

TEMPORARY PRODUCT SPECIFICATION

☒ Production Approval

☐ Limited Approval

Model Name	SER-8189
Item	WIFI Ant
Specification	
CODE No.	IN-WFSEV028
MAKER	MAXWAVE i
Rev. No.	R01
REMARK	

CUSTOMER	DIRECTOR	EXAMINATION	APPROVAL
			

PROVIDER	DIRECTOR	EXAMINATION	APPROVAL
			

CONSENT	Quality	Parts Developme			
					

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DATE : Feb 26th 2010



MAXWAVE&MENIX	PRODUCT SPECIFICATION	
	SER-8189	

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1. Abbreviations and Definitions

AVG	Average
°	Degree
°C	Celsius (degrees Centigrade)
cm	Centimeter
G	Gravitational Force
g	Grams
Hz	Hertz
In	Inches
IQC	Incoming Quality Control
MHz	Megahertz
m	Meter
mm	Millimeter
N	Newton
PCB	Printed Circuit Board
TX	Transmit Band
RH	Relative Humidity
RX	Receive Band
VSWR	Voltage Standing Wave Ratio
W	Watt

Design specification: A target specification to guide design process.

Product Specification: A final specification for the qualified product.

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2. ELECTRICAL SPECIFICATION FOR MASS1

2.1. Frequency Band

Mode	Frequency Band (MHz)
WIFI	2400~2480 MHz

2.2. Electrical Characteristics

2.2.1. VSWR Typical Measurements

Frequency Range		2400 MHz	2480 MHz
V.S.W.R		1.56:1	1.83:1
Gain	H-Plane	-7.35	-7.06
	E1-Plane	-6.02	-5.37
	E2-Plane	-13.20	-15.00
Impedance Matching		50 Ω	

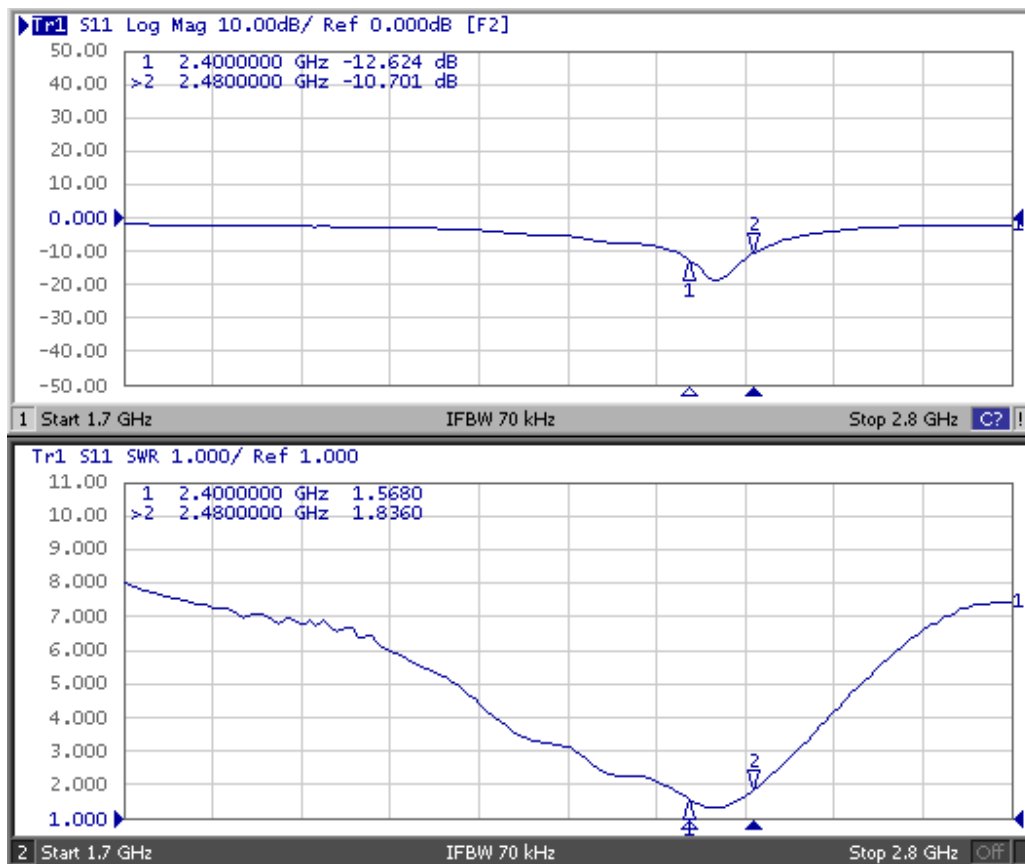
2.3. Matching Requirements

In order to assure the best performance of the antenna, the matching will be evaluated in free space and in talk position. The antenna will comply with the Electrical Specification requirements, as set out below, while mounted on the handset containing the PCB. The handset and PCB are to be provided by the customer and should be representative of the latest design version of all parts. Any modifications in the handset or PCB can affect the performance of the antenna and should be discussed with Menix & Maxwave to determine the affect of such changes on the antenna performance and delivery requirements.



Optional matching network to be determined by Epivalley RF team if needed.

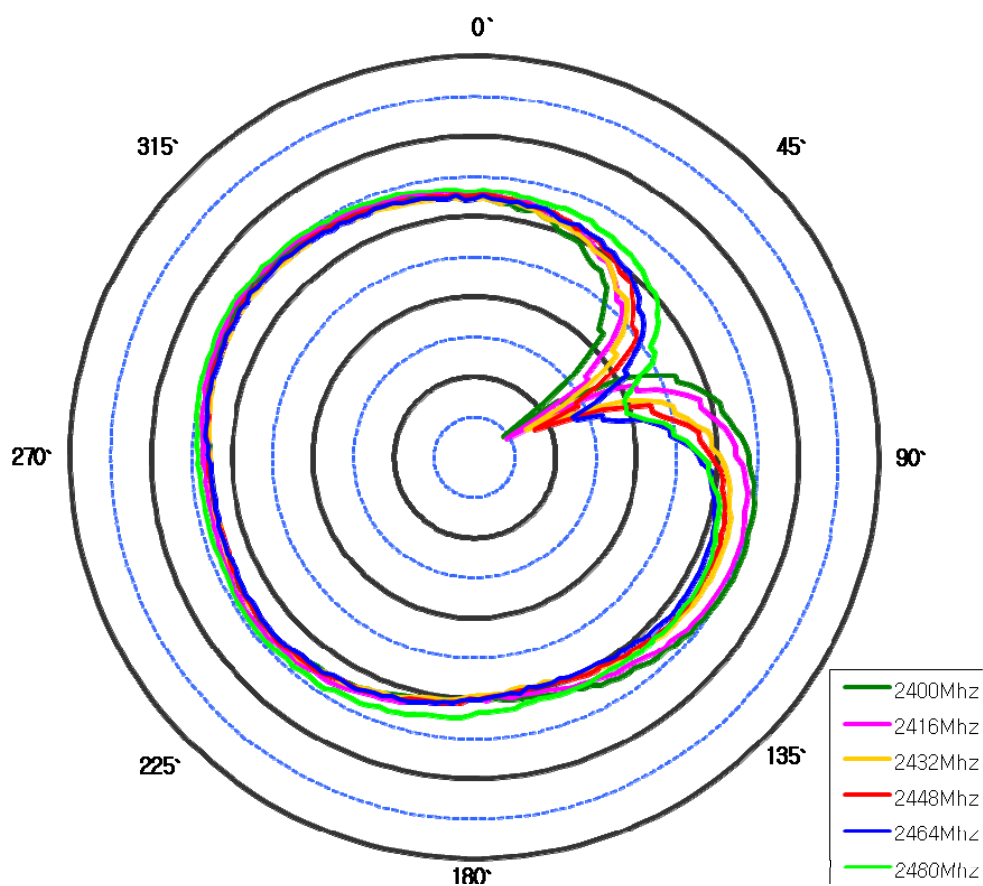
2.3.1. Input Return Loss , VSWR - WIFI



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2.4. Radiation Pattern

2.4.1. SER-8189 WIFI BAND (H-plane)

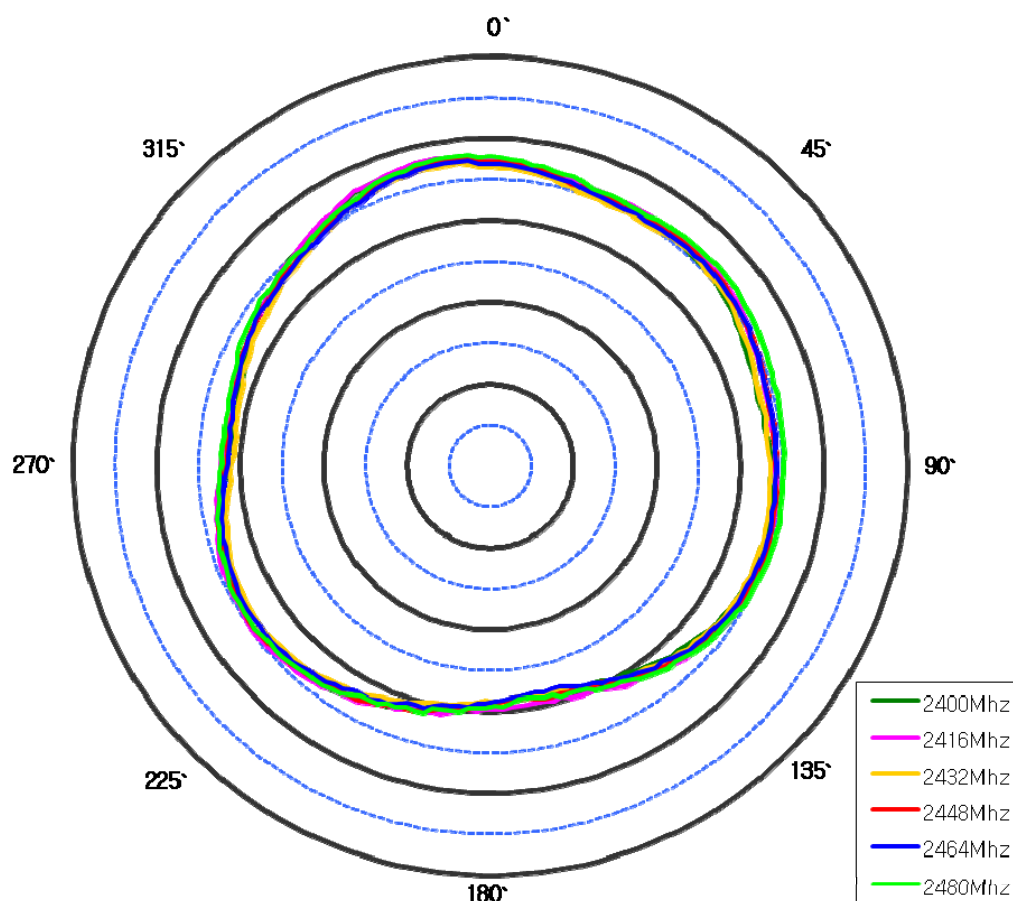


< Phone mounted typical measurements >

Frequency	Max.	Min.	Avg.
2400Mhz	-4.63	-35.60	-7.35
2416Mhz	-4.93	-35.36	-7.25
2432Mhz	-5.83	-32.86	-8.20
2448Mhz	-5.64	-31.80	-8.09
2464Mhz	-5.65	-26.94	-8.33
2480Mhz	-4.48	-20.45	-7.06

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2.4.2. SER-8189 WIFI BAND (E1-plane)

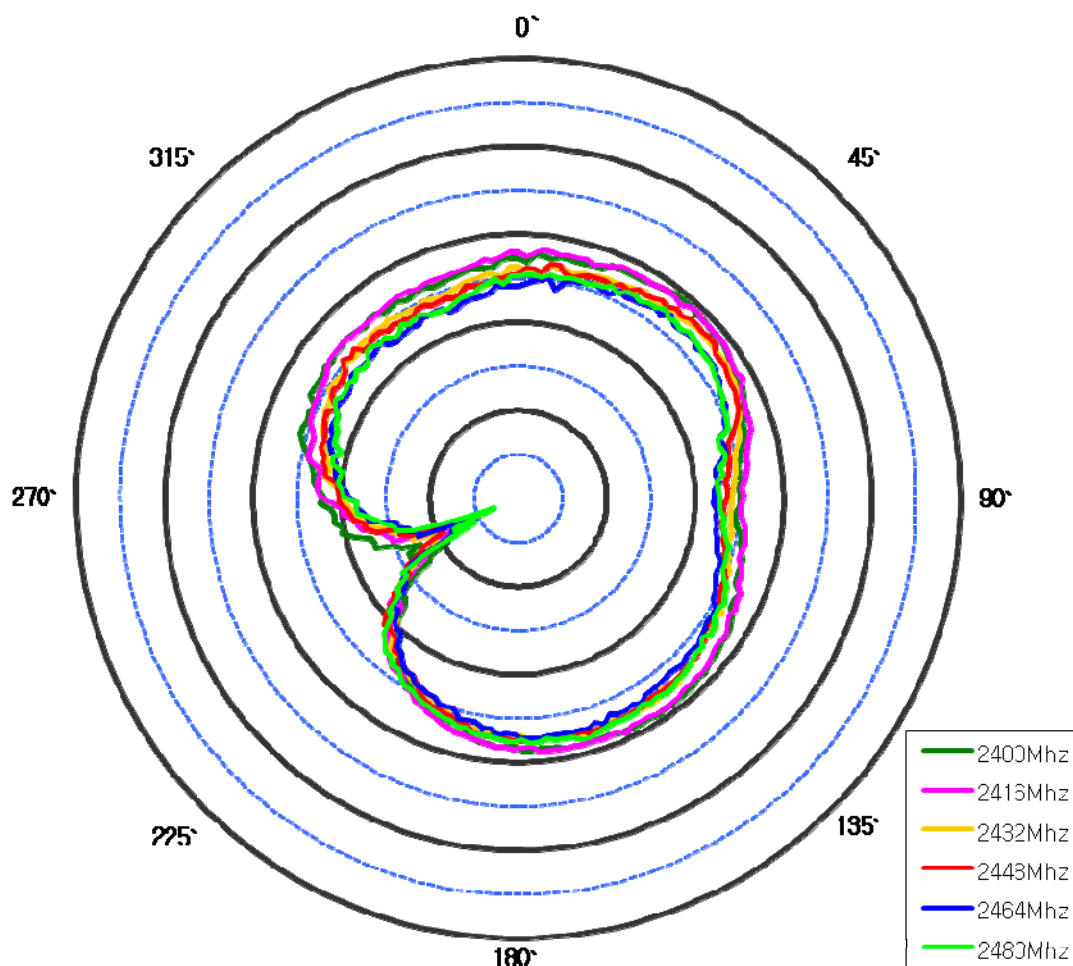


< Phone mounted typical measurements >

Frequency	Max.	Min.	Avg.
2400Mhz	-2.26	-11.53	-6.02
2416Mhz	-1.97	-10.50	-5.52
2432Mhz	-2.93	-11.59	-6.41
2448Mhz	-2.36	-11.31	-5.80
2464Mhz	-2.67	-11.85	-6.07
2480Mhz	-2.02	-11.26	-5.37

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2.4.3. SER-8189 WIFI BAND (E2-plane)

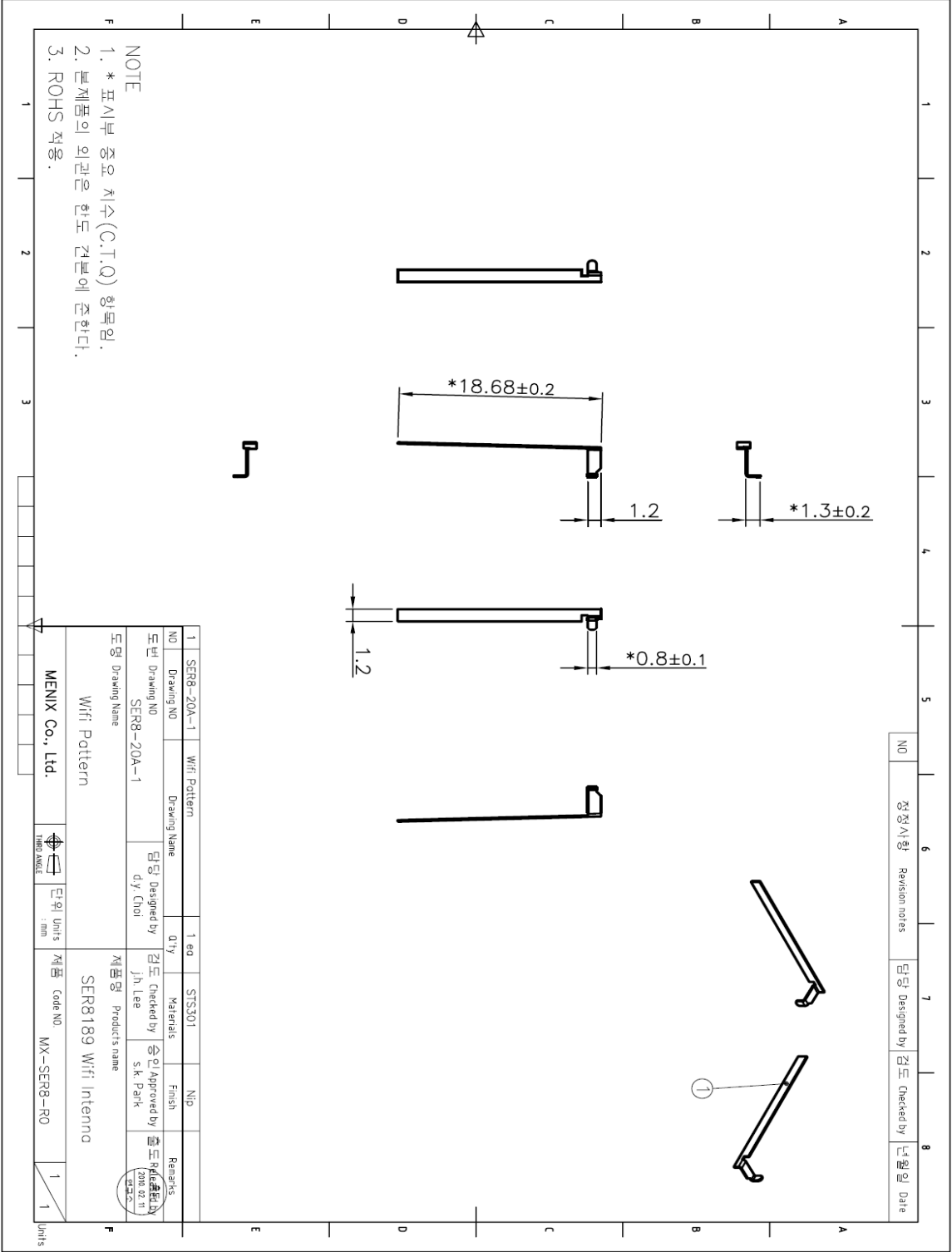


< Phone mounted typical measurements >

Frequency	Max.	Min.	Avg.
2400Mhz	-10.58	-30.58	-13.20
2416Mhz	-10.68	-32.53	-13.10
2432Mhz	-11.98	-29.80	-14.50
2448Mhz	-11.71	-30.65	-14.60
2464Mhz	-12.62	-34.90	-15.50
2480Mhz	-11.67	-37.06	-15.00

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3. Drawing



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4. TEST METHOD

4.1. Return Loss & VSWR Test

The VSWR measurement of antennas assembled into a fully operating MASS1 phone handset is measured on the Network Analyzer. The handset is set OPEN with a 50 Ohm coaxial cable connected to the 50 Ohm point. Calibration is done at the end of the 50 Ohm coaxial cable connection. The other end of the 50 Ohm coaxial cable is connected to a network analyzer. The handset is positioned on a non-conductive table for free space measurements.



Figure 1: Testing with network analyzer

4.2. Radiation Pattern Test

Antennas tested for Gain and Efficiency must be assembled into the enclosure and tested in the fully assembled and operating MASS1 handset. The antenna is tested in free space in the anechoic chamber in the H, E1 and, E2 planes. The radiation patterns are measured at the center of transmit and receive bands.

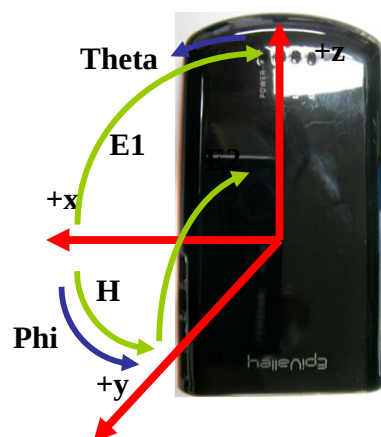


Figure 2: Geometry for MASS1 for radiation patterns.

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4.3. (IQC) Test Fixture Test Method

The (IQC) test fixture is designed to allow for sample testing the received antennas without having the antenna into the phone housing and testing it on an actual phone. The frequency measurements from the test fixture will be slightly different than when it is in the phone do to the additional plastic of the test fixture and the fixture is not 100% the same as the phone.



4.4. Test Method (Manufacturing)

In manufacturing it is not practical to electrically test all antennas until it is heat staked into a fully assembled and operating handset supplied by the customer. To ensure the customer has the ability to sample test the antennas prior to heat staking and assembling them into a phone handset, Menix & Maxwave typically designs a test fixture for use to electrically sample test the antennas.

4.5. Corrosion (Salt Spray) Test

Place the antennas into the Corrosion (Salt Spray) environmental chamber with 5% sodium atmosphere at 35°C for 72 hours. Then remove antennas from chamber and allow to stabilize at room temperature before measurement.

Post Test Requirements: There will be no evidence of mechanical damage.

Electrical characteristics should be within +/-0.5% of their initial value.

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5. CAUTION FOR USE

5.1. Storage

- Please keep the product away from high temperature and high humidity.
- Please keep product away from corrosive gases such as hydrogen sulfide, sulfurous acid, chlorine, ammonia, etc.... The acid could cause the metal antenna to corrode degrading antenna performance.

5.1.1. Storage condition 1

Temperature: 5 to 35°C
Humidity: 45 to 75% RH
Period: 6 months from date of packaging

5.1.2. Storage Condition 2

Temperature: -40 to 90°C
Humidity: 96% RH max
Period: 96 hours

5.2. Handling

- Since the antenna has a spring contact it is important not to bend or push on the spring as it will degrade the spring response and could cause poor contact.
- It is important to handle the antenna carefully and bending or dents made into the metal will cause the antenna to detune and could cause performance issues.
- Please do not touch product directly with bare hands. This will put fingerprints on the antennas and the acids in the hand will cause the antenna to discolor. While this will not have a performance effect it does have a cosmetic effect on the part.

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6. ROHS



Test Report No. F690501/LF-CTSAYAA09-14156R1A

Issued Date: May 22, 2009

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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 : STS 301
SGS File No. : AYAA09-14156R1A
Received Date : May 15, 2009
Test Performing Date : May 18, 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)
Buyer(s) : SAMSUNG
Comments : This Report supersedes the Report No.F690501/LF-CTSAYAA09-14156 dated May 22,2009 issued by SGS Testing Korea Co.,Ltd This report is separated from AYAA09-14156 by client's request.

Pluto Kim
Cindy Park
Jinee Song/ Testing Person

SGS Testing Korea Co. Ltd.

Jeff Jang / Chemical Lab Mgr

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SGS Testing Korea Co.,Ltd.

322, The D valley 555-8, Hobyu-dong, Dongan-gu, Anyang-si, Gyeonggi-do, Korea 431-080
t +82 (0)31 4608 000 f +82 (0)31 4608 059 <http://www.sgslab.co.kr> www.kr.sgs.com/greenlab

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Test Report No. F690501/LF-CTSAYAA09-14156R1A

Issued Date: May 22, 2009

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Sample No. : AYAA09-14156R1A.001
 Sample Description : STS 301
 Item No./Part No. : N/A
 Comments : Material is STS(stainless steel).

Heavy Metals

Test Items	Unit	Test Method	MDL	Results
Cadmium (Cd)	mg/kg	With reference to IEC 62321:2008, ICP	0.5	N.D.
Lead (Pb)	mg/kg	With reference to IEC 62321:2008, ICP	5	N.D.
Mercury (Hg)	mg/kg	With reference to IEC 62321:2008, ICP	2	N.D.
Hexavalent Chromium (Cr VI) By boiling water extraction*	**	With reference to IEC 62321:2008	-	Negative

Flame Retardants-PBBs/PBDEs

Test Items	Unit	Test Method	MDL	Results
Monobromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Dibromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Tribromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Tetrabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Pentabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Hexabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Heptabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Octabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Nonabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Decabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Monobromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Dibromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Tribromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Tetrabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Pentabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Hexabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Heptabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Octabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Nonabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Decabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, 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) * = Boiling-water-extraction:
 Negative = Absence of CrVI coating
 Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm² sample surface area.

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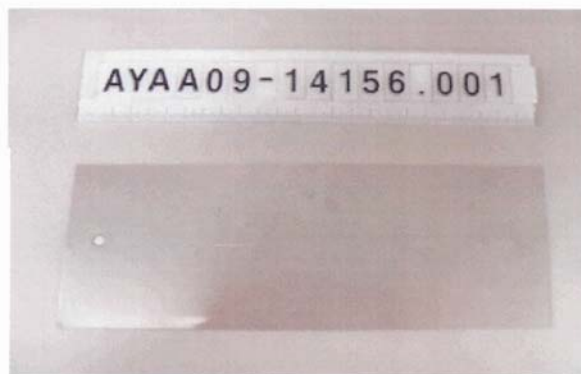
Test Report No. F690501/LF-CTSAYAA09-14156R1A

Issued Date: May 22, 2009

Page 3 of 4

Sample No. : AYAA09-14156R1A.001
Sample Description : STS 301
Item No./Part No. : N/A
Comments : Material is STS(stainless steel).

Picture of Sample as Received:



NOTE: (1) N.D. = Not detected.(<MDL)
(2) mg/kg = ppm
(3) MDL = Method Detection Limit
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(5) ** = Qualitative analysis (No Unit)
(6) * = Boiling-water-extraction:
Negative = Absence of CrVI coating
Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm2 sample surface area.

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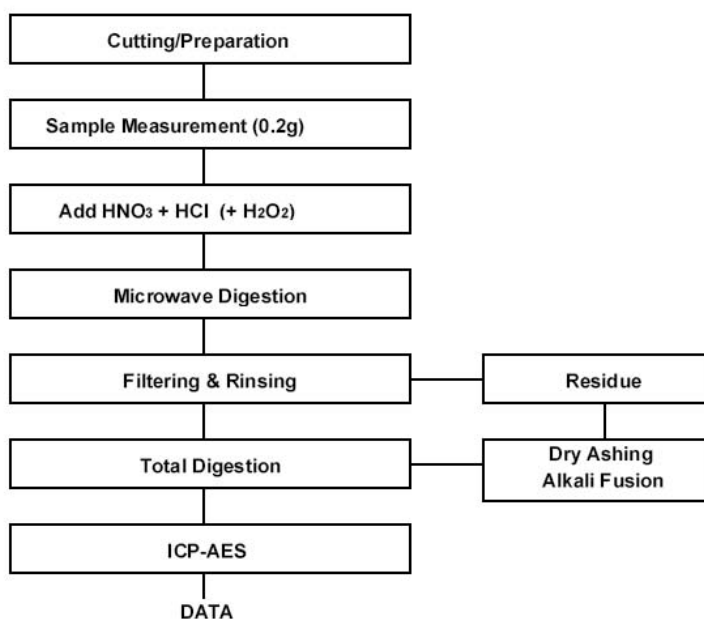
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Flow Chart of Digestion

(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:
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 - (2) mg/kg = ppm
 - (3) MDL = Method Detection Limit
 - (4) - = No regulation
 - (5) ** = Qualitative analysis (No Unit)
 - (6) Negative = Undetectable / Positive = Detectable

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