

SAR Comparison Report

Reference Number: 3103519

Report Number: 3103519EMC01

Revision Level: 0

Client: Lifewave

Equipment Under Test:

Model Name: Matrix 2

Test Protocol: SAR Comparison

Report issued on: 15 May 2013

Tested by:



Fabian Nica, Engineering Technician

Reviewed by:



David Schramm, EMC Manager

Remarks:

This report details the results of the testing carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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1 General Information

1.1 *Client Information*

Name: Lifewave
Address: 9444 Balboa Ave., Suite 150
City, State, Zip, Country: San Diego, CA 92123

1.2 *Test Laboratory*

Name: SGS North America, Inc.
Address: 620 Old Peachtree Road NW, Suite 100
City, State, Zip, Country: Suwanee, GA 30024, USA

1.3 *General Information of EUT*

Product Name: Matrix 2
Host phone 1: Samsung Galaxy S II
Host phone 1: Samsung Galaxy S III
Host phone 1: HTC One
Host phone 1: iPhone 4s
Host phone 1: iPhone 5
Host phone 1: Nokia

Sample Received Date: 20 March 2013
Dates of testing: 21 to 26 March 2013

1.4 *Operating Modes and Conditions*

A mobile phone was tested for SAR with and without the shield attached. A call was established between the phone and the base-station simulator, which set the phone to its maximum power level.

2 SAR Comparisons

2.1 Test Method and Results

A mobile phone was tested for SAR with and without the shield attached. A call was established between the phone and the base-station simulator, which set the phone to its maximum power level. The setup and test conditions were kept as close as possible between the scans. The results were recorded for comparison. Tests were performed according to the following test tables.

General settings for all devices

Band	Mode	Phantom	Test Position	Ch No	Frequency MHz
GSM 850	GSM	Head	Right cheek Touch	190	836.6
GSM 900	GSM	Head	Right cheek Touch	62	902.4
GSM 1800	GSM	Head	Right cheek Touch	711	1750
GSM 1900	GSM	Head	Right cheek Touch	661	1880

Host phone	Band	SAR without shield		SAR with shield	
		1g:mW/g	10g:mW/g	1g:mW/g	10g:mW/g
Samsung Galaxy S II	GSM 850	0.415	0.284	0.0334	0.023
	GSM 900	0.401	0.27	0.047	0.0314
	GSM 1800	0.201	0.12	0.127	0.0761
	GSM 1900	0.247	0.142	0.0503	0.0285
Samsung Galaxy S III	GSM 850	0.248	0.171	0.0353	0.0244
	GSM 900	0.372	0.252	0.011	0.00745
	GSM 1800	0.222	0.129	0.0371	0.0205
	GSM 1900	0.222	0.131	0.115	0.0669
HTC One	GSM 850	0.529	0.363	0.011	0.00761
	GSM 900	0.306	0.208	0.0136	0.00921
	GSM 1800	0.339	0.198	0.0548	0.0316
	GSM 1900	0.418	0.244	0.105	0.062
iPhone 4s	GSM 850	0.634	0.382	0.43	0.237
	GSM 900	0.649	0.435	0.532	0.363
	GSM 1800	0.505	0.307	0.283	0.115
	GSM 1900	0.681	0.41	0.334	0.199
iPhone 5	GSM 850	0.504	0.349	0.0577	0.0385
	GSM 900	0.559	0.388	0.146	0.0802
	GSM 1800	0.598	0.341	0.0379	0.0211
	GSM 1900	0.519	0.287	0.0353	0.0165
Nokia	GSM 850	0.738	0.507	0.0729	0.0501
	GSM 900	0.737	0.504	0.036	0.0248
	GSM 1800	0.257	0.156	0.0833	0.0496
	GSM 1900	0.597	0.363	0.0631	0.038

2.2 Test Site

SAR Room, Small Shielded Enclosure, Suwanee, GA

Environmental Conditions

Temperature: 21.9 to 23.9 °C

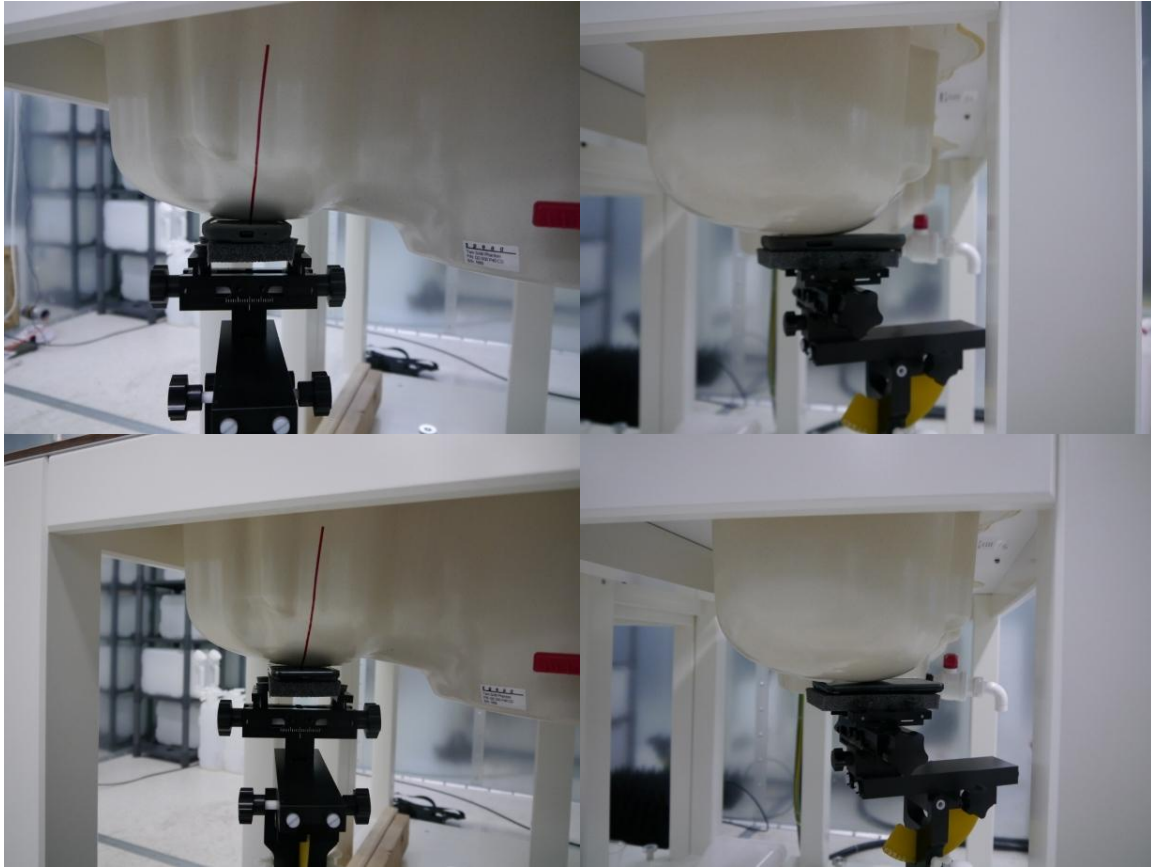
Relative Humidity: 32 to 47 %

2.3 Test Equipment

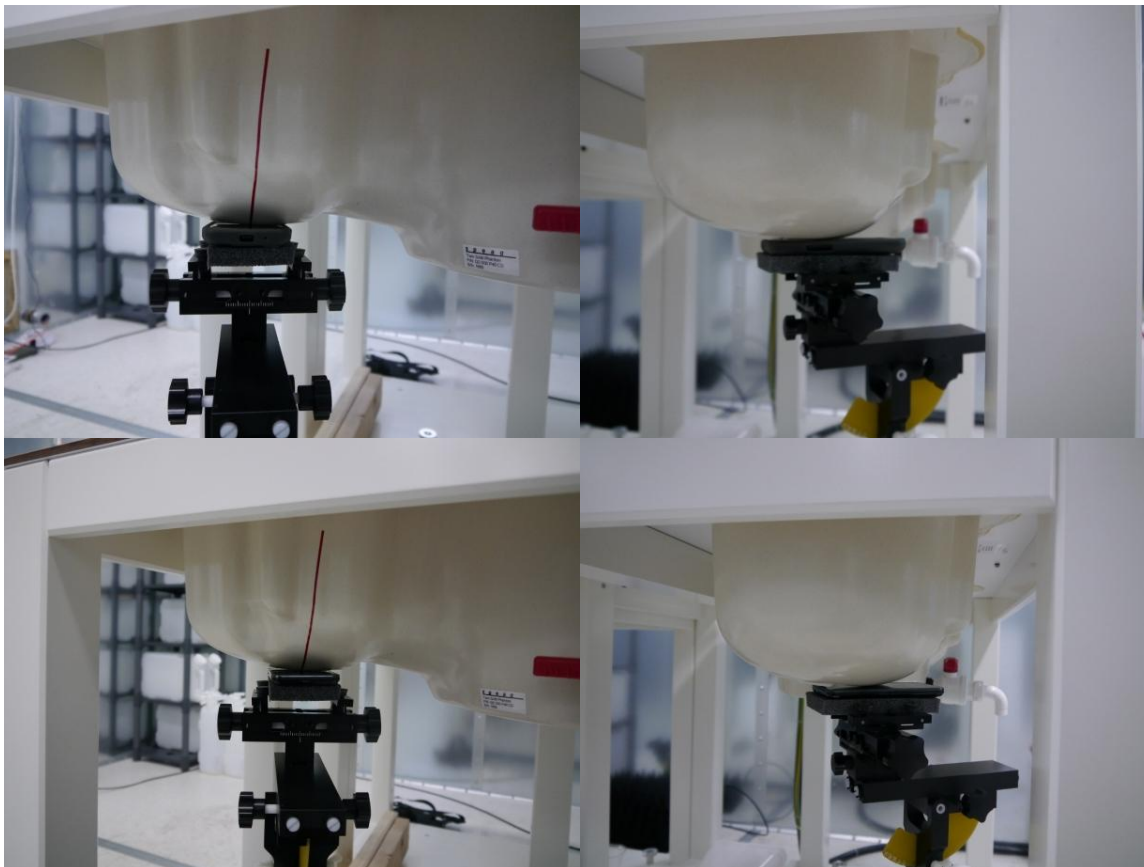
Equipment	Model	Manufacturer	Serial Number	Cal Due Date
Dasy5 Controller	SP1D	Stäubli	S-1188	NA
Probe Alignment Light Beam	LB5/80	Speag	SEUKS030AA	NA
Data Acquisition Electronics	DAE4	Speag	1287	NA
Phantom	Twin Sam	Speag	1665	NA
Oval Phantom	ELI5	Speag	1146	NA
System Validation Dipole	D1900V2	Speag	5d144	26 Sep 2014
System Validation Dipole	D835V2	Speag	4d123	26 Sep 2014
E-Field Probe	ES3DV3	Speag	3272	16 May 2013
E-Field Probe	EX3DV4	Speag	3812	12 Dec 2014
Head Simulating Liquid	HSL900V2	Speag	110815-2	Prior to testing
Head Simulating Liquid	HSL1900	--	--	Prior to testing
Device Holder	SD 00 HO1 HA	Speag	NA	NA
Electrical Parameter Network Analyzer	E5062A	Agilent	MY44102097	10 Aug 2013
Power Meter	E4419B	Agilent	G839511059	13 Aug 2013
Power Sensor	84814A	Agilent	MY41094585	13 Aug 2013
Power Meter	8481A	Agilent	2702A61269	13 Aug 2013
Signal Generator	SMB100A	Rohde & Schwarz	104999	22 May 2013
Wideband Radio Communication Tester	CMW 500	Rohde & Schwarz	111428	29 Sep 2013
Thermometer	87	Fluke	17130391	10 Aug 2013
Dielectric Probe Kit	85070E	Agilent	MY44300638	NA
PC	HP Compaq 8000 Elite	HP	CZC1231RWS	NA

2.4 Test Setup Photographs

Samsung Galaxy S II



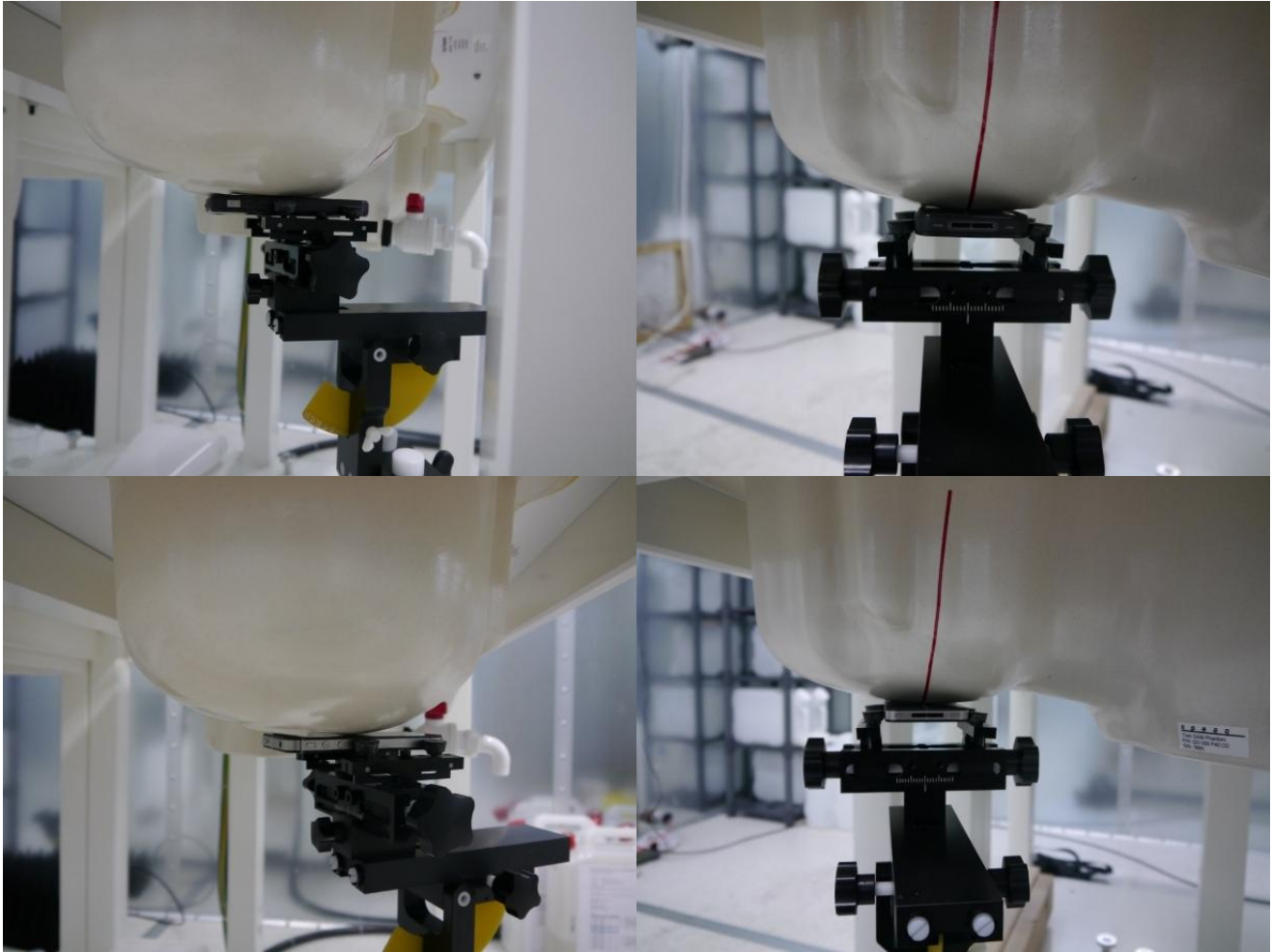
Samsung Galaxy S III



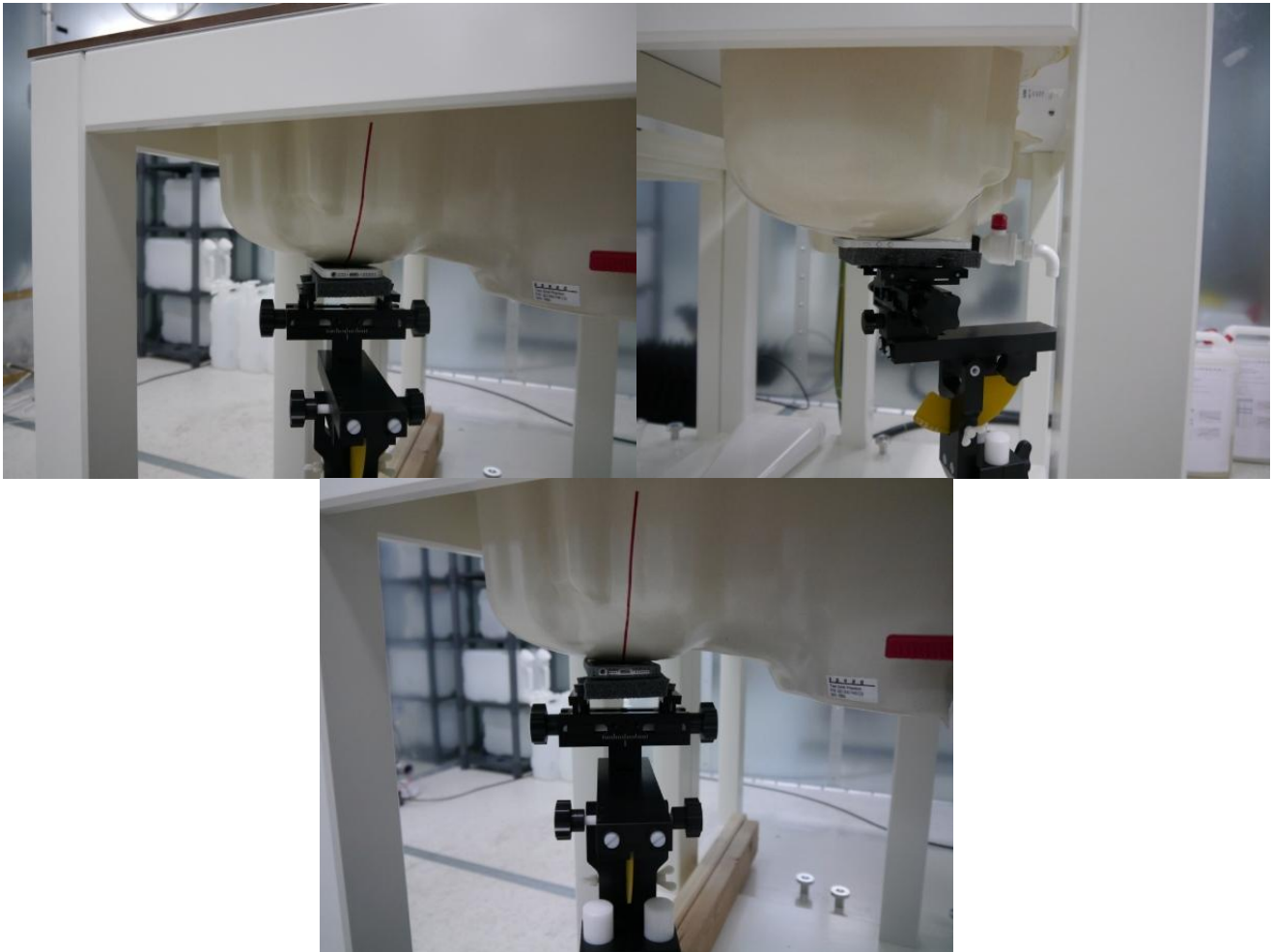
HTC One



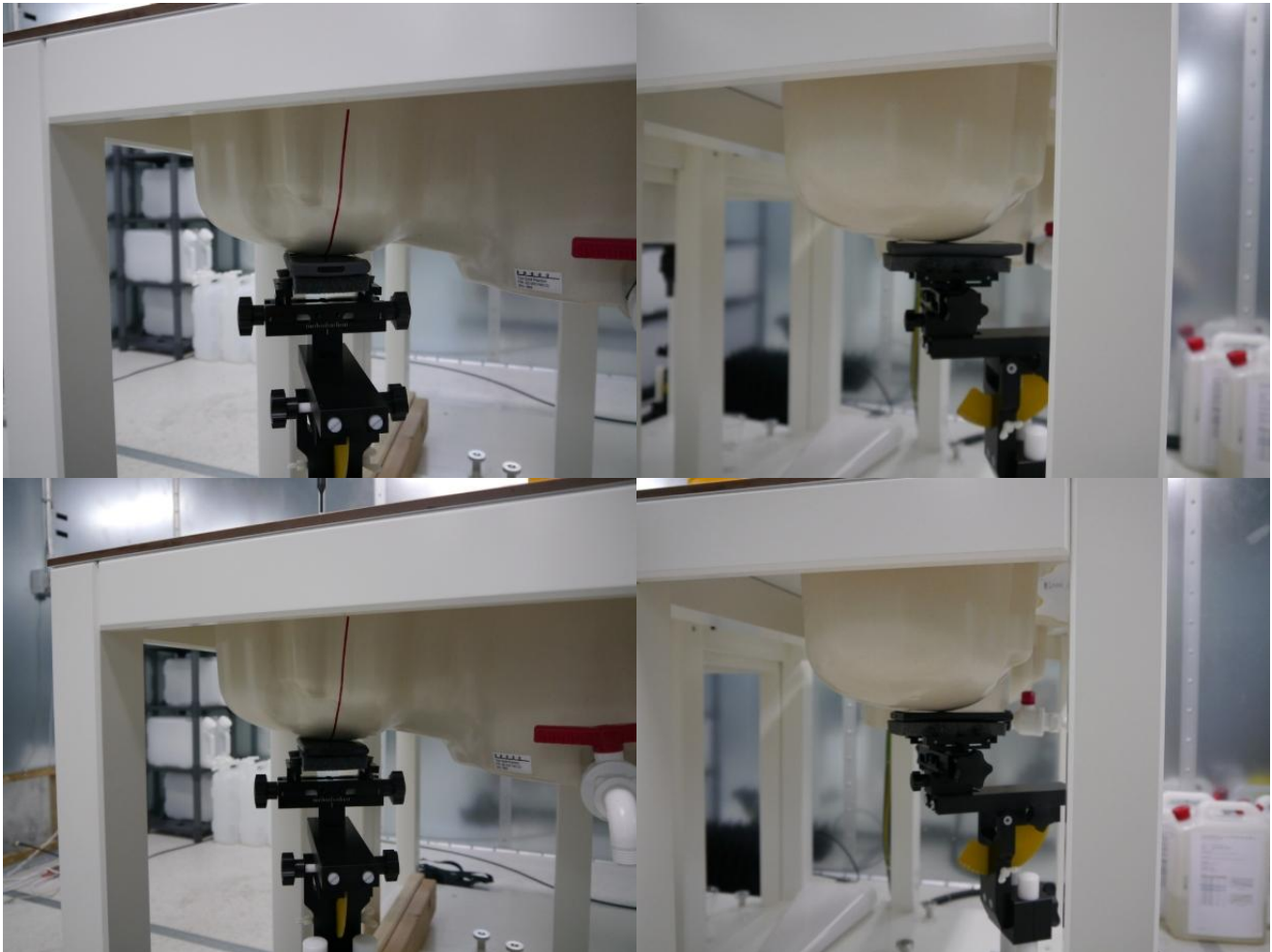
iPhone 4s



iPhone 5



Nokia



3 Revision History

Revision Level	Description of changes	Revision Date
0	Initial release	15 May 2013