

Prüfbericht-Nr.: Test report no.:	CN22CQQL 001	Auftrags-Nr.: Order no.:	168395327	Seite 1 von 23 Page 1 of 23
Kunden-Referenz-Nr.: Client reference no.:	N/A	Auftragsdatum: Order date:	2022-10-21	
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.:	QUANTUM TWS AIR (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 2 February 2017 RSS-Gen Issue 5 March 2019			
Wareneingangsdatum: Date of receipt:	2022-10-20	Refer to photos document		
Prüfmuster-Nr.: Test sample No.:	A003358854			
Prüfzeitraum: Testing period:	2022-10-26 – 2022-11-03			
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:			genehmigt von: authorized by:	
Datum: Date:	2022-11-11		Ausstellungsdatum: Issue date:	2022-12-07
	Signed by: Alex Lan		Signed by: Winnie Hou	
Stellung / Position	Assistant Project Manager		Stellung / Position	Department Manager
Sonstiges / Other:	FCC ID: APIJBLQTWSAIR IC: 6132A-JBLQTWSAIR HVIN: QTWSAIRL, QTWSAIRR			
Zustand des Prüfgegenstandes bei Anlieferung: Condition of the test item at delivery:	Prüfmuster vollständig und unbeschädigt Test item complete and undamaged:			
* Legende:	1 = sehr gut P(ass) = entspricht o.g. Prüfgrundlage(n)	2 = gut F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	3 = befriedigend N/A = nicht anwendbar	4 = ausreichend N/T = nicht getestet
Legend:	1 = very good P(ass) = passed a.m. test specifications(s)	2 = good F(ail) = failed a.m. test specifications(s)	3 = satisfactory N/A = not applicable	4 = sufficient 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. <i>This test report only relates to the a. m. 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.</i>				

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Test Summary

5.1.1 ANTENNA REQUIREMENT

RESULT: Pass

5.1.2 MAXIMUM CONDUCTED OUTPUT POWER

RESULT: Pass

5.1.3 99% BANDWIDTH

RESULT: Pass

5.1.4 CONDUCTED SPURIOUS EMISSIONS MEASURED IN 100 KHz BANDWIDTH

RESULT: Pass

5.1.5 RADIATED SPURIOUS EMISSION

RESULT: Pass

5.1.6 20dB BANDWIDTH

RESULT: Pass

5.1.7 CARRIER FREQUENCY SEPARATION

RESULT: Pass

5.1.8 FREQUENCY STABILITY

RESULT: Pass

5.1.9 NUMBER OF HOPPING FREQUENCY

RESULT: Pass

5.1.10 TIME OF OCCUPANCY

RESULT: Pass

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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 B: Test Results of right earbud.

2 Test Sites

2.1 Test Facilities

TÜV Rheinland (Shenzhen) Co., Ltd.

No. 362 Huanguan Road Middle, Longhua District, Shenzhen 518110, People's Republic of China

FCC Registration No.: 694916

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

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2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Radio Spectrum				
Description	Manufacturer	Model	Serial No.	Calibrated until
EXA Signal Analyzer, Multi-touch	Keysight	N9010B	MY60241175	2023-09-27
MXG X-Series RF Vector Signal Generator	Keysight	N5182B	MY61250137	2023-09-27
EXG X-Series Microwave Analog Signal Generator	Keysight	N5173B	MY61250141	2023-09-27
DC Power Supply	Keysight	E3642A	MY61276100	2023-09-27
Wireless Connectivity Tester	R&S	CMW270	102505	2023-09-27
Power Control Unit	Tonscend	JS0806-4ADC	N/A	2023-09-27
Automation Control Unit	Tonscend	JS0806-2	21C8060396	2023-09-27
Test Software	Tonscend	JS1120-3	N/A	N/A
Control PC	Lenovo	TianYi510S-071MB	YLX23JMF	N/A
Radiated Spurious Emissions				
Description	Manufacturer	Model	Serial No.	Calibrated until
EMI Test Receiver	R&S	ESR 7	102021	2023-08-02
Signal Analyzer	R&S	FSV 40	101439	2023-08-01
System Controller Interface	R&S	SCI-100	S10010038	N/A
Filterbank	R&S	Wlan	100759	2023-08-01
OSP	R&S	OSP 120	102040	N/A
Pre-amplifier	R&S	SCU08F1	08320031	2023-08-02
Amplifier	R&S	SCU-18F	180070	2023-08-02
Amplifier	R&S	SCU40A	100475	2023-08-02
Trilog Broadband Antenna (30 MHz - 7 GHz)	Schwarzbeck	VULB 9162	193	2024-08-06
Double-Ridged Antenna (1 -18 GHz)	ETS-LINDGREN	3117	00218717	2024-08-06
Wideband Ridged Horn Antenna (18-40 GHz)	Steatite	QMS-00880	19067	2022-09-08
Active Loop Antenna	Schwarzbeck	FMZB 1513	302	2024-08-06
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	2024-06-22

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 basis 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	$\pm 2.08 \%$
RF output power, conducted	$\pm 0.99 \text{ dB}$
RF power density, conducted	$\pm 0.99 \text{ dB}$
Unwanted Emissions, conducted	$\pm 0.89 \text{ dB}$
All emissions, radiated	$\pm 4.17 \text{ dB}$
Conducted Emission, (9kHz to 150kHz)/(150kHz to 30MHz)	$\pm 3.70 \text{ dB} / \pm 3.30 \text{ dB}$

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 Road Middle, Longhua District, Shenzhen 518110, People's Republic of China 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 EUTs are Bluetooth earbuds, which supports Bluetooth dual mode technology.

There is no difference except the PCB layout of left and right earbuds.

For details refer to the User Manual, Technical Description 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	QUANTUM TWS AIR
Trademark	JBL
FCC ID	APIJBLQTWSAIR
IC	6132A-JBLQTWSAIR
HVIN	QTWSAIRL, QTWSAIRR
Extreme Temperature Range	-10°C to +45°C
Operating Voltage	DC 3.85, 50mAh, 0.1925Wh via built-in Li-ion cell battery DC 5V, 100mA via charging case for charging
Technical Specification of Classical Bluetooth	
Bluetooth Core Version	Bluetooth 5.2
Operating Frequency band	2402 ~ 2480 MHz
Channel Number	79 channels
Channel separation	1MHz
Modulation	GFSK, $\pi/4$ DQPSK
Antenna Type	PIFA LDS antenna
Antenna Gain	-2.21 dBi for left earbud -3.71 dBi for right earbud
Technical Specification of Bluetooth Low Energy	
Bluetooth Core Version	Bluetooth 5.2
Operating Frequency band	2402 ~ 2480 MHz
Channel Number	40 channels
Channel separation	2MHz
Data rate	1Mbps, 2Mbps
Modulation	GFSK
Antenna Type	PIFA LDS antenna
Antenna Gain	-2.21 dBi for left earbud -3.71 dBi for right earbud

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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
 - 1. Bluetooth transmitting mode (BDR & EDR mode)
 - a) Low Channel
 - b) Middle Channel
 - c) High Channel
- B. On, Transmitting on Hopping channel
- C. Off

3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

3.5 Submitted Documents

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

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 QUANTUM TWS AIR with left & right earbuds.

4.3 Special Accessories and Auxiliary Equipment

Table 5: List of Accessories and Auxiliary Equipment

Description	Manufacturer	Model	S/N or Rating
Laptop	Lenovo	ThinkPad T14	10Q67059

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)

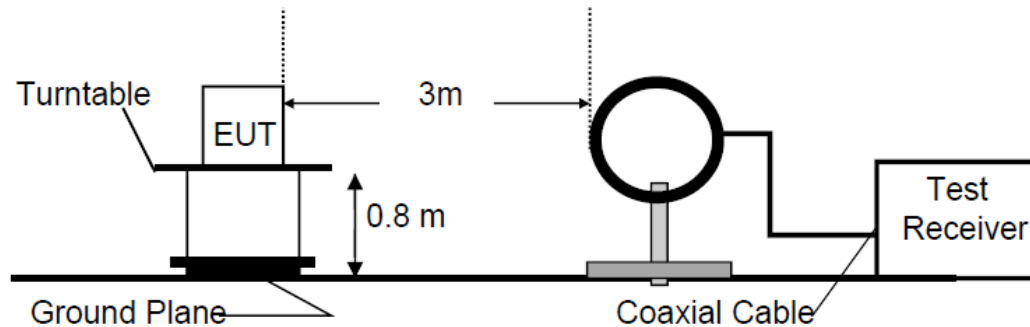


Diagram of Measurement Configuration for Radiation Test (Below 1GHz)

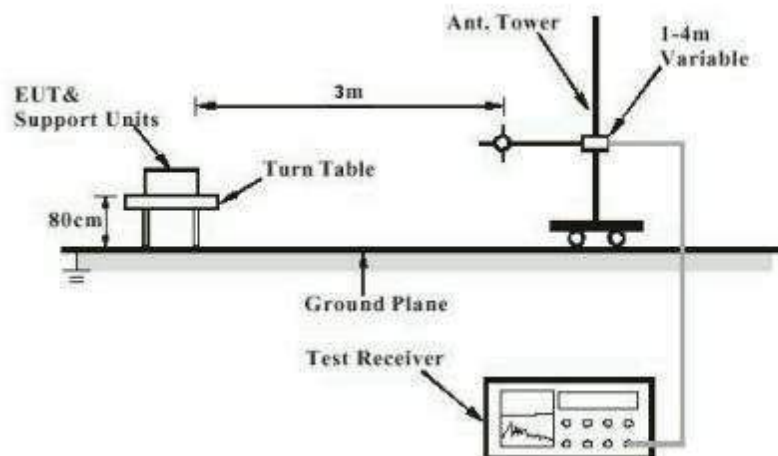
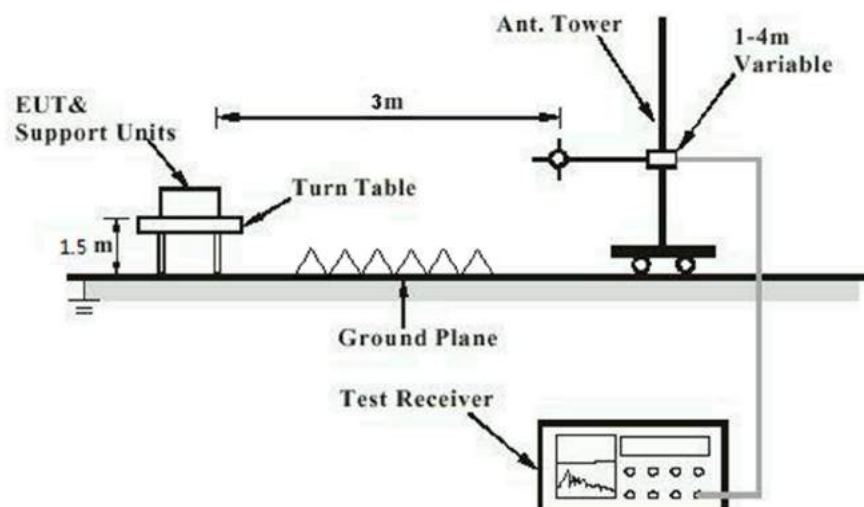


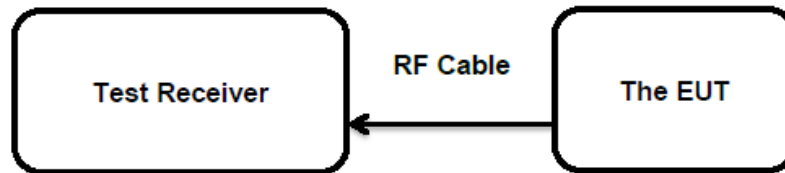
Diagram of Measurement Configuration for Radiation Test (Above 1GHz)



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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 8.3

According to the manufacturer declared, the EUT has one integral antenna, the directional gain of antennas are -2.21 dBi for left earbud & -3.71 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.

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5.1.2 Maximum Conducted Output Power

RESULT:

Pass

Test Specification

Test standard	FCC Part 15.247(b)(1) RSS-247 Clause 5.4(b)
Basic standard	ANSI C63.10: 2013
Limits	FHSS<0.125W(Maximum peak conducted output power) < 4 W (e.i.r.p.)
Kind of test site	Shielded Room

Test Setup

Date of testing	2022-11-01
Input voltage	DC 3.85V
Operation mode	A.1
Test channel	Low / Middle / High
Ambient temperature	24.4 °C
Relative humidity	61 %
Atmospheric pressure	101 kPa

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

Test Mode	Channel Frequency (MHz)	Measured Peak Output Power		Limit (W)
		(dBm)	(W)	
BDR	2402	10.53	0.01130	< 0.125
	2441	10.19	0.01045	
	2480	10.12	0.01028	
EDR	2402	10.51	0.01125	< 0.125
	2441	10.33	0.01079	
	2480	10.25	0.01059	

Note: The cable loss is taken into account in results and the maximum e.i.r.p. is 8.32 dBm less than 4W(36dBm).

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

Test Mode	Channel Frequency (MHz)	Measured Peak Output Power		Limit (W)
		(dBm)	(W)	
BDR	2402	10.68	0.01169	< 0.125
	2441	10.40	0.01096	
	2480	10.27	0.01064	
EDR	2402	10.65	0.01161	< 0.125
	2441	10.39	0.01094	
	2480	10.25	0.01059	

Note: The cable loss is taken into account in results and the maximum e.i.r.p. is 6.97 dBm less than 4W(36dBm).

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5.1.3 99% 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 : 2022-11-01
Input voltage : DC 3.85V
Operation mode : A.1
Test channel : Low / Middle / High
Ambient temperature : 24.4 °C
Relative humidity : 61 %
Atmospheric pressure : 101 kPa

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

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

Test Mode	Channel Frequency (MHz)	Measured 99% Bandwidth	Limit
		(MHz)	
BDR	2402	0.85742	/
	2441	0.86285	
	2480	0.87297	
EDR	2402	1.1869	/
	2441	1.1876	
	2480	1.1829	

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

Test Mode	Channel Frequency (MHz)	Measured 99% Bandwidth	Limit
		(MHz)	
BDR	2402	0.88557	/
	2441	0.88635	
	2480	0.88033	
EDR	2402	1.1999	/
	2441	1.1988	
	2480	1.2046	

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

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5.1.4 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);
Kind of test site	: Shielded Room

Test Setup

Date of testing	: 2022-11-01
Input voltage	: DC 3.85V
Operation mode	: A.1
Test channel	: Low / Middle / High
Ambient temperature	: 24.4 °C
Relative humidity	: 61 %
Atmospheric pressure	: 101 kPa

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

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

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5.1.5 Radiated Spurious Emission

RESULT:

Pass

Test Specification

Test standard	: FCC Part 15.247(d) & FCC Part 15.205 RSS-247 Clause 3.3
Basic standard	: ANSI C63.10: 2013
Limits	: Refer to 15.209(a) of FCC part 15.247(d) RSS-Gen Table 6 & Table 7
Kind of test site	: 3m Semi-anechoic Chamber

Test Setup

Date of testing	: 2022-11-03
Input voltage	: DC 3.85V
Operation mode	: A.1
Test channel	: Low / Middle / High
Ambient temperature	: Refer to test result
Relative humidity	: Refer to test result
Atmospheric pressure	: 101 kPa

Remark:

During the pretest the EUT was rotated through three orthogonal axes to determine the attitude that maximizes the emissions. After that the EUT was manually handled to find the orientation that has the maximum emission, which is the orientation shown in the test set-up photos.

Testing was carried out within frequency range 9kHz to the tenth harmonics.

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

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5.1.6 20dB Bandwidth

RESULT:

Pass

Test Specification

Test standard : FCC Part 15.247(a)(1)
RSS-247 Clause 5.1(a)
Basic standard : ANSI C63.10: 2013
Kind of test site : Shielded Room

Test Setup

Date of testing : 2022-11-01
Input voltage : DC 3.85V
Operation mode : A.1
Test channel : Low / Middle / High
Ambient temperature : 24.4 °C
Relative humidity : 61 %
Atmospheric pressure : 101 kPa

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

Table 10: Test Result of -20dB Bandwidth, Left earbud

Test Mode	Channel Frequency (MHz)	20dB Bandwidth (kHz)	2/3 of 20dB Bandwidth (kHz)	Limit (MHz)
BDR	2402	942	628.000	/
	2441	930	620.000	
	2480	942	628.000	
EDR	2402	1266	844.000	/
	2441	1260	840.000	
	2480	1275	850.000	

Table 11: Test Result of -20dB Bandwidth, Right earbud

Test Mode	Channel Frequency (MHz)	20dB Bandwidth (kHz)	2/3 of 20dB Bandwidth (kHz)	Limit (MHz)
BDR	2402	942	628.000	/
	2441	945	630.000	
	2480	951	634.000	
EDR	2402	1269	846.000	/
	2441	1275	850.000	
	2480	1269	846.000	

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5.1.7 Carrier Frequency Separation

RESULT:

Pass

Test Specification

Test standard : FCC Part 15.247(a)(1)
RSS-247 Clause 5.1(b)
Basic standard : ANSI C63.10: 2013
Limits : $\geq 25\text{kHz}$ or $2/3$ of 20dB bandwidth, whichever is greater
Kind of test site : Shielded Room

Test Setup

Date of testing : 2022-11-01
Input voltage : DC 3.85V
Operation mode : B
Test channel : Low / Middle / High
Ambient temperature : $24.4\text{ }^{\circ}\text{C}$
Relative humidity : 61 %
Atmospheric pressure : 101 kPa

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

Table 12: Test Result of Carrier Frequency Separation, Left earbud

TestMode	Channel	Result[MHz]	Limit[MHz]	Verdict
BDR-DH5	Hop	0.786	≥ 0.632	PASS
EDR-2DH5	Hop	1	≥ 0.848	PASS

Note:

The limit is maximum $2/3$ of the 20 dB bandwidth: 850KHz .

Table 13: Test Result of Carrier Frequency Separation, Right earbud

TestMode	Channel	Result[MHz]	Limit[MHz]	Verdict
BDR-DH5	Hop	0.998	≥ 0.632	PASS
EDR-2DH5	Hop	1.012	≥ 0.848	PASS

Note:

The limit is maximum $2/3$ of the 20 dB bandwidth: 850KHz .

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Test report no.:

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5.1.8 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	: 2022-11-01
Input voltage	: DC 3.85V
Operation mode	: B
Ambient temperature	: 24.4 °C
Relative humidity	: 61 %
Atmospheric pressure	: 101 kPa

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

Prüfbericht - Nr.: CN22CQQL 001

Test report no.:

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5.1.9 Number of Hopping Frequency

RESULT:

Pass

Test Specification

Test standard : FCC part 15.247(a)(1)(iii)
RSS-247 Clause 5.1(d)
Basic standard : ANSI C63.10: 2013
Limits : ≥ 15 non-overlapping channels
Kind of test site : Shielded Room

Test Setup

Date of testing : 2022-11-01
Input voltage : DC 3.85V
Operation mode : B
Ambient temperature : 24.4 °C
Relative humidity : 61 %
Atmospheric pressure : 101 kPa

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

Table 14: Test Result of Number of Hopping Frequency

Frequency Range	Measured Quantity of Hopping Channel	Limit	Result
2402 to 2480 MHz	79	≥ 15	Pass

Table 15: Test Result of Number of Hopping Frequency, Right earbud

Frequency Range	Measured Quantity of Hopping Channel	Limit	Result
2402 to 2480 MHz	79	≥ 15	Pass

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Test report no.:

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5.1.10 Time of Occupancy

RESULT:

Pass

Test Specification

Test standard	: FCC part 15.247(a)(1)(iii) RSS-247 Clause 5.1(d)
Basic standard	: ANSI C63.10: 2013
Limits	: < 0.4s
Kind of test site	: Shielded Room

Test Setup

Date of testing	: 2022-11-01
Input voltage	: DC 3.85V
Operation mode	: B
Test channel	: Low / Middle / High
Ambient temperature	: 24.4 °C
Relative humidity	: 61 %
Atmospheric pressure	: 101 kPa

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.

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Appendix B: Test Results of Left earbud

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Appendix B.1: Test Results of 99% Bandwidth

TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.85742	2401.5696	2402.4270	---	---
		2441	0.86285	2440.5606	2441.4234	---	---
		2480	0.87297	2479.5586	2480.4316	---	---
3DH5	Ant1	2402	1.1869	2401.3949	2402.5818	---	---
		2441	1.1876	2440.3940	2441.5816	---	---
		2480	1.1829	2479.3961	2480.5790	---	---

DH5_Ant1_2402



DH5_Ant1_2441



DH5_Ant1_2480



3DH5_Ant1_2402



3DH5_Ant1_2441





Appendix B.2: Test Results of 20dB Bandwidth

TestMode	Antenna	Channel	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.942	2401.529	2402.471	---	---
		2441	0.930	2440.544	2441.474	---	---
		2480	0.942	2479.529	2480.471	---	---
3DH5	Ant1	2402	1.266	2401.349	2402.615	---	---
		2441	1.260	2440.352	2441.612	---	---
		2480	1.275	2479.346	2480.621	---	---

DH5_Ant1_2402



DH5_Ant1_2441



DH5_Ant1_2480



3DH5_Ant1_2402



3DH5_Ant1_2441





Appendix B.3: 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	2401.994	6	2.497918	10
DC 3.85V	2401.990	10	4.163197	
DC 4.235	2401.988	12	4.995837	

Test result of frequency tolerance of temperature variation

Temperature (°C)	Test result (KHz)	Deviation Frequency (KHz)	Test result (ppm)	Limit (ppm)
-30	2401.986	14	5.828476	10
-20	2401.990	10	4.163197	
-10	2401.994	6	2.497918	
0	2401.985	10	4.163197	
10	2401.993	7	2.914238	
20	2401.990	10	4.163197	
30	2401.988	12	4.995837	
40	2401.994	6	2.497918	
50	2401.995	5	2.081599	
55	2401.994	6	2.497918	

Test Channel (MHz)	2441
-----------------------	------

Test result of frequency tolerance of voltage variation

Voltage	Test result (MHz)	Deviation Frequency (KHz)	Test result (ppm)	Limit (ppm)
DC 3.465V	2440.990	-10	-4.09668	10
DC 3.85V	2440.986	-14	-5.73535	
DC 4.235	2440.987	-13	-5.32569	

Test result of frequency tolerance of temperature variation

Temperature (°C)	Test result (KHz)	Deviation Frequency (KHz)	Test result (ppm)	Limit (ppm)
-30	2440.991	-9	-3.68701	10
-20	2440.995	-5	-2.04834	
-10	2440.995	-5	-2.04834	
0	2440.992	-8	-3.27735	
10	2440.993	-7	-2.86768	
20	2440.994	-6	-2.45801	
30	2440.989	-11	-4.50635	
40	2440.987	-13	-5.32569	
50	2440.991	-9	-3.68701	
55	2440.995	-5	-2.04834	

Test Channel (MHz)	2480
--------------------	------

Test result of frequency tolerance of voltage variation

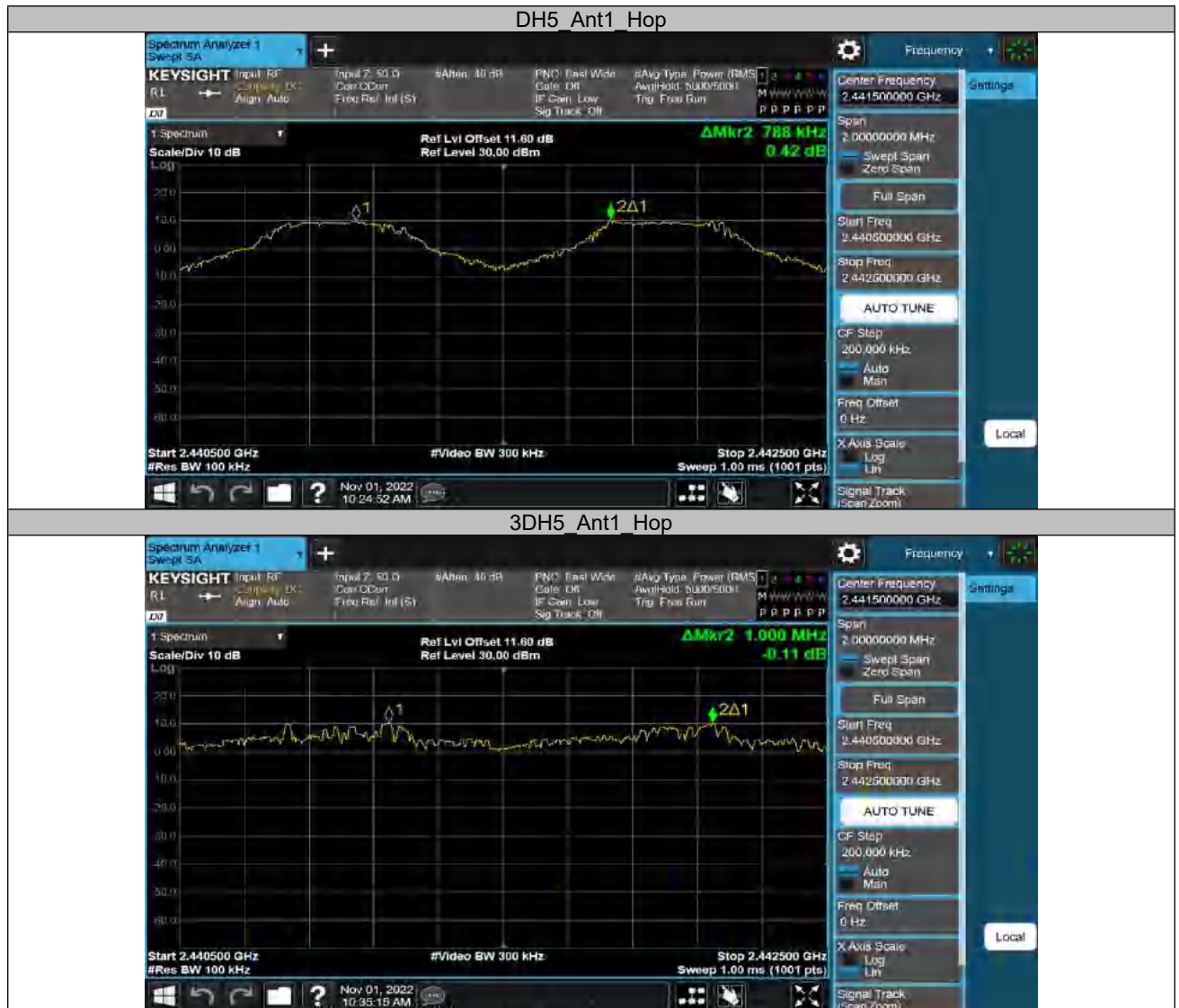
Voltage	Test result (MHz)	Deviation Frequency (KHz)	Test result (ppm)	Limit (ppm)
DC 3.465V	2479.988	-10	-4.03226	10
DC 3.85V	2479.990	-8	-3.22581	
DC 4.235	2479.992	-8	-3.22581	

Test result of frequency tolerance of temperature variation

Temperature (°C)	Test result (KHz)	Deviation Frequency (KHz)	Test result (ppm)	Limit (ppm)
-30	2479.985	-15	-6.04839	10
-20	2479.987	-13	-5.24194	
-10	2479.991	-9	-3.62903	
0	2479.990	-10	-4.03226	
10	2479.992	-8	-3.22581	
20	2479.995	-5	-2.01613	
30	2479.996	-4	-1.6129	
40	2479.992	-8	-3.22581	
50	2479.993	-7	-2.82258	
55	2479.991	-9	-3.62903	

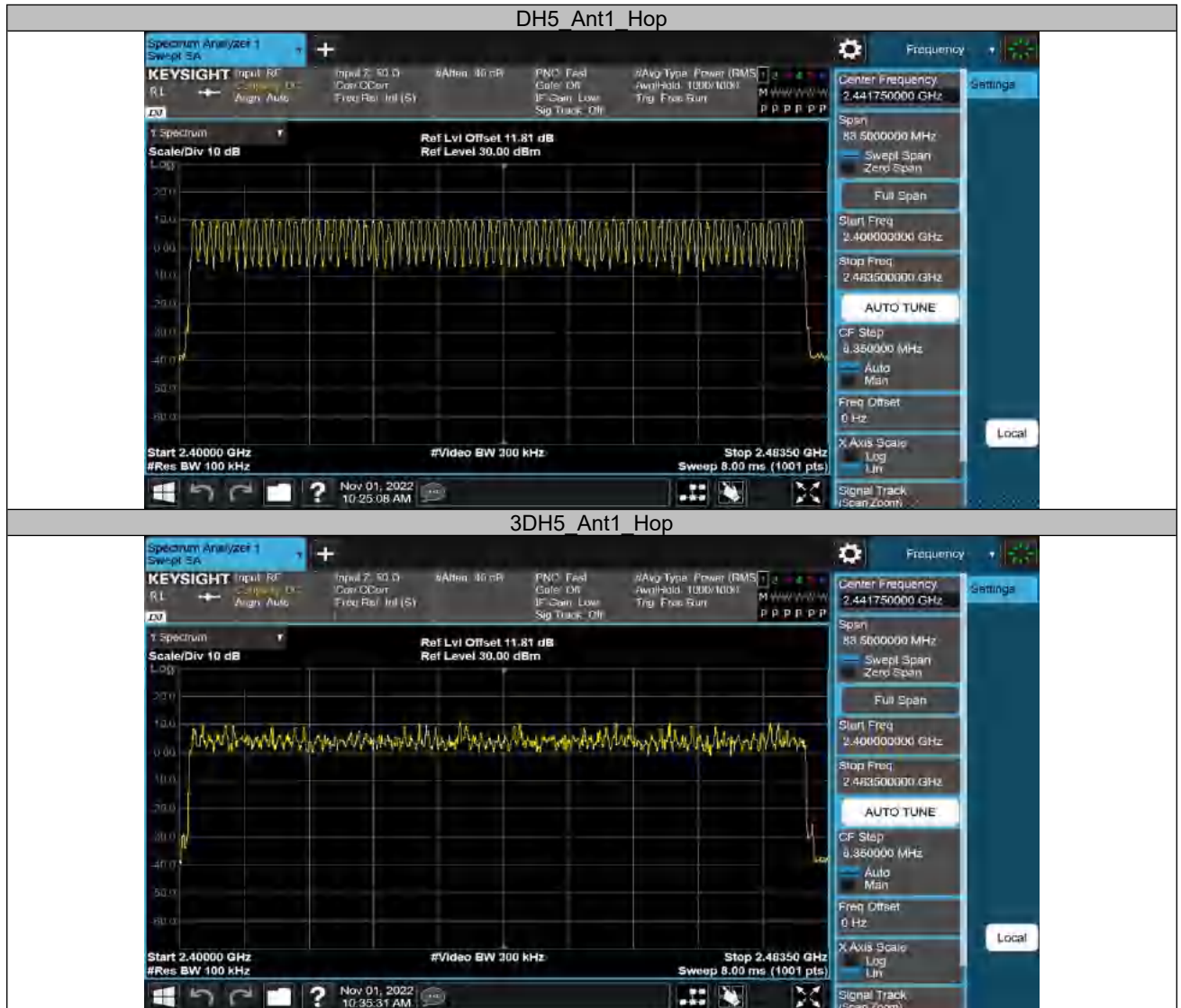
Appendix B.4: Test Results of Carrier Frequency Separation

TestMode	Antenna	Channel	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Hop	0.786	≥ 0.628	PASS
3DH5	Ant1	Hop	1	≥ 0.850	PASS



Appendix B.5: Test Results of Number of Hopping Frequencies

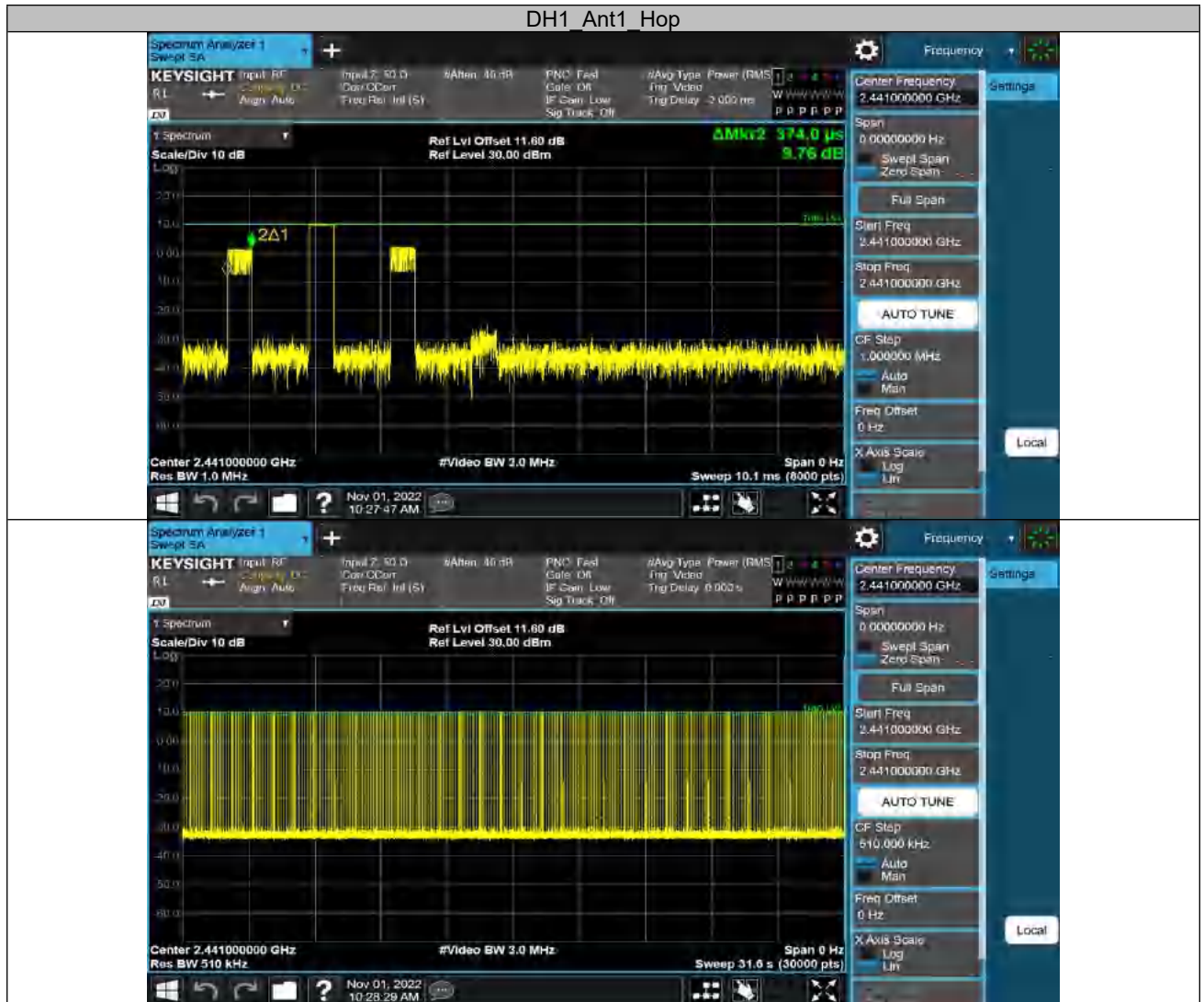
TestMode	Antenna	Channel	Result[Num]	Limit[Num]	Verdict
DH5	Ant1	Hop	79	≥15	PASS
3DH5	Ant1	Hop	79	≥15	PASS



Appendix B.6: Test Results of Time of Occupancy

TestMode	Antenna	Channel	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Hop	0.374	319	0.119	≤0.4	PASS
DH3	Ant1	Hop	1.631	159	0.259	≤0.4	PASS
DH5	Ant1	Hop	2.879	107	0.308	≤0.4	PASS
3DH1	Ant1	Hop	0.379	319	0.121	≤0.4	PASS
3DH3	Ant1	Hop	1.630	159	0.259	≤0.4	PASS
3DH5	Ant1	Hop	2.882	107	0.308	≤0.4	PASS

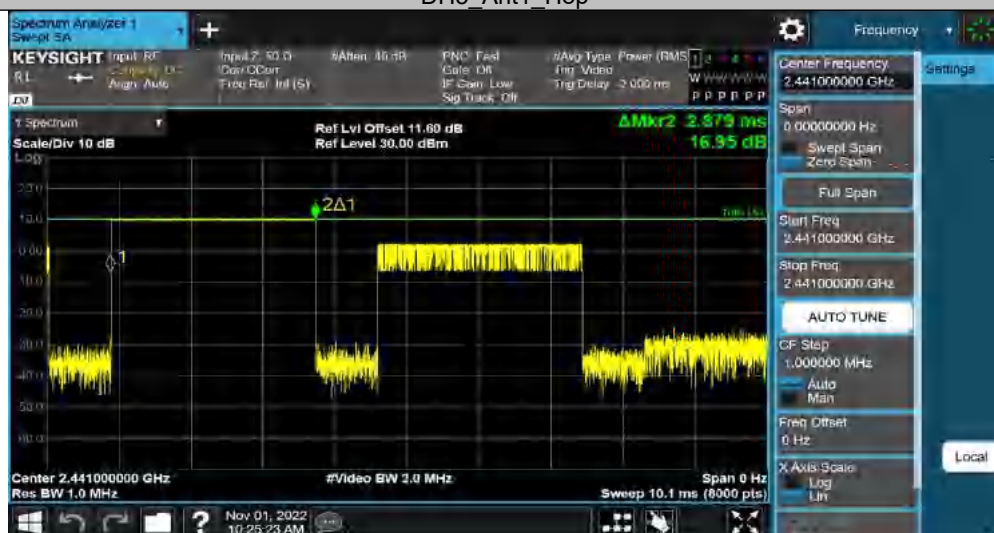
DH1_Ant1_Hop



DH3_Ant1_Hop

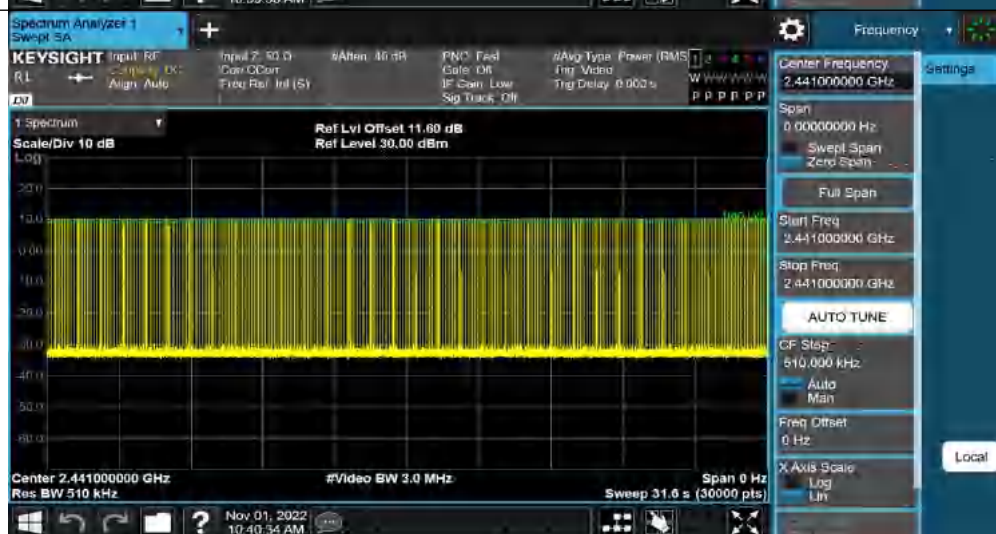


DH5_Ant1_Hop





3DH1_Ant1_Hop



3DH3_Ant1_Hop



3DH5_Ant1_Hop





Appendix B.7: Test Results of Conducted Spurious Emissions Measured in 100 kHz Bandwidth

Conducted Spurious Emission

TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	Reference	9.43	9.43	---	PASS
			30~1000	9.43	-48.15	≤-10.57	PASS
			1000~26500	9.43	-38.81	≤-10.57	PASS
		2441	Reference	9.30	9.30	---	PASS
			30~1000	9.30	-48.47	≤-10.7	PASS
			1000~26500	9.30	-39.36	≤-10.7	PASS
		2480	Reference	8.68	8.68	---	PASS
			30~1000	8.68	-48.53	≤-11.32	PASS
			1000~26500	8.68	-39.19	≤-11.32	PASS
3DH5	Ant1	2402	Reference	8.21	8.21	---	PASS
			30~1000	8.21	-47.72	≤-11.79	PASS
			1000~26500	8.21	-39.06	≤-11.79	PASS
		2441	Reference	5.28	5.28	---	PASS
			30~1000	5.28	-47.31	≤-14.72	PASS
			1000~26500	5.28	-39.7	≤-14.72	PASS
		2480	Reference	5.73	5.73	---	PASS
			30~1000	5.73	-47.67	≤-14.27	PASS
			1000~26500	5.73	-38.76	≤-14.27	PASS



DH5_Ant1_2402_30~1000



DH5_Ant1_2402_1000~26500



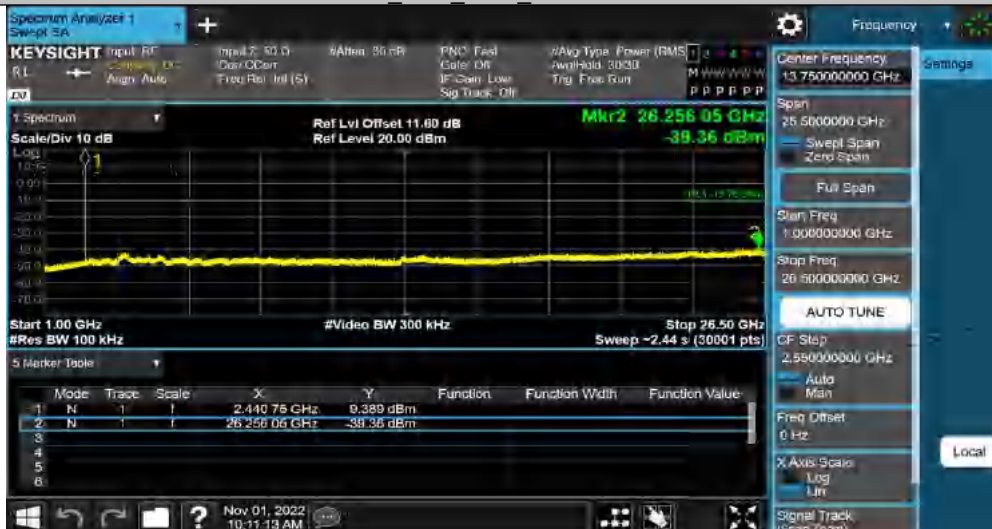
DH5_Ant1_2441_0~Reference



DH5_Ant1_2441_30~1000



DH5_Ant1_2441_1000~26500



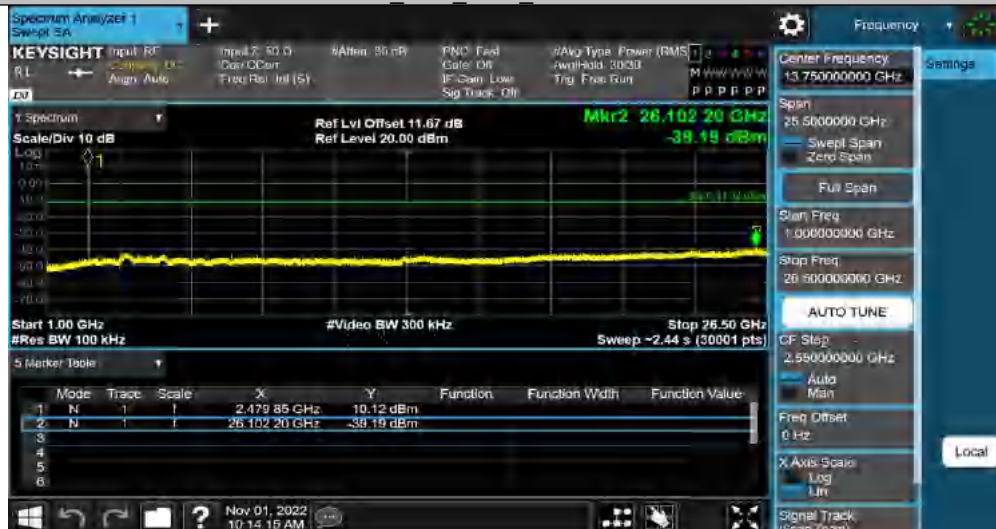
DH5_Ant1_2480_0~Reference



DH5_Ant1_2480_30~1000



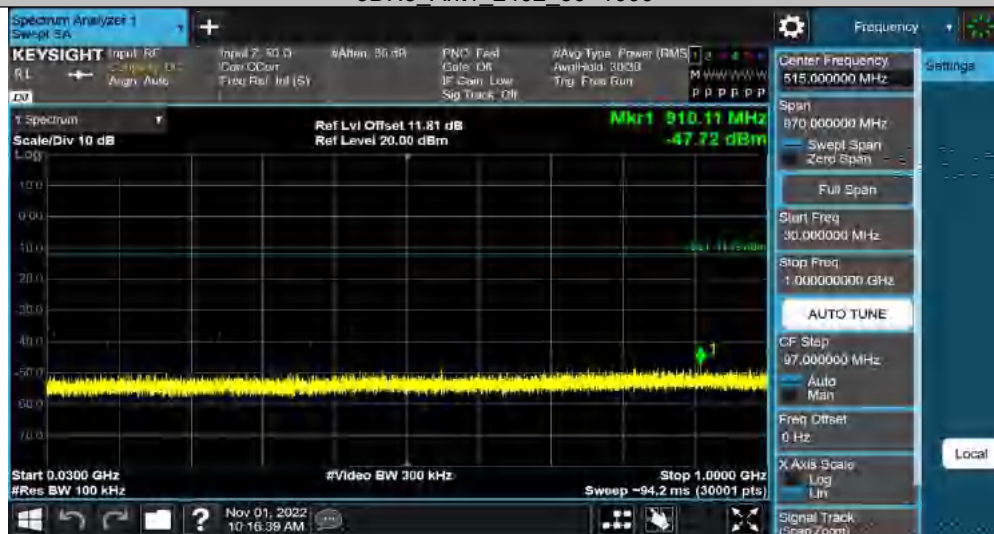
DH5_Ant1_2480_1000~26500



3DH5_Ant1_2402_0~Reference



3DH5_Ant1_2402_30~1000



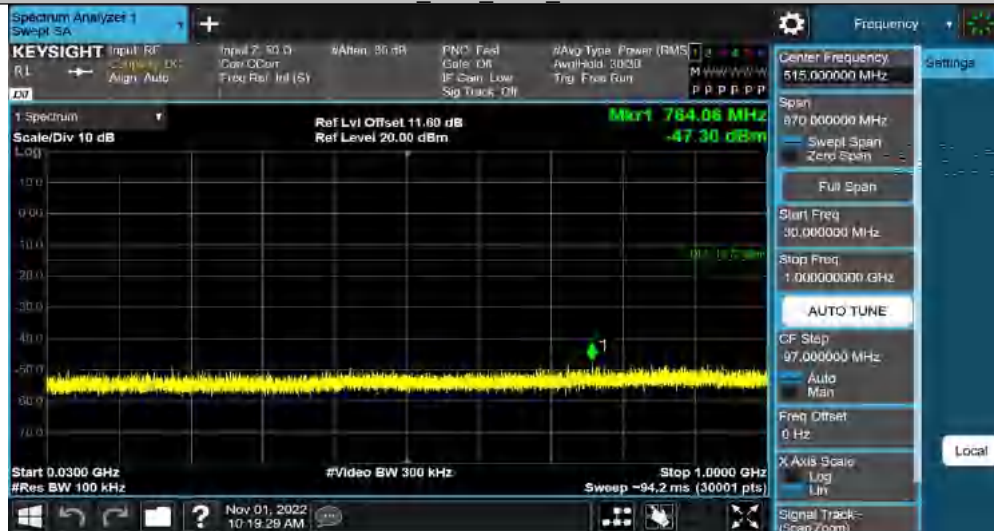
3DH5_Ant1_2402_1000~26500



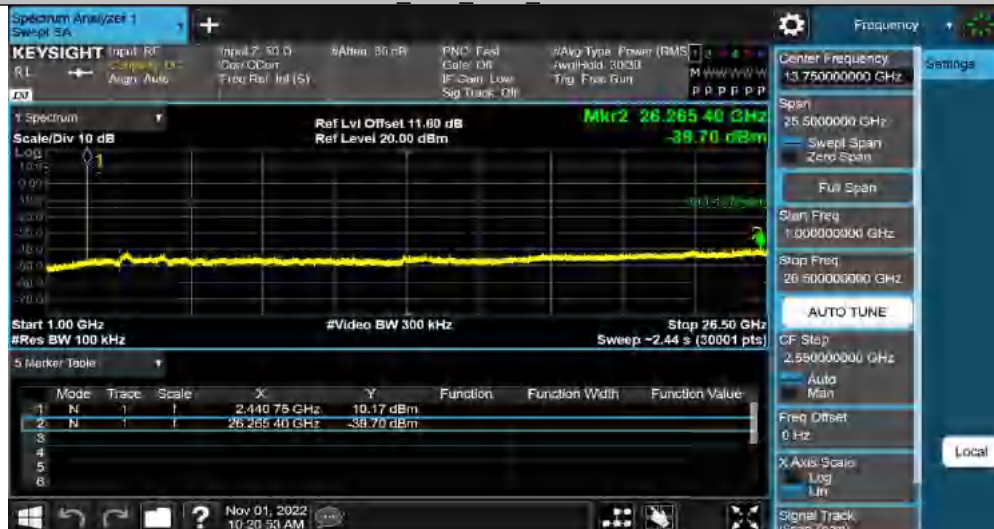
3DH5_Ant1_2441_0~Reference



3DH5_Ant1_2441_30~1000



3DH5_Ant1_2441_1000~26500



3DH5_Ant1_2480_0~Reference



3DH5_Ant1_2480_30~1000



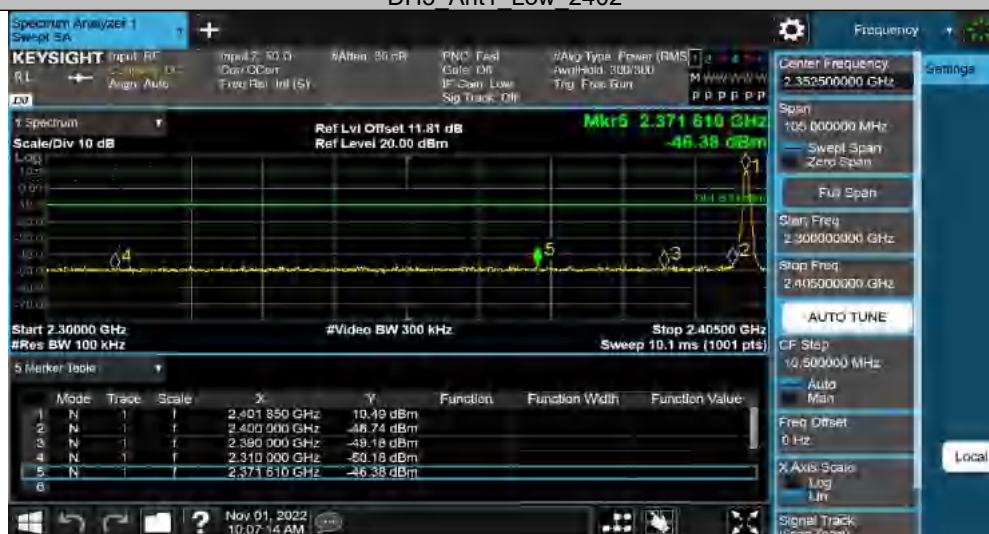
3DH5_Ant1_2480_1000~26500



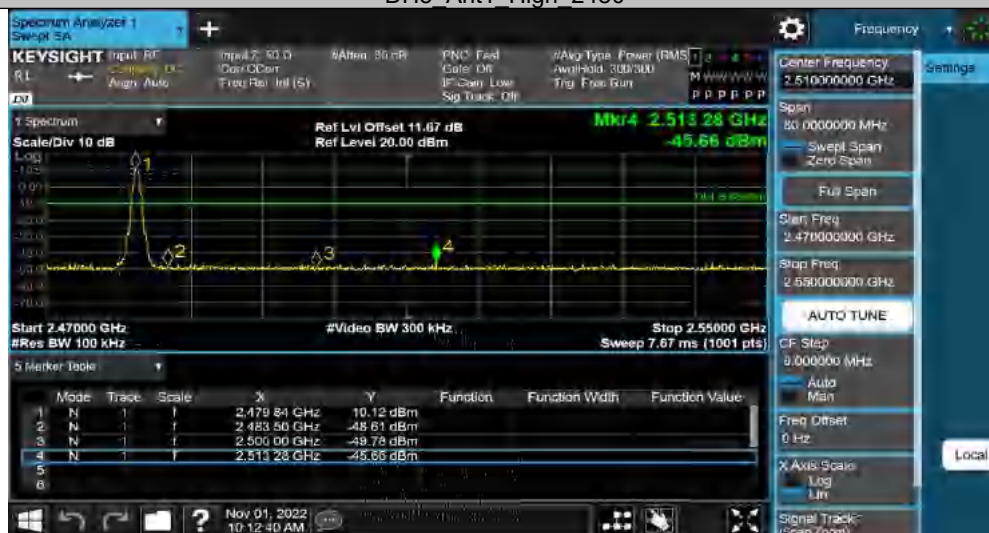
Band Edge

TestMode	Antenna	ChName	Channel	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	10.49	-46.38	≤-9.51	PASS
		High	2480	10.12	-45.66	≤-9.88	PASS
		Low	Hop 2402	9.68	-46.46	≤-10.32	PASS
		High	Hop 2480	9.54	-46.24	≤-10.46	PASS
3DH5	Ant1	Low	2402	10.49	-45.1	≤-9.51	PASS
		High	2480	10.11	-46.67	≤-9.89	PASS
		Low	Hop 2402	8.09	-46.97	≤-11.91	PASS
		High	Hop 2480	6.37	-45.55	≤-13.63	PASS

DH5 Ant1 Low 2402



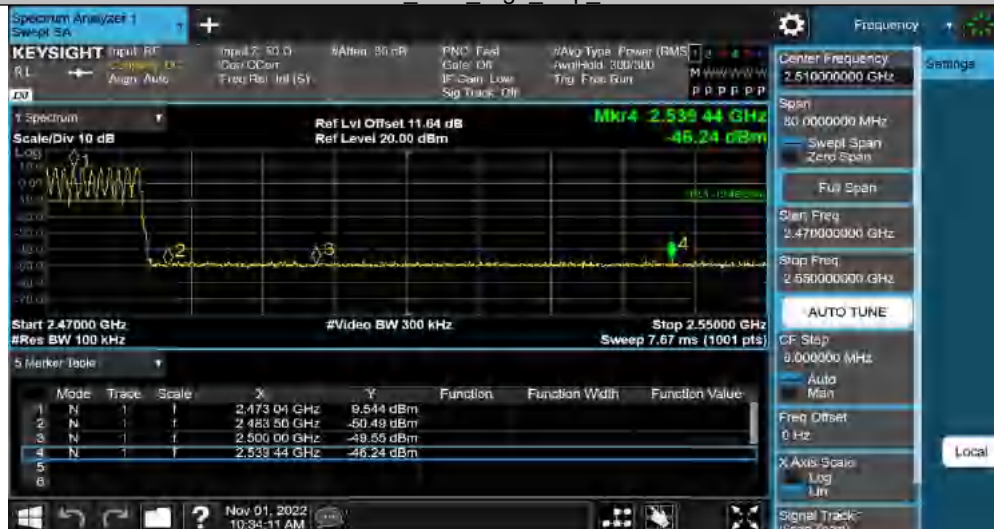
DH5 Ant1 High 2480



DH5 Ant1 Low Hop 2402



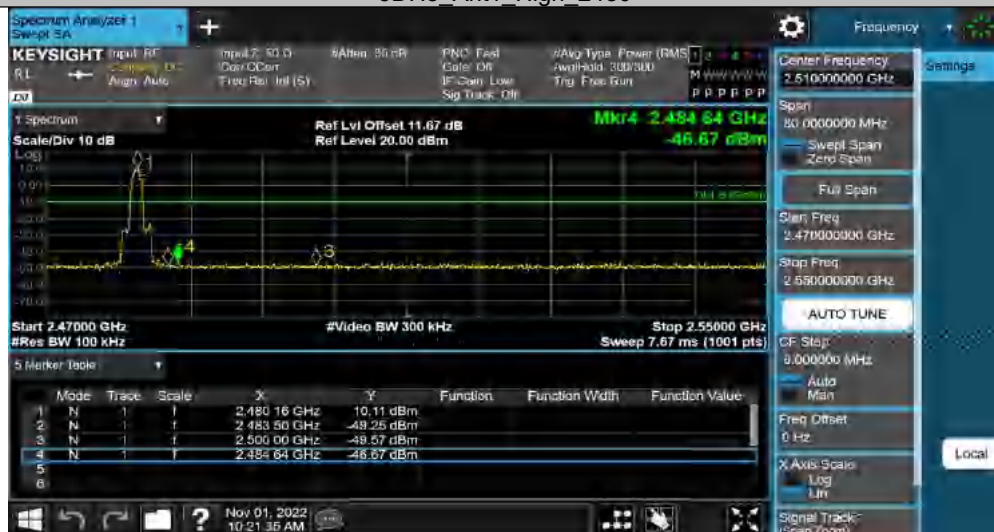
DH5 Ant1 High Hop 2480



3DH5 Ant1 Low 2402



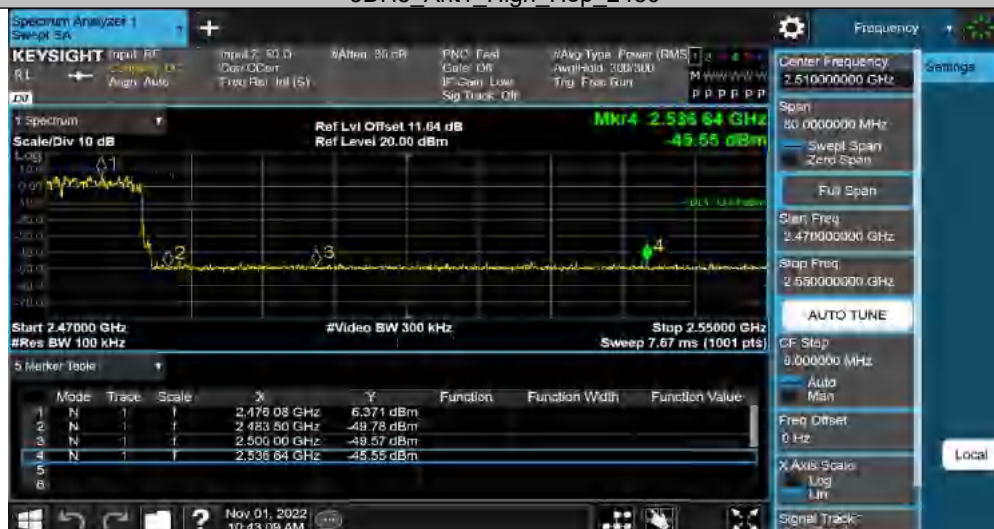
3DH5 Ant1 High 2480



3DH5 Ant1 Low Hop 2402



3DH5 Ant1 High Hop 2480



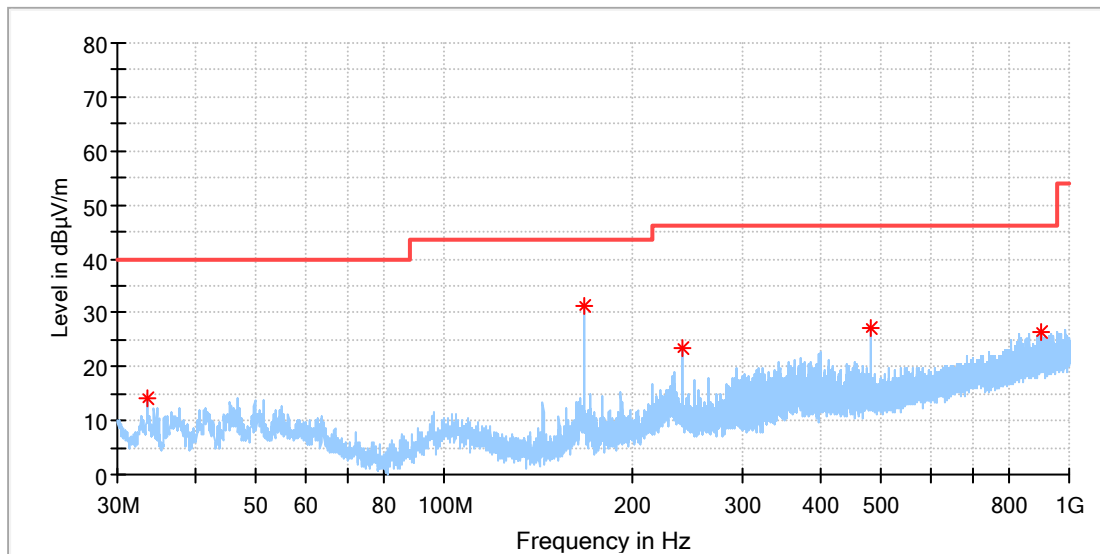
Appendix B.8: Test Results of Radiated Spurious Emissions

Note: 1. 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. 2. This testing was carried out on different modulations, but only the worst case was presented in this report.

30MHz - 1GHz

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	QUANTUM TWS AIR
Test Mode:	BR_DH5_Mid channel
Order No/Sample No:	168395349/A003358854-005
Test Voltage::	Battery
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

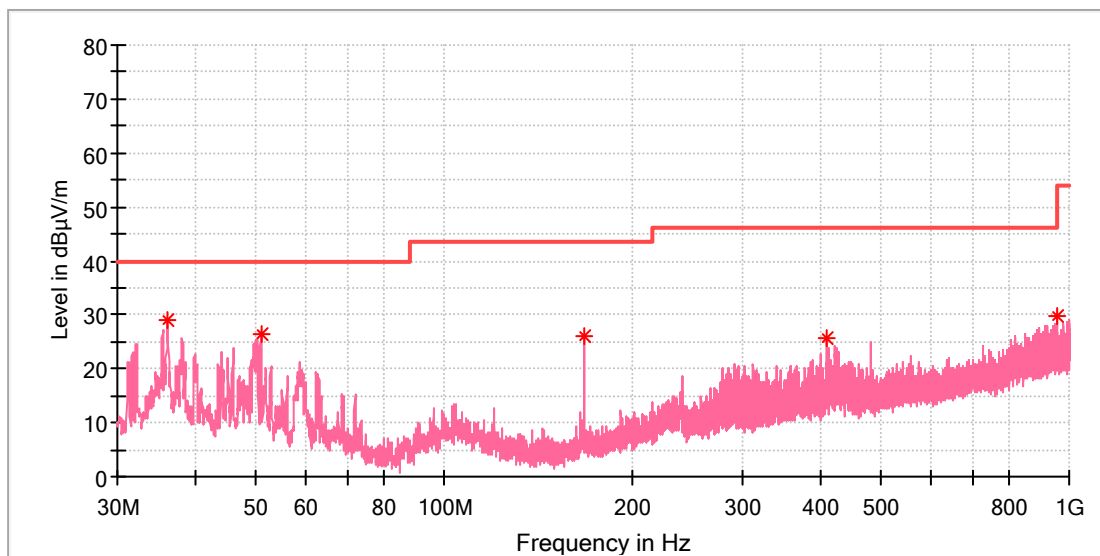


Critical Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
33.506923	14.30	40.00	25.70	100.0	H	248.0	-22.7
168.001154	31.40	43.50	12.10	100.0	H	190.0	-21.7
240.005000	23.31	46.00	22.69	100.0	H	265.0	-18.0
480.005385	27.08	46.00	18.92	100.0	H	290.0	-12.6
903.596923	26.42	46.00	19.58	100.0	H	274.0	-5.4

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	QUANTUM TWS AIR
Test Mode:	BR_DH5_Mid channel
Order No/Sample No:	168395349/A003358854-005
Test Voltage::	Battery
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

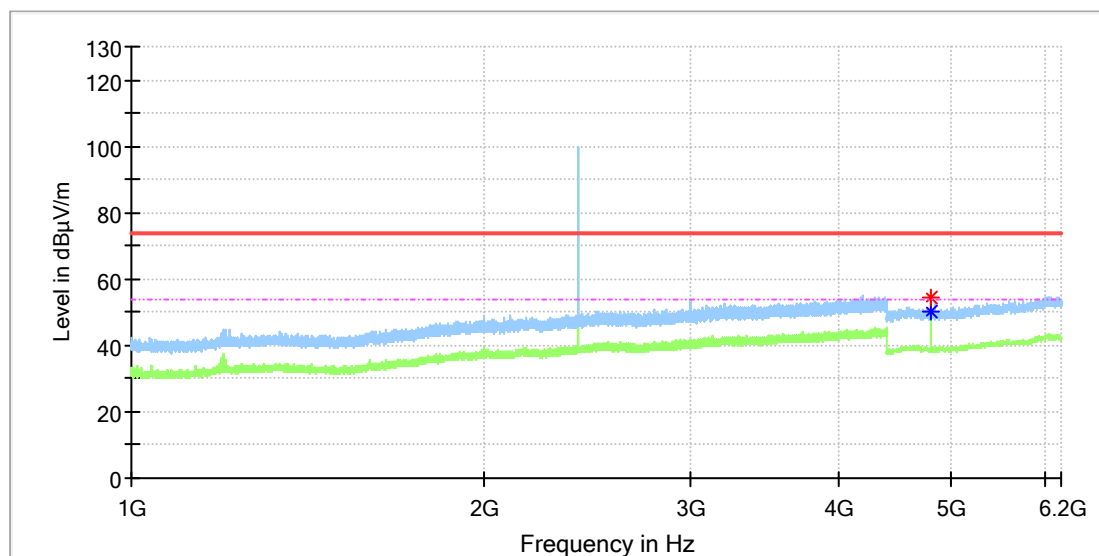
Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
36.081154	28.93	40.00	11.07	100.0	V	161.0	-21.8
50.966923	26.60	40.00	13.40	100.0	V	323.0	-18.6
168.001154	25.95	43.50	17.55	100.0	V	287.0	-21.7
410.575769	25.71	46.00	20.29	100.0	V	49.0	-13.9
957.916923	29.76	46.00	16.24	100.0	V	323.0	-4.8

1GHz - 6.2GHz

Note: The highest waveform in the figure is Bluetooth Fundamental.

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	QUANTUM TWS AIR
Test Mode:	BR_DH5_Low channel
Order No/Sample No:	168395349/A003358854-005
Test Voltage::	Battery
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

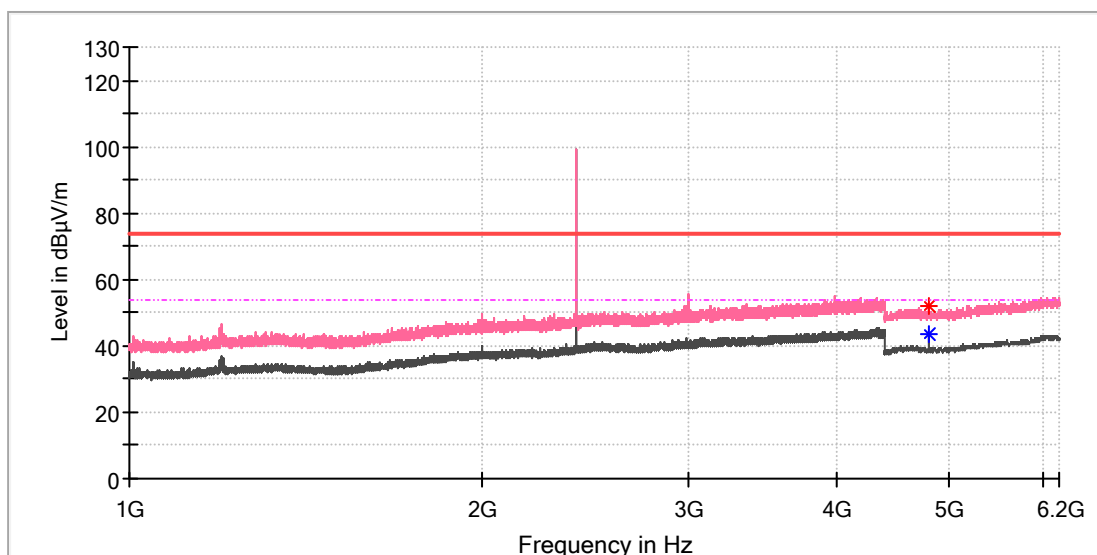


Critical Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4804.000000	---	50.09	54.00	3.91	100.0	H	268.0	11.8
4804.000000	54.14	---	74.00	19.86	100.0	H	268.0	11.8

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	QUANTUM TWS AIR
Test Mode:	BR_DH5_Low channel
Order No/Sample No:	168395349/A003358854-005
Test Voltage::	Battery
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

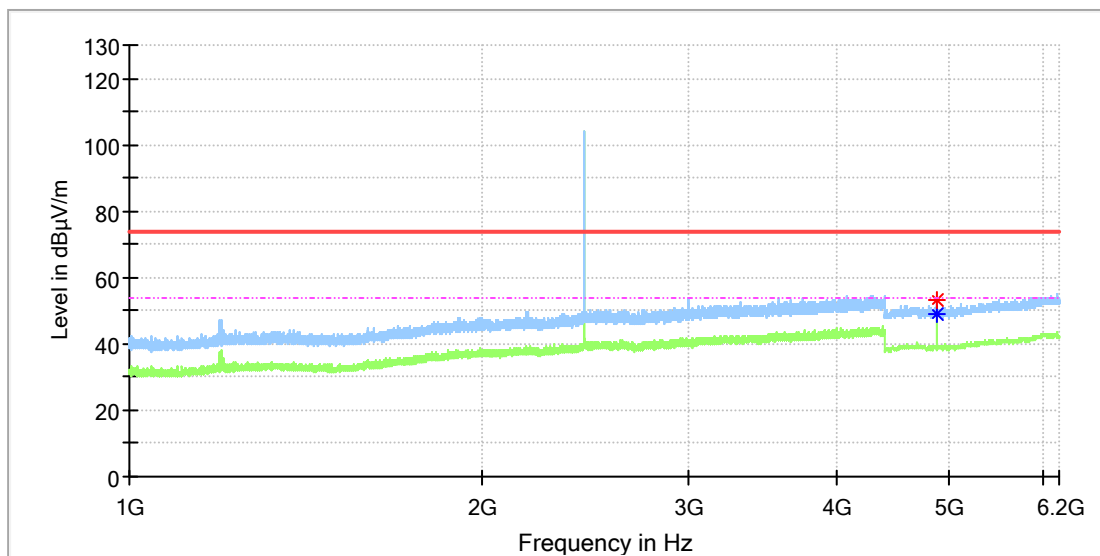


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4804.000000	51.87	---	74.00	22.13	100.0	V	258.0	11.8
4804.000000	---	43.29	54.00	10.71	100.0	V	258.0	11.8

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	QUANTUM TWS AIR
Test Mode:	BR_DH5_Mid channel
Order No/Sample No:	168395349/A003358854-005
Test Voltage::	Battery
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

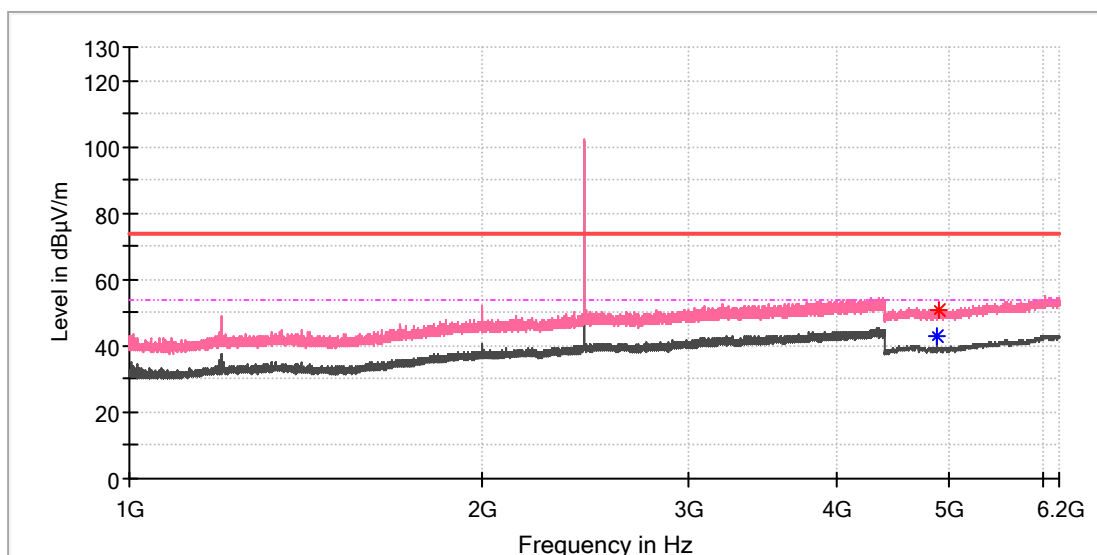


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4881.500000	53.01	---	74.00	20.99	100.0	H	275.0	11.8
4882.000000	---	48.92	54.00	5.08	100.0	H	282.0	11.8

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	QUANTUM TWS AIR
Test Mode:	BR_DH5_Mid channel
Order No/Sample No:	168395349/A003358854-005
Test Voltage::	Battery
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

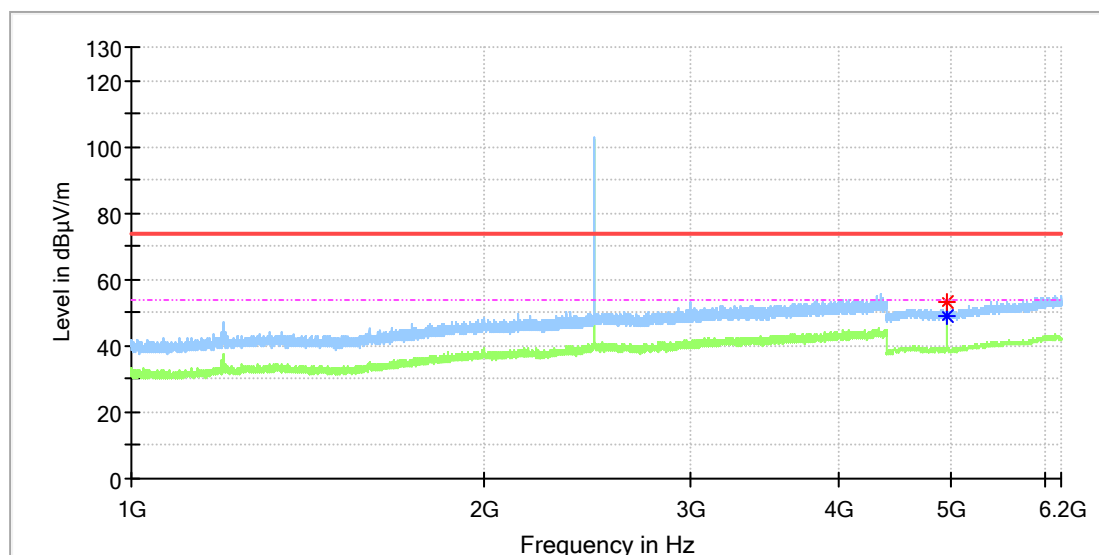


Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4882.000000	---	42.66	54.00	11.34	100.0	V	271.0	11.8
4890.500000	50.75	---	74.00	23.25	100.0	V	123.0	11.8

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	QUANTUM TWS AIR
Test Mode:	BR_DH5_High channel
Order No/Sample No:	168395349/A003358854-005
Test Voltage::	Battery
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

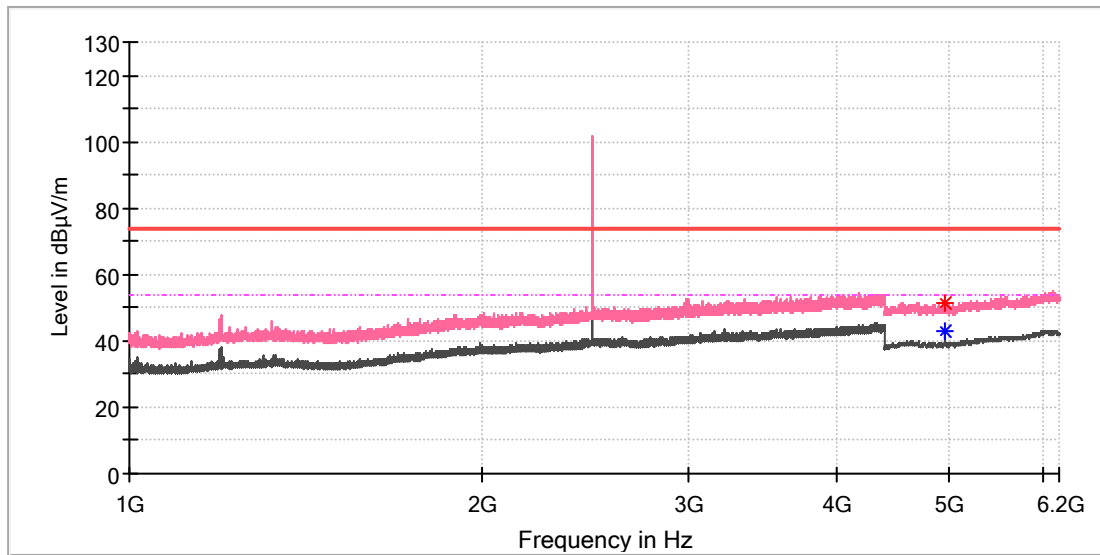


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4960.000000	53.22	---	74.00	20.78	100.0	H	282.0	11.8
4960.000000	---	49.00	54.00	5.00	100.0	H	282.0	11.8

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	QUANTUM TWS AIR
Test Mode:	BR_DH5_High channel
Order No/Sample No:	168395349/A003358854-005
Test Voltage::	Battery
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

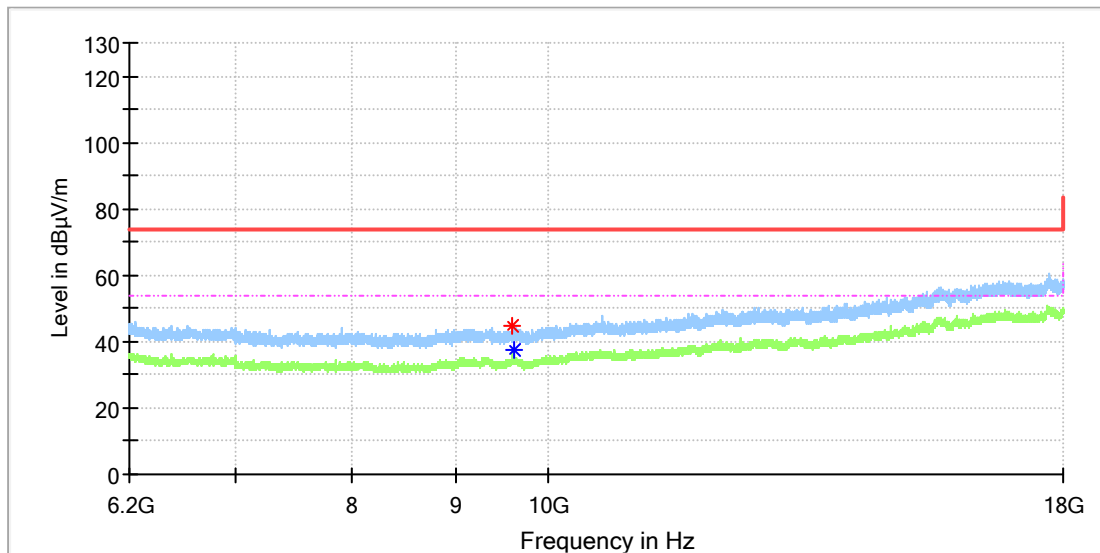
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4960.000000	51.21	---	74.00	22.79	100.0	V	253.0	11.8
4960.000000	---	43.08	54.00	10.92	100.0	V	253.0	11.8

6.2GHz - 18GHz

Note: The highest waveform in the figure is Bluetooth harmonic.

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	QUANTUM TWS AIR
Test Mode:	BR_DH5_Low channel
Order No/Sample No:	168395349/A003358854-005
Test Voltage::	Battery
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

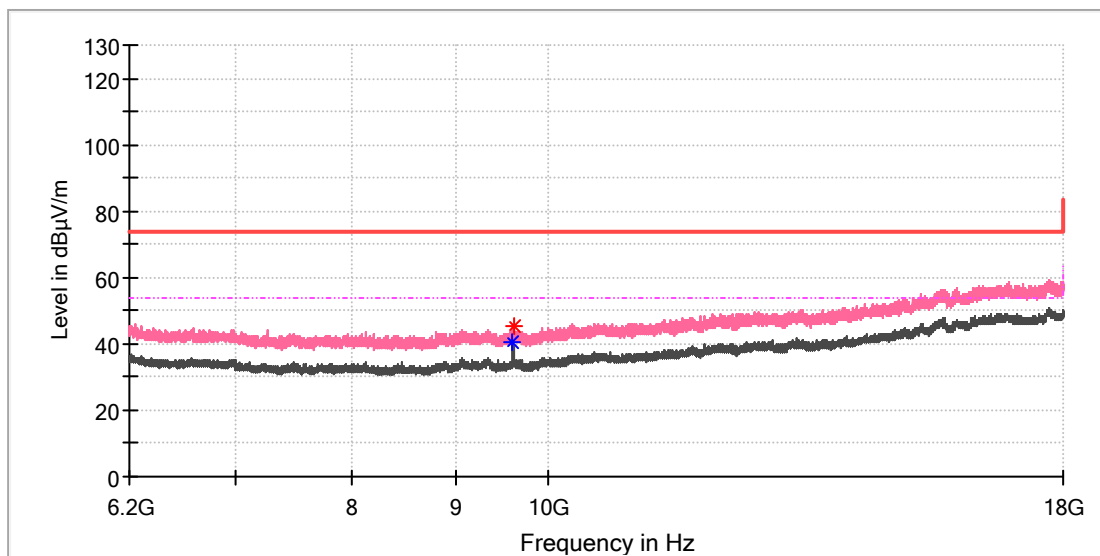


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
9598.891667	44.58	---	74.00	29.42	100.0	H	278.0	10.4
9607.741667	---	37.66	54.00	16.34	100.0	H	31.0	10.4

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	QUANTUM TWS AIR
Test Mode:	BR_DH5_Low channel
Order No/Sample No:	168395349/A003358854-005
Test Voltage::	Battery
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

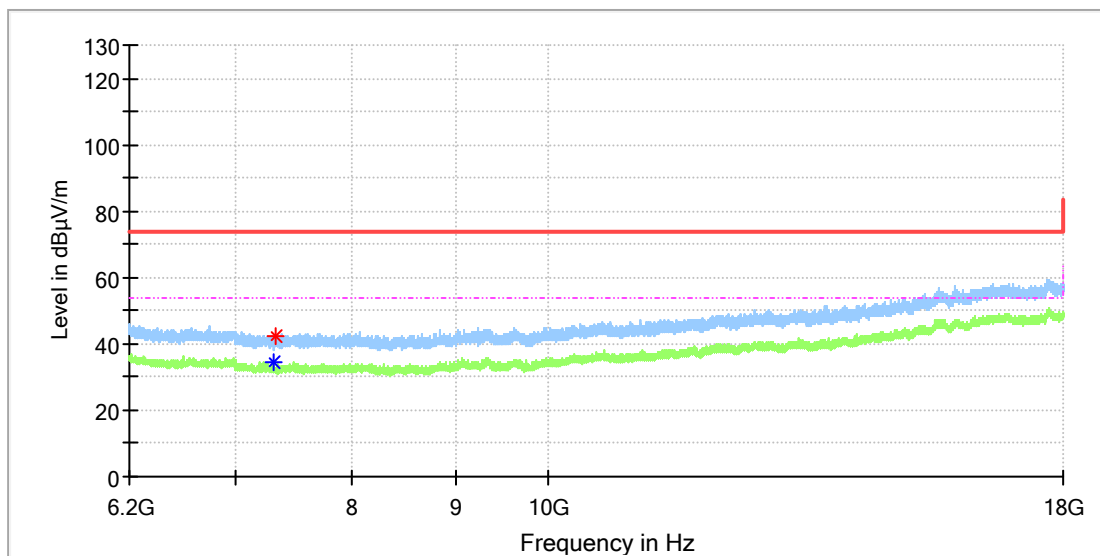


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
9607.250000	---	40.57	54.00	13.43	100.0	V	286.0	10.4
9607.741667	45.48	---	74.00	28.52	100.0	V	314.0	10.4

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	QUANTUM TWS AIR
Test Mode:	BR_DH5_Mid channel
Order No/Sample No:	168395349/A003358854-005
Test Voltage::	Battery
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

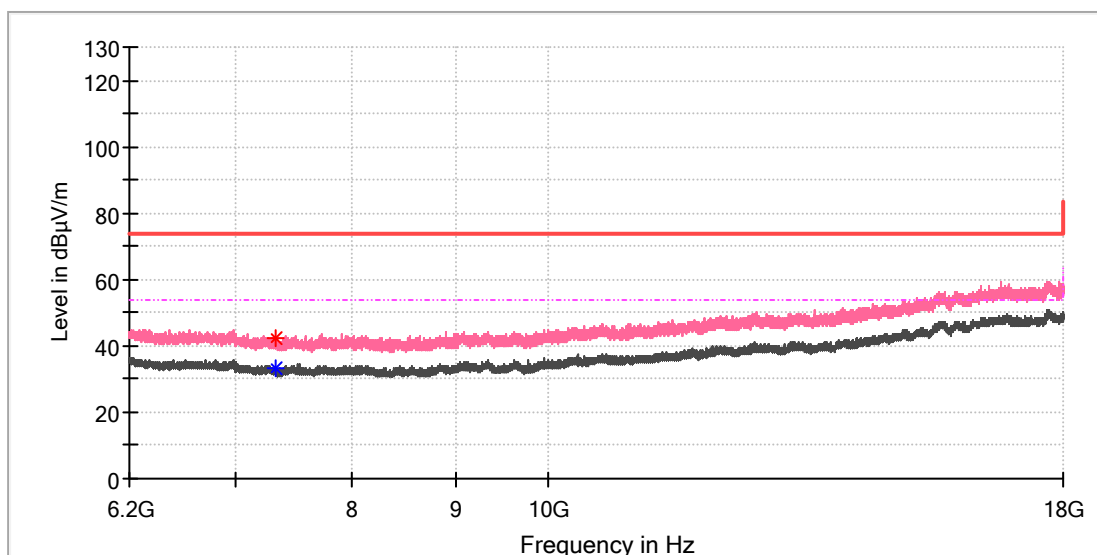


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7317.066667	---	34.21	54.00	19.79	100.0	H	12.0	8.2
7329.358333	42.48	---	74.00	31.52	100.0	H	120.0	8.1

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	QUANTUM TWS AIR
Test Mode:	BR_DH5_Mid channel
Order No/Sample No:	168395349/A003358854-005
Test Voltage::	Battery
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

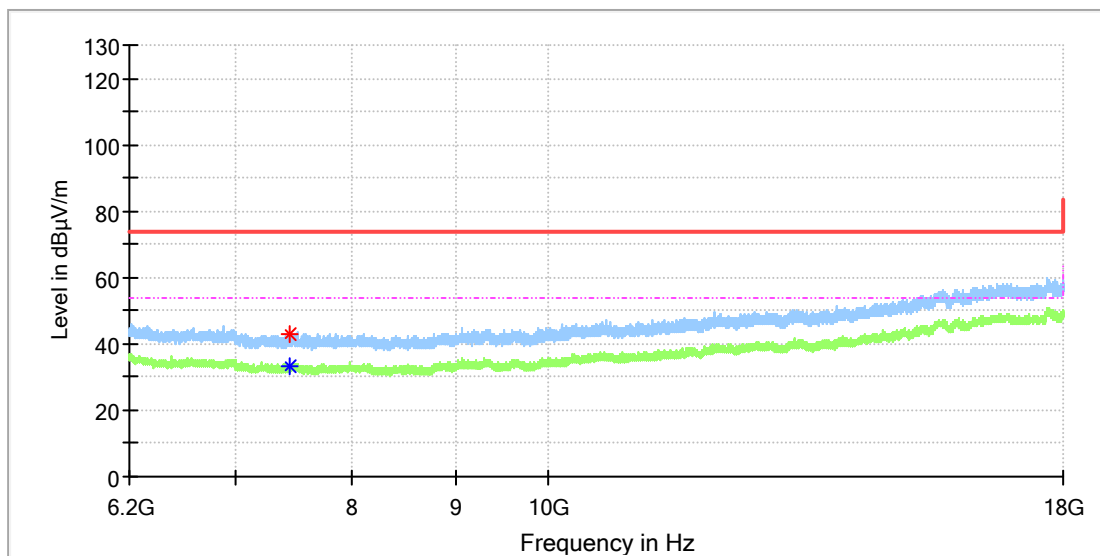


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7324.933333	---	33.29	54.00	20.71	100.0	V	163.0	8.2
7326.900000	42.10	---	74.00	31.90	100.0	V	6.0	8.1

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	QUANTUM TWS AIR
Test Mode:	BR_DH5_High channel
Order No/Sample No:	168395349/A003358854-005
Test Voltage::	Battery
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

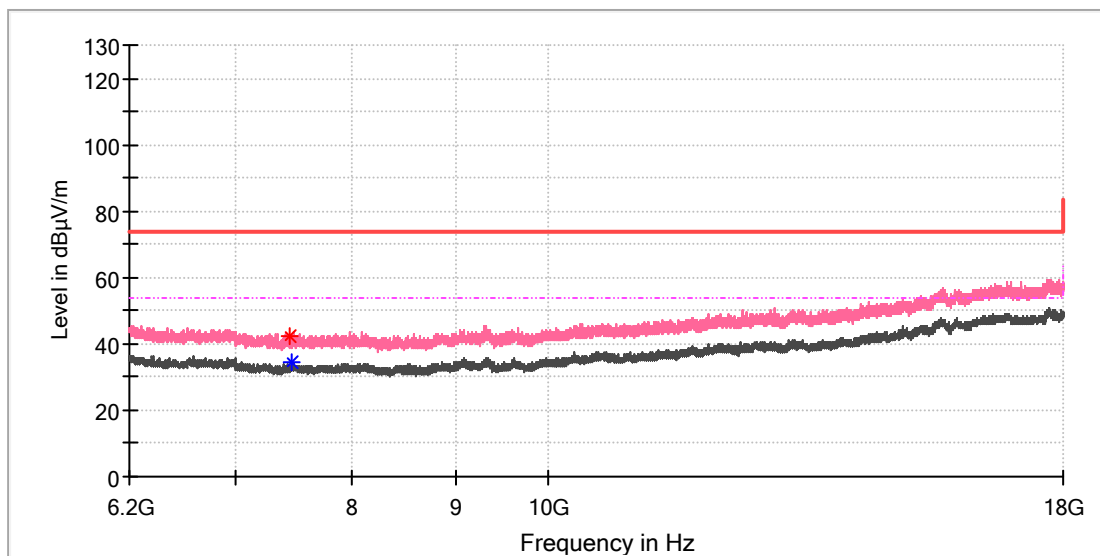


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7438.016667	42.88	---	74.00	31.12	100.0	H	114.0	8.4
7440.475000	---	33.24	54.00	20.76	100.0	H	6.0	8.4

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	QUANTUM TWS AIR
Test Mode:	BR_DH5_High channel
Order No/Sample No:	168395349/A003358854-005
Test Voltage::	Battery
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



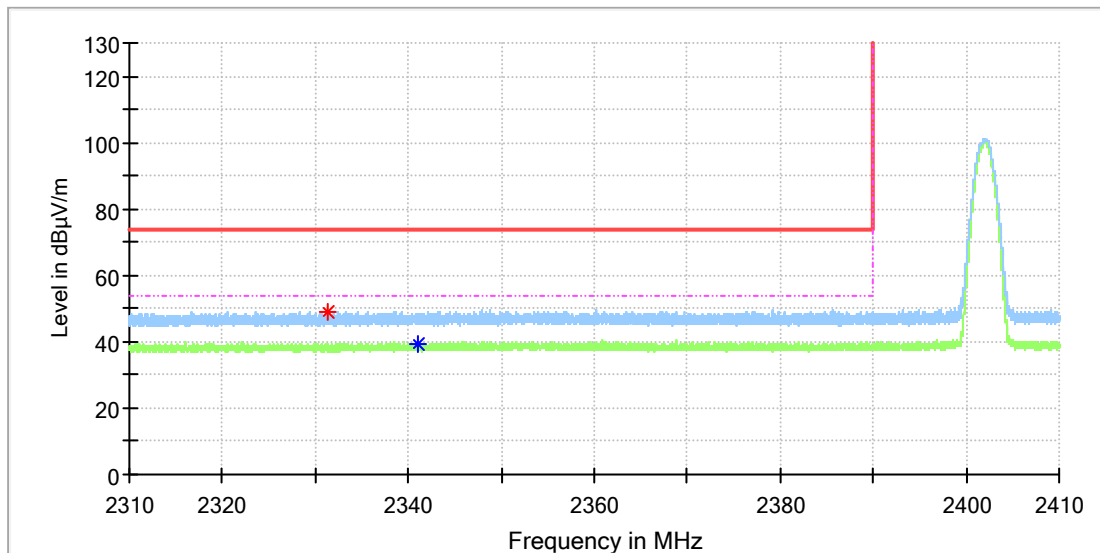
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7445.883333	42.52	---	74.00	31.48	100.0	V	0.0	8.5
7457.191667	---	34.27	54.00	19.73	100.0	V	0.0	8.5

Appendix B.9: Test Results of Radiated Emissions in Restricted Bands

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	QUANTUM TWS AIR
Test Mode:	BR_DH5_Low channel
Order No/Sample No:	168395349/A003358854-005
Test Voltage::	Battery
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

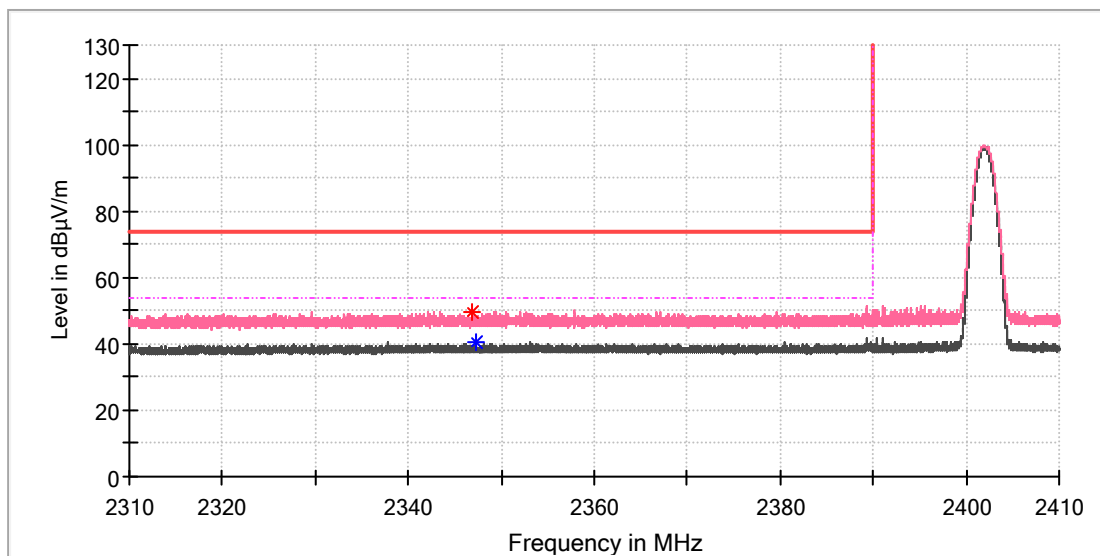


Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2331.300000	49.20	---	74.00	24.80	100.0	H	220.0	6.7
2341.095000	---	39.53	54.00	14.47	100.0	H	164.0	6.8

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	QUANTUM TWS AIR
Test Mode:	BR_DH5_Low channel
Order No/Sample No:	168395349/A003358854-005
Test Voltage::	Battery
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

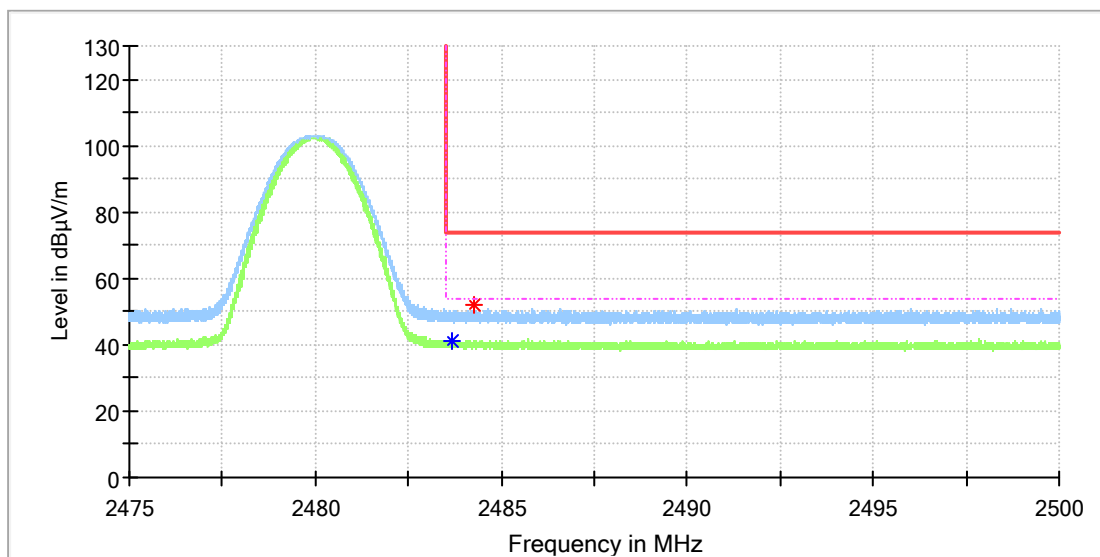


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2346.890000	49.66	---	74.00	24.34	100.0	V	169.0	6.9
2347.285000	---	40.23	54.00	13.77	100.0	V	328.0	6.9

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	QUANTUM TWS AIR
Test Mode:	BR_DH5_High channel
Order No/Sample No:	168395349/A003358854-005
Test Voltage::	Battery
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

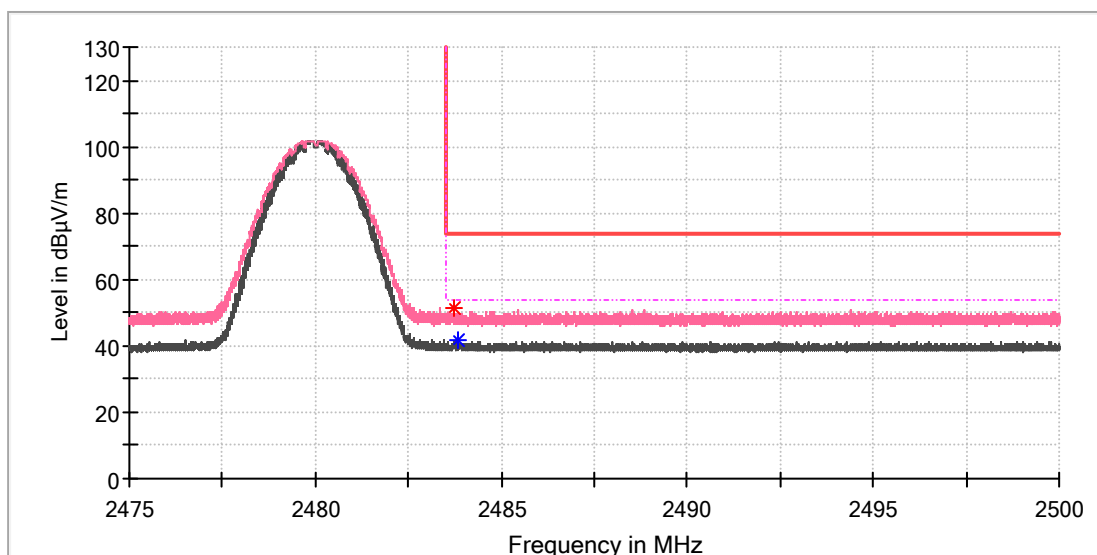


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.686250	---	41.09	54.00	12.91	100.0	H	274.0	7.4
2484.292500	52.17	---	74.00	21.83	100.0	H	274.0	7.4

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	QUANTUM TWS AIR
Test Mode:	BR_DH5_High channel
Order No/Sample No:	168395349/A003358854-005
Test Voltage::	Battery
Remark:	Temp 23 Humi:56%
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)
2483.706250	51.16	---	74.00	22.84	100.0	V	217.0	7.4
2483.817500	---	41.44	54.00	12.56	100.0	V	217.0	7.4

Appendix C: Test Results of right earbud

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Appendix C.1: Test Results of 99% Bandwidth

TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.88557	2401.5498	2402.4353	---	---
		2441	0.88635	2440.5495	2441.4359	---	---
		2480	0.88033	2479.5534	2480.4338	---	---
3DH5	Ant1	2402	1.1999	2401.3867	2402.5866	---	---
		2441	1.1988	2440.3858	2441.5846	---	---
		2480	1.2046	2479.3835	2480.5881	---	---

DH5 Ant1 2402



DH5 Ant1 2441



DH5_Ant1_2480



3DH5_Ant1_2402



3DH5_Ant1_2441





Appendix C.2: Test Results of 20dB Bandwidth

TestMode	Antenna	Channel	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.942	2401.532	2402.474	---	---
		2441	0.945	2440.532	2441.477	---	---
		2480	0.951	2479.526	2480.477	---	---
3DH5	Ant1	2402	1.269	2401.349	2402.618	---	---
		2441	1.275	2440.343	2441.618	---	---
		2480	1.269	2479.346	2480.615	---	---

DH5_Ant1_2402



DH5_Ant1_2441



DH5_Ant1_2480



3DH5_Ant1_2402



3DH5_Ant1_2441



3DH5_Ant1_2480



Appendix C.3: 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	2401.993	7	2.914238	10
DC 3.85V	2401.990	10	4.163197	
DC 4.235	2401.985	15	6.244796	

Test result of frequency tolerance of temperature variation

Temperature (°C)	Test result (KHz)	Deviation Frequency (KHz)	Test result (ppm)	Limit (ppm)
-30	2401.985	15	6.244796	10
-20	2401.991	9	3.746878	
-10	2401.993	7	2.914238	
0	2401.989	12	4.995837	
10	2401.992	8	3.330558	
20	2401.988	12	4.995837	
30	2401.988	12	4.995837	
40	2401.993	7	2.914238	
50	2401.995	5	2.081599	
55	2401.992	8	3.330558	

Test Channel (MHz)	2441
-----------------------	------

Test result of frequency tolerance of voltage variation

Voltage	Test result (MHz)	Deviation Frequency (KHz)	Test result (ppm)	Limit (ppm)
DC 3.465V	2440.992	-8	-3.27735	10
DC 3.85V	2440.990	-10	-4.09668	
DC 4.235	2440.986	-14	-5.73535	

Test result of frequency tolerance of temperature variation

Temperature (°C)	Test result (KHz)	Deviation Frequency (KHz)	Test result (ppm)	Limit (ppm)
-30	2440.991	-9	-3.68701	10
-20	2440.994	-6	-2.45801	
-10	2440.994	-6	-2.45801	
0	2440.995	-5	-2.04834	
10	2440.989	-11	-4.50635	
20	2440.990	-10	-4.09668	
30	2440.991	-9	-3.68701	
40	2440.987	-13	-5.32569	
50	2440.991	-9	-3.68701	
55	2440.995	-5	-2.04834	

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	2479.998	-5	-2.01613	10
DC 3.85V	2479.995	-8	-3.22581	
DC 4.235	2479.992	-8	-3.22581	

Test result of frequency tolerance of temperature variation

Temperature (°C)	Test result (KHz)	Deviation Frequency (KHz)	Test result (ppm)	Limit (ppm)
-30	2479.988	-12	-4.83871	10
-20	2479.985	-15	-6.04839	
-10	2479.991	-9	-3.62903	
0	2479.990	-10	-4.03226	
10	2479.993	-7	-2.82258	
20	2479.995	-5	-2.01613	
30	2479.996	-4	-1.6129	
40	2479.992	-8	-3.22581	
50	2479.993	-7	-2.82258	
55	2479.995	-5	-2.01613	

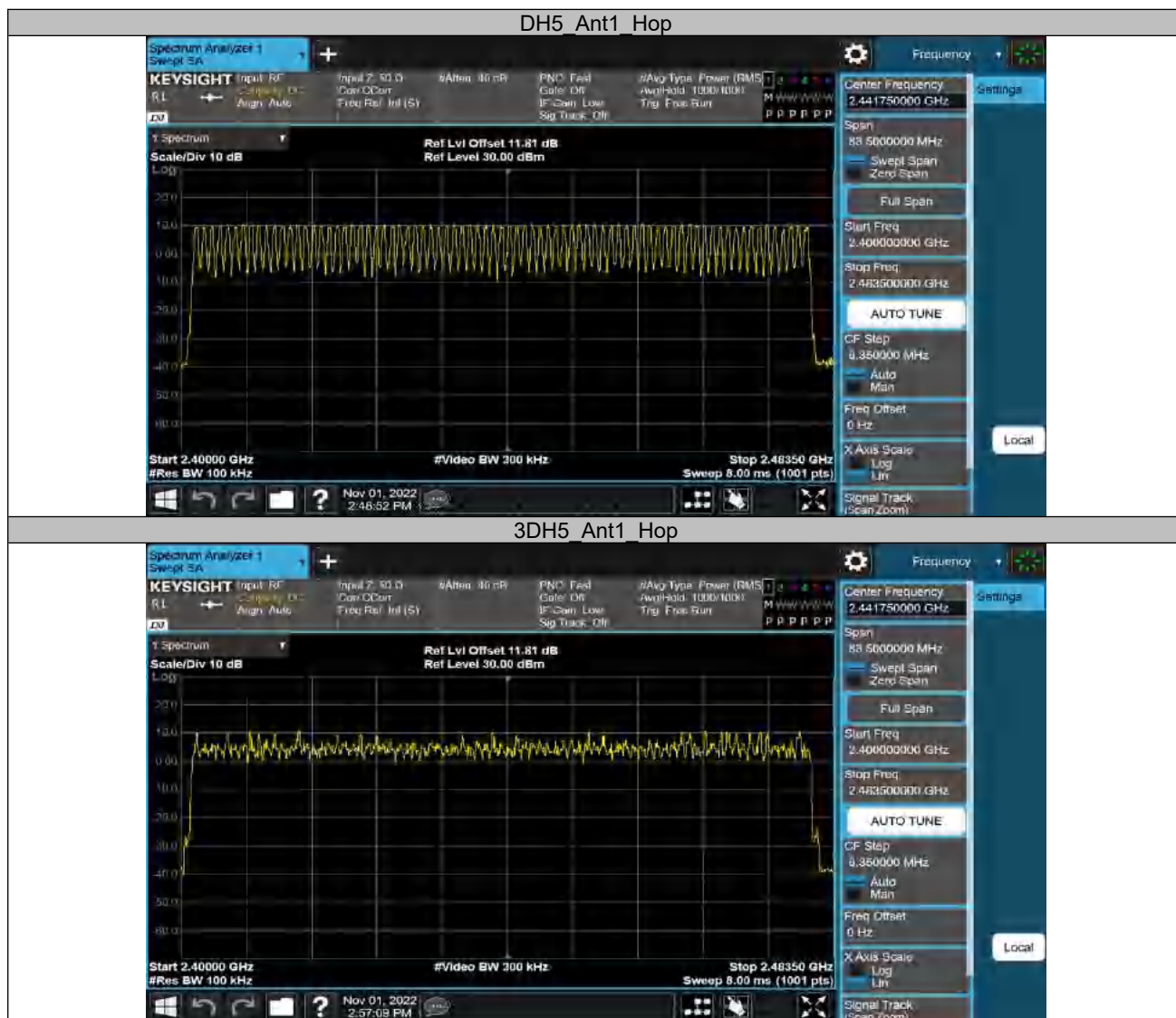
Appendix C.4: Test Results of Carrier Frequency Separation

TestMode	Antenna	Channel	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Hop	0.998	≥ 0.951	PASS
3DH5	Ant1	Hop	1.012	≥ 0.850	PASS



Appendix C.5: Test Results of Number of Hopping Frequencies

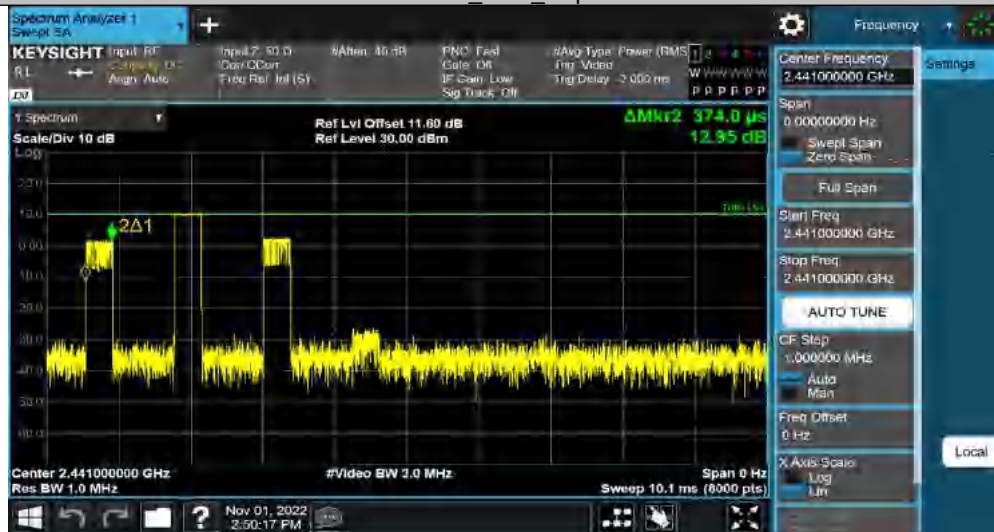
TestMode	Antenna	Channel	Result[Num]	Limit[Num]	Verdict
DH5	Ant1	Hop	79	≥15	PASS
3DH5	Ant1	Hop	79	≥15	PASS



Appendix C.6: Test Results of Time of Occupancy

TestMode	Antenna	Channel	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Hop	0.374	319	0.119	≤0.4	PASS
DH3	Ant1	Hop	1.630	159	0.259	≤0.4	PASS
DH5	Ant1	Hop	2.879	107	0.308	≤0.4	PASS
3DH1	Ant1	Hop	0.379	319	0.121	≤0.4	PASS
3DH3	Ant1	Hop	1.631	159	0.259	≤0.4	PASS
3DH5	Ant1	Hop	2.883	107	0.308	≤0.4	PASS

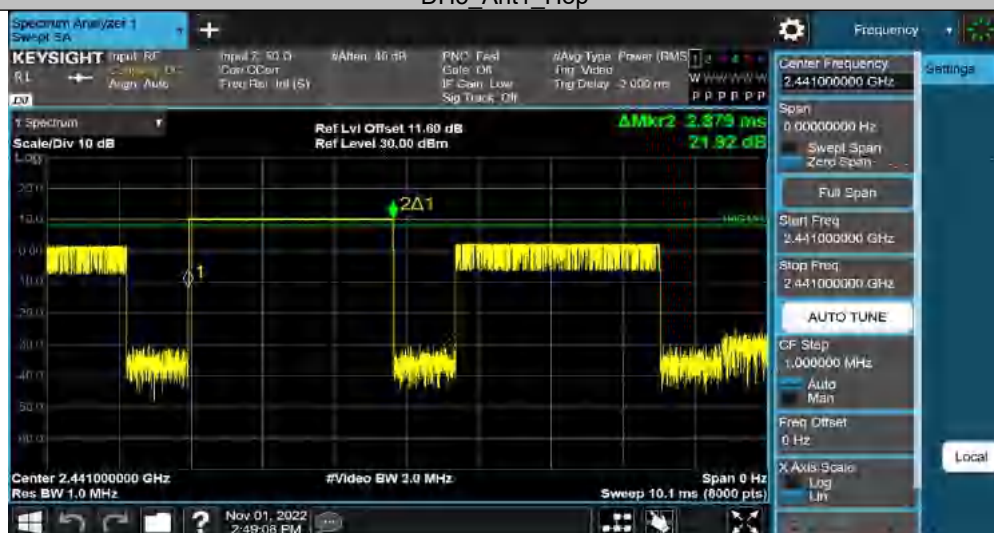
DH1_Ant1_Hop



DH3_Ant1_Hop

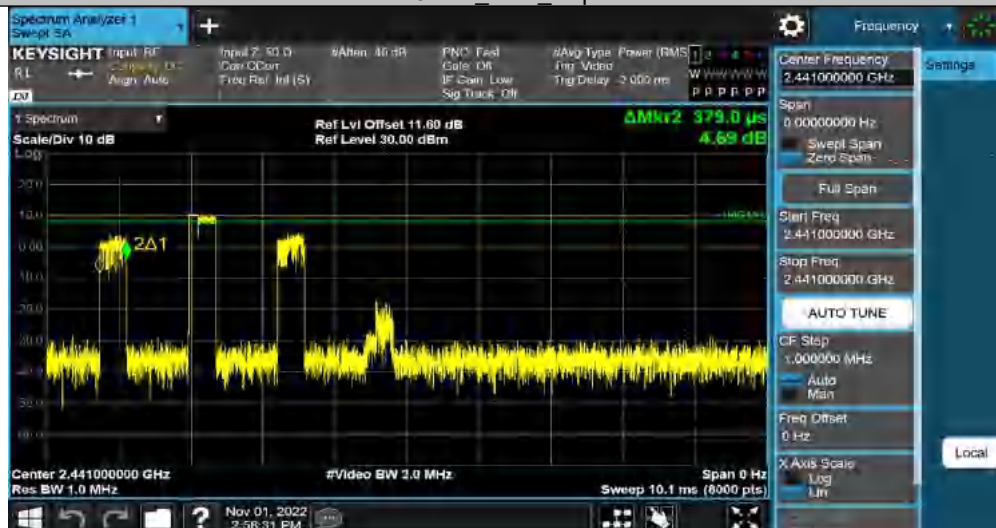


DH5_Ant1_Hop





3DH1_Ant1_Hop



3DH3_Ant1_Hop



3DH5_Ant1_Hop





Appendix C.7: Test Results of Conducted Spurious Emissions Measured in 100 kHz Bandwidth

Conducted Spurious Emission

TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	Reference	9.97	9.97	---	PASS
			30~1000	9.97	-47.7	≤-10.03	PASS
			1000~26500	9.97	-37.54	≤-10.03	PASS
		2441	Reference	9.52	9.52	---	PASS
			30~1000	9.52	-48.62	≤-10.48	PASS
			1000~26500	9.52	-39.18	≤-10.48	PASS
		2480	Reference	9.45	9.45	---	PASS
			30~1000	9.45	-48.11	≤-10.55	PASS
			1000~26500	9.45	-39.03	≤-10.55	PASS
3DH5	Ant1	2402	Reference	6.39	6.39	---	PASS
			30~1000	6.39	-47.45	≤-13.61	PASS
			1000~26500	6.39	-39.18	≤-13.61	PASS
		2441	Reference	6.50	6.50	---	PASS
			30~1000	6.50	-48.27	≤-13.5	PASS
			1000~26500	6.50	-39.01	≤-13.5	PASS
		2480	Reference	6.04	6.04	---	PASS
			30~1000	6.04	-48.19	≤-13.96	PASS
			1000~26500	6.04	-38.87	≤-13.96	PASS

DH5 Ant1 2402 0~Reference



DH5_Ant1_2402_30~1000



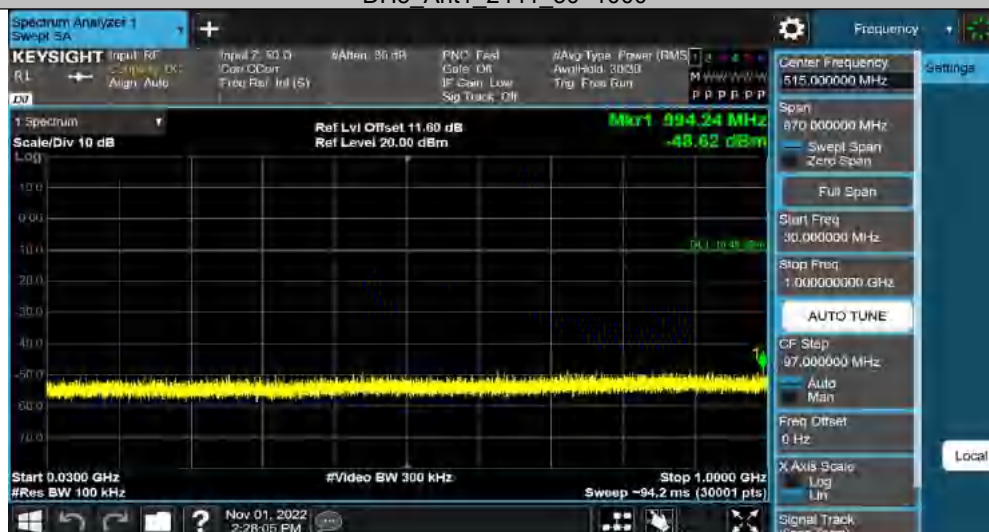
DH5_Ant1_2402_1000~26500



DH5_Ant1_2441_0~Reference



DH5_Ant1_2441_30~1000



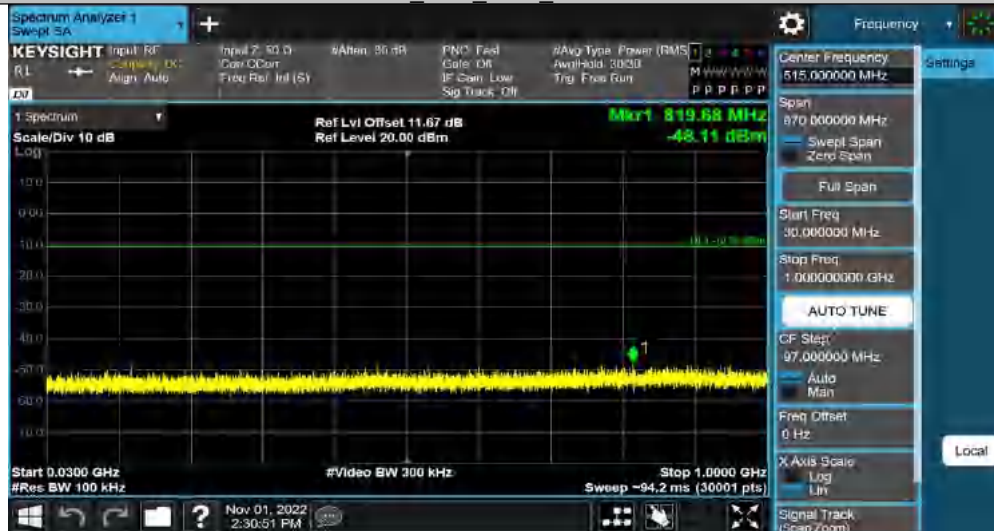
DH5_Ant1_2441_1000~26500



DH5_Ant1_2480_0~Reference



DH5_Ant1_2480_30~1000



DH5_Ant1_2480_1000~26500



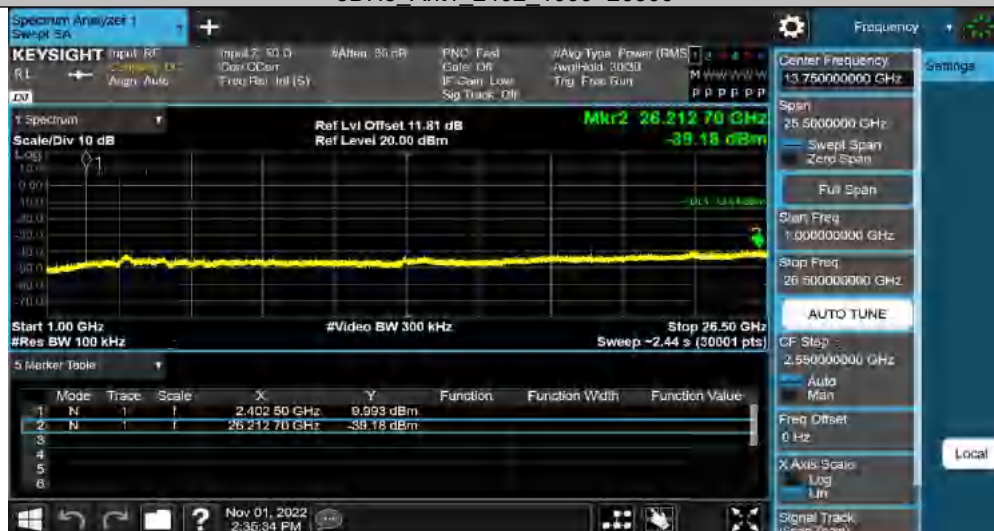
3DH5_Ant1_2402_0~Reference



3DH5_Ant1_2402_30~1000



3DH5_Ant1_2402_1000~26500



3DH5_Ant1_2441_0~Reference



3DH5_Ant1_2441_30~1000



3DH5_Ant1_2441_1000~26500



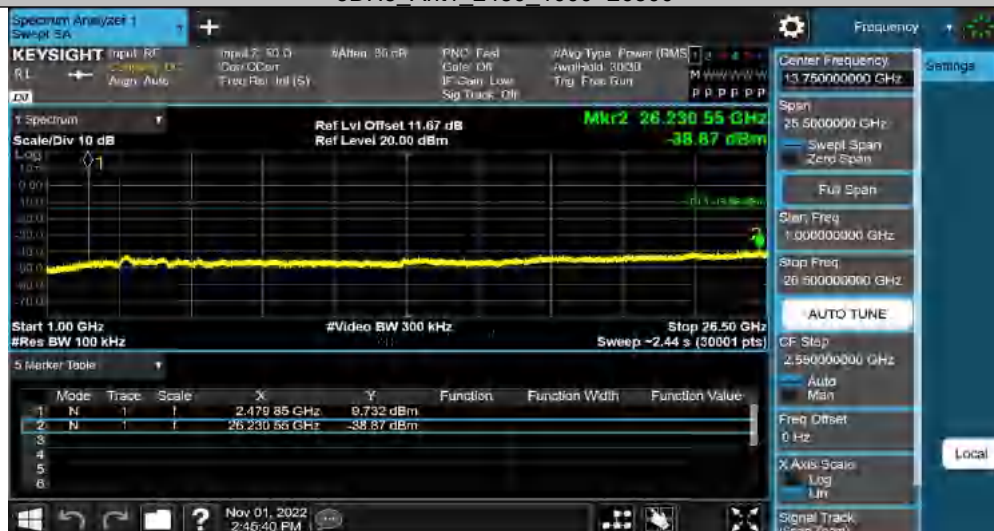
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3DH5_Ant1_2480_30~1000



3DH5_Ant1_2480_1000~26500



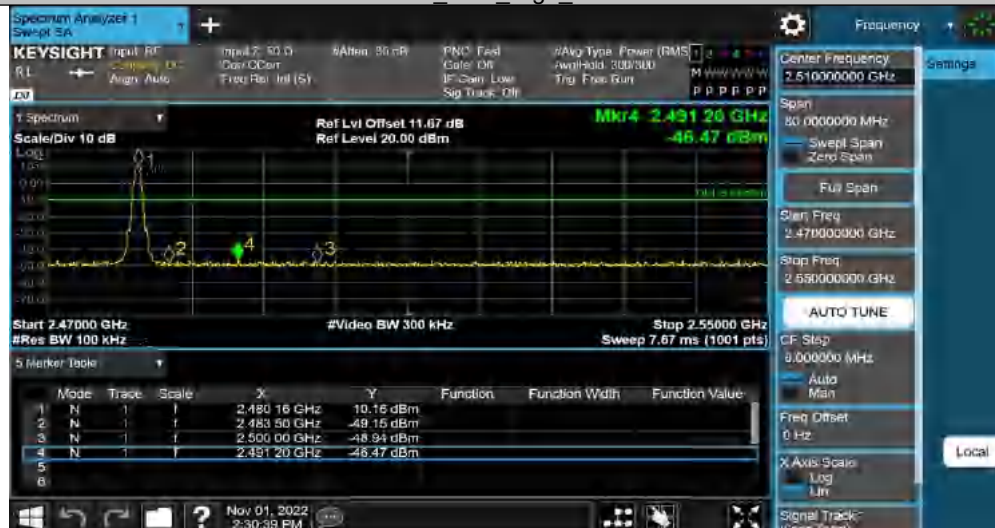
Band Edge

TestMode	Antenna	ChName	Channel	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	10.65	-45.85	≤-9.35	PASS
		High	2480	10.16	-46.47	≤-9.85	PASS
		Low	Hop 2402	9.83	-46.52	≤-10.17	PASS
		High	Hop 2480	9.86	-46.55	≤-10.15	PASS
3DH5	Ant1	Low	2402	10.56	-44	≤-9.44	PASS
		High	2480	10.17	-46.29	≤-9.84	PASS
		Low	Hop 2402	5.87	-46.56	≤-14.13	PASS
		High	Hop 2480	9.78	-46.59	≤-10.22	PASS

DH5 Ant1 Low 2402



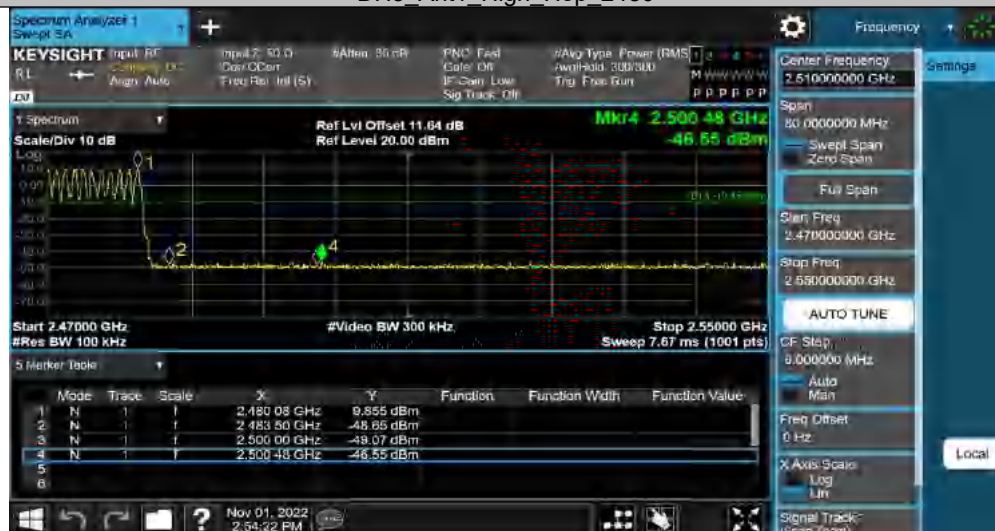
DH5 Ant1 High 2480



DH5 Ant1 Low Hop 2402



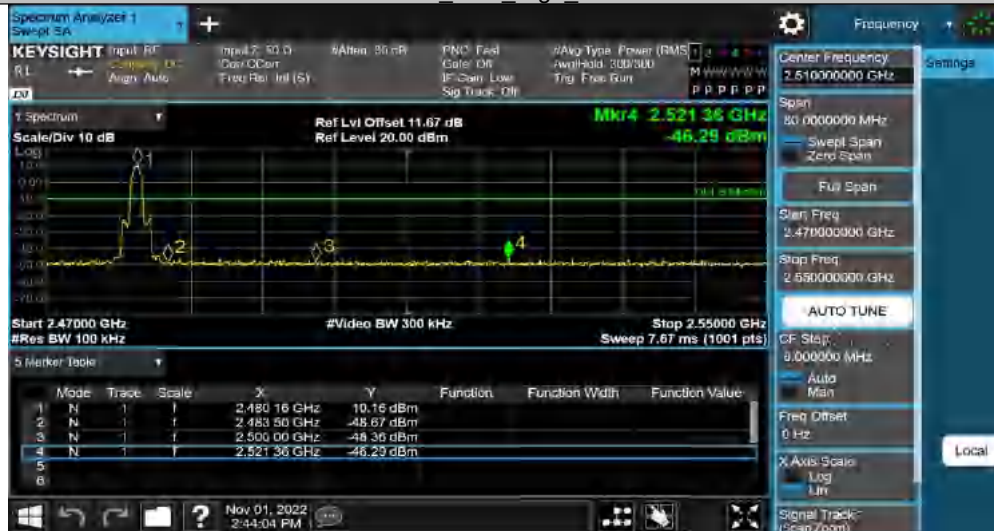
DH5 Ant1 High Hop 2480



3DH5 Ant1 Low 2402



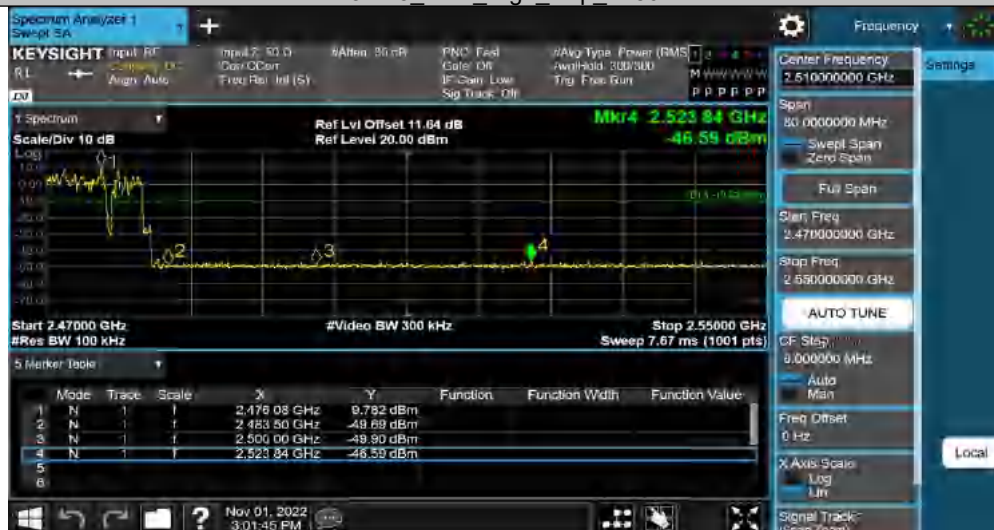
3DH5 Ant1 High 2480



3DH5 Ant1 Low Hop 2402



3DH5 Ant1 High Hop 2480



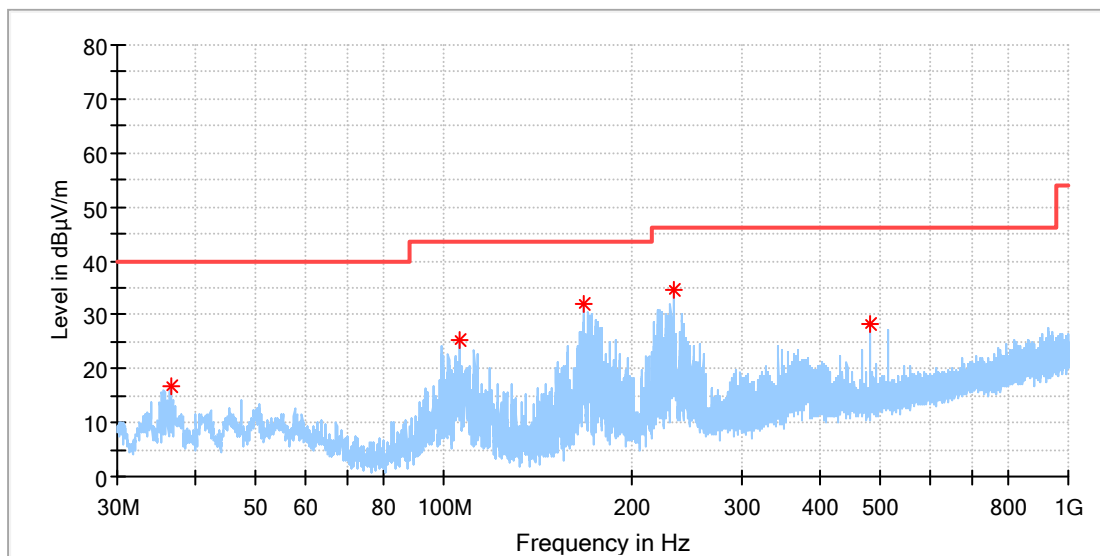
Appendix C.8: Test Results of Radiated Spurious Emissions

Note: 1. 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. 2. This testing was carried out on different modulations, but only the worst case was presented in this report.

30MHz - 1GHz

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	QUANTUM TWS AIR
Test Mode:	BR_DH5_Mid channel
Order No/Sample No:	168395349/A003358854-007
Test Voltage::	Battery
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

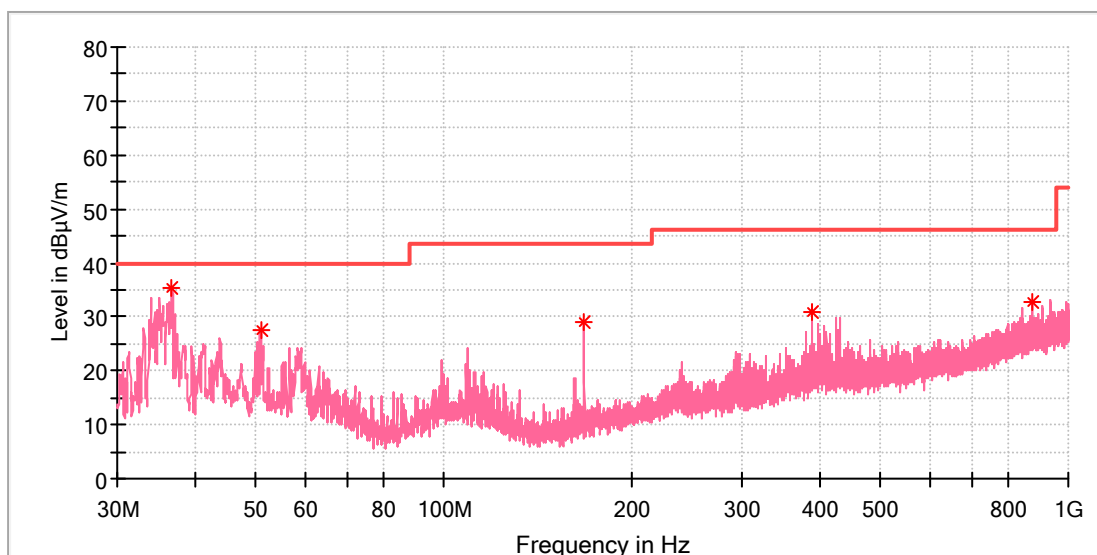


Critical Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
36.491539	16.67	40.00	23.33	100.0	H	212.0	-21.7
105.921154	25.12	43.50	18.38	100.0	H	293.0	-19.1
168.001154	31.91	43.50	11.59	100.0	H	188.0	-21.7
233.998462	34.72	46.00	11.28	100.0	H	212.0	-18.3
480.005385	28.34	46.00	17.66	100.0	H	196.0	-12.6

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	QUANTUM TWS AIR
Test Mode:	BR_DH5_Mid channel
Order No/Sample No:	168395349/A003358854-007
Test Voltage::	Battery
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical Freqs

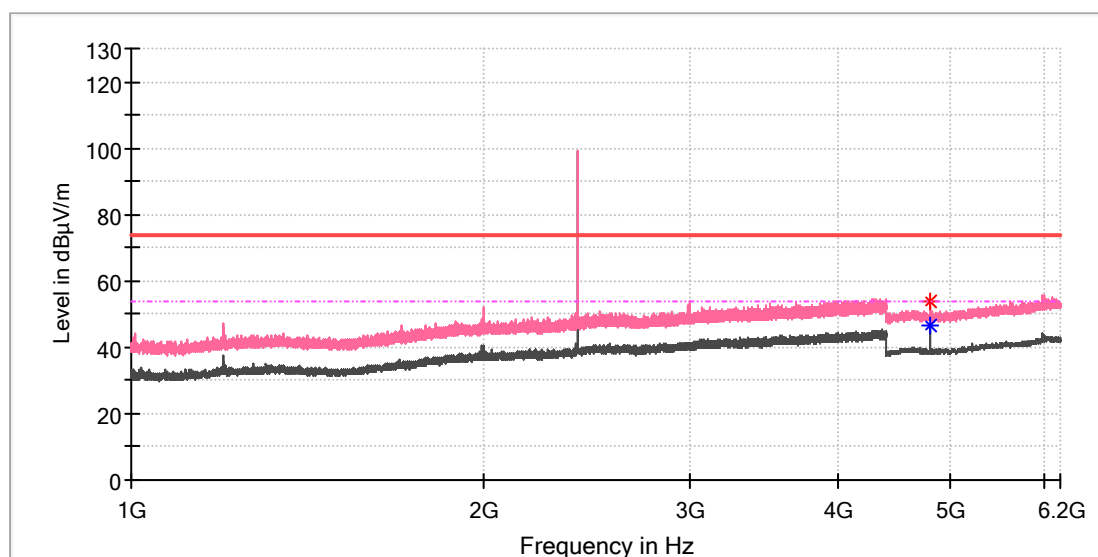
Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
36.741500	35.26	40.00	4.74	100.0	V	223.0	-21.3
50.903500	27.69	40.00	12.31	100.0	V	341.0	-18.3
168.031000	28.92	43.50	14.58	100.0	V	285.0	-21.3
389.918500	30.76	46.00	15.24	100.0	V	171.0	-13.9
877.489000	32.68	46.00	13.32	100.0	V	128.0	-5.2

1GHz - 6.2GHz

Note: The highest waveform in the figure is Bluetooth Fundamental.

UT Information

EUT Name:	BLUETOOTH HEADSET
Model:	QUANTUM TWS AIR
Test Mode:	BR_DH5_Low channel
Order No/Sample No:	168395349/A003358854-007
Test Voltage::	Battery
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

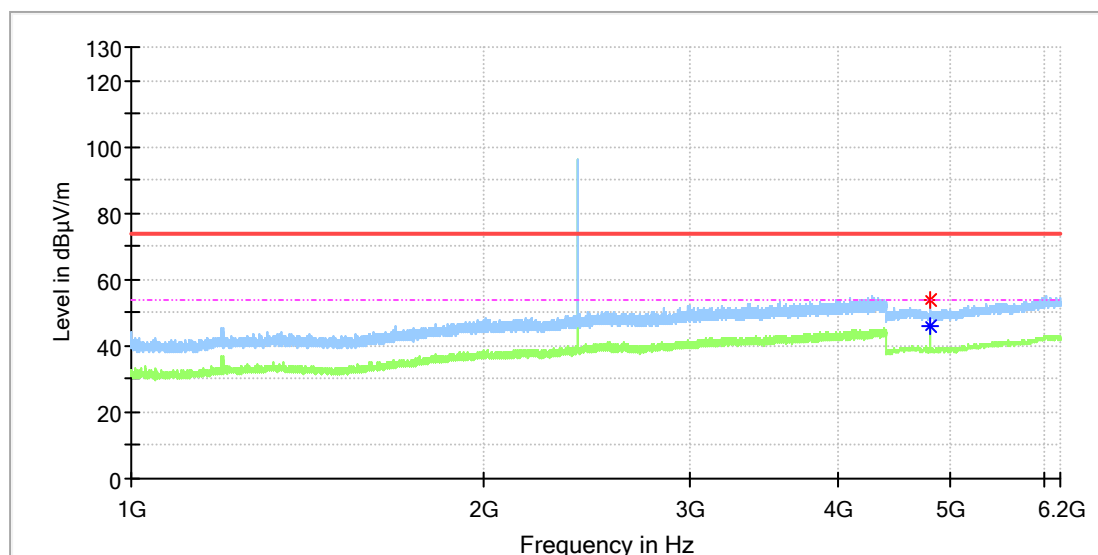


Critical Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4803.500000	53.59	---	74.00	20.41	100.0	V	51.0	11.8
4804.000000	---	46.53	54.00	7.47	100.0	V	45.0	11.8

EUT Information

EUT Name: BLUETOOTH HEADSET
 Model: QUANTUM TWS AIR
 Test Mode: BR_DH5_Low channel
 Order No/Sample No: 168395349/A003358854-007
 Test Voltage:: Battery
 Remark: Temp 23 Humi:56%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin

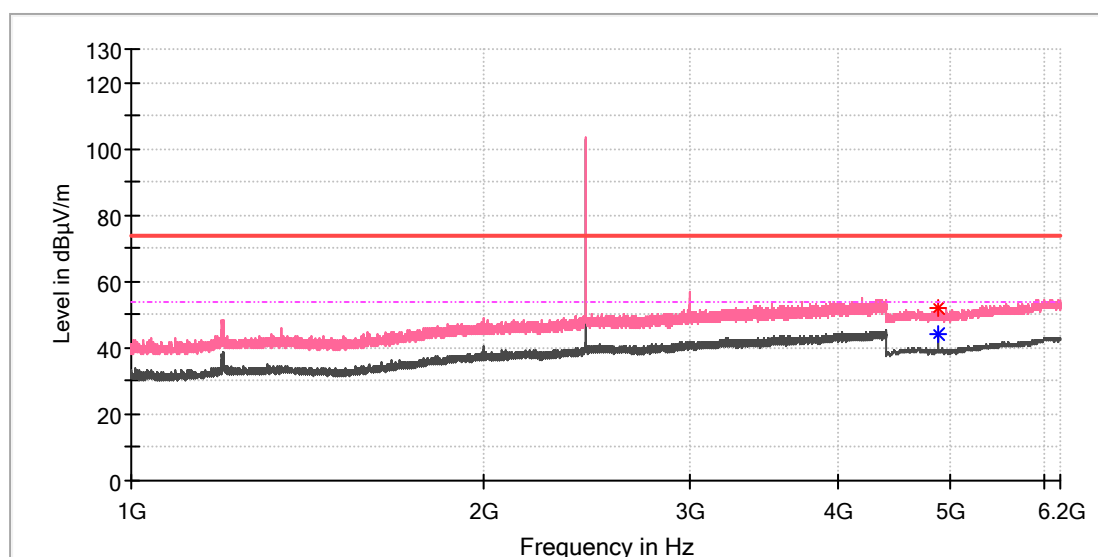


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4804.000000	53.59	---	74.00	20.41	100.0	H	25.0	11.8
4804.000000	---	45.73	54.00	8.27	100.0	H	25.0	11.8

EUT Information

EUT Name: BLUETOOTH HEADSET
 Model: QUANTUM TWS AIR
 Test Mode: BR_DH5_Mid channel
 Order No/Sample No: 168395349/A003358854-007
 Test Voltage:: Battery
 Remark: Temp 23 Humi:56%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin

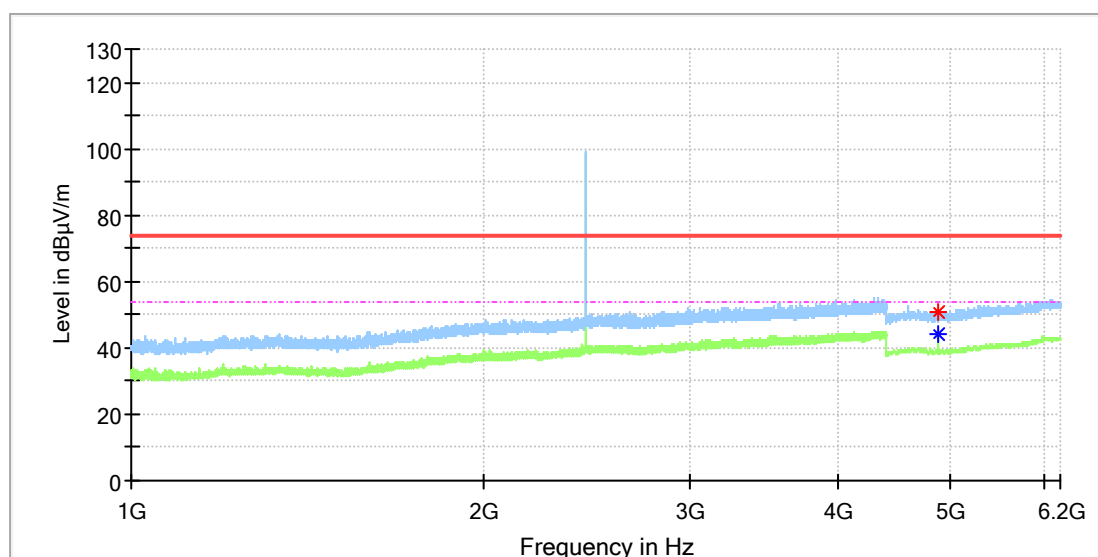


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4882.000000	51.85	---	74.00	22.15	100.0	V	49.0	11.8
4882.000000	---	44.43	54.00	9.57	100.0	V	49.0	11.8

EUT Information

EUT Name: BLUETOOTH HEADSET
 Model: QUANTUM TWS AIR
 Test Mode: BR_DH5_Mid channel
 Order No/Sample No: 168395349/A003358854-007
 Test Voltage:: Battery
 Remark: Temp 23 Humi:56%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin

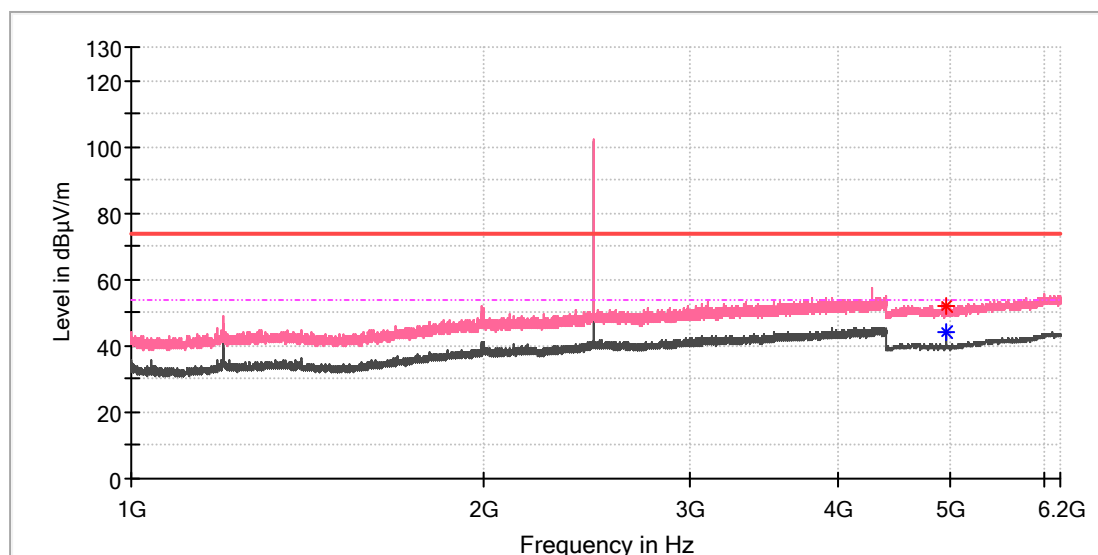


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4881.500000	51.00	---	74.00	23.00	100.0	H	315.0	11.8
4882.000000	---	44.19	54.00	9.81	100.0	H	165.0	11.8

EUT Information

EUT Name: BLUETOOTH HEADSET
 Model: QUANTUM TWS AIR
 Test Mode: BR_DH5_High channel
 Order No/Sample No: 168395349/A003358854-007
 Test Voltage:: Battery
 Remark: Temp 23 Humi:56%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin

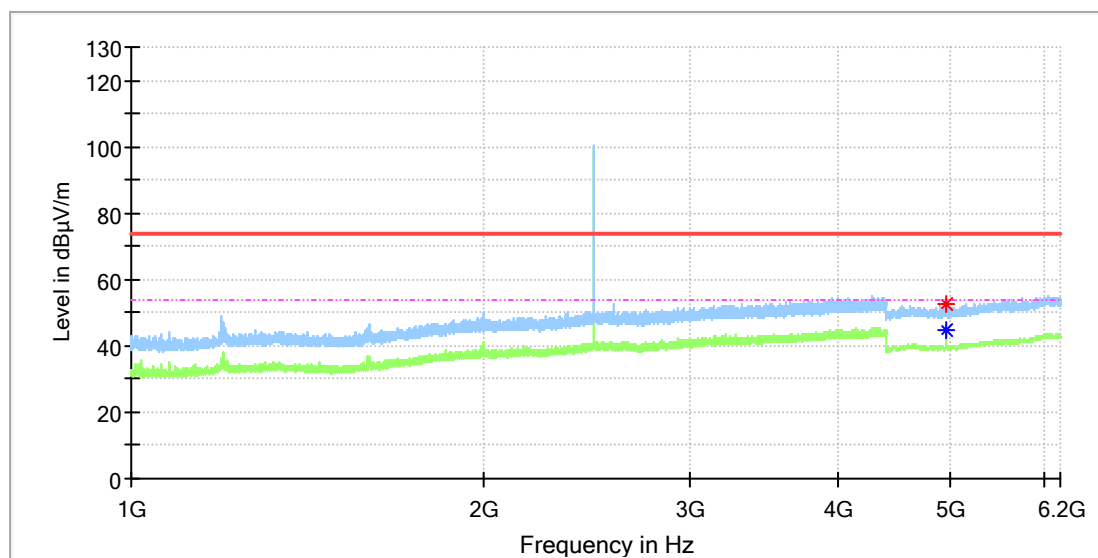


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4960.000000	52.04	---	74.00	21.96	100.0	V	57.0	11.8
4960.000000	---	43.91	54.00	10.09	100.0	V	57.0	11.8

EUT Information

EUT Name: BLUETOOTH HEADSET
 Model: QUANTUM TWS AIR
 Test Mode: BR_DH5_High channel
 Order No/Sample No: 168395349/A003358854-007
 Test Voltage:: Battery
 Remark: Temp 23 Humi:56%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin



Critical_Freqs

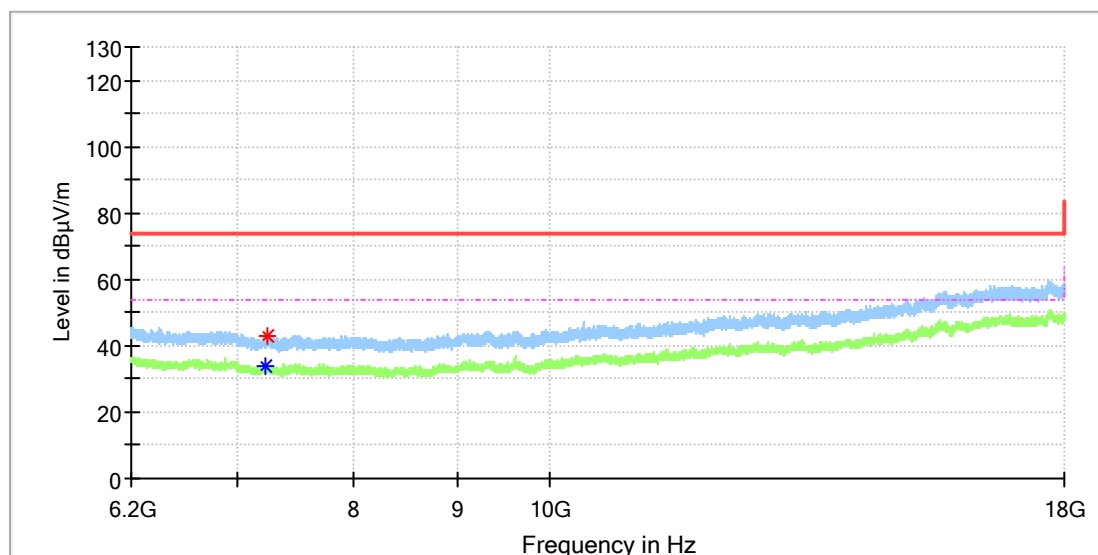
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4959.500000	52.57	---	74.00	21.43	100.0	H	348.0	11.8
4959.500000	---	44.45	54.00	9.55	100.0	H	348.0	11.8

6.2GHz - 18GHz

Note: The highest waveform in the figure is Bluetooth harmonic.

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	QUANTUM TWS AIR
Test Mode:	BR_DH5_Low channel
Order No/Sample No:	168395349/A003358854-007
Test Voltage::	Battery
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

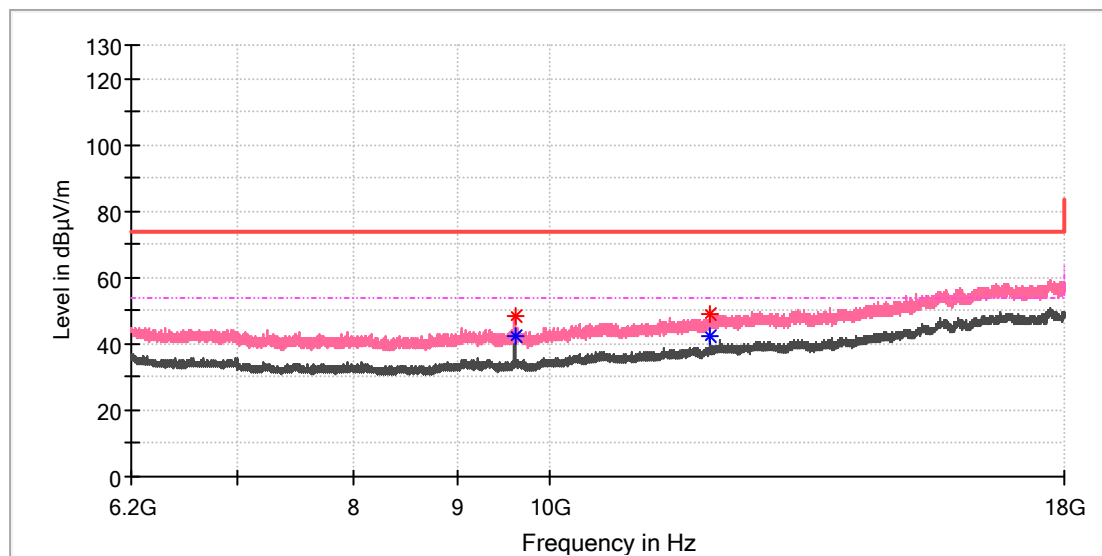


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7233.975000	---	33.77	54.00	20.23	100.0	H	77.0	8.6
7243.316667	42.75	---	74.00	31.25	100.0	H	16.0	8.6

EUT Information

EUT Name: BLUETOOTH HEADSET
 Model: QUANTUM TWS AIR
 Test Mode: BR_DH5_Low channel
 Order No/Sample No: 168395349/A003358854-007
 Test Voltage:: Battery
 Remark: Temp 23 Humi:56%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin

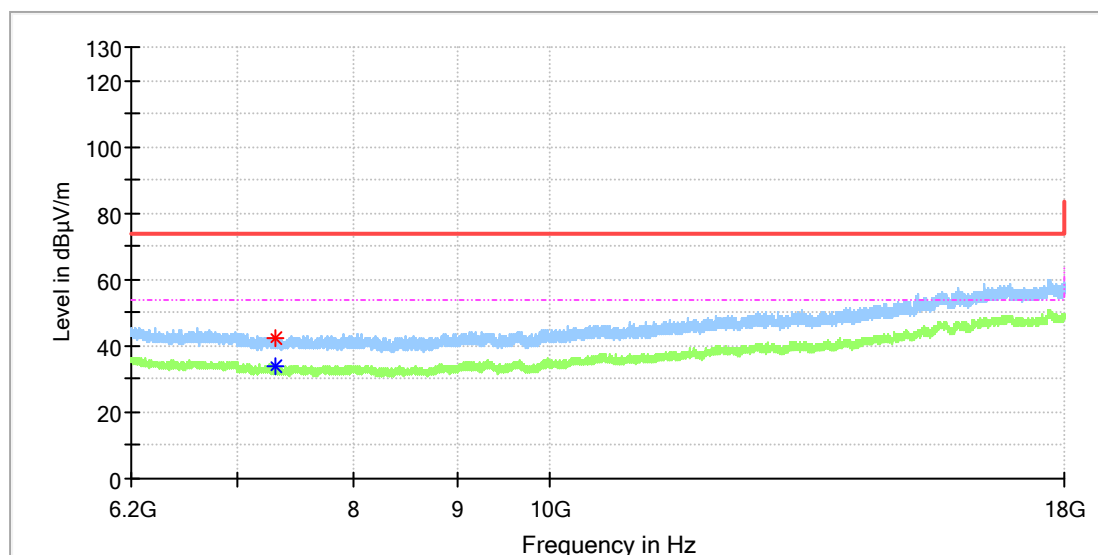


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
9607.741667	---	42.53	54.00	11.47	100.0	V	356.0	10.4
9608.725000	48.67	---	74.00	25.33	100.0	V	356.0	10.4
12010.516667	48.70	---	74.00	25.30	100.0	V	346.0	14.0
12010.516667	---	42.47	54.00	11.53	100.0	V	346.0	14.0

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	QUANTUM TWS AIR
Test Mode:	BR_DH5_Mid channel
Order No/Sample No:	168395349/A003358854-007
Test Voltage::	Battery
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

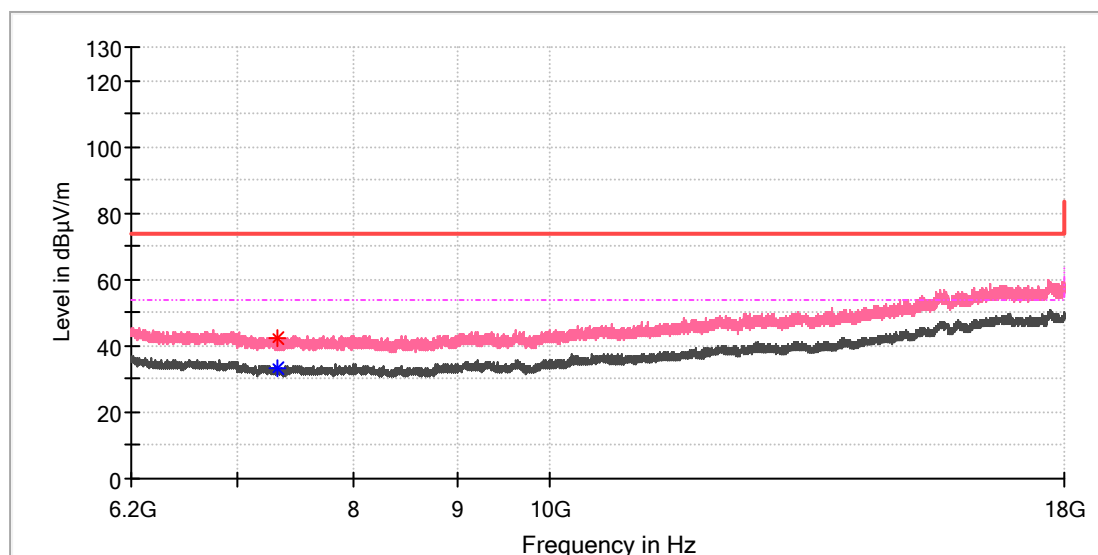


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7304.775000	---	33.71	54.00	20.29	100.0	H	203.0	8.3
7310.675000	42.40	---	74.00	31.60	100.0	H	203.0	8.2

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	QUANTUM TWS AIR
Test Mode:	BR_DH5_Mid channel
Order No/Sample No:	168395349/A003358854-007
Test Voltage::	Battery
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

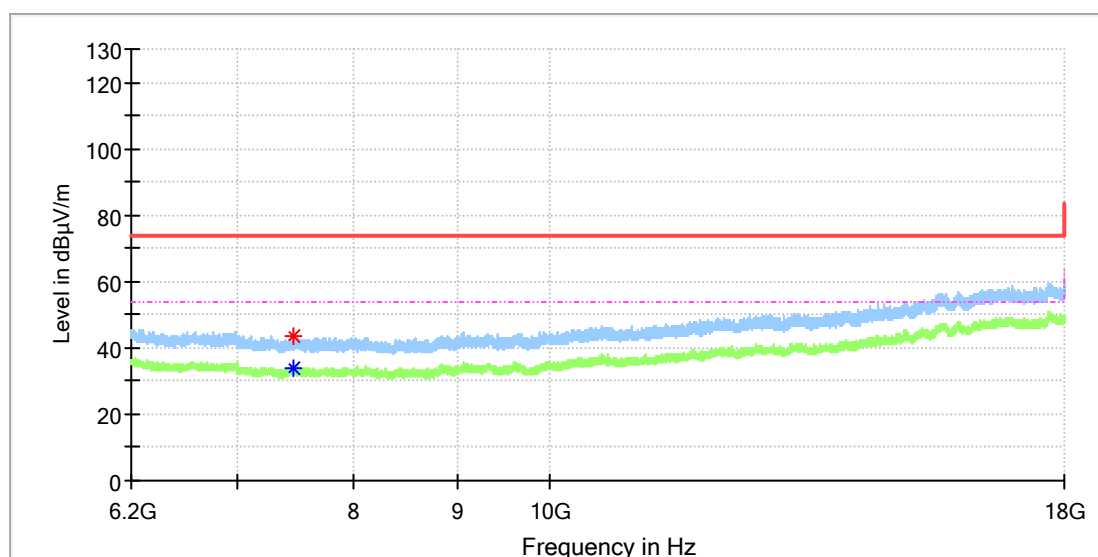


Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7322.475000	---	33.48	54.00	20.52	100.0	V	251.0	8.2
7328.375000	42.13	---	74.00	31.87	100.0	V	166.0	8.1

EUT Information

EUT Name: BLUETOOTH HEADSET
 Model: QUANTUM TWS AIR
 Test Mode: BR_DH5_High channel
 Order No/Sample No: 168395349/A003358854-007
 Test Voltage:: Battery
 Remark: Temp 23 Humi:56%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin

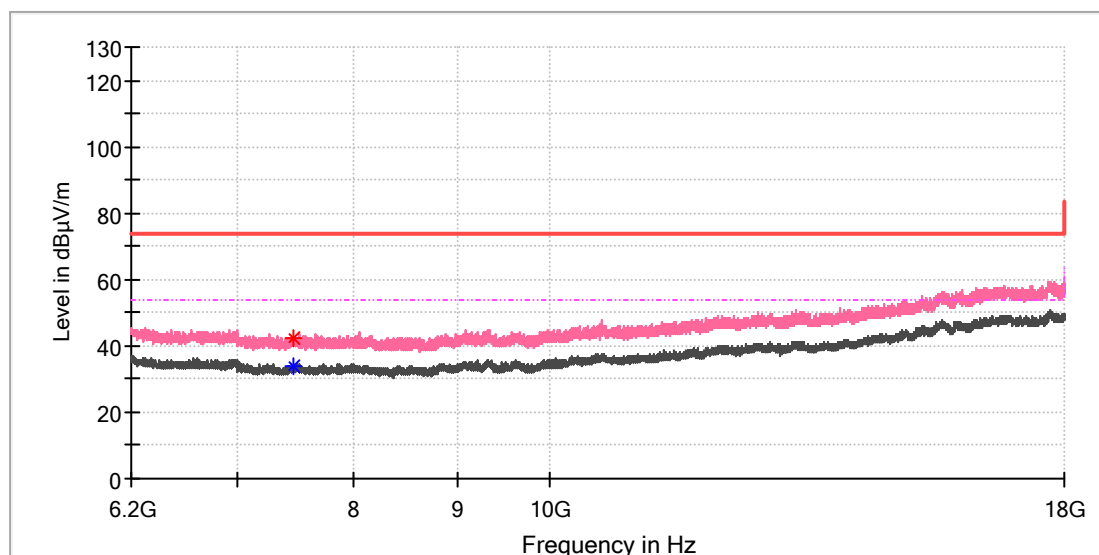


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7459.650000	---	33.84	54.00	20.16	100.0	H	316.0	8.5
7465.550000	43.38	---	74.00	30.62	100.0	H	344.0	8.6

EUT Information

EUT Name: BLUETOOTH HEADSET
 Model: QUANTUM TWS AIR
 Test Mode: BR_DH5_High channel
 Order No/Sample No: 168395349/A003358854-007
 Test Voltage:: Battery
 Remark: Temp 23 Humi:56%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin



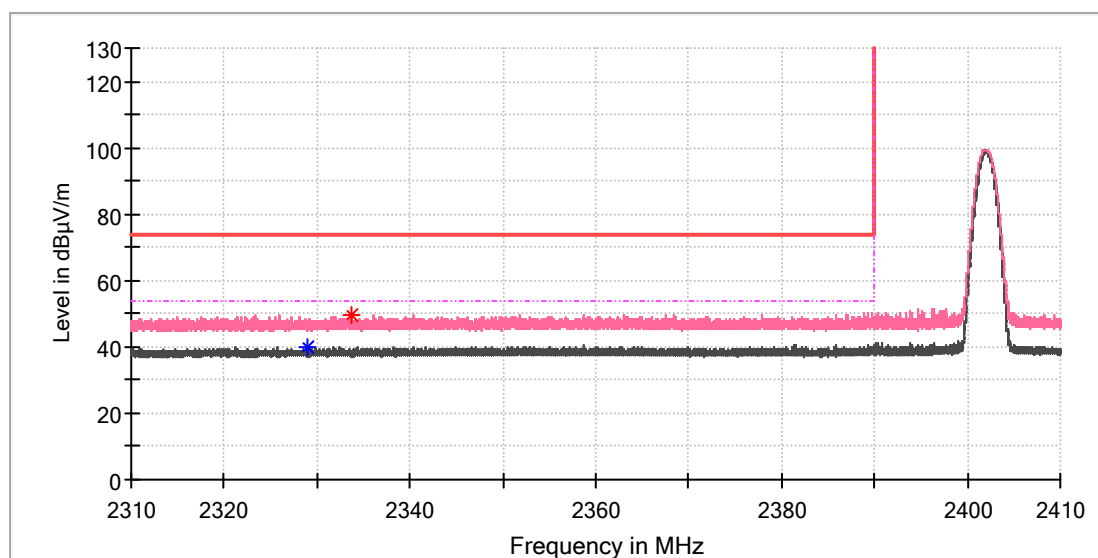
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7454.733333	42.31	---	74.00	31.69	100.0	V	1.0	8.5
7456.700000	---	34.16	54.00	19.84	100.0	V	152.0	8.5

Appendix C.9: Test Results of Radiated Emissions in Restricted Bands

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	QUANTUM TWS AIR
Test Mode:	BR_DH5_Low channel
Order No/Sample No:	168395349/A003358854-007
Test Voltage::	Battery
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

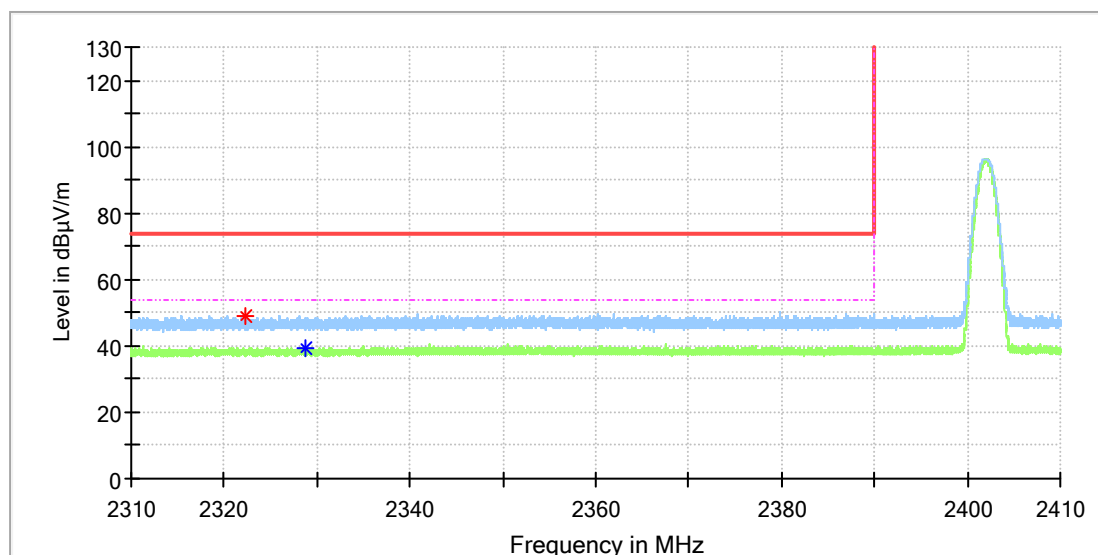


Critical Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2328.985000	---	39.82	54.00	14.18	100.0	V	91.0	6.7
2333.680000	49.71	---	74.00	24.29	100.0	V	267.0	6.7

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	QUANTUM TWS AIR
Test Mode:	BR_DH5_Low channel
Order No/Sample No:	168395349/A003358854-007
Test Voltage::	Battery
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

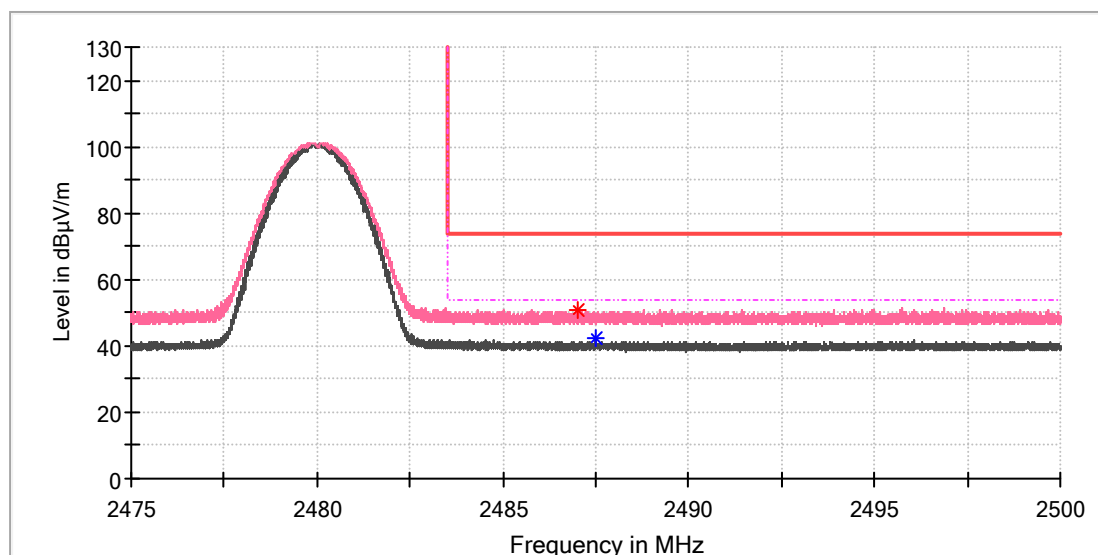


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2322.240000	48.83	---	74.00	25.17	100.0	H	189.0	6.6
2328.745000	---	39.59	54.00	14.41	100.0	H	166.0	6.7

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	QUANTUM TWS AIR
Test Mode:	BR_DH5_High channel
Order No/Sample No:	168395349/A003358854-007
Test Voltage::	Battery
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

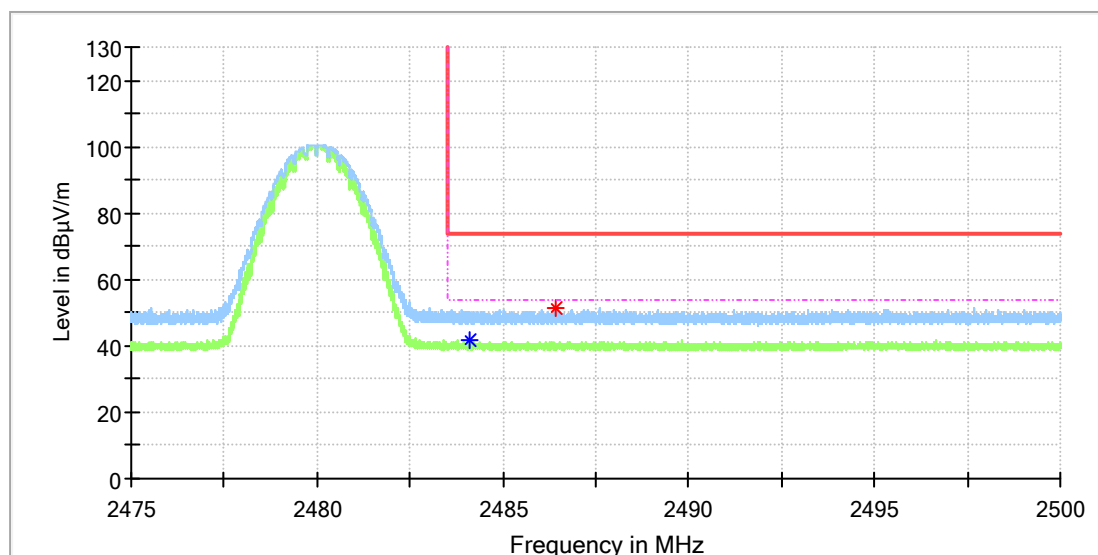


Critical_Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2487.035000	51.00	---	74.00	23.00	100.0	V	0.0	7.4
2487.482500	---	42.21	54.00	11.79	100.0	V	82.0	7.4

EUT Information

EUT Name:	BLUETOOTH HEADSET
Model:	QUANTUM TWS AIR
Test Mode:	BR_DH5_High channel
Order No/Sample No:	168395349/A003358854-007
Test Voltage::	Battery
Remark:	Temp 23 Humi:56%
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)
2484.126250	---	41.85	54.00	12.15	100.0	H	76.0	7.4
2486.398750	51.14	---	74.00	22.86	100.0	H	5.0	7.4