



TEST REPORT

Application No.: BTEK231024007AE
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: Waterproof Camera
Model No.: FS02
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 2023-11-14
Date of Issue: 2023-11-14

Test Result:	Pass*
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* 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		2023-11-14		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.



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4 General Information

4.1 Details of E.U.T.

Power supply:	DC 3.7V 1200mAh by Lithium-Ion Battery and recharged by usb port.
Cable(s):	N/A
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) 802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM)
Channel Numbers:	802.11b/g, 802.11n HT20: 11 Channels
Channel Spacing:	5MHz
Antenna Type:	PCB Antenna
Antenna Gain:	1.9dBi
Hardware Version:	IT_FS02_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.:	BTEK231024007AE-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/B arometric Pressure Indicator	KUMAR	F132	N/A	2023-06-12	2024-06-11
Humidity/Temperature/B arometric 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.

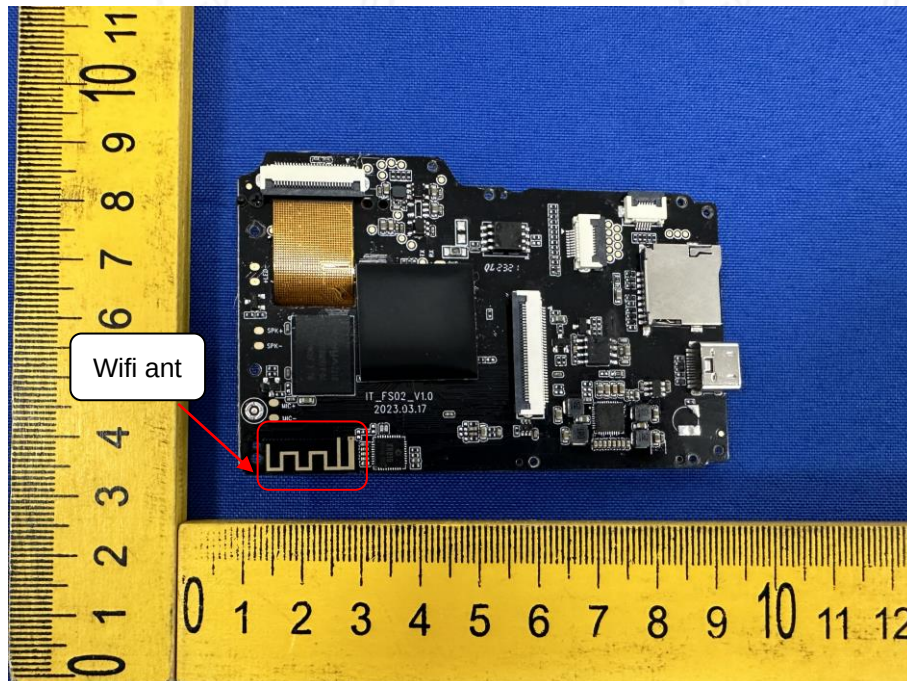
15.247(b) (4) requirement:

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 1.9Bi.

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

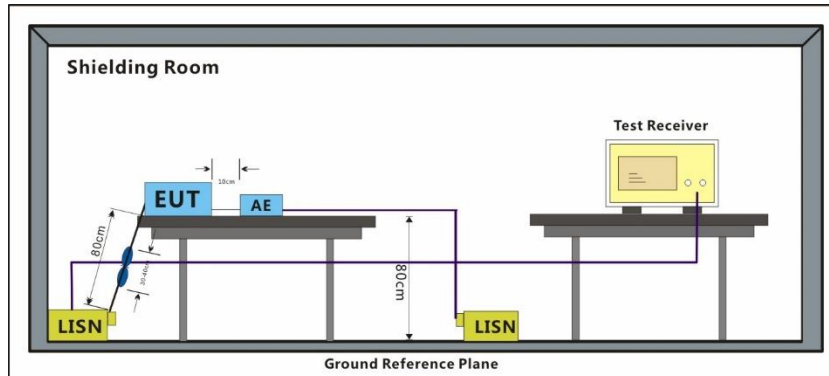
Atmospheric Pressure: 1010 mbar

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); Only the data of worst case is recorded in the report.



7.1.3 Test Setup Diagram

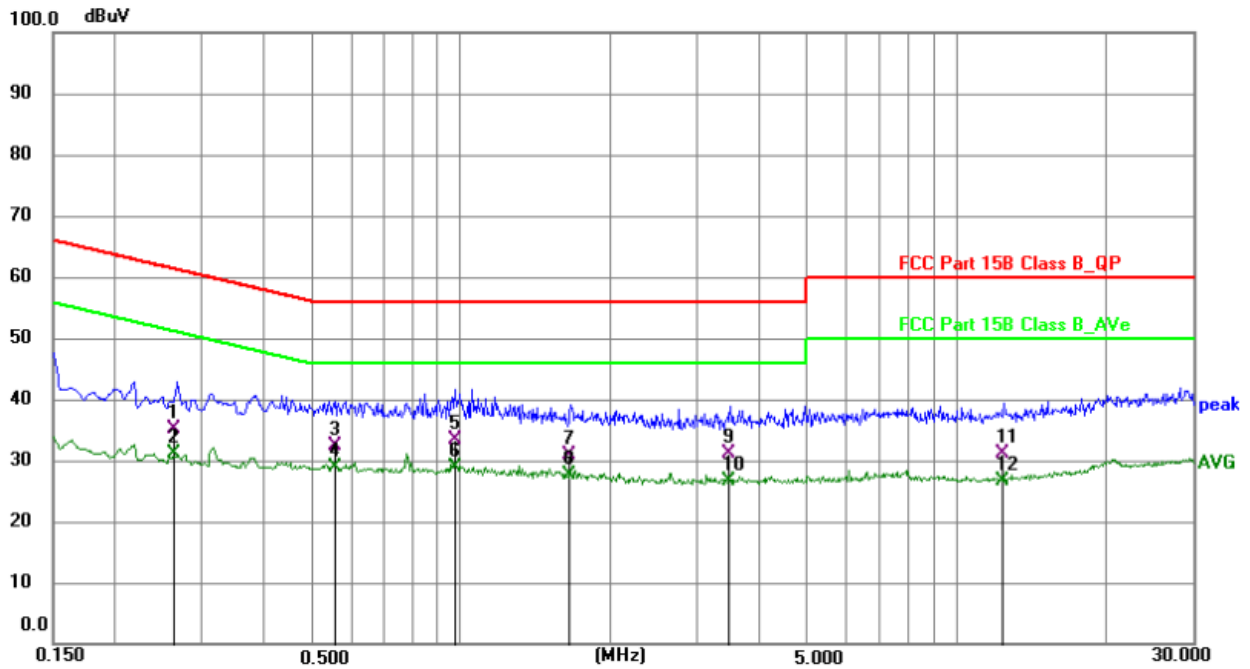


7.1.4 Measurement Procedure and Data

- 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 $50\Omega/50\mu\text{H} + 5\Omega$ 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.



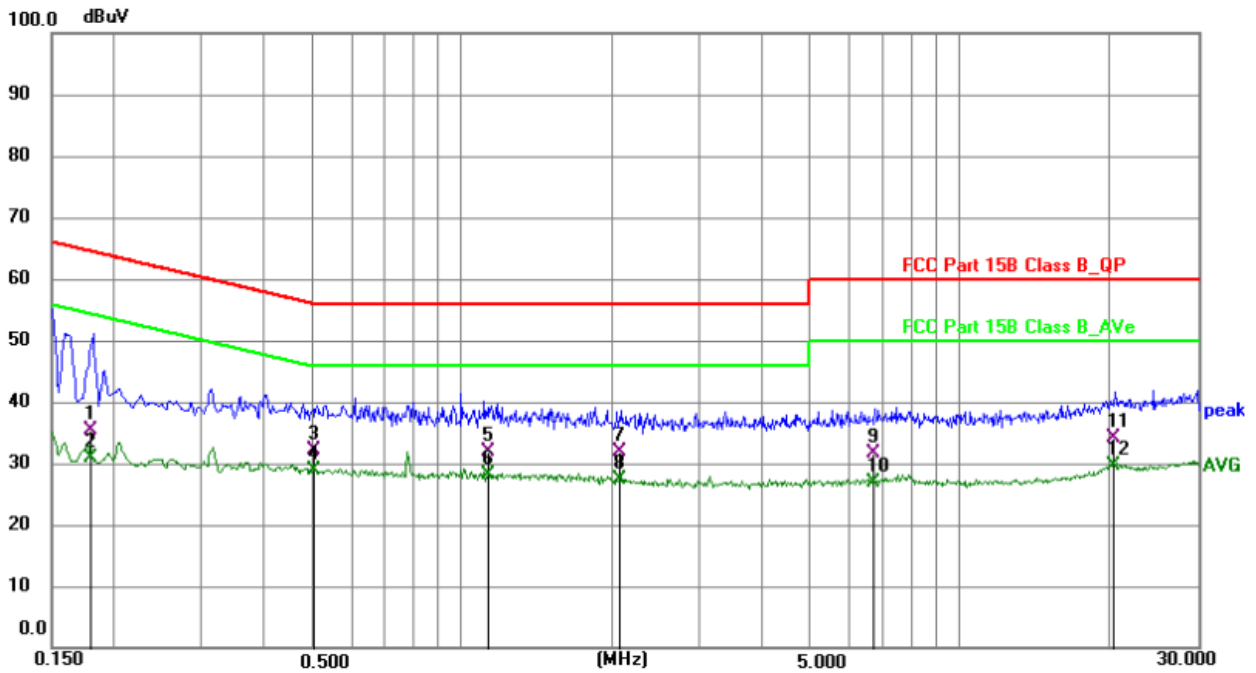
Test Mode: 01; Line: Live line; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.2634	15.25	19.81	35.06	61.32	-26.26	QP	P	
2	0.2634	11.25	19.81	31.06	51.32	-20.26	AVG	P	
3	0.5584	12.43	19.86	32.29	56.00	-23.71	QP	P	
4	0.5584	8.97	19.86	28.83	46.00	-17.17	AVG	P	
5	0.9731	13.28	20.01	33.29	56.00	-22.71	QP	P	
6 *	0.9731	8.95	20.01	28.96	46.00	-17.04	AVG	P	
7	1.6588	10.78	20.05	30.83	56.00	-25.17	QP	P	
8	1.6588	7.57	20.05	27.62	46.00	-18.38	AVG	P	
9	3.4896	10.84	20.20	31.04	56.00	-24.96	QP	P	
10	3.4896	6.32	20.20	26.52	46.00	-19.48	AVG	P	
11	12.4500	10.12	21.10	31.22	60.00	-28.78	QP	P	
12	12.4500	5.58	21.10	26.68	50.00	-23.32	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	0.1797	15.50	19.80	35.30	64.50	-29.20	QP	P	
2	0.1797	11.17	19.80	30.97	54.50	-23.53	AVG	P	
3	0.5049	12.32	19.84	32.16	56.00	-23.84	QP	P	
4 *	0.5049	9.11	19.84	28.95	46.00	-17.05	AVG	P	
5	1.1269	11.73	20.03	31.76	56.00	-24.24	QP	P	
6	1.1269	7.98	20.03	28.01	46.00	-17.99	AVG	P	
7	2.0814	11.85	20.08	31.93	56.00	-24.07	QP	P	
8	2.0814	7.19	20.08	27.27	46.00	-18.73	AVG	P	
9	6.7481	11.18	20.34	31.52	60.00	-28.48	QP	P	
10	6.7481	6.44	20.34	26.78	50.00	-23.22	AVG	P	
11	20.4398	12.26	21.96	34.22	60.00	-25.78	QP	P	
12	20.4398	7.60	21.96	29.56	50.00	-20.44	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 $25 \leq$ 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

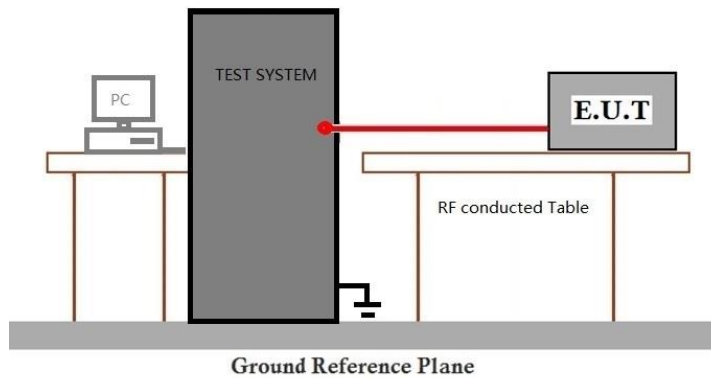
Atmospheric Pressure: 1010 mbar

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

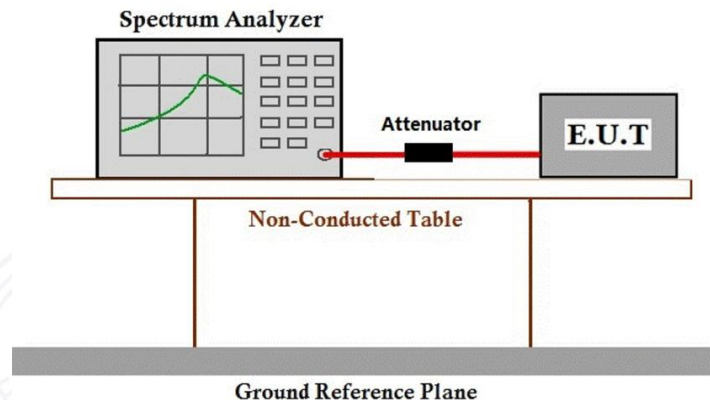
Operating Environment:

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

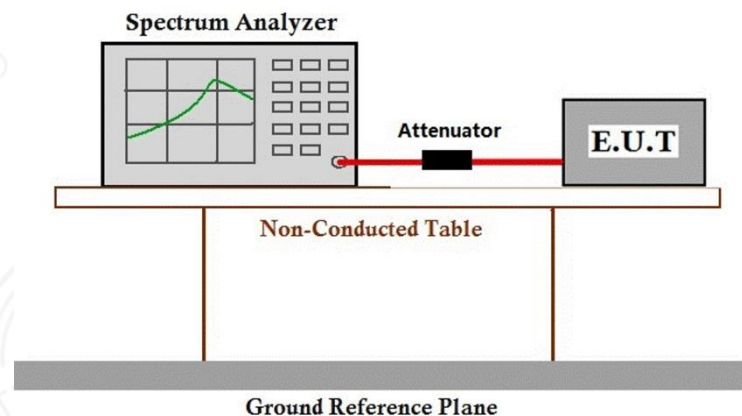
Humidity: 50.0 % RH

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:

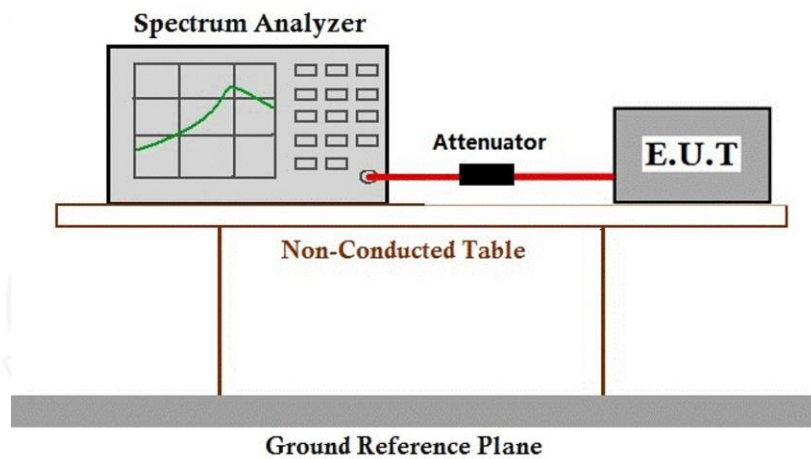
Temperature: 20.5 °C Humidity: 50.0 % RH Atmospheric Pressure: 1010 mbar

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

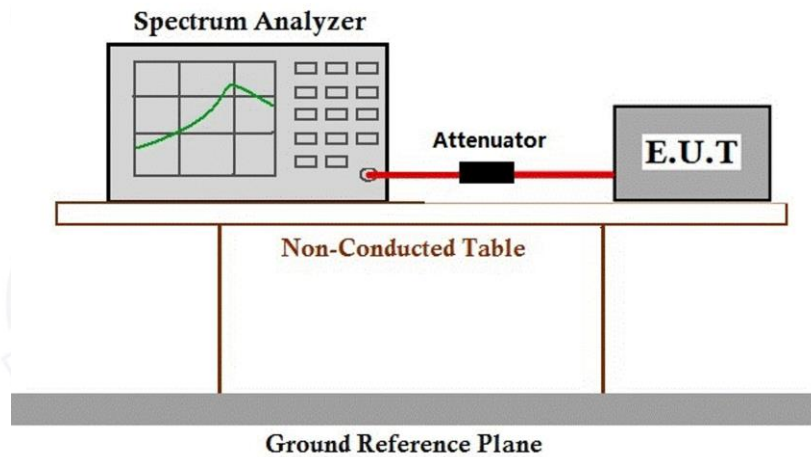
Atmospheric Pressure: 1010 mbar

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

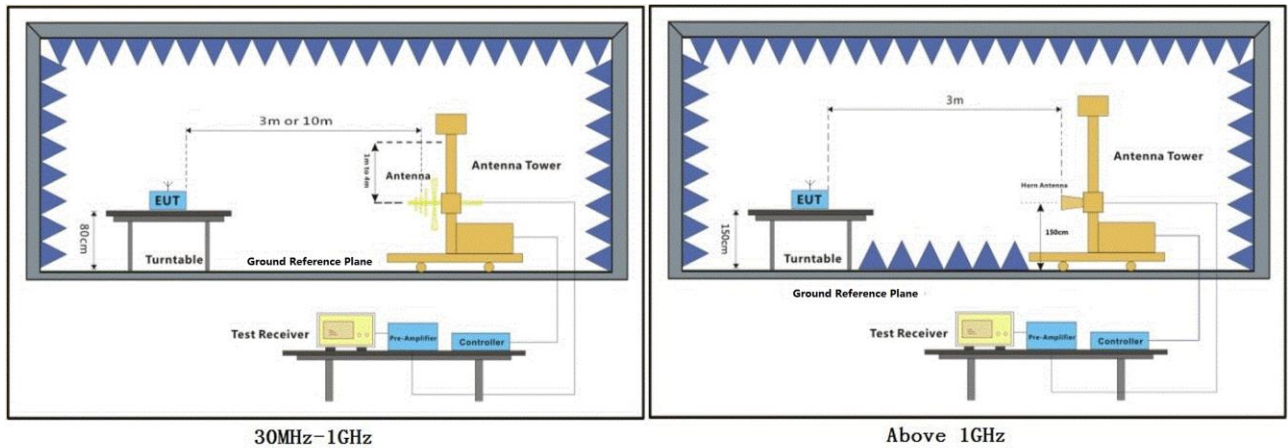
Atmospheric Pressure: 1010 mbar

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



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	67.64	-30.59	37.05	74.00	-36.95	peak	P
2	2390.000	70.76	-30.49	40.27	74.00	-33.73	peak	P
3	2400.000	78.93	-30.48	48.45	74.00	-25.55	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	67.37	-30.59	36.78	74.00	-37.22	peak	P
2	2390.000	70.75	-30.49	40.26	74.00	-33.74	peak	P
3	2400.000	78.41	-30.48	47.93	74.00	-26.07	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	80.80	-30.39	50.41	74.00	-23.59	peak	P
2	2500.000	70.30	-30.37	39.93	74.00	-34.07	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	79.12	-30.39	48.73	74.00	-25.27	peak	P
2	2500.000	71.68	-30.37	41.31	74.00	-32.69	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	68.30	-30.59	37.71	74.00	-36.29	peak	P
2	2390.000	68.93	-30.49	38.44	74.00	-35.56	peak	P
3	2400.000	79.27	-30.48	48.79	74.00	-25.21	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	67.66	-30.59	37.07	74.00	-36.93	peak	P
2	2390.000	70.28	-30.49	39.79	74.00	-34.21	peak	P
3	2400.000	79.19	-30.48	48.71	74.00	-25.29	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	80.07	-30.39	49.68	74.00	-24.32	peak	P
2	2500.000	70.47	-30.37	40.10	74.00	-33.90	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	80.18	-30.39	49.79	74.00	-24.21	peak	P
2	2500.000	71.23	-30.37	40.86	74.00	-33.14	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	68.62	-30.59	38.03	74.00	-35.97	peak	P
2	2390.000	69.74	-30.49	39.25	74.00	-34.75	peak	P
3	2400.000	77.46	-30.48	46.98	74.00	-27.02	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	68.14	-30.59	37.55	74.00	-36.45	peak	P
2	2390.000	70.12	-30.49	39.63	74.00	-34.37	peak	P
3	2400.000	77.52	-30.48	47.04	74.00	-26.96	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	80.84	-30.39	50.45	74.00	-23.55	peak	P
2	2500.000	71.02	-30.37	40.65	74.00	-33.35	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	79.13	-30.39	48.74	74.00	-25.26	peak	P
2	2500.000	70.58	-30.37	40.21	74.00	-33.79	peak	P

Note: Level = Reading level + Factor

Factor= Antenna Factor+ Cable Loss-Preamplifier 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

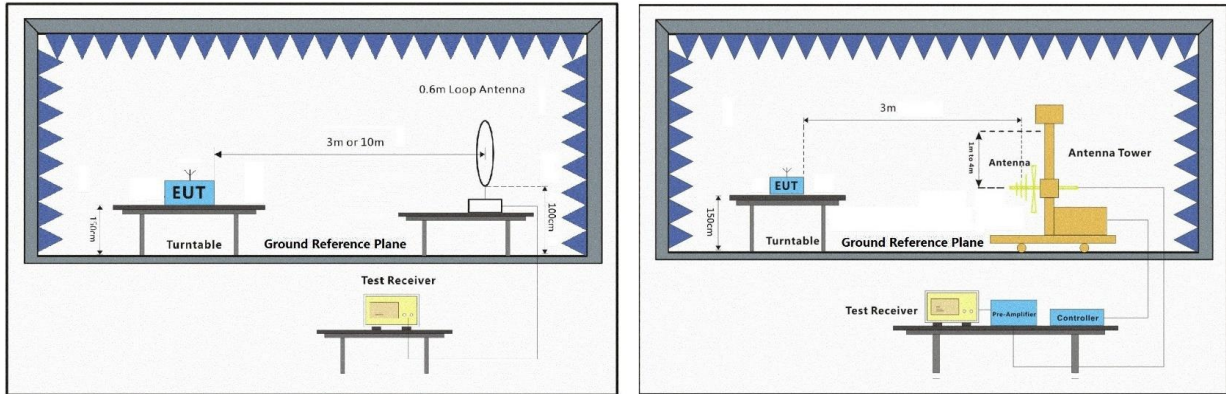
Atmospheric Pressure: 1010 mbar

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

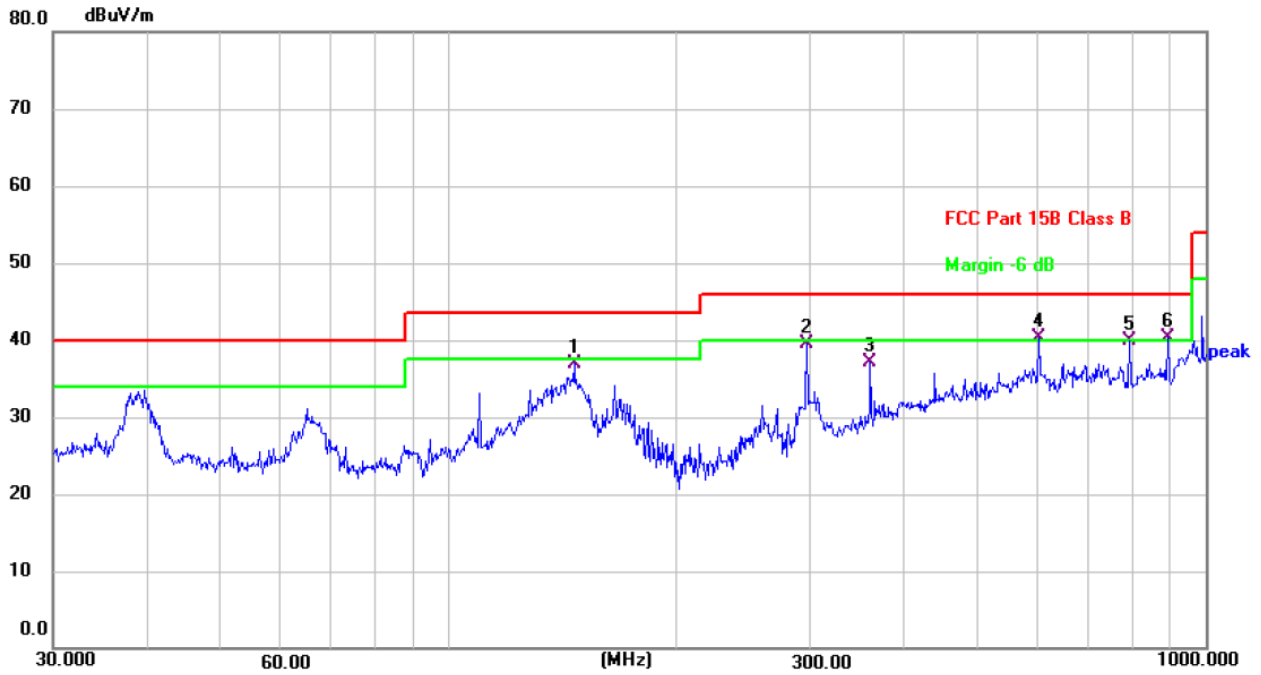
- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 or 10 meters away from the interference-receiving antenna,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

Remark:

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



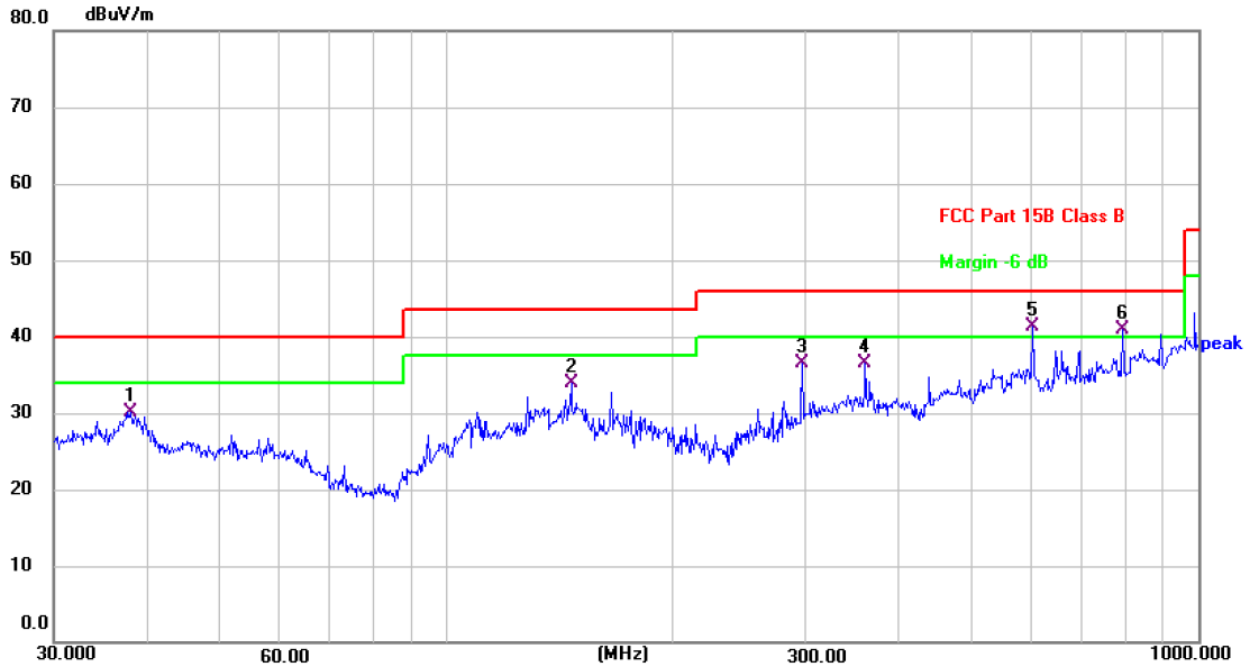
Test Mode: 01; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	146.3734	53.99	-17.02	36.97	43.50	-6.53	QP	100	68	P	
2	297.2240	57.42	-17.85	39.57	46.00	-6.43	QP	299	36	P	
3	360.4476	53.23	-16.20	37.03	46.00	-8.97	QP	99	189	P	
4 !	601.4265	51.79	-11.53	40.26	46.00	-5.74	QP	300	255	P	
5	793.3960	48.66	-8.81	39.85	46.00	-6.15	QP	300	147	P	
6 *	890.7277	48.29	-7.98	40.31	46.00	-5.69	QP	299	147	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	37.9450	47.30	-17.11	30.19	40.00	-9.81	QP	200	312	P	
2	146.3734	50.99	-17.02	33.97	43.50	-9.53	QP	300	78	P	
3	297.2240	54.42	-17.85	36.57	46.00	-9.43	QP	100	98	P	
4	360.4476	52.73	-16.20	36.53	46.00	-9.47	QP	100	122	P	
5 *	601.4265	52.79	-11.53	41.26	46.00	-4.74	QP	100	187	P	
6 !	793.3960	49.66	-8.81	40.85	46.00	-5.15	QP	200	228	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

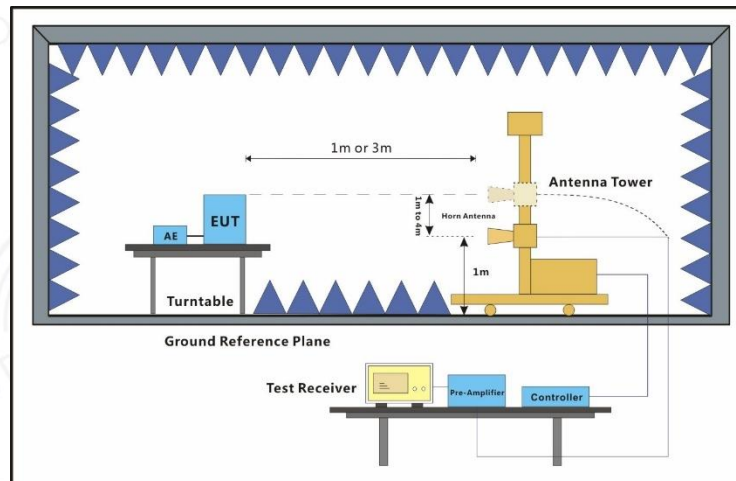
Atmospheric Pressure: 1010 mbar

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	2914.653	70.24	-30.17	40.07	74.00	-33.93	peak	P
2	4277.966	67.47	-29.34	38.13	74.00	-35.87	peak	P
3	6085.469	65.53	-24.74	40.79	74.00	-33.21	peak	P
4	8645.168	69.74	-25.33	44.41	74.00	-29.59	peak	P
5	11047.696	67.57	-23.31	44.25	74.00	-29.75	peak	P
6	14217.249	70.77	-20.85	49.92	74.00	-24.08	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	2973.628	67.77	-30.37	37.40	74.00	-36.60	peak	P
2	4313.391	68.90	-29.27	39.63	74.00	-34.37	peak	P
3	6353.909	67.57	-25.28	42.29	74.00	-31.71	peak	P
4	8577.072	69.72	-24.54	45.18	74.00	-28.82	peak	P
5	11287.078	68.79	-23.76	45.03	74.00	-28.97	peak	P
6	14956.478	71.96	-20.44	51.52	74.00	-22.48	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	2914.971	70.61	-28.83	41.77	74.00	-32.23	peak	P
2	4276.788	67.81	-27.96	39.85	74.00	-34.15	peak	P
3	6084.854	65.69	-24.52	41.17	74.00	-32.83	peak	P
4	8646.591	69.67	-25.66	44.02	74.00	-29.98	peak	P
5	11047.709	67.30	-22.79	44.52	74.00	-29.48	peak	P
6	14217.590	69.99	-21.31	48.68	74.00	-25.32	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	2973.882	67.93	-30.52	37.42	74.00	-36.58	peak	P
2	4312.224	68.56	-28.16	40.40	74.00	-33.60	peak	P
3	6352.855	66.88	-25.03	41.84	74.00	-32.16	peak	P
4	8576.867	70.58	-24.99	45.59	74.00	-28.41	peak	P
5	11286.654	68.27	-23.16	45.10	74.00	-28.90	peak	P
6	14954.910	71.57	-19.82	51.75	74.00	-22.25	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	2915.525	69.30	-29.65	39.65	74.00	-34.35	peak	P
2	4276.367	67.50	-28.07	39.43	74.00	-34.57	peak	P
3	6084.732	64.03	-25.15	38.87	74.00	-35.13	peak	P
4	8645.557	69.59	-25.47	44.12	74.00	-29.88	peak	P
5	11047.622	68.06	-22.96	45.09	74.00	-28.91	peak	P
6	14218.140	70.20	-20.18	50.02	74.00	-23.98	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	2974.143	67.52	-29.25	38.27	74.00	-35.73	peak	P
2	4313.990	67.95	-29.39	38.57	74.00	-35.43	peak	P
3	6352.623	66.73	-25.25	41.48	74.00	-32.52	peak	P
4	8575.900	69.86	-25.04	44.81	74.00	-29.19	peak	P
5	11285.643	68.75	-23.48	45.27	74.00	-28.73	peak	P
6	14955.468	70.46	-20.61	49.85	74.00	-24.15	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	2915.349	69.80	-29.69	40.11	74.00	-33.89	peak	P
2	4276.328	68.60	-28.95	39.66	74.00	-34.34	peak	P
3	6085.785	65.57	-25.38	40.19	74.00	-33.81	peak	P
4	8645.018	68.93	-24.85	44.08	74.00	-29.92	peak	P
5	11046.684	67.48	-22.57	44.91	74.00	-29.09	peak	P
6	14217.908	70.29	-21.55	48.74	74.00	-25.26	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	2972.792	67.83	-28.92	38.90	74.00	-35.10	peak	P
2	4313.496	69.31	-28.29	41.01	74.00	-32.99	peak	P
3	6352.327	67.14	-26.30	40.84	74.00	-33.16	peak	P
4	8576.510	70.62	-24.56	46.05	74.00	-27.95	peak	P
5	11285.161	68.09	-24.02	44.07	74.00	-29.93	peak	P
6	14955.521	71.59	-20.17	51.41	74.00	-22.59	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	2914.233	70.41	-30.41	40.00	74.00	-34.00	peak	P
2	4277.177	67.77	-29.32	38.45	74.00	-35.55	peak	P
3	6086.385	65.22	-26.32	38.89	74.00	-35.11	peak	P
4	8645.015	69.95	-24.74	45.21	74.00	-28.79	peak	P
5	11046.830	66.97	-23.63	43.34	74.00	-30.66	peak	P
6	14217.950	71.00	-21.91	49.09	74.00	-24.91	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	2973.670	66.30	-28.83	37.48	74.00	-36.52	peak	P
2	4312.975	69.78	-29.01	40.77	74.00	-33.23	peak	P
3	6352.745	68.30	-25.13	43.17	74.00	-30.83	peak	P
4	8576.235	69.24	-26.01	43.22	74.00	-30.78	peak	P
5	11286.962	67.66	-23.71	43.95	74.00	-30.05	peak	P
6	14955.549	70.16	-19.88	50.28	74.00	-23.72	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	2914.262	69.36	-29.22	40.14	74.00	-33.86	peak	P
2	4277.631	68.43	-28.41	40.02	74.00	-33.98	peak	P
3	6085.396	64.79	-24.44	40.36	74.00	-33.64	peak	P
4	8646.511	69.19	-25.00	44.19	74.00	-29.81	peak	P
5	11047.839	67.07	-24.39	42.69	74.00	-31.31	peak	P
6	14219.098	69.96	-21.23	48.73	74.00	-25.27	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	2913.892	69.65	-29.47	40.17	74.00	-33.83	peak	P
2	4278.035	68.85	-29.59	39.27	74.00	-34.73	peak	P
3	6086.446	64.60	-25.39	39.21	74.00	-34.79	peak	P
4	8645.988	69.76	-25.53	44.23	74.00	-29.77	peak	P
5	11046.550	67.62	-23.13	44.49	74.00	-29.51	peak	P
6	14217.192	71.45	-22.06	49.39	74.00	-24.61	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	2973.124	66.69	-28.84	37.85	74.00	-36.15	peak	P
2	4312.652	69.45	-29.71	39.74	74.00	-34.26	peak	P
3	6353.881	67.45	-26.00	41.45	74.00	-32.55	peak	P
4	8575.604	70.42	-24.22	46.20	74.00	-27.80	peak	P
5	11287.023	67.83	-24.06	43.77	74.00	-30.23	peak	P
6	14955.277	70.07	-20.04	50.03	74.00	-23.97	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	2913.651	68.72	-29.91	38.81	74.00	-35.19	peak	P
2	4277.196	67.54	-28.13	39.41	74.00	-34.59	peak	P
3	6086.112	64.79	-25.46	39.33	74.00	-34.67	peak	P
4	8644.976	69.18	-25.42	43.76	74.00	-30.24	peak	P
5	11047.504	67.36	-23.53	43.83	74.00	-30.17	peak	P
6	14219.065	71.78	-20.57	51.20	74.00	-22.80	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	2914.765	69.72	-29.94	39.78	74.00	-34.22	peak	P
2	4277.156	67.37	-28.77	38.59	74.00	-35.41	peak	P
3	6085.397	64.72	-25.20	39.51	74.00	-34.49	peak	P
4	8645.603	70.50	-25.20	45.30	74.00	-28.70	peak	P
5	11047.671	67.20	-24.04	43.16	74.00	-30.84	peak	P
6	14218.804	71.27	-22.03	49.24	74.00	-24.76	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	2972.504	67.25	-29.51	37.73	74.00	-36.27	peak	P
2	4312.991	69.17	-29.81	39.36	74.00	-34.64	peak	P
3	6353.399	67.65	-25.54	42.11	74.00	-31.89	peak	P
4	8576.668	70.79	-24.86	45.93	74.00	-28.07	peak	P
5	11286.462	68.50	-24.21	44.30	74.00	-29.70	peak	P
6	14955.029	71.07	-21.05	50.03	74.00	-23.97	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	2915.318	70.13	-28.70	41.43	74.00	-32.57	peak	P
2	4278.054	69.07	-29.04	40.03	74.00	-33.97	peak	P
3	6086.158	64.88	-26.24	38.64	74.00	-35.36	peak	P
4	8646.169	69.18	-25.96	43.22	74.00	-30.78	peak	P
5	11047.454	68.50	-23.16	45.34	74.00	-28.66	peak	P
6	14217.667	71.24	-21.15	50.09	74.00	-23.91	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	2972.605	67.48	-29.46	38.02	74.00	-35.98	peak	P
2	4313.870	68.38	-28.47	39.91	74.00	-34.09	peak	P
3	6353.444	67.99	-25.91	42.08	74.00	-31.92	peak	P
4	8576.057	69.33	-25.13	44.20	74.00	-29.80	peak	P
5	11285.819	67.85	-23.12	44.73	74.00	-29.27	peak	P
6	14955.985	71.12	-20.74	50.38	74.00	-23.62	peak	P



8 Test Setup Photo

Please Refer to appendix – Test Setup Photos for BTEK231024007AE

9 EUT Constructional Details (EUT Photos)

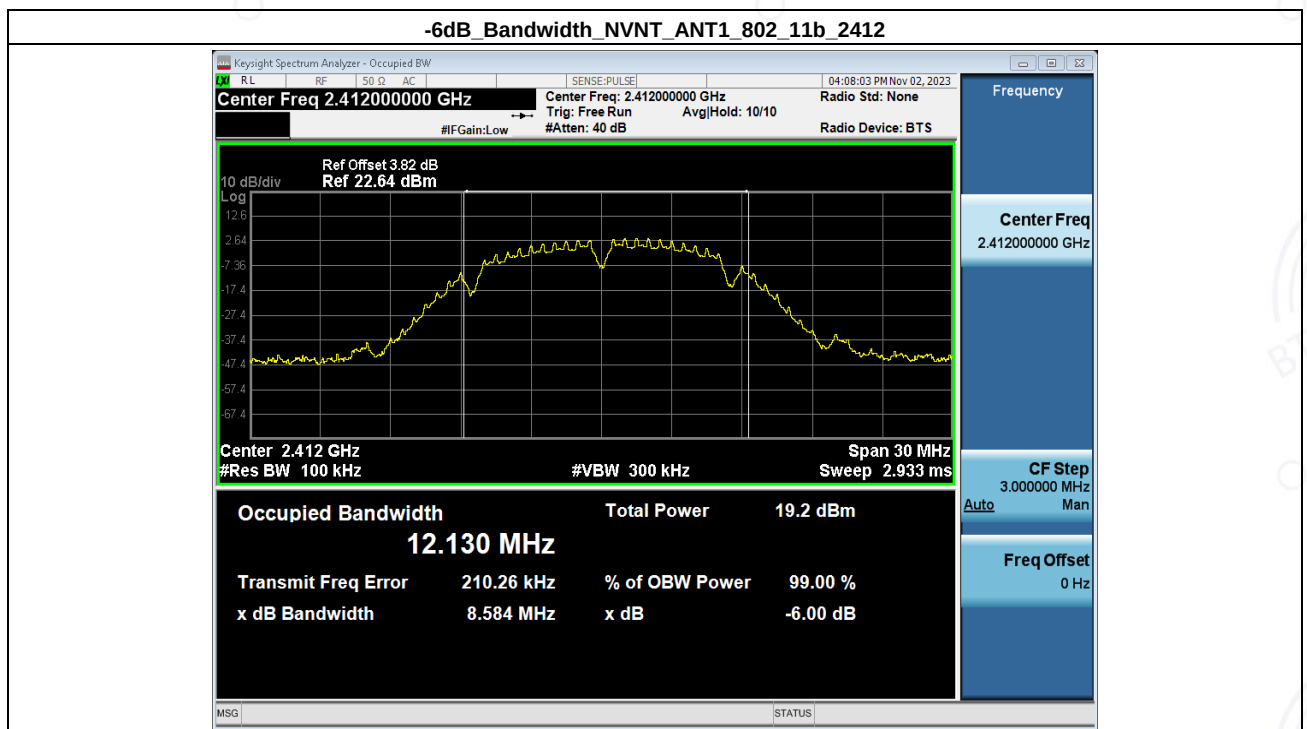
Please Refer to appendix - External and Internal Photos for BTEK231024007AE

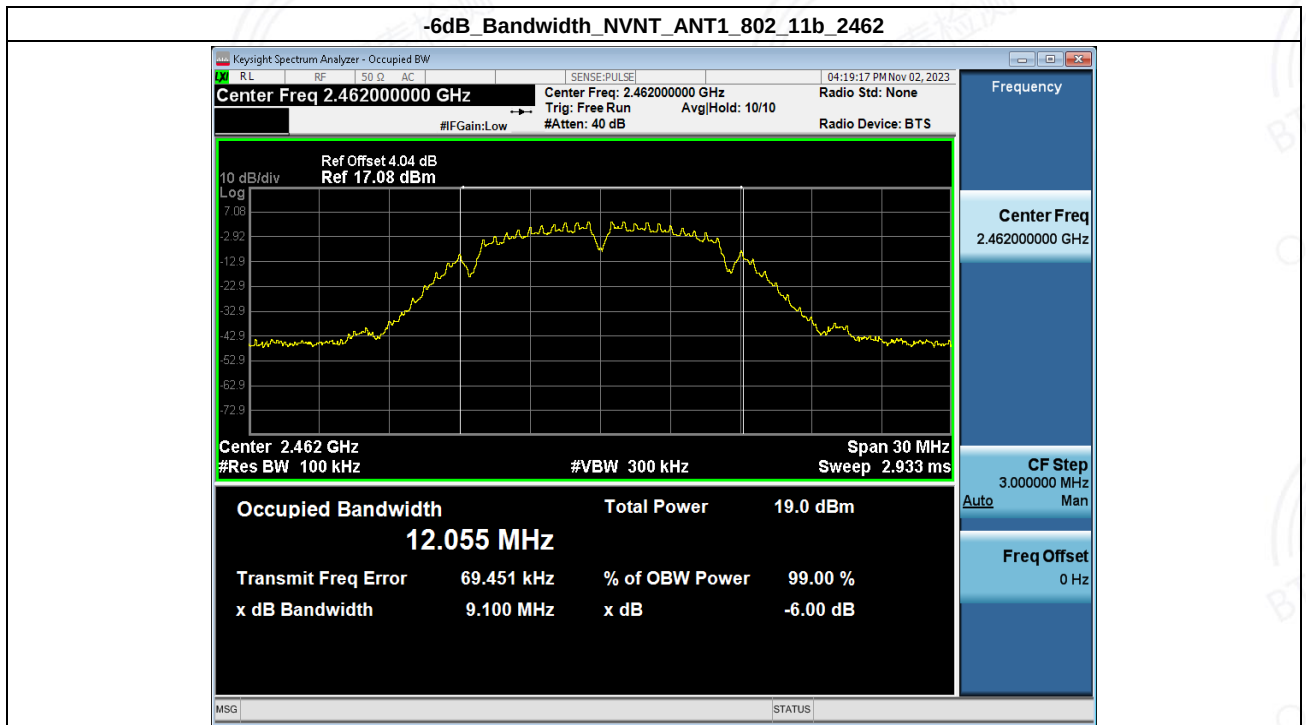
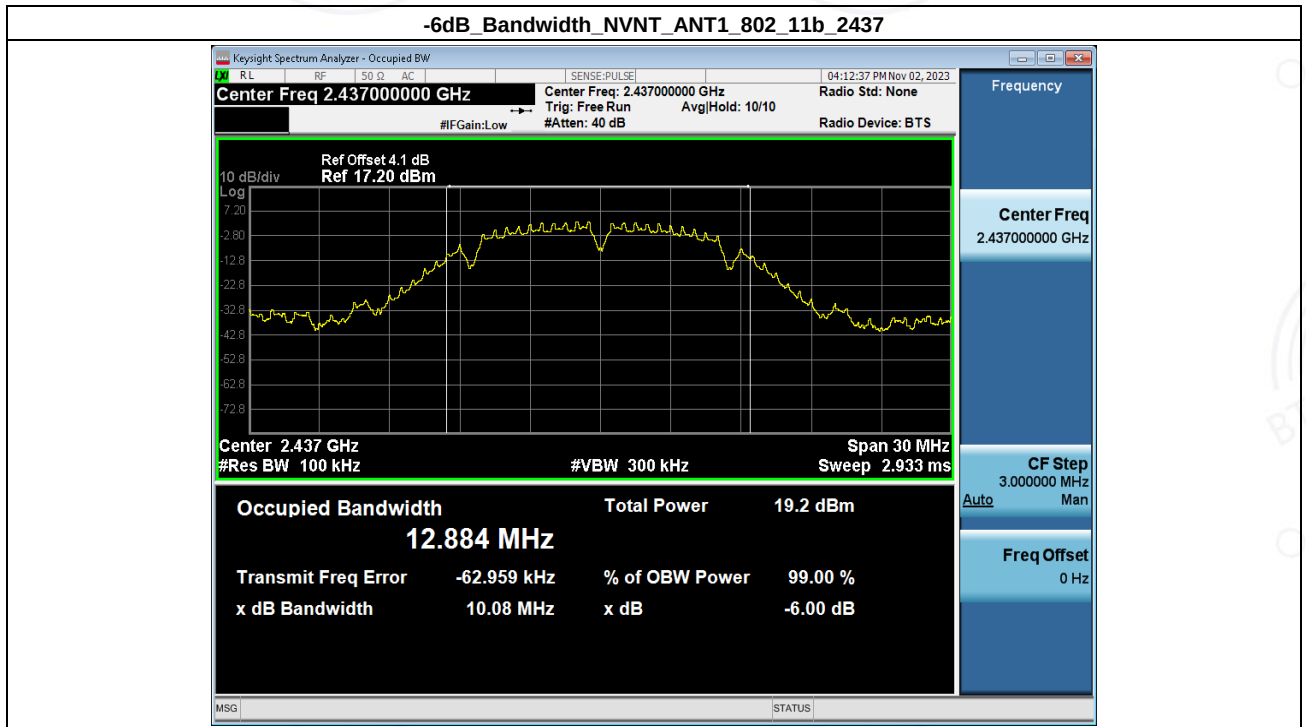


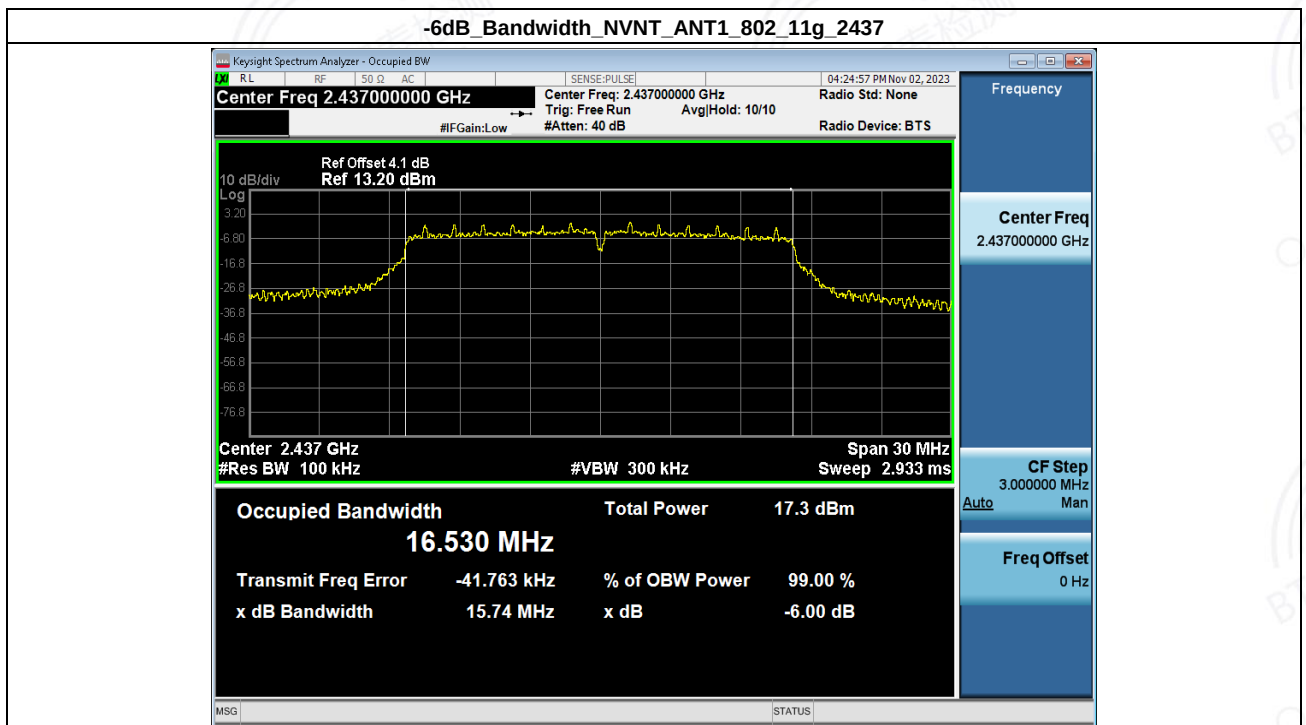
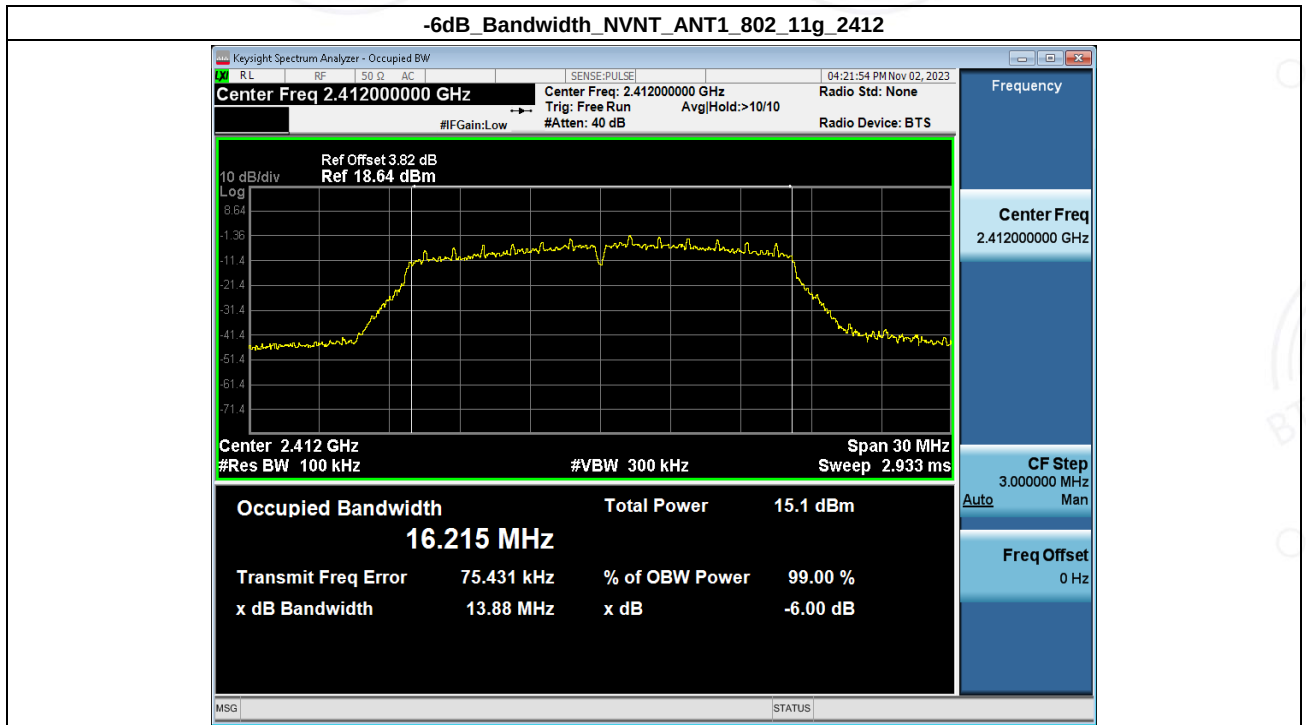
10 Appendix

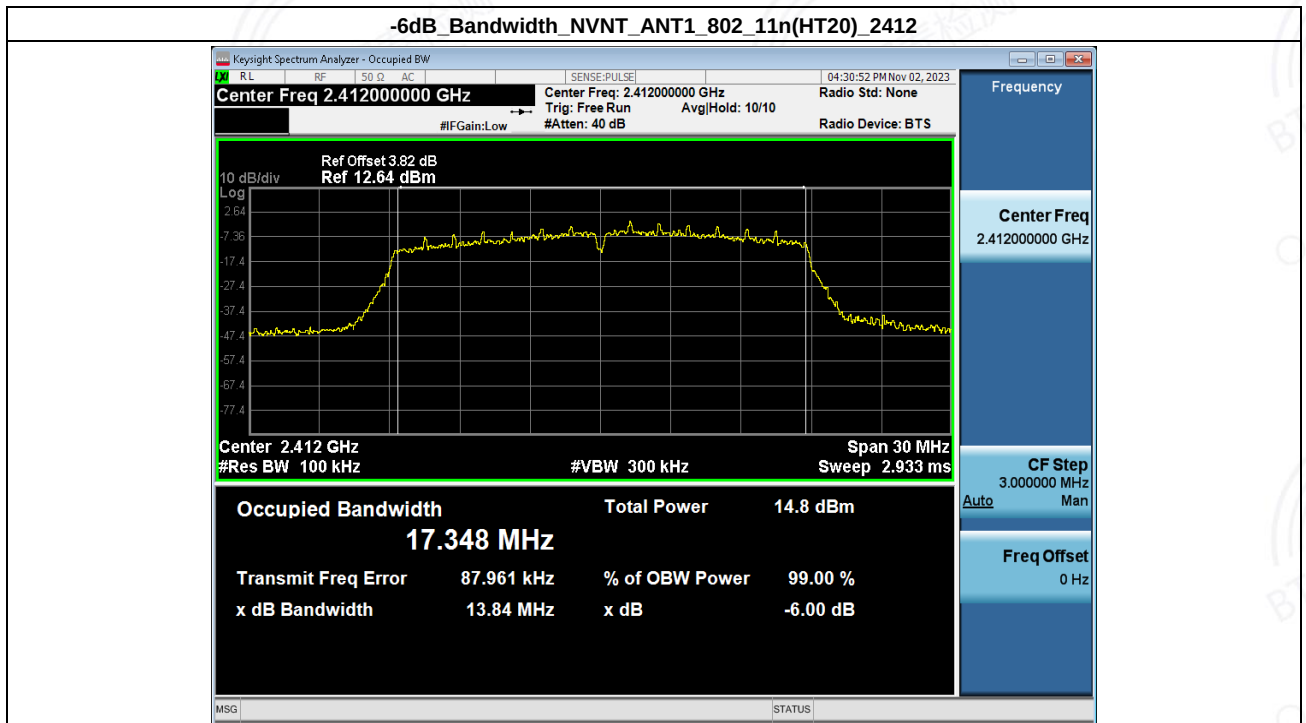
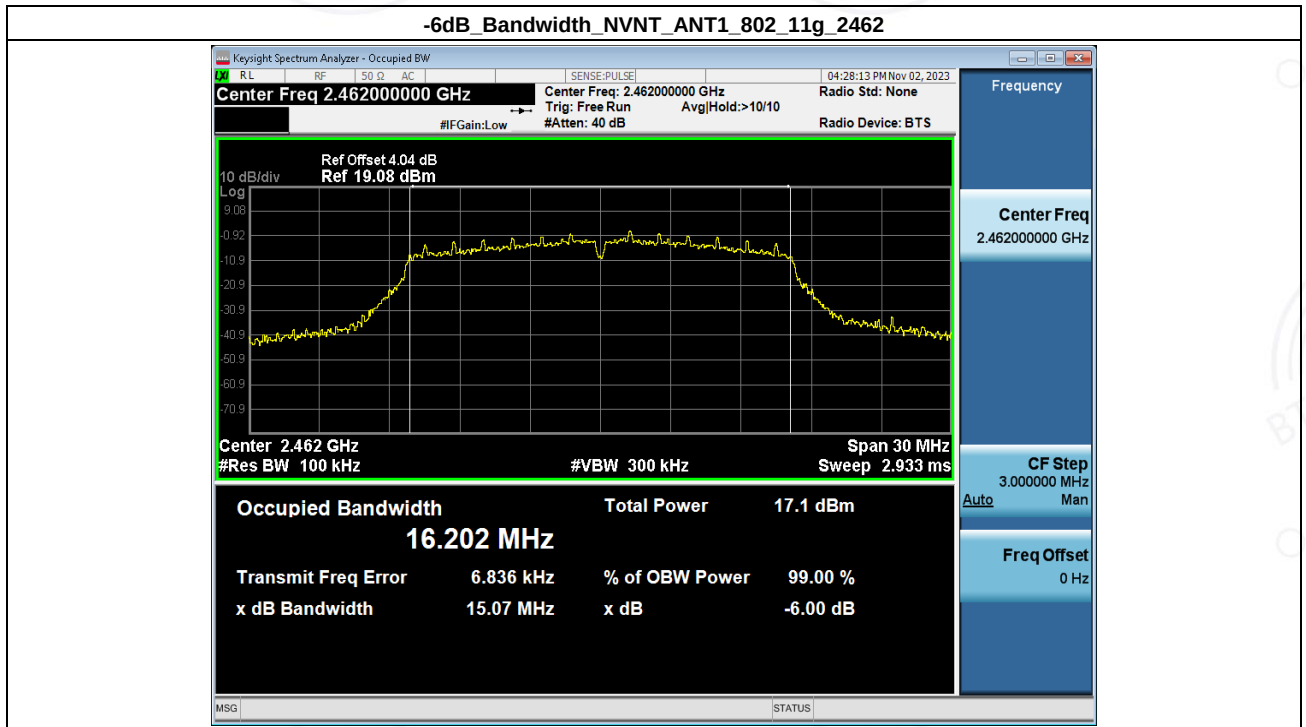
1. -6dB Bandwidth

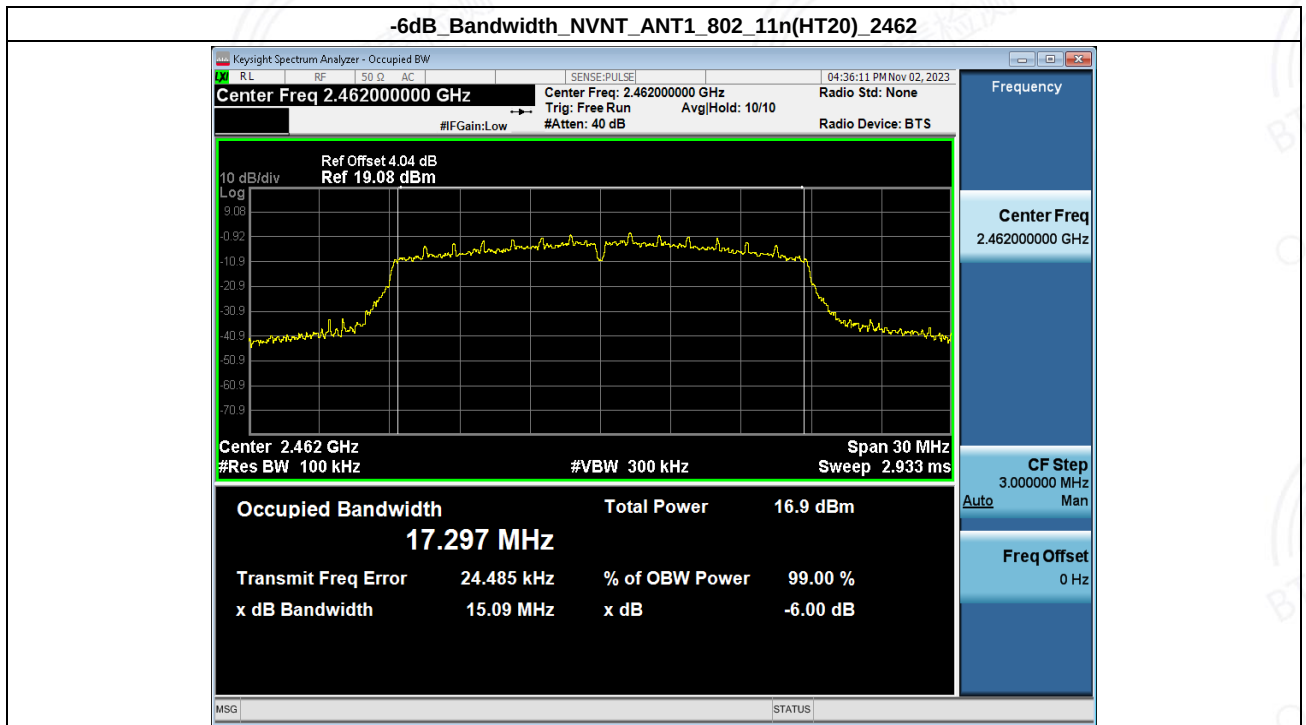
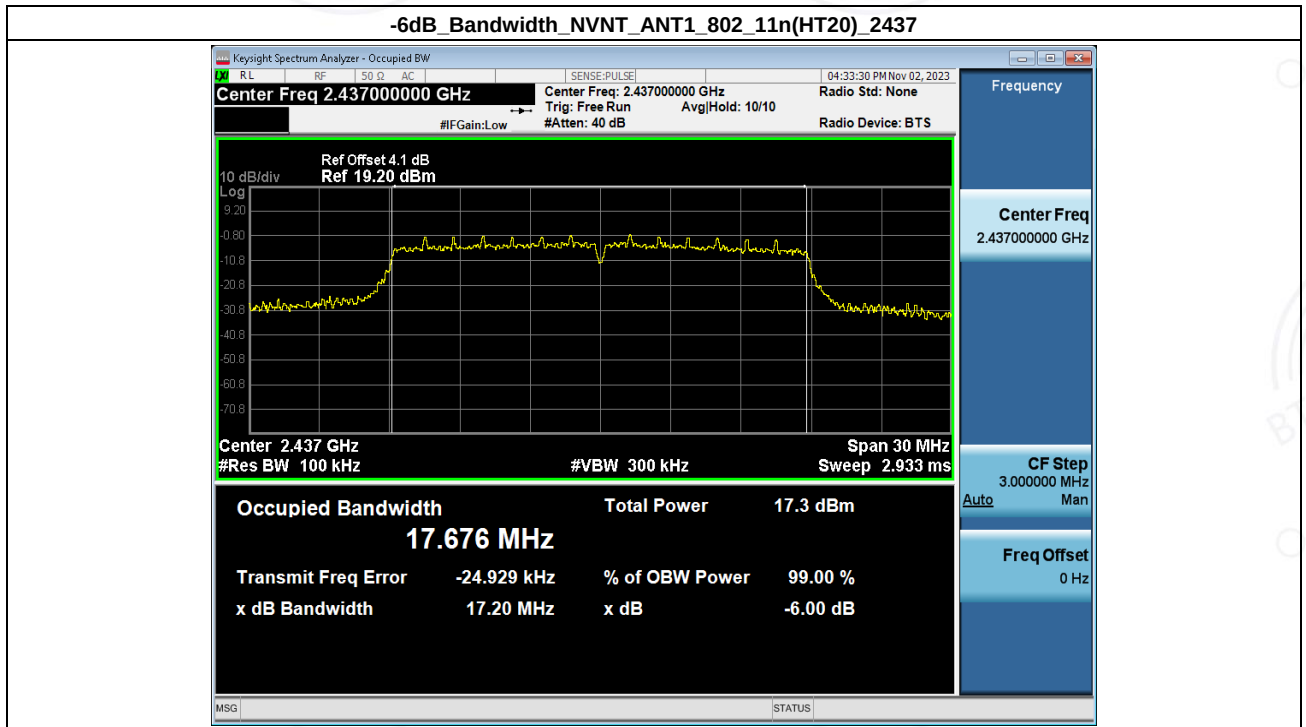
Condition	Antenna	Modulation	Frequency (MHz)	-6dB BW(MHz)	limit(kHz)	Result
NVNT	ANT1	802.11b	2412.00	8.58	500	Pass
NVNT	ANT1	802.11b	2437.00	10.08	500	Pass
NVNT	ANT1	802.11b	2462.00	9.10	500	Pass
NVNT	ANT1	802.11g	2412.00	13.88	500	Pass
NVNT	ANT1	802.11g	2437.00	15.74	500	Pass
NVNT	ANT1	802.11g	2462.00	15.07	500	Pass
NVNT	ANT1	802.11n(HT20)	2412.00	13.84	500	Pass
NVNT	ANT1	802.11n(HT20)	2437.00	17.20	500	Pass
NVNT	ANT1	802.11n(HT20)	2462.00	15.09	500	Pass





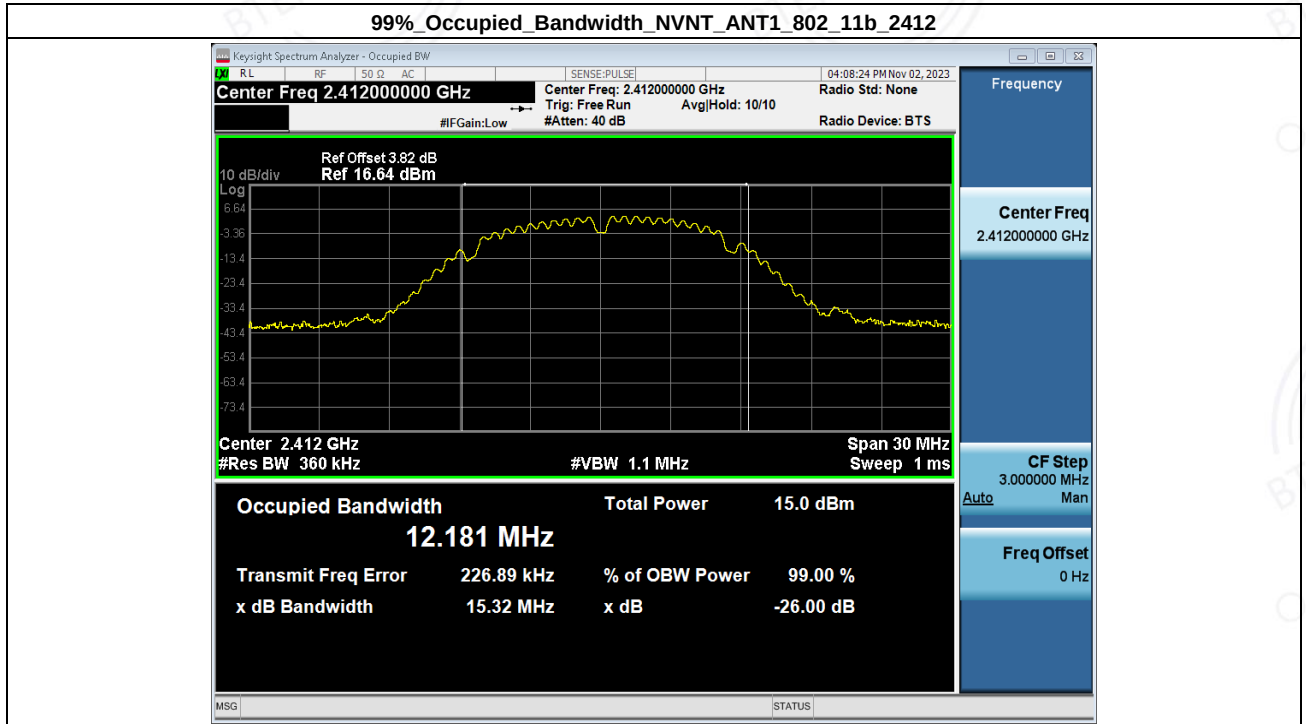




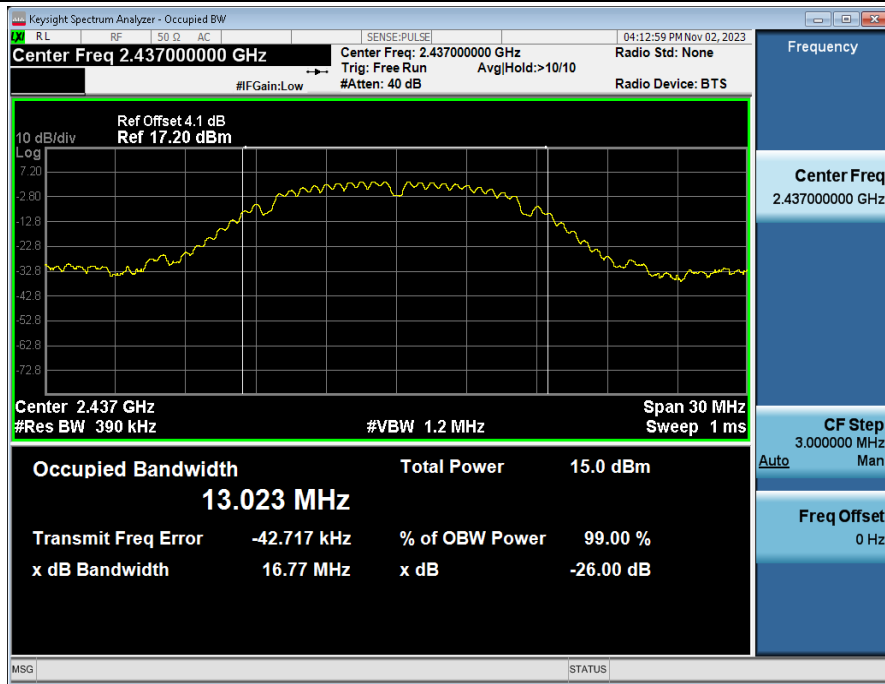


2. 99% Occupied Bandwidth

Condition	Antenna	Modulation	Frequency (MHz)	99%BW(MHz)
NVNT	ANT1	802.11b	2412.00	12.181
NVNT	ANT1	802.11b	2437.00	13.023
NVNT	ANT1	802.11b	2462.00	12.098
NVNT	ANT1	802.11g	2412.00	16.693
NVNT	ANT1	802.11g	2437.00	17.491
NVNT	ANT1	802.11g	2462.00	16.634
NVNT	ANT1	802.11n(HT20)	2412.00	17.592
NVNT	ANT1	802.11n(HT20)	2437.00	18.350
NVNT	ANT1	802.11n(HT20)	2462.00	17.516



99%_Occupied_Bandwidth_NVNT_ANT1_802_11b_2437



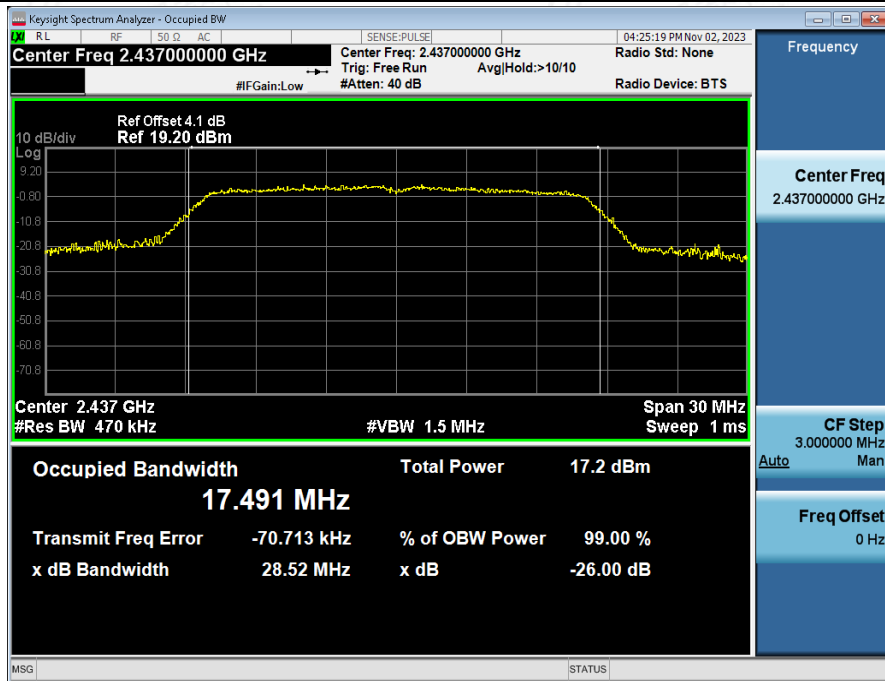
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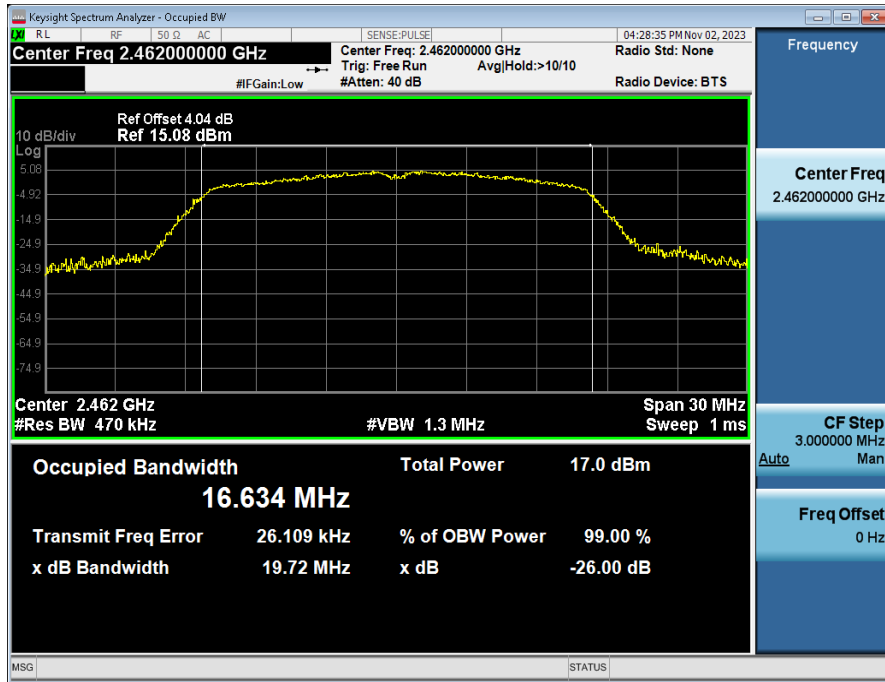
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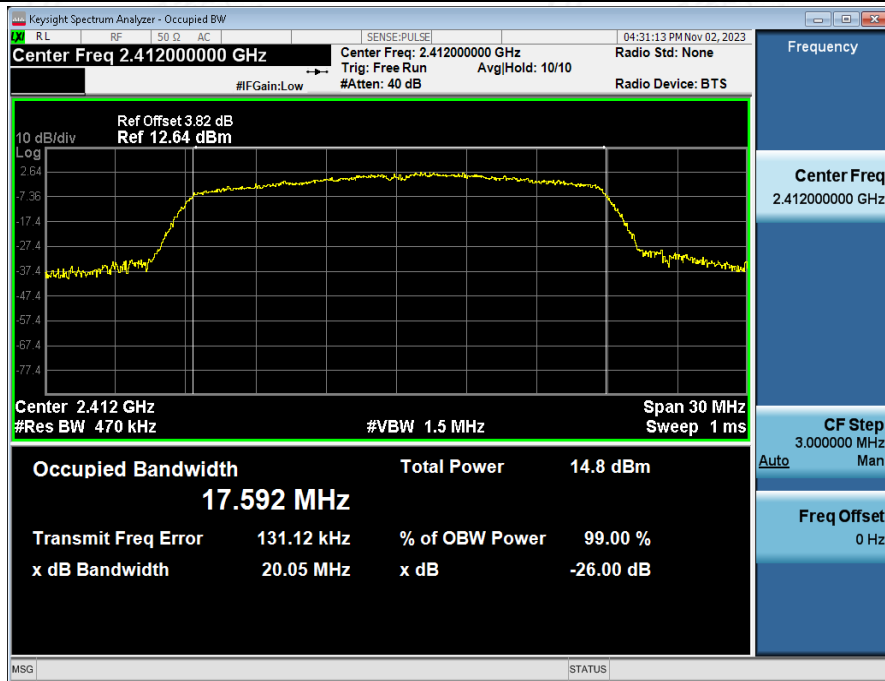
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99%_Occupied_Bandwidth_NVNT_ANT1_802_11g_2462



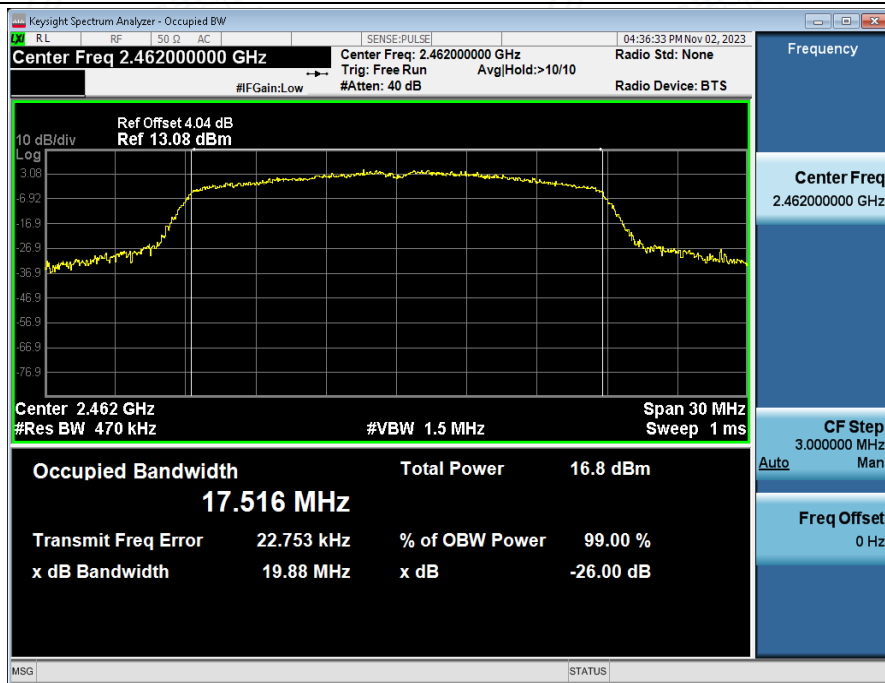
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99%_Occupied_Bandwidth_NVNT_ANT1_802_11n(HT20)_2437

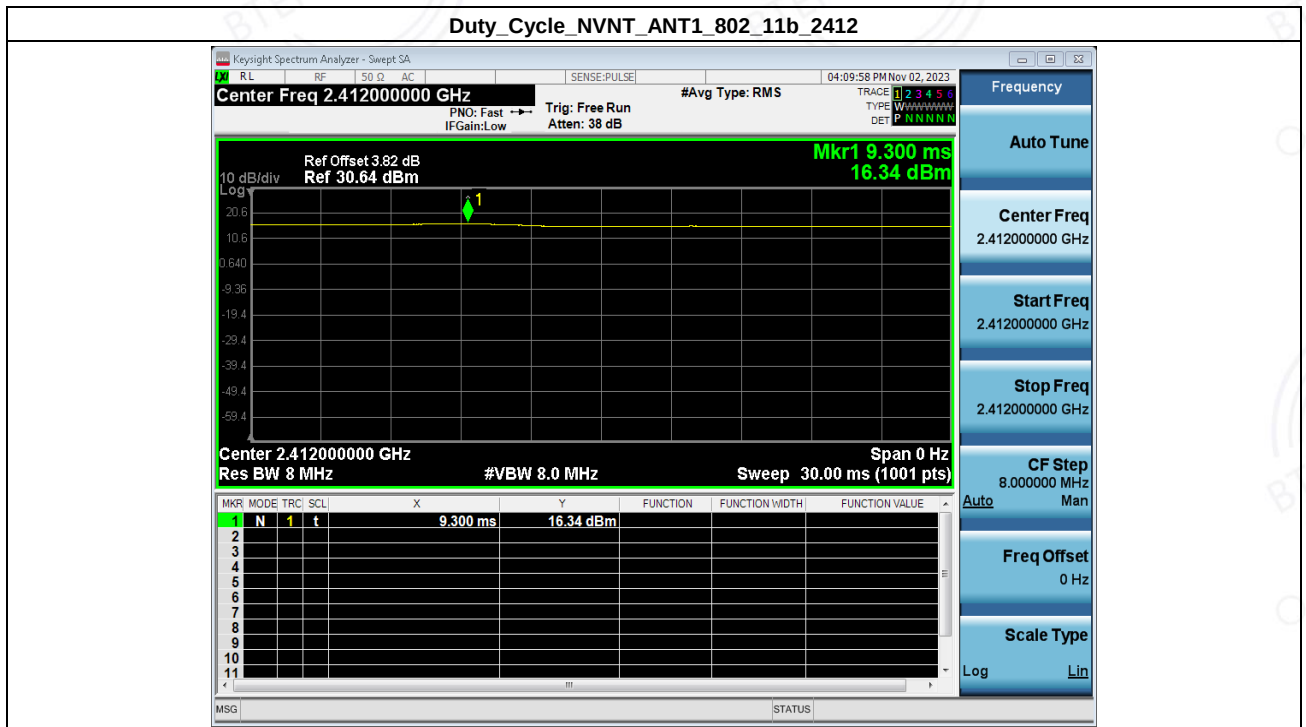


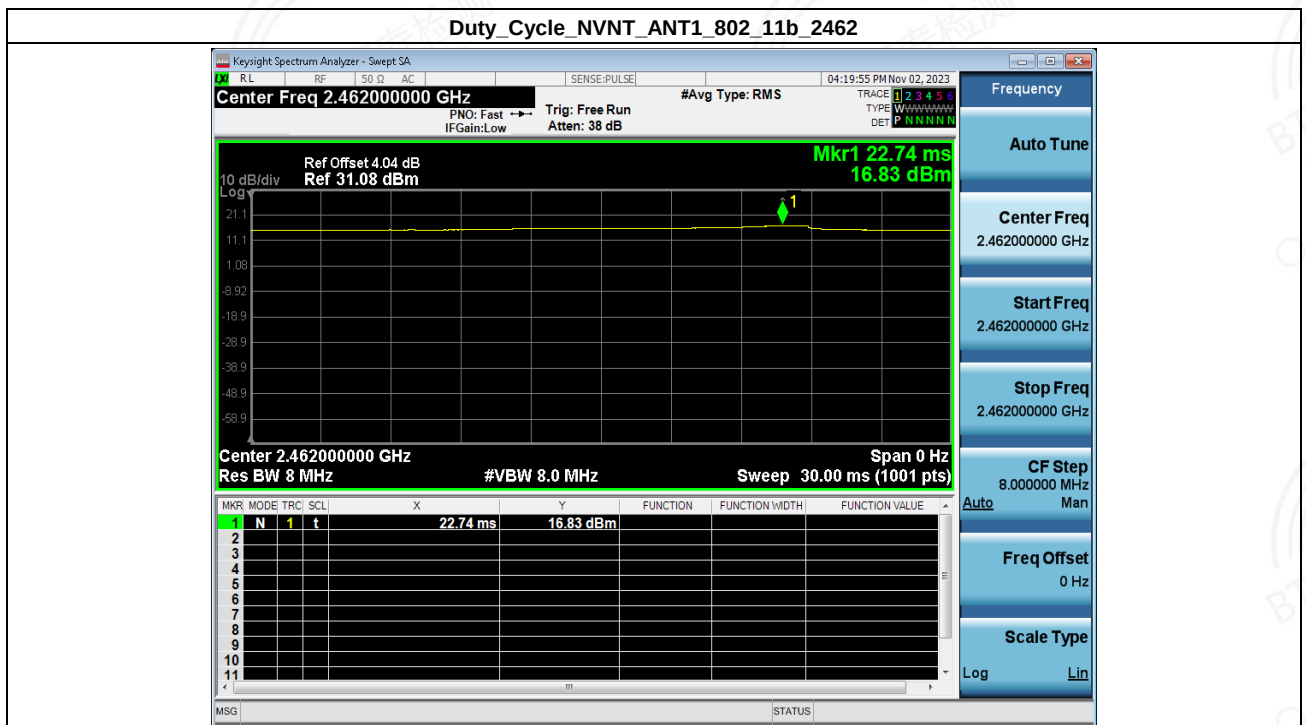
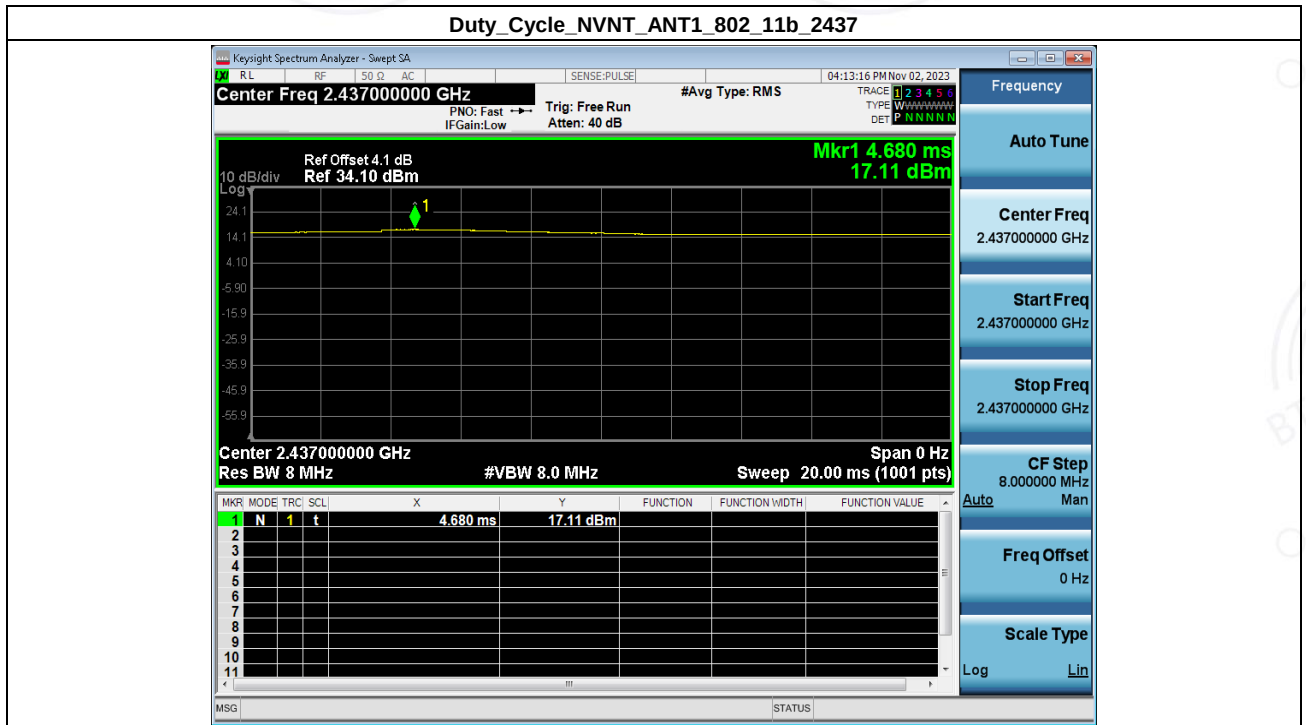
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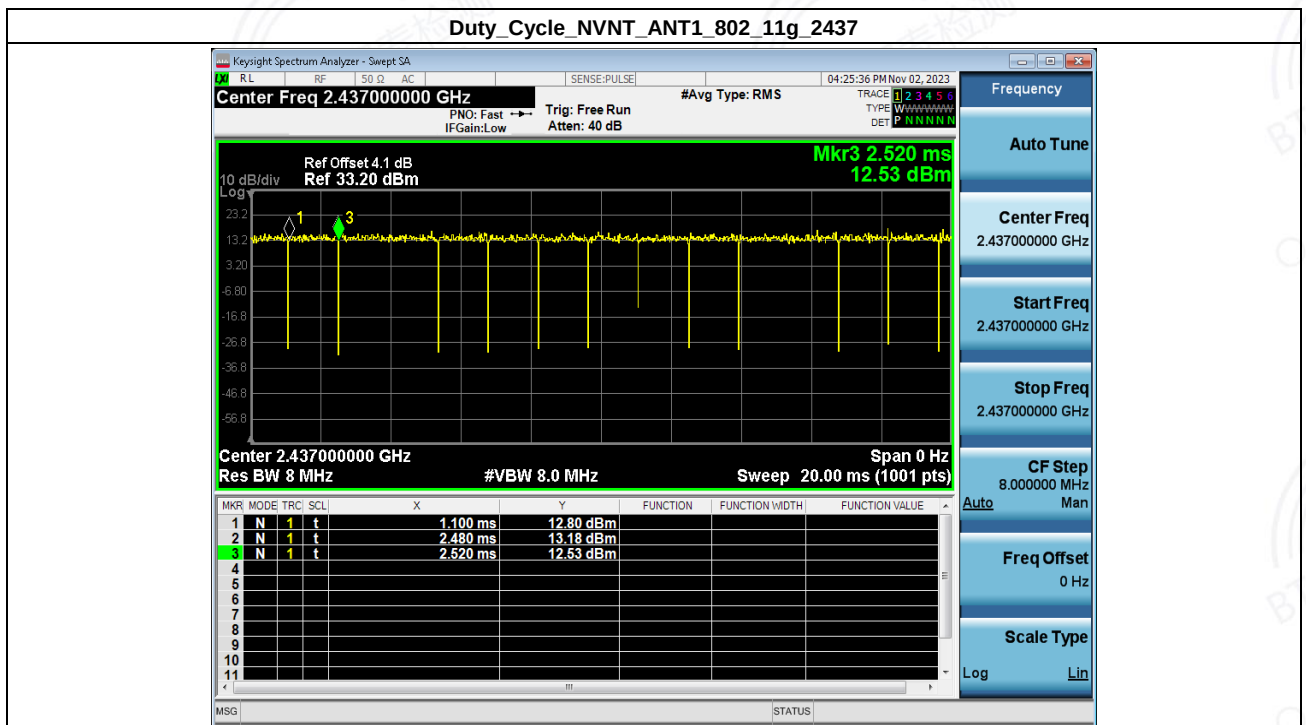
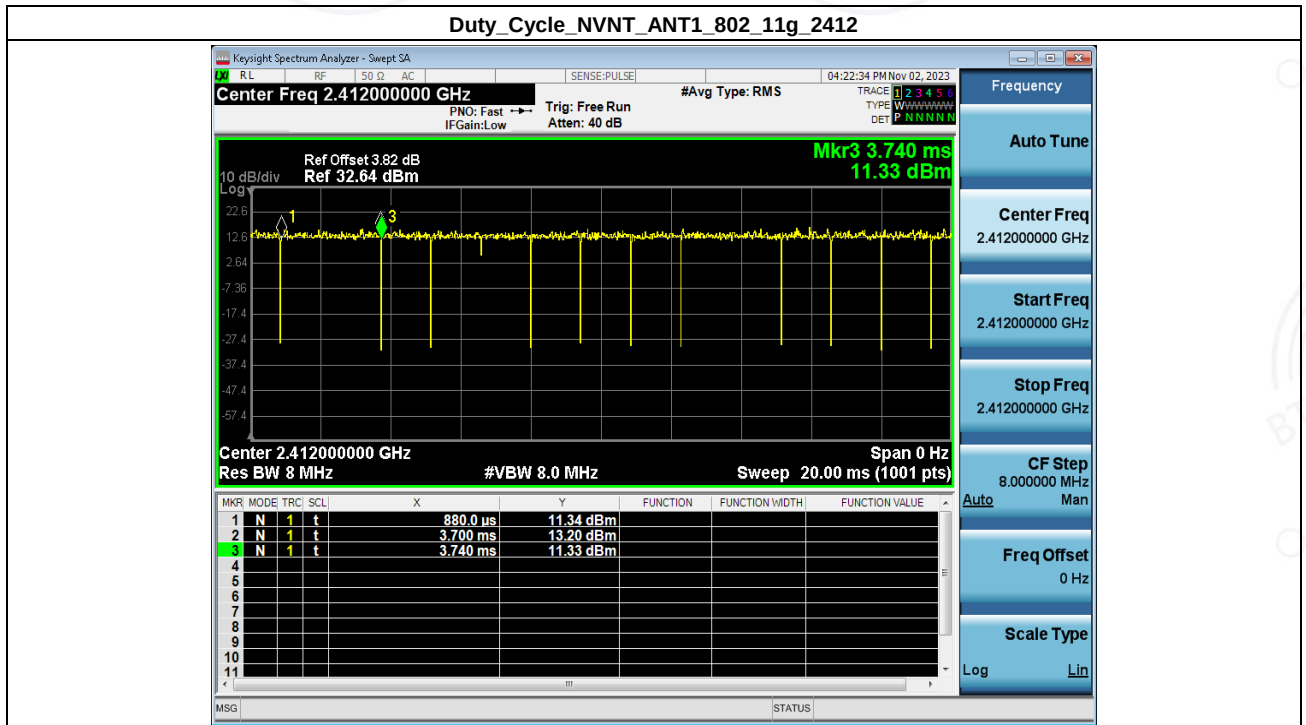


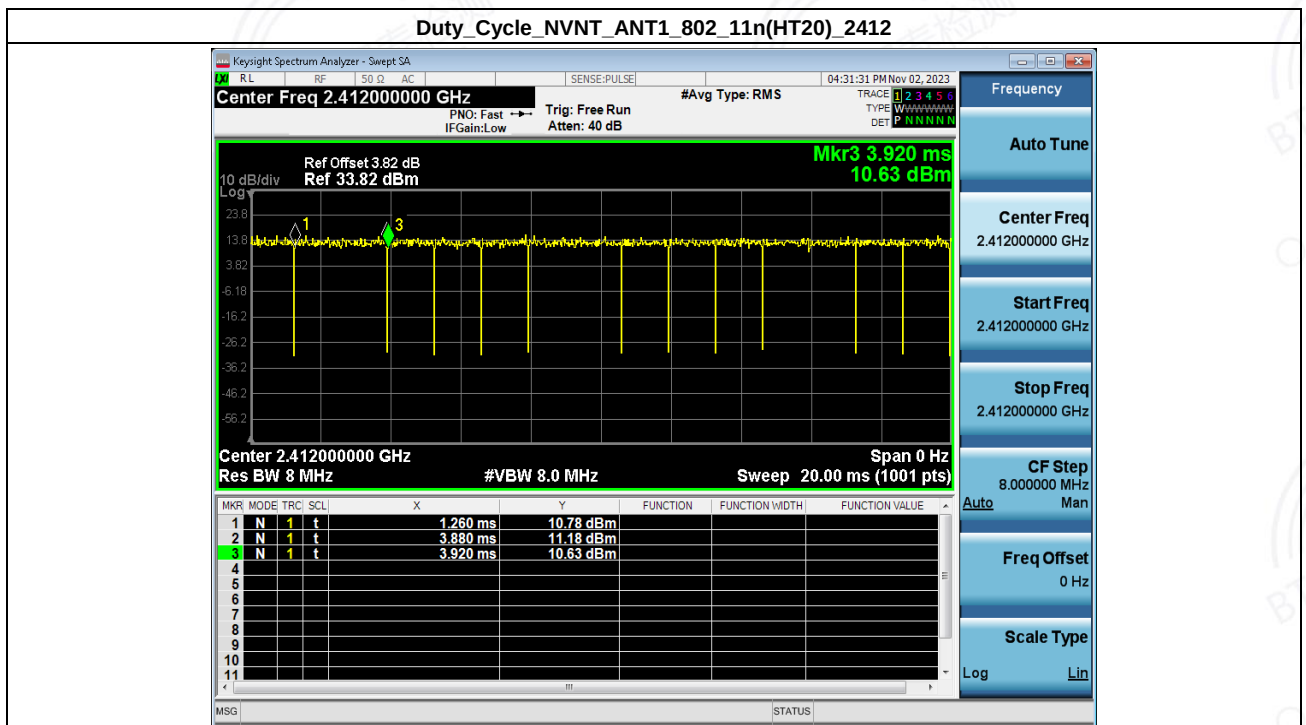
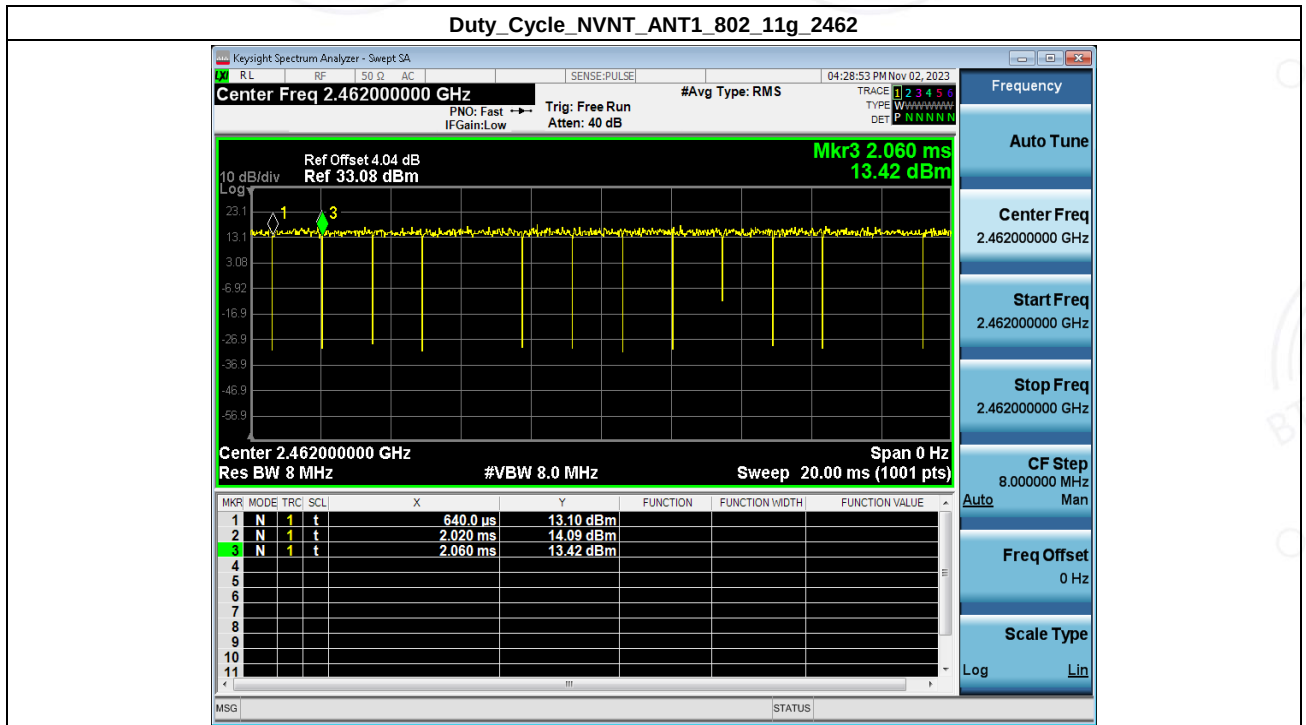
3. Duty Cycle

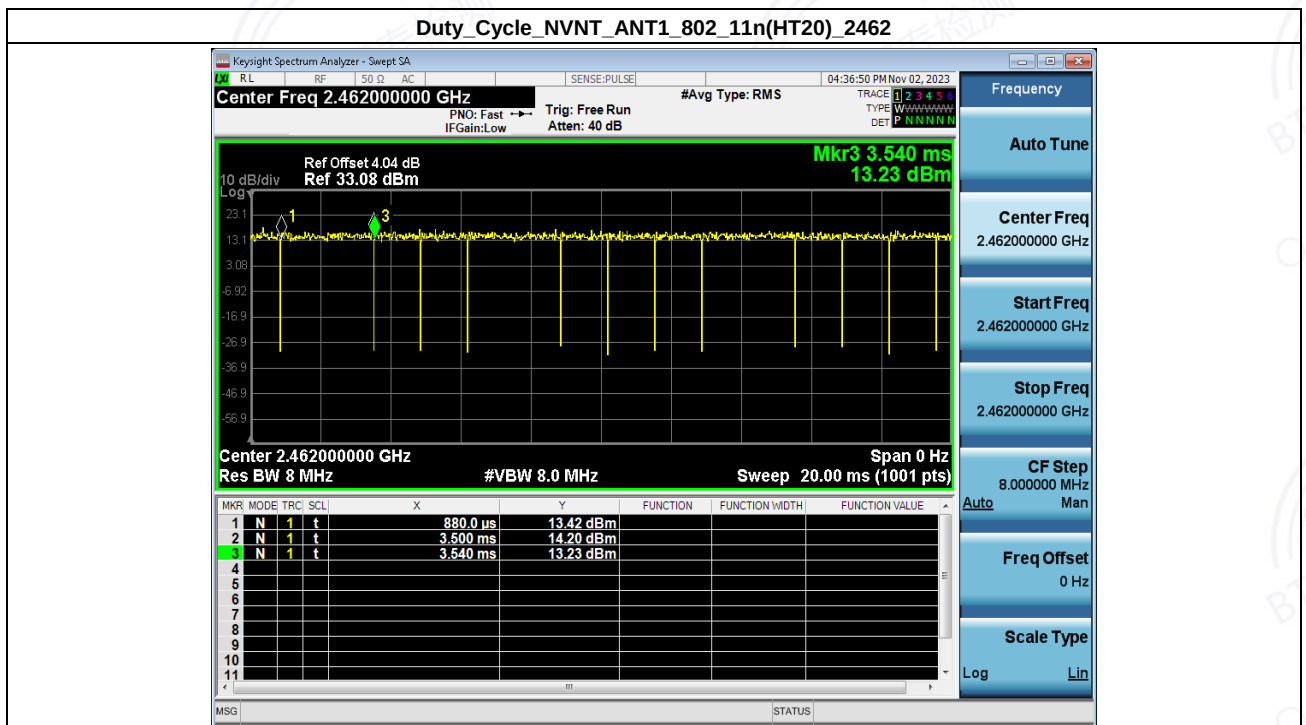
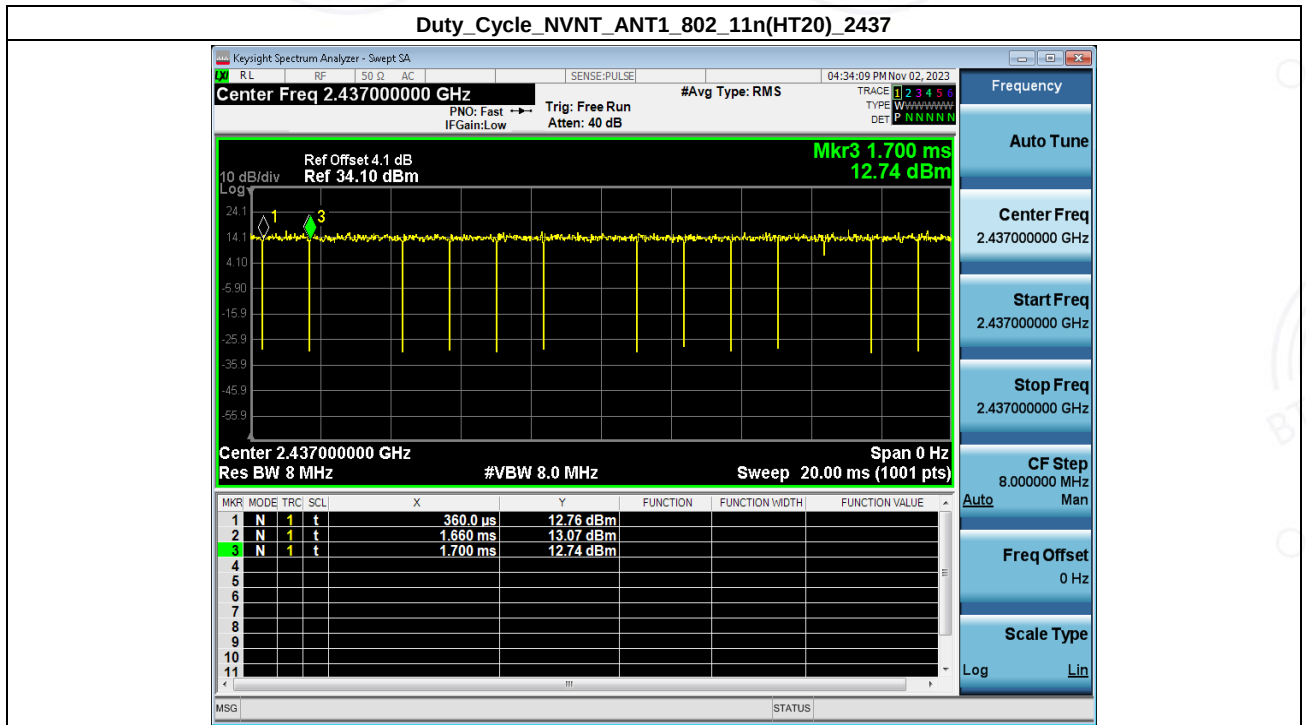
Condition	Antenna	Modulation	Frequency (MHz)	Duty cycle(%)	Duty factor(dB)
NVNT	ANT1	802.11b	2412.00	100	0.00
NVNT	ANT1	802.11b	2437.00	100	0.00
NVNT	ANT1	802.11b	2462.00	100	0.00
NVNT	ANT1	802.11g	2412.00	99.30	0.00
NVNT	ANT1	802.11g	2437.00	98.59	0.00
NVNT	ANT1	802.11g	2462.00	98.59	0.00
NVNT	ANT1	802.11n(HT20)	2412.00	99.25	0.00
NVNT	ANT1	802.11n(HT20)	2437.00	98.51	0.00
NVNT	ANT1	802.11n(HT20)	2462.00	99.25	0.00









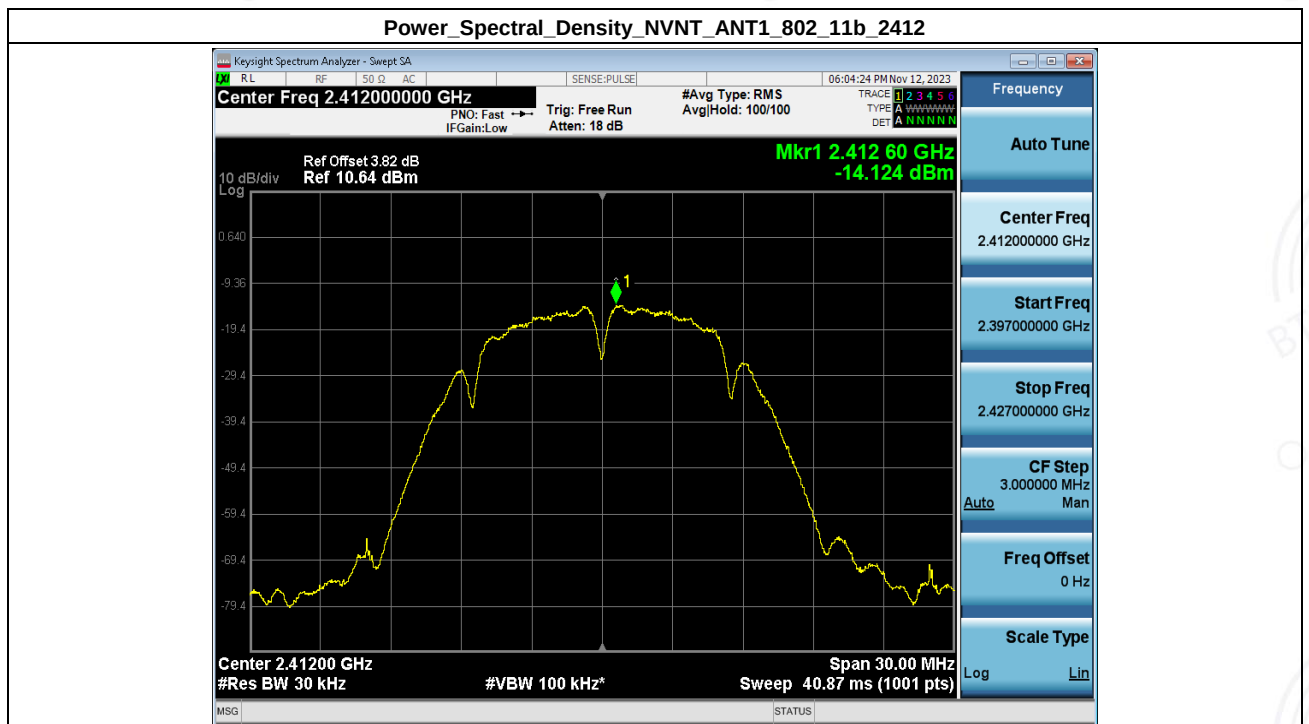


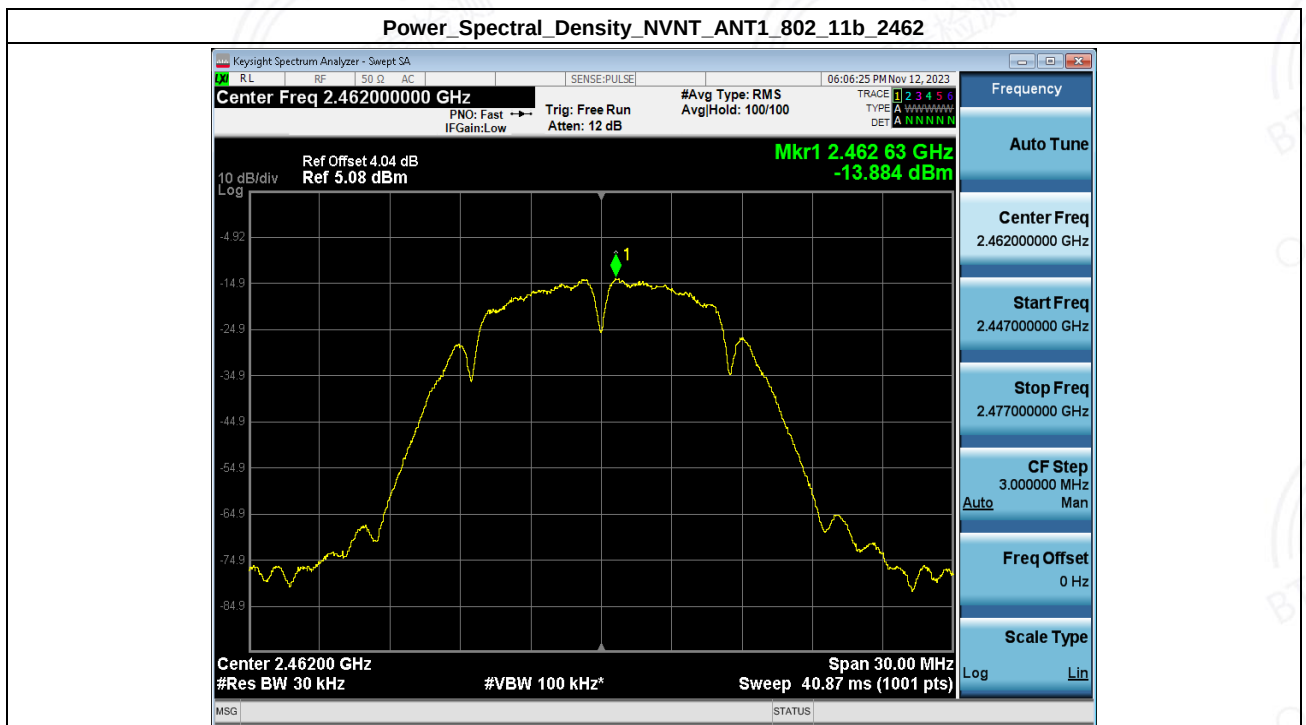
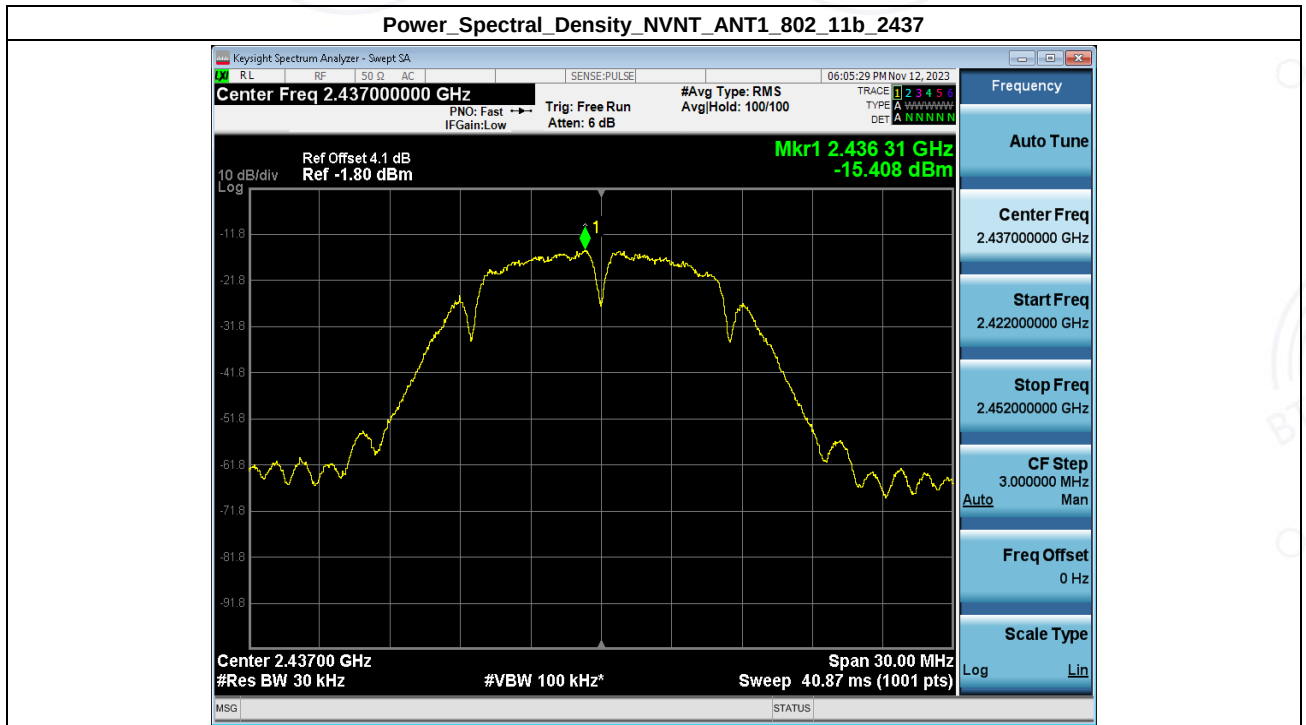
4. MAX. Output Power

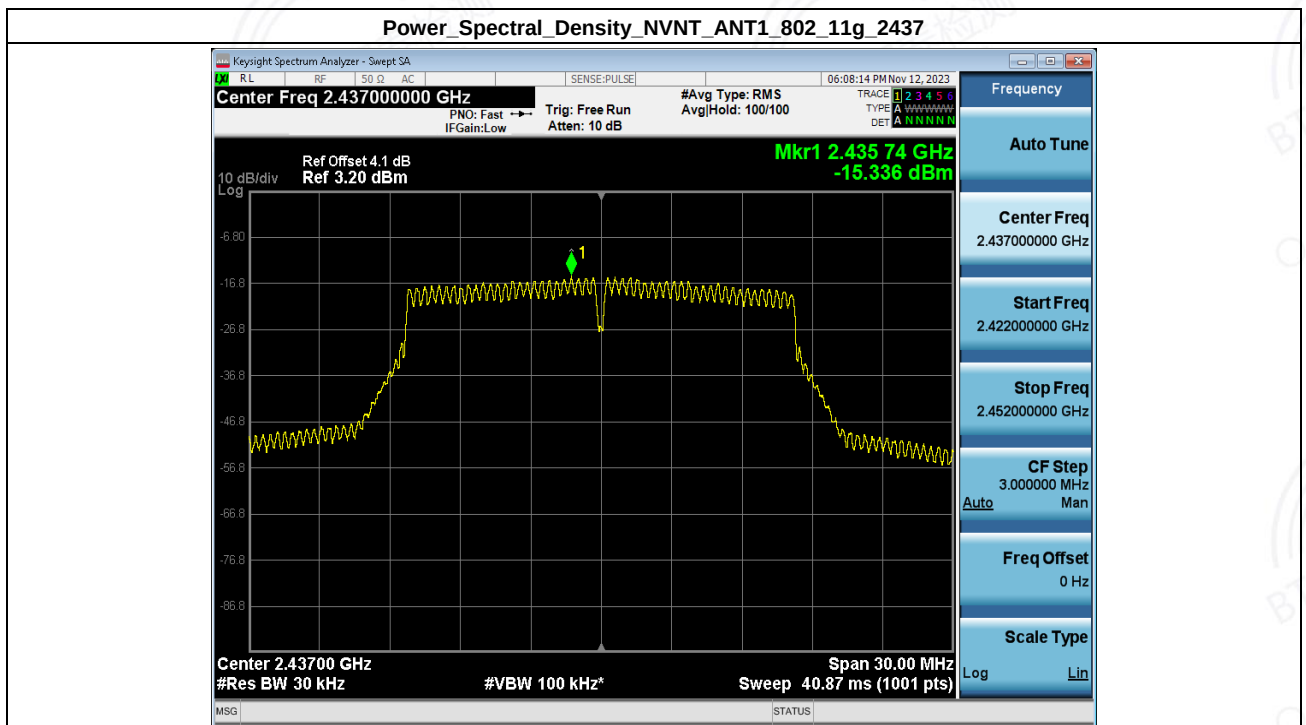
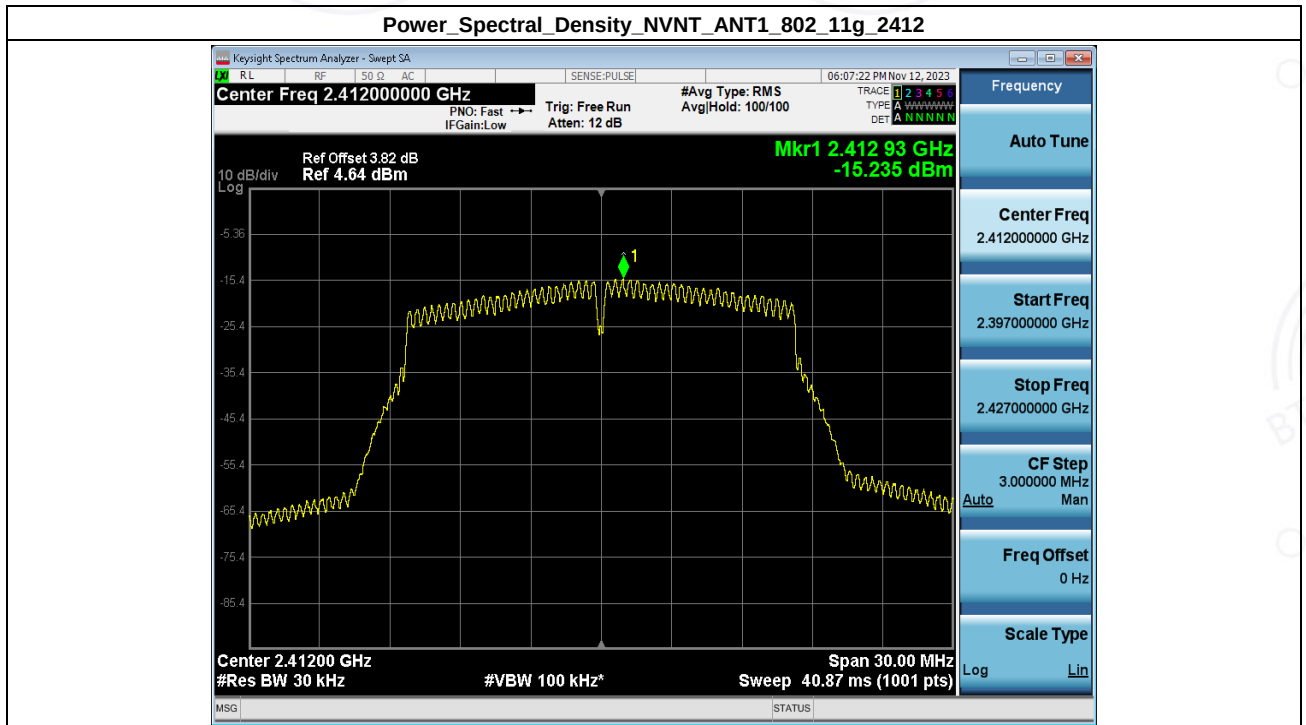
Condition	Antenna	Modulation	Frequency (MHz)	Detector	Conducted Power(dBm)	Duty factor(dB)	Total Power(dBm)	limit(dBm)	Result
NVNT	ANT1	802.11b	2412.00	RMS	8.19	0.00	8.19	30	Pass
NVNT	ANT1	802.11b	2437.00	RMS	8.59	0.00	8.59	30	Pass
NVNT	ANT1	802.11b	2462.00	RMS	8.18	0.00	8.18	30	Pass
NVNT	ANT1	802.11g	2412.00	RMS	8.00	0.00	8.00	30	Pass
NVNT	ANT1	802.11g	2437.00	RMS	8.59	0.00	8.59	30	Pass
NVNT	ANT1	802.11g	2462.00	RMS	8.40	0.00	8.40	30	Pass
NVNT	ANT1	802.11n(HT20)	2412.00	RMS	8.20	0.00	8.20	30	Pass
NVNT	ANT1	802.11n(HT20)	2437.00	RMS	8.19	0.00	8.19	30	Pass
NVNT	ANT1	802.11n(HT20)	2462.00	RMS	8.04	0.00	8.04	30	Pass

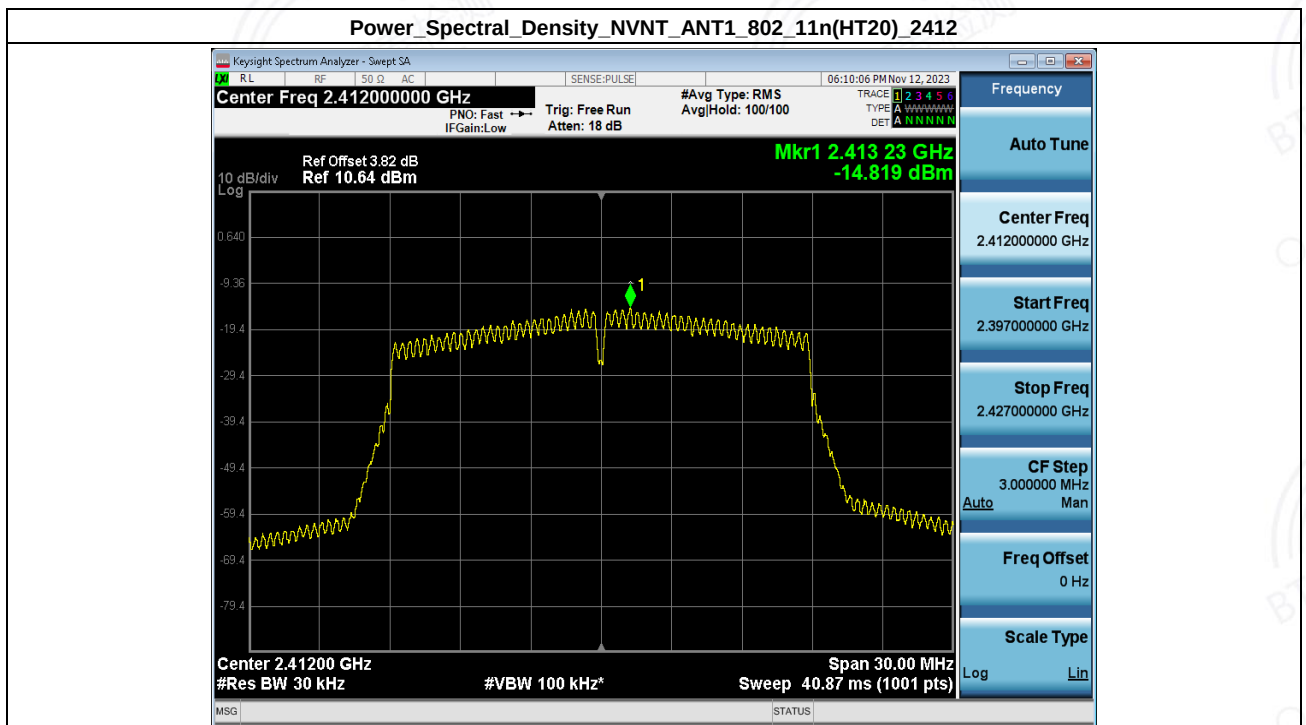
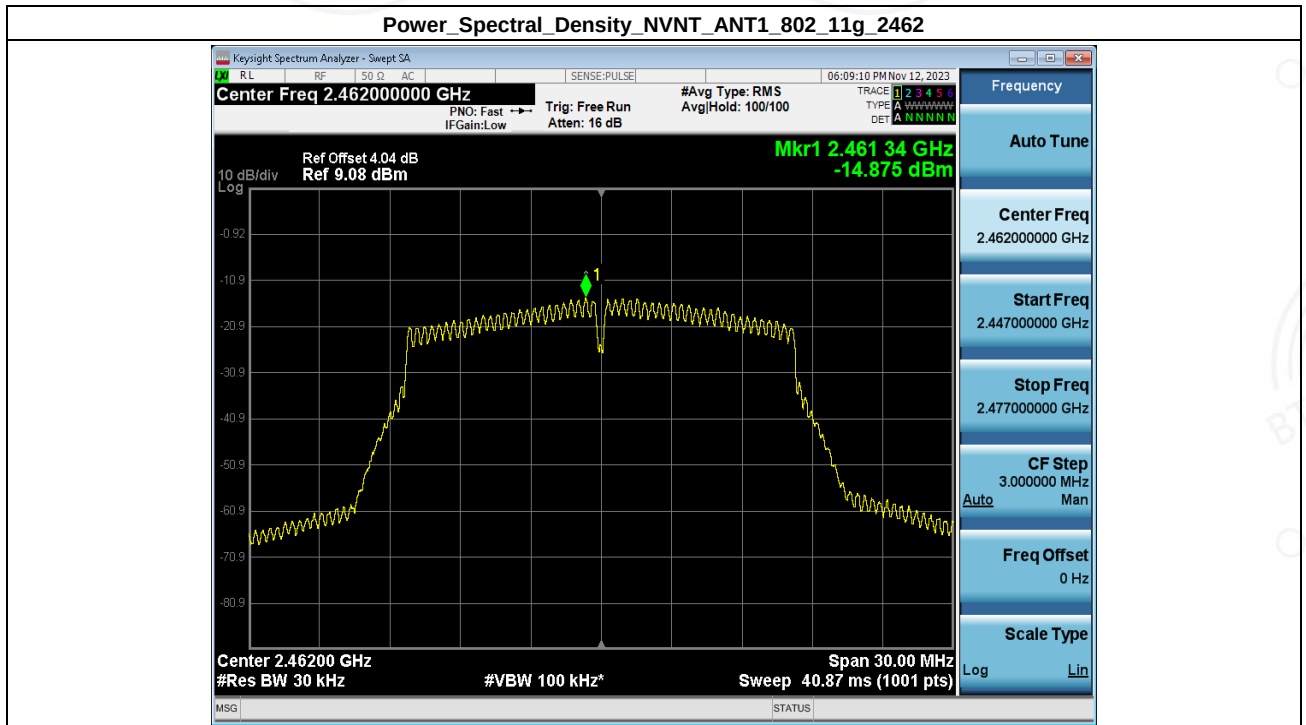
5. Power Spectral Density

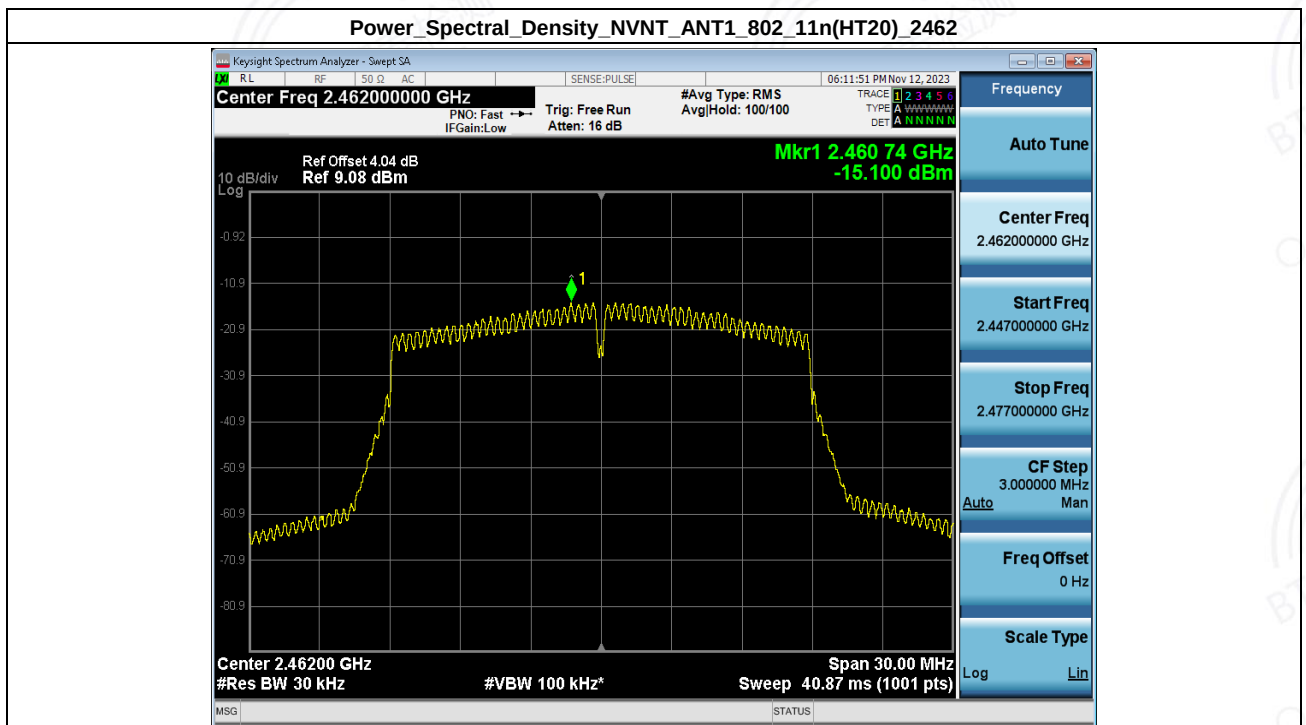
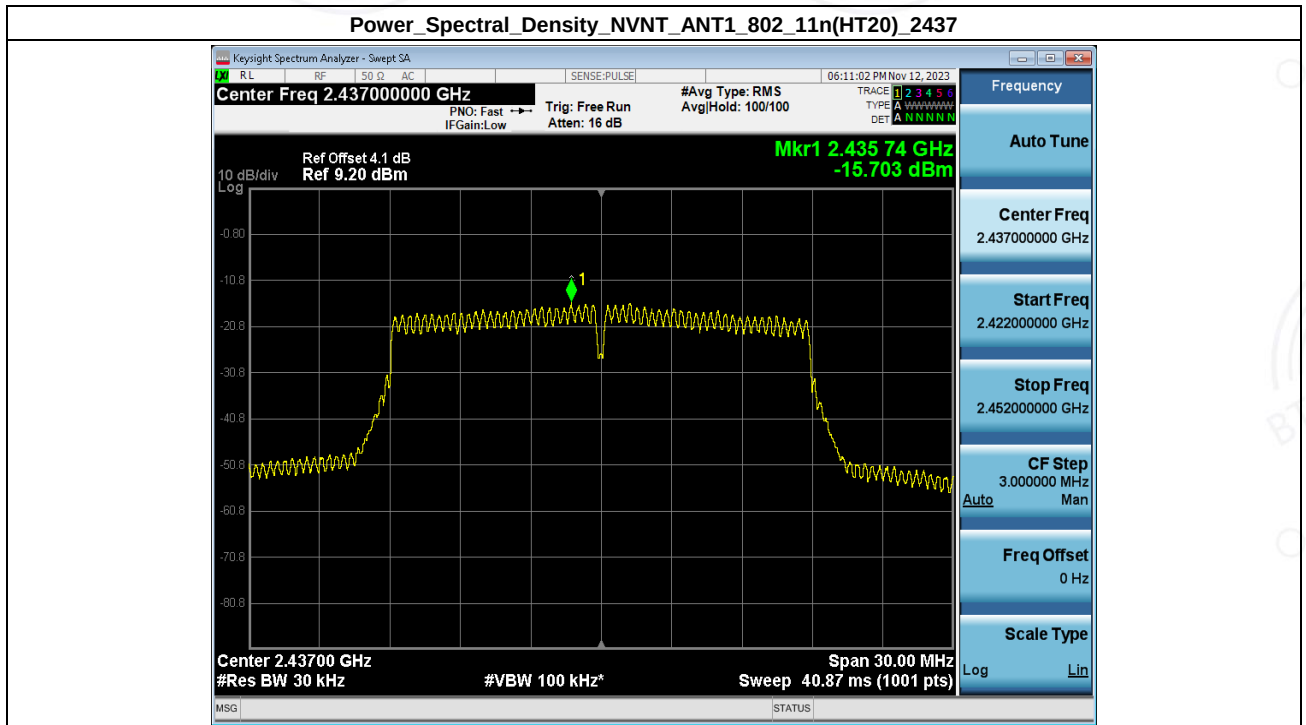
Condition	Antenna	Modulation	Frequency (MHz)	PSD(dBm/30kHz)	Duty factor(dB)	RB factor(dB)	PSD(dBm/3kHz)	limit(dBm/3kHz)	Result
NVNT	ANT1	802.11b	2412.00	-14.12	0.00	-10.00	-24.12	8	
NVNT	ANT1	802.11b	2437.00	-15.41	0.00	-10.00	-25.41	8	
NVNT	ANT1	802.11b	2462.00	-13.88	0.00	-10.00	-23.88	8	
NVNT	ANT1	802.11g	2412.00	-15.23	0.00	-10.00	-25.23	8	
NVNT	ANT1	802.11g	2437.00	-15.34	0.00	-10.00	-25.34	8	
NVNT	ANT1	802.11g	2462.00	-14.88	0.00	-10.00	-24.88	8	
NVNT	ANT1	802.11n(HT20)	2412.00	-14.82	0.00	-10.00	-24.82	8	
NVNT	ANT1	802.11n(HT20)	2437.00	-15.70	0.00	-10.00	-25.70	8	
NVNT	ANT1	802.11n(HT20)	2462.00	-15.10	0.00	-10.00	-25.10	8	











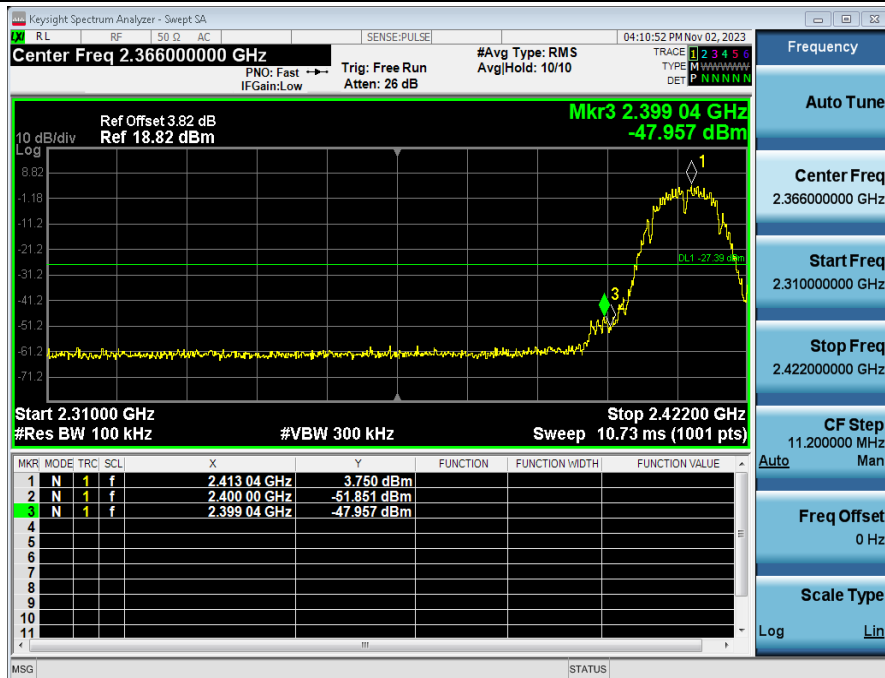
6. Bandedge

Condition	Antenna	Modulation	TX_Frequency (MHz)	Max. Mark_frequency(MHz)	Spurious level(dBm)	limit(dBm)	Result
NVNT	ANT1	802.11b	2412.00	2399.040	-47.957	-27.393	Pass
NVNT	ANT1	802.11b	2462.00	2487.952	-59.138	-27.074	Pass
NVNT	ANT1	802.11g	2412.00	2398.816	-46.066	-31.527	Pass
NVNT	ANT1	802.11g	2462.00	2484.208	-56.107	-31.478	Pass
NVNT	ANT1	802.11n(HT20)	2412.00	2399.488	-46.543	-31.100	Pass
NVNT	ANT1	802.11n(HT20)	2462.00	2483.584	-53.169	-30.393	Pass

1 Reference_Level_NVNT_ANT1_802_11b_2412



2 Bandedge_NVNT_ANT1_802_11b_2412



1 Reference_Level_NVNT_ANT1_802_11b_2462



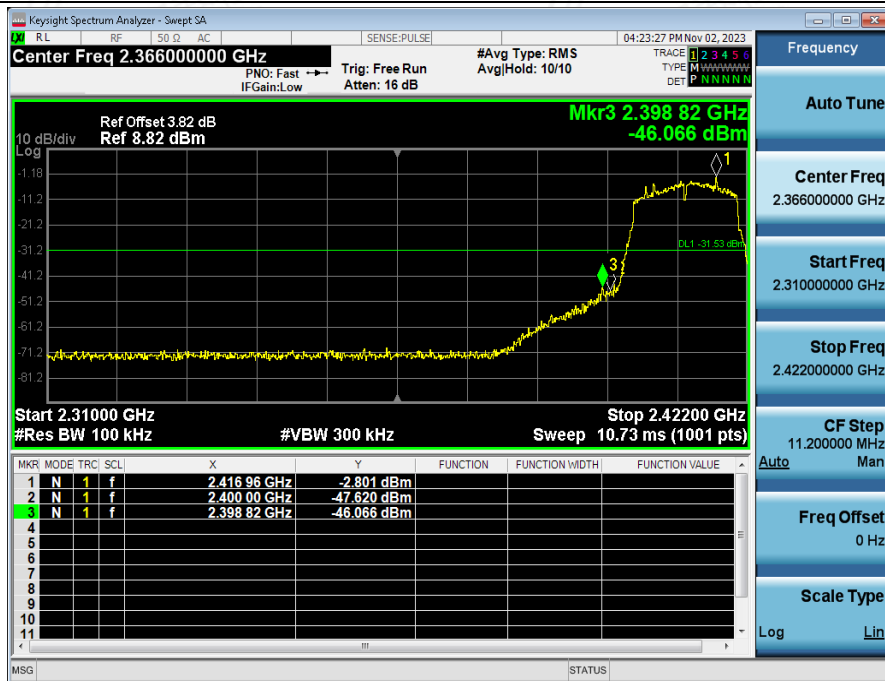
2 Bandedge_NVNT_ANT1_802_11b_2462



1 Reference_Level_NVNT_ANT1_802_11g_2412



2 Bandedge_NVNT_ANT1_802_11g_2412



1 Reference_Level_NVNT_ANT1_802_11g_2462



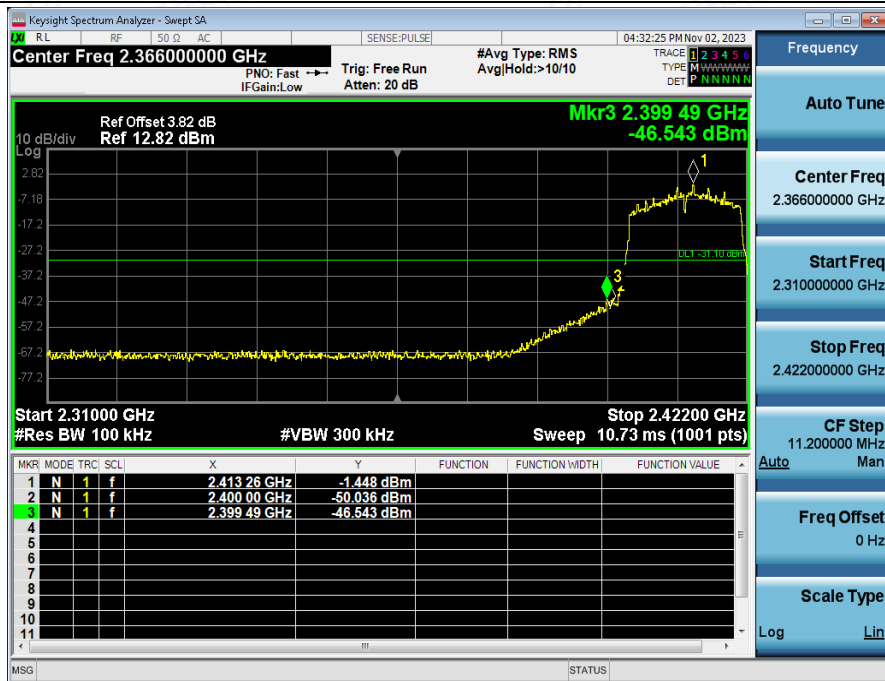
2 Bandedge_NVNT_ANT1_802_11g_2462



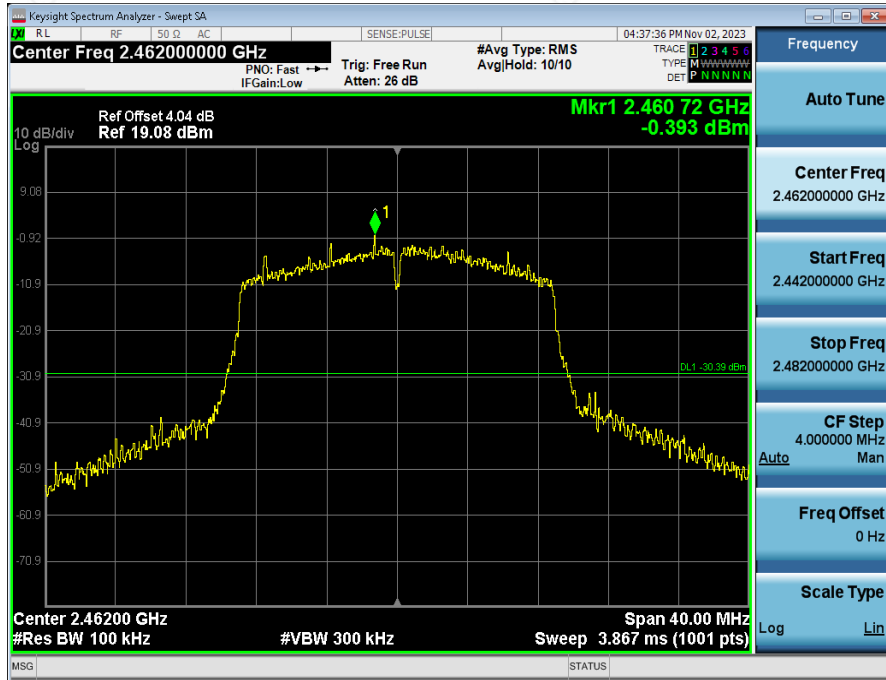
1 Reference_Level_NVNT_ANT1_802_11n(HT20)_2412



2 Bandedge_NVNT_ANT1_802_11n(HT20)_2412



1 Reference_Level_NVNT_ANT1_802_11n(HT20)_2462



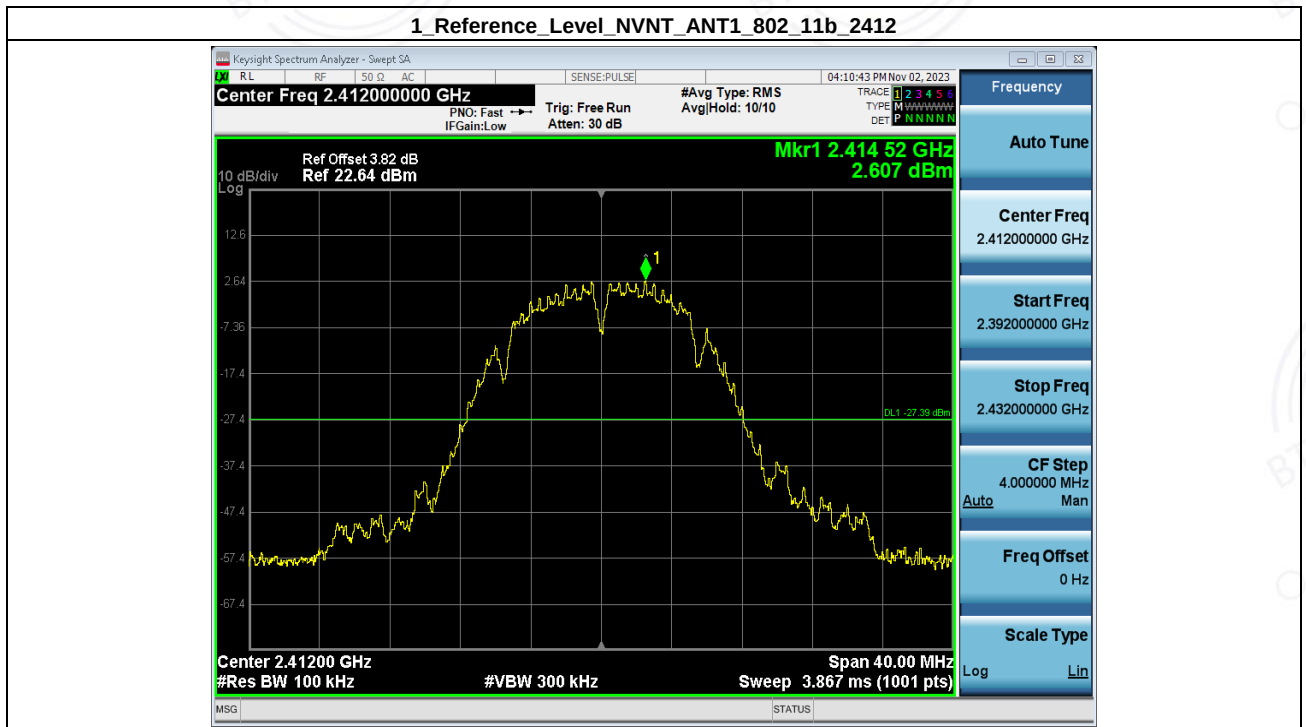
2 Bandedge_NVNT_ANT1_802_11n(HT20)_2462

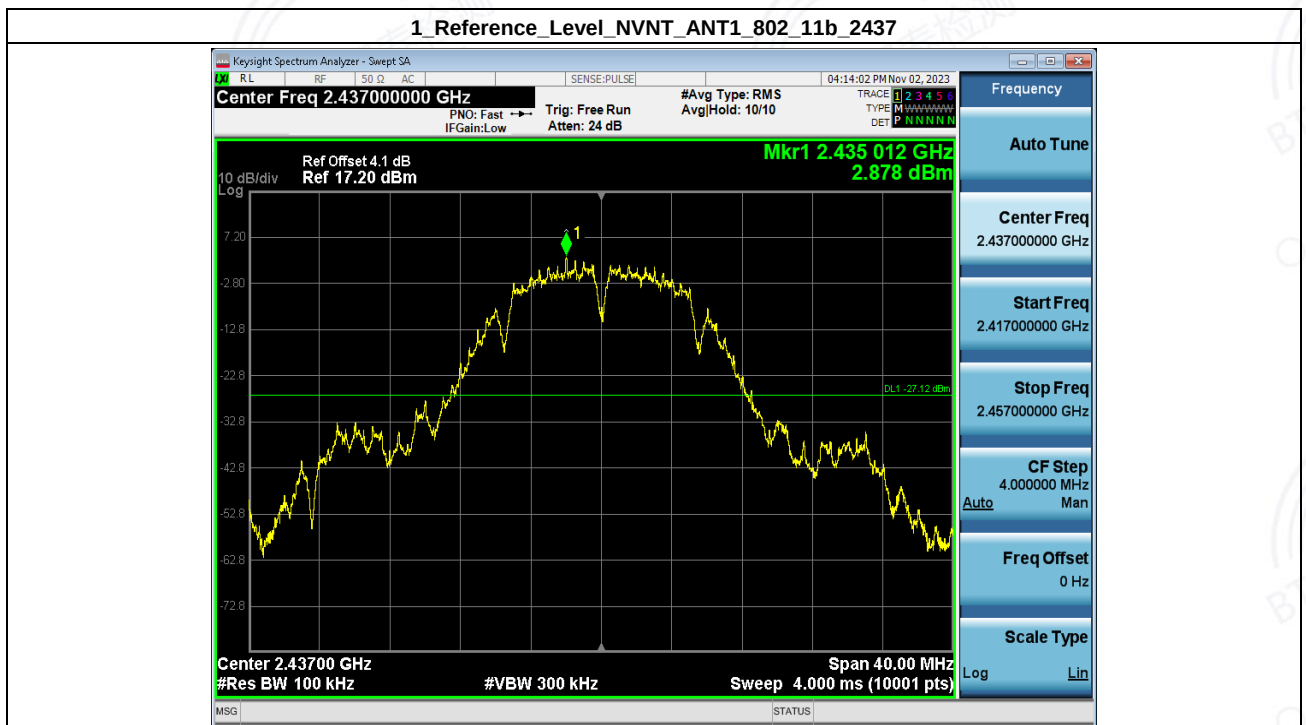
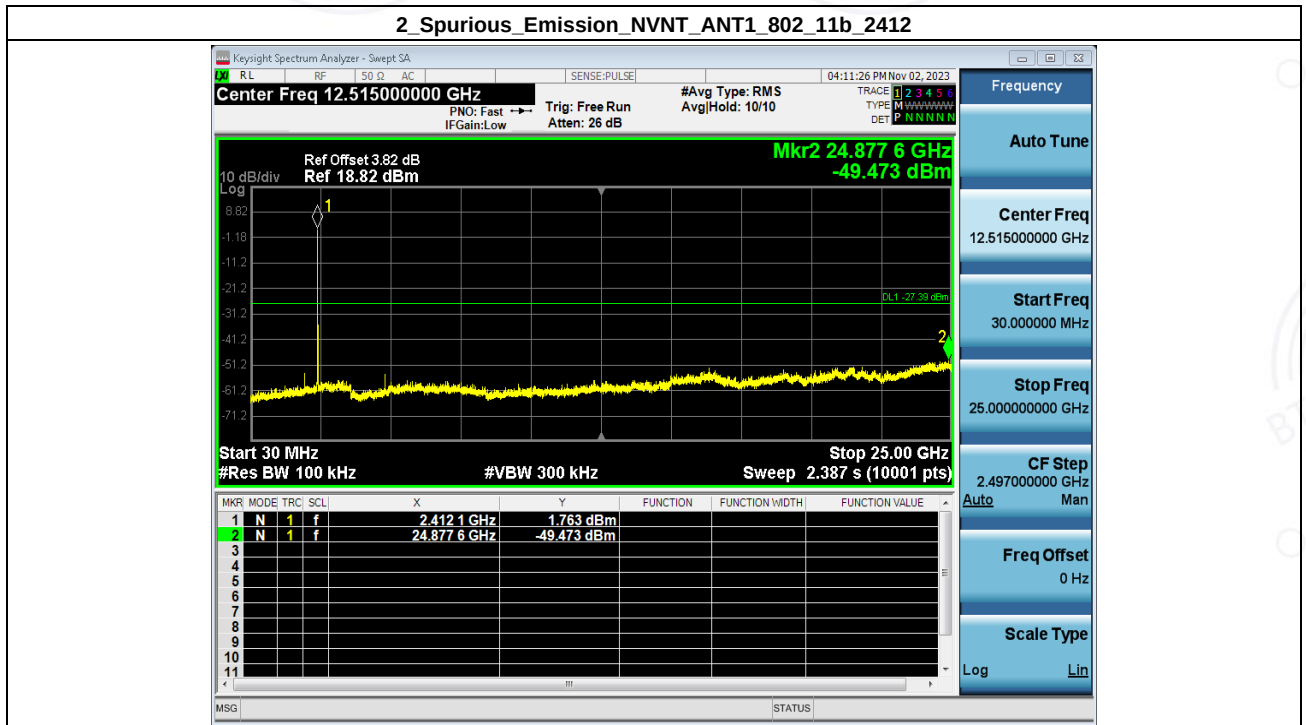


7. Spurious Emission

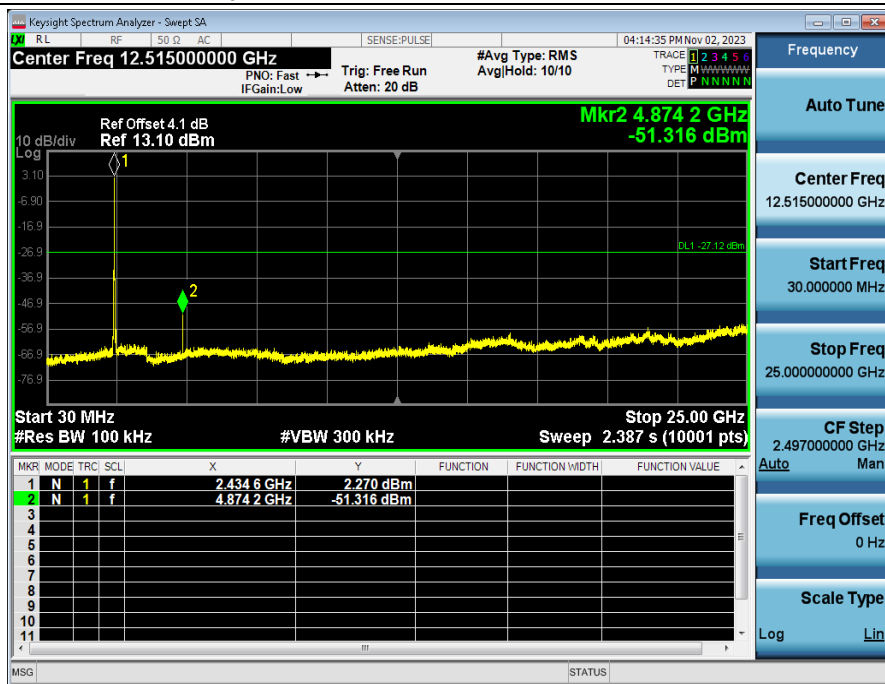
Condition	Antenna	Modulation	TX_Frequency (MHz)	Max. Mark_frequency(MHz)	Spurious level(dBm)	limit(dBm)	Result
NVNT	ANT1	802.11b	2412.00	24877.647	-49.473	-27.393	Pass
NVNT	ANT1	802.11b	2437.00	4874.180	-51.316	-27.122	Pass
NVNT	ANT1	802.11b	2462.00	24707.851	-55.594	-27.074	Pass
NVNT	ANT1	802.11g	2412.00	1920.229	-54.268	-31.527	Pass
NVNT	ANT1	802.11g	2437.00	24725.330	-53.426	-30.928	Pass
NVNT	ANT1	802.11g	2462.00	898.956	-53.881	-31.478	Pass
NVNT	ANT1	802.11n(HT20)	2412.00	24797.743	-55.063	-31.100	Pass
NVNT	ANT1	802.11n(HT20)	2437.00	24722.833	-52.576	-31.371	Pass
NVNT	ANT1	802.11n(HT20)	2462.00	893.962	-50.327	-30.393	Pass

1 Reference_Level_NVNT_ANT1_802_11b_2412





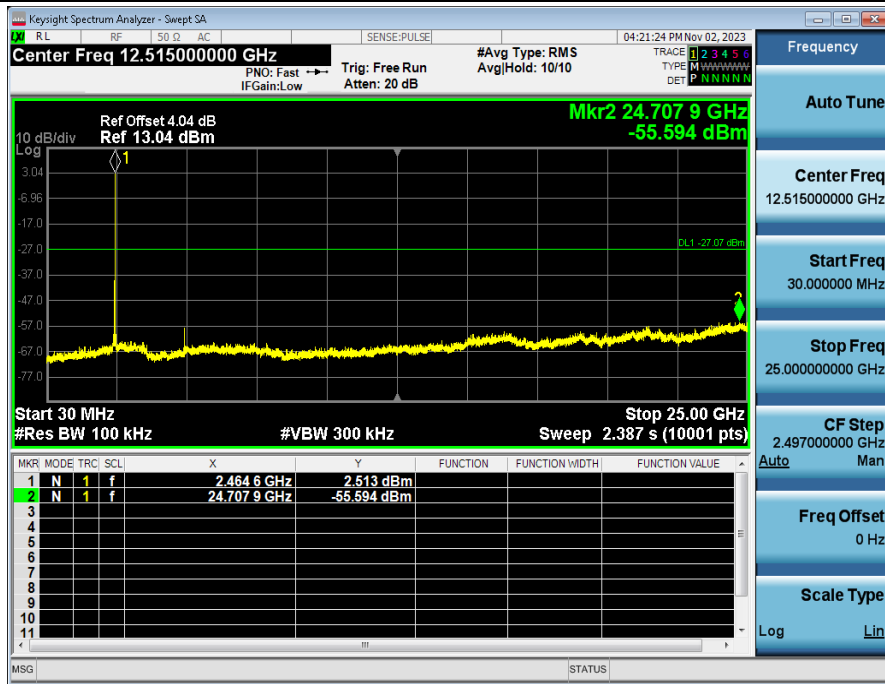
2_Spurious_Emission_NVNT_ANT1_802_11b_2437



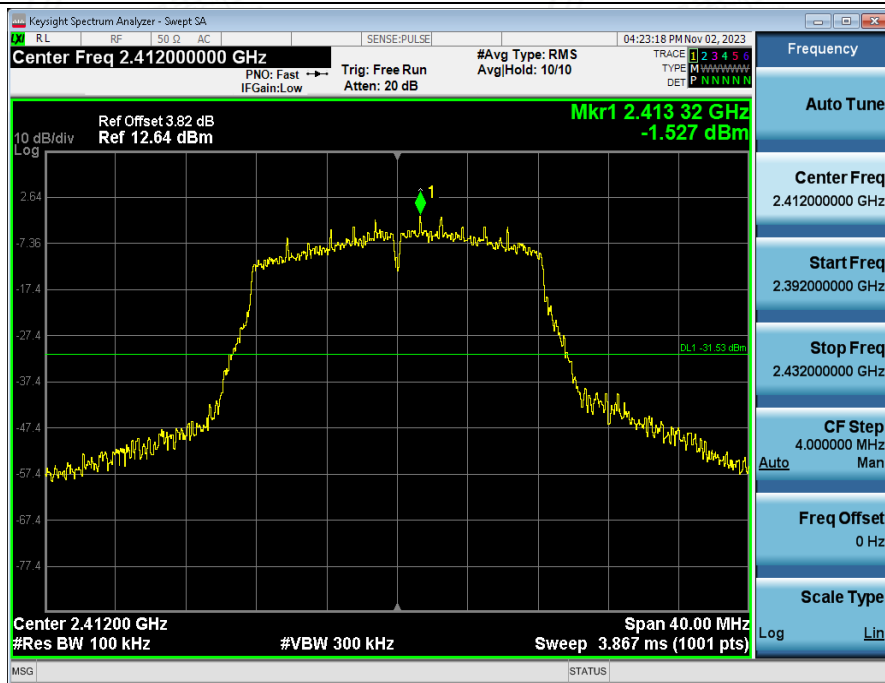
1_Reference_Level_NVNT_ANT1_802_11b_2462



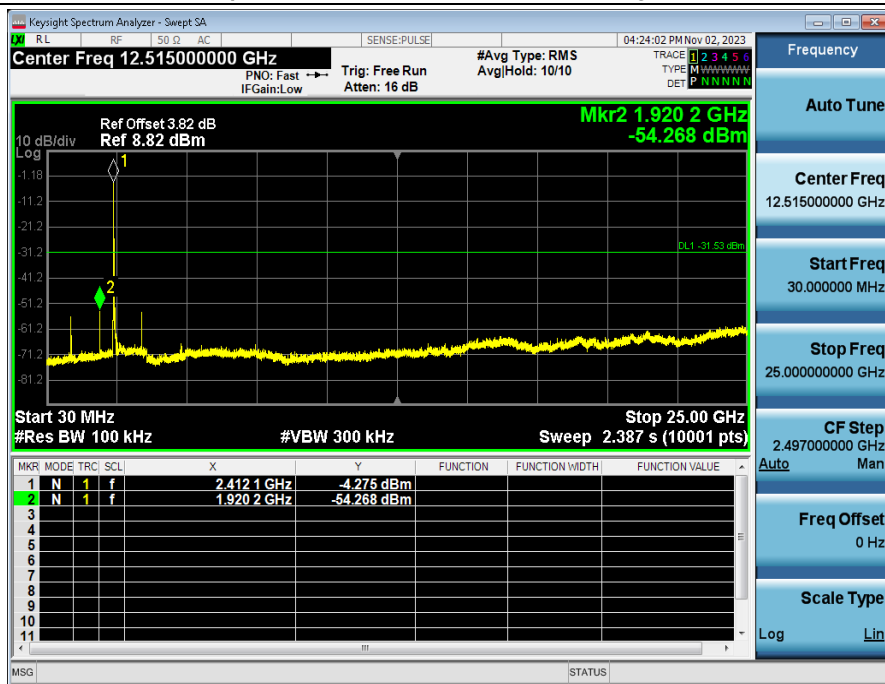
2_Spurious_Emission_NVNT_ANT1_802_11b_2462



1_Reference_Level_NVNT_ANT1_802_11g_2412

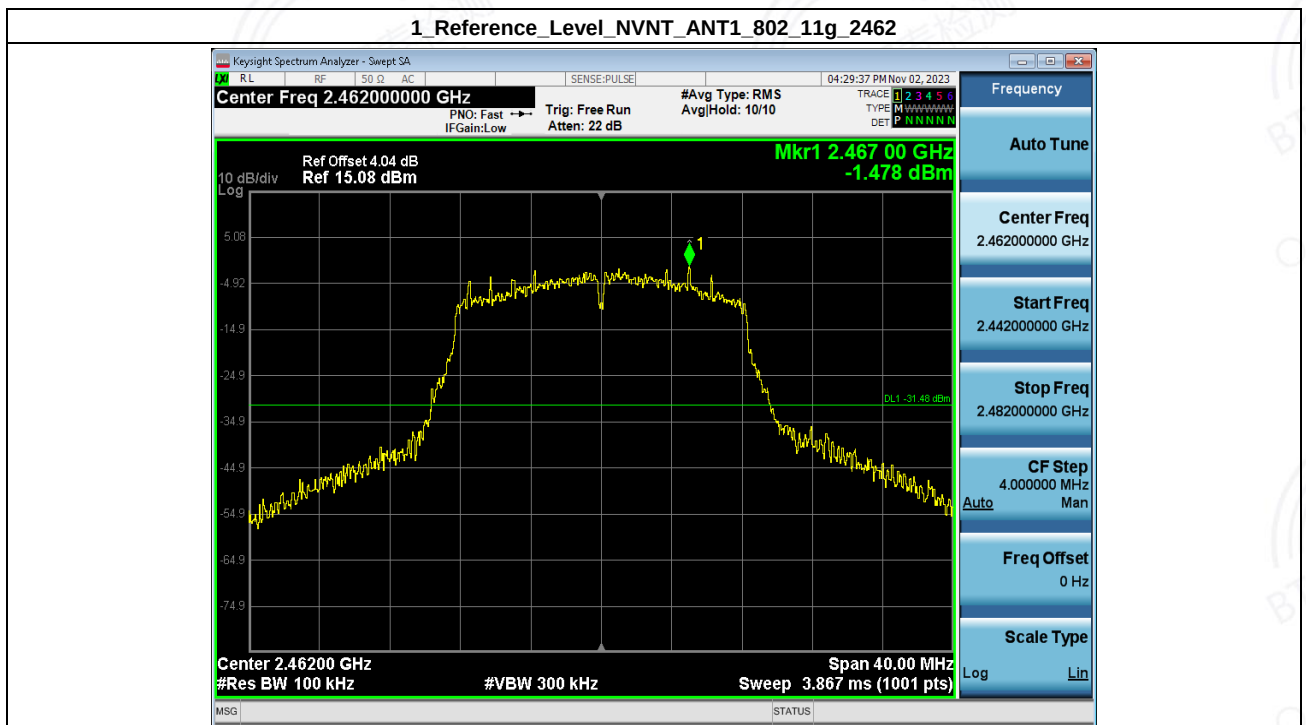
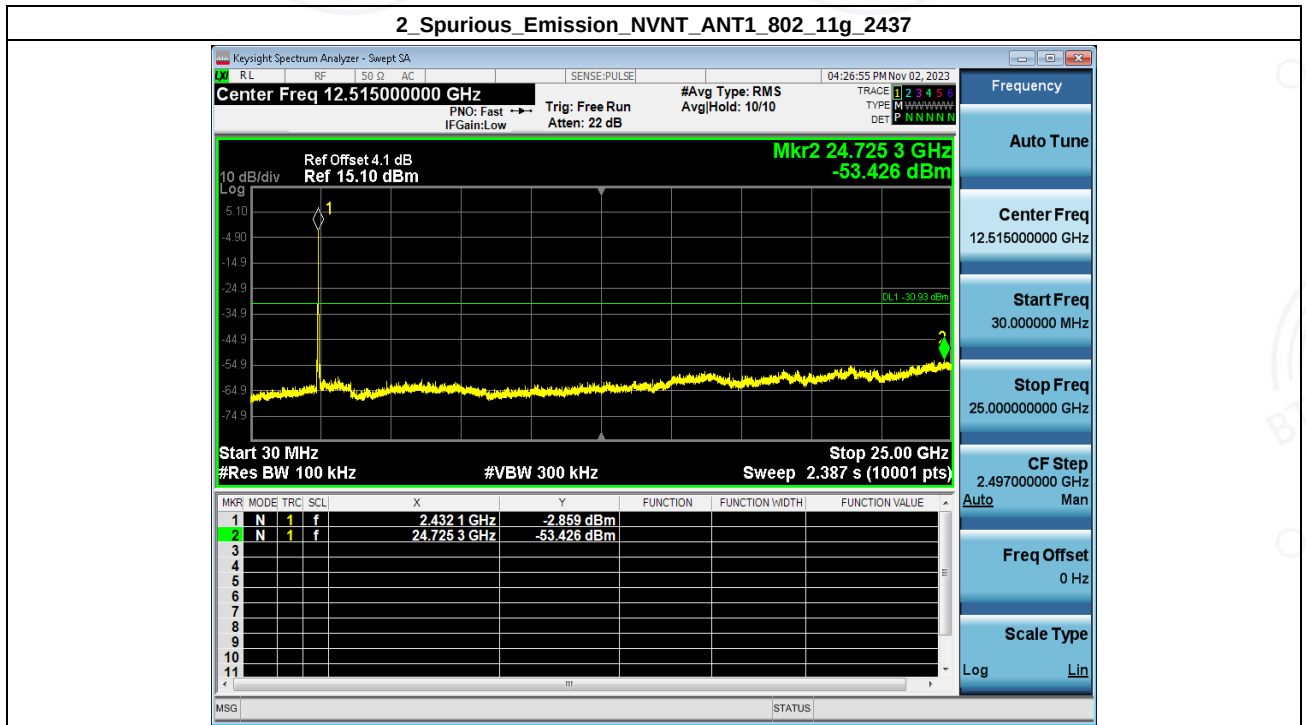


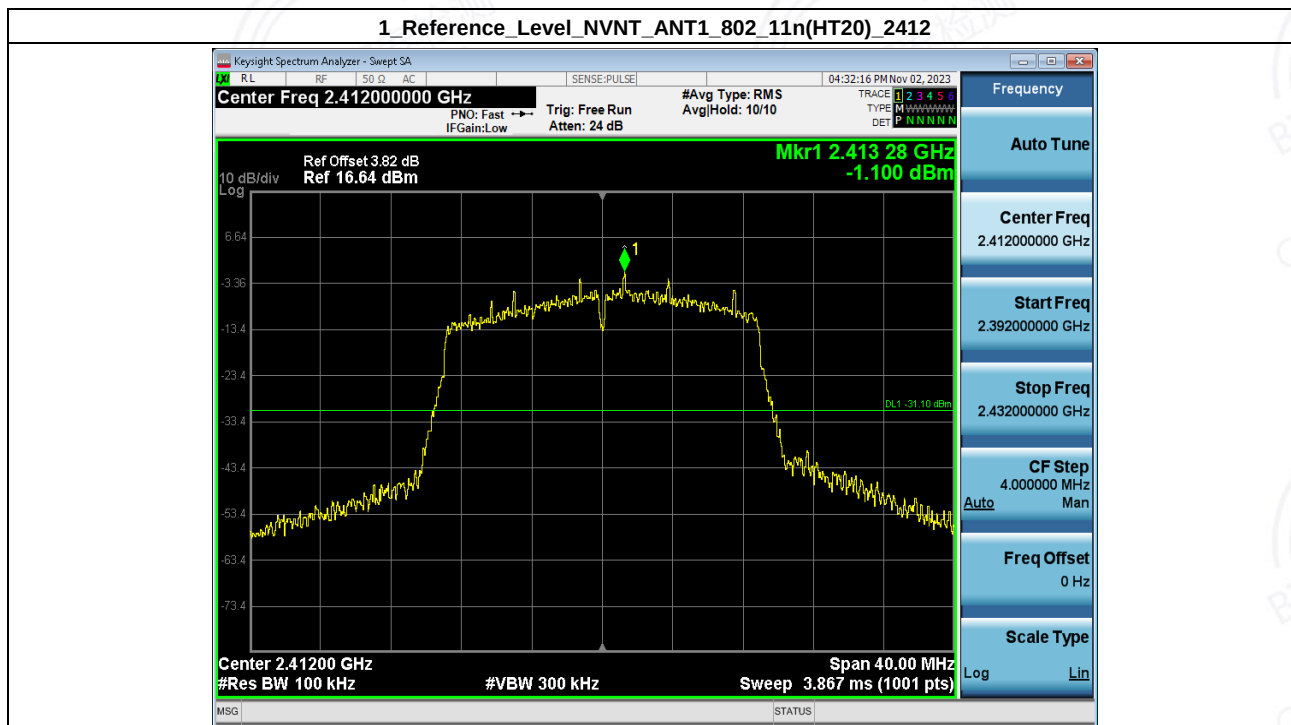
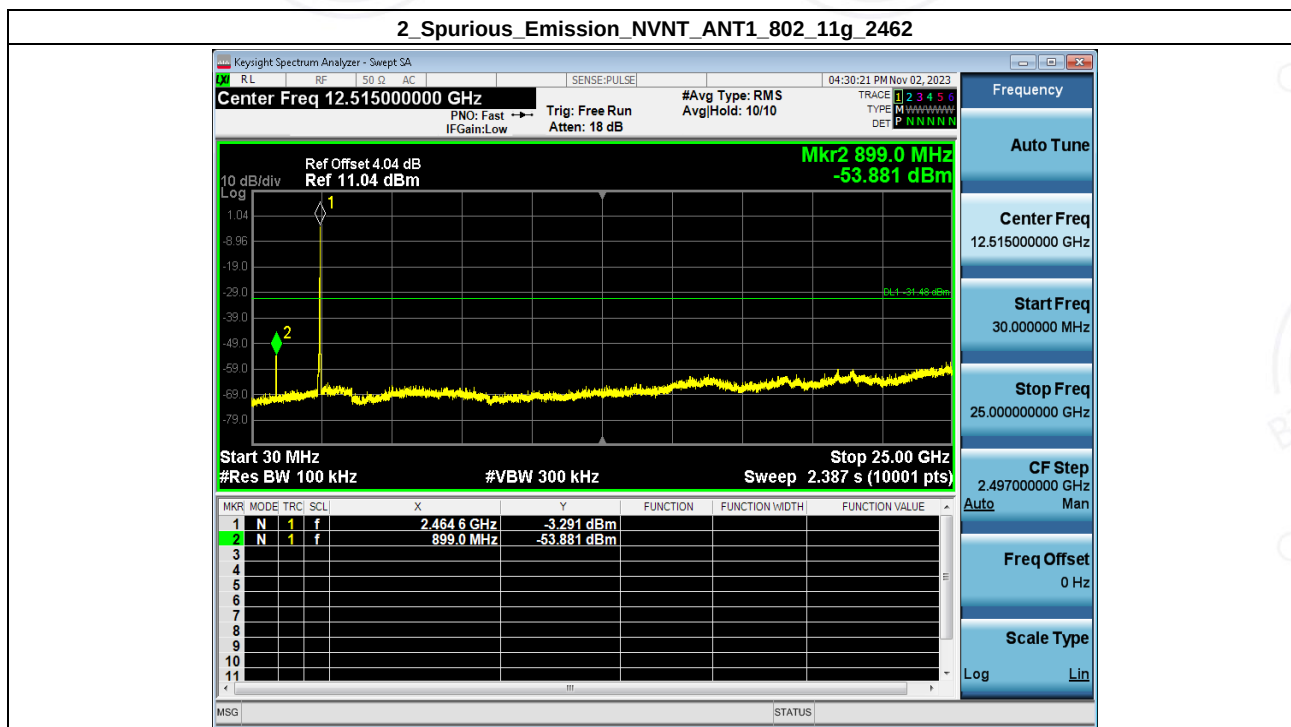
2_Spurious_Emission_NVNT_ANT1_802_11g_2412



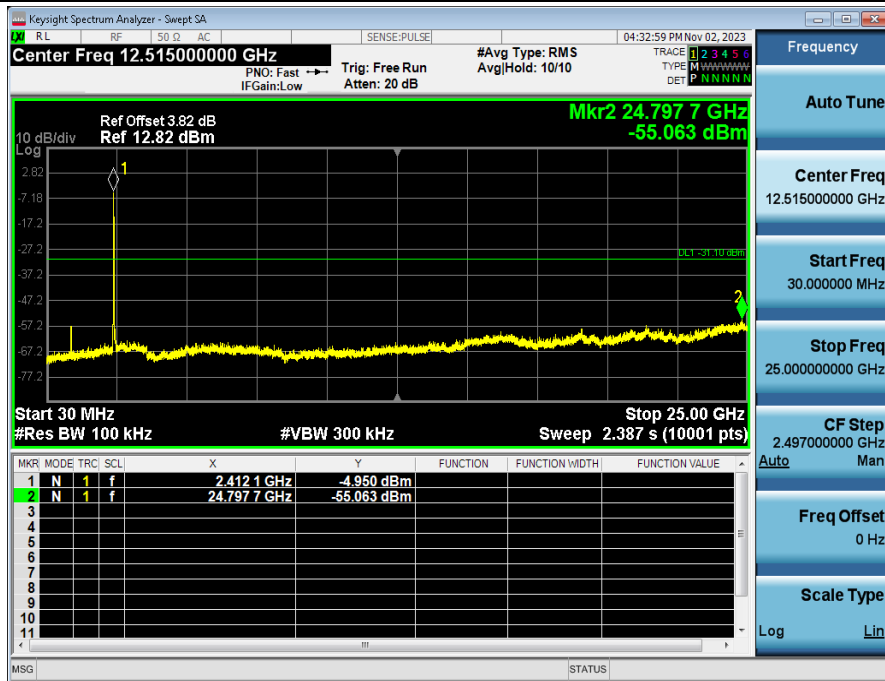
1_Reference_Level_NVNT_ANT1_802_11g_2437



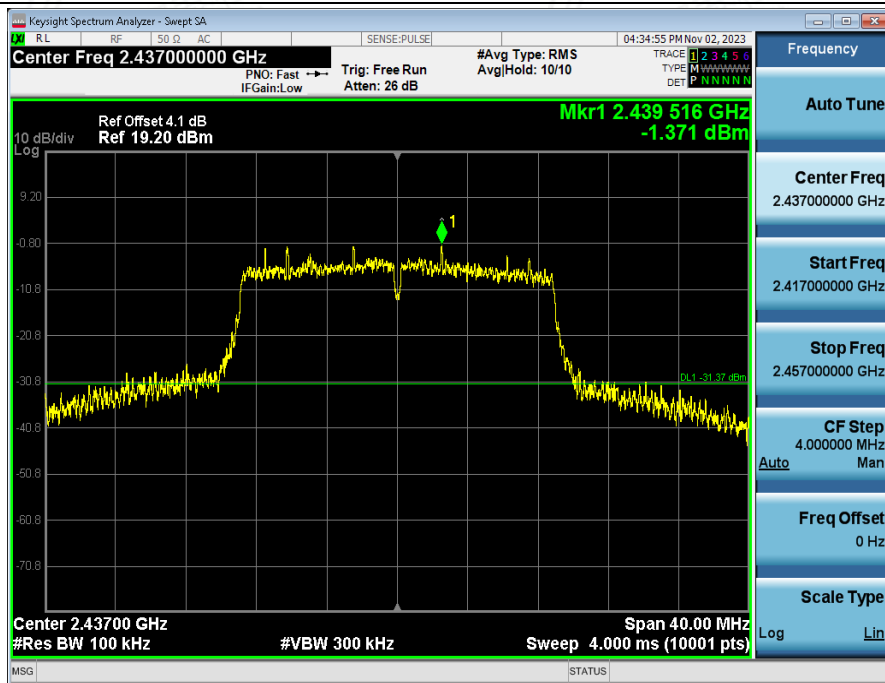




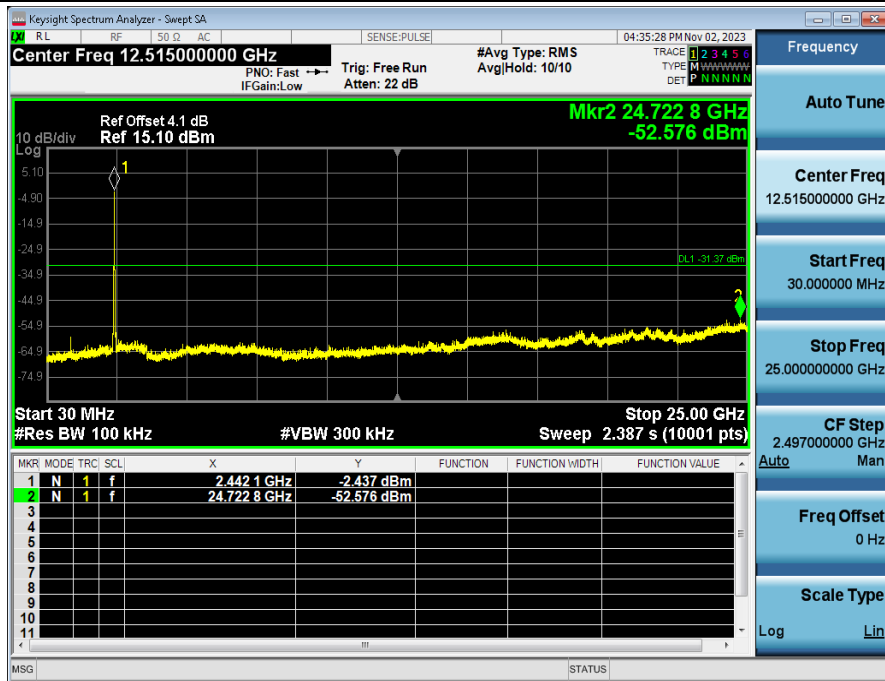
2_Spurious_Emission_NVNT_ANT1_802_11n(HT20)_2412



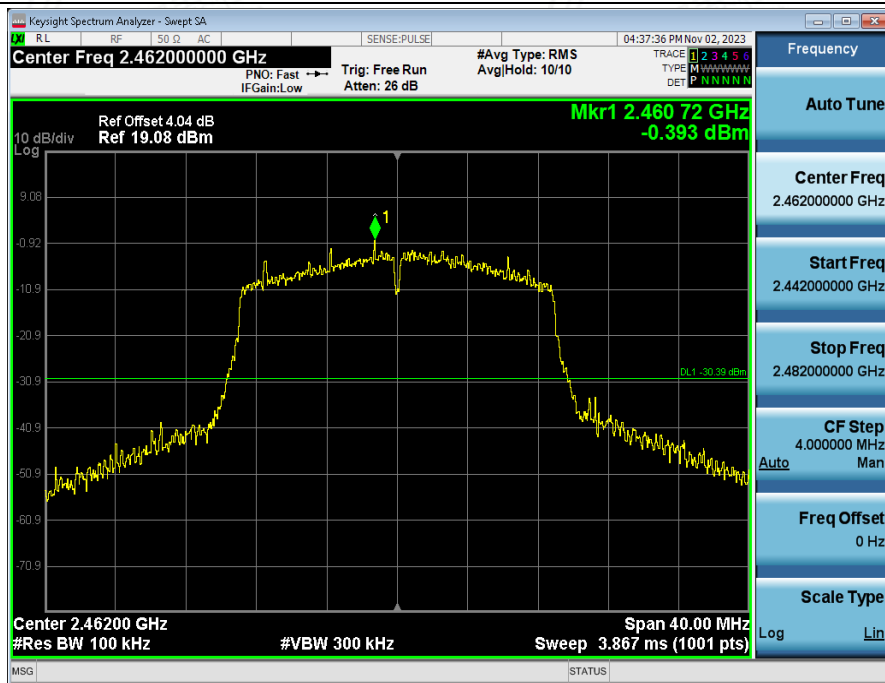
1_Reference_Level_NVNT_ANT1_802_11n(HT20)_2437

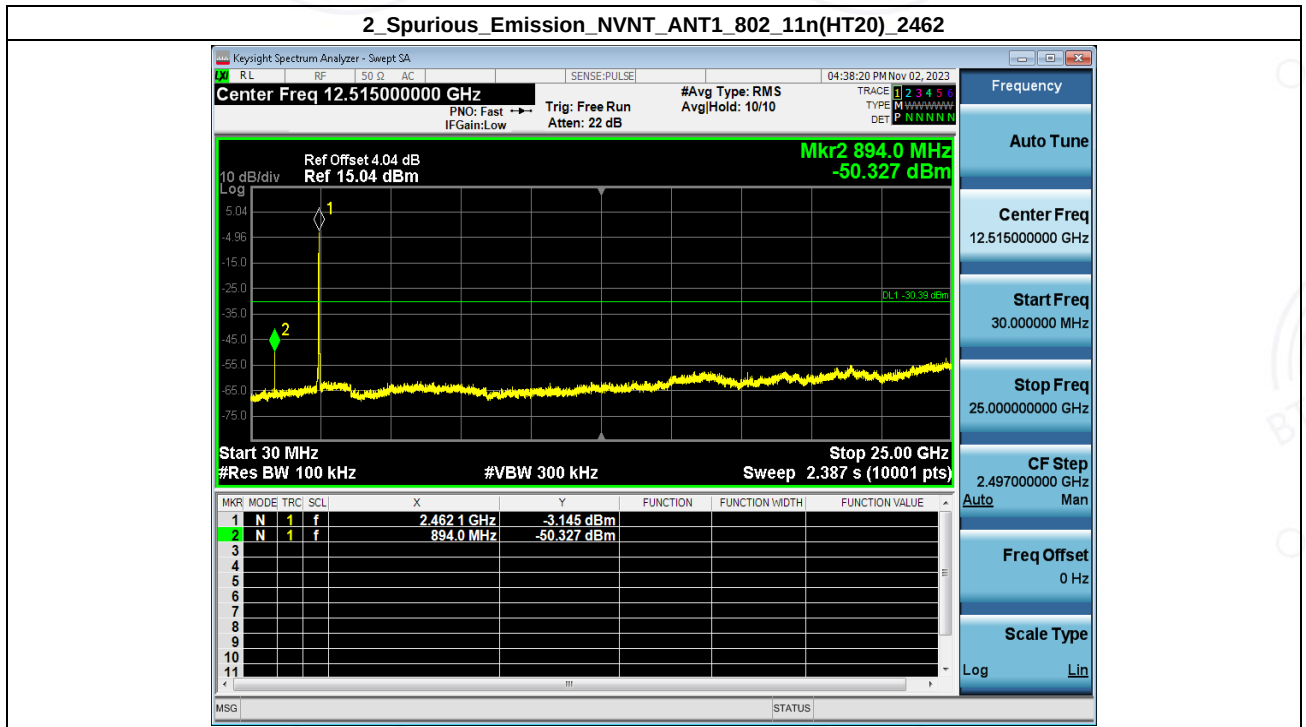


2_Spurious_Emission_NVNT_ANT1_802_11n(HT20)_2437



1_Reference_Level_NVNT_ANT1_802_11n(HT20)_2462





- End of the Report -

