FCC Part 15C & RSS-247
Measurement and Test Report

For

LM Technologies Ltd.

Unit19, Spectrum House, 32-34, Gordon House Road, London, NW5 1LP,

United Kingdom

FCC ID: VVX-LM910-XXXX & IC: 10531A-LM910XXXX

FCC Rule(s)/IC Standards:	FCC Part 15.247 & RSS-247 Issue 1 (2015-05)
Product Description:	Bluetooth USB Module 4.0 Low Energy Class 1 – LM910
Tested Model:	LM910-XXXX
Report No.:	STR16068005I-2
Tested Date:	2016-06-02 to 2016-06-13
Issued Date:	2016-06-13
Tested By:	Jason Su / Engineer
Reviewed By:	Silin Chen / EMC Manager
Approved & Authorized By:	Jandy so / PSQ Manager

Prepared By:

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1. GENERAL INFORMATION

Client Information

Applicant:	LM Technologies Ltd.
Address of applicant:	Unit19, Spectrum House, 32-34, Gordon House Road, London, NW5 1LP, United Kingdom
Manufacturer:	LM Technologies Ltd.
Address of manufacturer:	Unit19, Spectrum House, 32-34, Gordon House Road, London, NW5 1LP, United Kingdom

General Description of EUT	
Product Name:	Bluetooth USB Module 4.0 Low Energy Class 1 – LM910
Brand Name:	LM Technologies
Model No.:	LM910-XXXX
Rated Voltage:	DC 5V
Rated Current:	/
Note: The test data is gathered from a production sample provided by the manufacturer.	

Technical Characteristics of EUT	
Bluetooth Version:	V4.0 (BLE mode)
Frequency Range:	2402-2480MHz
RF Output Power:	7.799dBm (Conducted)
Data Rate:	25Mbps
Modulation:	GFSK
Quantity of Channels:	40
Channel Separation:	2MHz
Type of Antenna:	PCB Antenna
Antenna Gain:	-4dBi
Lowest Internal Frequency:	20MHz

1.2 Test Standards

The following report is prepared on behalf of the LM Technologies Ltd. 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, and RSS-Gen Issue 4 section 8.3, 8.8, 8.9, 8.10 and RSS-247 Issue 1of the Industry Canada 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, and RSS-Gen Issue 4 section 8.3, 8.8, 8.9, 8.10 and RSS-247 Issue 1of the Industry Canada 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 v03r05 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
/	/	/	/

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 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
RF Output Power	Conducted	±0.42dB
Occupied Bandwidth	Conducted	±1.5%
Power Spectral Density	Conducted	±1.8dB
Conducted Spurious Emission	Conducted	±2.17dB
Conducted Emissions	Conducted	±2.88dB
Transmitter Spurious Emissions	Radiated	±5.1dB

1.7 Test Equipment List and Details

No.	Description	Manufacturer	Model	Serial No.	Cal Date	Due Date
SEMT-1072	Spectrum Analyzer	Agilent	E4407B	MY41440400	2015-06-17	2016-06-16
SEMT-1031	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2015-06-17	2016-06-16
SEMT-1007	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2015-06-17	2016-06-16
SEMT-1008	Amplifier	Agilent	8447F	3113A06717	2015-06-17	2016-06-16
SEMT-1043	Amplifier	C&D	PAP-1G18	2002	2015-06-17	2016-06-16
SEMT-1011	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2015-06-17	2016-06-16
SEMT-1042	Horn Antenna	ETS	3117	00086197	2015-06-17	2016-06-16
SEMT-1121	Horn Antenna	ETS	3116B	00088203	2015-06-17	2016-06-16
SEMT-1069	Loop Antenna	Schwarz beck	FMZB 1516	9773	2015-06-17	2016-06-16
SEMT-1001	EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2015-06-17	2016-06-16
SEMT-1003	L.I.S.N	Schwarz beck	NSLK8126	8126-224	2015-06-17	2016-06-16
SEMT-1002	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2015-06-17	2016-06-16
SEMT-1035	Coaxial Cable	/	0M4RFC	AMP-SW(A)	2016-06-16	2017-06-15
SEMT-1036	Coaxial Cable	/	2M0RFC	966-AMP(A)	2016-06-16	2017-06-15
SEMT-1037	Coaxial Cable	/	5M0RFC	CLAMP(DP)	2016-06-16	2017-06-15
SEMT-1038	Coaxial Cable	/	2M4RFC	LISN(CE)	2016-06-16	2017-06-15
SEMT-1039	Coaxial Cable	/	1M0RFC	SW-ESVB(A)	2016-06-16	2017-06-15

2. SUMMARY OF TEST RESULTS

FCC Rules/IC Standards	Description of Test Item	Result
§ 2.1093	RF Exposure	Compliant
§ 15.203; § 15.247(b)(4)(i) § RSS-Gen Issue 4, 8.3	Antenna Requirement	Compliant
§15.205 § RSS-Gen Issue 4, 8.10	Restricted Band of Operation	Compliant
§ 15.207(a) § RSS-Gen Issue 4, 8.8	Conducted Emission	Compliant
§ 15.247(e) § RSS-247 Issue 1, 5.2(2)	Power Spectral Density	Compliant
§ 15.247(a)(2) § RSS-247 Issue 1, 5.2(1)	6 dB Bandwidth	Compliant
§ 15.247(b)(3) § RSS-247 Issue 1, 5.4(4)	RF Output Power	Compliant
§ 15.209(a) § RSS-Gen Issue 4, 8.9	Radiated Emission	Compliant
§ 15.247(d) § RSS-247 Issue 1, 5.5	Band Edge (Out of Band Emissions)	Compliant

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 RF Exposure 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.

According to RSS-Gen 8.3, a transmitter can only be sold or operated with antennas with which it was certified. A transmitter may be certified with multiple antenna types. An antenna type comprises antennas having similar in-band and out-of-band radiation patterns.

4.2 Evaluation Information

This product has a PCB 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.

According to RSS-247 5.2(2), The transmitter power spectral density conducted from the transmitter 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 v03r05, the test method of power spectral density as below:

a) Set analyzer center frequency to DTS channel center frequency.
b) Set the span to 1.5 times the DTS bandwidth.
c) Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
d) Set the VBW ≥ 3 × RBW.
e) Detector = peak.
f) Sweep time = auto couple.
g) Trace mode = max hold.
h) Allow trace to fully stabilize.
i) Use the peak marker function to determine the maximum amplitude level within the RBW.
j) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

5.3 Environmental Conditions

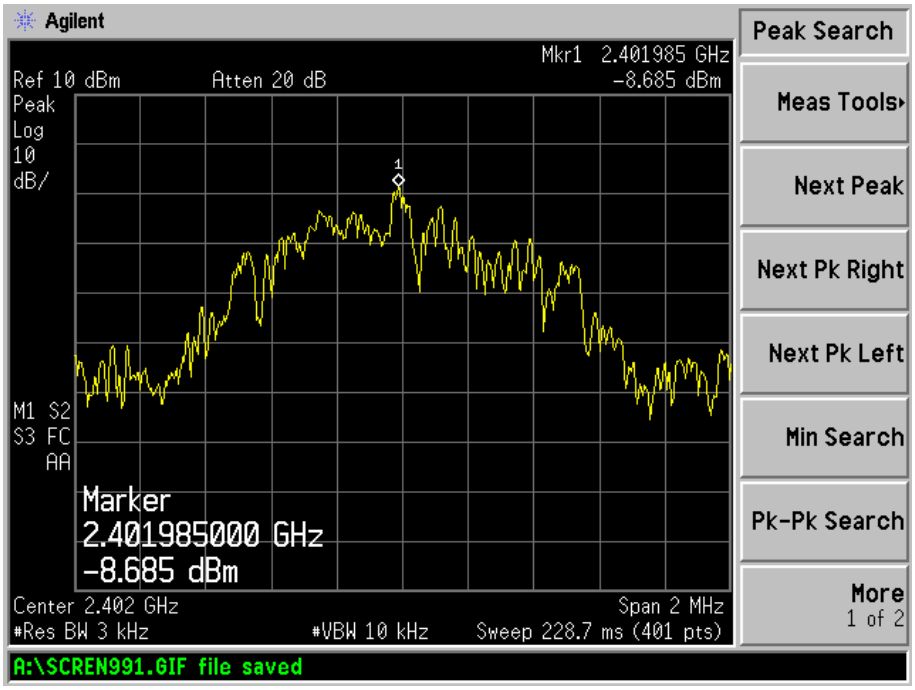
Temperature:	26° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

5.4 Summary of Test Results/Plots

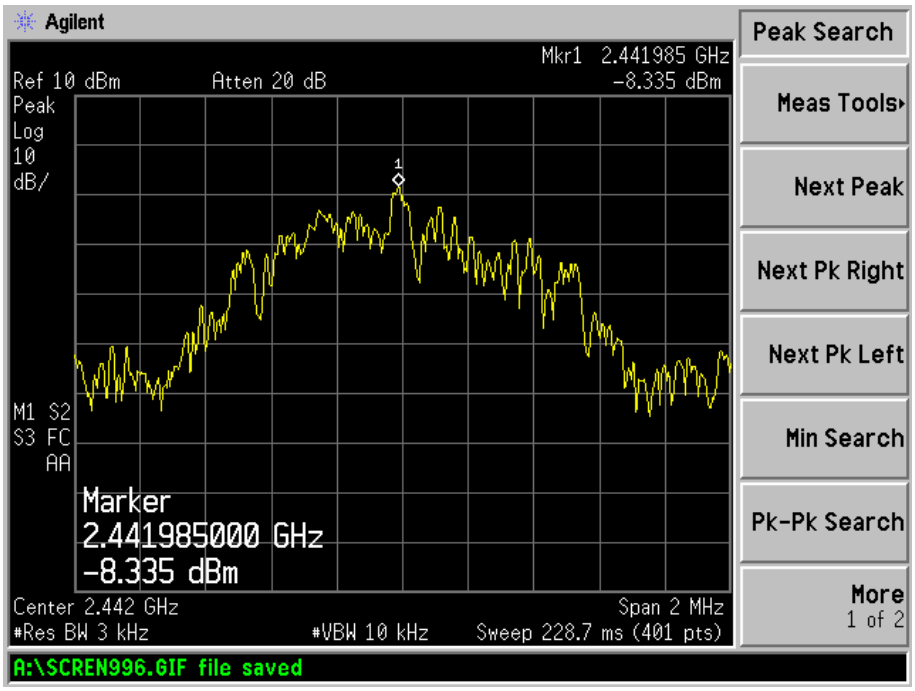
Test Mode	Test Channel MHz	Power Spectral Density dBm/3kHz	Limit dBm/3kHz
GFSK(BLE)	2402	-8.685	8
	2442	-8.335	8
	2480	-8.254	8

Please refer to the following test plots:

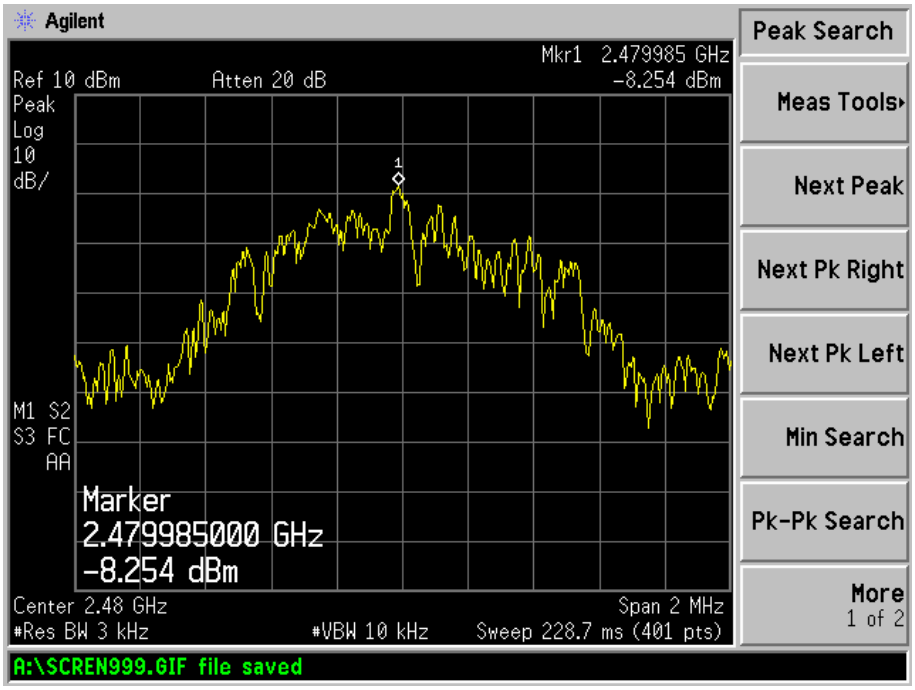
Low Channel



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.

According to RSS-247 5.2(1), the minimum 6 dB bandwidth shall be 500 kHz.

6.2 Test Procedure

a) Set RBW = 100 kHz.
b) Set the video bandwidth (VBW) ≥ 3 × 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

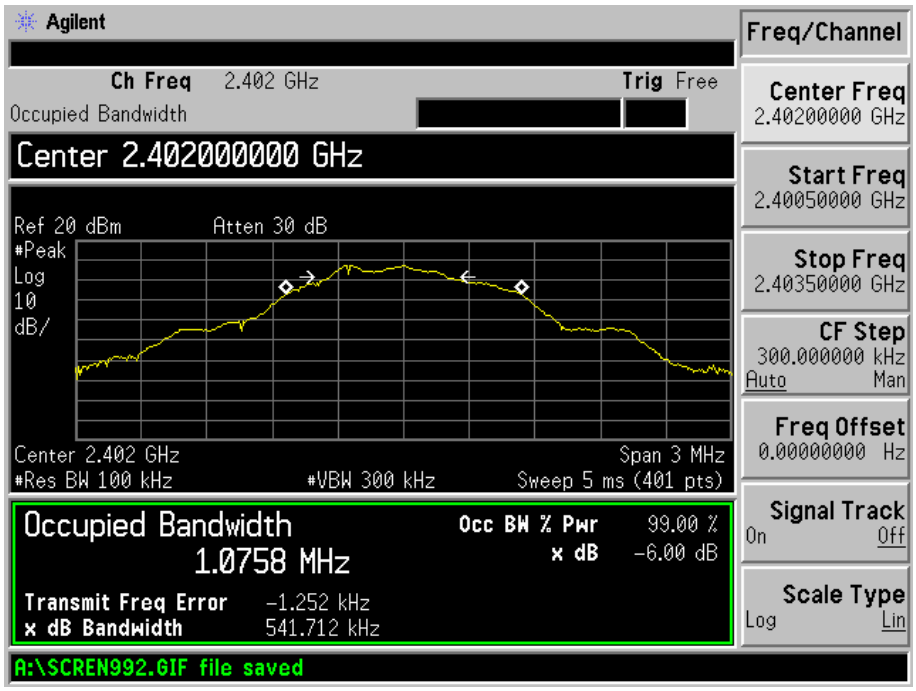
Temperature:	25° C
Relative Humidity:	53%
ATM Pressure:	1018 mbar

6.4 Summary of Test Results/Plots

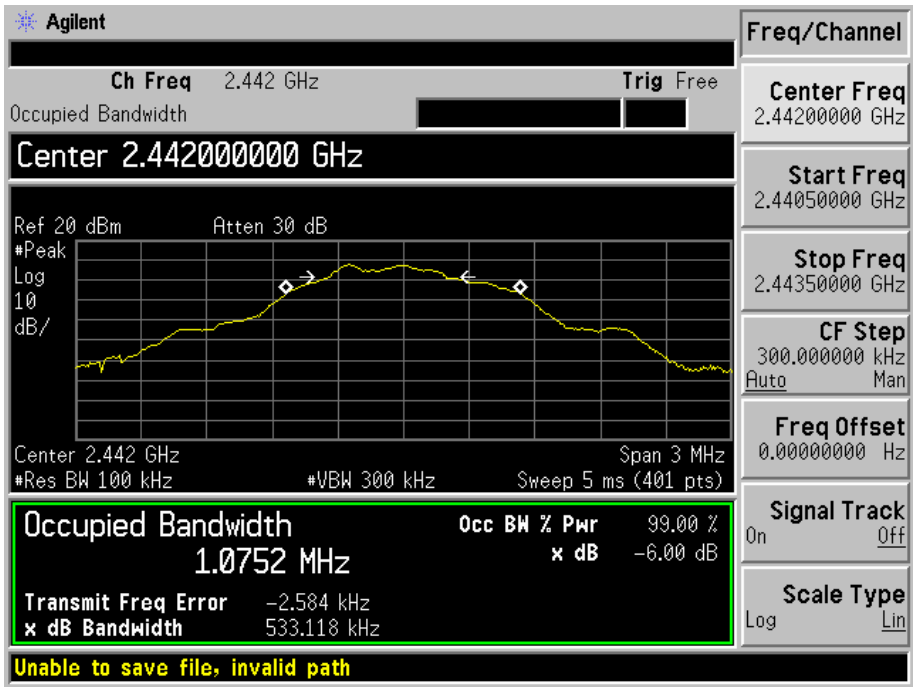
Test Mode	Test Channel MHz	6 dB Bandwidth kHz	99% Bandwidth kHz	Limit kHz
GFSK(BLE)	2402	541.712	1075.8	≥500
	2442	533.118	1075.2	≥500
	2480	544.040	1076.0	≥500

Please refer to the following test plots:

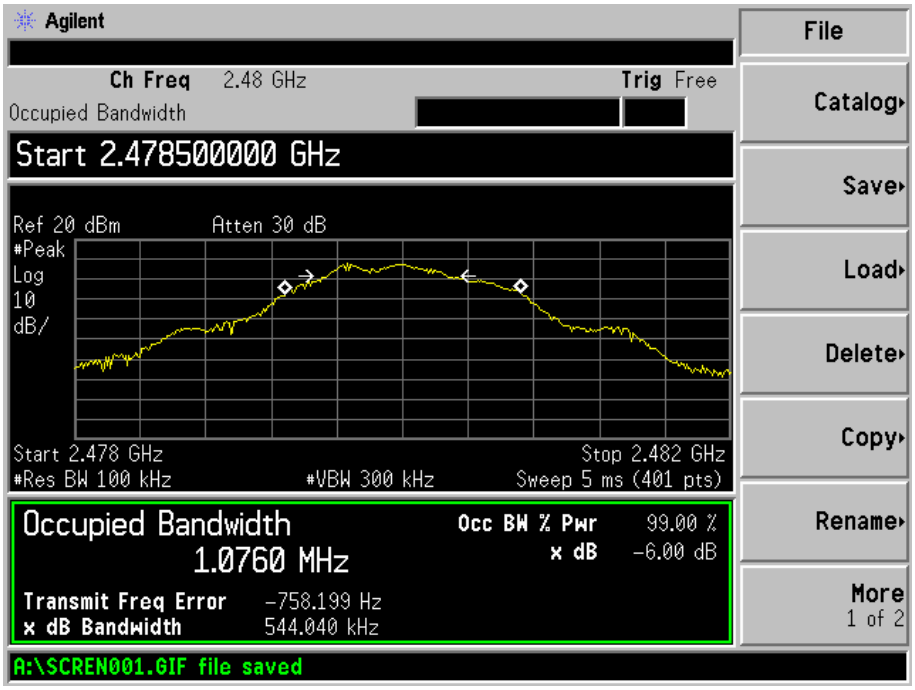
For BLE
Low Channel:



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.

According to RSS-247 5.4 (4), For DTSs employing digital modulation techniques operating in the bands 902-928 MHz and 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1W.

7.2 Test Procedure

According to section KDB-558074 D01 v03r05 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 ≥ DTS bandwidth.
b) Set VBW ≥ 3 × RBW.
c) Set span ≥ 3 x 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	7.380	5.47	1000
	2442	7.789	6.01	1000
	2480	7.799	6.02	1000

Note: the antenna gain of -4dBi less than 6dBi maximum permission antenna gain value based on 1 watt peak output power limit.

8. Field Strength of Spurious Emissions

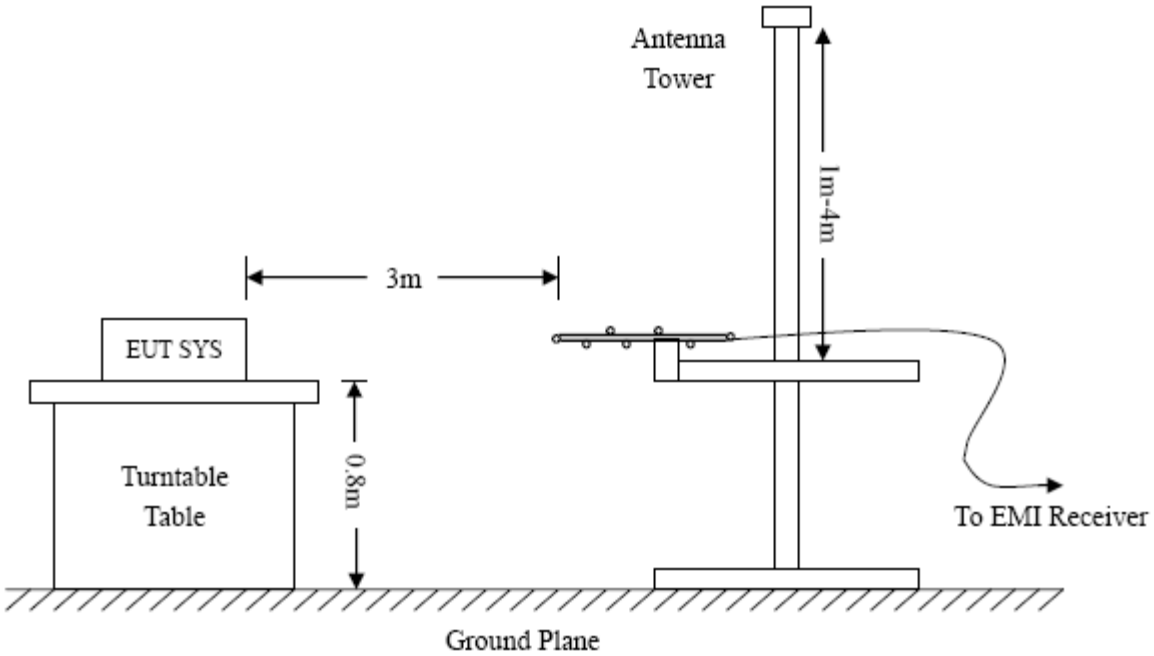
8.1 Standard Applicable

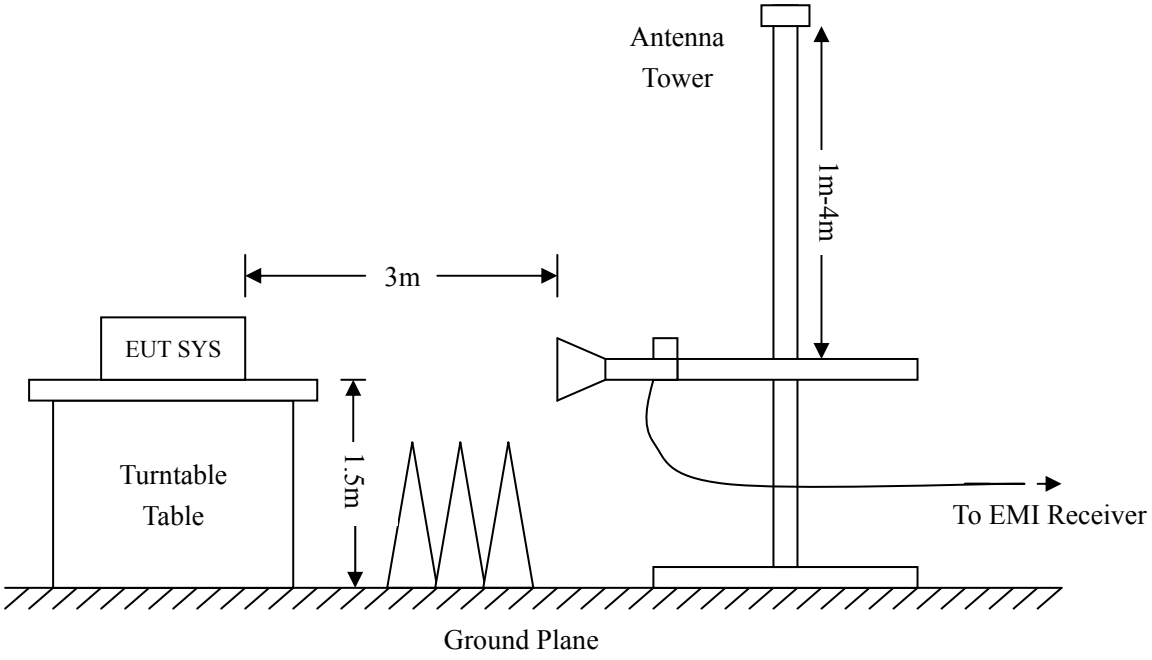
According to §15.247(d) and RSS-247 5.5, in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz 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.

8.2 Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.205 15.247(a) and FCC Part 15.209, RSS-Gen, 8.9 and 8.10 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	Frequency :30MHz-1GHz	Frequency :Above 1GHz
RBW=10KHz,	RBW=120KHz,	RBW=1MHz,
VBW =30KHz	VBW=300KHz	VBW=3MHz(Peak), 10Hz(AV)
Sweep time= Auto	Sweep time= Auto	Sweep time= Auto
Trace = max hold	Trace = max hold	Trace = max hold
Detector function = peak	Detector function = peak, QP	Detector function = peak, AV

8.3 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:

Corr. Ampl. = Indicated Reading + Ant. Factor + Cable Loss – Ampl. Gain

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

Margin = Corr. Ampl. – FCC Part 15 & RSS-GEN Issue 4, 8.9 Limit

8.4 Environmental Conditions

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

8.5 Summary of Test Results/Plots

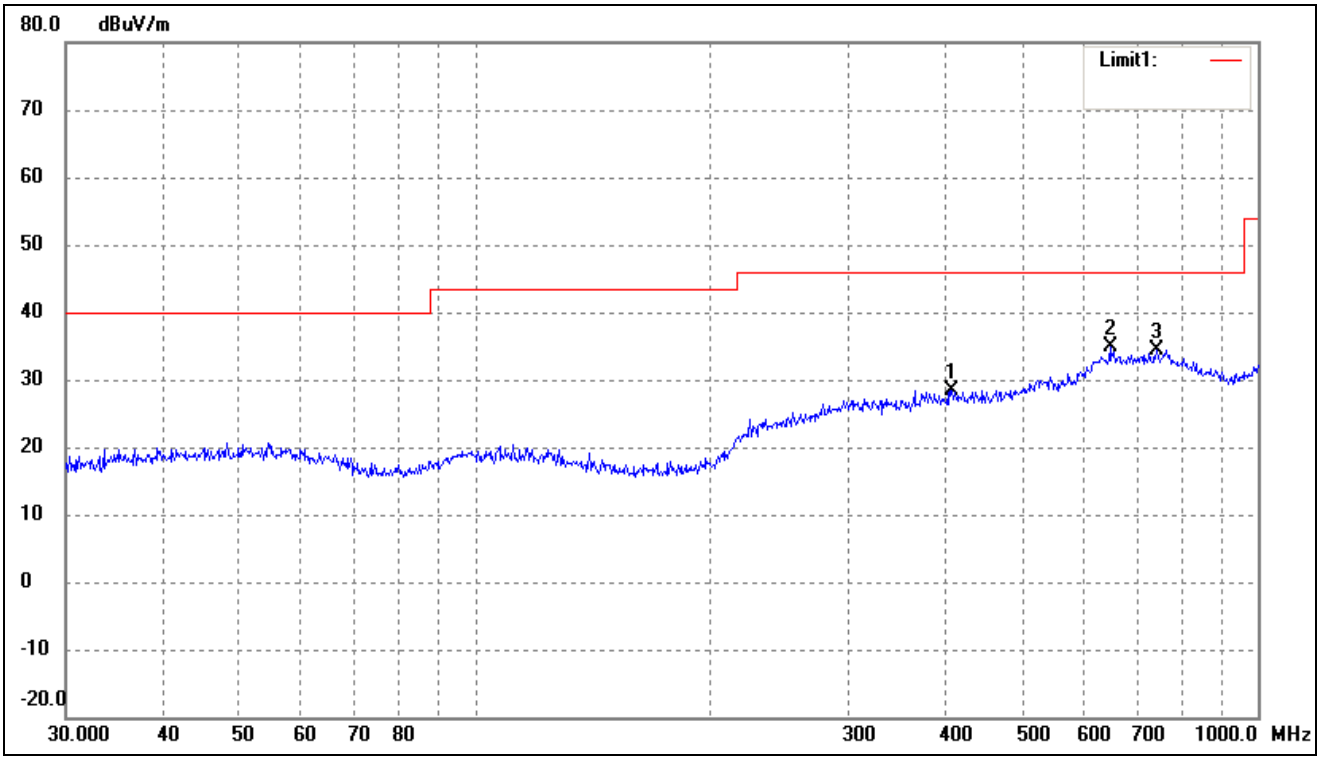
According to the data below, the FCC Part 15.205, 15.209, 15.247 and RSS-247 Issue 1 standard, and had the worst cases:

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

Plot of Radiated Emissions Test Data

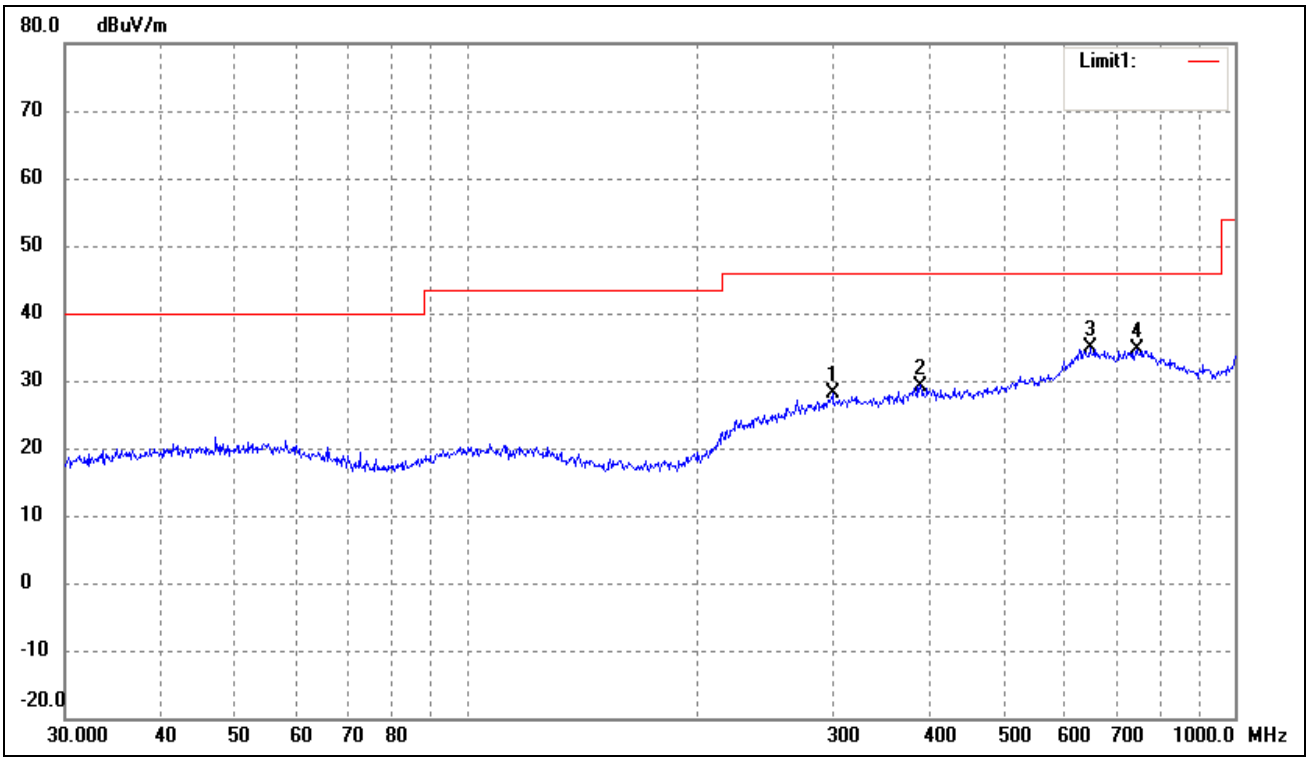
EUT: *Bluetooth USB Module 4.0 Low Energy Class 1 – LM910*
Tested Model: *LM910-XXXX*
Operating Condition: *Transmitting-Low channel (2402MHz)*
Comment: *DC 5V*

Test Specification: *Horizontal*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	406.0880	15.92	12.45	28.37	46.00	-17.63	159	100	peak
2	647.3856	16.95	17.90	34.85	46.00	-11.15	98	200	peak
3	742.2587	15.55	18.93	34.48	46.00	-11.52	201	200	peak

Test Specification: *Vertical*

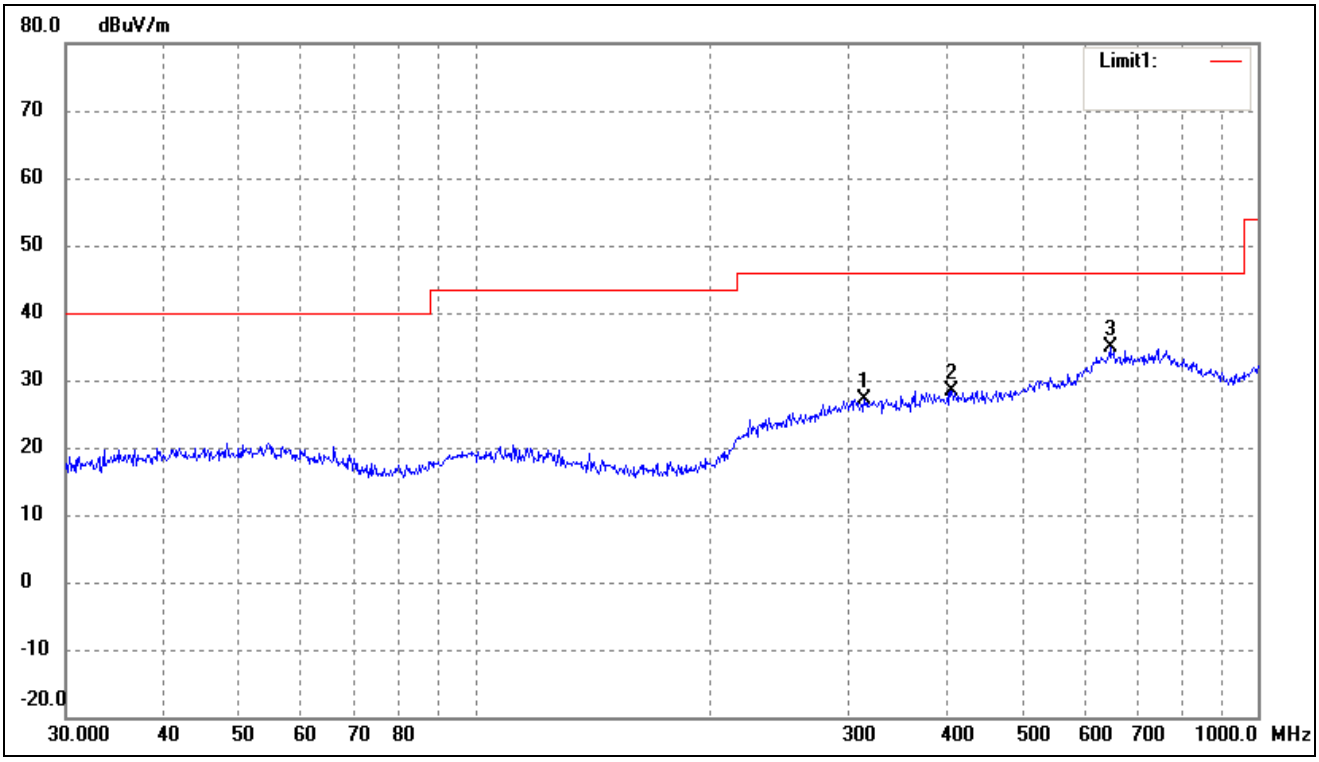


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	299.3158	16.14	11.92	28.06	46.00	-17.94	178	100	peak
2	389.3549	17.05	12.20	29.25	46.00	-16.75	54	100	peak
3	647.3856	16.95	17.90	34.85	46.00	-11.15	121	100	peak
4	744.8661	15.91	18.81	34.72	46.00	-11.28	65	100	peak

Plot of Radiated Emissions Test Data

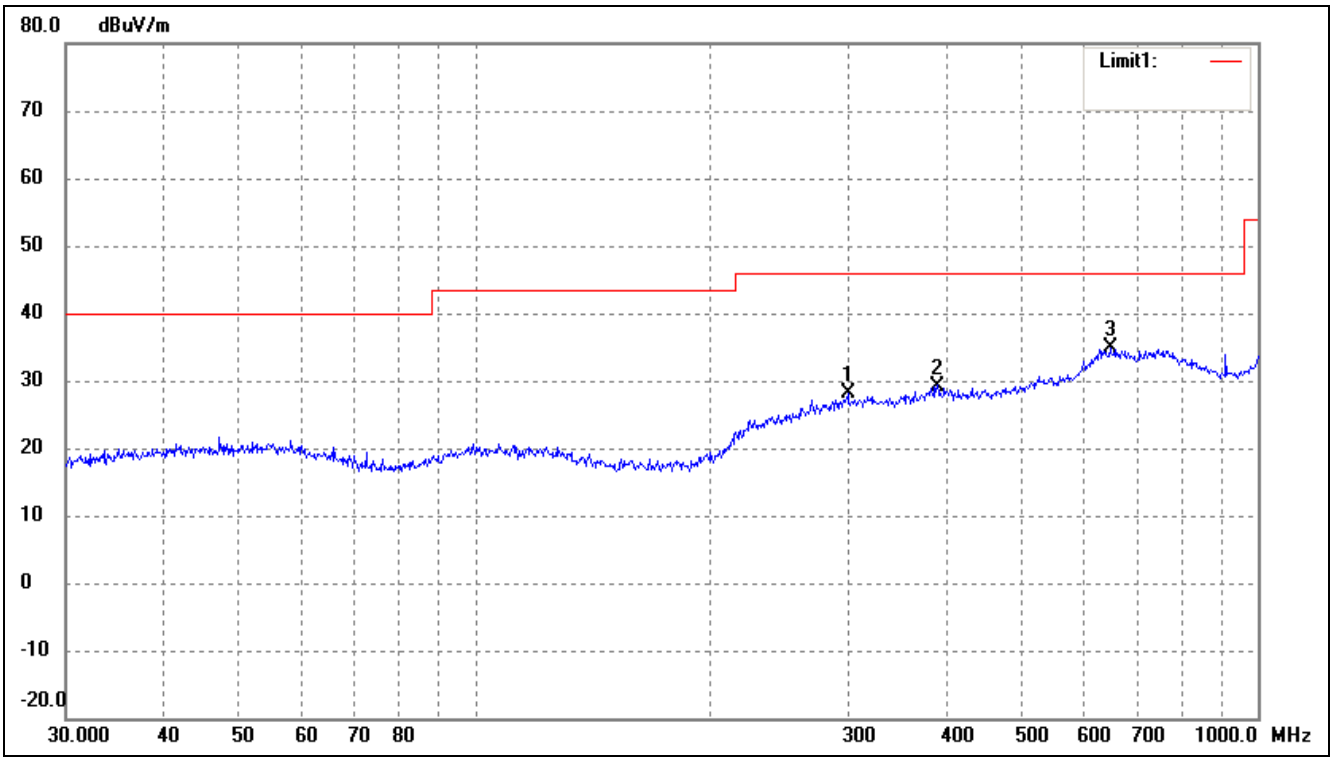
EUT: *Bluetooth USB Module 4.0 Low Energy Class 1 – LM910*
Tested Model: *LM910-XXXX*
Operating Condition: *Transmitting-Low channel (2442MHz)*
Comment: *DC5V*

Test Specification: *Horizontal*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	314.3765	15.22	11.96	27.18	46.00	-18.82	178	100	peak
2	406.0880	15.92	12.45	28.37	46.00	-17.63	41	100	peak
3	647.3856	16.95	17.90	34.85	46.00	-11.15	112	100	peak

Test Specification: *Vertical*

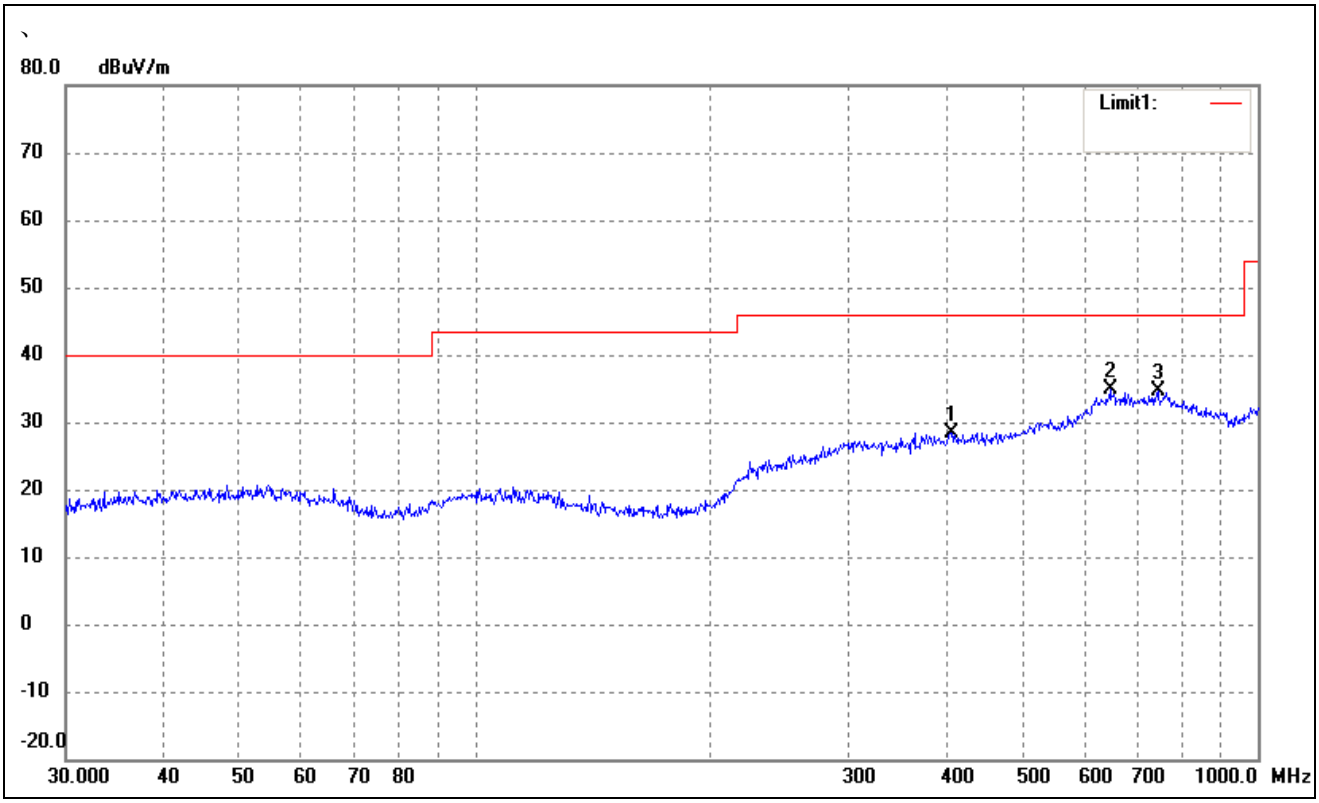


No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	299.3158	16.14	11.92	28.06	46.00	-17.94	174	100	peak
2	389.3549	17.05	12.20	29.25	46.00	-16.75	54	100	peak
3	647.3856	16.95	17.90	34.85	46.00	-11.15	65	100	peak

Plot of Radiated Emissions Test Data

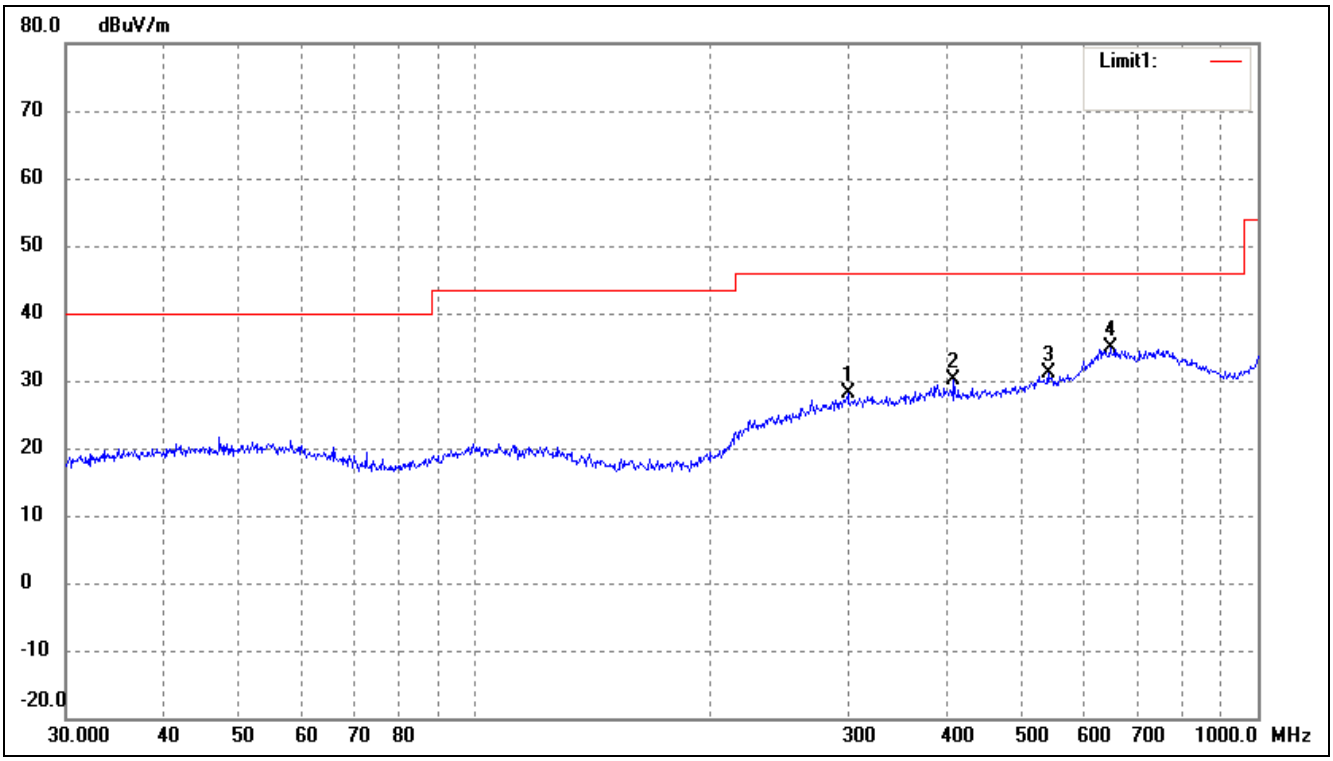
EUT: *Bluetooth USB Module 4.0 Low Energy Class 1 – LM910*
Tested Model: *LM910-XXXX*
Operating Condition: *Transmitting-Low channel (2480MHz)*
Comment: *DC5V*

Test Specification: *Horizontal*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	406.0880	15.92	12.45	28.37	46.00	-17.63	147	100	peak
2	647.3856	16.95	17.90	34.85	46.00	-11.15	315	100	peak
3	744.8661	15.91	18.81	34.72	46.00	-11.28	54	100	peak

Test Specification: *Vertical*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	299.3158	16.14	11.92	28.06	46.00	-17.94	177	100	peak
2	408.9460	17.73	12.33	30.06	46.00	-15.94	41	100	peak
3	539.4775	17.27	13.81	31.08	46.00	-14.92	122	100	peak
4	647.3856	16.95	17.90	34.85	46.00	-11.15	64	100	peak

Spurious Emissions Above 1GHz

Transmitting: BLE mode:

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel-2402MHz							
4804	61.49	-3.59	57.90	74	-16.10	H	PK
4804	50.21	-3.59	46.62	54	-7.38	H	AV
7206	59.25	-0.52	58.73	74	-15.27	H	PK
7206	44.21	-0.52	43.69	54	-10.31	H	AV
4804	59.15	-3.59	55.56	74	-18.44	V	PK
4804	48.16	-3.59	44.57	54	-9.43	V	AV
7206	60.11	-0.52	59.59	74	-14.41	V	PK
7206	44.15	-0.52	43.63	54	-10.37	V	AV
Middle Channel-2442MHz							
4884	58.21	-3.49	54.72	74	-19.28	H	PK
4884	47.16	-3.49	43.67	54	-10.33	H	AV
7326	58.21	-0.47	57.74	74	-16.26	H	PK
7326	43.12	-0.47	42.65	54	-11.35	H	AV
4884	60.26	-3.49	56.77	74	-17.23	V	PK
4884	49.11	-3.49	45.62	54	-8.38	V	AV
7326	60.15	-0.47	59.68	74	-14.32	V	PK
7326	45.11	-0.47	44.64	54	-9.36	V	AV
High Channel-2480MHz							
4960	64.23	-3.41	60.82	74	-13.18	H	PK
4960	49.51	-3.41	46.10	54	-7.90	H	AV
7440	53.46	-0.42	53.04	74	-20.96	H	PK
7440	44.14	-0.42	43.72	54	-10.28	H	AV
4960	57.61	-3.41	54.20	74	-19.80	V	PK
4960	44.55	-3.41	41.14	54	-12.86	V	AV
7440	59.19	-0.42	58.77	74	-15.23	V	PK
7440	43.97	-0.42	43.55	54	-10.45	V	AV

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

9. Out of Band Emissions

9.1 Standard Applicable

According to §15.247 (d) and RSS-247 5.5 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 v03r05, 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 v03r05, 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 ≥ 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

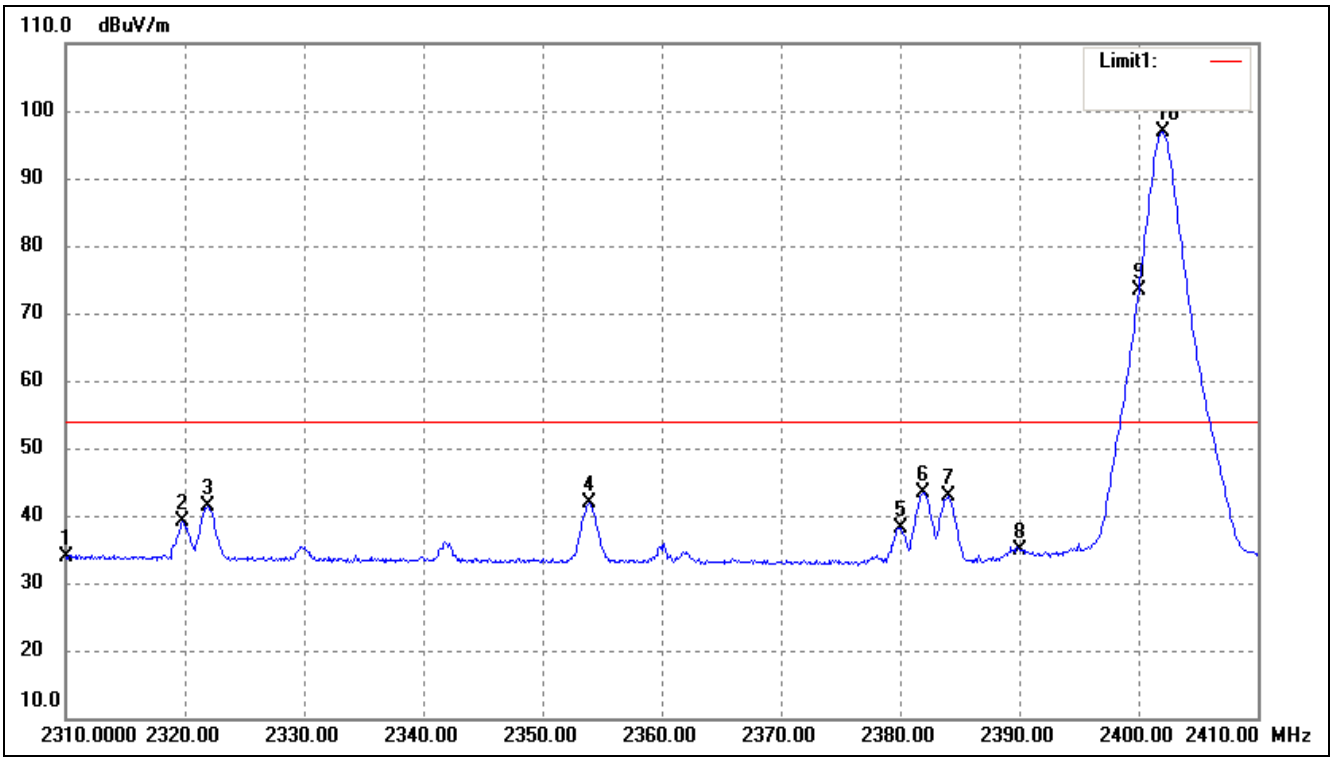
the three highest emissions relative to the limit.

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
Vertical (Worst case)

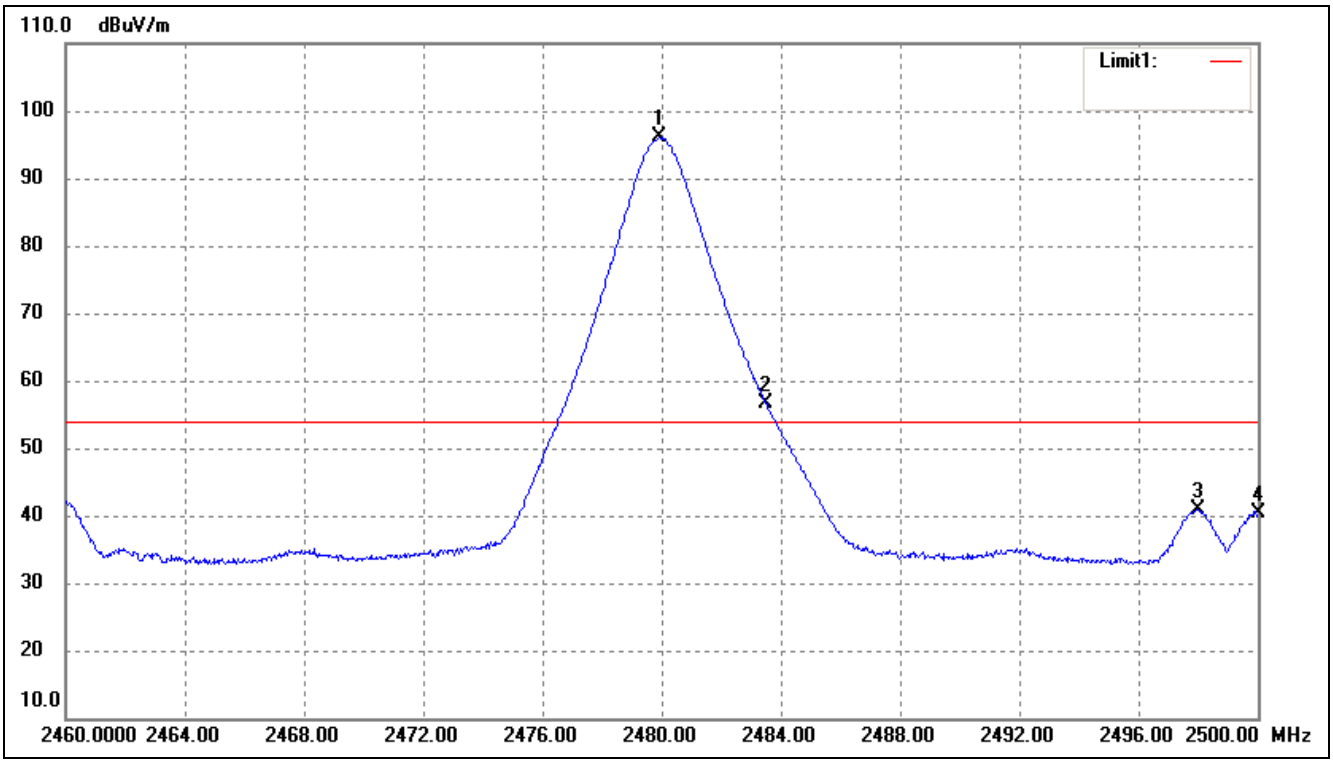


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2310.000	37.12	-3.35	33.77	54.00	-20.23	Average Detector
	2310.000	49.44	-3.35	46.09	74.00	-27.91	Peak Detector
2	2319.800	42.70	-3.47	39.23	54.00	-14.77	Average Detector
	2319.600	52.37	-3.47	48.90	74.00	-25.10	Peak Detector
3	2321.900	44.88	-3.49	41.39	54.00	-12.61	Average Detector
	2321.800	52.76	-3.49	49.27	74.00	-24.73	Peak Detector
4	2353.900	45.68	-3.86	41.82	54.00	-12.18	Average Detector
	2354.200	53.76	-3.86	49.90	74.00	-24.10	Peak Detector
5	2380.100	42.33	-4.17	38.16	54.00	-15.84	Average Detector

	2380.200	50.95	-4.17	46.78	74.00	-27.22	Peak Detector
6	2381.900	47.60	-4.19	43.41	54.00	-10.59	Average Detector
	2382.300	55.11	-4.20	50.91	74.00	-23.09	Peak Detector
7	2384.000	46.98	-4.22	42.76	54.00	-11.24	Average Detector
	2383.900	54.31	-4.22	50.09	74.00	-23.91	Peak Detector
8	2390.000	39.19	-4.29	34.90	54.00	-19.10	Average Detector
	2390.000	53.03	-4.29	48.74	74.00	-25.26	Peak Detector

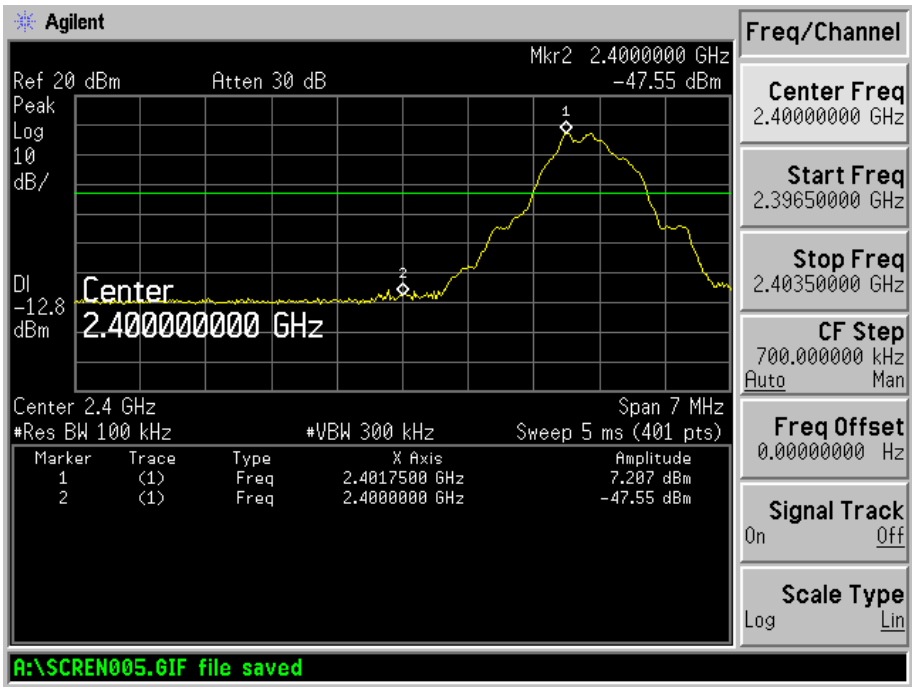
Highest Bandedge-BLE

Vertical (Worst case)

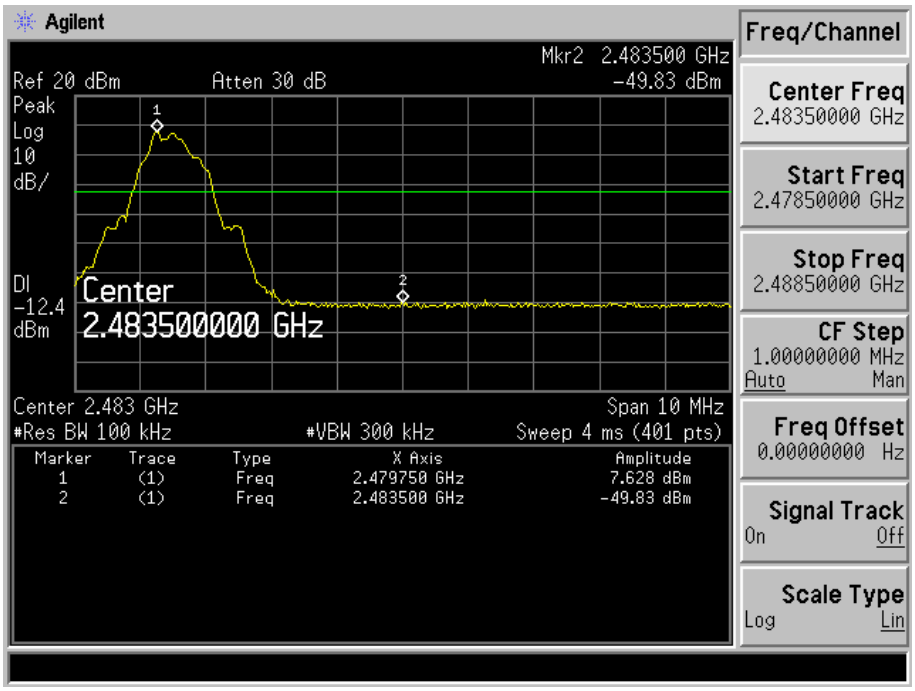


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2480.000	100.40	-4.36	96.04	/	/	Average Detector
	2480.000	108.27	-4.36	103.91	/	/	Peak Detector
2	2483.500	Delta = 69.79 dBc		26.25	54.00	-27.75	Average Detector
	2483.500			34.12	74.00	-39.88	Peak Detector
3	2498.000	45.33	-4.34	40.99	54.00	-13.01	Average Detector
	2497.960	53.33	-4.34	48.99	74.00	-25.01	Peak Detector
4	2500.000	44.61	-4.34	40.27	54.00	-13.73	Average Detector
	2500.000	52.93	-4.34	48.59	74.00	-25.41	Peak Detector

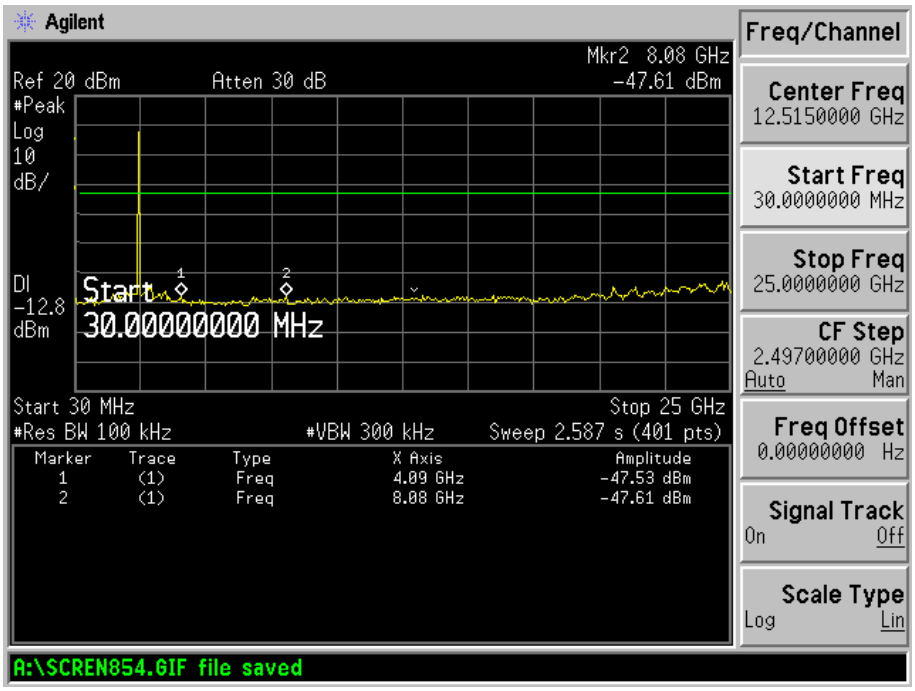
Bandedge (Conducted)
Lowest



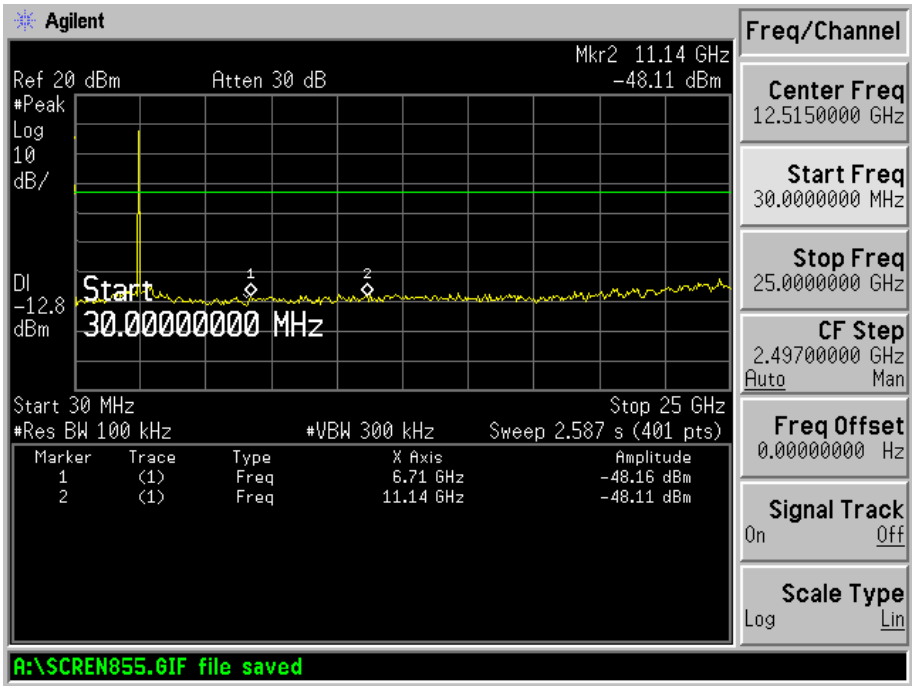
Highest



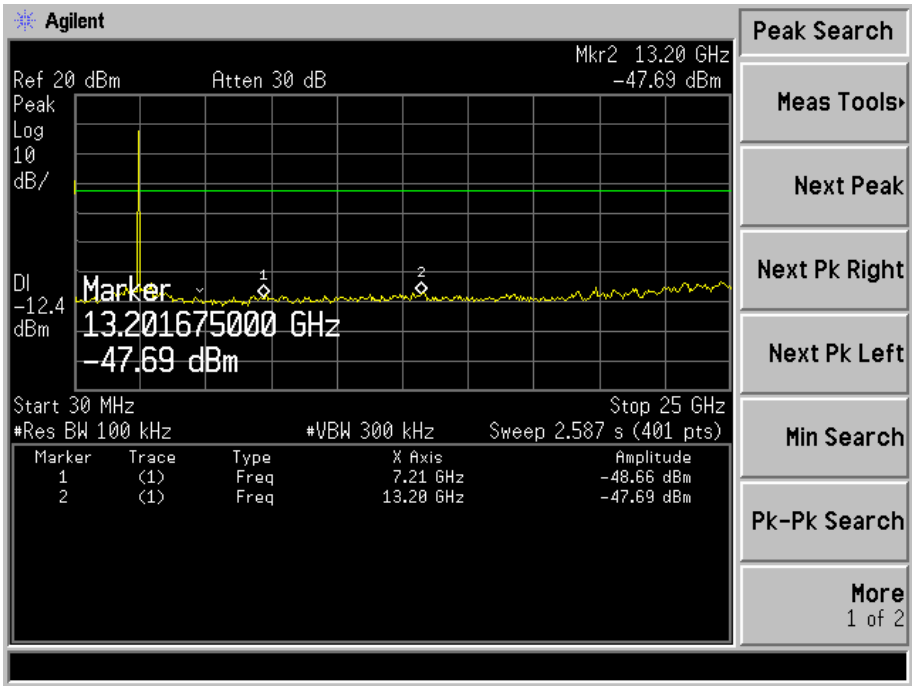
Conducted spurious emission
Lowest Channel



Middle Channel



High Channel



10. Conducted Emissions

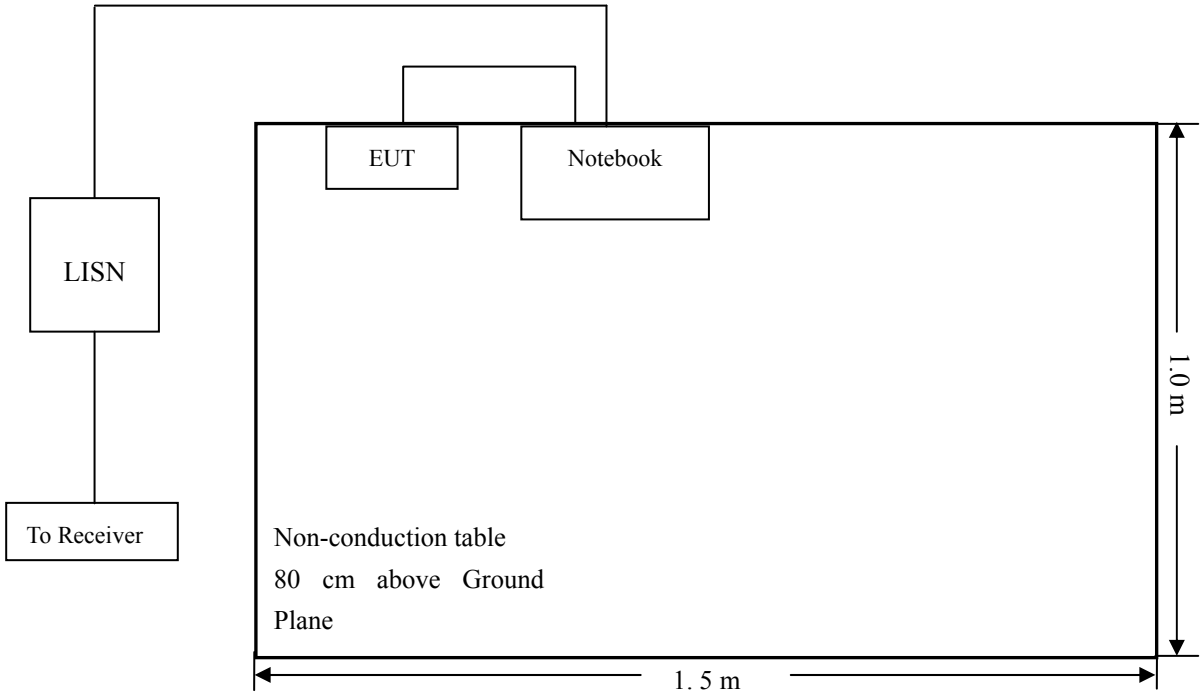
10.1 Measurement Uncertainty

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

Test is conducting under the description of 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.

10.3 Basic Test Setup Block Diagram



10.4 Environmental Conditions

Temperature:	20° C
Relative Humidity:	52%
ATM Pressure:	1011 mbar

10.5 Summary of Test Results/Plots

According to the data in section 10.6, the EUT complied with the FCC Part 15.207 & RSS-Gen 8.8 Conducted margin for this device, with the *worst* margin reading of:

-8.86 dB at **0.1540 MHz** in the **Neutral, Peak** detector, 0.15-30MHz

10.6 Conducted Emissions Test Data

Plot of Conducted Emissions Test Data

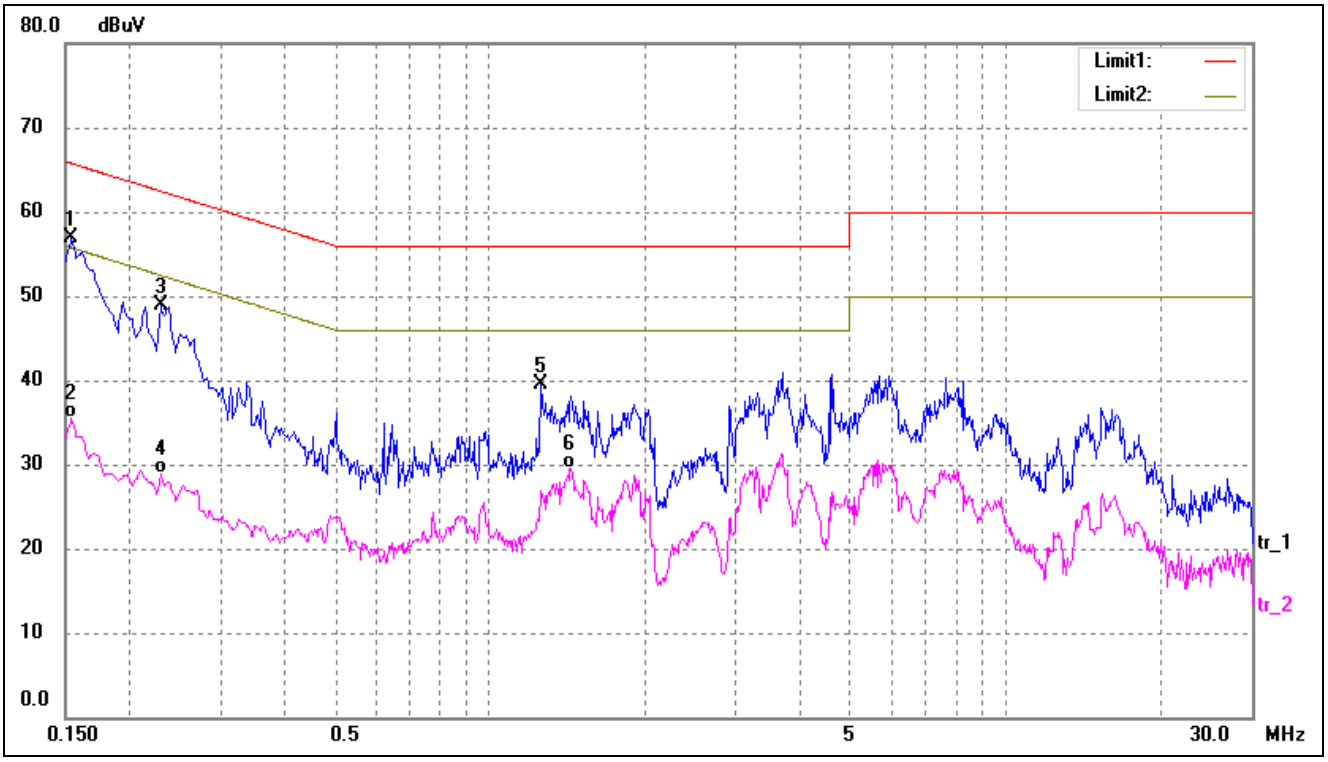
EUT: *Bluetooth USB Module 4.0 Low Energy Class 1 – LM910*

Tested Model: *LM910-XXXX*

Operating Condition: *Transmitting*

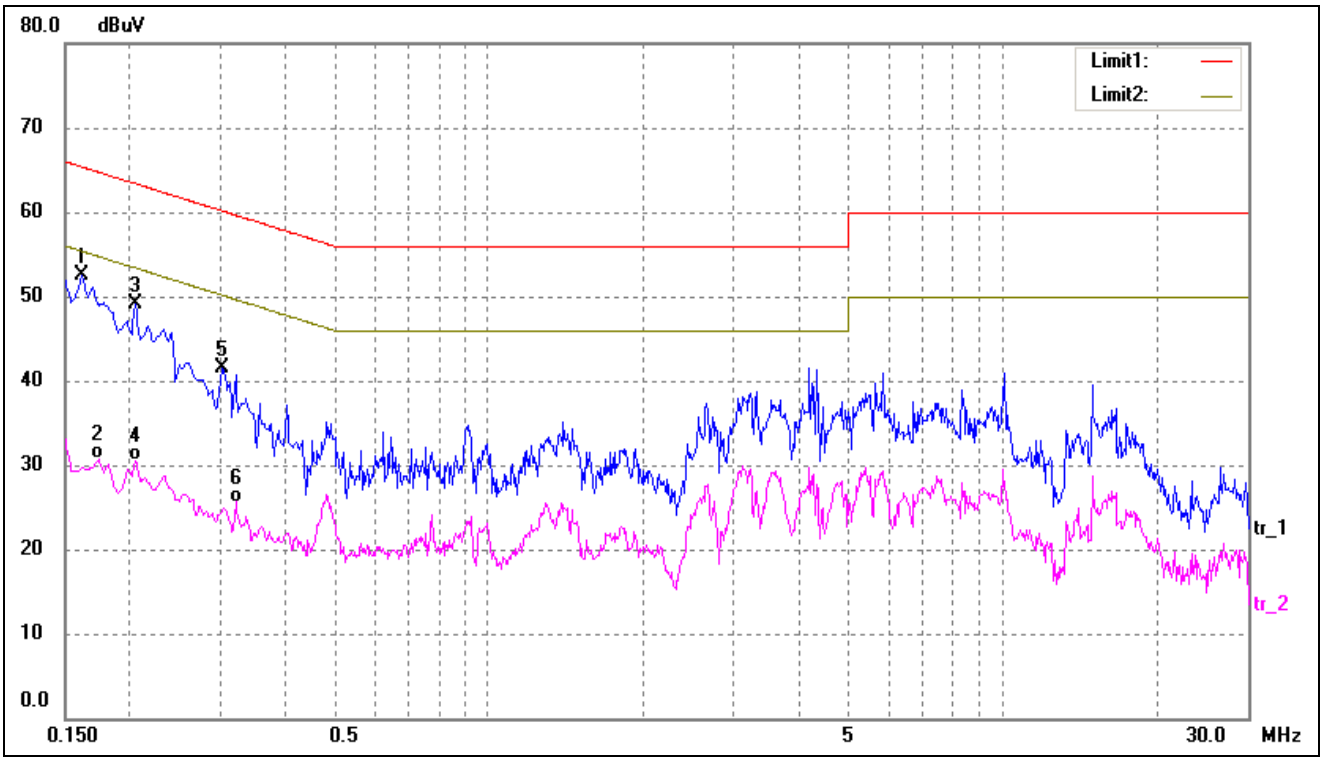
Comment: *AC 120V/60Hz; Notebook USB 5V*

Test Specification: *Neutral*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1*	0.1540	47.42	9.50	56.92	65.78	-8.86	peak
2	0.1540	26.03	9.50	35.53	55.78	-20.25	AVG
3	0.2300	39.35	9.50	48.85	62.45	-13.60	peak
4	0.2300	19.38	9.50	28.88	52.45	-23.57	AVG
5	1.2620	29.77	9.72	39.49	56.00	-16.51	peak
6	1.4260	19.85	9.74	29.59	46.00	-16.41	AVG

Test Specification: *Line*



No.	Frequency	Reading	Correct	Result	Limit	Margin	Detector
	(MHz)	(dBuV)	(dB/m)	(dBuV)	(dBuV)	(dB)	
1*	0.1620	42.95	9.50	52.45	65.36	-12.91	peak
2	0.1740	21.26	9.50	30.76	54.77	-24.01	AVG
3	0.2060	39.66	9.50	49.16	63.37	-14.21	peak
4	0.2060	20.93	9.50	30.43	53.37	-22.94	AVG
5	0.3020	31.97	9.50	41.47	60.19	-18.72	peak
6	0.3220	16.10	9.50	25.60	49.66	-24.06	AVG

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