



# **TEST REPORT**

Applicant Name :	ShenZhen Lami Technology Co. Ltd
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	Dalang St., Longhua Dist. Shenzhen, Guangdong China
Report Number :	SZNS210913-47770E-RF
FCC ID:	2A29C-L1

Test Standard (s) FCC PART 15.247

## **Sample Description**

Product:	Game Controller
Tested Model:	L1 pro
Trademark:	/
Date Received:	2021-09-13
Date of Test:	2022-02-28 to 2022-03-09
Report Date:	2022-03-11

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

Pass\*

# Prepared and Checked By:

Test Result:

Ting Lü EMC Engineer

**Approved By:** 

Candy . Li

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 <sup>1\*\*</sup>. Customer model name, addresses, names, trademarks etc. are not considered data.

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#### Shenzhen Accurate Technology Co., Ltd.

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FCC-BT

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# **GENERAL INFORMATION**

#### Product Description for Equipment under Test (EUT)

Product	Game Controller
Tested Model	L1 pro
Frequency Range	Bluetooth: 2402~2480MHz
Maximum conducted Peak output power	Bluetooth: 1.81dBm
Modulation Technique	Bluetooth: GFSK, $\pi/4$ -DQPSK, 8DPSK
Antenna Specification*	Internal Antenna: -0.58dBi(provided by the applicant)
Voltage Range	DC 3.7V from battery or DC 5V from USB port
Sample number	SZNS1220222-05348E-RF-S1 (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 Commission 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.

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.

#### **Measurement Uncertainty**

Parameter		Uncertainty		
Occupied Channel Bandwidth		5%		
RF output power, conducted		0.73dB		
Unwanted Emission, conducted		1.6dB		
AC Power Lines Conducted Emissions		2.72dB		
<b>.</b>	30MHz - 1GHz	4.28dB		
Emissions, Radiated	1GHz - 18GHz	4.98dB		
	18GHz - 26.5GHz	5.06dB		
Temperature		1 °C		
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.

Listed by Innovation, Science and Economic Development Canada (ISEDC), 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**

Software "FCC\_assist\_1.0.2.2"\* was used during testing and the power level was Default Power level 10\*.

## **Special Accessories**

No special accessory.

## **Equipment Modifications**

No modification was made to the EUT tested.

# **Support Equipment List and Details**

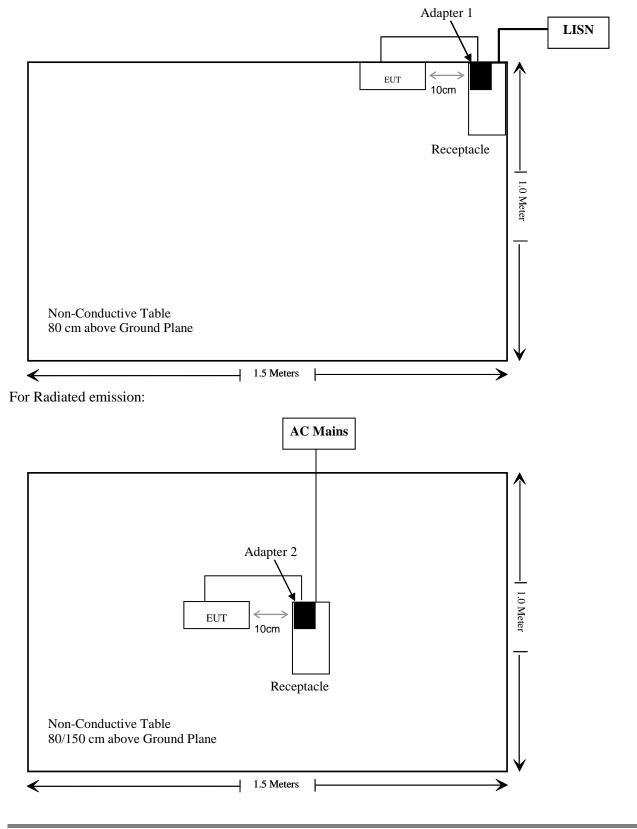
Manufacturer	Description	Model	Serial Number	
SHENZHEN KEYU POWER SUPPLY TECHNOLOGY CO.,LTD	Adapter 1	KA1803A-US	2045	
W&T	Adapter 2	W&T-AD1806a050120UU	Unknown	

# External I/O Cable

Cable Description	Length (m)	From Port	То	
Unshielded Detachable USB Cable	1.2	Adapter 1/2	EUT	

## **Block Diagram of Test Setup**

For conducted emission:



# **SUMMARY OF TEST RESULTS**

FCC Rules	Description of Test	Result	
FCC§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 & 99% Occupied 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	Model Serial Number		Calibration Due Date			
Conducted Emissions Test								
Rohde & Schwarz	EMI Test Receiver	ESCI	100784	2021/12/13	2022/12/12			
R & S	L.I.S.N.	ENV216	101314	2021/12/13	2022/12/12			
Anritsu Corp	50 Coaxial Switch	MP59B	6100237248	2021/12/13	2022/12/12			
Unknown	RF Coaxial Cable	No.17	N0350	2021/12/14	2022/12/13			
		Radiated Emissi	ons 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-184055 36-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			
Wainwright	High Pass Filter	WHKX3.6/18 G-10SS	5	2021/12/14	2022/12/13			
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			
		RF Conducted	d Test					
Rohde & Schwarz	Spectrum Analyzer	FSV-40	101495	2021/12/13	2022/12/12			
Rohde & Schwarz	Open Switch and Control Unit	OSP120 + OSP-B157	101244 + 100866	2021/12/13	2022/12/12			
WEINSCHEL	10dB Attenuator	5324	AU 3842	2021/12/14	2022/12/13			
Unknown	RF Coaxial Cable	No.32	RF-02	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) (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  $\le 7.5$  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.

#### **Test Result:**

Worst case for this handheld device:

Mode Frequency		Maximum Tune-up power		Calculated Distance	Calculated	Threshold (10-g	SAR Test
Mode	(MHz)	(dBm)	( <b>mW</b> )	(mm)	Value	extremity SAR)	Exclusion
Bluetooth	2402-2480	2	1.58	5	0.5	7.5	Yes

**Result:** Compliant.

# 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 one internal PCB antenna arrangement for Bluetooth, which was permanently attached and the antenna gain is -0.58dBi, fulfill the requirement of this section. Please refer to the EUT photos.

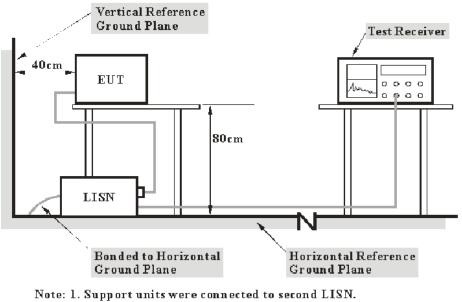
Result: Compliant.

# FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

## **Applicable Standard**

FCC §15.207(a)

## **EUT Setup**



Solver 1. Support units were connected to second LISN.
 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.

#### **Factor & Margin Calculation**

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

Factor = LISN VDF + Cable Loss

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

Over Limit = Level – Limit Level = Read Level + Factor

#### **Test Data**

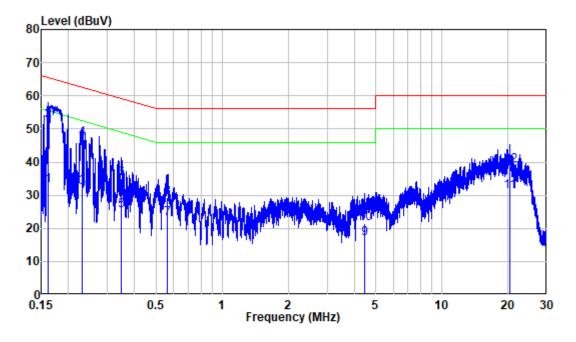
#### **Environmental Conditions**

Temperature:	23 °C
<b>Relative Humidity:</b>	53 %
ATM Pressure:	101.3 kPa

The testing was performed by Caro Hu on 2022-03-09.

EUT operation mode: Charging+BT Transmitting

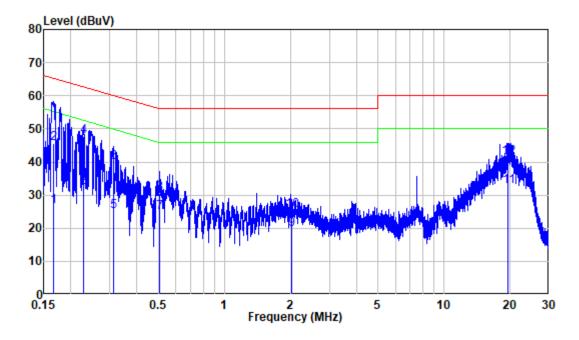
# AC 120V/60 Hz, Line



Site	:	Shielding Room
Condition	:	Line
Mode	:	Charging+Type C Connected
Model	:	L1 pro

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.161	9.87	23.15	33.02	55.39	-22.37	Average
2	0.161	9.87	42.81	52.68	65.39	-12.71	QP
3	0.231	9.80	22.52	32.32	52.43	-20.11	Average
4	0.231	9.80	37.22	47.02	62.43	-15.41	QP
5	0.347	9.80	15.65	25.45	49.04	-23.59	Average
6	0.347	9.80	25.25	35.05	59.04	-23.99	QP
7	0.565	9.81	13.04	22.85	46.00	-23.15	Average
8	0.565	9.81	19.58	29.39	56.00	-26.61	QP
9	4.463	9.96	6.80	16.76	46.00	-29.24	Average
10	4.463	9.96	11.42	21.38	56.00	-34.62	QP
11	20.283	10.21	20.86	31.07	50.00	-18.93	Average
12	20.283	10.21	28.72	38.93	60.00	-21.07	QP

# AC 120V/60 Hz, Neutral



Site	:	Shielding Room
Condition	:	Neutral
Mode	:	Charging+Type C Connected
Model	:	L1 pro

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.166	9.80	16.82	26.62	55.14	-28.52	Average
2	0.166	9.80	35.73	45.53	65.14	-19.61	QP
3	0.228	9.80	22.39	32.19	52.52	-20.33	Average
4	0.228	9.80	37.93	47.73	62.52	-14.79	QP
5	0.312	9.80	15.27	25.07	49.91	-24.84	Average
6	0.312	9.80	30.13	39.93	59.91	-19.98	QP
7	0.508	9.80	14.93	24.73	46.00	-21.27	Average
8	0.508	9.80	20.81	30.61	56.00	-25.39	QP
9	2.025	9.82	9.91	19.73	46.00	-26.27	Average
10	2.025	9.82	15.57	25.39	56.00	-30.61	QP
11	19.557	10.10	22.60	32.70	50.00	-17.30	Average
12	19.557	10.10	31.23	41.33	60.00	-18.67	QP

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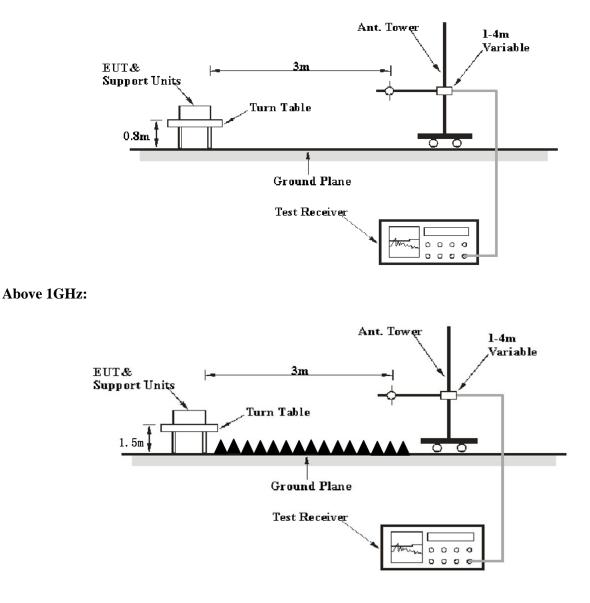
# FCC §15.205, §15.209 & §15.247(d) – RADIATED EMISSIONS

#### **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

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

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

## **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:	19 °C~22°C
<b>Relative Humidity:</b>	54 %~56 %
ATM Pressure:	101.0~101.2 kPa

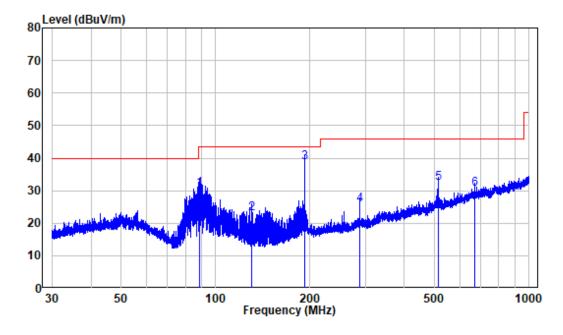
The testing was performed by Chao Mo from 2022-2-28 to 2022-3-1.

*EUT operation mode: Charging + BT Transmitting* 

(Scan with GFSK,  $\pi/4$ -DQPSK, 8DPSK mode at X axis, Y axis, Z axis, the worst case is 8DPSK Mode at X axis)

## **30MHz-1GHz: 8DPSK Low channel (Worst case)**

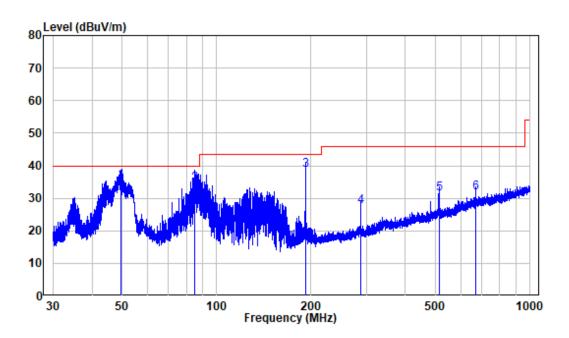
#### Horizontal:



Site :	chamber
Condition:	3m HORIZONTAL
Job No. :	SZNS210913-47770E-RF
Test Mode:	BT Transmitting

	Freq	Factor			Limit Line		Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	88.691	-14.38	44.85	30.47	43.50	-13.03	QP
2	129.923	-14.89	37.85	22.96	43.50	-20.54	QP
3	192.082	-11.25	49.86	38.61	43.50	-4.89	QP
4	288.117	-9.36	35.16	25.80	46.00	-20.20	QP
5	512.060	-4.27	36.52	32.25	46.00	-13.75	QP
6	671.960	-1.64	32.02	30.38	46.00	-15.62	QP





Site : chamber Condition: 3m VERTICAL Job No. : SZNS210913-47770E-RF Test Mode: BT Transmitting

	Freq	Factor			Limit Line		Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	49.511	-9.93	45.25	35.32	40.00	-4.68	QP
2	85.335	-15.49	50.02	34.53	40.00	-5.47	QP
3	192.082	-11.25	49.87	38.62	43.50	-4.88	QP
4	288.117	-9.36	36.77	27.41	46.00	-18.59	QP
5	512.060	-4.27	35.76	31.49	46.00	-14.51	QP
6	671.960	-1.64	33.29	31.65	46.00	-14.35	QP

#### Above 1GHz (Worst case)

Frequency	Receiver		Turntable Rx An		itenna	Factor	Absolute	Limit	Margin
(MHz)	Reading (dBuV)	PK/AV	Angle Degree Height Polor (dB/m		( <b>dB</b> / <b>m</b> )	Level (dBuV/m)	(dBuV/m)	(dB)	
			]	BT 3DH1, Lo	w Channel				
2310	44.91	РК	43	1.8	Н	-7.23	37.68	74	-36.32
2310	44.36	РК	259	2.0	V	-7.23	37.13	74	-36.87
2390	64.87	РК	259	2.0	Н	-7.21	57.66	74	-16.34
2390	56.98	AV	259	2.0	Н	-7.21	49.77	54	-4.23
2390	57.84	РК	221	1.5	V	-7.21	50.63	74	-23.37
4804	57.4	РК	246	1.9	Н	-3.52	53.88	74	-20.12
4804	59.17	РК	25	1.7	V	-3.52	55.65	74	-18.35
4804	50.94	AV	25	1.7	V	-3.52	47.42	54	-6.58
			B	T 3DH1, Mic	ldle Channel		•		
4882	57.81	РК	72	1.5	Н	-3.37	54.44	74	-19.56
4882	50.88	AV	72	1.5	Н	-3.37	47.51	54	-6.49
4882	59.68	РК	266	1.3	V	-3.37	56.31	74	-17.69
4882	52.01	AV	266	1.3	V	-3.37	48.64	54	-5.36
			I	3T 3DH1, Hi	gh Channel				
2483.5	51.35	РК	317	1.2	Н	-7.2	44.15	74	-29.85
2483.5	46.62	РК	210	1.6	V	-7.2	39.42	74	-34.58
2500	48.78	РК	172	1.1	Н	-7.18	41.6	74	-32.4
2500	45.98	РК	292	1.2	V	-7.18	38.8	74	-35.2
4960	59.8	РК	231	1.2	Н	-3.01	56.79	74	-17.21
4960	52.16	AV	231	1.2	Н	-3.01	49.15	54	-4.85
4960	60.08	РК	252	1.4	V	-3.01	57.07	74	-16.93
4960	53.5	AV	252	1.4	V	-3.01	50.49	54	-3.51

#### Note:

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

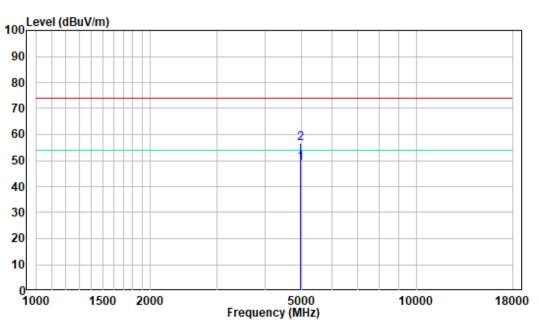
Corrected Amplitude = Corrected Factor + Reading Margin = Corrected Amplitude – Limit

The other spurious emission which is in the noise floor level was not recorded.

The test result of peak was 20dB below to the limit of peak, which can be compliant to the average limit, so just peak value was recorded.

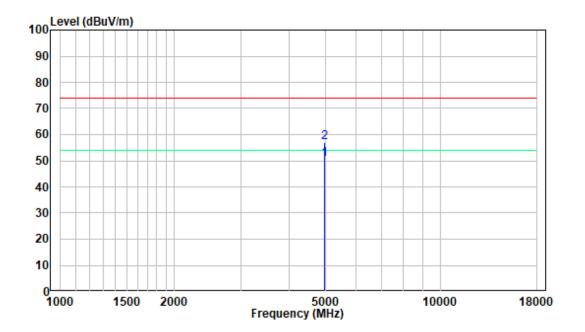
#### 1-18GHz

#### **Pre-scan plots:**



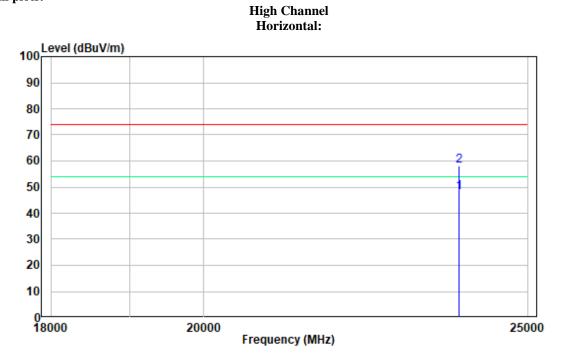
High Channel Horizontal:

#### Vertical:

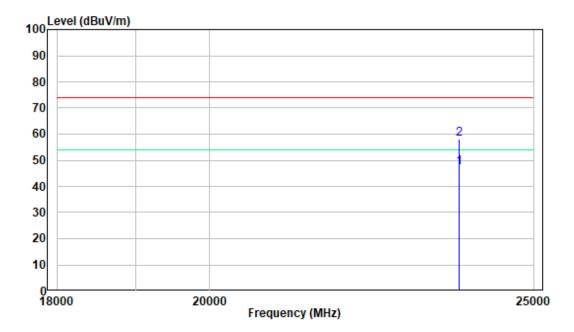


#### 18-25GHz

#### **Pre-scan plots:**



Vertical:



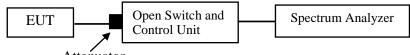
# FCC §15.247(a) (1)-CHANNEL SEPARATION TEST

## 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.



Attenuator

#### **Test Data**

#### **Environmental Conditions**

Temperature:	19 °C	
<b>Relative Humidity:</b>	48 %	
ATM Pressure:	101.2 kPa	

The testing was performed by Key Pei on 2022-03-02.

EUT operation mode: Transmitting

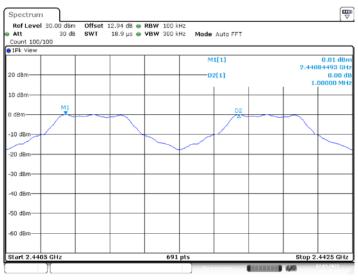
Test Result: Compliant.

Test Mode	Antenna	Channel	Result[MHz]	Limit[MHz]	Verdict
DH1	Ant1	Hop	1	>=0.562	PASS
2DH1	Ant1	Нор	1	>=0.808	PASS
3DH1	Ant1	Нор	1	>=0.804	PASS

Note: Limit=2/3\*20dB Emission Bandwidth

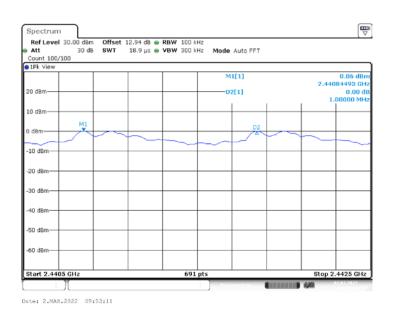
Please refer to the below plots:





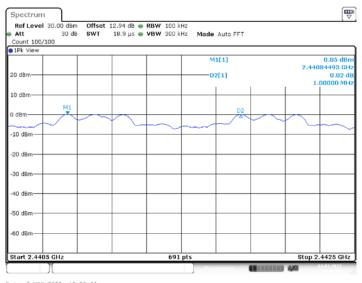
Date: 2.MAR.2022 09:43:26

2DH1\_Ant1\_Hop



Version 11: 2021-11-09

3DH1\_Ant1\_Hop



Date: 2.MAR.2022 10:00:44

# FCC §15.247(a) (1) – 20 dB EMISSION BANDWIDTH & 99% OCCUPIED 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**

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.

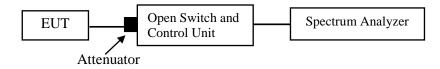
• The span of the spectrum analyzer shall be set large enough to capture all products of the modulation process, including the emission skirts, around the carrier frequency, but small enough to avoid having other emissions (e.g. on adjacent channels) within the span.

• 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:	19 °C	
<b>Relative Humidity:</b>	48 %	
ATM Pressure:	101.2 kPa	

The testing was performed by Key Pei on 2022-03-02.

EUT operation mode: Transmitting

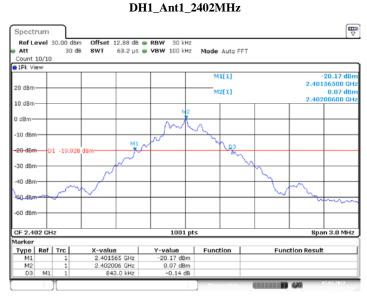
Test Result: Compliant.

Test Mode	Antenna	Channel[MHz]	20db EBW[MHz]	Limit[MHz]	Verdict
	Ant1	2402	0.843		PASS
DH1		2441	0.843		PASS
		2480	0.843		PASS
2DH1	Ant1	2402	1.209		PASS
		2441	1.212		PASS
		2480	1.209		PASS
3DH1	Ant1	2402	1.203		PASS
		2441	1.206		PASS
		2480	1.203		PASS

Test Mode	Antenna	Channel[MHz]	99% Occupied Bandwidth [MHz]	Limit[MHz]	Verdict
	Ant1	2402	0.815		PASS
DH1		2441	0.812		PASS
		2480	0.818		PASS
2DH1	Ant1	2402	1.163		PASS
		2441	1.160		PASS
		2480	1.166		PASS
3DH1	Ant1	2402	1.142		PASS
		2441	1.142		PASS
		2480	1.142		PASS

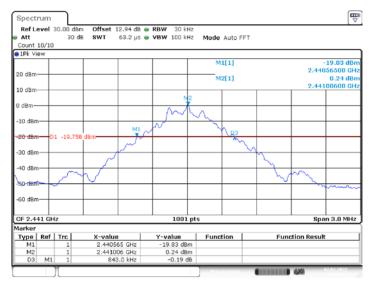
Please refer to the below plots:

#### 20 dB EMISSION BANDWIDTH



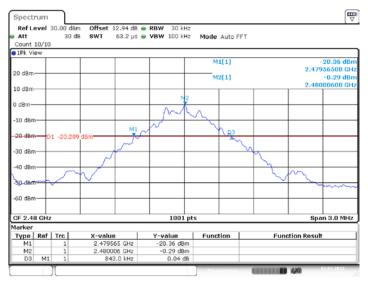
Date: 2.MAR.2022 08:56:53

#### DH1\_Ant1\_2441MHz



Date: 2.MAR.2022 08:59:04

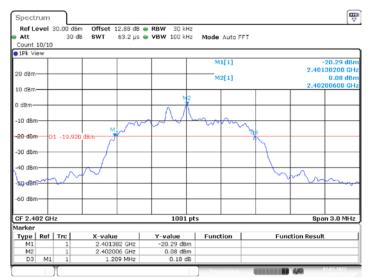
#### Version 11: 2021-11-09



#### DH1\_Ant1\_2480MHz

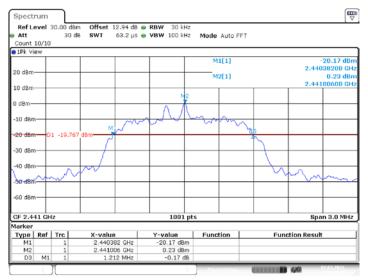
Date: 2.MAR.2022 08:59:57

#### 2DH1\_Ant1\_2402MHz



Date: 2.MAR.2022 09:01:24

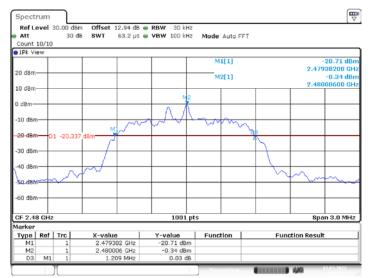
Version 11: 2021-11-09



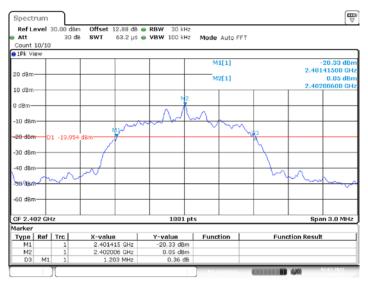
#### 2DH1\_Ant1\_2441MHz

Date: 2.MAR.2022 09:02:44

#### 2DH1\_Ant1\_2480MHz



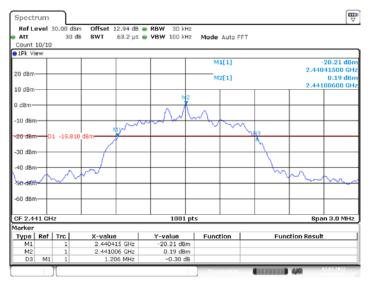
Date: 2.MAR.2022 09:03:38



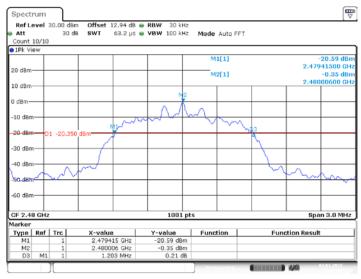
#### 3DH1\_Ant1\_2402MHz

Date: 2.MAR.2022 09:05:57

#### 3DH1\_Ant1\_2441MHz



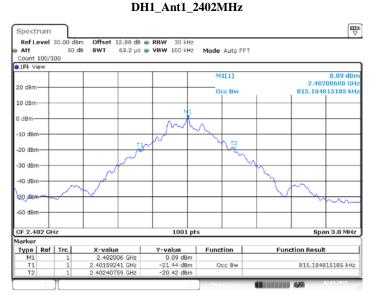
Date: 2.MAR.2022 09:07:26



#### 3DH1\_Ant1\_2480MHz

Date: 2.MAR.2022 09:10:07

#### 99% OCCUPIED BANDWIDTH

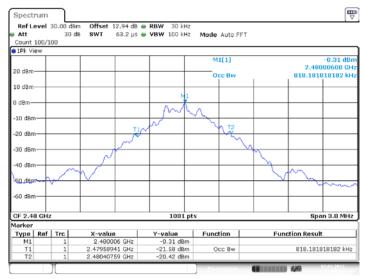


Date: 2.MAR.2022 08:57:10

#### DH1\_Ant1\_2441MHz



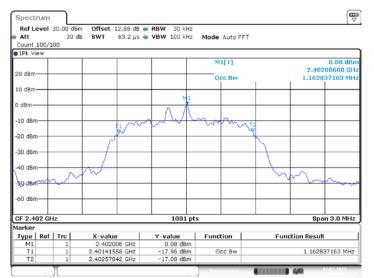
Date: 2.MAR.2022 08:59:21



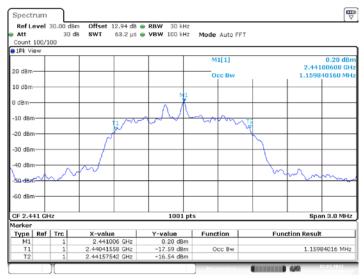
#### DH1\_Ant1\_2480MHz

Date: 2.MAR.2022 09:00:13

#### 2DH1\_Ant1\_2402MHz



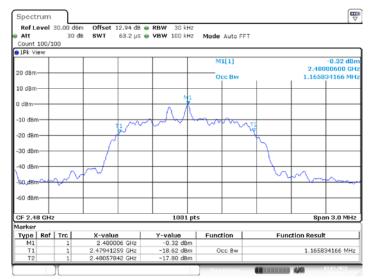
Date: 2.MAR.2022 09:01:41



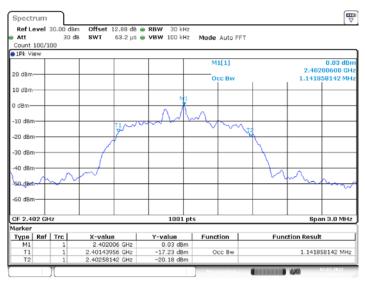
#### 2DH1\_Ant1\_2441MHz

Date: 2.MAR.2022 09:03:00

#### 2DH1\_Ant1\_2480MHz



Date: 2.MAR.2022 09:03:55



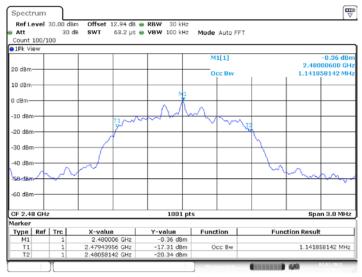
#### 3DH1\_Ant1\_2402MHz

Date: 2.MAR.2022 09:06:14

#### 3DH1\_Ant1\_2441MHz

Spectrur Ref Leve	1 30.00 di	Bm Offset 12,94 dB	RBW 30 kHz			
Att	30		VBW 100 kHz	Mode Auto FF	т	
Count 100	/100					
1Pk View						
				M1[1]		0.18 dBr
20 dBm						2.44100600 GH
				Occ Bw		1.141858142 MH
10 dBm						
			M1			
0 dBm						
				$\sim$		
-10 dBm—		11~~~	And the la	·· \/ \~~		
-20 dBm-		8		•	1	
-20 ubiii					~	
-30 dBm						
-40 dBm-					-	
	$h_{n}$				1 ~~	hr ah
59 d8m	1.4		+			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
-60 dBm-						
-60 dBm-						
CF 2.441	GHz		1001 pt	s		Span 3.0 MHz
larker	1 - 1					
Type Re		X-value	Y-value	Function	Fund	ction Result
M1 T1	1	2.441006 GHz 2.44043956 GHz	0.18 dBm -16.80 dBm	Occ Bw		1.141858142 MHz
T2	1	2.44158142 GHz	-19.29 dBm	000 84		A: ATA000142 MIT2
	NC					ALM 02.02.2022

Date: 2.MAR.2022 09:09:01



#### 3DH1\_Ant1\_2480MHz

Date: 2.MAR.2022 09:10:24

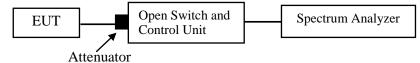
# FCC §15.247(a) (1) (iii)-QUANTITY OF HOPPING CHANNEL TEST

### **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:	19 °C
<b>Relative Humidity:</b>	48 %
ATM Pressure:	101.2 kPa

The testing was performed by Key Pei on 2022-03-02.

EUT operation mode: Transmitting

Test Result: Compliant.

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

Ref Level 3 Att	30.00 dBm 30 dB		12.88 dB 🖷	RBW 100   VBW 300		Auto Curre	_		
1Pk View	30 06	3111	1 ms 🖷	VBW 3001	mode	Auto Swee	9		
0 dBm									
0 dBm									
<b>ABRAADA</b>			NINDANDO	ABAADAAZ	harres.	LIKKALN	ALLAD LA C		14.580
NIA IA IA.	UBHA	INAMA	MUTAR	MUNUU	URMURA.	UNATROT	MIRAN	NUM	111,044
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and all h	Manad	AdlAntar	ALLOLAN	Lealled.	an a lot a ta	n mand and	Indika	and hours	n a k k k (
20 dBm									
30 dBm									
									- L
40 dBm									N
									יי
50 dBm									
50 dBm									
tart 2.4 GH	z			691	pts			Stop 2.	4835 GHz

DH1\_Ant1\_Hop

Date: 2.MAR.2022 09:43:54

#### 2DH1\_Ant1\_Hop

Ref Level Att	30.00 dBm 30 dB		12.88 dB	RBW 100 k VBW 300 k		Auto Swee	n		
1Pk View	00.00	0					*	-	
0 dBm									
0 dBm									
CREAT AND	MMM	MAMM	www		MAAAAAA		anana	ANAANAA	MAN
l0 dBm						0.0.0408	184-1444	VIVIV	
20 dBm			-						
30 dBm									
40 dBm									L
50 dBm									
NO GOAL									
50 dBm									
			1	1	1	1	1	1	1

Date: 2.MAR.2022 09:53:52

Ref Level : Att	30 de		12.88 dB 👄 1 ms 👄				Auto Swee	p		
1Pk View										
20 dBm										
10 dBm				<u> </u>						
dam-										
ANNANIA.	MADAGA	NUMMU.	MMMU	<b>MU</b>	ЛЛ	NIAMA	IMMAN	MIMAN	DARAMAN	UAMA
0 dBm	DALADA.	40.00.00	4140.004		- frai	- 40 40 404	88.80.00	1 A . 10 M D /		*****
20 dBm				<u> </u>						
30 dBm										
40 dBm										
NO GOM										V
-50 dBm				<u> </u>						
-60 dBm				-						
Start 2.4 GH	z				691	pts			Stop 2.	4835 GHz

#### 3DH1\_Ant1\_Hop

Version 11: 2021-11-09

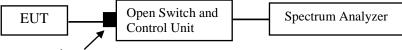
# FCC §15.247(a) (1) (iii) - TIME OF OCCUPANCY (DWELL TIME)

### **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×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



Attenuator

### **Test Data**

### **Environmental Conditions**

Temperature:	19 °C
<b>Relative Humidity:</b>	48 %
ATM Pressure:	101.2 kPa

The testing was performed by Key Pei on 2022-03-02.

#### EUT operation mode: Transmitting

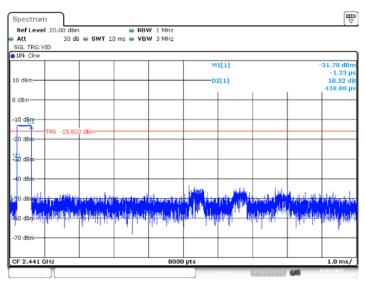
Test Result: Compliant.

Test Mode	Antenna	Channel	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Нор	0.42	330	0.138	<=0.4	PASS
DH3	Ant1	Нор	1.67	170	0.283	<=0.4	PASS
DH5	Ant1	Нор	2.91	90	0.262	<=0.4	PASS
2DH1	Ant1	Нор	0.43	320	0.137	<=0.4	PASS
2DH3	Ant1	Нор	1.67	170	0.284	<=0.4	PASS
2DH5	Ant1	Нор	2.91	130	0.379	<=0.4	PASS
3DH1	Ant1	Нор	0.43	330	0.142	<=0.4	PASS
3DH3	Ant1	Нор	1.67	180	0.301	<=0.4	PASS
3DH5	Ant1	Нор	2.92	110	0.321	<=0.4	PASS

Note 1: A period time=0.4\*79=31.6(S), Result=Burst Width\*Total Hops

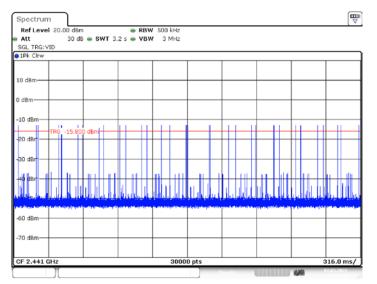
Note 2: Total Hops =Hopping Number in 3.16s\*10

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

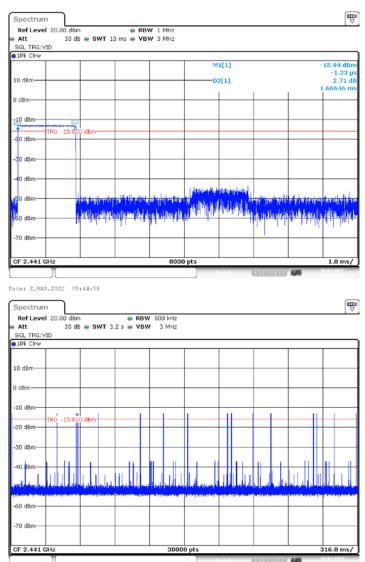


DH1\_Ant1\_Hop

Date: 2.MAR.2022 09:44:12



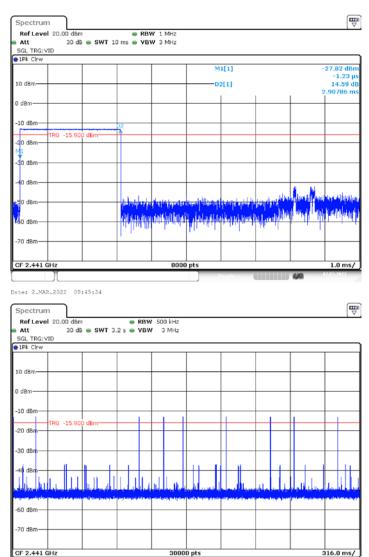
Date: 2.MAR.2022 09:44:18



DH3\_Ant1\_Hop

Date: 2.MAR.2022 09:45:03

Version 11: 2021-11-09

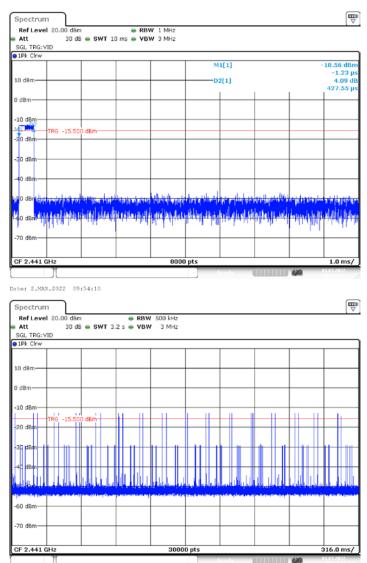


DH5\_Ant1\_Hop

Date: 2.MAR.2022 09:45:39

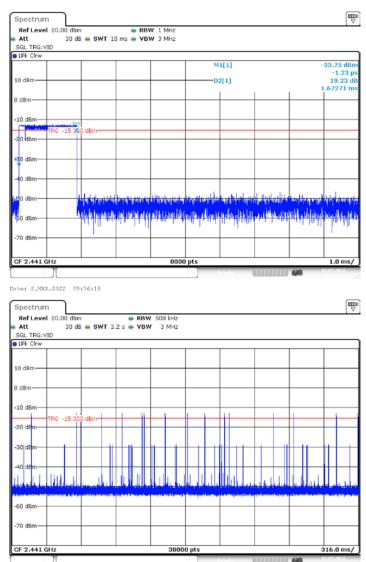
Version 11: 2021-11-09

430



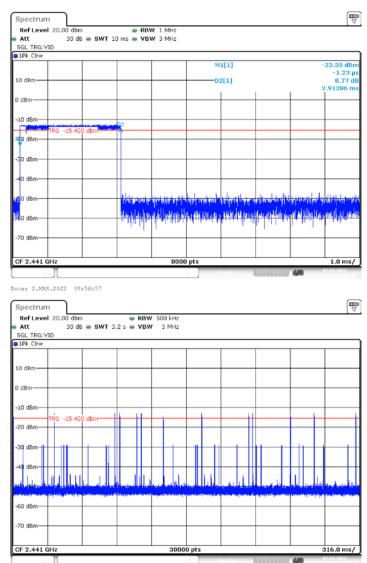
#### 2DH1\_Ant1\_Hop

Date: 2.MAR.2022 09:54:15



2DH3\_Ant1\_Hop

Date: 2.MAR.2022 09:56:24



2DH5\_Ant1\_Hop

Date: 2.MAR.2022 09:58:10

Att 30	m 18 👄 SWT 10	ms 👄 VBV	N 3 MHz					
SGL TRG:VID 1Pk Clrw								
JIPK CIFW				м	1[1]			-21.21 dB
10 dBm								-1.23 μ
10 dBm				0	2[1]			7.07 d 428.80 µ
0 dBm								
-10 dBm TRG -14.9								
-50 dBm	UU dBm							
-30 dBm	+ +							
-40 dBm								
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60 dBm	utist hits a	a falition of	line inter	1. satisfies	anni an	1.1.1.114	and the second second	<b>Andred</b> A
-70 dBm							1	·
/ 0 00111								1
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	0:01:34		8000	pts	teady.		4,40	1.0 ms/
ate: 2.MAR.2022 1	0:01:34		8000	i pts	leady.		dijKli	02.63.2622
ate: 2.MAR.2022 1		e RBW		pts	teady.		ujili	1.0 ms/
Ate: 2.MAR.2022 1 Spectrum Ref Level 20.00 de Att 30			500 kHz	pts	teady.		1000	02.63.2622
Ate: 2.MAR.2022 1 Spectrum Ref Level 20.00 dB Att 30 0 SGL TRG:VID	m		500 kHz	pts	leady.		ujan -	02.63.2622
Ate: 2.MAR.2022 1 Spectrum Ref Level 20.00 dB Att 30 0 SGL TRG:VID	m		500 kHz	pts	leady.		uper	02.63.2622
Att: 2,MAR,2022 1 Spectrum Ref Level 20.00 df Att 30 1 SGL TRG:VID 1Pk Clrw	m		500 kHz	pts	te aify		الكترك 	02.63.2622
Ate: 2.MAR.2022 1 Spectrum Ref Level 20.00 d Att 30 i SGL TRG:VID 10 dBm	m		500 kHz	pts	ieady.		6/6)	02.63.2622
Ate: 2.MAR.2022 1 Spectrum Ref Level 20.00 d Att 30 i SGL TRG:VID 10 dBm	m		500 kHz	pts			4,451	02.63.2622
Ate: 2.MAR.2022 1 Spectrum Ref Level 20.00 db Att SGL TRG:VID D1Pk Clrw 0 dBm 0 dBm 0 dBm	m		500 kHz	pts			4,49	02.63.2622
Ate: 2.MAR.2022 1 Spectrum Ref Level 20.00 de Att 30 i SGL TRG:VID IPk Clrw 0 dBm10 dBm	m		500 kHz	pts			656	02.63.2622
Ate: 2.MAR.2022 1 Spectrum Ref Level 20.00 de Att 30 i SGL TRG:VID 10 dBm 0 dBm -10 dB	m JB • SWT 3.2		500 kHz	pts				02.63.2622
Ate: 2.MAR.2022 1 Spectrum Ref Level 20.00 db Att SGL TRG:VID D1Pk Cirw 10 dBm -10 dBm -20 dBm	m JB • SWT 3.2		500 kHz	pts				02.63.2622
Ate: 2.MAR.2022 1 Spectrum Ref Level 20.00 d Att 30 i SGL TRG:VID 10 dBm 10 dBm 10 dBm 10 dBm 10 dBm 10 dBm	m JB • SWT 3.2		500 kHz	pts				02.63.2622
Ate: 2.MAR.2022 1 Spectrum Ref Level 20.00 db Att SGL TRG:VID D1Pk Cirw 10 dBm -10 dBm -20 dBm	m JB • SWT 3.2		500 kHz	pts				02.03.2022
Ate: 2.MAR.2022 1 Spectrum Ref Level 20.00 dB Att 30 ( SGL TRG: VID IPk Chw 10 dBm 0 dBm -10 dBm -30 d	m JB • SWT 3.2		500 kHz	pts				02.03.2022
Ate: 2.MAR.2022 1 Spectrum RefLevel 20.00 dB Other SGL TRG:VID IPk Chw O dBm O dBm O dBm -10 dBm -30 d	m JB • SWT 3.2		500 kHz	pts				02.03.2022
Att 30 / SGL TRG:VID     IPK Clrw     I0 dBm     O dBm     TRG -14.9     -30 #Bm     I0 dBm     I0	m JB • SWT 3.2		500 kHz	pts				02.03.2022

30000 pts

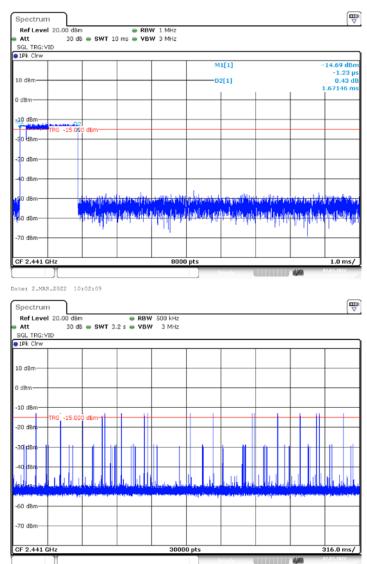
316.0 ms/

#### 3DH1\_Ant1\_Hop

Version 11: 2021-11-09

CF 2.441 GHz

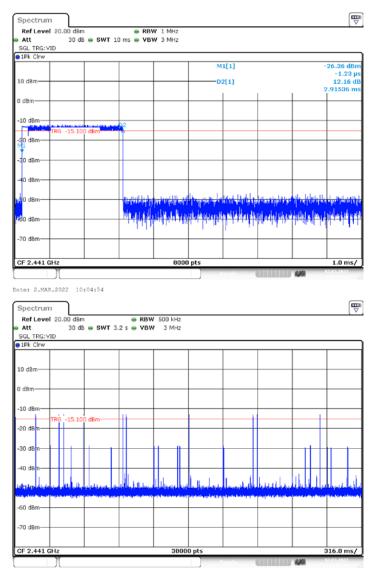
Date: 2.MAR.2022 10:01:39



#### 3DH3\_Ant1\_Hop

Date: 2.MAR.2022 10:02:14

Version 11: 2021-11-09



#### 3DH5\_Ant1\_Hop

Date: 2.MAR.2022 10:04:59

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

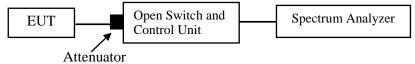
### Applicable Standard

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:	19 °C
<b>Relative Humidity:</b>	48 %
ATM Pressure:	101.2 kPa

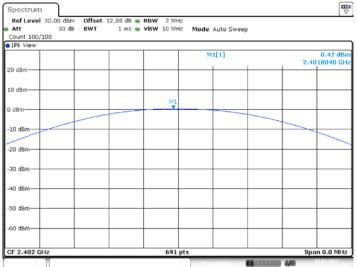
The testing was performed by Key Pei on 2022-03-02.

EUT operation mode: Transmitting

Test Result: Compliant.

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
		2402	0.42	<=20.97	PASS
DH1	Ant1	2441	0.61	<=20.97	PASS
		2480	0.04	<=20.97	PASS
		2402	1.16	<=20.97	PASS
2DH1	Ant1	2441	1.28	<=20.97	PASS
		2480	0.7	<=20.97	PASS
		2402	1.67	<=20.97	PASS
3DH1	Ant1	2441	1.81	<=20.97	PASS
		2480	1.25	<=20.97	PASS

#### DH1\_Ant1\_2402



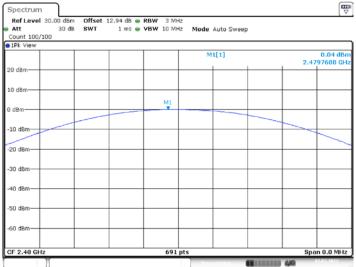
Date: 2.MAR.2022 08:52:49

#### DH1\_Ant1\_2441

Att Count 100/100	30 dB 8WT	1 ms 🖕 🗸	BW 10 MHz M	ode Auto Sweep	,	
1Pk View				M1[1]		0.61 dB 2.4408730 GH
20 dBm						
10 dBm						
0 dBm			M1 ¥			
-10 dBm						
-20 dBm						
-30 dBm						
-40 dBm						
-50 dBm						

Date: 2.MAR.2022 08:53:11

#### DH1\_Ant1\_2480



Date: 2.MAR.2022 08:53:31

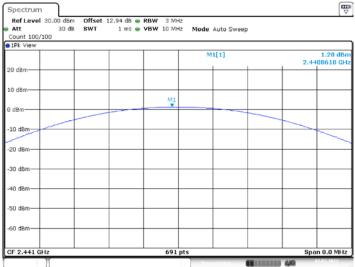
#### 2DH1\_Ant1\_2402

Count 100/100 IPk View		Mode Auto Swe	
		M1[1]	 1.16 dB 2.4018840 G
20 dBm			
10 dBm			 
) dBm-	 M1		
-10 dBm			
20 dBm			
30 dBm			
40 dBm			
50 dBm			
60 dBm			
CF 2.402 GHz	691 pt	s	 Span 8.0 MF

Date: 2.MAR.2022 08:53:55

Version 11: 2021-11-09

### 2DH1\_Ant1\_2441



Date: 2.MAR.2022 08:54:17

#### 2DH1\_Ant1\_2480

Count 100/100 1Pk View					
			M1[1]	2.47	0.70 dE 799310 G
20 dBm					
10 dBm		 		 	
) dBm		M3			
10 dBm					
20 dBm					
30 dBm					
40 dBm	-				
50 dBm	_			 	
60 dBm					

Date: 2.MAR.2022 08:54:34

#### 3DH1\_Ant1\_2402 Spectrum 1.67 dBm 2.4020000 GHz M1[1] 20 dBm 10 dBm 0 dBm--10 dBm--20 dBm -30 dBm -40 dBm -50 dBm -60 dBm CF 2.402 GHz Span 8.0 MHz 691 pts A20

Date: 2.MAR.2022 08:54:54

#### 3DH1\_Ant1\_2441

Ref Level 30.00 d Att 30 Count 100/100		12.94 dB 👄 1 ms 👄	RBW 3 MHz VBW 10 MHz		Auto Sweep	)		
1Pk View								
				м	1[1]			1.81 dBi 09420 GH
20 dBm	_					-	2.44	109420 GH
10 dBm								<u> </u>
0 dBm			M1					
u dem	-							
-10 dBm	-							
-20 dBm								
-30 dBm								
-50 0611								
-40 dBm								<u> </u>
-50 dBm								
-60 dBm								
oo dom								
CF 2.441 GHz			691 p					n 8.0 MHa

Date: 2.MAR.2022 08:55:18

#### 3DH1\_Ant1\_2480 Spectrum Ref Level 30.00 dBm Offset 12.94 dB RBW 3 MHz Att 30 dB SWT 1 ms VBW 10 MHz Node Auto Sweep Count 100/100 IPk View Image 1.25 dBn 2.4800350 GHa M1[1] 20 dBrr 10 dBm 0 dBm--10 dBm--20 dBm -30 dBm -40 dBm -50 dBm -60 dBm Span 8.0 MHz CF 2.48 GHz 691 pts 420

Date: 2.MAR.2022 08:55:38

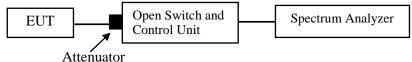
# FCC §15.247(d) - BAND EDGES TESTING

### 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:	19 °C
<b>Relative Humidity:</b>	48 %
ATM Pressure:	101.2 kPa

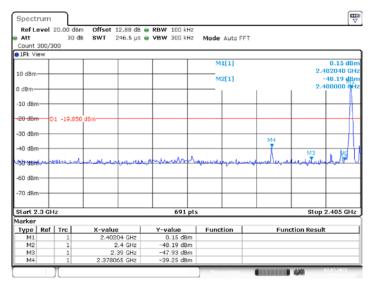
The testing was performed by Key Pei on 2022-03-02.

EUT operation mode: Transmitting

Test Result: Compliant.

### **Conducted Band Edge Result:**

#### DH1\_Ant1\_Low\_2402MHz

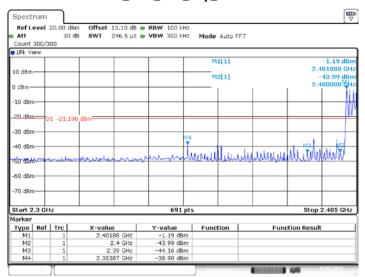


Date: 2.MAR.2022 08:57:25

#### DH1\_Ant1\_High\_2480MHz

Ref Le	vel 20.0	0 dBm	Offset 12	.94 dB 🧉	RBW 100 kHz					-
Att		30 dB	SWT	1.1 ms 🦷	VBW 300 kHz	Mode Au	to Sweep			
Count :	300/300									
■1Pk Vie	ew									
						M1[1	1		-0.21	dBn
10 dBm·							-		2.480010	GH
TO OBILI-	M1					M2[1	1		-38.90	dBr
0 dBm—	M1								2.483500	GH
o dom										
-10 dBm					+					
	- 1 8									
20 dBm	-01 -2	0.210	dBm-		+ +					
					1 1					
-30 dBm		M2			M4					
40 d0m		NT I		MS	7					
-40 dBm	with the	Mu	Summer sha	dramate	more lemons and	monull	man	hoursells	manships	, may
-50 dBm	<b></b>									
					1 1					
-60 dBm		-			++					
					1 1					
-70 dBm		-			+ +					
Start 2	.47 GHz				691 p	ts			Stop 2.55	GHz
1arker										
Type	Ref   Tro	:	X-value		Y-value	Function	n	Functio	in Result	
M1		1	2.48001	GHz	-0.21 dBm					
M2		1	2.4835		-38.90 dBm					
M3 M4		1		GHz	-44.29 dBm					
		1	2.503971		-36.84 dBm					

Date: 2.MAR.2022 09:00:29



#### DH1\_Ant1\_Low\_Hop\_2402MHz

Date: 2.MAR.2022 09:39:41

#### DH1\_Ant1\_High\_Hop\_2480MHz

Pofle	um	20.00 dBm	Offect	12 04 dB	<b>RBW</b> 100 kHz			
Att	ver 2	20.00 dem 30 de			VBW 300 kHz		Sween	
Count 3	ann/ar			1.1 10.5	FBR 500 Kin	Mode Auto :	Sweep	
1Pk Vie								
				1		M1[1]		-0.39 dBn
10 dBm-								2.473880 GH
M1						M2[1]		-39.64 dBn
a dam-								2.483500 GH
100/01	1N DA	n i			1 1			
-10 cB-m	#							
111.01	1	Ц			1 1			
20 dBm	-01	1 -20.390	dBm		+ +			
30 dBm								
30 dBm		1.142.1		M				
40 dBm		147.14	LINANIAA	110401	AAAAAAAAAA	MULLIN	MARIN	
ie dem		1.440	AAAAAAA	00000000	2000000000	างกอกงานการการเป	UNACCARA CONTRA	a some and a second
50 dBm	+				+ +			
					1 1			
60 dBm	+							
					1 1			
70 dBm	-							
Start 2.	47 G	Ηz			691 pt	5		Stop 2.55 GHz
larker								
	Ref	Trc	X-valu		Y-value	Function	Fur	nction Result
M1		1		88 GHz	-0.39 dBm			
M2		1		35 GHz	-39.64 dBm			
M3		1		2.5 GHz	-36.15 dBm			
M4		1	2.5009	57 GHz	-34.51 dBm			

Date: 2.MAR.2022 09:46:47

Att		20.00 dBr 30 d		<ul> <li>RBW 100 kHz</li> <li>VBW 300 kHz</li> </ul>	Mode Auto Fi	FT	
Count		00					
AFK TO	<u> </u>				M1[1]		0.13 dBn
10 dBm							2.401880 GH
TO OBIII					M2[1]		-46.98 dBn
0 dBm—	$\rightarrow$			_	<u> </u>		2.400000 QH
							1 A
-10 dBm	+						
20 dBm							
20 000	-0	1 -19.870	0 dBm				
30 dBm	$\rightarrow$						
	·					M4	
40 dBm	-						M3 M9
			and the lot of the	Marca marca		. Let	M3
50 den		بالريائة والرائدة	a service and the service of the ser	~ [ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	- A Carlor - Carlor	and and a start	- and an and a grant of the second
-60 dBm							
00 4011							
-70 dBm	-			_		_	
Start 2	.3 GH	z		691 pts			Stop 2.405 GHz
larker							
Type	Ref	Trc	X-value	Y-value	Function	Funct	ion Result
M1		1	2.40188 GHz	0.13 dBm	. anotion	Tanca	
M2		1	2.4 GHz	-46.98 dBm			
M3		1	2.39 GHz	-48.41 dBm			
M4		1	2.377913 GHz	-41.33 dBm			

#### 2DH1\_Ant1\_Low\_2402MHz

Date: 2.MAR.2022 09:01:56

#### 2DH1\_Ant1\_High\_2480MHz

	evel :	20.00 dBm		• RBW 100 kHz			
Att		30 dE	SWT 1.1 ms (	VBW 300 kHz	Mode Auto S	weep	
Count 1Pk Vi		00					
1PK VI	ew				M1[1]		-0.22 dBn
					witti		2.480010 GH
LO dBm					M2[1]		-41.41 dBr
) dBm-	P	11					2.483500 GH
ubili-		Λ					
10 dBn	n	4					
20 dBn	n	1 -20.220	dBm				
30 dBn	n-+-	-		M4			
40 dBe	. 4	12 12	M				
40 dBn	w	Martin	menning	is known	monder	unter all more thank	nonuman
50 dBn	n						
60 dBn	n+						
70 dBn	n- -						
	.47 G	Hz		691 pts			Stop 2.55 GHz
larker		Trc	X-value	Y-value	Function	Function	Result
larker Type	Ker	1	2.48001 GHz	-0.22 dBm			
larker Type M1	Ker		9 409E CUs				
Start 2 Iarker Type M1 M2 M3	Ker	1	2.4835 GHz 2.5 GHz	-41.41 dBm -43.54 dBm			

Date: 2.MAR.2022 09:04:10

#### Spectrum RefLevel 20.00 dBm Att 30 dB Offset 13.10 dB ● RBW 100 kHz SWT 246.5 µs ● VBW 300 kHz Mode Auto FFT 30 dB Count 300/300 1Pk Viev M1[1] -0.77 dBn 2.404920 GH -42.90 dBn 2.400000 GH 10 dBm M2[1] 0 dBrr -10 dBm -20 dBm 01 -20.77 -30 dBm <u>M4</u> -40 dBm willow the Joular -SO 387 -60 dBm -70 dBr 691 pts Stop 2.405 GHz Start 2.3 GHz Marker -0.77 dBm -42.90 dBm -43.74 dBm -40.57 dBm Marker Type Ref Trc M1 1 M2 1 M3 1 M4 1 X-value 2.40492 GHz 2.4 GHz 2.39 GHz 2.377913 GHz Function Function Result 1000 C

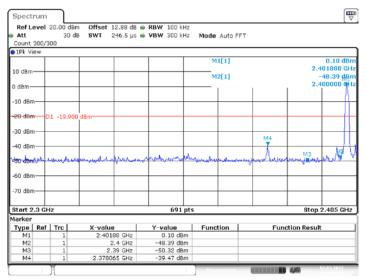
2DH1\_Ant1\_Low\_Hop\_2402MHz

Date: 2.MAR.2022 09:47:15

#### 2DH1\_Ant1\_High\_Hop\_2480MHz

Ref Le	vel 20.00 d	IBm Offset 12.94 dB	RBW 100 kHz			( )
Att	30	dB SWT 1.1 ms	👄 VBW 300 kHz	Mode Auto 9	Sweep	
Count 3	00/300					
●1Pk Vie	W					
				M1[1]		-0.39 dBr
10 dBm-						2.474920 GH
M1				M2[1]		-43.35 dBr
Q dBm	0.1.1					2.483500 GH
111111	1/////					
-10 dBm-						
20 dBm-						
20 0000	01 -20.3	IAD GRW				
-30 dBm-			1012			
	1 1 1				.	
-40 dBm-		MAANAAMAAN	Maryland	<b>WARNER ALLAND</b>	starka.	
	1			100 0p - 000	and taken were	and a state of the
-50 dBm-	-					
-60 dBm-						
-ou abm-						
-70 dBm-						
Start 2.4	17 CHz		691 pts			Stop 2.55 GHz
larker	ir dite		001 pt	,		0100 2100 0112
	Ref   Trc	X-value	Y-value	Function	Eupe	tion Result
M1	1	2.47492 GHz	-0.39 dBm	Function	Func	tion result
M2	1	2.4835 GHz	-43.35 dBm			
M3	1	2.5 GHz	-36.25 dBm			
M4	1	2.501072 GHz	-35.94 dBm			

Date: 2.MAR.2022 09:58:54



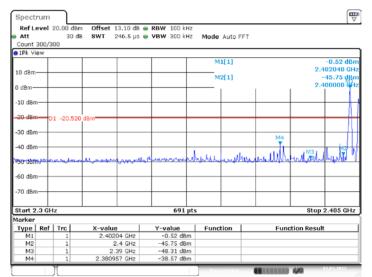
#### 3DH1\_Ant1\_Low\_2402MHz

Date: 2.MAR.2022 09:06:29

#### 3DH1\_Ant1\_High\_2480MHz

	vel 2	0.00 dBm					
Att		30 dB	SWT 1.1 ms	VBW 300 kHz	Mode Auto S	weep	
Count 3		)0					
1Pk Vie	w						
					M1[1]		-0.29 dBn
LO dBm-	+			+	M2[1]		2.480010 GH
	N	11			M2[1]		-39.49 dBn 2.483500 GH
) dBm—	-+-			+ +		1 I	2.483300 GH
10 dBm		1					
TO GBW-							
20-dBm-		-20,290	dam				
20 0011	1	-20,290	ubili				
30 dBm	$\rightarrow$						
		M2		M4			
40 dBm	11	N.	M	and manuelan	ليحسب وحساسا	in planes in	where the bid mat
		a me	and a stand the second s	and consider	contraction of the second	ware and the second second	week and the second
50 dBm	-						
60 dBm							
oo ubiii							
70 dBm	$\rightarrow$						
Start 2.	47 GI	-lz		691 pts			Stop 2.55 GHz
larker							
Type	Ref	Trc	X-value	Y-value	Function	Euncti	on Result
M1		1	2.48001 GHz	-0.29 dBm		T diffect	
M2		1	2.4835 GHz	-39.49 dBm			
M3		1	2.5 GHz	-44.95 dBm			
M4		1	2.504087 GHz	-37.45 dBm			

Date: 2.MAR.2022 09:10:39



#### 3DH1\_Ant1\_Low\_Hop\_2402MHz

Date: 2.MAR.2022 09:59:28

#### 3DH1\_Ant1\_High\_Hop\_2480MHz

Rofl	evel 20	.00 dBm	Offset 12.94	dB 👄 RBW 10	0 kHz			(
Att	<b>ave</b> i 20	30 dB		ms - VBW 30		Mode Auto S	ween	
	300/300		0111 1.1		U KITE I	Houe Auto a	weeh.	
1Pk Vi		,						
						M1[1]		-0.41 dBr
10 dBm								2.473880 GH
M1						M2[1]		-41.99 dBr
dem-					_			2.483500 GH
NVVN	NUU							
-10 dBn	i – Ť							
20 dBn								
50 gBu	01	-20.410	dBm		_			
-30 dBr				M3				
	·	Jună .						
-40 dBri		W/MU	UNHUMM	460 Lahrta	Month	ALLA AND	Mitchen	a la cata marta da astrola da
-50 dBri					_			
-60 dBr								
00 001	.							
-70 dBn	∩——							
Start 2	.47 GH	z		6	91 pts			Stop 2.55 GHz
larker								
Type	Ref	[rc	X-value	Y-valu	e	Function	Fu	nction Result
M1		1	2.47388 GH	iz -0.41	dBm			
M2		1	2.4835 GH					
		1	2.5 GH	z -35.69	dBm			
M3 M4		1	2.500145 GH	z -34.75				

Date: 2.MAR.2022 10:04:05

### \*\*\*\*\* END OF REPORT \*\*\*\*\*