RF Test Report
FCC ID: 2BAIG-TAS002
IC: 30210-TAS002

Applicant:	Motive Force Technology Limited
Address:	Unit 2703-04, 27/F, 9 Chong Yip Street, Kwun Tong, Hong Kong
Manufacturer:	Motive Force Technology Limited
Address:	Unit 2703-04, 27/F, 9 Chong Yip Street, Kwun Tong, Hong Kong
EUT:	Silvermove
Trade Mark:	N/A
Model Number:	TAS002
Date of Receipt:	Mar. 06, 2023
Test Date:	Mar. 06, 2023 - Mar. 16, 2023
Date of Report:	Mar. 16, 2023
Prepared By:	Shenzhen DL Testing Technology Co., Ltd.
Address:	101-201, Building C, Shuanghuan, No.8, Baoqing Road, Baolong Industrial Zone, Baolong Street, Longgang District, Shenzhen, Guangdong, China
Applicable Standards:	FCC PART 15 C 15.247 RSS-247 Issue2:Feb 2017 ANSI C63.10:2013
Test Result:	Pass
Report Number:	DL-20230310051E

Prepared (Test Engineer):	Pxing Huang
Reviewer (Supervisor):	Jack Bu
Approved (Manager):	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.

Table of Contents **Page**

1. SUMMARY OF TEST RESULTS 5
1.1 MEASUREMENT UNCERTAINTY 5
2. GENERAL INFORMATION 6
2.1 GENERAL DESCRIPTION OF EUT 6
2.2 DESCRIPTION OF TEST MODES 7
2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED 7
2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE) 8
2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS 9
3. EMC EMISSION TEST 10
3.1 CONDUCTED EMISSION MEASUREMENT 10
3.2 POWER LINE CONDUCTED EMISSION Limits 10
3.3TEST PROCEDURE 10
3.4 DEVIATION FROM TEST STANDARD 10
3.5 TEST SETUP 11
3.6 EUT OPERATING CONDITIONS 11
3.7 TEST RESULTS 11
4. RADIATED EMISSION MEASUREMENT 14
4.1 RADIATED EMISSION LIMITS 14
4.2 TEST PROCEDURE 15
4.3 DEVIATION FROM TEST STANDARD 15
4.4 TEST SETUP 15
4.5 EUT OPERATING CONDITIONS 16
4.6 TEST RESULTS 16
5. RADIATED BAND EMISSION MEASUREMENT 19
5.1 TEST REQUIREMENT: 20
5.2 TEST PROCEDURE 20
5.3 DEVIATION FROM TEST STANDARD 20
5.4 TEST SETUP 21
5.5 EUT OPERATING CONDITIONS 21
5.6 TEST RESULT 22

Table of Contents **Page**

6. PEAK OUTPUT POWER 23
6.1 APPLIED PROCEDURES / LIMIT 23
6.2 TEST PROCEDURE 23
6.3 DEVIATION FROM STANDARD 23
6.4 TEST SETUP 23
6.5 EUT OPERATION CONDITIONS 23
6.6 TEST RESULTS 23
7. POWER SPECTRAL DENSITY TEST 24
7.1 APPLIED PROCEDURES / LIMIT 24
7.2 TEST PROCEDURE 24
7.3 DEVIATION FROM STANDARD 24
7.4 TEST SETUP 24
7.5 EUT OPERATION CONDITIONS 24
7.6 TEST RESULTS 25
8. 6DB BANDWIDTH TEST 30
8.1 APPLIED PROCEDURES / LIMIT 30
8.2 TEST PROCEDURE 30
8.3 DEVIATION FROM STANDARD 30
8.4 TEST SETUP 30
8.5 EUT OPERATION CONDITIONS 30
8.6 TEST RESULTS 30
9. OUT OF BAND EMISSIONS TEST 41
9.1 APPLIED PROCEDURES / LIMIT 41
9.2 TEST PROCEDURE 41
9.3 DEVIATION FROM STANDARD 41
9.4 TEST SETUP 41
9.5 EUT OPERATION CONDITIONS 41
9.6 TEST RESULTS 41
10. SPURIOUS RF CONDUCTED EMISSION 45
10.1 APPLIED PROCEDURES / LIMIT 45
10.2 TEST PROCEDURE 45

Table of Contents **Page**

10.3 DEVIATION FROM STANDARD 45
10.4 TEST SETUP 45
10.5 EUT OPERATION CONDITIONS 45
10.6 TEST RESULTS 46
11. ANTENNA REQUIREMENT 51
11.1 STANDARD REQUIREMENT 51
11.2 EUT ANTENNA 51
12. TEST SEUUP PHOTO 52

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.247) , Subpart C & RSS-247			
Standard Section	Test Item	Judgment	Remark
15.207&RSS-Gen §8.8	Conducted Emission	PASS	
15.247(c)&RSS-247 §5.5	Radiated Spurious Emission	PASS	
15.205&RSS-247 §5.5	Band Edge Emission	PASS	
15.247(b)(1)&RSS-247 §5.4	Peak Output Power	PASS	
15.247(a)(2)&RSS-Gen §6.7	Occupied Bandwidth	PASS	
15.247(e)&RSS-247 §5.2	Power Spectral Density	PASS	
15.247(d)&RSS-247 §5.5	Band edge measurements	PASS	
15.247(d)&RSS-247 §5.5	Conducted Spurious Emission	PASS	
15.203	Antenna Requirement	PASS	

NOTE:

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

1.1 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	Conducted Emission Test	±2.56dB
2	RF power,conducted	±0.42dB
3	Spurious emissions,conducted	±2.76dB
4	All emissions,radiated(<1G)	±3.65dB
5	All emissions,radiated(>1G)	±4.89dB
6	Temperature	±0.5°C
7	Humidity	±2%

1.2 TEST FACILTY

Shenzhen DL Testing Technology Co., Ltd.
Add.: 101-201, Building C, Shuanghuan, No.8, Baoqing Road, Baolong Industrial Zone, Baolong Street, Longgang District, Shenzhen, Guangdong, China

FCC Test Firm Registration Number: 854456
Designation Number: CN1307
IC Registtered No.: CN0118

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product Name:	Silvermove
Trademark:	N/A
Model No.:	TAS002
Model Difference:	N/A
Sample No.:	DL-20230310051#
Operation Frequency:	WIFI: 2412~2462 MHz for 802.11b/g/nHT20
Channel Numbers:	11 Channels for 802.11b/g/n(HT20) for WIFI
Channel Separation:	5MHz for WIFI
Modulation Type:	DSSS, OFDM for WIFI
Antenna Type:	PCB Antenna
Antenna Gain:	0 dBi
Power Supply:	DC 5V/1000mA from Adapter
Battery:	Li-ion, 3.7V, 850mAh, 3.145Wh

Note:

1.For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2.The EUT's all information provided by client.

3.Channel List

WIFI

Channel	Frequency (GHz)	Channel	Frequency (GHz)
01	2.412	06	2.437
02	2.417	07	2.442
03	2.422	08	2.447
04	2.427	09	2.452
05	2.432	10	2.457
11	2.462		

2.2 DESCRIPTION OF TEST MODES

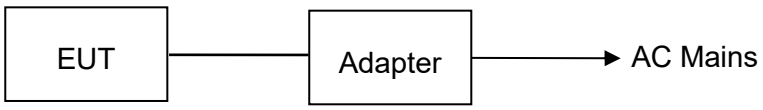
To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description for WIFI
	802.11b
Mode 1	2412MHz
Mode 2	2437MHz
Mode 3	2462MHz
Pretest Mode	Description for WIFI
	802.11g
Mode 4	2412MHz
Mode 5	2437MHz
Mode 6	2462MHz
Pretest Mode	Description for WIFI
	802.11n (20MHz)
Mode 7	2412MHz
Mode 8	2437MHz
Mode 9	2462MHz

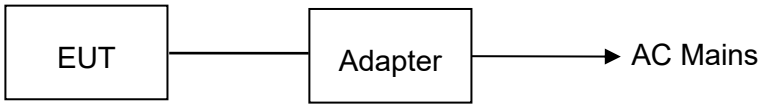
Remark: N/A

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated Spurious Emission Test



Conducted Spurious Emission Test



2.4 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	Model/Type No.	Series No.	Note
1	Notebook	Lenovo G475	GB14477457	AE
2	Adapter	GAT-0501000U	N/A	AE

Item	Shielded Type	Ferrite Core	Length	Note

Note:

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

2.5 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. 05, 2022	Nov. 04, 2023
2	Test Receiver (9kHz-7GHz)	R&S	ESRP7	101393	Nov. 05, 2022	Nov. 04, 2023
3	Bilog Antenna (30MHz-1GHz)	R&S	VULB9162	00306	Nov. 05, 2022	Nov. 04, 2023
4	Horn Antenna (1GHz-18GHz)	Schwarzbeck	BBHA9120D	02139	Nov. 05, 2022	Nov. 04, 2023
5	Horn Antenna (18GHz-40GHz)	A.H. Systems	SAS-574	588	Nov. 05, 2022	Nov. 04, 2023
6	Amplifier (9KHz-6GHz)	Schwarzbeck	BBV9743B	00153	Nov. 05, 2022	Nov. 04, 2023
7	Amplifier (1GHz-18GHz)	EMEC	EM01G8GA	00270	Nov. 05, 2022	Nov. 04, 2023
8	Amplifier (18GHz-40GHz)	Quanjuda	DLE-161	97	Nov. 05, 2022	Nov. 04, 2023
9	Loop Antenna (9KHz-30MHz)	Schwarzbeck	FMZB1519B	00014	Nov. 05, 2022	Nov. 04, 2023
10	RF cables1 (9kHz-1GHz)	ChengYu	966	004	Nov. 05, 2022	Nov. 04, 2023
11	RF cables2 (1GHz-40GHz)	ChengYu	966	003	Nov. 05, 2022	Nov. 04, 2023
12	Antenna connector	Florida RF Labs	N/A	RF 01#	Nov. 05, 2022	Nov. 04, 2023
13	Power probe	KEYSIGHT	U2021XA	MY55210018	Nov. 05, 2022	Nov. 04, 2023
14	Signal Analyzer 9kHz-26.5GHz	Agilent	N9020A	MY55370280	Nov. 05, 2022	Nov. 04, 2023
15	Test Receiver 20kHz-40GHz	R&S	ESU 40	100376	Nov. 05, 2022	Nov. 04, 2023
16	D.C. Power Supply	LongWei	PS-305D	010964729	Nov. 05, 2022	Nov. 04, 2023

Conduction Test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	843 Shielded Room	ChengYu	843 Room	843	Sep. 20, 2022	Sep. 19, 2023
2	EMI Receiver	R&S	ESR	101421	Nov. 05, 2022	Nov. 04, 2023
3	LISN	Schwarzbeck	NNLK 8128	5089	Nov. 05, 2022	Nov. 04, 2023
4	843 Cable 1#	ChengYu	CE Cable	001	Nov. 05, 2022	Nov. 04, 2023

Other

Item	Name	Manufacturer	Model	Software version
1	EMC Conduction Test System	AUDIX	e3	6.101223a
2	EMC radiation test system	AUDIX	e3	210616 crt-emc
3	RF test system	MAIWEI	MTS8310	2.0.0.0
4	RF communication test system	MAIWEI	MTS8200	2.0.0.0

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.2 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

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) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.3TEST 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.

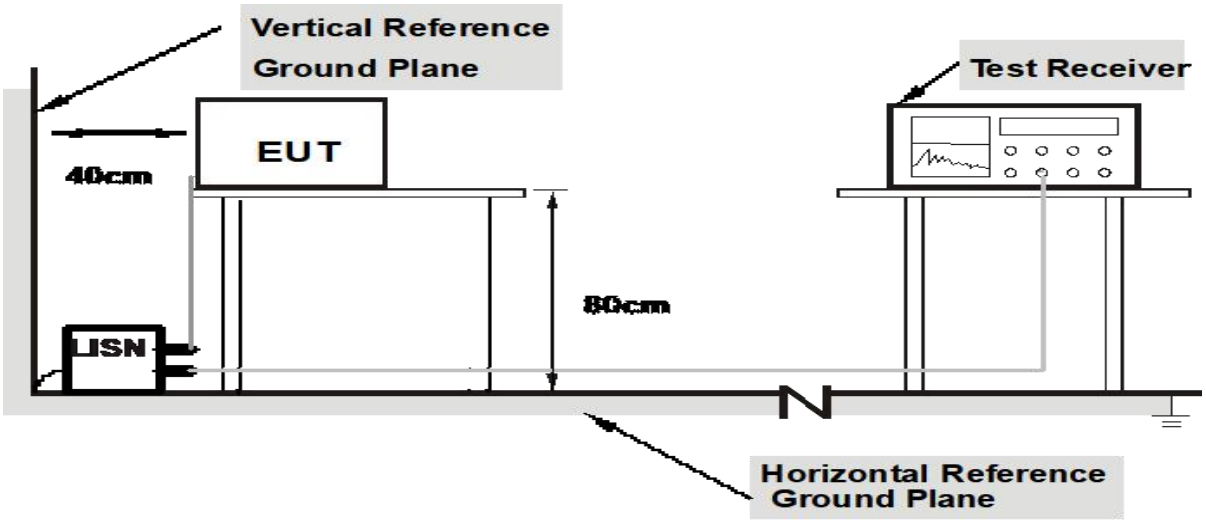
d. LISN at least 80 cm from nearest part of EUT chassis.

e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.4 DEVIATION FROM TEST STANDARD

No deviation

3.5 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

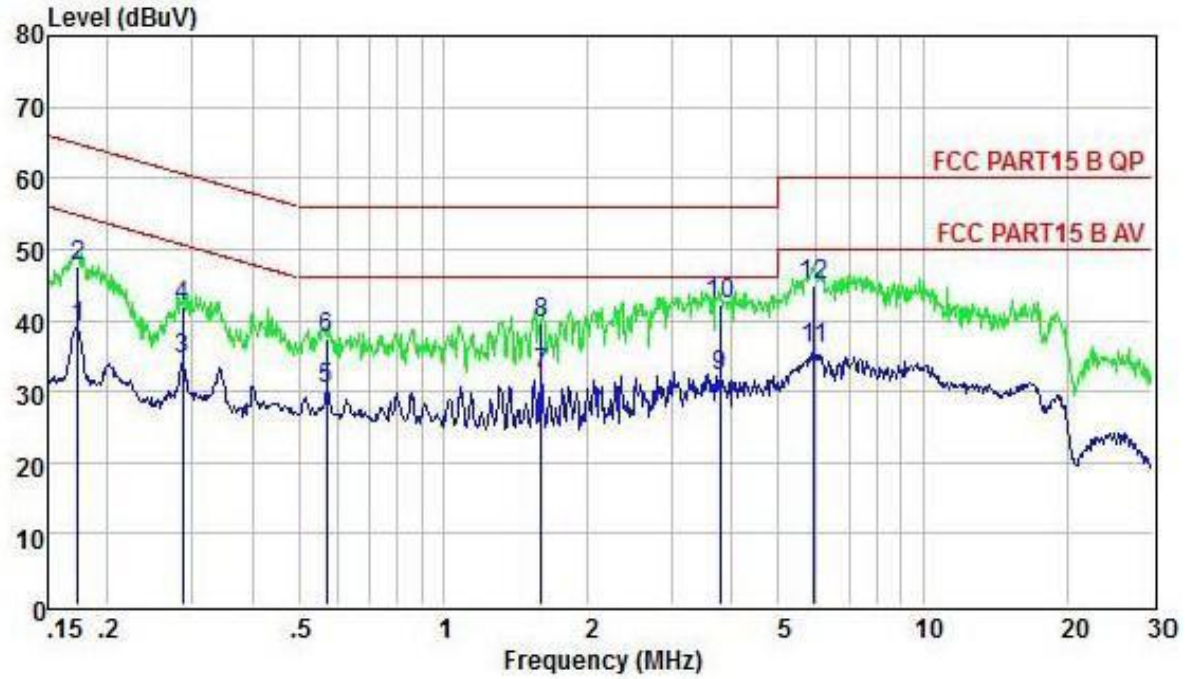
3.6 EUT OPERATING CONDITIONS

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.

3.7 TEST RESULTS

Note: 1. All modes were tested at AC 120V and 240V, only the worst result of AC 120V was reported.
2. All modes were Pre tested, and only worst mode 1was reported in the report.

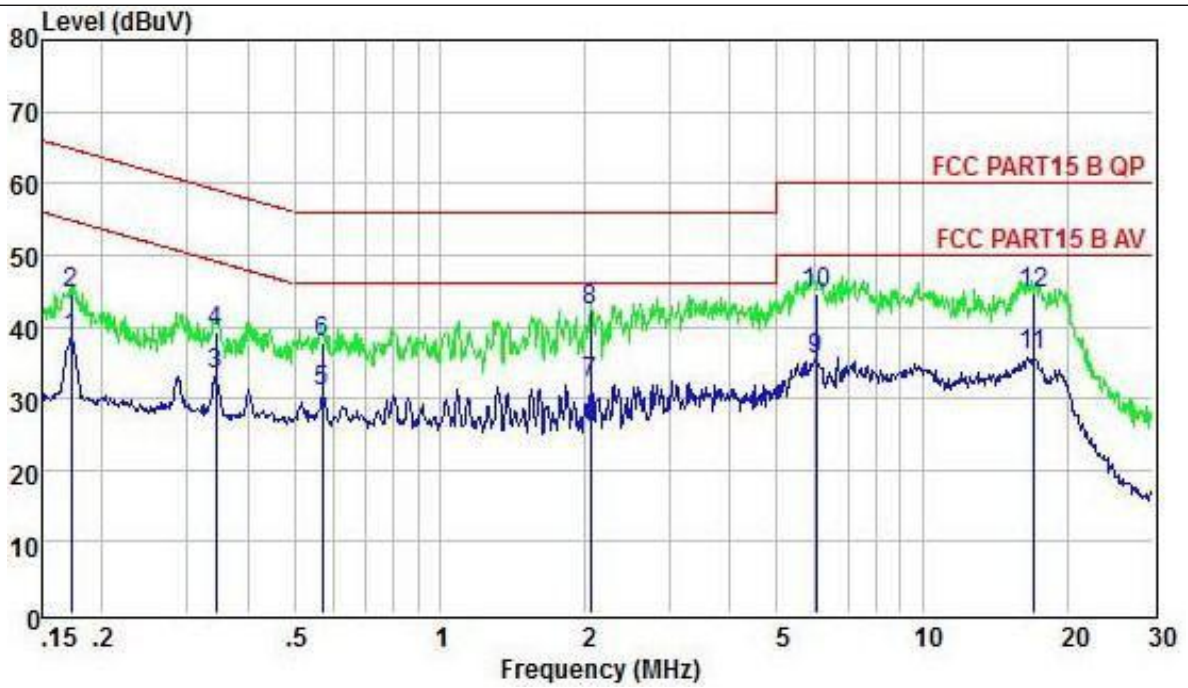
Temperature:	25 ℃	Relative Humidity:	54%
Pressure:	1010hPa	Phase :	L
Test Voltage:	AC 120V/60Hz		
Test Mode:	Mode 1		



Remark:
Over Limit = Limit – Level

	Freq	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	
1	0.17	39.06	54.81	-15.75	Average
2	0.17	47.50	64.81	-17.31	QP
3	0.29	34.36	50.63	-16.27	Average
4	0.29	42.06	60.63	-18.57	QP
5	0.57	30.48	46.00	-15.52	Average
6	0.57	37.48	56.00	-18.52	QP
7	1.60	32.53	46.00	-13.47	Average
8	1.60	39.50	56.00	-16.50	QP
9	3.78	31.98	46.00	-14.02	Average
10	3.78	42.22	56.00	-13.78	QP
11	5.93	35.92	50.00	-14.08	Average
12	5.93	44.98	60.00	-15.02	QP

Temperature:	25 ℃	Relative Humidity:	54%
Pressure:	1010hPa	Phase :	N
Test Voltage:	AC 120V/60Hz		
Test Mode:	Mode 1		



Remark:
Over Limit = Limit – Level

	Freq	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	
1	0.17	38.43	54.86	-16.43	Average
2	0.17	44.60	64.86	-20.26	QP
3	0.34	33.29	49.09	-15.80	Average
4	0.34	39.20	59.09	-19.89	QP
5	0.57	30.80	46.00	-15.20	Average
6	0.57	37.87	56.00	-18.13	QP
7	2.05	32.07	46.00	-13.93	Average
8	2.05	42.26	56.00	-13.74	QP
9	6.02	35.49	50.00	-14.51	Average
10	6.02	44.50	60.00	-15.50	QP
11	16.93	35.88	50.00	-14.12	Average
12	16.93	44.50	60.00	-15.50	QP

4. RADIATED EMISSION MEASUREMENT

4.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

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 (Above 1000MHz)

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).

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	25GHz
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

4.2 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-anechoic 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 (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

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 metre to 1.5 metre(Above 18GHz the distance is 1 meter and table is 1.5 metre).
h. Test the EUT in the lowest channel, the middle channel, the Highest channel

Note:

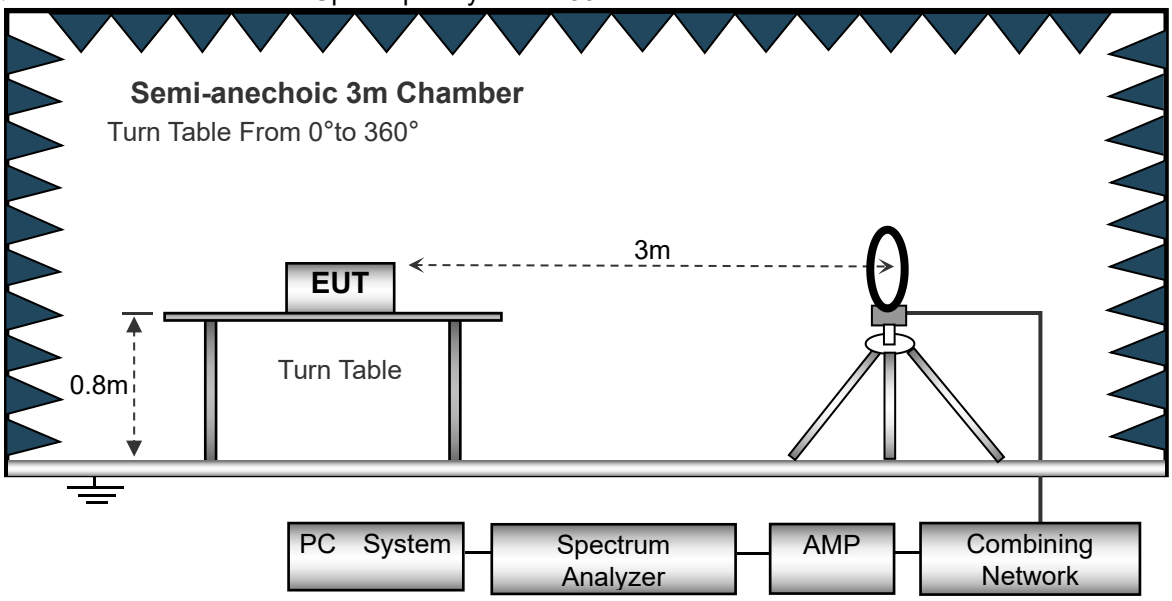
Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

4.3 DEVIATION FROM TEST STANDARD

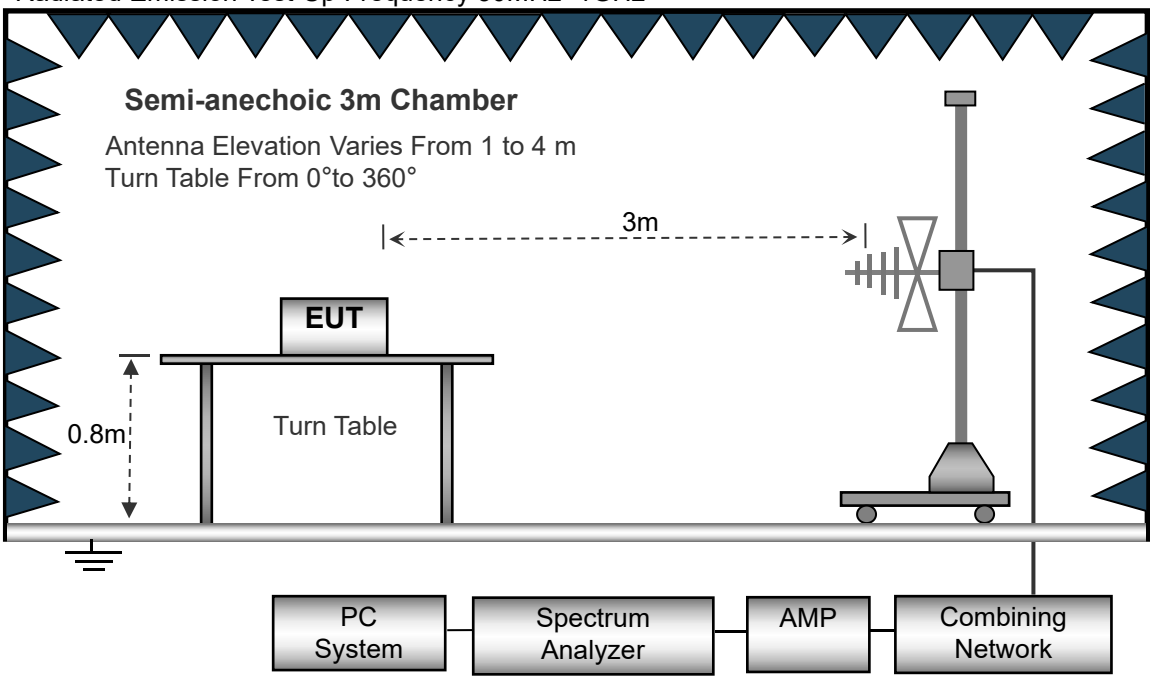
No deviation

4.4 TEST SETUP

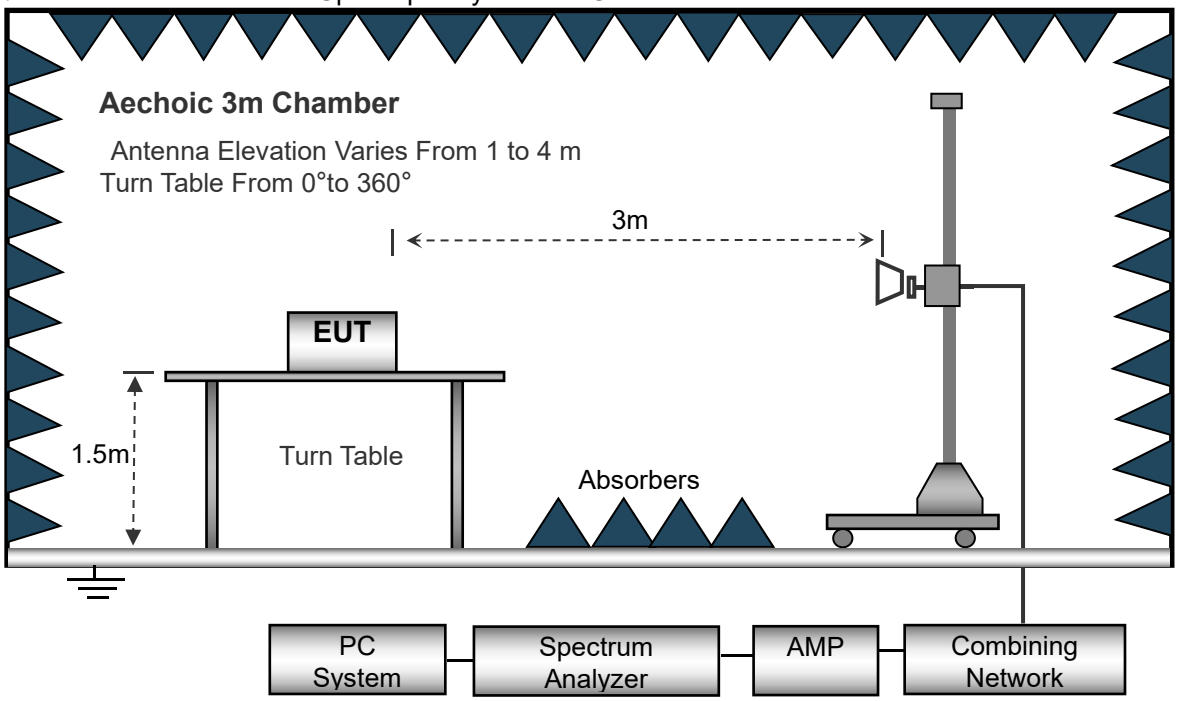
（A）Radiated Emission Test-Up Frequency Below 30MHz



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



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



4.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

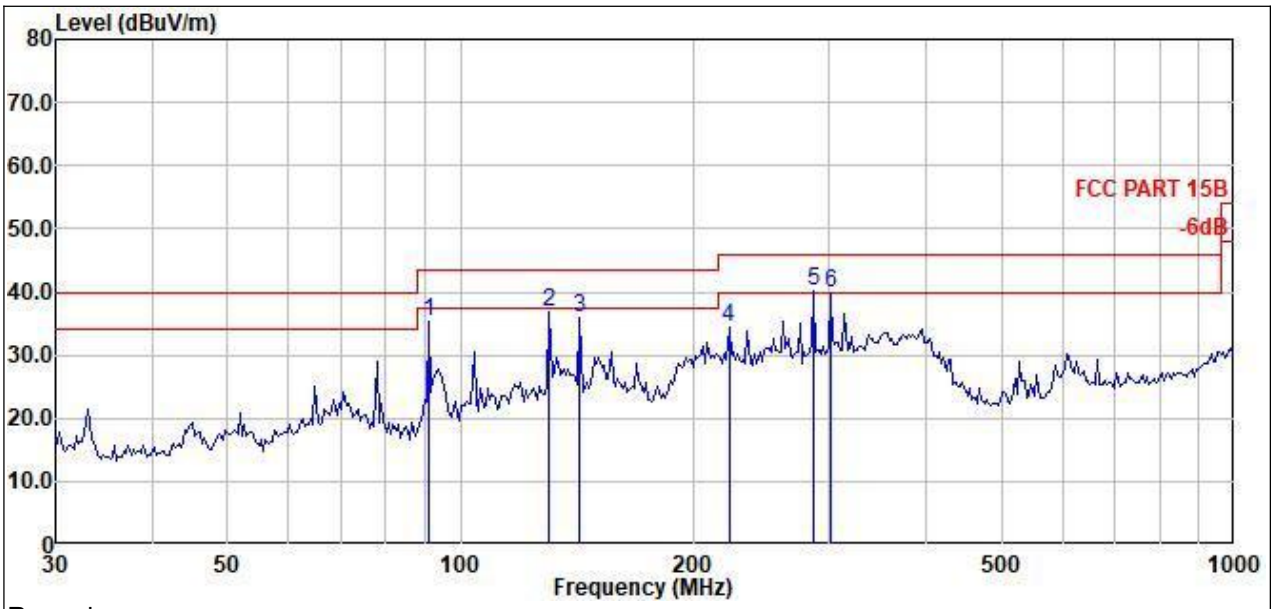
4.6 TEST RESULTS

Note: 1. All modes were Pre tested, and only worst mode 1was reported in the report.

2. By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that “Z axis” position was the worst, and test data recorded in this report.

Below 1GHz Test Results

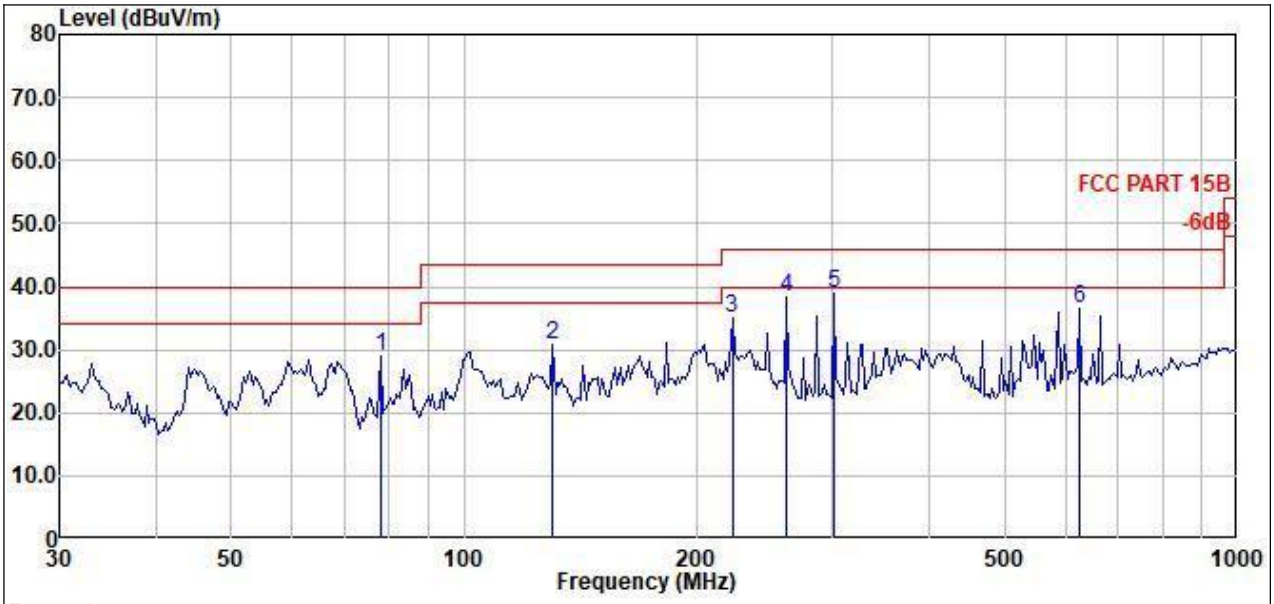
Temperature:	26℃	Relative Humidity:	54%
Pressure:	1010 hPa	Polarization :	Horizontal
Test Voltage :	AC 120V/60Hz		
Test Mode :	Mode 1		



Remark:
Correct Factor = Cable loss + Antenna factor – Preamplifier;
Level = Reading Level + Correct Factor; Margin = Limit – Level;

	Freq	Read Level	Level	Factor	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dBuV/m	dB/m	dBuV/m	dB		
1	91.057	59.56	35.27	-24.29	43.50	-8.23	Horizontal	QP
2	130.305	57.35	36.79	-20.56	43.50	-6.71	Horizontal	QP
3	142.769	55.50	35.89	-19.61	43.50	-7.61	Horizontal	QP
4	222.281	55.65	34.55	-21.10	46.00	-11.45	Horizontal	QP
5	286.265	58.70	40.09	-18.61	46.00	-5.91	Horizontal	QP
6	300.699	57.95	39.82	-18.13	46.00	-6.18	Horizontal	QP

Temperature:	26℃	Relative Humidity:	54%
Pressure:	1010 hPa	Polarization :	Vertical
Test Voltage :	AC 120V/60Hz		
Test Mode :	Mode 1		



Remark:

Correct Factor = Cable loss + Antenna factor – Preamplifier;

Level = Reading Level + Correct Factor; Margin = Limit – Level;

	Freq	Read Level	Level	Factor	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dBuV/m	dB/m	dBuV/m	dB		
1	78.014	53.20	28.88	-24.32	40.00	-11.12	Vertical	QP
2	130.305	51.47	30.91	-20.56	43.50	-12.59	Vertical	QP
3	222.281	56.15	35.05	-21.10	46.00	-10.95	Vertical	QP
4	261.273	57.88	38.31	-19.57	46.00	-7.69	Vertical	QP
5	300.699	57.10	38.97	-18.13	46.00	-7.03	Vertical	QP
6	624.490	47.58	36.65	-10.93	46.00	-9.35	Vertical	QP

Above 1GHz Test Results
(WIFI: 802.11b Worst Case)

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Mode 1: 2412MHz									
V	4824.00	67.59	50.65	6.87	31.34	55.15	74.00	-18.85	PK
V	4824.00	56.36	50.65	6.87	31.34	43.92	54.00	-10.08	AV
V	7236.00	67.47	49.98	7.19	36.68	61.36	74.00	-12.64	PK
V	7236.00	51.9	49.98	7.19	36.68	45.79	54.00	-8.21	AV
V	16087.00	48.68	51.53	11.43	41.57	50.15	74.00	-23.85	PK
H	4824.00	66.48	50.65	6.72	31.34	53.89	74.00	-20.11	PK
H	4824.00	55.74	50.65	6.72	31.34	43.15	54.00	-10.85	AV
H	7236.00	69.26	49.98	7.19	36.68	63.15	74.00	-10.85	PK
H	7236.00	51.77	49.98	7.19	36.68	45.66	54.00	-8.34	AV
H	16087.00	49.19	51.53	11.43	41.57	50.66	74.00	-23.34	PK
Mode 2: 2437MHz									
V	4874.00	67.44	50.67	6.91	31.38	55.06	74.00	-18.94	PK
V	4874.00	55.75	50.67	6.91	31.38	43.37	54.00	-10.63	AV
V	7311.00	69.35	50.02	7.27	36.63	63.23	74.00	-10.77	PK
V	7311.00	53.18	50.02	7.27	36.63	47.06	54.00	-6.94	AV
V	16087.00	48.58	51.53	11.45	41.52	50.02	74.00	-23.98	PK
H	4874.00	66.27	50.67	6.91	31.38	53.89	74.00	-20.11	PK
H	4874.00	55.64	50.67	6.91	31.38	43.26	54.00	-10.74	AV
H	7311.00	69.37	50.02	7.27	36.63	63.25	74.00	-10.75	PK
H	7311.00	52.43	50.02	7.27	36.63	46.31	54.00	-7.69	AV
H	16087.00	48.85	51.53	11.45	41.52	50.29	74.00	-23.71	PK
Mode 3: 2462MHz									
V	4924.00	68.28	50.79	6.98	31.36	55.83	74.00	-18.17	PK
V	4924.00	55.69	50.79	6.98	31.36	43.24	54.00	-10.76	AV
V	7386.00	69.42	50.11	7.35	36.58	63.24	74.00	-10.76	PK
V	7386.00	53.39	50.11	7.35	36.58	47.21	54.00	-6.79	AV
V	16087.00	49.35	51.53	11.54	41.52	50.88	74.00	-23.12	PK
H	4924.00	67.24	50.79	6.98	31.36	54.79	74.00	-19.21	PK
H	4924.00	55.19	50.79	6.98	31.36	42.74	54.00	-11.26	AV
H	7386.00	67.12	50.11	7.35	36.58	60.94	74.00	-13.06	PK
H	7386.00	52.44	50.11	7.35	36.58	46.26	54.00	-7.74	AV
H	16087.00	49.89	51.53	11.54	41.52	51.42	74.00	-22.58	PK

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 EMISSION MEASUREMENT

5.1 TEST REQUIREMENT:

FCC Part15 C Section 15.209 and 15.205

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

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).

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	2300MHz
Stop Frequency	2520MHz
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz 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 1.5 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 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

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

Note:

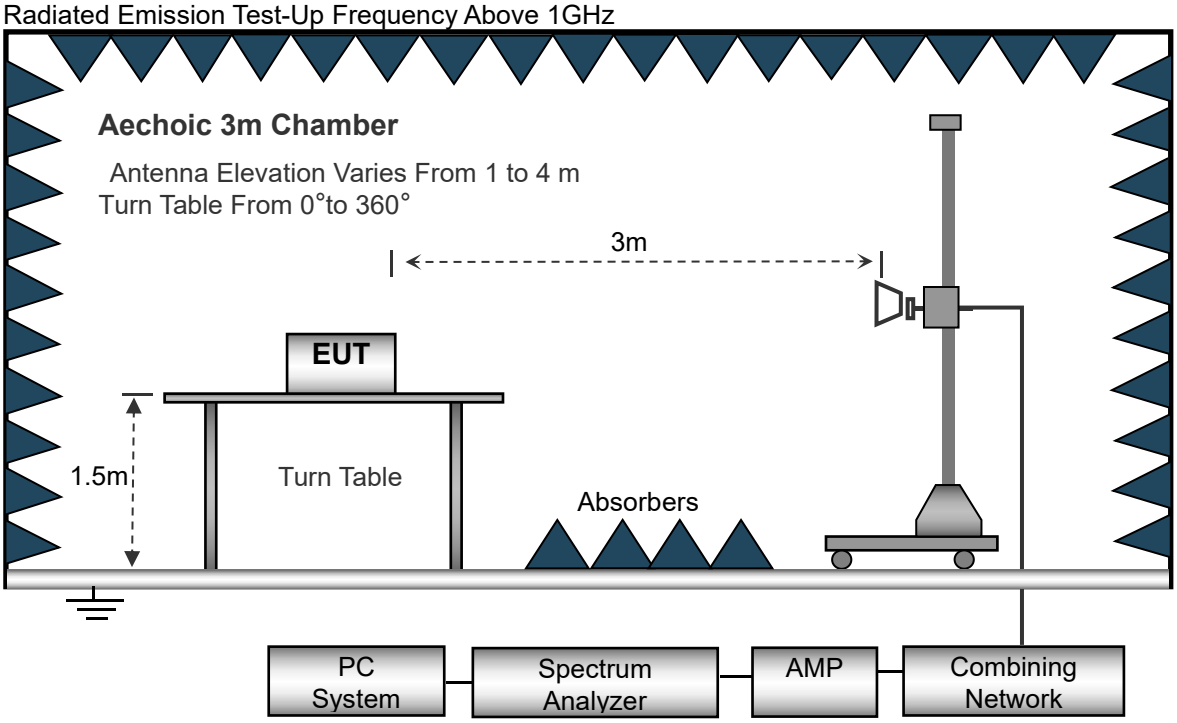
Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

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 tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

5.6 TEST RESULT

WIFI: 802.11b Worst Case

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Mode 1: 2412MHz									
V	2390.00	77.28	52.12	2.73	27.38	55.27	74.00	-18.73	PK
V	2390.00	66.15	52.12	2.73	27.38	44.14	54.00	-9.86	AV
V	2400.00	76.38	52.16	2.78	27.41	54.41	74.00	-19.59	PK
V	2400.00	64.81	52.16	2.78	27.41	42.84	54.00	-11.16	AV
H	2390.00	76.42	52.12	2.73	27.38	54.41	74.00	-19.59	PK
H	2390.00	65.25	52.12	2.73	27.38	43.24	54.00	-10.76	AV
H	2400.00	76.94	52.16	2.78	27.41	54.97	74.00	-19.03	PK
H	2400.00	65.59	52.16	2.78	27.41	43.62	54.00	-10.38	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
Mode 3: 2462MHz									
V	2483.50	77.11	52.23	2.86	27.44	55.18	74.00	-18.82	PK
V	2483.50	65.19	52.23	2.86	27.44	43.26	54.00	-10.74	AV
V	2500.00	76.96	52.26	2.88	27.49	55.07	74.00	-18.93	PK
V	2500.00	64.47	52.26	2.88	27.49	42.58	54.00	-11.42	AV
H	2483.50	76.58	52.23	2.86	27.44	54.65	74.00	-19.35	PK
H	2483.50	65.62	52.23	2.86	27.44	43.69	54.00	-10.31	AV
H	2500.00	76.33	52.26	2.88	27.49	54.44	74.00	-19.56	PK
H	2500.00	65.28	52.26	2.88	27.49	43.39	54.00	-10.61	AV

Remark:

1. Emission Level = Reading Level+Antenna Factor+Cable loss-Preamp Factor.
2.Over Limit= Absolute Level – Limit.
3.The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has not to be reported.
4.EUT Pre-scan X/Y/Z orientation, only worst case is presented in the report (Z orientation)

6. PEAK OUTPUT POWER

6.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C & RSS-247 & RSS-247				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(3)& RSS-247 §5.4	Peak Output Power	1 watt or 30dBm	2400-2483.5	PASS

6.2 TEST PROCEDURE

a. The EUT was directly connected to the power meter and antenna output port as show in the block diagram below,

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 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

6.6 TEST RESULTS

WIFI				
Test Mode	**Channel**	**Peak Power[dBm]**	**Conducted Limit[dBm]**	**Verdict**
11B	2412	5.66	≤30	PASS
	2437	5.49	≤30	PASS
	2462	5.70	≤30	PASS
11G	2412	5.82	≤30	PASS
	2437	5.76	≤30	PASS
	2462	5.89	≤30	PASS
11N20SISO	2412	5.98	≤30	PASS
	2437	5.83	≤30	PASS
	2462	5.94	≤30	PASS

7. POWER SPECTRAL DENSITY TEST

7.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C & RSS-247				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247& RSS-247 §5.2	Power Spectral Density	8 dBm (in any 3KHz)	2400-2483.5	PASS

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	= the frequency band of operation
RB	RBW ≥ 3kHz
VB	VBW ≥ 3RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

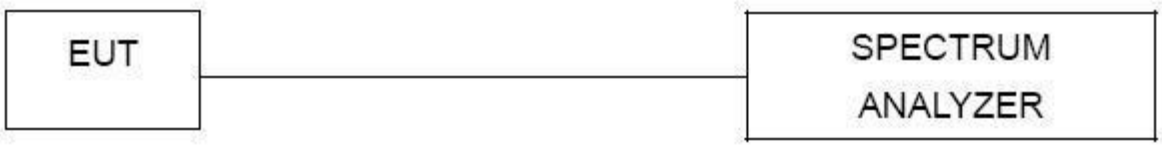
7.2 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,

7.3 DEVIATION FROM STANDARD

No deviation.

7.4 TEST SETUP



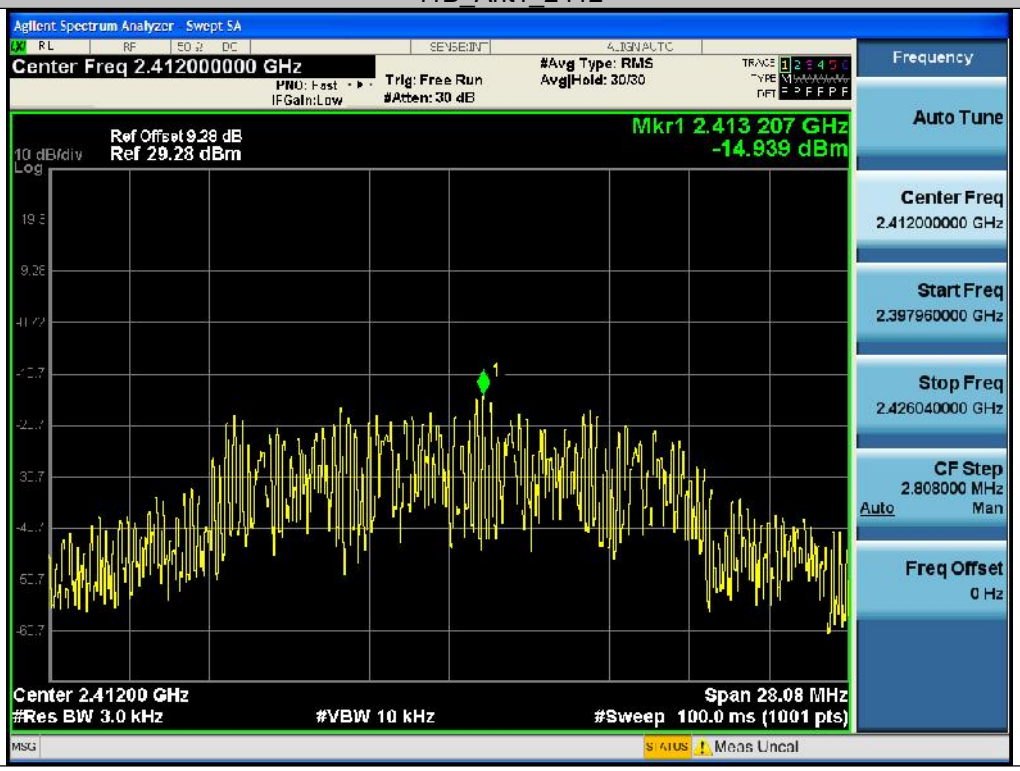
7.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

7.6 TEST RESULTS

WIFI				
TestMode	Channel	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
11B	2412	-14.94	≤8	PASS
	2437	-13.32	≤8	PASS
	2462	-13.48	≤8	PASS
11G	2412	-17.45	≤8	PASS
	2437	-16.41	≤8	PASS
	2462	-14.16	≤8	PASS
11N20SISO	2412	-19.14	≤8	PASS
	2437	-17.01	≤8	PASS
	2462	-12.66	≤8	PASS

11B_Ant1_2412

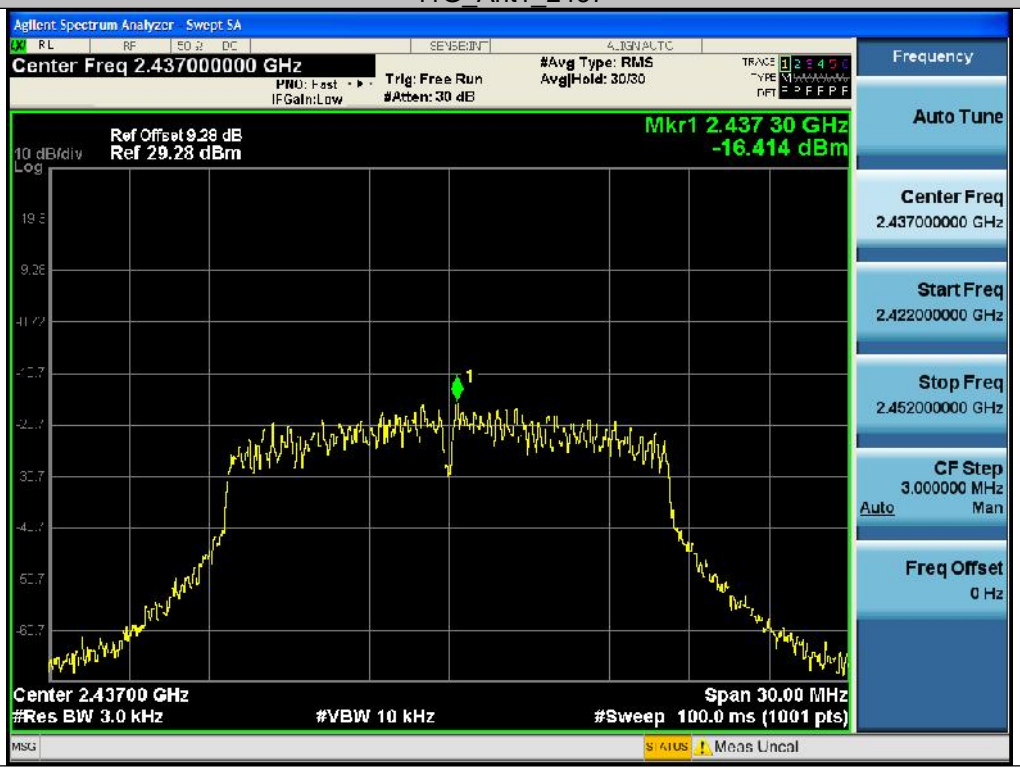


11B_Ant1_2437

11B_Ant1_2462

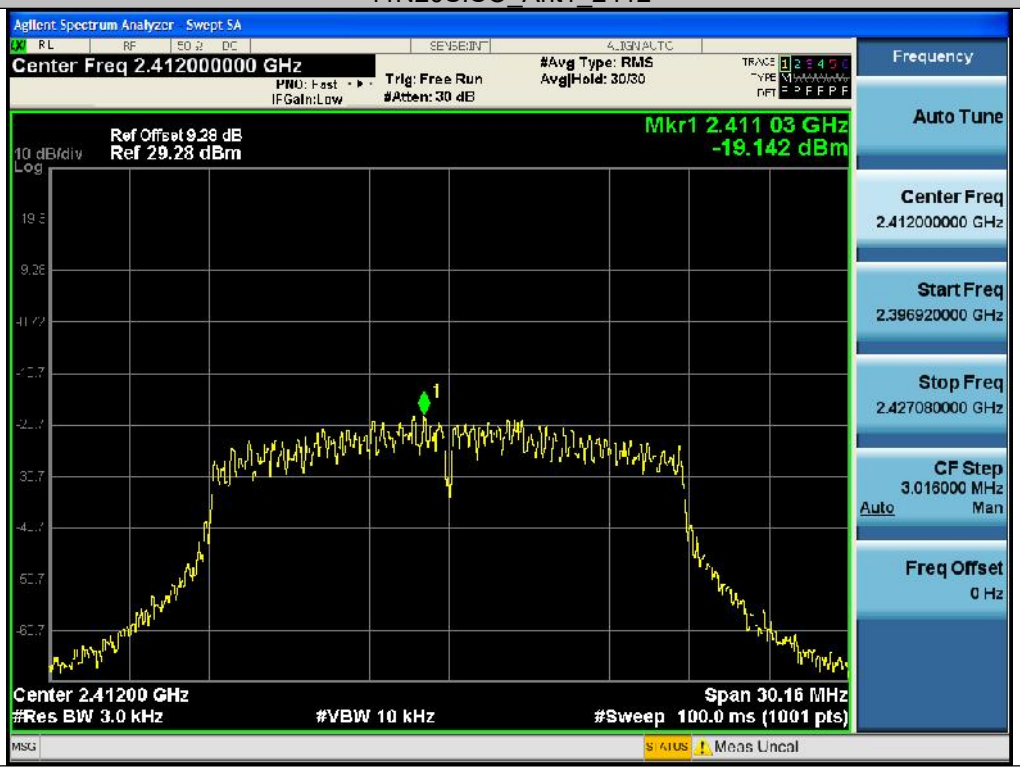
11G_Ant1_2412

11G_Ant1_2437



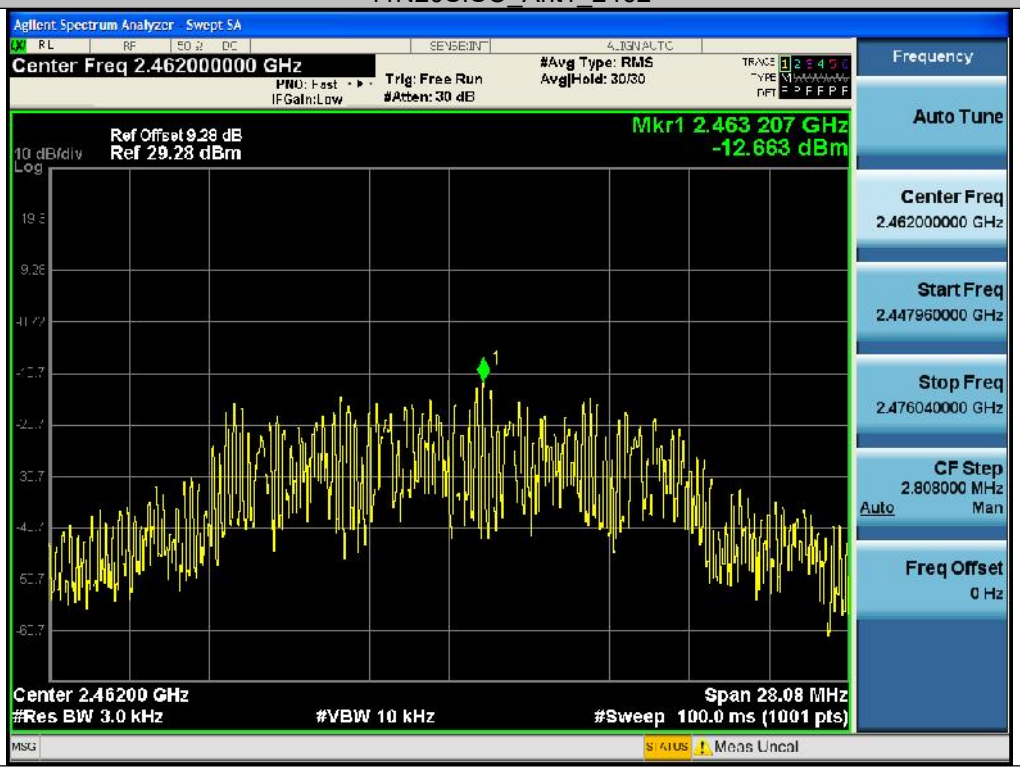
11G_Ant1_2462

11N20SISO_Ant1_2412



11N20SISO_Ant1_2437

11N20SISO_Ant1_2462



8. OCCUPIED BANDWIDTH

8.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C & RSS-247				
Section	Test Item	Limit	Frequency Range(MHz)	Result
15.247(a)(2)& RSS-247 §5.2	Bandwidth	>= 500KHz	2400-2483.5	PASS

8.2 TEST PROCEDURE

1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) ≥RBW.
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 20 dB relative to the maximum level measured in the fundamental emission.

8.3 DEVIATION FROM STANDARD

No deviation.

8.4 TEST SETUP

8.5 EUT OPERATION CONDITIONS

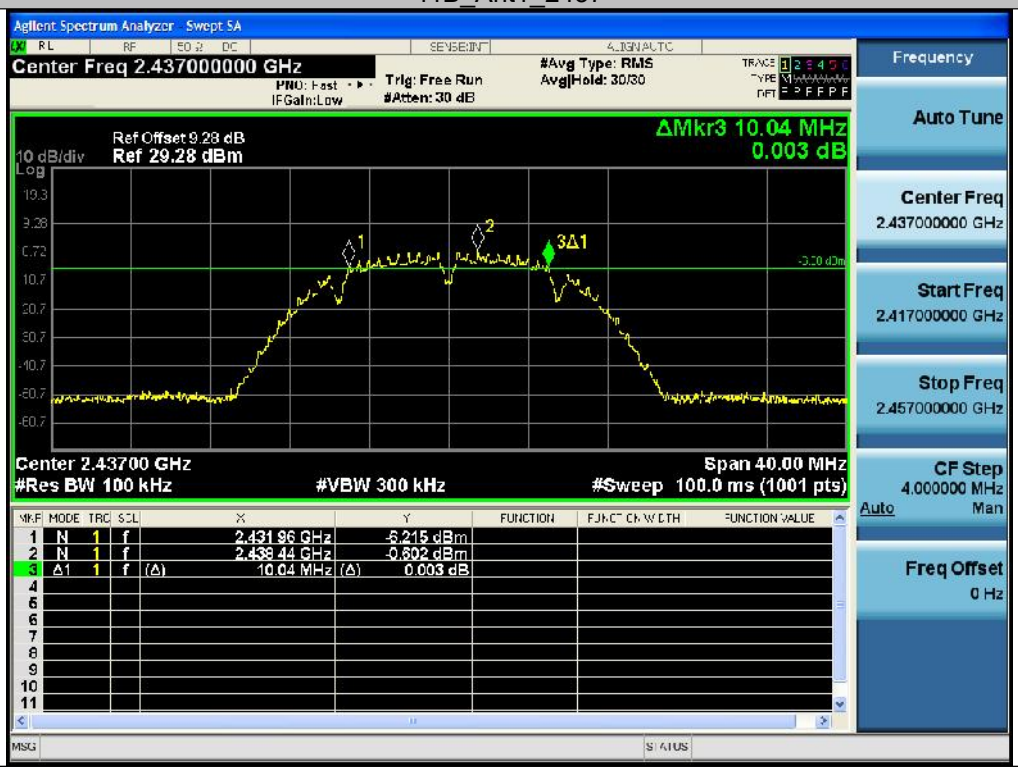
The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

8.6 TEST RESULTS

WIFI				
Test Mode	Channel	DTS BW [MHz]	Limit[MHz]	Verdict
11B	2412	14.040	0.5	PASS
	2437	10.040	0.5	PASS
	2462	10.040	0.5	PASS
11G	2412	13.800	0.5	PASS
	2437	15.000	0.5	PASS
	2462	13.800	0.5	PASS
11N20SISO	2412	15.080	0.5	PASS
	2437	15.000	0.5	PASS
	2462	14.040	0.5	PASS

11B_Ant1_2412

11B_Ant1_2437



11B_Ant1_2462

11G_Ant1_2412

11G_Ant1_2437

11G_Ant1_2462

11N20SISO_Ant1_2412

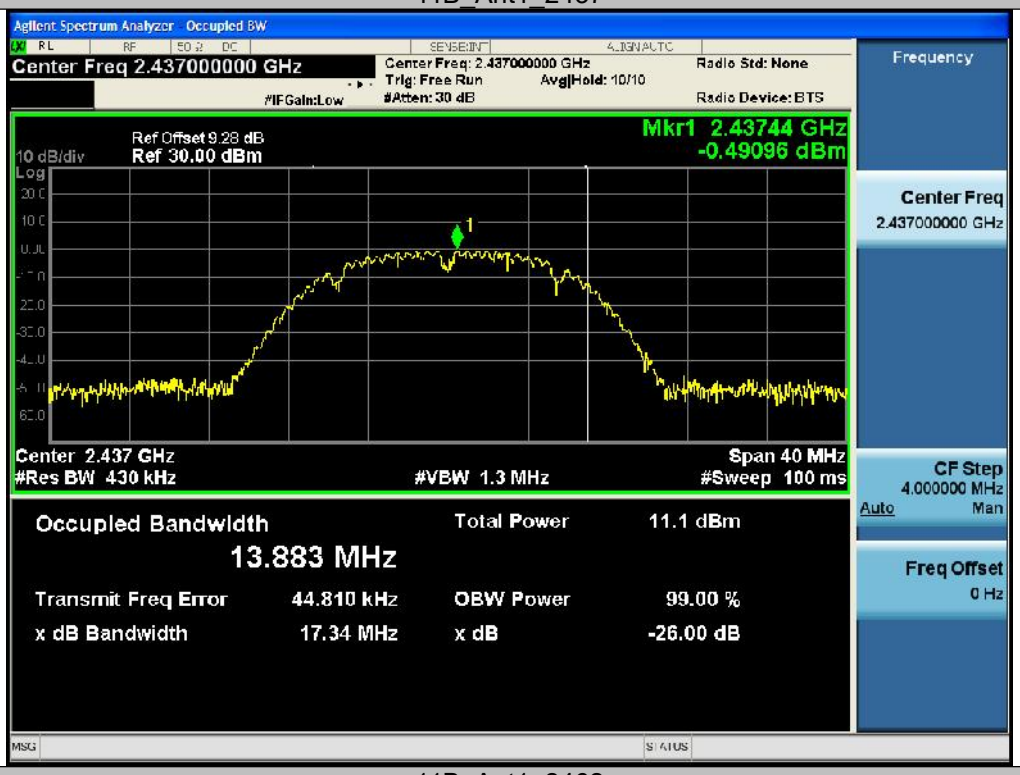
11N20SISO_Ant1_2437

11N20SISO_Ant1_2462

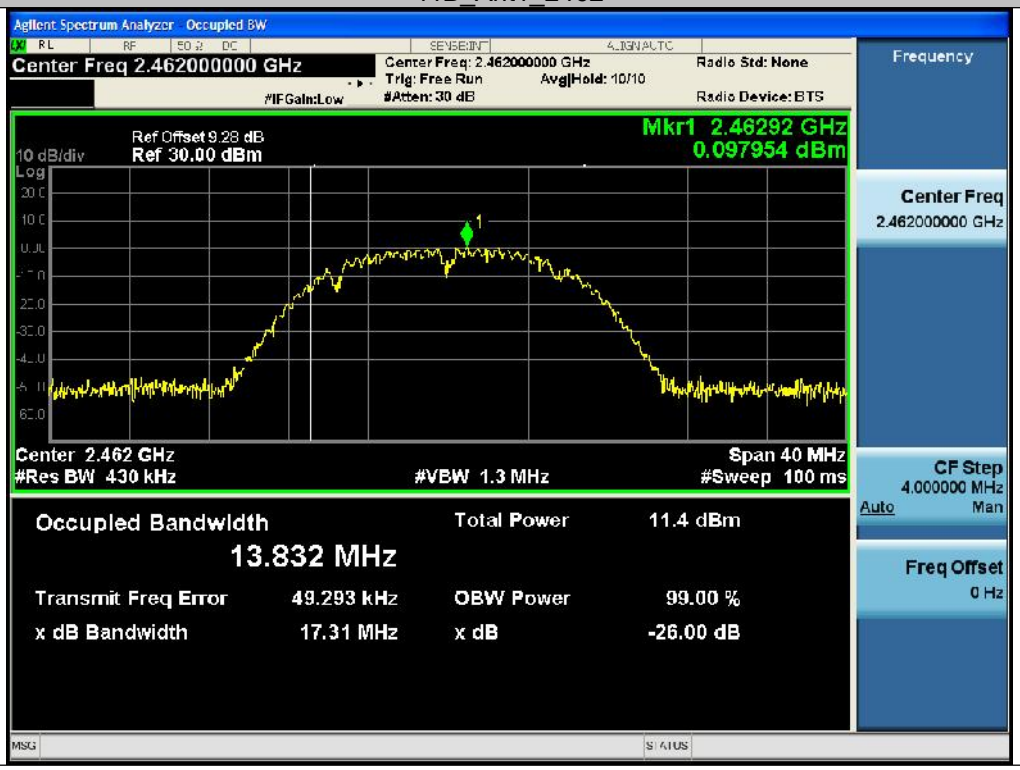
WIFI				
Test Mode	Channel	99% OCB [MHz]	Limit[MHz]	Verdict
11B	2412	19.317	/	PASS
	2437	13.883	/	PASS
	2462	13.832	/	PASS
11G	2412	16.269	/	PASS
	2437	16.196	/	PASS
	2462	16.361	/	PASS
11N20SISO	2412	16.258	/	PASS
	2437	16.230	/	PASS
	2462	16.300	/	PASS

11B_Ant1_2412

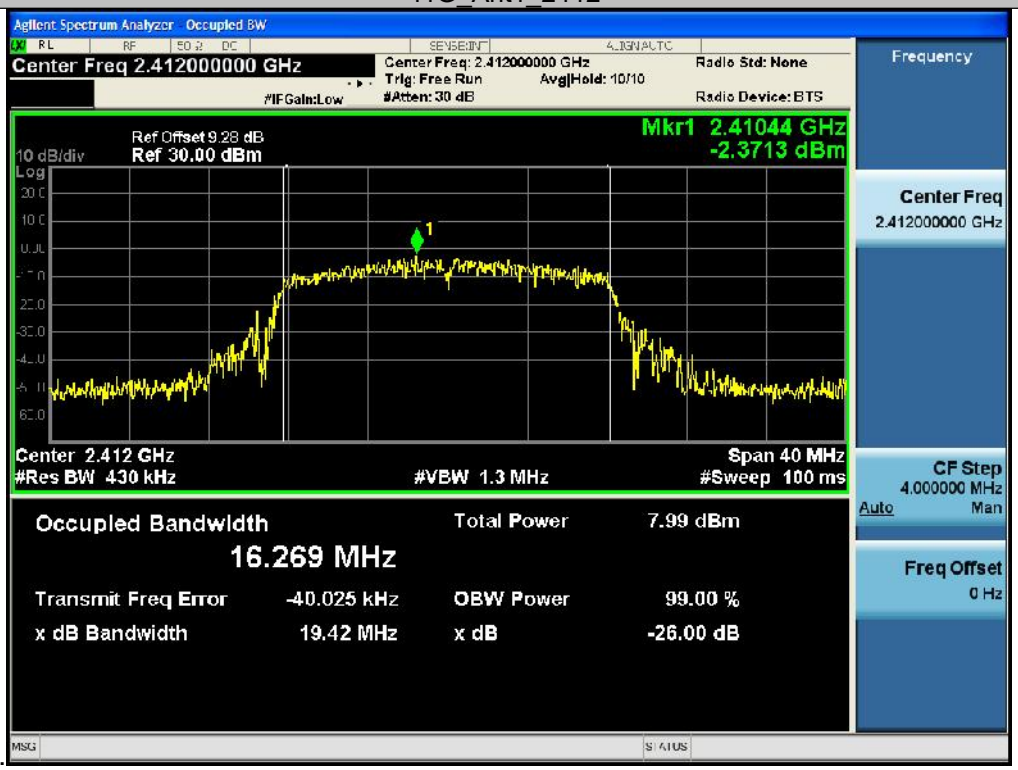
11B_Ant1_2437



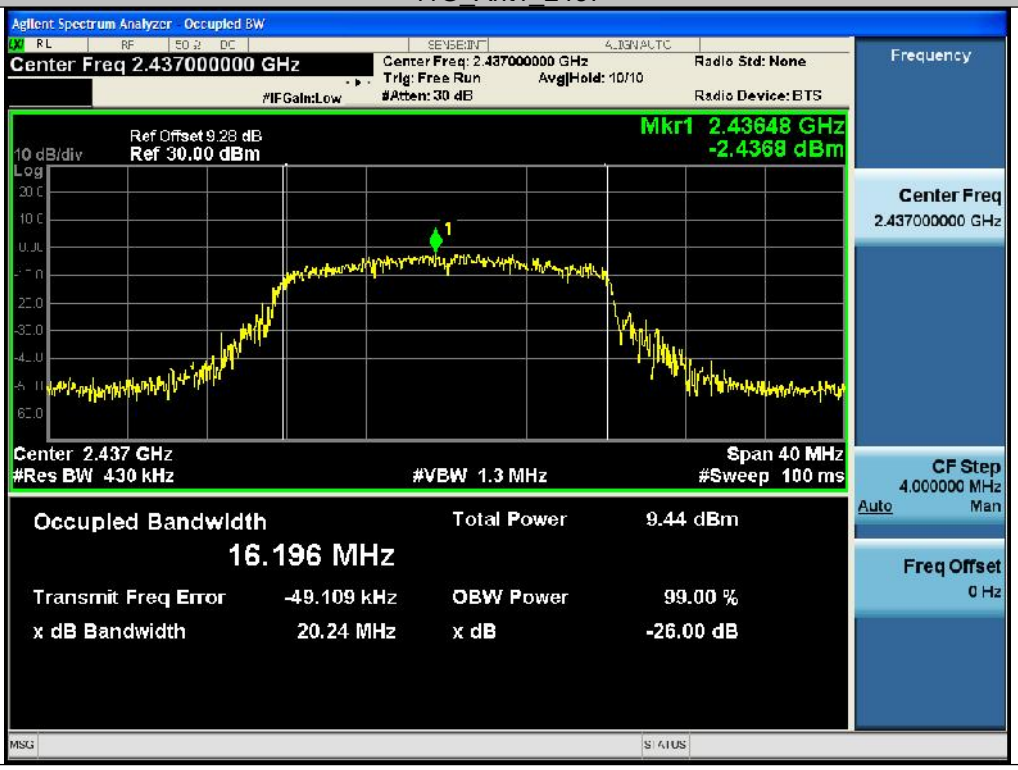
11B_Ant1_2462



11G_Ant1_2412



11G_Ant1_2437



11G_Ant1_2462

11N20SISO_Ant1_2412

11N20SISO_Ant1_2437

11N20SISO_Ant1_2462

9. OUT OF BAND EMISSIONS TEST

9.1 APPLIED PROCEDURES / LIMIT

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

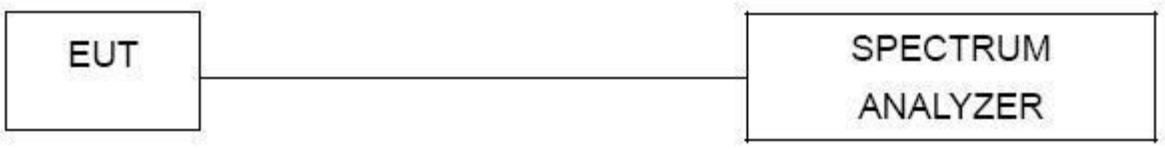
9.2 TEST PROCEDURE

1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) ≥RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.

9.3 DEVIATION FROM STANDARD

No deviation.

9.4 TEST SETUP



9.5 EUT OPERATION CONDITIONS

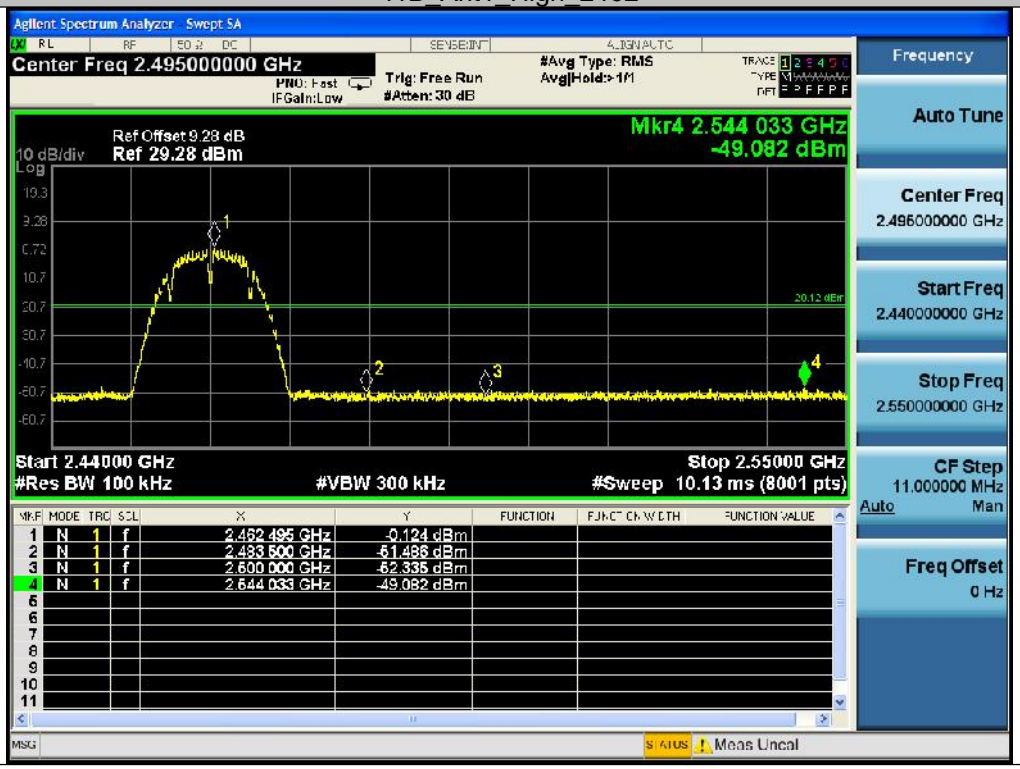
The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

9.6 TEST RESULTS

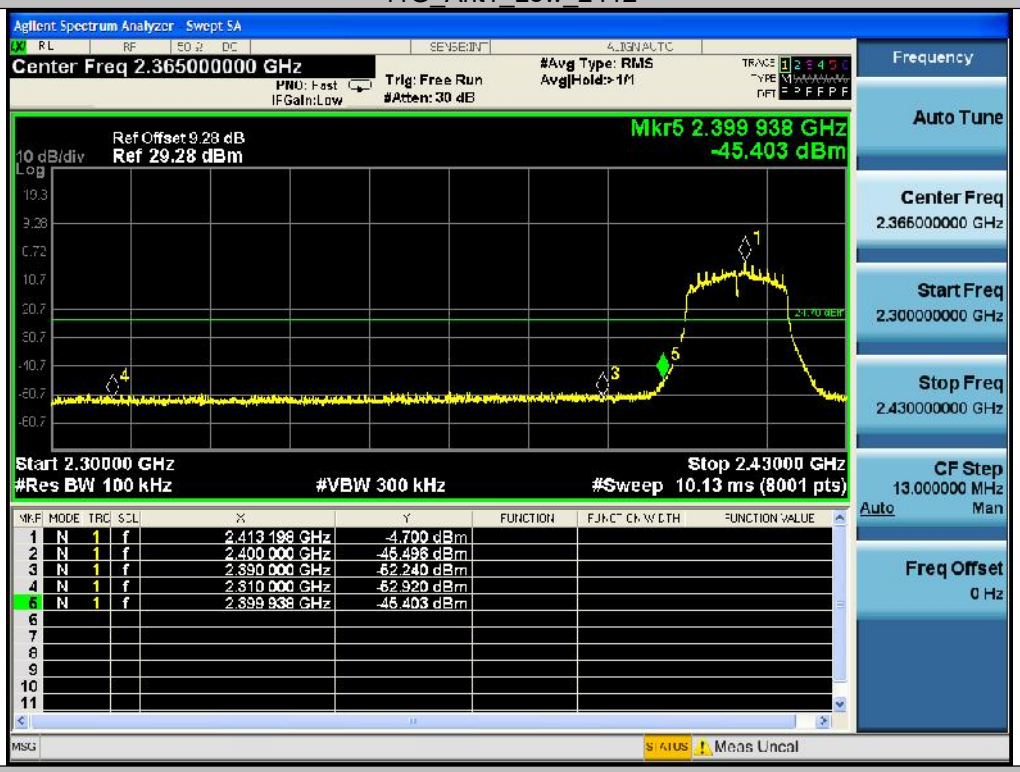
WIFI						
Test Mode	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Low	2412	-5.68	-28.66	≤-25.68	PASS
	High	2462	-0.12	-49.08	≤-20.12	PASS
11G	Low	2412	-4.70	-45.4	≤-24.70	PASS
	High	2462	-1.94	-49.24	≤-21.94	PASS
11N20SISO	Low	2412	-4.35	-42.98	≤-24.35	PASS
	High	2462	-3.47	-45.83	≤-23.47	PASS

11B_Ant1_Low_2412

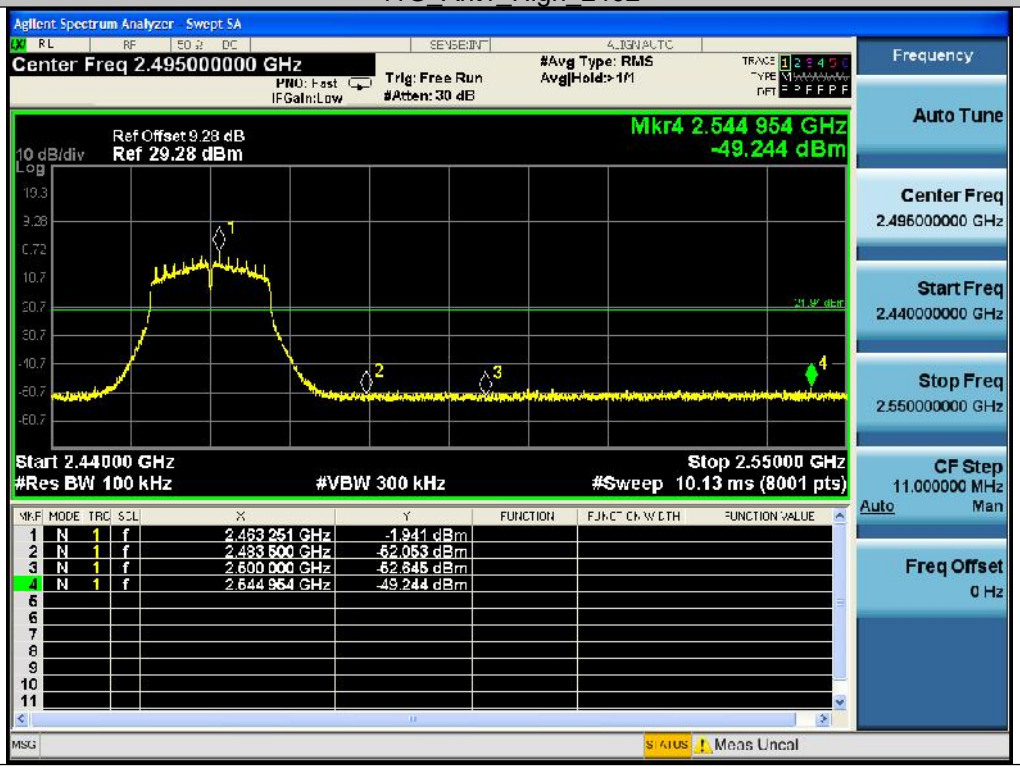
11B_Ant1_High_2462



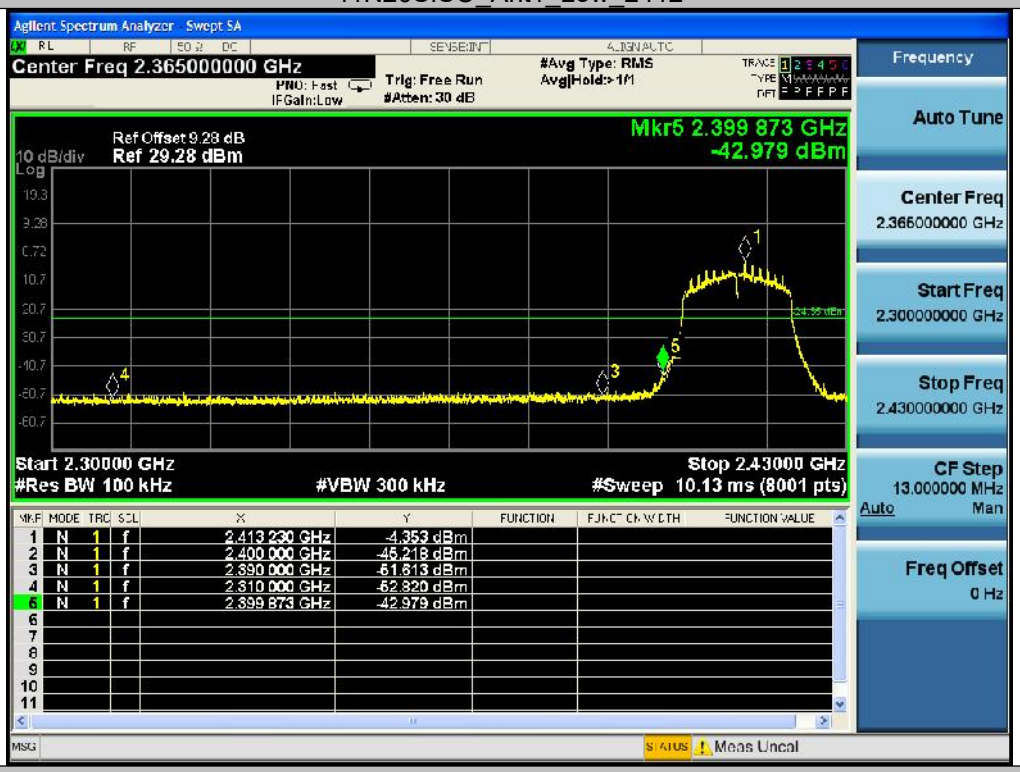
11G_Ant1_Low_2412



11G_Ant1_High_2462



11N20SISO_Ant1_Low_2412



11N20SISO_Ant1_High_2462

10. SPURIOUS RF CONDUCTED EMISSION

10.1 APPLIED PROCEDURES / LIMIT

1. Below -20dB of the highest emission level in operating band.
2. Fall in the restricted bands listed in section 15.205. The maximum permitted average field strength is listed in section 15.209.
3.For below 30MHz,For 9KHz-150kHz,150K-10MHz,We use the RBW 1KHz,10KHz, So the limit need to calculated by “10lg(BW1/BW2)“. for example For9KHz-150kHz,RBW 1KHz, The Limit= the highest emission level-20-10log(100/1)= the highest emission level-40.

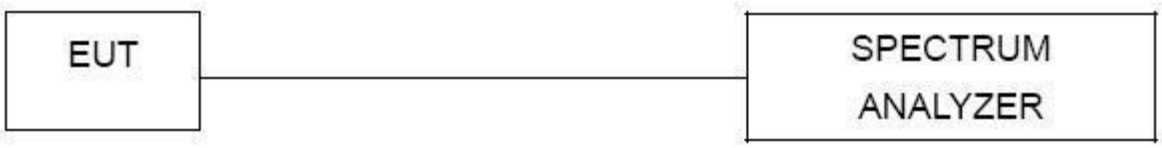
10.2 TEST PROCEDURE

1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) ≥RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.

10.3 DEVIATION FROM STANDARD

No deviation.

10.4 TEST SETUP



10.5 EUT OPERATION CONDITIONS

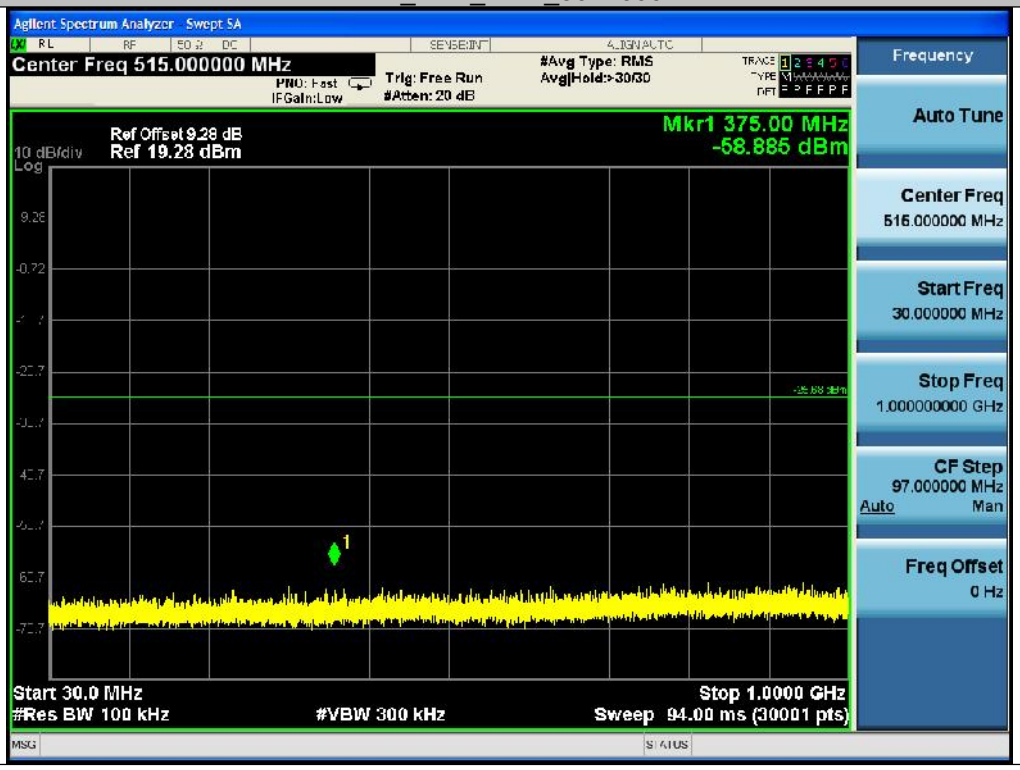
The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

10.6 TEST RESULTS

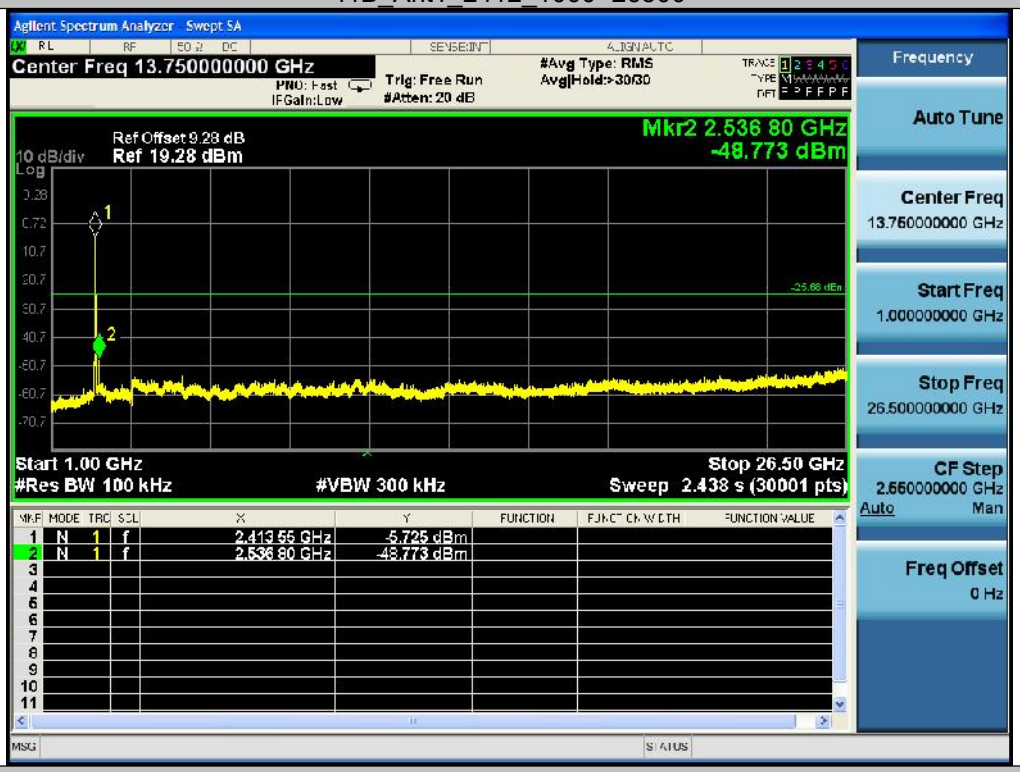
802.11b Worst Case

11B_Ant1_2412_0~Reference

11B_Ant1_2412_30~1000

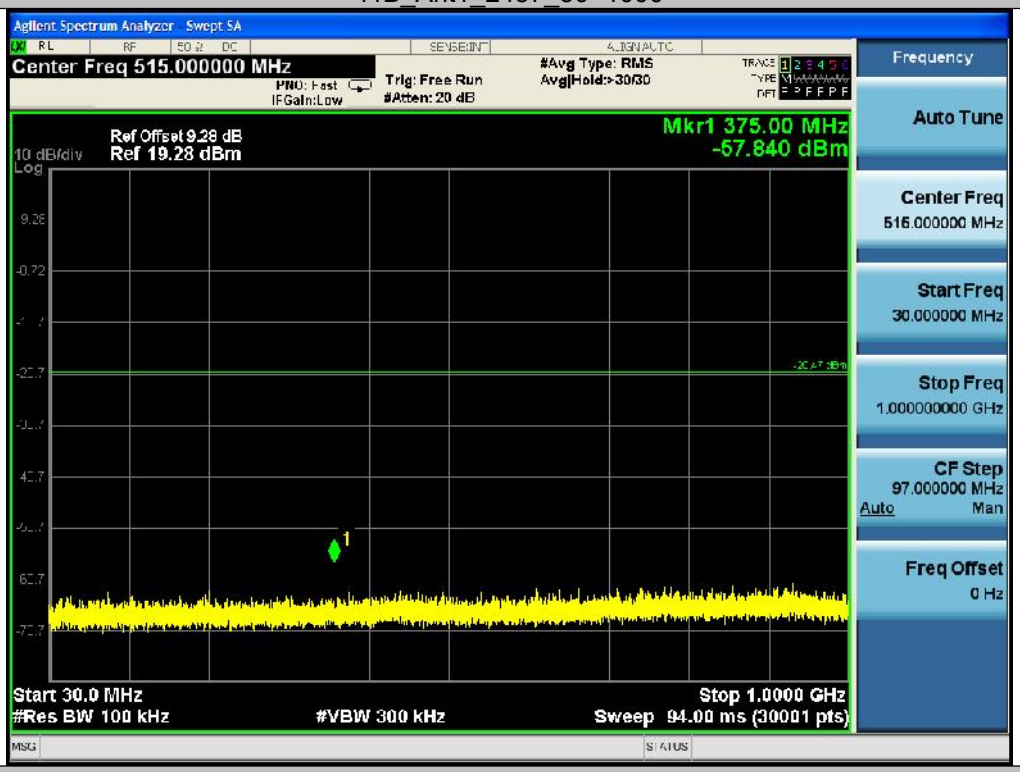


11B_Ant1_2412_1000~26500

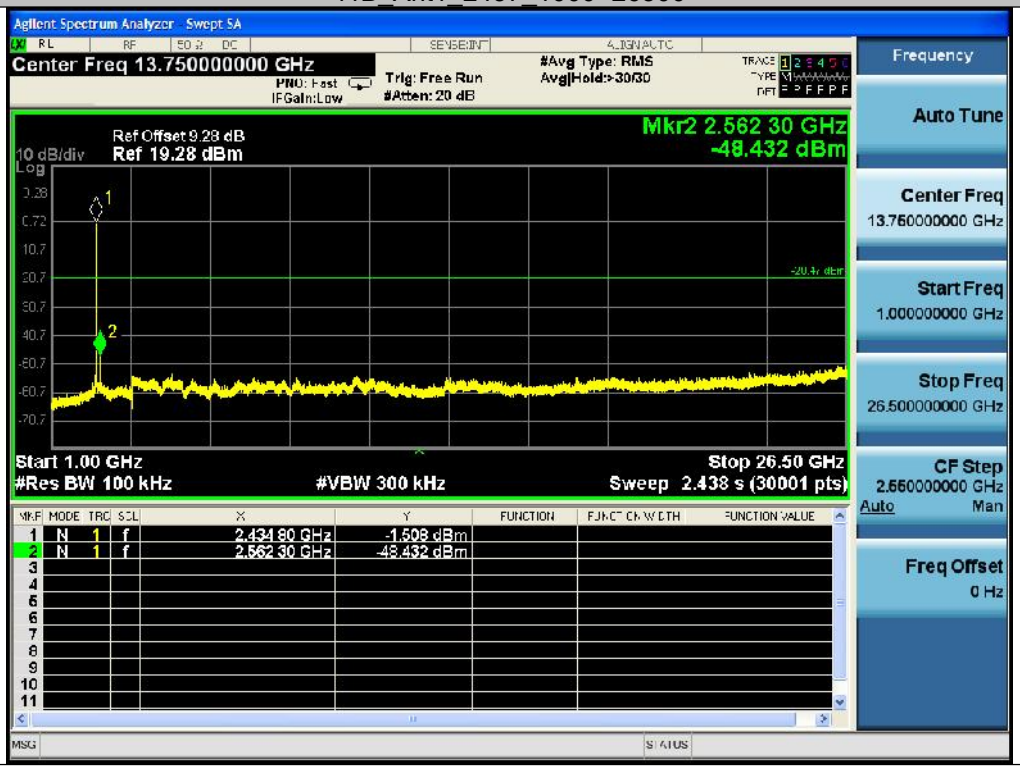


11B_Ant1_2437_0~Reference

11B_Ant1_2437_30~1000

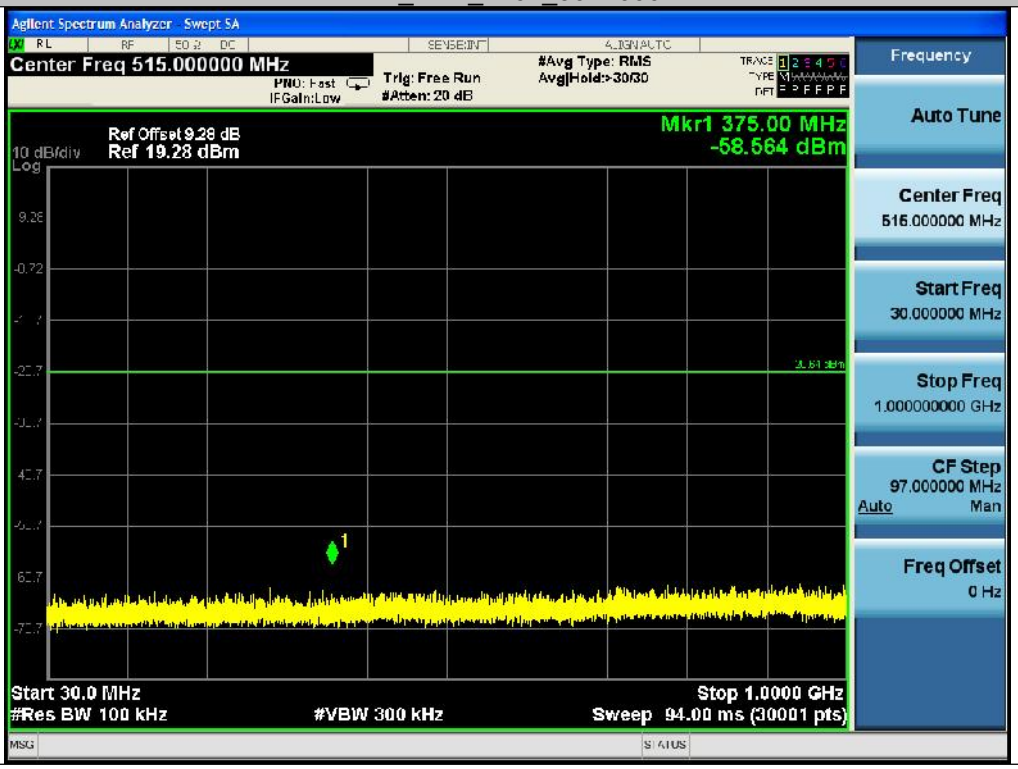


11B_Ant1_2437_1000~26500

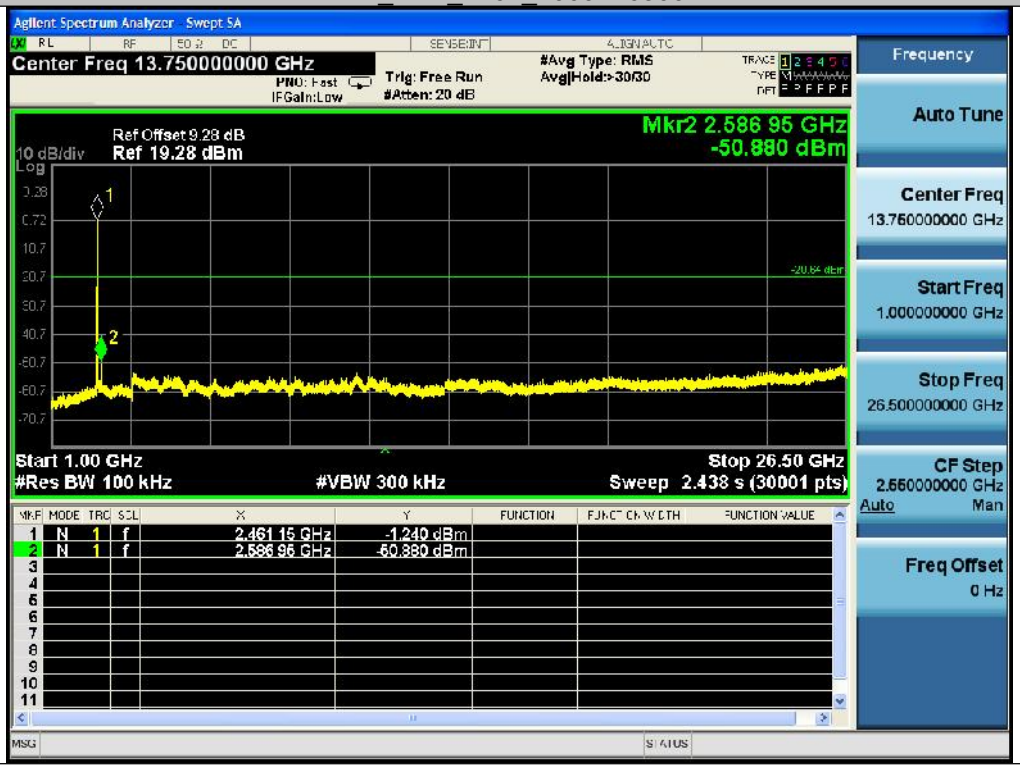


11B_Ant1_2462_0~Reference

11B_Ant1_2462_30~1000



11B_Ant1_2462_1000~26500



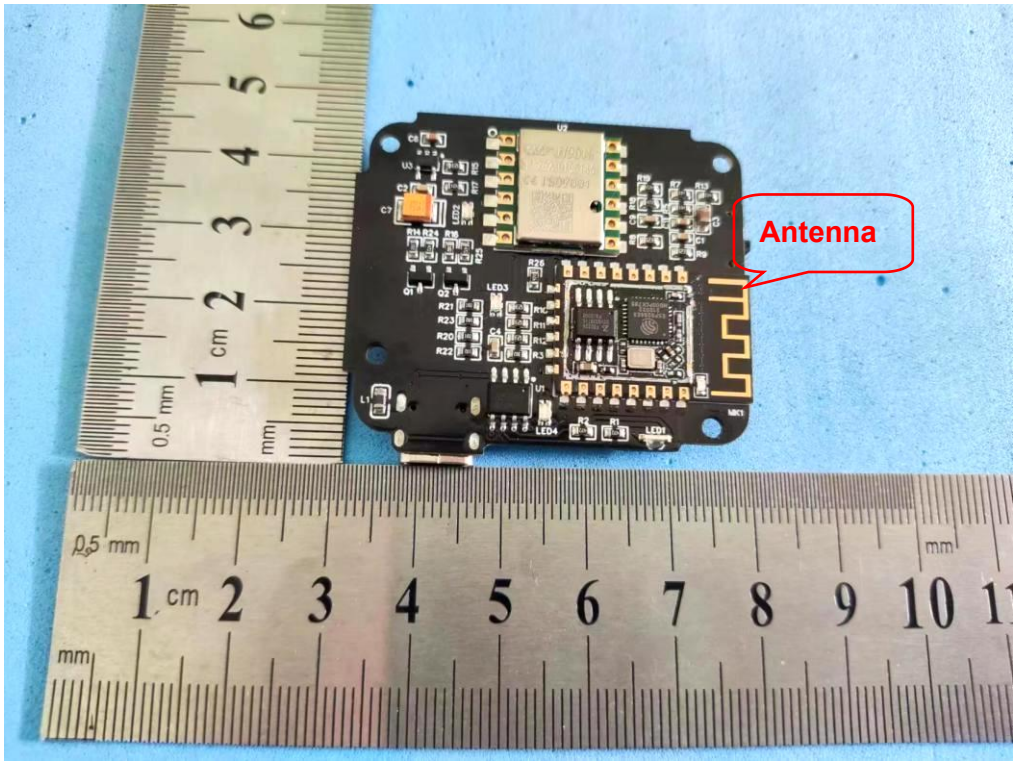
11. ANTENNA REQUIREMENT

11.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, according to 15.203: 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.

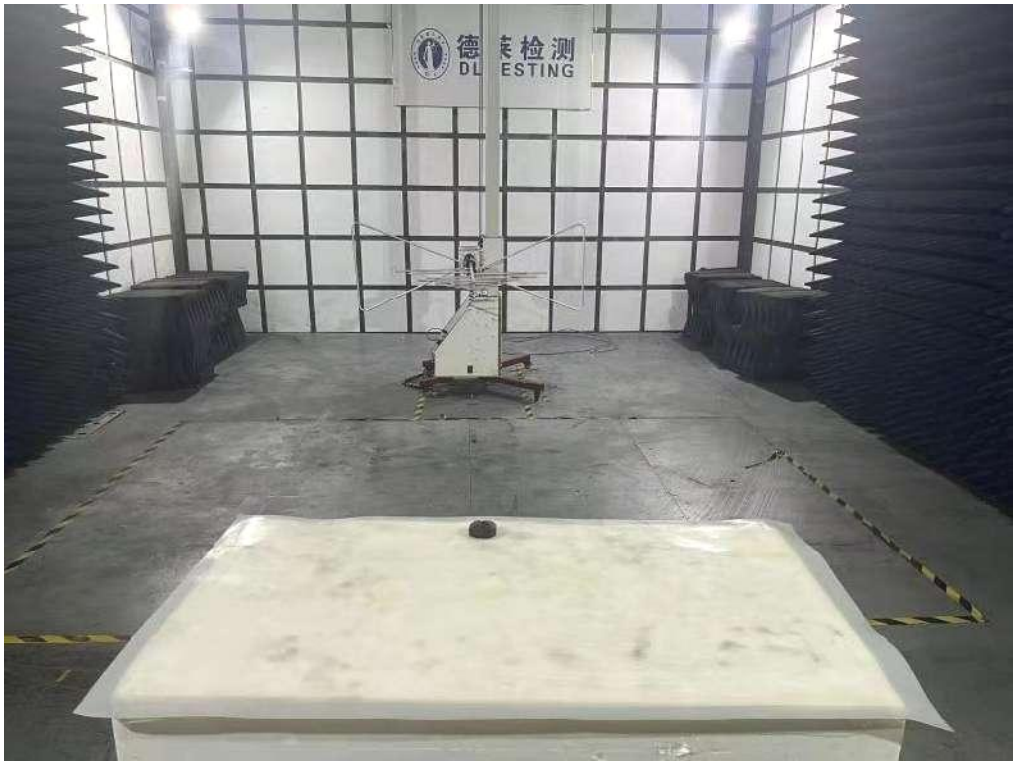
11.2 EUT ANTENNA

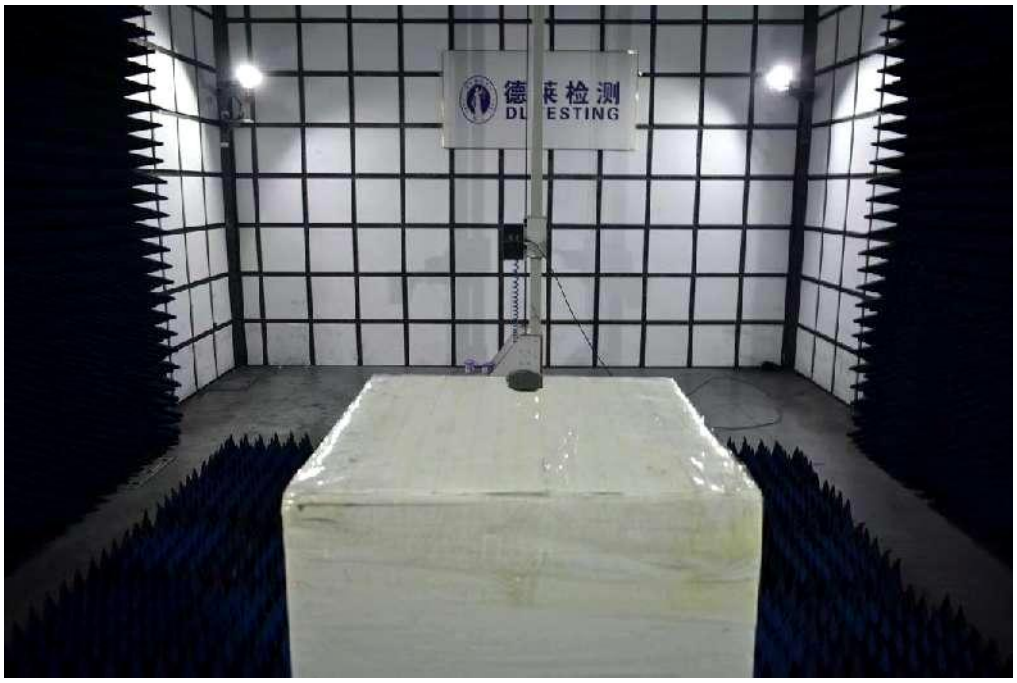
The EUT antenna is PCB Antenna. It comply with the standard requirement.



12. TEST SEUUP PHOTO

Radiated Measurement Photos





Conducted Measurement Photos

※※※※※ **END OF REPORT** ※※※※※