



# Product Specification

---

## Chip Antenna

3.2 x 1.6 x 0.5 (mm) WiFi/Bluetooth Ceramic Chip Antenna  
(AA055U) Engineering Specification

**#412, Ace high-end Tower3. 371-50**

**Gasan-dong, Geumcheon-gu, seoul 153-803 Korea**

**Tel : 82-785-2777~8,2624-0887~8**

**Fax : 82-785-2744**

## 개정 이력

# **3.2 x 1.6 x 0.5 (mm) WiFi/Bluetooth Ceramic Chip Antenna (AA055U) Engineering Specification**

## **1. Product Number**

**[H] [2] [U] [3] [4] [W] [1] [H] [1] [Z] [0] [7] [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**

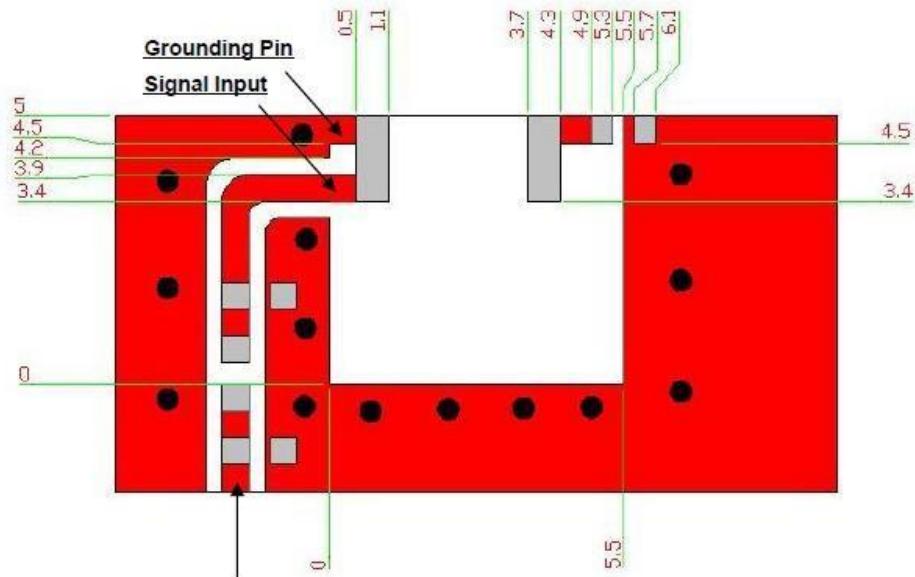
Innolink's AA055U ceramic chip antenna is designed for ISM 2.4GHz applications, covering frequencies 2400~2500MHz. Fabricated with proprietary design and processes, AA055U shows excellent performance and is fully compatible with SMT processes which can decrease the assembly cost and improve device's quality and consistency.

## 5. Layout Guide & Electrical Specifications

### 5-1. Layout Guide (unit : mm)

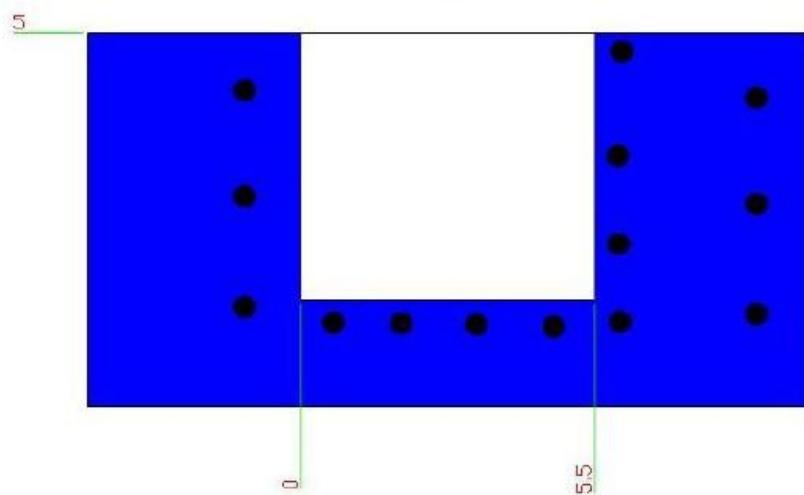
#### Solder Land Pattern:

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



#### Transmission Line with $50\Omega$ Impedance Characteristic

Top View



Bottom View

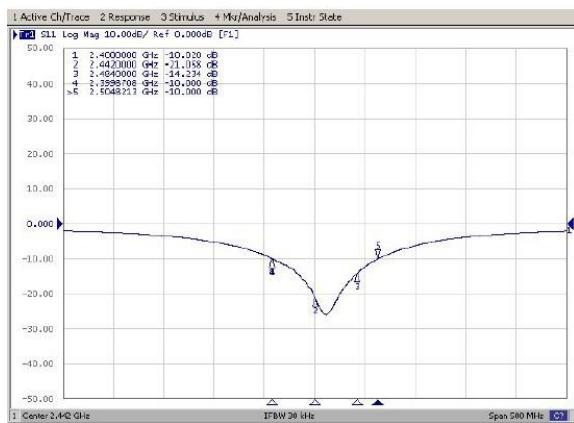
## 5-2. Electrical Specifications (Evaluation Board Dimensions: 80 x 40 mm<sup>2</sup>)

### 5-2-1. Electrical Table

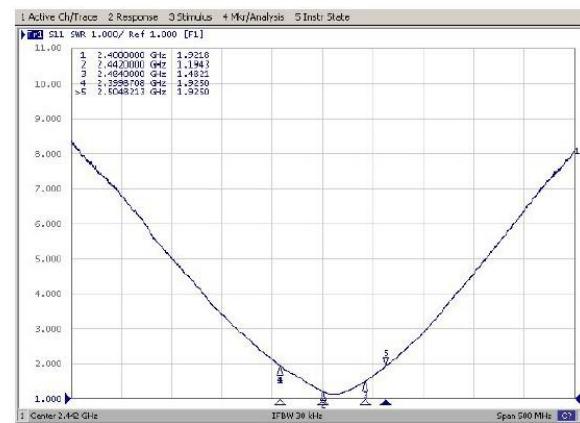
Characteristics	Specifications	Unit
Outline Dimensions	3.2 x 1.6 x 0.5	mm
Ground Plane Dimensions	80 x 40	mm
Working Frequency	2400~2500	MHz
Bandwidth	100 (typical)	MHz
VSWR	2 Max. (typical)	
Characteristic Impedance	50	Ω
Polarization	Linear Polarization	
Peak Gain	2.5 (typical)	dBi
Efficiency	84 (typical)	%

### 5-2-2. Return Loss & VSWR

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

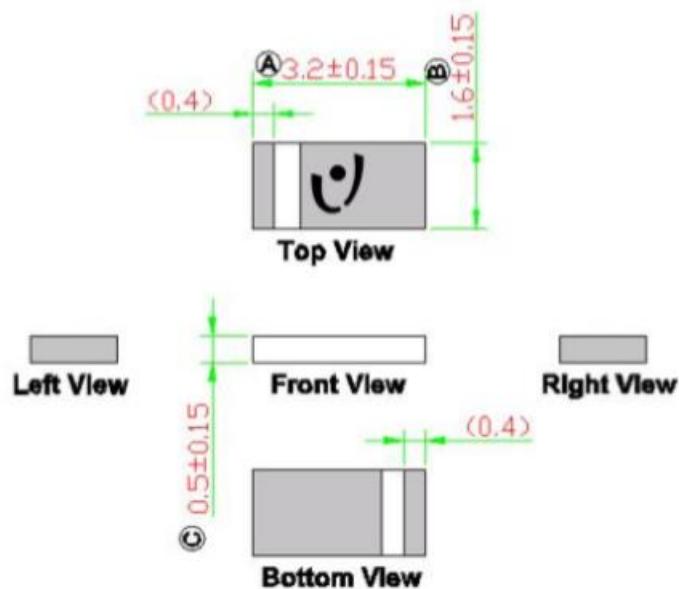


#### VSWR(S<sub>11</sub>)



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

### 6-1. Antenna Dimensions



NOTE:  
1. All materials are RoHS 2.0 compliant.  
2. "A~C" Critical Dimensions.  
3. "( )" Reference Dimensions.

### PIN Definition

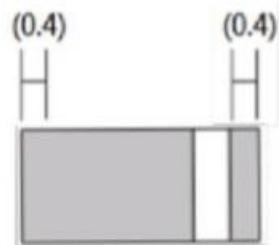
PIN 1



Top View

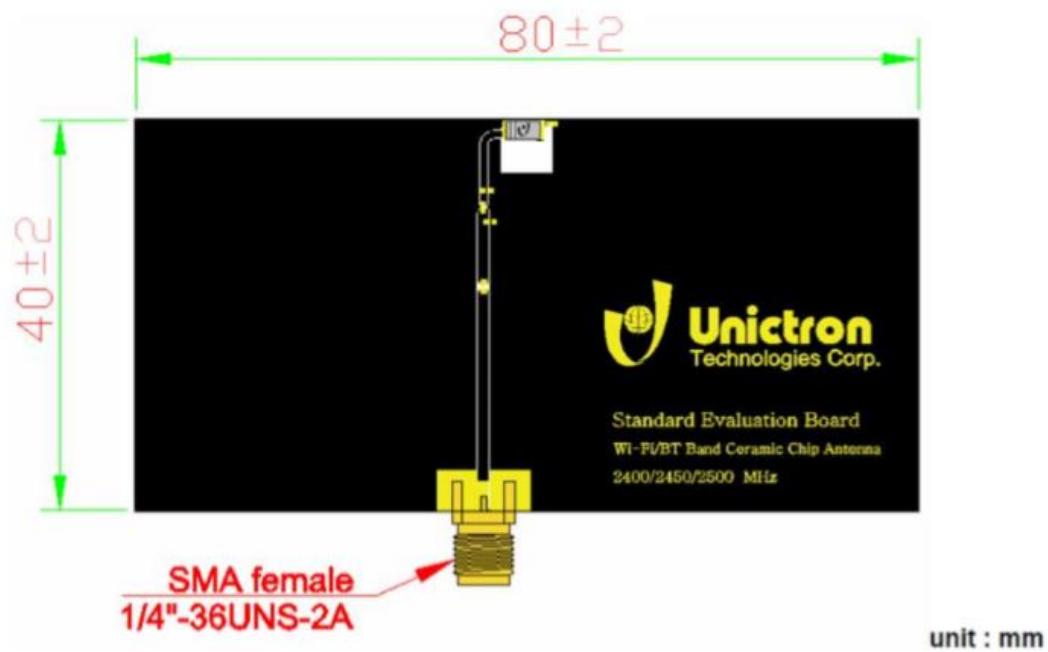
PIN 2

PIN 2



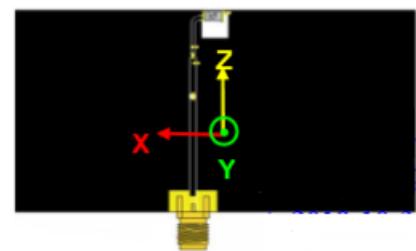
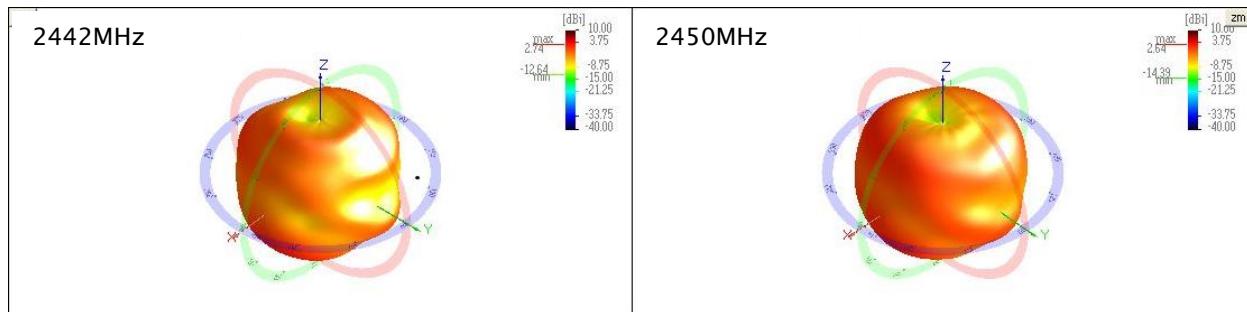
PIN 1

6-2. Evaluation Board with Antenna



## 7. Radiation Pattern (with 80 x 40 mm<sup>2</sup> Evaluation Board)

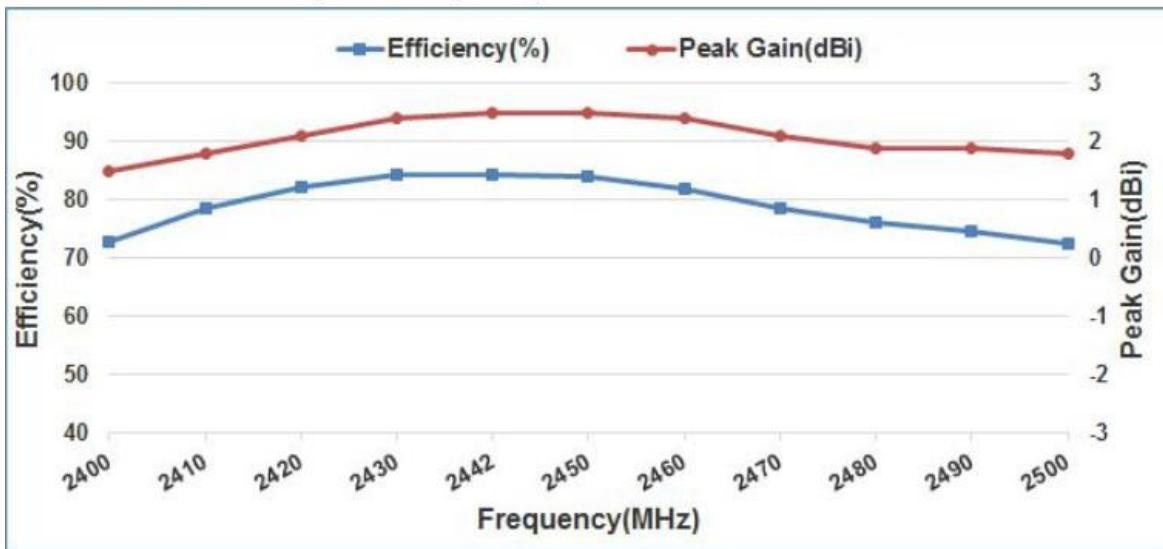
7-1. 3D Gain Pattern @ 2442 MHz / 2450MHz ( unit : dBi )



7-2. 3D Efficiency Table

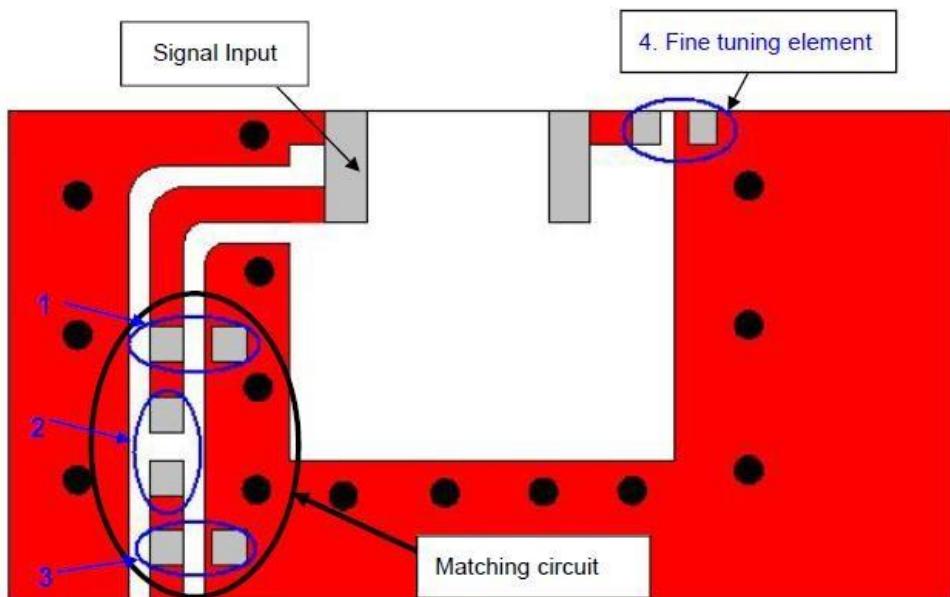
Frequency (MHz)	2400	2410	2420	2430	2442	2450	2460	2470	2480	2490	2500
Efficiency (dB)	-1.4	-1.0	-0.9	-0.7	-0.7	-0.8	-0.9	-1.1	-1.2	-1.3	-1.4
Efficiency (%)	72.8	78.7	82.3	84.4	84.5	84.0	82.0	78.6	76.1	74.6	72.5
Peak Gain (dBi)	1.5	1.8	2.1	2.4	2.5	2.5	2.4	2.1	1.9	1.9	1.8

7-3. 3D Efficiency vs. Frequency



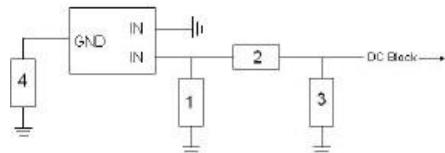
## 8. Frequency tuning and Matching circuit

### 8-1. Chip antenna tuning scenario :



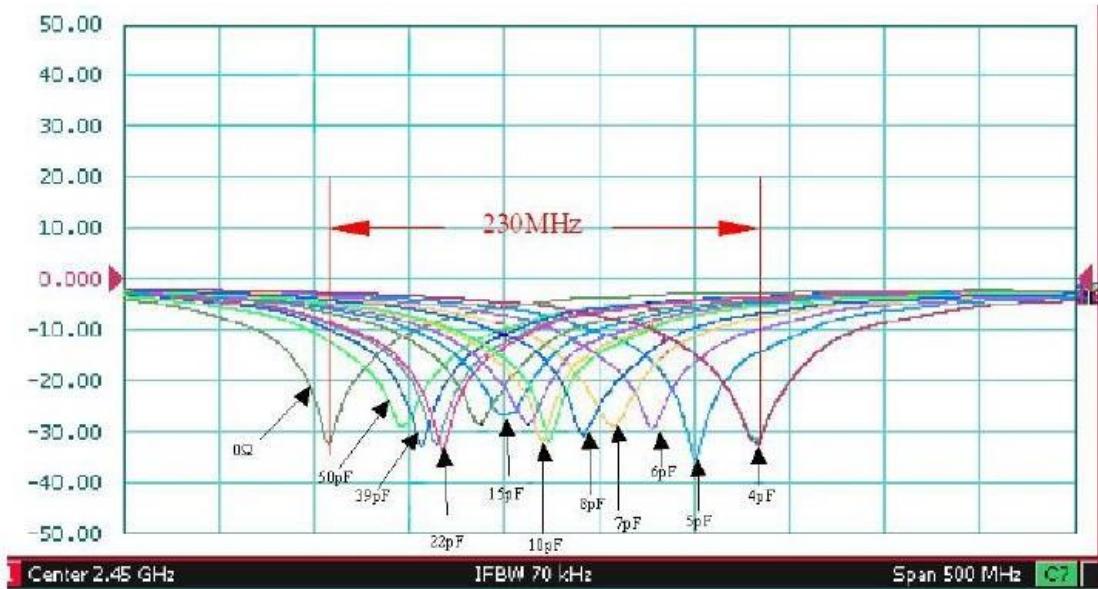
## 8-2. Matching circuit :

With the following recommended values of matching and tuning components, the center frequencies will be about 2442 MHz at our standard 80x40 mm<sup>2</sup> evaluation board. However, these are typical reference values which may need to be changed when circuit boards or part vendors are different.



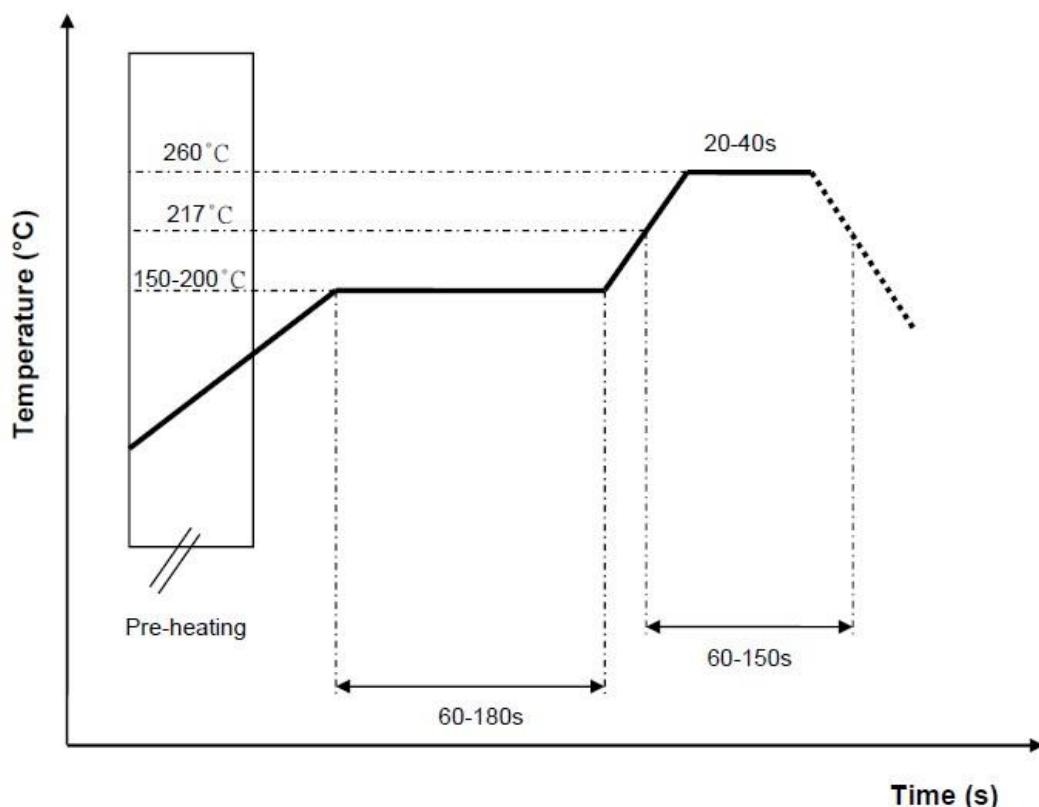
System Matching Circuit Component			
Location	Description	Vendor	Tolerance
1	1.2pF, (0402)	DARFON	$\pm 0.1$ pF
2	3.3nH, (0402)	DARFON	$\pm 0.1$ nH
3	N/A	-	-
4	Fine tuning element 1.5pF, (0402)	DARFON	$\pm 0.1$ pF

## 8-3. Reference for frequency tuning element



## 9. Soldering Conditions

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



## 10. Reminders for users of Innolink's AA055U ceramic chip antennas

10-1. This chip antenna is made of ceramic materials which are relatively more rigid and brittle compared to printed circuit board materials. Bending of circuit board at the locations where chip antenna is mounted may cause the cracking of solder joints or antenna itself.

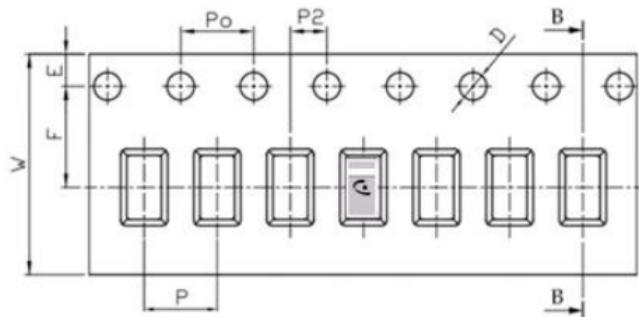
10-2. Punching/cutting of the break-off tab of PCB panel may cause severe bending of the circuit board which may result in cracking of solder joints or chip antenna itself. Therefore break-off tab shall be located away from the installation site of chip antenna.

10-3. Be cautious when ultrasonic welding process needs to be used near the locations where chip antennas are installed. Strong ultrasonic vibration may cause the cracking of chip antenna solder joints.

## 11. Packing

- (1) Packaging method is implemented according to " MSL 2a 包裝作業指導書 "
- (2) Quantity/Reel: 5000 pcs/Reel
- (3) Plastic tape: Black conductive polystyrene.

a. Tape Drawing



b. Tape Dimensions (unit: mm)

Feature	Specifications	Tolerances
W	12.00	$\pm 0.30$
P	4.00	$\pm 0.10$
E	1.75	$\pm 0.10$
F	5.50	$\pm 0.10$
P2	2.00	$\pm 0.10$
D	1.50	$+0.10$ $-0.00$
Po	4.00	$\pm 0.10$
10Po	40.00	$\pm 0.20$

## 12. Operating & Storage Conditions

### 12-1. Operating

- (1) Maximum Input Power: 2W
- (2) Operating Temperature: -40°C to 85°C

### 12-2. Storage

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

## 13. Notice

### (1) Installation Guide:

Please refer to Innolink's application note "General guidelines for the installation of Innolink's chip antennas" for further information.

### (2) All specifications are subject to change without notice.