

# 12.0 x 4.0 x 1.6 (mm) ISM 868 MHz Chip Antenna (C812D5)

## Engineering Specification

### 1. Product Number

H 2 U 6 6 J 1 K 2 B 0 1 0 0



### 2. Features

- \*Stable and reliable in performances
- \*Low profile, compact size
- \*RoHS compliance
- \*SMT processes compatible

### 3. Applications

- \*Short Range Devices (SRD)
- \*IoT applications
- \*Alarm system

### 4. Description

Unictron's C812D5 chip antenna is designed for ISM 868MHz band applications, covering frequencies 863~870 MHz. Fabricated with proprietary design and processes, C812D5 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 : Peter

Checked by : Mike

Approved by : Herbert

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DOCUMENT NO.

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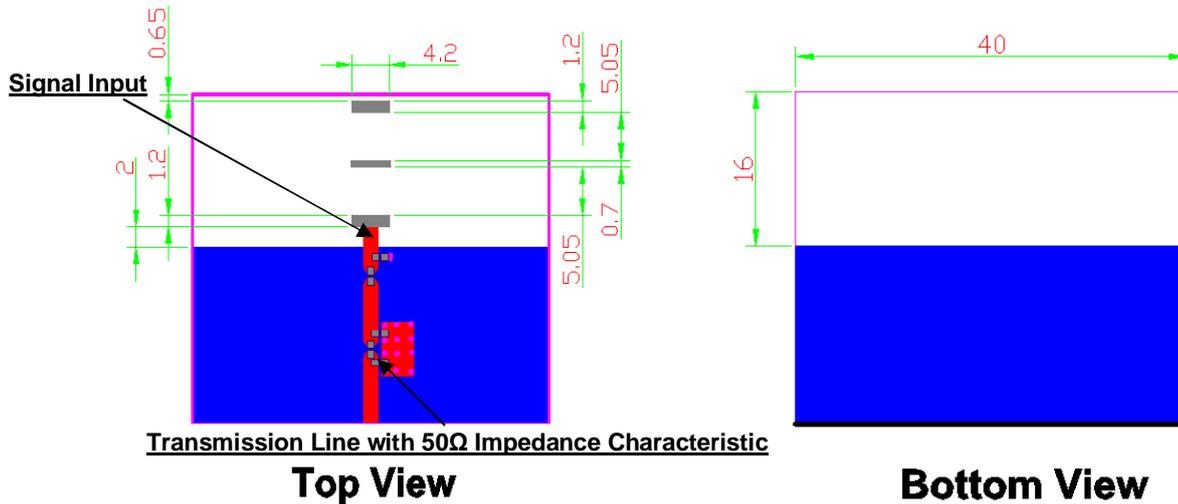
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## 5. Layout Guide & Electrical Specifications

### 5-1. Layout Guide (unit : mm)

Solder Land Pattern:

The solder land pattern (gray marking areas) is shown below. Recommendation on matching circuit will be provided according to customer's installation conditions.



### 5-2. Electrical Specifications (Evaluation Board Dimensions: 80 x 40 mm<sup>2</sup>)

#### 5-2-1. Electrical Table (863 ~ 870 MHz Band)

Characteristics		Specifications	Unit
Outline Dimensions		12.0 x 4.0 x 1.6	mm
Ground Plane Dimensions		64 x 40	mm
Working Frequency		863 ~ 870	MHz
VSWR (@ center frequency)*		2 Max.	
Characteristic Impedance		50	Ω
Polarization		Linear Polarization	
Peak Gain	(@ 868 MHz)	-0.6(typical)**	dBi
Efficiency		35.3(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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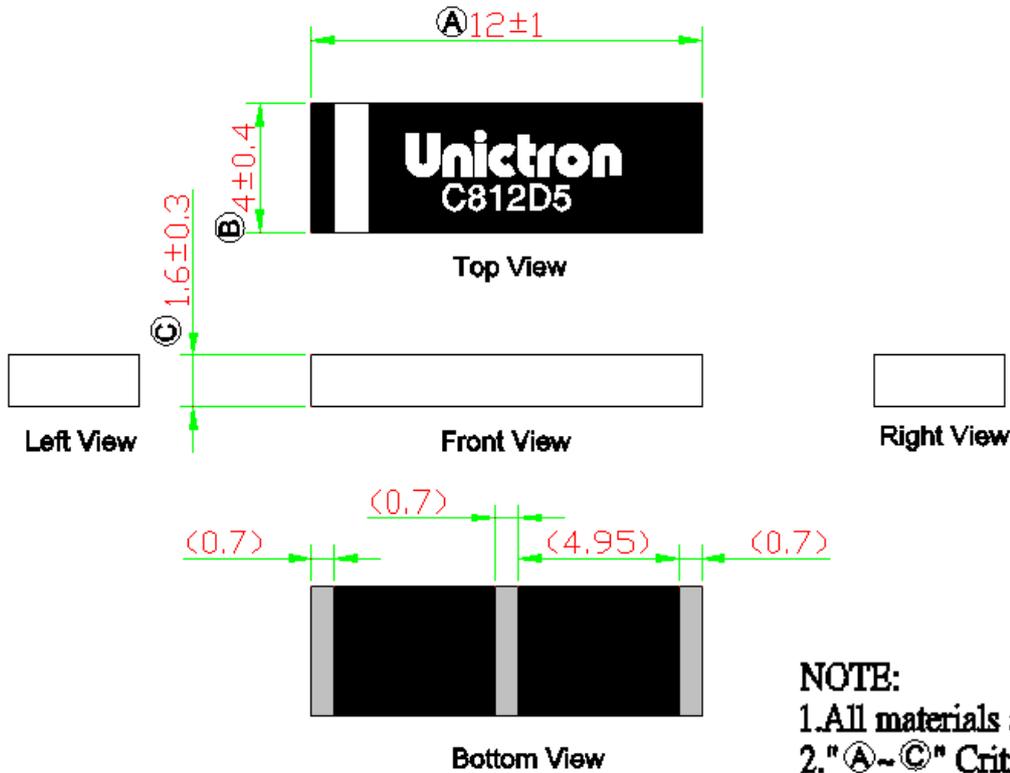
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## 6. Outline Dimensions of Antenna & Evaluation Board (unit: mm)

### 6-1. Antenna Dimensions



**NOTE:**

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

### PIN Definition



PIN	PIN 1	PIN 2	PIN 3
Soldering PAD	Signal	N/C	N/C

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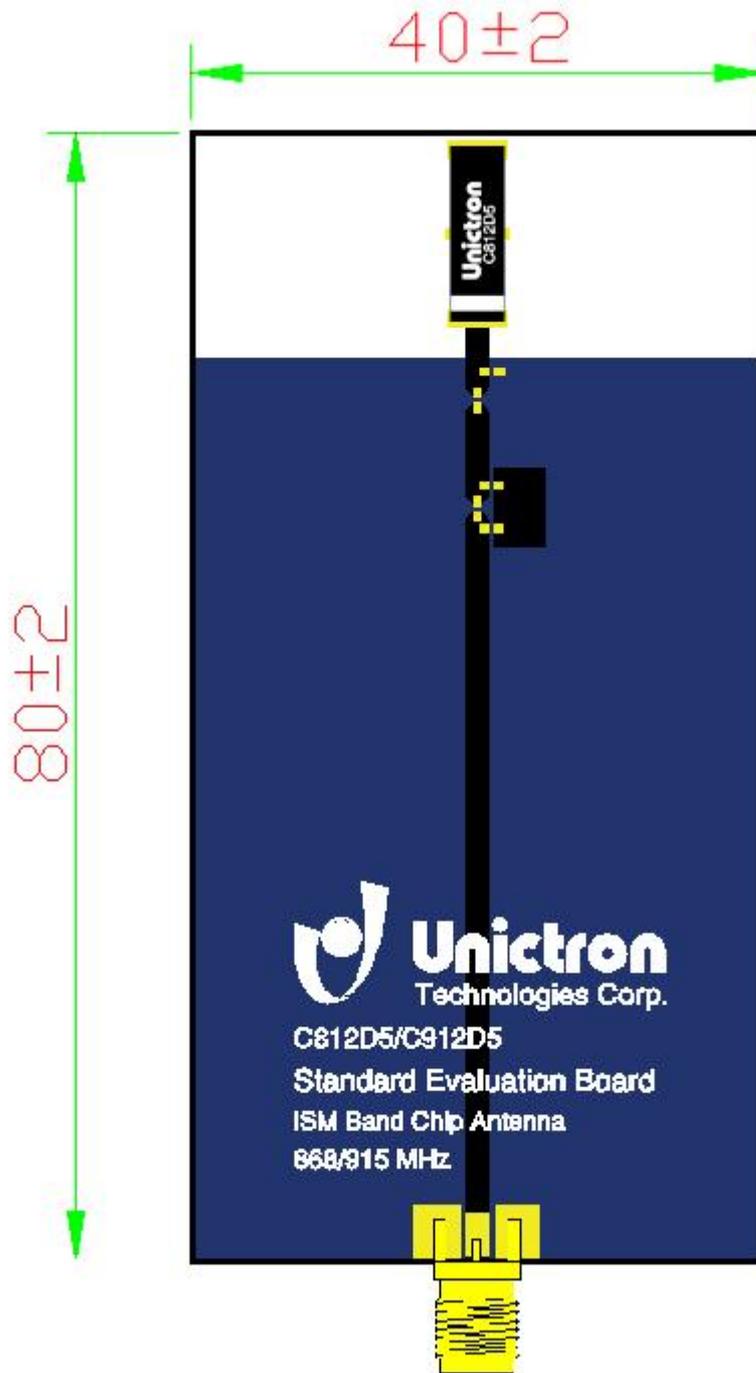
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6-2. Evaluation Board with Antenna



unit : mm

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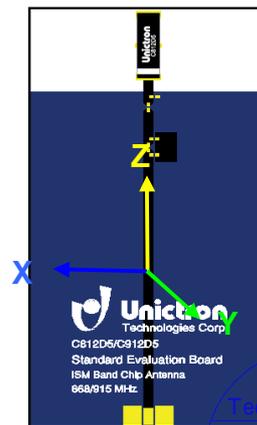
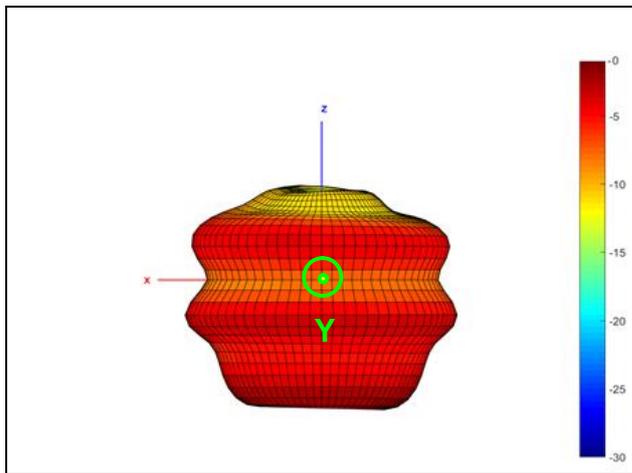
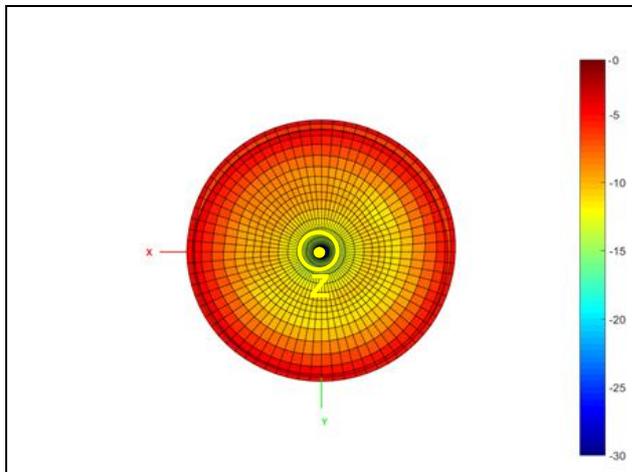
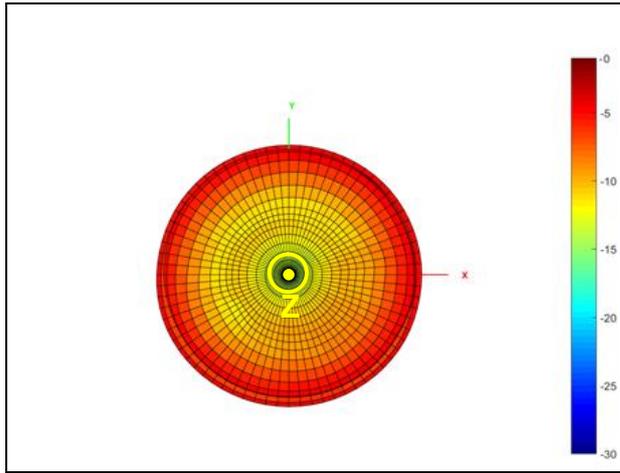
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## 7. Radiation Pattern (with 80 x 40 mm<sup>2</sup> Evaluation Board)

### 7-1. 3D Radiation Gain Pattern @ 868 MHz (unit: dBi)



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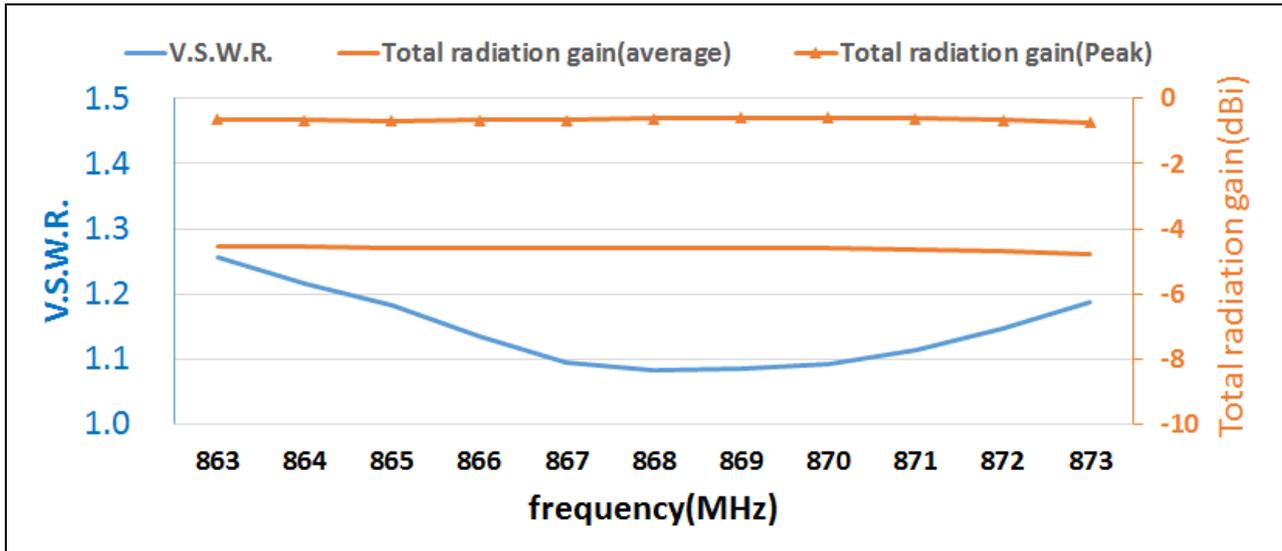
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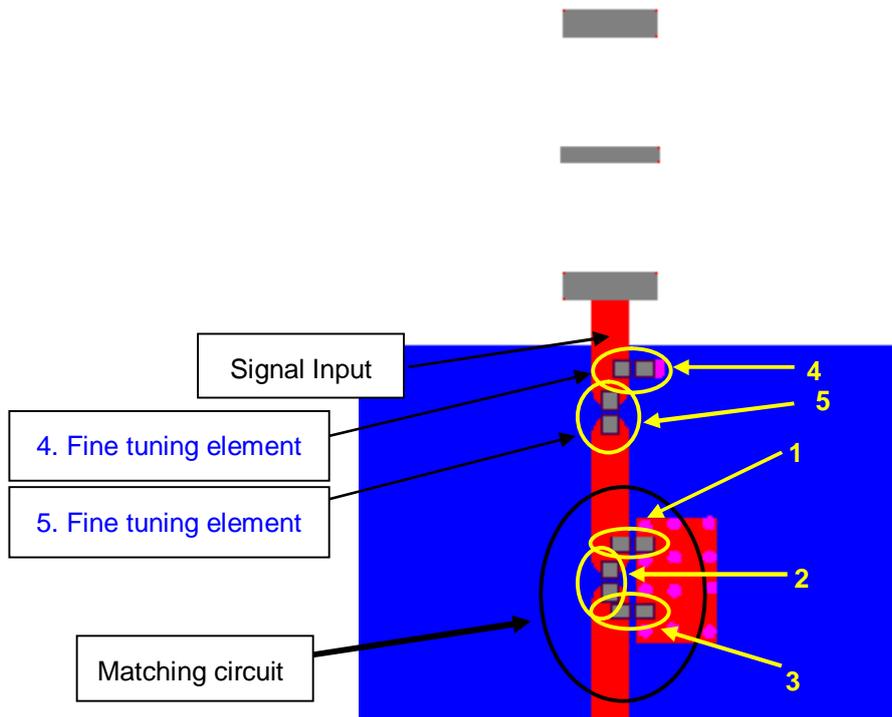
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## 7-2. 3D Efficiency Table



## 8. Frequency tuning and Matching circuit

### 8-1. Chip antenna tuning scenario :



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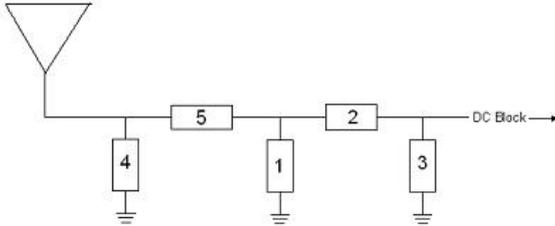
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## 8-2. Matching circuit :

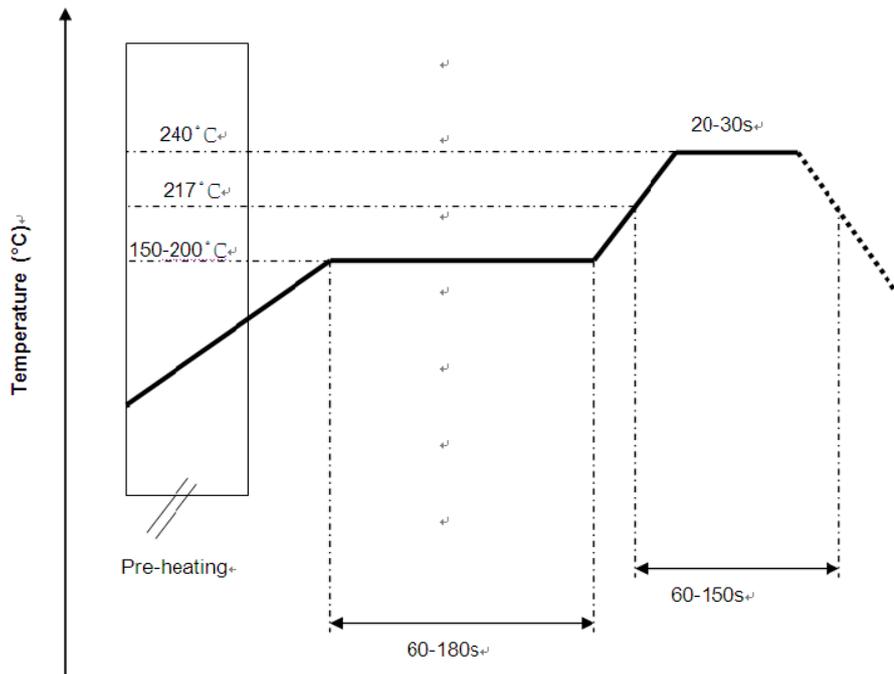
With the following recommended values of matching and tuning components, the center frequencies will be about 868 MHz at our standard 80 x 40 mm<sup>2</sup> evaluation board. However, these are typical reference values which may need to be changed when circuit boards or part vendors are different.



System Matching Circuit Component			
Location	Description	Vendor	Tolerance
1	1.8pF, (0402)	MURATA-	±0.05pF
2	0Ω	-	-
3	N/A	-	-
4	Fine tuning element	-	-
5	Fine tuning element	MURATA-	±5%

## 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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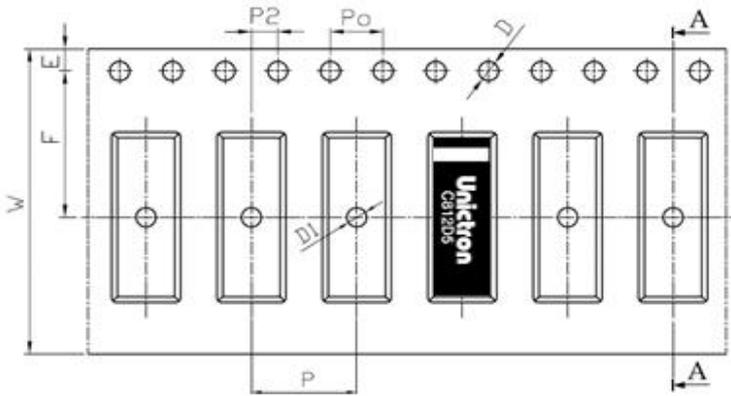
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## 10. Packing

- (1) Quantity/Reel: 3500 pcs/Reel
- (2) Plastic tape: Black Conductive Polystyrene.

a. Tape Drawing



b. Tape Dimensions (unit: mm)

Feature	Specification	Tolerance
	s	s
W	24.00	±0.30
P	8.00	±0.10
E	1.75	±0.10
F	11.50	±0.10
P2	2.00	±0.10
D	1.50	+0.10 -0.00
D1	1.50	±0.10
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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