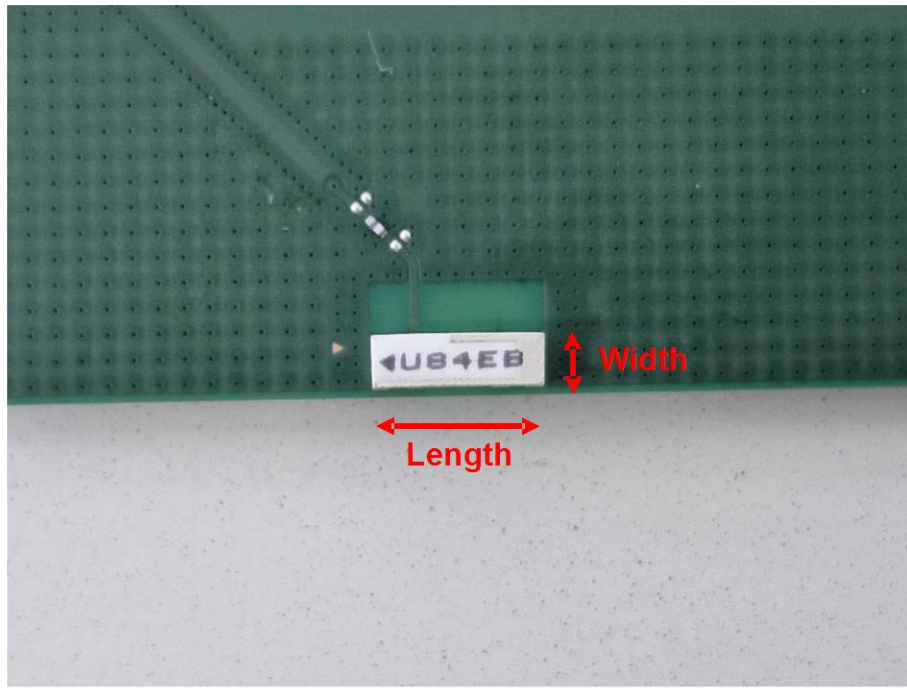


Antenna Information

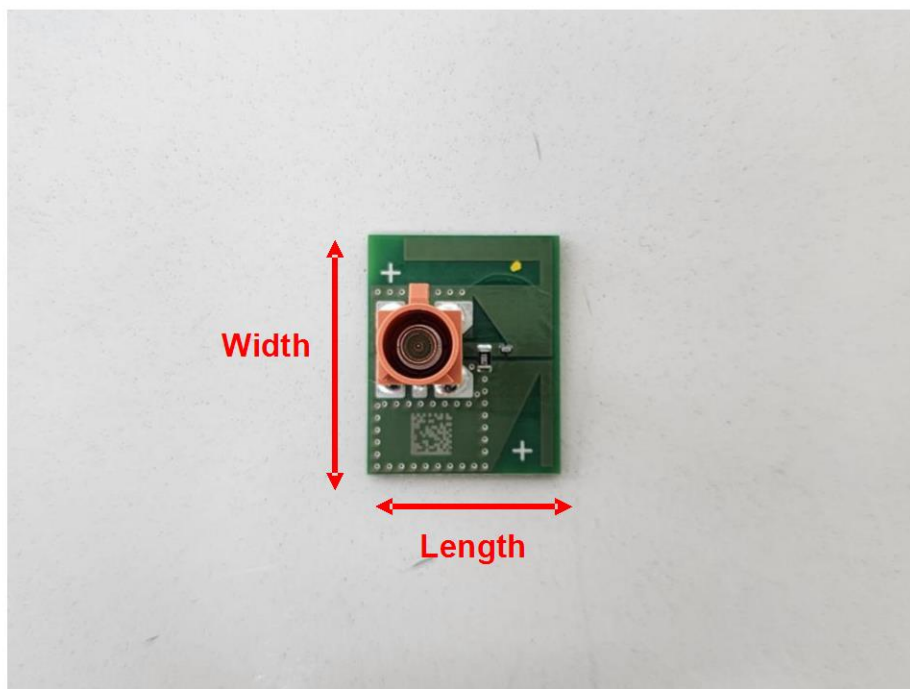
Item	Contents	
Antenna Type	Ant.1	Internal Dielectric Chip Antenna
	Ant.2	External PIFA
Antenna peak gain	Ant.1	BT/LE: 2 400 MHz ~ 2 483.5 MHz; 2.20 dBi WLAN5: 5 150 MHz ~ 5 250 MHz; 4.60 dBi 5 725 MHz ~ 5 875 MHz; 3.50 dBi
	Ant.2	WLAN2: 2 400 MHz ~ 2 483.5 MHz; 0.25 dBi
Manufacturer / Model name	Ant.1	Hirschmann Car Communication GmbH / 920-696-001
	Ant.2	AMOTECH Co., Ltd. / AMAN1003030ST02
Address of manufacturer	Ant.1	Stuttgarter Str. 45 – 51, 72654 Neckartenzlingen, Germany
	Ant.2	380, Namdongseo-ro, Namdong-gu, Incheon, Republic of Korea.
Test Laboratory	Ant.1	Hirschmann Car Communication GmbH
	Ant.2	AMOTECH Co., Ltd.
Internal Dielectric Chip Antenna	Length	10 mm
	Width	3 mm
External PIFA	Length	20 mm
	Width	25 mm

Model name: LANR41

Internal Dielectric Chip Antenna



External PIFA



Model name: LANR41

WiFi Antenna

TE Product Number: 920-696-001

Preliminary Data Sheet. All aspects may be subject to changes.

Mechanical description



Figure 1: Exemplary Picture of Part Number: 920-696-001 WiFi antenna.

Physical Dimensions: 20 mm * 25 mm * 16 mm

Weight: 3 g

Block Diagram

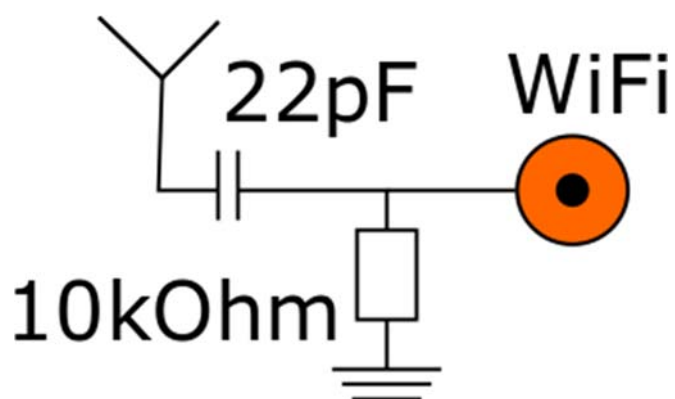


Figure 2 Block Diagram.

Dpt. PDA	Product Name WiFi Antenna	Product Number 920-696-001	Page 1 / 6
 is now part of		 Confidential	

Pinning

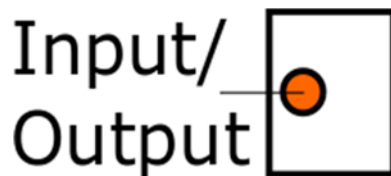


Figure 3 Pin Diagram.

Operating Conditions

Parameter	min.	typ.	max.	Unit
Operating Temperature	-40	25	90	°C
Storage Temperature	-40	25	90	°C

Technical Data

Parameter	Typical Value	Unit
Impedance	50	Ohm
S11	<-3, free-space <-6, mounted in car	dB
DC diagnosis resistor	10 ± 5%	kOhm

Antenna Gain

*Measured in setup as indicated in Figure 6

Frequency [MHz]	Partial Average Gain (θ= 0-180°)	Peak Gain (θ= 0-180°)	Unit
2400	-5.8	-1.4	dBi
2450	-4.5	-0.2	dBi
2480	-3.8	0.25	dBi

Additional Information

Antenna Type	PIFA
Polarization	Linear

Typical Antenna Reflection Performance

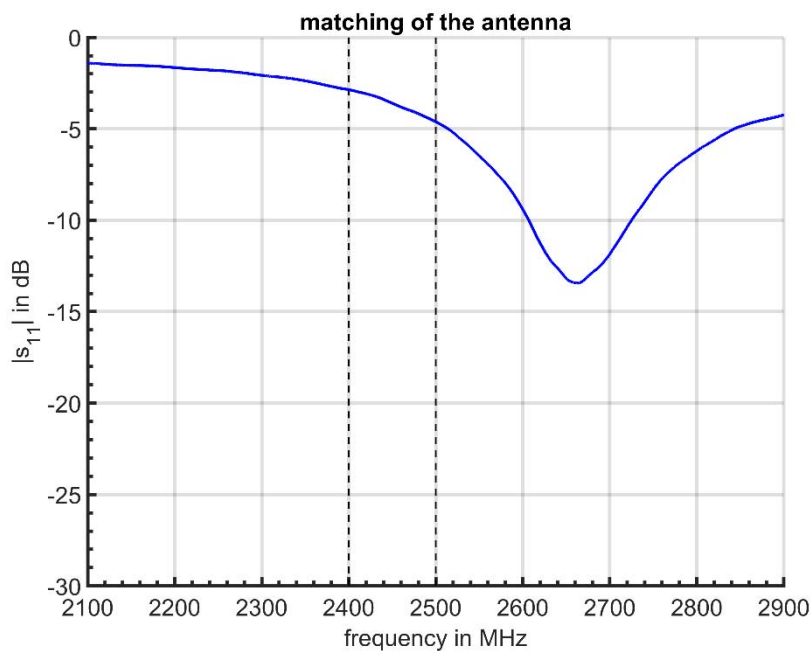


Figure 5 Typical measured S_{11} values free space.

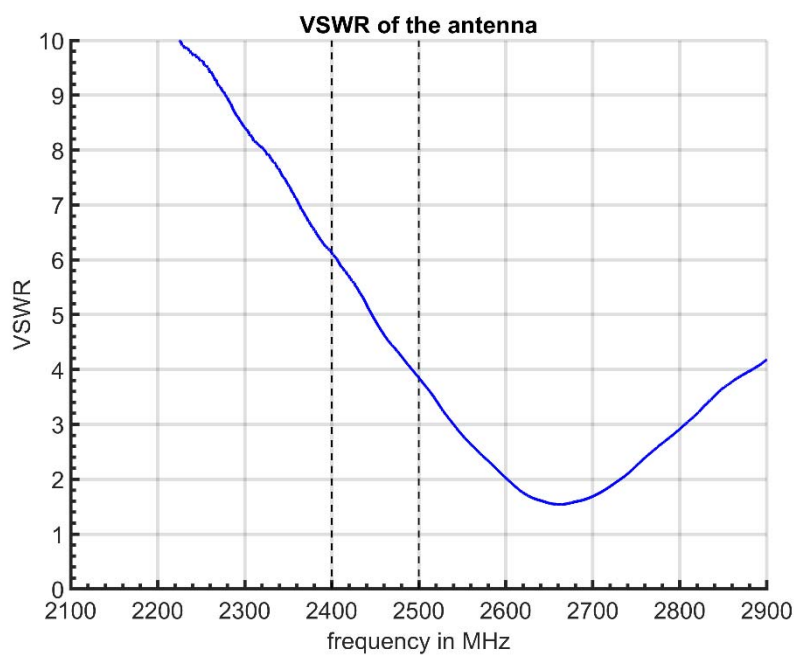


Figure 5 Typical measured VSWR values free space.

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Typical Antenna Radiation Performance Free-Space

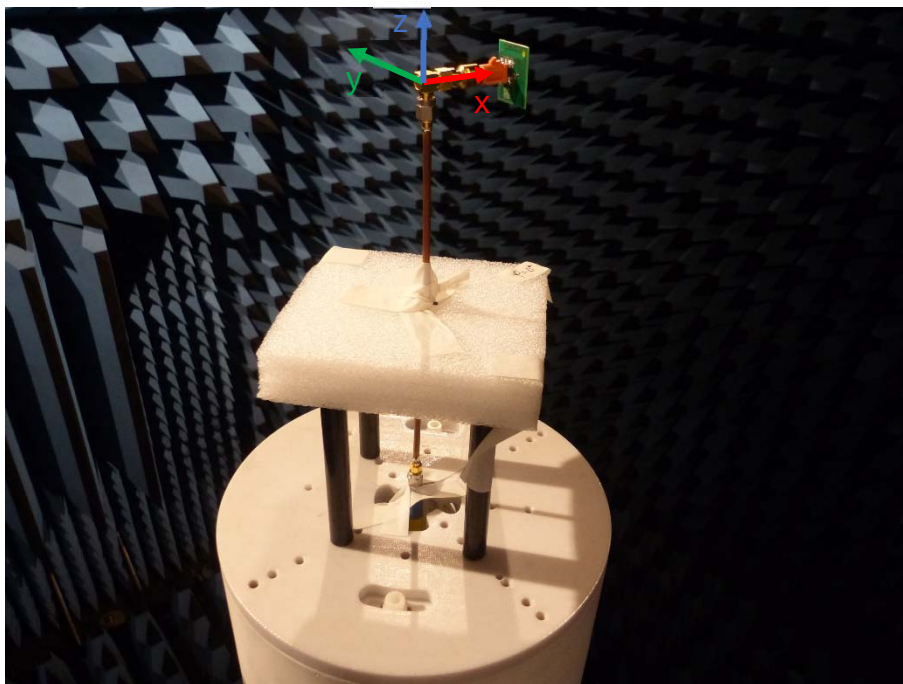


Figure 6 Measurement setup inside anechoic chamber.

Note: FAKRA faces in the direction of $\phi=0^\circ$. The ϕ -plane is parallel the polystyrol surface.

realized partial average gain (Theta=[0.00 - 180.00]° ; Phi=[0.00 - 360.00]°)
E_Total, Theta - linear w. spherical area consideration, Phi - linear

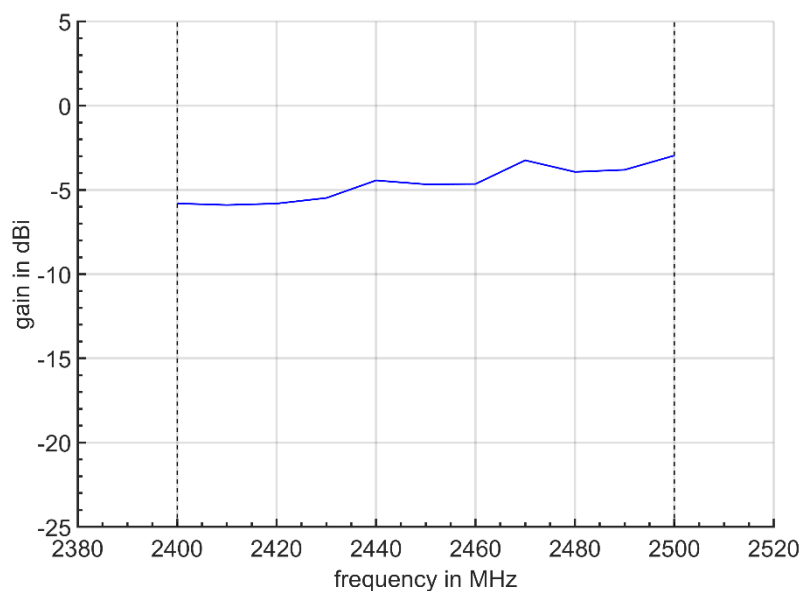
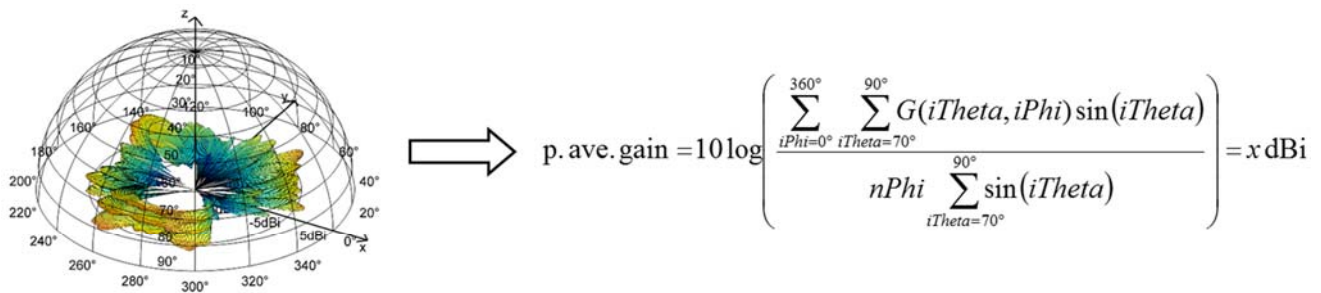


Figure 7 Realized Gain averaged in near azimuth region (Theta 0°-180°).

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Calculation formula of Partial Antenna Gain



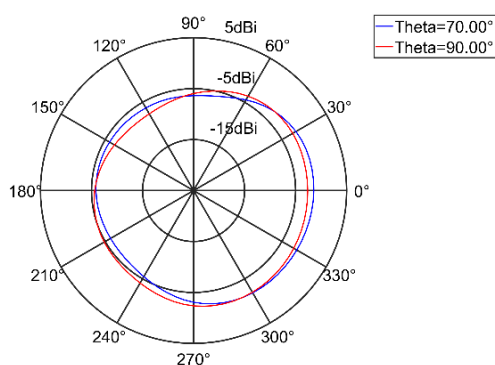
$n\Phi \Rightarrow$ number of elevation cuts

$G \Rightarrow$ total gain ($G_{\Theta} + G_{\Phi}$)

p. ave. gain $\Rightarrow$ partial average gain

2D Radiation Plots

radiation pattern of the antenna (azimuth cut)
realized gain (E_Total, Freq = 2440.00 MHz)



radiation pattern of the antenna (elevation cut)
realized gain (E_Total, Freq = 2440.00 MHz)

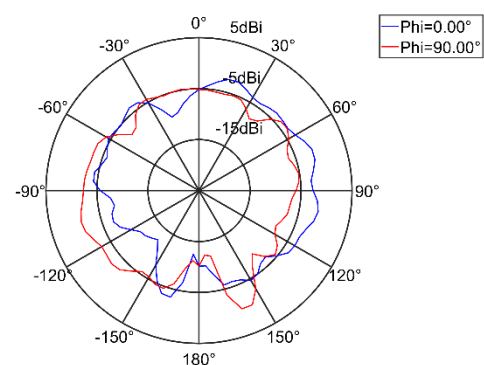
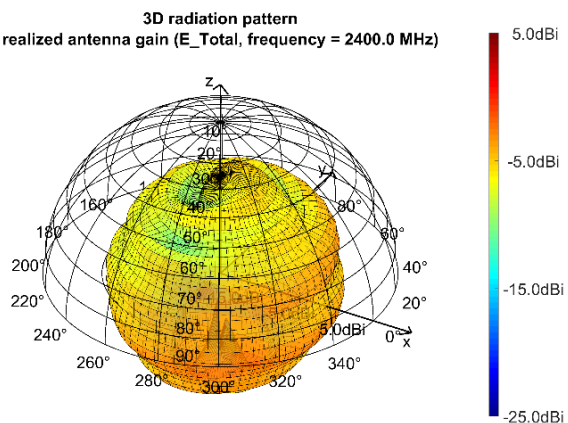


Figure 8 2D Radiation Plots.

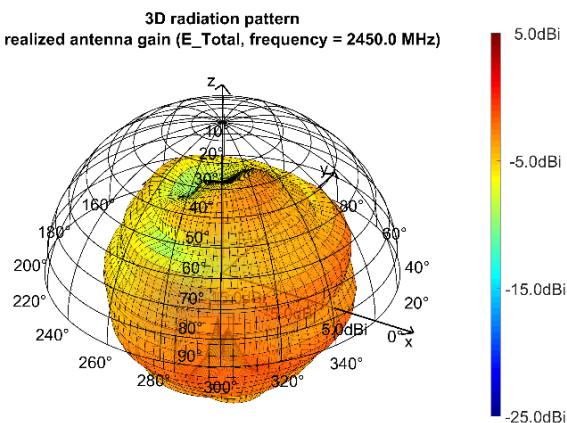
Dpt. PDA	Product Name WiFi Antenna	Product Number 920-696-001	Page 5 / 6
 		Confidential	

3D Radiation Plots

3D radiation pattern
realized antenna gain (E_Total, frequency = 2400.0 MHz)



3D radiation pattern
realized antenna gain (E_Total, frequency = 2450.0 MHz)



3D radiation pattern
realized antenna gain (E_Total, frequency = 2480.0 MHz)

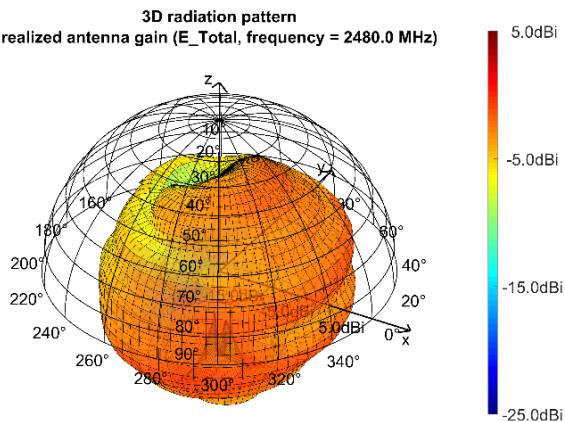


Figure 9 3D Radiation Plots.

Dpt. PDA	Product Name WiFi Antenna	Product Number 920-696-001	Page 6 / 6
 		Confidential	

Document	Datasheet
Type	Dielectric Chip Antenna
Application	2.4GHz/5GHz
Part No.	AMAN1003030ST02
Revision	4.0

DATASHEET

Application

WLAN Dual-band(2.4GHz/5GHz)

Features

PIFA structure

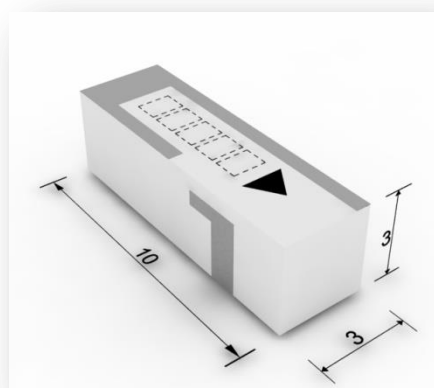
Size (10*3*3mm³)

Performance optimizing

with tuning the conductive pattern on the ceramic body

SMT available under Pb-free condition

RoHS compliant



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	'08.10.20		New Published	
1	'09.09.03	Format	Changed document format	
2	'11.05.18		Changed PCB Design Guide	4
3	2011. 06. 23		Changed Typical Measurement Result	5
3.1	2015. 09. 21		Changed Operating Temperature	3
4	2015. 12. 14		Changed Measurement Result	3,6,7

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1.1 Electrical Specifications	3
1.2 Mechanical Specifications	3
1.3 Appearance and Material	3
2. PCB Design for Test	4
2.1 Evaluation Board Dimension	4
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3. Measurement Result	5
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7.2 Packing Quantity	9
7.3 Packing Label	9

1. Specifications

1.1 Electrical Specifications

No	Item	Spec		Remark
1	Frequency Range [GHz]	2.400 ~2.485 / 5.150~5.875		
2	VSWR	Max 3.0:1		
3	Avg. Gain [dBi]	2.400GHz	-1.6	Measured Data (on the EVB)
		2.442GHz	-1.2	
		2.485GHz	-0.4	
		5.150GHz	-0.6	
		5.500GHz	-0.4	
		5.850GHz	-1.9	
4	Peak. Gain [dBi]	2.400GHz	1.8	
		2.442GHz	2.2	
		2.485GHz	3.1	
		5.150GHz	4.6	
		5.500GHz	5.1	
		5.850GHz	3.5	
5	Polarization	Linear		
6	Impedance [Ω]	Nominal 50		

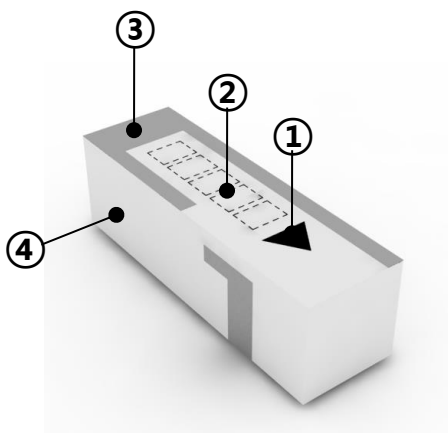
- ✓ The results are measured on the 100x50mm² evaluation board(EVB).
- ✓ See Page 6. for more detail gain parameter

1.2 Mechanical Specifications

No	Item	Spec.	Remark
1	Dimensions (LxWxH)	10.0x3.0x3.0 mm ³	
2	Unit Weight	typ. 0.3g	
3	Operating Temperature	-40 ~ +125 °C	

1.3 Appearance & Material

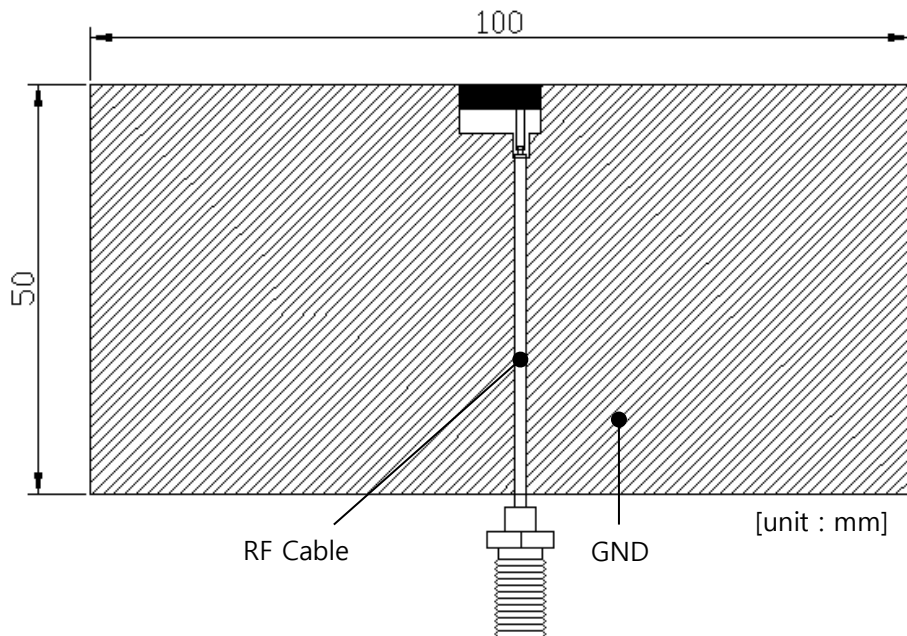
No	Item	Function	Material
①	Marking	Feeding Index	Ink
②	Marking	Week number	Ink
③	Electrode	Radiation Element	Ag
④	Ceramic Body	-	Ceramic



[unit : mm]

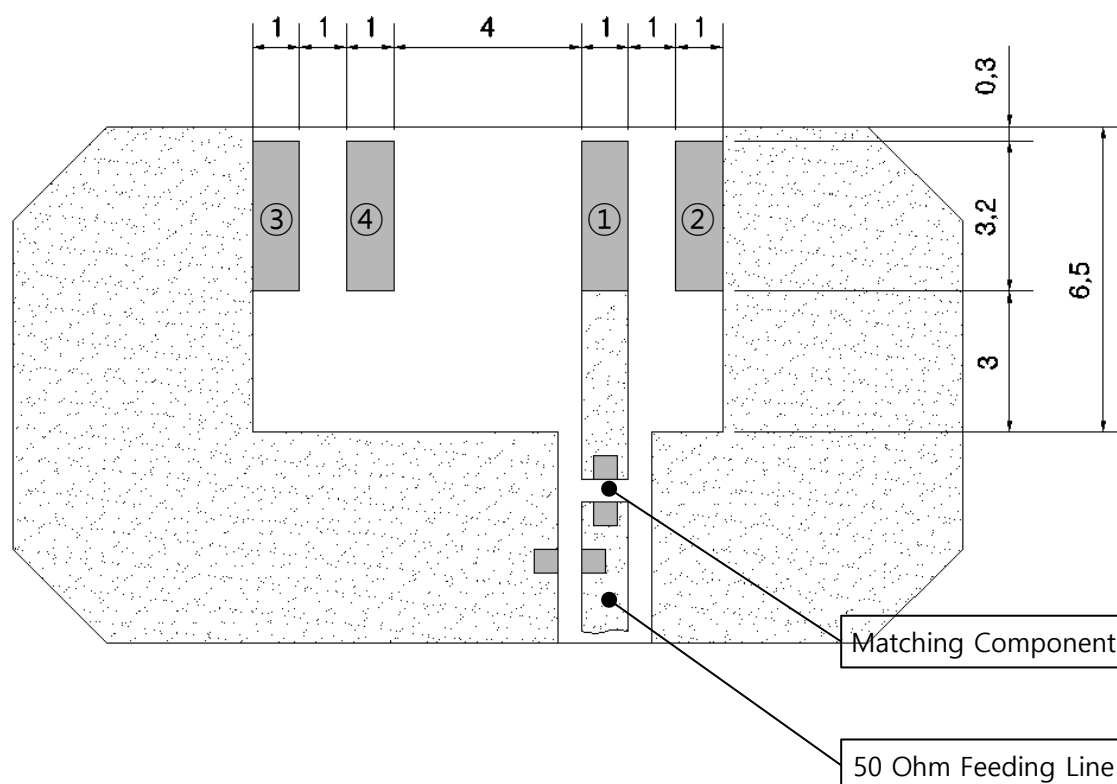
2. PCB Design for Test

2.1 Evaluation Board Dimension



- ✓ Evaluation board size ~ 100x50
- ✓ Fill Cut Area (GND Clearance) ~ 10.0x6.5

2.2 PCB Design Guide

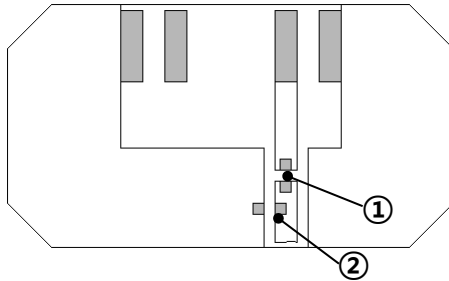


No	Pin Assignment
①	Feeding
②	GND
③	GND
④	N/C

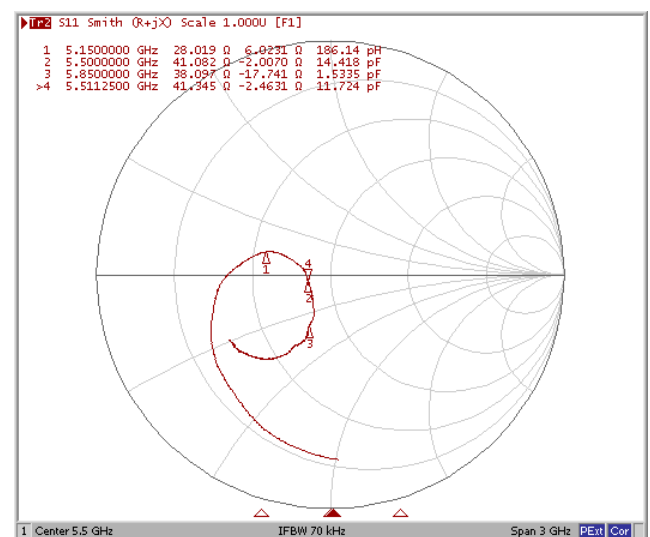
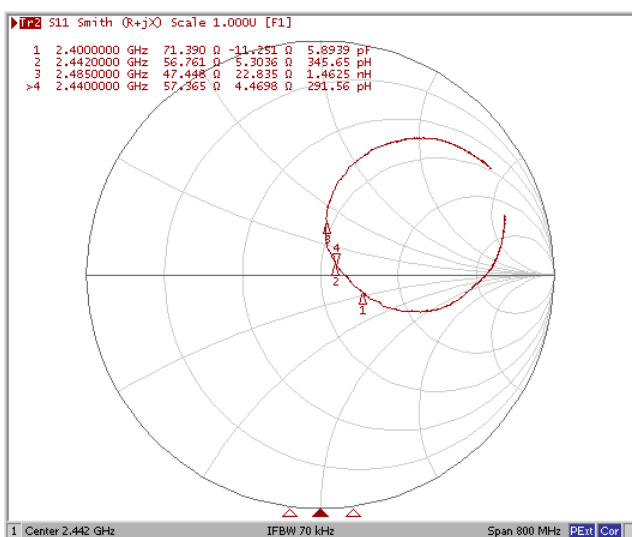
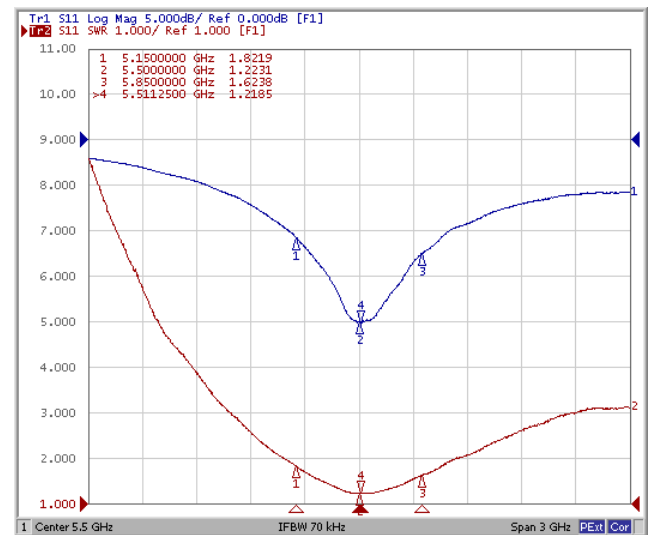
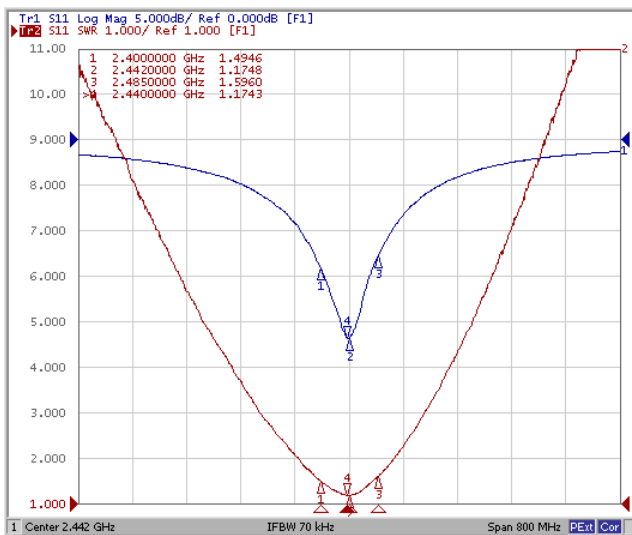
[unit : mm]

3. Measurement Result

3.1 Typical Measurement Result (VSWR/RL, Smithchart)



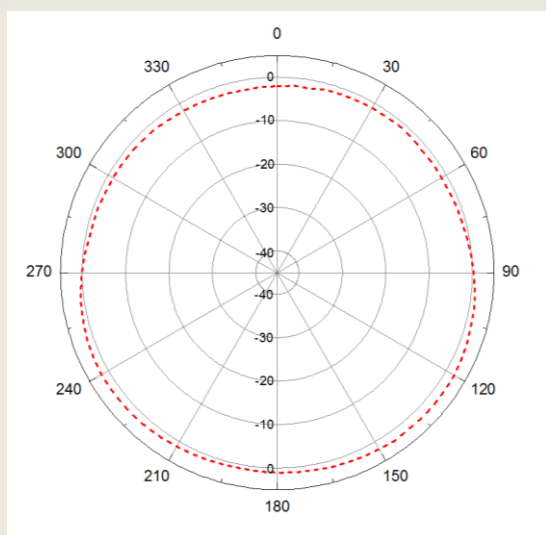
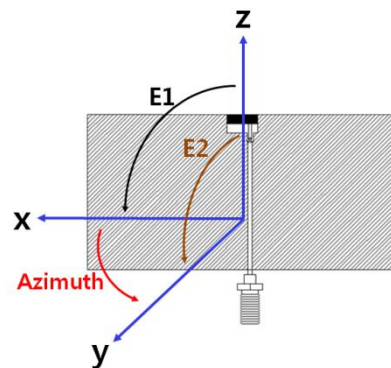
No	Matching Value
①	100 pF
②	N.C



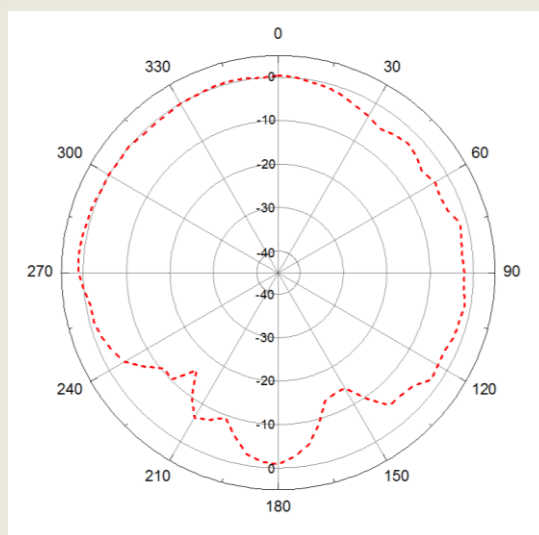
✓ The results are measured on the 100x50mm² evaluation board(EVB).

3.2 Typical Measurement Result (Gain, Radiation Pattern)

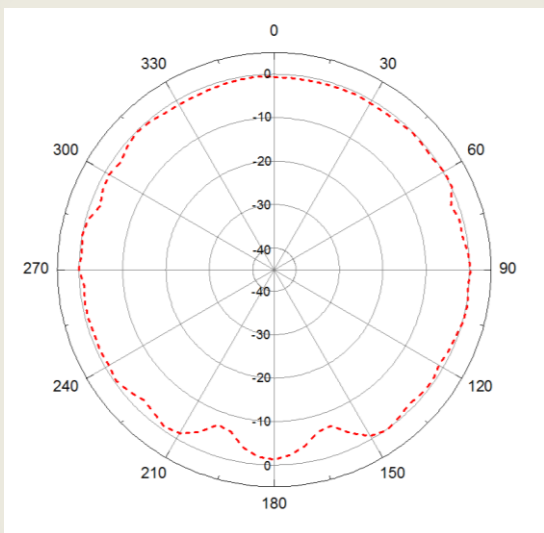
	Peak Gain (dBi)	Avg. Gain (dBi)	Efficiency(%)
Azimuth	2.23	0.32	76
Elevation 1	1.21	-2.05	
Elevation 2	0.28	-1.02	



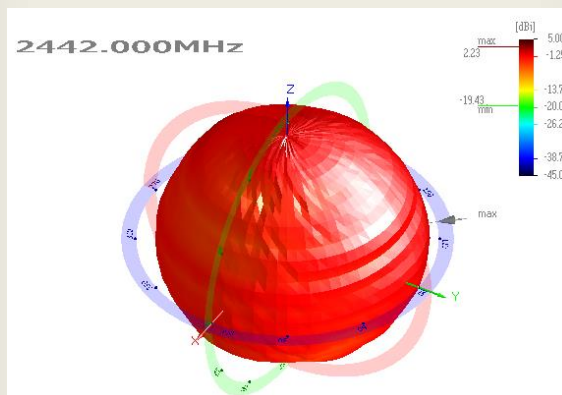
[Azimuth plane @2.442GHz]



[Elevation1 plane @2.442GHz]



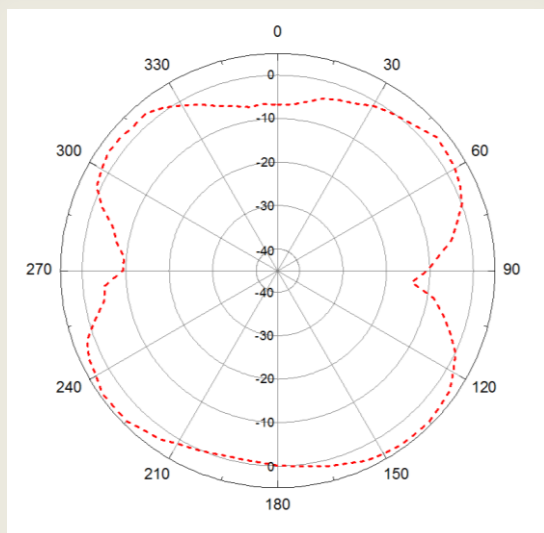
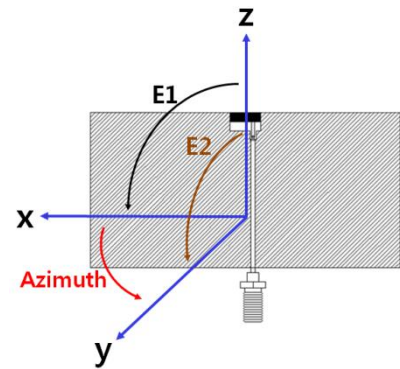
[Elevation2 plane @2.442GHz]



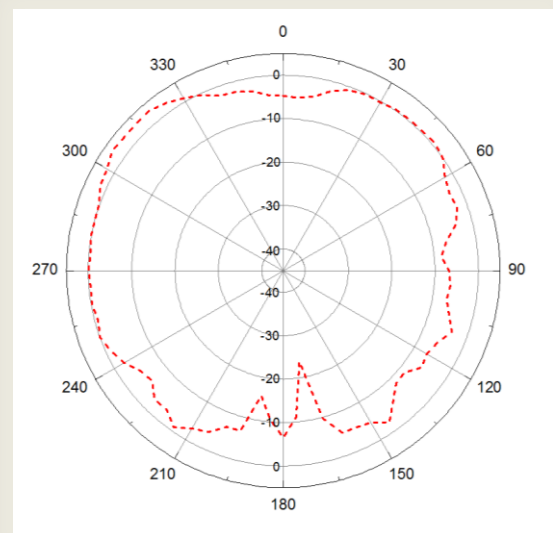
[3D Radiation Pattern]

3.2 Typical Measurement Result (Gain, Radiation Pattern)

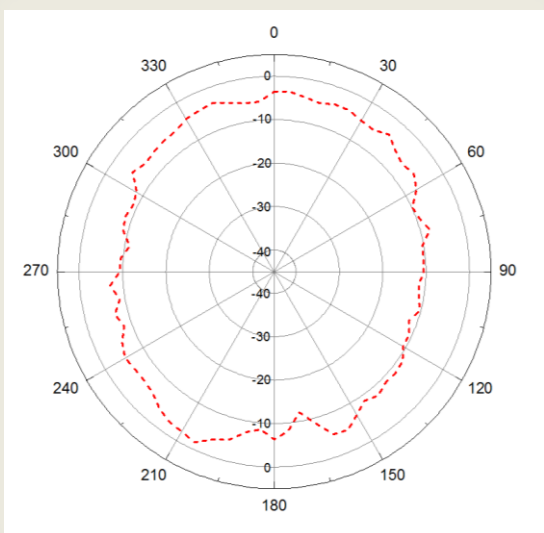
	Peak Gain (dBi)	Avg. Gain (dBi)	Efficiency(%)
Azimuth	4.31	0.48	92
Elevation 1	3.13	-1.82	
Elevation 2	-1.60	-6.21	



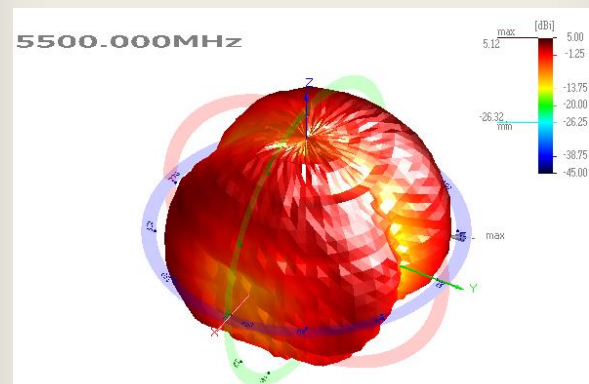
[Azimuth plane @5.500GHz]



[Elevation1 plane @5.500GHz]

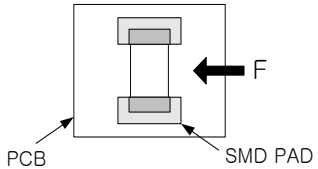


[Elevation2 plane @5.500GHz]



[3D Radiation Pattern]

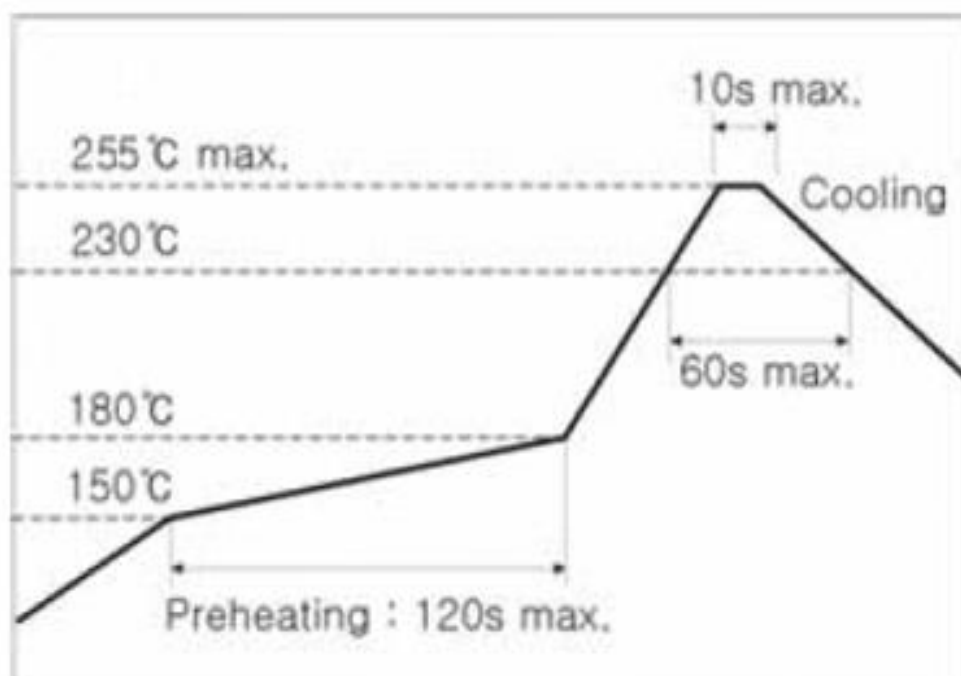
4. Reliability

No	Item	Test Condition	Test Requirements
1	Adhesive Strength of Termination	1. Applied force on SMT chip till detached point from PCB. 	1. No mechanical damage by applied force 2. Strength (F) > 5 kgf
2	Thermal Shock (Cycle)	1. Step 1 : $-40 \pm 3^{\circ}\text{C}$, 30 min Step 2 : $+125 \pm 3^{\circ}\text{C}$, 30 min 2. Number of cycle : 30	1. No visual damage 2. Within electric spec (VSWR)
3	High Temperature Resistance	1. Temperature : $+125 \pm 5^{\circ}\text{C}$ 2. Time : 1000 ± 24 hrs	1. No visual damage 2. Within electric spec (VSWR)
4	Low Temperature Resistance	1. Temperature : $-40 \pm 5^{\circ}\text{C}$ 2. Time : 1000 ± 24 hrs	1. No visual damage 2. Within electric spec (VSWR)
5	Humidity	1. Humidity : 85 % RH Temperature : $+85 \pm 3^{\circ}\text{C}$ 2. Time : 1000 ± 24 hrs	1. No visual damage 2. Within electric spec (VSWR)

5. Cautions (Recommendations)

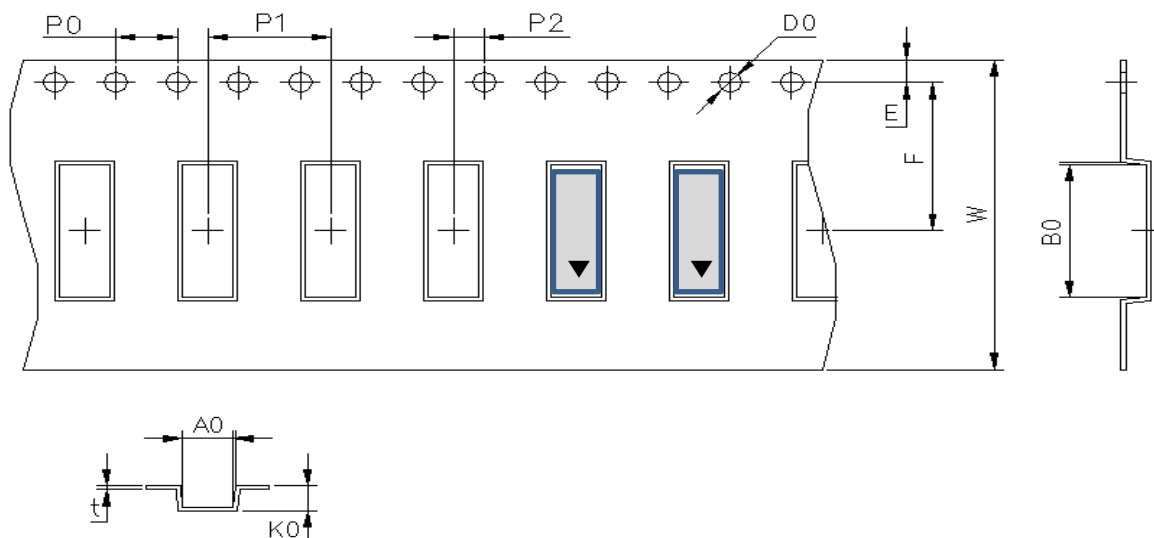
- ✓ Storage environment of parts must be at ambient temperatures of 5 to 40°C and maximum 60%RH humidity
- ✓ The parts should be used within 6 months from the time of delivery. If stored for over 6 months, check for solder ability before use.

6. Soldering Reflow Profile



7. Packaging

7.1 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	3.25 ±0.10	P2	2.00 ±0.10	W	24.00 ±0.30
D0	1.55 ±0.05	-	-	t	0.30 ±0.05

7.2 Packaging Quantity

Item	Quantity	Dimension
Reel	2,000 ea	Φ13" * 24mm
Inner	4,000 ea (2 Reel)	350 * 350 * 90 (mm3)
Outer Box	12,000 ea (3 Inner Box)	390 * 390 * 280 (mm3)

7.3 Packaging Label

AMOTECH Co., Ltd.

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

Dielectric Chip Antenna

P/N : AMAN1003030ST02

Lot No :

Quantity : 2,000 pcs Date : 2011/06/27