TEST REPORT

Applicant Name :	Shenzhen Yingkeda Technology Co., Ltd.
Address :	FCC: 3rd and 4th floors, 88, Xingwang Road, Sigang,Henggang Street,Longgang District, Shenzhen,China ISEDC:3rd and 4th floors, 88, Xingwang Road, Sigang,Henggang Street,Longgang District,Shenzhen 518000 China (Peoples Republic Of)
Report Number :	SZNS220620-27491E-RFA
FCC ID:	2AYLJ-ABF5X
IC:	26843-ABF5X

Test Standard (s)

FCC PART 15.247; RSS-GEN ISSUE 5, FEBRUARY 2021 AMENDMENT 2; RSS-247, ISSUE 2, FEBRUARY 2017

Sample Description

Product Type:	TWS headset
Model No.:	AbleBuds Free
Multiple Model(s) No.:	AblePods Free, AbleBuds Pro, AbleBuds, AblePods (Please refer to DOS for Model difference)
Trade Mark:	UMIDIGI
Date Received:	2022/06/20
Report Date:	2022/07/18

Test Result:	Pass*

* In the configuration tested, the EUT complied with the standards above.

Prepared and Checked By:

Nick Fang

EMC Engineer

Approved By:

Candy Li

EMC Engineer

Note: This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk "★ ".

Shenzhen Accurate Technology Co., Ltd. is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with an asterisk '*'. Customer model name, addresses, names, trademarks etc. are not considered data.

This report cannot be reproduced except in full, without prior written approval of the Company. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

TABLE OF CONTENTS

GENERAL INFORMATION **4**
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT) 4
OBJECTIVE 4
TEST METHODOLOGY 4
MEASUREMENT UNCERTAINTY 5
TEST FACILITY 5
SYSTEM TEST CONFIGURATION **6**
DESCRIPTION OF TEST CONFIGURATION 6
EUT EXERCISE SOFTWARE 6
SPECIAL ACCESSORIES 6
EQUIPMENT MODIFICATIONS 6
SUPPORT EQUIPMENT LIST AND DETAILS 6
EXTERNAL I/O CABLE 6
BLOCK DIAGRAM OF TEST SETUP 7
SUMMARY OF TEST RESULTS **8**
TEST EQUIPMENT LIST **9**
FCC§15.247 (I), §1.1307 (B) (3) &§2.1093 – RF EXPOSURE **11**
APPLICABLE STANDARD 11
RESULT 12
RSS-102 § 2.5.1 - EXEMPTION LIMITS FOR ROUTINE EVALUATION – SAR EVALUATION **13**
APPLICABLE STANDARD 13
FCC §15.203 & RSS-GEN §6.8 – ANTENNA REQUIREMENT **15**
APPLICABLE STANDARD 15
ANTENNA CONNECTOR CONSTRUCTION 15
FCC §15.209, §15.205 & §15.247(D) & RSS-247§ 5.5 - SPURIOUS EMISSIONS **16**
APPLICABLE STANDARD 16
EUT SETUP 16
EMI TEST RECEIVER & SPECTRUM ANALYZER SETUP 17
TEST PROCEDURE 17
FACTOR & MARGIN CALCULATION 17
TEST DATA 17
FCC §15.247(A) (1) & RSS-247 § 5.1 (B) -CHANNEL SEPARATION TEST **23**
APPLICABLE STANDARD 23
TEST PROCEDURE 23
TEST DATA 23
FCC §15.247(A) (1) & RSS-247 § 5.1 (A), RSS-GEN § 6.7 – 20 DB EMISSION BANDWIDTH & 99% OCCUPIED BANDWIDTH **24**
APPLICABLE STANDARD 24
TEST PROCEDURE 24
TEST DATA 25

FCC §15.247(A) (1) (III) & RSS-247 § 5.1 (D) - QUANTITY OF HOPPING CHANNEL TEST.....26
APPLICABLE STANDARD 26
TEST PROCEDURE 26
TEST DATA 26
FCC §15.247(A) (1) (III) & RSS-247 § 5.1 (D) - TIME OF OCCUPANCY (DWELL TIME) 27
APPLICABLE STANDARD 27
TEST PROCEDURE 27
TEST DATA 27
FCC §15.247(B) (1) & RSS-247§ 5.1(B) &§ 5.4(B) - PEAK OUTPUT POWER MEASUREMENT.....28
APPLICABLE STANDARD 28
TEST PROCEDURE 28
TEST DATA 28
FCC §15.247(D) & RSS-247 § 5.5 - BAND EDGES TESTING.....29
APPLICABLE STANDARD 29
TEST PROCEDURE 29
TEST DATA 30
APPENDIX 31
APPENDIX A: 20DB EMISSION BANDWIDTH.....31
APPENDIX B: OCCUPIED CHANNEL BANDWIDTH 35
APPENDIX C: MAXIMUM CONDUCTED PEAK OUTPUT POWER.....39
APPENDIX D: CARRIER FREQUENCY SEPARATION 43
APPENDIX E: TIME OF OCCUPANCY.....45
APPENDIX F: NUMBER OF HOPPING CHANNELS 52
APPENDIX G: BAND EDGE MEASUREMENTS 54

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

HVIN	R2-3001_MAIN
Frequency Range	Bluetooth: 2402~2480MHz
Transmit Peak Power	0.98dBm
Modulation Technique	Bluetooth: GFSK, π/4-DQPSK, 8DPSK
Antenna Specification*	1.72 dBi (It is provided by the applicant)
Voltage Range	DC3.85V from battery or DC5V from Charging box
Sample serial number	SZNS220620-27491E-RF-S1 for Radiated Emissions SZNS220620-27491E-RF-S2 for RF Conducted Test (Assigned by ATC)
Sample/EUT Status	Good condition

Objective

This test report is in accordance with Part 2-Subpart J, Part 15-Subparts A and C of the Federal Communication Commissions rules and RSS-247, Issue 2, February 2017, RSS-GEN Issue 5, Feb. 2021Amendment 2 of the Innovation, Science and Economic Development Canada rules.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices and RSS-247, Issue 2, February 2017, RSS-GEN Issue 5, Feb. 2021Amendment 2 of the Innovation, Science and Economic Development Canada rules.

All emissions measurement was performed at Shenzhen Accurate Technology Co., Ltd. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Each test item follows test standards and with no deviation.

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		5%
RF Frequency		$0.082*10^{-7}$
RF output power, conducted		0.73dB
Unwanted Emission, conducted		1.6dB
AC Power Lines Conducted Emissions		2.72dB
Emissions, Radiated	9kHz - 30MHz	2.66dB
	30MHz - 1GHz	4.28dB
	1GHz - 18GHz	4.98dB
	18GHz - 26.5GHz	5.06dB
	26.5GHz- 40GHz	4.72dB
Temperature		1℃
Humidity		6%
Supply voltages		0.4%

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Test Facility

The test site used by Shenzhen Accurate Technology Co., Ltd. to collect test data is located on the 1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No.: 708358, the FCC Designation No.: CN1189.

Accredited by American Association for Laboratory Accreditation (A2LA). The Certificate Number is 4297.01

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0016. The Registration Number is 5077A.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in an engineering mode.

EUT Exercise Software

"Non Signaling Test Tool"* Software was used and the power level is 0*. The power level was provided by the applicant.

Special Accessories

No special accessory.

Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

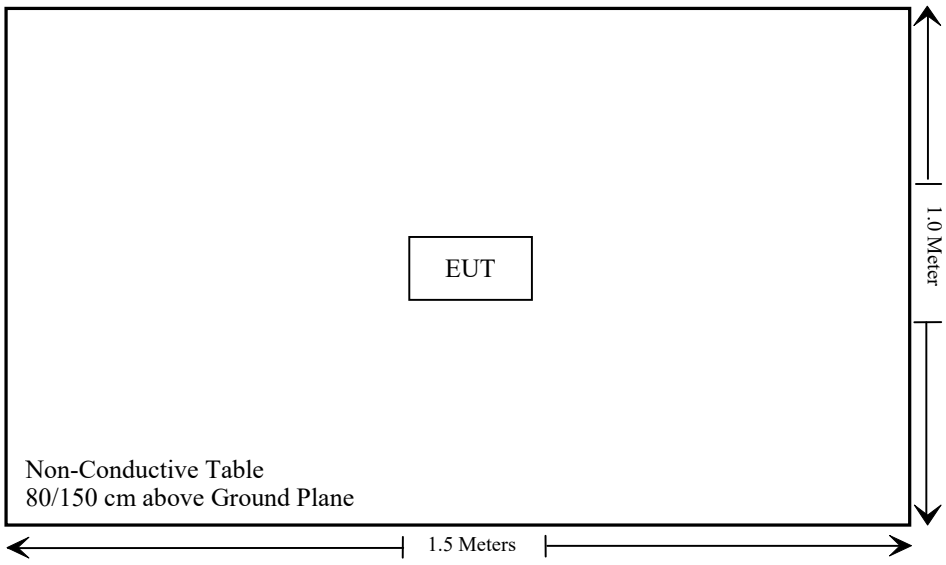
Manufacturer	Description	Model	Serial Number
/	/	/	/

External I/O Cable

Cable Description	Length (m)	From Port	To
/	/	/	/

Block Diagram of Test Setup

For Radiated Emissions:



SUMMARY OF TEST RESULTS

Rules	Description of Test	Result
FCC §15.247 (i) & §2.1093	RF EXPOSURE	Compliant
RSS-102 §2.5.1	EXEMPTION LIMITS FOR ROUTINE EVALUATION – SAR EVALUATION	Compliant
FCC §15.203 RSS-Gen §6.8	Antenna Requirement	Compliant
FCC §15.207(a) RSS-Gen §8.8	AC Line Conducted Emissions	Not Applicable
FCC §15.205, §15.209, §15.247(d) RSS-247 § 5.5, RSS-GEN § 8.10	Radiated Emissions	Compliant
FCC §15.247(a)(1) RSS-247 § 5.1(a), RSS-GEN § 6.7	20 dB Emission Bandwidth & 99% Occupied Bandwidth	Compliant
FCC §15.247(a)(1) RSS-247 § 5.1 (b)	Channel Separation Test	Compliant
FCC §15.247(a)(1)(iii) RSS-247 § 5.1 (d)	Time of Occupancy (Dwell Time)	Compliant
FCC §15.247(a)(1)(iii) RSS-247 § 5.1 (d)	Quantity of hopping channel Test	Compliant
FCC §15.247(b)(1) RSS-247 § 5.1(b) &§ 5.4(b)	Peak Output Power Measurement	Compliant
FCC §15.247(d) RSS-247 § 5.5	Band edges	Compliant

Not Applicable: The Bluetooth function cannot use when charging..
Note: the left earbud and right earbud are electrical identical, pre-scan the two earbuds, the worst case left earbud was selected to test.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emissions Test					
Rohde& Schwarz	Test Receiver	ESR	102725	2021/12/13	2022/12/12
Rohde&Schwarz	Spectrum Analyzer	FSV40	101949	2021/12/13	2022/12/12
SONOMA INSTRUMENT	Amplifier	310 N	186131	2021/11/09	2022/11/08
A.H. Systems, inc.	Preamplifier	PAM-0118P	135	2021/11/09	2022/11/08
Quinstar	Amplifier	QLW-18405536-J0	15964001002	2021/11/11	2022/11/10
Schwarzbeck	Bilog Antenna	VULB9163	9163-323	2021/07/06	2024/07/05
Schwarzbeck	Horn Antenna	BBHA9120D	9120D-1067	2020/01/05	2023/01/04
Schwarzbeck	HORN ANTENNA	BBHA9170	9170-359	2020/01/05	2023/01/04
Radiated Emission Test Software: e3 19821b (V9)					
Unknown	RF Coaxial Cable	No.10	N050	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.11	N1000	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.12	N040	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.13	N300	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.14	N800	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.15	N600	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.16	N650	2021/12/14	2022/12/13
Wainwright	High Pass Filter	WHKX3.6/18 G-10SS	5	2021/12/14	2022/12/13

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
Rohde & Schwarz	Spectrum Analyzer	FSV-40	101495	2021/12/13	2022/12/12
Tonscend	RF Control Unit	JS0806-2	19G8060182	2022/07/06	2023/07/05
Unknown	RF Coaxial Cable	No.31	RF-01	Each time	/
Unknown	RF Coaxial Cable	Unknown	2	Each time	/

*** Statement of Traceability:** Shenzhen Accurate Technology Co., Ltd. attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FCC§15.247 (i), §1.1307 (b) (3) &§2.1093 – RF EXPOSURE

Applicable Standard

According to FCC §2.1093 and §1.1307(b) (3), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

According to KDB 447498 D04 Interim General RF Exposure Guidance

SAR-Based Exemption:

SAR-based thresholds are derived based on frequency, power, and separation distance of the RF source. The formula defines the thresholds in general for either available maximum timeaveraged power or maximum time-averaged ERP, whichever is greater.

Per § 1.1307(b)(3)(i)(B), for single RF sources (i.e., any single fixed RF source, mobile device, or portable device, as defined in paragraph (b)(2) of this section): A single RF source is exempt if:

the available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold P_{th} (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive). P_{th} is given by:

$$P_{th}\ (\text{mW}) = \begin{cases} ERP_{20\ cm}(d/20\ \text{cm})^x & d \le 20\ \text{cm} \\ ERP_{20\ cm} & 20\ \text{cm} < d \le 40\ \text{cm} \end{cases}$$

Where

$$x = -\log_{10}\left(\frac{60}{ERP_{20\ cm}\sqrt{f}}\right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20\ cm}\ (\text{mW}) = \begin{cases} 2040f & 0.3\ \text{GHz} \le f < 1.5\ \text{GHz} \\ 3060 & 1.5\ \text{GHz} \le f \le 6\ \text{GHz} \end{cases}$$

d = the separation distance (cm);

Result

For worst case:

Exemption limit:

For f=2.48GHz, d=0.5cm, the P_{th}=2.72mW

The higher of the available maximum time-averaged power or effective radiated power (ERP):

The antenna gain is 1.72dBi(-0.43dBd), 0dBd=2.15dBi

The maximum tune-up conducted power is 1.0dBm (1.26mW), which less than 2.72mW@2480MHz exemption limit.

So the stand-alone SAR test can be exempted.

RSS-102 § 2.5.1 - EXEMPTION LIMITS FOR ROUTINE EVALUATION – SAR EVALUATION

Applicable Standard

According to RSS-102 Issue 5 § (2.5.1), SAR evaluation is required if the separation distance between the user and/or bystander and the antenna and/or radiating element of the device is less than or equal to 20 cm, except when the device operates at or below the applicable output power level (adjusted for tune-up tolerance) for the specified separation distance defined in Table 1.

Table 1: SAR evaluation – Exemption limits for routine evaluation based on frequency and separation distance4,5

Frequency (MHz)	Exemption Limits (mW)				
	At separation distance of ≤5 mm	At separation distance of 10 mm	At separation distance of 15 mm	At separation distance of 20 mm	At separation distance of 25 mm
≤300	71 mW	101 mW	132 mW	162 mW	193 mW
450	52 mW	70 mW	88 mW	106 mW	123 mW
835	17 mW	30 mW	42 mW	55 mW	67 mW
1900	7 mW	10 mW	18 mW	34 mW	60 mW
2450	4 mW	7 mW	15 mW	30 mW	52 mW
3500	2 mW	6 mW	16 mW	32 mW	55 mW
5800	1 mW	6 mW	15 mW	27 mW	41 mW

Frequency (MHz)	Exemption Limits (mW)				
	At separation distance of 30 mm	At separation distance of 35 mm	At separation distance of 40 mm	At separation distance of 45 mm	At separation distance of ≥50 mm
≤300	223 mW	254 mW	284 mW	315 mW	345 mW
450	141 mW	159 mW	177 mW	195 mW	213 mW
835	80 mW	92 mW	105 mW	117 mW	130 mW
1900	99 mW	153 mW	225 mW	316 mW	431 mW
2450	83 mW	123 mW	173 mW	235 mW	309 mW
3500	86 mW	124 mW	170 mW	225 mW	290 mW
5800	56 mW	71 mW	85 mW	97 mW	106 mW

Output power level shall be the higher of the maximum conducted or equivalent isotropically radiated power (e.i.r.p.) source-based, time-averaged output power. For controlled use devices where the 8 W/kg for 1 gram of tissue applies, the exemption limits for routine evaluation in Table 1 are multiplied by a factor of 5. For limb-worn devices where the 10 gram value applies, the exemption limits for routine evaluation in Table 1 are multiplied by a factor of 2.5. If the operating frequency of the device is between two frequencies located in Table 1, linear interpolation shall be applied for the applicable separation distance. For test separation distance less than 5 mm, the exemption limits for a separation distance of 5 mm can be applied to determine if a routine evaluation is required.

For medical implants devices, the exemption limit for routine evaluation is set at 1 mW. The output power of a medical implants device is defined as the higher of the conducted or e.i.r.p to determine whether the device is exempt from the SAR evaluation.

Test Result:

The higher of the conducted or equivalent isotropically radiated power (e.i.r.p.) source-based, time-averaged output power:

(2480-2450)/(3500-2450) = (4-P)/(4-2)

The exemption limit of 2480MHz is P = 3.94mW

Ant gain: 1.72dBi

Tune up conducted power = 1.0dBm;

Tune up EIRP = 1.0+1.72dBm = 2.72dBm = 1.87mW < 3.94mW

So the stand-alone SAR evaluation can be exempted.

FCC §15.203 & RSS-GEN §6.8 – ANTENNA REQUIREMENT

Applicable Standard

According to FCC § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

According to FCC § 15.203, the applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list.

For expediting the testing, measurements may be performed using only the antenna with highest gain of each combination of transmitter and antenna type, with the transmitter output power set at the maximum level. However, the transmitter shall comply with the applicable requirements under all operational conditions and when in combination with any type of antenna from the list provided in the test report (and in the notice to be included in the user manual, provided below).

When measurements at the antenna port are used to determine the RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna's manufacturer.

The test report shall state the RF power, output power setting and spurious emission measurements with each antenna type that is used with the transmitter being tested.

For licence-exempt equipment with detachable antennas, the user manual shall also contain the following notice in a conspicuous location:

This radio transmitter [enter the device's ISED certification number] has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.
Immediately following the above notice, the manufacturer shall provide a list of all antenna types which can be used with the transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna type.

Antenna Connector Construction

The EUT has one internal antenna arrangement which was permanently attached and the maximum antenna gain is1.72dBi, fulfill the requirement of this section. Please refer to the EUT photos.

Antenna Type	Antenna Gain	Impedance	Frequency Range
Integral	1.72 dBi	50 Ω	2.4~2.5GHz

Result: Compliance

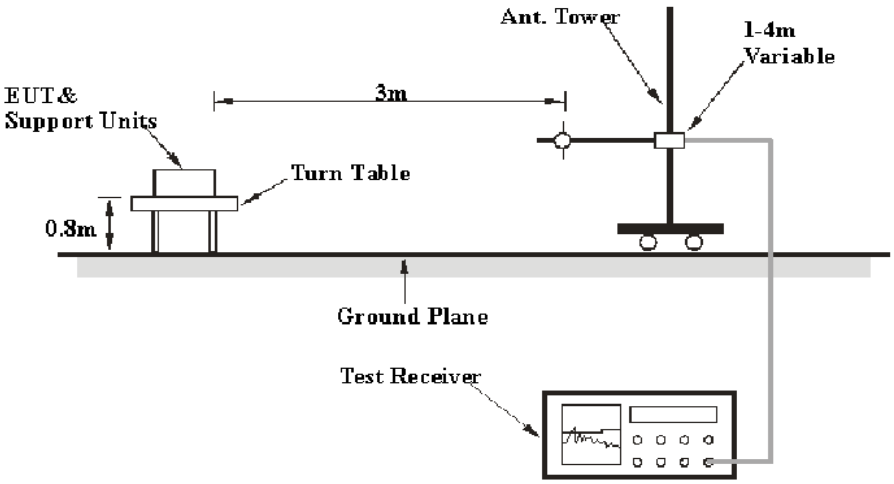
FCC §15.209, §15.205 & §15.247(d) & RSS-247§ 5.5 - SPURIOUS EMISSIONS

Applicable Standard

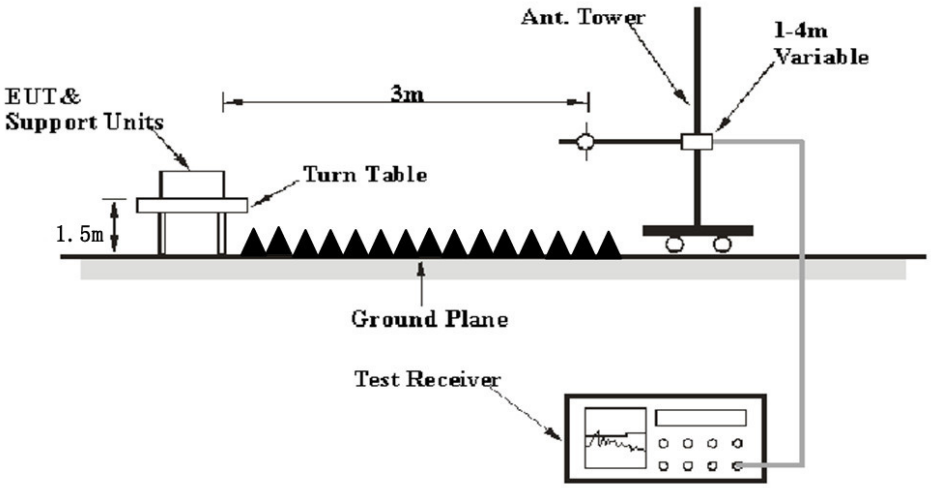
FCC §15.205; §15.209; §15.247(d); RSS-247§ 5.5; RSS-GEN § 8.10

EUT Setup

Below 1 GHz:



Above 1GHz:



The radiated emission tests were performed in the 3 meters test site, using the setup accordance with the ANSI C63.10-2013 & RSS-Gen. The specification used was the FCC 15.209, and FCC 15.247/RSS-247 limits.

EMI Test Receiver & Spectrum Analyzer Setup

The EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Measurement
30 MHz – 1000 MHz	100 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1 MHz	3 MHz	/	PK
	1 MHz	10 Hz	/	Average

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All final data was recorded in Quasi-peak detection mode for frequency range of 30 MHz -1 GHz and peak and Average detection modes for frequencies above 1 GHz.

Factor & Margin Calculation

The Factor is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain. The basic equation is as follows:

Factor = Antenna Factor + Cable Loss - Amplifier Gain

The "**Over Limit/Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, an Over Limit/margin of -7dB means the emission is 7dB below the limit. The equation for calculation is as follows:

Over Limit/Margin = Level / Corrected Amplitude – Limit
Level / Corrected Amplitude = Read Level + Factor

Test Data

Environmental Conditions

Temperature:	24~26℃
Relative Humidity:	58~61%
ATM Pressure:	101.0 kPa

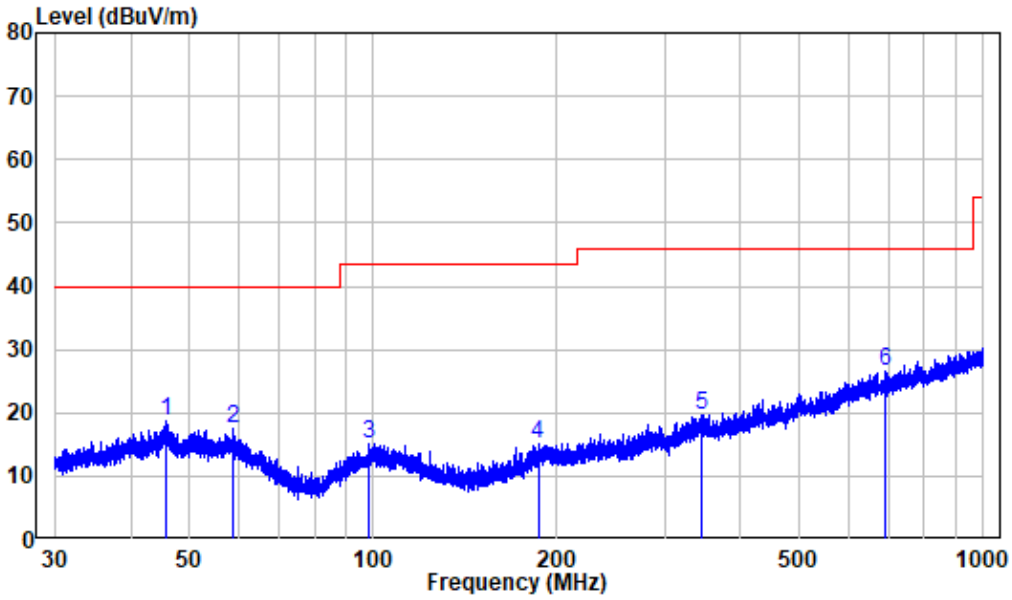
The testing was performed by Level Li on 2022-07-11for below 1GHz, and by Jeff Jiang on 2022-07-05 for above 1GHz.

EUT operation mode: Transmitting (Pre-scan in the X,Y and Z axes of orientation, the worst case of X-axes orientation was recorded)

Below 1GHz: (*the worst case is 8DPSK Mode, High channel*)

Note: When the test result of Peak was more than 6dB below the limit of QP, just the Peak value was recorded.

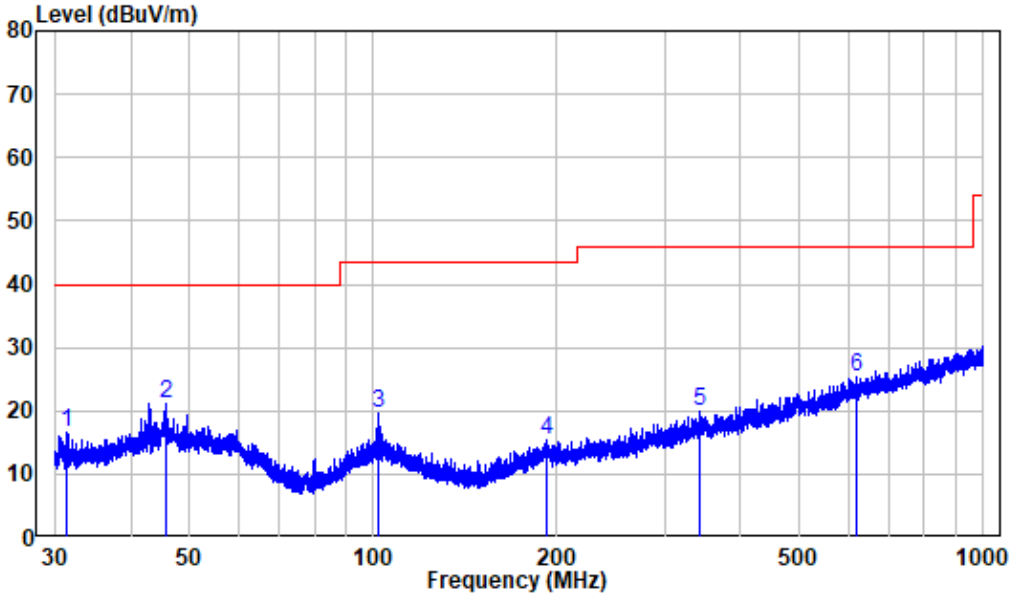
Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No. : SZNS220620-27491E-RF
Test Mode: BT

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	45.695	-9.97	28.54	18.57	40.00	-21.43	Peak
2	58.896	-10.23	27.69	17.46	40.00	-22.54	Peak
3	98.142	-12.21	27.41	15.20	43.50	-28.30	Peak
4	186.196	-12.03	27.24	15.21	43.50	-28.29	Peak
5	344.839	-7.23	26.88	19.65	46.00	-26.35	Peak
6	692.897	-1.52	28.18	26.66	46.00	-19.34	Peak

Vertical



Site : chamber
Condition: 3m VERTICAL
Job No. : SZNS220620-27491E-RF
Test Mode: BT

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	31.399	-12.24	28.99	16.75	40.00	-23.25	Peak
2	45.735	-9.98	31.16	21.18	40.00	-18.82	Peak
3	101.912	-11.58	31.34	19.76	43.50	-23.74	Peak
4	192.166	-11.26	26.54	15.28	43.50	-28.22	Peak
5	343.782	-7.27	27.11	19.84	46.00	-26.16	Peak
6	619.351	-2.52	27.95	25.43	46.00	-20.57	Peak

Above 1GHz: (worst case for 8DPSK)

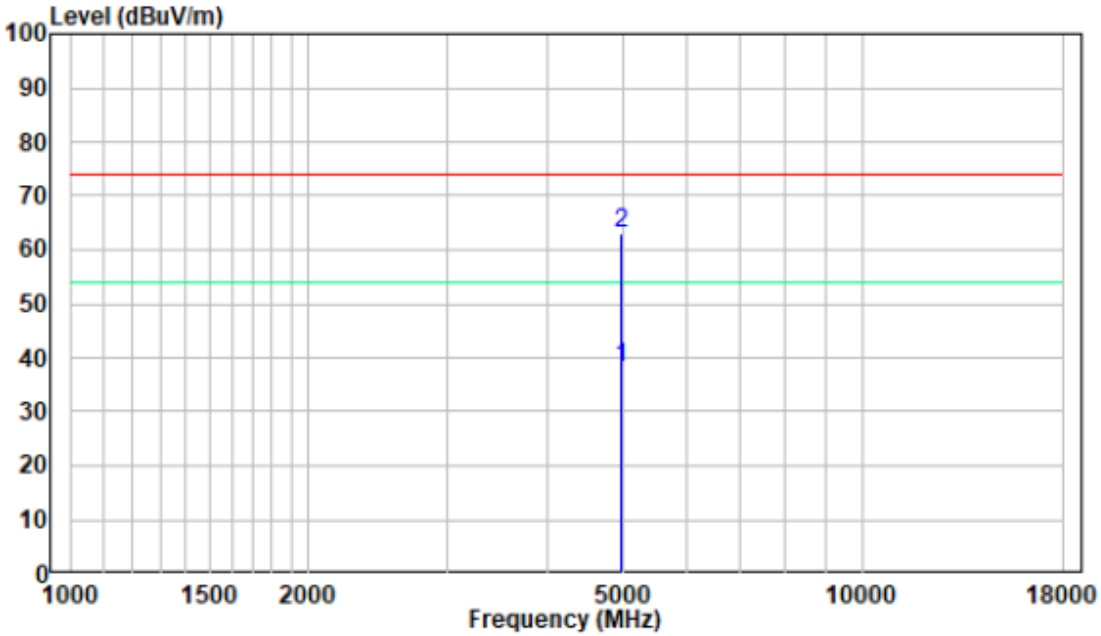
Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Absolute Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
	Reading (dBuV)	PK/AV		Height (m)	Polar (H/V)				
Low Channel									
2310	67.77	PK	57	1.3	H	-7.24	60.53	74	-13.47
2310	42.99	AV	57	1.3	H	-7.24	35.75	54	-18.25
2310	67.47	PK	226	1.9	V	-7.24	60.23	74	-13.77
2310	42.69	AV	226	1.9	V	-7.24	35.45	54	-18.55
2390	69.11	PK	345	2.3	H	-7.22	61.89	74	-12.11
2390	44.33	AV	345	2.3	H	-7.22	37.11	54	-16.89
2390	68.08	PK	216	2.3	V	-7.22	60.86	74	-13.14
2390	43.30	AV	216	2.3	V	-7.22	36.08	54	-17.92
4804	69.44	PK	320	2.4	H	-3.74	65.70	74	-8.30
4804	44.66	AV	320	2.4	H	-3.74	40.92	54	-13.08
4804	65.85	PK	199	2.2	V	-3.74	62.11	74	-11.89
4804	41.07	AV	199	2.2	V	-3.74	37.33	54	-16.67
Middle Channel									
4882	70.65	PK	0	1.1	H	-3.37	67.28	74	-6.72
4882	45.87	AV	0	1.1	H	-3.37	42.50	54	-11.50
4882	66.02	PK	142	1.7	V	-3.37	62.65	74	-11.35
4882	41.24	AV	142	1.7	V	-3.37	37.87	54	-16.13
High Channel									
2483.5	70.04	PK	227	1	H	-7.20	62.84	74	-11.16
2483.5	45.26	AV	227	1	H	-7.20	38.06	54	-15.94
2483.5	68.77	PK	161	1.8	V	-7.20	61.57	74	-12.43
2483.5	43.99	AV	161	1.8	V	-7.20	36.79	54	-17.21
2500	68.71	PK	255	2.1	H	-7.18	61.53	74	-12.47
2500	43.93	AV	255	2.1	H	-7.18	36.75	54	-17.25
2500	68.93	PK	127	1.4	V	-7.18	61.75	74	-12.25
2500	44.15	AV	127	1.4	V	-7.18	36.97	54	-17.03
4960	70.43	PK	224	1.7	H	-2.99	67.44	74	-6.56
4960	45.65	AV	224	1.7	H	-2.99	42.66	54	-11.34
4960	66.01	PK	176	1.7	V	-2.99	63.02	74	-10.98
4960	41.23	AV	176	1.7	V	-2.99	38.24	54	-15.76

Note:
Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor
Corrected Amplitude = Corrected Factor + Reading
Margin = Corrected. Amplitude - Limit
The other spurious emission which is 20dB to the limit or in noise floor level was not recorded.

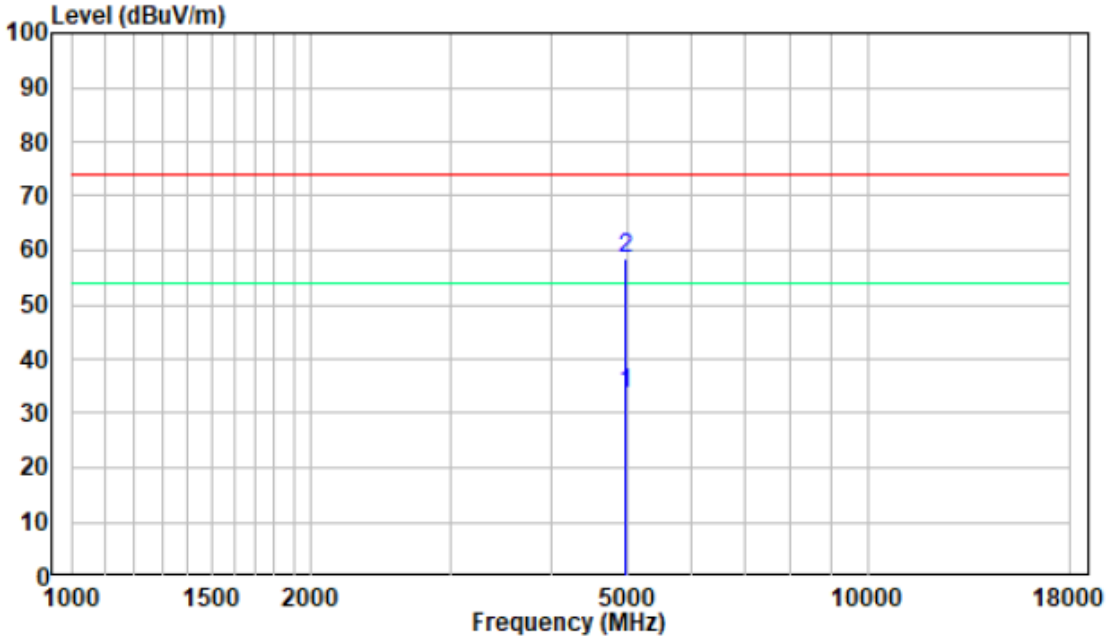
1 GHz - 18 GHz: (Pre-Scan plots)

High channel

Horizontal



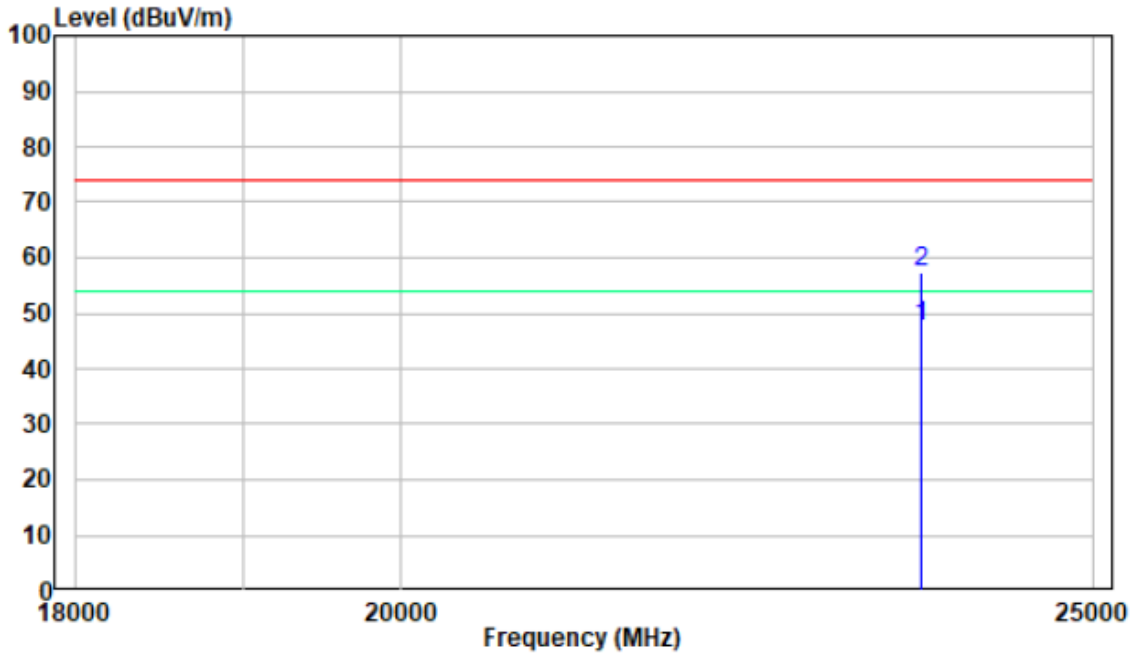
Vertical



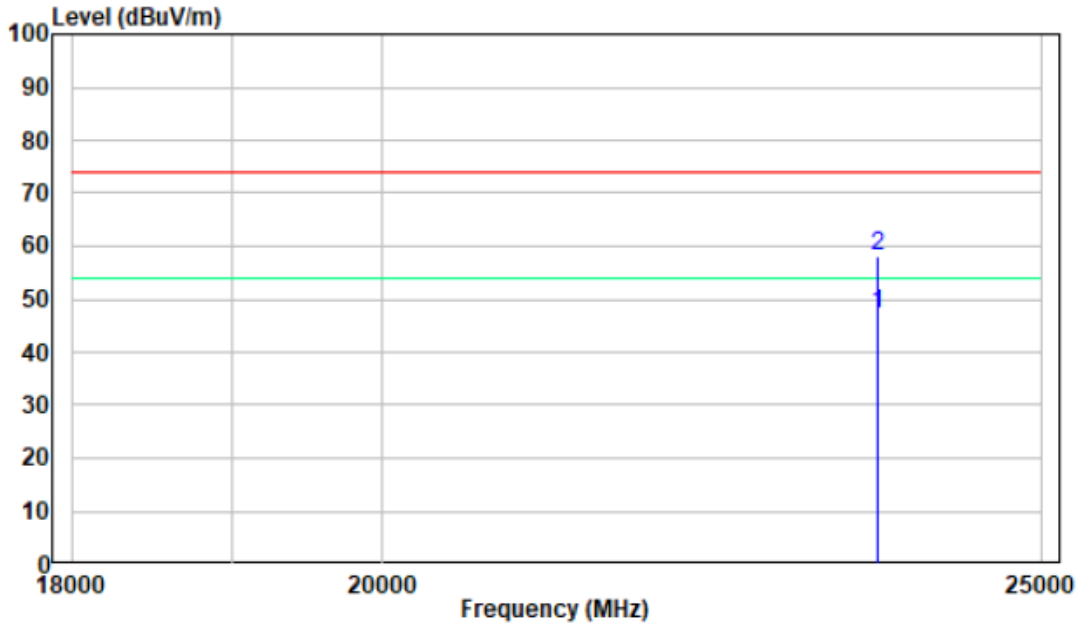
18-25GHz: (Pre-Scan plots)

High channel

Horizontal



Vertical



FCC §15.247(a) (1) & RSS-247 § 5.1 (b) -CHANNEL SEPARATION TEST

Applicable Standard

According to FCC §15.247(a) (1):

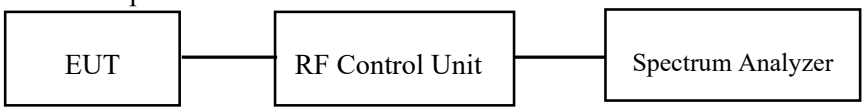
Frequency hopping systems shall have hoping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

According to RSS-247 § 5.1 (b):

Frequency hopping systems (FHSs) shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the -20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, FHSs operating in the band 2400-2483.5 MHz may have hopping channel carrier frequencies that are separated by 25 kHz or two thirds of the -20 dB bandwidth of the hopping channel, whichever is greater, provided that the systems operate with an output power no greater than 0.125 W. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

Test Procedure

1. Set the EUT in transmitting mode, max hold the channel.
2. Set the adjacent channel of the EUT and max hold another trace.
3. Measure the channel separation.



Test Data

Environmental Conditions

Temperature:	26.8 ℃
Relative Humidity:	51 %
ATM Pressure:	101.0 kPa

The testing was performed by Cat Kang on 2022-07-16.

EUT operation mode: Transmitting

Test Result: Compliant. Please refer to the Appendix.

FCC §15.247(a) (1) & RSS-247 § 5.1 (a), RSS-GEN § 6.7 – 20 dB EMISSION BANDWIDTH & 99% OCCUPIED BANDWIDTH

Applicable Standard

According to FCC §15.247(a) (1):

Alternatively, frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

According to RSS-247 § 5.1 (a), RSS-GEN § 6.7:

The occupied bandwidth or the "99% emission bandwidth" is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained. The occupied bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs.

In some cases, the "20 dB bandwidth" is required, which is defined as the frequency range between two points, one at the lowest frequency below and one at the highest frequency above the carrier frequency, at which the maximum power level of the transmitted emission is attenuated 20 dB below the maximum in-band power level of the modulated signal, where the two points are on the outskirts of the in-band emission.

Test Procedure

The following conditions shall be observed for measuring the occupied bandwidth and 20 dB bandwidth:

• The transmitter shall be operated at its maximum carrier power measured under normal test conditions.

• The span of the spectrum analyzer shall be set large enough to capture all products of the modulation process, including the emission skirts, around the carrier frequency, but small enough to avoid having other emissions (e.g. on adjacent channels) within the span.

• The detector of the spectrum analyzer shall be set to "Sample". However, a peak, or peak hold, may be used in place of the sampling detector since this usually produces a wider bandwidth than the actual bandwidth (worst-case measurement). Use of a peak hold (or "Max Hold") may be necessary to determine the occupied / 20 dB bandwidth if the device is not transmitting continuously.

• The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the actual occupied / 20 dB bandwidth and the video bandwidth (VBW) shall not be smaller than three times the RBW value. Video averaging is not permitted.

Note: It may be necessary to repeat the measurement a few times until the RBW and VBW are in compliance with the above requirement.
For the 99% emission bandwidth, the trace data points are recovered and directly summed in linear power level terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached, and that frequency recorded. The process is repeated for the highest frequency data points (starting at the highest frequency, at the right side of the span, and going down in frequency). This frequency is then recorded. The difference between the two recorded frequencies is the occupied bandwidth (or the 99% emission bandwidth).

Test Data

Environmental Conditions

Temperature:	26.8 ℃
Relative Humidity:	51 %
ATM Pressure:	101.0 kPa

The testing was performed by Cat Kang on 2022-07-16.

EUT operation mode: Transmitting

Test Result: Compliant. Please refer to the Appendix

FCC §15.247(a) (1) (iii) & RSS-247 § 5.1 (d) - QUANTITY OF HOPPING CHANNEL TEST

Applicable Standard

According to FCC §15.247(a) (1) (iii):

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

According to RSS-247 § 5.1 (d):

Frequency hopping systems (FHSS) operating in the band 2400-2483.5 MHz shall use at least 15 hopping channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds, multiplied by the number of hopping channels employed. Transmissions on particular hopping frequencies may be avoided or suppressed provided that at least 15 hopping channels are used.

Test Procedure

1. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.

2. Set the EUT in hopping mode from first channel to last.

3. By using the max-hold function record the quantity of the channel.

Test Data

Environmental Conditions

Temperature:	26.8 ℃
Relative Humidity:	51 %
ATM Pressure:	101.0 kPa

The testing was performed by Cat Kang on 2022-07-16.

EUT operation mode: Transmitting

Test Result: Compliant. Please refer to the Appendix.

FCC §15.247(a) (1) (iii) & RSS-247 § 5.1 (d) - TIME OF OCCUPANCY (DWELL TIME)

Applicable Standard

According to FCC §15.247(a) (1) (iii):

Frequency hopping systems in the 2400-2483.5 MHz shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

According to RSS-247 § 5.1 (d):

Frequency hopping systems (FHSs) operating in the band 2400-2483.5 MHz shall use at least 15 hopping channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds, multiplied by the number of hopping channels employed. Transmissions on particular hopping frequencies may be avoided or suppressed provided that at least 15 hopping channels are used.

Test Procedure

4. The EUT was worked in channel hopping.
5. Set the RBW to: 1MHz.
6. Set the VBW ≥ 3×RBW.
7. Set the span to 0Hz.
8. Detector = peak.
9. Sweep time = auto couple.
10. Trace mode = max hold.
11. Allow trace to fully stabilize.
12. Recorded the time of single pulses

Test Data

Environmental Conditions

Temperature:	26.8 ℃
Relative Humidity:	51 %
ATM Pressure:	101.0 kPa

The testing was performed by Cat Kang on 2022-07-16.

EUT operation mode: Transmitting

Test Result: Compliant. Please refer to the Appendix.

FCC §15.247(b) (1) & RSS-247§ 5.1(b) &§ 5.4(b) - PEAK OUTPUT POWER MEASUREMENT

Applicable Standard

According to FCC §15.247(b) (1):

For frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. And for all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 watts.

According to RSS-247§ 5.1(b) &§ 5.4(b):

For frequency hopping systems (FHSs) operating in the band 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1.0 W if the hopset uses 75 or more hopping channels; the maximum peak conducted output power shall not exceed 0.125 W if the hopset uses less than 75 hopping channels. The e.i.r.p. shall not exceed 4 W (see Section 5.4(e) for exceptions).

Frequency hopping systems (FHSs) shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the -20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, FHSs operating in the band 2400-2483.5 MHz may have hopping channel carrier frequencies that are separated by 25 kHz or two thirds of the -20 dB bandwidth of the hopping channel, whichever is greater, provided that the systems operate with an output power no greater than 0.125 W.

Test Procedure

1. Place the EUT on a bench and set in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to one test equipment.
3. Add a correction factor to the display.

Test Data

Environmental Conditions

Temperature:	26.8 ℃
Relative Humidity:	51 %
ATM Pressure:	101.0 kPa

The testing was performed by Cat Kang on 2022-07-16.

EUT operation mode: Transmitting

Test Result: Compliant. Please refer to the Appendix.

FCC §15.247(d) & RSS-247 § 5.5 - BAND EDGES TESTING

Applicable Standard

According to FCC §15.247(d).

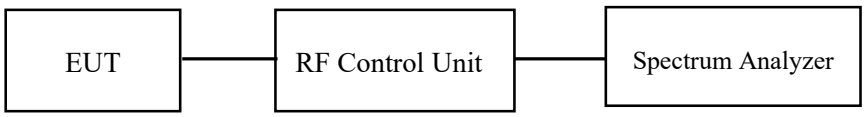
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

According to RSS-247 § 5.5.

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(e), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Remove the antenna from the EUT and then connect to a low loss RF cable from the antenna port to a EMI test receiver, then turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.



Test Data

Environmental Conditions

Temperature:	26.8 ℃
Relative Humidity:	51 %
ATM Pressure:	101.0 kPa

The testing was performed by Cat Kang on 2022-07-16.

EUT operation mode: Transmitting

Test Result: Compliant. Please refer to the Appendix.

APPENDIX

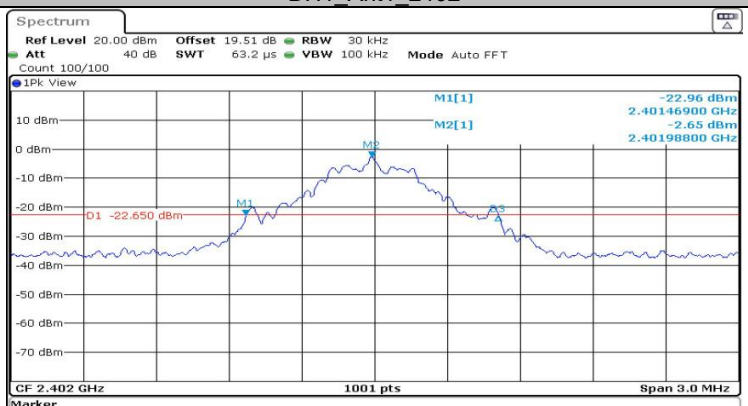
Appendix A: 20dB Emission Bandwidth

Test Result

Test Mode	Antenna	Channel	20db EBW[MHz]	Limit[MHz]	Verdict
DH1	Ant1	2402	1.04	---	---
		2441	1.04	---	---
		2480	1.04	---	---
2DH1	Ant1	2402	1.18	---	---
		2441	1.18	---	---
		2480	1.18	---	---
3DH1	Ant1	2402	1.18	---	---
		2441	1.18	---	---
		2480	1.18	---	---

Test Graphs

DH1_Ant1_2402

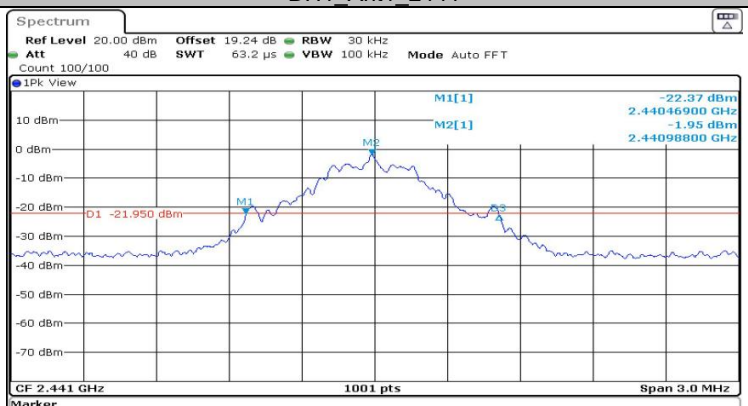


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.401469 GHz	-22.96 dBm		
M2		1	2.401988 GHz	-2.65 dBm		
D3	M1	1	1.041 MHz	0.13 dB		

Date: 16.JUL.2022 10:54:24

DH1_Ant1_2441

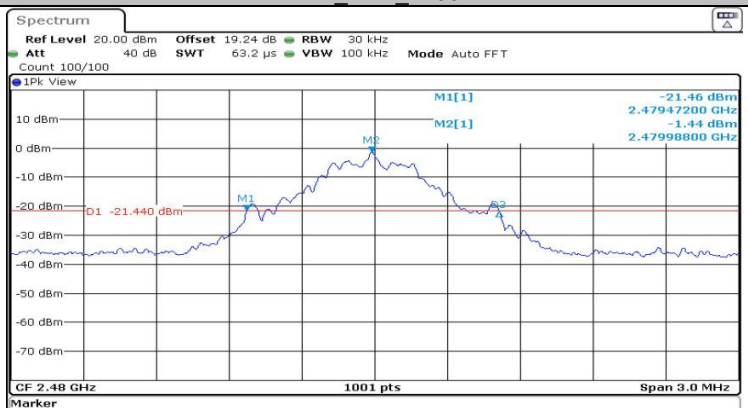


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.440469 GHz	-22.37 dBm		
M2		1	2.440988 GHz	-1.95 dBm		
D3	M1	1	1.044 MHz	-0.35 dB		

Date: 16.JUL.2022 10:55:35

DH1_Ant1_2480

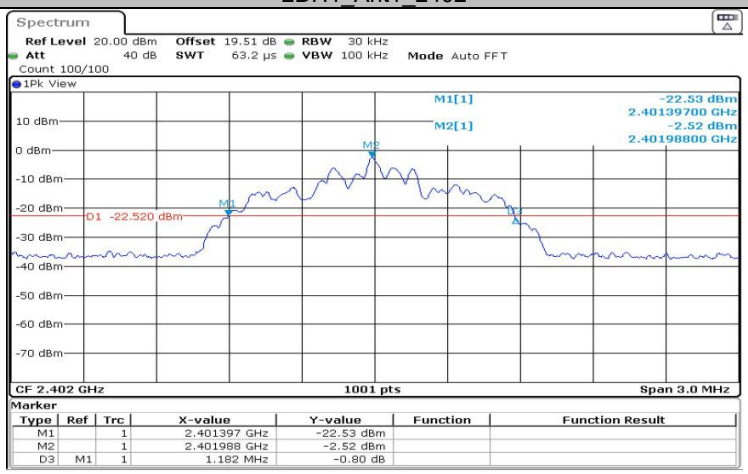


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.479472 GHz	-21.46 dBm		
M2		1	2.479988 GHz	-1.44 dBm		
D3	M1	1	1.041 MHz	-0.41 dB		

Date: 16.JUL.2022 10:56:25

2DH1_Ant1_2402

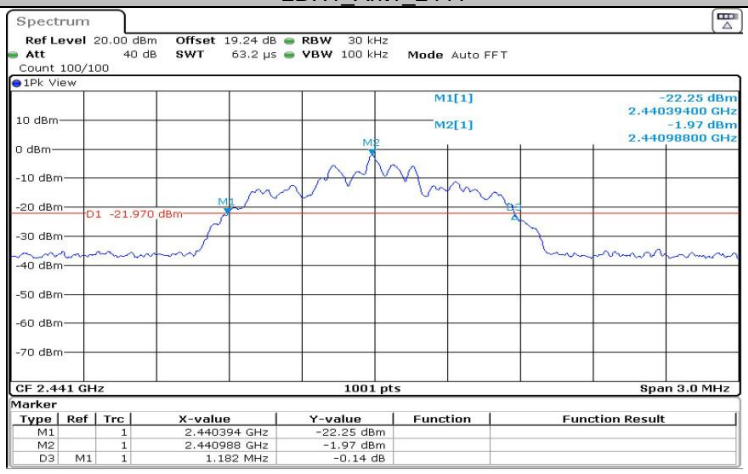


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.401397 GHz	-22.53 dBm		
M2		1	2.401988 GHz	-2.52 dBm		
D3	M1	1	1.182 MHz	-0.80 dB		

Date: 16.JUL.2022 10:57:45

2DH1_Ant1_2441

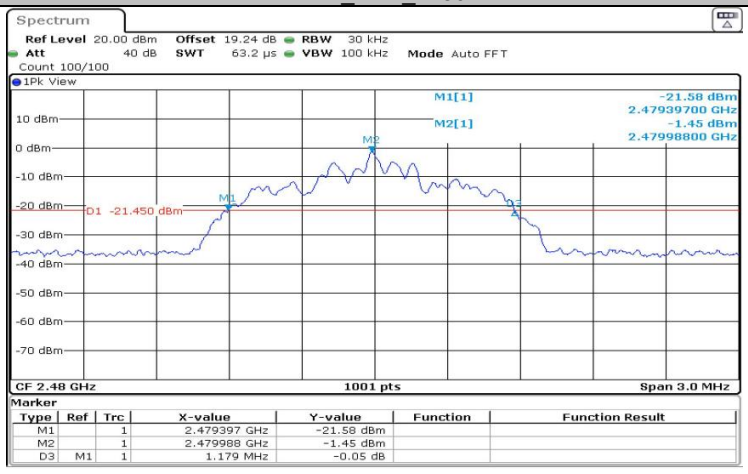


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.440394 GHz	-22.25 dBm		
M2		1	2.440988 GHz	-1.97 dBm		
D3	M1	1	1.182 MHz	-0.14 dB		

Date: 16.JUL.2022 10:58:53

2DH1_Ant1_2480

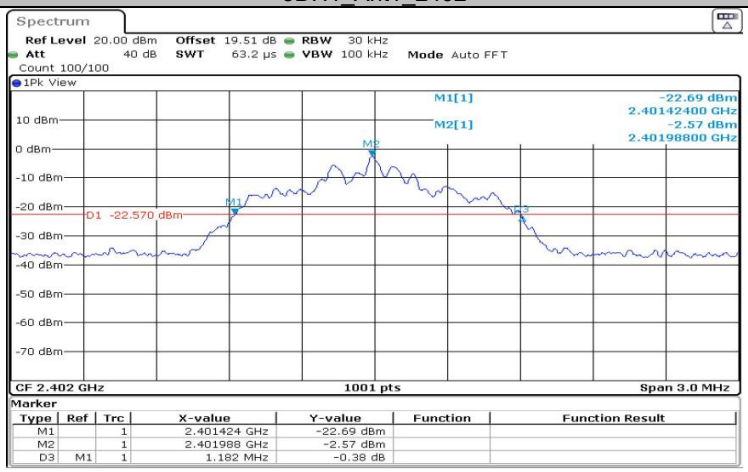


Marker

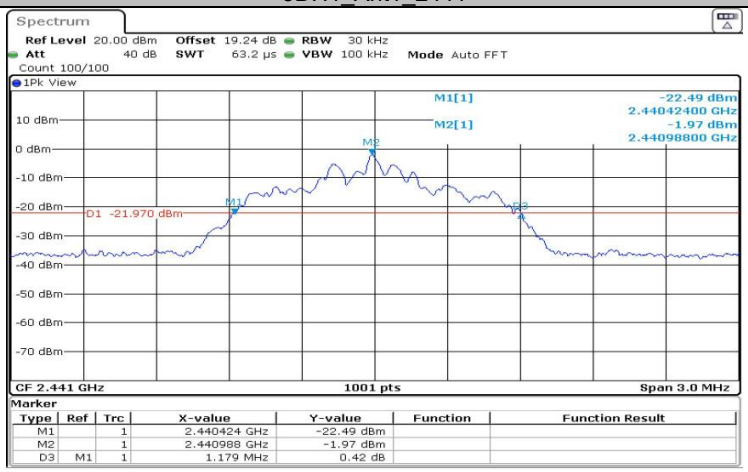
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.479397 GHz	-21.58 dBm		
M2		1	2.479988 GHz	-1.45 dBm		
D3	M1	1	1.179 MHz	-0.05 dB		

Date: 16.JUL.2022 10:59:48

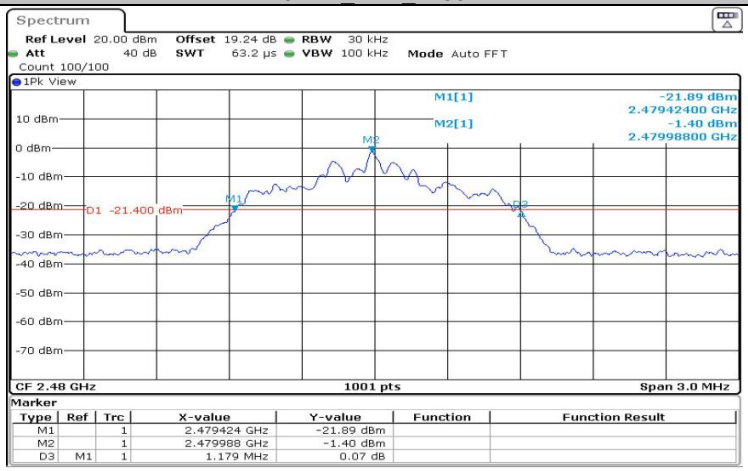
3DH1_Ant1_2402



3DH1_Ant1_2441



3DH1_Ant1_2480



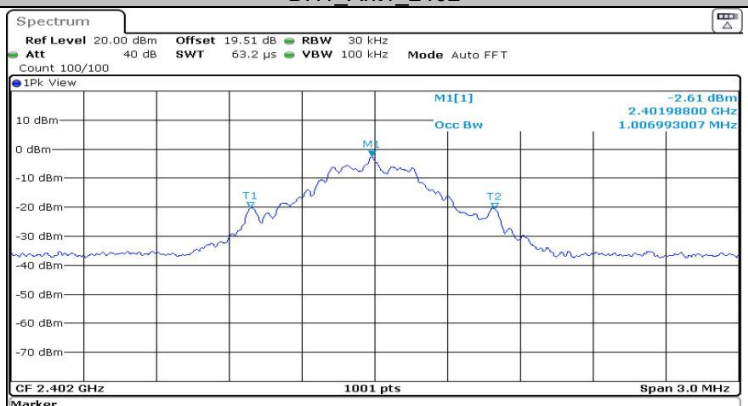
Appendix B: Occupied Channel Bandwidth

Test Result

Test Mode	Antenna	Channel	OCB [MHz]	Limit[MHz]	Verdict
DH1	Ant1	2402	1.007	---	---
		2441	1.001	---	---
		2480	0.998	---	---
2DH1	Ant1	2402	1.175	---	---
		2441	1.169	---	---
		2480	1.163	---	---
3DH1	Ant1	2402	1.166	---	---
		2441	1.157	---	---
		2480	1.154	---	---

Test Graphs

DH1_Ant1_2402

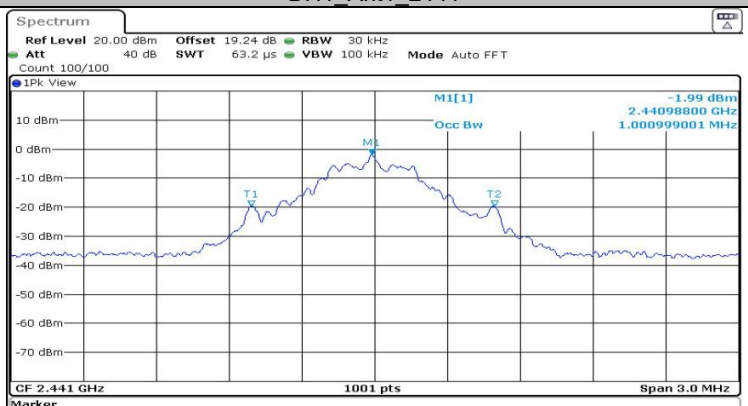


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.401988 GHz	-2.61 dBm		
T1		1	2.40148751 GHz	-20.33 dBm	Occ Bw	1.006993007 MHz
T2		1	2.40249451 GHz	-20.58 dBm		

Date: 16.JUL.2022 10:54:38

DH1_Ant1_2441

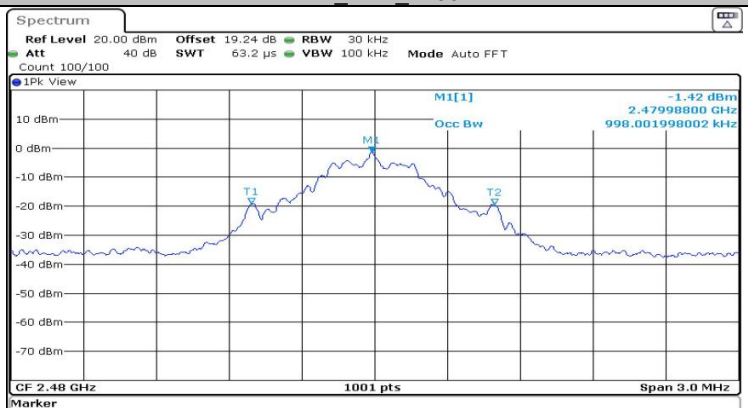


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.440988 GHz	-1.99 dBm		
T1		1	2.44049051 GHz	-19.58 dBm	Occ Bw	1.000999001 MHz
T2		1	2.44149151 GHz	-19.66 dBm		

Date: 16.JUL.2022 10:55:49

DH1_Ant1_2480

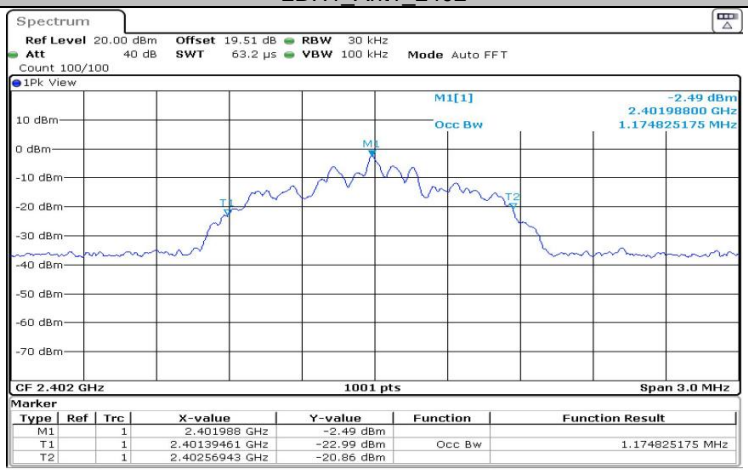


Marker

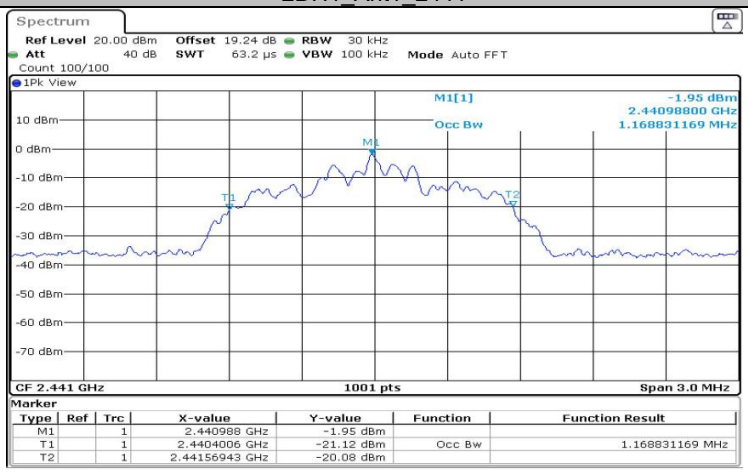
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.479988 GHz	-1.42 dBm		
T1		1	2.47949351 GHz	-19.13 dBm	Occ Bw	998.001998002 kHz
T2		1	2.48049151 GHz	-19.39 dBm		

Date: 16.JUL.2022 10:56:39

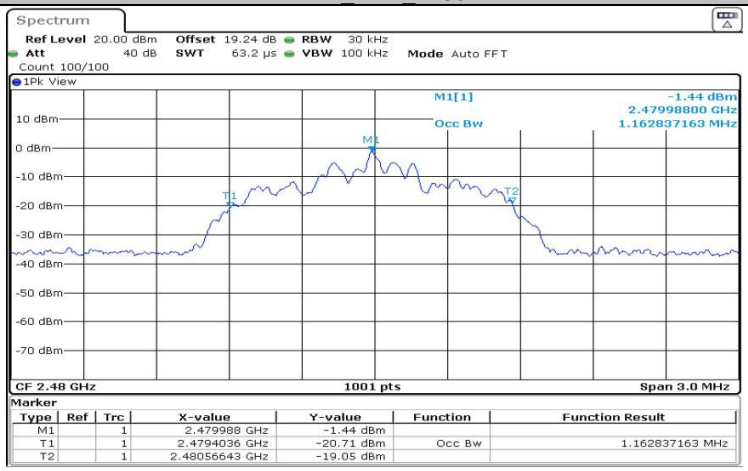
2DH1_Ant1_2402



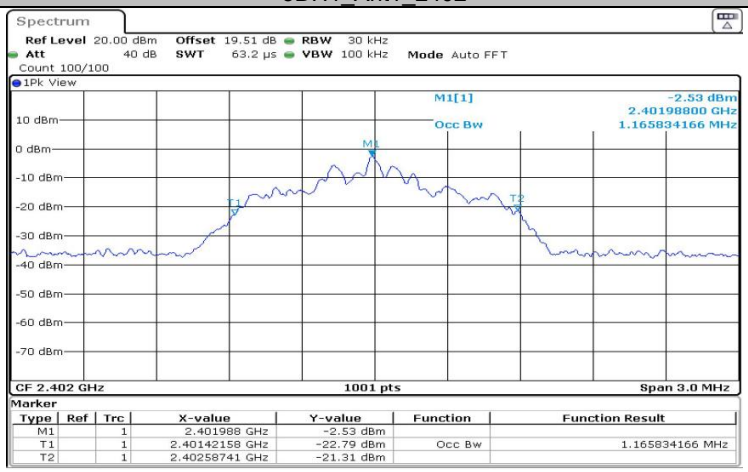
2DH1_Ant1_2441



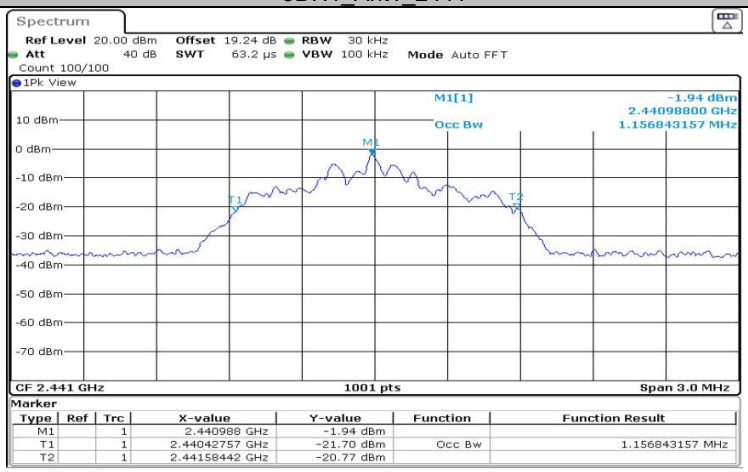
2DH1_Ant1_2480



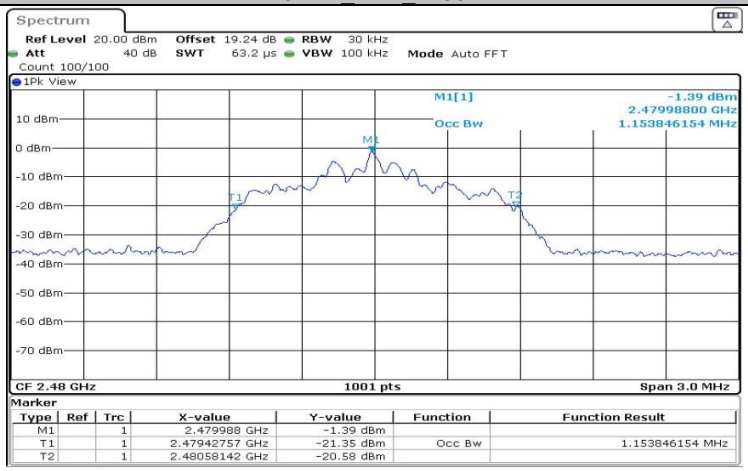
3DH1_Ant1_2402



3DH1_Ant1_2441



3DH1_Ant1_2480



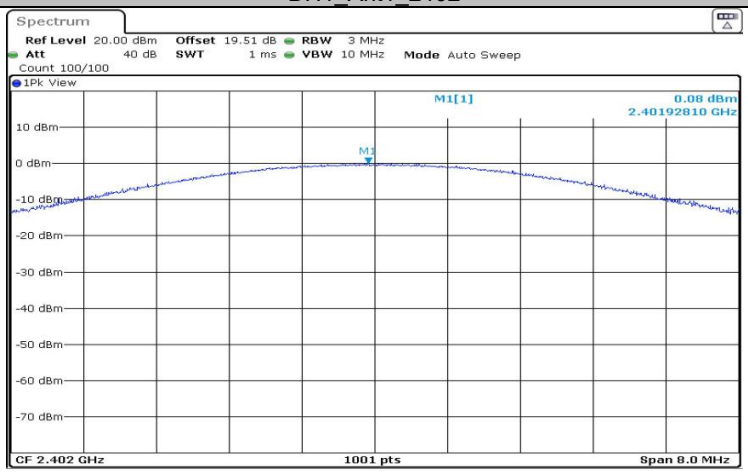
Appendix C: Maximum conducted Peak output power

Test Result

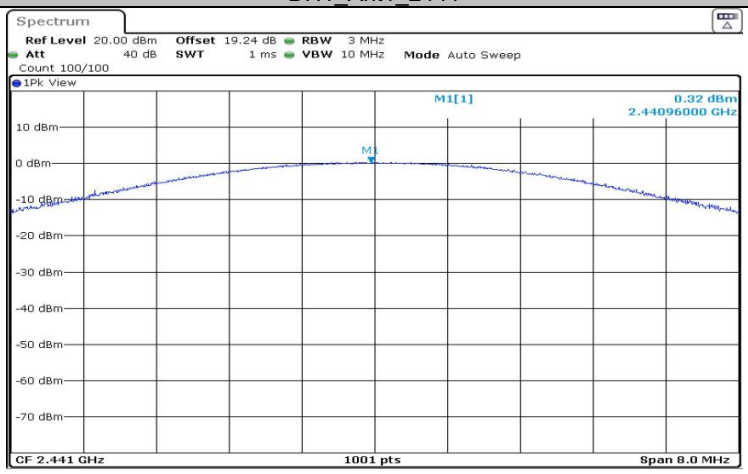
Test Mode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
DH1	Ant1	2402	0.08	≤20.97	PASS
		2441	0.32	≤20.97	PASS
		2480	0.93	≤20.97	PASS
2DH1	Ant1	2402	0.12	≤20.97	PASS
		2441	0.31	≤20.97	PASS
		2480	0.77	≤20.97	PASS
3DH1	Ant1	2402	-0.18	≤20.97	PASS
		2441	0.41	≤20.97	PASS
		2480	0.98	≤20.97	PASS
Note: the antenna gain is 1.72dBi, the maximum EIRP=2.7dBm<36dBm					

Test Graphs

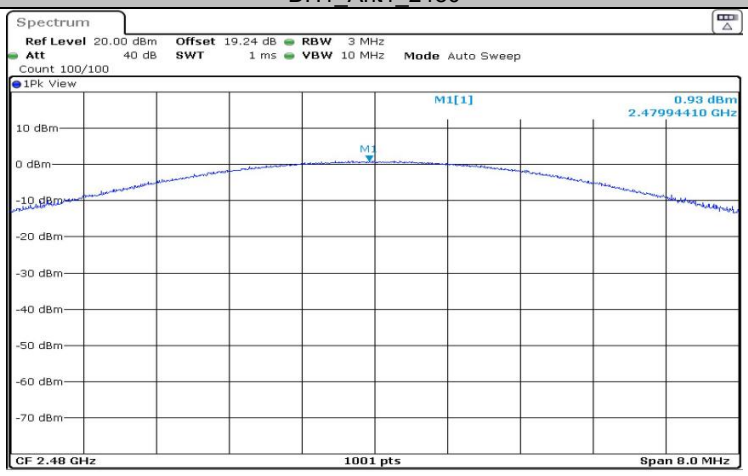
DH1_Ant1_2402



DH1_Ant1_2441

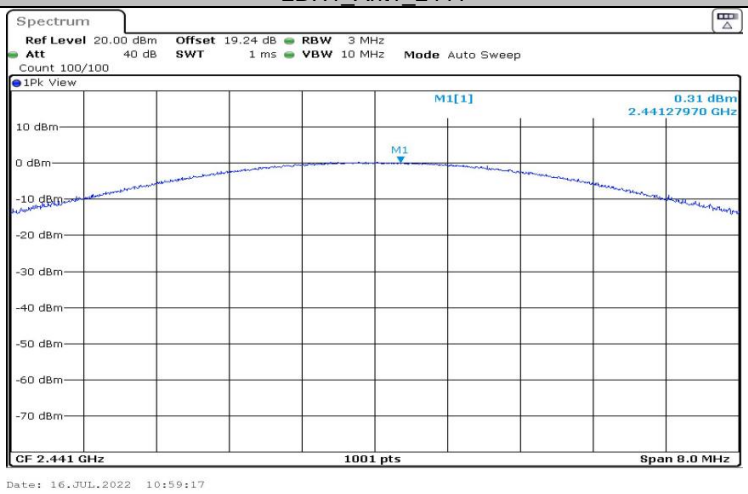


DH1_Ant1_2480

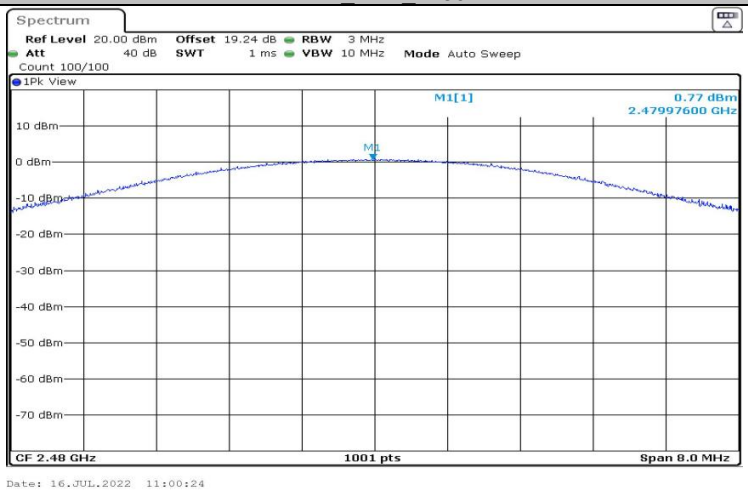


2DH1_Ant1_2402

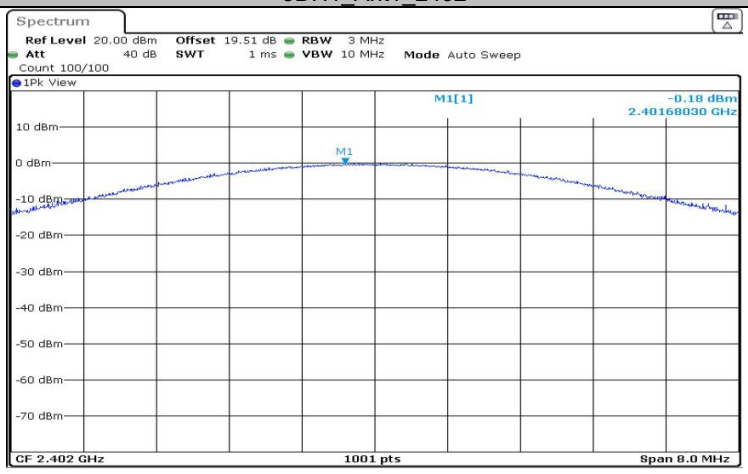
2DH1_Ant1_2441



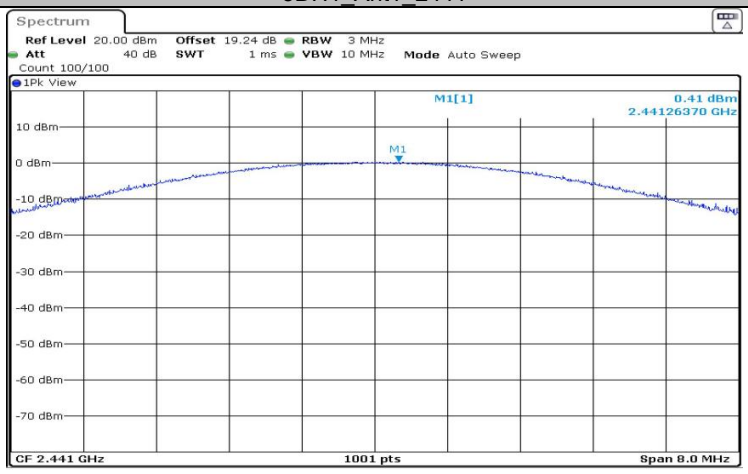
2DH1_Ant1_2480



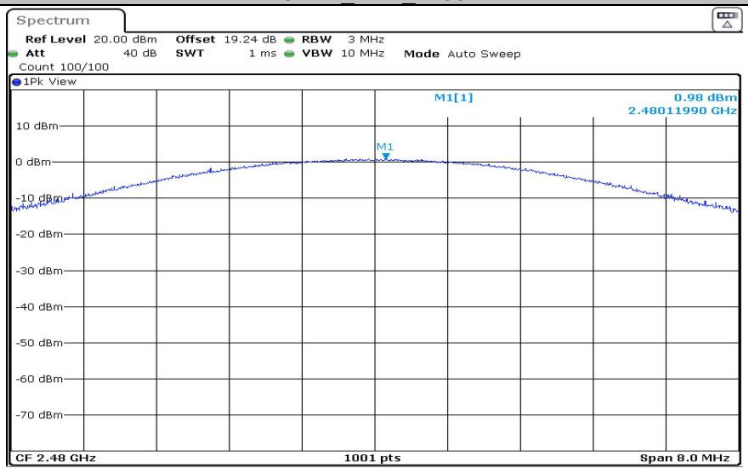
3DH1_Ant1_2402



3DH1_Ant1_2441



3DH1_Ant1_2480



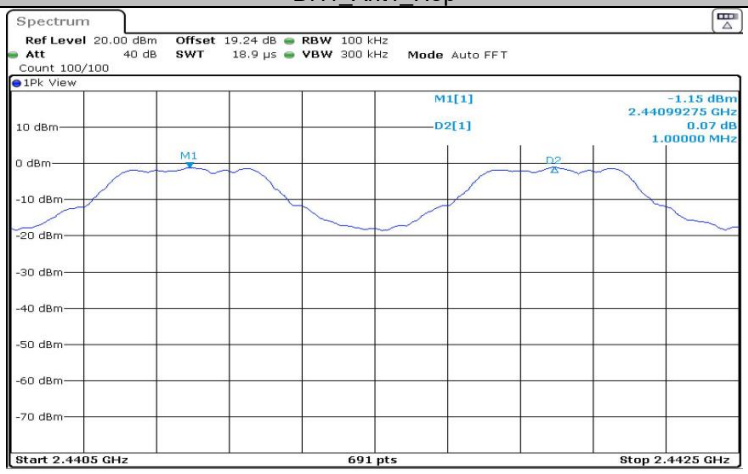
Appendix D: Carrier frequency separation

Test Result

Test Mode	Antenna	Channel	Result[MHz]	Limit[MHz]	Verdict
DH1	Ant1	Hop	1	≥0.693	PASS
2DH1	Ant1	Hop	1	≥0.787	PASS
3DH1	Ant1	Hop	1.006	≥0.787	PASS

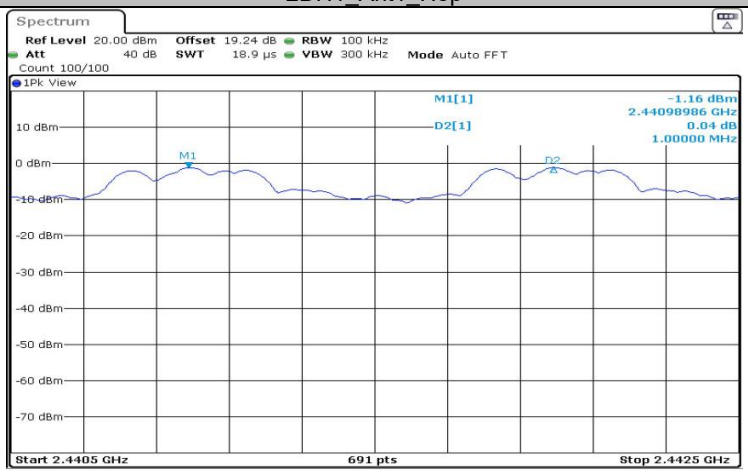
Test Graphs

DH1_Ant1_Hop



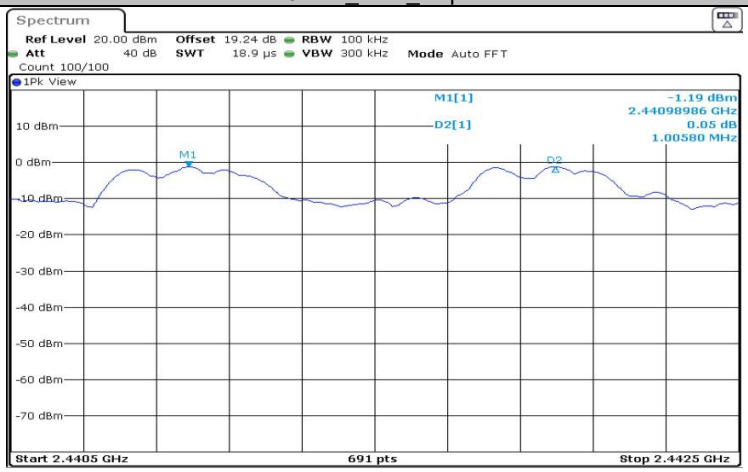
Date: 16.JUL.2022 11:07:09

2DH1_Ant1_Hop



Date: 16.JUL.2022 11:13:44

3DH1_Ant1_Hop



Date: 16.JUL.2022 11:18:25

Appendix E: Time of occupancy

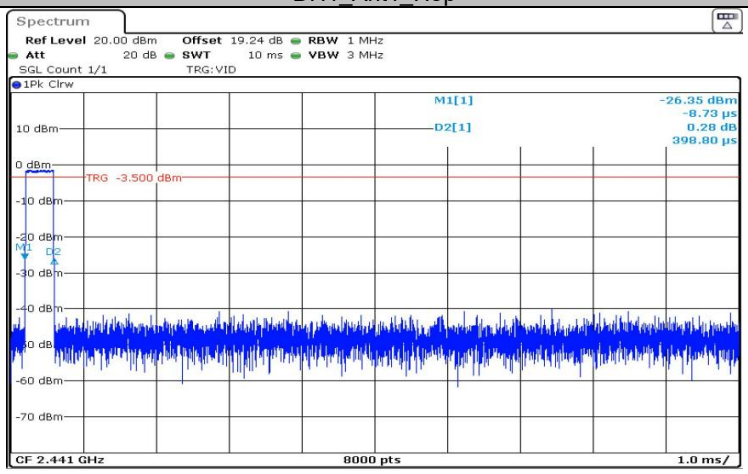
Test Result

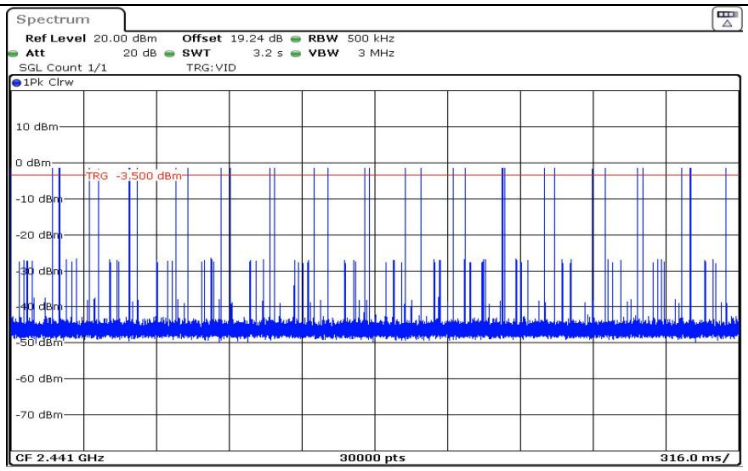
Test Mode	Antenna	Channel	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Hop	0.40	320	0.128	≤0.4	PASS
DH3	Ant1	Hop	1.64	140	0.23	≤0.4	PASS
DH5	Ant1	Hop	2.89	120	0.346	≤0.4	PASS
2DH1	Ant1	Hop	0.41	320	0.132	≤0.4	PASS
2DH3	Ant1	Hop	1.65	180	0.297	≤0.4	PASS
2DH5	Ant1	Hop	2.89	110	0.318	≤0.4	PASS
3DH1	Ant1	Hop	0.41	330	0.134	≤0.4	PASS
3DH3	Ant1	Hop	1.65	160	0.264	≤0.4	PASS
3DH5	Ant1	Hop	2.89	110	0.318	≤0.4	PASS

Note 1: A period time=0.4*79=31.6(S), Result=BurstWidth*Totalhops
Note 2: Totalhops=Hopping Number in 3.16s*10
Note 3: Hopping Number in 3.16s=Total of highest signals in 3.16s(Second high signals were other channel)

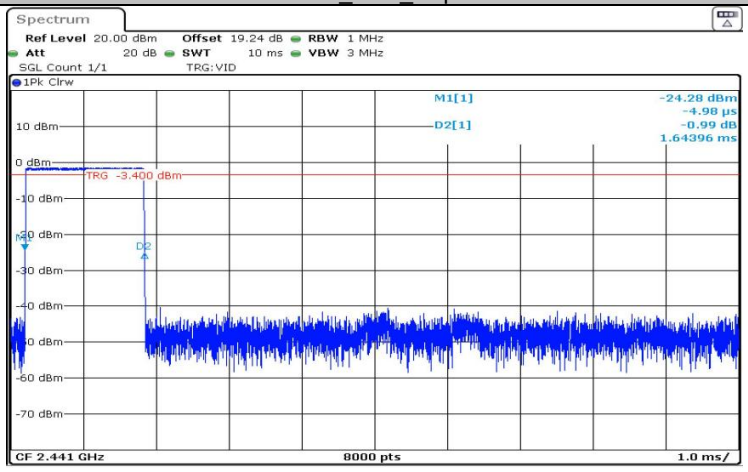
Test Graphs

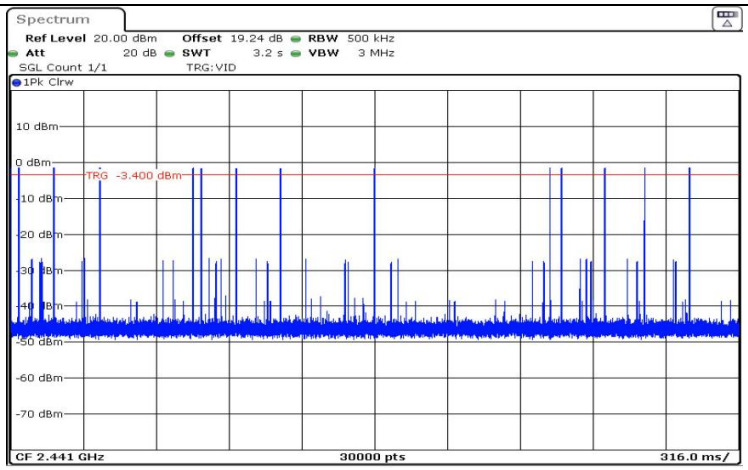
DH1_Ant1_Hop



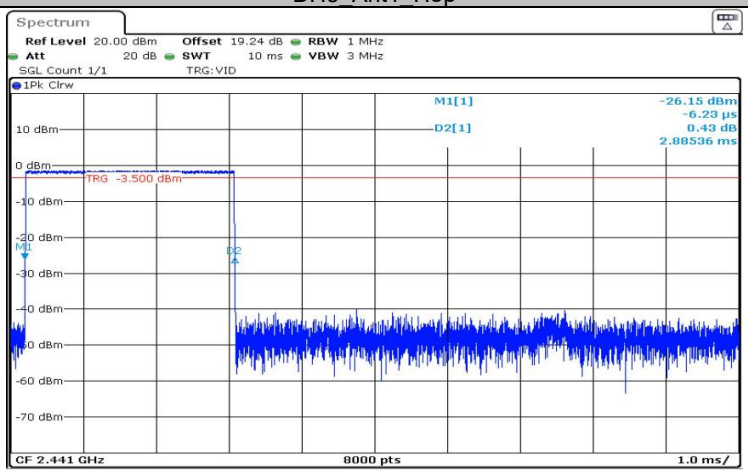


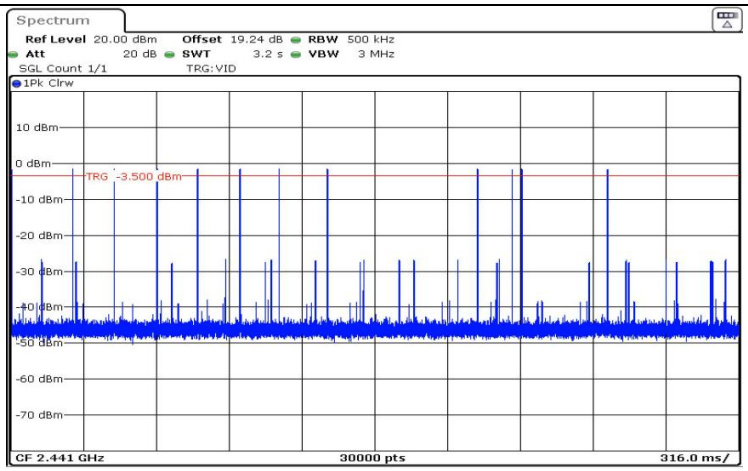
DH3_Ant1_Hop



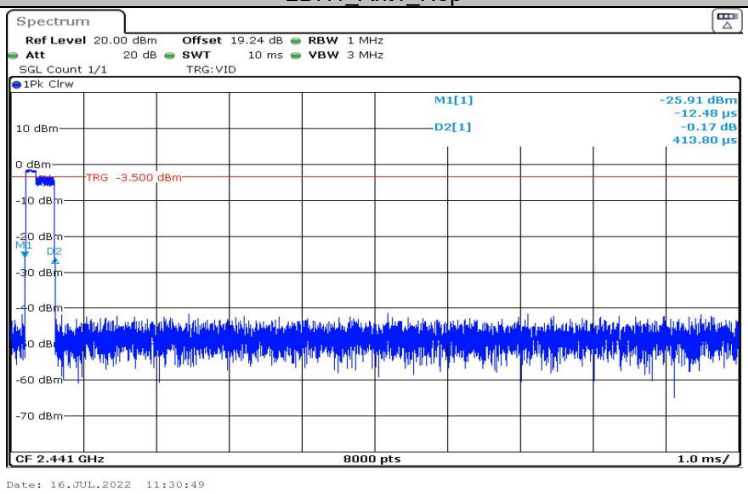

Spectrum
Ref Level 20.00 dBm Offset 19.24 dB RBW 500 kHz
Att 20 dB SWT 3.2 s VBW 3 MHz
SGL Count 1/1 TRG:VID
1Pk Clrw
10 dBm
0 dBm
TRG -3.400 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 2.441 GHz
30000 pts
316.0 ms/
Date: 16.JUL.2022 11:29:11

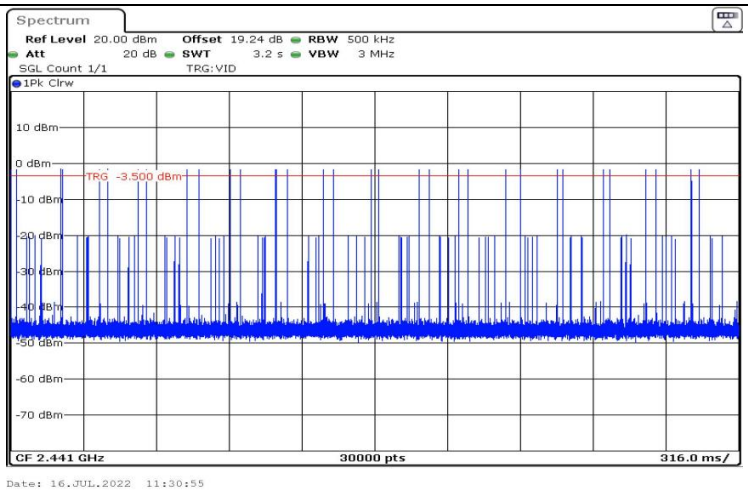
DH5_Ant1_Hop


Spectrum
Ref Level 20.00 dBm Offset 19.24 dB RBW 1 MHz
Att 20 dB SWT 10 ms VBW 3 MHz
SGL Count 1/1 TRG:VID
1Pk Clrw
M1[1] -26.15 dBm
-6.23 µs
D2[1] 0.43 dB
2.88536 ms
10 dBm
0 dBm
TRG -3.500 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
D2
CF 2.441 GHz
8000 pts
1.0 ms/
Date: 16.JUL.2022 11:29:56

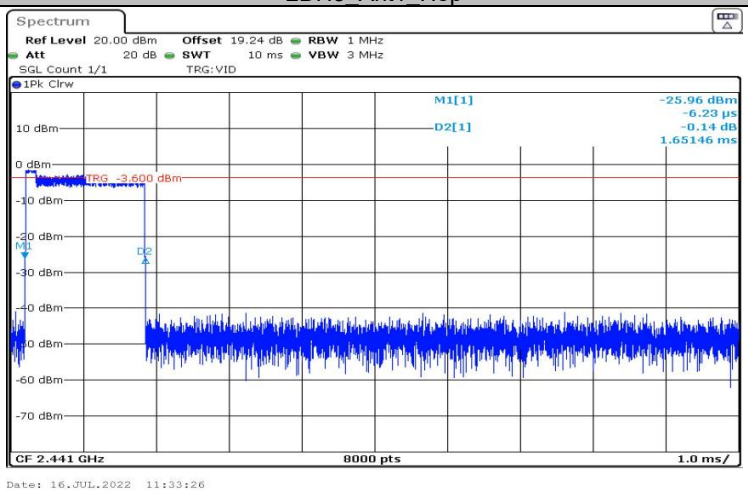

Spectrum
Ref Level 20.00 dBm Offset 19.24 dB RBW 500 kHz
Att 20 dB SWT 3.2 s VBW 3 MHz
SGL Count 1/1 TRG:VID
1Pk Clrw
10 dBm
0 dBm
TRG -3.500 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 2.441 GHz
30000 pts
316.0 ms/
Date: 16.JUL.2022 11:30:01

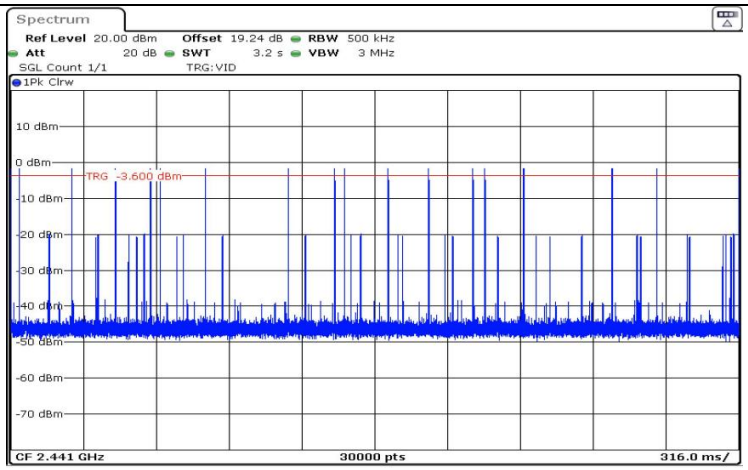
2DH1_Ant1_Hop



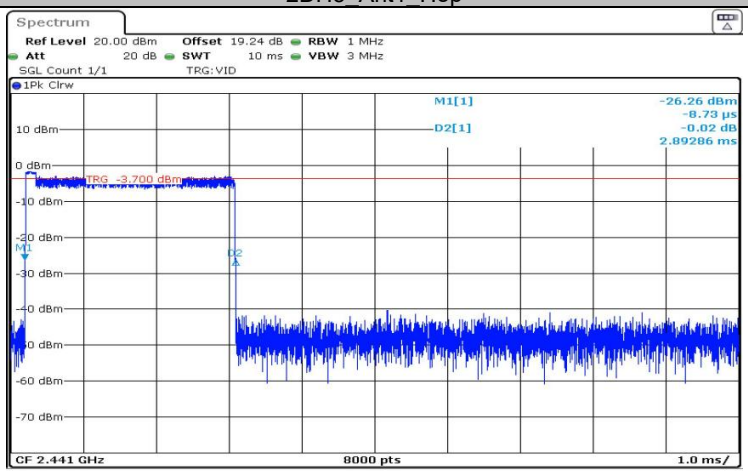


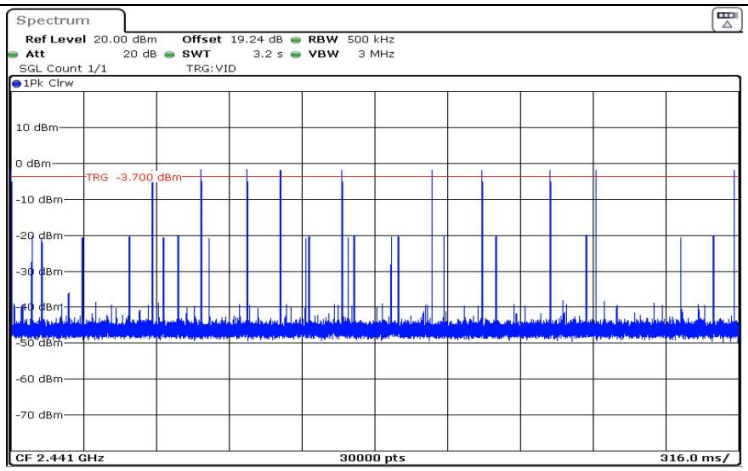
2DH3_Ant1_Hop



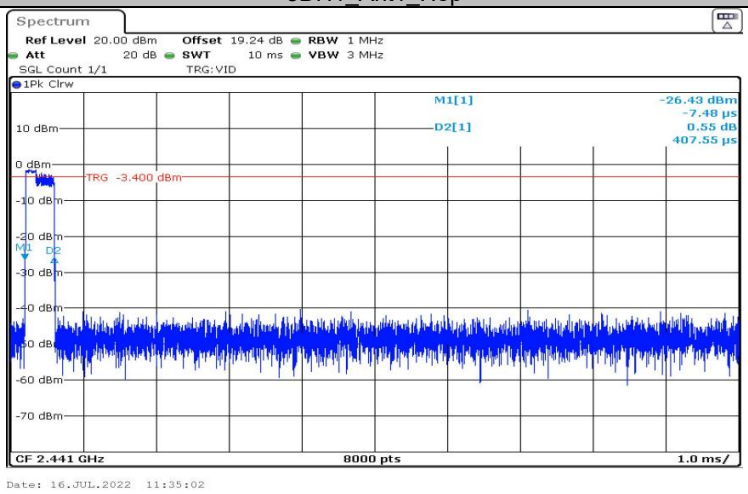


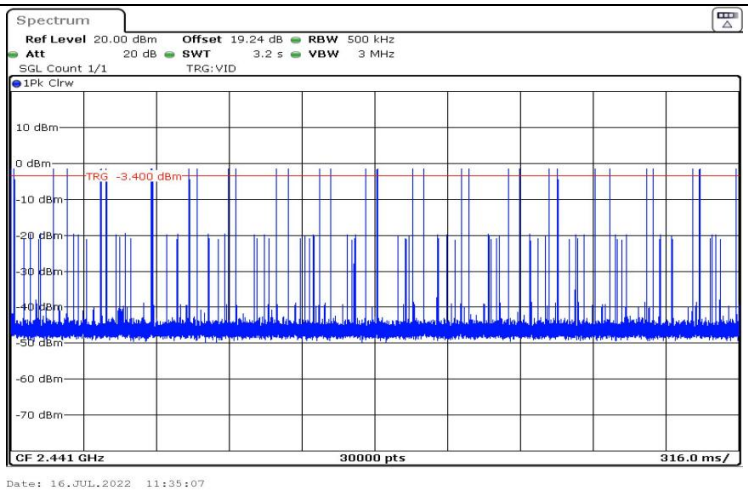
2DH5_Ant1_Hop



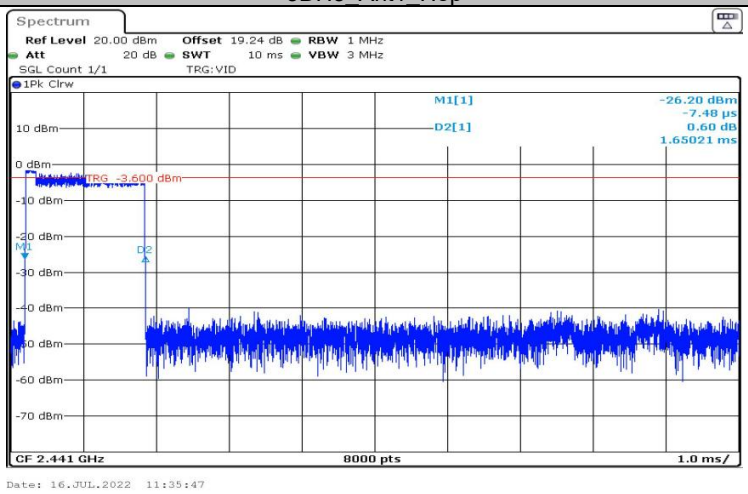


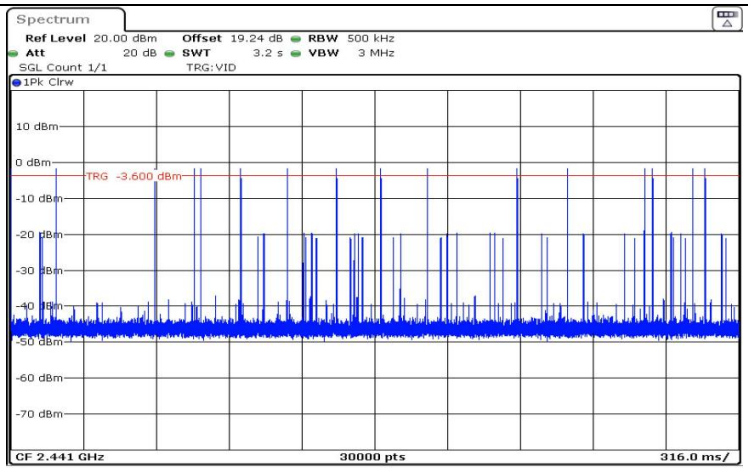
3DH1_Ant1_Hop



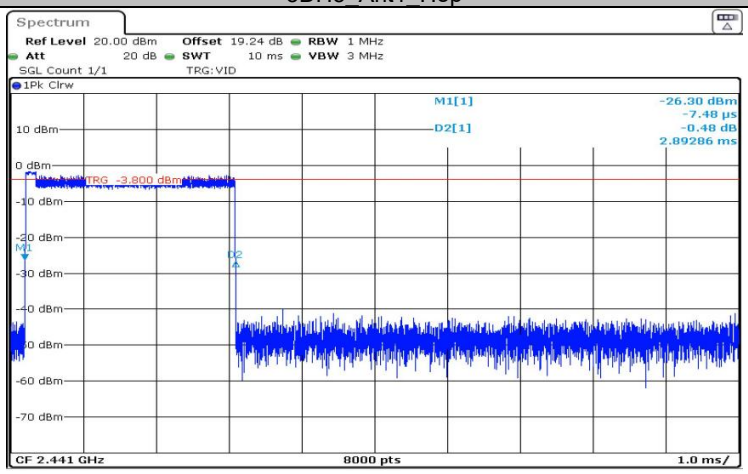


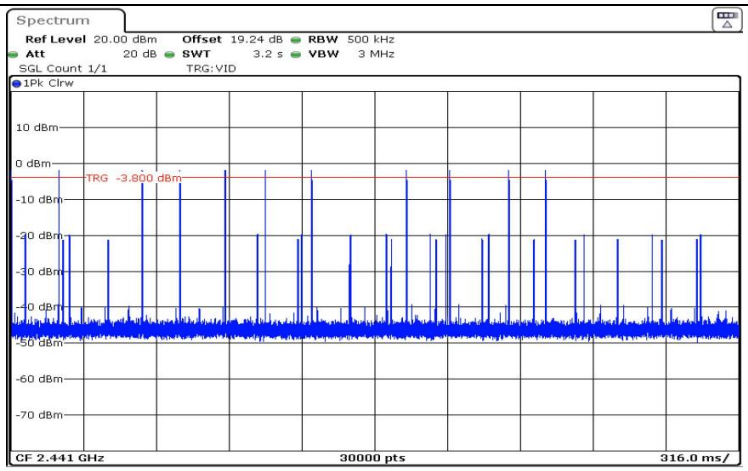
3DH3_Ant1_Hop





3DH5_Ant1_Hop





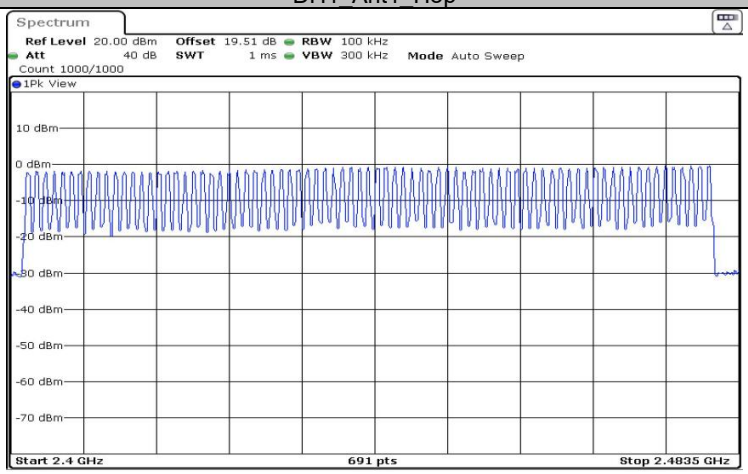
Appendix F: Number of hopping channels

Test Result

Test Mode	Antenna	Channel	Result[Num]	Limit[Num]	Verdict
DH1	Ant1	Hop	79	≥15	PASS
2DH1	Ant1	Hop	79	≥15	PASS
3DH1	Ant1	Hop	79	≥15	PASS

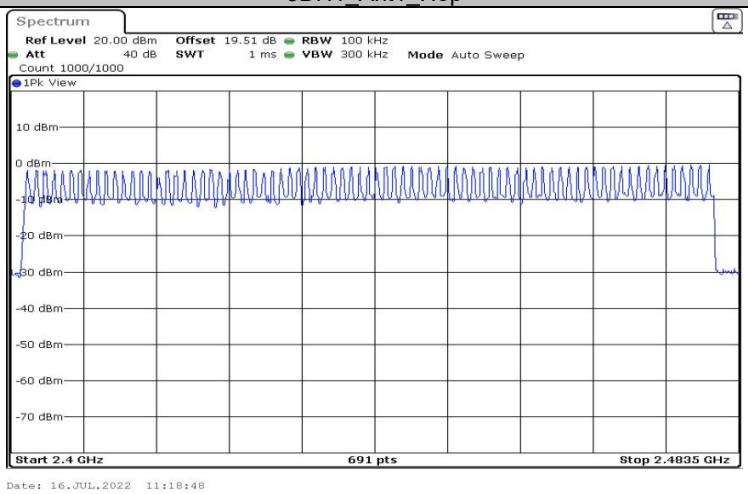
Test Graphs

DH1_Ant1_Hop



2DH1_Ant1_Hop

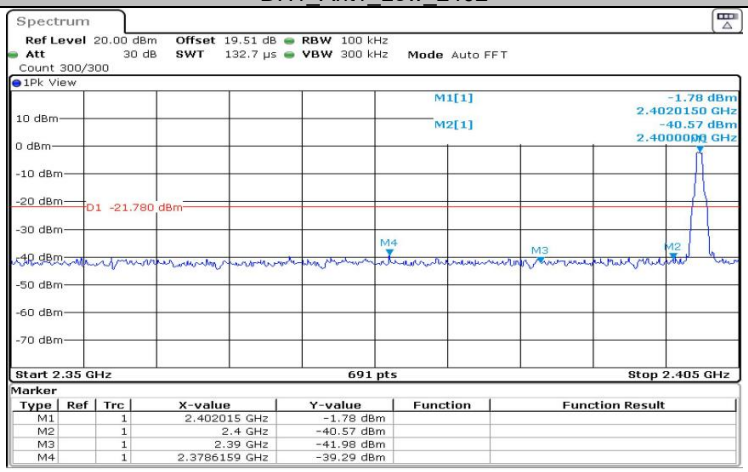
3DH1_Ant1_Hop



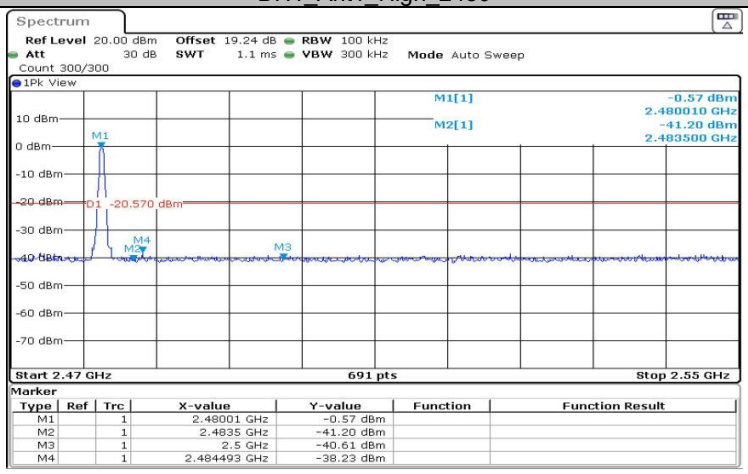
Appendix G: Band edge measurements

Test Graphs

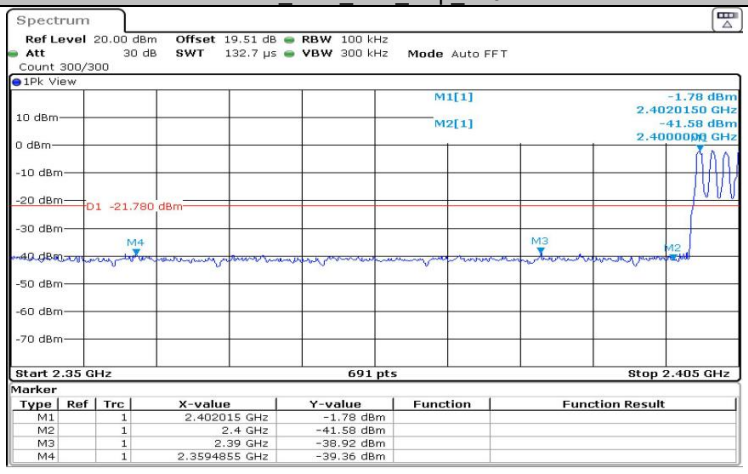
DH1_Ant1_Low_2402



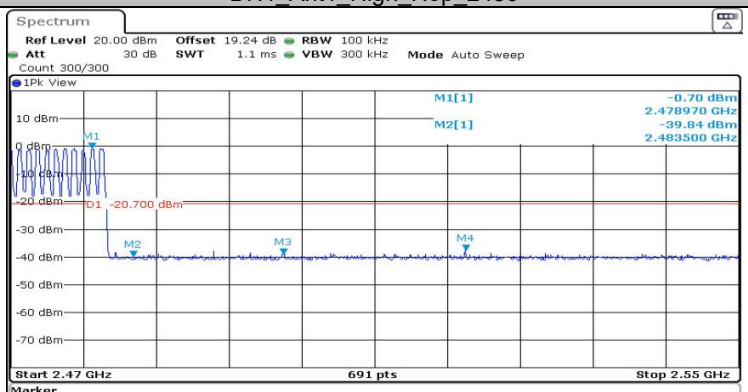
DH1_Ant1_High_2480



DH1_Ant1_Low_Hop_2402



DH1_Ant1_High_Hop_2480

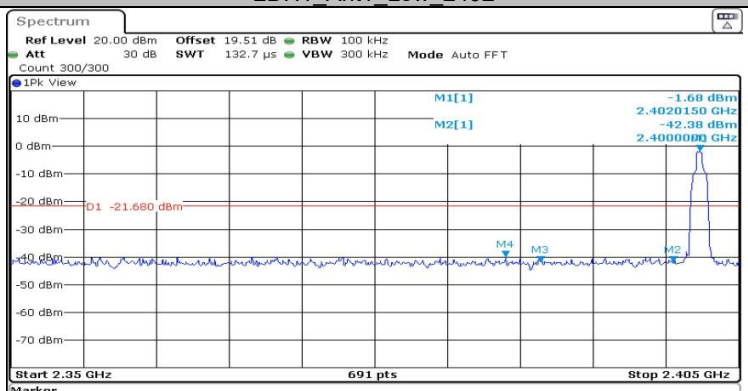


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.47897 GHz	-0.70 dBm		
M2		1	2.4835 GHz	-39.84 dBm		
M3		1	2.5 GHz	-39.11 dBm		
M4		1	2.519971 GHz	-37.73 dBm		

Date: 16.JUL.2022 11:08:23

2DH1_Ant1_Low_2402

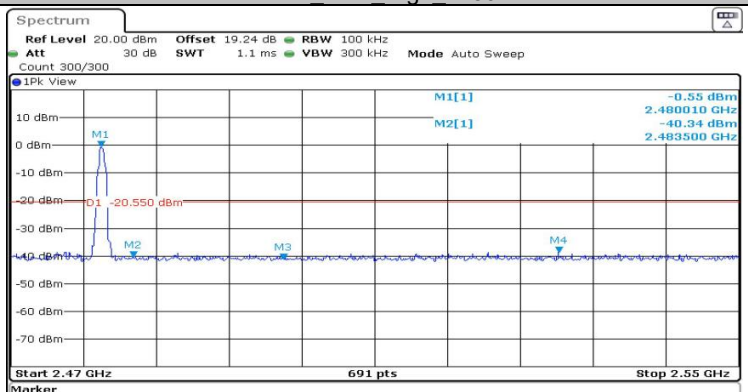


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.402015 GHz	-1.68 dBm		
M2		1	2.4 GHz	-42.38 dBm		
M3		1	2.39 GHz	-41.70 dBm		
M4		1	2.3873841 GHz	-39.84 dBm		

Date: 16.JUL.2022 10:58:12

2DH1_Ant1_High_2480

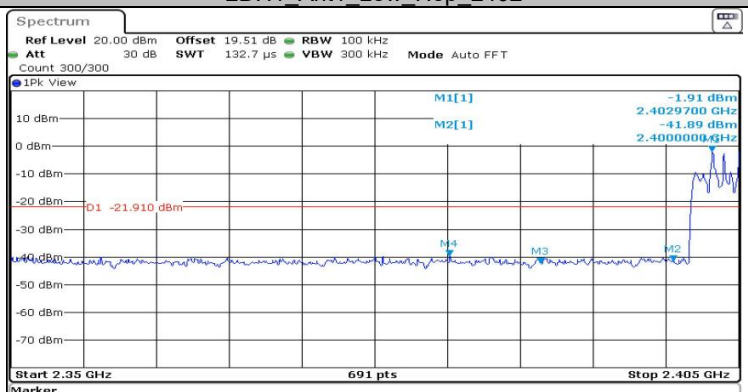


Marker

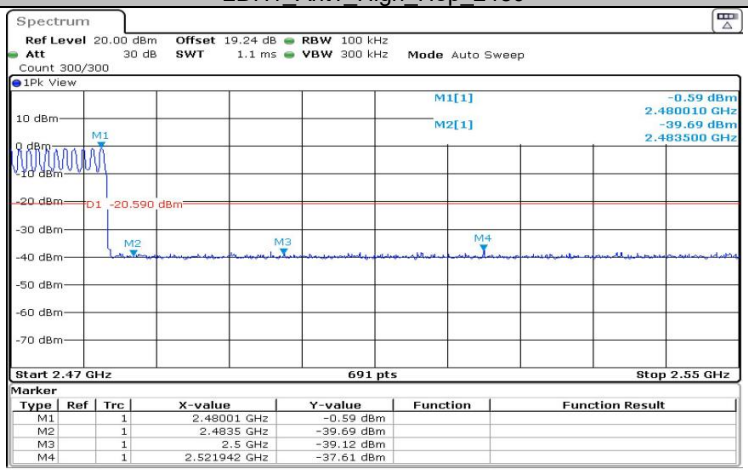
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.48001 GHz	-0.55 dBm		
M2		1	2.4835 GHz	-40.34 dBm		
M3		1	2.5 GHz	-41.31 dBm		
M4		1	2.530174 GHz	-38.70 dBm		

Date: 16.JUL.2022 11:00:14

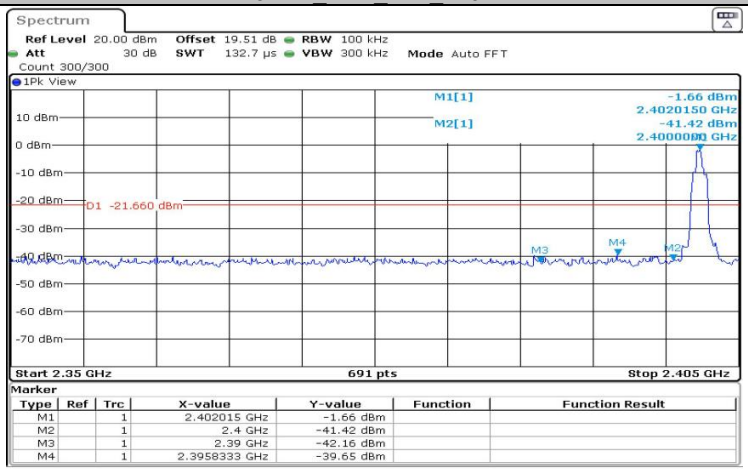
2DH1_Ant1_Low_Hop_2402



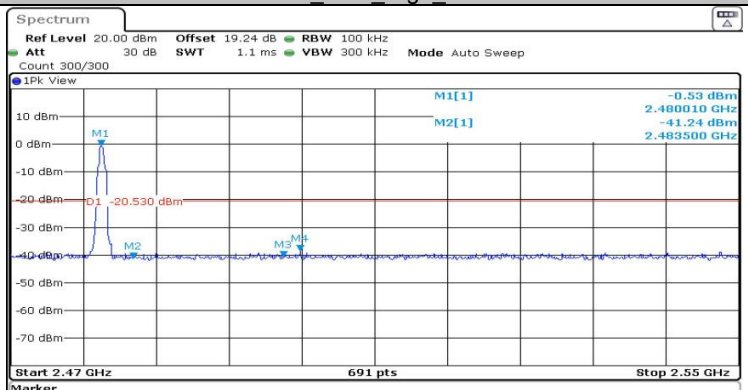
2DH1_Ant1_High_Hop_2480



3DH1_Ant1_Low_2402



3DH1_Ant1_High_2480

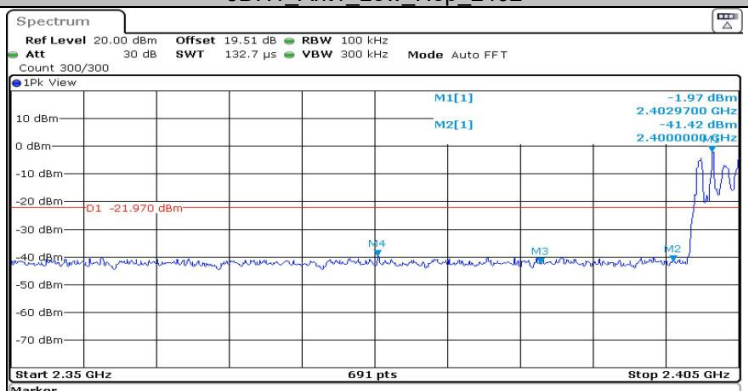


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.48001 GHz	-0.53 dBm		
M2		1	2.4835 GHz	-41.24 dBm		
M3		1	2.5 GHz	-40.63 dBm		
M4		1	2.501768 GHz	-38.42 dBm		

Date: 16.JUL.2022 11:03:32

3DH1_Ant1_Low_Hop_2402

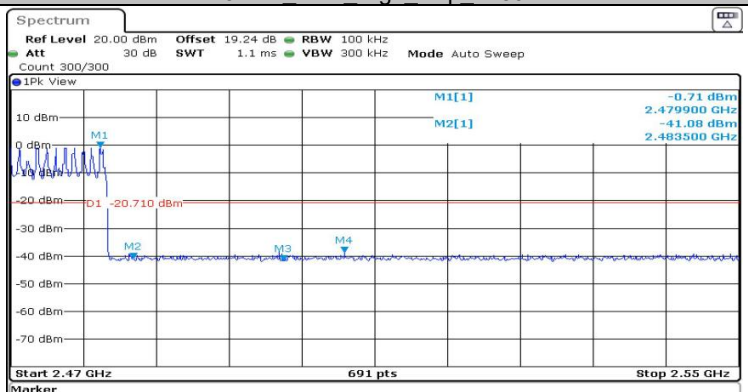


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.40297 GHz	-1.97 dBm		
M2		1	2.4 GHz	-41.42 dBm		
M3		1	2.39 GHz	-42.52 dBm		
M4		1	2.3777391 GHz	-39.52 dBm		

Date: 16.JUL.2022 11:18:09

3DH1_Ant1_High_Hop_2480



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.4799 GHz	-0.71 dBm		
M2		1	2.4835 GHz	-41.08 dBm		
M3		1	2.5 GHz	-41.71 dBm		
M4		1	2.506638 GHz	-38.85 dBm		

Date: 16.JUL.2022 11:19:24

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