FCC PART 15 SUBPART C TEST REPORT

FCC PART 15.247

Report Reference No.....:	**CTA22030301301**
FCC ID..... :	**2A4JU-Q3171**
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Date of issue.....:	Mar. 03, 2022
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Applicant's name.....:	**Shenzhen ShunXinDa Trading Co., Ltd.**
Address .....:	Room 308, 3rd Floor, Building B, Donghaiwang Building, Bantian Street, Longgang District, Shenzhen, Guangdong, China
Test specification .....**:**	
Standard .....:	**FCC Part 15.247**

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Test item description .....:	IP camera
Trade Mark .....:	N/A
Manufacturer .....:	Shenzhen ShunXinDa Trading Co., Ltd.
Model/Type reference.....:	Q3171
Listed Models .....:	See next page
Modulation .....:	802.11b: DSSS 802.11g/802.11n(H20)/ 802.11n(H40): OFDM
Frequency.....	From 2412MHz-2462MHz
Rating .....:	5V⎓1A
Result.....:	**PASS**

TEST REPORT

Equipment under Test	:	IP camera
Model /Type	:	Q3171
Listed Models	:	W7091, W7555, Z0615, A2817, W7223, W7216, W7531, W7535, W7062, W7206, W7389, W7802, W7557, W7819, W7805, W7806, W7810, W7825, W7858, W7852, W7592, W7838, W7835, W7568, W7826, W7530, W7320, W7823, W7836
Applicant	:	**Shenzhen ShunXinDa Trading Co., Ltd.**
Address	:	Room 308, 3rd Floor, Building B, Donghaiwang Building, Bantian Street, Longgang District, Shenzhen, Guangdong, China
Manufacturer	:	**Shenzhen ShunXinDa Trading Co., Ltd.**
Address	:	Room 308, 3rd Floor, Building B, Donghaiwang Building, Bantian Street, Longgang District, Shenzhen, Guangdong, China

Test Result:	**PASS**

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

Contents

1 TEST STANDARDS 4

2 SUMMARY 5

2.1 General Remarks 5
2.2 Product Description 5
2.3 Equipment Under Test 5
2.4 Short description of the Equipment under Test (EUT) 5
2.5 EUT operation mode 5
2.6 Block Diagram of Test Setup 6
2.7 Special Accessories 6
2.8 Related Submittal(s) / Grant (s) 6
2.9 Modifications 6

3 TEST ENVIRONMENT 7

3.1 Address of the test laboratory 7
3.2 Test Facility 7
3.3 Environmental conditions 7
3.4 Summary of measurement results 8
3.5 Statement of the measurement uncertainty 8
3.6 Equipments Used during the Test 9

4 TEST CONDITIONS AND RESULTS 10

4.1 AC Power Conducted Emission 10
4.2 Radiated Emission 13
4.3 Maximum Conducted Output Power 20
4.4 Power Spectral Density 21
4.5 6dB Bandwidth 24
4.6 Out-of-band Emissions 27
4.7 Antenna Requirement 36

5 TEST SETUP PHOTOS OF THE EUT 37

6 PHOTOS OF THE EUT 38

1 TEST STANDARDS

The tests were performed according to following standards:

FCC Rules Part 15.247: Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.
ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices
KDB558074 D01 V05r02: Guidance for Compliance Measurements on Digital Transmission Systems (DTS) ,Frequency Hopping Spread Spectrum System(HFSS), and Hybrid System Devices Operating Under §15.247 of The FCC rules.

2 SUMMARY

2.1 General Remarks

Date of receipt of test sample	:	Feb. 17, 2022
Testing commenced on	:	Feb. 18, 2022
Testing concluded on	:	Feb. 24, 2022

2.2 Product Description

Product Name:	IP camera
Model/Type reference:	Q3171
Power supply:	DC 5V from adapter
Hardware version:	D011AP_MB_V1_6
Software version:	V1.0
Testing sample ID：	CTA220303013-1# (Engineer sample) CTA220303013-2# (Normal sample)
WIFI:	
Supported type:	802.11b/802.11g/802.11n(H20)/802.11n(H40)
Modulation:	802.11b: DSSS 802.11g/802.11n(H20)/ 802.11n(H40): OFDM
Operation frequency:	802.11b/802.11g/802.11n(H20): 2412MHz~2462MHz 802.11n(H40): 2422MHz~2452MHz
Channel number:	802.11b/802.11g/802.11n(H20): 11 802.11n(H40): 7
Channel separation:	5MHz
Antenna type:	PCB antenna
Antenna gain:	0.00 dBi

Note:Antenna gain is provide by the manufacturer.

2.3 Equipment Under Test

Power supply system utilised

Power supply voltage	:	○	230V / 50 Hz	○	120V / 60Hz
		○	12 V DC	○	24 V DC
		●	Other (specified in blank below)		

DC 5V from adpater

2.4 Short description of the Equipment under Test (EUT)

This is an IP camera.
For more details, refer to the user's manual of the EUT.

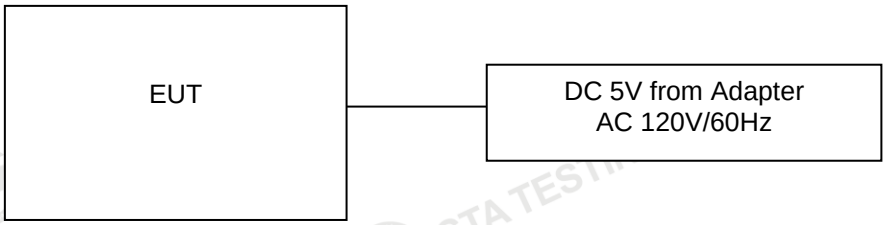
2.5 EUT operation mode

The application provider specific test software(Engineering mode) to control sample in continuous TX and RX (Duty Cycle >98%) for testing meet KDB558074 test requirement.

IEEE 802.11b/g/n: Thirteen channels are provided to the EUT.

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

2.6 Block Diagram of Test Setup



2.7 Special Accessories

Follow auxiliary equipment(s) test with EUT that provided by the manufacturer or laboratory is listed as follow:

Description	Manufacturer	Model	Technical Parameters	Certificate	Provided by
AC-DC Adapter	MOSO	MASO0510A W	Input:AC100-240V-50/60Hz，0.3A Output:DC 5V,1A	FCC	Applicant
/	/	/	/	/	/
/	/	/	/	/	/
/	/	/	/	/	/

2.8 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for the device filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.

2.9 Modifications

No modifications were implemented to meet testing criteria.

3 TEST ENVIRONMENT

3.1 Address of the test laboratory

Shenzhen CTA Testing Technology Co., Ltd.
Room 106, Building 1, Yibaolai Industrial Park, Qiaotou Community,Fuhai Street, Bao ‘an District, Shenzhen, China

3.2 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:
FCC-Registration No.: 517856 Designation Number: CN1318

Shenzhen CTA Testing Technology Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

A2LA-Lab Cert. No.: 6534.01

Shenzhen CTA Testing Technology Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.10 and CISPR 16-1-4:2010.

3.3 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:
Radiated Emission:

Temperature:	24 ° C
Humidity:	46 %
Atmospheric pressure:	950-1050mbar

AC Power Conducted Emission:

Temperature:	25 ° C
Humidity:	47 %
Atmospheric pressure:	950-1050mbar

Conducted testing:

Temperature:	24 ° C
Humidity:	46 %
Atmospheric pressure:	950-1050mbar

3.4 Summary of measurement results

Test Specification clause	Test case	Test Sample	Test Mode	Test Channel	Recorded In Report		Test result
§15.247(e)	Power spectral density	CTA220303013-1#	802.11b 802.11g 802.11n(HT)20 802.11n(HT)40	Lowest Middle Highest	802.11b 802.11g 802.11n(HT)20 802.11n(HT)40	Lowest Middle Highest	complies
§15.247(a)(2)	Spectrum bandwidth – 6 dB bandwidth	CTA220303013-1#	802.11b 802.11g 802.11n(HT)20 802.11n(HT)40	Lowest Middle Highest	802.11b 802.11g 802.11n(HT)20 802.11n(HT)40	Lowest Middle Highest	complies
§15.247(b)(3)	Maximum Conducted output power	CTA220303013-1#	802.11b 802.11g 802.11n(HT)20 802.11n(HT)40	Lowest Middle Highest	802.11b 802.11g 802.11n(HT)20 802.11n(HT)40	Lowest Middle Highest	complies
§15.247(d)	Band edge compliance conducted	CTA220303013-1#	802.11b 802.11g 802.11n(HT)20 802.11n(HT)40	Lowest Highest	802.11b 802.11g 802.11n(HT)20 802.11n(HT)40	Lowest Highest	complies
§15.205	Band edge compliance radiated	CTA220303013-1#	802.11b 802.11g 802.11n(HT)20 802.11n(HT)40	Lowest Highest	802.11b	Lowest Highest	complies
§15.247(d)	TX spurious emissions conducted	CTA220303013-1#	802.11b 802.11g 802.11n(HT)20 802.11n(HT)40	Lowest Middle Highest	802.11b 802.11g 802.11n(HT)20 802.11n(HT)40	Lowest Middle Highest	complies
§15.209(a)	TX spurious emissions Radiated above 1GHz	CTA220303013-1#	802.11b 802.11g 802.11n(HT)20 802.11n(HT)40	Lowest Middle Highest	802.11b	Lowest Middle Highest	complies
§15.209(a)	TX spurious Emissions radiated Below 1GHz	CTA220303013-2#	802.11b 802.11g 802.11n(HT)20 802.11n(HT)40	Lowest Middle Highest	802.11b	Lowest	complies
§15.107(a) §15.207	Conducted Emissions < 30 MHz	CTA220303013-2#	802.11b 802.11g 802.11n(HT)20 802.11n(HT)40	Lowest Middle Highest	802.11b	Lowest	complies

Remark:
1. The measurement uncertainty is not included in the test result.
2. We tested all test mode and recorded worst case in report

3.5 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01" Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 2 " and is documented in the Shenzhen CTA Testing Technology Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen CTA Testing Technology Co., Ltd. :

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.06 dB	(1)
Radiated Emission	1~18GHz	5.14 dB	(1)
Radiated Emission	18-40GHz	5.38 dB	(1)
Conducted Disturbance	0.15~30MHz	2.14 dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

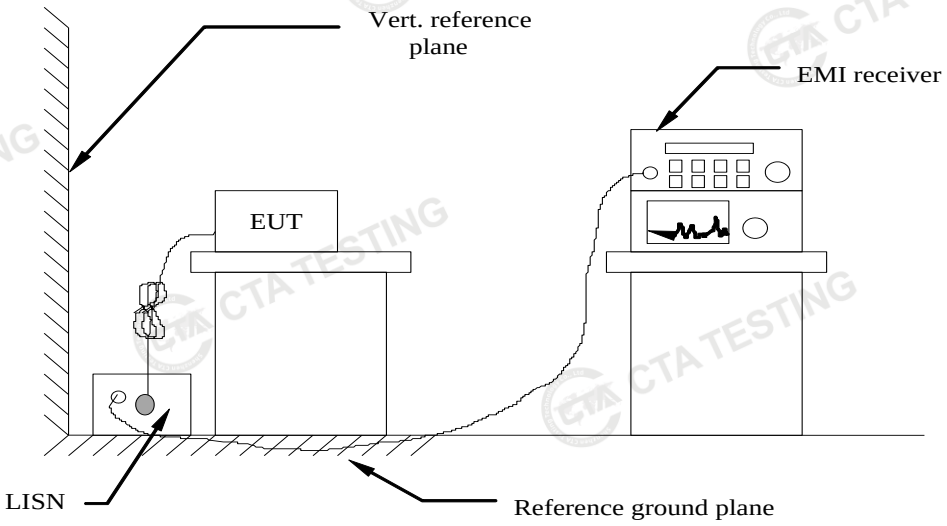
3.6 Equipments Used during the Test

Test Equipment	Manufacturer	Model No.	Equipment No.	Calibration Date	Calibration Due Date
LISN	R&S	ENV216	CTA-308	2021/08/06	2022/08/05
LISN	R&S	ENV216	CTA-314	2021/08/06	2022/08/05
EMI Test Receiver	R&S	ESPI	CTA-307	2021/08/06	2022/08/05
EMI Test Receiver	R&S	ESCI	CTA-306	2021/08/06	2022/08/05
Spectrum Analyzer	Agilent	N9020A	CTA-301	2021/08/06	2022/08/05
Spectrum Analyzer	R&S	FSP	CTA-337	2021/08/06	2022/08/05
Vector Signal generator	Agilent	N5182A	CTA-305	2021/08/06	2022/08/05
Analog Signal Generator	R&S	SML03	CTA-304	2021/08/06	2022/08/05
Universal Radio Communication	CMW500	R&S	CTA-302	2021/08/06	2022/08/05
Temperature and humidity meter	Chigo	ZG-7020	CTA-326	2021/08/06	2022/08/05
Ultra-Broadband Antenna	Schwarzbeck	VULB9163	CTA-310	2021/08/07	2022/08/06
Horn Antenna	Schwarzbeck	BBHA 9120D	CTA-309	2021/08/07	2022/08/06
Loop Antenna	Zhinan	ZN30900C	CTA-311	2021/08/07	2022/08/06
Horn Antenna	Beijing Hangwei Dayang	OBH100400	CTA-336	2021/08/06	2022/08/05
Amplifier	Schwarzbeck	BBV 9745	CTA-312	2021/08/06	2022/08/05
Amplifier	Taiwan chengyi	EMC051845B	CTA-313	2021/08/06	2022/08/05
Directional coupler	NARDA	4226-10	CTA-303	2021/08/06	2022/08/05
High-Pass Filter	XingBo	XBLBQ-GTA18	CTA-402	2021/08/06	2022/08/05
High-Pass Filter	XingBo	XBLBQ-GTA27	CTA-403	2021/08/06	2022/08/05
Automated filter bank	Tonscend	JS0806-F	CTA-404	2021/08/06	2022/08/05
Power Sensor	Agilent	U2021XA	CTA-405	2021/08/06	2022/08/05
Amplifier	Schwarzbeck	BBV9719	CTA-406	2021/08/06	2022/08/05

4 TEST CONDITIONS AND RESULTS

4.1 AC Power Conducted Emission

TEST CONFIGURATION



TEST PROCEDURE

1 The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10-2013.
2 Support equipment, if needed, was placed as per ANSI C63.10-2013
3 All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10-2013
4 The EUT received DC 12V power from adapter, the adapter received AC120V/60Hz and AC 240V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5 All support equipments received AC power from a second LISN, if any.
6 The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT.The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7 Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
8 During the above scans, the emissions were maximized by cable manipulation.

AC Power Conducted Emission Limit

For intentional device, according to § 15.207(a) AC Power Conducted Emission Limits is as following：

Frequency range (MHz)	Limit (dBuV)	
	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.		

TEST RESULTS

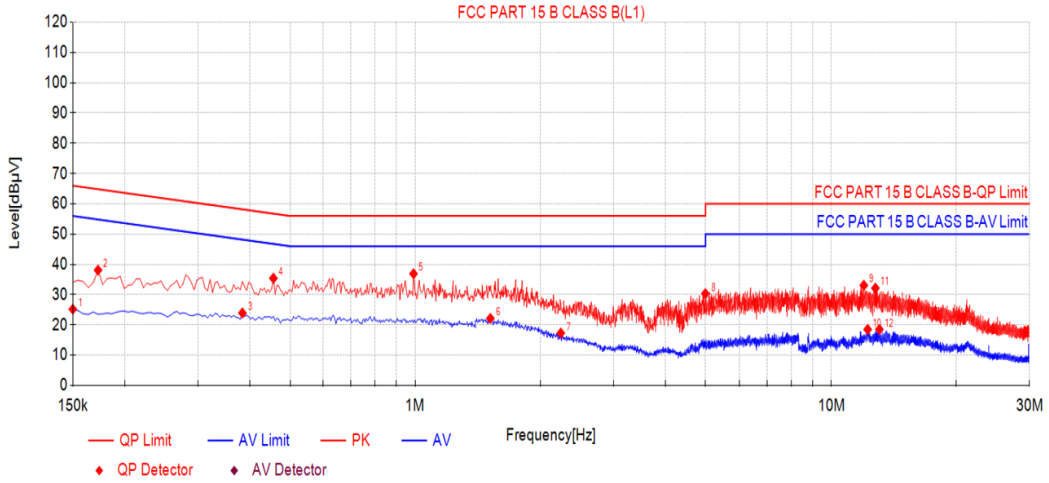
Remark:

1. All modes of 802.11b/g/n were tested at Low, Middle, and High channel; only the worst result of 802.11b low channel was reported as below:

2. Both 120 VAC, 50/60 Hz and 240 VAC, 50/60 Hz power supply have been tested, only the worst result of 120 VAC, 60 Hz was reported as below:

Power supply:	DC 5V from Adapter AC 120V/60Hz	Polarization	L

Test Graph



Suspected List									
NO.	Freq. [MHz]	Reading [dBµV]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Detector	Type	Verdict
1	0.15	14.69	25.19	10.50	56.00	30.81	AV	L1	PASS
2	0.1725	27.60	38.10	10.50	64.84	26.74	PK	L1	PASS
3	0.384	13.45	23.95	10.50	48.19	24.24	AV	L1	PASS
4	0.456	24.91	35.41	10.50	56.77	21.36	PK	L1	PASS
5	0.9915	26.42	36.92	10.50	56.00	19.08	PK	L1	PASS
6	1.518	11.64	22.14	10.50	46.00	23.86	AV	L1	PASS
7	2.2425	6.80	17.30	10.50	46.00	28.70	AV	L1	PASS
8	4.9965	19.83	30.33	10.50	56.00	25.67	PK	L1	PASS
9	11.9715	22.57	33.07	10.50	60.00	26.93	PK	L1	PASS
10	12.228	8.01	18.51	10.50	50.00	31.49	AV	L1	PASS
11	12.7635	21.66	32.16	10.50	60.00	27.84	PK	L1	PASS
12	13.0515	8.01	18.51	10.50	50.00	31.49	AV	L1	PASS

Note:1).QP Value (dBµV)= QP Reading (dBµV)+ Factor (dB)

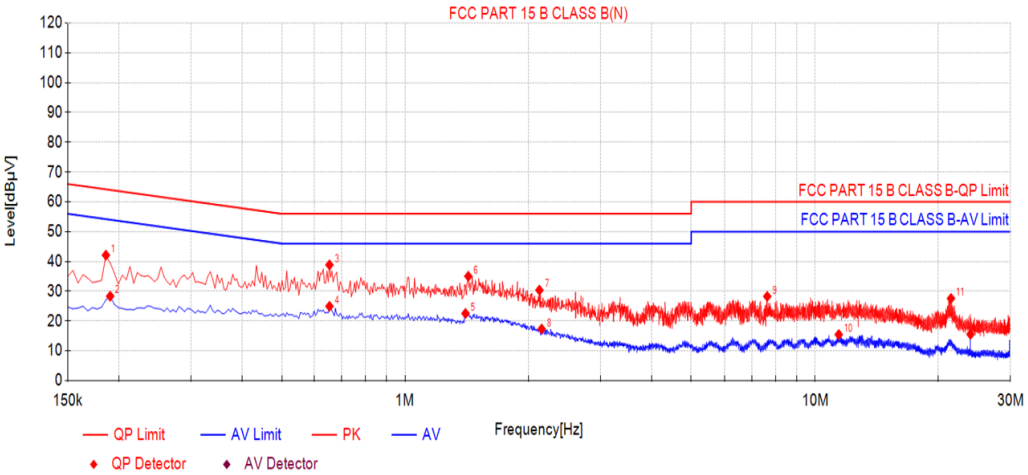
2). Factor (dB)=insertion loss of LISN (dB) + Cable loss (dB)

3). QPMargin(dB) = QP Limit (dBµV) - QP Value (dBµV)

4). AVMargin(dB) = AV Limit (dBµV) - AV Value (dBµV)

Power supply:	DC 5V from Adapter AC 120V/60Hz	Polarization	N

Test Graph



Suspected List

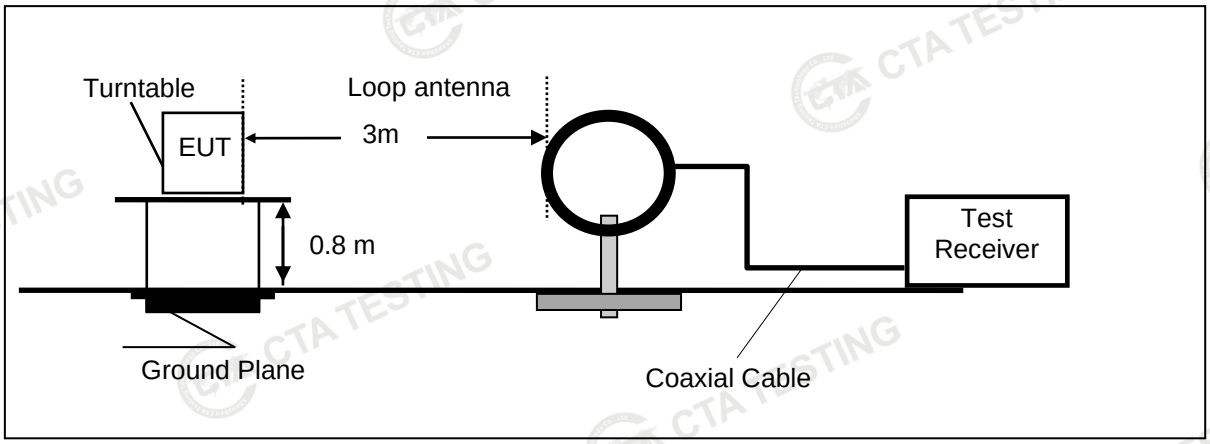
NO.	Freq. [MHz]	Reading [dBµV]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Detector	Type	Verdict
1	0.186	31.62	42.12	10.50	64.21	22.09	PK	N	PASS
2	0.1905	17.83	28.33	10.50	54.01	25.68	AV	N	PASS
3	0.654	28.34	38.84	10.50	56.00	17.16	PK	N	PASS
4	0.654	14.45	24.95	10.50	46.00	21.05	AV	N	PASS
5	1.4055	12.05	22.55	10.50	46.00	23.45	AV	N	PASS
6	1.428	24.52	35.02	10.50	56.00	20.98	PK	N	PASS
7	2.13	19.88	30.38	10.50	56.00	25.62	PK	N	PASS
8	2.157	6.83	17.33	10.50	46.00	28.67	AV	N	PASS
9	7.638	17.76	28.26	10.50	60.00	31.74	PK	N	PASS
10	11.418	4.96	15.46	10.50	50.00	34.54	AV	N	PASS
11	21.462	17.07	27.57	10.50	60.00	32.43	PK	N	PASS
12	23.955	5.04	15.54	10.50	50.00	34.46	AV	N	PASS

Note:1).QP Value (dBµV)= QP Reading (dBµV)+ Factor (dB)
2). Factor (dB)=insertion loss of LISN (dB) + Cable loss (dB)
3). QPMargin(dB) = QP Limit (dBµV) - QP Value (dBµV)
4). AVMargin(dB) = AV Limit (dBµV) - AV Value (dBµV)

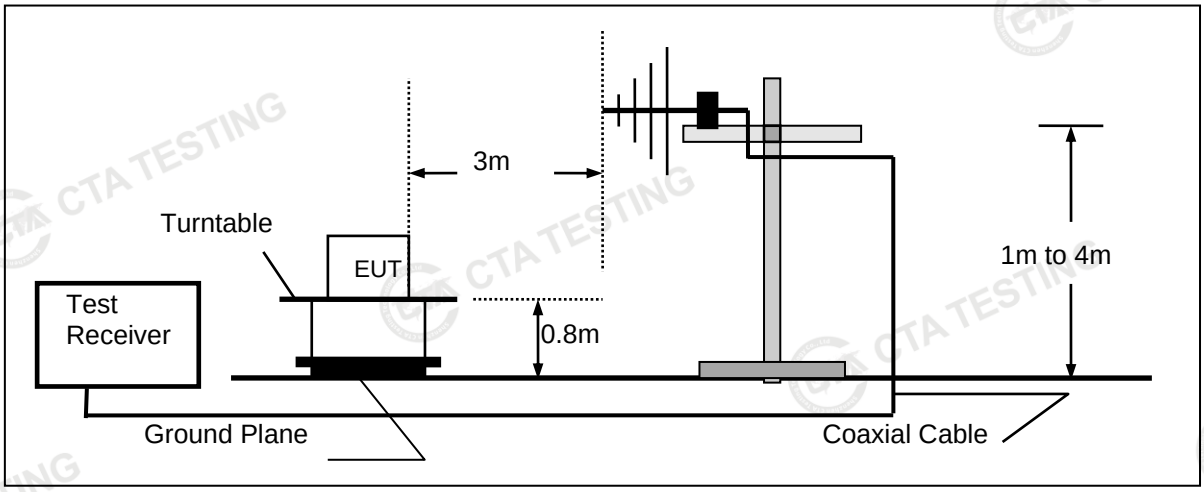
4.2 Radiated Emission

TEST CONFIGURATION

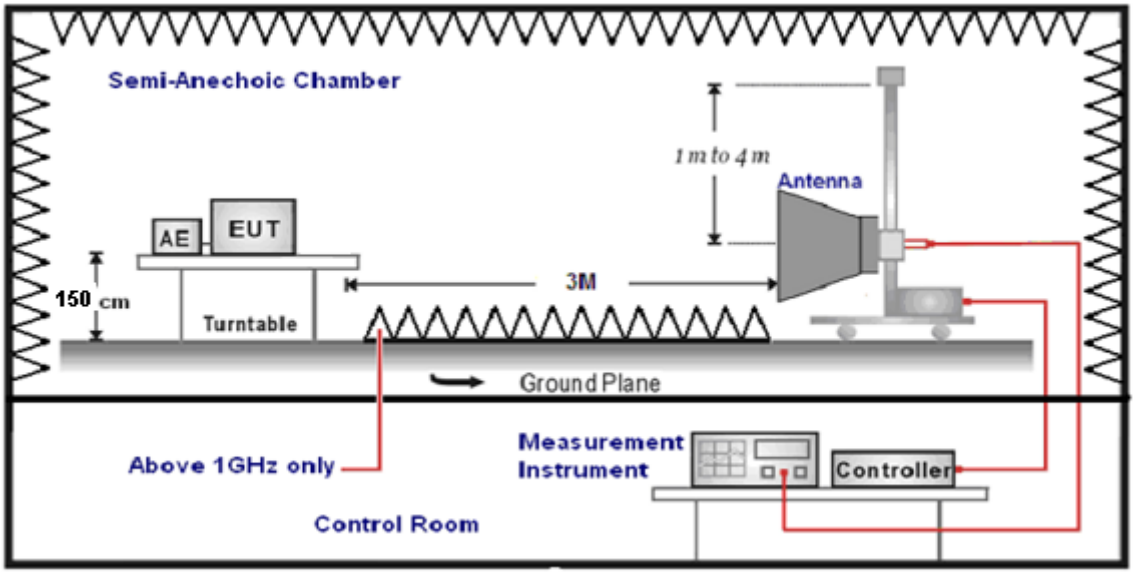
Frequency range 9 KHz – 30MHz



Frequency range 30MHz – 1000MHz



Frequency range above 1GHz-25GHz



TEST PROCEDURE

1. The EUT was placed on a turn table which is 0.8m above ground plane when testing frequency range 9 KHz –1GHz;the EUT was placed on a turn table which is 1.5m above ground plane when testing frequency range 1GHz – 25GHz.
2. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0° to 360° to acquire the highest emissions from EUT.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measurements have been completed.
5. Radiated emission test frequency band from 9KHz to 25GHz.
6. The distance between test antenna and EUT as following table states:

Test Frequency range	Test Antenna Type	Test Distance
9KHz-30MHz	Active Loop Antenna	3
30MHz-1GHz	Ultra-Broadband Antenna	3
1GHz-18GHz	Double Ridged Horn Antenna	3
18GHz-25GHz	Horn Anternna	1

7. Setting test receiver/spectrum as following table states:

Test Frequency range	Test Receiver/Spectrum Setting	Detector
9KHz-150KHz	RBW=200Hz/VBW=3KHz,Sweep time=Auto	QP
150KHz-30MHz	RBW=9KHz/VBW=100KHz,Sweep time=Auto	QP
30MHz-1GHz	RBW=120KHz/VBW=1000KHz,Sweep time=Auto	QP
1GHz-40GHz	Peak Value: RBW=1MHz/VBW=3MHz, Sweep time=Auto Average Value: RBW=1MHz/VBW=10Hz, Sweep time=Auto	Peak

Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

Transd=AF +CL-AG

RADIATION LIMIT

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emission from intentional radiators at a distance of 3 meters shall not exceed the following table. According to § 15.247(d), in any 100kHz bandwidth outside the frequency band in which the EUT is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the100kHz bandwidth within the band that contains the highest level of desired power.

The pre-test have done for the EUT in three axes and found the worst emission at position shown in test setup photos.

Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
0.009-0.49	3	20log(2400/F(KHz))+40log(300/3)	2400/F(KHz)
0.49-1.705	3	20log(24000/F(KHz))+ 40log(30/3)	24000/F(KHz)
1.705-30	3	20log(30)+ 40log(30/3)	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

TEST RESULTS

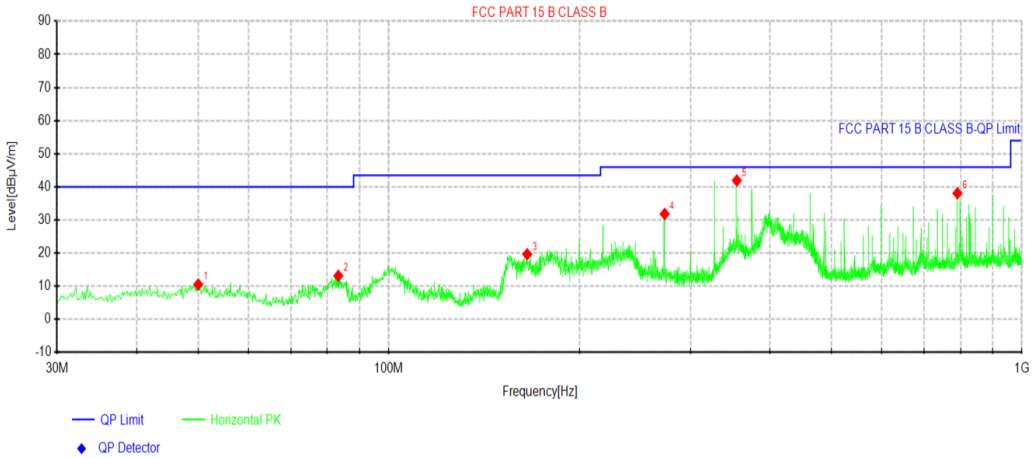
Remark:

1. All three channels (lowest/middle/highest) of each mode were measured below 1GHz and recorded worst case at 802.11b low channel.
2. All three channels (lowest/middle/highest) of each mode were measured above1GHz and recorded worst case at 802.11b mode.
3. Radiated emission test from 9 KHz to 10th harmonic of fundamental was verified, and no emission found except system noise floor in 9 KHz to 30MHz and not recorded in this report.

For 30MHz-1GHz

Horizontal

Test Graph



Suspected Data List

NO.	Freq. [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	50.0062	26.59	10.53	-16.06	40.00	29.47	100	221	Horizontal
2	83.2288	34.02	13.14	-20.88	40.00	26.86	100	27	Horizontal
3	165.436	40.97	19.67	-21.30	43.50	23.83	100	27	Horizontal
4	272.742	49.54	31.85	-17.69	46.00	14.15	100	262	Horizontal
5	354.586	57.95	41.95	-16.00	46.00	4.05	100	343	Horizontal
6	790.965	48.88	38.08	-10.80	46.00	7.92	100	67	Horizontal

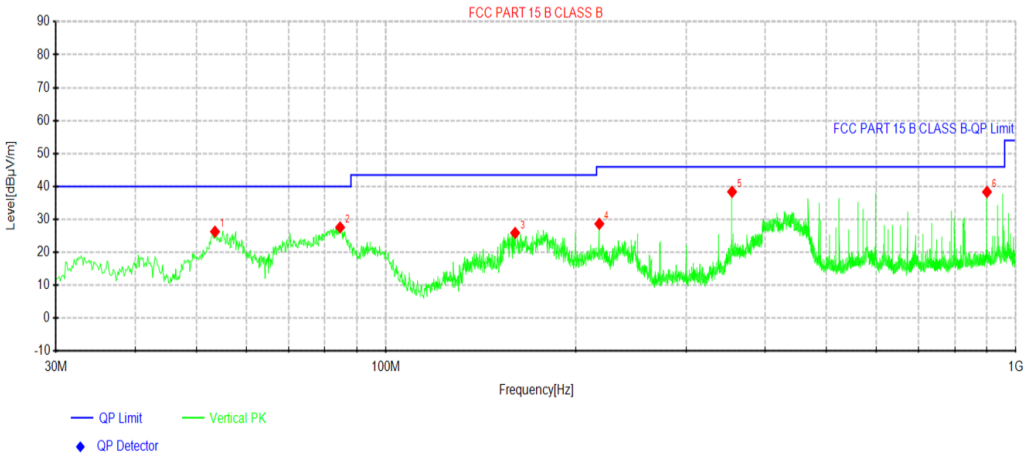
Note:1).Level (dBµV/m)= Reading (dBµV/m)+ Factor (dB/m)

2). Factor(dB/m)=Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB)

3). Margin(dB) = Limit (dBµV/m) - Level (dBµV/m)

Vertical

Test Graph



Suspected Data List

NO.	Freq. [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	53.5225	43.11	26.29	-16.82	40.00	13.71	100	237	Vertical
2	84.5625	48.27	27.58	-20.69	40.00	12.42	100	51	Vertical
3	160.343	47.50	25.90	-21.60	43.50	17.60	100	358	Vertical
4	218.18	47.53	28.67	-18.86	46.00	17.33	100	115	Vertical
5	354.465	54.39	38.39	-16.00	46.00	7.61	100	347	Vertical
6	900.09	47.53	38.35	-9.18	46.00	7.65	100	83	Vertical

Note:1).Level (dBµV/m)= Reading (dBµV/m)+ Factor (dB/m)
2). Factor(dB/m)=Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB)
3). Margin(dB) = Limit (dBµV/m) - Level (dBµV/m)

For 1GHz to 25GHz

*Note: 802.11b/802.11g/802.11n (H20)/*802.11n(H40) *all have been tested, only worse case 802.11b mode 1Mbps is reported*

Frequency(MHz):			2412		Polarity:			HORIZONTAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
4824.00	47.58	PK	74	26.42	51.94	32.40	5.11	41.87	-4.36
4824.00	--	AV	54	--	--	--	--	--	--
7236.00	50.11	PK	74	23.89	50.74	36.58	6.43	43.64	-0.63
7236.00	--	AV	54	--	--	--	--	--	--

Frequency(MHz):			2412		Polarity:			VERTICAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
4824.00	48.58	PK	74	25.42	52.94	32.40	5.11	41.87	-4.36
4824.00	--	AV	54	--	--	--	--	--	--
7236.00	50.61	PK	74	23.39	51.24	36.58	6.43	43.64	-0.63
7236.00	--	AV	54	--	--	--	--	--	--

Frequency(MHz):			2437		Polarity:			HORIZONTAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
4874.00	47.58	PK	74	26.42	51.53	32.56	5.34	41.85	-3.95
4874.00	--	AV	54	--	--	--	--	--	--
7311.00	49.50	PK	74	24.50	49.86	36.54	6.81	43.71	-0.36
7311.00	--	AV	54	--	--	--	--	--	--

Frequency(MHz):			2437		Polarity:			VERTICAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
4874.00	48.68	PK	74	25.32	52.63	32.56	5.34	41.85	-3.95
4874.00	--	AV	54	--	--	--	--	--	--
7311.00	50.40	PK	74	23.60	50.76	36.54	6.81	43.71	-0.36
7311.00	--	AV	54	--	--	--	--	--	--

Frequency(MHz):			2462		Polarity:			HORIZONTAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
4924.00	48.46	PK	74	25.54	51.92	32.73	5.64	41.83	-3.46
4924.00	--	AV	54	--	--	--	--	--	--
7386.00	50.56	PK	74	23.44	50.62	36.50	7.23	43.79	-0.06
7386.00	--	AV	54	--	--	--	--	--	--

Frequency(MHz):			2462		Polarity:			VERTICAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
4924.00	49.76	PK	74	24.24	53.22	32.73	5.64	41.83	-3.46
4924.00	--	AV	54	--	--	--	--	--	--
7386.00	51.86	PK	74	22.14	51.92	36.50	7.23	43.79	-0.06
7386.00	--	AV	54	--	--	--	--	--	--

REMARKS:

1. Emission level (dBuV/m) =Raw Value (dBuV)+Correction Factor (dB/m)
2. Correction Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
3. Margin value = Limit value- Emission level.
4. -- Mean the PK detector measured value is below average limit.
5. The other emission levels were very low against the limit.
6. RBW1MHz VBW3MHz Peak detector is for PK value; RBW 1MHz VBW10Hz Peak detector is for AV value.

Results of Band Edges Test (Radiated)

Note: 802.11b/802.11g/802.11n (H20) /802.11n (H40) all have been tested, only worse case 802.11b is reported.

Frequency(MHz):			2412		Polarity:			HORIZONTAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2390.00	54.90	PK	74.00	19.10	65.32	27.42	4.31	42.15	-10.42
2390.00	46.25	AV	54.00	7.75	56.67	27.42	4.31	42.15	-10.42

Frequency(MHz):			2412		Polarity:			VERTICAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2390.00	56.00	PK	74.00	18.00	66.42	27.42	4.31	42.15	-10.42
2390.00	47.25	AV	54.00	6.75	57.67	27.42	4.31	42.15	-10.42

Frequency(MHz):			2462		Polarity:			HORIZONTAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2483.50	55.58	PK	74.00	18.42	65.69	27.70	4.47	42.28	-10.11
2483.50	48.33	AV	54.00	5.67	58.44	27.70	4.47	42.28	-10.11

Frequency(MHz):			2462		Polarity:			VERTICAL	
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2483.50	57.38	PK	74.00	16.62	67.49	27.70	4.47	42.28	-10.11
2483.50	50.63	AV	54.00	3.37	60.74	27.70	4.47	42.28	-10.11

REMARKS:

1. Emission level (dBuV/m) =Raw Value (dBuV)+Correction Factor (dB/m)
2. Correction Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
3. Margin value = Limit value- Emission level.
4. -- Mean the PK detector measured value is below average limit.
5. The other emission levels were very low against the limit.
6. RBW1MHz VBW3MHz Peak detector is for PK value; RBW 1MHz VBW10Hz Peak detector is for AV value.

4.3 Maximum Conducted Output Power

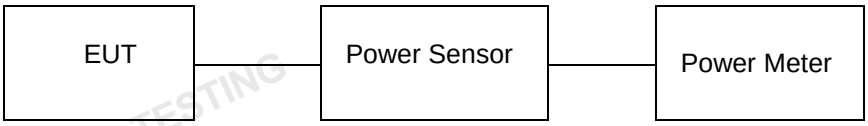
Limit

The Maximum Peak Output Power Measurement is 30dBm.

Test Procedure

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power sensor.

Test Configuration



Test Results

WIFI

Type	Channel	Output power (dBm)	Limit (dBm)	Result
802.11b	01	17.32	30.00	Pass
	06	17.22		
	11	16.94		
802.11g	01	18.57	30.00	Pass
	06	18.92		
	11	19.06		
802.11n(HT20)	01	18.76	30.00	Pass
	06	19.17		
	11	19.28		
802.11n(HT40)	03	17.85	30.00	Pass
	06	18.06		
	09	18.28		

Note: 1.The test results including the cable lose.

4.4 Power Spectral Density

Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

Test Procedure

1. Use this procedure when the maximum peak conducted output power in the fundamental emission is used to demonstrate compliance.
2. Set the RBW ≥ 3 kHz.
3. Set the VBW ≥ 3× RBW.
4. Set the span to 1.5 times the DTS channel bandwidth.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum power level.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.
11. The resulting peak PSD level must be 8dBm.

Test Configuration

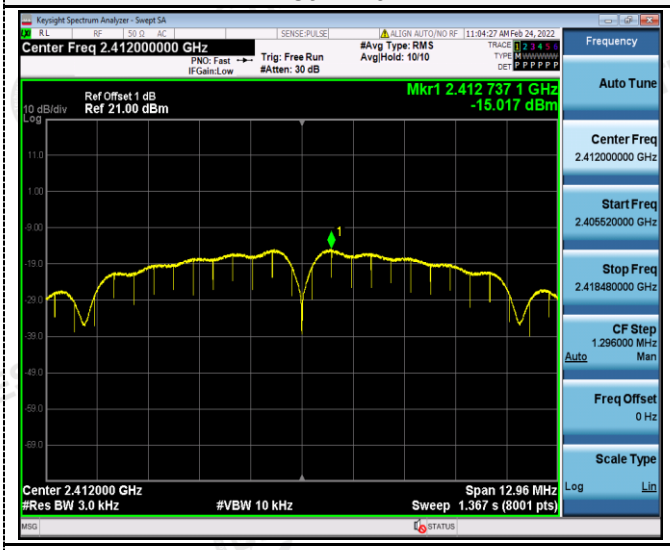
Test Results

WIFI

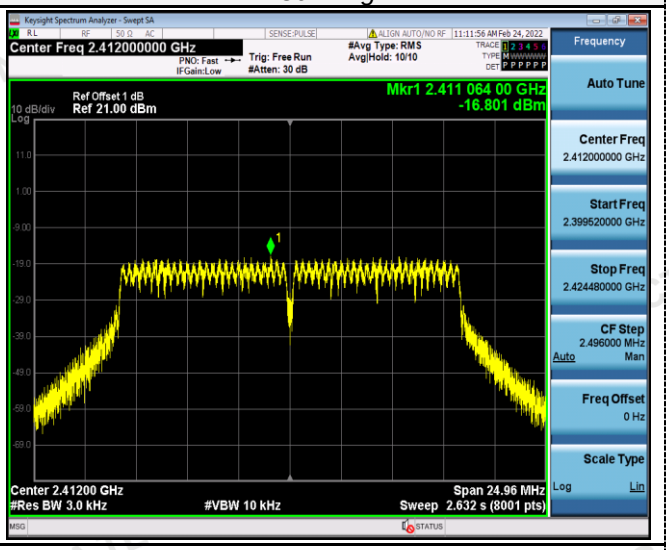
Type	Channel	Power Spectral Density (dBm/3KHz)	Limit (dBm/3KHz)	Result
802.11b	01	-15.02	8.00	Pass
	06	-15.11		
	11	-15.38		
802.11g	01	-16.80	8.00	Pass
	06	-16.47		
	11	-16.26		
802.11n(HT20)	01	-16.31	8.00	Pass
	06	-15.79		
	11	-15.66		
802.11n(HT40)	03	-17.44	8.00	Pass
	06	-19.14		
	09	-18.69		

Test plot as follows:

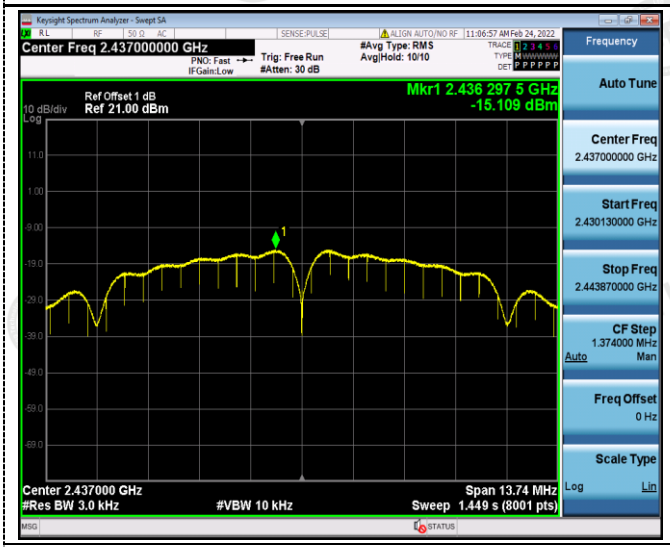
802.11b



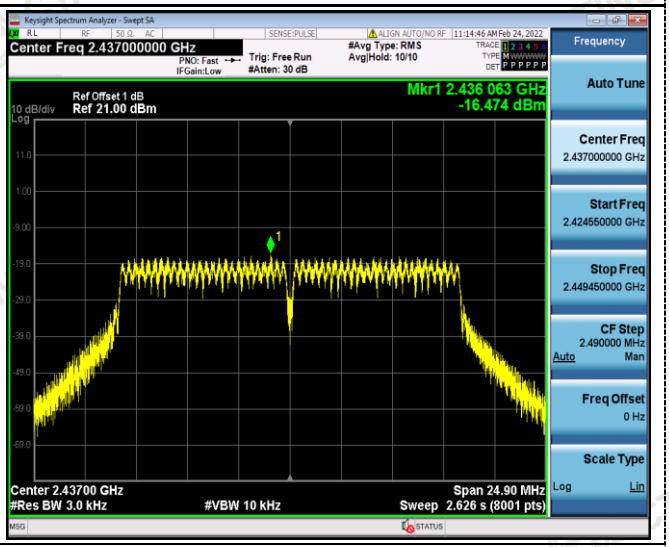
802.11g



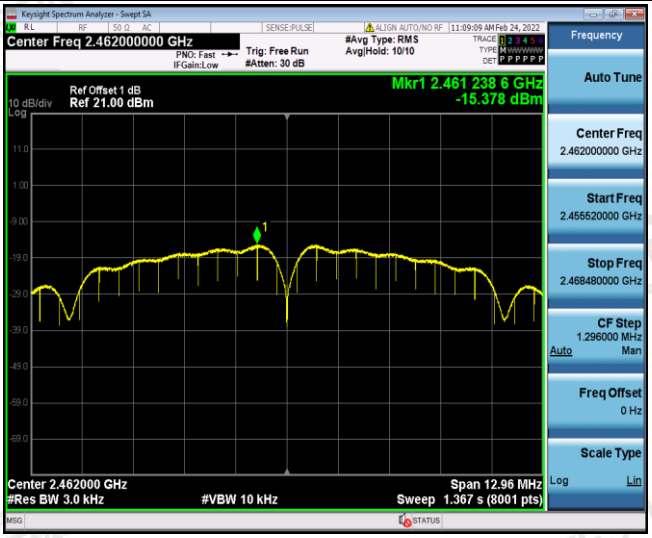
CH01



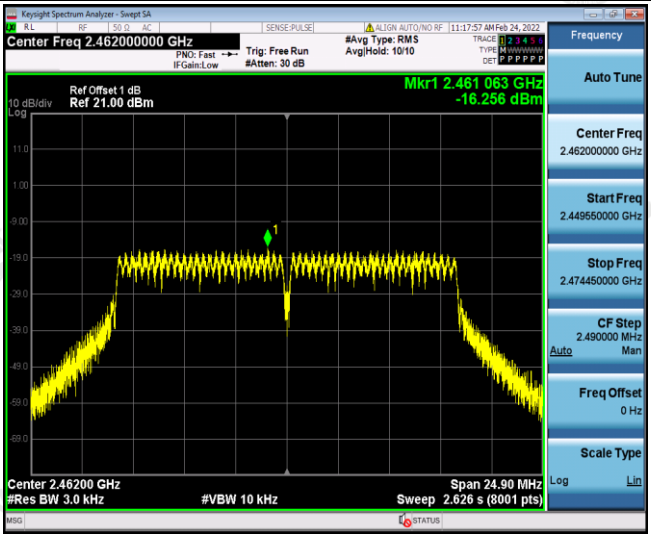
CH01



CH06



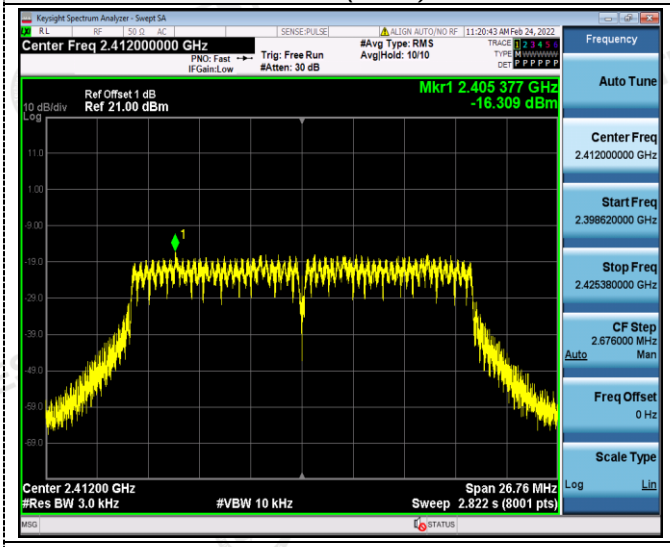
CH06



CH11

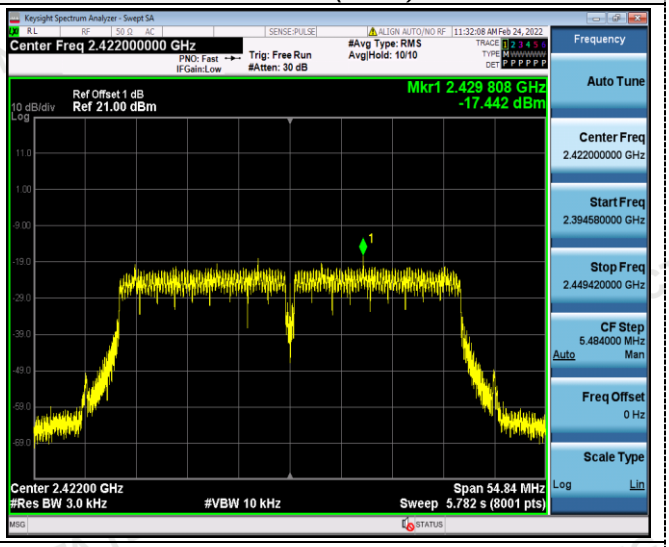
CH11

802.11n(HT20)

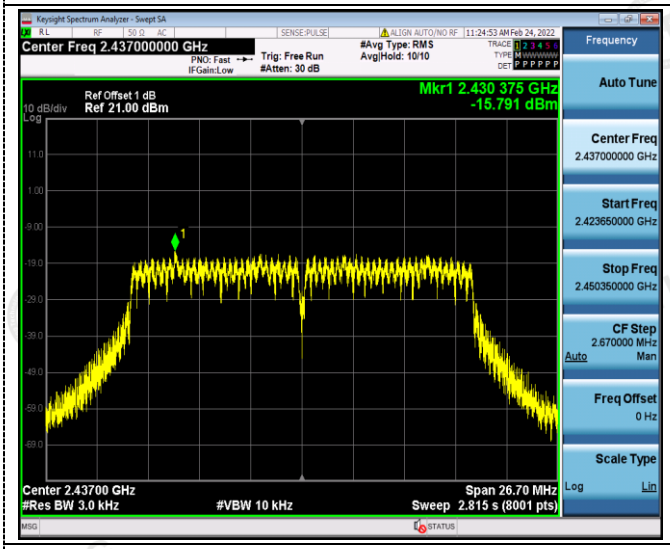


CH01

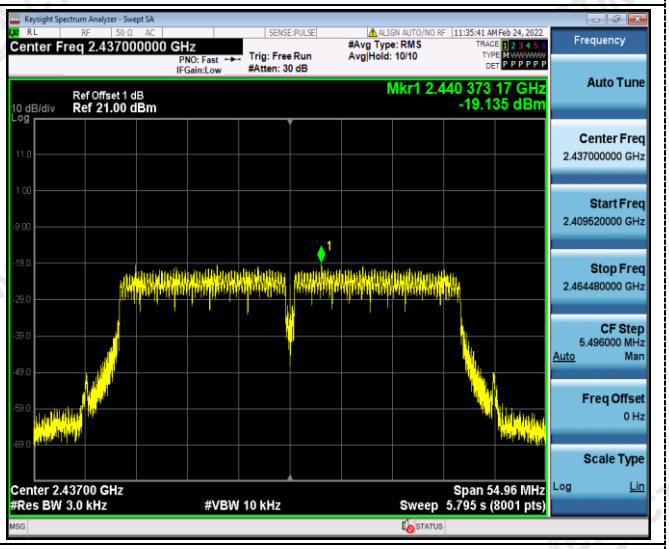
802.11n(HT40)



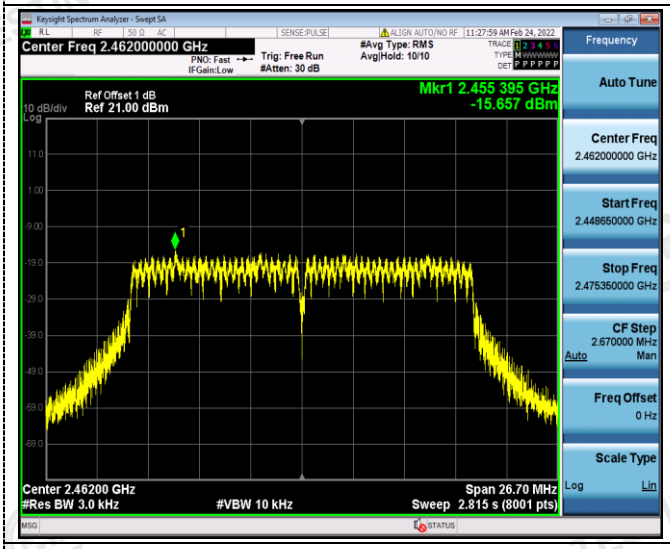
CH03



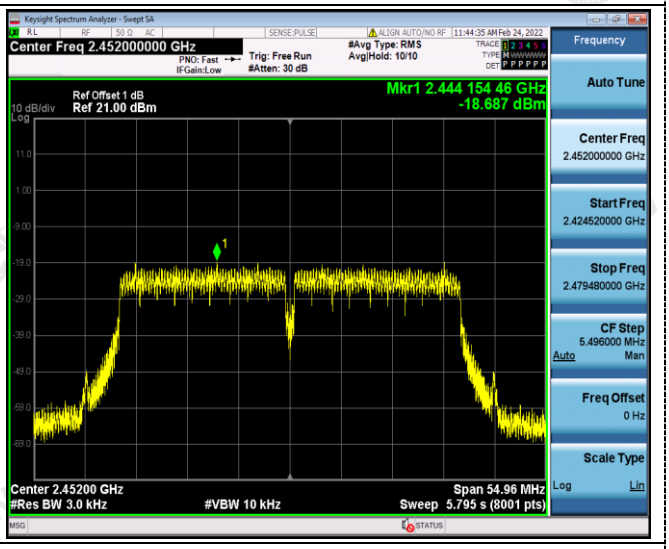
CH06



CH06



CH11



CH09

4.5 6dB Bandwidth

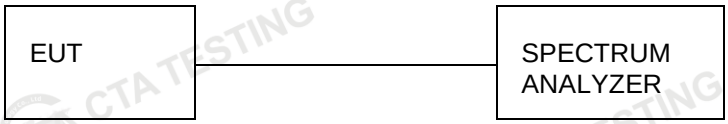
Limit

For digital modulation systems, the minimum 6 dB bandwidth shall be at least 500 kHz

Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100 KHz RBW and 300 KHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

Test Configuration

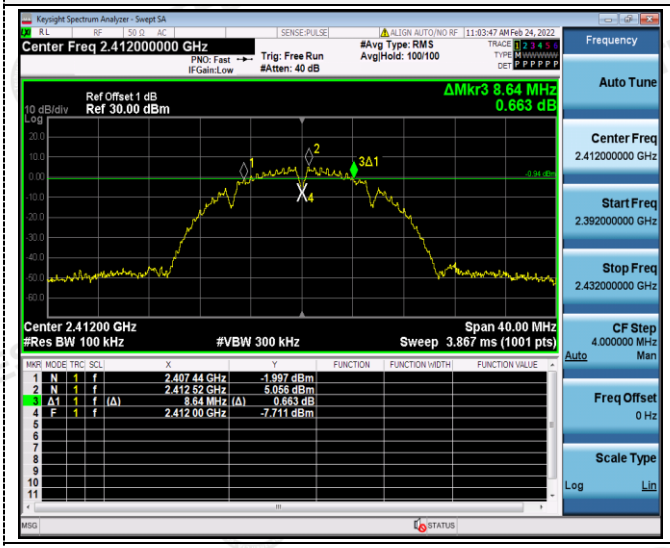
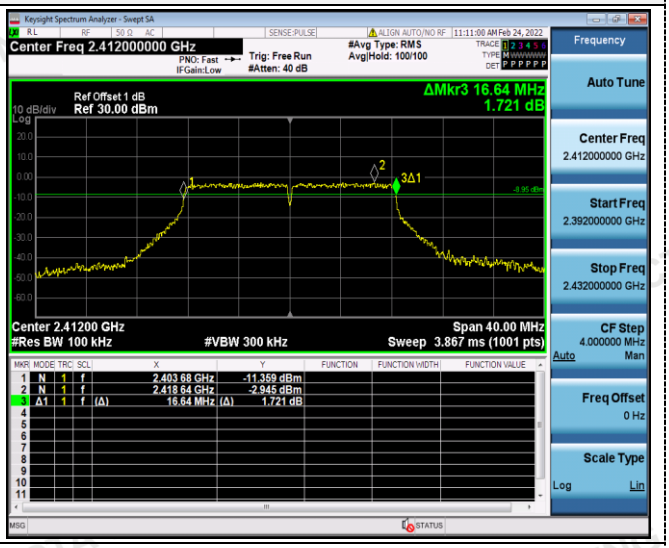
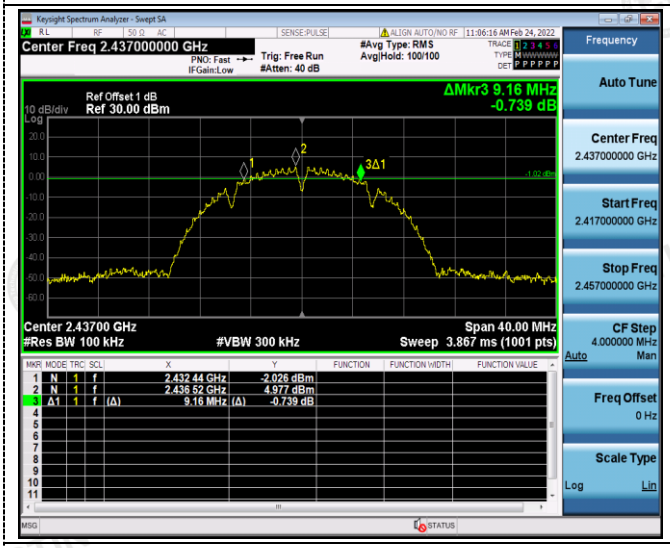
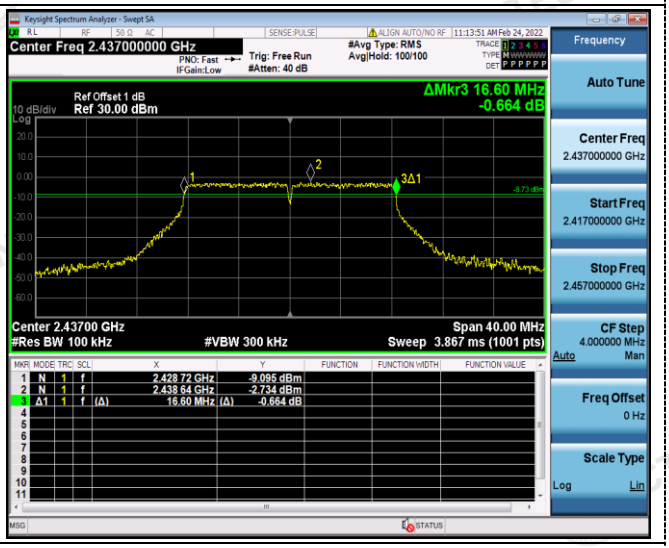
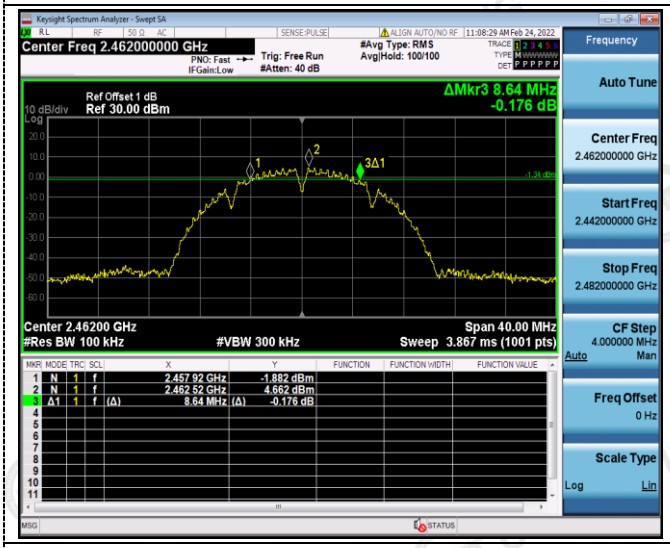
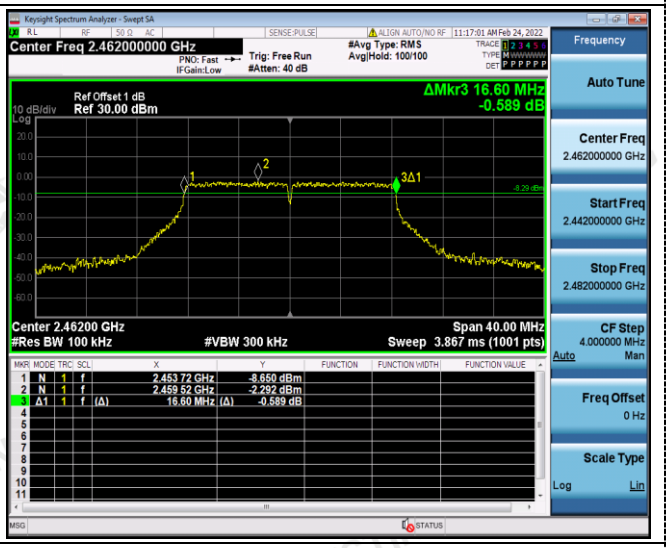


Test Results

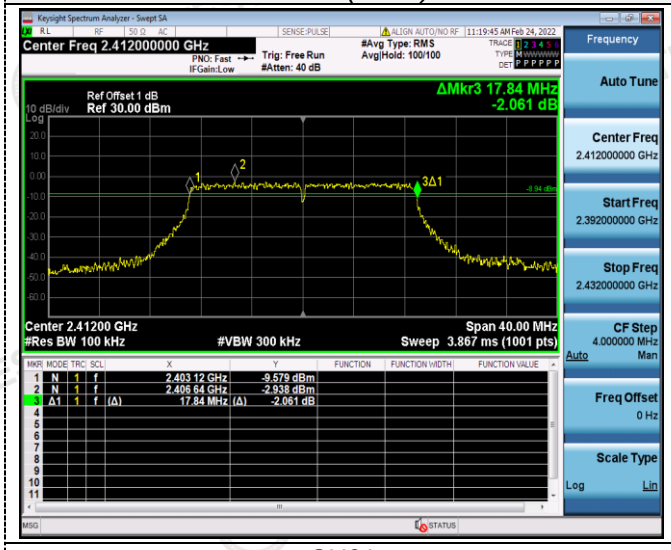
WIFI

Type	Channel	6dB Bandwidth (MHz)	Limit (KHz)	Result
802.11b	01	8.640	≥500	Pass
	06	9.160		
	11	8.640		
802.11g	01	16.640	≥500	Pass
	06	16.600		
	11	16.600		
802.11n(HT20)	01	17.840	≥500	Pass
	06	17.800		
	11	17.800		
802.11n(HT40)	03	36.560	≥500	Pass
	06	36.640		
	09	36.640		

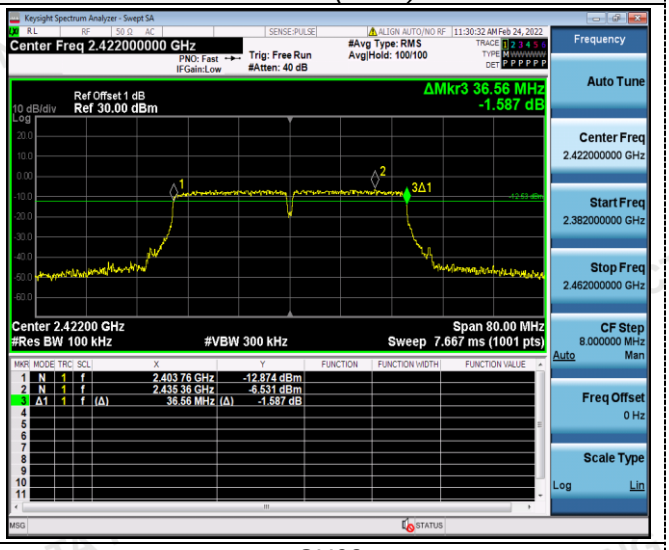
Test plot as follows:

802.11b	802.11g
	
CH01	CH01
	
CH06	CH06
	
CH11	CH11

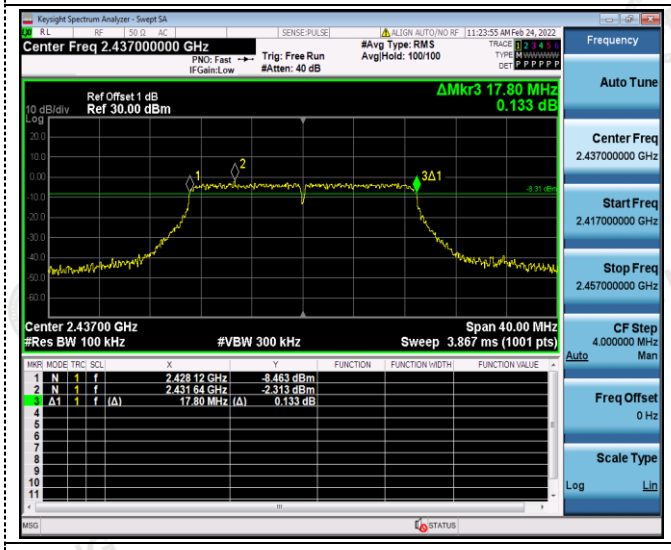
802.11n(HT20)



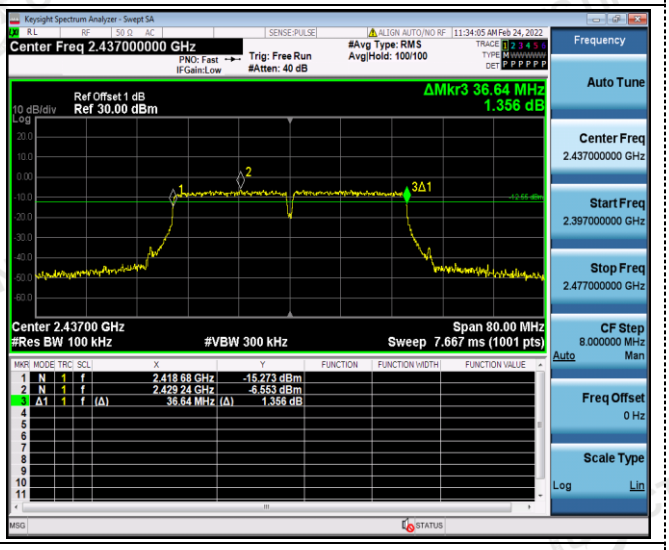
802.11n(HT40)



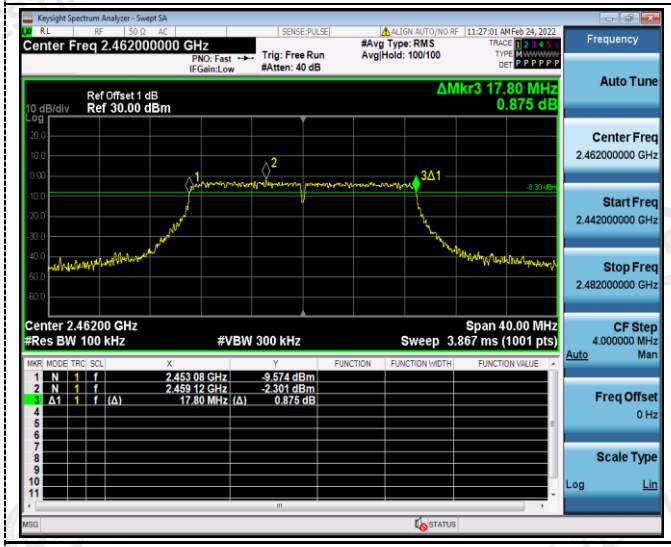
CH01



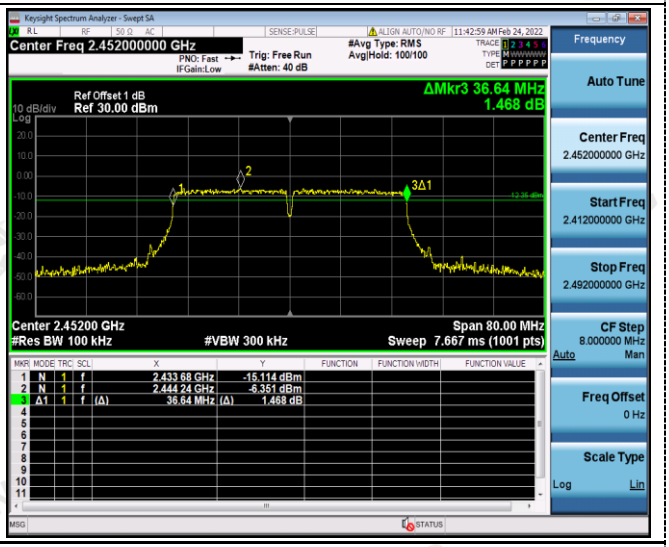
CH03



CH06



CH06



CH11

CH09

4.6 Out-of-band Emissions

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 con-ducted or a radiated measurement, pro-vided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter com-plies 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.

Test Procedure

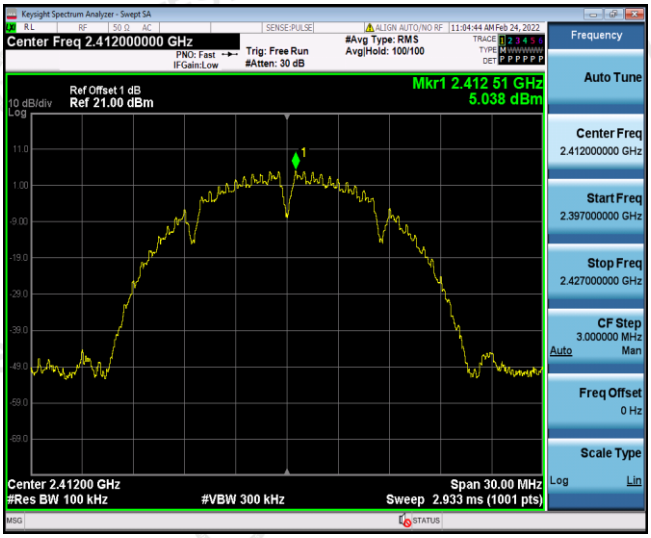
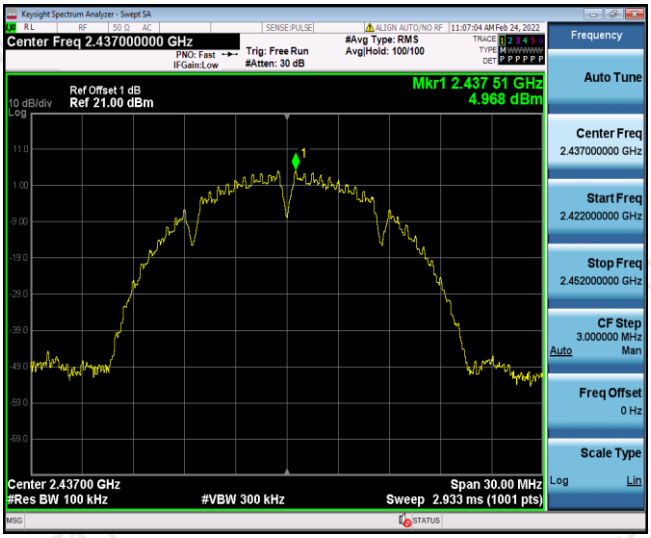
Connect the transmitter output to spectrum analyzer using a low loss RF cable, and set the spectrum analyzer to RBW=100 kHz, VBW= 300 kHz, peak detector , and max hold. Measurements utilizing these setting are made of the in-band reference level, bandedge and out-of-band emissions.

Test Configuration

Test Results

Remark: The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the spurious emissions and bandage measurement data.

Test plot as follows:

802.11b CH01	802.11b CH06
	
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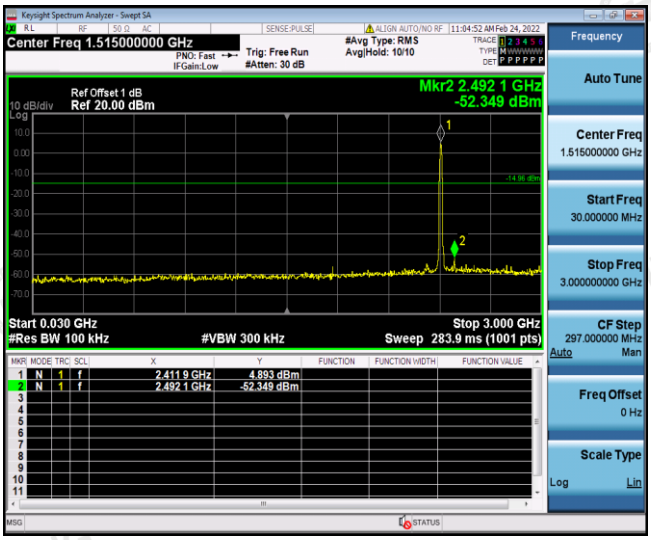
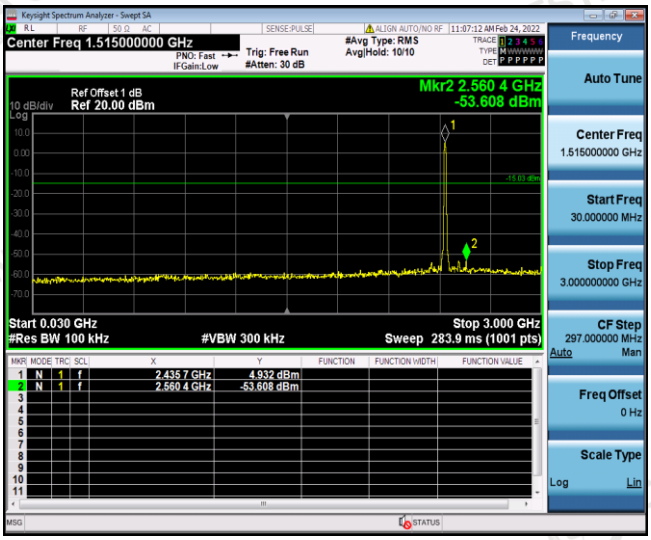
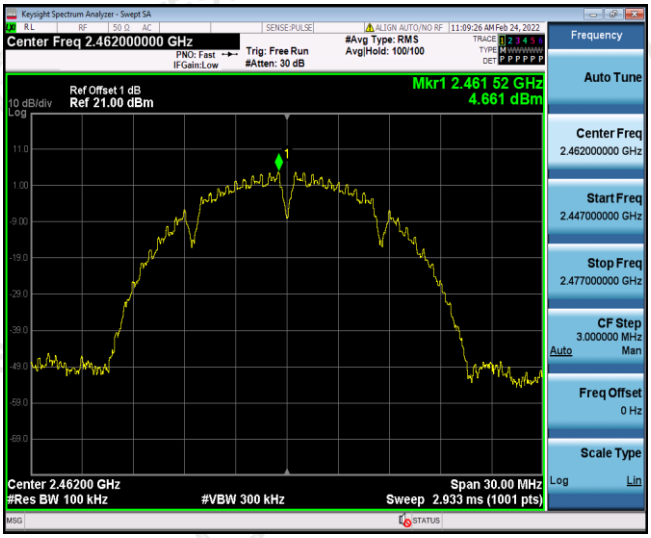
	
30MHz-3GHz	30MHz-3GHz
3GHz-25GHz	3GHz-25GHz

802.11b CH11	802.11g CH01
	
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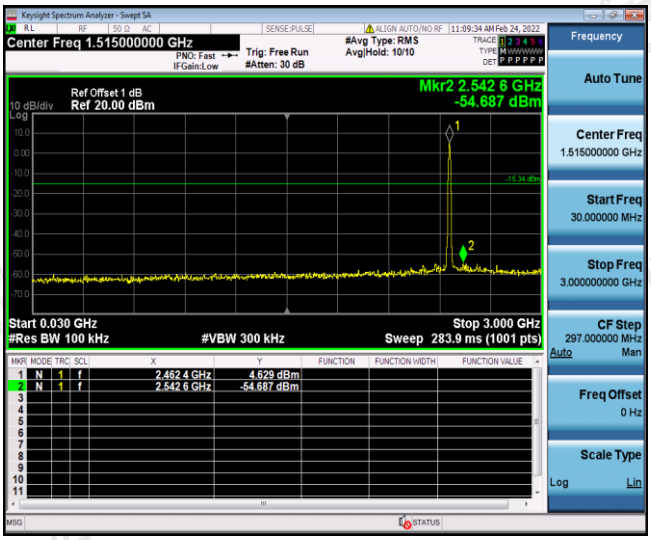	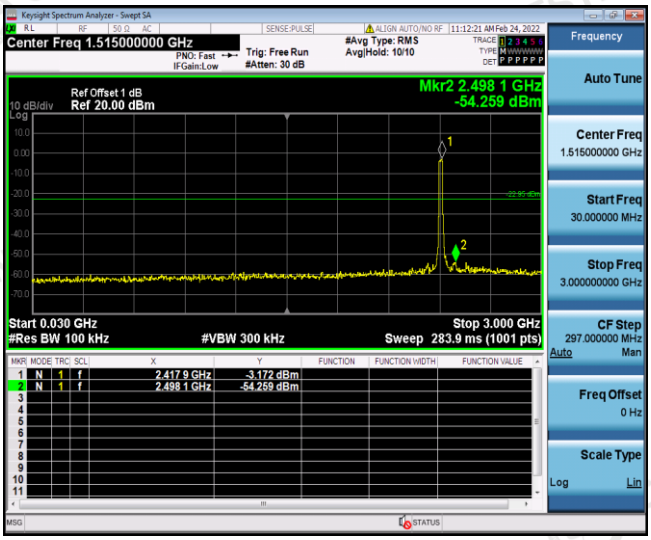
30MHz-3GHz	30MHz-3GHz
3GHz-25GHz	3GHz-25GHz