



FCC PART 15.247 TEST REPORT

For

JEM ACCESSORIES INC.

32 Brunswick Avenue, Edison, New Jersey, United States, 08817

FCC ID: 2AHAS-XBS91062

Report Type:		Product	Туре:	
Original Report			Rocker	Lightshow
		Bluetooth	1 Speaker	
Report Number:	RSZ210113830-J	RF-00		
Report Date:	2021-07-27			
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Reviewed By:	RF Engineer		1	~
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GENERAL INFORMATION

Product	Power Rocker Lightshow Bluetooth Speaker
Tested Model	XBS9-1062-BLK
Frequency Range	Bluetooth: 2402-2480MHz
Maximum conducted Peak output power	Bluetooth: 5.40 dBm
Modulation Technique	Bluetooth: GFSK, $\pi/4$ -DQPSK, 8DPSK
Antenna Specification*	-0.58dBi(It is provided by the applicant)
Voltage Range	DC5V from USB Port & DC3.7V from Battery
Date of Test	2021-02-19 to 21-07-26
Sample number	RSZ210113830-RF-S1 (Assigned by BACL, Shenzhen)
Received date	2021-01-13
Sample/EUT Status	Good condition

Product Description for Equipment under Test (EUT)

Objective

This test report is in accordance with Part 2-Subpart J, Part 15-Subparts A and C of the Federal Communication Commissions rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, section 15.203, 15.205, 15.207, 15.209 and 15.247 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.

For Radiated Emissions testing, please refer to DA 00-705 Released March 30, 2000, Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems.

All emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Shenzhen). 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
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Parameter		Uncertainty
Occupied Cha	nnel Bandwidth	±5%
RF Output Power	with Power meter	±0.73dB
RF conducted test with spectrum		±1.6dB
AC Power Lines Conducted Emissions		±1.95dB
Emissions,	Below 1GHz	±4.75dB
Radiated	Above 1GHz	$\pm 4.88 \mathrm{dB}$
Temperature		±1°C
Humidity		±6%
Supply voltages		$\pm 0.4\%$

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 Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 5F(B-West), 6F, 7F, the 3rd Phase of Wan Li Industrial Building D, Shihua Rd, FuTian Free Trade Zone, Shenzhen, 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.: 342867, the FCC Designation No.: CN1221.

The test site has been registered with ISED Canada under ISED Canada Registration Number 3062B.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in an engineering mode.

EUT Exercise Software

"BT_Tool V1.0.9*" was used for the test and the power level is 7*. The software and power level was provided by the applicant.

Special Accessories

No special accessory.

Equipment Modifications

No modification was made to the EUT tested.

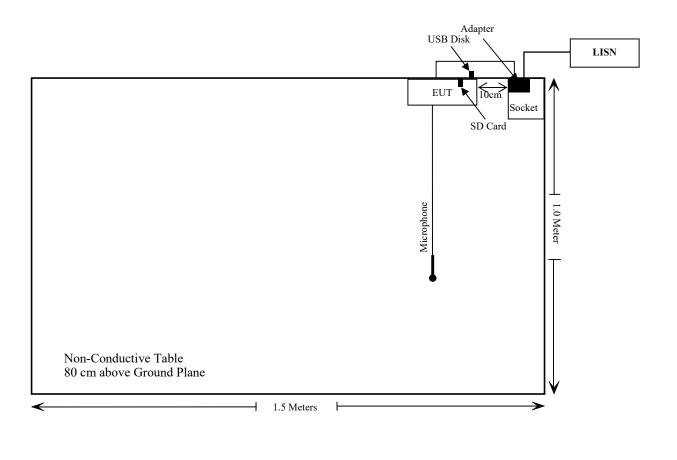
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Dongguan Aohai Power Technology Co.,Ltd.	Adapter	A8-501000	A1906034835
Sandisk	SD Card	SDSDUNG- 128G-ZN61N	SD012463
Kingston	USB Disk	DTSE9G2 64G	DTSE9G2
Unknown	Microphone	Unknown	Unknown

External I/O Cable

Cable Description	Length (m)	From Port	То
Un-shielding Un-detachable AC Cable	1.0	LISN	Socket
Un-shielding Detachable USB Cable	1.0	EUT	Adapter
Un-shield Detachable Audio cable	1.5	EUT	Microphone

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (i), §1.1307 (b) (1)& §2.1093	RF Exposure	Compliant
§15.203	Antenna Requirement	Compliant
§15.207(a)	AC Line Conducted Emissions	Compliant
§15.205, §15.209 & §15.247(d)	Radiated Emissions	Compliant
§15.247(a)(1)	20 dB Emission Bandwidth	Compliant
§15.247(a)(1)	Channel Separation Test	Compliant
§15.247(a)(1)(iii)	Time of Occupancy (Dwell Time)	Compliant
§15.247(a)(1)(iii)	Quantity of hopping channel Test	Compliant
§15.247(b)(1)	Peak Output Power Measurement	Compliant
§15.247(d)	Band edges Compliant	

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
	Condu	cted Emissions	Test		
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2021/07/07	2022/07/06
Rohde & Schwarz	LISN	ENV216	101613	2021/07/07	2022/07/06
Rohde & Schwarz	Transient Limitor	ESH3Z2	DE25985	2020/11/29	2021/11/28
Unknown	CE Cable	CE Cable	UF A210B-1- 0720-504504	2020/11/29	2021/11/28
Rohde & Schwarz	CE Test software	EMC 32	V8.53.0	NCR	NCR
	Radia	ated Emission T	est		
R&S	EMI Test Receiver	ESR3	102455	2021/07/06	2022/07/05
Sonoma instrument	Pre-amplifier	310 N	186238	2020/08/04	2021/08/03
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2020/12/22	2023/12/21
Unknown	Cable 2	RF Cable 2	F-03-EM197	2020/11/29	2021/11/28
Unknown	Cable	Chamber Cable 1	F-03-EM236	2020/11/29	2021/11/28
Rohde & Schwarz	Auto test software	EMC 32	V9.10.00	NCR	NCR
Rohde & Schwarz	Spectrum Analyzer	FSV40-N	102259	2021/07/06	2022/07/05
COM-POWER	Pre-amplifier	PA-122	181919	2020/11/29	2021/11/28
Quinstar	Amplifier	QLW- 18405536-J0	15964001002	2020/11/28	2021/11/27
Sunol Sciences	Horn Antenna	3115	9107-3694	2021/01/15	2024/01/14
Unknown	RF Cable	W1101-EQ1 OUT	F-19-EM005	2020/11/29	2021/11/28
SNSD	Band Reject filter	BSF2402- 2480MN- 0898-001	2.4G filter	2021/04/20	2022/04/20
Ducommun Technolagies	Horn antenna	ARH-4223- 02	1007726-02 1304	2020/12/06	2023/12/05
RF Conducted Test					
Tonscend Corporation	RF control Unit	JS0806-2	19D8060154	2020/08/04	2021/08/03
Rohde & Schwarz	Signal and Spectrum Analyzer	FSV40	101473	2020/08/04	2021/08/03
Unknown	RF Cable	Unknown	Unknown	2020/11/29	2021/11/28

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) 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) (1) &§2.1093 – RF EXPOSURE

Applicable Standard

According to FCC §2.1093 and §1.1307(b) (1), 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 D01 General RF Exposure Guidance

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances \leq 50 mm are determined by:

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] ·

 $[\sqrt{f}(GHz)] \le 3.0$ for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

1. f(GHz) is the RF channel transmit frequency in GHz.

2. Power and distance are rounded to the nearest mW and mm before calculation.

3. The result is rounded to one decimal place for comparison.

4. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test Exclusion.

For worst case:

Frequency	Maximum pov	1	Calculated Distance	Calculated	Threshold	SAR Test
(MHz)	(dBm)	(mW)	(mm)	Value	(1-g SAR)	Exclusion
2402-2480	6.0	3.98	5	1.3	3.0	Yes

Result: No Standalone SAR test is required

FCC §15.203 – 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.

Antenna Connector Construction

The EUT has an internal antenna arrangement which was permanently attached and the antenna gain is -0.58dBi, fulfill the requirement of this section. Please refer to the EUT photos.

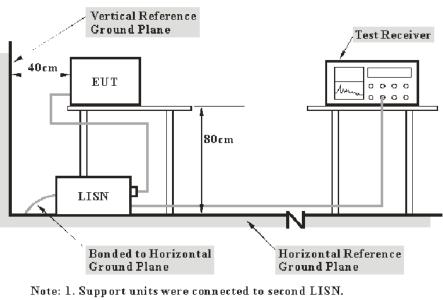
Result: Compliance.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC §15.207(a)

EUT Setup



Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The measurement procedure of EUT setup is according with ANSI C63.10-2013. The related limit was specified in FCC Part 15.207.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W	
150 kHz – 30 MHz	9 kHz	

Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All final data was recorded in the Quasi-peak and average detection mode.

Corrected Factor & Margin Calculation

The Corrected factor is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

Correction Factor = LISN VDF + Cable Loss + Transient Limiter Attenuation

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

Margin = Limit – Corrected Amplitude

Test Data

Environmental Conditions

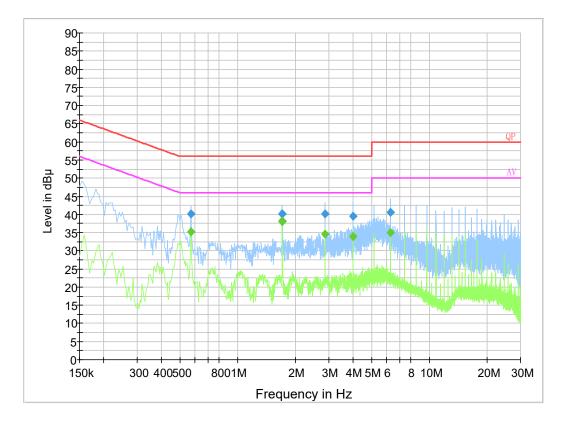
Temperature:	26 °C
Relative Humidity:	70 %
ATM Pressure:	101.0 kPa

The testing was performed by Haiguo Li on 2021-07-19.

EUT operation mode: Transmitting

Report No.: RSZ210113830-RF-00

AC 120V/60 Hz, Line



Final Result 1

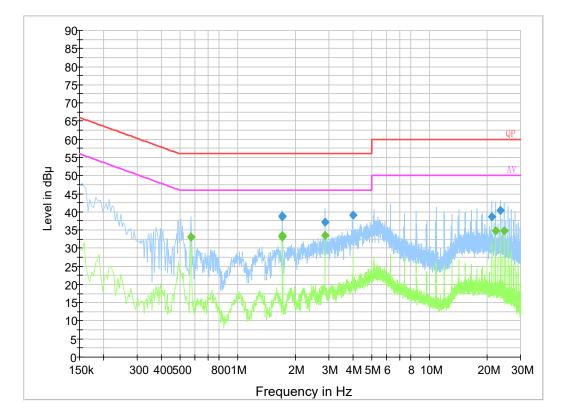
Frequency (MHz)	QuasiPeak (dB µ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.573450	40.1	9.000	L1	19.8	15.9	56.0
1.716230	40.1	9.000	L1	19.9	15.9	56.0
1.716290	40.1	9.000	L1	19.9	15.9	56.0
2.859130	40.1	9.000	L1	19.9	15.9	56.0
4.001970	39.5	9.000	L1	19.9	16.5	56.0
6.287710	40.7	9.000	L1	19.9	19.3	60.0

Final Result 2

Frequency (MHz)	Average (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.573450	35.2	9.000	L1	19.8	10.8	46.0
1.716230	38.3	9.000	L1	19.9	7.7	46.0
1.716290	38.1	9.000	L1	19.9	7.9	46.0
2.859130	34.6	9.000	L1	19.9	11.4	46.0
4.001970	34.0	9.000	L1	19.9	12.0	46.0
6.287710	35.1	9.000	L1	19.9	14.9	50.0

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AC 120V/60 Hz, Neutral



Final Result 1

Frequency (MHz)	QuasiPeak (dB	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
1.716230	38.9	9.000	N	19.8	17.1	56.0
1.716290	38.7	9.000	N	19.8	17.3	56.0
2.863130	37.1	9.000	N	19.9	18.9	56.0
4.001970	39.2	9.000	N	19.9	16.8	56.0
21.164570	38.7	9.000	N	20.4	21.3	60.0
23.454190	40.3	9.000	Ν	20.3	19.7	60.0

Final Result 2

Frequency (MHz)	Average (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.570000	33.1	9.000	N	19.8	12.9	46.0
1.714000	33.4	9.000	N	19.8	12.6	46.0
1.718000	33.0	9.000	N	19.8	13.0	46.0
2.858000	33.5	9.000	N	19.9	12.5	46.0
22.310000	34.7	9.000	N	20.3	15.3	50.0
24.594000	34.8	9.000	N	20.3	15.2	50.0

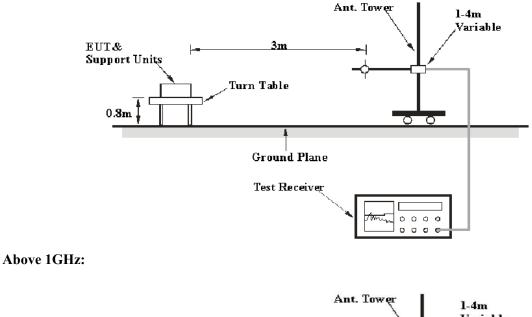
FCC §15.205, §15.209 & §15.247(d) – RADIATED EMISSIONS

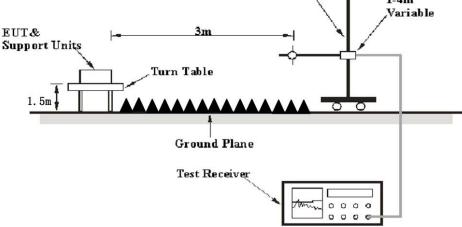
Applicable Standard

FCC §15.205; §15.209; §15.247(d)

EUT Setup

Below 1 GHz:





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

EMI Test Receiver & Spectrum Analyzer Setup

During the radiated emission test, 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	/	РК
Above I GHZ	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.

Corrected Amplitude & Margin Calculation

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

Corrected Amplitude = Meter Reading + Antenna Factor + Cable Loss - Amplifier Gain

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

Margin = Limit – Corrected Amplitude

Test Data

Environmental Conditions

Temperature:	26~27.8 °C
Relative Humidity:	51~56 %
ATM Pressure:	101.0 kPa

The testing was performed by Cloud Qiu on 2021-07-13 for below 1GHz and Dio Ding on 2021-07-26 for above 1GHz.

EUT operation mode: Transmitting

Report No.: RSZ210113830-RF-00

80-70 60[.] Electric Field Strength QP-3m 50[.] Level in dBµV/ 40 30 20 10 0-200 30M 50 60 80 100M 300 400 500 800 1G Frequency in Hz

30 MHz~1 GHz:

Critical_Freqs

Frequency (MHz)	MaxPeak (dB	Limit (dB µ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
37.153750	27.93	40.00	12.07	100.0	V	0.0	-8.7
120.088750	34.34	43.50	9.16	300.0	н	147.0	-10.3
208.843750	30.73	43.50	12.77	200.0	н	36.0	-11.2
372.531250	35.61	46.00	10.39	100.0	Н	86.0	-8.2
496.691250	31.12	46.00	14.88	100.0	V	47.0	-5.1
931.372500	33.32	46.00	12.68	200.0	Н	36.0	1.4

Report No.: RSZ210113830-RF-00

F	Re	eceiver	T	Rx An	tenna	Corrected	Corrected	T ••4	Maria
Frequency (MHz)	Reading (dBµV)	PK/QP/Ave.	Turntable Degree	Height (m)		Factor (dB/m)	Amplituda	Limit (dBµV/m)	Margin (dB)
			Low Ch	annel (2	402 MI	Hz)			
2356.25	28.95	PK	173	1.0	Н	31.77	60.72	74	13.28
2356.25	14.52	Ave.	173	1.0	Н	31.77	46.29	54	7.71
2495.83	29.3	РК	116	1.9	Н	32.13	61.43	74	12.57
2495.83	14.57	Ave.	116	1.9	Н	32.13	46.70	54	7.30
4804.00	45.31	РК	204	1.8	Н	6.28	51.59	74	22.41
4804.00	30.38	Ave.	204	1.8	Н	6.28	36.66	54	17.34
			Middle C	hannel ((2441 M	fHz)			
4882.00	44.15	РК	261	1.7	Н	6.76	50.91	74	23.09
4882.00	29.79	Ave.	261	1.7	Н	6.76	36.55	54	17.45
		_	High Cl	nannel(2	480 MI	Hz)			
2345.02	28.78	PK	246	1.0	Н	31.64	60.42	74	13.58
2345.02	14.38	Ave.	246	1.0	Н	31.64	46.02	54	7.98
2493.81	29.15	РК	162	2.2	Н	32.13	61.28	74	12.72
2493.81	14.48	Ave.	162	2.2	Н	32.13	46.61	54	7.39
4960.00	44.35	РК	229	1.5	Н	6.80	51.15	74	22.85
4960.00	29.80	Ave.	229	1.5	Н	6.80	36.60	54	17.40

1 GHz - 25 GHz: (Scan with GFSK, $\pi/4$ -DQPSK, 8DPSK mode, the worst case is 8DPSK Mode)

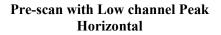
Note:

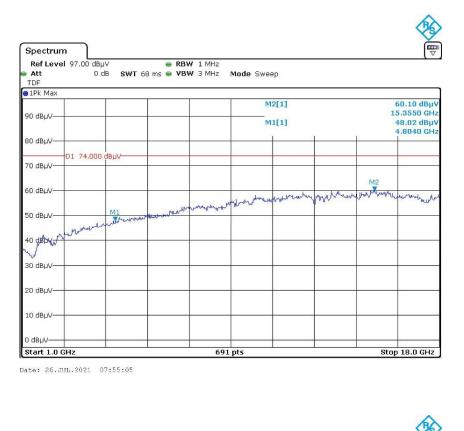
Corrected Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor

Corrected Amplitude = Corrected Factor + Reading

Margin = Limit - Corrected. Amplitude

The other spurious emission which is 20dB to the limit was not recorded.



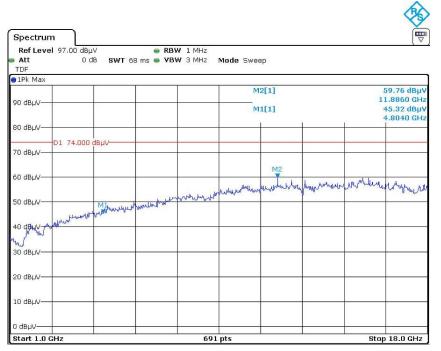


RefLevel 97.00 dBµV Att 0 dB SW TDF	● RBW 11 F28 ms ● VBW 31		еер			
1Pk Max						
90 dBµV			M1[1]			50.21 dBµ 4.9750 GH
30 dBµV					2	(d)
D1 74.000 dBµV						
60 dBµV			-		8	www.
BOMBHY to and when when we are	man wather	when a white where	-	al-when has	andouthat	velordor
40 dBµV						
30 dBµV						
20 dBµV						
10 dBµV					5	
0 dBµV						
Start 18.0 GHz		691 pts			Stor	25.0 GHz

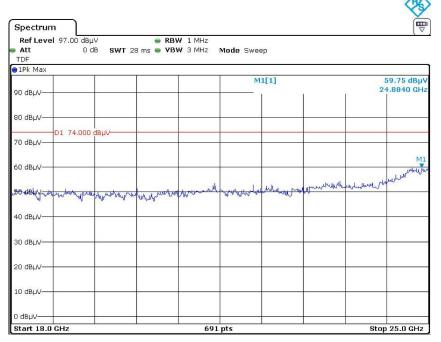
Date: 26.JUL.2021 08:40:07

Report No.: RSZ210113830-RF-00

Vertical



Date: 26.JUL.2021 08:05:33



Date: 26.JUL.2021 08:50:30



		8
Att 0 dB SWT 4 s 👄	RBW 1 MHz VBW 10 Hz Mode Sweep	
TDF 1Pk Max		
90 dBµV	M1[1]	36.66 dBµV 4.8037680 GHz
80 dBµV		
70 dBµV		
50 dBµV		
D2 54.000 dBµV		
40 dBµV	Mi	
30 dBµV		
20 dBµV		
10 dBµV		
0 dBµV		
CF 4.804 GHz	691 pts	Span 20.0 MHz

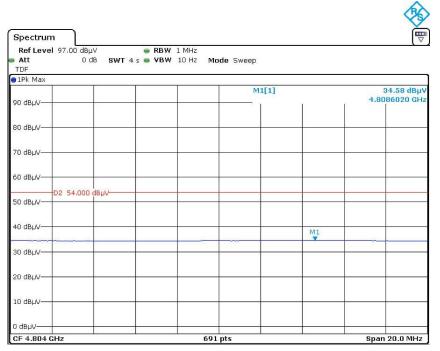
Date: 26.JUL.2021 08:00:31

			
Spectrum Ref Level 97.00 dBµV Att 0 dB sw TDF	● RBW 1 MHz /T 4 s ● VBW 10 Hz Mo	ode Sweep	
●1Pk Max			
90 dBµV		M1[1]	46.83 dBµV 24.9826120 GHz
80 dBµV			
70 dBµV			
60 dBµV			
D2 54.000 dBµV			M1
40 dBµV			
30 dBµV			
20 dBµV			
10 dBµV			
0 dBµV			
CF 24.975 GHz	691	pts	Span 20.0 MHz

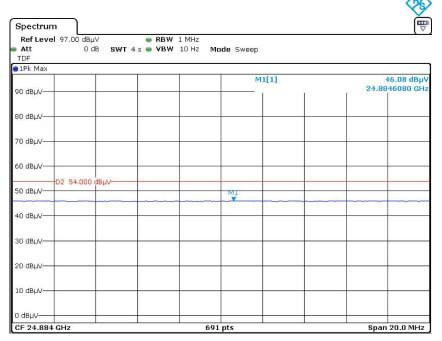
Date: 26.JUL.2021 08:45:32

Report No.: RSZ210113830-RF-00

Vertical



Date: 26.JUL.2021 08:10:15



Date: 26.JUL.2021 08:54:57

FCC §15.247(a) (1)-CHANNEL SEPARATION TEST

Applicable Standard

Frequency hopping systems 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, 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.

Test Procedure

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

Test Data

Environmental Conditions

Temperature:	26.4 ℃	
Relative Humidity:	56 %	
ATM Pressure:	101.0 kPa	

The testing was performed by Blaker Zhang on 2021-02-19 and 2021-02-20.

EUT operation mode: Transmitting

FCC §15.247(a) (1) – 20 dB EMISSION BANDWIDTH

Applicable Standard

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.

Test Procedure

- 1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- 2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
- 3. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
- 4. Repeat above procedures until all frequencies measured were complete.

Test Data

Environmental Conditions

Temperature:	26.4 °C	
Relative Humidity:	56 %	
ATM Pressure:	101.0 kPa	

The testing was performed by Blaker Zhang on 2021-02-19.

EUT operation mode: Transmitting

Report No.: RSZ210113830-RF-00

FCC §15.247(a) (1) (iii)-QUANTITY OF HOPPING CHANNEL TEST

Applicable Standard

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.

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:	26.4 °C	
Relative Humidity:	56 %	
ATM Pressure:	101.0 kPa	

The testing was performed by Blaker Zhang on 2021-02-19 and 2021-02-20.

EUT operation mode: Transmitting

Report No.: RSZ210113830-RF-00

FCC §15.247(a) (1) (iii) - TIME OF OCCUPANCY (DWELL TIME)

Applicable Standard

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.

Test Procedure

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

Test Data

Environmental Conditions

Temperature:	26.4 °C	
Relative Humidity:	56 %	
ATM Pressure:	101.0 kPa	

The testing was performed by Blaker Zhang on 2021-02-19 and 2021-02-20.

EUT operation mode: Transmitting

FCC §15.247(b) (1) - PEAK OUTPUT POWER MEASUREMENT

Applicable Standard

According to §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.

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:	26.4 °C	
Relative Humidity:	56 %	
ATM Pressure:	101.0 kPa	

The testing was performed by Blaker Zhang on 2021-02-20.

EUT operation mode: Transmitting

FCC §15.247(d) - BAND EDGES TESTING

Applicable Standard

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)).

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:	26.4 °C	
Relative Humidity:	56 %	
ATM Pressure:	101.0 kPa	

The testing was performed by Blaker Zhang on 2021-02-19 and 2021-02-20.

EUT operation mode: Transmitting

APPENDIX

Appendix A: 20dB Emission Bandwidth

Test Result

TestMode	Antenna	Channel	20db EBW[MHz]	Limit[MHz]	Verdict
DH1	Ant1	2402	0.924		PASS
		2441	0.927		PASS
		2480	0.927		PASS
2DH1	Ant1	2402	1.269		PASS
		2441	1.266		PASS
		2480	1.266		PASS
3DH1	Ant1	2402	1.242		PASS
		2441	1.224		PASS
		2480	1.248		PASS

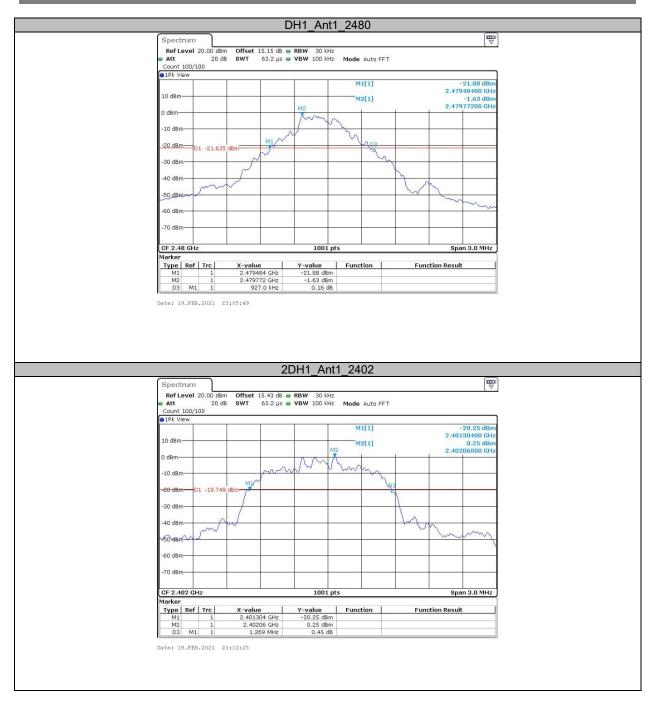
Report No.: RSZ210113830-RF-00

Test Graphs



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Appendix B: Maximum conducted Peak output power

Test Result

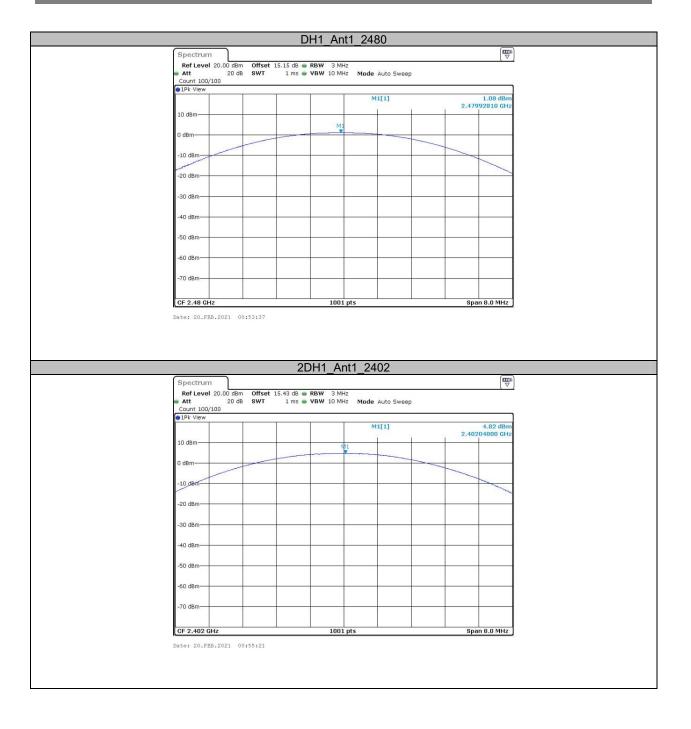
TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
DH1	Ant1	2402	2.50	<=20.97	PASS
		2441	1.66	<=20.97	PASS
		2480	1.08	<=20.97	PASS
2DH1	Ant1	2402	4.82	<=20.97	PASS
		2441	3.93	<=20.97	PASS
		2480	3.31	<=20.97	PASS
3DH1	Ant1	2402	5.40	<=20.97	PASS
		2441	4.55	<=20.97	PASS
		2480	3.94	<=20.97	PASS

Test Graphs

Spectrum (* Ref Level 20.00 dBm Offset 15.43 dB # RBW 3 MHz Mode Auto Sweep Count 100/100 • Ifk View 2.40200900 G • DBM N1[1] 2.50 dE • O dBm N1[1] 2.40200900 G • O dBm N1 0 • O dBm N1 0 • O dBm 0 0					D	H1_An	t1_24	.02				
Er L Lovel 20.00 @m Offset 15.43 @b @ RBW 3 Met att 20 @b SWT 1 m: @ VBW 10 Met Mode Auto Sweep count 100/100 Image VBW 10 Met Mi[1] 2.50 @c @ JP I View	s	pectrun	7									
6/EV 2.50 de 0 dbm 4 0 dbm 4 0 dbm 4 -10 dbm 4 -20 dbm -0 -30 dbm -0 -30 dbm -0 -40 dbm -0 -50 dbm -0 -60 dbm -0 -70 dbm -1		Ref Leve	1 20.00 dBm	Offset 1	L5.43 dB 🖷	RBW 3 MH	Hz				(*	
BiPk View 2.50 de 10 dem 11 3 2.4020000 0 0 dem 10 dem 10 dem 10 dem -20 dem -0 dem -0 dem -0 dem -30 dem -0 dem -0 dem -0 dem -40 dem -0 dem -0 dem -0 dem -50 dem -0 dem -0 dem -0 dem -50 dem -0 dem -0 dem -0 dem -60 dem -0 dem -0 dem -0 dem -70 dem -0 dem -0 dem -0 dem -10 dem -0 dem -0 dem -0 dem -20 dem -0 dem -0 dem -0 dem -0 dem -0 dem -0 dem -0 dem -0 dem -0 dem -0 dem -0 dem -0 dem	c	ount 100	20 dE /100	SWI	1 ms 👄	VBW 10 MF	12 Mode	auto Sweep				
10 dm 2.4020000 d 0 dBm 10 dm -10 dBm 10 dm -20 dBm -0 dm -30 dBm -0 dm -30 dBm -0 dm -50 dBm -0 dm -60 dBm -0 dm -60 dBm -0 dm -70 dBm -0 dm <	• 1	1Pk View				1		M1[1]	-		9 50 dp-	
0 dBm -10 dBm -20 dBm -30 dBm -40 dBm -40 dBm -40 dBm -50 dBm -50 dBm -50 dBm -70 dBm -70 dBm -70 dBm -20 d								MI[1]		2.402	2.50 UBH	
0 dBm -10 dBm -20 dBm -20 dBm -30 dBm -40 dBm -40 dBm -50 dBm -70 d	10) dBm				M	1					
-10 dBm -20 dBm -30 dBm -40 dBm -40 dBm -40 dBm -50 dBm -70 dBm -70 dBm -70 dBm -70 dBm -10	0	dBm										
20 dBm -20 dBm -30 dBm -40 dBm -40 dBm -70	, in the second s	dom								~		
-30 dBm -40 dBm -50 dBm -50 dBm -60 dBm -70 dBm -10	-1	0 dBm	-									
-30 dBm -40 dBm -50 dBm -50 dBm -60 dBm -70 dBm -10	rom											
40 dbm	-2	0 dBm										
ASO dBm 4SO	-3	0 dBm						0 0				
ASO dBm 4SO												
60 dBm 70 dBm <th 70="" dbm<<="" td=""><td>-4</td><td>0 dBm</td><td>-</td><td>-</td><td></td><td>-</td><td></td><td></td><td></td><td></td><td></td></th>	<td>-4</td> <td>0 dBm</td> <td>-</td> <td>-</td> <td></td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td>	-4	0 dBm	-	-		-					
60 dBm 70 dBm <th 70="" dbm<<="" td=""><td>-5</td><td>in dBm</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th>	<td>-5</td> <td>in dBm</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	-5	in dBm									
Other Description Span 8.0 MH Date: 20,FEB.2021 00:53:16 Span 8.0 MH Date: 20,FEB.2021 00:53:16 Span 8.0 MH Main DH1 Ant1_2441 (* (* Ref Level 20.00 dBm Offset 15.15 dB 8 RBW 3 MH2 Att 20 dB SWT 1 ms VBW 10 MH2 Mode Auto Sweep Out 100,000 M1[1] 2.44097600 cf 10.66 dB 0 10 dBm Main M1[1] 2.44097600 cf 10.66 dB 0 -20 dBm Main Main Main 0 0 0 -30 dBm Main Main Main 0 0 0 0 -50 dBm Main Main Main Main Main Main -50 dBm Main Main Main Main Main Main Main -50 dBm Main Main Main Main Main Main	~											
LF 2.402 GHz J001 pts Span 8.0 MH Date: 20.FEB.2021 00:53:18 DH1 Ant1_2441 (************************************	-6	0 dBm—		-				+			-	
LF 2.402 GHz J001 pts Span 8.0 MH Date: 20.FEB.2021 00:53:18 DH1 Ant1_2441 (************************************												
Date: 20.FEB.2021 00:53:18 DH1 Ant1 2441 Spectrum Ref Level 20.00 dBm Offset 15.15 dB • RBW 3 MHz Count 100/100 • IPk View 10 dBm 10 dBm -20 dBm -30 dBm -60 dBm -70 dBm	-2	U dBm							2			
Date: 20.FEB.2021 00:53:18 DH1 Ant1 2441 Spectrum Ref Level 20.00 dBm Offset 15.15 dB • RBW 3 MHz Count 100/100 • IPk View 10 dBm 10 dBm -20 dBm -30 dBm -60 dBm -70 dBm												
Spectrum (r Ref Level 20.00 dBm Offset 15.15 dB • RBW 3 MHz Mode Auto Sweep Count 100/100 • IPK View • III] 1.66 dB 0 dBm • M1[1] 1.66 dB • III] -10 dBm • M1[1] 1.66 dB • III] -20 dBm • III] • III] • III] • III] -20 dBm • III] • III] • III] • III] -20 dBm • III] • III] • III] • III] -20 dBm • III] • III] • III] • III] -20 dBm • III] • III] • III] • III] -20 dBm • III] • III] • III] • III] -20 dBm • III] • III] • III] • III] -30 dBm • III] • III] • III] • III] -50 dBm • III] • III] • III] • III] -70 dBm • III] • III] • III] • III] -70 dBm • III] • IIII]												
Spectrum (r Ref Level 20.00 dBm Offset 15.15 dB • RBW 3 MHz Mode Auto Sweep Count 100/100 • IPK View • III] 1.66 dB 0 dBm • M1[1] 1.66 dB • III] -10 dBm • M1[1] 1.66 dB • III] -20 dBm • III] • III] • III] • III] -20 dBm • III] • III] • III] • III] -20 dBm • III] • III] • III] • III] -20 dBm • III] • III] • III] • III] -20 dBm • III] • III] • III] • III] -20 dBm • III] • III] • III] • III] -20 dBm • III] • III] • III] • III] -30 dBm • III] • III] • III] • III] -50 dBm • III] • III] • III] • III] -70 dBm • III] • III] • III] • III] -70 dBm • III] • IIII]												
Ref Level 20.00 dBm Offset 15.15 dB RBW 3 MHz Att 20 dB SWT 1 ms VBW 10 MHz Mode Auto Sweep Count 100/100 I ms VBW 10 MHz Mode Auto Sweep 10 dBm Mil 2.44097600 G Mil 2.44097600 G 0 dBm Mil 0 dBm 0 dBm -10 dBm Mil 0 dBm 0 dBm -20 dBm -30 dBm -40 dBm -40 dBm -40 dBm -40 dBm -40 dBm -40 dBm -50 dBm					D	H1 An	t1 24	41				
Count 100/100 PI- View 10 dBm M1[1] 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -50 dBm -60 dBm -70 dBm	ſs	pectrun	n		D	H1_An	t1_24	41			Ē	
• IPk View M1[1] 1.66 de 10 dBm M1[1] 2.44097600 c 0 dBm M1 10 dBm M1 10 dBm M1 -20 dBm -30 dBm -50 dBm -70 dBm </td <td></td> <td>Ref Leve</td> <td>1 20.00 dBm</td> <td></td> <td>L5.15 dB 🖷</td> <td>RBW 3 MH</td> <td>łz</td> <td></td> <td></td> <td></td> <td></td>		Ref Leve	1 20.00 dBm		L5.15 dB 🖷	RBW 3 MH	łz					
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10 dBm	c	Ref Leve Att count 100,	l 20.00 dBm 20 dB		L5.15 dB 🖷	RBW 3 MH	Hz Hz Mode	a Auto Sweep				
0 d8m -10 d8m -20 d8m -30 d8m -30 d8m -40 d8m -50 d8m -50 d8m -60 d8m -70 d8m -70 d8m -70 d8m -70 d8m -50 d	c	Ref Leve Att count 100,	I 20.00 dBm 20 dB		L5.15 dB 🖷	RBW 3 MH	Hz Hz Mode	a Auto Sweep		2,440	1.66 dBm	
-10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -50 dBm -60 dBm -70 dBm -70 dBm -70 dBm -70 dBm -70 dBm -70 dBm -70 dBm -70 dBm -70 dBm	C	Ref Leve Att ount 100, IPk View	I 20.00 dBm 20 dB		L5.15 dB 🖷	RBW 3 MH VBW 10 MH	Hz Hz Mode	a Auto Sweep		2.440	1.66 dBm	
-20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -60 dBm -70 dBm -70 dBm -70 dBm -70 dBm -60 dBm -70	c • 10	Ref Leve Att Count 100, IPk View	I 20.00 dBm 20 dB		L5.15 dB 🖷	RBW 3 MH VBW 10 MH	Hz Hz Mode	a Auto Sweep		2,440	1.66 dBm	
-20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -60 dBm -70 dBm -70 dBm -70 dBm -70 dBm -60 dBm -70	c • 10	Ref Leve Att Count 100, IPk View	I 20.00 dBm 20 dB		L5.15 dB 🖷	RBW 3 MH VBW 10 MH	Hz Hz Mode	a Auto Sweep		2.440	1.66 dBm	
-30 dBm -40 dBm -50 dBm -60 dBm -70	c • 10 • 0	Ref Leve Att count 100, IPk View D dBm	I 20.00 dBm 20 dB		L5.15 dB 🖷	RBW 3 MH VBW 10 MH	Hz Hz Mode	a Auto Sweep		2,440	1.66 dBm	
-40 dBm	د د 110 0 -1	Ref Leve Att Count 100, IPk View 0 dBm dBm 0 dBm	I 20.00 dBm 20 dB		L5.15 dB 🖷	RBW 3 MH VBW 10 MH	Hz Hz Mode	a Auto Sweep		2.440	1.66 dBm	
-40 dBm	د وی 11 0 -1	Ref Leve Att Count 100, IPk View 0 dBm dBm 0 dBm	I 20.00 dBm 20 dB		L5.15 dB 🖷	RBW 3 MH VBW 10 MH	Hz Hz Mode	a Auto Sweep		2.440	1.66 dBm	
-50 dBm	C 0 -1 -2	Ref Leve Att Sount 100, IPk View 0 dBm 0 dBm 0 dBm	I 20.00 dBm 20 dB		L5.15 dB 🖷	RBW 3 MH VBW 10 MH	Hz Hz Mode	a Auto Sweep		2.440	1.66 dBm	
-60 dBm	C 0 -1 -2	Ref Leve Att Sount 100, IPk View 0 dBm 0 dBm 0 dBm	I 20.00 dBm 20 dB		L5.15 dB 🖷	RBW 3 MH VBW 10 MH	Hz Hz Mode	a Auto Sweep		2.440	1.66 dBm	
-60 dBm	ر د 10 10 -1 -2 -3	Ref Leve Att Jount 100, JPK View D dBm D dBm 0 dBm	I 20.00 dBm 20 dB		L5.15 dB 🖷	RBW 3 MH VBW 10 MH	Hz Hz Mode	a Auto Sweep		2.440	1.66 dBm	
-70 dBm.	C 0 -1 -2 -3 -4	Ref Leve Att fount 100, fount 100, IPk View 0 dBm	I 20.00 dBm 20 dB		L5.15 dB 🖷	RBW 3 MH VBW 10 MH	Hz Hz Mode	a Auto Sweep		2.440	1.66 dBm	
-70 dBm.	c 0 -1 -2 -3 -4	Ref Leve Att fount 100, fount 100, IPk View 0 dBm	l 20.00 dBm 20 dB		L5.15 dB 🖷	RBW 3 MH VBW 10 MH	Hz Hz Mode	a Auto Sweep		2.440	1.66 dBm	
CF 2.441 GHz 1001 pts Span 8.0 MH	د د 10 11 10 11 10 12 12 13 14 14 15	Ref Leve Att sount 100, JPk View 0 dBm	l 20.00 dBm 20 dB		L5.15 dB 🖷	RBW 3 MH VBW 10 MH	Hz Hz Mode	a Auto Sweep		2.440	1.66 dBm	
	د د ۱۱ ۱۱ ۱۱ ۱۱ ۱۱ ۱۱ ۱۱ ۱۱ ۱۱ ۱۱ ۱۱ ۱۱	Ref Leve Att sount 100, JPk View 0 dBm	l 20.00 dBm 20 dB		L5.15 dB 🖷	RBW 3 MH VBW 10 MH	Hz Hz Mode	a Auto Sweep		2.440	1.66 dBm	
	c 0 -1 -2 -3 -4 -5 -6	Ref Leve Att Sount 100, IPk View 0 dBm 0 dBm	l 20.00 dBm 20 dB		L5.15 dB 🖷	RBW 3 MH VBW 10 MH	Hz Hz Mode	a Auto Sweep		2,440	1.66 dBm	
Date: 20.FEB.2021 00:53:29	c 0 -1 -2 -3 -4 -5 -6	Ref Leve Att Sount 100, IPk View 0 dBm 0 dBm	l 20.00 dBm 20 dB		L5.15 dB 🖷	RBW 3 MM VBW 10 MH	12 12 Mode	a Auto Sweep		2,440	1.66 dBm	
	-2 -3 -6 -7	Ref Leve Att ount 100,0001 100,0001 100,0001 100,0001 100,0001 100,0001 100,00000000	20 dB 20 dB //100		L5.15 dB 🖷	RBW 3 MM VBW 10 MH	12 12 Mode	a Auto Sweep			1.66 dBm	
	-1 -2 -3 -6 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7	Ref Leve Att ount 100,000 Band 0 dBm 0 dBm	1 20.00 dBm 20 dE /100	3 SWT	L5.15 dB 🖷	RBW 3 MM VBW 10 MH	12 12 Mode	a Auto Sweep			1.66 dBm	
	-1 -2 -3 -6 -7 -7 -7	Ref Leve Att ount 100,000 Band 0 dBm 0 dBm	1 20.00 dBm 20 dE /100	3 SWT	L5.15 dB 🖷	RBW 3 MM VBW 10 MH	12 12 Mode	a Auto Sweep			1.66 dBm	
	-1 -1 -2 -3 -4 -5 -6 -7 -7 -7	Ref Leve Att ount 100,000 Band 0 dBm 0 dBm	1 20.00 dBm 20 dE /100	3 SWT	L5.15 dB 🖷	RBW 3 MM VBW 10 MH	12 12 Mode	a Auto Sweep			1.66 dBm	
	-1 -2 -3 -6 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7 -7	Ref Leve Att ount 100,000 Band 0 dBm 0 dBm	1 20.00 dBm 20 dE /100	3 SWT	L5.15 dB 🖷	RBW 3 MM VBW 10 MH	12 12 Mode	a Auto Sweep			1.66 dBm	

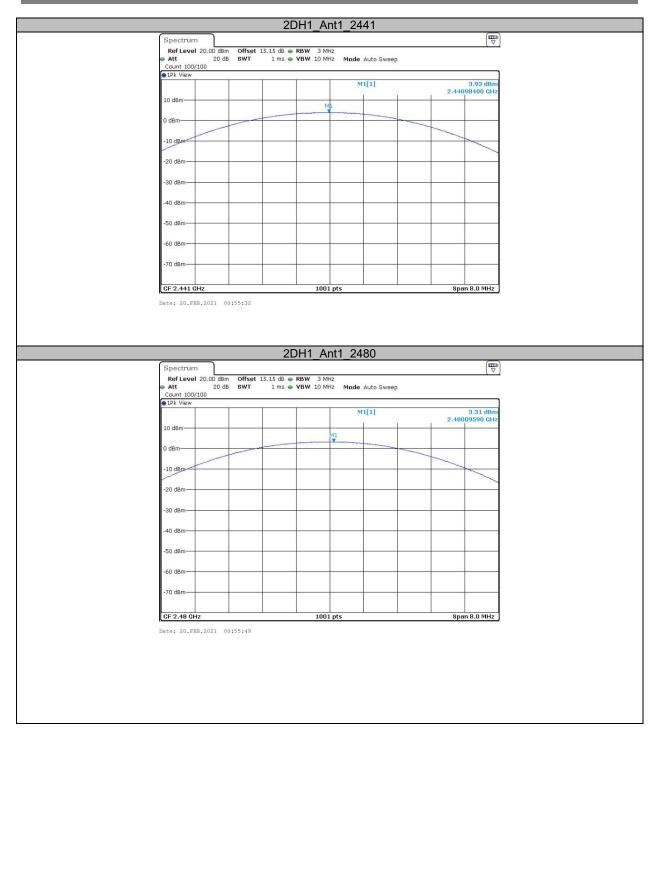
FCC Part 15.247

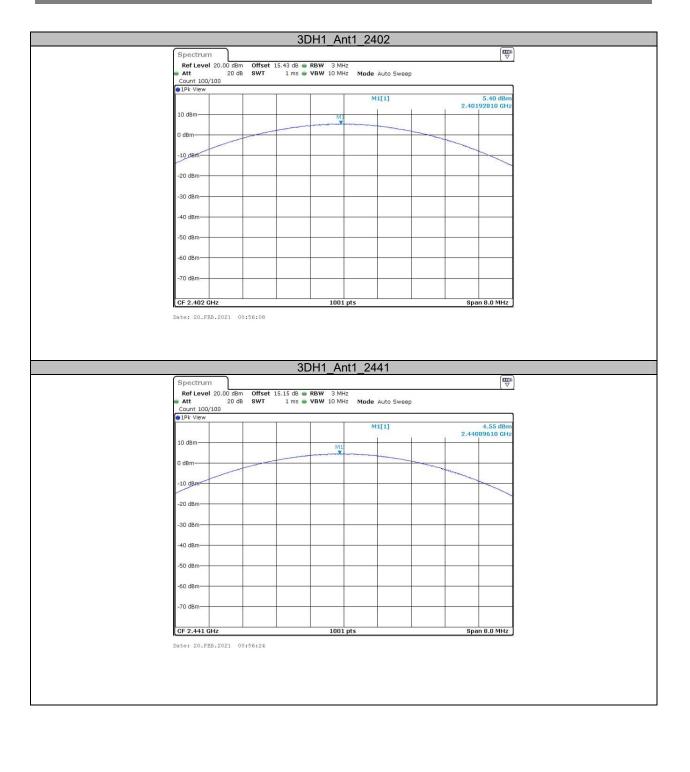
Report No.: RSZ210113830-RF-00



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3DH1_Ant1_2480	
Ref Level 20.00 dBm Offset 15.15 dB RBW 3 MHz	
Att 20 dB SWT 1 ms VBW 10 MHz Mode Auto Sweep	
Count 100/100	
IPk View	
M1[1] 3.94 dBm	
10 dBm	
ML ML	
0 dBm	
-10 dgm	
-20 dBm	
-30 dBm	
-40 dBm-	
-50 dBm	
-60 dBm	
-70 dBm	
CF 2.48 GHz 1001 pts Span 8.0 MHz	

Appendix C: Carrier frequency separation Test Result

TestMode	Antenna	Channel	Result[MHz]	Limit[MHz]	Verdict
DH1	Ant1	Нор	1.000	>=0.616	PASS
2DH1	Ant1	Нор	1.000	>=0.844	PASS
3DH1	Ant1	Нор	1.003	>=0.816	PASS

Test Graphs

)H1 Ai	nt1_Ho	ac			
Spectrur	7								
Ref Leve	1 20.00 dBn		15.15 dB 👄						(v.
Att Count 100	20 df /100	B SWT	18.9 µs 👄	VBW 300 k	Hz Mode	a Auto FFT			
⊖1Pk View	1		1	1		11[1]			1.44 dBm
144000000000000								2.44	077536 GHz
10 dBm	M1		8			02[1]		1	0.03 dB .00000 MHz
0 dBm	×		~	-		D2		-	
/	r				-	X		1	
-10 dBm-				5					5
-20 dBm				\sim					
-30 dBm		-				8			<u>.</u>
-40 dBm									
-50 dBm									
-60 dBm			-	-		-			
-70 dBm									
-70 0011									
Start 2.44	05 GHz			691	pts			Stop 2	2.4425 GHz
			· //	א 1 וות	nt1 H	on			
				DU1 A	m+1 ∐	<u>0</u> 2			
Spectrur			21	DH1_A	.nt1_H	ор			Ē
	1 20.00 dBn	n Offset	15.15 dB 🖷	RBW 100 k	Hz				(The second seco
Ref Leve Att Count 100	l 20.00 dBn 20 dB	n Offset 3 SWT		RBW 100 k	Hz				
Ref Leve Att	l 20.00 dBn 20 dB	n Offset 3 SWT	15.15 dB 🖷	RBW 100 k	Hz Hz Mode	e Auto FFT			
Ref Leve Att Count 100 1Pk View	l 20.00 dBn 20 dB	n Offset 3 SWT	15.15 dB 🖷	RBW 100 k	KHZ KHZ Mode	9 Auto FFT		2.44	1.34 dBm 077826 GHz
Ref Leve Att Count 100	1 20.00 dBn 20 dB /100	n Offset 3 SWT	15.15 dB 🖷	RBW 100 k	KHZ KHZ Mode	9 Auto FFT 11[1] 02[1]			1.34 dBm
Ref Leve Att Count 100 1Pk View	l 20.00 dBn 20 dB	n Offset 3 SWT	15.15 dB 🖷	RBW 100 k	KHZ KHZ Mode	9 Auto FFT	+		1.34 dBm 077826 GHz 0.03 dB
Ref Leve Att Count 100 PPk View 10 dBm 0 dBm	1 20.00 dBn 20 dB /100	n Offset 3 SWT	15.15 dB 🖷	RBW 100 k	KHZ KHZ Mode	9 Auto FFT 11[1] 02[1]			1.34 dBm 077826 GHz 0.03 dB
Ref Leve Att Count 100 PR View 10 dBm	1 20.00 dBn 20 dB /100	n Offset 3 SWT	15.15 dB 🖷	RBW 100 k	KHZ KHZ Mode	9 Auto FFT 11[1] 02[1]			1.34 dBm 077826 GHz 0.03 dB
Ref Leve Att Count 100 PPk View 10 dBm 0 dBm	1 20.00 dBn 20 dB /100	n Offset 3 swT	15.15 dB 🖷	RBW 100 k	KHZ KHZ Mode	9 Auto FFT 11[1] 02[1]			1.34 dBm 077826 GHz 0.03 dB
Ref Leve Att Count 100 1Pk View 10 dBm 0 dBm -10 dBm -20 dBm	1 20.00 dBn 20 dB /100	n Offset 3 swT	15.15 dB 🖷	RBW 100 k	KHZ KHZ Mode	9 Auto FFT 11[1] 02[1]			1.34 dBm 077826 GHz 0.03 dB
Ref Leve Att Count 100 1Pk View 10 dBm- -10 dBm-	1 20.00 dBn 20 dB /100	n Offset 3 SWT	15.15 dB 🖷	RBW 100 k	KHZ KHZ Mode	9 Auto FFT 11[1] 02[1]			1.34 dBm 077826 GHz 0.03 dB
Ref Leve Att Count 100 1Pk View 10 dBm 0 dBm -10 dBm -20 dBm	1 20.00 dBn 20 dB /100	n Offset	15.15 dB 🖷	RBW 100 k	KHZ KHZ Mode	9 Auto FFT 11[1] 02[1]			1.34 dBm 077826 GHz 0.03 dB
Ref Leve Att Count 100 1Pk View 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm	1 20.00 dBn 20 dB /100	n Offset 3 SWT	15.15 dB 🖷	RBW 100 k	KHZ KHZ Mode	9 Auto FFT 11[1] 02[1]			1.34 dBm 077826 GHz 0.03 dB
Ref Leva Att Count 100 10 dBm- 0 dBm- -10 dBm- -20 dBm- -30 dBm- -40 dBm- -50 dBm-	1 20.00 dBn 20 dB /100	n Offset 3 SWT	15.15 dB 🖷	RBW 100 k	KHZ KHZ Mode	9 Auto FFT 11[1] 02[1]			1.34 dBm 077826 GHz 0.03 dB
Ref Leve Att Count 100 1Pk View 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm	1 20.00 dBn 20 dB /100	n Offset 3 SWT	15.15 dB 🖷	RBW 100 k	KHZ KHZ Mode	9 Auto FFT 11[1] 02[1]			1.34 dBm 077826 GHz 0.03 dB
Ref Leva Att Count 100 10 dBm- 0 dBm- -10 dBm- -20 dBm- -30 dBm- -40 dBm- -50 dBm-	1 20.00 dBn 20 dB /100	n Offset 3 SWT	15.15 dB 🖷	RBW 100 k	KHZ KHZ Mode	9 Auto FFT 11[1] 02[1]			1.34 dBm 077826 GHz 0.03 dB
Ref Leve Att Count 100 1Pk View 10 dBm 0 dBm -20 dBm -30 dBm -40 dBm -50 dBm	1 20.00 dBn 20 dB /100	n Offset 3 SWT	15.15 dB 🖷	RBW 100 k	KHZ KHZ Mode	9 Auto FFT 11[1] 02[1]			1.34 dBm 077826 GHz 0.03 dB
Ref Leve Att Count 100 1Pk View 10 dBm 0 dBm -20 dBm -30 dBm -40 dBm -50 dBm	1 20.00 dBn 20 dt //100	n Offset	15.15 dB 🖷	RBW 100 k	KHZ KHZ Mode	9 Auto FFT 11[1] 02[1]			1.34 dBm 077826 GHz 0.03 dB
Ref Leve Att Count 100 1Pk View 10 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -60 dBm -70 dBm	05 GHz	3 SWT	15.15 dB 🖷	RBW 100 k	HZ Mode	9 Auto FFT 11[1] 02[1]			1.34 dBm 077826 GHz 0.03 dB .00000 MHz
Ref Leve Att Count 100 1Pk View 10 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -50 dBm -50 dBm -50 dBm Start 2.44	05 GHz	3 SWT	15.15 dB 🖷	RBW 100 k	HZ Mode	9 Auto FFT 11[1] 02[1]			1.34 dBm 077826 GHz 0.03 dB .00000 MHz
Ref Leve Att Count 100 1Pk View 10 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -50 dBm -50 dBm -50 dBm Start 2.44	05 GHz	3 SWT	15.15 dB 🖷	RBW 100 k	HZ Mode	9 Auto FFT 11[1] 02[1]			1.34 dBm 077826 GHz 0.03 dB .00000 MHz
Ref Leve Att Count 100 1Pk View 10 dBm -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm -50 dBm -50 dBm -50 dBm Start 2.44	05 GHz	3 SWT	15.15 dB 🖷	RBW 100 k	HZ Mode	9 Auto FFT 11[1] 02[1]			1.34 dBm 077826 GHz 0.03 dB .00000 MHz

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Spectrun					1
👄 Att	20 dB SWT 1	.15 dB 👄 RBW 100 ki 8.9 μs 👄 VBW 300 ki		X	-
Count 100/	100				ı
			M1[1]	1.43 dBm 2.44077536 GHz	
10 dBm	M1		D2[1]	0.03 dB 1.00290 MHz	
0 dBm	-		02		-
-10 dBm-]
-10 0.611					
-20 dBm					
-30 dBm					
-40 dBm					
-50 dBm					
-60 dBm					
-70 dBm					-
Start 2.440	5 GHz	691	pts	Stop 2.4425 GHz	l

Appendix D: Time of occupancy Test Result

TestMode	Antenna	Channel	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Нор	0.39	320	0.126	<=0.4	PASS
DH3	Ant1	Нор	1.64	140	0.230	<=0.4	PASS
DH5	Ant1	Нор	2.88	110	0.317	<=0.4	PASS
2DH1	Ant1	Нор	0.40	330	0.132	<=0.4	PASS
2DH3	Ant1	Нор	1.65	140	0.231	<=0.4	PASS
2DH5	Ant1	Нор	2.89	120	0.346	<=0.4	PASS
3DH1	Ant1	Нор	0.40	320	0.129	<=0.4	PASS
3DH3	Ant1	Нор	1.65	170	0.281	<=0.4	PASS
3DH5	Ant1	Нор	2.89	100	0.289	<=0.4	PASS

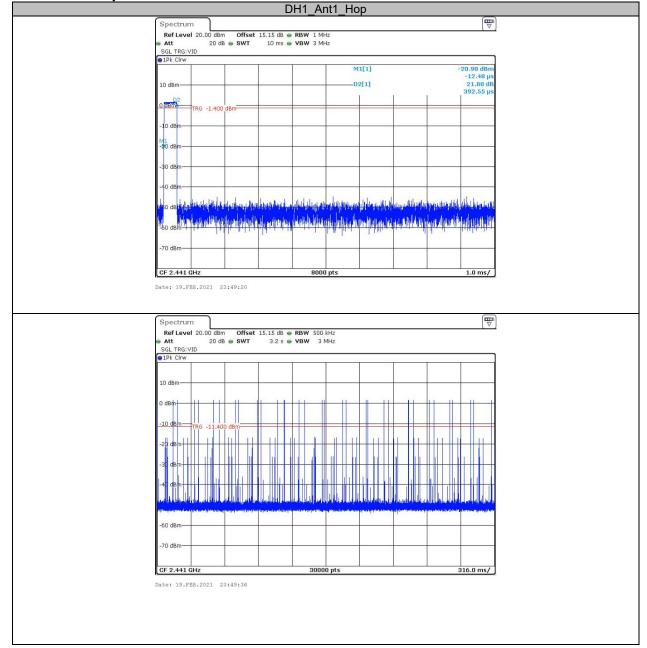
Note 1: A period time=0.4*79=31.6(S), Result=BurstWidth*Totalhops

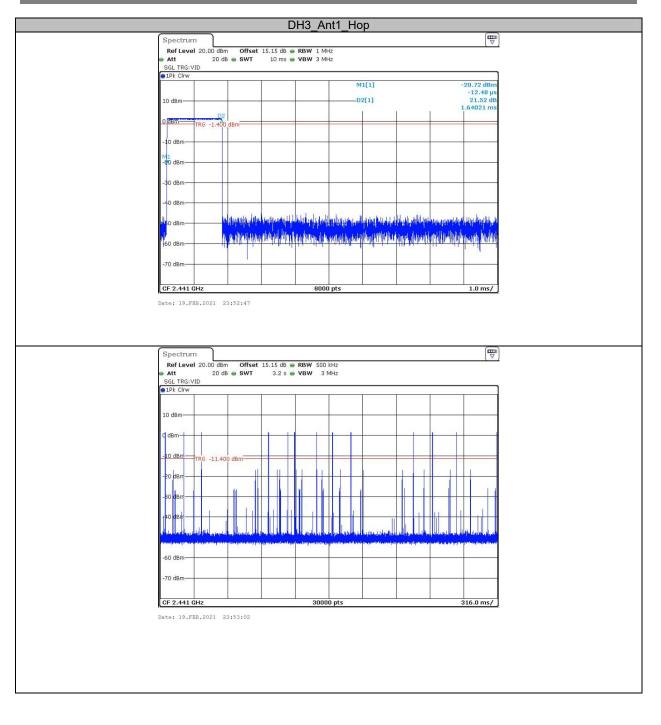
Note 2: Totalhops=Hopping Number in 3.16s*10

Note 3: Hopping Number in 3.16s=Total of highest signals in 3.16s(Second high signals were other channel)

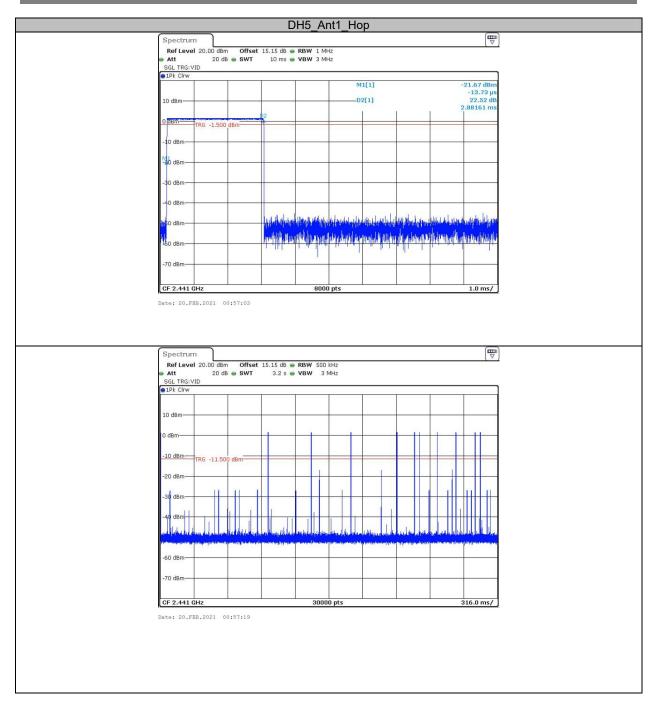
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Test Graphs





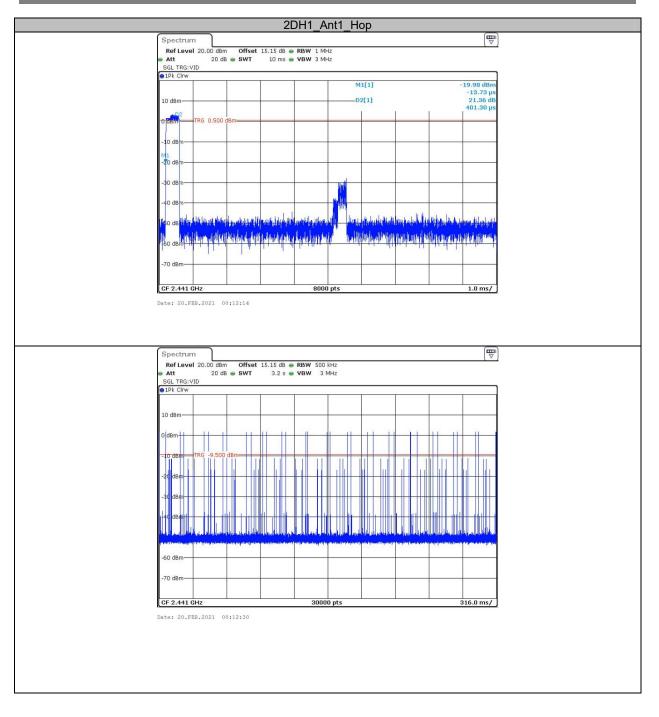
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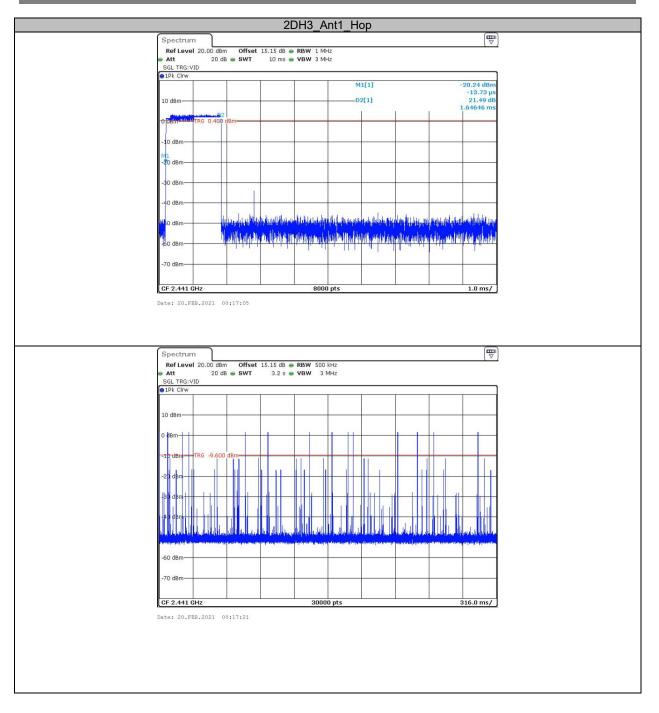
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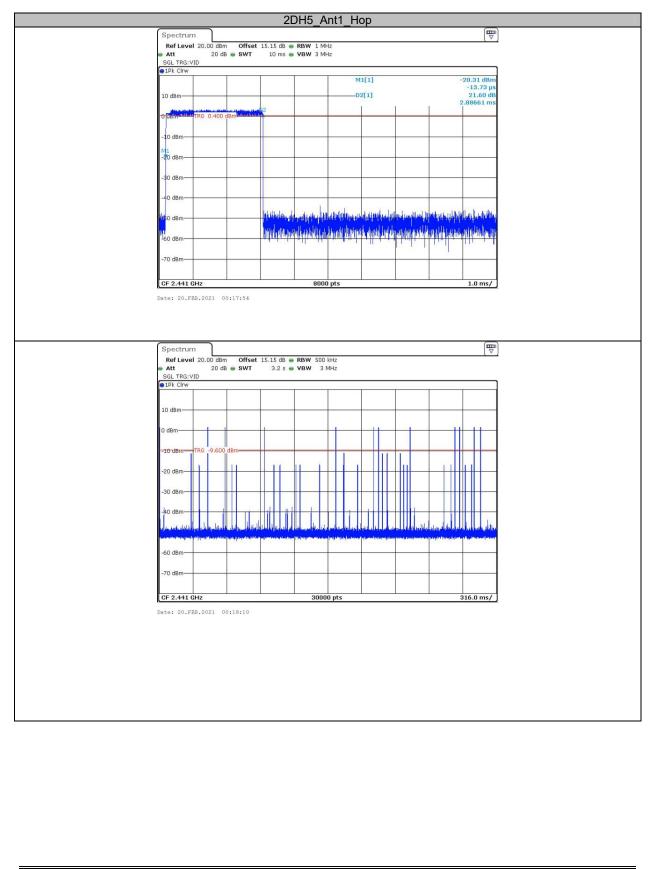
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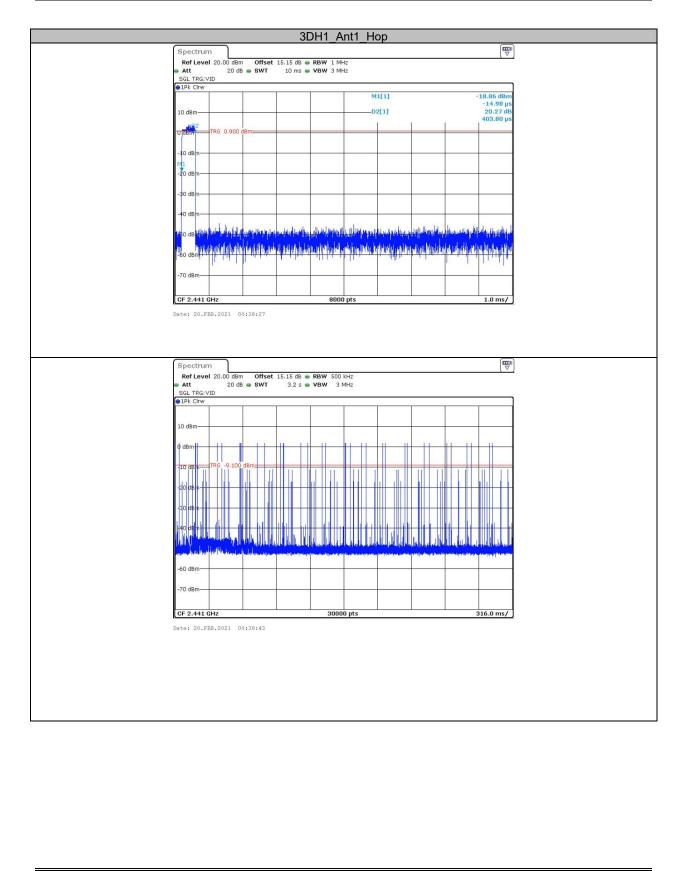


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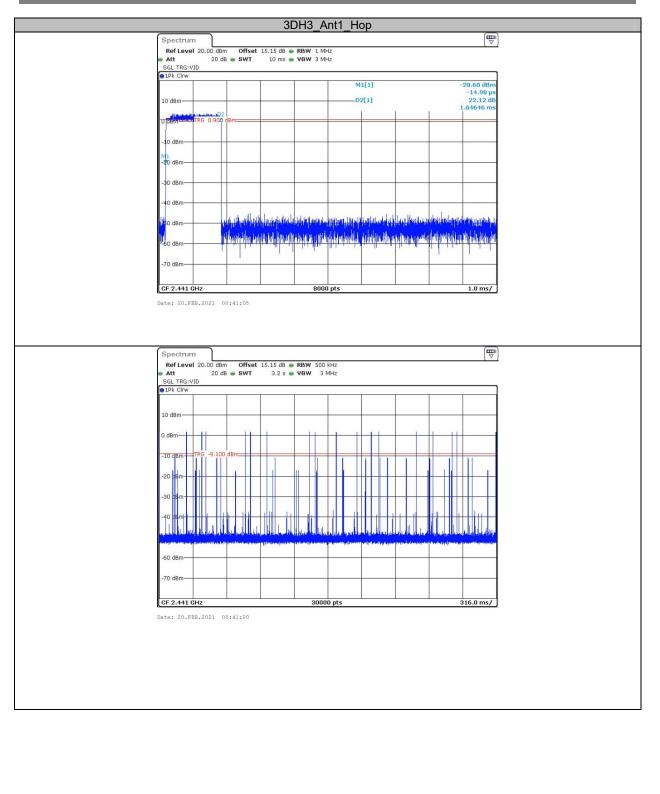


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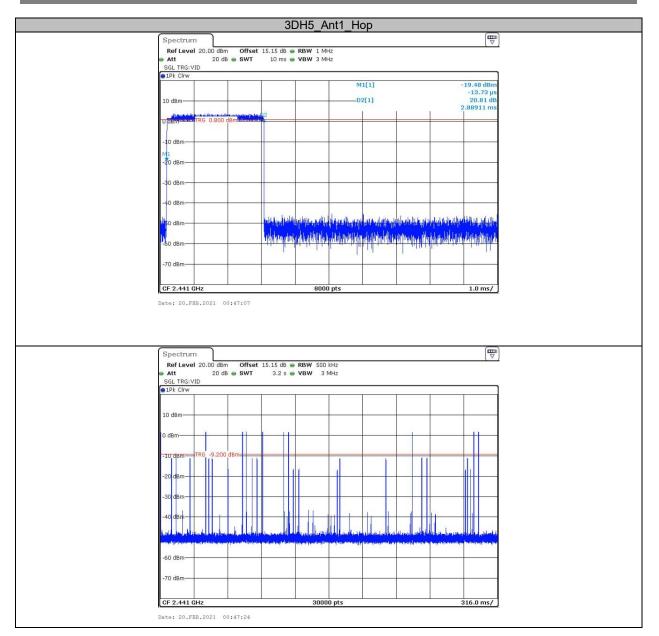


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Appendix E: Number of hopping channels Test Result

TestMode	Antenna	Channel	Result[Num]	Limit[Num]	Verdict
DH1	Ant1	Нор	79	>=15	PASS
2DH1	Ant1	Нор	79	>=15	PASS
3DH1	Ant1	Нор	79	>=15	PASS

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Test Graphs

Test Graphs			DH1_Ant1_	Hon				
	Spectrum			пор			(q	₩
	RefLevel 20.00 dBm Att 20 dB	Offset 15.43 dB SWT 1 ms	RBW 100 kHz VBW 300 kHz M	ode Auto Swe	ар			<u>· ·)</u>
	●1Pk View						1	
	10 dBm							_
	o REALANDAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA				DUBBARORD			
				W.A. (A)			111	
	-1 € ₽₩₩ ₽₽₩₩₩₩₩₩		<u>Hannann</u>	<u>authauthau</u> t				_
	-20 dBm							_
	-30 dBm							
	40 dBm							
	-50 dBm							Ъ
	-60 dBm							_
	-70 dBm		-					_
	Start 2.4 GHz		691 pts			Ston 2	.4835 GH	z
	Date: 19.FEB.2021 2	3:49:09	652 pts			0.00 2		
		2	DH1_Ant1_	Нор				
	Spectrum						9	
	Ref Level 20.00 dBm Att 20 dB	o Offset 15.43 dB SWT 1 ms	 RBW 100 kHz VBW 300 kHz 	ode Auto Swe	эр			_
	●1Pk View							_
	10 dBm							_
	o, REALTANTIA AND A DE LA COMPANYA	AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	ANANAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	ARAARAAAAA		AAAAAAAA	ANNAN	_
	-10 dBm		0440.0440.0400.040		AAAAAAAAA	148048888	NAMAA	
	-20 dBm							_
	-30 dBm							_
	40 dBm							_
	-50 dBm							
	-60 dBm							v.
	-70 dBm			C				_
	Start 2.4 GHz		691 pts			Stop 2	.4835 GH	z
	Date: 20.FEB.2021 0	0:12:03						

 Spectrum
Ref Level 20.00 dBm Offset 15.43 dB RBW 100 kHz Att 20 dB SWT 1 ms VBW 300 kHz Mode Auto Sweep
10 View
10 dBm
- LADIT LURAL DATA DE LA DE
 เพิ่มการการการการการการการการการการการการการก
-10 dBm
-20 dBm
-30 dBm
40 dBm
-50 dBm
-60 dBm-
-70 dBm
Start 2.4 GHz 691 pts Stop 2.4835 GHz

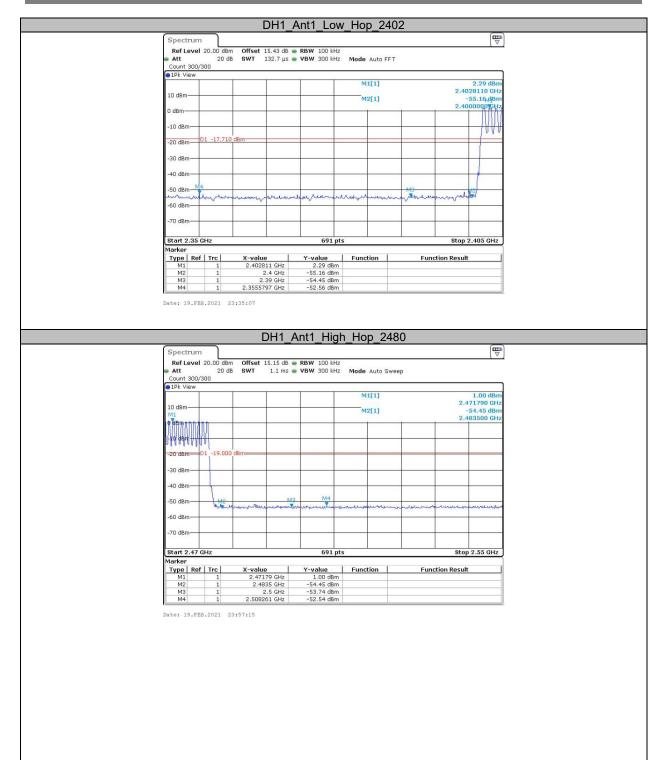
Appendix F:Band edge measurements Test Graphs

DH1_Ant1_Low_2402
Spectrum 🕎
Ref Level 20.00 dBm Offset 15.43 dB RBW 100 kHz
Count 300/300
1Pk View MIT11 2 20 dbm
M1[1] 2.29 dBm 2.4017760 GHz
10 08m M2[1] -50,83 dBm 2 40000m CH2
0 dBm
-10 dBm-
-20 dBm D1 -17.710 dBm
-30 dBm
-40 dBm
-50 dBm M3
60 dBm and me warm from mary war and the man the ward and the second the seco
-70 dBm
Start 2.35 GHz 691 pts Stap 2.405 GHz
Marker
Type Ref Trc X-value Y-value Function Function Result M1 1 2.401776 GHz 2.29 dBm
M2 1 2.4 GHz -50.33 dBm M3 1 2.39 GHz -56.09 dBm
M4 1 2.3987029 GHz -49.63 dBm
Date: 19.FEB.2021 22:53:32
DH1_Ant1_High_2480
Spectrum 🕎
Ref Level 20.00 dBm Offset 15.15 dB RBW 100 kHz Att 20 dB SWT 1.1 ms VBW 300 kHz Mode Auto Sweep
Count 300/300
PIk View M1[1] 0.85 dBm
10 d0m 2.479780 GHz
M1 2483500 GHz
0 dBm
-10 dBm
-20 dBm 01 -19.150 dBm
-30 dBm
-40 dBm
-50 dBm 192 194 M2
-60 dBm
-70 dBm
Start 2.47 GHz 691 pts Stop 2.55 GHz
Marker Type Ref Trc X-value Y-value Function Function Result
M1 1 2.47978 GHz 0.85 dBm
M2 1 2.4835 GHz ~55.06 dBm M3 1 2.5 GHz ~54.49 dBm
M4 1 2.494812 GHz -52.68 dBm
Date: 19.FEB.2021 23:06:07

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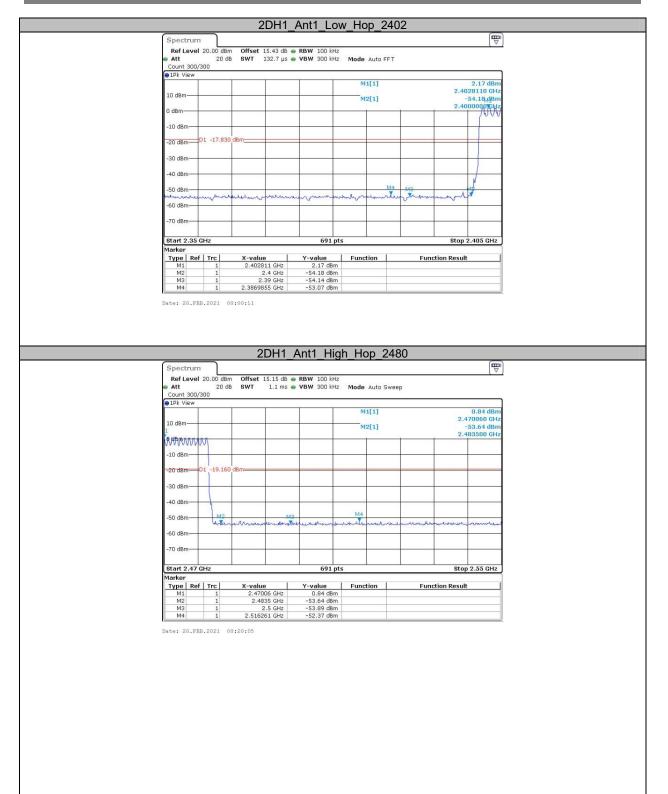
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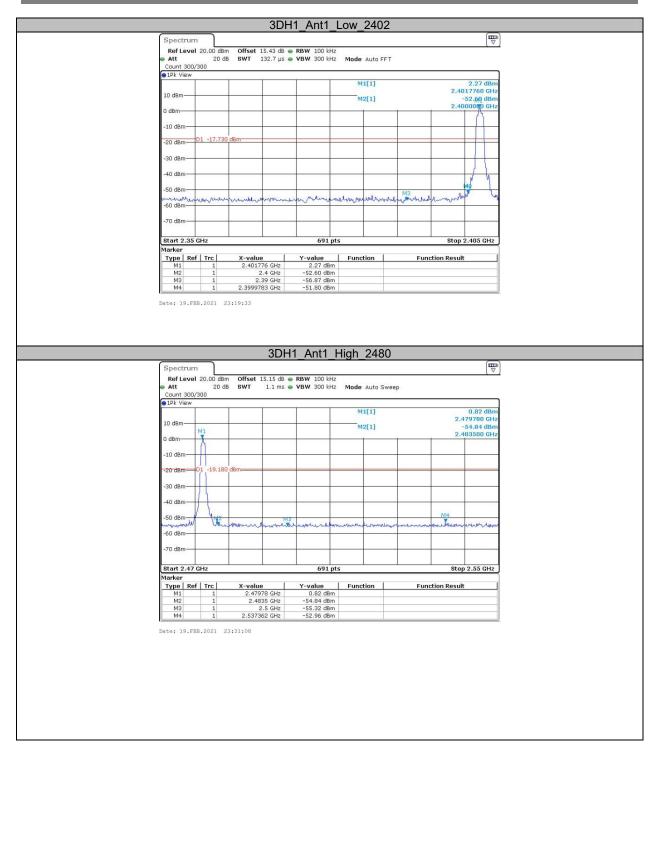


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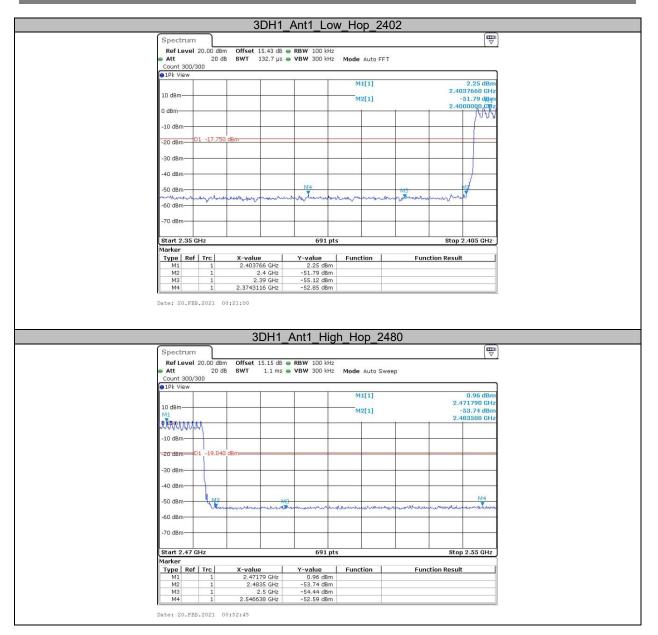
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