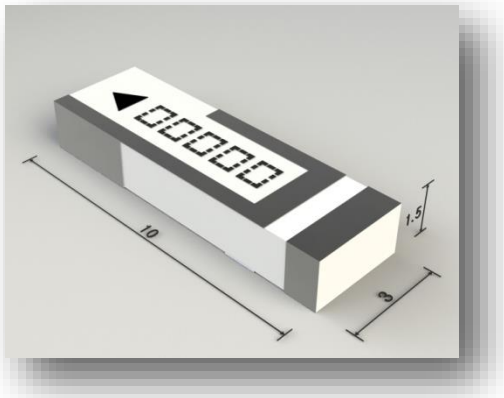
| Document | Datasheet |
|---|---|
| Type | Dielectric Chip Antenna |
| Application | 2.4GHz/5GHz |
| Part No. | AMAN1003015ST07 |
| Revision | 1.1 |

# DATASHEET




## Application

WLAN Dual-band(2.4GHz/5GHz)

## Features

PIFA structure
Size (10.0*3.0*1.5mm$^3$)
Performance optimizing
with tuning the conductive pattern on the ceramic body
SMT available under Pb-free condition
RoHS compliant
AEC-Q200 Qualified

# AMOTECH

***Notes***

*The contents of this datasheet are subject to change without notice. Please confirm the specifications and delivery conditions when placing your order.*

## Revision History

| Rev. No | Date | Title | Contents | Page |
|---|---|---|---|---|
| 0.0 | 2013. 09. 23 | | New Published | |
| 1.0 | 2013. 11. 18 | | Changed PCB Pin Number | 4 |
| 1.1 | 2017. 11. 14 | | Changed PCB Pin Number | 4 |
| | | | | |
| | | | | |
| | | | | |

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# 1. Specifications

## 1.1 Electrical Specifications

| No | Item | Spec. | | Remark |
|---|---|---|---|---|
| 1 | Frequency Range [MHz] | 2400 ~ 2485 | 5150 ~ 5850 | **EVB Condition** |
| | | 2318 ~ 2402 | 4765 ~ 5465 | **Jig Condition** |
| 2 | VSWR | Max 3.0 : 1 | Max 3.0 : 1 | **EVB Condition** |
| | | Max 2.5 :1 | Max 4.5 :1 | **Jig Condition** |
| 3 | Avg. Gain [dBi] | 2.442GHz | typ. -0.3 | **EVB Condition** |
| | | 5.500GHz | typ. -1.0 | |
| 4 | Efficiency [%] | 2.442GHz | typ. 92 | |
| | | 5.500GHz | typ. 79 | |
| 5 | Polarization | Linear | | |
| 6 | Impedance [Ω] | Nominal 50 | | |

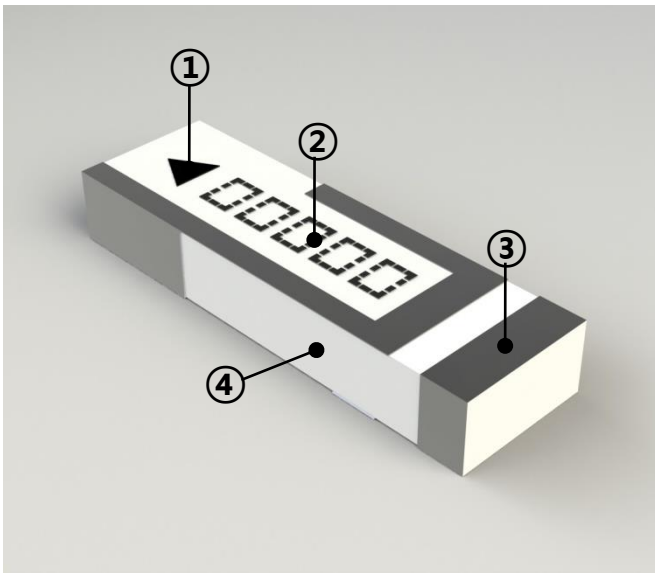
✓ The results are measured on the 100x50mm$^2$ evaluation board(EVB).
✓ See Page 6. for more detail gain parameter

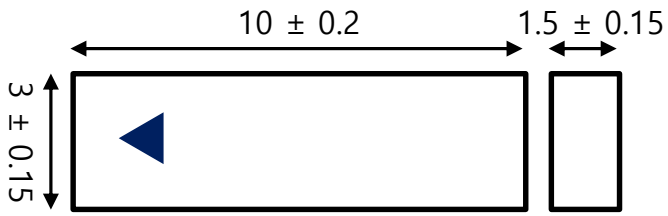
## 1.2 Mechanical Specifications

| No | Item | Spec. | Remark |
|---|---|---|---|
| 1 | Dimensions (LxWxH) | 10.0x3.0x1.5 mm$^3$ | |
| 2 | Unit Weight | typ. 110mg | |
| 3 | Operating Temperature | -40 ~ +125 ℃ | |

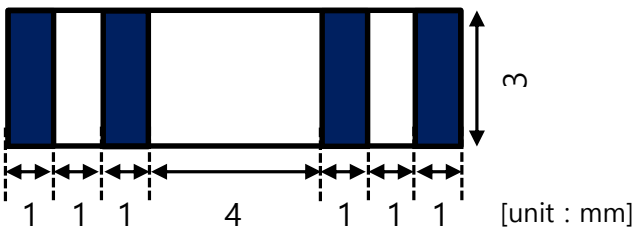
## 1.3 Appearance & Material

| No | Item | Function | Material |
|---|---|---|---|
| ① | Marking | Feeding Index | Ink |
| ② | Marking | Week number | Ink |
| ③ | Electrode | Radiation Element | Ag |
| ④ | Ceramic Body | - | Ceramic |



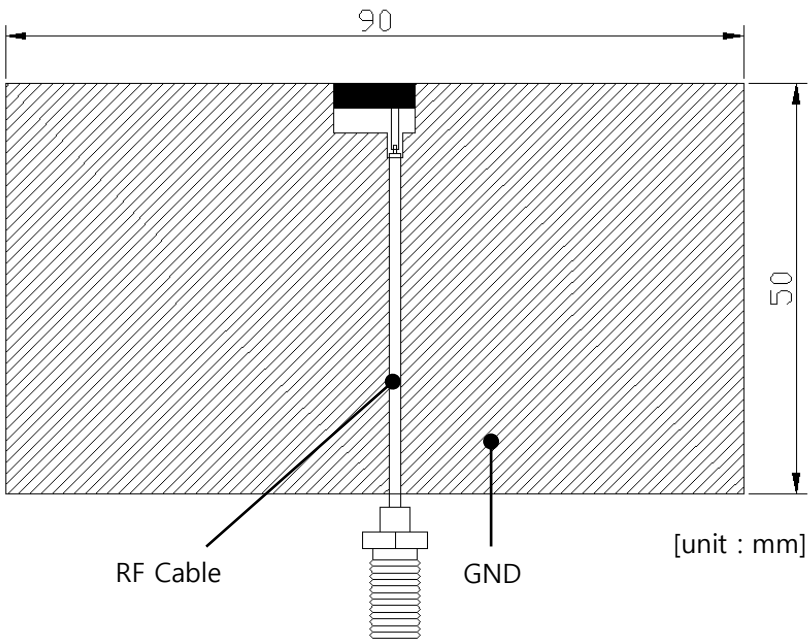

Antenna Top & Side




Antenna Bottom

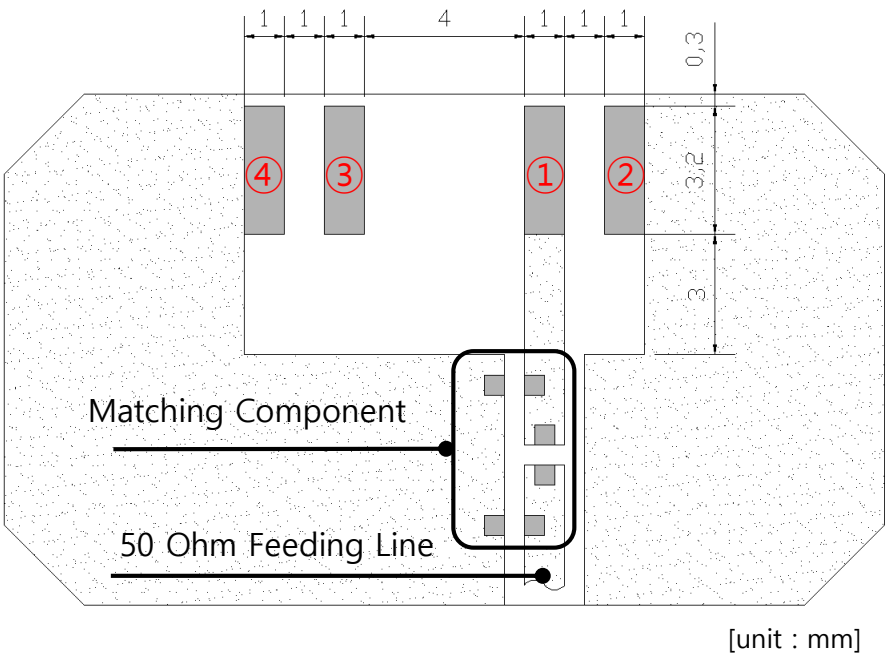
## 2. PCB Design for Test

### 2.1 Evaluation Board Dimension




✓ Evaluation board size ~ 90x50
✓ Fill Cut Area (GND Clearance) ~ 10.0x5.5

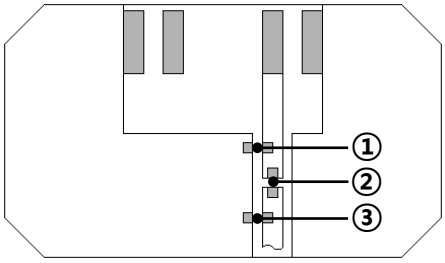
### 2.2 PCB Design Guide



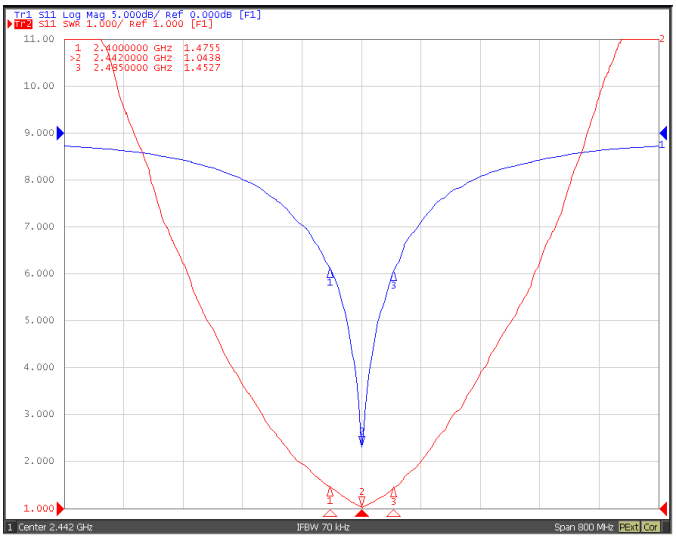
| No | Pin Assignment |
|---|---|
| ① | Feeding |
| ② | GND |
| ③ | N/C |
| ④ | GND |

## 3. Measurement Result

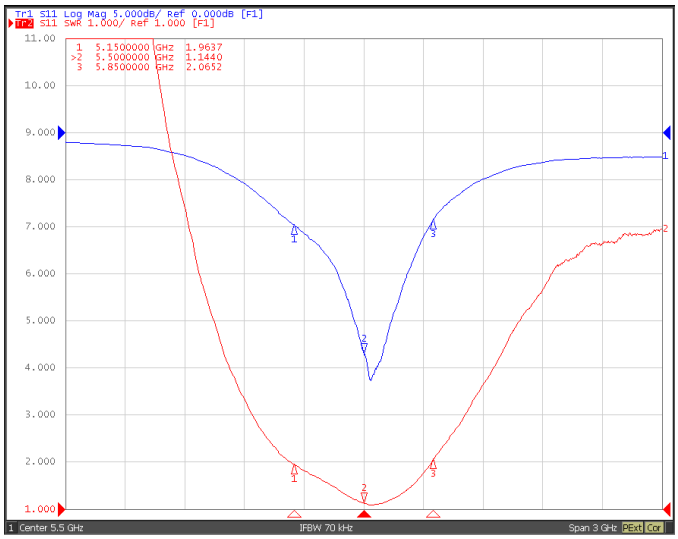
### 3.1 Typical Measurement Result (VSWR/RL, Smithchart)



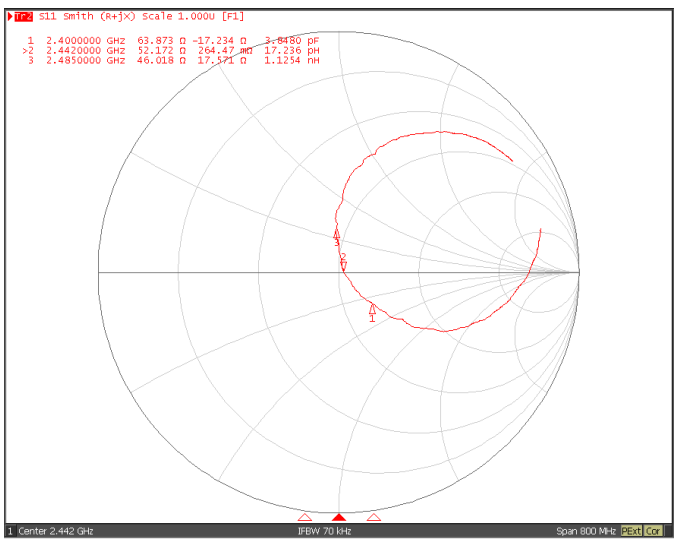

| No | Matching Value |
|---|---|
| ① | N/C |
| ② | 0Ω (100pF) |
| ③ | N/C |



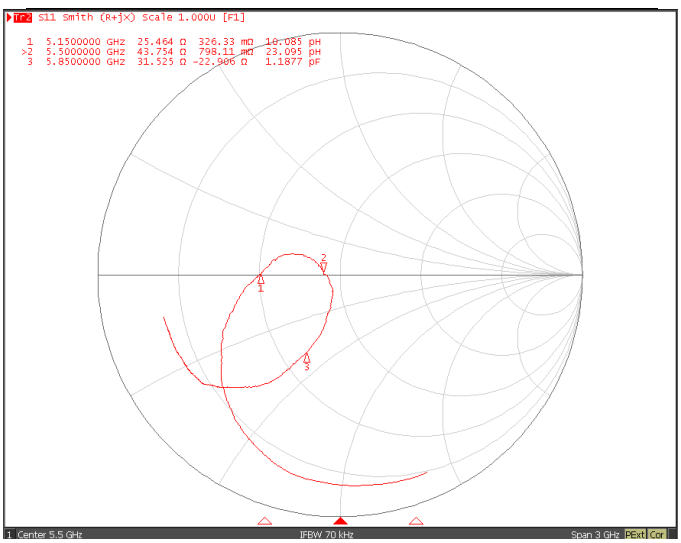

VSWR (2.442GHz)




VSWR (5.500GHz)




Smith Chart (2.442GHz)

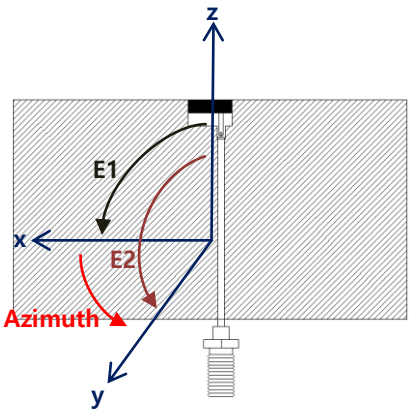


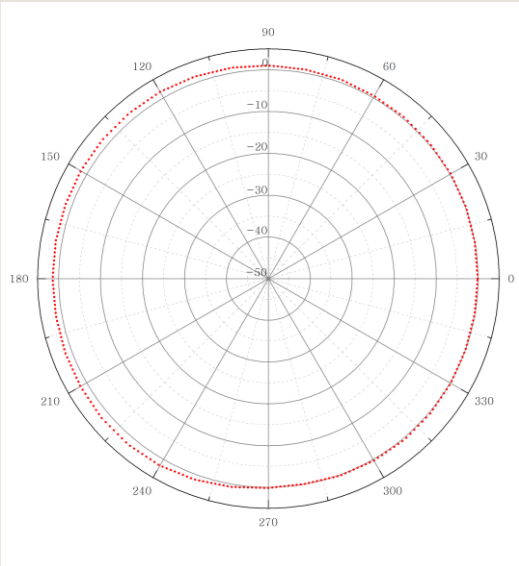

Smith Chart (5.500GHz)

✓ The results are measured on the 90x50mm$^2$ evaluation board(EVB).

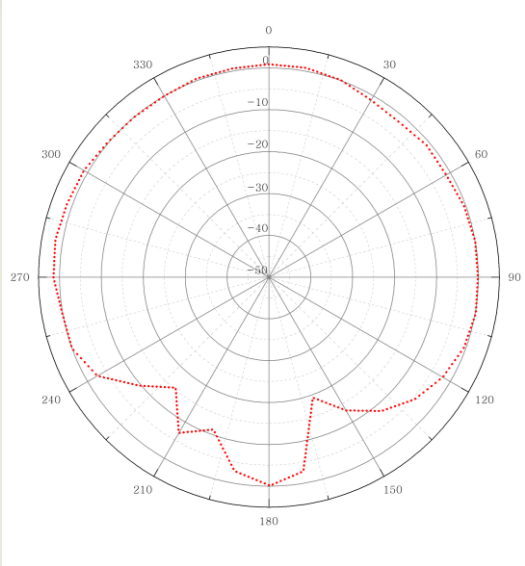
## 3.2 Typical Measurement Result (Gain, Radiation Pattern)

| | Peak Gain (dBi) | Avg. Gain (dBi) | Efficiency(%) |
|---|---|---|---|
| Azimuth | 1.88 | 0.9 | 92 |
| Elevation 1 | 1.72 | -1.08 | |
| Elevation 2 | 1.39 | -0.03 | |

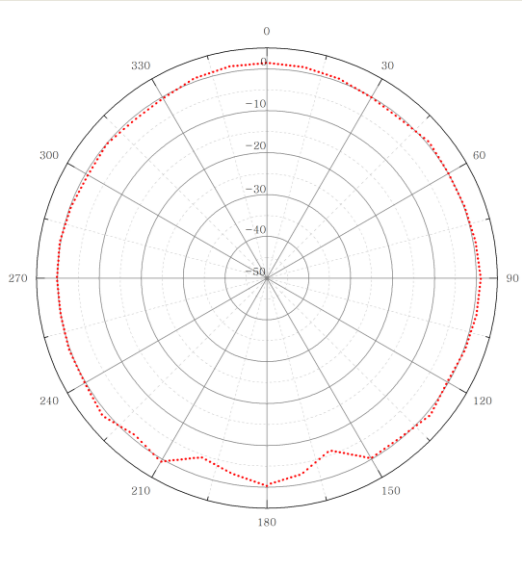


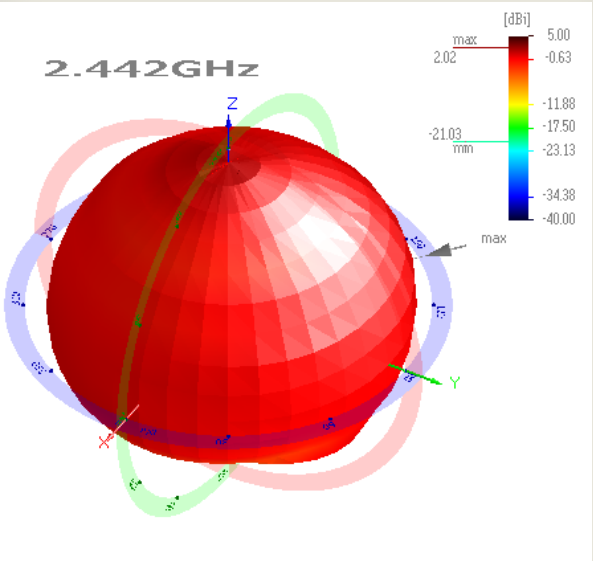
[Azimuth plane @2.442GHz ]



[Elevation1 plane @2.442GHz ]



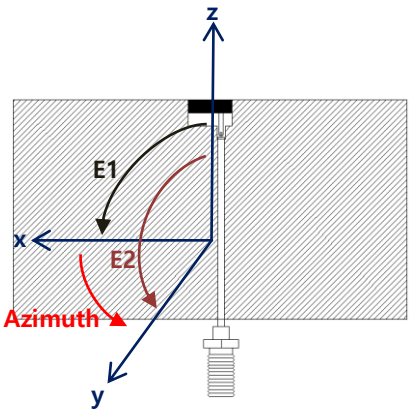
[Elevation2 plane @2.442GHz ]

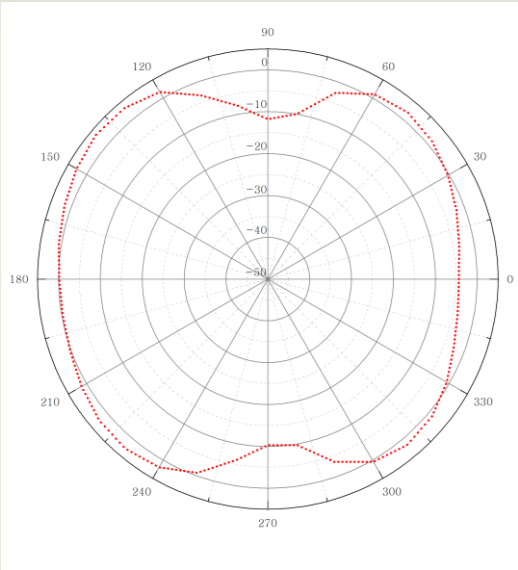



[3D Radiation Pattern]

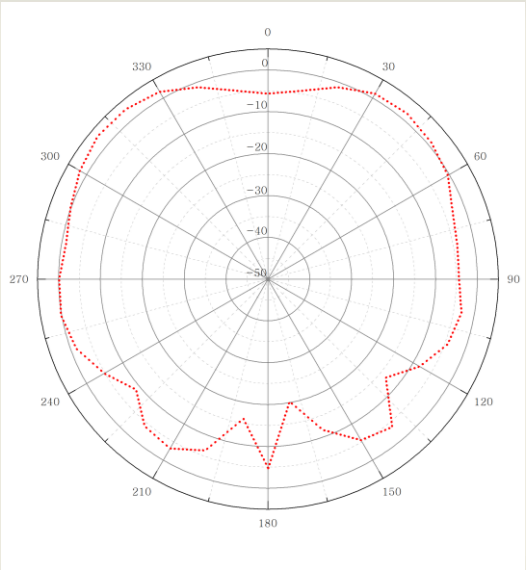
## 3.2 Typical Measurement Result (Gain, Radiation Pattern)

| | Peak Gain (dBi) | Avg. Gain (dBi) | Efficiency(%) |
|---|---|---|---|
| Azimuth | 3.60 | -0.09 | 79 |
| Elevation 1 | 3.08 | -1.79 | |
| Elevation 2 | -3.52 | -7.16 | |

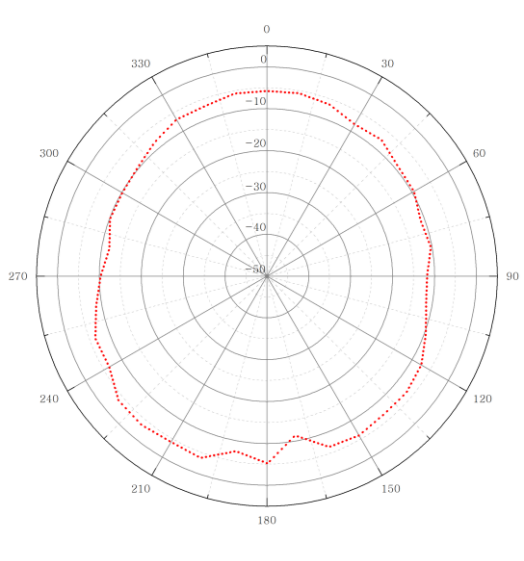


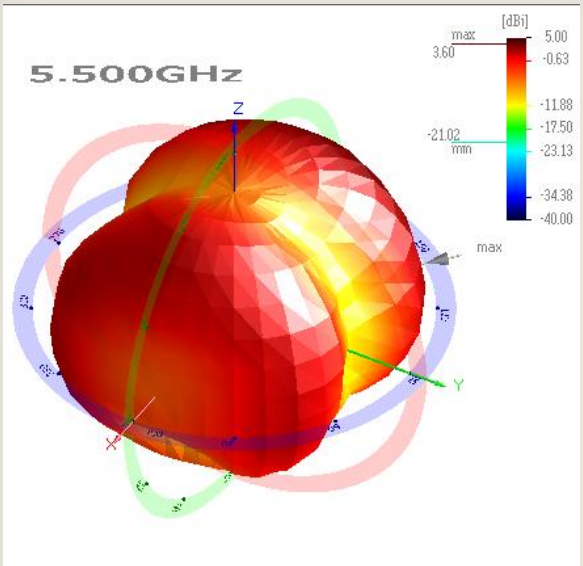
[Azimuth plane @5.5GHz ]



[Elevation1 plane @5.5GHz ]

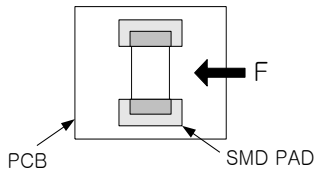


[Elevation2 plane @5.5GHz ]




[3D Radiation Pattern]

## 4. Reliability

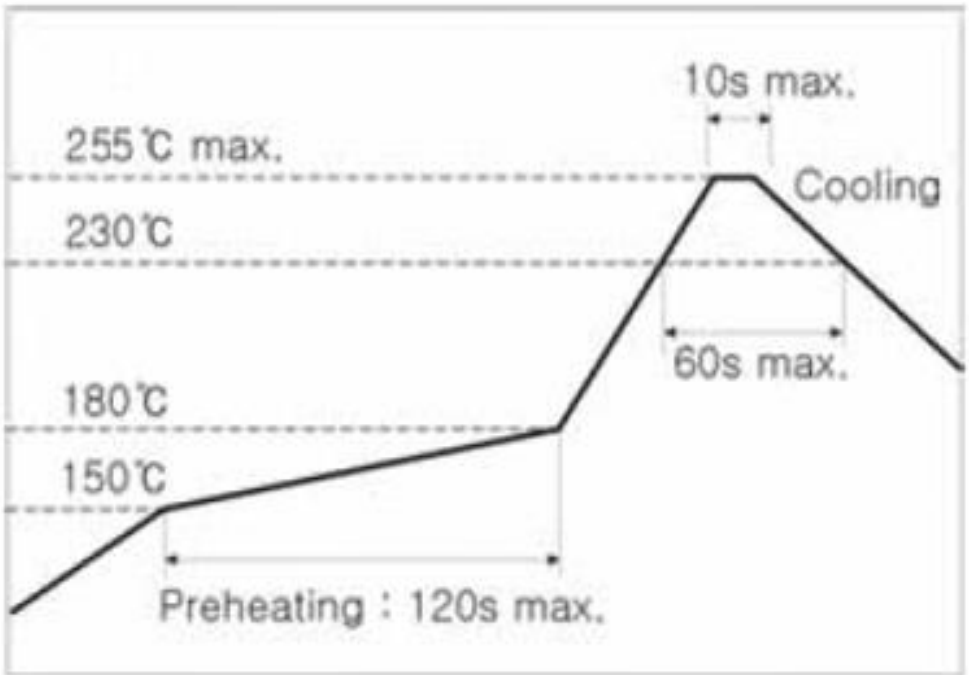
| No | Item | Test Condition | Test Requirements |
|---|---|---|---|
| 1 | Adhesive Strength of Termination | Apply force on SMT chip till detached from PCB.<br>  | 1. No mechanical damage within applied force(F≤5 kgf) on chip.<br>2. The force when the chip drops off the PCB should be greater than 5 kgf. |
| 2 | Thermal Shock (Cycle) | 1. Step 1 : -40 ± 3℃, 30 min<br>Step 2 : +85 ± 3℃, 30 min<br>2. Number of cycle : 1000 | 1. No visual damage<br>2. Within electric specification (VSWR) |
| 3 | High Temperature Resistance | 1. Temperature : +125 ± 5℃<br>2. Time : 1000 ± hrs. | 1. No visual damage<br>2. Within electric specification (VSWR) |
| 4 | Humidity | 1. Humidity : 85 % RH<br>Temperature : +85 ± 3℃<br>2. Time : 1000 ± hrs. | 1. No visual damage<br>2. Within electric specification (VSWR) |
| 5 | ESD | 1. ESD level : 8KV<br>2. Mode : contact discharge<br>3. Count : 10 | 1. No visual damage<br>2. Within electric specification (VSWR) |

## 5. Cautions (Recommendations )

✓ Storage environment of parts must be at ambient temperatures of 5 to 40℃ and maximum 60%RH humidity

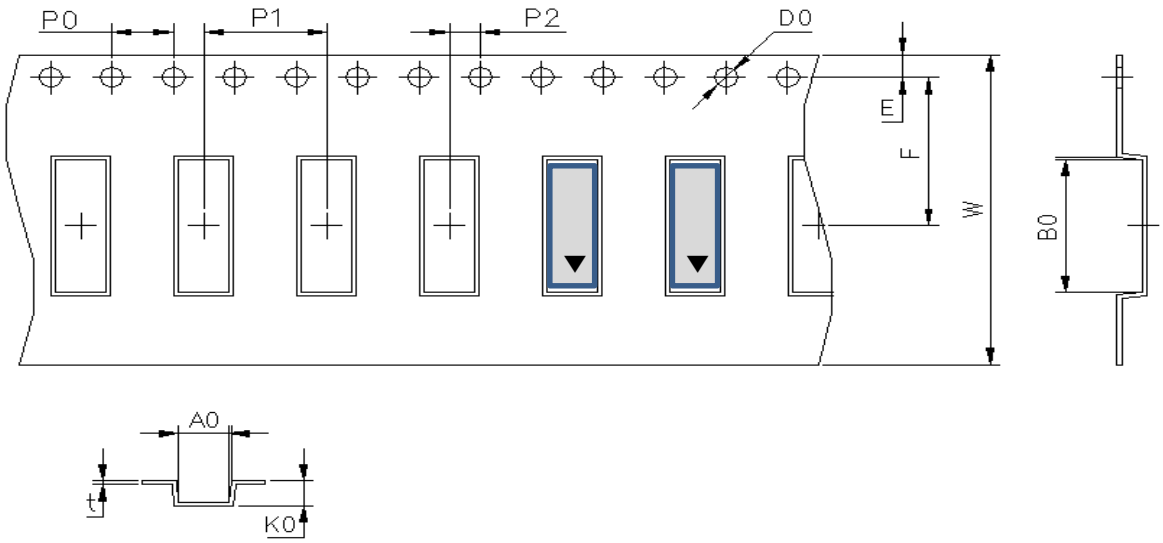
✓ The parts should be used within 6 months from the time of delivery. If stored for over 6 months, check for solder ability before use.

## 6. Soldering Reflow Profile



## 6. Packaging

### 6.1 Carrier Tape Dimension




| Item | Spec. | Item | Spec. | Item | Spec. |
|---|---|---|---|---|---|
| A0 | 3.30 ±0.10 | P0 | 4.00 ±0.10 | E | 1.75 ±0.10 |
| B0 | 10.30 ±0.10 | P1 | 8.00 ±0.10 | F | 11.50 ±0.10 |
| K0 | 1.65 ±0.10 | P2 | 2.00 ±0.10 | W | 24.00 ±0.30 |
| D0 | 1.55 ±0.05 | - | - | t | 0.30 ±0.05 |

### 6.2 Packaging Quantity

| Item | Quantity | Dimension |
|---|---|---|
| Reel | 4,000 ea | Φ13" * 24mm |
| Inner | 4,000 ea (1 Reel) | 350 * 350 * 90 (mm3) |
| Outer Box | 12,000 ea (3 Inner Box) | 390 * 390 * 280 (mm3) |

### 6.3 Packaging Label

**AMOTECH Co., Ltd.**

5BL-1Lot, 617, Namchon-Dong, Namdong-Gu, Incheon, Korea

**Dielectric Chip Antenna**

P/N : AMAN1003015ST07

Lot No :

Quantity : 4,000 pcs  Date : 2013/09/23