




Prüfbericht-Nr.: <i>Test report No.:</i>	50333357 001	Auftrags-Nr.: <i>Order No.:</i>	168143071	Seite 1 von 27 <i>Page 1 of 27</i>
Kunden-Referenz-Nr.: <i>Client reference No.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	10.12.2019	
Auftraggeber: <i>Client:</i>	SHENZHEN FENDA TECHNOLOGY CO., LTD. Fenda Hi-Tech Park, Zhoushi Road, Shiyan Town, Baoan District, Shenzhen, China			
Prüfgegenstand: <i>Test item:</i>	Portable Outdoor IPX5 Waterproof Bluetooth Speaker, 5W			
Bezeichnung / Typ-Nr.: <i>Identification / Type No.:</i>	B081HCHC4Y, B081HD1ZR1, B081HD9TRN, WP522BLACK, WP522RED, WP522BLUE (Trademark: )			
Auftrags-Inhalt: <i>Order content:</i>	FCC and IC approval			
Prüfgrundlage: <i>Test specification:</i>	CFR47 FCC Part 15: Subpart C Section 15.247 RSS-247 Issue 2 February 2017 CFR47 FCC Part 15: Subpart C Section 15.207 RSS-Gen Issue 5 March 2019 CFR47 FCC Part 15: Subpart C Section 15.209 RSS-102 Issue 5 March 2015 CFR47 FCC Part 2.1093			
Wareneingangsdatum: <i>Date of receipt:</i>	08.11.2019	Please refer to photo documents		
Prüfmuster-Nr.: <i>Test sample No.:</i>	A001035918 -014			
Prüfzeitraum: <i>Testing period:</i>	23.12.2019 - 02.04.2020			
Ort der Prüfung: <i>Place of testing:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft von / tested by:		kontrolliert von / reviewed by:		
				
13.04.2020	Alex Lan / Senior Project Engineer	13.04.2020	Winnie Hou / Technical Certifier	
Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>	Unterschrift <i>Signature</i>	Datum <i>Date</i>	Name/Stellung <i>Name/Position</i>
				Unterschrift <i>Signature</i>
Sonstiges / Other:				
FCC ID: HBOWP522B IC: 10550A-WP522B HVIN: WP522B				
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>		Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged:</i>		
Legende:	1 = sehr gut	2 = gut	3 = befriedigend	4 = ausreichend
	P(ass) = entspricht o.g. Prüfgrundlage(n)	F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	5 = mangelhaft
Legend:	1 = very good	2 = good	3 = satisfactory	4 = sufficient
	P(ass) = passed a.m. test specifications(s)	F(ail) = failed a.m. test specifications(s)	N/A = not applicable	5 = poor
				N/T = nicht getestet
				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>				

V04

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 NUMBER OF HOPPING FREQUENCY***RESULT: Pass***5.1.9 TIME OF OCCUPANCY***RESULT: Pass***5.1.10 CONDUCTED EMISSION ON AC MAINS***RESULT: Pass***6.1.1 ELECTROMAGNETIC FIELDS***RESULT: Pass*

Contents

1	GENERAL REMARKS	5
1.1	COMPLEMENTARY MATERIALS.....	5
2	TEST SITES.....	5
2.1	TEST FACILITIES	5
2.2	LIST OF TEST AND MEASUREMENT INSTRUMENTS	6
2.3	TRACEABILITY	8
2.4	CALIBRATION.....	8
2.5	MEASUREMENT UNCERTAINTY.....	8
2.6	LOCATION OF ORIGINAL DATA.....	8
2.7	STATUS OF FACILITY USED FOR TESTING	8
3	GENERAL PRODUCT INFORMATION	9
3.1	PRODUCT FUNCTION AND INTENDED USE	9
3.2	RATINGS AND SYSTEM DETAILS.....	9
3.3	INDEPENDENT OPERATION MODES.....	12
3.4	NOISE GENERATING AND NOISE SUPPRESSING PARTS	12
3.5	SUBMITTED DOCUMENTS.....	12
4	TEST SET-UP AND OPERATION MODES.....	13
4.1	PRINCIPLE OF CONFIGURATION SELECTION	13
4.2	TEST OPERATION AND TEST SOFTWARE	13
4.3	SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT	13
4.4	COUNTERMEASURES TO ACHIEVE EMC COMPLIANCE	13
4.5	TEST SETUP DIAGRAM	14
5	TEST RESULTS	16
5.1	TRANSMITTER REQUIREMENT & TEST SUITES.....	16
5.1.1	<i>Antenna Requirement.....</i>	<i>16</i>
5.1.2	<i>Maximum Conducted Output Power.....</i>	<i>17</i>
5.1.3	<i>99% Bandwidth.....</i>	<i>18</i>
5.1.4	<i>Conducted Spurious Emissions Measured in 100 kHz Bandwidth.....</i>	<i>19</i>
5.1.5	<i>Radiated Spurious Emission</i>	<i>20</i>
5.1.6	<i>20dB Bandwidth</i>	<i>21</i>
5.1.7	<i>Carrier Frequency Separation</i>	<i>22</i>
5.1.8	<i>Number of Hopping Frequency</i>	<i>23</i>
5.1.9	<i>Time of Occupancy.....</i>	<i>24</i>
5.1.10	<i>Conducted Emission on AC Mains.....</i>	<i>25</i>
6	SAFETY HUMAN EXPOSURE.....	26
6.1	RADIO FREQUENCY EXPOSURE COMPLIANCE.....	26
6.1.1	<i>Electromagnetic Fields</i>	<i>26</i>
7	PHOTOGRAPHS OF THE TEST SET-UP	27

Prüfbericht - Nr.: 50333357 001
Test Report No.:

Seite 4 von 27
Page 4 of 27

8	LIST OF TABLES.....	27
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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 Conducted Testing

Appendix C: Test Results of Radiated Testing & AC Mains Conducted Emission

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

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

TÜV Rheinland (Shenzhen) Co., Ltd.

Conducted Emissions				
Equipment	Manufacturer	Model No.	Serial No.	Cal. Until
EMI Test Receiver	R&S	ESR3	102428	03.09.2020
Artificial Mains Network	R&S	ENV216	102333	19.08.2020
Artificial Mains Network	R&S	ENV432	101411	19.08.2020
Impedance Stabilisation Network	R&S	ENY81	100323	19.08.2020
Impedance Stabilisation Network	R&S	ENY81-CA6	101810	20.08.2020
Current Probe	R&S	EZ-17	101247	19.08.2020
Voltage Probe	R&S	ESH2-Z3	100557	19.08.2020
Attenuator	R&S	ESH2Z31	100300	19.08.2020
EMC32 test software	R&S	EMC32(Ver.10.50.01)	N/A	N/A
Click test software	R&S	Click Rate Analyzer 2.4.2	N/A	N/A
Radio Spectrum Testing				
Equipment	Manufacturer	Model No.	Serial No.	Cal. Until
Wireless Connectivity Tester	Rohde & Schwarz	CMW270	101375	20.08.2020
Signal Analyzer	Rohde & Schwarz	FSV 40	101441	20.08.2020
Vector Signal Generator	Rohde & Schwarz	SMBV100A	263301	21.08.2020
Signal Generator	Rohde & Schwarz	SMB100A	115186	21.08.2020
OSP	Rohde & Schwarz	OSP 150	101017	20.12.2019
Control PC	DELL	OptiPlex 7050	FTJZ9P2	N/A
Test Software	Rohde & Schwarz	WMS32 (V10.40.10)	N/A	N/A
Power Meter	Rohde & Schwarz	NRP2	107105	20.12.2019
Wideband Power Sensor	Rohde & Schwarz	NRP-Z81	105350	20.12.2019
Humid & Temp Programmable Tester	BOST	NTH090-60	19040801	16.04.2020
Shielding Room 8#	Albatross	SR8	APC17151-SR8	23.07.2020
Unwanted Emission Testing				
Equipment	Manufacturer	Model No.	Serial No.	Cal. Until
Signal Generator	Rohde & Schwarz	SMB100A	180840	20.08.2020
Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	165339	20.08.2020

Signal Analyzer	Rohde & Schwarz	FSV 40	101440	21.08.2020
System Controller Interface	Rohde & Schwarz	SCI-100	S10010036	N/A
Filterbank	Rohde & Schwarz	CDMA	100751	30.08.2020
Filterbank	Rohde & Schwarz	GSM	100811	21.08.2020
OSP	Rohde & Schwarz	OSP 120	102041	N/A
OSP	Rohde & Schwarz	OSP 150	101385	20.12.2019
Pre-amplifier	Rohde & Schwarz	SCU08F1	08320030	20.08.2020
Amplifier	Rohde & Schwarz	SCU-18F	180079	20.08.2020
Amplifier	Rohde & Schwarz	SCU40A	100450	02.09.2020
Trilog Broadband Antenna (30 MHz - 1 GHz)	Schwarzbeck	VULB9162	192	02.09.2020
Double-Ridged Antenna (1 -18 GHz)	ETS-LINDGREN	3117	00218719	02.09.2020
Wideband Ridged Horn Antenna (12-18 GHz)	Steatite	QMS-00208	18312	02.09.2020
Wideband Ridged Horn Antenna (18-40 GHz)	Steatite	QMS-00880	19066	02.09.2020
Biconical Broadband Antenna (30 MHz - 1 GHz)	Schwarzbeck	VUBA 9117	357	02.09.2020
Double Ridged Broadband Horn Antenna (1 – 18 GHz)	Schwarzbeck	BBHA 9120 D	01760	02.09.2020
Broadband Horn Antenna (15 – 40 GHz)	Schwarzbeck	BBHA 9170	00862	02.09.2020
Test software	Rohde & Schwarz	EMC32 (V10.40.00)	N/A	N/A
Control PC	Dell	OptiPlex 7050	36NW9P2	N/A

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

Item	Extended Uncertainty
Conducted Emission	± 2.74 dB
Radiated Emission (30-1000MHz)	Field strength (dBµV/m) 4.27dB
Radiated Emission (above 1000MHz)	Field strength (dBµV/m) 4.46dB
Radio Spectrum	± 1.5 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 Portable Outdoor IPX5 Waterproof Bluetooth Speaker, 5W which supports Bluetooth 5.0 (BDR&EDR) technology.

Both models are identical except the model name and colour of enclosure are different.

Model	colour of enclosure
B081HCHC4Y, WP522BLACK	Black
B081HD1ZR1, WP522RED	Red
B081HD9TRN, WP522BLUE	Blue

For details refer to the User Manual, Technical Description and Circuit Diagram.

3.2 Ratings and System Details

Table 2: Technical Specification of EUT

Technical Specification	Value
Kind of Equipment	Portable Outdoor IPX5 Waterproof Bluetooth Speaker, 5W
Type Designation	B081HCHC4Y, B081HD1ZR1, B081HD9TRN, WP522BLACK, WP522RED, WP522BLUE
FCC ID	HBOWP522B
IC	10550A-WP522B
HVIN	WP522B
Operating Frequency	2402 - 2480 MHz
Operating Voltage	DC 3.7V, 1300mAh via built-in Lithium Battery DC 5V, 1A via Micro USB interface for Charging
Type of Modulation	GFSK, $\pi/4$ DQPSK, 8DPSK
Channel Number	BDR & EDR mode:79 channels
Channel Separation	BDR & EDR mode:1MHz
Wireless Technology	Bluetooth 5.0
Antenna Type	Integral Antenna
Max. Antenna Gain	-0.347 dBi

Table 3: RF Channel and Frequency of 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: Frequency Hopping Information

Technical Specification	Description
Hopping Range	<p>Hereby we declare that the frequency range of this device is 2402-2480MHz. This is according the Bluetooth Core Specification 5.0 for devices which will be operated in the USA. This was checked during the Bluetooth Qualification tests.</p>
Hopping Sequence	<p>Example of a 79 hopping sequence in data mode:</p> <p>33,04,21,44,23,42,53,46,55,48,40,59,72,29,76,31,08,73,07,75,09,45,60,39,58,13,47,11,77,52,35,50,65,54,67,56,69,62,71,64, 7,25,27,66,57,70,74,61,78,63,10,41,05,43,15,44,64,68,02,70,06,01,51,03,55,05,03,66,53,49,36,47..</p>
Receiver input bandwidth	<p>The input bandwidth of the receiver is 1MHz. In every connection one Bluetooth device is the master and the other one is the slave. The master determines the hopping sequence. The slave follows this sequence. Both devices shift between RX and TX time slot according to the clock of the master.</p> <p>Additionally the type of connection is set up at the beginning of the connection. The master adapts its hopping frequency and its TX/RX timing according to the packet type of the connection. Also the slave of the connection will use these settings.</p> <p>Repeating of a packer has no influence on the hopping sequence. The hopping sequence generated by the master of the connection will be followed in any case.</p> <p>That means a repeated packet will not be send on the same frequency, it is send on the next frequency of the hopping sequence.</p>

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. On, Bluetooth connecting mode
- D. Off

3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

3.5 Submitted Documents

- Application Form
- Block Diagram
- Schematics
- Technical Description
- FCC/IC Label and Location Info
- Photo Document
- 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 tests were applied on model WP522RED.

4.3 Special Accessories and Auxiliary Equipment

Table 5: List of Accessories and Auxiliary Equipment

Description	Manufacturer	Model	S/N
iPhone 5c	Apple	A1526	2013CJ1056
Power Supply	Mass Power	PEF-0500200UA	N/A
Power Supply	Aohai	A70-502000	N/A

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 1GHz)

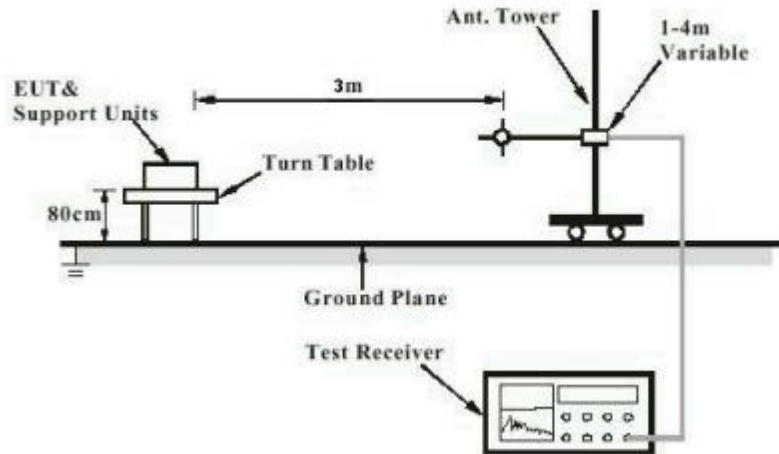


Diagram of Measurement Configuration for Radiation Test (Above 1GHz)

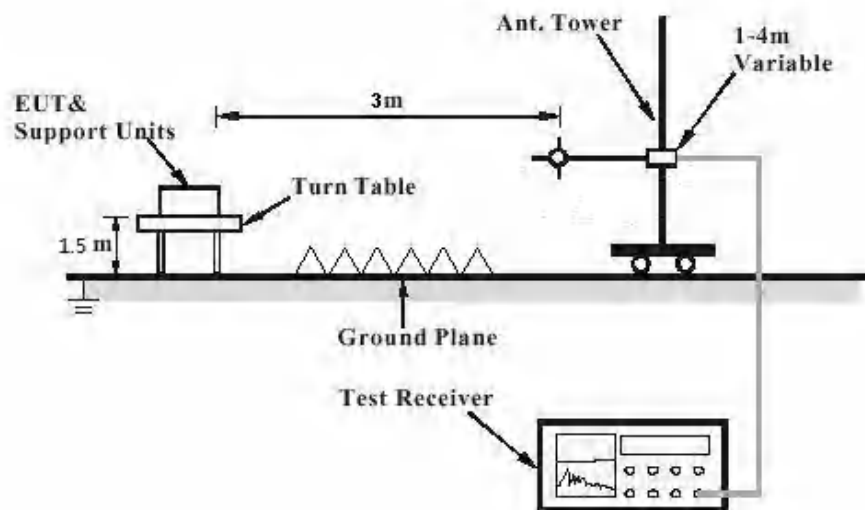


Diagram of Measurement Configuration for Mains Conduction Measurement

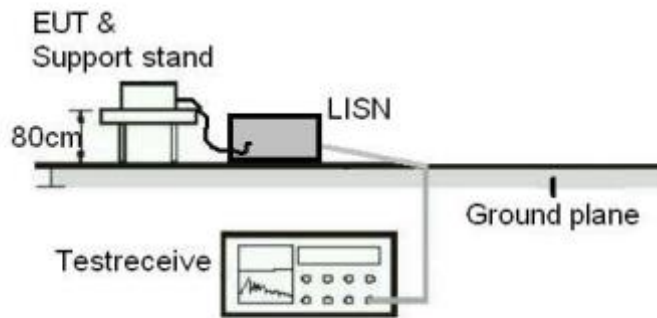
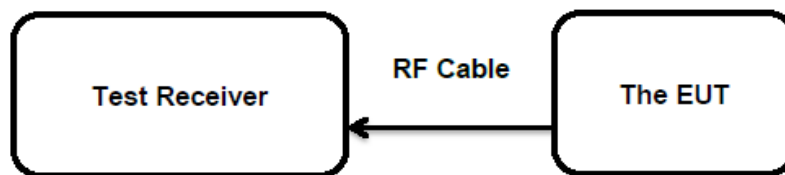


Diagram of Measurement Configuration for Conducted Transmitter Measurement



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 an integral antenna, the directional gain of antenna is -0.347 dBi, 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 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
FHSS<0.125W(Maximum peak conducted output power)

Limits : < 4 W (e.i.r.p.)

Kind of test site : Shielded Room

Test Setup

Date of testing : 06.01.2020

Input voltage : DC 3.7V

Operation mode : A.1

Test channel : Low / Middle / High

Ambient temperature : 25 °C

Relative humidity : 56 %

Atmospheric pressure : 101 kPa

Table 6: Test Result of Maximum Conducted Output Power

Band	Bluetooth(8QPSK)		
Data Rate	3DH5		
Channel	0	39	78
Frequency (MHz)	2402	2441	2480
Peak. Power (dBm)	4.73	4.19	3.16
Avg.Power (dBm)	-1.71	-2.28	-3.26
Band	Bluetooth(GFSK)		
Data Rate	DH5		
Channel	0	39	78
Frequency (MHz)	2402	2441	2480
Peak.Power (dBm)	-0.63	-1.15	-2.19
Avg.Power (dBm)	-2.21	-2.76	-3.74

Note: The cable loss is taken into account in results and the maximum e.i.r.p. is 4.383 dBm less than 4W(36dBm).

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 : 23.12.2019
 Input voltage : DC 3.7V
 Operation mode : A.1
 Test channel : Low / Middle / High
 Ambient temperature : 25 °C
 Relative humidity : 56 %
 Atmospheric pressure : 101 kPa

Table 7: Test Result of 99% Bandwidth

Test Mode	Channel Frequency (MHz)	99% Bandwidth (kHz)	Limit (kHz)
BDR	2402	920	/
	2441	920	
	2480	920	
EDR	2402	1195	/
	2441	1120	
	2480	1195	

For the measurement records, refer to the appendix B

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 : 24.12.2019

Input voltage : DC 3.7V

Operation mode : A.1

Test channel : Low / Middle / High

Ambient temperature : 25 °C

Relative humidity : 56 %

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.

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	: 24.12.2019
Input voltage	: DC 3.7V
Operation mode	: A.1, B
Test channel	: Low / Middle / High
Ambient temperature	: 23 °C
Relative humidity	: 56 %
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 C.

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 : 24.12.2019
 Input voltage : DC 3.7V
 Operation mode : A.1
 Test channel : Low / Middle / High
 Ambient temperature : 25 °C
 Relative humidity : 56 %
 Atmospheric pressure : 101 kPa

Table 8: Test Result of 20dB Bandwidth

Test Mode	Channel Frequency (MHz)	20dB Bandwidth (kHz)	2/3 of 20dB Bandwidth (kHz)	Limit (MHz)
BDR	2402	950	633.333	/
	2441	940	626.667	
	2480	940	626.667	
EDR	2402	1350	900.000	/
	2441	1345	896.667	
	2480	1345	896.667	

For the measurement records, refer to the appendix B.

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 : 24.12.2019
 Input voltage : DC 3.7V
 Operation mode : B
 Test channel : Low / Middle / High
 Ambient temperature : 25 °C
 Relative humidity : 56 %
 Atmospheric pressure : 101 kPa

Table 9: Test Result of Carrier Frequency Separation

Test Mode	Channel	Channel Frequency (MHz)	Measured Channel Separation (MHz)	Limit (kHz)	Result
BDR	Low Channel	2402.024752	0.980198	$\geq 25\text{kHz}$ or 2/3 of 20dB bandwidth	Pass
	Adjacency Channel	2403.004950			
	Middle Channel	2441.024752	0.980198		Pass
	Adjacency Channel	2442.004950			
	High Channel	2479.024752	0.980198		Pass
	Adjacency Channel	2480.004950			
EDR	Low Channel	2402.024752	1.009901	$\geq 25\text{kHz}$ or 2/3 of 20dB bandwidth	Pass
	Adjacency Channel	2403.034653			
	Middle Channel	2441.024752	1.009901		Pass
	Adjacency Channel	2442.034653			
	High Channel	2479.024752	1.009901		Pass
	Adjacency Channel	2480.034653			

Note:

The limit is maximum 2/3 of the 20 dB bandwidth: 900 KHz.
 For the measurement records, refer to the appendix B.

5.1.8 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 : 23.12.2019
Input voltage : DC 3.7V
Operation mode : B
Ambient temperature : 25 °C
Relative humidity : 56 %
Atmospheric pressure : 101 kPa

Table 10: Test Result of Number of Hopping Frequency

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

For the measurement records, refer to the appendix B.

5.1.9 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 : 23.12.2019
 Input voltage : DC 3.7V
 Operation mode : B
 Test channel : Low / Middle / High
 Ambient temperature : 25 °C
 Relative humidity : 56 %
 Atmospheric pressure : 101 kPa

Table 11: Test Result of Time of Occupancy

Test Mode	Channel	Data Packet	Pulse width (ms)	Measured Dwell time(s)	Limit (s)
BDR	2441	DH1	0.394	0.126	< 0.4s
		DH3	1.666	0.267	
		DH5	2.937	0.313	
EDR	2441	2DH1	0.394	0.126	< 0.4s
		2DH3	1.664	0.266	
		2DH5	2.939	0.313	

Note:

$$\text{Dwell time} = \text{Pulse width} \times (\text{Hopping rate} / \text{Number of channels}) \times \text{Period}$$

$$\text{Period} = 0.4 \times 79 \text{ (channel)} = 31.6 \text{ seconds}$$

5.1.10 Conducted Emission on AC Mains**RESULT:****Pass****Test Specification**

Test standard	:	FCC Part 15.207(a) RSS-Gen Clause 8.8
Basic standard	:	ANSI C63.10: 2013
Frequency range	:	0.15 – 30MHz
Limits	:	FCC Part 15.207(a) RSS-Gen Table 4
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	02.04.2020
Input voltage	:	DC 3.7V
Operation mode	:	C
Earthing	:	Not connected
Ambient temperature	:	25 °C
Relative humidity	:	56 %
Atmospheric pressure	:	101 kPa

For the measurement records, refer to the appendix C.

6 Safety Human Exposure

6.1 Radio Frequency Exposure Compliance

6.1.1 Electromagnetic Fields

RESULT:**Pass****Test Specification**

Test standard : CFR47 FCC Part 2.1093
RSS-102 Issue 5 March 2015
FCC KDB Publication 447498 v06

Limit : CFR47 FCC Part 1.1310

The separation distance of the EUT should be 5mm. The measured maximum conducted power of the EUT is 4.73dBm \approx 2.97 mW , which is far below the SAR exclusion threshold level 10mW (Appendix A, SAR Test Exclusion Thresholds for 100 MHz – 6 GHz and \leq 50 mm), hence the EUT is excluded from SAR evaluation according to FCC KDB publication 447498 D01: Mobile and Portable RF Exposure. Guidance v06.

The separation distance of the EUT should be 5mm. The measured maximum output power of the EUT is 4.73dBm \approx 2.97 mW , which is far below the SAR exclusion threshold level 4mW, hence the EUT is excluded from SAR evaluation according to RSS-102 Issue 5 section 2.5.1.

7 Photographs of the Test Set-Up

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

8 List of Tables

Table 1: List of Test and Measurement Equipment.....	6
Table 2: Technical Specification of EUT.....	9
Table 3: RF Channel and Frequency of Bluetooth	10
Table 4: Frequency Hopping Information	11
Table 5: List of Accessories and Auxiliary Equipment.....	13
Table 6: Test Result of Maximum Conducted Output Power	17
Table 7: Test Result of 99% Bandwidth	18
Table 8: Test Result of 20dB Bandwidth	21
Table 9: Test Result of Carrier Frequency Separation	22
Table 10: Test Result of Number of Hopping Frequency	23
Table 11: Test Result of Time of Occupancy	24

Appendix B

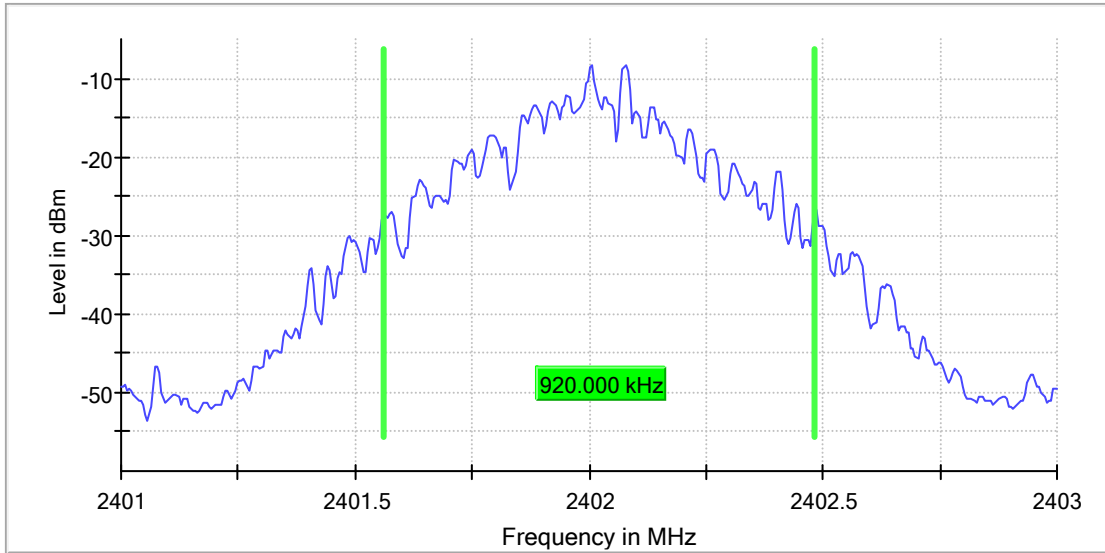
Test Results of Conducted Testing

APPENDIX B	1
APPENDIX B.1: TEST PLOTS OF 99% BANDWIDTH	2
<i>BDR Mode, DH1</i>	2
<i>EDR Mode, 3DH1</i>	3
APPENDIX B.2: TEST PLOTS OF 20dB BANDWIDTH	5
<i>BDR Mode, DH1</i>	5
<i>EDR Mode, 3DH1</i>	6
APPENDIX B.3: TEST PLOTS OF CONDUCTED SPURIOUS EMISSIONS MEASURED IN 100 KHz BANDWIDTH	8
<i>BDR Mode, Low Channel</i>	8
<i>BDR Mode, Middle Channel</i>	9
<i>BDR Mode, High Channel</i>	10
<i>BDR, Hopping</i>	11
<i>EDR Mode, Low Channel</i>	12
<i>EDR Mode, Middle Channel</i>	13
<i>EDR Mode, High Channel</i>	14
<i>EDR, Hopping</i>	15
<i>BDR Mode, Band Edge, Low Channel</i>	16
<i>BDR Mode, Band Edge, High Channel</i>	16
<i>BDR Mode, Hopping Band Edge</i>	17
<i>EDR Mode, Band Edge, Low Channel</i>	18
<i>EDR Mode, Band Edge, High Channel</i>	18
<i>EDR Mode, Hopping Band Edge</i>	19
APPENDIX B.4: TEST PLOTS OF CARRIER FREQUENCY SEPARATION	20
<i>BDR, Low Channel</i>	20
<i>BDR, Middle Channel</i>	20
<i>BDR, High Channel</i>	21
<i>EDR, Low Channel</i>	21
<i>EDR, Middle Channel</i>	22
<i>EDR, High Channel</i>	22
APPENDIX B.5: TEST PLOTS OF NUMBER OF HOPPING FREQUENCY	23
<i>BDR, Hopping</i>	23
<i>EDR, Hopping</i>	23
APPENDIX B.6: TEST PLOTS OF TIME OF OCCUPANCY	24
<i>BDR Mode, DH1, Middle Channel</i>	24
<i>BDR Mode, DH3, Middle Channel</i>	24
<i>BDR Mode, DH5, Middle Channel</i>	25
<i>EDR Mode, 3DH1, Middle Channel</i>	25
<i>EDR Mode, 3DH3, Middle Channel</i>	26
<i>EDR Mode, 3DH5, Middle Channel</i>	26

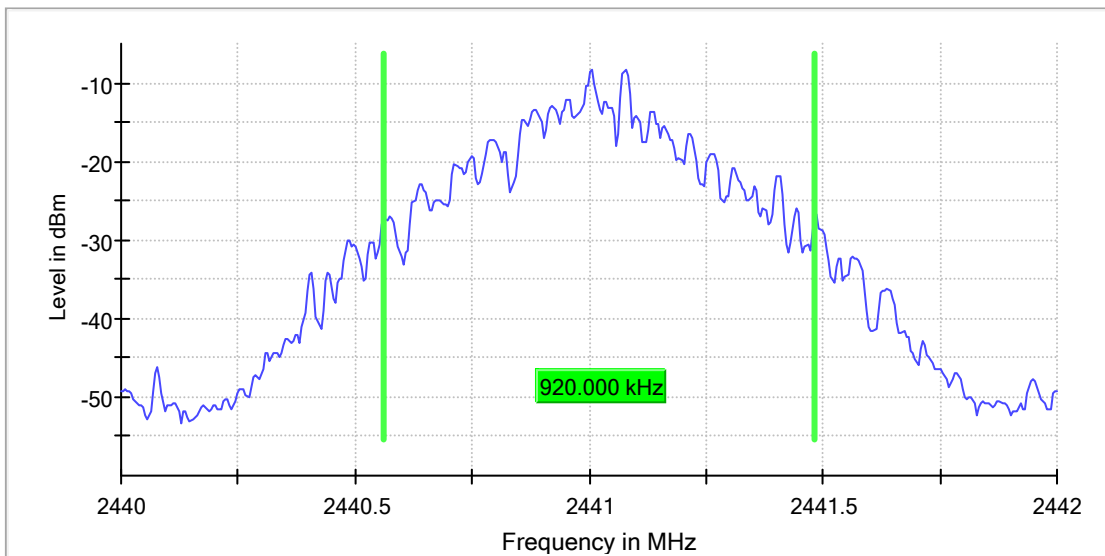
Appendix B.1: Test Plots of 99% Bandwidth

BDR Mode, DH1

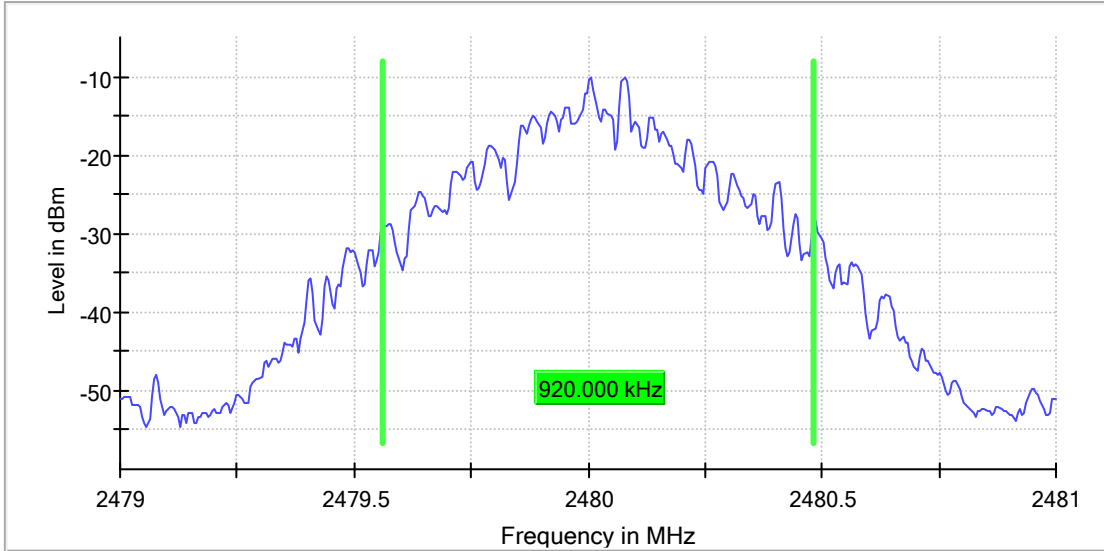
RBW=10KHz, VBW=30KHz



RBW=10KHz, VBW=30KHz

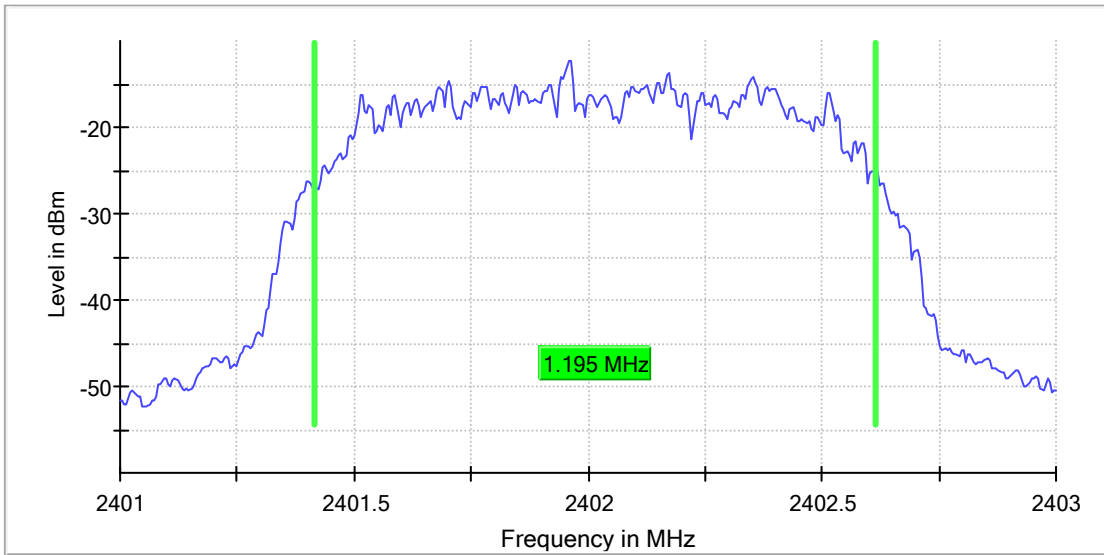


RBW=10KHz, VBW=30KHz

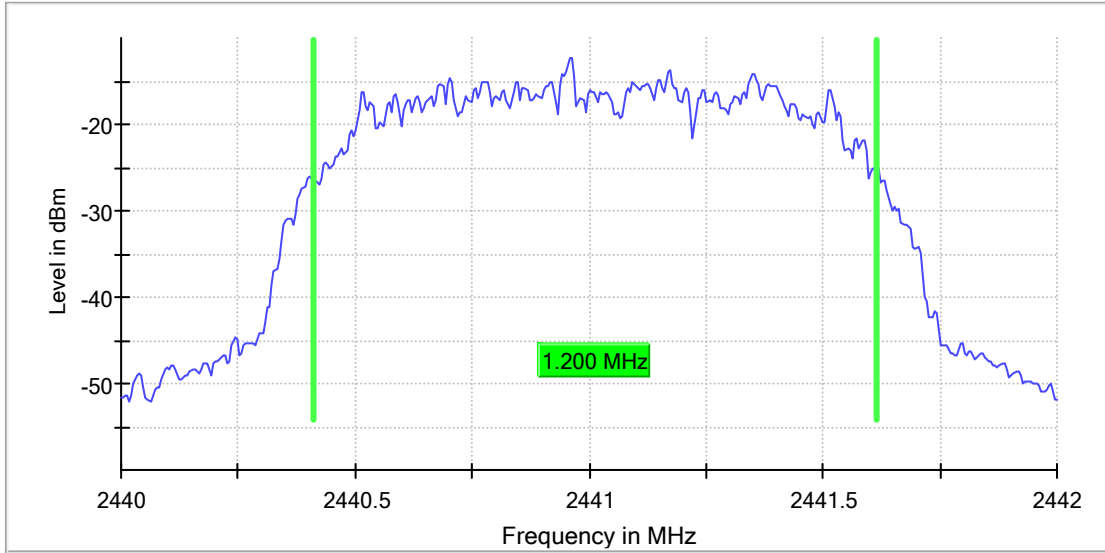


EDR Mode, 3DH1

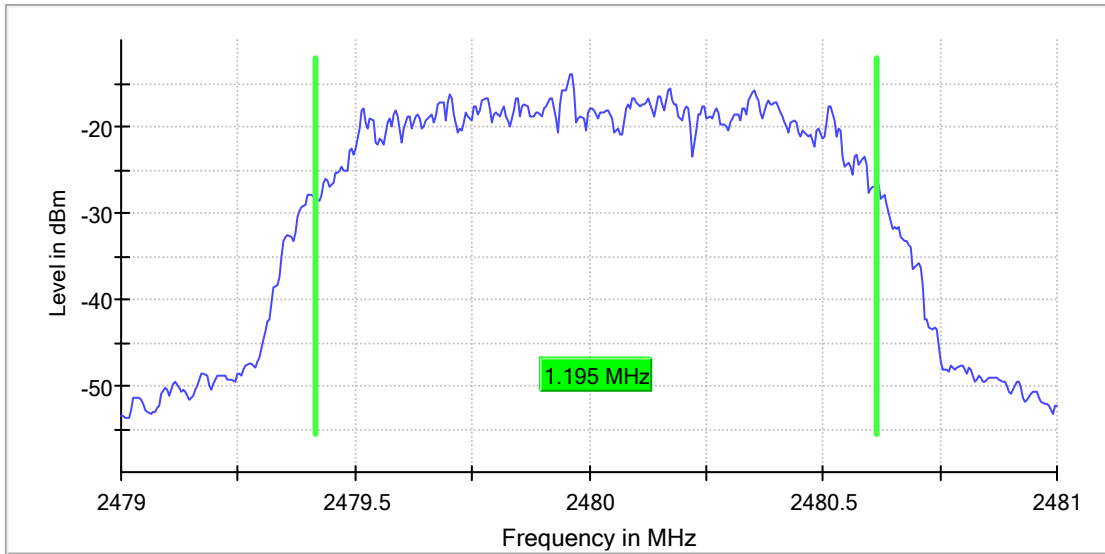
RBW=30KHz VBW=100KHz



RBW=30KHz VBW=100KHz



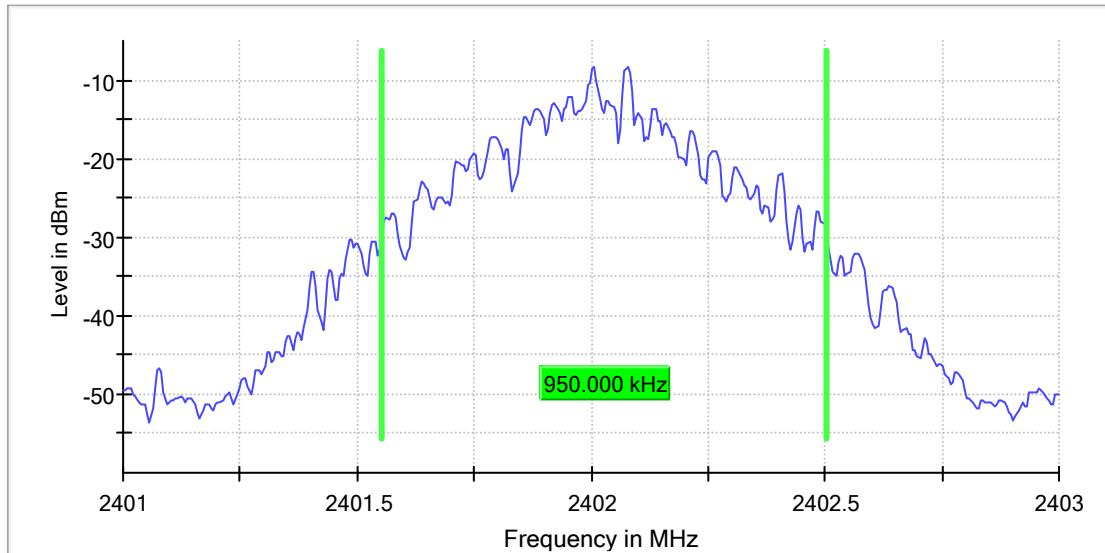
RBW=30KHz VBW=100KHz



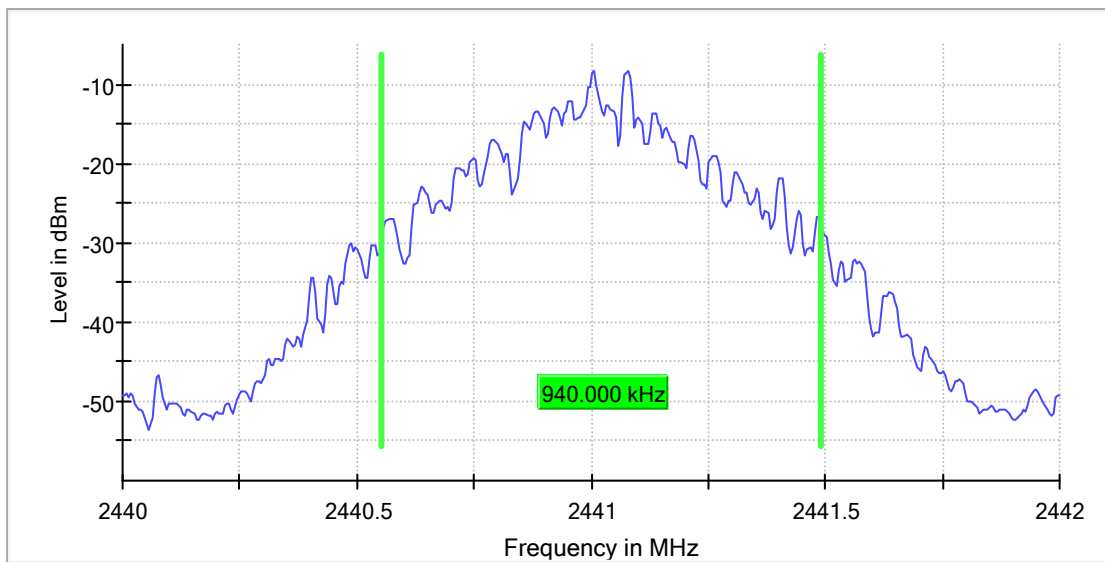
Appendix B.2: Test Plots of 20dB Bandwidth

BDR Mode, DH1

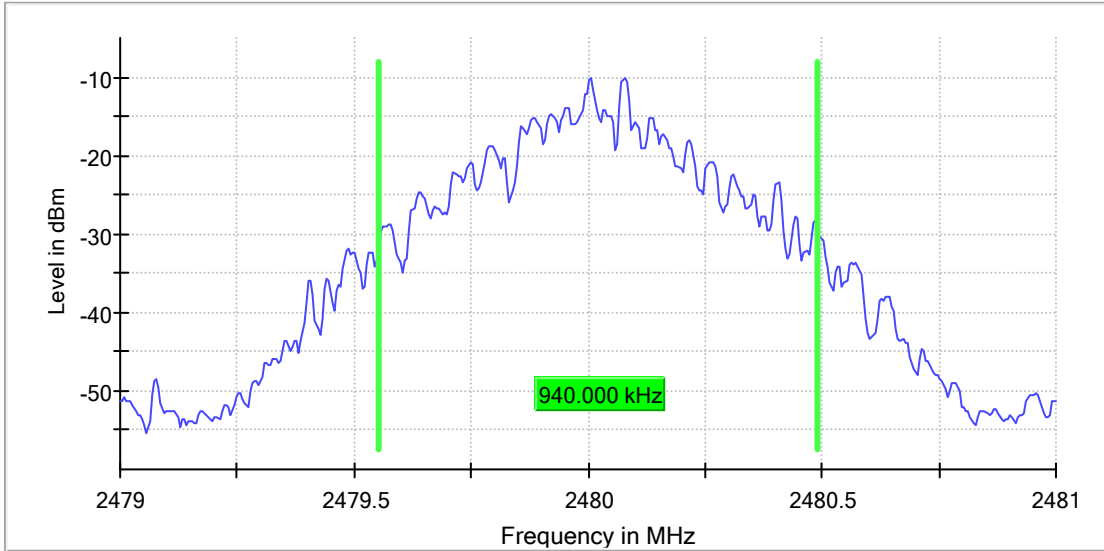
RBW=10KHz VBW=30KHz



RBW=10KHz VBW=30KHz

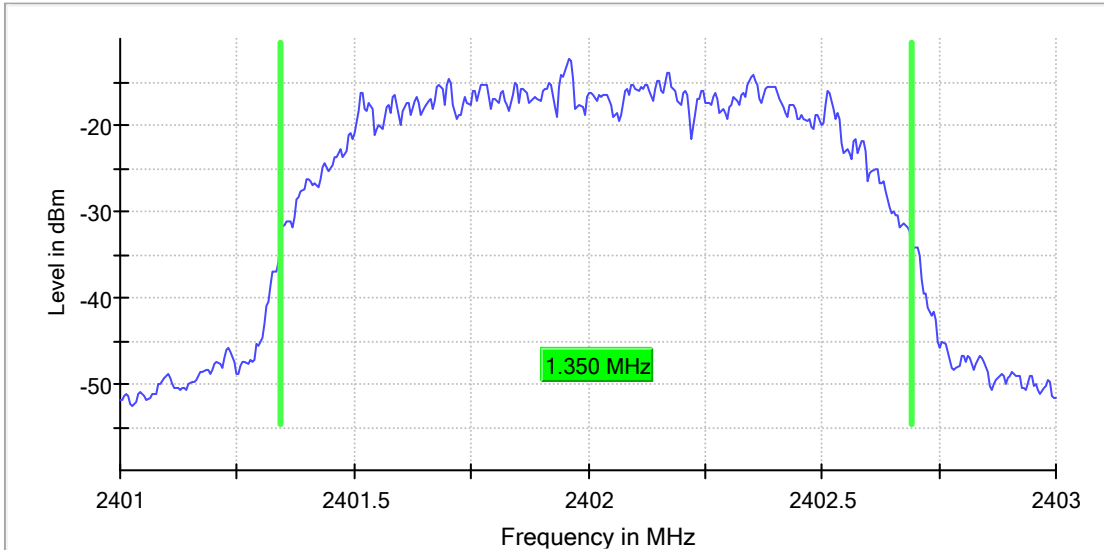


RBW=10KHz VBW=30KHz

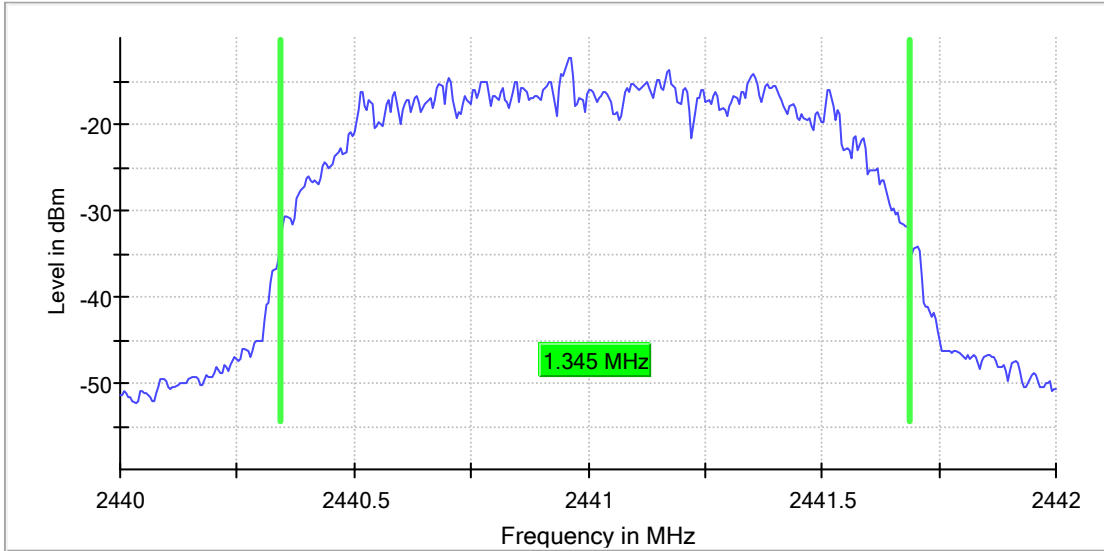


EDR Mode, 3DH1

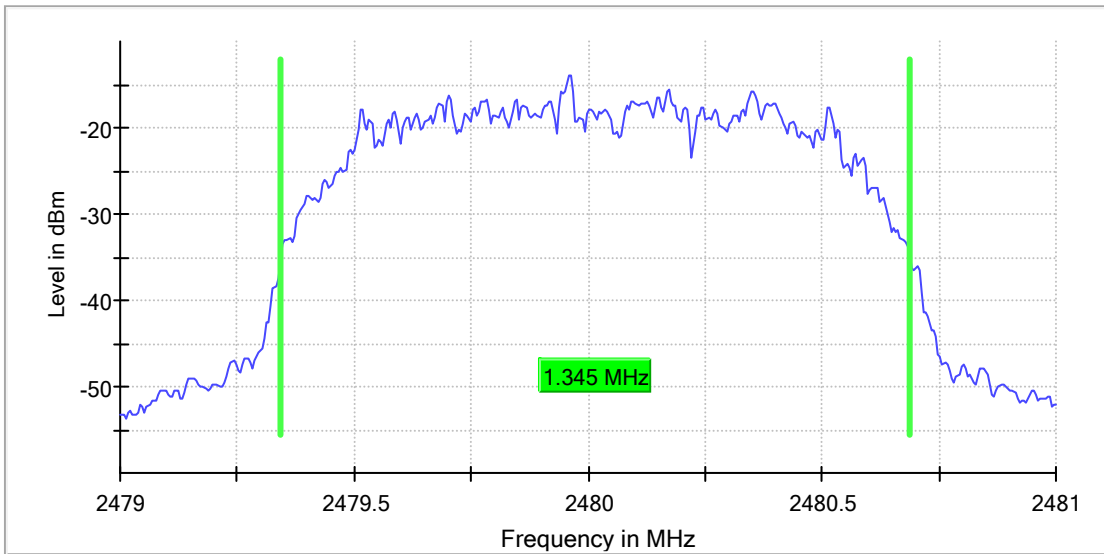
RBW=30KHz VBW=100KHz



RBW=30KHz VBW=100KHz

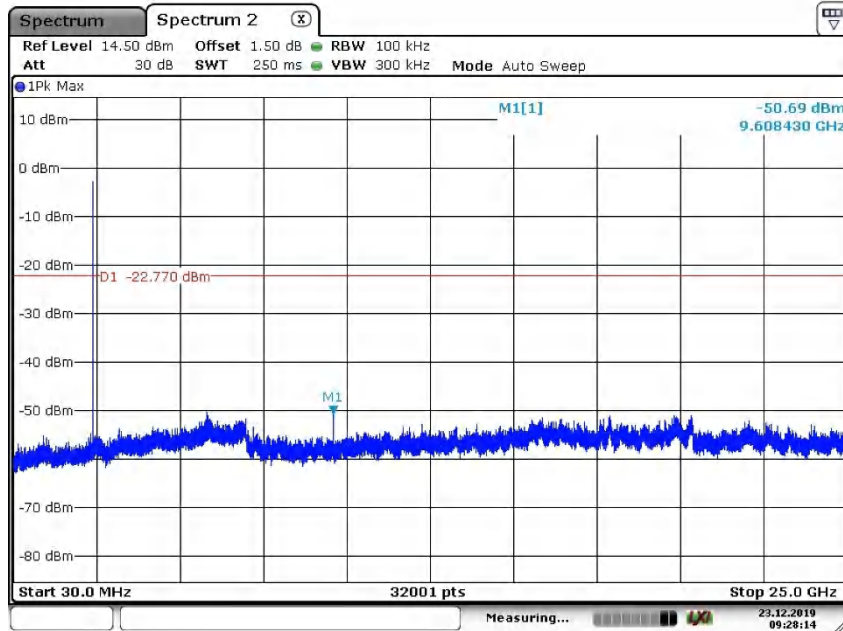
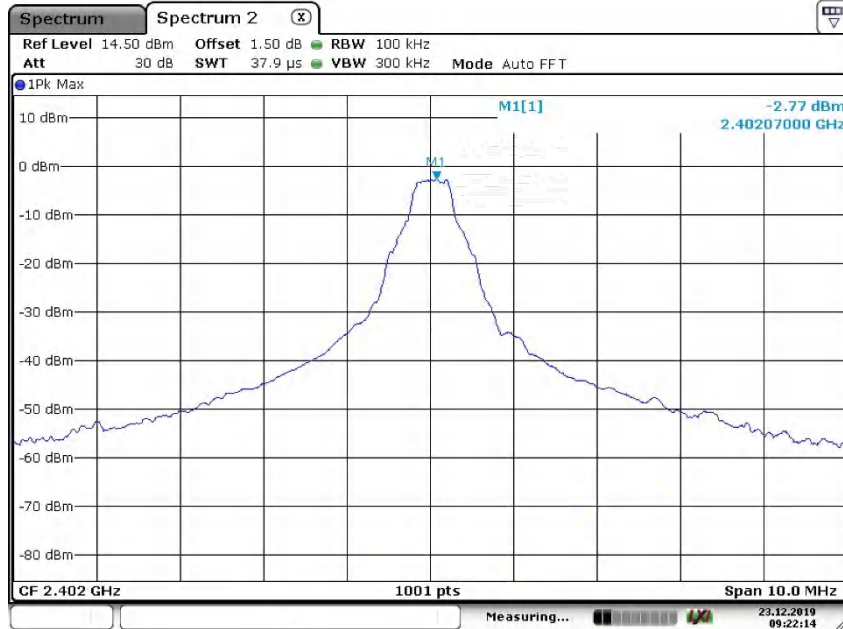


RBW=30KHz VBW=100KHz

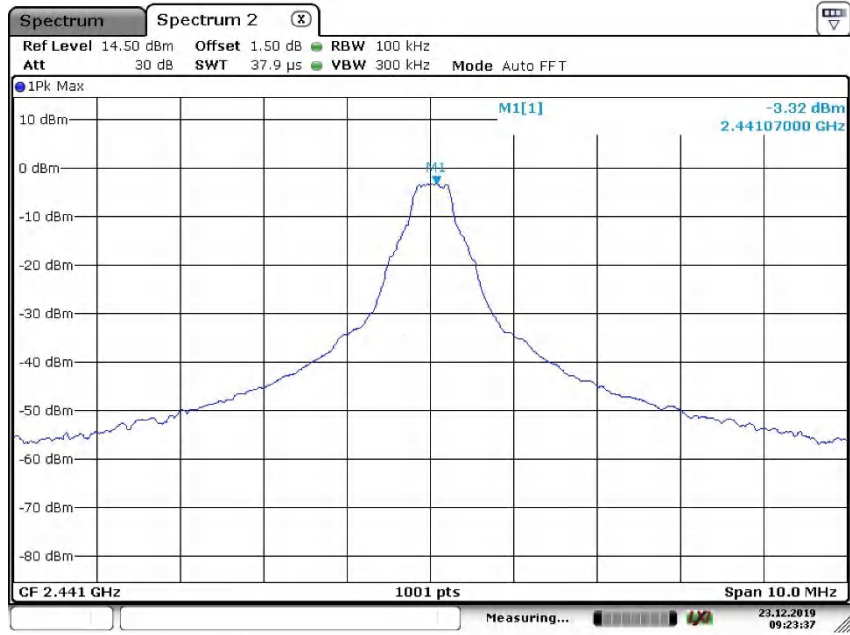


Appendix B.3: Test Plots of Conducted Spurious Emissions Measured in 100 kHz Bandwidth

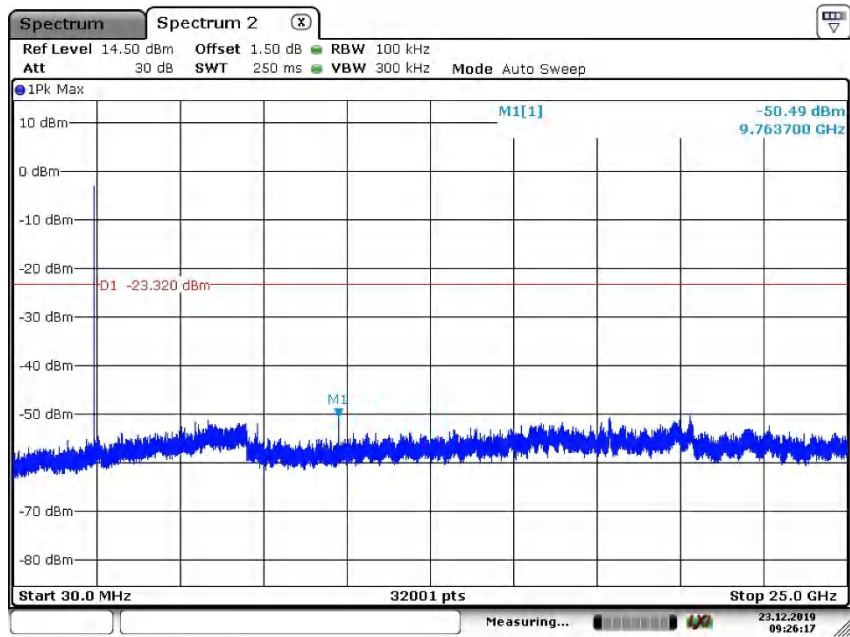
BDR Mode, Low Channel



BDR Mode, Middle Channel

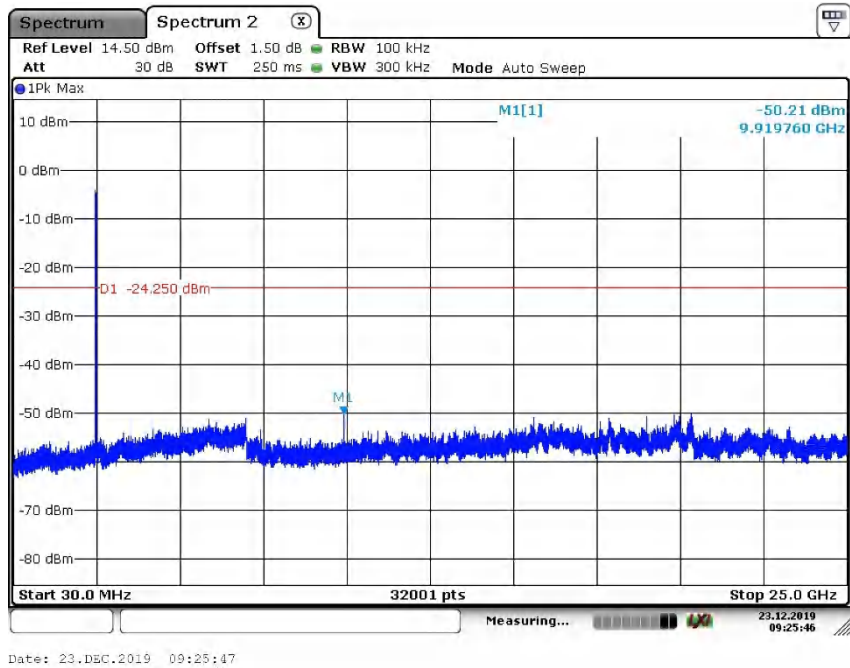
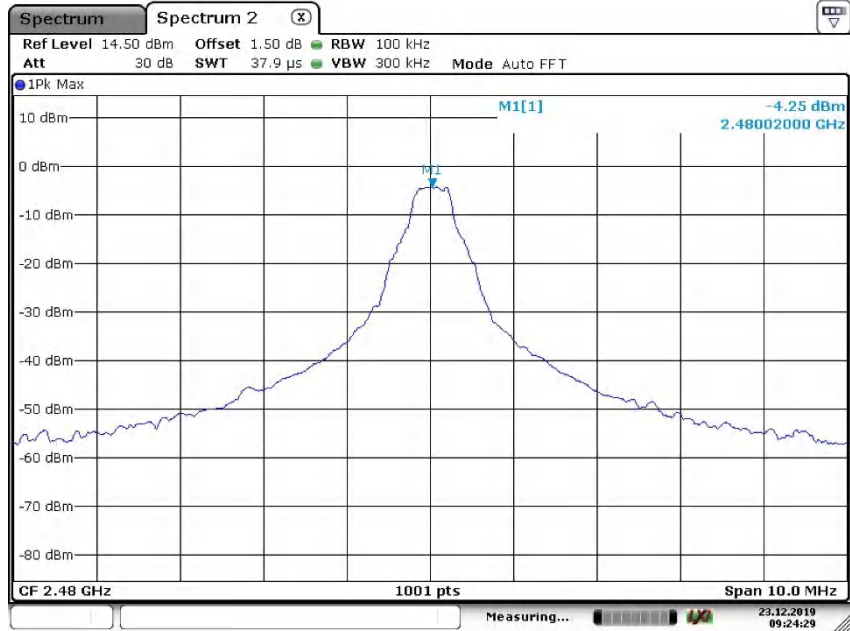


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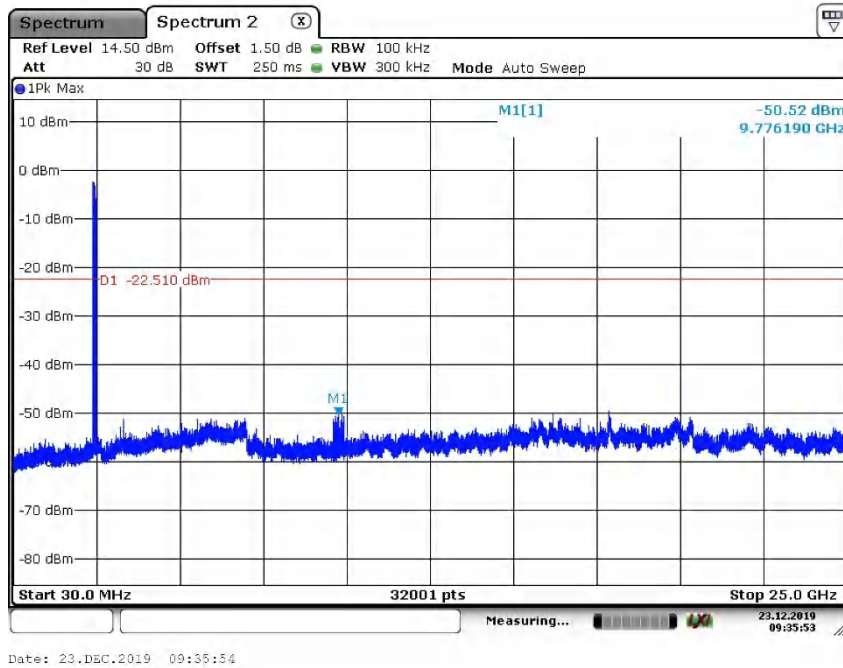
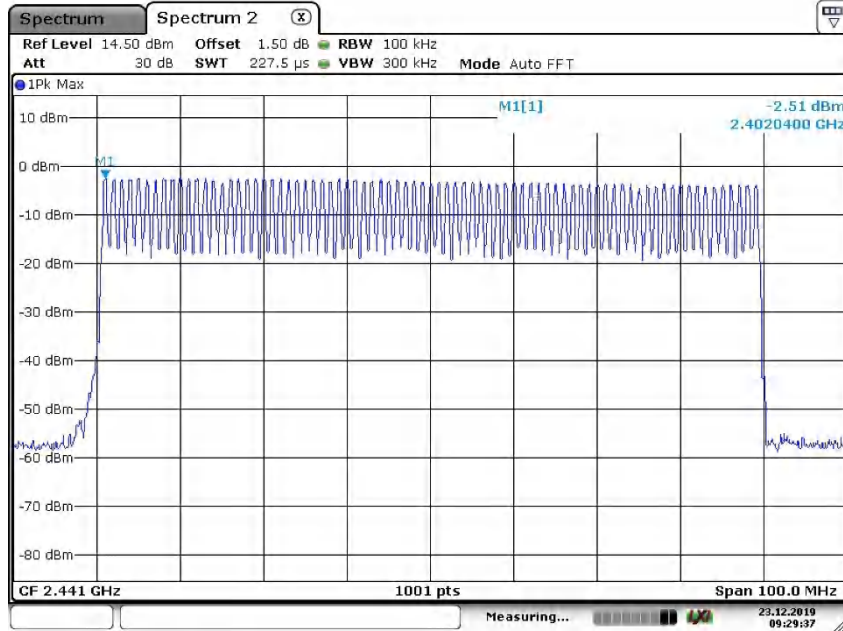


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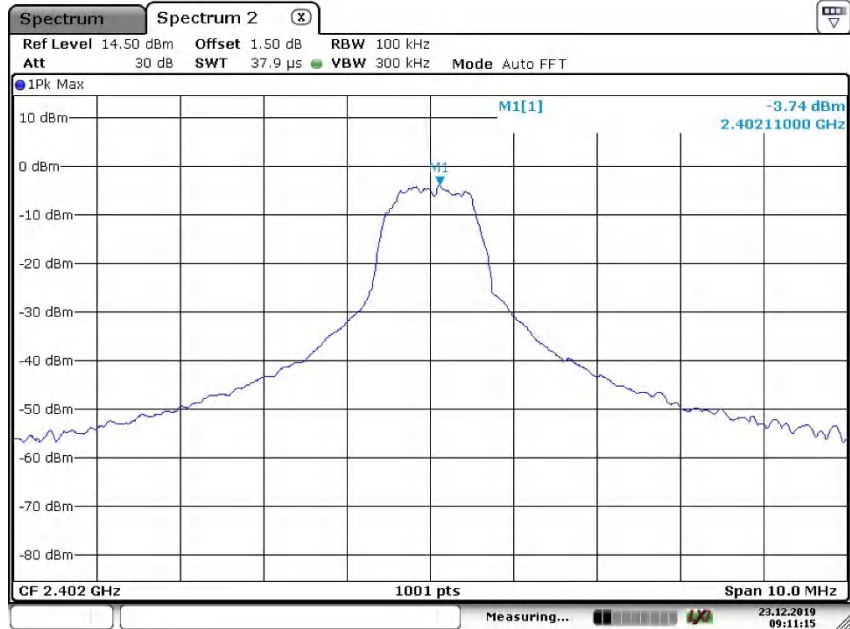
BDR Mode, High Channel



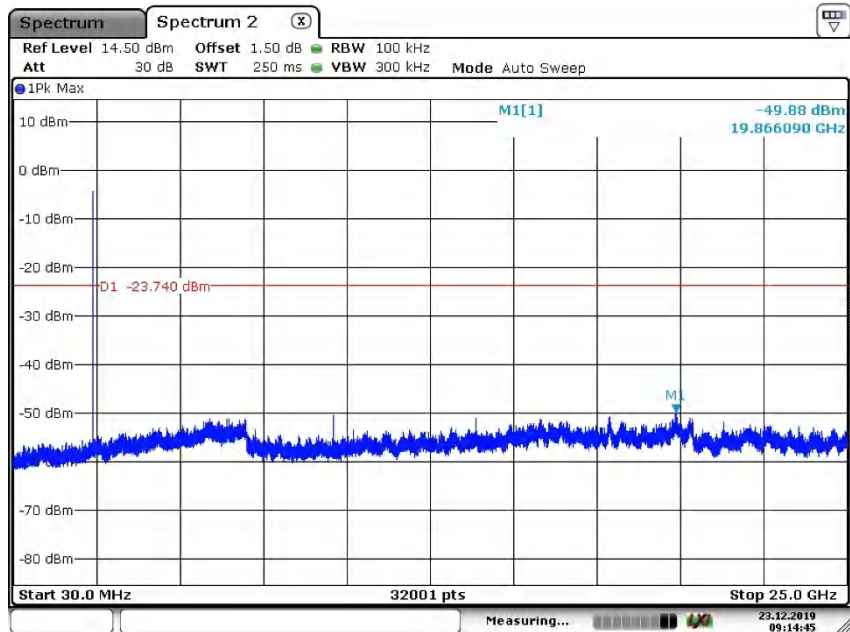
BDR, Hopping



EDR Mode, Low Channel

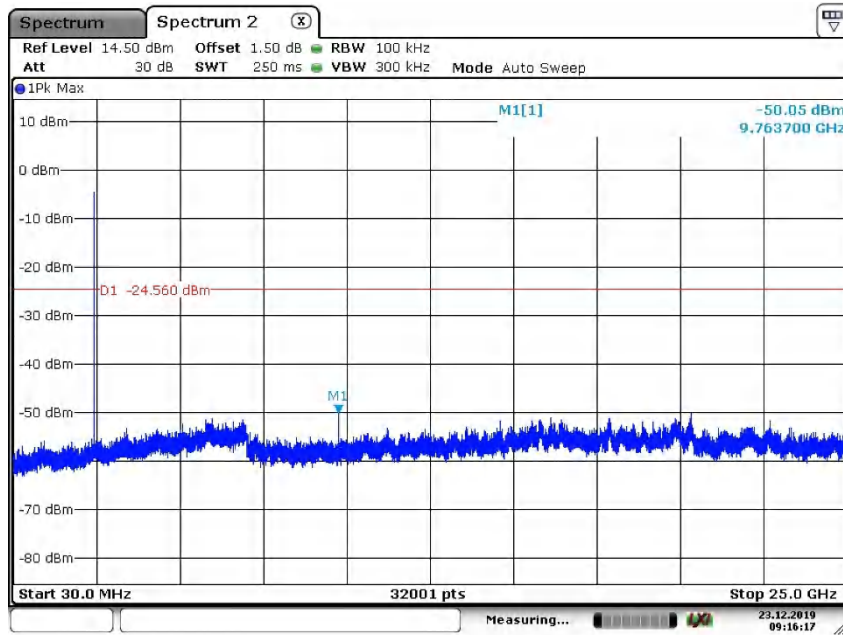
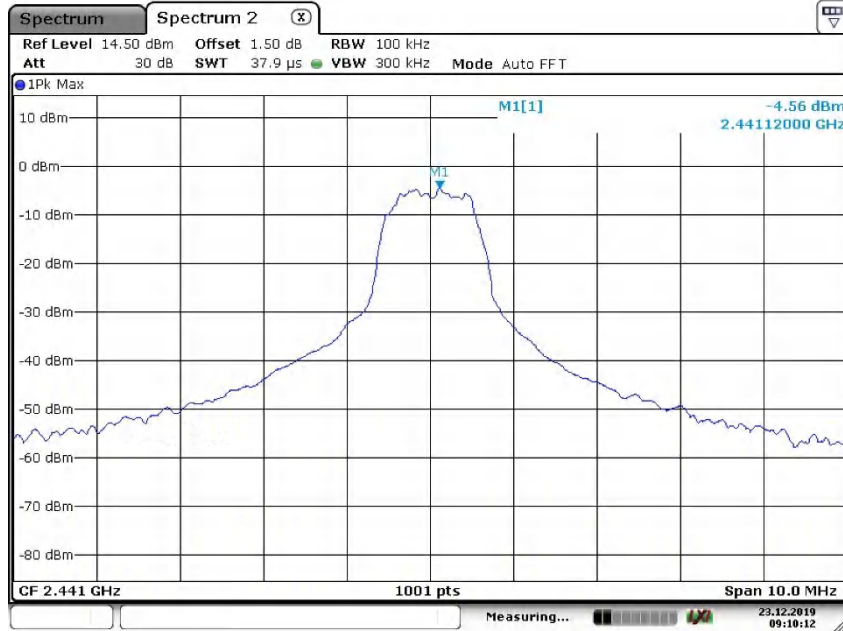


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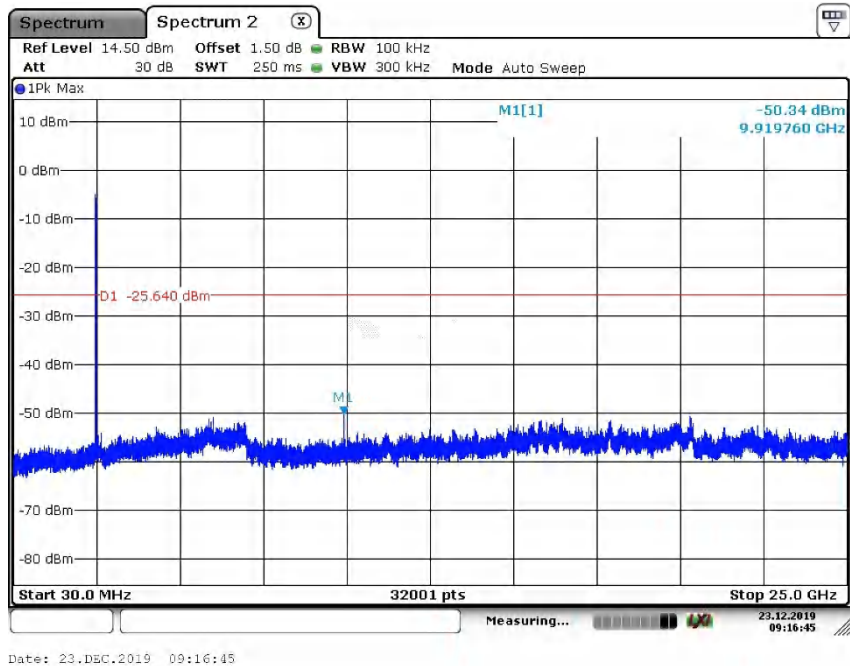
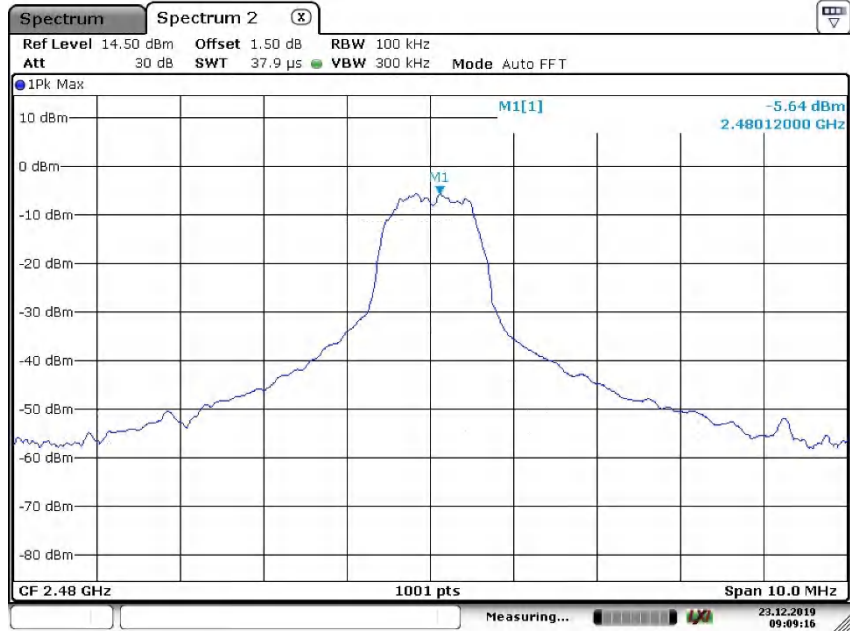


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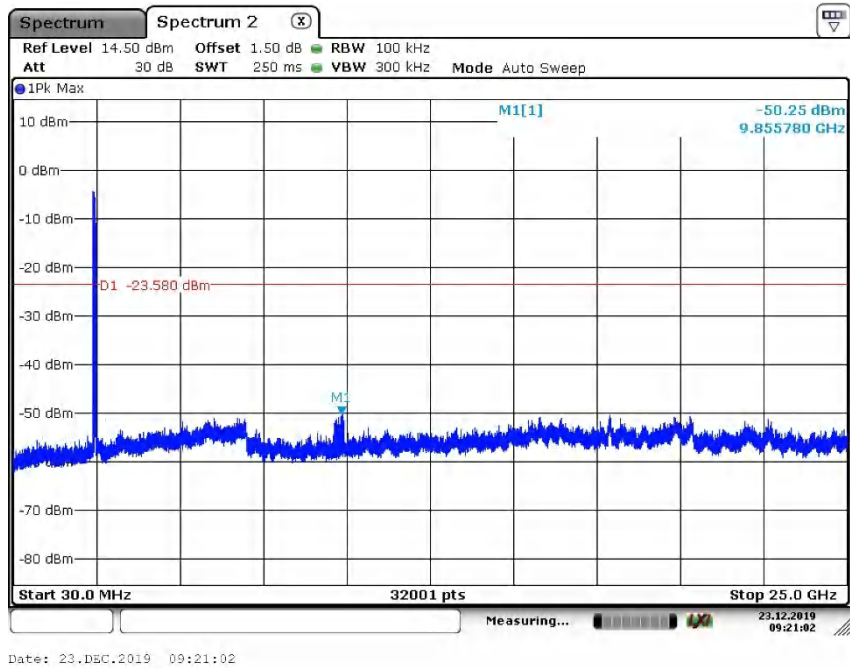
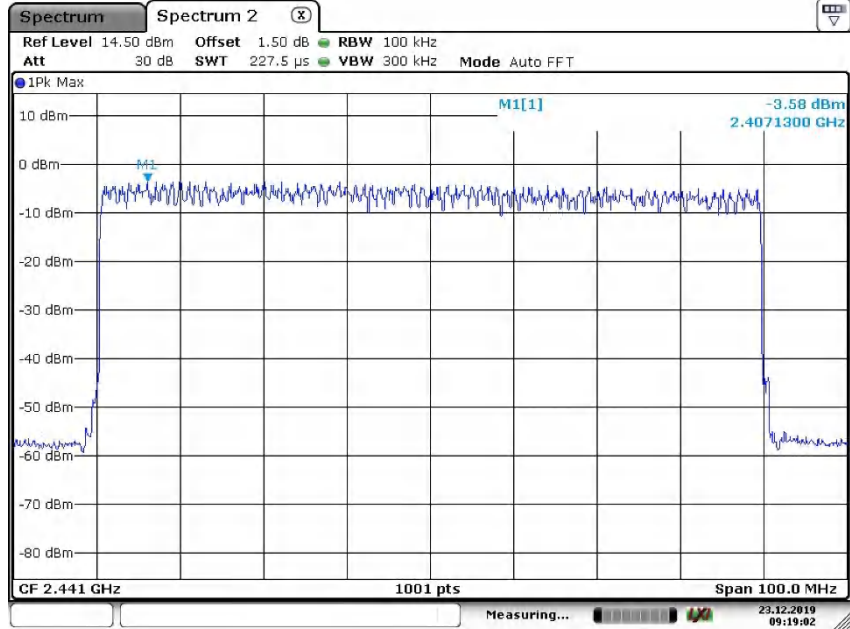
EDR Mode, Middle Channel



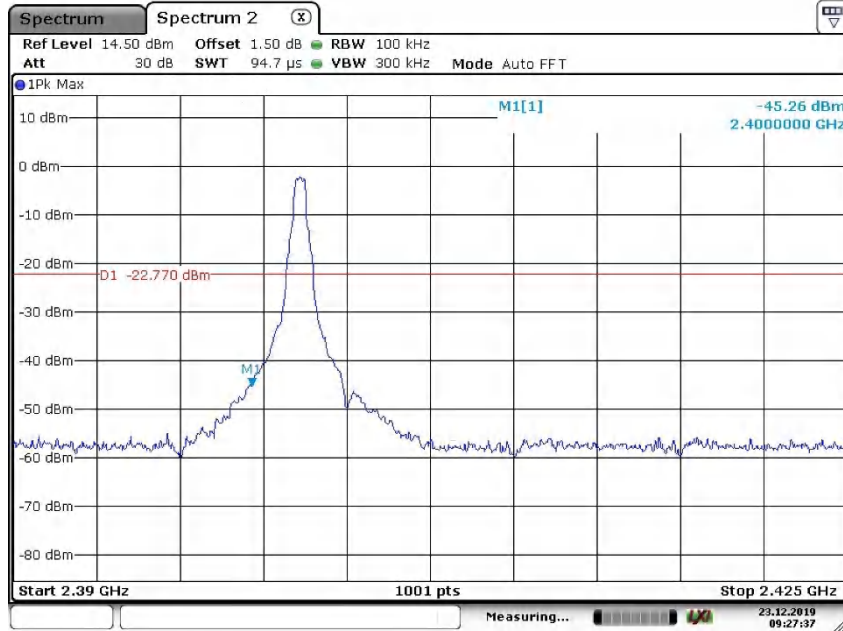
EDR Mode, High Channel



EDR, Hopping

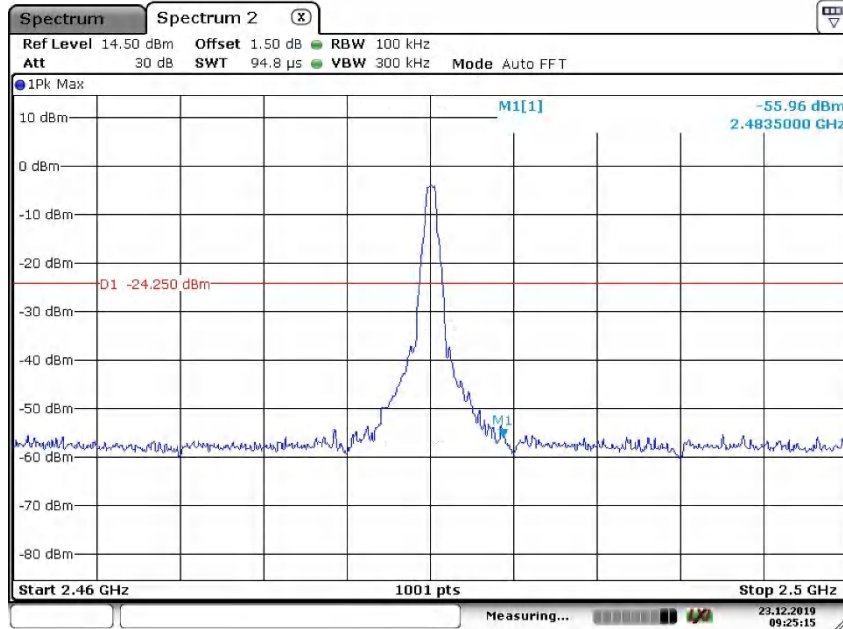


BDR Mode, Band Edge, Low Channel



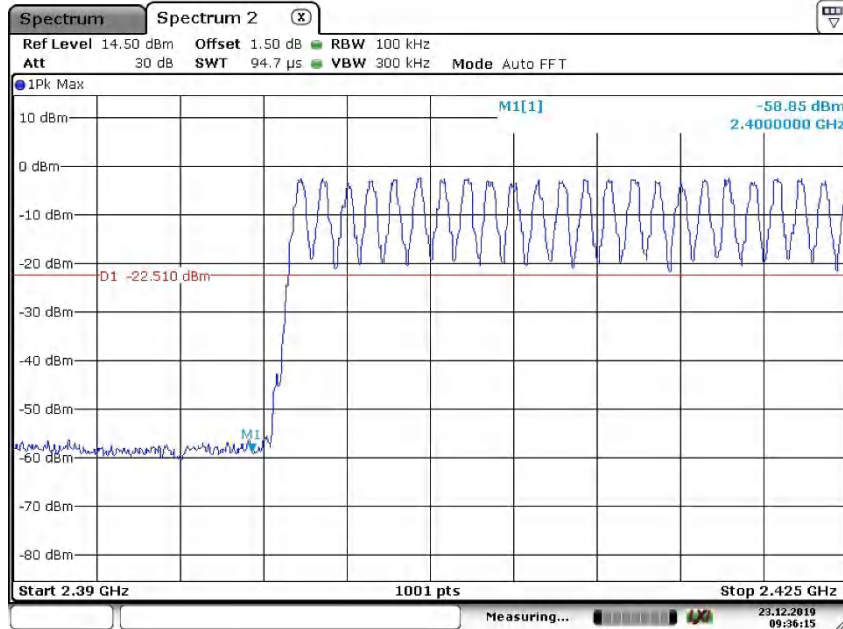
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BDR Mode, Band Edge, High Channel

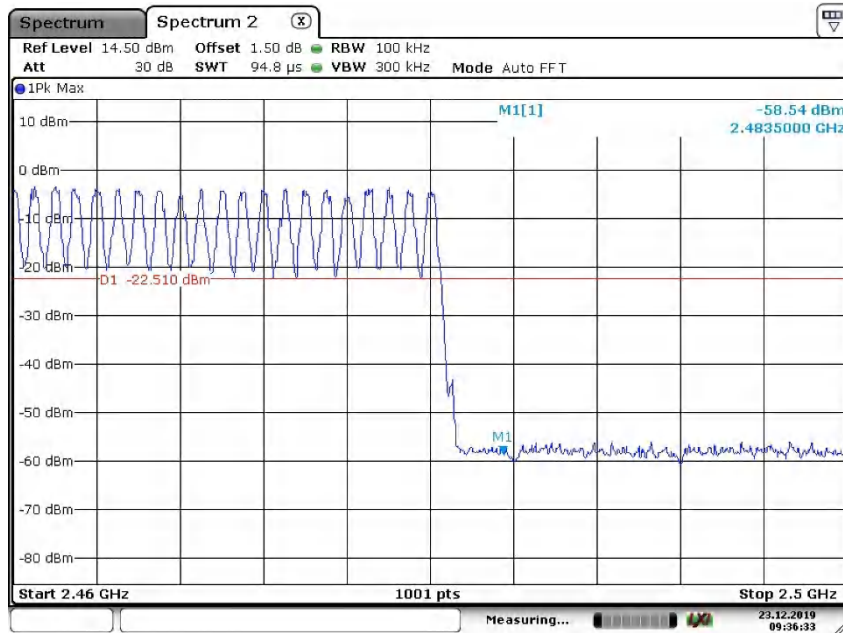


Date: 23.DEC.2019 09:28:16

BDR Mode, Hopping Band Edge

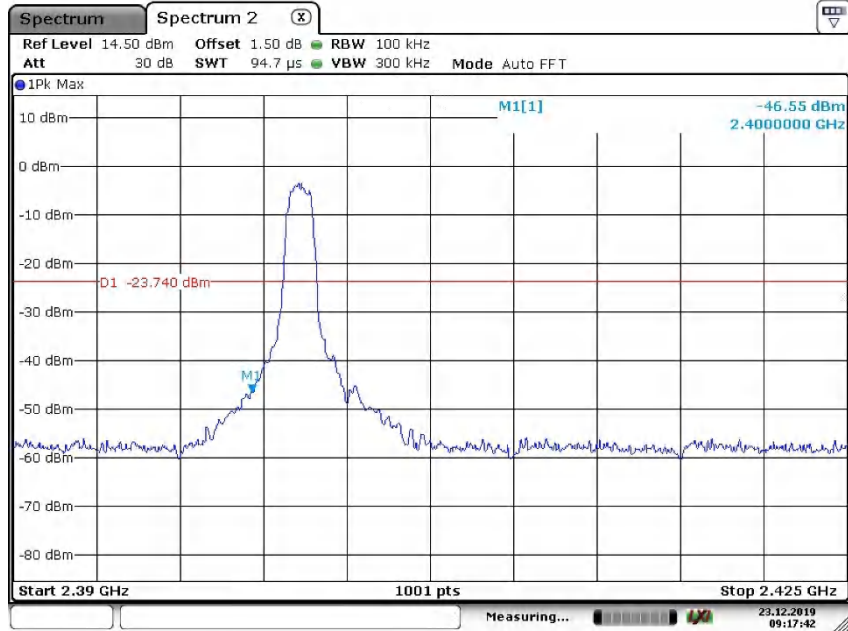


Date: 23.DEC.2019 09:36:15



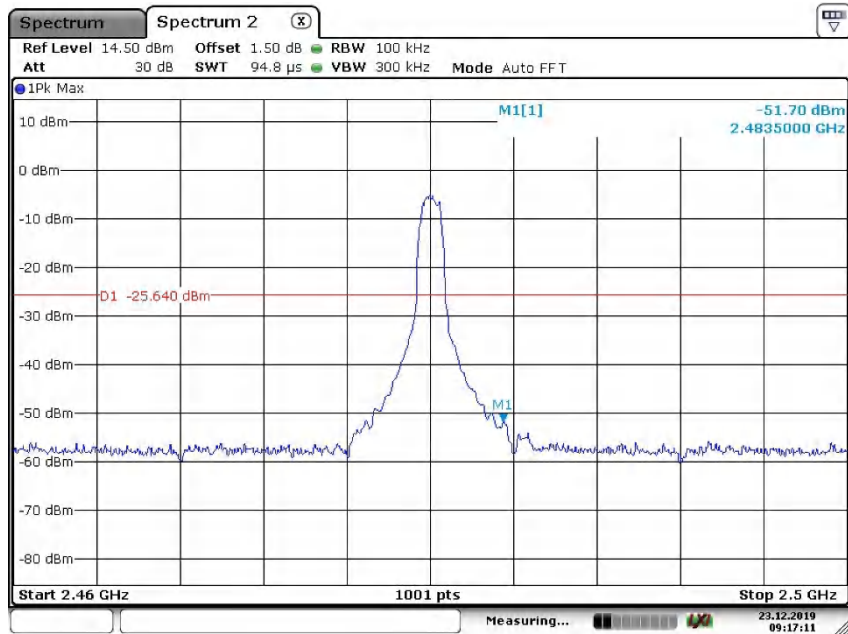
Date: 23.DEC.2019 09:36:34

EDR Mode, Band Edge, Low Channel



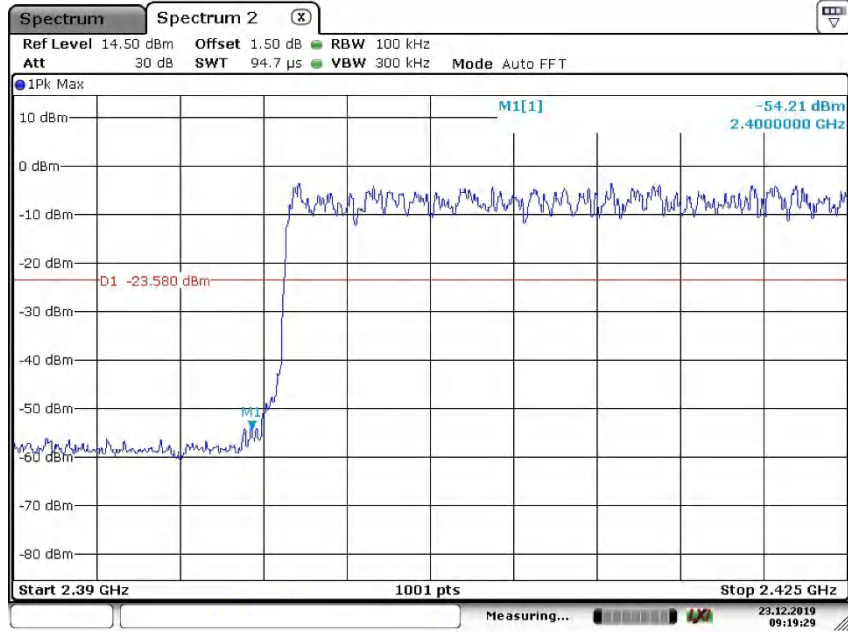
Date: 23.DEC.2019 09:17:42

EDR Mode, Band Edge, High Channel

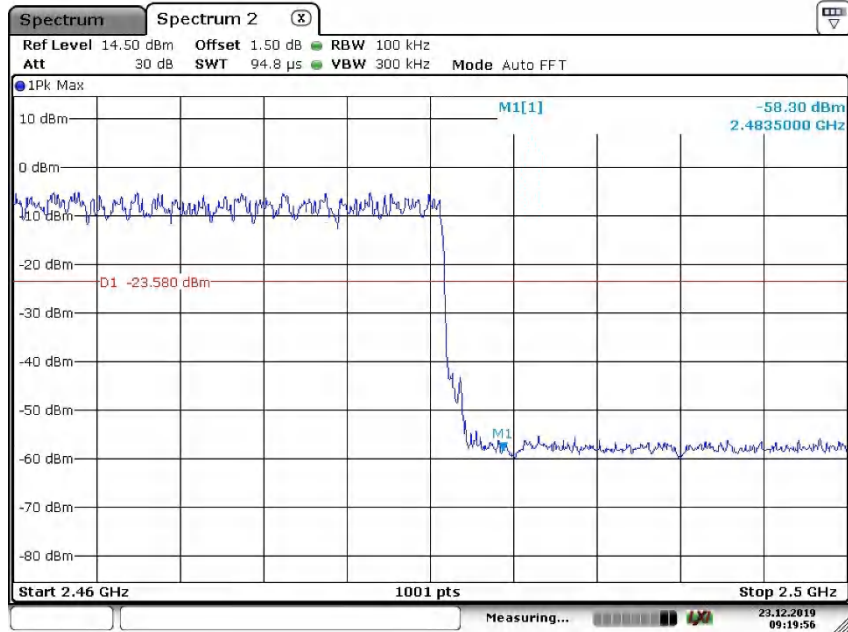


Date: 23.DEC.2019 09:17:11

EDR Mode, Hopping Band Edge



Date: 23.DEC.2019 09:19:29

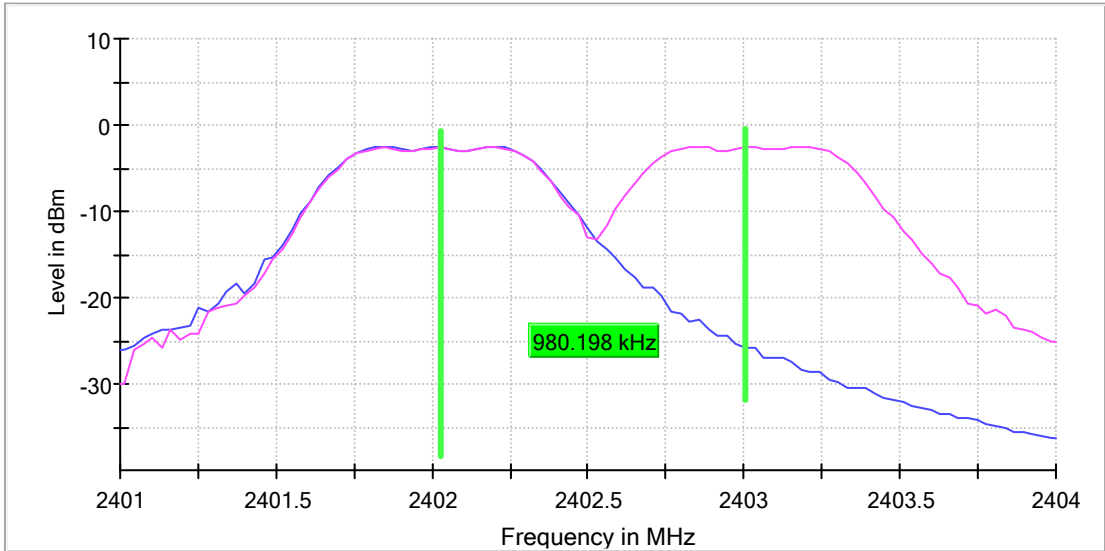


Date: 23.DEC.2019 09:19:56

Appendix B.4: Test Plots of Carrier Frequency Separation

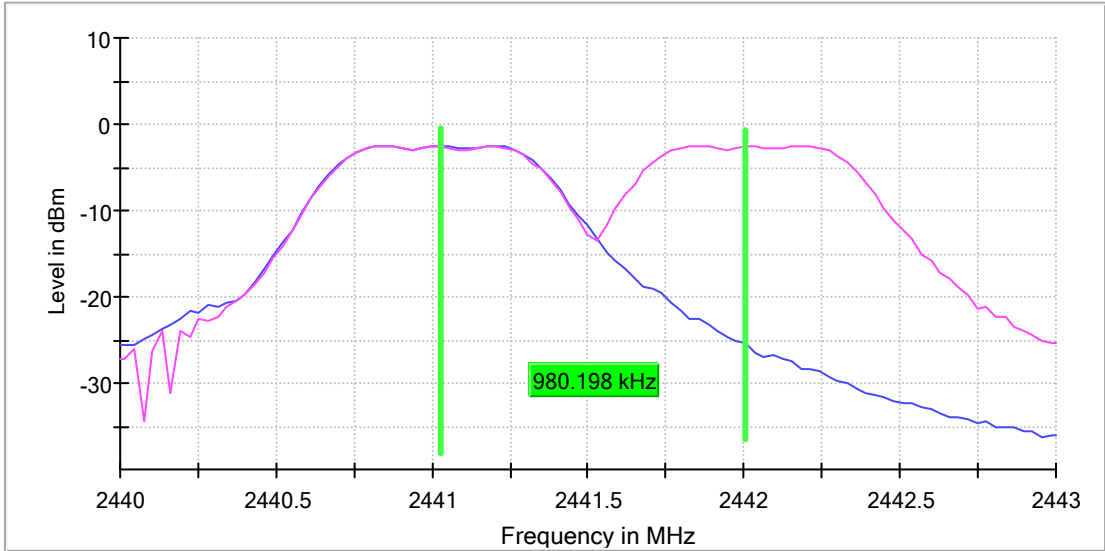
BDR, Low Channel

RBW=300KHz, VBW=300KHz



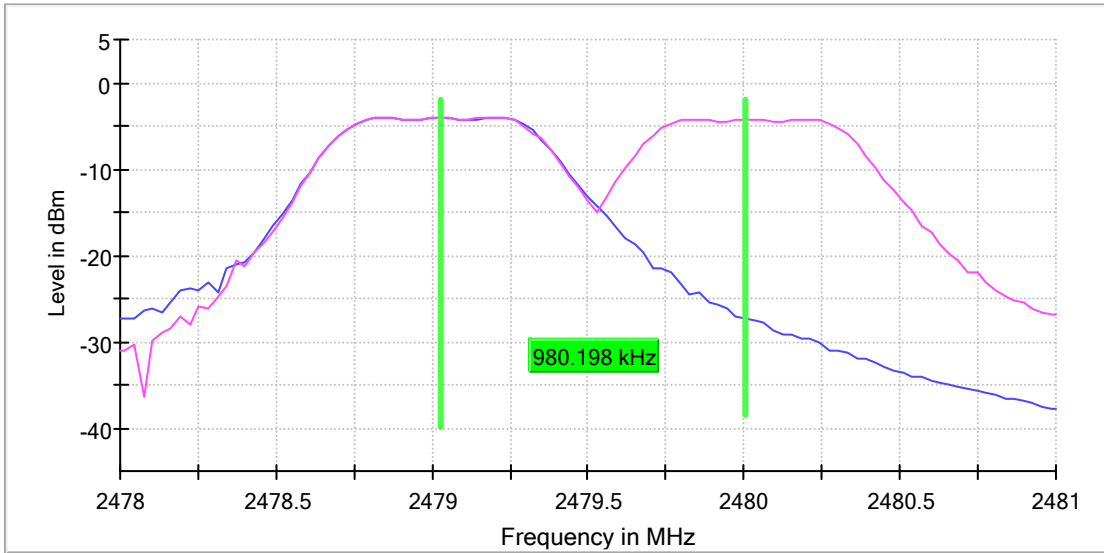
BDR, Middle Channel

RBW=300KHz, VBW=300KHz



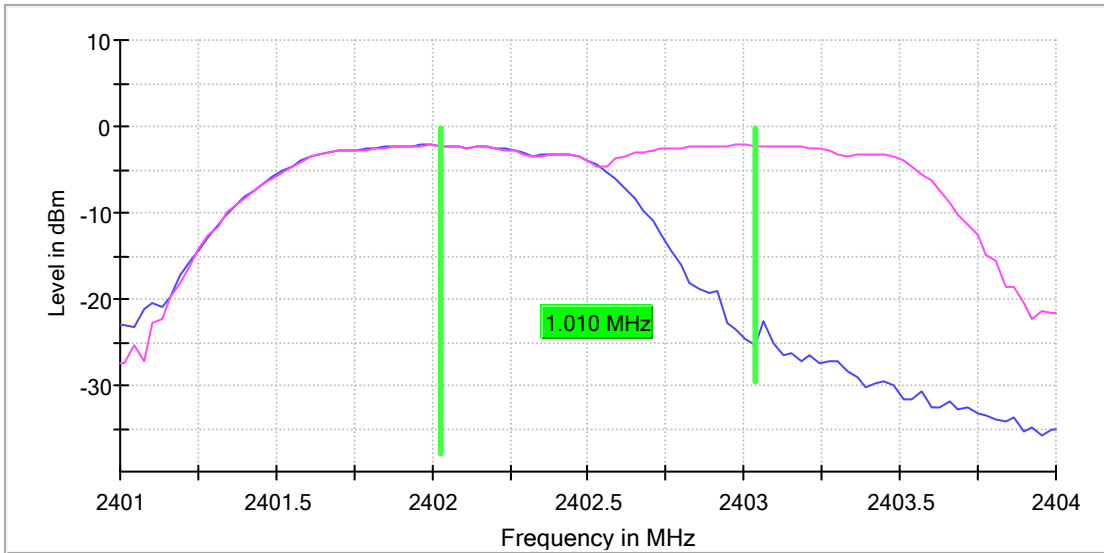
BDR, High Channel

RBW=300KHz, VBW=300KHz



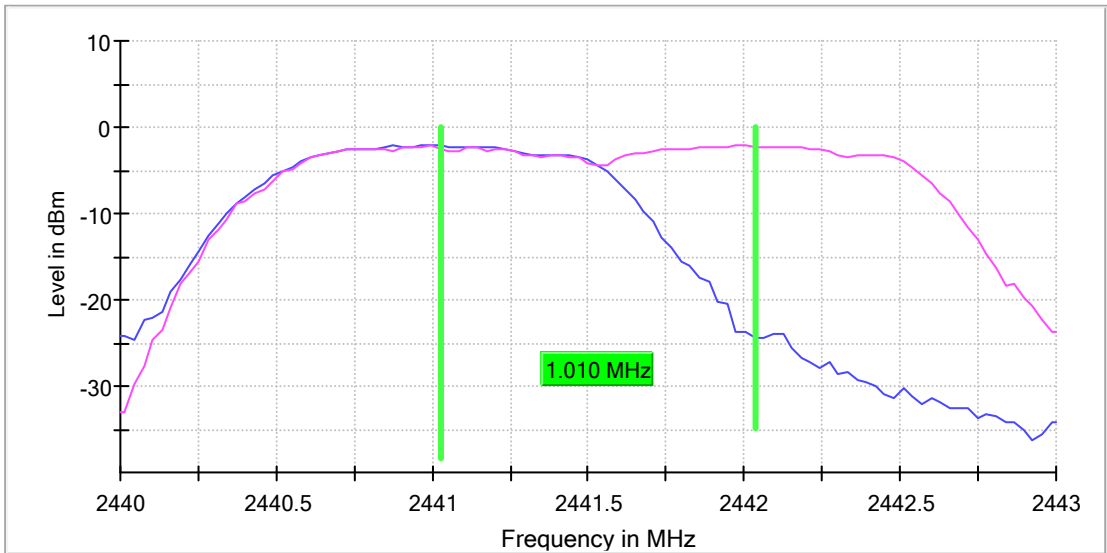
EDR, Low Channel

RBW=300KHz, VBW=300KHz



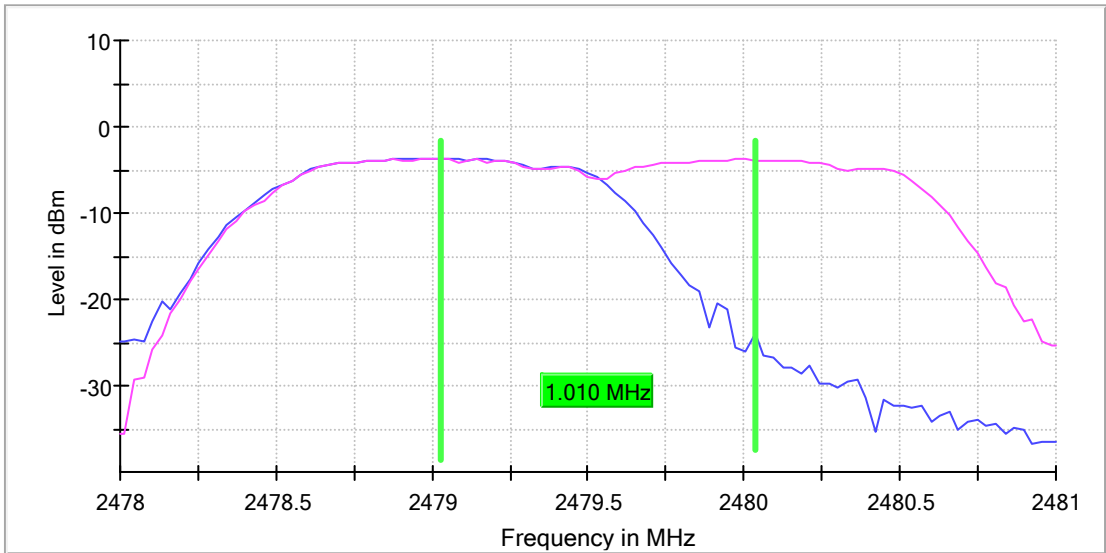
EDR, Middle Channel

RBW=300KHz, VBW=300KHz



EDR, High Channel

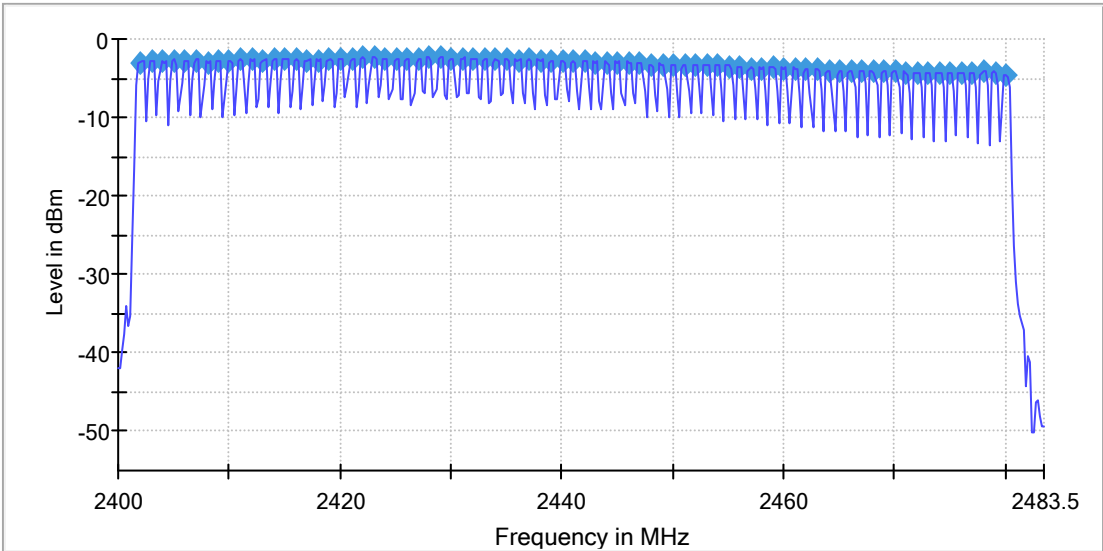
RBW=300KHz, VBW=300KHz



Appendix B.5: Test Plots of Number of Hopping Frequency

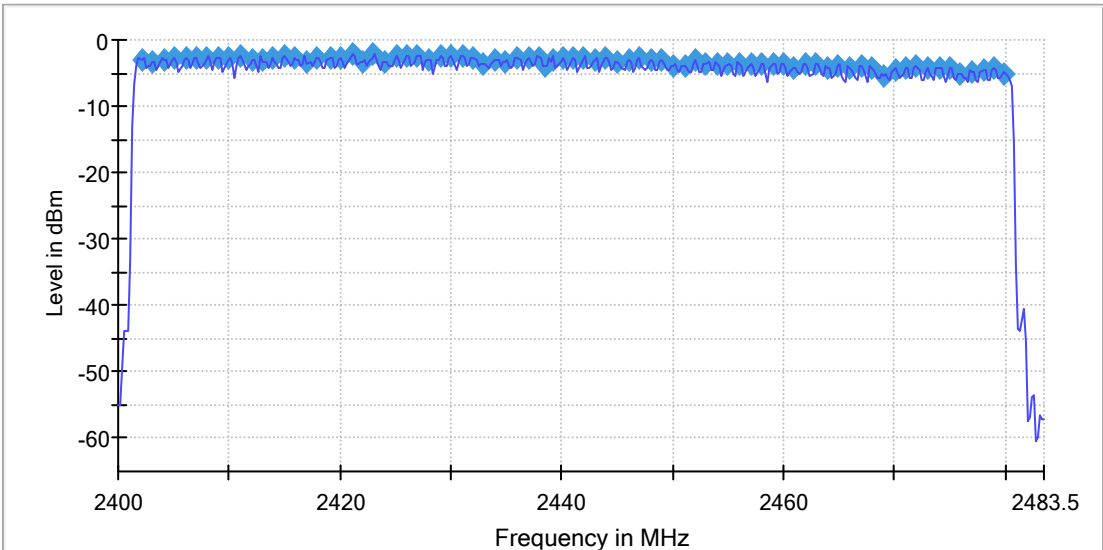
BDR, Hopping

RBW=200KHzM, VBW=200KHz



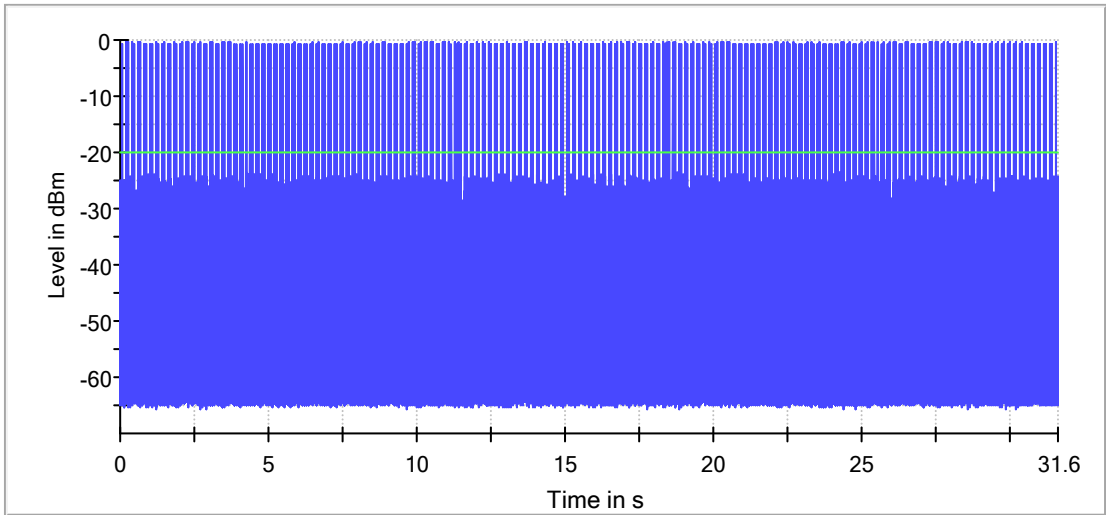
EDR, Hopping

RBW=200KHzM, VBW=200KHz



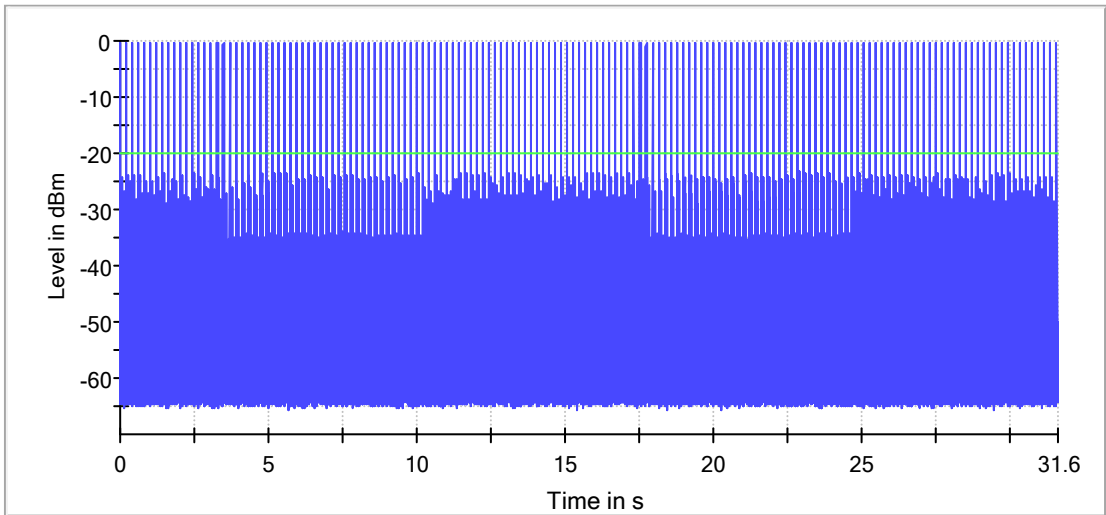
Appendix B.6: Test Plots of Time of Occupancy

BDR Mode, DH1, Middle Channel
RBW=500KHzM, VBW=1MHz



— Trace — Threshold

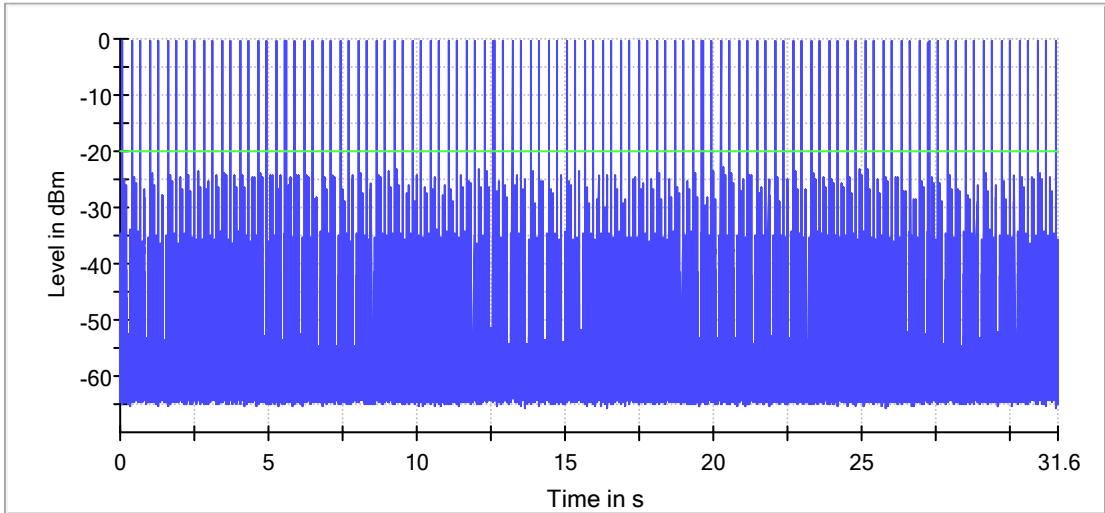
BDR Mode, DH3, Middle Channel
RBW=500KHzM, VBW=1MHz



— Trace — Threshold

BDR Mode, DH5, Middle Channel

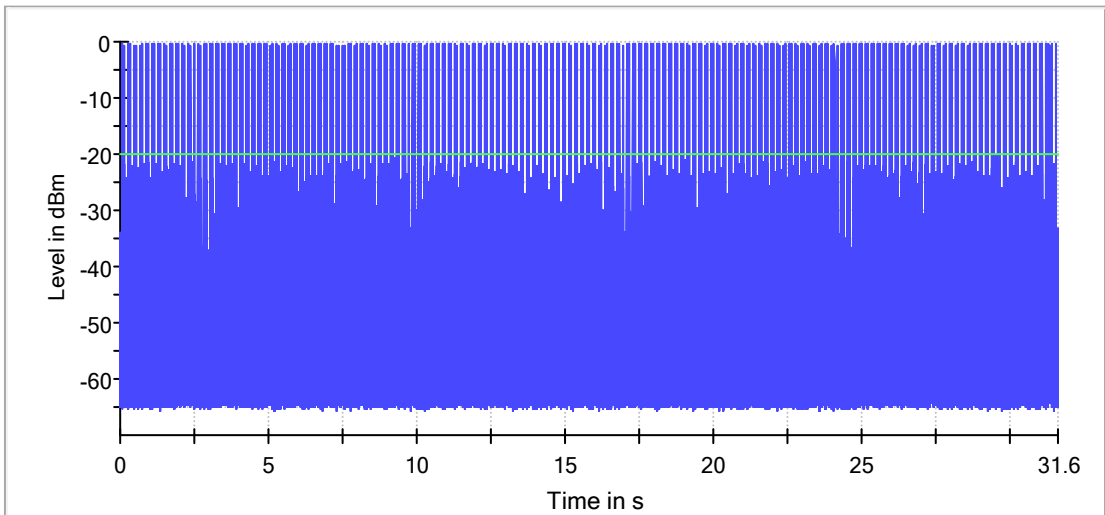
RBW=500KHzM, VBW=1MHz



— Trace — Threshold

EDR Mode, 3DH1, Middle Channel

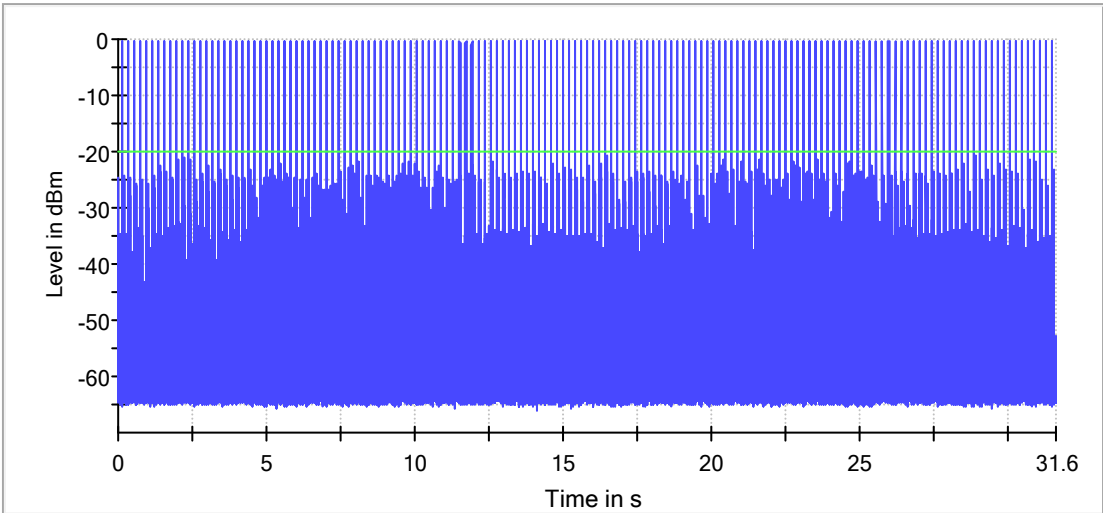
RBW=500KHzM, VBW=1MHz



— Trace — Threshold

EDR Mode, 3DH3, Middle Channel

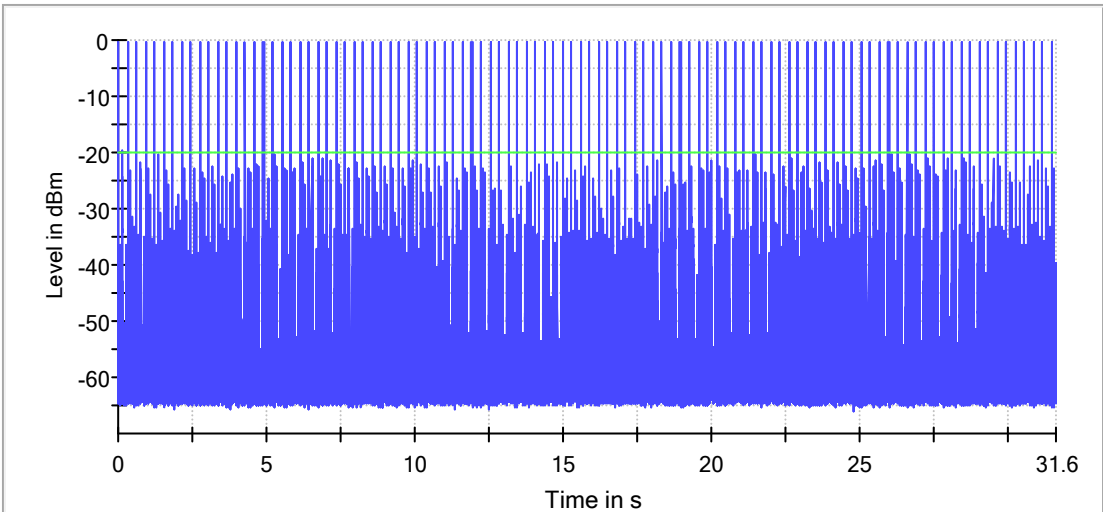
RBW=500KHzM, VBW=1MHz



— Trace — Threshold

EDR Mode, 3DH5, Middle Channel

RBW=500KHzM, VBW=1MHz



— Trace — Threshold

Appendix C

Test Results of Radiated Emission & AC Mains Conducted Emission

APPENDIX C	1
APPENDIX C.1: TEST PLOTS OF RADIATED SPURIOUS EMISSION	2
<i>BDR mode, 30MHz - 1GHz</i>	2
<i>BDR mode, 1GHz - 18GHz</i>	6
<i>EDR mode, 30MHz - 1GHz</i>	12
<i>EDR mode, 1GHz - 18GHz</i>	16
APPENDIX C.2: TEST PLOTS OF BAND EDGE (RADIATED)	22
<i>BDR mode, Low Channel</i>	22
<i>BDR mode, High Channel</i>	24
<i>EDR mode, Low Channel</i>	26
<i>EDR mode, High Channel</i>	28
APPENDIX C.3: TEST PLOTS OF AC MAINS CONDUCTED EMISSION	30

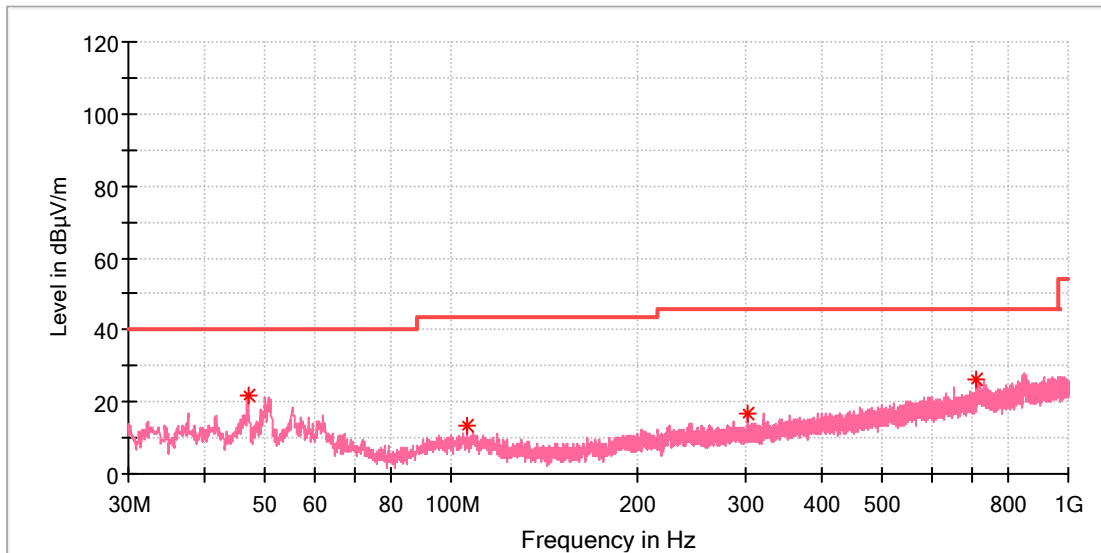
Note: Testing was carried out within frequency range 9kHz to the tenth harmonics. The measurement results below 30MHz and above 18GHz were greater than 20dB below the limit, so only the radiated spurious emissions from 30MHz to 18GHz were reported.

Appendix C.1: Test Plots of Radiated Spurious Emission

BDR mode, 30MHz - 1GHz

EUT Information

EUT Name:	Portable Outdoor IPX5 Waterproof Bluetooth Speaker
Model:	WP522RED
Test Mode:	BT_GFSK_TX_Low channel
Test Voltage::	DC 3.7V
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

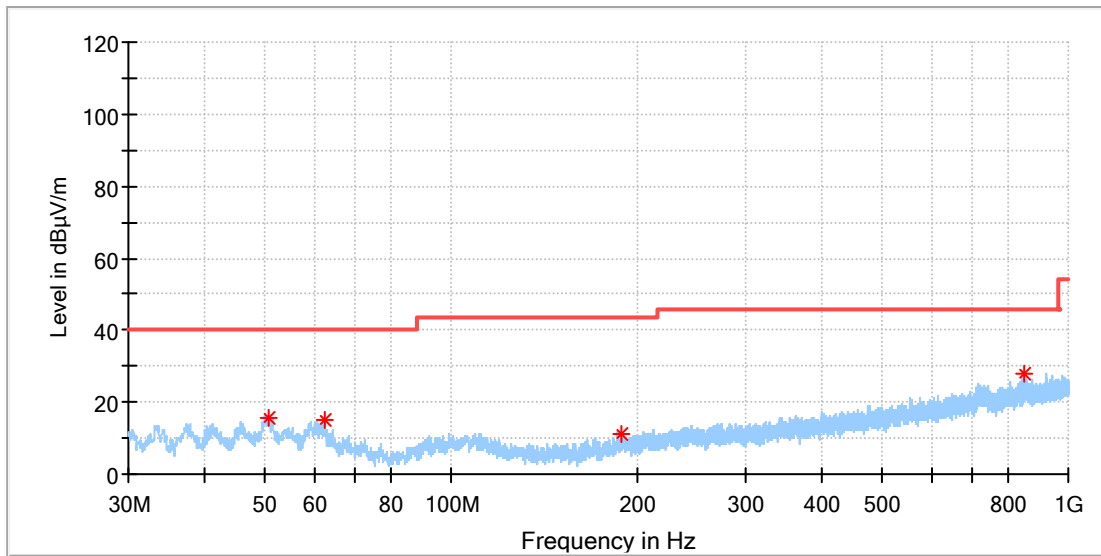


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
46.829500	22.02	---	40.00	17.98	100.0	V	202.0	-18.9
106.193500	13.54	---	43.50	29.96	100.0	V	202.0	-19.2
303.346000	16.52	---	46.00	29.48	100.0	V	276.0	-16.6
709.291000	25.96	---	46.00	20.04	100.0	V	251.0	-8.3

EUT Information

EUT Name:	Portable Outdoor IPX5 Waterproof Bluetooth Speaker
Model:	WP522RED
Test Mode:	BT_GFSK_TX_Low channel
Test Voltage::	DC 3.7V
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

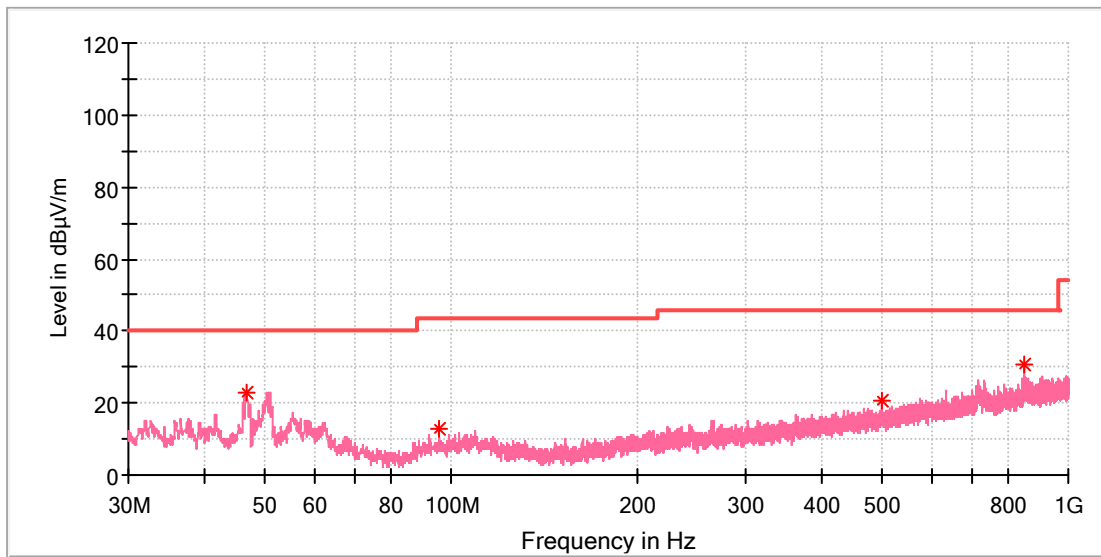


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
50.612500	15.58	---	40.00	24.42	100.0	H	165.0	-18.6
62.495000	15.30	---	40.00	24.70	100.0	H	288.0	-19.9
188.110000	10.97	---	43.50	32.53	100.0	H	11.0	-20.0
846.109500	27.75	---	46.00	18.25	100.0	H	338.0	-6.0

EUT Information

EUT Name: Portable Outdoor IPX5 Waterproof Bluetooth Speaker
 Model: WP522RED
 Test Mode: BT_GFSK_TX_High channel
 Test Voltage: DC 3.7V
 Remark: Temp 23 Humi:56%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin

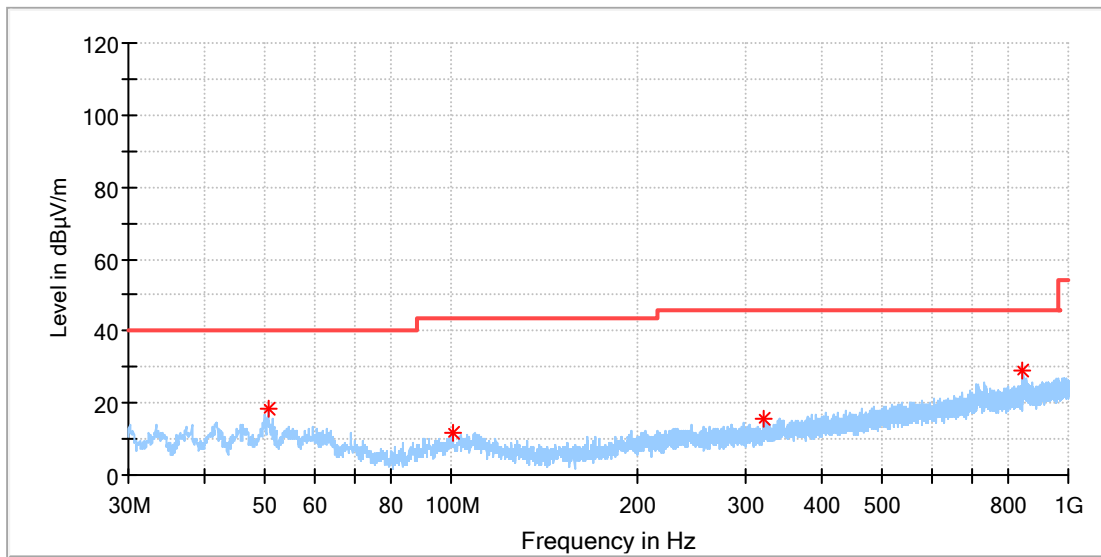


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
46.635500	23.02	---	40.00	16.98	100.0	V	3.0	-18.9
95.378000	12.59	---	43.50	30.91	100.0	V	48.0	-20.0
497.588500	20.76	---	46.00	25.24	100.0	V	89.0	-12.3
845.867000	30.59	---	46.00	15.41	100.0	V	81.0	-6.0

EUT Information

EUT Name: Portable Outdoor IPX5 Waterproof Bluetooth Speaker
 Model: WP522RED
 Test Mode: BT_GFSK_TX_High channel
 Test Voltage: DC 3.7V
 Remark: Temp 23 Humi:56%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin



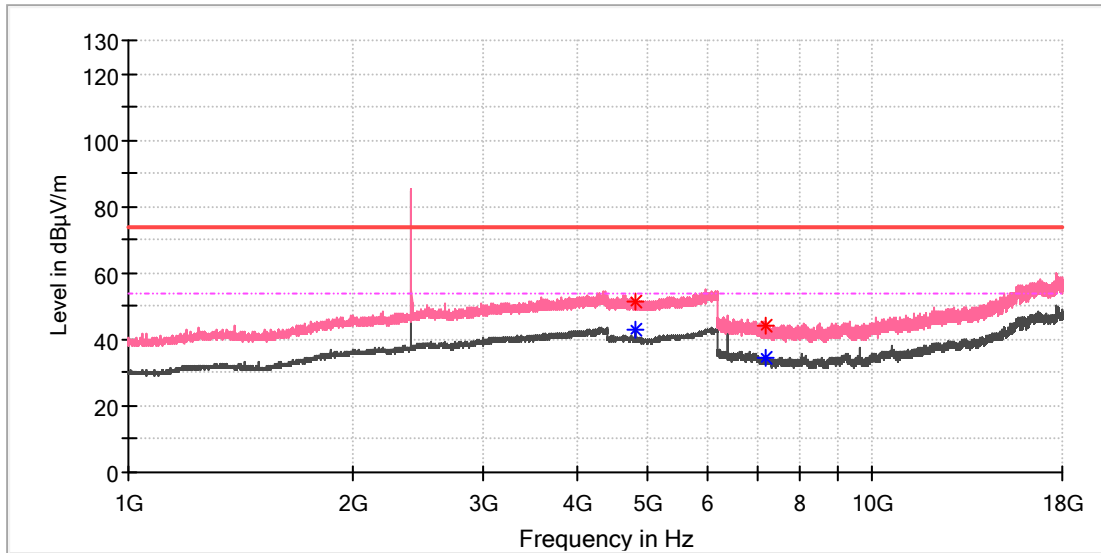
Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
50.564000	18.25	---	40.00	21.75	100.0	H	345.0	-18.6
100.858500	11.86	---	43.50	31.64	100.0	H	85.0	-19.3
321.776000	15.74	---	46.00	30.26	100.0	H	159.0	-16.0
845.091000	28.92	---	46.00	17.08	100.0	H	184.0	-6.0

BDR mode, 1GHz - 18GHz

EUT Information

EUT Name:	Portable Outdoor IPX5 Waterproof Bluetooth Speaker
Model:	WP522RED
Test Mode:	BT_GFSK_TX_Low channel
Test Voltage::	DC 3.7V
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

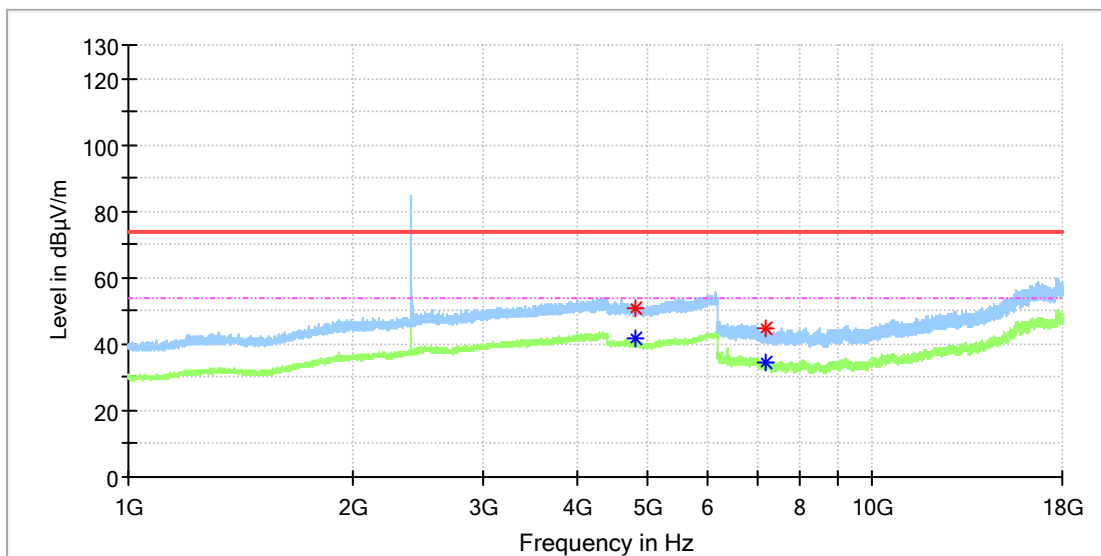


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4802.500000	51.43	---	74.00	22.57	100.0	V	173.0	13.6
4804.000000	---	43.09	54.00	10.91	100.0	V	286.0	13.6
7204.966667	---	34.60	54.00	19.40	100.0	V	89.0	8.8
7208.408333	44.41	---	74.00	29.59	100.0	V	108.0	8.8

EUT Information

EUT Name: Portable Outdoor IPX5 Waterproof Bluetooth Speaker
 Model: WP522RED
 Test Mode: BT_GFSK_TX_Low channel
 Test Voltage:: DC 3.7V
 Remark: Temp 23 Humi:56%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin

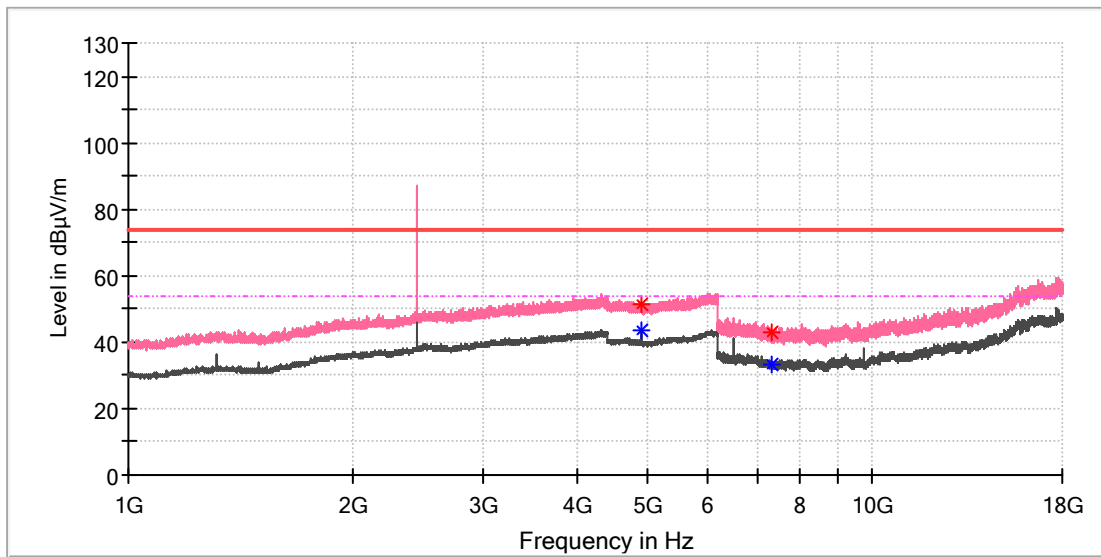


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4804.000000	---	41.93	54.00	12.07	100.0	H	265.0	13.6
4804.000000	51.09	---	74.00	22.91	100.0	H	265.0	13.6
7203.983333	---	34.45	54.00	19.55	100.0	H	187.0	8.8
7208.900000	44.58	---	74.00	29.42	100.0	H	187.0	8.8

EUT Information

EUT Name: Portable Outdoor IPX5 Waterproof Bluetooth Speaker
 Model: WP522RED
 Test Mode: BT_GFSK_TX_Mid channel
 Test Voltage:: DC 3.7V
 Remark: Temp 23 Humi:56%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin

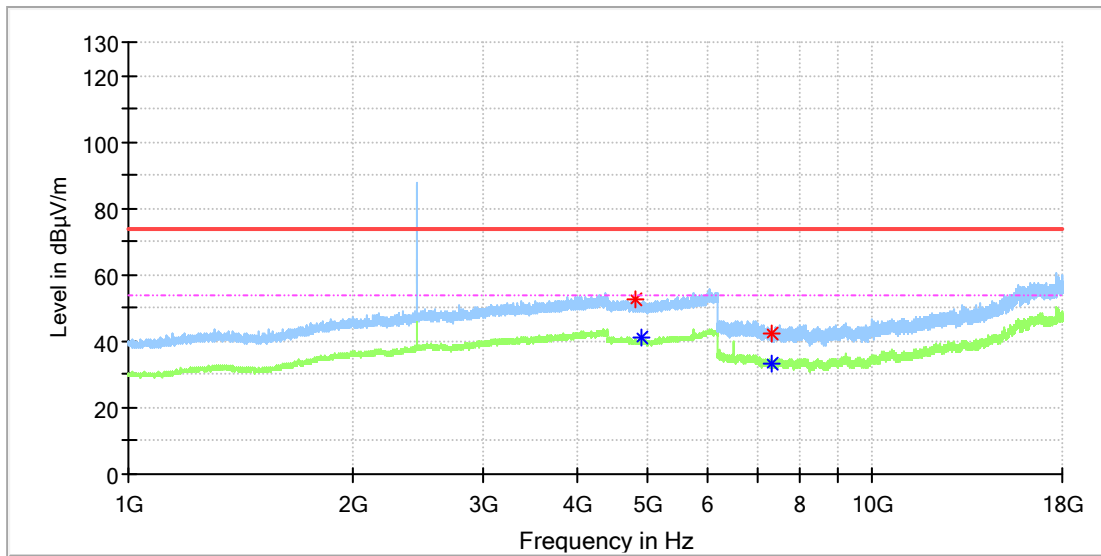


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4882.000000	51.68	---	74.00	22.32	100.0	V	276.0	13.4
4882.000000	---	43.36	54.00	10.64	100.0	V	276.0	13.4
7315.591667	43.08	---	74.00	30.92	100.0	V	53.0	8.2
7323.458333	---	33.55	54.00	20.45	100.0	V	117.0	8.2

EUT Information

EUT Name:	Portable Outdoor IPX5 Waterproof Bluetooth Speaker
Model:	WP522RED
Test Mode:	BT_GFSK_TX_Mid channel
Test Voltage::	DC 3.7V
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

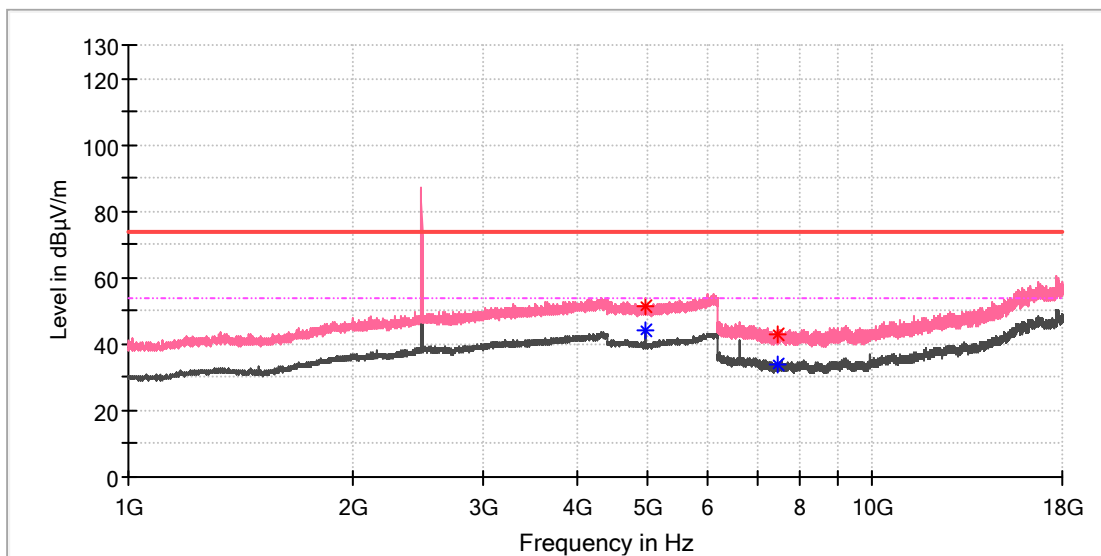


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4814.500000	52.82	---	74.00	21.18	100.0	H	359.0	13.6
4882.000000	---	41.04	54.00	12.96	100.0	H	337.0	13.4
7321.491667	---	33.48	54.00	20.52	100.0	H	184.0	8.2
7324.933333	42.52	---	74.00	31.48	100.0	H	3.0	8.2

EUT Information

EUT Name:	Portable Outdoor IPX5 Waterproof Bluetooth Speaker
Model:	WP522RED
Test Mode:	BT_GFSK_TX_High channel
Test Voltage::	DC 3.7V
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

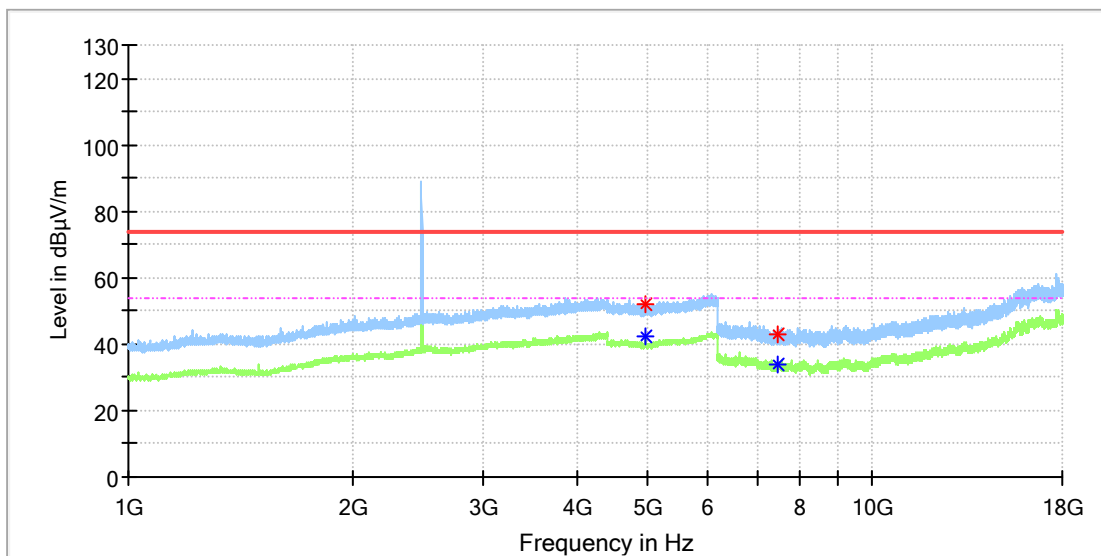


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4959.500000	51.44	---	74.00	22.56	100.0	V	268.0	13.2
4960.000000	---	44.15	54.00	9.85	100.0	V	276.0	13.2
7439.983333	---	33.90	54.00	20.10	100.0	V	22.0	8.4
7439.983333	42.64	---	74.00	31.36	100.0	V	22.0	8.4

EUT Information

EUT Name: Portable Outdoor IPX5 Waterproof Bluetooth Speaker
 Model: WP522RED
 Test Mode: BT_GFSK_TX_High channel
 Test Voltage:: DC 3.7V
 Remark: Temp 23 Humi:56%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin



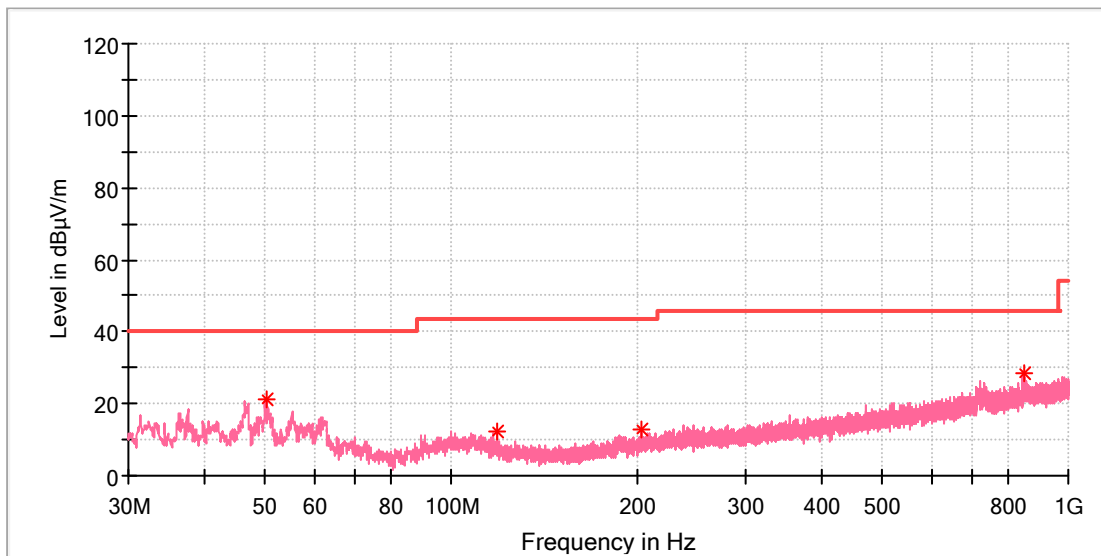
Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4958.500000	51.73	---	74.00	22.27	100.0	H	78.0	13.2
4960.000000	---	42.04	54.00	11.96	100.0	H	342.0	13.2
7439.983333	---	33.62	54.00	20.38	100.0	H	167.0	8.4
7443.425000	43.12	---	74.00	30.88	100.0	H	265.0	8.5

EDR mode, 30MHz - 1GHz

EUT Information

EUT Name:	Portable Outdoor IPX5 Waterproof Bluetooth Speaker
Model:	WP522RED
Test Mode:	BT_8PSK_TX_Low channel
Test Voltage::	DC 3.7V
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

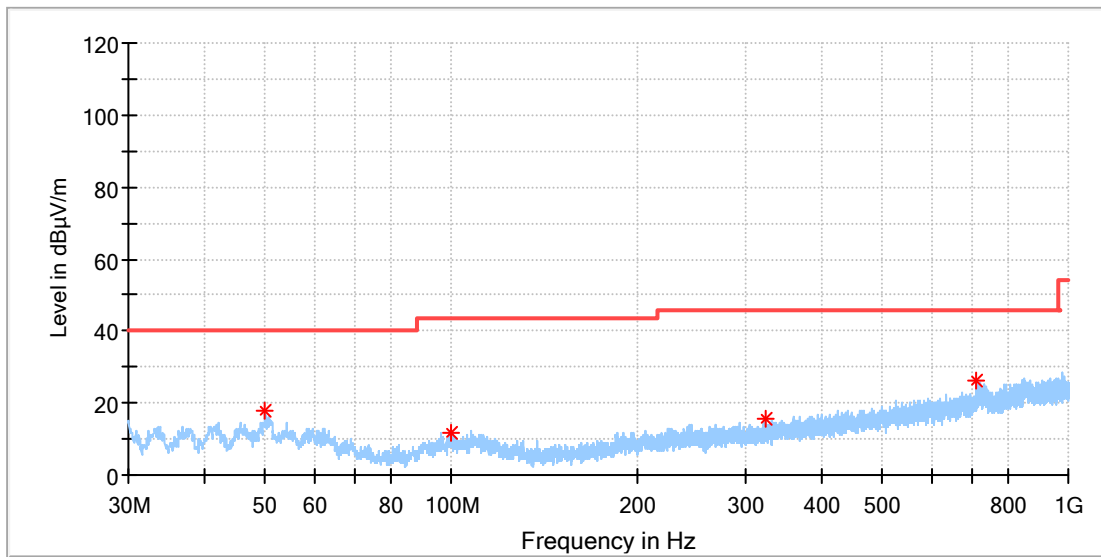


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
50.321500	21.25	---	40.00	18.75	100.0	V	119.0	-18.6
118.755000	12.52	---	43.50	30.98	100.0	V	45.0	-20.8
202.854000	12.98	---	43.50	30.52	100.0	V	340.0	-19.3
845.721500	28.21	---	46.00	17.79	100.0	V	135.0	-6.0

EUT Information

EUT Name: Portable Outdoor IPX5 Waterproof Bluetooth Speaker
 Model: WP522RED
 Test Mode: BT_8PSK_TX_Low channel
 Test Voltage:: DC 3.7V
 Remark: Temp 23 Humi:56%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin

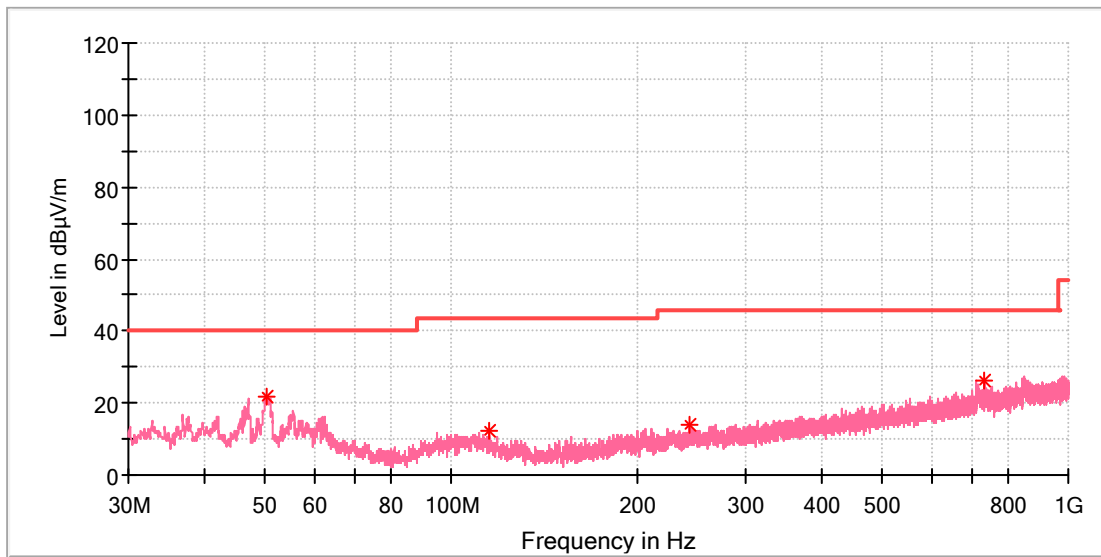


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
49.982000	17.69	---	40.00	22.31	100.0	H	320.0	-18.6
100.082500	11.98	---	43.50	31.52	100.0	H	94.0	-19.3
324.443500	15.44	---	46.00	30.56	100.0	H	0.0	-15.9
709.097000	25.98	---	46.00	20.02	100.0	H	254.0	-8.3

EUT Information

EUT Name: Portable Outdoor IPX5 Waterproof Bluetooth Speaker
 Model: WP522RED
 Test Mode: BT_8PSK_TX_High channel
 Test Voltage:: DC 3.7V
 Remark: Temp 23 Humi:56%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin

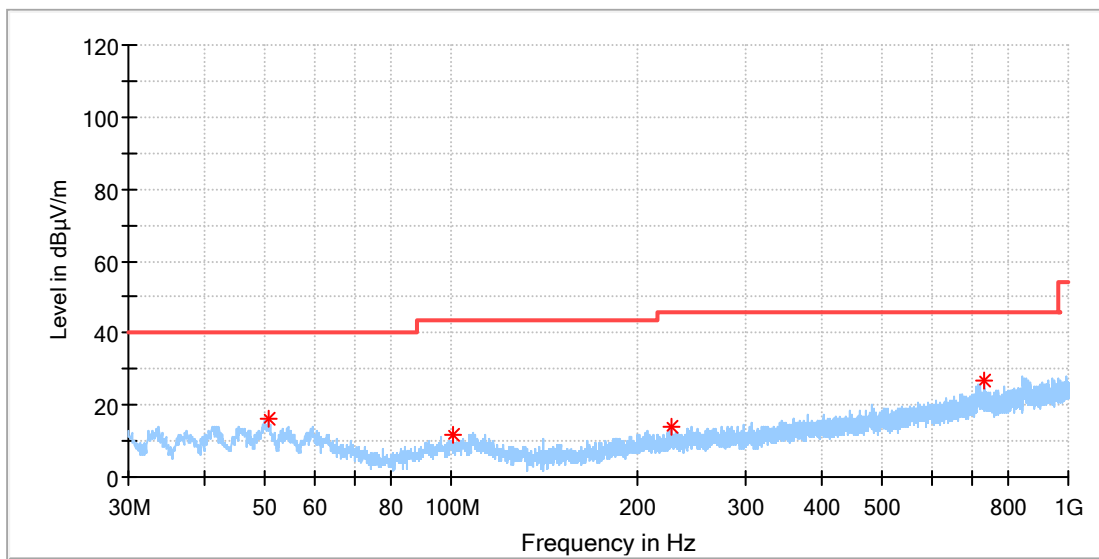


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
50.370000	21.77	---	40.00	18.23	100.0	V	135.0	-18.6
115.602500	12.40	---	43.50	31.10	100.0	V	340.0	-20.2
243.642500	14.01	---	46.00	31.99	100.0	V	94.0	-17.9
729.030500	26.49	---	46.00	19.51	100.0	V	39.0	-7.9

EUT Information

EUT Name: Portable Outdoor IPX5 Waterproof Bluetooth Speaker
 Model: WP522RED
 Test Mode: BT_8PSK_TX_High channel
 Test Voltage:: DC 3.7V
 Remark: Temp 23 Humi:56%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin



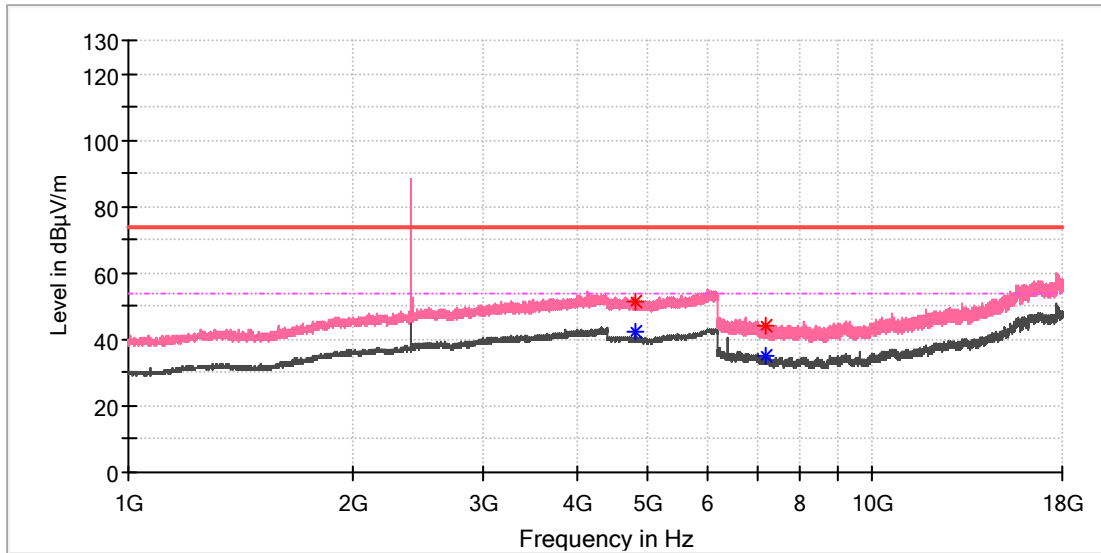
Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
50.709500	16.19	---	40.00	23.81	100.0	H	4.0	-18.6
100.664500	11.76	---	43.50	31.74	100.0	H	185.0	-19.3
227.395000	13.97	---	46.00	32.03	100.0	H	167.0	-18.5
728.448500	26.89	---	46.00	19.11	100.0	H	11.0	-7.9

EDR mode, 1GHz - 18GHz

EUT Information

EUT Name:	Portable Outdoor IPX5 Waterproof Bluetooth Speaker
Model:	WP522RED
Test Mode:	BT_8PSK_TX_Low channel
Test Voltage::	DC 3.7V
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

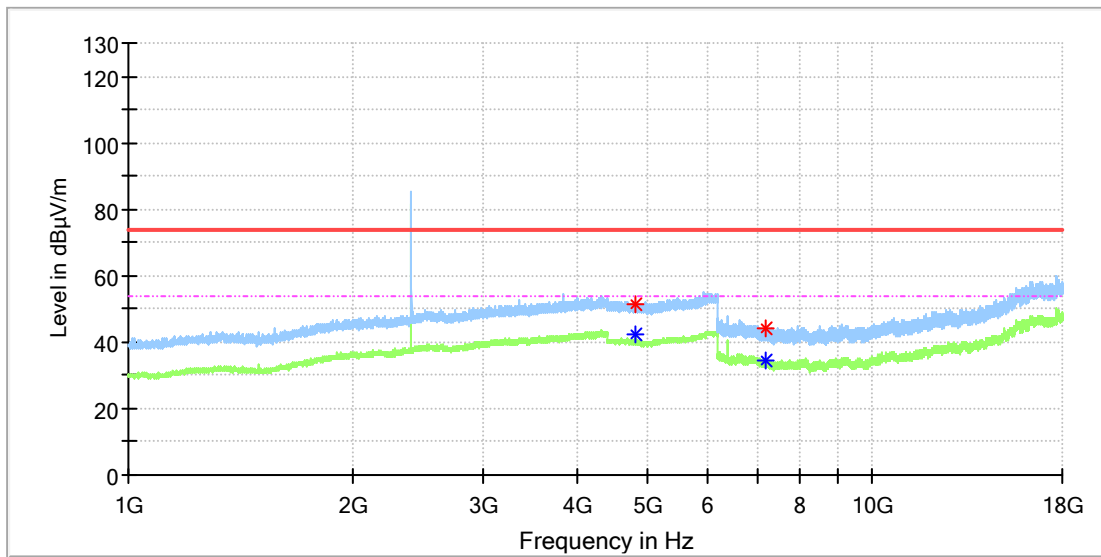


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4804.000000	51.15	---	74.00	22.85	100.0	V	288.0	13.6
4804.000000	---	42.58	54.00	11.42	100.0	V	288.0	13.6
7205.458333	---	35.25	54.00	18.75	100.0	V	23.0	8.8
7205.458333	44.21	---	74.00	29.79	100.0	V	23.0	8.8

EUT Information

EUT Name: Portable Outdoor IPX5 Waterproof Bluetooth Speaker
 Model: WP522RED
 Test Mode: BT_8PSK_TX_Low channel
 Test Voltage:: DC 3.7V
 Remark: Temp 23 Humi:56%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin

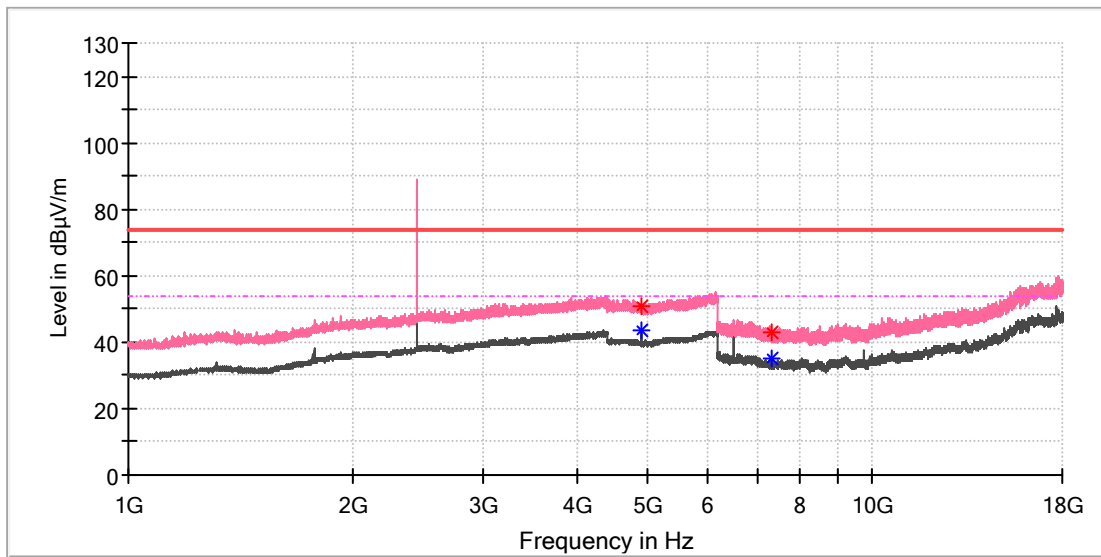


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4798.500000	51.69	---	74.00	22.31	100.0	H	295.0	13.6
4804.000000	---	42.58	54.00	11.42	100.0	H	35.0	13.6
7205.950000	---	34.22	54.00	19.78	100.0	H	46.0	8.8
7208.900000	44.01	---	74.00	29.99	100.0	H	207.0	8.8

EUT Information

EUT Name: Portable Outdoor IPX5 Waterproof Bluetooth Speaker
 Model: WP522RED
 Test Mode: BT_8PSK_TX_Mid channel
 Test Voltage:: DC 3.7V
 Remark: Temp 23 Humi:56%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin

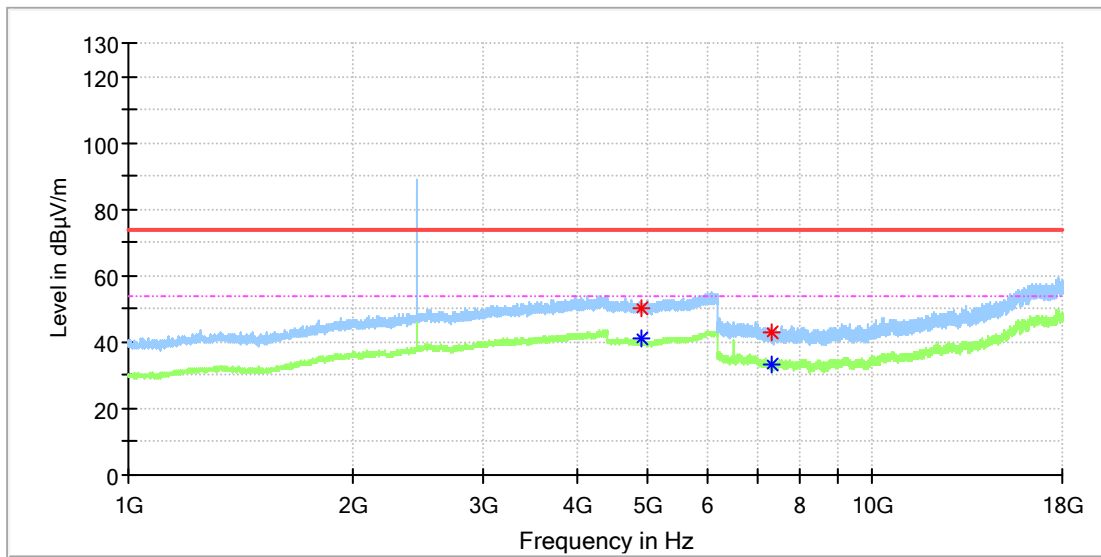


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4882.000000	51.08	---	74.00	22.92	100.0	V	272.0	13.4
4882.000000	---	43.72	54.00	10.28	100.0	V	272.0	13.4
7322.966667	---	34.95	54.00	19.05	100.0	V	22.0	8.2
7331.325000	43.05	---	74.00	30.95	100.0	V	40.0	8.1

EUT Information

EUT Name: Portable Outdoor IPX5 Waterproof Bluetooth Speaker
 Model: WP522RED
 Test Mode: BT_8PSK_TX_Mid channel
 Test Voltage:: DC 3.7V
 Remark: Temp 23 Humi:56%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin

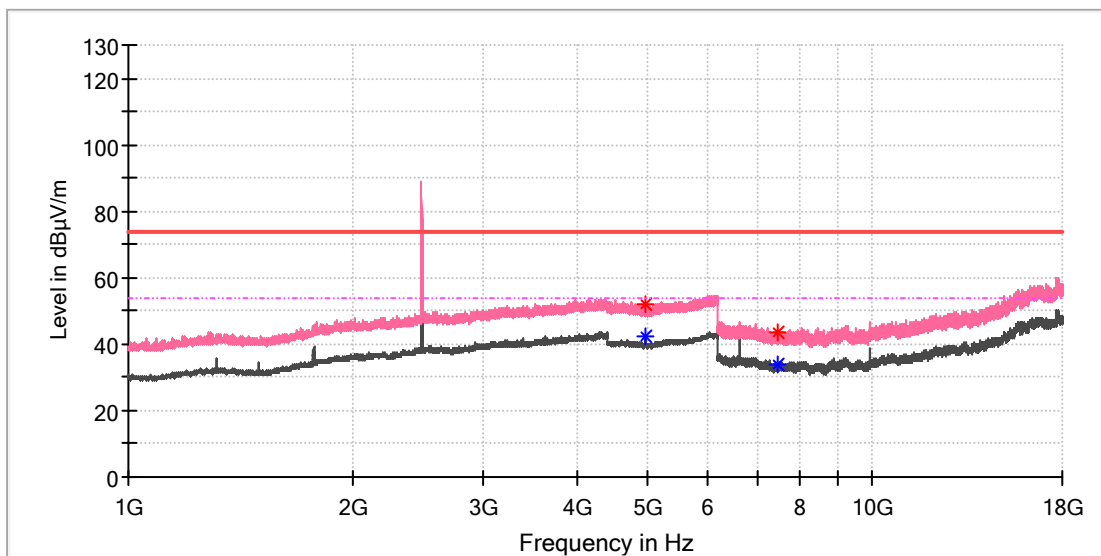


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4881.500000	50.46	---	74.00	23.54	100.0	H	41.0	13.4
4882.000000	---	41.01	54.00	12.99	100.0	H	342.0	13.4
7323.458333	---	33.51	54.00	20.50	100.0	H	187.0	8.2
7323.458333	42.75	---	74.00	31.25	100.0	H	187.0	8.2

EUT Information

EUT Name: Portable Outdoor IPX5 Waterproof Bluetooth Speaker
 Model: WP522RED
 Test Mode: BT_8PSK_TX_High channel
 Test Voltage:: DC 3.7V
 Remark: Temp 23 Humi:56%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin

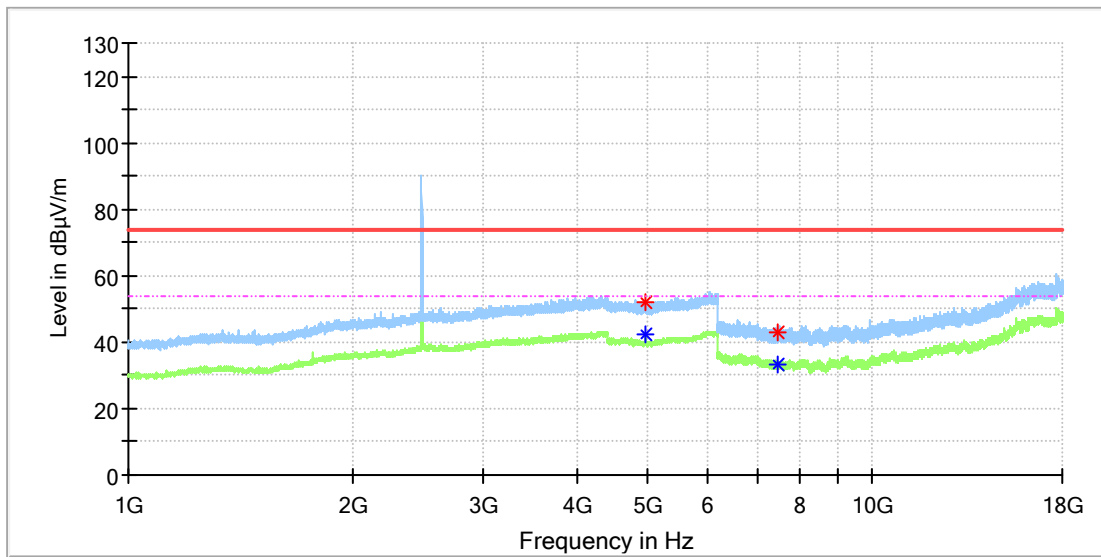


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4960.000000	---	42.60	54.00	11.40	100.0	V	258.0	13.2
4960.500000	51.84	---	74.00	22.16	100.0	V	266.0	13.2
7439.983333	43.41	---	74.00	30.59	100.0	V	7.0	8.4
7440.475000	---	33.58	54.00	20.42	100.0	V	22.0	8.4

EUT Information

EUT Name: Portable Outdoor IPX5 Waterproof Bluetooth Speaker
 Model: WP522RED
 Test Mode: BT_8PSK_TX_High channel
 Test Voltage:: DC 3.7V
 Remark: Temp 23 Humi:56%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin



Critical Freqs

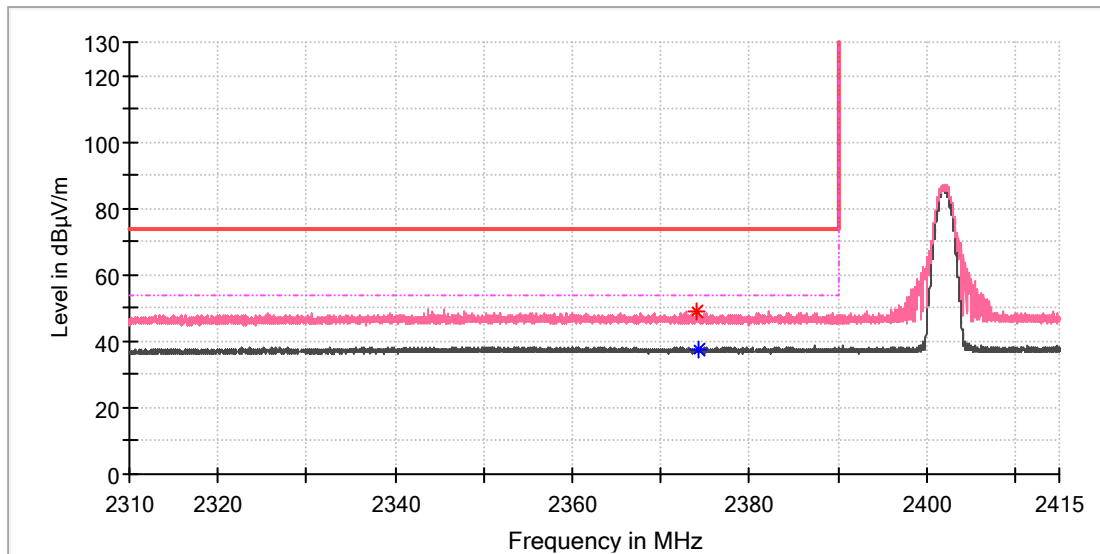
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4958.500000	51.83	---	74.00	22.17	100.0	H	275.0	13.2
4960.000000	---	42.45	54.00	11.55	100.0	H	342.0	13.2
7440.475000	42.69	---	74.00	31.31	100.0	H	246.0	8.4
7441.950000	---	33.37	54.00	20.63	100.0	H	87.0	8.4

Appendix C.2: Test Plots of Band Edge (Radiated)

BDR mode, Low Channel

EUT Information

EUT Name:	Portable Outdoor IPX5 Waterproof Bluetooth Speaker
Model:	WP522RED
Test Mode:	BT_GFSK_TX_Low channel
Test Voltage::	DC 3.7V
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

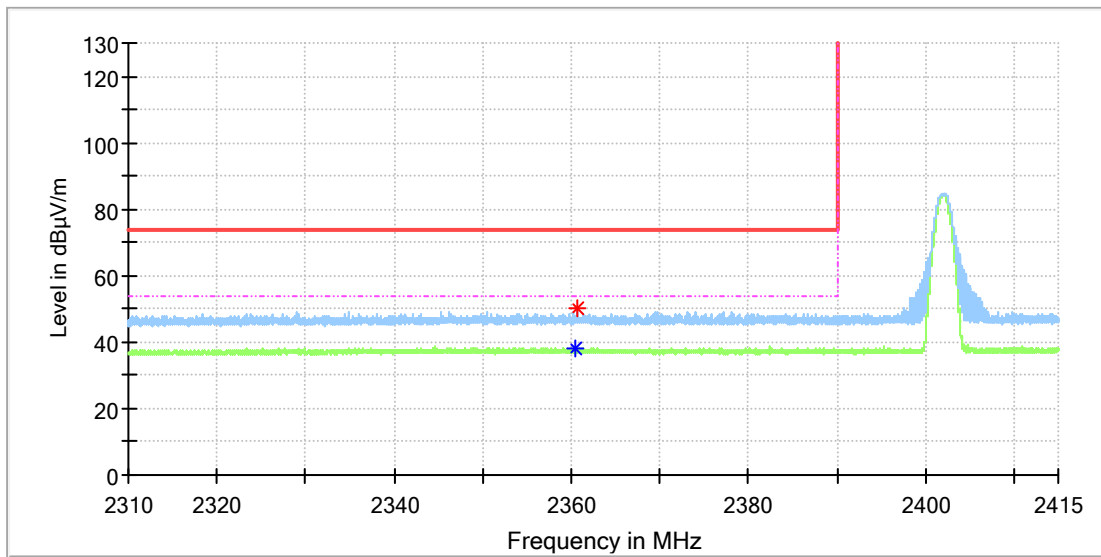


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2374.034559	49.04	---	74.00	24.96	100.0	V	0.0	6.9
2374.158088	---	37.64	54.00	16.36	100.0	V	9.0	6.9

EUT Information

EUT Name: Portable Outdoor IPX5 Waterproof Bluetooth Speaker
 Model: WP522RED
 Test Mode: BT_GFSK_TX_Low channel
 Test Voltage: DC 3.7V
 Remark: Temp 23 Humi:56%
 Test Standard: FCC 15.247
 Tested By: Kei Zhang
 Reviewed By: Terry Yin



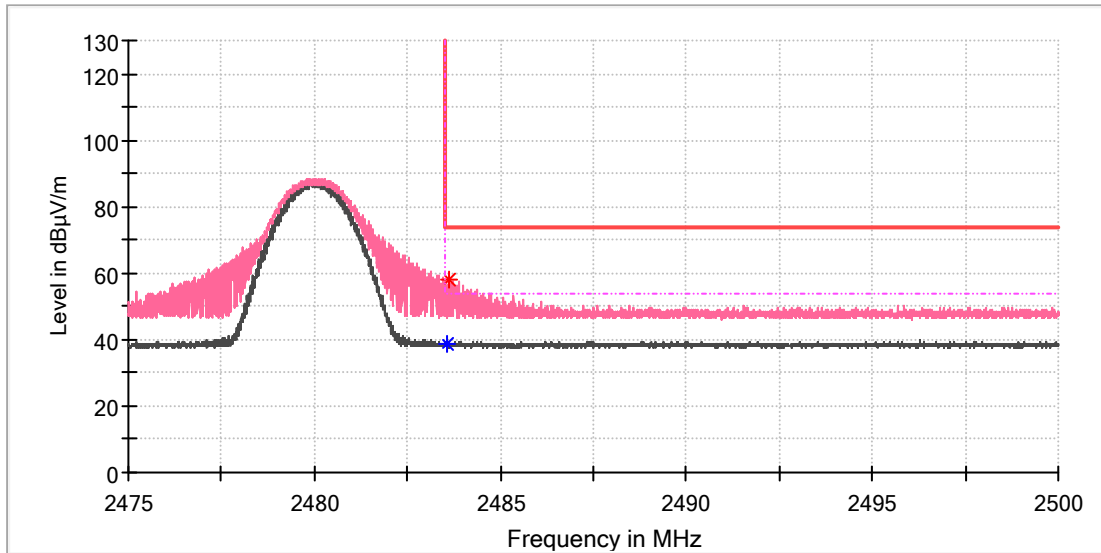
Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2360.400000	---	38.05	54.00	15.95	100.0	H	245.0	6.9
2360.693382	50.10	---	74.00	23.90	100.0	H	93.0	6.9

BDR mode, High Channel

EUT Information

EUT Name:	Portable Outdoor IPX5 Waterproof Bluetooth Speaker
Model:	WP522RED
Test Mode:	BT_GFSK_TX_High channel
Test Voltage::	DC 3.7V
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

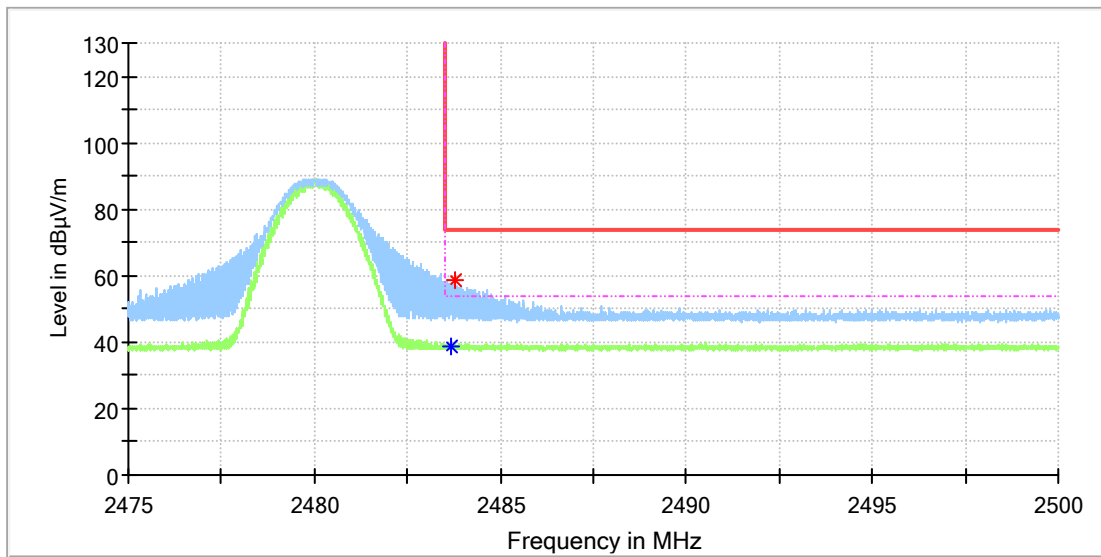


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.558824	---	38.94	54.00	15.06	100.0	V	59.0	7.4
2483.595588	58.15	---	74.00	15.85	100.0	V	282.0	7.4

EUT Information

EUT Name:	Portable Outdoor IPX5 Waterproof Bluetooth Speaker
Model:	WP522RED
Test Mode:	BT_GFSK_TX_High channel
Test Voltage::	DC 3.7V
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



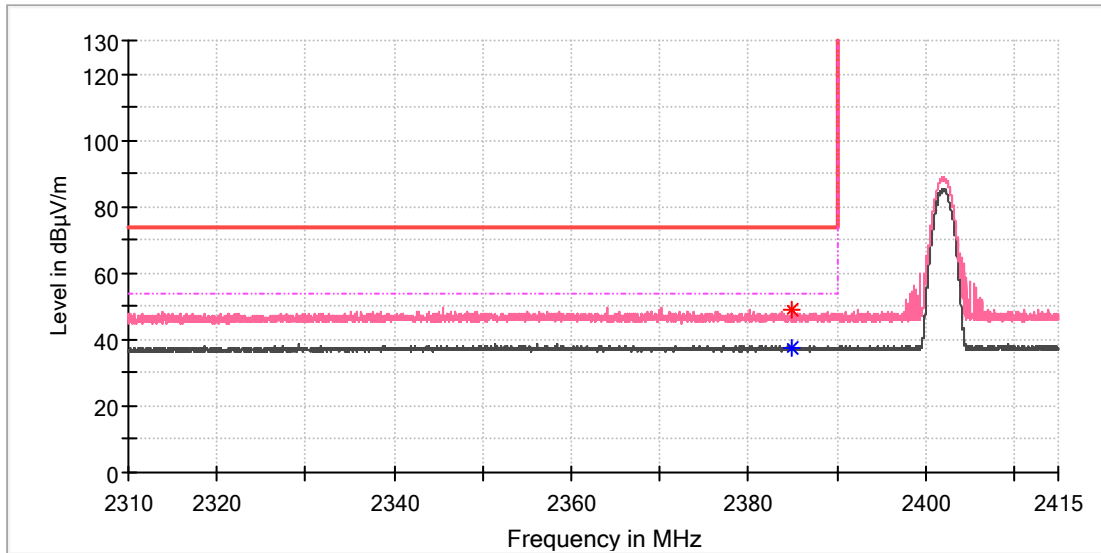
Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.680147	---	38.86	54.00	15.14	100.0	H	302.0	7.4
2483.786765	58.36	---	74.00	15.64	100.0	H	343.0	7.4

EDR mode, Low Channel

EUT Information

EUT Name:	Portable Outdoor IPX5 Waterproof Bluetooth Speaker
Model:	WP522RED
Test Mode:	BT_8PSK_TX_Low channel
Test Voltage::	DC 3.7V
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

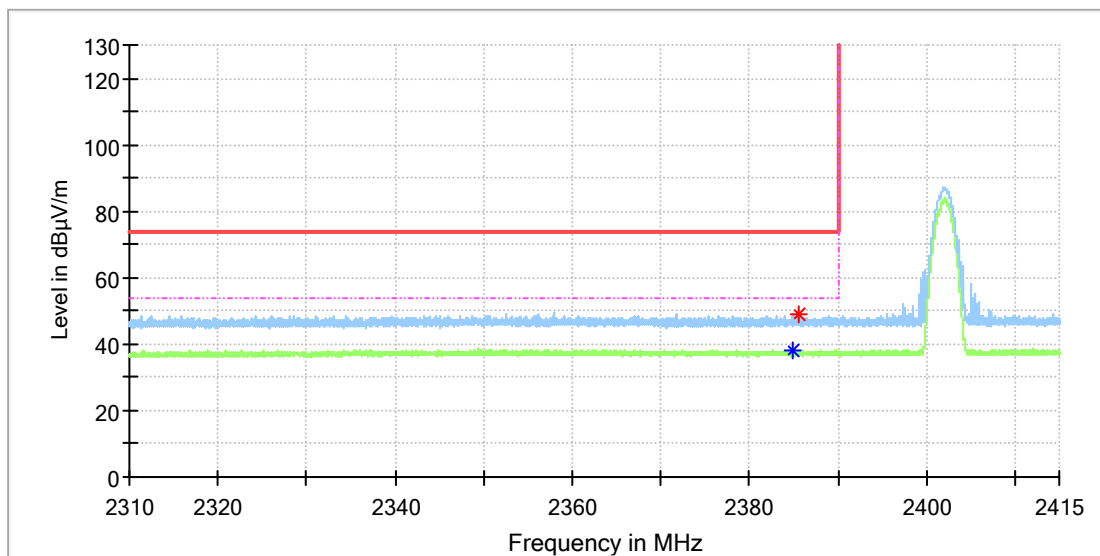


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2384.827941	48.69	---	74.00	25.31	100.0	V	2.0	7.0
2384.874265	---	37.21	54.00	16.79	100.0	V	30.0	7.0

EUT Information

EUT Name:	Portable Outdoor IPX5 Waterproof Bluetooth Speaker
Model:	WP522RED
Test Mode:	BT_8PSK_TX_Low channel
Test Voltage::	DC 3.7V
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



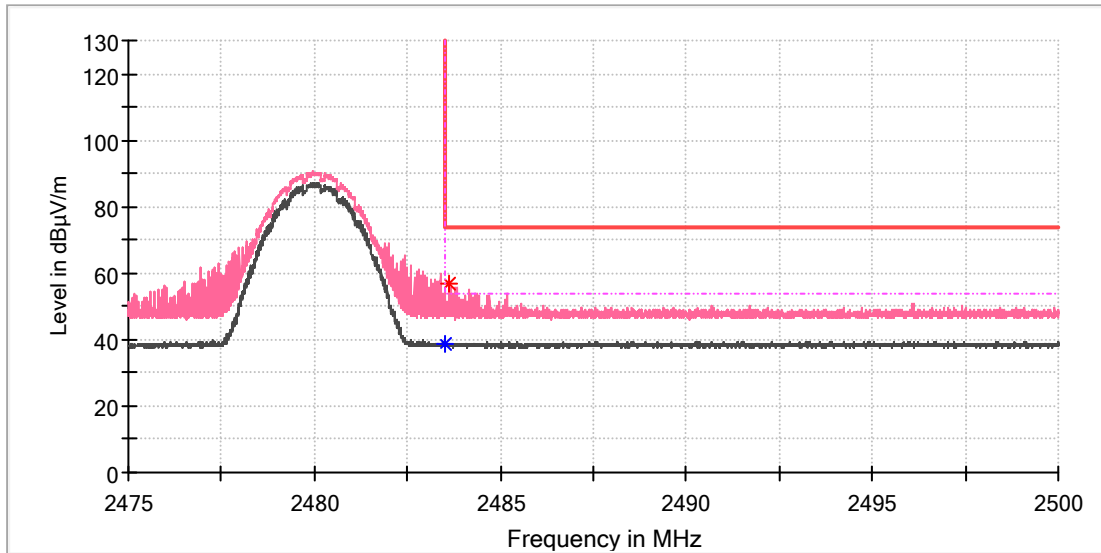
Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2384.997794	---	38.11	54.00	15.89	100.0	H	196.0	7.0
2385.553677	49.25	---	74.00	24.75	100.0	H	322.0	7.0

EDR mode, High Channel

EUT Information

EUT Name:	Portable Outdoor IPX5 Waterproof Bluetooth Speaker
Model:	WP522RED
Test Mode:	BT_8PSK_TX_High channel
Test Voltage::	DC 3.7V
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

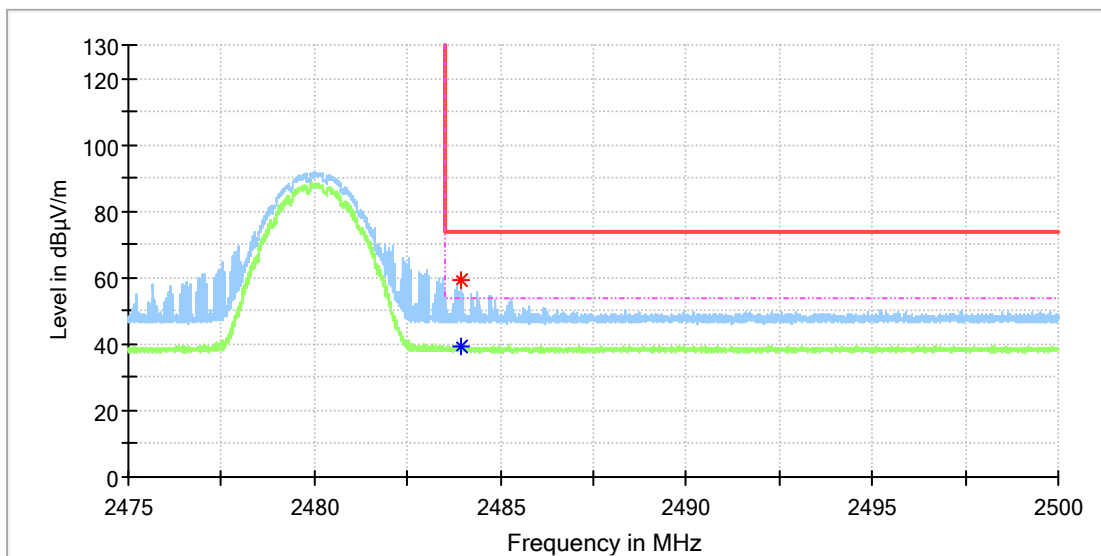


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.507353	---	38.61	54.00	15.39	100.0	V	66.0	7.4
2483.599265	56.96	---	74.00	17.04	100.0	V	101.0	7.4

EUT Information

EUT Name:	Portable Outdoor IPX5 Waterproof Bluetooth Speaker
Model:	WP522RED
Test Mode:	BT_8PSK_TX_High channel
Test Voltage::	DC 3.7V
Remark:	Temp 23 Humi:56%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

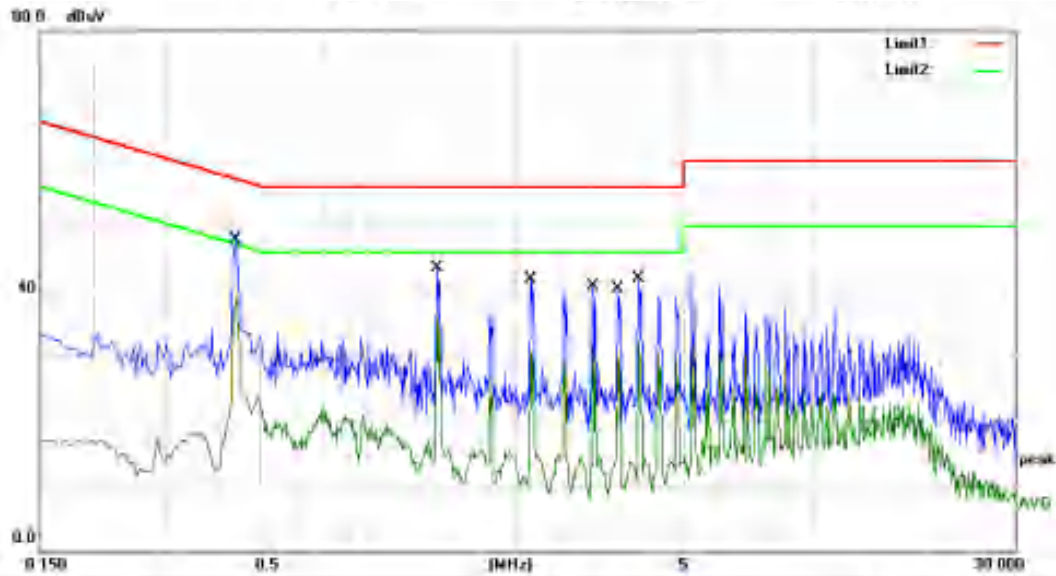


Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.926471	---	39.20	54.00	14.80	100.0	H	341.0	7.4
2483.926471	58.99	---	74.00	15.01	100.0	H	341.0	7.4

Appendix C.3: Test Plots of AC Mains Conducted Emission

EUT Name: Portable Outdoor IPX5 Waterproof Bluetooth Speaker
 Model: WP522RED
 Test Mode: BT
 Comment: Line

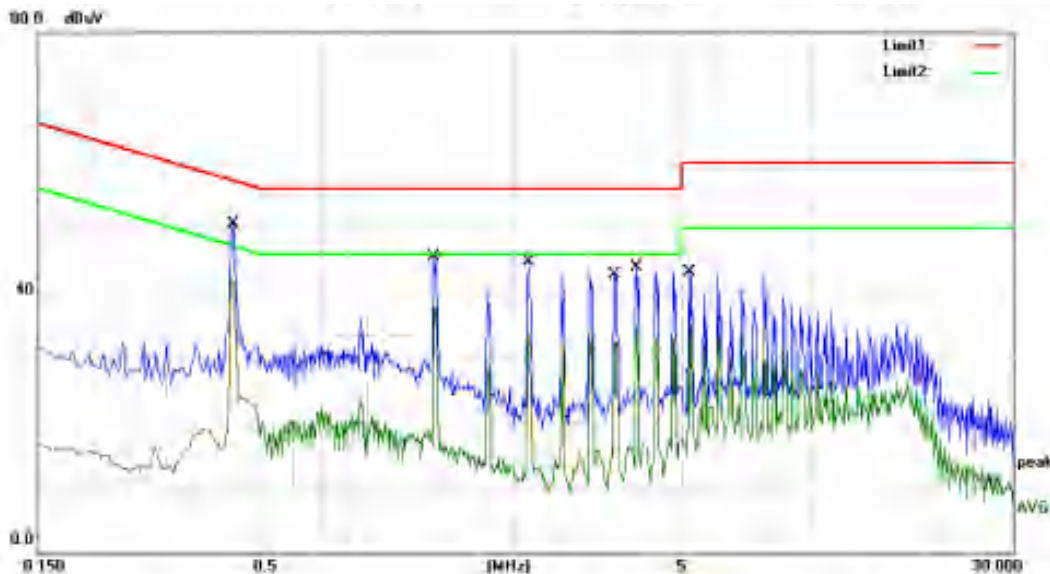


Site: Conduction #2
 Limit: (CE)FCC PART 15 class B_QP
 EUT: W522
 MN: 522B
 Mode: BT MODE
 Note:

Phase: N
 Power: AC 120V/60Hz
 Temperature: 25.0
 Humidity: 45 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.4340	37.93	9.92	47.85	57.18	-9.33	QP	
2	*	0.4340	29.11	9.92	39.03	47.18	-8.15	AVG	
3		1.3020	33.54	9.93	43.47	56.00	-12.53	QP	
4		1.3020	26.25	9.93	36.18	46.00	-9.82	AVG	
5		2.1660	31.75	9.94	41.69	56.00	-14.31	QP	
6		2.1660	20.70	9.94	30.64	46.00	-15.36	AVG	
7		3.0340	30.81	9.94	40.75	56.00	-15.25	QP	
8		3.0340	21.49	9.94	31.43	46.00	-14.57	AVG	
9		3.4660	30.46	9.94	40.40	56.00	-15.60	QP	
10		3.4660	19.78	9.94	29.72	46.00	-16.28	AVG	
11		3.8980	31.87	9.94	41.81	56.00	-14.19	QP	
12		3.8980	22.08	9.94	32.02	46.00	-13.98	AVG	

EUT Name: Portable Outdoor IPX5 Waterproof Bluetooth Speaker
 Model: WP522RED
 Test Mode: BT
 Comment: Nature



Site: Conduction #2
 Phase: L1
 Temperature: 20.0
 Limit: (CE)FCC PART 15 class B_QP
 Power: AC 120V/60Hz
 Humidity: 45 %
 EUT: W522
 MN: 522B
 Mode: BT MODE
 Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.4340	40.65	9.92	50.57	57.18	-6.61	QP	
2	*	0.4340	32.11	9.92	42.03	47.18	-5.15	AVG	
3		1.2940	35.50	9.93	45.43	56.00	-10.57	QP	
4		1.2940	29.28	9.93	39.21	46.00	-6.79	AVG	
5		2.1580	34.69	9.94	44.63	56.00	-11.37	QP	
6		2.1580	24.06	9.94	34.00	46.00	-12.00	AVG	
7		3.4500	32.79	9.94	42.73	56.00	-13.27	QP	
8		3.4500	22.57	9.94	32.51	46.00	-13.49	AVG	
9		3.8820	34.01	9.94	43.95	56.00	-12.05	QP	
10		3.8820	24.89	9.94	34.83	46.00	-11.17	AVG	
11		5.1820	33.17	9.95	43.12	60.00	-16.88	QP	
12		5.1820	25.04	9.95	34.99	50.00	-15.01	AVG	