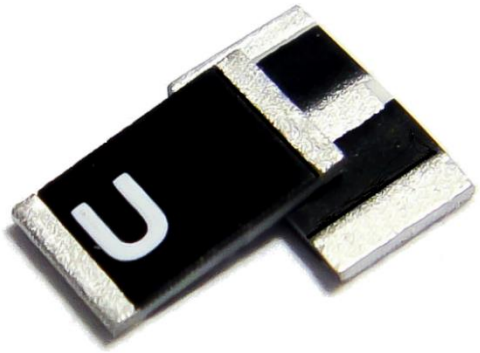
Unictron Technologies Corp.



ISM 868 MHz Ceramic Chip Antenna
Model: AA701
TELA chip antenna
Product Number: H2U64U1H2B0200

REFERENCE SPECIFICATION

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Table of Contents

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1 Introduction

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.

Features

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

Applications

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

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2 Electrical Characteristics

2.1 Table with electrical properties:

Characteristics		Specifications	Unit
Outline Dimensions		5.0 x 3.0 x 0.5	mm
Ground Plane Dimensions		80x40	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		49 (typical)	%

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

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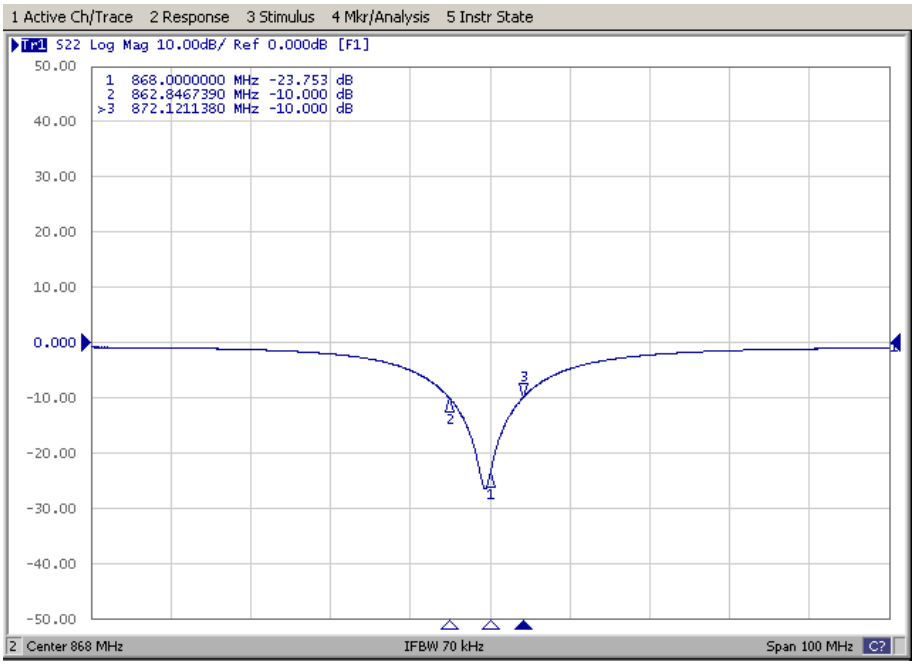
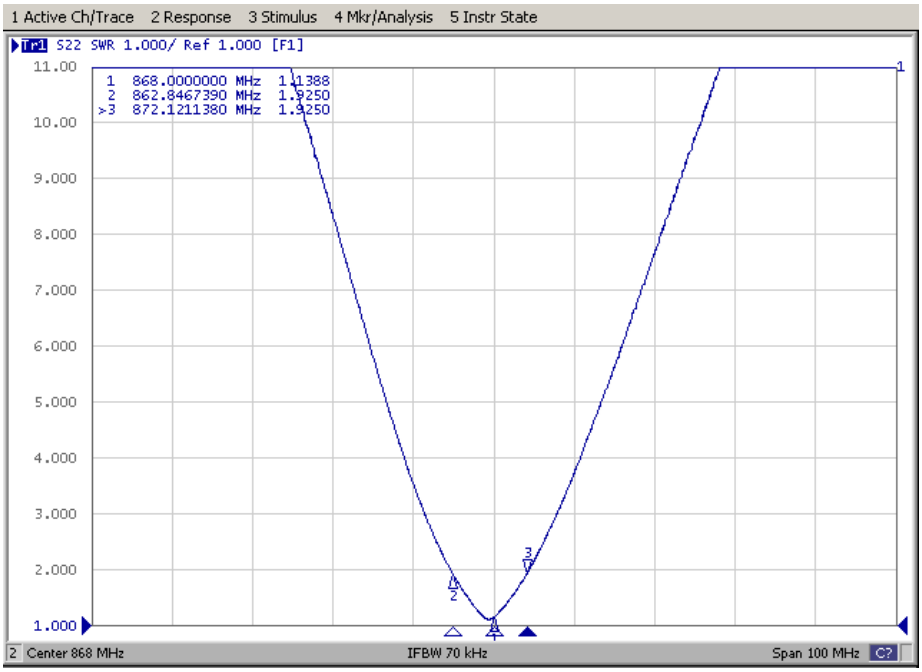
2.2 Return Loss (S_{11})



2.3 VSWR (S_{11})



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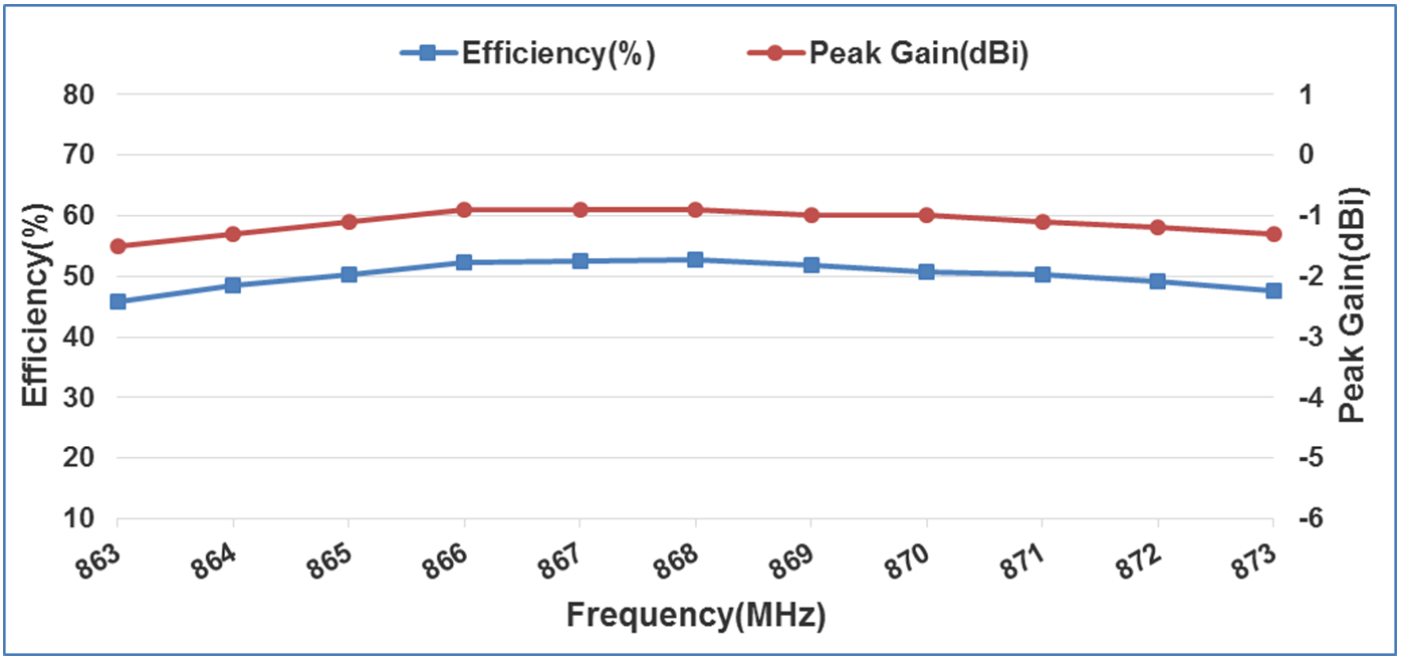
2.4 Efficiency Table

Frequency(MHz)	863	864	865	866	867	868	869	870	871	872	873
Efficiency(dB)	-3.4	-3.2	-3.0	-2.8	-2.8	-2.8	-2.9	-2.9	-3.0	-3.1	-3.2
Efficiency(%)	45.9	48.4	50.3	52.2	52.5	52.8	51.8	50.8	50.3	49.2	47.7
Gain(dBi)	-1.5	-1.3	-1.1	-0.9	-0.9	-0.9	-1.0	-1.0	-1.1	-1.2	-1.3

2.5 Efficiency vs. Frequency



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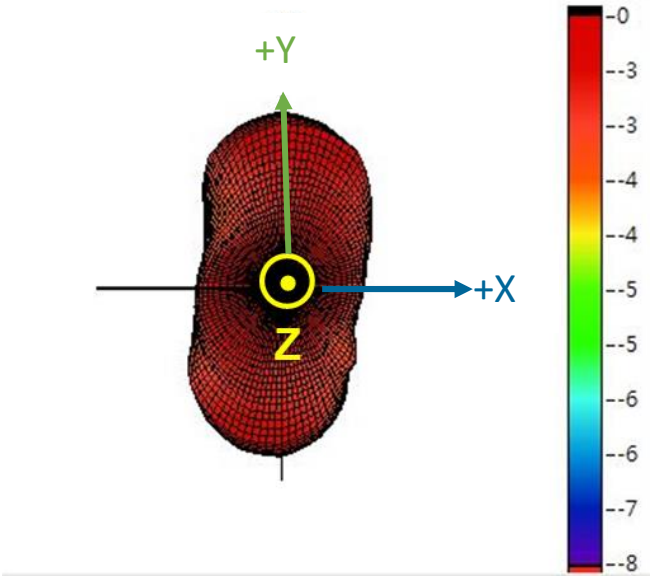
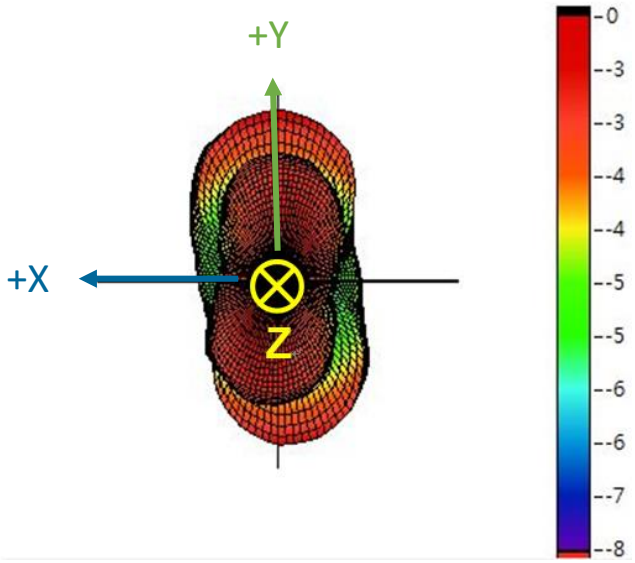
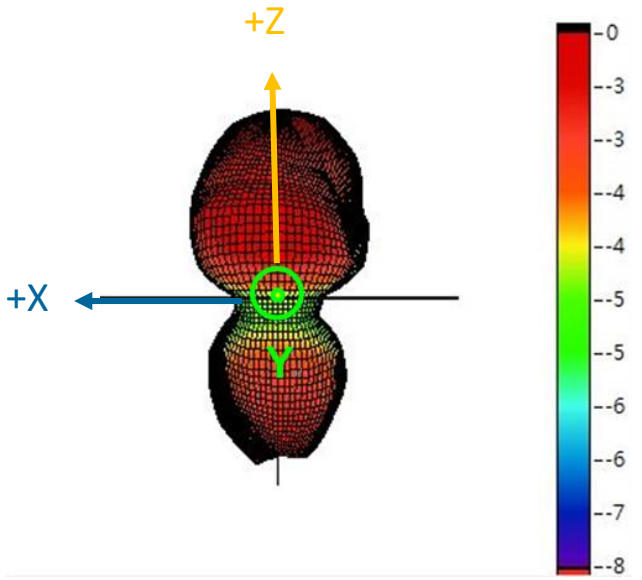
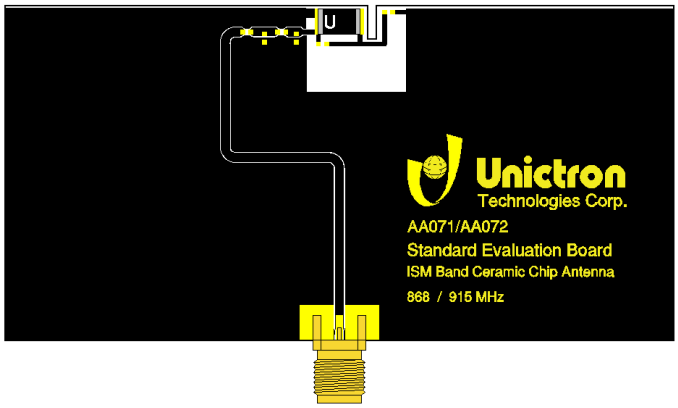
2.6 Radiation Pattern (with 80x40mm^2 Evaluation Board)

3D Gain Pattern @ 868 MHz (unit: dBi)









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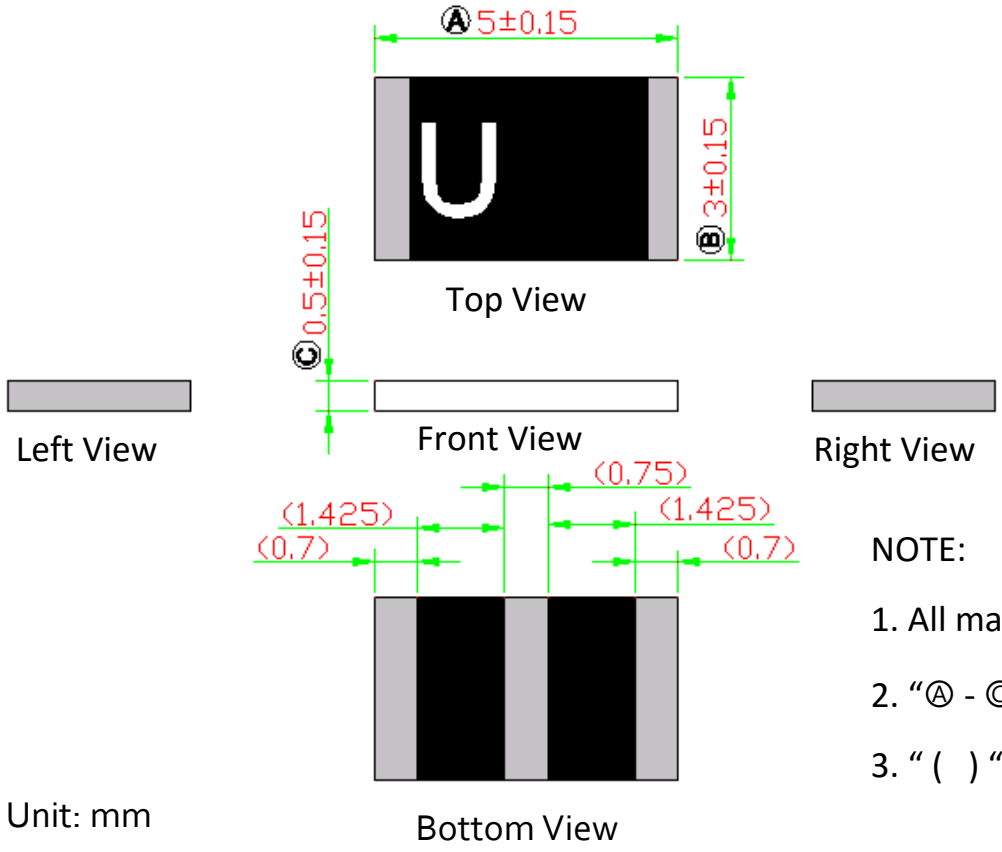
3 Layout

3.1 Antenna Dimensions

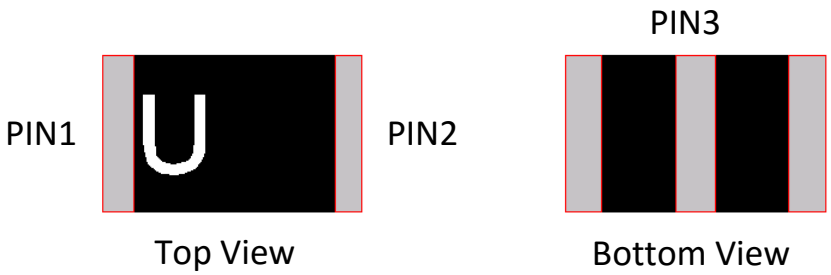


Unit: mm

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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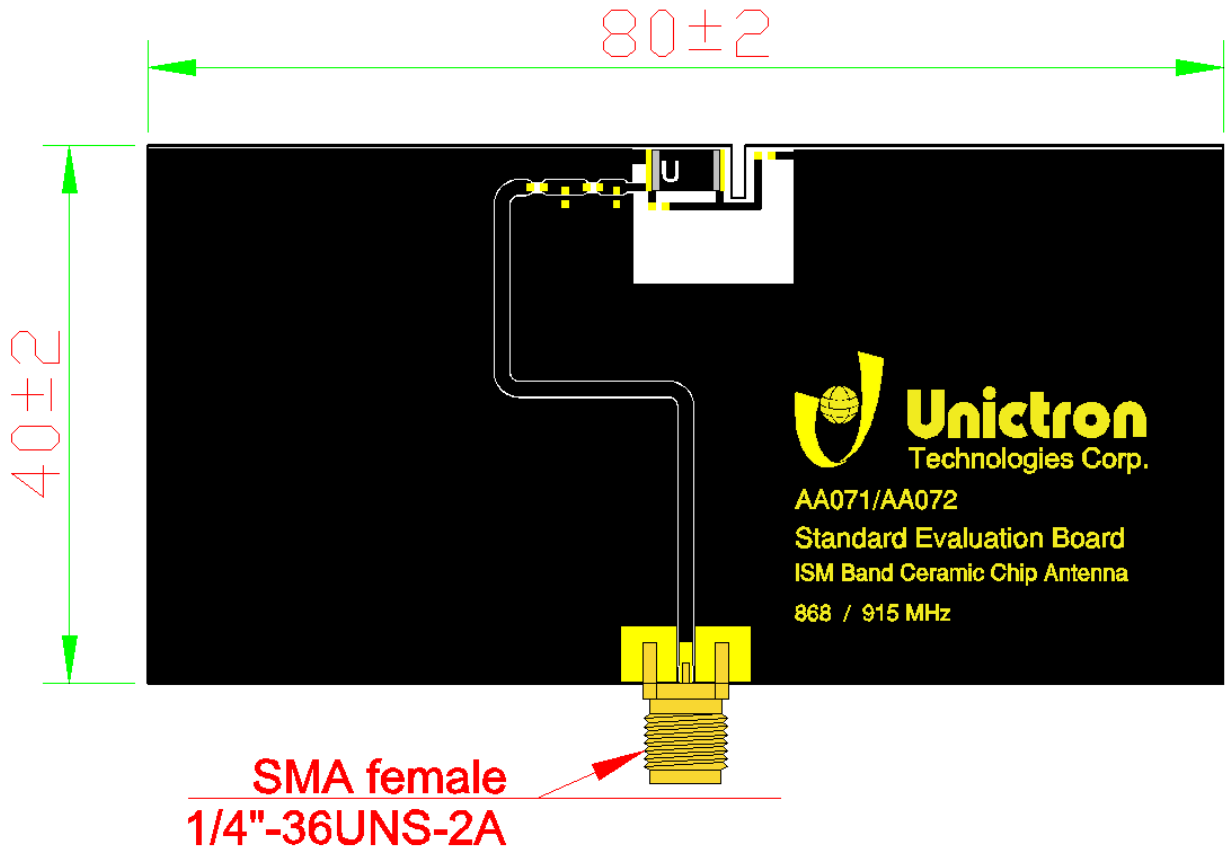
3.2 Evaluation Board with Antenna



Unit: mm

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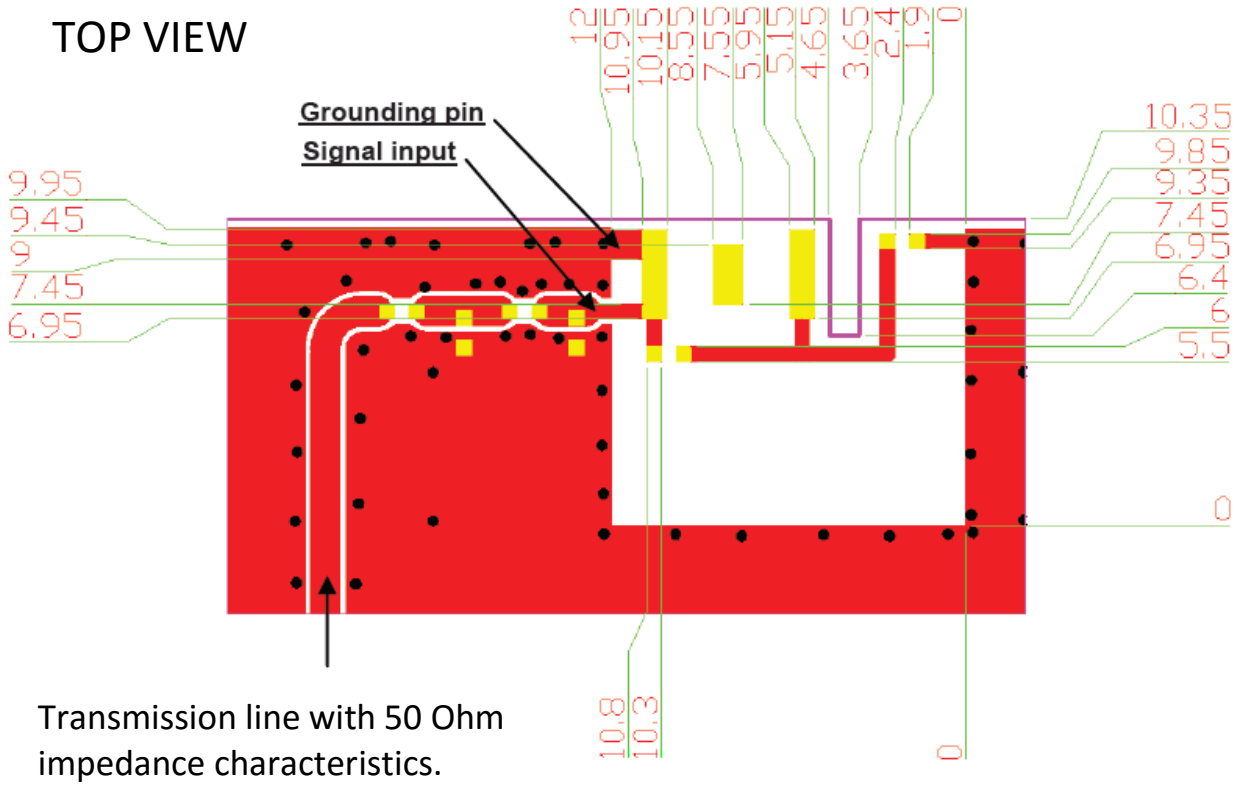
3.3 Solder Land Pattern

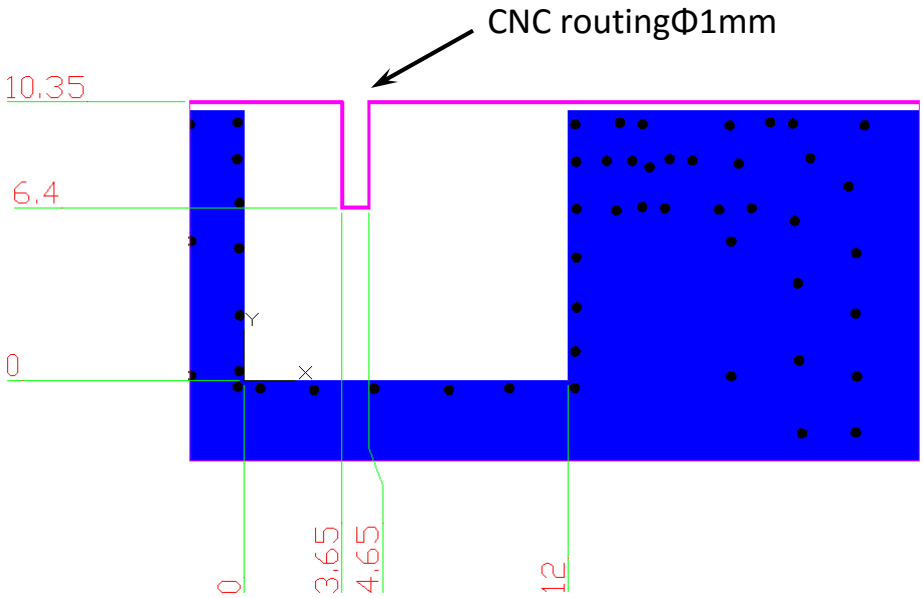
The solder land pattern (gold marking areas) is shown below. Recommendation on matching circuit will be provided according to customer's installation conditions.

TOP VIEW



Transmission line with 50 Ohm impedance characteristics.

BOTTOM VIEW



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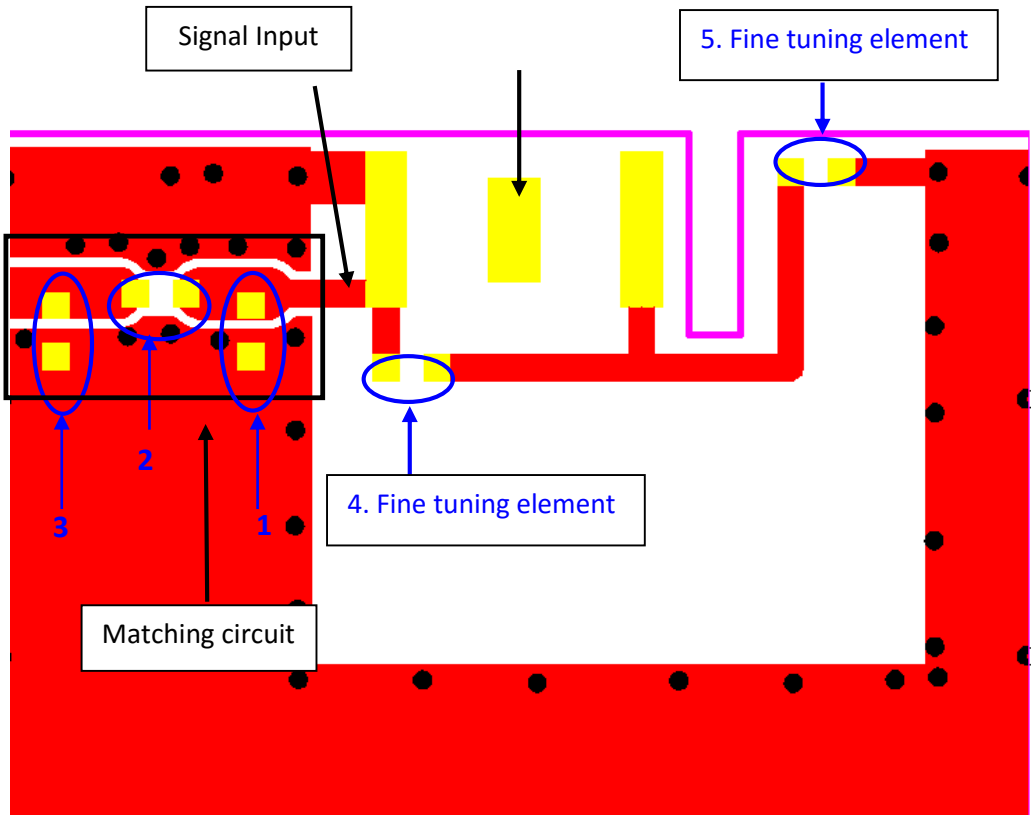
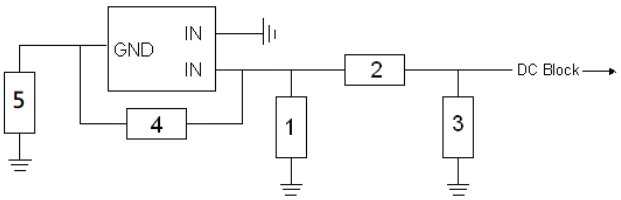
4 Frequency tuning

Chip antenna tuning scenario



With the following recommended values of matching and tuning components, the center frequencies will be about 868 MHz at out standard 80x40 mm^2 evaluation board.



System Matching Circuit Component			
Location	**Description**	**Vendor**	**Tolerance**
1	N/A	-	-
2	0Ω, (0402)	-	-
3	12 nH,(0402)	Murata	5%
4 Fine tuning element	2.7 pF,(0402)	Murata	±0.05pF
5 Fine tuning element	2.7 pF,(0402)	Murata	±0.05pF

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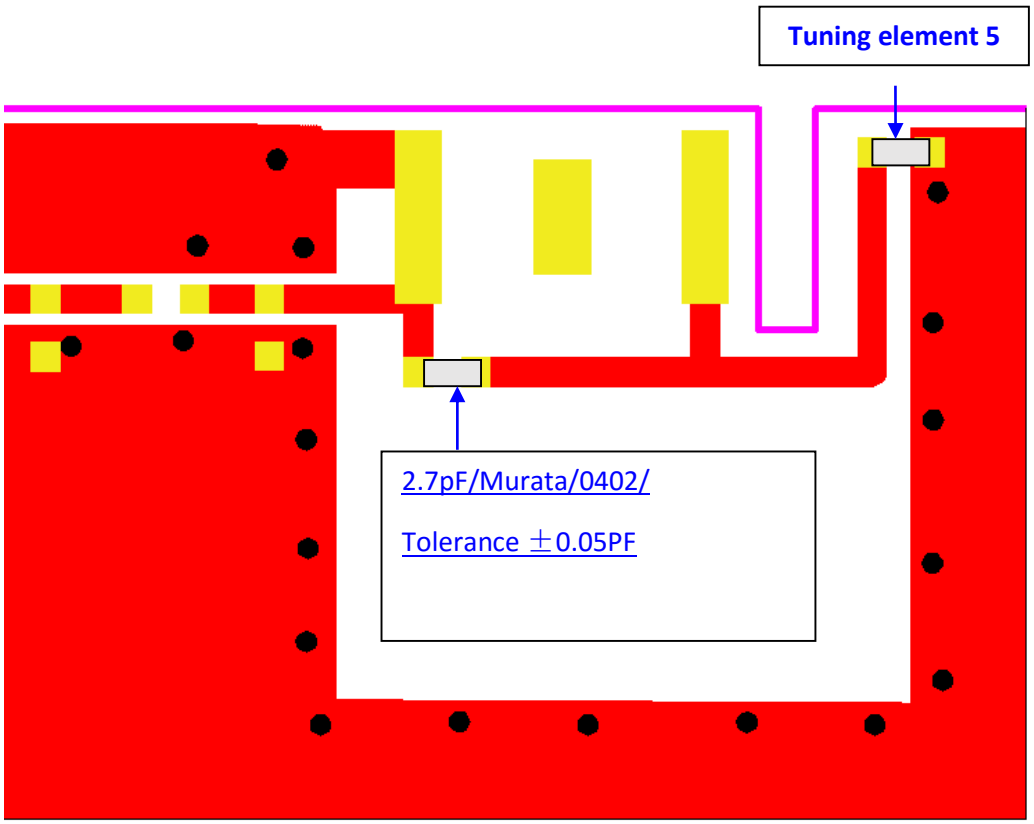
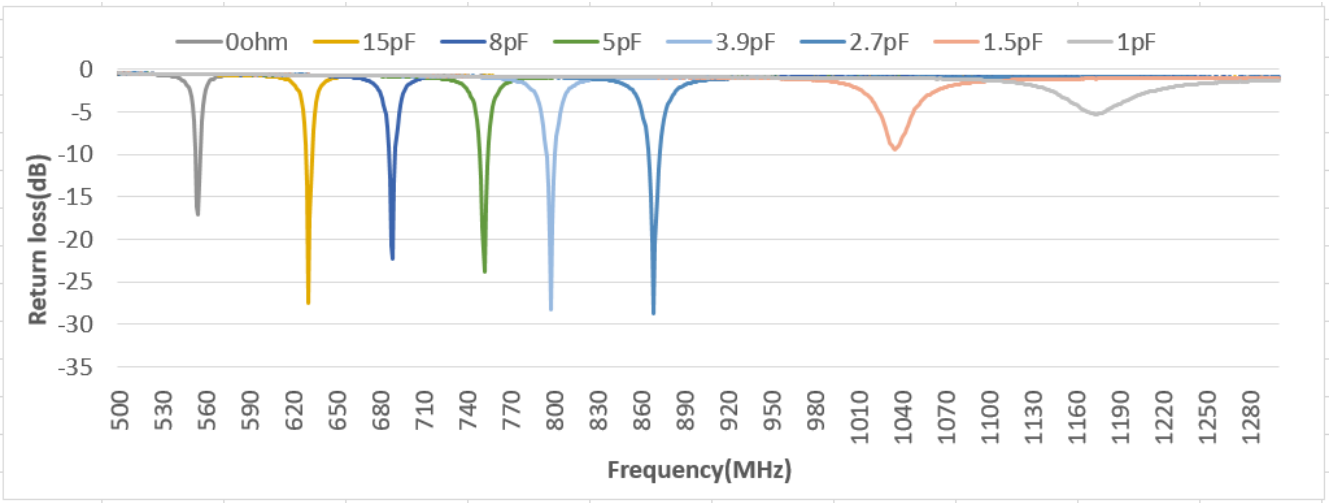
If you are using a PCB board of different dimensions, the values of suitable matching and tuning components may differ. Feel free to contact a Unictron's representative at e-sales@unictron.com for further assistance adjusting these components, optimizing PCB layout and antenna's performance.

4.1 Reference for frequency tuning element



Frequencies vs. capacitance of tuning element 5



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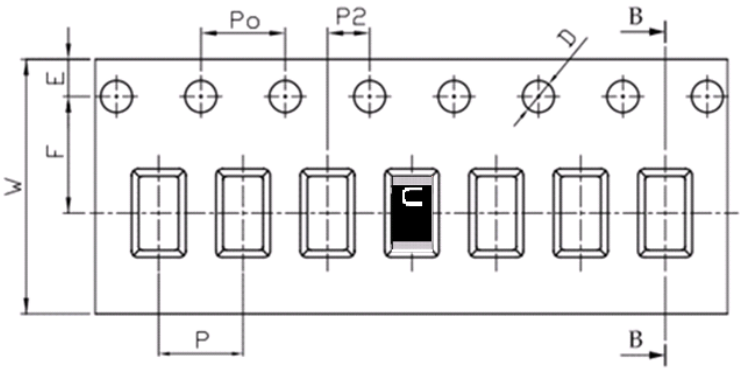
Packing

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

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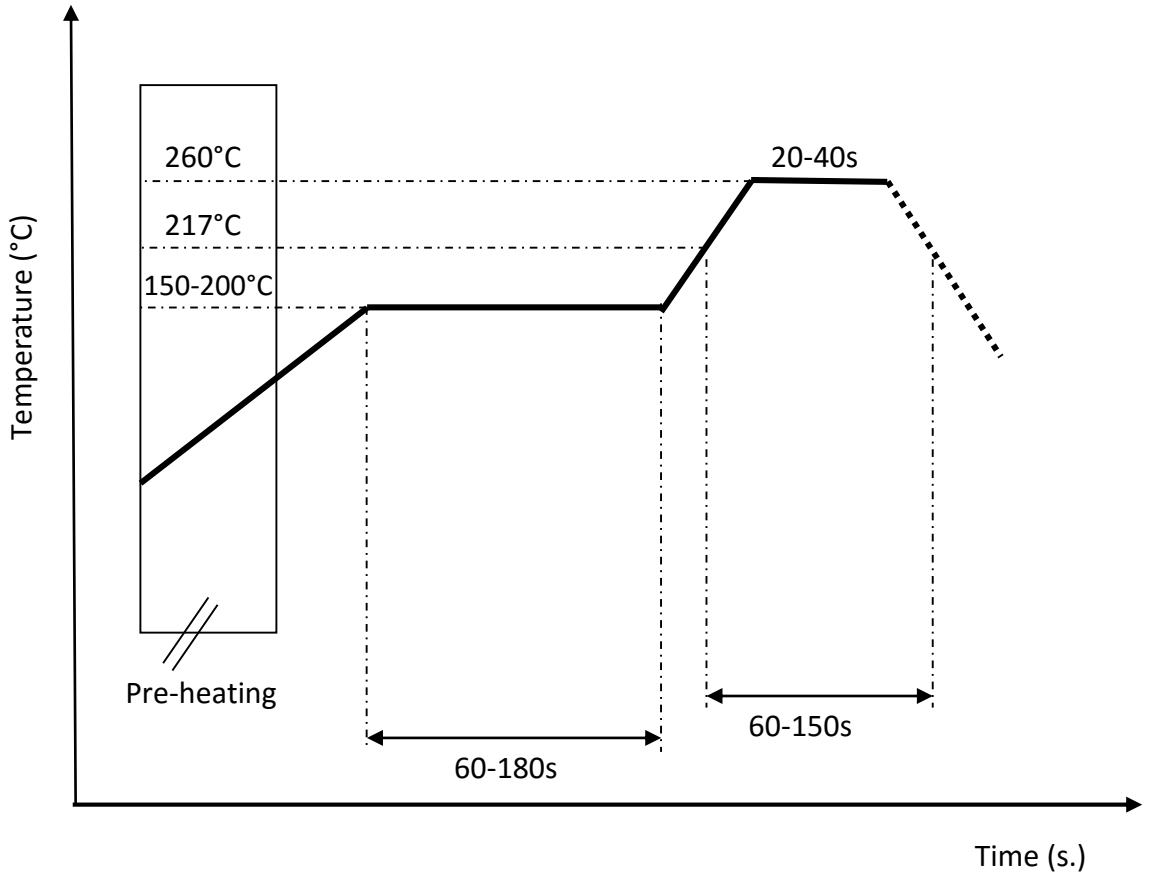
5 Notes

5.1 Typical Soldering Profile for Lead-free Process

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



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5.2 Operating and storage conditions:

Operating:

Maximum Input Power: 2W

Operating Temperature: -40°C to +85°C

Storage:

Storage Temperature -5°C to +40°C

Relative Humidity: 20% to 70%

Shelf Life: 1 year

5.3 Installation guide:

Request Unictron's application notes "General guidelines for the installation of Unictron's chip antennas" for further information at e-sales@unictron.com.

5.4 Reminders for users of Unictron's AA701 ceramic chip antennas

6.4.1. This chip antenna is made of ceramic materials which are relatively more rigid and brittle compared to printed circuit board materials. Bending of circuit board at the locations where chip antenna is mounted may cause the cracking of solder joints or antenna itself.

6.4.2. 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.

6.4.3. 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.

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Presented data were measured on reference PCB (ground) as shown in this specification. When the antenna placement or size of the PCB is changed, antenna performance and values of matching components may differ from data shown here.

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