

12.0 x 4.0 x 1.6 (mm) ISM 915 MHz Chip Antenna (C912D5)

Engineering Specification

1. Product Number

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



2. Features

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

3. Applications

- *ISM 915 MHz Band applications
- *IoT applications
- *IEEE 802.11ah/ Wi-Fi Certified HaLow technology

4. Description

Unictron's C912D5 chip antenna is designed for ISM 915 MHz band applications, covering frequencies 902~928 MHz. Fabricated with proprietary design and processes, C912D5 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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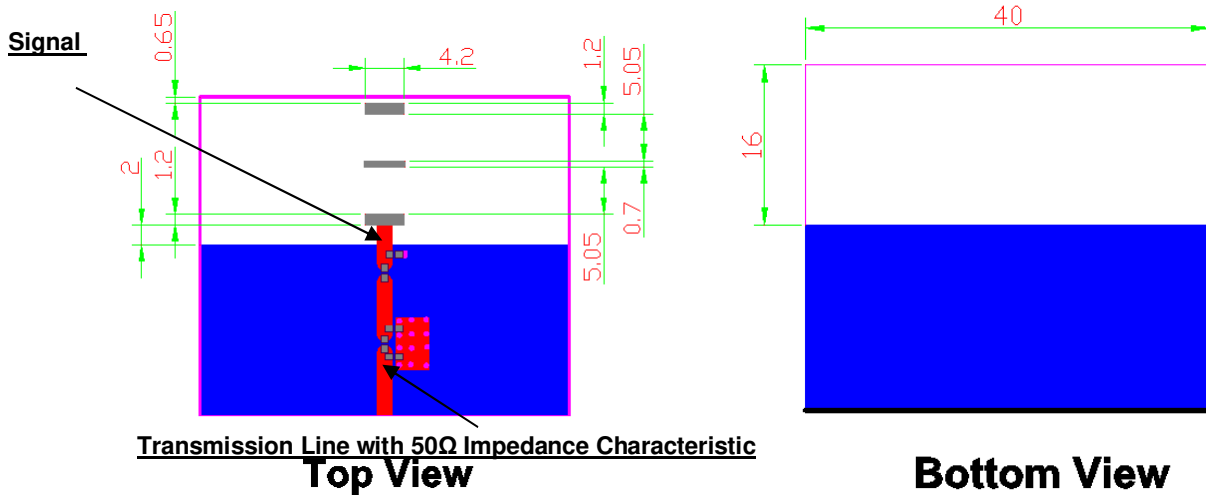
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5. Layout Guide & Electrical Specifications

5-1. Layout Guide (unit : mm)

Solder Land Pattern:

The solder land pattern (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 mm²)

5-2-1. Electrical Table

Characteristics		Specifications	Unit
Outline Dimensions		12.0 x 4.0 x 1.6	mm
Ground Plane Dimensions		64 x 40	mm
Working Frequency		902 ~ 928	MHz
VSWR (@ center frequency)*		2 Max.	
Characteristic Impedance		50	Ω
Polarization		Linear Polarization	
Peak Gain	(@ 915 MHz)	-0.98 (typical)**	dB
Efficiency		32.9 (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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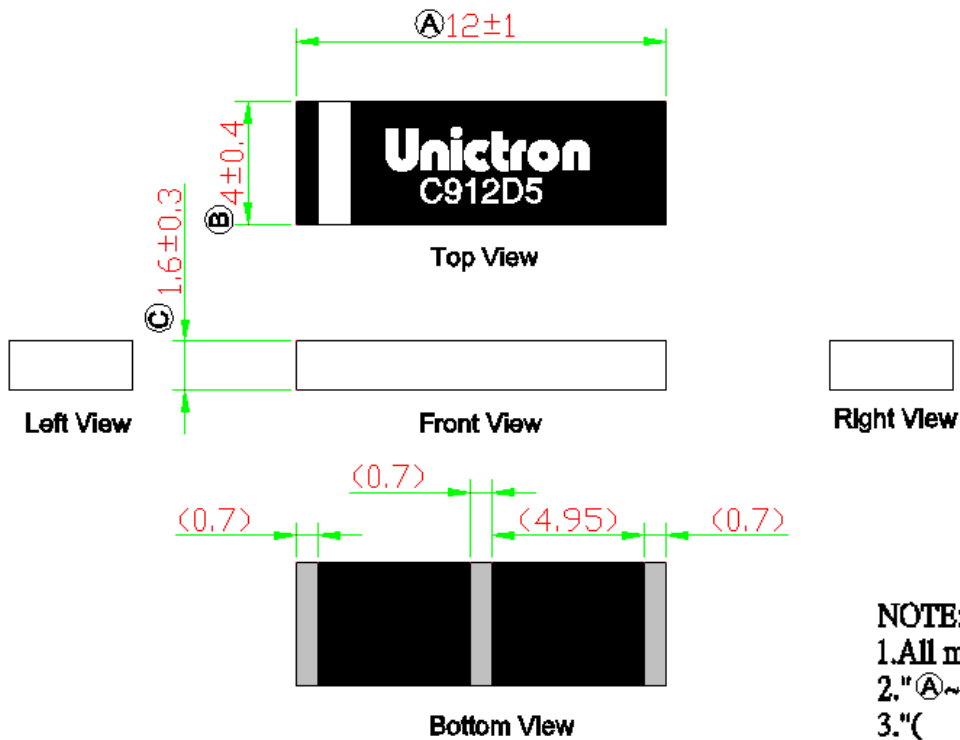
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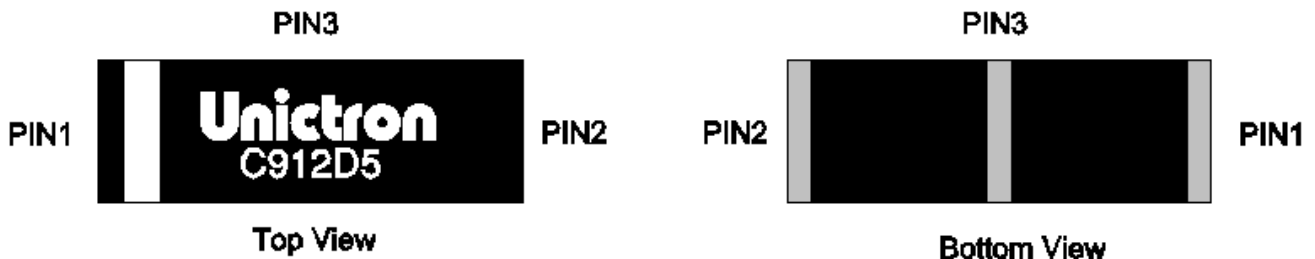
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6. Outline Dimensions of Antenna & Evaluation Board (unit: mm)

6-1. Antenna Dimensions



PIN Definition



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

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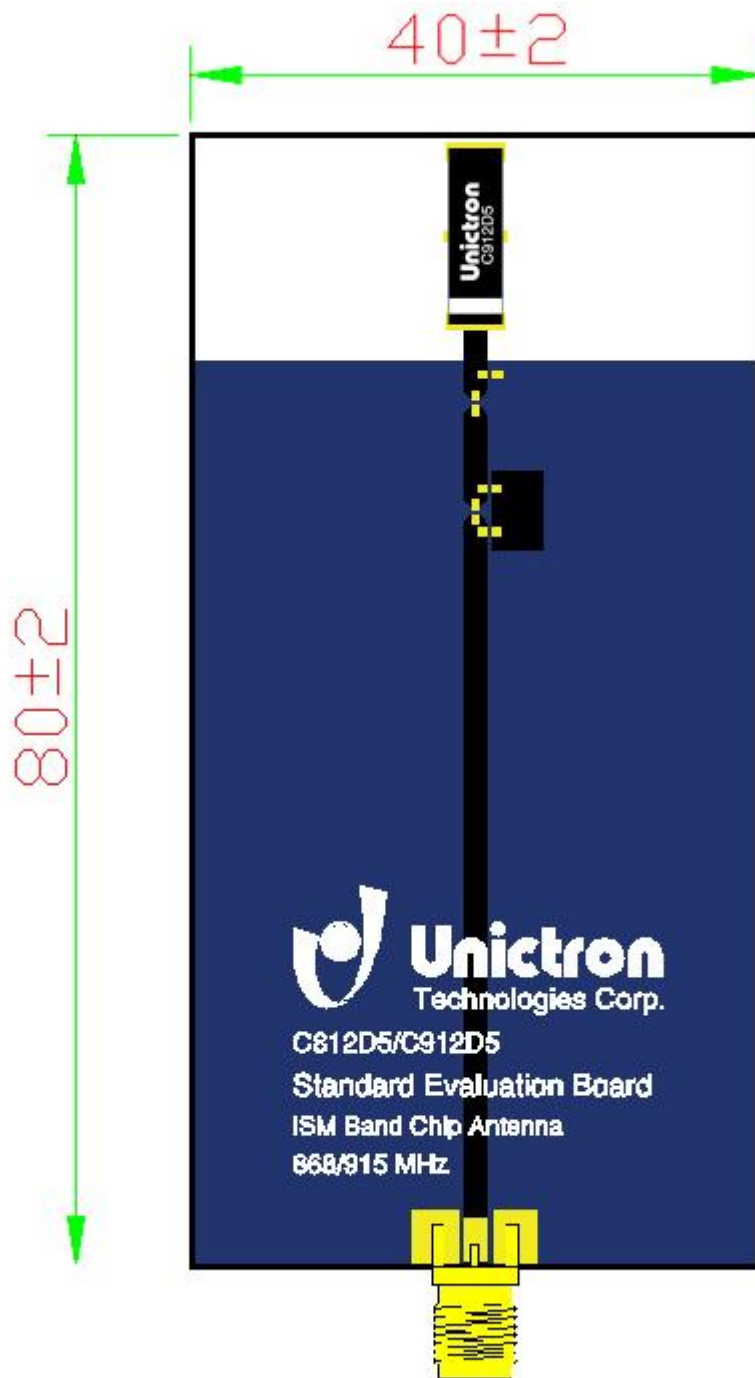
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6-2. Evaluation Board with Antenna



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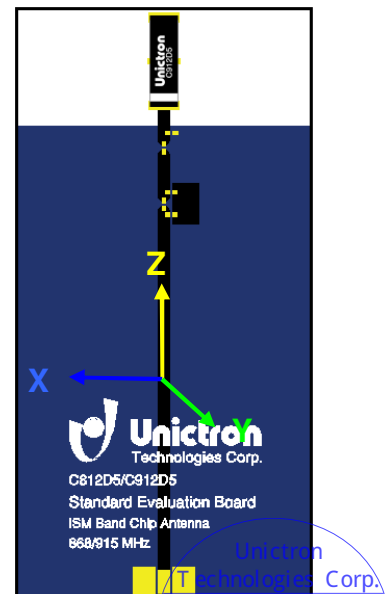
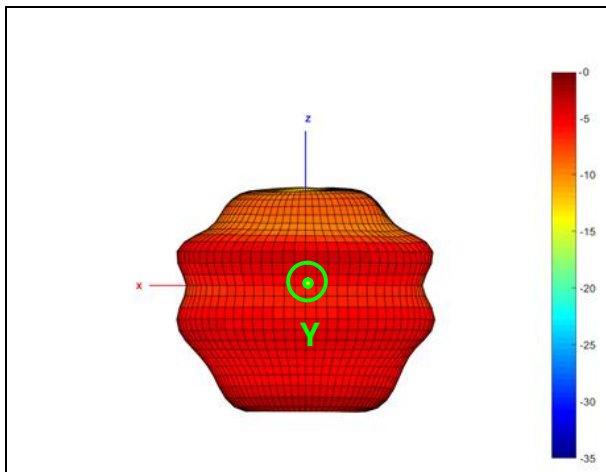
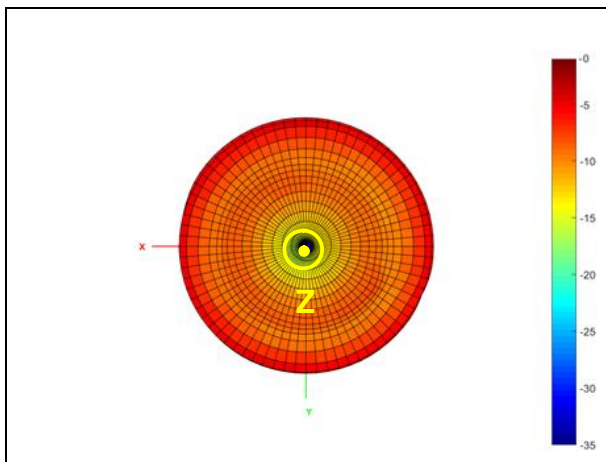
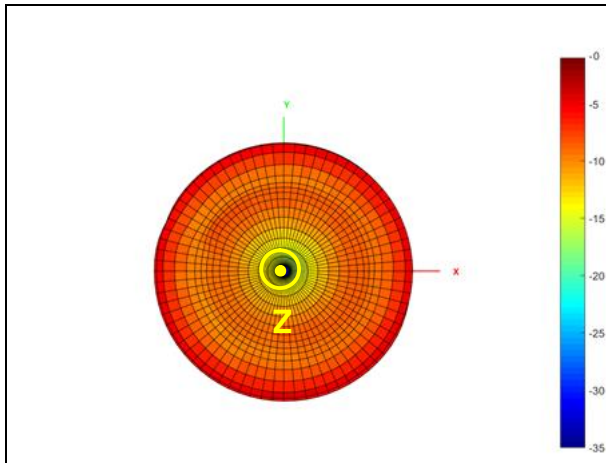
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7. Radiation Pattern (with 80 x 40 mm² Evaluation Board)

7-1. 3D Radiation Gain Pattern @ 915 MHz (unit: dBi)



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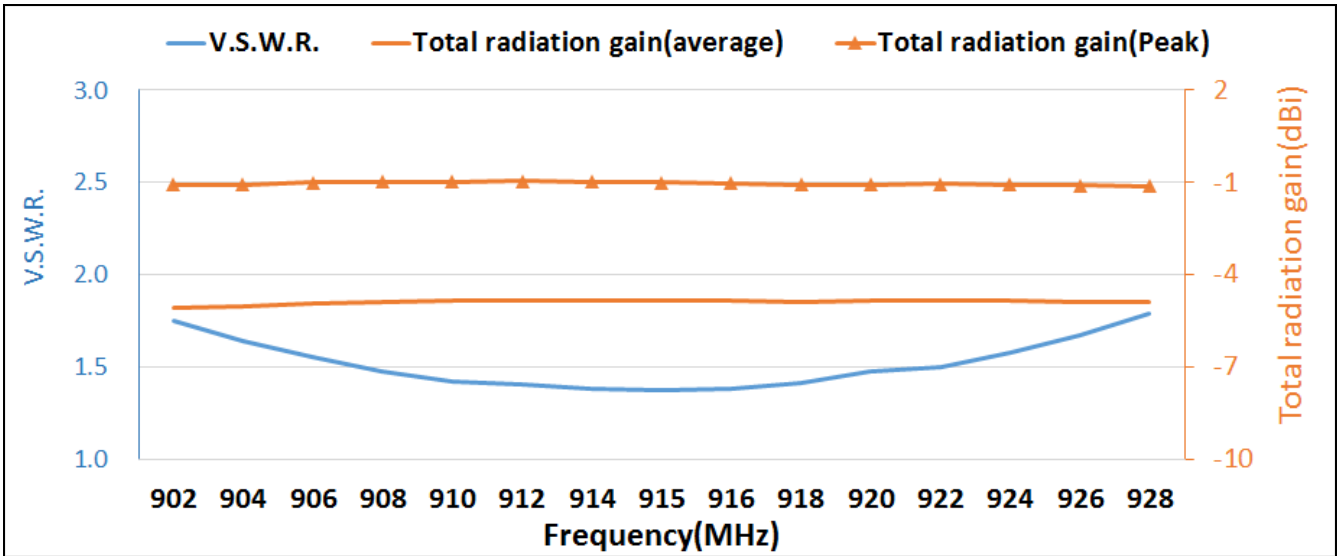
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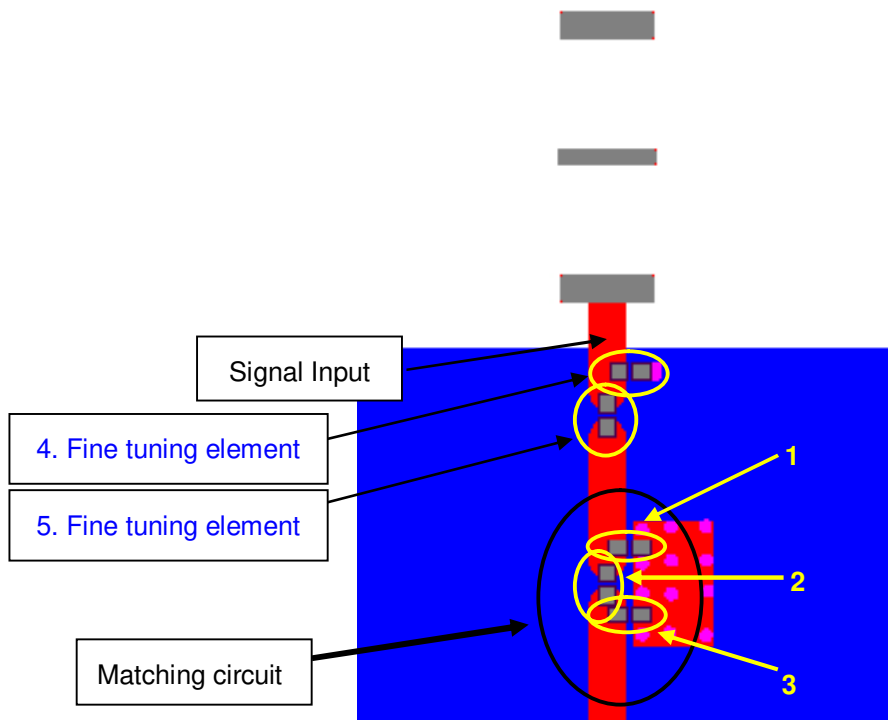
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7-2. 3D Efficiency Table



8. Frequency tuning and Matching circuit

8-1. Chip antenna tuning scenario :



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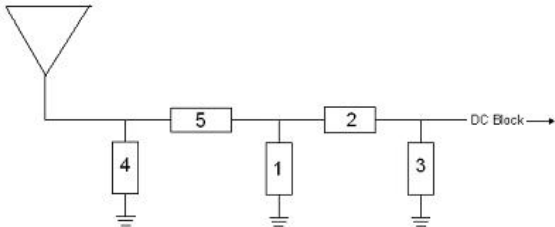
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8-2. Matching circuit :

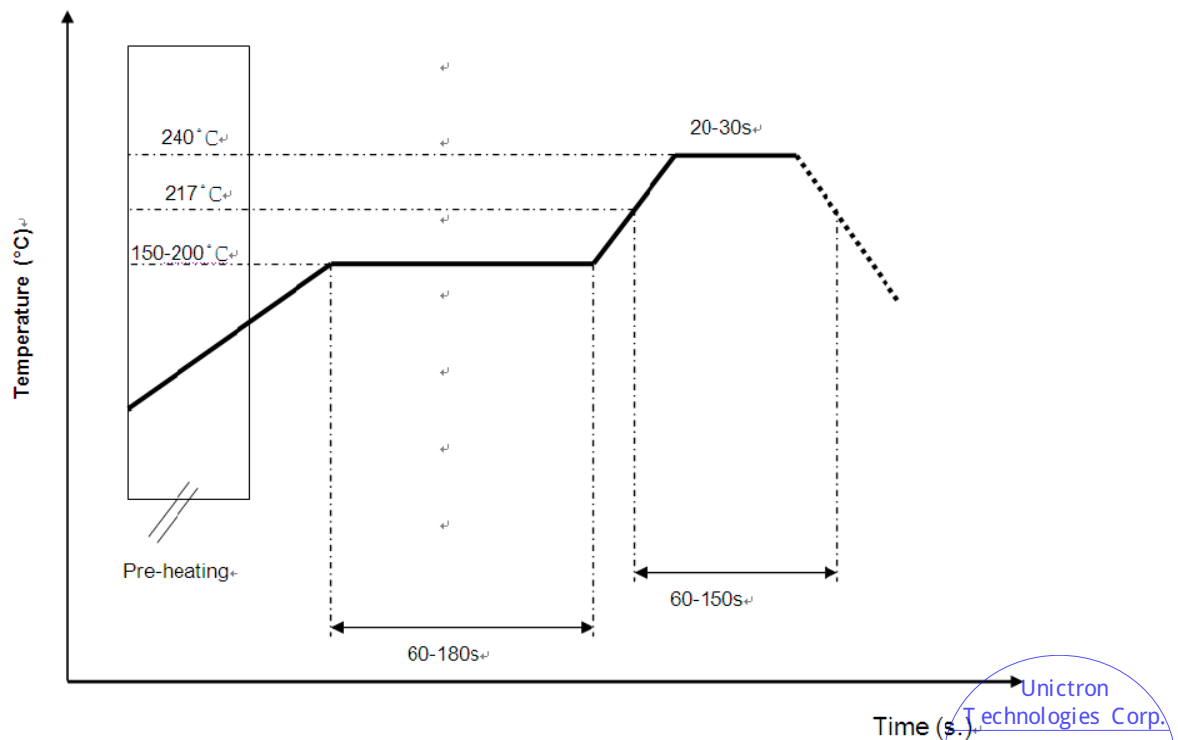
With the following recommended values of matching and tuning components, the center frequencies will be about 915 MHz at our standard 80 x 40 mm² evaluation board. However, these are typical reference values which may need to be changed when circuit boards or part vendors are different.



System Matching Circuit Component			
Location	Description	Vendor	Tolerance
1	6.8nH, (0402)	MURATA	±3%
2	1.5nH, (0402)	MURATA	±0.1nH
3	N/A	-	-
4	Fine tuning element 0.4pF, (0402)	MURATA	±0.05pF
5	Fine tuning element 10nH, (0402)	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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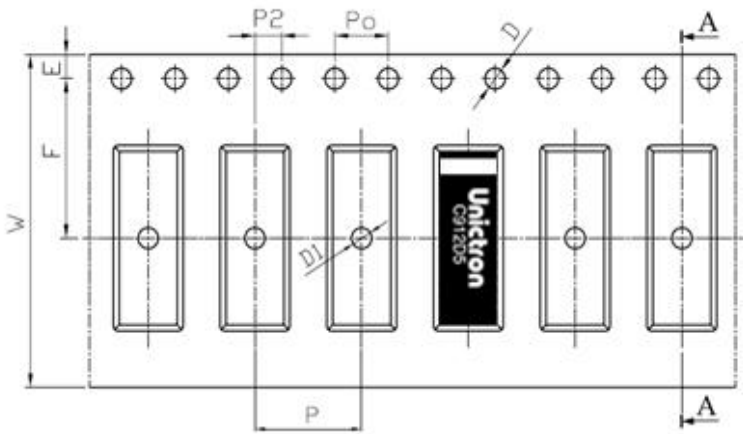
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10. Packing

- (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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