Prüfbericht-Nr.: *Test report no.*:	**CN247SOL 002**	**Auftrags-Nr.:** *Order no.*:	168486983	**Page 1 of 22** *Seite 1 von 22*
Kunden-Referenz-Nr.: *Client reference no.*:	N/A	**Auftragsdatum**: *Order date:*	2024-05-29	
Auftraggeber: *Client*:	**Harman International Industries, Inc** 8500 Balboa Blvd, Northridge, California, 91329, United States			
Prüfgegenstand: *Test item*:	BLUETOOTH HEADSET			
Bezeichnung / Typ-Nr.: *Identification / Type no.*:	TUNE BEAM 2 (Trademark: JBL)			
Auftrags-Inhalt: *Order content*:	Type test			
Prüfgrundlage: *Test specification*:	CFR47 FCC Part 15: Subpart C Section 15.247 CFR47 FCC Part 15: Subpart C Section 15.207 CFR47 FCC Part 15: Subpart C Section 15.209		RSS-247 Issue 3 August 2023 RSS-Gen Issue 5 March 2019	

Wareneingangsdatum: *Date of sample receipt*:	2024-05-30	Refer to photos document
Prüfmuster-Nr.: *Test sample no:*	A003731935	
Prüfzeitraum: *Testing period*:	2024-05-30 – 2024-06-12	
Ort der Prüfung: *Place of testing*:	TÜV Rheinland (Shenzhen) Co., Ltd.	
Prüflaboratorium: *Testing laboratory:*	TÜV Rheinland (Shenzhen) Co., Ltd.	
Prüfergebnis*: *Test result**:	Pass	

geprüft von: tested by:	X Signed by: Harry W. C. Wu	**genehmigt von:** *authorized by*:	X Signed by: Alex Lan
Datum: *Date:* 2024-07-19		**Ausstellungsdatum:** *Issue date:* 2024-07-19	
Stellung / Position:	Project Manager	**Stellung** / Position:	Department Manager

Sonstiges / *Other*: FCC ID: APITUNEBEAM2
IC: 6132A-TUNEBEAM2 HVIN: TUNE BEAM 2

Zustand des Prüfgegenstandes bei Anlieferung: Prüfmuster vollständig und unbeschädigt
Condition of the test item at delivery: *Test item complete and undamaged*

* Legende:	P(ass) = entspricht o.g. Prüfgrundlage(n)	F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
** Legend:*	*P(ass) = passed a.m. test specification(s)*	*F(ail) = failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.
This test report only relates to the above mentioned test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.

Remarks
Anmerkungen

1	The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system. Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request. *Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben.* *Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden.*
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3	Test clauses with remark of * are subcontracted to qualified subcontractors and descripted under the respective test clause in the report. Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report. *Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben. Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt.*
4	The decision rule for statements of conformity, based on numerical measurement results, in this test report is based on the “Zero Guard Band Rule” and “Simple Acceptance” in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report. For additional information to the resulting risk based of this decision rule please refer to ILAC G8:2019. *Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnisen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird. Zu weiteren Informationen bezueglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019.*

Test Summary

5.1.1 ANTENNA REQUIREMENT
RESULT: Pass

5.1.2 MAXIMUM PEAK CONDUCTED OUTPUT POWER
RESULT: Pass

5.1.3 CONDUCTED POWER SPECTRAL DENSITY
RESULT: Pass

5.1.4 99%DB BANDWIDTH
RESULT: Pass

5.1.5 6DB BANDWIDTH
RESULT: Pass

5.1.6 FREQUENCY STABILITY
RESULT: Pass

5.1.7 CONDUCTED SPURIOUS EMISSIONS MEASURED IN 100 KHZ BANDWIDTH
RESULT: Pass

5.1.8 RADIATED SPURIOUS EMISSION
RESULT: Pass

Contents

1 General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix A: Photographs of the Test Set-up

Appendix B: Test Results of left earbud.

Appendix C: Test Results of right earbud.

2 Test Sites

2.1 Test Facilities

TÜV Rheinland (Shenzhen) Co., Ltd.
No.362, Huanguan Middle Road, Songyuansha Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China/518110

FCC Registration No.: 694916

IC Registration No.: 25069 and the CAB identifier is CN0078.

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Radio Spectrum Testing (TS8997)				
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Cal. until**
Wireless Connectivity Tester	R&S	CMW270	101375	25.07.2024
Signal Analyzer	R&S	FSV 40	101441	25.07.2024
Vector Signal Generator	R&S	SMBV100A	263301	25.07.2024
Signal Generator	R&S	SMB100A	115186	25.07.2024
OSP	R&S	OSP 150	101017	13.11.2024
Control PC	DELL	OptiPlex 7050	FTJZ9P2	N/A
Test Software	R&S	WMS32 (V11.00.00)	N/A	N/A
Power Meter	R&S	NRP2	107105	13.11.2024
Power Sensor	R&S	NRP-Z81	105677	25.07.2024
Humid & Temp Programmable Tester	BOST	NTH090-60	19040801	28.02.2025
Shielding Room 8#	Albatross	SR8	APC17151-SR8	22.06.2024
Unwanted Emission Testing (TS9975)				
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Cal. until**
EMI Test Receiver	R&S	ESR 7	102021	25.07.2024
Signal Analyzer	R&S	FSV 40	101439	25.07.2024
System Controller Interface	R&S	SCI-100	S10010038	N/A
Filterbank	R&S	Wlan	100759	25.07.2024
OSP	R&S	OSP 120	102040	N/A
Pre-amplifier	R&S	SCU08F1	08320031	25.07.2024
Amplifier	R&S	SCU-18F	180070	25.07.2024
Amplifier	R&S	SCU40A	100475	25.07.2024
Trilog Broadband Antenna (30 MHz - 7 GHz)	Schwarzbeck	VULB 9162	193	06.08.2024
Double-Ridged Antenna (1 -18 GHz)	ETS-LINDGREN	3117	00218717	06.08.2024
Wideband Ridged Horn Antenna (18-40 GHz)	Steatite	QMS-00880	19067	27.08.2024
Active Loop Antenna	Schwarzbeck	FMZB 1513	302	06.08.2024
Test software	R&S	EMC32 (V10.60.10)	N/A	N/A
Control PC	Dell	OptiPlex 7050	36NV9P2	N/A
3m Semi-Anechoic Chamber	Albatross	SAC-3m	APC17151-SAC	22.06.2024

2.3 Traceability

All measurement equipment calibrations are traceable to NIM (National Institute of Metrology) or where calibration is performed in other countries, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basics using in house standards or comparisons.

2.5 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements as below table.

Parameter	Uncertainty (k=2)
Occupied Channel Bandwidth	± 2.08 %
RF output power, conducted	± 0.99 dB
RF power density, conducted	± 0.99 dB
Unwanted Emissions, conducted	± 0.89 dB
All emissions, radiated	± 4.17 dB

2.6 Location of Original Data

The original copies of all test data taken during actual testing were attached at Appendix A & B & C of this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Shenzhen) file for certification follow-up purposes.

2.7 Status of Facility Used for Testing

The TÜV Rheinland (Shenzhen) Co., Ltd. Test facility located at No.362, Huanguan Middle Road, Songyuansha Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China/518110 is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

3 General Product Information

3.1 Product Function and Intended Use

The EUT is Bluetooth Headset, which supports Bluetooth dual mode technology.

This product has two different version: Solid version and Ghost version.
For Solid Version: The left & right earbuds are identical in schematic except the PCB layout different.
For Ghost Version: The left & right earbuds are identical in schematic except the PCB layout different
For Solid Version and Ghost Version: all in identical except the charging case and enclosure are different.

For details refer to the User Manual and Circuit Diagram.

3.2 Ratings and System Details

Table 2: Technical Specification of EUT

General Information of EUT	Value
Kind of Equipment	BLUETOOTH HEADSET
Type Designation	TUNE BEAM 2
Trademark	JBL
FCC ID	APITUNEBEAM2
IC	6132A-TUNEBEAM2
HVIN	TUNE BEAM 2
Extreme Temperature Range	0ºC to +45ºC
Operating Voltage	For charging case: Input: DC 5V, 1A via Type C interface or DC 3.8V, 590mAh via built-in Li-ion battery Output: DC 5V, 200mA * 2 For left & right earbuds: DC 3.85V, 65mAh via built-in lithium-ion battery DC 5V, 0.2A*2 via charging case
Technical Specification of Classical Bluetooth	
Bluetooth Core Version	Bluetooth 5.3
Operating Frequency band	2402 ~ 2480 MHz
Channel Number	79 channels
Channel separation	1MHz
Modulation	GFSK, π/4DQPSK, 8DPSK
Antenna Type	PIFA antenna
Antenna Gain	-1.36 dBi for left earbud -2.16 dBi for right earbud

Technical Specification of Bluetooth Low Energy	
Bluetooth Core Version	Bluetooth 5.3
Operating Frequency band	2402 – 2480 MHz for data rate 1Mbps 2404 – 2478 MHz for data rate 2Mbps
Channel Number	40 channels for data rate 1Mbps 37 channels for data rate 2Mbps Note: 2402MHz/2426MHz/2480MHz will be disable via software for date rate 2Mbps.
Channel separation	2MHz
Data rate	1Mbps, 2Mbps
Modulation	GFSK
Antenna Type	PIFA antenna
Antenna Gain	-1.36 dBi for left earbud -2.16 dBi for right earbud

Table 3: RF Channel and Frequency of Classic Bluetooth

RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)
00	**2402.00**	20	2422.00	40	2442.00	60	2462.00
01	2403.00	21	2423.00	41	2443.00	61	2463.00
02	2404.00	22	2424.00	42	2444.00	62	2464.00
03	2405.00	23	2425.00	43	2445.00	63	2465.00
04	2406.00	24	2426.00	44	2446.00	64	2466.00
05	2407.00	25	2427.00	45	2447.00	65	2467.00
06	2408.00	26	2428.00	46	2448.00	66	2468.00
07	2409.00	27	2429.00	47	2449.00	67	2469.00
08	2410.00	28	2430.00	48	2450.00	68	2470.00
09	2411.00	29	2431.00	49	2451.00	69	2471.00
10	2412.00	30	2432.00	50	2452.00	70	2472.00
11	2413.00	31	2433.00	51	2453.00	71	2473.00
12	2414.00	32	2434.00	52	2454.00	72	2474.00
13	2415.00	33	2435.00	53	2455.00	73	2475.00
14	2416.00	34	2436.00	54	2456.00	74	2476.00
15	2417.00	35	2437.00	55	2457.00	75	2477.00
16	2418.00	36	2438.00	56	2458.00	76	2478.00
17	2419.00	37	2439.00	57	2459.00	77	2479.00
18	2420.00	38	2440.00	58	2460.00	**78**	**2480.00**
19	2421.00	**39**	**2441.00**	59	2461.00	--	--

Table 4: RF Channel and Frequency of Bluetooth Low Energy

RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)
00	**2402.00**	10	2422.00	20	2442.00	30	2462.00
01	2404.00	11	2424.00	21	2444.00	31	2464.00
02	2406.00	12	2426.00	22	2446.00	32	2466.00
03	2408.00	13	2428.00	23	2448.00	33	2468.00
04	2410.00	14	2430.00	24	2450.00	34	2470.00
05	2412.00	15	2432.00	25	2452.00	35	2472.00
06	2414.00	16	2434.00	26	2454.00	36	2474.00
07	2416.00	17	2436.00	27	2456.00	37	2476.00
08	2418.00	18	2438.00	28	2458.00	38	2478.00
09	2420.00	**19**	**2440.00**	29	2460.00	**39**	**2480.00**

3.3 Independent Operation Modes

The basic operation modes are:

A. On, Bluetooth LE transmitting mode
    1. Low channel
    2. Middle channel
    3. High channel

B. On, Bluetooth connecting mode

C. Off

3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

3.5 Submitted Documents

- Application Form
- Block Diagram
- FCC/IC Label and Location Info
- Operation Description
- Photo Document
- Schematics
- User Manual

4 Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

Radio Spectrum: The equipment under test (EUT) was configured at its highest power output in order to measure its highest possible radiation and conducted level. The test modes were adapted accordingly in reference to the instructions for use.

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5. All testing were performed according to the procedures in ANSI C63.10: 2013.
According to clause 3.1, all test items were applied on model TUNE BEAM (Solid version) with left & right earbuds.

4.3 Special Accessories and Auxiliary Equipment

Table 5: List of Accessories and Auxiliary Equipment

Description	Manufacturer	Model	S/N
Laptop	Lenovo	T480	PF-16A6N8
USB cable	Shen zhen Daytone Electronics Co., Ltd	CE-2196N	28AWG ; length：0.2M

4.4 Countermeasures to Achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Technical Construction File (TCF).

No additional measures were employed to achieve compliance.

4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test (Below 30MHz)

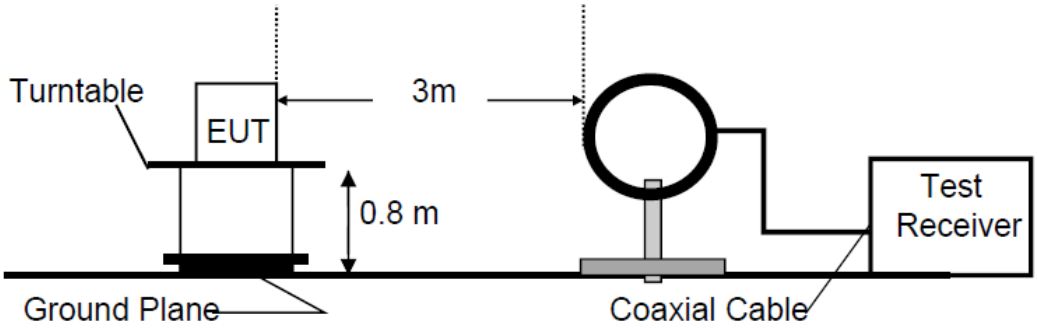


Diagram of Measurement Configuration for Radiation Test (Below 1GHz)

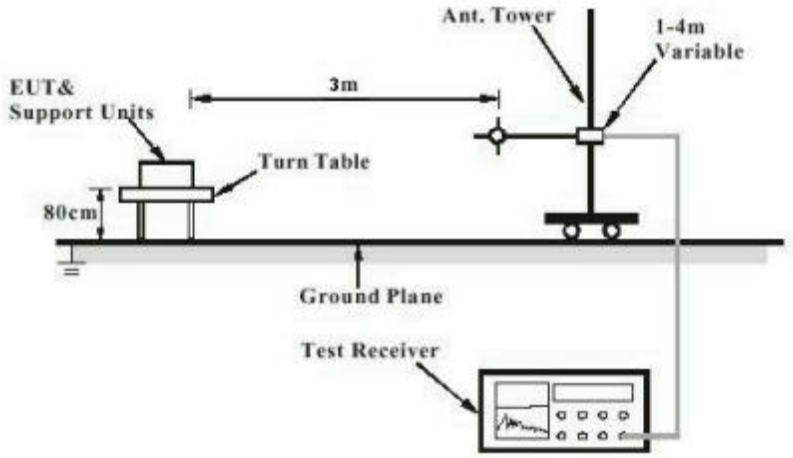


Diagram of Measurement Configuration for Radiation Test (Above 1GHz)

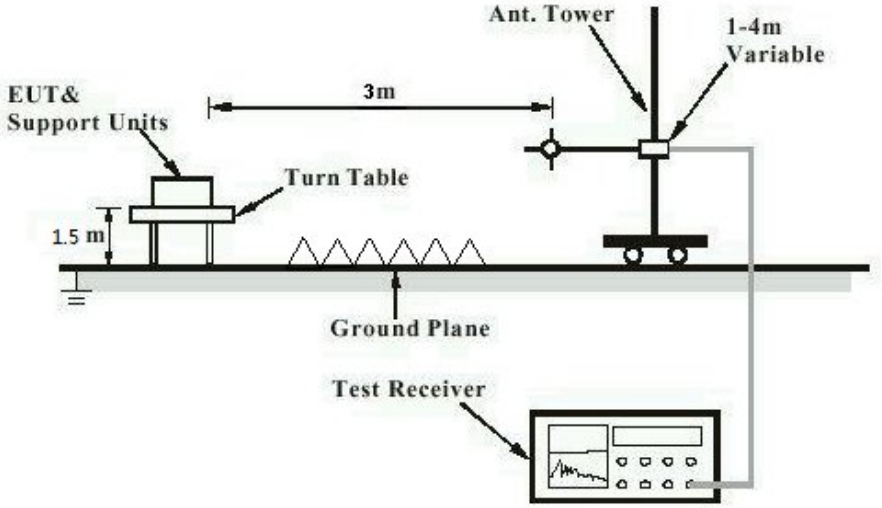
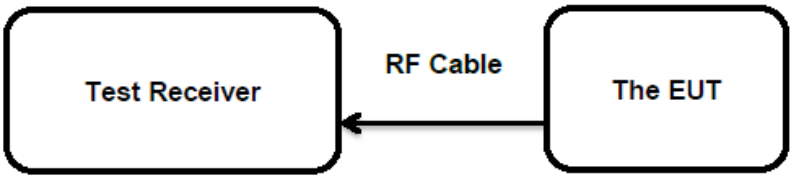


Diagram of Measurement Configuration for Conducted Transmitter Measurement



5 Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.247(b)(4) and Part 15.203 RSS-Gen Clause 6.7
Limit	:	the use of antennas with directional gains that do not exceed 6 dBi

According to the manufacturer declared, the EUT has one PIFA antenna, the directional gain of antennas are -1.36 dBi for left earbud & -2.16 dBi for right earbud , and the antenna connector is designed with permanent attachment and no consideration of replacement. Therefore the EUT is considered sufficient to comply with the provision.

Refer to EUT Photo for further details.

5.1.2 Maximum Peak Conducted Output Power

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.247(b)(3) RSS-247 Clause 5.4(d)
Basic standard	:	ANSI C63.10: 2013
Limits	:	< 1 Watt (Maximum Conducted Peak Power) e.i.r.p. <4W
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	2024-05-30 to 2024-06-12
Input voltage	:	DC 3.85V for left and right earbud
Operation mode	:	A
Test channel	:	Low / Middle / High
Ambient temperature	:	23.5 ℃
Relative humidity	:	54 %
Atmospheric pressure	:	101 kPa

For details refer to following test result.

Table 6: Test Result of Maximum Peak Conducted Output Power, Left earbud

Data Rate	Test Channel (MHz)	Measured Peak Power		Limit (W)
		(dBm)	(W)	
1 Mbps	2402	6.5	0.0045	< 1.0
	2440	7.2	0.0052	
	2480	6.6	0.0046	
2 Mbps	2404	4.2	0.0026	
	2440	4.8	0.0030	
	2478	4.2	0.0026	
Maximum Measured Value		7.2	0.0052	

Note: The cable loss is taken into account in results and the maximum e.i.r.p. is 5.84 dBm less than 4W (36 dBm).

Table 7: Test Result of Maximum Peak Conducted Output Power, Right earbud

Data Rate	Test Channel (MHz)	Measured Peak Power		Limit (W)
		(dBm)	(W)	
1 Mbps	2402	6.9	0.0049	< 1.0
	2440	7.3	0.0054	
	2480	6.6	0.0046	
2 Mbps	2404	4.3	0.0027	
	2440	4.8	0.0030	
	2478	3.9	0.0025	
Maximum Measured Value		7.3	0.0054	

Note: The cable loss is taken into account in results and the maximum e.i.r.p. is 5.14 dBm less than 4W (36 dBm).

5.1.3 Conducted Power Spectral Density

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.247(e) RSS-247 Clause 5.2(b)
Basic standard	:	ANSI C63.10: 2013
Limits	:	8 dBm / 3kHz
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	2024-05-30 to 2024-06-12
Input voltage	:	DC 3.85V for left and right earbud
Operation mode	:	A
Test channel	:	Low / Middle / High
Ambient temperature	:	23.5 ℃
Relative humidity	:	54 %
Atmospheric pressure	:	101 kPa

For the measurement records, refer to the appendix B&C.

Table 8: Test Result of 99% Bandwidth, left earbud

Data Rate	Channel Frequency (MHz)	Measured Conducted Power Spectral Density (dBm / 3kHz)	Limit
1 Mbps	2402	-8.94	8 dBm / 3kHz
	2440	-8.99	
	2480	-9.11	
2 Mbps	2404	-13.34	8 dBm / 3kHz
	2440	-12.99	
	2478	-13.01	

Table 9: Test Result of 99% Bandwidth, right earbud

Data Rate	Channel Frequency (MHz)	Measured Conducted Power Spectral Density (dBm / 3kHz)	Limit
1 Mbps	2402	-8.40	8 dBm / 3kHz
	2440	-7.97	
	2480	-8.67	
2 Mbps	2404	-12.28	8 dBm / 3kHz
	2440	-11.84	
	2478	-12.54	

5.1.4 99%dB Bandwidth

RESULT: **Pass**

Test Specification

Test standard	:	RSS-Gen clause 6.7
Basic standard	:	ANSI C63.10: 2013
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	2024-05-30 to 2024-06-12
Input voltage	:	DC 3.85V for left and right earbud
Operation mode	:	A
Test channel	:	Low / Middle / High
Ambient temperature	:	23.5 ℃
Relative humidity	:	54 %
Atmospheric pressure	:	101 kPa

For the measurement records, refer to the appendix B&C.

Table 10: Test Result of 99% Bandwidth, left earbud

Data Rate	Channel Frequency (MHz)	Measured 99% Bandwidth (MHz)	Limit
1 Mbps	2402	1.020	/
	2440	1.020	
	2480	1.020	
2 Mbps	2404	1.930	/
	2440	1.930	
	2478	1.930	

Table 11: Test Result of 99% Bandwidth, right earbud

Data Rate	Channel Frequency (MHz)	Measured 99% Bandwidth (MHz)	Limit
1 Mbps	2402	1.020	/
	2440	1.025	
	2480	1.025	
2 Mbps	2404	1.930	/
	2440	1.930	
	2478	1.930	

Note: The fundamental emissions stay within the allocated band 2400-2483.5MHz.

5.1.5 6dB Bandwidth

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.247(a)(2) RSS-247 Clause 5.2(a)
Basic standard	:	ANSI C63.10: 2013
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	2024-05-30 to 2024-06-12
Input voltage	:	DC 3.85V for left and right earbud
Operation mode	:	A
Test channel	:	Low / Middle / High
Ambient temperature	:	23.5 ℃
Relative humidity	:	54 %
Atmospheric pressure	:	101 kPa

For the measurement records, refer to the appendix B&C.

Table 12: Test Result of 6dB Bandwidth, left earbud

Data Rate	Channel Frequency (MHz)	Measured 6dB Bandwidth (MHz)	Limit
1 Mbps	2402	0.693070	>500kHz
	2440	0.693070	
	2480	0.712872	
2 Mbps	2404	1.227722	>500kHz
	2440	1.227722	
	2478	1.227722	

Table 13: Test Result of 99% Bandwidth, right earbud

Data Rate	Channel Frequency (MHz)	Measured 6dB Bandwidth (MHz)	Limit
1 Mbps	2402	0.712872	>500kHz
	2440	0.693070	
	2480	0.693070	
2 Mbps	2404	1.227722	>500kHz
	2440	1.227722	
	2478	1.188118	

5.1.6 Frequency stability

RESULT: **Pass**

Test Specification

Test standard	:	RSS-247 Clause 8.11
Basic standard	:	ANSI C63.10: 2013
Limits	:	within at least the central 80% of its permitted operating frequency band (2400-2483.5MHz)
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	2024-05-30 to 2024-06-12
Input voltage	:	DC 3.85V for left and right earbud
Operation mode	:	B
Ambient temperature	:	23.5 ℃
Relative humidity	:	54 %
Atmospheric pressure	:	101 kPa

For the measurement records, refer to the appendix B & C

5.1.7 Conducted Spurious Emissions Measured in 100 kHz Bandwidth

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.247(d) RSS-247 Clause 5.5
Basic standard	:	ANSI C63.10: 2013
Limits	:	20dB (below that in the 100kHz bandwidth within the band that contains the highest level of the desired power); In addition, radiated emissions which fall in the restricted bands, must also comply with the radiated emission limits specified in 15.209(a)
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	2024-05-30 to 2024-06-12
Input voltage	:	DC 3.85V for left and right earbud
Operation mode	:	A
Test channel	:	Low / Middle / High
Ambient temperature	:	23.5 ℃
Relative humidity	:	54 %
Atmospheric pressure	:	101 kPa

Test results of 100kHz Bandwidth of Frequency Band Edge by Conducted method refer to test plots, and compliance is achieved as well.

For the measurement records, refer to the appendix B&C.

5.1.8 Radiated Spurious Emission

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.247(d) & FCC Part 15.205 RSS-247 Clause 3.3 & 5.5
Basic standard	:	ANSI C63.10: 2013
Limits	:	Refer to 15.209(a) of FCC part 15.247(d) RSS-Gen Table 4 & Table 5
Kind of test site	:	3m Semi-anechoic Chamber

Test Setup

Date of testing	:	2024-05-30 to 2024-06-12
Input voltage	:	DC 3.85V for left and right earbud
Operation mode	:	A
Test channel	:	Low / Middle / High
Ambient temperature	:	Refer to test result
Relative humidity	:	Refer to test result
Atmospheric pressure	:	101 kPa

Remark:
Testing was carried out within frequency range 9kHz to the tenth harmonics. Only the worst case spurious emissions configuration of the each mode were reported.

For the measurement records, refer to the appendix B&C.

6 Photographs of the Test Set-Up

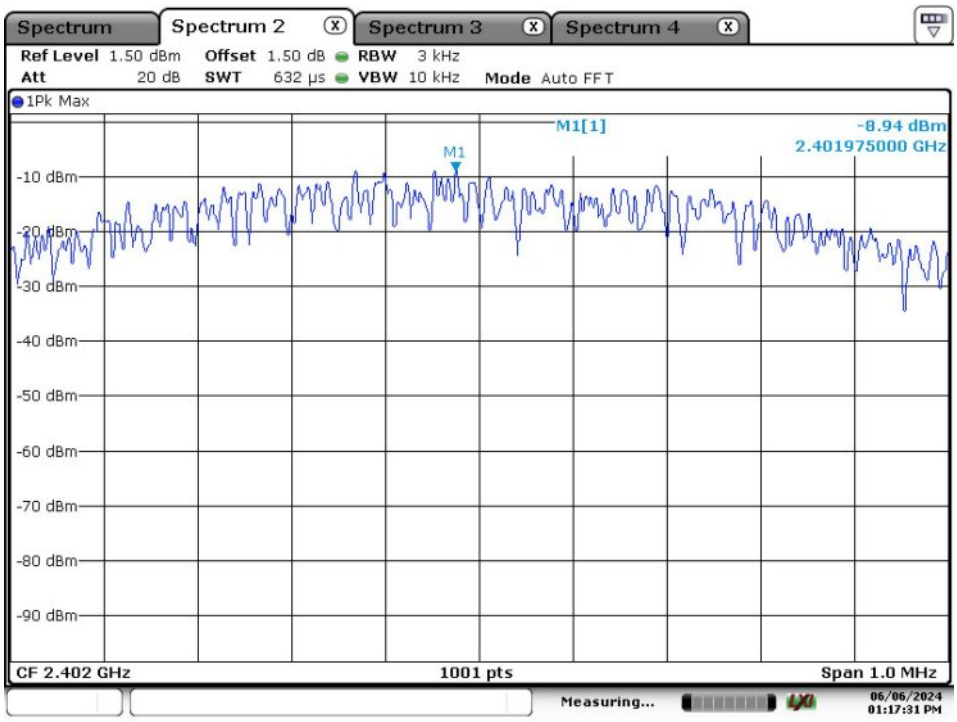
For photographs of the test set-up, refer to the appendix A.

7 List of Tables

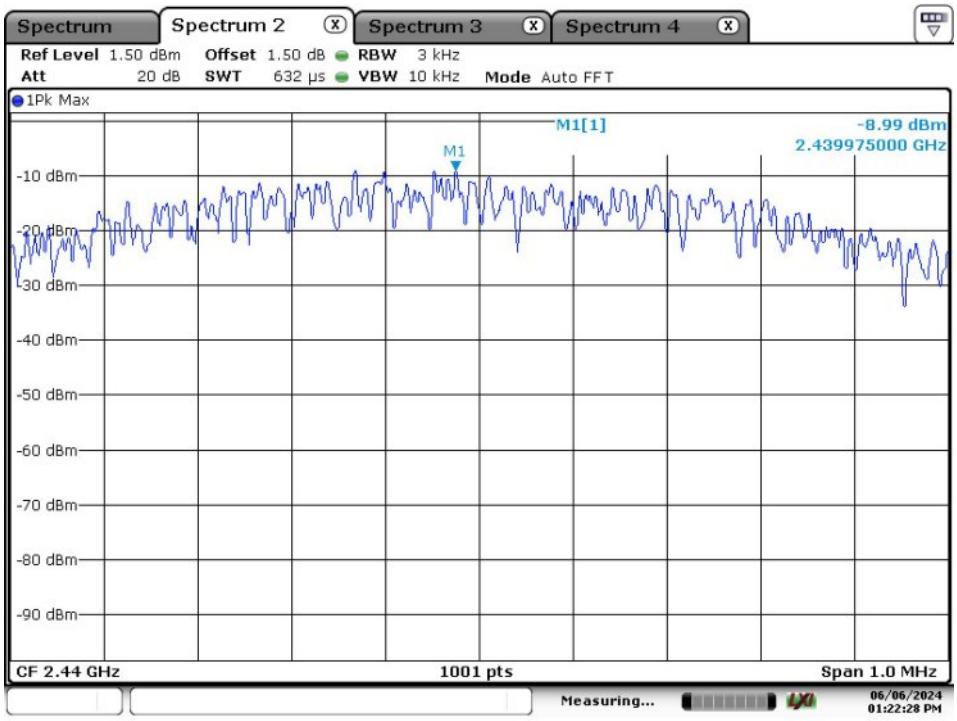
Appendix B: Test Results of Left earbud

Appendix B.1: Test Results of Conducted Power Spectral Density

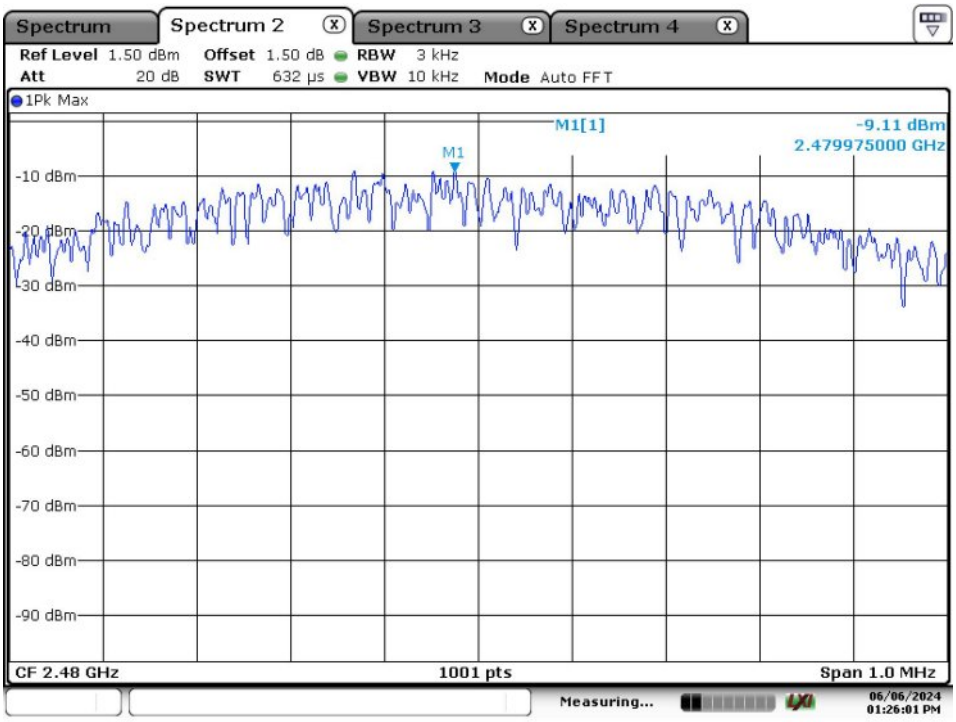
Bluetooth LE Mode, 1Mbps



Date: 6.JUN.2024 13:17:32

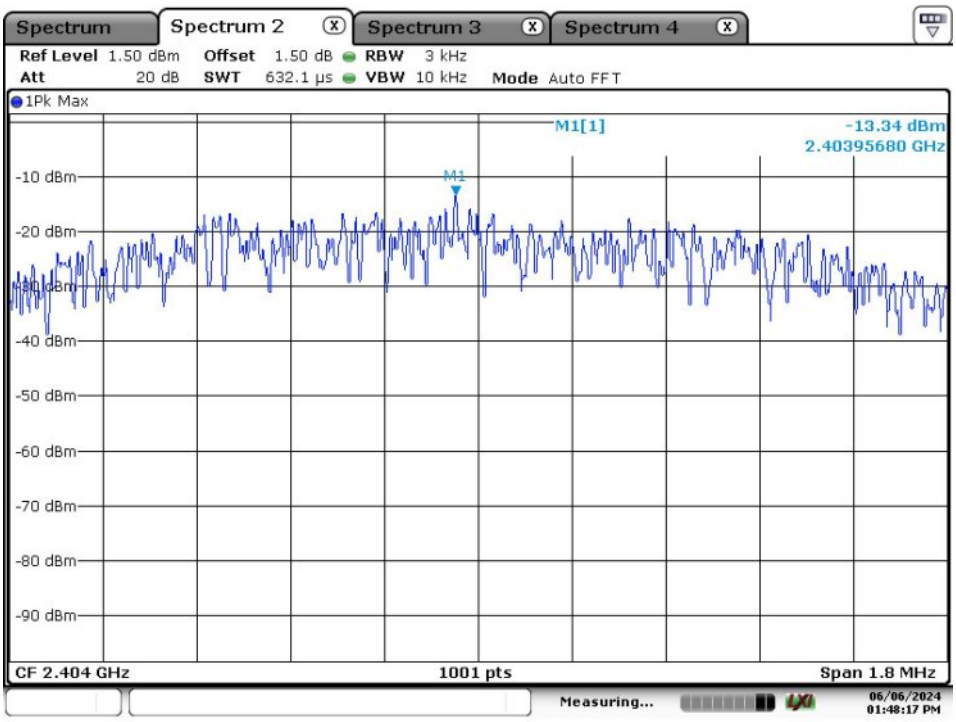


Date: 6.JUN.2024 13:22:28

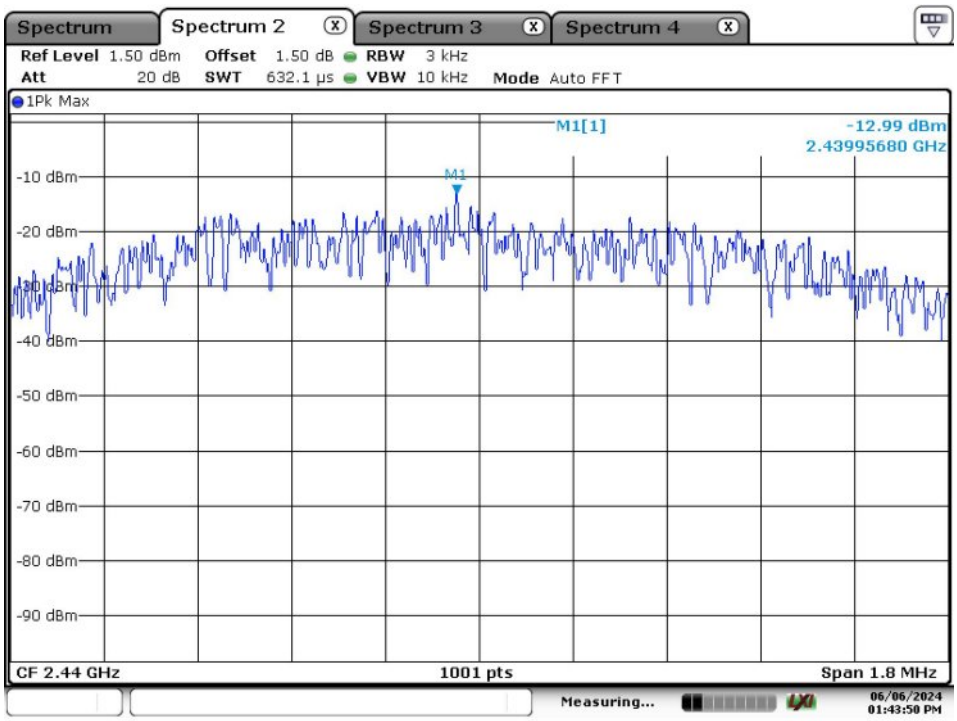


Date: 6.JUN.2024 13:26:01

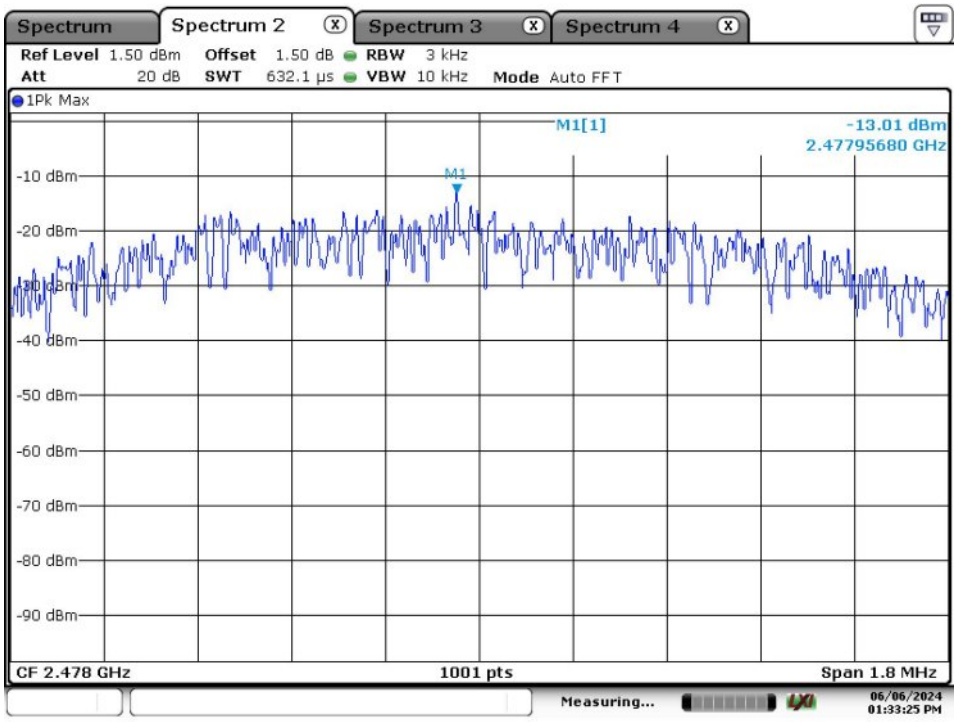
Bluetooth LE Mode, 2Mbps



Date: 6.JUN.2024 13:48:17



Date: 6.JUN.2024 13:43:50



Date: 6.JUN.2024 13:33:25

Appendix B.2: Test Results of 6dB Bandwidth

Bluetooth LE Mode, 1Mbps

6 dB Bandwidth

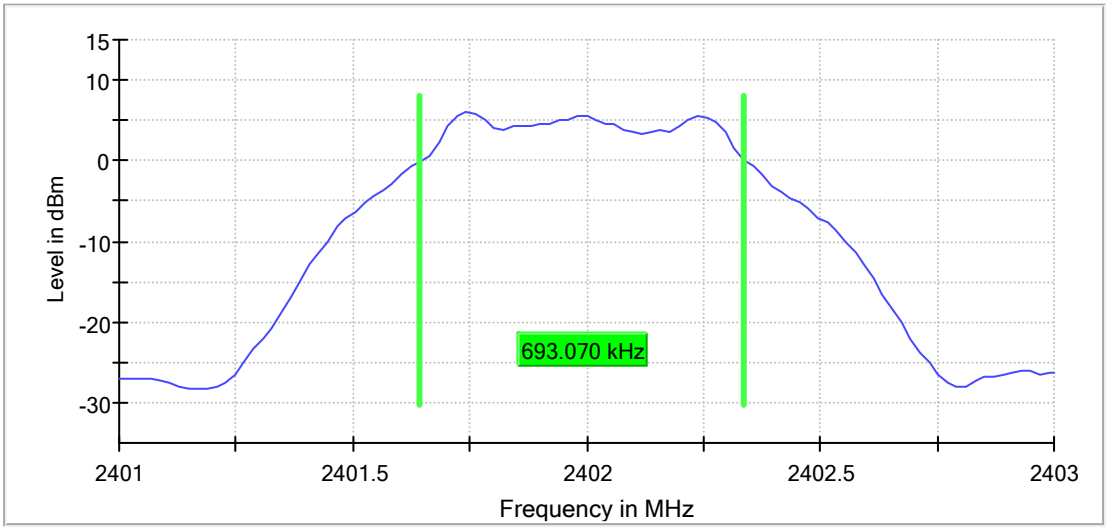
DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2402.000000	0.693070	0.500000	---	2401.643564	2402.336634

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2402.000000	6.0	PASS

RBW=100kHz, VBW=300kHz

6 dB Bandwidth



6 dB Bandwidth

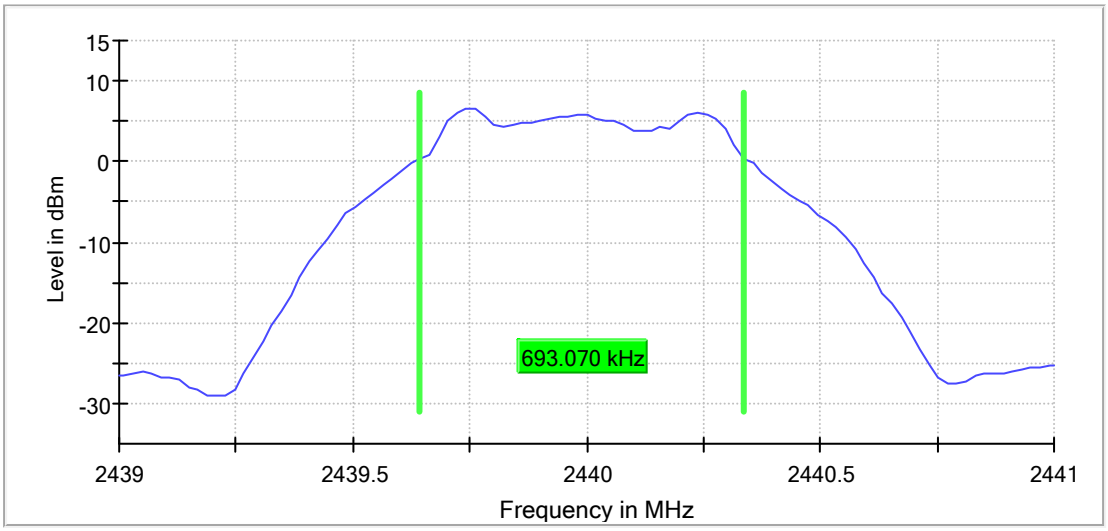
DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2440.000000	0.693070	0.500000	---	2439.643564	2440.336634

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2440.000000	6.5	PASS

RBW=100kHz, VBW=300kHz

6 dB Bandwidth



6 dB Bandwidth

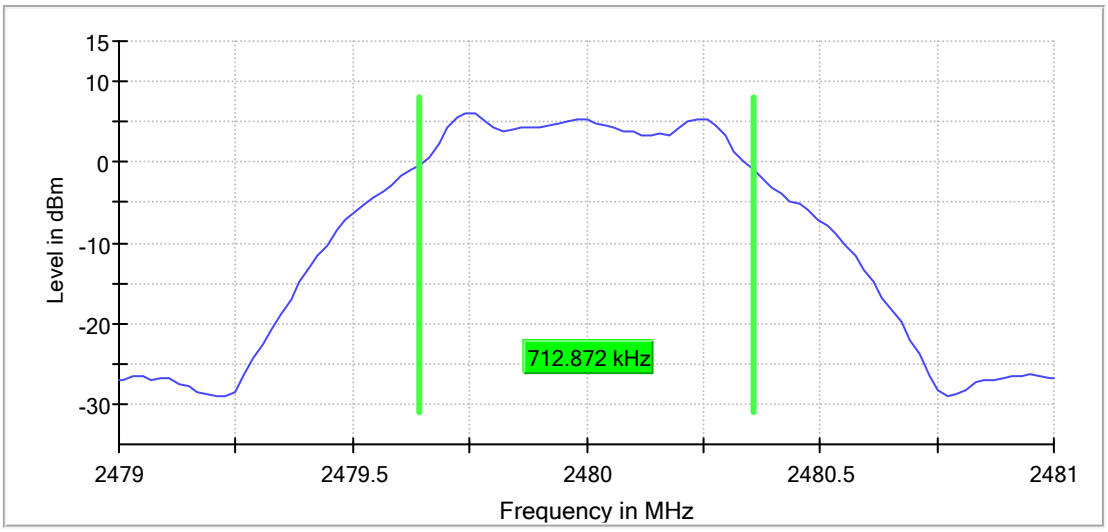
DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2480.000000	0.712872	0.500000	---	2479.643564	2480.356436

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2480.000000	6.0	PASS

RBW=100kHz, VBW=300kHz

6 dB Bandwidth



Bluetooth LE Mode, 2Mbps

6 dB Bandwidth

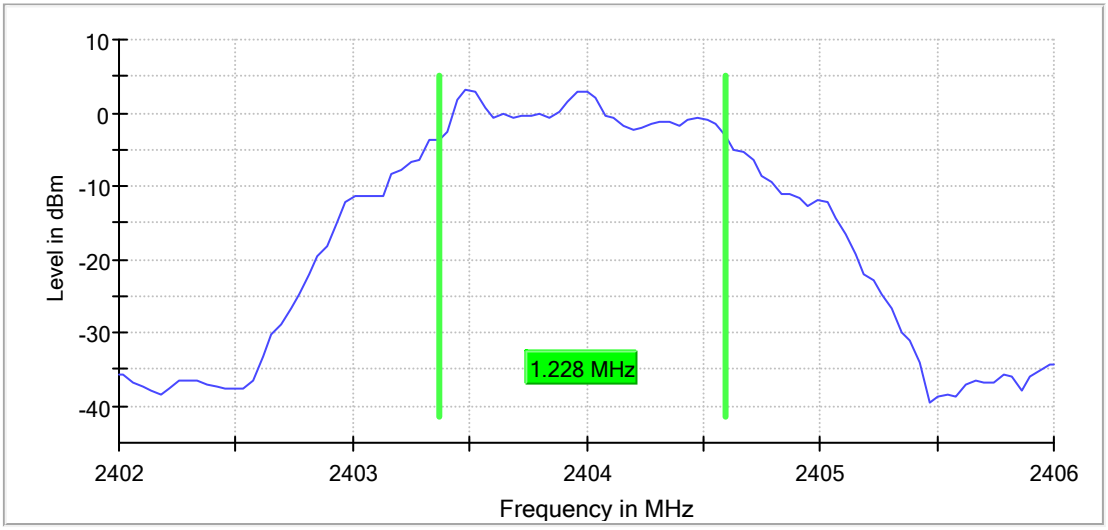
DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2404.000000	1.227722	0.500000	---	2403.366337	2404.594059

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2404.000000	3.1	PASS

RBW=100kHz, VBW=300kHz

6 dB Bandwidth



6 dB Bandwidth

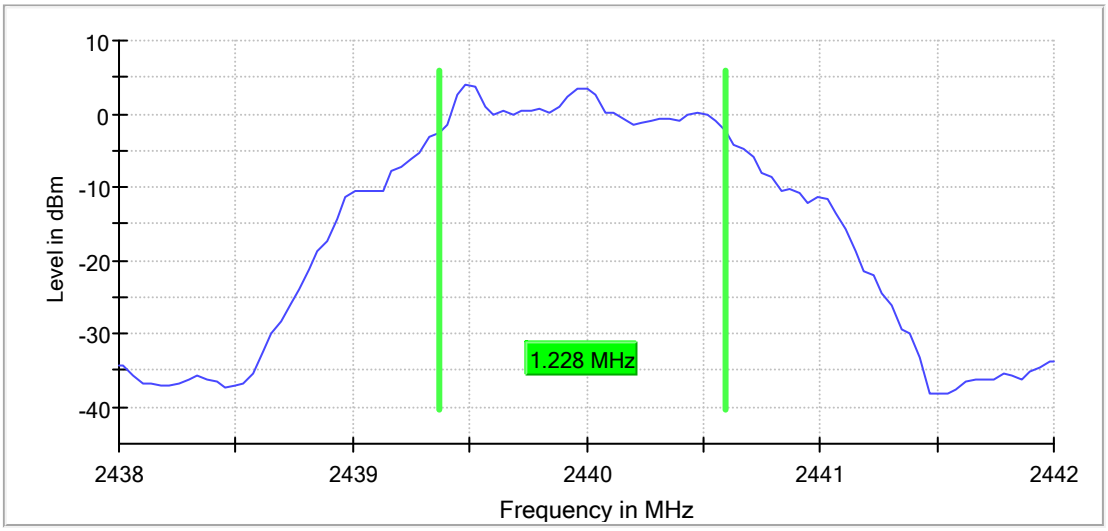
DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2440.000000	1.227722	0.500000	---	2439.366337	2440.594059

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2440.000000	3.9	PASS

RBW=100kHz, VBW=300kHz

6 dB Bandwidth



6 dB Bandwidth

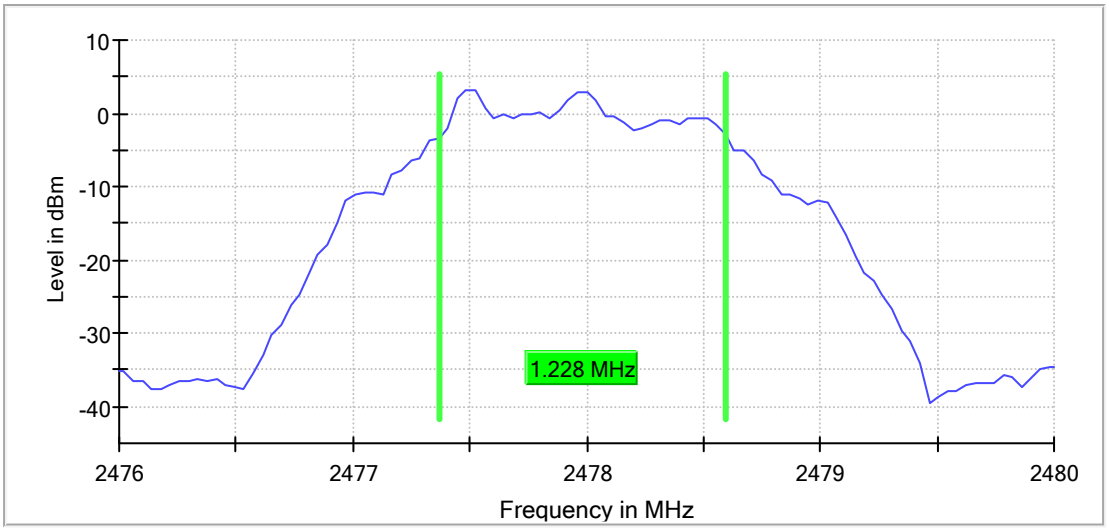
DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2478.000000	1.227722	0.500000	---	2477.366337	2478.594059

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2478.000000	3.3	PASS

RBW=100kHz, VBW=300kHz

6 dB Bandwidth



Appendix B.3: Test Results of 99% Bandwidth

Bluetooth LE Mode, 1Mbps

99 % Bandwidth

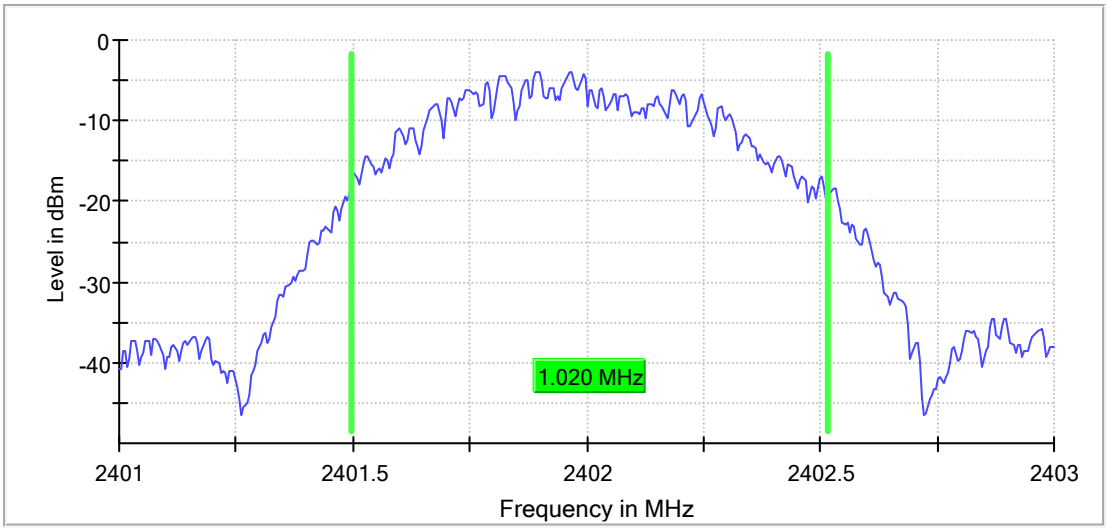
DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2402.000000	1.020000	---	---	2401.497500	2402.517500

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
2402.000000	PASS

RBW=30kHz, VBW=100kHz

99 % Bandwidth



99 % Bandwidth

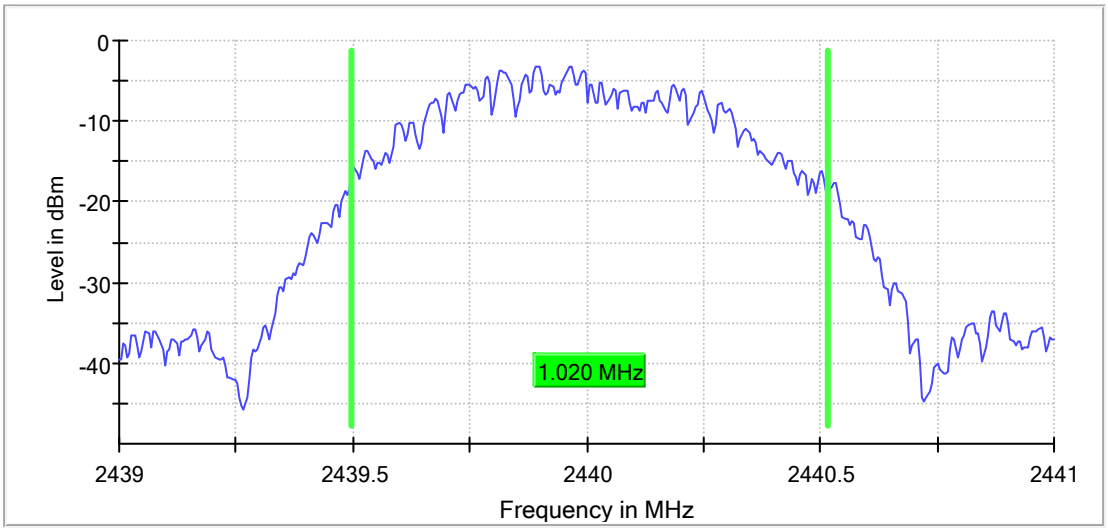
DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2440.000000	1.020000	---	---	2439.497500	2440.517500

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
2440.000000	PASS

RBW=30kHz, VBW=100kHz

99 % Bandwidth



99 % Bandwidth

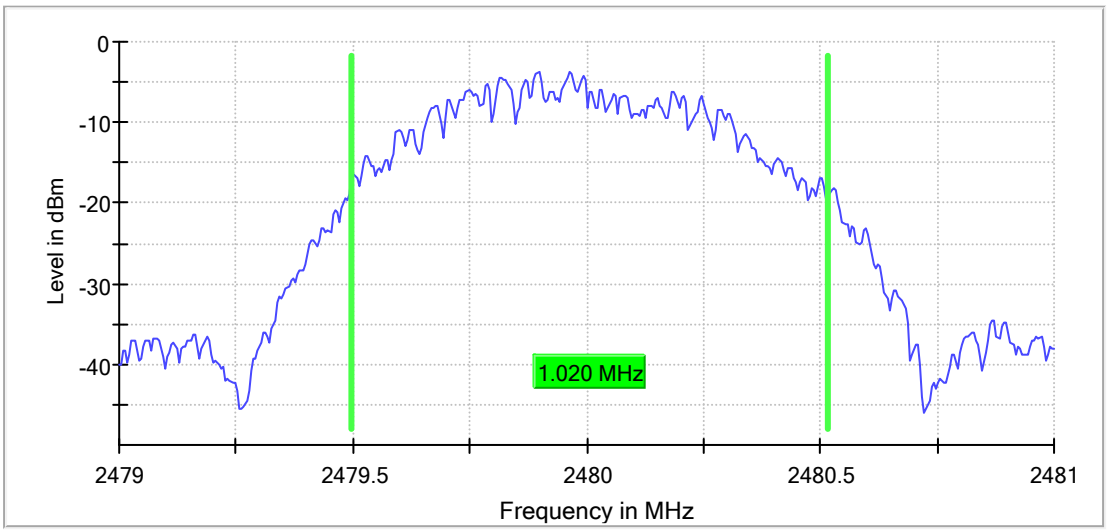
DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2480.000000	1.020000	---	---	2479.497500	2480.517500

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
2480.000000	PASS

RBW=30kHz, VBW=100kHz

99 % Bandwidth



Bluetooth LE Mode, 2Mbps

99 % Bandwidth

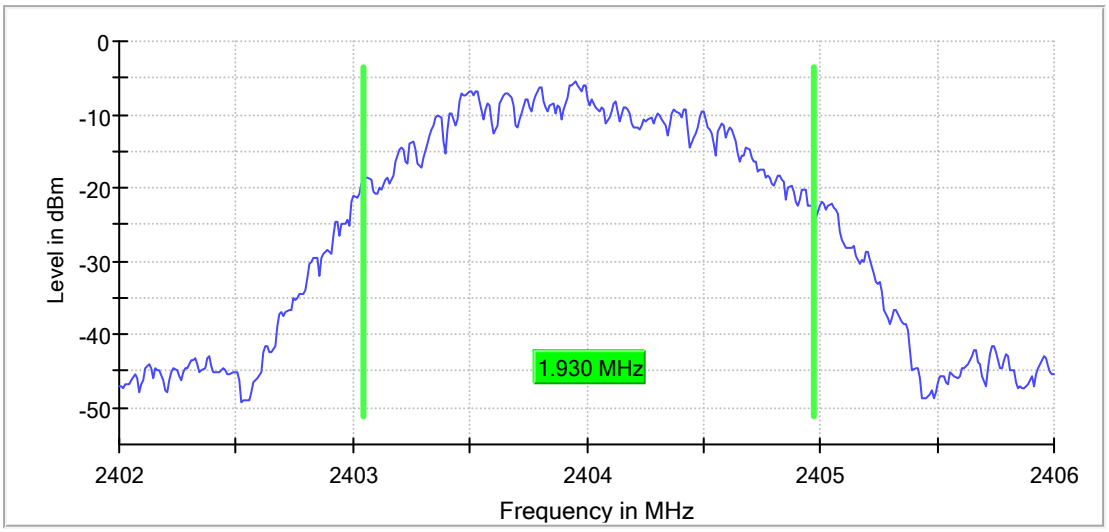
DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2404.000000	1.930000	---	---	2403.045000	2404.975000

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
2404.000000	PASS

RBW=30kHz, VBW=100kHz

99 % Bandwidth



99 % Bandwidth

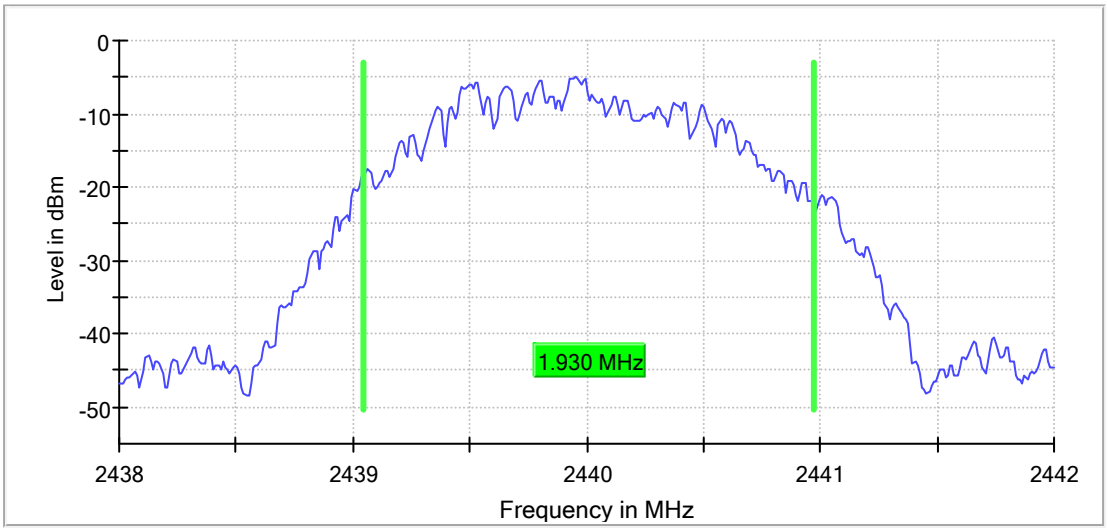
DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2440.000000	1.930000	---	---	2439.045000	2440.975000

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
2440.000000	PASS

RBW=30kHz, VBW=100kHz

99 % Bandwidth



99 % Bandwidth

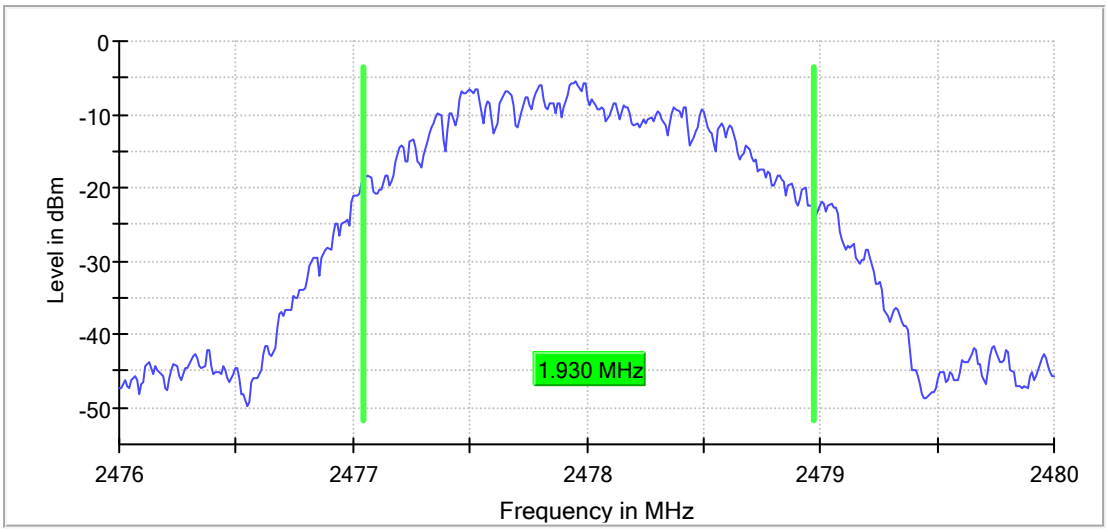
DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2478.000000	1.930000	---	---	2477.045000	2478.975000

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
2478.000000	PASS

RBW=30kHz, VBW=100kHz

99 % Bandwidth



Appendix B.4: Test Results of Frequency stability

Test Channel (MHz)	2402

Test result of frequency tolerance of voltage variation

Voltage	Test result (MHz)	Deviation Frequency (KHz)	Test result (ppm)	Limit (ppm)
DC 3.465V	2401.992	-8	-3.33	10
DC 3.85V	2401.996	-4	-1.67	
DC 4.235V	2401.991	-9	-3.75	

Test result of frequency tolerance of temperature variation

Temperature (℃)	Test result (MHz)	Deviation Frequency (KHz)	Test result (ppm)	Limit (ppm)
-30	2401.986	-14	-5.83	10
-20	2401.985	-15	-6.24	
-10	2401.986	-14	-5.83	
0	2401.989	-11	-4.58	
10	2401.990	-10	-4.16	
20	2401.988	-12	-5.00	
30	2401.988	-12	-5.00	
40	2401.987	-13	-5.41	
50	2401.985	-15	-6.24	
55	2401.983	-17	-7.08	

Test Channel (MHz)	2440

Test result of frequency tolerance of voltage variation

Voltage	Test result (MHz)	Deviation Frequency (KHz)	Test result (ppm)	Limit (ppm)
DC 3.465V	2439.992	-8	-3.28	10
DC 3.85V	2439.995	-5	-2.05	
DC 4.235V	2439.993	-7	-2.87	

Test result of frequency tolerance of temperature variation

Temperature (℃)	Test result (MHz)	Deviation Frequency (KHz)	Test result (ppm)	Limit (ppm)
-30	2439.993	-7	-2.87	10
-20	2439.996	-4	-1.64	
-10	2439.995	-5	-2.05	
0	2439.992	-8	-3.28	
10	2439.993	-7	-2.87	
20	2439.991	-9	-3.69	
30	2439.994	-6	-2.46	
40	2439.996	-4	-1.64	
50	2439.997	-3	-1.23	
55	2439.994	-6	-2.46	

Test Channel (MHz)	2480

Test result of frequency tolerance of voltage variation

Voltage	Test result (MHz)	Deviation Frequency (KHz)	Test result (ppm)	Limit (ppm)
DC 3.465V	2479.997	-3	-1.21	10
DC 3.85V	2479.995	-5	-2.02	
DC 4.235V	2479.996	-4	-1.61	

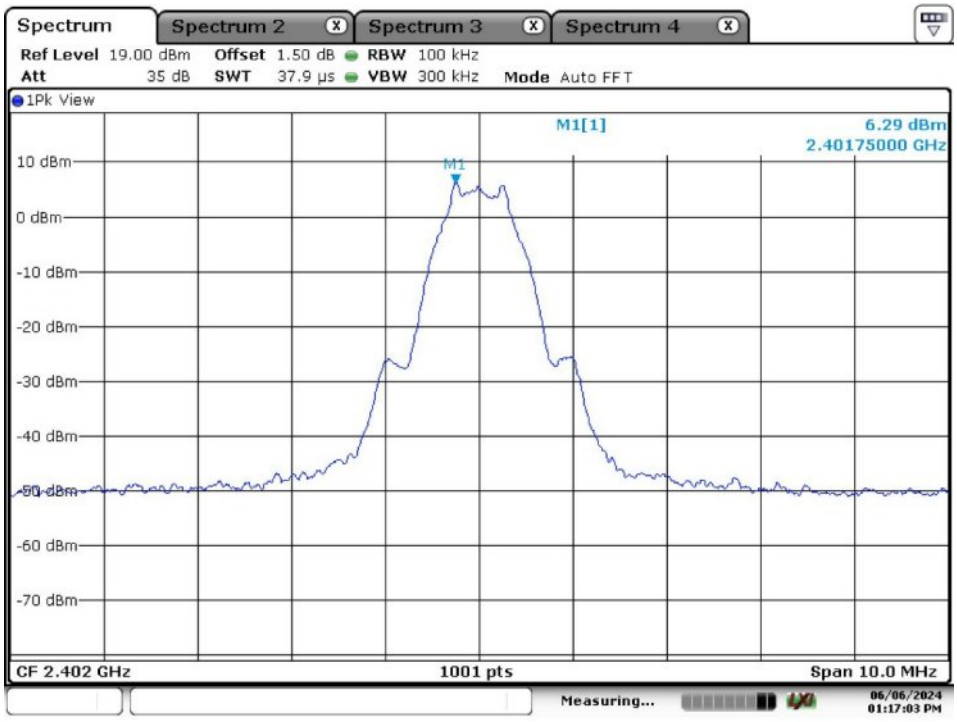
Test result of frequency tolerance of temperature variation

Temperature (℃)	Test result (MHz)	Deviation Frequency (KHz)	Test result (ppm)	Limit (ppm)
-30	2479.995	-5	-2.02	10
-20	2479.995	-5	-2.02	
-10	2479.993	-7	-2.82	
0	2479.994	-6	-2.42	
10	2479.993	-7	-2.82	
20	2479.995	-5	-2.02	
30	2479.996	-4	-1.61	
40	2479.996	-4	-1.61	
50	2479.993	-7	-2.82	
55	2479.995	-5	-2.02	

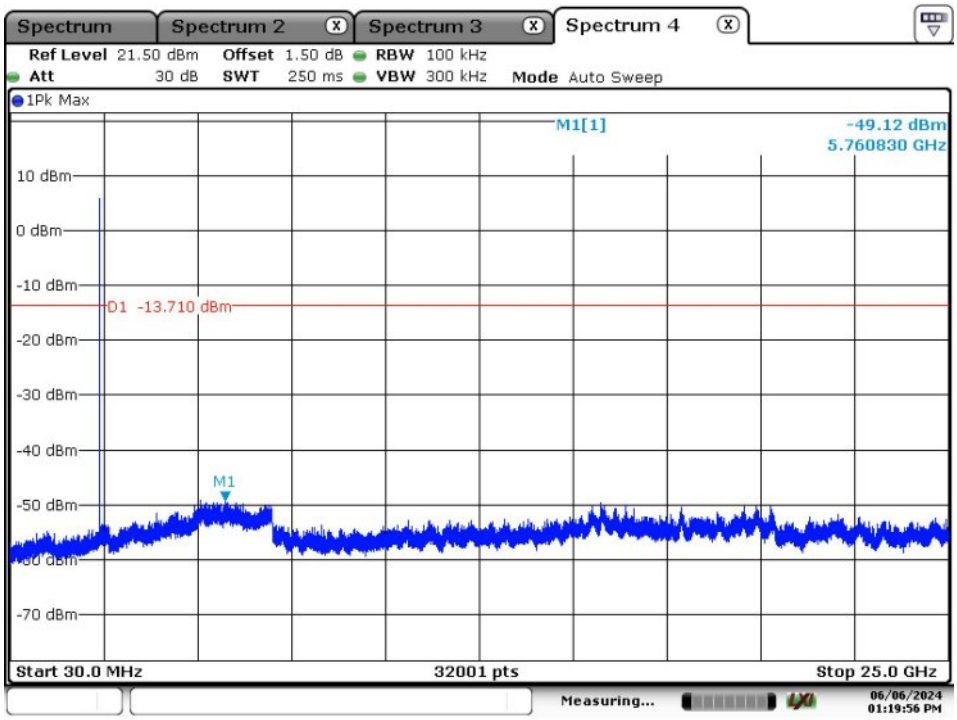
Appendix B.5: Test Results of Conducted Spurious Emissions Measured in 100 kHz Bandwidth

Bluetooth LE Mode, 1Mbps

Low Channel:

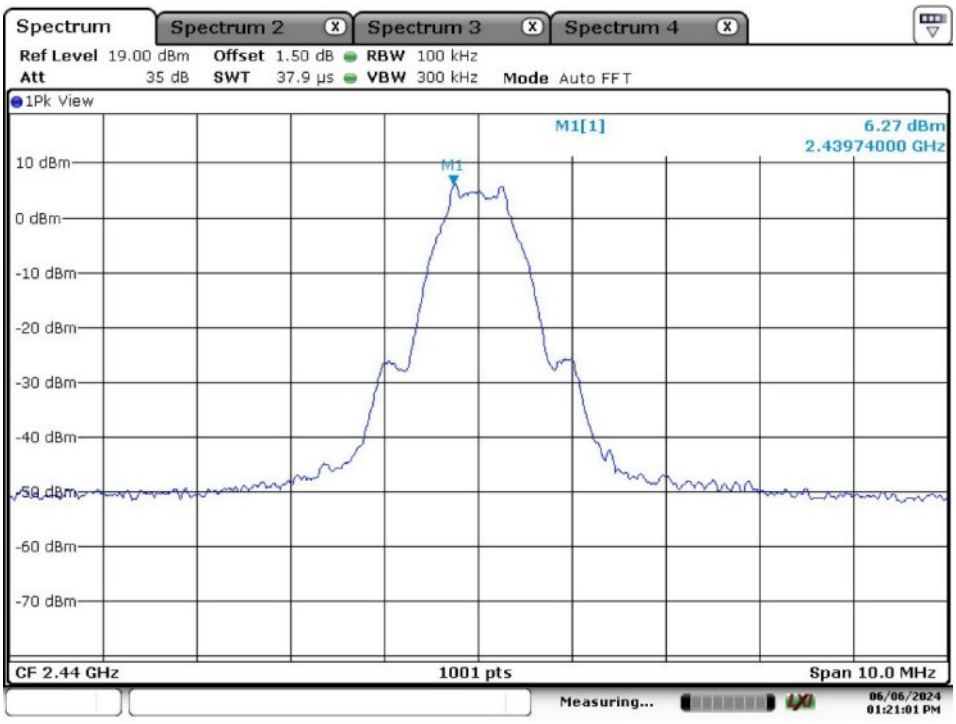


Date: 6.JUN.2024 13:17:03

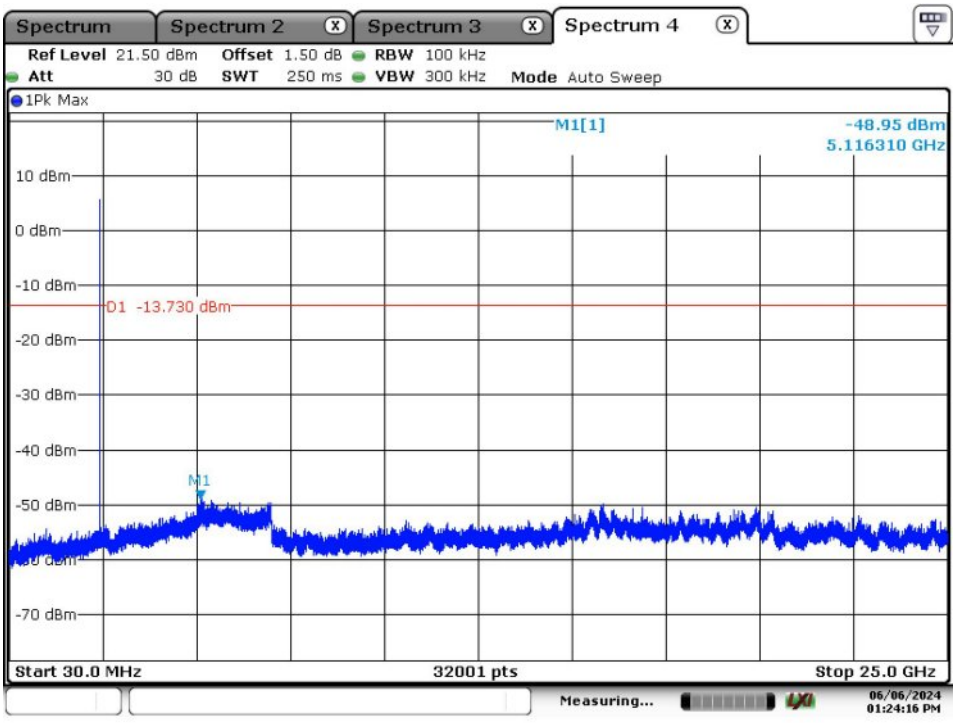


Date: 6.JUN.2024 13:19:56

Middle Channel:

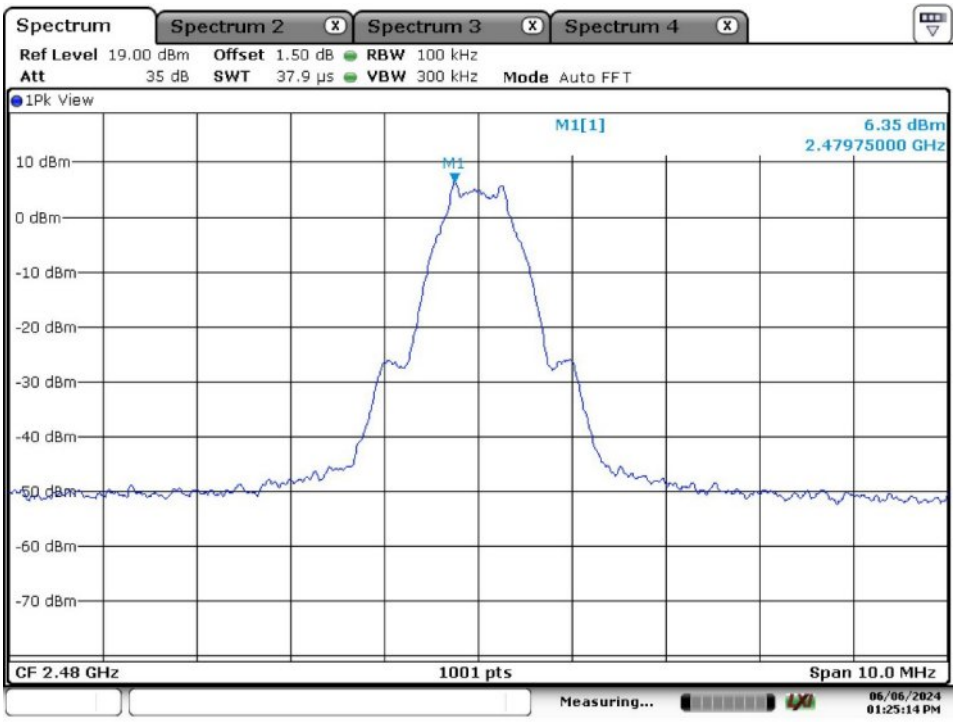


Date: 6.JUN.2024 13:21:01

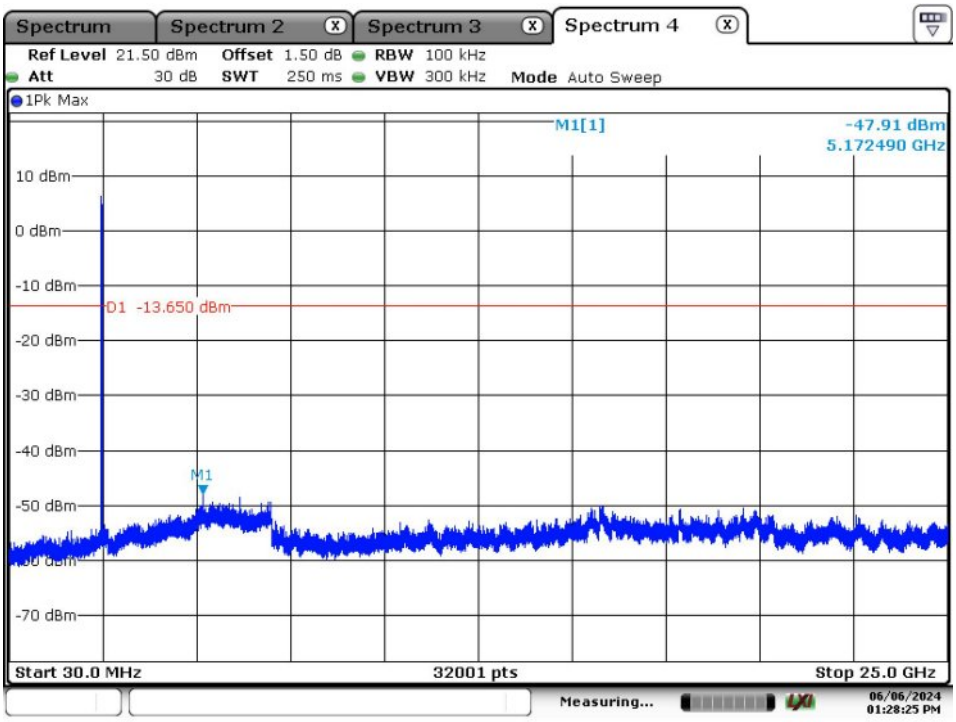


Date: 6.JUN.2024 13:24:17

High Channel:

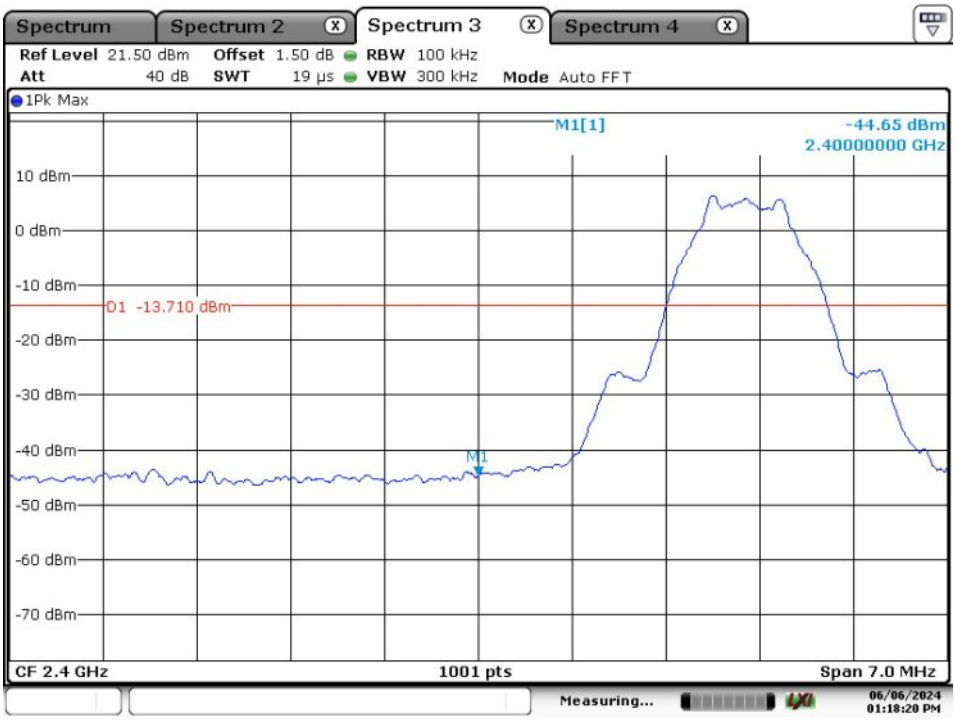


Date: 6.JUN.2024 13:25:14



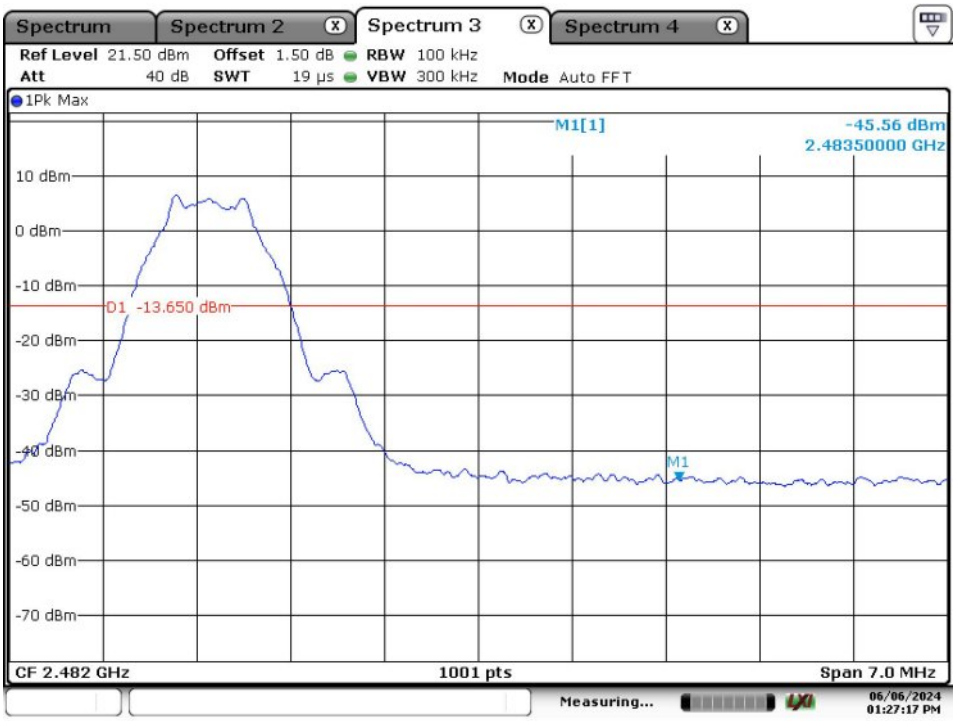
Date: 6.JUN.2024 13:28:25

Band Edge, Low Channel:



Date: 6.JUN.2024 13:18:20

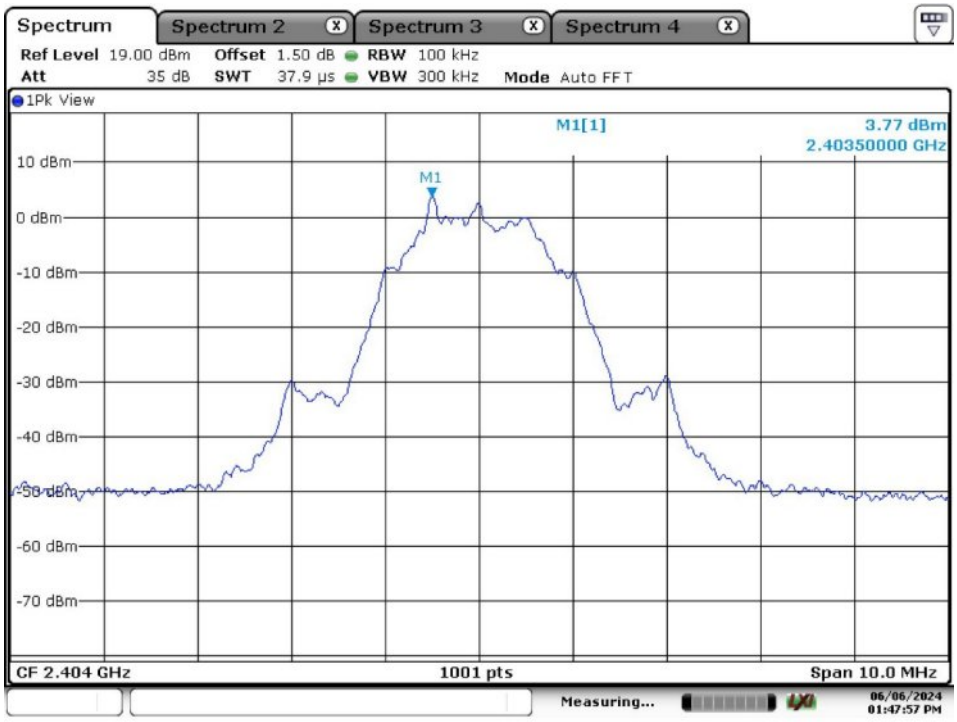
Band Edge, High Channel:



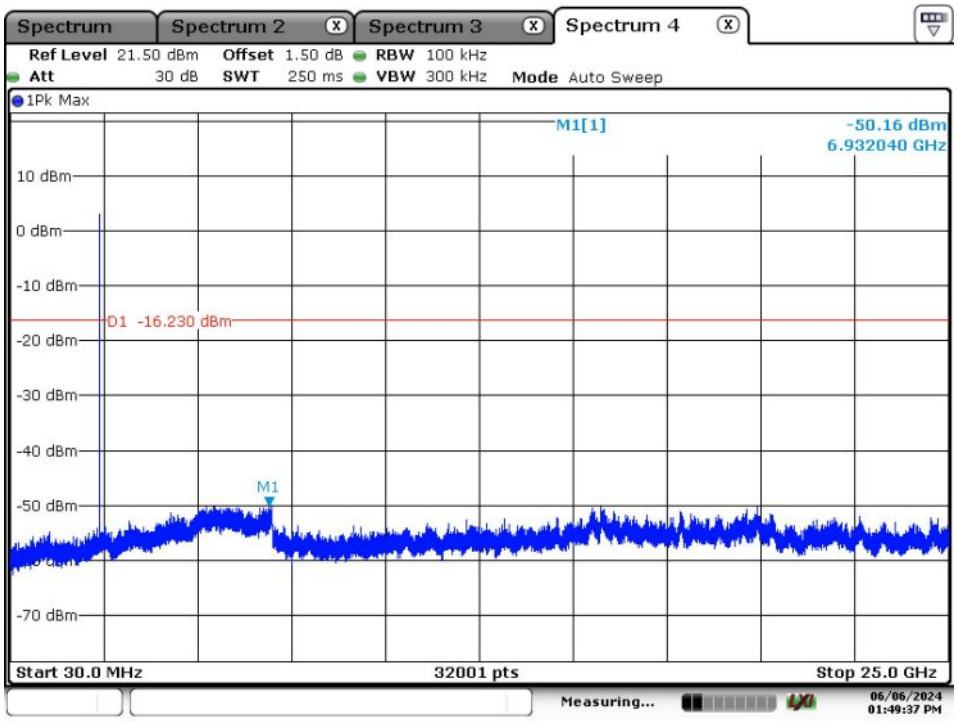
Date: 6.JUN.2024 13:27:17

Bluetooth LE Mode, 2Mbps

Low Channel:

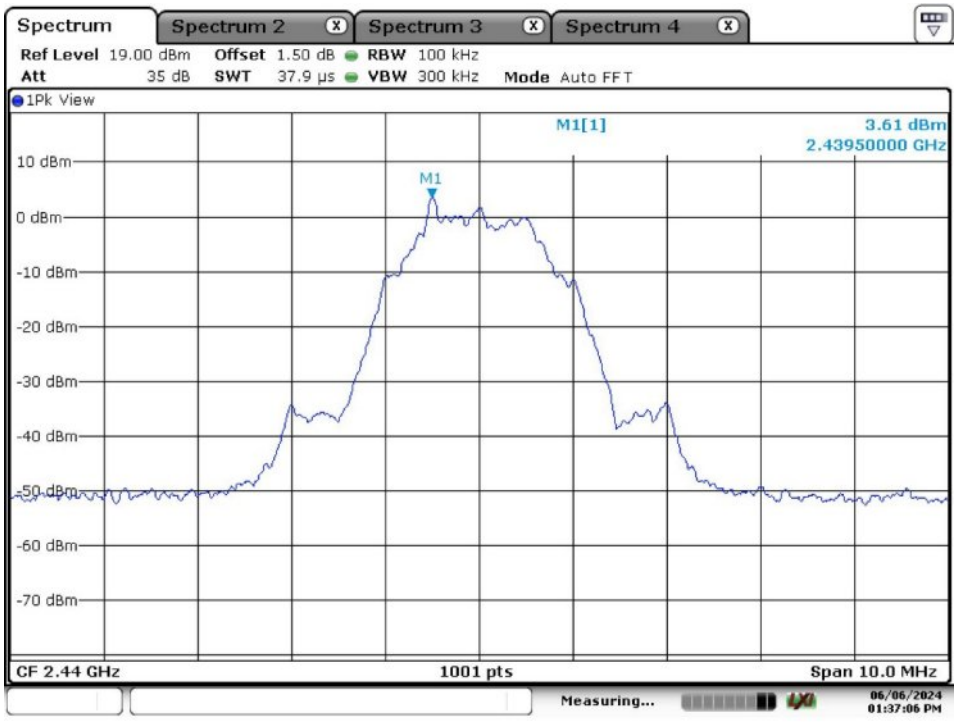


Date: 6.JUN.2024 13:47:58

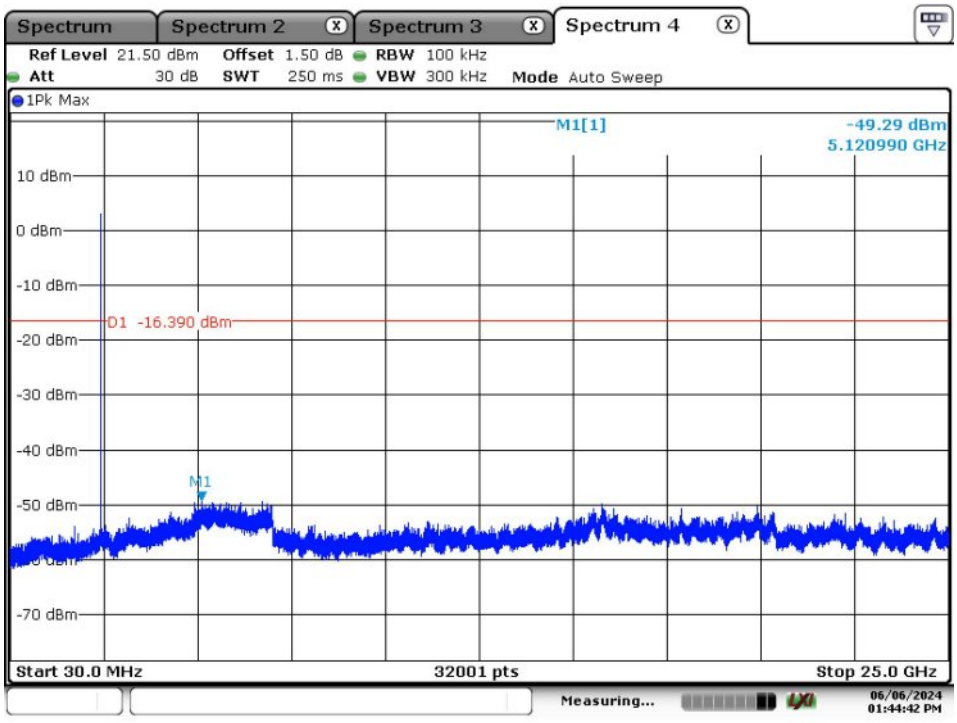


Date: 6.JUN.2024 13:49:37

Middle Channel:

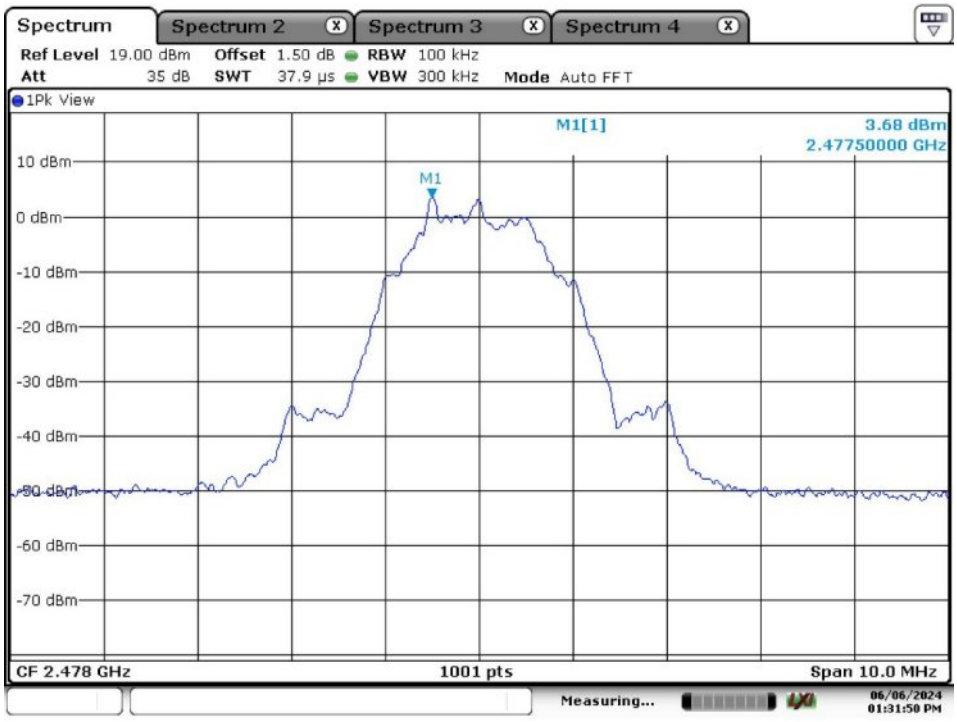


Date: 6.JUN.2024 13:37:06

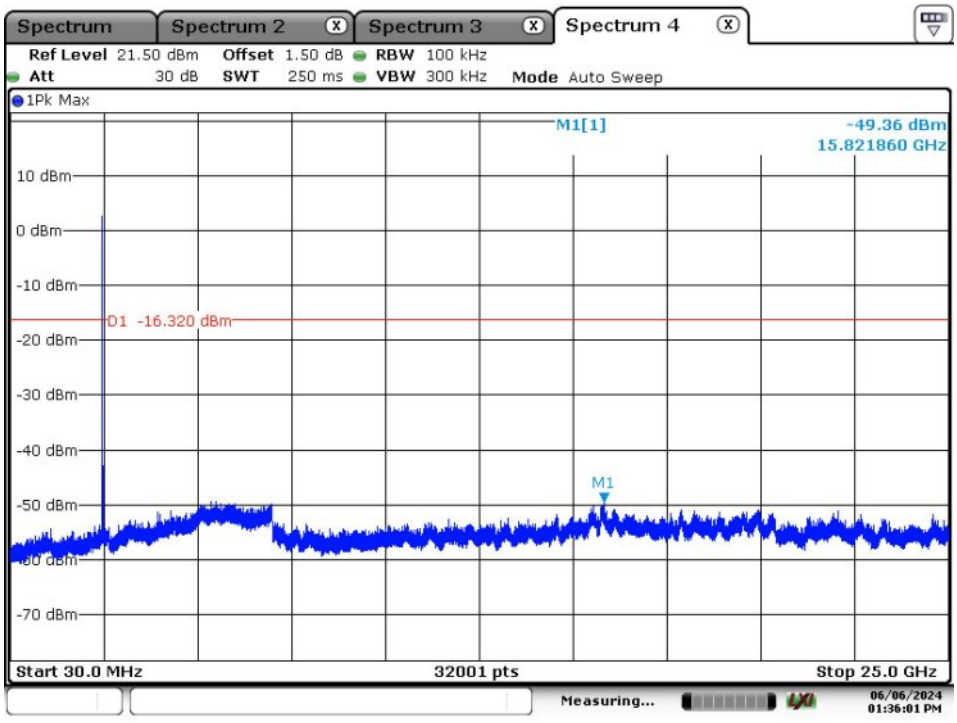


Date: 6.JUN.2024 13:44:42

High Channel:

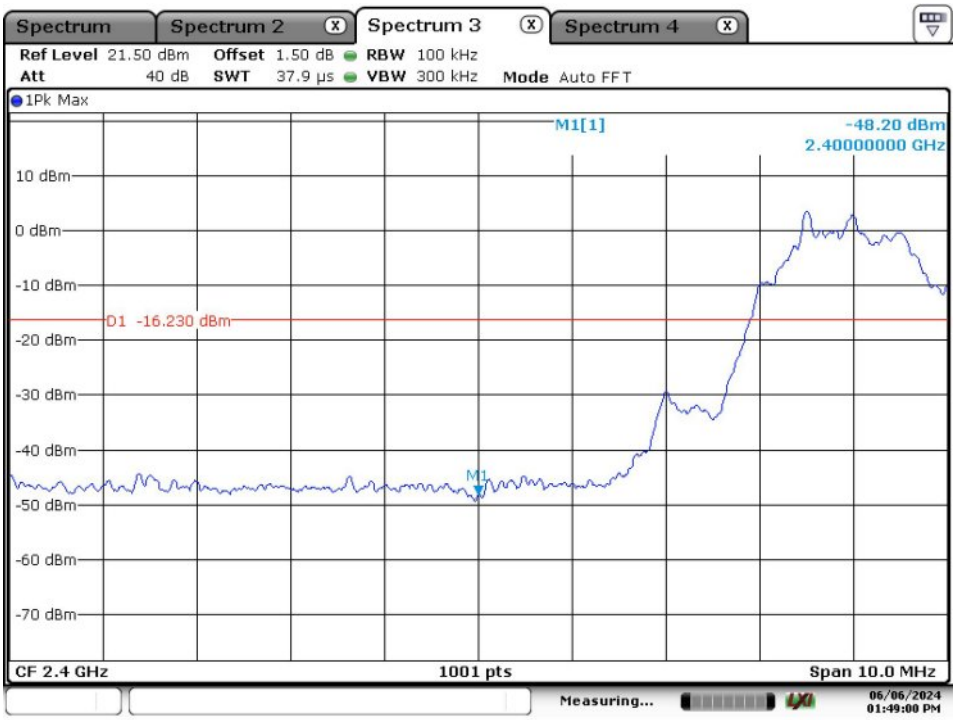


Date: 6.JUN.2024 13:31:51



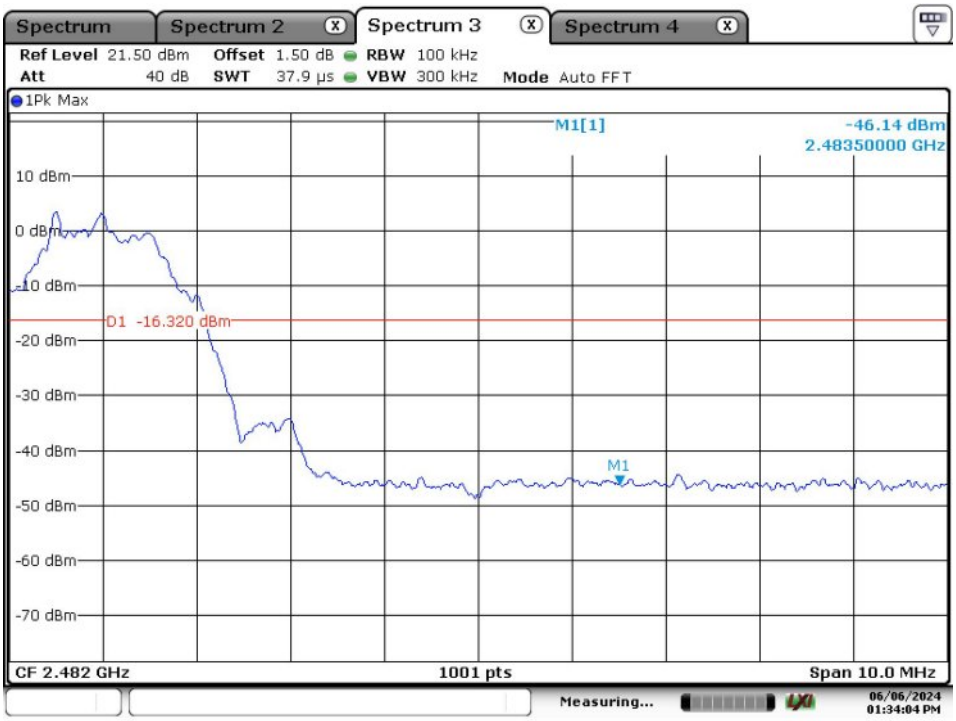
Date: 6.JUN.2024 13:36:01

Band Edge, Low Channel:



Date: 6.JUN.2024 13:49:00

Band Edge, High Channel:



Date: 6.JUN.2024 13:34:04

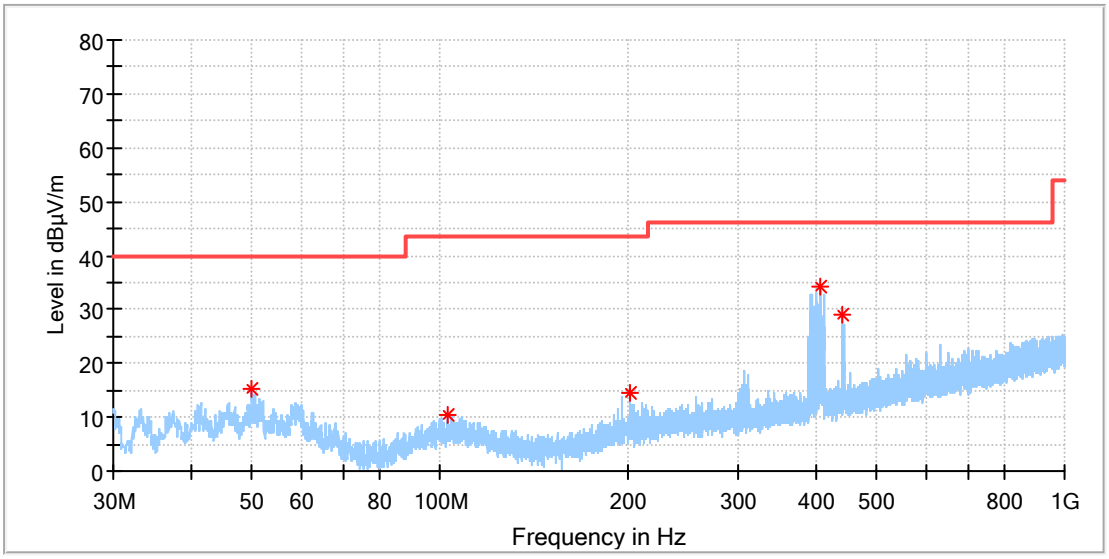
Appendix B.6: Test Results of Radiated Spurious Emissions

Note:
1) This testing was carried out on different modulations, but only the worst case was presented in this report.
2) Testing was carried out within frequency range 9kHz to the tenth harmonics. The measurement results below 30MHz and 18GHz - 26.5GHz were greater than 20dB below the limit, so only the radiated spurious emissions from 30MHz to 18GHz were reported.

30 MHz - 1GHz

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	A003731935-035
Test Voltage::	Battery
Remark:	Temp 24 Humi:50%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

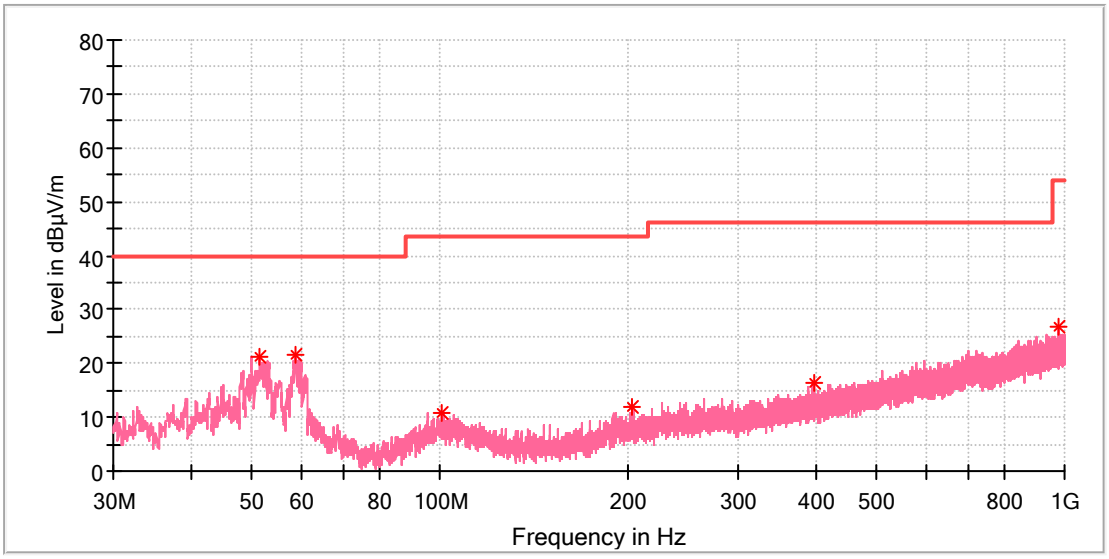


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
49.996923	15.33	40.00	24.67	100.0	H	258.0	-18.6
103.123077	10.52	43.50	32.98	100.0	H	298.0	-19.2
201.205000	14.44	43.50	29.06	100.0	H	119.0	-19.3
406.807692	34.31	46.00	11.69	100.0	H	152.0	-14.0
440.832308	28.98	46.00	17.02	100.0	H	307.0	-13.4

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	A003731935-035
Test Voltage::	Battery
Remark:	Temp 24 Humi:50%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



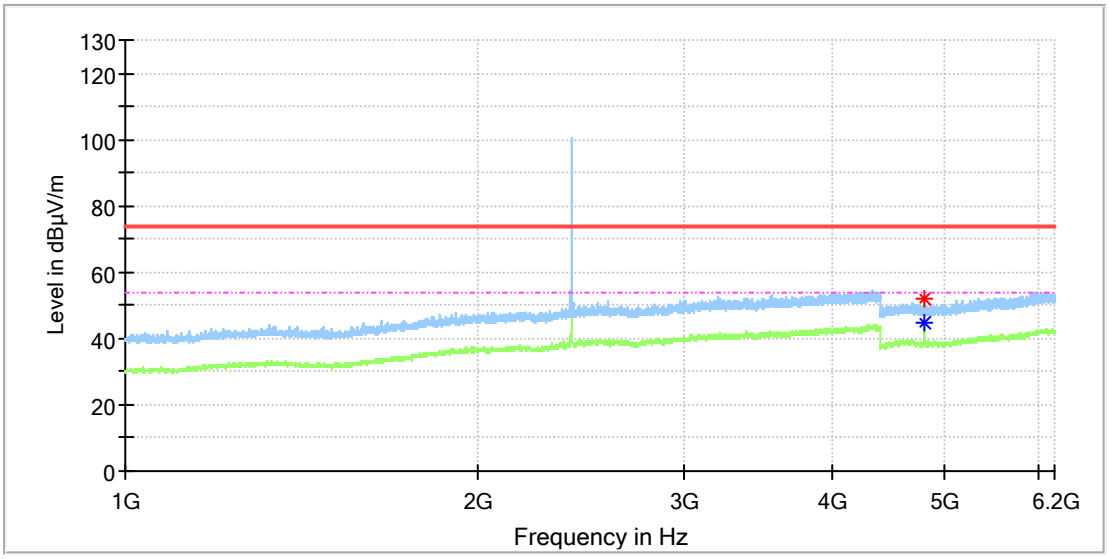
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
51.489231	21.20	40.00	18.80	100.0	V	146.0	-18.6
58.801539	21.66	40.00	18.34	100.0	V	336.0	-19.2
100.996539	10.95	43.50	32.55	100.0	V	328.0	-19.3
202.361539	12.06	43.50	31.44	100.0	V	180.0	-19.3
396.548077	16.38	46.00	29.62	100.0	V	0.0	-14.2
979.182308	26.70	54.00	27.30	100.0	V	236.0	-4.4

1GHz - 18GHz
Note: The highest waveform in the figure is Bluetooth Fundamental.

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 1M_Low channel
Order No/Sample No:	A003731935-035
Test Voltage::	Battery
Remark:	Temp 22 Humi:52%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

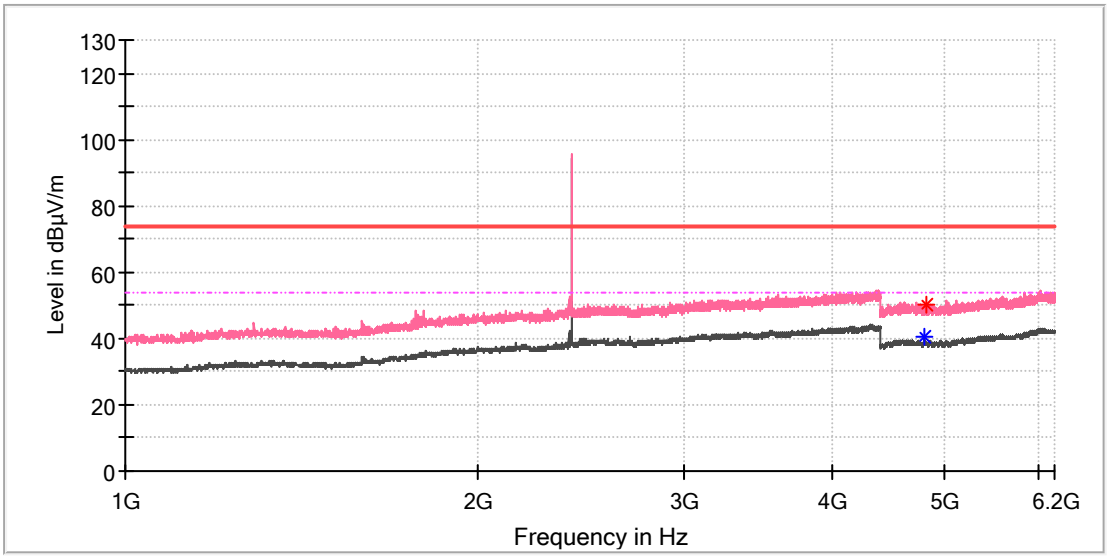


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4803.500000	51.78	---	74.00	22.22	150.0	H	172.0	11.8
4804.000000	---	44.57	54.00	9.43	150.0	H	172.0	11.8

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 1M_Low channel
Order No/Sample No:	A003731935-035
Test Voltage::	Battery
Remark:	Temp 22 Humi:52%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

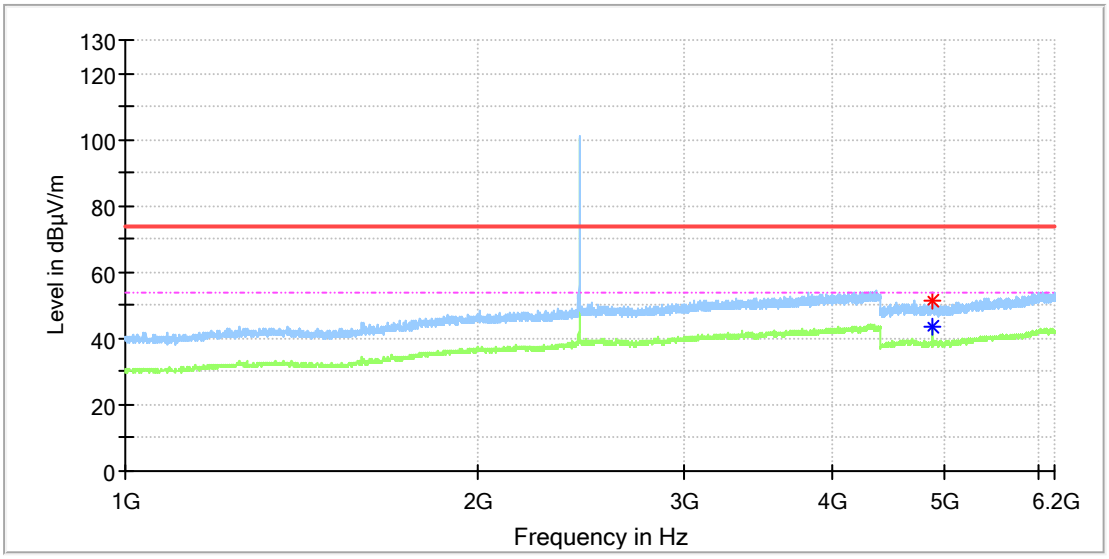


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4804.000000	---	40.36	54.00	13.64	150.0	V	227.0	11.8
4819.500000	50.30	---	74.00	23.70	150.0	V	358.0	11.8

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	A003731935-035
Test Voltage::	Battery
Remark:	Temp 22 Humi:52%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

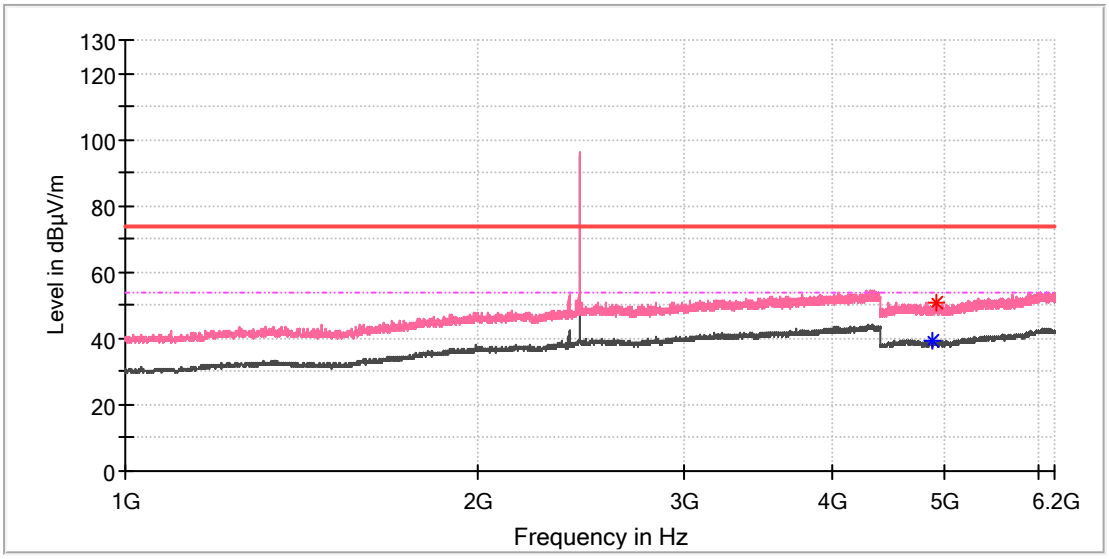


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4879.500000	51.55	---	74.00	22.45	150.0	H	172.0	11.8
4879.500000	---	43.31	54.00	10.69	150.0	H	172.0	11.8

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	A003731935-035
Test Voltage::	Battery
Remark:	Temp 22 Humi:52%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

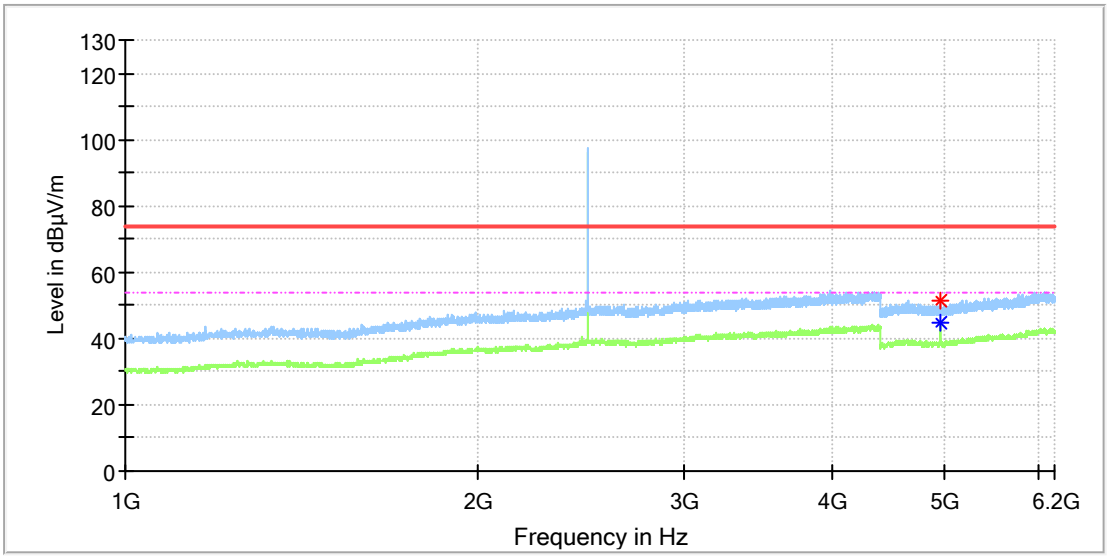


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4879.500000	---	39.53	54.00	14.47	150.0	V	235.0	11.8
4918.500000	50.64	---	74.00	23.36	150.0	V	266.0	11.8

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 1M_High channel
Order No/Sample No:	A003731935-035
Test Voltage::	Battery
Remark:	Temp 22 Humi:52%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

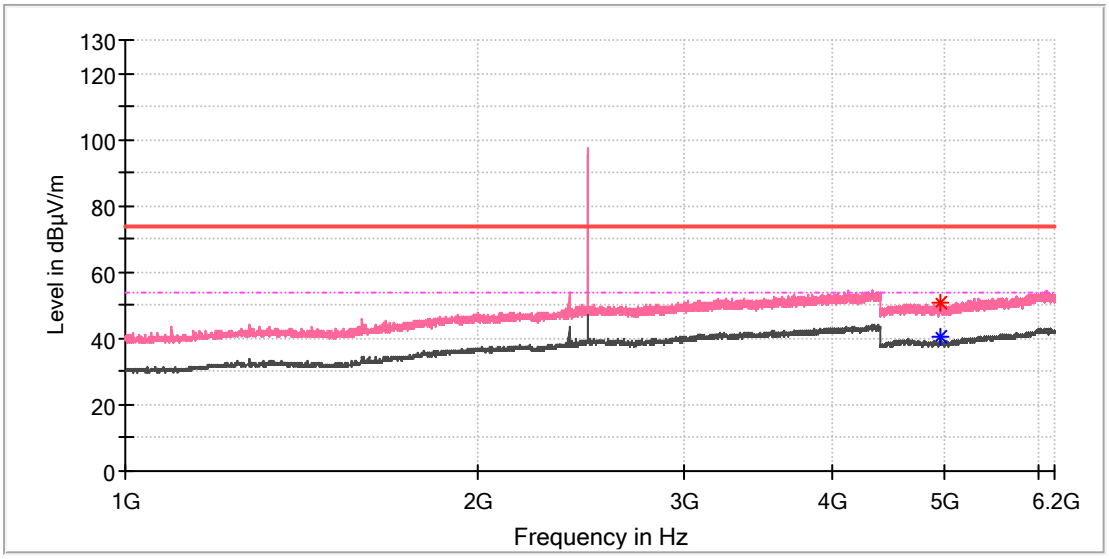


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4959.000000	51.34	---	74.00	22.66	150.0	H	227.0	11.8
4960.000000	---	44.57	54.00	9.43	150.0	H	173.0	11.8

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 1M_High channel
Order No/Sample No:	A003731935-035
Test Voltage::	Battery
Remark:	Temp 22 Humi:52%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

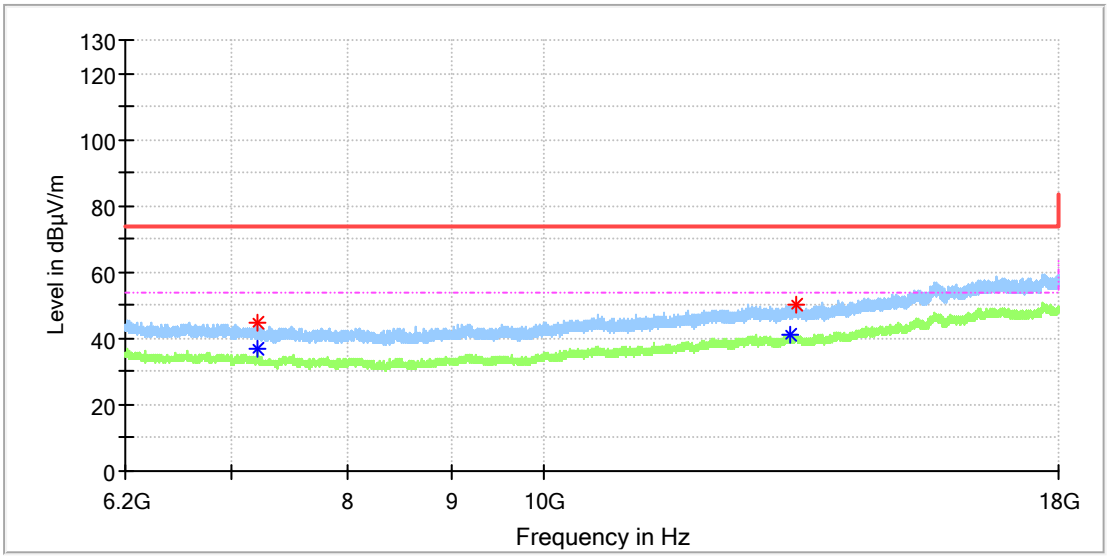


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4953.500000	50.54	---	74.00	23.46	150.0	V	340.0	11.8
4959.500000	---	40.71	54.00	13.29	150.0	V	226.0	11.8

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 1M_Low channel
Order No/Sample No:	A003731935-035
Test Voltage::	Battery
Remark:	Temp 22 Humi:52%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

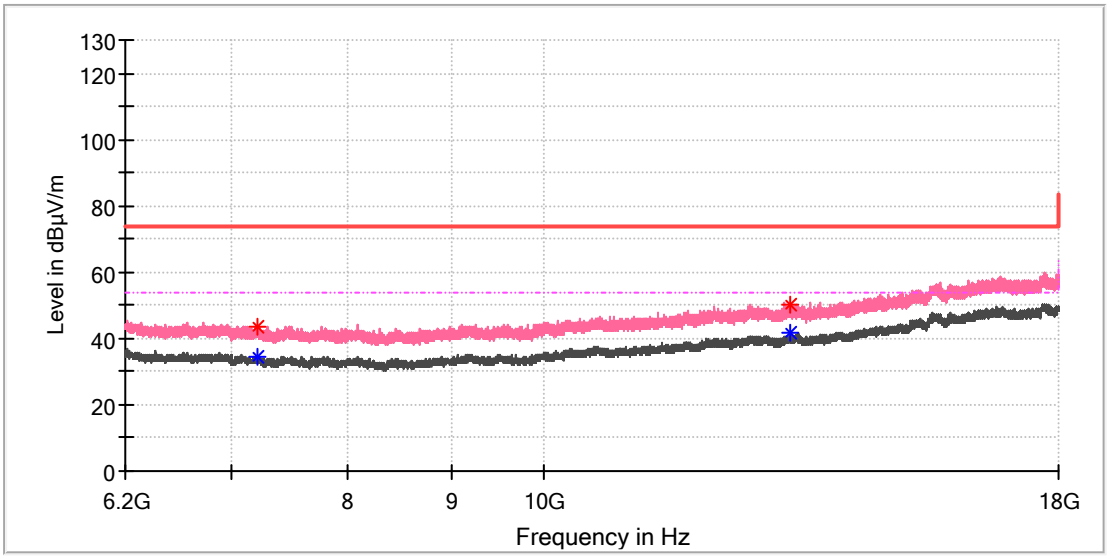


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7205.458333	---	36.88	54.00	17.12	150.0	H	2.0	8.8
7206.441667	44.79	---	74.00	29.21	150.0	H	2.0	8.8
13253.941667	---	40.88	54.00	13.12	150.0	H	11.0	15.5
13347.358333	50.38	---	74.00	23.62	150.0	H	119.0	15.5

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 1M_Low channel
Order No/Sample No:	A003731935-035
Test Voltage::	Battery
Remark:	Temp 22 Humi:52%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

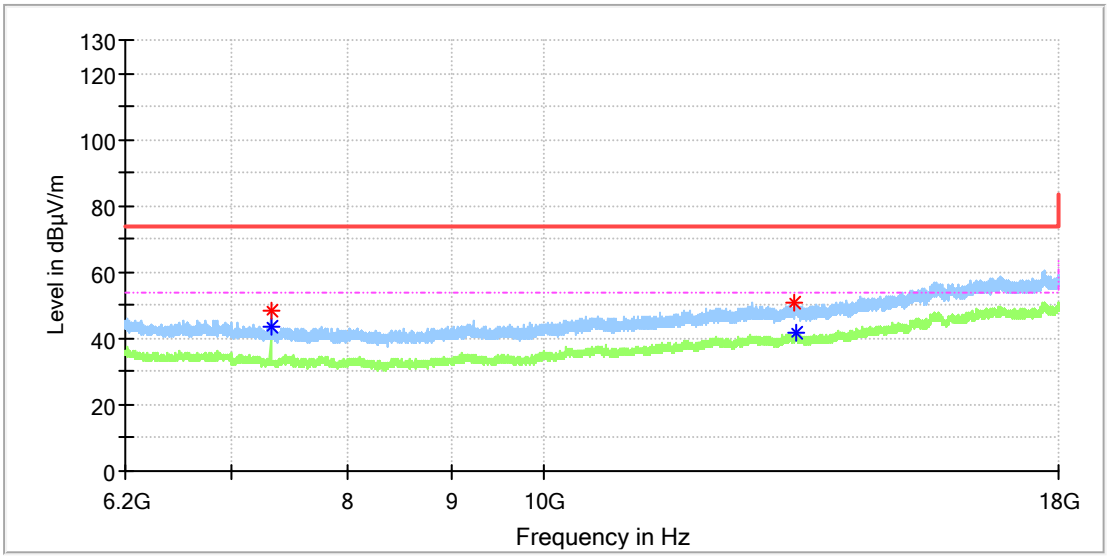


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7206.933333	---	34.47	54.00	19.53	150.0	V	275.0	8.8
7213.325000	43.82	---	74.00	30.18	150.0	V	322.0	8.7
13235.750000	---	41.74	54.00	12.26	150.0	V	358.0	15.5
13242.633333	50.38	---	74.00	23.62	150.0	V	298.0	15.5

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	A003731935-035
Test Voltage::	Battery
Remark:	Temp 24 Humi:50%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

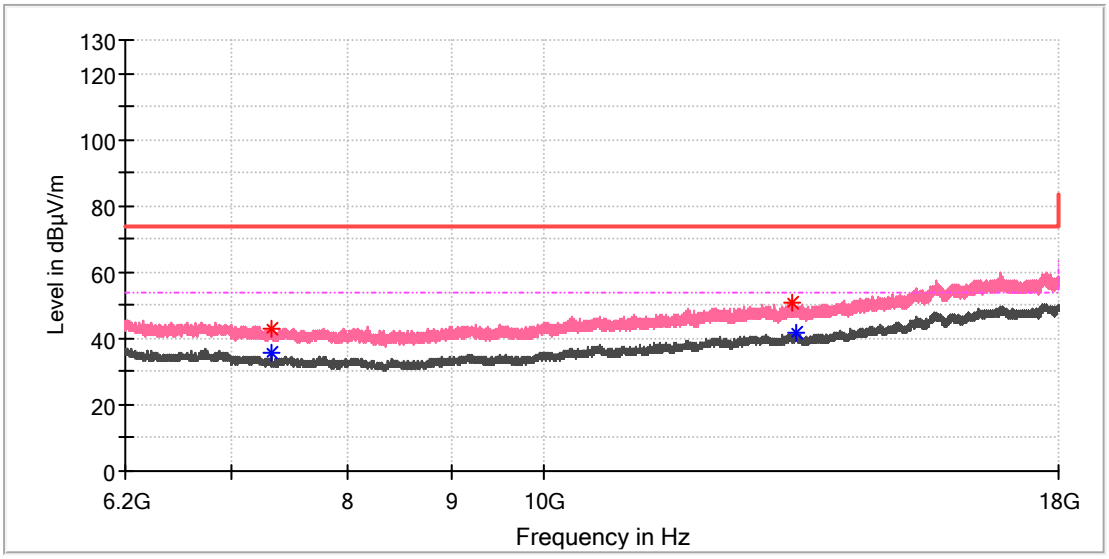


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7319.033333	48.53	---	74.00	25.47	150.0	H	118.0	8.2
7320.016667	---	43.56	54.00	10.44	150.0	H	11.0	8.2
13306.058333	50.80	---	74.00	23.20	150.0	H	118.0	15.5
13335.066667	---	41.48	54.00	12.52	150.0	H	200.0	15.5

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	A003731935-035
Test Voltage::	Battery
Remark:	Temp 24 Humi:50%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

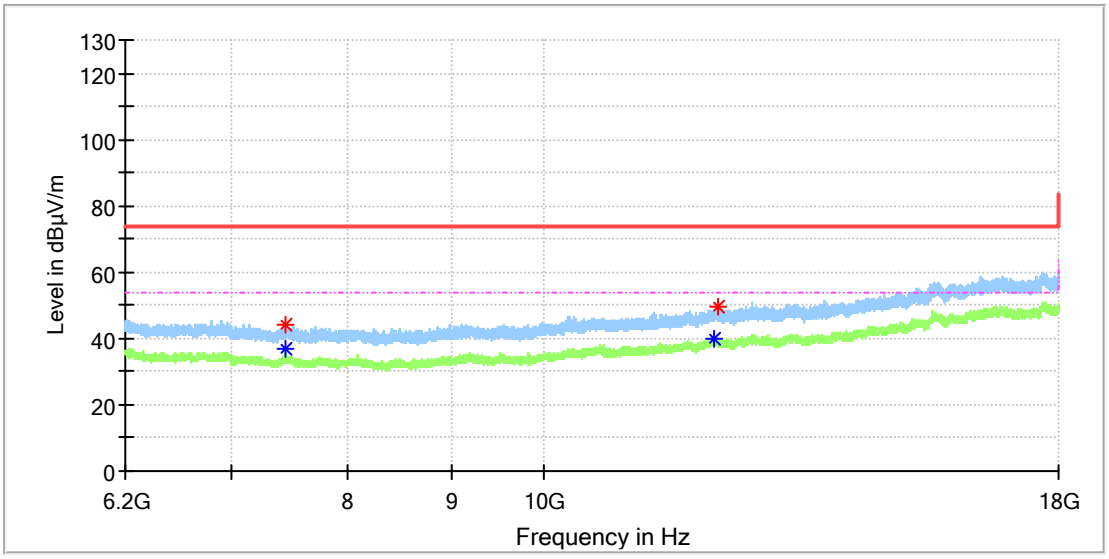


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7319.033333	---	35.89	54.00	18.12	150.0	V	270.0	8.2
7321.000000	43.14	---	74.00	30.86	150.0	V	172.0	8.2
13272.625000	50.56	---	74.00	23.44	150.0	V	270.0	15.5
13353.750000	---	41.76	54.00	12.24	150.0	V	295.0	15.5

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 1M_High channel
Order No/Sample No:	A003731935-035
Test Voltage::	Battery
Remark:	Temp 24 Humi:50%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

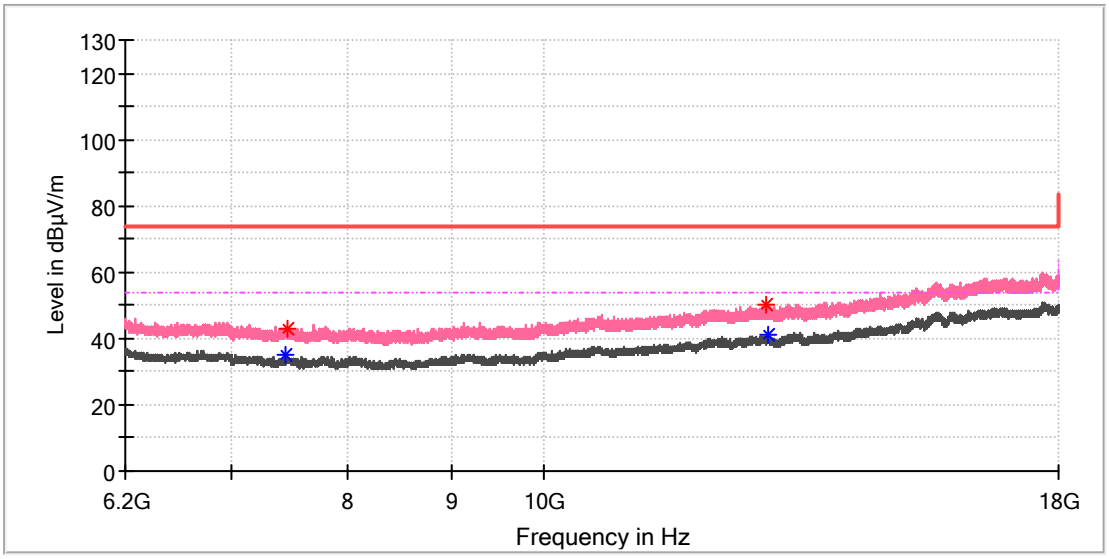


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7439.491667	---	36.61	54.00	17.39	150.0	H	74.0	8.4
7440.475000	44.20	---	74.00	29.80	150.0	H	0.0	8.4
12153.591667	---	39.94	54.00	14.06	150.0	H	271.0	14.4
12203.250000	49.59	---	74.00	24.41	150.0	H	307.0	14.7

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 1M_High channel
Order No/Sample No:	A003731935-035
Test Voltage::	Battery
Remark:	Temp 24 Humi:50%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



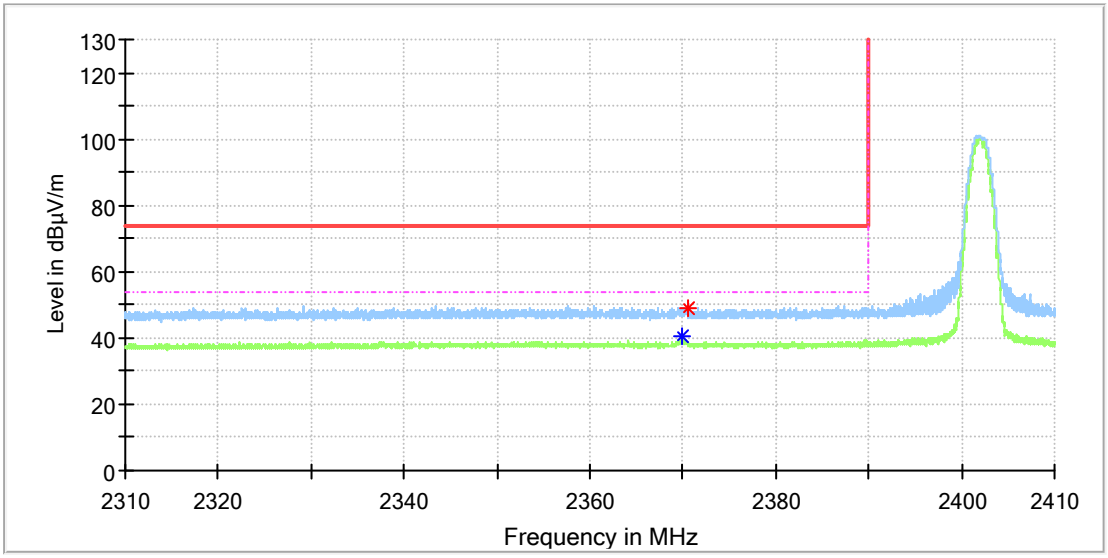
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7439.000000	---	34.92	54.00	19.08	150.0	V	108.0	8.4
7458.666667	43.03	---	74.00	30.97	150.0	V	143.0	8.5
12881.258333	50.04	---	74.00	23.96	150.0	V	190.0	15.4
12915.183333	---	41.18	54.00	12.82	150.0	V	263.0	15.5

Appendix B.7: Test Results of Radiated Emissions in Restricted Bands

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 1M_Low channel
Order No/Sample No:	A003731935-035
Test Voltage::	Battery
Remark:	Temp 22 Humi:52%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

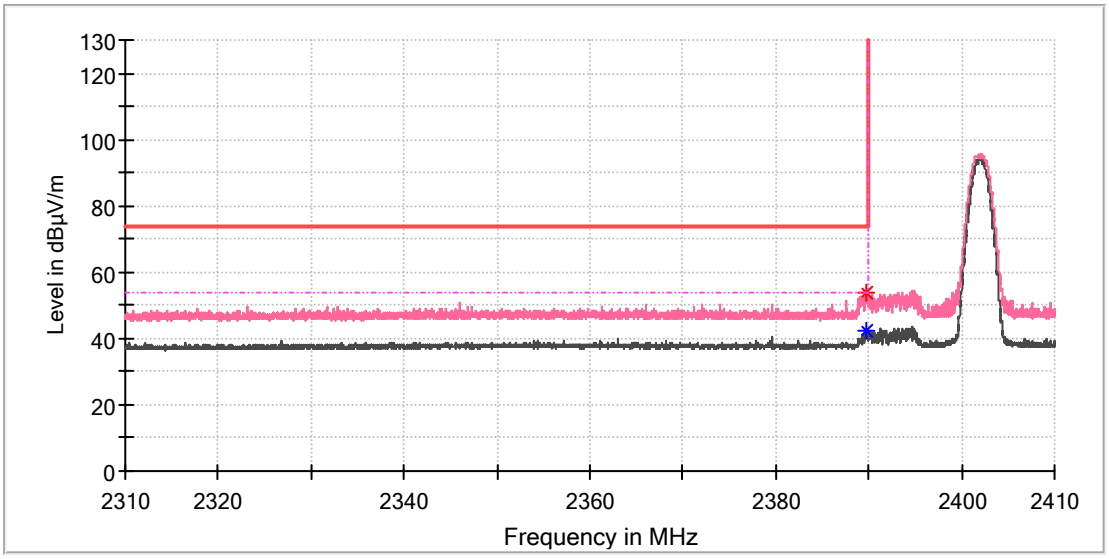


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2369.852941	---	40.26	54.00	13.74	150.0	H	303.0	6.9
2370.647059	48.96	---	74.00	25.04	150.0	H	357.0	6.9

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 1M_Low channel
Order No/Sample No:	A003731935-035
Test Voltage::	Battery
Remark:	Temp 22 Humi:52%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

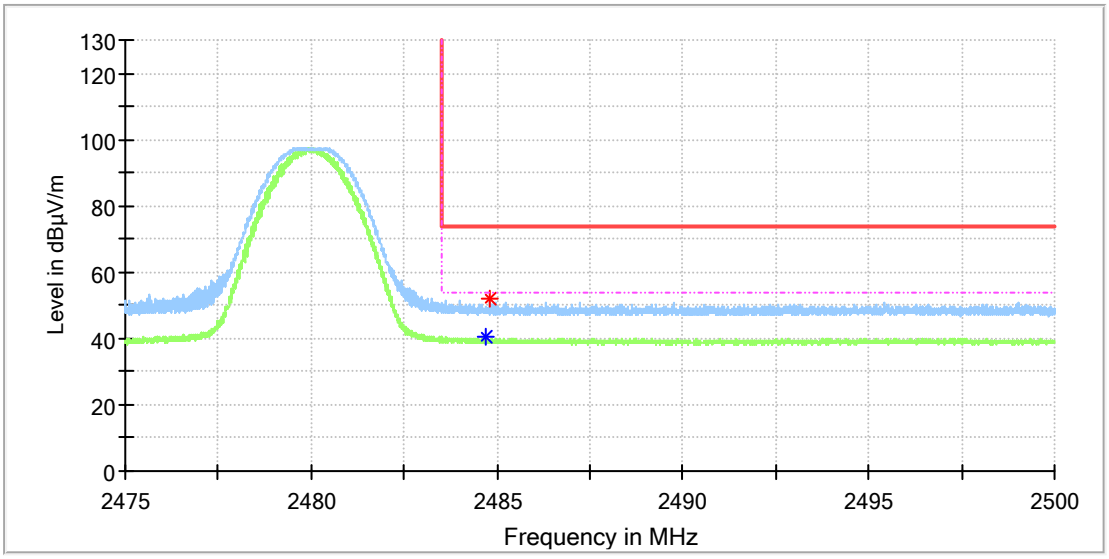


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2389.808824	---	42.46	54.00	11.54	150.0	V	260.0	7.0
2389.838235	53.51	---	74.00	20.49	150.0	V	267.0	7.0

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 1M_High channel
Order No/Sample No:	A003731935-035
Test Voltage::	Battery
Remark:	Temp 22 Humi:52%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

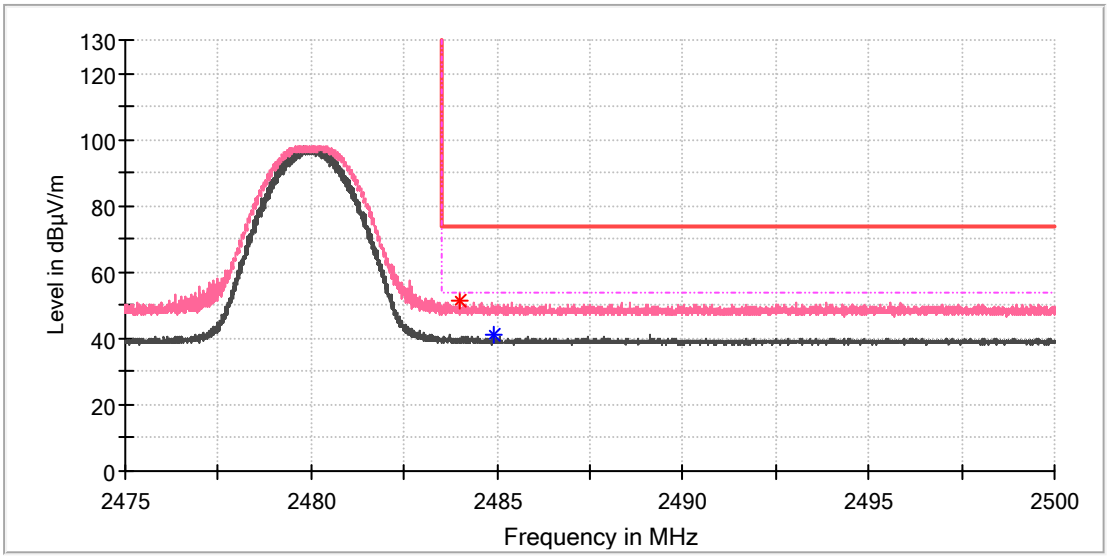


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2484.691177	---	40.37	54.00	13.63	150.0	H	328.0	7.4
2484.827206	51.87	---	74.00	22.13	150.0	H	314.0	7.4

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 1M_High channel
Order No/Sample No:	A003731935-035
Test Voltage::	Battery
Remark:	Temp 22 Humi:52%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

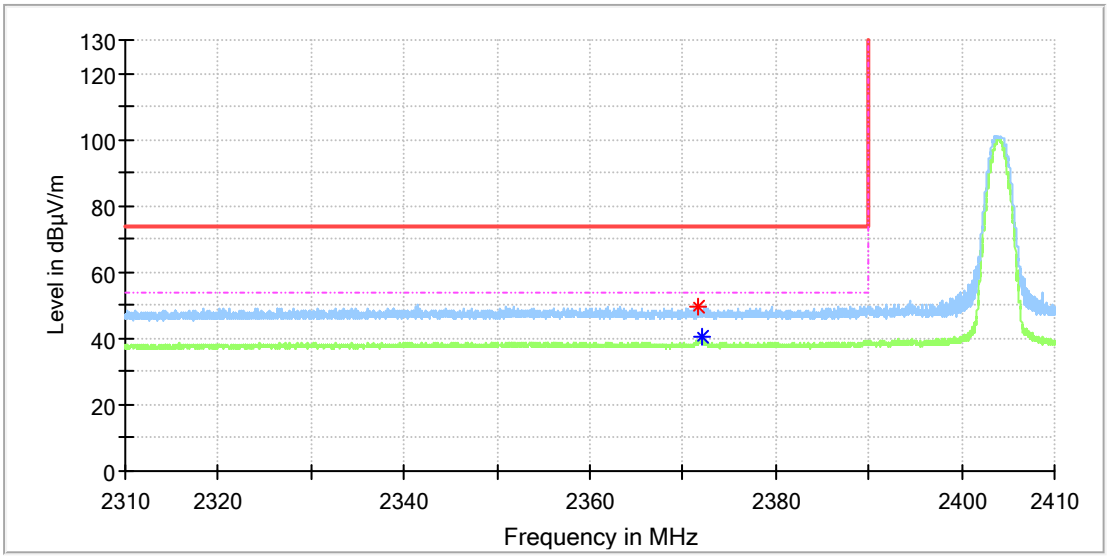


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.992647	51.16	---	74.00	22.84	150.0	V	86.0	7.4
2484.919118	---	40.90	54.00	13.10	150.0	V	106.0	7.4

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 2M_Low channel
Order No/Sample No:	A003731935-035
Test Voltage::	Battery
Remark:	Temp 22 Humi:52%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

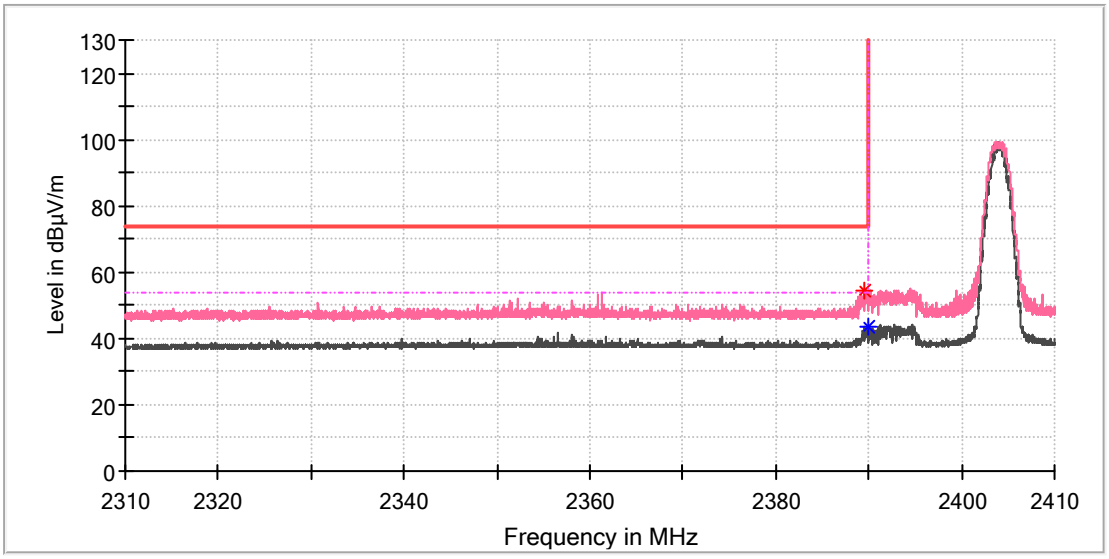


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2371.588235	49.45	---	74.00	24.55	150.0	H	206.0	6.9
2372.132353	---	40.35	54.00	13.65	150.0	H	29.0	6.9

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 2M_Low channel
Order No/Sample No:	A003731935-035
Test Voltage::	Battery
Remark:	Temp 22 Humi:52%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

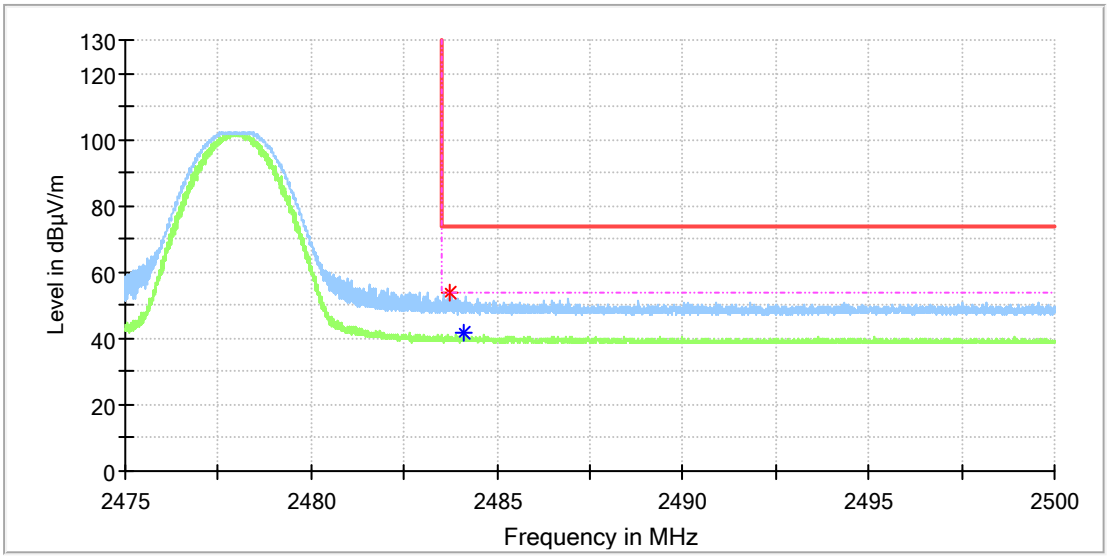


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2389.470588	54.36	---	74.00	19.64	150.0	V	266.0	7.0
2389.911765	---	43.39	54.00	10.61	150.0	V	266.0	7.0

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 2M_High channel
Order No/Sample No:	A003731935-035
Test Voltage::	Battery
Remark:	Temp 22 Humi:52%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

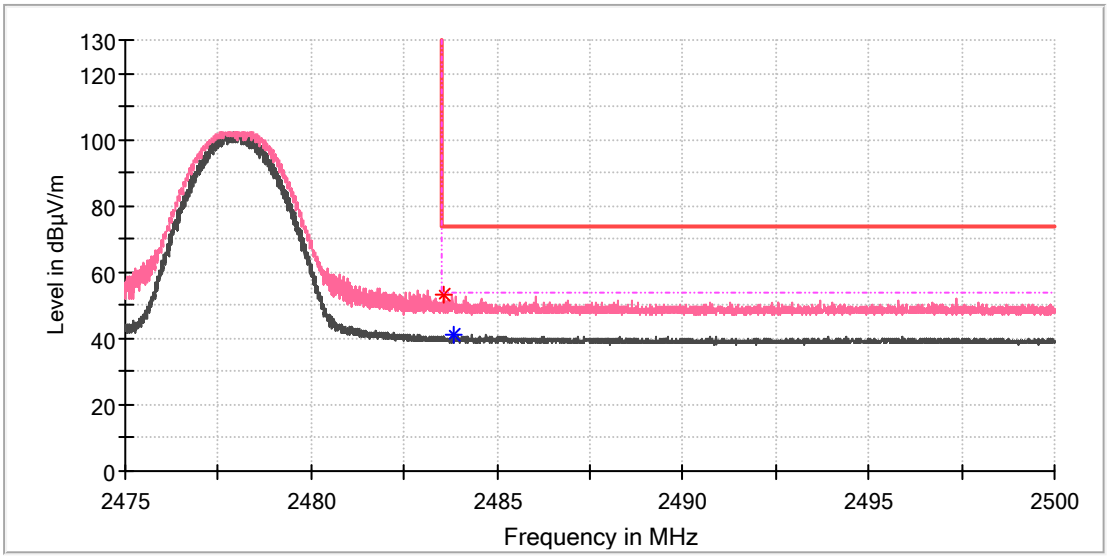


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.716912	53.59	---	74.00	20.41	150.0	H	100.0	7.4
2484.106618	---	41.65	54.00	12.35	150.0	H	93.0	7.4

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 2M_High channel
Order No/Sample No:	A003731935-035
Test Voltage::	Battery
Remark:	Temp 22 Humi:52%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



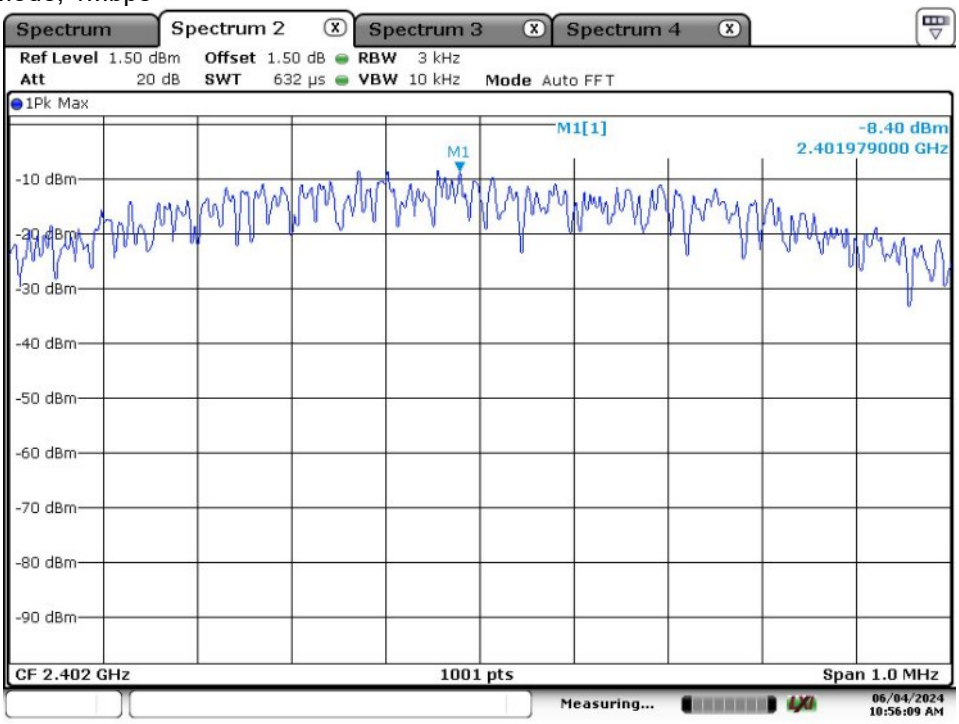
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.591912	53.35	---	74.00	20.65	150.0	V	188.0	7.4
2483.819853	---	40.89	54.00	13.11	150.0	V	97.0	7.4

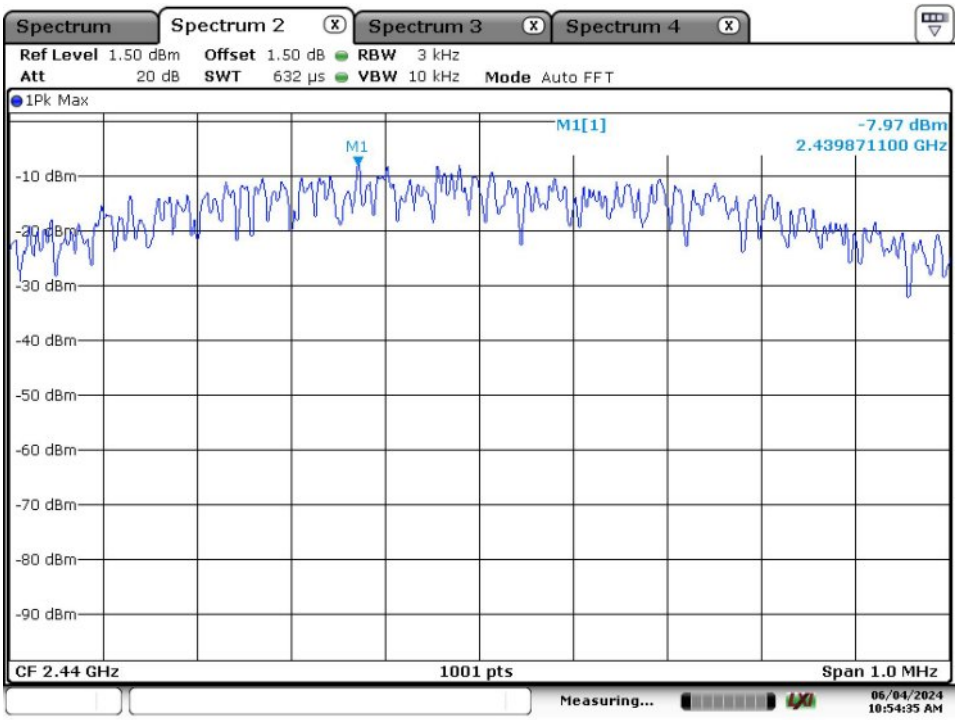
Appendix C: Test Results of Right earbud

Appendix C.1: Test Results of Conducted Power Spectral Density

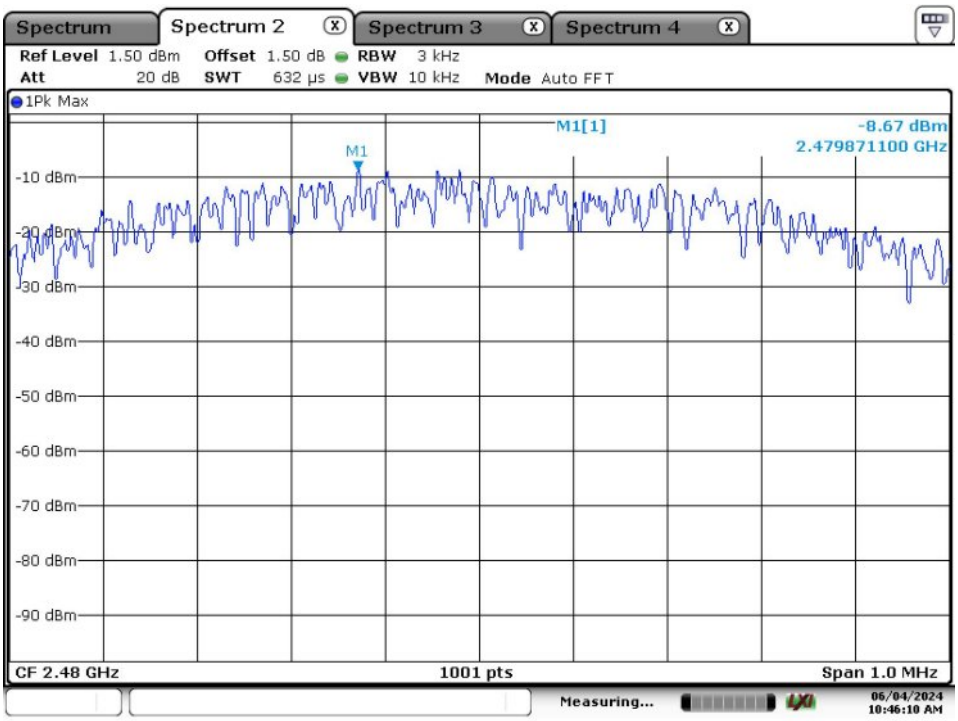
Bluetooth LE Mode, 1Mbps



Date: 4.JUN.2024 10:56:09

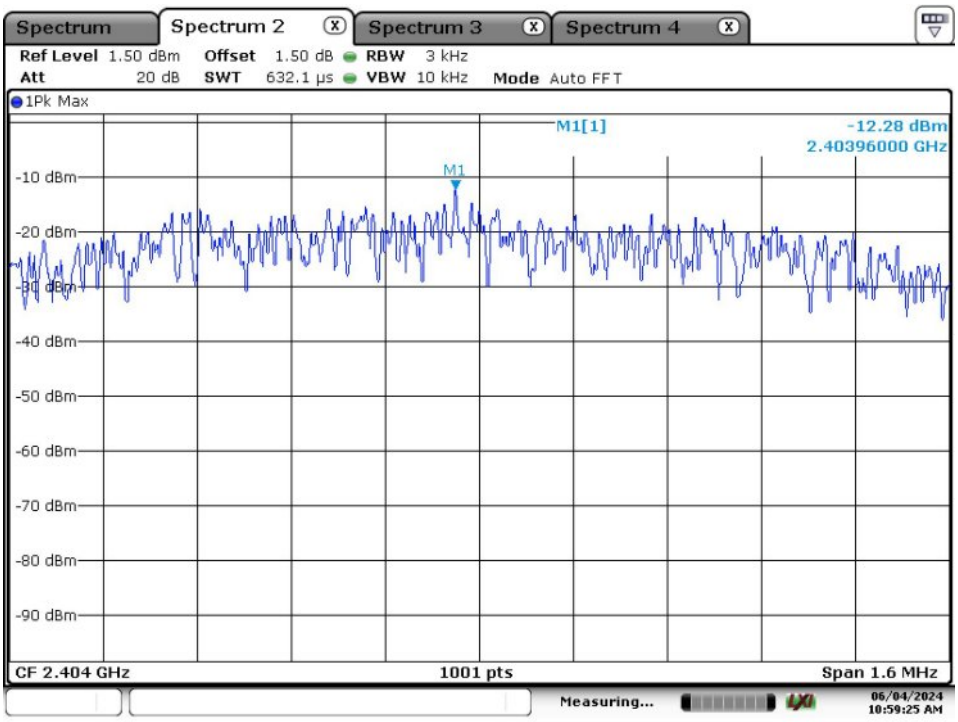


Date: 4.JUN.2024 10:54:36

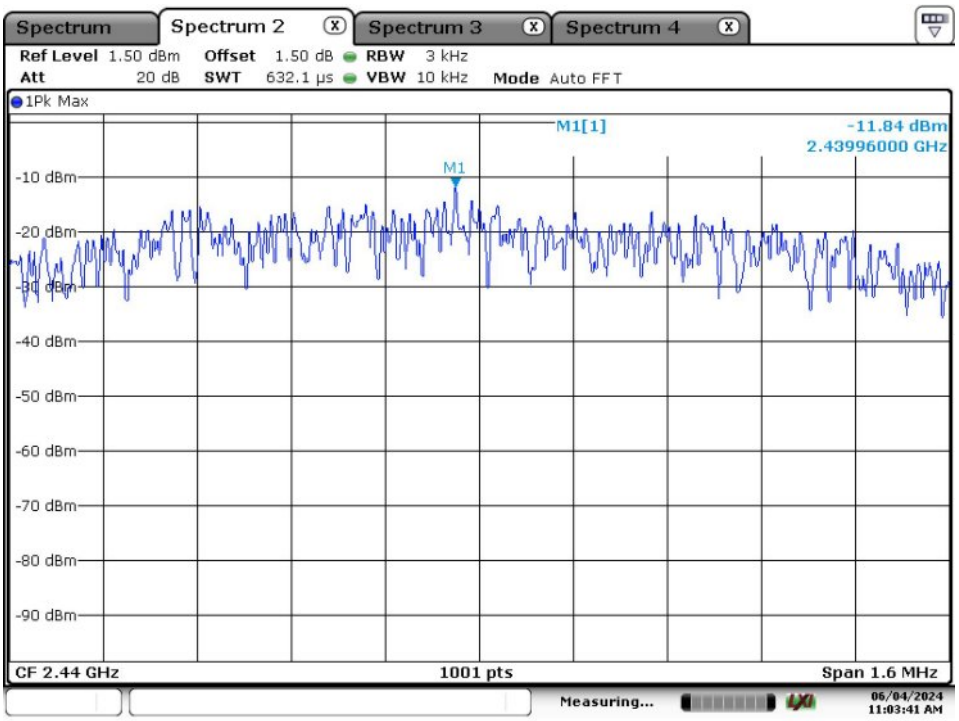


Date: 4.JUN.2024 10:46:10

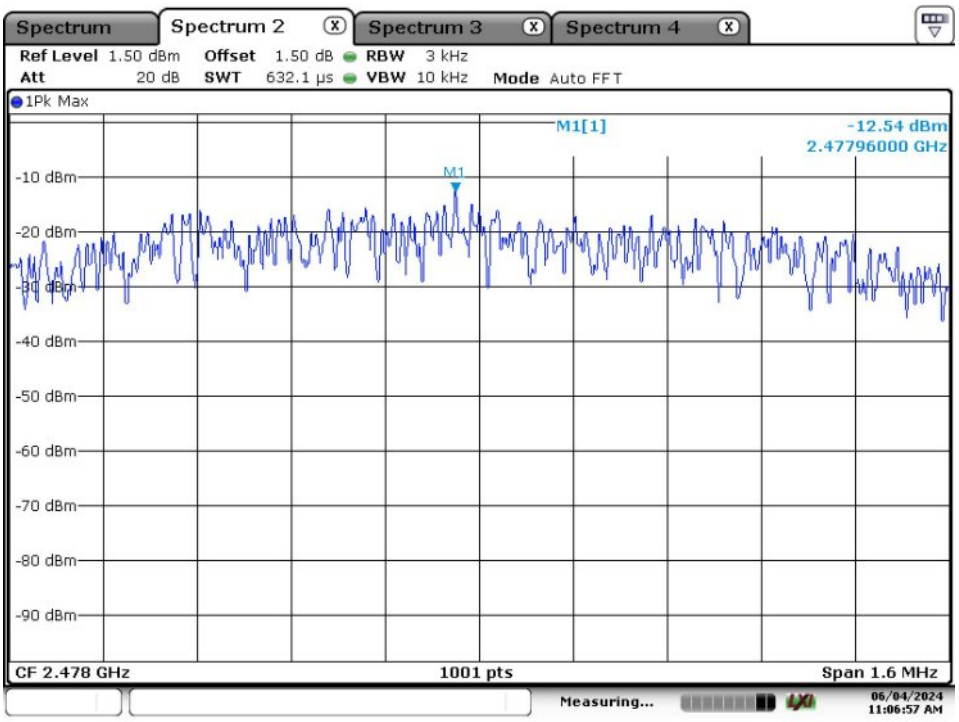
Bluetooth LE Mode, 2Mbps



Date: 4.JUN.2024 10:59:25



Date: 4.JUN.2024 11:03:40



Date: 4.JUN.2024 11:06:57

Appendix C.2: Test Results of 6dB Bandwidth

Bluetooth LE Mode, 1Mbps

6 dB Bandwidth

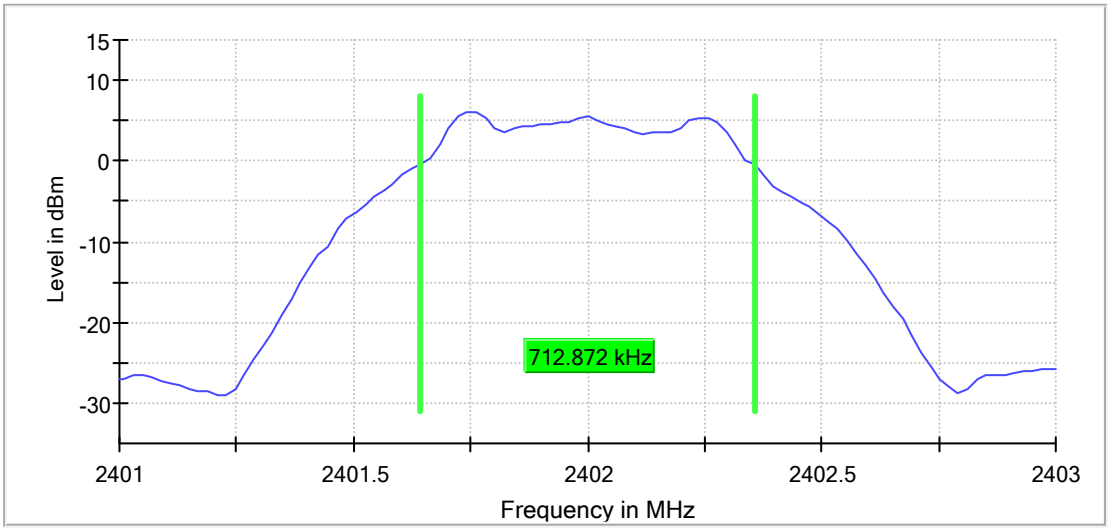
DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2402.000000	0.712872	0.500000	---	2401.643564	2402.356436

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2402.000000	6.0	PASS

RBW=100kHz, VBW=300kHz

6 dB Bandwidth



6 dB Bandwidth

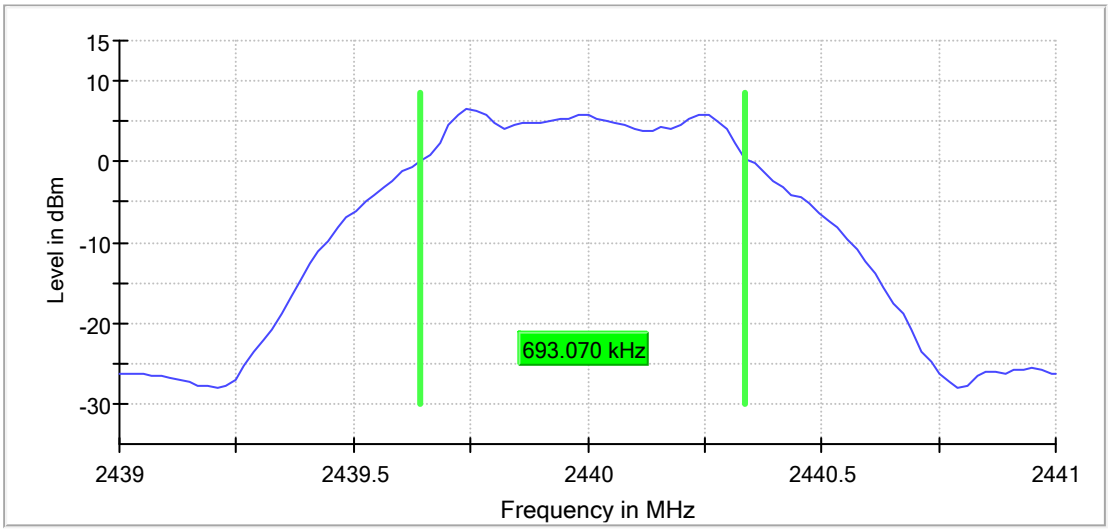
DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2440.000000	0.693070	0.500000	---	2439.643564	2440.336634

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2440.000000	6.4	PASS

RBW=100kHz, VBW=300kHz

6 dB Bandwidth



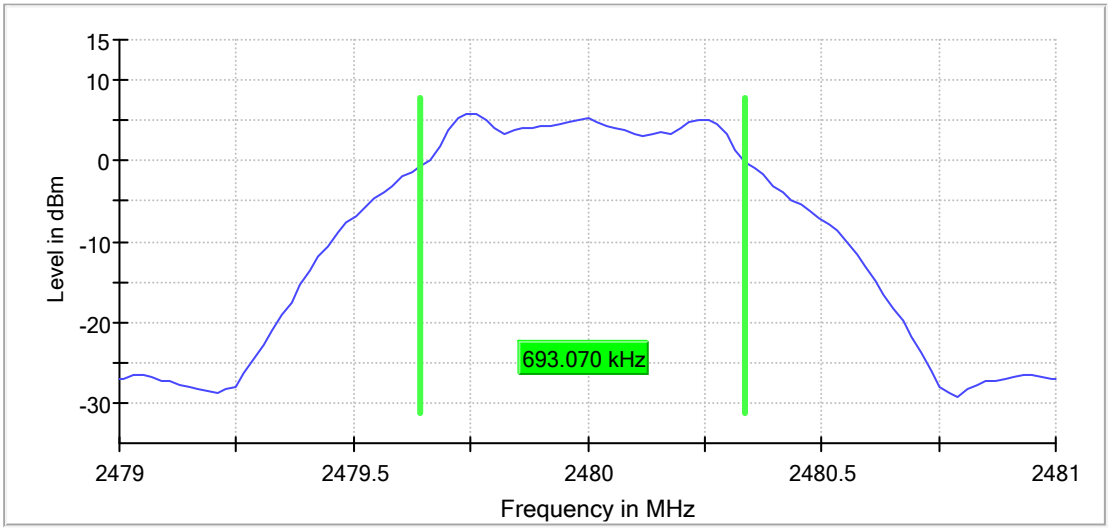
6 dB Bandwidth

DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2480.000000	0.693070	0.500000	---	2479.643564	2480.336634

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2480.000000	5.8	PASS

6 dB Bandwidth



RBW=100kHz, VBW=300kHz

Bluetooth LE Mode, 2Mbps

6 dB Bandwidth

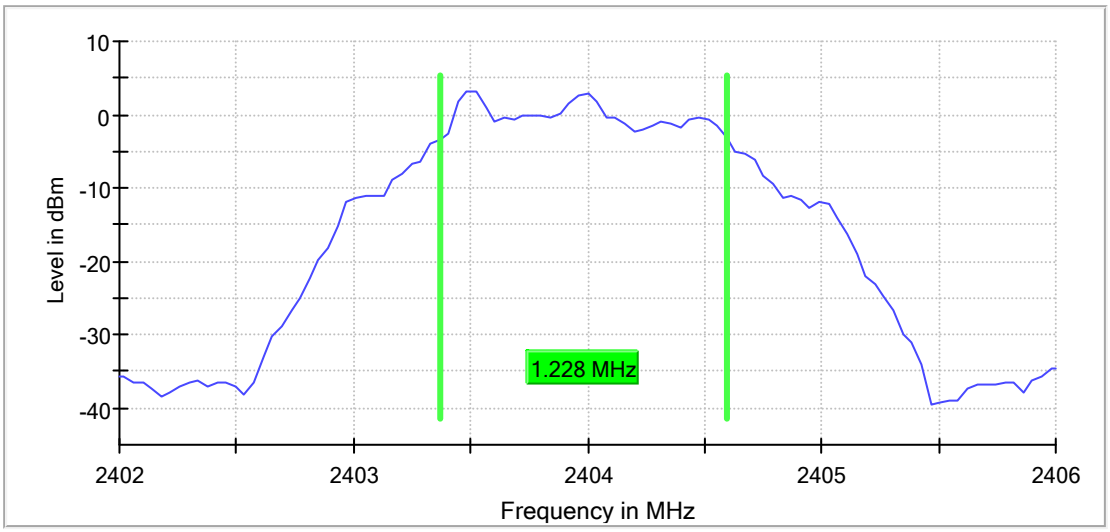
DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2404.000000	1.227722	0.500000	---	2403.366337	2404.594059

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2404.000000	3.2	PASS

RBW=100kHz, VBW=300kHz

6 dB Bandwidth



6 dB Bandwidth

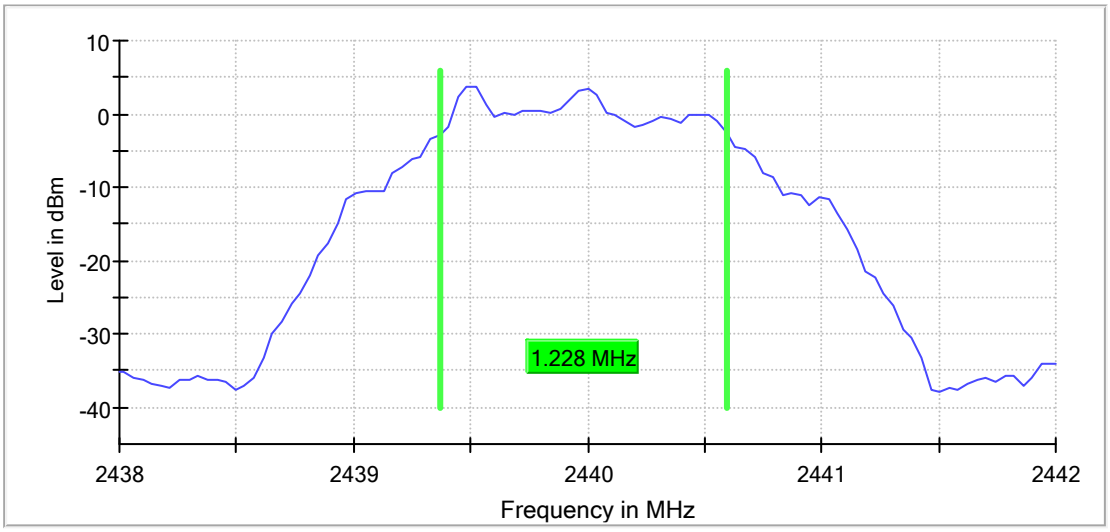
DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2440.000000	1.227722	0.500000	---	2439.366337	2440.594059

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2440.000000	3.8	PASS

RBW=100kHz, VBW=300kHz

6 dB Bandwidth



6 dB Bandwidth

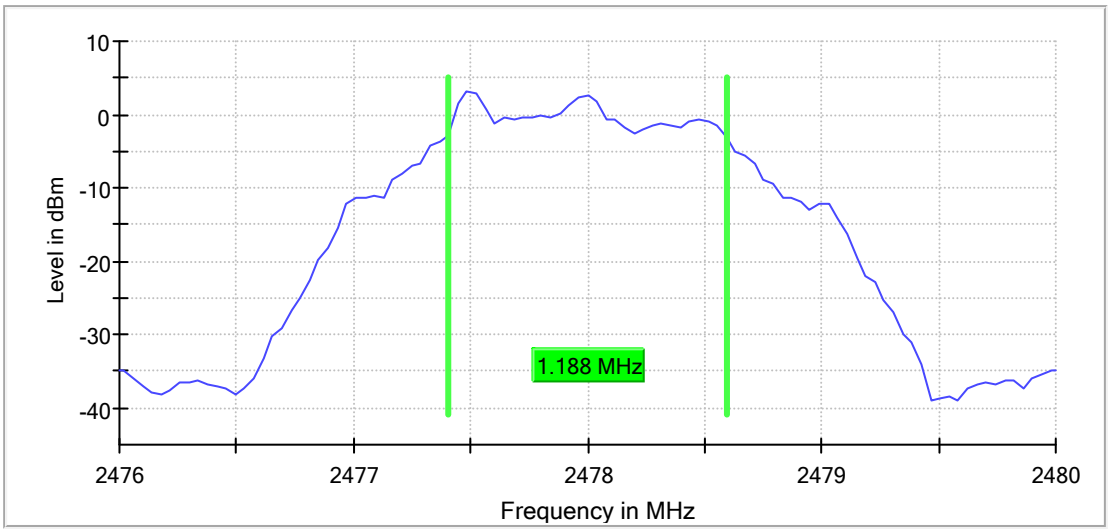
DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2478.000000	1.188118	0.500000	---	2477.405941	2478.594059

(continuation of the "6 dB Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Max Level (dBm)	Result
2478.000000	3.1	PASS

RBW=100kHz, VBW=300kHz

6 dB Bandwidth



Appendix C.3: Test Results of 99% Bandwidth

Bluetooth LE Mode, 1Mbps

99 % Bandwidth

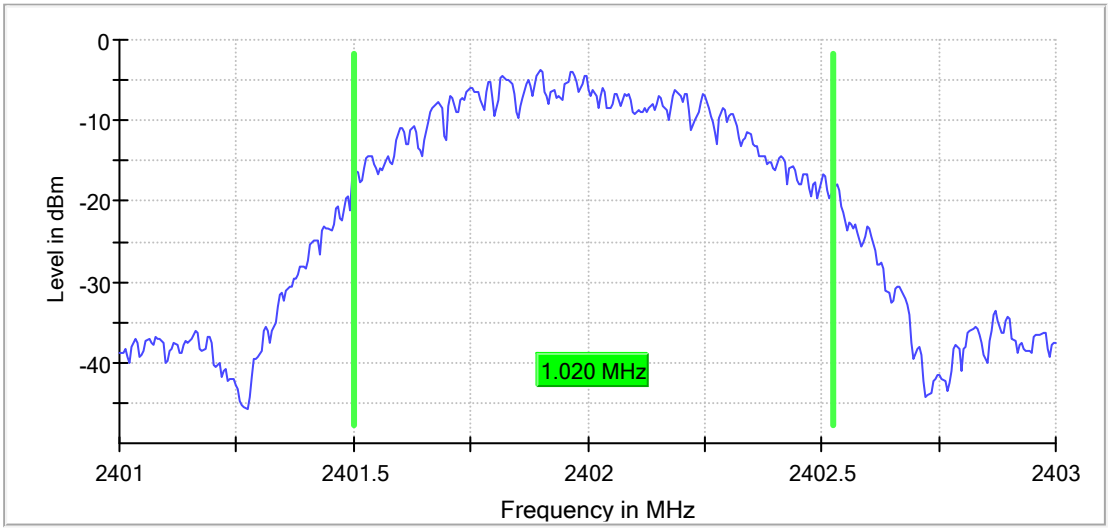
DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2402.000000	1.020000	---	---	2401.502500	2402.522500

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
2402.000000	PASS

RBW=30kHz, VBW=100kHz

99 % Bandwidth



99 % Bandwidth

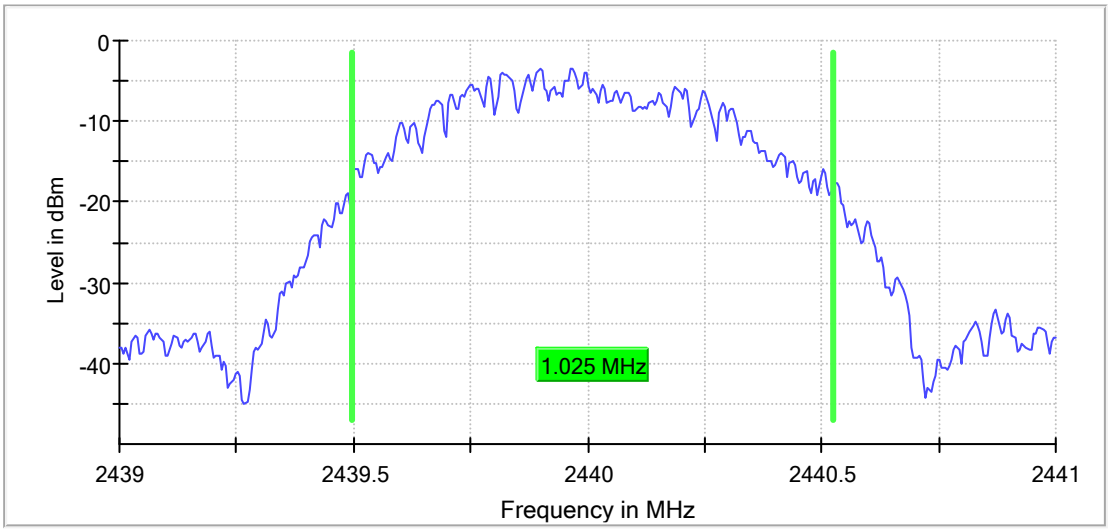
DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2440.000000	1.025000	---	---	2439.497500	2440.522500

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
2440.000000	PASS

RBW=30kHz, VBW=100kHz

99 % Bandwidth



99 % Bandwidth

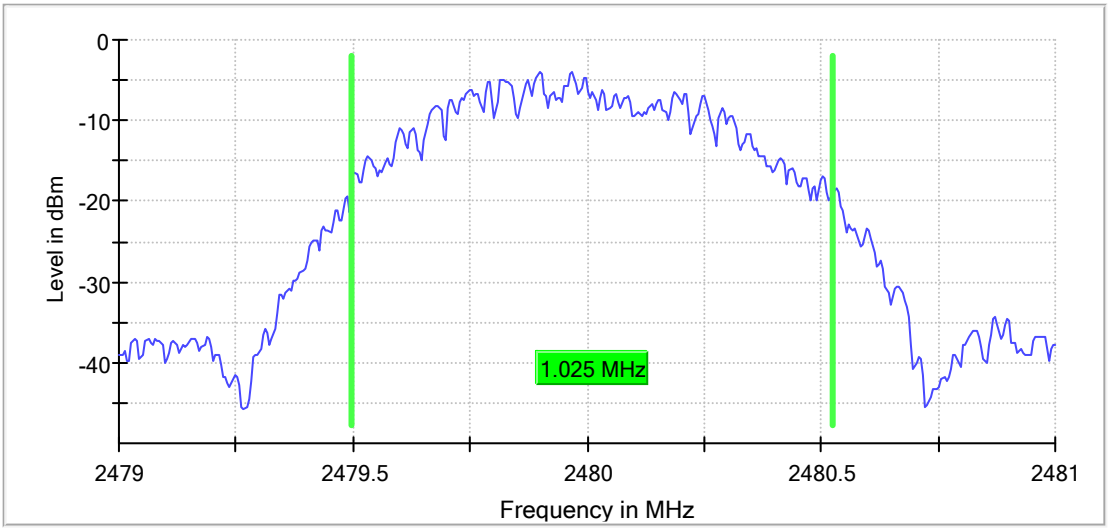
DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2480.000000	1.025000	---	---	2479.497500	2480.522500

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
2480.000000	PASS

RBW=30kHz, VBW=100kHz

99 % Bandwidth



Bluetooth LE Mode, 2Mbps

99 % Bandwidth

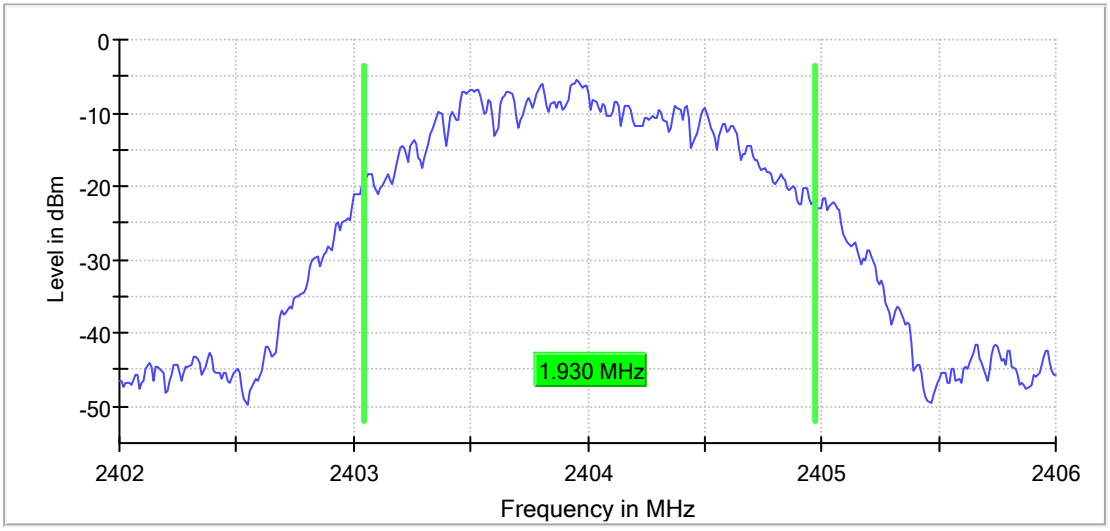
DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2404.000000	1.930000	---	---	2403.045000	2404.975000

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
2404.000000	PASS

RBW=30kHz, VBW=100kHz

99 % Bandwidth



99 % Bandwidth

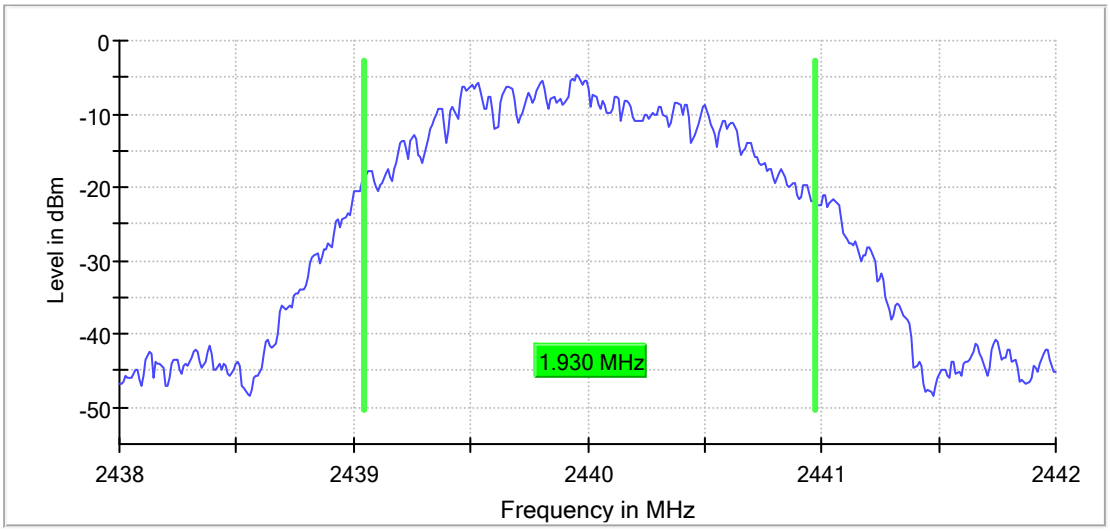
DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2440.000000	1.930000	---	---	2439.045000	2440.975000

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
2440.000000	PASS

RBW=30kHz, VBW=100kHz

99 % Bandwidth



99 % Bandwidth

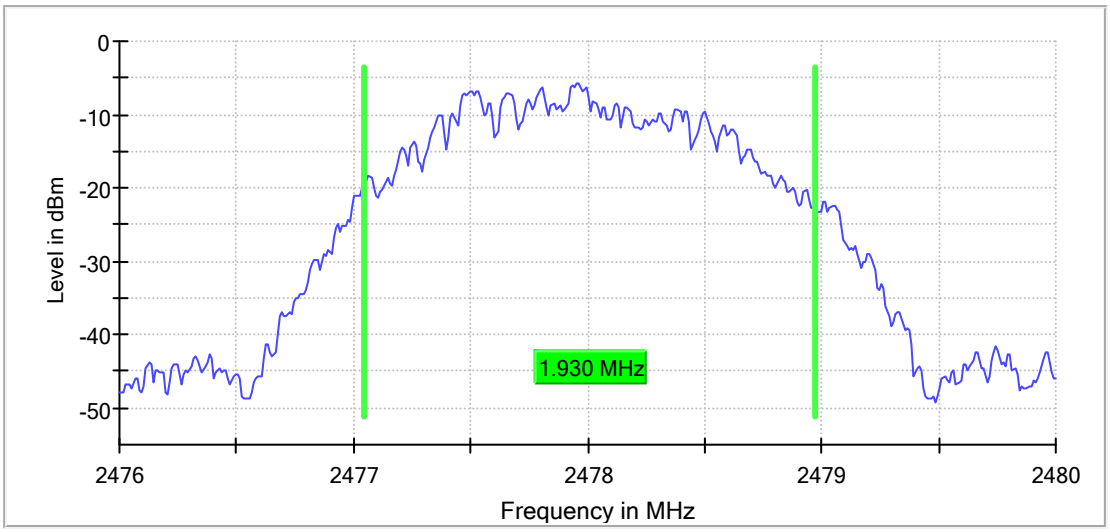
DUT Frequency (MHz)	Bandwidth (MHz)	Limit Min (MHz)	Limit Max (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2478.000000	1.930000	---	---	2477.045000	2478.975000

(continuation of the "99 % Bandwidth" table from column 6 ...)

DUT Frequency (MHz)	Result
2478.000000	PASS

RBW=30kHz, VBW=100kHz

99 % Bandwidth



Appendix C.4: Test Results of Frequency stability

Test Channel (MHz)	2402

Test result of frequency tolerance of voltage variation

Voltage	Test result (MHz)	Deviation Frequency (KHz)	Test result (ppm)	Limit (ppm)
DC 3.465V	2401.991	-9	-3.75	10
DC 3.85V	2401.989	-11	-4.58	
DC 4.235V	2401.993	-7	-2.91	

Test result of frequency tolerance of temperature variation

Temperature (℃)	Test result (MHz)	Deviation Frequency (KHz)	Test result (ppm)	Limit (ppm)
-30	2401.988	-12	-5.00	10
-20	2401.986	-14	-5.83	
-10	2401.984	-16	-6.66	
0	2401.988	-12	-5.00	
10	2401.987	-13	-5.41	
20	2401.986	-14	-5.83	
30	2401.988	-12	-5.00	
40	2401.984	-16	-6.66	
50	2401.985	-15	-6.24	
55	2401.983	-17	-7.08	

Test Channel (MHz)	2440

Test result of frequency tolerance of voltage variation

Voltage	Test result (MHz)	Deviation Frequency (KHz)	Test result (ppm)	Limit (ppm)
DC 3.465V	2439.992	-8	-3.27869	10
DC 3.85V	2439.995	-5	-2.04918	
DC 4.235V	2439.993	-7	-2.86885	

Test result of frequency tolerance of temperature variation

Temperature (℃)	Test result (MHz)	Deviation Frequency (KHz)	Test result (ppm)	Limit (ppm)
-30	2439.993	-7	-2.86885	10
-20	2439.992	-8	-3.27869	
-10	2439.995	-5	-2.04918	
0	2439.992	-8	-3.27869	
10	2439.993	-7	-2.86885	
20	2439.991	-9	-3.68852	
30	2439.994	-6	-2.45902	
40	2439.988	-12	-4.91803	
50	2439.987	-13	-5.32787	
55	2439.990	-10	-4.09836	

Test Channel (MHz)	2480

Test result of frequency tolerance of voltage variation

Voltage	Test result (MHz)	Deviation Frequency (KHz)	Test result (ppm)	Limit (ppm)
DC 3.465V	2479.995	-5	-2.02	10
DC 3.85V	2479.992	-8	-3.23	
DC 4.235V	2479.994	-6	-2.42	

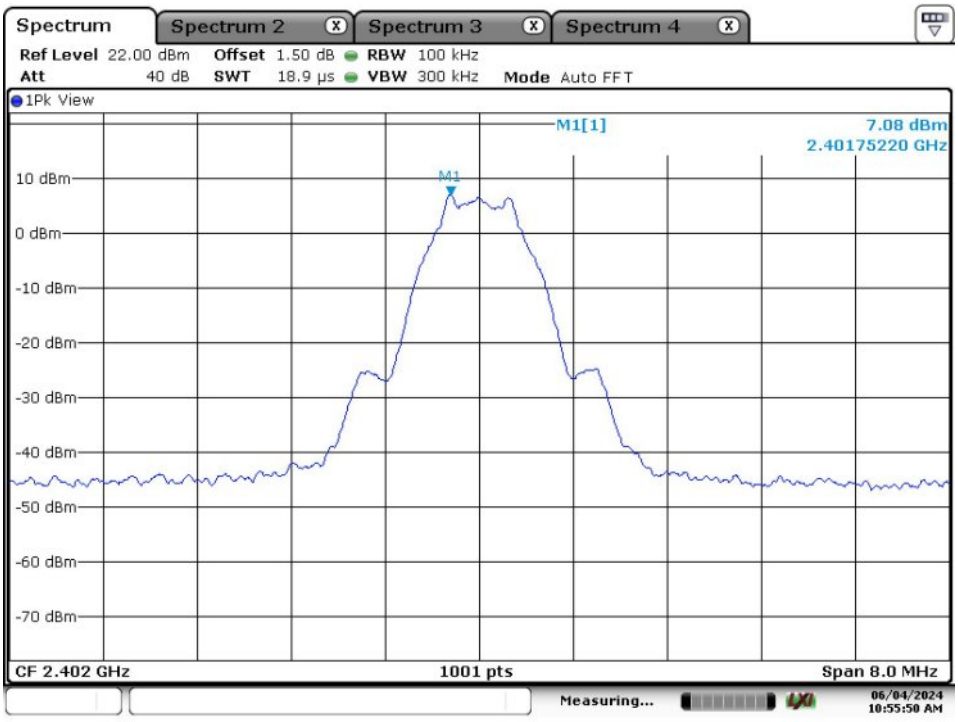
Test result of frequency tolerance of temperature variation

Temperature (℃)	Test result (MHz)	Deviation Frequency (KHz)	Test result (ppm)	Limit (ppm)
-30	2479.991	-9	-3.63	10
-20	2479.992	-8	-3.23	
-10	2479.989	-11	-4.44	
0	2479.991	-9	-3.63	
10	2479.990	-10	-4.03	
20	2479.988	-12	-4.84	
30	2479.985	-15	-6.05	
40	2479.986	-14	-5.65	
50	2479.988	-12	-4.84	
55	2479.985	-15	-6.05	

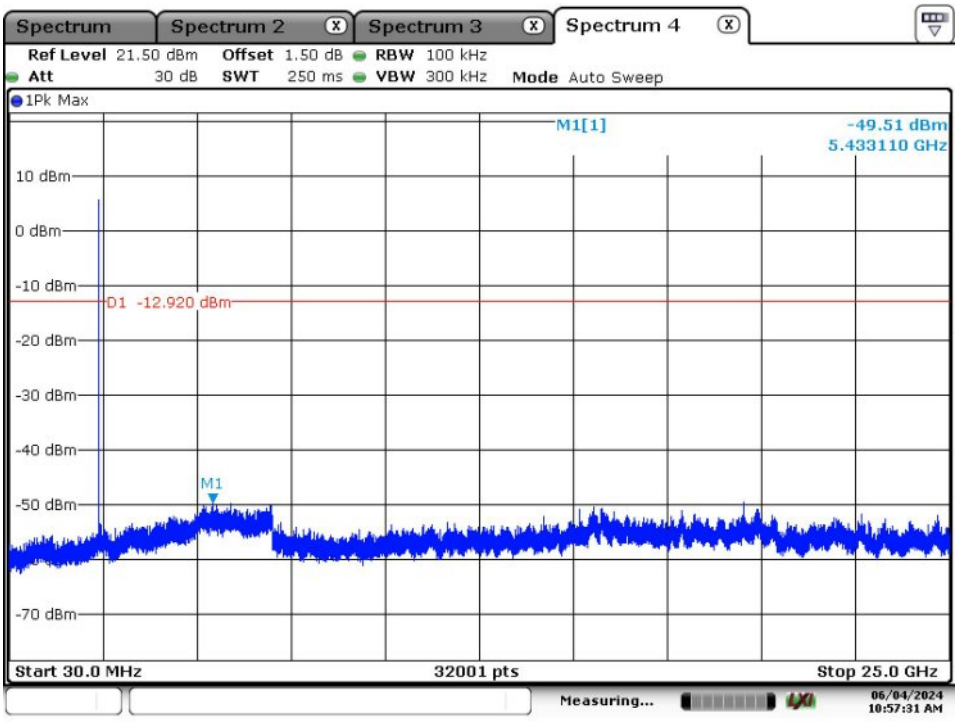
Appendix C.5: Test Results of Conducted Spurious Emissions Measured in 100 kHz Bandwidth

Bluetooth LE Mode, 1Mbps

Low Channel:

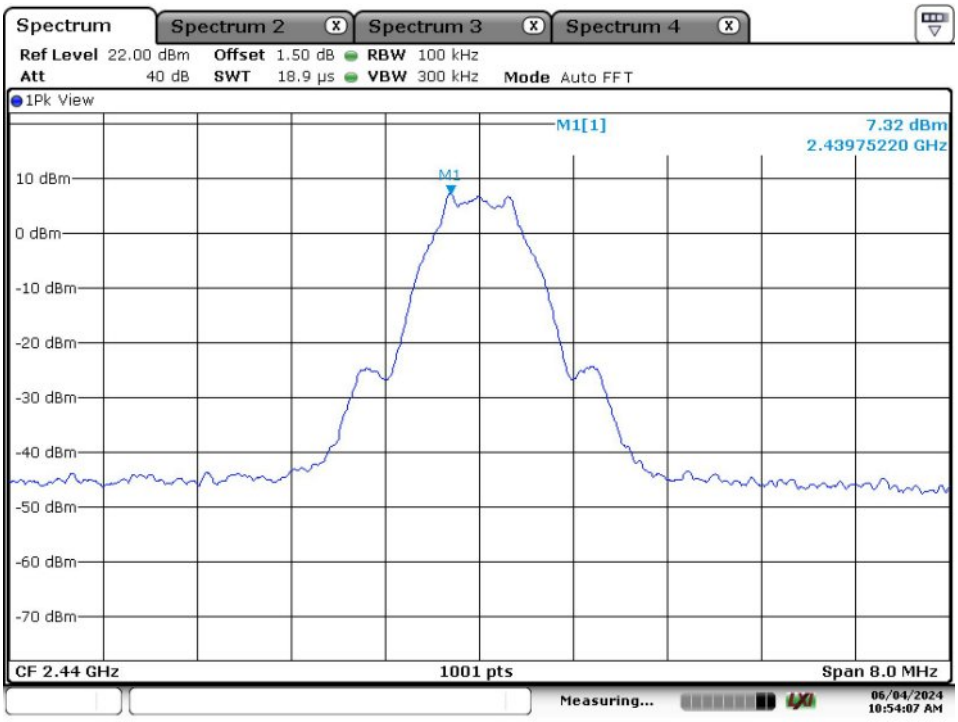


Date: 4.JUN.2024 10:55:50

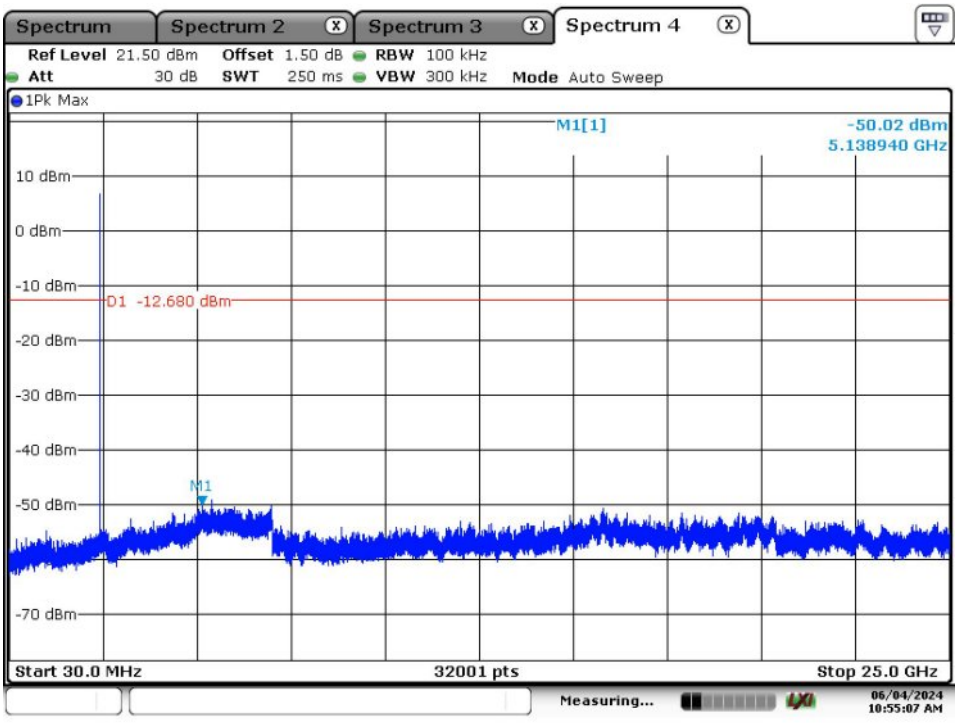


Date: 4.JUN.2024 10:57:32

Middle Channel:

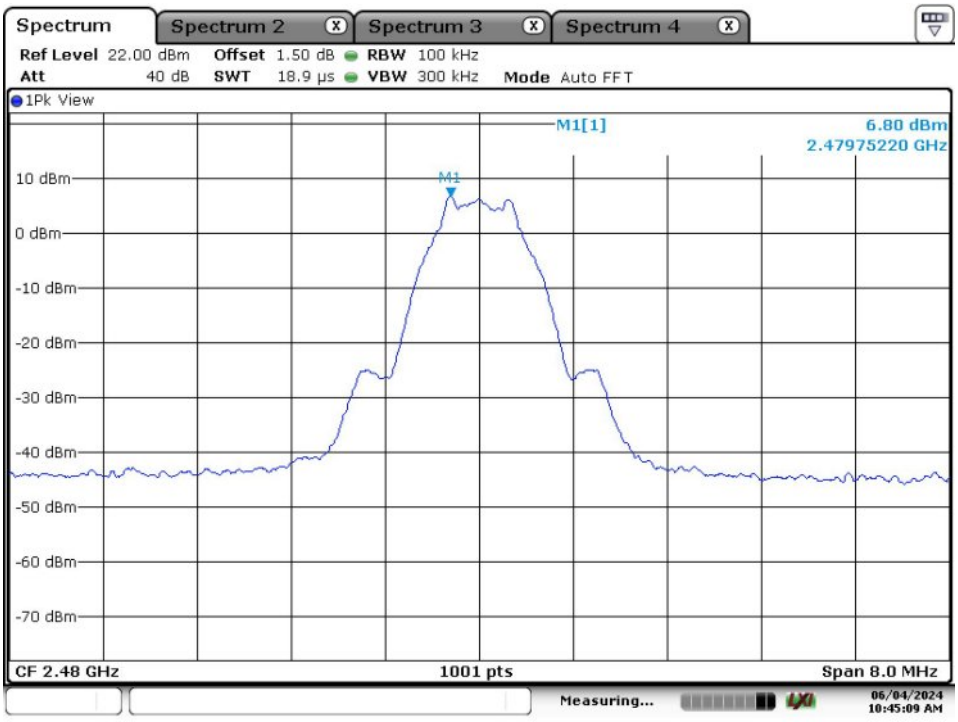


Date: 4.JUN.2024 10:54:07

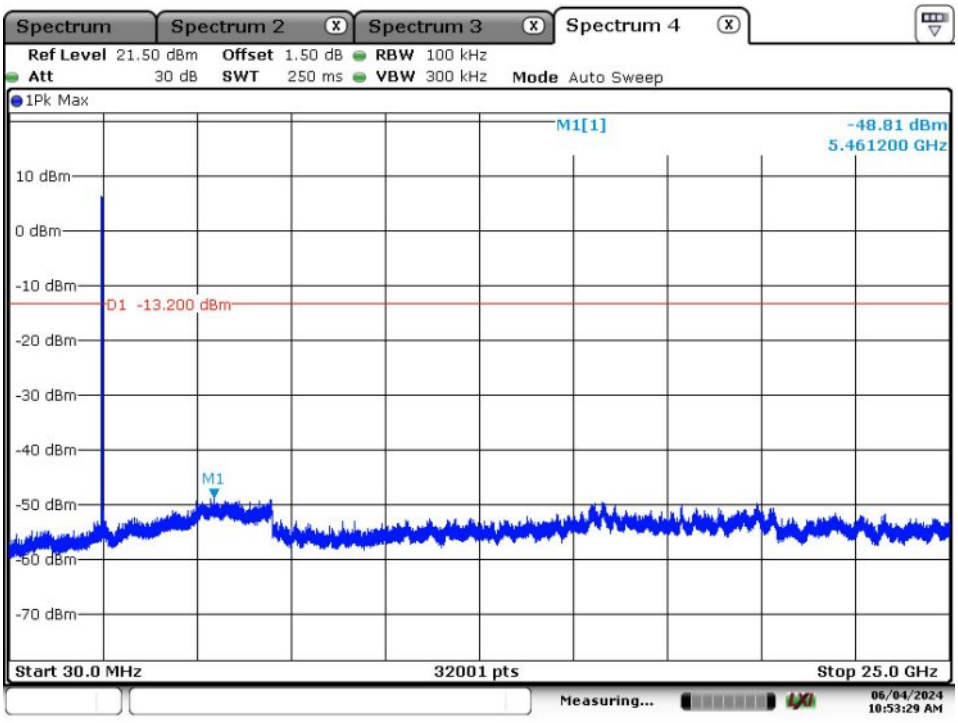


Date: 4.JUN.2024 10:55:08

High Channel:

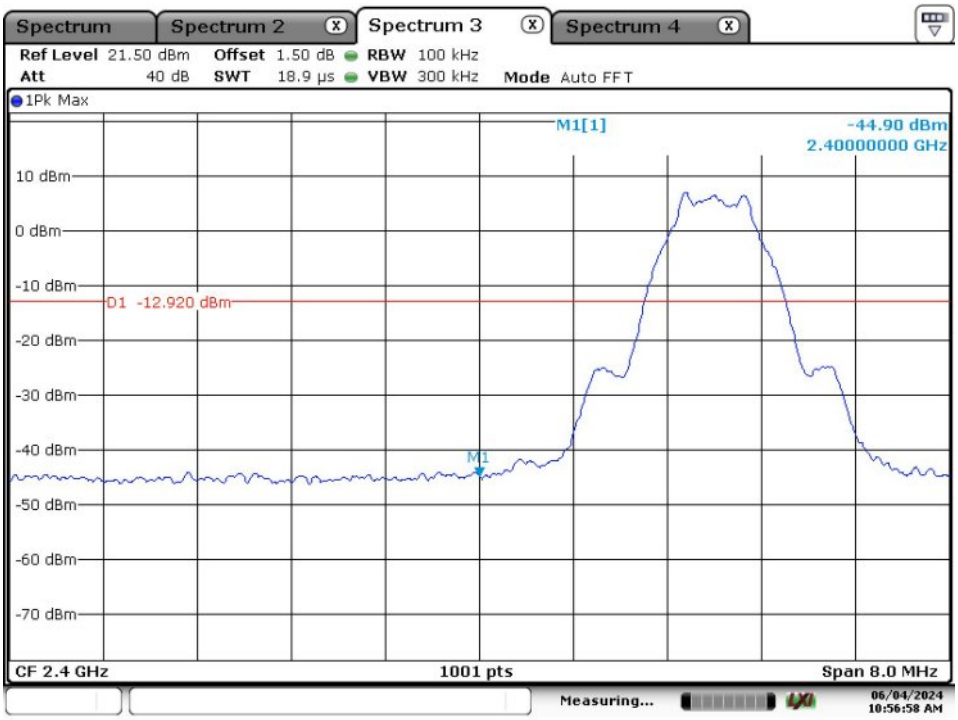


Date: 4.JUN.2024 10:45:10



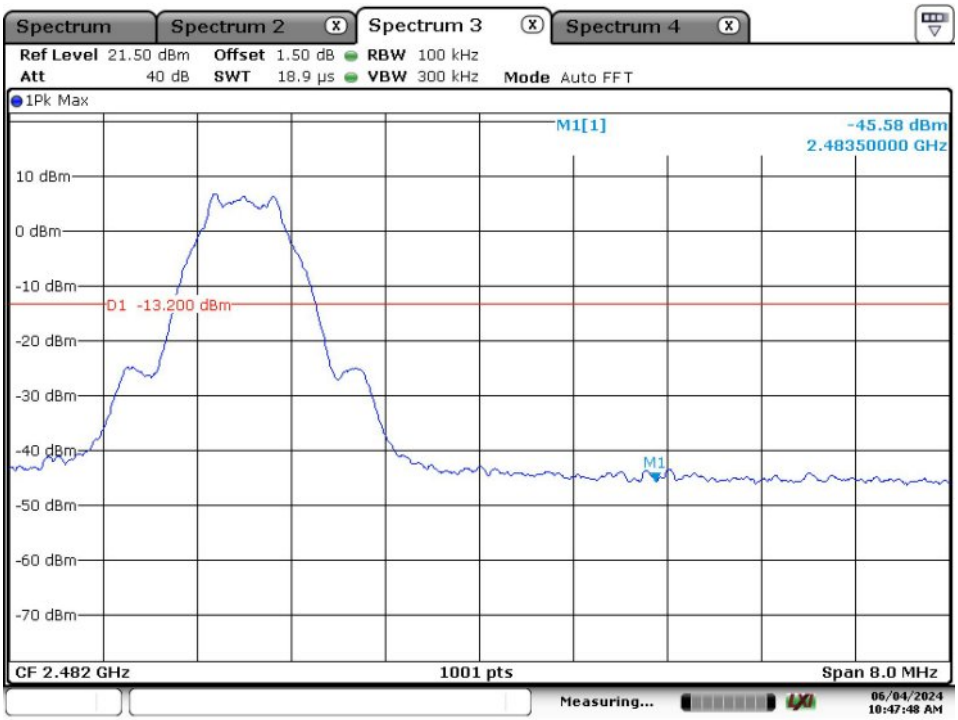
Date: 4.JUN.2024 10:53:30

Band Edge, Low Channel:



Date: 4.JUN.2024 10:56:59

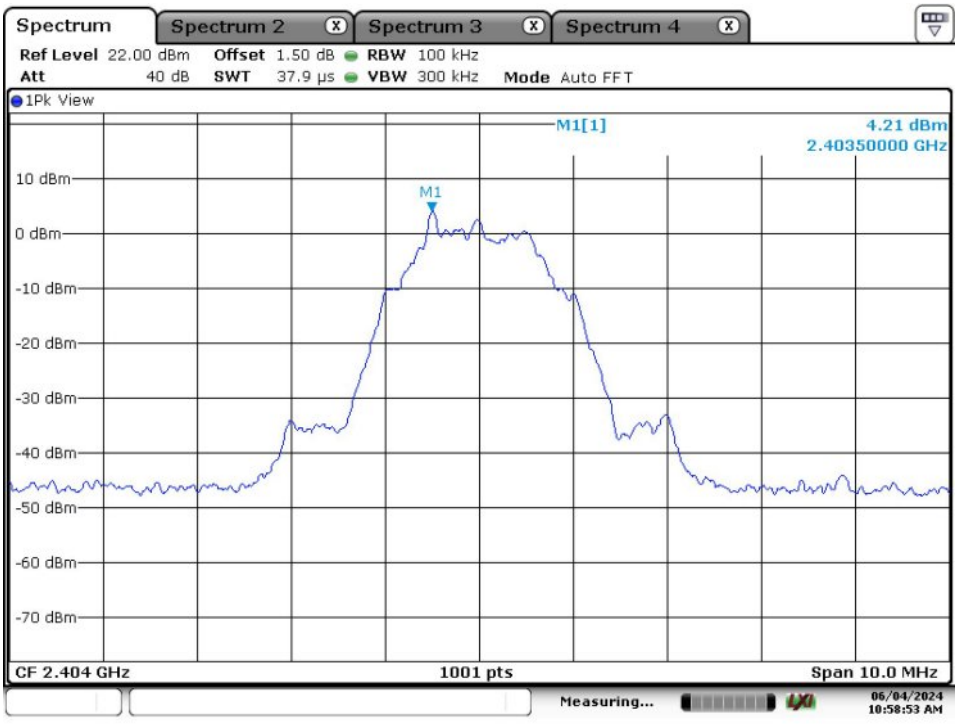
Band Edge, High Channel:



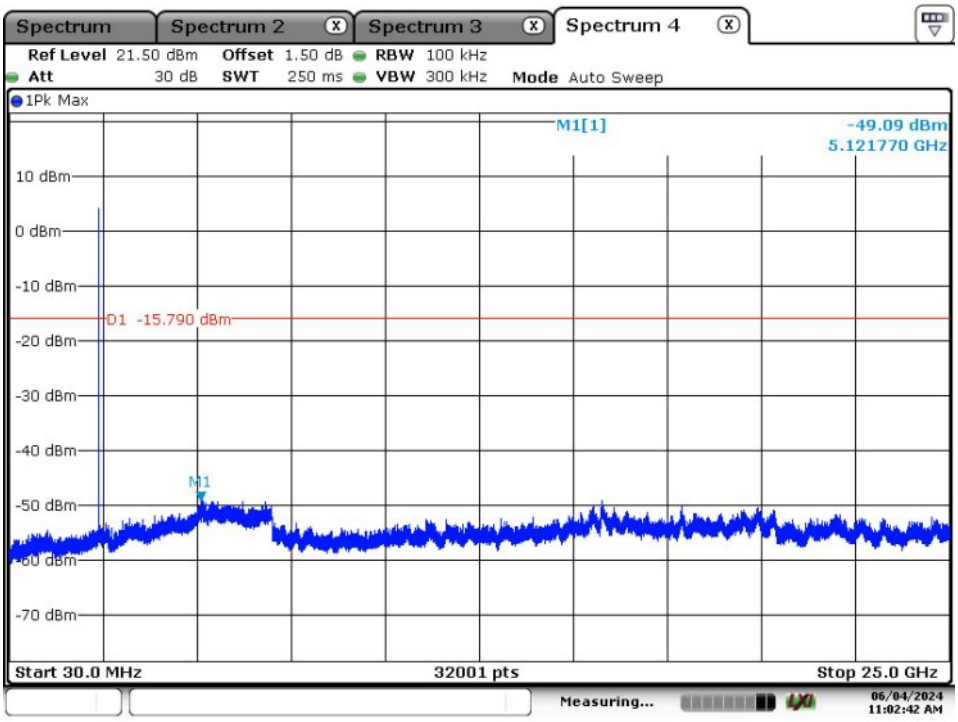
Date: 4.JUN.2024 10:47:49

Bluetooth LE Mode, 2Mbps

Low Channel:

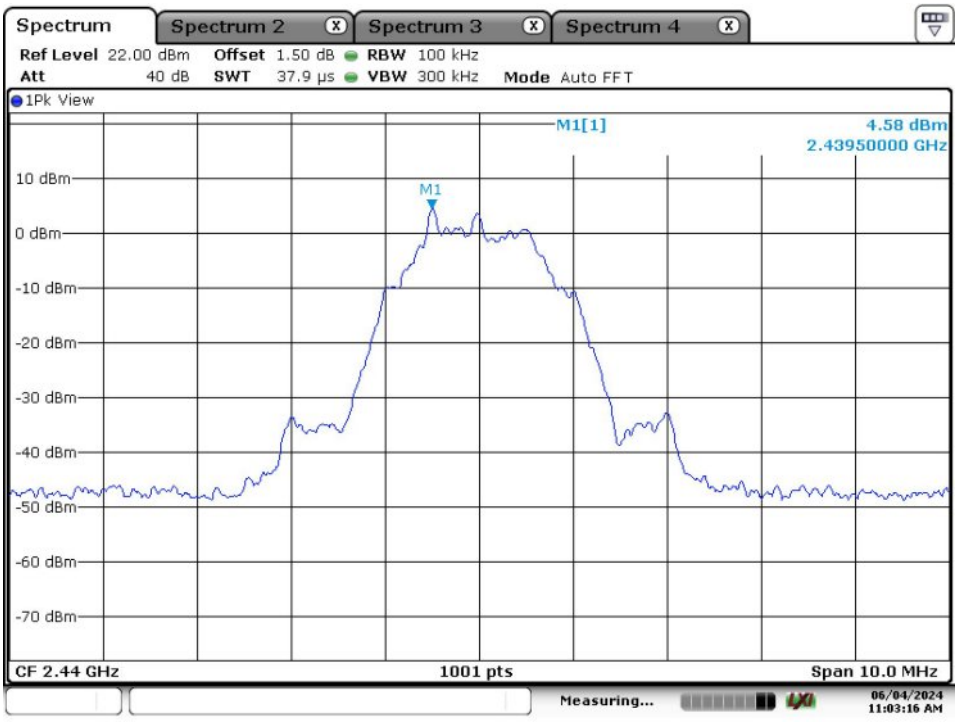


Date: 4.JUN.2024 10:58:53

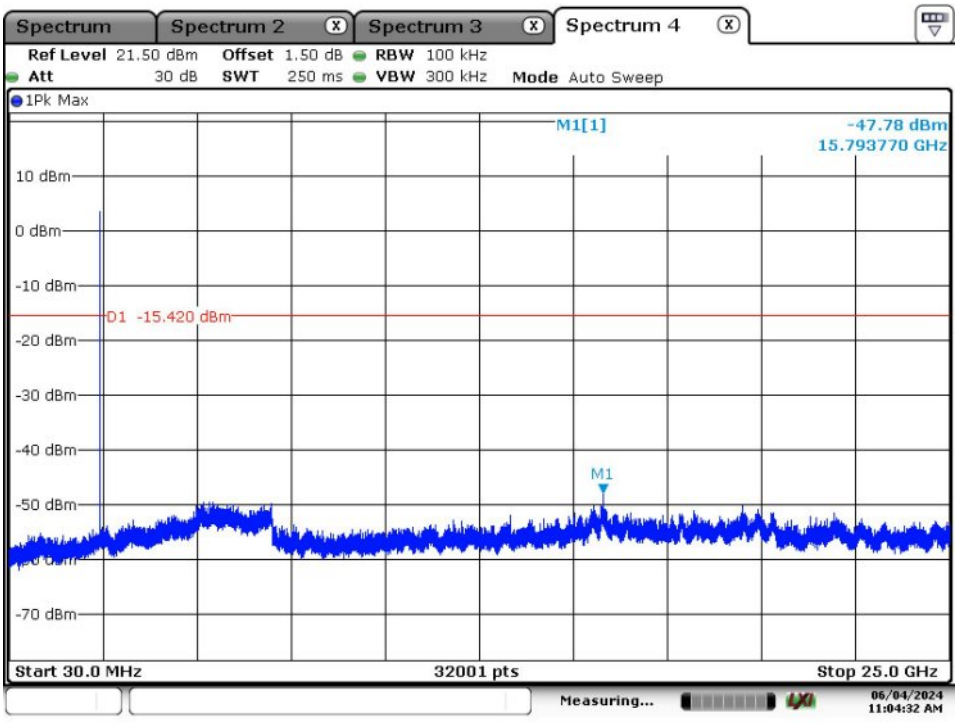


Date: 4.JUN.2024 11:02:42

Middle Channel:

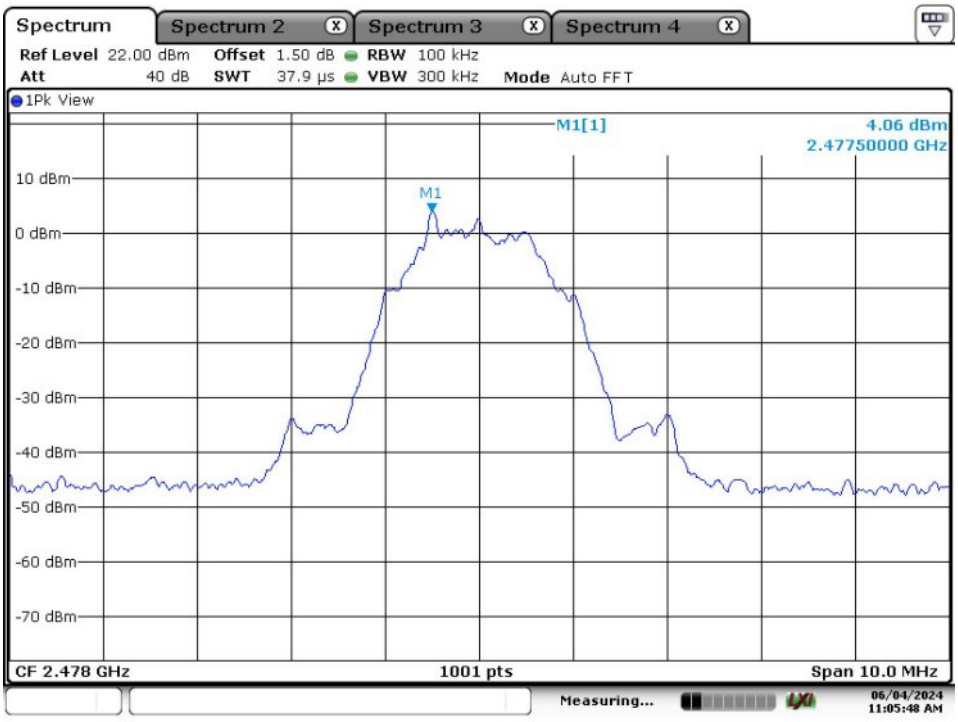


Date: 4.JUN.2024 11:03:16

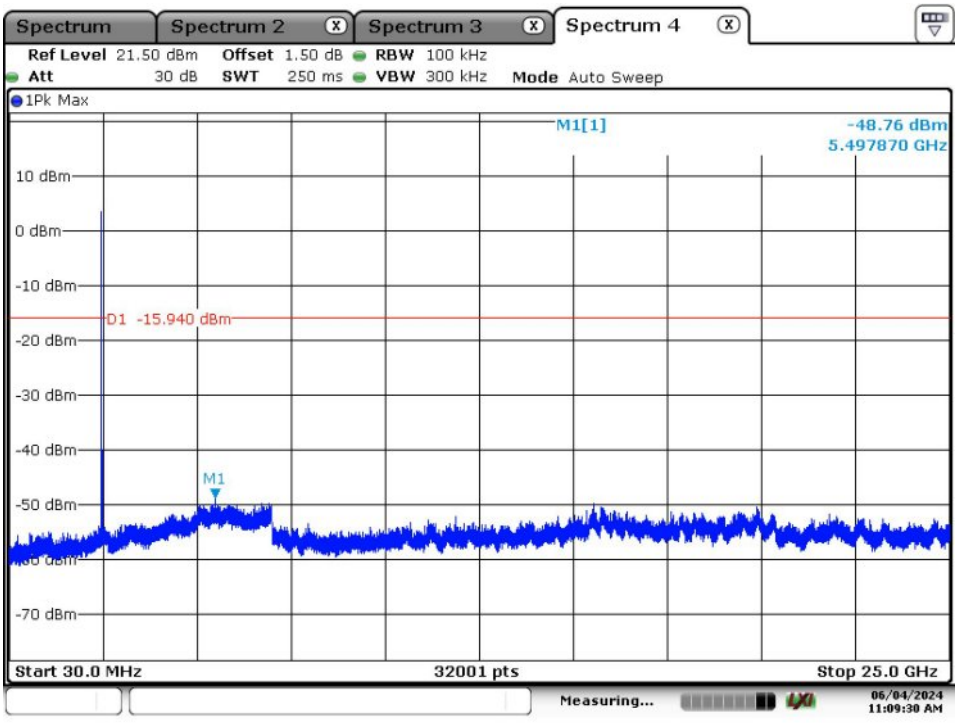


Date: 4.JUN.2024 11:04:32

High Channel:

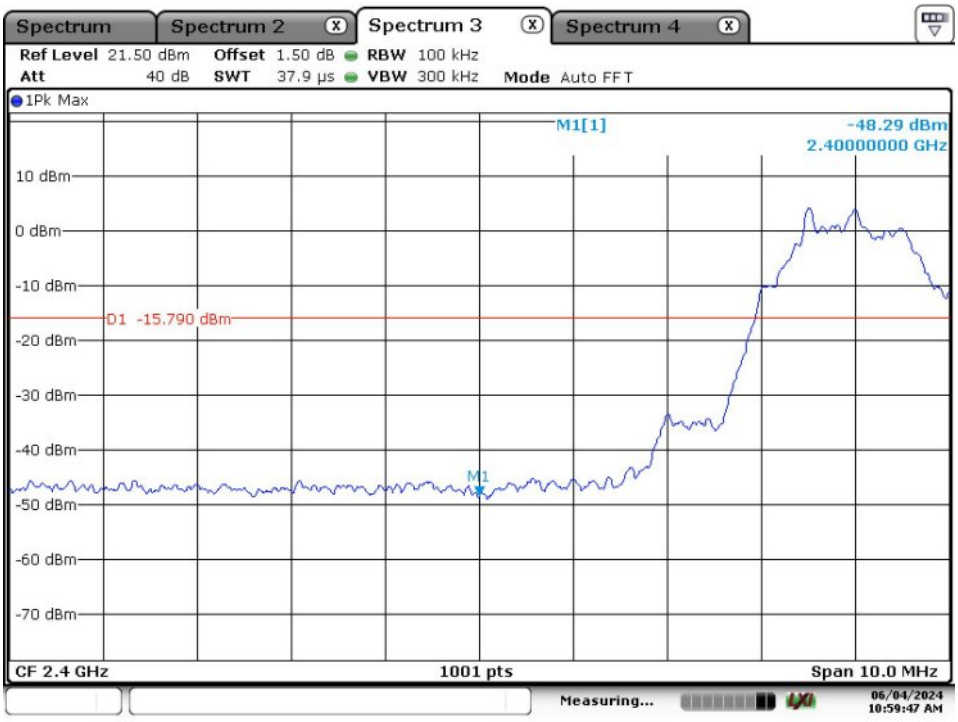


Date: 4.JUN.2024 11:05:48



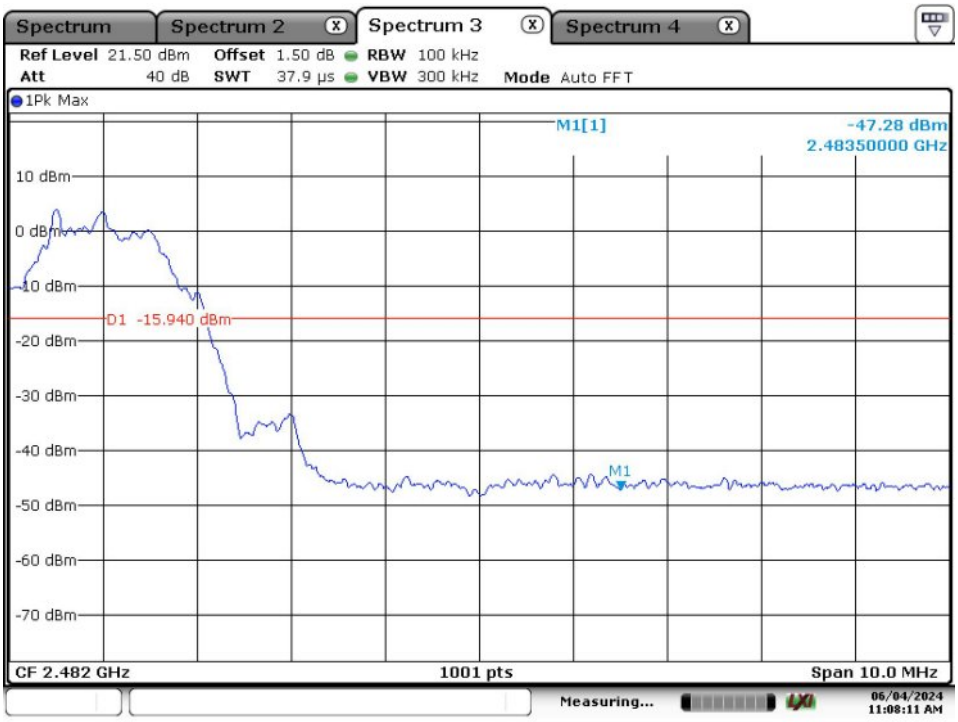
Date: 4.JUN.2024 11:09:30

Band Edge, Low Channel:



Date: 4.JUN.2024 10:59:47

Band Edge, High Channel:



Date: 4.JUN.2024 11:08:11

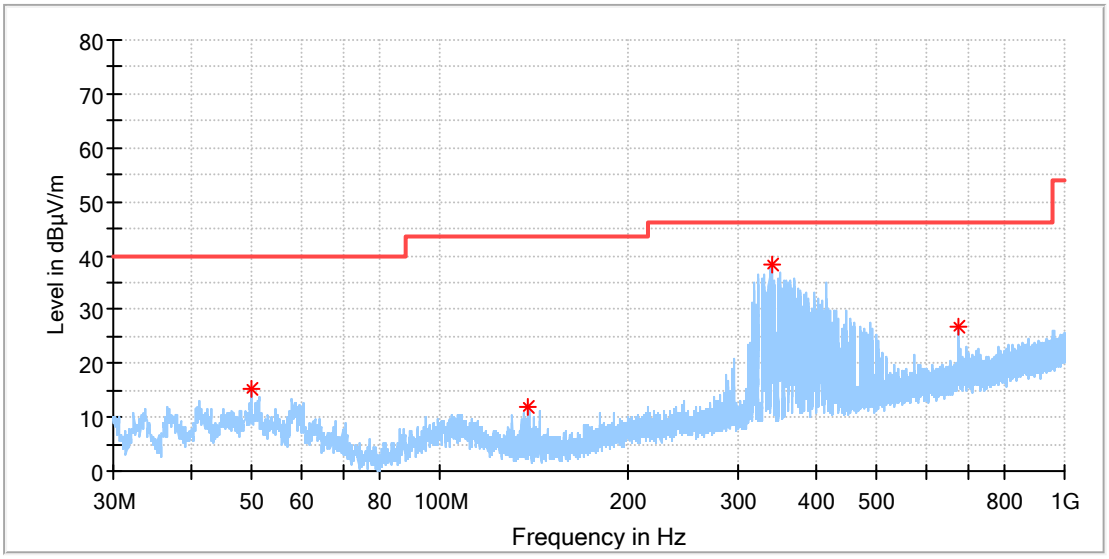
Appendix C.6: Test Results of Radiated Spurious Emissions

Note:
1) This testing was carried out on different modulations, but only the worst case was presented in this report.
2) Testing was carried out within frequency range 9kHz to the tenth harmonics. The measurement results below 30MHz and 18GHz - 26.5GHz were greater than 20dB below the limit, so only the radiated spurious emissions from 30MHz to 18GHz were reported.

30 MHz to 1GHz

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	A003731935-034
Test Voltage::	Battery
Remark:	Temp 24 Humi:50%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

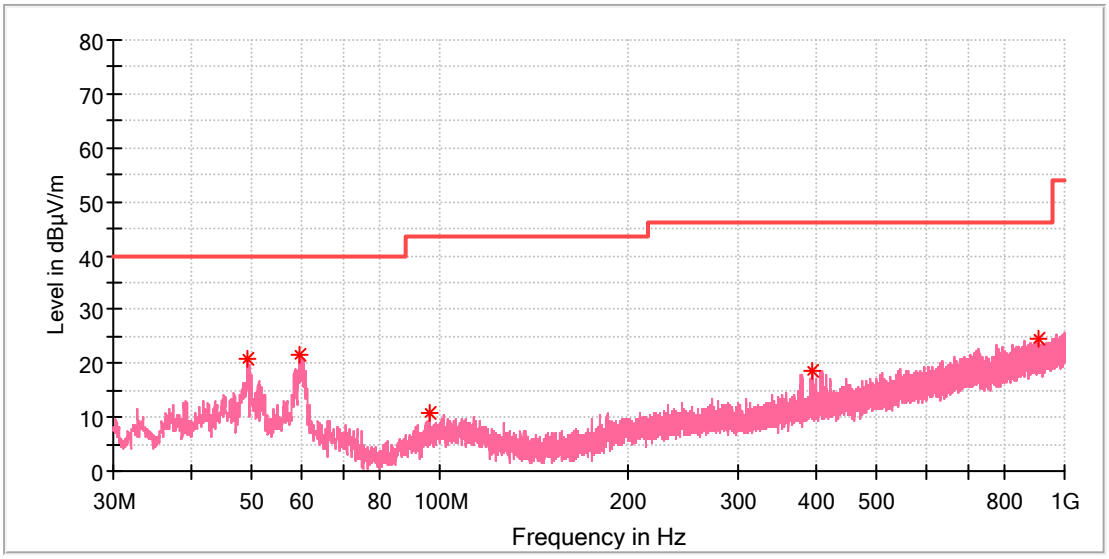


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
49.996923	15.17	40.00	24.83	100.0	H	344.0	-18.6
138.751923	11.90	43.50	31.60	100.0	H	258.0	-22.5
341.220769	38.43	46.00	7.57	100.0	H	71.0	-15.4
678.034615	26.63	46.00	19.37	100.0	H	71.0	-8.8

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	A003731935-034
Test Voltage::	Battery
Remark:	Temp 24 Humi:50%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



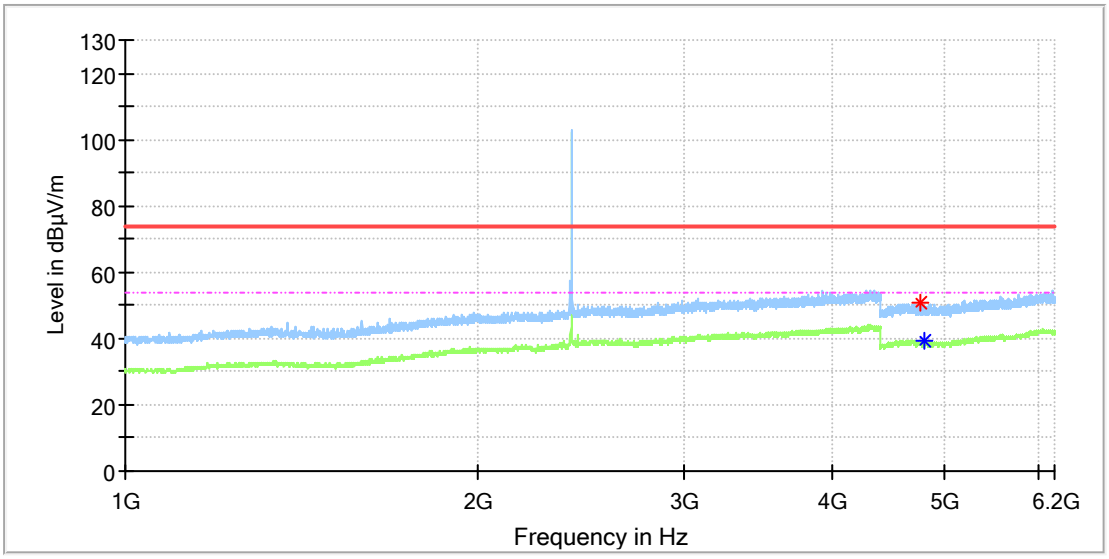
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
49.138846	20.91	40.00	19.09	100.0	V	227.0	-18.6
59.510385	21.51	40.00	18.49	100.0	V	180.0	-19.2
96.519615	10.63	43.50	32.87	100.0	V	307.0	-19.8
394.608077	18.70	46.00	27.30	100.0	V	307.0	-14.2
906.581539	24.47	46.00	21.53	100.0	V	79.0	-5.4

1GHz-18GHz
Note: The highest waveform in the figure is Bluetooth Fundamental.

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 1M_Low channel
Order No/Sample No:	A003731935-034
Test Voltage::	Battery
Remark:	Temp 22 Humi:52%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

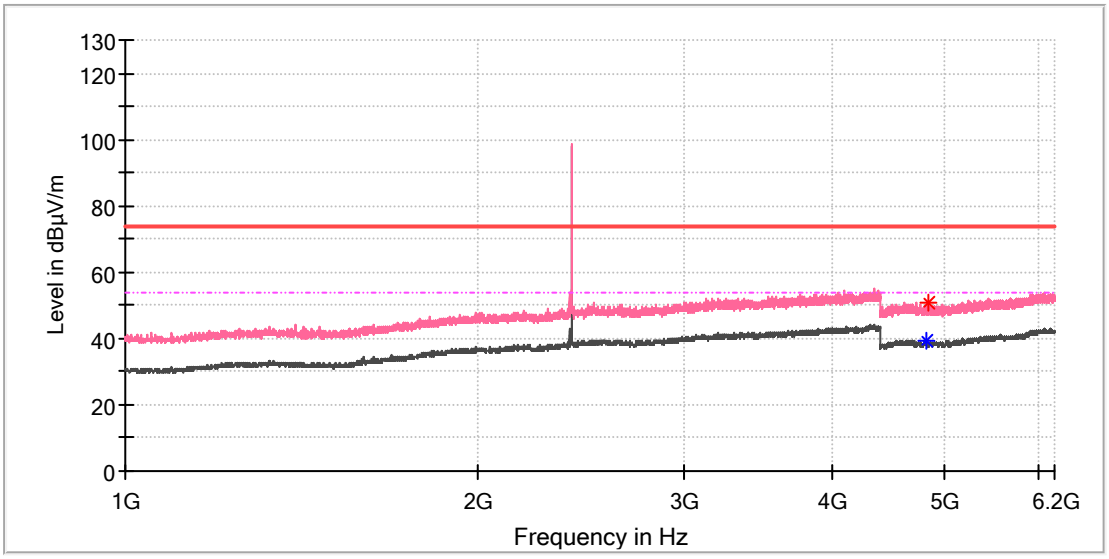


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4763.000000	50.78	---	74.00	23.22	150.0	H	287.0	11.8
4804.000000	---	39.21	54.00	14.79	150.0	H	281.0	11.8

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 1M_Low channel
Order No/Sample No:	A003731935-034
Test Voltage::	Battery
Remark:	Temp 22 Humi:52%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

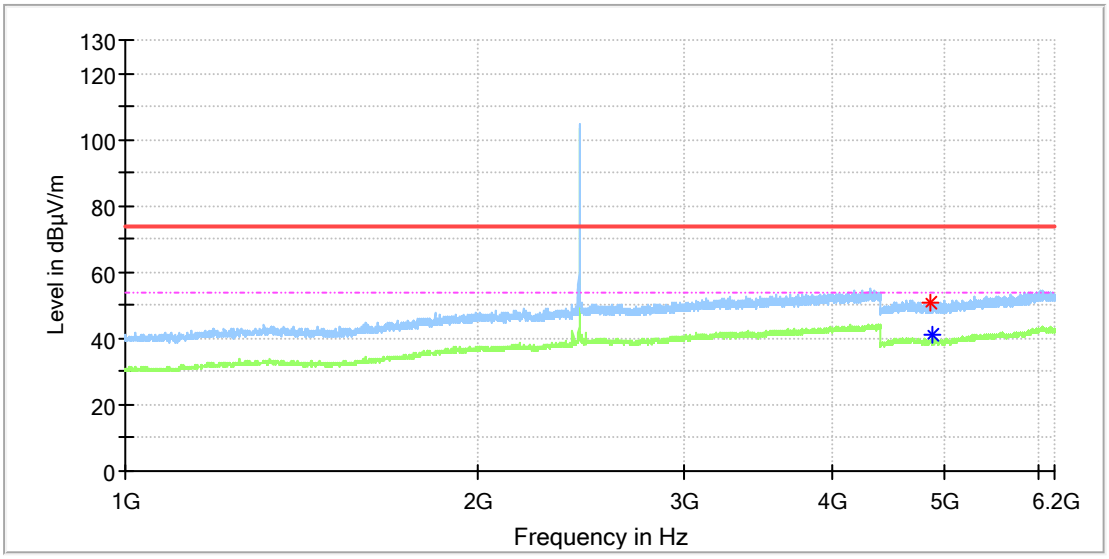


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4815.000000	---	39.40	54.00	14.60	150.0	V	43.0	11.8
4832.000000	50.50	---	74.00	23.50	150.0	V	272.0	11.8

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	A003731935-034
Test Voltage::	Battery
Remark:	Temp 24 Humi:50%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

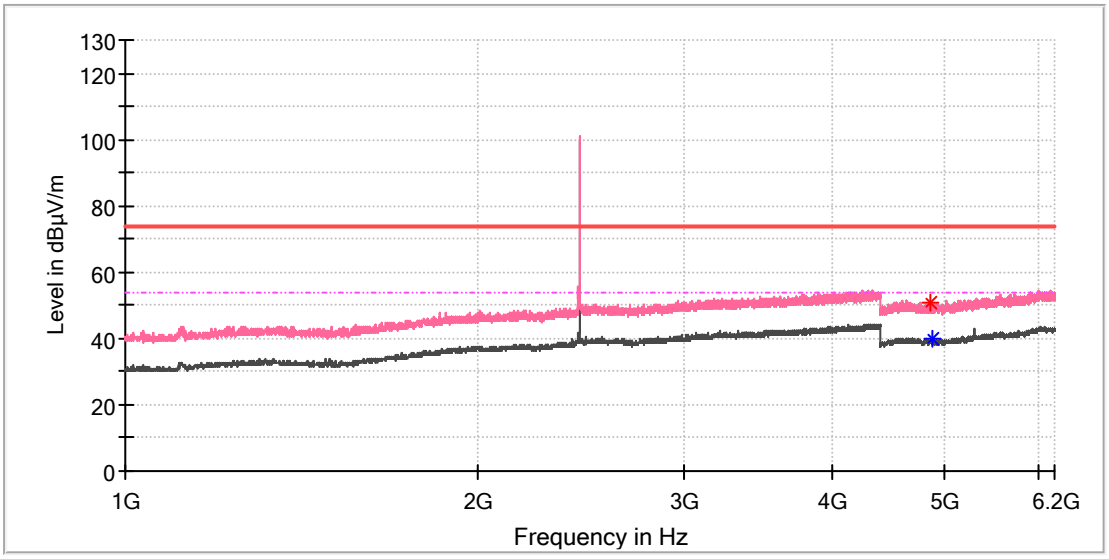


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4866.000000	51.05	---	74.00	22.95	150.0	H	180.0	11.8
4880.000000	---	41.29	54.00	12.72	150.0	H	339.0	11.8

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	A003731935-034
Test Voltage::	Battery
Remark:	Temp 24 Humi:50%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

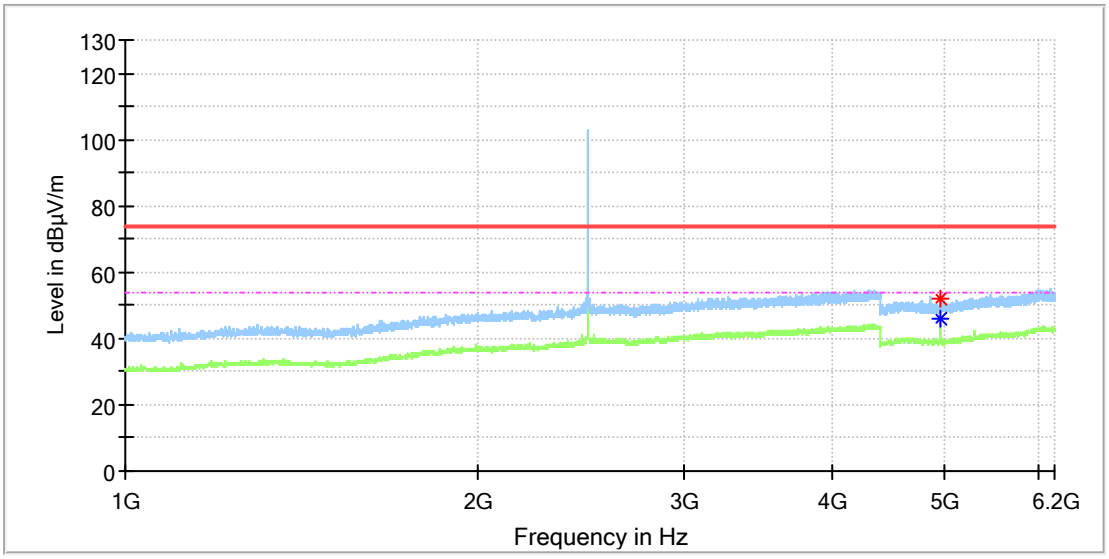


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4859.000000	50.77	---	74.00	23.23	150.0	V	32.0	11.8
4871.500000	---	39.91	54.00	14.09	150.0	V	142.0	11.8

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 1M_High channel
Order No/Sample No:	A003731935-034
Test Voltage::	Battery
Remark:	Temp 24 Humi:50%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

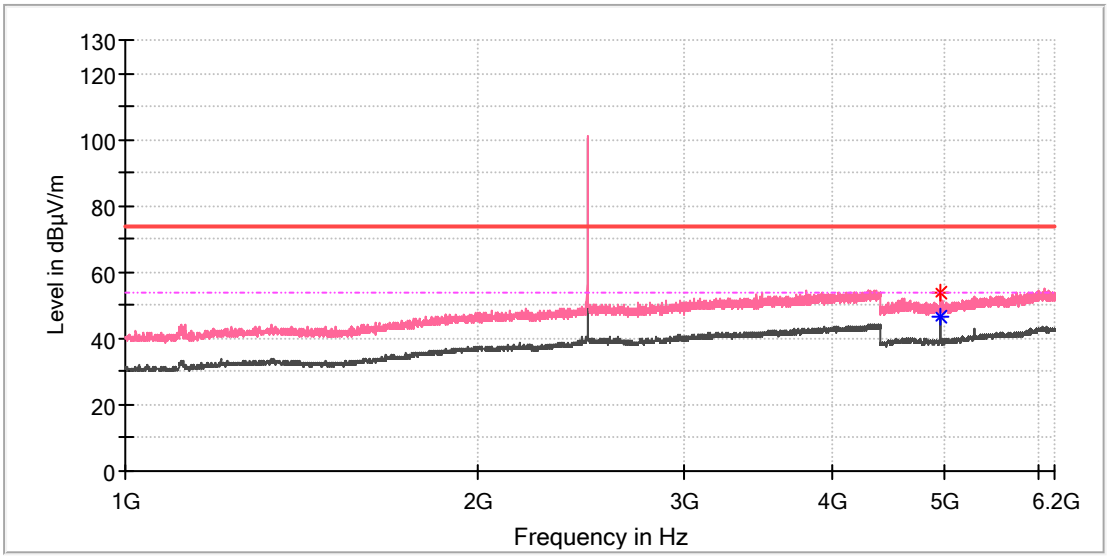


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4960.000000	51.86	---	74.00	22.14	150.0	H	169.0	11.8
4960.000000	---	45.79	54.00	8.21	150.0	H	169.0	11.8

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 1M_High channel
Order No/Sample No:	A003731935-034
Test Voltage::	Battery
Remark:	Temp 24 Humi:50%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

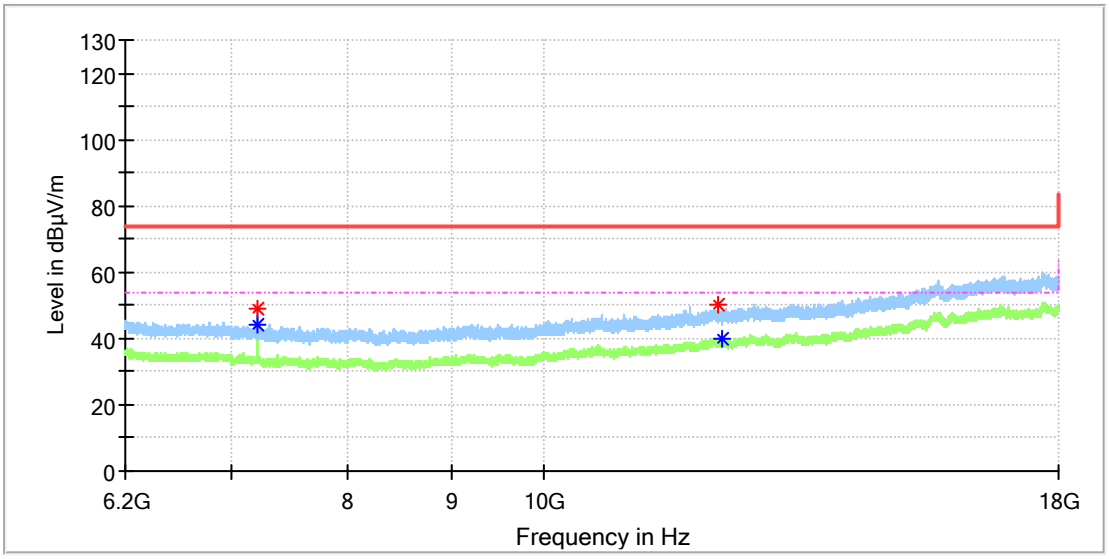


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4959.500000	54.05	---	74.00	19.95	150.0	V	124.0	11.8
4960.000000	---	46.83	54.00	7.17	150.0	V	124.0	11.8

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 1M_Low channel
Order No/Sample No:	A003731935-034
Test Voltage::	Battery
Remark:	Temp 24 Humi:50%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

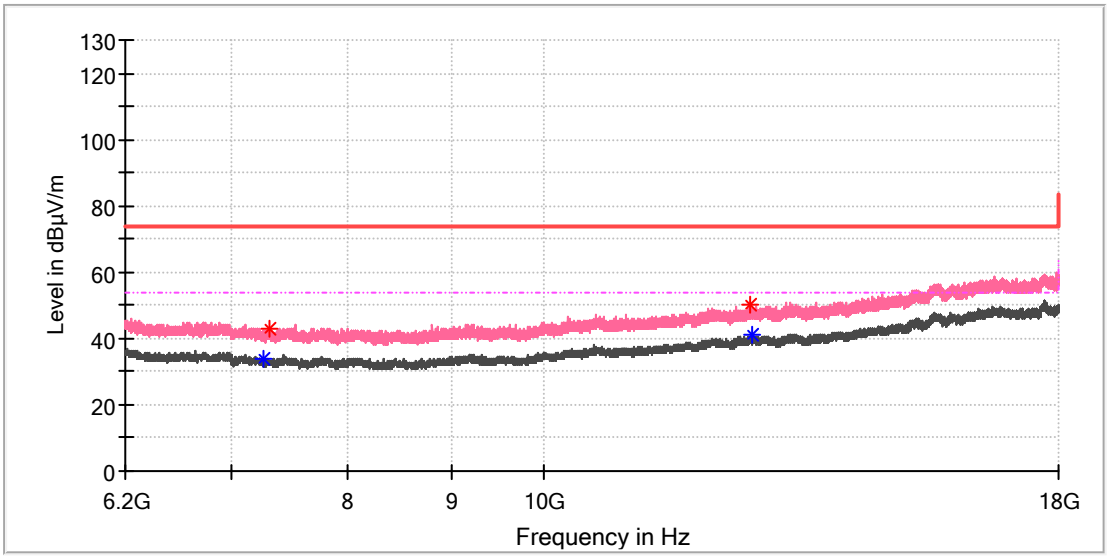


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7204.966667	49.06	---	74.00	24.94	150.0	H	186.0	8.8
7205.458333	---	44.28	54.00	9.72	150.0	H	174.0	8.8
12192.433333	49.91	---	74.00	24.09	150.0	H	51.0	14.6
12256.841667	---	39.88	54.00	14.12	150.0	H	114.0	14.8

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 1M_Low channel
Order No/Sample No:	A003731935-034
Test Voltage::	Battery
Remark:	Temp 24 Humi:50%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

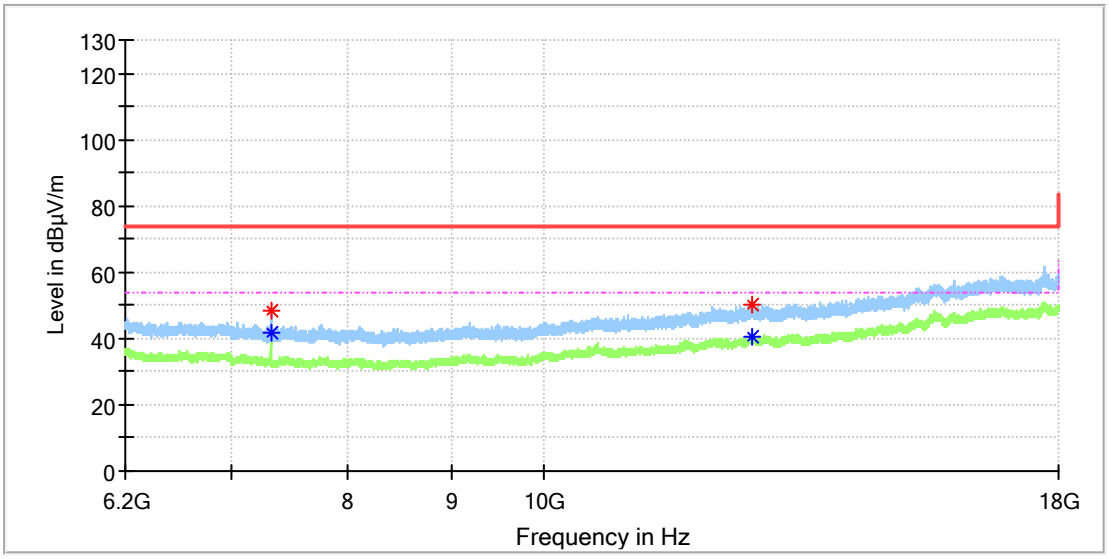


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7256.100000	---	34.04	54.00	19.96	150.0	V	16.0	8.5
7311.166667	43.18	---	74.00	30.82	150.0	V	101.0	8.2
12646.733333	50.48	---	74.00	23.52	150.0	V	0.0	15.0
12676.725000	---	41.15	54.00	12.85	150.0	V	115.0	15.1

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	A003731935-034
Test Voltage::	Battery
Remark:	Temp 24 Humi:50%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

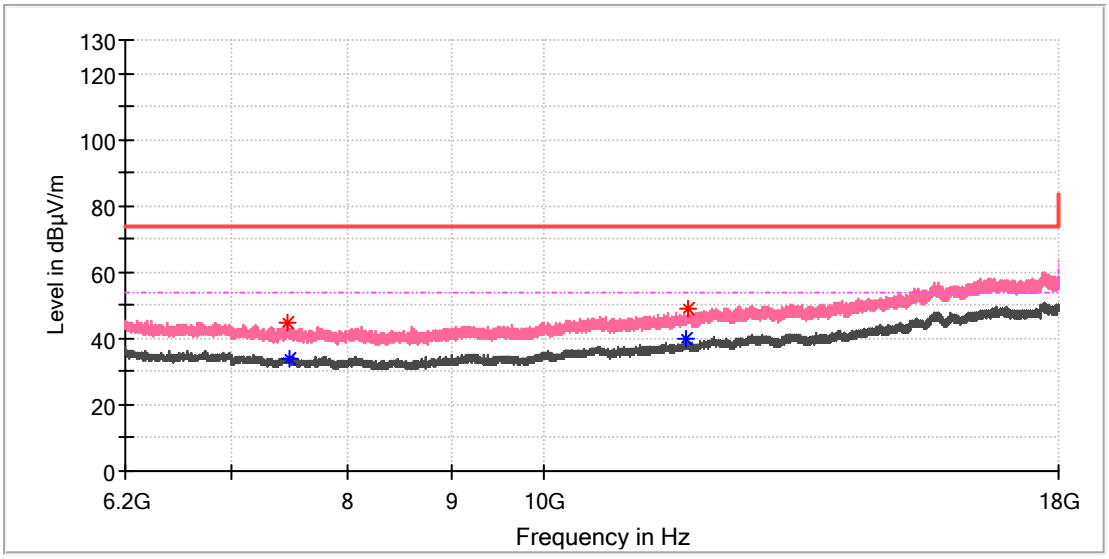


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7319.525000	48.50	---	74.00	25.50	150.0	H	190.0	8.2
7319.525000	---	41.96	54.00	12.04	150.0	H	190.0	8.2
12677.216667	---	40.78	54.00	13.22	150.0	H	190.0	15.1
12695.900000	50.43	---	74.00	23.57	150.0	H	317.0	15.1

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	A003731935-034
Test Voltage::	Battery
Remark:	Temp 24 Humi:50%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

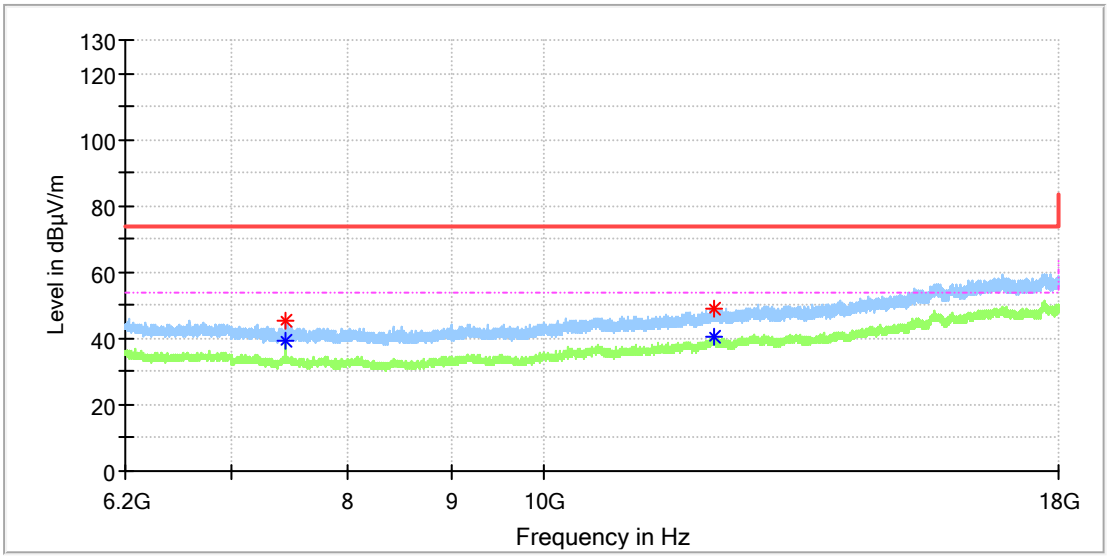


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7460.633333	44.77	---	74.00	29.23	150.0	V	322.0	8.5
7472.433333	---	34.15	54.00	19.85	150.0	V	47.0	8.6
11766.158333	---	39.62	54.00	14.38	150.0	V	299.0	13.4
11786.316667	49.18	---	74.00	24.82	150.0	V	155.0	13.4

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 1M_High channel
Order No/Sample No:	A003731935-034
Test Voltage::	Battery
Remark:	Temp 24 Humi:50%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

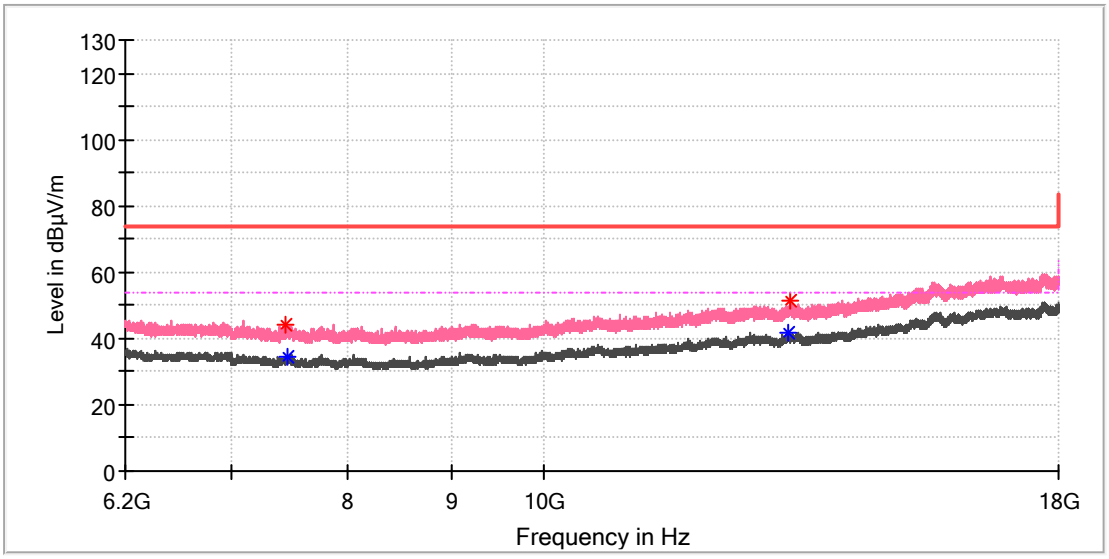


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7439.000000	45.07	---	74.00	28.93	150.0	H	192.0	8.4
7439.983333	---	39.37	54.00	14.63	150.0	H	205.0	8.4
12141.300000	---	40.28	54.00	13.72	150.0	H	169.0	14.4
12144.741667	48.96	---	74.00	25.04	150.0	H	181.0	14.4

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 1M_High channel
Order No/Sample No:	A003731935-034
Test Voltage::	Battery
Remark:	Temp 24 Humi:50%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



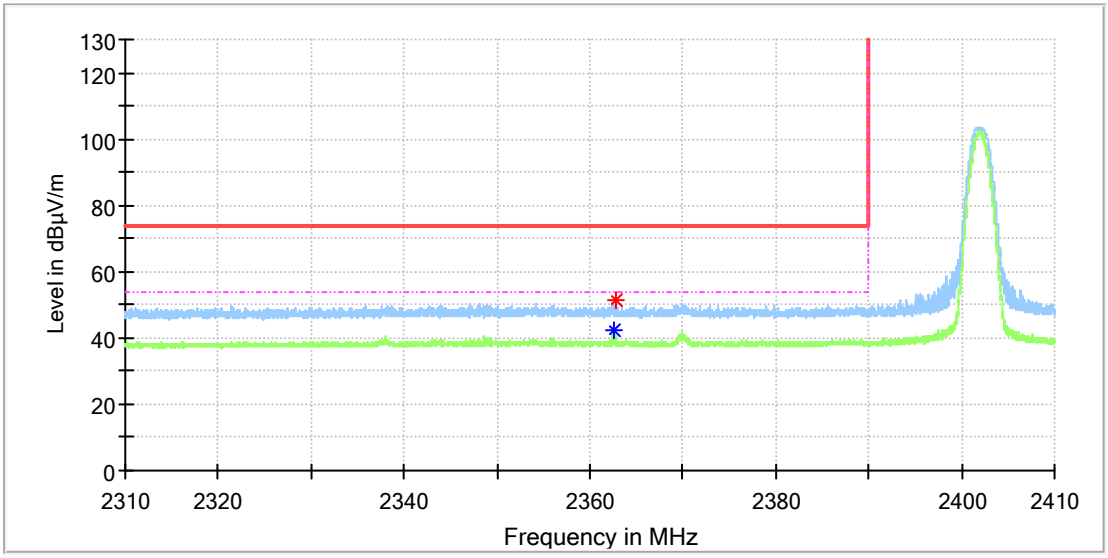
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7439.983333	43.93	---	74.00	30.07	150.0	V	142.0	8.4
7458.175000	---	34.53	54.00	19.47	150.0	V	337.0	8.5
13229.358333	---	41.56	54.00	12.44	150.0	V	166.0	15.5
13247.058333	51.20	---	74.00	22.80	150.0	V	23.0	15.5

Appendix C.7: Test Results of Radiated Emissions in Restricted Bands

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 1M_Low channel
Order No/Sample No:	A003731935-034
Test Voltage::	Battery
Remark:	Temp 24 Humi:50%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

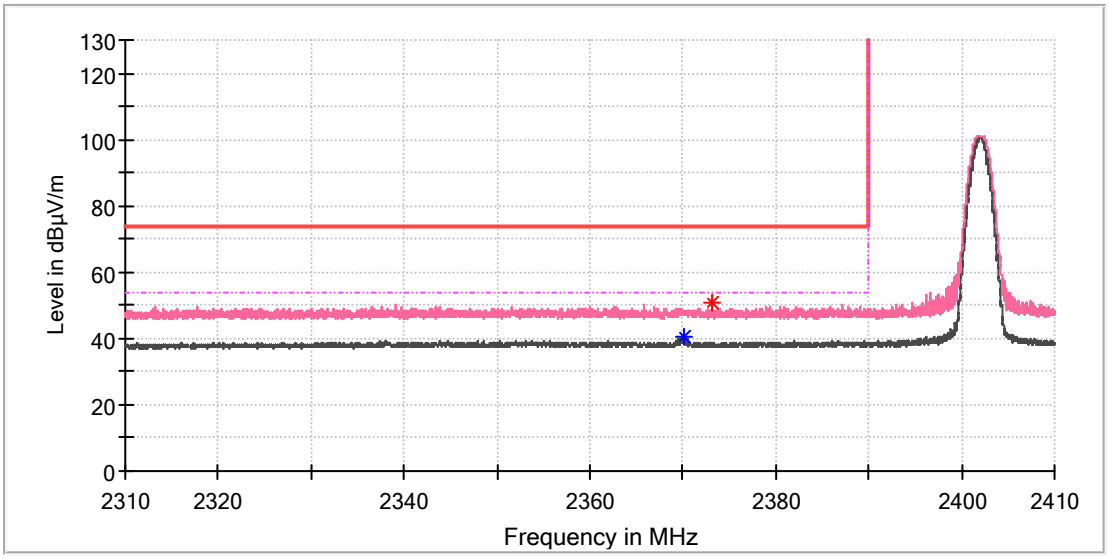


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2362.691177	---	42.08	54.00	11.92	150.0	H	18.0	6.9
2362.779412	51.10	---	74.00	22.90	150.0	H	18.0	6.9

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 1M_Low channel
Order No/Sample No:	A003731935-034
Test Voltage::	Battery
Remark:	Temp 24 Humi:50%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

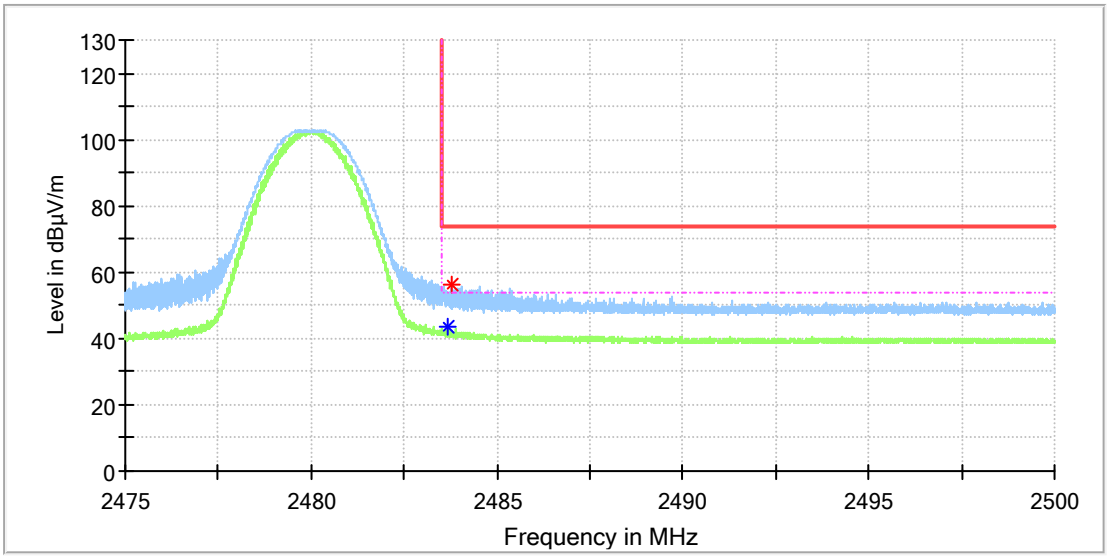


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2370.176471	---	40.49	54.00	13.51	150.0	V	197.0	6.9
2373.073529	50.52	---	74.00	23.48	150.0	V	72.0	6.9

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 1M_High channel
Order No/Sample No:	A003731935-034
Test Voltage::	Battery
Remark:	Temp 24 Humi:50%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

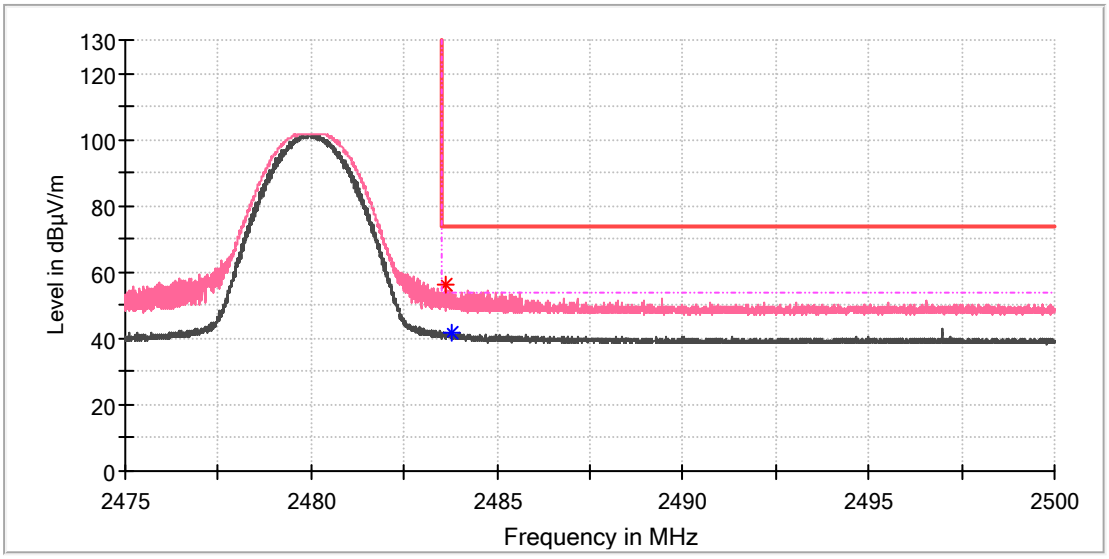


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.669118	---	43.65	54.00	10.35	150.0	H	308.0	7.4
2483.786765	56.42	---	74.00	17.58	150.0	H	315.0	7.4

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 1M_High channel
Order No/Sample No:	A003731935-034
Test Voltage::	Battery
Remark:	Temp 24 Humi:50%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

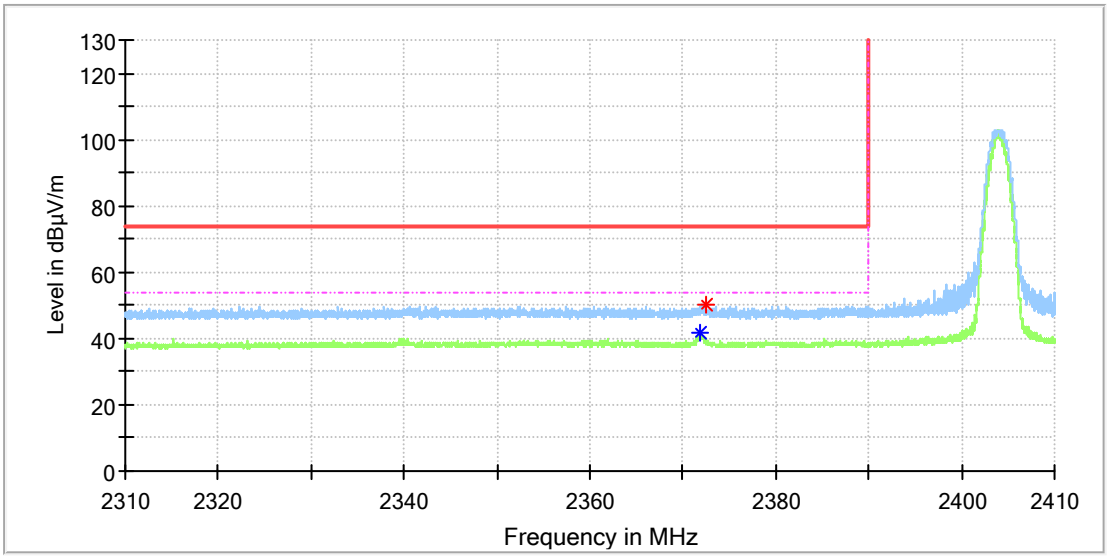


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.610294	56.19	---	74.00	17.81	150.0	V	356.0	7.4
2483.764706	---	41.93	54.00	12.07	150.0	V	351.0	7.4

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 2M_Low channel
Order No/Sample No:	A003731935-034
Test Voltage::	Battery
Remark:	Temp 24 Humi:50%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

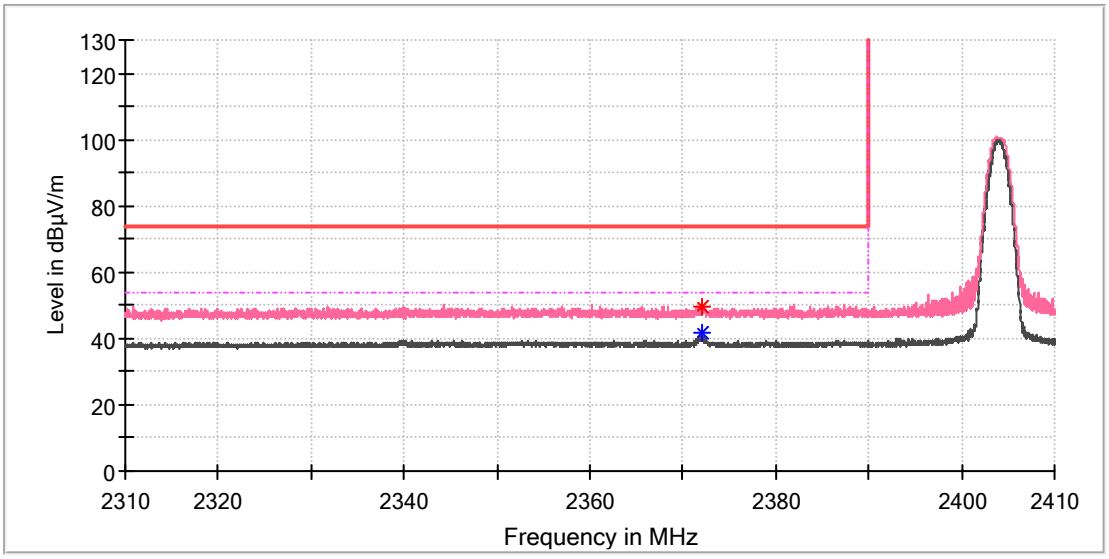


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2371.882353	---	41.64	54.00	12.36	150.0	H	160.0	6.9
2372.455882	50.31	---	74.00	23.69	150.0	H	160.0	6.9

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 2M_Low channel
Order No/Sample No:	A003731935-034
Test Voltage::	Battery
Remark:	Temp 24 Humi:50%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

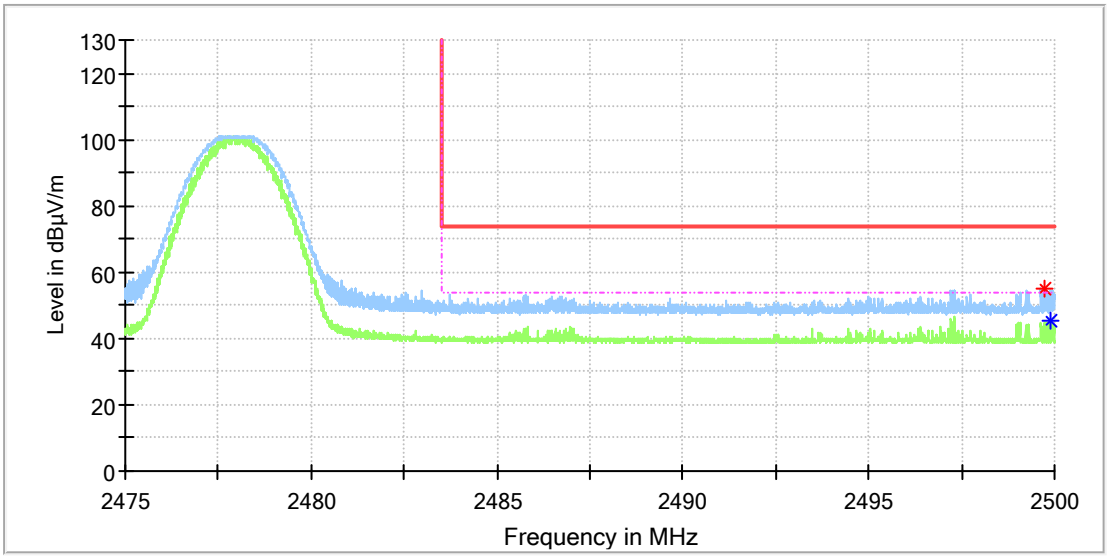


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2371.970588	49.74	---	74.00	24.26	150.0	V	205.0	6.9
2372.058824	---	41.81	54.00	12.19	150.0	V	282.0	6.9

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 2M_High channel
Order No/Sample No:	A003731935-034
Test Voltage::	Battery
Remark:	Temp 24 Humi:50%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

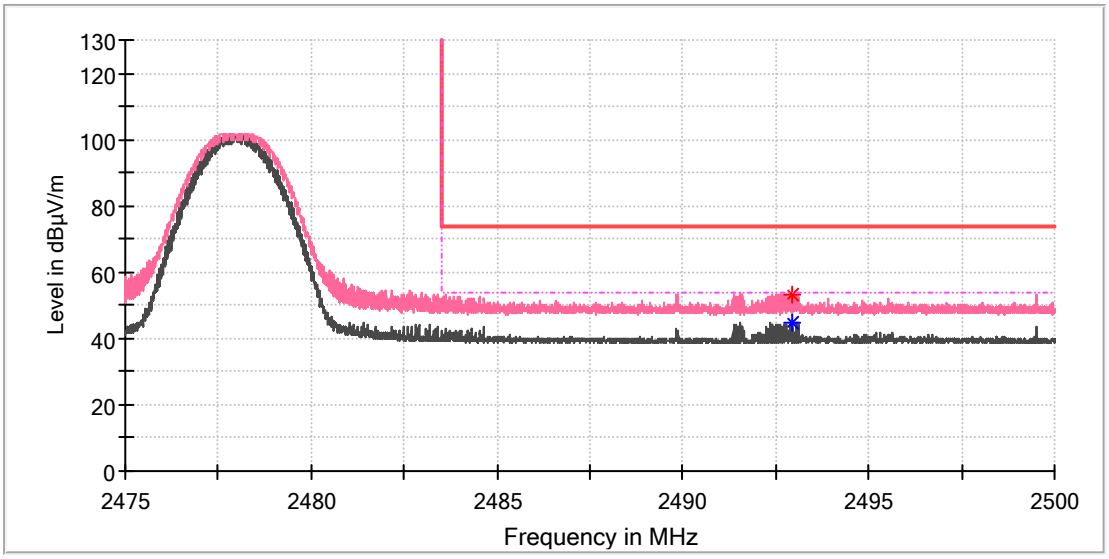


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2499.757353	54.94	---	74.00	19.06	150.0	H	285.0	7.4
2499.871324	---	45.18	54.00	8.82	150.0	H	285.0	7.4

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	TUNE BEAM 2
Test Mode:	BLE 2M_High channel
Order No/Sample No:	A003731935-034
Test Voltage::	Battery
Remark:	Temp 24 Humi:50%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2492.948529	53.43	---	74.00	20.57	150.0	V	169.0	7.4
2492.948529	---	44.70	54.00	9.30	150.0	V	169.0	7.4