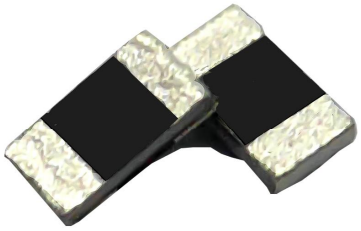
1.6 x 0.8 x 0.3 (mm) Bluetooth Chip Antenna (AA080H)

Engineering Specification

1. Product Number

H	2	U	B	4	K	1	H	1	B	0	2	0	0



2. Features

*Stable and reliable in performances
*Low profile, compact size
*RoHS2.0 compliance
*SMT processes compatible

3. Applications

*ISM 2.4 GHz applications
*ZigBee/BLE applications
*Bluetooth earphone systems
*Hand-held devices when WiFi / Bluetooth functions are needed, e.g., Smart phones
*IEEE802.11 b/g/n
*Wireless PCMCIA cards or USB dongles

4. Description

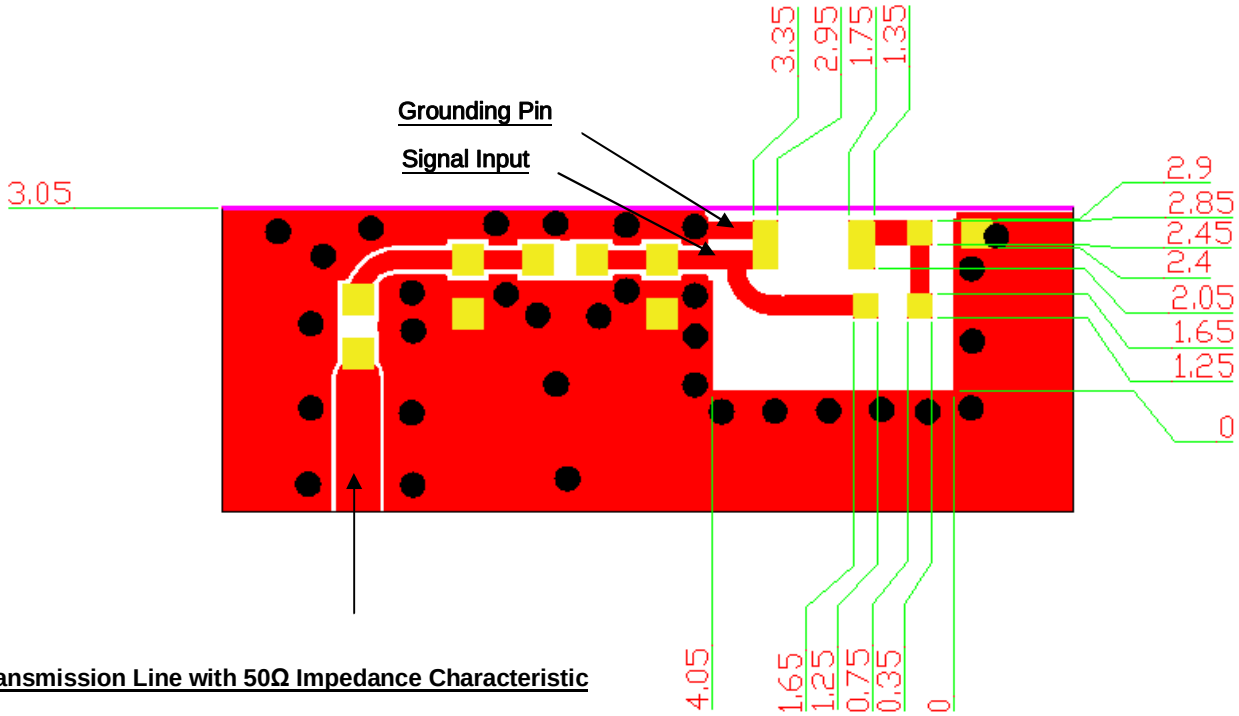
Unictron's AA080H ceramic chip antenna is designed for ISM 2.4GHz applications, covering frequencies 2400~2500MHz. Fabricated with proprietary design and processes, AA080H shows excellent performance and is fully compatible with SMT processes which can decrease the assembly cost and improve device's quality and consistency.

5. Layout Guide & Electrical Specifications

5-1. Layout Guide (unit：mm)

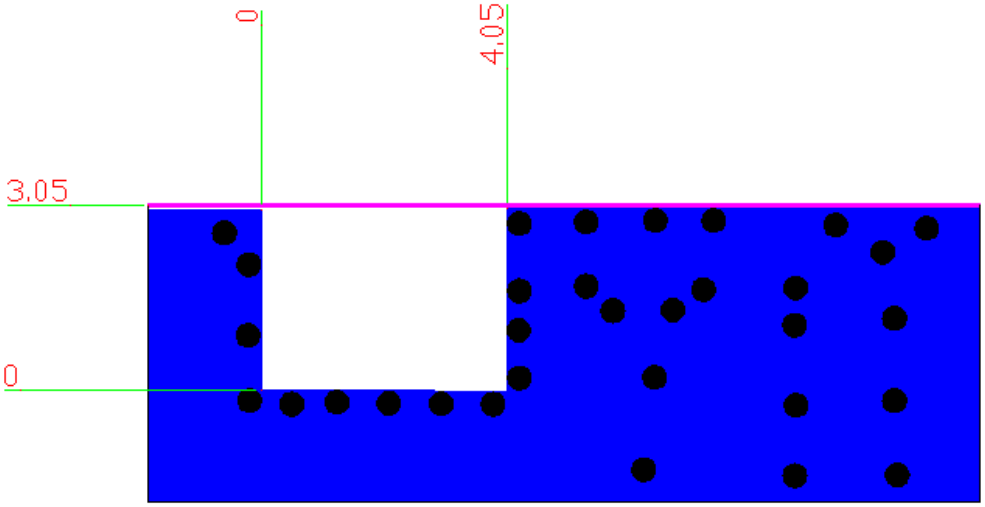
Solder Land Pattern:

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



Transmission Line with 50Ω Impedance Characteristic

Top View



Bottom View

Prepared by : Wen	Designed by : James	Checked by : Mike	Approved by：Herbert

TITLE: 1.6x0.8x0.3(mm) Bluetooth Chip Antenna (AA080H)Engineering Specification	DOCUMENT NO.	H2UB4K1H1B0200	REV. Pre

5-2. Electrical Specifications (Evaluation Board Dimensions: 40 x 20 mm^2)

5-2-1. Electrical Table

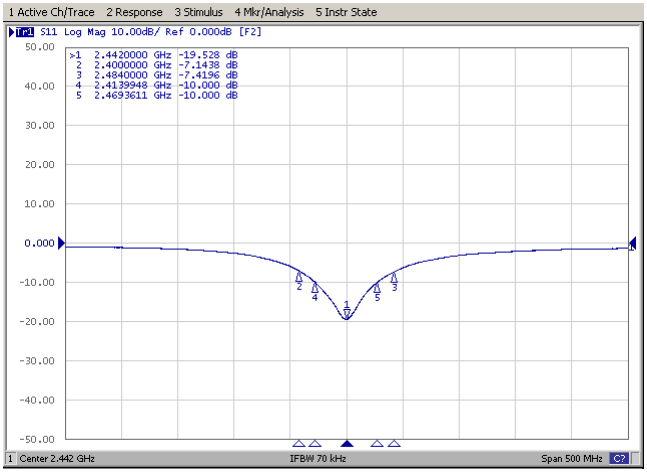
Characteristics		Specifications	Unit
Outline Dimensions		1.6 x 0.8 x 0.3	mm
Ground Plane Dimensions		40 x 20	mm
Working Frequency		2400~2500	MHz
VSWR(@ center frequency)*		2.5 Max.	
Characteristic Impedance		50	Ω
Polarization		Linear Polarization	
Peak Gain	(@2442 MHz)	-0.3 (typical)**	dBi
Efficiency		60 (typical)**	%

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

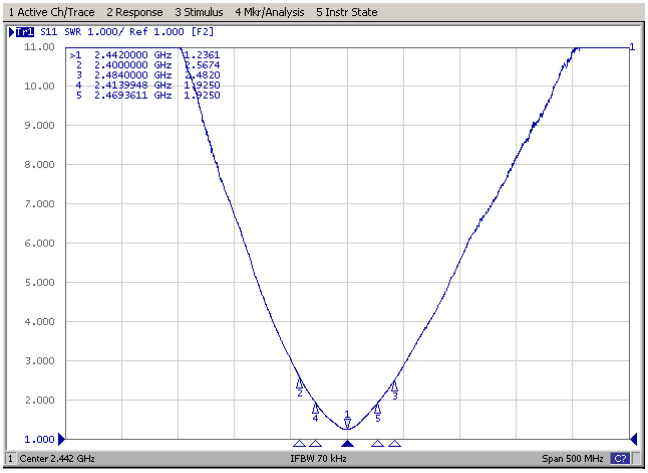
**A Typical value is for reference only, not guaranteed.

5-2-2. Return Loss & VSWR

Return Loss (S_{11})

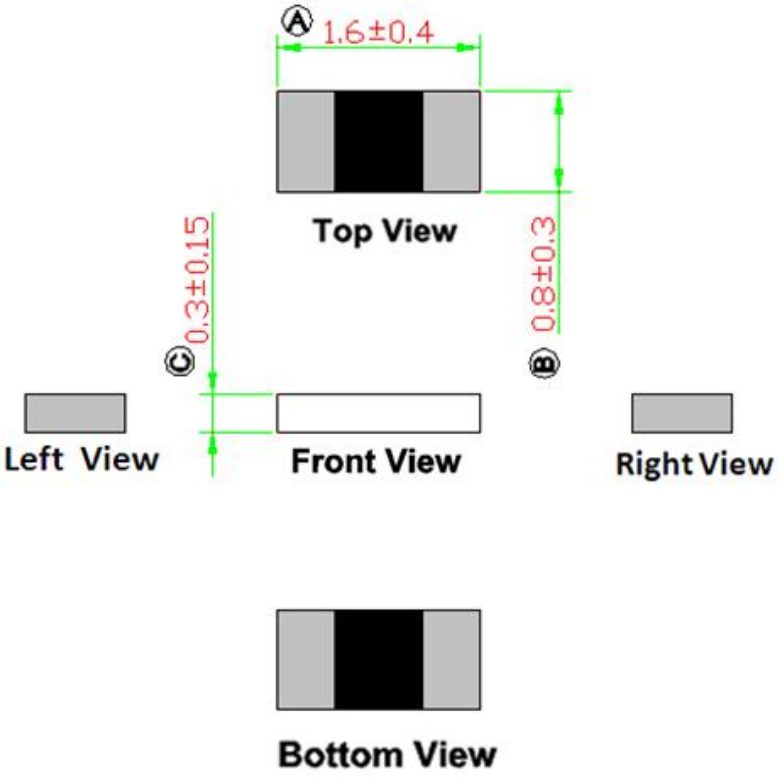


VSWR (S_{11})



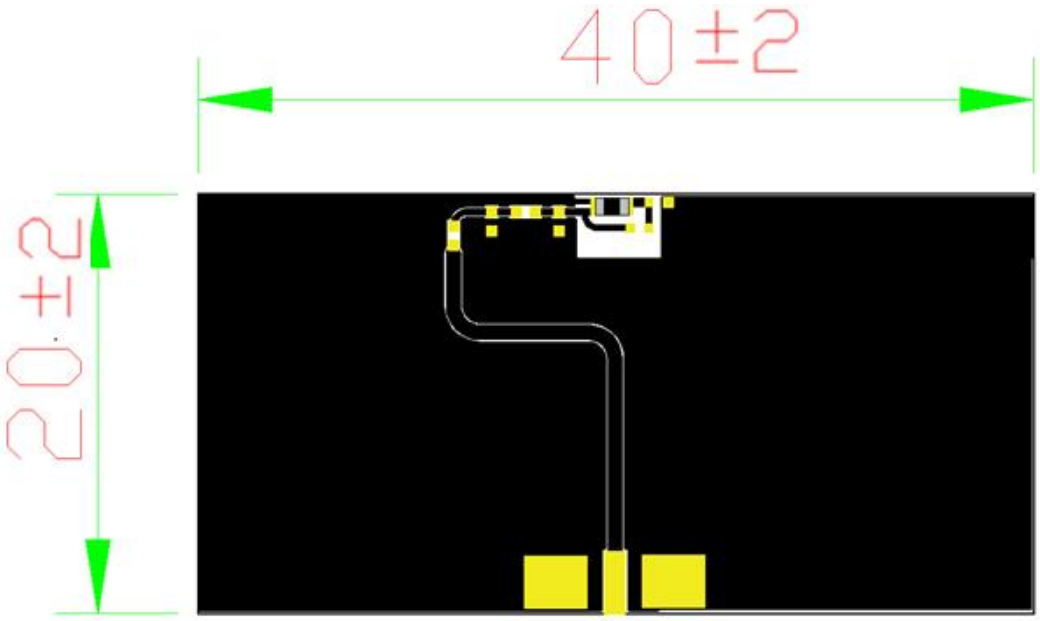
6. Outline Dimensions of Antenna & Evaluation Board (unit: mm)

6-1. Antenna Dimensions



NOTE:
1.All materials are RoHS 2.0 compliant.
2."Ⓐ~Ⓒ" Critical Dimensions.
3."( )" Reference Dimensions.

6-2. Evaluation Board with Antenna



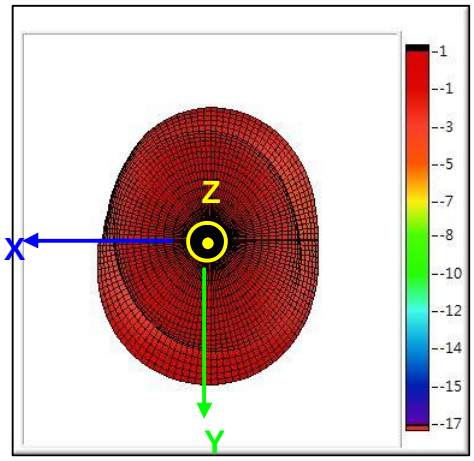
unit : mm

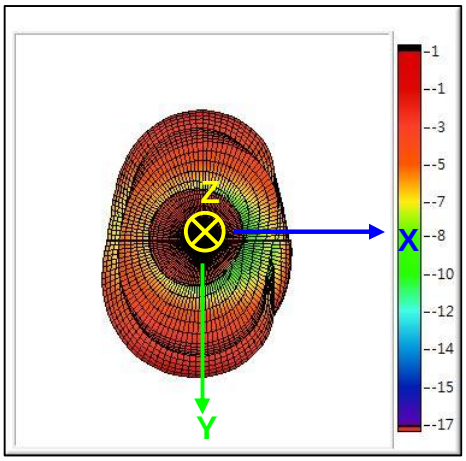
Prepared by : Wen	Designed by : James	Checked by : Mike	Approved by : Herbert

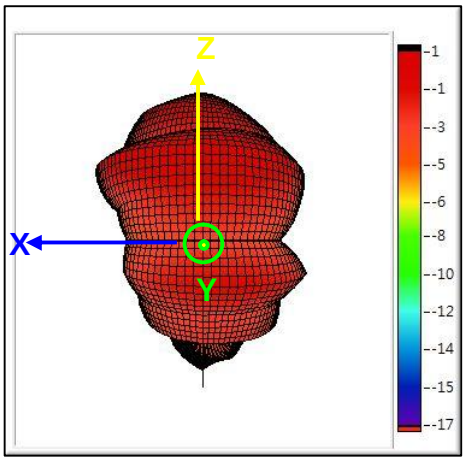
TITLE: 1.6x0.8x0.3(mm) Bluetooth Chip Antenna (AA080H)Engineering Specification	DOCUMENT NO.	H2UB4K1H1B0200	REV. Pre

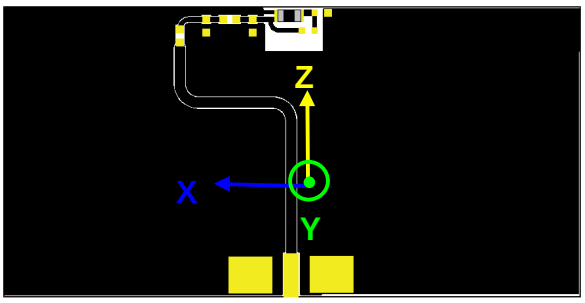
7. Radiation Pattern (with 40 x 20 mm^2 Evaluation Board)

7-1. 3D Gain Pattern @ 2442 MHz (unit: dBi)





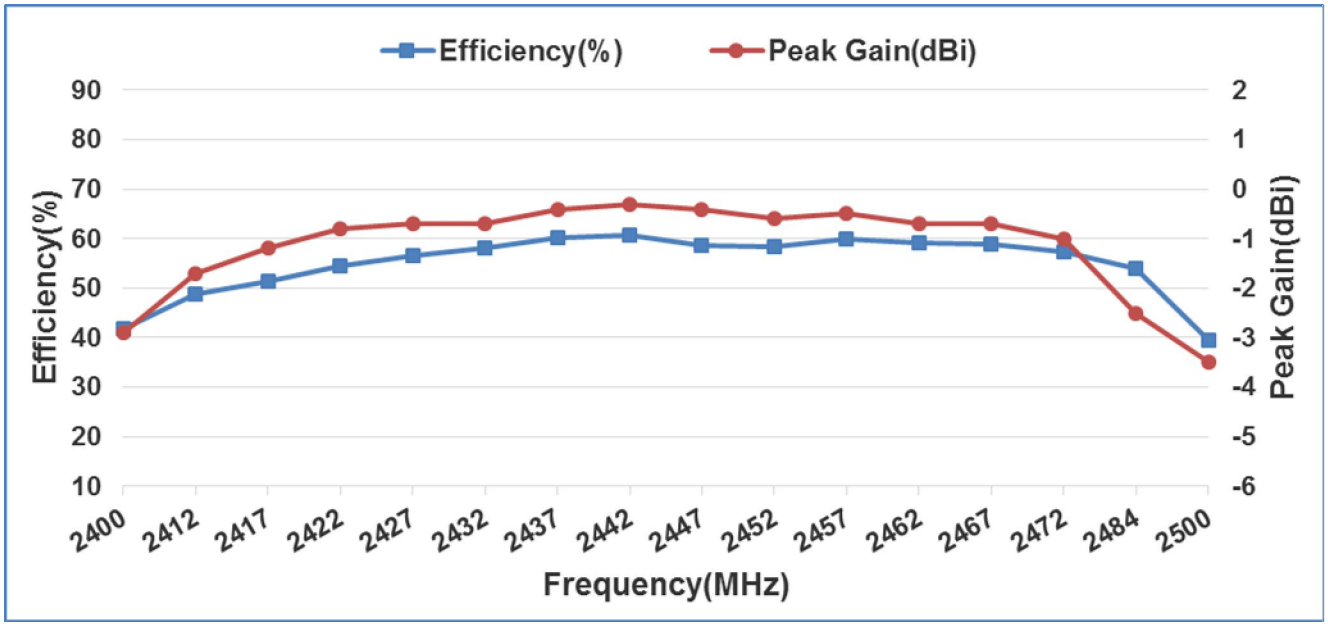




7-2. 3D Efficiency Table

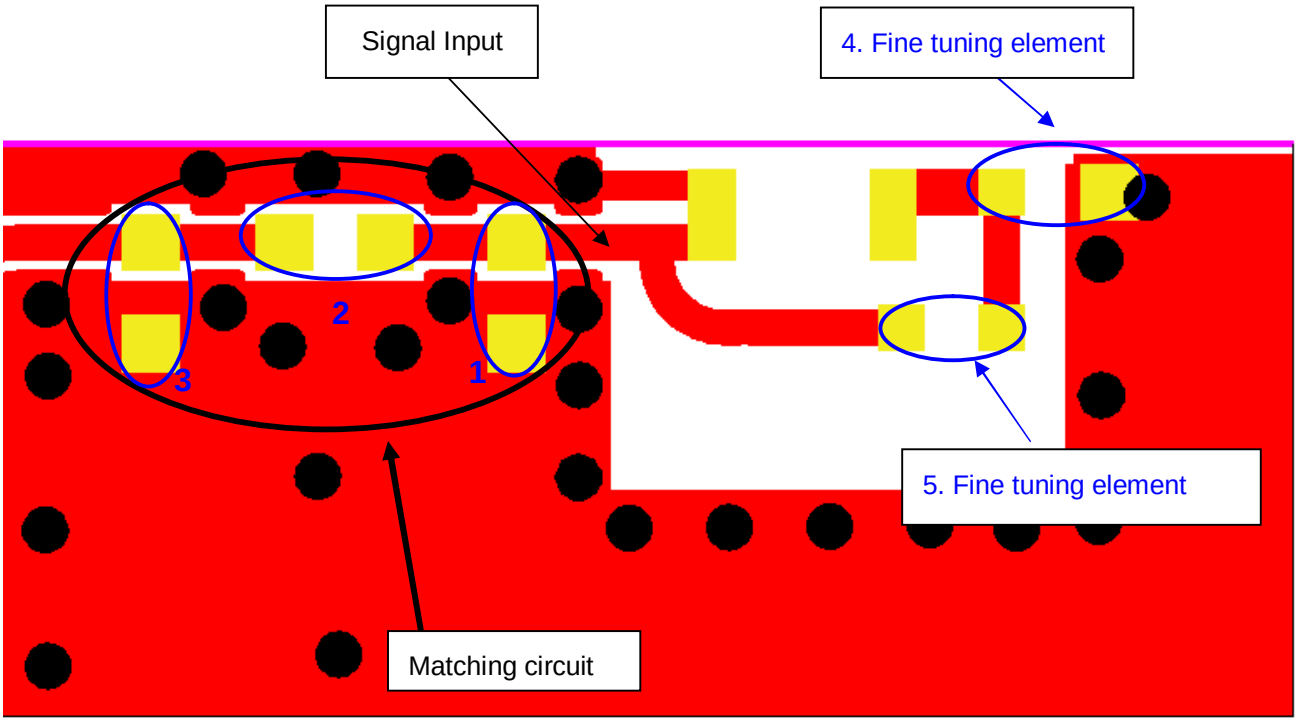
Frequency(MHz)	2400	2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472	2484	2500
Efficiency(dB)	-3.8	-3.1	-2.9	-2.6	-2.5	-2.4	-2.2	-2.2	-2.3	-2.3	-2.2	-2.3	-2.3	-2.4	-2.7	-4.0
Efficiency(%)	41.8	48.9	51.4	54.6	56.5	58.1	60.1	60.7	58.6	58.3	60.0	59.2	59.0	57.4	53.9	39.5
Peak Gain(dBi)	-2.9	-1.7	-1.2	-0.8	-0.7	-0.7	-0.4	-0.3	-0.4	-0.6	-0.5	-0.7	-0.7	-1.0	-2.5	-3.5

7-3. 3D Efficiency vs. Frequency



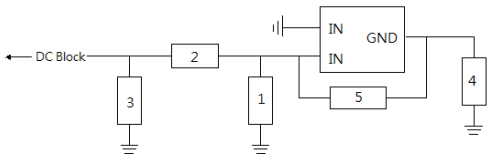
8. Frequency Tuning

8-1. Chip antenna tuning scenario：



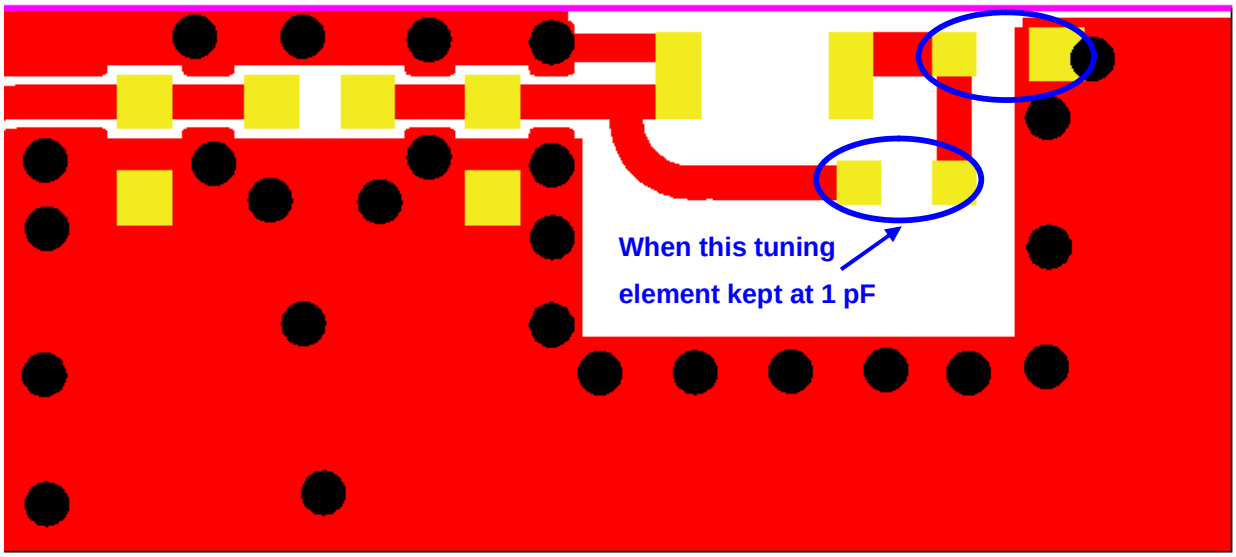
8-2. Matching circuit：

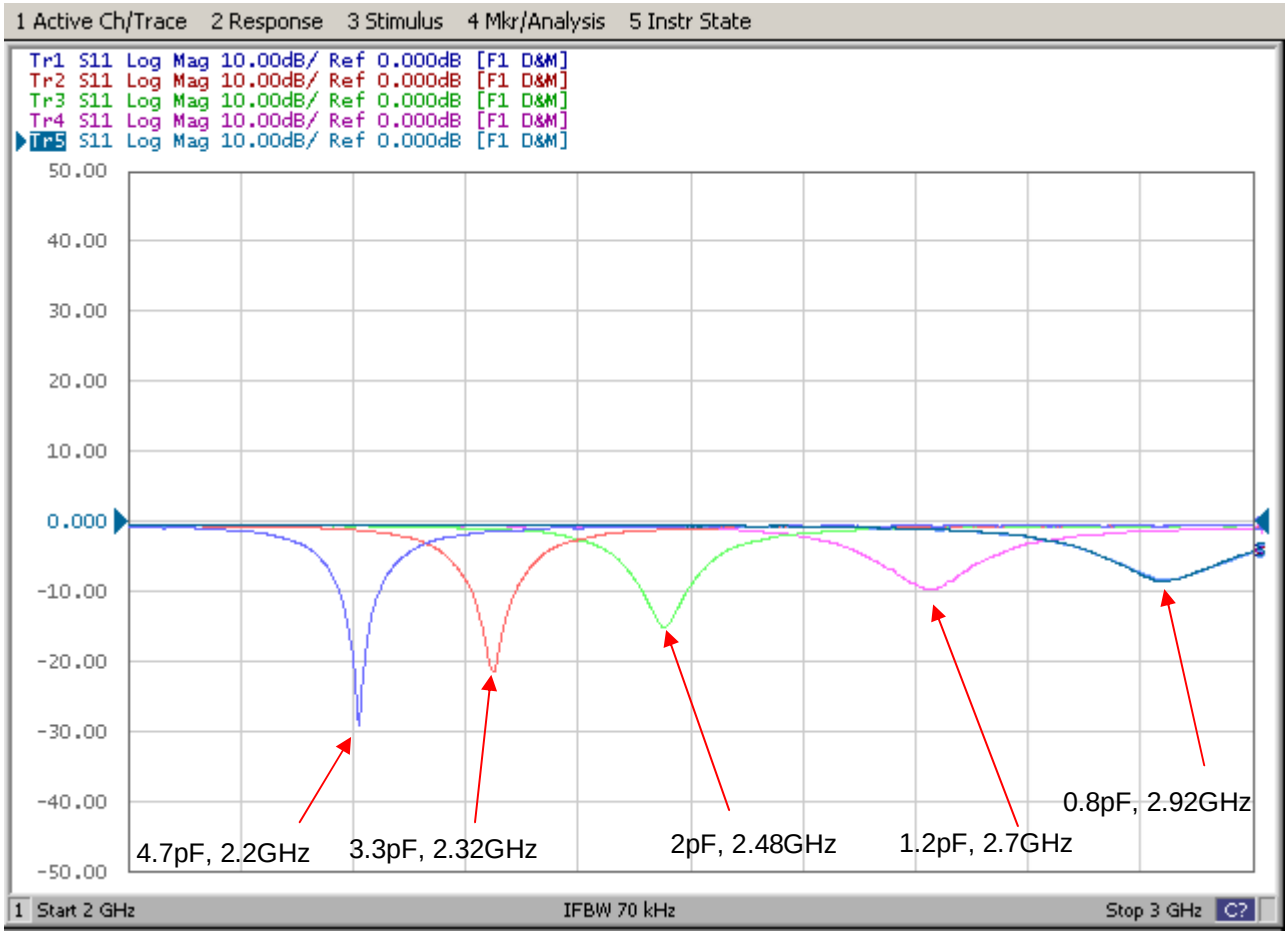
With the following recommended values of matching and tuning components, the center frequencies will be about 2442 MHz at our standard 40 x 20 mm^2 evaluation board. However, these are typical reference values which may need to be changed when circuit boards or part vendors are different.



System Matching Circuit Component			
Location	Description	Vendor	Tolerance
1	N/A	-	-
2	0Ω, (0402)	-	-
3	N/A*	-	-
4 Fine tuning element	2.2pF, (0402)	DARFON	±0.1 pF
5 Fine tuning element	1.2pF, (0402)	DARFON	±0.1 pF

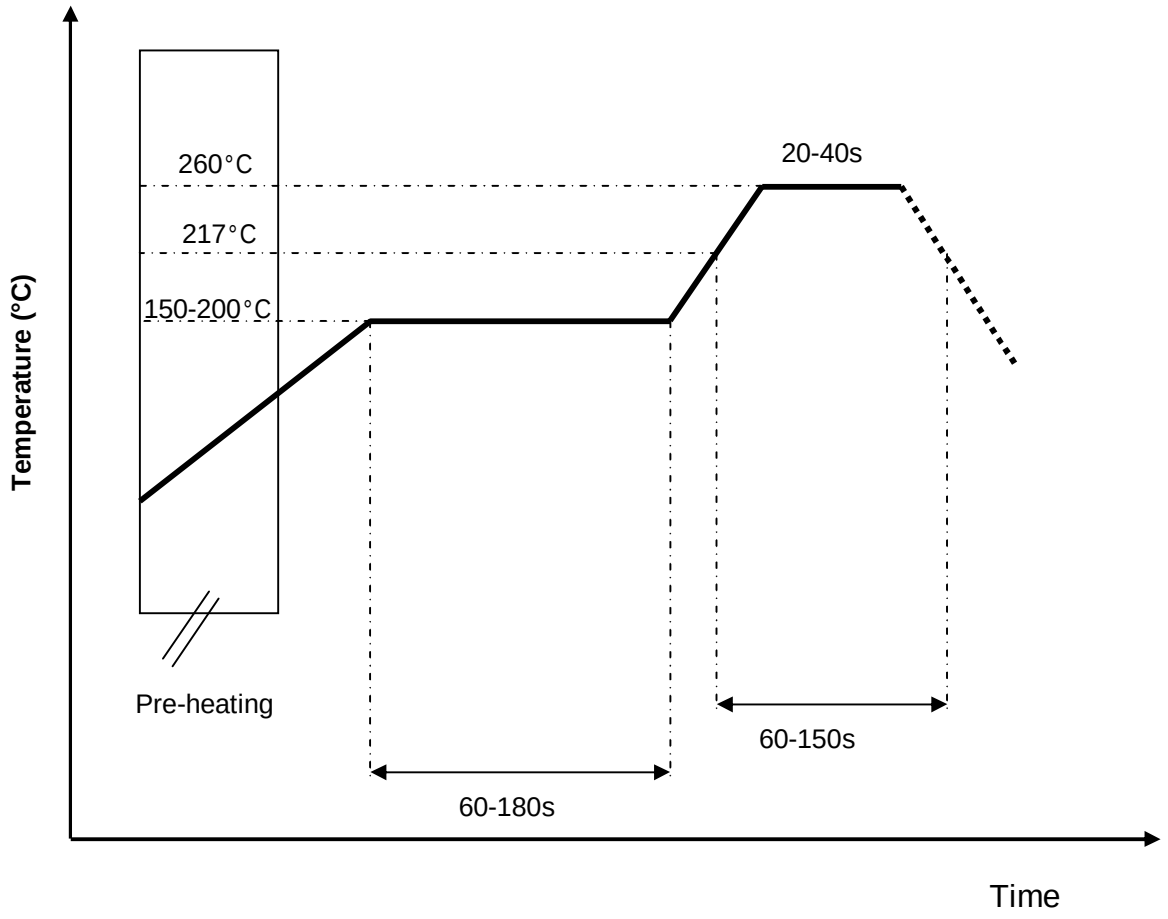
8-3. Reference for frequency tuning element





9. Soldering Conditions:

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



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

10. Reminders for users of Unictron's AA080H ceramic chip antennas

10-1. 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.

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.

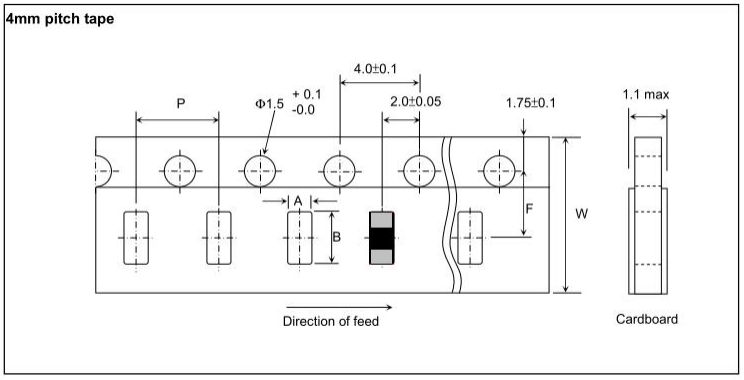
10-3. Be cautious when ultrasonic welding process needs to be used near the locations where chip antennas are installed. Strong ultrasonic vibration may cause the cracking of chip antenna solder joints.

11. Packing:

(1) Quantity/Reel: 5000pcs/Reel

(2) Cardboard tape:

a. Tape Drawing



b. Tape Dimensions (unit: mm)

Feature	Specifications	Tolerances
A	1.1	±0.20
B	1.9	±0.20
F	3.5	±0.05
P	4	±0.10
W	8	±0.20

1. Material: ■Cardboard

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

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.