

FCC TEST REPORT

For

AUDIO GLASSES

Model Number: SOUNDGEAR FRAMES

FCC ID: APIJBLSGF

IC: 6132A-JBLSGF

Report Number : WT248001947

Test Laboratory : Shenzhen Academy of Metrology and Quality Inspection

Site Location : No.4, Tongfa Road, Xili Street, Nanshan District,
Shenzhen, Guangdong, China

Tel : 0086-755-86928965

Fax : 0086-755-86009898-31396

Web : www.smq.com.cn

E-mail : emcrf@smq.com.cn

The "important statement" on the back of report's homepage is an element of the report, and any copy that does not contain the "important statement" is incomplete.

Revision History

No	Date	Remark
V1.0	2024.10.24	Initial issue

TEST REPORT DECLARATION

Applicant : Harman International Industries, Incorporated
Address : 8500 Balboa Blvd, Northridge, California, 91329, United States
Manufacturer : Harman International Industries, Incorporated
Address : 8500 Balboa Blvd, Northridge, California, 91329, United States
EUT Description : AUDIO GLASSES
Model No. : SOUNDGEAR FRAMES
Trade mark : JBL
HVIN : SOUNDGEAR FRAMES
FCC ID : APIJBLSGF
IC : 6132A-JBLSGF

Test Standards:

FCC Part 15 Subpart C
RSS-247 Issue 3 (2023-08)
RSS-GEN Issue 5 (2021-02)

The EUT described above is tested by Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory to determine the maximum emissions from the EUT. Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory is assumed full responsibility for the accuracy of the test results, unless they depend on the manufacturer information.

The test report is valid for above tested sample only and shall not be reproduced in part without written approval of the laboratory.

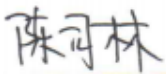
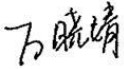
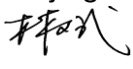
Project Engineer:	 (Chen Silin 陈司林)	Date:	<u>Oct. 24, 2024</u>
Checked by:	 (Wan Xiaojing 万晓婧)	Date:	<u>Oct. 24, 2024</u>
Approved by:	 (Lin Bin 林斌)	Date:	<u>Oct. 24, 2024</u>

TABLE OF CONTENTS

TEST REPORT DECLARATION	3
1. TEST RESULTS SUMMARY	6
2. GENERAL INFORMATION.....	7
2.1. Report Information.....	7
2.2. Laboratory Accreditation and Relationship to Customer	7
2.3. Measurement Uncertainty	8
3. PRODUCT DESCRIPTION.....	9
3.1. EUT Description.....	9
3.2. Related Submittal(s) / Grant (s)	9
3.3. Block Diagram of EUT Configuration	9
3.4. Operating Condition of EUT	9
3.5. Directional Antenna Gain	10
3.6. Support Equipment List	10
3.7. Test Conditions.....	10
3.8. Special Accessories.....	10
3.9. Equipment Modifications	10
4. TEST EQUIPMENT USED	11
5. 6DB BANDWIDTH MEASUREMENT.....	12
5.1. Limits of 6dB Bandwidth Measurement	12
5.2. Test Procedure	12
5.3. Test Setup	12
5.4. Test Data	12
6. MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT	17
6.1. Limits of Maximum Conducted Output Power Measurement.....	17
6.2. Test Procedure	17
6.3. Test Setup	17
6.4. Test Data	17
7. MAXIMUM POWER SPECTRAL DENSITY LEVEL MEASUREMENT	21
7.1. Limits of Maximum Power Spectral Density Level Measurement	21
7.2. Test Procedure	21
7.3. Test Data	21
8. CONDUCTED BANDEDGE AND SPURIOUS MEASUREMENT.....	25
8.1. Limits of Conducted Bandedge and Spurious Measurement.....	25
8.2. Test Procedure	25
8.3. Test Data	25
9. RADIATED BANDEDGE AND SPURIOUS MEASUREMENT	38
9.1. Limits of Radiated Bandedge and Spurious Measurement	38
9.2. Test Procedure	39
9.3. Test Data	39
10. CONDUCTED EMISSION TEST FOR AC POWER PORT MEASUREMENT	57
10.1. Test Standard and Limit	57
10.2. Test Procedure	57
10.3. Test Arrangement.....	57

10.4.	Test Data	57
11.	99% BANDWIDTH	60
11.1.	LIMITS OF 99% Bandwidth	60
11.2.	TEST PROCEDURE.....	60
11.3.	TEST SETUP	60
11.4.	TEST DATA.....	60
12.	ANTENNA REQUIREMENTS	64
12.1.	Antenna Connector	64
12.2.	Antenna Gain	64

1. TEST RESULTS SUMMARY

Table 1 Test Results Summary

Test Items	FCC Rules	ISED Rules	Test Results
6dB DTS Bandwidth	15.247 (a) (2)	RSS-247 Clause 5.2(a)	Pass
Maximum Peak Conducted Power	15.247 (b) (3)	RSS-247 Clause 5.4(d)	Pass
Maximum Power Spectral Density Level	15.247 (e)	RSS-247 Clause 5.2(b)	Pass
Conducted Bandedge and Spurious	15.247 (d)	RSS-247 Clause 5.5	Pass
Radiated Bandedge and Spurious	15.247 (d) 15.209 15.205	RSS-Gen Clause 8.9 & RSS-247 Clause 5.5	Pass
Conducted Emission Test for AC Power Port	15.207	RSS-Gen Clause 8.8	Pass
99% Bandwidth	N/A	RSS-Gen Clause 6.7	Pass
Antenna Requirements	15.203	RSS-GEN Clause 6.8	Pass

Remark: "N/A" means "Not applicable."

2. GENERAL INFORMATION

2.1. Report Information

This report is not a certificate of quality; it only applies to the sample of the specific product/equipment given at the time of its testing. The results are not used to indicate or imply that they are application to the similar items. In addition, such results must not be used to indicate or imply that SMQ approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that SMQ in any way guarantees the later performance of the product/equipment.

The sample/s mentioned in this report is/are supplied by Applicant, SMQ therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture or any information supplied.

Additional copies of the report are available to the Applicant at an additional fee. No third part can obtain a copy of this report through SMQ, unless the applicant has authorized SMQ in writing to do so.

The lab will not be liable for any loss or damage resulting for false, inaccurate, inappropriate or incomplete product information provided by the applicant/manufacturere.

2.2. Laboratory Accreditation and Relationship to Customer

The testing report were performed by the Shenzhen Academy of Metrology and quality Inspection EMC Laboratory (Guangdong EMC compliance testing center), in their facilities located at NETC Building, No.4 Tongfa Rd., Xili, Nanshan, Shenzhen, China. At the time of testing, Laboratory is accredited by the following organizations:

China National Accreditation Service for Conformity Assessment (CNAS) accredits the Laboratory for conformance to FCC standards, EMC international standards and EN standards. The Registration Number is CNAS L0579.

The Laboratory is Accredited Testing Laboratory of FCC with Designation number CN1165 and Site registration number 582918.

The Laboratory is registered to perform emission tests with Innovation, Science and Economic Development (ISED), and the registration number is 11177A.

The Laboratory is registered to perform emission tests with VCCI, and the registration number are C-20048, G20076, R-20077, R-20078 and T-20047.

The Laboratory is Accredited Testing Laboratory of American Association for Laboratory Accreditation (A2LA) and certificate number is 3292.01.

2.3.Measurement Uncertainty

Conducted Emission

9 kHz~150 kHz $U=3.7$ dB $k=2$

150 kHz~30MHz $U=3.3$ dB $k=2$

Radiated Emission

30MHz~1000MHz $U=4.3$ dB $k=2$

1GHz~6GHz $U=4.6$ dB $k=2$

6GHz~40GHz $U=5.1$ dB $k=2$

3. PRODUCT DESCRIPTION

NOTE: The extreme test conditions for temperature and antenna gain were declared by the manufacturer.

3.1. EUT Description

Description : AUDIO GLASSES

Manufacturer : Harman International Industries, Incorporated

Model Number : SOUNDGEAR FRAMES

Operate Frequency : 2.402 GHz~2.480 GHz

Antenna Designation : FPC Antenna
Antenna Gain:
-2.57 dBi for left glasses leg
-2.34 dBi for right glasses leg

Operating Voltage : DC 3.8 V or DC 5 V/0.5 A *2 by AC/DC adapter

Software Version : V2.8.0

Hardware Version : V0.2

Remark: /

Bluetooth Low Energy:

Table 2 Working Frequency List

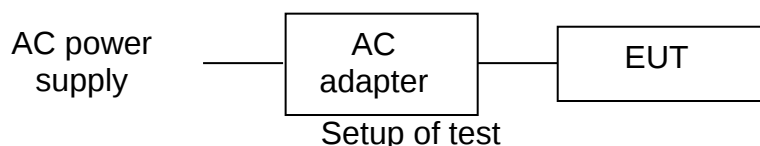
Regulatory Range	RF Channels
2.400-2.4835 GHz	$f=2402+k*2$ MHz, $k=0, \dots, 39$

3.2. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: **APIJBLSGF** filing to comply with Section 15.207, 15.209, 15.247 of the FCC Part 15 Subpart C Rules.

This submittal(s) (test report) is intended for IC: **6132A-JBLSGF** filing to comply with RSS-247 and RSS-GEN.

3.3. Block Diagram of EUT Configuration



3.4. Operating Condition of EUT

Worst-case mode and channel used for 30-1000 MHz radiated and power line conducted emissions was the mode and channel with the highest output power.

Worst-case data rates as provided by the client were:

Bluetooth low energy

Test mode is configured to be with duty cycle >98%

3.5. Directional Antenna Gain

Directional gain need NOT to be considered.

3.6. Support Equipment List

Table 3 Support Equipment List

Name	Model No	S/N	Manufacturer
Adapter	VCB3HDUH	---	Huizhou Golden Lake Industrial Co., Ltd.

3.7. Test Conditions

Date of test: Sep.26, 2024- Oct.14, 2024

Date of EUT Receive: Sep.25, 2024

Temperature: 23 °C-25 °C

Relative Humidity: 42%-50%

3.8. Special Accessories

Not available for this EUT intended for grant.

3.9. Equipment Modifications

Not available for this EUT intended for grant.

4. TEST EQUIPMENT USED

Table 4 Test Equipment

No.	Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
SB9054/05	Test Receiver	R&S	ESCI	Jun.17, 2024	1 Year
SB8501/06	AMN	R&S	ESH-Z5	Jan.16, 2024	1 Year
SB9549	Shielded Room	Albatross	SR	Aug.28, 2024	1 Year
SB17366	Test Receiver	R&S	ESR26	Apr.30, 2024	1 Year
SB3345	Loop Antenna	Schwarzbeck	FMZB1516	Jan.12, 2024	1 Year
SB3955	Broadband Antenna	SCHWARZBECK	VULB9163	Apr.30, 2024	1 Year
SB9555/01	Semi Anechoic Chamber	Albatross	9×6×6(m)	Aug.12, 2024	1 Year
SB8501/09	Test Receiver	R&S	ESU40	Jan.17, 2024	1 Year
SB3435	Horn Antenna	R&S	HF906	Nov.21, 2023	1 Year
SB9058/03	Pre-Amplifier	R&S	SCU 18	Jan.16, 2024	1 Year
SB8501/11	Antenna	R&S	3160-09	Feb.22, 2023	3 Years
SB8501/12	Antenna	R&S	3160-10	Feb.22, 2023	3 Years
SB8501/16	Pre-Amplifier	R&S	SCU-26	Jan.16, 2024	1 Year
SB9555/02	Fully Anechoic Chamber	Albatross	10.0×5.2×5.4(m)	Aug.08, 2024	1 Year
SB9060	Signal Analyzer	R&S	FSQ40	Apr.22, 2024	1 Year

Table 5 Test software

Name	Manufacturer	Version
Bluetooth and WiFi Test System	Shenzhen JS tonscond co.,ltd	3.3.10

5. 6DB BANDWIDTH MEASUREMENT

5.1.Limits of 6dB Bandwidth Measurement

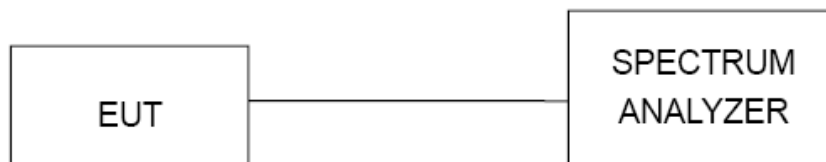
CFR 47 (FCC) part 15.247 (a) (2), 558074 D01 DTS Meas Guidance v05r02
RSS-247 Clause 5.2(a) the minimum 6 dB bandwidth shall be 500 kHz

5.2.Test Procedure

The transmitter output was connected to the spectrum analyzer.

- Set RBW = 100 kHz.
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Allow the trace to stabilize.
- 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.

5.3.Test Setup



5.4.Test Data

Left glasses leg:

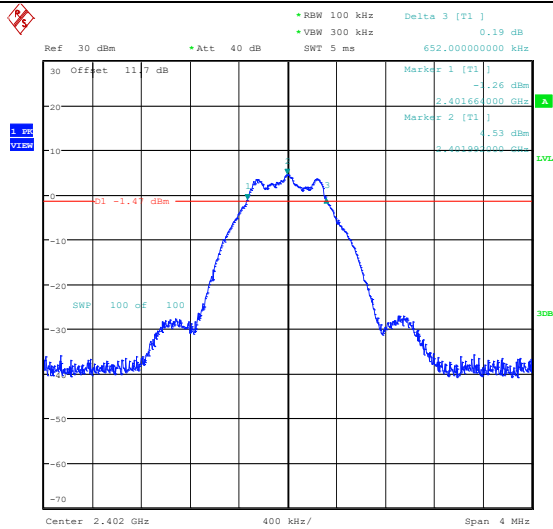
Table 6 6dB Bandwidth Test Data BLE

TestMode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.65	2401.66	2402.32	0.5	PASS
BLE_1M	Ant1	2440	0.66	2439.66	2440.32	0.5	PASS
BLE_1M	Ant1	2480	0.65	2479.66	2480.32	0.5	PASS

Right glasses leg:

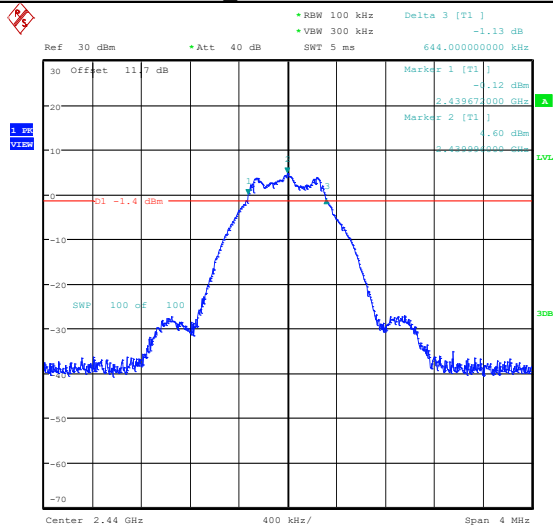
Table 7 6dB Bandwidth Test Data BLE

TestMode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.65	2401.66	2402.32	0.5	PASS
BLE_1M	Ant1	2440	0.64	2439.67	2440.32	0.5	PASS
BLE_1M	Ant1	2480	0.66	2479.66	2480.32	0.5	PASS



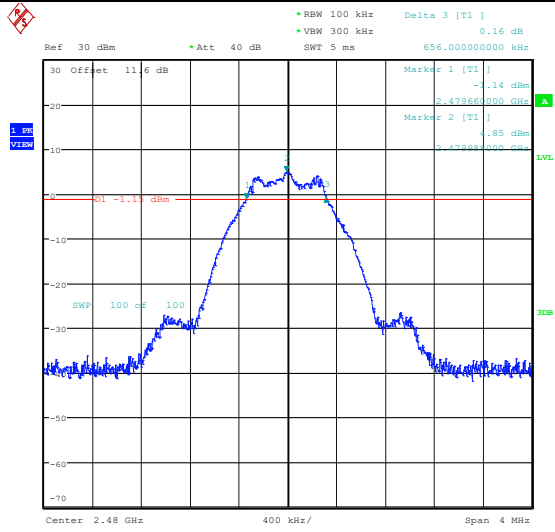
Date: 14.OCT.2024 15:40:26

BLE_1M-Ant1-2402-PASS



Date: 14.OCT.2024 15:51:03

BLE_1M-Ant1-2440-PASS



Date: 14.OCT.2024 15:52:56

BLE_1M-Ant1-2480-PASS

6. MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT

6.1.Limits of Maximum Conducted Output Power Measurement

CFR 47 (FCC) part 15.247 (b) (3), 558074 D01 DTS Meas Guidance v05r02
RSS-247 Clause 5.4(d), For DTSs employing digital modulation techniques operating in the bands 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1 W. The e.i.r.p. shall not exceed 4 W.

6.2. Test Procedure

The transmitter output was connected to the spectrum analyzer.

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

6.3. Test Setup

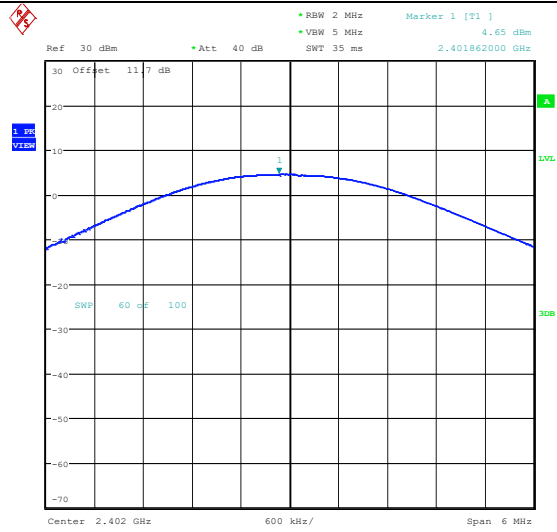


6.4. Test Data

Left glasses leg:

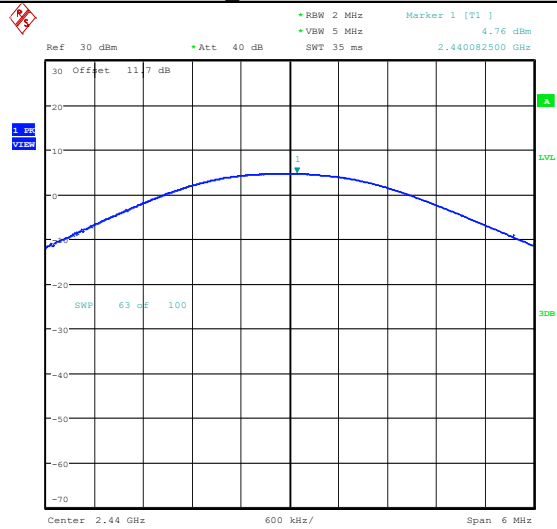
Table 8 Maximum Conducted Output Power Test Data

TestMode	Antenna	Frequency[MHz]	Conducted Peak Power[dBm]	Conducted Limit[dBm]	Antenna Gain[dBi]	EIRP[dBm]	EIRP Limit[dBm]	Verdict
BLE_1M	Ant1	2402	4.65	≤ 30	-2.57	2.08	≤ 36	PASS
BLE_1M	Ant1	2440	4.76	≤ 30	-2.57	2.19	≤ 36	PASS
BLE_1M	Ant1	2480	4.94	≤ 30	-2.57	2.37	≤ 36	PASS



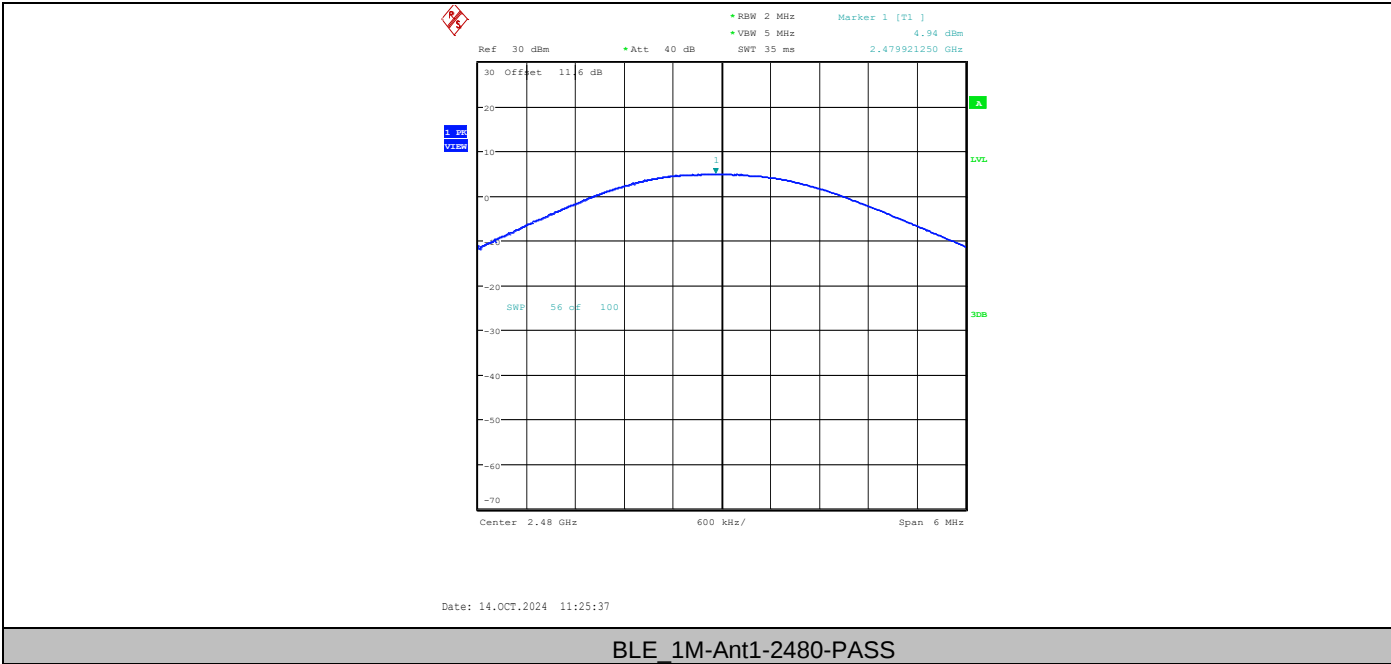
Date: 14.OCT.2024 11:15:09

BLE_1M-Ant1-2402-PASS



Date: 14.OCT.2024 11:22:06

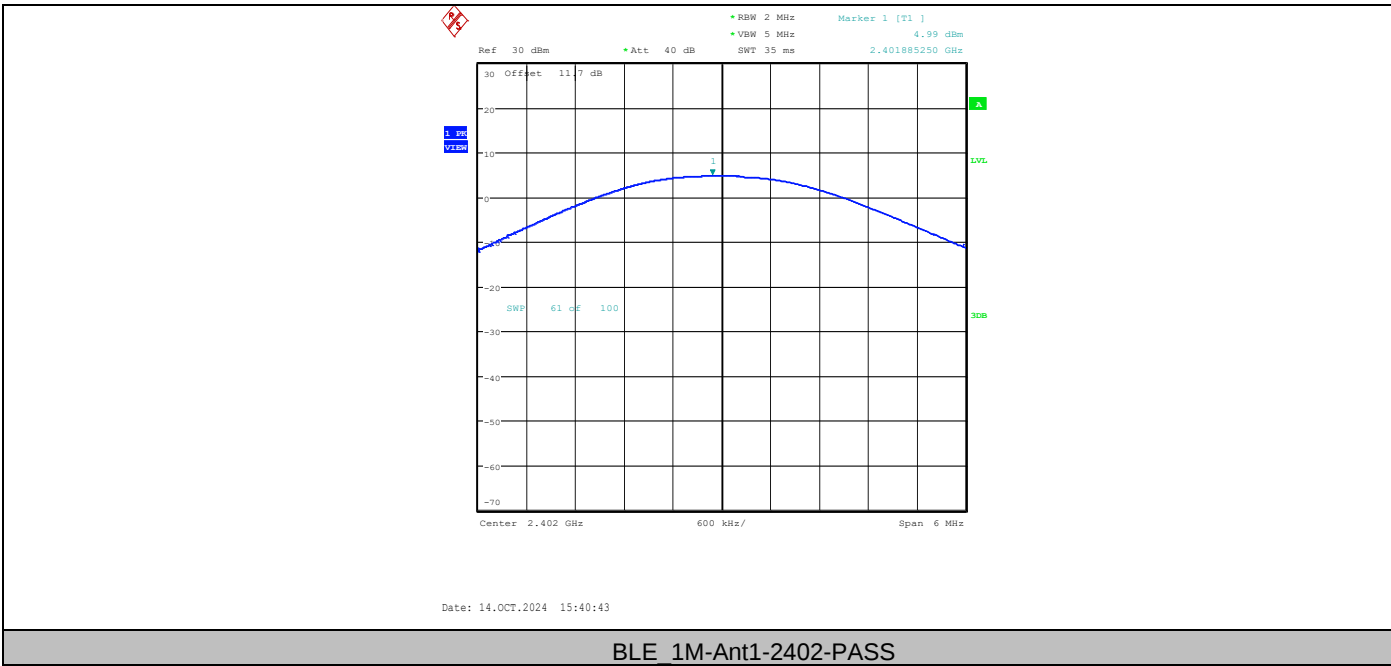
BLE_1M-Ant1-2440-PASS

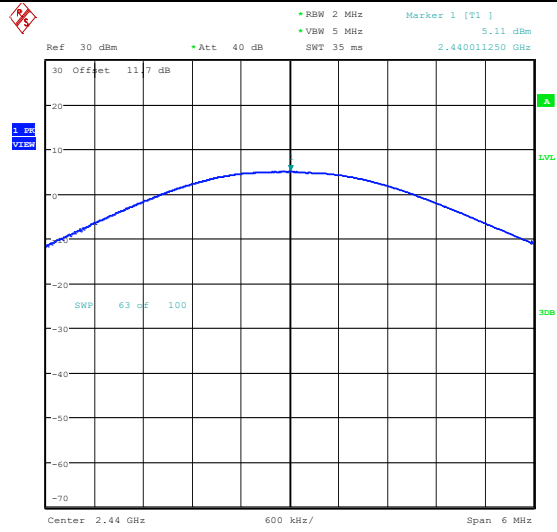


Right glasses leg:

Table 9 Maximum Conducted Output Power Test Data

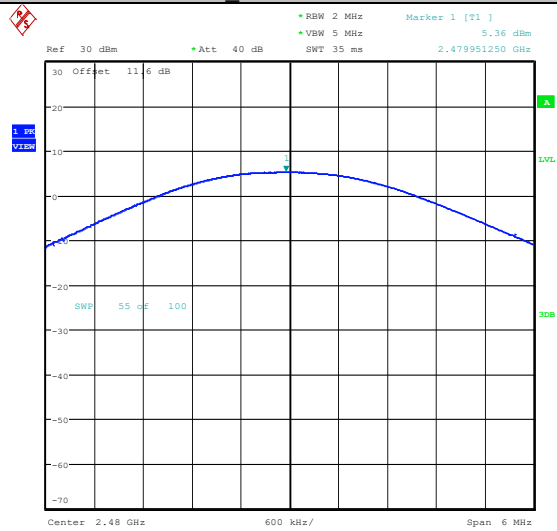
TestMode	Antenna	Frequency[MHz]	Conducted Peak Power[dBm]	Conducted Limit[dBm]	Antenna Gain[dBi]	EIRP[dBm]	EIRP Limit[dBm]	Verdict
BLE_1M	Ant1	2402	4.99	≤30	-2.34	2.65	≤36	PASS
BLE_1M	Ant1	2440	5.11	≤30	-2.34	2.77	≤36	PASS
BLE_1M	Ant1	2480	5.36	≤30	-2.34	3.02	≤36	PASS





Date: 14.OCT.2024 15:51:20

BLE_1M-Ant1-2440-PASS



Date: 14.OCT.2024 15:53:13

BLE_1M-Ant1-2480-PASS

7. MAXIMUM POWER SPECTRAL DENSITY LEVEL MEASUREMENT

7.1.Limits of Maximum Power Spectral Density Level Measurement

CFR 47 (FCC) part 15.247 (e) , 558074 D01 DTS Meas Guidance v05r02, RSS-247 Clause 5.2(b), 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.

7.2.Test Procedure

The transmitter output was connected to the spectrum analyzer.

a)Set analyzer center frequency to DTS channel center frequency.

b) Set the span to 1.5 times the DTS bandwidth.

c) Set RBW to: $3\text{kHz} \leq \text{RBW} \leq 100\text{ kHz}$.

d) Set VBW $\geq 3 \times \text{RBW}$.

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.

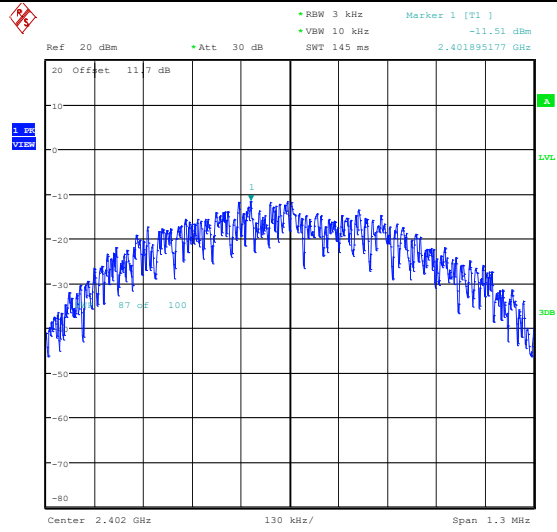
j)If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

7.3.Test Data

Left glasses leg:

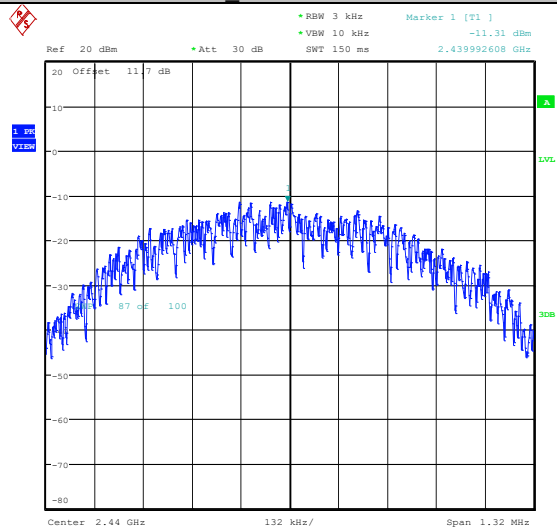
Table 10 Maximum Power Spectral Density Level Test Data

TestMode	Antenna	Frequency[MHz]	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-11.51	≤ 8.00	PASS
BLE_1M	Ant1	2440	-11.31	≤ 8.00	PASS
BLE_1M	Ant1	2480	-11.27	≤ 8.00	PASS



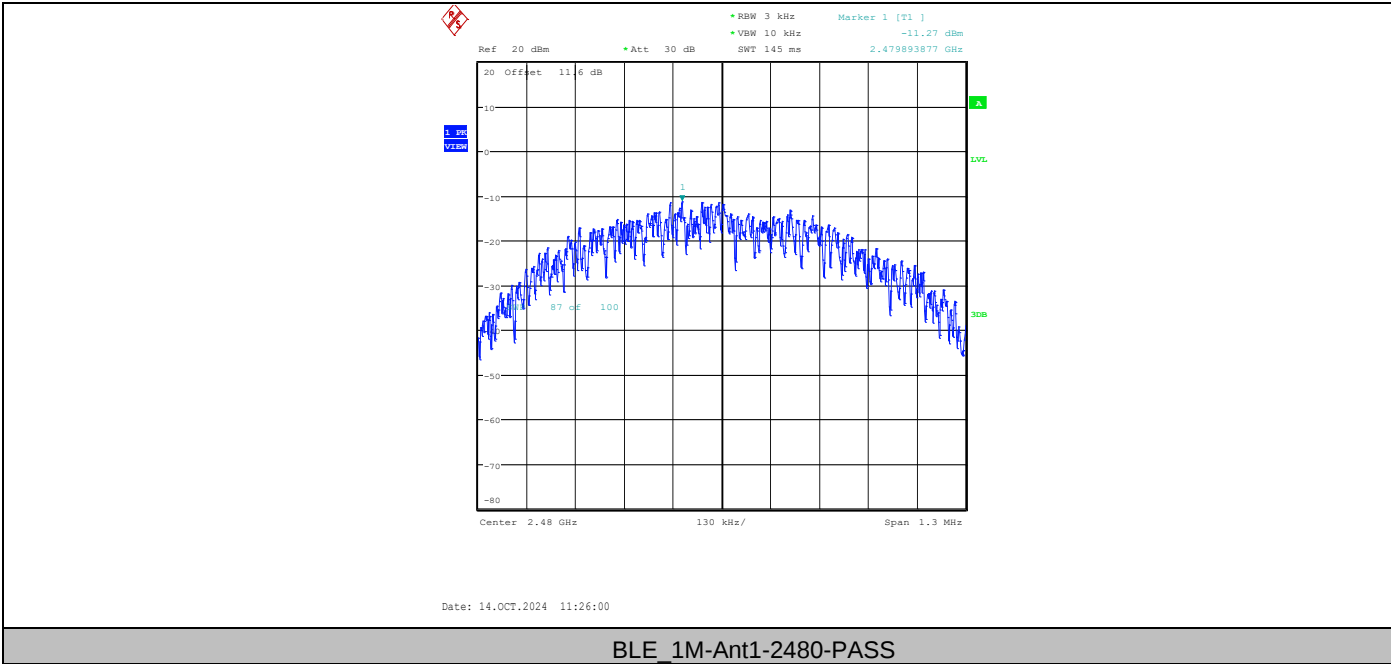
Date: 14.OCT.2024 11:15:32

BLE_1M-Ant1-2402-PASS



Date: 14.OCT.2024 11:22:30

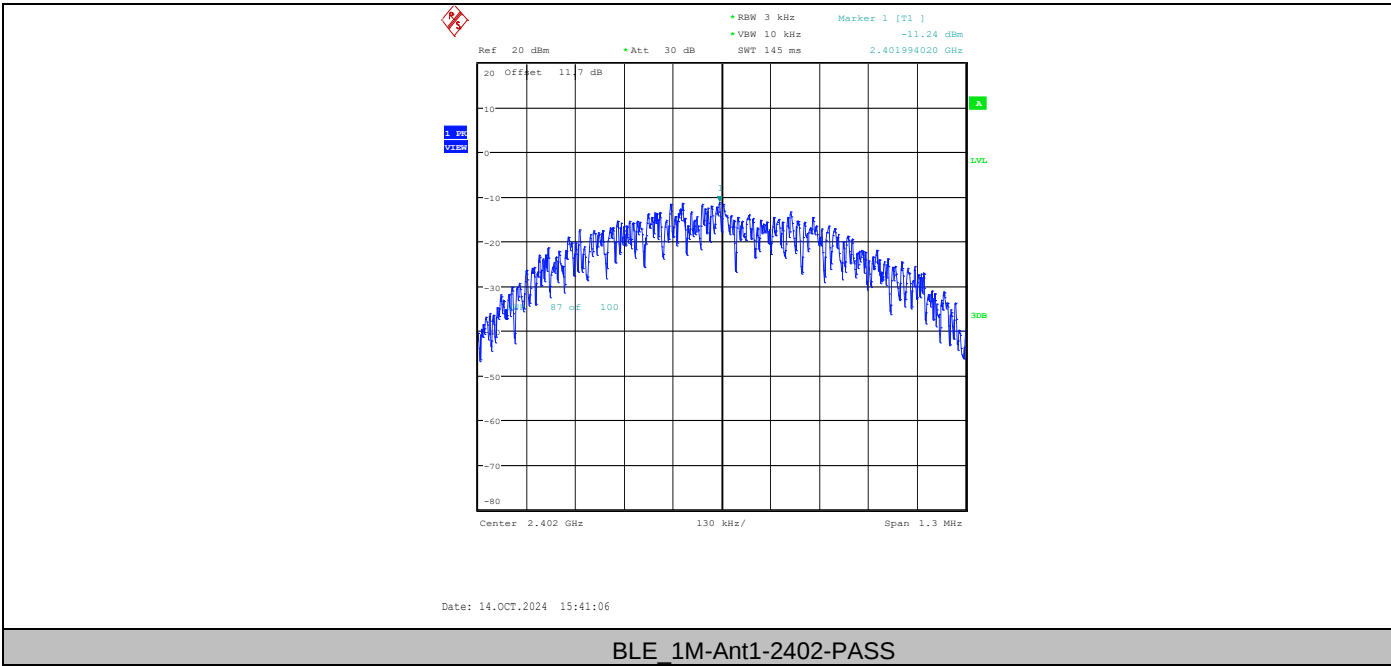
BLE_1M-Ant1-2440-PASS

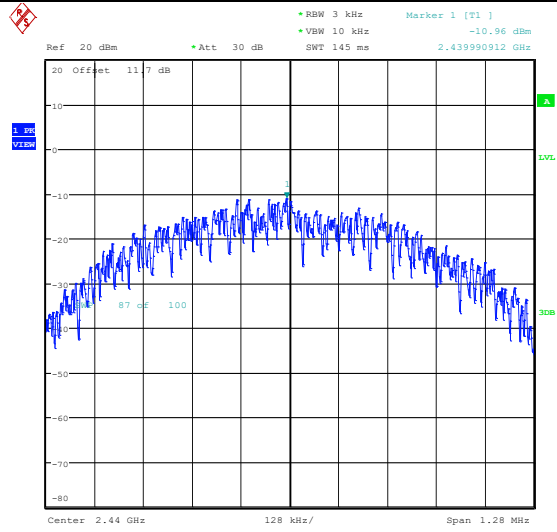


Right glasses leg:

Table 11 Maximum Power Spectral Density Level Test Data

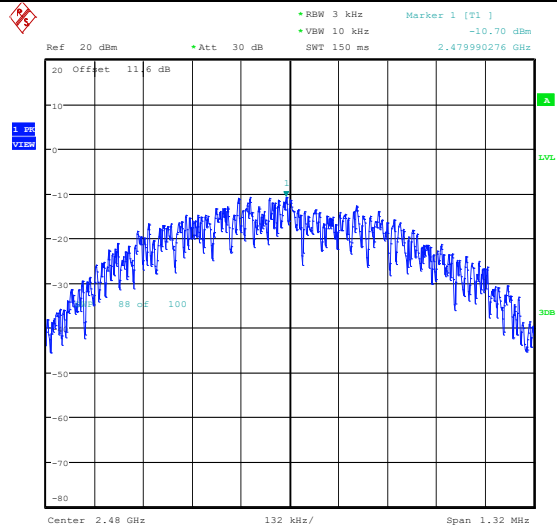
TestMode	Antenna	Frequency[MHz]	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-11.24	≤8.00	PASS
BLE_1M	Ant1	2440	-10.96	≤8.00	PASS
BLE_1M	Ant1	2480	-10.70	≤8.00	PASS





Date: 14.OCT.2024 15:51:43

BLE_1M-Ant1-2440-PASS



Date: 14.OCT.2024 15:53:37

BLE_1M-Ant1-2480-PASS

8. CONDUCTED BANDEDGE AND SPURIOUS MEASUREMENT

8.1. Limits of Conducted Bandedge and Spurious Measurement

CFR 47 (FCC) part 15.247 (d) and 558074 D01 DTS Meas Guidance v05r02, RSS-247 Clause 5.5, In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced 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 that the transmitter demonstrates compliance with the peak conducted power limits.

8.2. Test Procedure

The transmitter output was connected to the spectrum analyzer.

Establish a reference level by using the following procedure:

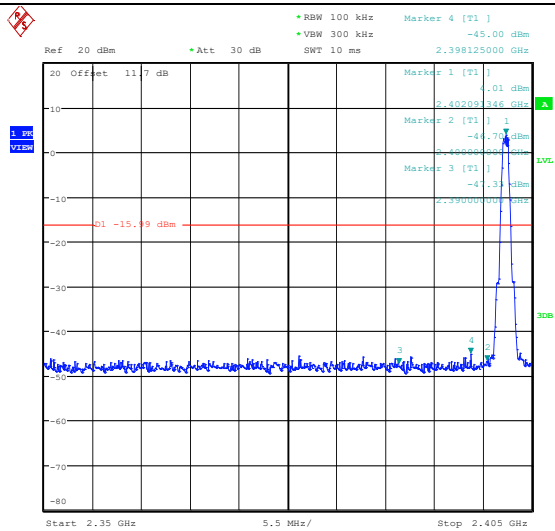
- a) Set instrument center frequency to DTS channel center frequency.
 - b) Set the span to ≥ 1.5 times the DTS bandwidth.
 - c) Set the RBW = 100 kHz.
 - d) Set the VBW $\geq 3 \times$ RBW.
 - e) Detector = peak.
 - f) Sweep time = auto couple.
 - g) Trace mode = max hold.
 - h) Allow trace to fully stabilize.
 - i) Use the peak marker function to determine the maximum PSD level.
- Emission level measurement
- a) Set the center frequency and span to encompass frequency range to be measured.
 - b) Set the RBW = 100 kHz.
 - c) Set the VBW $\geq 3 \times$ RBW.
 - d) Detector = peak.
 - e) Ensure that the number of measurement points $\geq$ span/RBW
 - 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.

8.3. Test Data

Left glasses leg:

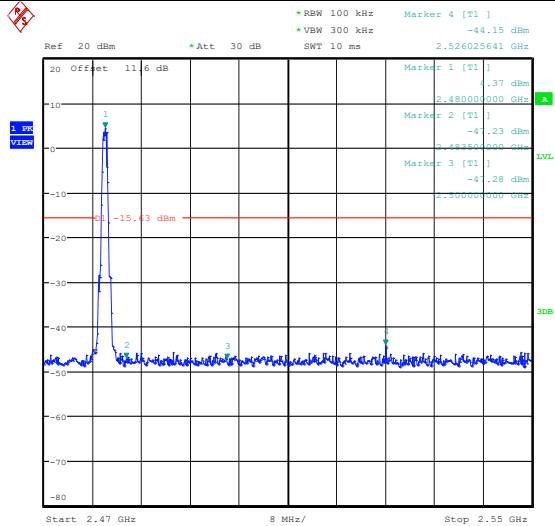
Table 12 Band edge Test Data

TestMode	Antenna	ChName	Frequency[MHz]	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	4.01	-45	≤-15.99	PASS
BLE_1M	Ant1	High	2480	4.37	-44.15	≤-15.63	PASS



Date: 14.OCT.2024 11:15:42

BLE_1M-Ant1-2402-PASS

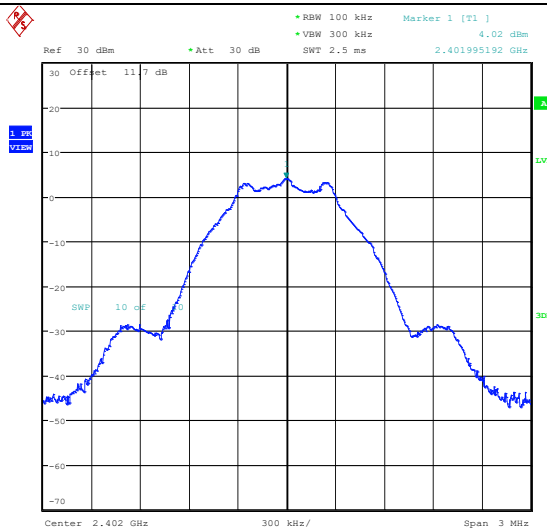


Date: 14.OCT.2024 11:26:10

BLE_1M-Ant1-2480-PASS

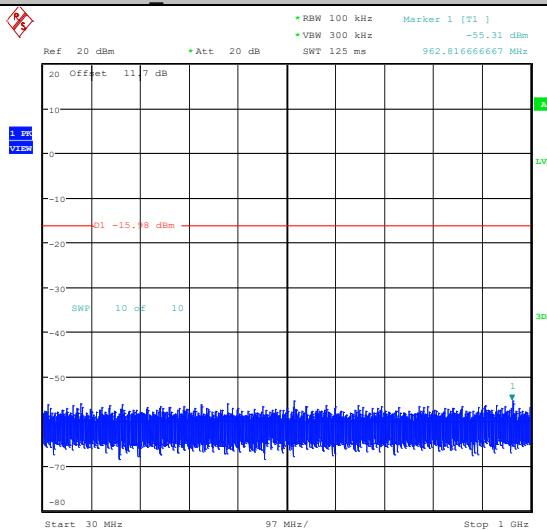
Table 13 Conducted Spurious Emission Test Data

TestMode	Antenna	Frequency[MHz]	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	0~Reference	4.02	4.02	---	PASS
BLE_1M	Ant1	2402	30~1000	4.02	-55.31	≤-15.98	PASS
BLE_1M	Ant1	2402	1000~26500	4.02	-52.2	≤-15.98	PASS
BLE_1M	Ant1	2440	0~Reference	4.21	4.21	---	PASS
BLE_1M	Ant1	2440	30~1000	4.21	-55.13	≤-15.79	PASS
BLE_1M	Ant1	2440	1000~26500	4.21	-51.84	≤-15.79	PASS
BLE_1M	Ant1	2480	0~Reference	4.34	4.34	---	PASS
BLE_1M	Ant1	2480	30~1000	4.34	-55.18	≤-15.66	PASS
BLE_1M	Ant1	2480	1000~26500	4.34	-52.13	≤-15.66	PASS



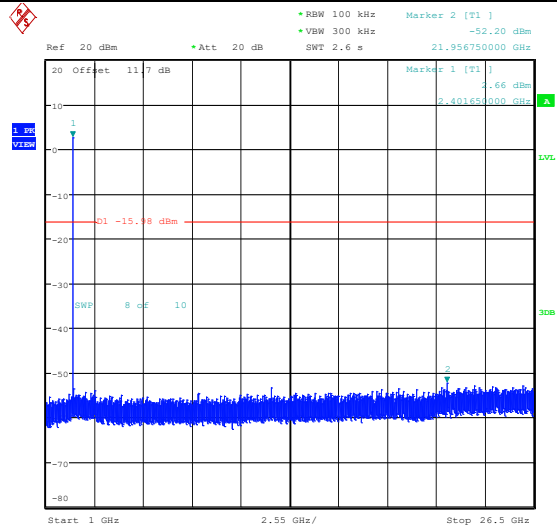
Date: 14.OCT.2024 11:16:48

BLE_1M-Ant1-2402-0~Reference-PASS



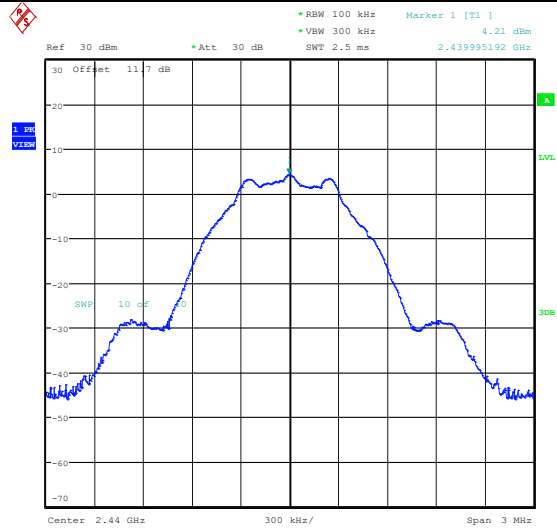
Date: 14.OCT.2024 11:16:57

BLE_1M-Ant1-2402-30~1000-PASS



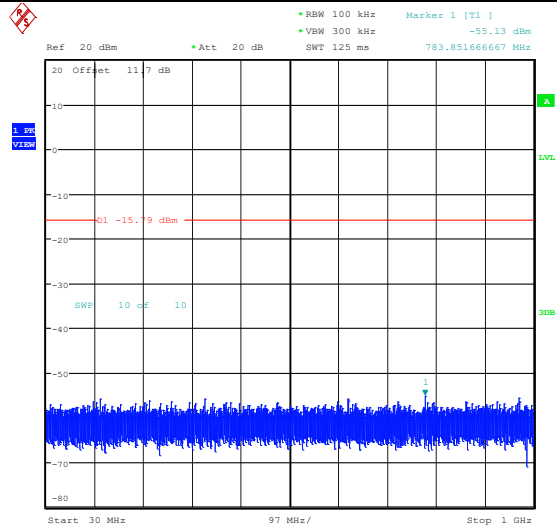
Date: 14.OCT.2024 11:17:19

BLE_1M-Ant1-2402-1000~26500-PASS



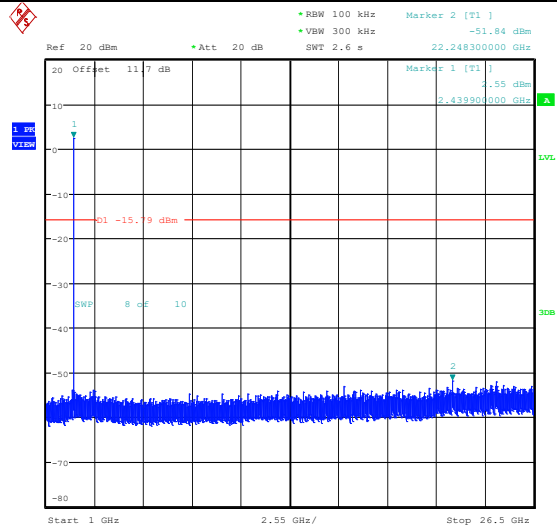
Date: 14.OCT.2024 11:22:38

BLE_1M-Ant1-2440-0~Reference-PASS



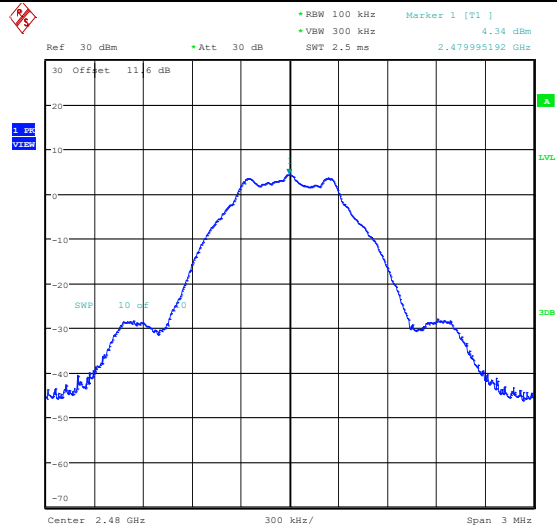
Date: 14.OCT.2024 11:22:47

BLE_1M-Ant1-2440-30~1000-PASS



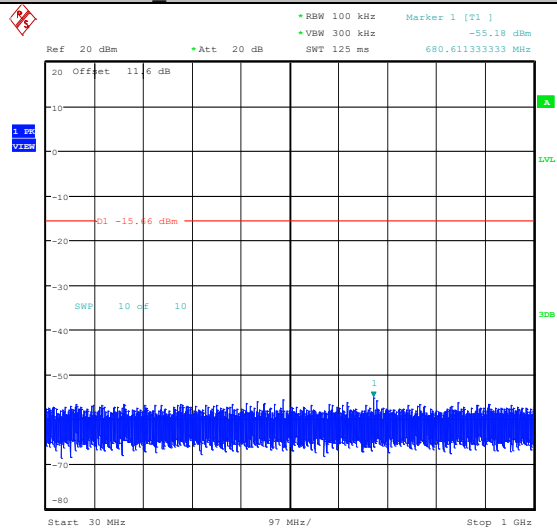
Date: 14.OCT.2024 11:23:10

BLE_1M-Ant1-2440-1000~26500-PASS



Date: 14.OCT.2024 11:27:14

BLE_1M-Ant1-2480-0~Reference-PASS



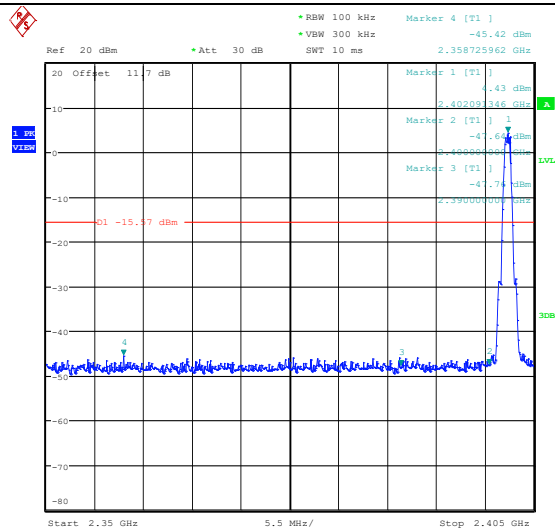
Date: 14.OCT.2024 11:27:23

BLE_1M-Ant1-2480-30~1000-PASS

Right glasses leg:

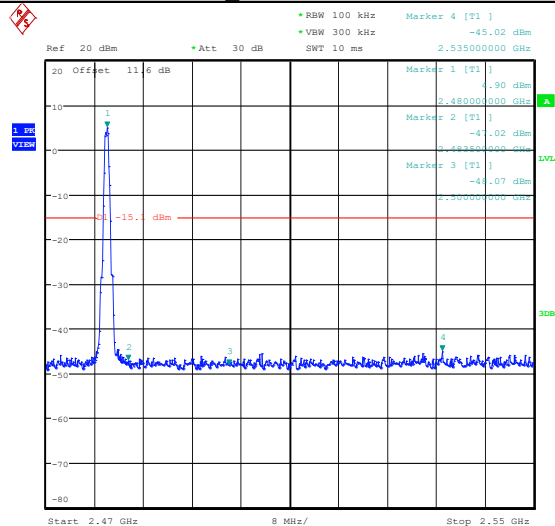
Table 14 Band edge Test Data

TestMode	Antenna	ChName	Frequency[MHz]	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	4.43	-45.42	≤-15.57	PASS
BLE_1M	Ant1	High	2480	4.90	-45.02	≤-15.1	PASS



Date: 14.OCT.2024 15:41:16

BLE_1M-Ant1-2402-PASS

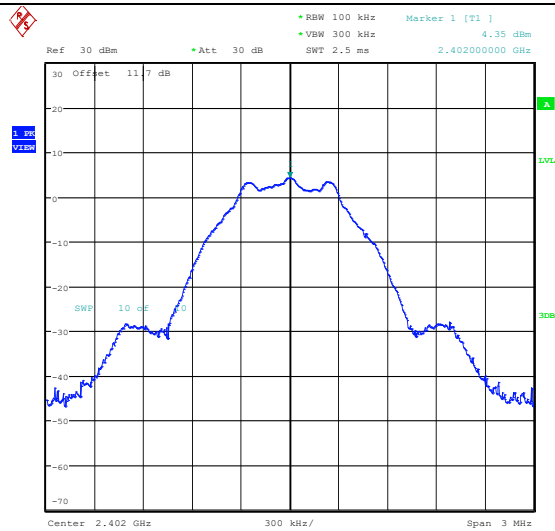


Date: 14.OCT.2024 15:53:46

BLE 1M-Ant1-2480-PASS

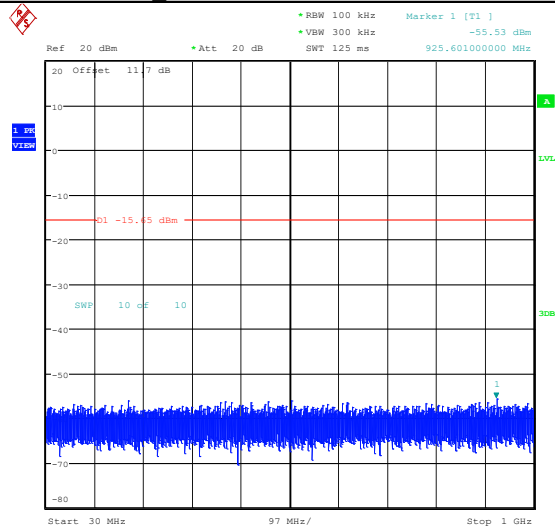
Table 15 Conducted Spurious Emission Test Data

TestMode	Antenna	Frequency[MHz]	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	0~Reference	4.35	4.35	---	PASS
BLE_1M	Ant1	2402	30~1000	4.35	-55.53	≤-15.65	PASS
BLE_1M	Ant1	2402	1000~26500	4.35	-52.22	≤-15.65	PASS
BLE_1M	Ant1	2440	0~Reference	4.60	4.60	---	PASS
BLE_1M	Ant1	2440	30~1000	4.60	-55.58	≤-15.4	PASS
BLE_1M	Ant1	2440	1000~26500	4.60	-52.33	≤-15.4	PASS
BLE_1M	Ant1	2480	0~Reference	4.79	4.79	---	PASS
BLE_1M	Ant1	2480	30~1000	4.79	-55.72	≤-15.21	PASS
BLE_1M	Ant1	2480	1000~26500	4.79	-52.08	≤-15.21	PASS



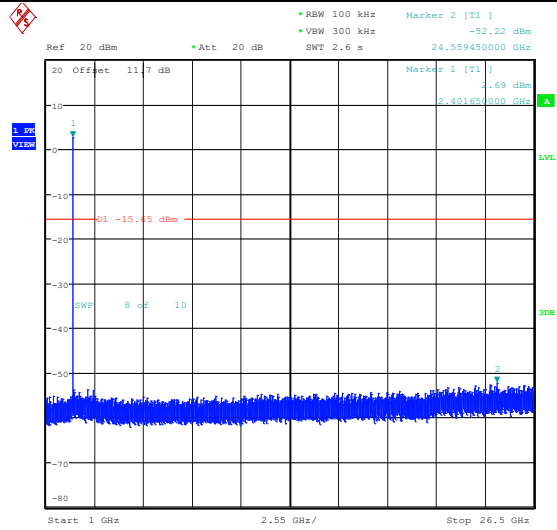
Date: 14.OCT.2024 15:42:21

BLE_1M-Ant1-2402-0~Reference-PASS



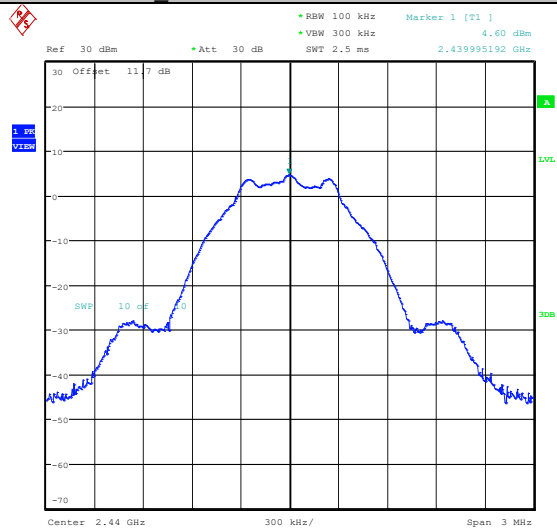
Date: 14.OCT.2024 15:42:30

BLE_1M-Ant1-2402-30~1000-PASS



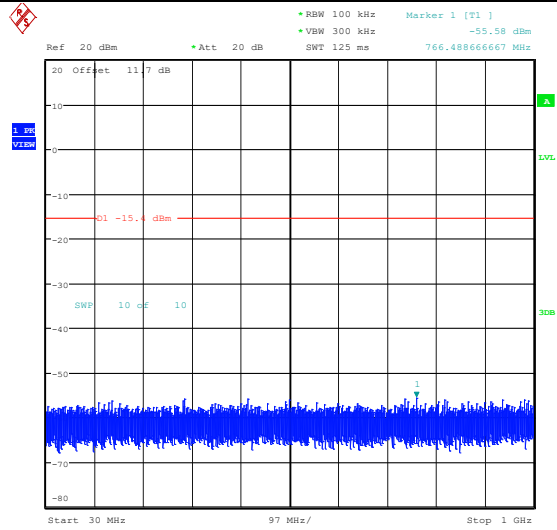
Date: 14.OCT.2024 15:42:52

BLE_1M-Ant1-2402-1000~26500-PASS



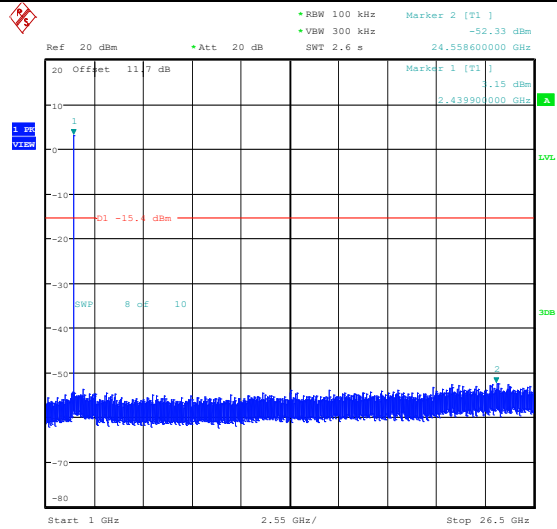
Date: 14.OCT.2024 15:51:51

BLE_1M-Ant1-2440-0~Reference-PASS



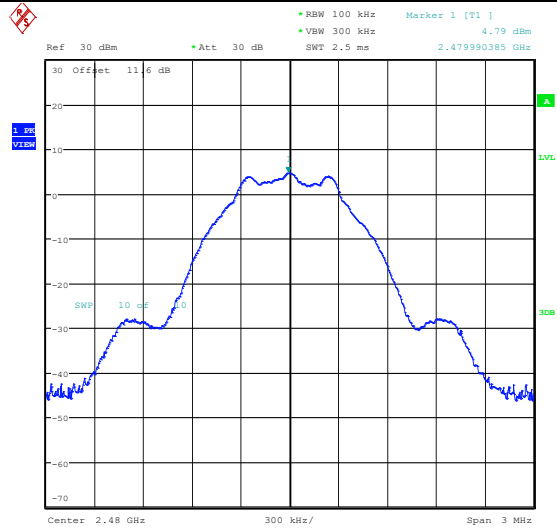
Date: 14.OCT.2024 15:52:00

BLE_1M-Ant1-2440-30~1000-PASS



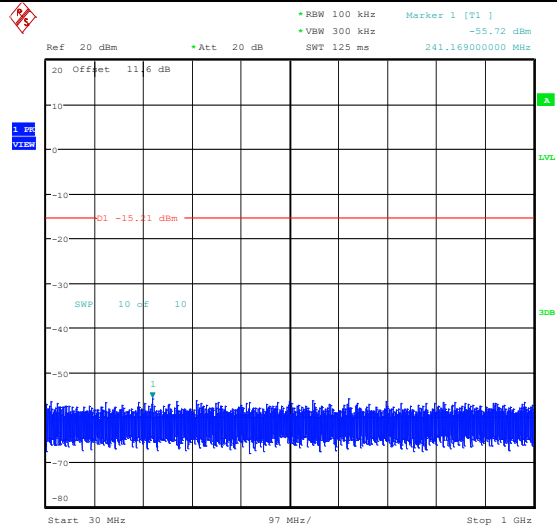
Date: 14.OCT.2024 15:52:23

BLE_1M-Ant1-2440-1000~26500-PASS



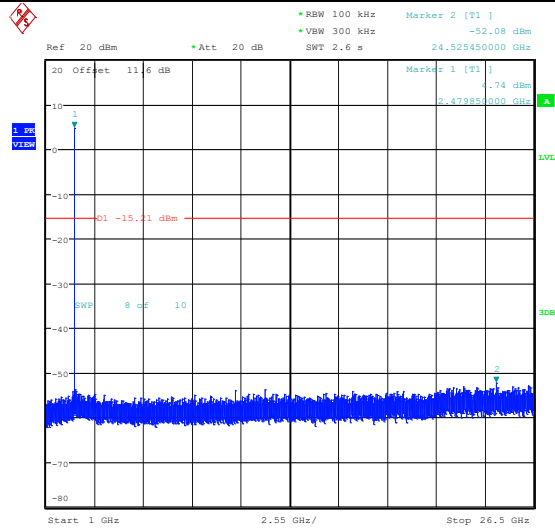
Date: 14.OCT.2024 15:54:51

BLE_1M-Ant1-2480-0~Reference-PASS



Date: 14.OCT.2024 15:55:00

BLE_1M-Ant1-2480-30~1000-PASS



Date: 14.OCT.2024 15:55:23

BLE_1M-Ant1-2480-1000~26500-PASS

9. RADIATED BANDEDGE AND SPURIOUS MEASUREMENT

9.1.Limits of Radiated Bandedge and Spurious Measurement

CFR 47 (FCC) part 15.247 (d) and 558074 D01 DTS Meas Guidance v05r02
RSS-247 Clause 5.5 and RSS GEN Clause 8.9

Table 16 Radiation Emission Test Limit for FCC (9KHz-1GHz)

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
960~1000	500	3

Table 17 Radiation Emission Test Limit for FCC (Above 1G)

Frequency (MHz)	(dBuV/m) (at 3 meters)	
	PEAK	AVERAGE
Above 1000	74	54

Table 18 Restricted Band Radiated Emission Data

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6-12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25-13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47-14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35-16.2
8.362 - 8.366	156.52475	2483.5 - 2500	17.7-21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01-23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6-24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2-31.8
12.51975 -	167.72 - 173.2	3345.8 - 3358	36.43-36.5
12.52025	240 - 285	3600 - 4400	(²)
12.57675 -	322 - 335.4		
12.57725			

13.36 - 13.41			
---------------	--	--	--

¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

² Above 38.6

9.2. Test Procedure

1. The testing follows the guidelines in ANSI C63.10-2013.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. For measurement below 1GHz, the EUT was placed on a turntable with 0.8meter, above ground. For measurement above 1 GHz, test at FAR, the EUT is placed on a non-conductive table, which is 1.5 meter above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
7. Use the following spectrum analyzer settings:
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Set RBW=100 kHz for $f < 1$ GHz; VBW $\geq$ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW= 3MHz for $f > 1$ GHz for peak measurement. Set RBW = 1 MHz, and 1/T (on time) for average measurement.

9.3. Test Data

9 kHz-30 MHz

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

Table 19 Radiated Emission Test Data 9k Hz-30MHz

Frequency (MHz)	Cable Loss +preamp (dB)	Antenna Factor (dB)	Reading (dB μ V/m)	Level (dB μ V/m)	Polarity (H/V)	Limit (dB μ V/m)	Margin (dB)	Note
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--

30 MHz-1 GHz

Worst case is shown below for 30MHz-1GHz only.

The emissions don't show in following result tables are more than 20dB below the limits.

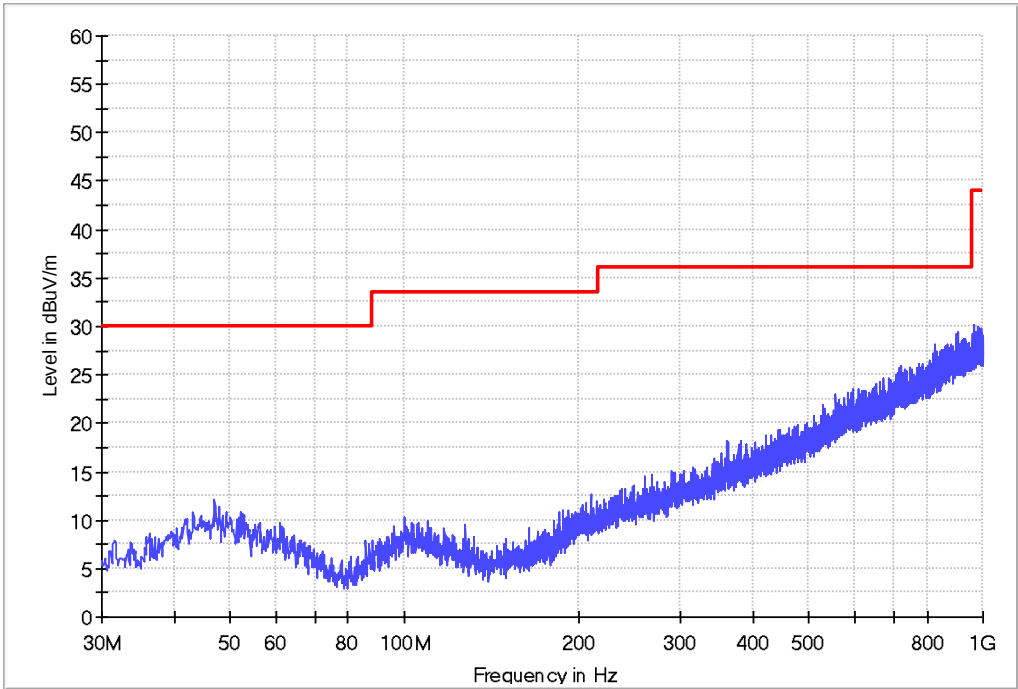
Table 20 Radiated Emission Test Data 30MHz-1GHz

Frequency (MHz)	Cable Loss +preamp (dB)	Antenna Factor (dB)	Reading (dBμV/m)	Level (dBμV/m)	Polarity (Horizontal/ Vertical)	Limit (dBμV/m)	Margin (dB)	Note
38.439	0.7	12.3	9.7	22.7	Vertical	40.0	17.3	QP
44.55	0.7	13.6	4.3	18.6	Vertical	40.0	21.4	QP
54.541	0.8	13.3	3.2	17.3	Vertical	40.0	22.7	QP
109.831	1.2	13.2	5.4	19.8	Vertical	43.5	23.7	QP
123.508	1.2	10.5	7.9	19.6	Vertical	43.5	23.9	QP
132.626	1.3	8.9	10.5	20.7	Vertical	43.5	22.8	QP
44.938	0.7	13.6	-3.4	10.9	Horizontal	40	29.1	QP
99.281	1.1	12.8	-0.2	13.7	Horizontal	43.5	29.8	QP
113.42	1.2	12.3	3.2	16.7	Horizontal	43.5	26.8	QP
132.529	1.3	8.9	8.2	18.4	Horizontal	43.5	25.1	QP
174.627	1.5	9.0	7.2	17.7	Horizontal	43.5	25.8	QP
269.784	2.0	12.1	1.0	15.1	Horizontal	46	30.9	QP

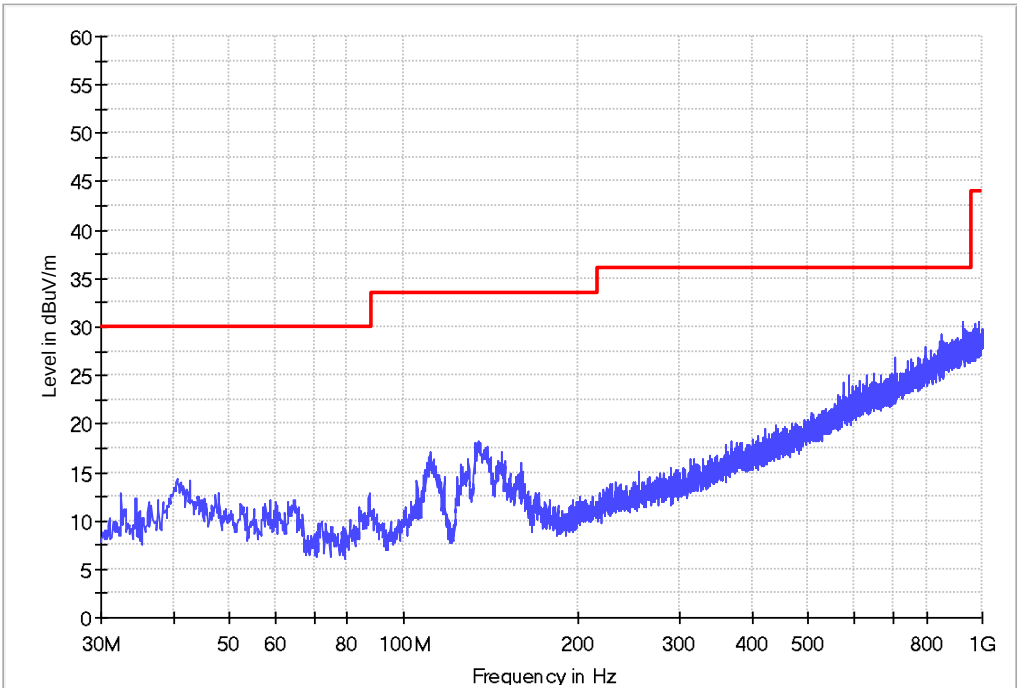
Remark: Emission level (dBμV) =Read Value(dBμV/m) + Antenna Factor(dB)+ Cable Loss +preamp(dB)

30MHz-1GHz

Horizontal

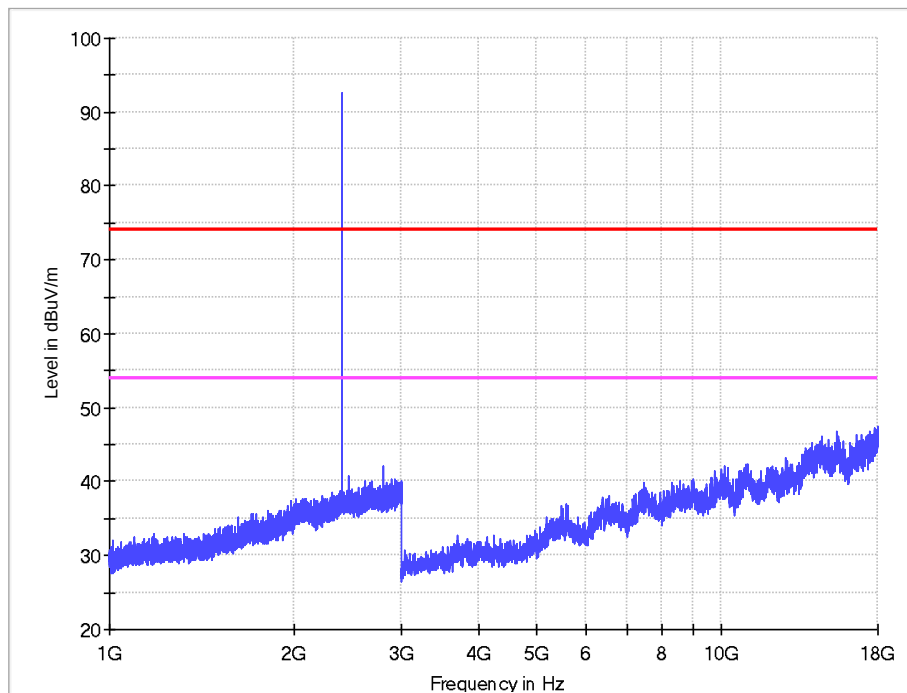


Vertical

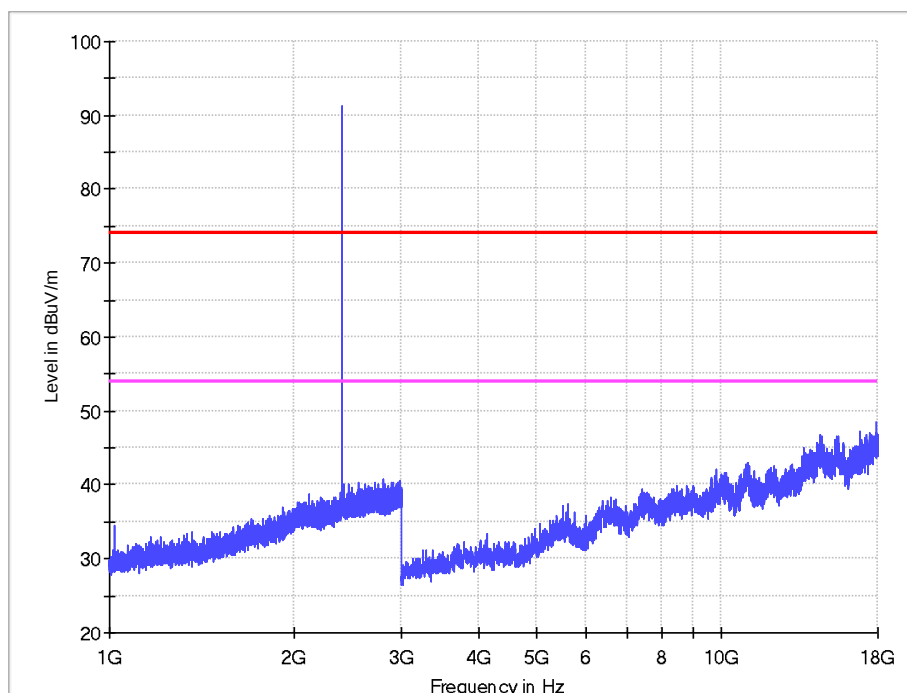


Left glasses leg:
1-18 GHz

BLE_1Mbps CH0
Horizontal

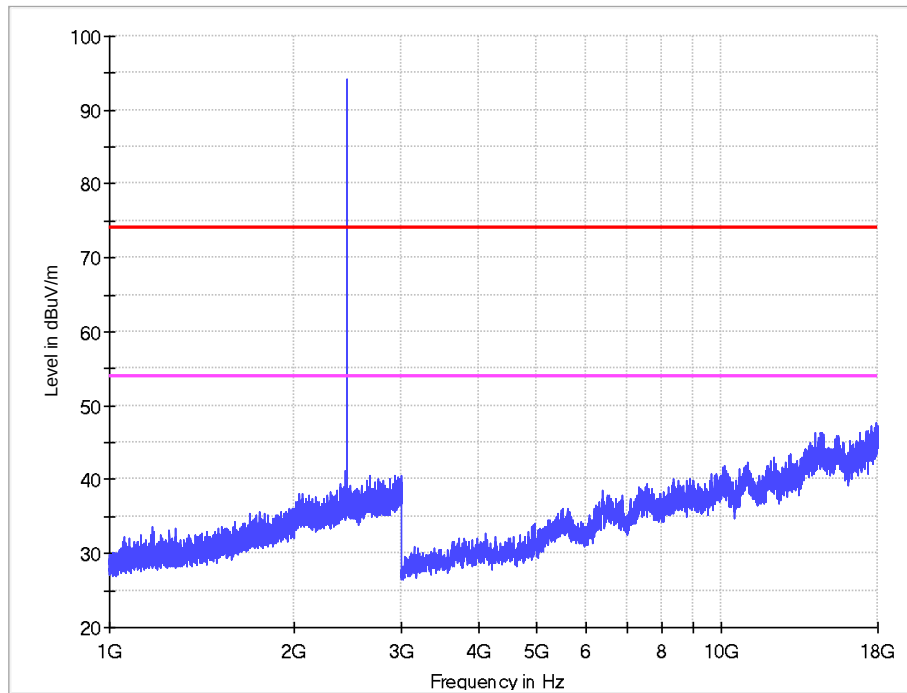


Vertical

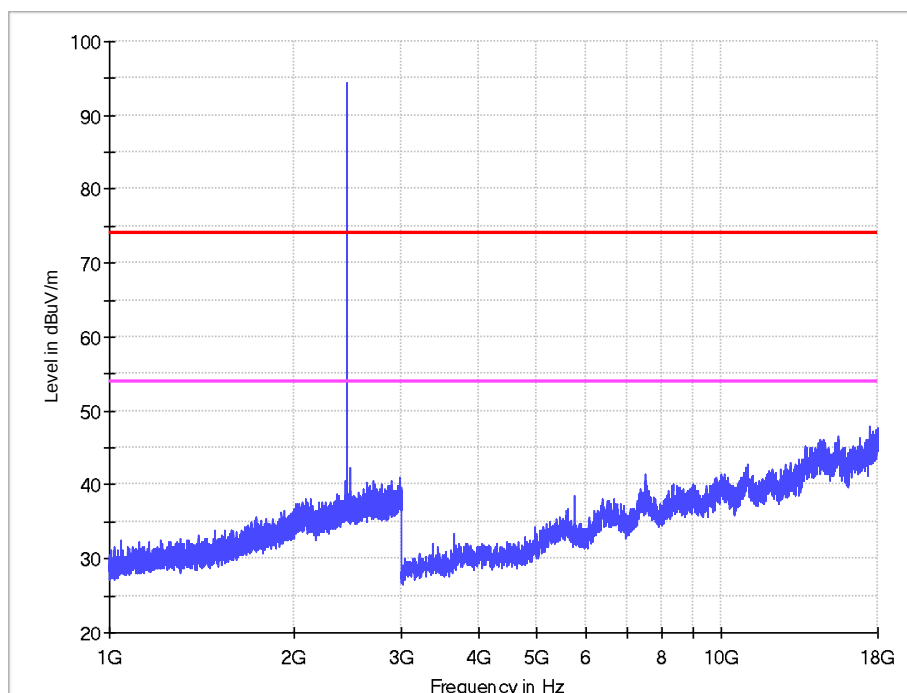


Left glasses leg:
1-18 GHz

BLE_1Mbps BLE CH19
Horizontal

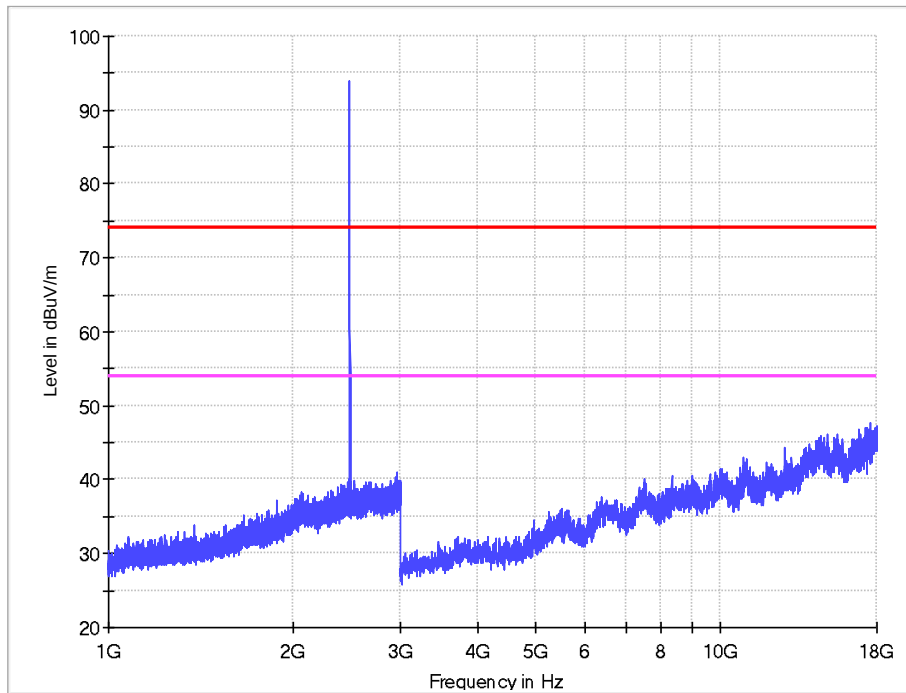


Vertical

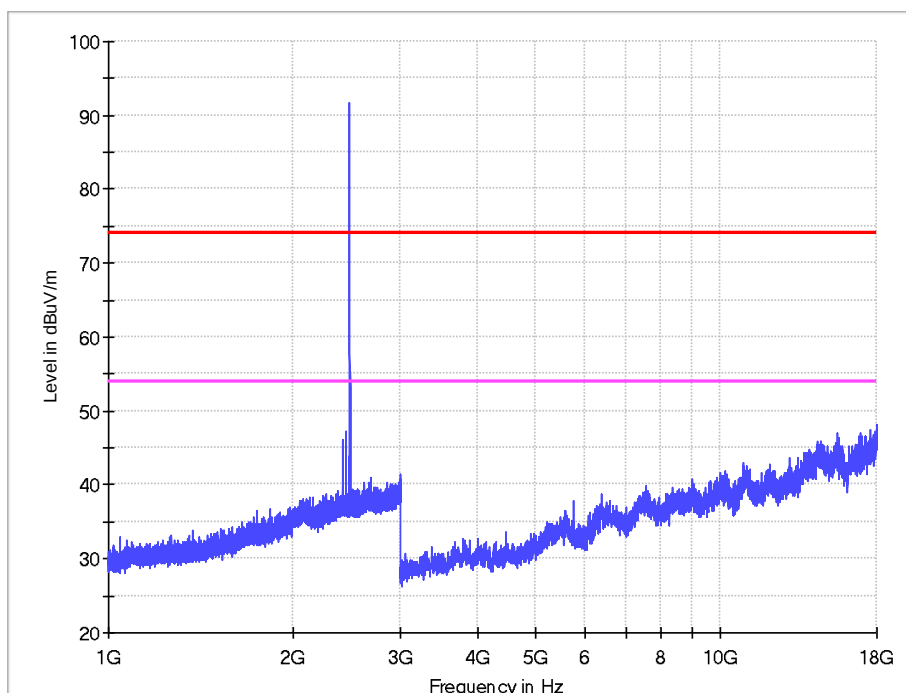


Left glasses leg:
1-18 GHz

BLE_1Mbps BLE CH39
Horizontal

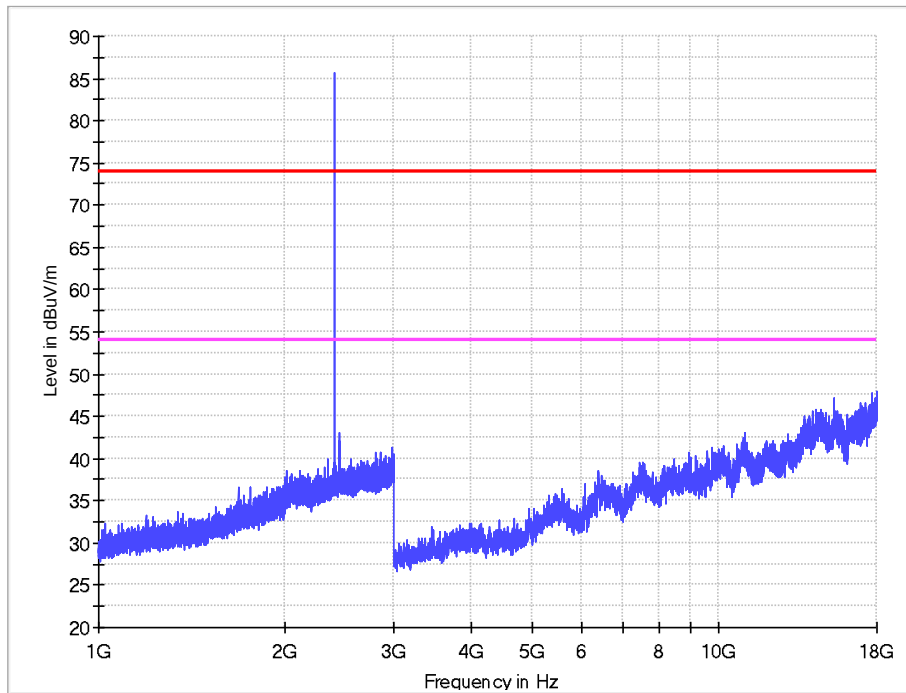


Vertical

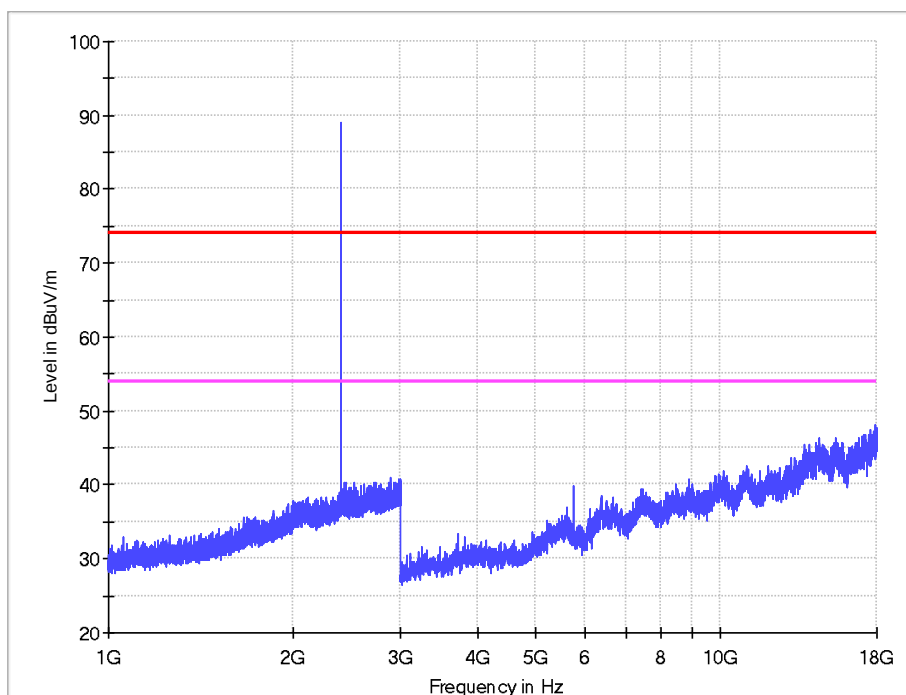


Right glasses leg:
1-18 GHz

BLE_1Mbps CH0
Horizontal

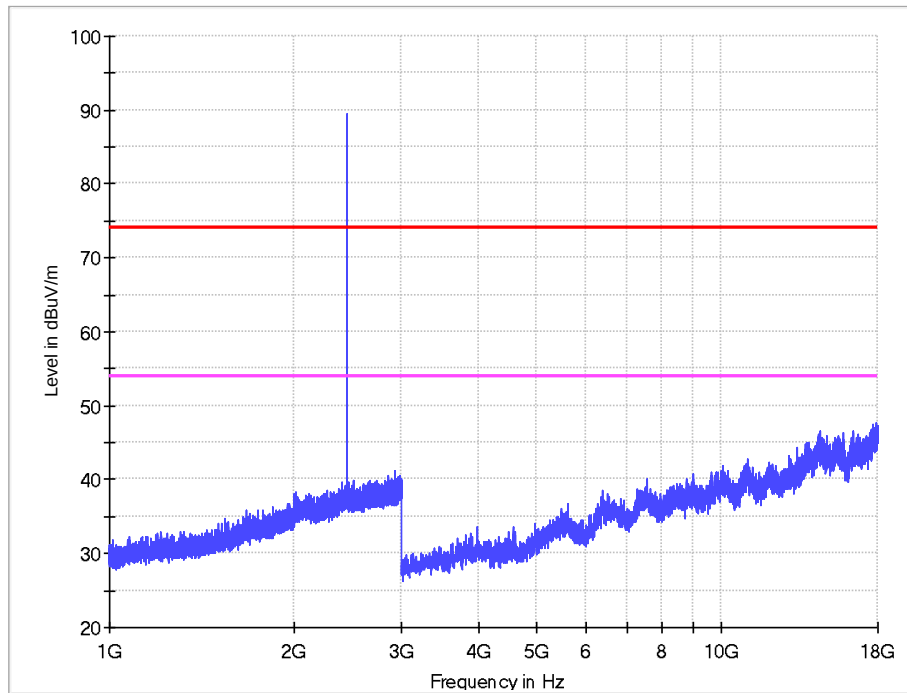


Vertical

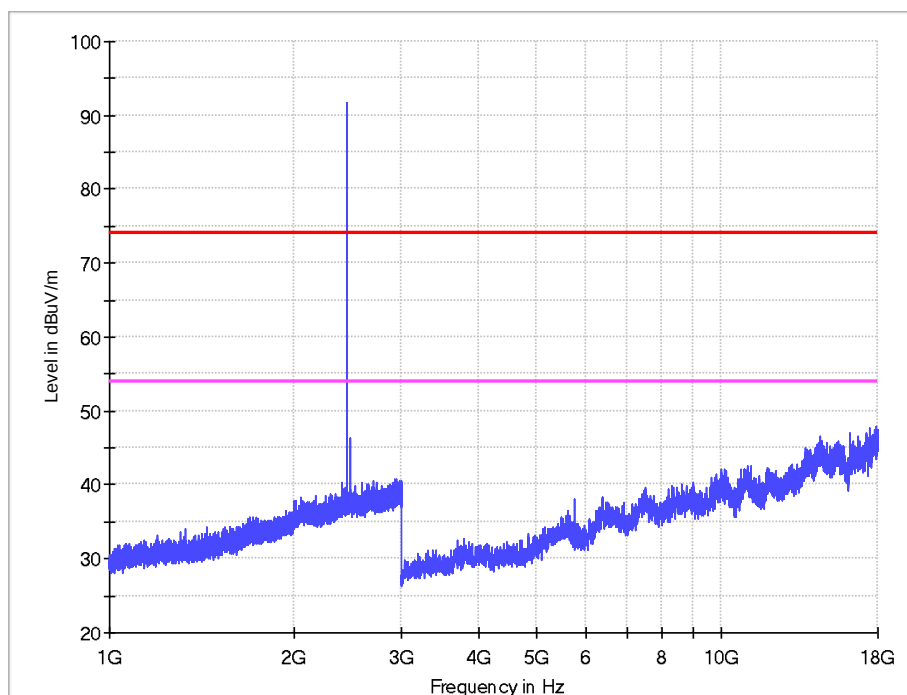


Right glasses leg:
1-18 GHz

BLE_1Mbps BLE CH19
Horizontal

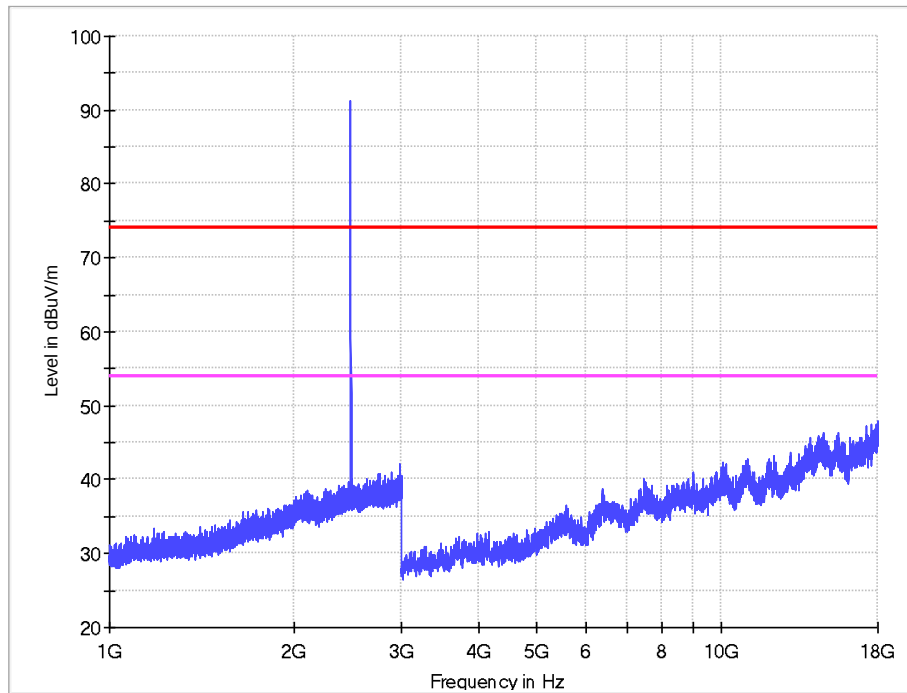


Vertical

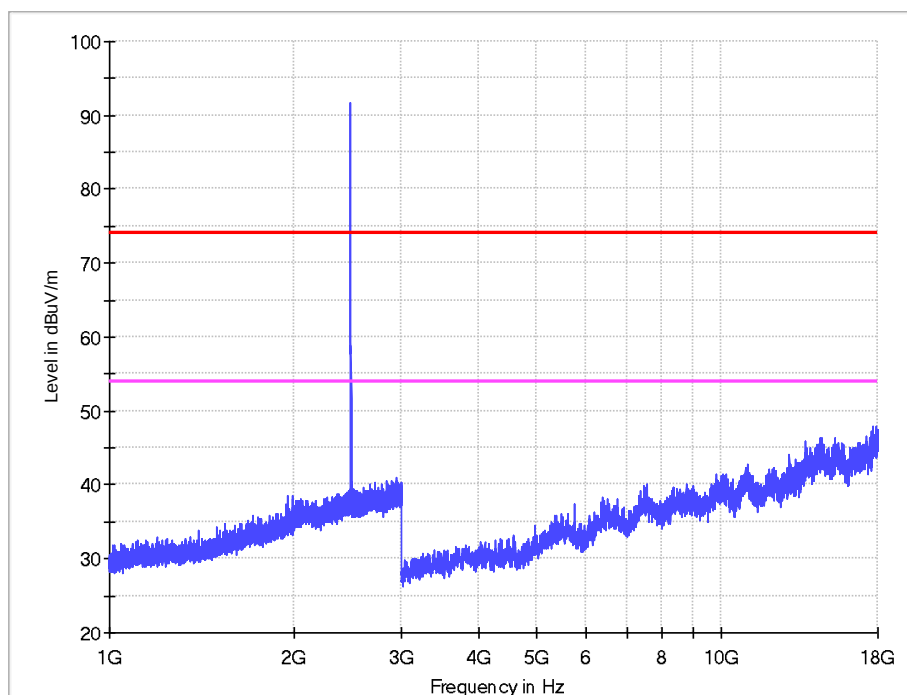


Right glasses leg:
1-18 GHz

BLE_1Mbps BLE CH39
Horizontal

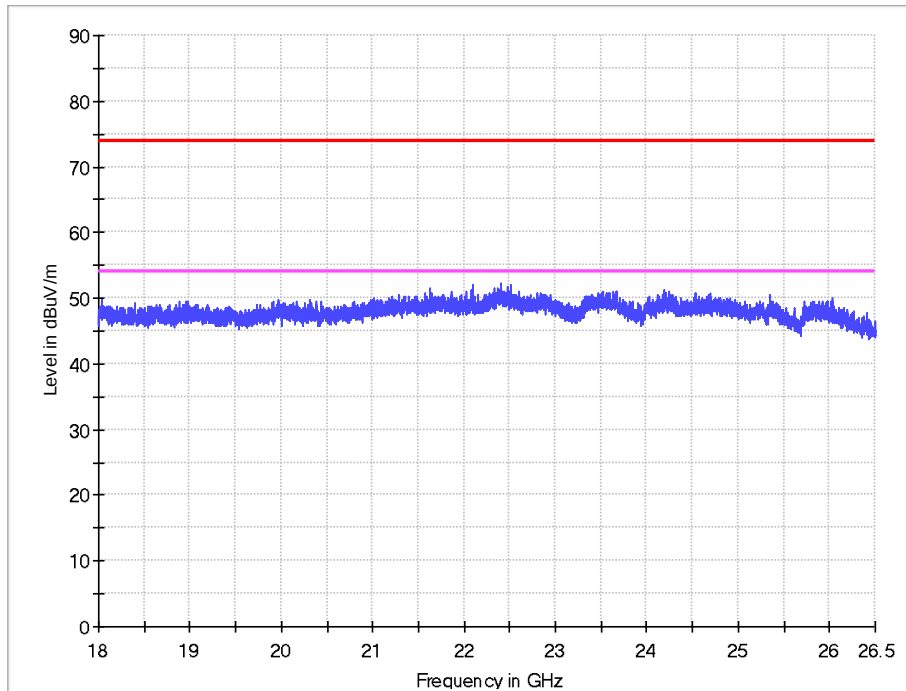


Vertical

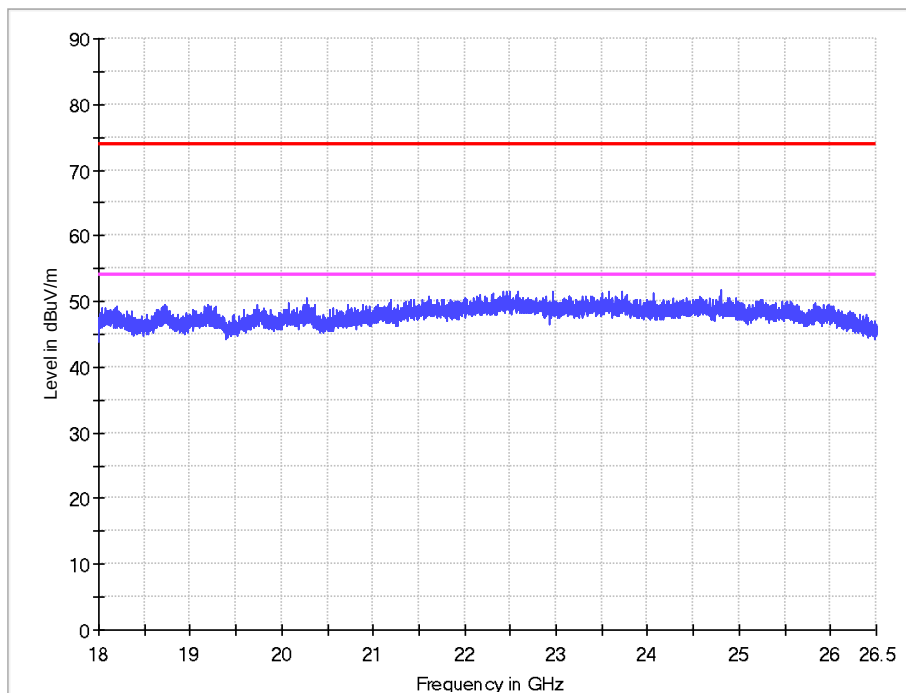


18-26.5 GHz

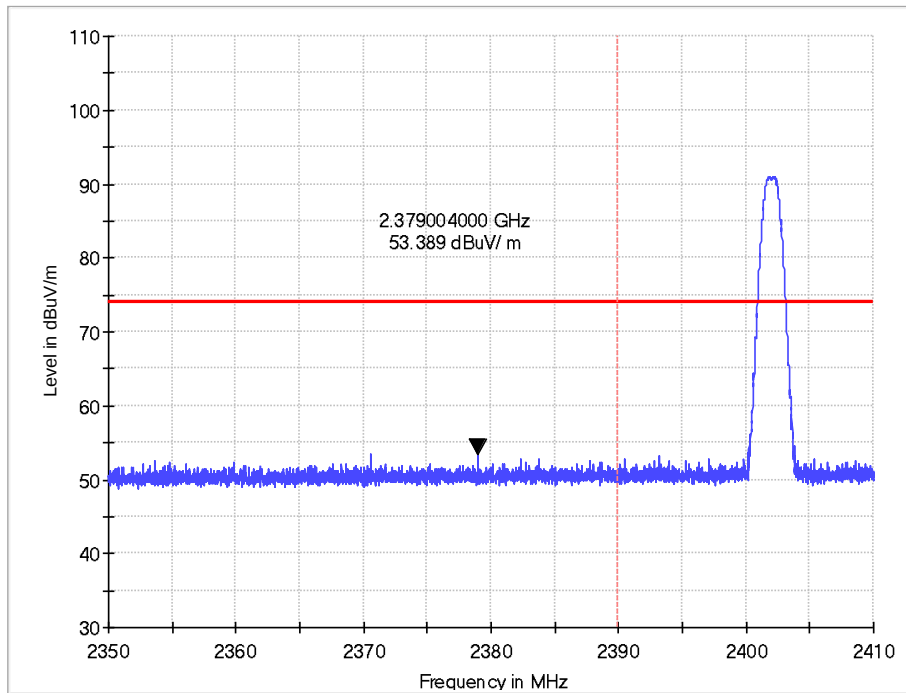
No Peak found in pre-scan, only worst case result is listed in this report.
Horizontal



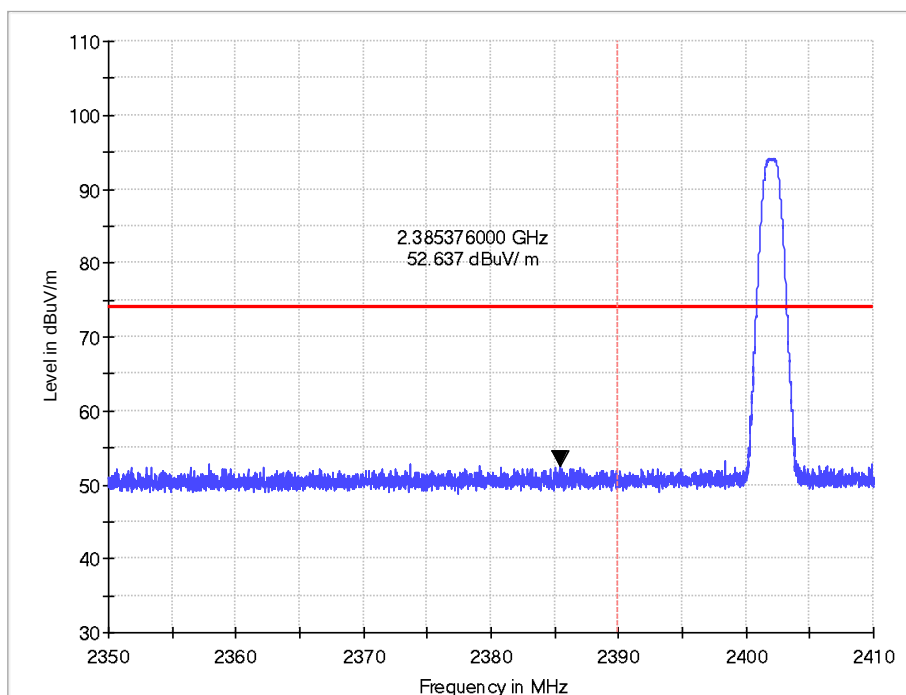
Vertical



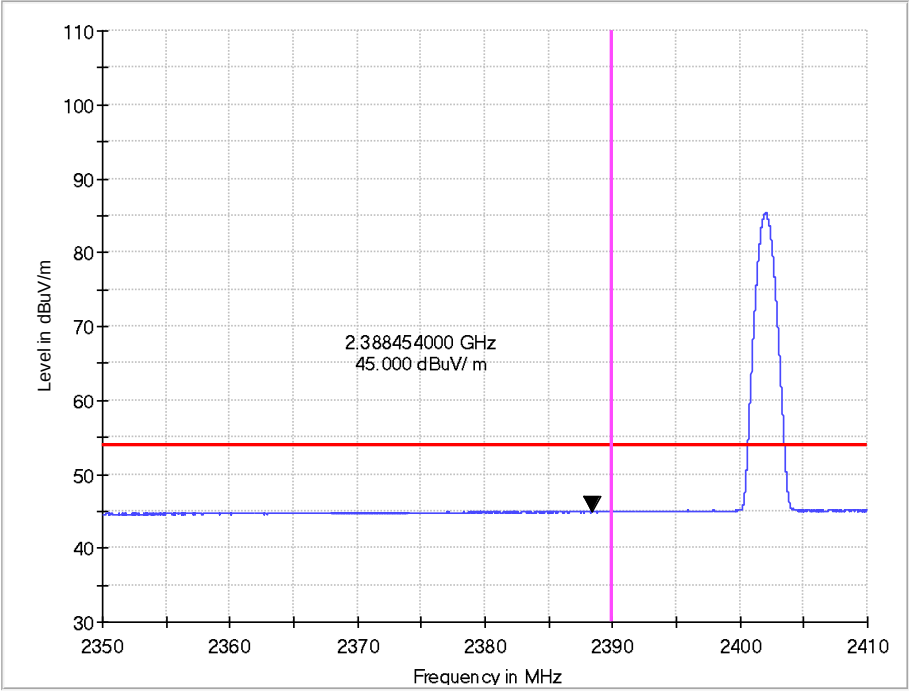
Left glasses leg:
Band Edge
BLE_1Mbps BLE CH0
PK
Horizontal



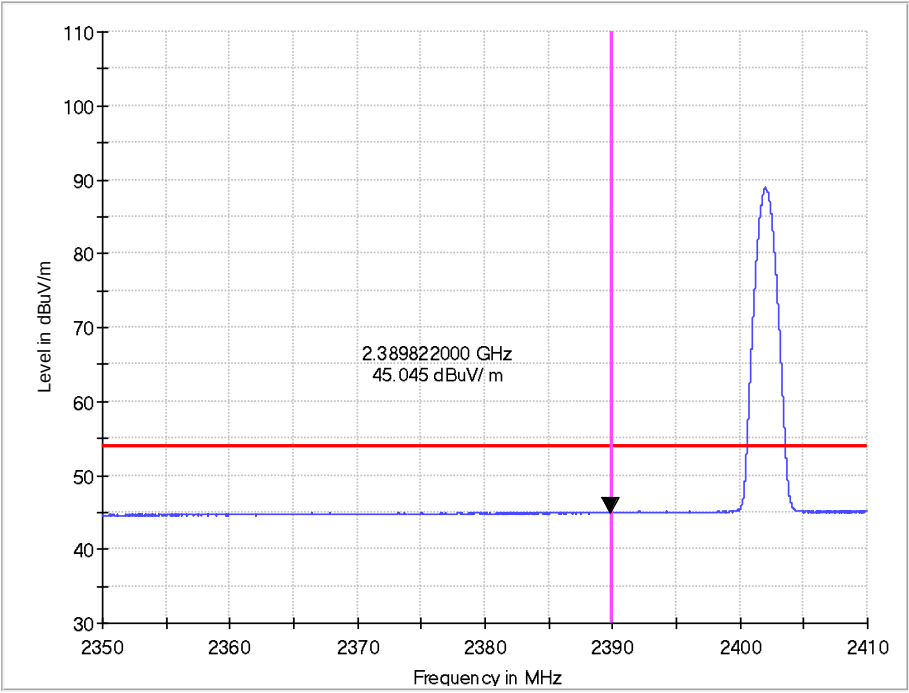
Vertical



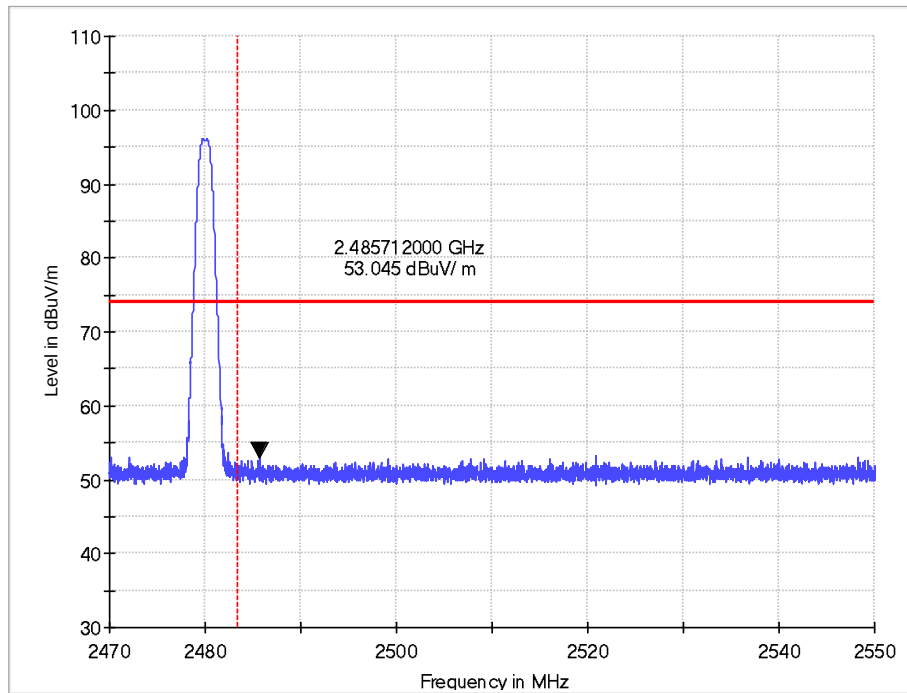
AV
Horizontal



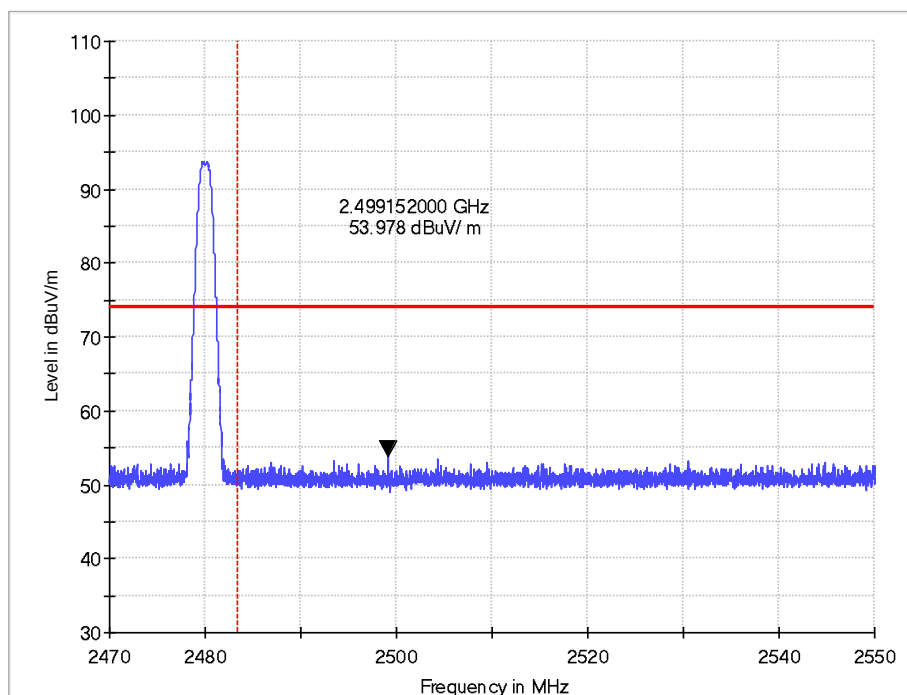
Vertical



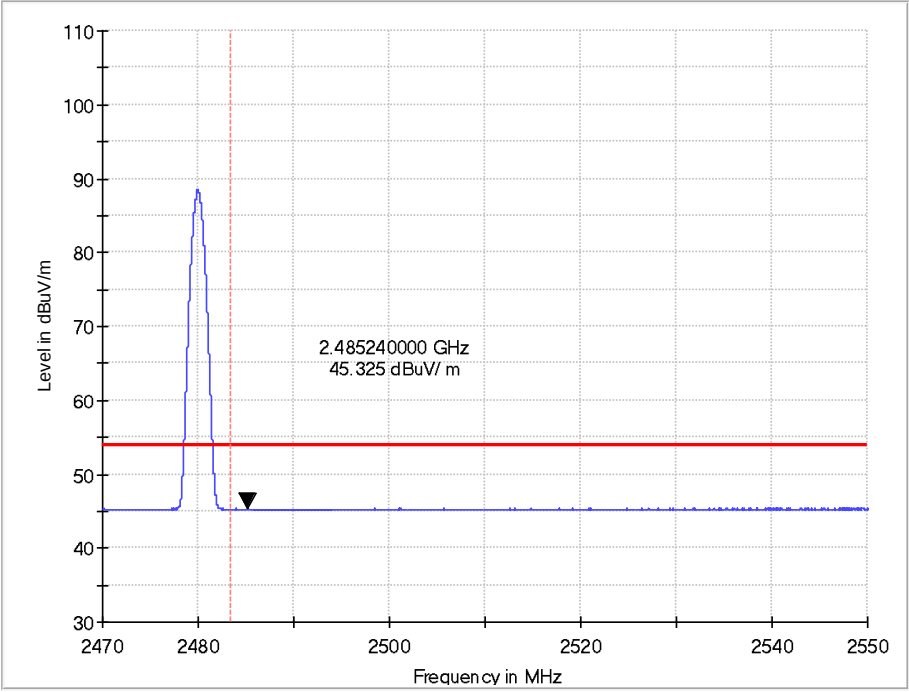
Left glasses leg:
Band Edge
BLE_1Mbps BLE CH39
PK
Horizontal



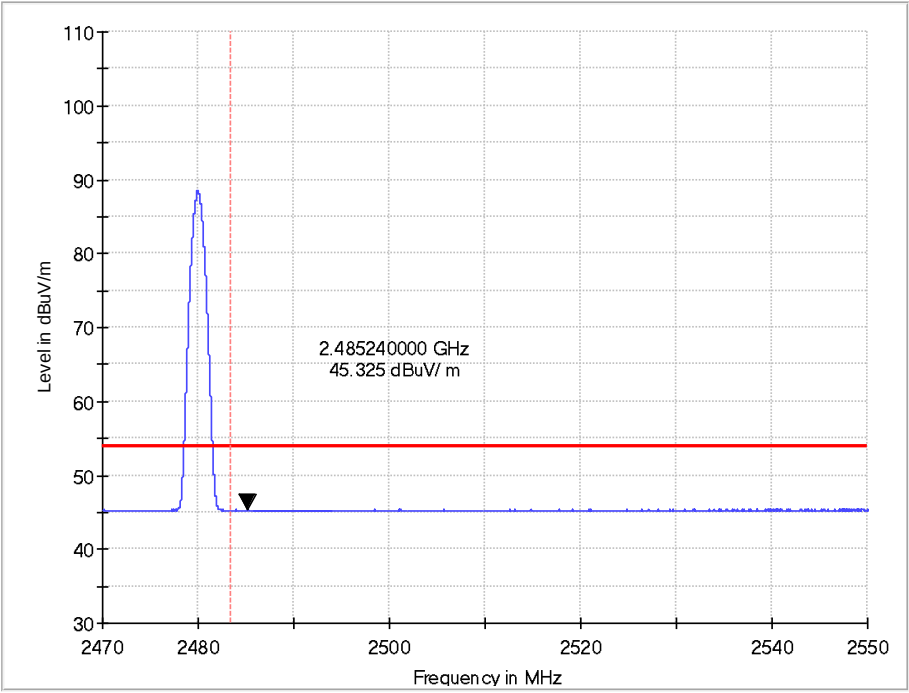
Vertical



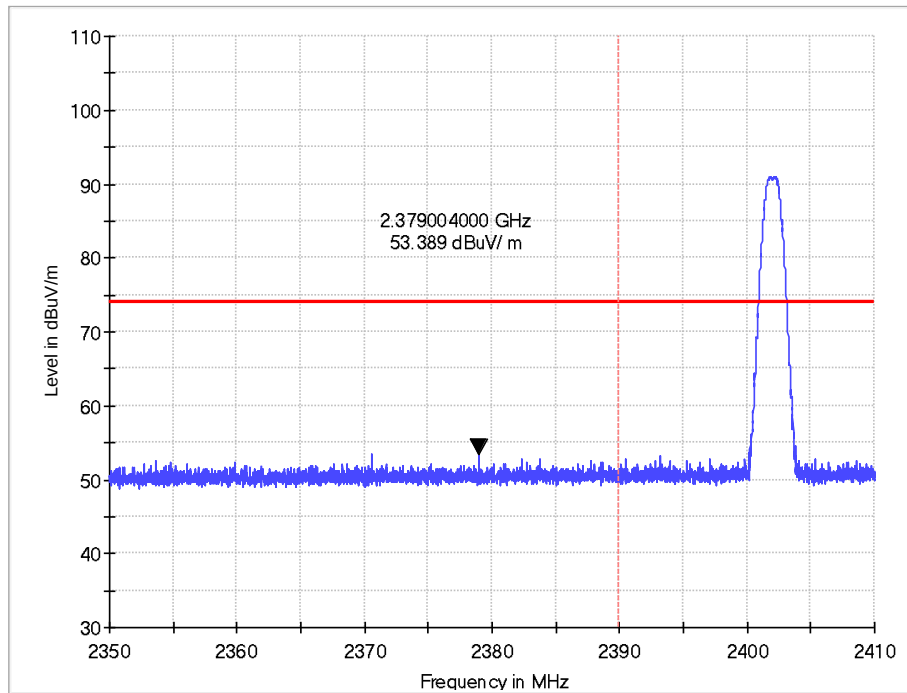
AV
Horizontal



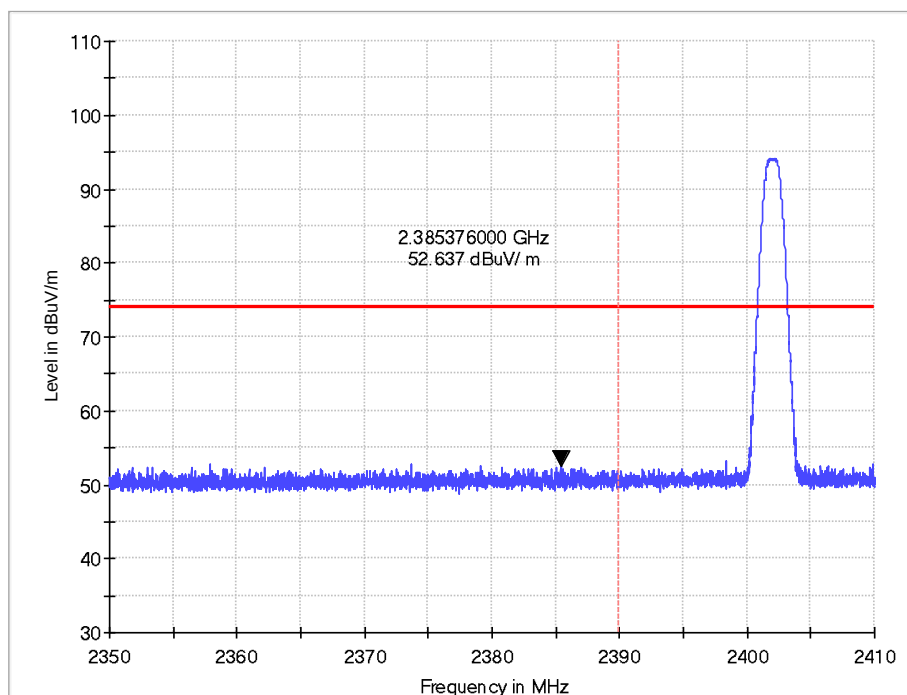
Vertical



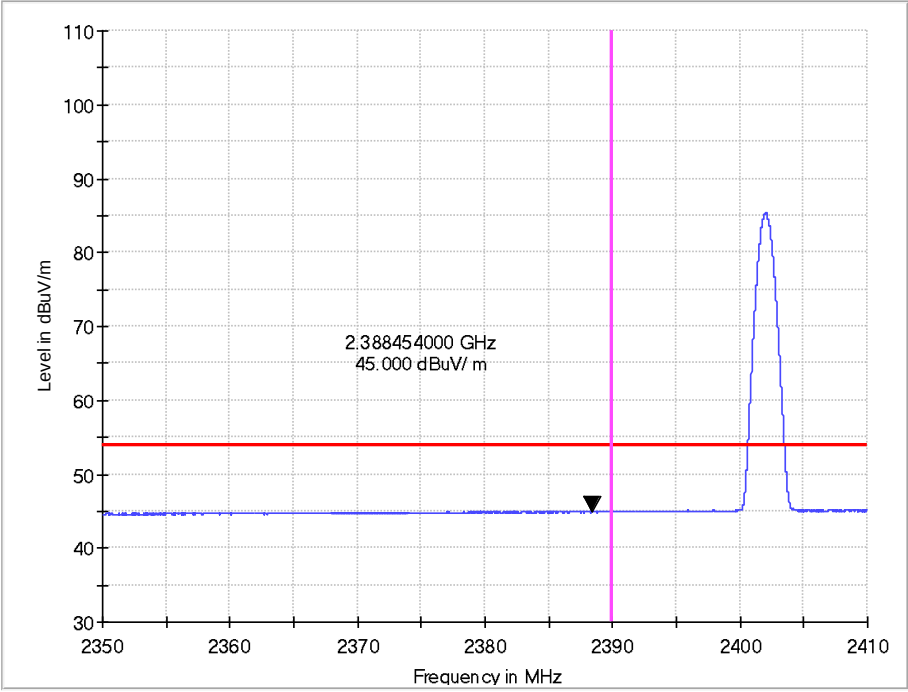
Right glasses leg:
Band Edge
BLE_1Mbps BLE CH0
PK
Horizontal



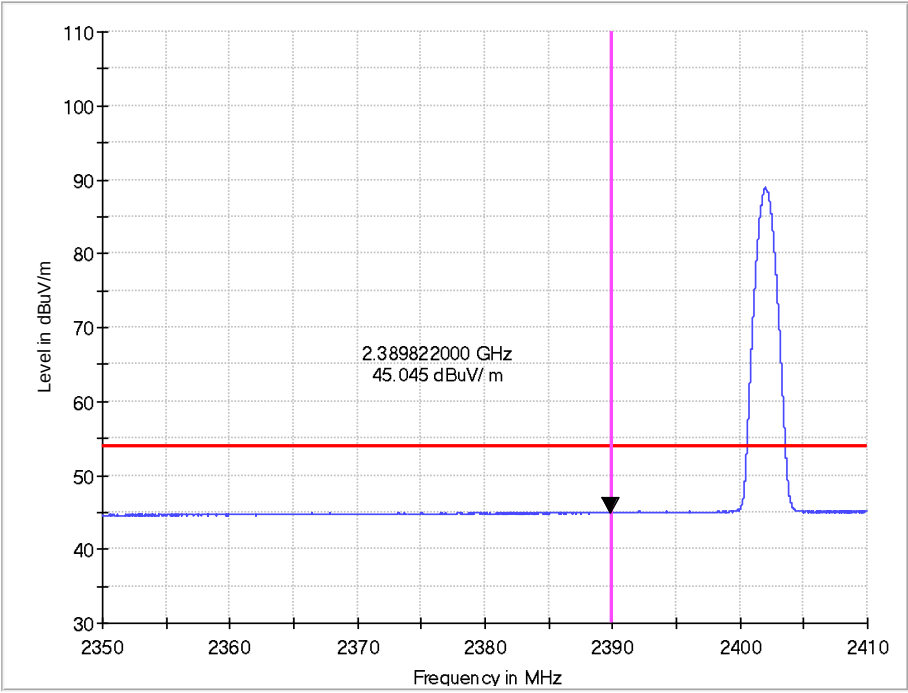
Vertical



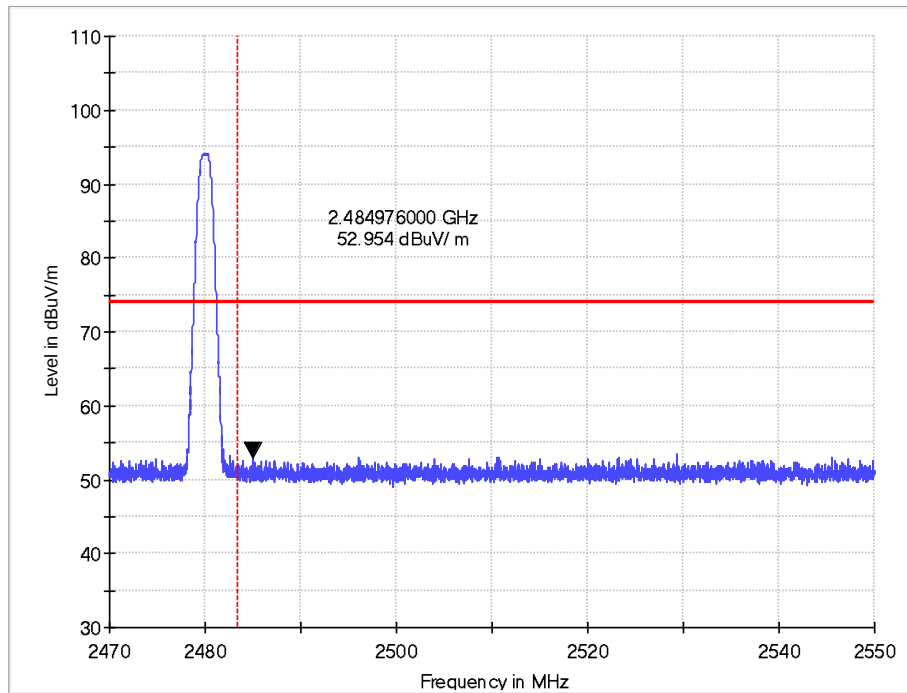
AV
Horizontal



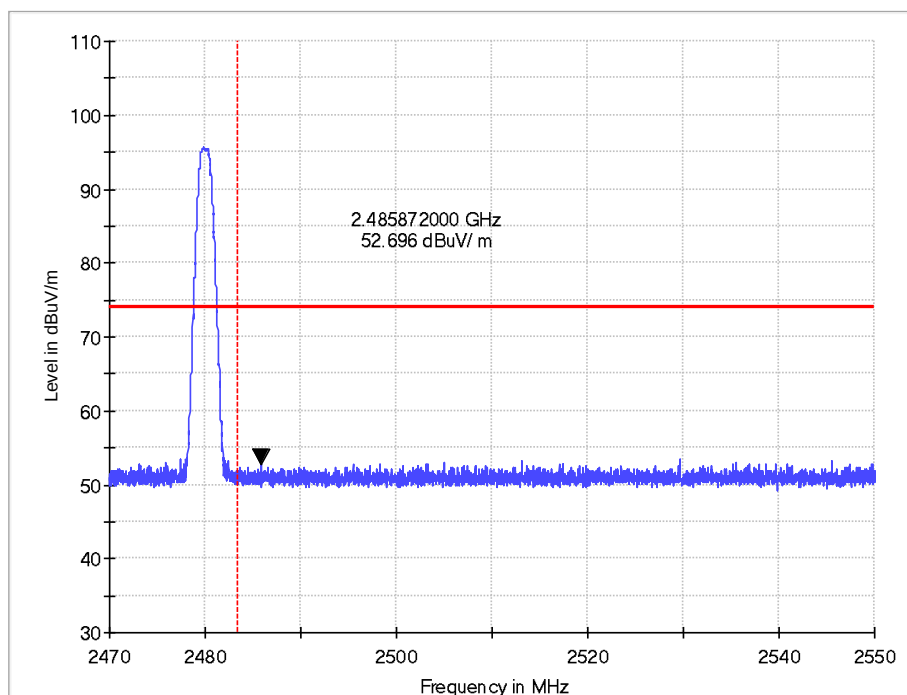
Vertical



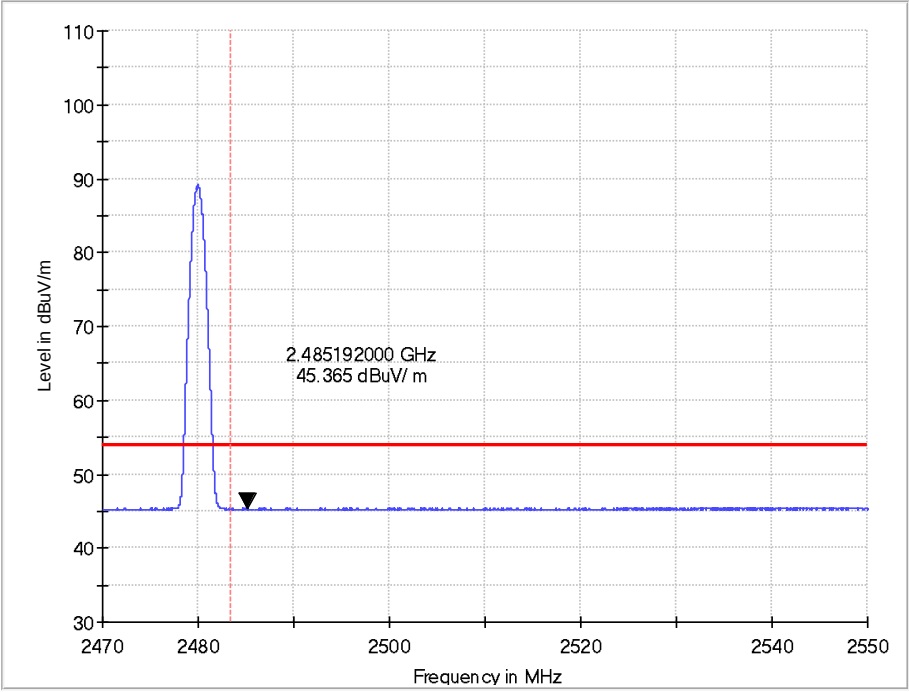
Right glasses leg:
Band Edge
BLE_1Mbps BLE CH39
PK
Horizontal



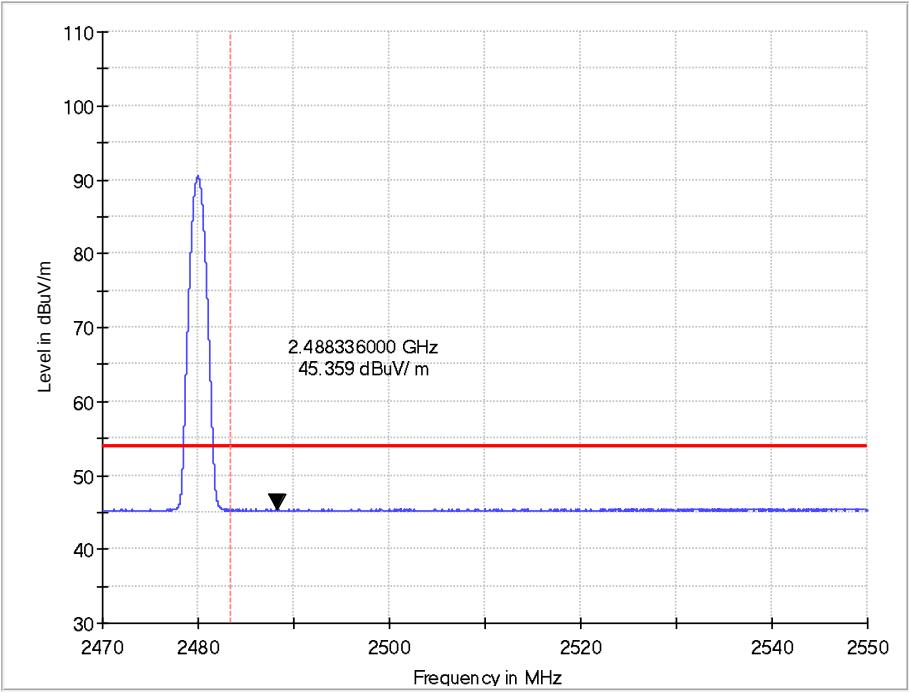
Vertical



AV
Horizontal



Vertical



10. CONDUCTED EMISSION TEST FOR AC POWER PORT MEASUREMENT

10.1. Test Standard and Limit

10.1.1. Test Standard

FCC Part 15.207
RSS-Gen Clause 8.8

10.1.2. Test Limit

Table 21 Conducted Emission Test Limit

Frequency	Maximum RF Line Voltage (dB μ V)	
	Quasi-peak Level	Average Level
150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
500kHz~5MHz	56	46
5MHz~30MHz	60	50

* Decreasing linearly with logarithm of the frequency

* The lower limit shall apply at the transition frequency.

10.2. Test Procedure

The EUT is put on a table of non-conducting material that is 80cm high. The vertical conducting wall of shielding is located 40cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI test receiver is used to test the emissions from both sides of AC line. According to the requirements of ANSI C63.10-2013. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and average detector mode.

The bandwidth of EMI test receiver is set at 9 kHz.

10.3. Test Arrangement

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application. The detailed information refers to test picture.

10.4. Test Data

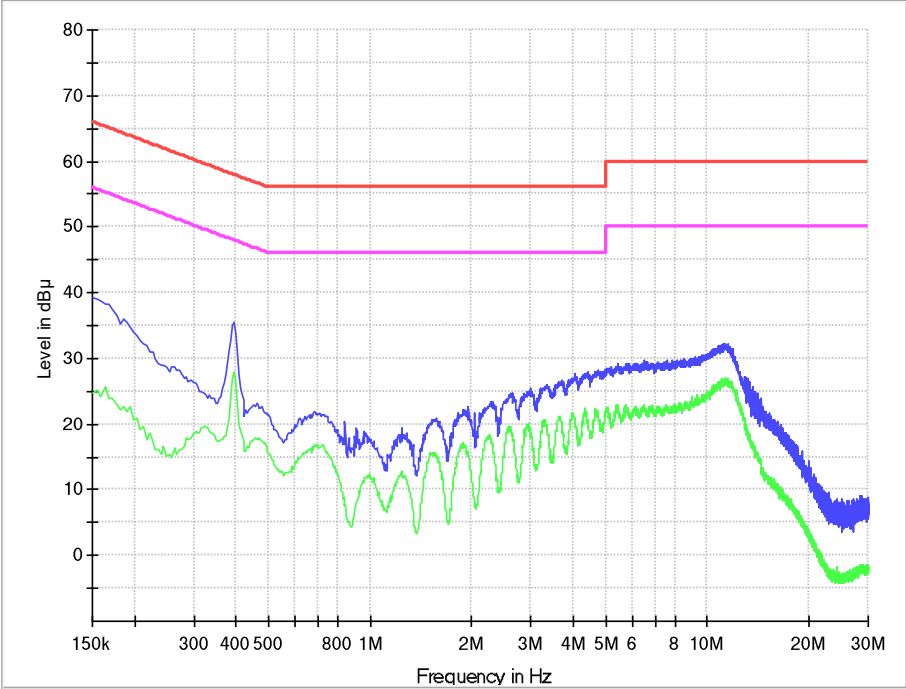
The emissions don't show in below are too low against the limits. Refer to the test curves.

Table 22 Conducted Emission Test Data

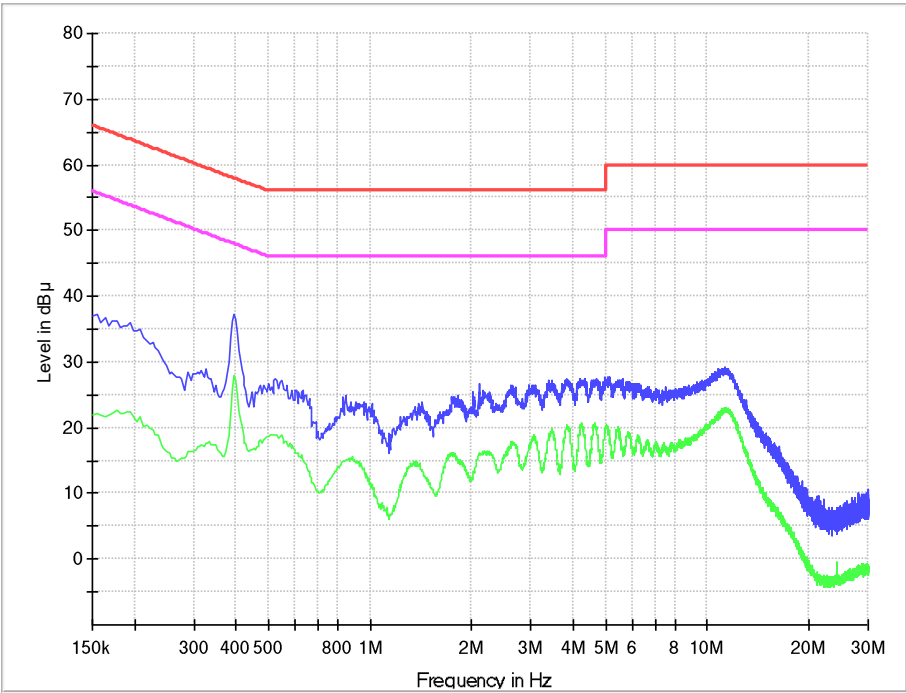
Test mode: Charging and Transmitting								
	Frequency (MHz)	Correction Factor (dB)	Quasi-Peak			Average		
			Reading (dB μ V)	Emission Level (dB μ V)	Limit (dB μ V)	Reading (dB μ V)	Emission Level (dB μ V)	Limit (dB μ V)
Line	0.15	9.7	25.4	35.1	66	12.7	22.4	56
	0.393	9.7	23.2	32.9	58.0	15.6	25.3	48.0
	2.652	9.9	11.8	21.7	56	6.2	16.1	46
	4.06	9.9	12.6	22.5	56	7.7	17.6	46
	5.014	10.0	14.9	24.9	60	11.4	21.4	50
	11.269	9.9	18.2	28.1	60	14.5	24.4	50
Neutral	0.154	9.7	23.7	33.4	65.8	13.0	22.7	55.8
	0.393	9.7	24.4	34.1	58.0	18.2	27.9	48.0
	0.523	9.8	13.6	23.4	56	9.2	19	46
	2.107	9.9	12.8	22.7	56	7.2	17.1	46
	4.204	9.9	14.6	24.5	56	10.5	20.4	46
	11.521	9.9	17.0	26.9	60	12.8	22.7	50

REMARKS: 1. Emission level (dB μ V) = Read Value (dB μ V) + Correction Factor (dB)
 2. Correction Factor (dB) = LISN Factor (dB) + Cable Factor (dB) + Limiter Factor (dB)
 3. The other emission levels were very low against the limit.

Line



Neutral



11. 99% BANDWIDTH

11.1.LIMITS OF 99% Bandwidth

RSS-GEN Clause 6.7, for reporting purposes only

11.2.TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer.

The transmitter output is connected to a spectrum analyzer.

The RBW is set to $\geq 1\%$ to 5% of the actual occupied.

The VBW is set to $\geq 3\text{RBW}$. The sweep time is coupled

11.3.TEST SETUP

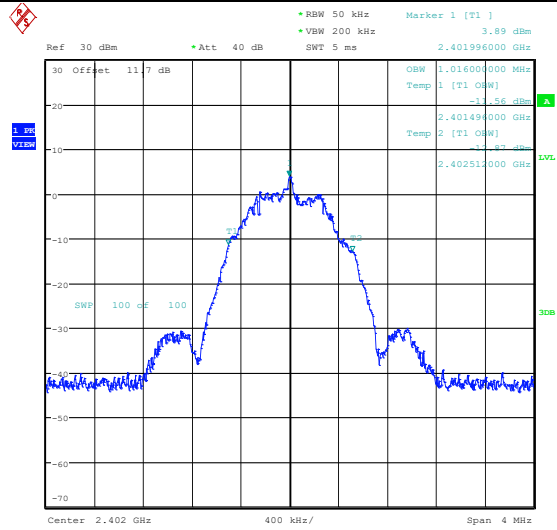


11.4.TEST DATA

Left glasses leg:

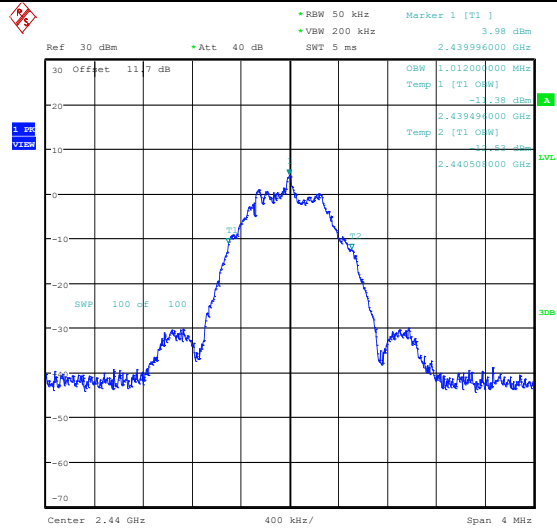
Table 23 99%Occupied Bandwidth Test Data

TestMode	Antenna	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	1.016	2401.4960	2402.5120	---	---
BLE_1M	Ant1	2440	1.012	2439.4960	2440.5080	---	---
BLE_1M	Ant1	2480	1.012	2479.4920	2480.5040	---	---



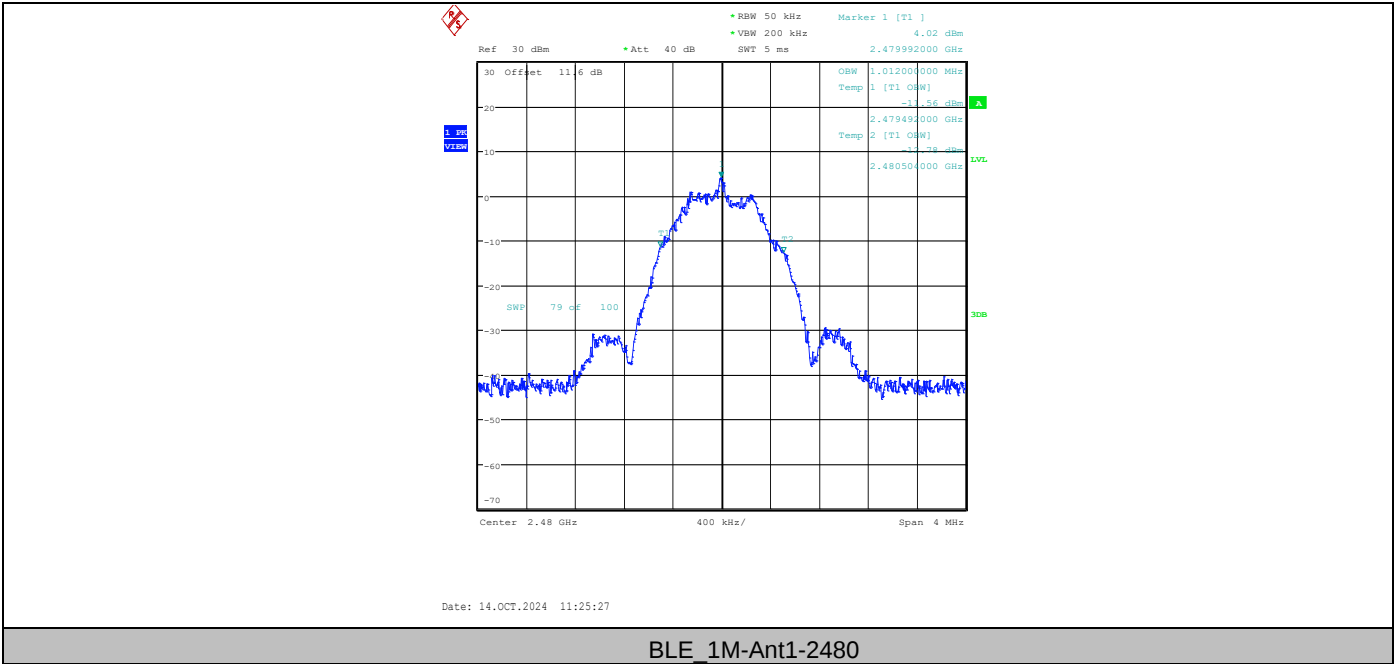
Date: 14.OCT.2024 11:14:59

BLE_1M-Ant1-2402



Date: 14.OCT.2024 11:21:56

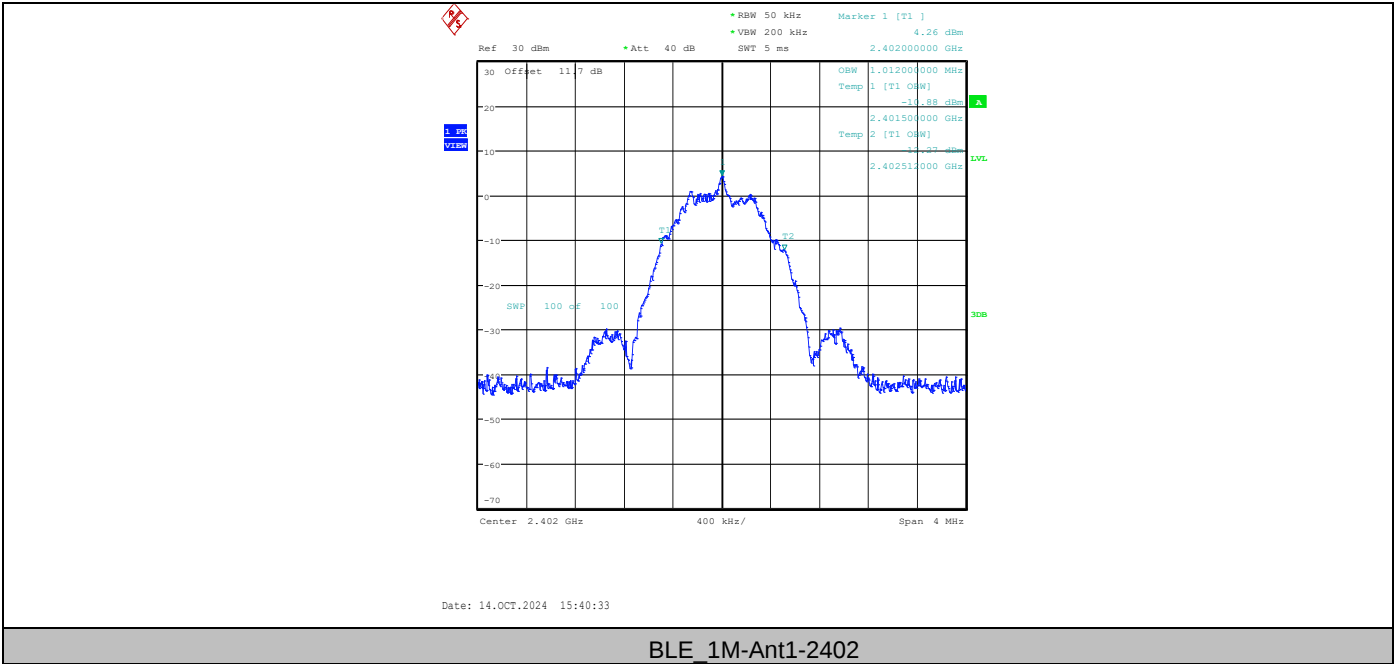
BLE_1M-Ant1-2440

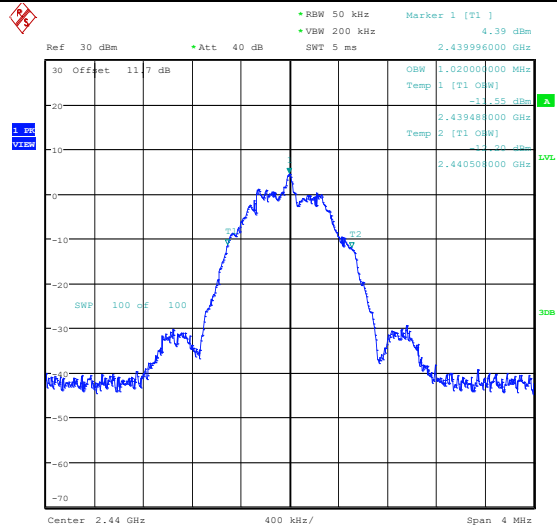


Right glasses leg:

Table 24 99%Occupied Bandwidth Test Data

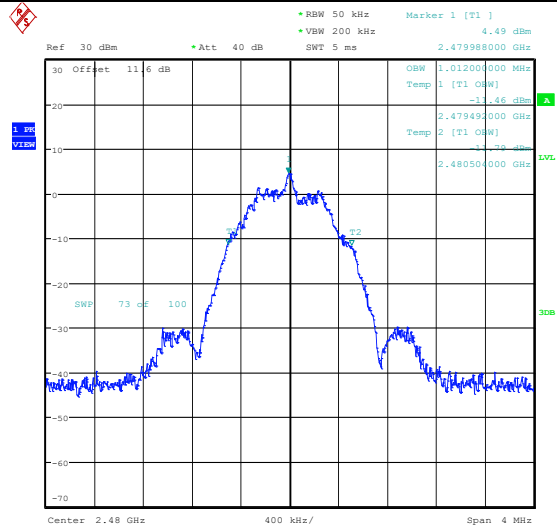
TestMode	Antenna	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	1.012	2401.5000	2402.5120	---	---
BLE_1M	Ant1	2440	1.02	2439.4880	2440.5080	---	---
BLE_1M	Ant1	2480	1.012	2479.4920	2480.5040	---	---





Date: 14.OCT.2024 15:51:10

BLE_1M-Ant1-2440



Date: 14.OCT.2024 15:53:03

BLE_1M-Ant1-2480

12. ANTENNA REQUIREMENTS

15.203 requirements:

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. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

15.247(b) (4) requirements:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

RSS-GEN Section 6.8:

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.

12.1. Antenna Connector

Antenna Connector is on the PCB within enclosure and not accessible to user.

12.2. Antenna Gain

The antenna gain of EUT is less than 6 dBi.

END OF REPORT