TEST REPORT

Application No.:	BTEK231024010AE
Applicant:	Shenzhen Haijixing Technology Co., Ltd
Address of Applicant:	2/F, No. 97 of Tianwan Road, Tianliao Community, Guangming New District, Shenzhen, China
Manufacturer:	Shenzhen Haijixing Technology Co., Ltd
Address of Manufacturer:	2/F, No. 97 of Tianwan Road, Tianliao Community, Guangming New District, Shenzhen, China
Factory:	Shenzhen Haijixing Technology Co., Ltd
Address of Factory:	2/F, No. 97 of Tianwan Road, Tianliao Community, Guangming New District, Shenzhen, China
Equipment Under Test (EUT):	
EUT Name:	Digital Camera
Model No.:	WD02, WD03, WD06, WD07, WD08, WD09, WD10 Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.
Trade Mark:	NA
Standard(s) :	47 CFR Part 15, Subpart C 15.247
Date of Receipt:	2023-10-24
Date of Test:	2023-10-24 to 2023-11-13
Date of Issue:	2023-11-13
Test Result:	**Pass***

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

Damon Su
EMC Laboratory Manager

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
01		2023-11-13		*Original*

Authorized for issue by				
		 **Carl Yang /Project Engineer**		
		 **Keven Tan /Reviewer**		

2 Test Summary

Radio Spectrum Technical Requirement				
Item	**Standard**	**Method**	**Requirement**	**Result**
Antenna Requirement	47 CFR Part 15, Subpart C 15.247	N/A	47 CFR Part 15, Subpart C 15.203 & 15.247(b)(4)	Pass

Radio Spectrum Matter Part				
Item	**Standard**	**Method**	**Requirement**	**Result**
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
Conducted Average Output Power		ANSI C63.10 (2013) Section 11.9.1.3	47 CFR Part 15, Subpart C 15.247(b)(3)	Pass
Minimum 6dB Bandwidth		ANSI C63.10 (2013) Section 11.8.1	47 CFR Part 15, Subpart C 15.247a(2)	Pass
Power Spectrum Density		ANSI C63.10 (2013) Section 11.10.2	47 CFR Part 15, Subpart C 15.247(e)	Pass
Conducted Band Edges Measurement		ANSI C63.10 (2013) Section 11.13.3.2	47 CFR Part 15, Subpart C 15.247(d)	Pass
Conducted Spurious Emissions		ANSI C63.10 (2013) Section 11.11	47 CFR Part 15, Subpart C 15.247(d)	Pass
Radiated Emissions which fall in the restricted bands		ANSI C63.10 (2013) Section 6.10.5	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass
Radiated Spurious Emissions (Below 1GHz)		ANSI C63.10 (2013) Section 6.4,6.5,6.6	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass
Radiated Spurious Emissions (Above 1GHz)		ANSI C63.10 (2013) Section 6.4,6.5,6.6	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass

Note:

E.U.T./EUT means Equipment Under Test.

Pass means the test result passed the test standard requirement, please find the detailed decision rule in the report relative section.

Model No.: WD02, WD03, WD06, WD07, WD08, WD09, WD10

Only the model WD02 was tested. According to the declaration from the applicant, the electrical circuit design, layout, components used, internal wiring and functions of other models are identical for the above models, with only difference on colour.

3 Contents

4 General Information

4.1 Details of E.U.T.

Power supply:	DC 3.7V 1500mAh by Rechargeable Lithium-Ion Battery and recharged by usb port.
Cable(s):	NA
Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz
Modulation Type:	802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) 802.11n20: OFDM (BPSK, QPSK, 16QAM, 64QAM)
Channel Numbers:	802.11b/g, 802.11n HT20: 11 Channels
Channel Spacing:	5MHz
Antenna Type:	PCB Antenna
Antenna Gain:	-0.58dBi
Hardware Version:	WD02F_LCD_V1.0
Software and Firmware Version:	V1.0
Remark: The information in this section is provided by the applicant or manufacturer, BANTEK is not liable to the accuracy, suitability, reliability or/and integrity of the information.	
Sample No.:	BTEK231024010AE-01

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
adapter	FUSHIGANG	AS1201A0502000USU	--

4.3 Measurement Uncertainty

Test Item	Measurement Uncertainty
Conducted Emissions at AC Power Line (150kHz-30MHz)	±3.12dB
Conducted Peak Output Power	± 0.75dB
Minimum 6dB Bandwidth	± 3%
Power Spectrum Density	± 2.84dB
Conducted Band Edges Measurement	± 0.75dB
Conducted Spurious Emissions	± 0.75dB
Radiated Emissions which fall in the restricted bands	±5.08dB (1GHz-6GHz);±5.14dB(above 6GHz)
Radiated Spurious Emissions (Below 1GHz)	±5.06dB (3m); ±4.46dB (10m)
Radiated Spurious Emissions (Above 1GHz)	±5.08dB (1GHz-6GHz);±5.14dB(above 6GHz)

4.4 Test Location

All tests were performed at:
Shenzhen BANTEK Testing Co., Ltd.,
A5&A6, Building B1&B2, No.45 Gangtou Road, Bogang Community, Shajing Street, Bao'an District, Shenzhen, Guangdong, China 518103
Tel:0755-2334 4200 Fax: 0755-2334 4200
FCC Registration Number: 264293
Designation Number: CN1356
No tests were sub-contracted.

4.5 Deviation from Standards

None

4.6 Abnormalities from Standard Conditions

None

5 Equipment List

Conducted Emissions at AC Power Line (150kHz-30MHz)					
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Shielding Room	YIHENG ENECTRONIC	9*5*3.3	YH-BT-220304-04	2022-03-03	2025-03-02
EMI Test Receiver	Rohde&Schwarz	ESCI	101021	2023-06-12	2024-06-11
Measurement Software	Fara	EZ_EMC Ver. FA-03A2	N/A	N/A	N/A
LISN	Rohde&Schwarz	ENV216	101472	2023-06-12	2024-06-11
LISN	Schwarzbeck	NSLK 8128	05127	2023-06-12	2024-06-11

RF Conducted					
Equipment	**Manufacturer**	**Model No**	**Serial No**	**Cal Date**	**Cal Due Date**
Shielding Room	YIHENG ENECTRONIC	5.5*3.1*3	YH-BT-220304-03	2022-03-03	2025-03-02
EXA Signal Analyzer	KEYSIGHT	N9020A	MY54230486	2023-06-12	2024-06-11
DC Power Supply	E3632A	E3642A	KR75304416	2023-06-12	2024-06-11
Attenuator	RswTech	SMA-JK-6dB	N/A	2023-06-12	2024-06-11
Attenuator	RswTech	SMA-JK-3dB	N/A	2023-06-12	2024-06-11
RF Control Unit	Techy	TR1029-1	N/A	2023-06-12	2024-06-11
RF Sensor Unit	Techy	TR1029-2	N/A	2023-06-12	2024-06-11
WIDEBAND RADIO COMMUNICATION TESTER	R&S	CMW 500	141258	2023-06-12	2024-06-11
MXG Vector Signal Generator	Agilent	N5182A	US46240522	2023-06-12	2024-06-11
Programmable Temperature&Humidity Chamber	GRT	GR-HWX1000	GR22051001	2023-06-12	2024-06-11
Measurement Software	TACHOY	RF TestSoft	N/A	N/A	N/A

RSE					
Equipment	**Manufacturer**	**Model No**	**Serial No**	**Cal Date**	**Cal Due Date**
3m Semi-Anechoic Chamber	YIHENG ENECTRONIC	966	YH-BT-220304-01	2022-05-06	2025-05-05
EMI Test Receiver	Rohde&Schwarz	ESCI	100694	2023-06-12	2024-06-11
TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	01324	2022-06-15	2025-06-14
Pre-Amplifier	Schwarzbeck	BBV 9745	#180	2023-06-12	2024-06-11
Measurement Software	Fara	EZ_EMC Ver. FA-03A2	N/A	2023-06-12	2024-06-11
EXA Signal Analyzer	Keysight	N9020A	MY54440290	2023-06-12	2024-06-11
Horn Antenna	Schwarzbeck	BBHA 9120D	02695	2022-06-15	2025-06-14
Pre-Amplifier	Tonscend	TAP0118045	AP20K806109	2023-06-12	2024-06-11
Horn Antenna	SCHWARZBECK	BBHA9170	1157	2022-06-15	2025-06-14
Low Noise Pre-amplifier	SKET	LNPA-1840G-	SK2022032902	2023-06-12	2024-06-11

		50			
Signal analyzer	ROHDE&SCHWARZ	FSQ40	100010	2023-06-12	2024-06-11
Loop Antenna	ETS	6502	00201177	2022-06-15	2025-06-14

General used equipment					
Equipment	**Manufacturer**	**Model No**	**Serial No**	**Cal Date**	**Cal Due Date**
Humidity/Temperature/Barometric Pressure Indicator	KUMAR	F132	N/A	2023-06-12	2024-06-11
Humidity/Temperature/Barometric Pressure Indicator	KUMAR	F132	N/A	2023-06-12	2024-06-11

6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203 & 15.247(b)(4)

6.1.2 Conclusion

Standard Requirement:

Testing shall be performed using the highest gain antenna of each combination of licence-exempt transmitter and antenna type, with the transmitter output power set at the maximum level. When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna manufacturer.

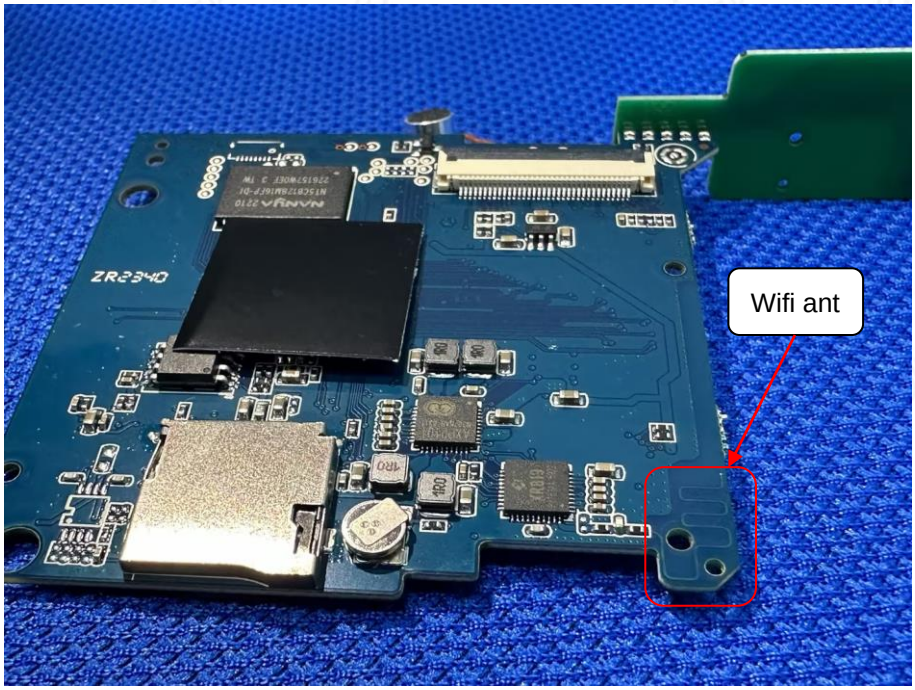
15.247(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

EUT Antenna:

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is -0.58dBi.

Please refer to internal photos.



7 Radio Spectrum Matter Test Results

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

Test Requirement 47 CFR Part 15, Subpart C 15.207

Test Method: ANSI C63.10 (2013) Section 6.2

Limit:

Frequency of emission(MHz)	Conducted limit(dBμV)	
	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.		
Detector: Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz		

7.1.1 E.U.T. Operation

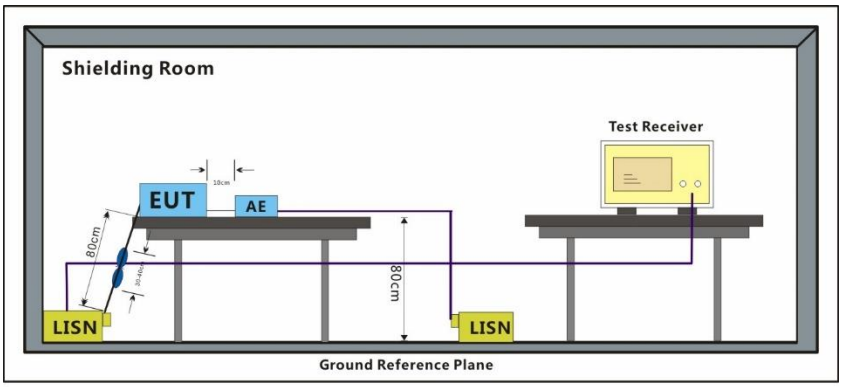
Operating Environment:

Temperature: 22.2 °C Humidity: 60.5 % RH Atmospheric Pressure: 1010 mbar

7.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	Charge + TX mode_Keep the EUT in charging and continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40). Only the data of worst case is recorded in the report.

7.1.3 Test Setup Diagram



7.1.4 Measurement Procedure and Data

1) The mains terminal disturbance voltage test was conducted in a shielded room.

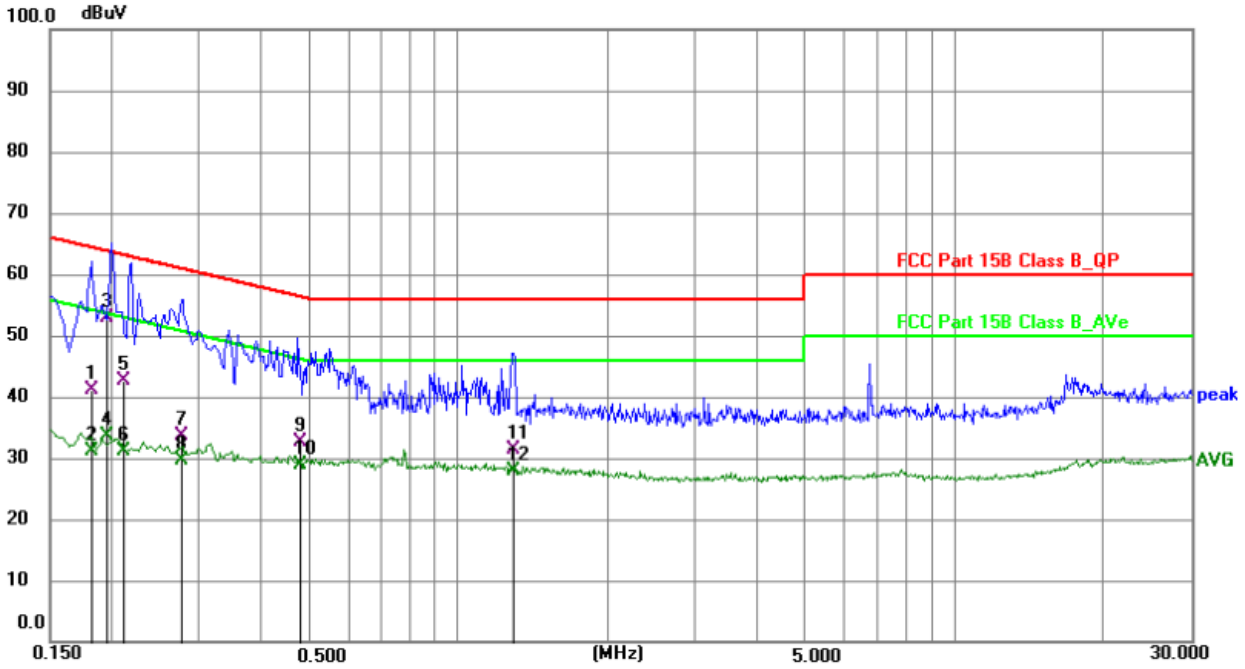
2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50μH + 5ohm linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as 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.

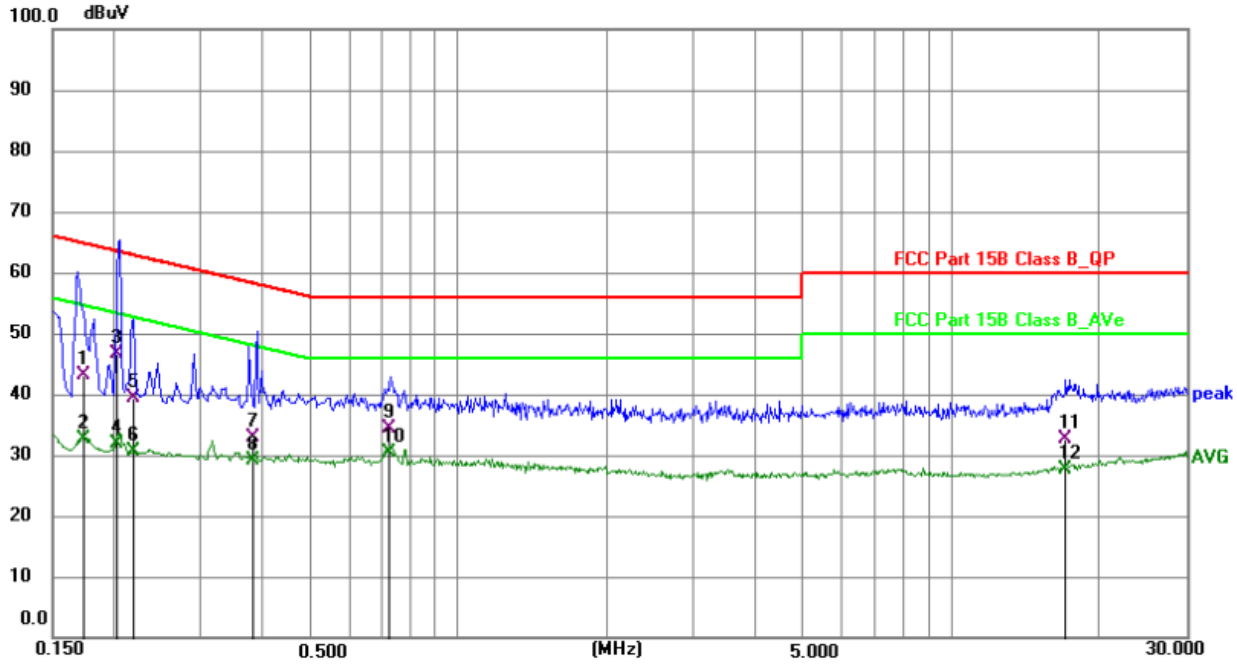
5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.

Test Mode: 01; Line: Live line; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1832	21.40	19.79	41.19	64.34	-23.15	QP	P	
2	0.1832	11.40	19.79	31.19	54.34	-23.15	AVG	P	
3 *	0.1955	33.17	19.80	52.97	63.80	-10.83	QP	P	
4	0.1955	13.79	19.80	33.59	53.80	-20.21	AVG	P	
5	0.2119	22.88	19.81	42.69	63.13	-20.44	QP	P	
6	0.2119	11.21	19.81	31.02	53.13	-22.11	AVG	P	
7	0.2759	13.77	19.81	33.58	60.94	-27.36	QP	P	
8	0.2759	9.90	19.81	29.71	50.94	-21.23	AVG	P	
9	0.4789	12.76	19.84	32.60	56.36	-23.76	QP	P	
10	0.4789	9.14	19.84	28.98	46.36	-17.38	AVG	P	
11	1.2935	11.29	20.04	31.33	56.00	-24.67	QP	P	
12	1.2935	7.83	20.04	27.87	46.00	-18.13	AVG	P	

Test Mode: 01; Line: Neutral Line; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1728	23.44	19.79	43.23	64.82	-21.59	QP	P	
2	0.1728	12.73	19.79	32.52	54.82	-22.30	AVG	P	
3	0.2028	26.70	19.81	46.51	63.50	-16.99	QP	P	
4	0.2028	12.03	19.81	31.84	53.50	-21.66	AVG	P	
5	0.2177	19.64	19.82	39.46	62.91	-23.45	QP	P	
6	0.2177	10.70	19.82	30.52	52.91	-22.39	AVG	P	
7	0.3820	13.14	19.83	32.97	58.24	-25.27	QP	P	
8	0.3820	9.36	19.83	29.19	48.24	-19.05	AVG	P	
9	0.7300	14.38	19.92	34.30	56.00	-21.70	QP	P	
10 *	0.7300	10.38	19.92	30.30	46.00	-15.70	AVG	P	
11	17.0785	11.12	21.53	32.65	60.00	-27.35	QP	P	
12	17.0785	6.02	21.53	27.55	50.00	-22.45	AVG	P	

Note:
1) Pre-scan all modes and recorded the worst case results in this report(Low Channel).
2) Level= Reading+ Factor; Margin=Level-limit.

7.2 Conducted Average Output Power

Test Requirement 47 CFR Part 15, Subpart C 15.247(b)(3)
Test Method: ANSI C63.10 (2013) Section 11.9.1.3
Limit:

Frequency range(MHz)	Output power of the intentional radiator(watt)
902-928	1 for ≥50 hopping channels
	0.25 for 25≤ hopping channels <50
	1 for digital modulation
2400-2483.5	1 for ≥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

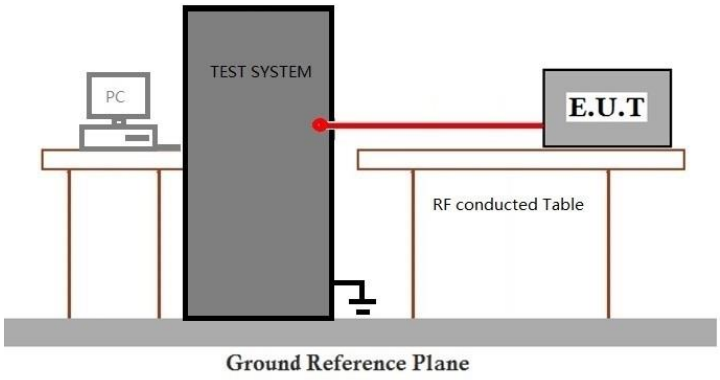
7.2.1 E.U.T. Operation

Operating Environment:
Temperature: 20.5 °C Humidity: 50.0 % RH Atmospheric Pressure: 1010 mbar

7.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Pre-scan	00	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); Only the data of worst case is recorded in the report.
Final test	01	Charge + TX mode_Keep the EUT in charging and continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); Only the data of worst case is recorded in the report.

7.2.3 Test Setup Diagram



7.2.4 Measurement Procedure and Data

cable loss=0.9dB

Please Refer to Appendix for Details

7.3 Minimum 6dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.247a(2)
Test Method: ANSI C63.10 (2013) Section 11.8.1
Limit: ≥500 kHz

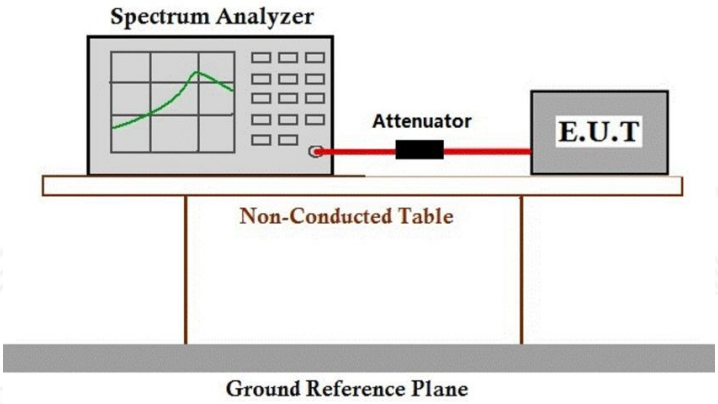
7.3.1 E.U.T. Operation

Operating Environment:
Temperature: 20.5 °C Humidity: 50.0 % RH Atmospheric Pressure: 1010 mbar

7.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Pre-scan	00	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); Only the data of worst case is recorded in the report.
Final test	01	Charge + TX mode_Keep the EUT in charging and continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); Only the data of worst case is recorded in the report.

7.3.3 Test Setup Diagram



7.3.4 Measurement Procedure and Data

cable loss=0.9dB

Please Refer to Appendix for Details

7.4 Power Spectrum Density

Test Requirement 47 CFR Part 15, Subpart C 15.247(e)

Test Method: ANSI C63.10 (2013) Section 11.10.2

Limit:

≤8dBm in any 3 kHz band during any time interval of continuous transmission

7.4.1 E.U.T. Operation

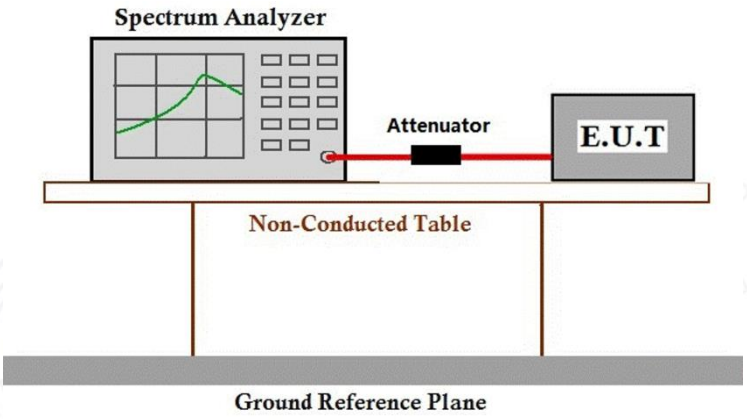
Operating Environment:

Temperature: 20.5 °C Humidity: 50.0 % RH Atmospheric Pressure: 1010 mbar

7.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Pre-scan	00	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); Only the data of worst case is recorded in the report.
Final test	01	Charge + TX mode_Keep the EUT in charging and continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); Only the data of worst case is recorded in the report.

7.4.3 Test Setup Diagram



7.4.4 Measurement Procedure and Data

cable loss=0.9dB

Please Refer to Appendix for Details

7.5 Conducted Band Edges Measurement

Test Requirement 47 CFR Part 15, Subpart C 15.247(d)

Test Method: ANSI C63.10 (2013) Section 11.13.3.2

Limit:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted 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).

7.5.1 E.U.T. Operation

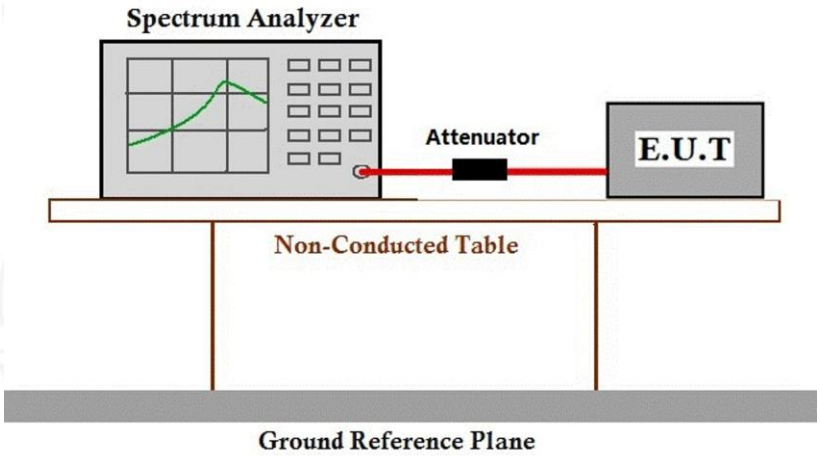
Operating Environment:

Temperature: 20.5 °C Humidity: 50.0 % RH Atmospheric Pressure: 1010 mbar

7.5.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Pre-scan	00	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); Only the data of worst case is recorded in the report.
Final test	01	Charge + TX mode_Keep the EUT in charging and continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); Only the data of worst case is recorded in the report.

7.5.3 Test Setup Diagram



7.5.4 Measurement Procedure and Data

cable loss=0.9dB

Please Refer to Appendix for Details

7.6 Conducted Spurious Emissions

Test Requirement 47 CFR Part 15, Subpart C 15.247(d)

Test Method: ANSI C63.10 (2013) Section 11.11

Limit:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted 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).

7.6.1 E.U.T. Operation

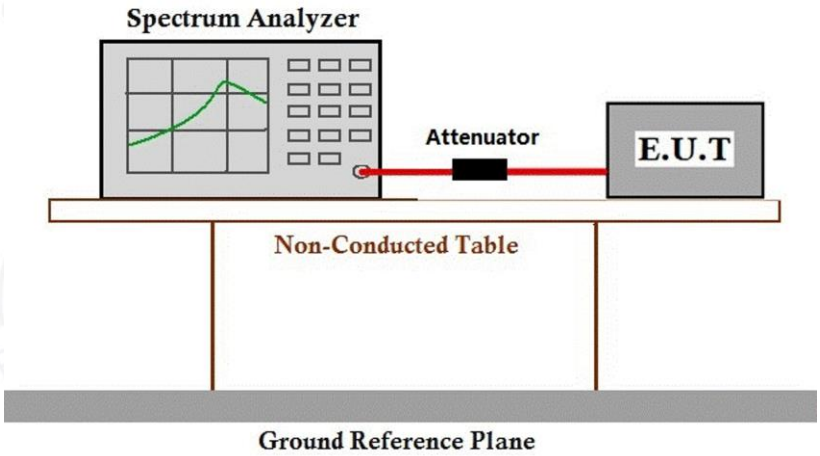
Operating Environment:

Temperature: 20.5 °C Humidity: 50.0 % RH Atmospheric Pressure: 1010 mbar

7.6.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Pre-scan	00	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); Only the data of worst case is recorded in the report.
Final test	01	Charge + TX mode_Keep the EUT in charging and continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); Only the data of worst case is recorded in the report.

7.6.3 Test Setup Diagram



7.6.4 Measurement Procedure and Data

cable loss=0.9dB

Please Refer to Appendix for Details

7.7 Radiated Emissions which fall in the restricted bands

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209
Test Method: ANSI C63.10 (2013) Section 6.10.5
Limit:

Frequency(MHz)	Field strength(microvolts/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
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.		

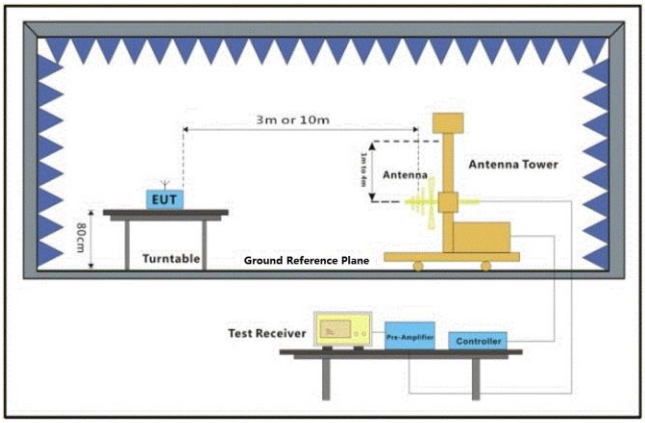
7.7.1 E.U.T. Operation

Operating Environment:
Temperature: 21.4 °C Humidity: 54.3 % RH Atmospheric Pressure: 1010 mbar

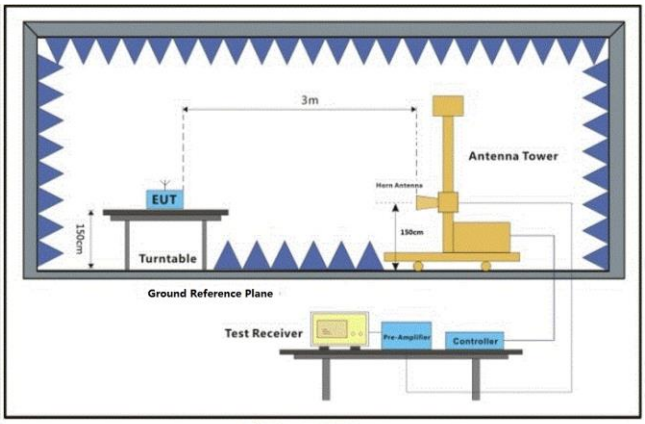
7.7.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Pre-scan	00	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); Only the data of worst case is recorded in the report.
Final test	01	Charge + TX mode_Keep the EUT in charging and continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); Only the data of worst case is recorded in the report.

7.7.3 Test Setup Diagram



30MHz-1GHz



Above 1GHz

7.7.4 Measurement Procedure and Data

a. 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.

b. 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.

c. 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.

d. 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.

e. 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.

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

g. 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 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.

Test Mode: 01; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:Low

No.	Frequency (MHz)	Reading (dBuv)	Factor (dB/m)	Level (dBuv/m)	Limit (dBuv/m)	Margin(dB)	Detector	P/F
1	2310.000	69.01	-30.59	38.42	74.00	-35.58	peak	P
2	2390.000	69.14	-30.49	38.65	74.00	-35.35	peak	P
3	2400.000	78.66	-30.48	48.18	74.00	-25.82	peak	P

Test Mode: 01; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:Low

No.	Frequency (MHz)	Reading (dBuv)	Factor (dB/m)	Level (dBuv/m)	Limit (dBuv/m)	Margin(dB)	Detector	P/F
1	2310.000	67.65	-30.59	37.06	74.00	-36.94	peak	P
2	2390.000	68.91	-30.49	38.42	74.00	-35.58	peak	P
3	2400.000	78.00	-30.48	47.52	74.00	-26.48	peak	P

Test Mode: 01; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:High

No.	Frequency (MHz)	Reading (dBuv)	Factor (dB/m)	Level (dBuv/m)	Limit (dBuv/m)	Margin(dB)	Detector	P/F
1	2483.500	79.85	-30.39	49.46	74.00	-24.54	peak	P
2	2500.000	70.22	-30.37	39.85	74.00	-34.15	peak	P

Test Mode: 01; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:High

No.	Frequency (MHz)	Reading (dBuv)	Factor (dB/m)	Level (dBuv/m)	Limit (dBuv/m)	Margin(dB)	Detector	P/F
1	2483.500	79.10	-30.39	48.71	74.00	-25.29	peak	P
2	2500.000	71.86	-30.37	41.49	74.00	-32.51	peak	P

Test Mode: 01; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:Low

No.	Frequency (MHz)	Reading (dBuv)	Factor (dB/m)	Level (dBuv/m)	Limit (dBuv/m)	Margin(dB)	Detector	P/F
1	2310.000	67.80	-30.59	37.21	74.00	-36.79	peak	P
2	2390.000	70.30	-30.49	39.81	74.00	-34.19	peak	P
3	2400.000	77.48	-30.48	47.00	74.00	-27.00	peak	P

Test Mode: 01; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:Low

No.	Frequency (MHz)	Reading (dBuv)	Factor (dB/m)	Level (dBuv/m)	Limit (dBuv/m)	Margin(dB)	Detector	P/F
1	2310.000	68.32	-30.59	37.73	74.00	-36.27	peak	P
2	2390.000	69.31	-30.49	38.82	74.00	-35.18	peak	P
3	2400.000	77.63	-30.48	47.15	74.00	-26.85	peak	P

Test Mode: 01; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:High

No.	Frequency (MHz)	Reading (dBuv)	Factor (dB/m)	Level (dBuv/m)	Limit (dBuv/m)	Margin(dB)	Detector	P/F
1	2483.500	79.28	-30.39	48.89	74.00	-25.11	peak	P
2	2500.000	71.69	-30.37	41.32	74.00	-32.68	peak	P

Test Mode: 01; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:High

No.	Frequency (MHz)	Reading (dBuv)	Factor (dB/m)	Level (dBuv/m)	Limit (dBuv/m)	Margin(dB)	Detector	P/F
1	2483.500	79.02	-30.39	48.63	74.00	-25.37	peak	P
2	2500.000	71.75	-30.37	41.38	74.00	-32.62	peak	P

Test Mode: 01; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:Low

No.	Frequency (MHz)	Reading (dBuv)	Factor (dB/m)	Level (dBuv/m)	Limit (dBuv/m)	Margin(dB)	Detector	P/F
1	2310.000	69.05	-30.59	38.46	74.00	-35.54	peak	P
2	2390.000	70.47	-30.49	39.98	74.00	-34.02	peak	P
3	2400.000	79.25	-30.48	48.77	74.00	-25.23	peak	P

Test Mode: 01; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:Low

No.	Frequency (MHz)	Reading (dBuv)	Factor (dB/m)	Level (dBuv/m)	Limit (dBuv/m)	Margin(dB)	Detector	P/F
1	2310.000	67.26	-30.59	36.67	74.00	-37.33	peak	P
2	2390.000	69.36	-30.49	38.87	74.00	-35.13	peak	P
3	2400.000	77.57	-30.48	47.09	74.00	-26.91	peak	P

Test Mode: 01; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:High

No.	Frequency (MHz)	Reading (dBuv)	Factor (dB/m)	Level (dBuv/m)	Limit (dBuv/m)	Margin(dB)	Detector	P/F
1	2483.500	79.06	-30.39	48.67	74.00	-25.33	peak	P
2	2500.000	70.29	-30.37	39.92	74.00	-34.08	peak	P

Test Mode: 01; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:High

No.	Frequency (MHz)	Reading (dBuv)	Factor (dB/m)	Level (dBuv/m)	Limit (dBuv/m)	Margin(dB)	Detector	P/F
1	2483.500	79.36	-30.39	48.97	74.00	-25.03	peak	P
2	2500.000	71.99	-30.37	41.62	74.00	-32.38	peak	P

Note: Level = Reading level + Factor
Factor= Antenna Factor+ Cable Loss-Preamp Factor

7.8 Radiated Spurious Emissions (Below 1GHz)

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209
Test Method: ANSI C63.10 (2013) Section 6.4,6.5,6.6
Limit:

Frequency(MHz)	Field strength(microvolts/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
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.		

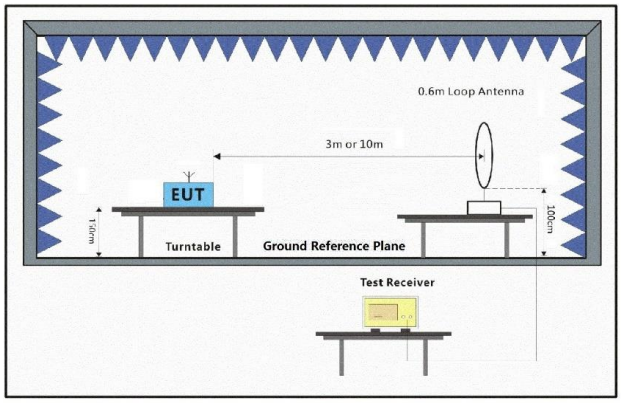
7.8.1 E.U.T. Operation

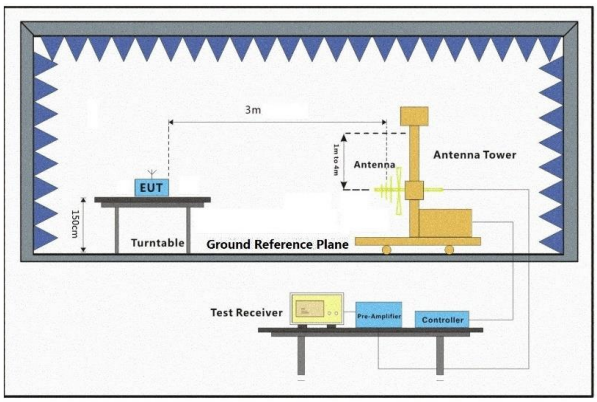
Operating Environment:
Temperature: 25.5 °C Humidity: 68.6 % RH Atmospheric Pressure: 1010 mbar

7.8.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Pre-scan	00	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); Only the data of worst case is recorded in the report.
Final test	01	Charge + TX mode_Keep the EUT in charging and continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); Only the data of worst case is recorded in the report.

7.8.3 Test Setup Diagram





7.8.4 Measurement Procedure and Data

a. 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.

b. 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.

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.

g. Test the EUT in the lowest channel, the middle channel, the Highest channel.

h. 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.

i. Repeat above procedures until all frequencies measured was complete.

Remark:

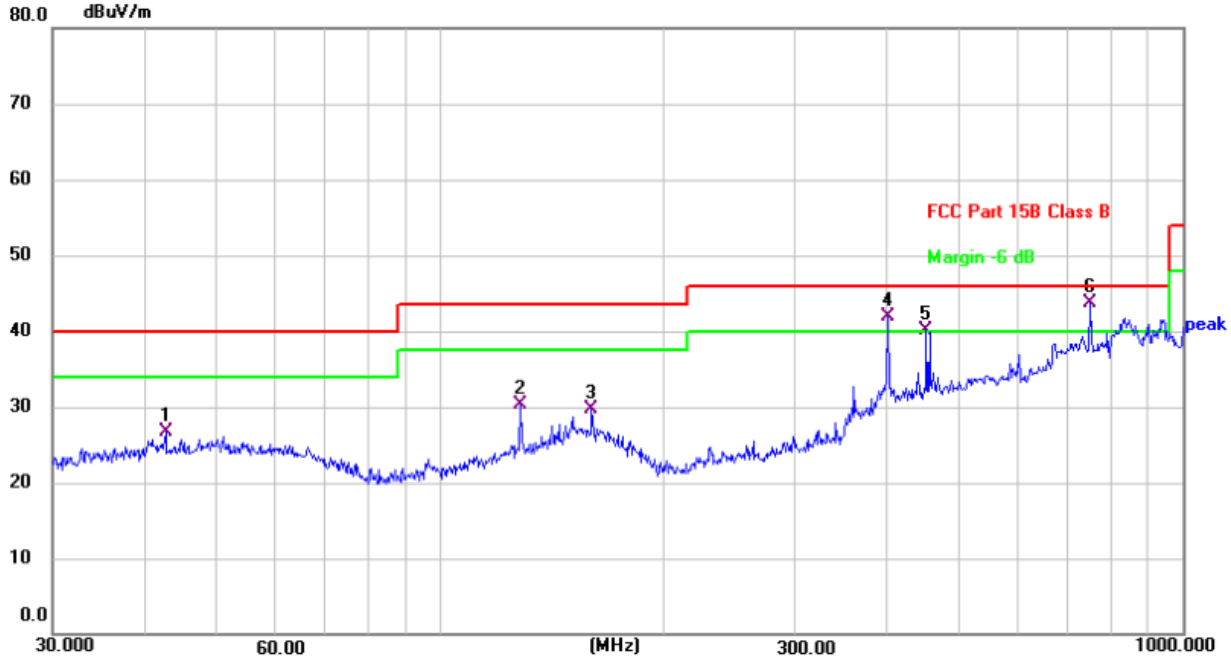
1) Through pre-scan found the worst case is the lowest channel. Only the worst case is recorded in the report.

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

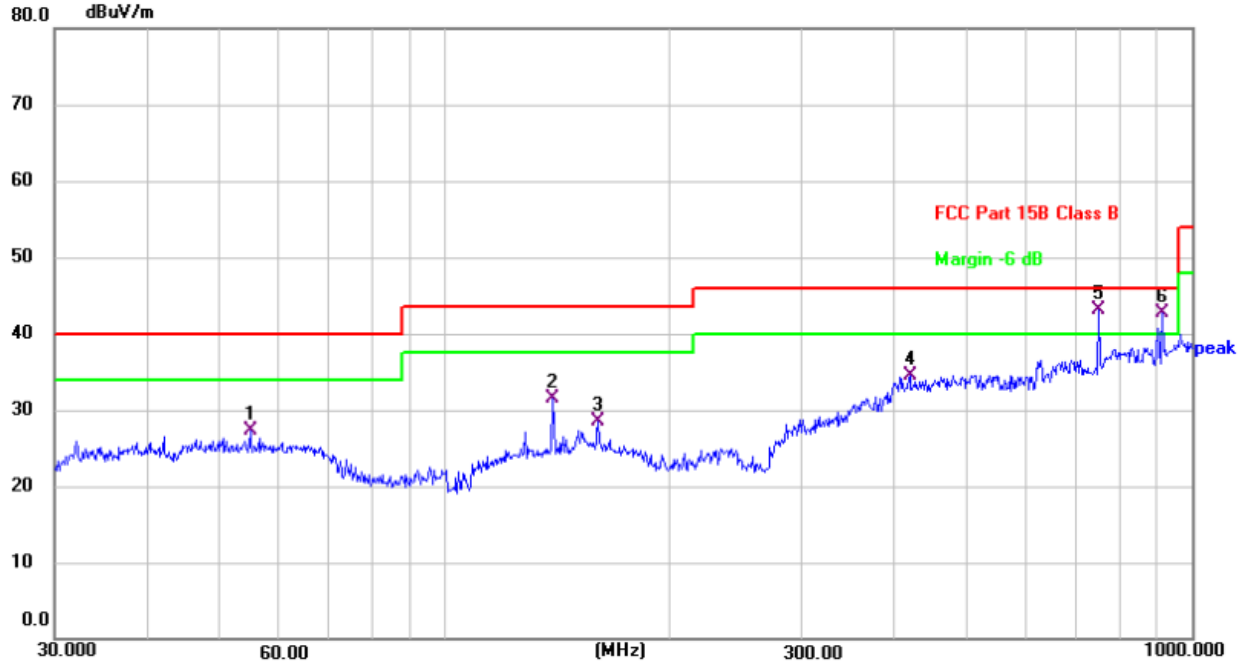
3) Scan from 9kHz to 1 GHz, the disturbance below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

Test Mode: 01; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	42.6000	44.12	-17.41	26.71	40.00	-13.29	QP	126	56	P	
2	128.1130	48.64	-18.26	30.38	43.50	-13.12	QP	100	46	P	
3	159.7844	46.88	-17.23	29.65	43.50	-13.85	QP	100	53	P	
4 !	400.4318	57.16	-15.34	41.82	46.00	-4.18	QP	256	126	P	
5 !	451.1350	54.23	-14.15	40.08	46.00	-5.92	QP	43	251	P	
6 *	750.1082	52.65	-8.86	43.79	46.00	-2.21	QP	56	254	P	

Test Mode: 01; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	54.8348	45.20	-17.85	27.35	40.00	-12.65	QP	100	25	P	
2	139.3610	49.09	-17.52	31.57	43.50	-11.93	QP	256	126	P	
3	160.3454	45.91	-17.32	28.59	43.50	-14.91	QP	123	125	P	
4	419.1080	49.39	-14.83	34.56	46.00	-11.44	QP	126	46	P	
5 *	750.1082	52.01	-8.86	43.15	46.00	-2.85	QP	125	25	P	
6 !	912.8620	50.42	-7.77	42.65	46.00	-3.35	QP	251	135	P	

Note:

1) Pre-scan all modes and recorded the worst case results in this report (Low Channel).
2) Emission level (dBuV/m) = 20 log Emission level (uV/m).
3) Level= Reading+ Factor, Margin= Level- Limit, Factor= Antenna Factor Cable Loss-Preamp Factor

7.9 Radiated Spurious Emissions (Above 1GHz)

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209
Test Method: ANSI C63.10 (2013) Section 6.4,6.5,6.6
Limit:

Frequency(MHz)	Field strength(microvolts/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
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.		

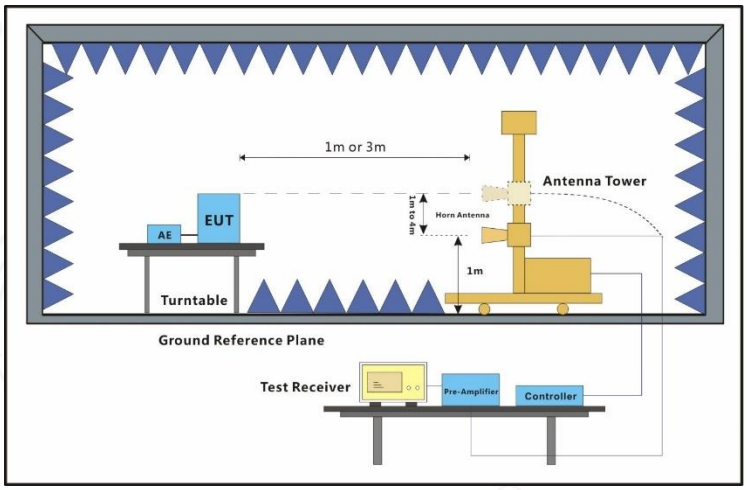
7.9.1 E.U.T. Operation

Operating Environment:
Temperature: 21.4 °C Humidity: 54.3 % RH Atmospheric Pressure: 1010 mbar

7.9.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Pre-scan	00	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); Only the data of worst case is recorded in the report.
Final test	01	Charge + TX mode_Keep the EUT in charging and continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); Only the data of worst case is recorded in the report.

7.9.3 Test Setup Diagram



7.9.4 Measurement Procedure and Data

a. 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.

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 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.

g. Test the EUT in the lowest channel, the middle channel, the Highest channel.

h. 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.

i. Repeat above procedures until all frequencies measured was complete.

Remark:

1) 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

2) Scan from 1GHz to 25GHz, the disturbance above 18GHz 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.

3) 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.

Test Mode: 01; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:Low

No.	Frequency (MHz)	Reading (dBuv)	Factor (dB/m)	Level (dBuv/m)	Limit (dBuv/m)	Margin(dB)	Detector	P/F
1	2913.943	70.00	-29.79	40.21	74.00	-33.79	peak	P
2	4277.113	68.14	-29.41	38.73	74.00	-35.27	peak	P
3	6085.668	65.26	-26.15	39.11	74.00	-34.89	peak	P
4	8646.750	70.38	-24.35	46.04	74.00	-27.96	peak	P
5	11046.718	68.57	-24.23	44.34	74.00	-29.66	peak	P
6	14218.893	70.86	-20.97	49.89	74.00	-24.11	peak	P

Test Mode: 01; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:Low

No.	Frequency (MHz)	Reading (dBuv)	Factor (dB/m)	Level (dBuv/m)	Limit (dBuv/m)	Margin(dB)	Detector	P/F
1	2973.906	67.34	-30.48	36.86	74.00	-37.14	peak	P
2	4312.961	67.99	-29.72	38.27	74.00	-35.73	peak	P
3	6352.592	67.93	-26.14	41.78	74.00	-32.22	peak	P
4	8576.764	70.69	-24.81	45.88	74.00	-28.12	peak	P
5	11286.453	67.06	-23.49	43.57	74.00	-30.43	peak	P
6	14955.660	70.49	-20.26	50.24	74.00	-23.76	peak	P

Test Mode: 01; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:middle

No.	Frequency (MHz)	Reading (dBuv)	Factor (dB/m)	Level (dBuv/m)	Limit (dBuv/m)	Margin(dB)	Detector	P/F
1	2915.016	69.16	-29.06	40.10	74.00	-33.90	peak	P
2	4276.675	67.63	-28.88	38.75	74.00	-35.25	peak	P
3	6085.948	63.99	-24.78	39.21	74.00	-34.79	peak	P
4	8645.834	69.16	-24.46	44.70	74.00	-29.30	peak	P
5	11047.230	68.26	-22.92	45.34	74.00	-28.66	peak	P
6	14217.427	70.15	-21.44	48.71	74.00	-25.29	peak	P

Test Mode: 01; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:middle

No.	Frequency (MHz)	Reading (dBuv)	Factor (dB/m)	Level (dBuv/m)	Limit (dBuv/m)	Margin(dB)	Detector	P/F
1	2973.685	66.82	-28.88	37.94	74.00	-36.06	peak	P
2	4313.550	68.68	-29.24	39.44	74.00	-34.56	peak	P
3	6352.366	67.99	-25.96	42.03	74.00	-31.97	peak	P
4	8576.404	69.92	-25.92	43.99	74.00	-30.01	peak	P
5	11286.338	67.40	-22.84	44.57	74.00	-29.43	peak	P
6	14956.687	70.90	-20.11	50.80	74.00	-23.20	peak	P

Test Mode: 01; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:High

No.	Frequency (MHz)	Reading (dBuv)	Factor (dB/m)	Level (dBuv/m)	Limit (dBuv/m)	Margin(dB)	Detector	P/F
1	2914.476	68.68	-29.44	39.23	74.00	-34.77	peak	P
2	4277.144	67.26	-29.13	38.13	74.00	-35.87	peak	P
3	6084.584	65.71	-24.88	40.83	74.00	-33.17	peak	P
4	8645.602	70.55	-25.71	44.84	74.00	-29.16	peak	P
5	11047.458	67.14	-24.34	42.81	74.00	-31.19	peak	P
6	14217.526	70.38	-21.14	49.25	74.00	-24.75	peak	P

Test Mode: 01; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:High

No.	Frequency (MHz)	Reading (dBuv)	Factor (dB/m)	Level (dBuv/m)	Limit (dBuv/m)	Margin(dB)	Detector	P/F
1	2972.852	66.53	-28.96	37.57	74.00	-36.43	peak	P
2	4312.705	68.15	-29.49	38.65	74.00	-35.35	peak	P
3	6353.264	67.55	-24.73	42.82	74.00	-31.18	peak	P
4	8575.890	70.32	-25.65	44.67	74.00	-29.33	peak	P
5	11285.747	68.48	-23.09	45.39	74.00	-28.61	peak	P
6	14956.553	70.07	-20.56	49.51	74.00	-24.49	peak	P

Test Mode: 01; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:Low

No.	Frequency (MHz)	Reading (dBuv)	Factor (dB/m)	Level (dBuv/m)	Limit (dBuv/m)	Margin(dB)	Detector	P/F
1	2915.017	69.77	-29.51	40.26	74.00	-33.74	peak	P
2	4276.815	67.78	-29.05	38.73	74.00	-35.27	peak	P
3	6084.939	64.21	-25.72	38.48	74.00	-35.52	peak	P
4	8646.425	70.60	-24.74	45.86	74.00	-28.14	peak	P
5	11047.600	68.68	-23.96	44.72	74.00	-29.28	peak	P
6	14217.398	70.75	-20.36	50.39	74.00	-23.61	peak	P

Test Mode: 01; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:Low

No.	Frequency (MHz)	Reading (dBuv)	Factor (dB/m)	Level (dBuv/m)	Limit (dBuv/m)	Margin(dB)	Detector	P/F
1	2973.985	66.72	-29.64	37.08	74.00	-36.92	peak	P
2	4313.182	69.81	-29.88	39.93	74.00	-34.07	peak	P
3	6352.443	67.81	-25.32	42.49	74.00	-31.51	peak	P
4	8577.069	70.52	-24.90	45.62	74.00	-28.38	peak	P
5	11286.478	67.34	-22.74	44.60	74.00	-29.40	peak	P
6	14955.864	70.21	-20.83	49.38	74.00	-24.62	peak	P

Test Mode: 01; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:middle

No.	Frequency (MHz)	Reading (dBuv)	Factor (dB/m)	Level (dBuv/m)	Limit (dBuv/m)	Margin(dB)	Detector	P/F
1	2915.360	69.79	-30.03	39.77	74.00	-34.23	peak	P
2	4276.157	67.82	-28.08	39.75	74.00	-34.25	peak	P
3	6086.306	65.57	-24.86	40.72	74.00	-33.28	peak	P
4	8646.245	69.52	-24.50	45.01	74.00	-28.99	peak	P
5	11047.789	67.12	-23.61	43.51	74.00	-30.49	peak	P
6	14218.280	70.80	-21.93	48.87	74.00	-25.13	peak	P

Test Mode: 01; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:middle

No.	Frequency (MHz)	Reading (dBuv)	Factor (dB/m)	Level (dBuv/m)	Limit (dBuv/m)	Margin(dB)	Detector	P/F
1	2973.897	67.93	-29.00	38.92	74.00	-35.08	peak	P
2	4313.547	69.26	-28.14	41.12	74.00	-32.88	peak	P
3	6353.848	67.22	-25.29	41.93	74.00	-32.07	peak	P
4	8576.278	70.12	-25.12	45.00	74.00	-29.00	peak	P
5	11285.213	68.77	-23.98	44.78	74.00	-29.22	peak	P
6	14956.670	71.86	-19.78	52.08	74.00	-21.92	peak	P

Test Mode: 01; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:High

No.	Frequency (MHz)	Reading (dBuv)	Factor (dB/m)	Level (dBuv/m)	Limit (dBuv/m)	Margin(dB)	Detector	P/F
1	2914.818	69.15	-29.38	39.77	74.00	-34.23	peak	P
2	4277.194	67.88	-28.55	39.32	74.00	-34.68	peak	P
3	6084.955	64.96	-24.82	40.13	74.00	-33.87	peak	P
4	8645.680	69.58	-24.35	45.23	74.00	-28.77	peak	P
5	11047.062	68.39	-23.00	45.39	74.00	-28.61	peak	P
6	14218.902	70.61	-21.67	48.95	74.00	-25.05	peak	P

Test Mode: 01; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:High

No.	Frequency (MHz)	Reading (dBuv)	Factor (dB/m)	Level (dBuv/m)	Limit (dBuv/m)	Margin(dB)	Detector	P/F
1	2972.451	67.90	-29.19	38.71	74.00	-35.29	peak	P
2	4314.051	68.95	-28.54	40.41	74.00	-33.59	peak	P
3	6352.513	67.76	-25.74	42.02	74.00	-31.98	peak	P
4	8576.567	70.55	-25.95	44.60	74.00	-29.40	peak	P
5	11286.309	67.57	-22.45	45.12	74.00	-28.88	peak	P
6	14956.743	70.83	-19.74	51.09	74.00	-22.91	peak	P

Test Mode: 01; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:Low

No.	Frequency (MHz)	Reading (dBuv)	Factor (dB/m)	Level (dBuv/m)	Limit (dBuv/m)	Margin(dB)	Detector	P/F
1	2915.479	69.97	-28.95	41.03	74.00	-32.97	peak	P
2	4277.486	69.12	-29.42	39.70	74.00	-34.30	peak	P
3	6085.160	65.43	-24.69	40.74	74.00	-33.26	peak	P
4	8644.958	69.17	-25.41	43.76	74.00	-30.24	peak	P
5	11047.573	67.04	-23.32	43.72	74.00	-30.28	peak	P
6	14217.701	69.95	-21.45	48.50	74.00	-25.50	peak	P

Test Mode: 01; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:Low

No.	Frequency (MHz)	Reading (dBuv)	Factor (dB/m)	Level (dBuv/m)	Limit (dBuv/m)	Margin(dB)	Detector	P/F
1	2972.534	67.91	-28.90	39.01	74.00	-34.99	peak	P
2	4312.532	68.67	-28.12	40.54	74.00	-33.46	peak	P
3	6354.092	67.44	-24.51	42.93	74.00	-31.07	peak	P
4	8576.880	69.63	-24.36	45.27	74.00	-28.73	peak	P
5	11286.107	68.05	-24.03	44.02	74.00	-29.98	peak	P
6	14956.502	71.43	-20.92	50.51	74.00	-23.49	peak	P

Test Mode: 01; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:middle

No.	Frequency (MHz)	Reading (dBuv)	Factor (dB/m)	Level (dBuv/m)	Limit (dBuv/m)	Margin(dB)	Detector	P/F
1	2914.192	69.58	-30.18	39.39	74.00	-34.61	peak	P
2	4276.155	67.87	-29.26	38.61	74.00	-35.39	peak	P
3	6086.024	64.14	-25.09	39.06	74.00	-34.94	peak	P
4	8645.700	69.37	-24.56	44.81	74.00	-29.19	peak	P
5	11046.712	68.65	-23.17	45.48	74.00	-28.52	peak	P
6	14217.161	71.72	-21.58	50.14	74.00	-23.86	peak	P

Test Mode: 01; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:middle

No.	Frequency (MHz)	Reading (dBuv)	Factor (dB/m)	Level (dBuv/m)	Limit (dBuv/m)	Margin(dB)	Detector	P/F
1	2972.738	66.23	-29.21	37.01	74.00	-36.99	peak	P
2	4313.759	69.64	-28.31	41.33	74.00	-32.67	peak	P
3	6352.606	67.61	-24.57	43.04	74.00	-30.96	peak	P
4	8576.502	69.27	-24.88	44.39	74.00	-29.61	peak	P
5	11285.409	67.40	-22.88	44.52	74.00	-29.48	peak	P
6	14955.339	70.16	-19.97	50.18	74.00	-23.82	peak	P

Test Mode: 01; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:High

No.	Frequency (MHz)	Reading (dBuv)	Factor (dB/m)	Level (dBuv/m)	Limit (dBuv/m)	Margin(dB)	Detector	P/F
1	2973.965	67.53	-30.25	37.28	74.00	-36.72	peak	P
2	4314.090	68.79	-29.48	39.31	74.00	-34.69	peak	P
3	6354.096	68.26	-25.54	42.73	74.00	-31.27	peak	P
4	8575.751	70.03	-25.33	44.70	74.00	-29.30	peak	P
5	11285.309	68.68	-23.27	45.41	74.00	-28.59	peak	P
6	14956.402	70.92	-20.28	50.63	74.00	-23.37	peak	P

Test Mode: 01; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:High

No.	Frequency (MHz)	Reading (dBuv)	Factor (dB/m)	Level (dBuv/m)	Limit (dBuv/m)	Margin(dB)	Detector	P/F
1	2913.665	70.00	-29.43	40.56	74.00	-33.44	peak	P
2	4277.309	68.79	-28.40	40.39	74.00	-33.61	peak	P
3	6085.653	65.21	-25.50	39.72	74.00	-34.28	peak	P
4	8646.677	69.38	-25.37	44.00	74.00	-30.00	peak	P
5	11046.890	68.90	-24.26	44.64	74.00	-29.36	peak	P
6	14217.413	70.69	-22.10	48.59	74.00	-25.41	peak	P

8 Test Setup Photo

Please Refer to appendix – Test Setup Photos for BTEK231024010AE

9 EUT Constructional Details (EUT Photos)

Please Refer to appendix - External and Internal Photos for BTEK231024010AE

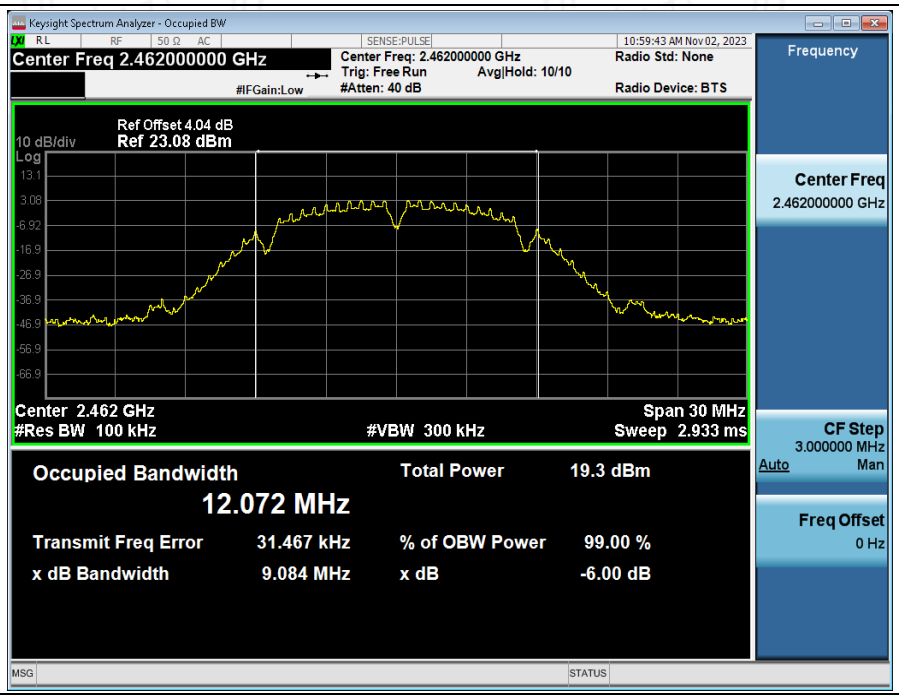
10 Appendix

1. -6dB Bandwidth

Condition	Antenna	Modulation	Frequency (MHz)	-6dB BW(MHz)	limit(kHz)	Result
NVNT	ANT1	802.11b	2412.00	8.60	500	Pass
NVNT	ANT1	802.11b	2437.00	10.08	500	Pass
NVNT	ANT1	802.11b	2462.00	9.08	500	Pass
NVNT	ANT1	802.11g	2412.00	13.87	500	Pass
NVNT	ANT1	802.11g	2437.00	16.08	500	Pass
NVNT	ANT1	802.11g	2462.00	15.09	500	Pass
NVNT	ANT1	802.11n(HT20)	2412.00	13.86	500	Pass
NVNT	ANT1	802.11n(HT20)	2437.00	16.37	500	Pass
NVNT	ANT1	802.11n(HT20)	2462.00	15.09	500	Pass

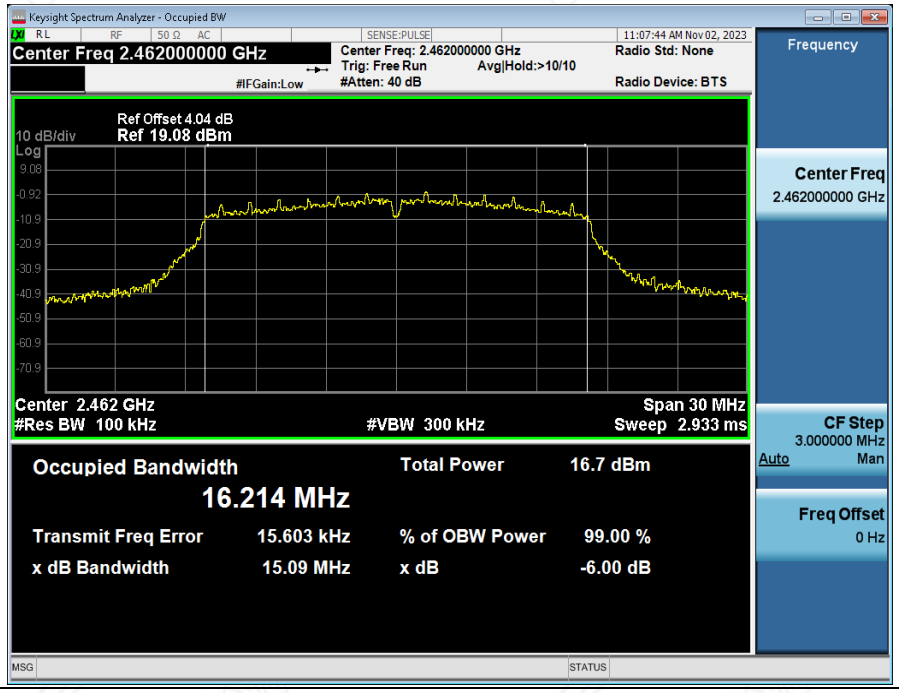
-6dB_Bandwidth_NVNT_ANT1_802_11b_2412

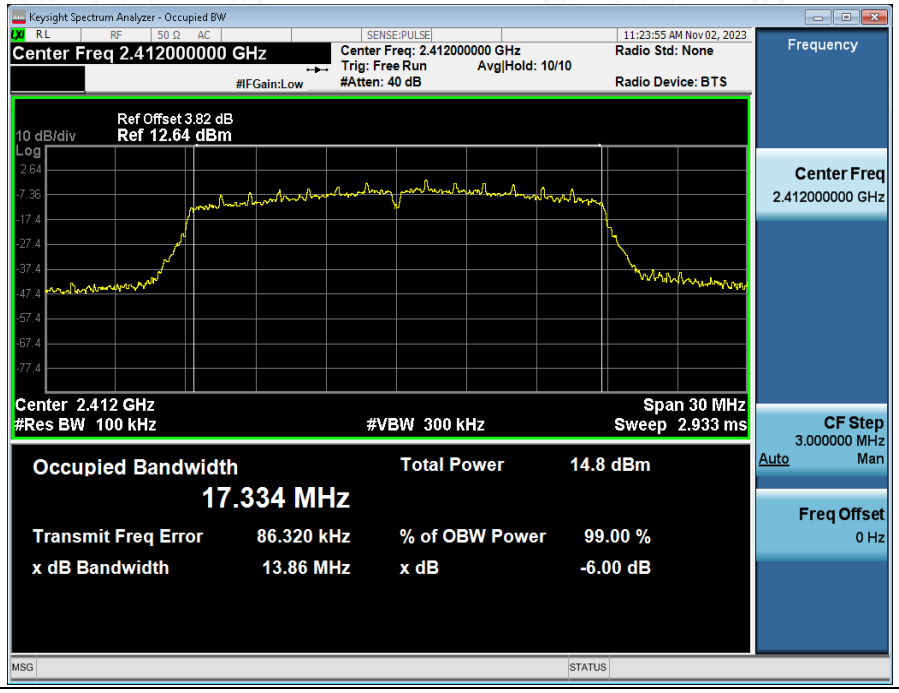
-6dB_Bandwidth_NVNT_ANT1_802_11b_2437


-6dB_Bandwidth_NVNT_ANT1_802_11b_2462


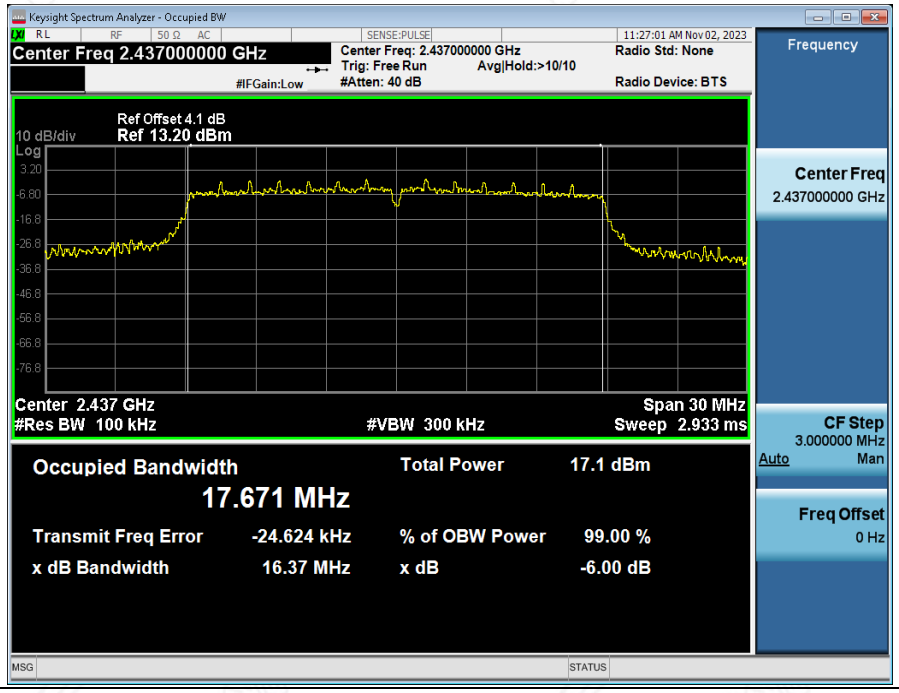
-6dB_Bandwidth_NVNT_ANT1_802_11g_2412

-6dB_Bandwidth_NVNT_ANT1_802_11g_2437

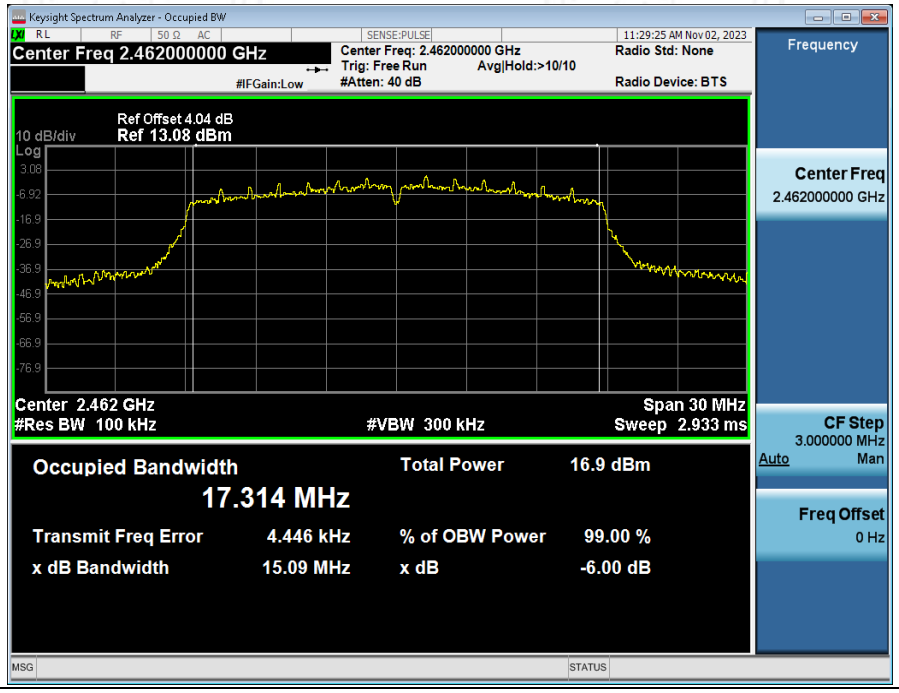
-6dB_Bandwidth_NVNT_ANT1_802_11g_2462


-6dB_Bandwidth_NVNT_ANT1_802_11n(HT20)_2412


-6dB_Bandwidth_NVNT_ANT1_802_11n(HT20)_2437



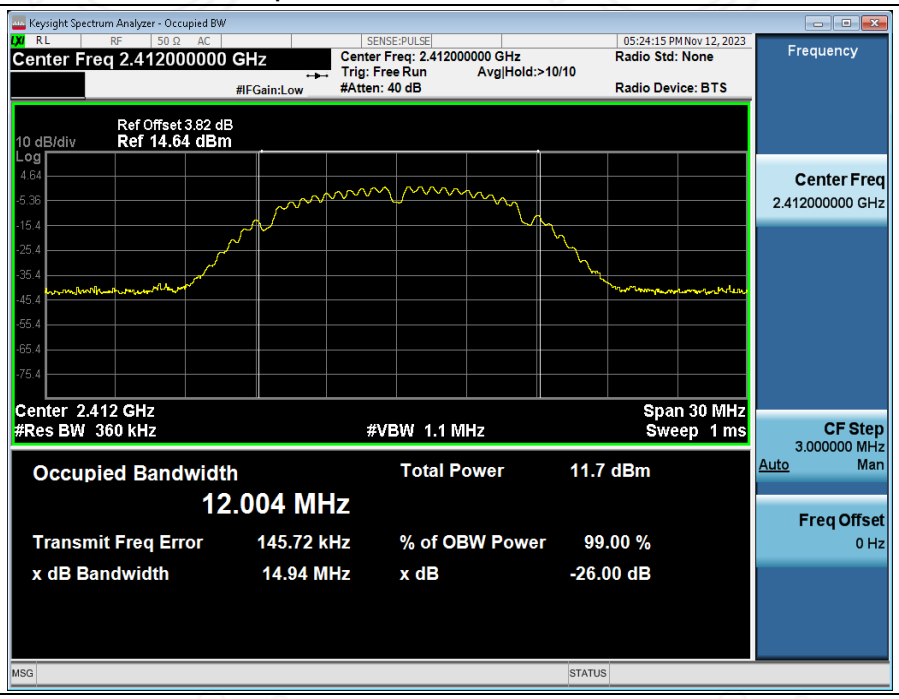
-6dB_Bandwidth_NVNT_ANT1_802_11n(HT20)_2462

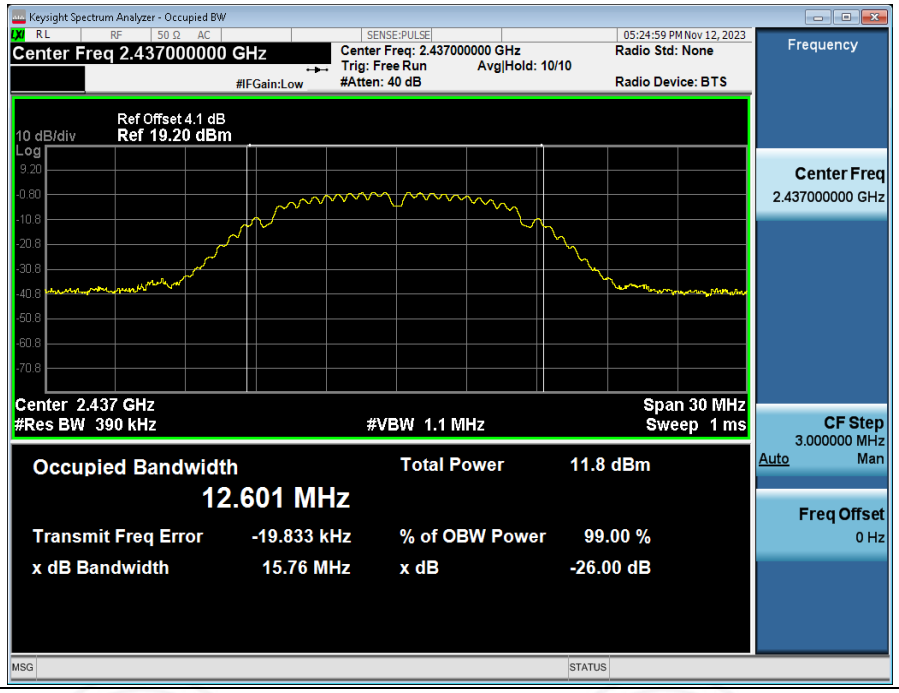


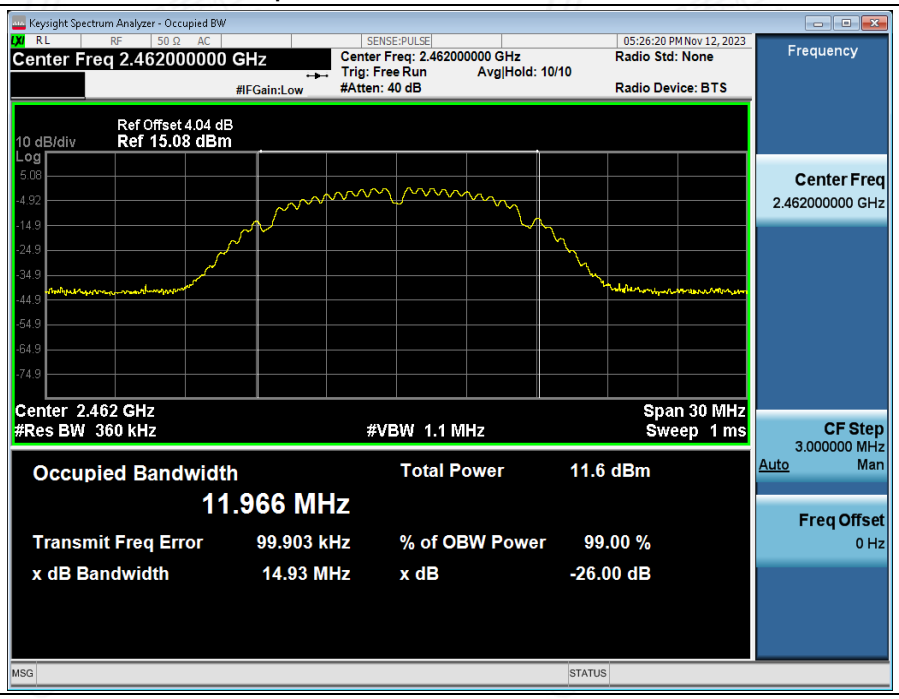
2. 99% Occupied Bandwidth

Condition	Antenna	Modulation	Frequency (MHz)	99%%BW(MHz)
NVNT	ANT1	802.11b	2412.00	12.004
NVNT	ANT1	802.11b	2437.00	12.601
NVNT	ANT1	802.11b	2462.00	11.966
NVNT	ANT1	802.11g	2412.00	16.724
NVNT	ANT1	802.11g	2437.00	17.343
NVNT	ANT1	802.11g	2462.00	16.574
NVNT	ANT1	802.11n(HT20)	2412.00	17.567
NVNT	ANT1	802.11n(HT20)	2437.00	18.070
NVNT	ANT1	802.11n(HT20)	2462.00	17.497

99%_Occupied_Bandwidth_NVNT_ANT1_802_11b_2412



99%_Occupied_Bandwidth_NVNT_ANT1_802_11b_2437


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

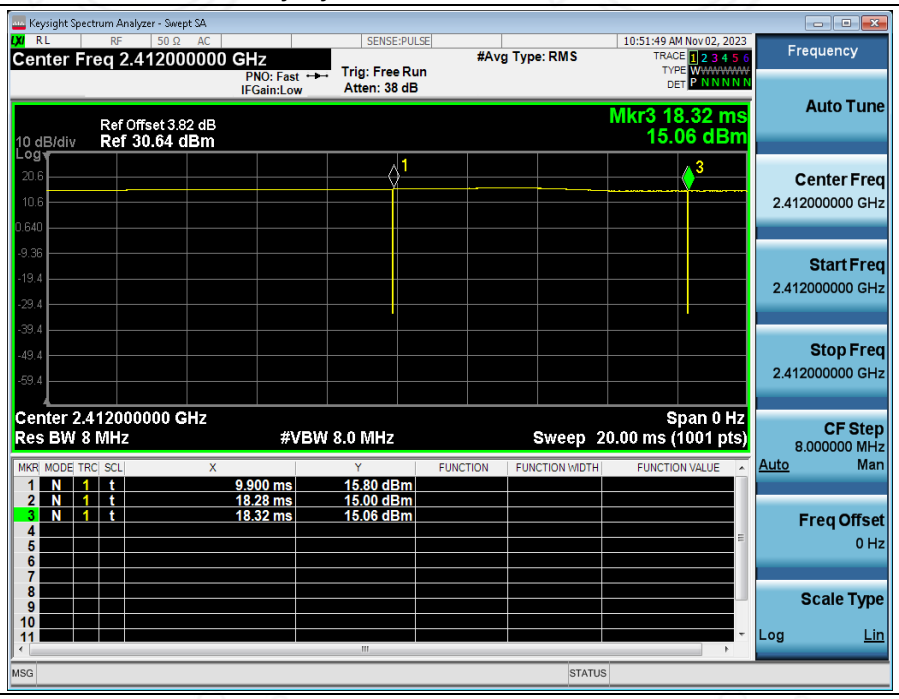
99%_Occupied_Bandwidth_NVNT_ANT1_802_11n(HT20)_2437

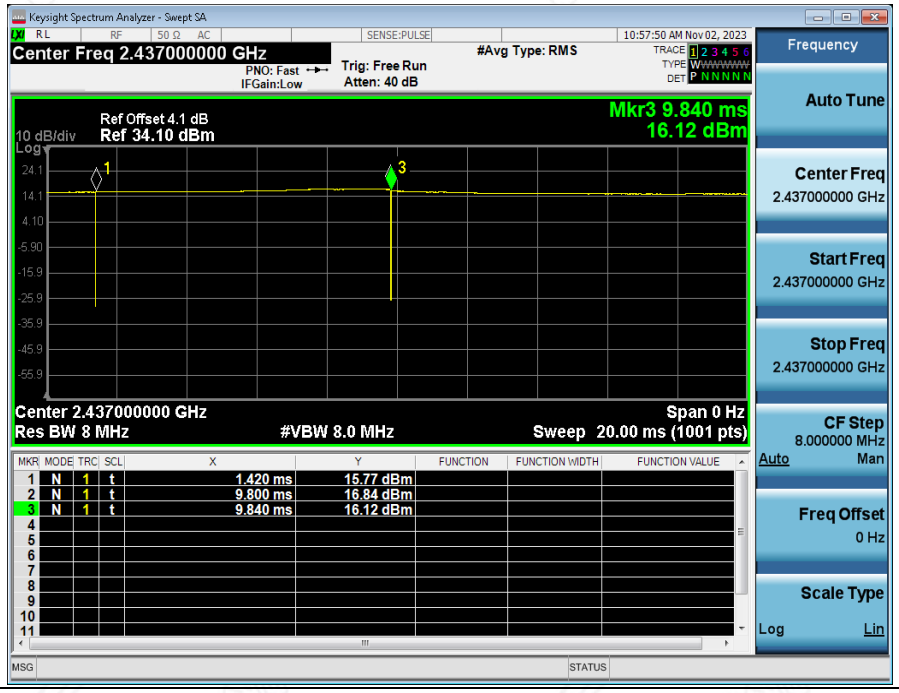

99%_Occupied_Bandwidth_NVNT_ANT1_802_11n(HT20)_2462

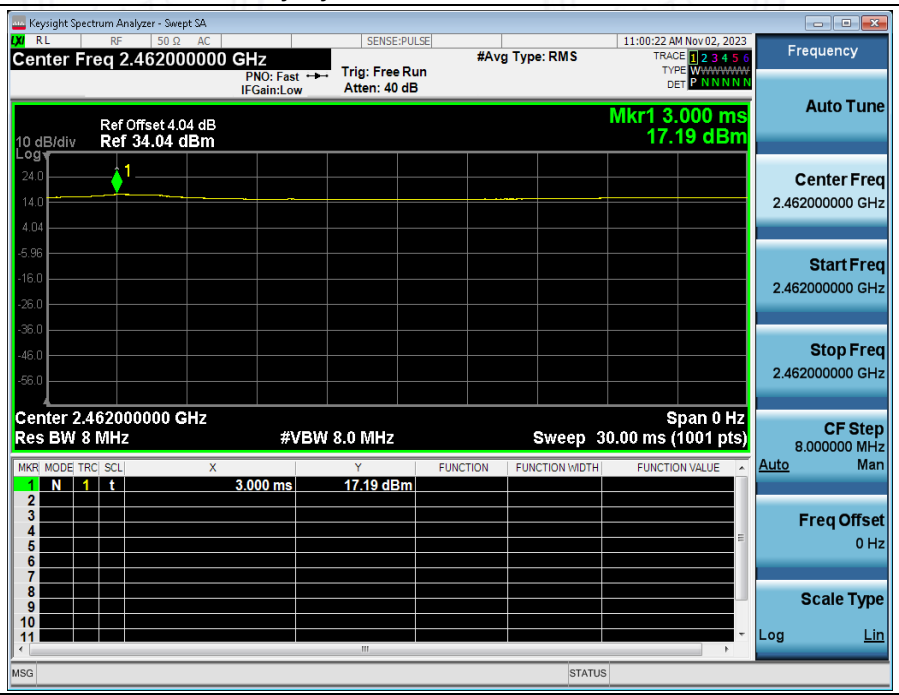

3. Duty Cycle

Condition	Antenna	Modulation	Frequency (MHz)	Duty cycle(%)	Duty factor(dB)
NVNT	ANT1	802.11b	2412.00	99.76	0.00
NVNT	ANT1	802.11b	2437.00	99.76	0.00
NVNT	ANT1	802.11b	2462.00	100	0.00
NVNT	ANT1	802.11g	2412.00	97.18	0.12
NVNT	ANT1	802.11g	2437.00	99.30	0.00
NVNT	ANT1	802.11g	2462.00	98.59	0.00
NVNT	ANT1	802.11n(HT20)	2412.00	98.51	0.00
NVNT	ANT1	802.11n(HT20)	2437.00	98.51	0.00
NVNT	ANT1	802.11n(HT20)	2462.00	98.51	0.00

Duty_Cycle_NVNT_ANT1_802_11b_2412



Duty_Cycle_NVNT_ANT1_802_11b_2437


Duty_Cycle_NVNT_ANT1_802_11b_2462


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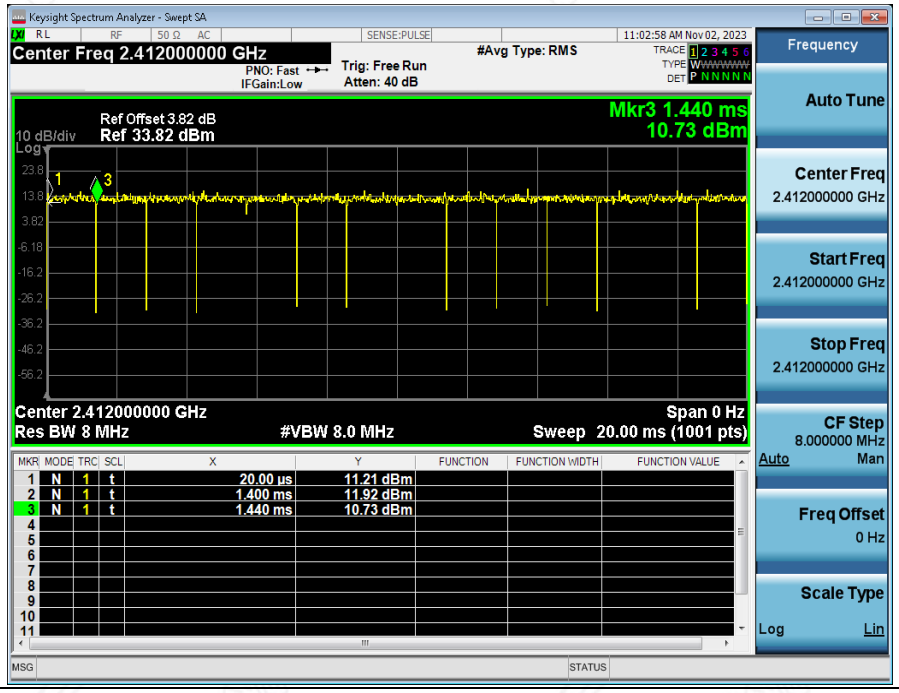
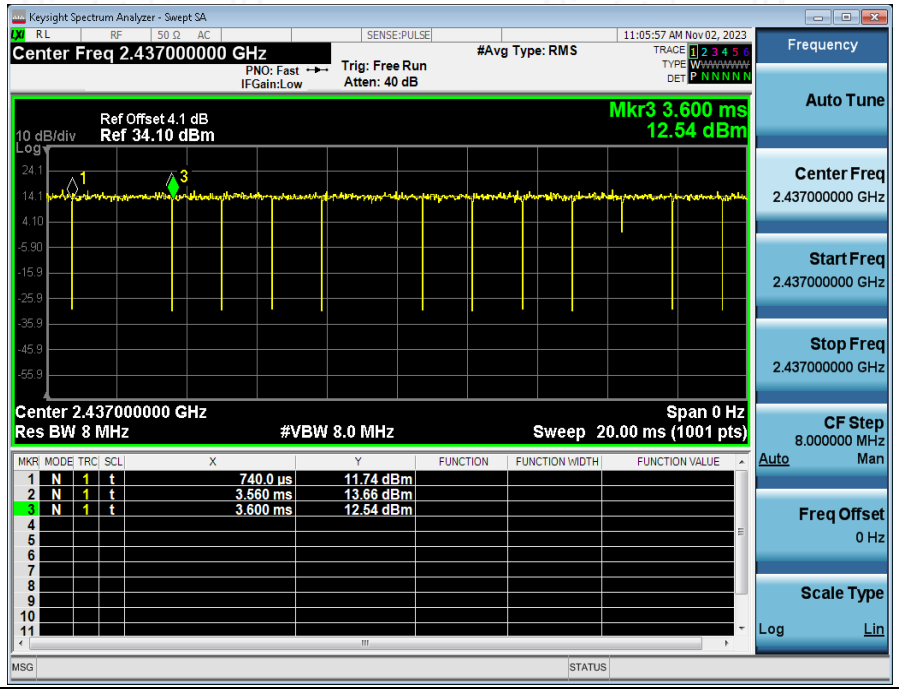


Duty_Cycle_NVNT_ANT1_802_11g_2437


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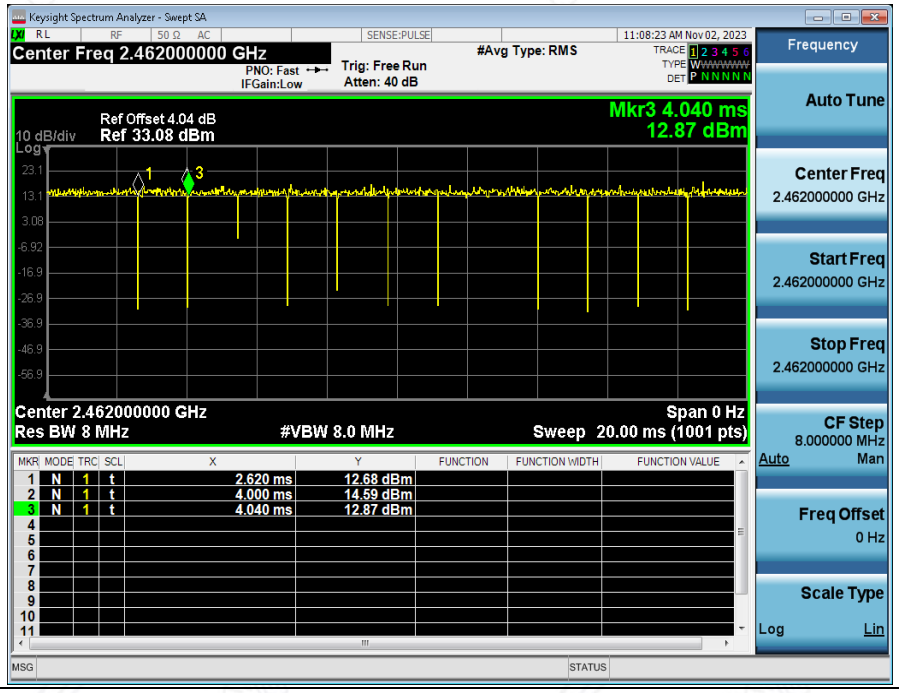
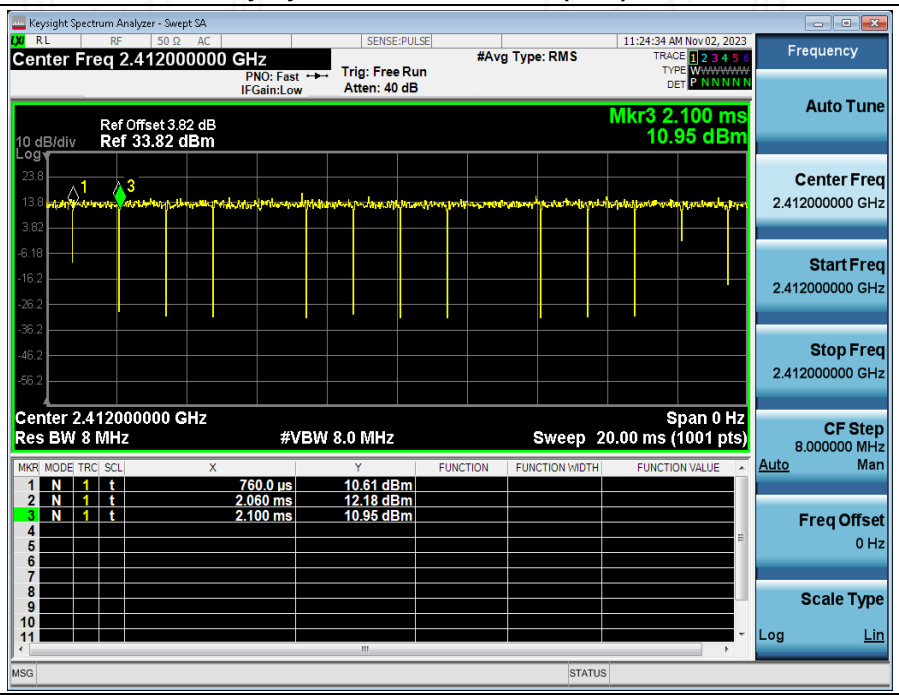
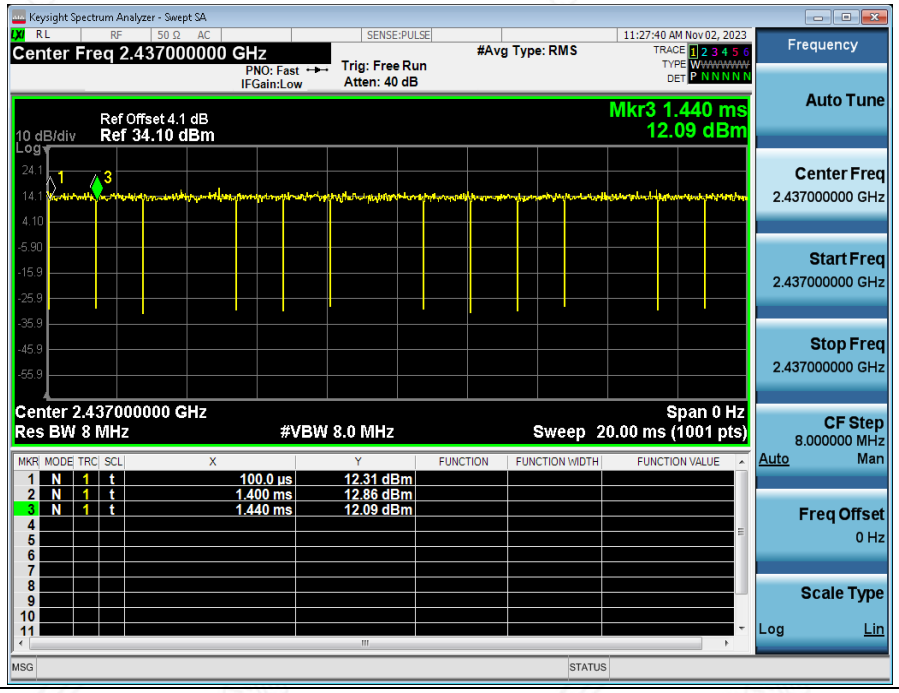
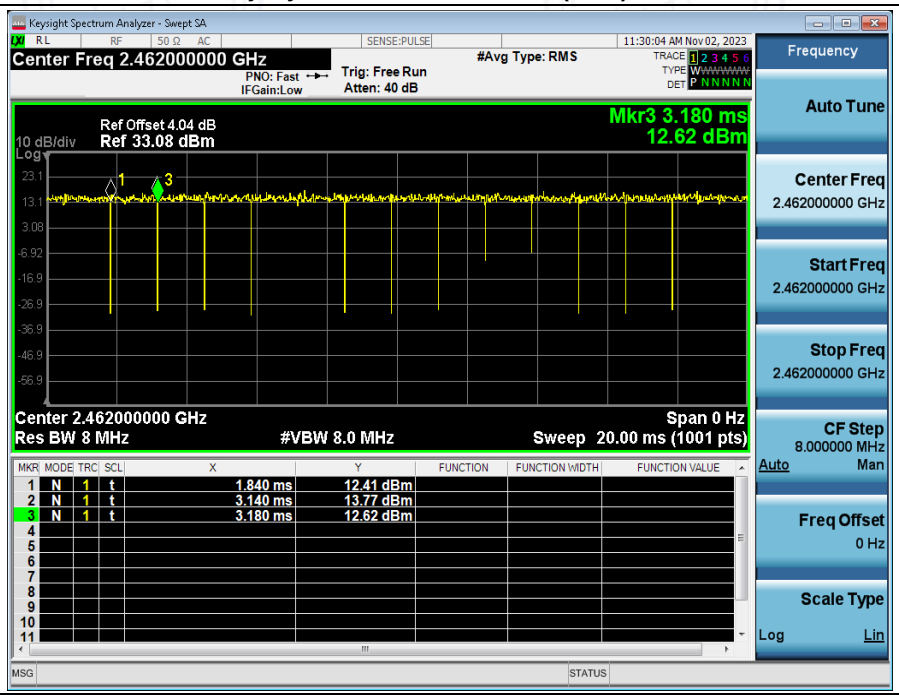


Duty_Cycle_NVNT_ANT1_802_11n(HT20)_2412


Duty_Cycle_NVNT_ANT1_802_11n(HT20)_2437


Duty_Cycle_NVNT_ANT1_802_11n(HT20)_2462


4. MAX. Output Power

Condition	Antenna	Modulation	Frequency (MHz)	Detector	Conducted Power(dBm)	Duty factor(dB)	Total Power(dBm)	limit(dBm)	Result
NVNT	ANT1	802.11b	2412.00	RMS	8.30	0.00	8.30	30	Pass
NVNT	ANT1	802.11b	2437.00	RMS	8.56	0.00	8.56	30	Pass
NVNT	ANT1	802.11b	2462.00	RMS	8.22	0.00	8.22	30	Pass
NVNT	ANT1	802.11g	2412.00	RMS	8.40	0.12	8.52	30	Pass
NVNT	ANT1	802.11g	2437.00	RMS	8.39	0.00	8.39	30	Pass
NVNT	ANT1	802.11g	2462.00	RMS	8.22	0.00	8.22	30	Pass
NVNT	ANT1	802.11n(HT20)	2412.00	RMS	8.32	0.00	8.32	30	Pass
NVNT	ANT1	802.11n(HT20)	2437.00	RMS	8.62	0.00	8.62	30	Pass
NVNT	ANT1	802.11n(HT20)	2462.00	RMS	7.92	0.00	7.92	30	Pass

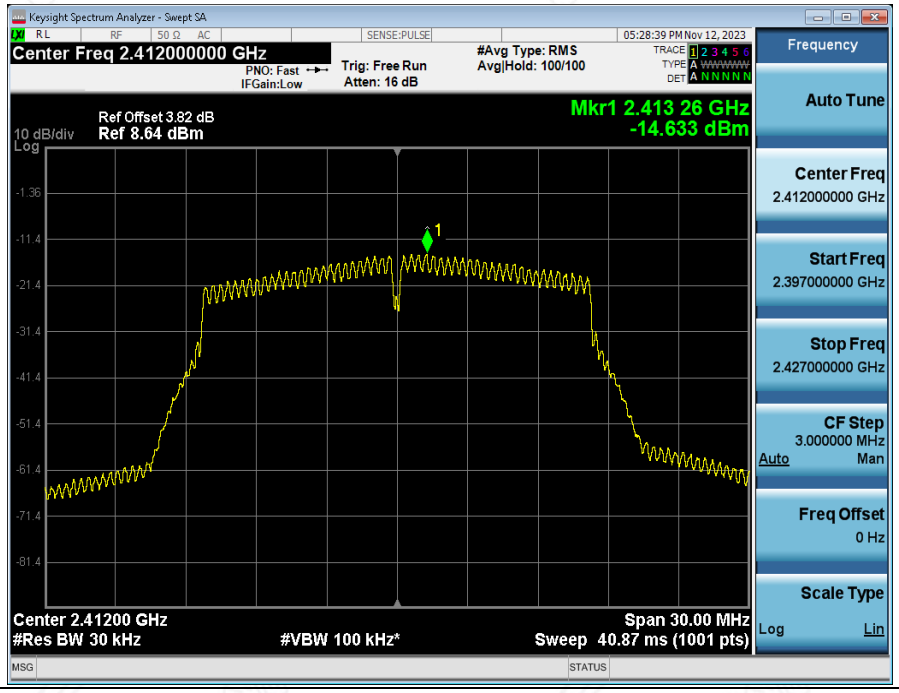
5. Power Spectral Density

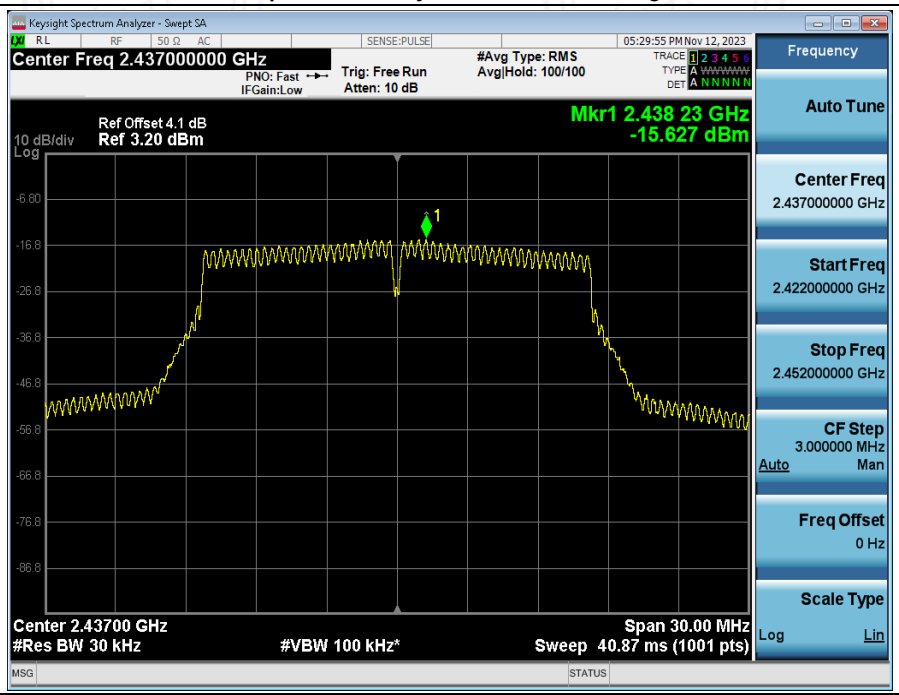
Condition	Antenna	Modulation	Frequency (MHz)	PSD(dBm/30kHz)	Duty factor(dB)	RB factor(dB)	PSD(dBm/3kHz)	limit(dBm/3kHz)	Result
NVNT	ANT1	802.11b	2412.00	-13.55	0.00	-10.00	-23.55	8	
NVNT	ANT1	802.11b	2437.00	-13.74	0.00	-10.00	-23.74	8	
NVNT	ANT1	802.11b	2462.00	-13.67	0.00	-10.00	-23.67	8	
NVNT	ANT1	802.11g	2412.00	-14.63	0.12	-10.00	-24.51	8	
NVNT	ANT1	802.11g	2437.00	-15.63	0.00	-10.00	-25.63	8	
NVNT	ANT1	802.11g	2462.00	-14.69	0.00	-10.00	-24.69	8	
NVNT	ANT1	802.11n(HT20)	2412.00	-14.44	0.00	-10.00	-24.44	8	
NVNT	ANT1	802.11n(HT20)	2437.00	-15.60	0.00	-10.00	-25.60	8	
NVNT	ANT1	802.11n(HT20)	2462.00	-15.03	0.00	-10.00	-25.03	8	

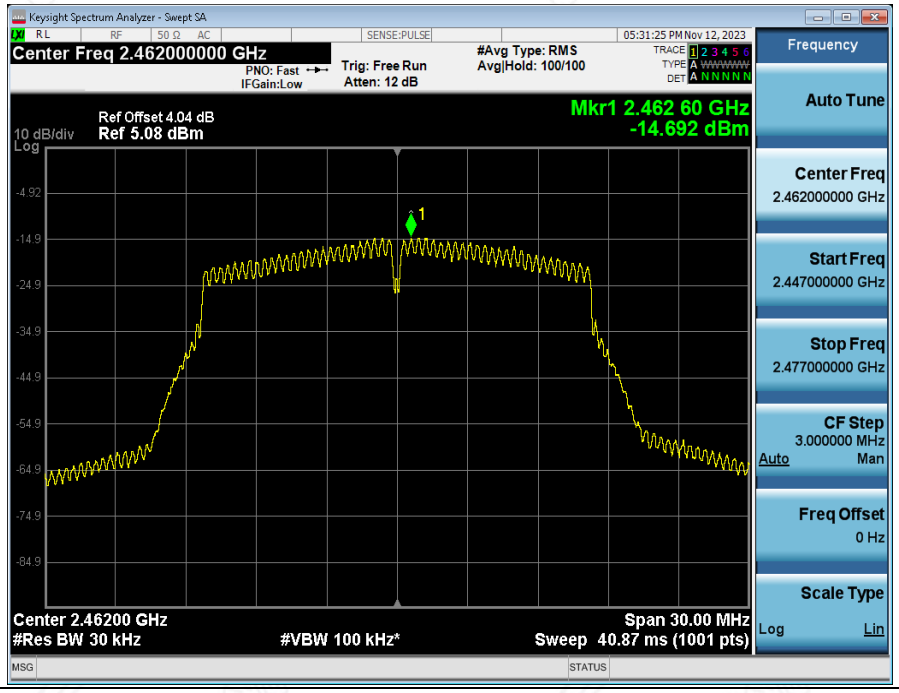
Power_Spectral_Density_NVNT_ANT1_802_11b_2412

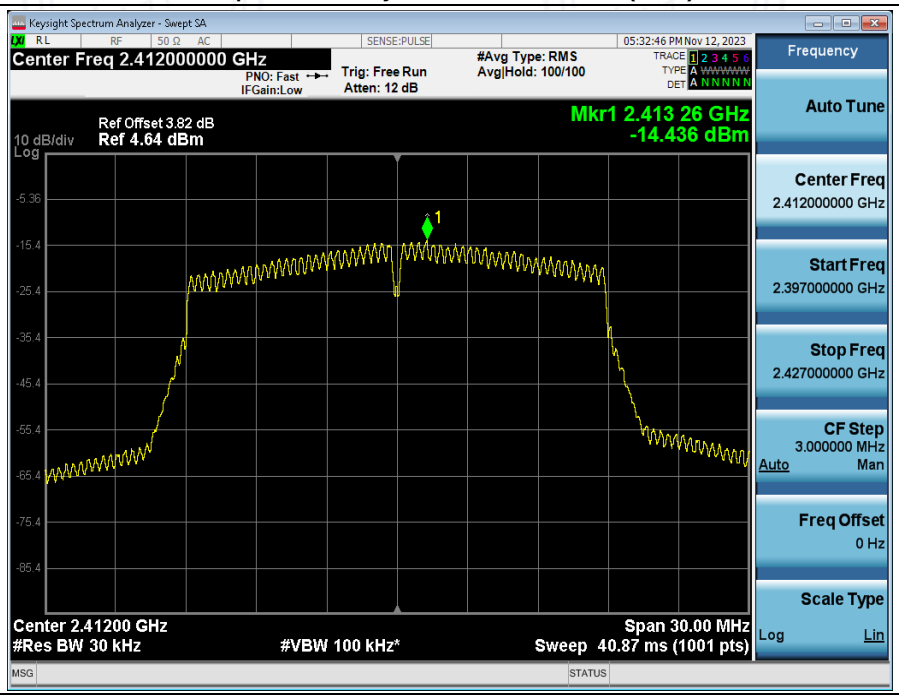
Power_Spectral_Density_NVNT_ANT1_802_11b_2437


Power_Spectral_Density_NVNT_ANT1_802_11b_2462

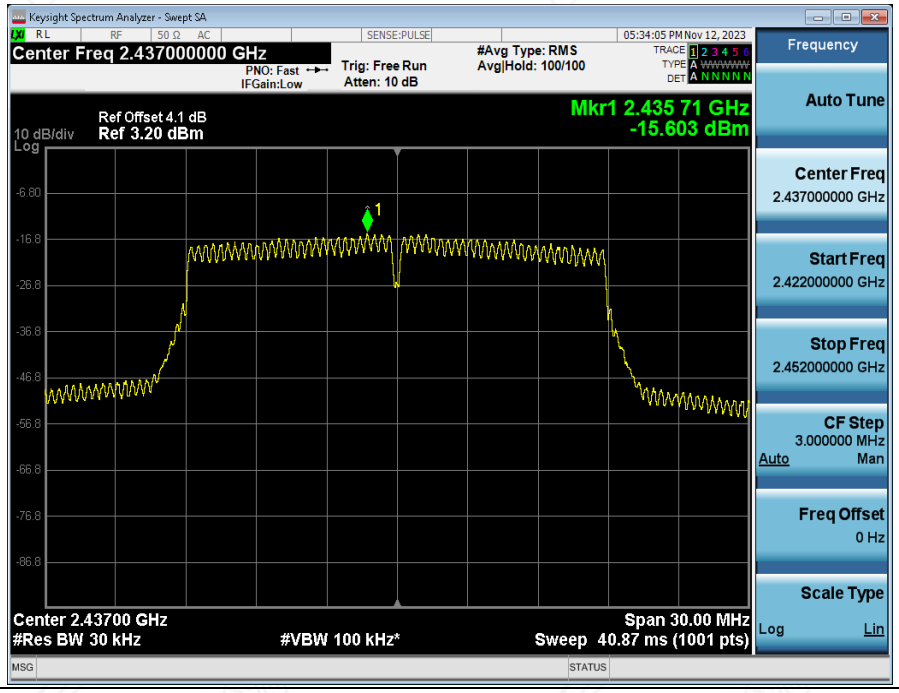

Power_Spectral_Density_NVNT_ANT1_802_11g_2412


Power_Spectral_Density_NVNT_ANT1_802_11g_2437


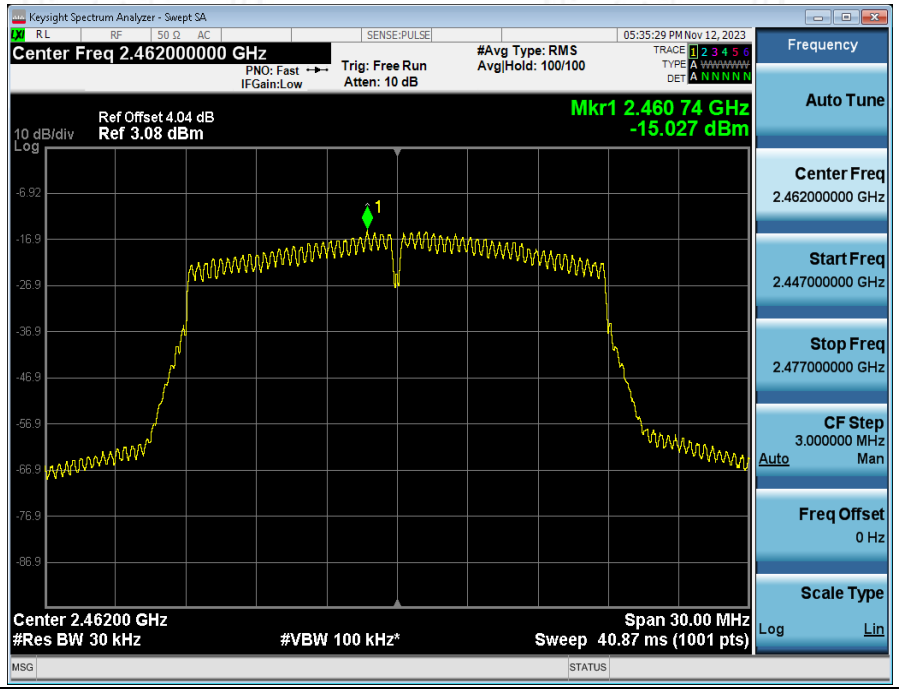
Power_Spectral_Density_NVNT_ANT1_802_11g_2462


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

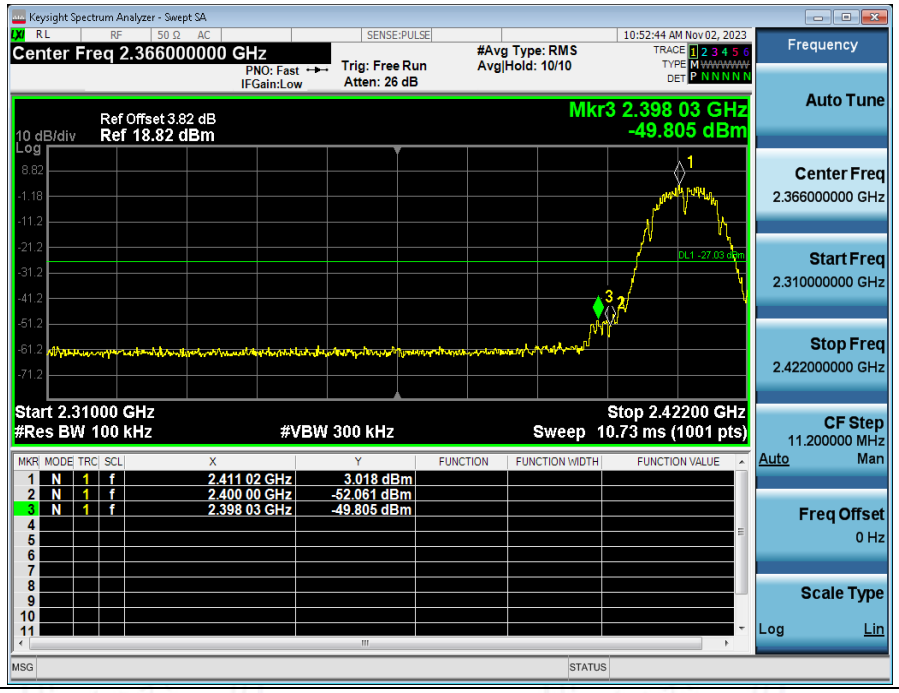


6. Bandedge

Condition	Antenna	Modulation	TX_Frequency (MHz)	Max. Mark_frequency(MHz)	Spurious level(dBm)	limit(dBm)	Result
NVNT	ANT1	802.11b	2412.00	2398.032	-49.805	-27.032	Pass
NVNT	ANT1	802.11b	2462.00	2488.048	-60.578	-27.437	Pass
NVNT	ANT1	802.11g	2412.00	2399.824	-47.541	-32.864	Pass
NVNT	ANT1	802.11g	2462.00	2483.536	-54.240	-30.359	Pass
NVNT	ANT1	802.11n(HT20)	2412.00	2399.488	-45.574	-31.289	Pass
NVNT	ANT1	802.11n(HT20)	2462.00	2483.536	-52.824	-30.349	Pass

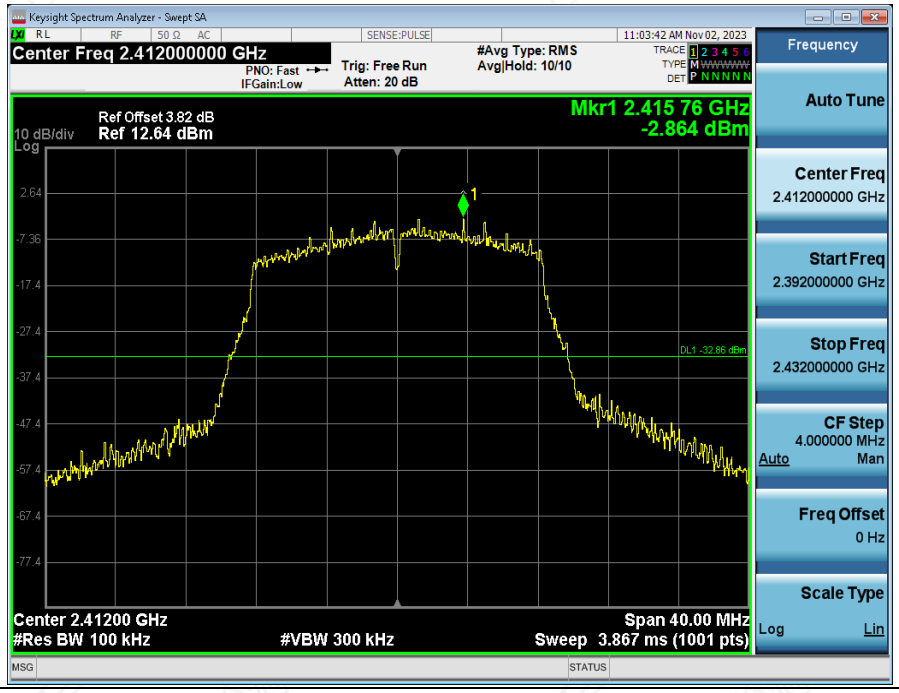
1_Reference_Level_NVNT_ANT1_802_11b_2412

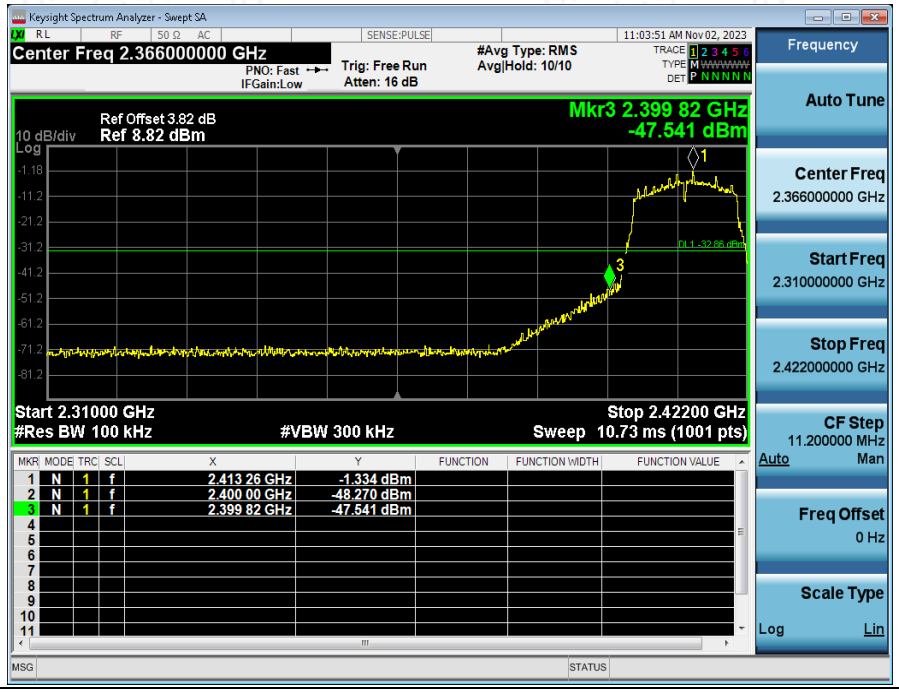
2_Bandedge_NVNT_ANT1_802_11b_2412



1_Reference_Level_NVNT_ANT1_802_11b_2462


2_Bandedge_NVNT_ANT1_802_11b_2462

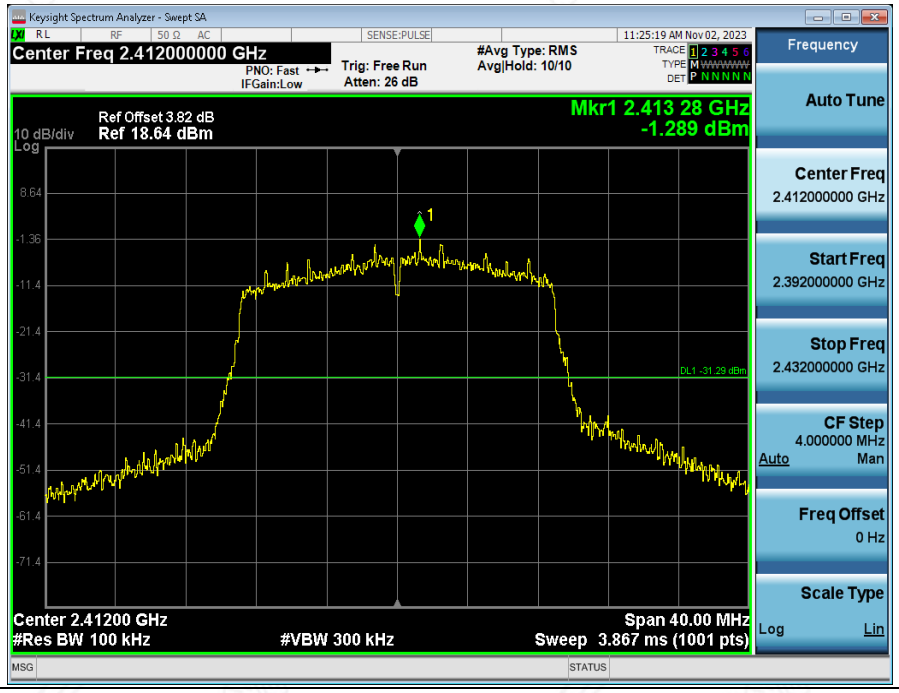

1_Reference_Level_NVNT_ANT1_802_11g_2412


2_Bandedge_NVNT_ANT1_802_11g_2412


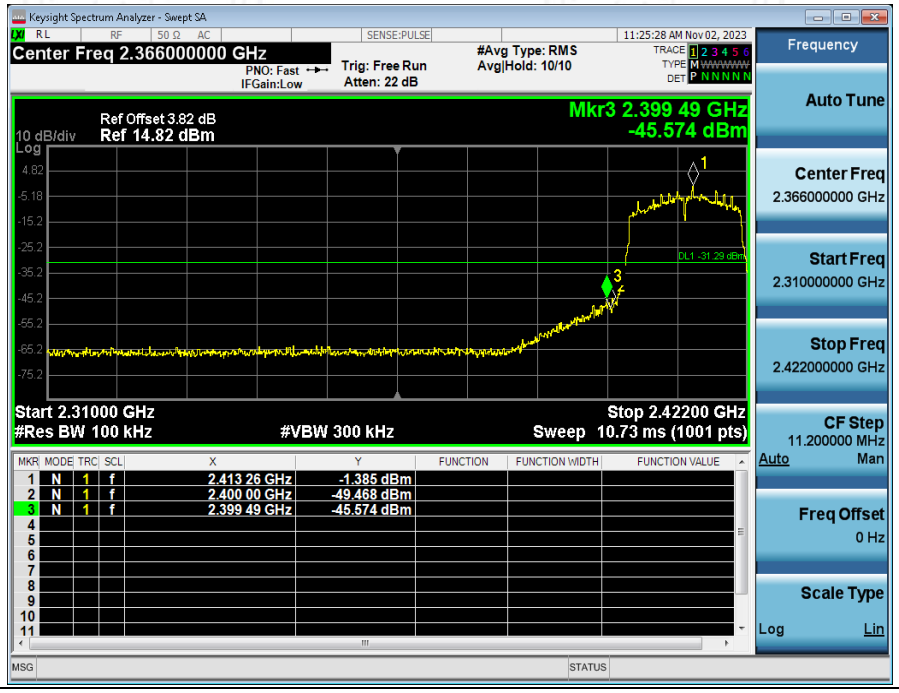
1_Reference_Level_NVNT_ANT1_802_11g_2462


2_Bandedge_NVNT_ANT1_802_11g_2462

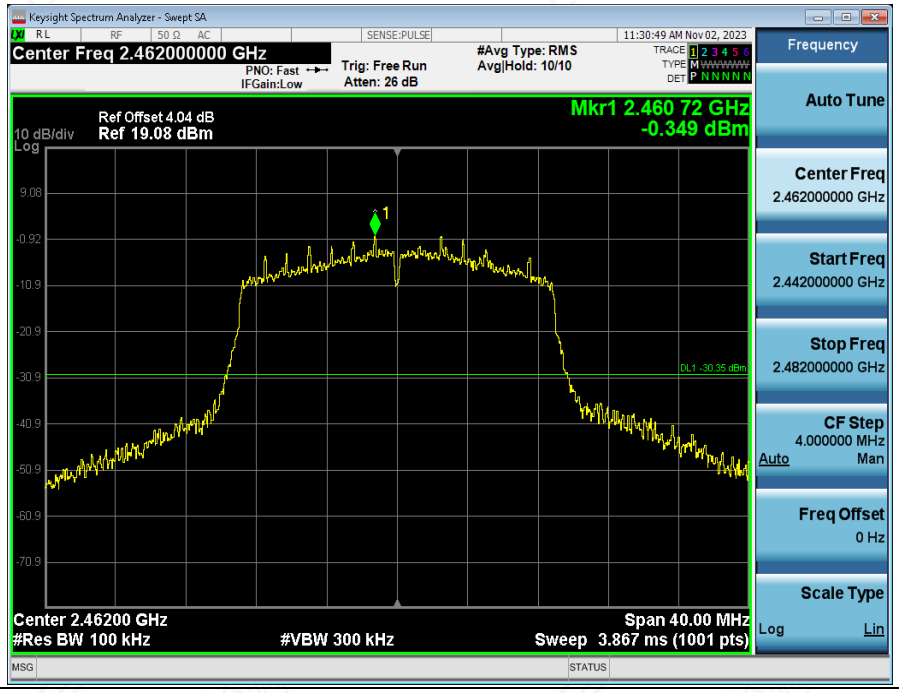

1_Reference_Level_NVNT_ANT1_802_11n(HT20)_2412



2_Bandedge_NVNT_ANT1_802_11n(HT20)_2412



1_Reference_Level_NVNT_ANT1_802_11n(HT20)_2462

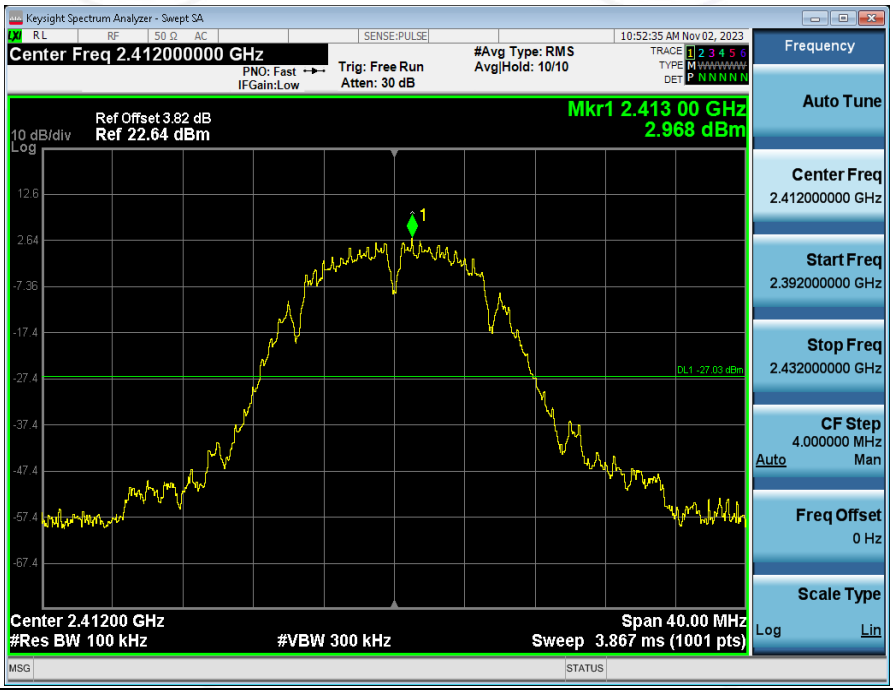


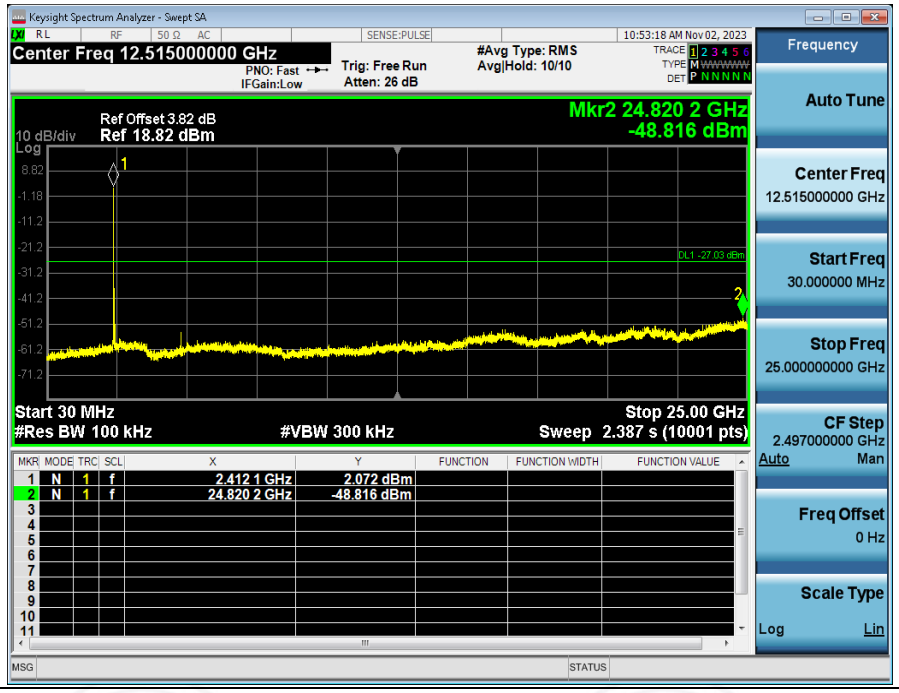
2_Bandedge_NVNT_ANT1_802_11n(HT20)_2462

7. Spurious Emission

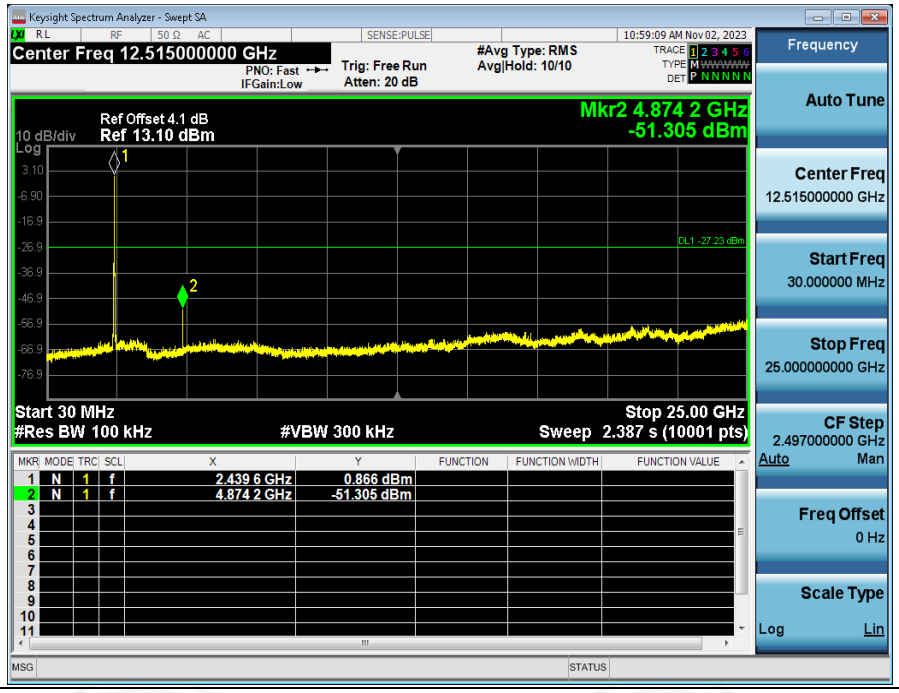
Condition	Antenna	Modulation	TX_Frequency (MHz)	Max. Mark_frequency(MHz)	Spurious level(dBm)	limit(dBm)	Result
NVNT	ANT1	802.11b	2412.00	24820.216	-48.816	-27.032	Pass
NVNT	ANT1	802.11b	2437.00	4874.180	-51.305	-27.228	Pass
NVNT	ANT1	802.11b	2462.00	24747.803	-55.761	-27.437	Pass
NVNT	ANT1	802.11g	2412.00	24882.641	-59.743	-32.864	Pass
NVNT	ANT1	802.11g	2437.00	24940.072	-60.046	-30.784	Pass
NVNT	ANT1	802.11g	2462.00	24700.360	-52.941	-30.359	Pass
NVNT	ANT1	802.11n(HT20)	2412.00	24887.635	-52.994	-31.289	Pass
NVNT	ANT1	802.11n(HT20)	2437.00	24278.367	-59.565	-31.236	Pass
NVNT	ANT1	802.11n(HT20)	2462.00	24885.138	-53.423	-30.349	Pass

1_Reference_Level_NVNT_ANT1_802_11b_2412



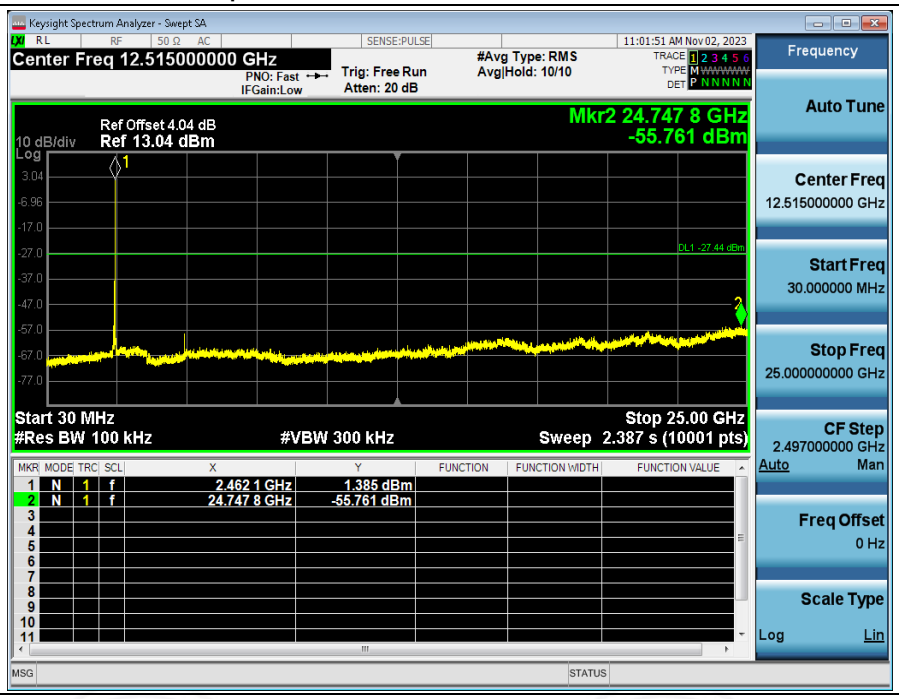
2_Spurious_Emission_NVNT_ANT1_802_11b_2412


1_Reference_Level_NVNT_ANT1_802_11b_2437

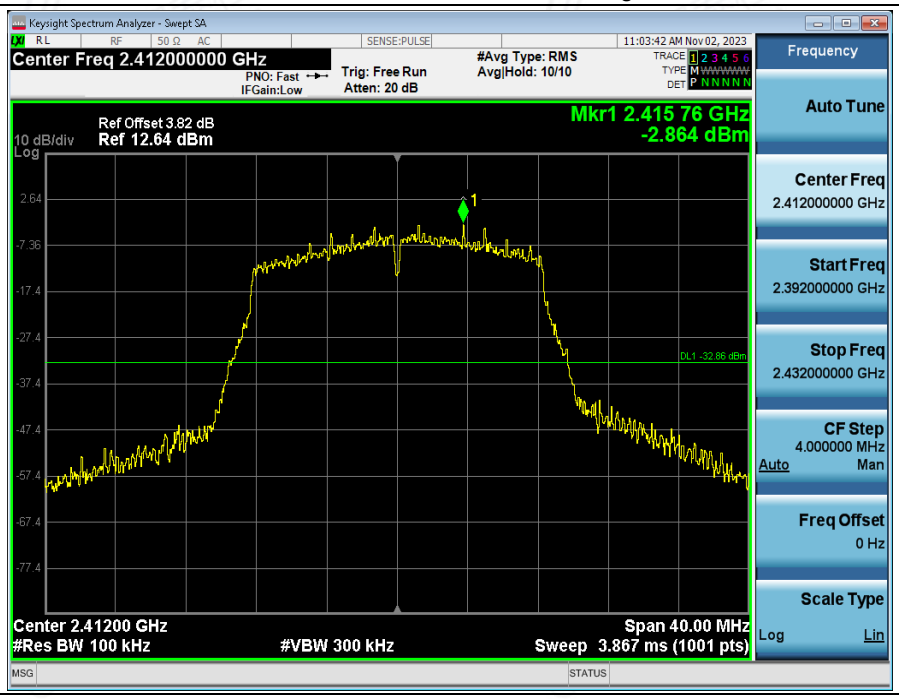

2_Spurious_Emission_NVNT_ANT1_802_11b_2437


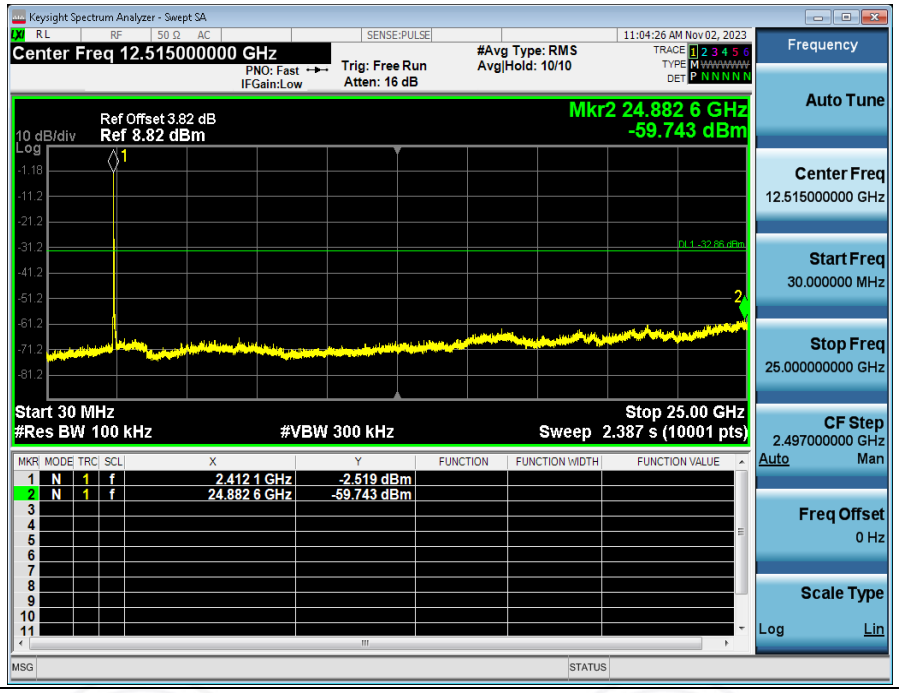
1_Reference_Level_NVNT_ANT1_802_11b_2462

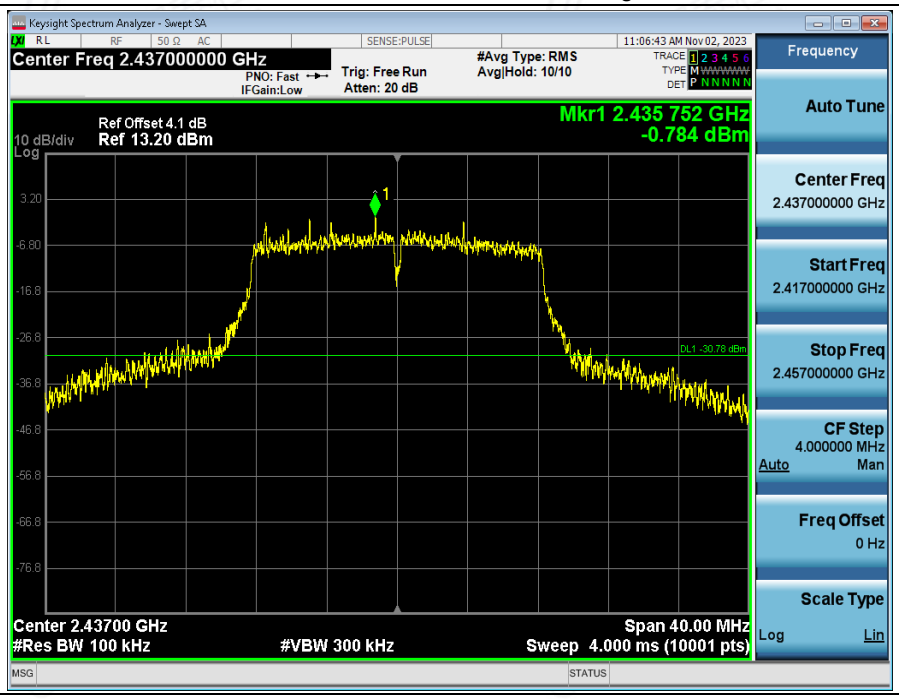

2_Spurious_Emission_NVNT_ANT1_802_11b_2462



1_Reference_Level_NVNT_ANT1_802_11g_2412



2_Spurious_Emission_NVNT_ANT1_802_11g_2412


1_Reference_Level_NVNT_ANT1_802_11g_2437


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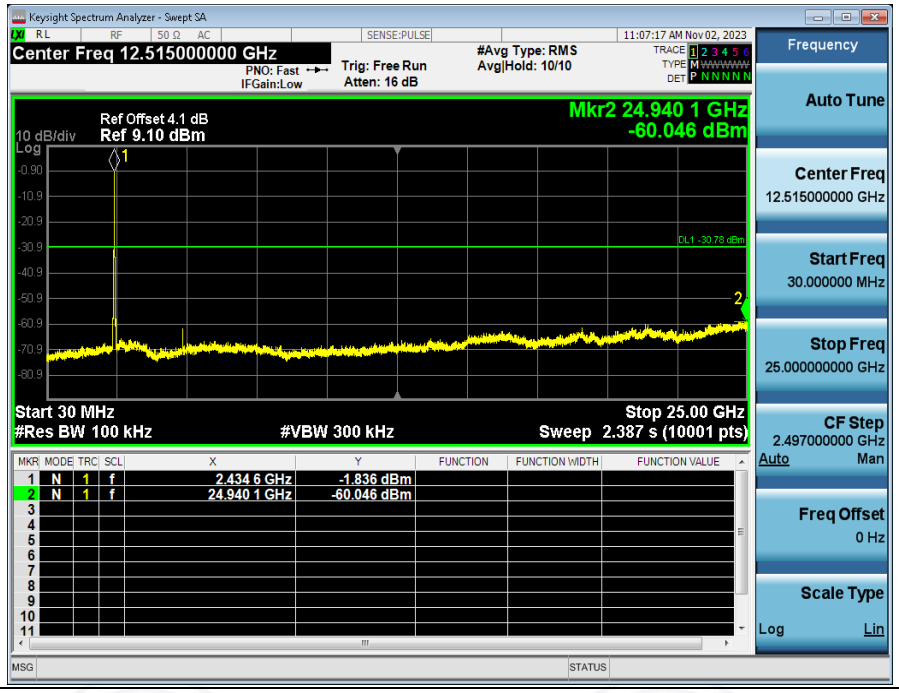
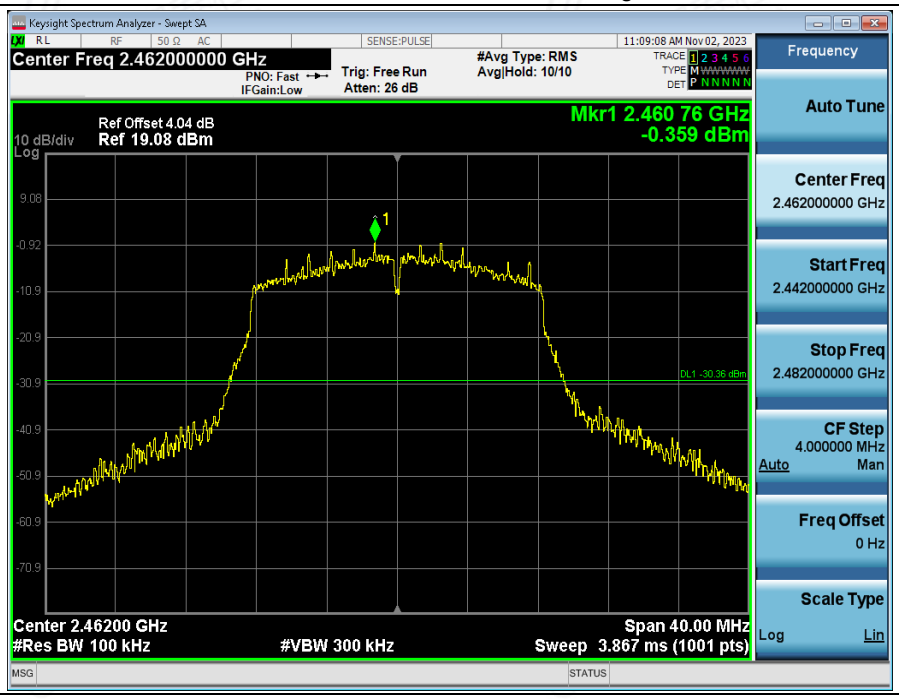
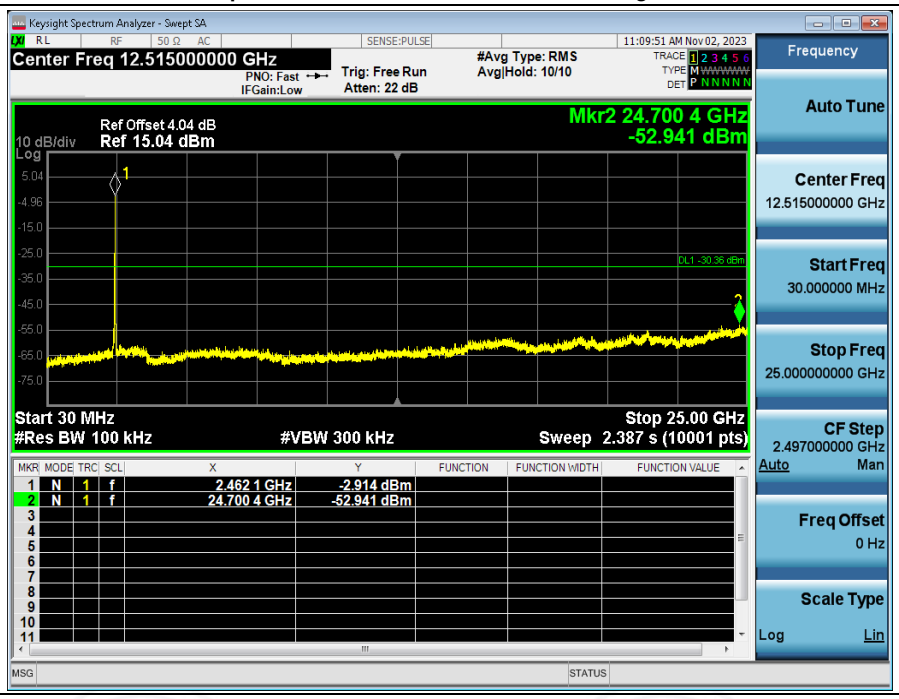
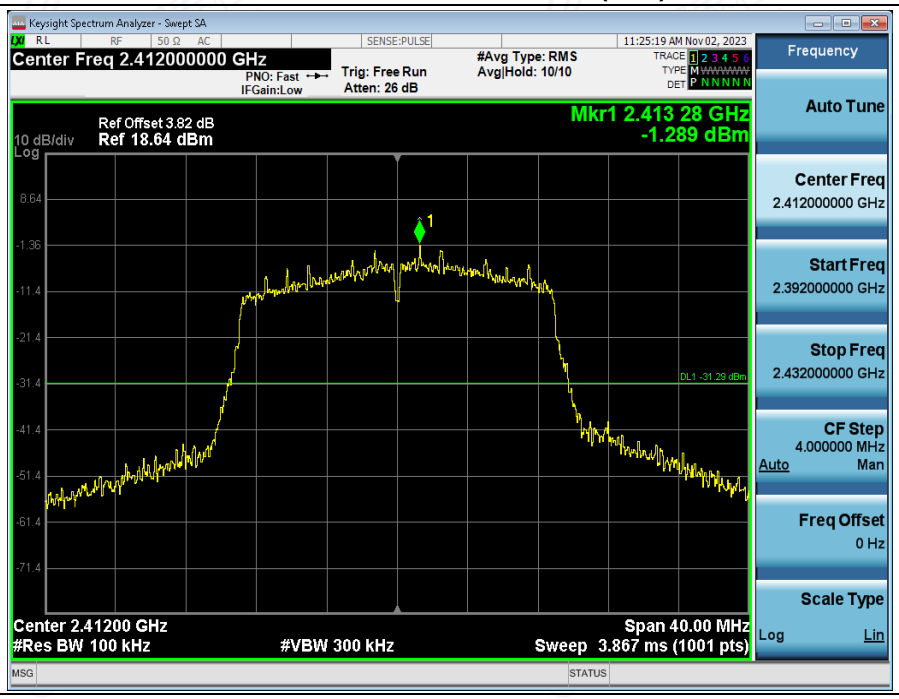


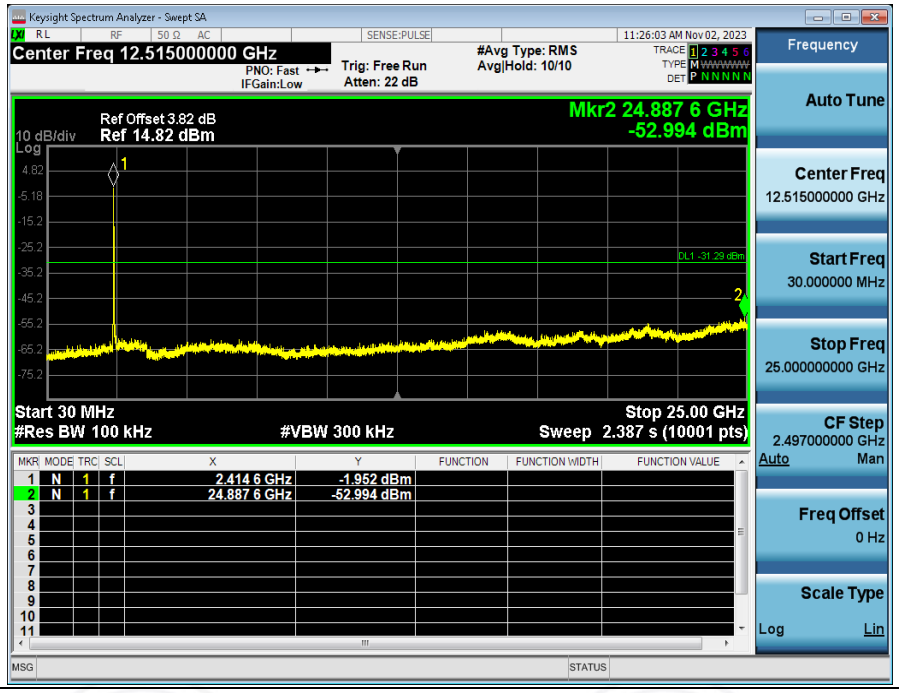
1_Reference_Level_NVNT_ANT1_802_11g_2462


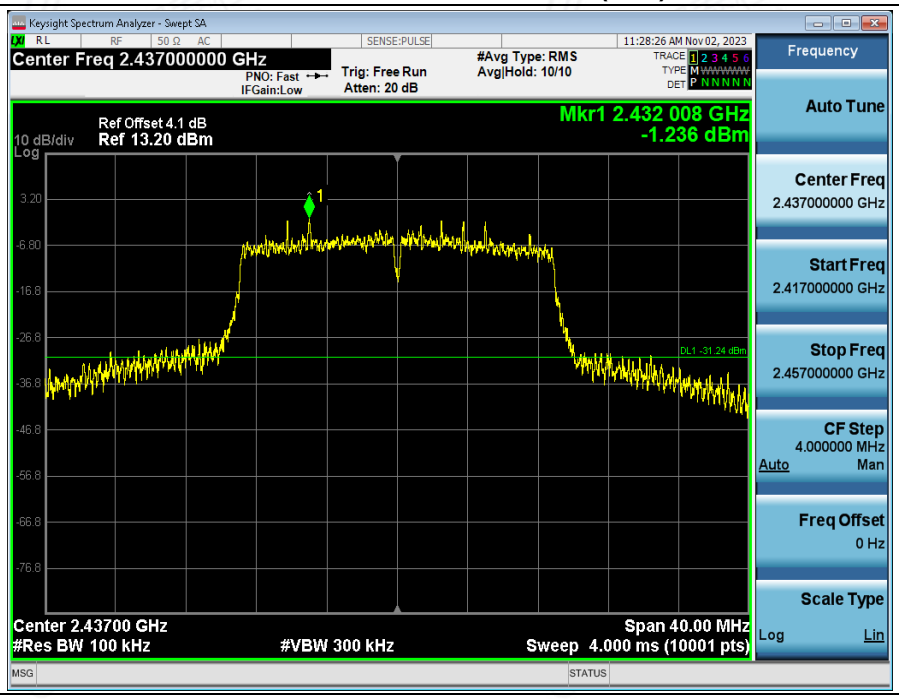
2_Spurious_Emission_NVNT_ANT1_802_11g_2462



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


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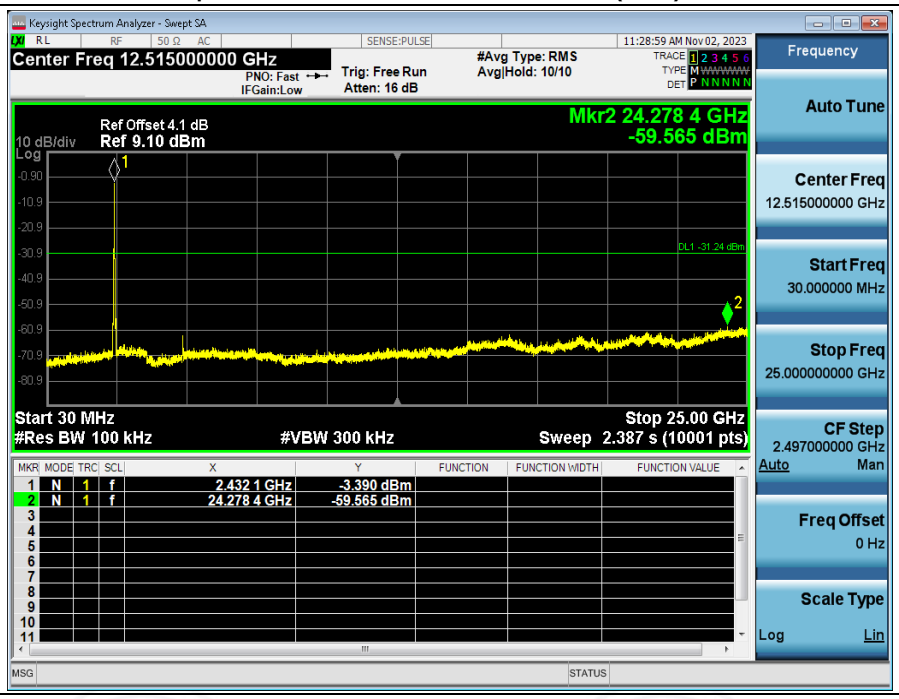
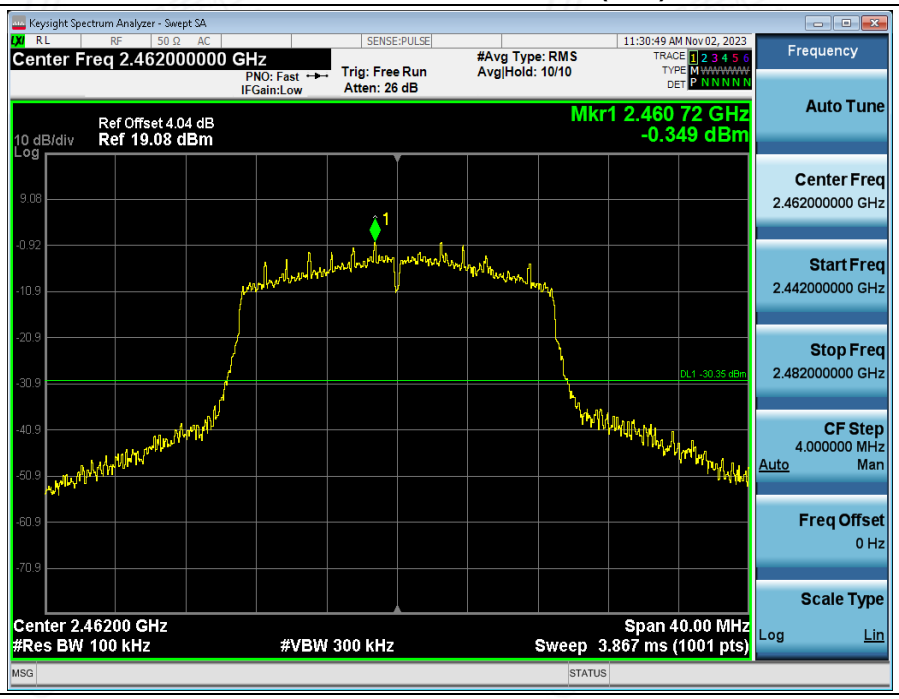
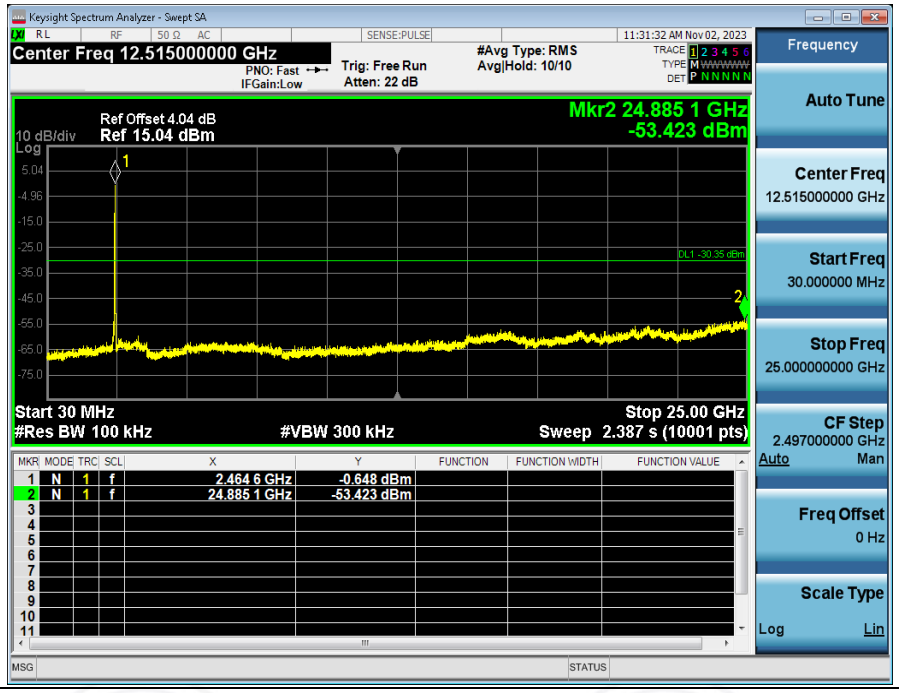


1_Reference_Level_NVNT_ANT1_802_11n(HT20)_2462


2_Spurious_Emission_NVNT_ANT1_802_11n(HT20)_2462


- End of the Report -