

# TEST REPORT

**Product Name** : TRUE WIRELESS EARBUDS  
**Brand Mark** : KELL, Vieta Pro  
**Model No.** : KTW-824  
**Extension Model** : Vieta Pro Done 3, Done 3, MK009, MK009LP, MK009LB, MK009BK, MK009WH, Light, VAQ-TWS11, VAQ-TWS11WH, VAQ-TWS11BK, VAQ-TWS11LP, VAQ-TWS11LB, Vieta Pro #Enjoy, #Enjoy, TWS11, TWS11BK, TWS11WH, TWS11LP, TWS11LB  
**FCC ID** : 2ARR8-KTW-824  
**Report Number** : BLA-EMC-202108-A0602  
**Date of Sample Receipt** : 2021/8/2  
**Date of Test** : 2021/8/2 to 2021/8/17  
**Date of Issue** : 2021/8/17  
**Test Standard** : 47 CFR Part 15, Subpart C 15.247  
**Test Result** : Pass

Prepared for:

**KELL ELECTRONICS LIMITED**  
**UNIT 506A, HARBOUR CRYSTAL CENTRE, 100 GRANVILLE ROAD, TSIM**  
**SHA TSUI KOWLOON, HONG KONG**

Prepared by:

**BlueAsia of Technical Services(Shenzhen) Co.,Ltd.**  
**Building C, No. 107, Shihuan Road, Shiyuan Sub-District, Baoan District,**  
**Shenzhen, Guangdong Province, China**  
**TEL: +86-755-23059481**



Compiled by:

Jozu.

Approved by:

Blue Zhong

Review by:

Sueels

Date:

2021/8/17



## REPORT REVISE RECORD

Version No.	Date	Description
00	2021/8/17	Original

## TABLE OF CONTENTS

<b>1</b>	<b>TEST SUMMARY.....</b>	<b>6</b>
<b>2</b>	<b>GENERAL INFORMATION.....</b>	<b>7</b>
<b>3</b>	<b>GENERAL DESCRIPTION OF E.U.T.....</b>	<b>7</b>
<b>4</b>	<b>TEST ENVIRONMENT.....</b>	<b>8</b>
<b>5</b>	<b>TEST MODE.....</b>	<b>8</b>
<b>6</b>	<b>MEASUREMENT UNCERTAINTY.....</b>	<b>8</b>
<b>7</b>	<b>DESCRIPTION OF SUPPORT UNIT.....</b>	<b>9</b>
<b>8</b>	<b>LABORATORY LOCATION.....</b>	<b>9</b>
<b>9</b>	<b>TEST INSTRUMENTS LIST.....</b>	<b>10</b>
<b>10</b>	<b>ANTENNA REQUIREMENT.....</b>	<b>14</b>
10.1	CONCLUSION.....	14
<b>11</b>	<b>CONDUCTED SPURIOUS EMISSIONS.....</b>	<b>15</b>
11.1	LIMITS.....	15
11.2	BLOCK DIAGRAM OF TEST SETUP.....	15
11.3	TEST DATA.....	16
<b>12</b>	<b>RADIATED EMISSIONS WHICH FALL IN THE RESTRICTED BANDS.....</b>	<b>17</b>
12.1	LIMITS.....	17
12.2	BLOCK DIAGRAM OF TEST SETUP.....	18
12.3	PROCEDURE.....	18
12.4	TEST DATA.....	20
<b>13</b>	<b>CONDUCTED BAND EDGES MEASUREMENT.....</b>	<b>24</b>
13.1	LIMITS.....	24
13.2	BLOCK DIAGRAM OF TEST SETUP.....	24
13.3	TEST DATA.....	25
<b>14</b>	<b>DWELL TIME.....</b>	<b>26</b>
14.1	LIMITS.....	26
14.2	BLOCK DIAGRAM OF TEST SETUP.....	26
14.3	TEST DATA.....	27
<b>15</b>	<b>HOPPING CHANNEL NUMBER.....</b>	<b>28</b>

15.1	LIMITS.....	28
15.2	BLOCK DIAGRAM OF TEST SETUP.....	28
15.3	TEST DATA.....	28
<b>16</b>	<b>CARRIER FREQUENCIES SEPARATION.....</b>	<b>29</b>
16.1	LIMITS.....	29
16.2	BLOCK DIAGRAM OF TEST SETUP.....	29
16.3	TEST DATA.....	29
<b>17</b>	<b>20DB BANDWIDTH.....</b>	<b>30</b>
17.1	BLOCK DIAGRAM OF TEST SETUP.....	30
17.2	TEST DATA.....	30
<b>18</b>	<b>CONDUCTED PEAK OUTPUT POWER.....</b>	<b>31</b>
18.1	LIMITS.....	31
18.2	BLOCK DIAGRAM OF TEST SETUP.....	31
18.3	TEST DATA.....	32
<b>19</b>	<b>CONDUCTED EMISSIONS AT AC POWER LINE (150KHZ-30MHZ).....</b>	<b>33</b>
19.1	LIMITS.....	33
19.2	BLOCK DIAGRAM OF TEST SETUP.....	33
19.3	PROCEDURE.....	33
19.4	TEST DATA.....	35
<b>20</b>	<b>RADIATED SPURIOUS EMISSIONS.....</b>	<b>37</b>
20.1	LIMITS.....	37
20.2	BLOCK DIAGRAM OF TEST SETUP.....	38
20.3	PROCEDURE.....	38
20.4	TEST DATA.....	40
<b>21</b>	<b>APPENDIX.....</b>	<b>48</b>
21.1	MAXIMUM CONDUCTED OUTPUT POWER.....	48
21.2	-20DB BANDWIDTH.....	53
21.3	OCCUPIED CHANNEL BANDWIDTH.....	58
21.4	BAND EDGE.....	63
21.5	BAND EDGE(HOPPING).....	70
21.6	CONDUCTED RF SPURIOUS EMISSION.....	77
21.7	CARRIER FREQUENCIES SEPARATION.....	87
21.8	NUMBER OF HOPPING CHANNEL.....	89

21.9	DWELL TIME.....	91
<b>APPENDIX A: PHOTOGRAPHS OF TEST SETUP.....</b>		<b>95</b>
<b>APPENDIX B: PHOTOGRAPHS OF EUT.....</b>		<b>97</b>

BlueAsia

## 1 TEST SUMMARY

Test item	Test Requirement	Test Method	Class/Severity	Result
Antenna Requirement	47 CFR Part 15, Subpart C 15.247	N/A	47 CFR Part 15, Subpart C 15.203 & 15.247(c)	Pass
Conducted Spurious Emissions	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.6 & Section 11.11	47 CFR Part 15, Subpart C 15.247(d)	Pass
Radiated Emissions which fall in the restricted bands	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.10.5	47 CFR Part 15, Subpart C 15.209 & 15.247(d)	Pass
Conducted Band Edges Measurement	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.8 & Section 11.13.3.2	47 CFR Part 15, Subpart C 15.247(d)	Pass
Dwell Time	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.4	47 CFR Part 15, Subpart C 15.247a(1)(iii)	Pass
Hopping Channel Number	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.3	47 CFR Part 15, Subpart C 15.247a(1)(iii)	Pass
Carrier Frequencies Separation	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.2	47 CFR Part 15, Subpart C 15.247a(1)	Pass
20dB Bandwidth	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.7	47 CFR Part 15, Subpart C 15.247(a)(1)	Pass
Conducted Peak Output Power	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 7.8.5	47 CFR Part 15, Subpart C 15.247(b)(3)	Pass
Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.2	47 CFR Part 15, Subpart C 15.207	Pass
Radiated Spurious Emissions	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.4,6.5,6.6	47 CFR Part 15, Subpart C 15.209 & 15.247(d)	Pass

## 2 GENERAL INFORMATION

<b>Applicant</b>	KELL ELECTRONICS LIMITED
<b>Address</b>	UNIT 506A,HARBOUR CRYSTAL CENTRE, 100 GRANVILLE ROAD, TSIM SHA TSUI KOWLOON, HONG KONG
<b>Manufacturer</b>	KELL ELECTRONICS LIMITED
<b>Address</b>	UNIT 506A,HARBOUR CRYSTAL CENTRE, 100 GRANVILLE ROAD, TSIM SHA TSUI KOWLOON, HONG KONG
<b>Factory</b>	Shenzhen yutian digital Co., Ltd.
<b>Address</b>	5th Floor, Xinhongzheng Science and Technology Park, No. 8 Shenbao Road, Tielukeng Village, Qishi Town, Dongguan City, Guangdong Province.
<b>Product Name</b>	TRUE WIRELESS EARBUDS
<b>Test Model No.</b>	KTW-824

## 3 GENERAL DESCRIPTION OF E.U.T.

<b>Hardware Version</b>	Earphone: V2.0 Charging case: V1.2
<b>Software Version</b>	V1.3.1
<b>Operation Frequency:</b>	2402MHz-2480MHz
<b>Modulation Type:</b>	GFSK, pi/4DQPSK, 8DPSK
<b>Channel Spacing:</b>	1MHz
<b>Number of Channels:</b>	79
<b>Antenna Type:</b>	Chip Antenna
<b>Antenna Gain:</b>	0.41 dBi(Provided by the applicant)

#### 4 TEST ENVIRONMENT

Environment	Temperature	Voltage
Normal	25°C	3.7Vdc

#### 5 TEST MODE

TEST MODE	TEST MODE DESCRIPTION
Transmitting mode	Keep the EUT in continuously transmitting mode with modulation. (hopping and non hopping mode all have been tested, non hopping mode is worse case for RE )
Remark: Full battery is used during all test except ac conducted emission, DH1, DH3, DH5 all have been tested, during the test, GFSK, Pi/4QPSK, 8-DPSK modulation were all pre-scanned only Pi/4QPSK worse case is reported.	

#### 6 MEASUREMENT UNCERTAINTY

Parameter	Expanded Uncertainty (Confidence of 95%)
Radiated Emission(9kHz-30MHz)	±4.34dB
Radiated Emission(30Mz-1000MHz)	±4.24dB
Radiated Emission(1GHz-18GHz)	±4.68dB
AC Power Line Conducted Emission(150kHz-30MHz)	±3.45dB



## 7 DESCRIPTION OF SUPPORT UNIT

Device Type	Manufacturer	Model Name	Serial No.	Remark
PC	HASEE	K610D	N/A	N/A

## 8 LABORATORY LOCATION

All tests were performed at:  
BlueAsia of Technical Services(Shenzhen) Co., Ltd.  
Building C, No. 107, Shihuan Road, Shiyuan Sub-District, Baoan District, Shenzhen, Guangdong Province,  
China  
Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673  
No tests were sub-contracted.

## 9 TEST INSTRUMENTS LIST

Test Equipment Of Conducted Emissions at AC Power Line (150kHz-30MHz)					
Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
Shield room	SKET	833	N/A	2020/11/25	2023/11/24
Receiver	R&S	ESPI3	101082	2020/10/12	2021/10/11
LISN	R&S	ENV216	3560.6550.15	2020/10/12	2021/10/11
LISN	AT	AT166-2	AKK1806000003	2020/10/12	2021/10/11
EMI software	EZ	EZ-EMC	EEMC-3A1	N/A	N/A

Test Equipment Of Radiated Spurious Emissions					
Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
Chamber	SKET	966	N/A	2020/11/10	2023/11/9
Spectrum	R&S	FSP40	100817	2020/10/12	2021/10/11
Receiver	R&S	ESR7	101199	2020/10/12	2021/10/11
broadband Antenna	Schwarzbeck	VULB9168	00836 P:00227	2020/9/26	2022/9/25
Horn Antenna	Schwarzbeck	9120D	01892 P:00331	2020/9/26	2022/9/25
Amplifier	SKET	PA-000318G-45	N/A	2020/10/16	2021/10/15
EMI software	EZ	EZ-EMC	EEMC-3A1	N/A	N/A
Loop antenna	SCHNARZBECK	FMZB1519B	00102	2020/9/26	2022/9/25
Controller	SKET	N/A	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-02	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-03	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-01	N/A	N/A	N/A

**Test Equipment Of Radiated Emissions which fall in the restricted bands**

Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
Chamber	SKET	966	N/A	2020/11/10	2023/11/9
Spectrum	R&S	FSP40	100817	2020/10/12	2021/10/11
Receiver	R&S	ESR7	101199	2020/10/12	2021/10/11
broadband Antenna	Schwarzbeck	VULB9168	00836 P:00227	2020/9/26	2022/9/25
Horn Antenna	Schwarzbeck	9120D	01892 P:00331	2020/9/26	2022/9/25
Amplifier	SKET	PA-000318G-45	N/A	2020/10/16	2021/10/15
EMI software	EZ	EZ-EMC	EEMC-3A1	N/A	N/A
Loop antenna	SCHNARZBECK	FMZB1519B	00102	2020/9/26	2022/9/25
Controller	SKET	N/A	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-02	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-03	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-01	N/A	N/A	N/A

**Test Equipment Of Conducted Spurious Emissions**

Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
Spectrum	R&S	FSP40	100817	2020/10/12	2021/10/11
Spectrum	Agilent	N9020A	MY49100060	2020/10/12	2021/10/11
Signal Generator	Agilent	N5182A	MY49060650	2020/10/12	2021/10/11
Signal Generator	Agilent	E8257D	MY44320250	2020/10/12	2021/10/11

**Test Equipment Of Dwell Time**

Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
-----------	--------------	-------	-----	----------	---------

Spectrum	R&S	FSP40	100817	2020/10/12	2021/10/11
Spectrum	Agilent	N9020A	MY49100060	2020/10/12	2021/10/11
Signal Generator	Agilent	N5182A	MY49060650	2020/10/12	2021/10/11
Signal Generator	Agilent	E8257D	MY44320250	2020/10/12	2021/10/11

**Test Equipment Of Conducted Band Edges Measurement**

Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
Spectrum	R&S	FSP40	100817	2020/10/12	2021/10/11
Spectrum	Agilent	N9020A	MY49100060	2020/10/12	2021/10/11
Signal Generator	Agilent	N5182A	MY49060650	2020/10/12	2021/10/11
Signal Generator	Agilent	E8257D	MY44320250	2020/10/12	2021/10/11

**Test Equipment Of Hopping Channel Number**

Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
Spectrum	R&S	FSP40	100817	2020/10/12	2021/10/11
Spectrum	Agilent	N9020A	MY49100060	2020/10/12	2021/10/11
Signal Generator	Agilent	N5182A	MY49060650	2020/10/12	2021/10/11
Signal Generator	Agilent	E8257D	MY44320250	2020/10/12	2021/10/11

**Test Equipment Of Carrier Frequencies Separation**

Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
Spectrum	R&S	FSP40	100817	2020/10/12	2021/10/11
Spectrum	Agilent	N9020A	MY49100060	2020/10/12	2021/10/11
Signal Generator	Agilent	N5182A	MY49060650	2020/10/12	2021/10/11

Signal Generator	Agilent	E8257D	MY44320250	2020/10/12	2021/10/11
------------------	---------	--------	------------	------------	------------

**Test Equipment Of 20dB Bandwidth**

Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
Spectrum	R&S	FSP40	100817	2020/10/12	2021/10/11
Spectrum	Agilent	N9020A	MY49100060	2020/10/12	2021/10/11
Signal Generator	Agilent	N5182A	MY49060650	2020/10/12	2021/10/11
Signal Generator	Agilent	E8257D	MY44320250	2020/10/12	2021/10/11

**Test Equipment Of Conducted Peak Output Power**

Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
Spectrum	R&S	FSP40	100817	2020/10/12	2021/10/11
Spectrum	Agilent	N9020A	MY49100060	2020/10/12	2021/10/11
Signal Generator	Agilent	N5182A	MY49060650	2020/10/12	2021/10/11
Signal Generator	Agilent	E8257D	MY44320250	2020/10/12	2021/10/11

## 10 ANTENNA REQUIREMENT

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	N/A

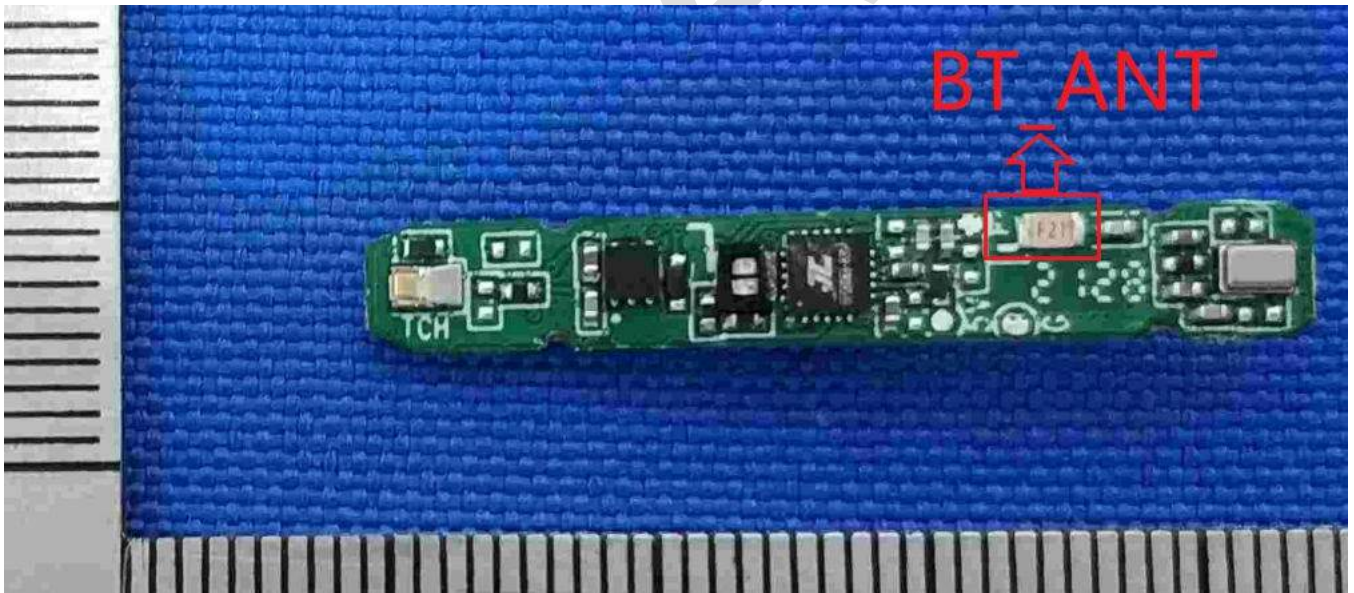
### 10.1 CONCLUSION

Standard Requirement:

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 an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit permanently attached antenna or of an so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

EUT Antenna:

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 0.41dBi.



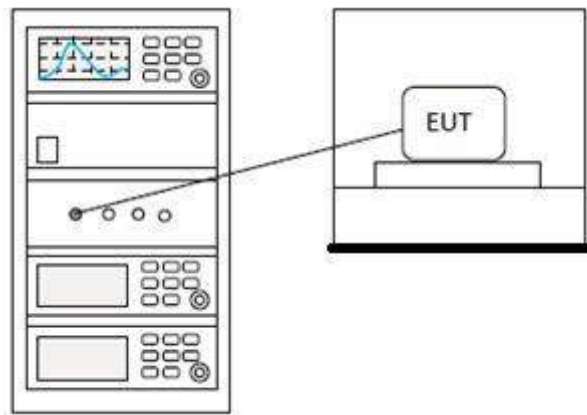
## 11 CONDUCTED SPURIOUS EMISSIONS

<b>Test Standard</b>	47 CFR Part 15, Subpart C 15.247
<b>Test Method</b>	ANSI C63.10 (2013) Section 7.8.6 & Section 11.11
<b>Test Mode (Pre-Scan)</b>	TX
<b>Test Mode (Final Test)</b>	TX
<b>Tester</b>	Jozu
<b>Temperature</b>	25°C
<b>Humidity</b>	60%

### 11.1 LIMITS

<b>Limit:</b>	<p>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)).</p>
---------------	---

### 11.2 BLOCK DIAGRAM OF TEST SETUP



### 11.3 TEST DATA

**Pass: Please Refer To Appendix: Appendix1 For Details**

BlueAsia



## 12 RADIATED EMISSIONS WHICH FALL IN THE RESTRICTED BANDS

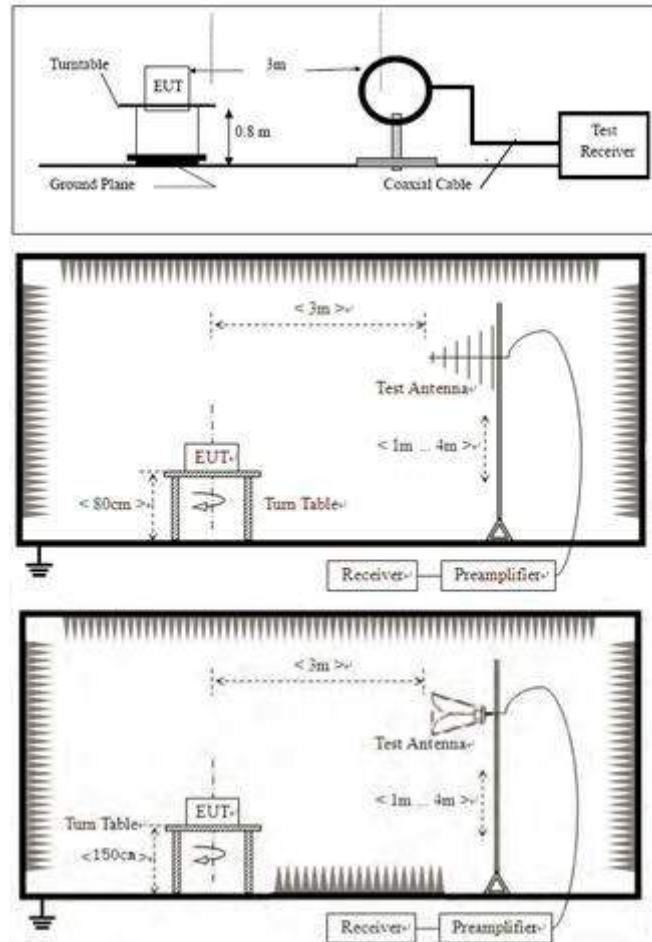
<b>Test Standard</b>	47 CFR Part 15, Subpart C 15.247
<b>Test Method</b>	ANSI C63.10 (2013) Section 6.10.5
<b>Test Mode (Pre-Scan)</b>	TX
<b>Test Mode (Final Test)</b>	TX
<b>Tester</b>	Jozu
<b>Temperature</b>	25°C
<b>Humidity</b>	60%

### 12.1 LIMITS

<b>Frequency(MHz)</b>	<b>Field strength(microvolts/meter)</b>	<b>Measurement distance(meters)</b>
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

## 12.2 BLOCK DIAGRAM OF TEST SETUP



## 12.3 PROCEDURE

- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.

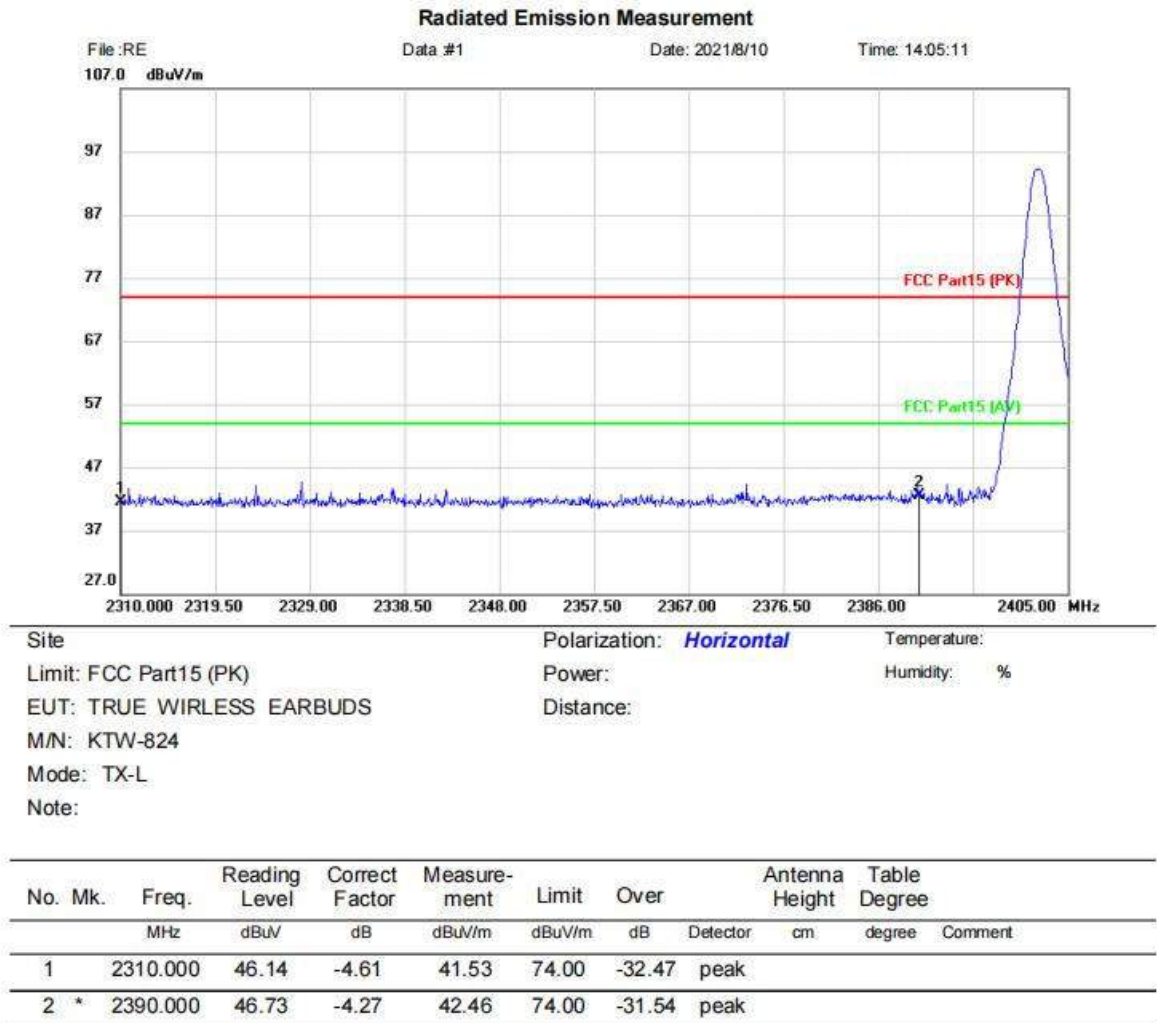
Remark 1:  $Level = Read\ Level + Cable\ Loss + Antenna\ Factor - Preamp\ Factor$

Remark 2: For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

BlueAsia

### 12.4 TEST DATA

[TestMode: TX low channel]; [Polarity: Horizontal]

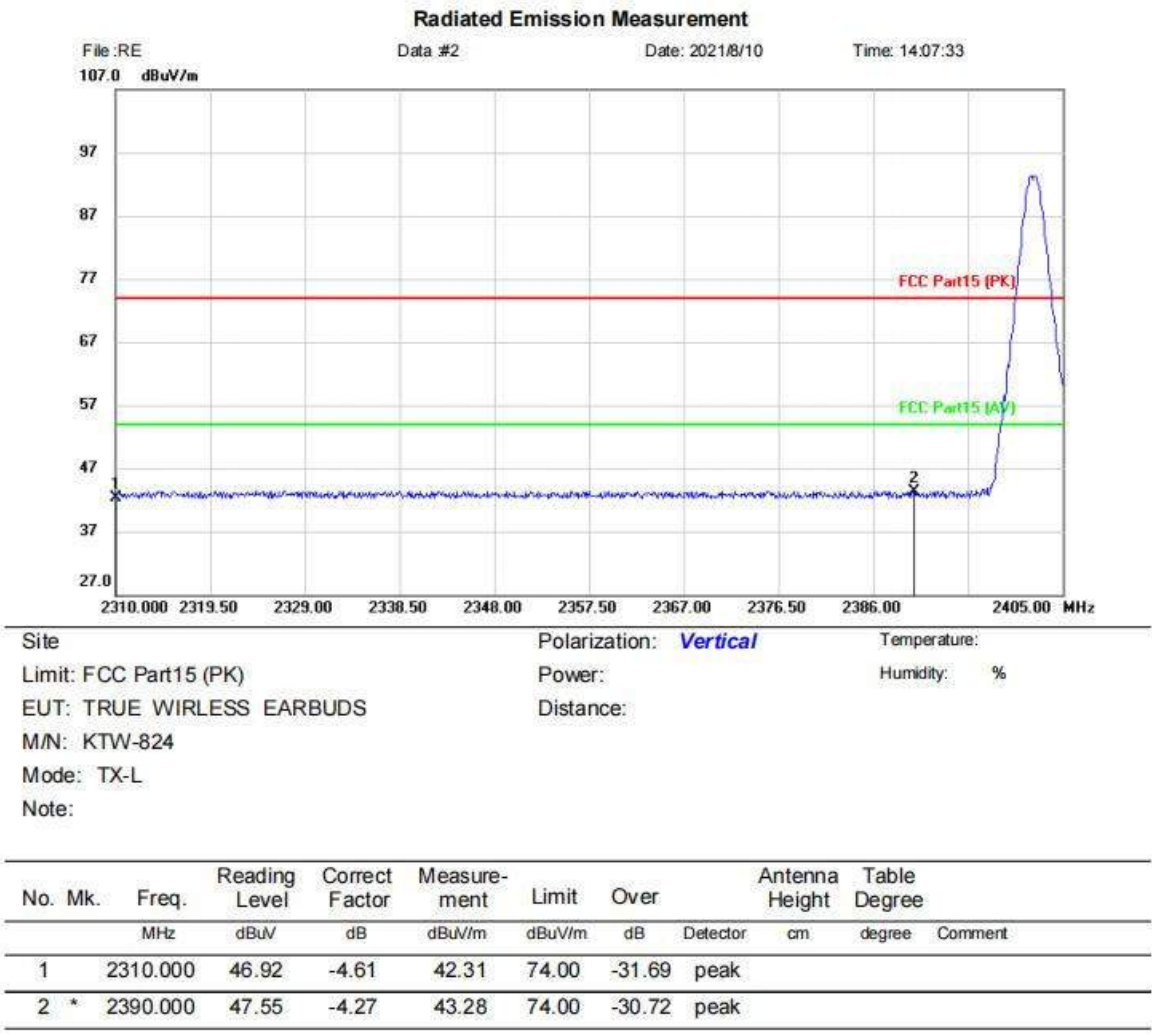


\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

**Test Result: Pass**

[TestMode: TX low channel]; [Polarity: Vertical]

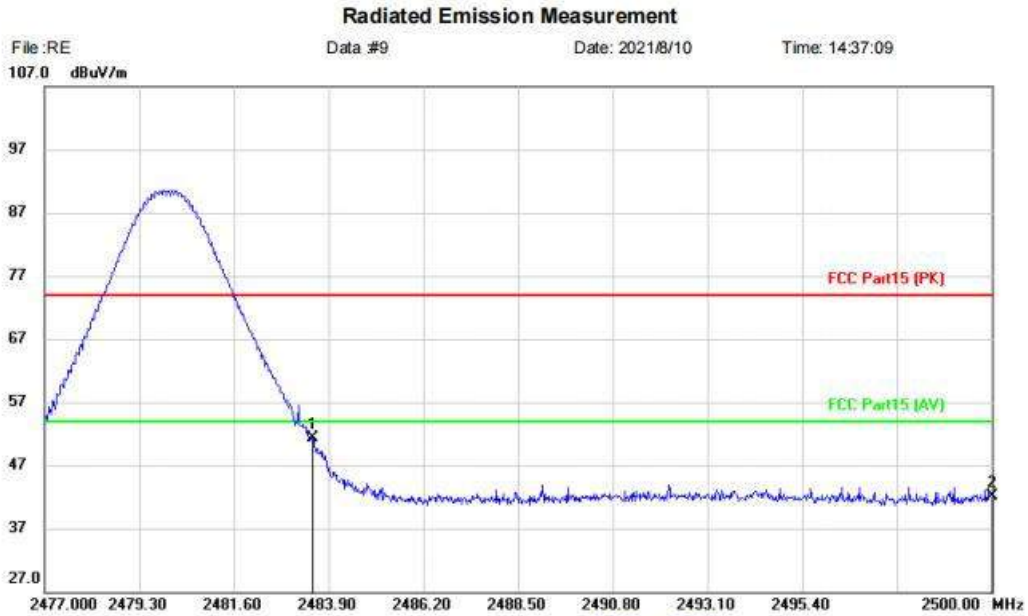


\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

**Test Result: Pass**

[TestMode: TX high channel]; [Polarity: Horizontal]



Site	Polarization: <b>Horizontal</b>	Temperature:
Limit: FCC Part15 (PK)	Power:	Humidity: %
EUT: TRUE WIRELESS EARBUDS	Distance:	
M/N: KTW-824		
Mode: TX-H		
Note:		

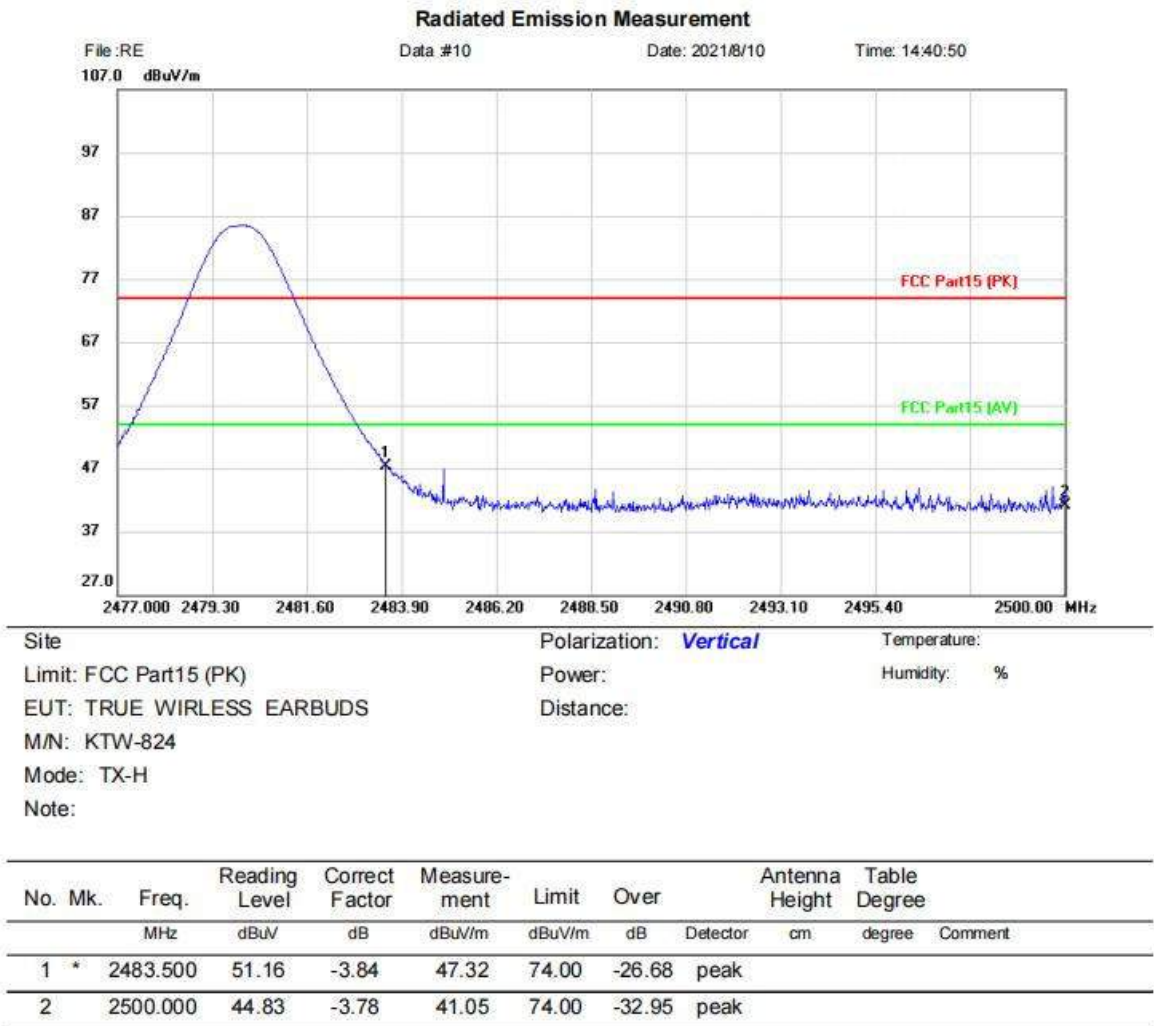
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree
1	*	2483.500	55.16	-3.84	51.32	74.00	-22.68	peak	
2		2500.000	45.91	-3.78	42.13	74.00	-31.87	peak	

\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

**Test Result: Pass**

[TestMode: TX high channel]; [Polarity: Vertical]



\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

**Test Result: Pass**



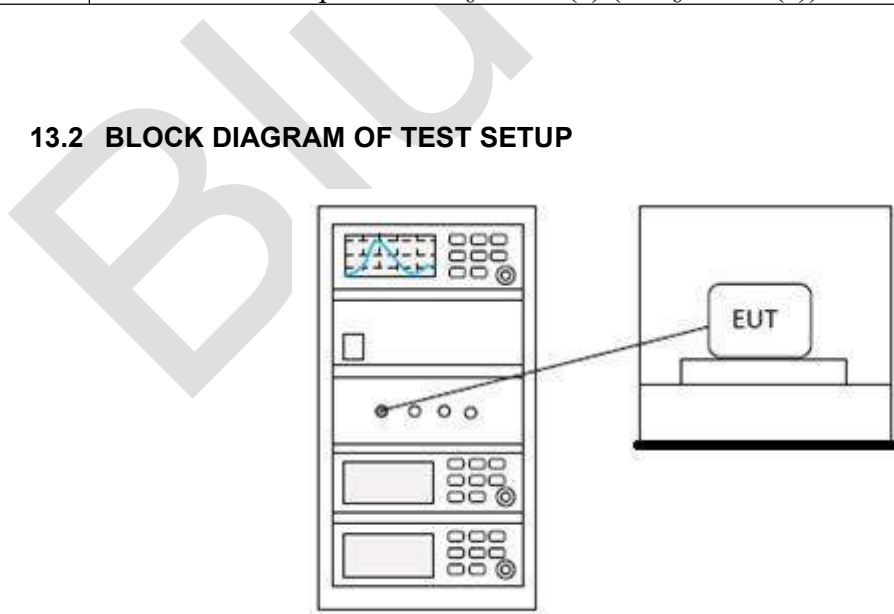
### 13 CONDUCTED BAND EDGES MEASUREMENT

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 7.8.8 & Section 11.13.3.2
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Jozu
Temperature	25°C
Humidity	60%

#### 13.1 LIMITS

<b>Limit:</b>	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)).
---------------	--

#### 13.2 BLOCK DIAGRAM OF TEST SETUP





### 13.3 TEST DATA

**Pass: Please Refer To Appendix: Appendix1 For Details**

BlueAsia

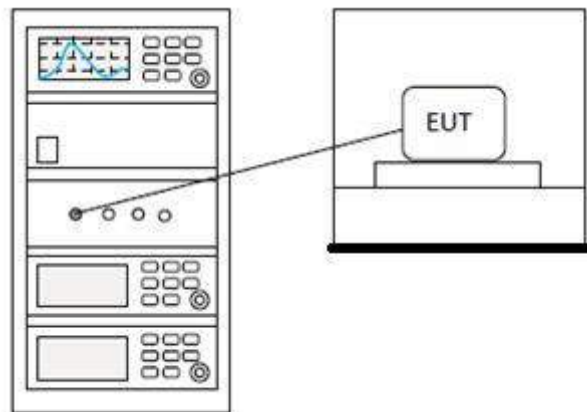
## 14 DWELL TIME

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 7.8.4
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Jozu
Temperature	25°C
Humidity	60%

### 14.1 LIMITS

Frequency(MHz)	Limit
902-928	0.4S within a 20S period(20dB bandwidth<250kHz)
	0.4S within a 10S period(20dB bandwidth≥250kHz)
2400-2483.5	0.4S within a period of 0.4S multiplied by the number of hopping channels
5725-5850	0.4S within a 30S period

### 14.2 BLOCK DIAGRAM OF TEST SETUP



### 14.3 TEST DATA

**Pass: Please Refer To Appendix: Appendix1 For Details**

BlueAsia

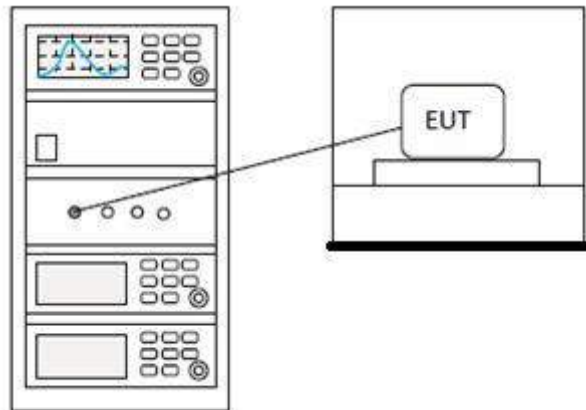
## 15 HOPPING CHANNEL NUMBER

<b>Test Standard</b>	47 CFR Part 15, Subpart C 15.247
<b>Test Method</b>	ANSI C63.10 (2013) Section 7.8.3
<b>Test Mode (Pre-Scan)</b>	TX
<b>Test Mode (Final Test)</b>	TX
<b>Tester</b>	Jozu
<b>Temperature</b>	25°C
<b>Humidity</b>	60%

### 15.1 LIMITS

<b>Frequency range(MHz)</b>	<b>Number of hopping channels (minimum)</b>
902-928	50 for 20dB bandwidth <250kHz
	25 for 20dB bandwidth ≥250kHz
2400-2483.5	15
5725-5850	75

### 15.2 BLOCK DIAGRAM OF TEST SETUP



### 15.3 TEST DATA

**Pass: Please Refer To Appendix: Appendix1 For Details**

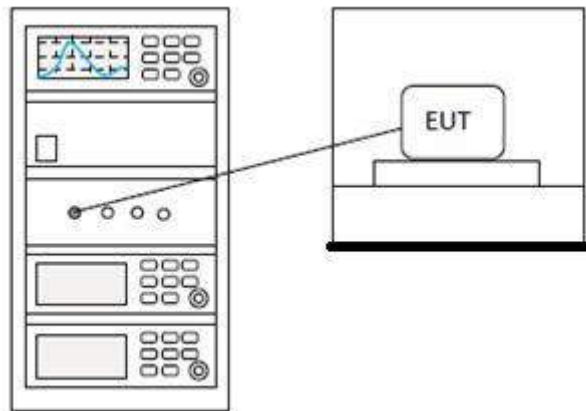
## 16 CARRIER FREQUENCIES SEPARATION

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 7.8.2
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Jozu
Temperature	25°C
Humidity	60%

### 16.1 LIMITS

<b>Limit:</b>	2/3 of the 20dB bandwidth base on the transmission power is less than 0.125W
---------------	--

### 16.2 BLOCK DIAGRAM OF TEST SETUP



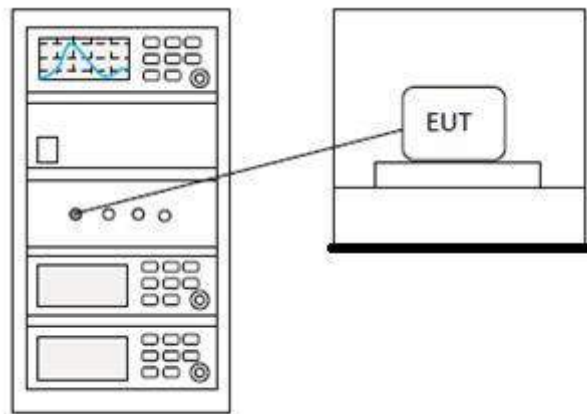
### 16.3 TEST DATA

<b>Pass: Please Refer To Appendix: Appendix1 For Details</b>
--

## 17 20DB BANDWIDTH

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 7.8.7
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Jozu
Temperature	25°C
Humidity	60%

### 17.1 BLOCK DIAGRAM OF TEST SETUP



### 17.2 TEST DATA

**Pass: Please Refer To Appendix: Appendix1 For Details**

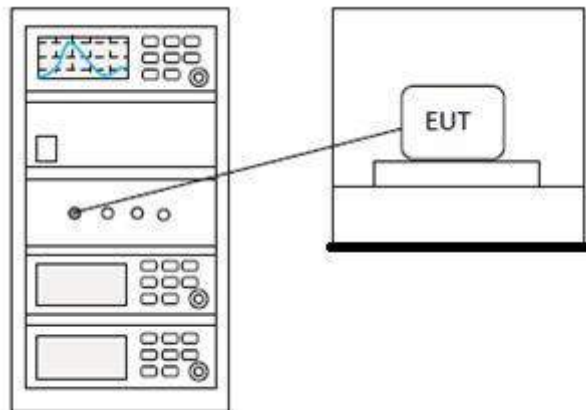
## 18 CONDUCTED PEAK OUTPUT POWER

<b>Test Standard</b>	47 CFR Part 15, Subpart C 15.247
<b>Test Method</b>	ANSI C63.10 (2013) Section 7.8.5
<b>Test Mode (Pre-Scan)</b>	TX
<b>Test Mode (Final Test)</b>	TX
<b>Tester</b>	Jozu
<b>Temperature</b>	25°C
<b>Humidity</b>	60%

### 18.1 LIMITS

Frequency range(MHz)	Output power of the intentional radiator(watt)
902-928	1 for $\geq 50$ hopping channels
	0.25 for $25 \leq$ hopping channels $< 50$
	1 for digital modulation
2400-2483.5	1 for $\geq 75$ non-overlapping hopping channels
	0.125 for all other frequency hopping systems
	1 for digital modulation
5725-5850	1 for frequency hopping systems and digital modulation

### 18.2 BLOCK DIAGRAM OF TEST SETUP



### 18.3 TEST DATA

**Pass: Please Refer To Appendix: Appendix1 For Details**

BlueAsia



## 19 CONDUCTED EMISSIONS AT AC POWER LINE (150KHZ-30MHZ)

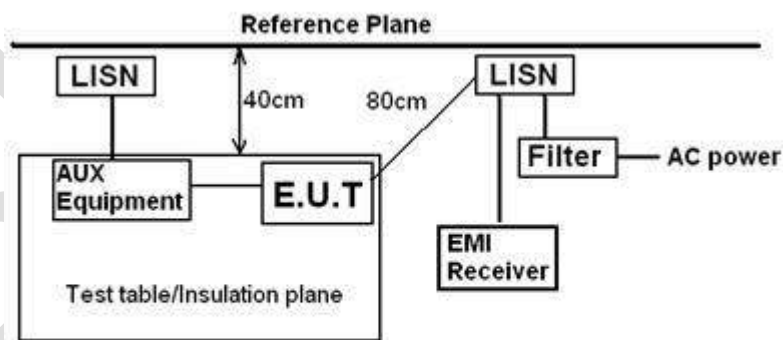
Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 6.2
Test Mode (Pre-Scan)	Transmitting mode
Test Mode (Final Test)	Transmitting mode
Tester	Jozu
Temperature	25°C
Humidity	60%

### 19.1 LIMITS

Frequency of emission(MHz)	Conducted limit(dB $\mu$ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\*Decreases with the logarithm of the frequency.

### 19.2 BLOCK DIAGRAM OF TEST SETUP



Remark:  
 E.U.T: Equipment Under Test  
 LISN: Line Impedance Stabilization Network  
 Test table height=0.8m

### 19.3 PROCEDURE

- 1) The mains terminal disturbance voltage test was conducted in a shielded room.
- 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50H + 5ohm linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.

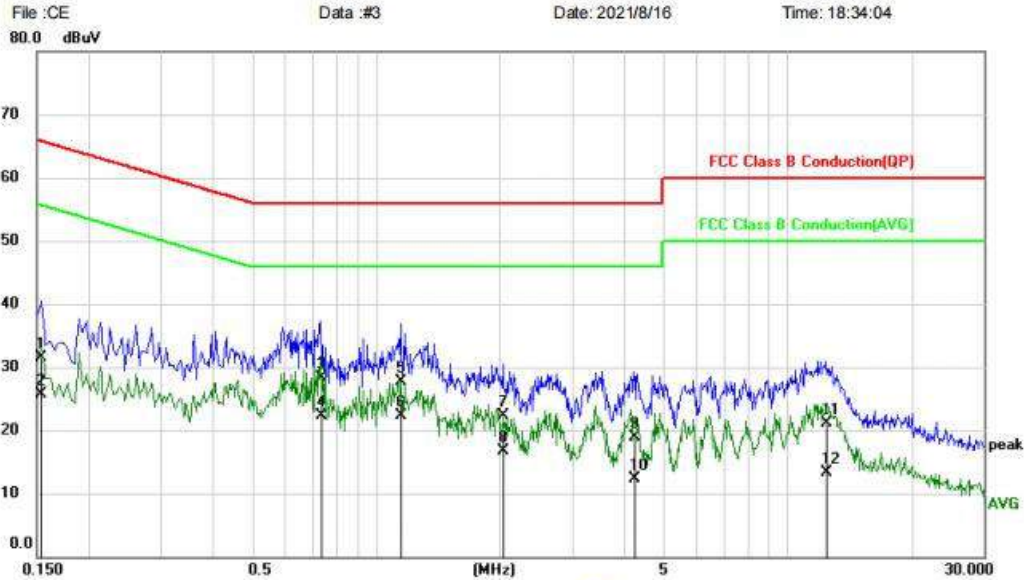
- 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,
  - 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
  - 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.
- Remark: LISN=Read Level+ Cable Loss+ LISN Factor

BlueAsia

### 19.4 TEST DATA

[TestMode: Transmitting mode]; [Line: Neutral]; [Power: AC120V/60Hz]

**Conducted Emission Measurement**



File : CE                      Data : #3                      Date : 2021/8/16                      Time : 18:34:04  
Site    Phase: *N*                      Temperature:                        
Limit: FCC Class B Conduction(QP)                      Power:                      Humidity: %

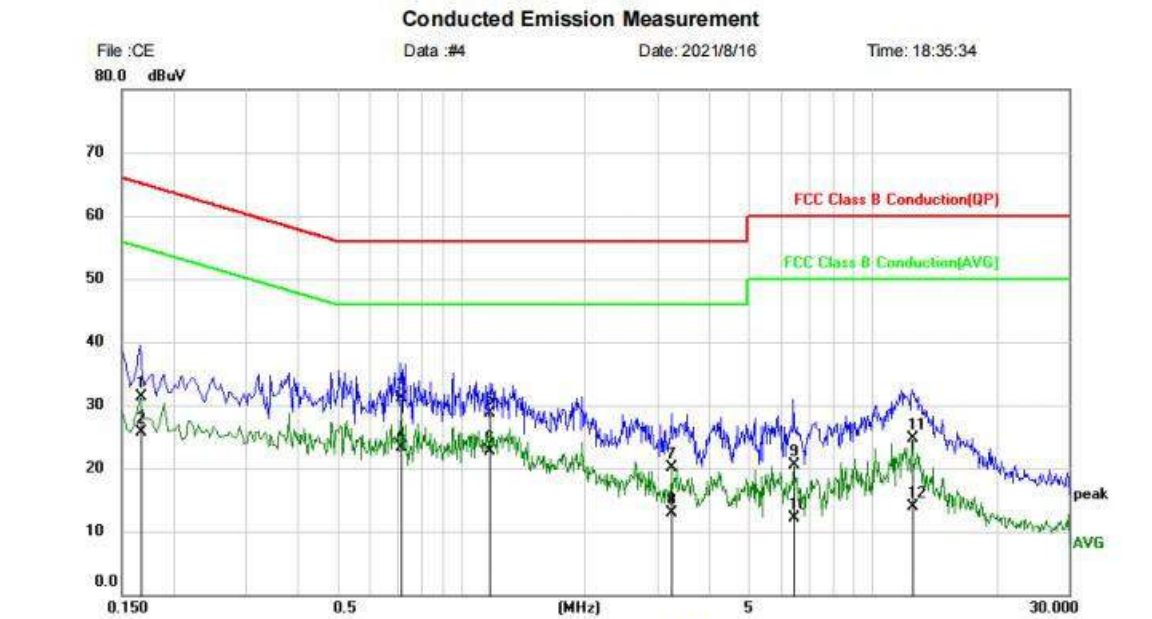
EUT: TRUE WIRELESS EARBUDS  
M/N: KTW-824  
Mode: BT mode  
Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.1539	21.79	9.73	31.52	65.79	-34.27	QP	
2		0.1539	16.01	9.73	25.74	55.79	-30.05	AVG	
3		0.7340	18.50	9.82	28.32	56.00	-27.68	QP	
4	*	0.7340	12.47	9.82	22.29	46.00	-23.71	AVG	
5		1.1500	17.86	9.84	27.70	56.00	-28.30	QP	
6		1.1500	12.42	9.84	22.26	46.00	-23.74	AVG	
7		2.0340	12.52	9.86	22.38	56.00	-33.62	QP	
8		2.0340	6.75	9.86	16.61	46.00	-29.39	AVG	
9		4.2260	9.05	9.92	18.97	56.00	-37.03	QP	
10		4.2260	2.36	9.92	12.28	46.00	-33.72	AVG	
11		12.4260	10.83	10.23	21.06	60.00	-38.94	QP	
12		12.4260	3.11	10.23	13.34	50.00	-36.66	AVG	

\*:Maximum data    x:Over limit    !:over margin                      (Reference Only)

**Test Result: Pass**

[TestMode: Transmitting mode]; [Line: Line]; ;[Power:AC120V/60Hz]



Site: Phase: **L1** Temperature:   
 Limit: FCC Class B Conduction(QP) Power: Humidity: %   
 EUT: TRUE WIRELESS EARBUDS   
 M/N: KTW-824   
 Mode: BT mode   
 Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1660	21.51	9.82	31.33	65.16	-33.83	QP	
2		0.1660	15.94	9.82	25.76	55.16	-29.40	AVG	
3		0.7140	21.19	9.89	31.08	56.00	-24.92	QP	
4	*	0.7140	13.51	9.89	23.40	46.00	-22.60	AVG	
5		1.1740	18.69	9.92	28.61	56.00	-27.39	QP	
6		1.1740	12.81	9.92	22.73	46.00	-23.27	AVG	
7		3.2540	10.19	9.97	20.16	56.00	-35.84	QP	
8		3.2540	3.01	9.97	12.98	46.00	-33.02	AVG	
9		6.4340	10.37	10.07	20.44	60.00	-39.56	QP	
10		6.4340	2.10	10.07	12.17	50.00	-37.83	AVG	
11		12.4940	14.34	10.28	24.62	60.00	-35.38	QP	
12		12.4940	3.69	10.28	13.97	50.00	-36.03	AVG	

\*:Maximum data x:Over limit !:over margin (Reference Only)

**Test Result: Pass**

## 20 RADIATED SPURIOUS EMISSIONS

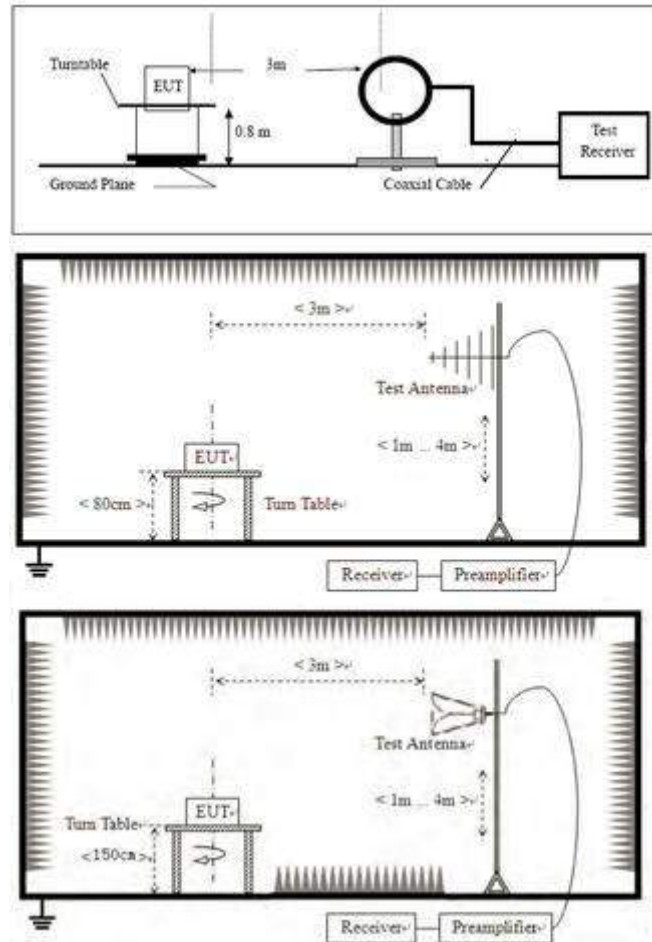
<b>Test Standard</b>	47 CFR Part 15, Subpart C 15.247
<b>Test Method</b>	ANSI C63.10 (2013) Section 6.4,6.5,6.6
<b>Test Mode (Pre-Scan)</b>	TX
<b>Test Mode (Final Test)</b>	TX
<b>Tester</b>	Jozu
<b>Temperature</b>	25°C
<b>Humidity</b>	60%

### 20.1 LIMITS

<b>Frequency(MHz)</b>	<b>Field strength(microvolts/meter)</b>	<b>Measurement distance(meters)</b>
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

## 20.2 BLOCK DIAGRAM OF TEST SETUP



## 20.3 PROCEDURE

- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.



- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.

Remark:

- 1) For emission below 1GHz, through pre-scan found the worst case is the lowest channel. Only the worst case is recorded in the report.
- 2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:  
Final Test Level = Receiver Reading + Antenna Factor + Cable Factor - Preamplifier Factor
- 3) Scan from 9kHz to 25GHz, the disturbance above 12.75GHz and below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported. fundamental frequency is blocked by filter, and only spurious emission is shown.
- 4) For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

### 20.4 TEST DATA

[TestMode: TX low channel]; [Polarity: Horizontal]



\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

**Test Result: Pass**



[TestMode: TX low channel]; [Polarity: Vertical]



\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

**Test Result: Pass**

[TestMode: TX mid channel]; [Polarity: Horizontal]



\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

**Test Result: Pass**

[TestMode: TX mid channel]; [Polarity: Vertical]



\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

**Test Result: Pass**

[TestMode: TX high channel]; [Polarity: Vertical]



\*:Maximum data    x:Over limit    !:over margin

(Reference Only)

**Test Result: Pass**

[TestMode: TX high channel]; [Polarity: Horizontal]



\*:Maximum data    x:Over limit    !:over margin

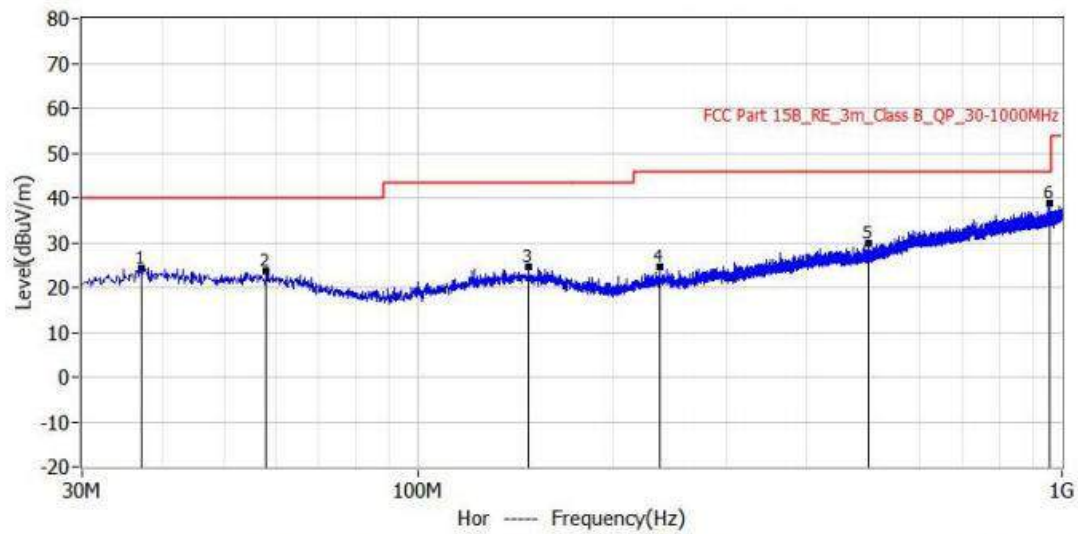
(Reference Only)

**Test Result: Pass**



[TestMode: TX below 1G]; [Polarity: Horizontal]

Test Lab: BlueAsia EMC Lab (RE #1)	Project: 202108-A06
EUT: TRUE WIRELESS EARBUDS	Test Engineer: Charlie
M/N: KTW-824	Temperature:
S/N:	Humidity:
Test Mode: TX mode	Test Voltage:
Note:	Test Data: 2021-08-16 17:10:24

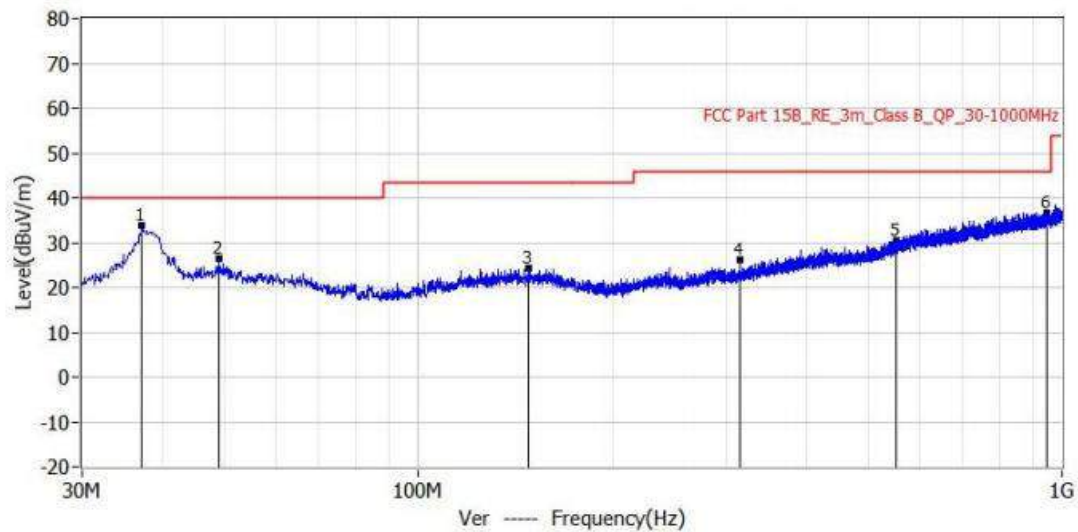


No.	Frequency	Limit dBuV/m	Level dBuV/m	Delta dB	Reading dBuV	Factor dB/m	Detector	Polar	Height cm	Angle deg
1*	37.154MHz	40.0	24.4	-15.6	0.6	23.8	QP	Hor	100.0	85.0
2*	58.009MHz	40.0	23.6	-16.4	0.0	23.6	QP	Hor	100.0	0.0
3*	148.340MHz	43.5	24.5	-19.0	1.0	23.5	QP	Hor	100.0	176.0
4*	236.974MHz	46.0	24.5	-21.5	1.9	22.6	QP	Hor	100.0	230.0
5*	499.965MHz	46.0	30.0	-16.0	1.6	28.4	QP	Hor	100.0	170.0
6*	956.956MHz	46.0	38.9	-7.1	3.2	35.7	QP	Hor	100.0	63.0

**Test Result: Pass**

[TestMode: TX below 1G]; [Polarity: Vertical]

Test Lab: BlueAsia EMC Lab (RE #1)	Project: 202108-A06
EUT: TRUE WIRELESS EARBUDS	Test Engineer: Charlie
M/N: KTW-824	Temperature:
S/N:	Humidity:
Test Mode: TX mode	Test Voltage:
Note:	Test Data: 2021-08-16 17:13:07



No.	Frequency	Limit dBuV/m	Level dBuV/m	Delta dB	Reading dBuV	Factor dB/m	Detector	Polar	Height cm	Angle deg
1*	37.154MHz	40.0	33.8	-6.2	10.0	23.8	QP	Ver	100.0	313.0
2*	48.915MHz	40.0	26.5	-13.5	2.7	23.8	QP	Ver	100.0	130.0
3*	148.461MHz	43.5	24.2	-19.3	0.7	23.5	QP	Ver	100.0	16.0
4*	315.908MHz	46.0	26.1	-19.9	1.5	24.6	QP	Ver	100.0	92.0
5*	553.073MHz	46.0	30.6	-15.4	0.7	29.9	QP	Ver	100.0	328.0
6*	947.014MHz	46.0	36.7	-9.3	1.2	35.5	QP	Ver	100.0	164.0

**Test Result: Pass**

## 21 APPENDIX

### 21.1 MAXIMUM CONDUCTED OUTPUT POWER

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	1-DH1	2402	Ant1	-1.942	21	Pass
NVNT	1-DH1	2441	Ant1	-2.299	21	Pass
NVNT	1-DH1	2480	Ant1	-2.237	21	Pass
NVNT	2-DH1	2402	Ant1	-1.079	21	Pass
NVNT	2-DH1	2441	Ant1	-1.523	21	Pass
NVNT	2-DH1	2480	Ant1	-1.485	21	Pass
NVNT	3-DH1	2402	Ant1	-2.162	21	Pass
NVNT	3-DH1	2441	Ant1	-2.682	21	Pass
NVNT	3-DH1	2480	Ant1	-2.621	21	Pass

Power NVNT 1-DH1 2402MHz Ant1



Power NVNT 1-DH1 2441MHz Ant1





Power NVNT 1-DH1 2480MHz Ant1



Power NVNT 2-DH1 2402MHz Ant1



Power NVNT 2-DH1 2441MHz Ant1



Power NVNT 2-DH1 2480MHz Ant1



Power NVNT 3-DH1 2402MHz Ant1



Power NVNT 3-DH1 2441MHz Ant1



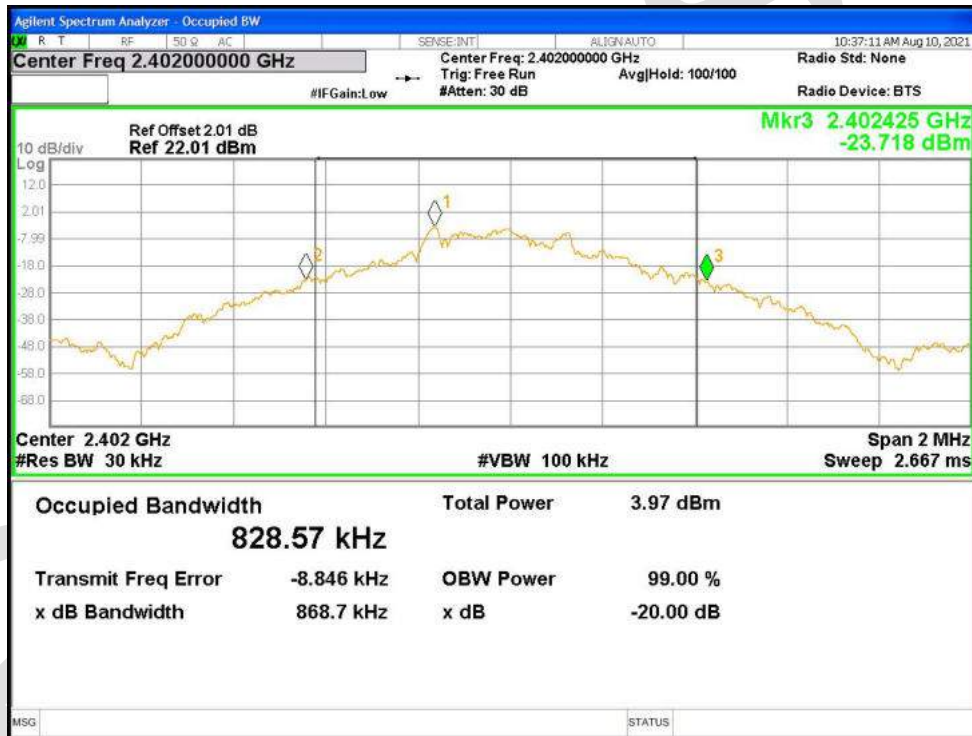
Power NVNT 3-DH1 2480MHz Ant1



**21.2 -20DB BANDWIDTH**

Condition	Mode	Frequency (MHz)	Antenna	-20 dB Bandwidth (MHz)	Limit -20 dB Bandwidth (MHz)	Verdict
NVNT	1-DH1	2402	Ant1	0.869	0	Pass
NVNT	1-DH1	2441	Ant1	0.843	0	Pass
NVNT	1-DH1	2480	Ant1	0.862	0	Pass
NVNT	2-DH1	2402	Ant1	1.253	0	Pass
NVNT	2-DH1	2441	Ant1	1.237	0	Pass
NVNT	2-DH1	2480	Ant1	1.228	0	Pass
NVNT	3-DH1	2402	Ant1	0.928	0	Pass
NVNT	3-DH1	2441	Ant1	0.935	0	Pass
NVNT	3-DH1	2480	Ant1	0.968	0	Pass

-20dB Bandwidth NVNT 1-DH1 2402MHz Ant1



-20dB Bandwidth NVNT 1-DH1 2441MHz Ant1

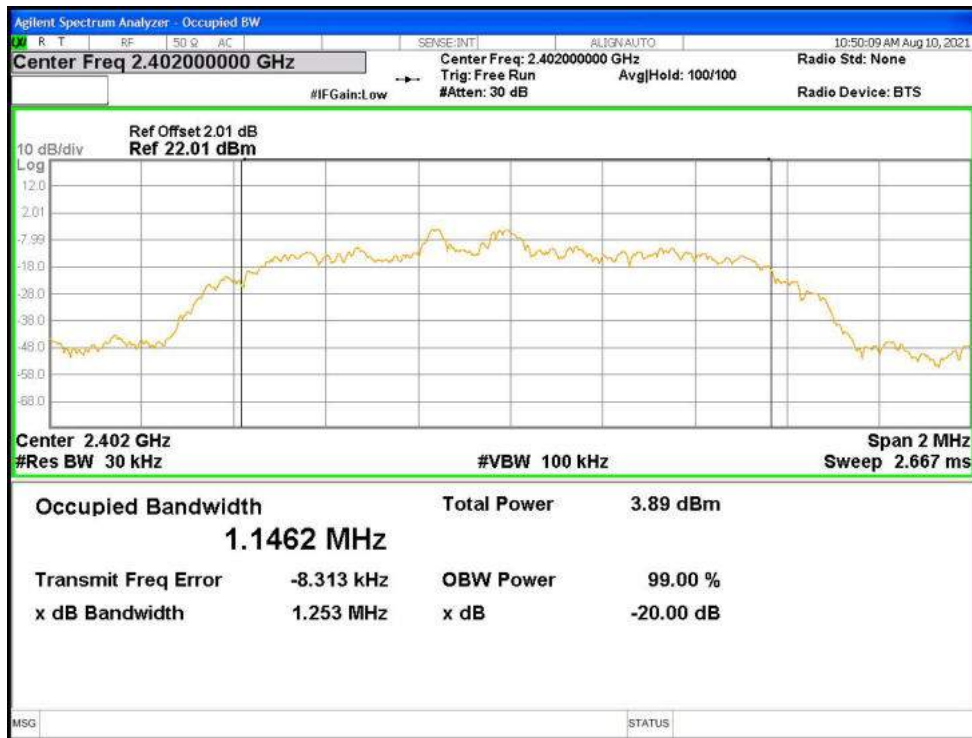




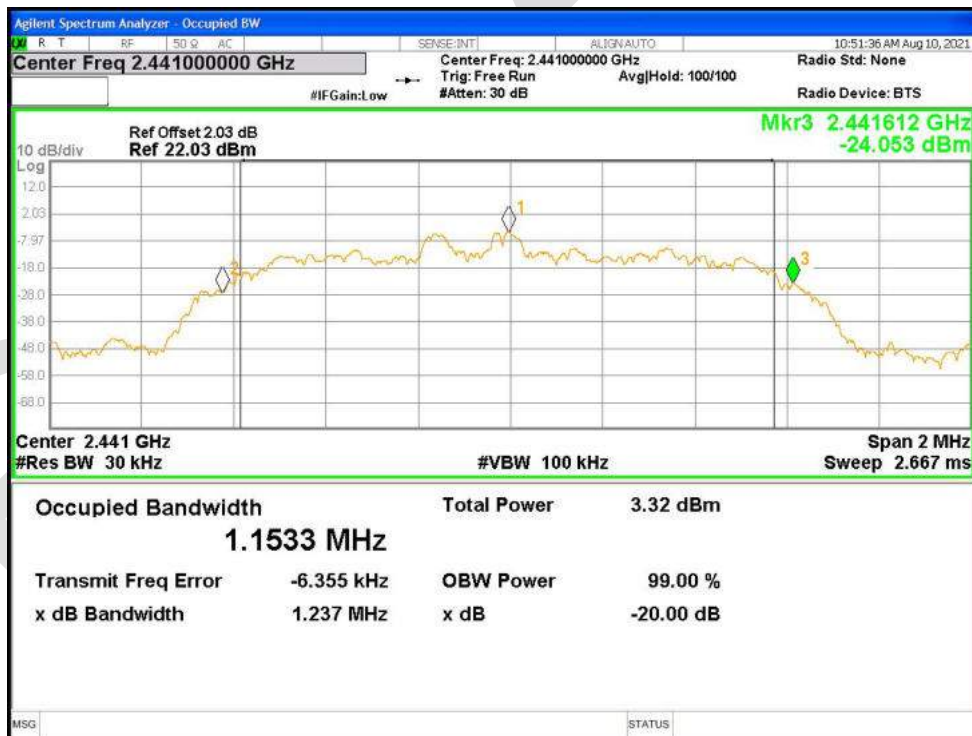
-20dB Bandwidth NVNT 1-DH1 2480MHz Ant1



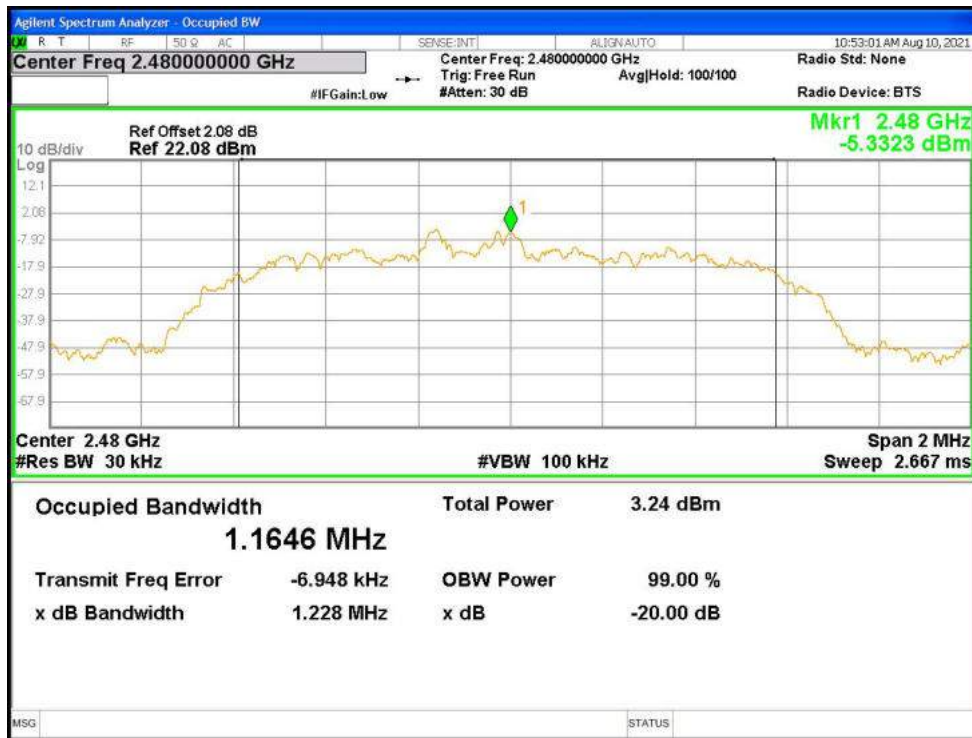
-20dB Bandwidth NVNT 2-DH1 2402MHz Ant1



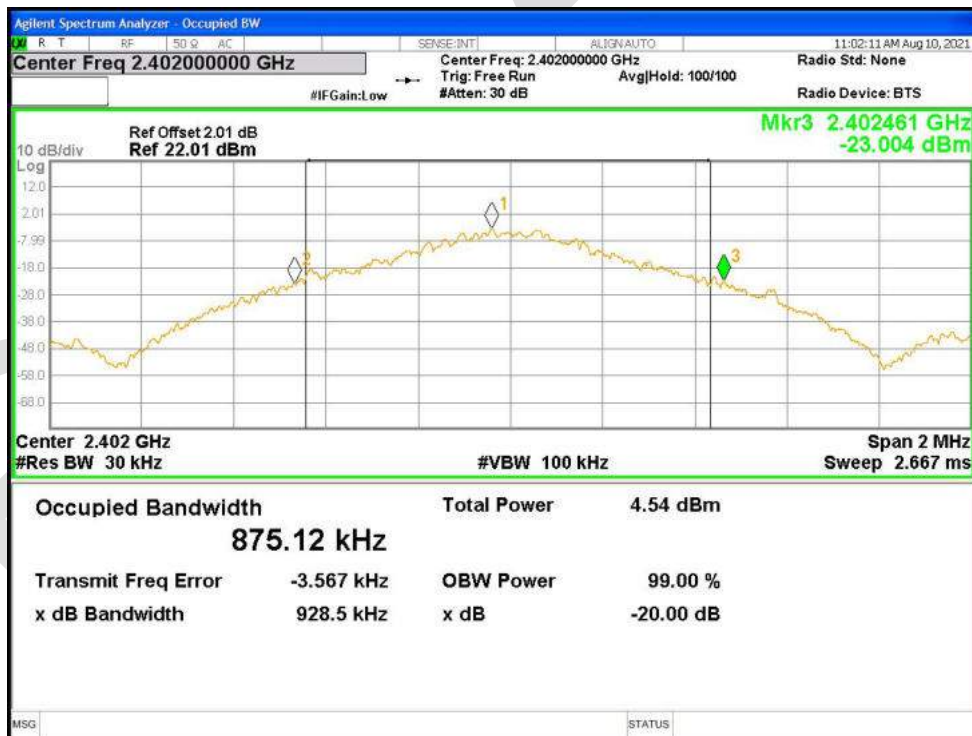
-20dB Bandwidth NVNT 2-DH1 2441MHz Ant1



-20dB Bandwidth NVNT 2-DH1 2480MHz Ant1

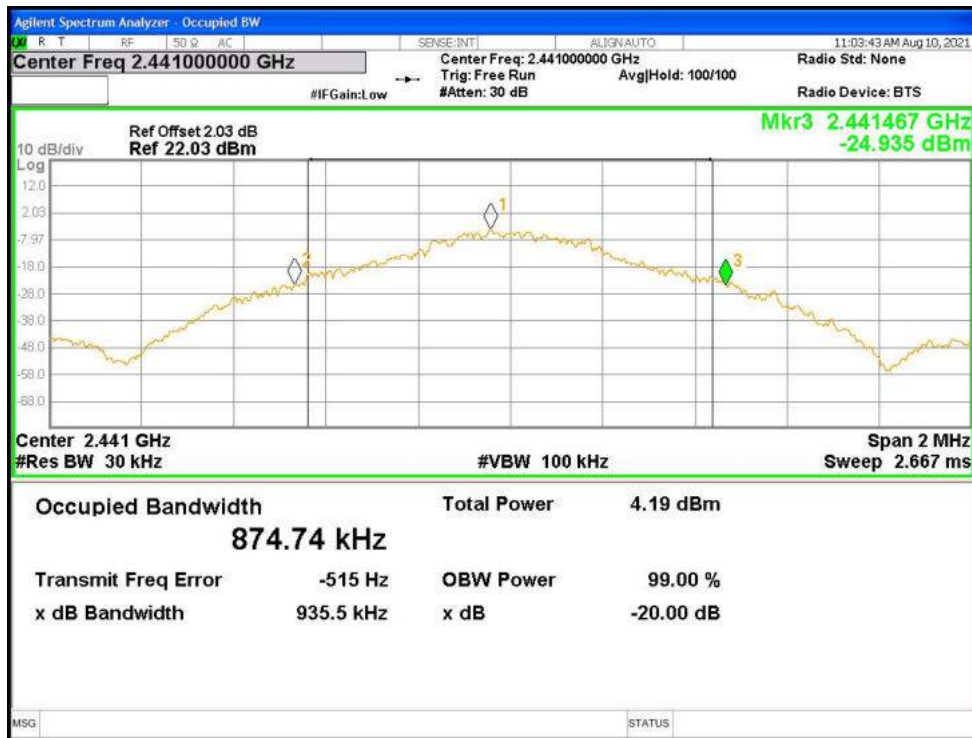


-20dB Bandwidth NVNT 3-DH1 2402MHz Ant1



-20dB Bandwidth NVNT 3-DH1 2441MHz Ant1





-20dB Bandwidth NVNT 3-DH1 2480MHz Ant1



### 21.3 OCCUPIED CHANNEL BANDWIDTH

Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)
NVNT	1-DH1	2402	Ant1	0.815214267
NVNT	1-DH1	2441	Ant1	0.8385534737
NVNT	1-DH1	2480	Ant1	0.8359224769
NVNT	2-DH1	2402	Ant1	1.16279274
NVNT	2-DH1	2441	Ant1	1.1574066
NVNT	2-DH1	2480	Ant1	1.16368316
NVNT	3-DH1	2402	Ant1	0.874760088
NVNT	3-DH1	2441	Ant1	0.8759214119
NVNT	3-DH1	2480	Ant1	0.8784196087

OBW NVNT 1-DH1 2402MHz Ant1



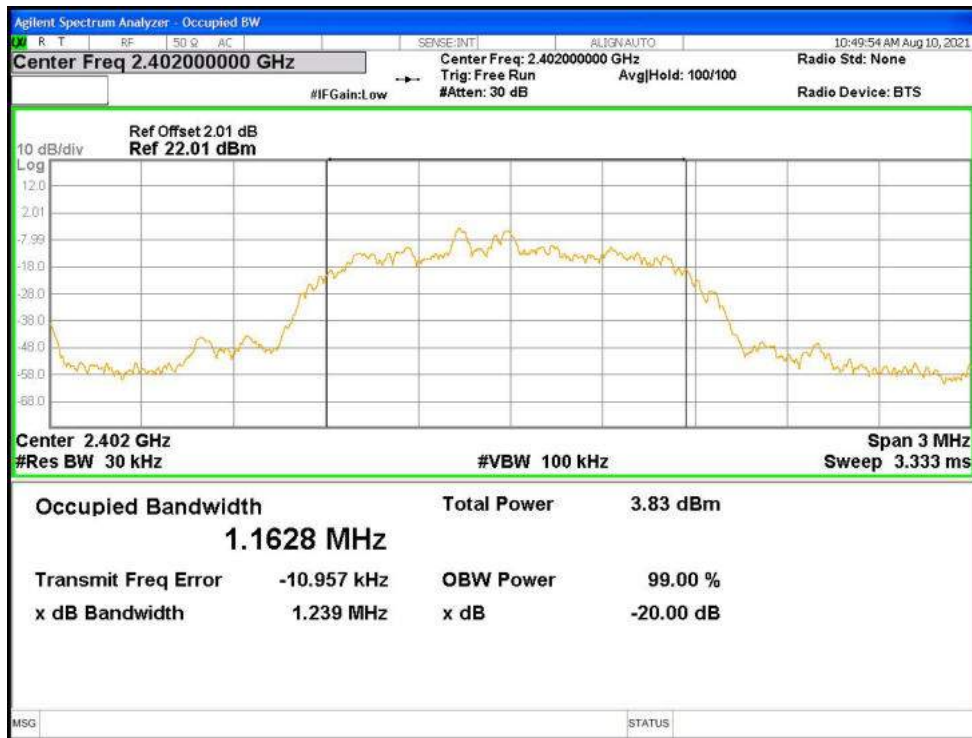
OBW NVNT 1-DH1 2441MHz Ant1



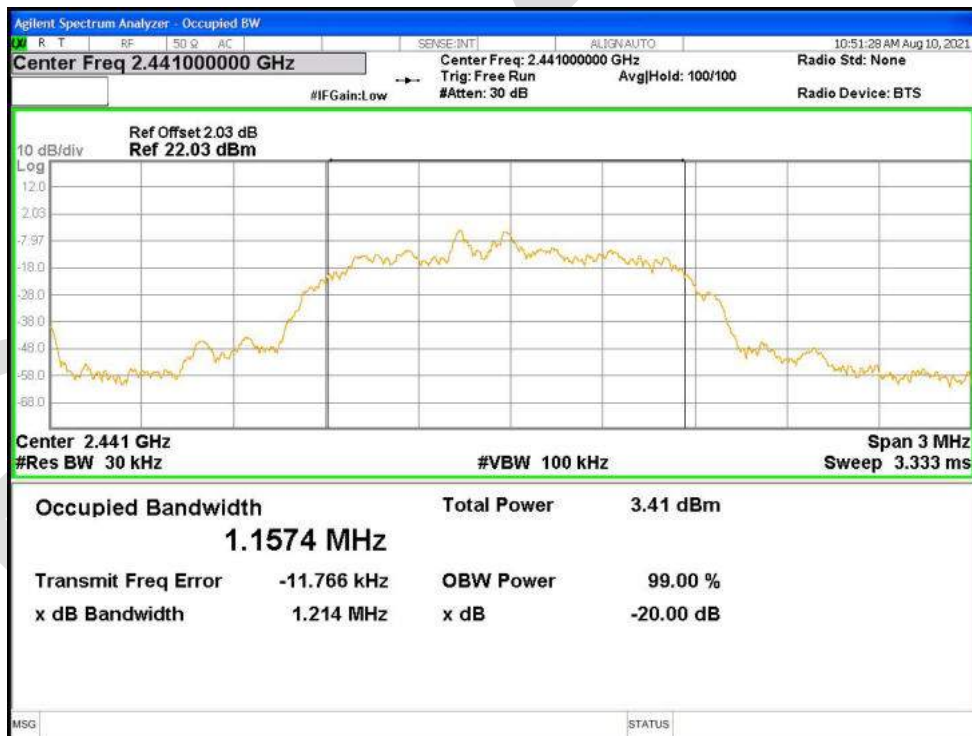
OBW NVNT 1-DH1 2480MHz Ant1



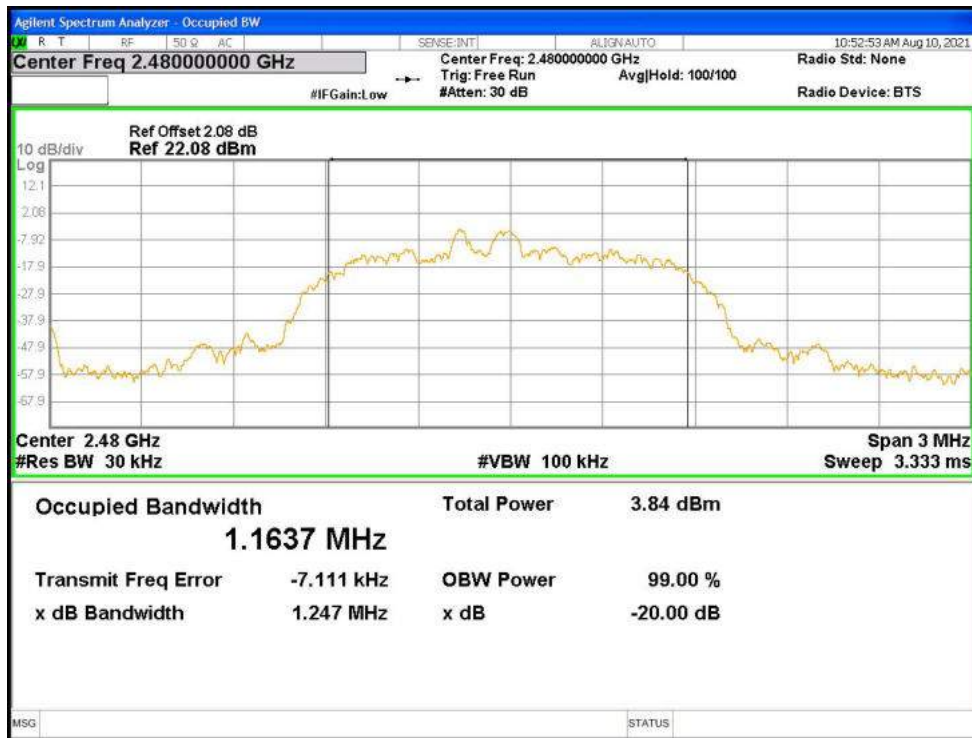
OBW NVNT 2-DH1 2402MHz Ant1



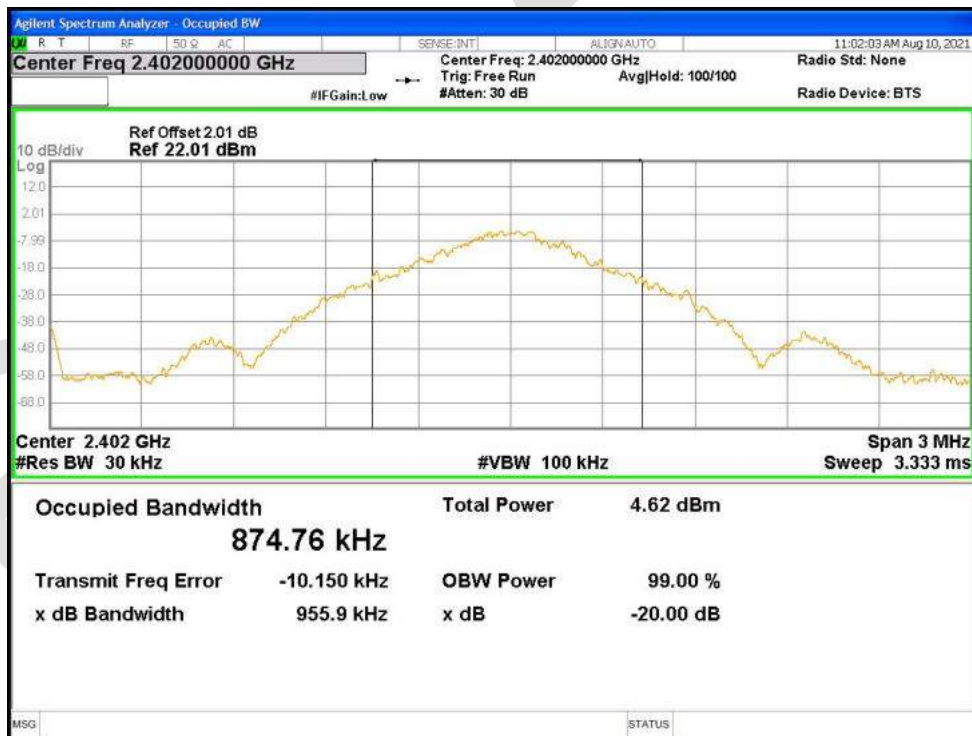
OBW NVNT 2-DH1 2441MHz Ant1



OBW NVNT 2-DH1 2480MHz Ant1

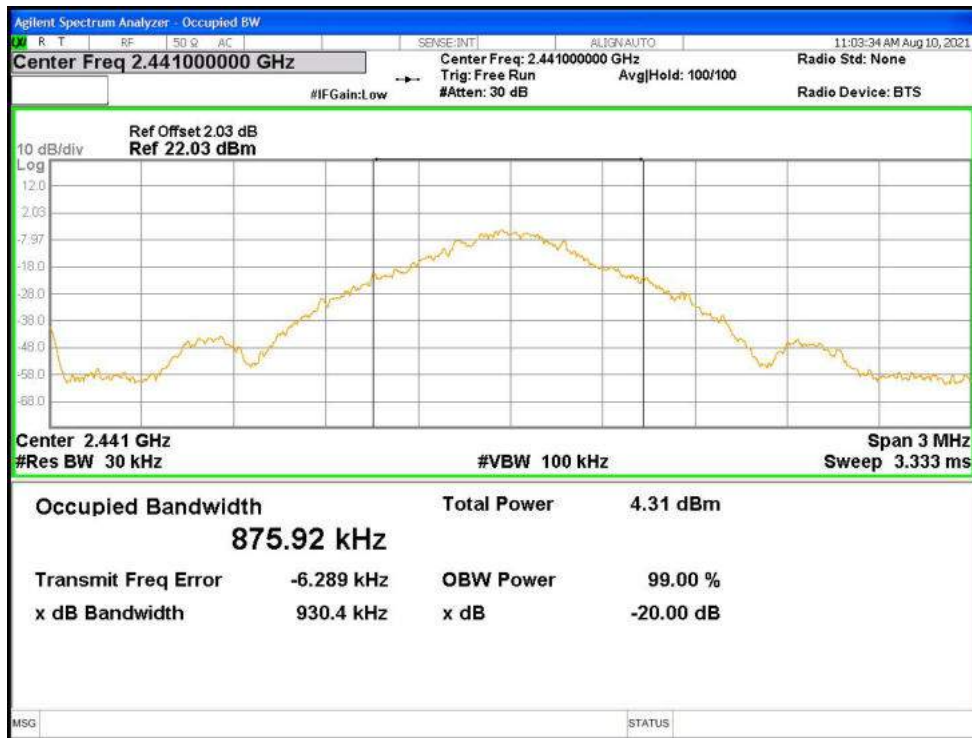


OBW NVNT 3-DH1 2402MHz Ant1

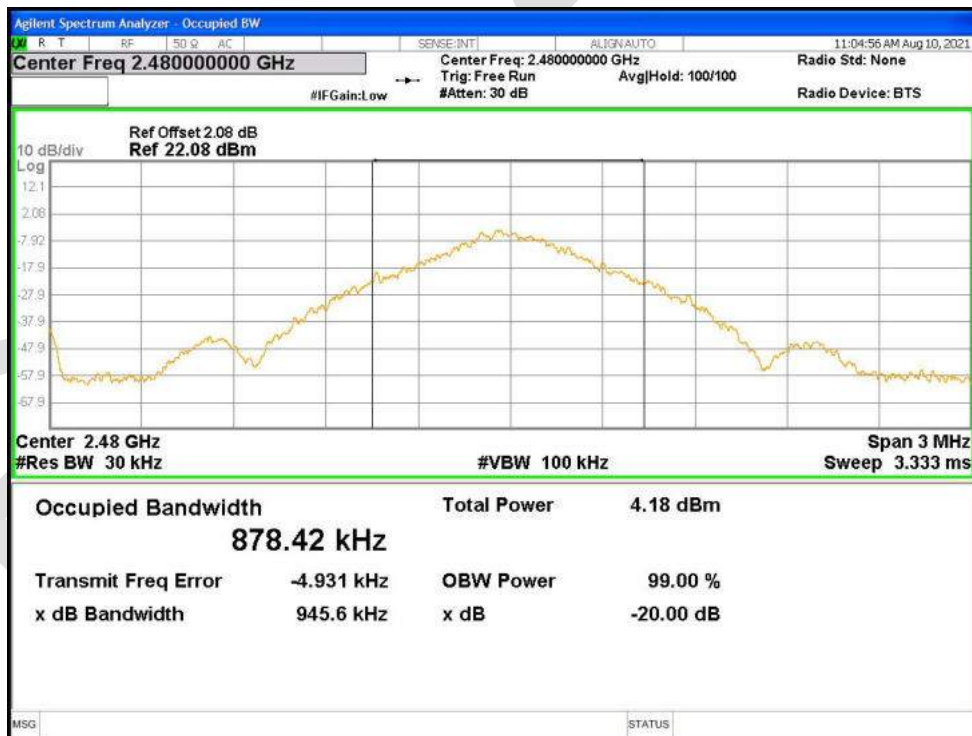


OBW NVNT 3-DH1 2441MHz Ant1





OBW NVNT 3-DH1 2480MHz Ant1



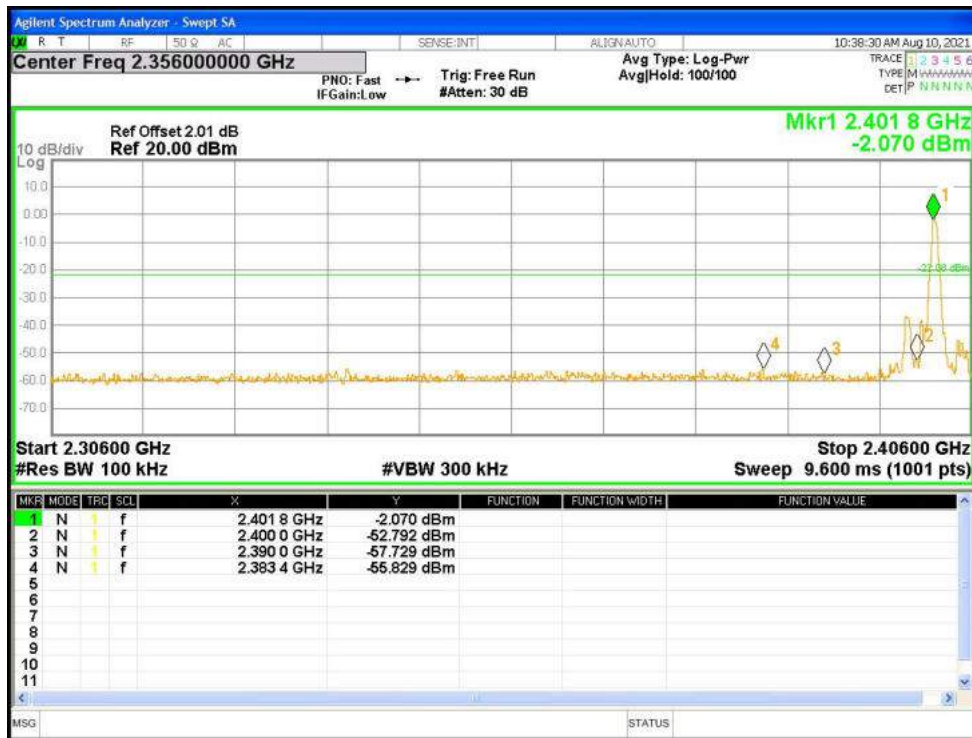
**21.4 BAND EDGE**

Condition	Mode	Frequency (MHz)	Antenna	Hopping Mode	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	1-DH1	2402	Ant1	No-Hopping	-53.74	-20	Pass
NVNT	1-DH1	2480	Ant1	No-Hopping	-41.25	-20	Pass
NVNT	2-DH1	2402	Ant1	No-Hopping	-52.91	-20	Pass
NVNT	2-DH1	2480	Ant1	No-Hopping	-47.29	-20	Pass
NVNT	3-DH1	2402	Ant1	No-Hopping	-52.62	-20	Pass
NVNT	3-DH1	2480	Ant1	No-Hopping	-41.62	-20	Pass

Band Edge NVNT 1-DH1 2402MHz Ant1 No-Hopping Ref



Band Edge NVNT 1-DH1 2402MHz Ant1 No-Hopping Emission

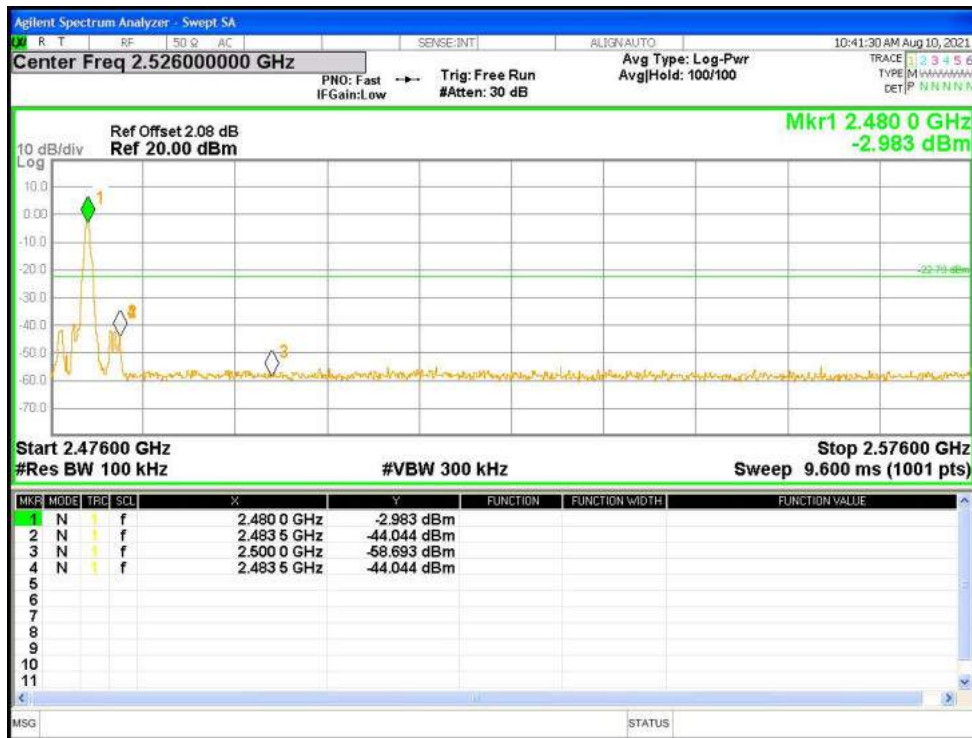


Band Edge NVNT 1-DH1 2480MHz Ant1 No-Hopping Ref



Band Edge NVNT 1-DH1 2480MHz Ant1 No-Hopping Emission

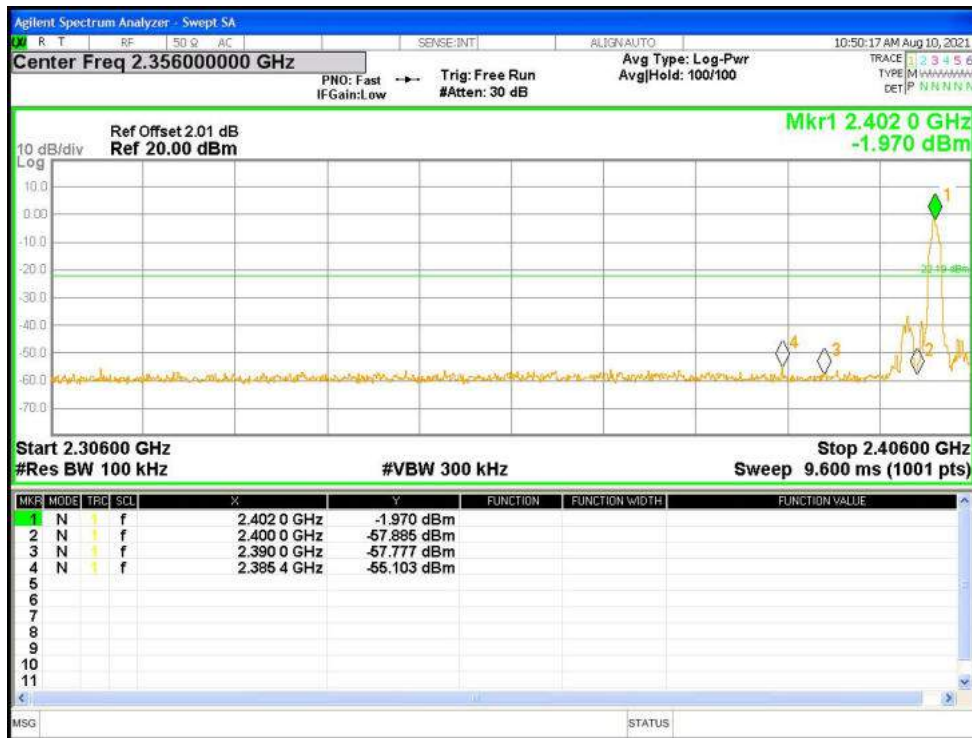




Band Edge NVNT 2-DH1 2402MHz Ant1 No-Hopping Ref



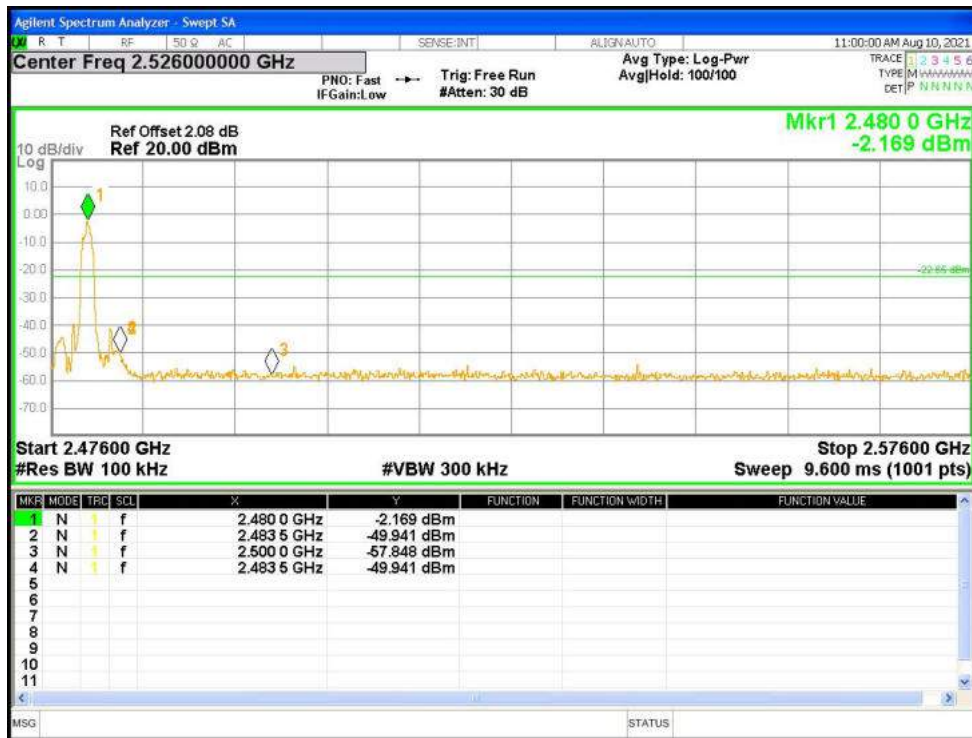
Band Edge NVNT 2-DH1 2402MHz Ant1 No-Hopping Emission



Band Edge NVNT 2-DH1 2480MHz Ant1 No-Hopping Ref



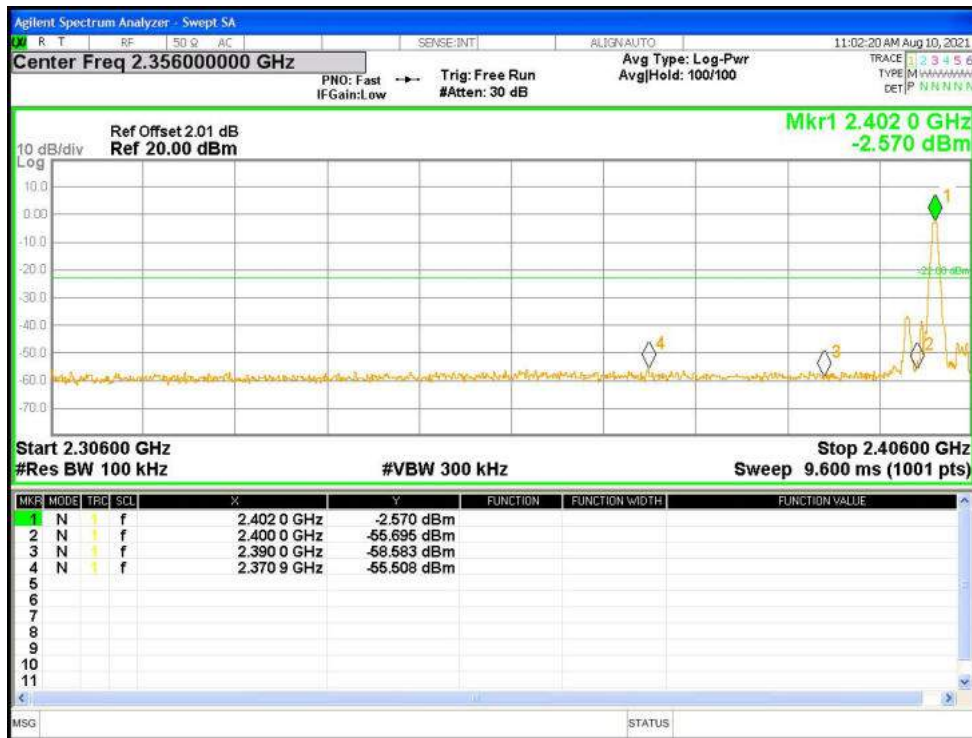
Band Edge NVNT 2-DH1 2480MHz Ant1 No-Hopping Emission



Band Edge NVNT 3-DH1 2402MHz Ant1 No-Hopping Ref



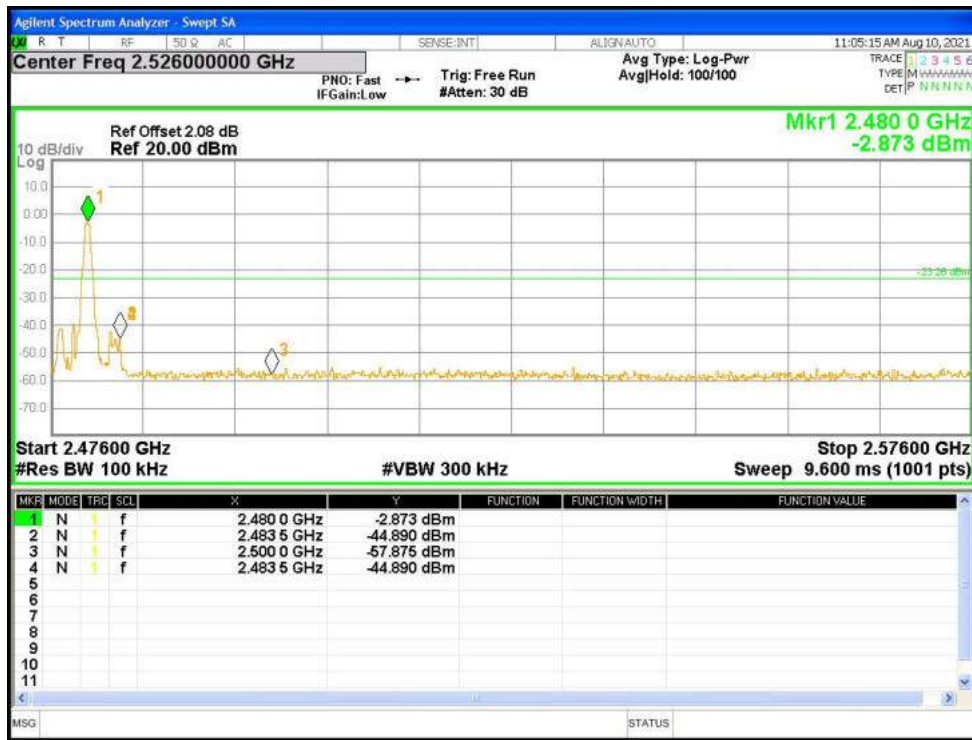
Band Edge NVNT 3-DH1 2402MHz Ant1 No-Hopping Emission



Band Edge NVNT 3-DH1 2480MHz Ant1 No-Hopping Ref



Band Edge NVNT 3-DH1 2480MHz Ant1 No-Hopping Emission



BlueAsia



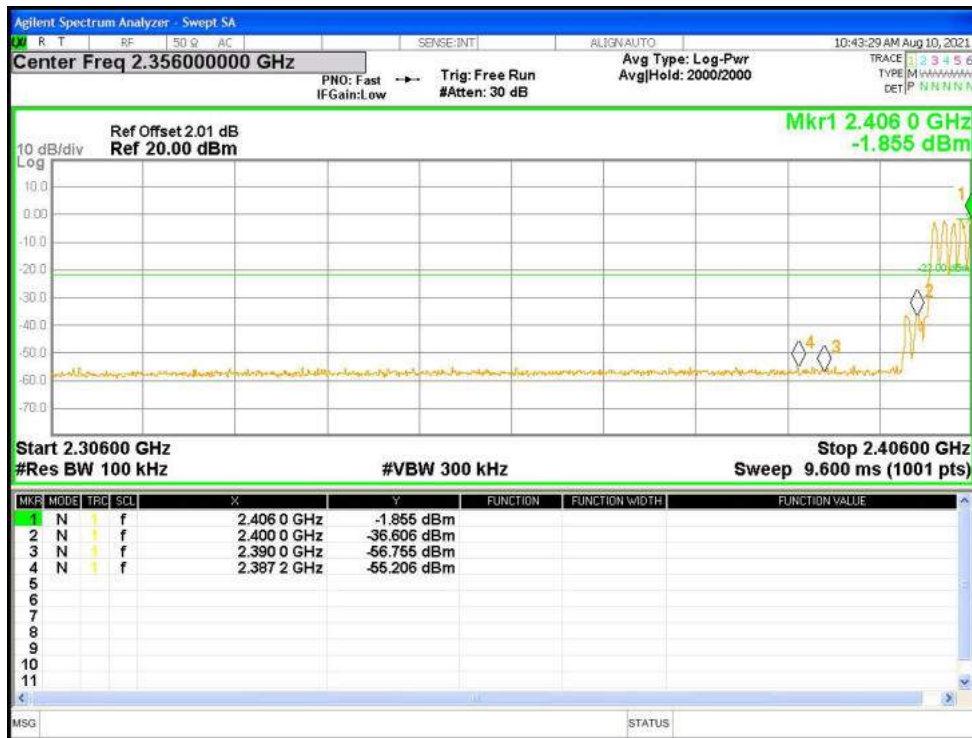
**21.5 BAND EDGE(HOPPING)**

Condition	Mode	Frequency (MHz)	Antenna	Hopping Mode	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	1-DH1	2402	Ant1	Hopping	-53.2	-20	Pass
NVNT	1-DH1	2480	Ant1	Hopping	-47.21	-20	Pass
NVNT	2-DH1	2402	Ant1	Hopping	-52.8	-20	Pass
NVNT	2-DH1	2480	Ant1	Hopping	-45.52	-20	Pass
NVNT	3-DH1	2402	Ant1	Hopping	-52.17	-20	Pass
NVNT	3-DH1	2480	Ant1	Hopping	-41.65	-20	Pass

Band Edge(Hopping) NVNT 1-DH1 2402MHz Ant1 Hopping Ref



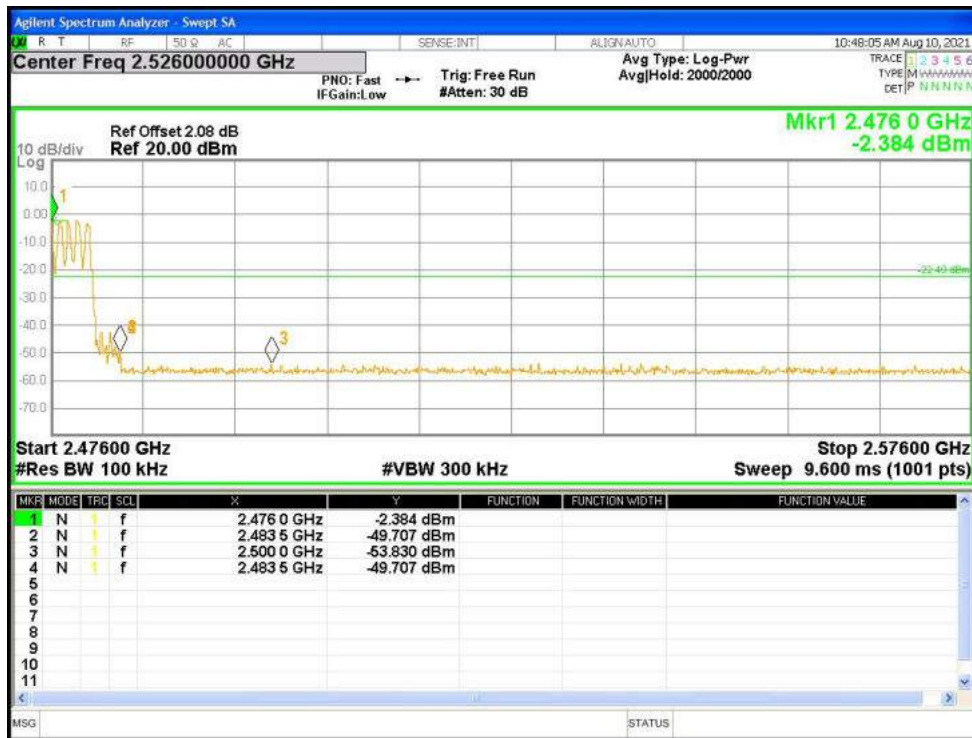
Band Edge(Hopping) NVNT 1-DH1 2402MHz Ant1 Hopping Emission



Band Edge(Hopping) NVNT 1-DH1 2480MHz Ant1 Hopping Ref



Band Edge(Hopping) NVNT 1-DH1 2480MHz Ant1 Hopping Emission

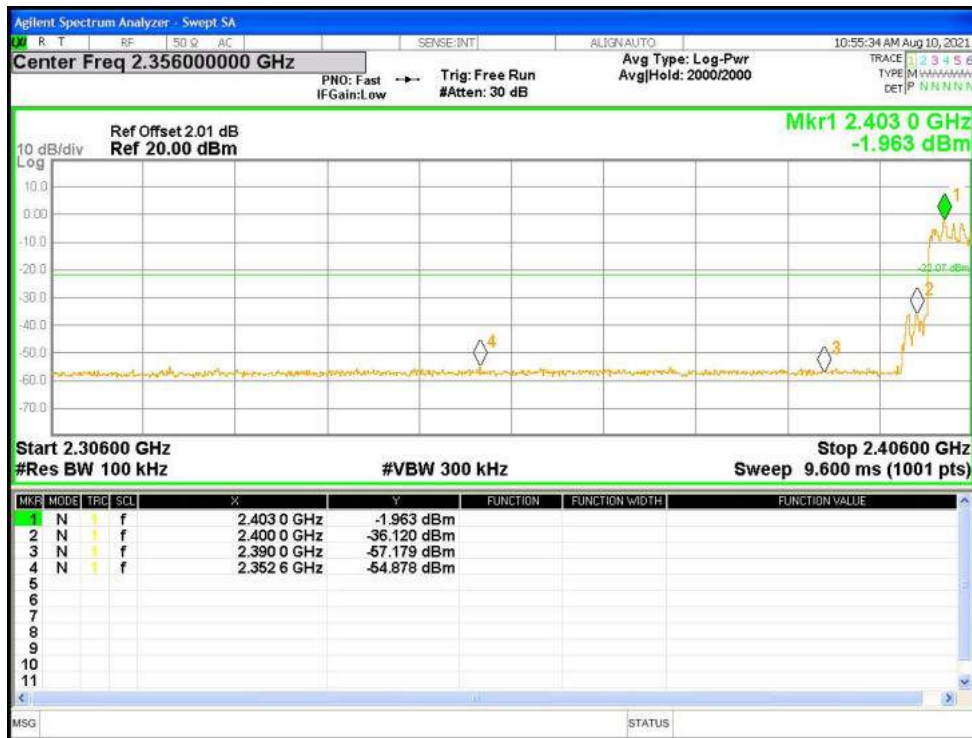


Band Edge(Hopping) NVNT 2-DH1 2402MHz Ant1 Hopping Ref



Band Edge(Hopping) NVNT 2-DH1 2402MHz Ant1 Hopping Emission

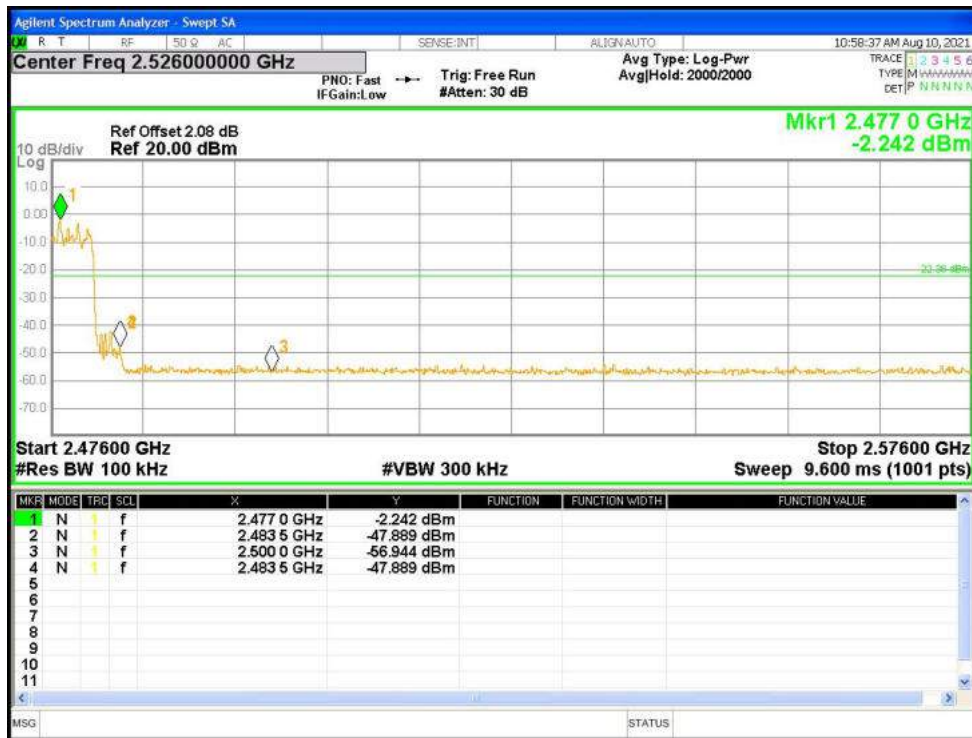




Band Edge(Hopping) NVNT 2-DH1 2480MHz Ant1 Hopping Ref



Band Edge(Hopping) NVNT 2-DH1 2480MHz Ant1 Hopping Emission



Band Edge(Hopping) NVNT 3-DH1 2402MHz Ant1 Hopping Ref



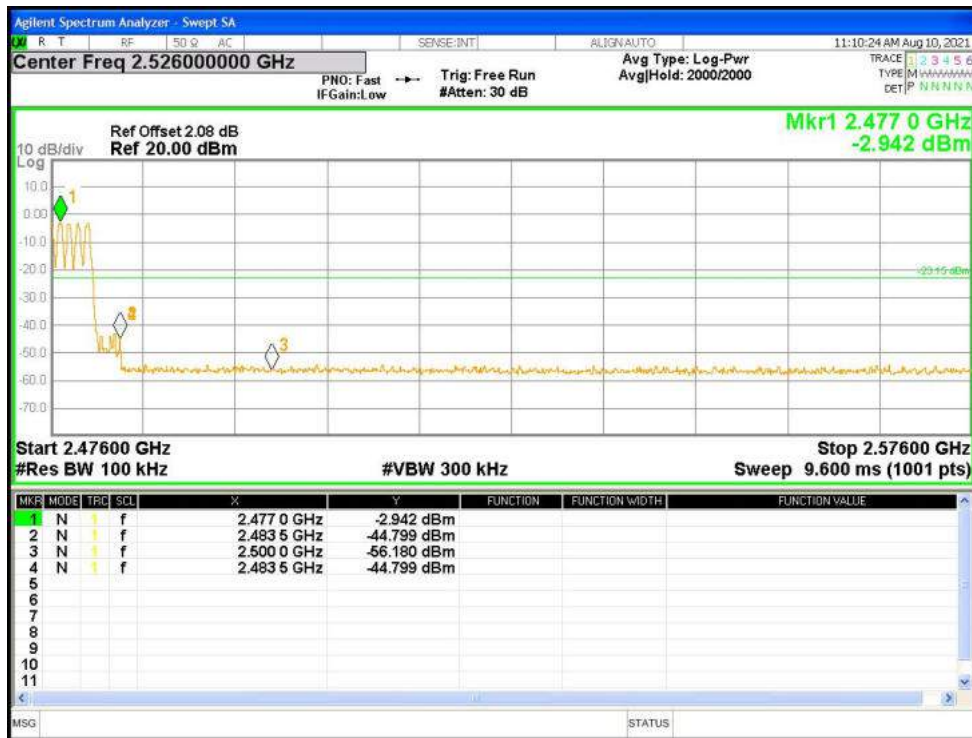
Band Edge(Hopping) NVNT 3-DH1 2402MHz Ant1 Hopping Emission



Band Edge(Hopping) NVNT 3-DH1 2480MHz Ant1 Hopping Ref



Band Edge(Hopping) NVNT 3-DH1 2480MHz Ant1 Hopping Emission



### 21.6 CONDUCTED RF SPURIOUS EMISSION

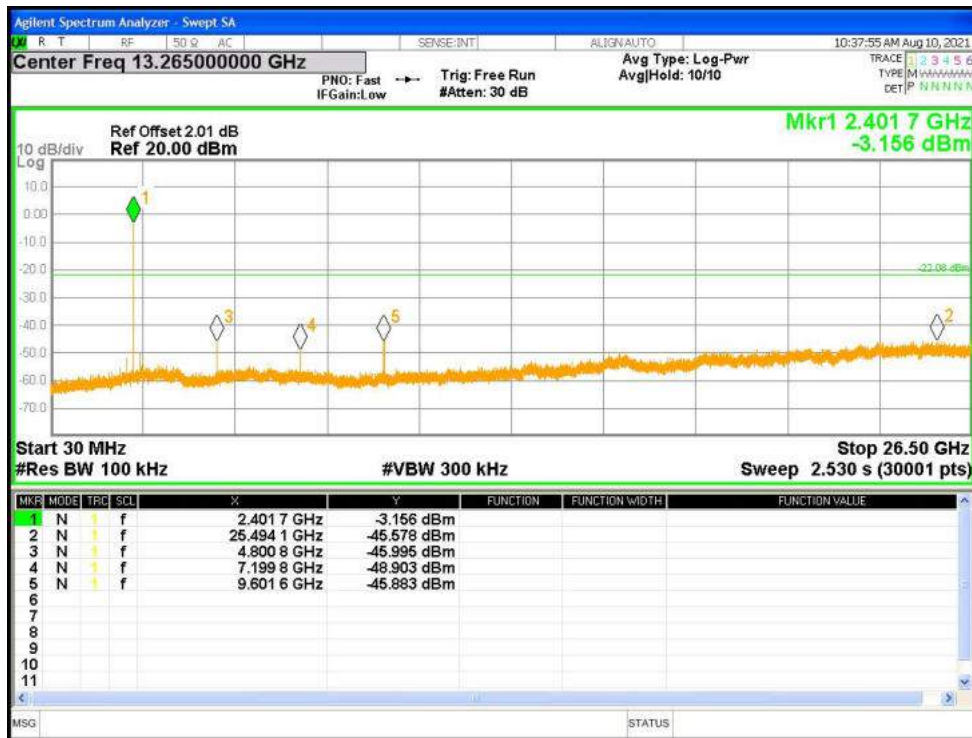
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	1-DH1	2402	Ant1	-43.49	-20	Pass
NVNT	1-DH1	2441	Ant1	-41.46	-20	Pass
NVNT	1-DH1	2480	Ant1	-37.42	-20	Pass
NVNT	2-DH1	2402	Ant1	-42.84	-20	Pass
NVNT	2-DH1	2441	Ant1	-40.92	-20	Pass
NVNT	2-DH1	2480	Ant1	-37.44	-20	Pass
NVNT	3-DH1	2402	Ant1	-41.95	-20	Pass
NVNT	3-DH1	2441	Ant1	-40.79	-20	Pass
NVNT	3-DH1	2480	Ant1	-36.51	-20	Pass

Tx. Spurious NVNT 1-DH1 2402MHz Ant1 Ref



Tx. Spurious NVNT 1-DH1 2402MHz Ant1 Emission

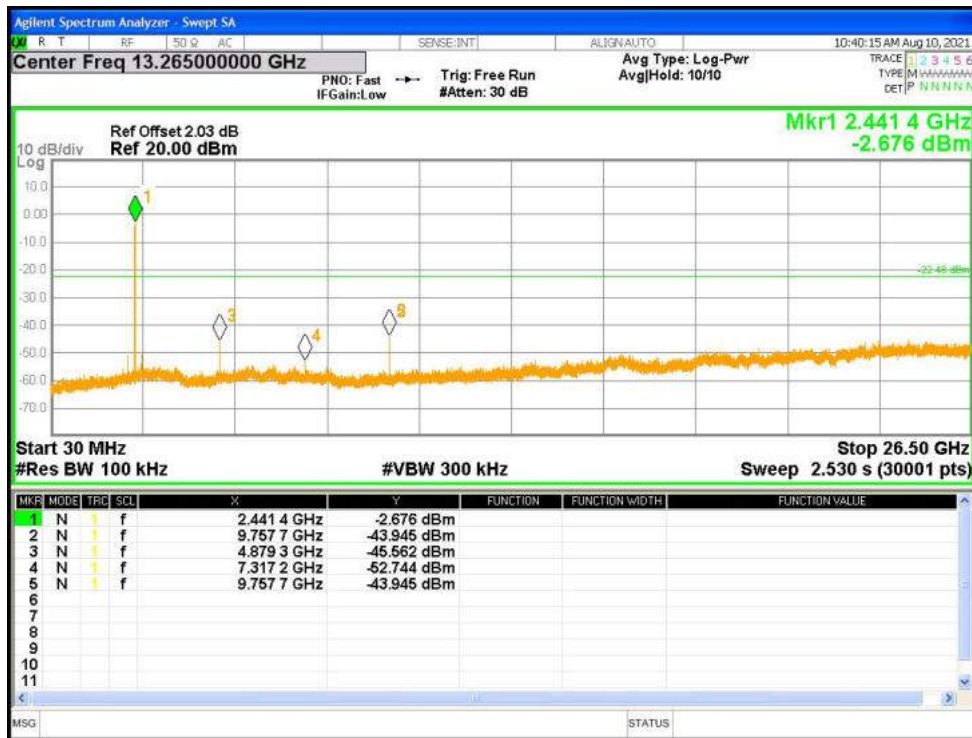




Tx. Spurious NVNT 1-DH1 2441MHz Ant1 Ref



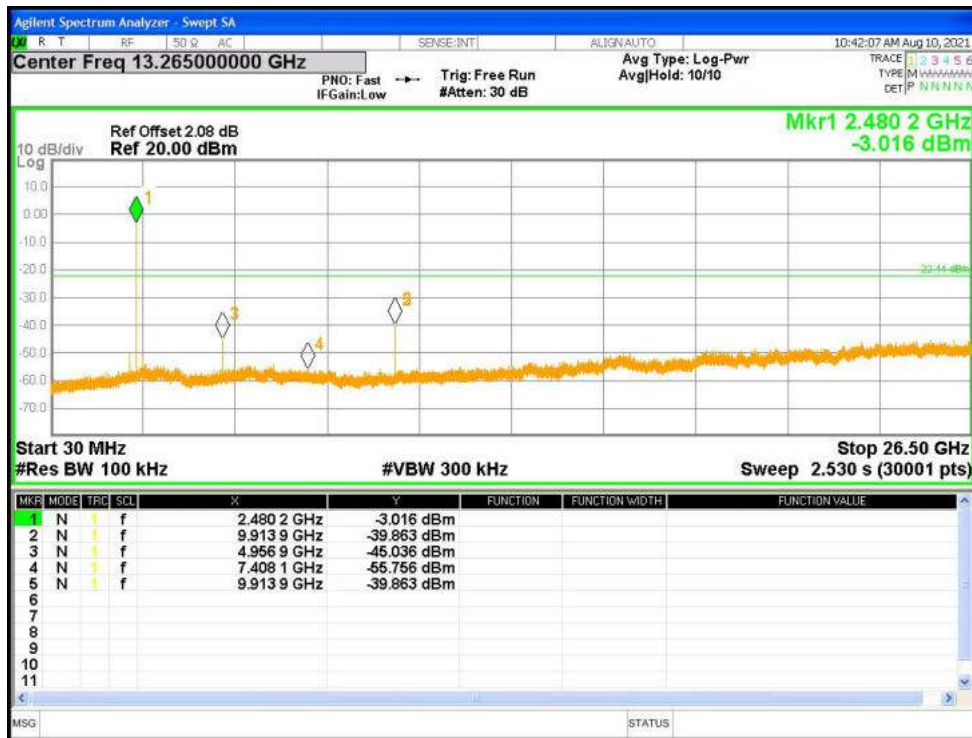
Tx. Spurious NVNT 1-DH1 2441MHz Ant1 Emission



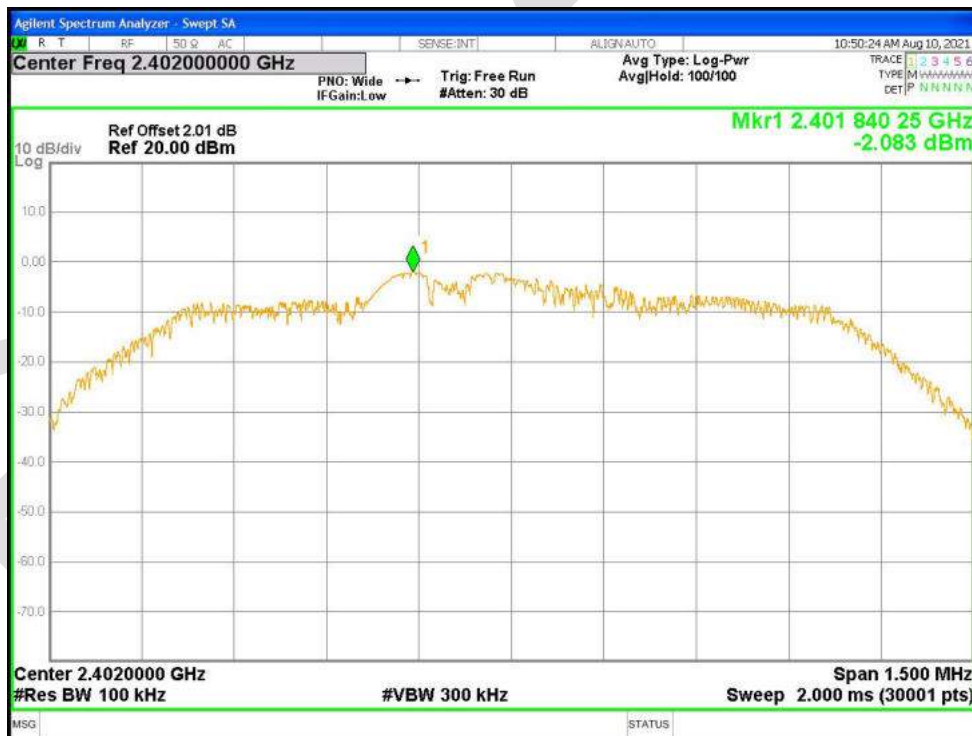
Tx. Spurious NVNT 1-DH1 2480MHz Ant1 Ref



Tx. Spurious NVNT 1-DH1 2480MHz Ant1 Emission

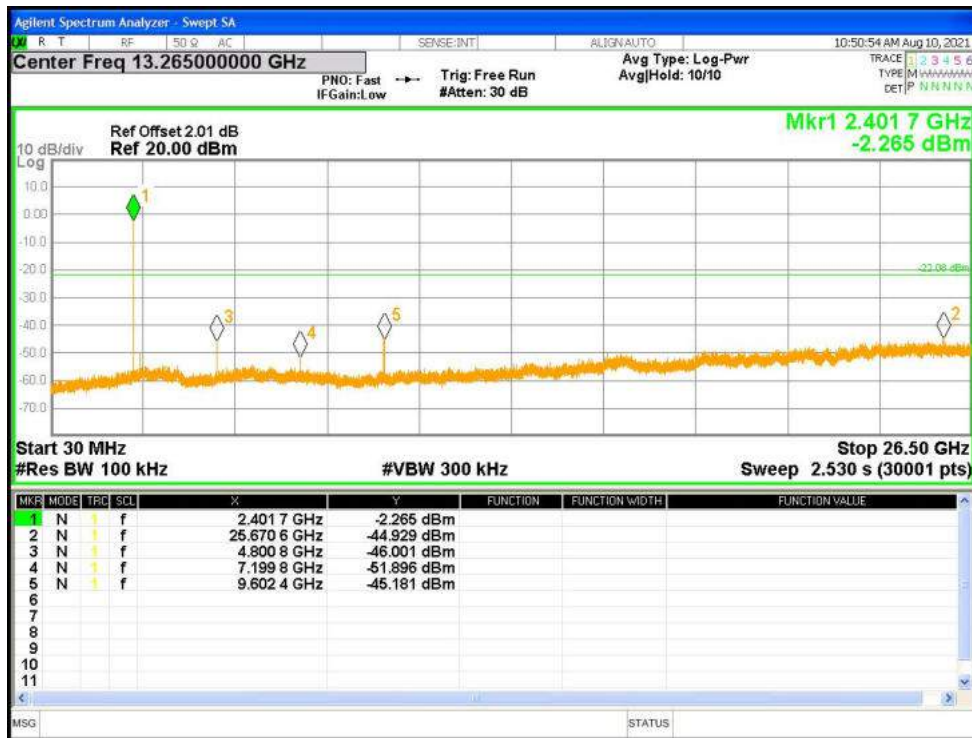


Tx. Spurious NVNT 2-DH1 2402MHz Ant1 Ref



Tx. Spurious NVNT 2-DH1 2402MHz Ant1 Emission

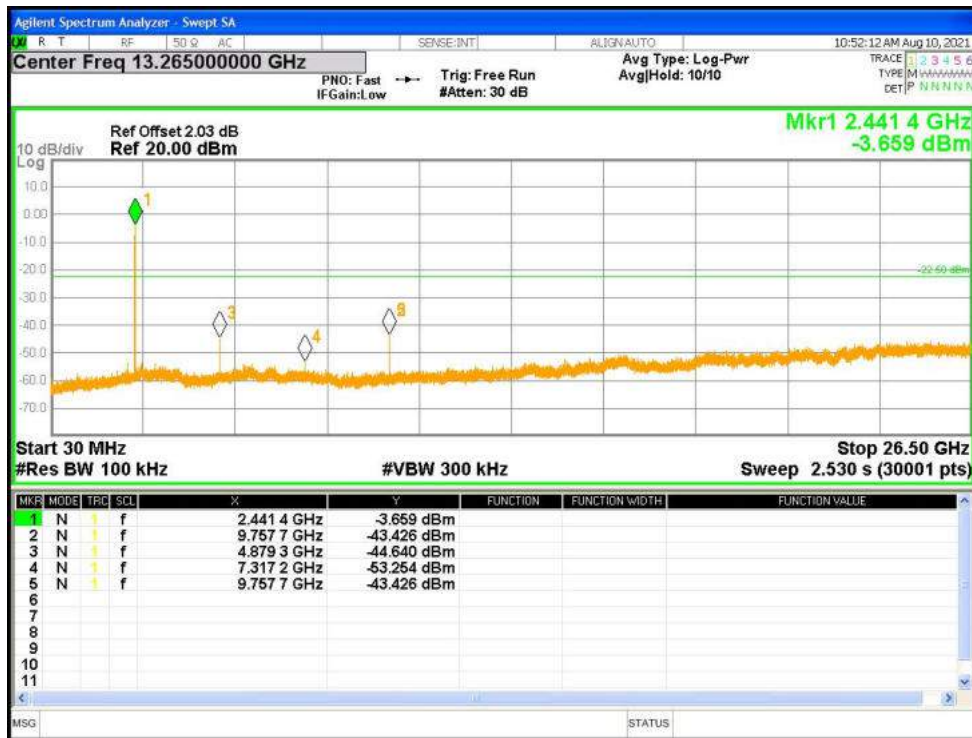




Tx. Spurious NVNT 2-DH1 2441MHz Ant1 Ref



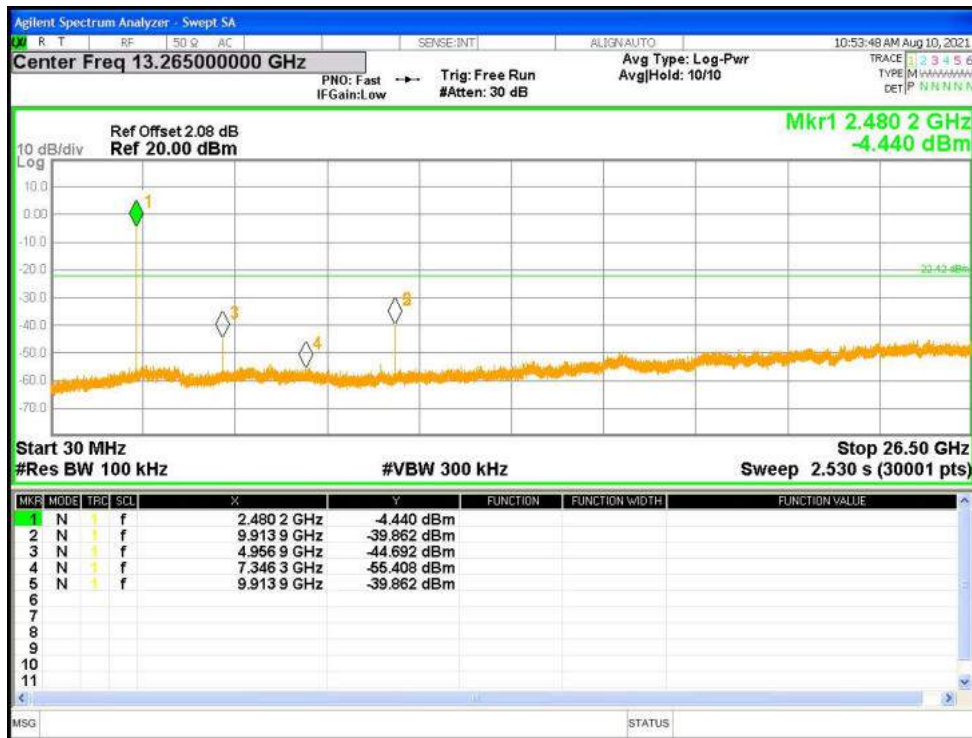
Tx. Spurious NVNT 2-DH1 2441MHz Ant1 Emission



Tx. Spurious NVNT 2-DH1 2480MHz Ant1 Ref



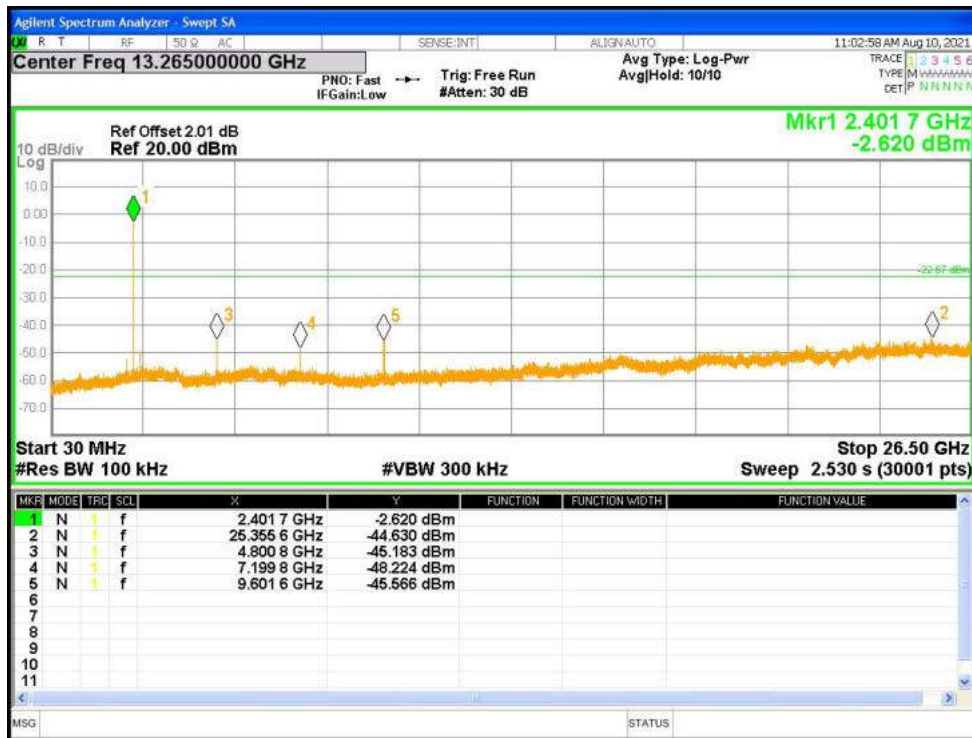
Tx. Spurious NVNT 2-DH1 2480MHz Ant1 Emission



Tx. Spurious NVNT 3-DH1 2402MHz Ant1 Ref



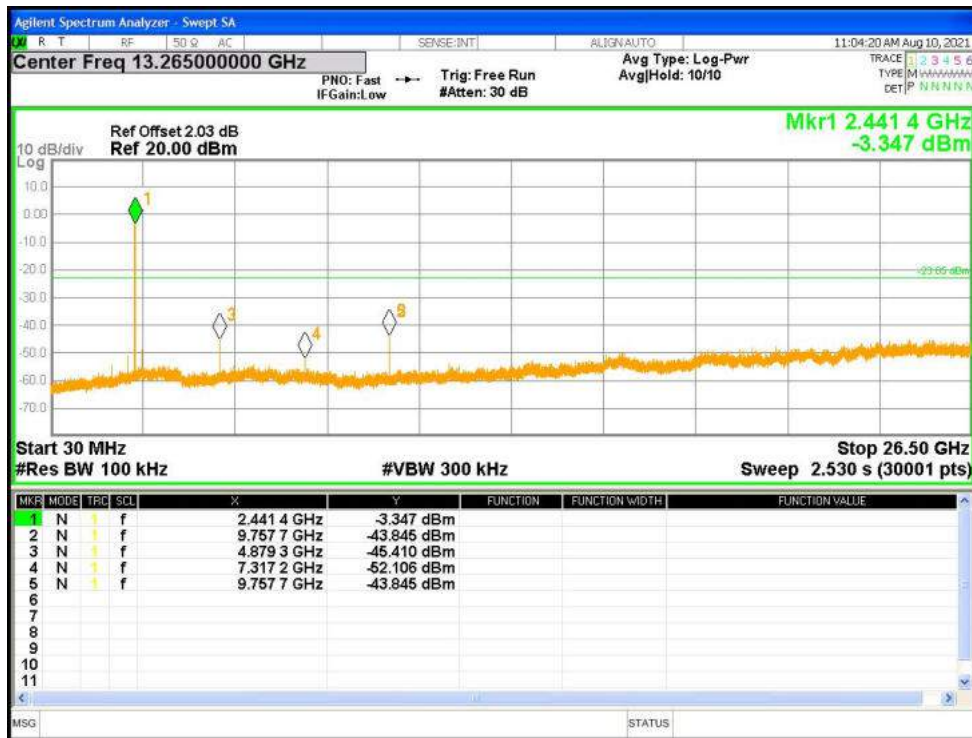
Tx. Spurious NVNT 3-DH1 2402MHz Ant1 Emission



Tx. Spurious NVNT 3-DH1 2441MHz Ant1 Ref



Tx. Spurious NVNT 3-DH1 2441MHz Ant1 Emission

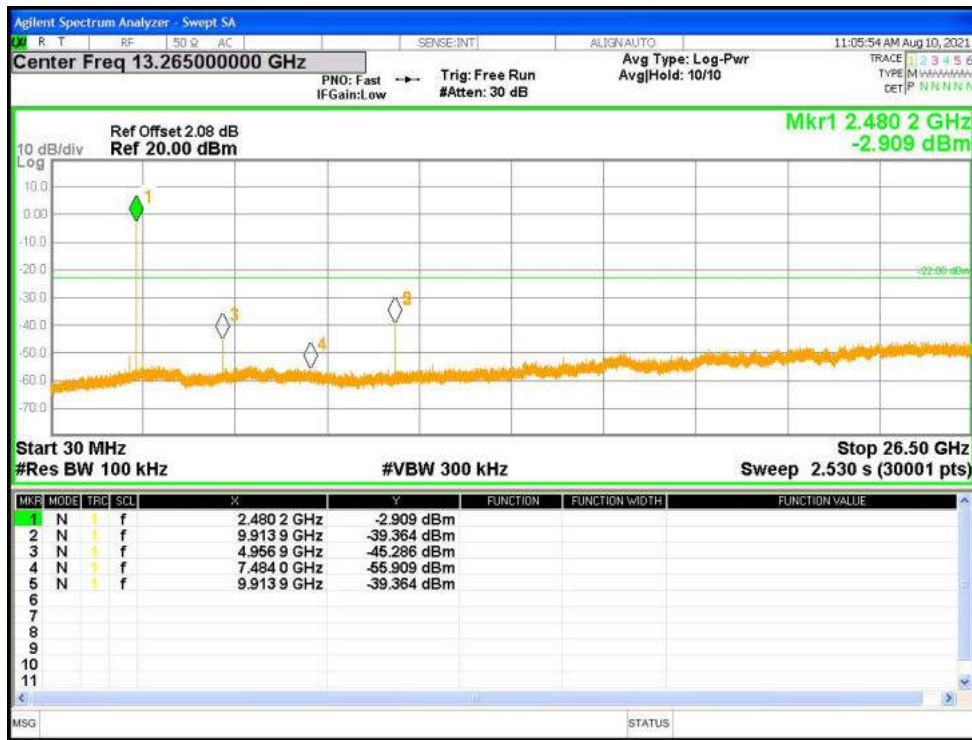


Tx. Spurious NVNT 3-DH1 2480MHz Ant1 Ref



Tx. Spurious NVNT 3-DH1 2480MHz Ant1 Emission



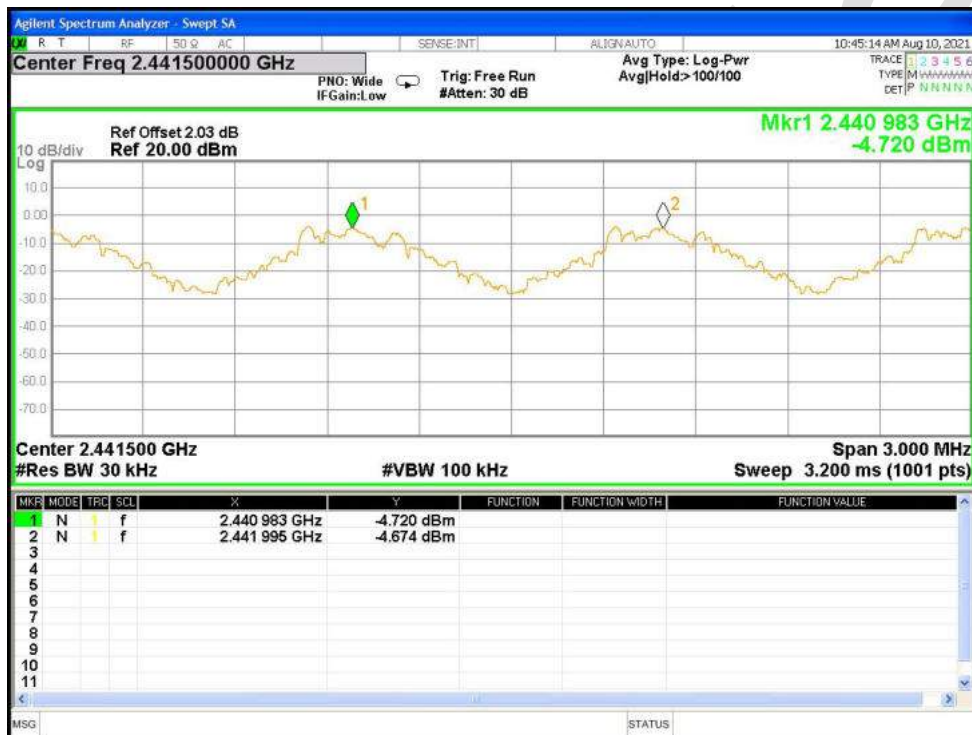


BlueAsia

### 21.7 CARRIER FREQUENCIES SEPARATION

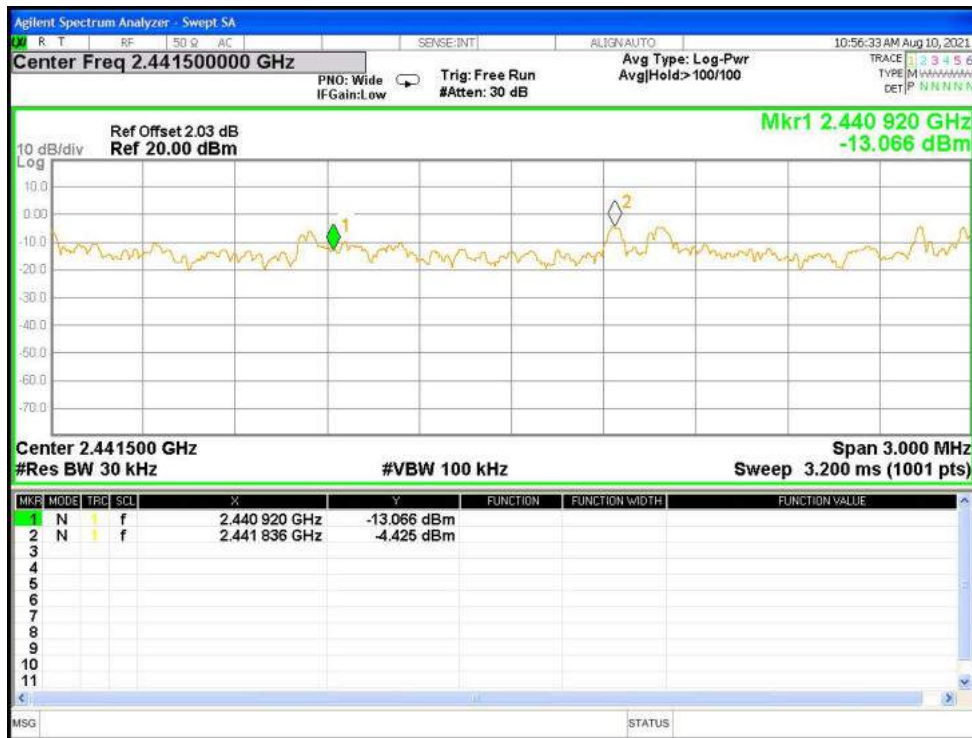
Condition	Mode	Antenna	Hopping Freq1 (MHz)	Hopping Freq2 (MHz)	HFS (MHz)	Limit (MHz)	Verdict
NVNT	1-DH1	Ant1	2440.9825	2441.995	1.0125	0.843	Pass
NVNT	2-DH1	Ant1	2440.9195	2441.836	0.9165	0.825	Pass
NVNT	3-DH1	Ant1	2440.9975	2441.986	0.9885	0.623	Pass

CFS NVNT 1-DH1 2441MHz Ant1

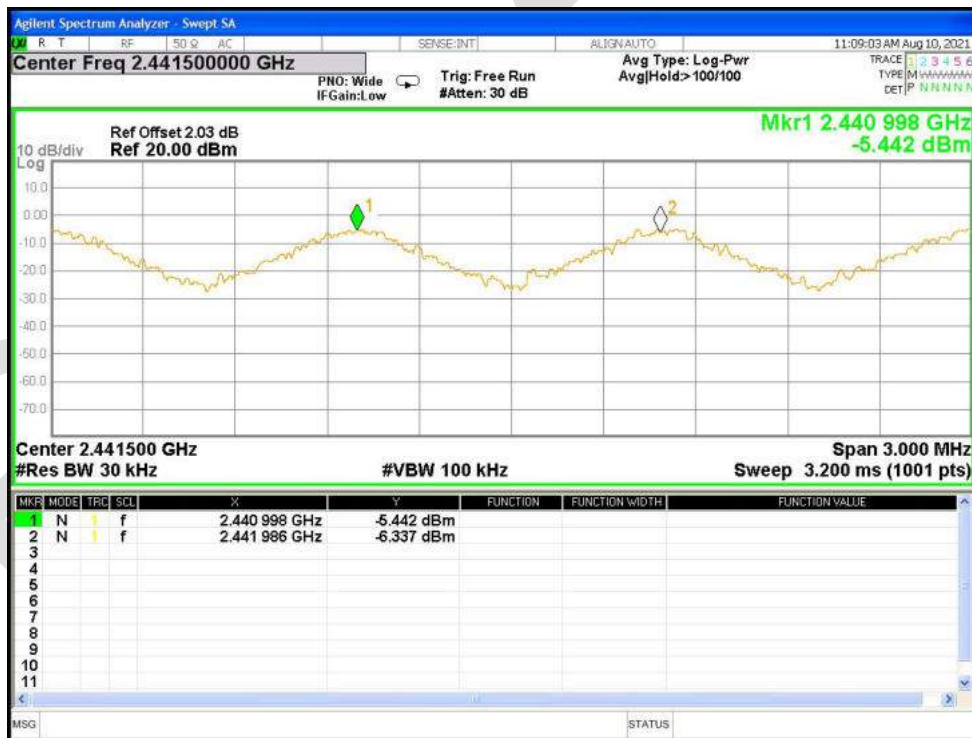


CFS NVNT 2-DH1 2441MHz Ant1





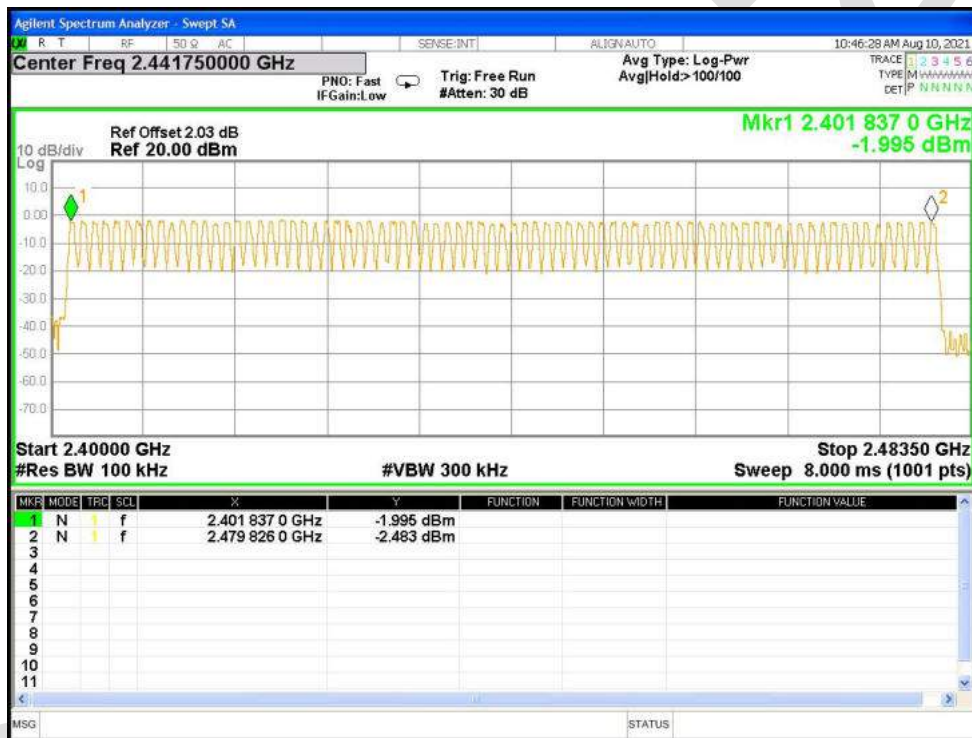
CFS NVNT 3-DH1 2441MHz Ant1



**21.8 NUMBER OF HOPPING CHANNEL**

Condition	Mode	Antenna	Hopping Number	Limit	Verdict
NVNT	1-DH1	Ant1	79	15	Pass
NVNT	2-DH1	Ant1	79	15	Pass
NVNT	3-DH1	Ant1	79	15	Pass

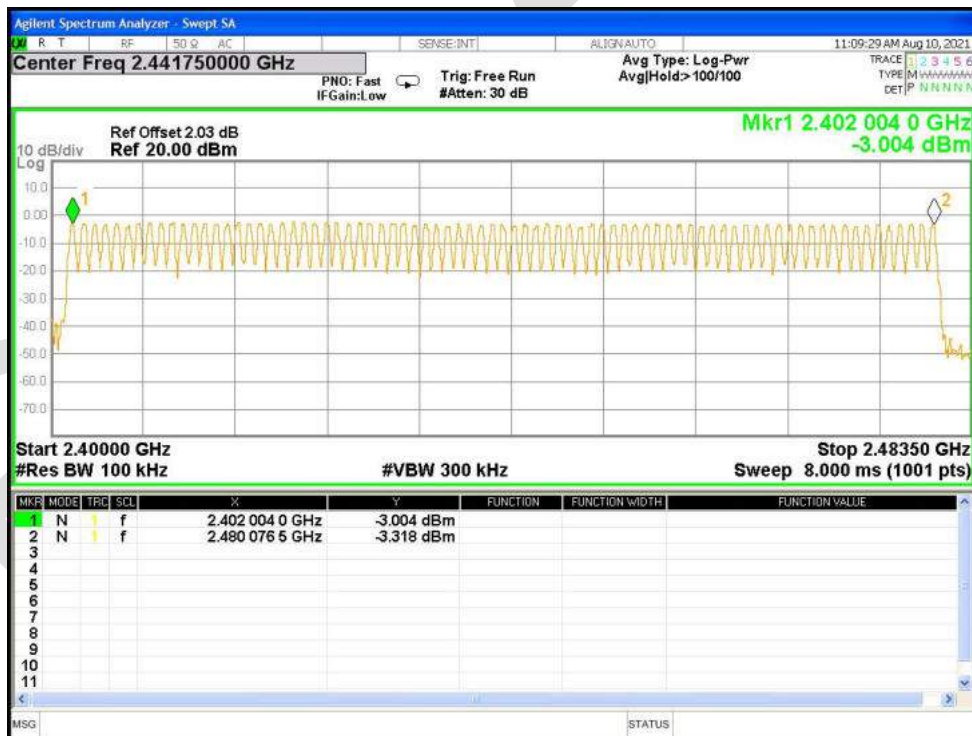
Hopping No. NVNT 1-DH1 2441MHz Ant1



Hopping No. NVNT 2-DH1 2441MHz Ant1



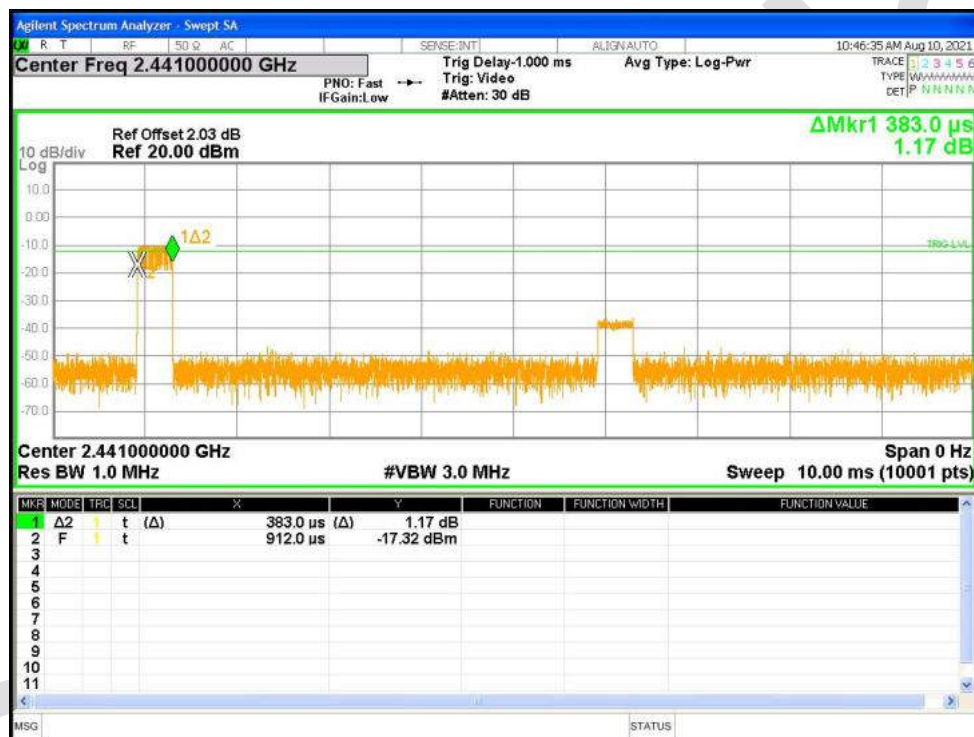
Hopping No. NVNT 3-DH1 2441MHz Ant1



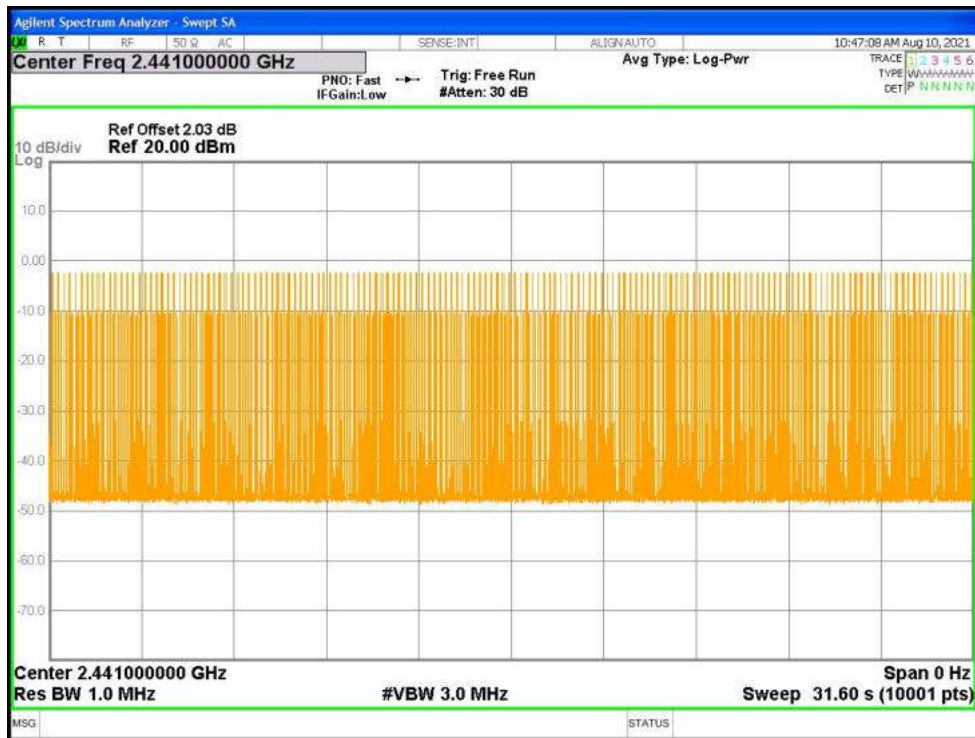
### 21.9 DWELL TIME

Condition	Mode	Frequency (MHz)	Antenna	Pulse Time (ms)	Total Dwell Time (ms)	Burst Count	Period Time (ms)	Limit (ms)	Verdict
NVNT	1-DH1	2441	Ant1	0.383	121.794	318	31600	400	Pass
NVNT	1-DH3	2441	Ant1	1.637	265.194	162	31600	400	Pass
NVNT	1-DH5	2441	Ant1	2.886	326.118	113	31600	400	Pass

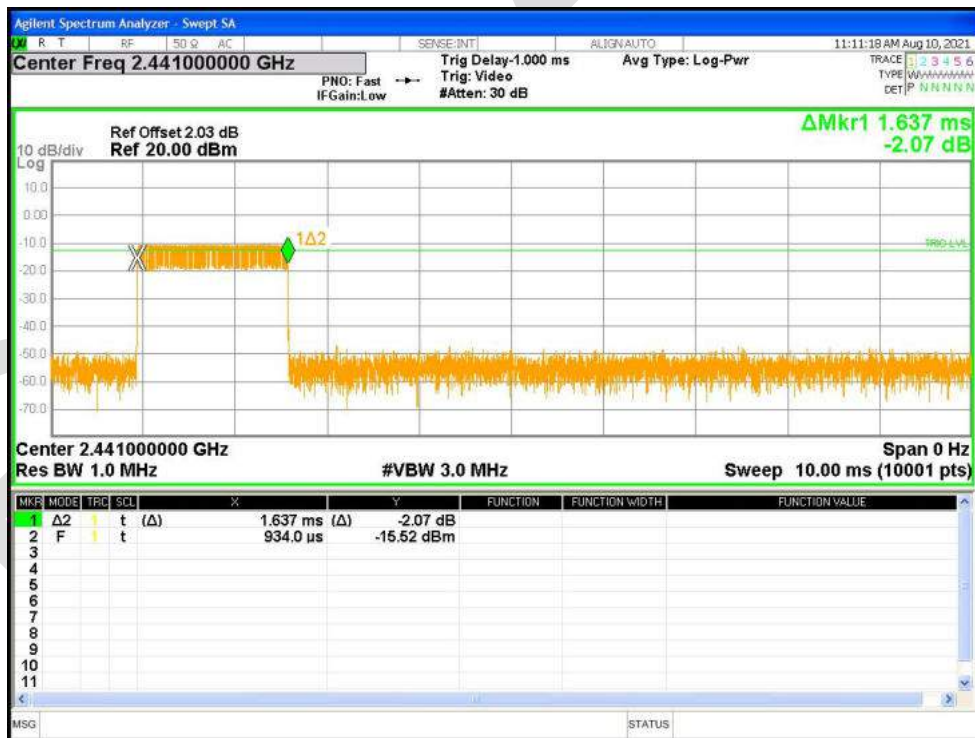
Dwell NVNT 1-DH1 2441MHz Ant1 One Burst



Dwell NVNT 1-DH1 2441MHz Ant1 Accumulated

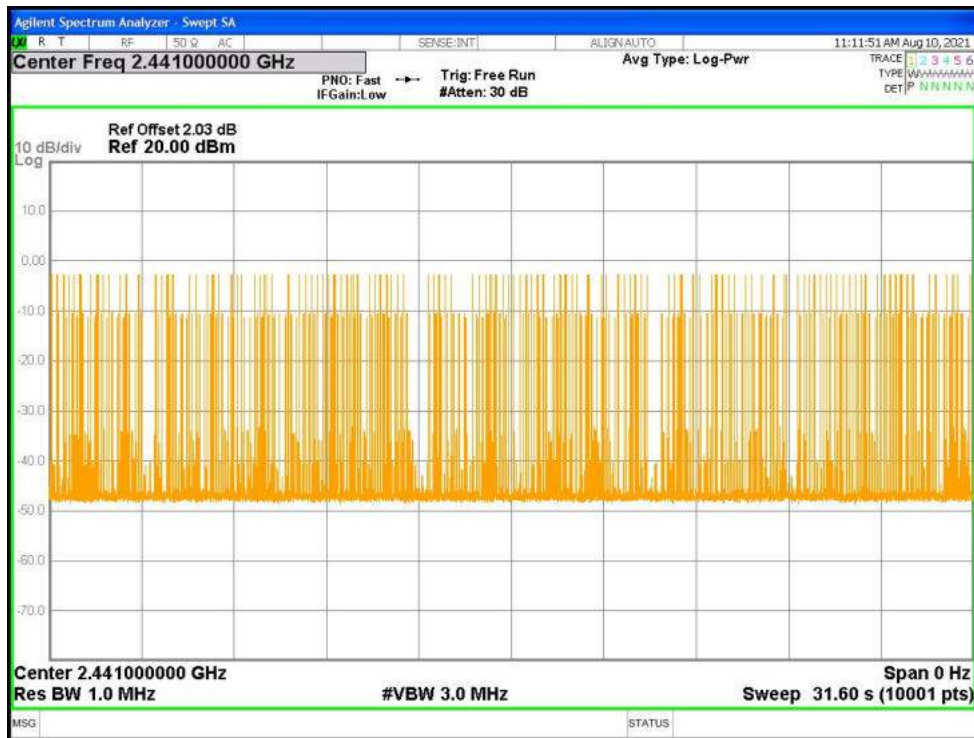


Dwell NVNT 1-DH3 2441MHz Ant1 One Burst

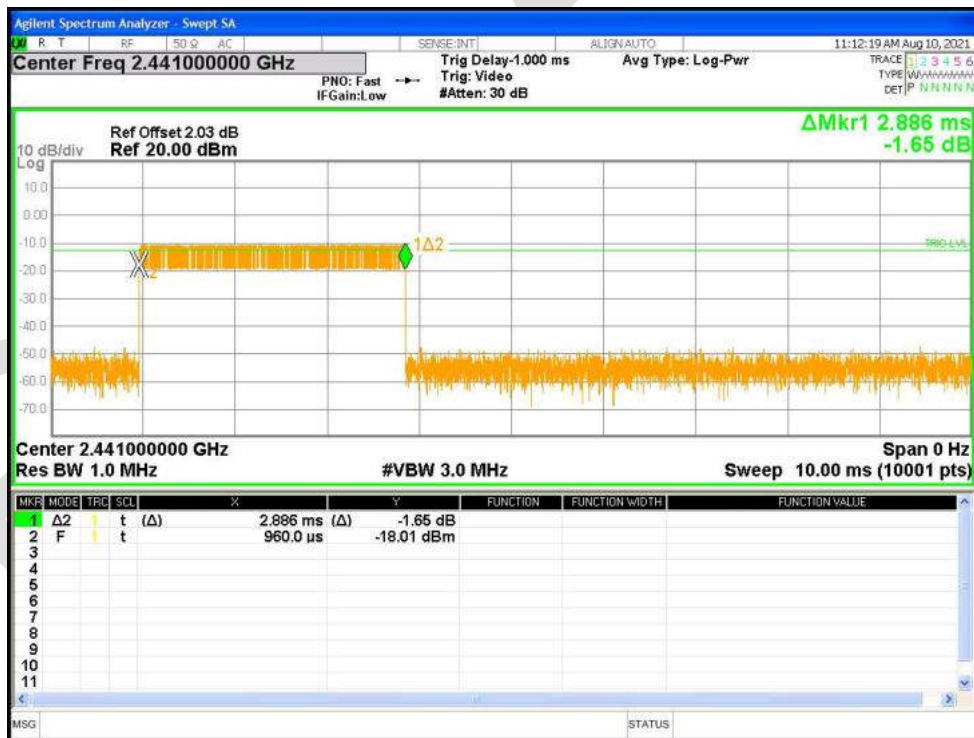


Dwell NVNT 1-DH3 2441MHz Ant1 Accumulated

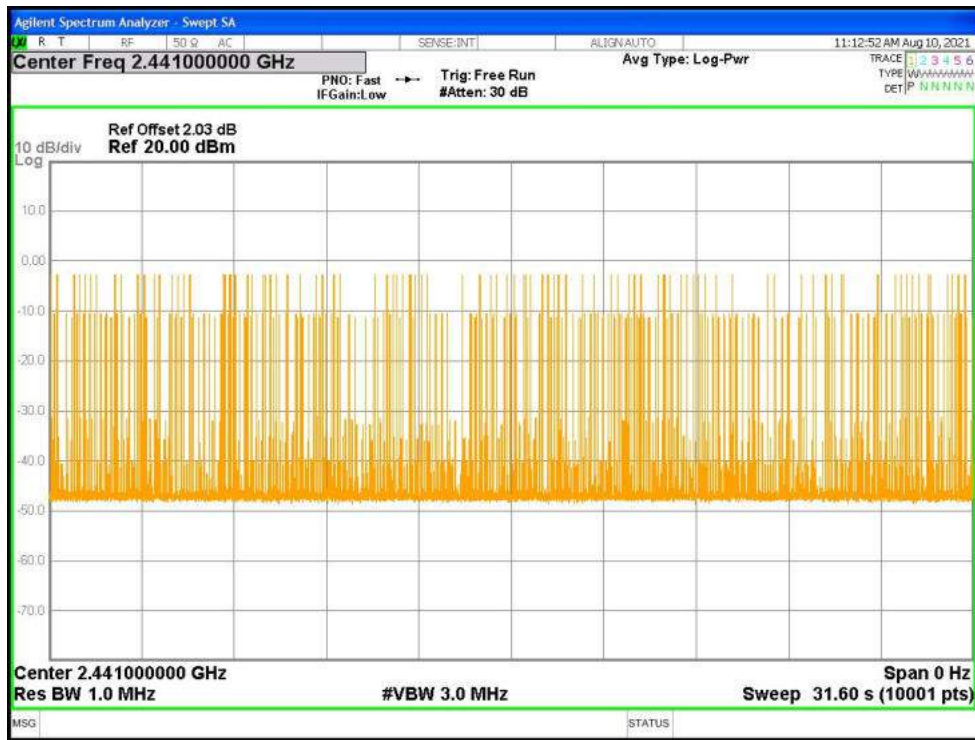




Dwell NVNT 1-DH5 2441MHz Ant1 One Burst



Dwell NVNT 1-DH5 2441MHz Ant1 Accumulated



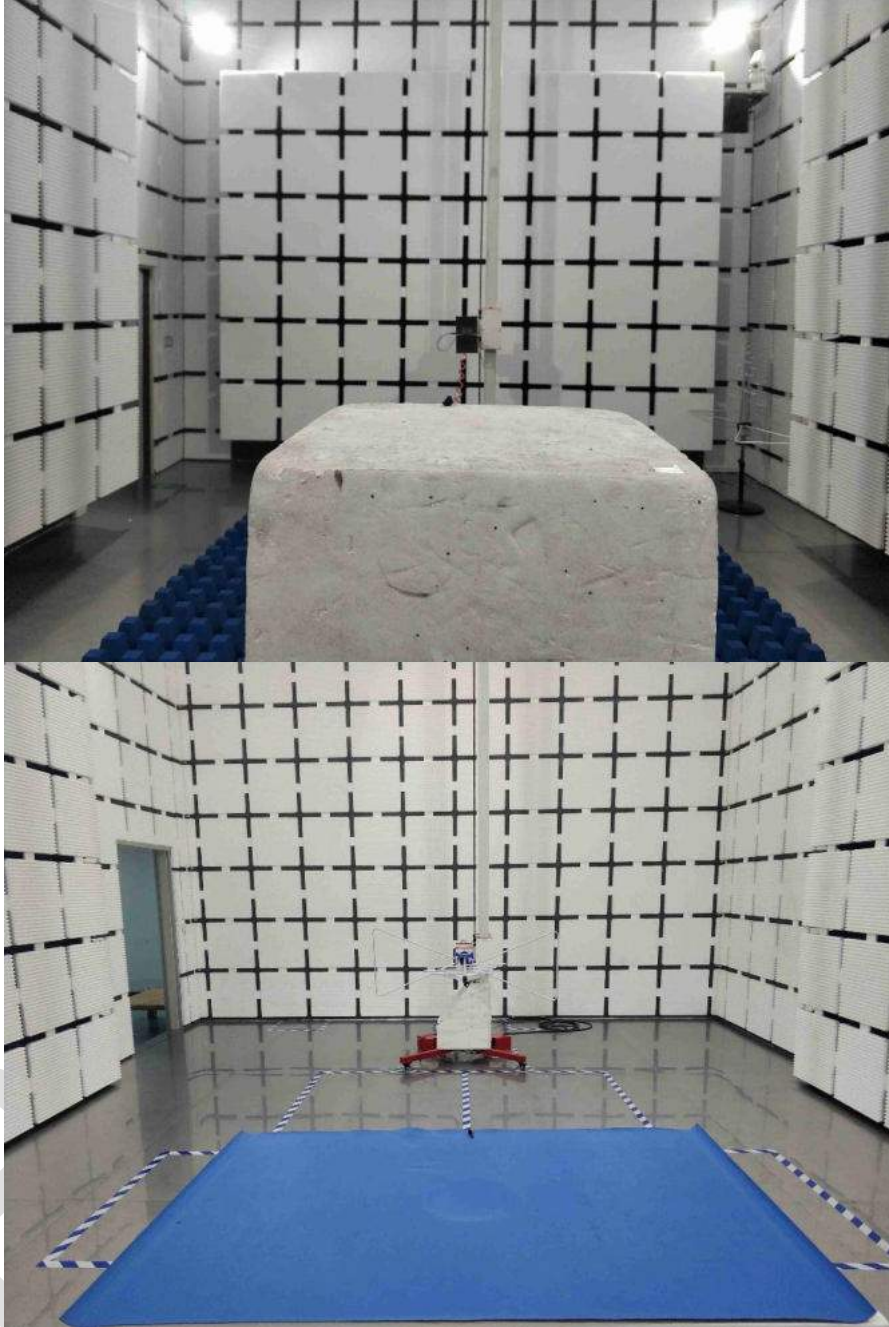


## APPENDIX A: PHOTOGRAPHS OF TEST SETUP

### Conducted Emissions at AC Power Line (150kHz-30MHz)



**Radiated Spurious Emissions**



**APPENDIX B: PHOTOGRAPHS OF EUT**

Reference to the test report No. BLA-EMC-202108-A0601

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

The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of BlueAsia, this report can't be reproduced except in full.

BlueAsia