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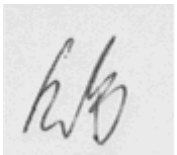
ANTENNA SPECIFICATION

	Prepared by	Reviewed by	Check by	Approved by
R F				
	09/03/05			
R & D				
	09/03/05			09/03/05

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8.3. Packing Spec Drawing

8.4. Reliability Test

8.5. Environment Test Report

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1. Approval Check List

Approval Check List				
No	Date	Change Contents	Change Cause	Rev
1	2009.03.05	ANTENNA SPECIFICATION		A
2				
3				
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9				
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13				
14				

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2. Material Certification

No	Part material	Raw material	Processing	Finishing	EA	Raw material company	Processing Plant	Etc
1	FRAME	PC(141R-701)	MOLD	-	1	GE	신아정밀	-
2	SLOT	STS301	PRESS	-	1	풍산	유한프리시젼	-
3								
4								
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3. Technical Specifications

3.1 Electrical Specifications.

- Slide Down

Electrical Spec.	BAND					
Frequency Range (MHz)	Cellular		PCS		AWS	
V.S.W.R (Max.)	824 MHz	894 MHz	1850 MHz	1990 MHz	1710 MHz	2155 MHz
	3.7:1 below	3.2:1 below	3.6:1 below	2.4:1 below	2.8:1 below	4.0:1 below
PEAK GAIN (Min., E2-Plane)	Tx	Rx	Tx	Rx	Tx	Rx
	-4.7 dBi	-2.5 dBi	-11.1 dBi	-11.2 dBi	-7.2 dBi	-5.0 dBi
AVERAGE GAIN (Min., H-Plane)	Tx	Rx	Tx	Rx	Tx	Rx
	-4.2 dBi	-4.3 dBi	-7.0 dBi	-6.5 dBi	-8.6 dBi	-7.7 dBi

- Slide Up

Electrical Spec.	BAND					
Frequency Range (MHz)	Cellular		PCS		AWS	
V.S.W.R (Max.)	824 MHz	894 MHz	1850 MHz	1990 MHz	1710 MHz	2155 MHz
	3.9:1 below	2.6:1 below	3.4:1 below	2.4:1 below	2.6:1 below	3.5:1 below
PEAK GAIN (Min., E2-Plane)	Tx	Rx	Tx	Rx	Tx	Rx
	-3.6 dBi	-1.5 dBi	-8.0 dBi	-6.0 dBi	-5.2 dBi	-3.6 dBi
AVERAGE GAIN (Min., H-Plane)	Tx	Rx	Tx	Rx	Tx	Rx
	-3.0 dBi	-2.7 dBi	-7.0 dBi	-8.2 dBi	-9.6 dBi	-10.1 dBi

Impedance(Nominal)	50 ohms
Polarization	VERTICAL
Radiation Pattern	OMNI-DIRECTIONAL
Maximum Power	2 W

3.2 Mechanical Specifications

Mechanical Spec.	
Connector	Board contact pin type
Overall length	See drawing
Operating Temperature	-40℃ ~+85 ℃
Weight	1.67g (Unit)

3.3 Packing Specifications

Packing Spec.		
PRODUCT	QUANTITY (Antenna)	MATERIAL
TRAY	1/40EA	P.S (0.8t)
TRAY INNER PAD	1/400EA	SW 2 type (B corrugated paper)
CARTON BOX	800EA/1BOX	DW 2 type (AB corrugated paper)

4. Test Equipment

The equipment for antenna test is as follows,

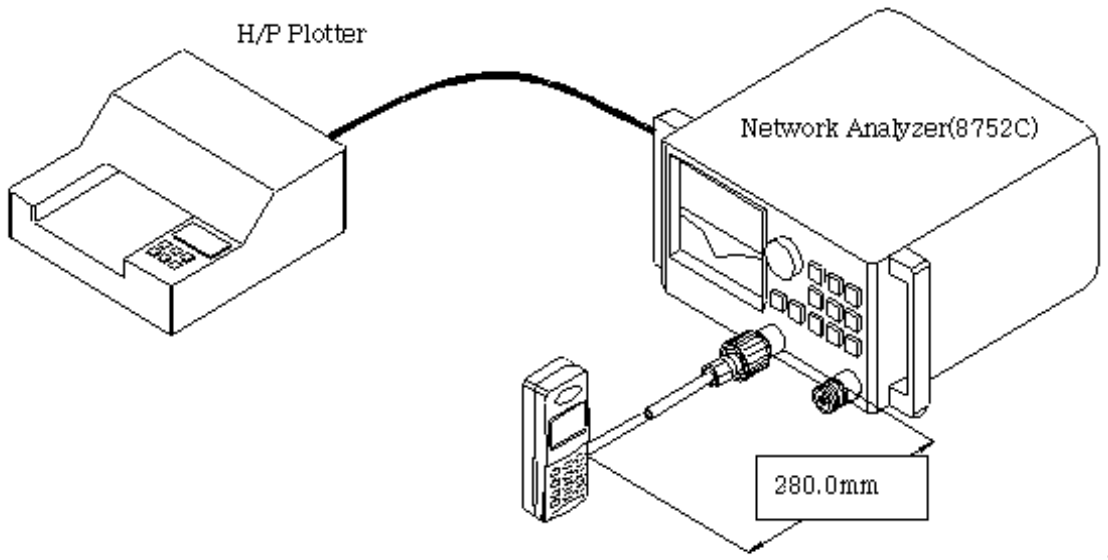
- ♦ Network Analyzer (HP8752C) to measure the V.S.W.R., Standing wave ratio(SWR) and impedance bandwidth of antenna
- ♦ Standard horn antennas adjustable to the CELLULAR bands
- ♦ Standard horn antennas adjustable to the PCS bands
- ♦ Standard horn antennas adjustable to the AWS bands
- ♦ Anechoic Chamber installed the cables, connectors and equipments for measurements
- ♦ Digital Caliper to measure the dimensions
- ♦ Torque Driver to measure the torque force of the helix
- ♦ Push/Pull gauge to measure the pulling forces
- ♦ Climatic Chamber for environmental tests

5. Electrical Demands

5.1 V.S.W.R

The V.S.W.R characteristics must be satisfied the electrical demands in the below table.

Frequency Range (MHz)	Cellular (824~894MHz)		PCS (1850~1990MHz)		AWS (1710~1755 & 2110~2155MHz)	
V.S.W.R (Slide Down)	824 MHz	894 MHz	1850 MHz	1990 MHz	1710 MHz	2155 MHz
	3.7:1 below	3.2:1 below	3.6:1 below	2.4:1 below	2.8:1 below	4.0:1 below
V.S.W.R (Slide Up)	824 MHz	894 MHz	1850 MHz	1990 MHz	1710 MHz	2155 MHz
	3.9:1 below	2.6:1 below	3.4:1 below	2.4:1 below	2.6:1 below	3.5:1 below



5.2 Radiation Pattern

The radiation pattern must have the omni-directional characteristic in Cellular Band and PCS and AWS Band.

5.3 Gain

The gain is expressed as dBi. with condition (E2, H-Plane), the minimum Gain of antenna must be satisfied the electrical demands in the below table.

- Slide Down State

Electrical Spec.	BAND					
Frequency Range (MHz)	Cellular		PCS		AWS	
PEAK GAIN (Min., E2-Plane)	Tx	Rx	Tx	Rx	Tx	Rx
	-4.7 dBi	-2.5 dBi	-11.1 dBi	-11.2 dBi	-7.2 dBi	-5.0 dBi
AVERAGE GAIN (Min., H-Plane)	Tx	Rx	Tx	Rx	Tx	Rx
	-4.2 dBi	-4.3 dBi	-7.0 dBi	-6.5 dBi	-8.6 dBi	-7.7 dBi

- Slide Up State

Electrical Spec.	BAND					
Frequency Range (MHz)	Cellular		PCS		AWS	
PEAK GAIN (Min., E2-Plane)	Tx	Rx	Tx	Rx	Tx	Rx
	-3.6 dBi	-1.5 dBi	-8.0 dBi	-6.0 dBi	-5.2 dBi	-3.6 dBi
AVERAGE GAIN (Min., H-Plane)	Tx	Rx	Tx	Rx	Tx	Rx
	-3.0 dBi	-2.7 dBi	-7.0 dBi	-8.2 dBi	-9.6 dBi	-10.1 dBi

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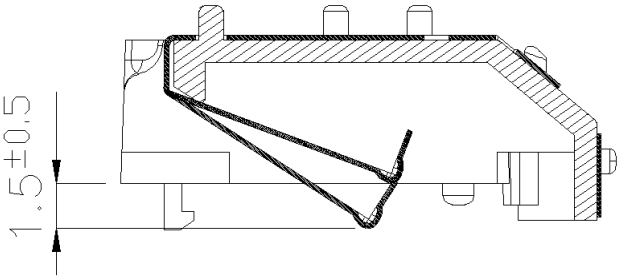
6. Mechanical Demands

6.1. Contact Pin Force Test

Contact pin of antenna must keep 200g/f ±150 in operation distance. (Operation distance of antenna is same to under drawing. / PCB overlap : 0mm~2.0mm)



6.2. Contact Pin Resistance Test.

After assemble antenna to test equipment, Contact pins are pressed to nominal assembly position 500 times. The antenna contact force must satisfy of (6.1) operation force. (Cycle time: 60 times/min)

6.3 Drop Test

The antenna is attached to the handset. The handset is dropped with the antenna downward onto a concrete surface at 1.5 m height and angle D(45°). The number of drop is 3 times.

After the test, the original shape shall be possible to restore. The antenna shall satisfy the electrical demands.

7.Environmental Demands

7.1 Operation Temperature Test

- Test A: Place the antennas for testing in chamber. The chamber condition should be as follows: 1hours at -20℃.
- Final measurements: The antenna shall be visually inspected and electrically and also mechanically checked as required by products standard.
- Test B: Place the antennas for testing in chamber. The chamber condition should be as follows: 1hours at 70℃.
- Final measurements: The antenna shall be visually inspected and electrically and also mechanically checked as required by products standard.

7.2 Temperature Change Test

The object of temperature test is to evaluate the reliability of antenna component at temperature change.

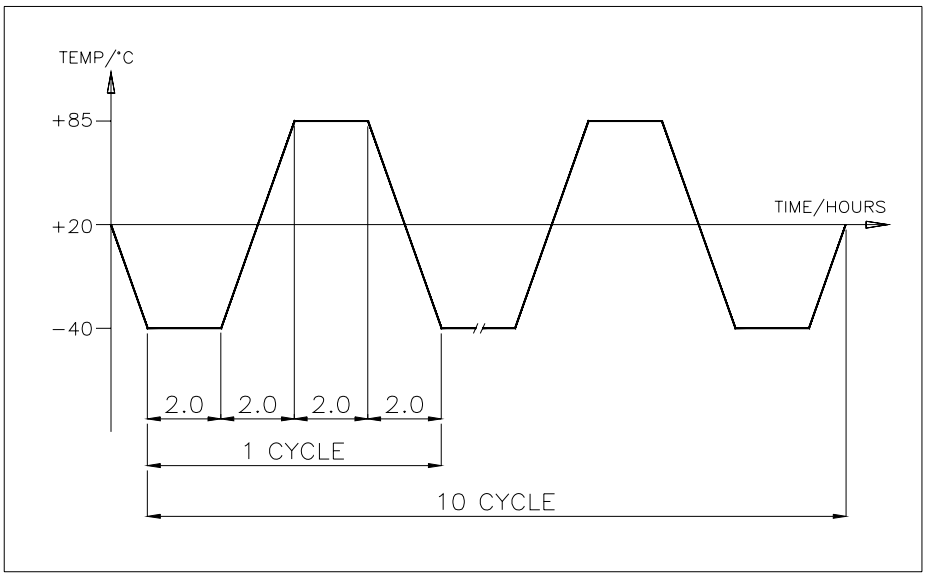
Test: Temperature cycle is as follows. 2 hours at -40℃.

2 hours at +85℃.

Temperature increase/decrease time (Temperature change time) is

2 hours. 10 cycles.

Final measurements: The antenna shall be visually inspected and electrically and mechanically checked as required by products standard.



7.3 High Humidity Test

Test: Place the antennas for testing in chamber. The chamber condition should be as follows: 24hours at +55℃, Relative humidity is 95%.

Final measurements: The antenna shall be visually inspected and electrically and also mechanically checked as required by products standard.

7.4 Vibration Test

After assemble antenna to test equipment, Do test in X, Z direction per 1hour as a under spec. The antenna shall be visually inspected and electrically and mechanically checked as required by products standard. The test must satisfy to IEC 68-2-6 spec

Vibration frequency	F=5~55~5Hz(1cycle)
Sweeping Rate	0.5 octave/min
Maximum displacement	1.5mm
Maximum acceleration	2 g
Crossover Frequency	18.0Hz

7.5 Salt spray Test

Sprayed with the salt spray solution for a period of 96 hours at a temperature of+35℃.

The antenna shall be visually inspected and electrically and mechanically checked as required by products standard. The test must satisfy to IEC 68-2-11 spec .

7.6 Storage temperature Test

After antenna are stored for a period of 96 hours at a temperature of -30 °C and a relative humidity of 95 %. Stored for a period of 96 hours at a temperature of +80 °C and a relative humidity of 95 % (total: 192 hour)

The antenna shall be visually inspected and electrically and mechanically checked as required by products standard.

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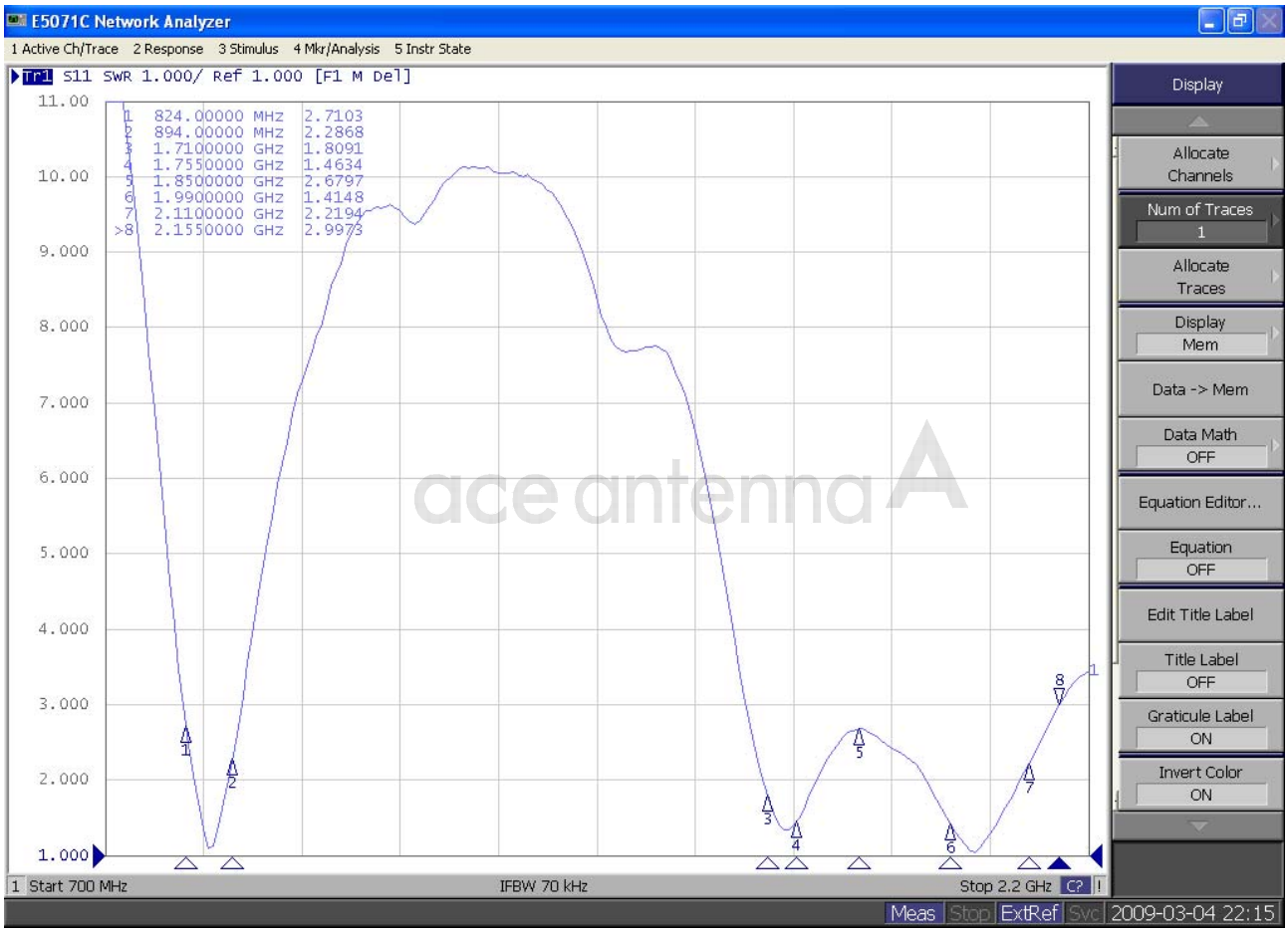
8. Antenna data

8.1. Electrical data(V.S.W.R & GAIN)

→ V.S.W.R (Slide Down)



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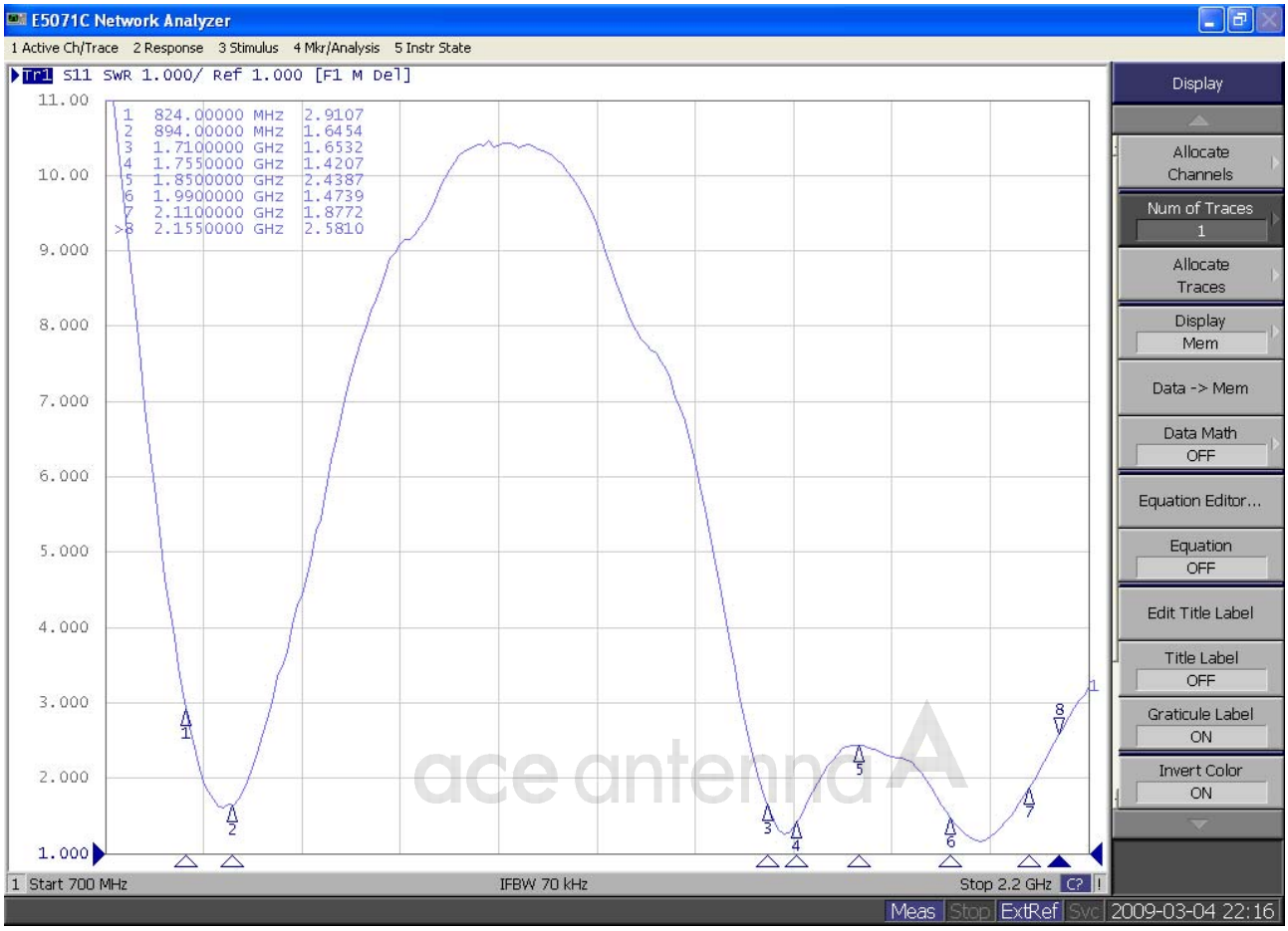
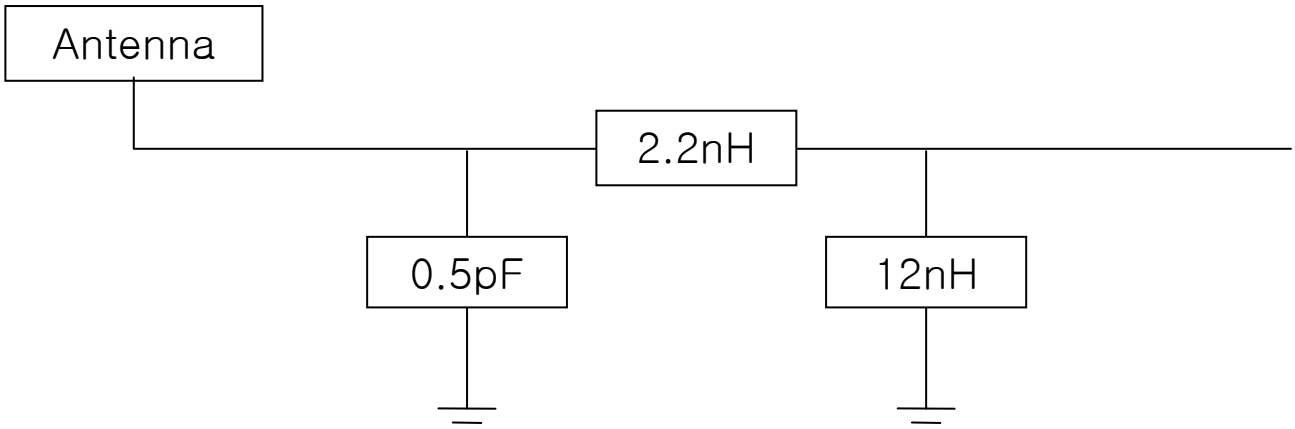
→ V.S.W.R (Slide Up)



→ Matching Circuit Diagram



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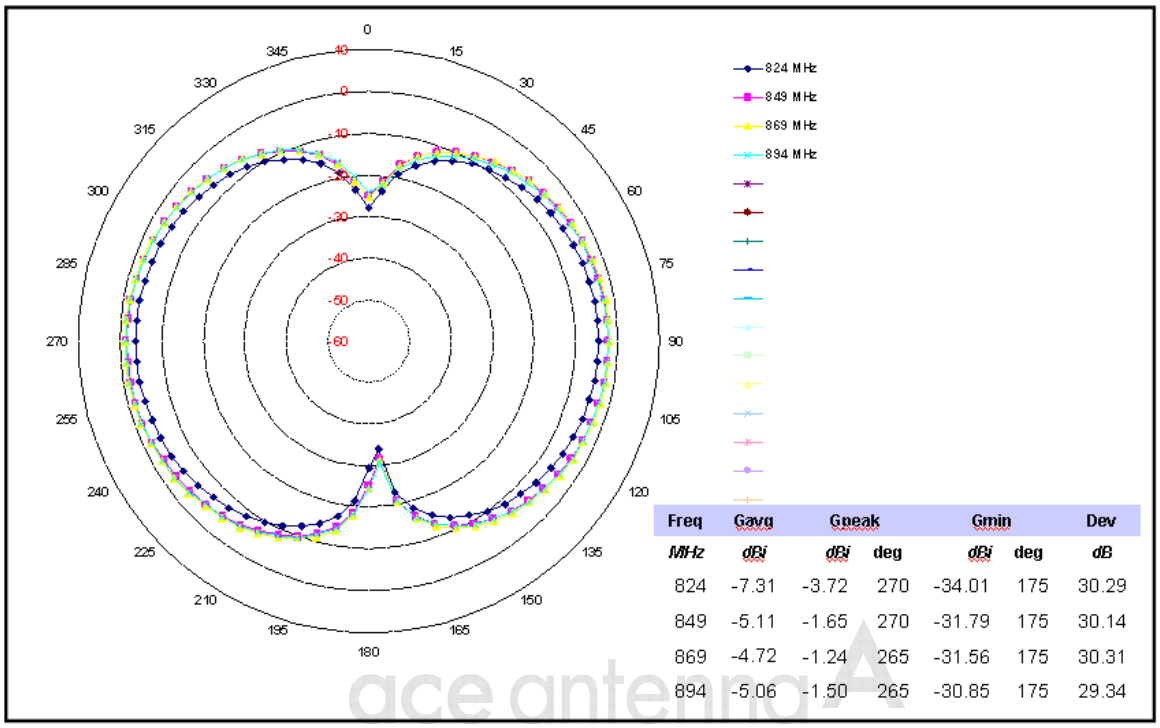
→ GAIN (with Matching Circuit)

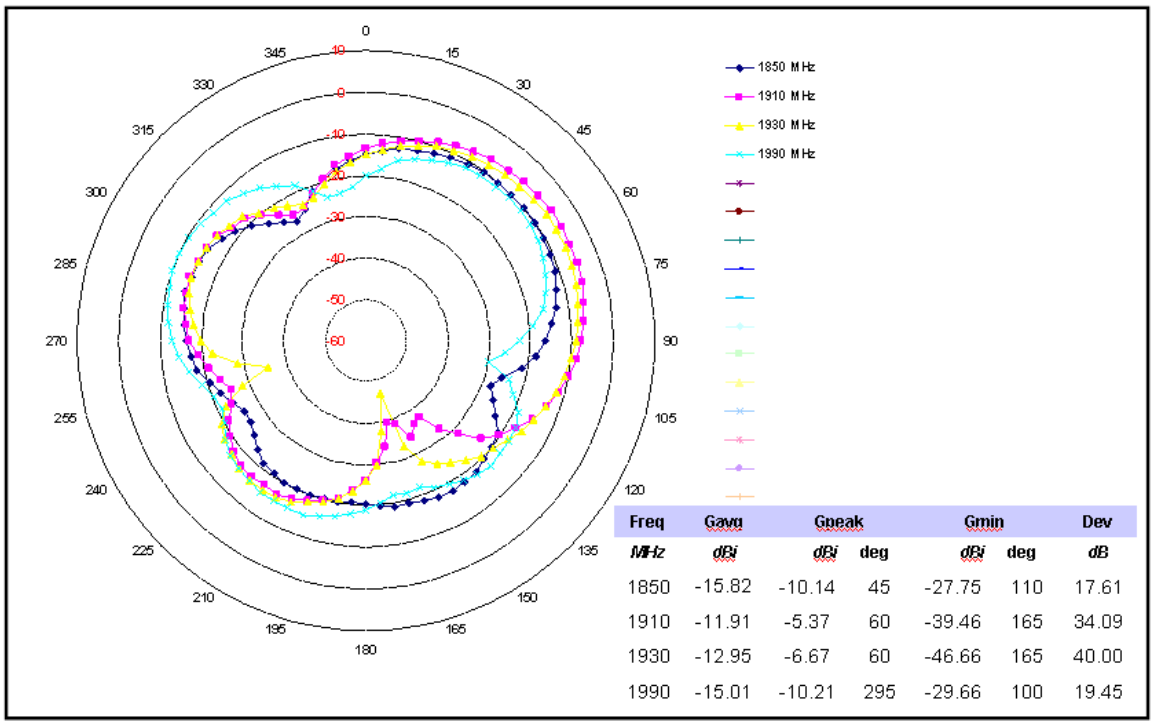
- E2-Plane

→ [Cellular Slide Down]



Freq	Gavg	Gpeak		Gmin		Dev
MHz	dBi	dBi	deg	dBi	deg	dB
824	-7.31	-3.72	270	-34.01	175	30.29
849	-5.11	-1.65	270	-31.79	175	30.14
869	-4.72	-1.24	265	-31.56	175	30.31
894	-5.06	-1.50	265	-30.85	175	29.34

→ [PCS Slide Down]



Freq	Gavg	Gpeak		Gmin		Dev
MHz	dBi	dBi	deg	dBi	deg	dB
1850	-15.82	-10.14	45	-27.75	110	17.61
1910	-11.91	-5.37	60	-39.46	165	34.09
1930	-12.95	-6.67	60	-46.66	165	40.00
1990	-15.01	-10.21	295	-29.66	100	19.45

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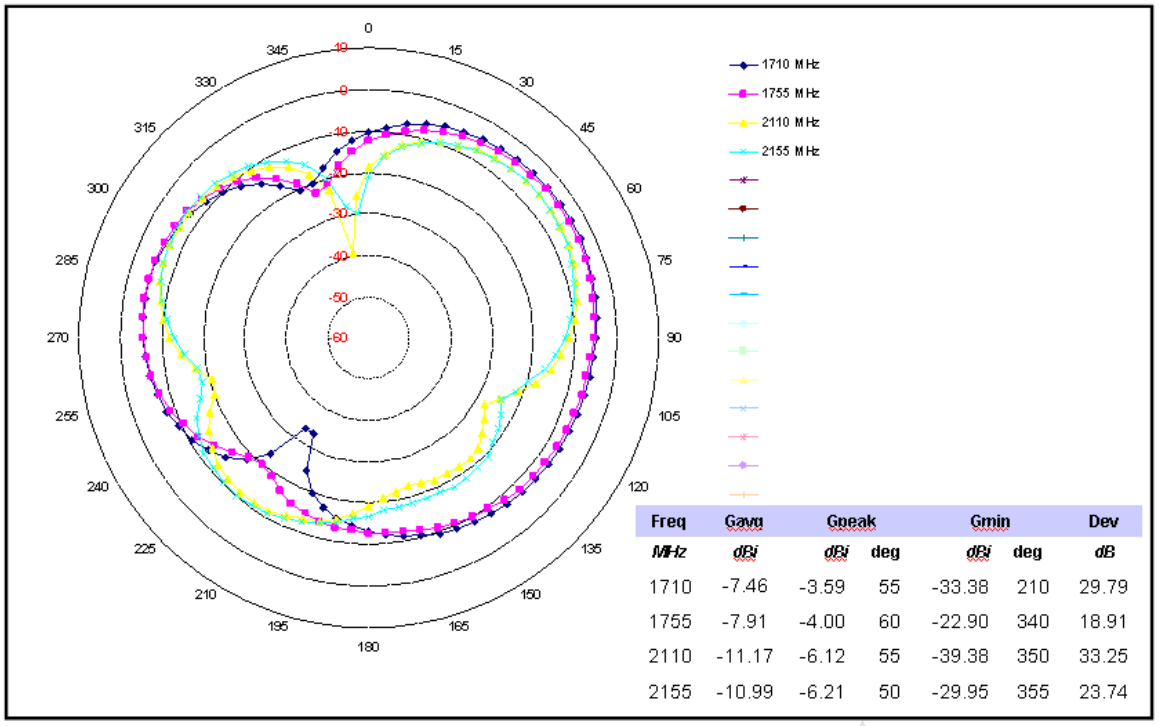
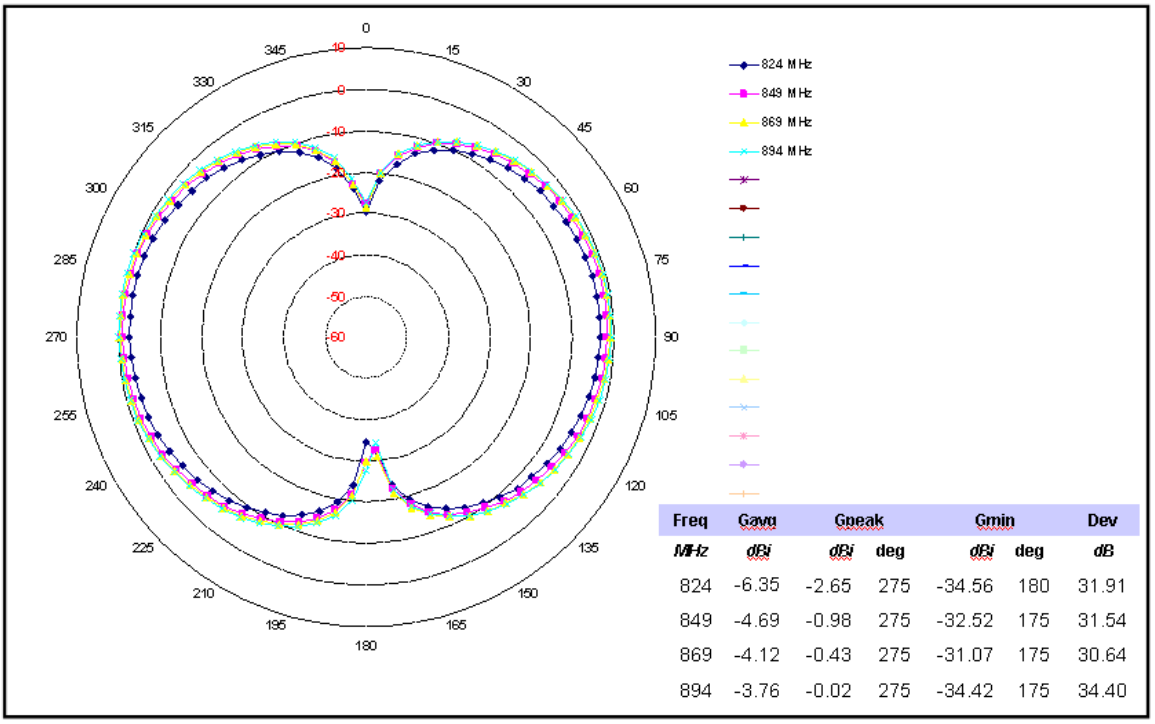
→ [AWS Slide Down]



Freq	Gavg	Gpeak		Gmin		Dev
MHz	dBi	dBi	deg	dBi	deg	dB
1710	-7.46	-3.59	55	-33.38	210	29.79
1755	-7.91	-4.00	60	-22.90	340	18.91
2110	-11.17	-6.12	55	-39.38	350	33.25
2155	-10.99	-6.21	50	-29.95	355	23.74

→ [Cellular Slide Up]



Freq	Gavg	Gpeak		Gmin		Dev
MHz	dBi	dBi	deg	dBi	deg	dB
824	-6.35	-2.65	275	-34.56	180	31.91
849	-4.69	-0.98	275	-32.52	175	31.54
869	-4.12	-0.43	275	-31.07	175	30.64
894	-3.76	-0.02	275	-34.42	175	34.40

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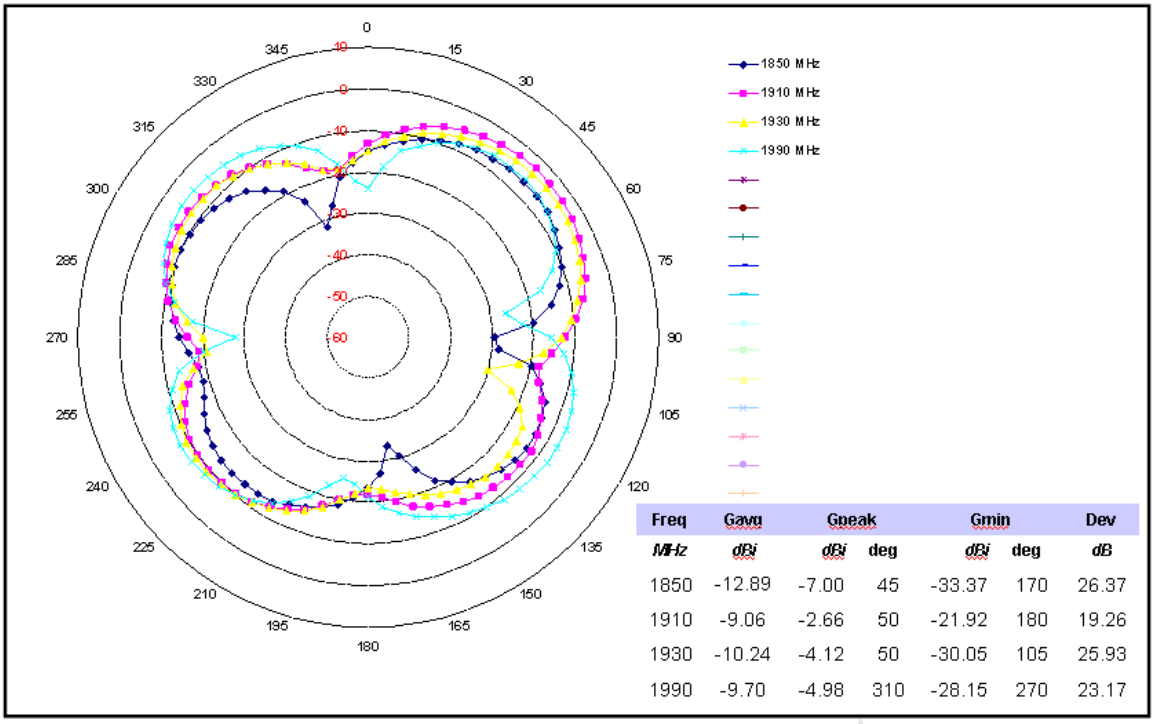
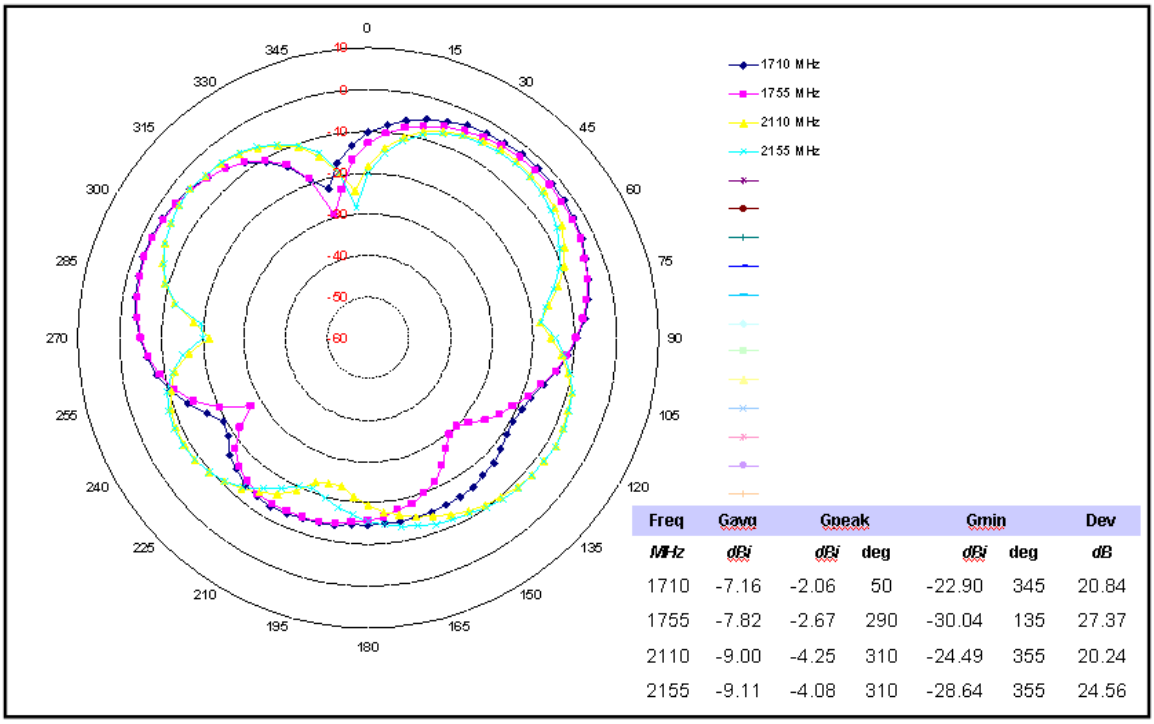
→ [PCS Slide Up]



Freq	Gavg	Gpeak		Gmin		Dev
MHz	dBi	dBi	deg	dBi	deg	dB
1850	-12.89	-7.00	45	-33.37	170	26.37
1910	-9.06	-2.66	50	-21.92	180	19.26
1930	-10.24	-4.12	50	-30.05	105	25.93
1990	-9.70	-4.98	310	-28.15	270	23.17

→ [AWS Slide Up]



Freq	Gavg	Gpeak		Gmin		Dev
MHz	dBi	dBi	deg	dBi	deg	dB
1710	-7.16	-2.06	50	-22.90	345	20.84
1755	-7.82	-2.67	290	-30.04	135	27.37
2110	-9.00	-4.25	310	-24.49	355	20.24
2155	-9.11	-4.08	310	-28.64	355	24.56

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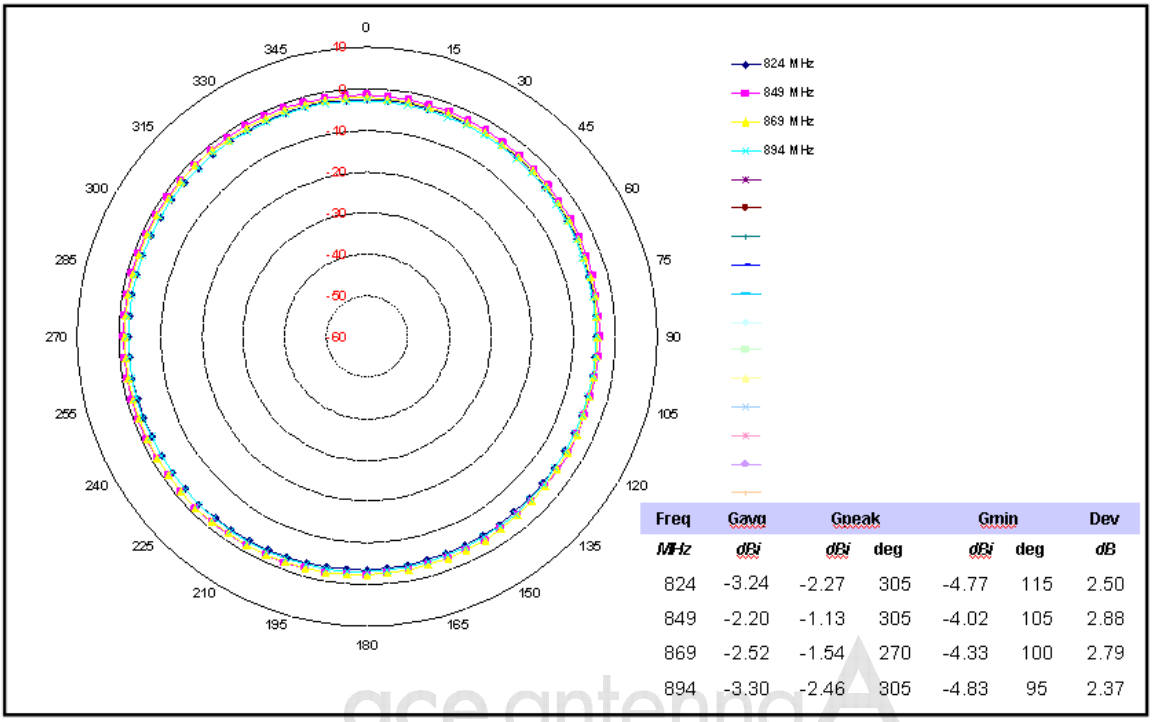
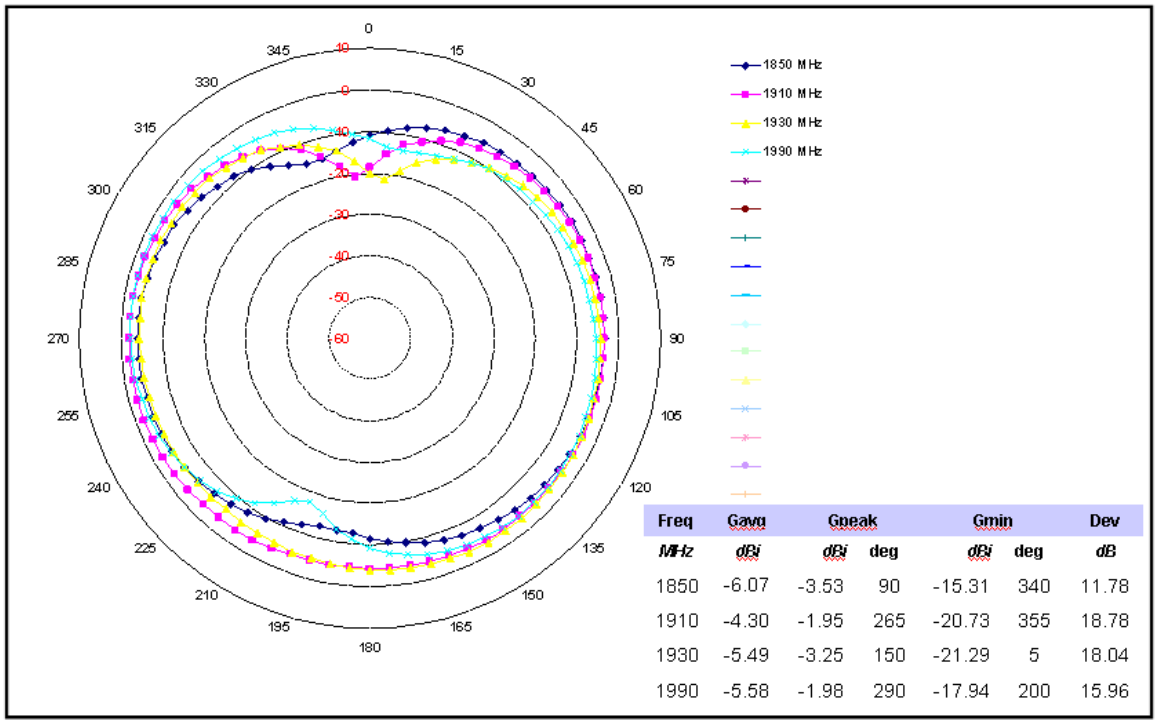
- H-Plane

→ [Cellular Slide Down]



Freq	Gavg	Gpeak		Gmin		Dev
MHz	dBi	dBi	deg	dBi	deg	dB
824	-3.24	-2.27	305	-4.77	115	2.50
849	-2.20	-1.13	305	-4.02	105	2.88
869	-2.52	-1.54	270	-4.33	100	2.79
894	-3.30	-2.46	305	-4.83	95	2.37

→ [PCS Slide Down]



Freq	Gavg	Gpeak		Gmin		Dev
MHz	dBi	dBi	deg	dBi	deg	dB
1850	-6.07	-3.53	90	-15.31	340	11.78
1910	-4.30	-1.95	265	-20.73	355	18.78
1930	-5.49	-3.25	150	-21.29	5	18.04
1990	-5.58	-1.98	290	-17.94	200	15.96

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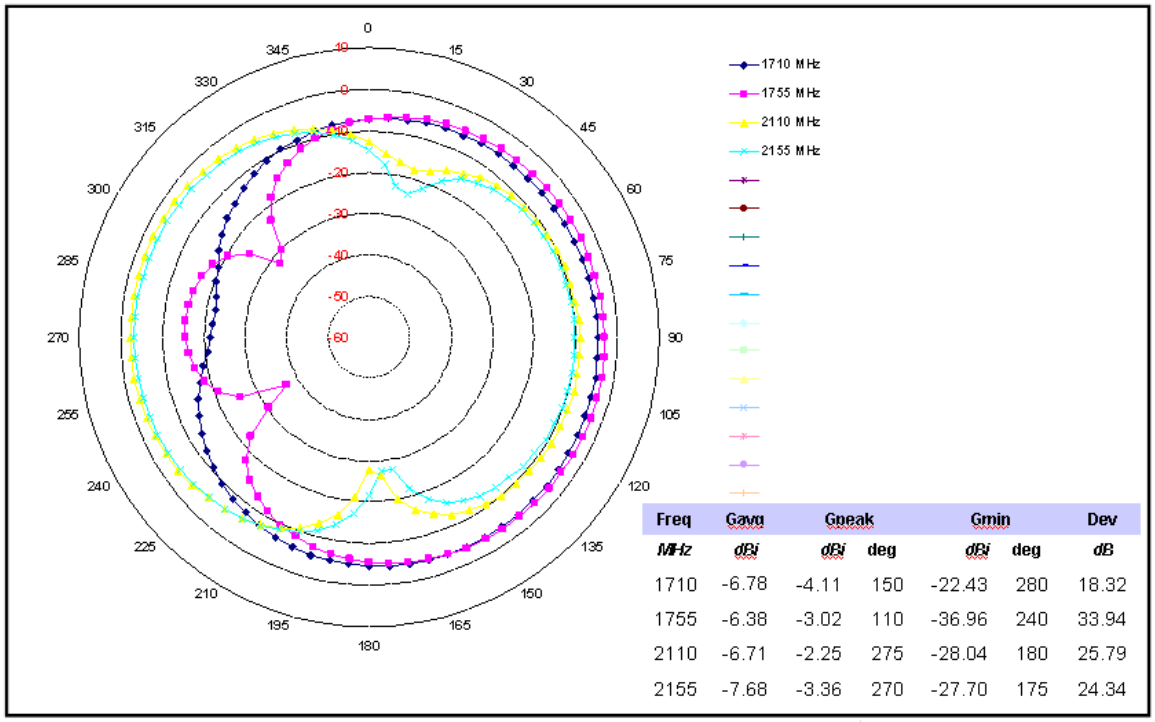
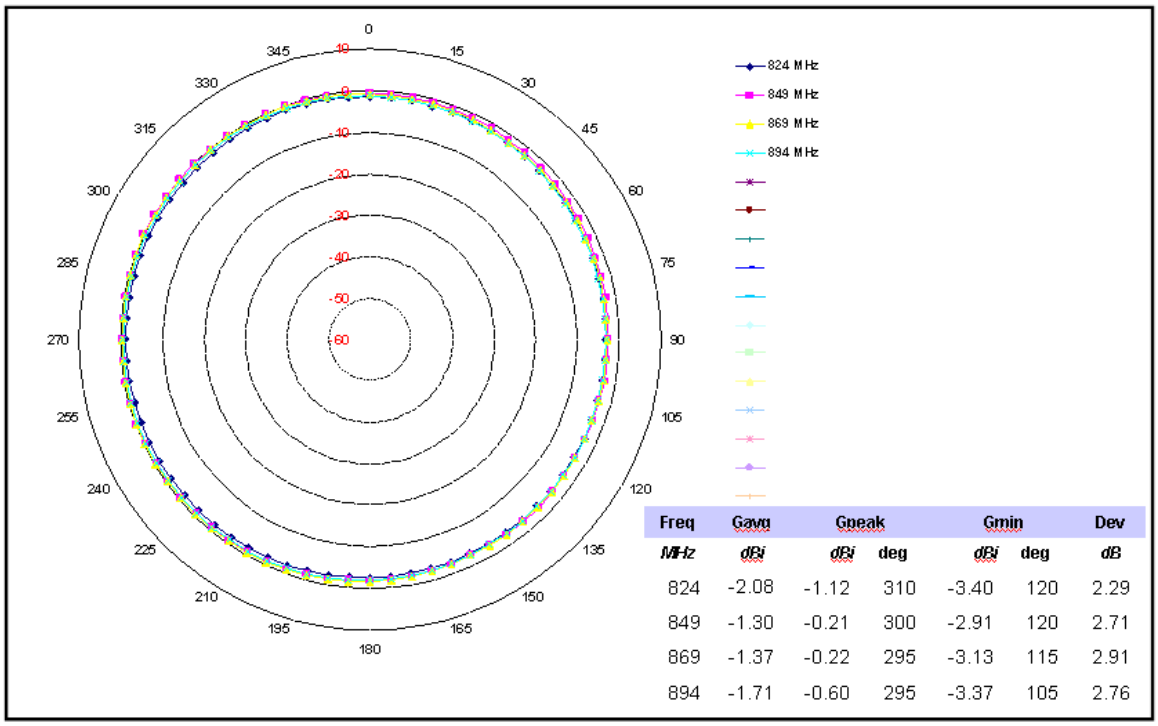
→ [AWS Slide Down]



Freq	Gavg	Gpeak		Gmin		Dev
MHz	dBi	dBi	deg	dBi	deg	dB
1710	-6.78	-4.11	150	-22.43	280	18.32
1755	-6.38	-3.02	110	-36.96	240	33.94
2110	-6.71	-2.25	275	-28.04	180	25.79
2155	-7.68	-3.36	270	-27.70	175	24.34

→ [Cellular Slide Up]



Freq	Gavg	Gpeak		Gmin		Dev
MHz	dBi	dBi	deg	dBi	deg	dB
824	-2.08	-1.12	310	-3.40	120	2.29
849	-1.30	-0.21	300	-2.91	120	2.71
869	-1.37	-0.22	295	-3.13	115	2.91
894	-1.71	-0.60	295	-3.37	105	2.76

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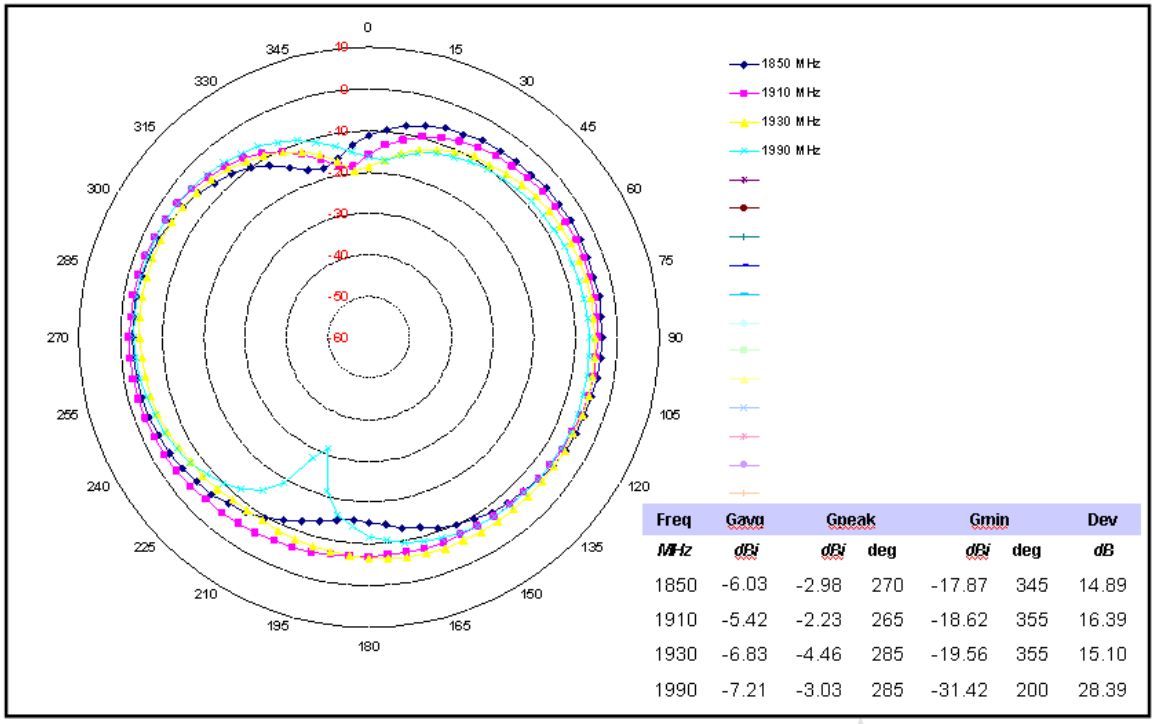
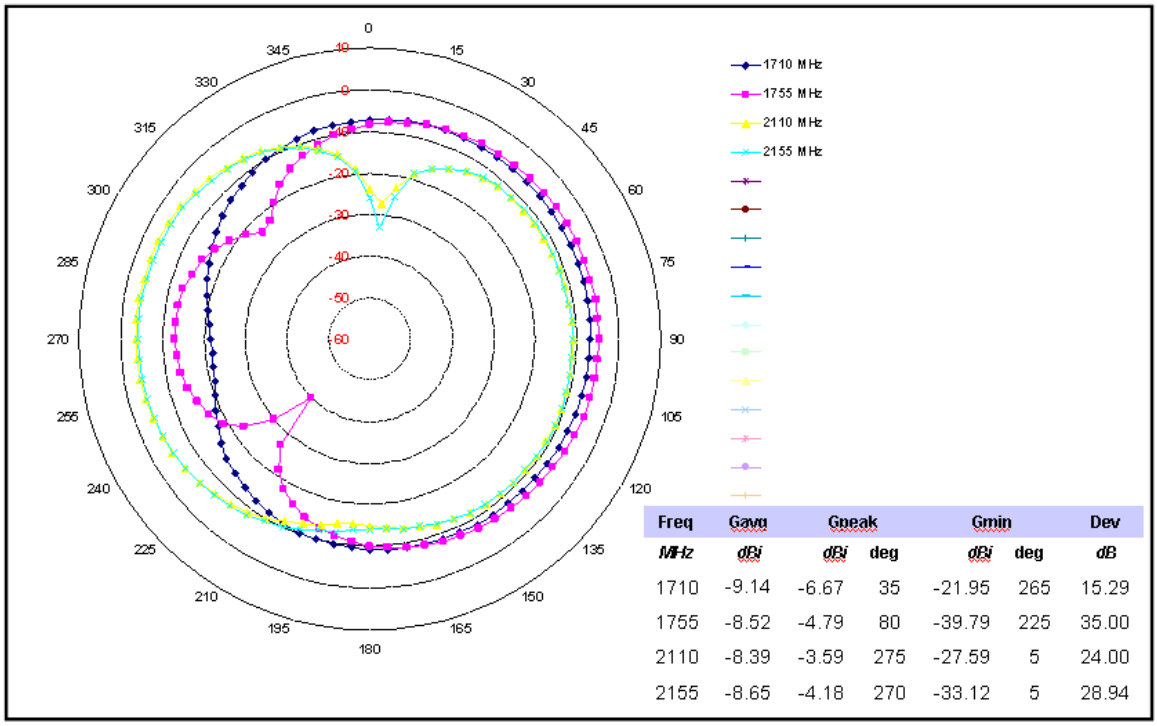
→ [PCS Slide Up]



Freq	Gavg	Gpeak		Gmin		Dev
MHz	dBi	dBi	deg	dBi	deg	dB
1850	-6.03	-2.98	270	-17.87	345	14.89
1910	-5.42	-2.23	265	-18.62	355	16.39
1930	-6.83	-4.46	285	-19.56	355	15.10
1990	-7.21	-3.03	285	-31.42	200	28.39

→ [AWS Slide Up]



Freq	Gavg	Gpeak		Gmin		Dev
MHz	dBi	dBi	deg	dBi	deg	dB
1710	-9.14	-6.67	35	-21.95	265	15.29
1755	-8.52	-4.79	80	-39.79	225	35.00
2110	-8.39	-3.59	275	-27.59	5	24.00
2155	-8.65	-4.18	270	-33.12	5	28.94

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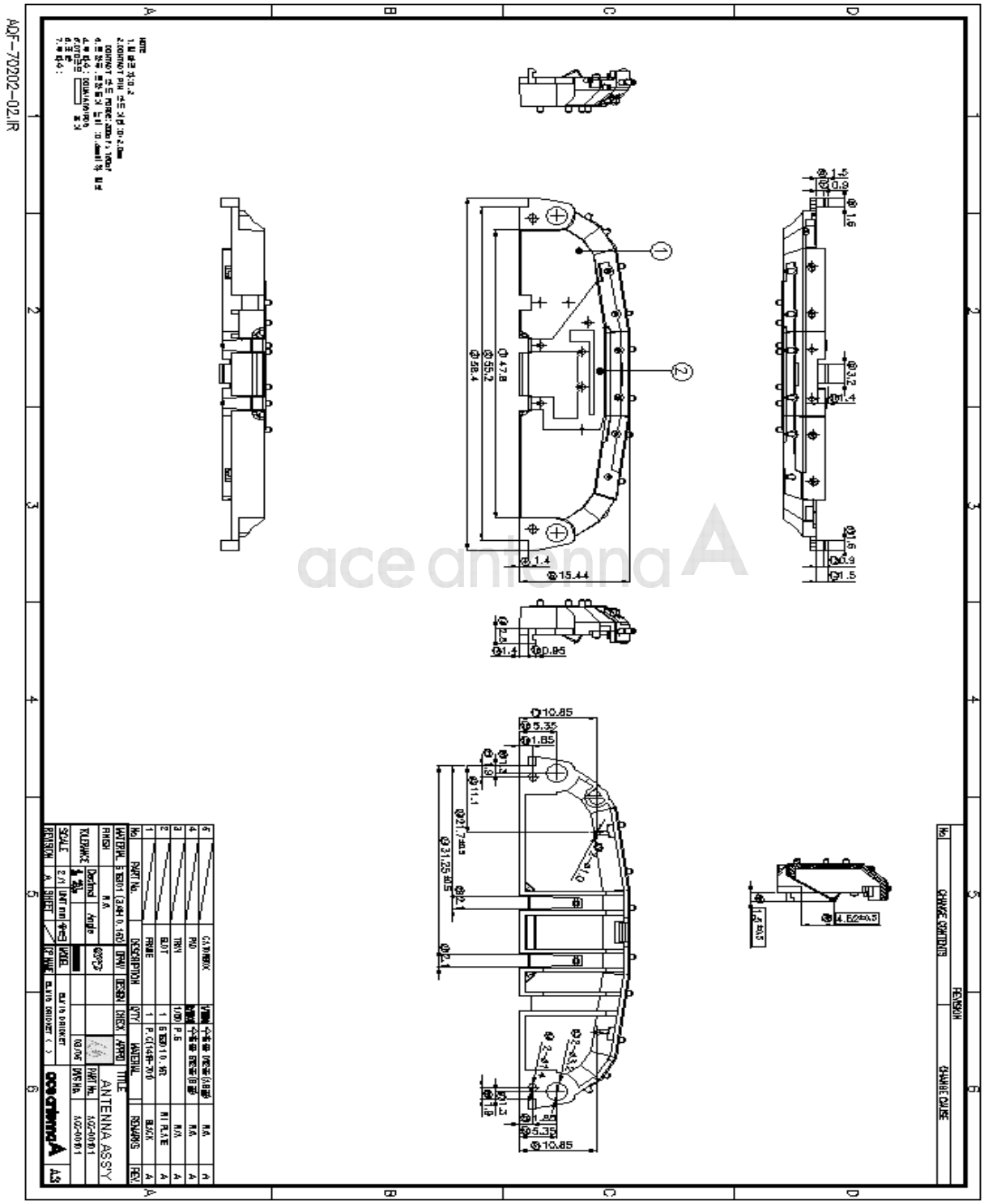
8.2. Antenna Drawing



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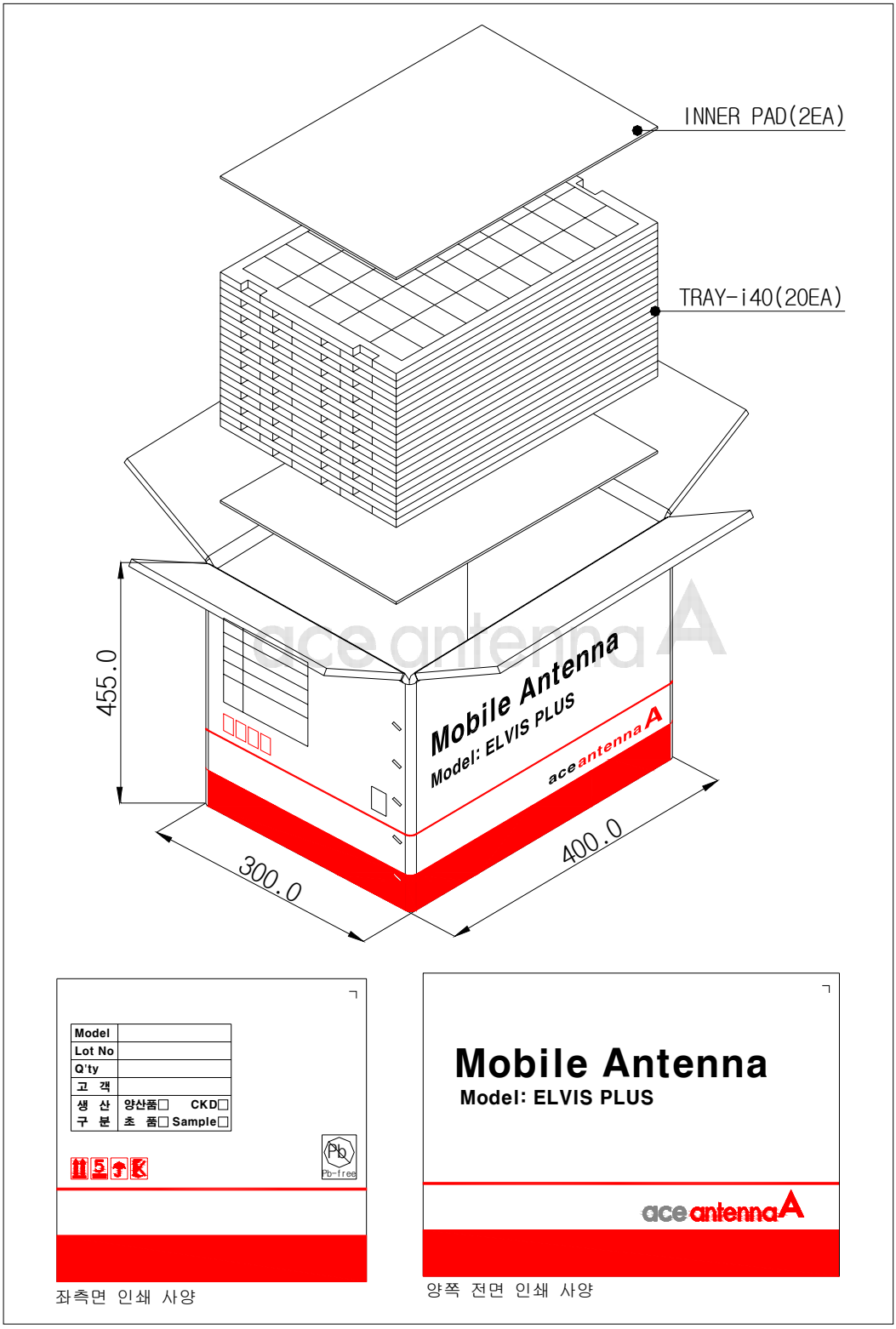
8.3. Packing Spec Drawing.



좌측면 인쇄 사양

양쪽 전면 인쇄 사양

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8.4 Reliability Test.

8.5. Environment test report

8.5.1 FRAME [141R-701]

Intertek Testing Center
340-2, Yongam-ri, Chongryang-myun,
Ulju-gun, Ulsan, 689-865 Korea
Tel : 052-257-6754, Fax : 052-276-6792

TEST REPORT

Applicant : GE Plastics Korea
Address : 240-18, Mokhang-Dong, Chungju-Si,
Chungcheongbuk-Do, Korea

Page: 1 of 5
Report No. UT07R-0872 Date: Jul. 13, 2007

Sample Description : The following submitted sample(s) said to be:-

Name/Type of Product : 141R-701
Sample ID No. : UT07R-0872
Manufacturer/Vender : GE Plastics Korea

Sample received : Jul. 11, 2007
Testing Date : Jul. 11, 2007 ~ Jul. 13, 2007
Testing Laboratory : Intertek Testing Center
Testing Environment : Temperature : 22℃ Relative Humidity: 51 %

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.

Tested by,

E.Y.Lee / Chemist

Authorized by,

H.W.Yoo / Lab Manager

Intertek Testing Center
340-2, Yongam-ri, Chongryang-myun,
Ulju-gun, Ulsan, 689-865 Korea
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TEST REPORT

Report No. UT07R-0872 Date: Jul. 13, 2007

Sample ID No. : UT07R-0872
Sample Description : 141R-701

Test Items	Unit	Test Method	MDL	Results
Cadmium (Cd)	mg/kg	With reference to BS EN 1122, by acid digestion and determined by ICP-OES	0.5	N.D
Lead (Pb)	mg/kg	With reference to US EPA 3052, by acid digestion and determined by ICP-OES	5	N.D
Mercury (Hg)	mg/kg	With reference to US EPA 3052, by acid digestion and determined by ICP-OES	2	N.D
Hexavalent Chromium (Cr^{6+})	mg/kg	US EPA 3060A and determined by UV-visible	1	N.D
Polybrominated Biphenyl (PBBs)				
Monobromobiphenyl	mg/kg	With reference to US EPA 3540C, by solvent extraction and determined by GC/MS Analysis	5	N.D
Dibromobiphenyl	mg/kg		5	N.D
Tribromobiphenyl	mg/kg		5	N.D
Tetrabromobiphenyl	mg/kg		5	N.D
Pentabromobiphenyl	mg/kg		5	N.D
Hexabromobiphenyl	mg/kg		5	N.D
Heptabromobiphenyl	mg/kg		5	N.D
Octabromobiphenyl	mg/kg		5	N.D
Nonabromobiphenyl	mg/kg		5	N.D
Decabromobiphenyl	mg/kg		5	N.D
Polybrominated Diphenyl Ether (PBDEs)				
Monobromodiphenyl ether	mg/kg	With reference to US EPA 3540C, by solvent extraction and determined by GC/MS Analysis	5	N.D
Dibromodiphenyl ether	mg/kg		5	N.D
Tribromodiphenyl ether	mg/kg		5	N.D
Tetrabromodiphenyl ether	mg/kg		5	N.D
Pentabromodiphenyl ether	mg/kg		5	N.D
Hexabromodiphenyl ether	mg/kg		5	N.D
Heptabromodiphenyl ether	mg/kg		5	N.D
Octabromodiphenyl ether	mg/kg		5	N.D
Nonabromodiphenyl ether	mg/kg		5	N.D
Decabromodiphenyl ether	mg/kg		5	N.D

Notes : mg/kg = ppm = parts per million
< = Less than
N.D = Not detected (<MDL)
MDL = Method detection limit

ANTENNA SPECIFICATION		DATE	2009-03-05	REV.	A
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TEST REPORT

Report No. UT07R-0872 Date: Jul. 13, 2007

Sample ID No. : UT07R-0872
Sample Description : 141R-701

* View of sample as received;-

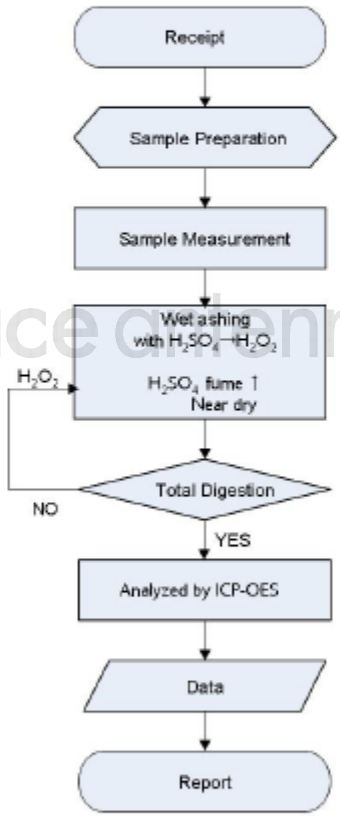
Intertek Testing Center
340-2, Yongam-ri, Chongryang-myun,
Ulju-gun, Ulsan, 689-865 Korea
Tel : 052-257-6754, Fax : 052-276-6792

TEST REPORT

Report No. UT07R-0872 Date: Jul. 13, 2007

Sample ID No. : UT07R-0872
Sample Description : 141R-701

Flow Chart Of Digestion (EN 1122 for Cd)



** Remarks : The samples were dissolved totally by pre-conditioning method according to above flow chart.

Intertek Testing Center
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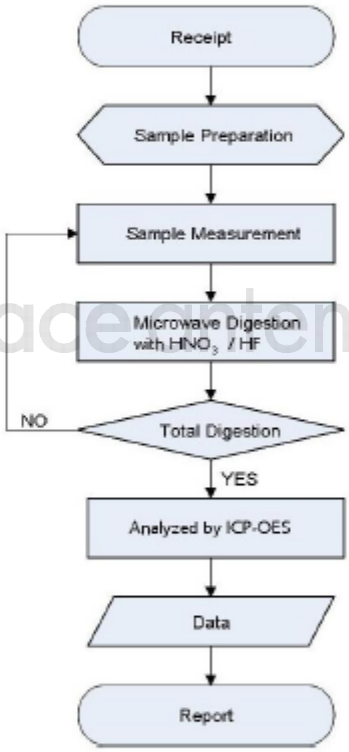
Ulju-gun, Ulsan, 689-865 Korea
Tel : 052-257-6754, Fax : 052-276-6792

TEST REPORT

Report No. UT07R-0872 Date: Jul. 13, 2007

Sample ID No. : UT07R-0872
Sample Description : 141R-701

Flow Chart Of Digestion (EPA 3052 for Cd, Pb)



** Remarks : The samples were dissolved totally by pre-conditioning method according to above flow chart.

Prepared by Eung Yong Lee, Chemist
Confirmed by Sang Chul Park, Senior Researcher

***** End of Report *****

ANTENNA SPECIFICATION		DATE	2009-03-05	REV.	A
MODEL	ELVIS PLUS	TYPE	Built in	PAGE	30/33

8.5.2 SLOT [STS 301]

SGS

Test Report No. F690501/LF-CTSAYA07-25043 Issued Date: November 14, 2007 Page 1 of 4

To: TAIHAN STAINLESS STEEL CO., LTD
603 Seonggok-dong
Danwon-gu
Ansan-city
GYEONGGI-DO
Korea

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

Product Name	: STS301
SGS File No.	: AYA07-25043
Received Date	: November 08, 2007
Test Performing Date	: November 09, 2007
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)
Buyer(s)	: LG,SAMSUNG

SGS Testing Korea Co. Ltd.

Pluto Kim
Monet Jeong
Billy Oh / Testing Person

Jeff Jang

Jeff Jang / Chemical Lab Mgr

SGS

Test Report No. F690501/LF-CTSAYA07-25043 Issued Date: November 14, 2007 Page 2 of 4

Sample No. : AYA07-25043.001
Sample Description : STS301
Style/Item No. : N/A
Comments : Material is stainless steel.

Heavy Metals

Test Items	Unit	Test Method	MDL	Results
Cadmium (Cd)	mg/kg	US EPA 3052(1996), US EPA 6010B(1996), ICP	0.5	N.D.
Lead (Pb)	mg/kg	US EPA 3052(1996), US EPA 6010B(1996), ICP	5	N.D.
Mercury (Hg)	mg/kg	US EPA 3052(1996), US EPA 6010B(1996), ICP	2	N.D.
Hexavalent Chromium (Cr VI)	mg/kg	US EPA 3060A(1996), US EPA 7196A(1992), UV	1	N.D.

Flame Retardants-PBBs/PBDEs

Test Items	Unit	Test Method	MDL	Results
Monobromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Dibromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Tribromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Tetrabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Pentabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Hexabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Heptabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Octabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Nonabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Decabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Monobromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Dibromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Tribromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Tetrabromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Pentabromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Hexabromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Heptabromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Octabromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Nonabromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Decabromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.

NOTE: (1) N.D. = Not detected.(<MDL)
(2) mg/kg = ppm
(3) MDL = Method Detection Limit
(4) - = No regulation
(5) ** = Qualitative analysis (No Unit)
(6) Negative = Undetectable / Positive = Detectable

ANTENNA SPECIFICATION		DATE	2009-03-05	REV.	A
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SGS

Test Report No. F690501/LF-CTSAYA07-25043 Issued Date: November 14, 2007 Page 3 of 4

Picture of Sample as Received:

Sample Color : Silver

NOTE: (1) N.D. = Not detected.(<MDL)
(2) mg/kg = ppm
(3) MDL = Method Detection Limit
(4) - = No regulation
(5) ** = Qualitative analysis (No Unit)
(6) Negative = Undetectable / Positive = Detectable

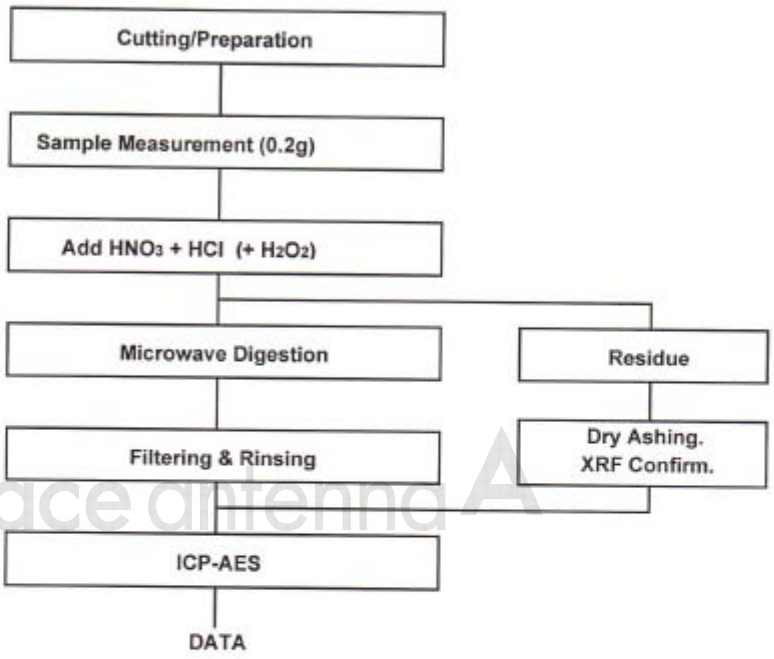
F052 Version2

SGS

Test Report No. F690501/LF-CTSAYA07-25043 Issued Date: November 14, 2007 Page 4 of 4

Flow Chart of Digestion

(EPA 3052 for Cd, Pb)



The samples were dissolved totally by pre-conditioning method according to above flow chart.

Operator Dami Yeom

Section Chief Jeff Jang

*** End ***

NOTE: (1) N.D. = Not detected.(<MDL)
(2) mg/kg = ppm
(3) MDL = Method Detection Limit
(4) - = No regulation
(5) ** = Qualitative analysis (No Unit)
(6) Negative = Undetectable / Positive = Detectable