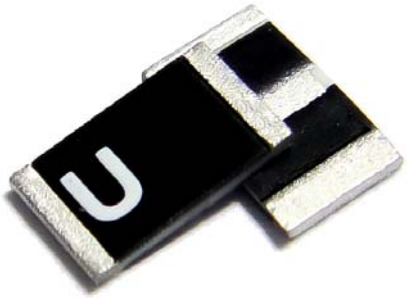
5.0 x 3.0 x 0.5 (mm) ISM 868 MHz Ceramic Chip Antenna (AA701)

Engineering Specification

1. Product Number

H	2	U	6	4	U	1	H	2	B	0	2	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 AA701 ceramic chip antenna is designed for ISM 868MHz band applications, covering frequencies 863~870 MHz. Fabricated with proprietary design and processes, AA701 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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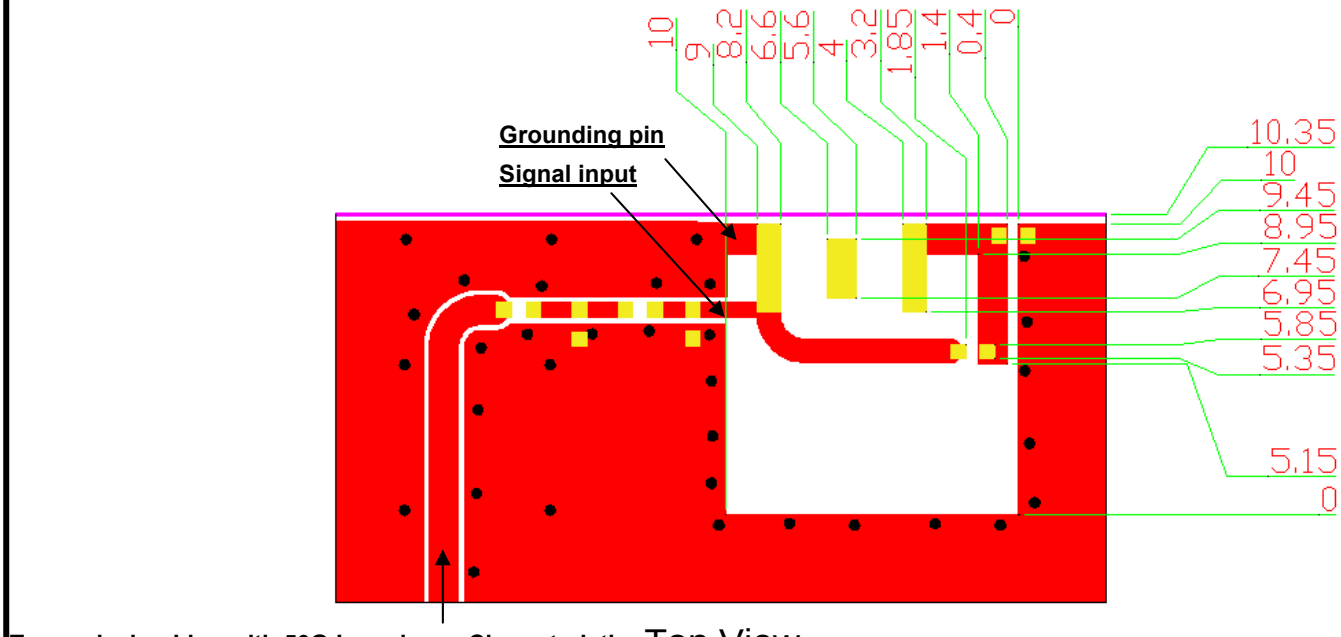
5. Layout Guide & Electrical Specifications

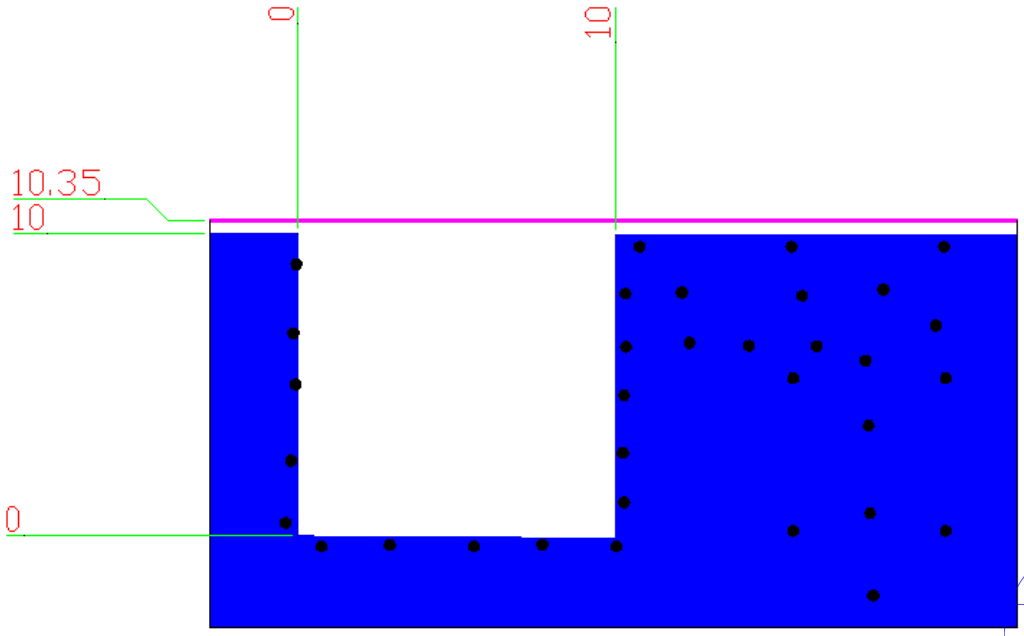
5-1. Layout Guide (unit：mm)

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

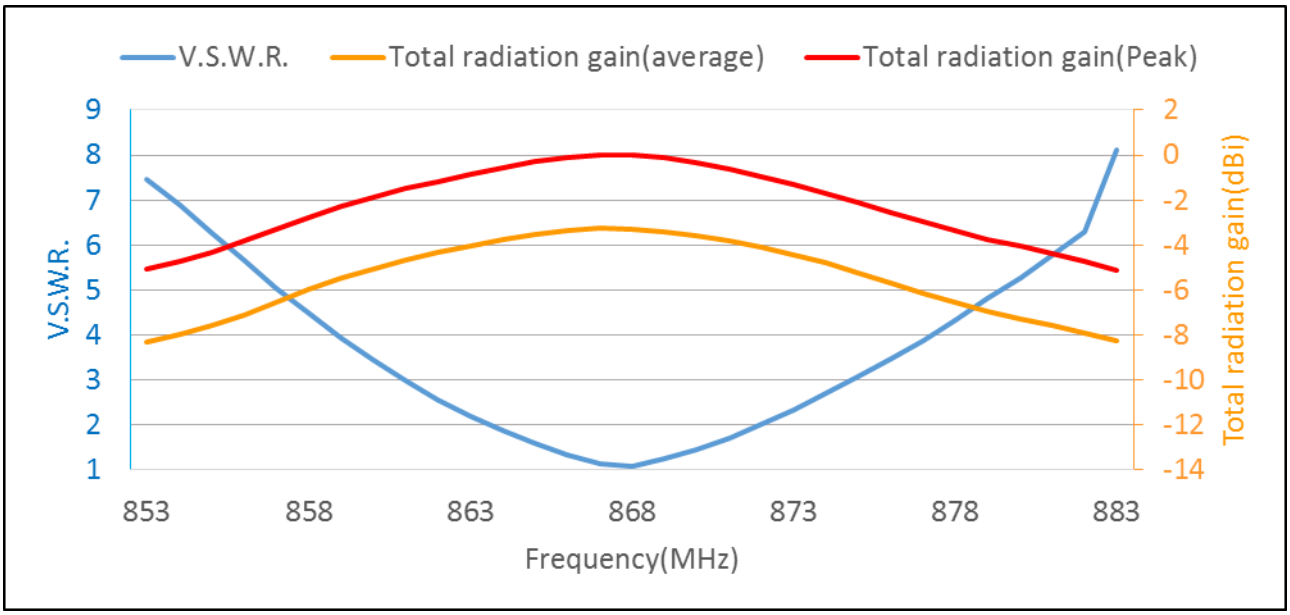
5-2. Electrical Specifications (Evaluation Board Dimensions: 80 x 40 mm^2)

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		863~870	MHz
VSWR (@ center frequency)*		2 Max.	
Characteristic Impedance		50	Ω
Polarization		Linear Polarization	
Peak Gain	(@868 MHz)	0 (typical)	dBi
Efficiency		47 (typical)	%

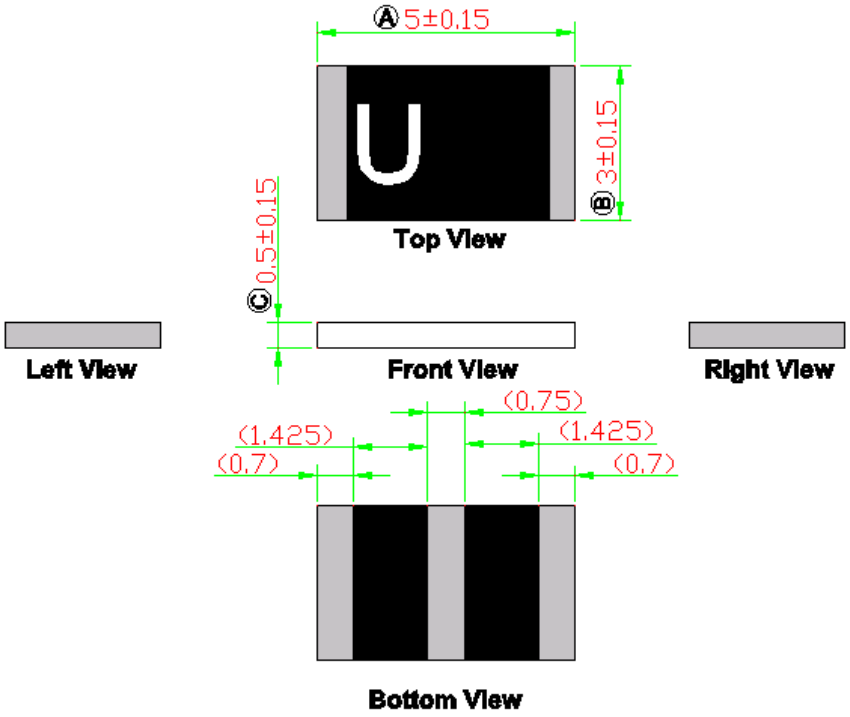
*Center frequency means the frequency with the lowest value in return loss of the chip antenna on the evaluation board.

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



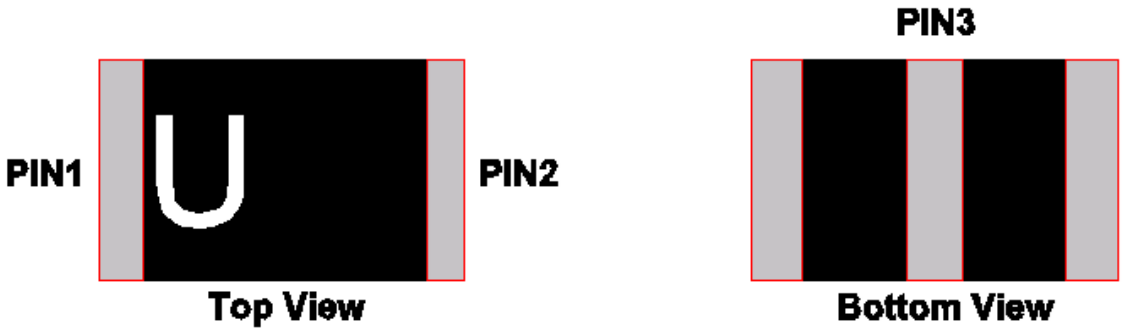
6. Outline Dimensions of Antenna & Evaluation Board (unit: mm)

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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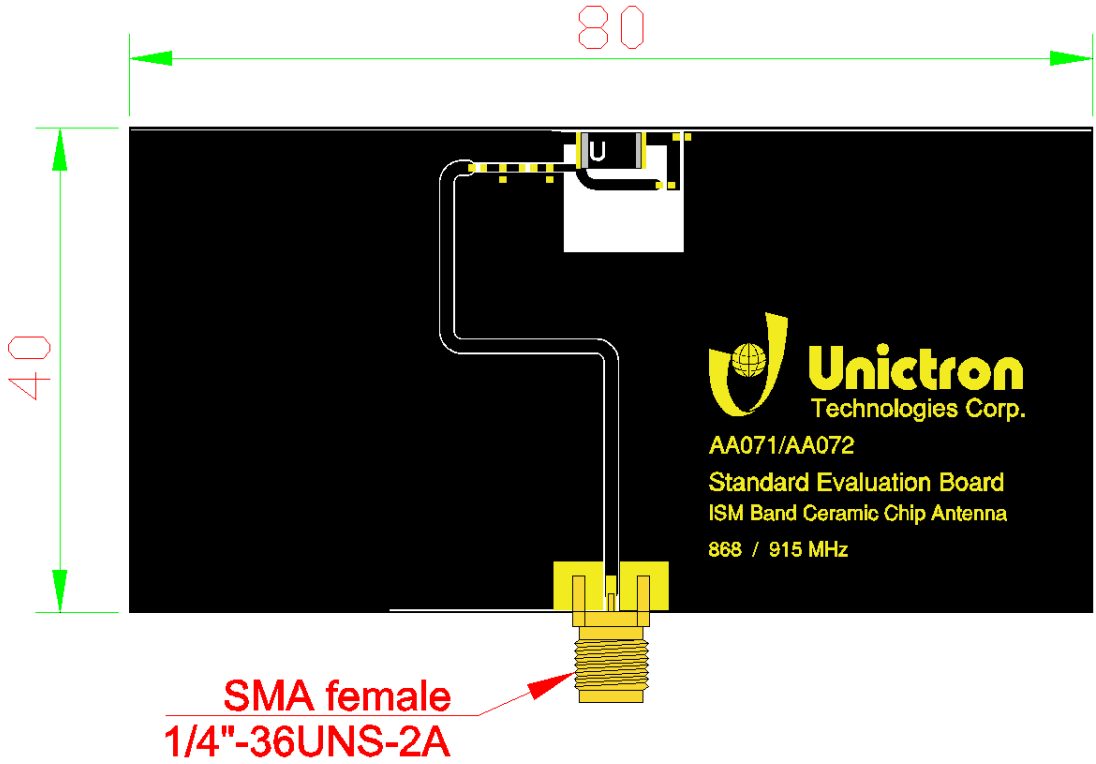
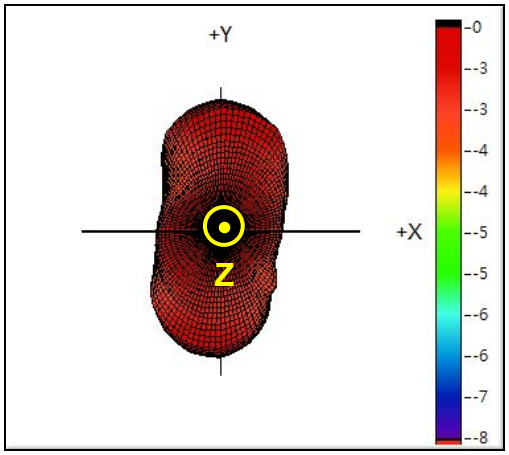
6-2. Evaluation Board with Antenna

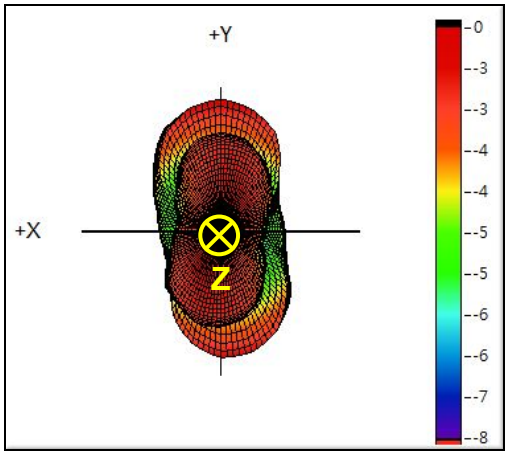


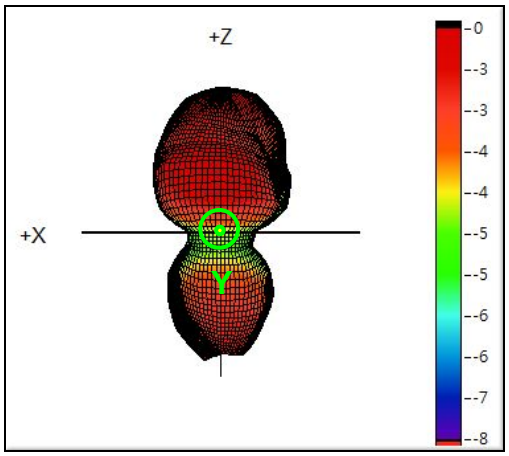
unit: mm

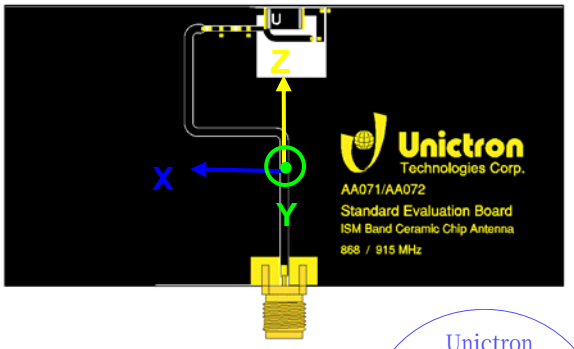
7. Radiation Pattern (with 80 x 40 mm^2 Evaluation Board)

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



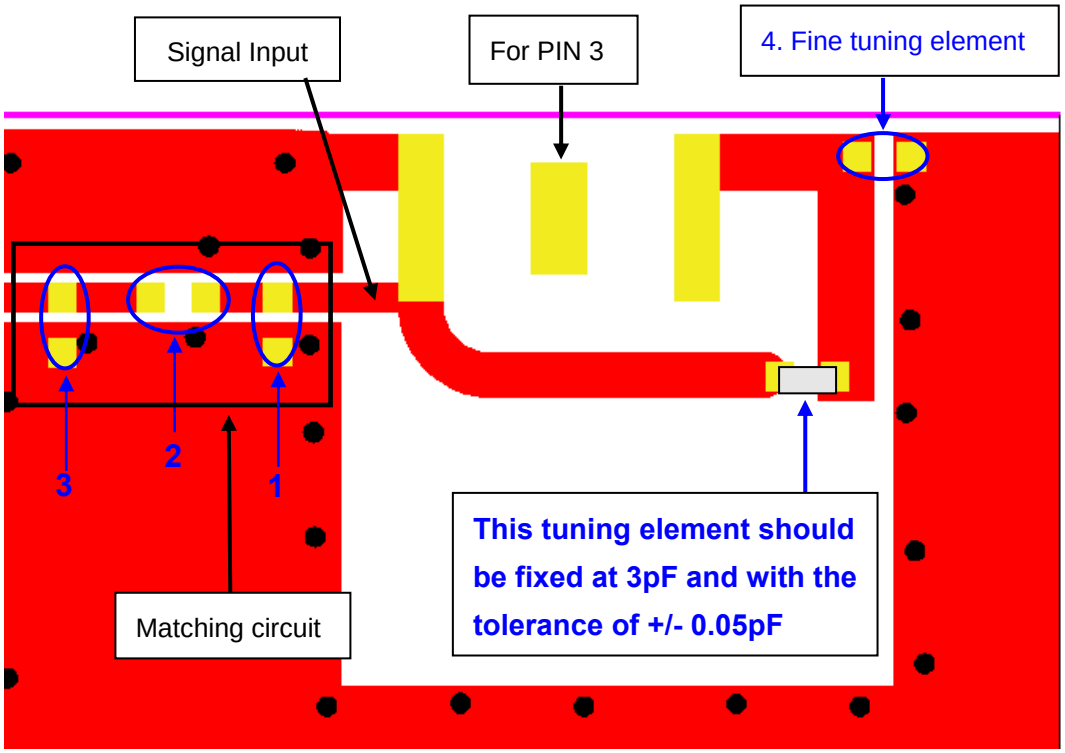






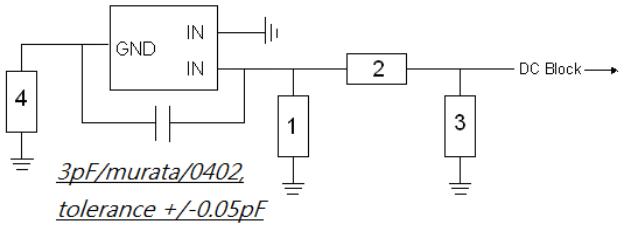
8. Frequency Tuning and Matching Circuit

8-1. Chip antenna tuning scenario：



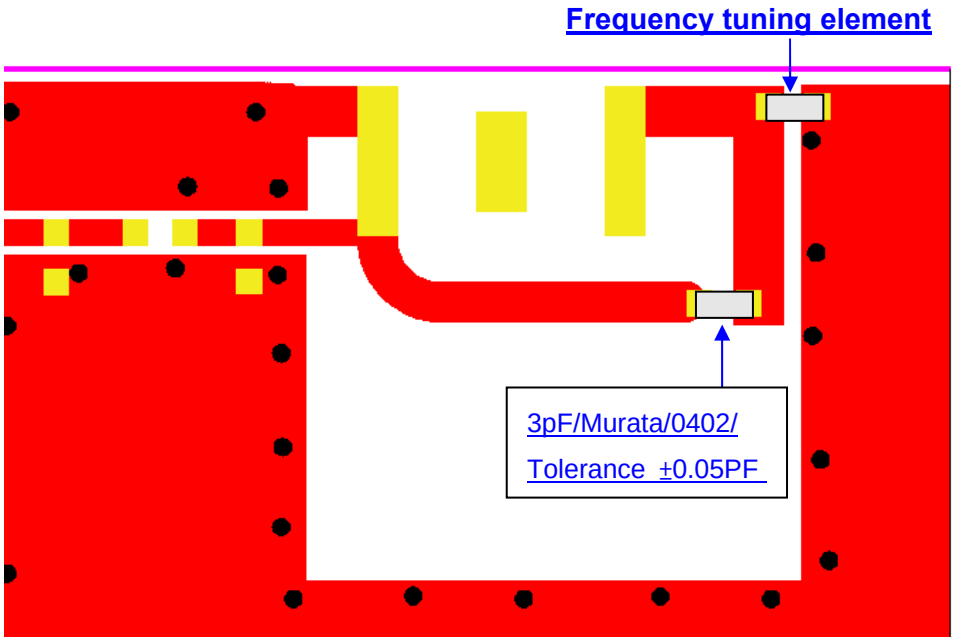
8-2. Matching circuit：

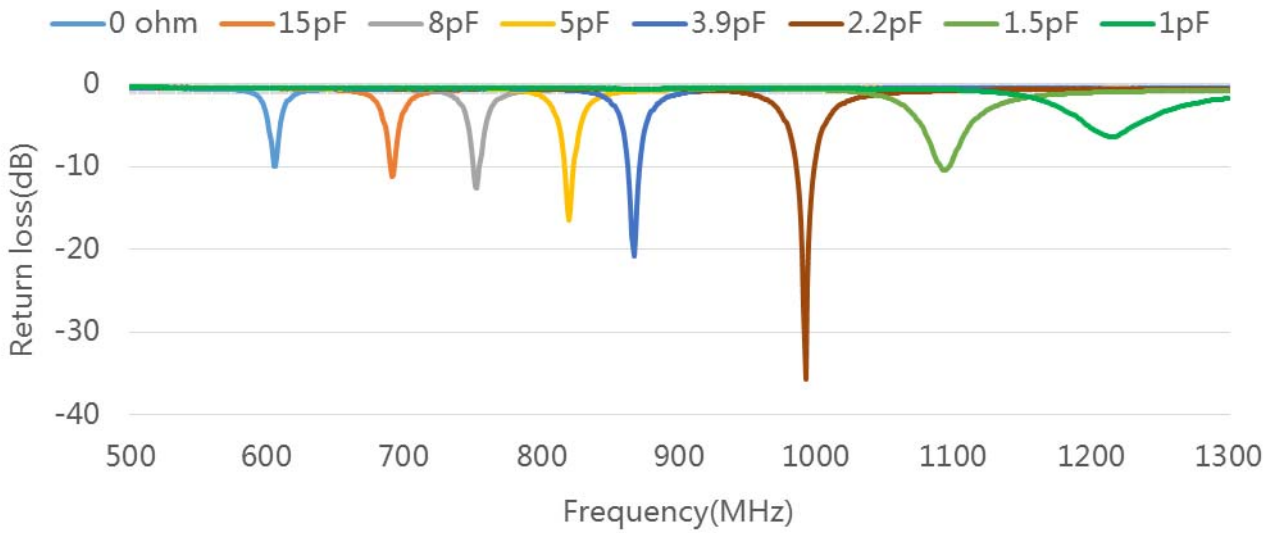
With the following recommended values of matching and tuning components, the center frequencies will be about 868 MHz at our standard 80x40 mm^2 evaluation board. However, these are typical reference values which may need to be changed when circuit boards or part vendors are different.



System Matching Circuit Component			
Location	Description	Vendor	Tolerance
1	N/A	-	-
2	2.7nH, (0402)	Murata	±0.1nH
3	N/A	-	-
4 Fine tuning element	3.9 pF, (0402)	Murata	±0.05pF

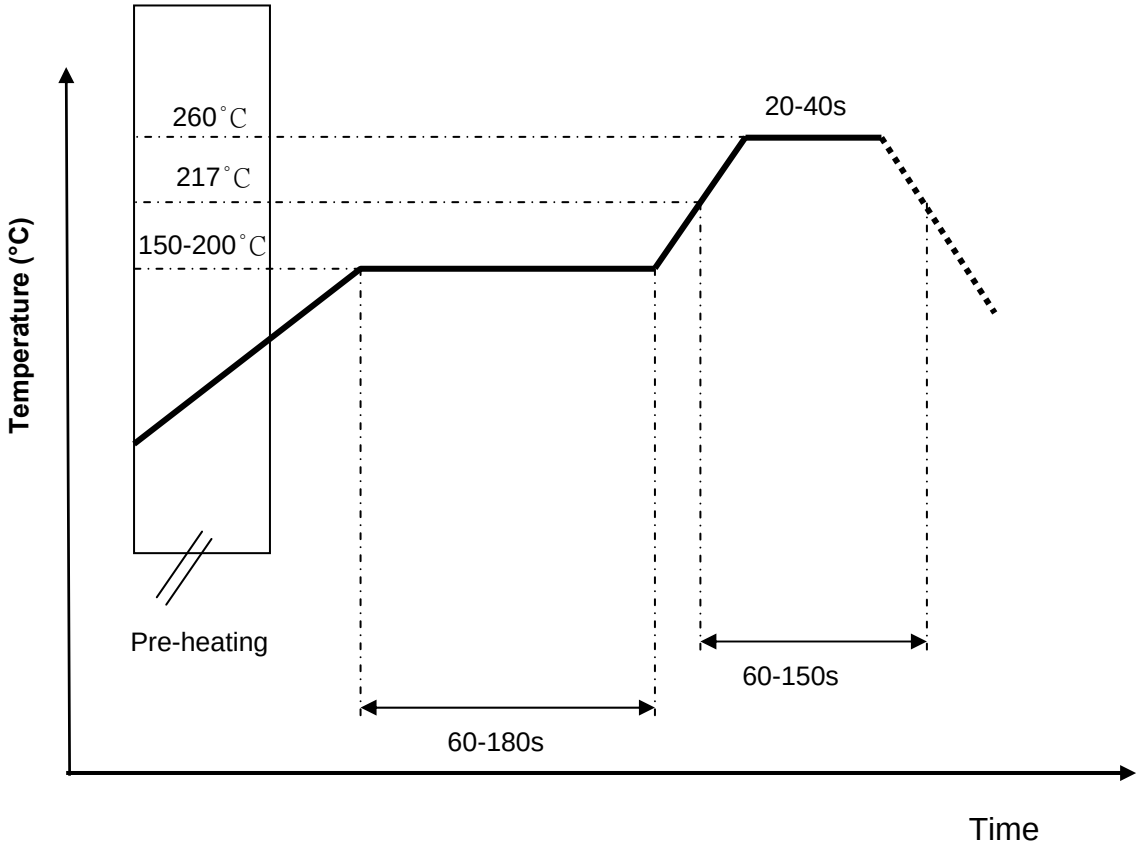
8-3. Reference for use of the frequency tuning element





9. Soldering Conditions

9-1. Typical Soldering Profile for Lead-free Process



10. Reminders for users of Unictron's AA701 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.

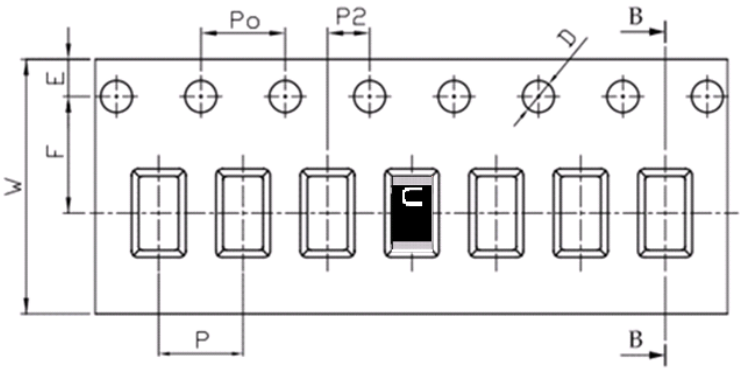
10-3. Be cautious when ultrasonic welding process needs to be used near the locations where chip antennas are installed. Strong ultrasonic vibration may cause the cracking of chip antenna solder joints.

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	1.20	+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℃

12-2. Storage

(1) Storage Temperature: -5℃ to 40℃

(2) Relative Humidity: 20% to 70%

(3) Shelf Life: 1 year

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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