

# 3.0 x 3.0 x 10.0 (mm), 2.4 GHz, Vertical Polarization Pillar Antenna (CW10D7) Engineering Specification

## 1. Product Number

H 2 U 3 6 D 2 K 1 B 0 1 0 0



## 2. Features

- \*Stable and reliable in performance.
- \*RoHS 2.0 compliance
- \*SMT processes compatible

## 3. Applications

- \*ISM 2.4 GHz applications
- \*Wi-Fi router (IEEE802.11 b/g/n)
- \*Hand-held devices when WiFi / Bluetooth functions are needed, e.g. Tracker、IoT Devices, etc.

## 4. Description

Unictron's CW10D7 chip antenna is designed for ISM 2.4GHz applications, covering frequencies 2400~2500MHz. Fabricated with proprietary design and processes, CW10D7 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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Designed by : **Peter**

Checked by : **Mike**

Approved by : **Herbert**

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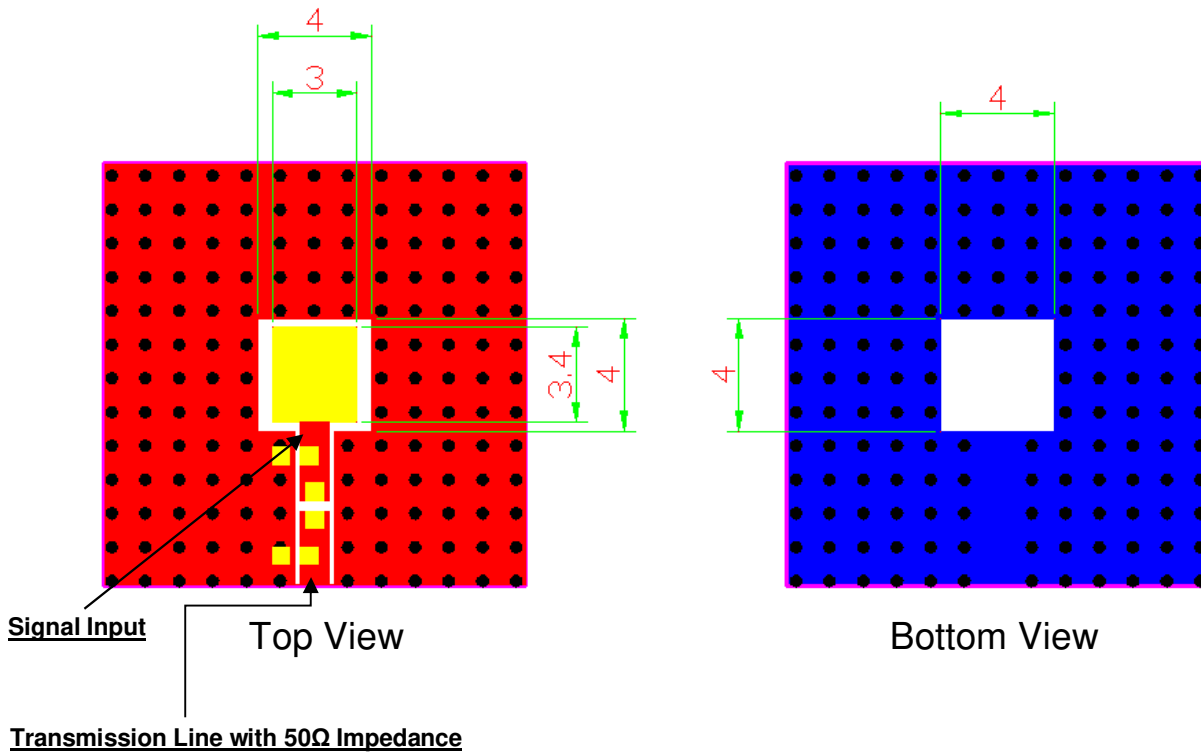
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## 5. Layout Guide & Electrical Specifications

### 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.



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## 5-2. Electrical Specifications

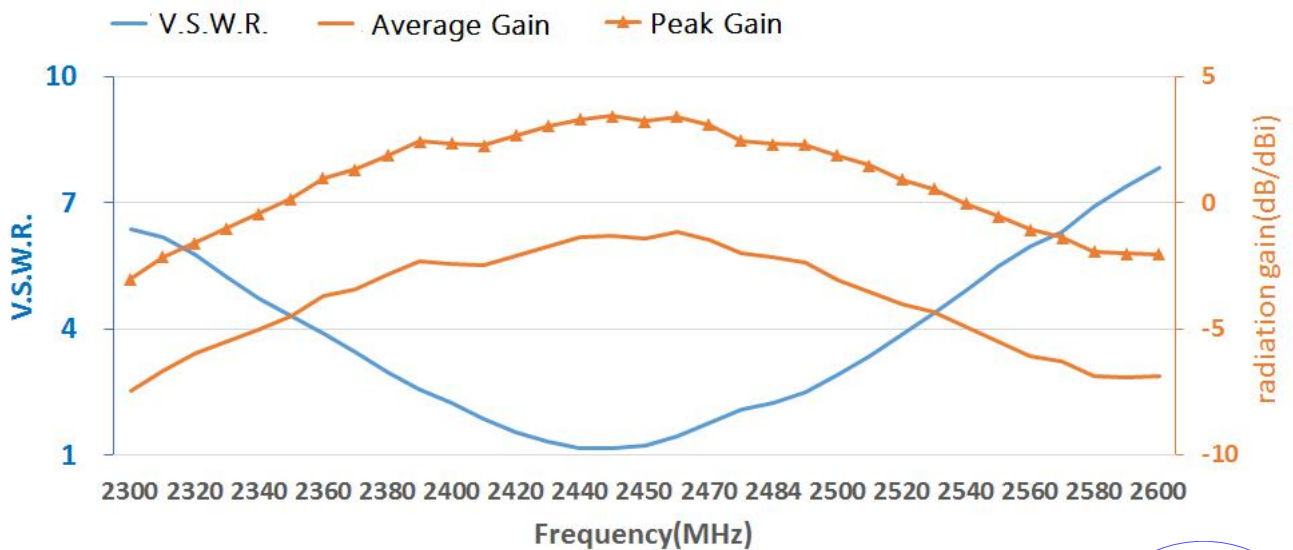
### 5-2-1. Electrical Table

Characteristics		Specifications	Unit
Outline Dimensions		3.0 x 3.0 x 10.0	mm
Ground Plane Dimensions		80 x 80	mm
Working Frequency		2400~ 2500	MHz
VSWR (@ center frequency)*		2 Max.	
Characteristic Impedance		50	$\Omega$
Polarization		Vertical Polarization	
Peak Gain	(@2442 MHz)	3.4(Typical**)	dBi
Efficiency		61.5(Typical**)	%

\* Center frequency is the frequency with the lowest value of return loss.

\*\* Typical value is for reference only. The actual efficiency will depend on the circuit board used

### 5-2-2. Frequency vs. V.S.W.R. and Radiation Gain



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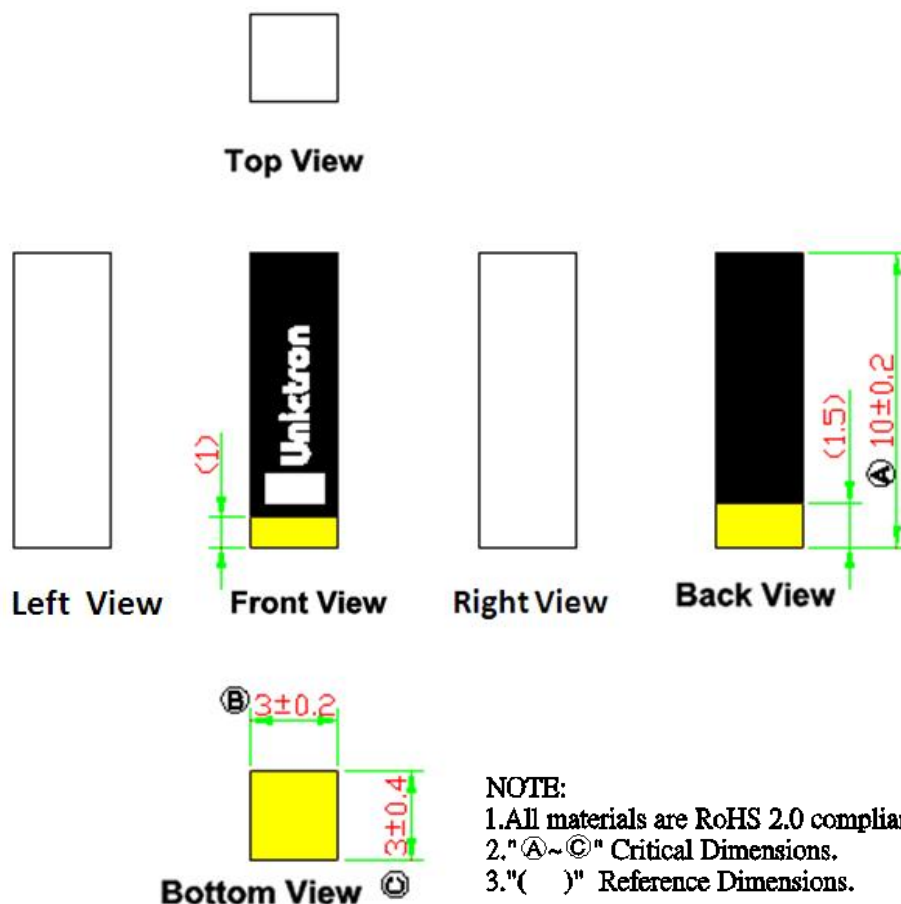
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## 6. Outline Dimensions of Antenna (unit: mm)

### 6-1. Antenna Dimensions



**NOTE:**

1. All materials are RoHS 2.0 compliant.
2. "A~C" Critical Dimensions.
3. "( )" Reference Dimensions.



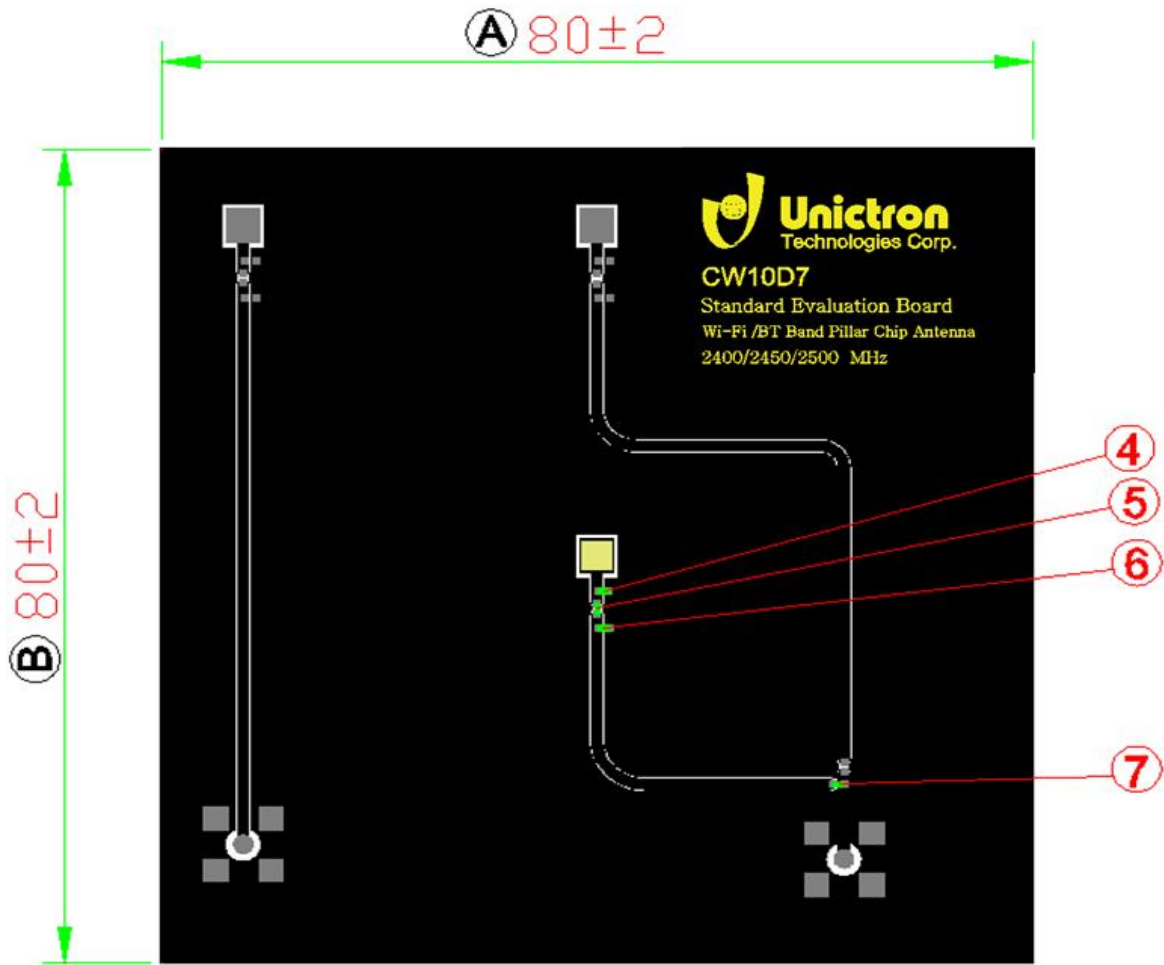
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6-2. Evaluation Board with Antenna



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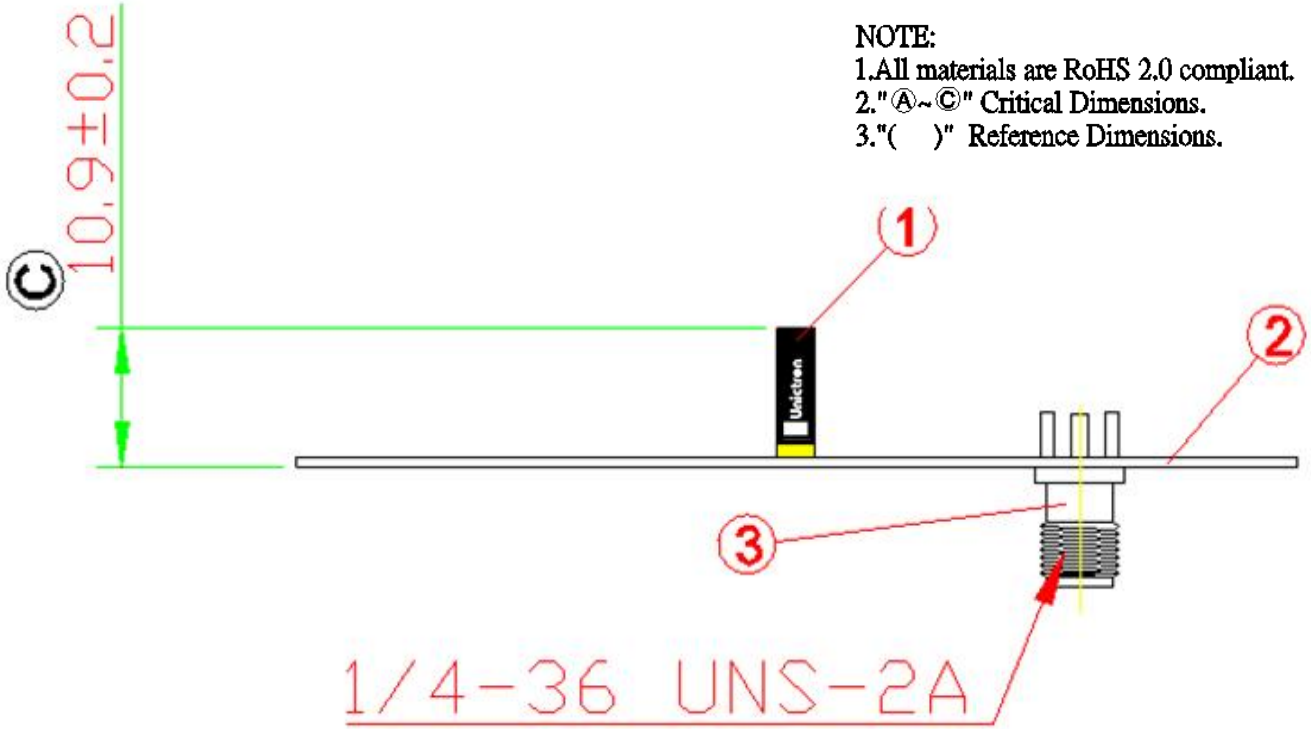
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NOTE:  
 1.All materials are RoHS 2.0 compliant.  
 2."A~C" Critical Dimensions.  
 3."( )" Reference Dimensions.



Unit: mm

ITEM	PART NO.	Name	Material	Color	Q'ty
1		Chip antenna	FR4		1
2		EVB Board PCB	FR4	Black	1
3		SMA(F)ST	Brass	Gold	1
4		L_0402			1
5		L_0402			1
6		C_0402			1
7		0Ω			1

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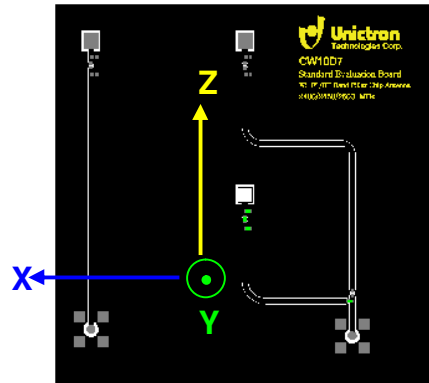
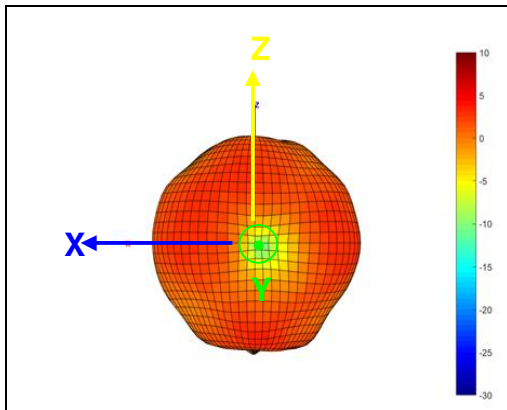
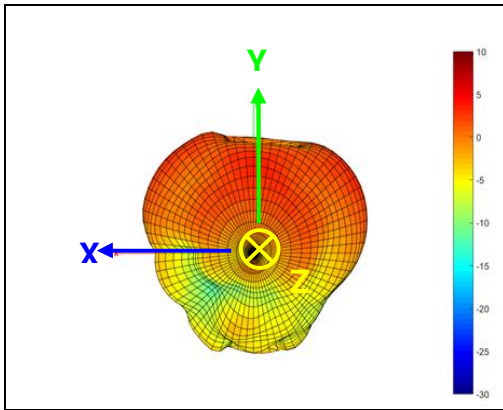
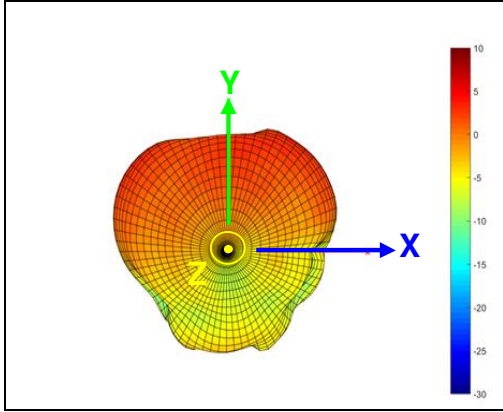
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## 7. 3D Radiation Gain Pattern@ 2442 MHz (Unit: dBi)



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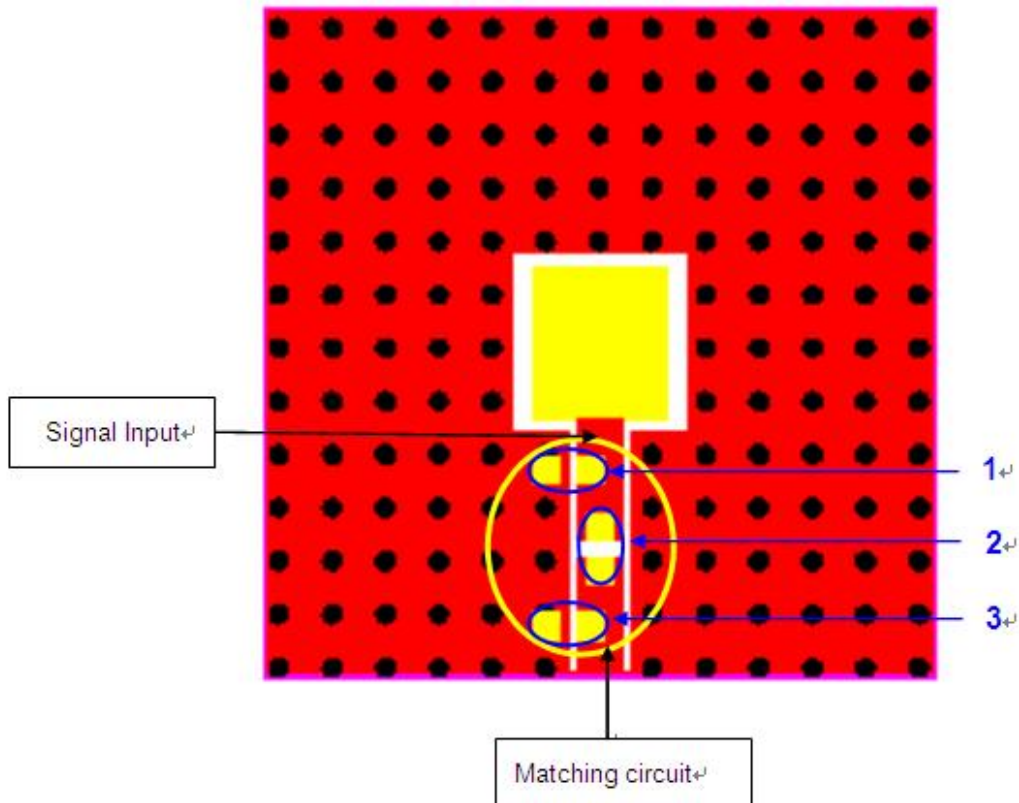
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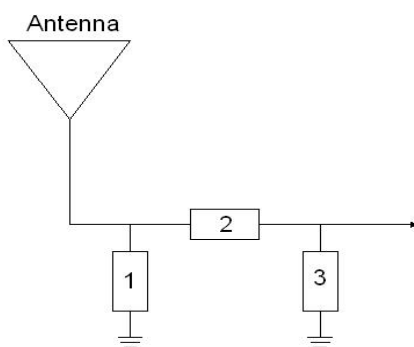
## 8. Frequency Tuning

### 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 80 x 80 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	1nH, (0402)	MURATA	±0.1 nH
2	1nH, (0402)	MURATA	±0.1 nH
3	1.5pF,(0402)	MURATA	±0.1 pF

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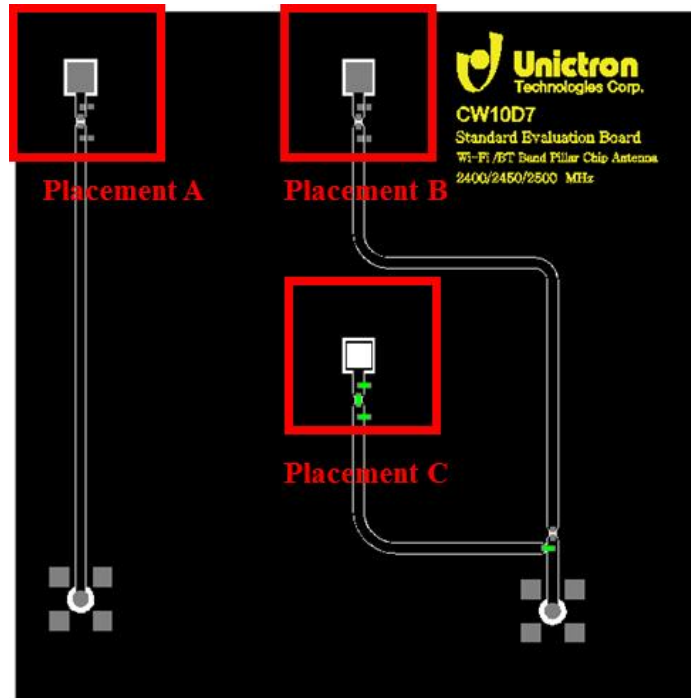
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## 9. Typical Efficiency Values @ 2442 MHz with three antenna installation locations

The radiation efficiencies of antenna installed at various locations on the evaluation board are shown in the table below.



Placements	Efficiency (%)	Polarizations
A	74.6	Horizontal + Vertical
B	63.6	Horizontal + Vertical
C	61.5	Vertical



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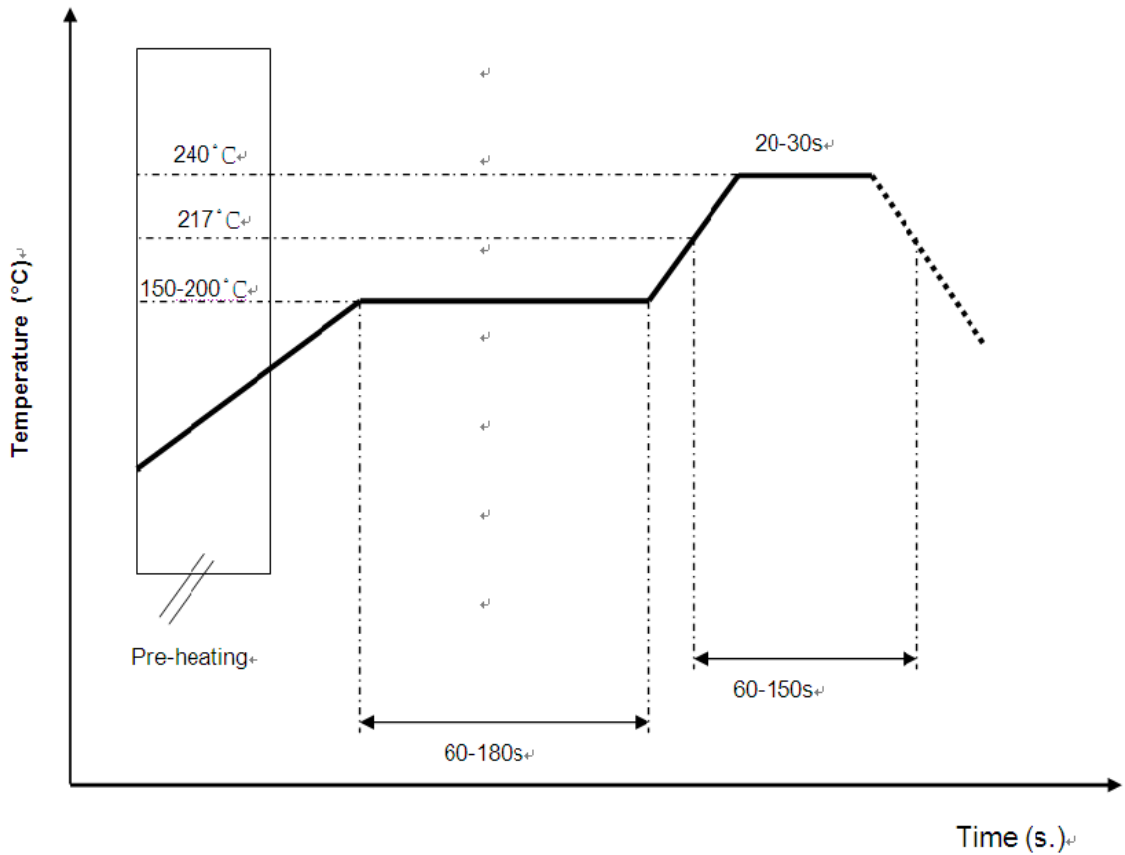
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# 10. Soldering Conditions

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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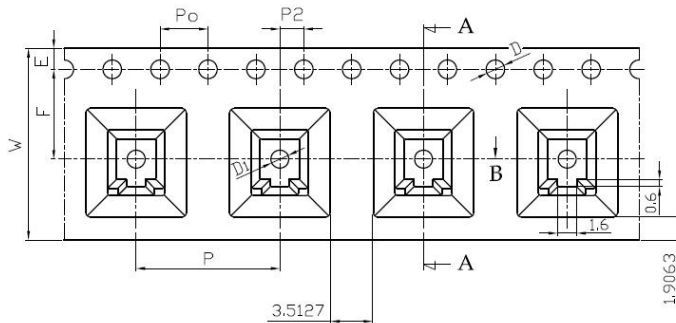
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## 11. Packing

- (1) Quantity/Reel: 500 pcs/Reel
- (2) Plastic tape: Black Conductive Polystyrene.

a. Tape Drawing



b. Tape Dimensions (unit: mm)

Feature	Specifications	Tolerances
W	16.00	±0.30
P	12.00	±0.10
E	1.75	±0.10
F	7.50	±0.10
P <sub>2</sub>	2.00	±0.10
D	1.50	+0.10 -0.00
D <sub>1</sub>	1.50	±0.10
P <sub>0</sub>	4.00	±0.10
10P <sub>0</sub>	40.00	±0.20

## 12. Operating & Storage Conditions

### 12-1. Operating

- (1) Maximum Input Power: 2 W
- (2) Operating Temperature: -40°C to 85°C
- (3) Relative Humidity: 10% to 70%

### 12-2. Storage (sealed)

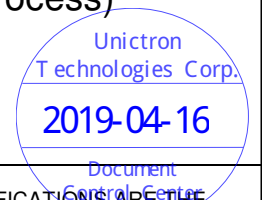
- (1) Storage Temperature: -5°C to 40°C
- (2) Relative Humidity: 20% to 70%
- (3) Shelf Life: 1 year

### 12-3. Storage (unsealed)

Meet the criteria of J-STD-033 MSL2a

### 12-4. 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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### 13. 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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