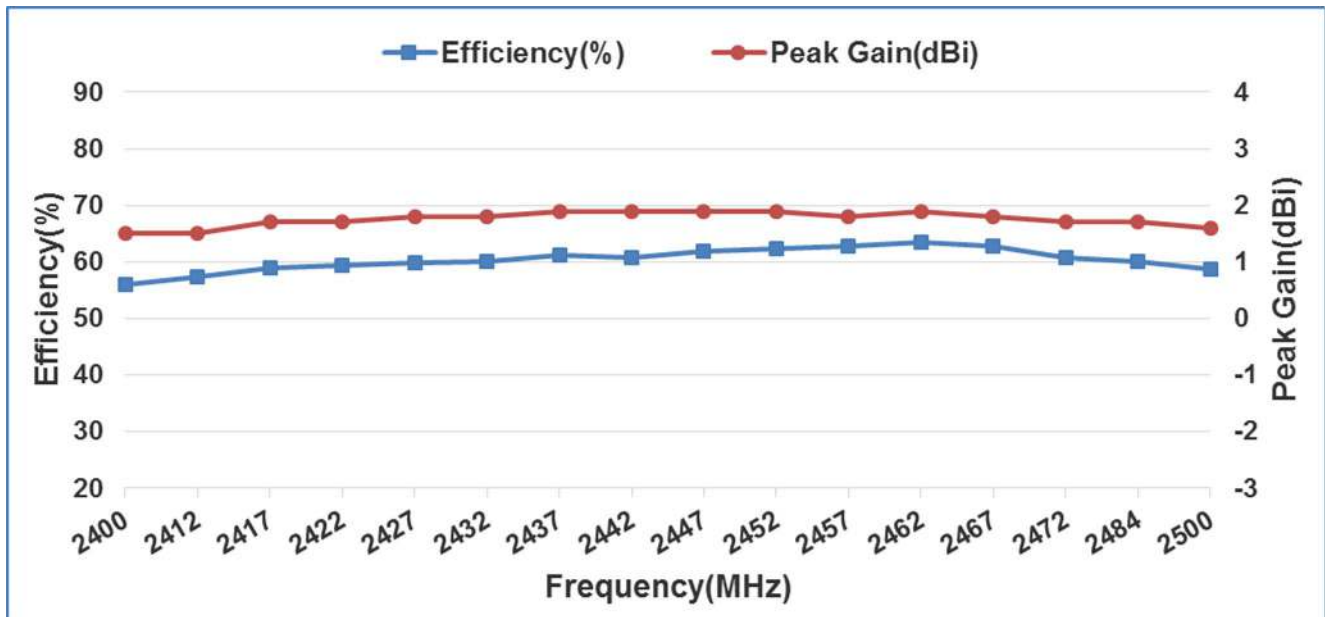
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## 7-2. 3D Efficiency Table

Frequency(MHz)	2400	2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472	2484	2500
Efficiency(dB)	-2.5	-2.4	-2.3	-2.3	-2.2	-2.2	-2.1	-2.2	-2.1	-2.1	-2.0	-2.0	-2.0	-2.2	-2.2	-2.3
Efficiency(%)	56.0	57.4	58.9	59.4	59.8	60.1	61.1	60.8	61.8	62.4	62.8	63.4	62.8	60.8	60.0	58.7
Peak Gain(dBi)	1.5	1.5	1.7	1.7	1.8	1.8	1.9	1.9	1.9	1.9	1.8	1.9	1.8	1.7	1.7	1.6

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



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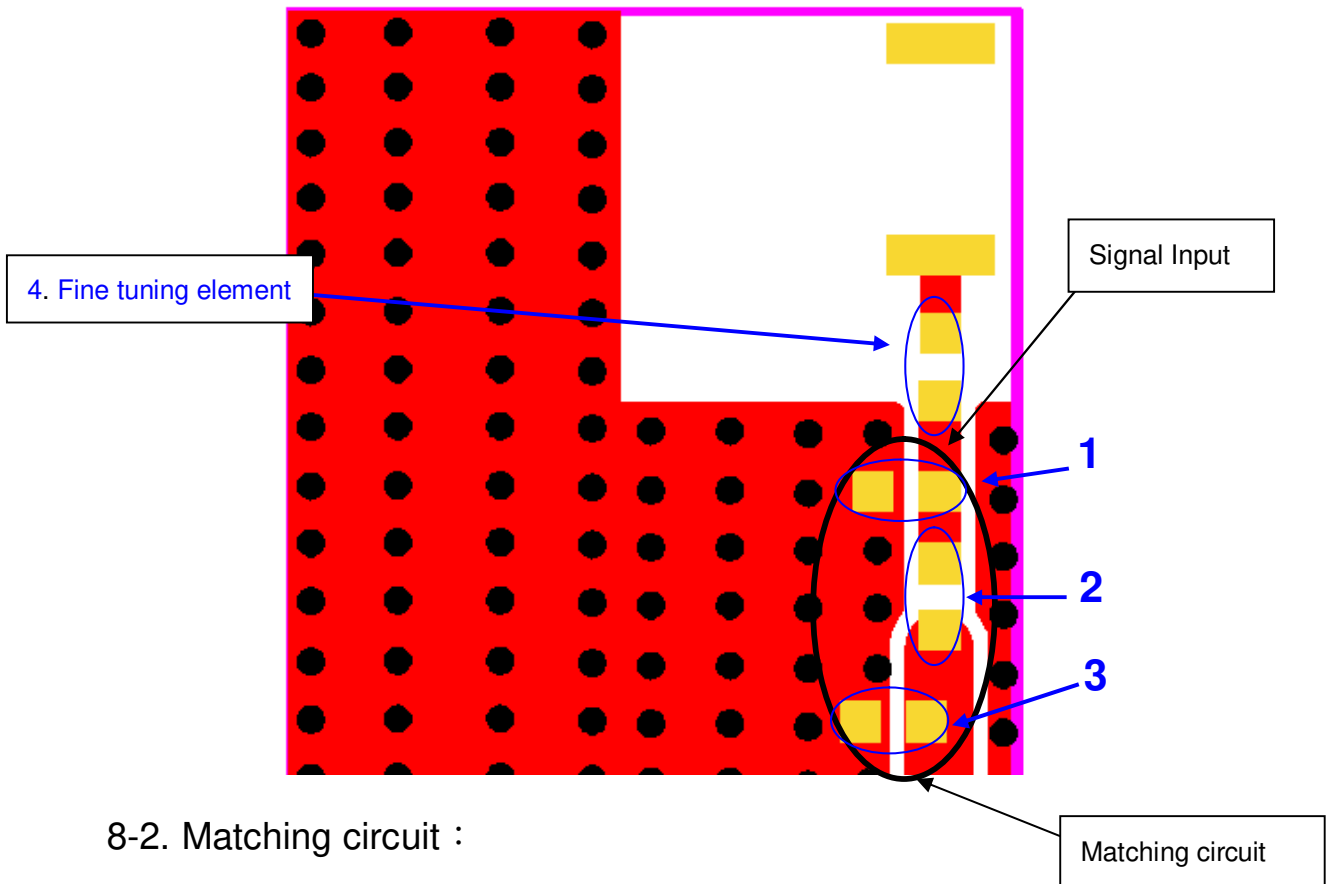
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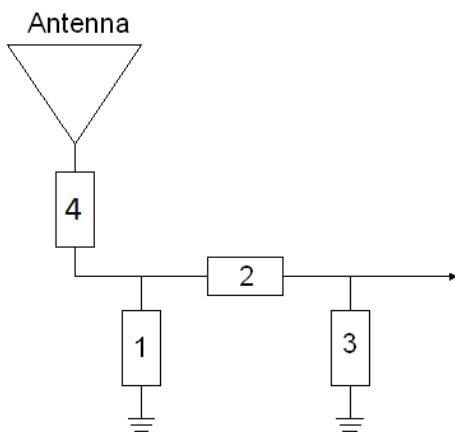
## 8. Frequency tuning and Matching circuit

### 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	0Ω, (0402)	-	-
3	0.4pF, (0402)	MURATA	±0.05pF
4	Fine tuning element 8.2nH, (0402)	MURATA	±2%

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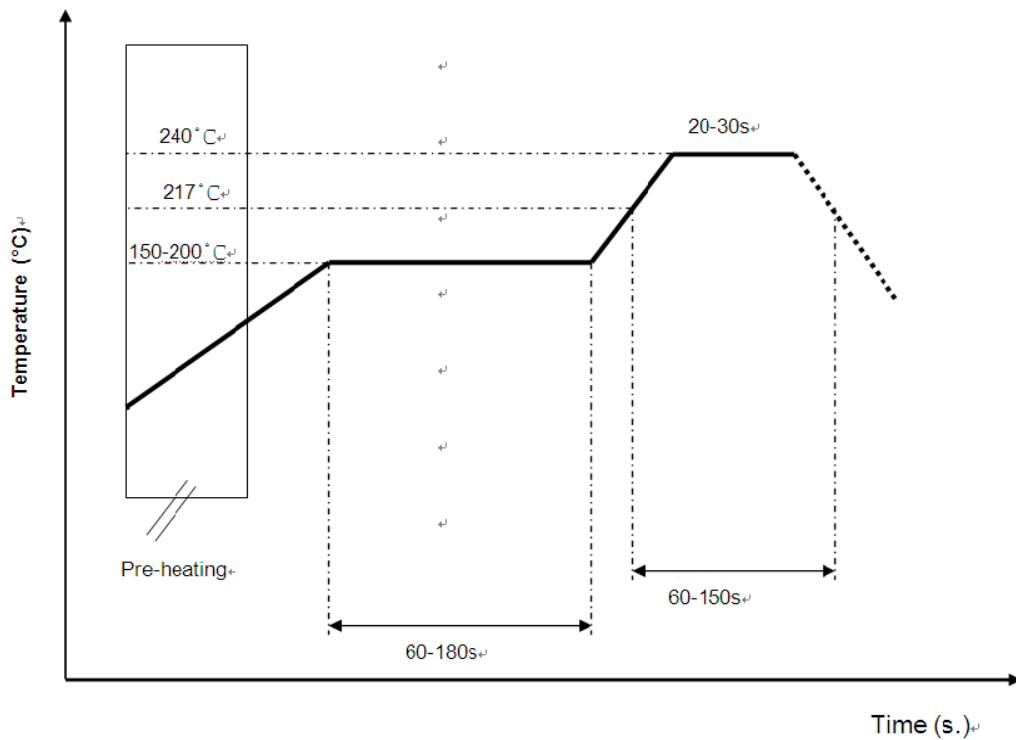
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## 9. Soldering Conditions

### Typical Soldering Profile for Lead-free Process



\*Recommended solder paste alloy: SAC305 (Sn96.5 /Ag3 /Cu0.5) Lead Free solder paste.



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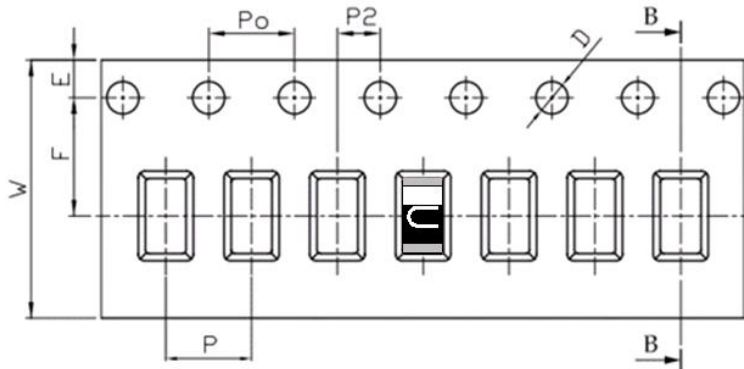
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## 10. Packing

- (1) Quantity/Reel: 2000pcs/Reel
- (2) Plastic tape: Black Conductive Polystyrene.

a. Tape Drawing



b. Tape Dimensions (unit: mm)

Feature	Specifications	Tolerances
W	12.00	±0.30
P	4.00	±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
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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