

# 8.0 x 1.0 x 1.3 (mm) Wi-Fi/Bluetooth Chip Antenna (CW804)

## Engineering Specification

### 1. Product Number

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



### 2. Features

- \*Stable and reliable in performances
- \*Low profile, compact size
- \*RoHS 2.0 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 CW804 chip antenna is designed for ISM 2.4GHz applications, covering frequencies 2400~2500MHz. Fabricated with proprietary design and processes, CW804 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 : George Hung

Checked by : Mike

Approved by : Herbert

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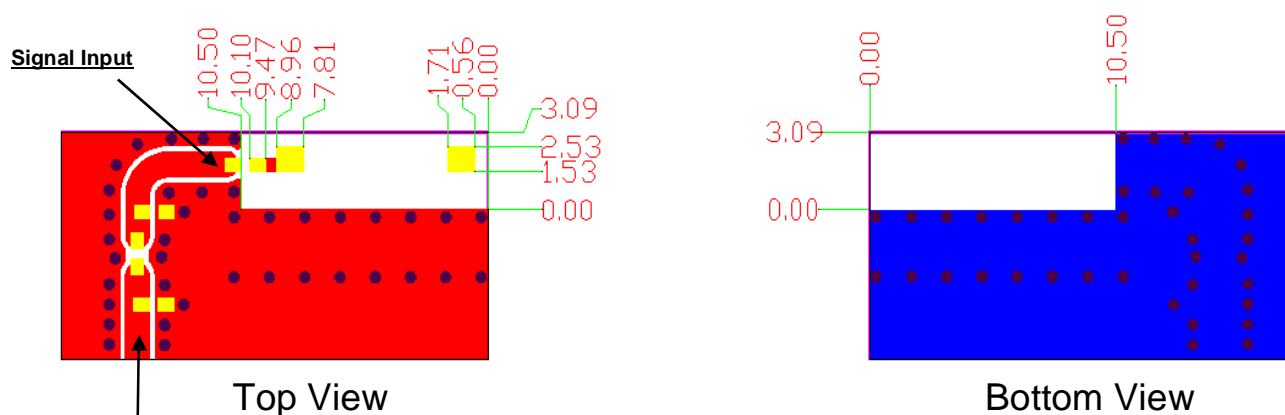
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## 5. Layout Guide & Electrical Specifications

### 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.



Transmission Line with 50Ω Impedance Characteristic

### 5-2. Electrical Specifications (Evaluation board dimensions: 50 x 40 mm<sup>2</sup>)

#### 5-2-1. Electrical Table

Characteristics		Specifications	Unit
Outline Dimensions		8.0 x 1.0 x 1.3	mm
Working Frequency		2400~ 2500	MHz
VSWR(@ center frequency)*		2.0 Max.	
Characteristic Impedance		50	Ω
Polarization		Linear Polarization	
Peak Gain	(@2450 MHz)	0.9 (typical**)	dBi
Efficiency		60 (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.



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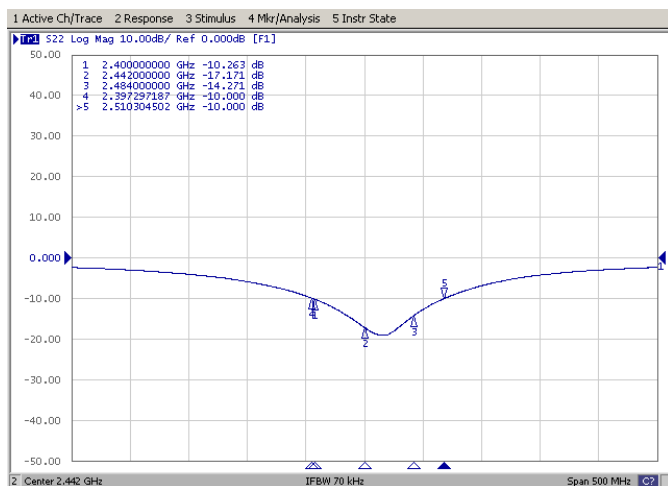
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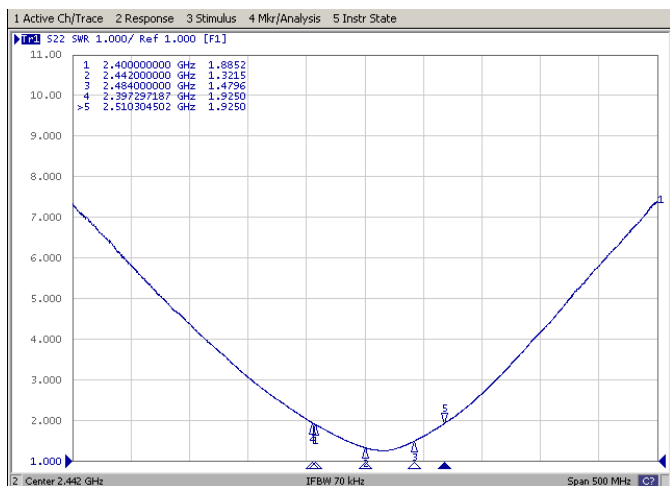
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## 5-2-2. Return Loss & VSWR

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



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



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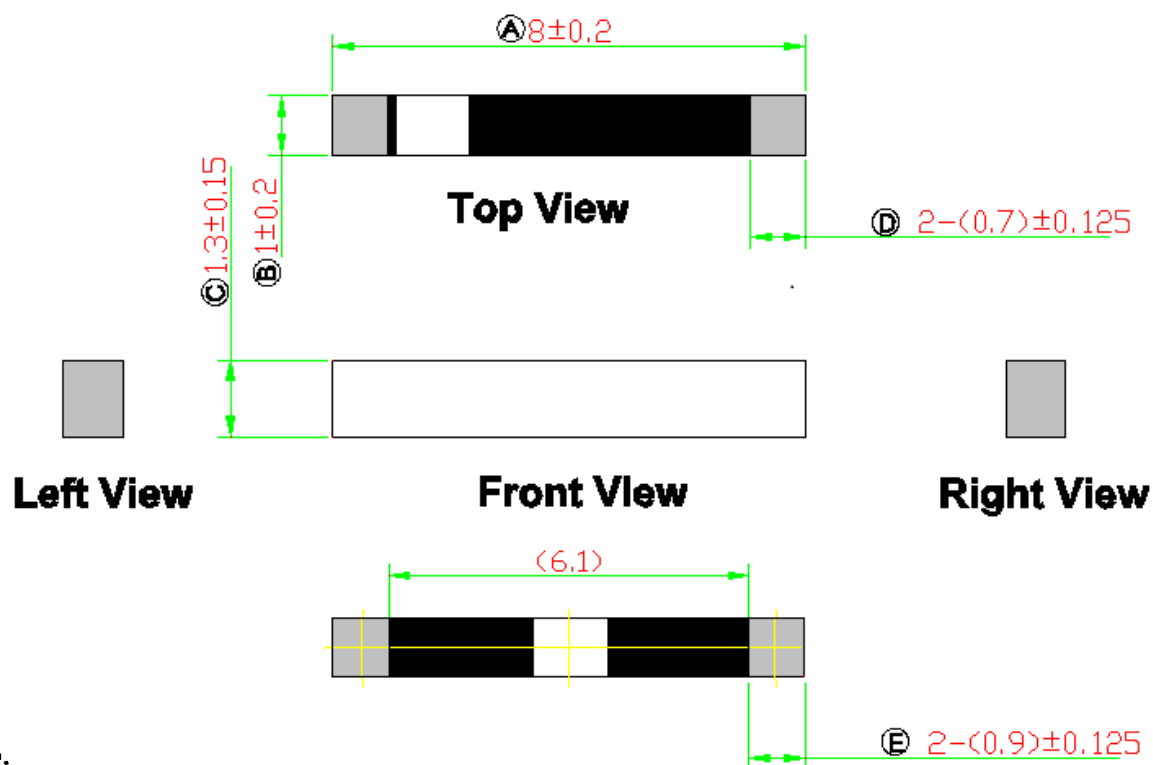
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## 6. Outline Dimensions of Antenna & Evaluation Board (unit: mm)

### 6-1. Antenna Dimensions



#### NOTE:

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

### Bottom View

### PIN Definitions

PIN1  PIN2  PIN1

PIN	1	2
Soldering PAD	Signal	N/C



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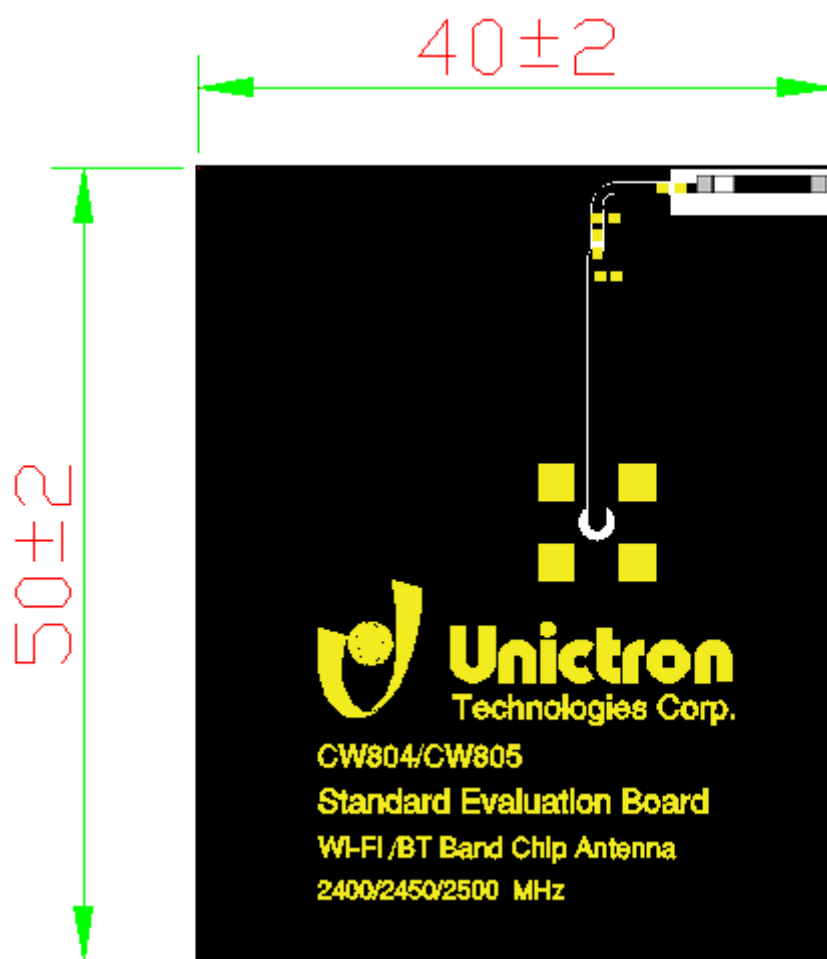
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## 6-2. Evaluation Board with Antenna



Unit: mm



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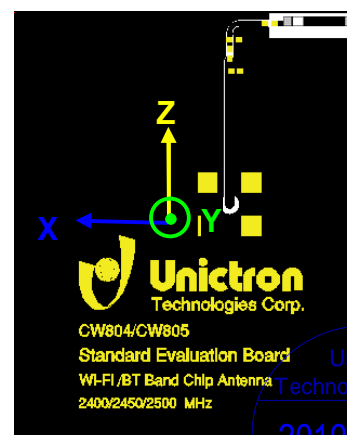
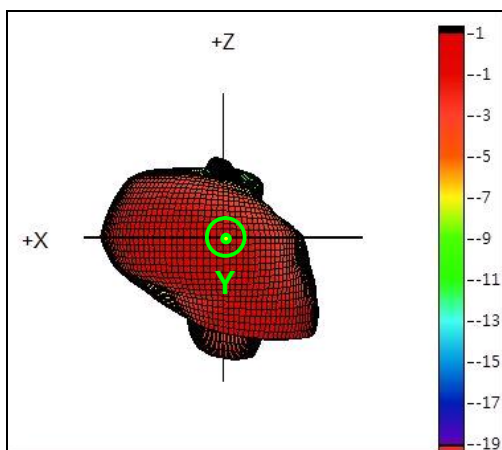
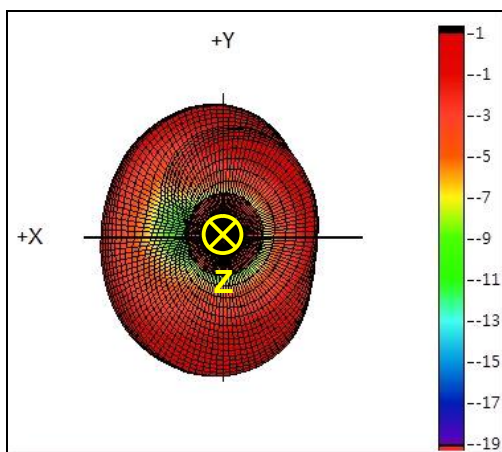
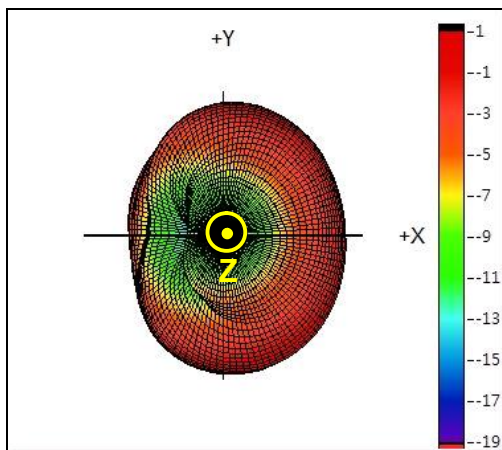
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## 7. 3D Radiation Gain Pattern (with 50 x 40 mm<sup>2</sup> Evaluation Board)

### 7-1. 3D Radiation Gain Pattern @ 2450 MHz (Unit: dBi)



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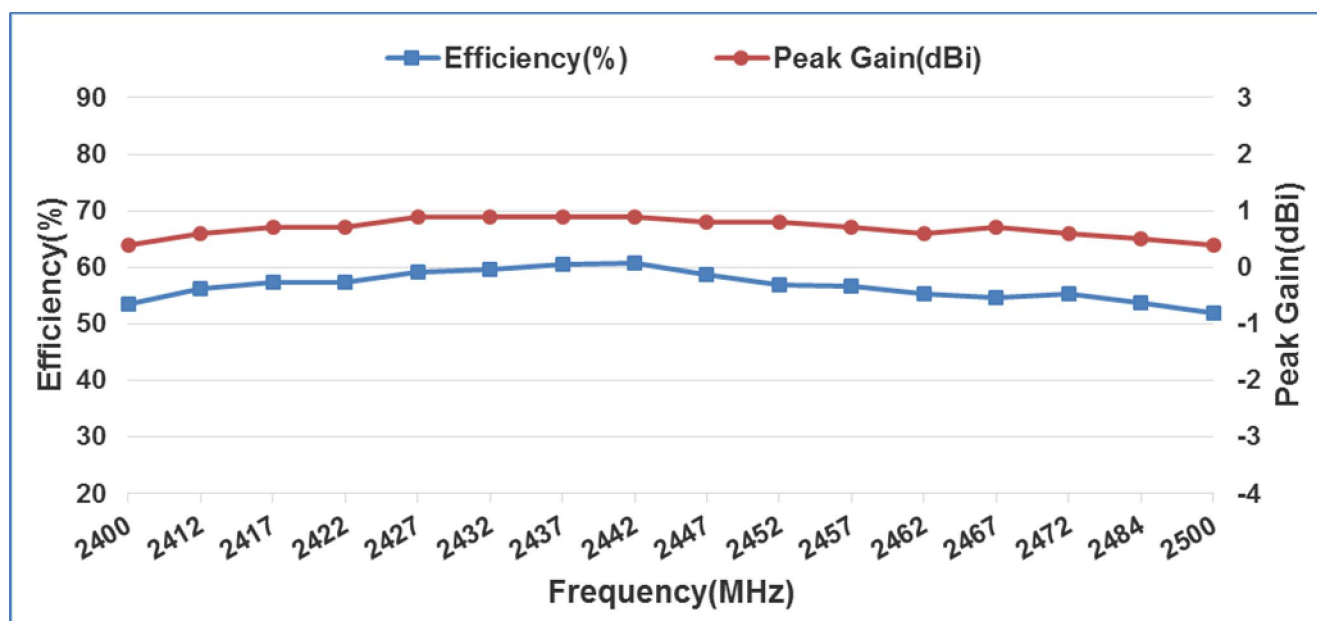
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## 7-2. 3D Efficiency Table

Frequency(MHz)	2400	2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472	2484	2500
Efficiency(dB)	-2.7	-2.5	-2.4	-2.4	-2.3	-2.2	-2.2	-2.2	-2.3	-2.4	-2.5	-2.6	-2.6	-2.6	-2.7	-2.9
Efficiency(%)	53.4	56.3	57.3	57.4	59.2	59.7	60.5	60.7	58.8	56.9	56.7	55.3	54.7	55.4	53.7	51.8
Peak Gain(dBi)	0.4	0.6	0.7	0.7	0.9	0.9	0.9	0.9	0.8	0.8	0.7	0.6	0.7	0.6	0.5	0.4

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



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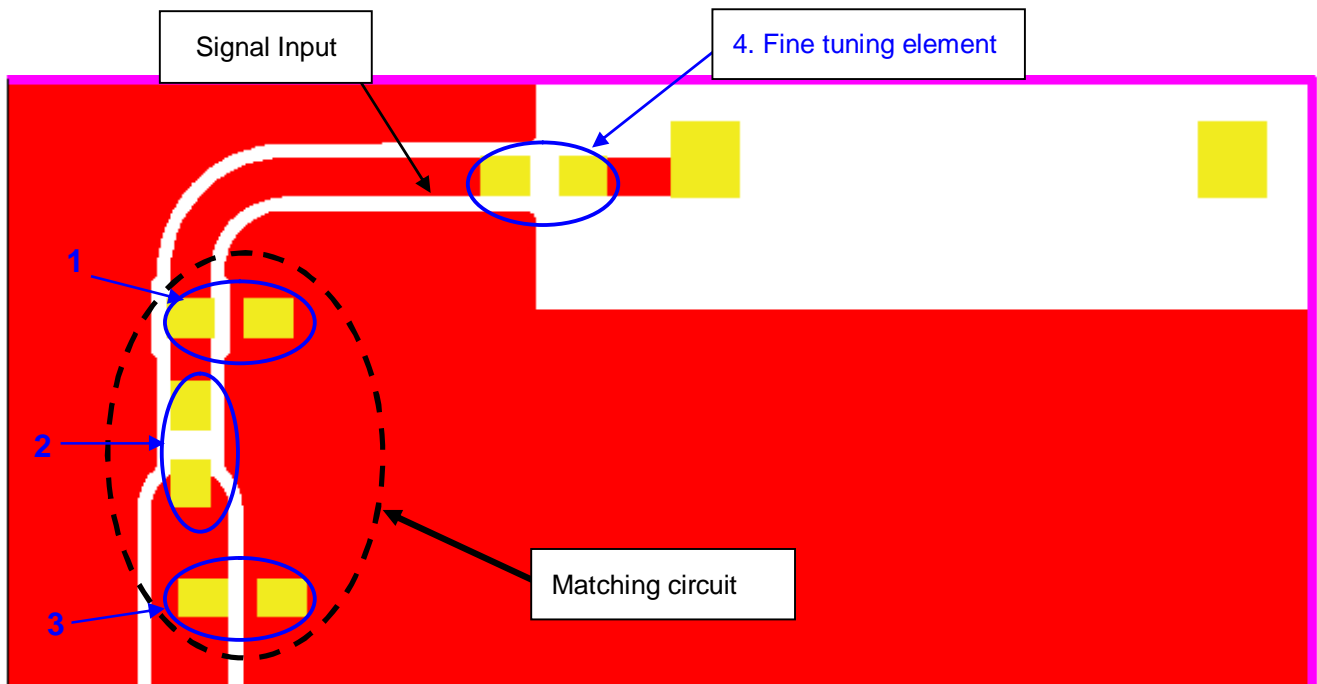
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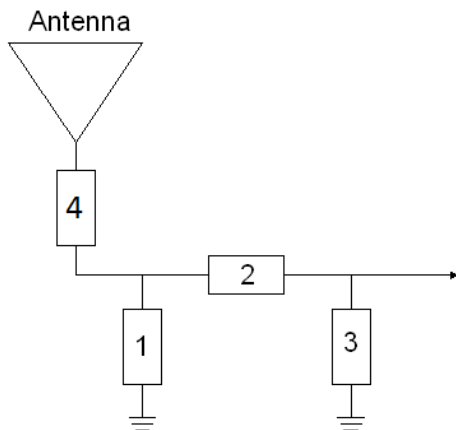
## 8. Frequency tuning and matching circuit

### 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 50 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	2.5 pF, (0402)	MURATA	±0.05 pF
2	0Ω*	-	-
3	0.4 pF, (0402)	MURATA	±0.05 pF
4 Fine tuning element	3.9 nH, (0402)	MURATA	±0.1 nH



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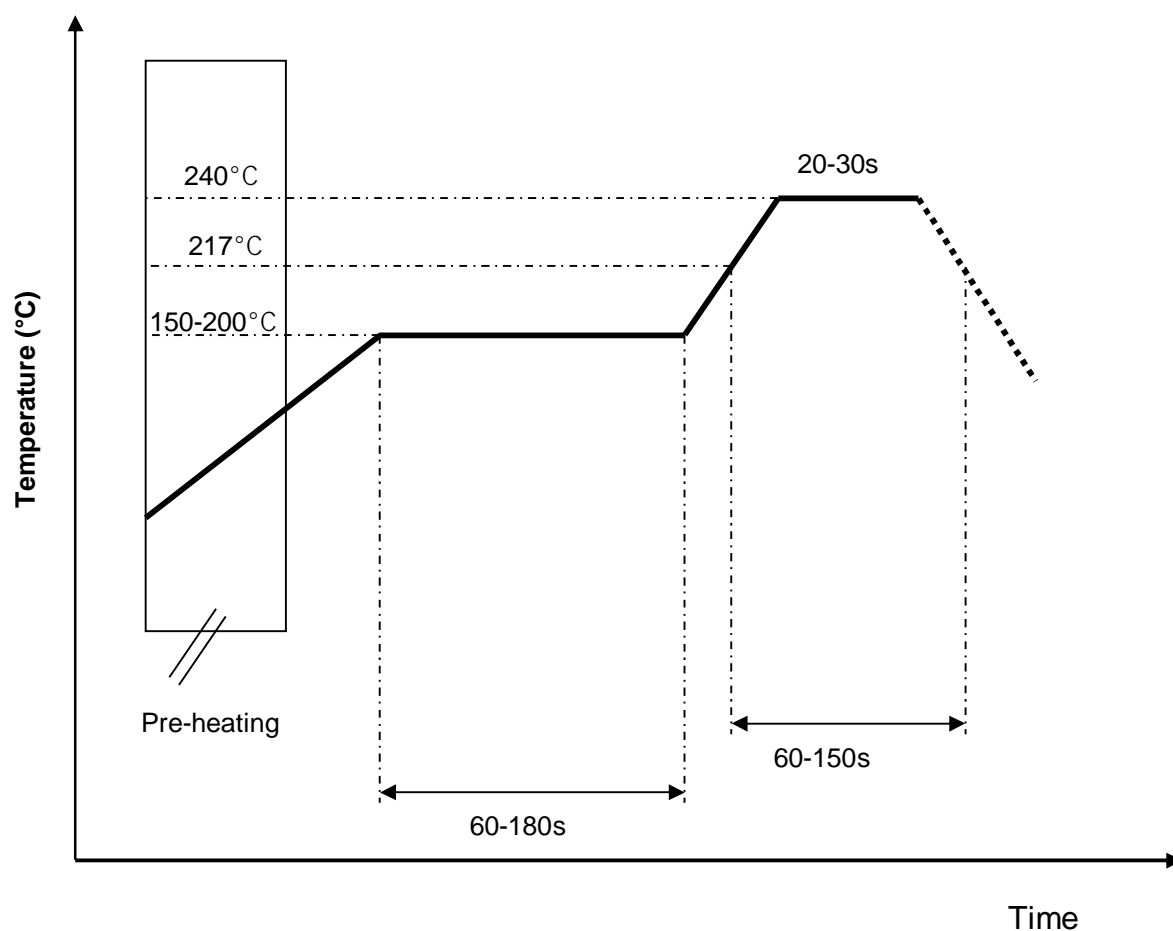
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## 9. Soldering Conditions

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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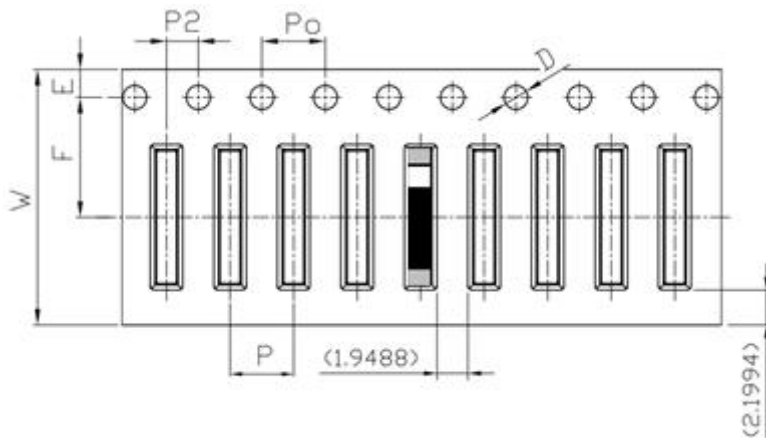
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## 10. Packing

- (1) Quantity/Reel: 2500pcs/Reel
- (2) Plastic tape: Black Conductive Polystyrene.

### a. Tape Drawing



### b. Tape Dimensions (unit: mm)

Feature	Specifications	Tolerances
W	16.00	±0.30
P	4.00	±0.10
E	1.75	±0.10
F	7.50	±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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