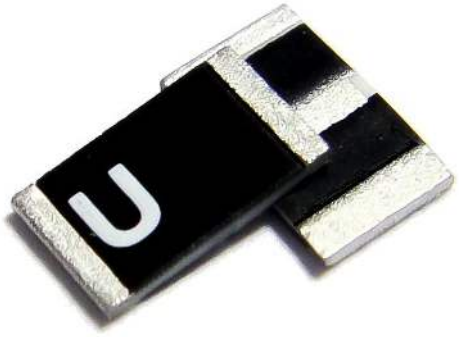
5.0 x 3.0 x 0.5 (mm) ISM 915 MHz Ceramic Chip Antenna (AA702)

Engineering Specification

1. Product Number

H	2	U	6	4	U	1	H	2	C	0	2	0	0



2. Features

*Stable and reliable in performances
*Low profile, compact size
*RoHS 2.0 compliance
*SMT processes compatible
*AEC-Q200 compliant

3. Applications

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

4. Description

Unictron's AA702 ceramic chip antenna is designed for ISM 915MHz band applications, covering frequencies 902~928 MHz. Fabricated with proprietary design and processes, AA702 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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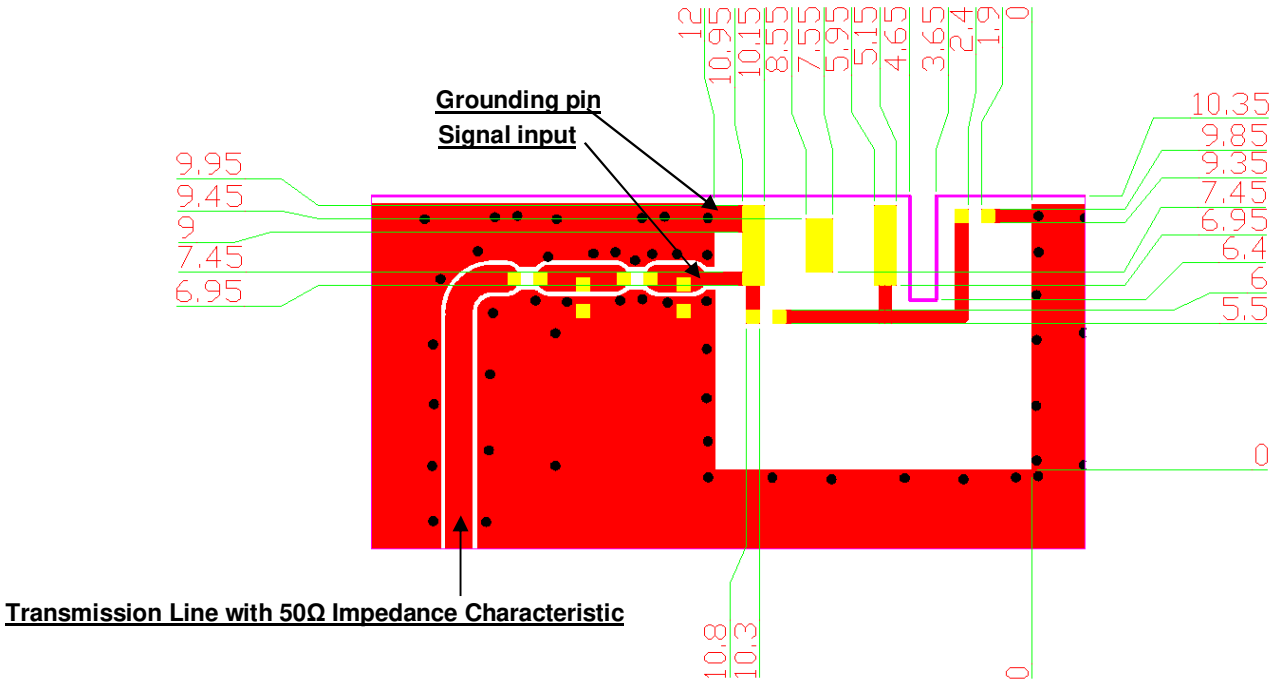
TITLE : 5.0 x 3.0 x 0.5 (mm) ISM 915MHz Ceramic Chip Antenna (AA702) Engineering Specification	DOCUMENT NO.	H2U64U1H2C0200	REV. M

5. Layout Guide & Electrical Specifications

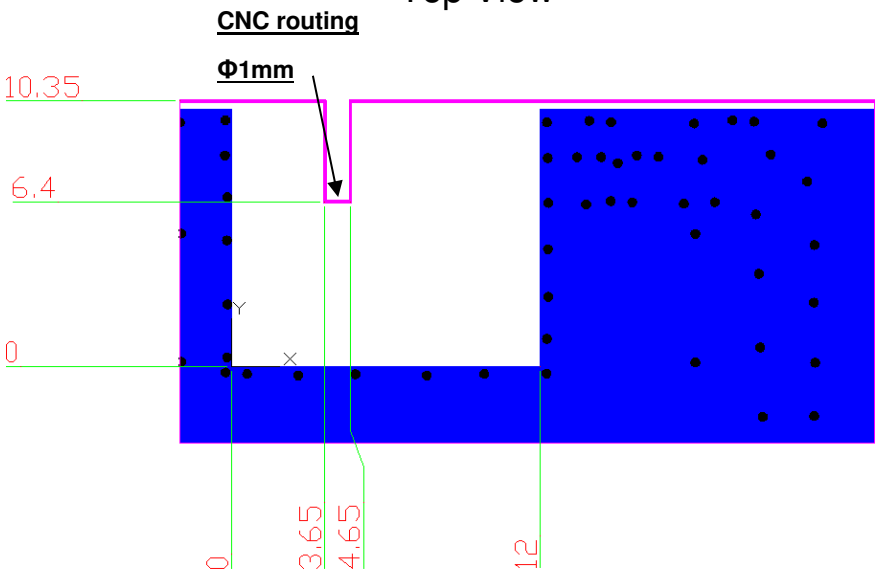
5-1. Layout Guide (unit：mm)

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.



Top View



Bottom View

5-2. Electrical Specifications (Evaluation Board Dimensions: 80 x 40 mm^2)

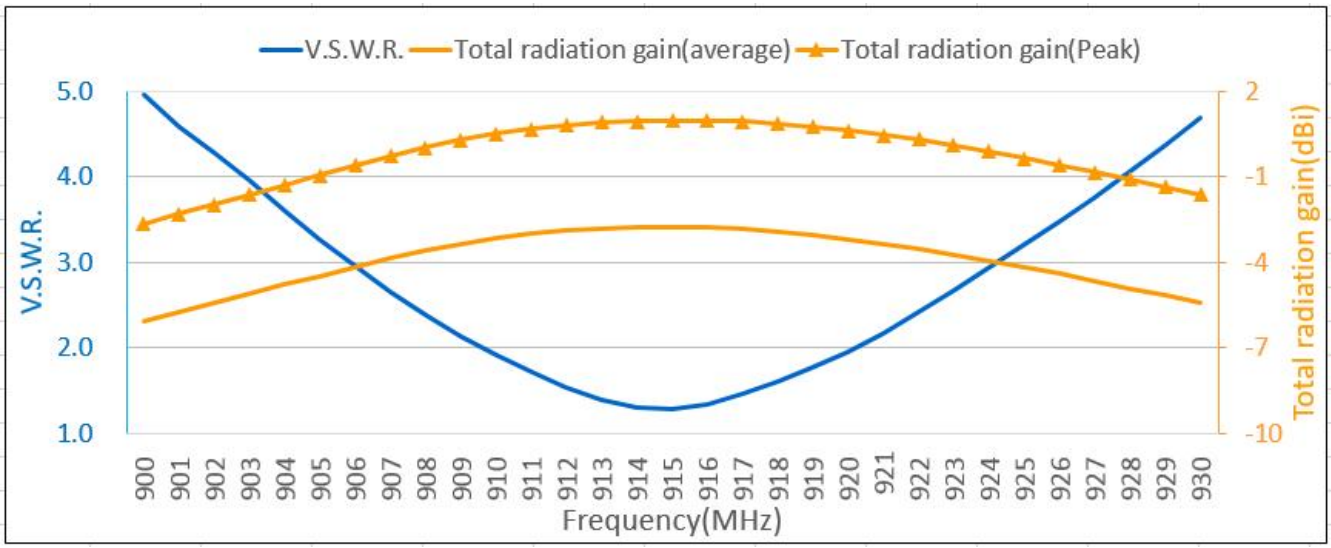
5-2-1. Electrical Table

Characteristics		Specifications	Unit
Outline Dimensions		5.0 x 3.0 x 0.5	mm
Ground Plane Dimensions		80 x 40	mm
Working Frequency		902~928	MHz
VSWR (@ center frequency)*		2 Max.	
Characteristic Impedance		50	Ω
Polarization		Linear Polarization	
Peak Gain	(@915 MHz)	0.8 (typical**)	dBi
Efficiency		52 (typical**)	%

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

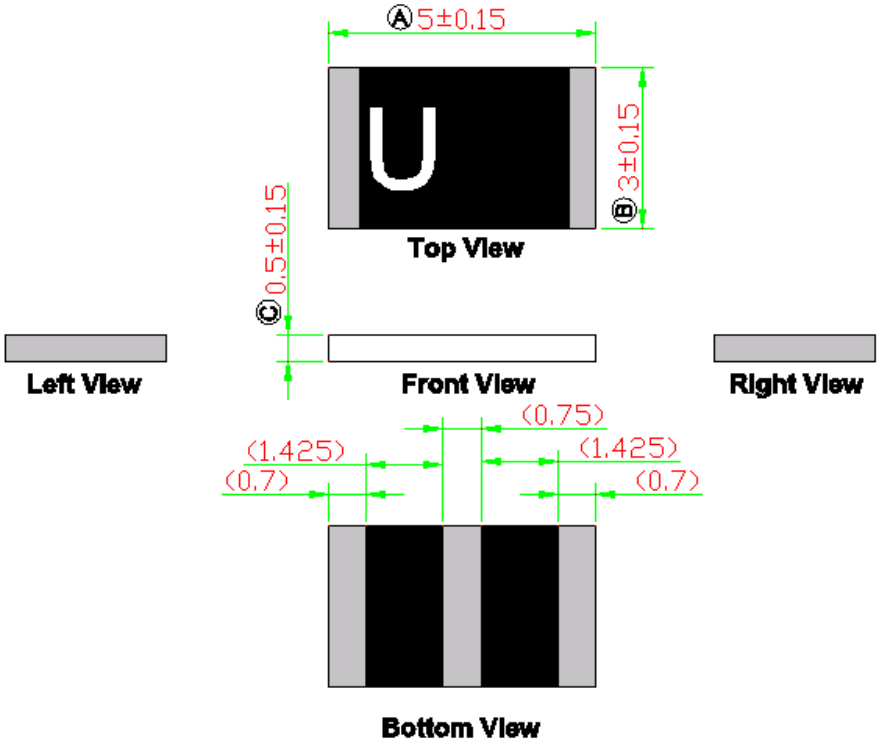
**A typical value is for reference only, could be changed due to the system or equipment of measurement is different.

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



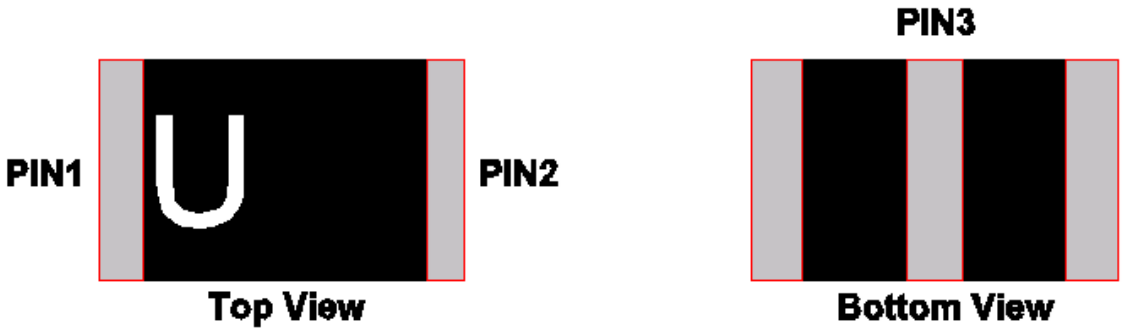
6. Outline Dimensions of Antenna & Evaluation Board (unit: mm)

6-1. Antenna Dimensions



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

PIN Definitions



PIN	1	2	3
Soldering Pad	Signal	Tuning / Ground	N/C

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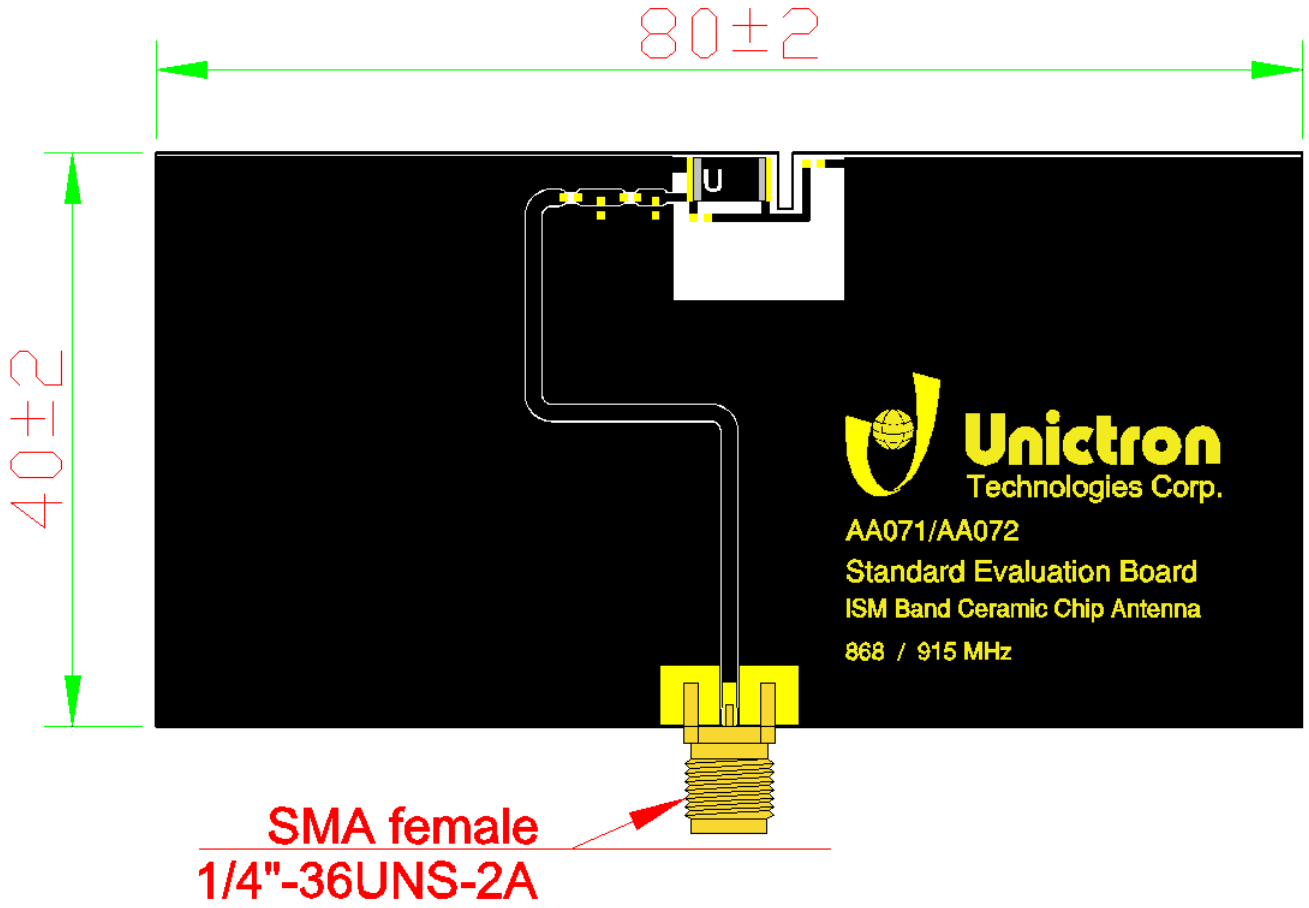
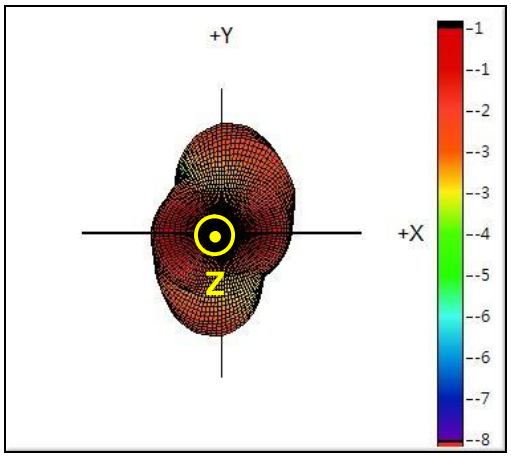
6-2. Evaluation Board with Antenna

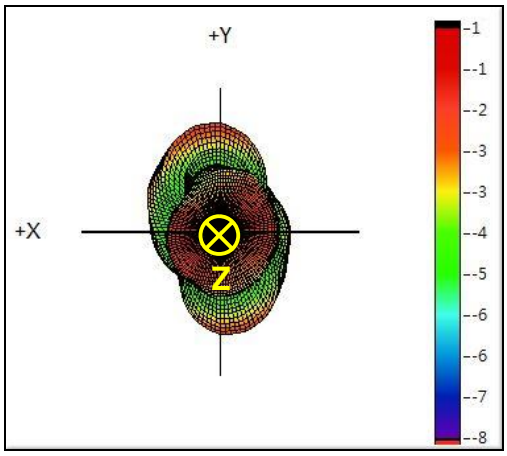


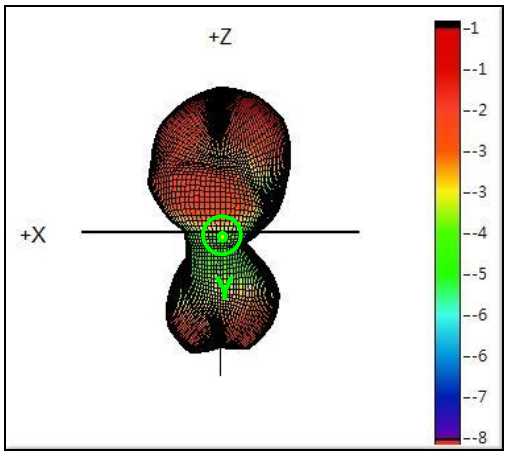
Unit: mm

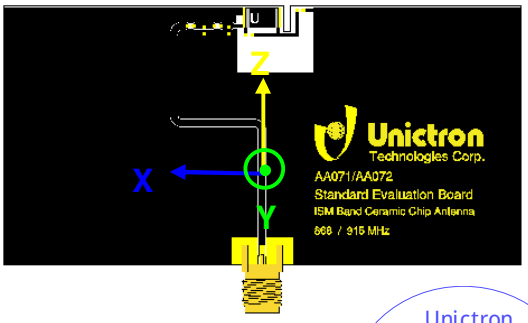
7. 3D Radiation Gain Pattern (with 80 x 40 mm² Evaluation Board)

3D Radiation Gain Pattern @ 915 MHz (unit: dBi)



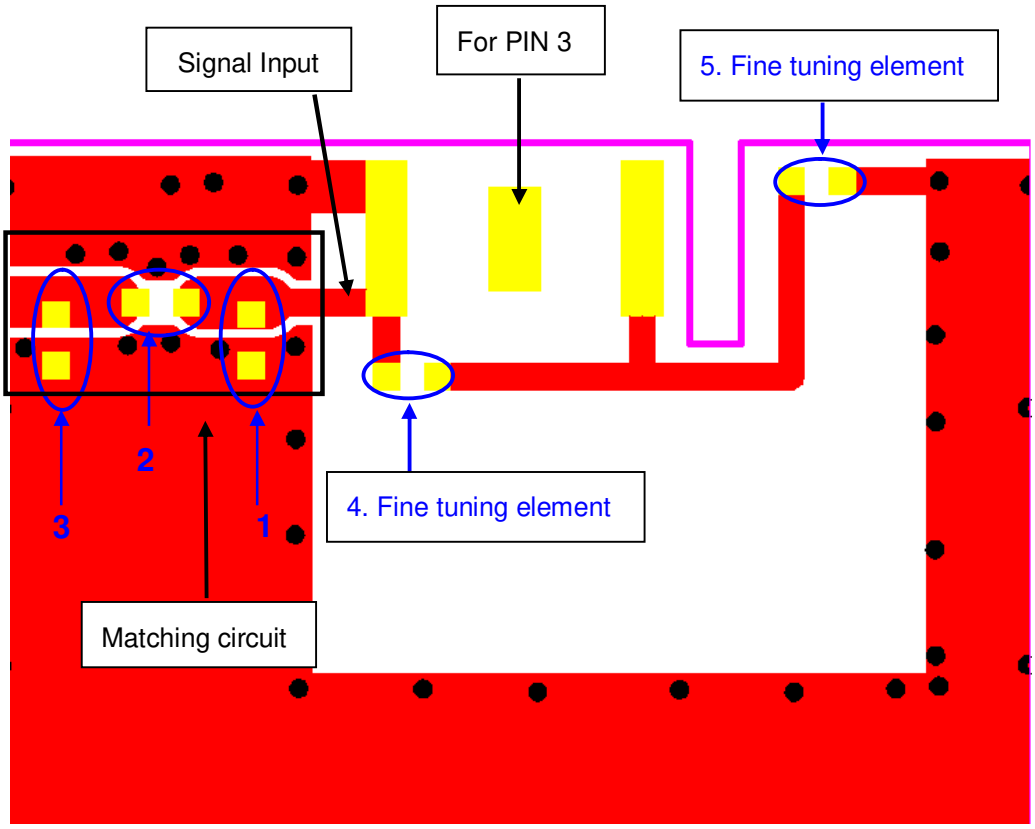






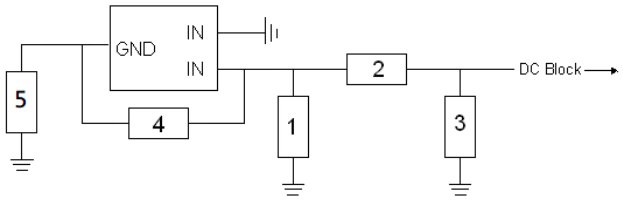
8. Frequency Tuning and Matching Circuit

8-1. Chip antenna tuning scenario：



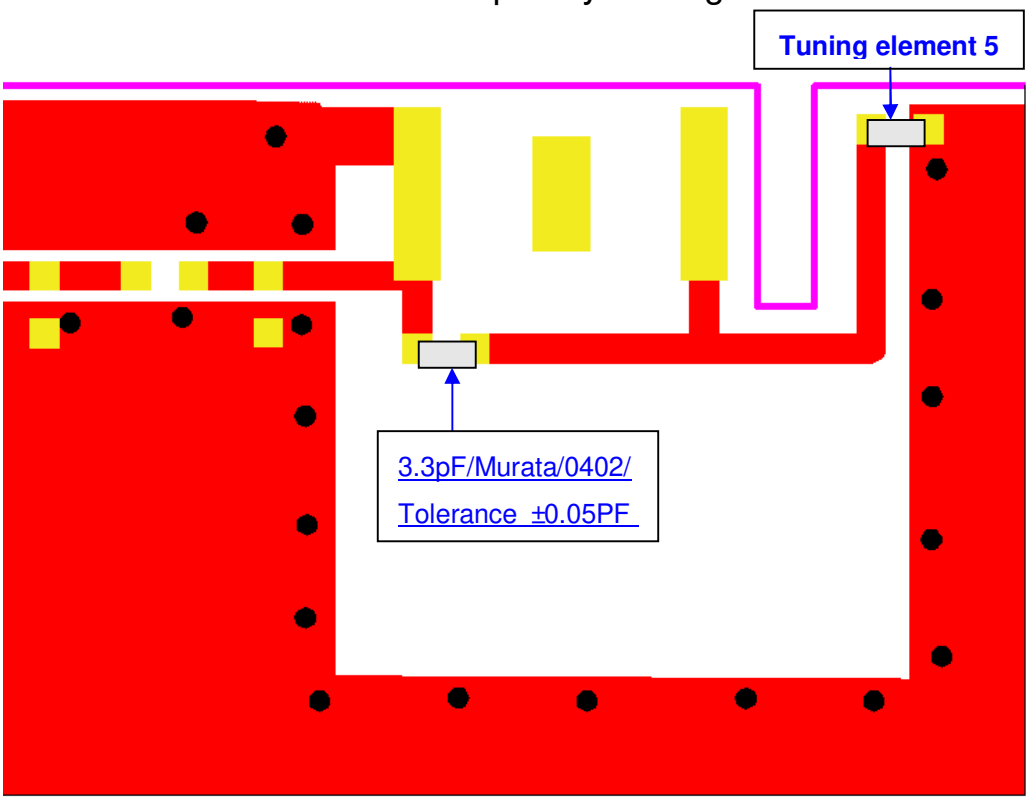
8-2. Matching Circuit：

With the following recommended values of matching and tuning components, the center frequencies will be about 915 MHz at our standard 80x40 mm^2 evaluation board. However, these are typical reference values which may need to be changed when circuit boards or part vendors are different.

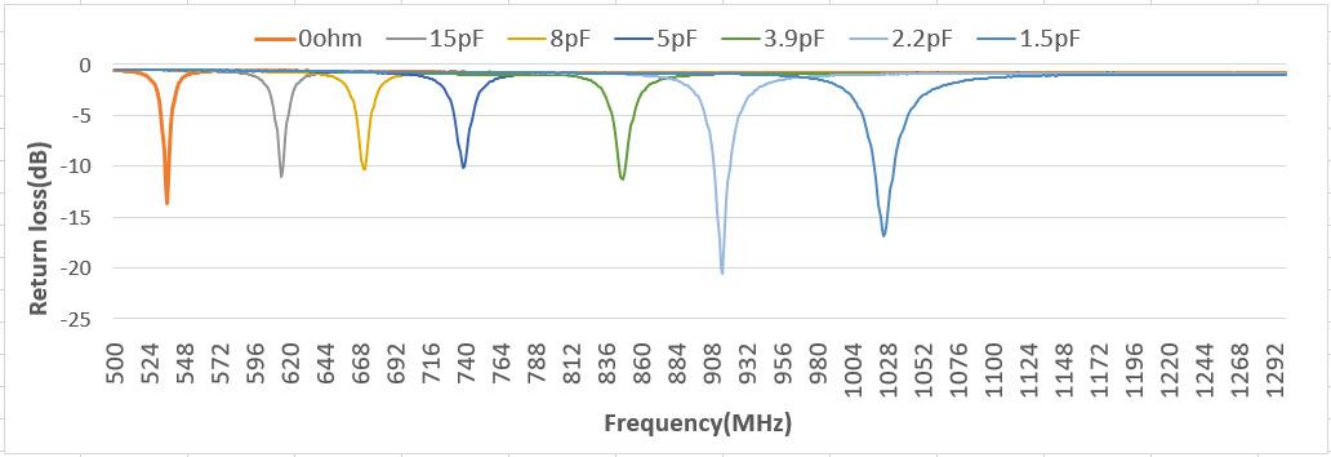


System Matching Circuit Component			
Location	Description	Vendor	Tolerance
1	N/A	-	-
2	6pF, (0402)	Murata	±0.05pF
3	N/A	-	-
4.Fine tuning element	3.3pF, (0402)	Murata	±0.05pF
5.Fine tuning element	2.2pF, (0402)	Murata	±0.05pF

8-3. Reference for the Use of Frequency Tuning Element

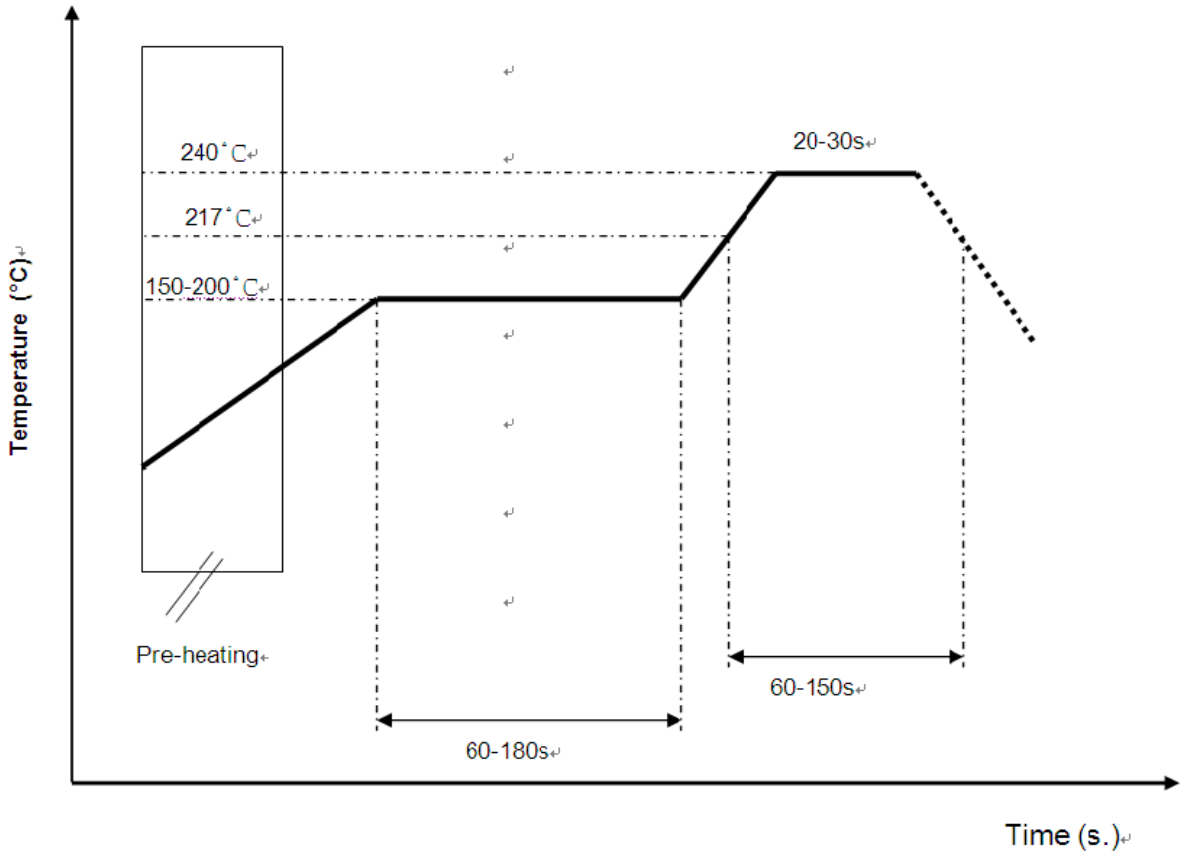


Frequencies vs. capacitance of tuning element 5



9. Soldering Conditions

Solder paste alloy: SAC305 (Sn96.5/Ag3/Cu0.5) Lead Free solder paste



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

10. Reminders for users of Unictron's AA702 ceramic chip antennas

10-1. This chip antenna is made of ceramic materials which is relatively more rigid and brittle compared to circuit board materials. Furthermore, the length of this antenna is quite long. Bending of circuit board at the locations where chip antenna is mounted may cause the cracking of solder joints or antenna itself.

10-2. Punching/cutting of the break-off tab of PCB panel may cause severe bending of the circuit board which may result in cracking of solder joints or chip antenna itself. Therefore break-off tab shall be located away from the installation site of chip antenna.

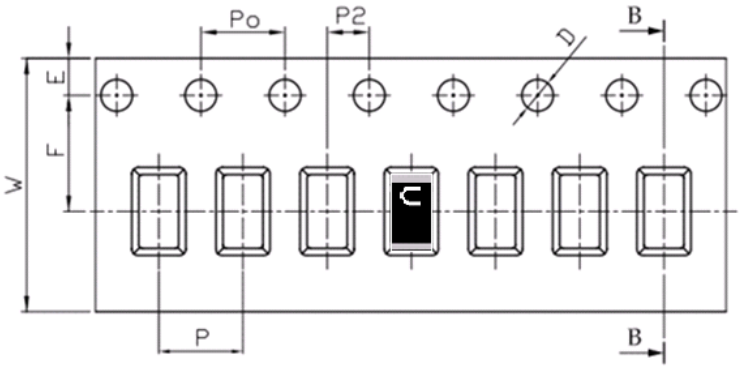
10-3. Be cautious when ultrasonic welding process needs to be used near the locations where chip antennas are installed. Strong ultrasonic vibration may cause the cracking of chip antenna solder joints.

11. Packing

(1) Quantity/Reel: 6000 pcs/Reel

(2) Plastic tape:

a. Tape Drawing



b. Tape Dimensions (unit: mm)

Feature	Specifications	Tolerances
W	12.00	±0.30
P	8.00	±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

12. Operating & Storage Conditions

12-1. Operating

(1) Maximum Input Power: 2 W

(2) Operating Temperature: -40℃ to 85℃

(3) Relative Humidity: 10% to 70%

12-2. Storage (sealed)

(1) Storage Temperature: -5℃ to 40℃

(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℃ to 85℃

(2) Relative Humidity: 10% to 70%

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.