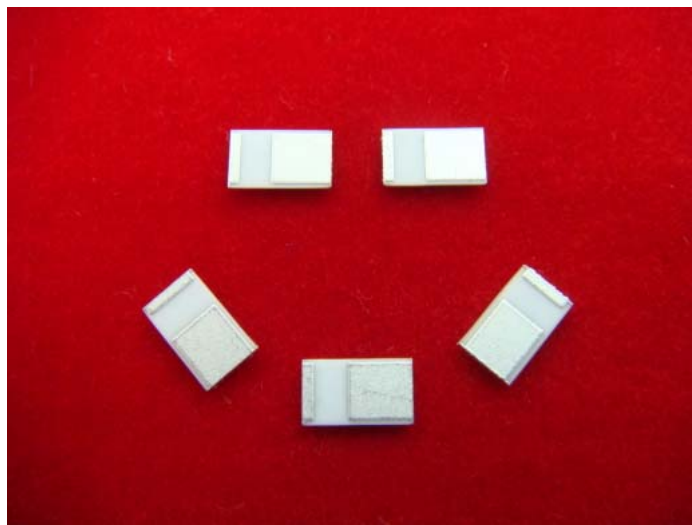


# 5.0 x 3.0 x 0.5 GPS Ceramic Chip Antenna (AA095)

## 1. Explanation of Product Number

H	2	P	1	4	U	G	T	R	W	0	1	0	0
				(1)	(2)	(3)			(4)				



Product Code:

(1) Product Categories:

4: ceramic substrate chip antenna

(2) Dimensions and Polarization:


UG: 5.0 x 3.0 x 0.5(mm) / linear polarization

(3) Material / Working Frequency / Ground Plane Dimensions:

TRW: AS6 / 1575.42MHz / 80 x 40 (mm)

(4) Antenna Series:

02: serial number

<b>Tolerances (Unless otherwise specified)</b> X : ± 1      X.X : ± 0.1      X.XX : ± 0.01 Angle : ±      Hole Dia. : ±		 Unictron Technologies Corporation 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 : Herbert			
Designed By : Mike	Approved By : Jeff			
<b>TITLE: 5.0 x 3.0 x 0.5 GPS Ceramic Chip Antenna (AA095)</b>		DOCUMENT NO.	<b>H2P14UGTRW0100</b>	REV. <b>D</b>

## 2. Features

- \*Stable and reliable in performances
- \*Low temperature coefficient of frequency
- \*Low profile, compact size
- \*RoHS compliance
- \*SMT processes compatible

## 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 ceramic antennas 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		5.0x3.0x0.5	mm
Ground Plane		80x40	mm
Center Frequency*		1575.42	MHz
Bandwidth (under -10dB return loss)		50 min.	MHz
VSWR		2 max.	
Impedance		50	$\Omega$
Polarization		Linear Polarization	
Gain**	Peak	2.5 (typical)	dBi
	Efficiency	84 (typical)	%
Temperature Coefficient of Frequency		0 $\pm$ 20 max (@ -40 $^{\circ}$ C ~85 $^{\circ}$ C)	ppm/ $^{\circ}$ C

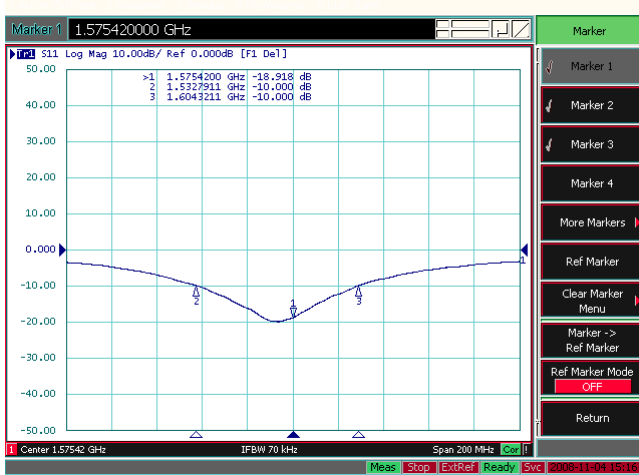
\*Center frequency will be offset to working frequency according to the conditions of user's ground plane and radome.

\*\*The data was measured by A Test Lab Techno Corp.(CTIA Authorized Test Lab).

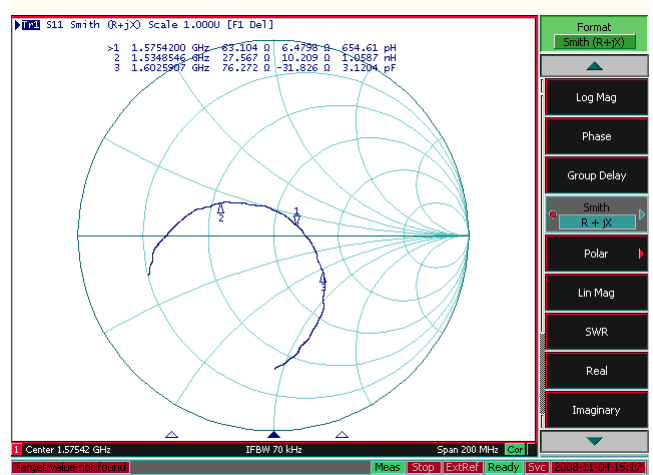
<b>Tolerances (Unless otherwise specified)</b> X : $\pm 1$ X.X : $\pm 0.1$ X.XX : $\pm 0.01$ Angle : $\pm$ Hole Dia. : $\pm$		 Unictron Technologies Corporation Website: www.unictron.com
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5-2.

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

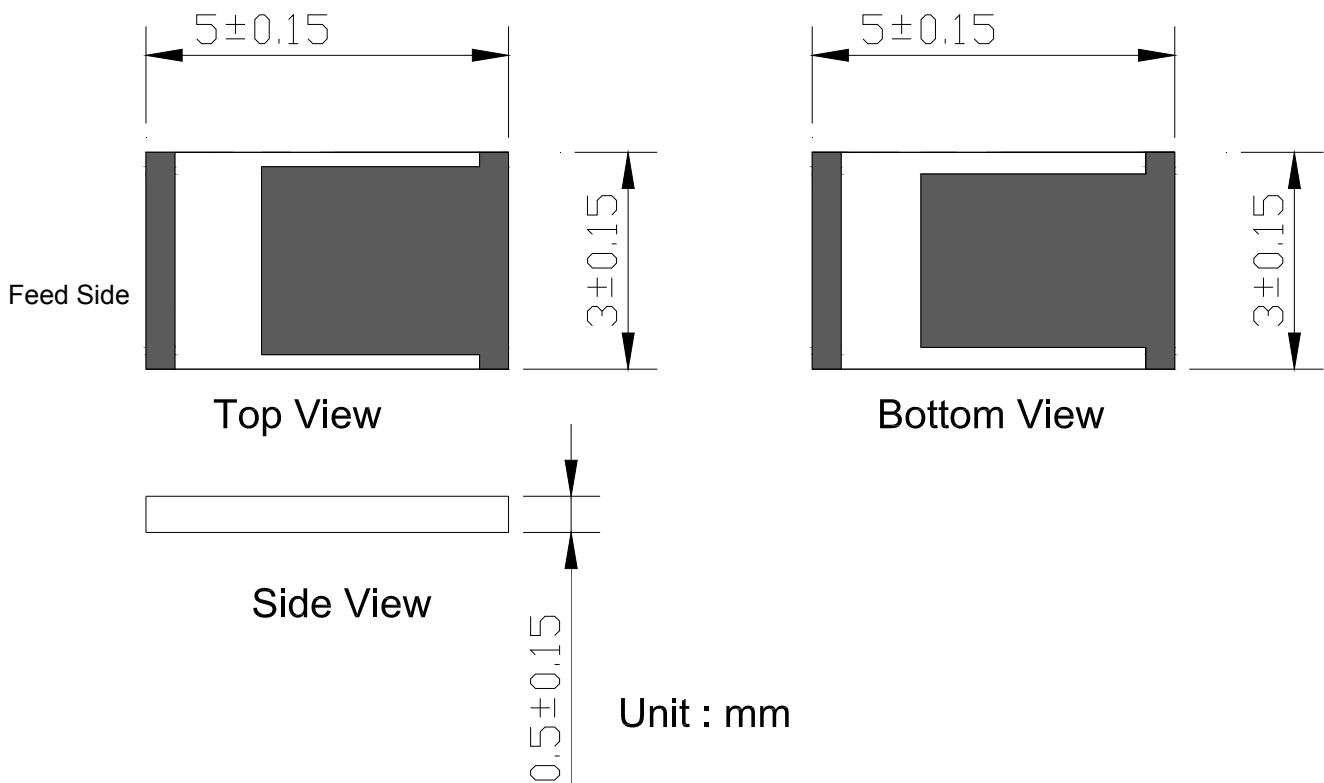



Smith Chart



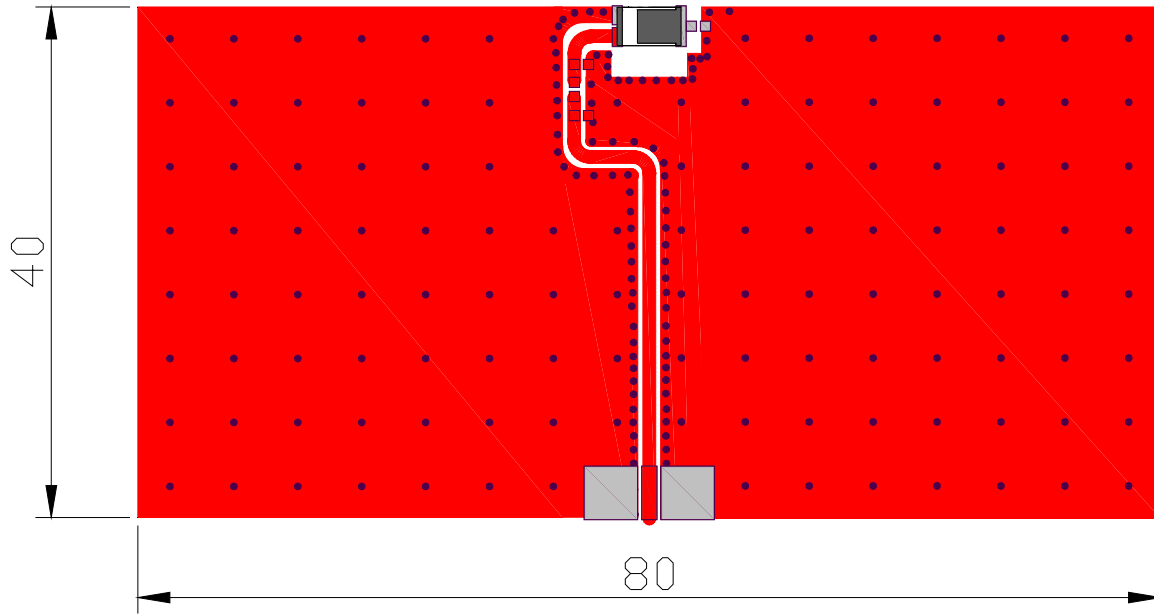
6. Antenna Dimensions & Test Board(unit: mm)

a. Antenna Dimensions



<b>Tolerances (Unless otherwise specified)</b> X : $\pm 1$ X.X : $\pm 0.1$ X.XX : $\pm 0.01$ Angle : $\pm$ Hole Dia. : $\pm$		 Unictron Technologies Corporation Website: www.unictron.com
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b. Test Board with Antenna



Unit: mm

**Tolerances (Unless otherwise specified)**

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

Angle : ±      Hole Dia. : ±



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Scale :      Unit : mm

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**DOCUMENT NO.**

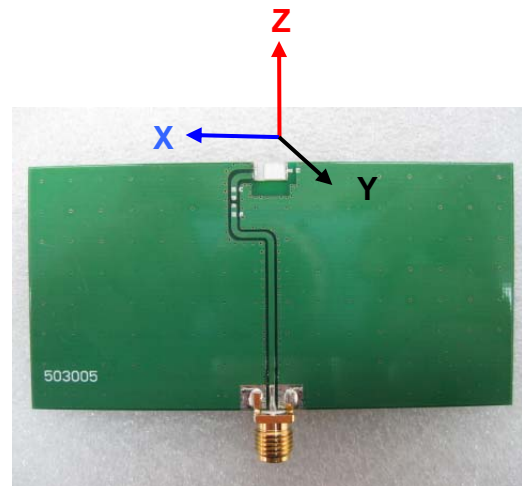
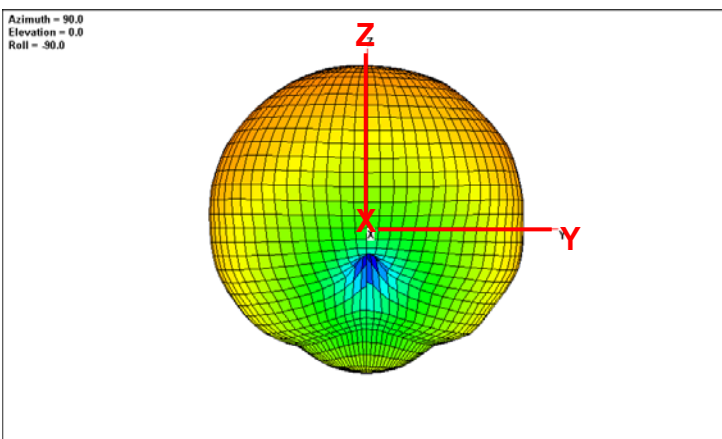
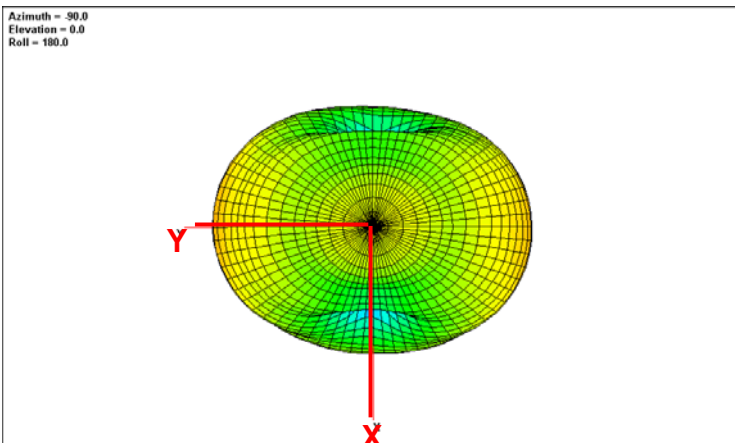
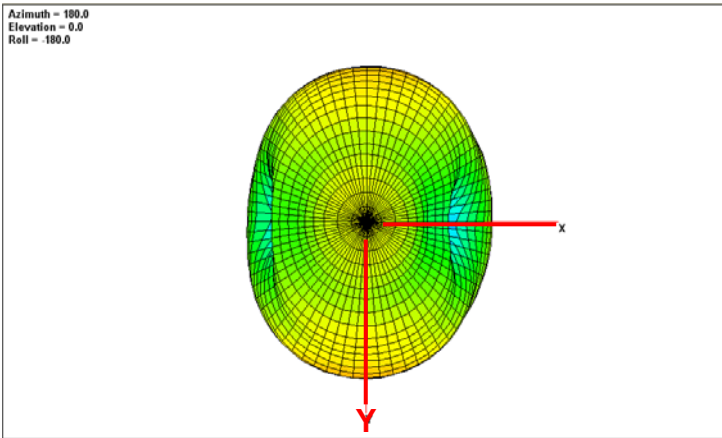
**H2P14UGTRW0100**

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## 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 : Herbert

Designed By : Mike      Approved By : Jeff



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**H2P14UGTRW0100**

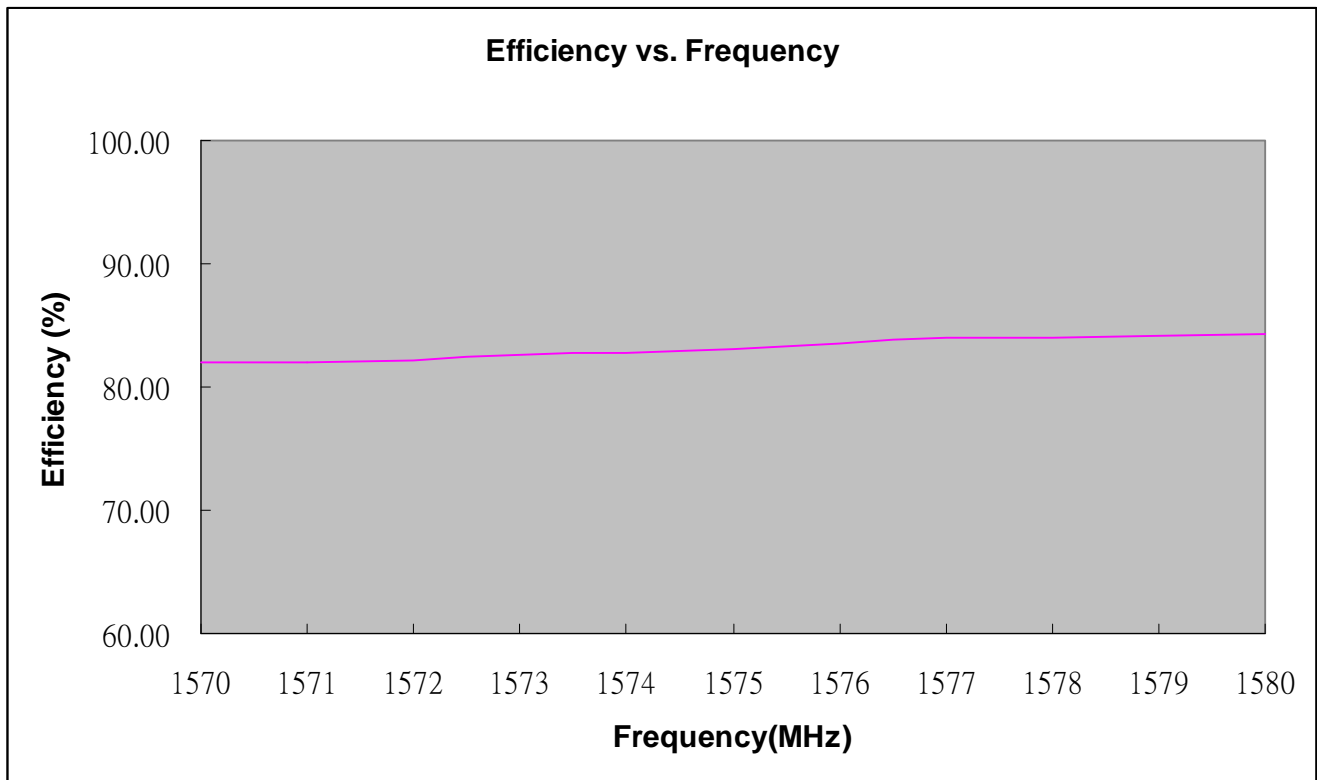
REV.


**D**

### 7-2. Efficiency Table

Frequency(MHz)	1570	1571	1572	1573	1574	1575	1576	1577	1578	1579	1580
Efficiency (dB)	-0.86	-0.86	-0.85	-0.83	-0.82	-0.80	-0.78	-0.76	-0.76	-0.75	-0.74
Efficiency (%)	82.00	82.03	82.21	82.61	82.70	83.15	83.60	83.95	84.03	84.18	84.28
Gain (dBi)	2.41	2.41	2.42	2.44	2.44	2.48	2.51	2.51	2.52	2.53	2.55

### 7-3. Efficiency vs. Frequency

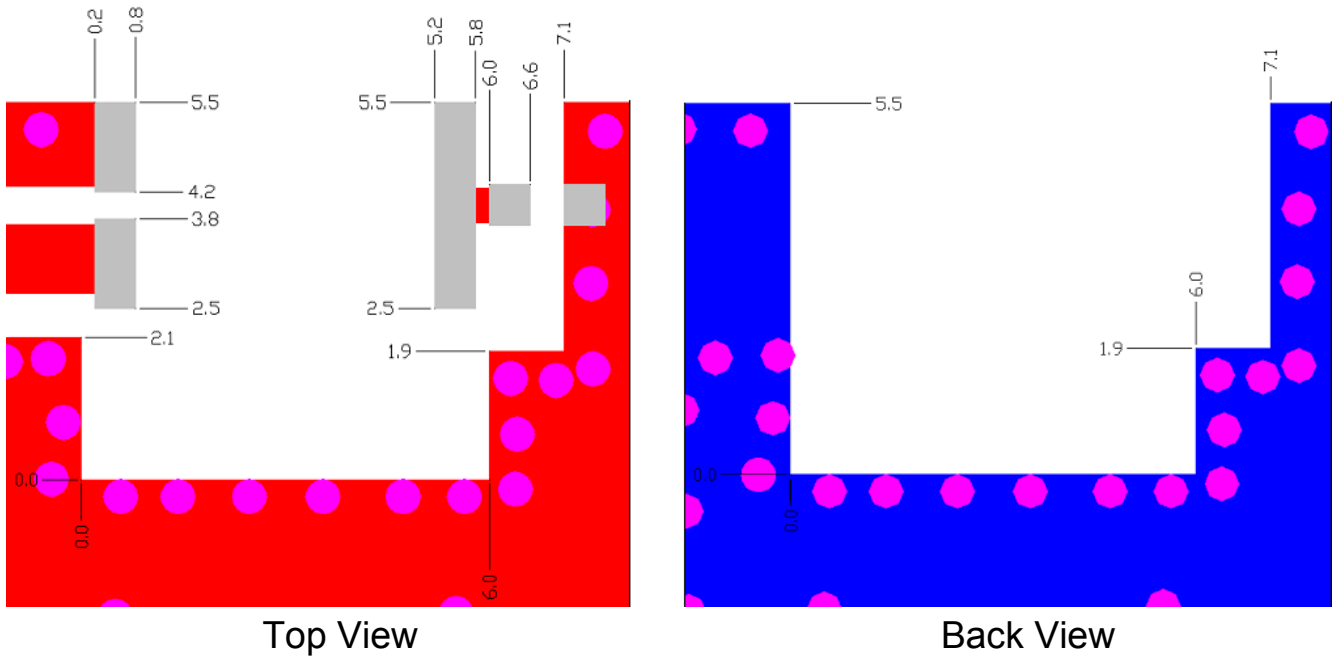


<b>Tolerances (Unless otherwise specified)</b> X : ± 1      X.X : ± 0.1      X.XX : ± 0.01 Angle : ±      Hole Dia. : ±		 Unictron Technologies Corporation Website: www.unictron.com
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		REV. <b>D</b>

## 8. Layout Guide:

### a. Solder Land Pattern:

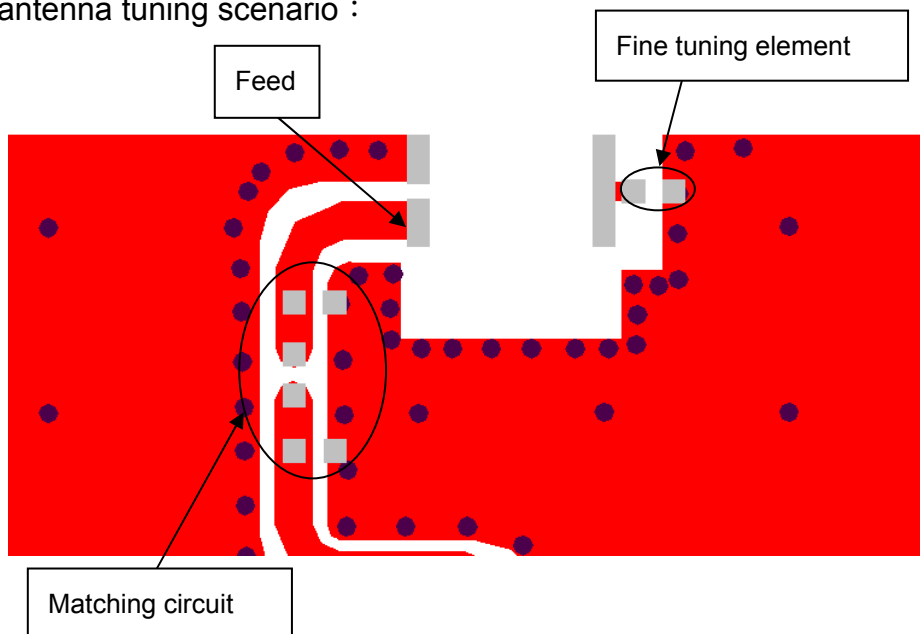
Land pattern for soldering (gray marking areas) is as shown below. Depending on Customer's requirement, matching circuit as shown below is also recommended .



Unit : mm

## 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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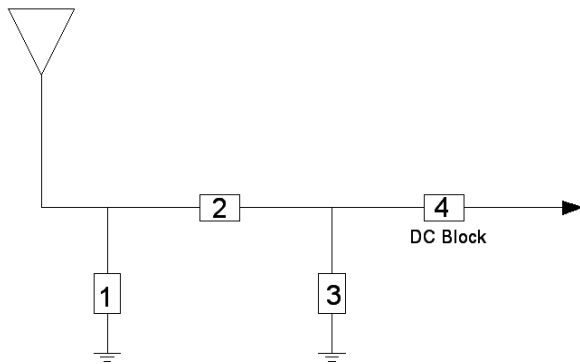
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REV.

**D**

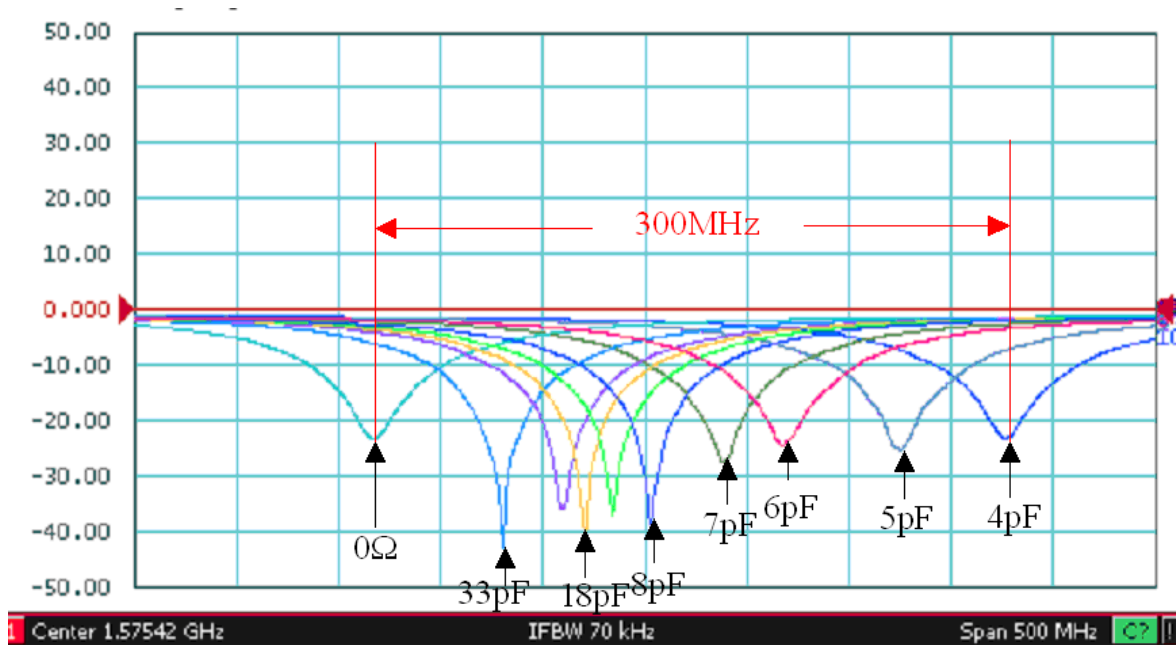
b. Matching circuit : (Center frequency is about 1575.42MHz at 80x40(mm) ground plane)

### Antenna



System Matching Circuit Component		
Location	Description	Vendor
1	N/A	-
2	0Ω	(0402)
3	2.2pF	TDK(0402)
4	22pF	TDK(0402)
Fine tuning element	8pF	TDK(0402)

c. Fine tuning element vs. Center frequency



**Tolerances (Unless otherwise specified)**

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

Angle : ±      Hole Dia. : ±

Scale :      Unit : mm

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REV.

**D**



## 10. Reliability test :

Test item	Test condition / Test method	Specification
Solderability	*Solder bath temperature : $260 \pm 5^{\circ}\text{C}$ *Immersion time : $2 \pm 0.5$ sec	At least 95% of a surface of each terminal electrode must be covered by fresh solder.
Resistance to dissolution of metallization)	*Solder bath temperature : $260 \pm 5^{\circ}\text{C}$ *Leaching immersion time : $30 \pm 0.5$ sec	Loss of metallization on the edges of each electrode shall not exceed 25%.
Drop Test	*1.8m drop on concrete with 150g weight *XYZ each 30 times	No mechanical damage. Samples shall satisfy electrical specification after test.
Bending test	Warp:2mm	No mechanical damage. Samples shall satisfy electrical specification after test.
Temperature cycle	$-55^{\circ}\text{C}/30\text{min} \sim 125^{\circ}\text{C}/30\text{min}$ Total 1000 cycles	No mechanical damage. Samples shall satisfy electrical specification after test
High temperature	*Temperature : $125^{\circ}\text{C}$ *Test duration : 1000 hours	No mechanical damage. Samples shall satisfy electrical specification after test.
Low temperature	*Temperature : $-55^{\circ}\text{C}$ *Test duration : 1000 hours	No mechanical damage. Samples shall satisfy electrical specification after test.
Adhesive Strength of Termination	*Pressure:5N *Duration : $10 \pm 1$ sec	No remarkable damage or removal of the termination.
Vibration	*Applied Frequency : 10-55-10Hz(1min) *1.5 p-p amplitude for XYZ each direction of 120min	No mechanical damage. Samples shall satisfy electrical specification after test
Damp heat	*Humidity:85% *Temperature:85°C *Time : 1000 hours	No mechanical damage. Samples shall satisfy electrical specification after test

### Tolerances (Unless otherwise specified)

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

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



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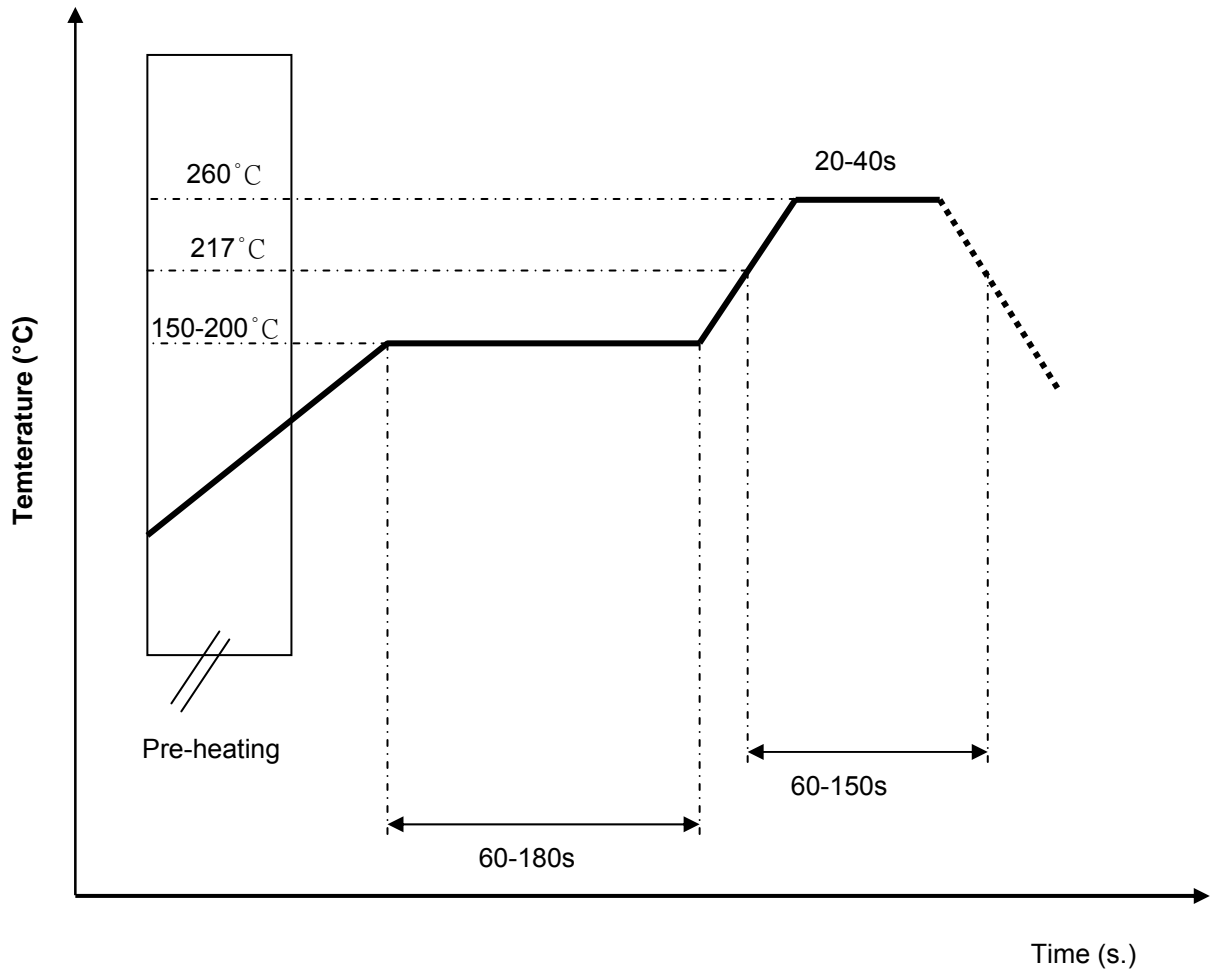
**H2P14UGTRW0100**


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# 11. Soldering Conditions:

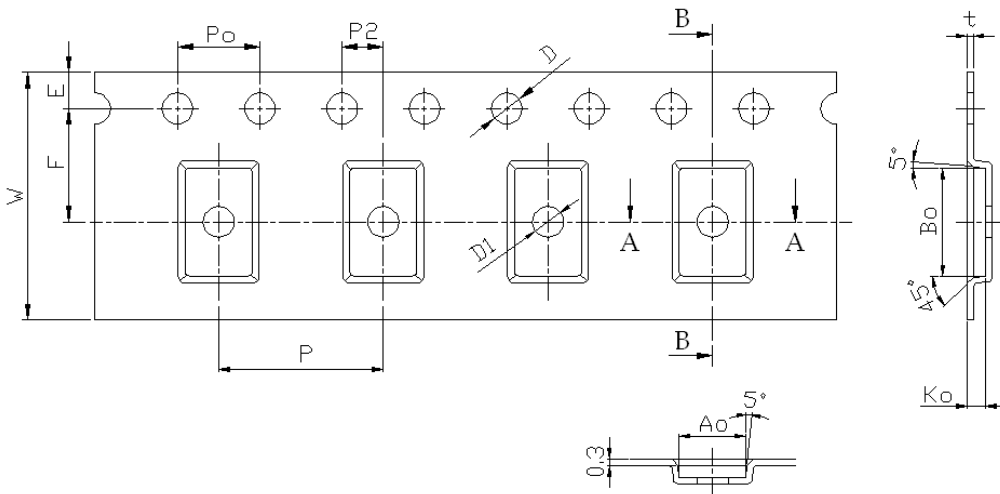
a. Typical Soldering Profile for Lead-free Process



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## 12. Packing:

- (1) Quantity/Reel: 6000pcs/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	12.00	$\pm 0.30$
P	8.00	$\pm 0.10$
E	1.75	$\pm 0.10$
F	5.50	$\pm 0.10$
P2	2.00	$\pm 0.10$
D	1.20	+0.10 -0.00
Po	4.00	$\pm 0.10$
10Po	40.00	$\pm 0.20$

### 2.2 Pocket Dimensions(unit: mm)

Feature	Specifications	Tolerances
Ao	3.25	$\pm 0.20$
Bo	5.25	$\pm 0.10$
Ko	0.90	$\pm 0.10$
t	0.30	$\pm 0.05$

## 13. 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> X : $\pm 1$ X.X : $\pm 0.1$ X.XX : $\pm 0.01$ Angle : $\pm$ Hole Dia. : $\pm$		 Unictron Technologies Corporation Website: www.unictron.com		
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