

5.0 x 2.2 x 1.0 (mm) WiFi / Bluetooth Chip Antenna (CW503)

Engineering Specification

1. Product Number

H 2 U 3 6 F 1 K 1 B 0 3 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 CW503 chip antenna is designed for ISM 2.4GHz applications, covering frequencies 2400~2500MHz. Fabricated with proprietary design and processes, CW503 shows excellent performance and is fully compatible with SMT processes which can decrease the assembly cost and improve device's quality and consistency.



詠業科技股份有限公司
Unictron Technologies Corporation
Website: www.unictron.com

THIS DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF UNICTRON TECHNOLOGIES CORPORATION AND SHALL NOT BE REPRODUCED OR USED AS THE BASIS FOR THE MANUFACTURE OR SALE OF APPARATUS OR DEVICES WITHOUT PERMISSION

Prepared by : Xenia

Designed by : Peter

Checked by : Mike

Approved by : Herbert

TITLE : 5.0 x 2.2 x 1.0 (mm) WiFi Band Chip
Antenna(CW503) Engineering Specification

DOCUMENT
NO.

H2U36F1K1B0300

REV.

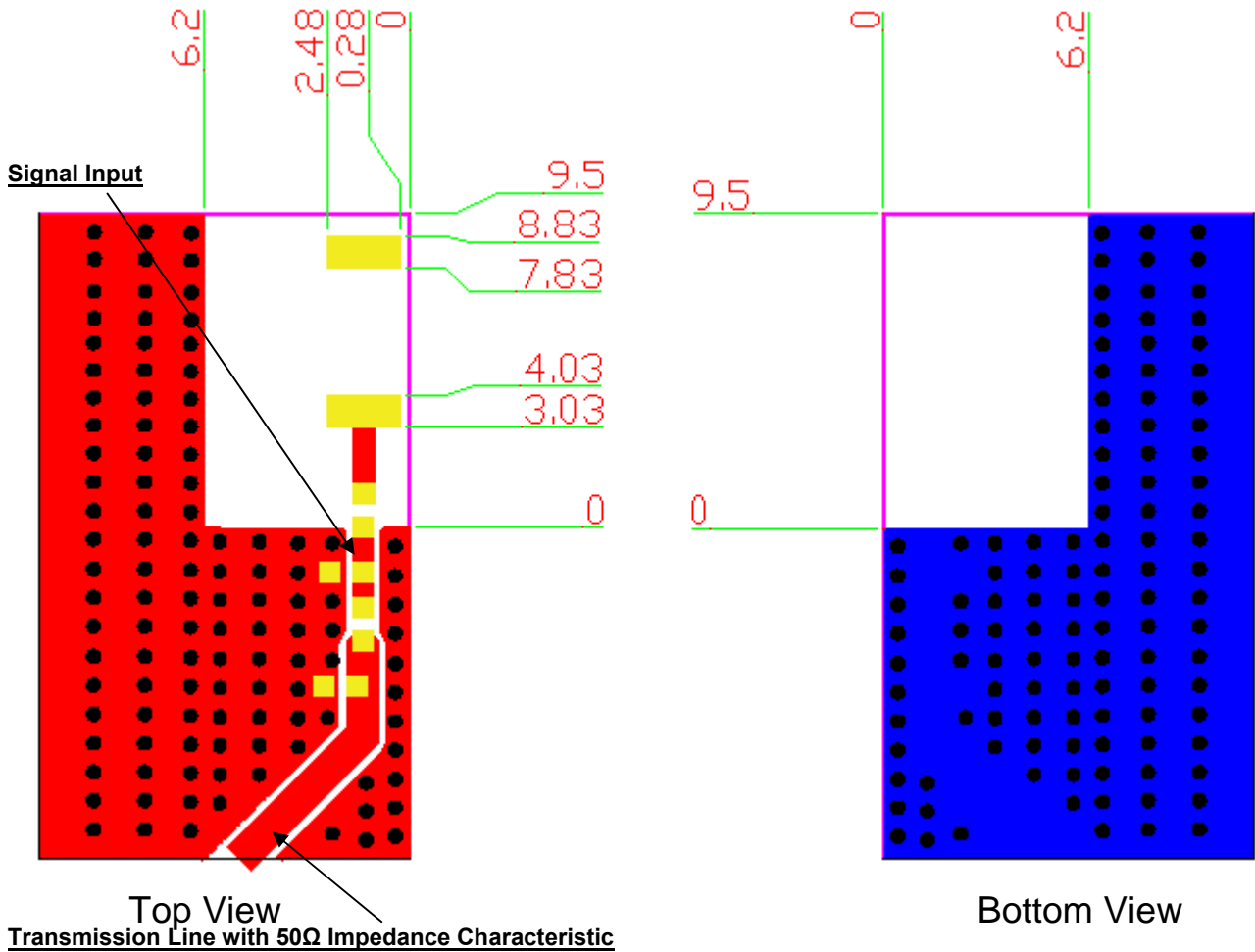
A

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.



詠業科技股份有限公司
 Unictron Technologies Corporation
 Website: www.unictron.com

THIS DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF UNICTRON TECHNOLOGIES CORPORATION AND SHALL NOT BE REPRODUCED OR USED AS THE BASIS FOR THE MANUFACTURE OR SALE OF APPARATUS OR DEVICES WITHOUT PERMISSION

Prepared by : Xenia

Designed by : Peter

Checked by : Mike

Approved by : Herbert

TITLE : 5.0 x 2.2 x 1.0 (mm) WiFi Band Chip
 Antenna(CW503) Engineering Specification

DOCUMENT
 NO.

H2U36F1K1B0300

REV.
 A

5-2. Electrical Specifications (Evaluation Board Dimensions: 40 x 40 mm²)

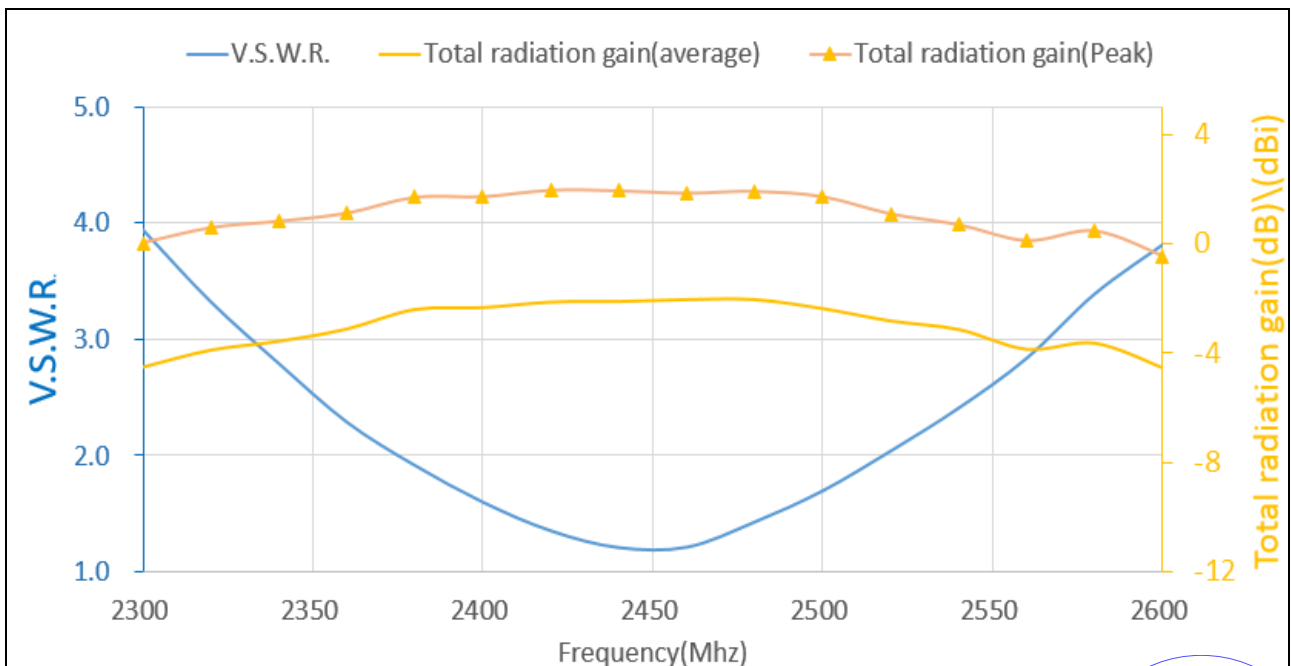
5-2-1. Electrical Table (2400~2500 MHz Band)

Characteristics		Specifications	Unit
Outline Dimensions		5.0 x 2.2 x 1.0	mm
Ground Plane Dimensions		40 x 40	mm
Working Frequency		2400~ 2500	MHz
VSWR (@ center frequency)*		< 2:1	
Characteristic Impedance		50	Ω
Polarization		Linear Polarization	
Peak Gain	(@2442 MHz)	1.9(typical**)	dBi
Efficiency		62.3(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. Frequency vs. V.S.W.R. and Total Radiation Gain



Unictron
Technologies Corp.
2017-05-26
Document
Control Center



詠業科技股份有限公司
Unictron Technologies Corporation
Website: www.unictron.com

THIS DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF UNICTRON TECHNOLOGIES CORPORATION AND SHALL NOT BE REPRODUCED OR USED AS THE BASIS FOR THE MANUFACTURE OR SALE OF APPARATUS OR DEVICES WITHOUT PERMISSION

Prepared by : Xenia

Designed by : Peter

Checked by : Mike

Approved by : Herbert

TITLE : 5.0 x 2.2 x 1.0 (mm) WiFi Band Chip
Antenna(CW503) Engineering Specification

DOCUMENT
NO.

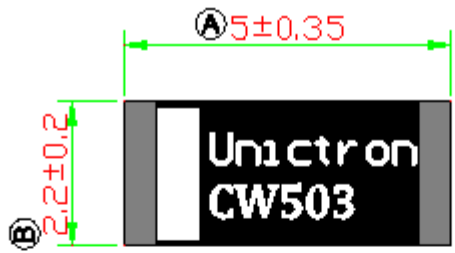
H2U36F1K1B0300

REV.

A

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

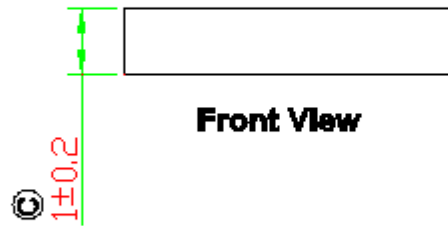
6-1. Antenna Dimensions



Top View



Left View



Front View



Right View

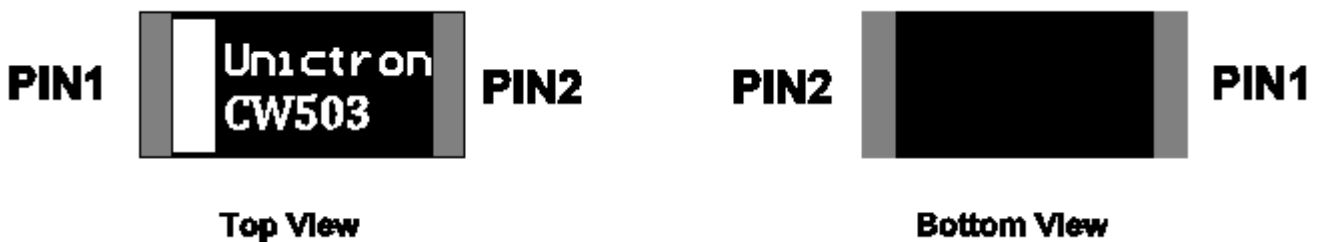


Bottom View

NOTE:

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

PIN Definition



PIN	1	2
Soldering PAD	Signal	N/C



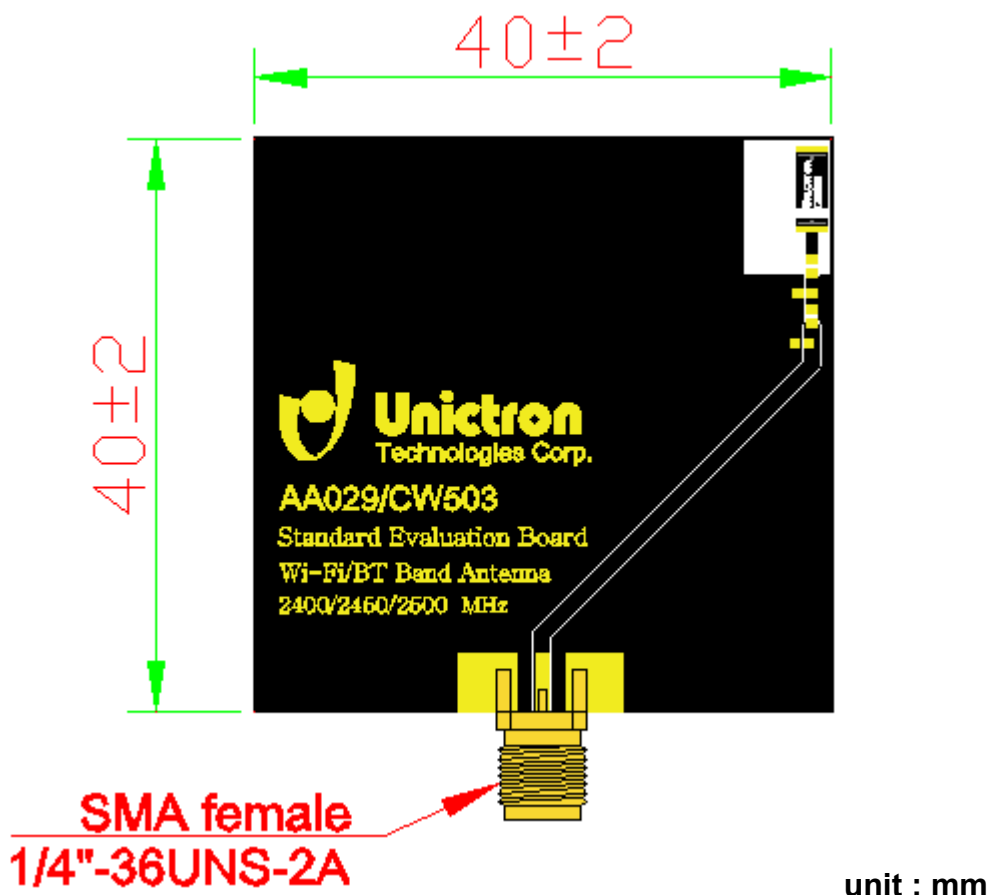
詠業科技股份有限公司
Unictron Technologies Corporation
Website: www.unictron.com

THIS DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF UNICTRON TECHNOLOGIES CORPORATION AND SHALL NOT BE REPRODUCED OR USED AS THE BASIS FOR THE MANUFACTURE OR SALE OF APPARATUS OR DEVICES WITHOUT PERMISSION

Prepared by : Xenia Designed by : Peter Checked by : Mike Approved by : Herbert

TITLE : 5.0 x 2.2 x 1.0 (mm) WiFi Band Chip Antenna(CW503) Engineering Specification	DOCUMENT NO.	H2U36F1K1B0300	REV.
			A

6-2. Evaluation Board with Antenna



詠業科技股份有限公司
Unictron Technologies Corporation
Website: www.unictron.com

THIS DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF UNICTRON TECHNOLOGIES CORPORATION AND SHALL NOT BE REPRODUCED OR USED AS THE BASIS FOR THE MANUFACTURE OR SALE OF APPARATUS OR DEVICES WITHOUT PERMISSION

Prepared by : Xenia

Designed by : Peter

Checked by : Mike

Approved by : Herbert

TITLE : 5.0 x 2.2 x 1.0 (mm) WiFi Band Chip
Antenna(CW503) Engineering Specification

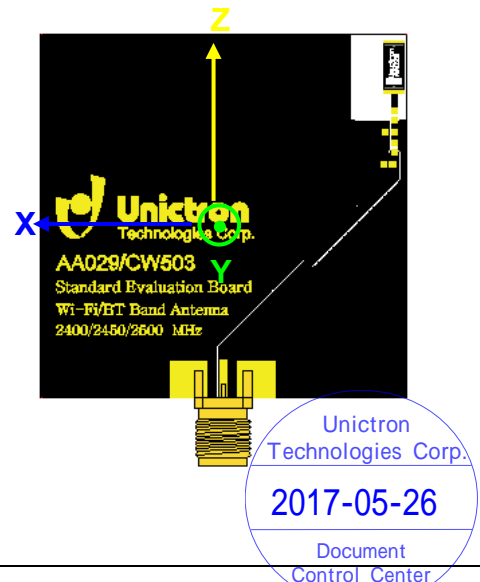
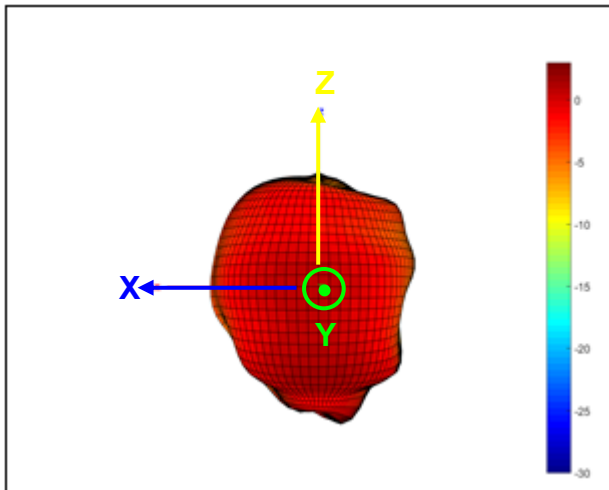
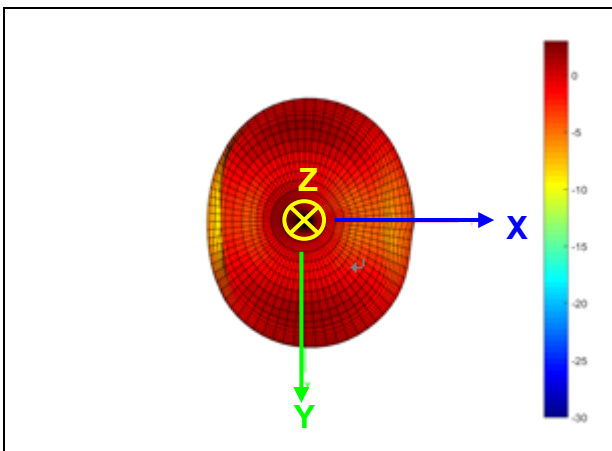
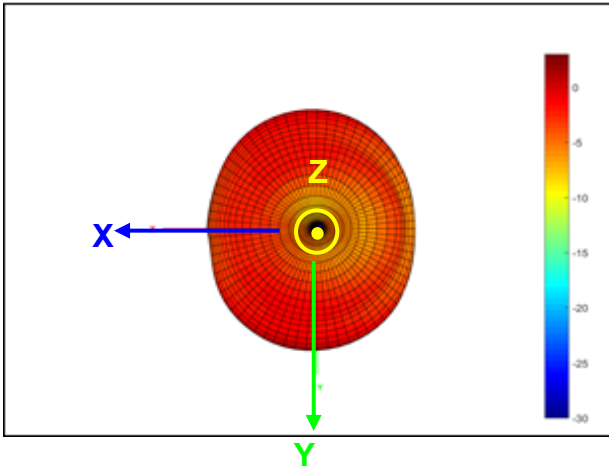
DOCUMENT
NO.

H2U36F1K1B0300

REV.
A

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

3D Radiation Gain Pattern @ 2450 MHz (unit: dBi)



詠業科技股份有限公司
Unictron Technologies Corporation
Website: www.unictron.com

THIS DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF UNICTRON TECHNOLOGIES CORPORATION AND SHALL NOT BE REPRODUCED OR USED AS THE BASIS FOR THE MANUFACTURE OR SALE OF APPARATUS OR DEVICES WITHOUT PERMISSION

Prepared by : Xenia

Designed by : Peter

Checked by : Mike

Approved by : Herbert

TITLE : 5.0 x 2.2 x 1.0 (mm) WiFi Band Chip
Antenna(CW503) Engineering Specification

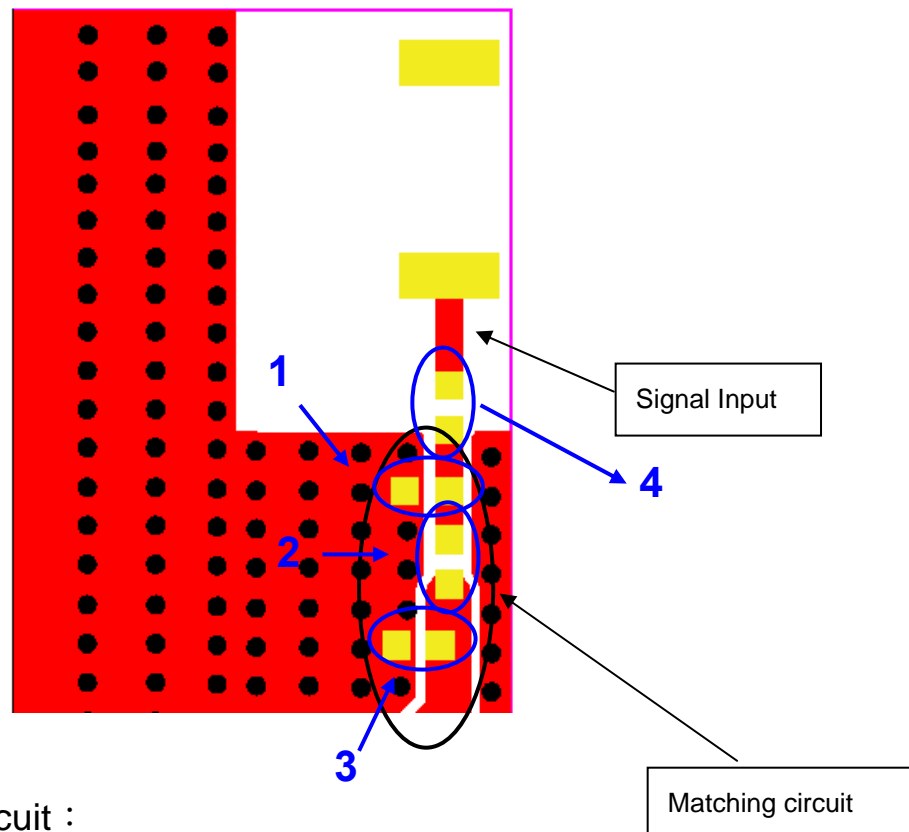
DOCUMENT
NO.

H2U36F1K1B0300

REV.
A

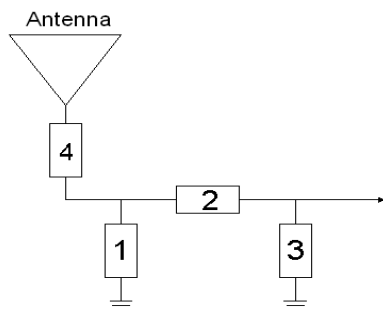
8. Frequency tuning and Matching circuit

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 2450 MHz at our standard 40x40 mm² evaluation board. However, these are reference values, may need to be changed when the circuit boards or part vendors are different.



System Matching Circuit Component			
Location	Description	Vendor	Tolerance
1	N/A*	-	-
2	3.3nH, (0402)	DARFON	±0.1nH
3	1.5pF, (0402)	MURATA	±0.1pF
4	0Ω, (0402)	-	-

2017-05-26

Document Control Center



詠業科技股份有限公司
Unictron Technologies Corporation
Website: www.unictron.com

THIS DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF UNICTRON TECHNOLOGIES CORPORATION AND SHALL NOT BE REPRODUCED OR USED AS THE BASIS FOR THE MANUFACTURE OR SALE OF APPARATUS OR DEVICES WITHOUT PERMISSION

Prepared by : Xenia

Designed by : Peter

Checked by : Mike

Approved by : Herbert

TITLE : 5.0 x 2.2 x 1.0 (mm) WiFi Band Chip
Antenna(CW503) Engineering Specification

DOCUMENT NO.

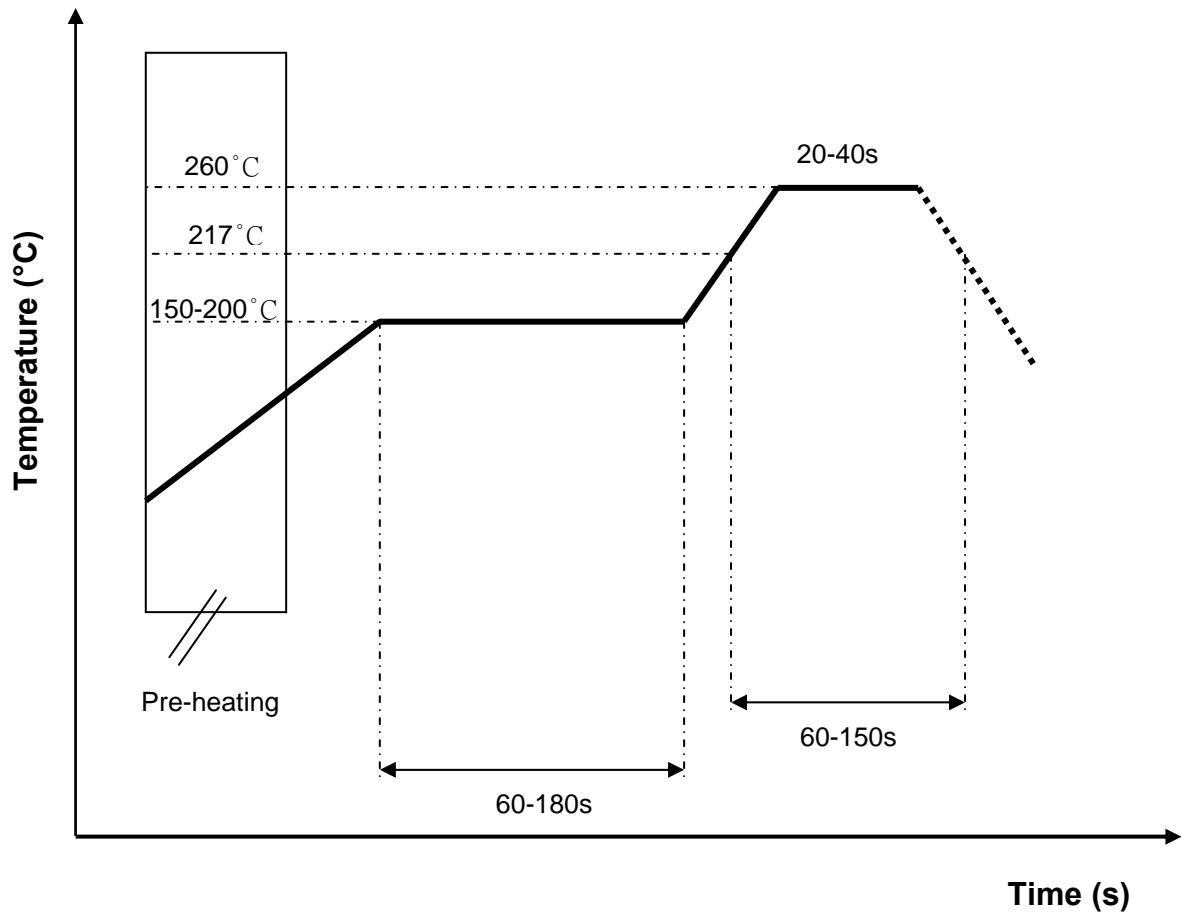
H2U36F1K1B0300

REV.

A

9. Soldering Conditions

Typical Soldering Profile for Lead-free Process



詠業科技股份有限公司
Unictron Technologies Corporation
Website: www.unictron.com

THIS DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF UNICTRON TECHNOLOGIES CORPORATION AND SHALL NOT BE REPRODUCED OR USED AS THE BASIS FOR THE MANUFACTURE OR SALE OF APPARATUS OR DEVICES WITHOUT PERMISSION

Prepared by : Xenia

Designed by : Peter

Checked by : Mike

Approved by : Herbert

TITLE : 5.0 x 2.2 x 1.0 (mm) WiFi Band Chip
Antenna(CW503) Engineering Specification

DOCUMENT
NO.

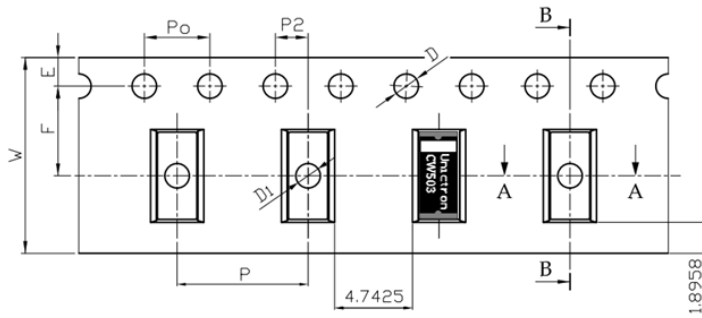
H2U36F1K1B0300

REV.
A

10. Packing

- (1) Quantity/Reel: 5500 pcs/Reel
- (2) Plastic tape: Black conductive polystyrene

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
P0	4.00	±0.10
D1	1.50	±0.10
10P0	40.00	±0.20

11. Operating & Storage Conditions

11-1. Operating

- (1) Maximum Input Power: 2 W
- (2) Operating Temperature: -40°C to 85°C
- (3) Relative Humidity: 10% to 70%

11-2. Storage (sealed)

- (1) Storage Temperature: -5°C to 40°C
- (2) Relative Humidity: 20% to 70%
- (3) Shelf Life: 1 year

11-3. Storage (unsealed)

Meet the criteria of J-STD-033 MSL2a

11-4. Storage (After mounted on customer's PCB with SMT process)

- (1) Storage Temperature: -40°C to 85°C
- (2) Relative Humidity: 10% to 70%



詠業科技股份有限公司
Unictron Technologies Corporation
Website: www.unictron.com

THIS DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF UNICTRON TECHNOLOGIES CORPORATION AND SHALL NOT BE REPRODUCED OR USED AS THE BASIS FOR THE MANUFACTURE OR SALE OF APPARATUS OR DEVICES WITHOUT PERMISSION

Prepared by : Xenia

Designed by : Peter

Checked by : Mike

Approved by : Herbert

TITLE : 5.0 x 2.2 x 1.0 (mm) WiFi Band Chip
Antenna(CW503) Engineering Specification

DOCUMENT
NO.

H2U36F1K1B0300

REV.

A

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.



詠業科技股份有限公司
Unictron Technologies Corporation
Website:www.unictron.com

THIS DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF UNICTRON TECHNOLOGIES CORPORATION AND SHALL NOT BE REPRODUCED OR USED AS THE BASIS FOR THE MANUFACTURE OR SALE OF APPARATUS OR DEVICES WITHOUT PERMISSION

Prepared by : **Xenia**

Designed by : **Peter**

Checked by : **Mike**

Approved by : **Herbert**

**TITLE : 5.0 x 2.2 x 1.0 (mm) WiFi Band Chip
Antenna(CW503) Engineering Specification**

**DOCUMENT
NO.**

H2U36F1K1B0300

REV.

A