FCC TEST REPORT

FCC ID:2BKA7-HMI081

Applicant:	**Shenzhen Novtie Technology Co.,LTD.**
Address:	Building 8, Rundongsheng Industrial Area, Longteng Community, Xixiang Street, Bao'an District, Shenzhen, China
Manufacturer:	**Shenzhen Novtie Technology Co.,LTD.**
Address:	Building 8, Rundongsheng Industrial Area, Longteng Community, Xixiang Street, Bao'an District, Shenzhen, China
EUT:	**Industrial Tablet**
Trade Mark:	SUNSTONE
Model Number:	HMI081 Orion X
Date of Receipt:	Jun. 10, 2025
Test Date:	Jun. 10, 2025 to Jun. 24, 2025
Date of Report:	Jun. 24, 2025
Prepared By:	Shenzhen DL Testing Technology Co., Ltd.
Address:	101-201, Building C, Shuanghuan, No.8, Baoqing Roa Baolong Industrial Zone, Baolong Street, Longgang Shenzhen, Guangdong, China
Applicable Standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.247 ANSI C63.10:2013
Test Result:	Pass
Report Number:	DLE-250624009R

Prepared (Test Engineer):	Dimon Tan	Dimon Tan
Reviewer (Supervisor):	Jack Bu	Jack Bu
Approved (Manager):	Jade Yang	Jade Yang

This test report is based on a single evaluation of one sample of above mentioned products. It is not permitted to be duplicated in extracts without written approval of Shenzhen DL Testing Technology Co., Ltd.

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1. VERSION

Report No.	Version	Description	Approved
DLE-250624009R	Rev.01	Initial issue of report	Jun. 24, 2025

2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.247) , Subpart C			
Standard Section	Test Item	Result	Remark
FCC part 15.203/15.247 (c)	Antenna requirement	PASS	
FCC part 15.207	AC Power Line Conducted Emission	PASS	
FCC part 15.247 (b)(3)	Conducted Peak Output Power	PASS	
FCC part 15.247 (a)(2)	6dB Occupied Bandwidth	PASS	
FCC part 15.247 (e)	Power Spectral Density	PASS	
FCC part 15.247(d)	Band Edge	PASS	
FCC part 15.205/15.209	Spurious Emission	PASS	
ANSI C63.10:2013	Duty cycle	PASS	

NOTE:

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

2.1 TEST FACILITY

Shenzhen DL Testing Technology Co., Ltd.

Add. : 101-201, Building C, Shuanghuan, No.8, Baoqing Roa Baolong Industrial Zone, Baolong Street, Longgang Shenzhen, Guangdong, China

FCC Test Firm Registration Number: 854456

Designation Number: CN1307

IC Registered No.: 27485

CAB identifier: CN0118

2.2 MEASUREMENT UNCERTAINTY

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

No.	Item	Uncertainty
1	3m camber Radiated spurious emission(9KHz-30MHz)	U=4.5dB
2	3m camber Radiated spurious emission(30MHz-1GHz)	U=4.8dB
3	3m chamber Radiated spurious emission(1GHz-6GHz)	U=4.9dB
4	3m chamber Radiated spurious emission(6GHz-40GHz)	U=5.0dB
5	Conducted disturbance	U=3.2dB
6	RF Band Edge	U=1.68dB
7	RF power conducted	U=1.86dB
8	RF conducted Spurious Emission	U=2.2dB
9	RF Occupied Bandwidth	U=1.8MHz
10	RF Power Spectral Density	U=1.75dB
11	humidity uncertainty	U=5.3%
12	Temperature uncertainty	U=0.59℃

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Product Name:	Industrial Tablet
Model No.:	HMI081
Serial No.:	Orion X
Model Different.:	All the model are the same circuit and RF module,Only the model name different.
Hardware Version:	V1.0
Software Version:	V1.1
Sample(s) Status:	Engineer sample
Frequency Range:	2412-2462MHz for 802.11 b/g/n20
Channel Numbers:	802.11b/g/n: 11 Channels
Channel Separation:	5MHz
Modulation Technology:	802.11b: Direct Sequence Spread Spectrum (DSSS) 802.11g/n: Orthogonal Frequency Division Multiplexing (OFDM)
Data Rate:	802.11b: 1/2/5.5/11Mbit/s 802.11g: 6/9/12/24/18/36/48/54Mbit/s 802.11n: MCS0-MCS7
Antenna Type:	FPC Antenna
Antenna Gain:	5.55dBi
Power Supply:	Input: 12V⎓2A

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

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

Test channel	**Frequency**		
	802.11b	802.11g	802.11n20
Lowest channel	2412MHz	2412MHz	2412MHz
Middle channel	2437MHz	2437MHz	2437MHz
Highest channel	2462MHz	2462MHz	2462MHz

3.2 DESCRIPTION OF TEST MODES

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.	

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

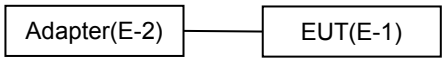
Pre-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.

Mode	802.11b	802.11g	802.11n20
Data rate	1Mbps	6Mbps	MCS0(HT0)

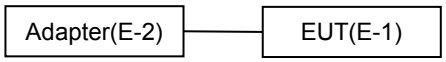
Test Software	CMD
Power level setup	Default

3.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

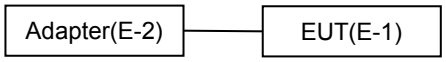
Conducted Emission



Radiated Emission



Conducted Spurious



3.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

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

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	Industrial Tablet	SUNSTONE	HMI081	N/A	EUT
E-2	AC/DC Adapter	GVE	GM25-120200-D	N/A	Auxiliary

Item	Shielded Type	Ferrite Core	Length	Note

Note:

(1) The support equipment was authorized by Declaration of Confirmation.

(2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

3.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation test, Band-edge test and 6db bandwidth test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Spectrum Analyzer (9kHz-26.5GHz)	Agilent	E4408B	MY50140780	Nov. 01, 2024	Oct. 31, 2025
2	Test Receiver (9kHz-7GHz)	R&S	ESRP7	101393	Nov. 01, 2024	Oct. 31, 2025
3	Bilog Antenna (30MHz-1GHz)	R&S	VULB9162	00306	Nov. 01, 2024	Oct. 31, 2025
4	Horn Antenna (1GHz-18GHz)	Schwarzbeck	BBHA9120D	02139	Nov. 01, 2024	Oct. 31, 2025
5	Horn Antenna (18GHz-40GHz)	A.H. Systems	SAS-574	588	Nov. 01, 2024	Oct. 31, 2025
6	Amplifier (9KHz-6GHz)	Schwarzbeck	BBV9743B	00153	Nov. 01, 2024	Oct. 31, 2025
7	Amplifier (1GHz-18GHz)	EMEC	EM01G8GA	00270	Nov. 01, 2024	Oct. 31, 2025
8	Amplifier (18GHz-40GHz)	Quanjuda	DLE-161	97	Nov. 01, 2024	Oct. 31, 2025
9	Loop Antenna (9KHz-30MHz)	Schwarzbeck	FMZB1519B	00014	Nov. 01, 2024	Oct. 31, 2025
10	RF cables1 (9kHz-1GHz)	ChengYu	966	004	Nov. 01, 2024	Oct. 31, 2025
11	RF cables2 (1GHz-40GHz)	ChengYu	966	003	Nov. 01, 2024	Oct. 31, 2025
12	Antenna connector	Florida RF Labs	N/A	RF 01#	Nov. 01, 2024	Oct. 31, 2025
13	Power probe	KEYSIGHT	U2021XA	MY55210018	Nov. 01, 2024	Oct. 31, 2025
14	Signal Analyzer 9kHz-26.5GHz	Agilent	N9020A	MY55370280	Nov. 01, 2024	Oct. 31, 2025
15	Test Receiver 20kHz-40GHz	R&S	ESU 40	100376	Nov. 01, 2024	Oct. 31, 2025
16	D.C. Power Supply	LongWei	PS-305D	010964729	Nov. 01, 2024	Oct. 31, 2025

Conduction Test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	843 Shielded Room	YIHENG	843 Room	843	Nov. 05, 2023	Nov. 04, 2026
2	EMI Receiver	R&S	ESR	101421	Nov. 01, 2024	Oct. 31, 2025
3	LISN	R&S	ENV216	102417	Nov. 01, 2024	Oct. 31, 2025
4	843 Cable 1#	ChengYu	CE Cable	001	Nov. 01, 2024	Oct. 31, 2025

Other

Item	Name	Manufacturer	Model	Software version
1	EMC Conduction Test System	FALA	EZ_EMC	EMC-CON 3A1.1
2	EMC radiation test system	FALA	EZ_EMC	FA-03A2
3	RF test system	MAIWEI	MTS8310	2.0.0.0
4	RF communication test system	MAIWEI	MTS8200	2.0.0.0

4. EMC EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

Test Requirement:	FCC Part15 C Section 15.207
Test Method:	ANSI C63.10:2013
Test Frequency Range:	150KHz to 30MHz
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto

4.1.1 POWER LINE CONDUCTED EMISSION LIMITS

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

Note:

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

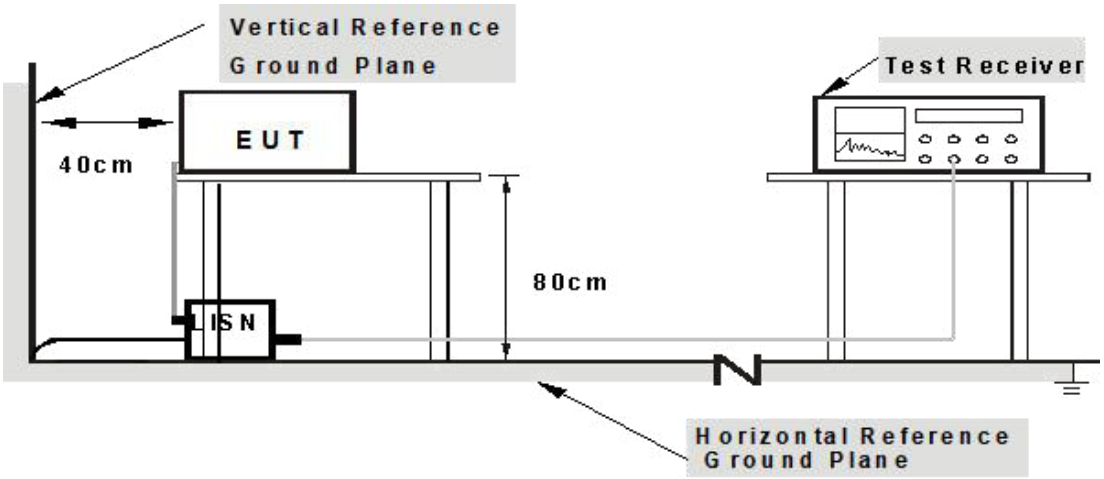
4.1.2 TEST PROCEDURE

a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.1.3 DEVIATION FROM TEST STANDARD

No deviation

4.1.4 TEST SETUP



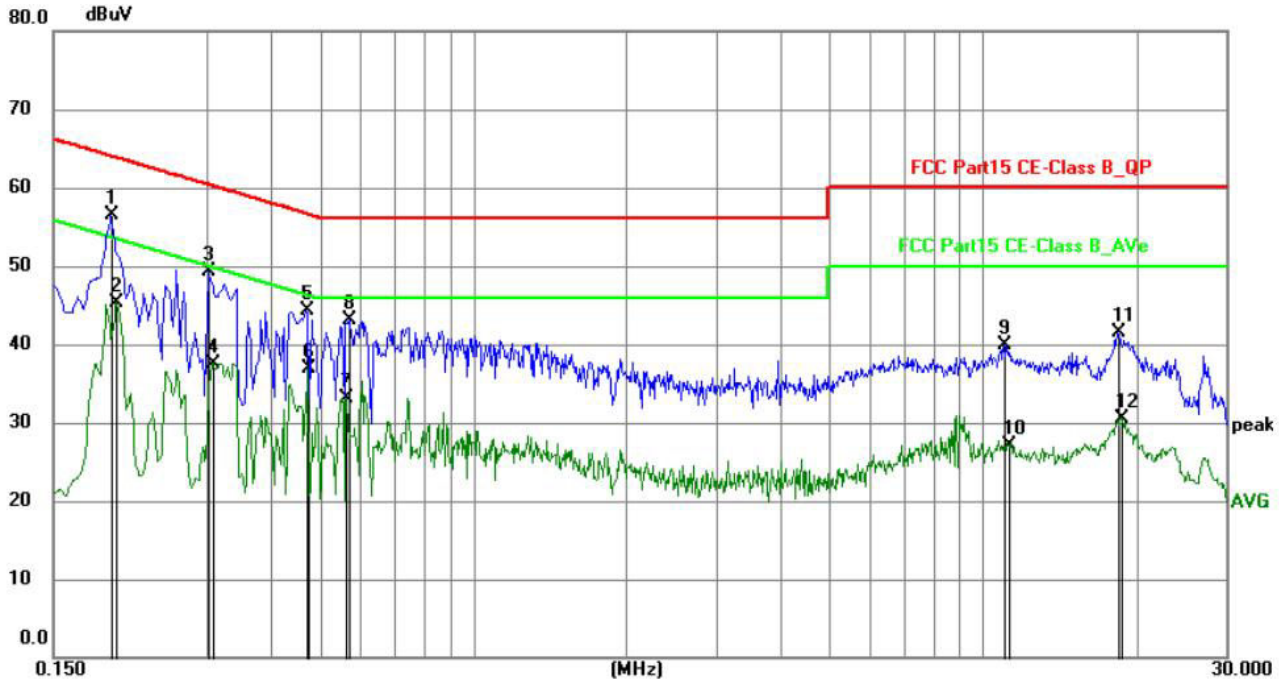
Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

4.1.5 EUT OPERATING CONDITIONS

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

4.1.6 TEST RESULT

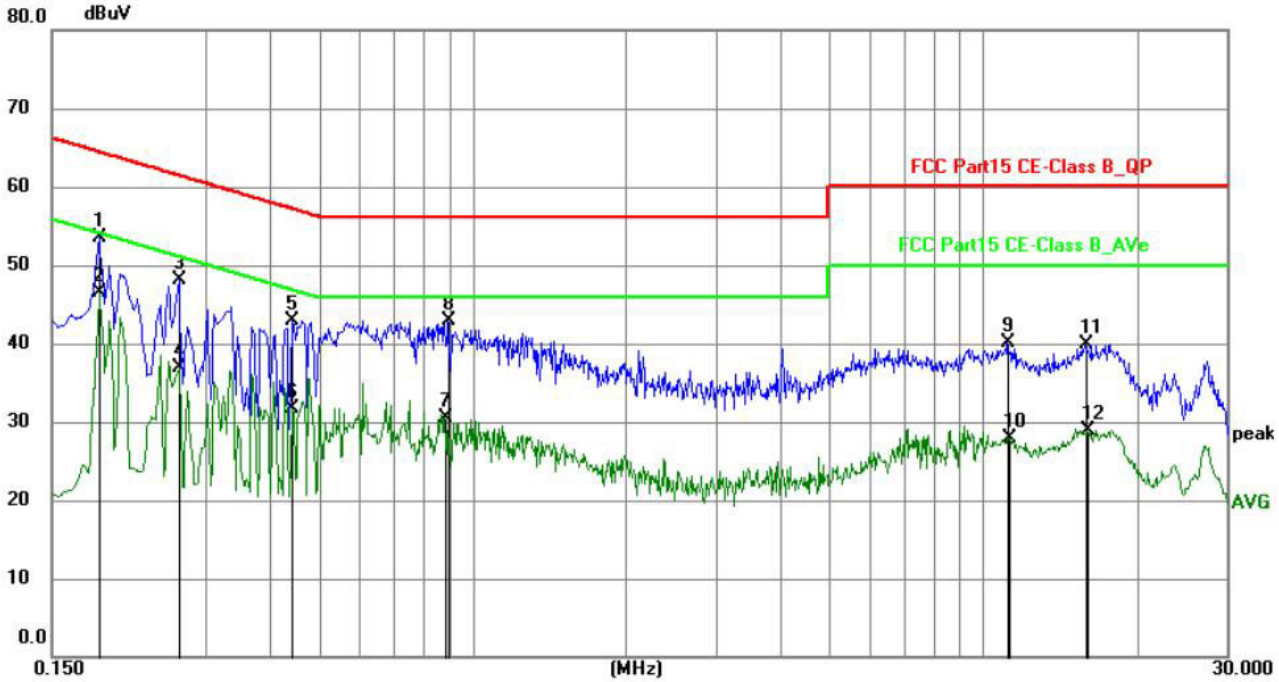
Temperature:	26℃	Relative Humidity:	54%
Pressure:	101 kPa	Polarization:	L
Test Voltage:	AC 120V/60Hz	Test Mode:	TX 802.11b - 2412MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1949	36.17	20.36	56.53	63.83	-7.30	QP	P	
2	0.1995	24.94	20.38	45.32	53.63	-8.31	AVG	P	
3	0.3030	28.95	20.35	49.30	60.16	-10.86	QP	P	
4	0.3075	17.22	20.34	37.56	50.04	-12.48	AVG	P	
5	0.4695	23.94	20.31	44.25	56.52	-12.27	QP	P	
6	0.4740	16.50	20.31	36.81	46.44	-9.63	AVG	P	
7	0.5639	12.79	20.29	33.08	46.00	-12.92	AVG	P	
8	0.5729	22.91	20.29	43.20	56.00	-12.80	QP	P	
9	10.9635	19.37	20.46	39.83	60.00	-20.17	QP	P	
10	11.2110	6.73	20.46	27.19	50.00	-22.81	AVG	P	
11	18.4110	21.08	20.50	41.58	60.00	-18.42	QP	P	
12	18.6225	10.10	20.50	30.60	50.00	-19.40	AVG	P	

Notes:
1.An initial pre-scan was performed on the line and neutral lines with peak detector.
2.Quasi - Peak and Average measurement were performed at the frequencies with maximized peak emission.
3.Final Level = Reading level + Correct Factor.
4.Correct Factor = Lisn factor+ Cable loss factor + limiter factor.
5.Margin = Measurement Level-Limit.
6.The test data shows only the worst case TX 802.11b - 2412MHz.

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101 kPa	Polarization:	N
Test Voltage:	AC 120V/60Hz	Test Mode:	TX 802.11b - 2412MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1860	33.28	20.32	53.60	64.21	-10.61	QP	P	
2	0.1860	26.19	20.32	46.51	54.21	-7.70	AVG	P	
3	0.2670	27.68	20.35	48.03	61.21	-13.18	QP	P	
4	0.2670	16.59	20.35	36.94	51.21	-14.27	AVG	P	
5	0.4425	22.61	20.31	42.92	57.01	-14.09	QP	P	
6	0.4425	11.30	20.31	31.61	47.01	-15.40	AVG	P	
7	0.8834	10.27	20.30	30.57	46.00	-15.43	AVG	P	
8	0.8969	22.51	20.30	42.81	56.00	-13.19	QP	P	
9	11.1885	19.55	20.47	40.02	60.00	-19.98	QP	P	
10	11.2425	7.51	20.47	27.98	50.00	-22.02	AVG	P	
11	15.8280	19.47	20.50	39.97	60.00	-20.03	QP	P	
12	16.0395	8.43	20.50	28.93	50.00	-21.07	AVG	P	

Notes:
1.An initial pre-scan was performed on the line and neutral lines with peak detector.
2.Quasi - Peak and Average measurement were performed at the frequencies with maximized peak emission.
3.Final Level = Reading level + Correct Factor.
4.Correct Factor = Lisn factor+ Cable loss factor + limiter factor.
5.Margin = Measurement Level-Limit.
6.The test data shows only the worst case TX 802.11b - 2412MHz.

4.2 RADIATED EMISSION MEASUREMENT

Test Requirement:	FCC Part15 C Section 15.209
Test Method:	ANSI C63.10:2013
Test Frequency Range:	9kHz to 25GHz
Test site:	Measurement Distance: 3m
Receiver setup:	

Frequency	Detector	RBW	VBW	Value
9KHz-150KHz	Quasi-peak	200Hz	600Hz	Quasi-peak
150KHz-30MHz	Quasi-peak	9KHz	30KHz	Quasi-peak
30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak
Above 1GHz	Peak	1MHz	3MHz	Peak
	Peak	1MHz	10Hz	Average

4.2.1 RADIATED EMISSION LIMITS

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT

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

Notes:

(1) The limit for radiated test was performed according to FCC PART 15C.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

4.2.2 TEST PROCEDURE

Below 1GHz test procedure as below:

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoiccamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of avariable-height antenna tower.

c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1meter) 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 10dBmargin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Above 1GHz test procedure as below:

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

Note:

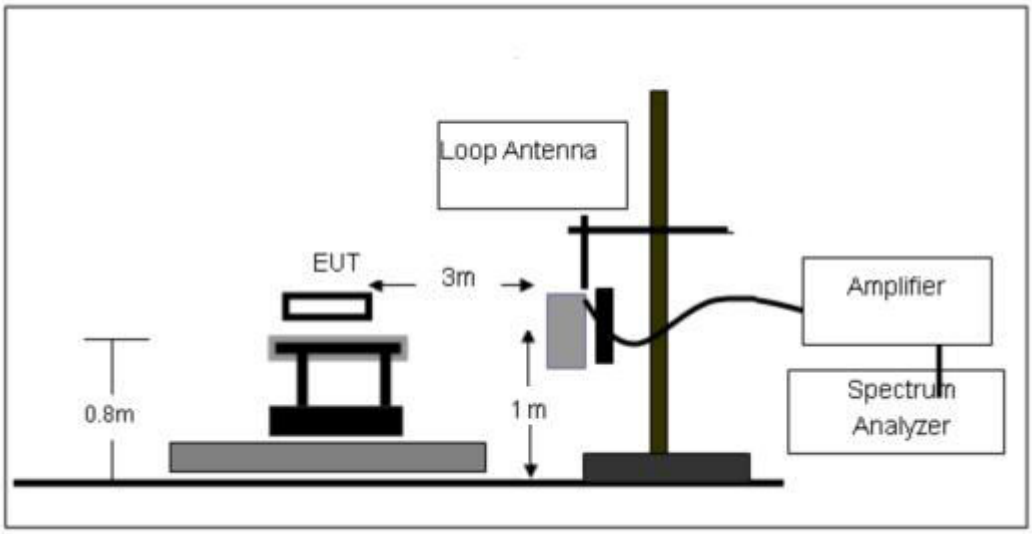
Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

4.2.3 DEVIATION FROM TEST STANDARD

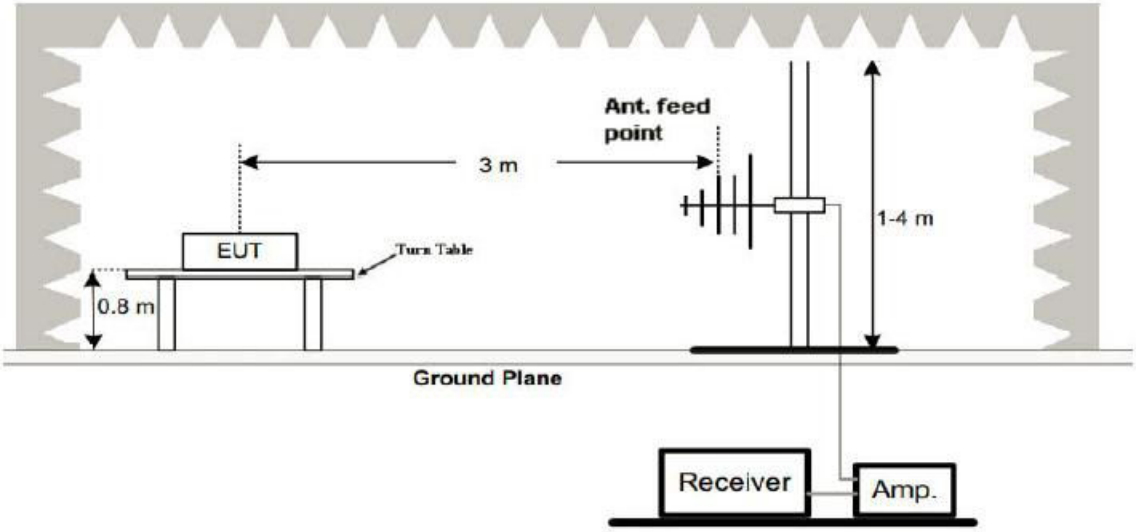
No deviation

4.2.4 TEST SETUP

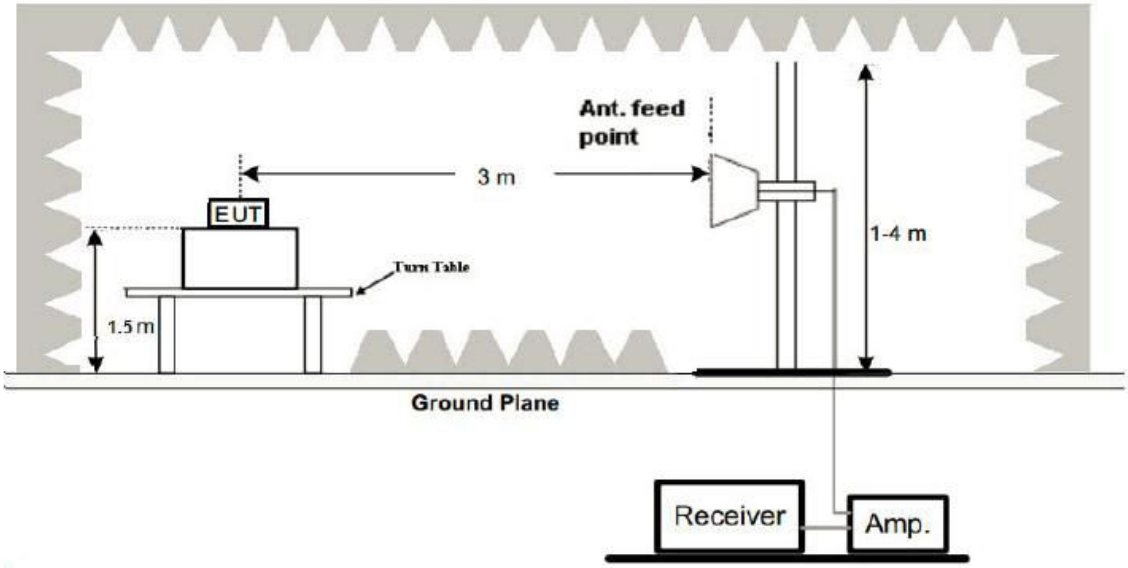
（A）Radiated Emission Test-Up Frequency Below 30MHz



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



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



4.2.5 EUT OPERATING CONDITIONS

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

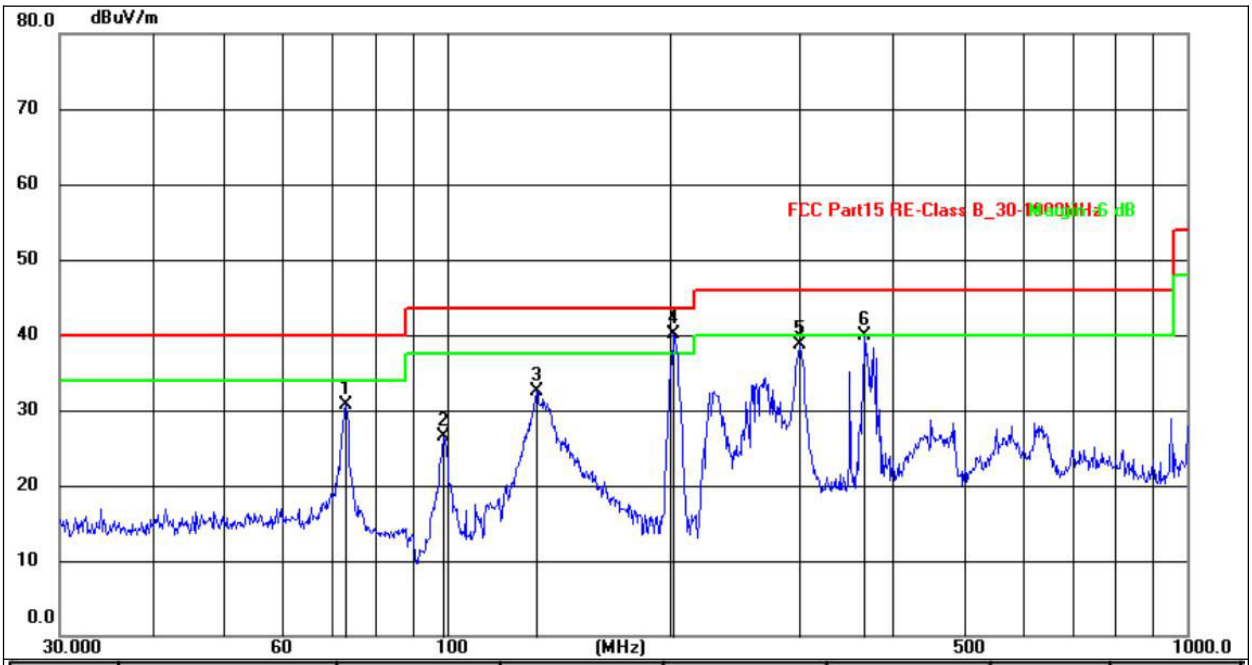
4.2.6 TEST RESULTS

Between 9KHz – 30MHz

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

Between 30MHz – 1GHz

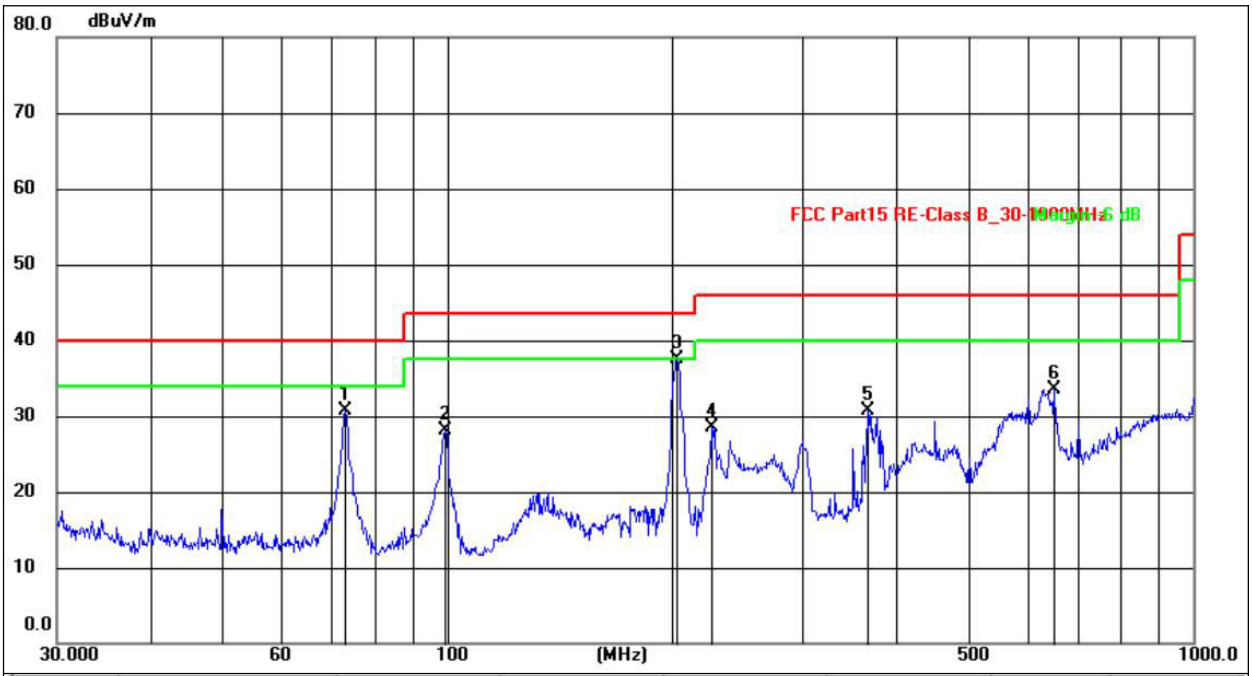
Temperature:	26℃	Relative Humidity:	54%
Pressure:	101 kPa	Polarization:	Horizontal
Test Voltage:	DC 12V From Adapter AC 120V/60Hz	Test Mode :	TX 802.11b - 2412MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	73.1025	48.34	-17.58	30.76	40.00	-9.24	QP
2	98.8324	46.23	-19.75	26.48	43.50	-17.02	QP
3	132.2204	49.94	-17.39	32.55	43.50	-10.95	QP
4	202.8103	58.47	-18.36	40.11	43.50	-3.39	QP
5	300.3672	55.30	-16.55	38.75	46.00	-7.25	QP
6	366.8231	56.07	-16.22	39.85	46.00	-6.15	QP

Remarks:
1.An initial pre-scan was performed on the peak detector.
2.Quasi - Peak measurement were performed at the frequencies with maximized peak emission.
3.The emission levels of other frequencies are very lower than the limit and not show in test report.
4.Final Level = Reading level + Correct Factor.
5.Correct Factor = Antenna factor+ Cable loss factor - Amplifier factor.
6.Margin = Measurement Level-Limit.
7.The test data shows only the worst case TX 802.11b - 2412MHz.

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101kPa	Polarization:	Vertical
Test Voltage:	DC 12V From Adapter AC 120V/60Hz	Test Mode :	TX 802.11b - 2412MHz



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	73.1025	50.70	-20.02	30.68	40.00	-9.32	QP
2	99.5279	49.31	-21.12	28.19	43.50	-15.31	QP
3	203.5226	57.93	-20.34	37.59	43.50	-5.91	QP
4	226.0994	48.59	-20.01	28.58	46.00	-17.42	QP
5	366.8231	46.29	-15.64	30.65	46.00	-15.35	QP
6	651.9415	40.80	-7.35	33.45	46.00	-12.55	QP

Remarks:
1.An initial pre-scan was performed on the peak detector.
2.Quasi - Peak measurement were performed at the frequencies with maximized peak emission.
3.The emission levels of other frequencies are very lower than the limit and not show in test report.
4.Final Level = Reading level + Correct Factor.
5.Correct Factor = Antenna factor+ Cable loss factor - Amplifier factor.
6.Margin = Measurement Level-Limit.
7.The test data shows only the worst case TX 802.11b - 2412MHz.

1GHz~25GHz

802.11b

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)	Detector Type
Low Channel:2412MHz									
V	4824.00	51.99	30.55	5.77	24.66	51.87	74.00	-22.13	PK
V	4824.00	43.35	30.55	5.77	24.66	43.23	54.00	-10.77	AV
V	7236.00	50.08	30.33	6.32	24.55	50.62	74.00	-23.38	PK
V	7236.00	43.30	30.33	6.32	24.55	43.84	54.00	-10.16	AV
V	9648.00	52.96	30.85	7.45	24.69	54.25	74.00	-19.75	PK
V	9648.00	43.01	30.85	7.45	24.69	44.30	54.00	-9.70	AV
V	12060.00	53.82	31.02	8.99	25.57	57.36	74.00	-16.64	PK
V	12060.00	43.45	31.02	8.99	25.57	46.99	54.00	-7.01	AV
H	4824.00	52.54	30.55	5.77	24.66	52.42	74.00	-21.58	PK
H	4824.00	43.71	30.55	5.77	24.66	43.59	54.00	-10.41	AV
H	7236.00	53.65	30.33	6.32	24.55	54.19	74.00	-19.81	PK
H	7236.00	43.29	30.33	6.32	24.55	43.83	54.00	-10.17	AV
H	9648.00	50.74	30.85	7.45	24.69	52.03	74.00	-21.97	PK
H	9648.00	43.81	30.85	7.45	24.69	45.10	54.00	-8.90	AV
H	12060.00	53.42	31.02	8.99	25.57	56.96	74.00	-17.04	PK
H	12060.00	43.54	31.02	8.99	25.57	47.08	54.00	-6.92	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)	Detector Type
Middle Channel:2437MHz									
V	4874.00	51.73	30.55	5.77	24.66	51.61	74.00	-22.39	PK
V	4874.00	43.58	30.55	5.77	24.66	43.46	54.00	-10.54	AV
V	7311.00	52.96	30.33	6.32	24.55	53.50	74.00	-20.50	PK
V	7311.00	43.70	30.33	6.32	24.55	44.24	54.00	-9.76	AV
V	9748.00	50.18	30.85	7.45	24.69	51.47	74.00	-22.53	PK
V	9748.00	43.37	30.85	7.45	24.69	44.66	54.00	-9.34	AV
V	12185.00	51.92	31.02	8.99	25.57	55.46	74.00	-18.54	PK
V	12185.00	43.26	31.02	8.99	25.57	46.80	54.00	-7.20	AV
H	4874.00	53.67	30.55	5.77	24.66	53.55	74.00	-20.45	PK
H	4874.00	43.18	30.55	5.77	24.66	43.06	54.00	-10.94	AV
H	7311.00	53.10	30.33	6.32	24.55	53.64	74.00	-20.36	PK
H	7311.00	43.79	30.33	6.32	24.55	44.33	54.00	-9.67	AV
H	9748.00	53.61	30.85	7.45	24.69	54.90	74.00	-19.10	PK
H	9748.00	43.49	30.85	7.45	24.69	44.78	54.00	-9.22	AV
H	12185.00	54.88	31.02	8.99	25.57	58.42	74.00	-15.58	PK
H	12185.00	43.16	31.02	8.99	25.57	46.70	54.00	-7.30	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)	Detector Type
High Channel:2462MHz									
V	4924.00	50.94	30.55	5.77	24.66	50.82	74.00	-23.18	PK
V	4924.00	43.13	30.55	5.77	24.66	43.01	54.00	-10.99	AV
V	7386.00	50.44	30.33	6.32	24.55	50.98	74.00	-23.02	PK
V	7386.00	43.53	30.33	6.32	24.55	44.07	54.00	-9.93	AV
V	9848.00	52.73	30.85	7.45	24.69	54.02	74.00	-19.98	PK
V	9848.00	43.29	30.85	7.45	24.69	44.58	54.00	-9.42	AV
V	12310.00	51.88	31.02	8.99	25.57	55.42	74.00	-18.58	PK
V	12310.00	43.05	31.02	8.99	25.57	46.59	54.00	-7.41	AV
H	4924.00	51.34	30.55	5.77	24.66	51.22	74.00	-22.78	PK
H	4924.00	43.24	30.55	5.77	24.66	43.12	54.00	-10.88	AV
H	7386.00	53.11	30.33	6.32	24.55	53.65	74.00	-20.35	PK
H	7386.00	43.05	30.33	6.32	24.55	43.59	54.00	-10.41	AV
H	9848.00	52.71	30.85	7.45	24.69	54.00	74.00	-20.00	PK
H	9848.00	43.36	30.85	7.45	24.69	44.65	54.00	-9.35	AV
H	12310.00	50.31	31.02	8.99	25.57	53.85	74.00	-20.15	PK
H	12310.00	43.76	31.02	8.99	25.57	47.30	54.00	-6.70	AV

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

802.11g

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)	Detector Type
Low Channel:2412MHz									
V	4824.00	51.75	30.55	5.77	24.66	51.63	74.00	-22.37	PK
V	4824.00	43.61	30.55	5.77	24.66	43.49	54.00	-10.51	AV
V	7236.00	52.96	30.33	6.32	24.55	53.50	74.00	-20.50	PK
V	7236.00	43.41	30.33	6.32	24.55	43.95	54.00	-10.05	AV
V	9648.00	50.53	30.85	7.45	24.69	51.82	74.00	-22.18	PK
V	9648.00	43.23	30.85	7.45	24.69	44.52	54.00	-9.48	AV
V	12060.00	52.74	31.02	8.99	25.57	56.28	74.00	-17.72	PK
V	12060.00	43.42	31.02	8.99	25.57	46.96	54.00	-7.04	AV
H	4824.00	50.94	30.55	5.77	24.66	50.82	74.00	-23.18	PK
H	4824.00	43.83	30.55	5.77	24.66	43.71	54.00	-10.29	AV
H	7236.00	53.68	30.33	6.32	24.55	54.22	74.00	-19.78	PK
H	7236.00	43.46	30.33	6.32	24.55	44.00	54.00	-10.00	AV
H	9648.00	52.03	30.85	7.45	24.69	53.32	74.00	-20.68	PK
H	9648.00	43.28	30.85	7.45	24.69	44.57	54.00	-9.43	AV
H	12060.00	54.71	31.02	8.99	25.57	58.25	74.00	-15.75	PK
H	12060.00	43.59	31.02	8.99	25.57	47.13	54.00	-6.87	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)	Detector Type
Middle Channel:2437MHz									
V	4874.00	52.09	30.55	5.77	24.66	51.97	74.00	-22.03	PK
V	4874.00	43.62	30.55	5.77	24.66	43.50	54.00	-10.50	AV
V	7311.00	51.24	30.33	6.32	24.55	51.78	74.00	-22.22	PK
V	7311.00	43.96	30.33	6.32	24.55	44.50	54.00	-9.50	AV
V	9748.00	50.46	30.85	7.45	24.69	51.75	74.00	-22.25	PK
V	9748.00	43.38	30.85	7.45	24.69	44.67	54.00	-9.33	AV
V	12185.00	54.13	31.02	8.99	25.57	57.67	74.00	-16.33	PK
V	12185.00	43.55	31.02	8.99	25.57	47.09	54.00	-6.91	AV
H	4874.00	54.43	30.55	5.77	24.66	54.31	74.00	-19.69	PK
H	4874.00	43.54	30.55	5.77	24.66	43.42	54.00	-10.58	AV
H	7311.00	54.74	30.33	6.32	24.55	55.28	74.00	-18.72	PK
H	7311.00	43.97	30.33	6.32	24.55	44.51	54.00	-9.49	AV
H	9748.00	54.90	30.85	7.45	24.69	56.19	74.00	-17.81	PK
H	9748.00	43.65	30.85	7.45	24.69	44.94	54.00	-9.06	AV
H	12185.00	53.06	31.02	8.99	25.57	56.60	74.00	-17.40	PK
H	12185.00	43.32	31.02	8.99	25.57	46.86	54.00	-7.14	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)	Detector Type
High Channel:2462MHz									
V	4924.00	51.06	30.55	5.77	24.66	50.94	74.00	-23.06	PK
V	4924.00	44.00	30.55	5.77	24.66	43.88	54.00	-10.12	AV
V	7386.00	51.22	30.33	6.32	24.55	51.76	74.00	-22.24	PK
V	7386.00	43.48	30.33	6.32	24.55	44.02	54.00	-9.98	AV
V	9848.00	50.34	30.85	7.45	24.69	51.63	74.00	-22.37	PK
V	9848.00	43.06	30.85	7.45	24.69	44.35	54.00	-9.65	AV
V	12310.00	50.10	31.02	8.99	25.57	53.64	74.00	-20.36	PK
V	12310.00	43.27	31.02	8.99	25.57	46.81	54.00	-7.19	AV
H	4924.00	50.14	30.55	5.77	24.66	50.02	74.00	-23.98	PK
H	4924.00	43.15	30.55	5.77	24.66	43.03	54.00	-10.97	AV
H	7386.00	50.90	30.33	6.32	24.55	51.44	74.00	-22.56	PK
H	7386.00	43.54	30.33	6.32	24.55	44.08	54.00	-9.92	AV
H	9848.00	50.91	30.85	7.45	24.69	52.20	74.00	-21.80	PK
H	9848.00	43.22	30.85	7.45	24.69	44.51	54.00	-9.49	AV
H	12310.00	54.01	31.02	8.99	25.57	57.55	74.00	-16.45	PK
H	12310.00	43.79	31.02	8.99	25.57	47.33	54.00	-6.67	AV

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

802.11n20

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)	Detector Type
Low Channel:2412MHz									
V	4824.00	52.16	30.55	5.77	24.66	52.04	74.00	-21.96	PK
V	4824.00	43.68	30.55	5.77	24.66	43.56	54.00	-10.44	AV
V	7236.00	51.43	30.33	6.32	24.55	51.97	74.00	-22.03	PK
V	7236.00	43.79	30.33	6.32	24.55	44.33	54.00	-9.67	AV
V	9648.00	50.42	30.85	7.45	24.69	51.71	74.00	-22.29	PK
V	9648.00	43.56	30.85	7.45	24.69	44.85	54.00	-9.15	AV
V	12060.00	53.99	31.02	8.99	25.57	57.53	74.00	-16.47	PK
V	12060.00	44.00	31.02	8.99	25.57	47.54	54.00	-6.46	AV
H	4824.00	53.48	30.55	5.77	24.66	53.36	74.00	-20.64	PK
H	4824.00	43.91	30.55	5.77	24.66	43.79	54.00	-10.21	AV
H	7236.00	50.98	30.33	6.32	24.55	51.52	74.00	-22.48	PK
H	7236.00	43.38	30.33	6.32	24.55	43.92	54.00	-10.08	AV
H	9648.00	50.64	30.85	7.45	24.69	51.93	74.00	-22.07	PK
H	9648.00	43.39	30.85	7.45	24.69	44.68	54.00	-9.32	AV
H	12060.00	50.18	31.02	8.99	25.57	53.72	74.00	-20.28	PK
H	12060.00	43.81	31.02	8.99	25.57	47.35	54.00	-6.65	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)	Detector Type
Middle Channel:2437MHz									
V	4874.00	54.27	30.55	5.77	24.66	54.15	74.00	-19.85	PK
V	4874.00	43.35	30.55	5.77	24.66	43.23	54.00	-10.77	AV
V	7311.00	52.56	30.33	6.32	24.55	53.10	74.00	-20.90	PK
V	7311.00	43.18	30.33	6.32	24.55	43.72	54.00	-10.28	AV
V	9748.00	54.30	30.85	7.45	24.69	55.59	74.00	-18.41	PK
V	9748.00	43.05	30.85	7.45	24.69	44.34	54.00	-9.66	AV
V	12185.00	54.05	31.02	8.99	25.57	57.59	74.00	-16.41	PK
V	12185.00	43.28	31.02	8.99	25.57	46.82	54.00	-7.18	AV
H	4874.00	50.65	30.55	5.77	24.66	50.53	74.00	-23.47	PK
H	4874.00	43.78	30.55	5.77	24.66	43.66	54.00	-10.34	AV
H	7311.00	53.20	30.33	6.32	24.55	53.74	74.00	-20.26	PK
H	7311.00	43.54	30.33	6.32	24.55	44.08	54.00	-9.92	AV
H	9748.00	54.32	30.85	7.45	24.69	55.61	74.00	-18.39	PK
H	9748.00	43.80	30.85	7.45	24.69	45.09	54.00	-8.91	AV
H	12185.00	50.73	31.02	8.99	25.57	54.27	74.00	-19.73	PK
H	12185.00	43.91	31.02	8.99	25.57	47.45	54.00	-6.55	AV

Polar (H/V)	Frequency	Meter Reading	Pre-amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
High Channel:2462MHz									
V	4924.00	53.16	30.55	5.77	24.66	53.04	74.00	-20.96	PK
V	4924.00	43.56	30.55	5.77	24.66	43.44	54.00	-10.56	AV
V	7386.00	50.51	30.33	6.32	24.55	51.05	74.00	-22.95	PK
V	7386.00	43.17	30.33	6.32	24.55	43.71	54.00	-10.29	AV
V	9848.00	51.34	30.85	7.45	24.69	52.63	74.00	-21.37	PK
V	9848.00	43.71	30.85	7.45	24.69	45.00	54.00	-9.00	AV
V	12310.00	53.64	31.02	8.99	25.57	57.18	74.00	-16.82	PK
V	12310.00	43.11	31.02	8.99	25.57	46.65	54.00	-7.35	AV
H	4924.00	52.55	30.55	5.77	24.66	52.43	74.00	-21.57	PK
H	4924.00	43.79	30.55	5.77	24.66	43.67	54.00	-10.33	AV
H	7386.00	53.05	30.33	6.32	24.55	53.59	74.00	-20.41	PK
H	7386.00	43.34	30.33	6.32	24.55	43.88	54.00	-10.12	AV
H	9848.00	53.54	30.85	7.45	24.69	54.83	74.00	-19.17	PK
H	9848.00	43.67	30.85	7.45	24.69	44.96	54.00	-9.04	AV
H	12310.00	50.11	31.02	8.99	25.57	53.65	74.00	-20.35	PK
H	12310.00	43.65	31.02	8.99	25.57	47.19	54.00	-6.81	AV

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

5. RADIATED BAND EMISSIONMEASUREMENT

5.1 TEST REQUIREMENT

Test Requirement:	FCC Part15 C Section 15.209 and 15.205 and 15.247(d)
Test Method:	ANSI C63.10: 2013
Test Frequency Range:	All of the restrict bands were tested, only the worst band's (2310MHz to 2500MHz) data was showed.
Test site:	Measurement Distance: 3m
Receiver setup:	

Frequency	Detector	RBW	VBW	Value
Above 1GHz	Peak	1MHz	3MHz	Peak
	Average	1MHz	3MHz	Average

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

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

Notes:

(1) The limit for radiated test was performed according to FCC PART 15C.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	2310MHz
Stop Frequency	2500MHz
RB / VB (emission in restricted band)	1 MHz / 3 MHz for Peak, 1 MHz / 3MHz for Average

5.2 TEST PROCEDURE

Above 1GHz test procedure as below:

a. 1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.

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

f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dBmargin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

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

Note:

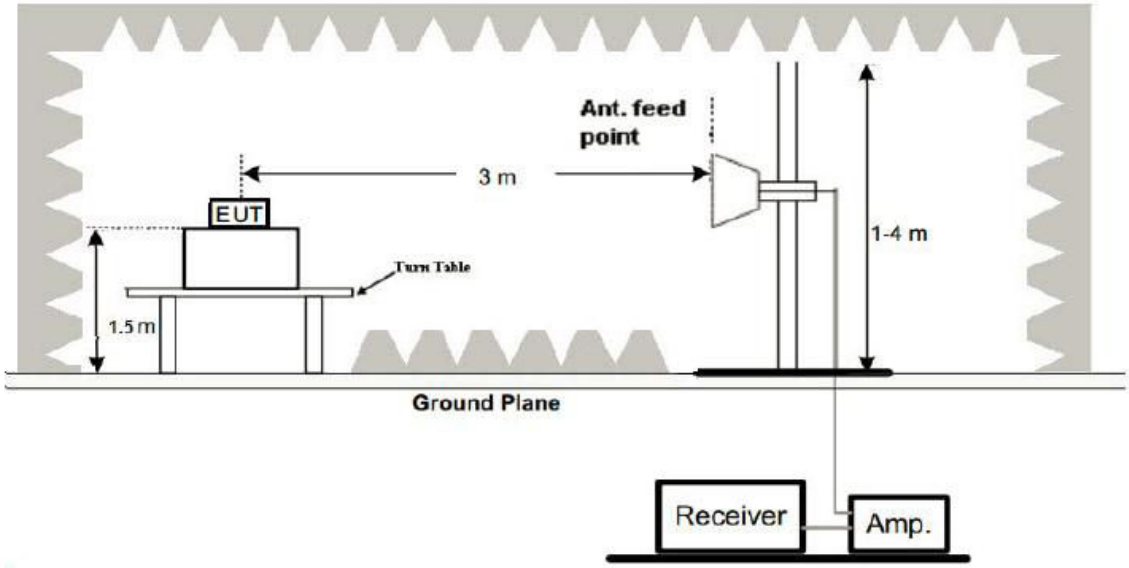
Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

5.3 DEVIATION FROM TEST STANDARD

No deviation

5.4 TEST SETUP

Radiated Emission Test-Up Frequency Above 1GHz



5.5 EUT OPERATING CONDITIONS

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

5.6 TEST RESULT

	Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector Type	Result
802.11b	LowChannel 2412MHz										
	H	2310.00	53.88	30.22	4.85	23.98	52.49	74.00	-21.51	PK	PASS
	H	2310.00	44.19	30.22	4.85	23.98	42.80	54.00	-11.20	AV	PASS
	H	2350.00	54.34	30.22	4.85	23.98	52.95	74.00	-21.05	PK	PASS
	H	2350.00	44.36	30.22	4.85	23.98	42.97	54.00	-11.03	AV	PASS
	H	2390.00	54.51	30.22	4.85	23.98	53.12	74.00	-20.88	PK	PASS
	H	2390.00	44.79	30.22	4.85	23.98	43.40	54.00	-10.60	AV	PASS
	V	2310.00	54.83	30.22	4.85	23.98	53.44	74.00	-20.56	PK	PASS
	V	2310.00	44.63	30.22	4.85	23.98	43.24	54.00	-10.76	AV	PASS
	V	2350.00	53.14	30.22	4.85	23.98	51.75	74.00	-22.25	PK	PASS
	V	2350.00	44.40	30.22	4.85	23.98	43.01	54.00	-10.99	AV	PASS
	V	2390.00	53.77	30.22	4.85	23.98	52.38	74.00	-21.62	PK	PASS
	V	2390.00	44.06	30.22	4.85	23.98	42.67	54.00	-11.33	AV	PASS
	HighChannel 2462MHz										
	H	2483.50	54.55	30.22	4.85	23.98	53.16	74.00	-20.84	PK	PASS
	H	2483.50	44.72	30.22	4.85	23.98	43.33	54.00	-10.67	AV	PASS
	H	2490.00	54.07	30.22	4.85	23.98	52.68	74.00	-21.32	PK	PASS
	H	2490.00	44.81	30.22	4.85	23.98	43.42	54.00	-10.58	AV	PASS
	H	2500.00	53.40	30.22	4.85	23.98	52.01	74.00	-21.99	PK	PASS
	H	2500.00	44.20	30.22	4.85	23.98	42.81	54.00	-11.19	AV	PASS
	V	2483.50	54.12	30.22	4.85	23.98	52.73	74.00	-21.27	PK	PASS
	V	2483.50	44.60	30.22	4.85	23.98	43.21	54.00	-10.79	AV	PASS
	V	2490.00	53.62	30.22	4.85	23.98	52.23	74.00	-21.77	PK	PASS
	V	2490.00	44.55	30.22	4.85	23.98	43.16	54.00	-10.84	AV	PASS
	V	2500.00	53.12	30.22	4.85	23.98	51.73	74.00	-22.27	PK	PASS
	V	2500.00	44.43	30.22	4.85	23.98	43.04	54.00	-10.96	AV	PASS

Remark:

Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier, Margin= Emission Level - Limit

	Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector Type	Result
802.11g	LowChannel 2412MHz										
	H	2310.00	53.97	30.22	4.85	23.98	52.58	74.00	-21.42	PK	PASS
	H	2310.00	44.39	30.22	4.85	23.98	43.00	54.00	-11.00	AV	PASS
	H	2350.00	53.67	30.22	4.85	23.98	52.28	74.00	-21.72	PK	PASS
	H	2350.00	44.13	30.22	4.85	23.98	42.74	54.00	-11.26	AV	PASS
	H	2390.00	53.45	30.22	4.85	23.98	52.06	74.00	-21.94	PK	PASS
	H	2390.00	44.20	30.22	4.85	23.98	42.81	54.00	-11.19	AV	PASS
	V	2310.00	53.63	30.22	4.85	23.98	52.24	74.00	-21.76	PK	PASS
	V	2350.00	44.75	30.22	4.85	23.98	43.36	54.00	-10.64	PK	PASS
	V	2350.00	54.64	30.22	4.85	23.98	53.25	74.00	-20.75	AV	PASS
	V	2310.00	44.66	30.22	4.85	23.98	43.27	54.00	-10.73	AV	PASS
	V	2390.00	54.36	30.22	4.85	23.98	52.97	74.00	-21.03	PK	PASS
	V	2390.00	44.44	30.22	4.85	23.98	43.05	54.00	-10.95	AV	PASS
	High Channel 2462MHz										
	H	2483.50	54.19	30.22	4.85	23.98	52.80	74.00	-21.20	PK	PASS
	H	2483.50	44.51	30.22	4.85	23.98	43.12	54.00	-10.88	AV	PASS
	H	2490.00	53.70	30.22	4.85	23.98	52.31	74.00	-21.69	PK	PASS
	H	2490.00	44.63	30.22	4.85	23.98	43.24	54.00	-10.76	AV	PASS
	H	2500.00	53.73	30.22	4.85	23.98	52.34	74.00	-21.66	PK	PASS
	H	2500.00	44.34	30.22	4.85	23.98	42.95	54.00	-11.05	AV	PASS
	V	2483.50	53.23	30.22	4.85	23.98	51.84	74.00	-22.16	PK	PASS
	V	2483.50	44.83	30.22	4.85	23.98	43.44	54.00	-10.56	AV	PASS
	V	2490.00	54.11	30.22	4.85	23.98	52.72	74.00	-21.28	PK	PASS
	V	2490.00	44.90	30.22	4.85	23.98	43.51	54.00	-10.49	AV	PASS
	V	2500.00	53.55	30.22	4.85	23.98	52.16	74.00	-21.84	PK	PASS
	V	2500.00	44.36	30.22	4.85	23.98	42.97	54.00	-11.03	AV	PASS

Remark:

Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier, Margin= Emission Level - Limit

	Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector Type	Result
802.11 n20	LowChannel 2412MHz										
	H	2310.00	53.89	30.22	4.85	23.98	52.50	74.00	-21.50	PK	PASS
	H	2310.00	44.75	30.22	4.85	23.98	43.36	54.00	-10.64	AV	PASS
	H	2350.00	54.19	30.22	4.85	23.98	52.80	74.00	-21.20	PK	PASS
	H	2350.00	44.38	30.22	4.85	23.98	42.99	54.00	-11.01	AV	PASS
	H	2390.00	53.23	30.22	4.85	23.98	51.84	74.00	-22.16	PK	PASS
	H	2390.00	44.08	30.22	4.85	23.98	42.69	54.00	-11.31	AV	PASS
	V	2310.00	53.68	30.22	4.85	23.98	52.29	74.00	-21.71	PK	PASS
	V	2310.00	44.21	30.22	4.85	23.98	42.82	54.00	-11.18	AV	PASS
	V	2350.00	53.54	30.22	4.85	23.98	52.15	74.00	-21.85	PK	PASS
	V	2350.00	44.68	30.22	4.85	23.98	43.29	54.00	-10.71	AV	PASS
	V	2390.00	54.00	30.22	4.85	23.98	52.61	74.00	-21.39	PK	PASS
	V	2390.00	44.32	30.22	4.85	23.98	42.93	54.00	-11.07	AV	PASS
	HighChannel 2462MHz										
	H	2483.50	53.67	30.22	4.85	23.98	52.28	74.00	-21.72	PK	PASS
	H	2483.50	44.31	30.22	4.85	23.98	42.92	54.00	-11.08	AV	PASS
	H	2490.00	54.64	30.22	4.85	23.98	53.25	74.00	-20.75	PK	PASS
	H	2490.00	44.24	30.22	4.85	23.98	42.85	54.00	-11.15	AV	PASS
	H	2500.00	53.47	30.22	4.85	23.98	52.08	74.00	-21.92	PK	PASS
	H	2500.00	44.75	30.22	4.85	23.98	43.36	54.00	-10.64	AV	PASS
	V	2483.50	54.02	30.22	4.85	23.98	52.63	74.00	-21.37	PK	PASS
	V	2483.50	44.51	30.22	4.85	23.98	43.12	54.00	-10.88	AV	PASS
	V	2490.00	54.85	30.22	4.85	23.98	53.46	74.00	-20.54	PK	PASS
	V	2490.00	44.58	30.22	4.85	23.98	43.19	54.00	-10.81	AV	PASS
	V	2500.00	54.83	30.22	4.85	23.98	53.44	74.00	-20.56	PK	PASS
	V	2500.00	44.20	30.22	4.85	23.98	42.81	54.00	-11.19	AV	PASS

Remark:

Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier, Margin= Emission Level - Limit

6. POWER SPECTRAL DENSITY TEST

Test Requirement:	FCC Part15 C Section 15.247 (e)
Test Method:	KDB558074 D0115.247 Meas Guidancev05r02

6.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247	Power Spectral Density	8dBm/3kHz	2400-2483.5	PASS

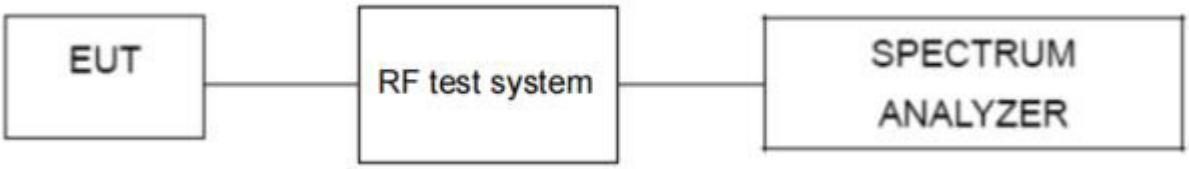
6.2 TEST PROCEDURE

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

6.3 DEVIATION FROM STANDARD

No deviation.

6.4 TEST SETUP



6.5 EUT OPERATION CONDITIONS

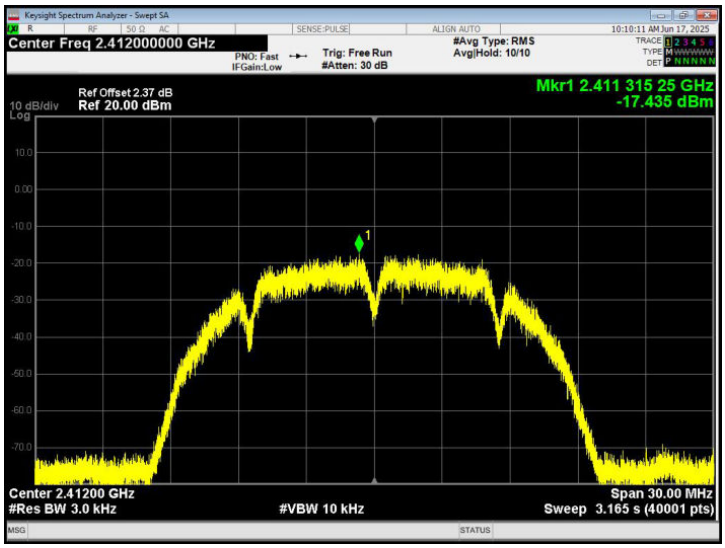
The EUT tested system was configured as the statements of chapter 3, Unless otherwise a special operating condition is specified in the follows during the testing.

6.6 TEST RESULT

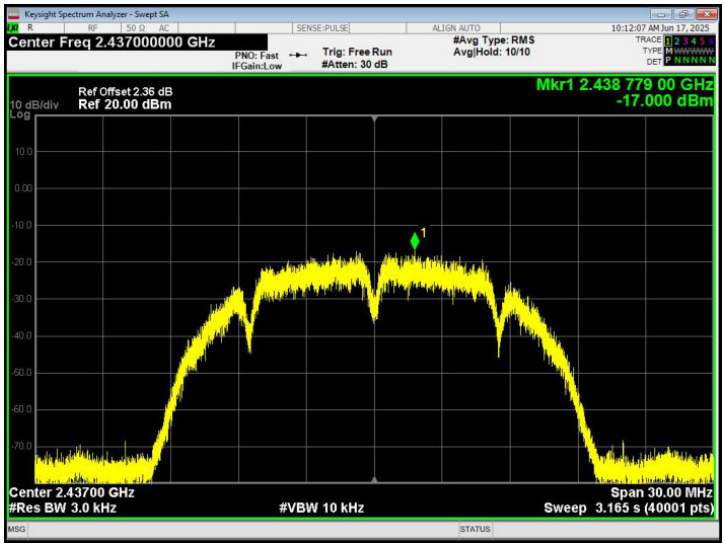
Temperature：	26℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	DC 12V From Adapter AC 120V/60Hz

Test Mode	Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
802.11b	2412	-17.435	8	PASS
	2437	-17.000	8	PASS
	2462	-17.392	8	PASS
802.11g	2412	-22.317	8	PASS
	2437	-21.983	8	PASS
	2462	-22.816	8	PASS
802.11n20	2412	-22.297	8	PASS
	2437	-22.504	8	PASS
	2462	-23.071	8	PASS

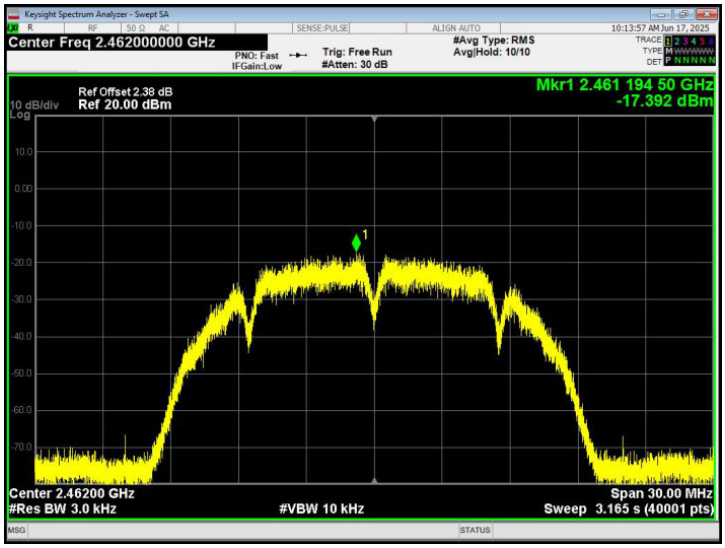
802.11b - CH01



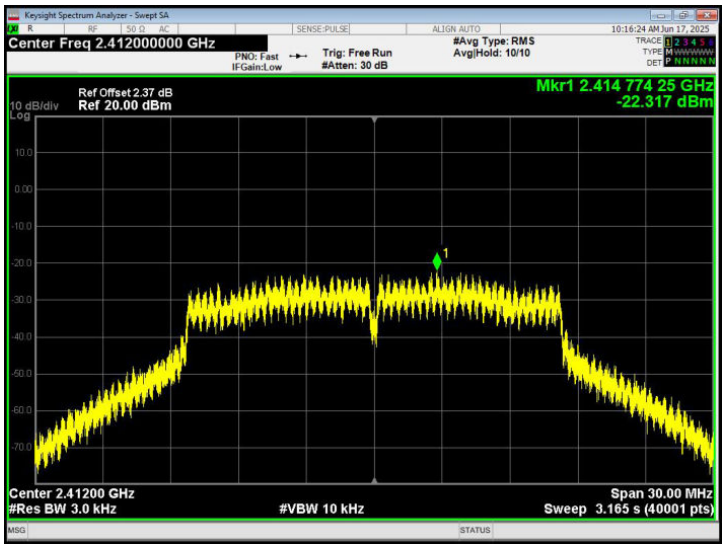
802.11b - CH06



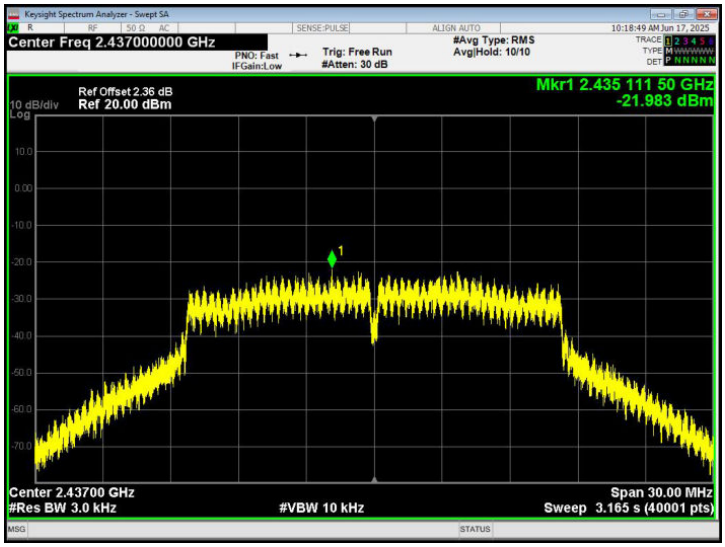
802.11b - CH11



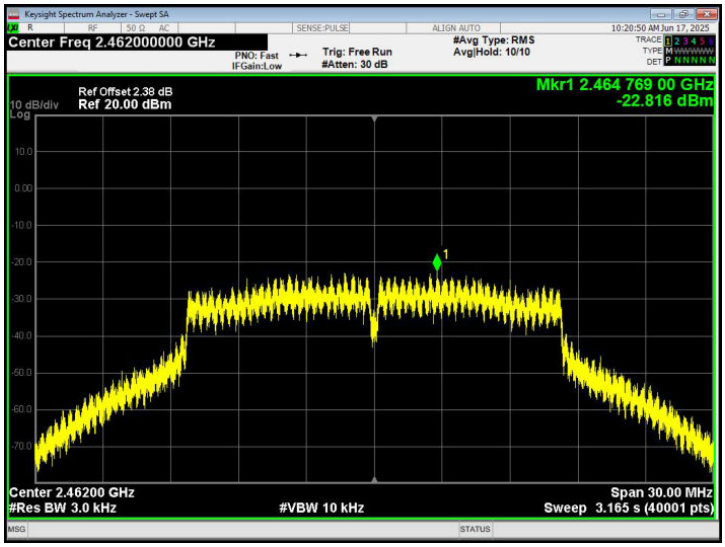
802.11g - CH01



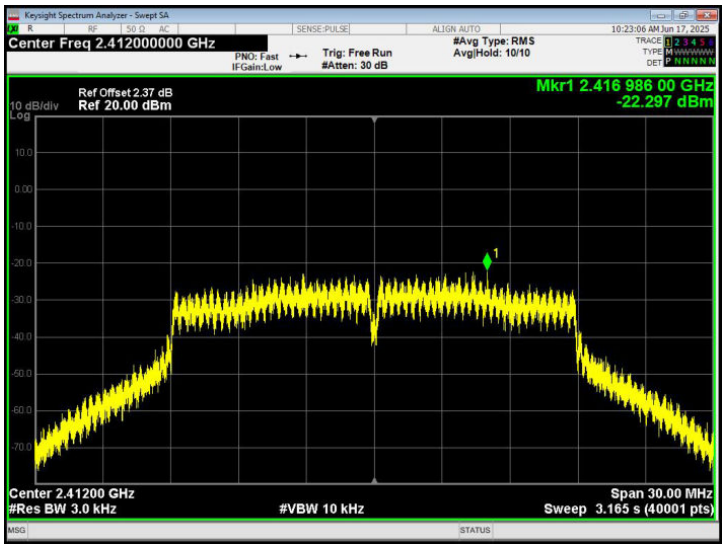
802.11g - CH06



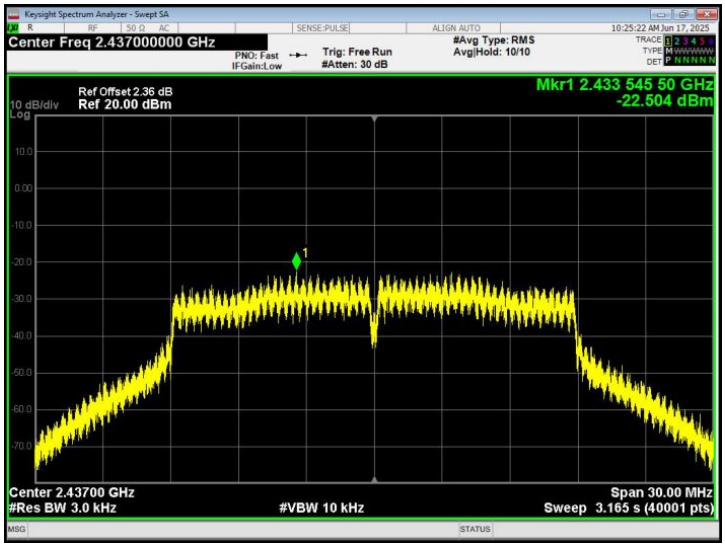
802.11g - CH11



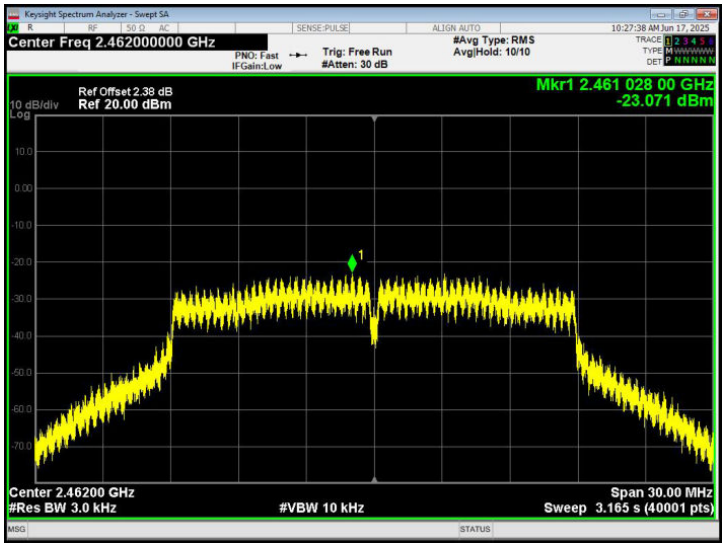
802.11n20 - CH01



802.11n20 - CH06



802.11n20 - CH11



7. 6DB OCCUPIED BANDWIDTH

Test Requirement:	FCC Part15 C Section 15.247 (a)(2)
Test Method:	KDB558074 D0115.247 Meas Guidancev05r02

7.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(2)	Bandwidth	>= 500KHz (6dB Occupied Bandwidth)	2400-2483.5	PASS

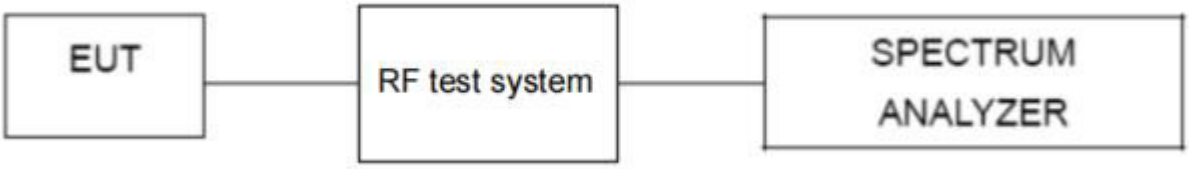
7.2 TEST PROCEDURE

1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) ≥ 3 xRBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

7.3 DEVIATION FROM STANDARD

No deviation.

7.4 TEST SETUP



7.5 EUT OPERATION CONDITIONS

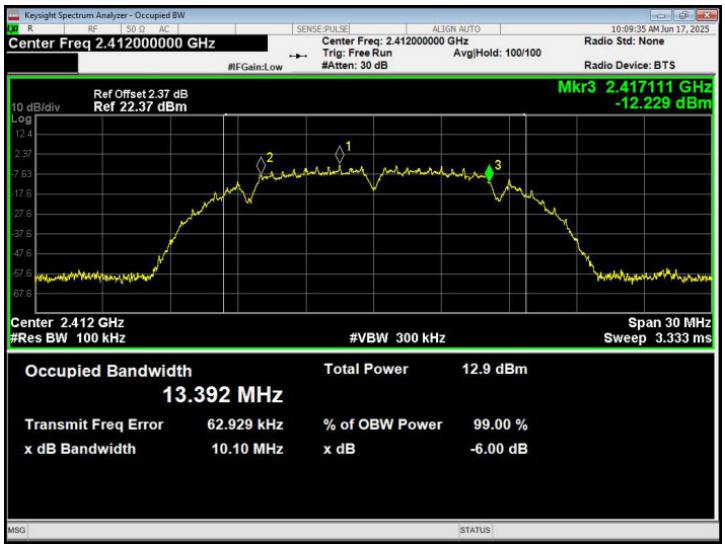
The EUT tested system was configured as the statements of chapter 3, Unless otherwise a special operating condition is specified in the follows during the testing.

7.6 TEST RESULT

Temperature：	26℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage：	DC 12V From Adapter AC 120V/60Hz
Test Mode ：	TX		

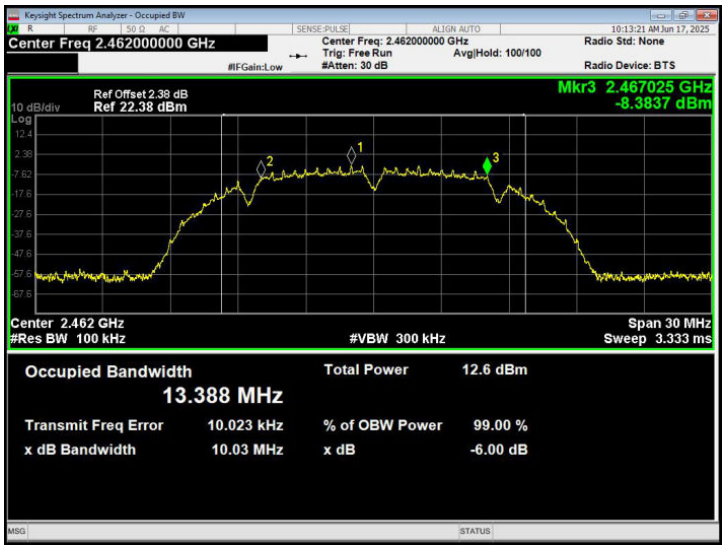
Test Mode	Test Channel (MHz)	6dB Occupied Bandwidth (MHz)	Limit (kHz)	Result
802.11b	2412	10.10	>500	Pass
	2437	10.07		
	2462	10.03		
802.11g	2412	13.21	>500	Pass
	2437	16.33		
	2462	12.32		
802.11n20	2412	13.78	>500	Pass
	2437	17.55		
	2462	17.52		

802.11b - CH01



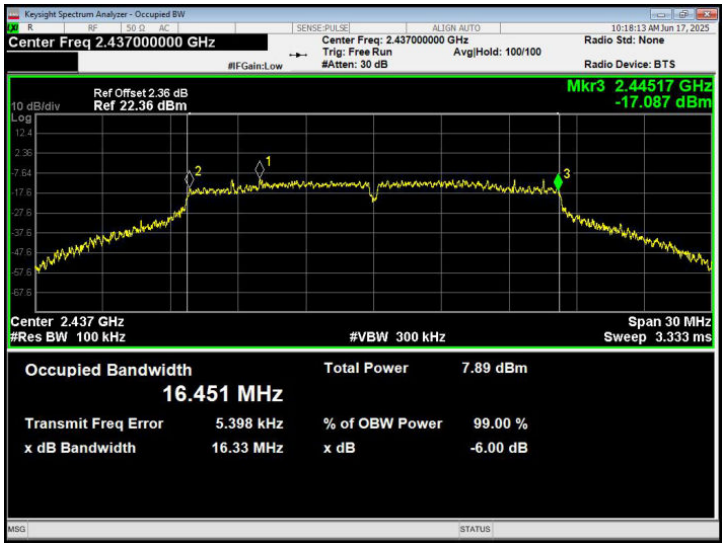
802.11b - CH06

802.11b - CH11



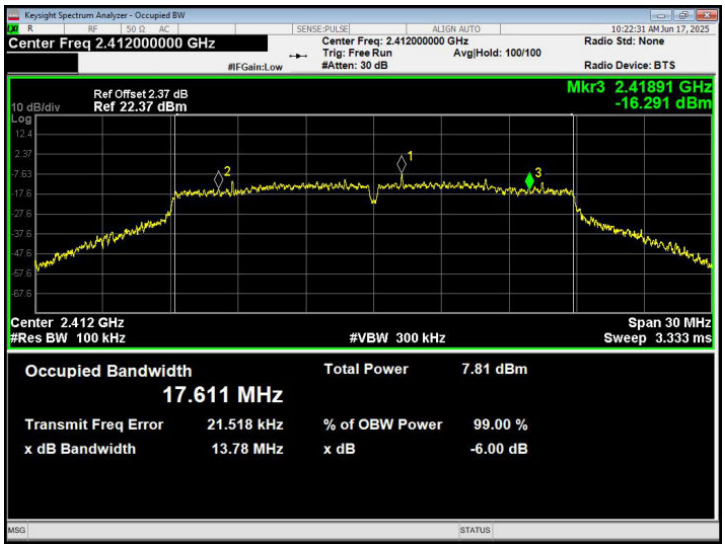
802.11g - CH01

802.11g - CH06

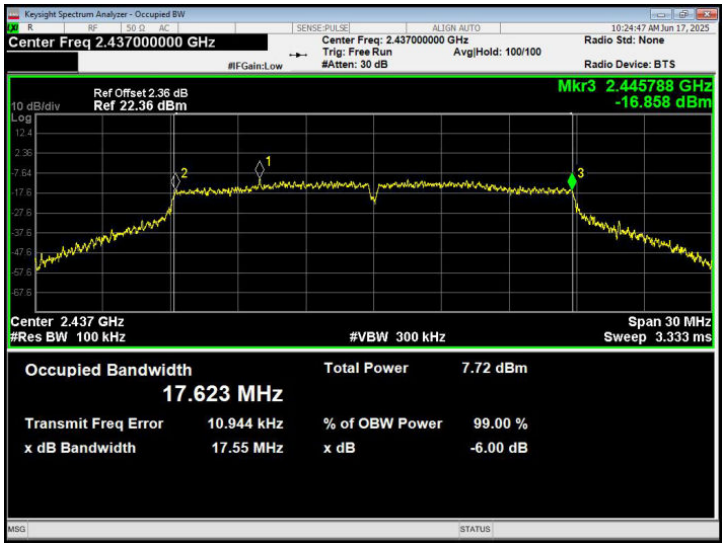


802.11g - CH11

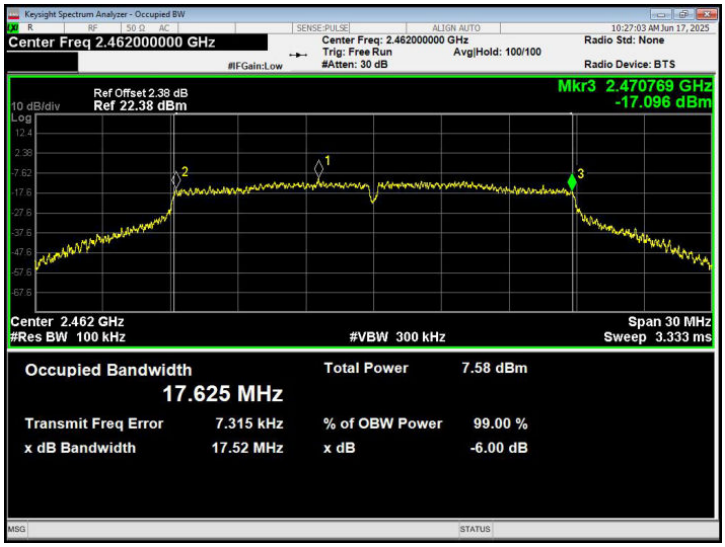
802.11n20 - CH01



802.11n20 - CH06



802.11n20 - CH11



8.PEAK OUTPUT POWER TEST

Test Requirement:	FCC Part15 C Section 15.247 (b)(3)
Test Method:	KDB558074 D0115.247 Meas Guidancev05r02

8.1 APPLIED PROCEDURES/LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(3)	Peak Output Power	1 watt or 30dBm	2400-2483.5	PASS

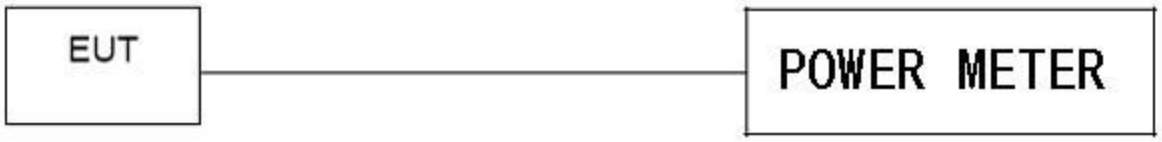
8.2 TEST PROCEDURE

a. The EUT was directly connected to the Power meter

8.3 DEVIATION FROM STANDARD

No deviation.

8.4 TEST SETUP



8.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of chapter 3, Unless otherwise a special operating condition is specified in the follows during the testing.

8.6 TEST RESULT

Temperature :	26℃	Relative Humidity :	54%
Pressure :	101kPa	Test Voltage :	DC 12V From Adapter AC 120V/60Hz

Test Mode	Test Channel (MHz)	Peak Output Power (dBm)	Limit (dBm)	Result
802.11b	2412	7.953	30.00	Pass
	2437	7.818		
	2462	7.607		
802.11g	2412	6.753	30.00	Pass
	2437	6.705		
	2462	6.421		
802.11n20	2412	6.609	30.00	Pass
	2437	6.485		
	2462	6.447		

9. CONDUCTED BAND EDGE AND SPURIOUS EMISSION

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	KDB558074 D0115.247 Meas Guidancev05r02

9.1 APPLICABLE STANDARD

Typical regulatory requirements specify that in any 100 khz bandwidth outside of the authorized frequency band, the power shall be attenuated according to the following conditions[89]:
The maximum peak conducted output power procedure was used to determine compliance as described in 11.9.1, then the peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz (i.e., 20 dBc).

9.2 TEST PROCEDURE

A. Reference level measurement, establish a reference level by using the following procedure:

a) Set instrument center frequency to DTS channel center frequency.
b) Set the span to ≥ 1.5 times the DTS bandwidth.
c) Set the RBW = 100 kHz.
d) Set the VBW ≥ [3 × RBW].
e) Detector = peak.
f) Sweep time = auto couple.
g) Trace mode = max hold.
h) Allow trace to fully stabilize.
i) Use the peak marker function to determine the maximum PSD level.

Note that the channel found to contain the maximum PSD level can be used to establish the reference level.

B. Emission level measurement, establish an emission level by using the following procedure:

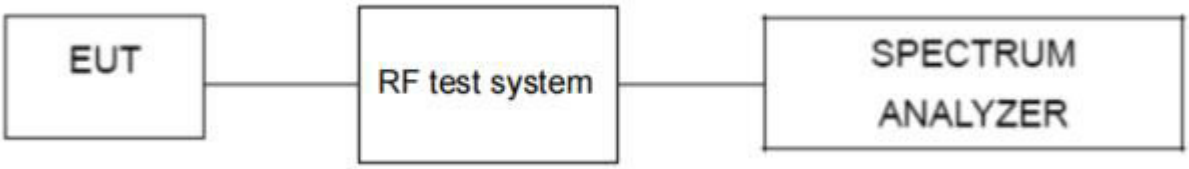
a) Set the center frequency and span to encompass frequency range to be measured.
b) Set the RBW = 100 kHz.
c) Set the VBW ≥ [3 × RBW].
d) Detector = peak.
e) Sweep time = auto couple.
f) Trace mode = max hold.
g) Allow trace to fully stabilize.
h) Use the peak marker function to determine the maximum amplitude level.

Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) is attenuated by at least the minimum requirements specified in 11.11. Report the three highest emissions relative to the limit.

9.3 DEVIATION FROM STANDARD

No deviation.

9.4 TEST SETUP



9.5 EUT OPERATION CONDITIONS

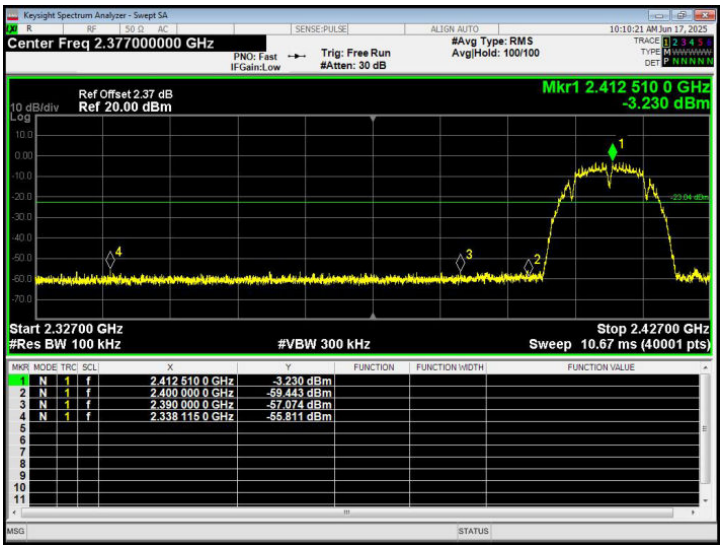
The EUT tested system was configured as the statements of chapter 3, Unless otherwise a special operating condition is specified in the follows during the testing.

9.6 TEST RESULTS

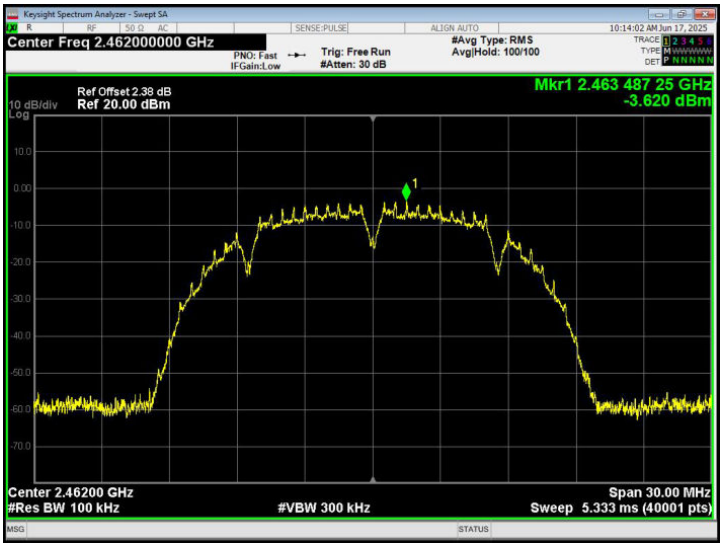
Band edge test plot as follows:

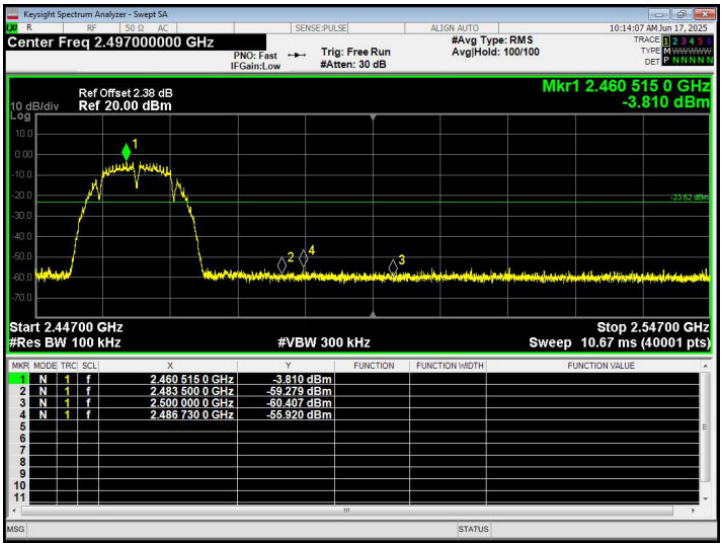
Temperature：	26℃	Relative Humidity：	54%
Pressure：	101kPa	Test Voltage ：	DC 12V From Adapter AC 120V/60Hz

802.11b - Lowest channel

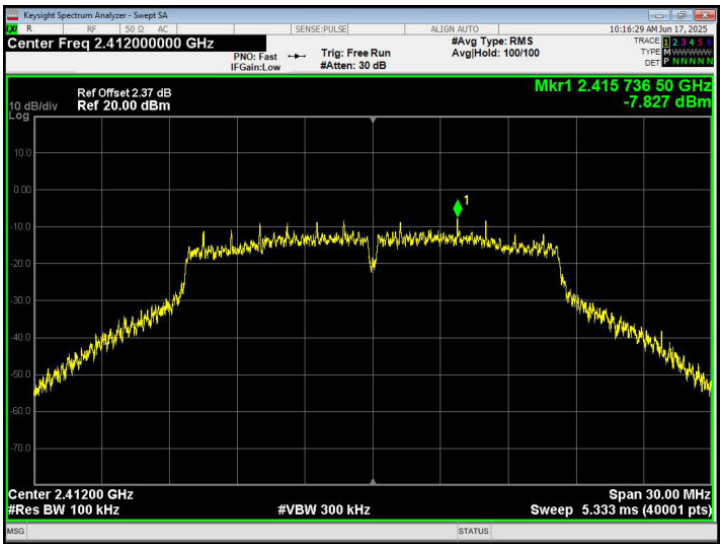


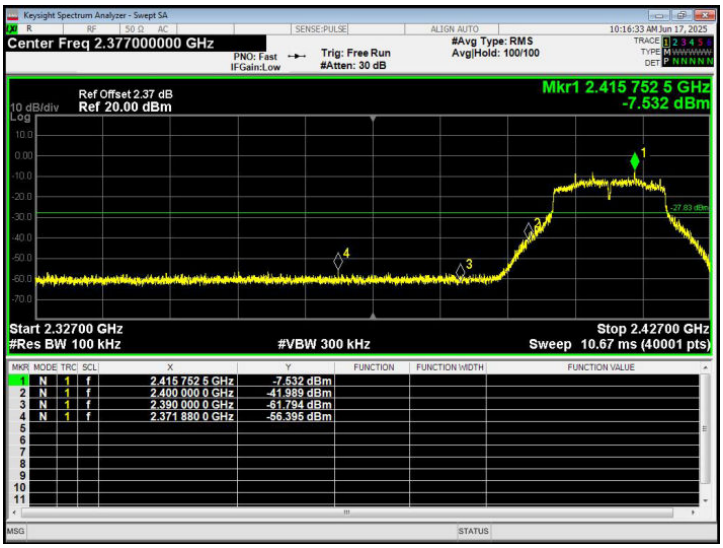
802.11b - Highest channel



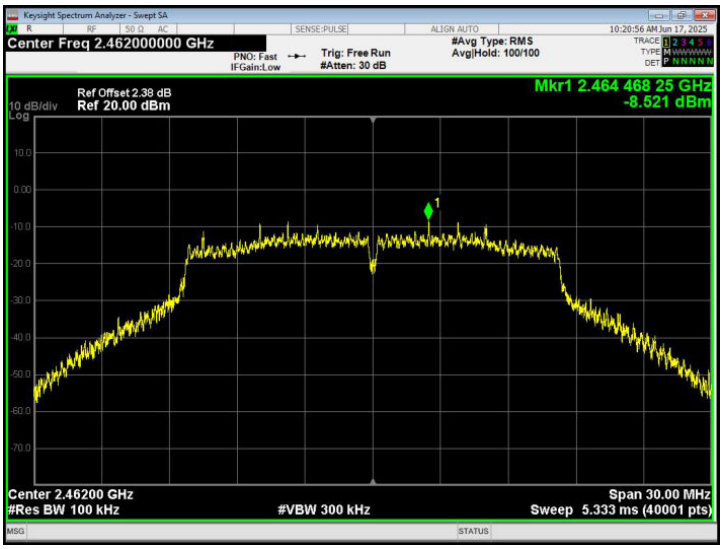


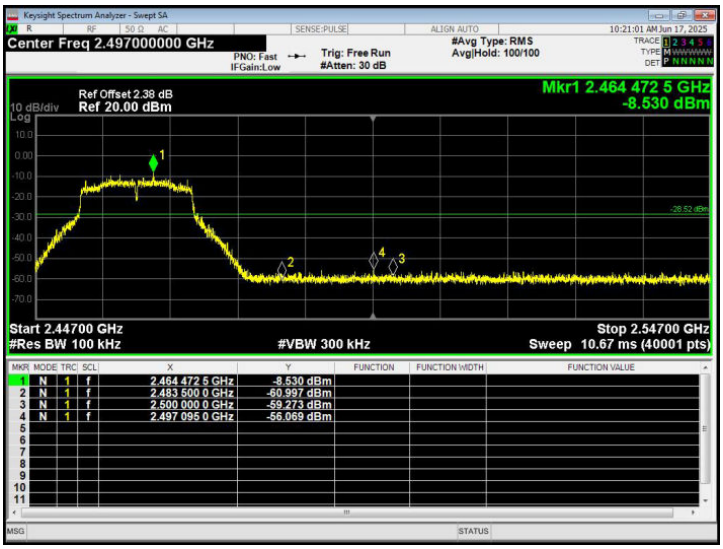
802.11g - Lowest channel



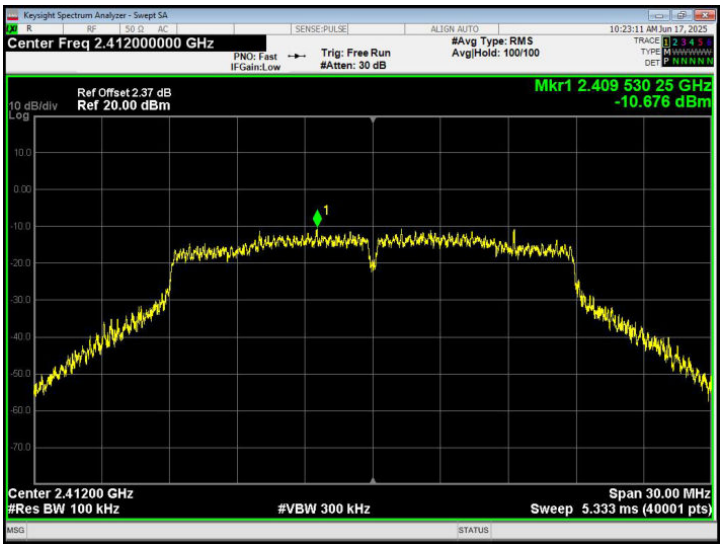


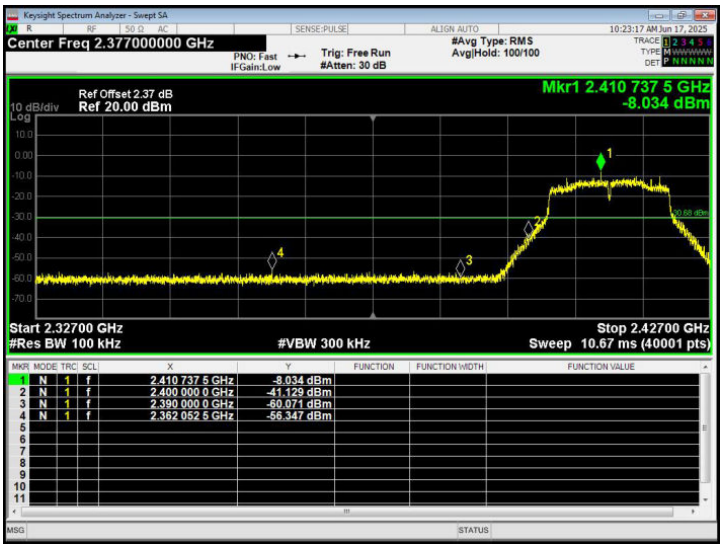
802.11g - Highest channel



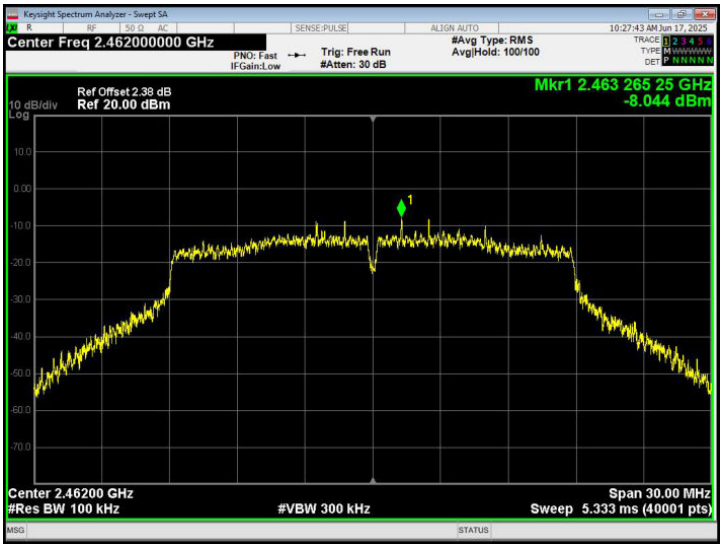


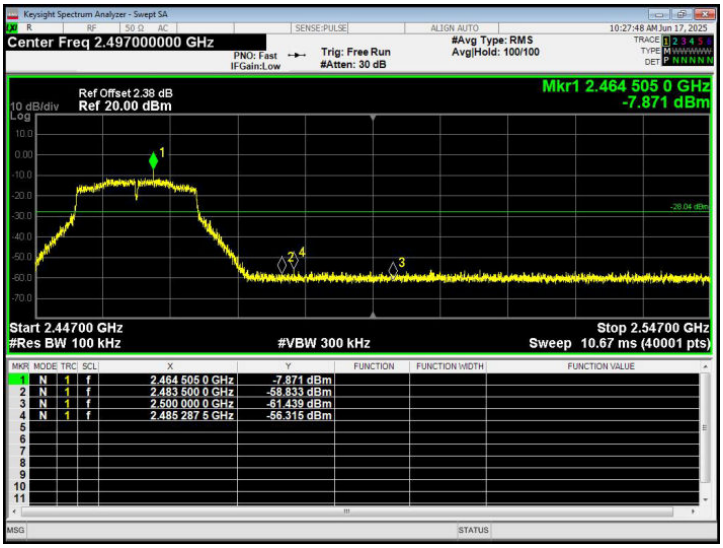
802.11n20 - Lowest channel





802.11n20 - Highest channel

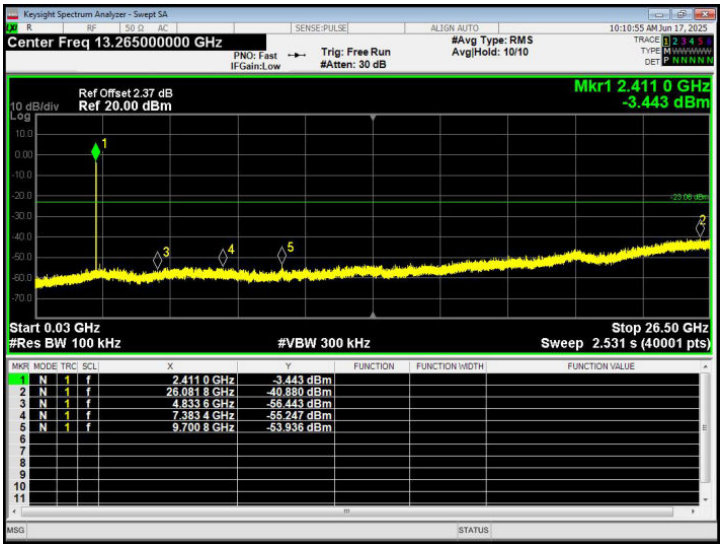




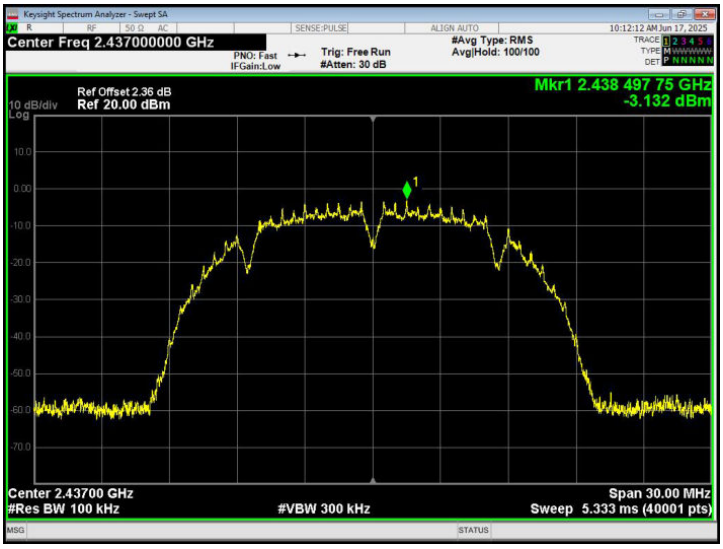
Spurious emission test plot as follows:

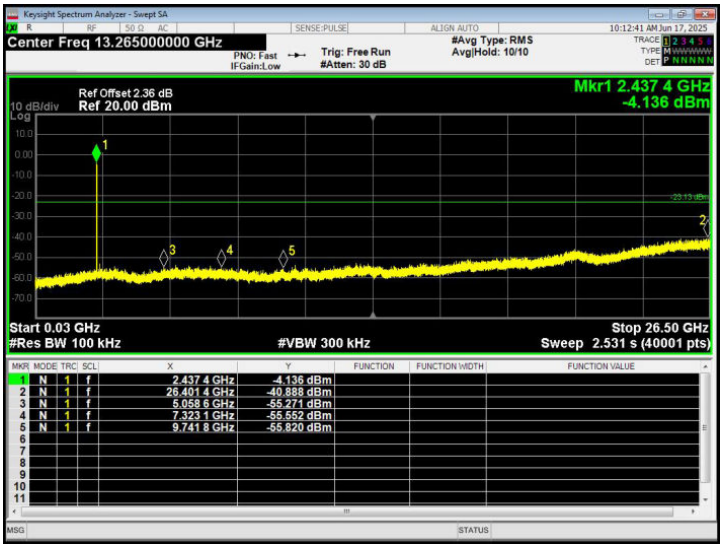
802.11b

Lowest channel

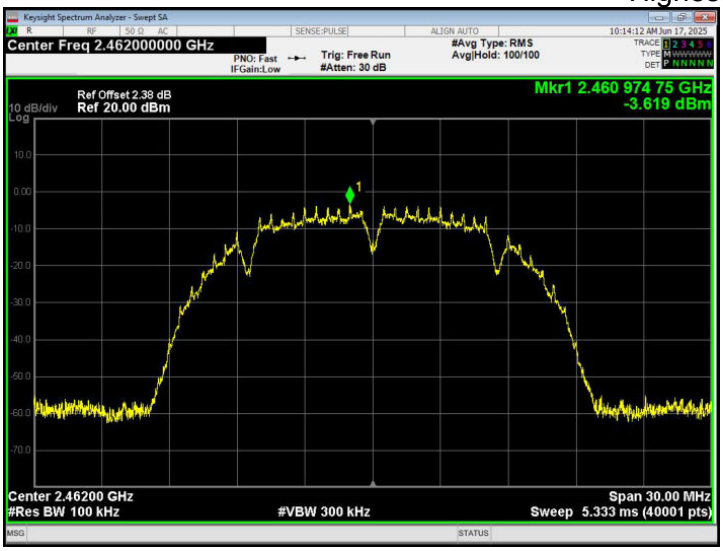


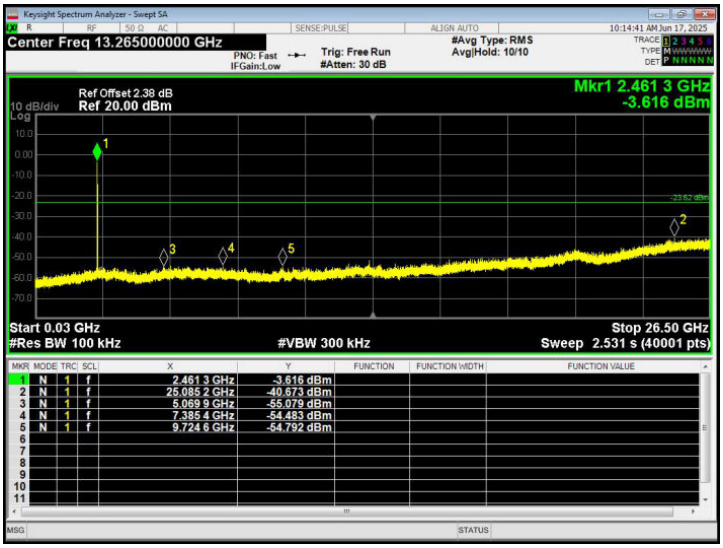
Middle channel





Highest channel

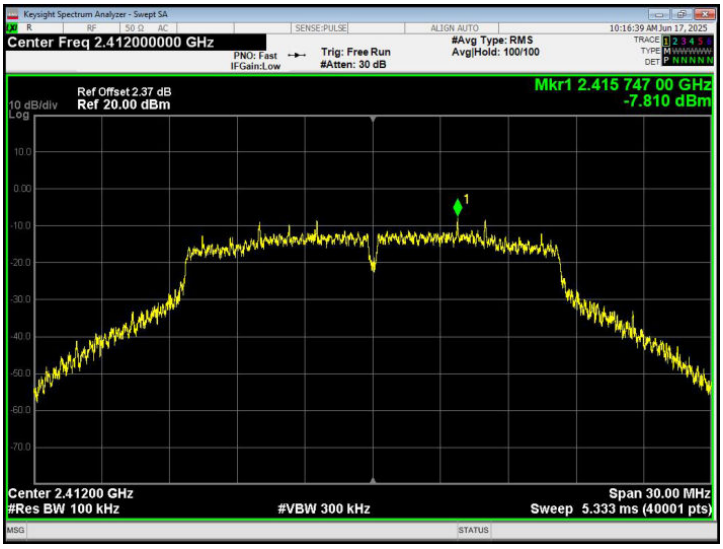


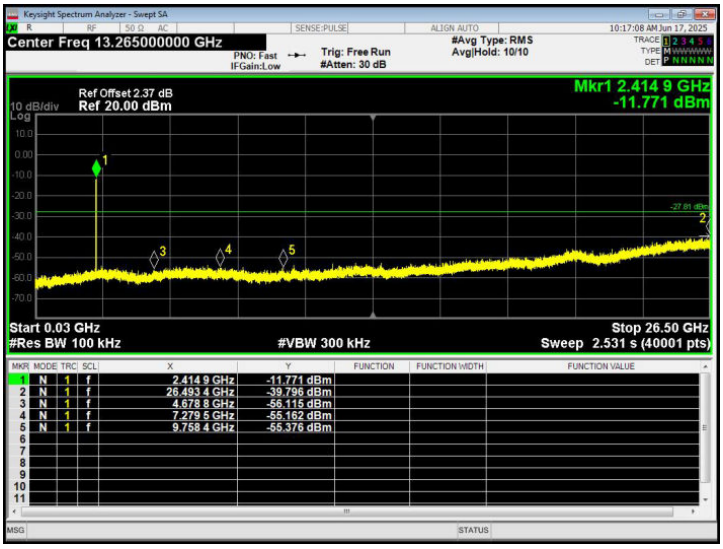


30MHz ~ 26.5GHz

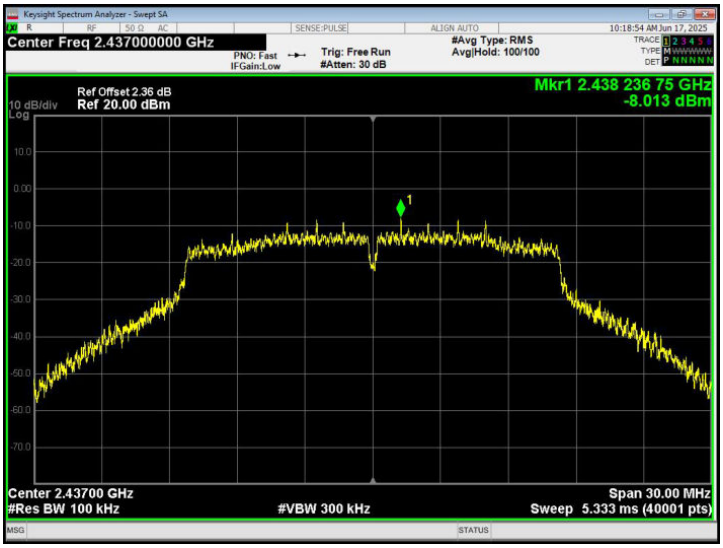
802.11g

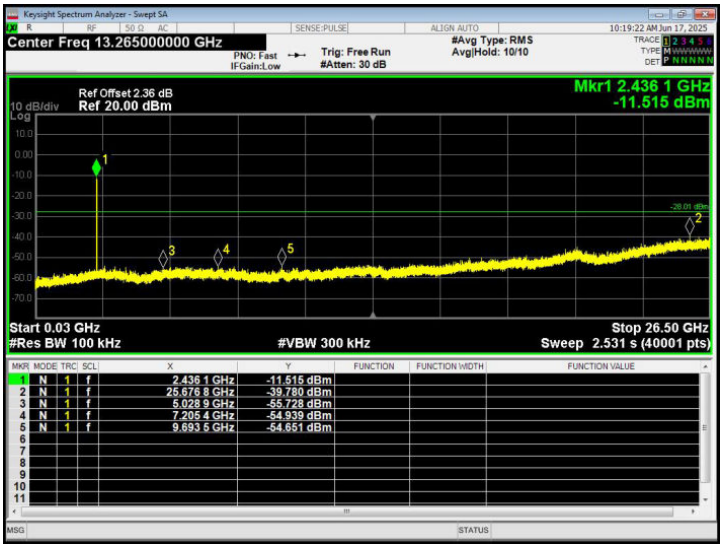
Lowest channel



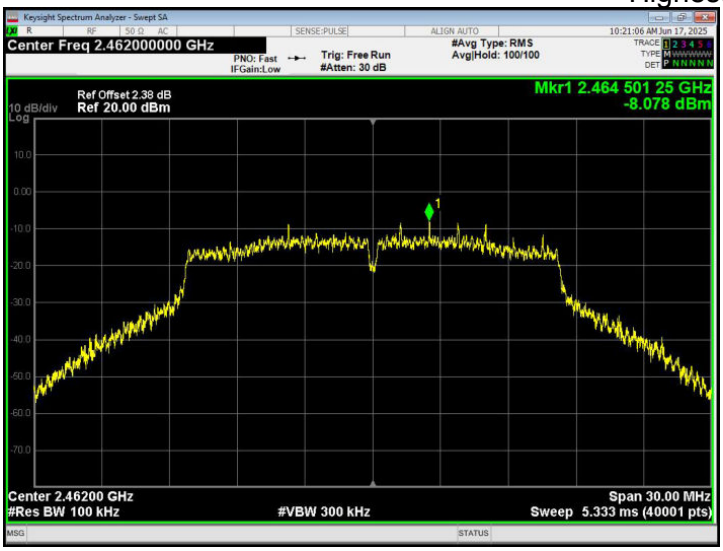


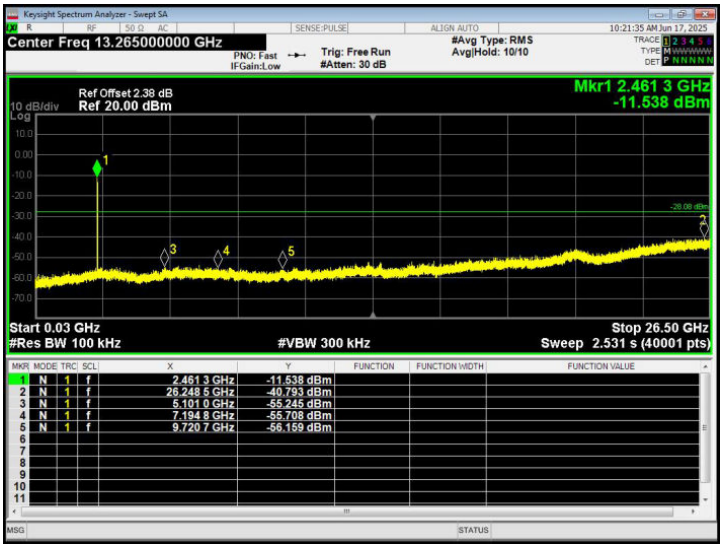
Middle channel





Highest channel

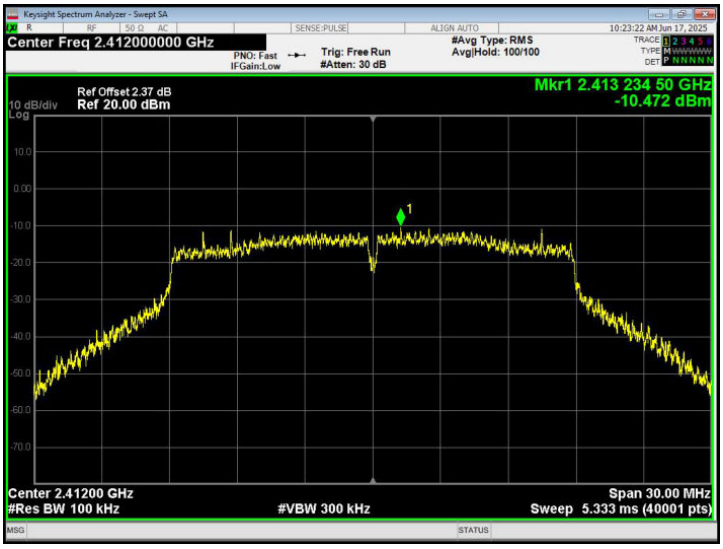


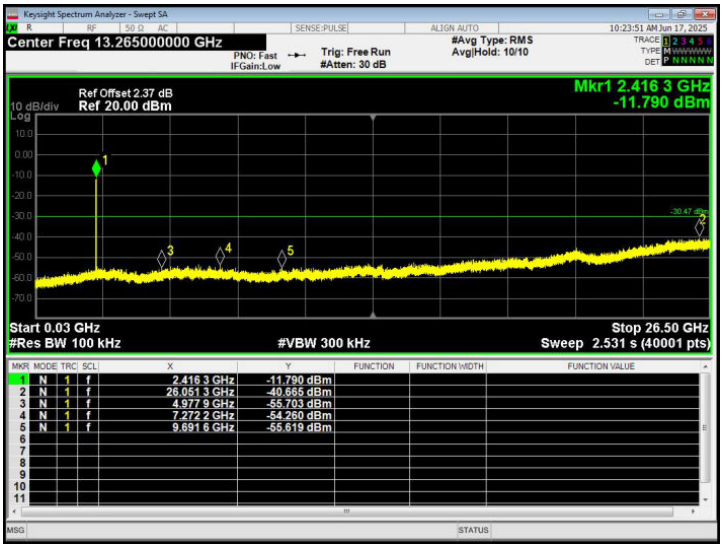


30MHz ~ 26.5GHz

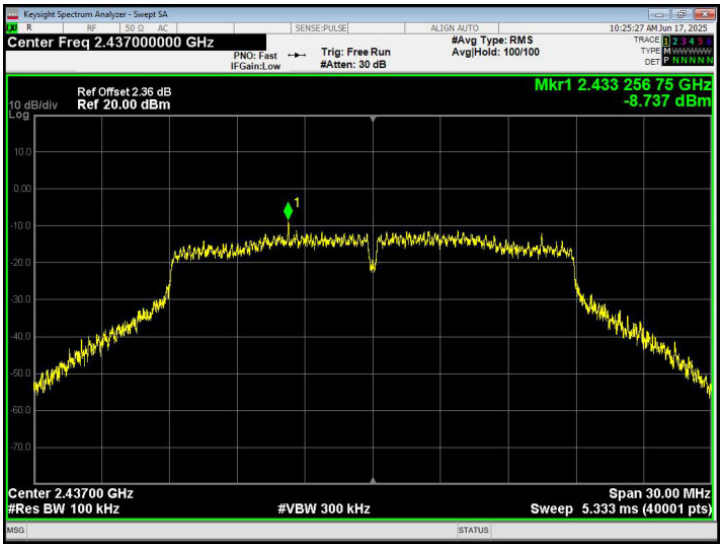
802.11n20

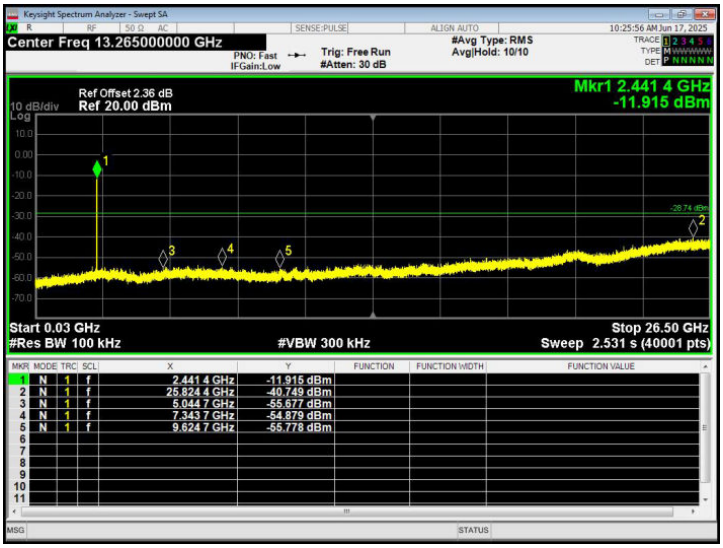
Lowest channel



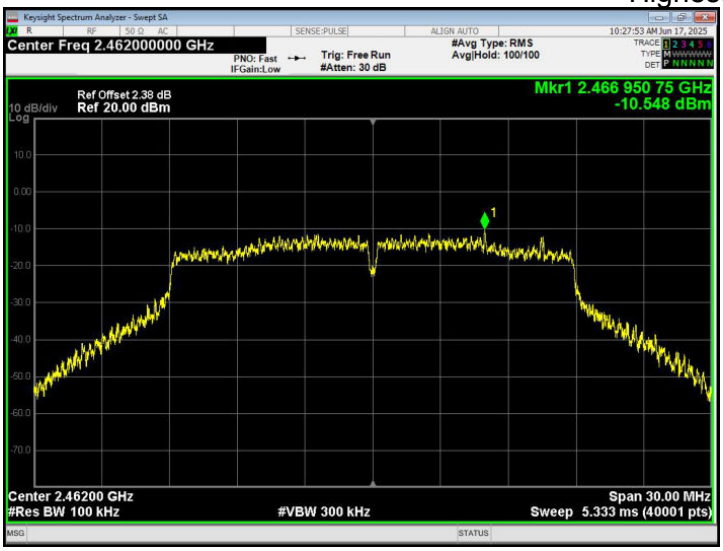


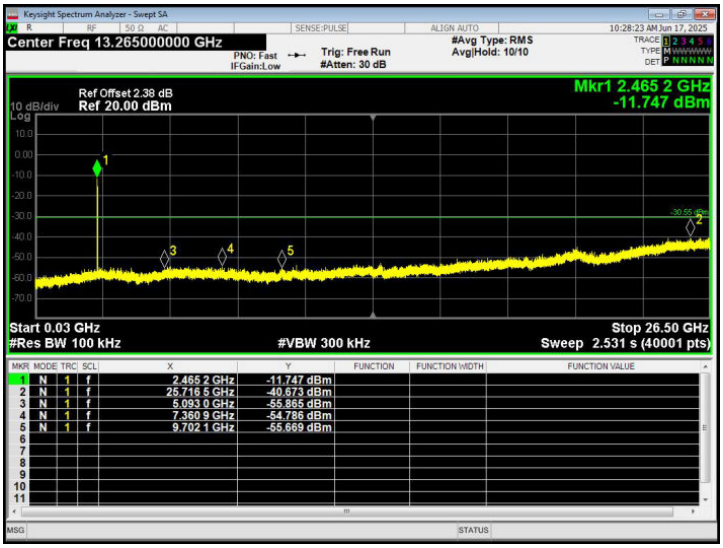
Middle channel





Highest channel





30MHz ~ 26.5GHz

10. DUTY CYCLE

Test Method:	ANSI C63.10:2013

10.1 APPLIED PROCEDURES / LIMIT

Measurements of duty cycle and transmission duration shall be performed using one of the following techniques:

a) A diode detector and an oscilloscope that together have a sufficiently short response time to permit accurate measurements of the ON and OFF times of the transmitted signal.

b) The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the ON and OFF times of the transmitted signal:

1) Set the center frequency of the instrument to the center frequency of the transmission.

2) Set RBW ≥ OBW if possible; otherwise, set RBW to the largest available value.

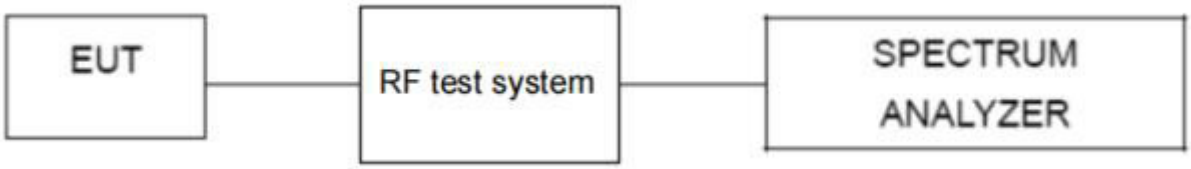
3) Set VBW ≥ RBW. Set detector = peak or average.

4) The zero-span measurement method shall not be used unless both RBW and VBW are > 50/*T* and the number of sweep points across duration *T* exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring the duty cycle shall not be used if $T \leq 16.7$ µs.)

10.2 DEVIATION FROM STANDARD

No deviation.

10.3 TEST SETUP



10.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of chapter 3, Unless otherwise a special operating condition is specified in the follows during the testing.

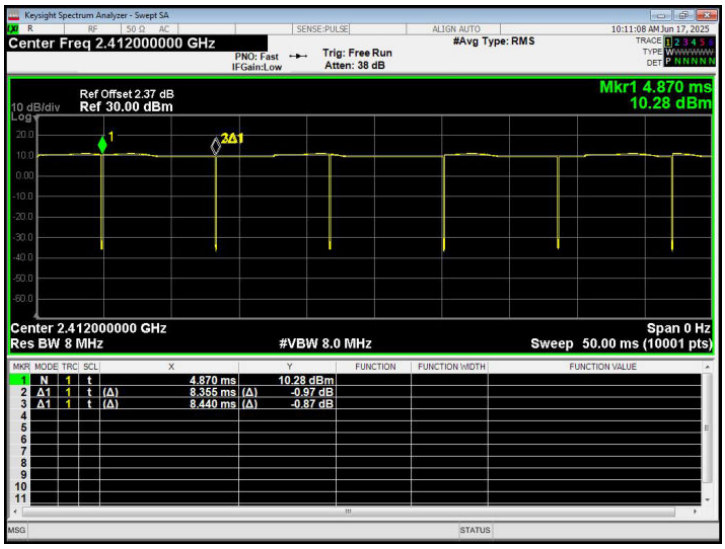
10.5 TEST RESULTS

Temperature :	26℃	Relative Humidity :	54%
Pressure :	101kPa	Test Voltage :	DC 12V From Adapter AC 120V/60Hz

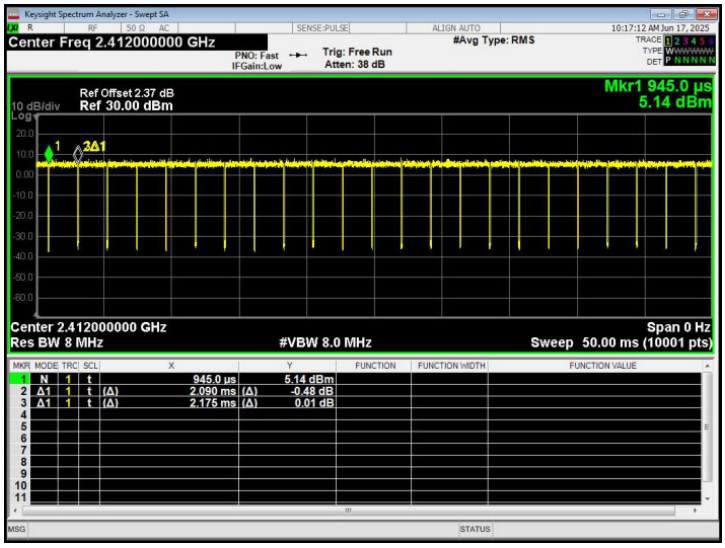
Test Mode	Test Frequency (MHz)	Duty Cycle (%)	Factor (dB)	Result
802.11b	2412	98.99	0.04	Pass
802.11g	2412	96.09	0.17	Pass
802.11n20	2412	98.94	0.05	Pass

Note: Duty Cycle = Ton / Total * 100%;
Duty Cycle Correction Factor = 10log (1/Duty Cycle).

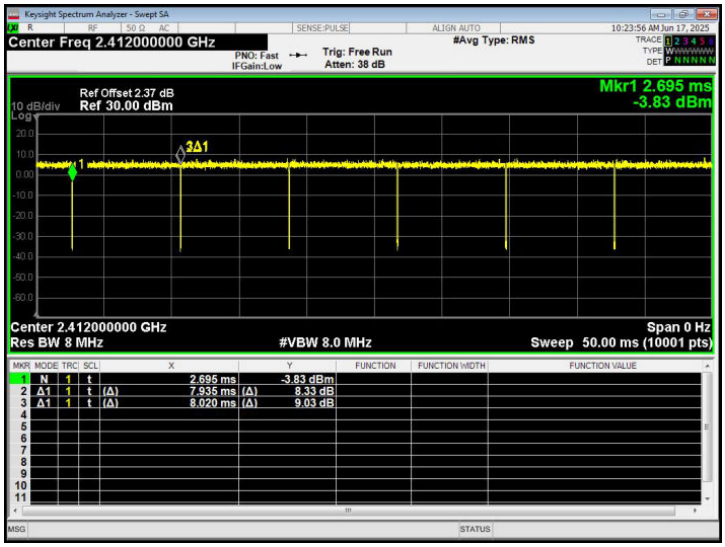
802.11b 2412MHz



802.11g 2412MHz



802.11n20 2412MHz



Note: All channel have been tested, and the report only reflects the worst case data.

11. ANTENNA REQUIREMENT

Standard requirement:	FCC Part15 C Section 15.203 /247(c)
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. 15.247(c) (1)(i) requirement: (i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.	
EUT Antenna:	
The antenna is FPC antenna (with non-standard antenna jack), the best case gain of the antenna is 5.55dBi, reference to the appendix II for details.	

12. TEST SETUP PHOTO

Reference to the appendix I for details.

13. EUT CONSTRUCTIONAL DETAILS

Reference to the appendix II for details.

※※※※※ **END OF REPORT** ※※※※※