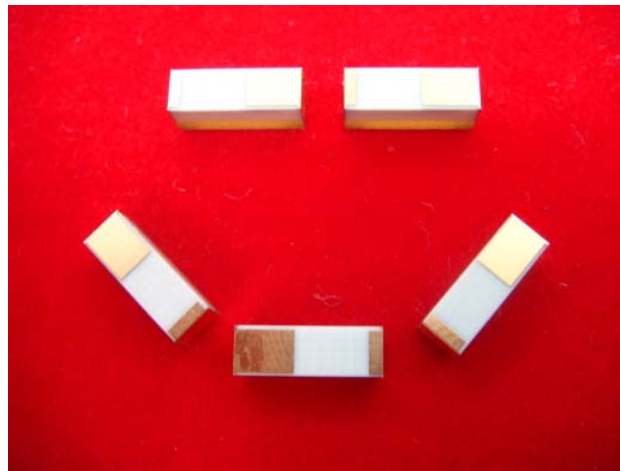


# 10 x 3.2 x 3.9 GPS Chip Antenna (AA064)


## 1. Explanation of Product Number

|   |   |   |   |     |     |     |     |     |   |   |   |   |   |
|---|---|---|---|-----|-----|-----|-----|-----|---|---|---|---|---|
| H | 2 | U | 1 | 6   | 3   | 1   | S   | 1   | A | 0 | 1 | 0 | 0 |
|   |   |   |   | (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:  
01: serial number

|   |                       |   |                       |                  |
|---|-----------------------|---|-----------------------|------------------|
| <b>Tolerances (Unless otherwise specified)</b><br>X : ± 1      X.X : ± 0.1      X.XX : ± 0.01<br>Angle : ±      Hole Dia. : ± |                       |  Unictron Technologies Corporation<br>Website: www.unictron.com         |                       |                  |
| 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 : Chinling |   |                       |                  |
| Designed By : Chinling  | Approved By : Herbert |   |                       |                  |
| <b>TITLE : 10x3.2x3.9 GPS Chip Antenna (AA064)</b>  |                       | DOCUMENT NO.  | <b>H2U1631S1A0100</b> | REV.<br><b>A</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.

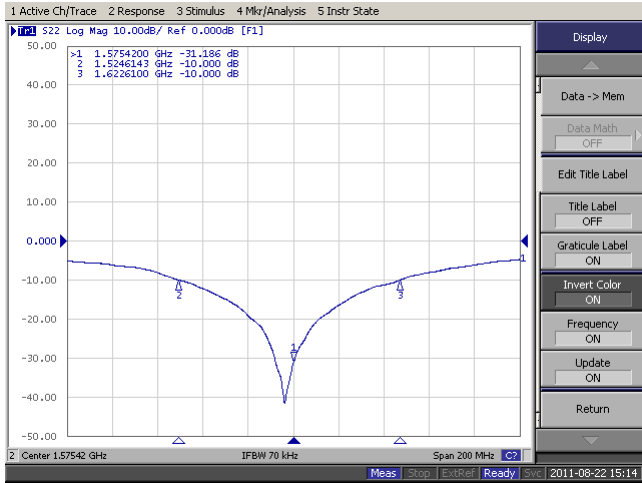
| Characteristics                      |            | Specifications   | Unit              |
|--------------------------------------|------------|--|-------------------|
| Outline Dimensions                   |            | 10x3.2x3.9   | mm                |
| Ground Plane                         |            | 80x40  | mm                |
| Center Frequency*                    |            | 1575.42  | MHz               |
| Bandwidth (under -10dB return loss)  |            | 81 min.  | MHz               |
| VSWR                                 |            | 2 max.   |                   |
| Impedance                            |            | 50   | $\Omega$          |
| Polarization                         |            | Linear Polarization                                    |                   |
| Gain                                 | Peak       | 3 (typical)  | dBi               |
|                                      | Efficiency | 83 (typical)   | %                 |
| Temperature Coefficient of Frequency |            | 0 $\pm$ 20 max<br>(@ -40 $^{\circ}$ C~85 $^{\circ}$ C) | ppm/ $^{\circ}$ C |

\*Center frequency will be offset to working frequency according to the conditions of user's ground plane and radome.

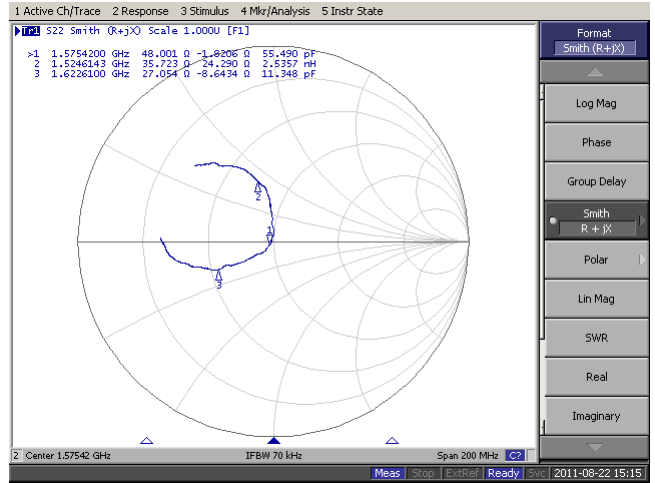
|  |                       |   |
|--|-----------------------|---|
| <b>Tolerances (Unless otherwise specified)</b><br>X : $\pm 1$ X.X : $\pm 0.1$ X.XX : $\pm 0.01$<br>Angle : $\pm$ Hole Dia. : $\pm$ |                       |  Unictron Technologies Corporation<br>Website: www.unictron.com         |
| Scale :  | Unit : mm             |   |
| Prepared By : Meiping  | Checked By : Chinling | THIS SPECIFICATION IS THE PROPERTY OF UNICTRON TECHNOLOGIES CORPORATION AND SHALL NOT BE REPRODUCED OR USED IN ALL CIRCUMSTANCES WITHOUT WRITTEN PERMISSION |
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| <b>TITLE : 10x3.2x3.9 GPS Chip Antenna (AA064)</b>   |                       | DOCUMENT NO. <b>H2U1631S1A0100</b>  |
|  |                       | REV. <b>A</b>   |

5-2.

Return Loss(S<sub>11</sub>)

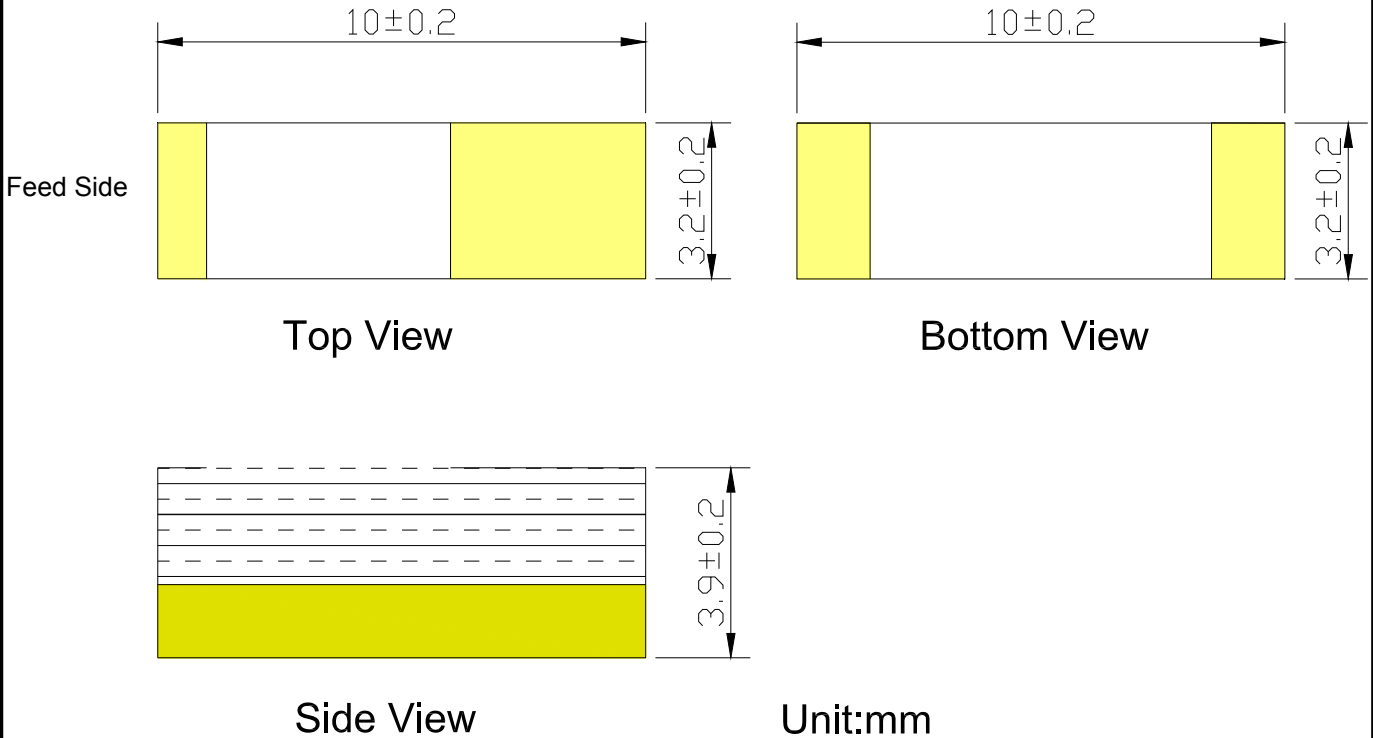



Smith Chart



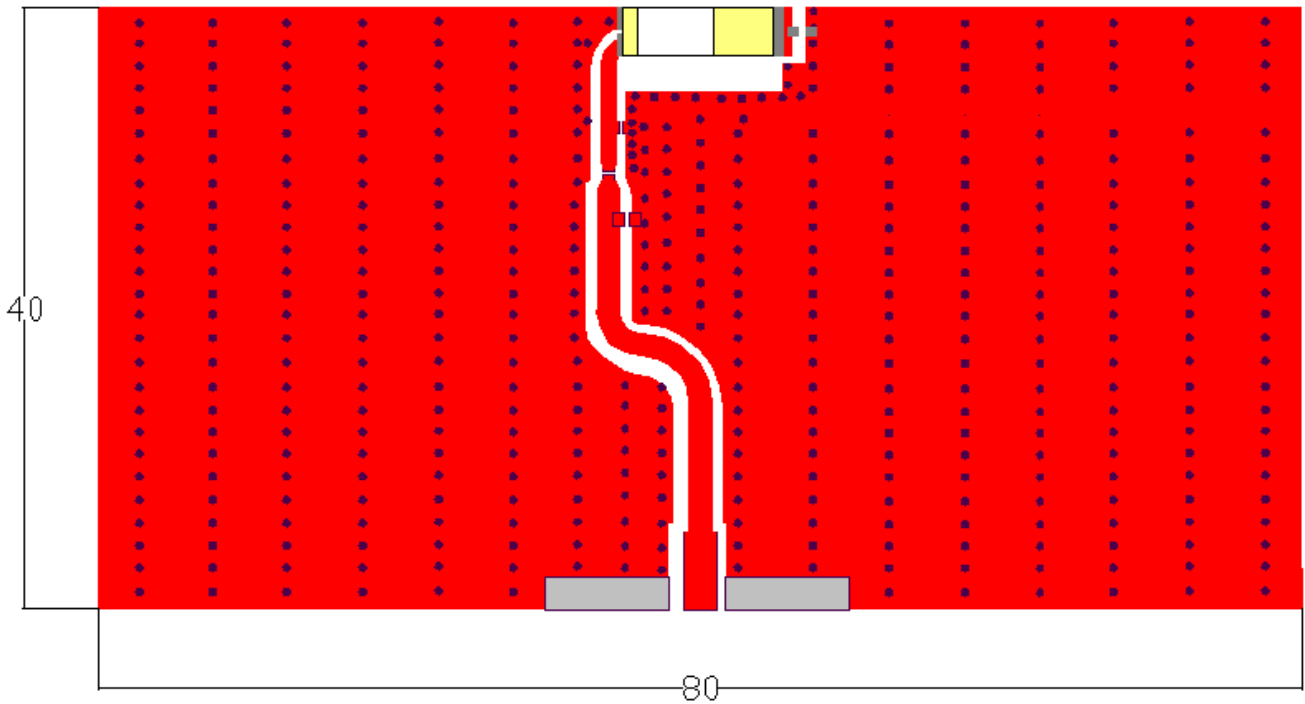
6. Antenna & Test Board Dimensions (unit: mm)

a. Antenna Dimensions




|   |                       |   |
|---|-----------------------|---|
| <b>Tolerances (Unless otherwise specified)</b><br>X : ± 1      X.X : ± 0.1      X.XX : ± 0.01<br>Angle : ±      Hole Dia. : ± |                       |  Unictron Technologies Corporation<br>Website: www.unictron.com         |
| Scale :   | Unit : mm             |   |
| Prepared By : Meiping   | Checked By : Chinling | THIS SPECIFICATION IS THE PROPERTY OF UNICTRON TECHNOLOGIES CORPORATION AND SHALL NOT BE REPRODUCED OR USED IN ALL CIRCUMSTANCES WITHOUT WRITTEN PERMISSION |
| Designed By : Chinling  | Approved By : Herbert |   |
| <b>TITLE : 10x3.2x3.9 GPS Chip Antenna (AA064)</b>  |                       | DOCUMENT NO. <b>H2U1631S1A0100</b> REV. <b>A</b>  |

b. Test Board Dimensions

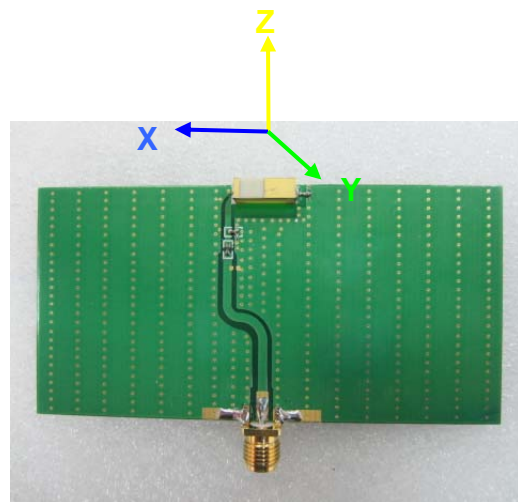
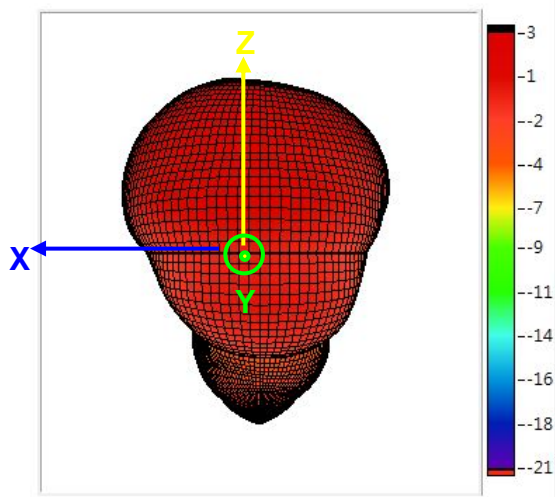
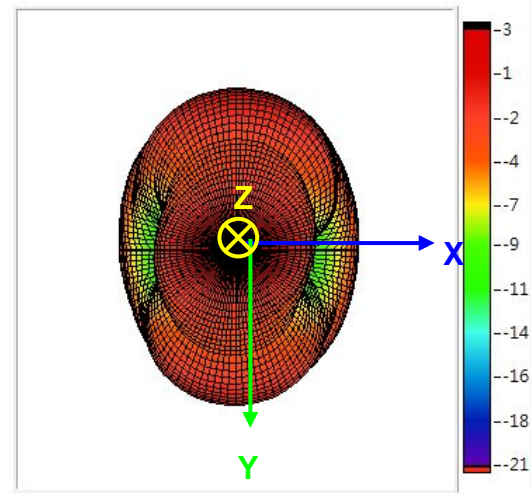
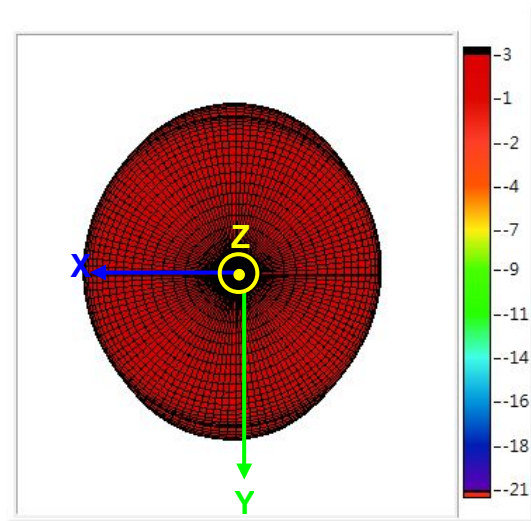


Unit : mm

|  |                       |   |                       |                  |
|--|-----------------------|---|-----------------------|------------------|
| <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. : $\pm$ |                       |  Unictron Technologies Corporation<br>Website: www.unictron.com         |                       |                  |
| 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 |                       |                  |
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| <b>TITLE : 10x3.2x3.9 GPS Chip Antenna (AA064)</b>   |                       | DOCUMENT NO.  | <b>H2U1631S1A0100</b> | REV.<br><b>A</b> |

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

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



**Tolerances (Unless otherwise specified)**

X : ± 1      X.X : ± 0.1      X.XX : ± 0.01

Angle : ±      Hole Dia. : ±

Scale :      Unit : mm

Prepared By : Meiping      Checked By : Chinling

Designed By : Chinling      Approved By : Herbert



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**TITLE : 10x3.2x3.9 GPS Chip Antenna (AA064)**

**DOCUMENT NO.**

**H2U1631S1A0100**

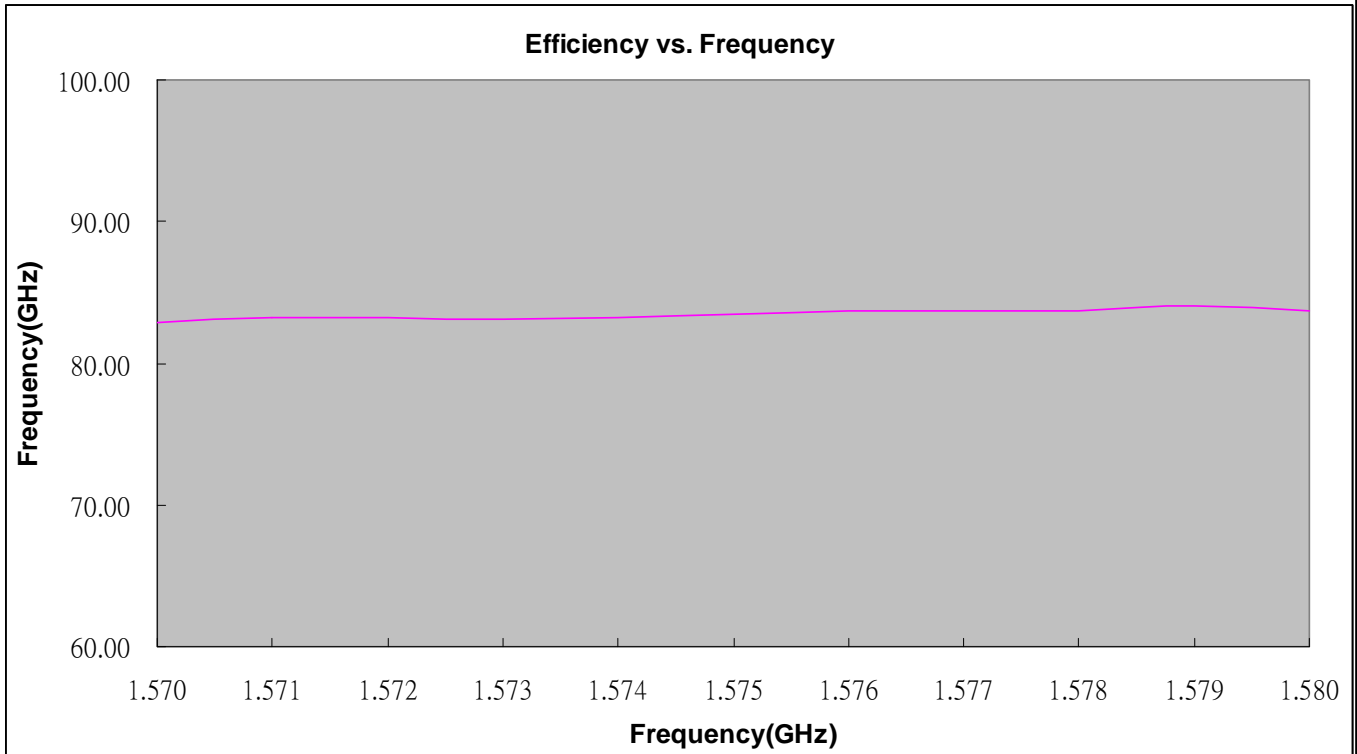
REV.

**A**

### 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 : ± 1      X.X : ± 0.1      X.XX : ± 0.01

Angle : ±      Hole Dia. : ±



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Scale :      Unit : mm

Prepared By : Meiping      Checked By : Chinling

Designed By : Chinling      Approved By : Herbert

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**TITLE : 10x3.2x3.9 GPS Chip Antenna (AA064)**

**DOCUMENT NO.**

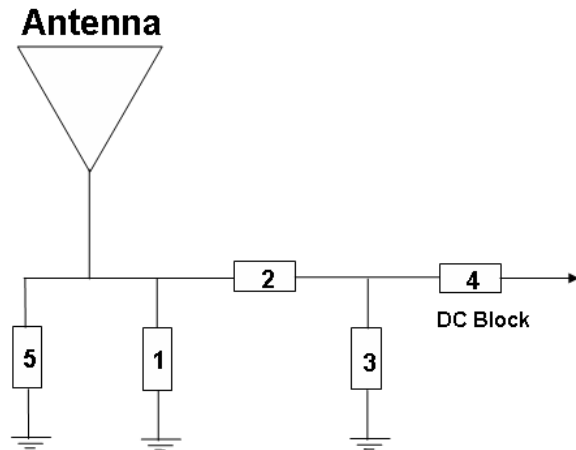
**H2U1631S1A0100**

REV.

**A**

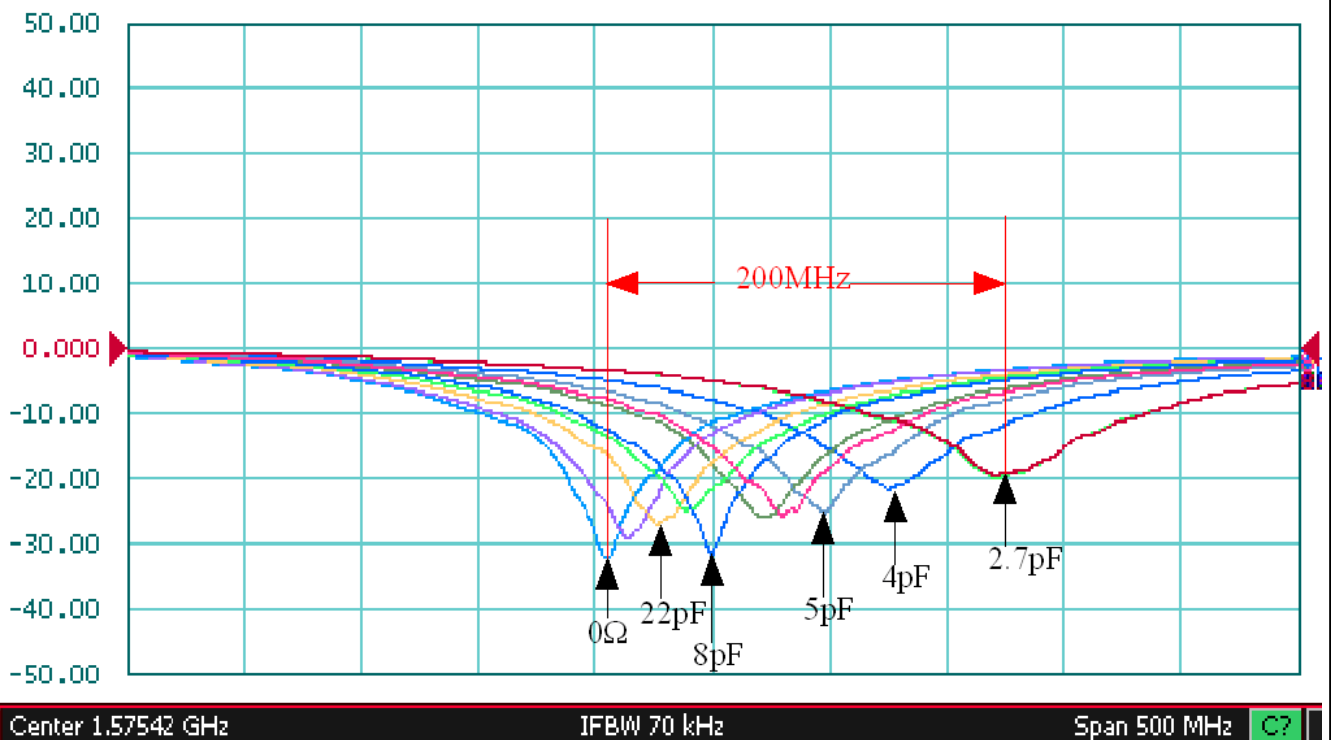


b. Matching circuit : (Center frequency is about 1575MHz at 80x40(mm) ground plane)




| System Matching Circuit Component |             |           |
|-----------------------------------|-------------|-----------|
| Location                          | Description | Vendor    |
| 1                                 | 1.8pF       | TDK(0402) |
| 2                                 | 4.7pF       | TDK(0402) |
| 3                                 | N/A         | -         |
| 4                                 | 22pF        | TDK(0402) |
| 5<br>(Fine tuning element)        | 8pF         | TDK(0402) |

c. Fine tuning element vs. Center frequency



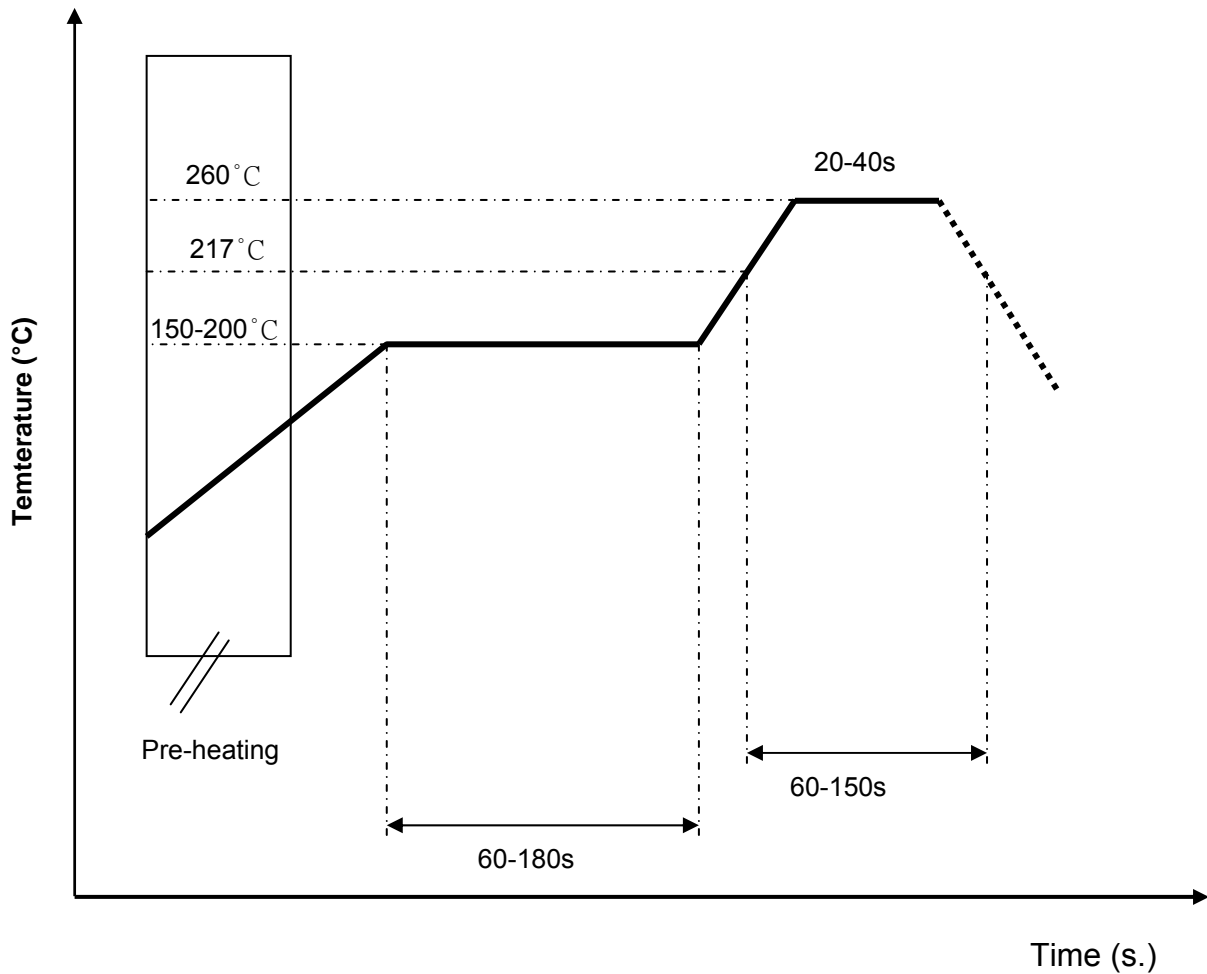
|  |                              |
|--|------------------------------|
| <b>Tolerances (Unless otherwise specified)</b>     |                              |
| X : ± 1  | X.X : ± 0.1    X.XX : ± 0.01 |
| Angle : ±  | Hole Dia. : ±                |
| Scale :  | Unit : mm                    |
| Prepared By : Meiping                              | Checked By : Chinling        |
| Designed By : Chinling                             | Approved By : Herbert        |
| <b>TITLE : 10x3.2x3.9 GPS Chip Antenna (AA064)</b> |                              |


|  |                       |   |          |
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| <b>DOCUMENT NO.</b>  | <b>H2U1631S1A0100</b> | <b>REV.</b>   | <b>A</b> |



# 10. Soldering Conditions:

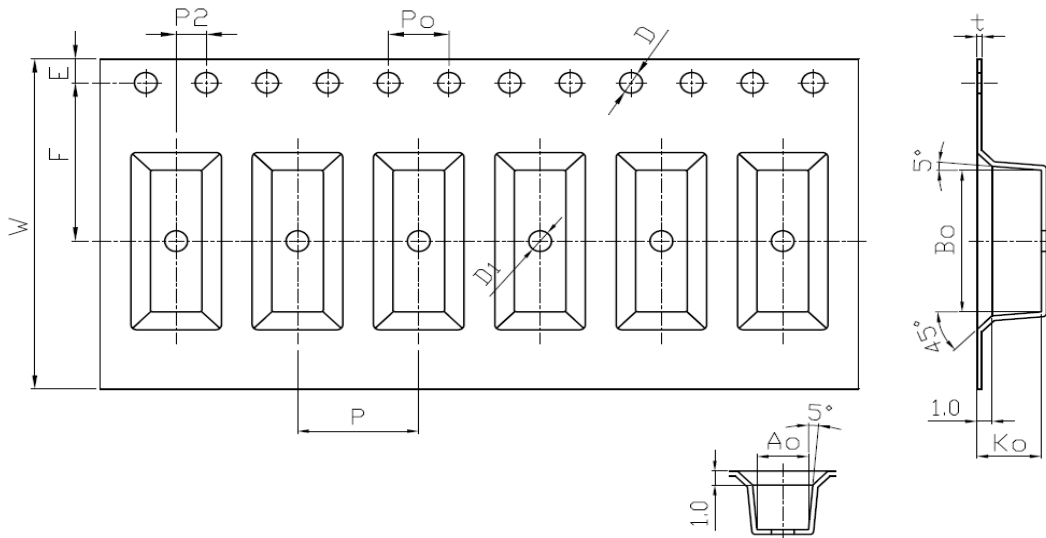
a. Typical Soldering Profile for Lead-free Process



|   |   |  |
|---|---|--|
| <b>Tolerances (Unless otherwise specified)</b><br>X : ± 1      X.X : ± 0.1      X.XX : ± 0.01<br>Angle : ±      Hole Dia. : ± |   |  <b>Unictron Technologies Corporation</b><br>Website: www.unictron.com |
| 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 : Chinling   | DOCUMENT NO. <b>H2U1631S1A0100</b>   |
| Designed By : Chinling  | Approved By : Herbert   |  |
| <b>TITLE : 10x3.2x3.9 GPS Chip Antenna (AA064)</b>  |   | PAGE 9 OF 10   |

# 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. : $\pm$ |                       |  Unictron Technologies Corporation<br>Website: www.unictron.com         |                       |                  |
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