SGS-CSTC Standards
Technical Services
（Shanghai） Co., Ltd.

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EMC TEST REPORT

Application No.: SHEMO09120140801

Applicant: Shanghai Simcom Ltd.

Equipment Under Test (EUT):

NOTE: The following sample(s) submitted was/were identified on behalf of the client as

EUT Name:	SIM900
Brand Name:	SIMCOM
Model Name:	SIM900
Serial No.:	Not supplied by client
Standards:	ETSI EN 301 489-1 V1.8.1 (2008-04) ETSI EN 301 489-7 V1.3.1 (2005-11)
Date of Receipt:	Dec 18, 2009
Date of Test:	Dec 18, 2009 to Dec 29, 2009
Date of Issue:	Dec 29, 2009

Test Result :	**PASS***

* In the configuration tested, the EUT complied with the standards specified above

The CE mark as shown below can be used, under the responsibility of the manufacturer, after completion of an EC Declaration of Conformity and compliance with all relevant EC Directives.

CE

Tino Pan
E&E Section Manager
SGS-CSTC(Shanghai) Co., Ltd.

Jack Wu
Project Engineer
SGS-CSTC(Shanghai) Co., Ltd.

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2 Test Summary

Test Items	Test Requirement	Test Method	Class / Severity	Result
Radiated Emission (30MHz to 6GHz)	ETSI EN 301 489-1 V1.8.1 (2008-04) Clause 8.2	EN 55022:2006	3m	PASS
Conducted emission	ETSI EN 301 489-1 V1.8.1 (2008-04) Clause 8.4	EN 55022:2006	N/A	N/A
Harmonic Current Emission on AC, up to 2kHz	ETSI EN 301 489-1 V1.8.1 (2008-04) Clause 8.5	EN 61000-3-2:2006	N/A	N/A
Voltage Fluctuation and Flicker on AC	ETSI EN 301 489-1 V1.8.1 (2008-04) Clause 8.6	EN 61000-3-3: 1995/A1:2001/A2:2005	Clause 5 of EN61000-3-3	N/A
Radiated Immunity (80MHz to 1GHz) (1.4GHz to 2.7GHz)	ETSI EN 301 489-1 V1.8.1 (2008-04) Clause 9.2	EN 61000-4-3:2006	3V/m, 80%, 1kHz, Amp. Mod.	PASS
ESD	ETSI EN 301 489-1 V1.8.1 (2008-04) Clause 9.3	EN 61000-4-2:1995+A1: 1998+A2: 2001	±4 kV Contact ±8 kV Air	PASS
Electrical Fast Transients (EFT)	ETSI EN 301 489-1 V1.8.1 (2008-04) Clause 9.4	EN 61000-4-4:2004	DC port	N/A
RF common mode, 150kHz to 80MHz	ETSI EN 301 489-1 V1.8.1 (2008-04) Clause 9.5	EN 61000-4-6:2007	DC port	N/A
Transients	ETSI EN 301 489-1 V1.8.1 (2008-04) Clause 9.6	ISO 7637-2:2004	DC port	N/A
Voltage dips and interruptions	ETSI EN 301 489-1 V1.8.1 (2008-04) Clause 9.7	EN 61000-4-11:2004	AC port	N/A
Surges	ETSI EN 301 489-1 V1.8.1 (2008-04) Clause 9.8	EN 61000-4-5:2006	AC port	N/A

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3 Contents

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4 General Information

4.1 Client Information

Applicant:	Shanghai Simcom Ltd.
Address of Applicant:	SIM Technology Building, No.633 Jinzhong Road, Changning District , Shanghai, P.R.China(Postalcode 200335)
Manufacturer:	Shanghai Simcom Ltd.
Address of Manufacturer:	SIM Technology Building, No.633 Jinzhong Road, Changning District , Shanghai, P.R.China(Postalcode 200335)

4.2 General Description of E.U.T.

EUT Name:	SIM900
Brand Name:	SIMCOM
Model Name:	SIM900
Support Frequency Band:	GSM 850/1900/900/1800
Testing frequency Band:	GSM 900/1800
Hardware Version:	V2.03
Software Version:	SIM900 R11.0

4.3 Description of Support Units

N/A

4.4 Standards Applicable for Testing

ETSI EN 301 489-1 V1.8.1 (2008-04)

ETSI EN 301 489-7 V1.3.1 (2005-11)

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Table 1 : Emission Tests Carried Out Under ETSI EN 301 489-1 V1.8.1

Emission		**Status**
EN 301 489-1 8.2	Radiated Emissions	√
EN 301 489-1 8.4	Conducted Emissions on AC	×
EN 301 489-1 8.3	Conducted Emissions on DC	×
EN 301 489-1 8.5	Harmonic Emissions on AC	×
EN 301 489-1 8.6	Flicker Emissions on AC	×

× Indicates that the test is not applicable.
√ Indicates that the test is applicable.

Table 2 : Immunity Tests Carried Out Under ETSI EN 301 489-1 V1.8.1

Immunity		**Status**
EN 301 489-1 9.2	Radiated Immunity (80MHz to 1GHz and 1.4GHz to 2.7GHz)	√
EN 301 489-1 9.3	ESD	√
EN 301 489-1 9.4	Fast transients common mode	×
EN 301 489-1 9.5	Radio frequency common mode	×
EN 301 489-1 9.6	Transients	×
EN 301 489-1 9.7	Voltage dips and interruptions	×
EN 301 489-1 9.8	Surges	×

× Indicates that the test is not applicable
√ Indicates that the test is applicable

4.5 Deviation from Standards

None.

4.6 Abnormalities from Standard Conditions

None.

4.7 Monitoring of EUT for All Immunity Test

Visual: By software(EMC32) or CMU200.

4.8 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.
No.588 West Jindu Road, Songjiang District, Shanghai, China. 201612.
Tel: +86 21 6191 5666 Fax: +86 21 6191 5655

4.9 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing. Date of expiry: 2011-07-29.

- **FCC – Registration No.: 402683**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered and fully described in a report filed with the Federal Communications Commission (FCC). The acceptance letter from the FCC is maintained in our files. Registration No.: 402683, Expiry Date: 2012-03-17.

- **Industry Canada (IC) – IC Assigned Code: 8617A**

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A. Expiry Date: 2011-09-29.

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5 Equipment Used during Test

Radiated Emission

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due date
1	EMI test receiver	Rohde & Schwarz	ESU40	100109	2009-6-4	2010-6-3
2	ANTENNA	SCHWARZBECK	VULB9168	9168-313	2009-6-4	2010-6-3
3	ANTENNA	SCHWARZBECK	BBHA9120 D	9120D-679	2009-6-4	2010-6-3
4	TURNTABLE	INNCO	DS 2000S-1T	/	/	/
5	UNIVERSAL RADIO COMMUNICATION TESTER	Rohde & Schwarz	CMU 200	112012	2009-08-25	2010-08-24

ESD

Item	Test Equipment	Manufacturer	Model No.	Series No.	Cal. Date	Cal.Due date
1	Electrostatic Discharge Simulator	KIKUSUI	KES4021	LL004261	2009-04-25	2010-4-24

Radiated Immunity

Item	Test Equipment	Manufacturer	Model No.	Series No.	Cal. Date	Cal.Due date
1	Signal generator	Rohde & Schwarz	SMR40	100555	2009-6-24	2010-6-23
2	Ultra broadband antenna	Rohde & Schwarz	HL562	100227	2009-10-9	2010-10-8
3	Power meter	Rohde & Schwarz	NRP	101641	2009-6-17	2010-6-16
4	Sensor of power meter	Rohde & Schwarz	NRP－Z91	100648	2009-6-6	2010-6-5

5	sensor of power meter	Rohde & Schwarz	NRP－Z91	100647	2009-6-6	2010-6-5
6	UPV audio analyzer	Rohde & Schwarz	UPL	101249	2009-6-24	2010-6-23
7	MOUTH SIMULATOR	Brüel & Kjaer	4227	2630626	2009-3-25	2010-3-24
8	Mouth simulator fixtuer	Brüel & Kjaer	/	/	/	/
9	Dual Microphone Supply	Brüel & Kjaer	5935	2564744	2009-3-18	2010-3-17
10	Dual Microphone Supply-box	Brüel & Kjaer	/	/	/	/
11	Sound Pressure Calibrator	Brüel & Kjaer	4231	2499267	/	/
12	Communication Antenna	EUROPEAN ANTENNA	FPA-0.8-0.6R/1329	405156-0004	2009-12-01	2010-11-30
13	UNIVERSAL RADIO COMMUNICATION TESTER	Rohde & Schwarz	CMU 200	112012	2009-08-25	2010-08-24
14	Amplifier	AR	30W1000B	0327284	2009-03-09	2010-03-08
15	Amplifier	AR	30S1G3	0324978	2009-03-09	2010-03-08

General Equipment

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal.Due date
1	Atmosphere pressure meter	Shanghai ZhongXuan Electronic Co;Ltd	BY－2003P	/	2009-10-15	2010-10-14
2	CLAMP METER	FLUKE	316	86080010	2009-04-27	2010-04-26
3	Thermo-Hygrometer	ZHICHEN	ZC1-2	01050033	2009-10-21	2010-10-20
4	Digital illuminance meter	TES electrical electronic Corp.	TES-1330A	050602219	2009-10-16	2010-10-15
5	DC Power	KIKUSUI	PMC35－3	NF100260	2009-1-16	2010-1-15

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6 Emission Test Results

6.1 Radiated Emissions

Test Requirement:	ETSI EN 301 489-1 V1.8.1 Clause 8.2
Test Method:	EN55022:2006
Test Date:	Dec 22,2009
Frequency Range:	30MHz to 6GHz
Measurement Distance:	3m
Limit:	40.0 dBμV/m between 30MHz & 230MHz
	47.0 dBμV/m between 230MHz &1GHz
	50.0 dBμV/m(Average), 70.0 dBμV/m(Peak) between 1G & 3GHz
	54.0 dBμV/m(Average), 74.0 dBμV/m(Peak) Between 3G & 6GHz

6.1.1 E.U.T. Operation

Operating Environment:

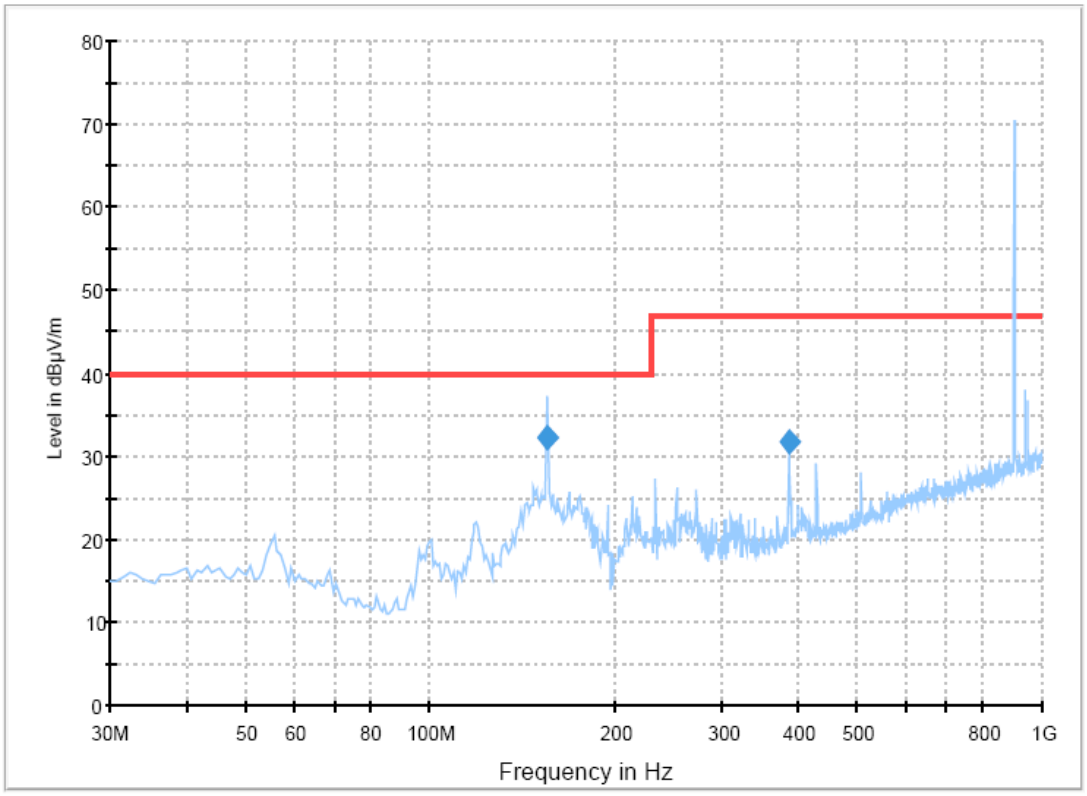
Temperature: 24.0°C Humidity: 46% RH Atmospheric Pressure: 1008 mbar

EUT Operation: Test EUT allocated GSM900/1800 connected to the earphone

6.1.2 Test Result and Partial Measurement Data

PASS

GSM 900 connected mode
Horizontal(30M-1GHz):



Final Result 1

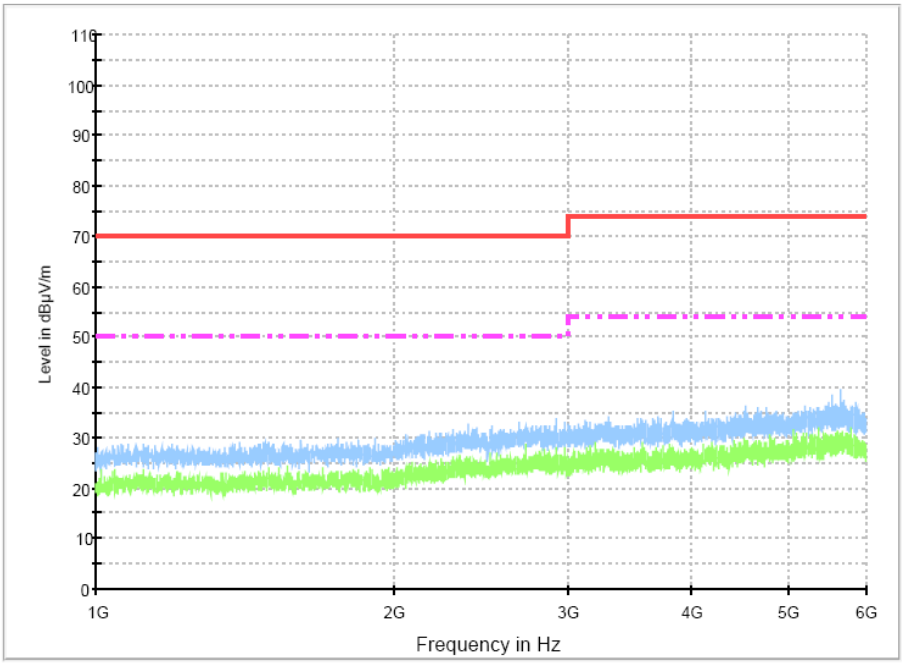
Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)
156.008640	32.2	1000.000	120.000	213.0	H	286.0	-8.0	7.80
387.347520	31.9	1000.000	120.000	100.0	H	3.0	-5.3	15.10

(continuation of the "Final Result 1" table from column 9 ...)

Frequency (MHz)	Limit (dBµV/m)	Comment
156.008640	40.00	
387.347520	47.00	

Note:902.4MHz is the mobile operating frequency.

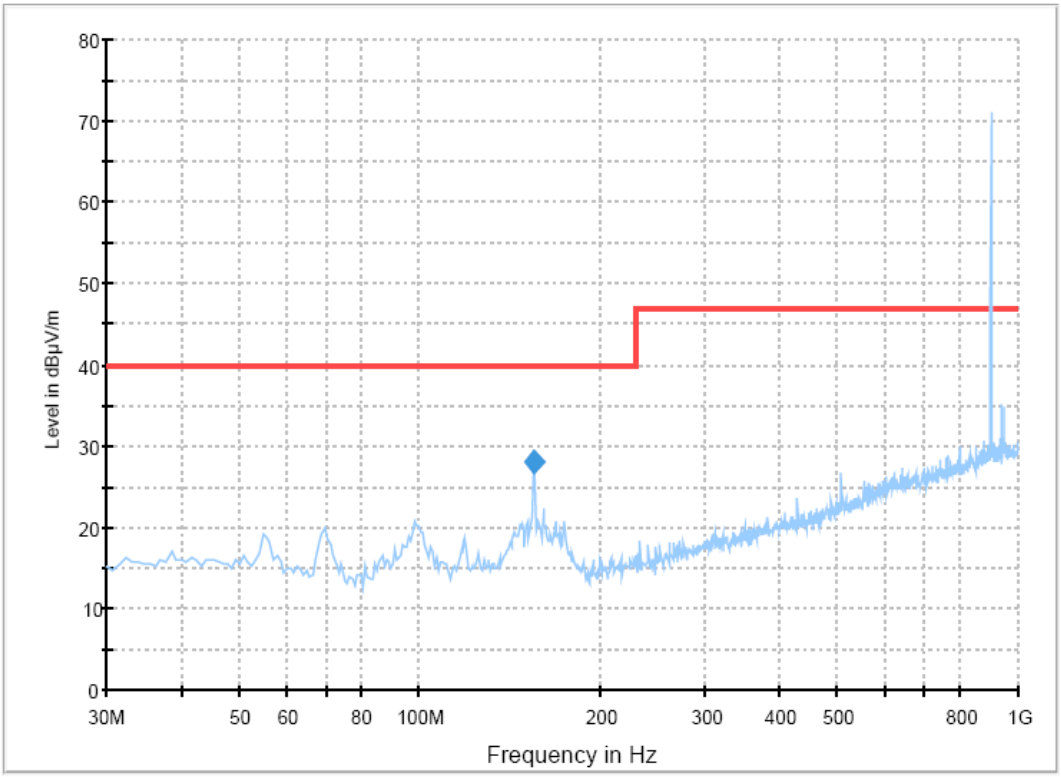
1G-6GHz:



Frequency	Level AV	Level Peak	Limit AV	Limit Peak
(MHz)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)
1000.00	*	*	50	70
2000.00	*	*	50	70
3000.00	*	*	50	70
4000.00	*	*	54	74
6000.00	*	*	54	74

"*" means the emission level is 6dB lower than the relevant limit.

Vertical:
30M-1GHz:



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)
155.988480	28.0	1000.000	120.000	130.0	V	257.0	-8.0	12.00

(continuation of the "Final Result 1" table from column 9 ...)

Frequency (MHz)	Limit (dBµV/m)	Comment
155.988480	40.00	

Note:902.4MHz is the mobile operating frequency.

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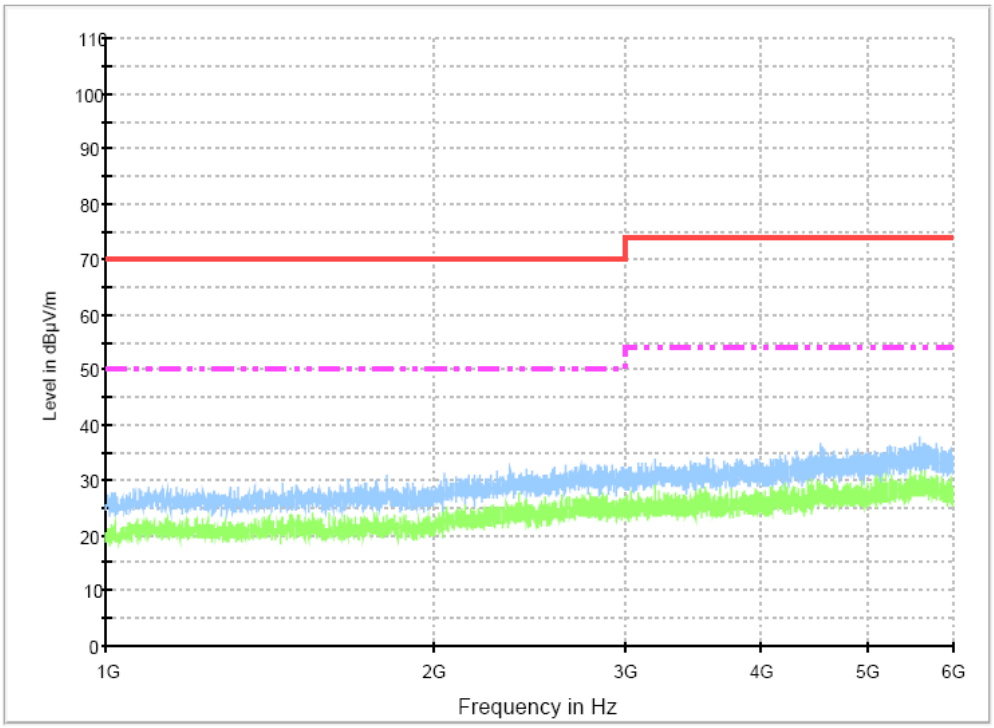
1G-6GHz:



Frequency	Level AV	Level Peak	Limit AV	Limit Peak
(MHz)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)
1000.00	*	*	50	70
2000.00	*	*	50	70
3000.00	*	*	50	70
4000.00	*	*	54	74
6000.00	*	*	54	74

"*" means the emission level is 6dB lower than the relevant limit.

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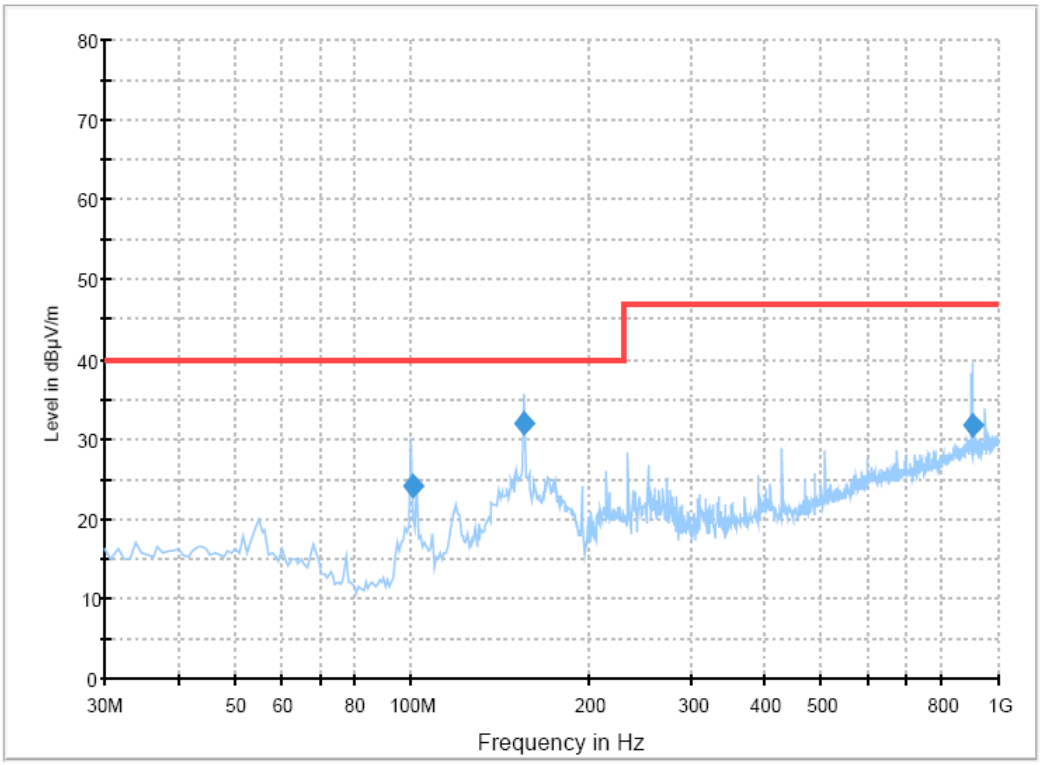
GSM1800 connected mode
Horizontal:
30M-1GHz



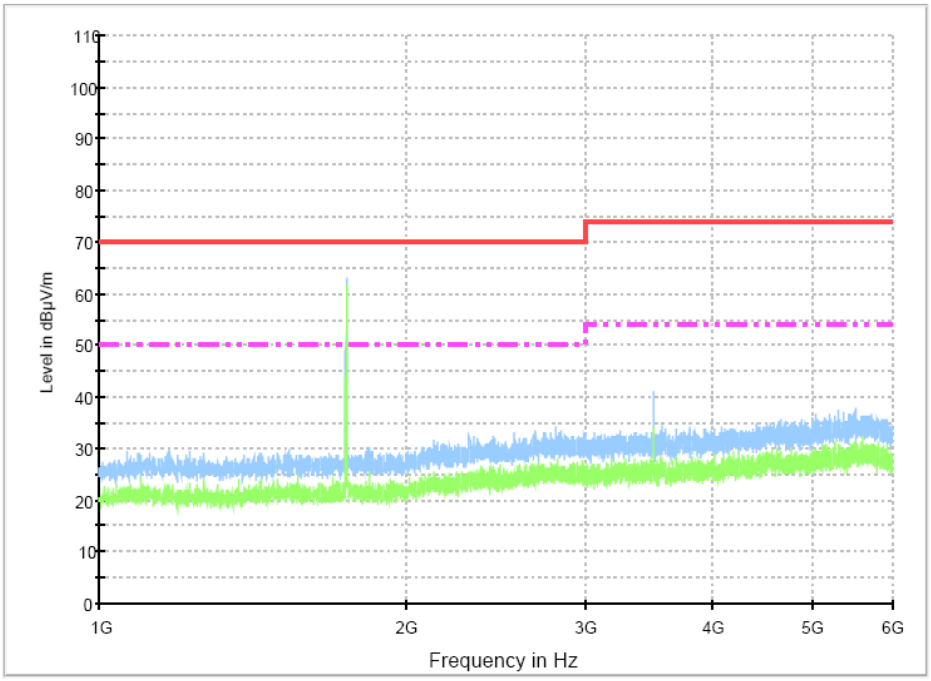
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)
100.836480	24.0	1000.000	120.000	200.0	H	104.0	-12.3	31.00
155.991360	32.0	1000.000	120.000	200.0	H	307.0	-8.0	8.00
907.005120	31.8	1000.000	120.000	100.0	H	166.0	3.1	26.20

(continuation of the "Final Result 1" table from column 9 ...)

Frequency (MHz)	Limit (dBµV/m)	Comment
100.836480	40.00	
155.991360	40.00	
907.005120	47.00	

1G-6GHz



Frequency	Level AV	Level Peak	Limit AV	Limit Peak
(MHz)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)
1000.00	*	*	50	70
2000.00	*	*	50	70
3000.00	*	*	50	70
4000.00	*	*	54	74
6000.00	*	*	54	74

“*” means the emission level is 6dB lower than the relevant limit.

Note:1747.4MHz is the mobile operating frequency.

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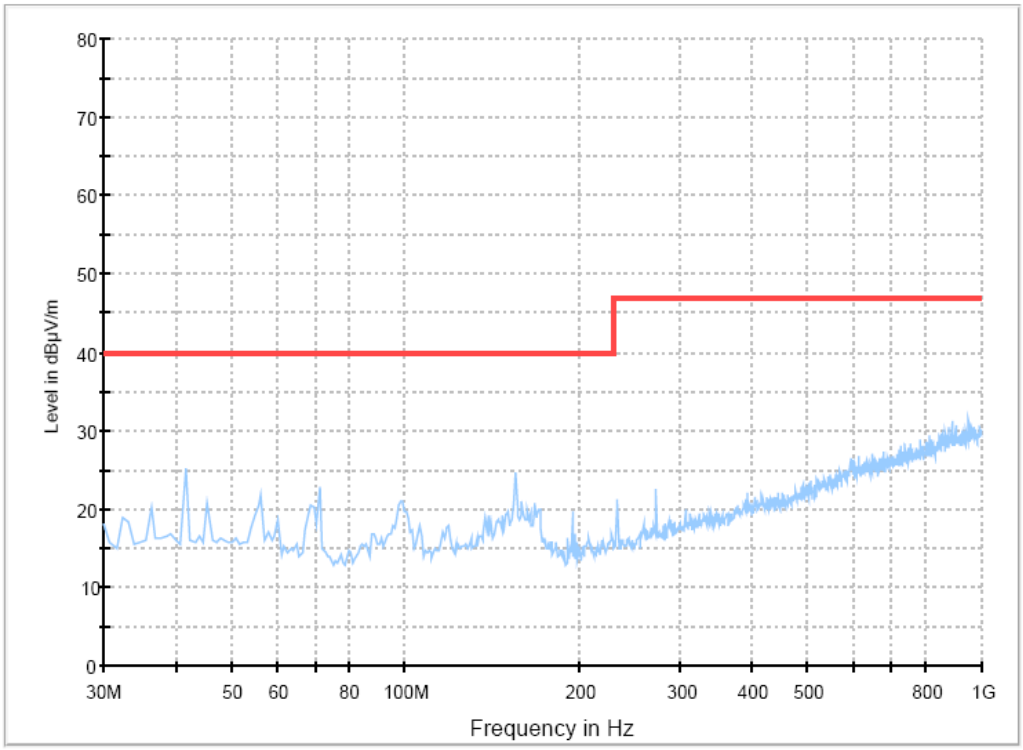
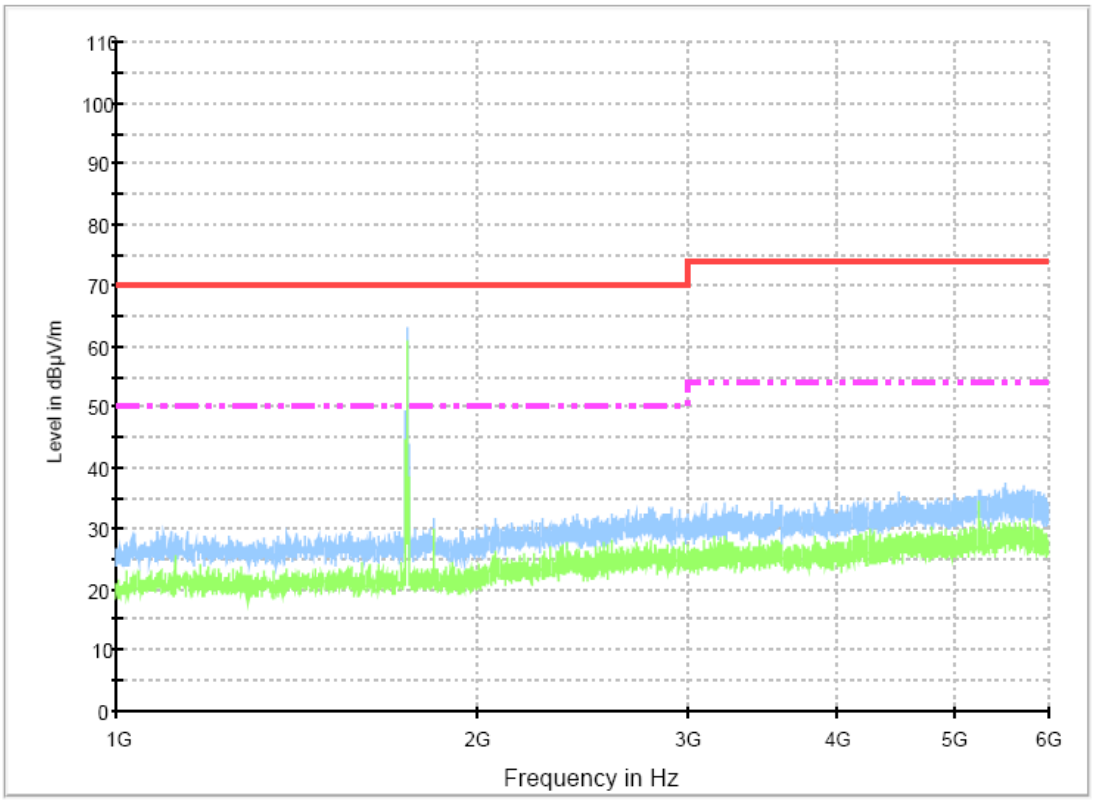
Vertical:
30M-1GHz



Frequency	Level QP	Limit	Margin
(MHz)	(dBuV/m)	(dBuV/m)	(dB)
30.00	*	40.0	*
50.00	*	40.0	*
100.00	*	40.0	*
200.00	*	40.0	*
500.00	*	47.0	*
1000.00	*	47.0	*

“*” means the emission level is 6dB lower than the relevant limit.

1G-6GHz



Frequency	Level AV	Level Peak	Limit AV	Limit Peak
(MHz)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)
1000.00	*	*	50	70
2000.00	*	*	50	70
3000.00	*	*	50	70
4000.00	*	*	54	74
6000.00	*	*	54	74

"*" means the emission level is 6dB lower than the relevant limit.

Note:1747.4MHz is the mobile operating frequency.

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7 Immunity Test Results

7.1 Performance Criteria

ETSI EN 301 489-7 Clause 6.1 Performance criteria for Continuous phenomena applied to Transmitters (CT)	A communication link shall be established at the start of the test, and maintained during the test, see clauses 4.2.2 to 4.2.5. During the test, the uplink speech output level shall be at least 35 dB less than the previously recorded reference levels, when measured through an audio band pass filter of width 200 Hz, centred on 1 kHz (audio breakthrough check). NOTE: When there is a high level background noise present the filter bandwidth can be reduced down to a minimum of 40 Hz. At the conclusion of the test, the EUT shall operate as intended with no loss of user control functions or stored data, and the communication link shall have been maintained. In addition to confirming the above performance during a call, the test shall also be performed in idle mode, and the transmitter shall not unintentionally operate.
ETSI EN 301 489-7 Clause 6.2 Performance criteria for Transient phenomena applied to Transmitters (TT)	A communications link shall be established at the start of the test, see clauses 4.2.2 to 4.2.5. At the conclusion of each exposure the EUT shall operate with no user noticeable loss of the communication link. At the conclusion of the total test comprising the series of individual exposures, the EUT shall operate as intended with no loss of user control functions or stored data, as declared by the manufacturer, and the communication link shall have been maintained. In addition to confirming the above performance during a call, the test shall also be performed in idle mode, and the transmitter shall not unintentionally operate.
ETSI EN 301 489-7 Clause 6.3 Performance criteria for Continuous phenomena applied to Receivers (CR)	A communications link shall be established at the start of the test, clauses 4.2.1 to 4.2.4. During the test, the RXQUAL of the downlink shall not exceed the value of three, measured during each individual exposure in the test sequence. During the test, the downlink speech output level shall be at least 35 dB less than the previously recorded reference levels, when measured through an audio band pass filter of width 200 Hz, centred on 1 kHz (audio breakthrough check). NOTE: When there is a high level background noise present the filter bandwidth can be reduced down to a minimum of 40 Hz. At the conclusion of the test, the EUT shall operate as intended with no loss of user control functions or stored data, and the communication link shall have been maintained.
ETSI EN 301 489-7 Clause 6.4 Performance criteria for Transient phenomena applied to Receivers (TR)	A communications link shall be established at the start of the test, clauses 4.2.1 to 4.2.4. At the conclusion of each exposure the EUT shall operate with no user noticeable loss of the communication link. At the conclusion of the total test comprising the series of individual exposures, the EUT shall operate as intended with no loss of user control functions or stored data, as declared by the manufacturer, and the communication link shall have been maintained.

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ETSI EN 301 489-7
Clause 7.2
Special conditions

Table 2: Special conditions for EMC immunity tests

Reference to clauses in EN 301 489-1 [1]	Special product-related conditions, additional to or modifying the test conditions in EN 301 489-1 [1], clause 9
9.2 Radio frequency electromagnetic field **9.2.2 Test method;**	When using the max hold detector method (see annex B) at each test frequency step initially an unmodulated test signal shall be applied. Then the test modulation shall be applied. The test shall be repeated with the equipment in the idle mode of operation and the exclusion band shall not be used during this test.
9.5 Radio frequency, common mode	When using the max hold detector method (see annex B) at each test frequency step initially an unmodulated test signal shall be applied. Then the test modulation shall be applied.
9.5.2 Test method;	The stepped frequency increments may be 50 kHz increment of the momentary frequency in the frequency range 150 kHz to 5 MHz. When using the max hold detector method, initially at each test frequency step an unmodulated immunity test signal shall be applied. Then the modulation of the immunity RF test signal (1 kHz tone) shall be applied as specified in the EN 301 489-1 [1].
9.6.3 Performance criteria;	During tests with pulses 3a and 3b, the performance criteria TT shall apply, see clause 6.2.
9.7.3 Performance criteria; Voltage dips and interruptions	For a voltage dip corresponding to a reduction of the supply voltage of 30 % for 10 ms the performance criteria TT or CR specified in clauses 6.2 or 6.3 shall apply as appropriate.

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7.2 ESD

Test Requirement:	ETSI EN 301 489-1 V1.8.1 Clause 9.3	
Test Method:	EN 61000-4-2:1995+A1: 1998+A2: 2001	
Test Date:	Dec 23,2009	
Discharge Impedance:	330 Ω / 150 pF	
Discharge Voltage:	Air Discharge:	±2,± 4, ±8 kV
	Contact Discharge:	±2, ±4 kV
Polarity:	Positive & Negative	
Number of Discharge:	Minimum 10 times at each test point	
Discharge Mode:	Single Discharge	
Discharge Period:	1 second minimum	
Required Performance Criteria:	TT/TR	

7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 24.0°C Humidity: 48% RH Atmospheric Pressure: 1010 mbar

EUT Operation: Test EUT allocated GSM900/1800 connected to the earphone

Test EUT in GSM900/1800 idle mode connected to the earphone

7.2.2 Test Results

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7.2.3 Direct Application Test Results

Observations: Test Point:

1. All insulated enclosure & seams around EUT.
2. All touchable metal material of EUT

EUT Performance: CT/CR

Direct Application			Test Results	
Discharge Level (kV)	**Polarity (+/-)**	**Test Points**	**Contact Discharge**	**Air Discharge**
2,4, 8	+/-	1	N/A	PASS
2,4	+/-	2	PASS	N/A

Indirect Application Test Results

Observations: Test Point: 1. All sides.

EUT Performance: CT/CR

Indirect Application			Test Results	
Discharge Level (kV)	**Polarity (+/-)**	**Test Point**	**Horizontal Coupling**	**Vertical Coupling**
2,4	+/-	1	PASS	PASS

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7.3 Radiated Immunity（80MHz to 1GHz & 1.4GHz to 2.7GHz）

Test Requirement:	ETSI EN 301 489-1 V1.8.1 Clause 9.2
Test Method:	EN 61000-4-3:2006
Test Date:	Dec 05,2009
Frequency Range:	80MHz to 1GHz & 1.4GHz to 2.7GHz
Test level:	3V/m on enclosure
Modulation:	80%, 1kHz Amplitude Modulation
Required Performance Criteria:	CT/CR

7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 24.0°C Humidity: 47% RH Atmospheric Pressure: 1012 mbar

EUT Operation:	Test EUT allocated GSM900/1800 connected to the earphone Test EUT in GSM900/1800 idle mode connected to the earphone

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7.3.2 Test Results

Dwell time	Field strength (unmod., rms)	Start frequency	Stop frequency	Frequency step	Modulation
					1 kHz, AM
3 s	3 V/m	80 MHz	1000 MHz	log 1%	80%
		1400 MHz	2700 MHz		

View to EUT surface	Antenna position	EUT Performance	Test result
	vertical	CT/CR	PASS
front side	horizontal	CT/CR	PASS
	vertical	CT/CR	PASS
left side	horizontal	CT/CR	PASS
	vertical	CT/CR	PASS
rear side	horizontal	CT/CR	PASS
	vertical	CT/CR	PASS
right side	horizontal	CT/CR	PASS
	vertical	CT/CR	PASS
top side	horizontal	CT/CR	PASS
	vertical	CT/CR	PASS
bottom side	horizontal	CT/CR	PASS

Remark: there is no unintentional operation during the test. We have performed all the status.

Below is the worst case.

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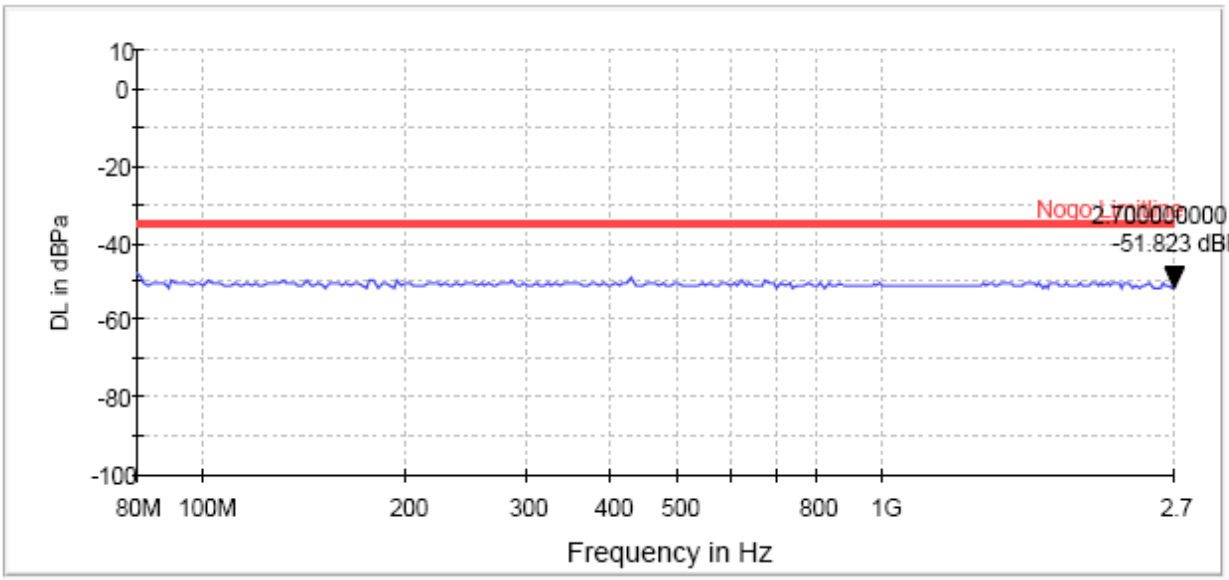
GSM 900 connected with earphone:

Horizontal:

Downlink:



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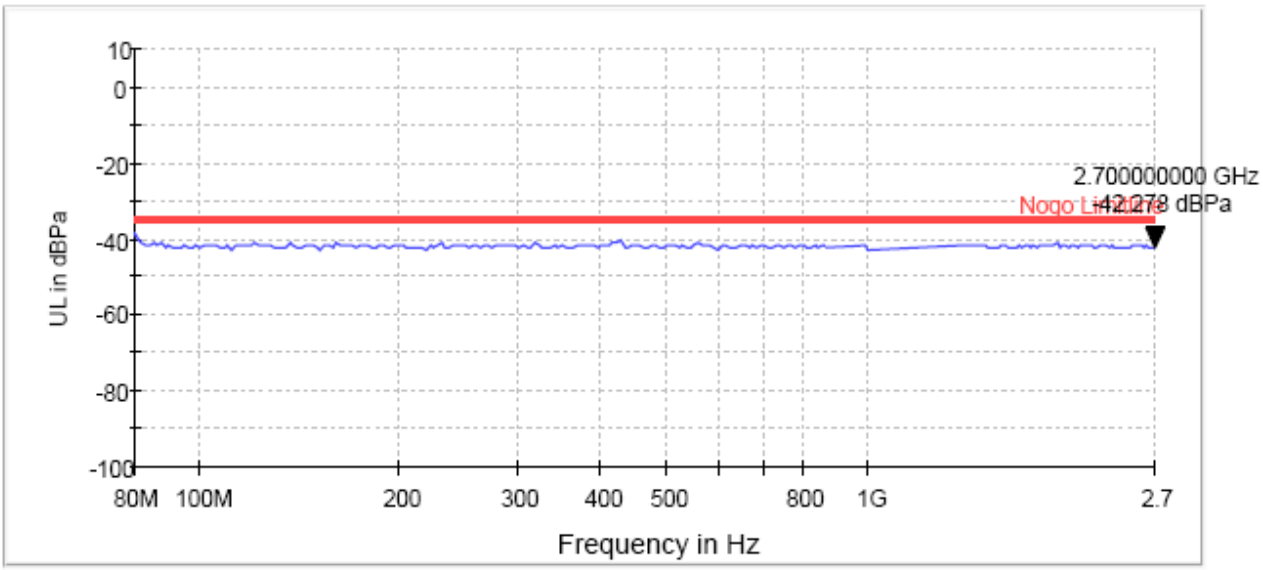

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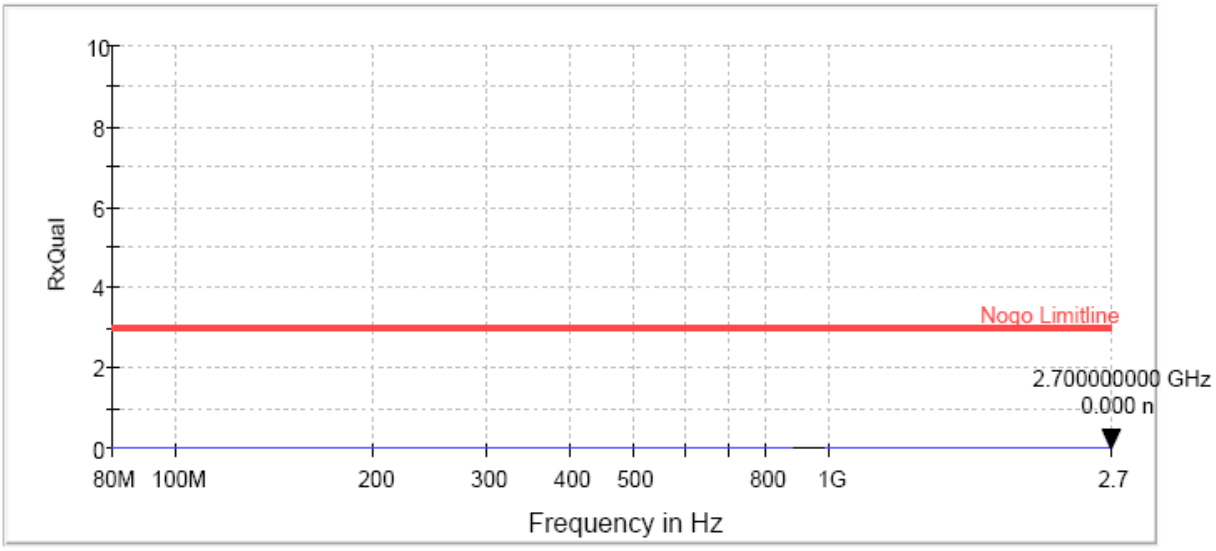
RXQUAL:



Vertical:

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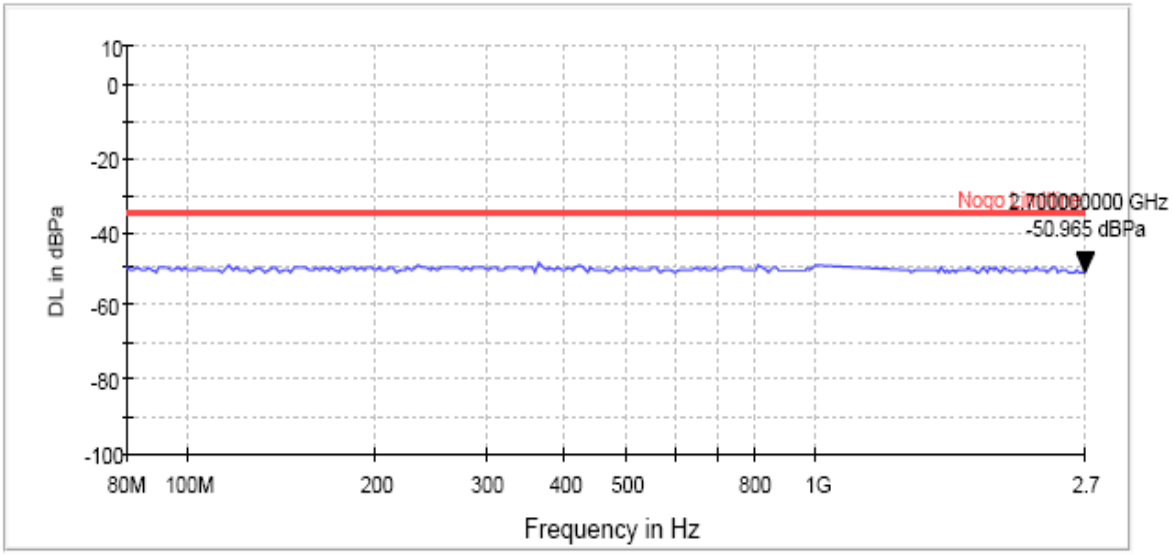

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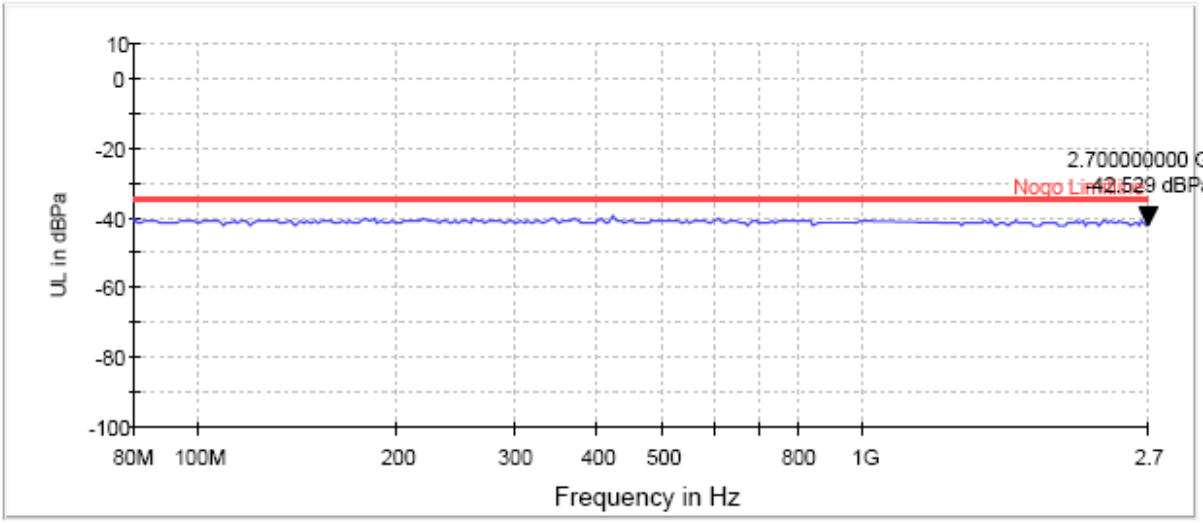

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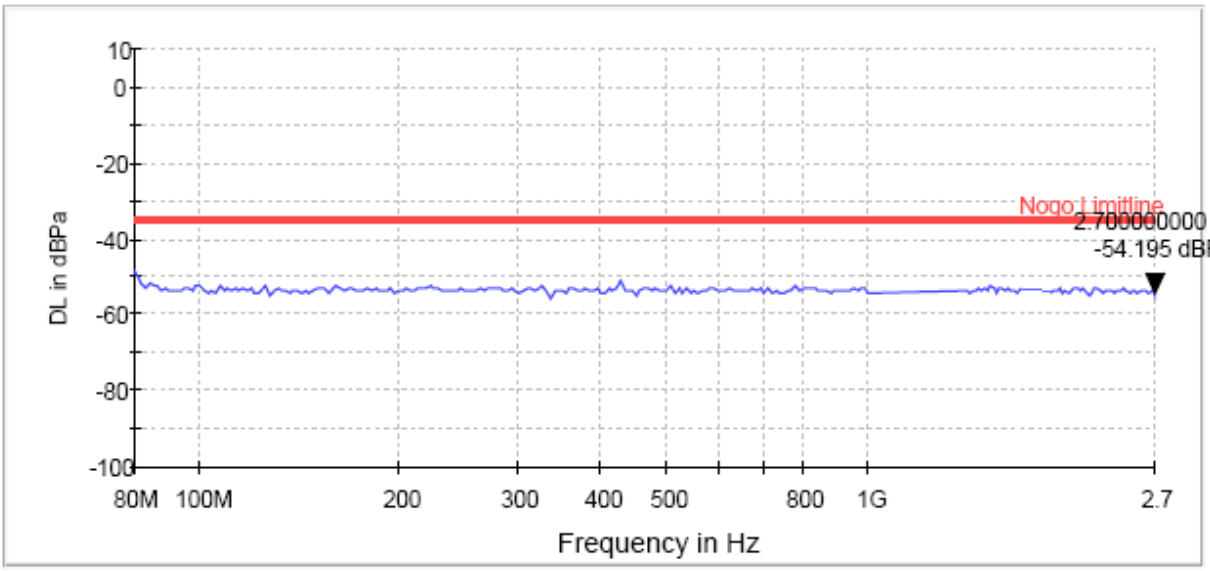
GSM 1800 mode

Horizontal:

Downlink:



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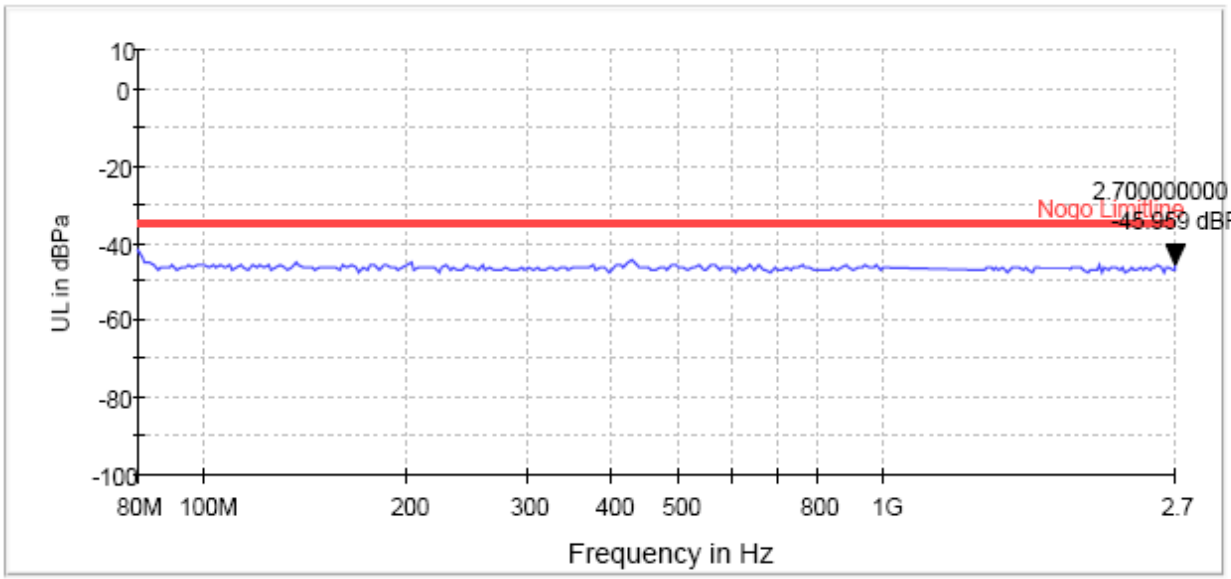

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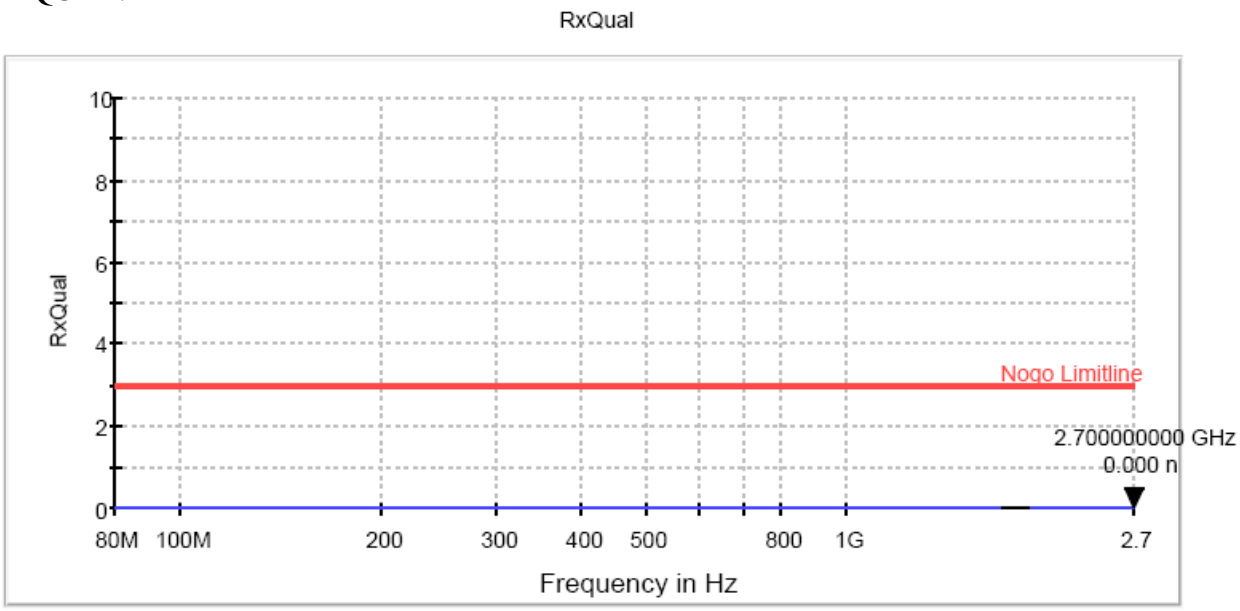

Vertical:

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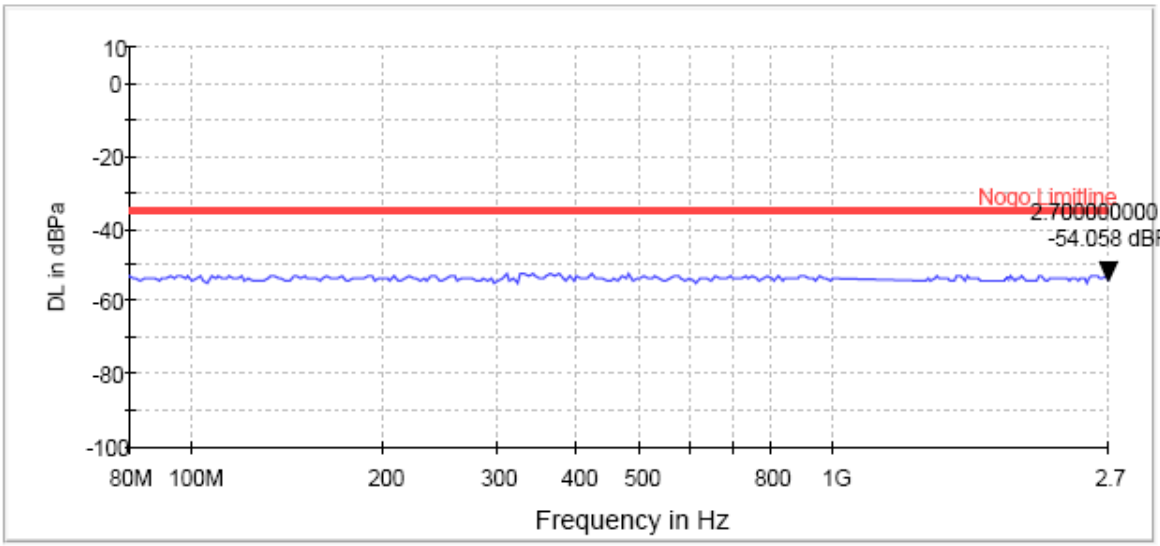

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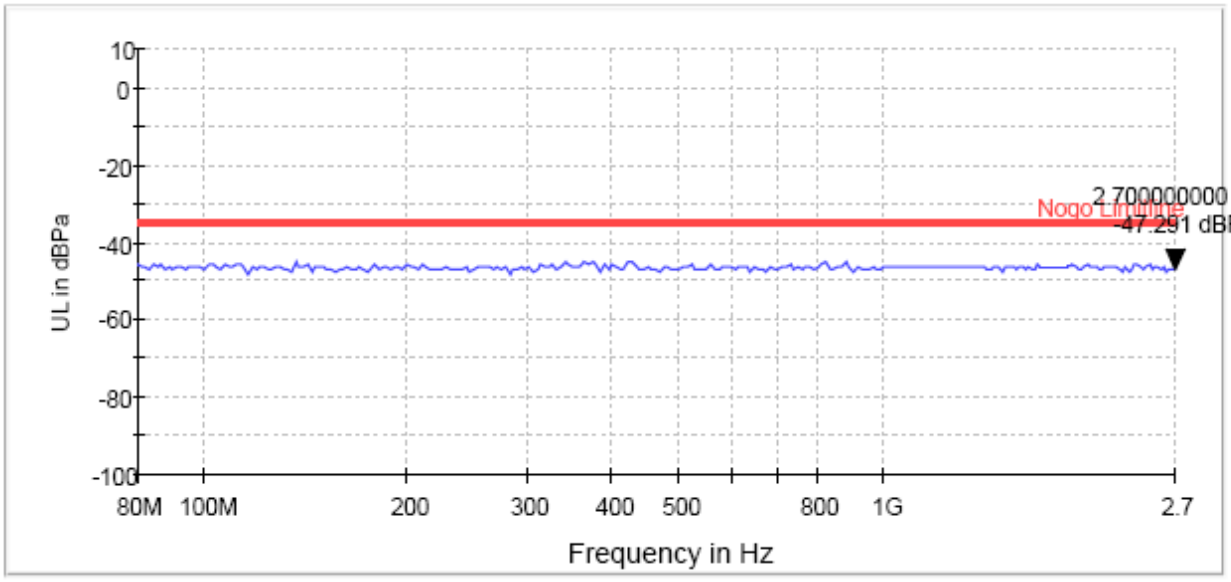

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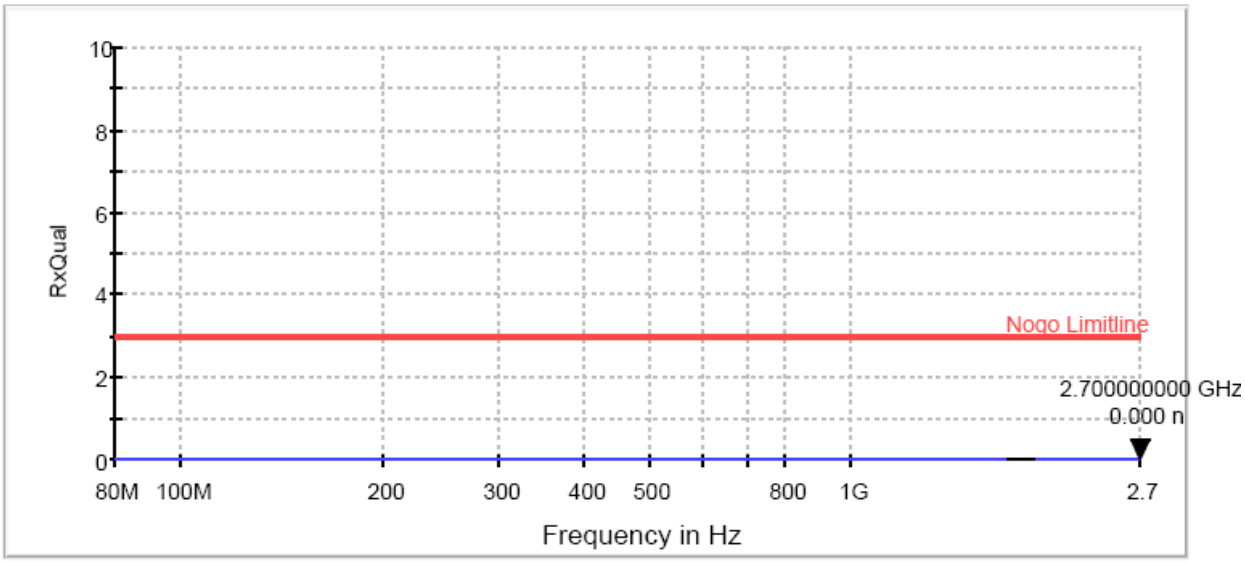

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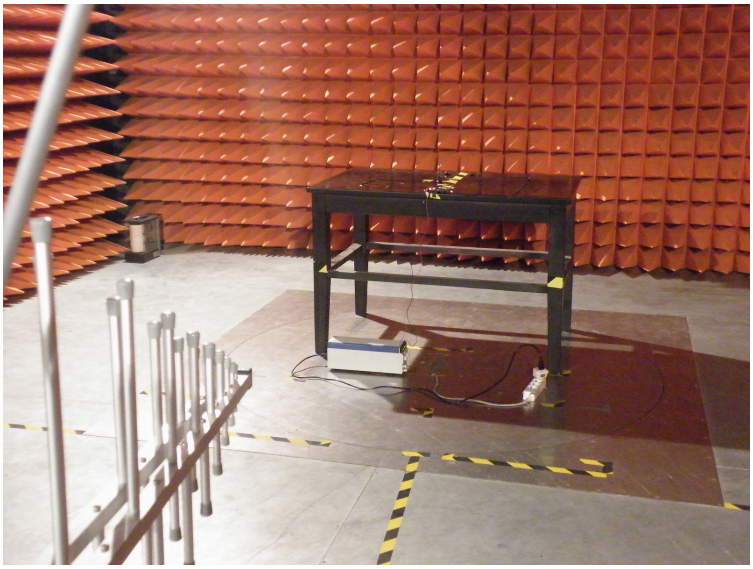
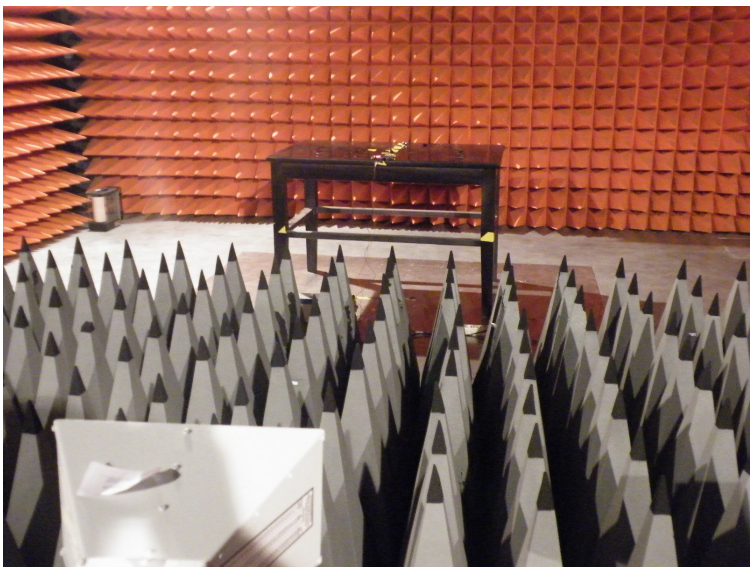
8 EQUIPMENT UNDER TEST PICTURES

8.1.1 Radiated Emission Test Setup

30M-1GHz



1G-6GHz



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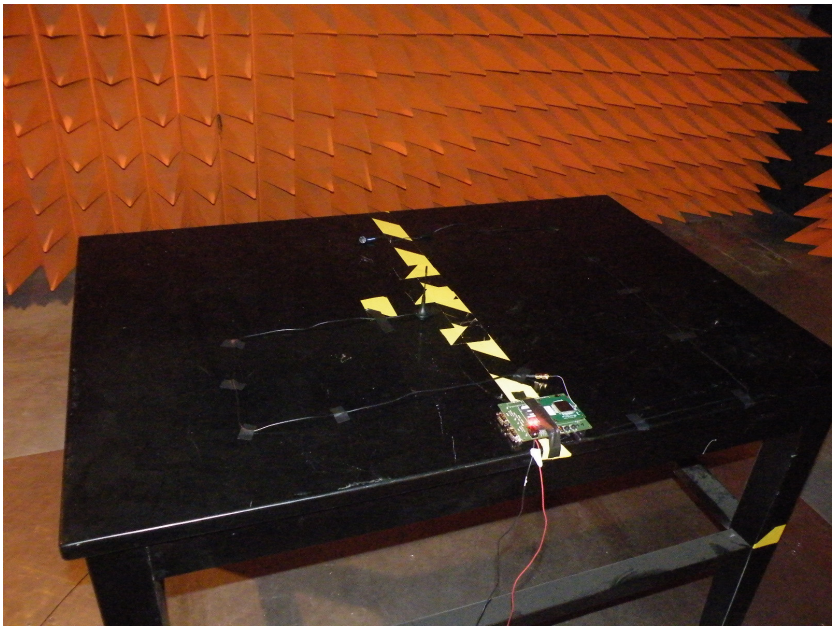

8.1.2 ESD Test Setup

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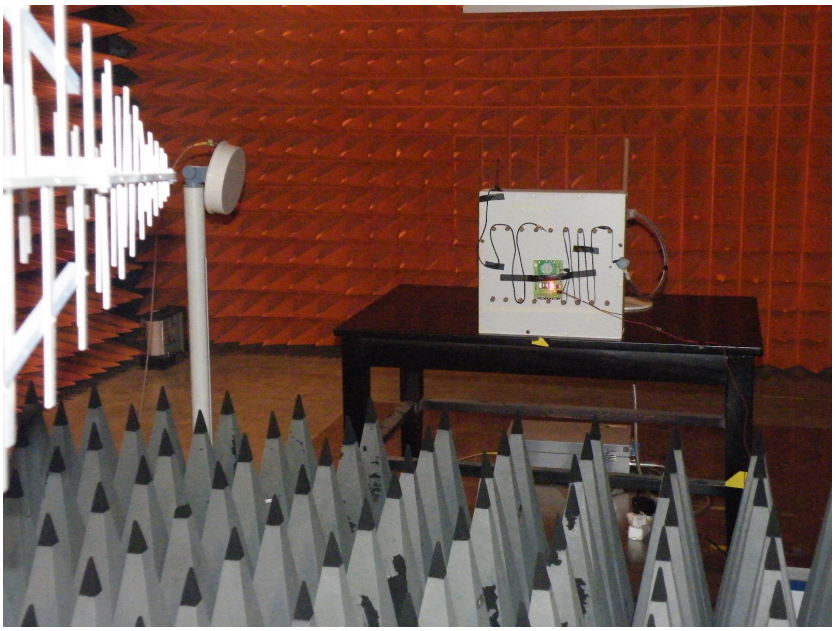
8.1.3 Radiated Immunity Test Setup



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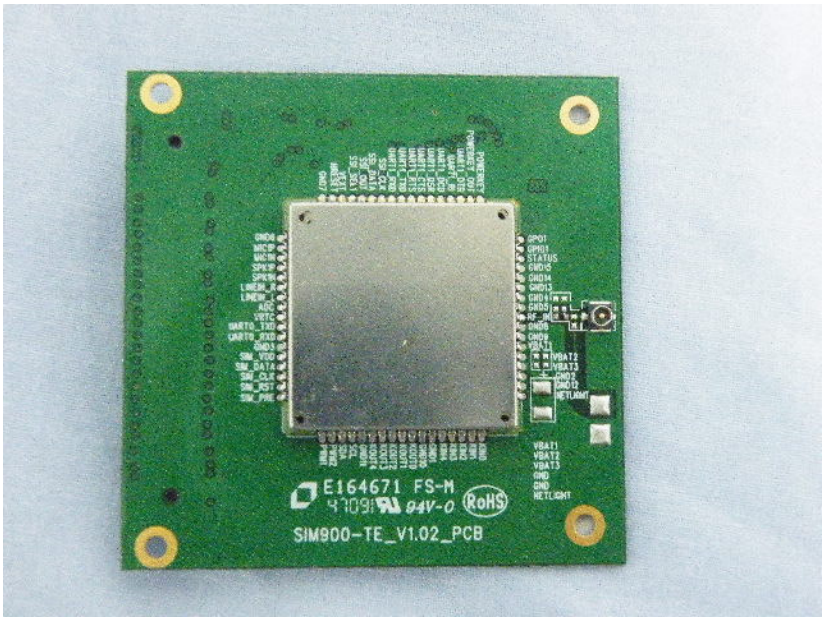
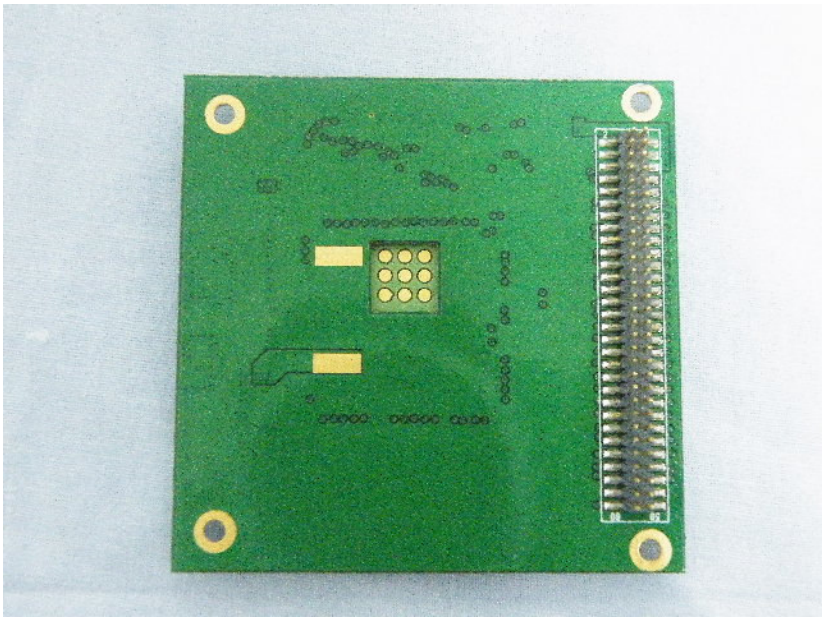
8.1.4 EUT Constructional Details





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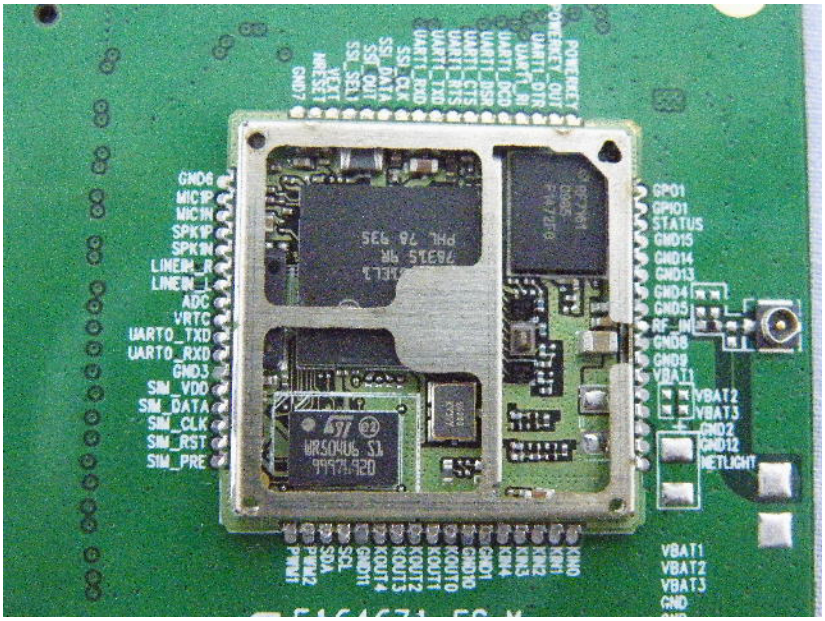

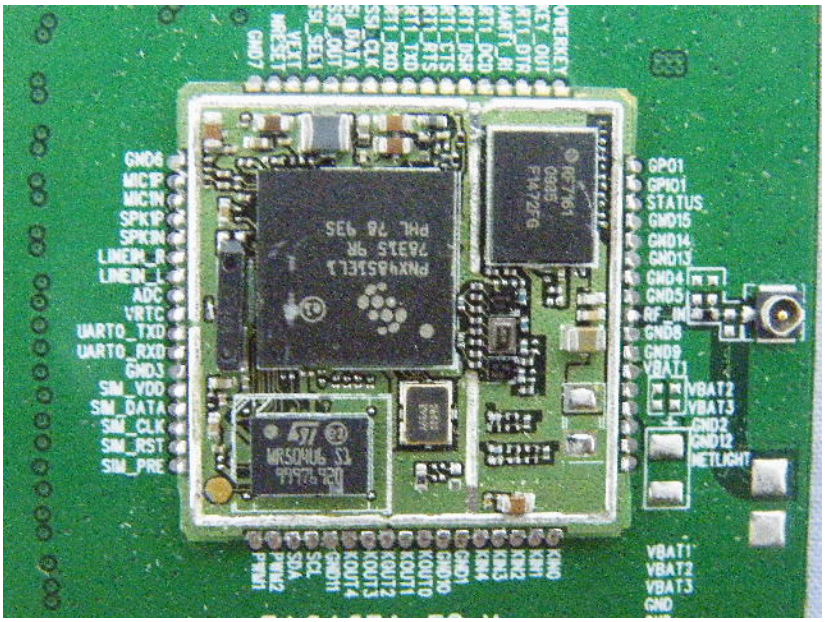

The end of report