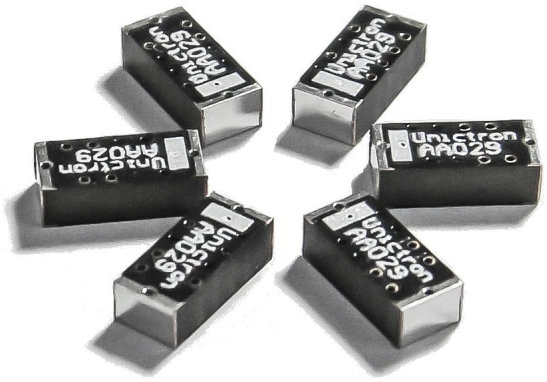
5.0 x 2.2 x 1.6 (mm) WiFi / Bluetooth Chip Antenna (AA029)
Engineering Specification

1. Explanation of Product Number

H	2	U	2	6	2	G	K	B	A	0	1	0	0



2. Features

*Stable and reliable in performances
*Low profile, compact size
*RoHS 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

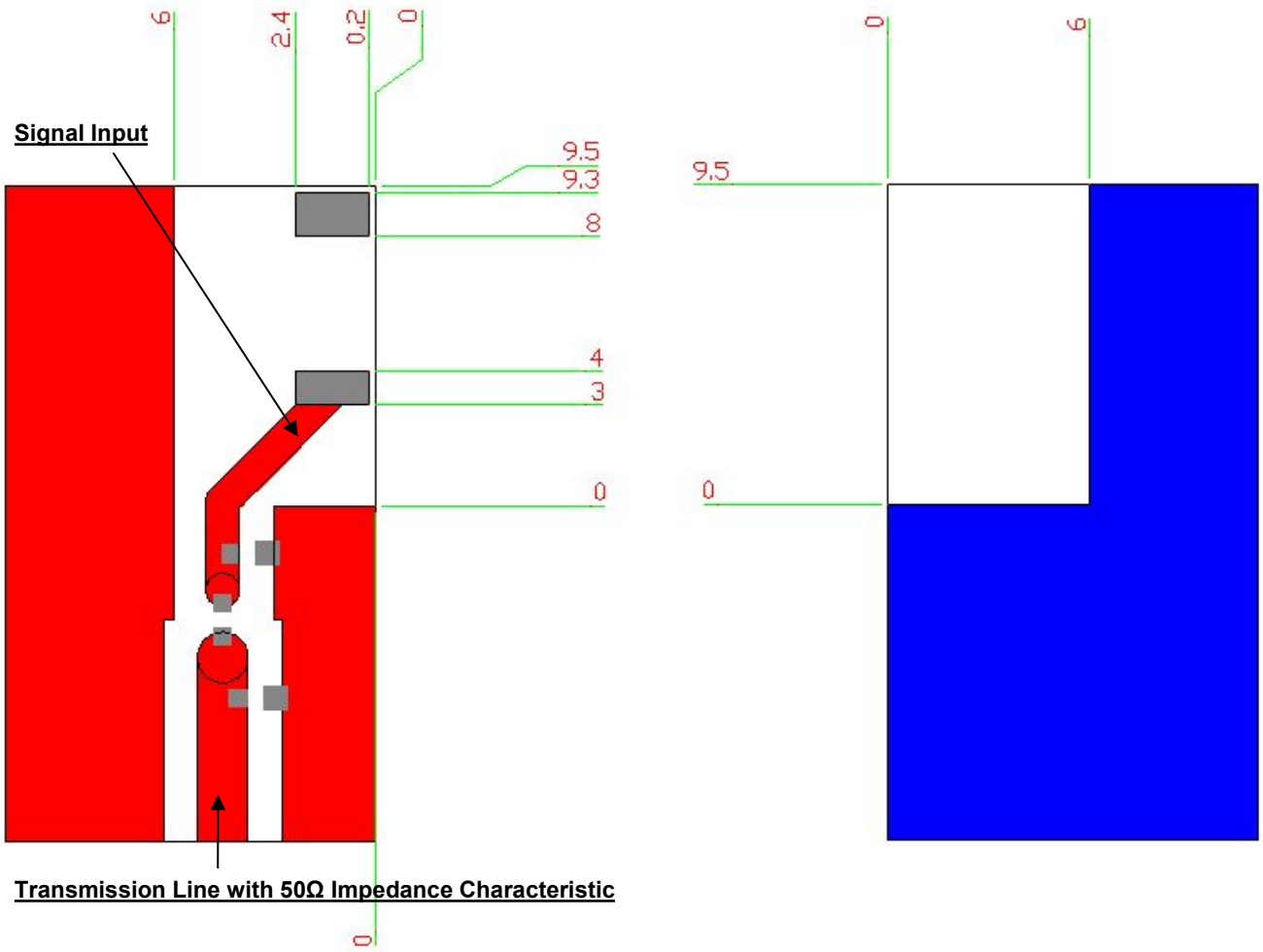
Unictron's AA029 chip antenna is designed for ISM 2.4GHz applications, covering frequencies 2400~2484MHz. Fabricated with proprietary design and processes, AA029 shows excellent performance and is fully compatible with SMT processes which can decrease the assembly cost and improve device's quality and consistency.

5. Layout Guide & Electrical Specifications

5-1. Layout Guide (unit：mm)

Solder Land Pattern:

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



Top View

Bottom View

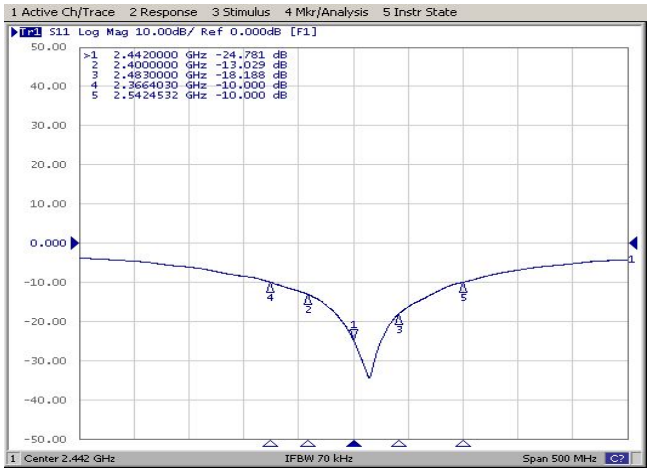
5-2. Electrical Specifications (Evaluation Board Dimensions: 100 x 50 mm^2)

5-2-1. Electrical Table

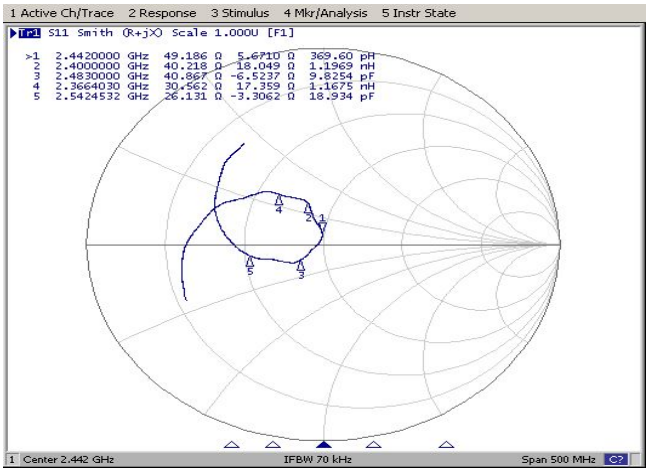
Characteristics		Specifications	Unit
Outline Dimensions		5.0 x 2.2 x 1.6	mm
Working Frequency		2400 ~ 2484	MHz
Bandwidth		140 (typical)	MHz
VSWR		2 Max. (typical)	
Characteristic Impedance		50	Ω
Polarization		Linear Polarization	
Peak Gain	(@2442 MHz)	3.8 (typical)	dBi
Efficiency		65 (typical)	%

5-2. Return Loss & Smith Chart

Return Loss (S_{11})

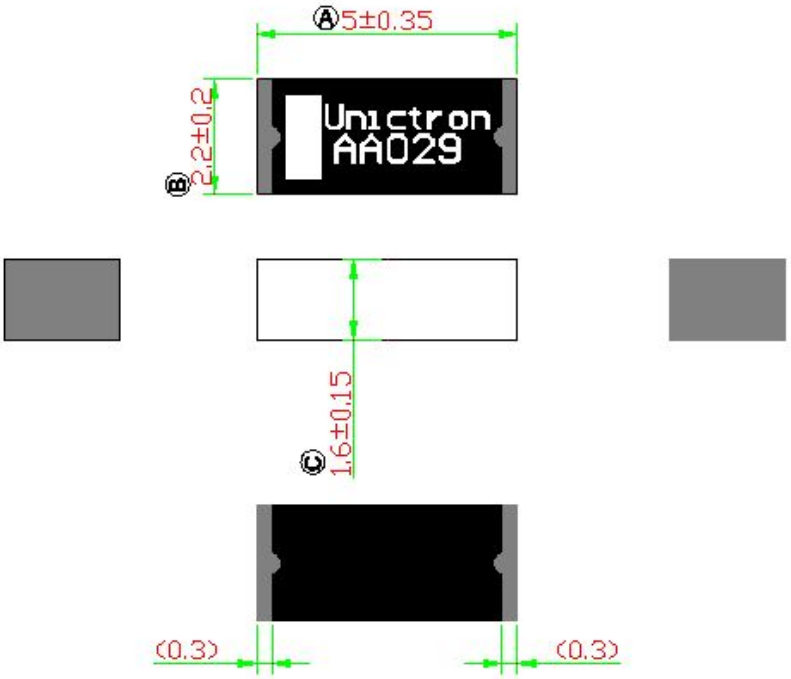


Smith Chart (S_{11})



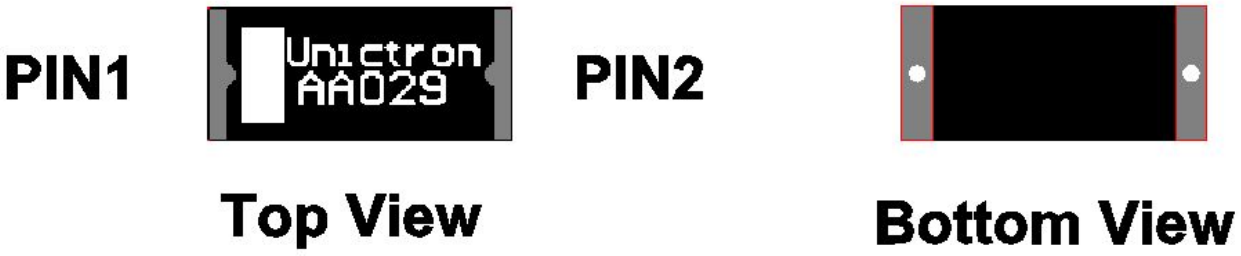
6. Outline Dimensions of Antenna & Evaluation Board (unit: mm)

6-1. Antenna Dimensions



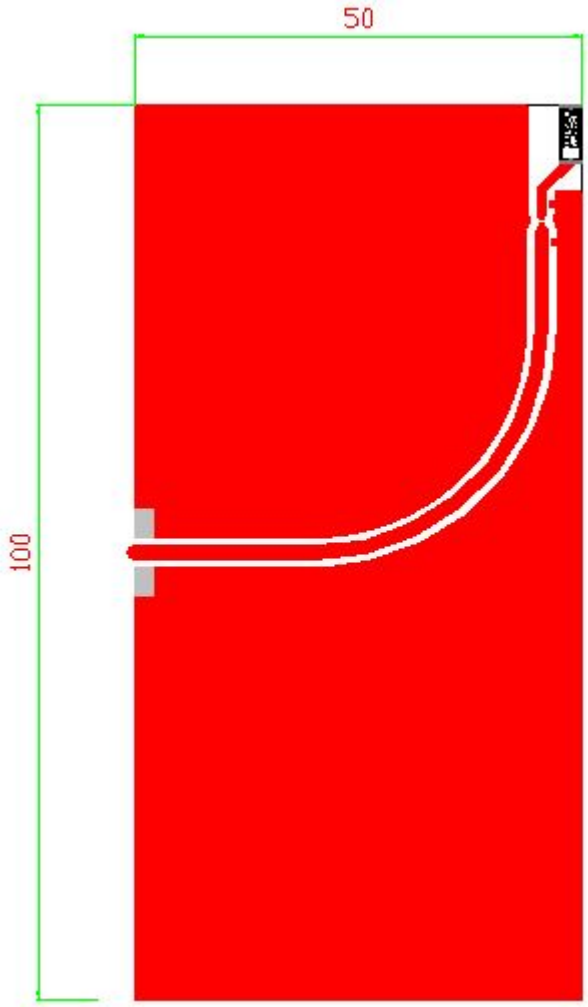
NOTE:
1.All materials are RoHS compliant.
2."Ⓐ~Ⓒ" Critical Dimensions.
3."( )" Reference Dimensions.

PIN Definitions



Item	PIN 1	PIN 2
Terminal	Signal	Soldering Pad

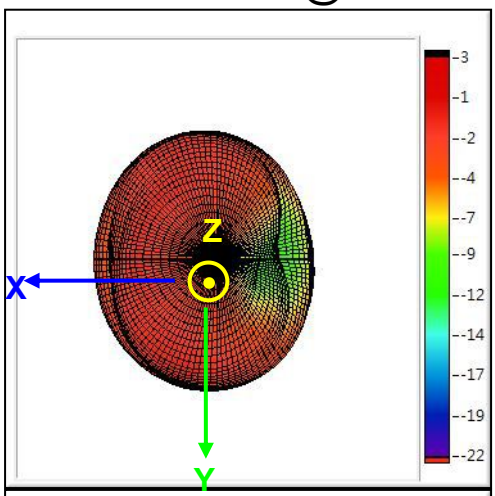
6-2. Evaluation Board with Antenna

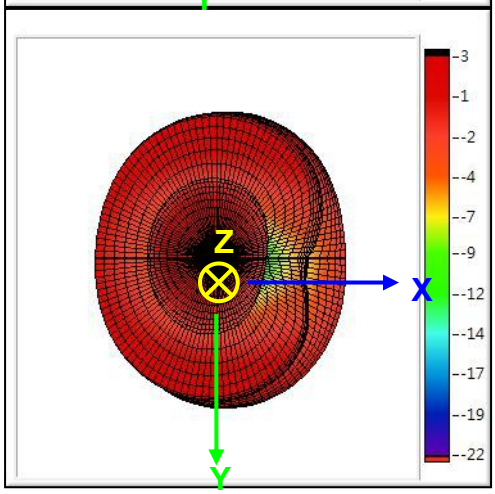


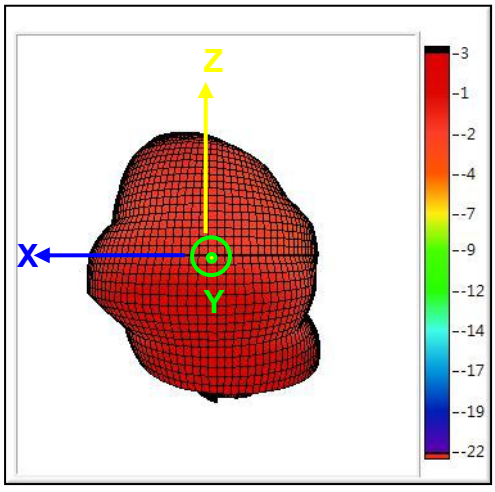
Unit: mm

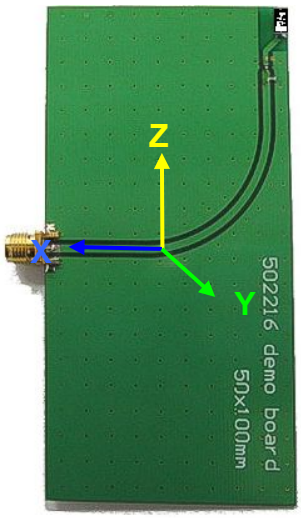
7. Radiation Pattern (with 100 x 50 mm² Evaluation Board)

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





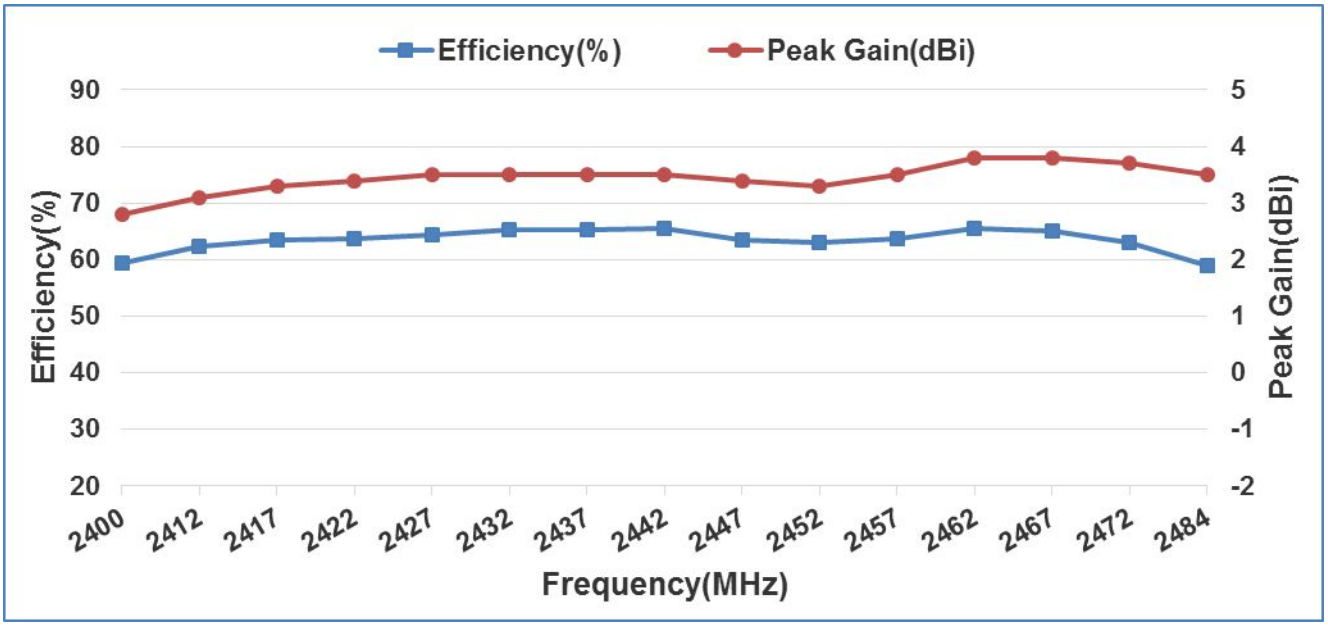




7-2. 3D Efficiency Table

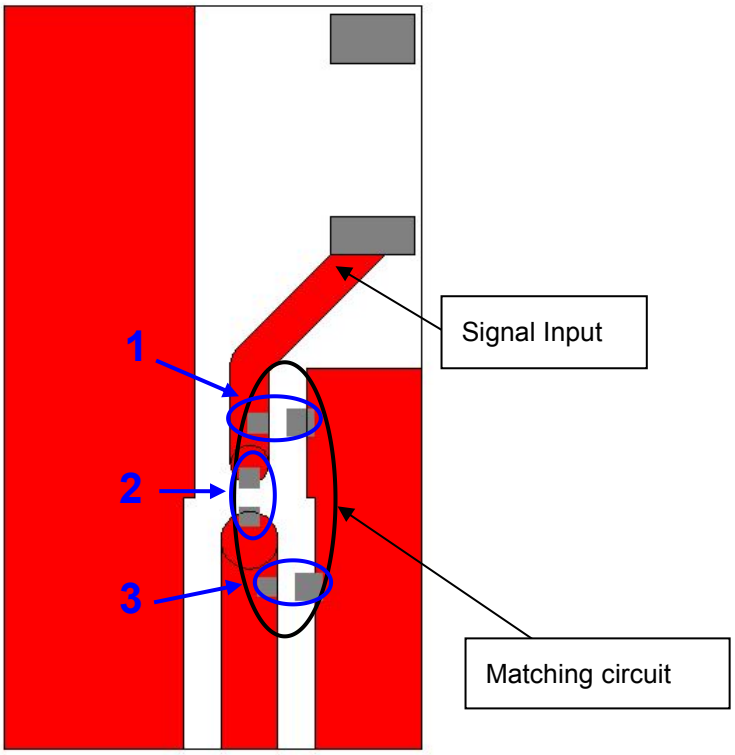
Frequency(MHz)	2400	2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472	2484
Efficiency(dB)	-2.3	-2.0	-2.0	-2.0	-1.9	-1.9	-1.9	-1.8	-2.0	-2.0	-2.0	-1.8	-1.9	-2.0	-2.3
Efficiency (%)	59.3	62.4	63.4	63.8	64.4	65.3	65.2	65.5	63.5	63.1	63.7	65.5	65.0	63.1	59.0
Peak Gain (dBi)	2.8	3.1	3.3	3.4	3.5	3.5	3.5	3.5	3.4	3.3	3.5	3.8	3.8	3.7	3.5

7-3. 3D Efficiency vs. Frequency



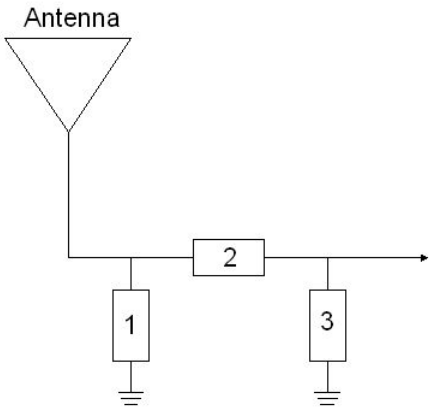
8. Frequency tuning and Matching circuit

8-1. Chip antenna tuning scenario：



8-2. Matching circuit：

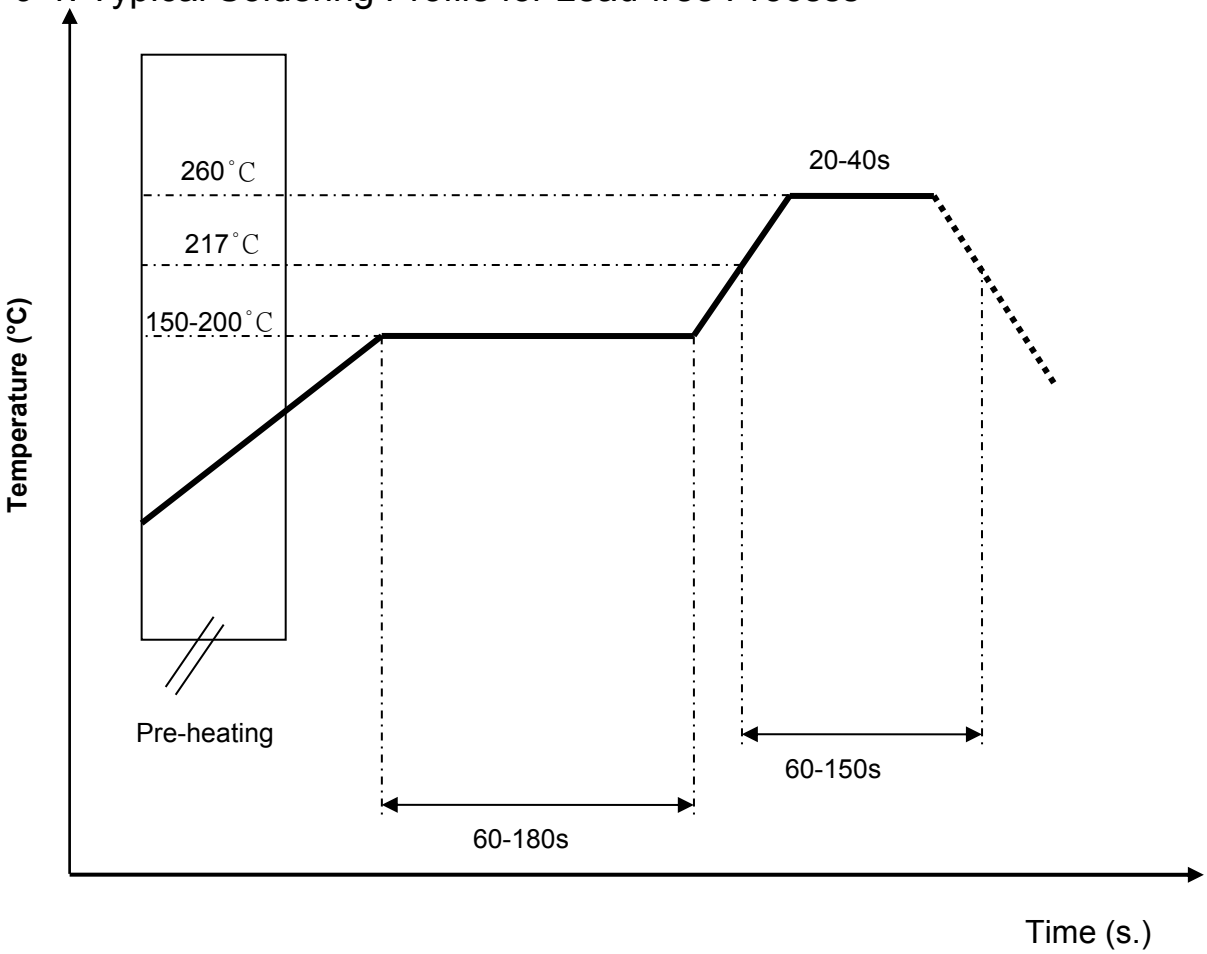
With the following recommended values of matching and tuning components, the center frequencies will be about 2442 MHz at our standard 100 x 50 mm^2 evaluation board. However, these are typical reference values which may need to be changed when circuit boards or part vendors are different.



System Matching Circuit Component			
Location	Description	Vendor	Tolerance
1	N/A*	-	-
2	2.2nH, (0402)	DARFON	±0.1nH
3	1pF, (0402)	DARFON	±0.1pF

9. Soldering Conditions

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

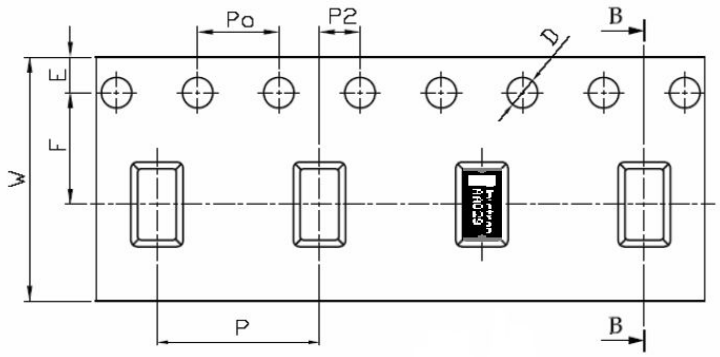


10. Packing

(1) Quantity/Reel: 3000pcs/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

11. Operating & Storage Conditions

11-1. Operating

(1) Maximum Input Power: 2 W

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

11-2. Storage

(1) Storage Temperature: -5℃ to 40℃

(2) Relative Humidity: 20% to 70%

(3) Shelf Life: 1 year

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.