

FCC Part 15C

Measurement and Test Report

For

MACATE GROUP CORPORATION

3401 SW 160th AVENUE, SUITE 430, MIRAMAR/FLORIDA, USA

FCC ID: 2AGMA-SGB1G

FCC Rule(s): FCC Part 15.247

Product Description: 4G-LTE Smartphone

Tested Model: SGB1G-W

Report No.: STR15118239I-5

Tested Date: 2015-12-03 to 2015-12-07

Issued Date: 2015-12-08

Tested By: Silin Chen / EMC Manager

Silin chen

Reviewed By: Suan Su / Engineer

Suan Su

Approved & Authorized By: Jandy So / PSQ Manager

Jandyso

Prepared By:

Shenzhen SEM.Test Technology Co., Ltd.

1/F, Building A, Hongwei Industrial Park, Liuxian 2nd Road,
Bao'an District, Shenzhen, P.R.C. (518101)

Tel.: +86-755-33663308 Fax.: +86-755-33663309 Website: www.semtest.com.cn

Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by Shenzhen SEM.Test Technology Co., Ltd.

TABLE OF CONTENTS

1. GENERAL INFORMATION.....	3
1.2 TEST STANDARDS.....	4
1.3 TEST METHODOLOGY.....	4
1.4 TEST FACILITY.....	4
1.5 EUT SETUP AND TEST MODE.....	5
1.6 TEST EQUIPMENT LIST AND DETAILS.....	5
2. SUMMARY OF TEST RESULTS.....	6
3. RF EXPOSURE.....	7
3.1 STANDARD APPLICABLE.....	7
3.2 TEST RESULT.....	7
4. ANTENNA REQUIREMENT.....	8
4.1 STANDARD APPLICABLE.....	8
4.2 EVALUATION INFORMATION.....	8
5. POWER SPECTRAL DENSITY.....	9
5.1 STANDARD APPLICABLE.....	9
5.2 TEST PROCEDURE.....	9
5.3 ENVIRONMENTAL CONDITIONS.....	9
5.4 SUMMARY OF TEST RESULTS/PLOTS.....	9
6. 6DB BANDWIDTH.....	12
6.1 STANDARD APPLICABLE.....	12
6.2 TEST PROCEDURE.....	12
6.3 ENVIRONMENTAL CONDITIONS.....	12
6.4 SUMMARY OF TEST RESULTS/PLOTS.....	12
7. RF OUTPUT POWER.....	15
7.1 STANDARD APPLICABLE.....	15
7.2 TEST PROCEDURE.....	15
7.3 ENVIRONMENTAL CONDITIONS.....	15
7.4 SUMMARY OF TEST RESULTS/PLOTS.....	15
8. FIELD STRENGTH OF SPURIOUS EMISSIONS.....	16
8.1 MEASUREMENT UNCERTAINTY.....	16
8.2 STANDARD APPLICABLE.....	16
8.3 TEST PROCEDURE.....	16
8.4 CORRECTED AMPLITUDE & MARGIN CALCULATION.....	18
8.5 ENVIRONMENTAL CONDITIONS.....	18
8.6 SUMMARY OF TEST RESULTS/PLOTS.....	18
9. OUT OF BAND EMISSIONS.....	26
9.1 STANDARD APPLICABLE.....	26
9.2 TEST PROCEDURE.....	26
9.3 ENVIRONMENTAL CONDITIONS.....	27
9.4 SUMMARY OF TEST RESULTS/PLOTS.....	27
10. CONDUCTED EMISSIONS.....	29
10.1 MEASUREMENT UNCERTAINTY.....	29
10.2 TEST PROCEDURE.....	29
10.3 BASIC TEST SETUP BLOCK DIAGRAM.....	29
10.4 ENVIRONMENTAL CONDITIONS.....	29
10.5 TEST RECEIVER SETUP.....	30
10.6 SUMMARY OF TEST RESULTS/PLOTS.....	30
10.7 CONDUCTED EMISSIONS TEST DATA.....	30

1. GENERAL INFORMATION

Client Information

Applicant: MACATE GROUP CORPORATION
Address of applicant: 3401 SW 160th AVENUE, SUITE 430,
MIRAMAR/FLORIDA, USA

Manufacturer: COOSEA GROUP(HK) COMPANY LIMITED
Address of manufacturer: UNIT 5-6 16F MULTIFIELD PLAZA 3-7A PRAT
AVENUE TSIM SHA TSUI KL HONGKONG

General Description of EUT	
Product Name:	4G-LTE Smartphone
Trade Name:	BELÉCI
Model No.:	SGB1G-W
Adding Model(s):	SGB1G-BL
Hardware Version:	V12
Software Version:	KD7LE22A.L1.ORIGINAL.SW.AM.SZ.V0.05
IMEI:	356590470001351/356590470001369
Rated Voltage:	Battery: DC 3.8V(8.17Wh)
Power Adaptor:	Model: A88A-120130U-US1
	INPUT: AC100-240V 50/60Hz,0.5A OUTPUT: DC5V/2A, DC9V/1.8A, DC12V/1.3A
<i>Note: The test data is gathered from a production sample provided by the manufacturer. The appearance of others models listed in the report is different from main-test model SGB1G-W, but the circuit and the electronic construction do not change, declared by the manufacturer.</i>	

Technical Characteristics of EUT	
Bluetooth Version:	V4.0(BLE mode)
Frequency Range:	2402-2480MHz
RF Output Power:	3dBm (Conducted)
Data Rate:	25Mbps
Modulation:	GFSK
Quantity of Channels:	40
Channel Separation:	2MHz
Type of Antenna:	Integral Antenna
Antenna Gain:	1.0dBi

1.2 Test Standards

The following report is prepared on behalf of the MACATE GROUP CORPORATION in accordance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 of the Federal Communication Commissions rules.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard for Testing Unlicensed Wireless Devices, and ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz. The measurement guide KDB 558074 D01 V03r03 for digital transmission systems shall be performed also.

1.4 Test Facility

FCC – Registration No.: 934118

Shenzhen SEM.Test Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files and the Registration is 934118.

Industry Canada (IC) Registration No.: 11464A

The 3m Semi-anechoic chamber of Shenzhen SEM.Test Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.

CNAS Registration No.: L4062

Shenzhen SEM.Test Technology Co., Ltd. is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L4062. All measurement facilities used to collect the measurement data are located at 1/F, Building A, Hongwei Industrial Park, Liuxian 2nd Road, Bao'an District, Shenzhen, P.R.C (518101).

1.5 EUT Setup and Test Mode

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. All testing shall be performed under maximum output power condition, and to measure its highest possible emissions level, more detailed description as follows:

Test Mode List		
Test Mode	Description	Remark
TM1	GFSK(BLE)	2402MHz, 2442MHz, 2480MHz

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
Earphone Cable	1.3	Unshielded	Without Core
USB Cable	1.0	Shielded	Without Core

Special Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
Notebook	Lenovo	E10	LR-63C8R

1.6 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal Date	Due Date
Spectrum Analyzer	Agilent	E4407B	MY41440400	2015-06-17	2016-06-16
Spectrum Analyzer	Rohde & Schwarz	FSP	836079/035	2015-06-17	2016-06-16
EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2015-06-17	2016-06-16
Amplifier	Agilent	8447F	3113A06717	2015-06-17	2016-06-16
Amplifier	C&D	PAP-1G18	2002	2015-06-17	2016-06-16
Broadband Antenna	Schwarz beck	VULB9163	9163-333	2015-06-17	2016-06-16
Horn Antenna	ETS	3117	00086197	2015-06-17	2016-06-16
Horn Antenna	ETS	3116B	00088203	2015-06-17	2016-06-16
Loop Antenna	Schwarz beck	FMZB 1516	9773	2015-06-17	2016-06-16
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2015-06-17	2016-06-16
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2015-06-17	2016-06-16
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2015-06-17	2016-06-16

2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test Item	Result
§ 2.1093	RF Exposure	Compliant
§ 15.203; § 15.247(b)(4)(i)	Antenna Requirement	Compliant
§ 15.207(a)	Conducted Emission	Compliant
§ 15.247(e)	Power Spectral Density	Compliant
§ 15.247(a)(2)	6 dB Bandwidth	Compliant
§ 15.247(b)(3)	RF Output Power	Compliant
§ 15.209(a)	Radiated Emission	Compliant
§ 15.247(d)	Band Edge (Out of Band Emissions)	Compliant

N/A: not applicable

3. RF Exposure

3.1 Standard Applicable

According to § 1.1307 and § 2.1093, the portable transmitter must comply the RF exposure requirements.

3.2 Test Result

This product complied with the requirement of the RF exposure, please see the SAR Report.

4. Antenna Requirement

4.1 Standard Applicable

According to FCC Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

4.2 Evaluation Information

This product has an Integral Antenna, fulfill the requirement of this section.

5. Power Spectral Density

5.1 Standard Applicable

According to 15.247(a)(1)(iii), For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

5.2 Test Procedure

According to the KDB 558074 D01 V03r03, the test method of power spectral density as below:

- Set analyzer center frequency to DTS channel center frequency.
- Set the span to 1.5 times the DTS bandwidth.
- Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- Set the VBW $\geq 3 \times \text{RBW}$.
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum amplitude level within the RBW.
- If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

5.3 Environmental Conditions

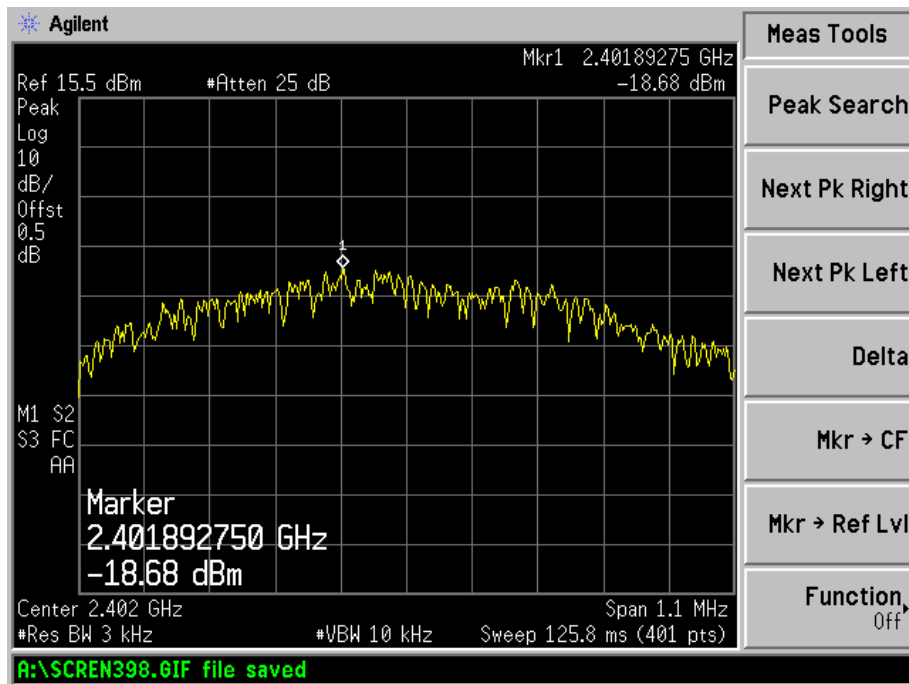
Temperature:	26° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

5.4 Summary of Test Results/Plots

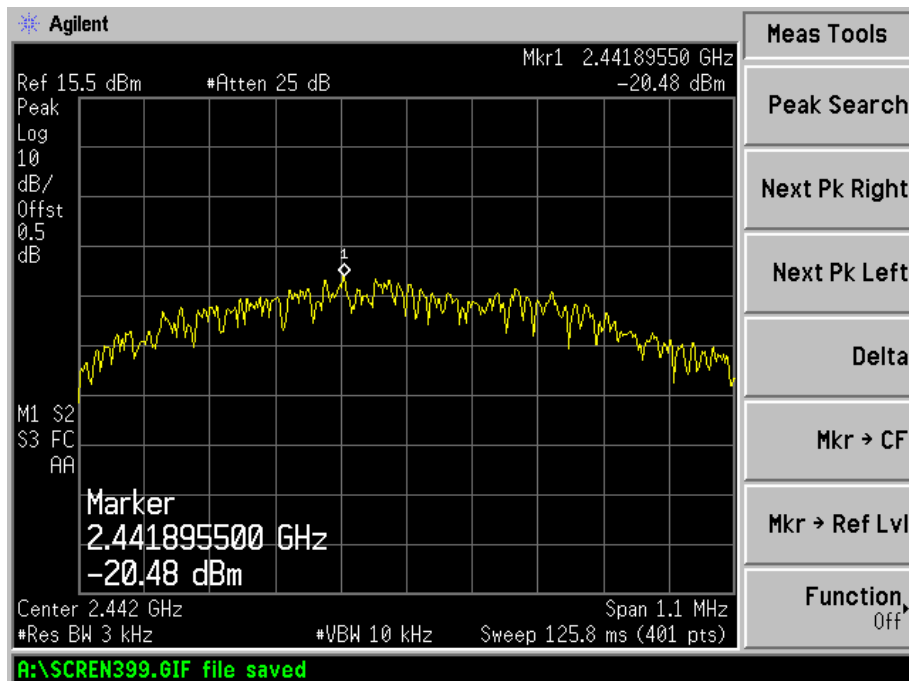
Test Mode	Test Channel MHz	Power Spectral Density dBm/3kHz	Limit dBm/3kHz
GFSK(BLE)	2402	-18.68	8
	2442	-20.48	8
	2480	-21.14	8

Please refer to the following test plots:

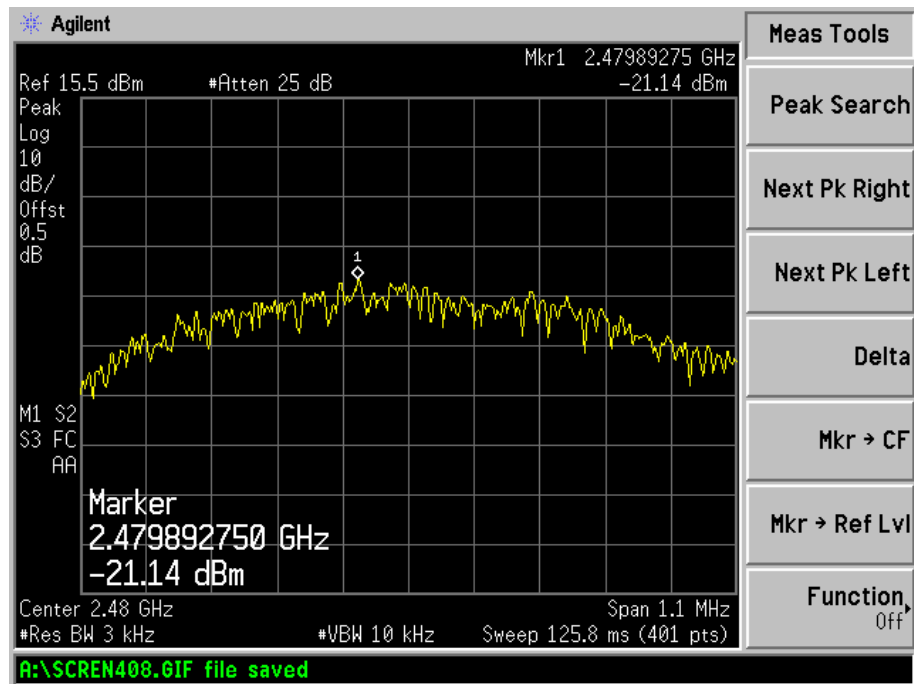
Low Channel



Middle Channel



High Channel



6. 6dB Bandwidth

6.1 Standard Applicable

According to 15.247(a)(2). Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

6.2 Test Procedure

- a) Set RBW = 100 kHz.
- b) Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.
- g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

6.3 Environmental Conditions

Temperature:	25° C
Relative Humidity:	53%
ATM Pressure:	1018 mbar

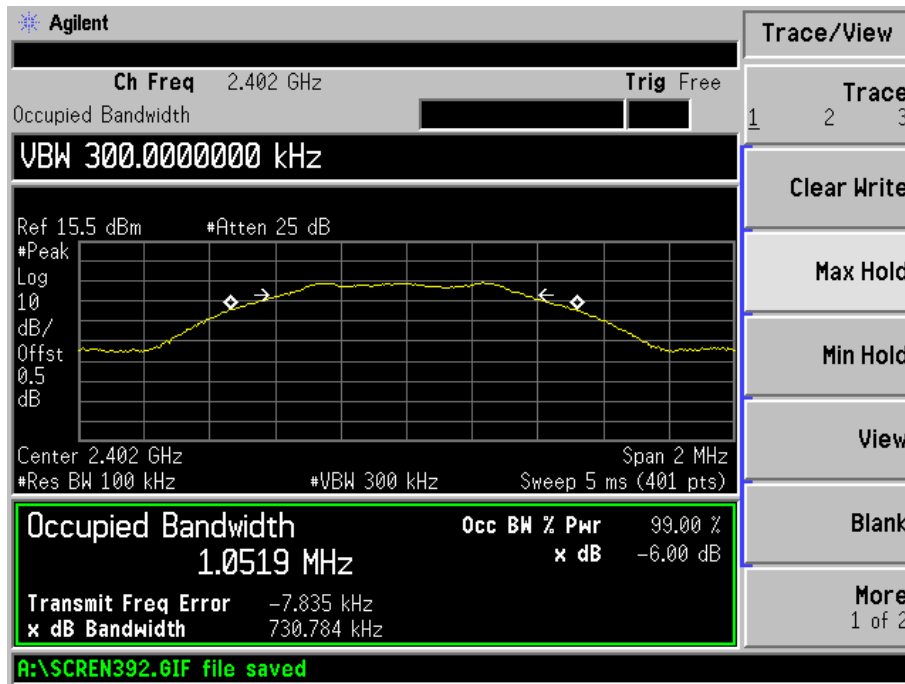
6.4 Summary of Test Results/Plots

Test Mode	Test Channel MHz	6 dB Bandwidth kHz	99% Bandwidth kHz	Limit kHz
GFSK(BLE)	2402	730.784	1051.9	>500
	2442	733.969	1051.4	>500
	2480	732.783	1050.3	>500

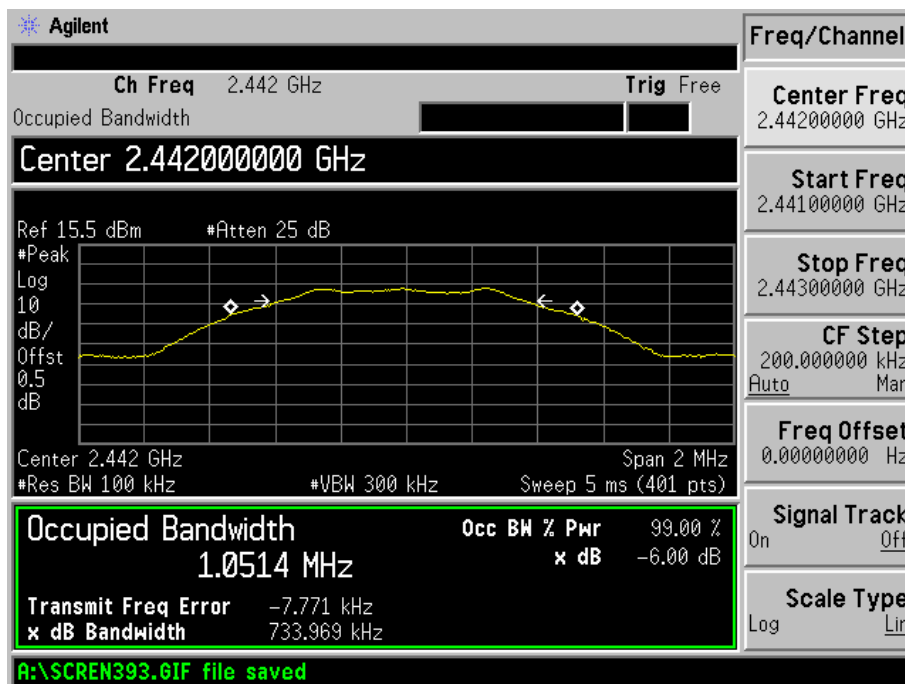
Please refer to the following test plots:

For BLE

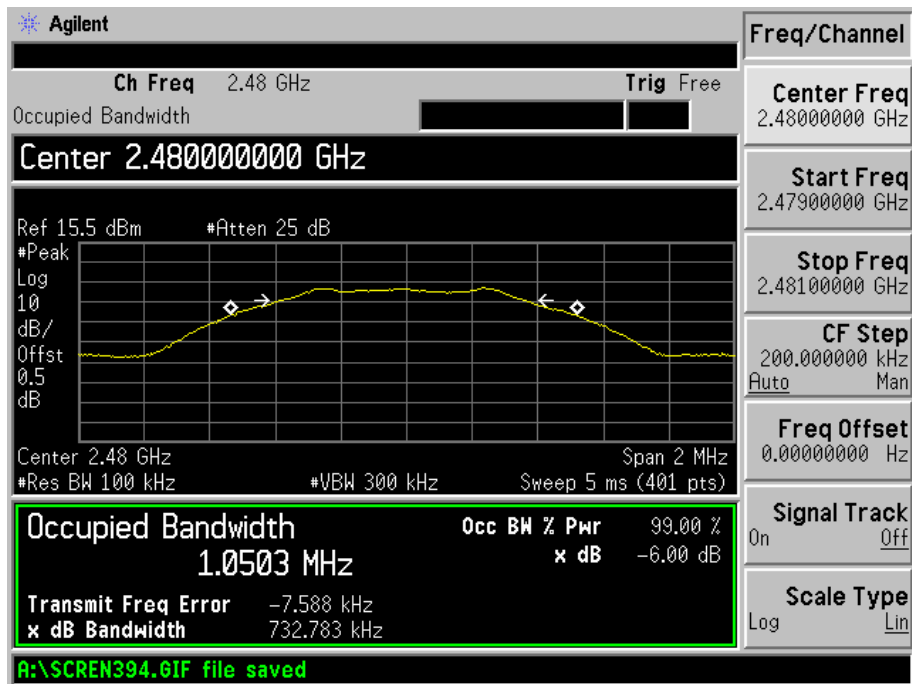
Low Channel:



Middle Channel:



High Channel:



7. RF Output Power

7.1 Standard Applicable

According to 15.247(b)(3). For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt.

7.2 Test Procedure

According to section 15.247(b)-power output of the KDB-558074 D01 V03r03 section 9.1.1, this procedure shall be used when the measurement instrument has available a resolution bandwidth that is greater than the DTS bandwidth.

- a) Set the RBW $\geq$ DTS bandwidth.
- b) Set VBW $\geq 3 \times$ RBW.
- c) Set span $\geq 3 \times$ RBW
- d) Sweep time = auto couple.
- e) Detector = peak.
- f) Trace mode = max hold.
- g) Allow trace to fully stabilize.
- h) Use peak marker function to determine the peak amplitude level.

7.3 Environmental Conditions

Temperature:	26° C
Relative Humidity:	57%
ATM Pressure:	1011 mbar

7.4 Summary of Test Results/Plots

Test Mode	Frequency MHz	Reading dBm	Output Power mW	Limit mW
GFSK(BLE)	2402	-4.760	0.334	1000
	2442	-5.277	0.297	1000
	2480	-5.205	0.302	1000

Note: the antenna gain of 1.0dBi less than 6dBi maximum permission antenna gain value based on 1 watt peak output power limit.

8. Field Strength of Spurious Emissions

8.1 Measurement Uncertainty

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement is ± 5.10 dB.

8.2 Standard Applicable

According to §15.247(d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

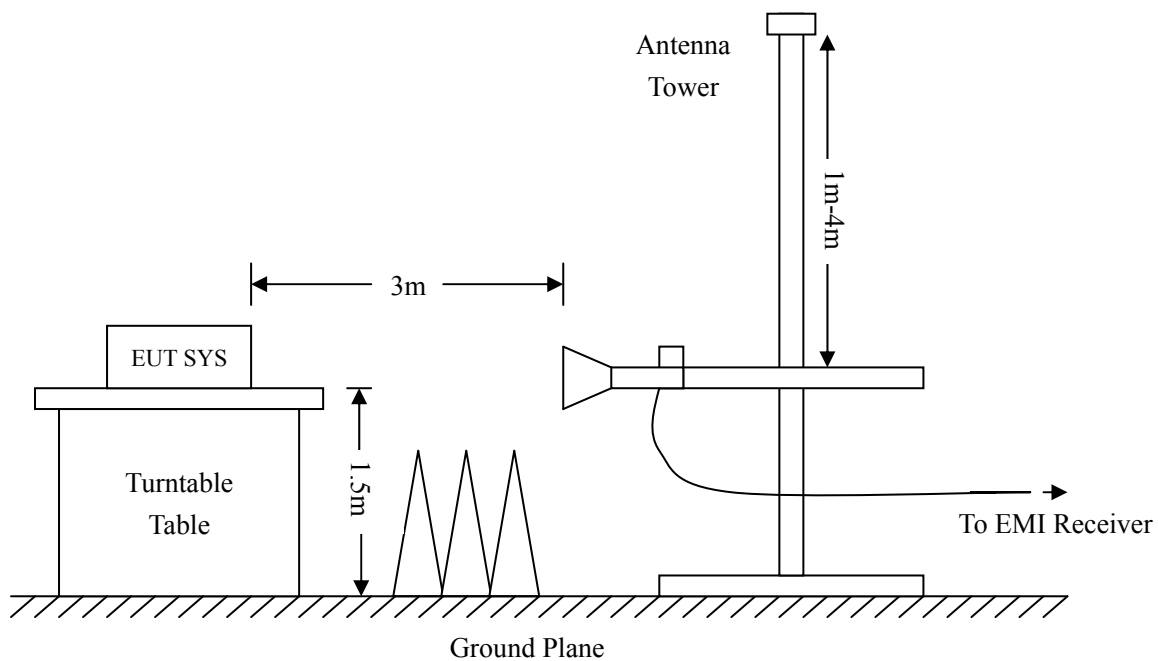
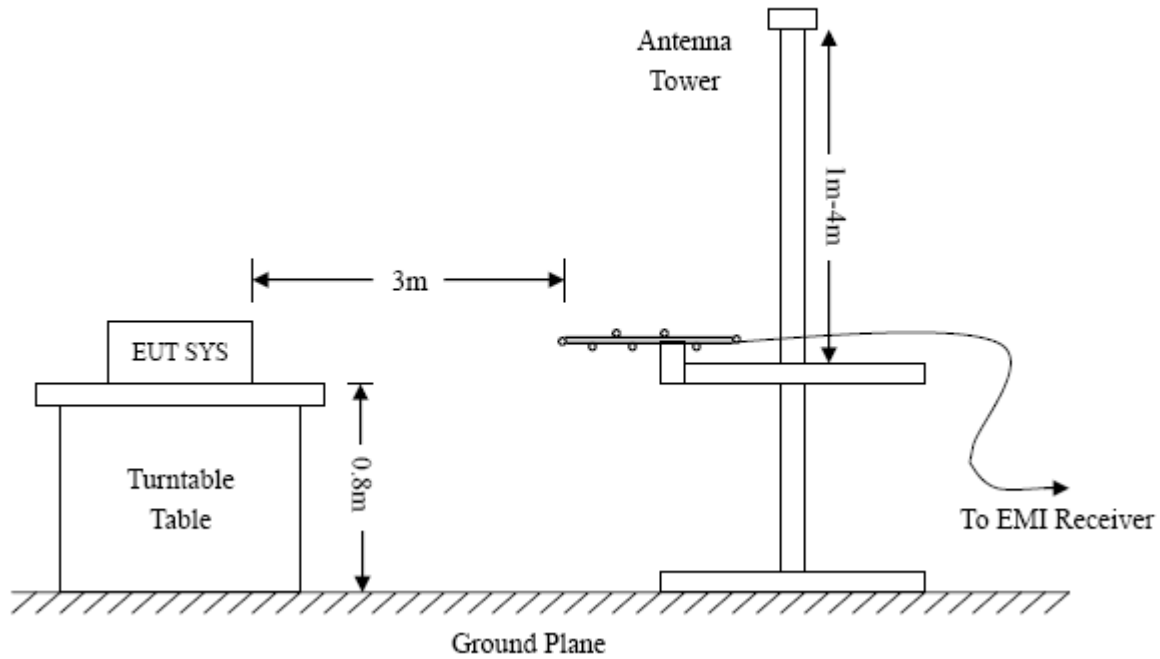
The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply. Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

8.3 Test Procedure

The setup of EUT is according with per ANSI C63.4-2014 measurement procedure. The specification used was with the FCC Part 15.205 15.247(a) and FCC Part 15.209 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.



Frequency :9kHz-30MHz
 RBW=10KHz,
 VBW =30KHz
 Sweep time= Auto
 Trace = max hold
 Detector function = peak

Frequency :30MHz-1GHz
 RBW=120KHz,
 VBW=300KHz
 Sweep time= Auto
 Trace = max hold
 Detector function = peak, QP

Frequency :Above 1GHz
 RBW=1MHz,
 VBW=3MHz(Peak), 10Hz(AV)
 Sweep time= Auto
 Trace = max hold
 Detector function = peak, AV

8.4 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Ant. Factor} + \text{Cable Loss} - \text{Ampl. Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dB μ V means the emission is 6dB μ V below the maximum limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15 Limit}$$

8.5 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52%
ATM Pressure:	1012 mbar

8.6 Summary of Test Results/Plots

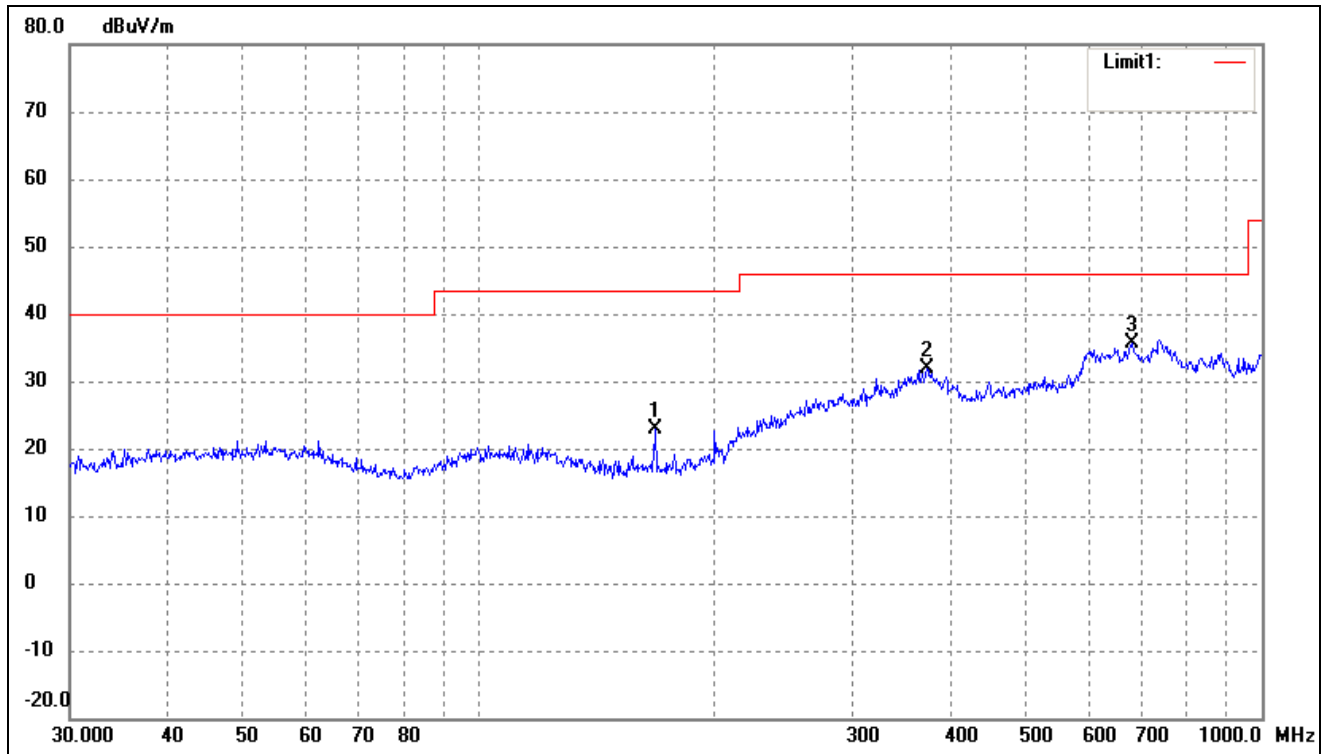
According to the data below, the FCC Part 15.205, 15.209 and 15.247 standards, and had the worst cases:

Note: this EUT was tested in 3 orthogonal positions and the worst case position (Vertical) data was reported.

Plot of Radiated Emissions Test Data

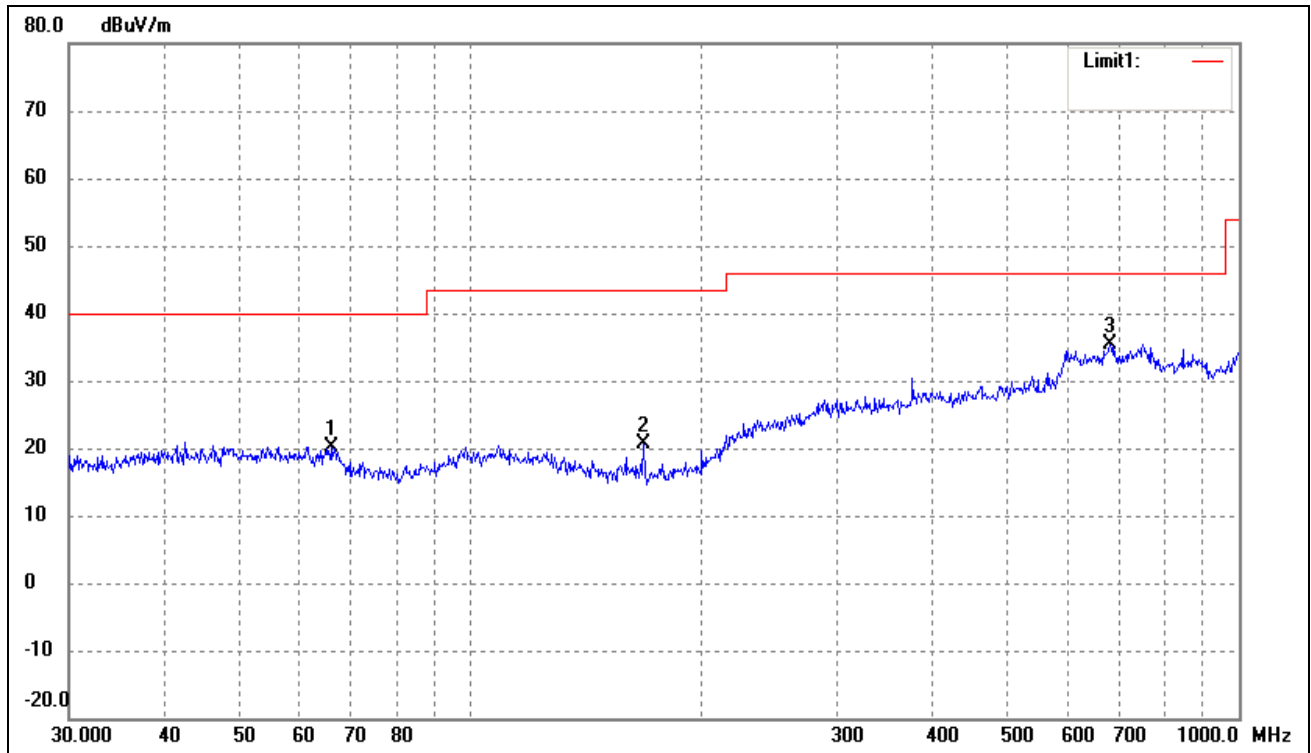
EUT: 4G-LTE Smartphone
 Tested Model: SGB1G-W
 Operating Condition: Transmitting-Low channel (2402MHz)
 Comment: Battery DC3.8V

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	167.8243	20.29	2.67	22.96	43.50	-20.54	310	100	QP
2	373.3112	19.76	12.22	31.98	46.00	-14.02	26	100	QP
3	682.3484	16.55	19.08	35.63	46.00	-10.37	54	100	QP

Test Specification: Vertical

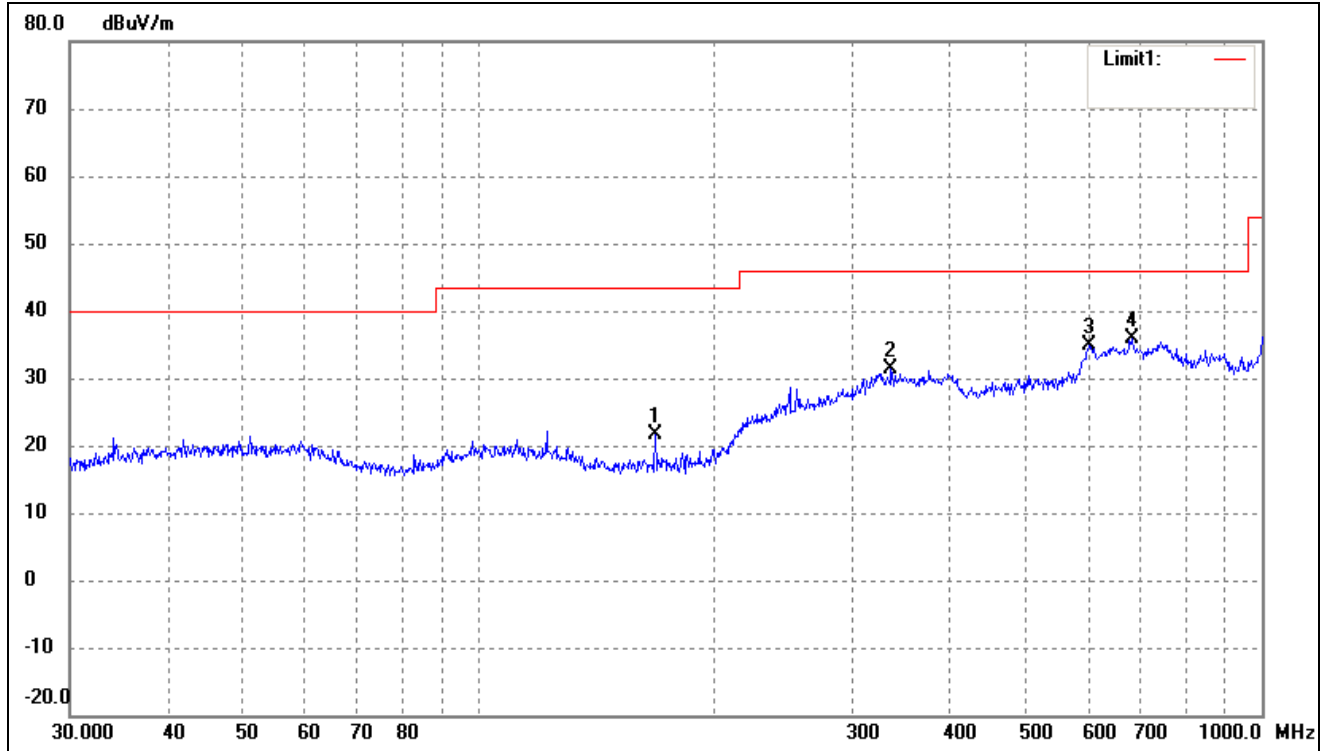


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	65.8031	16.08	4.10	20.18	40.00	-19.82	185	100	QP
2	167.8243	18.02	2.67	20.69	43.50	-22.81	206	100	QP
3	679.9600	16.07	19.26	35.33	46.00	-10.67	164	100	QP

Plot of Radiated Emissions Test Data

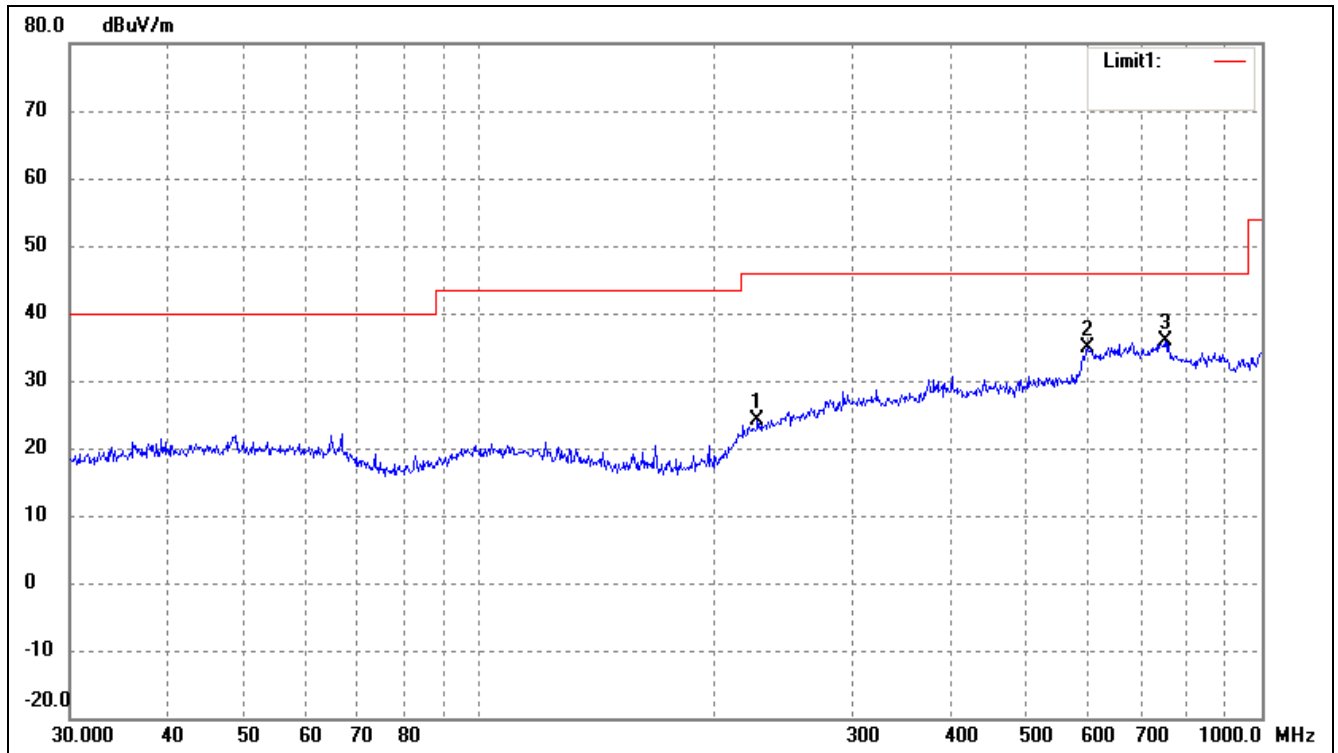
EUT: 4G-LTE Smartphone
 Tested Model: SGB1G-W
 Operating Condition: Transmitting-Low channel (2442MHz)
 Comment: Battery DC3.8V

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	167.8243	18.87	2.67	21.54	43.50	-21.96	175	100	QP
2	336.0352	19.46	11.84	31.30	46.00	-14.70	156	100	QP
3	601.4265	15.69	19.22	34.91	46.00	-11.09	201	100	QP
4	682.3484	16.69	19.08	35.77	46.00	-10.23	79	100	QP

Test Specification: Vertical

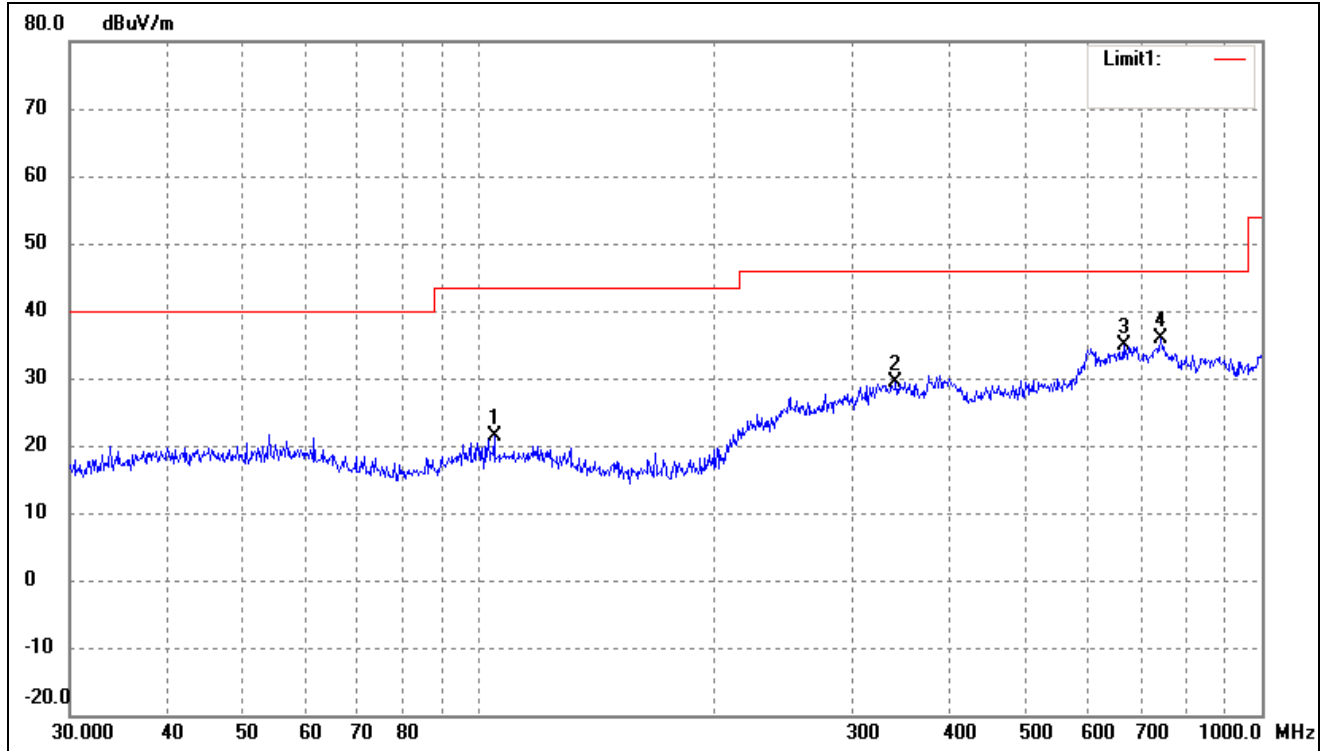


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	226.8936	15.56	8.53	24.09	46.00	-21.91	155	100	QP
2	599.3213	15.66	19.19	34.85	46.00	-11.15	201	100	QP
3	752.7432	16.79	18.98	35.77	46.00	-10.23	321	100	QP

Plot of Radiated Emissions Test Data

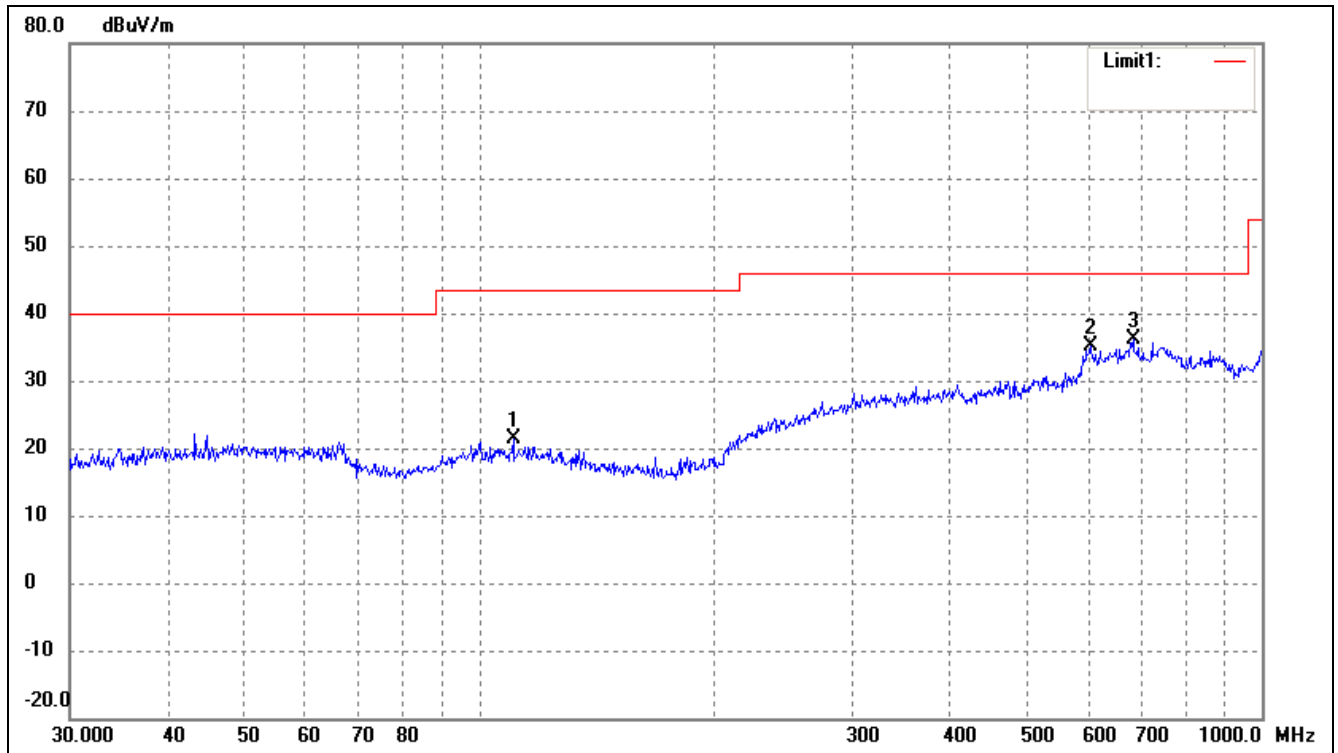
EUT: 4G-LTE Smartphone
 Tested Model: SGB1G-W
 Operating Condition: Transmitting-Low channel (2480MHz)
 Comment: Battery DC3.8V

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	104.5361	16.22	5.10	21.32	43.50	-22.18	15	100	QP
2	340.7817	17.56	11.74	29.30	46.00	-16.70	351	100	QP
3	665.8035	16.40	18.46	34.86	46.00	-11.14	23	100	QP
4	742.2587	16.42	19.45	35.87	46.00	-10.13	65	100	QP

Test Specification: Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	110.5687	16.21	5.07	21.28	43.50	-22.22	65	100	QP
2	603.5392	16.08	19.06	35.14	46.00	-10.86	12	100	QP
3	684.7454	17.23	18.91	36.14	46.00	-9.86	323	100	QP

Spurious Emissions Above 1GHz

Transmitting: BLE mode:

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel-2402MHz							
4804	61.09	0.53	61.62	74.00	-12.38	H	PK
4804	38.38	0.53	38.91	54.00	-15.09	H	AV
7206	58.07	3.66	61.73	74.00	-12.27	H	PK
7206	40.4	3.66	44.06	54.00	-9.94	H	AV
4804	60.78	0.53	61.31	74.00	-12.69	V	PK
4804	39.19	0.53	39.72	54.00	-14.28	V	AV
7206	58.81	3.66	62.47	74.00	-11.53	V	PK
7206	40.72	3.66	44.38	54.00	-9.62	V	AV
Middle Channel-2442MHz							
4884	59.08	0.66	59.74	74.00	-14.26	H	PK
4884	40.07	0.66	40.73	54.00	-13.27	H	AV
7326	59.37	3.76	63.13	74.00	-10.87	H	PK
7326	39.37	3.76	43.13	54.00	-10.87	H	AV
4884	61.04	0.66	61.7	74.00	-12.3	V	PK
4884	38.78	0.66	39.44	54.00	-14.56	V	AV
7326	58.87	3.76	62.63	74.00	-11.37	V	PK
7326	40.51	3.76	44.27	54.00	-9.73	V	AV
High Channel-2480MHz							
4960	59.16	0.77	59.93	74.00	-14.07	H	PK
4960	40.91	0.77	41.68	54.00	-12.32	H	AV
7440	61.74	3.85	65.59	74.00	-8.41	H	PK
7440	41.82	3.85	45.67	54.00	-8.33	H	AV
4960	58.74	0.77	59.51	74.00	-14.49	V	PK
4960	39.33	0.77	40.1	54.00	-13.9	V	AV
7440	58.81	3.85	62.66	74.00	-11.34	V	PK
7440	40.98	3.85	44.83	54.00	-9.17	V	AV

Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, which above 3th Harmonics are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

The measurements greater than 20dB below the limit from 9kHz to 30MHz and test data are not provided.

9. Out of Band Emissions

9.1 Standard Applicable

According to §15.247 (d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

9.2 Test Procedure

According to the KDB 558074 D01 v03r03, the band-edge radiated test method as follows:

Set span = wide enough to capture the peak level of the emission operating on the channel closest to the bandedge, as well as any modulation products which fall outside of the authorized band of operation (2310MHz to 2420MHz for low bandedge, 2460MHz to 2500MHz for the high bandedge)

RBW = 1MHz, VBW = 1MHz for peak value measured

RBW = 1MHz, VBW = 10Hz for average value measured

Sweep = auto; Detector function = peak/average; Trace = max hold

All the trace to stabilize, set the marker on the emission at the bandedge, or on the highest modulation product outside of the band, if this level is greater than that at the bandedge. Enable the marker-delta function, then use the marker-to-peak function to move the marker to the peak of the in-band emission. Those emission must comply with the 15.209 limit for fall in the restricted bands listed in section 15.205. Note that the method of measurement KDB publication number: 913591 may be used for the radiated bandedge measurements.

According to the KDB 558074 D01 V03r03, the conducted spurious emissions test method as follows:

1. Set start frequency to DTS channel edge frequency.
2. Set stop frequency so as to encompass the spectrum to be examined.
3. Set RBW = 100 kHz.
4. Set VBW $\geq$ 300 kHz.
5. Detector = peak.
6. Trace Mode = max hold.
7. Sweep = auto couple.
8. Allow the trace to stabilize (this may take some time, depending on the extent of the span).
9. Use peak marker function to determine maximum amplitude of all unwanted emissions within any 100 kHz bandwidth.

Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements specified in section 8.1. Report the three highest emissions relative to the limit.

9.3 Environmental Conditions

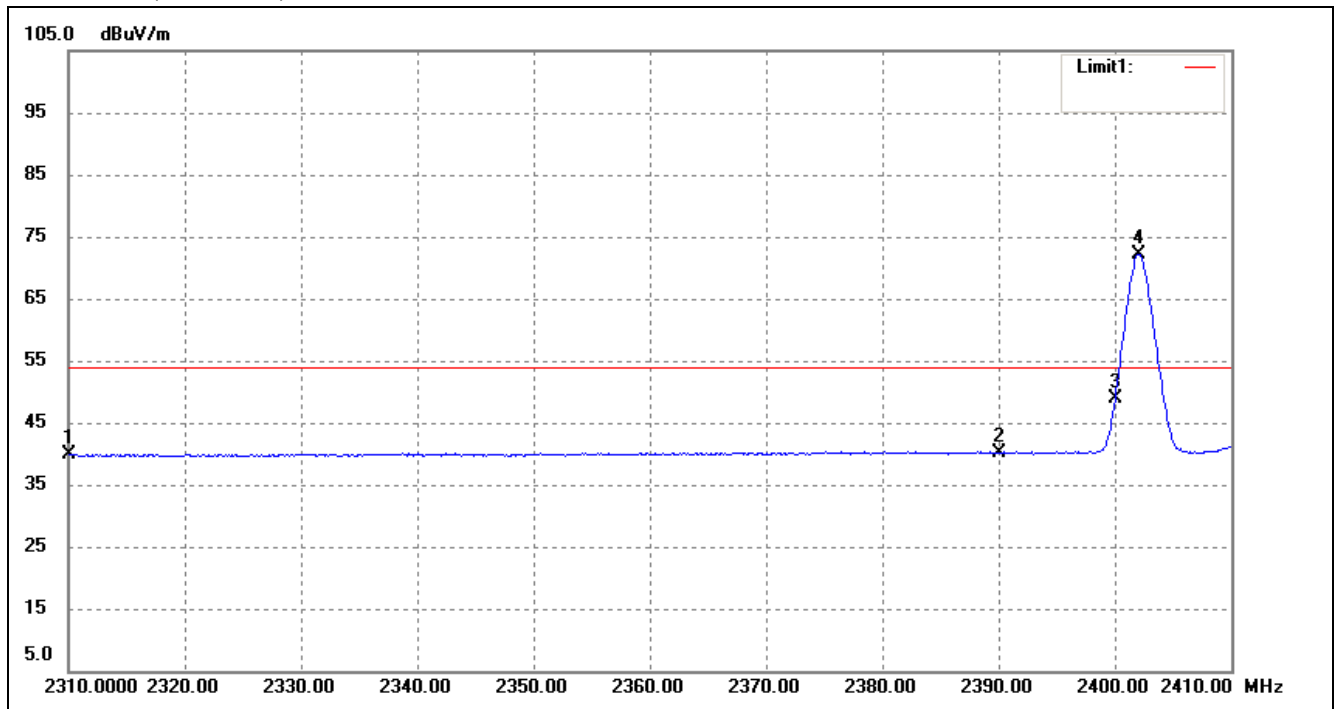
Temperature:	23°C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

9.4 Summary of Test Results/Plots

Bandedge (Radiated)

Lowest Bandedge-BLE

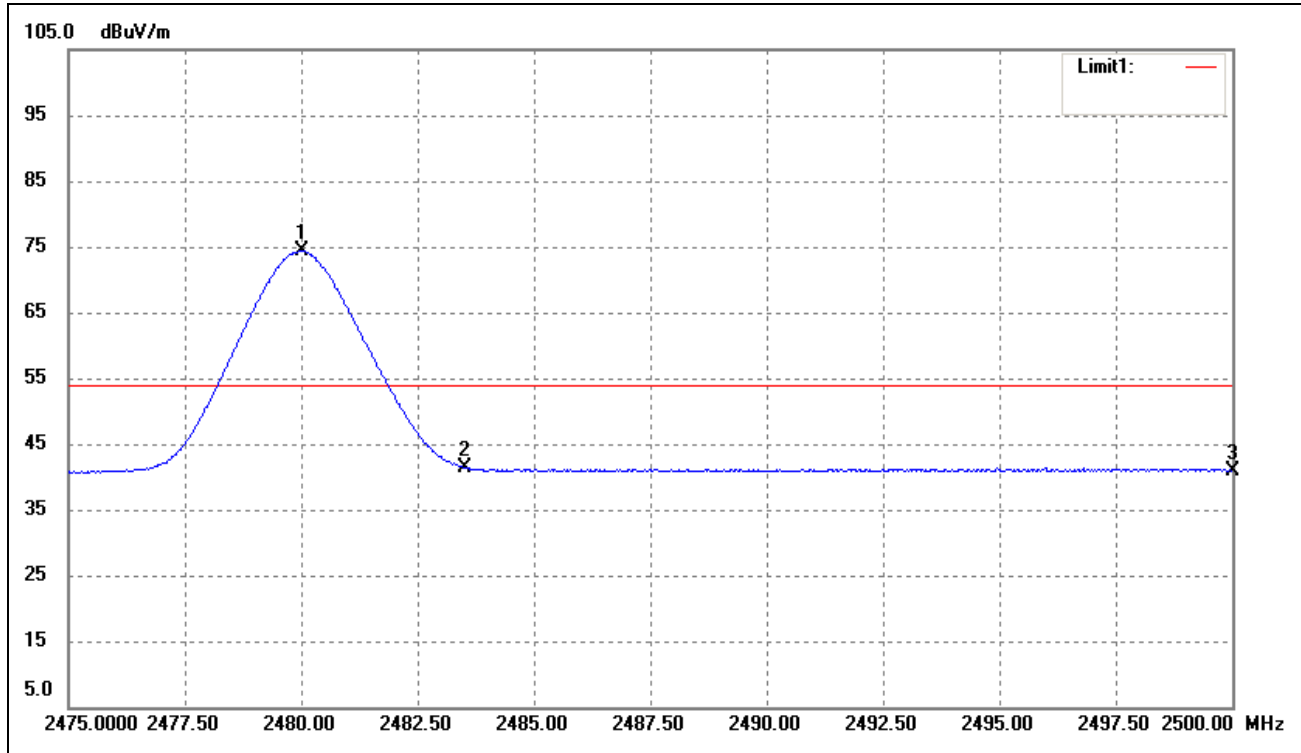
Horizontal (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	24.15	16.34	40.49	54.00	-13.51	Average Detector
	2310.000	35.21	16.34	51.55	74.00	-22.45	Peak Detector
2	2390.000	24.22	17.03	41.25	54.00	-12.75	Average Detector
	2390.000	34.18	17.03	51.21	74.00	-22.79	Peak Detector
3	2400.000	32.67	17.11	49.78	54.00	-4.22	Average Detector
	2400.000	44.69	17.11	61.81	74.00	-12.19	Peak Detector

Highest Bandedge-BLE

Horizontal (Worst case)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2480.025	57.65	-3.38	54.27	/	/	Average Detector
	2479.700	59.28	-3.38	55.90	/	/	Peak Detector
2	2483.500	Delta = 33.01dBc		21.26	54.00	-32.74	Average Detector
	2483.500			22.89	74.00	-51.11	Peak Detector
3	2500.000	37.95	-3.28	34.67	54.00	-19.33	Average Detector
	2500.000	55.09	-3.28	51.81	74.00	-22.19	Peak Detector

10. Conducted Emissions

10.1 Measurement Uncertainty

Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement is ± 2.88 dB.

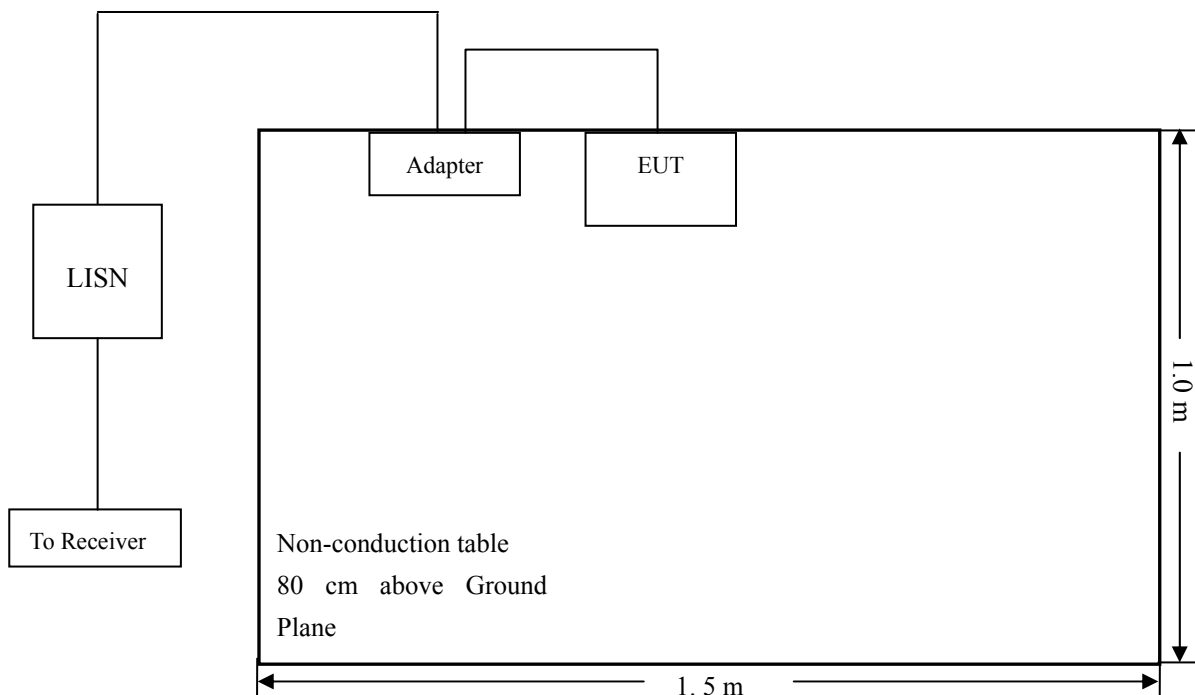
10.2 Test Procedure

The setup of EUT is according with per ANSI C63.4-2014 measurement procedure. The specification used was with the FCC Part 15.207 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

10.3 Basic Test Setup Block Diagram



10.4 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52%
ATM Pressure:	1012 mbar

10.5 Test Receiver Setup

During the conducted emission test, the test receiver was set with the following configurations:

Start Frequency	150 kHz
Stop Frequency.....	30 MHz
Sweep Speed	Auto
IF Bandwidth.....	10 kHz
Quasi-Peak Adapter Bandwidth	9 kHz
Quasi-Peak Adapter Mode	Normal

10.6 Summary of Test Results/Plots

According to the data in section 10.7, the EUT complied with the FCC Part 15.207 Conducted margin for this device, with the *worst* margin reading of:

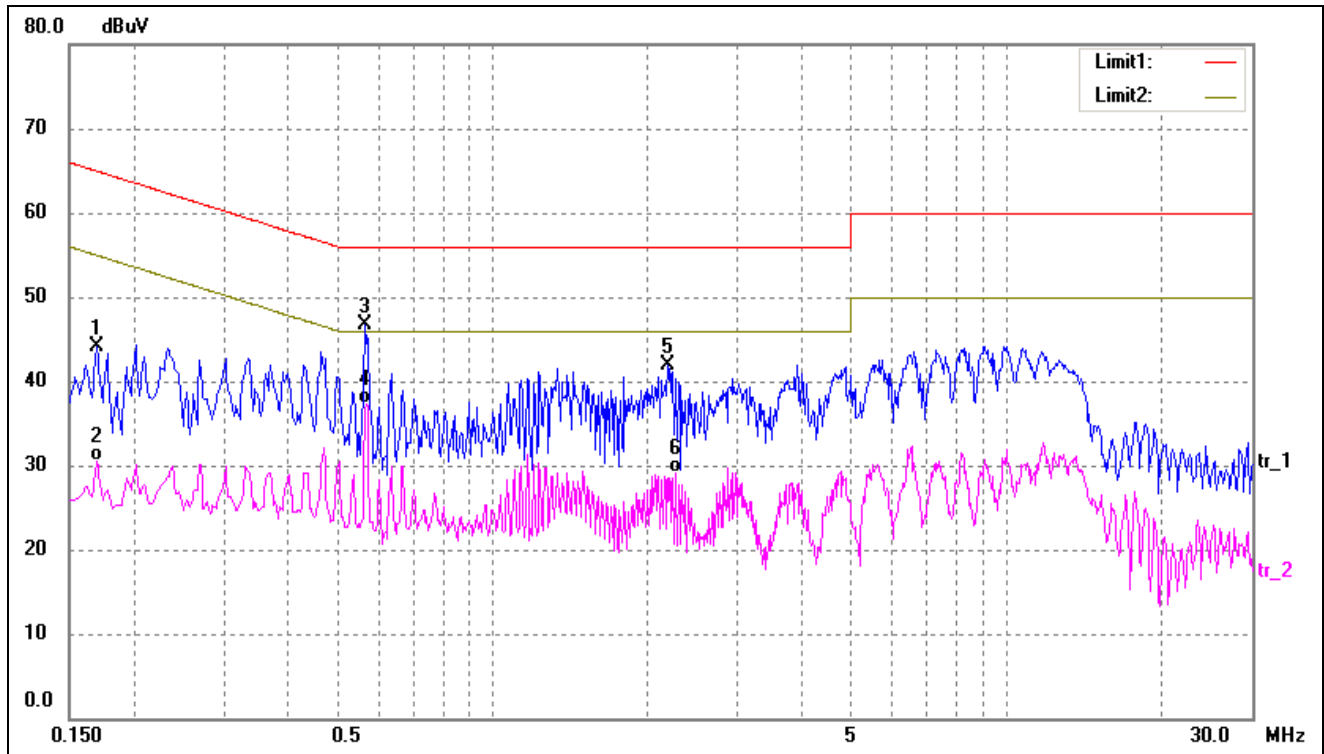
-2.87 dB at 0.5660 MHz in the **Line** mode, **AVG** detector, **0.15-30MHz**

10.7 Conducted Emissions Test Data

Plot of Conducted Emissions Test Data

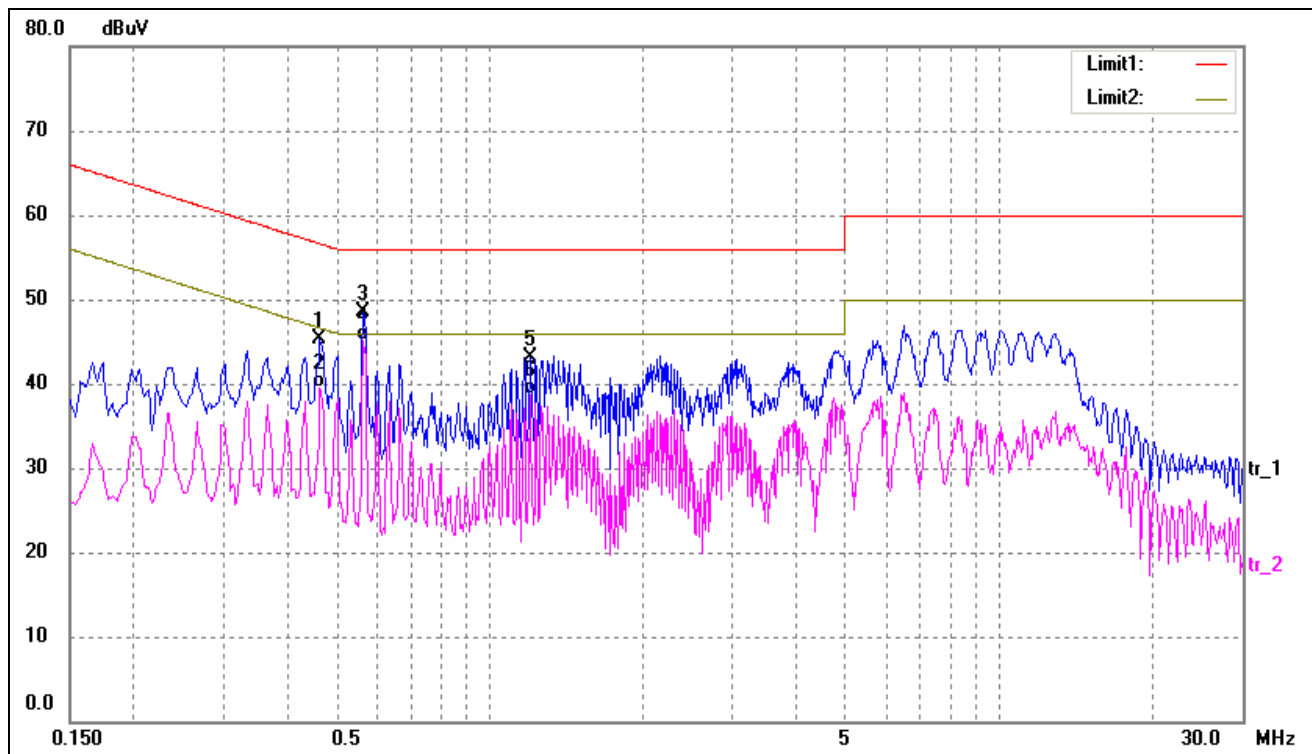
EUT: 4G-LTE Smartphone
Tested Model: SGB1G-W
Operating Condition: Transmitting
Comment: AC 120V/60Hz; Adapter DC 5V

Test Specification: Neutral



No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1	0.1700	31.64	12.50	44.14	64.96	-20.82	QP
2	0.1700	17.92	12.50	30.42	54.96	-24.54	AVG
3	0.5660	34.14	12.57	46.71	56.00	-9.29	QP
4	0.5700	24.68	12.57	37.25	46.00	-8.75	AVG
5	2.1980	28.99	13.00	41.99	56.00	-14.01	QP
6	2.2700	16.04	13.00	29.04	46.00	-16.96	AVG

Test Specification: Line



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.4660	32.83	12.50	45.33	56.58	-11.25	QP
2	0.4660	26.94	12.50	39.44	46.58	-7.14	AVG
3	0.5660	35.99	12.57	48.56	56.00	-7.44	QP
4	0.5660	30.56	12.57	43.13	46.00	-2.87	AVG
5	1.2020	30.12	13.00	43.12	56.00	-12.88	QP
6	1.2020	25.70	13.00	38.70	46.00	-7.30	AVG

***** END OF REPORT *****