

<b>Prüfbericht-Nr.:</b> <i>Test report no.:</i>	<b>CN22LJWT 001</b>	<b>Auftrags-Nr.:</b> <i>Order no.:</i>	<b>168361390</b>	<b>Seite 1 von 24</b> <i>Page 1 of 24</i>
<b>Kunden-Referenz-Nr.:</b> <i>Client reference no.:</i>	<b>N/A</b>	<b>Auftragsdatum:</b> <i>Order date:</i>	<b>2022-03-04</b>	
<b>Auftraggeber:</b> <i>Client:</i>	<b>Sichuan AI-Link Technology Co.,Ltd.</b> Anzhou Industrial Park, Mianyang, Sichuan,P.R.C			
<b>Prüfgegenstand:</b> <i>Test item:</i>	Wi-Fi Module			
<b>Bezeichnung / Typ-Nr.:</b> <i>Identification / Type no.:</i>	WF-M63B-UWP1			
<b>Auftrags-Inhalt:</b> <i>Order content:</i>	Test Report			
<b>Prüfgrundlage:</b> <i>Test specification:</i>	CFR47 FCC Part 15: Subpart C Section 15.247			
<b>Wareneingangsdatum:</b> <i>Date of sample receipt:</i>	2022-03-04	Please refer to Photo Document		
<b>Prüfmuster-Nr.:</b> <i>Test sample no:</i>	A003222723-001~004 A003224163-001~002			
<b>Prüfzeitraum:</b> <i>Testing period:</i>	2022-03-24 - 2022-04-13			
<b>Ort der Prüfung:</b> <i>Place of testing:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.			
<b>Prüflaboratorium:</b> <i>Testing laboratory:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.			
<b>Prüfergebnis*:</b> <i>Test result*:</i>	Pass			
<b>geprüft von:</b> <i>tested by:</i>	<u>X Bell Hu</u>	<b>genehmigt von:</b> <i>authorized by:</i>	<u>X Lin Lin</u>	
<b>Datum:</b> <i>Date:</i>	2022-04-25 <small>Signed by: Bell Hu</small>	<b>Ausstellungsdatum:</b> <i>Issue date:</i>	2022-04-25 <small>Signed by: Lin Lin</small>	
<b>Stellung / Position:</b>	Project Manager	<b>Stellung / Position:</b>	Reviewer	
<b>Sonstiges / Other:</b>	FCC ID: 2AOKI-WFM63BUWP1			
<b>Zustand des Prüfgegenstandes bei Anlieferung:</b> <i>Condition of the test item at delivery:</i>	Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>			
<b>* Legende:</b>	1 = sehr gut P(ass) = entspricht o.g. Prüfgrundlage(n)	2 = gut F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	3 = befriedigend N/A = nicht anwendbar	4 = ausreichend N/T = nicht getestet
<b>* Legend:</b>	1 = very good P(ass) = passed a.m. test specification(s)	2 = good F(ail) = failed a.m. test specification(s)	3 = satisfactory N/A = not applicable	4 = sufficient N/T = not tested
<b>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.</b> <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>				

v05

## Test Summary

**5.1.1 ANTENNA REQUIREMENT***RESULT: Pass***5.1.2 MAXIMUM PEAK CONDUCTED OUTPUT POWER***RESULT: Pass***5.1.3 CONDUCTED POWER SPECTRAL DENSITY***RESULT: Pass***5.1.4 6DB BANDWIDTH***RESULT: Pass***5.1.5 99% BANDWIDTH***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 SPURIOUS EMISSIONS MEASURED IN 100 KHz BANDWIDTH***RESULT: Pass***5.1.11 RADIATED SPURIOUS EMISSION***RESULT: Pass***5.1.12 AC CONDUCTED EMISSION***RESULT: Pass*

## Contents

<b>1</b>	<b>GENERAL REMARKS .....</b>	<b>4</b>
<b>1.1</b>	<b>COMPLEMENTARY MATERIALS .....</b>	<b>4</b>
<b>2</b>	<b>TEST SITES .....</b>	<b>4</b>
<b>2.1</b>	<b>TEST FACILITIES .....</b>	<b>4</b>
<b>2.2</b>	<b>LIST OF TEST AND MEASUREMENT INSTRUMENTS.....</b>	<b>5</b>
<b>2.3</b>	<b>TRACEABILITY .....</b>	<b>5</b>
<b>2.4</b>	<b>CALIBRATION .....</b>	<b>6</b>
<b>2.5</b>	<b>MEASUREMENT UNCERTAINTY.....</b>	<b>6</b>
<b>2.6</b>	<b>LOCATION OF ORIGINAL DATA.....</b>	<b>6</b>
<b>2.7</b>	<b>STATUS OF FACILITY USED FOR TESTING.....</b>	<b>6</b>
<b>3</b>	<b>GENERAL PRODUCT INFORMATION .....</b>	<b>7</b>
<b>3.1</b>	<b>PRODUCT FUNCTION AND INTENDED USE.....</b>	<b>7</b>
<b>3.2</b>	<b>RATINGS AND SYSTEM DETAILS .....</b>	<b>7</b>
<b>3.3</b>	<b>INDEPENDENT OPERATION MODES .....</b>	<b>8</b>
<b>3.4</b>	<b>NOISE GENERATING AND NOISE SUPPRESSING PARTS.....</b>	<b>8</b>
<b>3.5</b>	<b>SUBMITTED DOCUMENTS.....</b>	<b>8</b>
<b>4</b>	<b>TEST SET-UP AND OPERATION MODES .....</b>	<b>9</b>
<b>4.1</b>	<b>PRINCIPLE OF CONFIGURATION SELECTION .....</b>	<b>9</b>
<b>4.2</b>	<b>TEST OPERATION AND TEST SOFTWARE.....</b>	<b>9</b>
<b>4.3</b>	<b>SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT.....</b>	<b>9</b>
<b>4.4</b>	<b>COUNTERMEASURES TO ACHIEVE EMC COMPLIANCE.....</b>	<b>9</b>
<b>4.5</b>	<b>TEST SETUP DIAGRAM.....</b>	<b>10</b>
<b>5</b>	<b>TEST RESULTS .....</b>	<b>11</b>
<b>5.1</b>	<b>TRANSMITTER REQUIREMENT &amp; TEST SUITES .....</b>	<b>11</b>
<b>5.1.1</b>	<i>Antenna Requirement .....</i>	<i>11</i>
<b>5.1.2</b>	<i>Maximum Peak Conducted Output Power.....</i>	<i>12</i>
<b>5.1.3</b>	<i>Conducted Power Spectral Density .....</i>	<i>14</i>
<b>5.1.4</b>	<i>6dB Bandwidth .....</i>	<i>15</i>
<b>5.1.5</b>	<i>99% Bandwidth .....</i>	<i>16</i>
<b>5.1.6</b>	<i>20dB Bandwidth .....</i>	<i>17</i>
<b>5.1.7</b>	<i>Carrier Frequency Separation.....</i>	<i>18</i>
<b>5.1.8</b>	<i>Number of Hopping Frequency.....</i>	<i>19</i>
<b>5.1.9</b>	<i>Time of Occupancy .....</i>	<i>20</i>
<b>5.1.10</b>	<i>Conducted Spurious Emissions Measured in 100 kHz Bandwidth.....</i>	<i>21</i>
<b>5.1.11</b>	<i>Radiated Spurious Emission.....</i>	<i>22</i>
<b>5.1.12</b>	<i>AC Conducted Emission .....</i>	<i>23</i>
<b>6</b>	<b>PHOTOGRAPHS OF THE TEST SET-UP .....</b>	<b>24</b>
<b>7</b>	<b>LIST OF TABLES.....</b>	<b>24</b>

## 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 Test Set-up

Appendix B: Test Results of BR/EDR mode

Appendix C: Test Results of BLE mode

## 2 Test Sites

### 2.1 Test Facilities

**TÜV Rheinland (Shenzhen) Co., Ltd.**

362 Huanguan Road Middle Longhua District, Shenzhen 518110 People's Republic of China

FCC Registration No.: 694916

ISED wireless device testing laboratory: 25069

## 2.2 List of Test and Measurement Instruments

**Table 1: List of Test and Measurement Equipment**

<b>Radio Spectrum Testing (TS8997)</b>				
<b>Equipment</b>	<b>Manufacturer</b>	<b>Model</b>	<b>Serial No.</b>	<b>Cal. until</b>
Signal Analyzer	R&S	FSV 40	101441	09.08.2022
OSP	R&S	OSP 150	101017	02.12.2022
Control PC	DELL	OptiPlex 7050	FTJZ9P2	N/A
Test Software	R&S	WMS32 (V11.00.00)	N/A	N/A
Power Meter	R&S	NRP2	107105	02.12.2022
Wideband Power Sensor	R&S	NRP-Z81	105677	09.08.2022
Shielding Room 8#	Albatross	SR8	APC17151-SR8	22.06.2024
<b>Unwanted Emission Testing (TS9975)</b>				
<b>Equipment</b>	<b>Manufacturer</b>	<b>Model</b>	<b>Serial No.</b>	<b>Cal. until</b>
EMI Test Receiver	R&S	ESR 7	102021	10.08.2022
Signal Analyzer	R&S	FSV 40	101439	09.08.2022
System Controller Interface	R&S	SCI-100	S10010038	N/A
Filterbank	R&S	Wlan	100759	09.08.2022
OSP	R&S	OSP 120	102040	N/A
Pre-amplifier	R&S	SCU08F1	08320031	09.08.2022
Amplifier	R&S	SCU-18F	180070	09.08.2022
Amplifier	R&S	SCU40A	100475	09.08.2022
Trilog Broadband Antenna (30 MHz - 7 GHz)	Schwarzbeck	VULB 9162	193	08.08.2022
Double-Ridged Antenna (1 -18 GHz)	ETS-LINDGREN	3117	00218717	08.08.2022
Wideband Ridged Horn Antenna (18-40 GHz)	Steatite	QMS-00880	19067	08.08.2022
Active Loop Antenna	Schwarzbeck	FMZB 1513	302	13.09.2022
Test software	R&S	EMC32 (V10.60.10)	N/A	N/A
Control PC	Dell	OptiPlex 7050	36NV9P2	N/A
3m Semi-Anechoic Chamber	Albatross	SAC-3m	APC17151-SAC	22.06.2024

## 2.3 Traceability

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

## 2.4 Calibration

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

## 2.5 Measurement Uncertainty

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

Parameter	Uncertainty
Radio Frequency	$\pm 1 \times 10^{-7}$
RF Power (conducted)	$\pm 2.5$ dB
Radiated Emission of Transmitter, valid up to 26.5 GHz	$\pm 6$ dB
Radiated Emission of Receiver, valid up to 26.5 GHz	$\pm 6$ dB
Temperature	$\pm 1$ °C
Humidity	$\pm 5$ %
Voltage (DC)	$\pm 1$ %
Voltage (AC, <10kHz)	$\pm 2$ %

## 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) Co., Ltd. file for certification follow-up purposes.

## 2.7 Status of Facility Used for Testing

The TÜV Rheinland (Shenzhen) Co., Ltd. Test facility located at 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 EUT is a Wi-Fi Module, which supports Bluetooth, 2.4GHz Wi-Fi 802.11 b/g/n and 5GHz Wi-Fi 802.11a/b/g/n/ac wireless technology.

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

### 3.2 Ratings and System Details

**Table 2: Technical Specification of EUT**

General Information of EUT	Value
Kind of Equipment:	Wi-Fi Module
Type Designation:	WF-M63B-UWP1
FCC ID:	2AOKI-WFM63BUWP1
Operating Voltage:	DC 5V
Antenna Type:	Integral Antennas
Antenna Gain:	<b>Wi-Fi Antenna 1#:</b> Max gain 2.4dBi for 2.4GHz Wi-Fi Max gain 3.48dBi for 5GHz Wi-Fi <b>Wi-Fi Antenna 2#:</b> Max gain 3.9dBi for 2.4GHz Wi-Fi Max gain 4.44dBi for 5GHz Wi-Fi <b>BT Antenna 3#:</b> Max gain 3.0dBi for Bluetooth  As for MIMO mode for Antenna 1# and Antenna 2#, Cyclic Delay Diversity mode Employed.
<b>Technical Specification of Bluetooth</b>	
Operating Frequency:	2402 MHz to 2480 MHz
Type of Modulation:	GFSK, $\pi/4$ -DQPSK, 8DPSK
Channel Number:	BDR/EDR:79 channels; BLE:40 Channels
Channel Separation:	BDR/EDR: 1MHz; BLE: 2MHz
<b>Technical Specification of Wi-Fi 802.11 b/g/n</b>	
Operating Frequency:	2412 - 2462 MHz for 802.11b/g/n(HT20) 2422 - 2452 MHz for 802.11n(HT40)
Type of Modulation:	DSSS(DBPSK/DQPSK/CCK) OFDM(BPSK/QPSK/16QAM/64QAM)
Data Rate:	1/2/5.5/11 Mbps for 802.11b 6/9/12/18/24/36/48/54 Mbps for 802.11g MCS0 ~ MCS7 for 802.11n
Channel Number:	11 channels for 802.11b/g/n(HT20) 7 channels for 802.11n(HT40)
Channel Separation:	5 MHz
MIMO and SISO mode:	SISO for 802.11b/g, MIMO and SISO for 802.11n, no beamforming.

Technical Specification of Wi-Fi 802.11 a/n/ac	
Operating Frequency:	5180-5320MHz, 5500-5720MHz, 5745-5825MHz
Type of Modulation:	OFDM(BPSK/QPSK/16QAM/64QAM/256QAM)
Channels:	5180-5320MHz, 802.11 a/n20/n40/ac20/ac40/ac80 5500-5720MHz, 802.11 a/n20/n40/ac20/ac40/ac80 5745-5825MHz, 802.11 a/n20/n40/ac20/ac40/ac80
Channel Separation	5 MHz
MIMO and SISO mode:	SISO for 802.11a, MIMO and SISO for 802.11n/ac, no beamforming.

### 3.3 Independent Operation Modes

The basic operation modes are:

- A. On, Bluetooth transmitting mode (BR & EDR mode)
  - 1) Low Channel
  - 2) Middle Channel
  - 3) High Channel
- B. On, Bluetooth Transmitting on Hopping channel (BR & EDR mode)
- C. On, BLE transmitting mode (1M bps & 2Mbps)
  - 1) Low Channel
  - 2) Middle Channel
  - 3) High Channel

### 3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

### 3.5 Submitted Documents

- Application Form
- Block Diagram
- User Manual
- Operation Description



## 4 Test Set-up and Operation Modes

### 4.1 Principle of Configuration Selection

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

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

### 4.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5. All tests were performed according to the procedures in ANSI C63.10: 2013.

According to clause 3.1, all tests were performed on model WF-M63B-UWP1 in this report.

**Table 3: Test environments**

Environment Parameter	Selected Values During Tests		
	Temperature	Voltage	Relative Humidity
NTNV	24.6°C	DC 5.0V	Ambient

**Table 4: Test channel and frequency**

Mode	Test Channels
BR & EDR	L: 2402MHz; M: 2441MHz; H: 2480MHz
BLE	L: 2402MHz; M: 2440MHz; H: 2480MHz

### 4.3 Special Accessories and Auxiliary Equipment

**Table 5: Auxiliary Equipment Used during Test**

Description	Manufacturer	Model	S/N	Rating
Laptop	Lenovo	T480	PF-16A6N8	N/A
Test jig	Sichuan AI-Link Technology Co.,Ltd.	WF-M63B-UWP1	N/A	DC 5V

### 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)

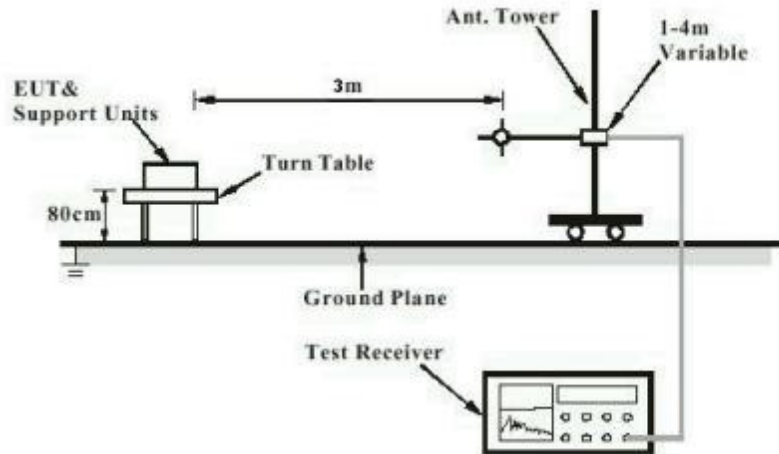


Diagram of Measurement Configuration for Radiation Test (Above 1GHz)

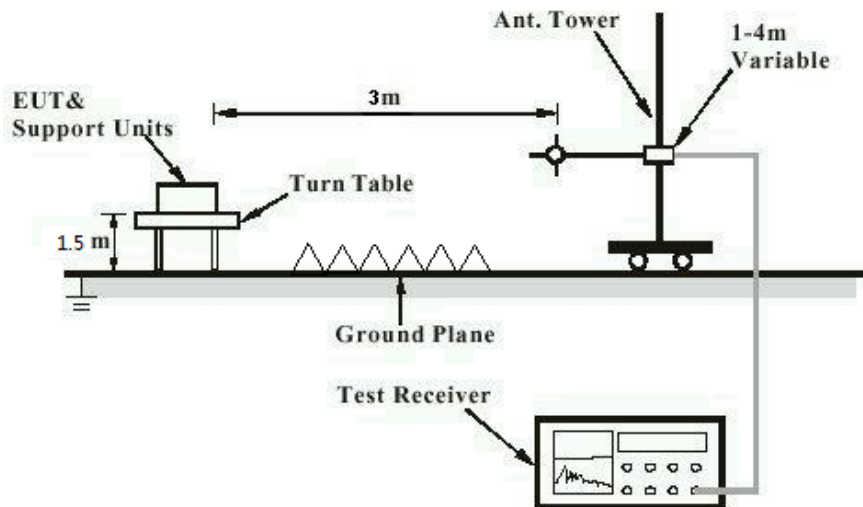
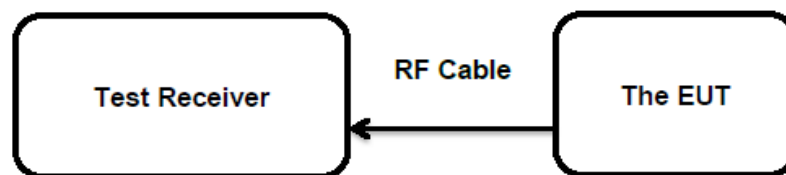


Diagram of Measurement Configuration for Conducted Transmitter Measurement



## 5 Test Results

### 5.1 Transmitter Requirement & Test Suites

#### 5.1.1 Antenna Requirement

RESULT:

Pass

**Test Specification**

Test standard : FCC Part 15.247(b)(4) and Part 15.203  
RSS-Gen Clause 6.8

According to the manufacturer declared, the EUT has an integral antennas with a unique connector, which is designed with permanent attachment and no consideration of replacement. The maximum antenna gain is 3.0 dBi.

Therefore the EUT is considered sufficient to comply with the provision.

Refer to EUT Photo for further details.

## 5.1.2 Maximum Peak Conducted Output Power

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

Test standard	: FCC Part 15.247(b)(1)&(3)
Basic standard	: ANSI C63.10: 2013
Limits	: FHSS < 0.125 Watts, DSSS < 1.0 Watts
Kind of test site	: Shielded Room

**Test Setup**

Date of testing	: 2022-04-02 and 2022-04-03
Input voltage	: DC 5.0V
Operation mode	: A, C
Test channel	: Low / Middle / High
Ambient temperature	: 24.6 °C
Relative humidity	: 55 %
Atmospheric pressure	: 101 kPa

**Table 6: Test Result of Maximum Peak Conducted Output Power**

Test Mode	Test Channel (MHz)	Measured Peak Power		Limit (W)
		(dBm)	(W)	
GFSK (BDR)	2402.0	5.11	0.0032	< 0.125
	2441.0	5.00	0.0032	
	2480.0	5.92	0.0039	
<b>Maximum Measured Value</b>		5.92	0.0039	

Test Mode	Test Channel (MHz)	Measured Peak Power		Limit (W)
		(dBm)	(W)	
8DPSK (EDR)	2402.0	7.74	0.0059	< 0.125
	2441.0	7.66	0.0058	
	2480.0	8.58	0.0072	
<b>Maximum Measured Value</b>		8.58	0.0072	

Test Mode	Test Channel (MHz)	Measured Peak Power		Limit (W)
		(dBm)	(W)	
BLE (1 Mbps)	2402	4.96	0.0031	< 1.0
	2440	5.09	0.0032	
	2480	5.86	0.0039	
<b>Max. Measured Value</b>		5.86	0.0039	

Test Mode	Test Channel (MHz)	Measured Peak Power		Limit (W)
		(dBm)	(W)	
BLE (2 Mbps)	2402	4.89	0.0031	< 1.0
	2440	4.98	0.0031	
	2480	6.18	0.0041	
<b>Max. Measured Value</b>		6.18	0.0041	

Note:

- 1) The cable loss is taken into account in results.
- 2) Antenna gain(G) of Bluetooth: 3.0 dBi  
 e.i.r.p.=P<sub>(Peak power)</sub>+ G, which is far below the 4 W

### 5.1.3 Conducted Power Spectral Density

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

Test standard	:	FCC Part 15.247(e)
Basic standard	:	ANSI C63.10: 2013
Limits	:	< 8 dBm / 3kHz
Kind of test site	:	Shielded Room

**Test Setup**

Date of testing	:	2022-04-02
Input voltage	:	DC 5.0V
Operation mode	:	C
Test channel	:	Low / Middle / High
Ambient temperature	:	24.6 °C
Relative humidity	:	55 %
Atmospheric pressure	:	101 kPa

For the measurement records, refer to the appendix C.

### 5.1.4 6dB Bandwidth

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

Test standard	:	FCC Part 15.247(a)(2)
Basic standard	:	ANSI C63.10: 2013
Limits	:	> 500 KHz
Kind of test site	:	Shielded Room

**Test Setup**

Date of testing	:	2022-04-02
Input voltage	:	DC 5.0V
Operation mode	:	C
Test channel	:	Low / Middle / High
Ambient temperature	:	24.6 °C
Relative humidity	:	55 %
Atmospheric pressure	:	101 kPa

For the measurement records, refer to the appendix C.

### 5.1.5 99% Bandwidth

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

Test standard	:	FCC Part 15.247(a) RSS-Gen Clause 6.7
Basic standard	:	ANSI C63.10: 2013
Kind of test site	:	Shielded Room

**Test Setup**

Date of testing	:	2022-04-02 and 2022-04-03
Input voltage	:	DC 5.0V
Operation mode	:	A,C
Test channel	:	Low / Middle / High
Ambient temperature	:	24.6 °C
Relative humidity	:	55 %
Atmospheric pressure	:	101 kPa

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



**Prüfbericht - Nr.:** CN22LJWT 001  
*Test Report No.:*Seite 17 von 24  
Page 17 of 24

### 5.1.6 20dB Bandwidth

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

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

**Test Setup**

Date of testing : 2022-04-03  
Input voltage : DC 5.0V  
Operation mode : A  
Test channel : Low / Middle / High  
Ambient temperature : 24.6 °C  
Relative humidity : 55 %  
Atmospheric pressure : 101 kPa

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)
Basic standard	:	ANSI C63.10: 2013
Limits	:	≥ 25kHz or 2/3 of 20dB bandwidth, whichever is greater
Kind of test site	:	Shielded Room

**Test Setup**

Date of testing	:	2022-04-03
Input voltage	:	DC 5.0V
Operation mode	:	B
Test channel	:	Low / Middle / High
Ambient temperature	:	24.6 °C
Relative humidity	:	55 %
Atmospheric pressure	:	101 kPa

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)
Basic standard	:	ANSI C63.10: 2013
Limits	:	≥ 15 non-overlapping channels
Kind of test site	:	Shielded Room

**Test Setup**

Date of testing	:	2022-04-03
Input voltage	:	DC 5.0V
Operation mode	:	B
Ambient temperature	:	24.6 °C
Relative humidity	:	55 %
Atmospheric pressure	:	101 kPa

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)  
Basic standard : ANSI C63.10: 2013  
Limits : < 0.4s  
Kind of test site : Shielded Room

**Test Setup**

Date of testing : 2022-04-03  
Input voltage : DC 5.0V  
Operation mode : B  
Test channel : Low / Middle / High  
Ambient temperature : 24.6 °C  
Relative humidity : 55 %  
Atmospheric pressure : 101 kPa

For the measurement records, refer to the appendix B.

### 5.1.10 Conducted Spurious Emissions Measured in 100 kHz Bandwidth

RESULT:

Pass

**Test Specification**

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

**Test Setup**

Date of testing	: 2022-04-02~2022-04-24
Input voltage	: DC 5.0V
Operation mode	: A,B,C
Test channel	: Low / Middle / High
Ambient temperature	: 24.6 °C
Relative humidity	: 55 %
Atmospheric pressure	: 101 kPa

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

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

## 5.1.11 Radiated Spurious Emission

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

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

**Test Setup**

Date of testing	: 2022-04-09~2022-04-12
Input voltage	: DC 5.0V
Operation mode	: A, C
Test channel	: Low / Middle / High
Ambient temperature	: Refer to test result
Relative humidity	: Refer to test result
Atmospheric pressure	: 101 kPa

**Remark:**

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

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

**5.1.12 AC Conducted Emission****RESULT:****Pass****Test Specification**

Test standard	:	FCC Part 15.207(a)
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	:	2022-04-09~2022-04-12
Input voltage	:	Power via USB Port
Operation mode	:	A, C
Test channel	:	Low / Middle / High
Ambient temperature	:	Refer to test result
Relative humidity	:	Refer to test result
Atmospheric pressure	:	101 kPa

For the measurement records, refer to the appendixes B &amp; C.

## 6 Photographs of the Test Set-Up

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

## 7 List of Tables

Table 1: List of Test and Measurement Equipment.....	5
Table 2: Technical Specification of EUT .....	7
Table 3: Test environments .....	9
Table 4: Test channel and frequency.....	9
Table 5: Auxiliary Equipment Used during Test .....	9
Table 6: Test Result of Maximum Peak Conducted Output Power.....	13

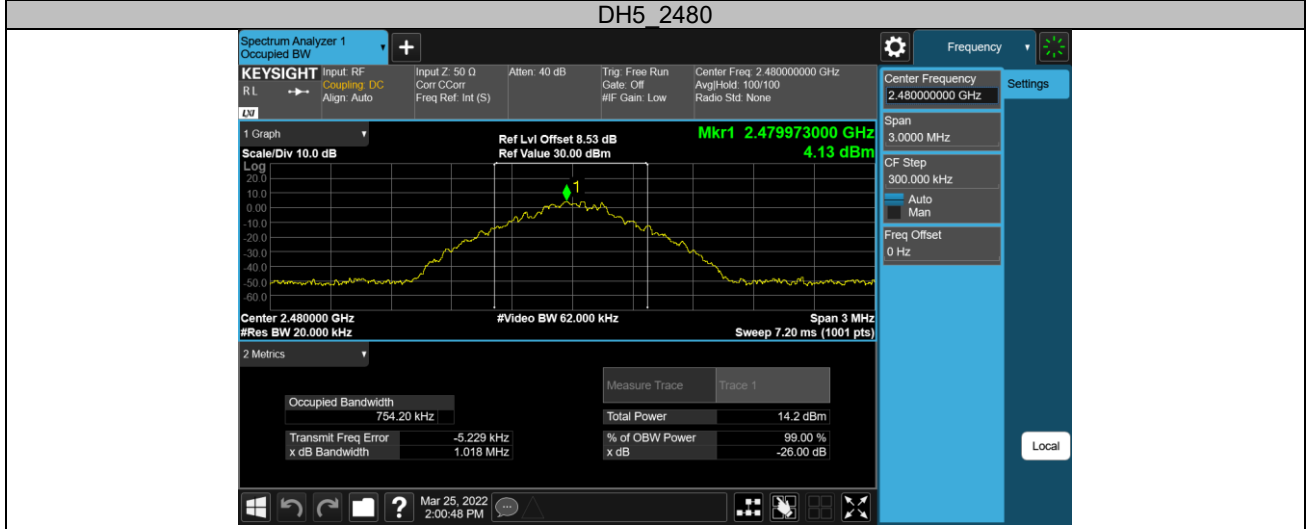
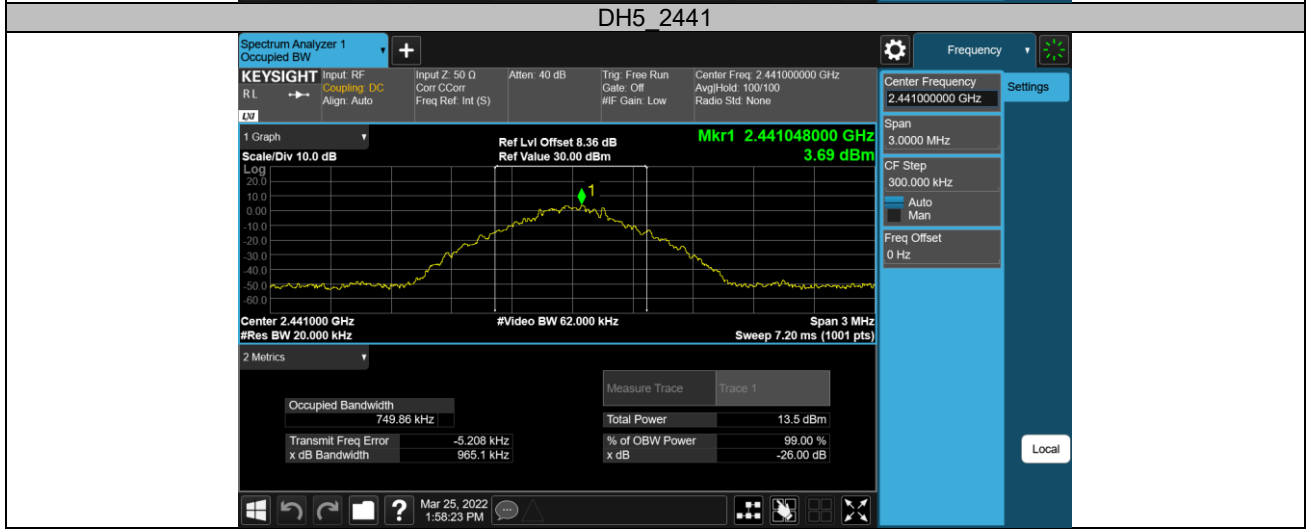
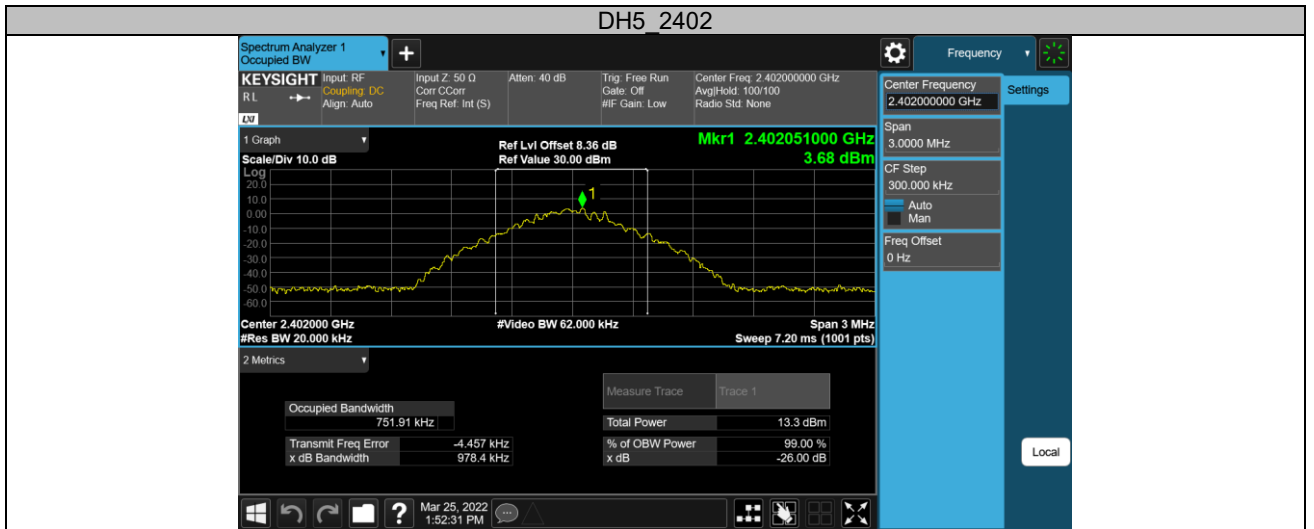


## Appendix B: Test Results of BR & EDR

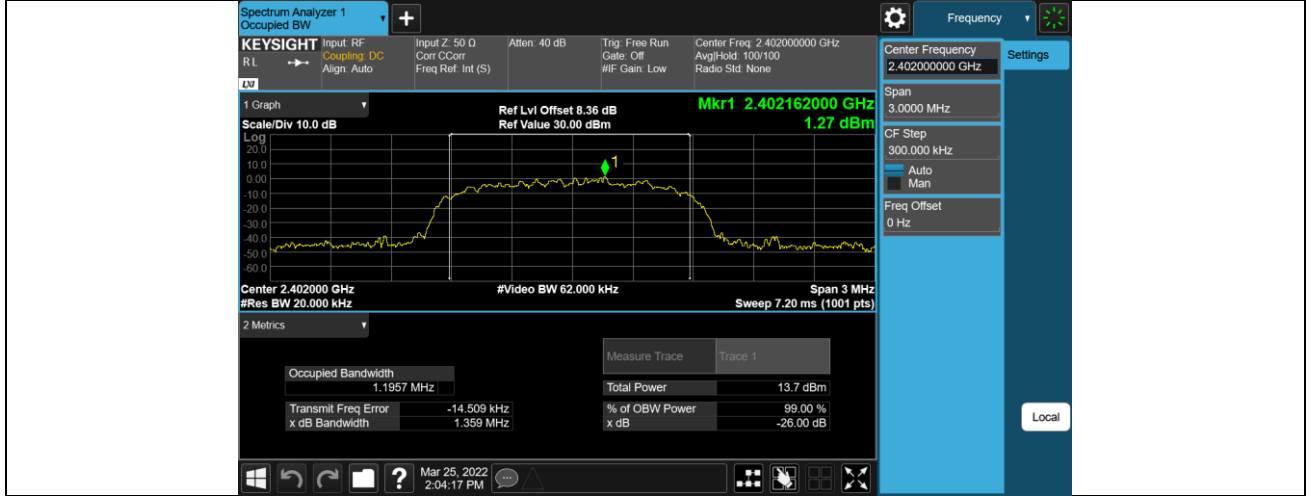
<b>APPENDIX B: TEST RESULTS OF BR &amp; EDR</b> .....	<b>1</b>
<b>APPENDIX B.1: TEST RESULTS OF 99% BANDWIDTH</b> .....	<b>2</b>
<b>APPENDIX B.2: TEST RESULTS OF 20DB BANDWIDTH</b> .....	<b>5</b>
<b>APPENDIX B.3: TEST RESULTS OF CARRIER FREQUENCY SEPARATION</b> .....	<b>8</b>
<b>APPENDIX B.4: TEST RESULTS OF NUMBER OF HOPPING FREQUENCY</b> .....	<b>9</b>
<b>APPENDIX B.5: TEST RESULTS OF TIME OF OCCUPANCY</b> .....	<b>10</b>
<b>APPENDIX B.6: TEST RESULTS OF CONDUCTED SPURIOUS EMISSIONS MEASURED IN 100 KHZ BANDWIDTH</b> .....	<b>15</b>
<b>APPENDIX B.7: TEST RESULTS OF RADIATED SPURIOUS EMISSIONS</b> .....	<b>25</b>
30MHz - 1GHz .....	<b>25</b>
Above 1GHz.....	<b>27</b>
<b>APPENDIX B.8: TEST RESULTS OF RADIATED EMISSIONS IN RESTRICTED BANDS</b> .....	<b>39</b>
<b>APPENDIX B.9: TEST RESULTS OF AC MAINS</b> .....	<b>43</b>

### Appendix B.1: Test Results of 99% Bandwidth

TestMode	Channel	OCB [MHz]	FL[MHz]	FH[MHz]
DH5	2402	0.75191	2401.620	2402.371
	2441	0.74986	2440.620	2441.370
	2480	0.75420	2479.618	2480.372
3DH5	2402	1.1957	2401.388	2402.583
	2441	1.1924	2440.389	2441.581
	2480	1.1765	2479.404	2480.580



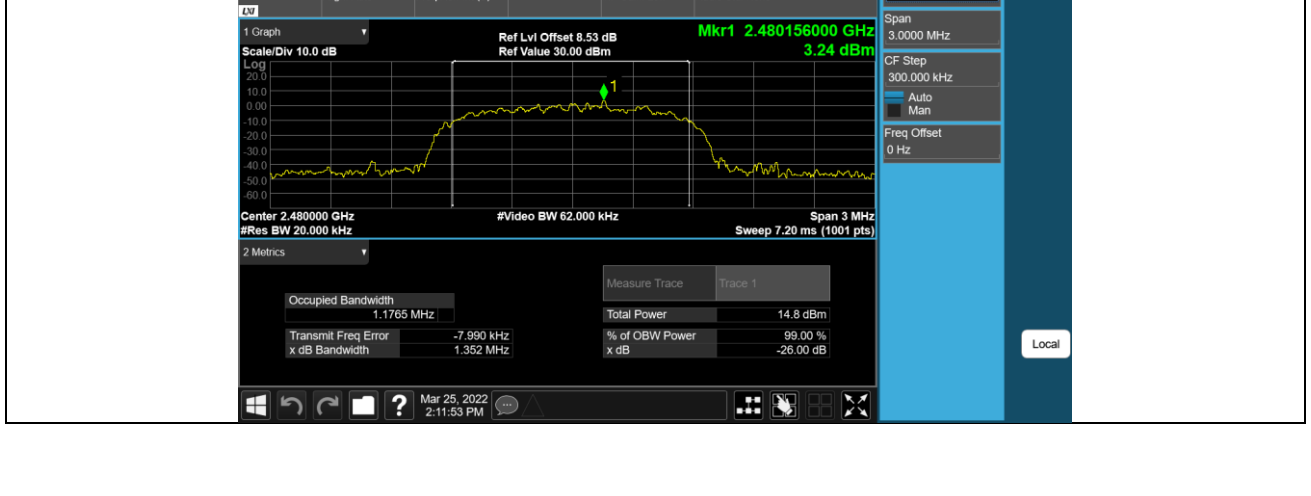
3DH5 2402



3DH5 2441

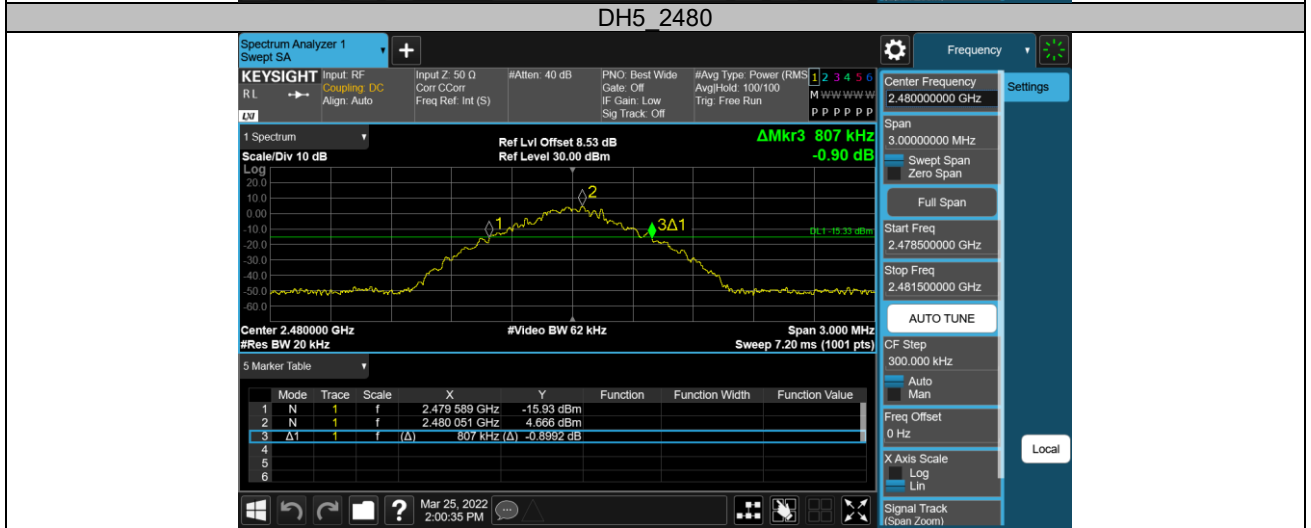
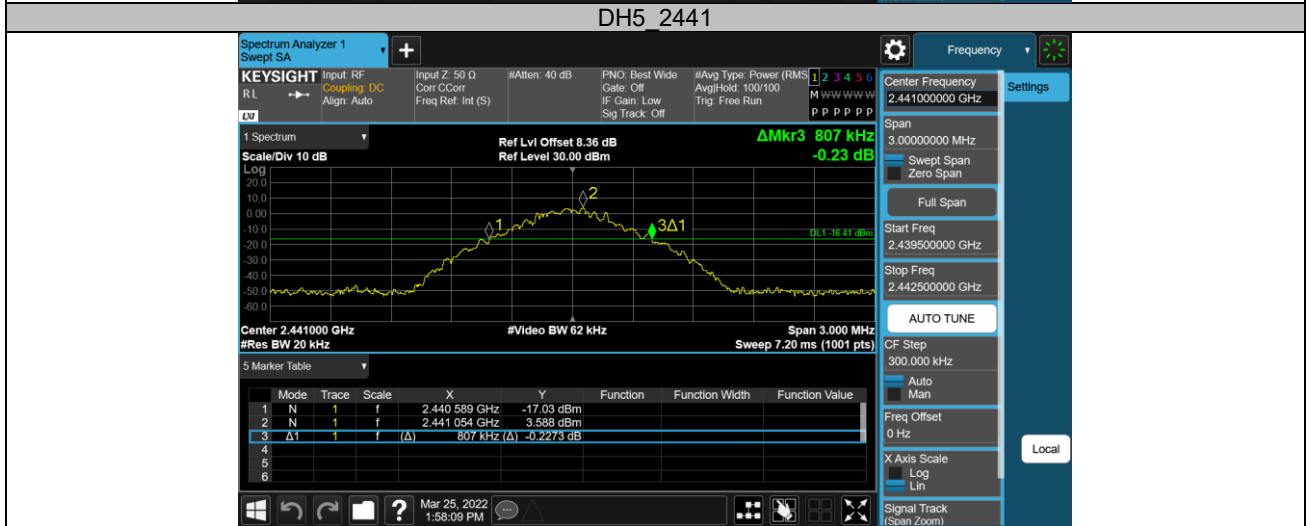
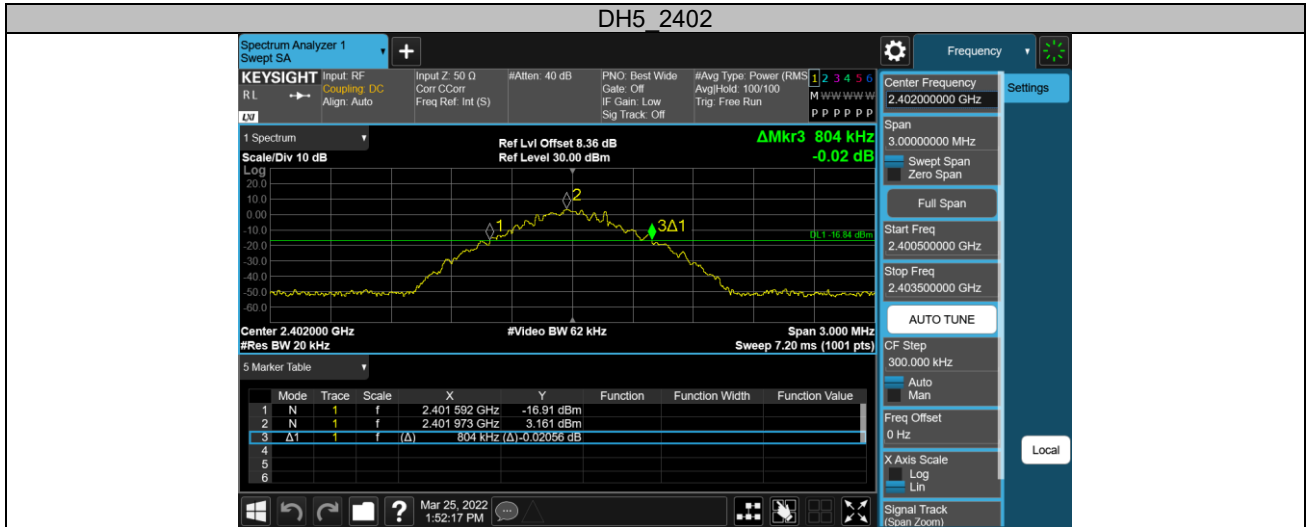


3DH5 2480

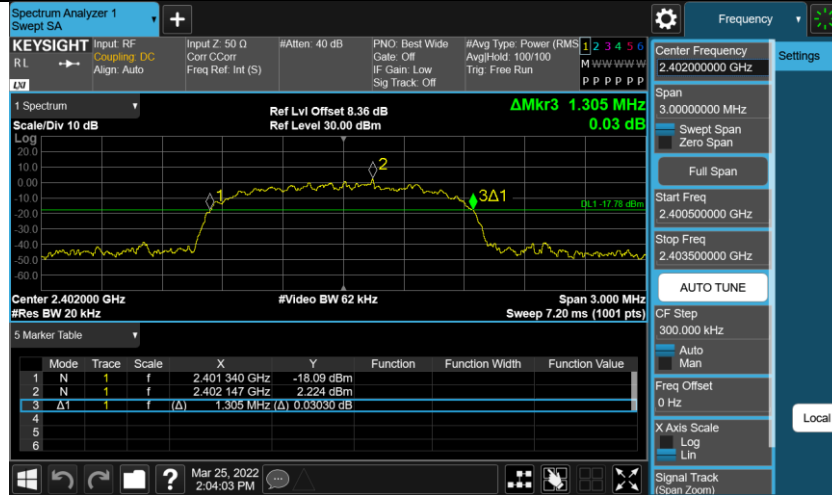


### Appendix B.2: Test Results of 20dB Bandwidth

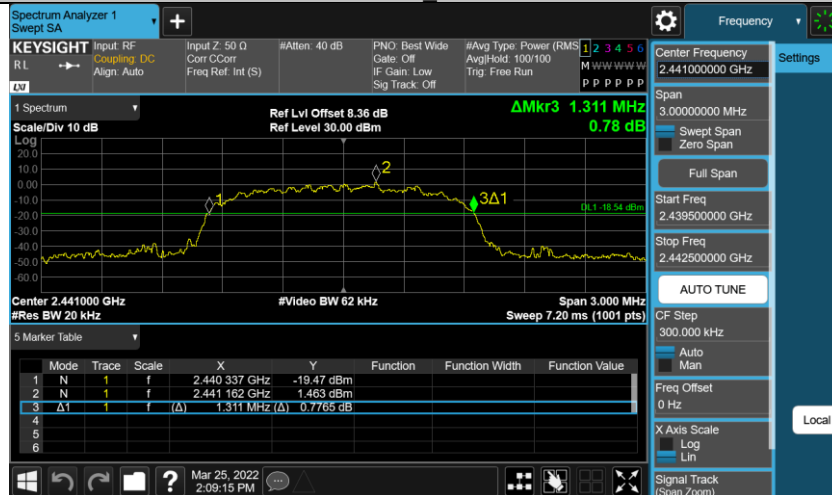
TestMode	Channel	20db EBW[MHz]	FL[MHz]	FH[MHz]
DH5	2402	0.804	2401.592	2402.396
	2441	0.807	2440.589	2441.396
	2480	0.807	2479.589	2480.396
3DH5	2402	1.305	2401.340	2402.645
	2441	1.311	2440.337	2441.648
	2480	1.299	2479.340	2480.639



3DH5\_2402



3DH5\_2441

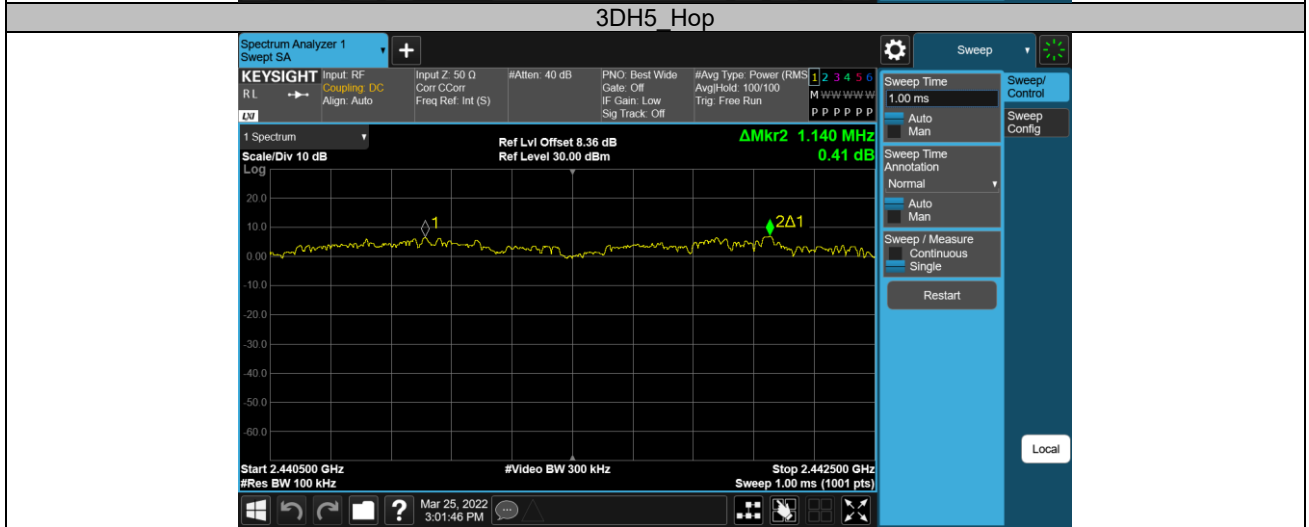
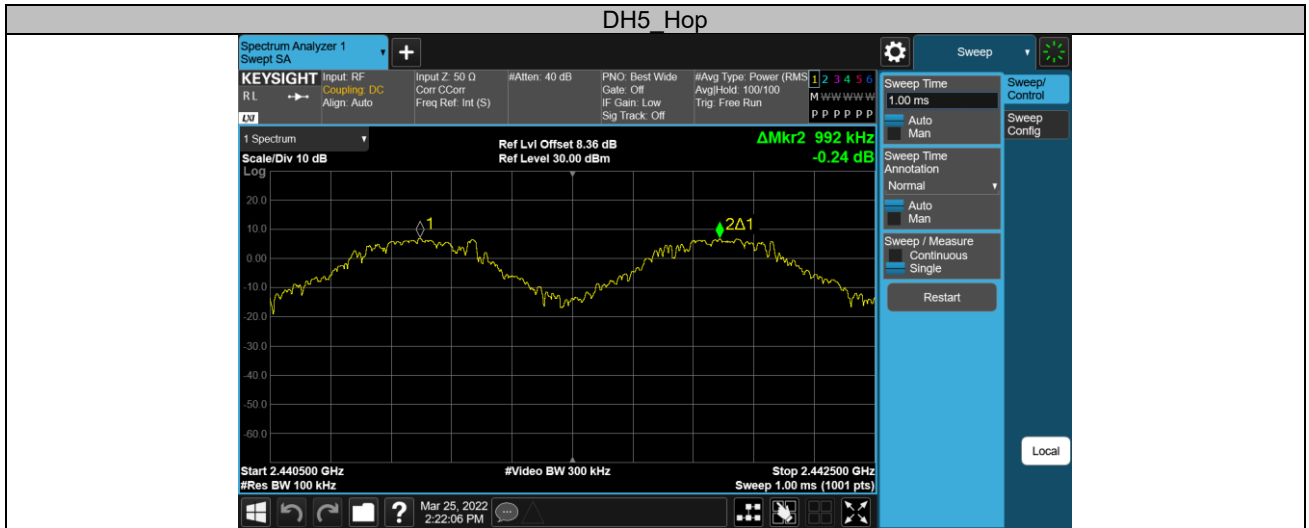


3DH5\_2480



### Appendix B.3: Test Results of Carrier Frequency Separation

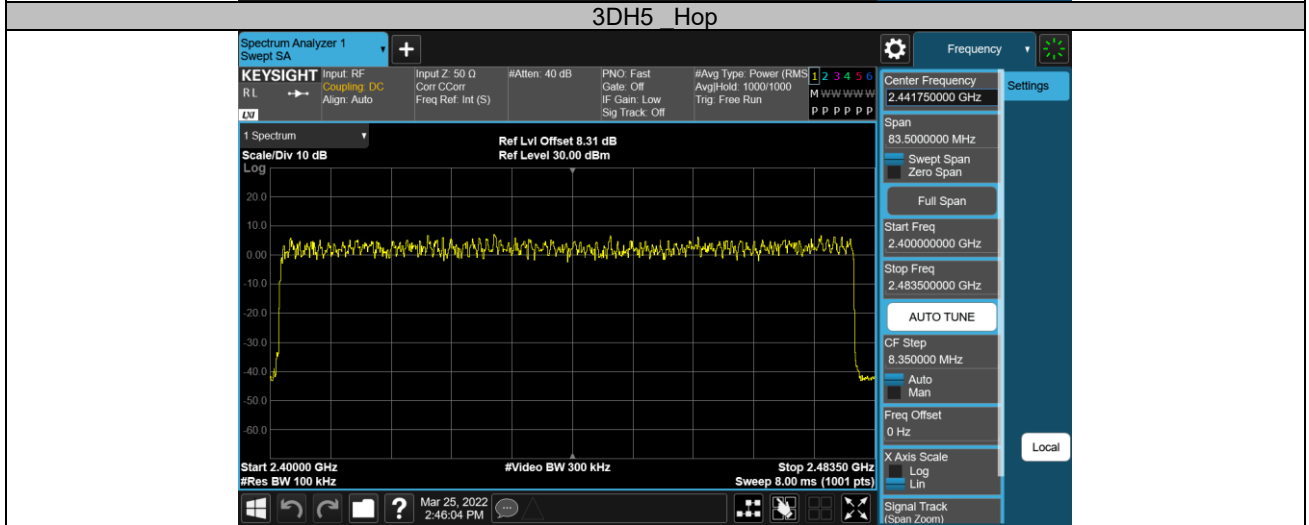
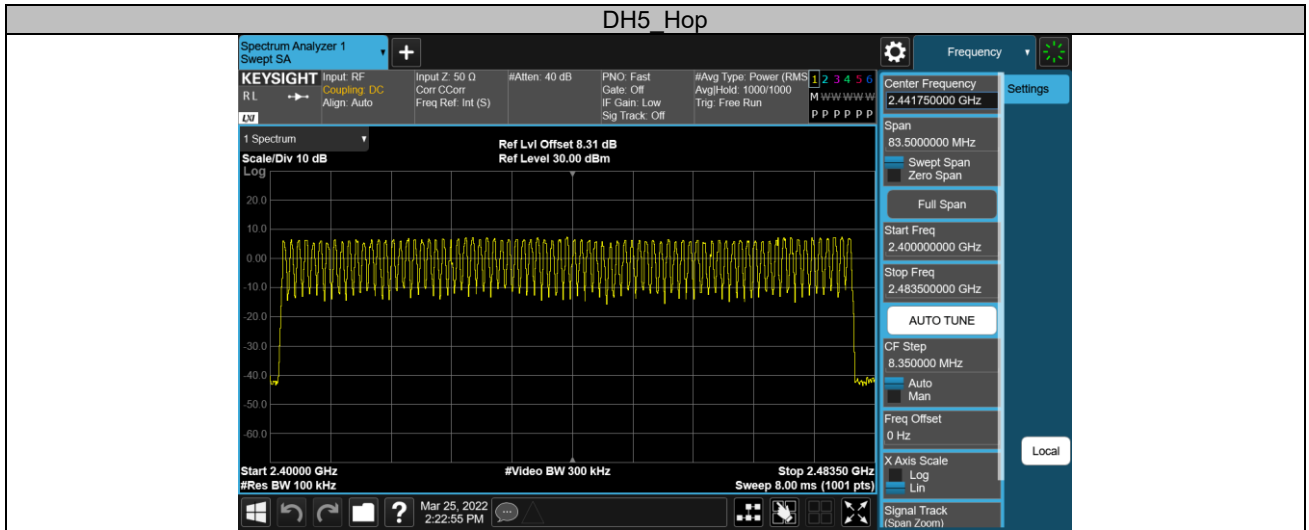
TestMode	Channel	Result[dBm]	Limit[dBm]	Verdict
DH5	Hop	0.992	≥0.807	PASS
3DH5	Hop	1.14	≥0.874	PASS





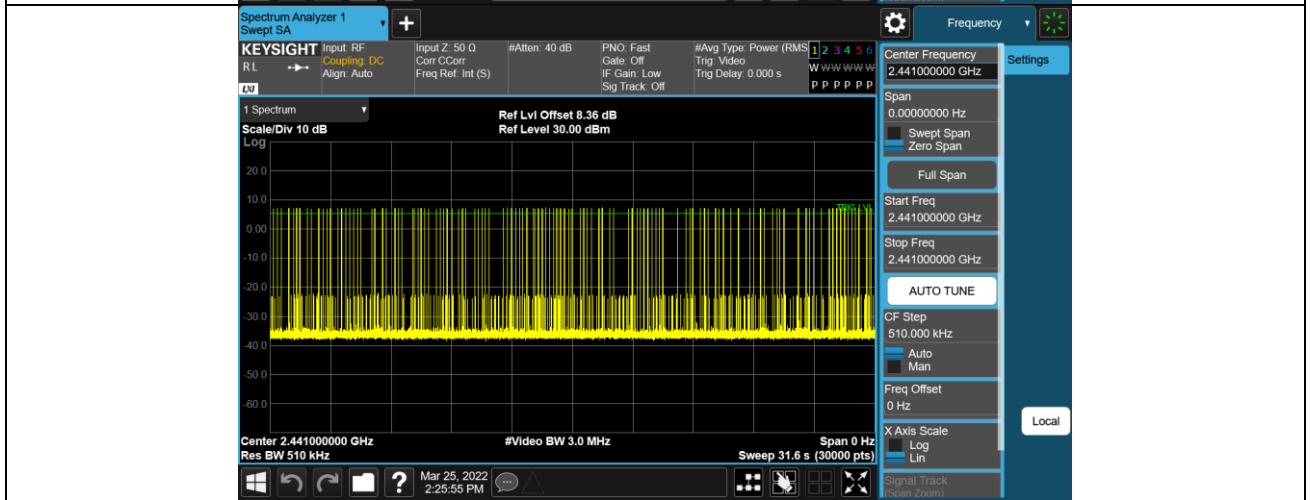
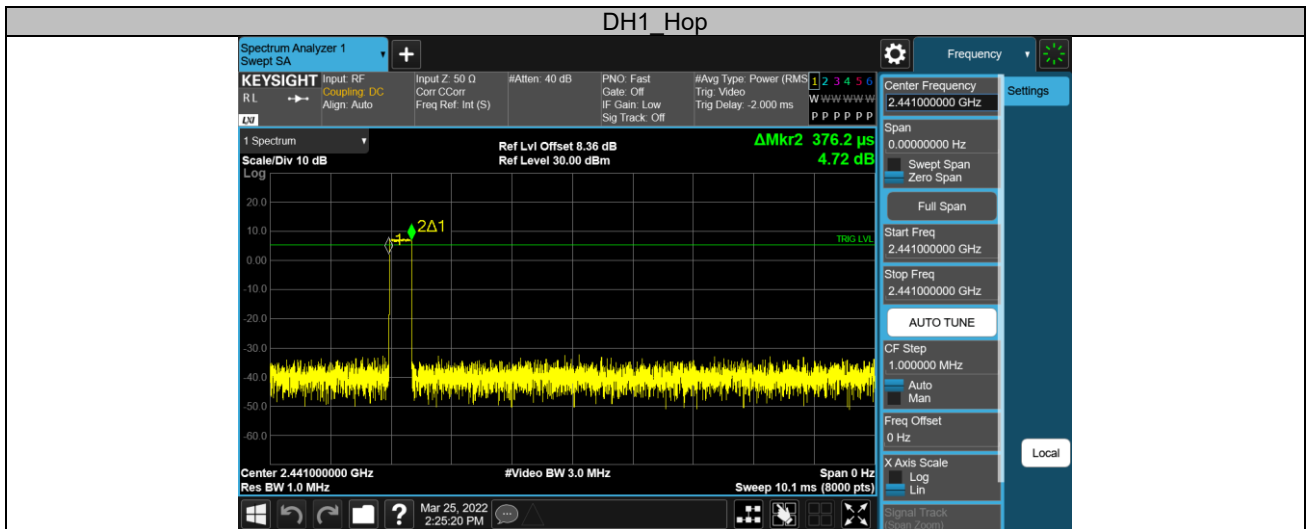
### Appendix B.4: Test Results of Number of Hopping Frequency

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



### Appendix B.5: Test Results of Time of Occupancy

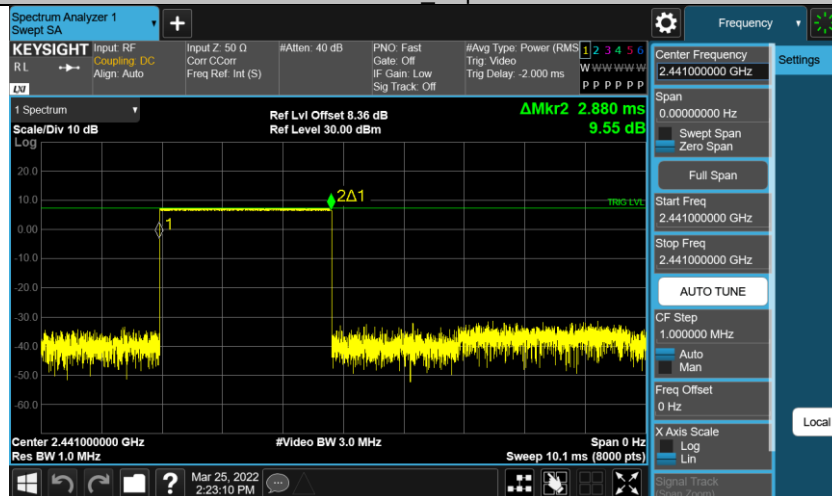
TestMode	Channel	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Hop	0.38	161	0.061	≤0.4	PASS
DH3	Hop	1.63	162	0.265	≤0.4	PASS
DH5	Hop	2.88	71	0.205	≤0.4	PASS
3DH1	Hop	0.39	165	0.064	≤0.4	PASS
3DH3	Hop	1.64	166	0.271	≤0.4	PASS
3DH5	Hop	2.89	81	0.234	≤0.4	PASS

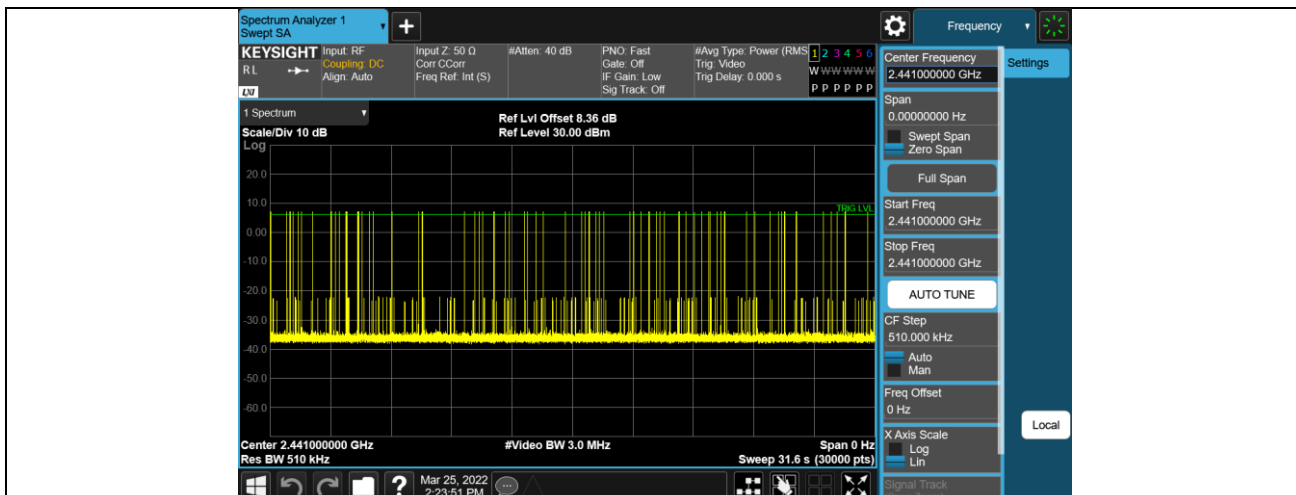


DH3 Hop

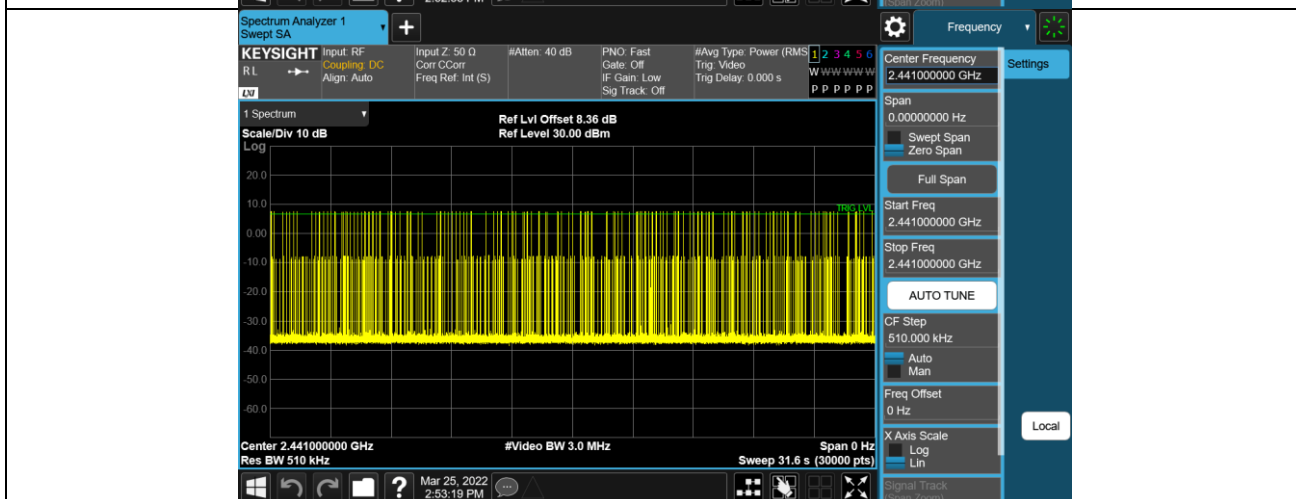
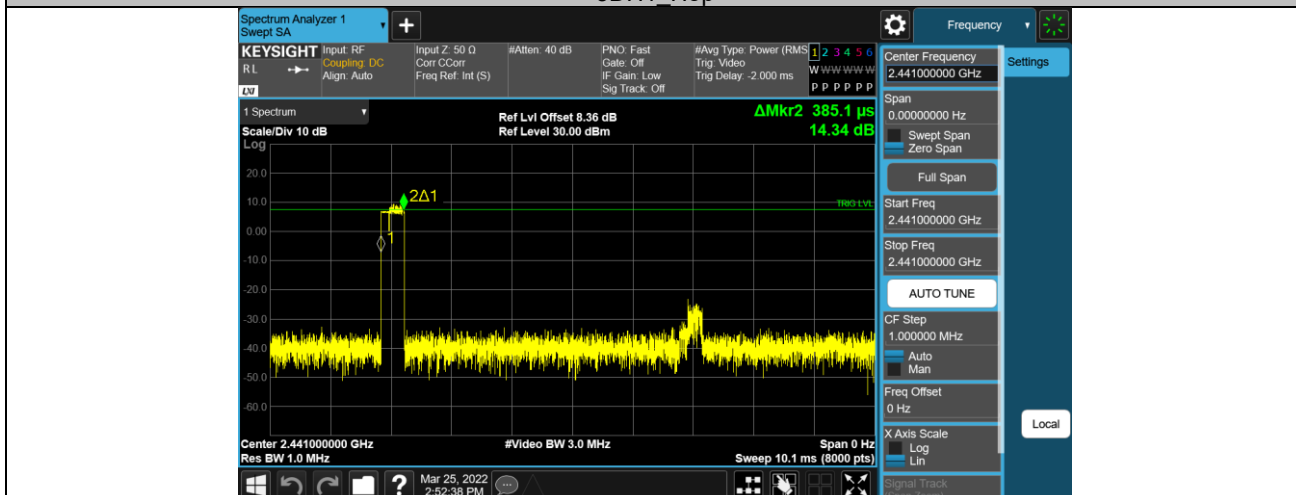


DH5 Hop

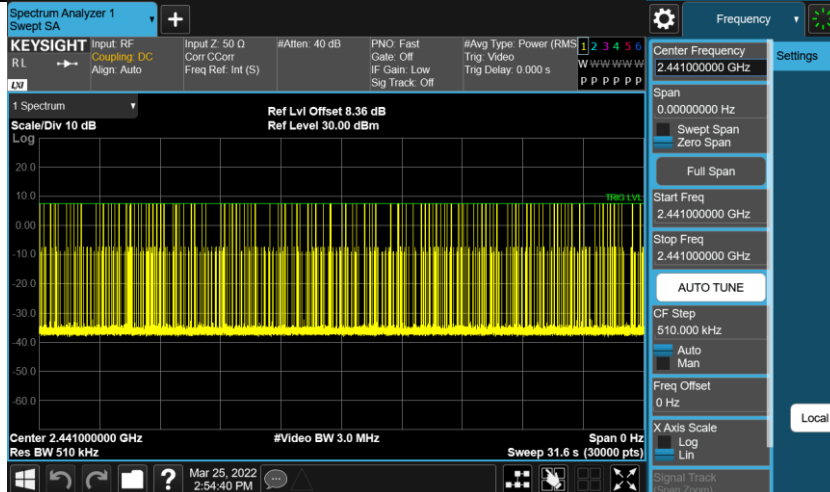
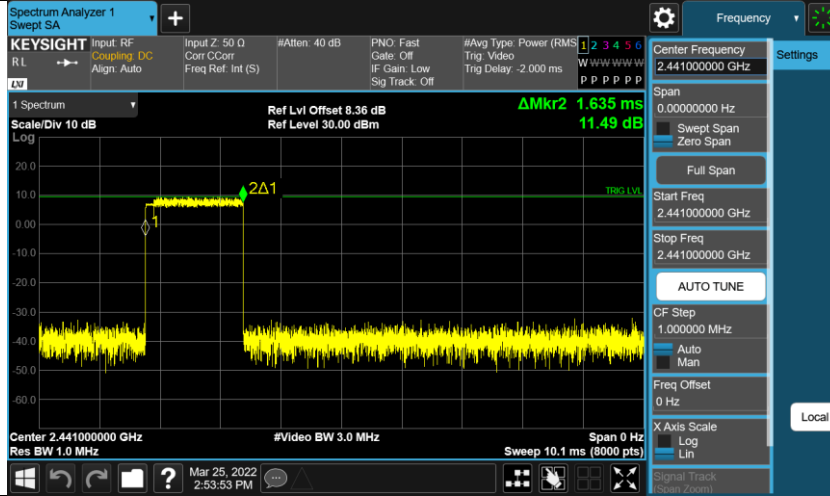


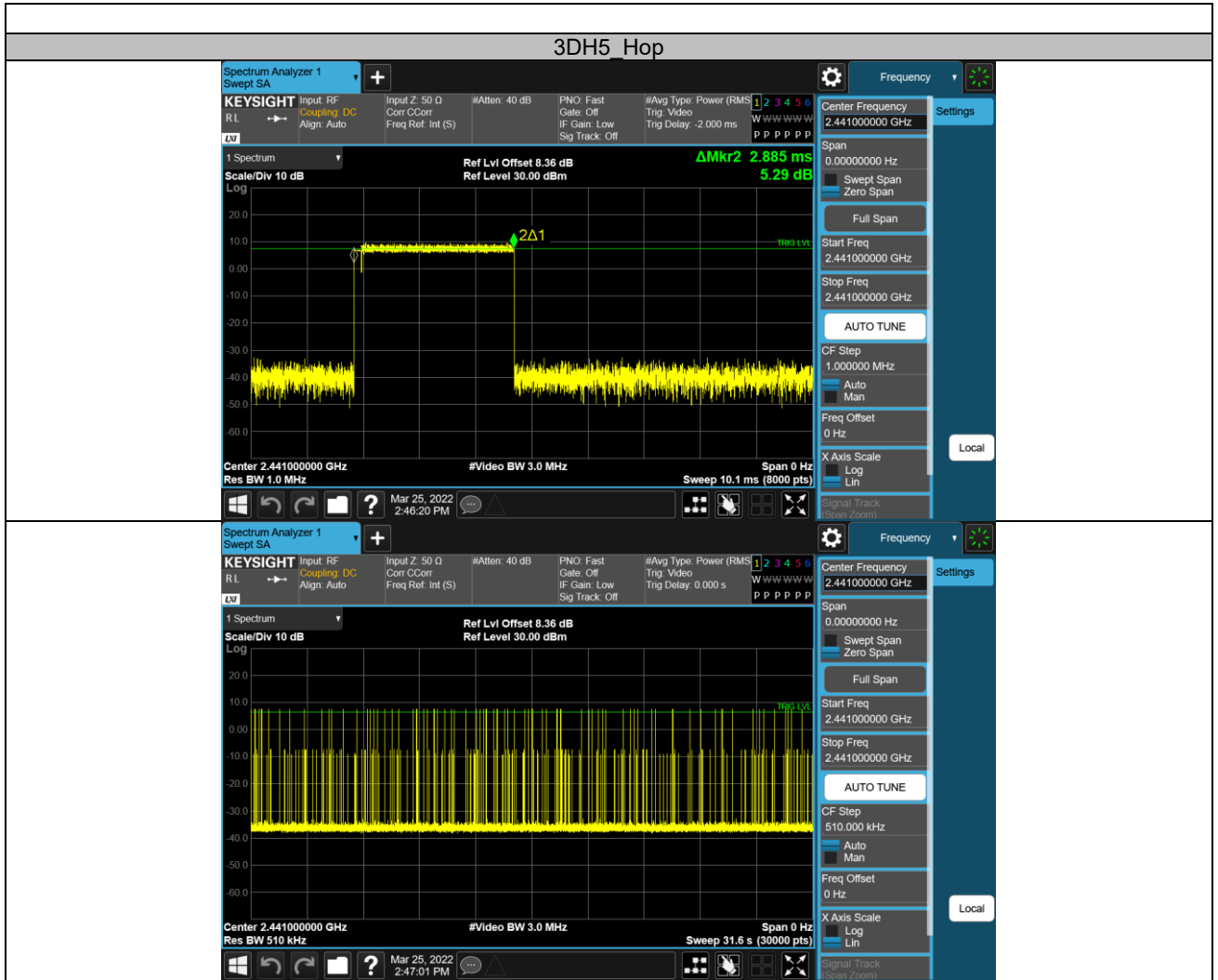


3DH1 Hop



3DH3 Hop





### Appendix B.6: Test Results of Conducted Spurious Emissions Measured in 100 kHz Bandwidth

TestMode	Channel	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	2402	Reference	6.26	6.26	---	PASS
		30~1000	6.26	-62.58	≤-13.74	PASS
		1000~26500	6.26	-53.35	≤-13.74	PASS
	2441	Reference	6.61	6.61	---	PASS
		30~1000	6.61	-62.64	≤-13.39	PASS
		1000~26500	6.61	-52.91	≤-13.39	PASS
	2480	Reference	7.19	7.19	---	PASS
		30~1000	7.19	-61.83	≤-12.81	PASS
		1000~26500	7.19	-52.63	≤-12.81	PASS
3DH5	2402	Reference	5.41	5.41	---	PASS
		30~1000	5.41	-62.58	≤-14.59	PASS
		1000~26500	5.41	-53.18	≤-14.59	PASS
	2441	Reference	5.85	5.85	---	PASS
		30~1000	5.85	-62.61	≤-14.15	PASS
		1000~26500	5.85	-52.81	≤-14.15	PASS
	2480	Reference	6.88	6.88	---	PASS
		30~1000	6.88	-61.96	≤-13.12	PASS
		1000~26500	6.88	-52.94	≤-13.12	PASS

Band edge:

TestMode	ChName	Channel	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Low	2402	6.91	-47.36	≤-13.09	PASS
	High	2480	7.75	-49.84	≤-12.25	PASS
	Low	Hop_2402	6.24	-50.15	≤-13.76	PASS
	High	Hop_2480	7.53	-49.34	≤-12.48	PASS
3DH5	Low	2402	6.94	-48.57	≤-13.07	PASS
	High	2480	7.63	-49.54	≤-12.37	PASS
	Low	Hop_2402	4.49	-50.54	≤-15.51	PASS
	High	Hop_2480	6.66	-49.23	≤-13.34	PASS

