RR051-17-105504-1-A Ed. 0

RADIO TEST REPORT

RADIATION PATTERNS

Equipment under test :

Adhesive protection OSENS AIR
Tested with a mobile phone SAMSUNG model SM-G925F

Company :
OSENS LIFE

Distribution : Mr BENOÎT

Company : OSENS LIFE

Number of pages: 15 included 1 appendix

Ed.	Date	Modified Page	Technical Verification and Quality Approval Name-Function Visa
0	12-Jan-18	Creation	M. Dumesnil- Radio Manager

EQUIPMENT UNDER TEST: mobile phone with adhesive protection

Mobile phone

Mark: SAMSUNG
Type: GALAXY S6 Edge – SM-G925F
Serial number (S/N): 359523068734811
Part number (P/N): -
MANUFACTURER: SAMSUNG

Adhesive protection

Mark: OSENS LIFE
Type: OSENS AIR
Serial number (S/N): -
Part number (P/N): -
MANUFACTURER: OSENS LIFE

APPLICANT: Mr BENOÎT

Company:	**OSENS LIFE**
Address:	20 bis rue Louis PHILIPPE 92200 NEUILLY-SUR-SEINE FRANCE

Contact person: Mr BENOÎT

Person(s) present(s) during the test: -

DATE OF TESTS: Nov 16, 2017

TEST SITE:
EMITECH
Parc d'Activités de Lanserre
21 rue de la Fuye
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FRANCE

TEST(S) OPERATOR(S): Gilles HYAUMET

WRITTEN BY: Gilles HYAUMET Visa:

CONTENTS

1. INTRODUCTION

This report presents the results of test, carried out on the equipment: SAMSUNG GALAXY S6 Edge – SM-G925F with the adhesive protection OSENS AIR (subsequently denominated E.U.T.: equipment under test), in accordance with normative reference.

2. REFERENCE SPECIFICATION

ETSI TS 151 010-1 V4.9.0 (07-2002)
Digital cellular telecommunications system (Phase 2+); Mobile Station (MS) conformance specification;
Part 1: Conformance specification (3GPP TS 51.010-1 version 4.9.0 Release 4)

It is applied on the whole test report even though the extensions (version, date and amendment) are not repeated.

3. ABREVIATIONS

Following abbreviations are expressed in the present report:

E.U.T.: equipment under test
E.I.R.P.: equivalent isotropic radiated power
Tx :transmitter
C : communication channel
MIMO : Multiple Input Multiple Output
MISO : Multiple Input Single Output

4. PERFORMED TESTS

The sections of the following standards have been taken for reference for the measure of radiated patterns of the mobile phone:

Transmitter:

ETSI TS 151 010-1:
- art. 13.3: Transmitter output power for GSM900, using radiation patterns

5. SETUP OF E.U.T.

Description of E.U.T :

Protective device for cellular mobile.

The mobile phone powered with its internal battery, has been measured with and without the device, in order to quantify the provided attenuation.

The device was set by the customer at the rear and center of the mobile phone.

The photo on annex shows the location of the device on the phone.

Operating mode during the tests:

Mobile phone is in communication mode with a tester, at its maximal output power in the frequency of the GSM900 uplink band.

During test, phone is in vertical position.

6. TESTS RESULTS SUMMARY

In the following table are reported the average values of radiated patterns, for transmitter, on middle channel of the GSM900 band.

If attenuation is positive for transmitter: average output power with the device is lower than one emitted by the mobile phone itself.

Communication band	Test antenna position	Average E.I.R.P. phone (dBm)	Average E.I.R.P. Average phone+Device (dBm)	Average attenuation for transmitter (dB)
GSM900	Vertical	27.6	27.7	**-0.1**
	Horizontal	12.3	12.1	**0.2**

Communication band	Test antenna position	Average output power phone (mW)	Average output power phone+device (mW)	Average attenuation for transmitter (mW)	Average attenuation for transmitter (%)
GSM900	Vertical	569.5	585.2	-15.7	-2.7
	Horizontal	17.0	16.4	0.6	-3.5

The tested protective device does not modify the radiated patterns of the tested mobile phone when set on its back cover for the location shown hereafter:

Note: The tested EUT could contain an antenna diversity technology, as MIMO or MISO. The control of the antenna's scheme has not been provided by the applicant. Thus, the radiated performances of the EUT are dependent on the test set-up; an antenna diversity control could lead to different results from those reported in this test report.

7. TRANSMITTER RADIATION PATTERNS

Reference specification

ETSI TS 151 010-1 art. 13.3.4.2 for the band GSM900

Test procedure

The mobile phone is on an isolated support, on a turntable, at 1.5m high, in an anechoic room.

Measuring distance is 3m, with antenna in vertical position.

The display of the mobile phone is front to the antenna (0°), and 90° is its right side.

Step measurement is close to 2° according to the continuous rotation of the turntable.

Test equipments used

Equipment	Manufacturer	Type	EMITECH N°
Antenna	Schwarzbeck	UHALP 9108A	8543
Radiocomunication tester	Rohde & Schwarz	CMU200	7090
Software	BAT	BAT-EMC v3.6.0.32	0000
Anechoic room	SIDT	8mx5mx4m	8593
Turntable controler	EMCO	1060C	8958

Results

The values listed hereafter are referred to an isotropic antenna (E.I.R.P: Equivalent Isotropically Radiated Power)

The measurements results are presented in the following table, with the related radiation patterns.

Transmitter GSM900

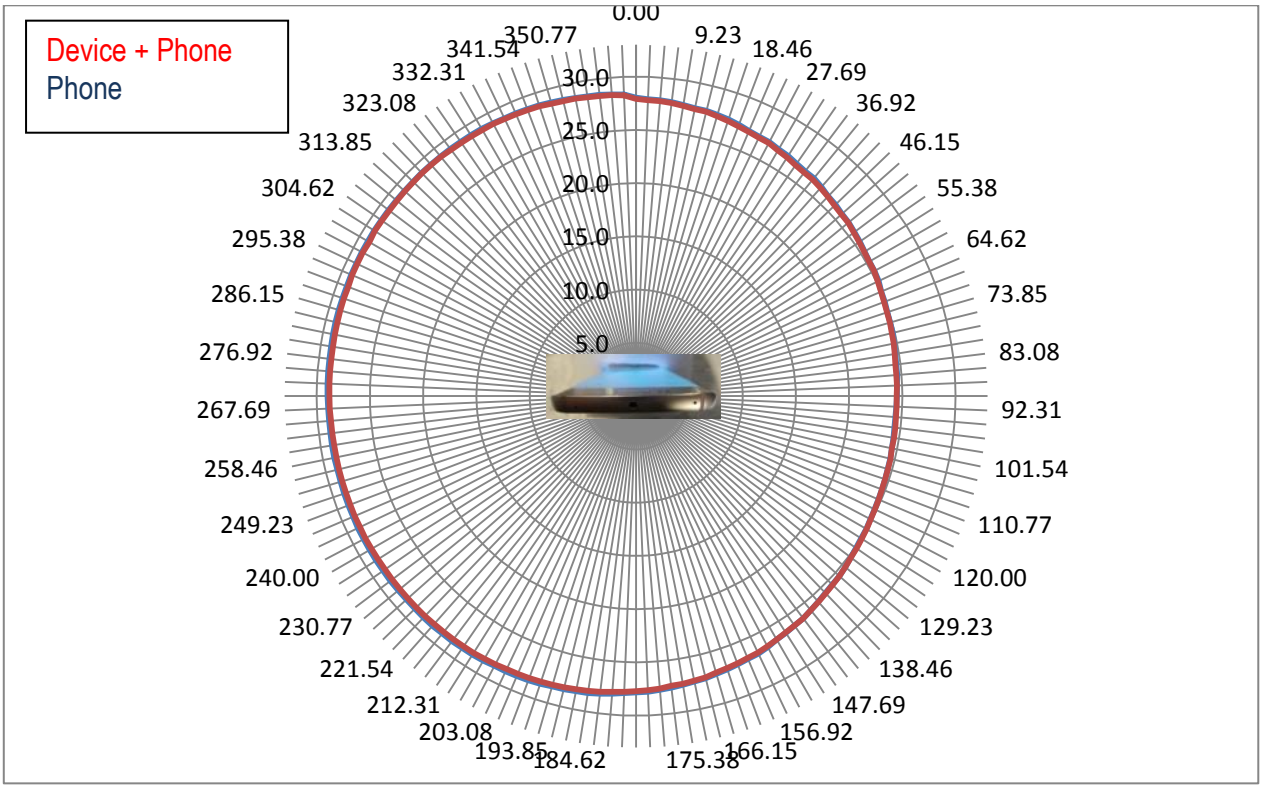
The power values, listed in the next table, are limited for a 10° step. The graphs are expressed for the measurement step 2°

Measuring antenna is in vertical position:

Angle (°)	Device + phone C38 (dBm)	phone C38 (dBm)	Device attenuation (dB)
0,0	28,0	27,9	-0.1
9,2	27,7	27,6	-0.1
18,5	27,4	27,2	-0.2
27,7	27,0	26.8	-0.1
36,9	26,4	26.3	-0.1
46,2	25,9	25.9	0
55,4	25,5	25.5	0
64,6	25,2	25.1	-0.1
73,8	24,8	24.8	0
83,1	24,6	24.5	-0.1
92,3	24,5	24.5	0
101,5	24,5	24.5	0
110,8	24,7	24.7	0
120,0	25,0	25.0	0
129,2	25,4	25.4	0
138,5	25,8	25.8	0
147,7	26,3	26.3	0
156,9	26,8	26.7	-0.1
166,2	27,3	27.2	-0.1
175,4	27,7	27.6	-0.1
184,6	28,0	27.9	-0.1
193,8	28,3	28.2	-0.1
203,1	28,6	28.3	-0.3
212,3	28,7	28.5	-0.2
221,5	28,8	28.6	-0.2
230,8	28,8	28.7	-0.1
240,0	28,9	28.7	-0.2
249,2	28,9	28.7	-0.2
258,5	28,9	28.7	-0.2
267,7	28,9	28.8	-0.1
276,9	29,0	28.8	-0.2
286,2	29,1	28.9	-0.2
295,4	29,1	29	-0.1
304,6	29,1	29	-0.1
313,8	29,1	29	-0.1
323,1	29,0	28.9	-0.1
332,3	28,9	28.9	0
341,5	28,8	28.7	-0.1
350,8	28,5	28.4	-0.1
Average	27.7	27.6	-0.1

Note: If attenuation is positive for transmitter: average output power with the device is lower than one emitted by the mobile phone itself

Device + Phone power Average (mW)	Phone power Average (mW)	Device attenuation Average (mW)	Device attenuation Average (%)
585.2	569.5	-15.7	-2.7

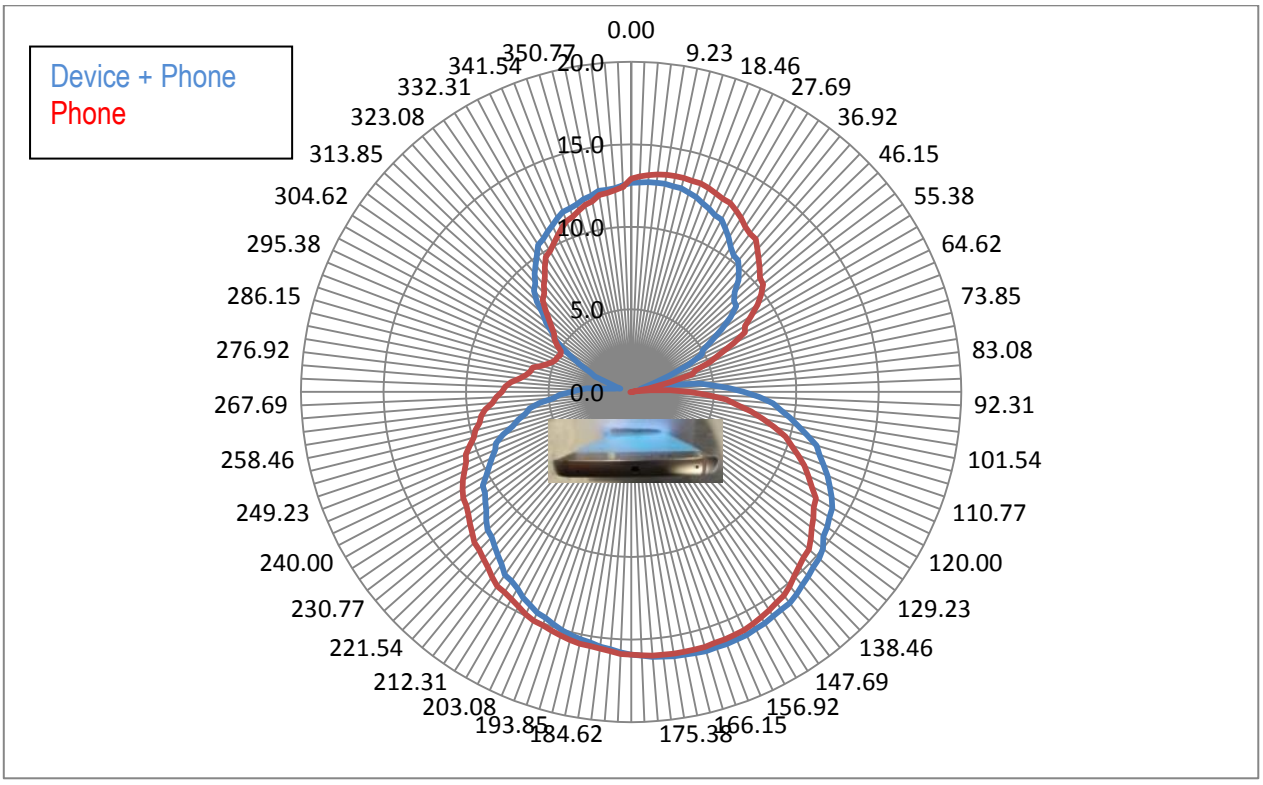


Measuring antenna is in horizontal position:

Angle (°)	Device + Phone C38 (dBm)	phone C38 (dBm)	Device attenuation (dB)
0,0	12,7	12.9	0.2
9,2	12,8	13.3	0.5
18,5	12,4	13.3	0.9
27,7	11,8	12.9	1.1
36,9	10,3	12.0	1.7
46,2	8,7	10.8	2.1
55,4	6,7	9.3	2.6
64,6	3,9	6.9	3
73,8	0,6	3.9	3.3
83,1	4,2	0.3	-3.9
92,3	7,8	4.7	-3.1
101,5	10,3	8.2	-2.1
110,8	12.5	10.8	-1.7
120,0	14.1	12.9	-1.2
129,2	15	14.1	-0.9
138,5	15.6	14.9	-0.7
147,7	16.1	15.6	-0.5
156,9	16.3	16	-0.3
166,2	16.3	16.1	-0.2
175,4	16.1	16.0	-0.1
184,6	15.6	15.8	0.2
193,8	15.2	15.5	0.3
203,1	14.5	15.1	0.6
212,3	13.6	14.4	0.8
221,5	13.6	13.5	0.1
230,8	11.3	12.6	1.3
240,0	10.1	11.8	1.7
249,2	8.8	10.7	1.9
258,5	6.5	9.4	2.9
267,7	4.3	8.2	3.9
276,9	1.7	6.8	5.1
286,2	0.7	5.7	5
295,4	2.7	4.9	2.2
304,6	5.6	5.7	0.1
313,8	7.9	7.2	-0.7
323,1	9.6	8.7	-0.9
332,3	10.9	10.1	-0.8
341,5	11.7	11.2	-0.5
350,8	12.3	12.1	-0.2
Average	12.1	12.3	0.2

Note: If attenuation is positive for transmitter: average output power with the device is lower than one emitted by the mobile phone itself

Device + Phone power Average (mW)	Phone power Average (mW)	Device attenuation Average (mW)	Device attenuation Average (%)
16.4	17.0	0.6	-3.5%



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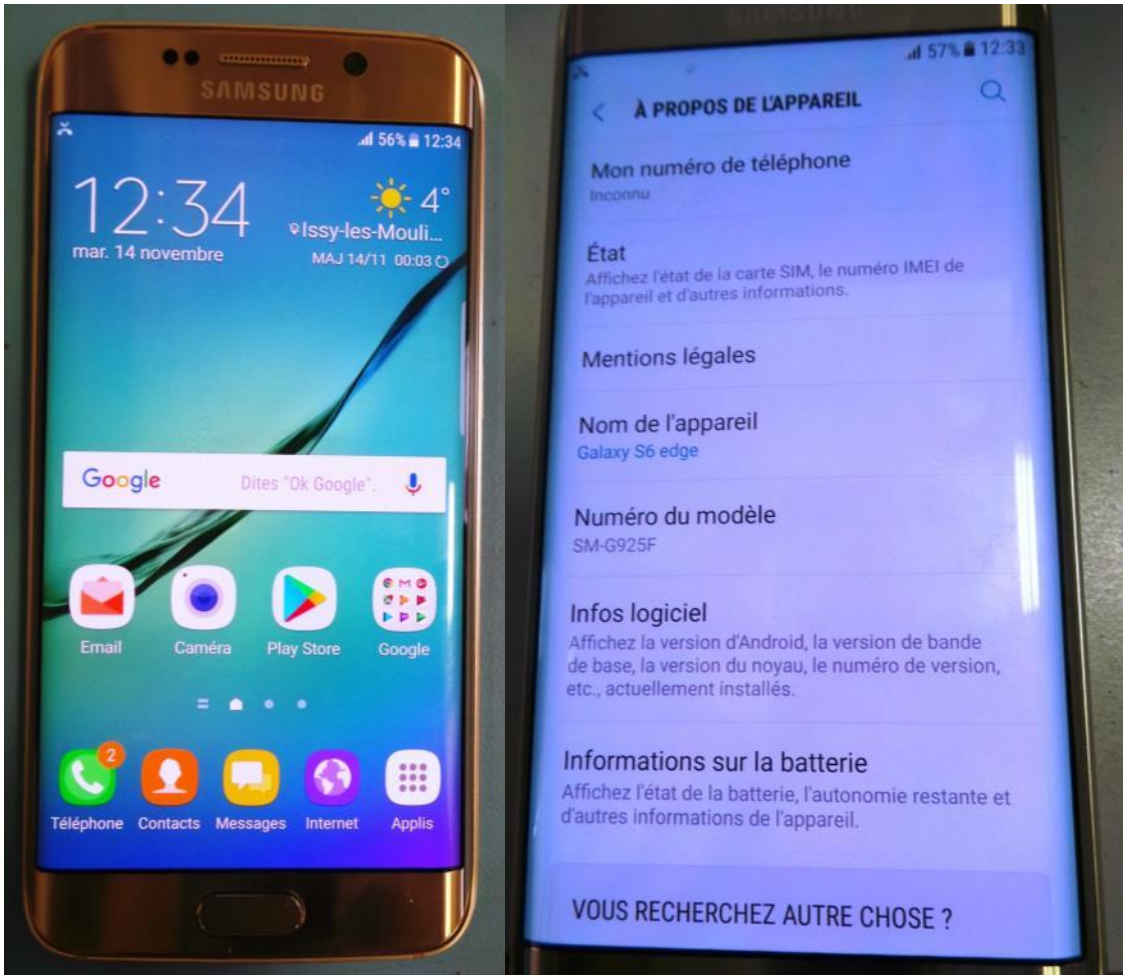
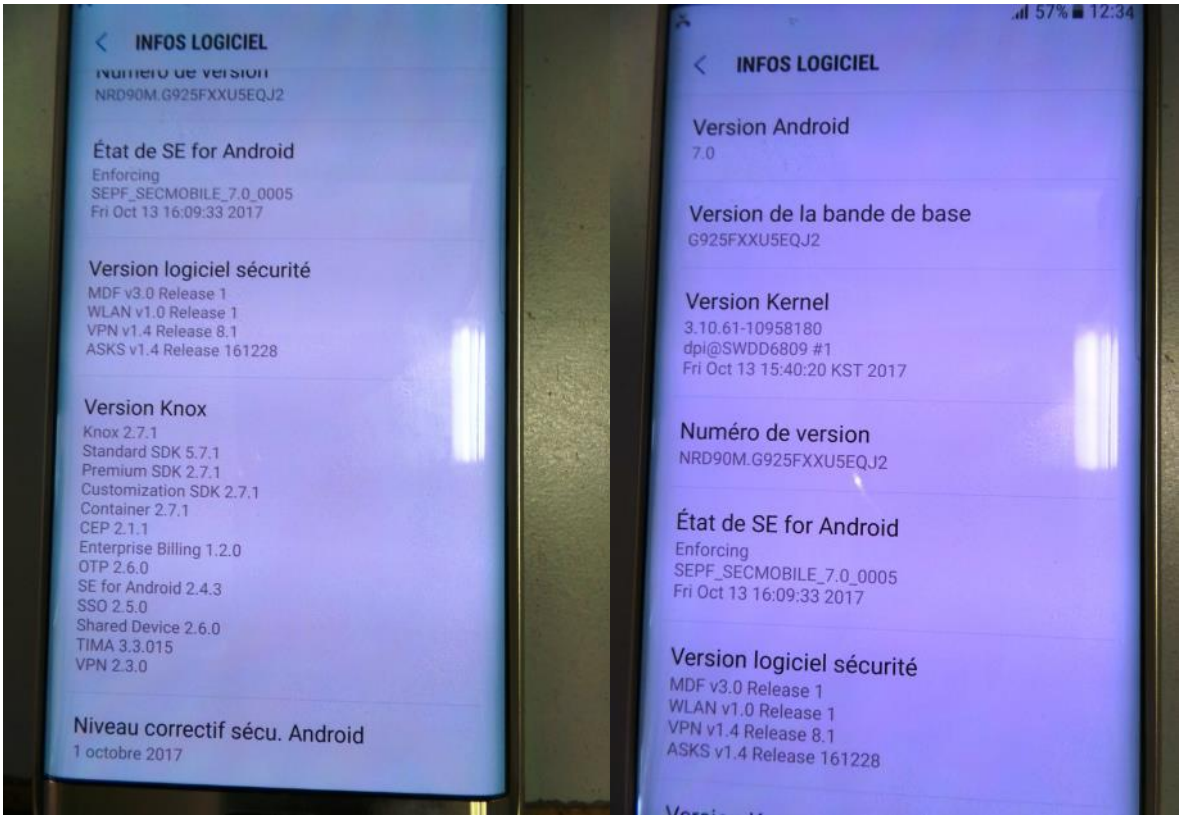
APPENDIX: PHOTOGRAPHIES

Tested device and phone:




INFOS LOGICIEL
NRD90M.G925FXXU5EQJ2
État de SE for Android
Enforcing
SEPF_SECMOBILE_7.0_0005
Fri Oct 13 16:09:33 2017
Version logiciel sécurité
MDF v3.0 Release 1
WLAN v1.0 Release 1
VPN v1.4 Release 8.1
ASKS v1.4 Release 161228
Version Knox
Knox 2.7.1
Standard SDK 5.7.1
Premium SDK 2.7.1
Customization SDK 2.7.1
Container 2.7.1
CEP 2.1.1
Enterprise Billing 1.2.0
OTP 2.6.0
SE for Android 2.4.3
SSO 2.5.0
Shared Device 2.6.0
TIMA 3.3.015
VPN 2.3.0
Niveau correctif sécu. Android
1 octobre 2017
57% 12:34
INFOS LOGICIEL
Version Android
7.0
Version de la bande de base
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Version Kernel
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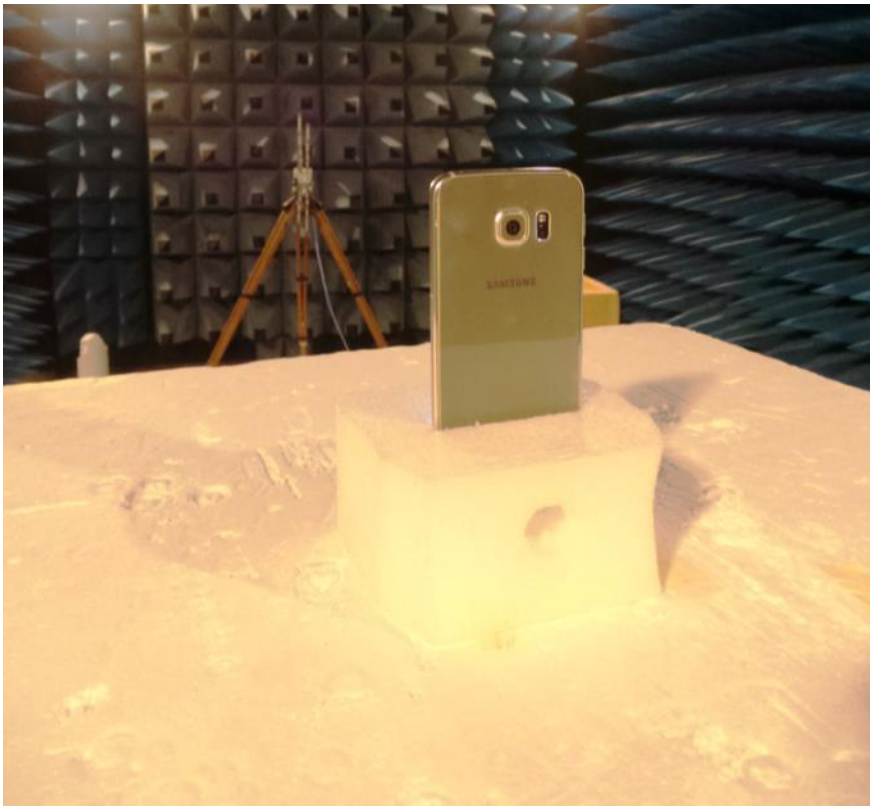
WLAN v1.0 Release 1
VPN v1.4 Release 8.1
ASKS v1.4 Release 161228

Test setup

Phone (step 0°):



Phone and device (step 0°):