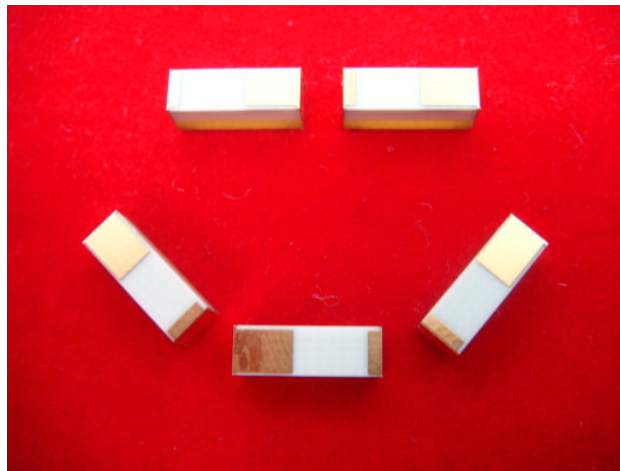


# 10 x 3.2 x 3.9 GPS Chip Antenna (AA064B)


## 1. Explanation of Product Number

|          |          |          |          |          |          |          |          |          |          |          |          |          |          |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| <u>H</u> | <u>2</u> | <u>U</u> | <u>1</u> | <u>6</u> | <u>3</u> | <u>1</u> | <u>S</u> | <u>1</u> | <u>A</u> | <u>0</u> | <u>2</u> | <u>0</u> | <u>0</u> |
|          |          |          |          | (1)      | (2)      | (3)      | (4)      |          |          | (5)      |          |          |          |



### Product Code:

- (1) Product Categories:  
6: polymer substrate antenna
- (2) Dimensions:  
31: 10 x 3.2 x 3.9 (mm)
- (3) Material:  
S: RGF
- (4) Working Frequency:  
1A: 1575.42MHz
- (5) Antenna Series:  
02: serial number

|  |                       |  |                       |
|--|-----------------------|--|-----------------------|
| <b>Tolerances (Unless otherwise specified)</b><br>X : $\pm 1$ X.X : $\pm 0.1$ X.XX : $\pm 0.01$<br>Angle : $\pm$ Hole Dia. : $\pm$ |                       |  <b>Unictron Technologies Corporation</b><br>Website: <a href="http://www.unictron.com">www.unictron.com</a> |                       |
| Scale :  | Unit : mm             | THIS SPECIFICATION IS THE PROPERTY OF UNICTRON TECHNOLOGIES CORPORATION AND SHALL NOT BE REPRODUCED OR USED IN ALL CIRCUMSTANCES WITHOUT WRITTEN PERMISSION                                      |                       |
| Prepared By : Meiping  | Checked By : Mike     |  |                       |
| Designed By : Chinling   | Approved By : Herbert |  |                       |
| <b>TITLE : 10x3.2x3.9 GPS Chip Antenna (AA064B)</b>  |                       | <b>DOCUMENT NO.</b>  | <b>H2U1631S1A0200</b> |
|  |                       |  | REV.<br><b>B</b>      |

## 2. Features

- \*Stable and reliable in performances
- \*Low temperature coefficient of frequency
- \*Compact size
- \*RoHS compliance

## 3. Applications

- \*Navigation systems or position tracking systems
- \*Hand-held devices when GPS function is needed, e.g., PDA, Smart phone, PND.

## 4. Description


Unictron's chip antenna series are specially designed for GPS application. Based on Unictron's proprietary design and processes, this chip antenna has excellent stability and sensitivity to consistently provide high signal reception efficiency.

## 5. Electrical Specifications (80x40(mm) ground plane)

5-1. Electrical Table:

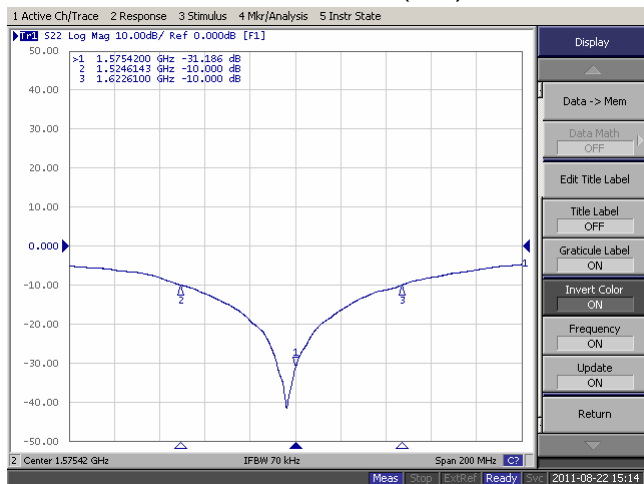
| Characteristics                      |             | Specifications               | Unit   |
|--------------------------------------|-------------|------------------------------|--------|
| Outline Dimensions                   |             | 10 x 3.2 x 3.9               | mm     |
| Ground Plane Dimensions              |             | 80 x 40                      | mm     |
| Working Frequency                    |             | 1575.42                      | MHz    |
| VSWR (@ center frequency)*           |             | 2 Max.                       |        |
| Characteristic Impedance             |             | 50                           | Ω      |
| Polarization                         |             | Linear Polarization          |        |
| Peak Gain                            | (@1575 MHz) | 3 (typical)                  | dBi    |
| Efficiency                           |             | 83 (typical)                 | %      |
| Temperature Coefficient of Frequency |             | 0±20 max<br>(@ -40°C ~85°C ) | ppm/°C |

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

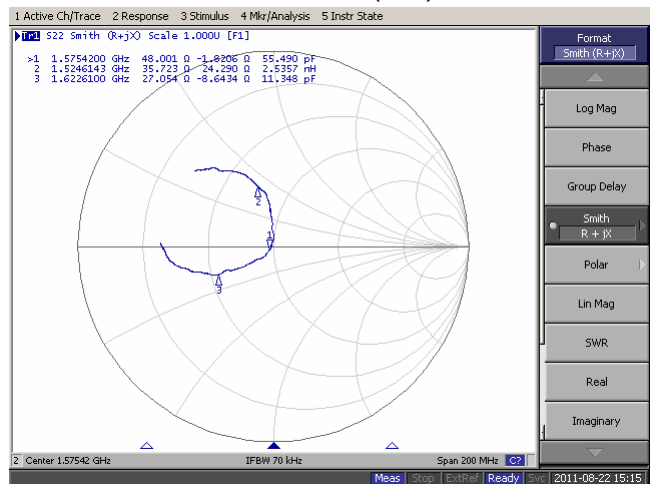
|  |                       |  |                       |
|--|-----------------------|--|-----------------------|
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|  |                       |  | REV.<br><b>B</b>      |

## 5-2. Return Loss & Smith Chart

Return Loss( $S_{11}$ )

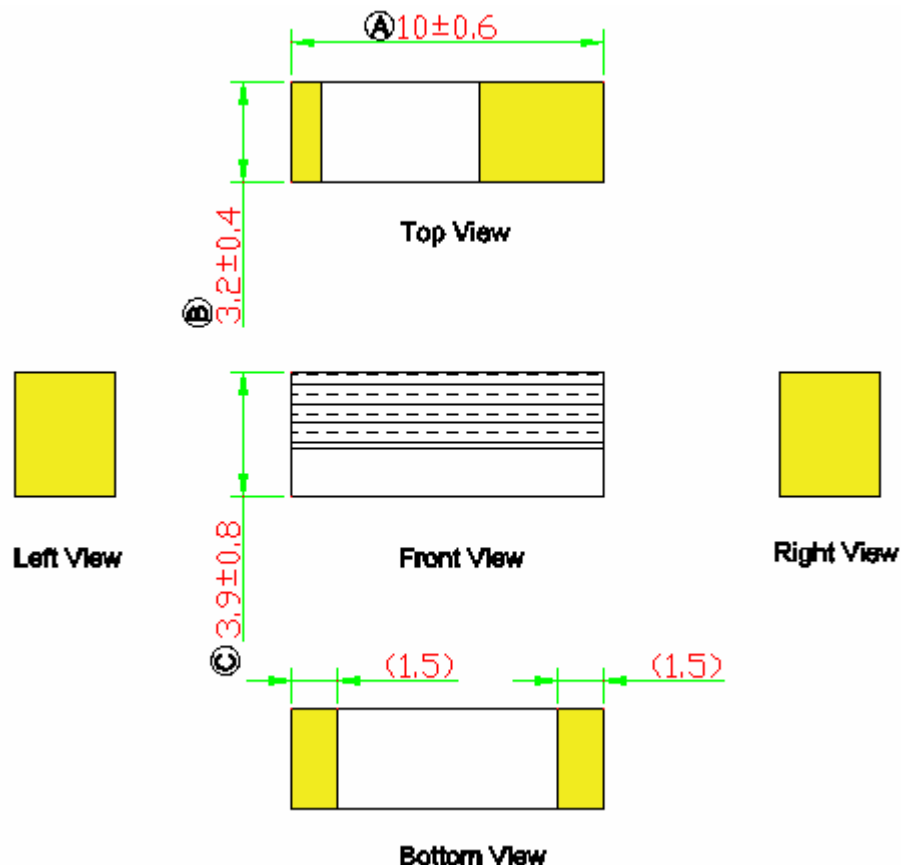


Smith Chart( $S_{11}$ )



## 6. Antenna & Test Board Dimensions (unit: mm)

### a. Antenna Dimensions



### Tolerances (Unless otherwise specified)

X:  $\pm 1$  X.X:  $\pm 0.1$  X.XX:  $\pm 0.01$

Angle:  $\pm$  Hole Dia.:  $\pm$

Scale: Unit: mm

Prepared By: Meiping Checked By: Mike

Designed By: Chinling Approved By: Herbert



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TITLE: 10x3.2x3.9 GPS Chip Antenna (AA064B)

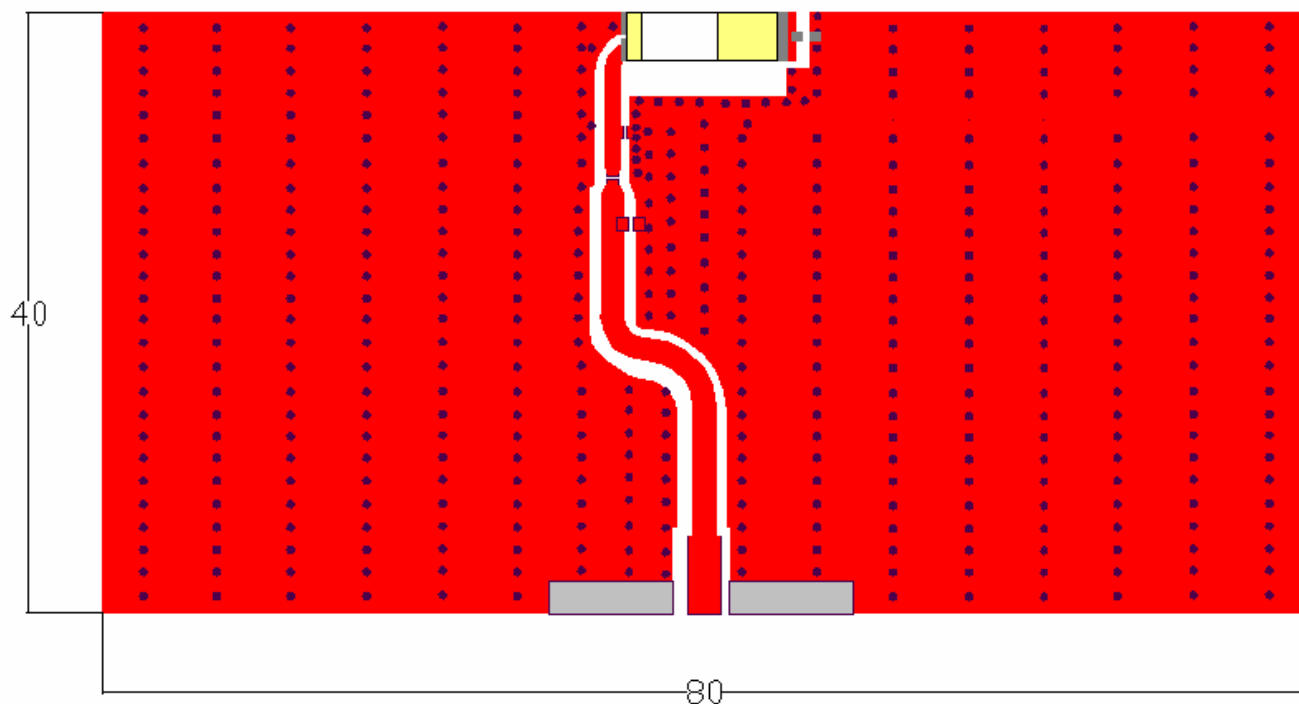
DOCUMENT NO.

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REV.

B

## b. Test Board Dimensions

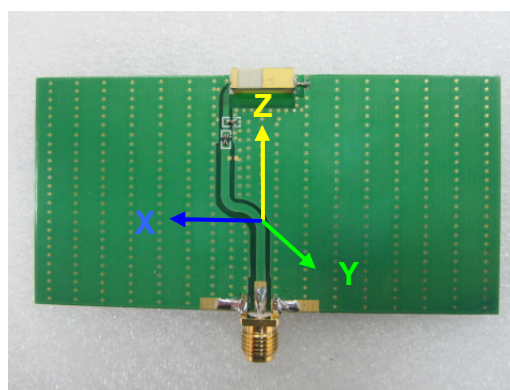
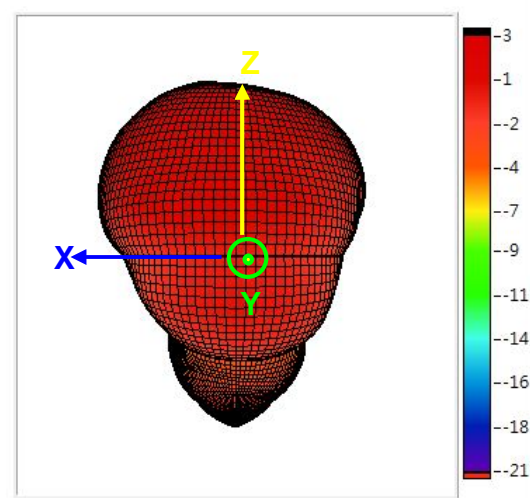
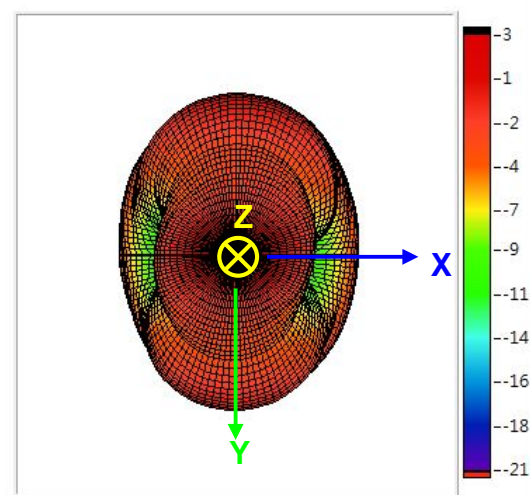
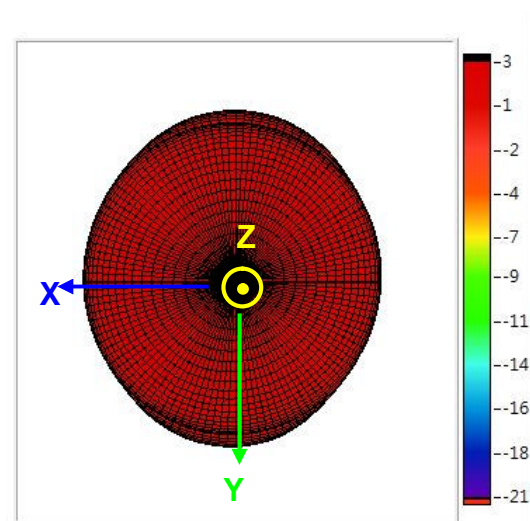


Unit : mm

|  |                       |  |                       |
|--|-----------------------|--|-----------------------|
| <b>Tolerances (Unless otherwise specified)</b><br>X : $\pm 1$ X.X : $\pm 0.1$ X.XX : $\pm 0.01$<br>Angle : $\pm$ Hole Dia. : $\pm$ |                       |  <b>Unictron Technologies Corporation</b><br>Website: <a href="http://www.unictron.com">www.unictron.com</a> |                       |
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|  |                       |  | REV.<br><b>B</b>      |

## 7. Radiation Pattern (80x40(mm) ground plane)

### 7-1. 3D Gain Pattern at 1575 MHz



Tolerances (Unless otherwise specified)

X :  $\pm 1$       X.X :  $\pm 0.1$       X.XX :  $\pm 0.01$

Angle :  $\pm$       Hole Dia. :  $\pm$

Scale :      Unit : mm

Prepared By : Meiping      Checked By : Mike

Designed By : Chinling      Approved By : Herbert



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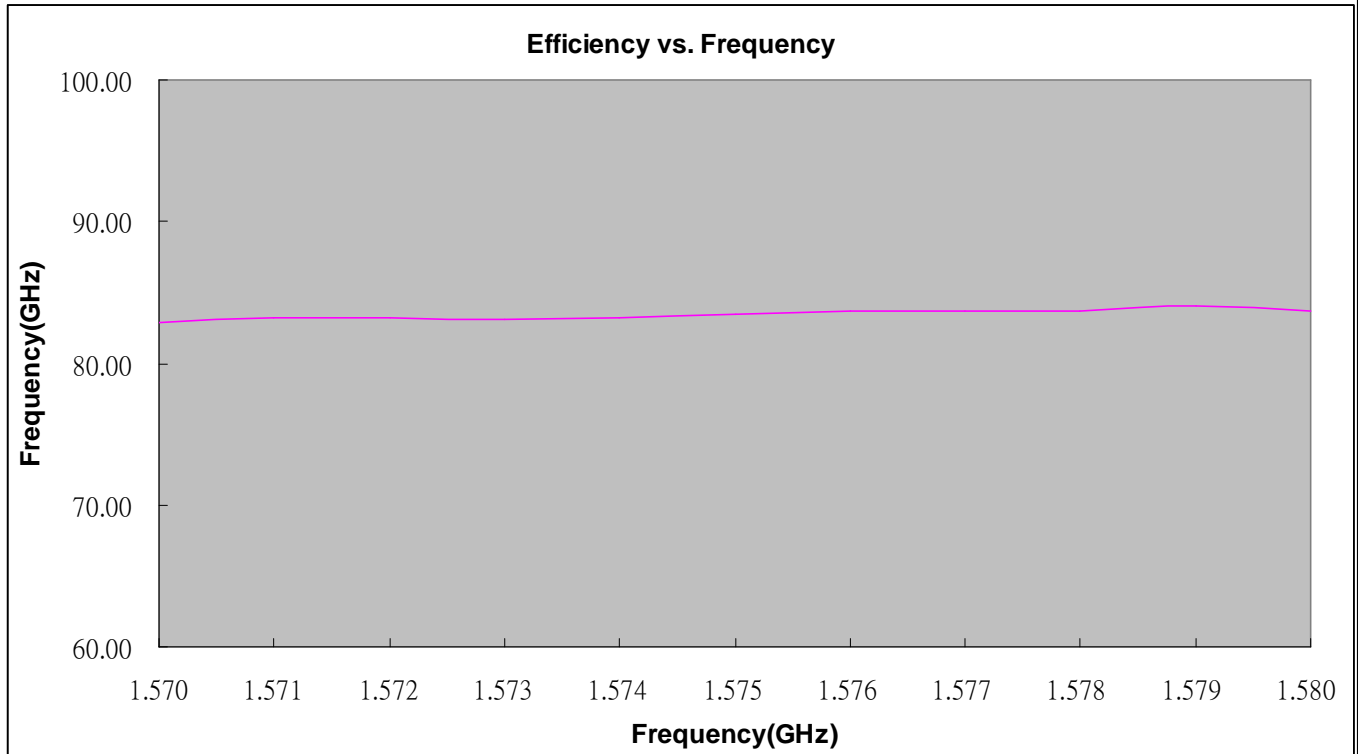
REV.

**B**

## 7-2. Efficiency Table

| Frequency(GHz) | 1.570 | 1.571 | 1.572 | 1.573 | 1.574 | 1.575 | 1.576 | 1.577 | 1.578 | 1.579 | 1.580 |
|----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Efficiency(dB) | -0.81 | -0.79 | -0.79 | -0.80 | -0.79 | -0.78 | -0.77 | -0.77 | -0.77 | -0.76 | -0.77 |
| Efficiency(%)  | 82.91 | 83.28 | 83.28 | 83.10 | 83.28 | 83.47 | 83.66 | 83.66 | 83.66 | 84.04 | 83.66 |
| Gain(dBi)      | 3.09  | 3.08  | 3.06  | 3.03  | 3.04  | 3.02  | 2.99  | 2.98  | 2.97  | 2.96  | 2.95  |

## 7-3. Efficiency vs. Frequency



### Tolerances (Unless otherwise specified)

X :  $\pm 1$       X.X :  $\pm 0.1$       X.XX :  $\pm 0.01$

Angle :  $\pm$       Hole Dia. :  $\pm$

Scale :      Unit : mm

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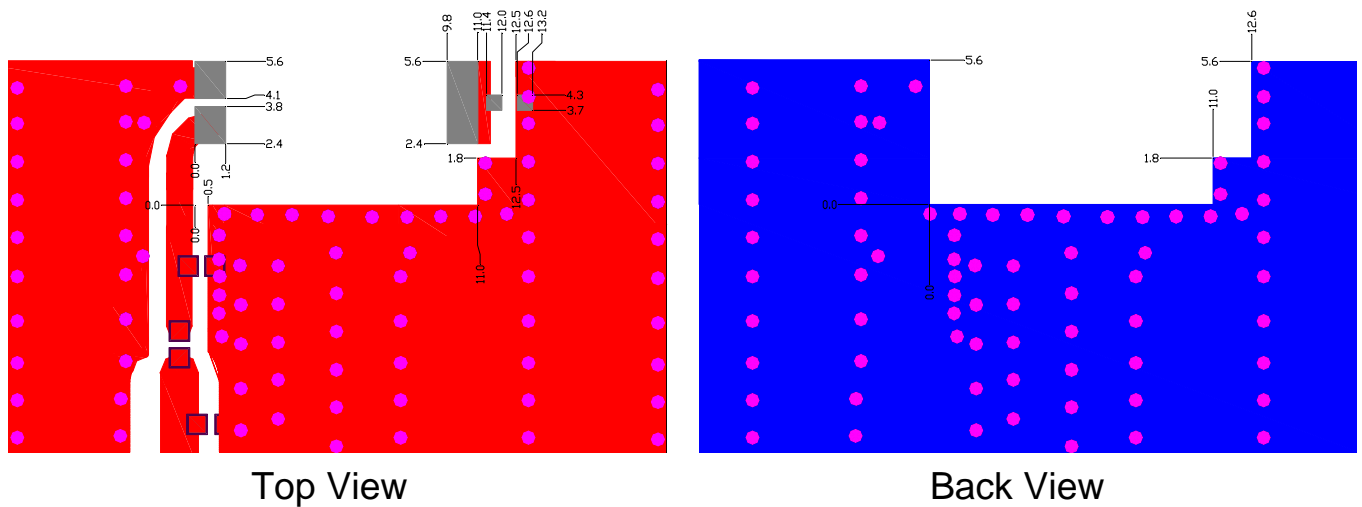
**REV.**

**B**

## 8. Layout Guide:

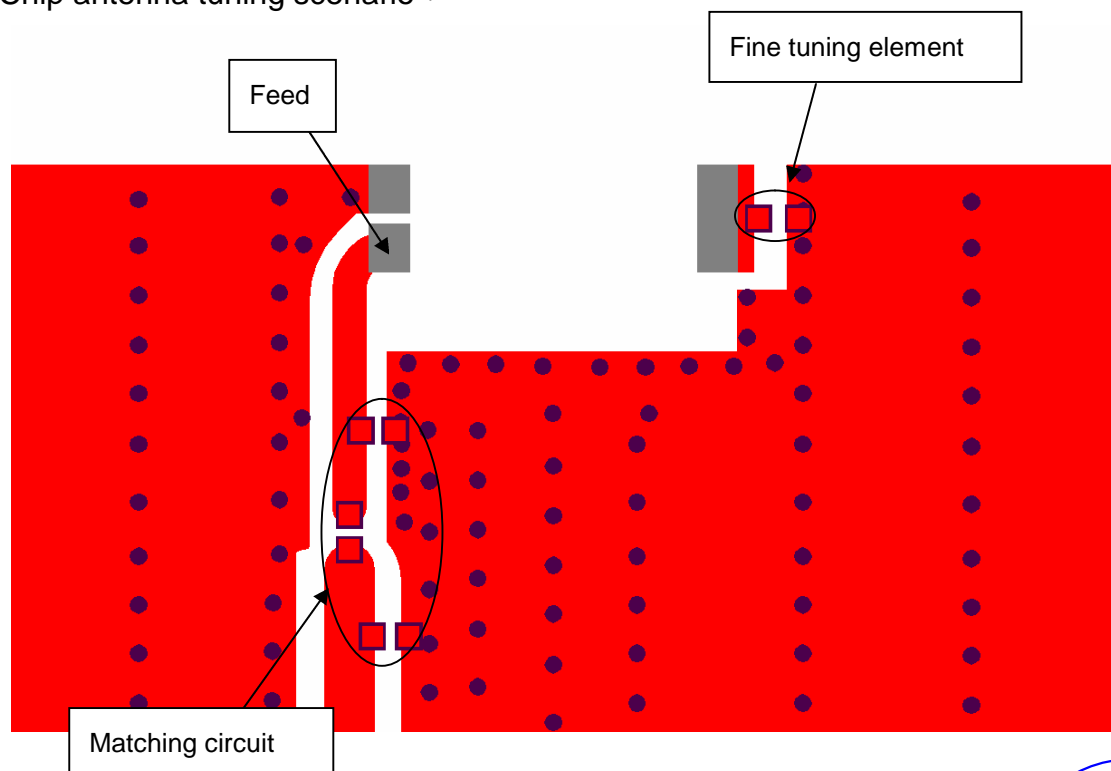
### a. Solder Land Pattern:

Land pattern for soldering (gray marking areas) is as shown below. Depending on Customer's requirement, matching circuit as shown below is also recommended.



## 9. Frequency tuning:

### a. Chip antenna tuning scenario :



#### Tolerances (Unless otherwise specified)

X :  $\pm 1$       X.X :  $\pm 0.1$       X.XX :  $\pm 0.01$

Angle :  $\pm$       Hole Dia. :  $\pm$

Scale :      Unit : mm

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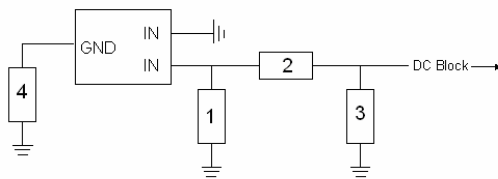
**DOCUMENT NO.**

**H2U1631S1A0200**

**REV.**

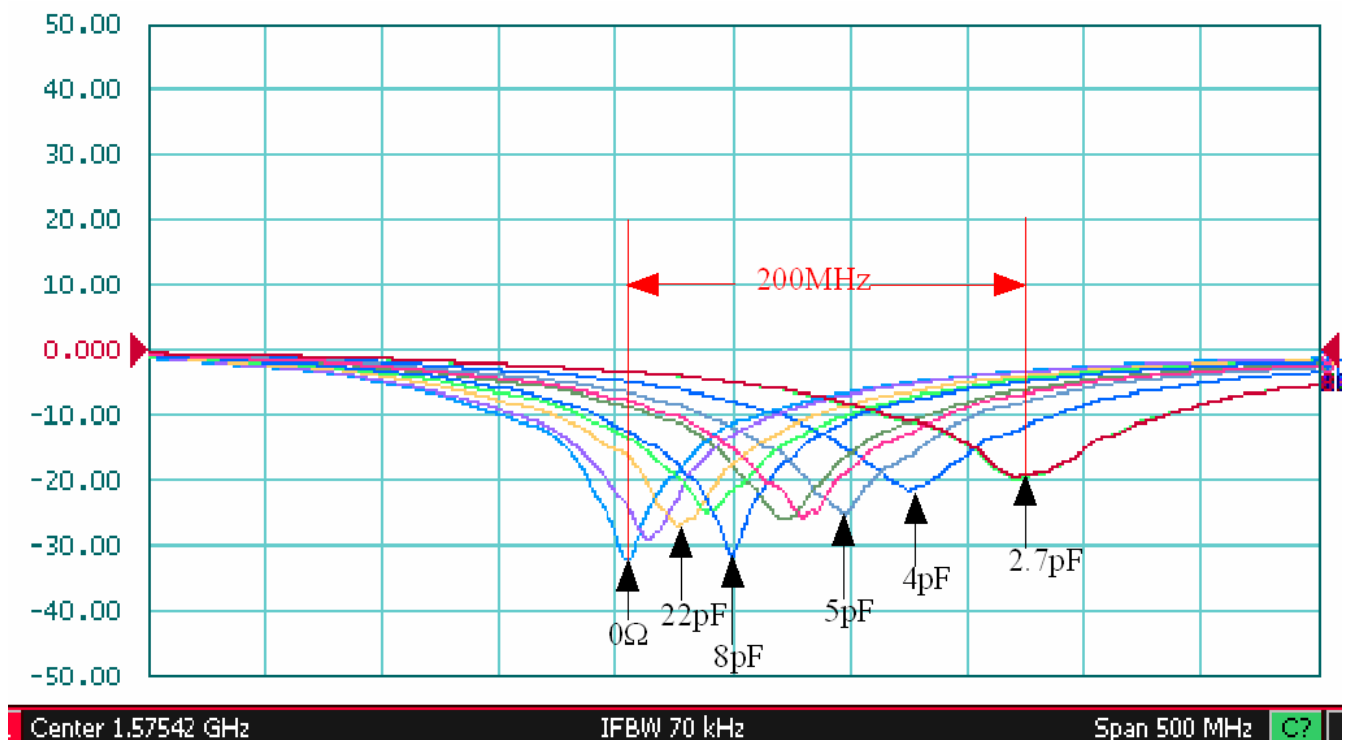
**B**

b. Matching circuit :



| System Matching Circuit Component |             |           |
|-----------------------------------|-------------|-----------|
| Location                          | Description | Vendor    |
| 1                                 | 1.8pF       | TDK(0402) |
| 2                                 | 4.7pF       | TDK(0402) |
| 3                                 | N/A         | -         |
| 4<br>(Fine tuning element)        | 8pF         | TDK(0402) |

c. Fine tuning element vs. Center frequency



**Tolerances (Unless otherwise specified)**  
X :  $\pm 1$       X.X :  $\pm 0.1$       X.XX :  $\pm 0.01$   
Angle :  $\pm$       Hole Dia. :  $\pm$

Scale :      Unit : mm  
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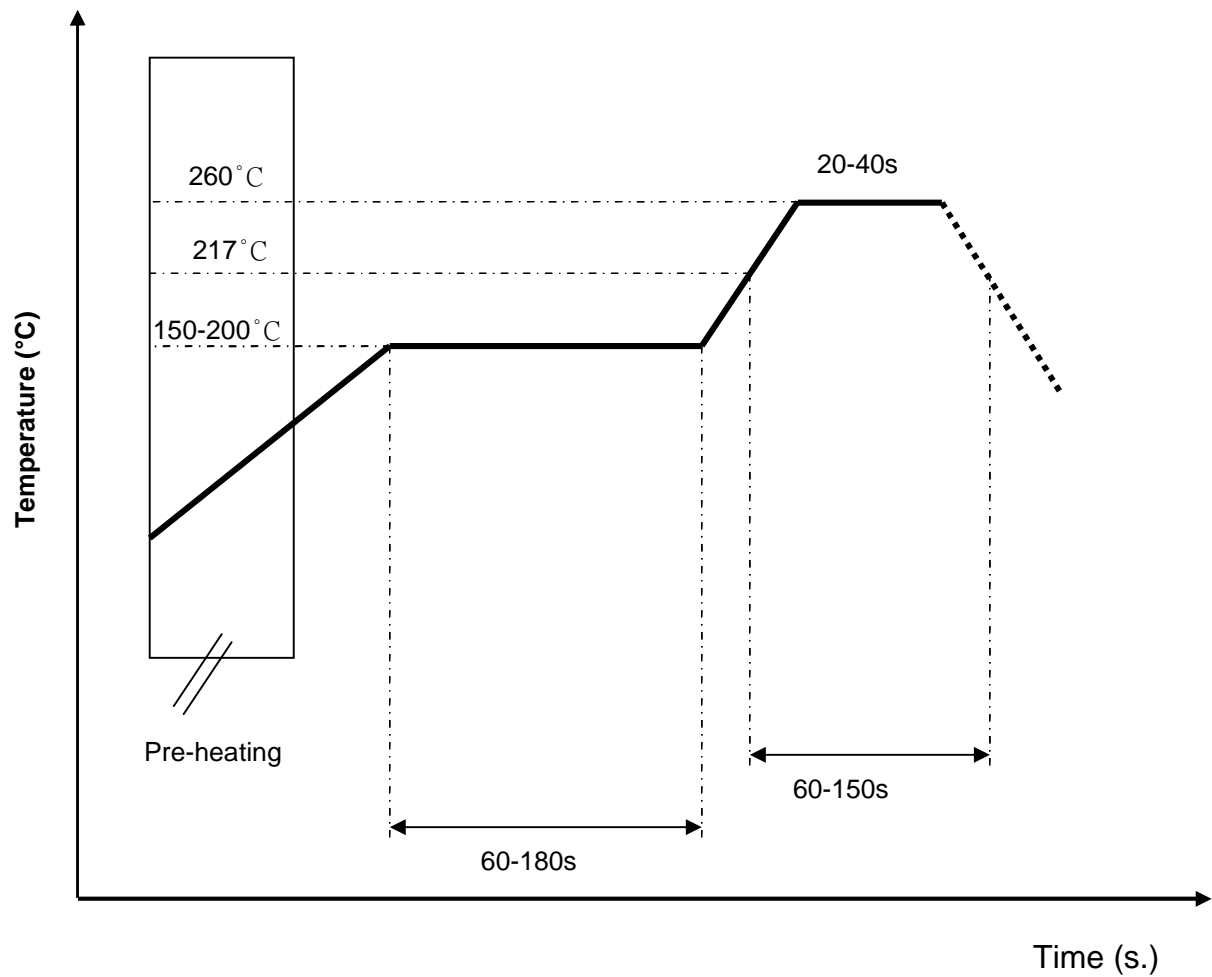
**H2U1631S1A0200**

**REV. B**



## 10. Soldering Conditions:

### a. Typical Soldering Profile for Lead-free Process



#### Tolerances (Unless otherwise specified)

X :  $\pm 1$       X.X :  $\pm 0.1$       X.XX :  $\pm 0.01$

Angle :  $\pm$       Hole Dia. :  $\pm$

Scale :      Unit : mm

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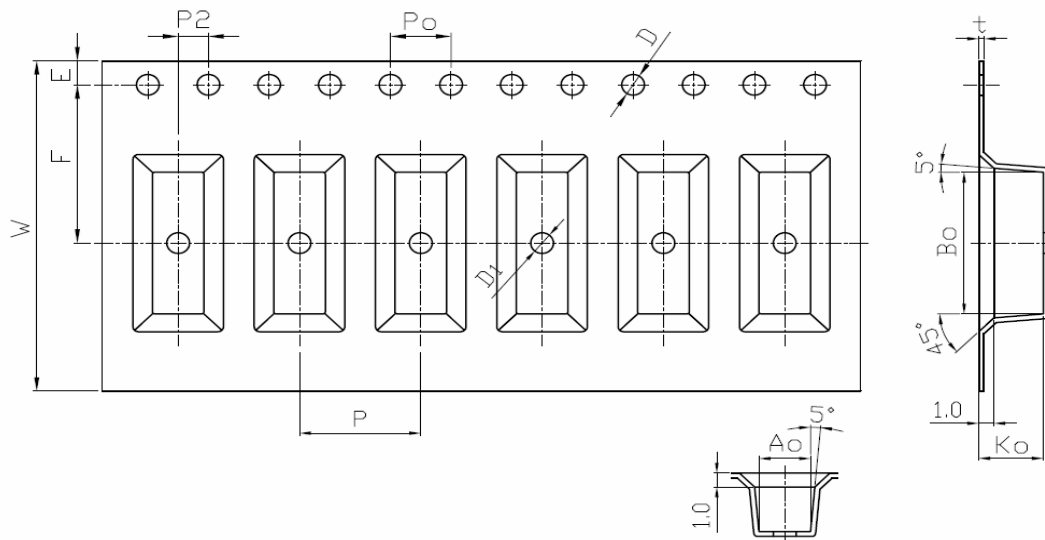
**H2U1631S1A0200**

**REV.**

**B**

## 11. Packing:

- (1) Quantity/Reel: 2000pcs/Reel
- (2) Plastic tape:



1. Cumulative tolerance of 10 sprocket hole pitch:  $\pm 0.20\text{mm}$
2. Carrier camber not to exceed 1mm in 250mm
3. Ao and Bo measured on a plane above the inside bottom of the pocket.
4. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
5. All dimensions meet EIA-481-B requirements.
6. Material: ☐ Clear Non Anti-Static Polystyrene.  
☒ Black Conductive Polystyrene.

2.1 Tape Dimensions(unit: mm)


| Feature | Specifications | Tolerances     |
|---------|----------------|----------------|
| W       | 24.00          | $\pm 0.30$     |
| P       | 8.00           | $\pm 0.10$     |
| E       | 1.75           | $\pm 0.10$     |
| F       | 11.50          | $\pm 0.10$     |
| P2      | 2.00           | $\pm 0.10$     |
| D       | 1.50           | +0.10<br>-0.00 |
| D1      | 1.50           | $\pm 0.10$     |
| Po      | 4.00           | $\pm 0.10$     |
| 10Po    | 40.00          | $\pm 0.20$     |

2.2 Pocket Dimensions(unit: mm)

| Feature | Specifications | Tolerances     |
|---------|----------------|----------------|
| Ao      | 3.40           | +0.20          |
| Bo      | 10.30          | -0.10          |
| Ko      | 4.25           | +0.20<br>-0.10 |
| t       | 0.35           | $\pm 0.05$     |

## 12. Storage Conditions:

- (1) Temperature:  $-25^{\circ}\text{C}$  to  $85^{\circ}\text{C}$
- (2) Relative Humidity: 20% to 70%

|   |                      |  |                         |
|---|----------------------|--|-------------------------|
| <b>Tolerances (Unless otherwise specified)</b><br>X: $\pm 1$ X.X: $\pm 0.1$ X.XX: $\pm 0.01$<br>Angle: $\pm$ Hole Dia.: $\pm$ |                      |  <b>Unictron Technologies Corporation</b><br>Website: <a href="http://www.unictron.com">www.unictron.com</a> |                         |
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|   |                      |  | <b>REV.</b><br><b>B</b> |