FCC Part 15C
Measurement and Test Report

For

Shenzhen Longgang district dabojin supply chain wholesale department

FCC ID: 2BFMK-C919

FCC Rule(s):	FCC Part 15.247	
Product Description:	speaker atomizing humidifier	
Tested Model:	C919	
Report No.:	BSL240161089601RF	
Tested Date:	Mar.7~.21, 2024	
Issued Date:	Mar. 29, 2024	
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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant:	Shenzhen Longgang district dabojin supply chain wholesale department
Address of applicant:	102, Unit 1, No. 49, Baoli Road, Dexing Community, Buji Street, Longgang District, Shenzhen
Manufacturer:	Shenzhen Longgang district dabojin supply chain wholesale department
Address of manufacturer:	102, Unit 1, No. 49, Baoli Road, Dexing Community, Buji Street, Longgang District, Shenzhen

General Description of EUT	
Product Name:	speaker atomizing humidifier
Brand Name:	N/A
Models No.:	C919
Rated Voltage:	DC 3.7V by battery
Note: The test data is gathered from a production sample provided by the manufacturer.	

Technical Characteristics of EUT	
Bluetooth Version:	V5.0
Frequency Range:	2402-2480MHz
Modulation:	GFSK
Quantity of Channels:	40
Channel Separation:	2MHz
Type of Antenna:	PCB Antenna
Antenna Gain:	1.3dBi

1.2 Test Standards

The following report is prepared on behalf of the Shenzhen Longgang district dabojin supply chain wholesale department 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 v05r02 for digital transmission systems shall be performed also.

1.4 Test Facility

BSL Testing Co.,LTD.
1/F, Building B, Xinshidai GR Park, Shiyan Street, Bao'an District, Shenzhen, ShiyanStreet, Bao'an District, Shenzhen,Guangdong,518052,People’s Republic of China

FCC Test Firm Registration Number: 562200
Designation Number: CN1338

Tel: 400-882-9628
Fax: 86-755-26508703

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, 2440MHz, 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

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

Description	Manufacturer	Model	Serial No.	Cal Date	Due. Date
Communication Tester	Rohde & Schwarz	CMW500	100358	2023-10-27	2024-10-26
Spectrum Analyzer	R&S	FSP40	100550	2023-10-27	2024-10-26
Test Receiver	R&S	ESCI7	US47140102	2023-10-27	2024-10-26
Signal Generator	HP	83630B	3844A01028	2023-10-27	2024-10-26
Test Receiver	R&S	ESPI-3	100180	2023-10-27	2024-10-26
Amplifier	Agilent	8449B	4035A00116	2023-10-27	2024-10-26
Amplifier	HP	8447E	2945A02770	2023-10-27	2024-10-26
Signal Generator	IFR	2023A	202307/242	2023-10-27	2024-10-26
Broadband Antenna	SCHAFFNER	2774	2774	2023-10-27	2024-10-26
Biconical and log periodic antennas	ELECTRO-METRICS	EM-6917B-1	171	2023-10-27	2024-10-26
Horn Antenna	R&S	HF906	100253	2023-10-27	2024-10-26
Horn Antenna	EM	EM-6961	6462	2023-10-27	2024-10-26
LISN	R&S	ESH3-Z5	100196	2023-10-27	2024-10-26
LISN	COM-POWER	LI-115	02027	2023-10-27	2024-10-26
3m Semi-Anechoic Chamber	Chengyu Electron	9 (L)*6 (W)* 6 (H)	BSL086	2023-10-27	2024-10-26
Horn Antenna	A-INFOMW	LB-180400KF	BSL088	2023-10-27	2024-10-26
20dB Attenuator	ICPROBING	IATS1	BSL1003	2023-10-27	2024-10-26
POWER DIVIDER	Mini-circuits	PD-2SF-0010	N/A	2023-10-27	2024-10-26
Power Meter	DARE	RPR3006W	15I00041SNO03	2023-10-27	2024-10-26
Loop Antenna	Schwarz beck	FMZB 1516	9773	2023-10-27	2024-10-26
Antenna Tower	SKET	BK-4AT-BS	N/A	N/A	N/A

2. SUMMARY OF TEST RESULTS

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

Note: PASS: applicable, 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 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.

4.2 Evaluation Information

This product has a PCB antenna(1.3dBi), 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 v05r02, 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

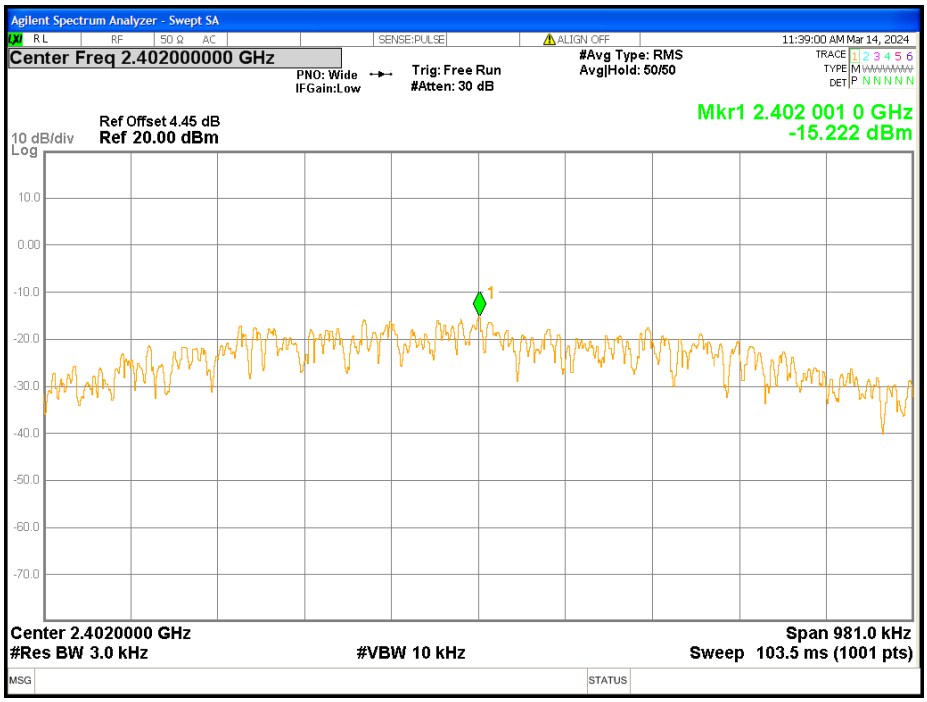
Temperature:	26° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

5.4 Summary of Test Results/Plots

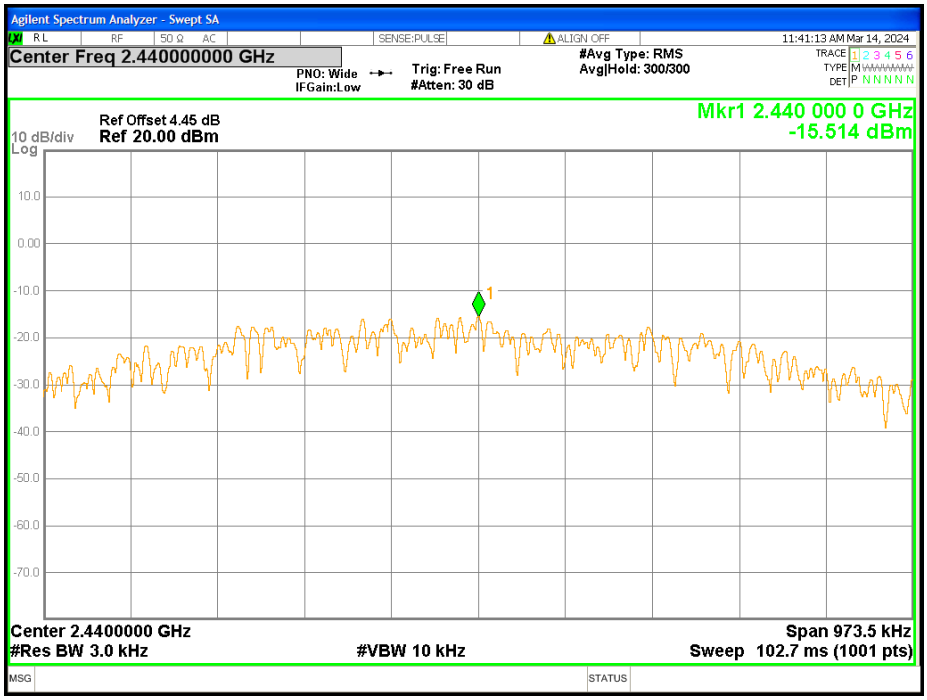
Test Mode	Test Channel MHz	Power Spectral Density dBm/3kHz	Limit dBm/3kHz
GFSK(BLE)	2402	-15.22	8
	2440	-15.51	8
	2480	-16.68	8

Please refer to the following test plots:

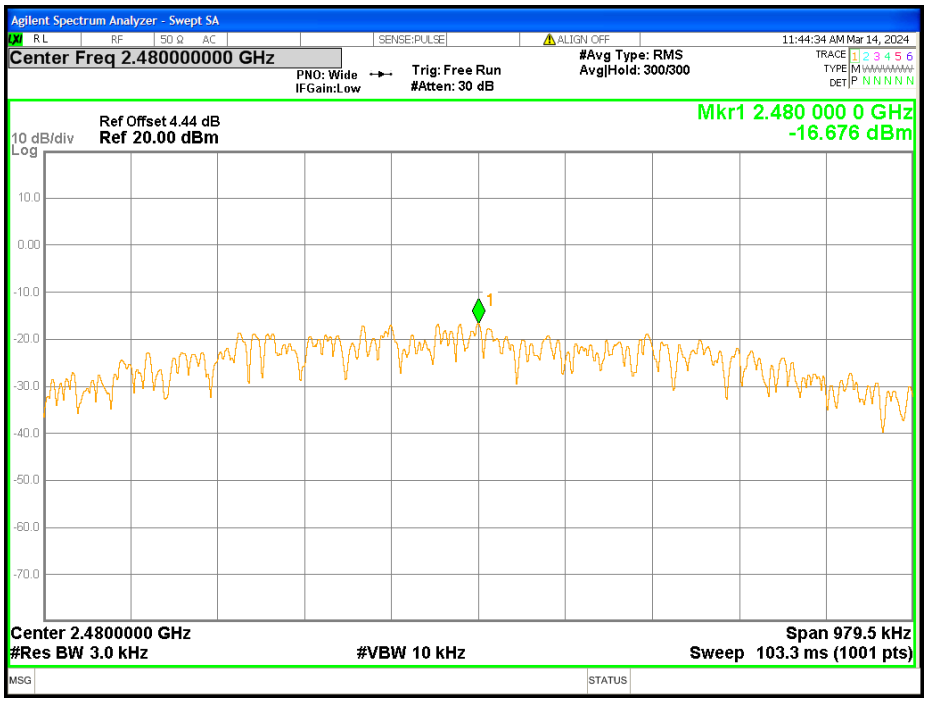
Low Channel



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) ⩾ 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

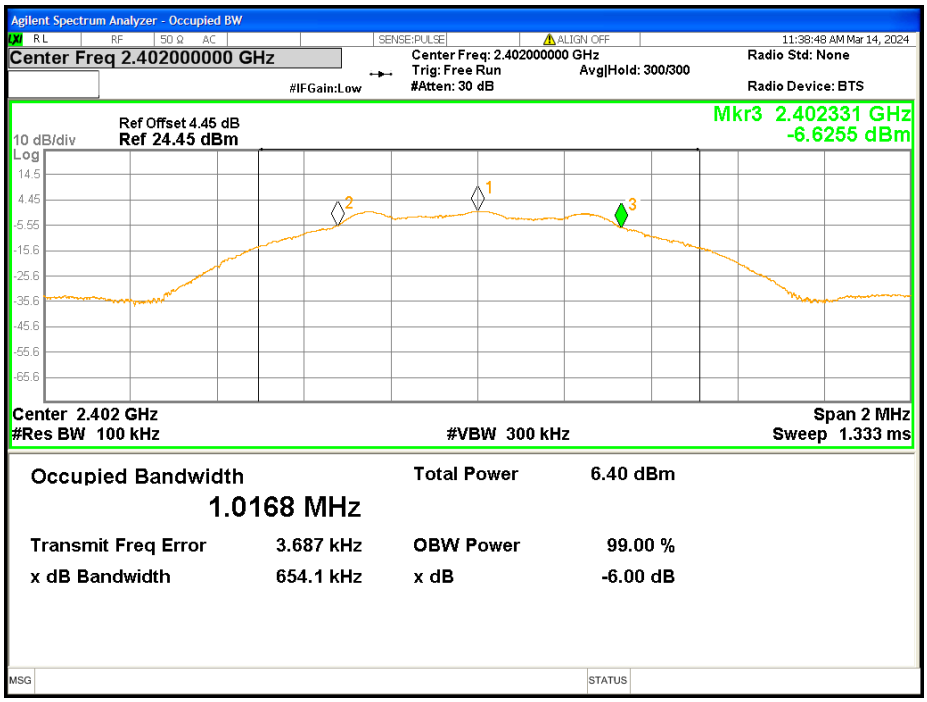
6.4 Summary of Test Results/Plots

Test Mode	Test Channel MHz	6 dB Bandwidth kHz	Limit kHz
GFSK(BLE)	2402	654	≥500
	2440	649	≥500
	2480	653	≥500

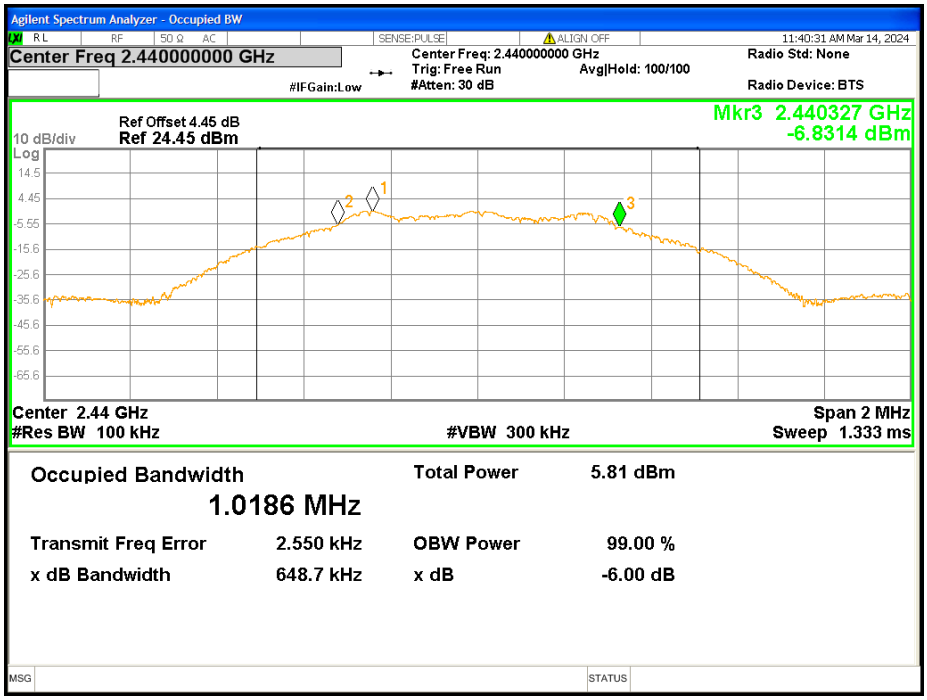
Please refer to the following test plots:

For BLE

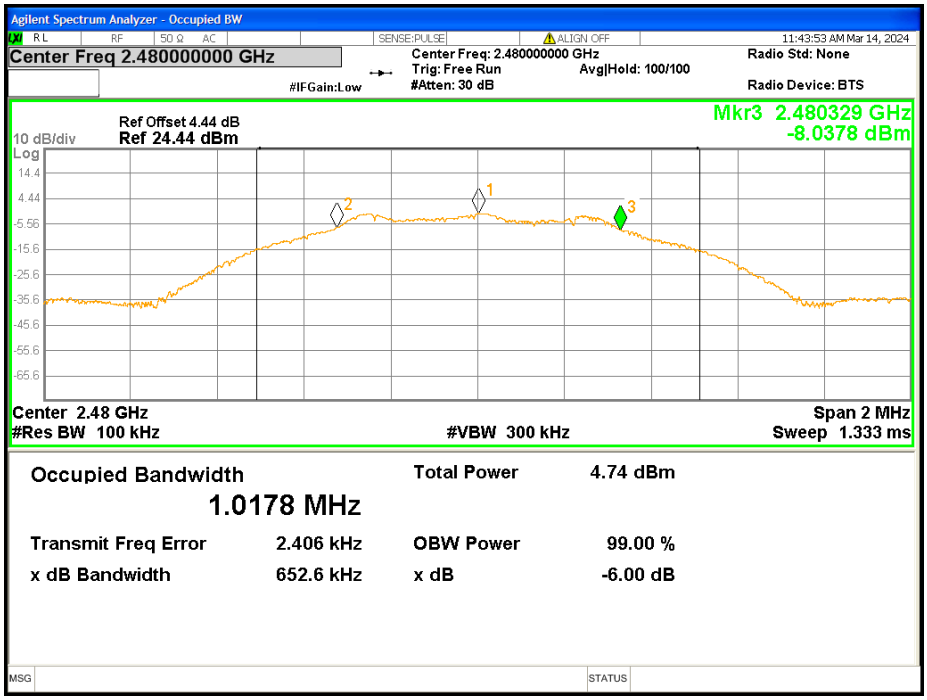
Low Channel:



Middle Channel:



High Channel:



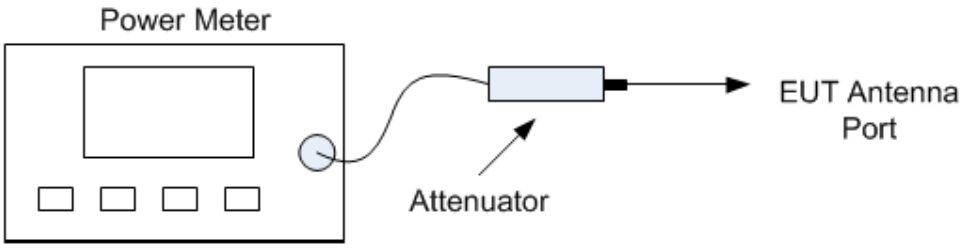
7. RF Output Power

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

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall use a fast-responding diode detector.



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	0.42	1.10	1000
	2440	0.13	1.03	1000
	2480	-1.05	0.79	1000

Note: the antenna gain of 1.3dBi less than 6dBi maximum permission antenna gain value based on 1 watt peak output power limit.

8. Field Strength of Spurious Emissions

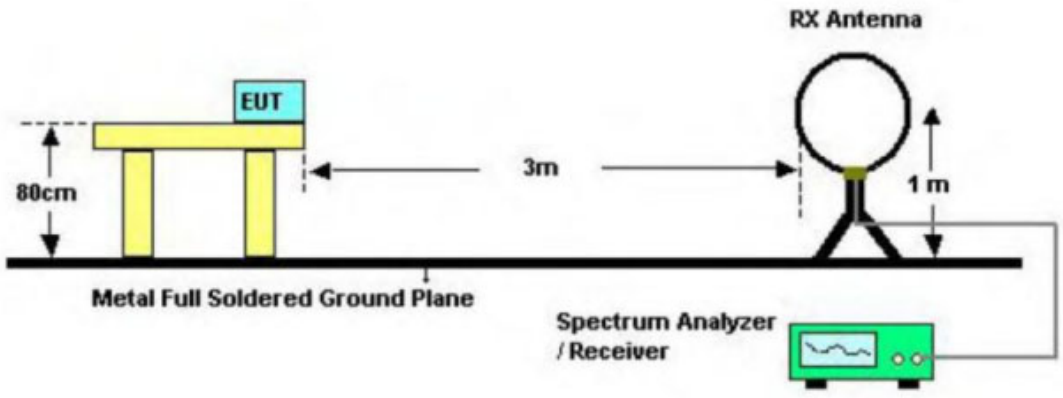
8.1 Standard Applicable

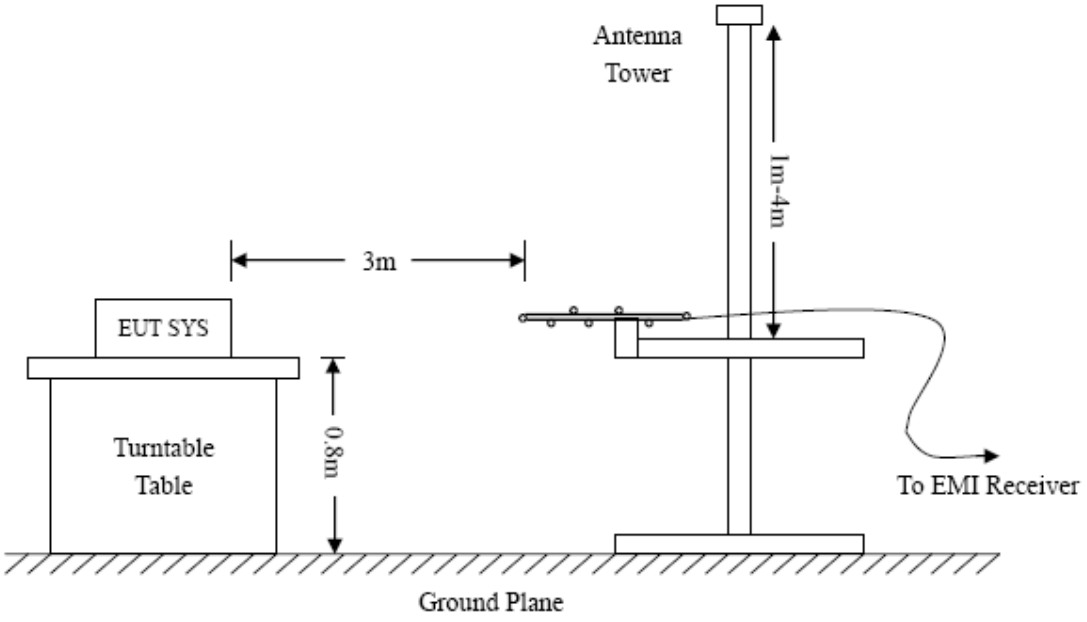
According to §15.247(d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within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

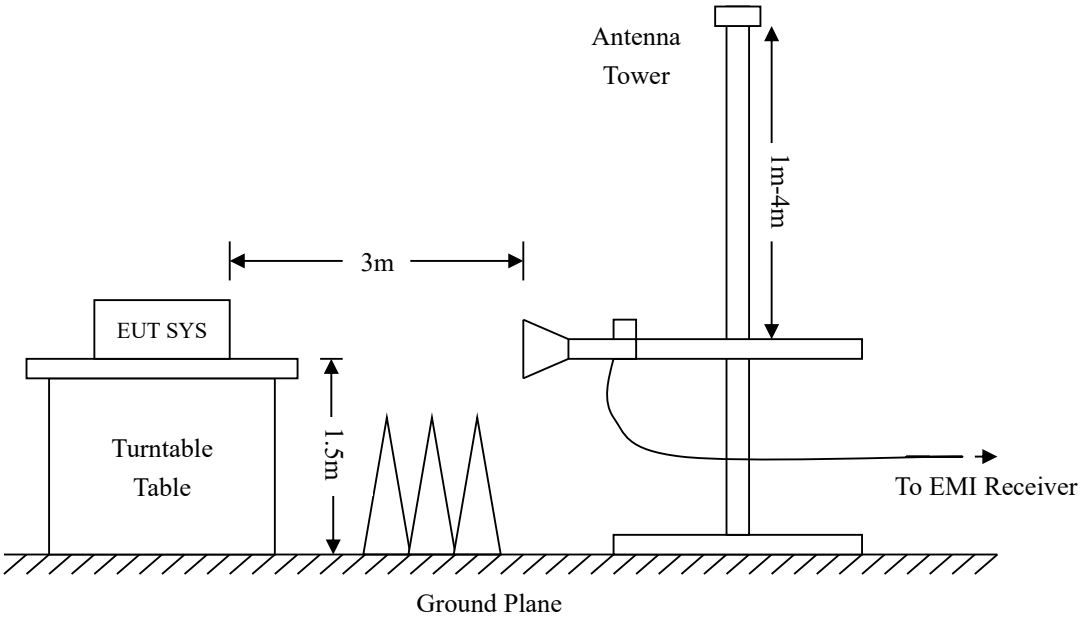
The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply. Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

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 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 Limit

8.4 Environmental Conditions

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

8.5 Summary of Test Results/Plots

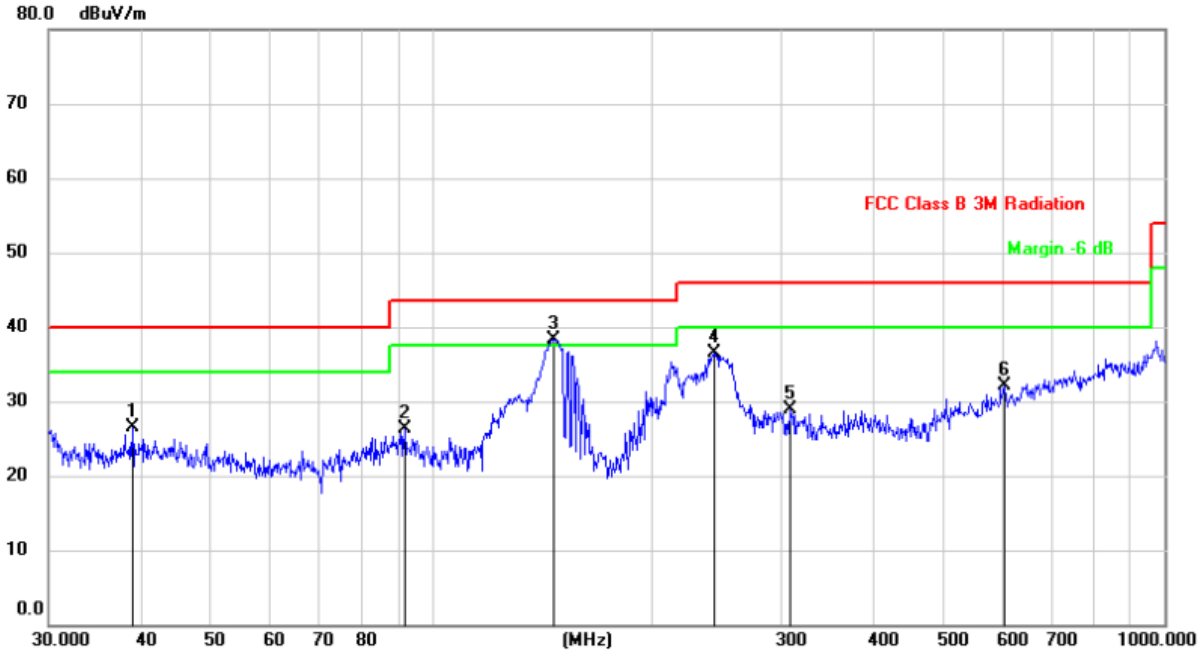
According to the data below, the FCC Part 15.205, 15.209 and 15.247 standards, and had the worst cases:

Note:
1. Worst-case radiated emission below 1GHz is GFSK (CH High) mode.
2. Worst-case radiated emission above 1GHz is GFSK (CH Low, Middle, High) mode.

The Worst Test Data Below 1GHz GFSK (CH High) mode:

Plot of Radiated Emissions

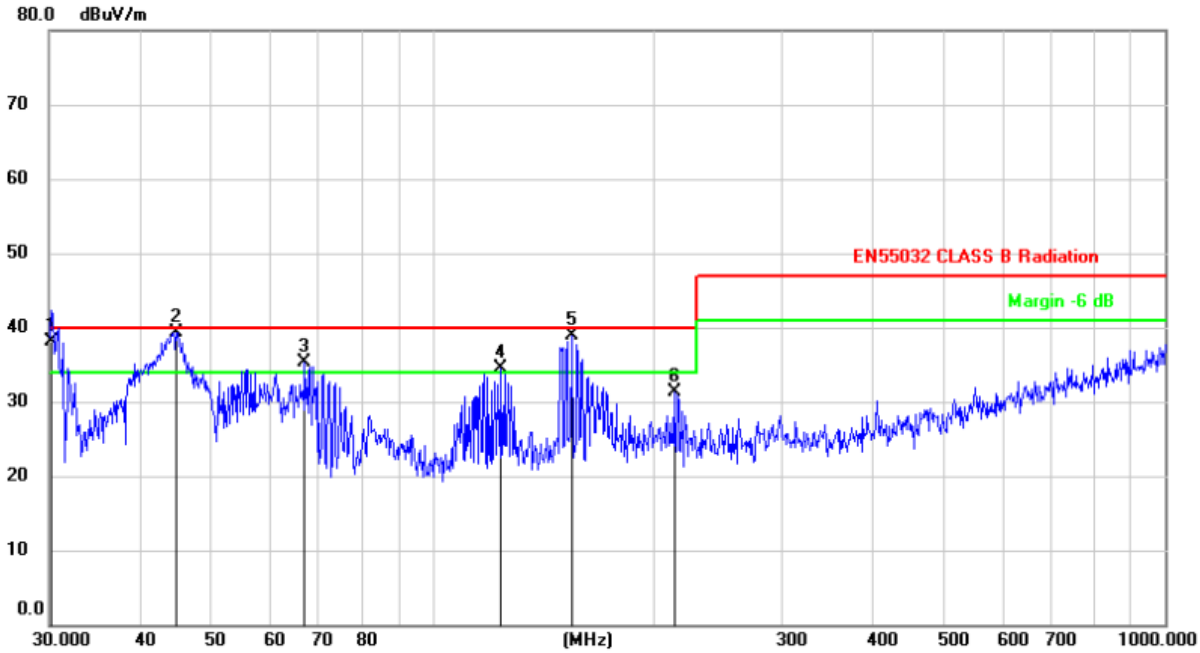
Test Specification: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB	Detector
1		39.0245	14.89	11.65	26.54	40.00	-13.46	QP
2		91.8161	14.79	11.49	26.28	43.50	-17.22	QP
3	*	146.8874	27.80	10.60	38.40	43.50	-5.10	QP
4		242.5252	27.43	9.14	36.57	46.00	-9.43	QP
5		307.8312	15.55	13.36	28.91	46.00	-17.09	QP
6		603.5392	14.64	17.54	32.18	46.00	-13.82	QP

*:Maximum data x:Over limit !:over margin

Test Specification: *Vertical*



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB	Detector
1	!	30.2111	25.61	11.49	37.10	40.00	-2.90	QP
2	*	44.7433	26.72	11.66	38.38	40.00	-1.62	QP
3	!	66.9669	24.67	10.62	35.29	40.00	-4.71	QP
4	!	124.1330	21.83	12.74	34.57	40.00	-5.43	QP
5	!	155.3644	25.55	12.31	37.86	40.00	-2.14	QP
6		213.7634	18.51	12.71	31.22	40.00	-8.78	QP

*:Maximum data x:Over limit !:over margin

The Worst Spurious Emissions Above 1GHz

Transmitting: BLE mode:

Test channel:	Lowest

Peak value:

Frequency (MHz)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2402	90.25	-	-	Vertical
4804	42.15	74.00	-31.85	Vertical
7206	39.02	74.00	-34.98	Vertical
9608	31.27	74.00	-42.73	Vertical
2402	88.34	-	-	Horizontal
4804	40.25	74.00	-33.75	Horizontal
7206	36.47	74.00	-37.53	Horizontal
9608	30.28	74.00	-43.72	Horizontal

Average value:

Frequency (MHz)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2402	89.35	-	-	Vertical
4804	40.25	54.00	-13.75	Vertical
7206	36.34	54.00	-17.66	Vertical
9608	31.05	54.00	-22.95	Vertical
2402	87.25	-	-	Horizontal
4804	36.21	54.00	-17.79	Horizontal
7206	35.24	54.00	-18.76	Horizontal
9608	31.28	54.00	-22.72	Horizontal

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *"*", means this data is the too weak instrument of signal is unable to test.*
3. *The emission from 9 kHz to 30MHz was pre tested and found the result was 20dB lower than the limit, and the permissible value has no need to be reported.*
4. *In frequency ranges 18 ~25GHz no any other harmonic emissions detected which are tested to compliance with the limit. No recording in the test report. No any other emissions level which are attenuated less than 20dB below the limit. No recording in the test report.*

Test channel:	Middle

Peak value:

Frequency (MHz)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2442	87.58	-	-	Vertical
4882	41.25	74.00	-32.75	Vertical
7323	37.34	74.00	-36.66	Vertical
9764	31.68	74.00	-42.32	Vertical
2442	86.54	-	-	Horizontal
4882	38.14	74.00	-35.86	Horizontal
7323	34.25	74.00	-39.75	Horizontal
9764	30.85	74.00	-43.15	Horizontal

Average value:

Frequency (MHz)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2442	86.58	-	-	Vertical
4882	40.10	54.00	-13.90	Vertical
7323	36.54	54.00	-17.46	Vertical
9764	30.27	54.00	-23.73	Vertical
2442	85.67	-	-	Horizontal
4882	35.21	54.00	-18.79	Horizontal
7323	33.54	54.00	-20.46	Horizontal
9764	30.28	54.00	-23.72	Horizontal

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *"*", means this data is the too weak instrument of signal is unable to test.*
3. *The emission from 9 kHz to 30MHz was pre tested and found the result was 20dB lower than the limit, and the permissible value has no need to be reported.*
4. *In frequency ranges 18 ~25GHz no any other harmonic emissions detected which are tested to compliance with the limit. No recording in the test report. No any other emissions level which are attenuated less than 20dB below the limit. No recording in the test report.*

Test channel:	Highest

Peak value:

Frequency (MHz)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2480	86.57	-	-	Vertical
4960	38.69	74.00	-35.31	Vertical
7440	36.52	74.00	-37.48	Vertical
9920	31.57	74.00	-42.43	Vertical
2480	85.64	-	-	Horizontal
4960	38.25	74.00	-35.75	Horizontal
7440	34.31	74.00	-39.69	Horizontal
9920	31.29	74.00	-42.71	Horizontal

Average value:

Frequency (MHz)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2480	85.67	-	-	Vertical
4960	37.54	54.00	-16.46	Vertical
7440	34.61	54.00	-19.39	Vertical
9920	30.29	54.00	-23.71	Vertical
2480	85.61	-	-	Horizontal
4960	37.56	54.00	-16.44	Horizontal
7440	34.18	54.00	-19.82	Horizontal
9920	30.51	54.00	-23.49	Horizontal

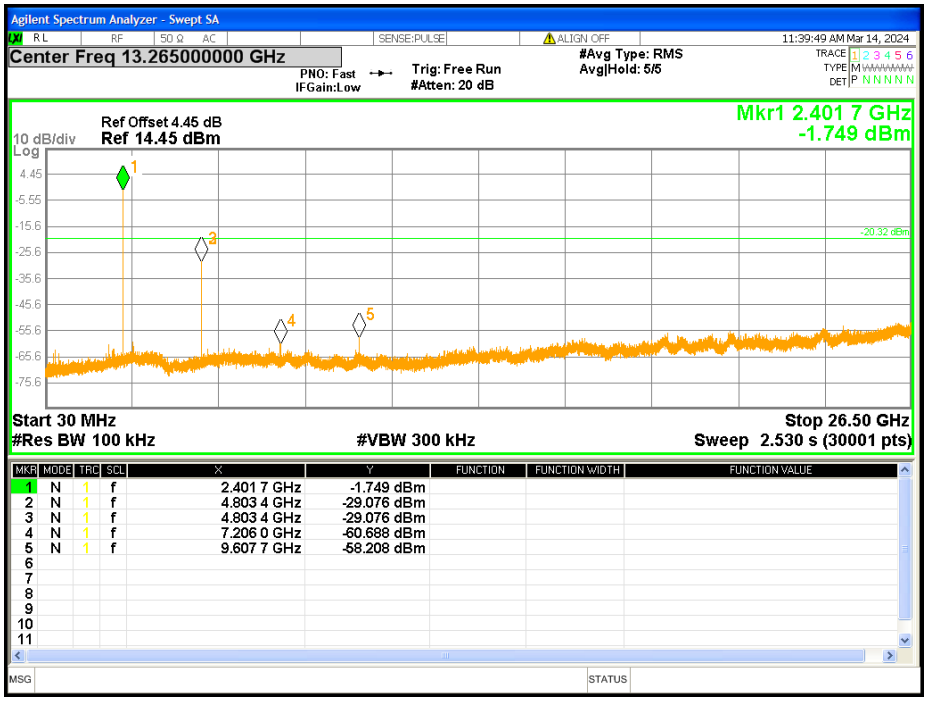
Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *"*", means this data is the too weak instrument of signal is unable to test.*
3. *The emission from 9 kHz to 30MHz was pre tested and found the result was 20dB lower than the limit, and the permissible value has no need to be reported.*
4. *In frequency ranges 18 ~25GHz no any other harmonic emissions detected which are tested to compliance with the limit. No recording in the test report. No any other emissions level which are attenuated less than 20dB below the limit. No recording in the test report.*

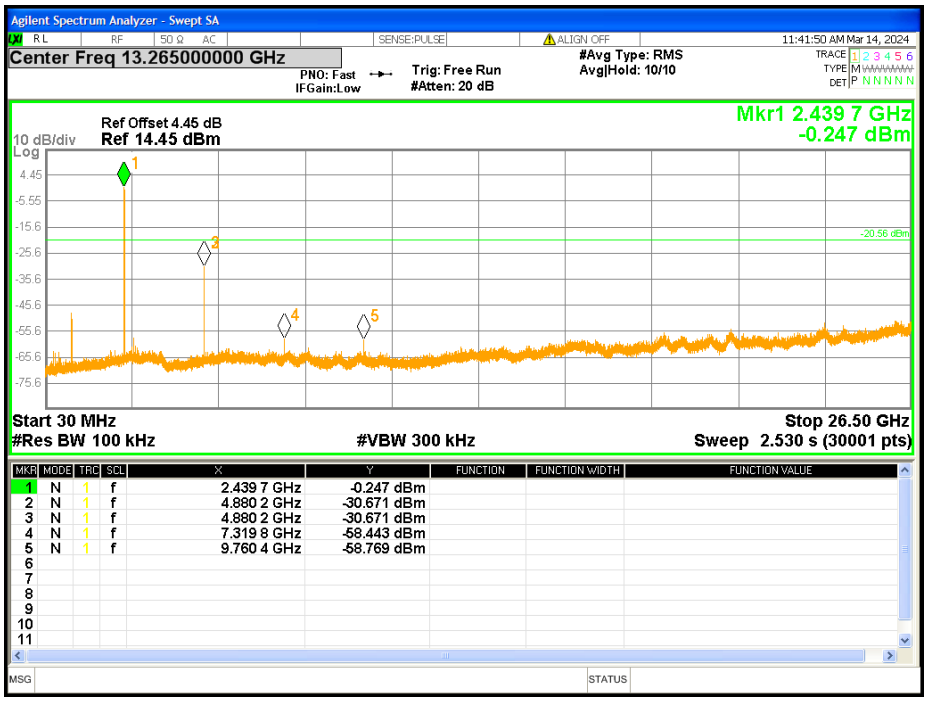
Spurious Emission(Conducted)

For BLE

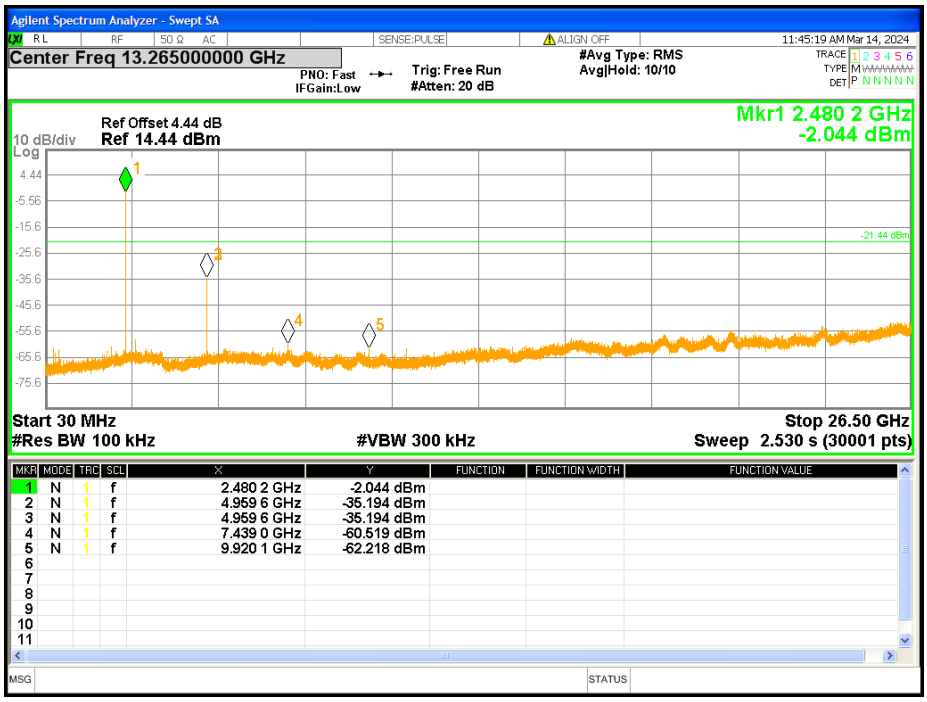
Low channel:



Middle channel:



High channel:


Agilent Spectrum Analyzer - Swept SA
Center Freq 13.265000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
Avg|Hold: 10/10
11:45:19 AM Mar 14, 2024
Ref Offset 4.44 dB
10 dB/div
Ref 14.44 dBm
Log
Mkr1 2.480 2 GHz
-2.044 dBm
-21.44 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 2.530 s (30001 pts)
1 N 1 f 2.480 2 GHz -2.044 dBm
2 N 1 f 4.959 6 GHz -35.194 dBm
3 N 1 f 4.959 6 GHz -35.194 dBm
4 N 1 f 7.439 0 GHz -60.519 dBm
5 N 1 f 9.920 1 GHz -62.218 dBm

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 v05r02, the Marker-delta method as follows:
for Antenna-port conducted measurement.
Antenna-port conducted measurements may also be used as an alternative to radiated measurements for demonstrating compliance in the restricted frequency bands. If conducted measurements are performed, then proper impedance matching must be ensured and an additional radiated test for cabinet/case spurious emissions is required.
1). Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2). Remove the antenna from the EUT and then connect to a low loss RF cable from the antenna port to an EMI test receiver, then turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range.
3). Set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100kHz bandwidth from band edge, for Radiated emissions restricted band RBW=1MHz, VBW=3MHz for peak detector and RBW=1MHz, VBW=1/B for AV detector.
4). Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5). Repeat above procedures until all measured frequencies were complete.
6). Measure the conducted output power (in dBm) using the detector specified by the appropriate regulatory agency (see 12.2.2, 12.2.3, and 12.2.4 for guidance regarding measurement procedures for determining quasi-peak, peak, and average conducted output power, respectively).
7). Add the maximum transmit antenna gain (in dBi) to the measured output power level to determine the EIRP level (see 12.2.5 for guidance on determining the applicable antenna gain)
8). Add the appropriate maximum ground reflection factor to the EIRP level (6 dB for frequencies ≤ 30 MHz, 4.7 dB for frequencies between 30 MHz and 1000 MHz, inclusive and 0 dB for frequencies > 1000 MHz).
9). For devices with multiple antenna-ports, measure the power of each individual chain and sum the EIRP of all chains in linear terms (e.g., Watts, mW).
10). Convert the resultant EIRP level to an equivalent electric field strength using the following relationship:

E = EIRP – 20log D + 104.77=EIRP+95.23
Where:
E = electric field strength in dBμV/m,
EIRP = equivalent isotropic radiated power in dBm
D = specified measurement distance in meters.
11). Since the out-of-band characteristics of the EUT transmit antenna will often be unknown, the use of a conservative antenna gain value is necessary. Thus, when determining the EIRP based on the measured conducted power, the upper bound on antenna gain for a device with a single RF output shall be selected as the maximum in-band gain of the antenna across all operating bands, or 2 dBi, whichever is greater. However, for devices that operate in multiple frequency bands while using the same transmit antenna, the highest gain of the antenna within the operating band nearest in frequency to the restricted band emission being measured may be used in lieu of the overall highest gain when the emission is at a frequency that is within 20 percent of the nearest band edge frequency, but in no case shall a value less than 2 dBi be used.
12). Compare the resultant electric field strength level to the applicable regulatory limit.
13). Perform radiated spurious emission test duress until all measured frequencies were complete.

9.3 Environmental Conditions

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

9.4 Summary of Test Results/Plots

Bandedge (Radiated)

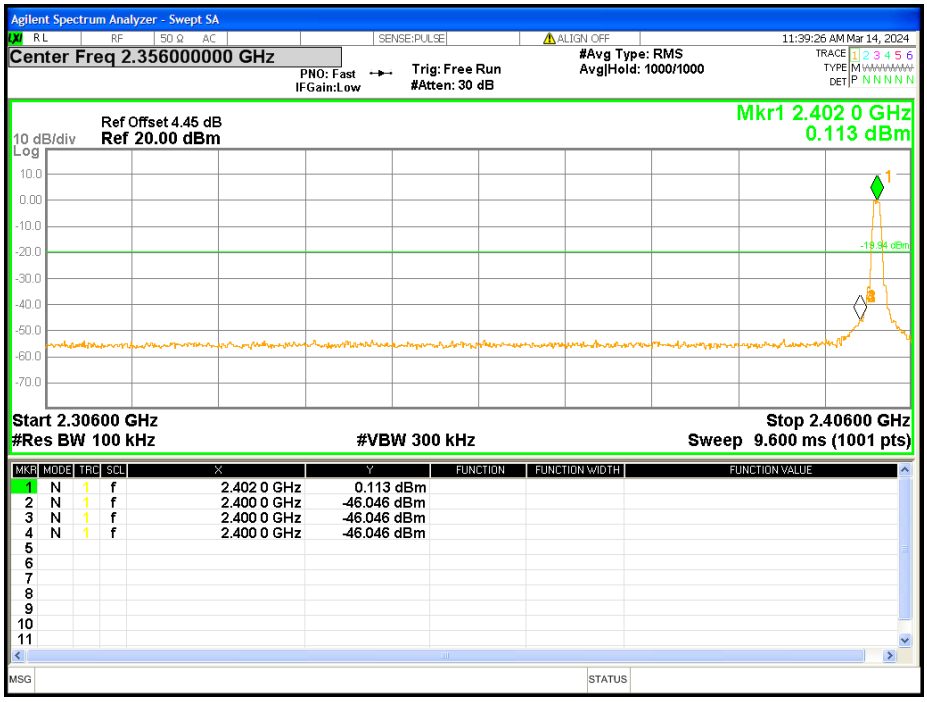
GFSK(BLE)

Channel	Freq.(MHz)	Power(dBm)	Gain(dBi)	Level(dBuV)	Limit(dBuV)	Margin(dB)	Detector
LOW (2402MHz)	2400.0	-46.05	2.00	51.18	74.00	-22.82	Peak
HIGH (2480MHz)	2483.5	-55.49	2.00	41.74	74.00	-32.26	Peak
	2500.0	-56.88	2.00	40.35	74.00	-33.65	Peak
	2484.5	-53.82	2.00	43.41	74.00	-30.59	Peak

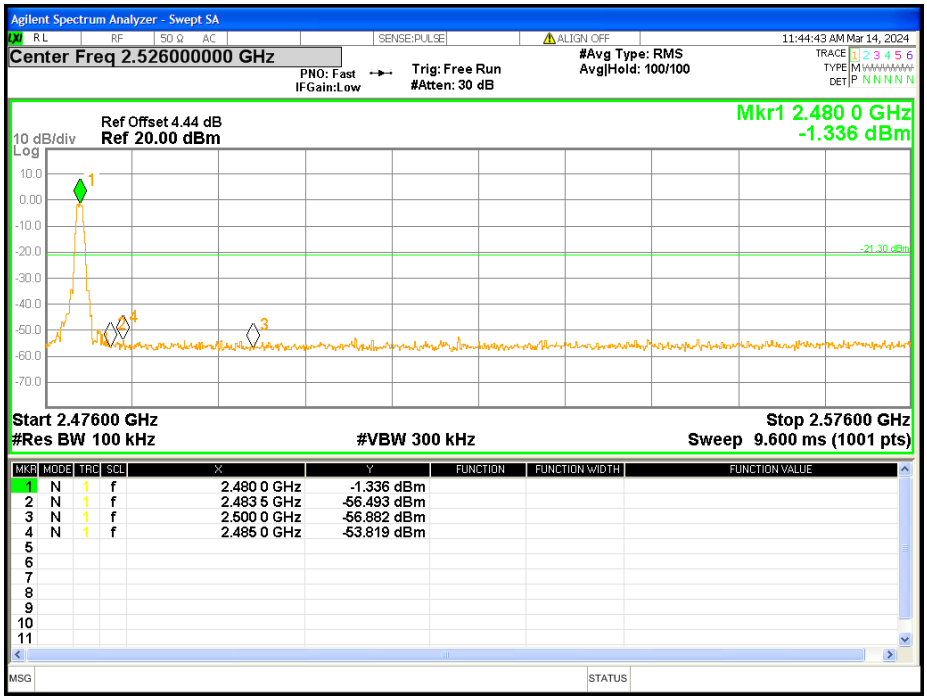
Remark: 1. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.
2. Maximum in-band gain of the antenna across all operating bands, or 2 dBi, whichever is greater.

Bandedge (Conducted)

Lowest



High Channel:

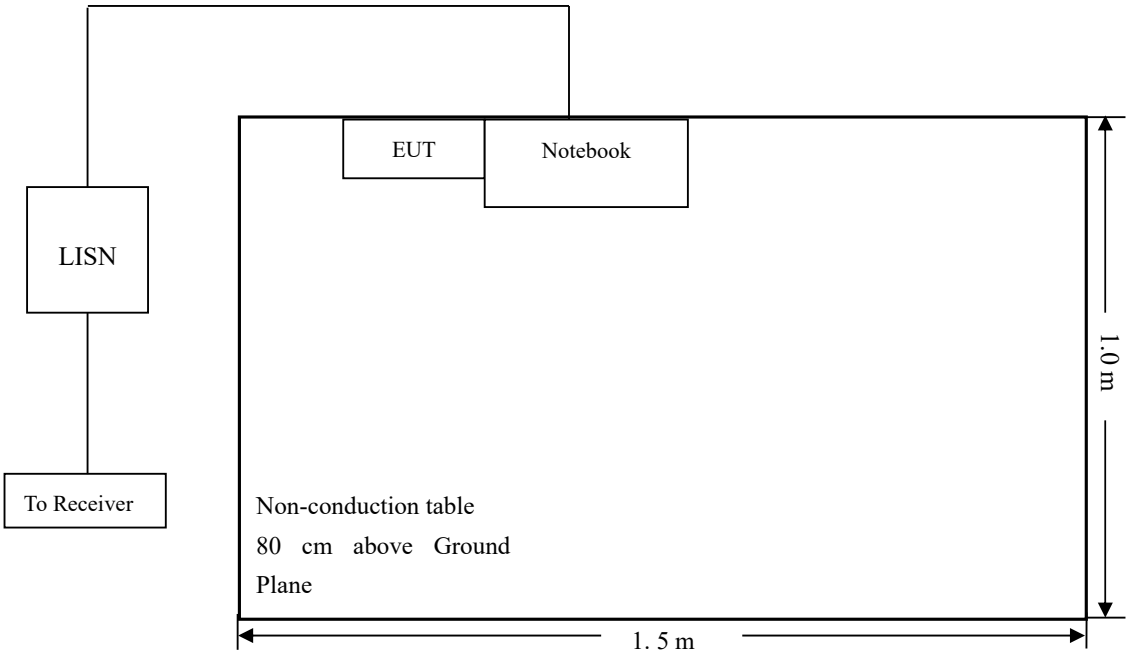


10. Conducted Emissions

10.1 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.

10.2 Basic Test Setup Block Diagram



10.3 Environmental Conditions

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

10.4 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

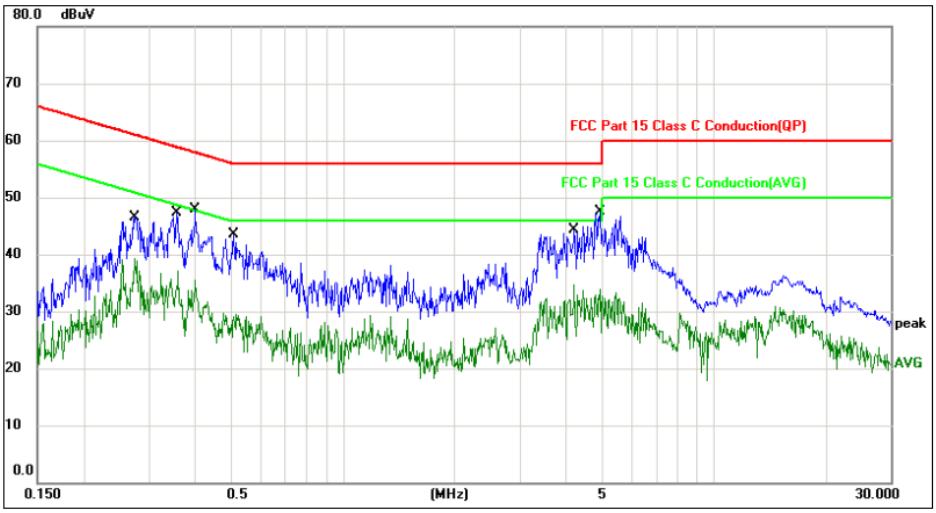
10.5 Summary of Test Results/Plots

According to the data in section 10.6, the EUT complied with the FCC Part 15.207 Conducted margin for this device

10.6 Conducted Emissions Test Data

Plot of Conducted Emissions Test Data

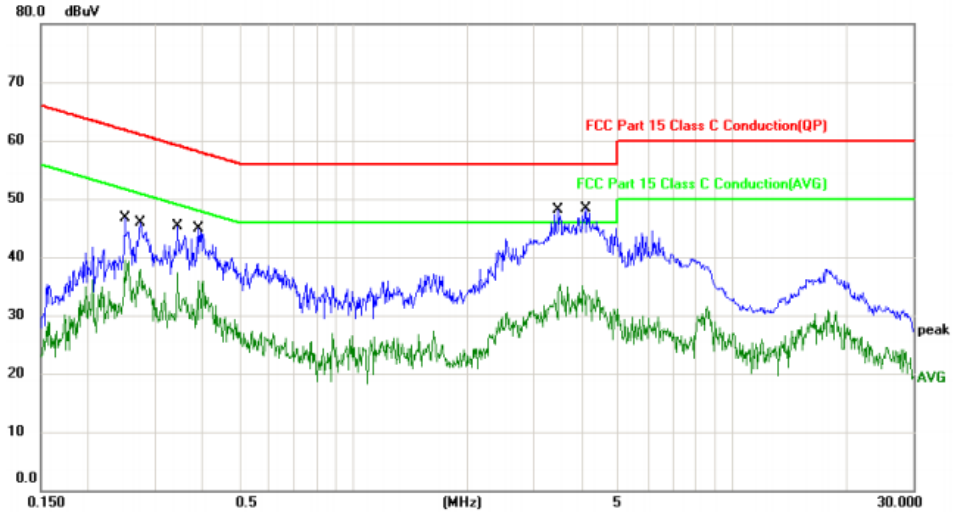
Test Specification: *Neutral*



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.2742	46.28	0.32	46.60	60.99	-14.39	QP	
2		0.2742	39.39	0.32	39.71	50.99	-11.28	AVG	
3		0.3558	47.03	0.37	47.40	58.82	-11.42	QP	
4		0.3558	36.95	0.37	37.32	48.82	-11.50	AVG	
5		0.3996	47.55	0.38	47.93	57.86	-9.93	QP	
6		0.3996	34.71	0.38	35.09	47.86	-12.77	AVG	
7		0.5072	43.18	0.42	43.60	56.00	-12.40	QP	
8		0.5072	28.90	0.42	29.32	46.00	-16.68	AVG	
9		4.2018	43.40	0.89	44.29	56.00	-11.71	QP	
10		4.2018	34.01	0.89	34.90	46.00	-11.10	AVG	
11	*	4.9256	46.52	0.92	47.44	56.00	-8.56	QP	
12		4.9256	32.34	0.92	33.26	46.00	-12.74	AVG	

*:Maximum data x:Over limit !:over margin

Test Specification: *Line*



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.2494	46.41	0.31	46.72	61.77	-15.05	QP	
2		0.2494	38.39	0.31	38.70	51.77	-13.07	AVG	
3		0.2742	45.62	0.32	45.94	60.99	-15.05	QP	
4		0.2742	35.94	0.32	36.26	50.99	-14.73	AVG	
5		0.3427	45.00	0.37	45.37	59.14	-13.77	QP	
6		0.3427	36.58	0.37	36.95	49.14	-12.19	AVG	
7		0.3914	44.61	0.38	44.99	58.03	-13.04	QP	
8		0.3914	33.81	0.38	34.19	48.03	-13.84	AVG	
9		3.4721	47.32	0.85	48.17	56.00	-7.83	QP	
10		3.4721	32.21	0.85	33.06	46.00	-12.94	AVG	
11	*	4.0918	47.40	0.88	48.28	56.00	-7.72	QP	
12		4.0918	32.14	0.88	33.02	46.00	-12.98	AVG	

*:Maximum data x:Over limit !:over margin

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