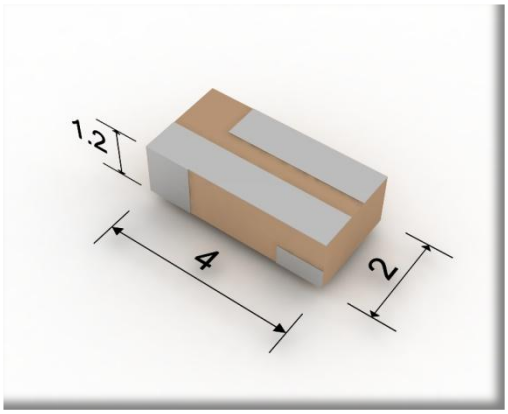
AMOTECH Co., Ltd.

Document	Datasheet
Type	Dielectric Chip Antenna
Application	2.4GHz
Part No.	AMAN402012ST01
Revision	1.0

DATASHEET



Application

Bluetooth
Zigbee
WLAN (IEEE 802.11 b/g)
ISM 2.4GHz Wireless Devices

Features

PIFA Structure
Small Size (4.0*2.0*1.2mm^3)
Easy Optimizing
with external lumped matching components
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	'08.09.05		New Published	
1.0	'10.01.19	Format	Changed document format	

Table of Content

1. Specifications

1.1 Electrical Specifications

No	Item	Spec.	Remark
1	Frequency Range [GHz]	2.4 ~2.485	
2	VSWR	Max 3.0:1	
3	Peak Gain [dBi]	typ. 2.9	
4	Total Avg. Gain [dBi]	typ. -0.5	
5	Efficiency [%]	typ. 90	
6	Polarization	Linear	
7	Impedance [Ω]	Nominal 50	

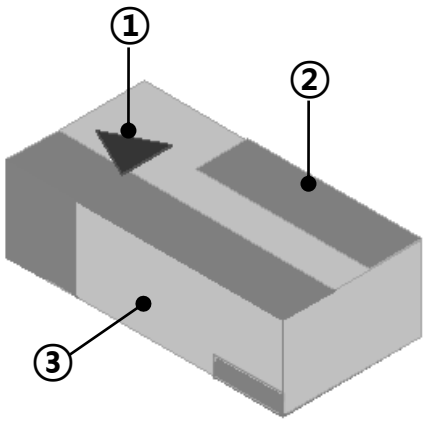
✓ The results are measured on the 50x50mm^2 evaluation board(EVB).
✓ See Page 6. for more detail gain parameter

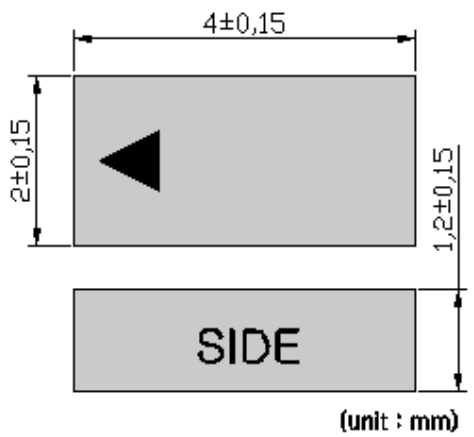
1.2 Mechanical Specifications

No	Item	Spec.	Remark
1	Dimensions (LxWxH)	4.0x2.0x1.2 mm^3	
2	Unit Weight	typ. 35 mg	
3	Operating Temperature	-35 ~ +85 ℃	

1.3 Appearance & Material

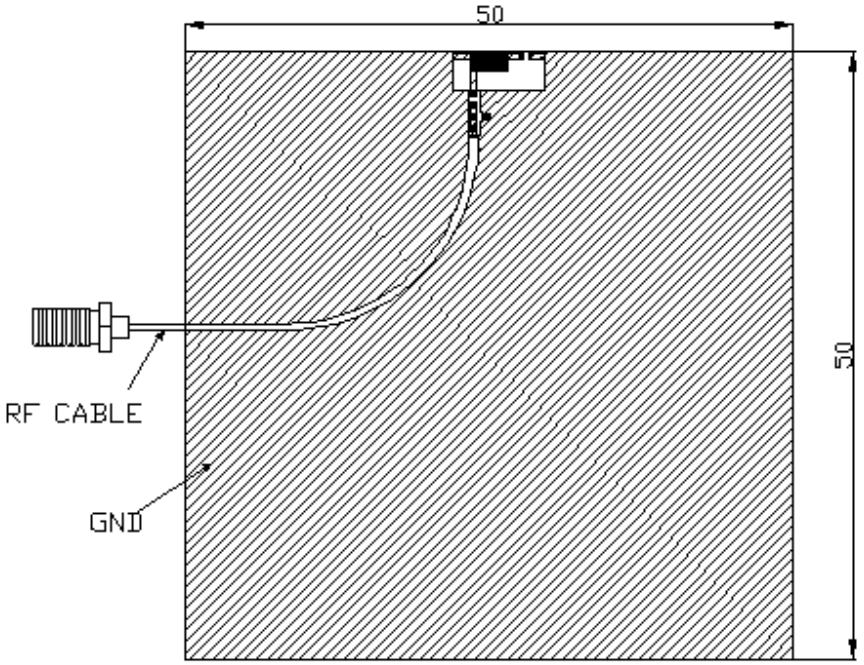
No	Item	Function	Material
①	Marking	Feeding Index	Ink
②	Electrode	Radiation Element	Ag
③	Ceramic Body	-	Ceramic





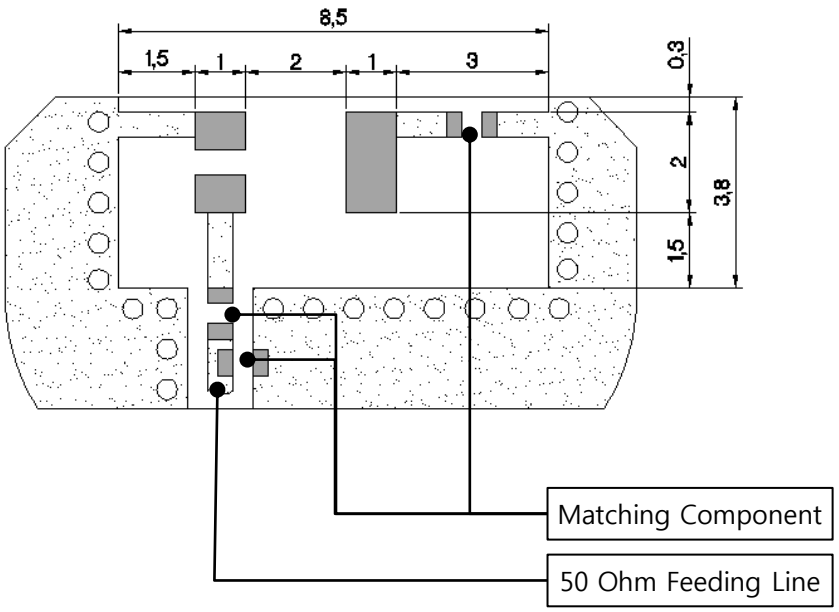
2. PCB Design for Test

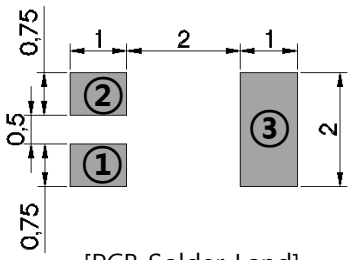
2.1 Evaluation Board Dimension



✓ Evaluation board size ~ 50x50
✓ Fill Cut Area (GND Clearance) ~ 8.5x3.8

2.2 PCB Design Guide





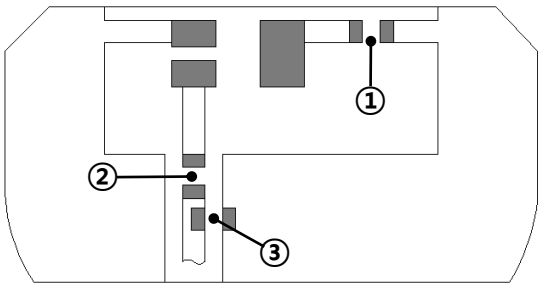
[PCB Solder Land]

No	Pin Assignment
①	Feeding
②	GND
③	GND

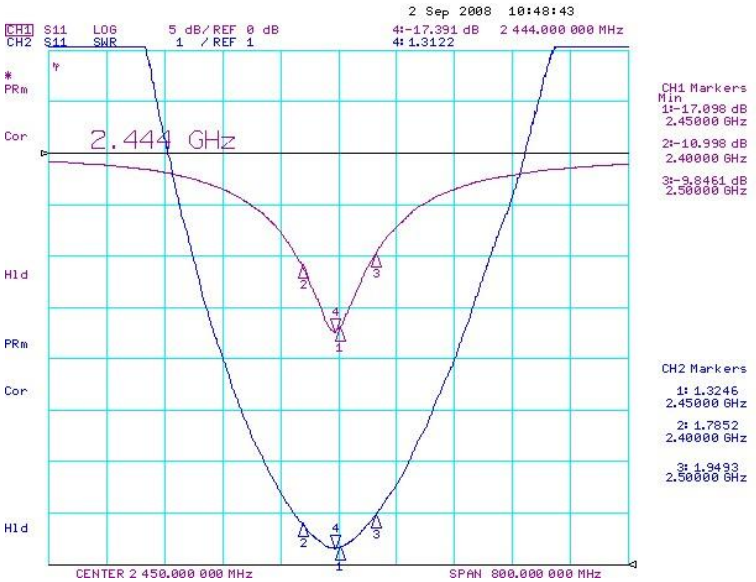
[unit : mm]

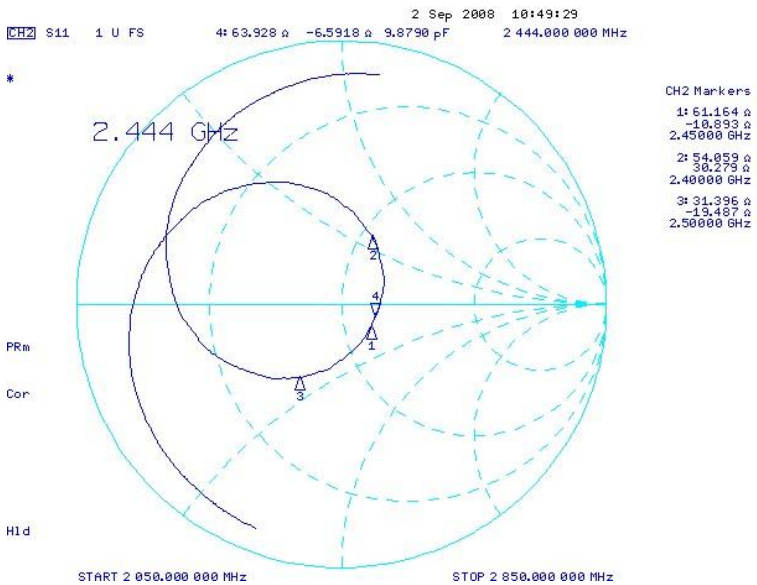
3. Measurement Result

3.1 Typical Measurement Result (VSWR/RL, Smithchart)



No	Matching Value
①	7.5 pF
②	1.8 nH
③	N.C

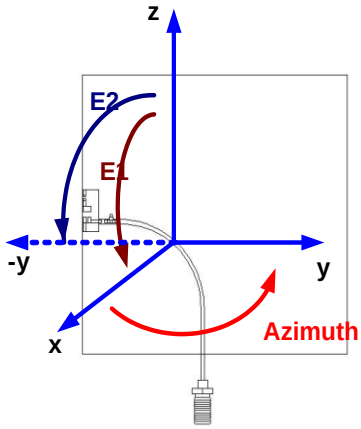


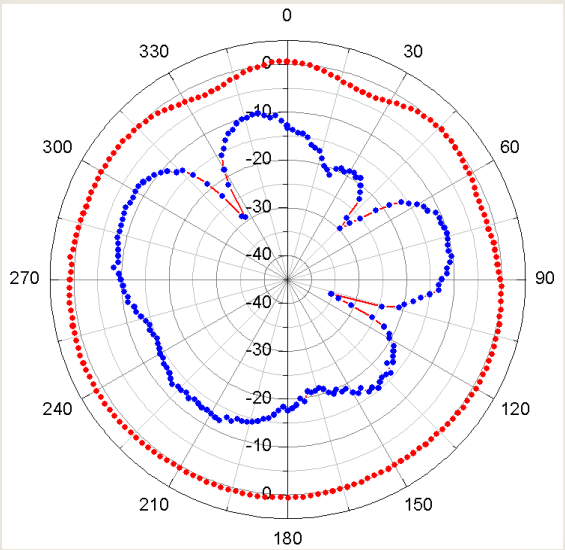


✓ The results are measured on the 50x50mm^2 evaluation board(EVB).

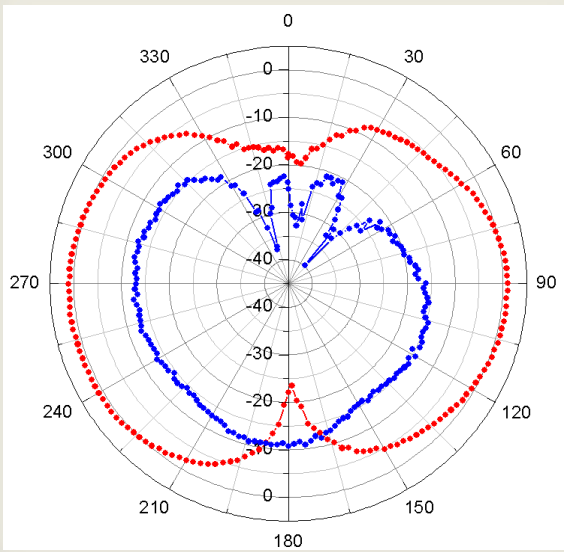
3.2 Typical Measurement Result (Gain, Radiation Pattern)

	Peak Gain (dBi)	Avg. Gain (dBi)	Total Avg. Gain (dBi)	Efficiency (%)
Azimuth	2.2	0.2	-0.45	90
Elevation 1	2.2	-0.8		
Elevation 2	2.7	-1.9		

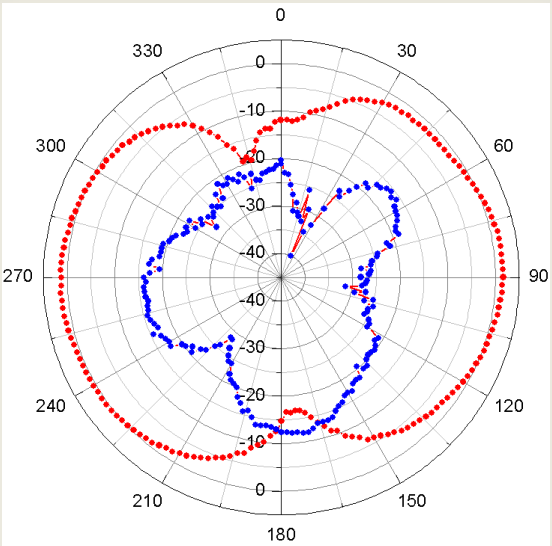




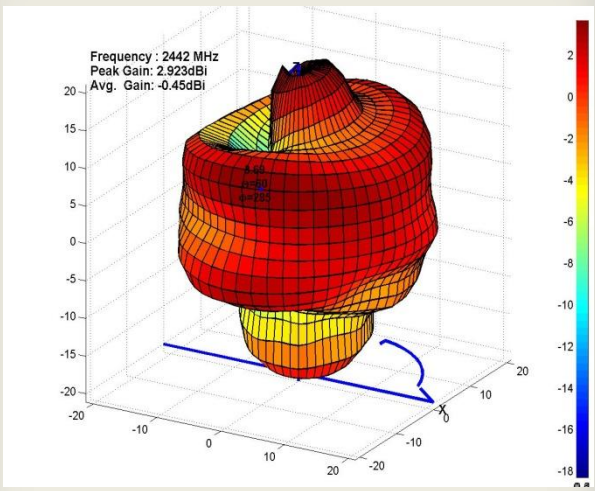
[Azimuth plane @2.45GHz]



[Elevation1 plane @2.45GHz]

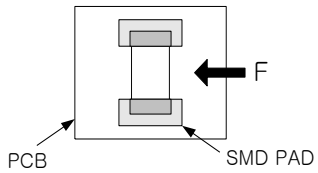


[Elevation2 plane @2.45GHz]

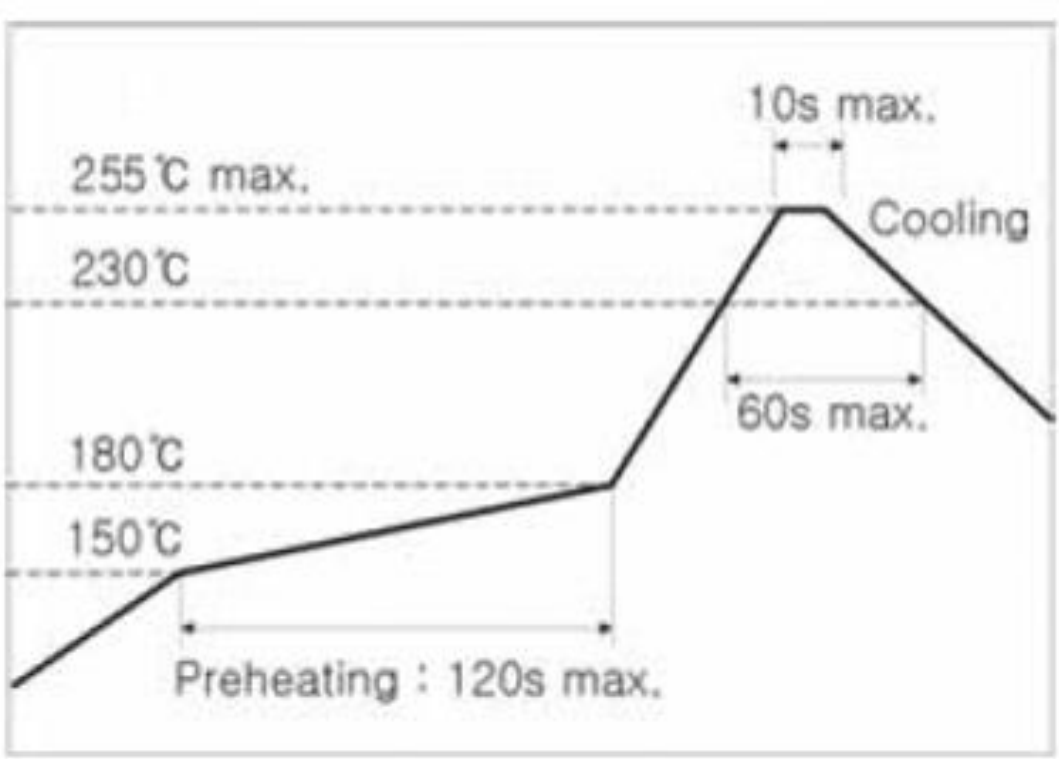


[3D Radiation Pattern]

4. Reliability

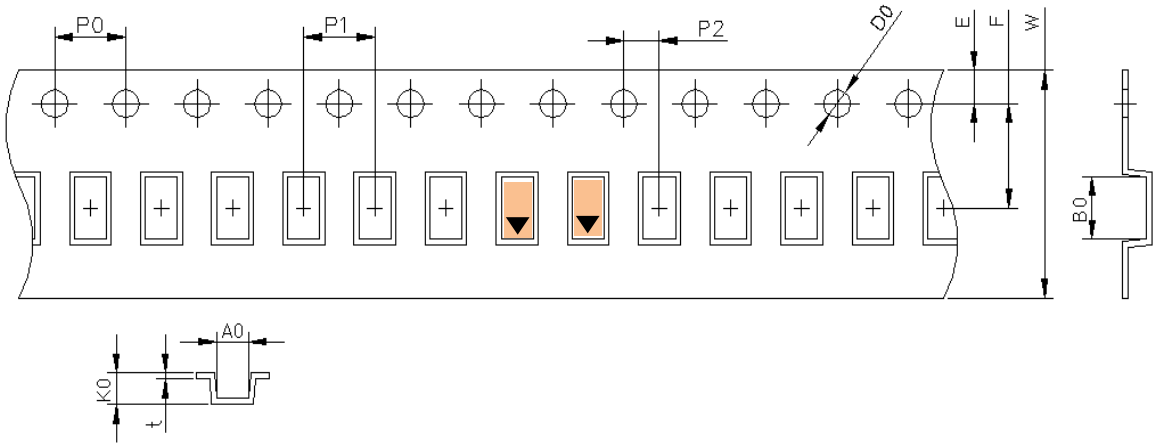
No	Item	Test Condition	Test Requirements
1	Adhesive Strength of Termination	1. Applied force on SMT chip till detached point from PCB. 	1. No mechanical damage by applied force 2. Strength (F) > 3 kgf
2	Thermal Shock (Cycle)	1. Step 1 : -40 ± 3℃, 30 min Step 2 : +125 ± 3℃, 30 min 2. Number of cycle :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

5. Soldering Reflow Profile



6. Packaging

6.1 Carrier Tape Dimension



Item	Spec.	Item	Spec.	Item	Spec.
A0	2.20 ±0.10	P0	4.00 ±0.10	E	1.75 ±0.10
B0	4.30 ±0.10	P1	4.00 ±0.10	F	7.50 ±0.10
K0	1.60 ±0.10	P2	2.00 ±0.10	W	12.00 ±0.30
D0	1.55 ±0.05	-	-	t	0.30 ±0.05

6.2 Packaging Quantity

Item	Quantity	Dimension
Reel	2,000ea	Φ7" * 16mm
Inner Box	6,000 ea (3 reel)	183 * 70 * 185 (mm^3)
Outer Box1	30,000 ea (5 Inner Box)	375 * 200 * 205 (mm^3)
Outer Box2	60,000 ea (10 Inner Box)	390 * 375 * 205 (mm^3)

6.3 Packaging Label

AMOTECH Co., Ltd.

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

Dielectric Chip Antenna

P/N : AMAN402012ST01

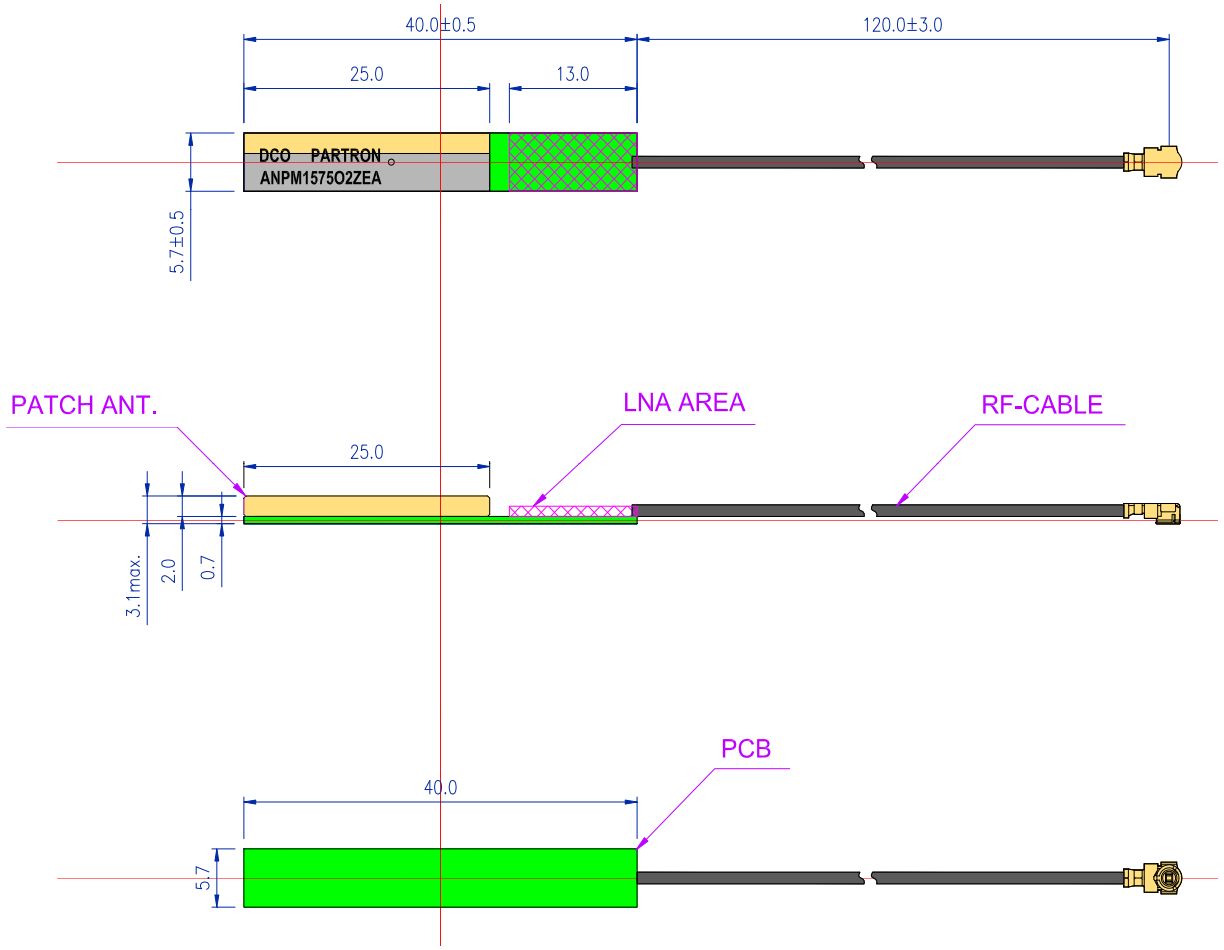
Lot No :

Quantity : 2,000 pcs Date : 2010/01/19

PARTRON GPS Active Ant.

Ver 1.0
DATE : 2012-10-22

■ **P/N : MAGBC063CDEA**
■ **CUSTOMER : 블루버드 소프트**
■ **QUANTITY : 100 ea**
■ **MECHANICAL DIMENSION (unit : mm)**

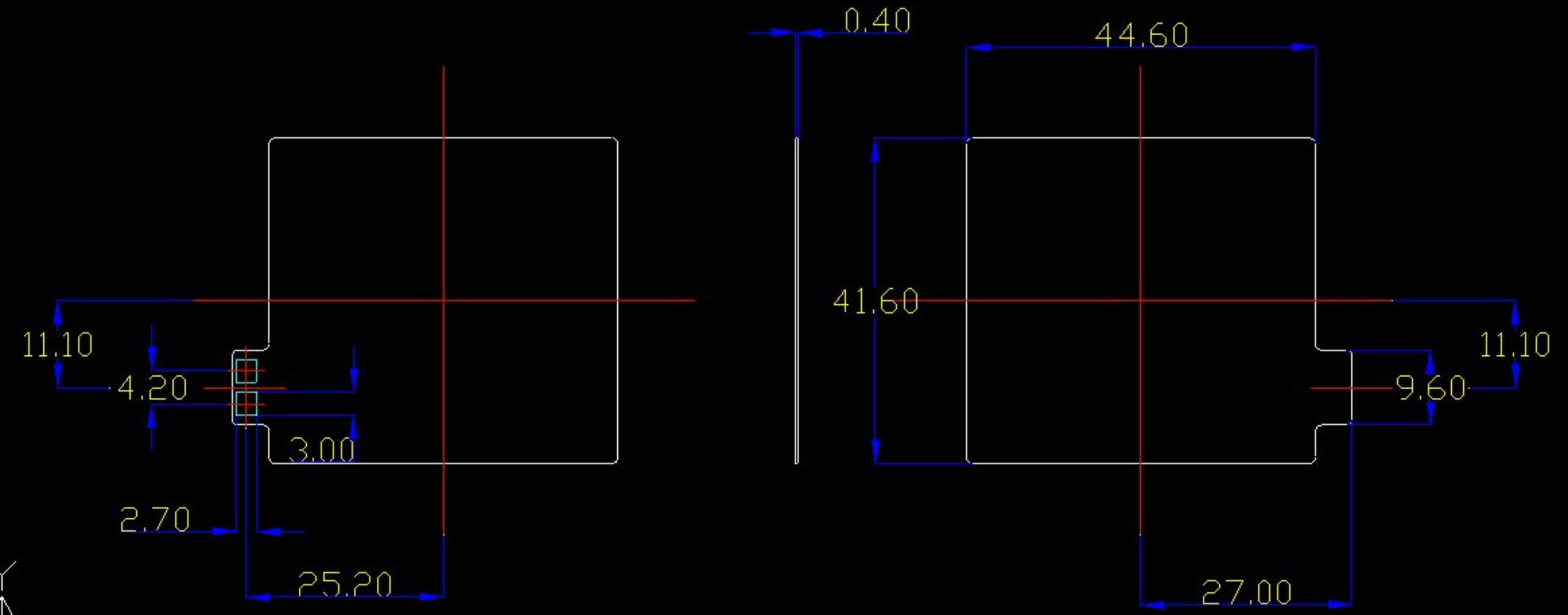


tolerance = ± 0.3

■ **ELECTRICAL CHARACTERISTICS**

	ITEM	Spec.	Remark
Antenna	1) Center frequency	1575.42 MHz	
	2) Gain @ Peak	0.5 dBi typ.	@ 58x19mm GND plane
	3) Polarization	Linear Polarization	
	4) Size	25x5.7x2.0 ㎜	
LNA	5) Operating frequency	1575.42 MHz ± 5MHz	
	6) Gain	20 dB typ.	Changeable by user request
	7) Noise Figure	2.0 dB max.	@ normal temperature
	8) Output V.S.W.R	2.0 : 1 max.	@ normal temperature
Overall	9) Overall Gain	18 dBi typ.	Includes cable loss
	10) Operating Voltage	3.0 Vdc	± 0.3V
	11) Consumption Current	3.5 mA typ.	
	12) Size	40x5.7x3.1 ㎜	
	13) Connector & Cable	CMP & Ø1.13	Cable length = 120.0mm

PARTRON GPS ANTENNA LAB.
22-6, Seokwoo-dong, Hwaseong-si, Gyeonggi-do, Korea 445-170
Tel. 82-31-201-7700 I Fax. 201-7800 I www.partron.co.kr


0.40
44.60
41.60
11.10
11.10
4.20
9.60
3.00
2.70
25.20
27.00

BP-80 WLAN Antenna
Passive Data

1. Chamber Condition

Active

Size : 3m 2.5m * 2.5m*

System : Aplustech (3D System)

Passive

*Size : 6m * 2.5m * 2.5m*

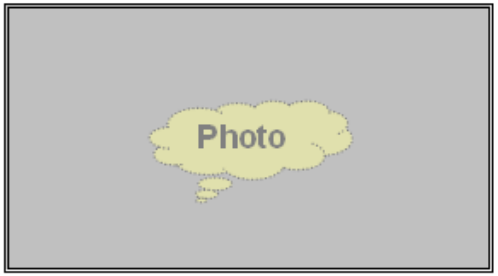
System : Aplustech (3D System)

2-1. Antenna Result - VSWR

2-2. Antenna Result - Gain

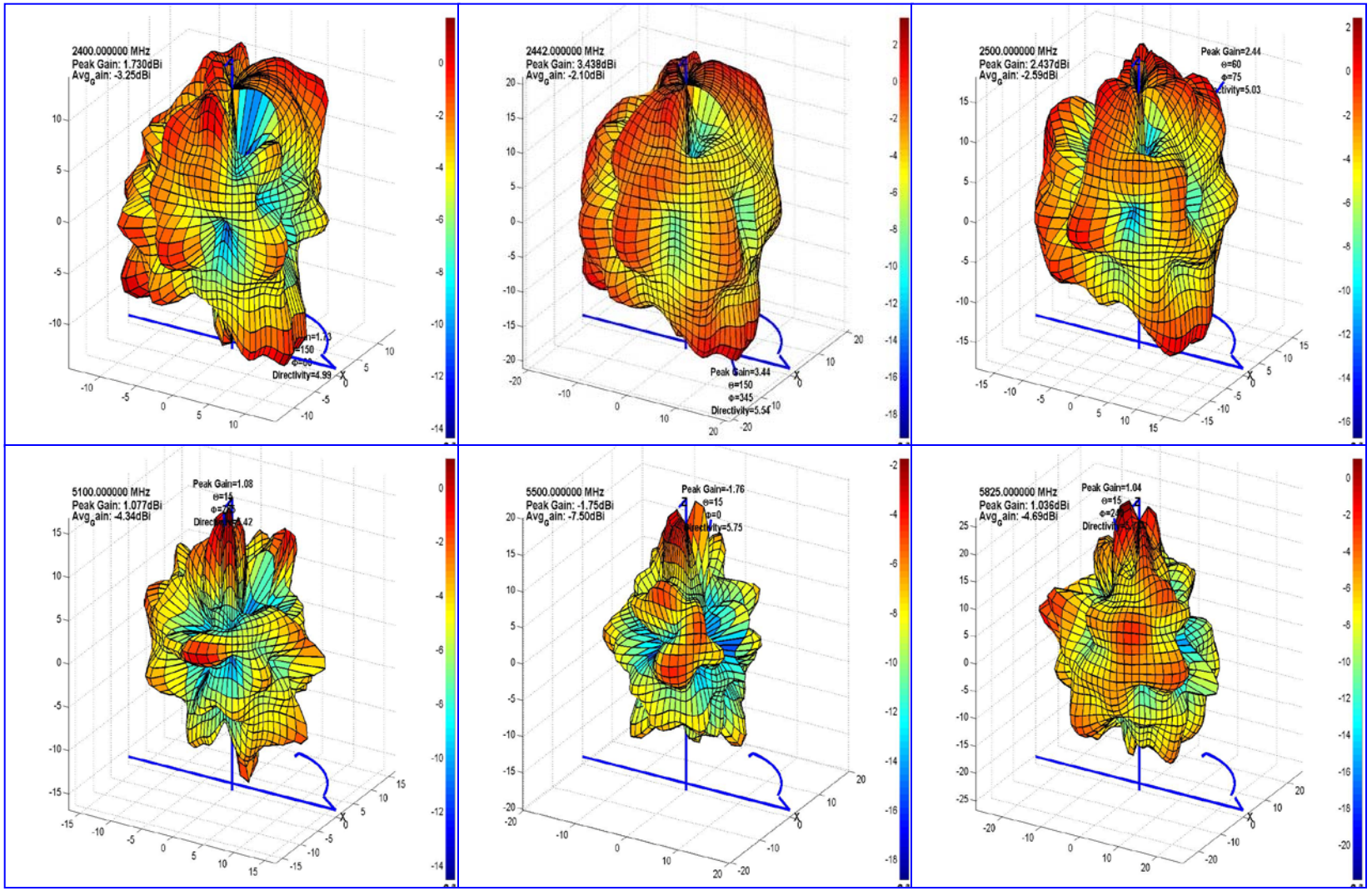
Antenna Pattern & Gain Report

Manufacturer	Company Name
Model Name	Filename
Tester Name	Airlink
Test Date	2012-11-26 오후 2:51:17
IF BW	100 Hz
Port Power	0.00 dBm
Meas Step	15 `



Frequency	Efficiency	Average Gain			Max Gain			Max Position	Directivity
		Ver	Hor	Total	Ver	Hor	Total		
2400.000000 MHz	47.3 %	-6.2 dBi	-6.3 dBi	-3.3 dBi	-0.4 dBi	0.9 dBi	1.7 dBi	Theta150/Pie60	4.99 dB
2412.000000 MHz	54.0 %	-5.7 dBi	-5.7 dBi	-2.7 dBi	-0.4 dBi	1.6 dBi	2.3 dBi	Theta150/Pie30	4.97 dB
2442.000000 MHz	61.6 %	-5.3 dBi	-4.9 dBi	-2.1 dBi	0.9 dBi	2.7 dBi	3.4 dBi	Theta150/Pie345	5.54 dB
2474.000000 MHz	62.8 %	-5.3 dBi	-4.8 dBi	-2.0 dBi	1.1 dBi	2.1 dBi	2.5 dBi	Theta60/Pie75	4.51 dB
2484.000000 MHz	62.6 %	-5.3 dBi	-4.8 dBi	-2.0 dBi	0.3 dBi	2.0 dBi	2.5 dBi	Theta150/Pie45	4.57 dB
2500.000000 MHz	55.0 %	-5.9 dBi	-5.3 dBi	-2.6 dBi	0.5 dBi	1.3 dBi	2.4 dBi	Theta60/Pie75	5.03 dB
5100.000000 MHz	36.8 %	-6.6 dBi	-8.3 dBi	-4.3 dBi	-0.7 dBi	1.0 dBi	1.1 dBi	Theta15/Pie285	5.42 dB
5200.000000 MHz	29.5 %	-7.6 dBi	-9.1 dBi	-5.3 dBi	-2.7 dBi	-1.5 dBi	-1.1 dBi	Theta75/Pie270	4.15 dB
5300.000000 MHz	22.2 %	-9.0 dBi	-10.2 dBi	-6.5 dBi	-2.0 dBi	-1.8 dBi	-1.0 dBi	Theta75/Pie270	5.59 dB
5400.000000 MHz	23.8 %	-9.1 dBi	-9.4 dBi	-6.2 dBi	-3.2 dBi	-2.0 dBi	-1.6 dBi	Theta45/Pie285	4.61 dB
5500.000000 MHz	17.8 %	-10.7 dBi	-10.3 dBi	-7.5 dBi	-1.9 dBi	-3.7 dBi	-1.8 dBi	Theta15/Pie0	5.75 dB
5600.000000 MHz	26.5 %	-9.1 dBi	-8.5 dBi	-5.8 dBi	-1.5 dBi	-2.5 dBi	-0.5 dBi	Theta90/Pie225	5.26 dB
5725.000000 MHz	25.2 %	-9.3 dBi	-8.7 dBi	-6.0 dBi	-0.5 dBi	-0.9 dBi	-0.3 dBi	Theta0/Pie0	5.65 dB
5825.000000 MHz	33.9 %	-8.3 dBi	-7.2 dBi	-4.7 dBi	0.0 dBi	-0.4 dBi	1.0 dBi	Theta15/Pie240	5.73 dB

2-2. Antenna Result – Radiation Pattern



Thank you!

BP-80 WWAN Antenna
Passive Data

1. Chamber Condition

Active

Size : 3m 2.5m * 2.5m*

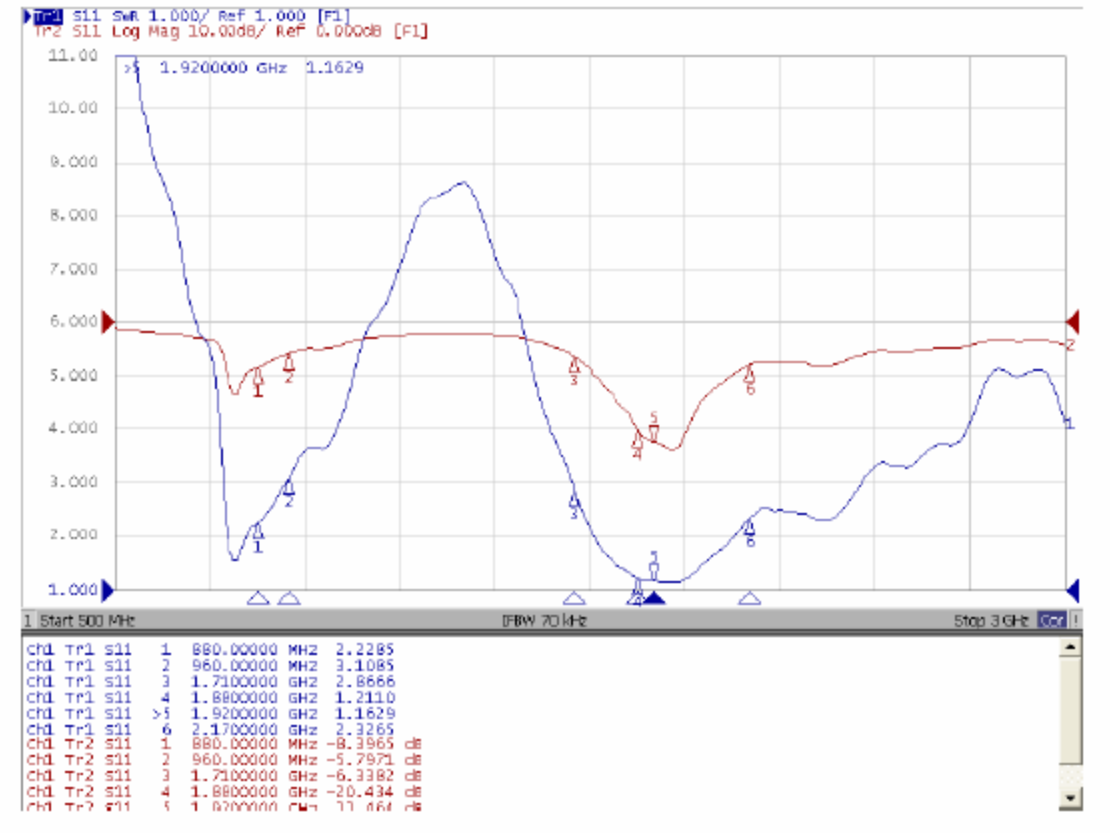
System : Aplustech (3D System)

Passive

*Size : 6m * 2.5m * 2.5m*

System : Aplustech (3D System)

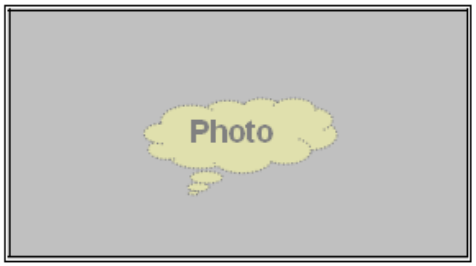
2-1. Antenna Result - VSWR



2-2. Antenna Result - Gain

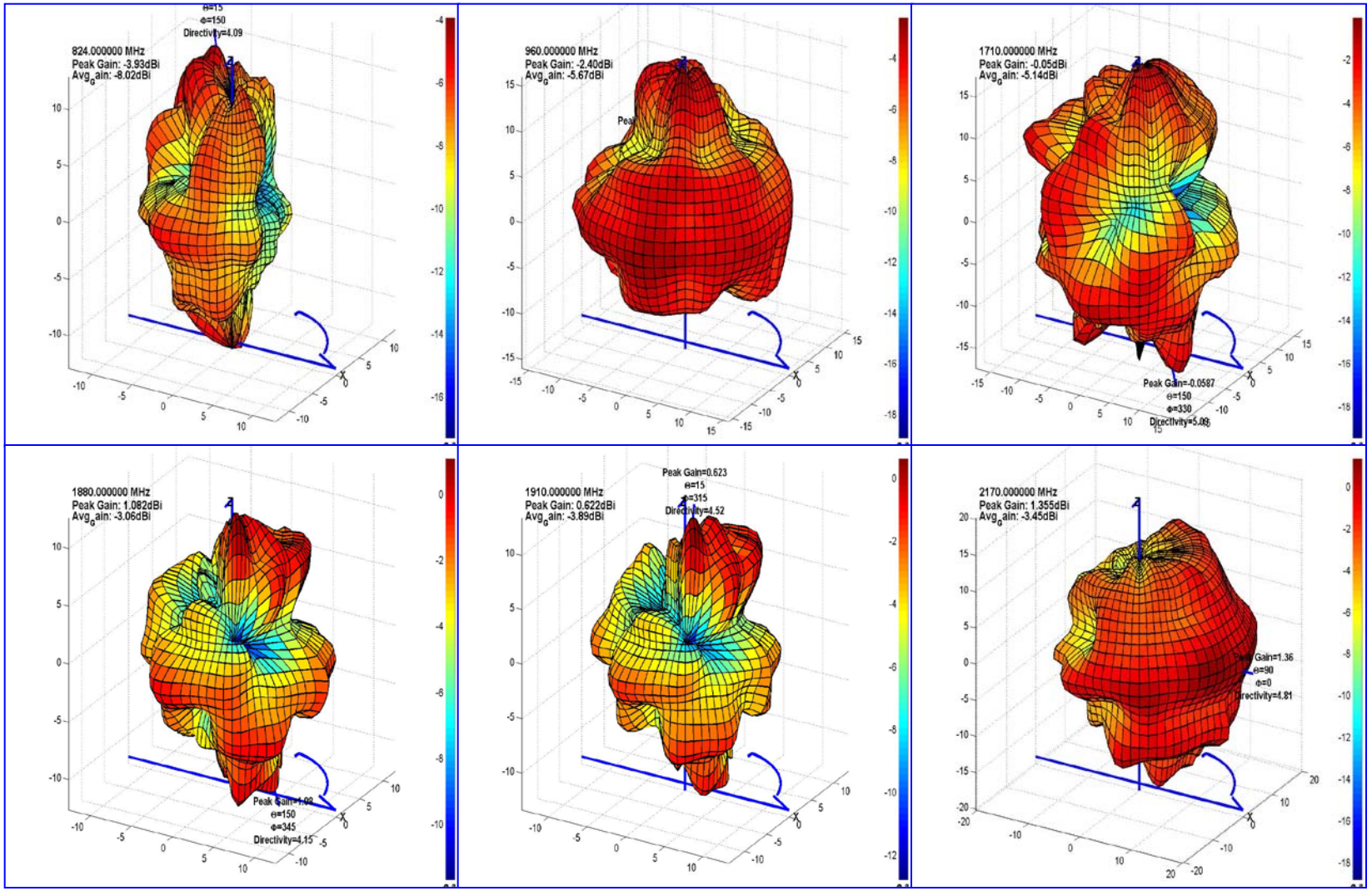
Antenna Pattern & Gain Report

Manufacturer	Company Name
Model Name	Filename
Tester Name	Airlink
Test Date	2012-10-31 오후 6:02:56
IF BW	100 Hz
Port Power	0.00 dBm
Meas Step	15 `



Frequency	Efficiency	Average Gain			Max Gain			Max Position	Directivity
		Ver	Hor	Total	Ver	Hor	Total		
824.000000 MHz	15.8 %	-10.0 dBi	-12.3 dBi	-8.0 dBi	-4.4 dBi	-6.4 dBi	-3.9 dBi	Theta15/Pie150	4.09 dB
849.000000 MHz	27.3 %	-7.5 dBi	-10.2 dBi	-5.6 dBi	-2.1 dBi	-4.4 dBi	-1.7 dBi	Theta15/Pie150	3.96 dB
869.000000 MHz	37.9 %	-6.2 dBi	-8.6 dBi	-4.2 dBi	-0.4 dBi	-2.9 dBi	-0.1 dBi	Theta120/Pie120	4.07 dB
880.000000 MHz	46.4 %	-5.4 dBi	-7.5 dBi	-3.3 dBi	0.6 dBi	-2.1 dBi	0.8 dBi	Theta120/Pie120	4.11 dB
894.000000 MHz	53.0 %	-5.1 dBi	-6.5 dBi	-2.8 dBi	1.3 dBi	-1.2 dBi	1.5 dBi	Theta120/Pie120	4.29 dB
915.000000 MHz	54.6 %	-5.4 dBi	-5.9 dBi	-2.6 dBi	0.7 dBi	-1.0 dBi	0.9 dBi	Theta120/Pie120	3.57 dB
925.000000 MHz	44.4 %	-6.6 dBi	-6.5 dBi	-3.5 dBi	-0.5 dBi	-1.9 dBi	-0.1 dBi	Theta90/Pie135	3.41 dB
960.000000 MHz	27.1 %	-9.4 dBi	-8.0 dBi	-5.7 dBi	-3.3 dBi	-3.2 dBi	-2.4 dBi	Theta90/Pie135	3.27 dB
1710.000000 MHz	30.5 %	-8.4 dBi	-7.9 dBi	-5.1 dBi	-2.7 dBi	-0.9 dBi	-0.1 dBi	Theta150/Pie330	5.09 dB
1785.000000 MHz	50.5 %	-7.1 dBi	-5.1 dBi	-3.0 dBi	0.0 dBi	0.6 dBi	2.4 dBi	Theta180/Pie0	5.40 dB
1810.000000 MHz	44.8 %	-7.8 dBi	-5.5 dBi	-3.5 dBi	-1.4 dBi	-0.3 dBi	1.3 dBi	Theta180/Pie0	4.75 dB
1850.000000 MHz	40.2 %	-8.7 dBi	-5.7 dBi	-4.0 dBi	-2.4 dBi	-1.1 dBi	0.2 dBi	Theta150/Pie345	4.14 dB
1880.000000 MHz	49.4 %	-8.1 dBi	-4.7 dBi	-3.1 dBi	-1.5 dBi	-0.1 dBi	1.1 dBi	Theta150/Pie345	4.15 dB
1910.000000 MHz	40.8 %	-9.3 dBi	-5.4 dBi	-3.9 dBi	-1.6 dBi	-0.4 dBi	0.6 dBi	Theta15/Pie315	4.52 dB
1920.000000 MHz	47.0 %	-8.8 dBi	-4.7 dBi	-3.3 dBi	-1.2 dBi	0.2 dBi	1.1 dBi	Theta15/Pie315	4.42 dB
1930.000000 MHz	48.1 %	-8.6 dBi	-4.6 dBi	-3.2 dBi	-1.0 dBi	0.4 dBi	1.3 dBi	Theta30/Pie315	4.53 dB
1980.000000 MHz	47.1 %	-9.1 dBi	-4.6 dBi	-3.3 dBi	-0.8 dBi	0.0 dBi	1.5 dBi	Theta15/Pie315	4.72 dB
1990.000000 MHz	42.6 %	-9.5 dBi	-5.0 dBi	-3.7 dBi	-1.8 dBi	-0.6 dBi	0.7 dBi	Theta150/Pie315	4.46 dB
2110.000000 MHz	44.5 %	-10.8 dBi	-4.4 dBi	-3.5 dBi	-3.8 dBi	1.6 dBi	1.7 dBi	Theta90/Pie330	5.19 dB
2170.000000 MHz	45.2 %	-11.7 dBi	-4.2 dBi	-3.5 dBi	-4.2 dBi	1.3 dBi	1.4 dBi	Theta90/Pie0	4.81 dB

2-2. Antenna Result – Radiation Pattern



Thank you!