

# TEST REPORT

## IC: 30533-BXX200OTA

**Report Number**..... : ZKT-230511L3439-02

Date of Test..... : Apr. 11, 2023 -- May. 15, 2023

Date of issue ..... : May. 15, 2023

Total number of pages ..... : 54

Test Result ..... : PASS

**Testing Laboratory**..... : **Shenzhen ZKT Technology Co., Ltd.**

Address ..... : 1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue, Fuhai Street, Bao'an District, Shenzhen, China

**Applicant's name** ..... : SENSOSCIENTIFIC INC

Address ..... : 685 COCHRAN ST., STE 200 SIMI VALLEY CA 93065

**Manufacturer's name** ..... : IBE Electronics Co., Ltd

Address ..... : East of 2nd Floor, Building 5, First Industrial Mansion of Tangtou Community, Shiyuan Street, Bao'an District  
Shenzhen 518108 China (Peoples Republic Of)

**Test specification:**

Standard ..... : RSS-247 Issue 2 February 2017  
RSS-Gen Issue 5 February 2021

Test procedure..... : /

Non-standard test method ..... : N/A

**Test Report Form No.** ..... : TRF-EL-110\_V0

**Test Report Form(s) Originator** .... : ZKT Testing

**Master TRF** ..... : Dated: 2020-01-06

This device described above has been tested by ZKT, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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**Product name** ..... : WiFi Node

Trademark ..... : SensoScientific

Model/Type reference ..... : B80-200-OTA, B26-200-OTA, B23-200-OTA, B22-200-OTA,  
B21-200-OTA, B20-200-OTA, B19-200-OTA, B18-200-OTA,  
B17-200-OTA, B16-200-OTA, B15-200-OTA, B14-200-OTA,  
B13-200-OTA, B11-200-OTA, B10-200-OTA

Ratings..... : DC 5.0-1A from mini-usb port  
DC 2.4V-3.0V from Battery

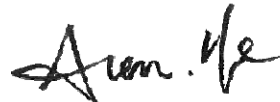
**Testing procedure and testing location:**

**Testing Laboratory** ..... : **Shenzhen ZKT Technology Co., Ltd.**

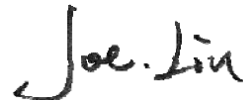
**Address** ..... : 1/F, No. 101, Building B, No. 6, Tangwei Community  
Industrial Avenue, Fuhai Street, Bao'an District,  
Shenzhen, China

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**Tested by (name + signature)** ..... : Alen He



**Reviewer (name + signature)** ..... : Joe Liu



**Approved (name + signature)** ..... : Lake Xie



**Table of Contents**

	<b>Page</b>
<b>1. VERSION</b>	<b>5</b>
<b>2. SUMMARY OF TEST RESULTS</b>	<b>6</b>
2.1 TEST FACILITY	6
2.2 MEASUREMENT UNCERTAINTY	7
<b>3. GENERAL INFORMATION</b>	<b>7</b>
3.1 GENERAL DESCRIPTION OF EUT	7
3.2 DESCRIPTION OF TEST MODES	8
3.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED	9
3.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)	9
3.5EQUIPMENTS LIST FOR ALL TEST ITEMS	9
<b>4. EMC EMISSION TEST</b>	<b>11</b>
4.1 CONDUCTED EMISSION MEASUREMENT	11
4.1.1 POWER LINE CONDUCTED EMISSION LIMITS	11
4.1.2 TEST PROCEDURE	11
4.1.3 DEVIATION FROM TEST STANDARD	11
4.1.4 TEST SETUP	11
4.1.5 EUT OPERATING CONDITIONS	12
4.1.6 TEST RESULT	12
4.2 RADIATED EMISSION MEASUREMENT	14
4.2.1 RADIATED EMISSION LIMITS	14
4.2.2 TEST PROCEDURE	14
4.2.3 DEVIATION FROM TEST STANDARD	15
4.2.4 TEST SETUP	15
4.2.5 EUT OPERATING CONDITIONS	16
4.2.6 TEST RESULTS	16
<b>5.RADIATED BAND EMISSIONMEASUREMENT</b>	<b>22</b>
5.1 TEST REQUIREMENT:	22
5.2 TEST PROCEDURE	22
5.3 DEVIATION FROM TEST STANDARD	22
5.4 TEST SETUP	23
5.5 EUT OPERATING CONDITIONS	23
5.6 TEST RESULT	23
<b>6. POWER SPECTRAL DENSITY TEST</b>	<b>25</b>
6.1 APPLIED PROCEDURES / LIMIT	25
6.2 TEST PROCEDURE	25
6.3 DEVIATION FROM STANDARD	25
6.4 TEST SETUP	25

6.5 EUT OPERATION CONDITIONS	25
7. 6DB CHANNEL BANDWIDTH & 99% OCCUPY BANDWIDTH	26
7.1 APPLIED PROCEDURES / LIMIT	26
7.2 TEST PROCEDURE	26
7.3 DEVIATION FROM STANDARD	26
7.4 TEST SETUP	26
7.5 EUT OPERATION CONDITIONS	26
7.6 TEST RESULT	26
8. OUTPUT POWER TEST	27
8.1 APPLIED PROCEDURES/LIMIT	27
8.2 TEST PROCEDURE	27
8.3 DEVIATION FROM STANDARD	27
8.4 TEST SETUP	27
8.5 EUT OPERATION CONDITIONS	27
8.6 TEST RESULT	27
9. CONDUCTED BAND EDGE AND SPURIOUS EMISSION	28
9.1 APPLICABLE STANDARD	28
9.2 TEST PROCEDURE	28
9.3 DEVIATION FROM STANDARD	28
9.4 TEST SETUP	28
9.5 EUT OPERATION CONDITIONS	28
9.6 TEST RESULTS	28
10. ANTENNA REQUIREMENT	29
11. APPENDIX1	30
1. -6DB BANDWIDTH	30
2. 99% OCCUPIED BANDWIDTH	34
3. BANDEDGE	38
4. MAX. OUTPUT POWER	42
5. POWER SPECTRAL DENSITY	43
6. SPURIOUS EMISSION	47
12. TEST SETUP PHOTO	53
13. EUT CONSTRUCTIONAL DETAILS	54

**1. VERSION**

Report No.	Version	Description	Approved
ZKT-230511L3439-02	Rev.01	Initial issue of report	May 15, 2023

## 2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.247) , Subpart C RSS-247 Issue 2: February 2017			
Standard Section	Test Item	Result	Remark
15.203/15.247 (c) RSS-Gen 6.8	Antenna Requirement	PASS	
15.207 RSS-Gen 8.8	AC Power Line Conducted Emission	PASS	
15.247 (b)(1) RSS-247.5.4(b)	Conducted Peak Output Power	PASS	
FCC Part 15.247(a)(2) RSS-247.5.2 RSS-Gen.6.7	6dB Bandwidth & 99% Bandwidth	PASS	
FCC Part 15.247(e) RSS-247.5.2	Power Spectral Density	PASS	
15.247(d) RSS-247 5.5/ RSS-Gen 8.10	Conducted Unwanted emissions and Band Edge	PASS	
15.205/15.209 RSS-Gen.8.9/ RSS-Gen.8.10	Spurious Emission	PASS	

NOTE:

(1) "N/A" denotes test is not applicable in this Test Report

### 2.1 TEST FACILITY

Shenzhen ZKT Technology Co., Ltd.  
Add. : 1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue, Fuhai Street, Bao'an District, Shenzhen, China

FCC Test Firm Registration Number: 692225  
Designation Number: CN1299  
IC Registered No.: 27033

## 2.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement  $y \pm U$ , where expanded uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95 %.

No.	Item	Uncertainty
1	Conducted Emission Test	$\pm 1.38\text{dB}$
2	RF power conducted	$\pm 0.16\text{dB}$
3	Spurious emissions conducted	$\pm 0.21\text{dB}$
4	All emissions radiated(<1G)	$\pm 4.68\text{dB}$
5	All emissions radiated(>1G)	$\pm 4.89\text{dB}$
6	Temperature	$\pm 0.5\text{C}$
7	Humidity	$\pm 2\%$

## 3. GENERAL INFORMATION

### 3.1 GENERAL DESCRIPTION OF EUT

Product Name:	WiFi Node
Model No.:	B80-200-OTA
Model List:	B26-200-OTA, B23-200-OTA, B22-200-OTA, B21-200-OTA, B20-200-OTA, B19-200-OTA, B18-200-OTA, B17-200-OTA, B16-200-OTA, B15-200-OTA, B14-200-OTA, B13-200-OTA, B11-200-OTA, B10-200-OTA
Model difference:	These models use the same BOM and PCB with the same design and layout. The software version(Display content or display interface structure) and different models are required by different customers. However, these differences will not affect the EMC and wireless performance of the product itself, so the test model is B80-200-OTA
Hardware Version:	94V-0
Software Version:	V1.0
Sample(s) Status:	Engineer sample
Frequency range:	802.11b/802.11g /802.11n(HT20): 2412MHz -2462MHz
Channel numbers:	802.11b/802.11g /802.11n(HT20):11
Channel separation:	5MHz
Modulation technology:	802.11b: Direct Sequence Spread Spectrum(DSSS) 802.11g/802.11n(H20): Orthogonal Frequency Division Multiplexing(OFDM)
Antenna Type:	External Panel-Mount Antenna
Antenna gain:	9.1dBi
Power supply:	DC 5.0-1A from mini-usb port DC 2.4V-3.0V from Battery

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2412MHz	4	2427MHz	7	2442MHz	10	2457MHz
2	2417MHz	5	2432MHz	8	2447MHz	11	2462MHz
3	2422MHz	6	2437MHz	9	2452MHz	X	

**Note:**

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Test channel	Frequency (MHz)
	802.11b/802.11g /802.11n(HT20)
Lowest channel	2412MHz
Middle channel	2437MHz
Highest channel	2462MHz

**3.2 DESCRIPTION OF TEST MODES**

We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:

Pre-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.

Mode	802.11b	802.11g	802.11n(HT20)
Data rate	1Mbps	6Mbps	MCS0

**Test Software**

**Test tool:**



Power level setup	<30dBm
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### 3.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Conducted Emission



Radiated Emission



Conducted Spurious



### 3.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
1	adapter	HW	HW-100400C01	/	SDOC
2	temperature sensor	IBE ELECTRONICS CO.,LTD	/	/	SDOC

Item	Shielded Type	Ferrite Core	Length	Note
	USB CABLE	/	100CM	Provide by client

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

### 3.5EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation Test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Spectrum Analyzer (9kHz-26.5GHz)	KEYSIGHT	9020A	MY55370835	Oct. 16,2022	Oct. 15,2023
2	Spectrum Analyzer (1GHz-40GHz)	R&S	FSQ	100363	Oct. 15, 2022	Oct. 14, 2023
3	EMI Test Receiver (9kHz-7GHz)	R&S	ESC17	101169	Oct. 16,2022	Oct. 15,2023

4	Bilog Antenna (30MHz-1500MHz)	Schwarzbeck	VULB9168	N/A	Oct. 15, 2022	Oct. 14, 2023
5	Horn Antenna (1GHz-18GHz)	Agilent	AH-118	071145	Oct. 15, 2022	Oct. 14, 2023
6	Loop Antenna	TESEQ	HLA6121	58357	Oct. 15, 2022	Oct. 14, 2023
7	Amplifier (30-1000MHz)	EM Electronics	EM330 Amplifier	060747	Oct. 15, 2022	Oct. 14, 2023
8	Amplifier (1GHz-26.5GHz)	Agilent	8449B	3008A00315	Oct. 16,2022	Oct. 15,2023
9	RF cables1 (9kHz-30MHz)	N/A	9kHz-30MHz	N/A	Oct. 16,2022	Oct. 15,2023
10	RF cables2 (30MHz-1GHz)	N/A	30MHz-1GHz	N/A	Oct. 16,2022	Oct. 15,2023
11	RF cables3 (1GHz-40GHz)	N/A	1GHz-40GHz	N/A	Oct. 16,2022	Oct. 15,2023
12	ESG Signal Generator	Agilent	E4421B	N/A	Oct. 16,2022	Oct. 15,2023
13	Signal Generator	Agilent	N5182A	N/A	Oct. 20, 2022	Oct. 19, 2023
14	Magnetic Field Probe Tester	Narda	ELT-400	0-0344	Oct. 17, 2021	Oct. 16, 2022
15	MWRP Power Meter Test system	MW	MW100-RPCB	N/A	Oct. 20, 2022	Oct. 19, 2023
16	D.C. Power Supply	LongWei	TPR-6405D	N/A	\	\
17	EMC Software	Frad	EZ-EMC	Ver.EMC-CON 3A1.1	\	\
18	RF Software	MW	MTS8310	V2.0.0.0	\	\
19	Turntable	MF	MF-7802BS	N/A	\	\
20	Antenna tower	MF	MF-7802BS	N/A	\	\

## Conduction Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	LISN	R&S	ENV216	101471	Oct. 20, 2022	Oct. 19, 2023
2	LISN	CYBERTEK	EM5040A	E185040014 g	Oct. 20, 2022	Oct. 19, 2023
3	Test Cable	N/A	C01	N/A	Oct. 16, 2022	Oct. 15, 2023
4	Test Cable	N/A	C02	N/A	Oct. 16, 2022	Oct. 15, 2023
5	EMI Test Receiver	R&S	ESCI3	101393	Oct. 15, 2022	Oct. 14, 2023
6	EMC Software	Frad	EZ-EMC	Ver.EMC-CO N 3A1.1	\	\

## 4. EMC EMISSION TEST

### 4.1 CONDUCTED EMISSION MEASUREMENT

Test Requirement:	FCC Part15 C Section 15.207& RSS-Gen [8.8]
Test Method:	ANSI C63.10:2013 and RSS-Gen
Test Frequency Range:	150KHz to 30MHz
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto

#### 4.1.1 POWER LINE CONDUCTED EMISSION LIMITS

FREQUENCY (MHz)	Limit (dBuV)		Standard
	Quasi-peak	Average	
0.15 -0.5	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	56.00	46.00	FCC
5.0 -30.0	60.00	50.00	FCC

Note:

(1) \*Decreases with the logarithm of the frequency.

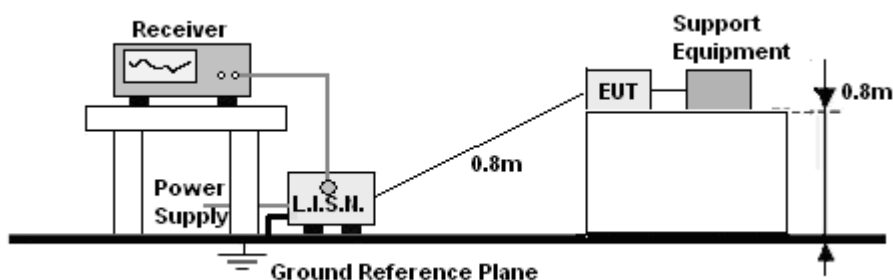
#### 4.1.2 TEST PROCEDURE

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system; a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10:2013.
2. Support equipment, if needed, was placed as per ANSI C63.10:2013
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10:2013.
4. The adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5. All support equipments received AC power from a second LISN, if any.
6. The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.e.
8. For the actual test configuration, please refer to the related Item –EUT Test Photos.

#### 4.1.3 DEVIATION FROM TEST STANDARD

No deviation

#### 4.1.4 TEST SETUP

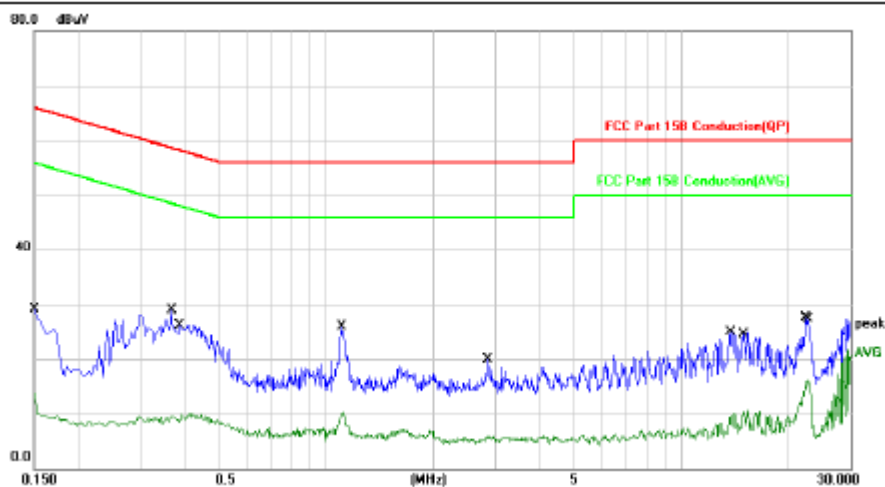


#### 4.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

#### 4.1.6 Test Result

Temperature:	26°C	Relative Humidity:	54%
Pressure:	101kPa	Phase :	L
Test Voltage :	AC 120V/60Hz	Test Mode:	802.11n(HT20)2437MHz

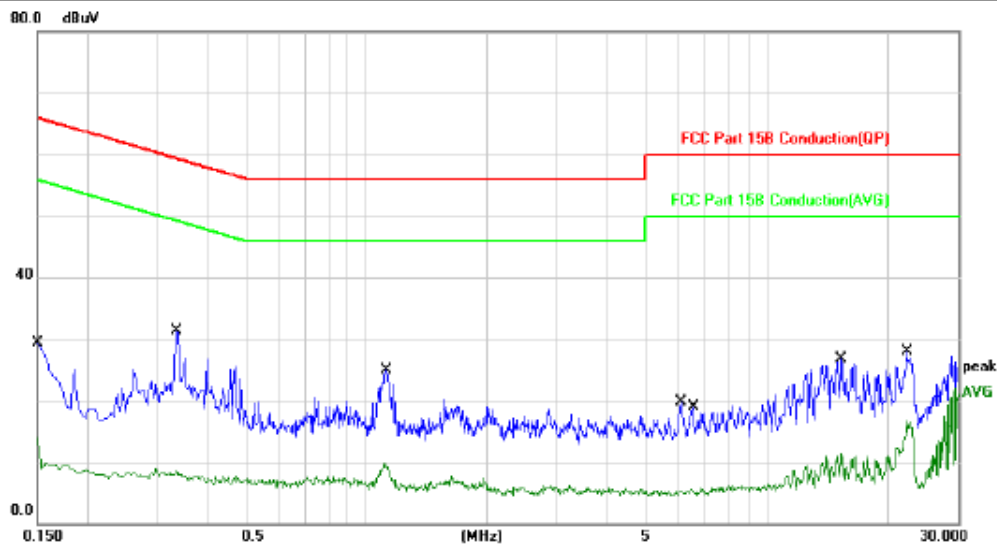


No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measurement dBuV	Limit dBuV	Over dB	Detector	Comment
1	0.1499	19.27	9.75	29.02	66.00	-36.98	QP	
2	0.1499	4.03	9.75	13.78	56.00	-42.22	AVG	
3 *	0.3661	19.05	9.86	28.91	58.50	-29.68	QP	
4	0.3901	0.09	9.87	9.96	48.06	-38.10	AVG	
5	1.1061	16.21	9.74	25.95	56.00	-30.05	QP	
6	1.1181	0.51	9.74	10.25	46.00	-35.75	AVG	
7	2.8421	10.22	9.71	19.93	56.00	-36.07	QP	
8	2.8661	-3.91	9.71	5.80	46.00	-40.20	AVG	
9	13.7381	15.27	9.72	24.99	60.00	-35.01	QP	
10	14.9461	0.56	9.66	10.22	50.00	-39.78	AVG	
11	22.3181	18.08	9.50	27.58	60.00	-32.42	QP	
12	22.7101	6.64	9.49	16.13	50.00	-33.87	AVG	

**Notes:**

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Measurement Level = Reading level + Correct Factor

Temperature:	26°C	Relative Humidity:	54%
Pressure:	101kPa	Phase :	N
Test Voltage :	AC 120V/60Hz	Test Mode:	802.11n(HT20)2437MHz



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1499	19.53	9.75	29.28	66.00	-36.72	QP	
2		0.1499	4.15	9.75	13.90	56.00	-42.10	AVG	
3	*	0.3341	21.36	9.86	31.22	59.35	-28.13	QP	
4		0.3341	-1.44	9.86	8.42	49.35	-40.93	AVG	
5		1.1100	0.03	9.74	9.77	46.00	-36.23	AVG	
6		1.1221	15.20	9.74	24.94	56.00	-31.06	QP	
7		6.1061	10.04	9.64	19.68	60.00	-40.32	QP	
8		6.4821	-4.12	9.63	5.51	50.00	-44.49	AVG	
9		15.3581	17.06	9.65	26.71	60.00	-33.29	QP	
10		15.3581	1.65	9.65	11.30	50.00	-38.70	AVG	
11		22.3181	18.42	9.50	27.92	60.00	-32.08	QP	
12		22.3181	7.19	9.50	16.69	50.00	-33.31	AVG	

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Measurement Level = Reading level + Correct Factor

## 4.2 RADIATED EMISSION MEASUREMENT

Test Requirement:	FCC part 15.205/15.209 & RSS-Gen.8.9				
Test Method:	ANSI C63.10:2013				
Test Frequency Range:	9kHz to 25GHz				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Value
	9KHz-150KHz	Quasi-peak	200Hz	600Hz	Quasi-peak
	150KHz-30MHz	Quasi-peak	9KHz	30KHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
Peak		1MHz	10Hz	Average	

## 4.2.1 RADIATED EMISSION LIMITS

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
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

## LIMITS OF RADIATED EMISSION MEASUREMENT

FREQUENCY (MHz)	Limit (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

## Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

## 4.2.2 TEST PROCEDURE

Below 1GHz test procedure as below:

- a. The EUT was placed on the top of a rotating table 0.1 meters above the ground at a 3 meter semi-anechoiccamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of variable-height antenna tower.

- c. 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.
- d. 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.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. 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.

Above 1GHz test procedure as below:

- g. Different from above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change from table 0.8 metre to 1.5 metre (Above 18GHz the distance is 1 meter and table is 1.5 metre).
- h. Test the EUT in the lowest channel, the middle channel, the Highest channel

Note:

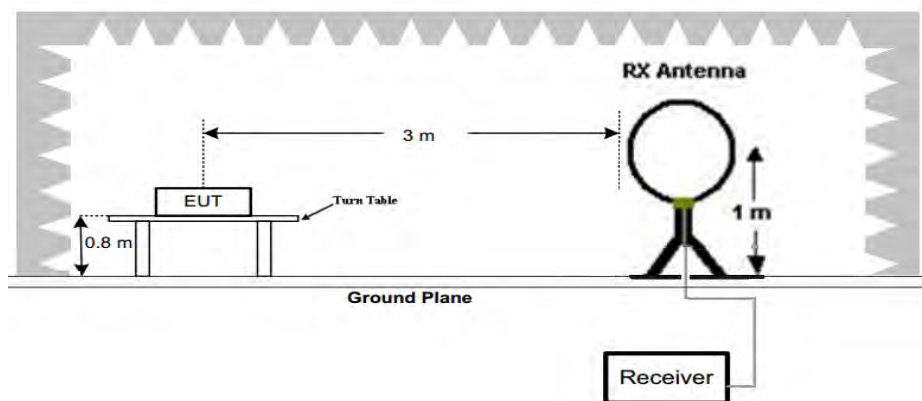
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

#### 4.2.3 DEVIATION FROM TEST STANDARD

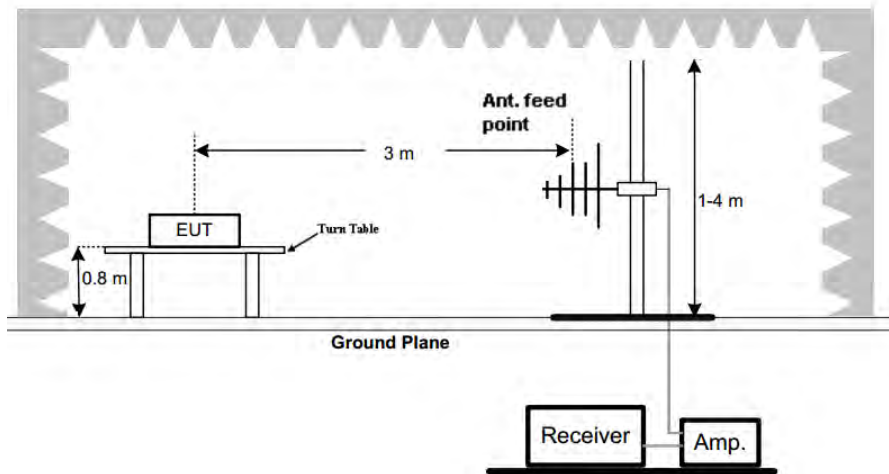
No deviation

#### 4.2.4 TEST SETUP

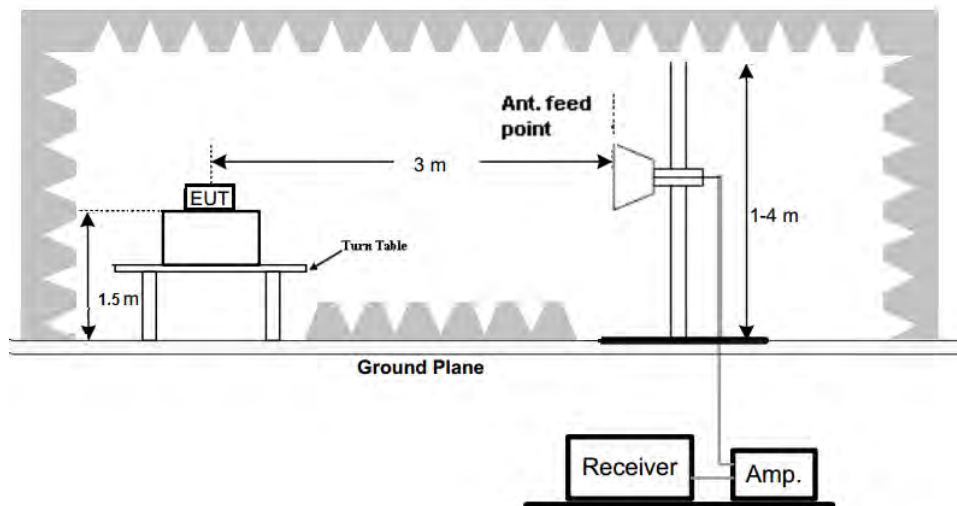
(A) Radiated Emission Test-Up Frequency Below 30MHz



## (B) Radiated Emission Test-Up Frequency 30MHz~1GHz



## (C) Radiated Emission Test-Up Frequency Above 1GHz



#### 4.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

#### 4.2.6 TEST RESULTS

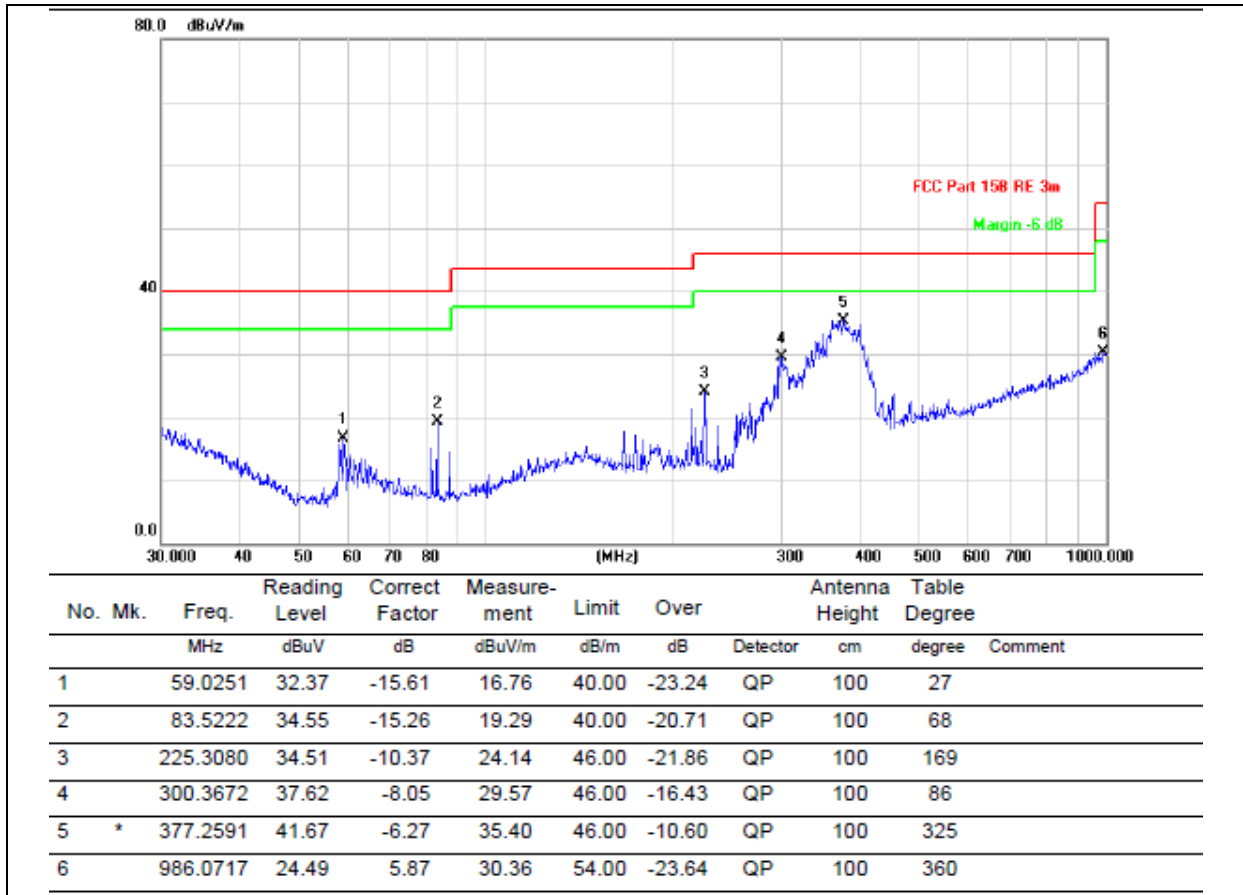
Between 9KHz – 30MHz

The emission from 9 kHz to 30MHz was pre-tested and found the result was 20dB lower than the limit, and according to 15.31(o) & RSS-Gen 6.13, the test result no need to reported.

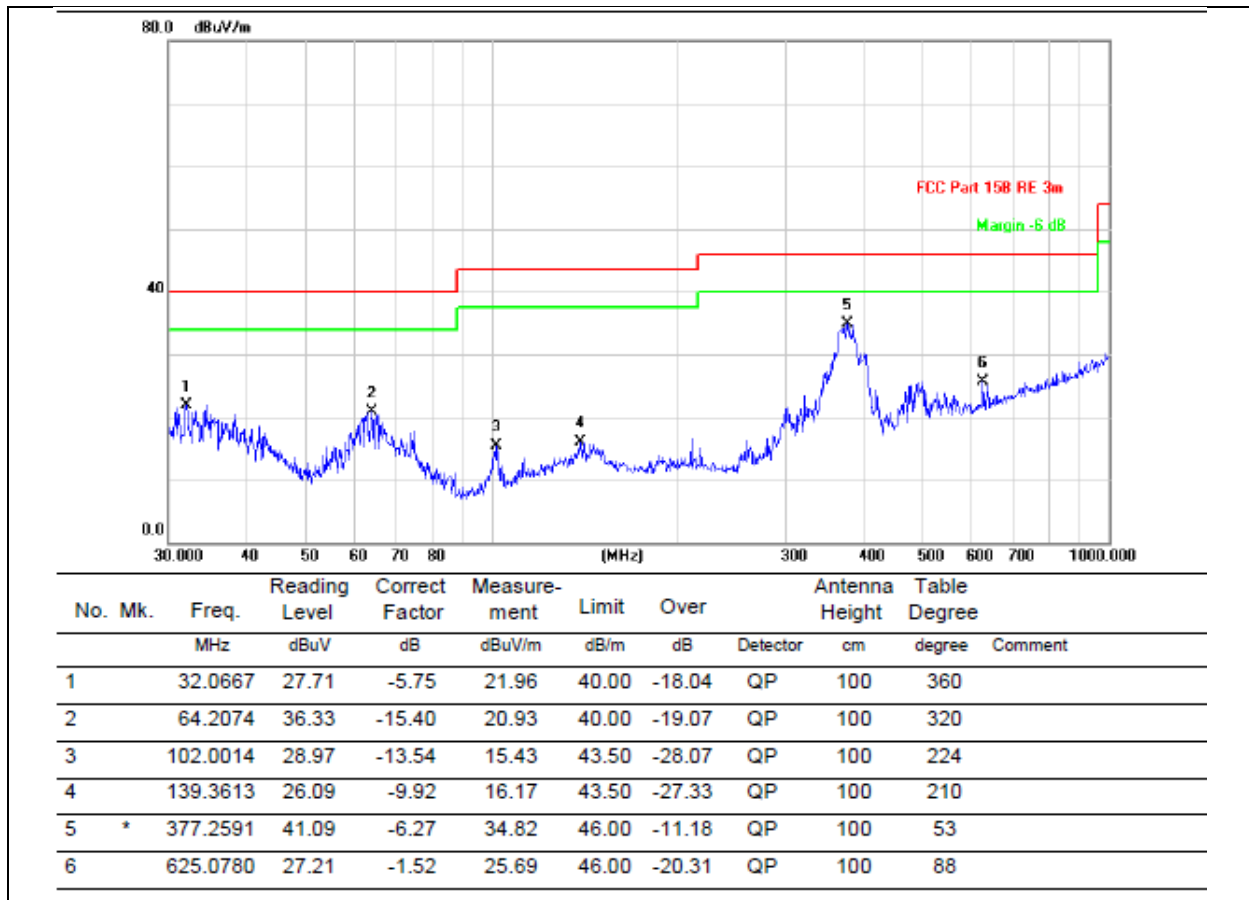


Between 30MHz – 1GHz

Temperature:	26°C	Relative Humidity:	54%
Pressure:	101 kPa	Polarization:	Horizontal
Test Voltage:	AC 120V/60Hz	Test Mode:	802.11n(HT20) 2437MHz



Temperature:	26°C	Relative Humidity:	54%
Pressure:	101kPa	Polarization:	Vertical
Test Voltage:	AC 120V/60Hz	Test Mode:	802.11n(HT20) 2437MHz



Remarks:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

1GHz~25GHz

802.11b

Polar (H/V)	Frequency	Meter Reading	Pre-amplif ier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detect or Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Low Channel:2412MHz									
V	4824	47.71	30.55	5.77	24.66	47.59	74.00	-26.41	PK
V	4824	36.36	30.55	5.77	24.66	36.24	54.00	-17.76	AV
V	7236	47.05	30.33	6.32	24.55	47.59	74.00	-26.41	PK
V	7236	33.37	30.33	6.32	24.55	33.91	54.00	-20.09	AV
V	9648	45.87	30.85	7.45	24.69	47.16	74.00	-26.84	PK
V	9648	34.03	30.85	7.45	24.69	35.32	54.00	-18.68	AV
H	4824	46.55	30.55	5.77	24.66	46.43	74.00	-27.57	PK
H	4824	37.11	30.55	5.77	24.66	36.99	54.00	-17.01	AV
H	7236	47.71	30.33	6.32	24.55	48.25	74.00	-25.75	PK
H	7236	34.36	30.33	6.32	24.55	34.90	54.00	-19.10	AV
H	9648	46.58	30.85	7.45	24.69	47.87	74.00	-26.13	PK
H	9648	32.82	30.85	7.45	24.69	34.11	54.00	-19.89	AV

Polar (H/V)	Frequency	Meter Reading	Pre-amplif ier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detect or Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Middle Channel:2437MHz									
V	4874	48.27	30.55	5.77	24.66	48.15	74.00	-25.85	PK
V	4874	37.64	30.55	5.77	24.66	37.52	54.00	-16.48	AV
V	7311	46.82	30.33	6.32	24.55	47.36	74.00	-26.64	PK
V	7311	34.60	30.33	6.32	24.55	35.14	54.00	-18.86	AV
V	9748	47.23	30.85	7.45	24.69	48.52	74.00	-25.48	PK
V	9748	35.09	30.85	7.45	24.69	36.38	54.00	-17.62	AV
H	4874	47.61	30.55	5.77	24.66	47.49	74.00	-26.51	PK
H	4874	35.90	30.55	5.77	24.66	35.78	54.00	-18.22	AV
H	7311	46.30	30.33	6.32	24.55	46.84	74.00	-27.16	PK
H	7311	33.92	30.33	6.32	24.55	34.46	54.00	-19.54	AV
H	9748	45.82	30.85	7.45	24.69	47.11	74.00	-26.89	PK
H	9748	34.93	30.85	7.45	24.69	36.22	54.00	-17.78	AV

Polar (H/V)	Frequency	Meter Reading	Pre-amplif ier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detect or Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
High Channel:2462MHz									
V	4924	45.85	30.55	5.77	24.66	45.73	74.00	-28.27	PK
V	4924	38.19	30.55	5.77	24.66	38.07	54.00	-15.93	AV
V	7386	45.87	30.33	6.32	24.55	46.41	74.00	-27.59	PK
V	7386	35.53	30.33	6.32	24.55	36.07	54.00	-17.93	AV
V	9848	46.82	30.85	7.45	24.69	48.11	74.00	-25.89	PK
V	9848	34.18	30.85	7.45	24.69	35.47	54.00	-18.53	AV
H	4924	47.15	30.55	5.77	24.66	47.03	74.00	-26.97	PK
H	4924	37.88	30.55	5.77	24.66	37.76	54.00	-16.24	AV
H	7386	46.84	30.33	6.32	24.55	47.38	74.00	-26.62	PK
H	7386	33.13	30.33	6.32	24.55	33.67	54.00	-20.33	AV
H	9848	47.10	30.85	7.45	24.69	48.39	74.00	-25.61	PK
H	9848	34.39	30.85	7.45	24.69	35.68	54.00	-18.32	AV

802.11g

Polar (H/V)	Frequency	Meter Reading	Pre-amplif ier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detect or Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Low Channel:2412MHz									
V	4824	47.70	30.55	5.77	24.66	47.58	74.00	-26.42	PK

V	4824	37.92	30.55	5.77	24.66	37.80	54.00	-16.20	AV
V	7236	46.11	30.33	6.32	24.55	46.65	74.00	-27.35	PK
V	7236	35.19	30.33	6.32	24.55	35.73	54.00	-18.27	AV
V	9648	47.16	30.85	7.45	24.69	48.45	74.00	-25.55	PK
V	9648	33.87	30.85	7.45	24.69	35.16	54.00	-18.84	AV
H	4824	46.85	30.55	5.77	24.66	46.73	74.00	-27.27	PK
H	4824	37.51	30.55	5.77	24.66	37.39	54.00	-16.61	AV
H	7236	46.60	30.33	6.32	24.55	47.14	74.00	-26.86	PK
H	7236	35.63	30.33	6.32	24.55	36.17	54.00	-17.83	AV
H	9648	46.76	30.85	7.45	24.69	48.05	74.00	-25.95	PK
H	9648	33.64	30.85	7.45	24.69	34.93	54.00	-19.07	AV

Polar (H/V)	Frequency	Meter Reading	Pre-amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detect or Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Middle Channel:2437MHz									
V	4874	45.98	30.55	5.77	24.66	45.86	74.00	-28.14	PK
V	4874	37.83	30.55	5.77	24.66	37.71	54.00	-16.29	AV
V	7311	46.50	30.33	6.32	24.55	47.04	74.00	-26.96	PK
V	7311	32.93	30.33	6.32	24.55	33.47	54.00	-20.53	AV
V	9748	45.17	30.85	7.45	24.69	46.46	74.00	-27.54	PK
V	9748	34.07	30.85	7.45	24.69	35.36	54.00	-18.64	AV
H	4874	48.17	30.55	5.77	24.66	48.05	74.00	-25.95	PK
H	4874	36.35	30.55	5.77	24.66	36.23	54.00	-17.77	AV
H	7311	47.71	30.33	6.32	24.55	48.25	74.00	-25.75	PK
H	7311	35.57	30.33	6.32	24.55	36.11	54.00	-17.89	AV
H	9748	47.54	30.85	7.45	24.69	48.83	74.00	-25.17	PK
H	9748	34.88	30.85	7.45	24.69	36.17	54.00	-17.83	AV

Polar (H/V)	Frequency	Meter Reading	Pre-amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detect or Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
High Channel:2462MHz									
V	4924	46.26	30.55	5.77	24.66	46.14	74.00	-27.86	PK
V	4924	38.01	30.55	5.77	24.66	37.89	54.00	-16.11	AV
V	7386	47.26	30.33	6.32	24.55	47.80	74.00	-26.20	PK
V	7386	33.20	30.33	6.32	24.55	33.74	54.00	-20.26	AV
V	9848	46.59	30.85	7.45	24.69	47.88	74.00	-26.12	PK
V	9848	34.03	30.85	7.45	24.69	35.32	54.00	-18.68	AV
H	4924	46.01	30.55	5.77	24.66	45.89	74.00	-28.11	PK
H	4924	35.53	30.55	5.77	24.66	35.41	54.00	-18.59	AV
H	7386	46.26	30.33	6.32	24.55	46.80	74.00	-27.20	PK
H	7386	35.43	30.33	6.32	24.55	35.97	54.00	-18.03	AV
H	9848	45.21	30.85	7.45	24.69	46.50	74.00	-27.50	PK
H	9848	32.41	30.85	7.45	24.69	33.70	54.00	-20.30	AV

## 802.11n20

Polar (H/V)	Frequency	Meter Reading	Pre-amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detect or Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Low Channel:2412MHz									
V	4824	48.05	30.55	5.77	24.66	47.93	74.00	-26.07	PK
V	4824	37.60	30.55	5.77	24.66	37.48	54.00	-16.52	AV
V	7236	46.34	30.33	6.32	24.55	46.88	74.00	-27.12	PK
V	7236	34.45	30.33	6.32	24.55	34.99	54.00	-19.01	AV
V	9648	46.22	30.85	7.45	24.69	47.51	74.00	-26.49	PK

V	9648	33.32	30.85	7.45	24.69	34.61	54.00	-19.39	AV
H	4824	45.82	30.55	5.77	24.66	45.70	74.00	-28.30	PK
H	4824	35.62	30.55	5.77	24.66	35.50	54.00	-18.50	AV
H	7236	47.18	30.33	6.32	24.55	47.72	74.00	-26.28	PK
H	7236	33.94	30.33	6.32	24.55	34.48	54.00	-19.52	AV
H	9648	47.09	30.85	7.45	24.69	48.38	74.00	-25.62	PK
H	9648	34.31	30.85	7.45	24.69	35.60	54.00	-18.40	AV

Polar (H/V)	Frequency	Meter Reading	Pre-amplif ier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detect or Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
Middle Channel:2437MHz									
V	4874	45.98	30.55	5.77	24.66	45.86	74.00	-28.14	PK
V	4874	37.26	30.55	5.77	24.66	37.14	54.00	-16.86	AV
V	7311	46.37	30.33	6.32	24.55	46.91	74.00	-27.09	PK
V	7311	34.27	30.33	6.32	24.55	34.81	54.00	-19.19	AV
V	9748	46.07	30.85	7.45	24.69	47.36	74.00	-26.64	PK
V	9748	33.53	30.85	7.45	24.69	34.82	54.00	-19.18	AV
H	4874	47.22	30.55	5.77	24.66	47.10	74.00	-26.90	PK
H	4874	36.23	30.55	5.77	24.66	36.11	54.00	-17.89	AV
H	7311	46.65	30.33	6.32	24.55	47.19	74.00	-26.81	PK
H	7311	34.20	30.33	6.32	24.55	34.74	54.00	-19.26	AV
H	9748	47.26	30.85	7.45	24.69	48.55	74.00	-25.45	PK
H	9748	33.08	30.85	7.45	24.69	34.37	54.00	-19.63	AV

Polar (H/V)	Frequency	Meter Reading	Pre-amplif ier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detect or Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
High Channel:2462MHz									
V	4924	48.03	30.55	5.77	24.66	47.91	74.00	-26.09	PK
V	4924	35.26	30.55	5.77	24.66	35.14	54.00	-18.86	AV
V	7386	47.44	30.33	6.32	24.55	47.98	74.00	-26.02	PK
V	7386	32.85	30.33	6.32	24.55	33.39	54.00	-20.61	AV
V	9848	46.93	30.85	7.45	24.69	48.22	74.00	-25.78	PK
V	9848	33.67	30.85	7.45	24.69	34.96	54.00	-19.04	AV
H	4924	47.19	30.55	5.77	24.66	47.07	74.00	-26.93	PK
H	4924	35.56	30.55	5.77	24.66	35.44	54.00	-18.56	AV
H	7386	46.41	30.33	6.32	24.55	46.95	74.00	-27.05	PK
H	7386	34.72	30.33	6.32	24.55	35.26	54.00	-18.74	AV
H	9848	46.21	30.85	7.45	24.69	47.50	74.00	-26.50	PK
H	9848	32.25	30.85	7.45	24.69	33.54	54.00	-20.46	AV

Remark:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,  
Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

## 5.RADIATED BAND EMISSIONMEASUREMENT

### 5.1 TEST REQUIREMENT:

Test Requirement:	FCC Part15 C Section 15.209 and 15.205 & RSS-Gen 8.10				
Test Method:	ANSI C63.10: 2013				
Test Frequency Range:	All of the restrict bands were tested, only the worst band's (2310MHz to 2500MHz) data was showed.				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Value
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Average	1MHz	3MHz	Average

### LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Class B (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

#### Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

### 5.2 TEST PROCEDURE

Above 1GHz test procedure as below:

- a. 1. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. 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.
- d. 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 and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could bestopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dBmargin would be re-tested one by one using peak, quasi-peak or average method as specified and then reportedin a data sheet.
- g. Test the EUT in the lowest channel,the Highest channel

#### Note:

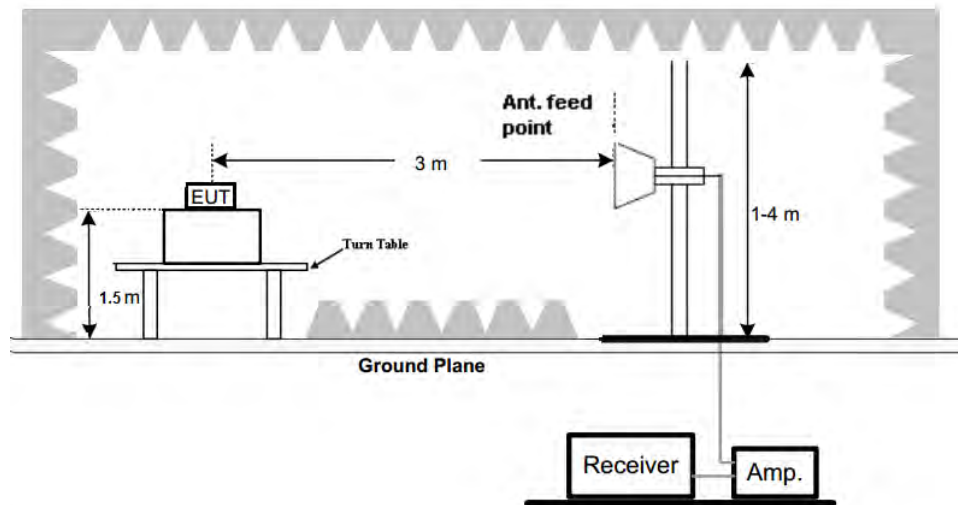
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

### 5.3 DEVIATION FROM TEST STANDARD

No deviation

## 5.4 TEST SETUP

### Radiated Emission Test-Up Frequency Above 1GHz



## 5.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

## 5.6 TEST RESULT

### 802.11b

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission level (dBuV/m)	Limit (dBuV/m)	Margin (dBuV/m)	Detect or Type	Result
Low Channel 2412MHz										
H	2390.00	52.08	30.22	4.85	23.98	50.69	74.00	-23.31	PK	PASS
H	2390.00	37.23	30.22	4.85	23.98	35.84	54.00	-18.16	AV	PASS
H	2400.00	54.53	30.22	4.85	23.98	53.14	74.00	-20.86	PK	PASS
H	2400.00	39.05	30.22	4.85	23.98	37.66	54.00	-16.34	AV	PASS
V	2390.00	51.45	30.22	4.85	23.98	50.06	74.00	-23.94	PK	PASS
V	2390.00	37.71	30.22	4.85	23.98	36.32	54.00	-17.68	AV	PASS
V	2400.00	54.40	30.22	4.85	23.98	53.01	74.00	-20.99	PK	PASS
V	2400.00	37.14	30.22	4.85	23.98	35.75	54.00	-18.25	AV	PASS
High Channel 2462MHz										
H	2483.50	50.89	30.22	4.85	23.98	49.50	74.00	-24.50	PK	PASS
H	2483.50	38.00	30.22	4.85	23.98	36.61	54.00	-17.39	AV	PASS
H	2500.00	54.16	30.22	4.85	23.98	52.77	74.00	-21.23	PK	PASS
H	2500.00	36.65	30.22	4.85	23.98	35.26	54.00	-18.74	AV	PASS
V	2483.50	50.81	30.22	4.85	23.98	49.42	74.00	-24.58	PK	PASS
V	2483.50	38.10	30.22	4.85	23.98	36.71	54.00	-17.29	AV	PASS
V	2500.00	53.69	30.22	4.85	23.98	52.30	74.00	-21.70	PK	PASS
V	2500.00	37.72	30.22	4.85	23.98	36.33	54.00	-17.67	AV	PASS

## 802.11g

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission level (dBuV/m)	Limit (dBuV /m)	Margin (dBuV/ m)	Detect or Type	Result
Low Channel 2412MHz										
H	2390.00	51.30	30.22	4.85	23.98	49.91	74.00	-24.09	PK	PASS
H	2390.00	37.80	30.22	4.85	23.98	36.41	54.00	-17.59	AV	PASS
H	2400.00	54.45	30.22	4.85	23.98	53.06	74.00	-20.94	PK	PASS
H	2400.00	36.75	30.22	4.85	23.98	35.36	54.00	-18.64	AV	PASS
V	2390.00	52.95	30.22	4.85	23.98	51.56	74.00	-22.44	PK	PASS
V	2390.00	38.86	30.22	4.85	23.98	37.47	54.00	-16.53	AV	PASS
V	2400.00	52.91	30.22	4.85	23.98	51.52	74.00	-22.48	PK	PASS
V	2400.00	37.31	30.22	4.85	23.98	35.92	54.00	-18.08	AV	PASS
High Channel 2462MHz										
H	2483.50	52.70	30.22	4.85	23.98	51.31	74.00	-22.69	PK	PASS
H	2483.50	39.32	30.22	4.85	23.98	37.93	54.00	-16.07	AV	PASS
H	2500.00	52.05	30.22	4.85	23.98	50.66	74.00	-23.34	PK	PASS
H	2500.00	37.55	30.22	4.85	23.98	36.16	54.00	-17.84	AV	PASS
V	2483.50	51.81	30.22	4.85	23.98	50.42	74.00	-23.58	PK	PASS
V	2483.50	38.33	30.22	4.85	23.98	36.94	54.00	-17.06	AV	PASS
V	2500.00	52.92	30.22	4.85	23.98	51.53	74.00	-22.47	PK	PASS
V	2500.00	36.76	30.22	4.85	23.98	35.37	54.00	-18.63	AV	PASS

## 802.11n20

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission level (dBuV/m)	Limit (dBuV /m)	Margin (dBuV/ m)	Detect or Type	Result
Low Channel 2412MHz										
H	2390.00	53.74	30.22	4.85	23.98	52.35	74.00	-21.65	PK	PASS
H	2390.00	37.88	30.22	4.85	23.98	36.49	54.00	-17.51	AV	PASS
H	2400.00	53.15	30.22	4.85	23.98	51.76	74.00	-22.24	PK	PASS
H	2400.00	38.17	30.22	4.85	23.98	36.78	54.00	-17.22	AV	PASS
V	2390.00	53.75	30.22	4.85	23.98	52.36	74.00	-21.64	PK	PASS
V	2390.00	39.34	30.22	4.85	23.98	37.95	54.00	-16.05	AV	PASS
V	2400.00	54.12	30.22	4.85	23.98	52.73	74.00	-21.27	PK	PASS
V	2400.00	37.87	30.22	4.85	23.98	36.48	54.00	-17.52	AV	PASS
High Channel 2462MHz										
H	2483.50	51.99	30.22	4.85	23.98	50.60	74.00	-23.40	PK	PASS
H	2483.50	38.13	30.22	4.85	23.98	36.74	54.00	-17.26	AV	PASS
H	2500.00	52.84	30.22	4.85	23.98	51.45	74.00	-22.55	PK	PASS
H	2500.00	37.96	30.22	4.85	23.98	36.57	54.00	-17.43	AV	PASS
V	2483.50	53.41	30.22	4.85	23.98	52.02	74.00	-21.98	PK	PASS
V	2483.50	39.55	30.22	4.85	23.98	38.16	54.00	-15.84	AV	PASS
V	2500.00	53.72	30.22	4.85	23.98	52.33	74.00	-21.67	PK	PASS
V	2500.00	36.47	30.22	4.85	23.98	35.08	54.00	-18.92	AV	PASS

## Remark:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,  
Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.



## 6. POWER SPECTRAL DENSITY TEST

Test Requirement:	FCC Part15 C Section 15.247 (e) & RSS-247.5.2
Test Method:	KDB558074 D0115.247 Meas Guidance v 05r02

### 6.1 APPLIED PROCEDURES / LIMIT

Test Item	Limit	Frequency Range (MHz)	Result
Power Spectral Density	8dBm/3kHz	2400-2483.5	PASS

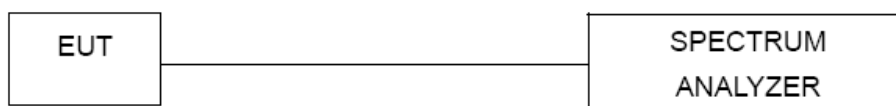
### 6.2 TEST PROCEDURE

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS bandwidth.
3. Set the RBW to:  $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$ .
4. Set the VBW  $\geq 3 \times \text{RBW}$ .
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level within the RBW.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

### 6.3 DEVIATION FROM STANDARD

No deviation.

### 6.4 TEST SETUP



### 6.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.1 Unless otherwise a special operating condition is specified in the follows during the testing.

### 6.6 Test result

**PASS: PLEASE REFER TO APPENDIX: APPENDIX1 FOR DETAILS**

## 7. 6DB CHANNEL BANDWIDTH & 99% OCCUPY BANDWIDTH

Test Requirement:	FCC Part15 C Section 15.247 (a)(2) & RSS-Gen.6.7
Test Method:	KDB558074 D0115.247 Meas Guidance v05r02

### 7.1 APPLIED PROCEDURES / LIMIT

Test Item	Limit	Frequency Range (MHz)	Result
Bandwidth	$\geq 500\text{KHz}$ (6dB bandwidth)	2400-2483.5	PASS

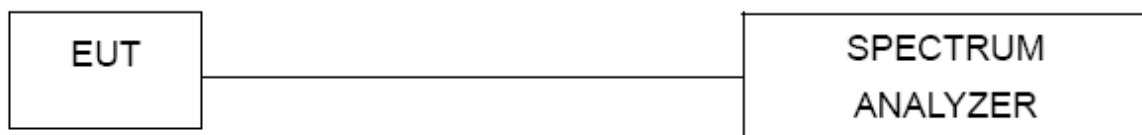
### 7.2 TEST PROCEDURE

1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW)  $\geq 3 \times$  RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. 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 6 dB relative to the maximum level measured in the fundamental emission.

### 7.3 DEVIATION FROM STANDARD

No deviation.

### 7.4 TEST SETUP



### 7.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

### 7.6 TEST RESULT

**PASS: PLEASE REFER TO APPENDIX: APPENDIX1 FOR DETAILS**

## 8. OUTPUT POWER TEST

Test Requirement:	FCC Part15 C Section 15.247 (b)(3) & RSS-247.5.4(b)
Test Method:	KDB558074 D0115.247 Meas Guidance v05r02

### 8.1 APPLIED PROCEDURES/LIMIT

Test Item	Limit	Frequency Range (MHz)	Result
Peak Output Power	1 watt or 30dBm	2400-2483.5	PASS
e.i.r.p.	4 W or 36dBm	2400-2483.5	PASS

### 8.2 TEST PROCEDURE

- a. The EUT was directly connected to the Power meter

### 8.3 DEVIATION FROM STANDARD

No deviation.

### 8.4 TEST SETUP



### 8.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

### 8.6 TEST RESULT

**PASS: PLEASE REFER TO APPENDIX: APPENDIX1 FOR DETAILS**

## 9. CONDUCTED BAND EDGE AND SPURIOUS EMISSION

Test Requirement:	FCC Part15 C Section 15.247 (d) & RSS-Gen 8.10
Test Method:	KDB558074 D0115.247 Meas Guidance v05r02

### 9.1 APPLICABLE STANDARD

in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, In addition, radiated emissions which fall in the restricted bands, as defined in§15.205(a), must also comply with the radiated emission limits specified in15.209(a).

### 9.2 TEST PROCEDURE

Using the following spectrum analyzer setting:

- A) Set the RBW = 100KHz.
- B) Set the VBW = 300KHz.
- C) Sweep time = auto couple.
- D) Detector function = peak.
- E) Trace mode = max hold.
- F) Allow trace to fully stabilize.

### 9.3 DEVIATION FROM STANDARD

No deviation.

### 9.4 TEST SETUP



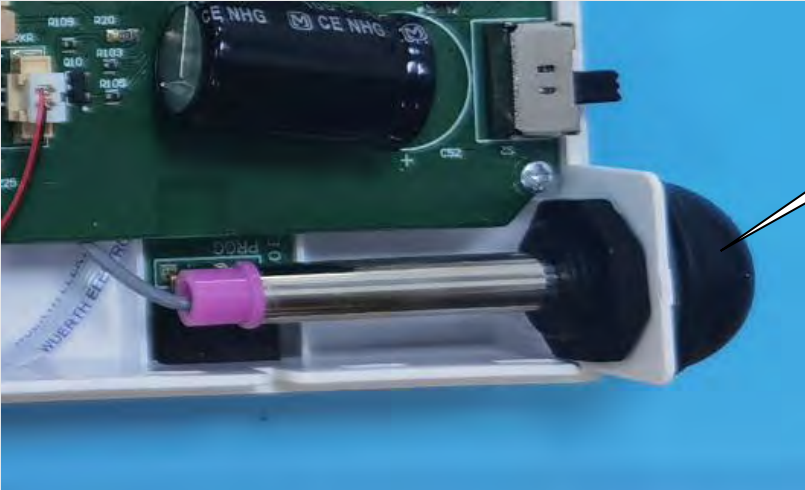
### 9.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

### 9.6 TEST RESULTS

PASS: PLEASE REFER TO APPENDIX: APPENDIX1 FOR DETAILS

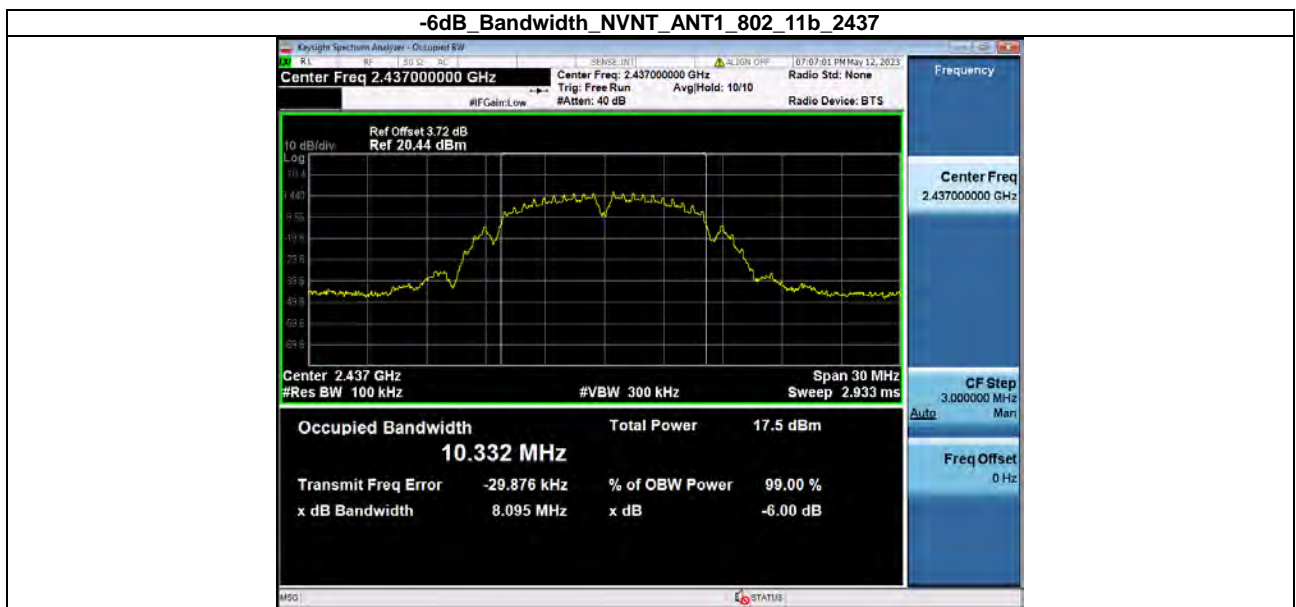
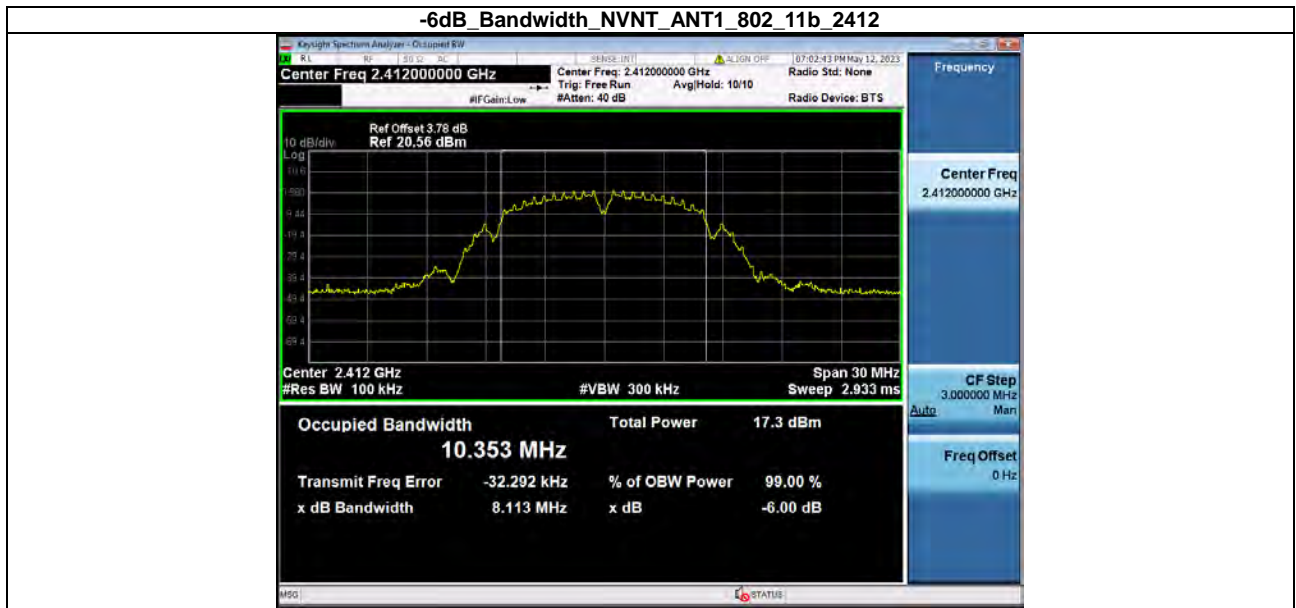
## 10. ANTENNA REQUIREMENT

Standard requirement:	FCC Part15 C Section 15.203 /247(c) & RSS-Gen 6.8
<p>For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247, if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.</p> <p>Refer to statement below for compliance.</p> <p>The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.</p> <p><b>Antenna Connected Construction</b></p> <p>The antenna is External Panel-Mount Antenna, the best case gain is 9.1dBi;, reference to the below photo for details</p>	
<p>EUT Antenna:</p>  <p>The image shows a close-up of an external panel-mount antenna. The antenna consists of a silver metal rod with a black hemispherical cap. It is connected to a green PCB via a pink connector. A callout box with a pointer identifies the antenna as 'WIFI ANT'. The PCB also features a black cylindrical component labeled 'CE NHG' and various electronic components.</p>	

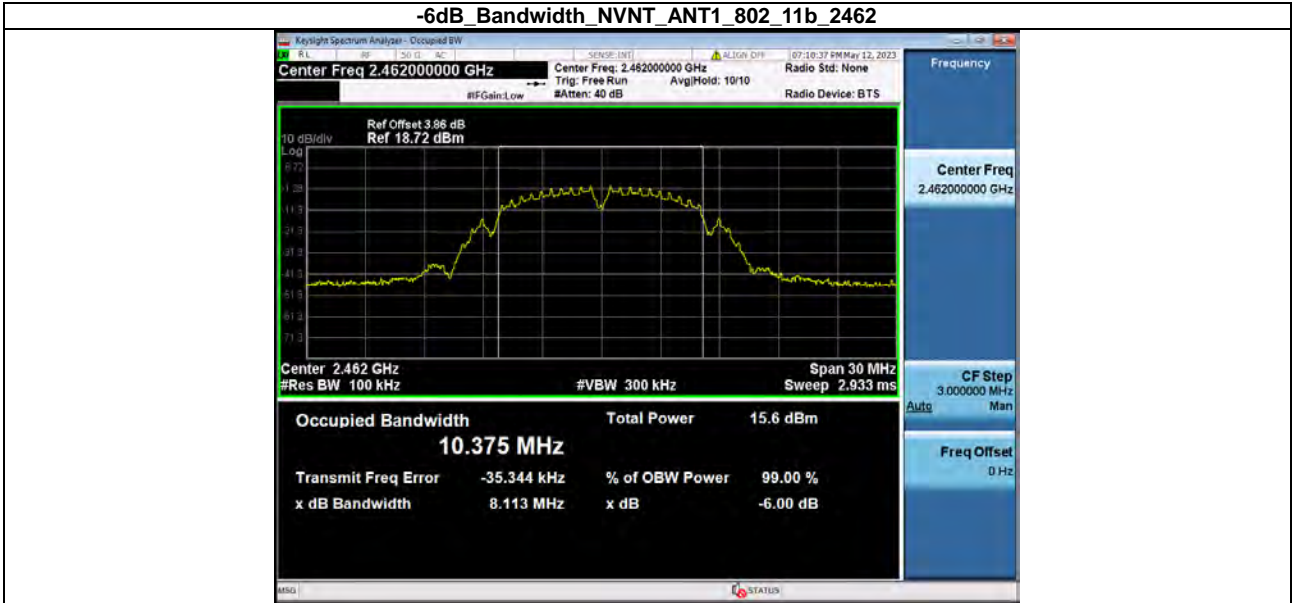
## 11. APPENDIX1

### 1. -6DB BANDWIDTH

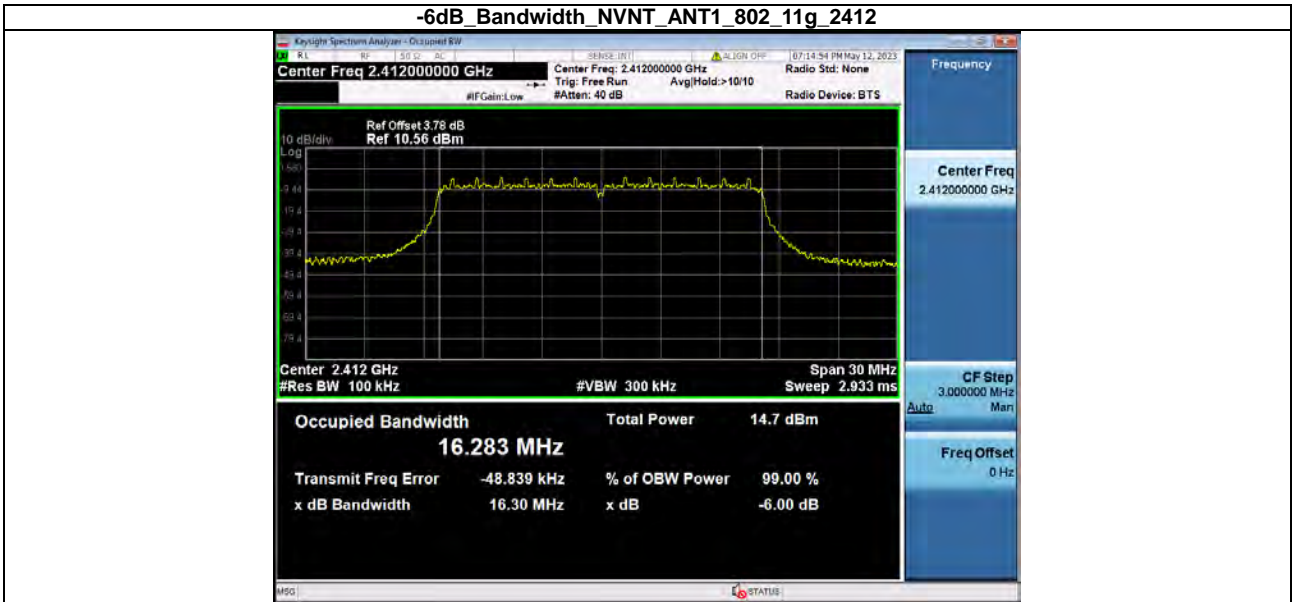
Condition	Antenna	Modulation	Frequency (MHz)	-6dB BW(MHz)	limit(kHz)	Result
NVNT	ANT1	802.11b	2412.00	8.11	500	Pass
NVNT	ANT1	802.11b	2437.00	8.09	500	Pass
NVNT	ANT1	802.11b	2462.00	8.11	500	Pass
NVNT	ANT1	802.11g	2412.00	16.30	500	Pass
NVNT	ANT1	802.11g	2437.00	16.30	500	Pass
NVNT	ANT1	802.11g	2462.00	16.31	500	Pass
NVNT	ANT1	802.11n(HT20)	2412.00	15.83	500	Pass
NVNT	ANT1	802.11n(HT20)	2437.00	15.82	500	Pass
NVNT	ANT1	802.11n(HT20)	2462.00	16.03	500	Pass



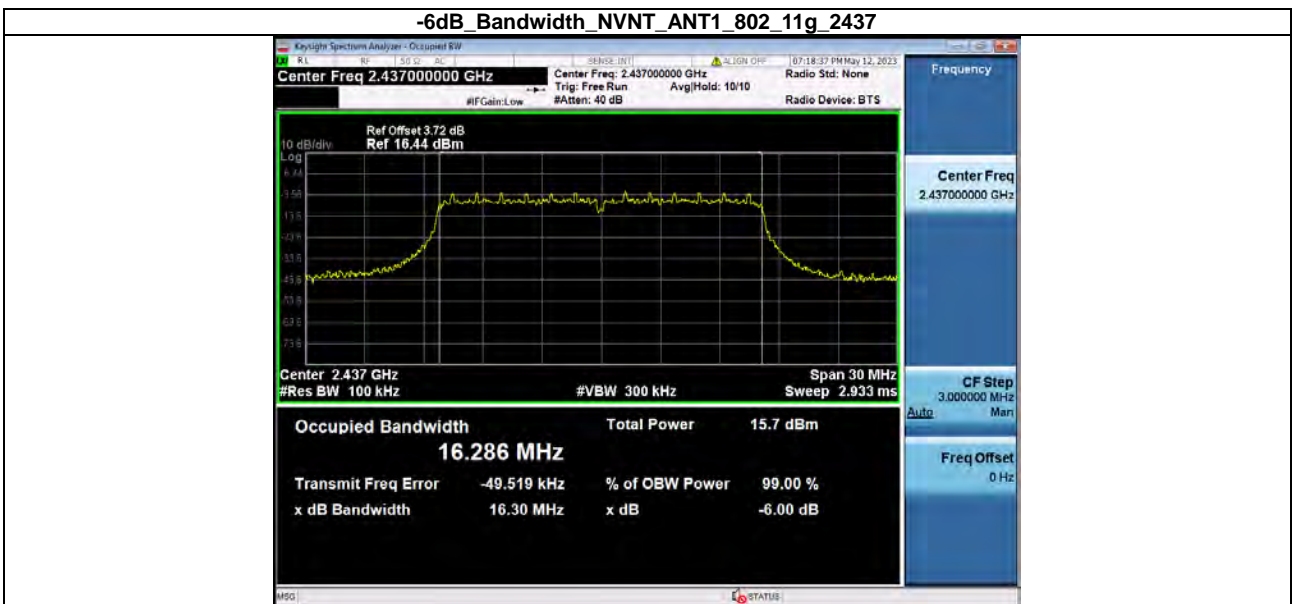
**-6dB\_Bandwidth\_NVNT\_ANT1\_802\_11b\_2462**



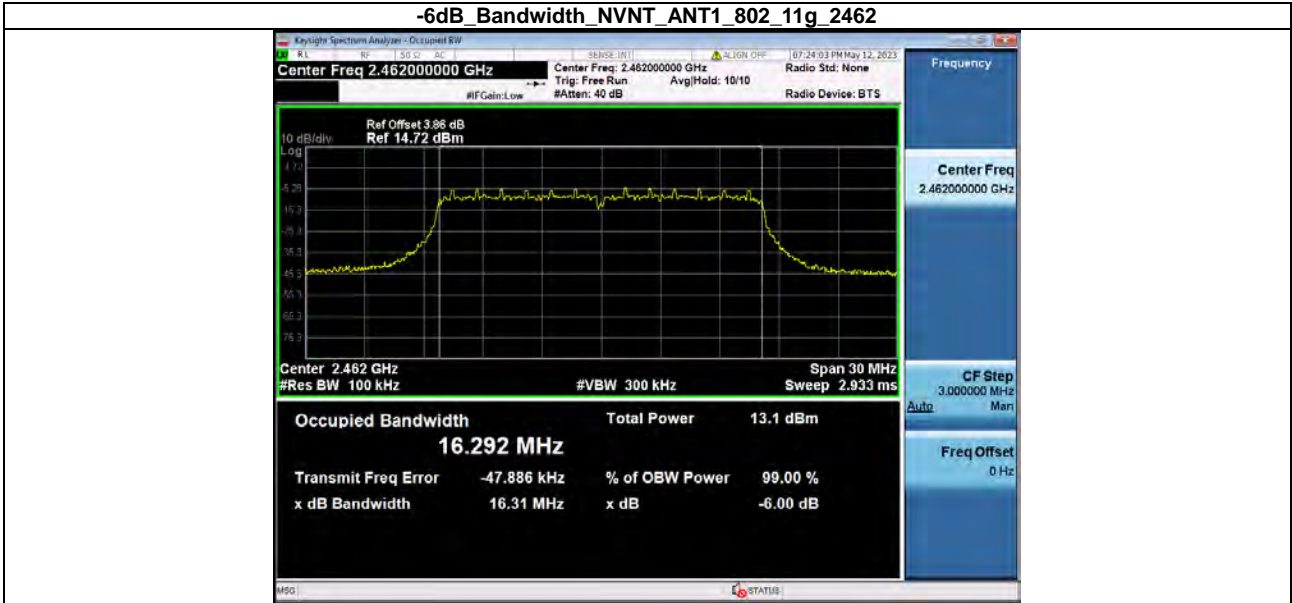
**-6dB\_Bandwidth\_NVNT\_ANT1\_802\_11g\_2412**



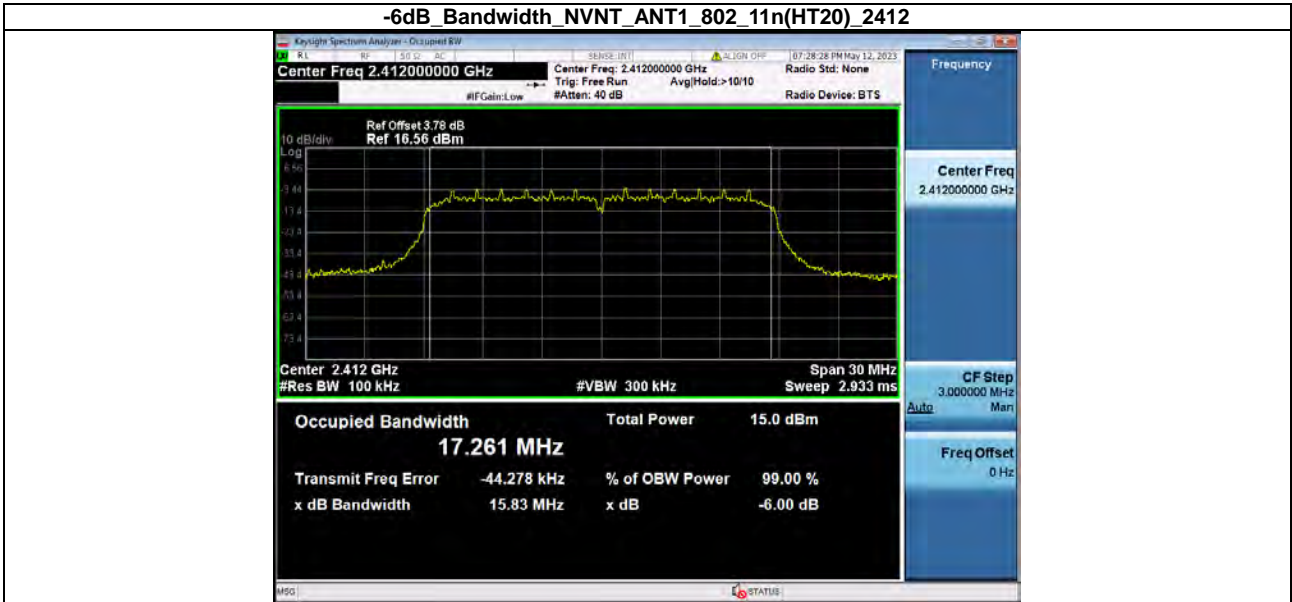
**-6dB\_Bandwidth\_NVNT\_ANT1\_802\_11g\_2437**



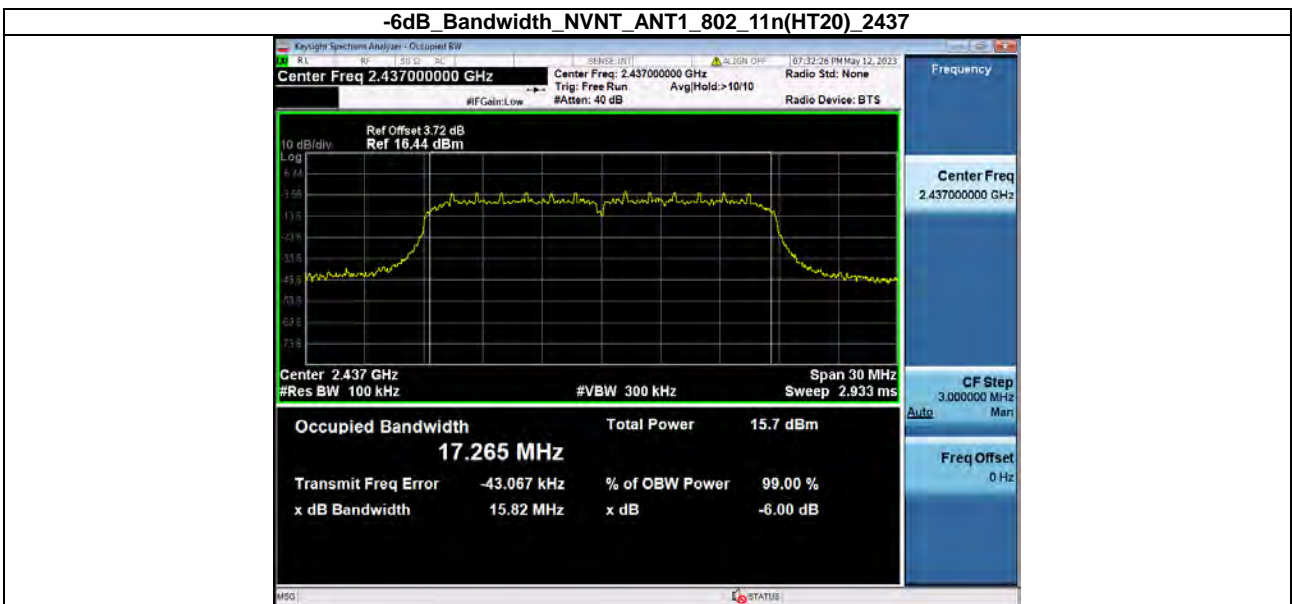
**-6dB\_Bandwidth\_NVNT\_ANT1\_802\_11g\_2462**



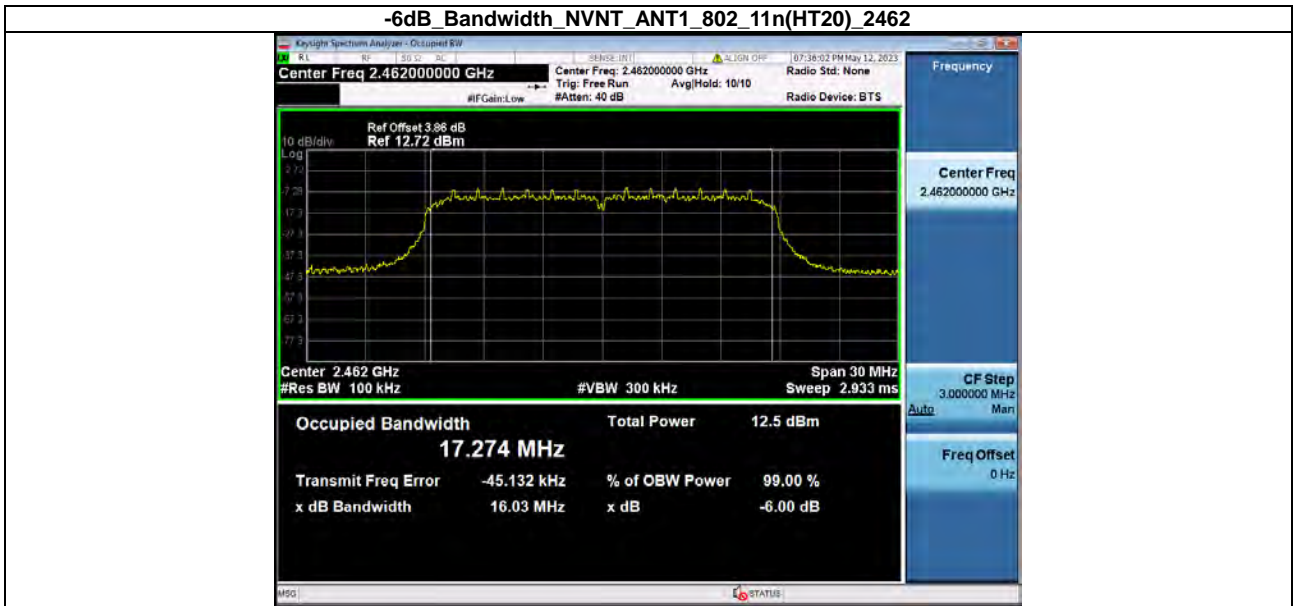
**-6dB\_Bandwidth\_NVNT\_ANT1\_802\_11n(HT20)\_2412**



**-6dB\_Bandwidth\_NVNT\_ANT1\_802\_11n(HT20)\_2437**

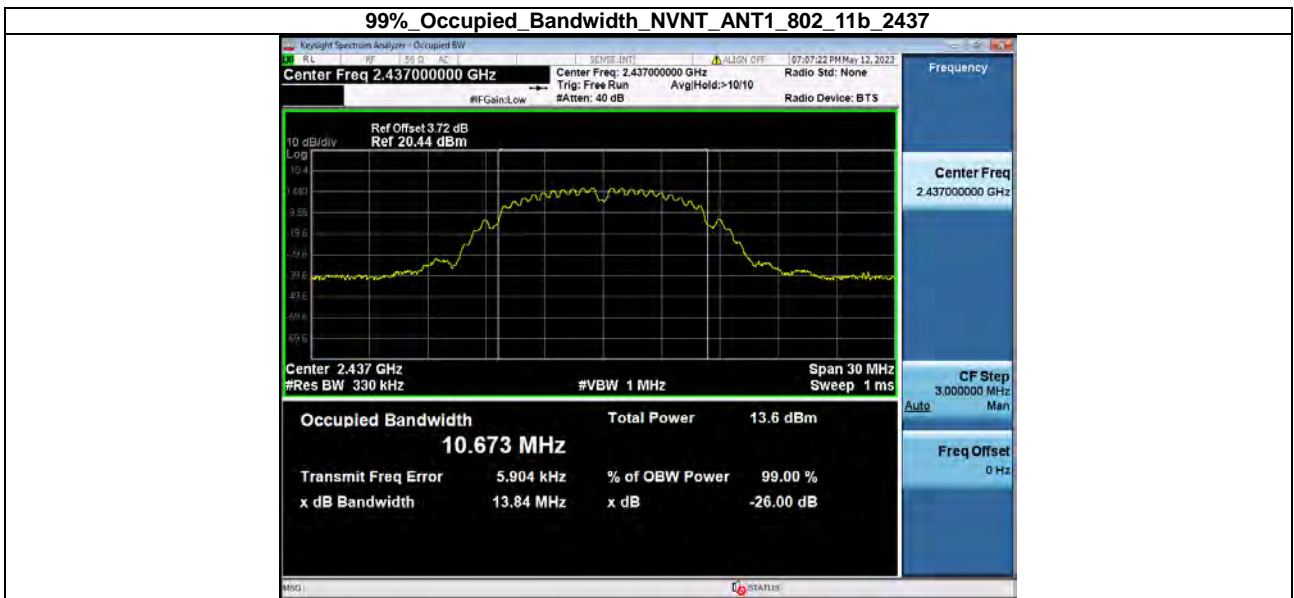
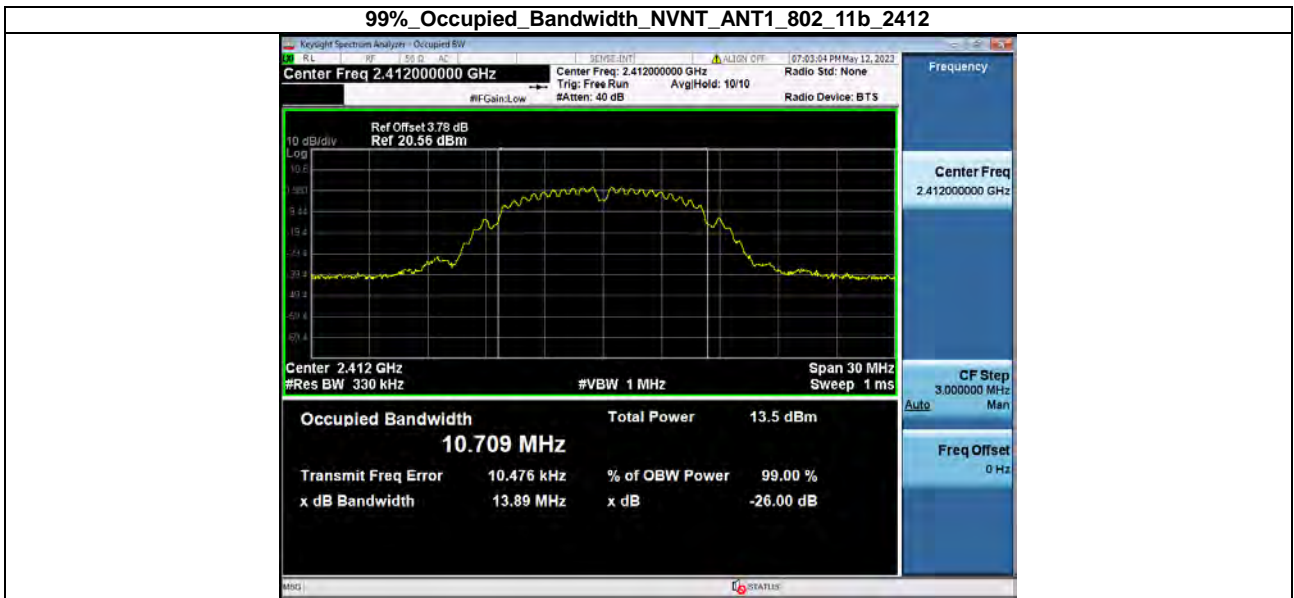




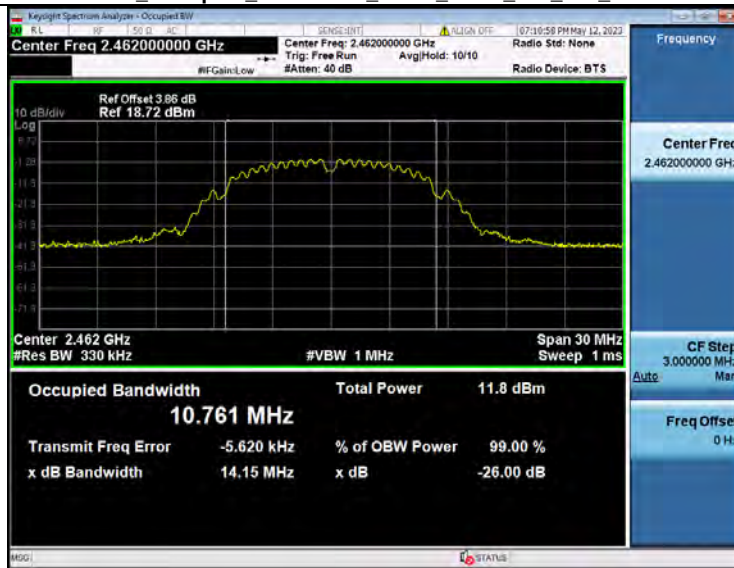


2. 99% OCCUPIED BANDWIDTH

Condition	Antenna	Modulation	Frequency (MHz)	99%OBW(MHz)
NVNT	ANT1	802.11b	2412.00	10.709
NVNT	ANT1	802.11b	2437.00	10.673
NVNT	ANT1	802.11b	2462.00	10.761
NVNT	ANT1	802.11g	2412.00	16.495
NVNT	ANT1	802.11g	2437.00	16.500
NVNT	ANT1	802.11g	2462.00	16.505
NVNT	ANT1	802.11n(HT20)	2412.00	17.476
NVNT	ANT1	802.11n(HT20)	2437.00	17.475
NVNT	ANT1	802.11n(HT20)	2462.00	17.482



99% Occupied Bandwidth NVNT\_ANT1\_802\_11b\_2462



99% Occupied Bandwidth NVNT\_ANT1\_802\_11g\_2412



99% Occupied Bandwidth NVNT\_ANT1\_802\_11g\_2437



99% Occupied Bandwidth\_NVNT\_ANT1\_802\_11g\_2462



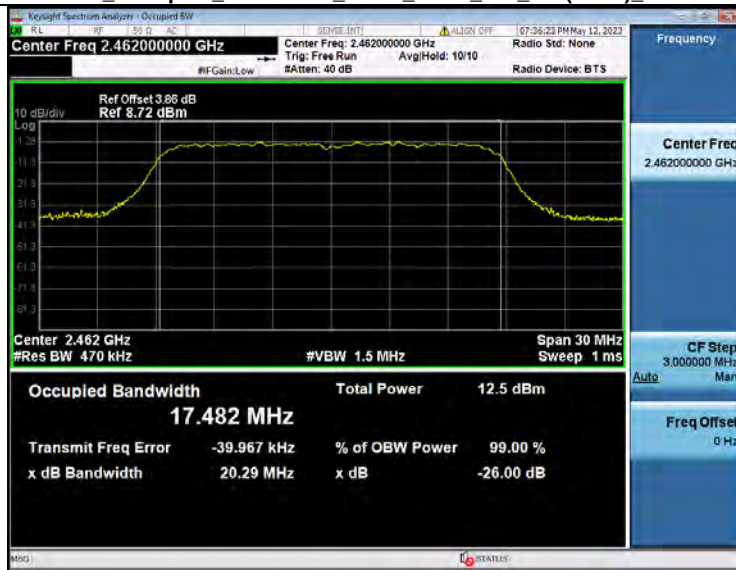
99% Occupied Bandwidth\_NVNT\_ANT1\_802\_11n(HT20)\_2412



99% Occupied Bandwidth\_NVNT\_ANT1\_802\_11n(HT20)\_2437



99%\_Occupied Bandwidth\_NVNT\_ANT1\_802\_11n(HT20)\_2462

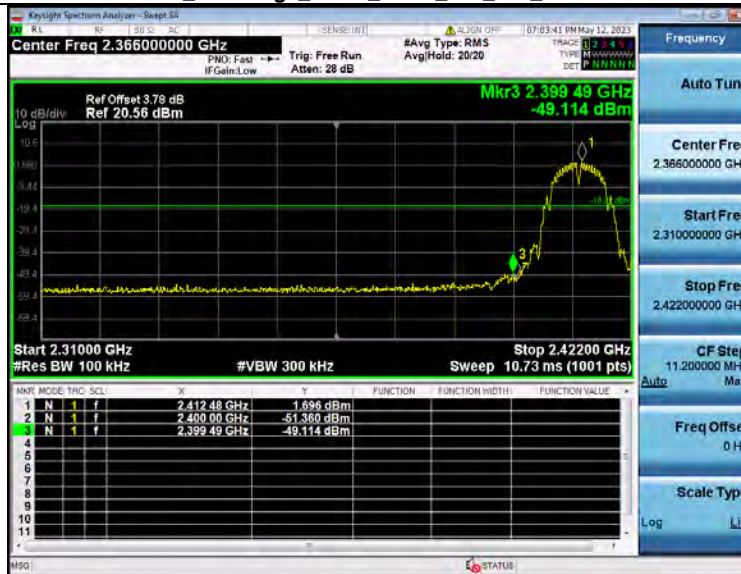


3. BANDEDGE

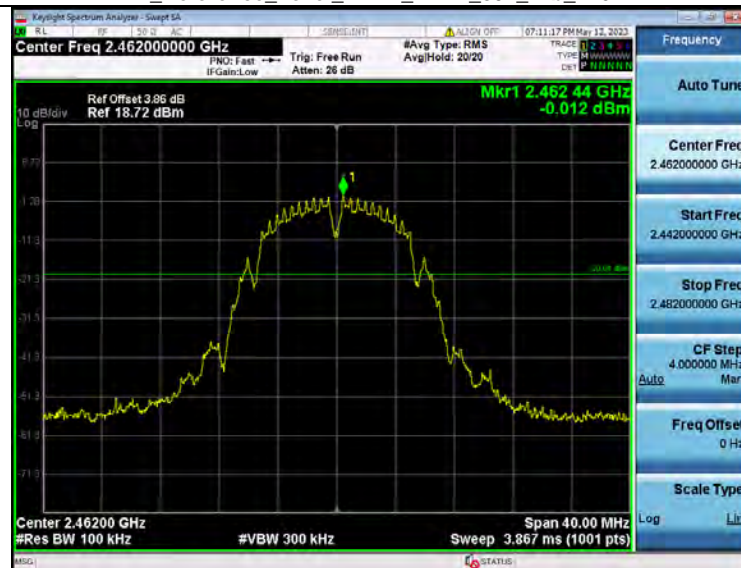
1 Reference\_Level\_NVNT\_ANT1\_802\_11b\_2412



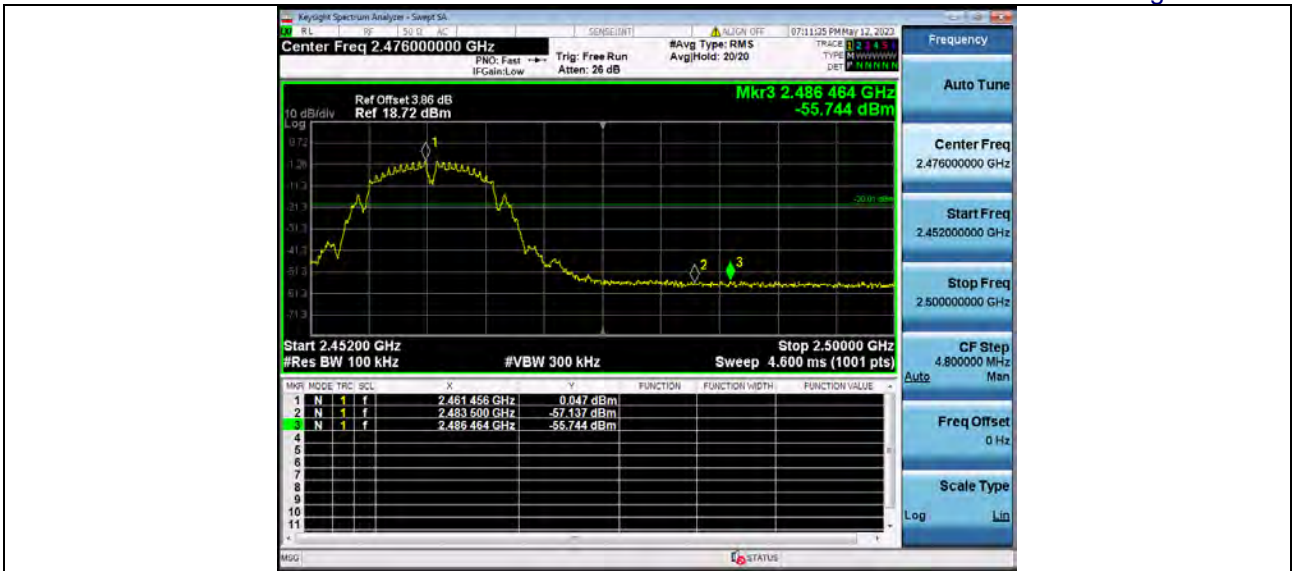
2 Bandedge\_NVNT\_ANT1\_802\_11b\_2412



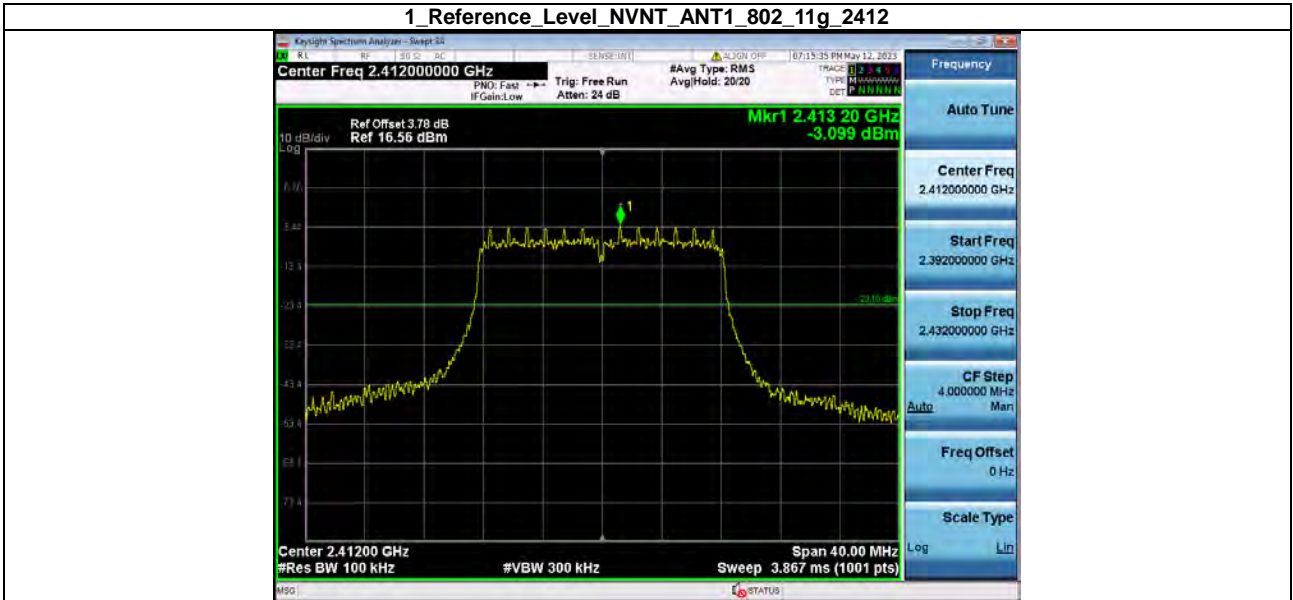
1 Reference\_Level\_NVNT\_ANT1\_802\_11b\_2462



2 Bandedge\_NVNT\_ANT1\_802\_11b\_2462



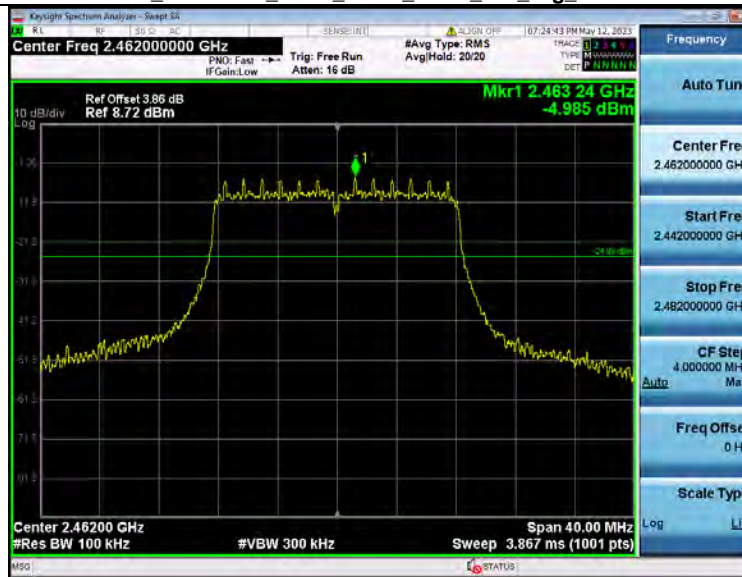
1 Reference Level NVNT\_ANT1\_802\_11g\_2412



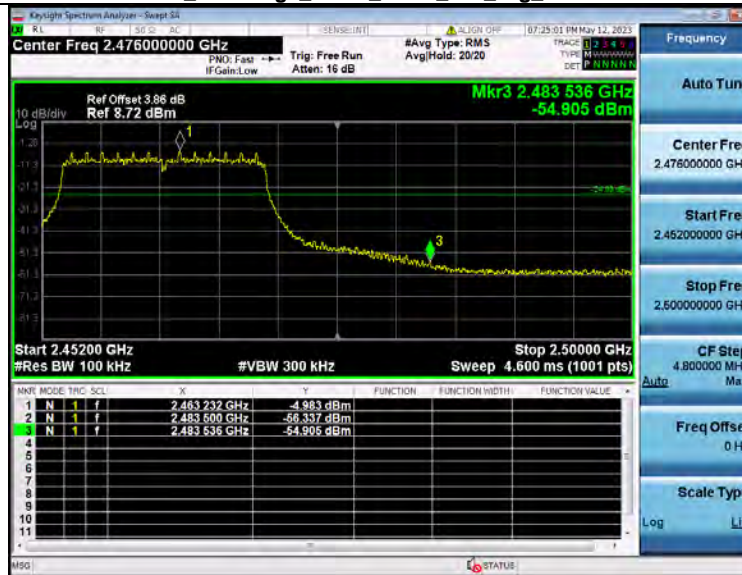
2 Bandedge NVNT\_ANT1\_802\_11g\_2412



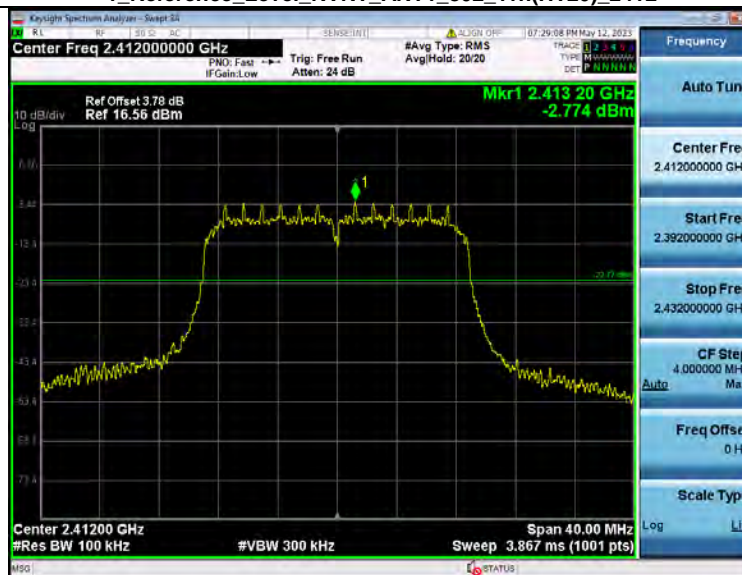
1\_Reference\_Level\_NVNT\_ANT1\_802\_11g\_2462



2\_Bandedge\_NVNT\_ANT1\_802\_11g\_2462

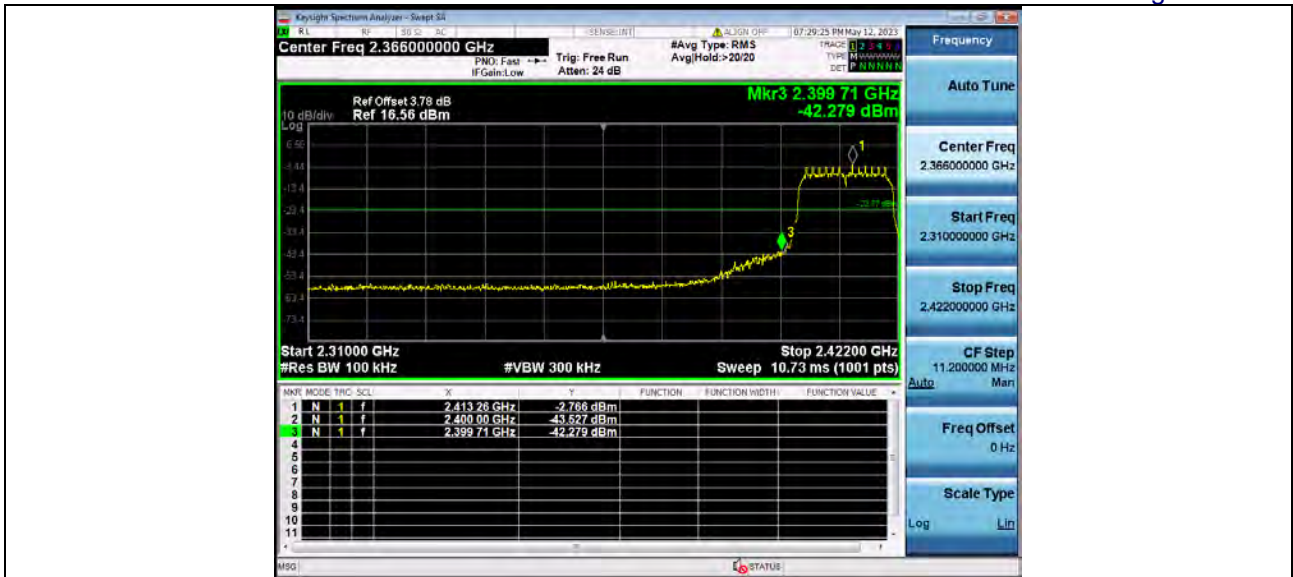


1\_Reference\_Level\_NVNT\_ANT1\_802\_11n(HT20)\_2412

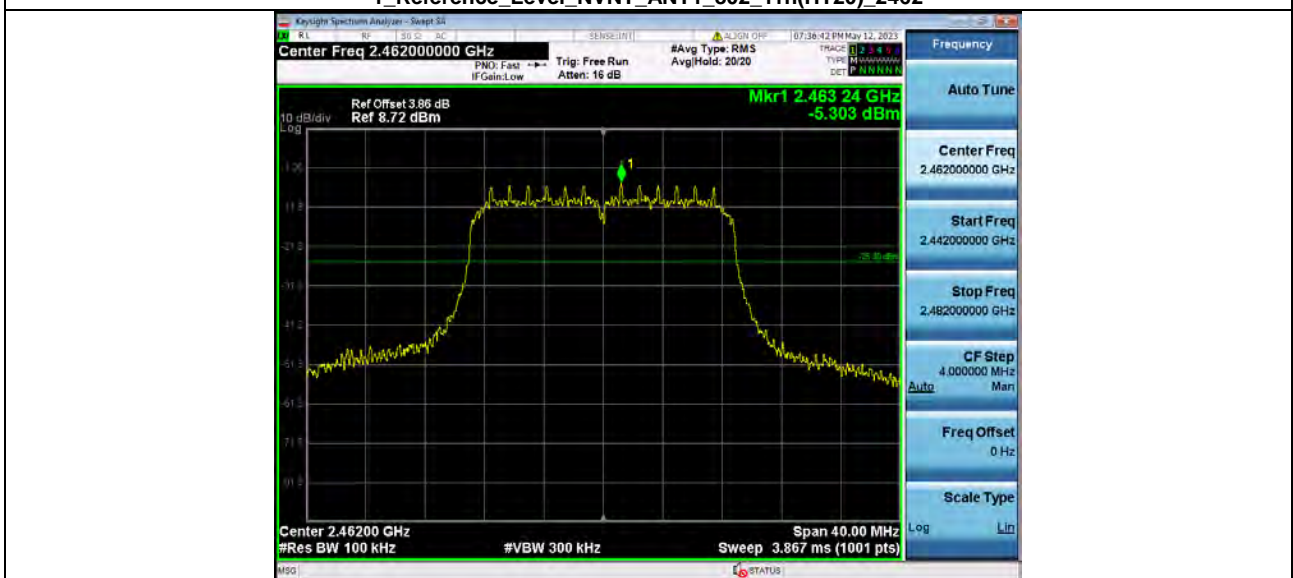


2\_Bandedge\_NVNT\_ANT1\_802\_11n(HT20)\_2412





1\_Reference\_Level\_NVNT\_ANT1\_802\_11n(HT20)\_2462



2\_Bandedge\_NVNT\_ANT1\_802\_11n(HT20)\_2462



## 4. MAX. OUTPUT POWER

Condition	Antenna	Modulation	Frequency (MHz)	Detector	Conducted Power(dBm)	limit(dBm)	Result
NVNT	ANT1	802.11b	2412.00	Peak	13.10	30	Pass
NVNT	ANT1	802.11b	2437.00	Peak	13.08	30	Pass
NVNT	ANT1	802.11b	2462.00	Peak	12.27	30	Pass
NVNT	ANT1	802.11g	2412.00	Peak	14.09	30	Pass
NVNT	ANT1	802.11g	2437.00	Peak	13.91	30	Pass
NVNT	ANT1	802.11g	2462.00	Peak	14.07	30	Pass
NVNT	ANT1	802.11n(HT20)	2412.00	Peak	13.04	30	Pass
NVNT	ANT1	802.11n(HT20)	2437.00	Peak	14.74	30	Pass
NVNT	ANT1	802.11n(HT20)	2462.00	Peak	13.56	30	Pass

Condition	Antenna	Modulation	Frequency (MHz)	Conducted Power(dBm)	ANT Gain(dBi)	EIRP (dBm)	limit(dBm)	Result
NVNT	ANT1	802.11b	2412.00	13.10	9.1	22.20	36	Pass
NVNT	ANT1	802.11b	2437.00	13.08	9.1	22.18	36	Pass
NVNT	ANT1	802.11b	2462.00	12.27	9.1	21.37	36	Pass
NVNT	ANT1	802.11g	2412.00	14.09	9.1	23.19	36	Pass
NVNT	ANT1	802.11g	2437.00	13.91	9.1	23.01	36	Pass
NVNT	ANT1	802.11g	2462.00	14.07	9.1	23.17	36	Pass
NVNT	ANT1	802.11n(HT20)	2412.00	13.04	9.1	22.14	36	Pass
NVNT	ANT1	802.11n(HT20)	2437.00	14.74	9.1	23.84	36	Pass
NVNT	ANT1	802.11n(HT20)	2462.00	13.56	9.1	22.66	36	Pass

5. POWER SPECTRAL DENSITY

Condition	Antenna	Modulation	Frequency (MHz)	PSD(dBm/3kHz)	limit(dBm/3kHz)	Result
NVNT	ANT1	802.11b	2412.00	-13.37	4.9	Pass
NVNT	ANT1	802.11b	2437.00	-12.33	4.9	Pass
NVNT	ANT1	802.11b	2462.00	-14.70	4.9	Pass
NVNT	ANT1	802.11g	2412.00	-17.21	4.9	Pass
NVNT	ANT1	802.11g	2437.00	-16.75	4.9	Pass
NVNT	ANT1	802.11g	2462.00	-17.39	4.9	Pass
NVNT	ANT1	802.11n(HT20)	2412.00	-17.62	4.9	Pass
NVNT	ANT1	802.11n(HT20)	2437.00	-16.98	4.9	Pass
NVNT	ANT1	802.11n(HT20)	2462.00	-18.01	4.9	Pass

Note: when the antenna gain is greater than 6dbi, the PSD limit should be original limit - (9.1-6)=8-3.1=4.9dB



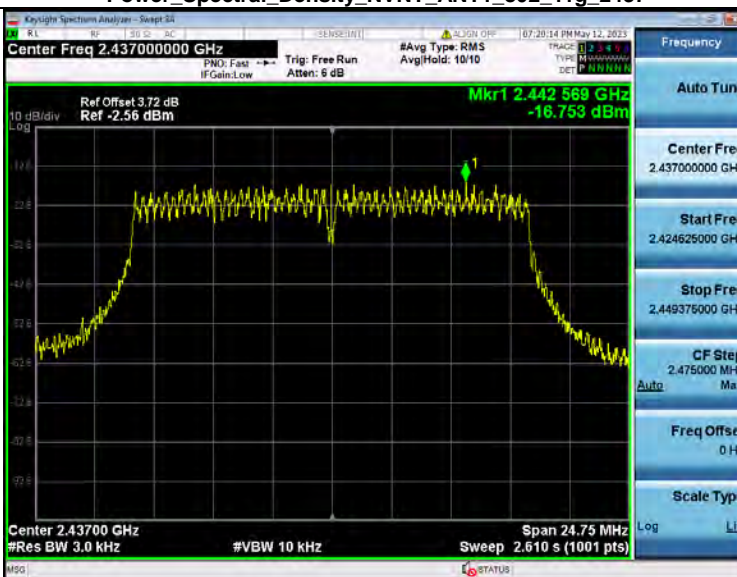
### Power Spectral Density NVNT\_ANT1\_802\_11b\_2462



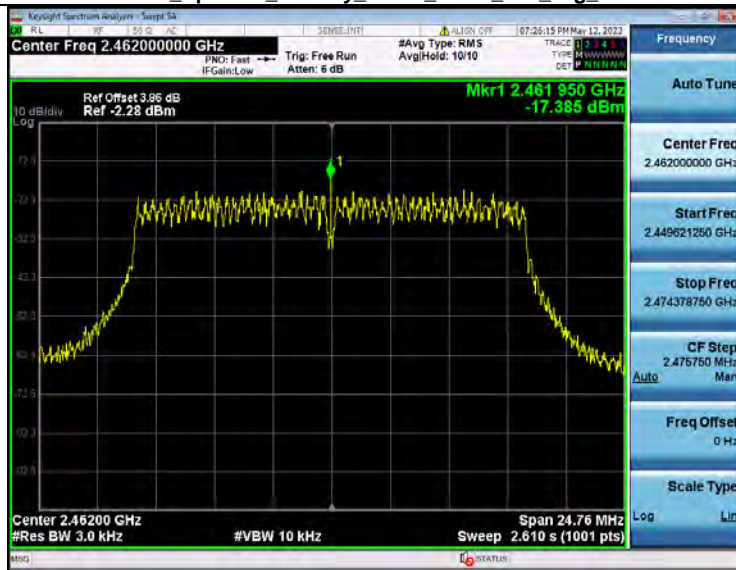
### Power Spectral Density NVNT\_ANT1\_802\_11g\_2412



### Power Spectral Density NVNT\_ANT1\_802\_11g\_2437



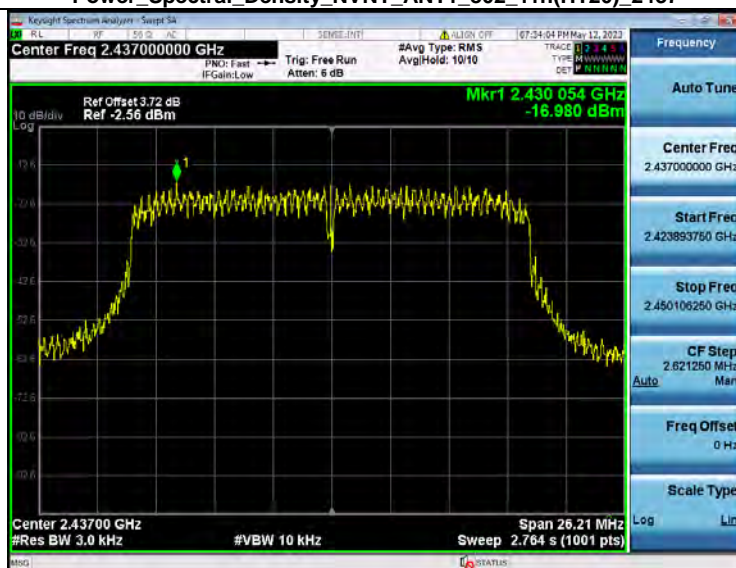
Power\_Spectral\_Density\_NVNT\_ANT1\_802\_11g\_2462



Power\_Spectral\_Density\_NVNT\_ANT1\_802\_11n(HT20)\_2412



Power\_Spectral\_Density\_NVNT\_ANT1\_802\_11n(HT20)\_2437



Power\_Spectral\_Density\_NVNT\_ANT1\_802\_11n(HT20)\_2462

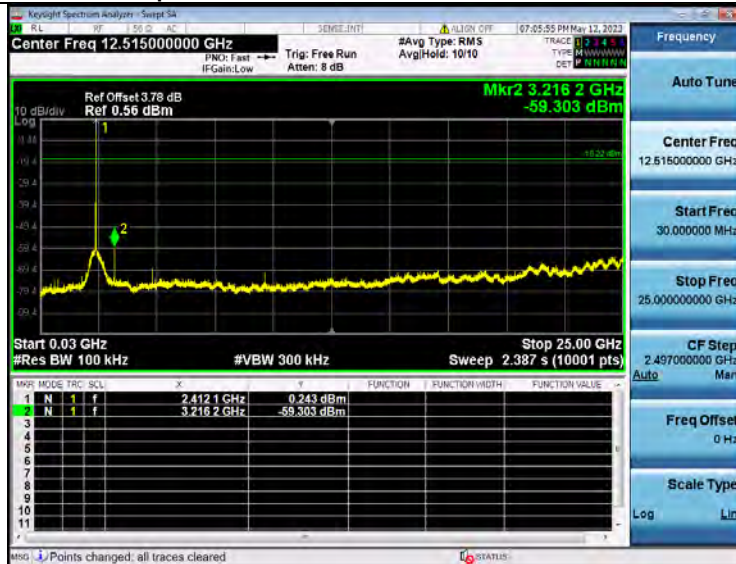


6. SPURIOUS EMISSION

1\_Reference\_Level\_NVNT\_ANT1\_802\_11b\_2412



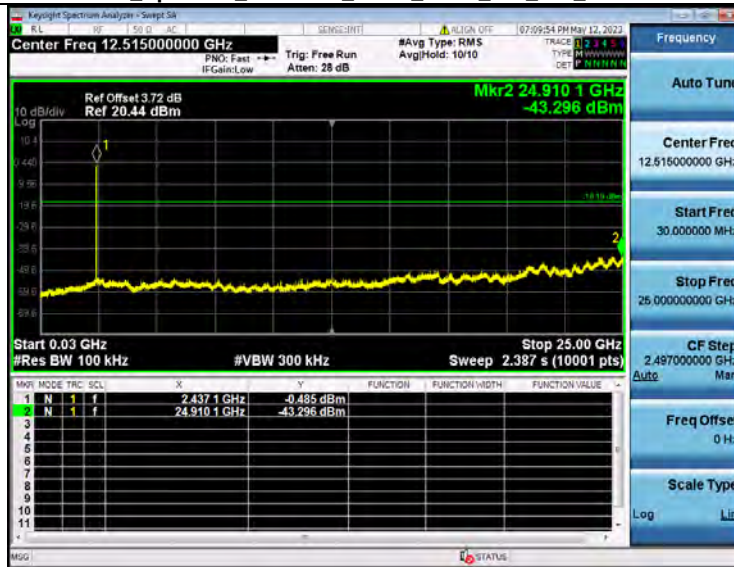
2\_Spurious\_Emission\_NVNT\_ANT1\_802\_11b\_2412



1\_Reference\_Level\_NVNT\_ANT1\_802\_11b\_2437



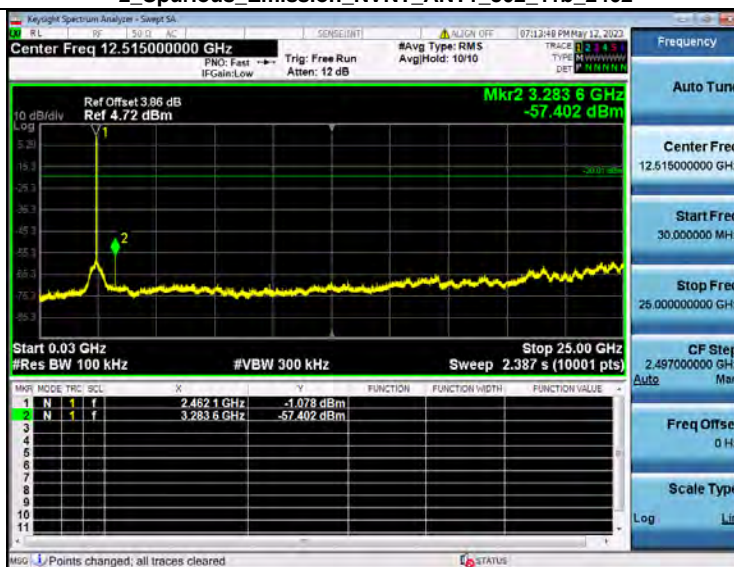
2\_Spurious\_Emission\_NVNT\_ANT1\_802\_11b\_2437



1\_Reference\_Level\_NVNT\_ANT1\_802\_11b\_2462

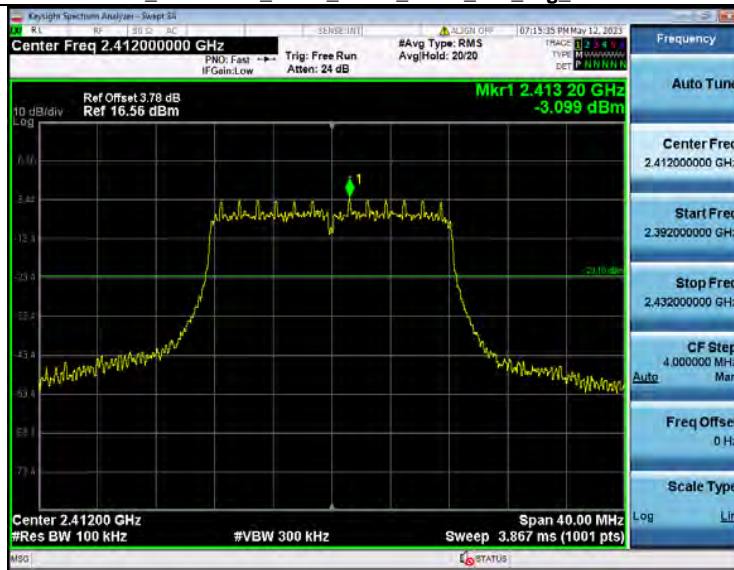


2\_Spurious\_Emission\_NVNT\_ANT1\_802\_11b\_2462





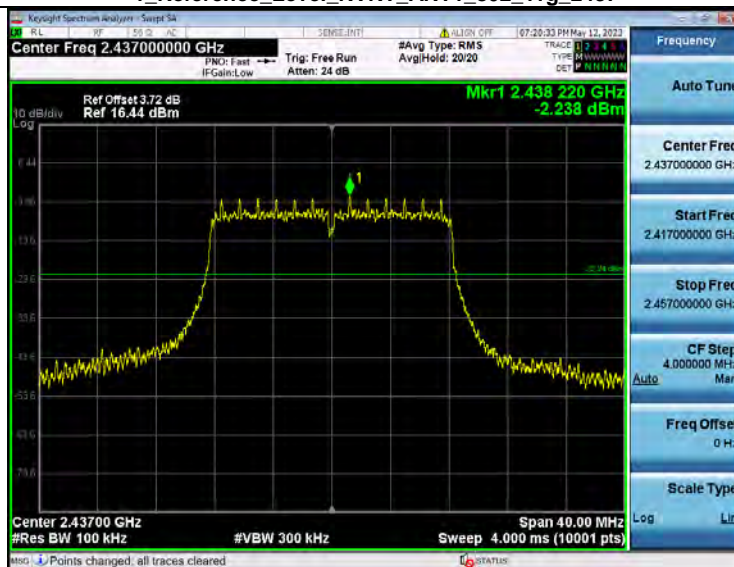
1\_Reference\_Level\_NVNT\_ANT1\_802\_11g\_2412



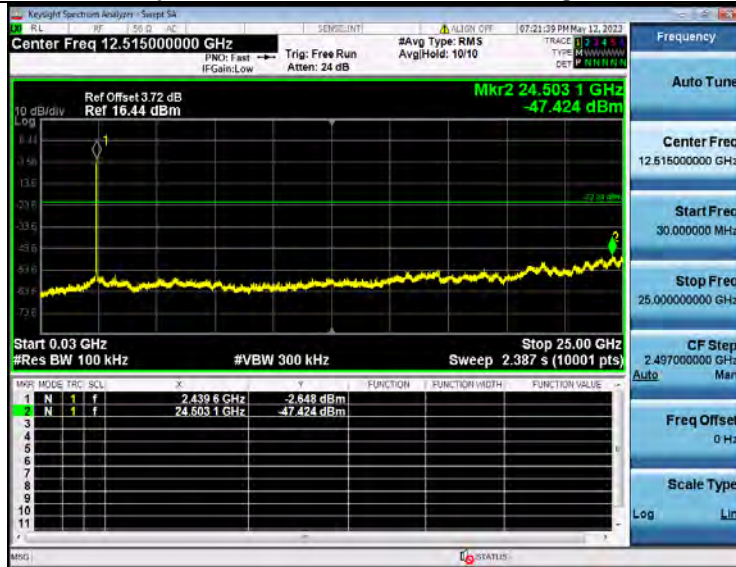
2\_Spurious\_Emission\_NVNT\_ANT1\_802\_11g\_2412



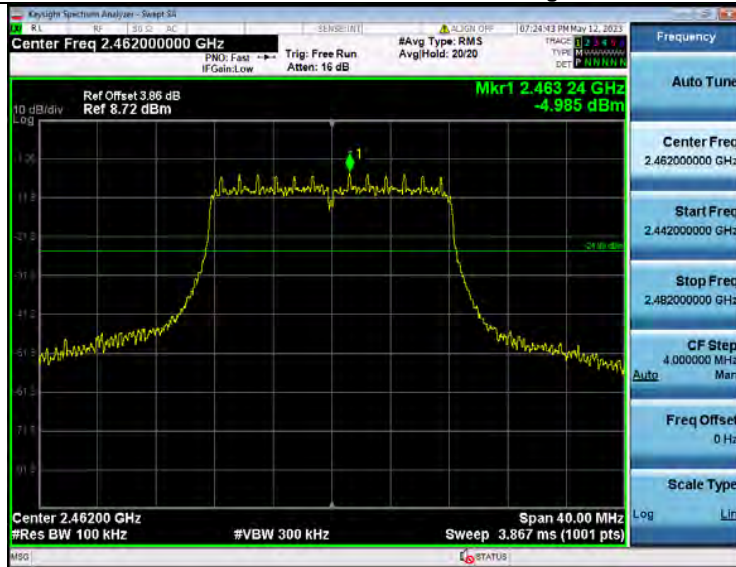
1\_Reference\_Level\_NVNT\_ANT1\_802\_11g\_2437



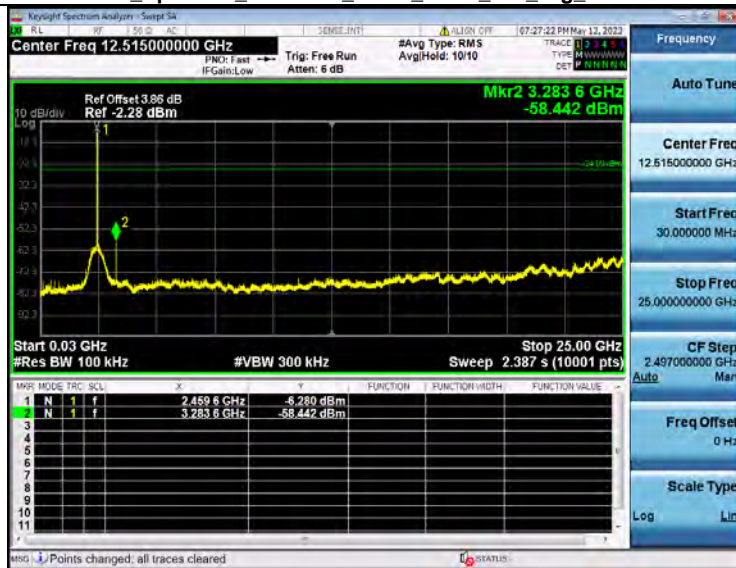
2\_Spurious\_Emission\_NVNT\_ANT1\_802\_11g\_2437



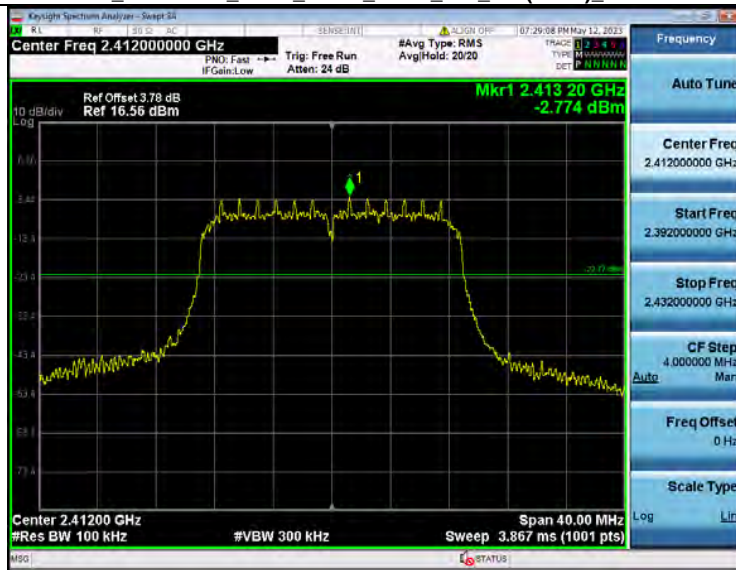
1\_Reference\_Level\_NVNT\_ANT1\_802\_11g\_2462



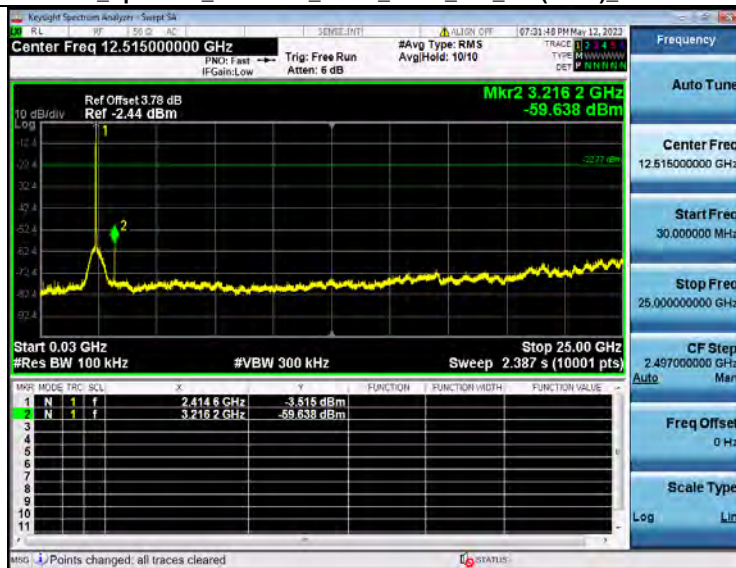
2\_Spurious\_Emission\_NVNT\_ANT1\_802\_11g\_2462



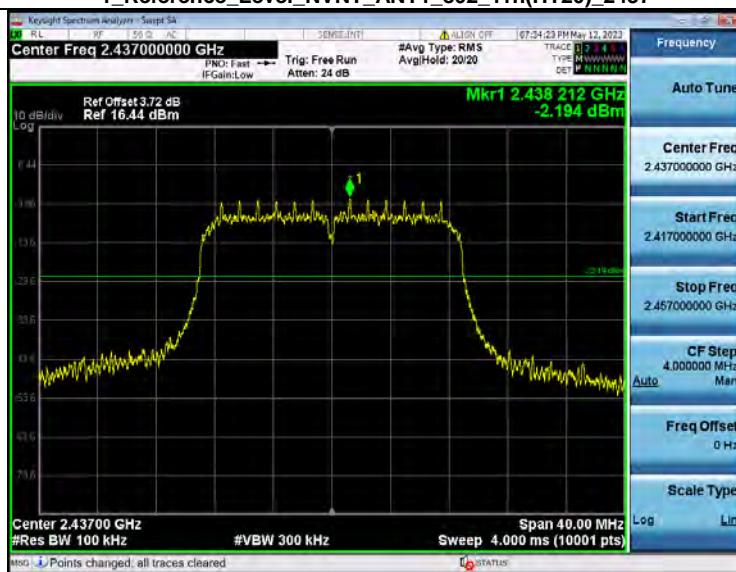
1\_Reference\_Level\_NVNT\_ANT1\_802\_11n(HT20)\_2412



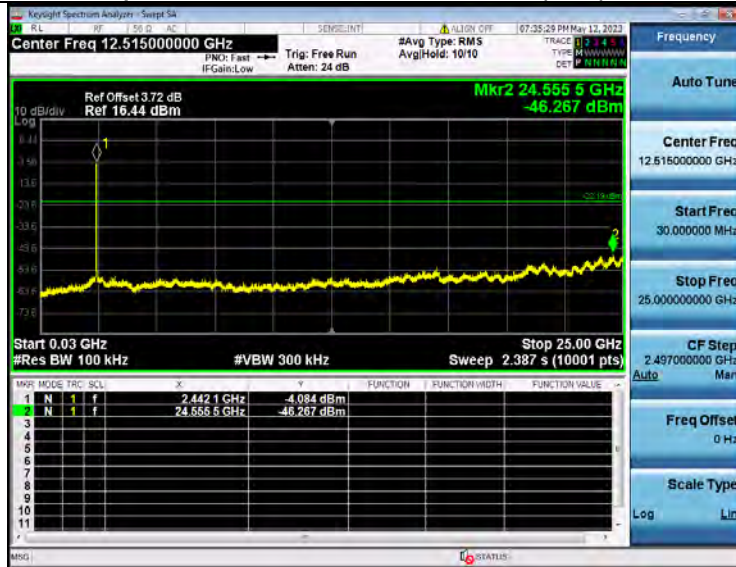
2\_Spurious\_Emission\_NVNT\_ANT1\_802\_11n(HT20)\_2412



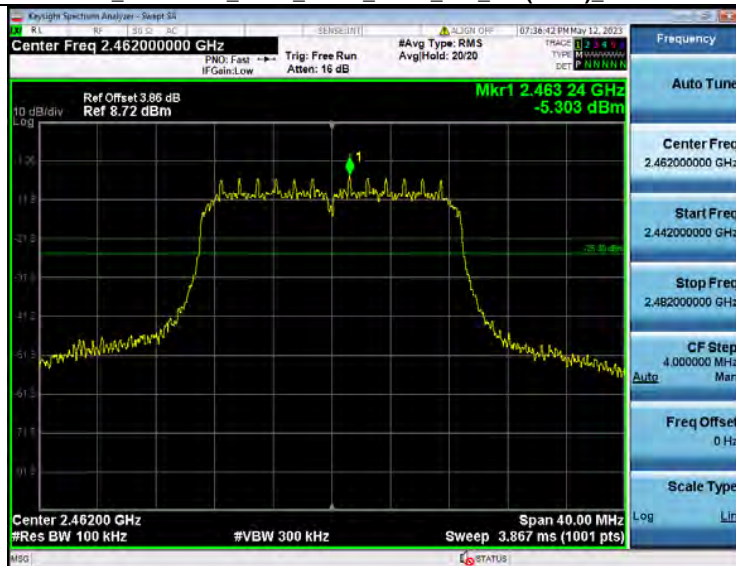
1\_Reference\_Level\_NVNT\_ANT1\_802\_11n(HT20)\_2437



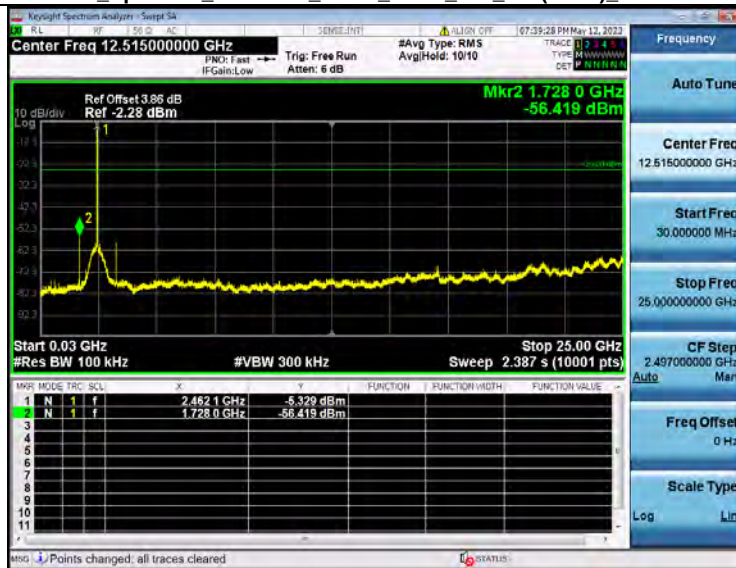
2\_Spurious\_Emission\_NVNT\_ANT1\_802\_11n(HT20)\_2437



1\_Reference\_Level\_NVNT\_ANT1\_802\_11n(HT20)\_2462



2\_Spurious\_Emission\_NVNT\_ANT1\_802\_11n(HT20)\_2462



12. TEST SETUP PHOTO



### 13. EUT CONSTRUCTIONAL DETAILS

Please refer to external photos file and internal photos file.

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