PRODUCT SPECIFICATIONS

Product type	WLAN PIFA antenna
Model number	Aquila
Part number	SS-03-03-013, SS-03-03-014

Nov. 14, 2002

Amphenol K.A.E. Co. Ltd.

436-2, Changkok-Ri,

Paltan-Myeon, Hwasung-City,

Kyunggi-Do, KOREA 445-913

Table of contents

1. Specifications
1.1 Specifications 3
1.2 Antenna data sheet 3

2. Test methodology
2.1 Test equipment 4
2.2 Test setup 4
2.2.1 Frequency range 4
2.2.2 Antenna configuration 4
2.2.3 VSWR 4
2.2.4 Radiation pattern and gain 5
2.2.5 Mechanical tests 5
3. Performance data
3.1 Left VSWR in the fixture 6
3.2 Right VSWR in the fixture
3.3 Radiation pattern and gain
3.3.1 Left E1-Plane 7
3.3.2 Left E2-Plane 7
3.3.3 Left H-Plane 8
3.3.4 Right E1-Plane
3.3.5 Right E2-Plane
3.3.6 Right H-Plane
4. Antenna drawing 9
5. Mechanical test 10

1. Specifications

1.1 Specifications for antennas

Frequency range (GHz)	2.4 – 2.4835
VSWR	< 2.0
Peak/Average gain (dBi)	3.0max / -5.0min
Impedance	50 ohms
Polarization	Linear
Radiation pattern	Omni-directional

1.2 Antenna data sheet

	Frequency	SS-03-03-013 (right)	SS-03-03-014 (left)
VSWR	2400	1.26	1.31
	2484	1.28	1.13
	5150	1.58	1.23
	5350	1.36	1.60
Gain	2400	-2.62	-2.64
	2484	-3.89	-3.61
	5150	-5.29	-5.12
	5350	-4.84	-5.68

2. Test Methodology

2.1 Test equipment

The equipment for the antenna measurement we used is as follows.

A. Agilent 8720ES Network Analyzer to measure the VSWR and input impedance.

B. Three-dimensional anechoic chamber to measure the gain (Standard dipole and horn were used to calibrate the chamber)

C. Digital caliper to measure the dimensions.

D. Climatic chamber for mechanical tests.

2.2 Test setup

2.2.1 Frequency Range

2.4 ~ 2.484GHz, 5.15 ~ 5.35GHz

2.2.2 Antenna configuration

The antenna basically has two parts ; the stamping and the cable assembly with the connector on one side. The detailed drawing is attached.

2.2.3 VSWR

The VSWR is measured with Agilent 8720ES network analyzer. All the measurements are performed with the customer provided fixture. Figure 1 shows the schematic diagram for measuring VSWR.

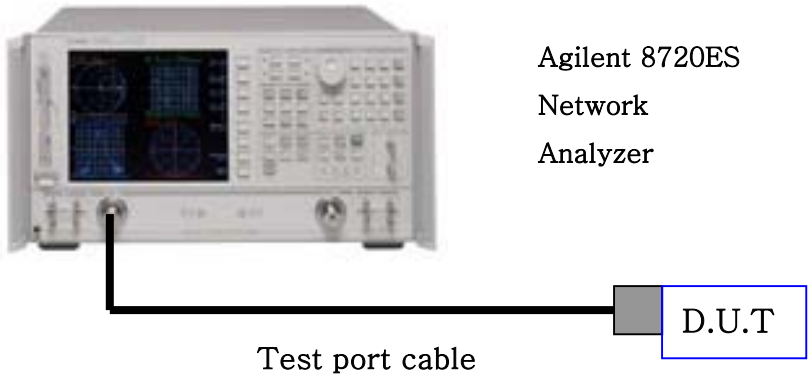


Figure 1. The schematic diagram for measuring VSWR

2.2.4 Radiation pattern and gain

The radiation pattern must have the omni-directional characteristic in both positions. The radiation pattern measurements are performed in the three-dimensional anechoic chamber. The chamber provides less than –30dB reflectivity from 800MHz through 6GHz. The chamber is calibrated using both standard dipole and horn antenna. The gain here is expressed as dBi that standardizes the isotropic antenna. The gain measurements are also performed in the same chamber described previously. Figure 2 shows the schematic diagram for measuring radiation pattern and gain.

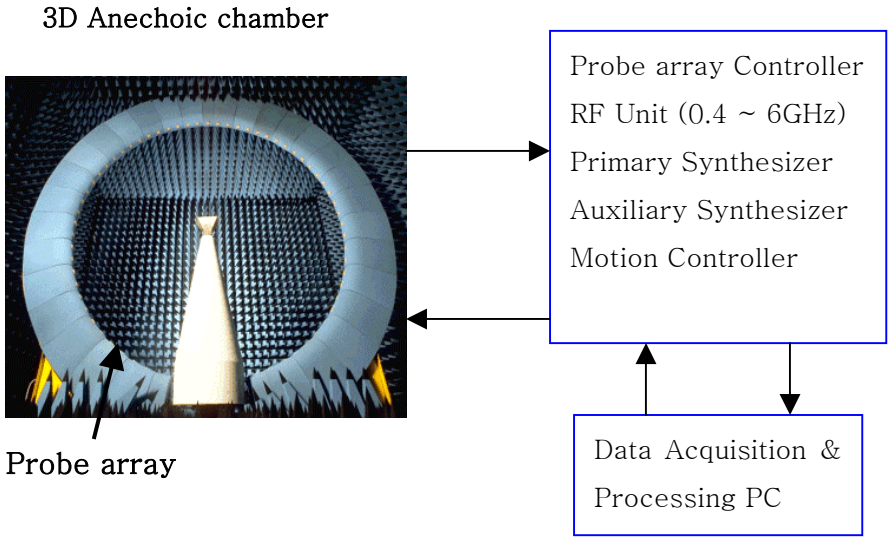


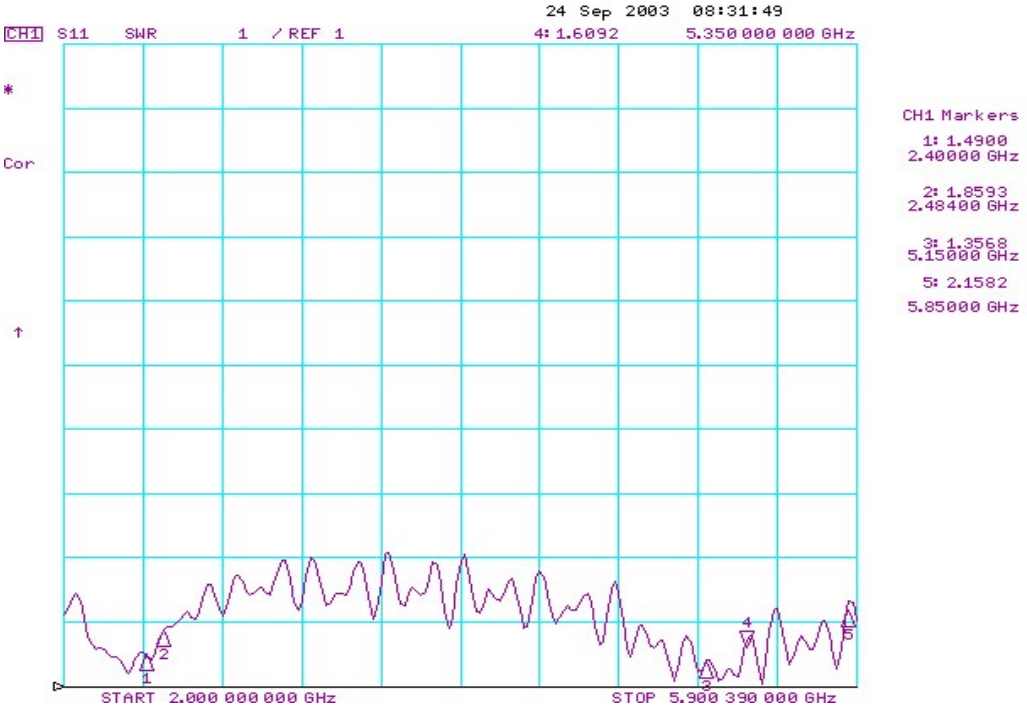
Figure 2. The schematic diagram for measuring radiation pattern and gain

2.2.5 Mechanical test

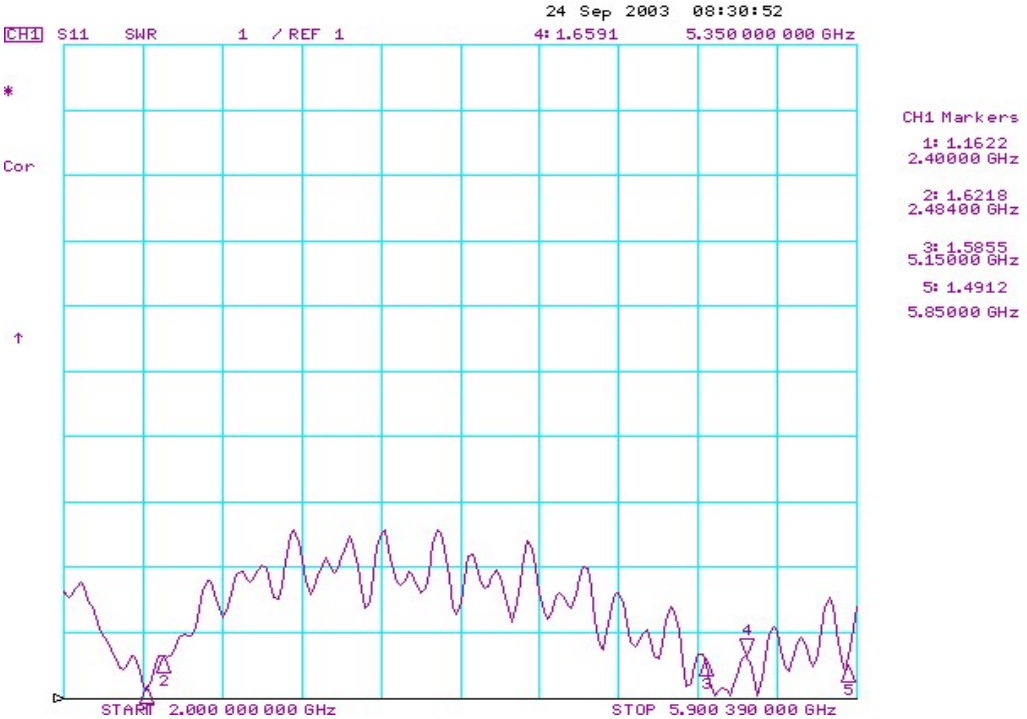
All mechanical tests are performed in the climatic chamber.

3. Performance Data

3.1 Left VSWR in the fixture

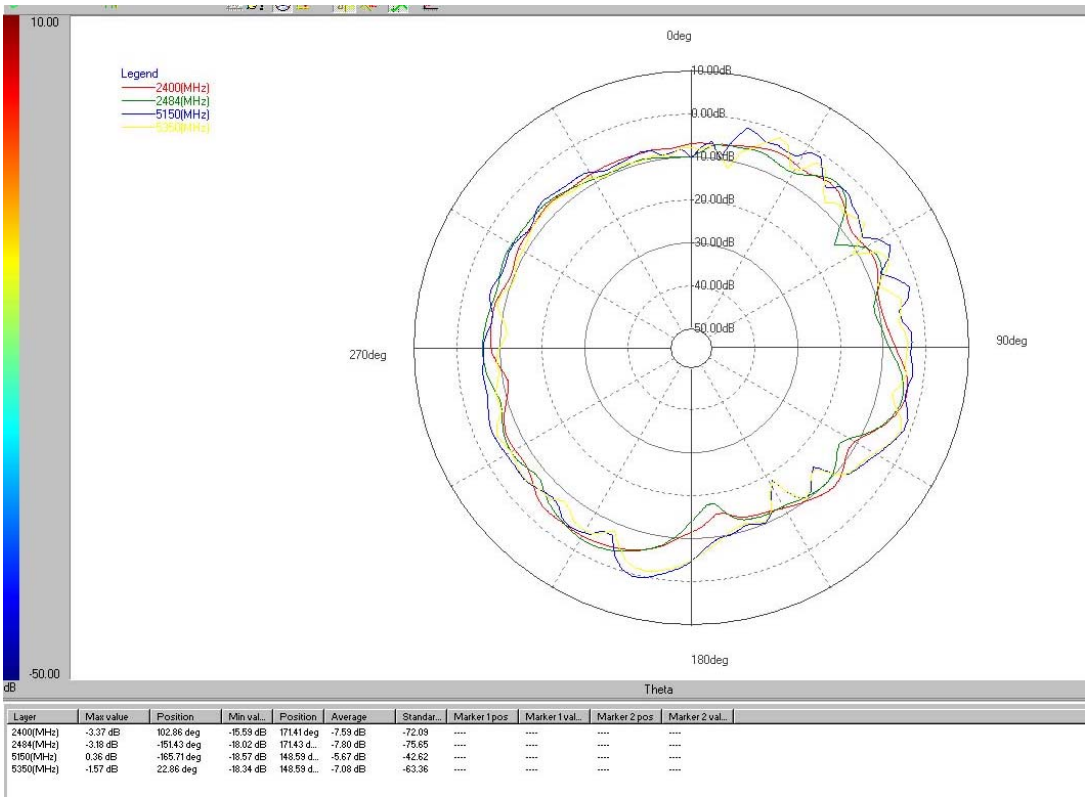


3.2 Right VSWR in the fixture



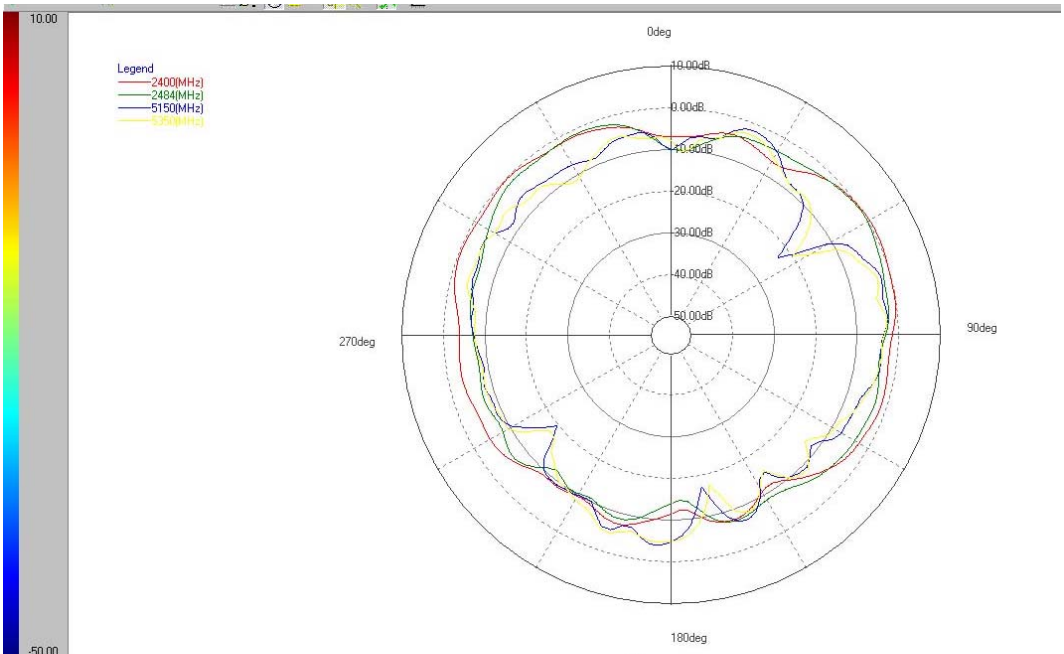
3.3 Radiation pattern and gain

3.3.1 Left E1-Plane



Layer	Max value	Position	Min val...	Position	Average	Standar...	Marker 1 pos	Marker 1 val...	Marker 2 pos	Marker 2 val...
2400(MHz)	-3.37 dB	102.86 deg	-15.59 dB	171.41 deg	-7.59 dB	-72.09	----	----	----	----
2484(MHz)	-3.18 dB	-151.43 deg	-18.02 dB	171.43 d...	-7.80 dB	-75.65	----	----	----	----
5150(MHz)	0.36 dB	-165.71 deg	-18.57 dB	148.59 d...	-5.67 dB	-42.62	----	----	----	----
5350(MHz)	-1.57 dB	22.86 deg	-18.34 dB	148.59 d...	-7.08 dB	-63.36	----	----	----	----

3.3.2 Left E2-Plane



Layer	Max value	Position	Min val...	Position	Average	Standar...	Marker 1 pos	Marker 1 val...	Marker 2 pos	Marker 2 val...
2400(MHz)	0.41 dB	62.86 deg	-12.57 dB	177.14 d...	-3.90 dB	-21.96	----	----	----	----
2484(MHz)	-0.19 dB	57.14 deg	-14.94 dB	177.13 d...	-5.16 dB	-35.78	----	----	----	----
5150(MHz)	-1.88 dB	22.86 deg	-23.26 d...	54.30 d...	-7.31 dB	-67.04	----	----	----	----
5350(MHz)	-2.67 dB	85.71 deg	-19.93 dB	57.13 deg	-7.56 dB	-71.29	----	----	----	----

3.3.3 Left H-Plane

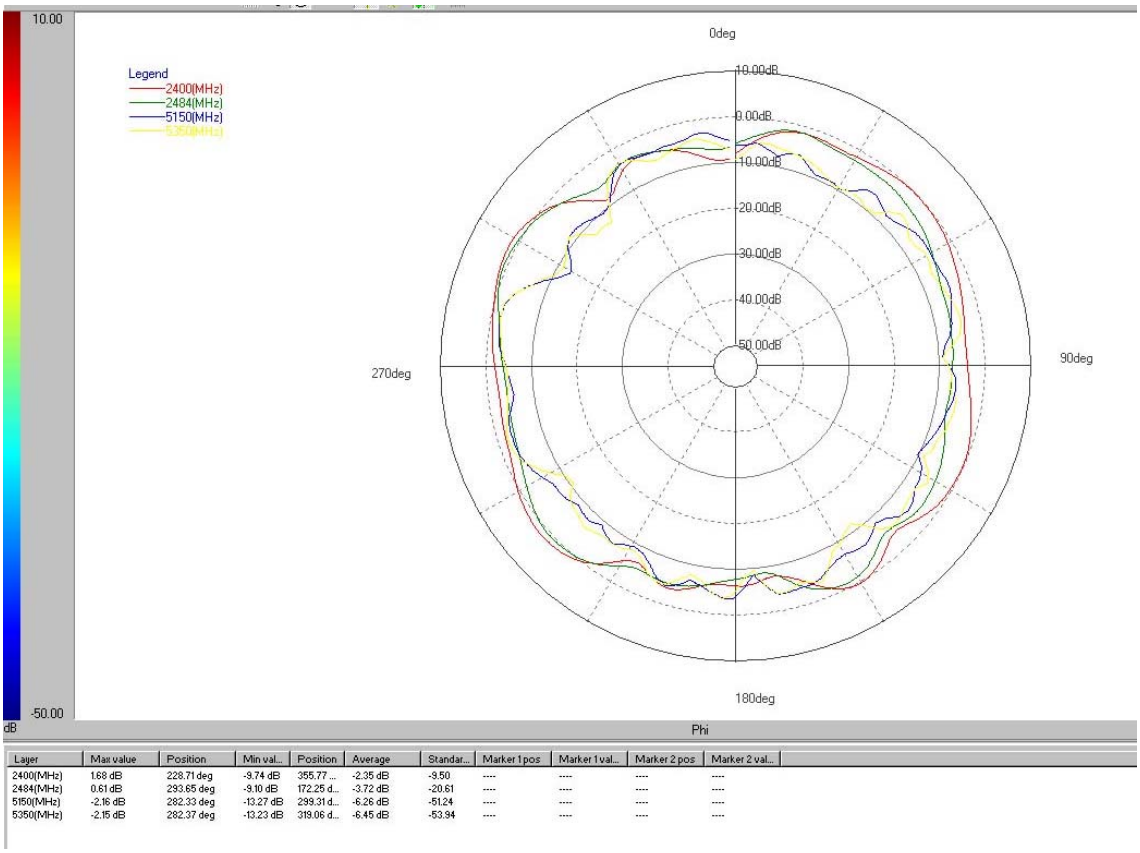
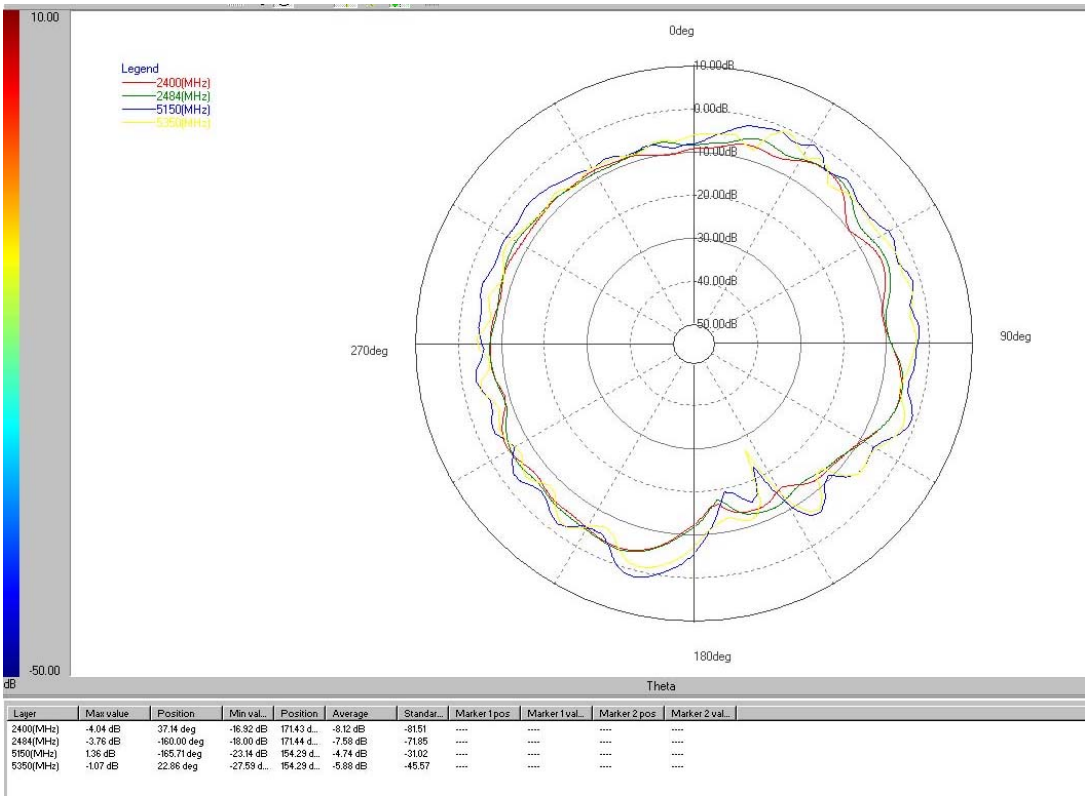


Table 1. Average gain (dBi) summary

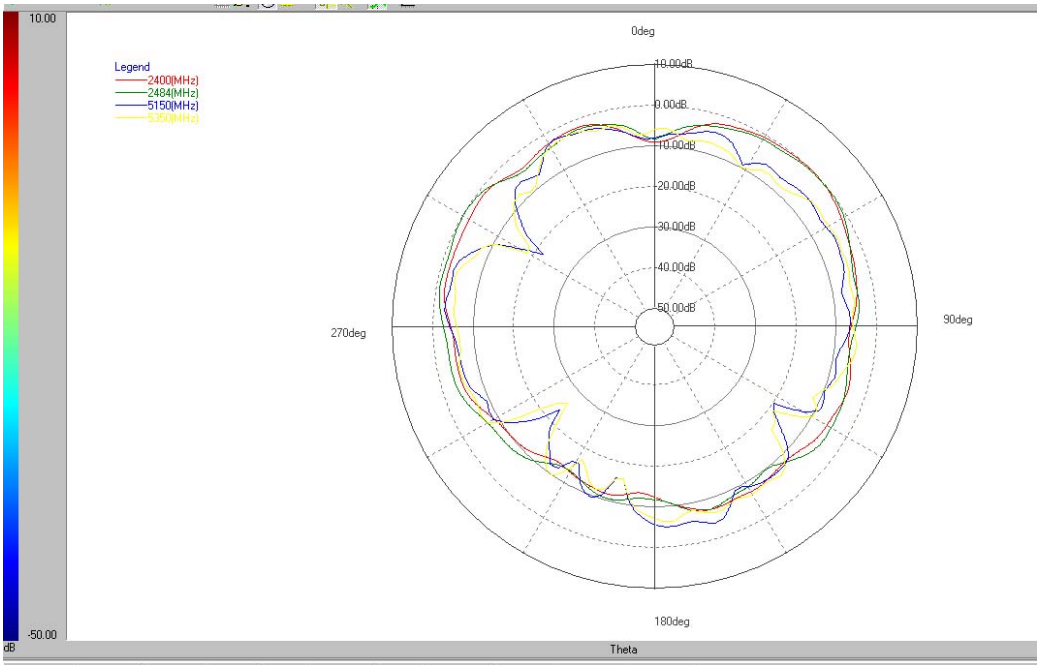
Frequency (MHz)	E1-plane	E2-plane	H-plane
2400	-7.59	-3.90	-2.35
2484	-7.80	-5.16	-3.72
5150	-5.67	-7.31	-6.26
5350	-7.08	-7.56	-6.45

3.3.4 Right E1-Plane



Layer	Max value	Position	Min val...	Position	Average	Standar...	Marker 1 pos	Marker 1 val...	Marker 2 pos	Marker 2 val...
2400(MHz)	-4.04 dB	37.14 deg	-16.92 dB	171.43 d...	-8.12 dB	-81.51	----	----	----	----
2484(MHz)	-3.76 dB	-160.00 deg	-18.00 dB	171.44 d...	-7.59 dB	-71.95	----	----	----	----
5150(MHz)	1.36 dB	-165.71 deg	-23.14 dB	154.29 d...	-4.74 dB	-31.02	----	----	----	----
5350(MHz)	-1.07 dB	22.86 deg	-27.59 d...	154.29 d...	-5.88 dB	-45.57	----	----	----	----

3.3.5 Right E2-Plane



Layer	Max value	Position	Min val...	Position	Average	Standar...	Marker 1 pos	Marker 1 val...	Marker 2 pos	Marker 2 val...
2400(MHz)	-0.15 dB	45.71 deg	-13.76 dB	-145.69 ...	-5.10 dB	-34.98	----	----	----	----
2484(MHz)	-0.24 dB	54.29 deg	-13.49 dB	-148.59 ...	-4.67 dB	-29.98	----	----	----	----
5150(MHz)	-2.41 dB	-28.57 deg	-23.74 d...	-131.44 ...	-7.53 dB	-70.65	----	----	----	----
5350(MHz)	-2.96 dB	-22.86 deg	-26.18 dB	-131.44 ...	-7.75 dB	-74.55	----	----	----	----

3.3.6 Right H-Plane

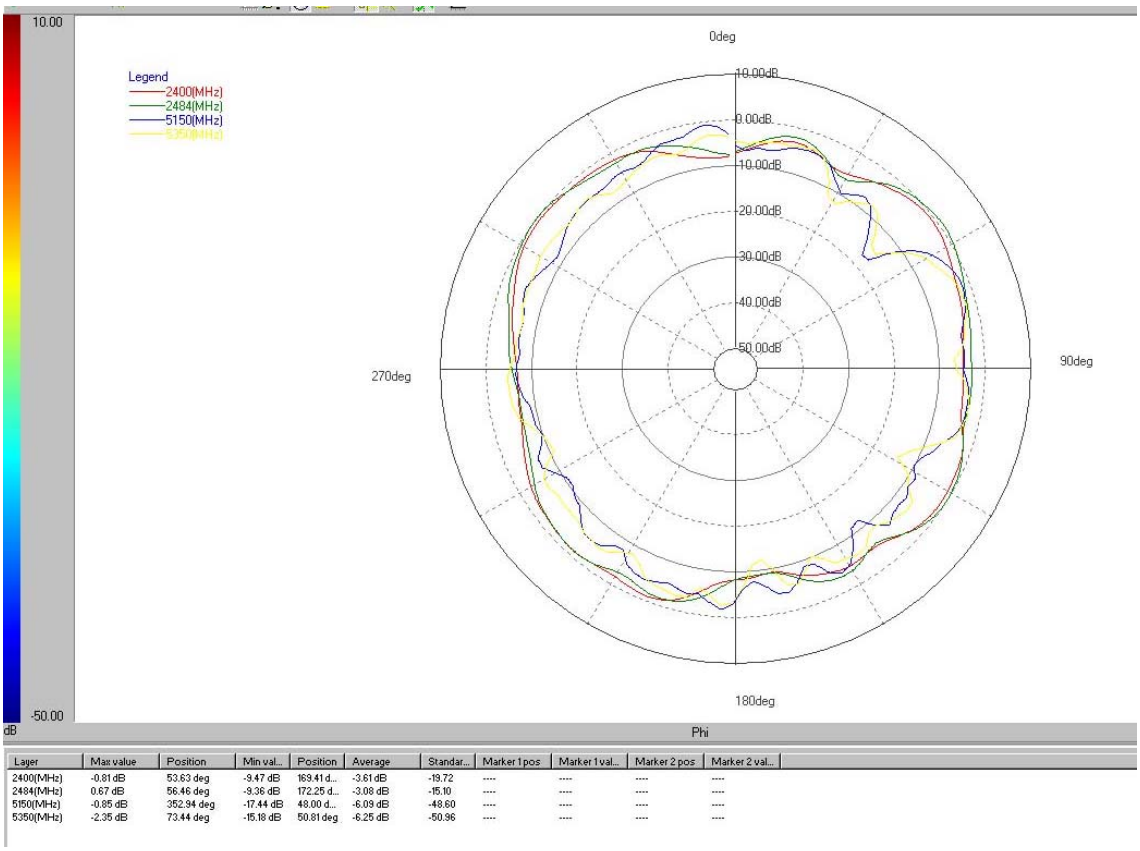
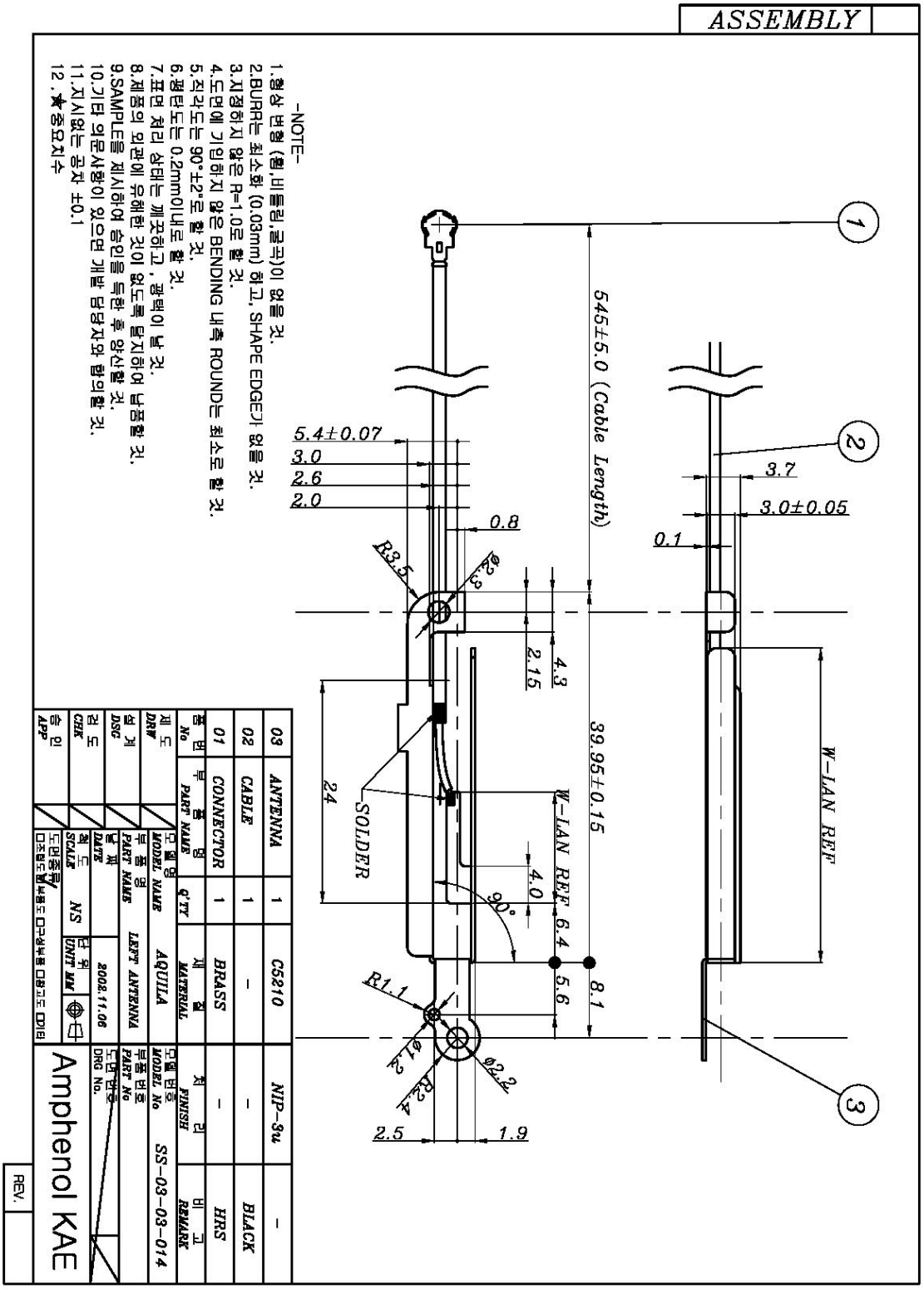
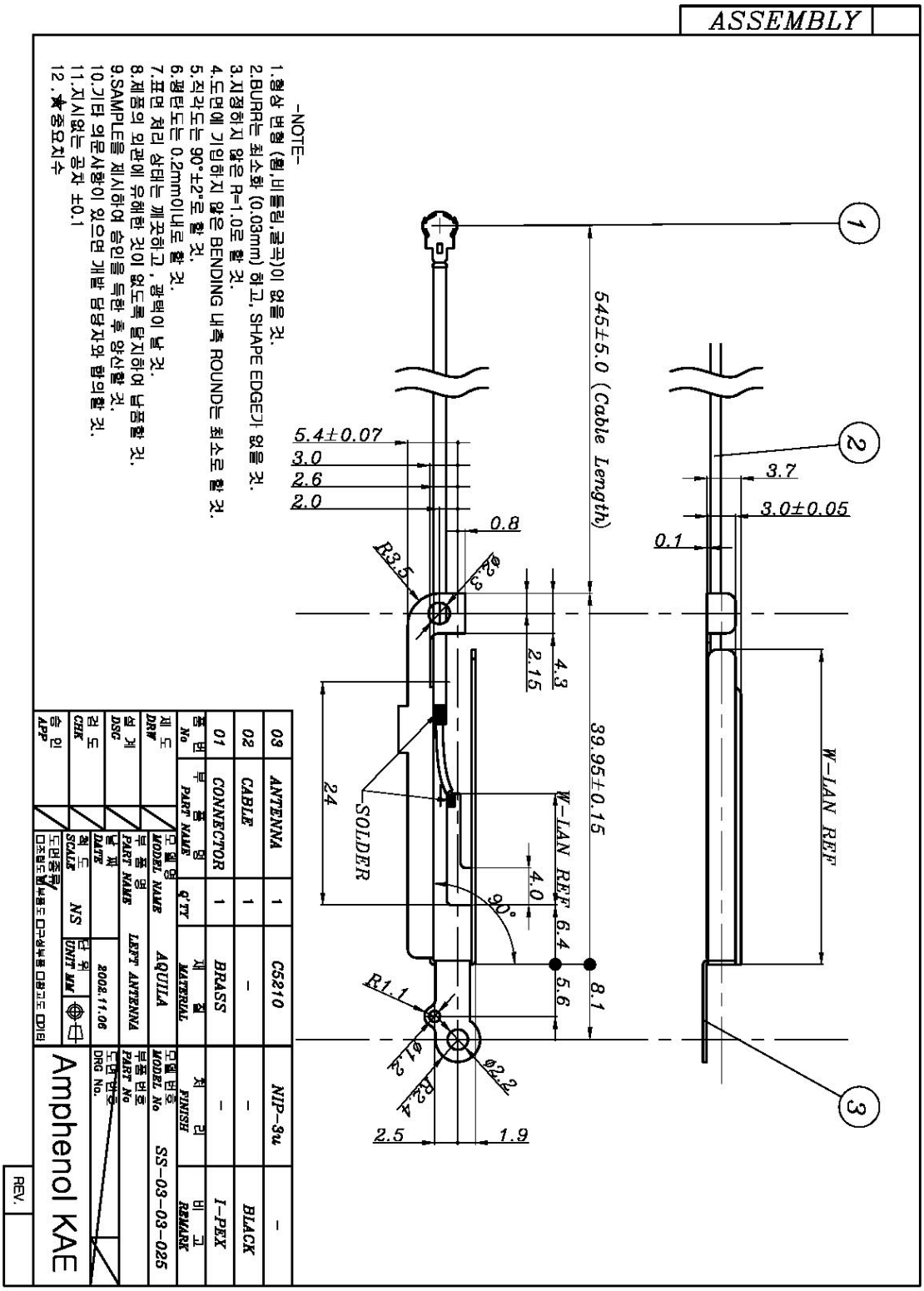


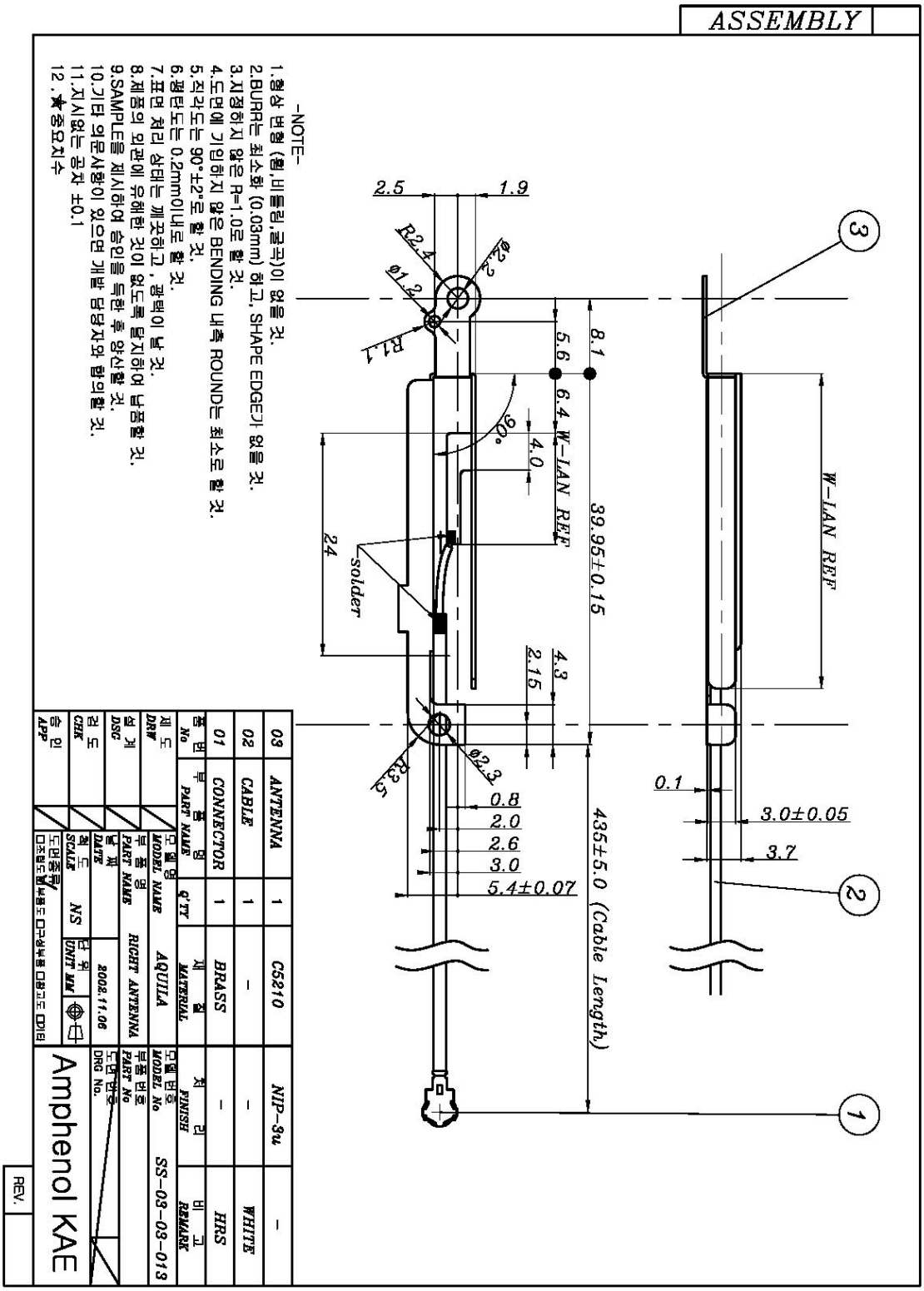
Table 2. Average gain (dBi) summary

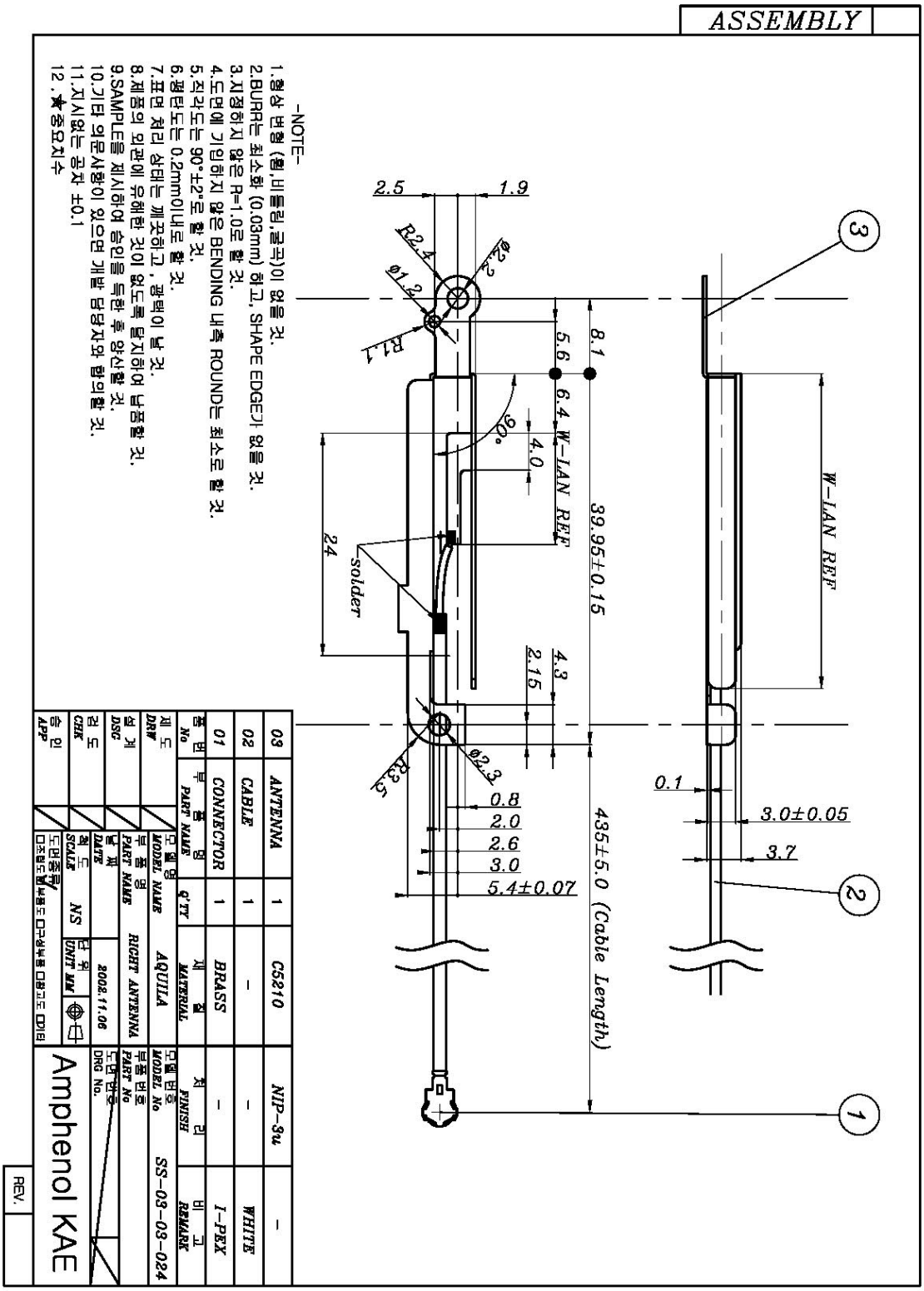
Frequency (MHz)	E1-plane	E2-plane	H-plane
2400	-8.12	-5.10	-3.61
2484	-7.58	-4.67	-3.08
5150	-4.74	-7.53	-6.09
5350	-5.88	-7.75	-6.25

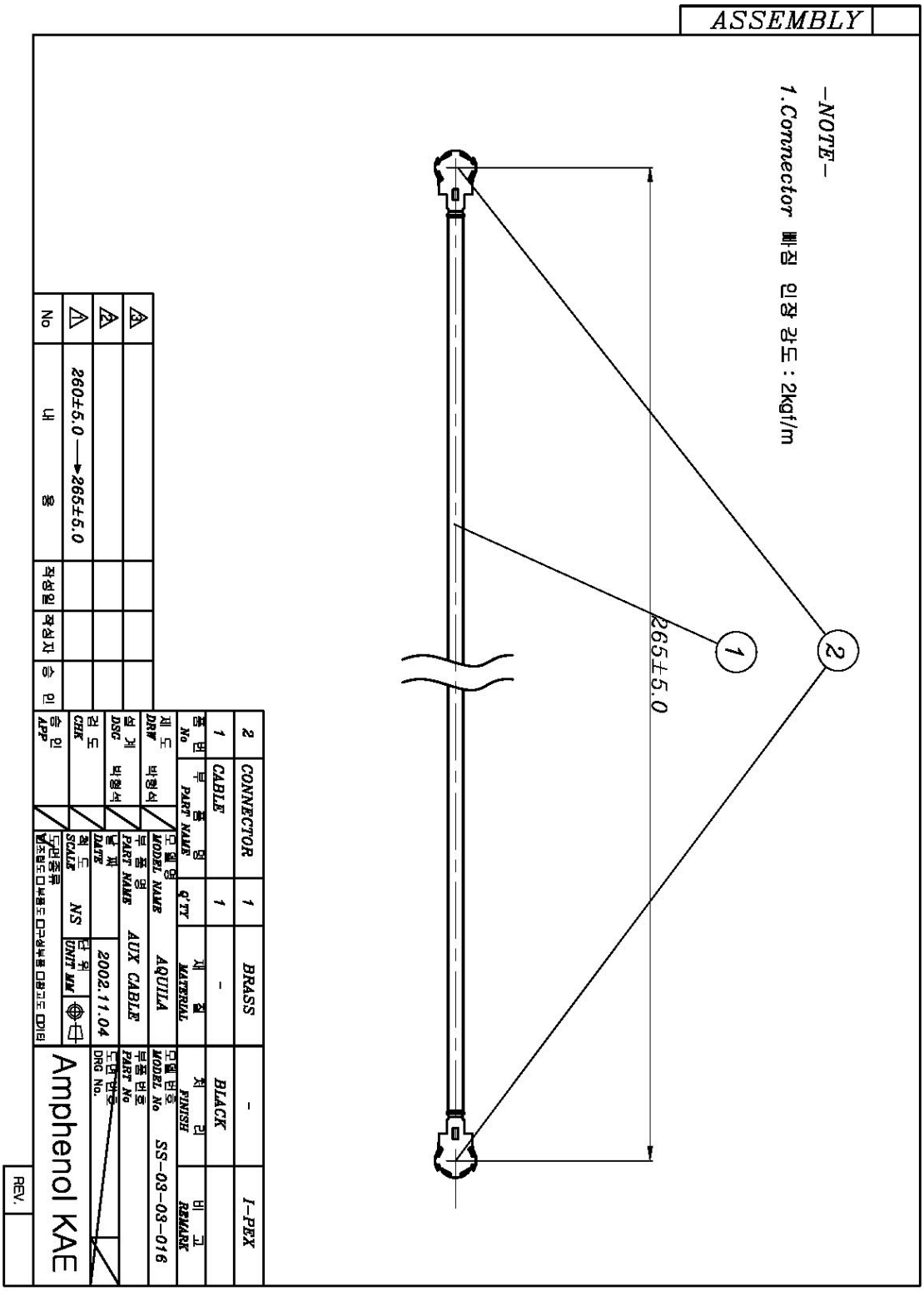
4. Antenna Drawing

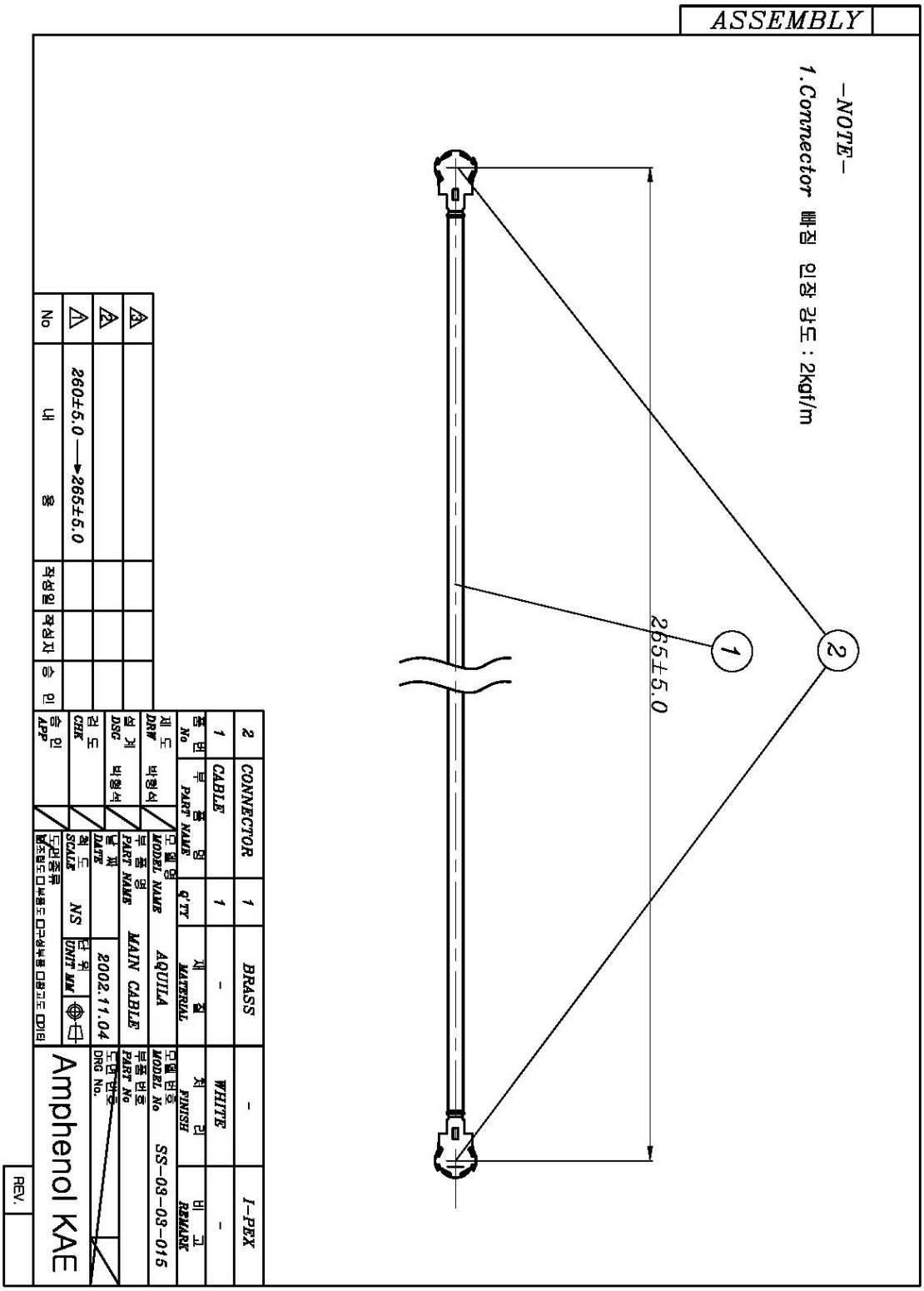


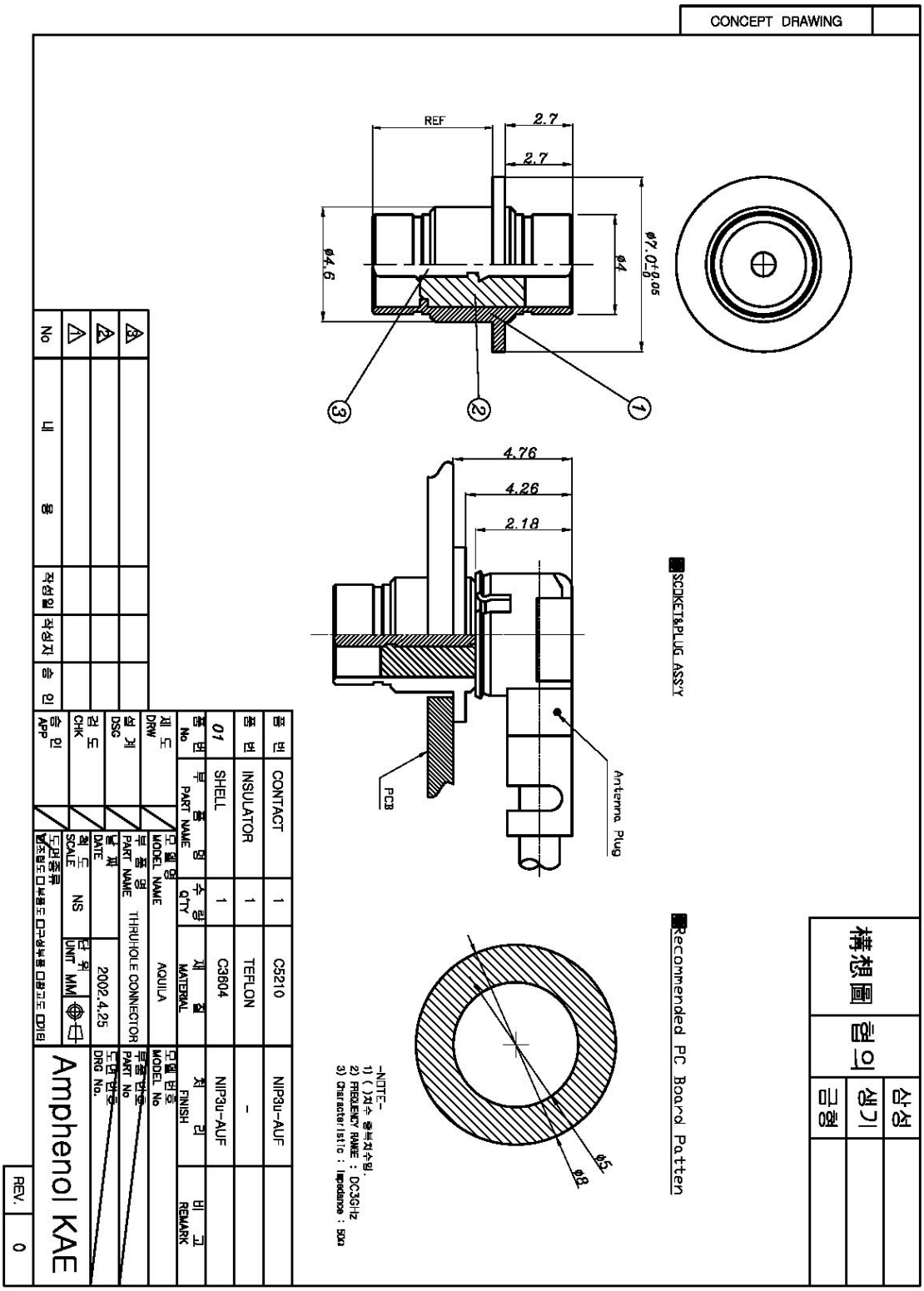

ASSEMBLY
-NOTE-
1.형상 변형 (휨,비틀림,굴곡)이 없을 것.
2.BURR는 최소화 (0.03mm) 하고, SHAPE EDGE가 없을 것.
3.지정하지 않은 R=1.0로 할 것.
4.도면에 기입하지 않은 BENDING 내측 ROUND는 최소로 할 것.
5.직각도는 90°±2°로 할 것.
6.평탄도는 0.2mm이내로 할 것.
7.표면 처리 상태는 깨끗하고 , 광택이 날 것.
8.제품의 외관에 유해한 것이 없도록 달지하여 납품할 것.
9.SAMPLE을 제시하여 승인을 득한 후 양산할 것.
10.기타 의문사항이 있으면 개발 담당자와 협의할 것.
11.지시없는 공차 ±0.1
12.★중요치수
545±5.0 (Cable Length)
5.4±0.07
3.0
2.6
2.0
0.8
R3.5
2.15
4.3
39.95±0.15
W-LAN REF
6.4
4.0
90°
5.6
8.1
24
SOLDER
R1.1
2.5
1.9
3.7
3.0±0.05
0.1
W-LAN REF
03 ANTENNA 1 C5210 NIP-3u -
02 CABLE 1 - - - BLACK
01 CONNECTOR 1 BRASS - I-PEX
품번 No / 부품명 PART NAME / Q'TY / 재질 MATERIAL / 처리 FINISH / 비고 REMARK
제도 DRW
설계 DSG
검도 CHK
승인 APP
모델명 MODEL NAME AQUILA
부품명 PART NAME LEFT ANTENNA
날짜 DATE 2002.11.06
척도 SCALE NS
단위 UNIT MM
모델번호 MODEL No SS-03-03-025
부품번호 PART No
도면번호 DRG No.
Amphenol KAE
REV.


ASSEMBLY
-NOTE-
1.형상 변형 (휨,비틀림,굴곡)이 없을 것.
2.BURR는 최소화 (0.03mm) 하고, SHAPE EDGE가 없을 것.
3.지정하지 않은 R=1.0로 할 것.
4.도면에 기입하지 않은 BENDING 내측 ROUND는 최소로 할 것.
5.직각도는 90°±2°로 할 것.
6.평탄도는 0.2mm이내로 할 것.
7.표면 처리 상태는 깨끗하고 , 광택이 날 것.
8.제품의 외관에 유해한 것이 없도록 탈지하여 납품할 것.
9.SAMPLE을 제시하여 승인을 득한 후 양산할 것.
10.기타 의문사항이 있으면 개발 담당자와 협의할 것.
11.지시없는 공차 ±0.1
12.★중요치수
2.5
1.9
R2.4
φ2.2
φ1.2
R1.7
8.1
5.6
6.4
W-LAN REF
4.0
90°
24
solder
39.95±0.15
4.3
2.15
R3.5
φ2.3
0.8
2.0
2.6
3.0
5.4±0.07
435±5.0 (Cable Length)
W-LAN REF
0.1
3.0±0.05
3.7
3
2
1
03 ANTENNA 1 C5210 NIP-3u -
02 CABLE 1 - - WHITE
01 CONNECTOR 1 BRASS - HRS
품번 No / 부품명 PART NAME / Q'TY / 재질 MATERIAL / 처리 FINISH / 비고 REMARK
제도 DRW
설계 DSG
검도 CHK
승인 APP
모델명 MODEL NAME AQUILA
부품명 PART NAME RIGHT ANTENNA
날짜 DATE 2002.11.06
척도 SCALE NS
단위 UNIT MM
모델번호 MODEL No SS-02-03-013
부품번호 PART No
도면번호 DRG No.
Amphenol KAE
REV.


ASSEMBLY
-NOTE-
1.형상 변형 (휨,비틀림,굴곡)이 없을 것.
2.BURR는 최소화 (0.03mm) 하고, SHAPE EDGE가 없을 것.
3.지정하지 않은 R=1.0로 할 것.
4.도면에 기입하지 않은 BENDING 내측 ROUND는 최소로 할 것.
5.직각도는 90°±2°로 할 것.
6.평탄도는 0.2mm이내로 할 것.
7.표면 처리 상태는 깨끗하고 , 광택이 날 것.
8.제품의 외관에 유해한 것이 없도록 탈지하여 납품할 것.
9.SAMPLE을 제시하여 승인을 득한 후 양산할 것.
10.기타 의문사항이 있으면 개발 담당자와 협의할 것.
11.지시없는 공차 ±0.1
12.★중요치수
2.5
1.9
R2.4
φ2.2
φ1.2
R1.7
8.1
5.6
6.4
W-LAN REF
4.0
90°
24
solder
39.95±0.15
4.3
2.15
φ2.3
R3.5
0.8
2.0
2.6
3.0
5.4±0.07
435±5.0 (Cable Length)
W-LAN REF
0.1
3.0±0.05
3.7
3
2
1
03 ANTENNA 1 C5210 NIP-3u -
02 CABLE 1 - - WHITE
01 CONNECTOR 1 BRASS - I-PEX
품번 No / 부품명 PART NAME / Q'TY / 재질 MATERIAL / 처리 FINISH / 비고 REMARK
제도 DRW
설계 DSG
검도 CHK
승인 APP
모델명 MODEL NAME AQUILA
부품명 PART NAME RIGHT ANTENNA
날짜 DATE 2002.11.06
척도 SCALE NS
단위 UNIT MM
모델번호 MODEL No SS-03-03-024
부품번호 PART No
도면번호 DRG No.
Amphenol KAE
REV.


ASSEMBLY
-NOTE-
1.Connector 빠짐 인장 강도 : 2kgf/m
265±5.0
1
2
No
내 용
작성일
작성자
승 인
260±5.0 → 265±5.0
2 CONNECTOR 1 BRASS - I-PEX
1 CABLE 1 - BLACK
품 번 PART NAME Q'TY MATERIAL FINISH REMARK
제 도 DRW
검 토 CHK
승 인 APP
모델명 MODEL NAME AQUILA
품 명 PART NAME AUX CABLE
날 짜 DATE 2002.11.04
척 도 SCALE NS
단 위 UNIT MM
모델 번호 MODEL No SS-03-03-016
품번 번호 PART No
도면 번호 DRG No.
Amphenol KAE
REV.


ASSEMBLY
-NOTE-
1.Connector 빠짐 인장 강도 : 2kgf/m
265±5.0
1
2
No
내 용
작성일
작성자
승 인
260±5.0 → 265±5.0
2 CONNECTOR 1 BRASS - I-PEX
1 CABLE - WHITE - -
품 번 PART No
부 품 명 PART NAME
Q'TY
재 질 MATERIAL
처 리 FINISH
비 고 REMARK
제 도 DRW
설 계 DSG
검 도 CHK
승 인 APP
모델 명 MODEL NAME AQUILA
모델 번호 MODEL No SS-03-03-015
부 품 명 PART NAME MAIN CABLE
부 품 번 호 PART No
날 짜 DATE 2002.11.04
도면 번호 DRG No.
척 도 SCALE NS
단 위 UNIT MM
일반공차 도면중등급
Amphenol KAE
REV.


CONCEPT DRAWING
構想圖
삼성
생기
금형
REF
2.7
2.7
ø4.6
ø4
ø7.0+0.05
4.76
4.26
2.18
SOCKET&PLUG ASS'Y
Antenna Plug
PCB
Recommended PC Board Patten
ø5
ø8
-NOTE-
1) ( )괄호수 중복괄수임.
2) FREQUENCY RANGE : DC3GHz
3) Characteristic : Impedance : 50Ω
품 번
품 명
수 량
재 질
처 리
비 고
CONTACT
INSULATOR
SHELL
C5210
TEFLON
C3604
NIP3u-AUF
NIP3u-AUF
-
01
1
1
1
No
PART NAME
QTY
MATERIAL
FINISH
REMARK
모델명
AQUILA
MODEL NAME
MODEL No
제 도
DRW
설 계
DSG
검 도
CHK
승 인
APP
THRUHOLE CONNECTOR
2002.4.25
NS
UNIT MM
SCALE
DATE
부품명
PART NAME
부품번호
PART No
도면번호
DRG No.
Amphenol KAE
REV.
0
No
내 용
작성일
작성자
승 인

5. Mechanical test

Item	Specifications	Conditions
Temperature cycle	No damage or cracks	Temperature (time): -40°C(40min) → 5 to 35°C(5min) → + 90°C(30min) → 5 to 35°C(5min)
Salt spray	No excessive corrosion	48 hours continuous exposure to 5% salt water
Humidity resistance	No damage or cracks	Temperature of 40°C, humidity of 95%, let stand of 96 hours