



RF MEASUREMENT REPORT

FCC ID: YY3-14249P
Applicant: Handheld Group AB
Product: Nautiz X9
Model No.: NX9V2-RF1-AS0, NX9V2-RF1-A00
Brand Name: Handheld
FCC Classification: FCC Part 15 Spread Spectrum Transmitter (DSS)
FCC Rule Part(s): Part15 Subpart C (Section 15.247)
Test Date: October 12 ~ November 26, 2021

Reviewed By:

Kevin Guo

Approved By:

Robin Wu



The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.10-2013. Test results reported herein relate only to the item(s) tested.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Shenzhen) Co., Ltd.

Revision History

Report No.	Version	Description	Issue Date	Note
2109RSU034-U4	Rev. 01	Initial Report	11-28-2021	

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1. General Information

1.1. Applicant

Handheld Group AB
 Strandgatan 40 531 30 LIDKÖPING Sweden

1.2. Manufacturer

Handheld Group AB
 Strandgatan 40 531 30 LIDKÖPING Sweden

1.3. Testing Facility

<input type="checkbox"/>	<p>Test Site – MRT Suzhou Laboratory</p> <hr/> <p>Laboratory Location (Suzhou - Wuzhong) D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China</p> <p>Laboratory Location (Suzhou - SIP) 4b Building, Liando U Valley, No.200 Xingpu Rd., Shengpu Town, Suzhou Industrial Park, China</p> <hr/> <p>Laboratory Accreditations</p> <p>A2LA: 3628.01 CNAS: L10551 FCC: CN1166 ISED: CN0001</p> <p>VCCI: <input type="checkbox"/>R-20025 <input type="checkbox"/>G-20034 <input type="checkbox"/>C-20020 <input type="checkbox"/>T-20020 <input type="checkbox"/>R-20141 <input type="checkbox"/>G-20134 <input type="checkbox"/>C-20103 <input type="checkbox"/>T-20104</p>
<input checked="" type="checkbox"/>	<p>Test Site – MRT Shenzhen Laboratory</p> <hr/> <p>Laboratory Location (Shenzhen) 1G, Building A, Junxiangda Building, Zhongshanyuan Road West, Nanshan District, Shenzhen, China</p> <hr/> <p>Laboratory Accreditations</p> <p>A2LA: 3628.02 CNAS: L10551 FCC: CN1284 ISED: CN0105</p>
<input type="checkbox"/>	<p>Test Site – MRT Taiwan Laboratory</p> <hr/> <p>Laboratory Location (Taiwan) No. 38, Fuxing 2nd Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)</p> <hr/> <p>Laboratory Accreditations</p> <p>TAF: L3261-190725 FCC: 291082, TW3261 ISED: TW3261</p>

1.4. Product Information

Product Name	Nautiz X9
Model No.	NX9V2-RF1-AS0, NX9V2-RF1-A00
Brand Name	Handheld
Wi-Fi Specification	802.11a/b/g/n/ac
Bluetooth Version	Bluetooth v5.0 Dual Mode
Wi-Fi Specification	802.11a/b/g/n/ac
GSM Bands	GSM850 / 1900
WCDMA Bands	Band II / IV / V
LTE Bands	FDD Band: 2, 4, 5,12, 17 TDD Band: 41
NFC Specification	13.56MHz
GNSS Specification	GPS / GLONASS / Beidou / Galileo
Software version	V000.06.00
Hardware version	DVT
Antenna Information	Refer to section 1.8
IMEI No.	Conducted Measurement: 358591250000136 Radiated Measurement: 35859125000698
Accessories	
Battery	Brand Name: Handheld Model: NX9V2-1004 Capacity: Typical 3.8V, 4800mAh, 18.24Wh
Power Adapter	MFR: Phihong Technology Co. Ltd. Model: PSAF10R-050Q Input: AC 100-240V~0.3A, 50-60Hz Output: DC 5V-2.0A
Micro USB Cable	Length: Shielded, 1.0m
Remark:	
1. The information of EUT was provided by the manufacturer, and the accuracy of the information shall be the responsibility of the manufacturer.	

Note:

1. Model Difference Description (declared by the manufacturer)

Model Number	Model Difference	Note
NX9V2-RF1-AS0	Support Barcode	--
NX9V2-RF1-A00	Not Barcode	Remove barcode hardware

2. The difference does not affect the RF test result, so we selected NX9V2-RF1-AS0 for all RF testing.

1.5. Radio Specification

Operating Frequency	2402~2480MHz
Channel Number	79
Type of modulation	GFSK, Pi/4 DQPSK, 8DPSK
Data Rate	1Mbps, 2Mbps, 3Mbps

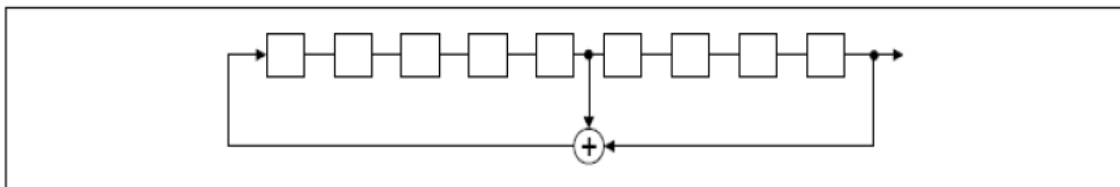
Note: The test data contained in this report pertains only to the emissions due to the EUT's Bluetooth transmitter.

- 15.247(g): In accordance with the Bluetooth Industry Standard, the system is designed to comply with all of the regulations in Section 15.247 when the transmitter is presented with a continuous data (or information) system.
- 15.247(h): In accordance with the Bluetooth Industry Standard, the system does not coordinate its channels selection/ hopping sequence with other frequency hopping systems for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters.
- 15.247(h): The EUT employs Adaptive Frequency Hopping (AFH) which identifies sources of interference namely devices operating in 802.11 WLAN and excludes them from the list of available channels. The process of re-mapping reduces the number of test channels from 79 channels to a minimum number of 20 channels.

1.6. Pseudorandom Frequency Hopping Sequence

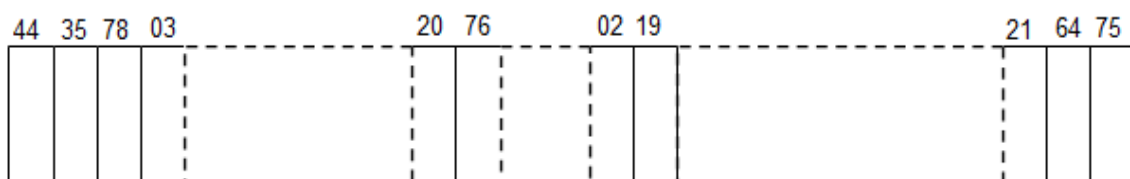
The pseudorandom sequence may be generated in a nine-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage. And the result is fed back to the input of the first stage. The sequence begins with the first ONE of 9 consecutive ONES; i.e. the shift register is initialized with nine ones.

- Number of shift register stages: 9
- Length of pseudo-random sequence: $2^9 - 1 = 511$ bits
- Longest sequence of zeros: 8 (non-inverted signal)



Linear Feedback Shift Register for Generation of the PRBS sequence

An example of Pseudorandom Frequency Hopping Sequence as follow:



Each frequency used equally on the average by each transmitter.

The system receivers have input bandwidths that match the hopping channel bandwidths of their Corresponding transmitters and shift frequencies in synchronization with the transmitted signals.

1.7. Operation Frequency / Channel List

Channel	Frequency	Channel	Frequency	Channel	Frequency
00	2402 MHz	01	2403 MHz	02	2404 MHz
03	2405 MHz	04	2406 MHz	05	2407 MHz
06	2408 MHz	07	2409 MHz	08	2410 MHz
09	2411 MHz	10	2412 MHz	11	2413 MHz
12	2414 MHz	13	2415 MHz	14	2416 MHz
15	2417 MHz	16	2418 MHz	17	2419 MHz
18	2420 MHz	19	2421 MHz	20	2422 MHz
21	2423 MHz	22	2424 MHz	23	2425 MHz
24	2426 MHz	25	2427 MHz	26	2428 MHz
27	2429 MHz	28	2430 MHz	29	2431 MHz
30	2432 MHz	31	2433 MHz	32	2434 MHz
33	2435 MHz	34	2436 MHz	35	2437 MHz
36	2438 MHz	37	2439 MHz	38	2440 MHz
39	2441 MHz	40	2442 MHz	41	2443 MHz
42	2444 MHz	43	2445 MHz	44	2446 MHz
45	2447 MHz	46	2448 MHz	47	2449 MHz
48	2450 MHz	49	2451 MHz	50	2452 MHz
51	2453 MHz	52	2454 MHz	53	2455 MHz
54	2456 MHz	55	2457 MHz	56	2458 MHz
57	2459 MHz	58	2460 MHz	59	2461 MHz
60	2462 MHz	61	2463 MHz	62	2464 MHz
63	2465 MHz	64	2466 MHz	65	2467 MHz
66	2468 MHz	67	2469 MHz	68	2470 MHz
69	2471 MHz	70	2472 MHz	71	2473 MHz
72	2474 MHz	73	2475 MHz	74	2476 MHz
75	2477 MHz	76	2478 MHz	77	2479 MHz
78	2480 MHz	-	-	-	-

1.8. Antenna Details

Antenna Type	Frequency Band (MHz)	T _x Paths	Max Antenna Gain (dBi)
Wi-Fi and Bluetooth			
FPC Antenna	2400 ~ 2500	1	2.25
	5150 ~ 5250 5725 ~ 5850	1	1.92

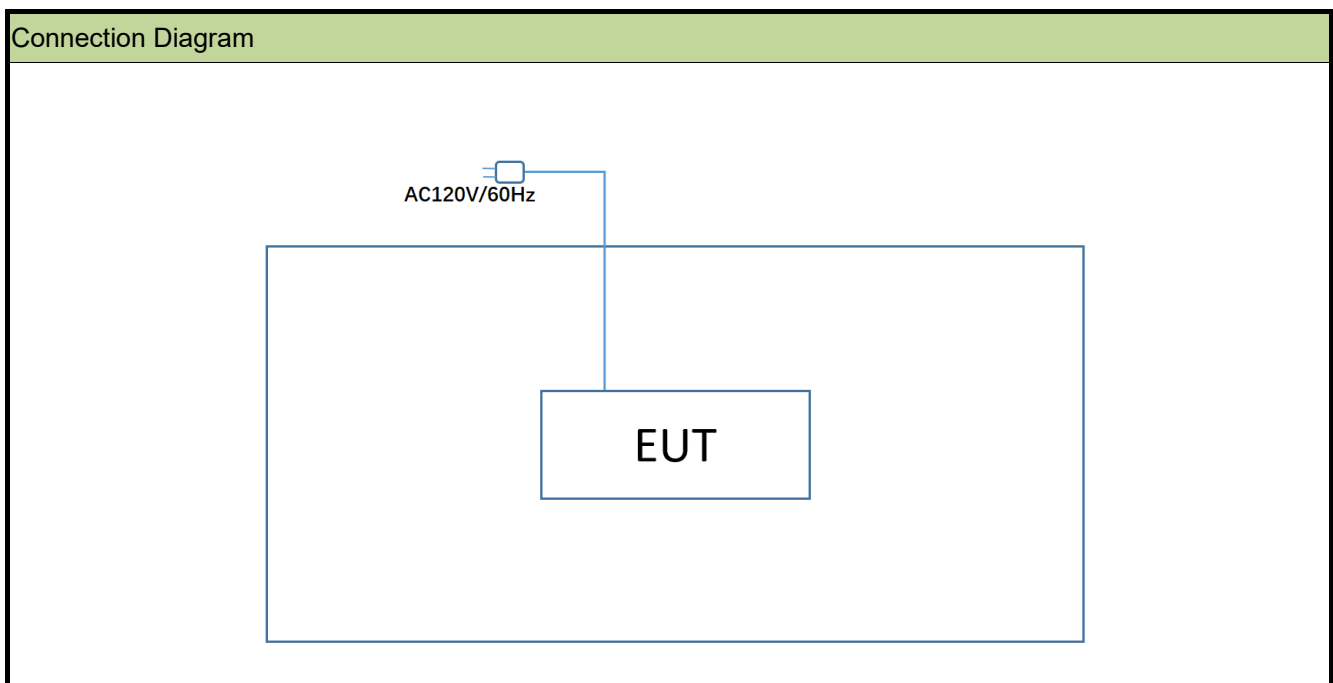
2. Test Configuration

2.1. Test Mode

Mode 1: Transmit by DH5
Mode 2: Transmit by 2DH5
Mode 3: Transmit by 3DH5

2.2. Test System Connection Diagram

The device was tested per the guidance ANSI C63.10: 2013 was used to reference the appropriate EUT setup for radiated emissions testing and AC line conducted testing.



2.3. Test System Details

Product	Manufacturer	Model No.
1 N/A	N/A	N/A

2.4. Test Software

The test utility software used during testing was "Engineer mode".

2.5. Applied Standards

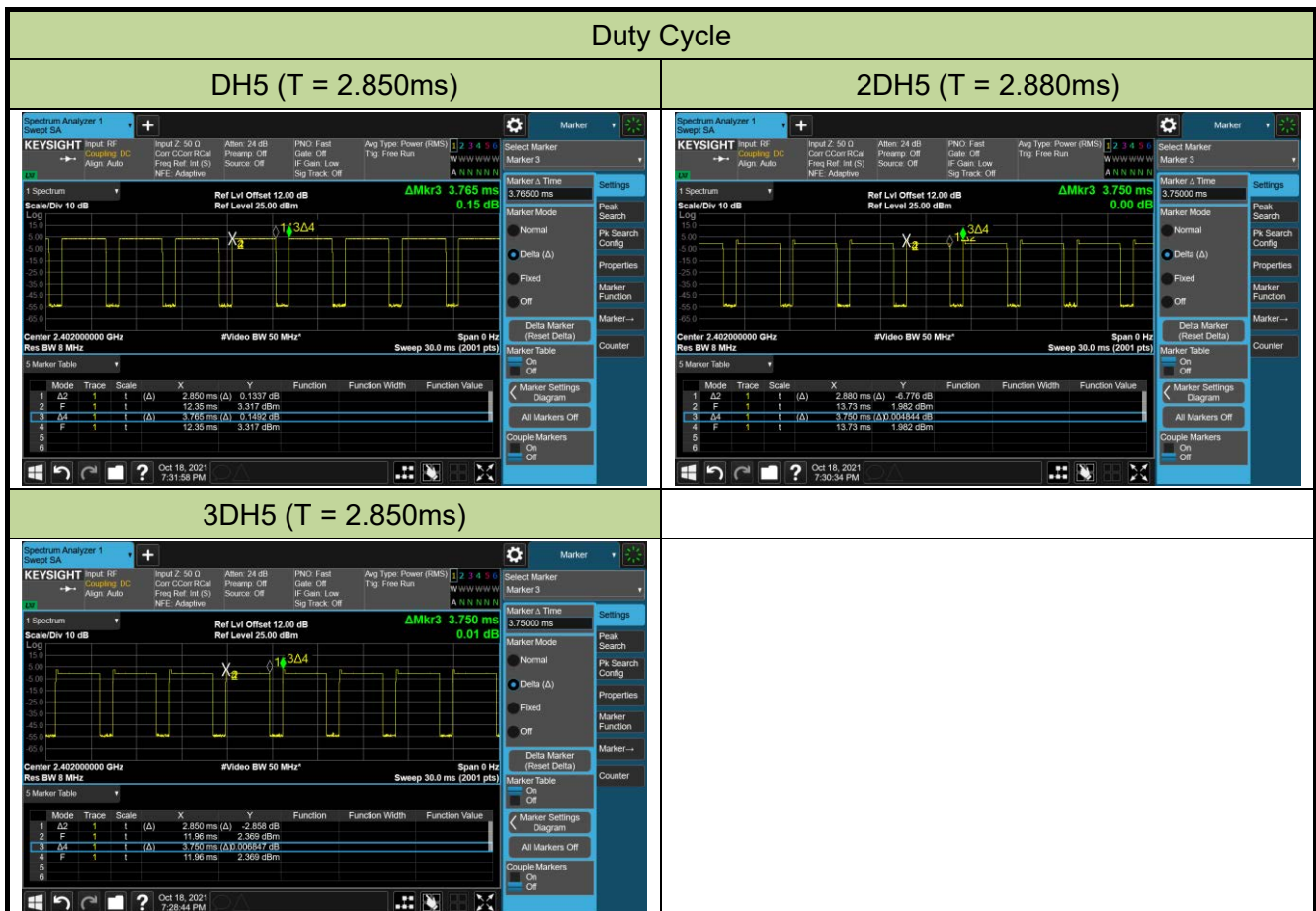
According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 15.247
- KDB 558074 D01v05r02
- ANSI C63.10-2013

2.6. Duty Cycle

The maximum achievable duty cycles for all modes were determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz. The RBW and VBW were both greater than 50/T, where T is the minimum transmission duration, and the number of sweep points across T was greater than 100. The duty cycles are as follows:

Test Mode	Duty Cycle
DH5	75.70%
2DH5	76.80%
3DH5	76.00%



2.7. Test Environment Condition

Ambient Temperature	15°C~35°C
Relative Humidity	20%RH ~75%RH

3. Antenna Requirement

Excerpt from §15.203 of the FCC Rules/Regulations:

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can 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 antenna of the device is **permanently attached**.
- There are no provisions for connection to an external antenna.

Conclusion:

The unit complies with the requirement of §15.203.

4. Measuring Instrument

No.	Instrument	Manufacturer	Model No.	Asset No.	Last Cali. Date	Cali. Due Date	Test Site
1	Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06292	1 year	2022/10/20	NS-AC1
2	Anechoic Chamber	BOOMWAVE	NS-AC1	MRTSUE06496	1 year	2022/07/24	NS-AC1
3	Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06572	1 year	2022/03/14	NS-AC1
4	TRILOG Antenna	Schwarzbeck	VULB 9162	MRTSUE06573	1 year	2022/06/29	NS-AC1
5	Preamplifier	Schwarzbeck	BBV 9718	MRTSUE06574	1 year	2022/07/12	NS-AC1
6	EMI Test Receiver	R&S	ESR3	MRTSUE06575	1 year	2022/06/27	NS-AC1
7	Thermohygrometer	DELI	NO.8813	MRTSUE06588	1 year	2022/06/30	NS-AC1
8	Preamplifier	EMCI	EMC184045SE	MRTSUE06641	1 year	2022/01/14	NS-AC1
9	Signal Analyzer	Agilent	N9010A	MRTSUE06195	1 year	2022/03/17	NS-AC1/NS-T R2
10	Signal Analyzer	Keysight	N9020A	MRTSUE10065	1 year	2022/06/17	NS-AC1/NS-T R2
11	Shielding Room	BOOMWAVE	NS-SR1	MRTSUE06550	/	/	NS-SR1
12	Shielding Room	BOOMWAVE	NS-SR2	MRTSUE06551	/	/	NS-SR2
13	Two-Line V-Network	R&S	ENV216	MRTSUE06577	1 year	2022/07/04	NS-SR2
14	Two-Line V-Network	R&S	ENV216	MRTSUE06578	1 year	2022/07/04	NS-SR2
15	USB Power Sensor	Keysight	U2021XA	MRTSUE06581	1 year	2022/08/15	NS-TR2

Software	Version	Function
EMI Software	V3	EMI Test Software

5. Measurement Uncertainty

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.

AC Conducted Emission Measurement
Measurement Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$): 9kHz~150kHz: 3.74dB 150kHz~30MHz: 3.44dB
Radiated Disturbance
Measurement Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$): Horizontal: 30MHz~300MHz: 5.04dB 300MHz~1GHz: 4.95dB 1GHz~40GHz: 6.40dB Vertical: 30MHz~300MHz: 5.24dB 300MHz~1GHz: 6.03dB 1GHz~40GHz: 6.40dB
Spurious Emissions, Conducted
Measuring Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$): 0.78dB
Output Power
Measuring Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$): 1.13dB
Occupied Bandwidth
Measuring Uncertainty for a Level of Confidence of 95% ($U=2Uc(y)$): 0.28%

6. Test Result

6.1. Summary

FCC Section(s)	Test Description	Test Condition	Verdict
15.247(a)(1)	20dB Bandwidth	Conducted	Pass
15.247(b)(1)	Peak Transmitter Output Power		Pass
15.247(a)(1)	Channel Separation		Pass
15.247(a)(1)(iii)	Number of Channels		Pass
15.247(a)(1)(iii)	Time of Occupancy		Pass
15.247(d)	Band Edge / Out- of-Band Emissions		Pass
15.205, 15.209	General Field Strength (Restricted Bands and Radiated Emission)	Radiated	Pass
15.207	AC Conducted Emissions 150kHz - 30MHz	Line Conducted	Pass

Remark:

The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.

6.2. Occupied Bandwidth

6.2.1. Test Limit

N/A

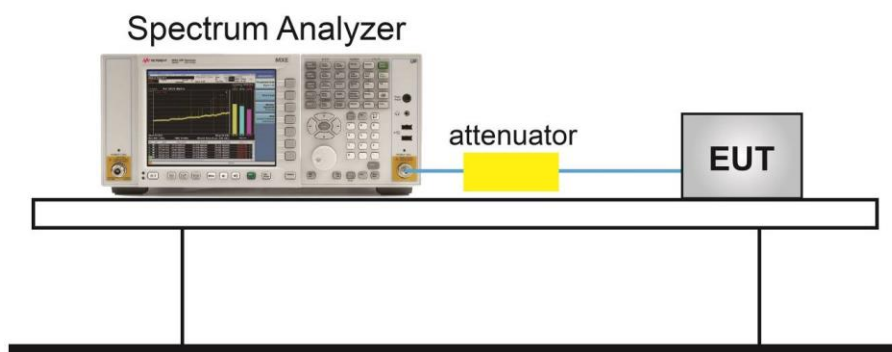
6.2.2. Test Procedure used

ANSI C63.10-2013 - Section 6.9.2 (20dB Bandwidth)

6.2.3. Test Setting

1. Set RBW \geq 1% to 5% of the 20dB bandwidth
2. VBW = approximately three times RBW
3. Span = approximately 2 to 5 times the 20dB bandwidth, centered on a hopping channel
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. Allow the trace to stabilize
8. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.

6.2.4. Test Setup



6.2.5. Test Result

Refer to Appendix A.1.

6.3. Output Power

6.3.1. Test Limit

For frequency hopping systems operating in the 2400-2483.5MHz band employing at least 75 non-overlapping hopping channels: 1watt (30dBm). For all other frequency hopping systems in the 2400 - 2483.5MHz band: 0.125 watt (21dBm).

6.3.2. Test Procedure Used

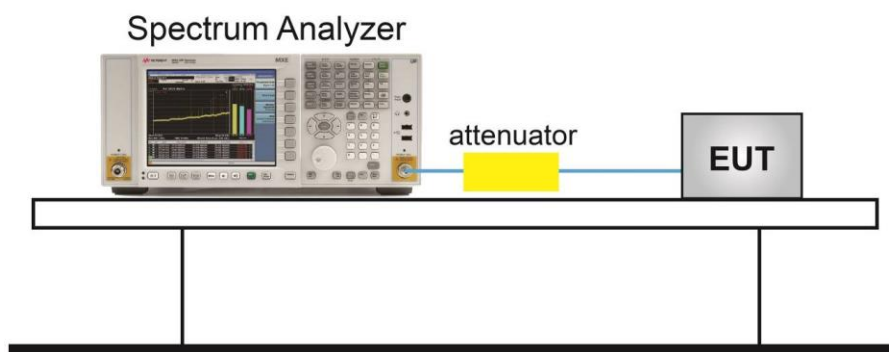
ANSI C63.10-2013 - Section 7.8.5

6.3.3. Test Setting

1. Set RBW \geq the 20 dB bandwidth of the emission being measured.
2. VBW \geq RBW
3. Span = approximately five times the 20dB bandwidth, centered on a hopping channel
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. Allow the trace to stabilize, Use the marker-to-peak function to set the marker to the peak of the emission.

The indicated level is the peak output power (don't forget added the external attenuation and cable loss)

6.3.4. Test Setup



6.3.5. Test Result

Refer to Appendix A.2.

6.4. Carrier Frequency Separation

6.4.1. Test Limit

The minimum permissible channel separation for this system is $\frac{2}{3}$ the value of the 20dB BW.

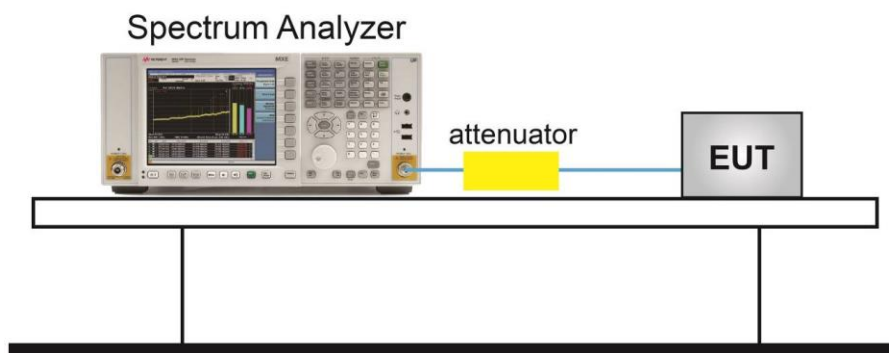
6.4.2. Test Procedure Used

ANSI C63.10-2013 - Section 7.8.2.

6.4.3. Test Setting

1. Span = wide enough to capture the peaks of two adjacent channels.
2. Start with the RBW set to approximately 30% of the channel spacing; adjust as necessary to best identify the center of each individual channel.
3. VBW \geq RBW
4. Sweep time = Auto couple
5. Detector = Peak
6. Trace mode = Max hold
7. Allowed the trace to stabilize
8. Use the marker-delta function to determine the separation between the peaks of the adjacent channels.

6.4.4. Test Setup



6.4.5. Test Result

Refer to Appendix A.3.

6.5. Number of Hopping Channels

6.5.1. Test Limit

This frequency hopping system must employ a minimum of 15 hopping channels.

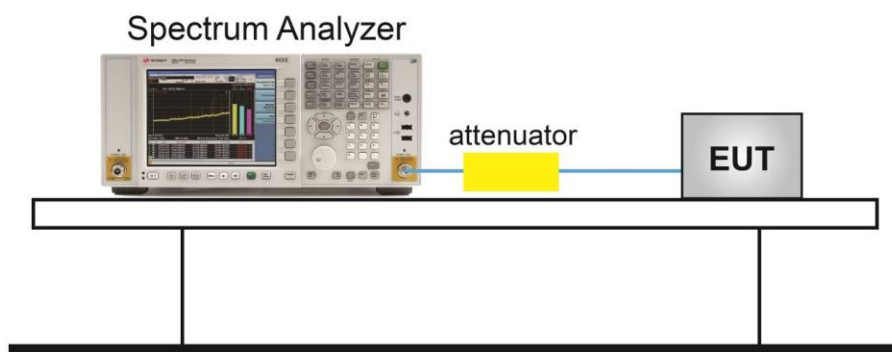
6.5.2. Test Procedure Used

ANSI C63.10-2013 - Section 7.8.3.

6.5.3. Test Setting

1. Span = the frequency band of operation. Depending on the number of channels the device supports, it may be necessary to divide the frequency range of operation across multiple spans, to allow the individual channels to be clearly seen.
2. To identify clearly the individual channels, set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.
3. VBW \geq RBW
4. Sweep time = Auto couple
5. Detector = Peak
6. Trace mode = Max hold
7. Allow the trace to stabilize

6.5.4. Test Setup



6.5.5. Test Result

Refer to Appendix A.4.

6.6. Time of Occupancy Measurement

6.6.1. Test Limit

The maximum permissible time of occupancy is 400ms within a period of 400ms multiplied by the number of hopping channels employed.

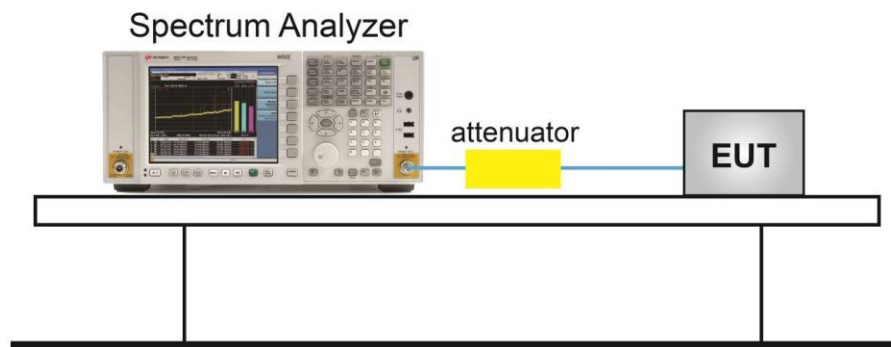
6.6.2. Test Procedure Used

ANSI C63.10-2013 - Section 7.8.4.

6.6.3. Test Setting

1. Span = zero span, centered on a hopping channel.
2. RBW shall be \leq channel spacing and where possible RBW should be set $\gg 1 / T$, where T is the expected dwell time per channel.
3. VBW \geq RBW
4. Sweep time = as necessary to capture the entire dwell time per hopping channel
5. Detector = Peak
6. Trace mode = max hold
7. Use the marker-delta function to determine the transmit time per hop. If this value varies with different modes of operation (data rate, modulation format, number of hopping channels, etc.), then repeat this test for each variation in transmit time. An oscilloscope may be used instead of a spectrum analyzer. The EUT shall show compliance with the appropriate regulatory limit for the number of hopping channels. A plot of the data shall be included in the test report.

6.6.4. Test Setup



6.6.5. Test Result

Refer to Appendix A.5.

6.7. Band-edge Compliance

6.7.1. Test Limit

The maximum permissible emission level is 20dBc. Any emissions were lying outside of the emission bandwidth and in authorized band edges to a field strength limit specified in Section 15.209 of the Title 47 CFR.

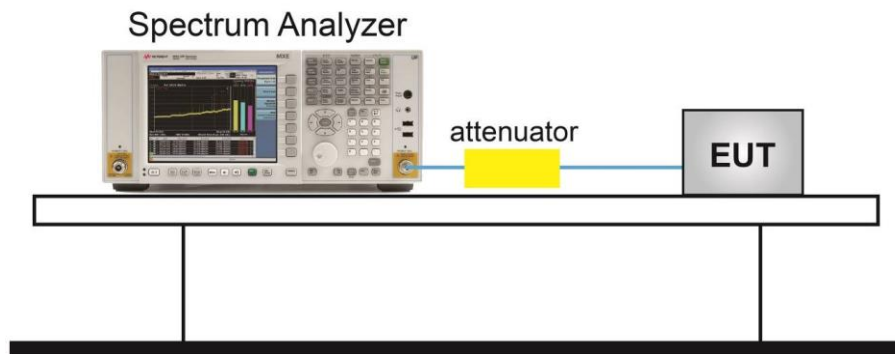
6.7.2. Test Procedure Used

ANSI C63.10-2013 - Section 6.10.4.

6.7.3. Test Setting

1. Span = wide enough to capture the peak level of the emission operating on the channel closest to the band edge, as well as any modulation products which fall outside of the authorized band of operation.
2. RBW = 100kHz
3. VBW = 300kHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize
8. Allow the trace to stabilize. Set the marker on the emission at the band edge, or on the highest modulation product outside of the band, if this level is greater than that at the band edge. Enable the marker-delta function, then use the marker-to-peak function to move the marker to the peak of the in-band emission.

6.7.4. Test Setup



6.7.5. Test Result

Refer to Appendix A.6.

6.8. Conducted Spurious Emissions

6.8.1. Test Limit

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 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, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

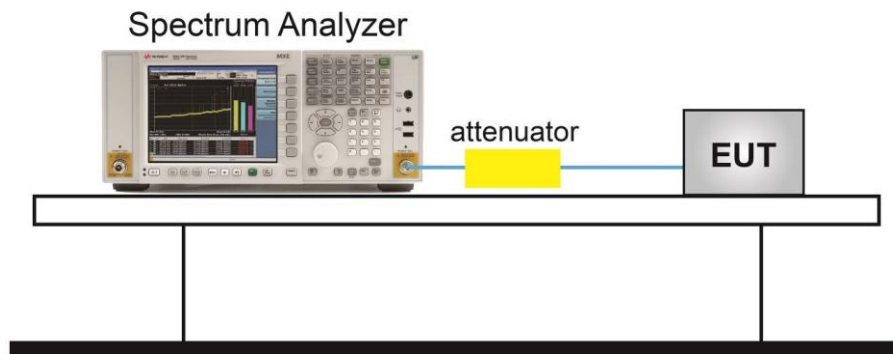
6.8.2. Test Procedure Used

ANSI C63.10-2013 - Section 7.8.8.

6.8.3. Test Setting

1. Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.
2. RBW = 100KHz
3. VBW = 300KHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize
8. Set the marker on the peak of any spurious emission recorded. The level displayed must comply with the limit specified in this section.

6.8.4. Test Setup



6.8.5. Test Result

Refer to Appendix A.7.

6.9. Radiated Spurious Emission

6.9.1. Test Limit

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table per Section 15.209.

FCC Part 15 Subpart C Paragraph 15.209		
Frequency [MHz]	Field Strength [uV/m]	Measured Distance [Meters]
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 - 30	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

6.9.2. Test Procedure Used

ANSI C63.10 Section 6.3 (General Requirements)

ANSI C63.10 Section 6.4 (Standard test method below 30MHz)

ANSI C63.10 Section 6.5 (Standard test method above 30MHz to 1GHz)

ANSI C63.10 Section 6.6 (Standard test method above 1GHz)

6.9.3. Test Setting

Table 1 - RBW as a function of frequency

Frequency	RBW
9 ~ 150 kHz	200 ~ 300 Hz
0.15 ~ 30 MHz	9 ~ 10 kHz
30 ~ 1000 MHz	100 ~ 120 kHz
> 1000 MHz	1 MHz

Quasi-Peak Measurements below 1GHz

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. Span was set greater than 1MHz
3. RBW = as specified in Table 1
4. Detector = CISPR quasi-peak
5. Sweep time = auto couple
6. Trace was allowed to stabilize

Peak Measurements above 1GHz

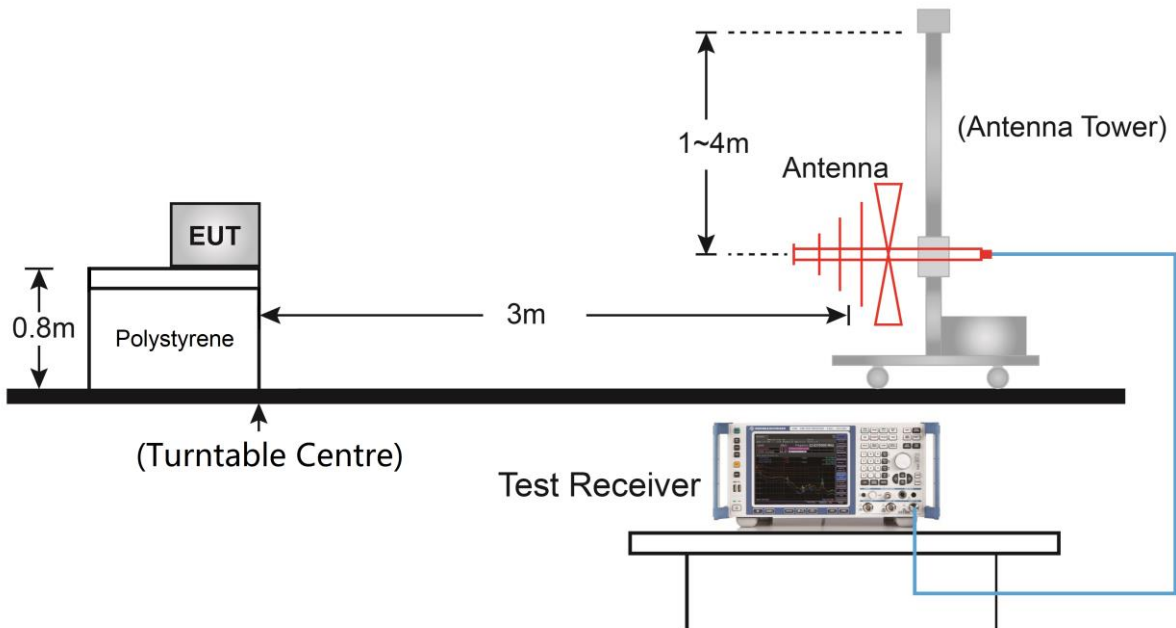
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

Average Measurements above 1GHz (Method VB)

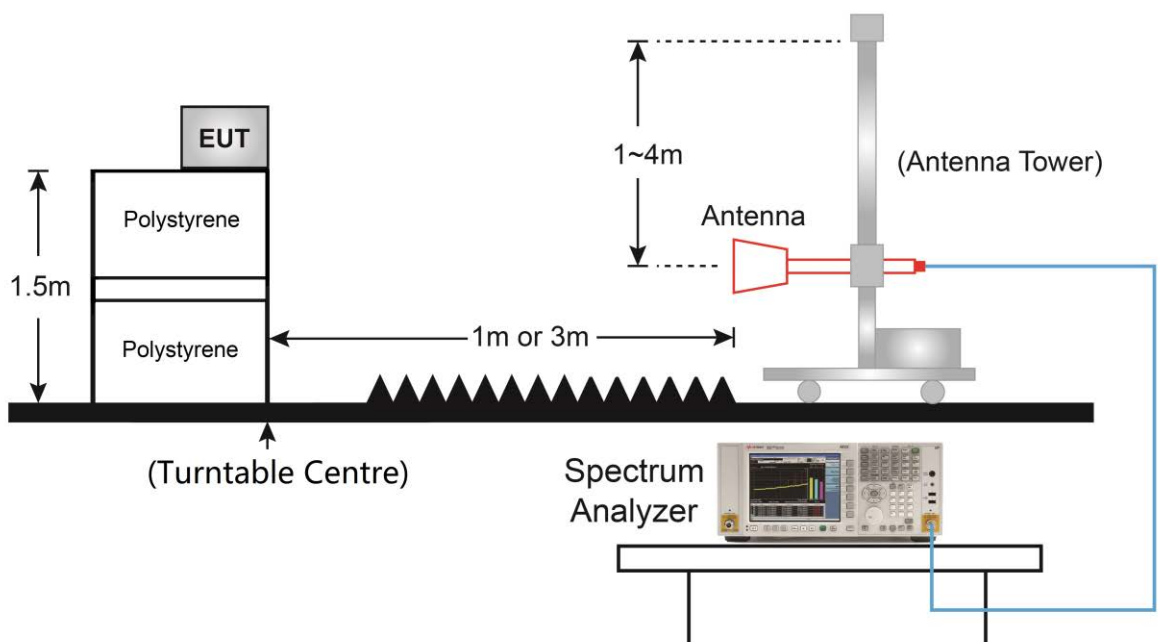
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW; If the EUT is configured to transmit with duty cycle $\geq 98\%$, set VBW = 10 Hz.
If the EUT duty cycle is $< 98\%$, set VBW $\geq 1/T$. T is the minimum transmission duration.
4. Detector = Peak
5. Sweep time = auto
6. Trace mode = max hold
7. Trace was allowed to stabilize

6.9.4. Test Setup

Below 1GHz Test Setup:



Above 1GHz Test Setup:



6.9.5. Test Result

Refer to Appendix A.8.

6.10. Radiated Restricted Band Edge

6.10.1. Test Limit

For 15.205 requirement:

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a) of FCC part 15, must also comply with the radiated emission limits specified in Section 15.209(a).

Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (GHz)
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)
13.36 - 13.41	--	--	--

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47CFR must not exceed the limits shown in Table per Section 15.209.

FCC Part 15 Subpart C Paragraph 15.209		
Frequency [MHz]	Field Strength [uV/m]	Measured Distance [Meters]
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 - 30	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

6.10.2. Test Procedure Used

ANSI C63.10 Section 6.3 (General Requirements)

ANSI C63.10 Section 6.6 (Standard test method above 1GHz)

6.10.3. Test Setting

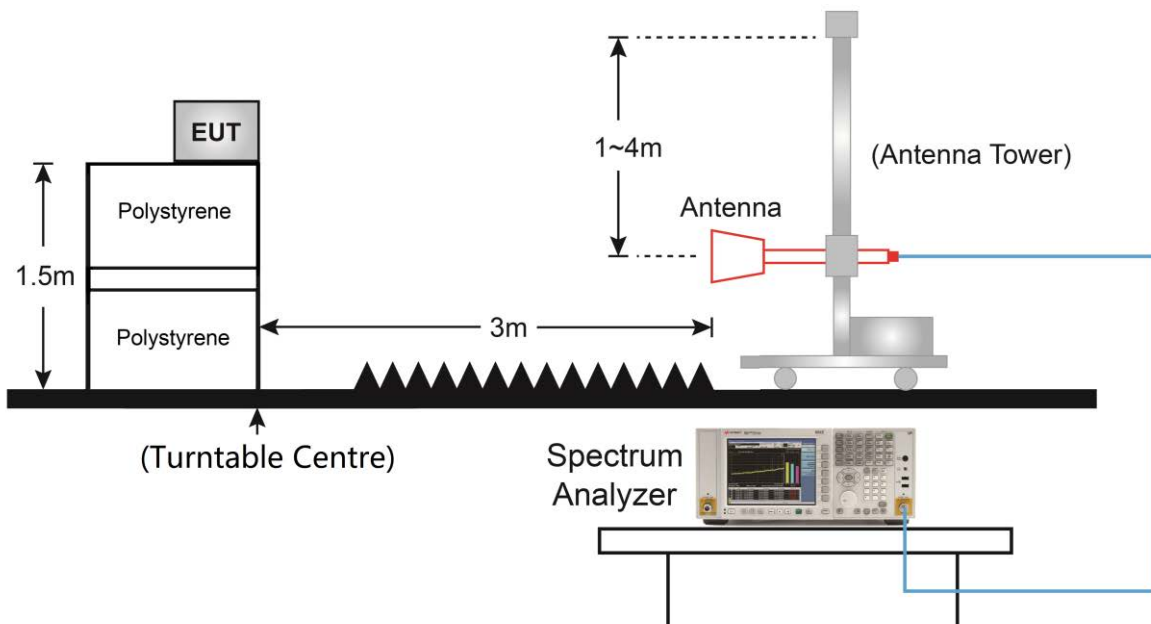
Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

Average Measurements above 1GHz (Method VB)

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW; If the EUT is configured to transmit with duty cycle $\geq 98\%$, set VBW = 10 Hz.
If the EUT duty cycle is $< 98\%$, set VBW $\geq 1/T$. T is the minimum transmission duration.
4. Detector = Peak
5. Sweep time = auto
6. Trace mode = max hold
7. Trace was allowed to stabilize

6.10.4. Test Setup



6.10.5. Test Result

Refer to Appendix A.9.

6.11. AC Conducted Emissions

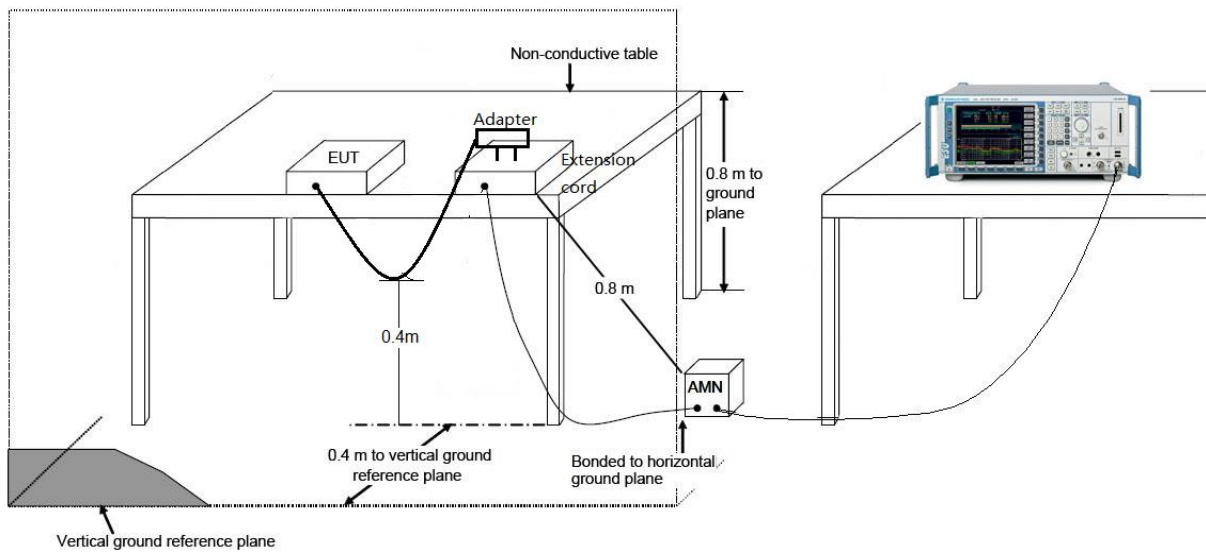
6.11.1. Test Limit

FCC Part 15 Subpart C Paragraph 15.207 Limits		
Frequency (MHz)	QP (dB μ V)	Average (dB μ V)
0.15 - 0.50	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30	60	50

Note 1: The lower limit shall apply at the transition frequencies.

Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

6.11.2. Test Setup



6.11.3. Test Result

Refer to Appendix A.10.

7. Conclusion

The data collected relate only the item(s) tested and show that the unit is in compliance with Part 15C of the FCC rules.

Appendix A - Test Result

A.1 20dB Bandwidth Test Result

Test Site	NS-TR2	Test Engineer	Summer Tang
Test Date	2021/10/19		

Test Mode	Channel No.	Frequency (MHz)	20dB Bandwidth (kHz)	Result
DH5	00	2402	858.6	Pass
DH5	39	2441	857.8	Pass
DH5	78	2480	858.4	Pass
2DH5	00	2402	1255.0	Pass
2DH5	39	2441	1254.0	Pass
2DH5	78	2480	1254.0	Pass
3DH5	00	2402	1251.0	Pass
3DH5	39	2441	1251.0	Pass
3DH5	78	2480	1265.0	Pass

DH5 20dB Bandwidth

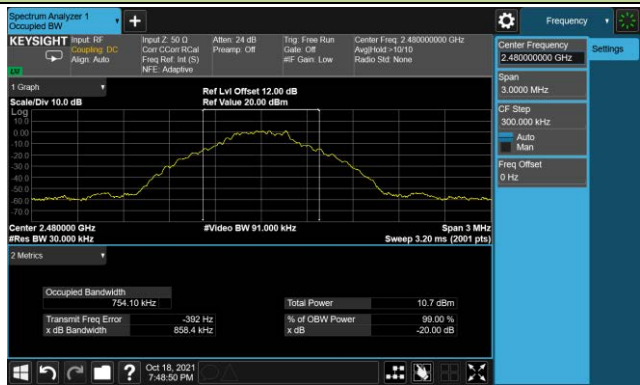
Channel 00 (2402MHz)



Channel 39 (2441MHz)



Channel 78 (2480MHz)



2DH5 20dB Bandwidth

Channel 00 (2402MHz)

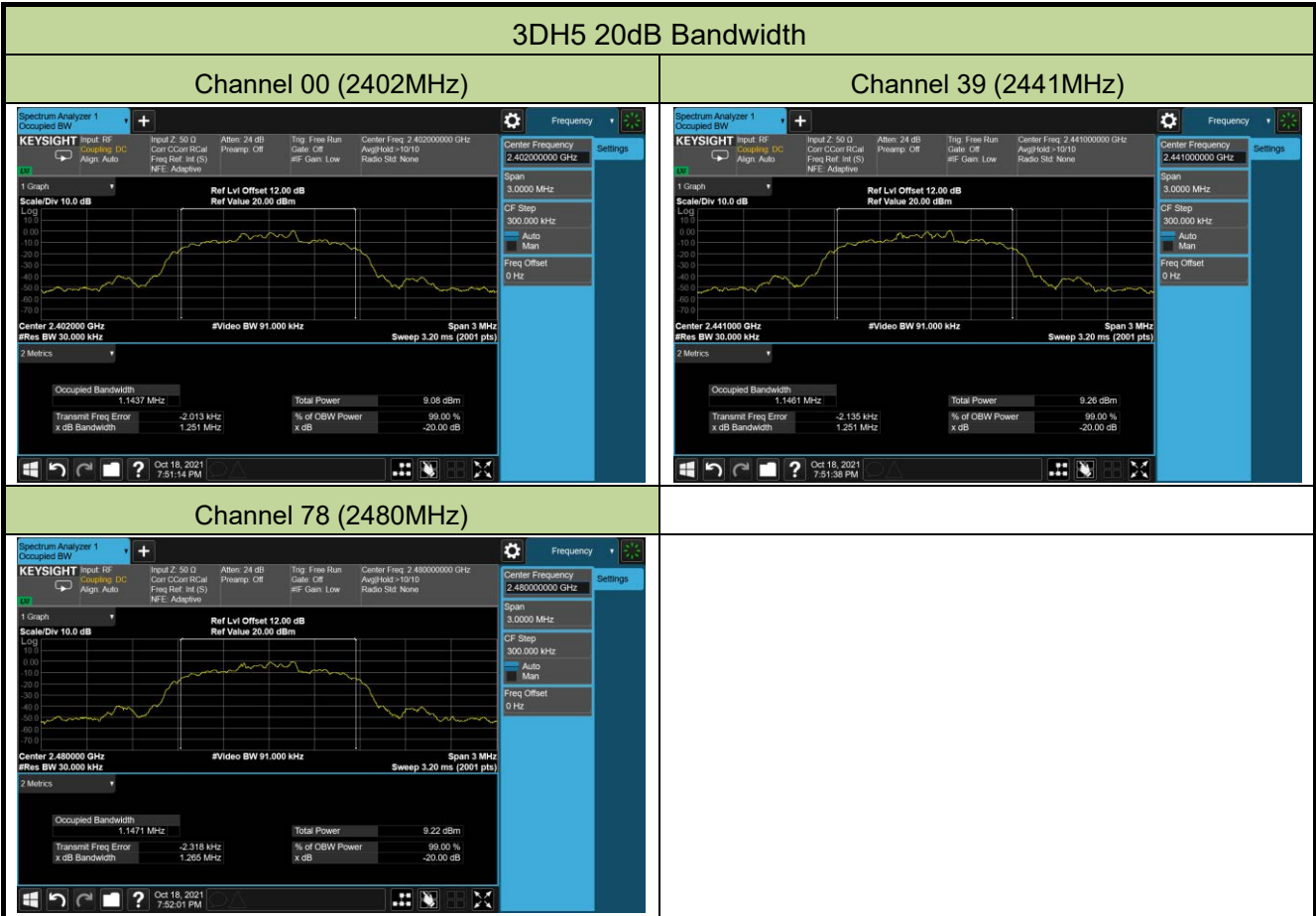


Channel 39 (2441MHz)



Channel 78 (2480MHz)





A.2 Output Power Test Result

Test Site	NS-TR2	Test Engineer	Summer Tang
Test Date	2021/10/19		

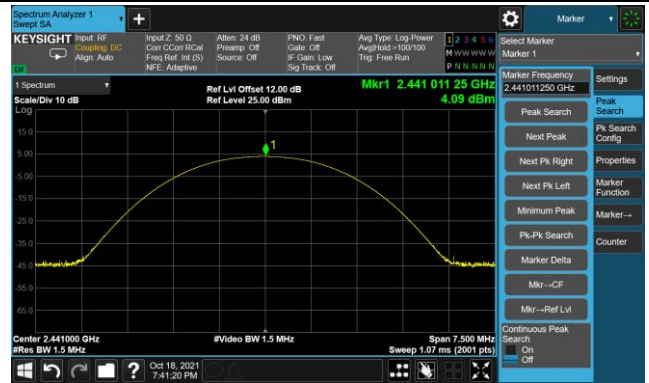
Test Mode	Channel No.	Frequency (MHz)	Peak Power (dBm)	Peak Power Limit (dBm)
DH5	00	2402	3.80	≤ 30
DH5	39	2441	4.09	≤ 30
DH5	78	2480	4.10	≤ 30
2DH5	00	2402	2.97	≤ 30
2DH5	39	2441	3.30	≤ 30
2DH5	78	2480	3.30	≤ 30
3DH5	00	2402	2.96	≤ 30
3DH5	39	2441	3.29	≤ 30
3DH5	78	2480	3.31	≤ 30

DH5 Output Power

Channel 00 (2402MHz)



Channel 39 (2441MHz)

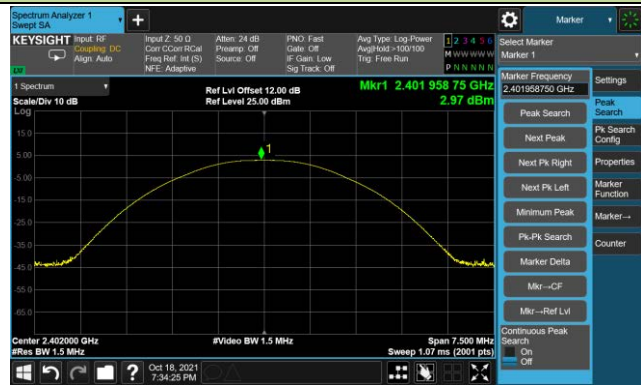


Channel 78 (2480MHz)



2DH5 Output Power

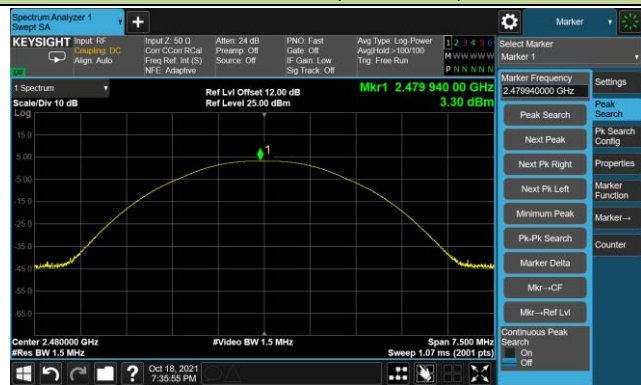
Channel 00 (2402MHz)



Channel 39 (2441MHz)



Channel 78 (2480MHz)



3DH5 Output Power

Channel 00 (2402MHz)



Channel 39 (2441MHz)



Channel 78 (2480MHz)



A.3 Carrier Frequency Separation Test Result

Test Site	NS-TR2	Test Engineer	Summer Tang
Test Date	2021/10/19		

Test Mode	Channel No.	Frequency (MHz)	Limit (kHz)	Result
DH5	00	2402	≥ 572.4	Pass
DH5	39	2441	≥ 571.9	Pass
DH5	78	2480	≥ 572.3	Pass
2DH5	00	2402	≥ 836.7	Pass
2DH5	39	2441	≥ 836.0	Pass
2DH5	78	2480	≥ 836.0	Pass
3DH5	00	2402	≥ 834.0	Pass
3DH5	39	2441	≥ 834.0	Pass
3DH5	78	2480	≥ 843.3	Pass

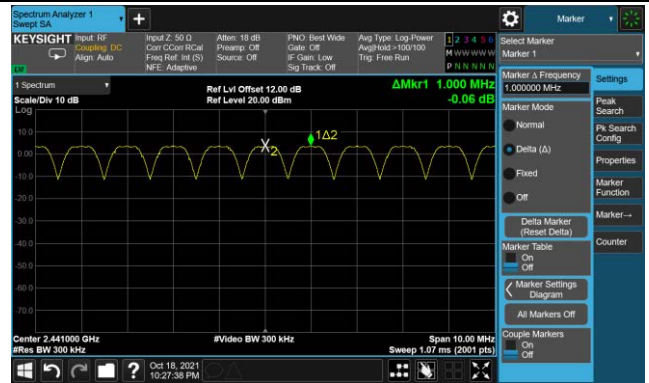
Note: The Limit is 2/3 the value of the 20dB BW.

DH5 Carrier Frequency Separation

Channel 00 (2402MHz)



Channel 39 (2441MHz)



Channel 78 (2480MHz)



2DH5 Carrier Frequency Separation

Channel 00 (2402MHz)



Channel 39 (2441MHz)



Channel 78 (2480MHz)



3DH5 Carrier Frequency Separation

Channel 00 (2402MHz)



Channel 39 (2441MHz)



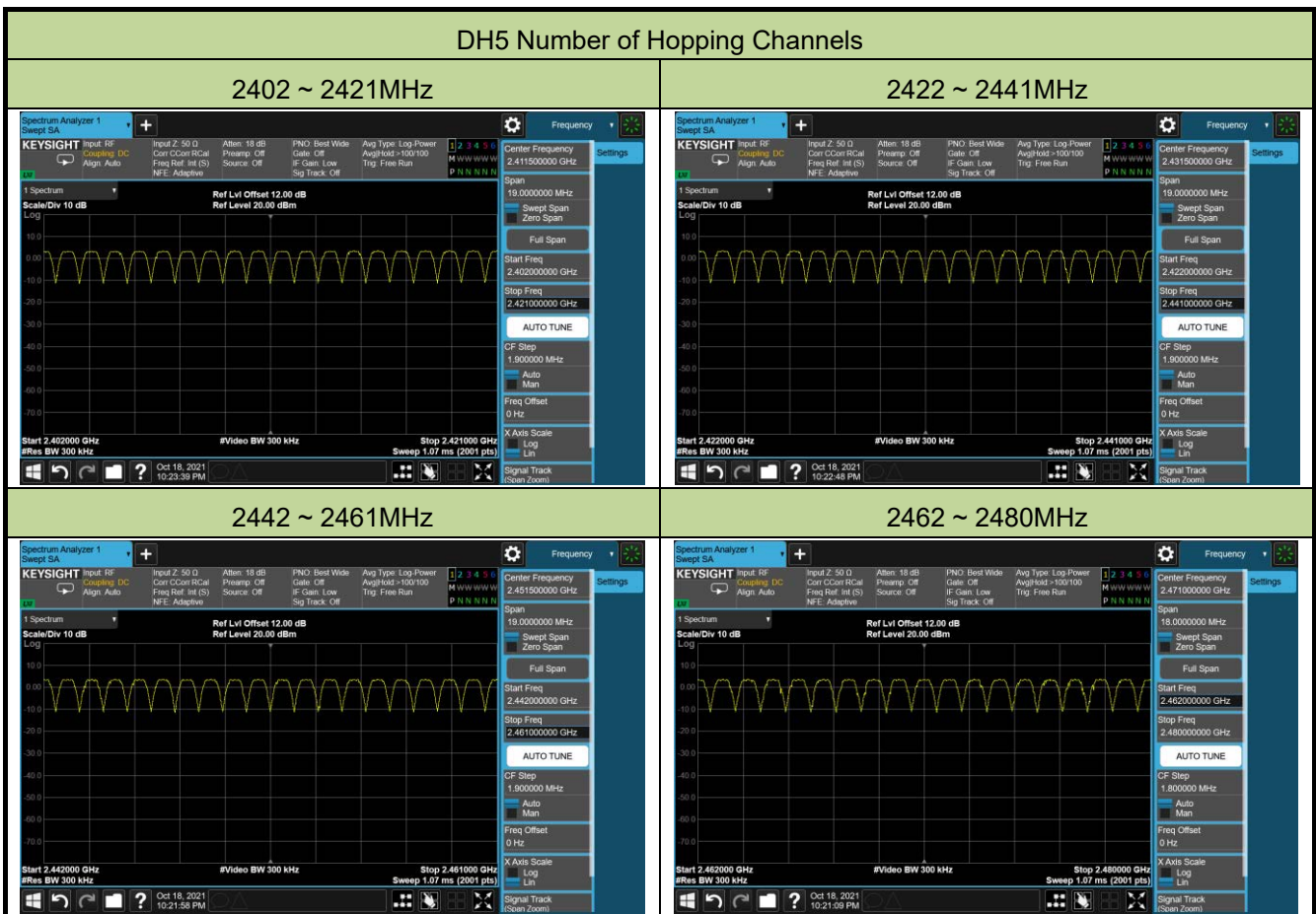
Channel 78 (2480MHz)



A.4 Number of Hopping Channels Test Result

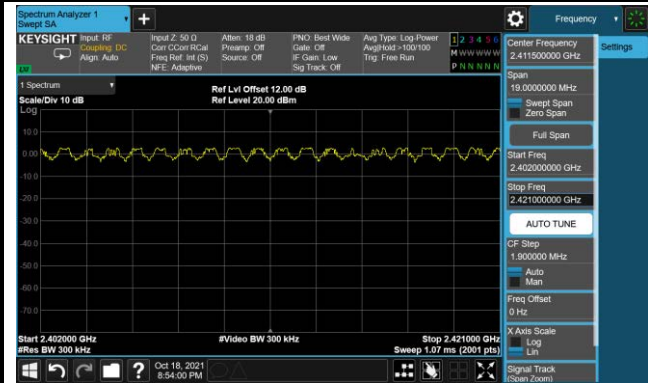
Test Site	NS-TR2	Test Engineer	Summer Tang
Test Date	2021/10/19		

Test Mode (Hopping)	Channel Numbers	Frequency (MHz)	Limit (Hopping Channels)	Result
DH5	79	2402~2480	≥ 15	Pass
2DH5	79	2402~2480	≥ 15	Pass
3DH5	79	2402~2480	≥ 15	Pass

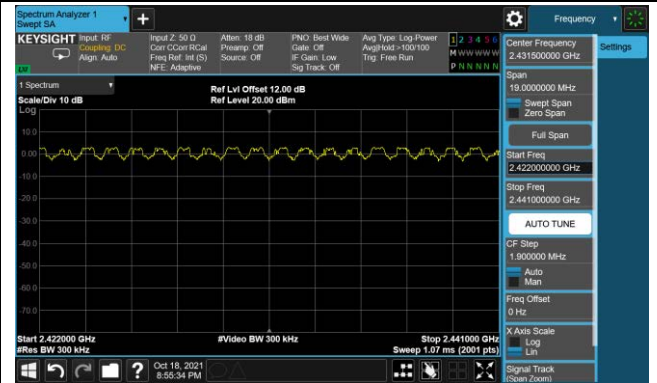


2DH5 Number of Hopping Channels

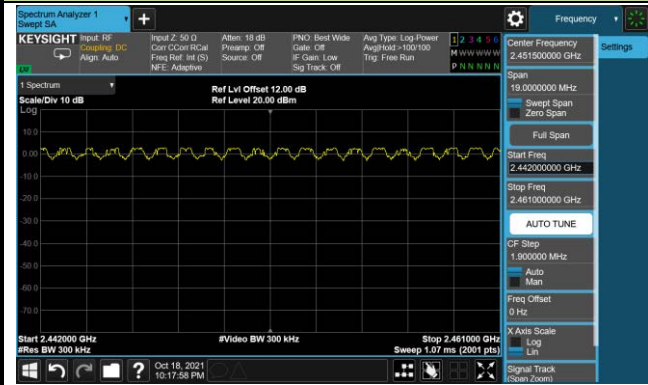
2402 ~ 2421MHz



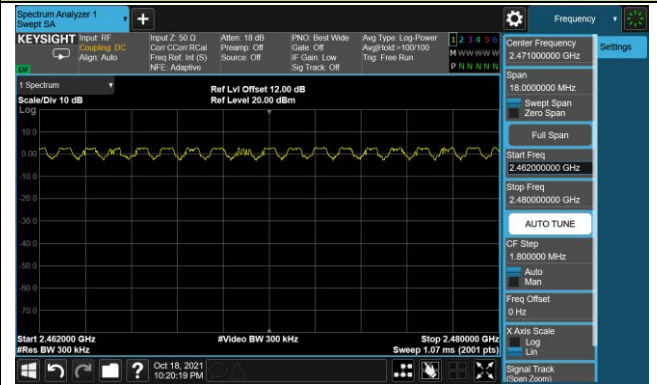
2422 ~ 2441MHz



2442 ~ 2461MHz

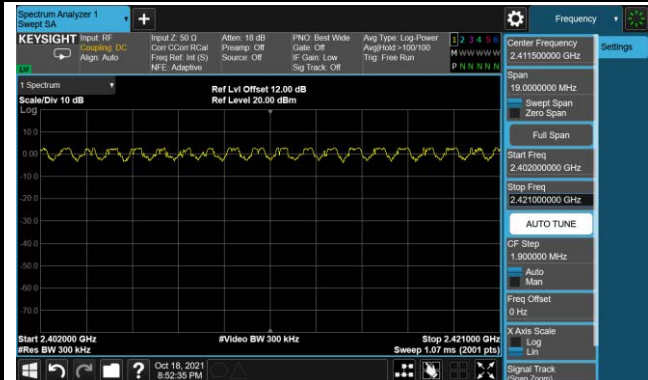


2462 ~ 2480MHz

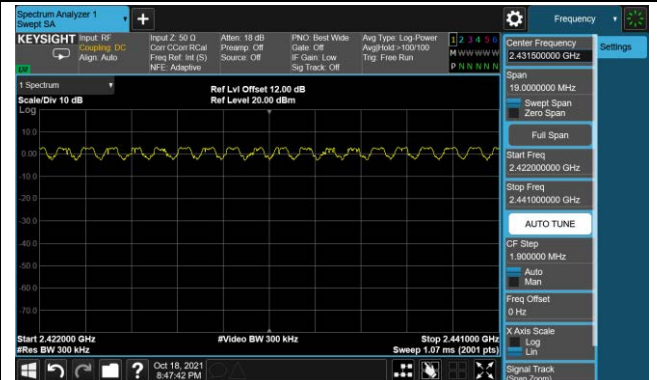


3DH5 Number of Hopping Channels

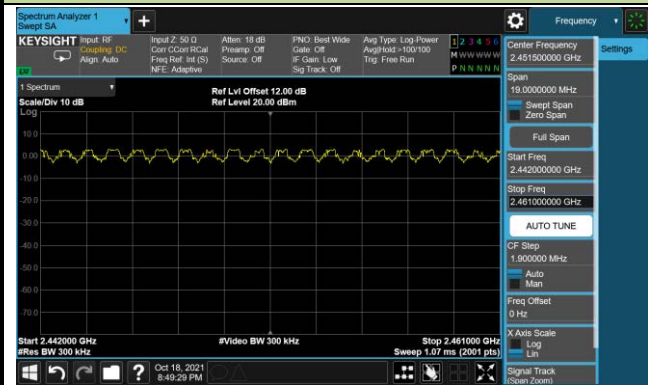
2402 ~ 2421MHz



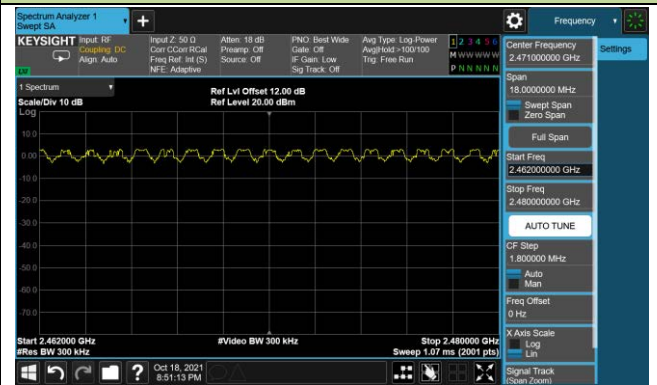
2422 ~ 2441MHz



2442 ~ 2461MHz



2462 ~ 2480MHz



A.5 Time of Occupancy Test Result

Test Site	NS-TR2	Test Engineer	Summer Tang
Test Date	2021/11/26		

Test Mode	Channel No.	Frequency (MHz)	Transmit Time Per Hop (ms)	Observation Period (s)	Number of Hops in Sweep Time	Number of Hops in Observation Period	Time of Occupancy (ms)	Limit (ms)	Result
3DH1	00~78	2402~2480	0.370	31.6	61	321.267	118.869	≤ 400	Pass
3DH3	00~78	2402~2480	1.620	31.6	28	147.467	238.896	≤ 400	Pass
3DH5	00~78	2402~2480	2.850	31.6	15	79.000	225.150	≤ 400	Pass

AFH*4 Test Mode	Frequency (MHz)	Hops Over Occupancy Time (Hops)	Packet Transfer Time (ms)	Time of Occupancy (ms)	Dwell Time (Sec)	Limit (ms)	Result
3-DH5 (3Mbps)	2402	53.5	2.89	154.62	0.15	≤ 400	Pass
	2441	53.5	2.89	154.62	0.15	≤ 400	Pass
	2480	53.5	2.88	154.08	0.15	≤ 400	Pass

Note 1: Number of Hops in Observation Period = Number of Hops in Sweep Time * (Observation Period / Sweep Time), Sweep Time = 6s.

Note 2: Time of Occupancy (ms) = Transmit Time Per Hop (ms) * Number of Hops in Observation Period.

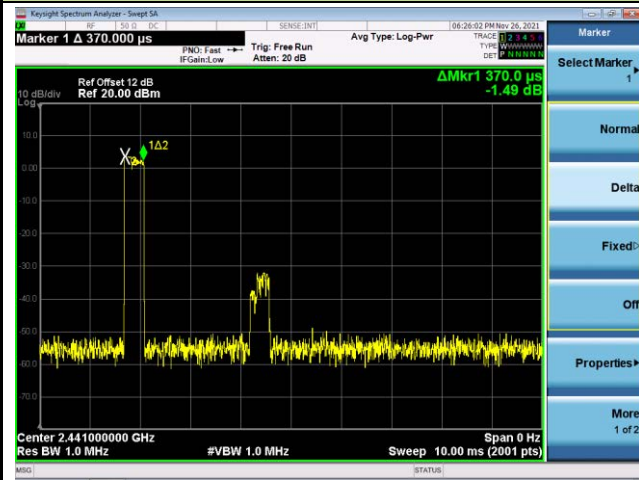
Note 3: According the Bluetooth standard Specification, the nominal hop rate is 1600 hops/s. All Bluetooth unit participating in the piconet are time and hop synchronized to the channel.

(1)Hops Over Occupancy Time in 31.6s for 3DH5 = $800 / 6 / 20 * 8.0 = 53.5$.

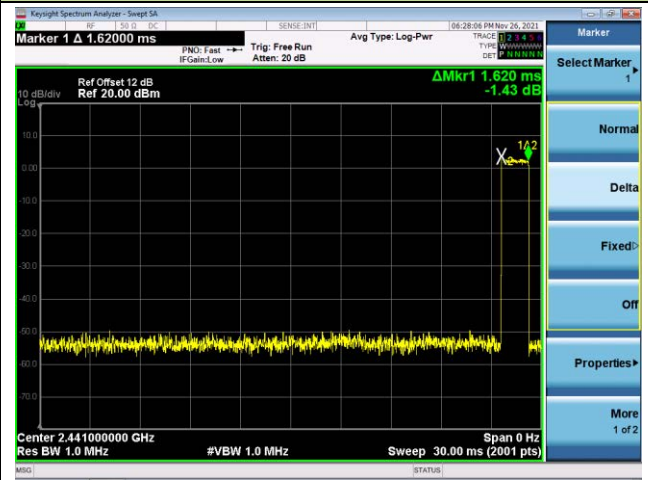
(2)Time of Occupancy= Packet Transfer Time * Hops Over Occupancy Time in 31.6s.

Transmit Time Per Hop

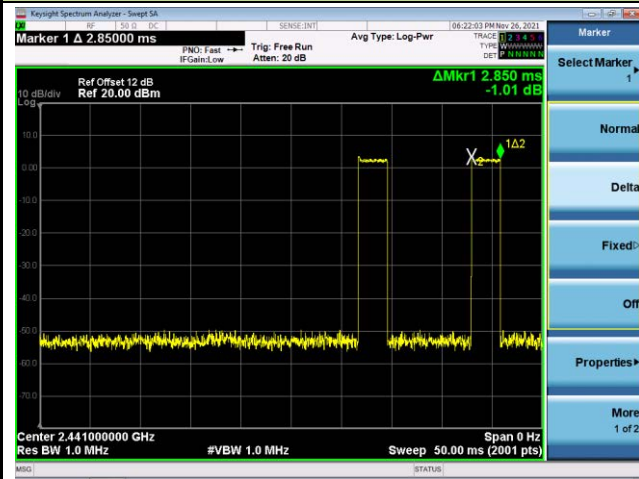
3DH1



3DH3

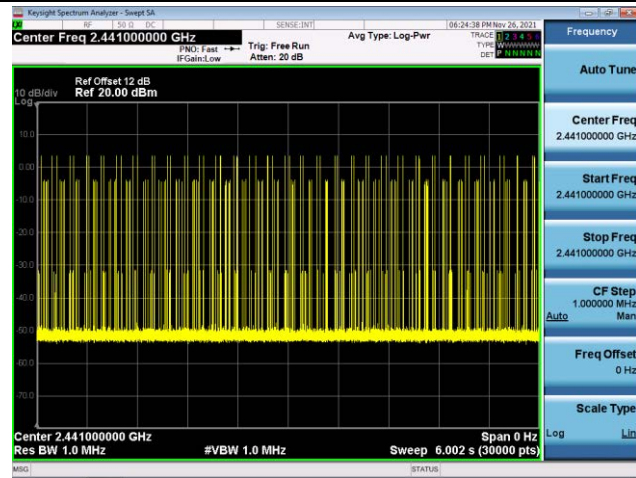


3DH5

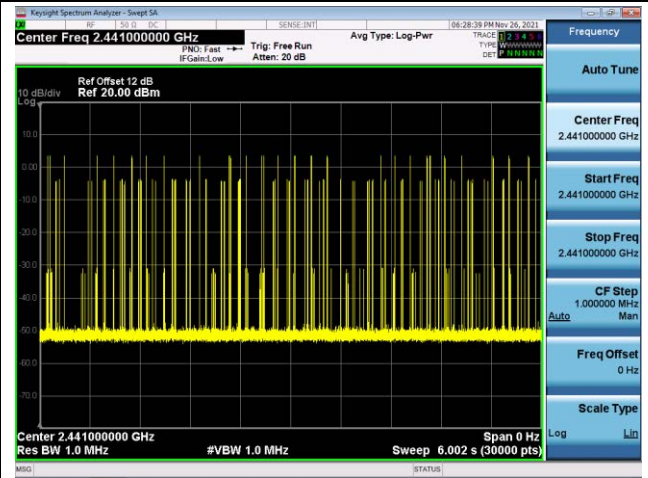


Number of Hops in Sweep Time

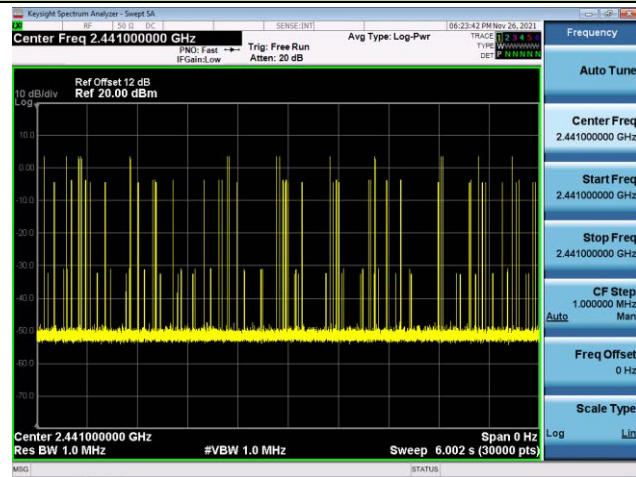
3DH1



3DH3



3DH5



A.6 Band-edge Compliance Test Result

Test Site	NS-TR2	Test Engineer	Summer Tang
Test Date	2021/10/19 ~ 2021/11/26		

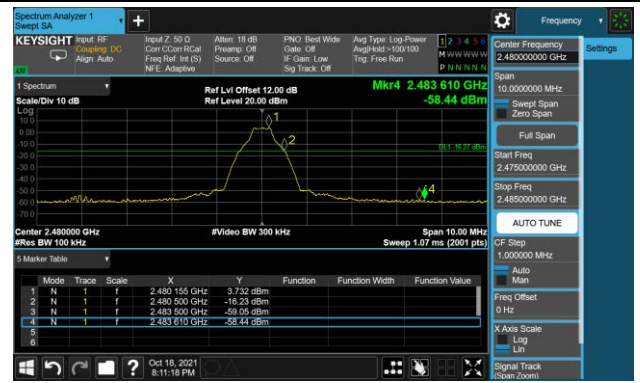
Test Mode	Channel No.	Frequency (MHz)	Limit	Result
DH5	00	2402	20dBc	Pass
DH5	78	2480	20dBc	Pass
2DH5	00	2402	20dBc	Pass
2DH5	78	2480	20dBc	Pass
3DH5	00	2402	20dBc	Pass
3DH5	78	2480	20dBc	Pass

Band-edge Compliance

DH5 - Channel 00 (2402MHz)



DH5 - Channel 78 (2480MHz)



2DH5 - Channel 00 (2402MHz)



2DH5 - Channel 78 (2480MHz)



3DH5 - Channel 00 (2402MHz)

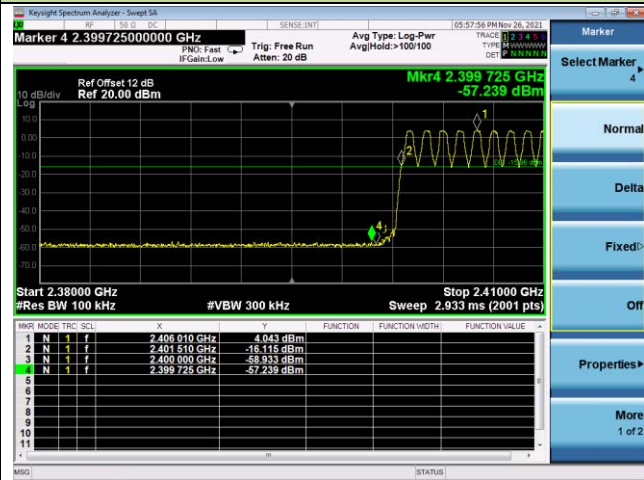


3DH5 - Channel 78 (2480MHz)

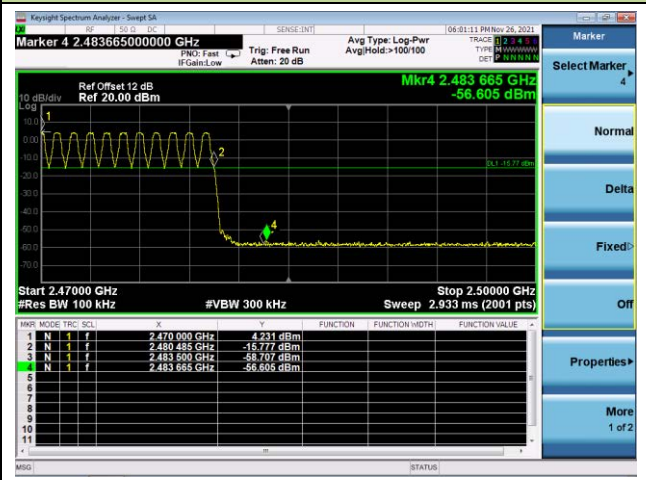


Operation Frequency Range of 20dB Bandwidth within Hopping Mode

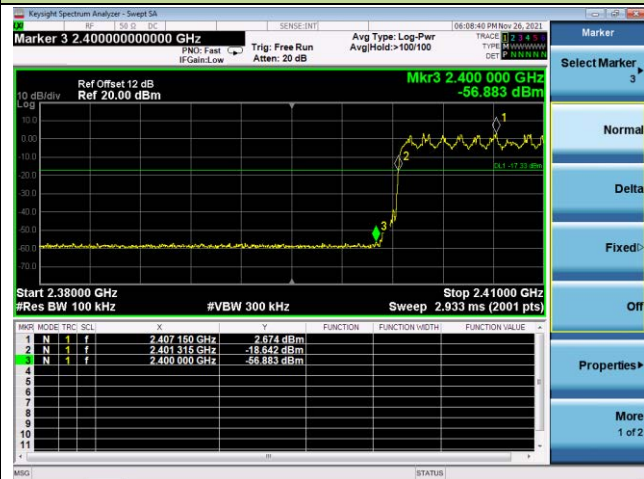
DH5 - Channel 00 (2402MHz)



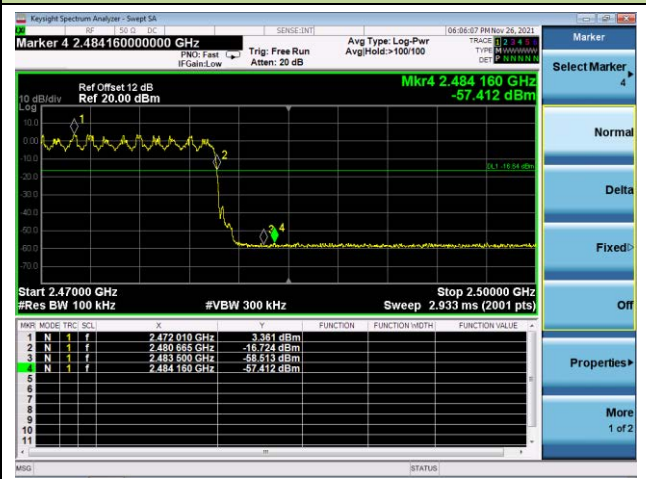
DH5 - Channel 78 (2480MHz)



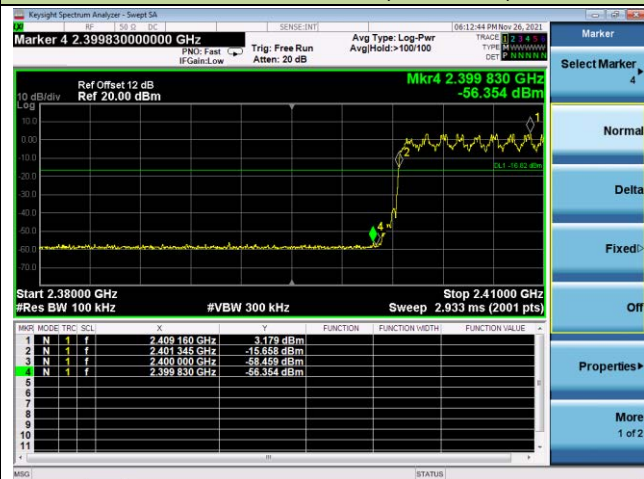
2DH5 - Channel 00 (2402MHz)



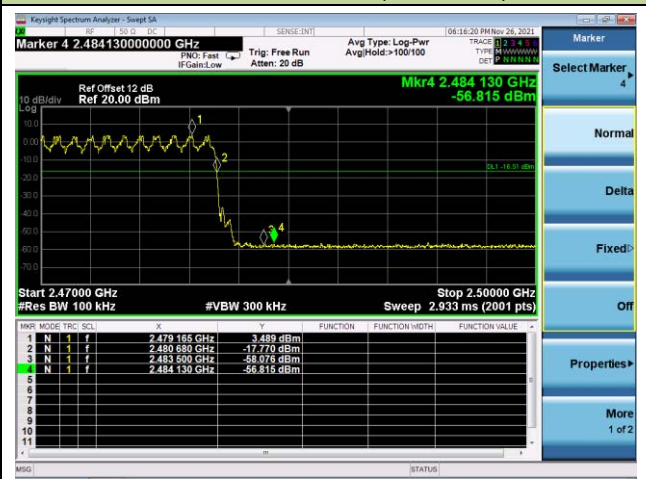
2DH5 - Channel 78 (2480MHz)



3DH5 - Channel 00 (2402MHz)



3DH5 - Channel 78 (2480MHz)



A.7 Conducted Spurious Emissions Test Result

Test Site	NS-TR2	Test Engineer	Summer Tang
Test Date	2021/10/19		

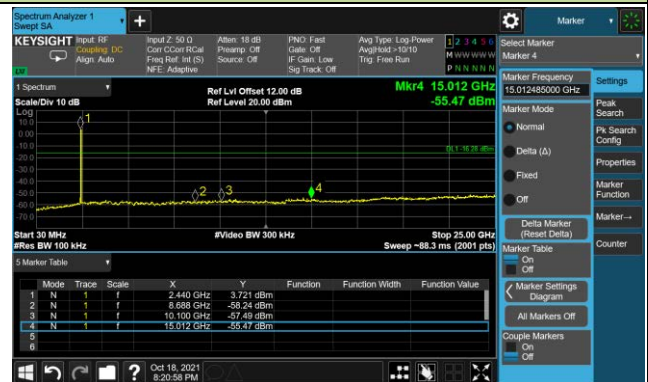
Test Mode	Channel No.	Frequency (MHz)	Limit (MHz)	Result
DH5	00	2402	20dBc	Pass
DH5	39	2441	20dBc	Pass
DH5	78	2480	20dBc	Pass
2DH5	00	2402	20dBc	Pass
2DH5	39	2441	20dBc	Pass
2DH5	78	2480	20dBc	Pass
3DH5	00	2402	20dBc	Pass
3DH5	39	2441	20dBc	Pass
3DH5	78	2480	20dBc	Pass

DH5 Conducted Spurious Emissions

Channel 00 (2402MHz)



Channel 39 (2441MHz)

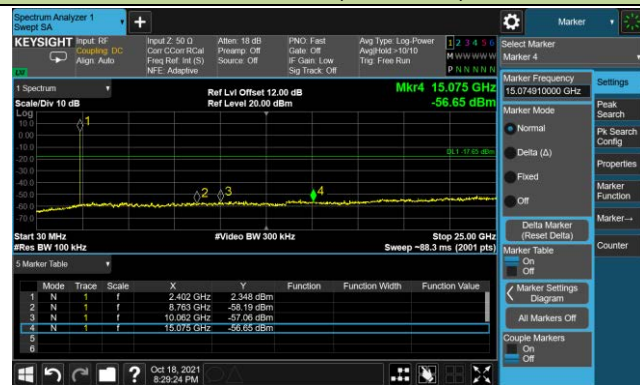


Channel 78 (2480MHz)



2DH5 Conducted Spurious Emissions

Channel 00 (2402MHz)



Channel 39 (2441MHz)



Channel 78 (2480MHz)



3DH5 Conducted Spurious Emissions

Channel 00 (2402MHz)



Channel 39 (2441MHz)



Channel 78 (2480MHz)



A.8 Radiated Spurious Emission Test Result

Test Site	NS-AC1	Test Engineer	Dillon Diao
Test Date	2021/10/18	Test Mode:	DH5
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Test Channel	Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
00	7723.5	36.7	8.6	45.3	74.0	-28.7	Peak	Horizontal
	9449.0	36.1	11.7	47.8	74.0	-26.2	Peak	Horizontal
	10630.5	34.2	13.8	48.0	74.0	-26.0	Peak	Horizontal
	5105.5	37.1	2.4	39.5	74.0	-34.5	Peak	Vertical
	6729.0	34.9	6.2	41.1	74.0	-32.9	Peak	Vertical
	7851.0	35.3	8.6	43.9	74.0	-30.1	Peak	Vertical
39	6712.0	35.8	5.9	41.7	74.0	-32.3	Peak	Horizontal
	8709.5	34.1	12.2	46.3	74.0	-27.7	Peak	Horizontal
	10273.5	34.7	13.2	47.9	74.0	-26.1	Peak	Horizontal
	8837.0	34.9	12.0	46.9	74.0	-27.1	Peak	Vertical
	10596.5	35.0	13.6	48.6	74.0	-25.4	Peak	Vertical
	11999.0	34.0	14.8	48.8	74.0	-25.2	Peak	Vertical
78	6108.5	35.9	4.0	39.9	74.0	-34.1	Peak	Horizontal
	7434.5	34.3	9.4	43.7	74.0	-30.3	Peak	Horizontal
	8131.5	33.4	9.2	42.6	74.0	-31.4	Peak	Horizontal
	6780.0	36.9	6.2	43.1	74.0	-30.9	Peak	Vertical
	7987.0	37.6	9.2	46.8	74.0	-27.2	Peak	Vertical
	9338.5	34.9	11.9	46.8	74.0	-27.2	Peak	Vertical

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Test Site	NS-AC1	Test Engineer	Dillon Diao
Test Date	2021/10/18	Test Mode:	2DH5
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Test Channel	Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
00	6117.0	36.3	3.8	40.1	74.0	-33.9	Peak	Horizontal
	8012.5	35.3	9.0	44.3	74.0	-29.7	Peak	Horizontal
	9457.5	35.8	11.6	47.4	74.0	-26.6	Peak	Horizontal
	4604.0	37.8	1.5	39.3	74.0	-34.7	Peak	Vertical
	6848.0	36.0	6.8	42.8	74.0	-31.2	Peak	Vertical
	9381.0	35.8	11.7	47.5	74.0	-26.5	Peak	Vertical
39	7868.0	35.9	8.5	44.4	74.0	-29.6	Peak	Horizontal
	9381.0	35.9	11.7	47.6	74.0	-26.4	Peak	Horizontal
	10256.5	34.7	13.1	47.8	74.0	-26.2	Peak	Horizontal
	6839.5	36.2	6.7	42.9	74.0	-31.1	Peak	Vertical
	9449.0	36.6	11.7	48.3	74.0	-25.7	Peak	Vertical
	10698.5	34.3	14.0	48.3	74.0	-25.7	Peak	Vertical
78	5649.5	36.5	2.7	39.2	74.0	-34.8	Peak	Horizontal
	7256.0	33.5	8.9	42.4	74.0	-31.6	Peak	Horizontal
	8429.0	36.5	10.1	46.6	74.0	-27.4	Peak	Horizontal
	4969.5	37.3	1.6	38.9	74.0	-35.1	Peak	Vertical
	6414.5	36.8	5.1	41.9	74.0	-32.1	Peak	Vertical
	9627.5	36.3	11.7	48.0	74.0	-26.0	Peak	Vertical

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Test Site	NS-AC1	Test Engineer	Dillon Diao
Test Date	2021/10/18	Test Mode:	3DH5
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

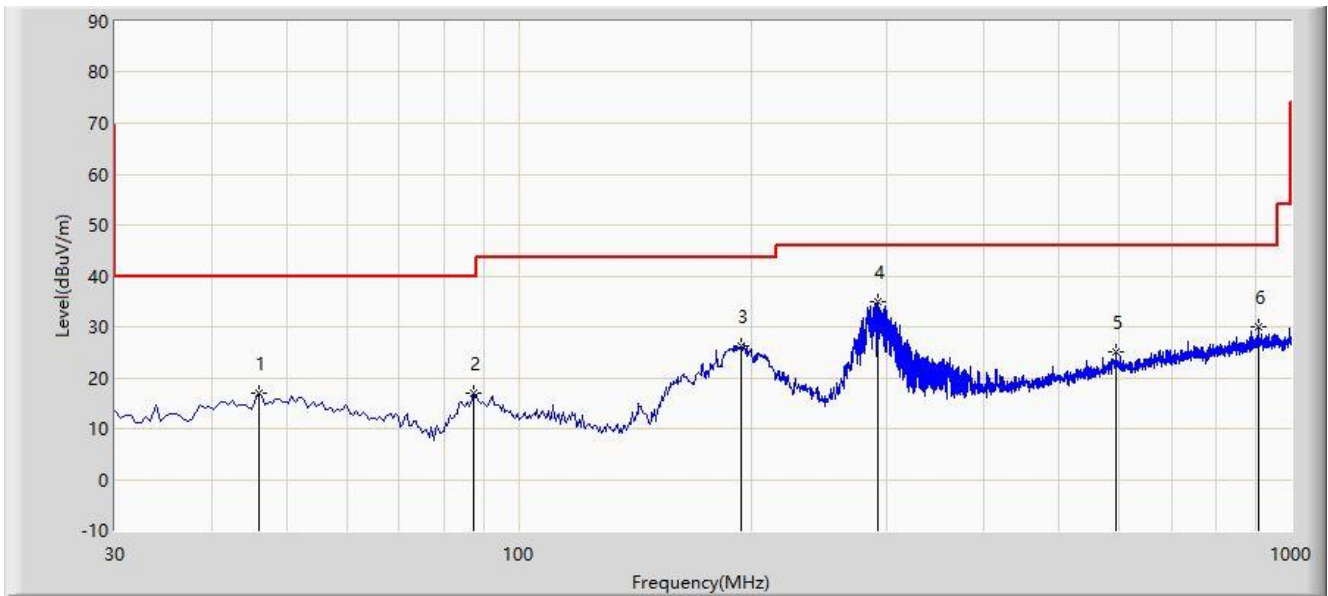
Test Channel	Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
00	5692.0	36.8	2.8	39.6	74.0	-34.4	Peak	Horizontal
	7332.5	34.3	9.1	43.4	74.0	-30.6	Peak	Horizontal
	9457.5	36.3	11.6	47.9	74.0	-26.1	Peak	Horizontal
	5267.0	37.2	1.7	38.9	74.0	-35.1	Peak	Vertical
	6950.0	36.7	7.3	44.0	74.0	-30.0	Peak	Vertical
	7961.5	38.1	8.9	47.0	74.0	-27.0	Peak	Vertical
39	6703.5	33.9	5.9	39.8	74.0	-34.2	Peak	Horizontal
	7783.0	36.1	8.5	44.6	74.0	-29.4	Peak	Horizontal
	8973.0	33.3	11.7	45.0	74.0	-29.0	Peak	Horizontal
	5989.5	36.0	3.9	39.9	74.0	-34.1	Peak	Vertical
	7230.5	33.2	8.7	41.9	74.0	-32.1	Peak	Vertical
	8794.5	34.7	11.9	46.6	74.0	-27.4	Peak	Vertical
78	6406.0	36.4	5.1	41.5	74.0	-32.5	Peak	Horizontal
	8437.5	36.5	10.3	46.8	74.0	-27.2	Peak	Horizontal
	9993.0	32.7	12.4	45.1	74.0	-28.9	Peak	Horizontal
	6108.5	36.2	4.0	40.2	74.0	-33.8	Peak	Vertical
	7995.5	36.8	9.0	45.8	74.0	-28.2	Peak	Vertical
	10248.0	35.1	13.2	48.3	74.0	-25.7	Peak	Vertical

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

The Result of Radiated Emission below 1GHz:

Site: NS-AC1	Time: 2021/10/12
Limit: FCC_Part 15.209_RE(3m)	Engineer: Dillon Diao
Probe: NS-AC1_VULB9162	Polarity: Horizontal
EUT: Nautiz X9	Power: AC 120V/60Hz
Test Mode: Transmit by DH5 at channel 2402MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dB μ V/m)	Reading Level (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Factor (dB/m)	Type
1			46.005	16.915	-0.505	-23.085	40.000	17.421	PK
2			87.230	17.042	4.658	-22.958	40.000	12.384	PK
3			194.415	26.302	11.388	-17.198	43.500	14.914	PK
4		*	291.900	34.789	17.892	-11.211	46.000	16.897	PK
5			594.055	25.169	1.662	-20.831	46.000	23.507	PK
6			906.395	29.900	2.165	-16.100	46.000	27.735	PK

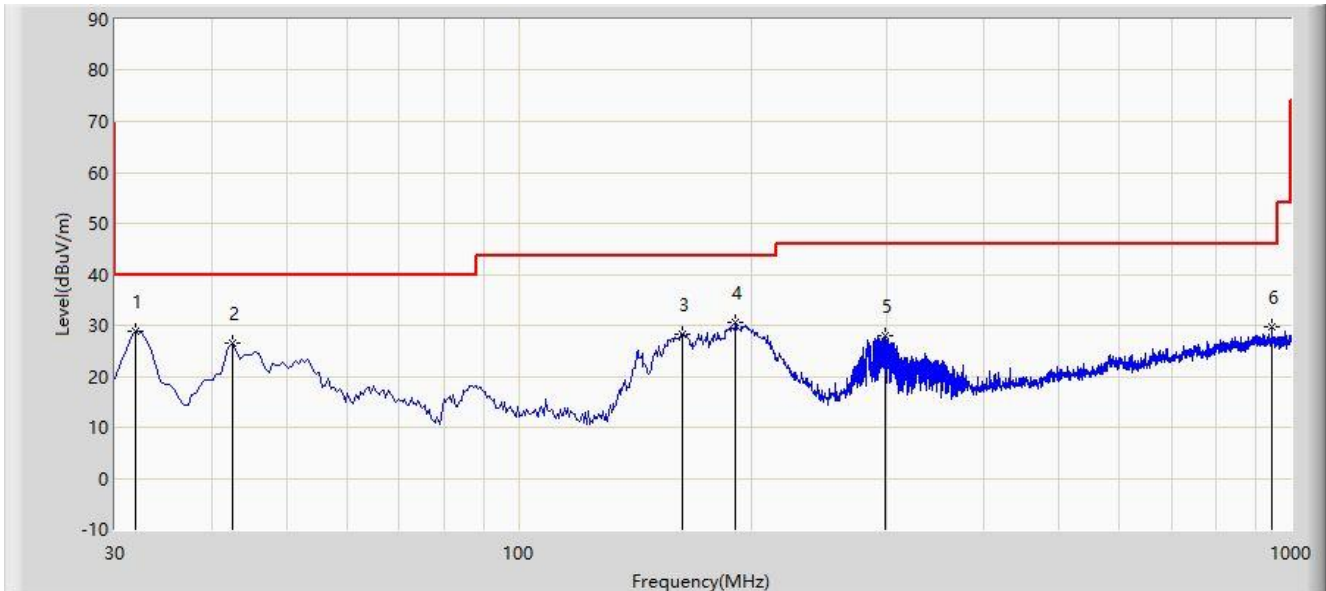
Note 1: Measure Level (dB μ V/m) = Reading Level (dB μ V) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m)

Note 2: The amplitude of radiated emissions (frequency range from 9kHz to 30MHz and 18GHz to 25GHz) is that proximity to ambient noise, which also are attenuated more than 20 dB below the permissible value.

Therefore, the data is not presented in the report.

Site: NS-AC1	Time: 2021/10/12
Limit: FCC_Part 15.209_RE(3m)	Engineer: Dillon Diao
Probe: NS-AC1_VULB9162	Polarity: Vertical
EUT: Nautiz X9	Power: AC 120V/60Hz
Test Mode: Transmit by DH5 at channel 2402MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dB μ V/m)	Reading Level (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Factor (dB/m)	Type
1		*	31.940	28.898	14.770	-11.102	40.000	14.128	PK
2			42.610	26.377	9.467	-13.623	40.000	16.910	PK
3			162.890	28.370	16.112	-15.130	43.500	12.258	PK
4			191.020	30.434	15.851	-13.066	43.500	14.583	PK
5			298.205	28.101	11.148	-17.899	46.000	16.953	PK
6			945.680	29.701	1.912	-16.299	46.000	27.789	PK

Note 1: Measure Level (dB μ V/m) = Reading Level (dB μ V) + Factor (dB/m)

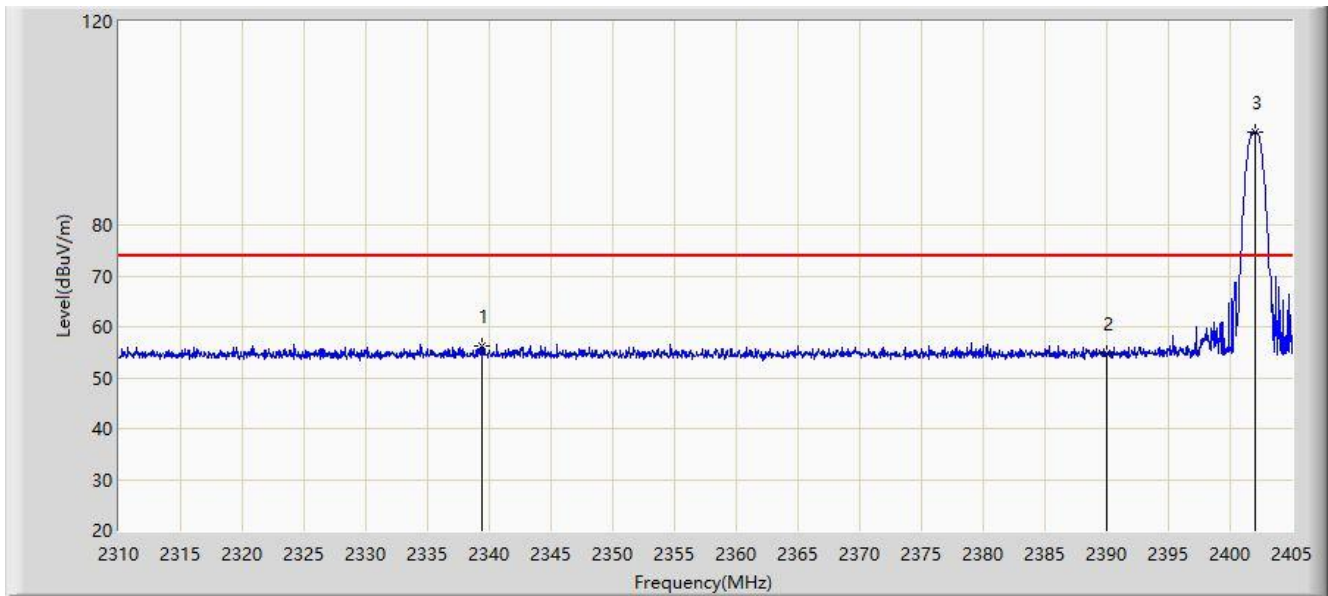
Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m)

Note 2: The amplitude of radiated emissions (frequency range from 9kHz to 30MHz and 18GHz to 25GHz) is that proximity to ambient noise, which also are attenuated more than 20 dB below the permissible value.

Therefore, the data is not presented in the report.

A.9 Radiated Restricted Band Edge Test Result

Site: NS-AC1	Time: 2021/10/18
Limit: FCC_Part15.209_RE(3m)	Engineer: Dillon Diao
Probe: NS-AC1_BBHA9120D	Polarity: Horizontal
EUT: Nautiz X9	Power: AC 120V/60Hz
Test Mode: Transmit by DH5 at channel 2402MHz	

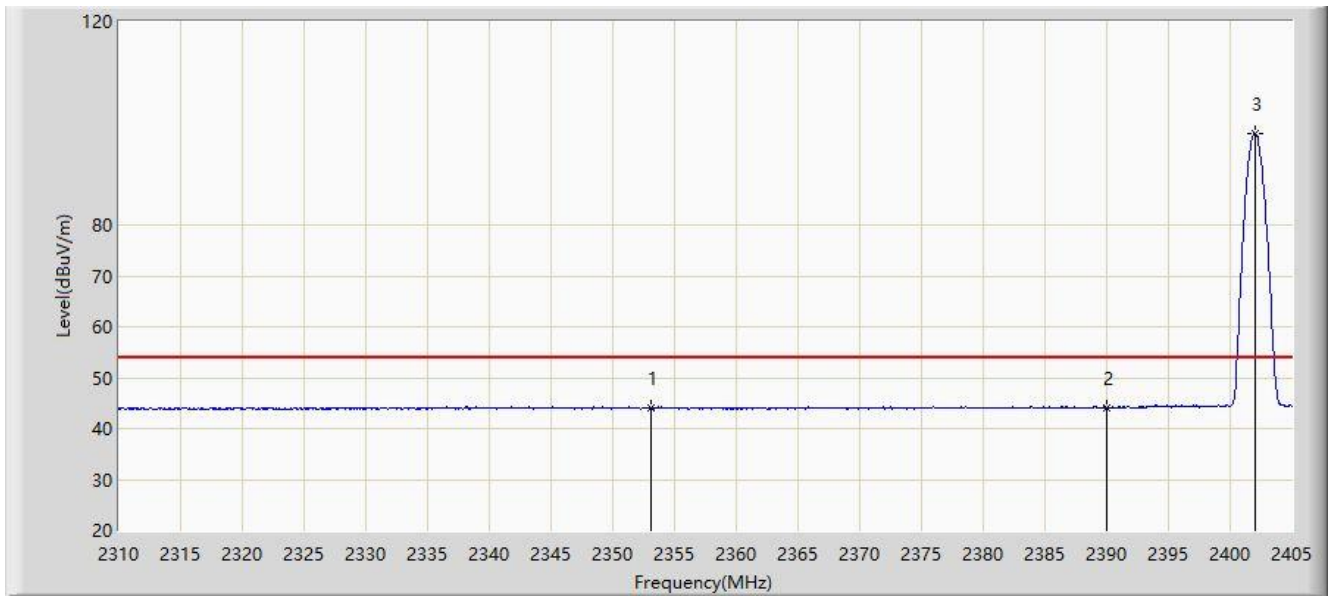


No	Flag	Mark	Frequency (MHz)	Measure Level (dB μ V/m)	Reading Level (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Factor (dB/m)	Type
1			2339.355	56.361	25.185	-17.639	74.000	31.176	PK
2			2390.000	54.747	23.844	-19.253	74.000	30.903	PK
3		*	2402.008	98.388	67.453	N/A	N/A	30.935	PK

Note: Measure Level (dB μ V/m) = Reading Level (dB μ V) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: NS-AC1	Time: 2021/10/18
Limit: FCC_Part15.209_RE(3m)	Engineer: Dillon Diao
Probe: NS-AC1_BBHA9120D	Polarity: Horizontal
EUT: Nautiz X9	Power: AC 120V/60Hz
Test Mode: Transmit by DH5 at channel 2402MHz	

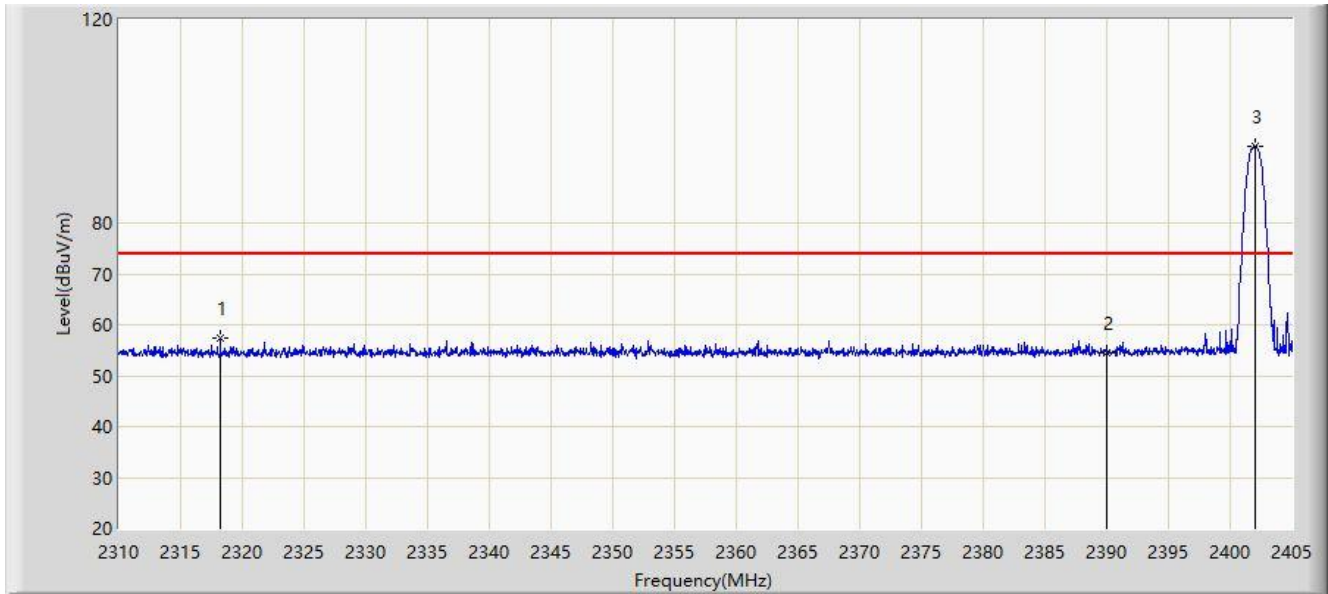


No	Flag	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1			2353.083	44.073	13.003	-9.927	54.000	31.070	AV
2			2390.000	44.061	13.158	-9.939	54.000	30.903	AV
3		*	2402.008	97.909	66.974	N/A	N/A	30.935	AV

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: NS-AC1	Time: 2021/10/18
Limit: FCC_Part15.209_RE(3m)	Engineer: Dillon Diao
Probe: NS-AC1_BBHA9120D	Polarity: Vertical
EUT: Nautiz X9	Power: AC 120V/60Hz
Test Mode: Transmit by DH5 at channel 2402MHz	

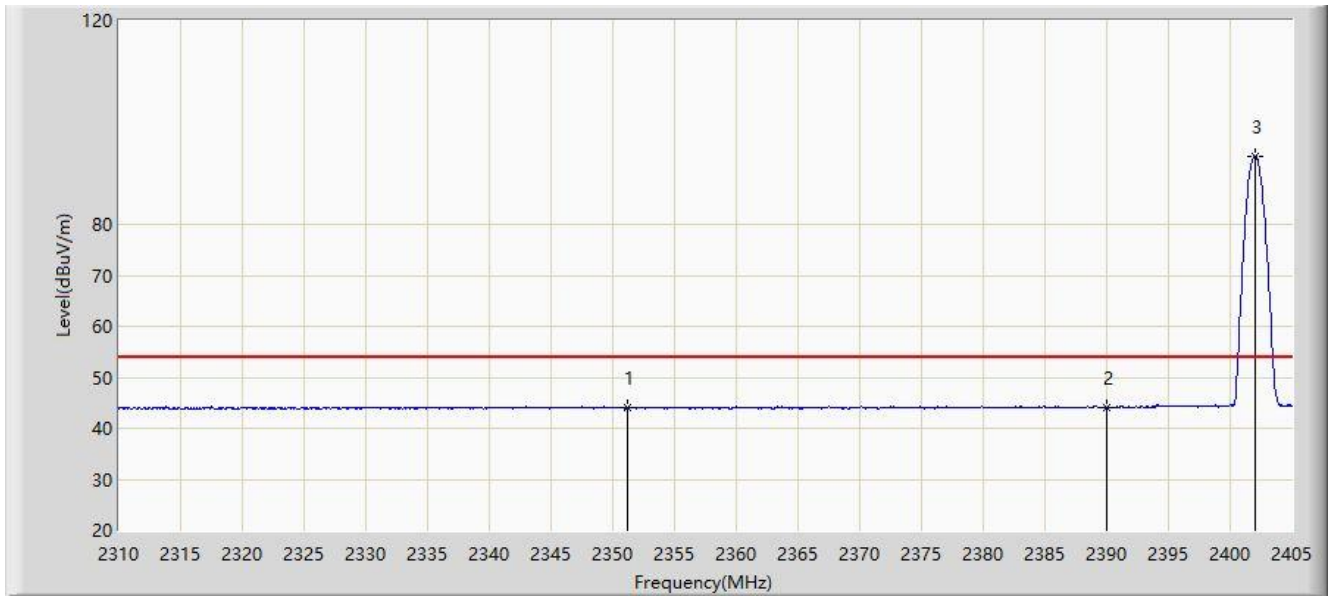


No	Flag	Mark	Frequency (MHz)	Measure Level (dB μ V/m)	Reading Level (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Factor (dB/m)	Type
1			2318.218	57.521	26.387	-16.479	74.000	31.134	PK
2			2390.000	54.559	23.656	-19.441	74.000	30.903	PK
3		*	2402.008	95.046	64.111	N/A	N/A	30.935	PK

Note: Measure Level (dB μ V/m) = Reading Level (dB μ V) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: NS-AC1	Time: 2021/10/18
Limit: FCC_Part15.209_RE(3m)	Engineer: Dillon Diao
Probe: NS-AC1_BBHA9120D	Polarity: Vertical
EUT: Nautiz X9	Power: AC 120V/60Hz
Test Mode: Transmit by DH5 at channel 2402MHz	

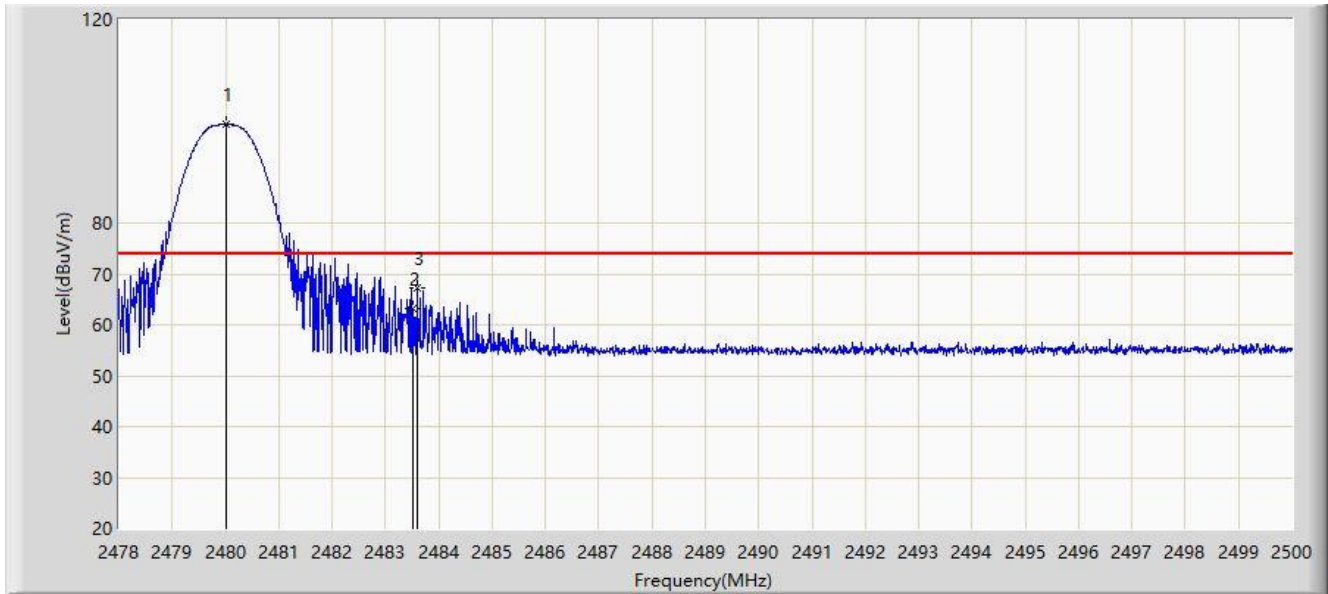


No	Flag	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1			2351.230	44.180	13.088	-9.820	54.000	31.091	AV
2			2390.000	44.106	13.203	-9.894	54.000	30.903	AV
3		*	2402.008	93.392	62.457	N/A	N/A	30.935	AV

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: NS-AC1	Time: 2021/10/18
Limit: FCC_Part15.209_RE(3m)	Engineer: Dillon Diao
Probe: NS-AC1_BBHA9120D	Polarity: Horizontal
EUT: Nautiz X9	Power: AC 120V/60Hz
Test Mode: Transmit by DH5 at channel 2480MHz	

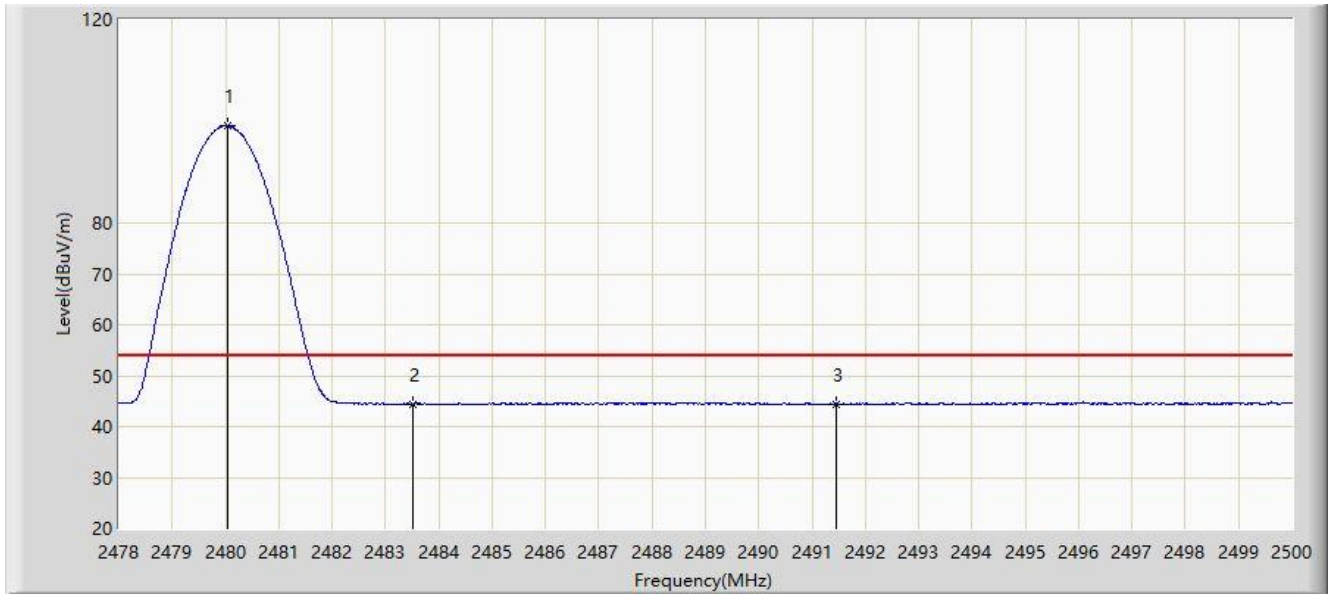


No	Flag	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		*	2480.002	99.423	68.552	N/A	N/A	30.871	PK
2			2483.500	63.254	32.365	-10.746	74.000	30.889	PK
3			2483.599	67.275	36.386	-6.725	74.000	30.889	PK

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: NS-AC1	Time: 2021/10/18
Limit: FCC_Part15.209_RE(3m)	Engineer: Dillon Diao
Probe: NS-AC1_BBHA9120D	Polarity: Horizontal
EUT: Nautiz X9	Power: AC 120V/60Hz
Test Mode: Transmit by DH5 at channel 2480MHz	

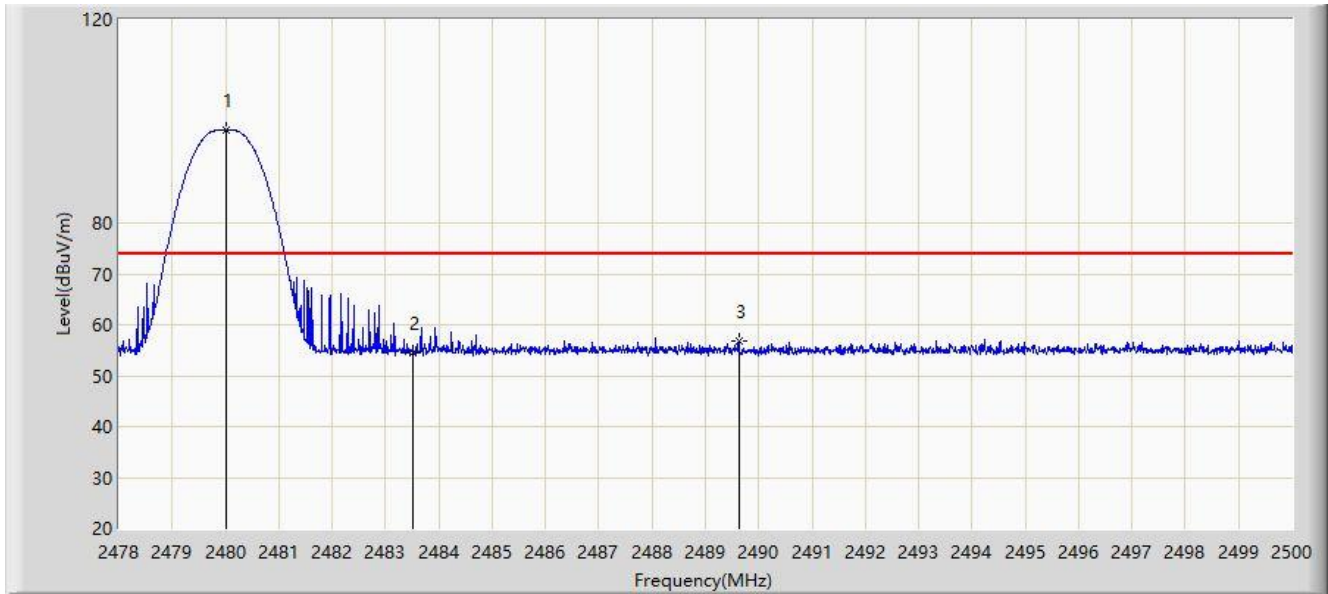


No	Flag	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		*	2480.046	99.085	68.213	N/A	N/A	30.872	AV
2			2483.500	44.370	13.481	-9.630	54.000	30.889	AV
3			2491.464	44.430	13.501	-9.570	54.000	30.929	AV

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: NS-AC1	Time: 2021/10/18
Limit: FCC_Part15.209_RE(3m)	Engineer: Dillon Diao
Probe: NS-AC1_BBHA9120D	Polarity: Vertical
EUT: Nautiz X9	Power: AC 120V/60Hz
Test Mode: Transmit by DH5 at channel 2480MHz	

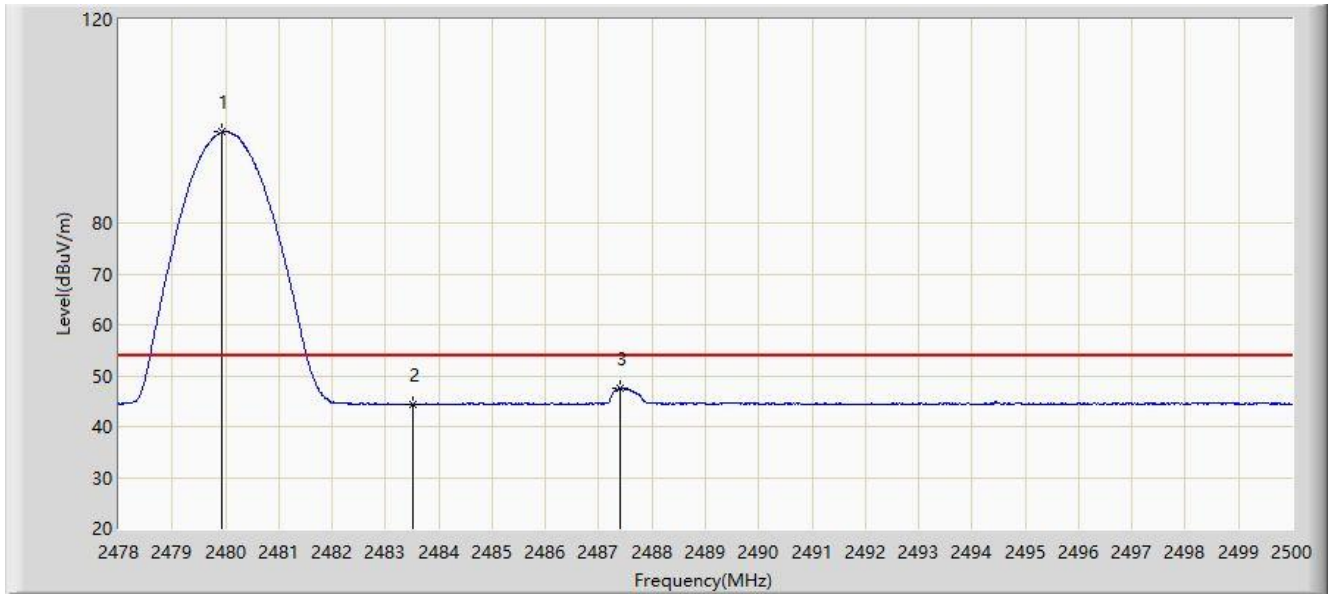


No	Flag	Mark	Frequency (MHz)	Measure Level (dB μ V/m)	Reading Level (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Factor (dB/m)	Type
1		*	2480.002	98.264	67.393	N/A	N/A	30.871	PK
2			2483.500	54.409	23.520	-19.591	74.000	30.889	PK
3			2489.627	56.946	26.027	-17.054	74.000	30.919	PK

Note: Measure Level (dB μ V/m) = Reading Level (dB μ V) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: NS-AC1	Time: 2021/10/18
Limit: FCC_Part15.209_RE(3m)	Engineer: Dillon Diao
Probe: NS-AC1_BBHA9120D	Polarity: Vertical
EUT: Nautiz X9	Power: AC 120V/60Hz
Test Mode: Transmit by DH5 at channel 2480MHz	

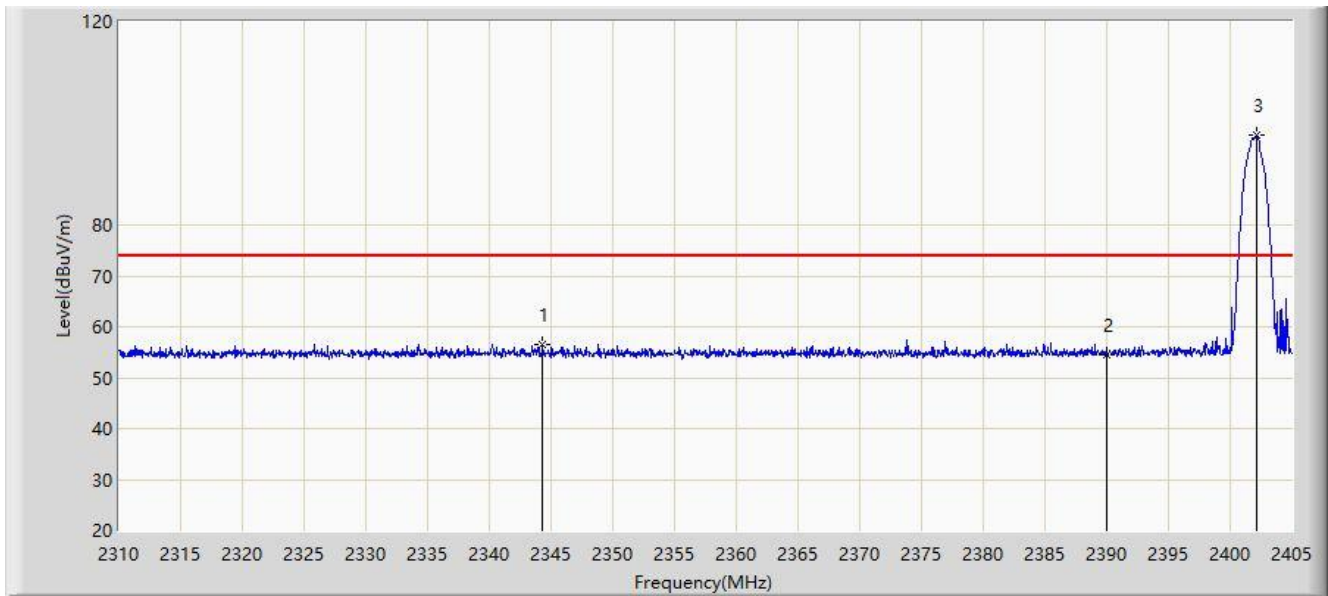


No	Flag	Mark	Frequency (MHz)	Measure Level (dB μ V/m)	Reading Level (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Factor (dB/m)	Type
1		*	2479.936	97.847	66.976	N/A	N/A	30.871	AV
2			2483.500	44.412	13.523	-9.588	54.000	30.889	AV
3			2487.405	47.494	16.586	-6.506	54.000	30.908	AV

Note: Measure Level (dB μ V/m) = Reading Level (dB μ V) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: NS-AC1	Time: 2021/10/18
Limit: FCC_Part15.209_RE(3m)	Engineer: Dillon Diao
Probe: NS-AC1_BBHA9120D	Polarity: Horizontal
EUT: Nautiz X9	Power: AC 120V/60Hz
Test Mode: Transmit by 2DH5 at channel 2402MHz	

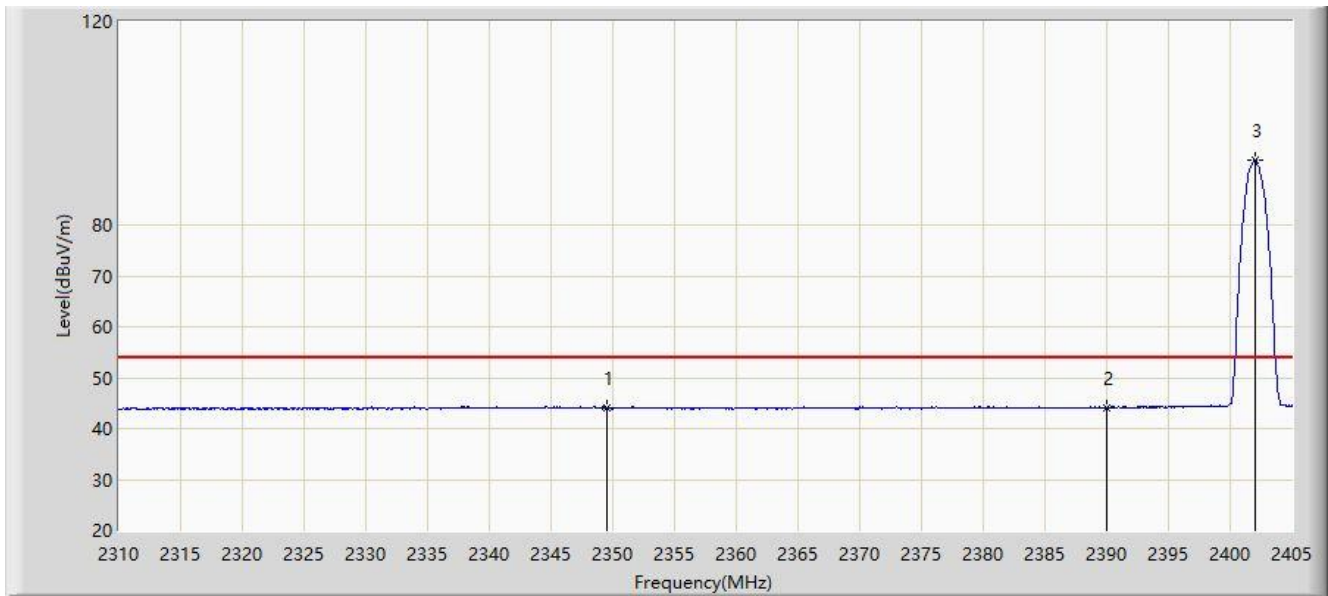


No	Flag	Mark	Frequency (MHz)	Measure Level (dB μ V/m)	Reading Level (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Factor (dB/m)	Type
1			2344.295	56.621	25.448	-17.379	74.000	31.173	PK
2			2390.000	54.591	23.688	-19.409	74.000	30.903	PK
3		*	2402.150	97.600	66.664	N/A	N/A	30.936	PK

Note: Measure Level (dB μ V/m) = Reading Level (dB μ V) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: NS-AC1	Time: 2021/10/18
Limit: FCC_Part15.209_RE(3m)	Engineer: Dillon Diao
Probe: NS-AC1_BBHA9120D	Polarity: Horizontal
EUT: Nautiz X9	Power: AC 120V/60Hz
Test Mode: Transmit by 2DH5 at channel 2402MHz	

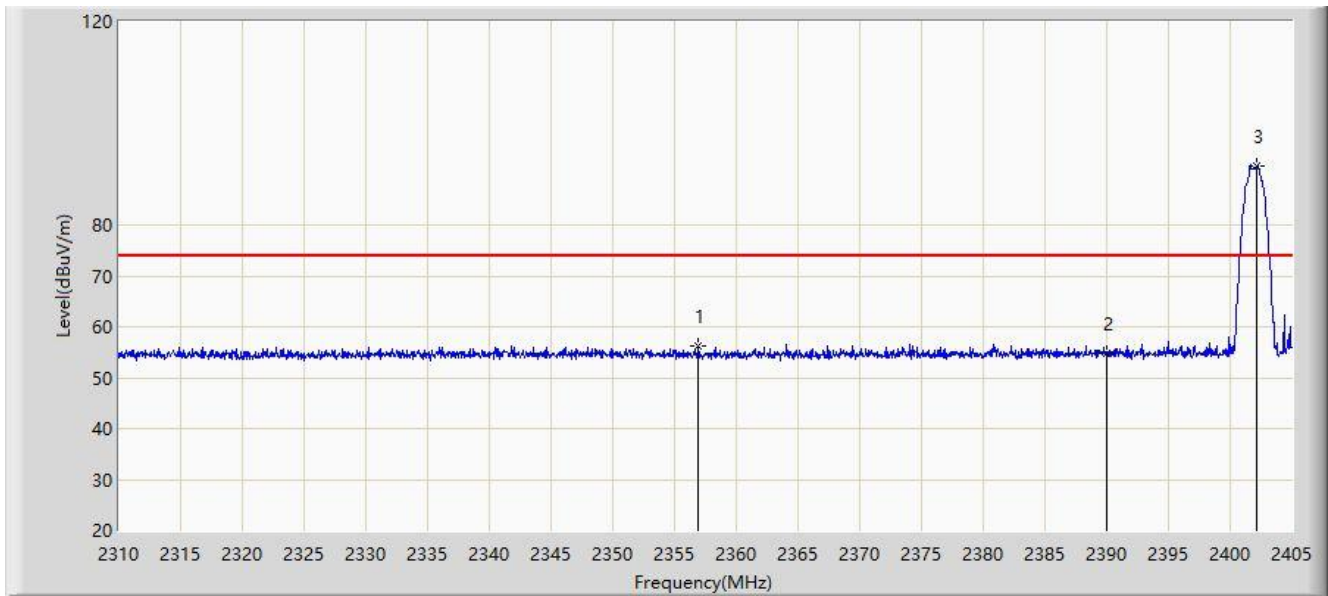


No	Flag	Mark	Frequency (MHz)	Measure Level (dB μ V/m)	Reading Level (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Factor (dB/m)	Type
1			2349.520	44.137	13.025	-9.863	54.000	31.111	AV
2			2390.000	44.085	13.182	-9.915	54.000	30.903	AV
3		*	2402.008	92.855	61.920	N/A	N/A	30.935	AV

Note: Measure Level (dB μ V/m) = Reading Level (dB μ V) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: NS-AC1	Time: 2021/10/18
Limit: FCC_Part15.209_RE(3m)	Engineer: Dillon Diao
Probe: NS-AC1_BBHA9120D	Polarity: Vertical
EUT: Nautiz X9	Power: AC 120V/60Hz
Test Mode: Transmit by 2DH5 at channel 2402MHz	

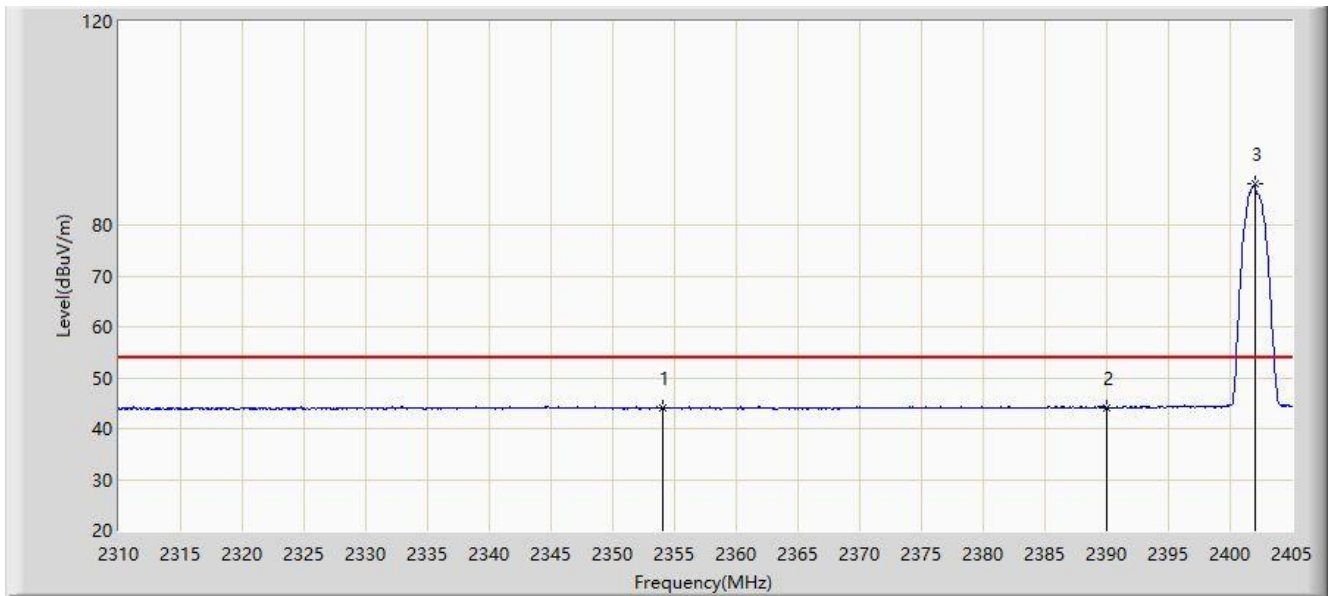


No	Flag	Mark	Frequency (MHz)	Measure Level (dB μ V/m)	Reading Level (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Factor (dB/m)	Type
1			2356.930	56.211	25.187	-17.789	74.000	31.024	PK
2			2390.000	54.700	23.797	-19.300	74.000	30.903	PK
3		*	2402.150	91.592	60.656	N/A	N/A	30.936	PK

Note: Measure Level (dB μ V/m) = Reading Level (dB μ V) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: NS-AC1	Time: 2021/10/18
Limit: FCC_Part15.209_RE(3m)	Engineer: Dillon Diao
Probe: NS-AC1_BBHA9120D	Polarity: Vertical
EUT: Nautiz X9	Power: AC 120V/60Hz
Test Mode: Transmit by 2DH5 at channel 2402MHz	

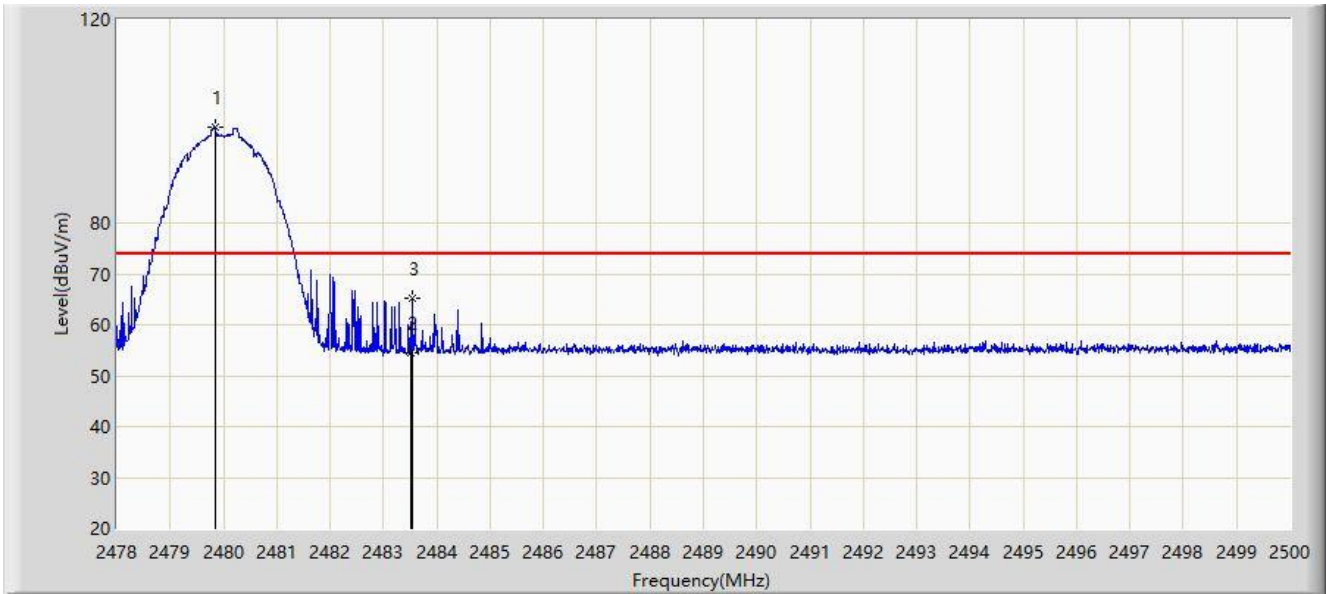


No	Flag	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1			2354.032	44.074	13.015	-9.926	54.000	31.059	AV
2			2390.000	44.102	13.199	-9.898	54.000	30.903	AV
3		*	2402.008	87.996	57.061	N/A	N/A	30.935	AV

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: NS-AC1	Time: 2021/10/18
Limit: FCC_Part15.209_RE(3m)	Engineer: Dillon Diao
Probe: NS-AC1_BBHA9120D	Polarity: Horizontal
EUT: Nautiz X9	Power: AC 120V/60Hz
Test Mode: Transmit by 2DH5 at channel 2480MHz	

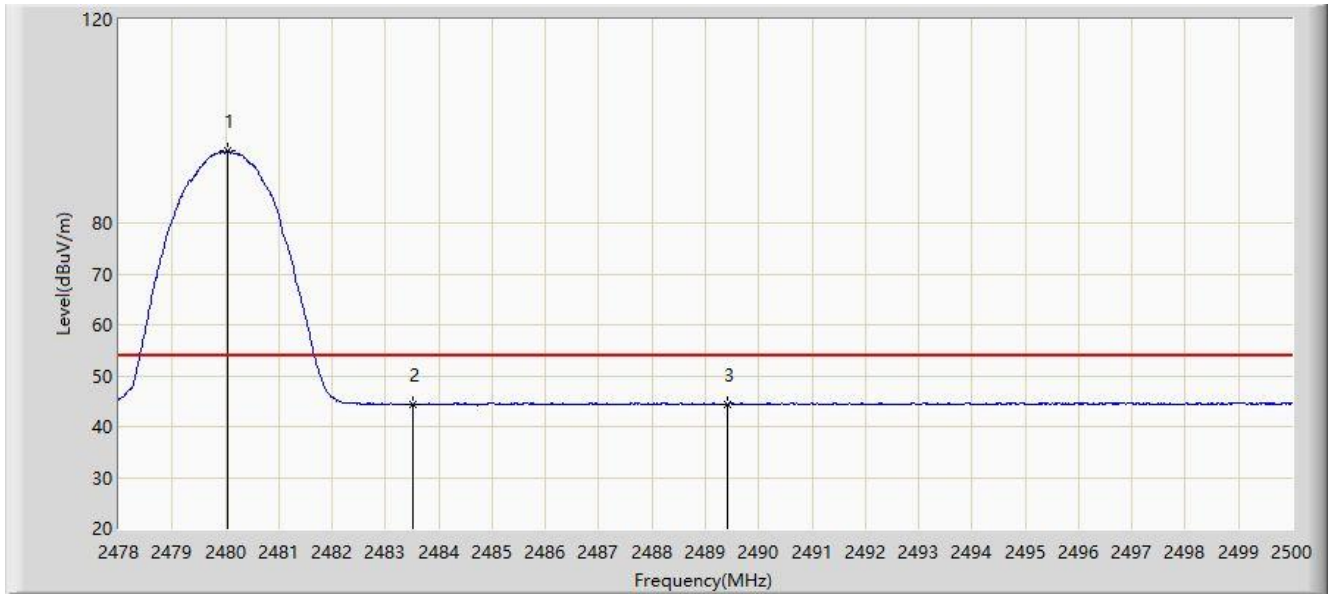


No	Flag	Mark	Frequency (MHz)	Measure Level (dB μ V/m)	Reading Level (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Factor (dB/m)	Type
1		*	2479.837	98.739	67.868	N/A	N/A	30.871	PK
2			2483.500	54.614	23.725	-19.386	74.000	30.889	PK
3			2483.544	65.333	34.444	-8.667	74.000	30.889	PK

Note: Measure Level (dB μ V/m) = Reading Level (dB μ V) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: NS-AC1	Time: 2021/10/18
Limit: FCC_Part15.209_RE(3m)	Engineer: Dillon Diao
Probe: NS-AC1_BBHA9120D	Polarity: Horizontal
EUT: Nautiz X9	Power: AC 120V/60Hz
Test Mode: Transmit by 2DH5 at channel 2480MHz	

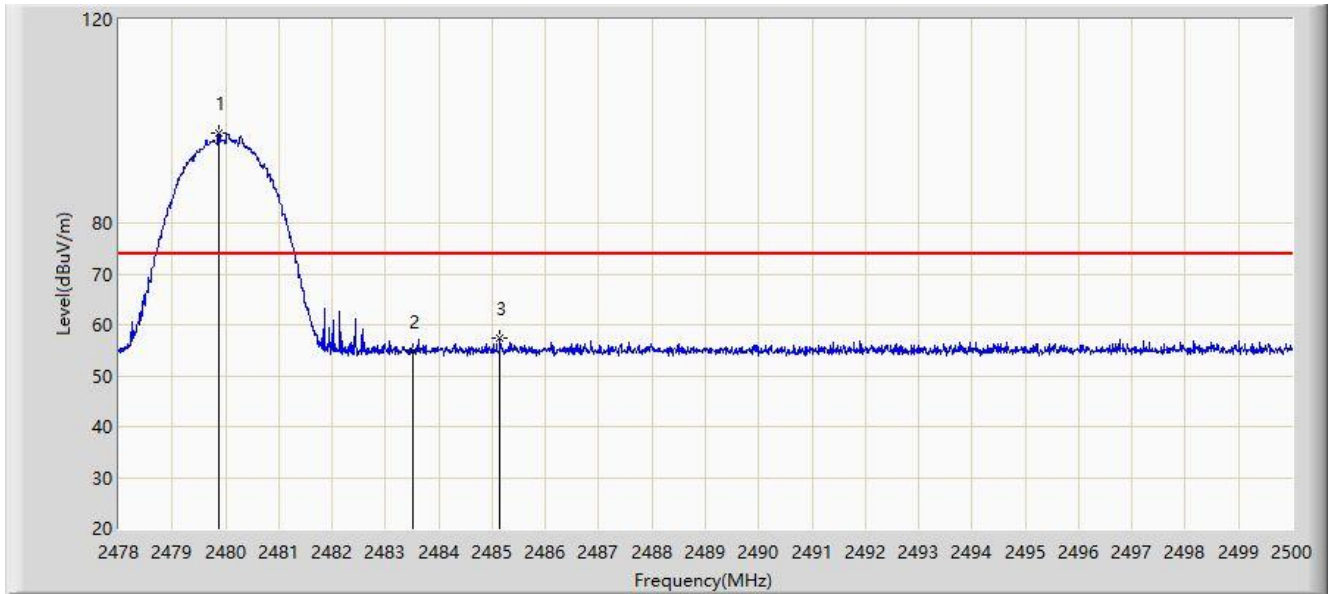


No	Flag	Mark	Frequency (MHz)	Measure Level (dB μ V/m)	Reading Level (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Factor (dB/m)	Type
1		*	2480.046	94.125	63.253	N/A	N/A	30.872	AV
2			2483.500	44.440	13.551	-9.560	54.000	30.889	AV
3			2489.418	44.383	13.465	-9.617	54.000	30.918	AV

Note: Measure Level (dB μ V/m) = Reading Level (dB μ V) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: NS-AC1	Time: 2021/10/18
Limit: FCC_Part15.209_RE(3m)	Engineer: Dillon Diao
Probe: NS-AC1_BBHA9120D	Polarity: Vertical
EUT: Nautiz X9	Power: AC 120V/60Hz
Test Mode: Transmit by 2DH5 at channel 2480MHz	

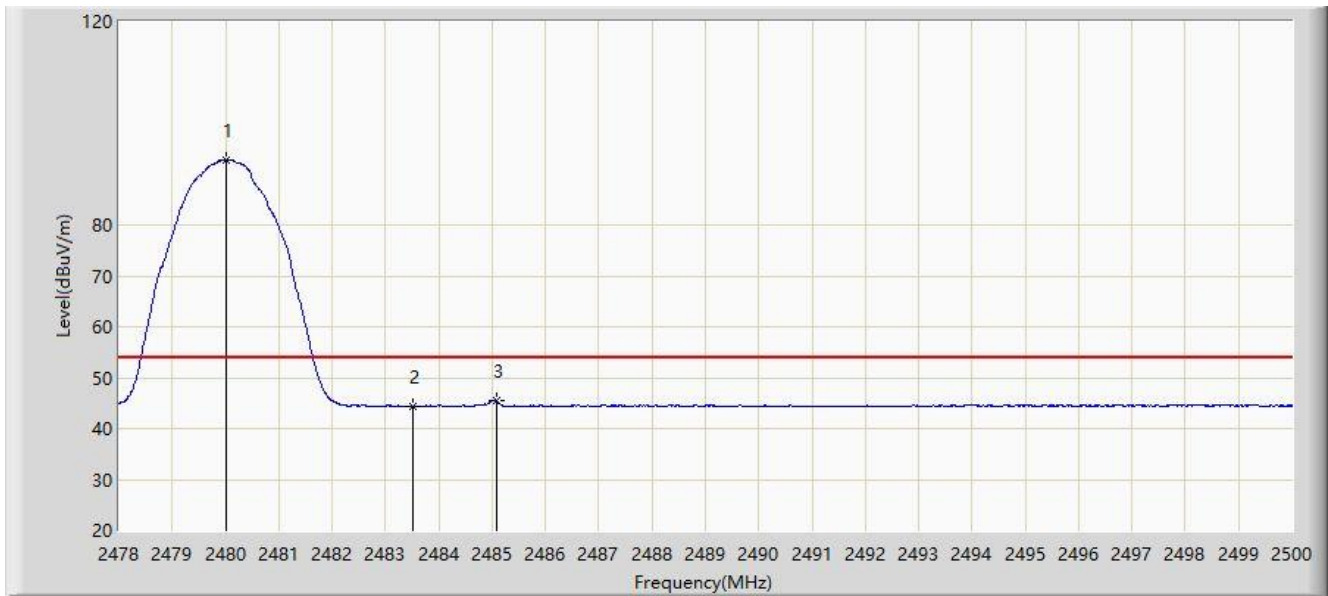


No	Flag	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		*	2479.870	97.543	66.672	N/A	N/A	30.871	PK
2			2483.500	54.651	23.762	-19.349	74.000	30.889	PK
3			2485.150	57.268	26.371	-16.732	74.000	30.897	PK

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: NS-AC1	Time: 2021/10/18
Limit: FCC_Part15.209_RE(3m)	Engineer: Dillon Diao
Probe: NS-AC1_BBHA9120D	Polarity: Vertical
EUT: Nautiz X9	Power: AC 120V/60Hz
Test Mode: Transmit by 2DH5 at channel 2480MHz	

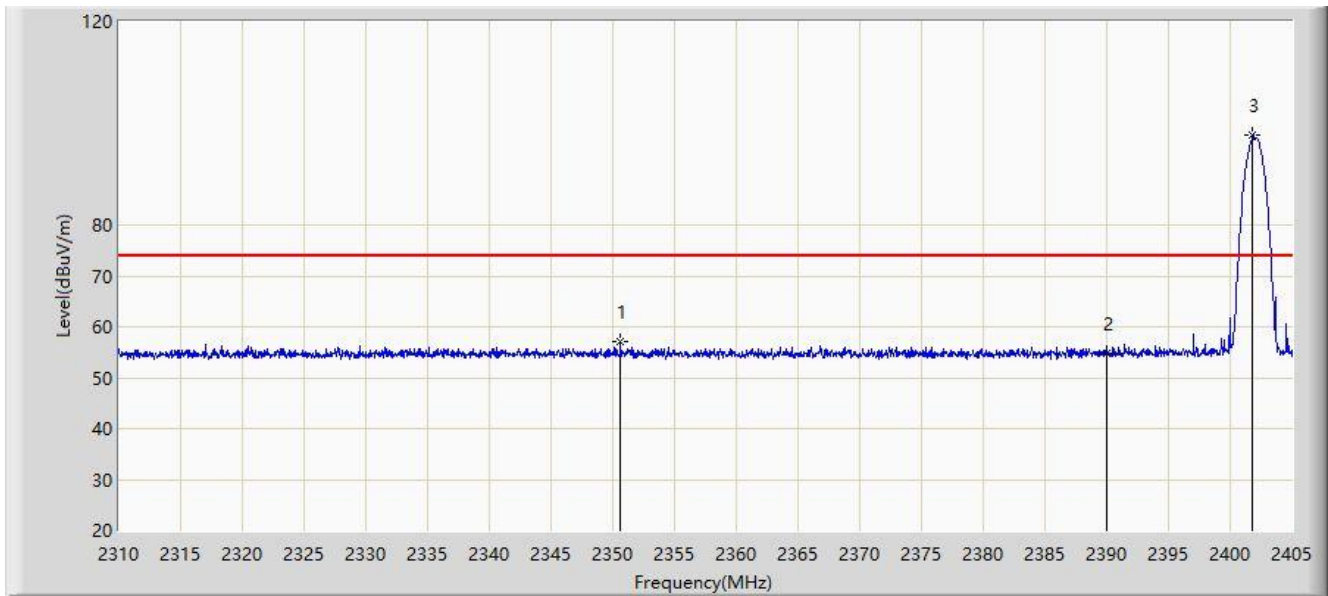


No	Flag	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		*	2480.024	92.829	61.958	N/A	N/A	30.871	AV
2			2483.500	44.310	13.421	-9.690	54.000	30.889	AV
3			2485.073	45.456	14.559	-8.544	54.000	30.897	AV

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: NS-AC1	Time: 2021/10/18
Limit: FCC_Part15.209_RE(3m)	Engineer: Dillon Diao
Probe: NS-AC1_BBHA9120D	Polarity: Horizontal
EUT: Nautiz X9	Power: AC 120V/60Hz
Test Mode: Transmit by 3DH5 at channel 2402MHz	

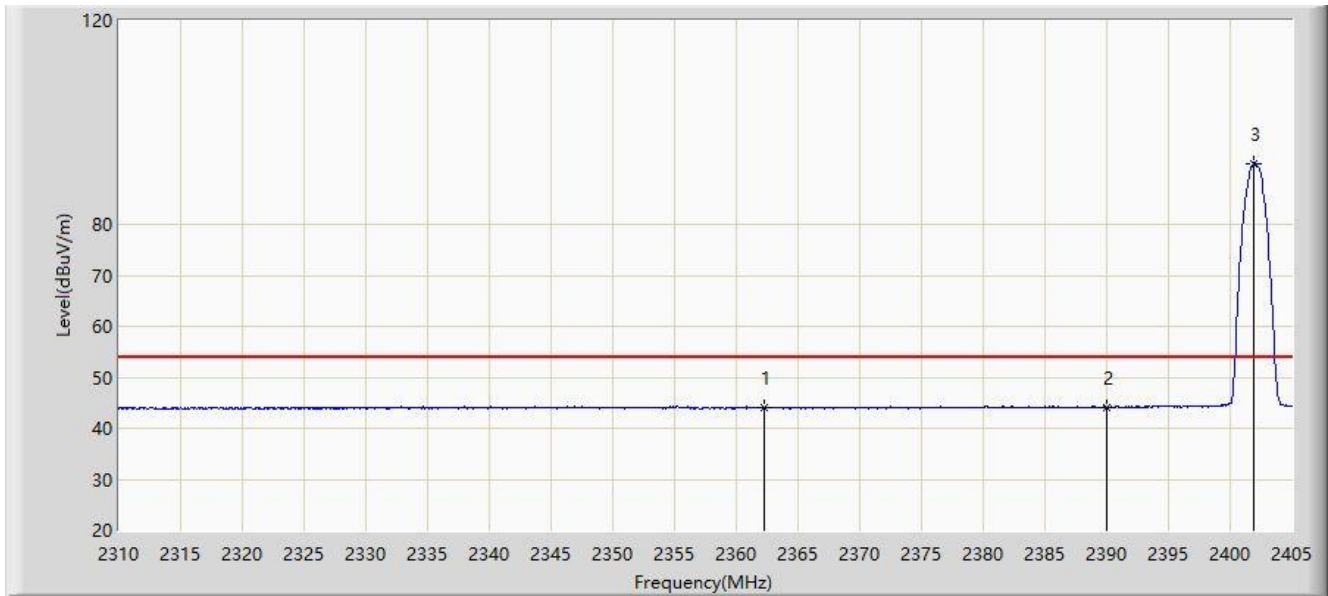


No	Flag	Mark	Frequency (MHz)	Measure Level (dB μ V/m)	Reading Level (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Factor (dB/m)	Type
1			2350.613	56.959	25.860	-17.041	74.000	31.099	PK
2			2390.000	54.657	23.754	-19.343	74.000	30.903	PK
3		*	2401.817	97.571	66.636	N/A	N/A	30.934	PK

Note: Measure Level (dB μ V/m) = Reading Level (dB μ V) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: NS-AC1	Time: 2021/10/18
Limit: FCC_Part15.209_RE(3m)	Engineer: Dillon Diao
Probe: NS-AC1_BBHA9120D	Polarity: Horizontal
EUT: Nautiz X9	Power: AC 120V/60Hz
Test Mode: Transmit by 3DH5 at channel 2402MHz	

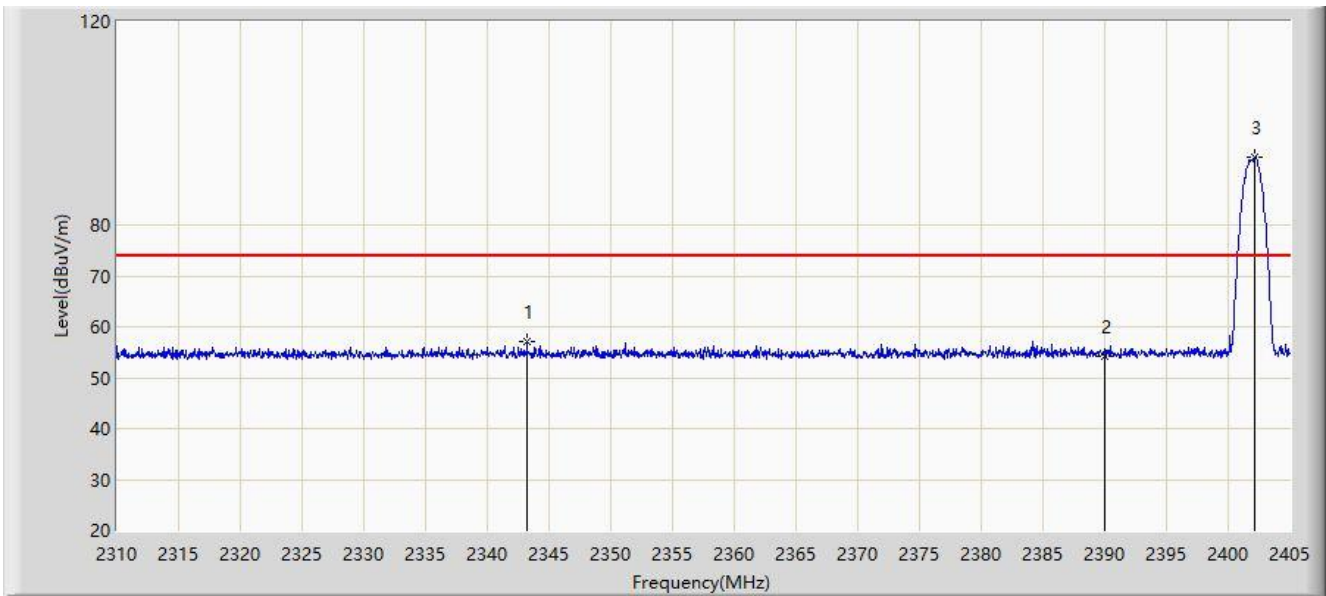


No	Flag	Mark	Frequency (MHz)	Measure Level (dB μ V/m)	Reading Level (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Factor (dB/m)	Type
1			2362.298	44.079	13.101	-9.921	54.000	30.978	AV
2			2390.000	44.059	13.156	-9.941	54.000	30.903	AV
3		*	2401.913	91.908	60.973	N/A	N/A	30.935	AV

Note: Measure Level (dB μ V/m) = Reading Level (dB μ V) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: NS-AC1	Time: 2021/10/18
Limit: FCC_Part15.209_RE(3m)	Engineer: Dillon Diao
Probe: NS-AC1_BBHA9120D	Polarity: Vertical
EUT: Nautiz X9	Power: AC 120V/60Hz
Test Mode: Transmit by 3DH5 at channel 2402MHz	

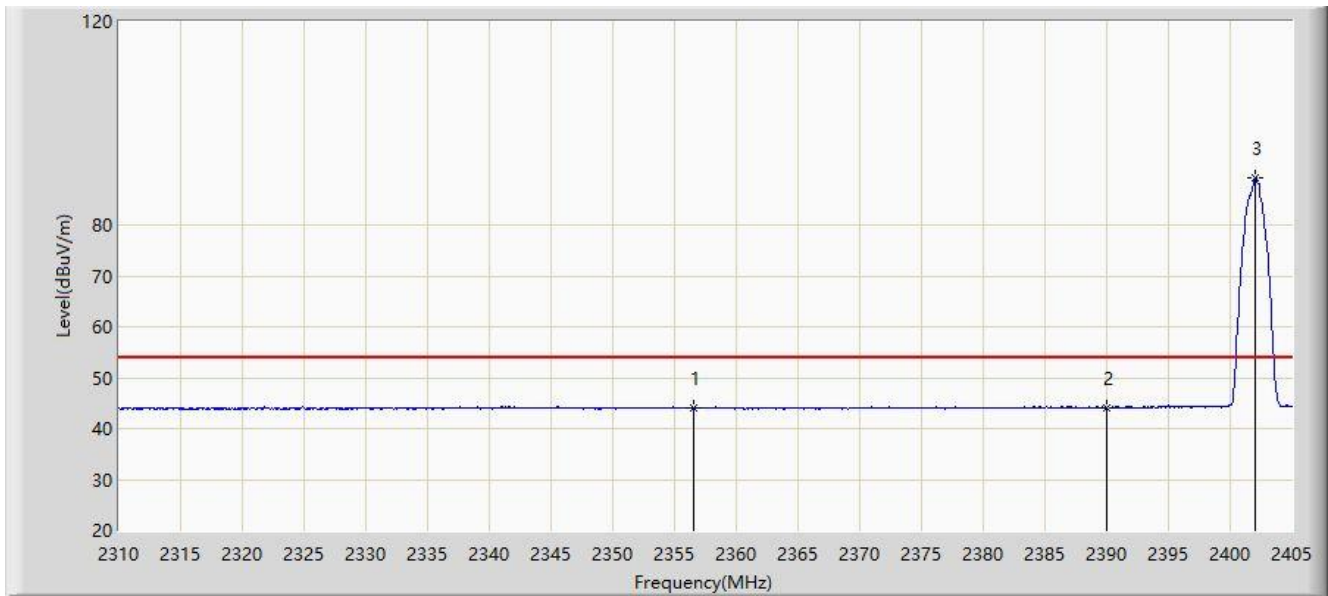


No	Flag	Mark	Frequency (MHz)	Measure Level (dB μ V/m)	Reading Level (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Factor (dB/m)	Type
1			2343.202	57.006	25.820	-16.994	74.000	31.186	PK
2			2390.000	54.259	23.356	-19.741	74.000	30.903	PK
3		*	2402.198	93.303	62.367	N/A	N/A	30.937	PK

Note: Measure Level (dB μ V/m) = Reading Level (dB μ V) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: NS-AC1	Time: 2021/10/18
Limit: FCC_Part15.209_RE(3m)	Engineer: Dillon Diao
Probe: NS-AC1_BBHA9120D	Polarity: Vertical
EUT: Nautiz X9	Power: AC 120V/60Hz
Test Mode: Transmit by 3DH5 at channel 2402MHz	

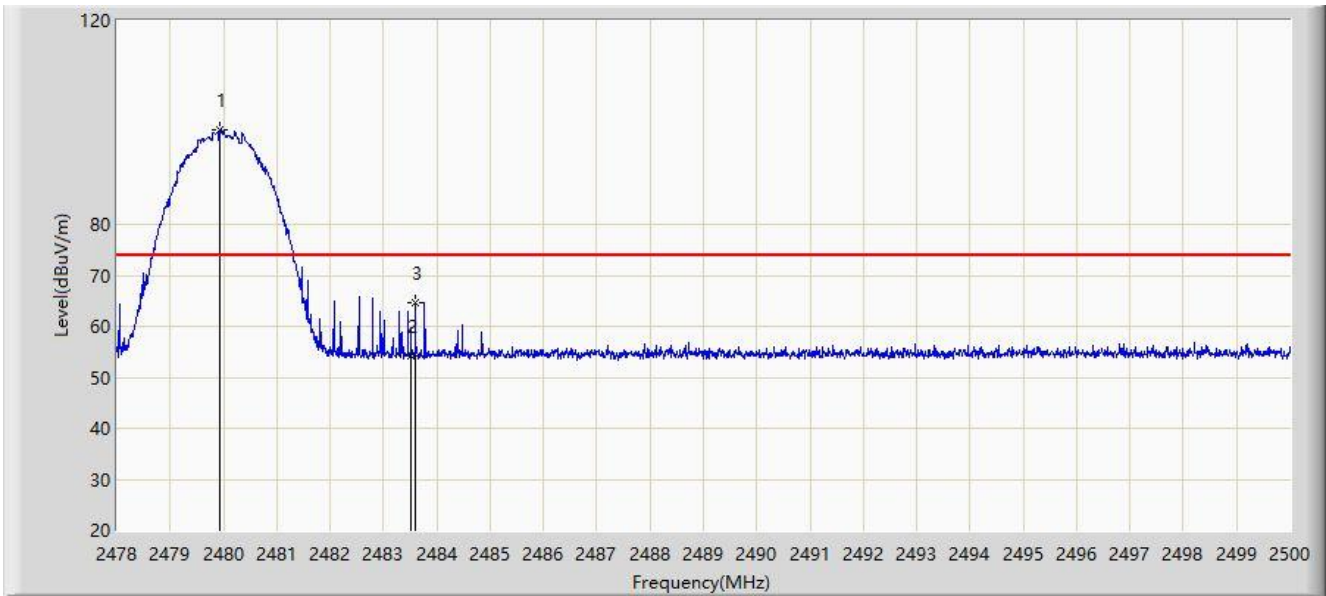


No	Flag	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1			2356.597	44.099	13.071	-9.901	54.000	31.028	AV
2			2390.000	44.138	13.235	-9.862	54.000	30.903	AV
3		*	2402.055	89.160	58.224	N/A	N/A	30.936	AV

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: NS-AC1	Time: 2021/10/18
Limit: FCC_Part15.209_RE(3m)	Engineer: Dillon Diao
Probe: NS-AC1_BBHA9120D	Polarity: Horizontal
EUT: Nautiz X9	Power: AC 120V/60Hz
Test Mode: Transmit by 3DH5 at channel 2480MHz	

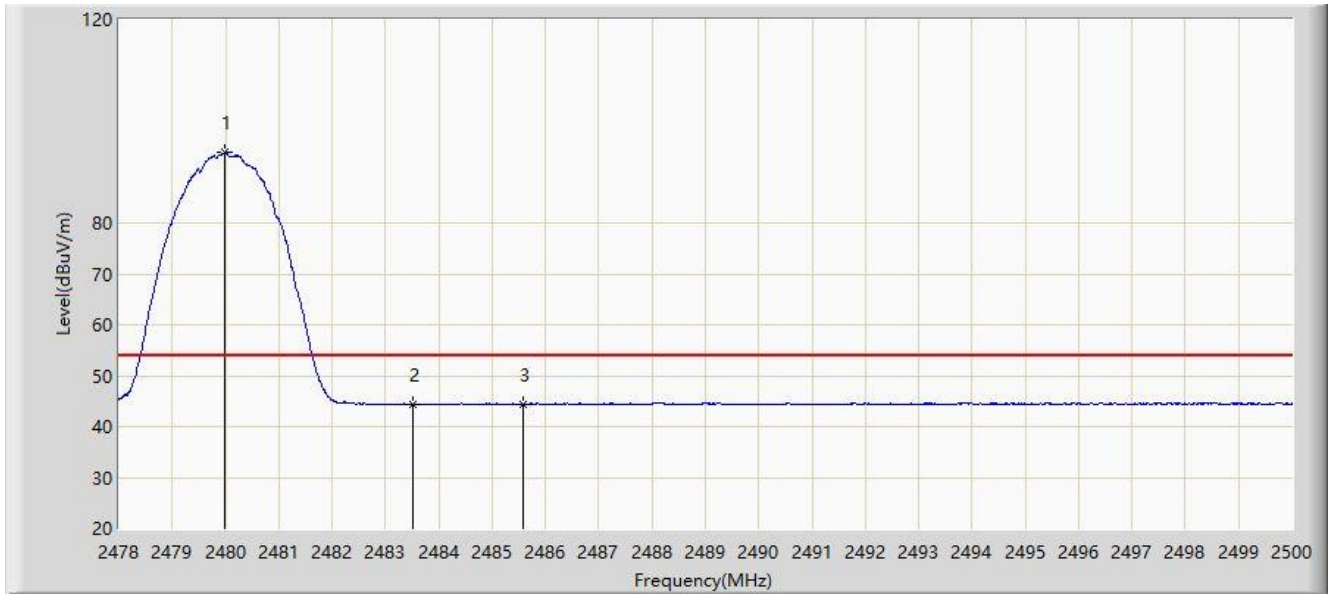


No	Flag	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		*	2479.936	98.662	67.791	N/A	N/A	30.871	PK
2			2483.500	54.276	23.387	-19.724	74.000	30.889	PK
3			2483.599	64.712	33.823	-9.288	74.000	30.889	PK

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: NS-AC1	Time: 2021/10/18
Limit: FCC_Part15.209_RE(3m)	Engineer: Dillon Diao
Probe: NS-AC1_BBHA9120D	Polarity: Horizontal
EUT: Nautiz X9	Power: AC 120V/60Hz
Test Mode: Transmit by 3DH5 at channel 2480MHz	

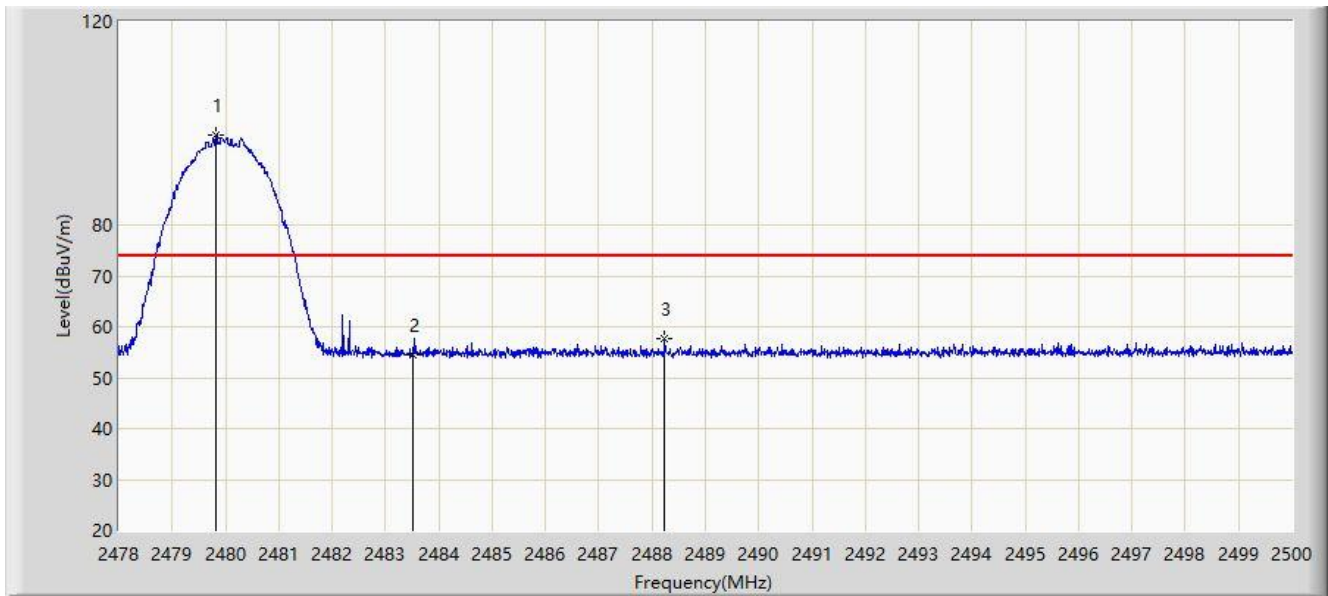


No	Flag	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		*	2479.991	93.784	62.913	N/A	N/A	30.871	AV
2			2483.500	44.390	13.501	-9.610	54.000	30.889	AV
3			2485.568	44.404	13.505	-9.596	54.000	30.899	AV

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: NS-AC1	Time: 2021/10/18
Limit: FCC_Part15.209_RE(3m)	Engineer: Dillon Diao
Probe: NS-AC1_BBHA9120D	Polarity: Vertical
EUT: Nautiz X9	Power: AC 120V/60Hz
Test Mode: Transmit by 3DH5 at channel 2480MHz	

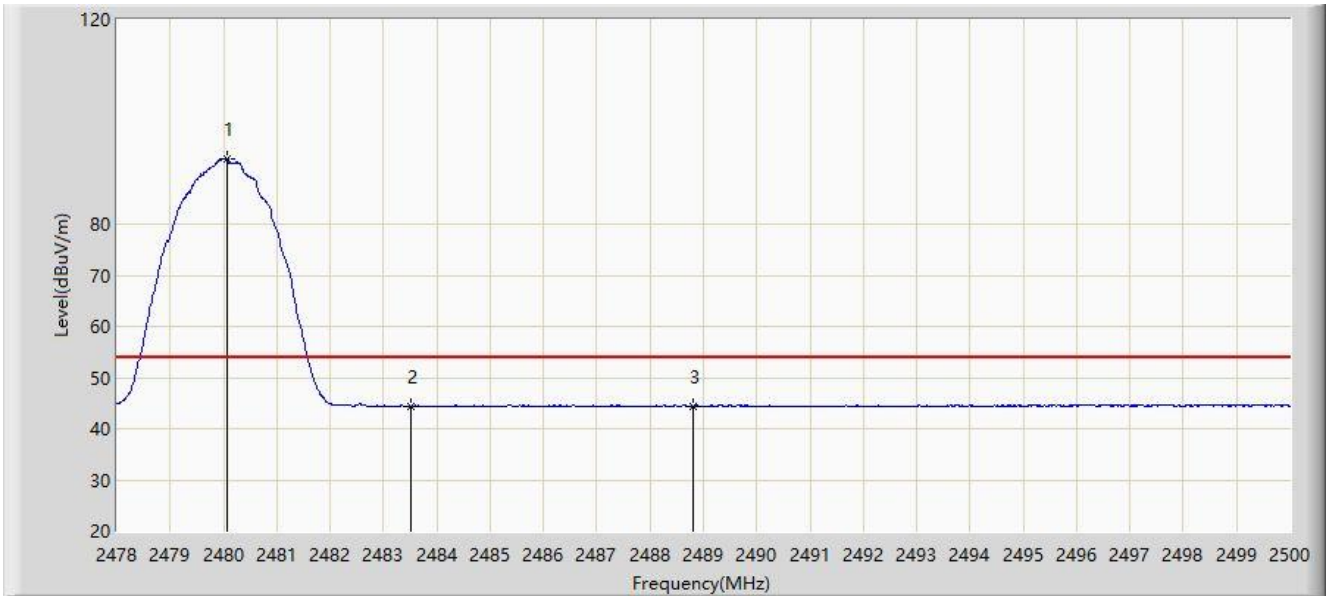


No	Flag	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		*	2479.826	97.600	66.730	N/A	N/A	30.870	PK
2			2483.500	54.471	23.582	-19.529	74.000	30.889	PK
3			2488.241	57.804	26.891	-16.196	74.000	30.913	PK

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: NS-AC1	Time: 2021/10/18
Limit: FCC_Part15.209_RE(3m)	Engineer: Dillon Diao
Probe: NS-AC1_BBHA9120D	Polarity: Vertical
EUT: Nautiz X9	Power: AC 120V/60Hz
Test Mode: Transmit by 3DH5 at channel 2480MHz	



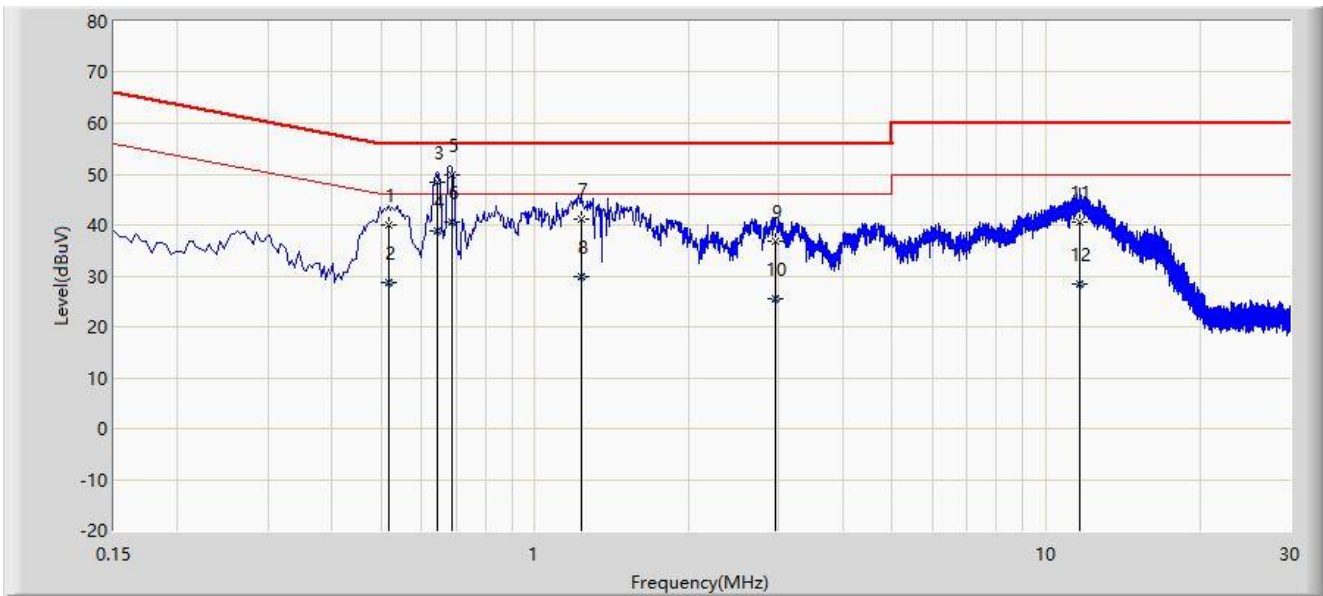
No	Flag	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		*	2480.079	92.883	62.011	N/A	N/A	30.872	AV
2			2483.500	44.319	13.430	-9.681	54.000	30.889	AV
3			2488.802	44.474	13.559	-9.526	54.000	30.915	AV

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

A.10 AC Conducted Emissions Test Result

Site: NS-SR2	Time: 2021/10/29
Limit: FCC_Part15.207_CE_AC Power	Engineer: Flag Yang
Probe: ENV216_102493_150KHz~30MHz	Polarity: Line
EUT: NAUTIZ X9	Power: AC 120V/60Hz
Test Mode: Transmit by DH5 at channel 2402MHz	

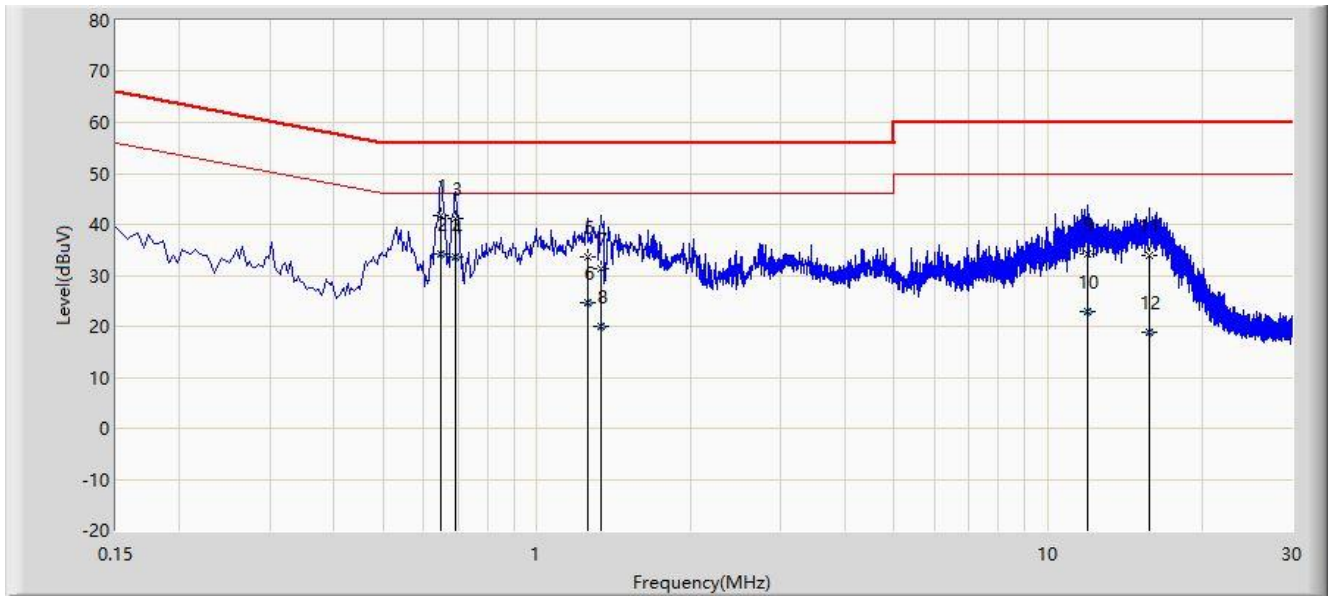


No	Flag	Mark	Frequency (MHz)	Measure Level (dBμV)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV)	Factor (dB)	Type
1			0.518	39.933	30.232	-16.067	56.000	9.701	QP
2			0.518	28.810	19.109	-17.190	46.000	9.701	AV
3			0.646	48.442	38.742	-7.558	56.000	9.700	QP
4			0.646	38.739	29.039	-7.261	46.000	9.700	AV
5			0.688	49.746	40.037	-6.254	56.000	9.709	QP
6		*	0.688	40.677	30.968	-5.323	46.000	9.709	AV
7			1.230	41.301	31.566	-14.699	56.000	9.735	QP
8			1.230	29.753	20.018	-16.247	46.000	9.735	AV
9			2.950	36.685	26.888	-19.315	56.000	9.797	QP
10			2.950	25.413	15.616	-20.587	46.000	9.797	AV
11			11.614	40.626	30.608	-19.374	60.000	10.018	QP
12			11.614	28.378	18.360	-21.622	50.000	10.018	AV

Note: Measure Level (dBμV) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + LISN Factor (dB)

Site: NS-SR2	Time: 2021/10/29
Limit: FCC_Part15.207_CE_AC Power	Engineer: Flag Yang
Probe: ENV216_102493_150KHz~30MHz	Polarity: Neutral
EUT: NAUTIZ X9	Power: AC 120V/60Hz
Test Mode: Transmit by DH5 at channel 2402MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dB μ V)	Reading Level (dB μ V)	Margin (dB)	Limit (dB μ V)	Factor (dB)	Type
1			0.650	41.759	32.121	-14.241	56.000	9.638	QP
2		*	0.650	34.103	24.465	-11.897	46.000	9.638	AV
3			0.694	41.173	31.524	-14.827	56.000	9.649	QP
4			0.694	33.590	23.941	-12.410	46.000	9.649	AV
5			1.254	33.675	24.000	-22.325	56.000	9.675	QP
6			1.254	24.680	15.005	-21.320	46.000	9.675	AV
7			1.330	31.447	21.769	-24.553	56.000	9.678	QP
8			1.330	19.979	10.301	-26.021	46.000	9.678	AV
9			11.986	34.093	24.022	-25.907	60.000	10.071	QP
10			11.986	22.919	12.848	-27.081	50.000	10.071	AV
11			15.818	34.047	23.848	-25.953	60.000	10.199	QP
12			15.818	18.978	8.779	-31.022	50.000	10.199	AV

Note: Measure Level (dB μ V) = Reading Level (dB μ V) + Factor (dB)

Factor (dB) = Cable Loss (dB) + LISN Factor (dB)

————— The End —————