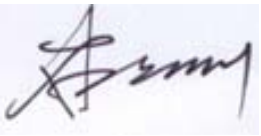
㈜ 카 모 스

Model Name: DVWS-100

Date: December 08, 2009

PRODUCT SPECIFICATION

Part No. KH – WFDA – AL001

DRAWN	CHECKED	APPROVED
		
09.12.08	09.12.08	09.12.08

KWANG HYUN AIRTECH

Address : Rm 414, Woolim Lions Valley Ⅱ, 680 Gasan-Dong,
Geumcheon-Gu, Seoul 153-787 Korea
Tel: 82-2-2027-2615, Fax: 82-2-2027-2614

—Table of Contents—

1. General

1.1 The Product

Model Name	KH – WFDA – AL001
Antenna Type	REVERSE SMA Dipole Antenna
Applications	WIFI 2.4~2.5 Ghz Antenna

1.2 Electrical Properties

Frequency Range	2400~2500 MHz
Resonance Frequency	2450Mhz +/- 2%
Impedance	To Resonance Frequency 50Ω ± 10Ω
VSWR	Less Than 2.0:1
Gain(AVR.) dBi	To H-Plane 4.0
Radiation Pattern	Omni-Directional
Polarization	Vertical

1.3 Mechanical Properties

Dimension	Φ15.0 x 163.1mm
Operational Temperature	-30°C ~ +70°C
Connector Type	SMA Connector

2. Electrical Properties

2.1 Frequency Band

Frequency Range	2400~2500 MHz

2.2 Impedance

2.2.1 Normal Value

50Ω ± 10Ω

2.2.2 Measuring Method

The impedance over the frequency bands shall be as close as possible to 50Ω after matching. Both free space and talk position are considered.

2.3 VSWR

2.3.1 Maximum values in free space

frequencies / Service	2400	2450	2500	-
VSWR	2.0:1	2.0:1	2.0:1	-

2.3.2 Measuring Method

A 50Ω coaxial cable is connected(soldered) to the 50Ω point, at the duplex-filter on the main PCB. The connection of the coaxial cable shall be done to introduce a minimum of mismatch. As much as possible the coaxial cable arrangement shall prevent influences from induced currents on the cable. In the other end, the coaxial cable is connected to a network analyzer. The measurement is performed at room temperature. The handset, including the PCB, must not in any significant way differ from the mass produced handset, i.e. the antenna feeding network has to be equivalent to the feeding network in mass production. The specification shall be met in the entire frequency band. The free space means that the handset is

placed on a non-conductive surface of cellular plastic.

2.4 Gain(dBi)

2.4.1 Typical minimum values in maximum direction

Frequencies (Mhz) / Service	2400	2450	2500	-
Gain(AVR.) dBi	4.0	4.0	4.0	-

2.4.2 Measuring Method

The connection is done according to 2.3.2.

Radiation patterns are measured at 6 different frequencies : Txmin, Txmid, Txmax, Rxmin, Rxmid and Rxmax. The antenna is measured in the 3D

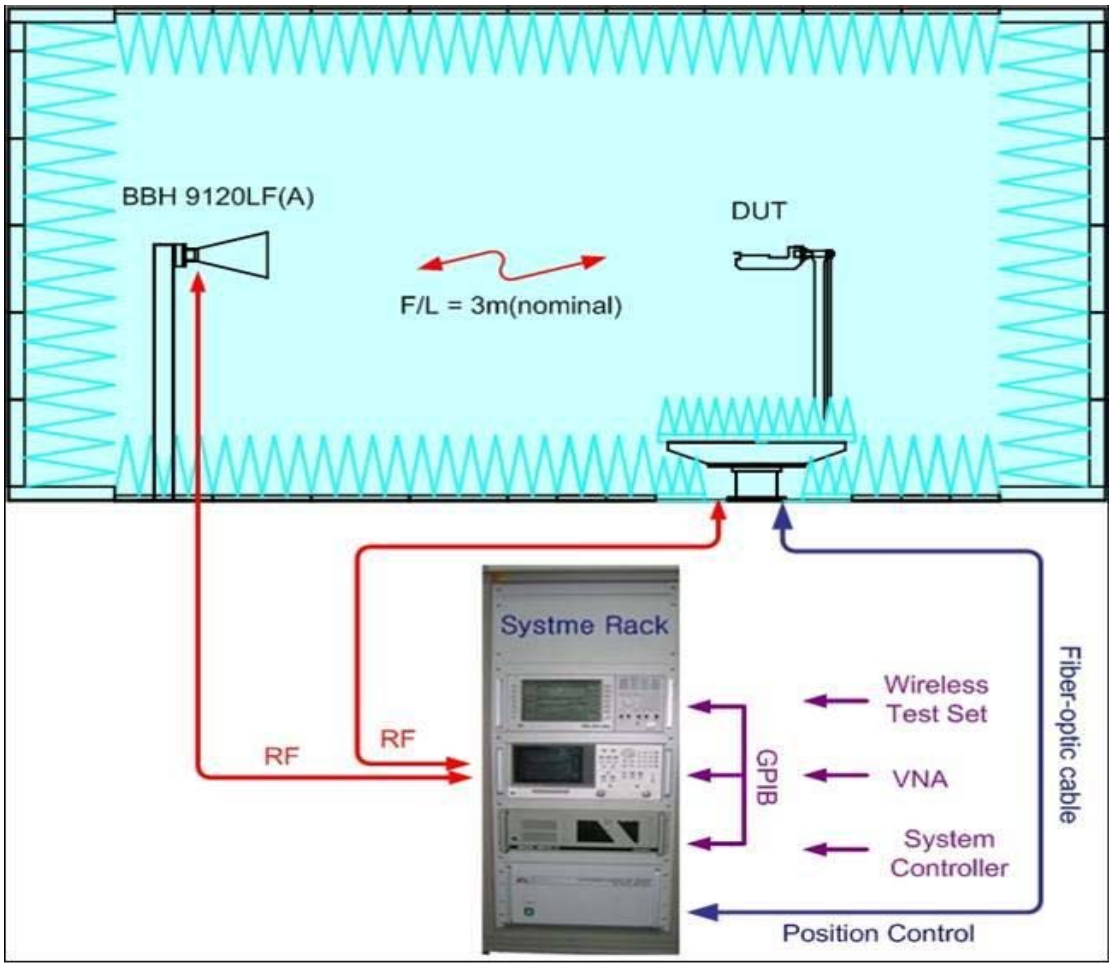


Figure 1. 3D Antenna Gain Test

2.5
SMA Connector

2.5.1 Specification Data

1) Impedance	50 ohm
2) Frequency Range	0~6 Ghz
3) V.S.W.R.	≤1.5
4) Working Voltage	≤250 Vrms
5) Dielectric Withstanding	≤670 Vrms
6) Voltage Insulation Resistance	≥2000 Mega ohm
7) Contact Resistance	Center contact:3.0 Milliohms (Max.)
	Outer contact:2.0 Milliohms (max.)
8) Recommended coupling nut torque	4.0~8.8 in.1bs (222N)
9) Coupling nut retention force	≥50 1bs (222N)
10) contact captivation force	≥5 1bs (22.2N)
11) Durability (mating)	≥500 cycles

2.5.2 Environmental Data

1) Operating Temperature	-65℃ ~ +165℃
2)Thermal Shock	MIL-STD-202,Method 107,Condition B
3)Corrosion	MIL-STD-202,Method 101,Condition B
4)Shock	MIL-STD-202,Method 213,Condition I
5)Vibration	MIL-STD-202,Method 204,Condition D
6)Moisture Resistance	MIL-STD-202,Method 106

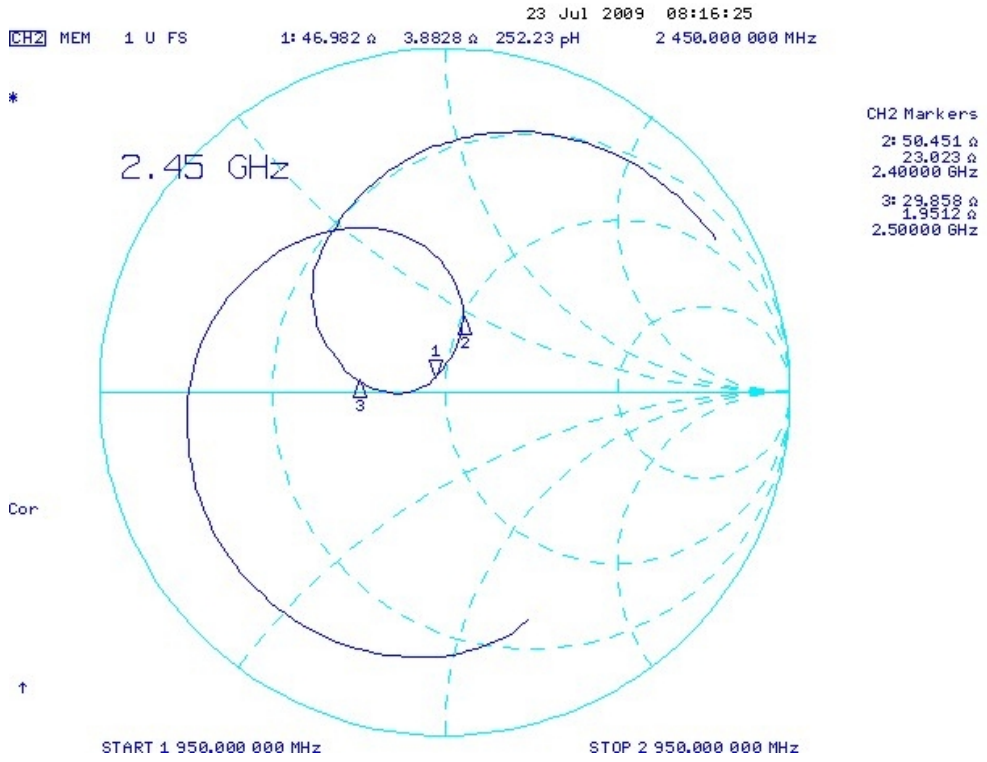
2.5.3 Material Specifications

Material Data	**Material**
1) Body	Brass
2)Contact	Brass
3)Insulator	Astal

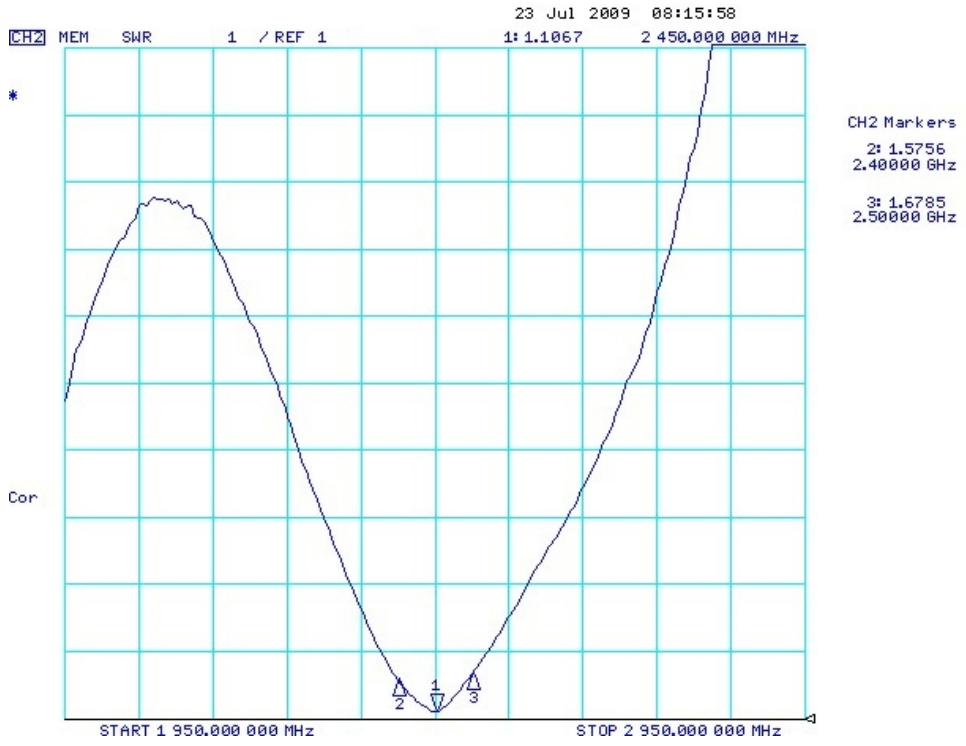
3. Test Data

3.1 Network Data

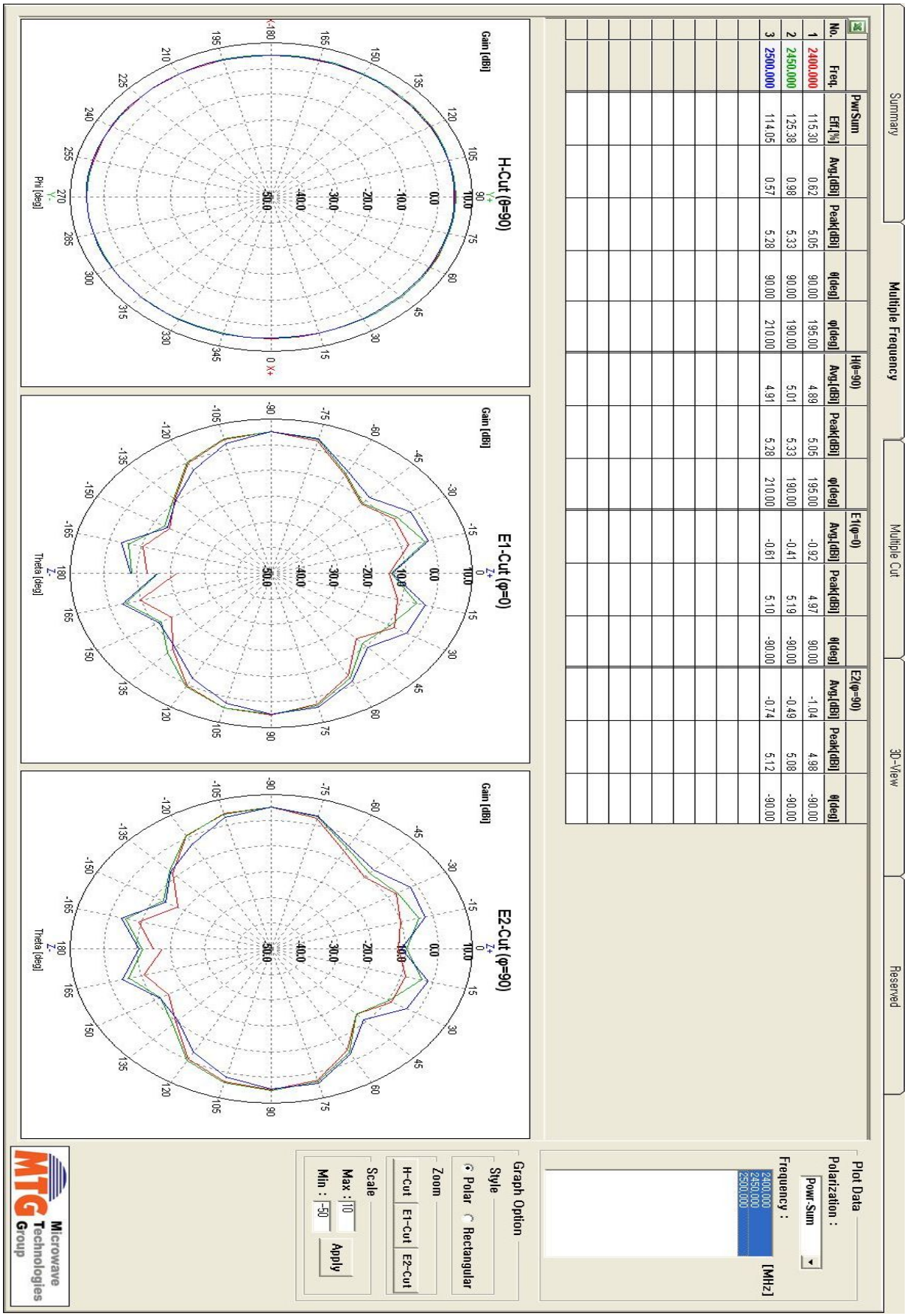
-임피던스



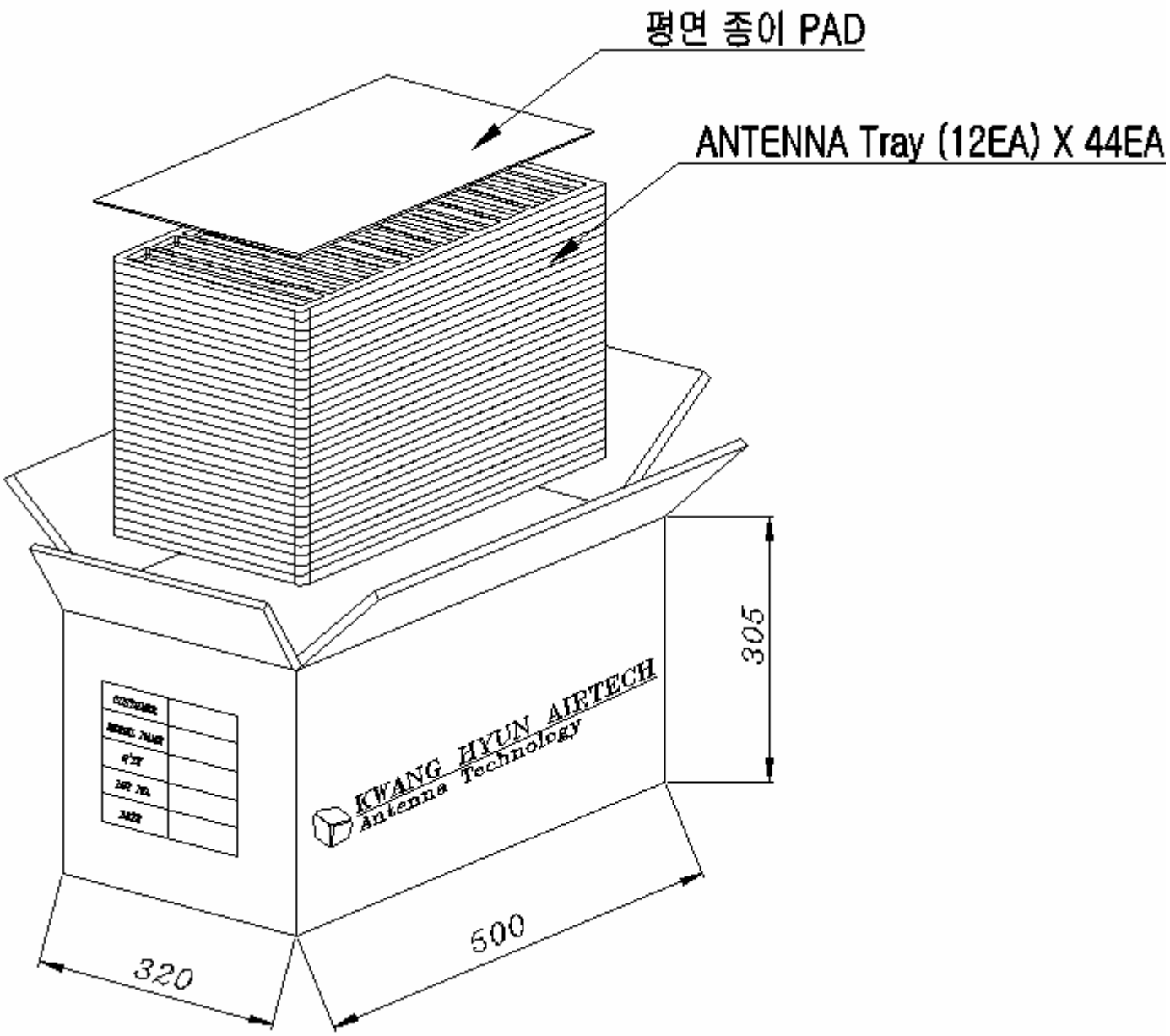
-S.W.R.



3.2 Radiation Pattern Data

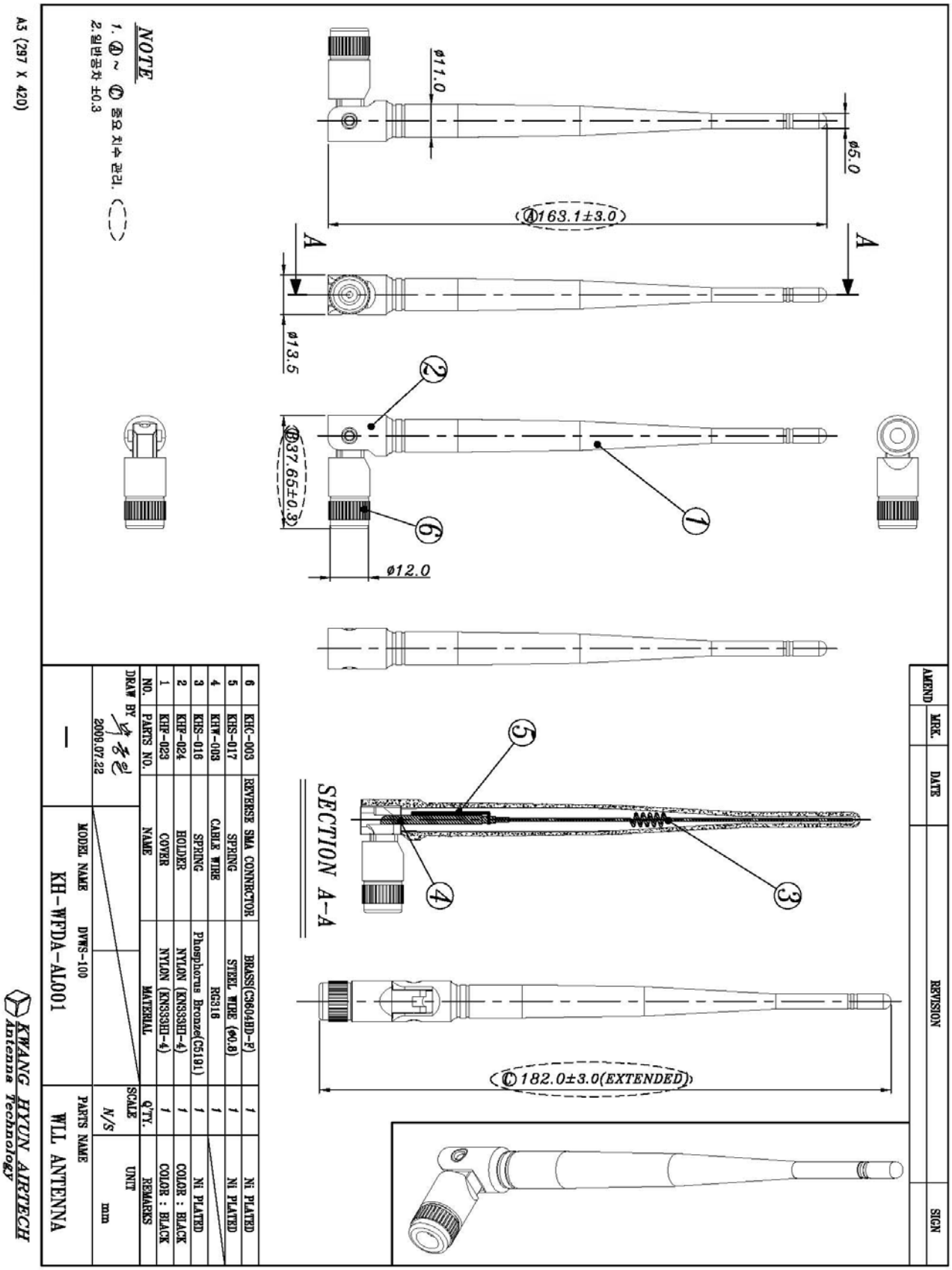


4. Packing Drawing (ANTENNA)



위 그림과 같이 TRAY 12EA에 ANTENNA를 44EA씩 담아 평면 종이 PAD를 1EA를 덮은 후 포장한다. (12 X 44 = 528EA)

5. Mechanical Drawing



6, RoHS Test Report

1) COVER & HOLER

Intertek

TEST REPORT

Applicant : KOLON PLASTICS INC.
Address : 1018, Ungmyung-Dong, Gimcheon-City,
Kyungbuk, Korea

Report No. RT08R-3542-002 Date: Jul. 14, 2008

Sample Description	: The following submitted sample(s) said to be:-
Name/Type of Product	: KOPA
Sample ID No.	: RT08R-3542-002
Item No.	: KN333HI-2, KN333HI4, KN333HI5
Manufacturer/Vender	: KOLON PLASTICS INC.
Sample received	: Jul. 09, 2008
Testing Date	: Jul. 09, 2008 ~ Jul. 14, 2008
Testing Laboratory	: Intertek Testing Center
Testing Environment	: Temperature : (22 ~ 26)℃ Relative Humidity: (55 ~ 65) %
Test Method(s)	: Please see the following page(s).
Test Result(s)	: Please see the following page(s).

* Note 1 : The test results presented in this report relate only to the object tested.
* Note 2 : This report shall not be reproduced except in full without the written approval of the testing laboratory.
* Note 3 : The item no. is assigned by client and indicated according to their requirement and guarantee letter.

Approved by,

E.Y.Lee / Lab. Technical Manager

Authorized by,

H.W.Yoo / Lab. General Manager

Intertek Testing Center

Seoul Office : Tel : 02-2109-1250 Fax : 02-2109-1259 Gumi Office : Tel : 054-462-7647 Fax : 054-462-7657 Web Site : www.Intertek.co.kr
Seoul Lab. : #709, 7Fl, Ace Techno Tower V, 197-22, Guro-3Dong, Guro-Gu, Seoul 152-766 Korea Tel : 02-2109-1260 Fax : 02-2109-1258
Ulsan Lab. : #340-2, Yongam-Ri, Chongryang-Myun, Ulju-Gun, Ulsan 689-865 Korea Tel : 052-257-6754 Fax : 052-276-6792

2) SPRING

SGS

Test Report No. F690501/LF-CTSULP08-00005 Issued Date: January 09, 2008 Page 1 of 3

To: **KOS LIMITED**
40-130,
Hangangro-3ka,
Yongsan-ku,
SEOUL
KOREA

The following merchandise was submitted and identified by the client as :

Product name	:	Stainless Steel Wire 304
SGS File No.	:	ULP08-00005
Received Date	:	January 02, 2008
Test Performing Date	:	January 03, 2008
Test Performed	:	SGS Testing Korea tested the sample(s) selected by applicant with following results
Test Results	:	For further details, please refer to following page(s)

SGS Testing Korea Co. Ltd. / Ulsan Laboratory

Sharpless Park
Annie Lim
Helen Yeo /Testing Person

Thomas Hwang / Ulsan Lab. Mgr

F055 Version1

SGS

Test Report No. F690501/LF-CTSAYAU09-04914 Issued Date: November 11, 2009 Page 1 of 3

To: **POONGSAN CORPORATION**
611 Daejung-ri Onsan-eup
Ulju
ULSAN
KOREA

The following merchandise was submitted and identified by the client as :

Product Name	: C5191
SGS File No.	: AYAU09-04914
Received Date	: November 04, 2009
Test Performing Date	: November 05, 2009
Test Performed	: SGS Testing Korea tested the sample(s) selected by applicant with following results
Test Results	: For further details, please refer to following page(s)

Conclusion : Based on the performed tests on submitted sample(s), the results **comply with** the RoHS Directive 2002/95/EC and its subsequent amendments.

SGS Testing Korea Co. Ltd. / Gimhae Laboratory

Sharpless Park
Annie Lim
Helen Yeo /Testing Person

Thomas Hwang / Gimhae Lab. Mgr

SGS Testing Korea Co., Ltd.
204, GBMC, 155-1, Nongso-ri, Jichon-myeon, Gimhae-si, Gyeongnam, Korea 621-842
t +82 (0)55 3108 800 f +82 (0)55 3108 809 http://www.sgslab.co.kr , www.kr.sgs.com/greenlab
Member of the SGS Group (Société Générale de Surveillance)

3) CABLE WIRE

SGS

Test Report No. F690501/LF-CTSAYAU09-02558 Issued Date: June 01, 2009 Page 1 of 3

To: **LS CABLE LTD**
190
Gongdan-dong
Gumi-city
GYEONGBUK
Korea

The following merchandise was submitted and identified by the client as :

Product Name	: Copper Rod
SGS File No.	: AYAU09-02558
Received Date	: May 27, 2009
Test Performing Date	: May 28, 2009
Test Performed	: SGS Testing Korea tested the sample(s) selected by applicant with following results
Test Results	: For further details, please refer to following page(s)

SGS Testing Korea Co. Ltd. / Gimhae Laboratory

Sharpless Park
Annie Lim
Helen Yeo /Testing Person

Thomas Hwang / Gimhae Lab. Mgr

SGS Testing Korea Co.,Ltd.
204, GSMC, 155-1, Nongso-ri, Jiuchon-myeon, Gimhae-si, Gyeongnam, Korea 621-842
t +82 (0)55 3108 600 f +82 (0)55 3108 609 http://www.sgslab.co.kr , www.kr.sgs.com/greenlab
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SGS

Test Report No. F690501/LF-CTSAYAA09-16080 Issued Date: June 05, 2009 Page 1 of 3

To: **HANWHA CHEMICAL CORP.**
Hanwha Bldg., 18F, #1
Janggyo-dong
Jung-gu
SEOUL
Korea

The following merchandise was submitted and identified by the client as :

Product Name	: LDPE
SGS File No.	: AYAA09-16080
Received Date	: June 02, 2009
Test Performing Date	: June 03, 2009
Test Performed	: SGS Testing Korea tested the sample(s) selected by applicant with following results
Test Results	: For further details, please refer to following page(s)

SGS Testing Korea Co. Ltd.

Pluto Kim
Cindy Park
Jinee Song/ Testing Person

Jeff Jang / Chemical Lab Mgr

SGS Testing Korea Co.,Ltd.
322, The O valley, 555-5, Hogye-dong, Dongan-gu, Anyang-si, Gyeonggi-do, Korea 431-080
t +82 (0)31 4608 000 f +82 (0)31 4608 099 http://www.sgslab.co.kr ,www.kr.sgs.com/greenlab
Member of the SGS Group (Société Générale de Surveillance)

KOREA TESTING & RESEARCH INSTITUTE

KTR
한국화학시험연구원
150-038 서울특별시 영등포구 영등포동 8가 88-2
Tel : 02-2164-0011 Fax : 02-2634-0016

시 험 성 적 서

우 415-871 경기도 김포시 월곶면 고막리 7-6번지 TEL (031)999-3000 FAX(031)999-3001

성적서번호 : TAS-021763
대 표 자 : 조태호
업 체 명 : 대명통신(유)
주 소 : 경기 화성시 비봉면 양노리 743-1

접 수 일 자 : 2009년 07월 07일
시험완료일자 : 2009년 07월 15일

시 료 명 : 주석도금선

시험환경 : 온도(22℃ ~ 26 ℃), 습도 (55% ~ 65 %)

시험방법 : 이 시험성적서의 다음 페이지 첨부

시험기간 : 2009년 07월 08일 ~ 2009년 07월 15일

시험결과 : 이 시험성적서의 다음 페이지 첨부

첨 부 : Flowchart 및 시료 사진

용 도 : 품질관리용

비고 : 1. 이 시험성적서는 의뢰자가 제시한 시료 및 시료명으로 시험한 결과로서 전체제품에 대한 품질을 보증하지 않습니다.
2. 이 성적서는 홍보, 선전, 광고 및 소송용으로 사용될 수 없으며, 용도 이외의 사용을 금합니다.

Jung-Woo Park
시험원 : 박정우
Tel : 031-999-3107

Sung-Taeg Hong
기술책임자 : 홍성택
E-mail : prohong@ktr.or.kr

2009년 07월 15일

한국화학시험연구원장

1/5 페이지

SGS

Test Report No. F690501/LF-CTSAYAA09-11822C Issued Date: April 29, 2009 Page 1 of 6

To: LG CHEM,LTD.
#679 Daejuk-ri
Daesan-eup
Seosan-city
CHUNGNAM
Korea

The following merchandise was submitted and identified by the client as :

Product Name	: PVC Resin
SGS File No.	: AYAA09-11822C
Received Date	: April 22, 2009
Test Performing Date	: April 23, 2009
Test Performed	: SGS Testing Korea tested the sample(s) selected by applicant with following results
Test Results	: For further details, please refer to following page(s)
Comments	: The client has confirmed that the described item No.s/part No.s are the same with the sample submitted.

SGS Testing Korea Co. Ltd.

Pluto Kim
Cindy Park
Jinee Song/ Testing Person

Jeff Jang / Chemical Lab Mgr

SGS Testing Korea Co.,Ltd.
322, The O valley, 555-9, Hogye-dong, Dongan-gu, Anyang-si, Gyeonggi-do, Korea 431-060
t +82 (0)31 4608 000 f +82 (0)31 4608 059 http://www.sgslab.co.kr ;www.kr.sgs.com/greenlab

Member of the SGS Group (Société Générale de Surveillance)

Intertek

TEST REPORT

Applicant : Rexm
Address : 4F, Hyecheon B/D, 1475-9, Seocho-3-dong, Seocho-gu,
Seoul, Korea

Report No. RT09R-S2405-E Date: Jun. 03, 2009

Sample Description	: The following submitted sample(s) said to be:-
Name/Type of Product	: $CaCO_3$
Sample ID No.	: RT09R-S2405
Item No.	: SN4000, SN5000, SN7000, ST7000, ST5000, S3000, S2000, S1000, S500(H), C140, T140, T-Type, S, V, H, P
Manufacturer/Vender	: Rexm
Sample received	: May 29, 2009
Testing Date	: May 29, 2009 ~ Jun. 03, 2009
Testing Laboratory	: Intertek Testing Center
Testing Environment	: Temperature : (24 ± 2) ℃, Humidity : (60 ± 5) % R.H.
Test Method(s)	: Please see the following page(s).
Test Result(s)	: Please see the following page(s).

* Note 1 : The test results presented in this report relate only to the object tested.
* Note 2 : This report shall not be reproduced except in full without the written approval of the testing laboratory.
* Note 3 : The item no. is assigned by client and indicated according to their requirement and guarantee letter.

Approved by,

Jade Jang / Lab. Technical Manager

Authorized by,

Bo Park / Lab. General Manager

Intertek Testing Center

Seoul Office : Tel : 02-2109-1250 Fax : 02-2109-1259 Gumi Office : Tel : 054-462-7647 Fax : 054-462-7657 Web Site : www.intertek.co.kr
Seoul Lab. : #709, 7Fl, Ace Techno Tower V, 197-22, Guro-3Dong, Guro-Gu, Seoul 152-766 Korea Tel : 02-2109-1260 Fax : 02-2109-1258
Ulsan Lab. : #340-2, Yongam-Ri, Chongryang-Myun, Ulju-Gun, Ulsan 689-865 Korea Tel : 052-257-6754 Fax : 052-276-6792

4) REVERSE SMA CONNECTOR

SGS

Test Report No. F690501/LF-CTSAYAU09-04929 Issued Date: November 11, 2009 Page 1 of 3

To: **POONGSAN CORPORATION**
611 Daejung-ri Onsan-eup
Ulju
ULSAN
KOREA

The following merchandise was submitted and identified by the client as :

Product Name	: C3604
SGS File No.	: AYAU09-04929
Received Date	: November 04, 2009
Test Performing Date	: November 05, 2009
Test Performed	: SGS Testing Korea tested the sample(s) selected by applicant with following results
Test Results	: For further details, please refer to following page(s)

SGS Testing Korea Co. Ltd. / Gimhae Laboratory

Sharpless Park
Annie Lim
Helen Yeo /Testing Person

Thomas Hwang / Gimhae Lab. Mgr

SGS Testing Korea Co.,Ltd.
204, GBMC, 155-1, Nongso-ri, Jiuchon-myeon, Gimhae-si, Gyeongnam, Korea 621-842
t +82 (0)55 3108 600 f +82 (0)55 3108 609 http://www.sgslab.co.kr , www.kr.sgs.com/greenlab
Member of the SGS Group (Société Générale de Surveillance)