

TEST REPORT

FCC ID: 2BH35-DS315WG

Product : DASH CAM
Model Name : DS315WG+RC-E11, DS318WG+RC-E11, DS319WG+RC-E11, DS315WG, DS318WG, DS319WG
Brand : Pernis
Report No. : NCT24032202

Prepared for

NetConn Electronics Co., Ltd

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Prepared by

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1 TEST RESULT CERTIFICATION

Applicant : NetConn Electronics Co., Ltd

Address : 18F-7, No.77, Sec.1, Xintai 5th Rd., Xizhi Dist., New Taipei City 221, Taiwan

Manufacturer : NetConn Electronics Co., Ltd

Address : 18F-7, No.77, Sec.1, Xintai 5th Rd., Xizhi Dist., New Taipei City 221, Taiwan

Product name : DASH CAM

Model name : DS315WG+RC-E11, DS318WG+RC-E11, DS319WG+RC-E11, DS315WG, DS318WG, DS319WG

Standards : FCC CFR47 Part 15 Section 15.247

Test procedure : ANSI C63.10:2013

Date of test : Jul. 22, 2024 to Aug. 09, 2024

Date of Issue : Aug. 10, 2024

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

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Test Engineer:


Keven Wu / Engineer

Technical Manager:


Henry Wang / Manager



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2 Test Summary

Test Items	Test Requirement	Result
Conduct Emission	FCC part 15.207	N/A
Radiated Spurious Emissions	FCC part 15.205/15.209	PASS
Conducted Spurious Emission	FCC part 15.205/15.209	PASS
Band edge	FCC part 15.247(d)	PASS
6dB&99% Bandwidth	FCC part 15.247 (a)(2)	PASS
Maximum Peak Output Power	FCC part 15.247 (b)(3)	PASS
Power Spectral Density	FCC part 15.247 (e)	PASS
Antenna Requirement	FCC part 15.203/15.247 (c)	PASS

Remark:

"N/A" denotes test is not applicable in this Test Report.

3 General Information

3.1 General Description of E.U.T.

Product Name	:	DASH CAM
Model Name	:	DS315WG+RC-E11
Sample ID	:	240729050
Sample(s) Status:	:	Engineer sample
Series Model	:	DS318WG+RC-E11, DS319WG+RC-E11, DS315WG, DS318WG, DS319WG
Model Different.:	:	PCB board, circuit, structure and internal of these model(s) are the same, Only model number is different for these model.
Specification	:	802.11b/g/n HT20;n HT40
Operation Frequency	:	2412-2462MHz for 802.11b/g/n20; 2422-2452MHz for 802.11n40;
Number of Channel	:	11 channels for 802.11b/g/n20; 7 channels for 802.11n40;
Type of Modulation	:	802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g/n(20)/n(40): DSSS (CCK, DQPSK,DBPSK)+OFDM+OFAMA (QPSK, BPSK, 16-QAM, 64-QAM)
Antenna installation	:	Internal Antenna
Antenna Gain	:	3.01dBi
Power supply	:	DC 12V-24V From Battery
Car Adapter	:	Input:DC 12-24V Output:5V/3.1A Max
Rear camera	:	Model Name:RC-E11 Input:DC 5V
Remark : the Antenna gain is provided by customer from Antenna spec. and the laboratory will not be responsible for the accumulated calculation results which covers the information provided by the applicant.		

3.2 Channel List

The EUT has been tested under its typical operating condition.

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

Test of channel included the lowest and middle and highest frequency to perform the test, then record on this report.

Those data rates (802.11b: 11 Mbps; 802.11g: 54 Mbps; MCS0:802.11n (HT20); MCS0:802.11n (HT40));were used for all test.

Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Frequency and Channel list for 802.11 b/g/n (HT20/HT40):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	5	2432	9	2452
2	2417	6	2437	10	2457
3	2422	7	2442	11	2462
4	2427	8	2447		

Test Frequency and Channel for 802.11 b/g/n (HT20/HT40):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	6	2437	11	2462
3	2422	6	2437	9	2452

3.3 Test Site

Site Description

EMC Lab. : Accredited by CNAS, 2022-09-27

The certificate is valid until 2028.01.07

The Laboratory has been assessed and proved to be in compliance with CNAS-CL01:2006 (identical to ISO/IEC 17025:2017)

The Certificate Registration Number is L8251

Designation Number: CN1347

Test Firm Registration Number: 894804

Accredited by A2LA, June 14, 2023

The Certificate Registration Number is 6837.01

Accredited by Industry Canada, November 09, 2018

The Conformity Assessment Body Identifier is CN0150

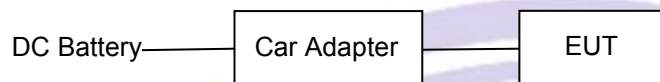
Company Number: 30806

Name of Firm : Shenzhen NCT Testing Technology Co., Ltd.

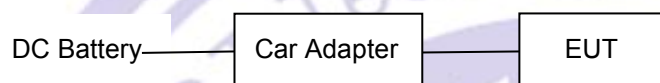
Site Location : A101&2F B2, Fuqiao 6th Area, Xintian Community, Fuhai Street, Baoan District, Shenzhen, People's Republic of China

3.4 Test Setup Configuration

Radiated Emission (30MHz-1GHz)



Radiated Emission(above 1GHz)



Conducted Spurious



3.5 Test Mode

Transmitting mode	Keep the EUT in continuously transmitting mode.
Remark: During the test, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.	

Test Software	SecuerCRT
Power level setup	10

4 Equipment During Test

4.1 Equipments List

Conducted emission Test Equipment

Name	Model No.	Serial No.	Manufacturer	Date of Cal.	Due Date
944 Shielded Room	944 Room	/	EMToni	2022/5/31	2025/5/30
EMI Test Receiver	ESPI	101604	Rohde & Schwarz	2024/6/17	2025/6/16
LISN	ENV 216	102796	Rohde & Schwarz	2024/6/17	2025/6/16
LISN	VN1-13S	004023	CRANAGE	2024/6/17	2025/6/16
Cable	RG223-1500MM	NA	RG	2024/6/17	2025/6/16

Radiated emission & Radio Frequency Test Equipment

Name	Model No.	Serial No.	Manufacturer	Date of Cal.	Due Date
966 Shielded Room	966 Room	/	EMToni	2022/5/31	2025/5/30
EMI Test Receiver	ESCI	101178	Rohde & Schwarz	2024/6/17	2025/6/16
Spectrum Analyze (10Hz-26.5GHz)	N9020A	MY50510202	Agilent	2024/6/17	2025/6/16
Amplifier (30MHz-1GHz)	BBV 9743 B	00374	SCHNWARZBECK	2024/6/17	2025/6/16
Bilog Antenna (30MHz-1GHz)	VULB9162	00473	SCHNWARZBECK	2023/3/19	2025/3/18
Horn antenna (1GHz-18GHz)	BBHA 9120 D	02622	SCHNWARZBECK	2023/3/19	2025/3/18
Preamplifier (1GHz-18GHz)	BBV 9718D	00042	SCHNWARZBECK	2024/6/17	2025/6/16
Spectrum Analyze (1GHz-40GHz)	FSV 40	100952	Rohde & Schwarz	2024/6/17	2025/6/16
Preamplifier (15GHz-40GHz)	BBV 9718D	0024	SCHNWARZBECK	2024/6/17	2025/6/16
Broadband Antenna (15GHz-40GHz)	SAS-574	588	A.H.System	2023/3/19	2025/3/18
Loop Antenna (9KHz-30MHz)	FMZB1519B	014	SCHNWARZBECK	2024/6/20	2025/6/19

Amplifier (9KHz-30MHz)	CVP 9222 C	00109	CHNWARZBECK	2024/6/18	2025/6/17
MXG Signal Analyzer	N9020A	MY50510202	Agilent	2024/6/17	2025/6/16
MXG Vector Signal Generator	N5182A	MY50140020	Agilent	2024/6/17	2025/6/16
MXG Analog Signal Generator	N5181A	MY47420919	Agilent	2024/6/17	2025/6/16
Power Sensor	TR1029-2	512364	Techoy	2024/6/17	2025/6/16
RF Swith	TR1029-1	512364	Techoy	2024/6/17	2025/6/16
Cable	DA800- 4000MM	NA	DA	2024/6/17	2025/6/16
Cable	DA800- 11000MM	NA	DA	2024/6/17	2025/6/16

Other

Item	Name	Manufacturer	Model	Software version
1	EMC Conduction Test System	AUDIX	e3	6.120718
2	EMC radiation test system	AUDIX	e3	6.120718
3	RF test system	TACHOY	RFTest	V1.0.0
4	RF communication test system	TACHOY	RFTest	V1.0.0

4.2 Measurement Uncertainty

Parameter	Uncertainty
RF output power, conducted	±1.0dB
Power Spectral Density, conducted	±2.2dB
Radio Frequency	± 1 x 10 ⁻⁶
Bandwidth	± 1.5 x 10 ⁻⁶
Time	±2%
Duty Cycle	±2%
Temperature	±1°C
Humidity	±5%
DC and low frequency voltages	±3%
Conducted Emissions (150kHz~30MHz)	±3.64dB
Radiated Emission(9KHz~30MHz)	±4.51dB
Radiated Emission(30MHz~1GHz)	±5.03dB
Radiated Emission(1GHz~25GHz)	±4.74dB
Radiated Emission(25GHz~40GHz)	±3.38dB
Remark: The coverage Factor (k=2), and measurement Uncertainty for a level of Confidence of 95%	

4.3 Description of Support Units

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

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	DASH CAM	Pernis	DASH CAM	N/A	EUT

Note:

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

5 Conducted Emission

Test Requirement: : FCC CFR 47 Part 15 Section 15.207
Test Method : ANSI C63.10: 2013
Test Result : N/A
Frequency Range : 150kHz to 30MHz
Class/Severity : Class B

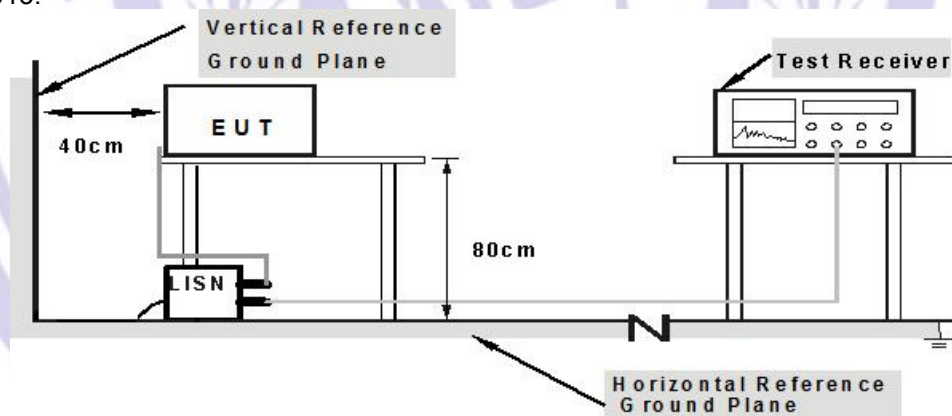
5.1 E.U.T. Operation

Operating Environment :

Temperature : 24.5 °C
Humidity : 51.3 % RH
Atmospheric Pressure : 101.11kPa

5.2 EUT Setup

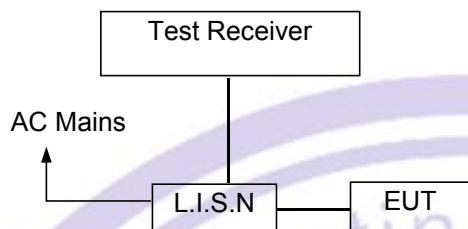
The conducted emission tests were performed using the setup accordance with the ANSI C63.10:2013.



Note: 1.Support units were connected to second LISN.

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

5.3 Test SET-UP (Block Diagram of Configuration)



5.4 Measurement Procedure

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured was complete.

5.5 Conducted Emission Limit

Conducted Emission

Frequency(MHz)	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50

Note:

1. The lower limit shall apply at the transition frequencies
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

5.6 Measurement Description

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

5.7 Conducted Emission Test Result

Not Applicable.

6 Radiated Spurious Emissions

Test Requirement : FCC CFR47 Part 15 Section 15.209 & 15.247
Test Method : ANSI C63.10:2013
Test Result : PASS
Measurement Distance : 3m
Limit : See the follow table

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	$2400/F(\text{kHz})$	300	$10000 * 2400/F(\text{kHz})$	$20\log^{(2400/F(\text{kHz}))} + 80$
0.490 ~ 1.705	$24000/F(\text{kHz})$	30	$100 * 24000/F(\text{kHz})$	$20\log^{(24000/F(\text{kHz}))} + 40$
1.705 ~ 30	30	30	$100 * 30$	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

6.1 EUT Operation

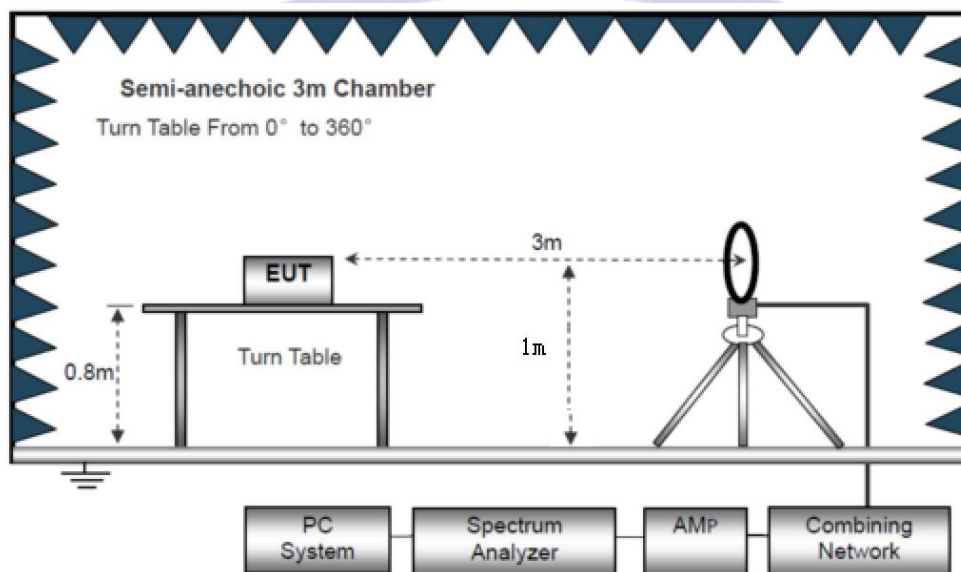
Operating Environment :

Temperature: : 24.5°C
Humidity: : 52 % RH
Atmospheric Pressure: : 101.11kPa
Test Voltage : AC 120V/60Hz

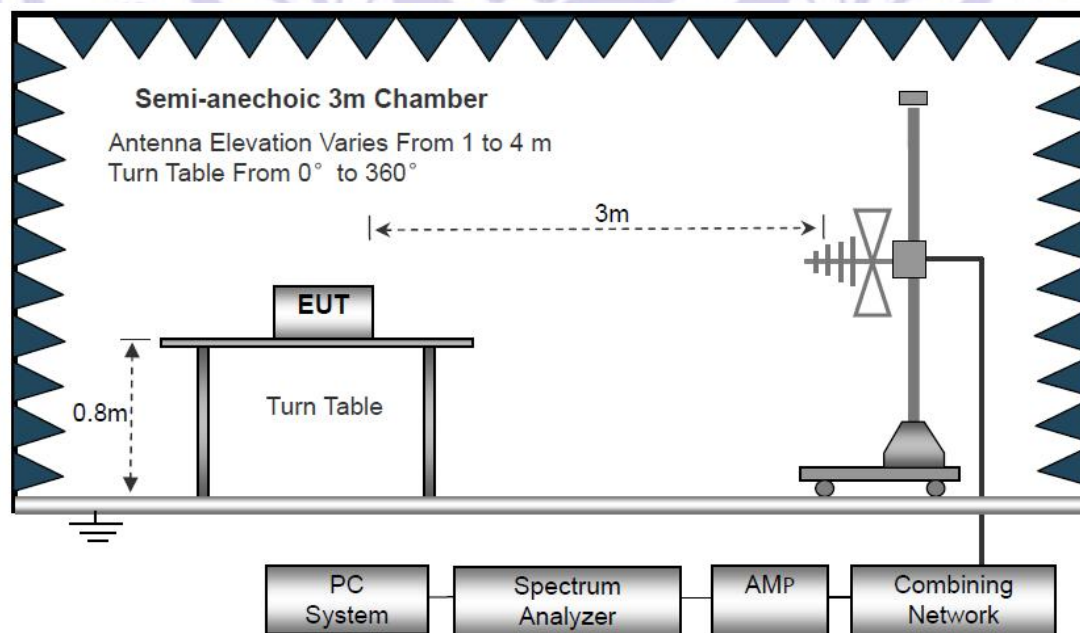
6.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site

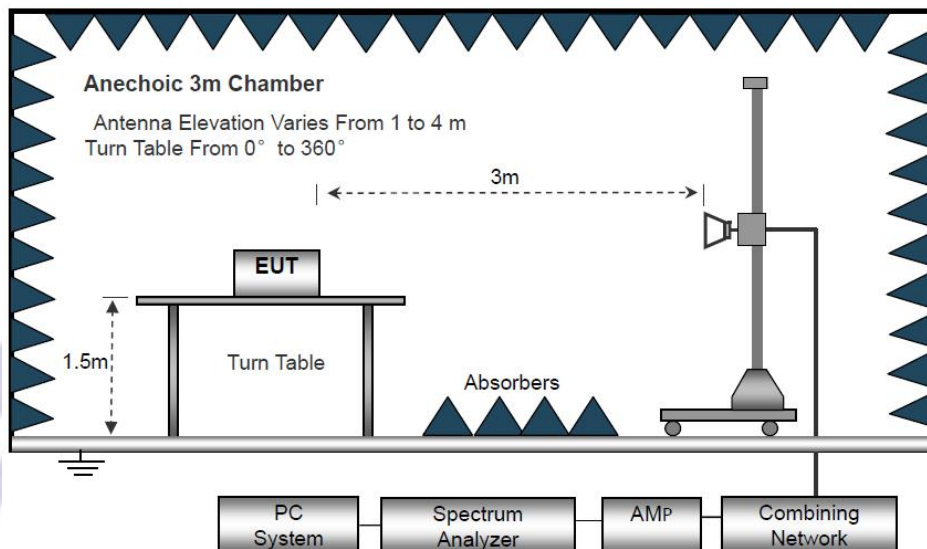
The test setup for emission measurement below 30MHz



The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz



6.3 Spectrum Analyzer Setup

Below 30MHz			
IF Bandwidth	:	10kHz	
Resolution Bandwidth	:	10kHz	
Video Bandwidth	:	10kHz	
30MHz ~ 1GHz			
Detector	:	PK	QP
Resolution Bandwidth	:	100kHz	120kHz
Video Bandwidth	:	300kHz	300kHz
Above 1GHz			
Detector	:	PK	AV
Resolution Bandwidth	:	1MHz	1MHz
Video Bandwidth	:	3MHz	10Hz

6.4 Test Procedure

1. Below 1000MHz, The EUT was placed on a turn table which is 0.8m above ground plane, And above 1000MHz, The EUT was placed on a styrofoam table which is 1.5m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions. The spectrum was investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.
8. The test above 1GHz must be use the fully anechoic room, and the test below 1GHz use the half anechoic room

6.5 Summary of Test Results

Test Frequency: 9KHz-30MHz

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)	Limit 3m (dBuV/m)	Over (dB)
--	--	--	--	>20

Note:

The amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

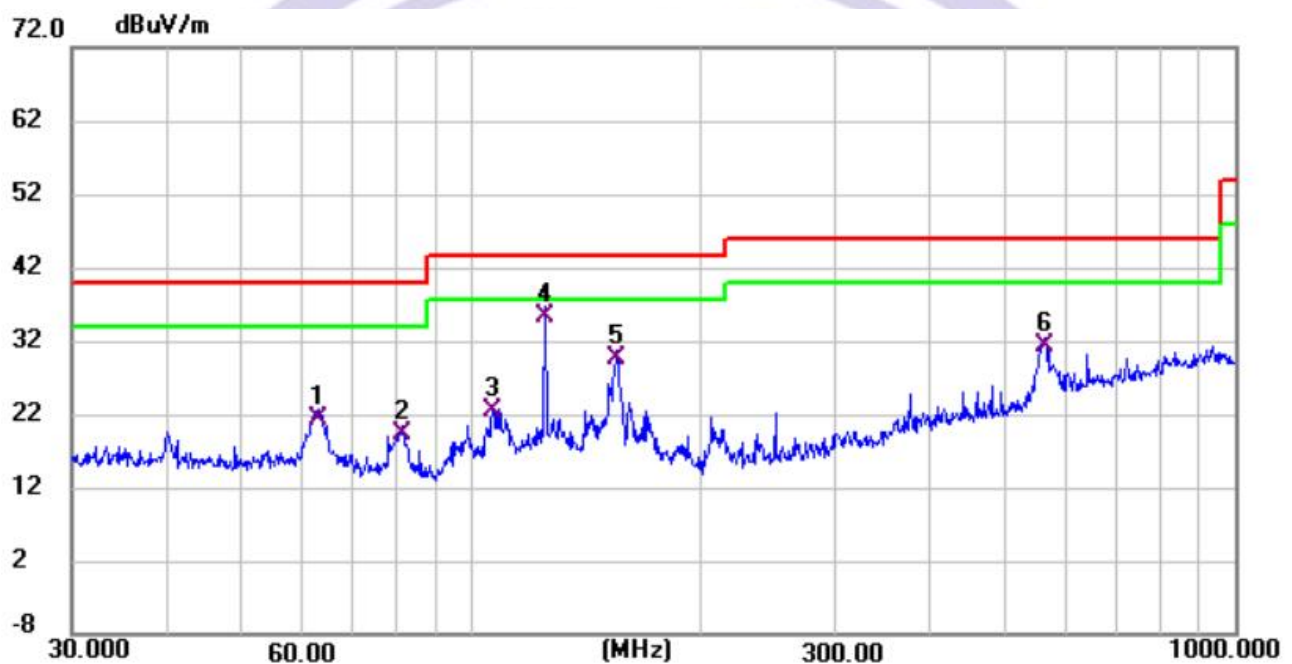
Distance extrapolation factor = $40 \log(\text{Specific distance} / \text{test distance})$ (dB);
Limit line = Specific limits (dBuV) + distance extrapolation factor.

Test Frequency: 30MHz ~ 1GHz

All the modulation modes were tested the data of the worst mode (TX 802.11n HT40 High Channel) are recorded in the following pages and the others modulation methods do not exceed the limits.

Please refer to the following test plots:

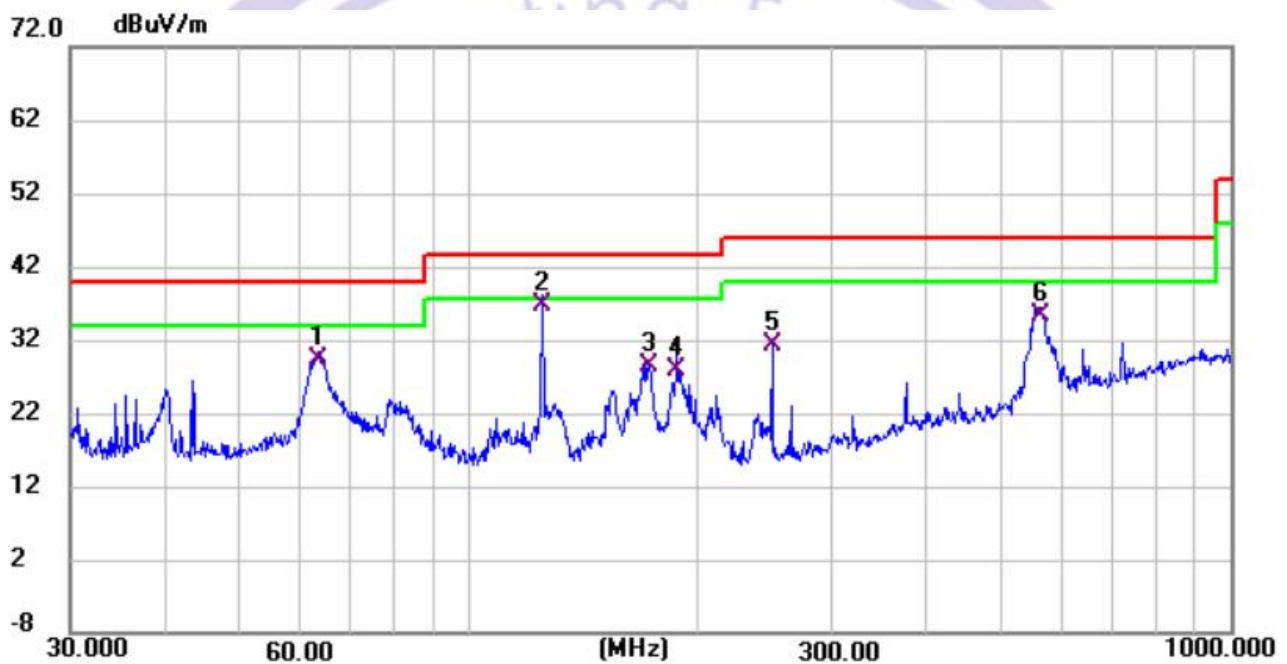
Temperature:	26℃	Relative Humidity:	54%
Pressure:	101 kPa	Polarization:	Horizontal
Test Voltage:	DC 12V from battery		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	63.092	9.31	12.05	21.36	40.00	-18.64	QP
2	81.497	8.01	11.35	19.36	40.00	-20.64	QP
3	106.759	10.30	12.01	22.31	43.50	-21.19	QP
4 *	125.007	21.50	13.74	35.24	43.50	-8.26	QP
5	155.364	16.20	13.45	29.65	43.50	-13.85	QP
6	562.662	11.75	19.67	31.42	46.00	-14.58	QP

Remark: Emission Level = Reading + Factor

Temperature:	26°C	Relative Humidity:	54%
Pressure:	101kPa	Polarization:	Vertical
Test Voltage:	DC 12V from battery		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	63.536	13.67	15.65	29.32	40.00	-10.68	QP
2 *	125.007	24.65	12.19	36.84	43.50	-6.66	QP
3	172.599	16.02	12.34	28.36	43.50	-15.14	QP
4	187.753	16.68	11.16	27.84	43.50	-15.66	QP
5	250.301	18.88	12.35	31.23	46.00	-14.77	QP
6	564.639	15.53	19.73	35.26	46.00	-10.74	QP

Remark: Emission Level = Reading + Factor

Test Frequency: From 1GHz to 25GHz

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre- amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/ m)	Margin (dB)	Detect or Type
Low Channel:2412MHz									
V	4824.00	49.37	34.12	5.03	32.39	52.67	74	-21.33	PK
V	4824.00	40.08	34.12	5.03	32.39	43.38	54	-10.62	AV
V	7236.00	44.98	32.54	6.29	35.86	54.59	74	-19.41	PK
V	7236.00	34.12	32.54	6.29	35.86	43.73	54	-10.27	AV
V	9648.00	47.47	32.98	7.55	38.4	60.44	74	-13.56	PK
V	9648.00	34.43	32.98	7.55	38.4	47.40	54	-6.60	AV
V	12060.00	41.33	32.09	8.93	39	57.17	74	-16.83	PK
V	12060.00	30.54	32.09	8.93	39	46.38	54	-7.62	AV
H	4824.00	49.17	34.12	5.03	32.39	52.47	74	-21.53	PK
H	4824.00	37.71	34.12	5.03	32.39	41.01	54	-12.99	AV
H	7236.00	46.66	32.54	6.29	35.86	56.27	74	-17.73	PK
H	7236.00	35.71	32.54	6.29	35.86	45.32	54	-8.68	AV
H	9648.00	44.51	32.98	7.55	38.4	57.48	74	-16.52	PK
H	9648.00	34.23	32.98	7.55	38.4	47.20	54	-6.80	AV
H	12060.00	39.20	32.09	8.93	39	55.04	74	-18.96	PK
H	12060.00	31.38	32.09	8.93	39	47.22	54	-6.78	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre- amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/ m)	Margin (dB)	Detect or Type
Middle Channel:2437MHz									
V	4874.00	47.13	34.07	5.09	32.59	50.74	74	-23.26	PK
V	4874.00	36.66	34.07	5.09	32.59	40.27	54	-13.73	AV
V	7311.00	45.23	32.63	6.34	35.96	54.90	74	-19.10	PK
V	7311.00	32.62	32.63	6.34	35.96	42.29	54	-11.71	AV
V	9748.00	39.39	32.92	7.59	38.4	52.46	74	-21.54	PK
V	9748.00	29.03	32.92	7.59	38.4	42.10	54	-11.90	AV
V	12185.00	38.27	31.96	8.88	39.04	54.23	74	-19.77	PK
V	12185.00	24.39	31.96	8.88	39.04	40.35	54	-13.65	AV
H	4874.00	48.77	34.07	5.09	32.59	52.38	74	-21.62	PK
H	4874.00	36.28	34.07	5.09	32.59	39.89	54	-14.11	AV
H	7311.00	43.73	32.63	6.34	35.96	53.40	74	-20.60	PK
H	7311.00	32.92	32.63	6.34	35.96	42.59	54	-11.41	AV
H	9748.00	38.08	32.92	7.59	38.4	51.15	74	-22.85	PK
H	9748.00	27.77	32.92	7.59	38.4	40.84	54	-13.16	AV
H	12185.00	39.30	31.96	8.88	39.04	55.26	74	-18.74	PK
H	12185.00	28.83	31.96	8.88	39.04	44.79	54	-9.21	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre- amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/ m)	Margin (dB)	Detect or Type
High Channel:2462MHz									
V	4924.00	46.54	34.02	5.15	32.8	50.47	74	-23.53	PK
V	4924.00	38.35	34.02	5.15	32.8	42.28	54	-11.72	AV
V	7386.00	42.69	32.71	6.4	36.05	52.43	74	-21.57	PK
V	7386.00	33.20	32.71	6.4	36.05	42.94	54	-11.06	AV
V	9848.00	40.90	32.86	7.62	38.4	54.06	74	-19.94	PK
V	9848.00	30.53	32.86	7.62	38.4	43.69	54	-10.31	AV
V	12310.00	39.13	31.82	8.84	39.08	55.23	74	-18.77	PK
V	12310.00	29.74	31.82	8.84	39.08	45.84	54	-8.16	AV
H	4924.00	49.24	34.02	5.15	32.8	53.17	74	-20.83	PK
H	4924.00	37.08	34.02	5.15	32.8	41.01	54	-12.99	AV
H	7386.00	46.00	32.71	6.4	36.05	55.74	74	-18.26	PK
H	7386.00	32.02	32.71	6.4	36.05	41.76	54	-12.24	AV
H	9848.00	42.28	32.86	7.62	38.4	55.44	74	-18.56	PK
H	9848.00	30.19	32.86	7.62	38.4	43.35	54	-10.65	AV
H	12310.00	39.40	31.82	8.84	39.08	55.50	74	-18.50	PK
H	12310.00	26.86	31.82	8.84	39.08	42.96	54	-11.04	AV

Note:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,
Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
4. We test all the mode and recorded the worst mode (802.11n HT40) in the report.

Radiated Band Emission Measurement:

	Polar (H/V)	Frequenc y (MHz)	Meter Reading (dBuV)	Pre- amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission level (dBuV/m)	Limit (dBuV /m)	Detec tor Type	Result
802.11b	Low Channel: 2412MHz									
	H	2390	58.77	35.17	3.48	27.49	54.57	74	PK	PASS
	H	2390	48.32	35.17	3.48	27.49	44.12	54	AV	PASS
	H	2400	59.35	35.16	3.49	27.52	55.20	74	PK	PASS
	H	2400	50.61	35.16	3.49	27.52	46.46	54	AV	PASS
	V	2390	57.02	35.17	3.48	27.49	52.82	74	PK	PASS
	V	2390	49.43	35.17	3.48	27.49	45.23	54	AV	PASS
	V	2400	59.83	35.16	3.49	27.52	55.68	74	PK	PASS
	V	2400	49.78	35.16	3.49	27.52	45.63	54	AV	PASS
	High Channel: 2462MHz									
	H	2483.5	57.98	35.11	3.56	27.75	54.18	74	PK	PASS
	H	2483.5	47.63	35.11	3.56	27.75	43.83	54	AV	PASS
	H	2500	59.99	35.1	3.57	27.8	56.26	74	PK	PASS
	H	2500	49.11	35.1	3.57	27.8	45.38	54	AV	PASS
	V	2483.5	58.16	35.11	3.56	27.75	54.36	74	PK	PASS
	V	2483.5	49.81	35.11	3.56	27.75	46.01	54	AV	PASS
	V	2500	58.99	35.1	3.57	27.8	55.26	74	PK	PASS
	V	2500	50.00	35.1	3.57	27.8	46.27	54	AV	PASS
802.11g	Low Channel: 2412MHz									
	H	2390	57.75	35.17	3.48	27.49	53.55	74	PK	PASS
	H	2390	48.84	35.17	3.48	27.49	44.64	54	AV	PASS
	H	2400	59.09	35.16	3.49	27.52	54.94	74	PK	PASS

	H	2400	49.58	35.16	3.49	27.52	45.43	54	AV	PASS
	V	2390	56.81	35.17	3.48	27.49	52.61	74	PK	PASS
	V	2390	48.81	35.17	3.48	27.49	44.61	54	AV	PASS
	V	2400	58.16	35.16	3.49	27.52	54.01	74	PK	PASS
	V	2400	48.79	35.16	3.49	27.52	44.64	54	AV	PASS
	High Channel: 2462MHz									
	H	2483.5	58.16	35.11	3.56	27.75	54.36	74	PK	PASS
	H	2483.5	48.89	35.11	3.56	27.75	45.09	54	AV	PASS
	H	2500	59.53	35.1	3.57	27.8	55.80	74	PK	PASS
	H	2500	48.41	35.1	3.57	27.8	44.68	54	AV	PASS
	V	2483.5	57.82	35.11	3.56	27.75	54.02	74	PK	PASS
	V	2483.5	49.74	35.11	3.56	27.75	45.94	54	AV	PASS
	V	2500	57.83	35.1	3.57	27.8	54.10	74	PK	PASS
	V	2500	48.56	35.1	3.57	27.8	44.83	54	AV	PASS
	Low Channel: 2412MHz									
	H	2390	56.49	35.17	3.48	27.49	52.29	74	PK	PASS
	H	2390	50.32	35.17	3.48	27.49	46.12	54	AV	PASS
	H	2400	61.14	35.16	3.49	27.52	56.99	74	PK	PASS
	H	2400	49.54	35.16	3.49	27.52	45.39	54	AV	PASS
802.11 n20	V	2390	57.20	35.17	3.48	27.49	53.00	74	PK	PASS
	V	2390	51.63	35.17	3.48	27.49	47.43	54	AV	PASS
	V	2400	60.31	35.16	3.49	27.52	56.16	74	PK	PASS
	V	2400	48.89	35.16	3.49	27.52	44.74	54	AV	PASS
	High Channel: 2462MHz									
	H	2483.5	58.85	35.11	3.56	27.75	55.05	74	PK	PASS
	H	2483.5	49.11	35.11	3.56	27.75	45.31	54	AV	PASS

	H	2500	59.94	35.1	3.57	27.8	56.21	74	PK	PASS
	H	2500	50.54	35.1	3.57	27.8	46.81	54	AV	PASS
	V	2483.5	58.48	35.11	3.56	27.75	54.68	74	PK	PASS
	V	2483.5	51.07	35.11	3.56	27.75	47.27	54	AV	PASS
	V	2500	58.76	35.1	3.57	27.8	55.03	74	PK	PASS
	V	2500	50.41	35.1	3.57	27.8	46.68	54	AV	PASS
802.11 n40	Low Channel: 2422MHz									
	H	2390	58.06	35.11	3.56	27.75	54.26	74	PK	PASS
	H	2390	50.55	35.11	3.56	27.75	46.75	54	AV	PASS
	H	2400	59.87	35.1	3.57	27.8	56.14	74	PK	PASS
	H	2400	51.34	35.1	3.57	27.8	47.61	54	AV	PASS
	V	2390	60.19	35.11	3.56	27.75	56.39	74	PK	PASS
	V	2390	50.13	35.11	3.56	27.75	46.33	54	AV	PASS
	V	2400	59.56	35.1	3.57	27.8	55.83	74	PK	PASS
	V	2400	52.11	35.1	3.57	27.8	48.38	54	AV	PASS
	High Channel: 2452MHz									
	H	2483.5	58.04	35.11	3.56	27.75	54.24	74	PK	PASS
	H	2483.5	51.02	35.11	3.56	27.75	47.22	54	AV	PASS
	H	2500	62.26	35.1	3.57	27.8	58.53	74	PK	PASS
	H	2500	51.55	35.1	3.57	27.8	47.82	54	AV	PASS
	V	2483.5	59.66	35.11	3.56	27.75	55.86	74	PK	PASS
	V	2483.5	52.10	35.11	3.56	27.75	48.30	54	AV	PASS
	V	2500	60.20	35.1	3.57	27.8	56.47	74	PK	PASS
	V	2500	50.90	35.1	3.57	27.8	47.17	54	AV	PASS
Remark:										
1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier, Margin= Emission Level - Limit										

7 Conduct Band Edge And Spurious Emissions Measurement

Test Requirement	:	FCC CFR47 Part 15 Section 15.247
Test Method	:	ANSI C63.10:2013
Test Limit	:	Regulation 15.247 (d), 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)).

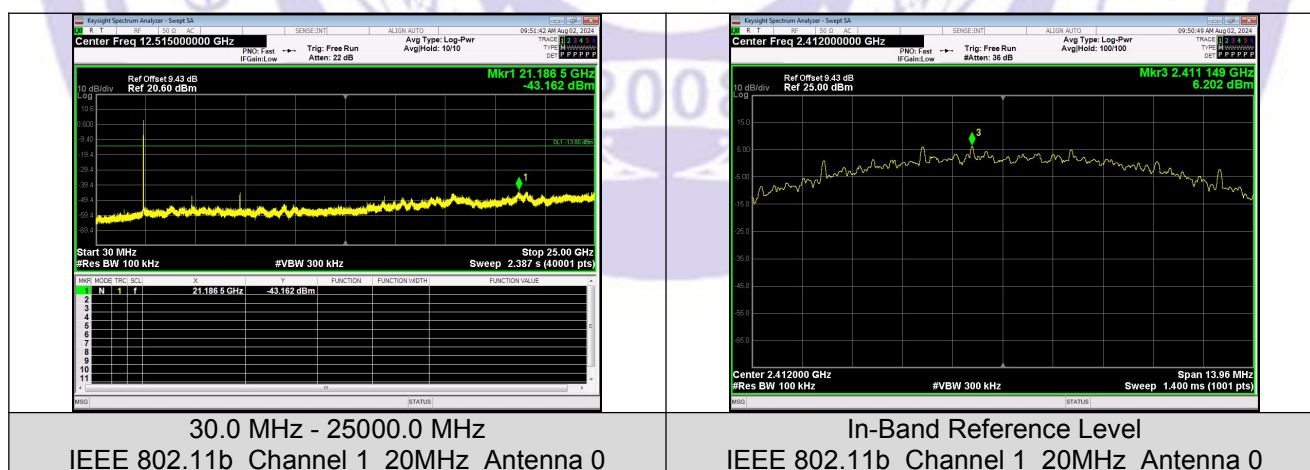
7.1 Test Procedure

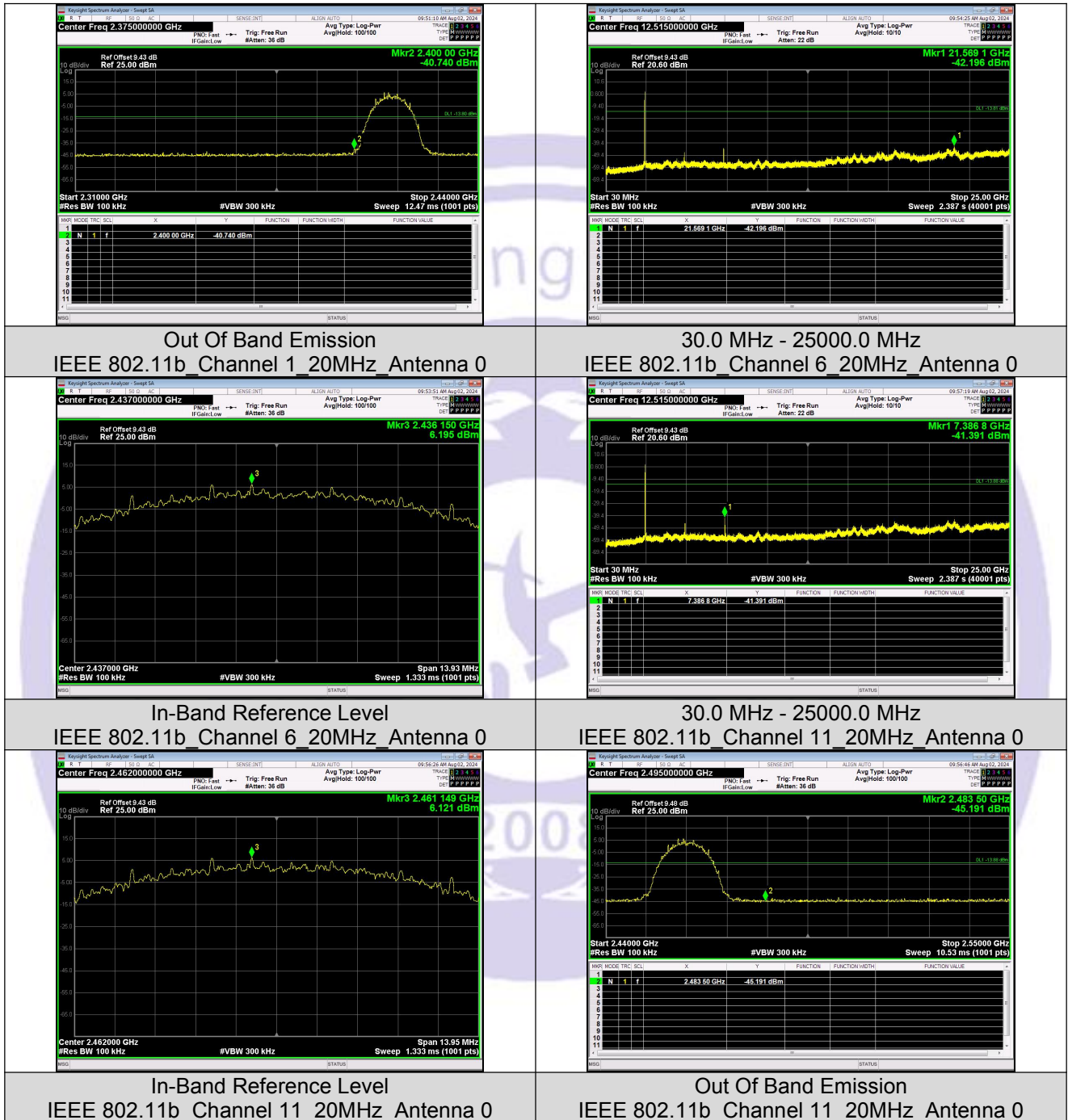
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz, Sweep = auto
Detector function = peak, Trace = max hold

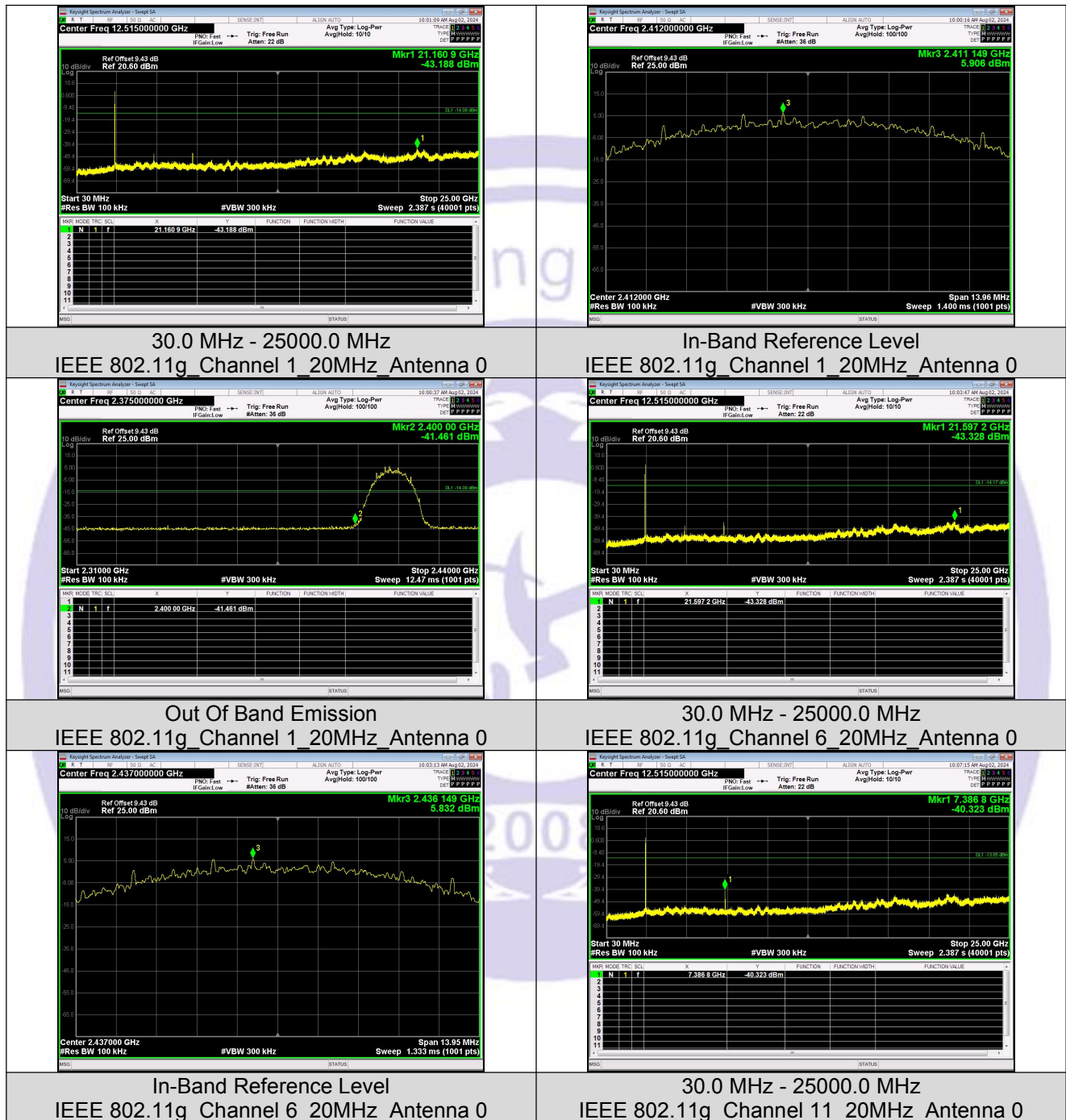
7.2 Test Result

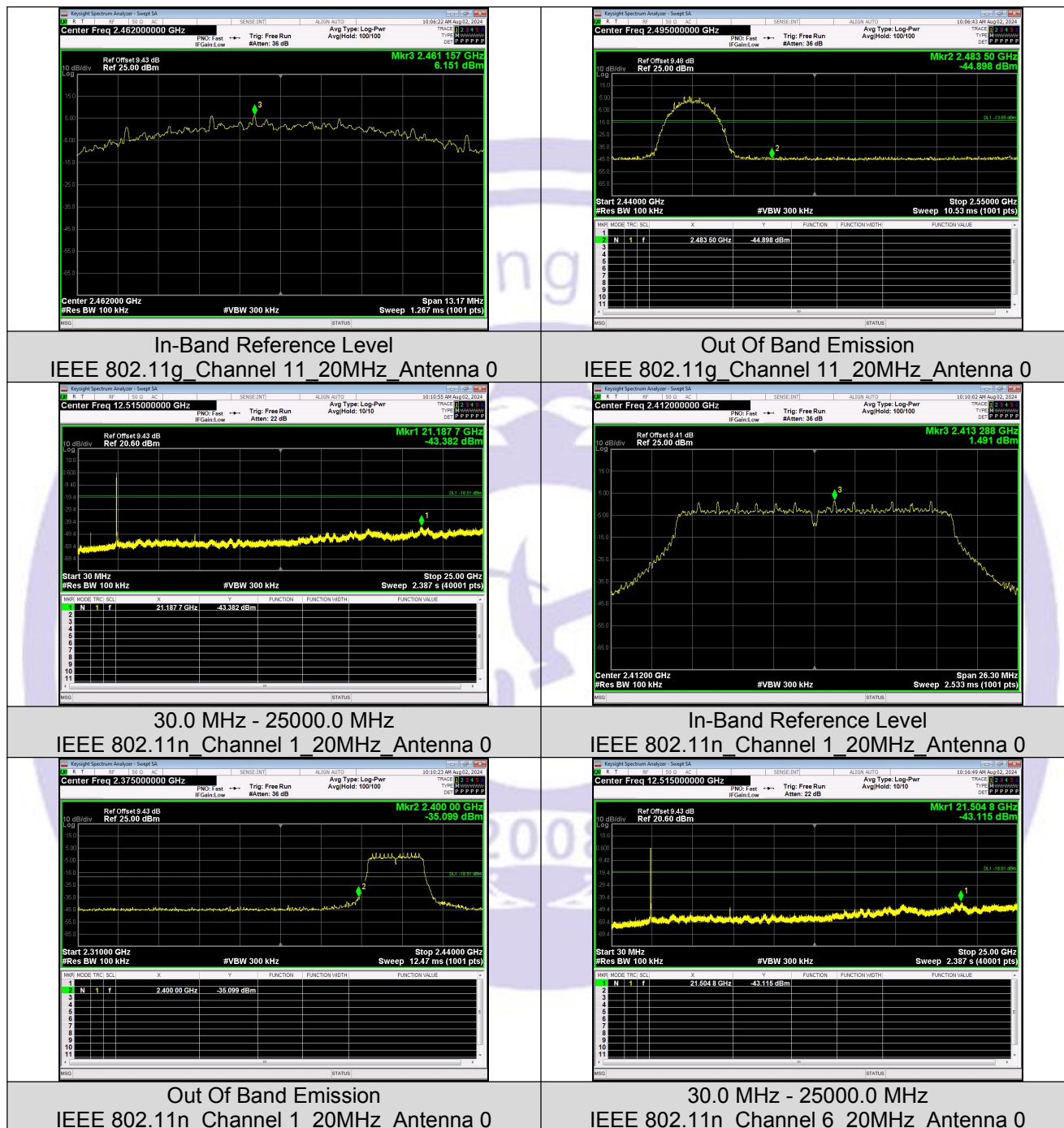
Mode	Channel	Ant.	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
IEEE 802.11b	1	0	2400.00	-40.740	-13.8	-26.940	PASS
			21186.5	-43.162	-13.8	-29.362	PASS
			21569.1	-42.196	-13.81	-28.386	PASS
			2483.50	-45.191	-13.88	-31.311	PASS
			7386.79	-41.391	-13.88	-27.511	PASS
IEEE 802.11g	1	0	2400.00	-41.461	-14.09	-27.371	PASS
			21160.9	-43.188	-14.09	-29.098	PASS
			21597.2	-43.328	-14.17	-29.158	PASS
			2483.50	-44.898	-13.85	-31.048	PASS
			7386.79	-40.323	-13.85	-26.473	PASS
IEEE 802.11n_20	1	0	2400.00	-35.099	-18.51	-16.589	PASS
			21187.7	-43.382	-18.51	-24.872	PASS
			21504.8	-43.115	-18.61	-24.505	PASS
			2483.50	-42.135	-18.54	-23.595	PASS
			24944.4	-43.055	-18.54	-24.515	PASS
IEEE 802.11n_40	3	0	2400.00	-36.393	-21.37	-15.023	PASS
			21170.2	-42.974	-21.37	-21.604	PASS
			21154.6	-43.712	-21.17	-22.542	PASS
			2483.50	-42.294	-21.35	-20.944	PASS
			21566.0	-42.622	-21.35	-21.272	PASS

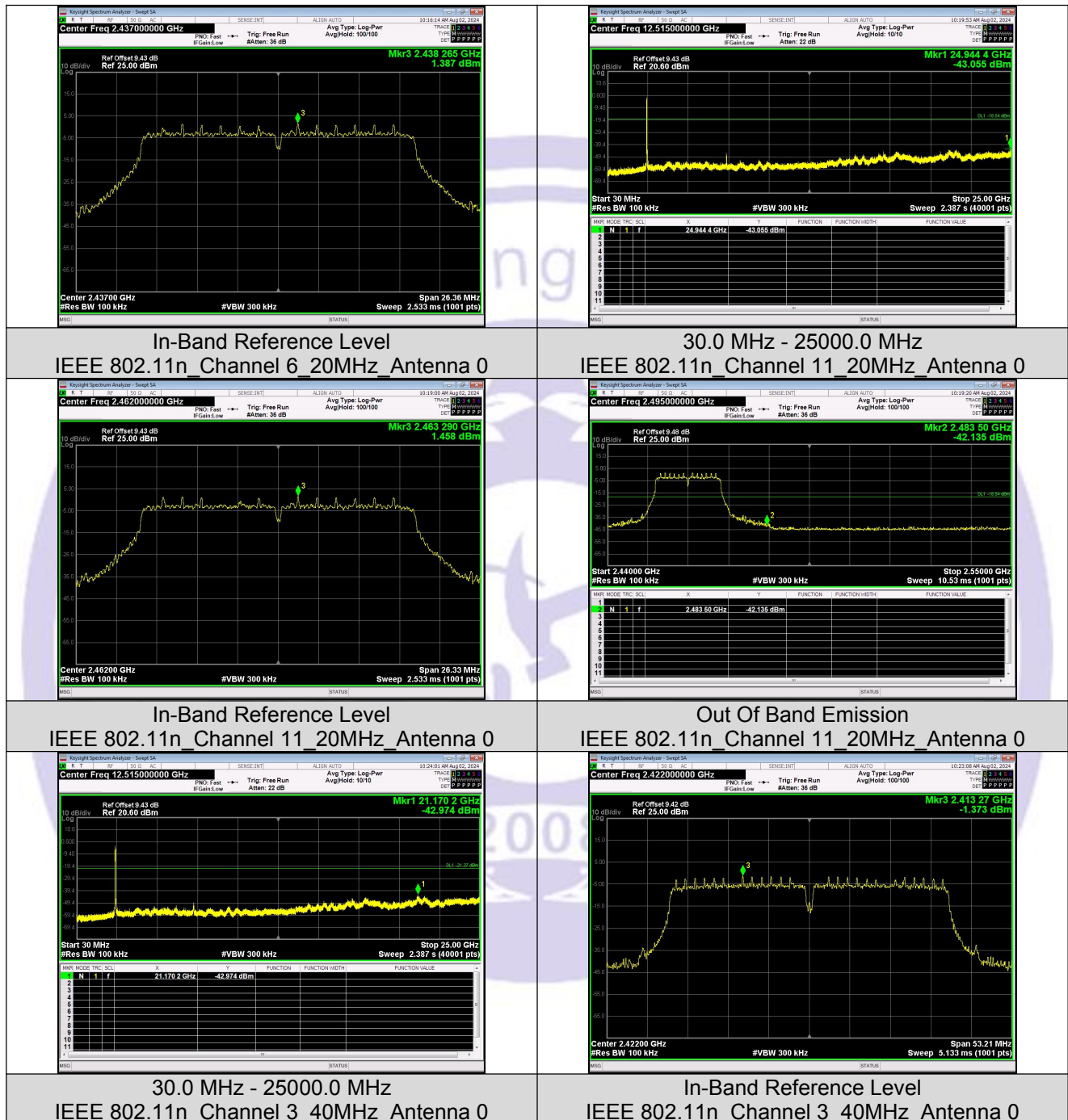
Test Graphs

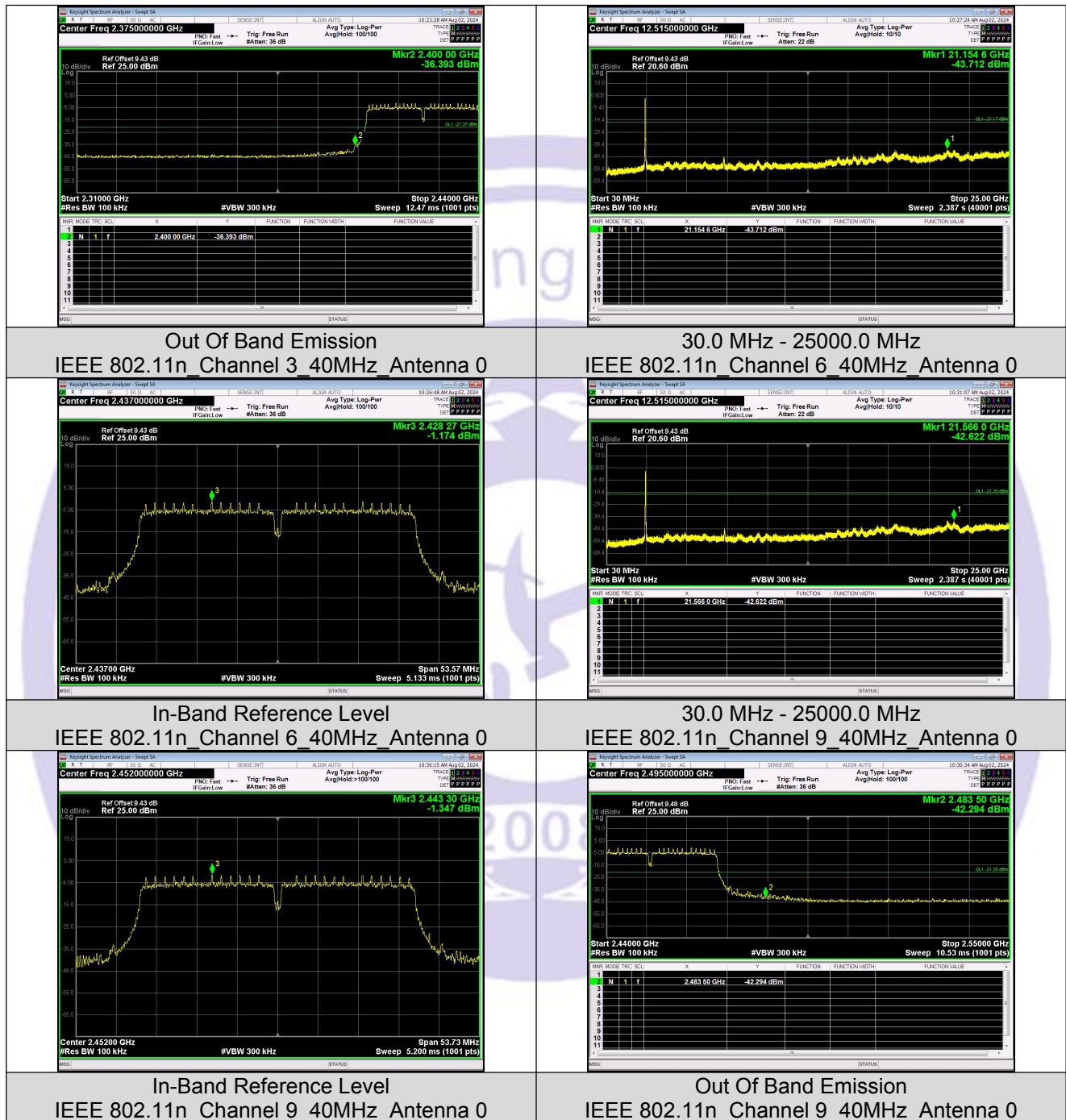












8 6dB&99% Bandwidth Measurement

Test Requirement : FCC CFR47 Part 15 Section 15.247

Test Method : ANSI C63.10:2013

Test Limit Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

8.1 Test Procedure

For 6dB Bandwidth Measurement

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz

For 99% Bandwidth Measurement

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 1%-5% OBW, VBW $\geq$ 3RBW

8.2 Test Result

Mode	Channel	Ant.	Center Frequency (MHz)	99% BW (MHz)
IEEE 802.11b	1	0	2412	13.255
	6		2437	13.339
	11		2462	13.314
IEEE 802.11g	1		2412	13.341
	6		2437	13.324
	11		2462	13.326
IEEE 802.11n_20	1		2412	17.803
	6		2437	17.836
	11		2462	17.784
IEEE 802.11n_40	3		2422	36.138
	6		2437	36.189
	9		2452	36.148

Test Graphs

