FCC 47 CFR PART 15 SUBPART C 15.247

TEST REPORT

FOR

ROBOT VACUUM CLEANER

Model : S3

Issued to

Shenzhen Lynkbey Intelligent Technology Co.,LTD
710 Fangda Building, No.011, No.12 South Road, Yuehai Street, Nanshan District, Shenzhen City

Issued by

WH Technology Corp.

Open Site		**No.120, Ln. 5, Hudong St., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)**
EMC Test Site	**Xizhi Office and Lab**	**7F., No.262, Sec. 3, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)**
Tel.: +886-7729-7707 Fax: +886-2- 8648-1311		

Note: This test refers exclusively to the test presented test model and sample. This report shall not be reproduced except in full, without the written approval of WH Technology Corp.. This document may be altered or revised by WH Technology Corp.. Personnel only, and shall be noted in the revision section of the document.

1. GENERAL INFORMATION

Applicant/ Manufacturer	:	**Shenzhen Lynkbey Intelligent Technology Co.,LTD**
Address	:	**710 Fangda Building, No.011, No.12 South Road, Yuehai Street, Nanshan District, Shenzhen City**
Factory	:	**Zhuhai Kaihao Electronics Co.,Ltd**
Address	:	**2nd Floor, Building C, No.3 Pinggongyi Road, Zhuhai, Guangdong, China.**
EUT	:	**Robot Vacuum Cleaner**
Model Name	:	**S3**
Trade Name	:	**N/A**
Model Differences	:	

Is here with confirmed to comply with the requirements set out in the FCC Rules and Regulations Part 15 Subpart C and the measurement procedures were according to ANSI C63.10-2013. The said equipment in the configuration described in this report shows the maximum emission levels emanating

FCC part 15 Subpart C

Receipt Date : 04/28/2020 Final Test Date :22/05/2020

Tested By: **Reviewed by:**

May 05, 2020
(Date)

Bing Chang/ Engineer

July 1, 2020
(Date)

Mike Lee / Manager
Designation Number: TW2954

2. REPORT OF MEASUREMENTS AND EXAMINATIONS

2.1 LIST OF MEASUREMENTS AND EXAMINATIONS

FCCRule	. Description of Test	Result
15.203	. Antenna Requirement	Pass
15.207	. Conducted Emission	Pass
15.209 15.247(d)	. Radiated Emission	Pass
15.247(a)(2)	. 6dB Bandwidth	Pass
15.247(b)	. Maximum Peak Output Power	Pass
15.247(d)	. 100kHz Bandwidth of Frequency Band Edges	Pass
15.247(e)	. Power Spectral Density	Pass
1.1307 1.1310 2.1091	. RF Exposure Compliance	Pass

3. TEST CONFIGURATION OF EQUIPMENT UNDER TEST

3.1 DESCRIPTION OF THE TESTED SAMPLES

EUT Name	:	Robot Vacuum Cleaner
Model Number	:	S3
FCC ID	:	2AWQB-S3
For Adapter Input		AC 100-240V,0.8A
Input Rate	:	DC 22V/1.0A
Rated power		30W
Operate Frequency	:	2412~2462MHz
Modulation Technique	:	OFDM/DSSS
Number of Channels	:	11 CH
Operating Mode	:	2412 MHz ~ 2462 MHz for 802.11b, 802.11g, 802.11n HT20 2422 MHz ~ 2452 MHz for 802.11n HT40
Antenna Type	:	PCB antenna
Channel Space	:	5MHz
Antenna gain	:	0dBi

3.2 CARRIER FREQUENCY OF CHANNELS

WIFI			
802.11b/g/n(HT20)		802.11n(HT40)	
Channel	Frequency (MHz)	Channel	Frequency(MHz)
1	2412	--	--
2	2417	--	--
3	2422	3	2422
4	2427	4	2427
5	2432	5	2432
6	2437	6	2437
7	2442	7	2442
8	2447	8	2447
9	2452	9	2452
10	2457	--	--
11	2462	--	--

3.3 TEST MODE AND TEST SOFTWARE

a. During testing, the interface cables and equipment positions were varied according to ANSI C63.10-2013.

b. The complete test system included Notebook and EUT for RF test.

c. An executive “putty” under Win 7 was executed to keep transmitting and receiving data via Wireless.

d. The following test modes were performed for test:
802.11b/g/n HT20: CH01: 2412MHz, CH06: 2437MHz, CH11: 2462MHz
802.11n HT40: CH03: 2422MHz, CH06: 2437MHz, CH09: 2452MHz

e.only the worst case was recorded in this report

3.4 TEST METHODOLOGY & GENERAL TEST PROCEDURES

All testing as described bellowed were performed in accordance with ANSI C63.10:2013 and FCC CFR 47 Part 15 Subpart C.

Conducted Emissions

The EUT is placed on a wood table, which is at 0.8 m above ground plane acceding to clause 15.207 and requirements of ANSI C63.10:2013. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz are using CISPR Quasi-Peak / Average detectors.

Radiated Emissions

The EUT is a placed on a turn table, which is 0.8 m above ground plane. The turntable was rotated through 360 degrees to determine the position of maximum emission level. The EUT is placed at 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

1)Putting the EUT on the platform and turning on the EUT (on/off button on the bottom of the EUT).
2)Setting test channel described as “Channel setting and operating condition”, and testing channel by channel.
3)For the maximum output power measurement, we followed the method of measurement KDB558074 D01.
4)For the spurious emission test based on ANSI(2014), at the frequency where below 1GHz used quasi-peak detector mode; where above 1GHz used the peak and average detector mode. IF the peak value may be under average limit, the average mode will not be performed.

3.5 MEASUREMENT UNCERTAINTY

Measurement Item	Uncertainty
Radiated emission	±4.11dB
Peak Output Power(conducted)	±1.38dB
Peak Output Power(Radiated)	±1.70dB
Power Spectral Density	±1.39dB
Radiated emission(3m)	±4.11dB
Radiated emission(10m)	±3.89dB

3.6 DESCRIPTION OF THE SUPPORT EQUIPMENTS

Setup Diagram

See test photographs attached in appendix 1 for the actual connections between EUT and support equipment.

Support Equipment

Peripherals Devices:

OUTSIDE SUPPORT EQUIPMENT							
No.	Equipment	Model	Serial No.	FCC ID	Trade name	Date Cable	Power Cord
1.	Lap top	14q-by00 1AX	N/A	FCC DOC	HP	N/A	N/A
2.	AC adapter	QX6.5W7 5100FG	N/A	VOC	Stos	N/A	N/A
INSIDE SUPPORT EQUIPMENT							
No.	Equipment	Model	Serial No.	FCC ID	Trade name	Date Cable	Power Cord
1.	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Note: All the above equipment /cable were placed in worse case position to maximize emission signals during emission test

Grounding: Grounding was in accordance with the manufacturer’s requirement and conditions for the intended use.

4. TEST AND MEASUREMENT EQUIPMENT

4.1 CALIBRATION

The measuring equipment utilized to perform the tests documented in the report has been calibrated once a year or in accordance with the manufacturer ' s recommendations, and is traceable to recognized national standards.

4.2 EQUIPMENT

The following list contains measurement equipment used for testing. The equipment conforms to the requirement of CISPR 16-1, ANSI C63.2 and. Other required standards. Calibration of all test and measurement, including any accessories that may effect such calibration, is checked frequently to ensure the accuracy. Adjustments are made and correction factors are applied in accordance with the instructions contained in the respective.

TABLELIST OF TEST AND MEASUREMENT EQUIPMENT

Instrument	Manufacturer	Model No.	S/N	Next Cal. Date
EMI Receiver	R&S	ESHS10	830223/008	2020/06/06
LISN	Rolf Heine Hochfrequenztechnik	NNB-2/16z	98062	2021/06/11
ISN	Schwarzbeck	8-Wire ISN CAT5	CAT5-8158-0094	2020/09/21
RF Cable	N/A	N/A	EMI-3	2020/10/19
Bilog antenna(30M-1G)	ETC	MCTD2786 B	BLB16M04004/JB-5-004	2021/03/18
Double Ridged Guide Horn antenna(1G-18G)	ETC	MCTD 1209	DRH15N02009	2020/11/23
Horn antenna (18G-26G)	com-power	AH-826	81000	2020/08/16
LOOP Antenna (Below 30M)	com-power	AL-130	17117	2020/10/04
Pre amplifier (30M-1G)	EMC INSTRUMENT	EMC9135	980334	2021/03/03
Microwave Preamplifier (1G-18G)	EMC INSTRUMENT	EMC051845	980108&AT-18001	2020/10/23
Pre amplifier (18G~26G)	MITEQ	JS4-18002600-30-5A	808329	2020/08/09
EMI Test Receiver	R&S	ESVS30 (20M-1000 MHz)	826006/002	2020/11/28
RF Cable (open site)	EMCI	N male on end of both sides (EMI4)	30m	2021/10/19
RF CABLE (1~26G)	HARBOUT INDUSTRIES	LL142MI(4M+4M)	NA	2021/04/17
RF CABLE (1~26G)	HARBOUT INDUSTRIES	LL142MI(7M)	NA	2020/08/09
Spectrum (9K--7GHz)	R&S	FSP7	830180/006	2021/04/14
Spectrum (9K--40GHz)	AGILENT	8564EC	4046A0032	2021/03/01
e3	AUDIX	N/A	N/A	N/A
SINGAL GENTERATOR (100k-1GHz)	HP	8648A	3619U00426	N/A
Power Meter	ANRITSU	ML2487	6K00001574	2020/08/09

***CALIBRATION INTERVAL OF INSTRUMENTS LISTED ABOVE IS ONE YEAR**

5. ANTENNA REQUIREMENTS

5.1 STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 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. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

5.2 ANTENNA CONSTRUCTION AND DIRECTIONAL GAIN

WIFI		
Antenna Type	:	PCB antenna
Antenna Gain	:	0 dBi

6. TEST OF CONDUCTED EMISSION

6.1 TEST LIMIT

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 KHz on the 120 VAC power and return leads of the EUT according to the methods defined in ANSI C63.10-2013 Section 3.1. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane as shown in section 2.2. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

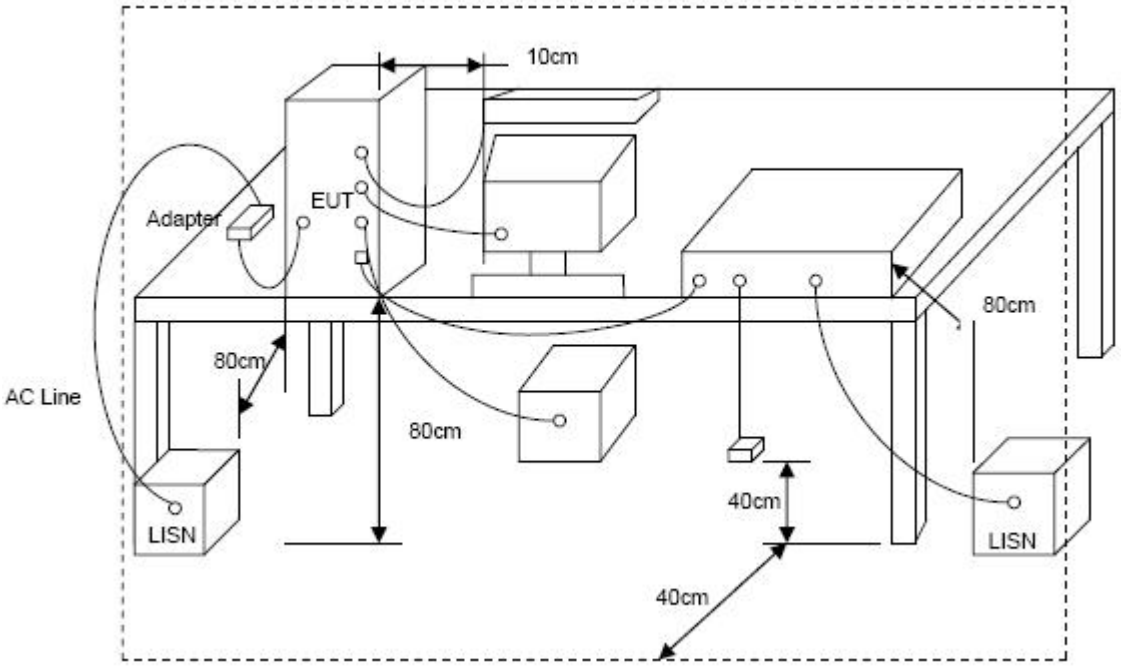
Frequency (MHz)	Quasi Peak (dB μ V)	Average (dB μ V)
0.15 – 0.5	66-56*	56-46*
0.5 – 5.0	56	46
5.0 – 30.0	60	50

*Decreases with the logarithm of the frequency.

6.2 TEST PROCEDURES

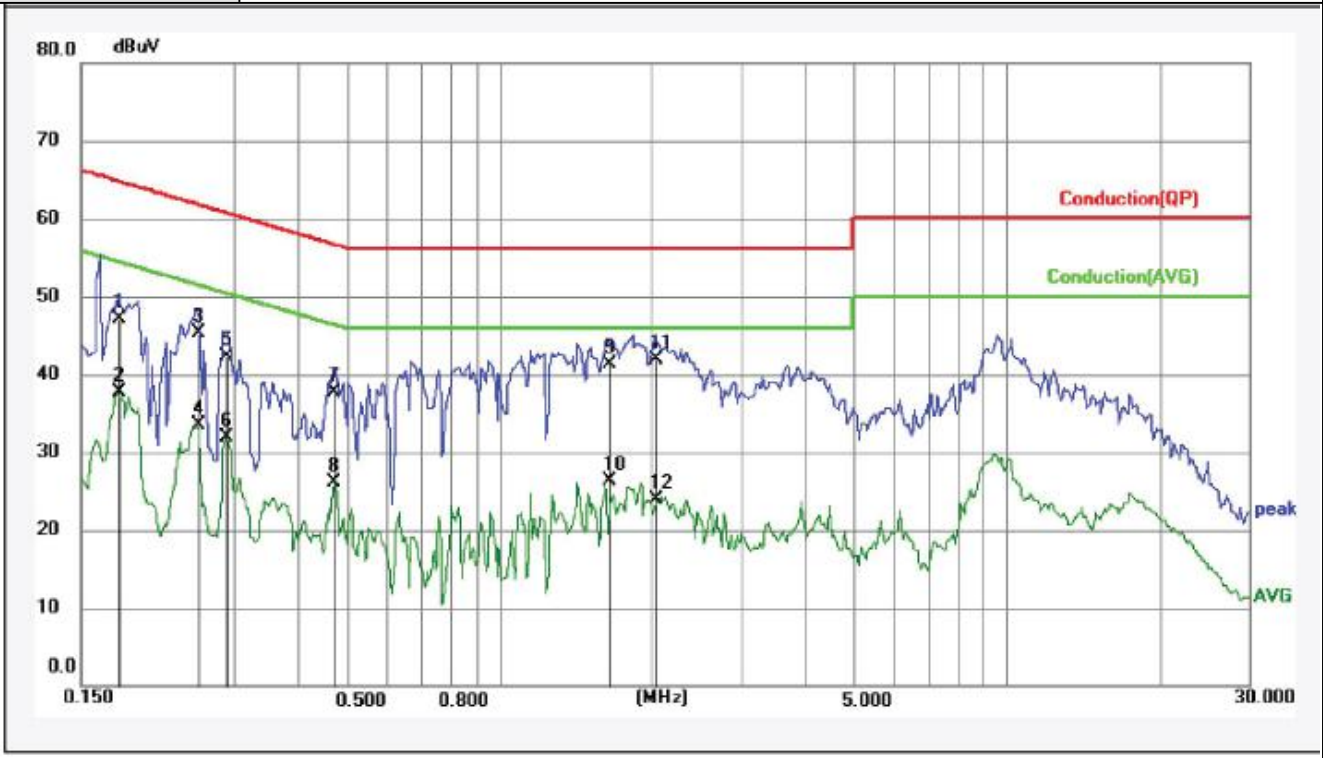
a. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
b. Connect EUT to the power mains through a line impedance stabilization network (LISN).
c. All the support units are connecting to the other LISN.
d. The LISN provides 50 ohm coupling impedance for the measuring instrument.
e. The FCC states that a 50 ohm, 50 micro-Henry LISN should be used.
f. Both sides of AC line were checked for maximum conducted interference.
g. The frequency range from 150 kHz to 30 MHz was searched.
h. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

6.3 TYPICAL TEST SETUP



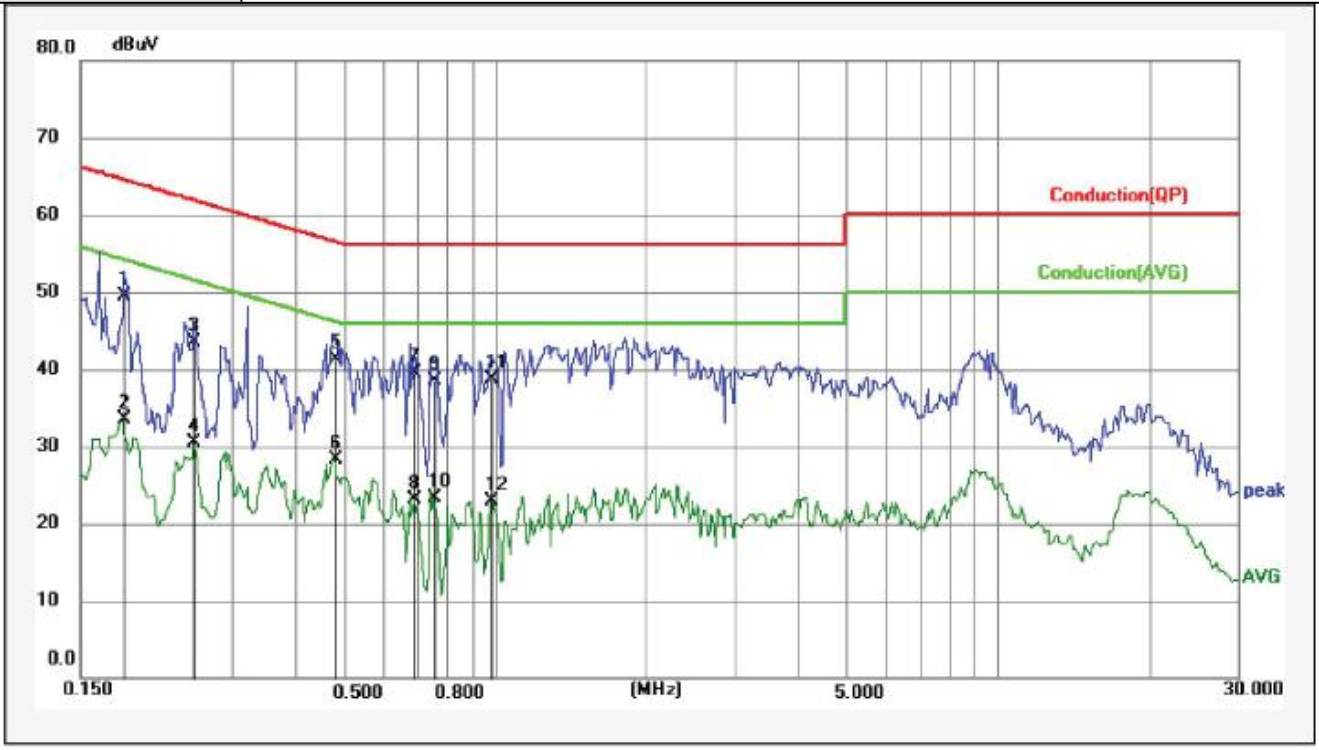
6.4 TEST RESULT AND DATA

M/N :	S3	Test Voltage:	AC 120V/60Hz
Test Date :	May 08, 2020	Phase:	L1
Temperature:	20℃	Relative Humidity:	54%
Pressure:	101.0KPa	Test by:	Bing
Test Mode:	Charging		



No.	Frequency (MHz)	Factor (dBuV)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	MK.	Remark
1	0.1773	9.76	37.34	47.10	64.61	-17.51	QP		
2	0.1773	9.76	27.97	37.73	54.61	-16.88	AVG		
3	0.2558	9.78	35.52	45.30	61.57	-16.27	QP		
4	0.2558	9.78	23.79	33.57	51.57	-18.00	AVG		
5	0.2883	9.79	32.61	42.40	60.57	-18.17	QP		
6	0.2883	9.79	22.18	31.97	50.57	-18.60	AVG		
7	0.4687	9.80	28.00	37.80	56.54	-18.74	QP		
8	0.4687	9.80	16.27	26.07	46.54	-20.47	AVG		
9	1.6376	9.84	31.56	41.40	56.00	-14.60	QP		
10	1.6376	9.84	16.38	26.22	46.00	-19.78	AVG		
11	2.0307	9.86	32.04	41.90	56.00	-14.10	QP	*	
12	2.0307	9.86	13.98	23.84	46.00	-22.16	AVG		

M/N :	S3	Test Voltage:	AC 120V/60Hz
Test Date :	May 08, 2020	Phase:	Neutral
Temperature:	20℃	Relative Humidity:	54%
Pressure:	101.0KPa	Test by:	Bing
Test Mode:	Charging		



No.	Frequency (MHz)	Factor (dBuV)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	MK.	Remark
1	0.1830	9.68	39.92	49.60	64.35	-14.75	QP	*	
2	0.1830	9.68	23.90	33.58	54.35	-20.77	AVG		
3	0.2516	9.70	33.80	43.50	61.70	-18.20	QP		
4	0.2516	9.70	20.74	30.44	51.70	-21.26	AVG		
5	0.4800	9.72	31.58	41.30	56.34	-15.04	QP		
6	0.4800	9.72	18.60	28.32	46.34	-18.02	AVG		
7	0.6926	9.73	29.77	39.50	56.00	-16.50	QP		
8	0.6926	9.73	13.30	23.03	46.00	-22.97	AVG		
9	0.7560	9.73	28.77	38.50	56.00	-17.50	QP		
10	0.7560	9.73	13.60	23.33	46.00	-22.67	AVG		
11	0.9835	9.74	28.96	38.70	56.00	-17.30	QP		
12	0.9835	9.74	13.22	22.96	46.00	-23.04	AVG		

7. TEST OF RADIATED EMISSION

7.1 TEST LIMIT

In any 100kHz 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 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. If the transmitter measurement is based on the maximum conducted output power, the attenuation required under this paragraph shall be 30dB instead of 20dB. In addition, radiated emissions which fall in section 15.205(a) the restricted bands must also comply with the radiated emission limit specified in section 15.209(a).

Frequency (MHz)	Field Strength (microvolt/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

7.2 TEST PROCEDURES

a. The EUT was placed on a rotatable table top 0.8 meter above ground.
b. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
c. The table was rotated 360 degrees to determine the position of the highest radiation.
d. The antenna is a broadband antenna and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
f. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
g. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported,

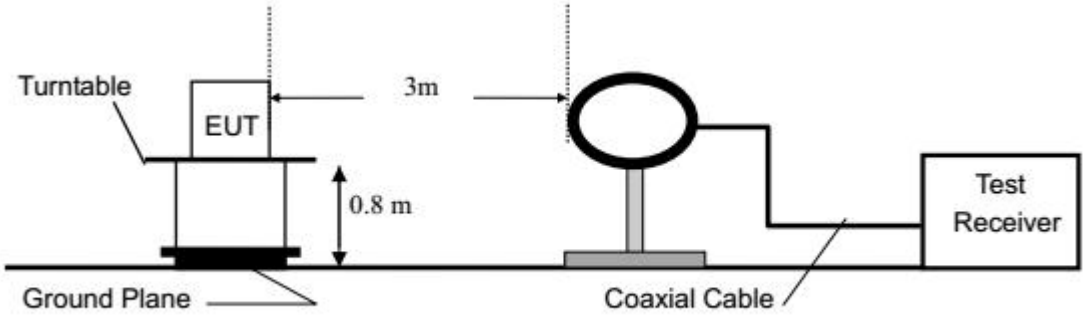
otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.

h. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower thanaverage limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

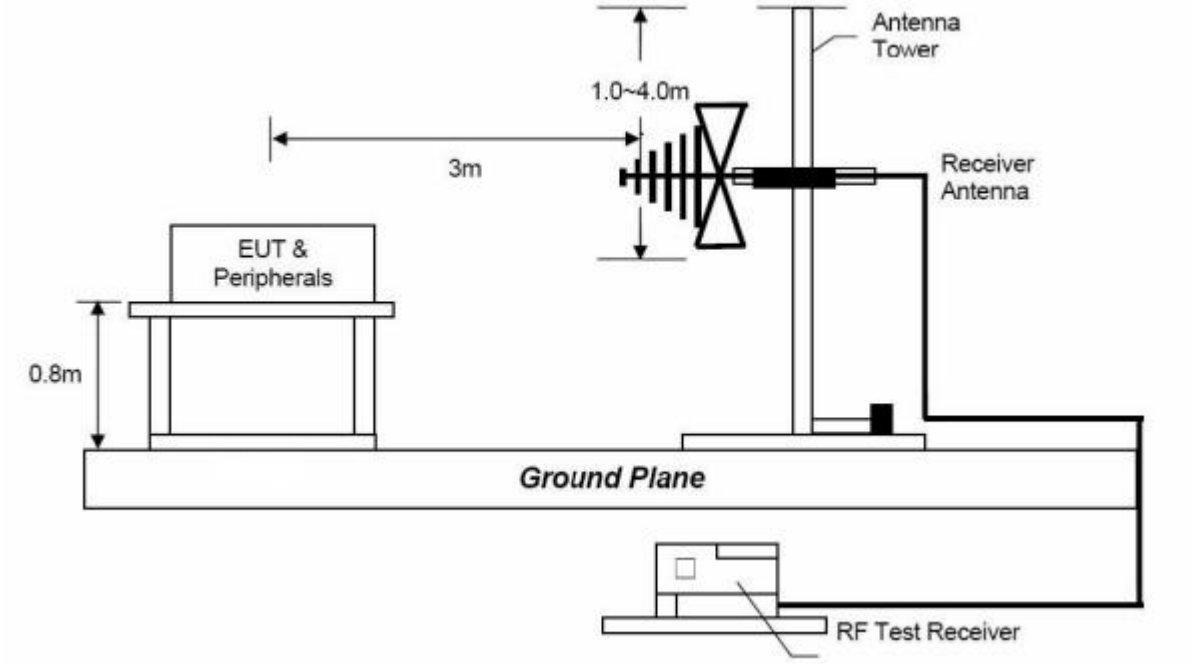
i. " Cone of radiation " has been considered to be 3dB bandwidth of the measurement antenna.

7.3 TYPICAL TEST SETUP

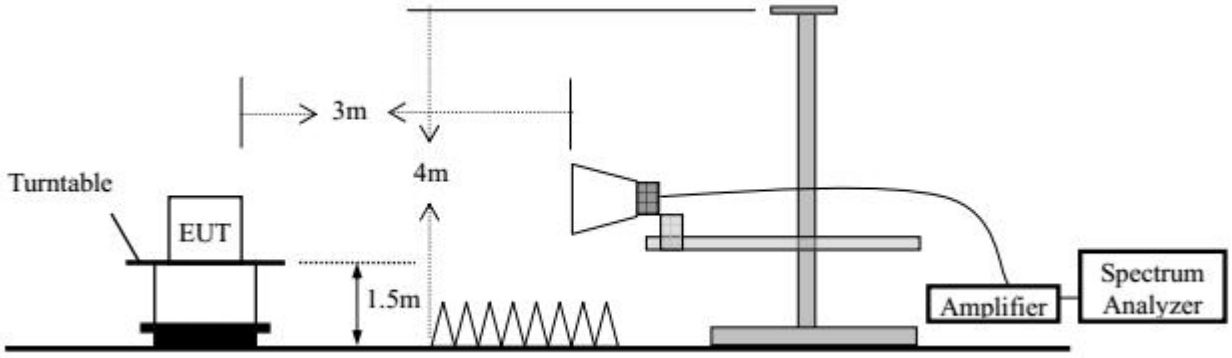
Radiated Emission Test Set-Up, Frequency Below 30MHz



Radiated Emission Test Set-Up, Frequency 30MHz-1000MHz



Radiated Emission Test Set-Up, Frequency above 1GHz

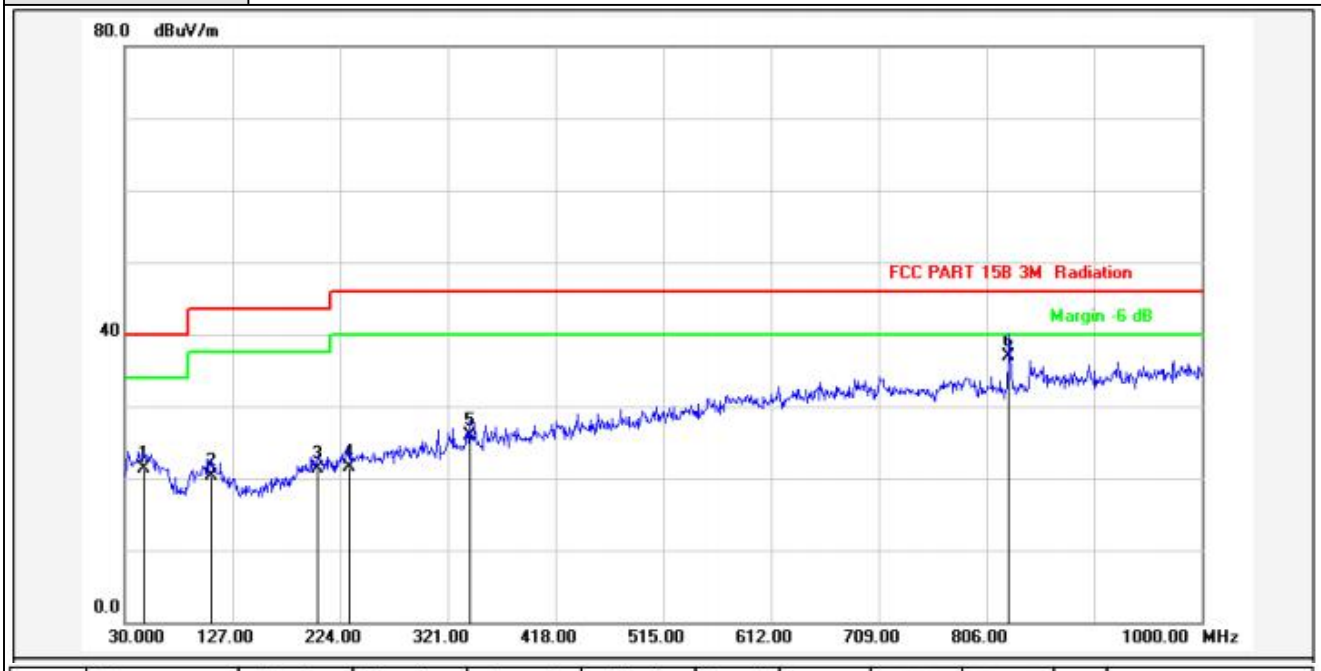


7.4 TEST RESULT AND DATA (9KHZ ~ 30MHZ)

The 9kHz - 30MHz spurious emission is under limit 20dB more.

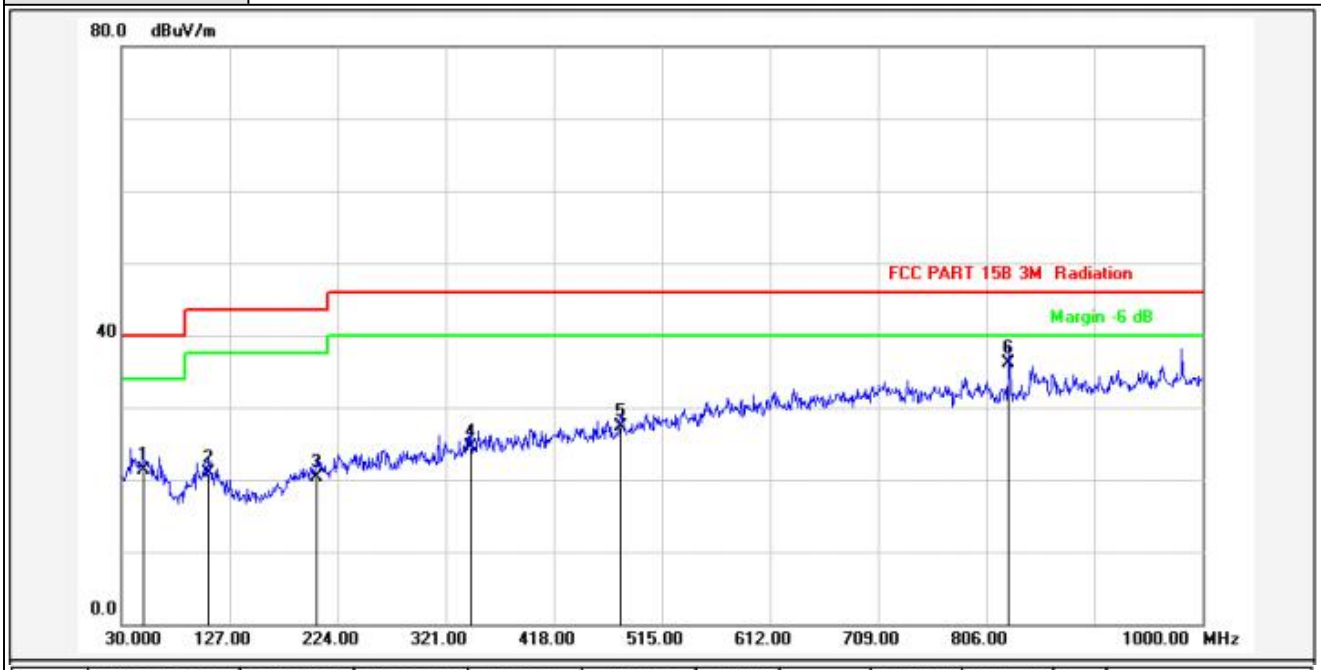
7.5 TEST RESULT AND DATA (30MHZ ~ 1GHZ, WORST EMISSIONS FOUND)

M/N :	S3	Test Voltage:	AC 120V/60Hz
Test Date :	May 08, 2020	Phase:	Vertical
Temperature:	20℃	Relative Humidity:	54%
Pressure:	101.0KPa	Test by:	Bing
Test Mode:	802.11b Low channel		



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	47.4600	16.14	5.16	21.30	40.00	-18.70	QP			P	
2	108.5700	14.15	6.15	20.30	43.50	-23.20	QP			P	
3	203.6300	13.88	7.42	21.30	43.50	-22.20	QP			P	
4	232.7300	14.47	7.13	21.60	46.00	-24.40	QP			P	
5	340.4000	17.44	8.52	25.96	46.00	-20.04	QP			P	
6	826.3700	25.02	11.88	36.90	46.00	-9.10	QP			P	

M/N :	S3	Test Voltage:	AC 120V/60Hz
Test Date :	May 08, 2020	Phase:	Horizontal
Temperature:	20℃	Relative Humidity:	54%
Pressure:	101.0KPa	Test by:	Bing
Test Mode:	802.11b Low channel		



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	49.4000	16.12	5.18	21.30	40.00	-18.70	QP			P	
2	107.6000	19.15	1.85	21.00	43.50	-22.50	QP			P	
3	205.5700	16.76	3.54	20.30	43.50	-23.20	QP			P	
4	343.3100	17.54	6.96	24.50	46.00	-21.50	QP			P	
5	478.1400	19.81	7.49	27.30	46.00	-18.70	QP			P	
6	826.3700	25.02	11.18	36.20	46.00	-9.80	QP			P	

7.6 TEST RESULT AND DATA (ABOVE 1GHZ)

M/N :	S3	Test Voltage:	AC 120V/60Hz
Test Date :	May 08, 2020	Phase:	Vertical
Temperature:	20℃	Relative Humidity:	54%
Pressure:	101.0KPa	Test by:	Bing
Test Mode:	802.11b channel		

Operation Mode:802.11b (Low)

Freq (MHz)	Ant.Pol (H/V)	Reading Level (dBuV)		Factor (dB)	Emission Level (dBuV/m)		Limit 3m (dBuV/m)		Margin (dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
4824	V	45.33	33.25	14.05	59.38	47.30	74.00	54.00	-14.62	-6.70
7236	V	37.84	27.62	18.81	56.65	46.43	74.00	54.00	-17.35	-7.57

4824	H	46.25	31.98	14.05	60.30	46.03	74.00	54.00	-13.70	-7.97
7236	H	38.07	26.02	18.18	56.25	44.20	74.00	54.00	-17.75	-9.80

Operation Mode:802.11b(Mid)

Freq (MHz)	Ant.Pol (H/V)	Reading Level (dBuV)		Factor (dB)	Emission Level (dBuV/m)		Limit 3m (dBuV/m)		Margin (dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
4874	V	46.40	31.55	14.41	60.81	45.96	74.00	54.00	-13.19	-8.04
7311	V	41.22	26.96	18.36	59.58	45.32	74.00	54.00	-14.42	-8.68

4874	H	45.26	32.06	14.41	59.67	46.47	74.00	54.00	-14.33	-7.53
7311	H	39.04	27.04	18.36	57.40	45.40	74.00	54.00	-16.60	-8.60

Operation Mode:802.11b(High)

Freq (MHz)	Ant.Pol (H/V)	Reading Level (dBuV)		Factor (dB)	Emission Level (dBuV/m)		Limit 3m (dBuV/m)		Margin (dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
4924	V	45.59	32.32	14.76	60.35	47.08	74.00	54.00	-13.65	-6.92
7386	V	38.27	26.63	18.55	56.82	45.18	74.00	54.00	-17.18	-8.82

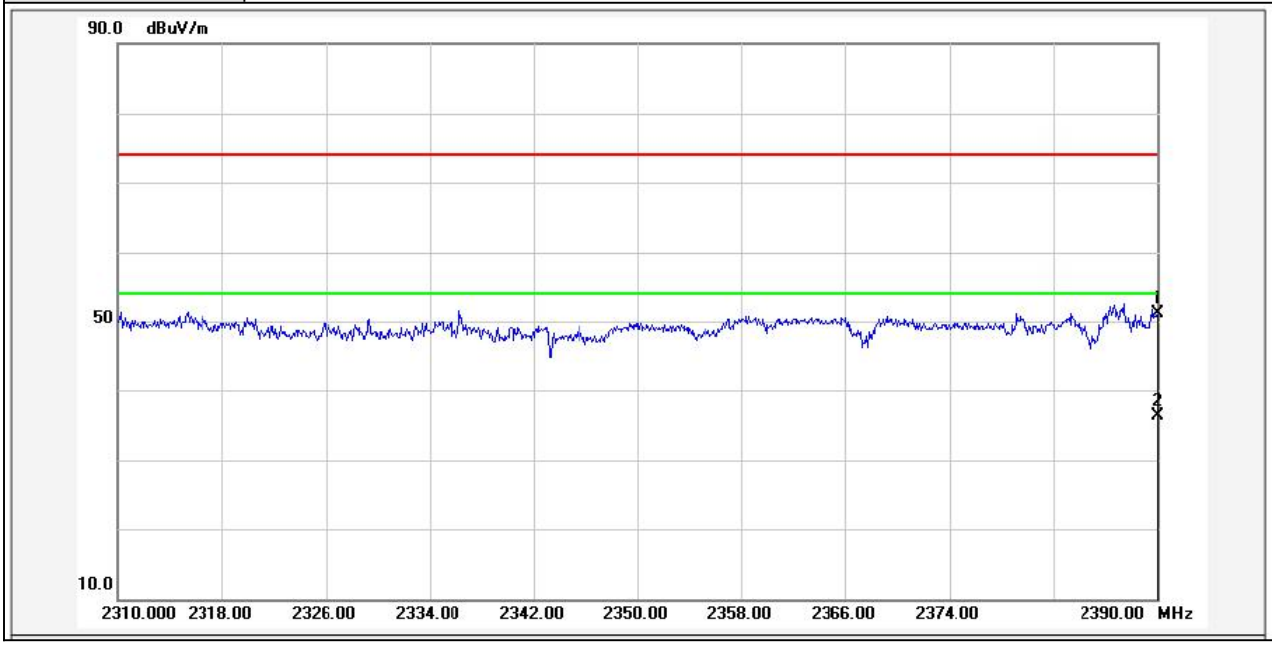
4924	H	45.68	31.99	14.76	60.44	46.75	74.00	54.00	-13.56	-7.25
7386	H	38.77	26.56	18.55	57.32	45.11	74.00	54.00	-16.68	-8.89

7.7 RESTRICT BAND EMISSION MEASUREMENT DATA

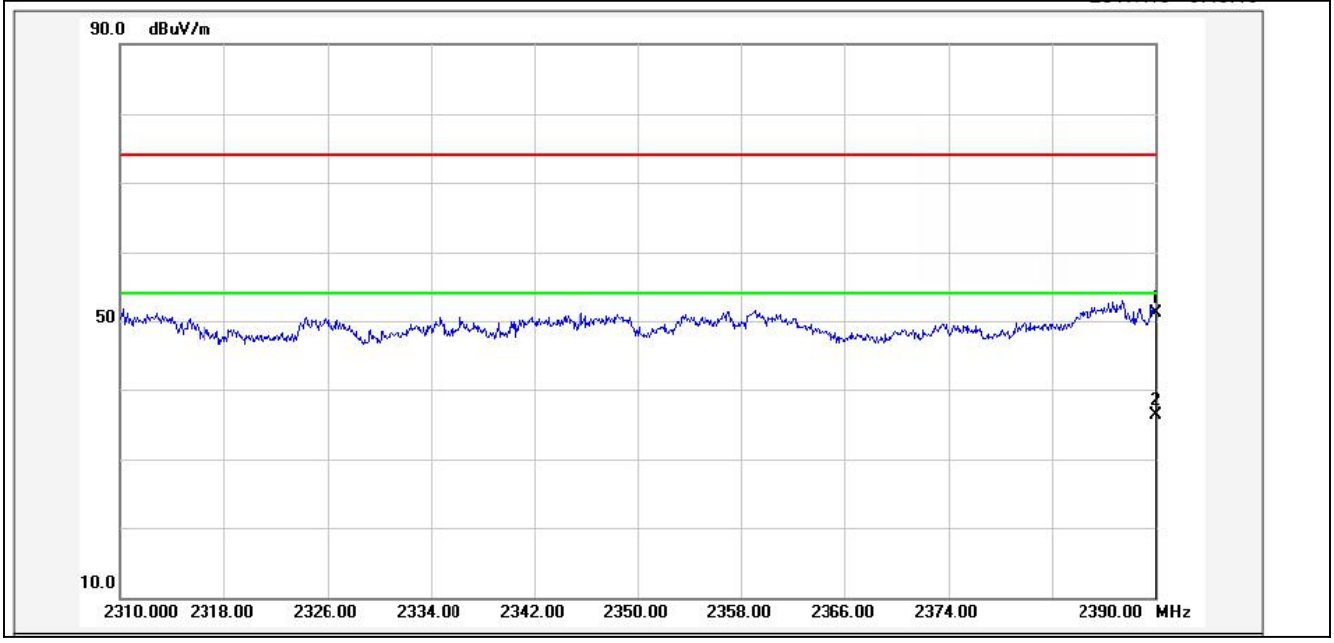
M/N :	S3	Test Voltage:	AC 120V/60Hz
Test Date :	May 08, 2020	Phase:	Vertical
Temperature:	20℃	Relative Humidity:	54%
Pressure:	101.0KPa	Test by:	Bing
Test Mode:	802.11b Low channel		

Freq (MHz)	Ant.Pol (H/V)	Reading Level (dBuV)		Factor (dB)	Emission Level (dBuV/m)		Limit 3m (dBuV/m)		Margin (dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
2390.000	H	33.97	18.24	12.56	46.53	30.80	74	54	-27.47	-23.20
2390.000	V	38.43	21.14	12.56	50.99	33.70	74	54	-23.01	-20.30
2483.500	H	30.03	17.53	12.67	45.70	30.20	74	54	-28.30	-23.80
2483.500	V	38.64	23.53	12.67	51.31	36.20	74	54	-22.69	-17.80

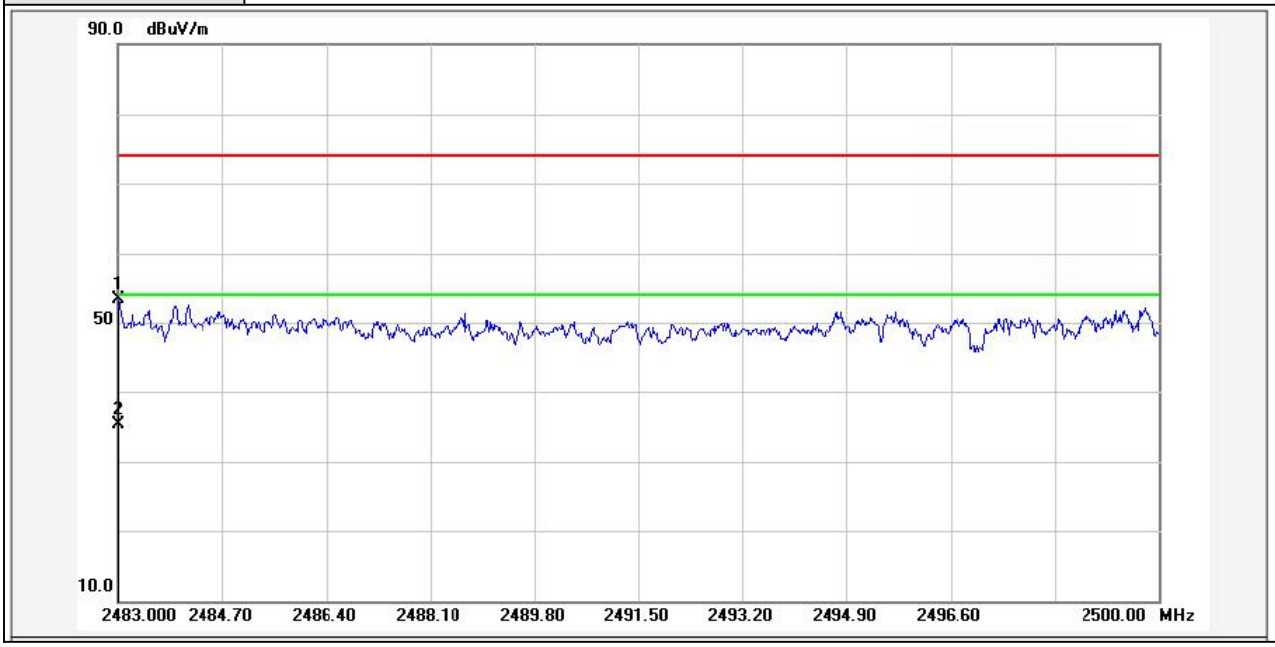
M/N :	S3	Test Voltage:	AC 120V/60Hz
Test Date :	May 08, 2020	Phase:	Vertical
Temperature:	20℃	Relative Humidity:	54%
Pressure:	101.0KPa	Test by:	Bing
Test Mode:	802.11b Low channel		



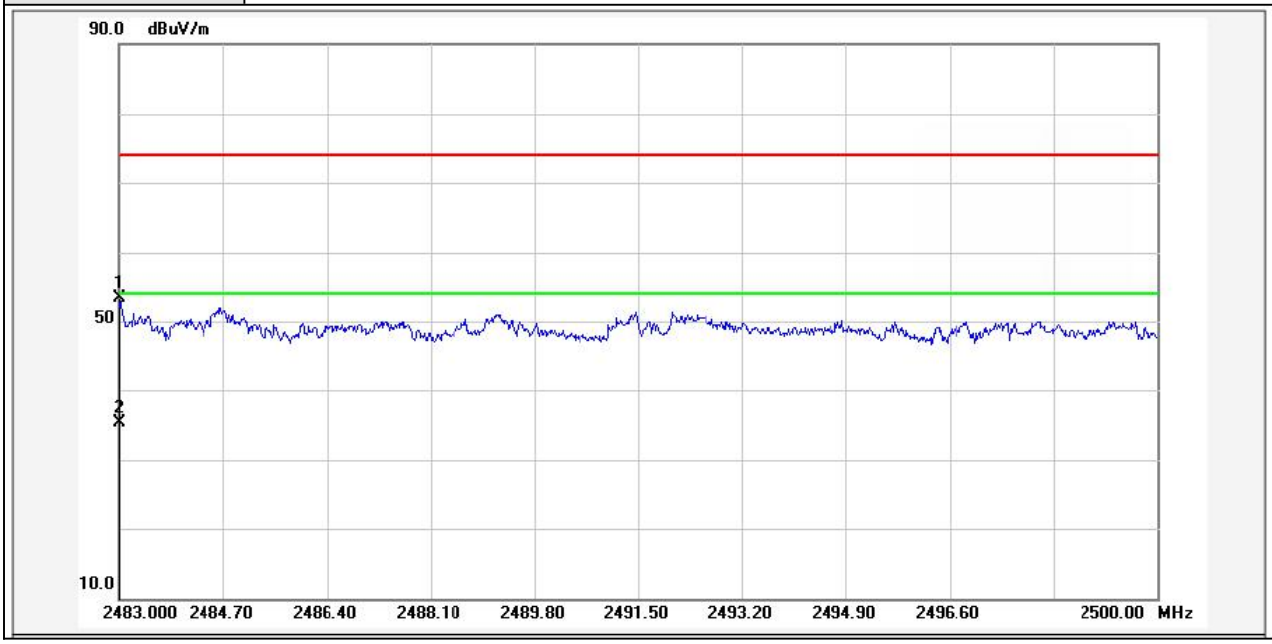
M/N :	S3	Test Voltage:	AC 120V/60Hz
Test Date :	May 08, 2020	Phase:	Horizontal
Temperature:	20℃	Relative Humidity:	54%
Pressure:	101.0KPa	Test by:	Bing
Test Mode:	802.11b Low channel		



M/N :	S3	Test Voltage:	AC 120V/60Hz
Test Date :	May 08, 2020	Phase:	Vertical
Temperature:	20℃	Relative Humidity:	54%
Pressure:	101.0KPa	Test by:	Bing
Test Mode:	802.11b Low channel		



M/N :	S3	Test Voltage:	AC 120V/60Hz
Test Date :	May 08, 2020	Phase:	Horizontal
Temperature:	20℃	Relative Humidity:	54%
Pressure:	101.0KPa	Test by:	Bing
Test Mode:	802.11b Low channel		



Note:
1. Emission level = Reading level + Correction factor
2. Correction factor : Antenna factor, Cable loss, Pre-Amp, etc.
3. All emissions as described above were determining by rotating the EUT through three orthogonal axes to maximizing the emissions if the EUT belongs to hand-held or body-worn devices.
4. Measurements above 1000 MHz, Peak detector setting:1 MHz RBW with 1 MHz VBW (Peak Detector).
5. Measurements above 1000 MHz, Average detector setting:1 MHz RBW with 10Hz VBW (RMS Detector).
6. Peak detector measurement data will represent the worst case results.
7. Where limits are specified for both average and peak detector functions, if the peak measured value complies with the average limit, it is unnecessary to perform an average measurement.

8. 6DB BANDWIDTH MEASUREMENT DATA

8.1 TEST LIMIT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.
Test Procedures

8.2 TEST PROCEDURES

a. The transmitter output was connected to the spectrum analyzer.
b. Set RBW of spectrum analyzer to 100KHz of the emission bandwidth and VBW ⩾ 3x RBW.
c. The 6 dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6 dB.
d. The 6dB Bandwidth was measured and recorded.

8.3 TEST SETUP LAYOUT

8.4 TEST RESULT AND DATA

PASS
Please refer to following table.

Temperature :	22 ℃	Humidity:	56%	Pressure:	101.45KPa
Test By:		Bing	Test Date :	May 07, 2020	
Frequency MHz		Data Rate Mbps	6dB Bandwidth MHz		Limit
IEE 802.11b Mode （CCK）					
Low Channel： 2412		1	8.571		＞500KHz
Middle Channel：2437		1	9.029		＞500KHz
High Channel： 2462		1	9.056		＞500KHz
IEE 802.11g Mode （OFDM）					
Low Channel： 2412		6	16.390		＞500KHz
Middle Channel：2437		6	16.450		＞500KHz
High Channel： 2462		6	16.450		＞500KHz
IEE 802.11n（HT20 Mode （OFDM）					
Low Channel： 2412		6.5	17.600		＞500KHz
Middle Channel：2437		6.5	17.370		＞500KHz
High Channel： 2462		6.5	17.630		＞500KHz
IEE 802.11n（HT40 Mode （OFDM）					
Low Channel： 2422		13.5	35.740		＞500KHz
Middle Channel：2437		13.5	35.750		＞500KHz
High Channel： 2452		13.5	35.410		＞500KHz

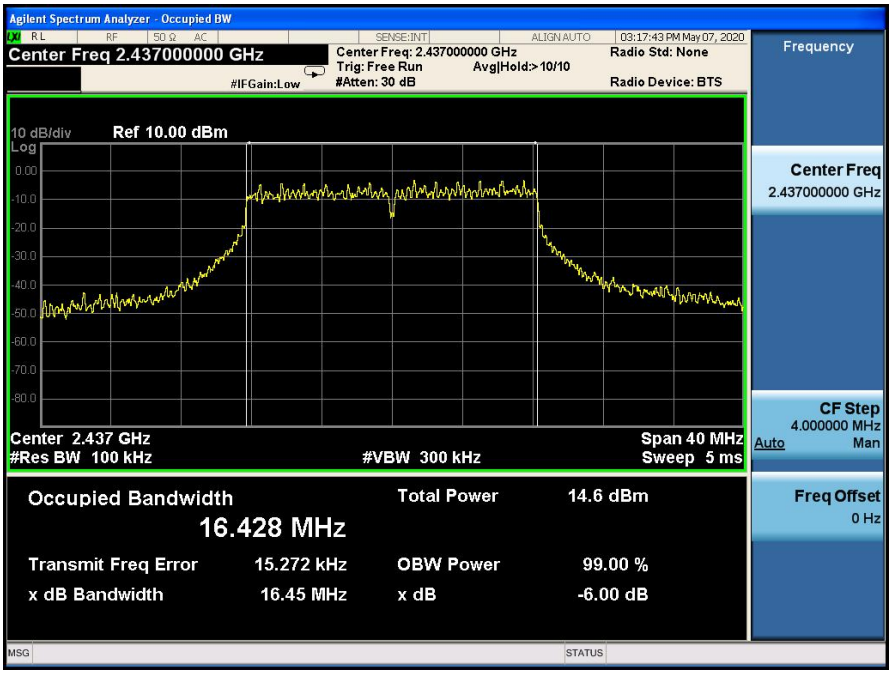
802.11b Low Channel

802.11b Middle Channel

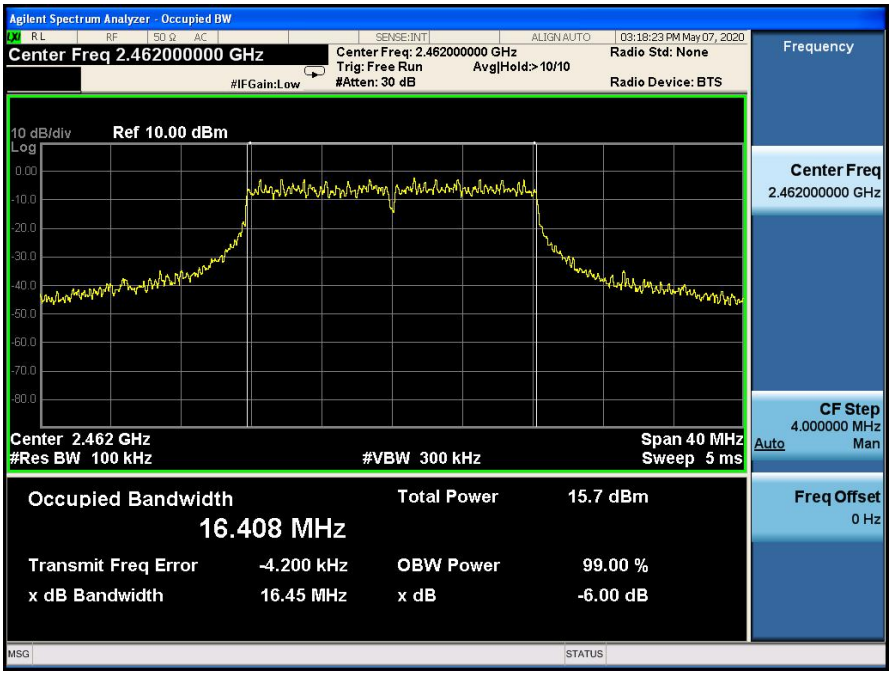
802.11b High Channel

802.11g Low Channel

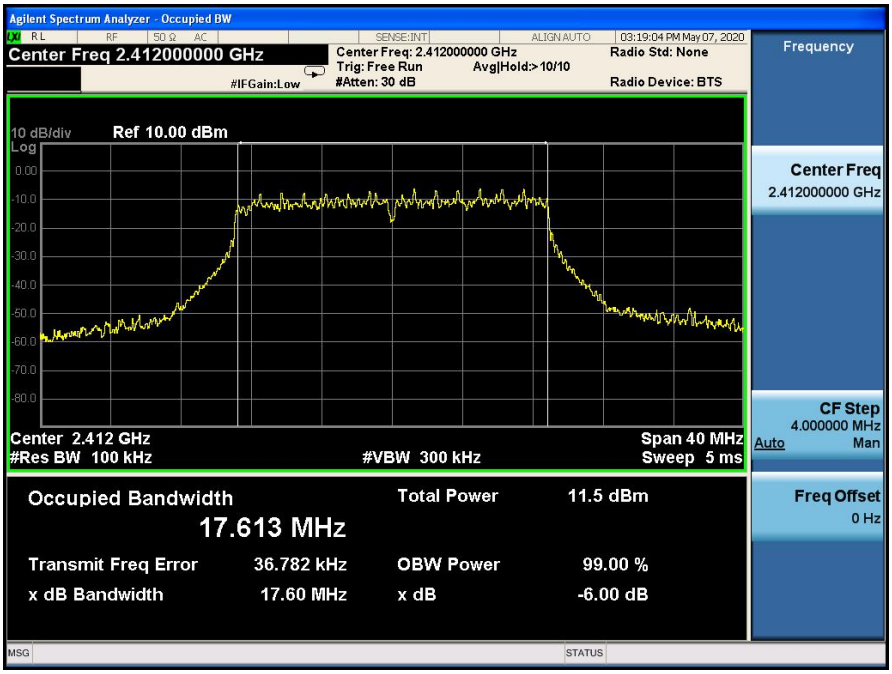
802.11g Middle Channel



802.11g High Channel

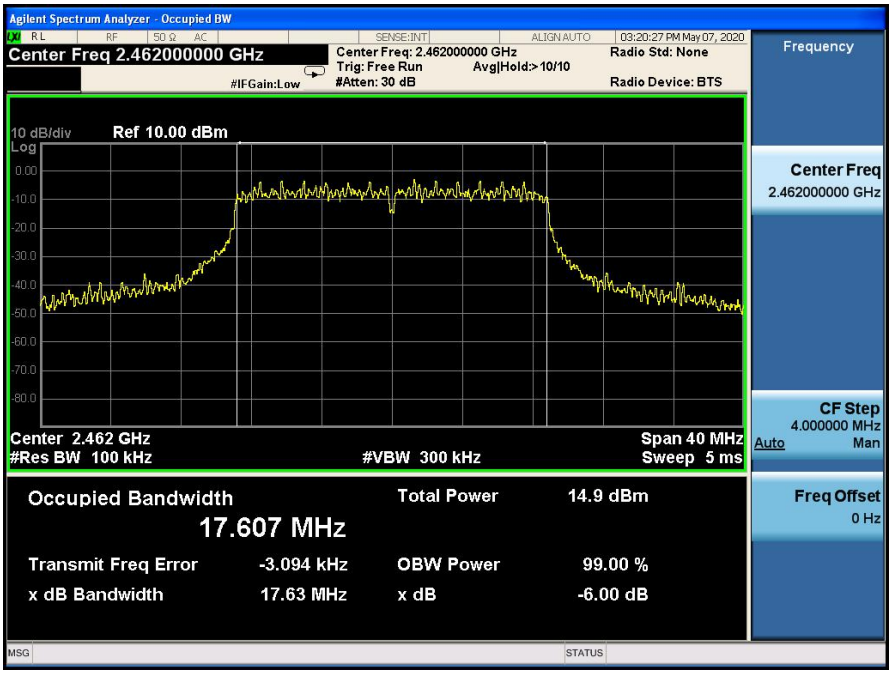


802.11n(HT20) Low Channel

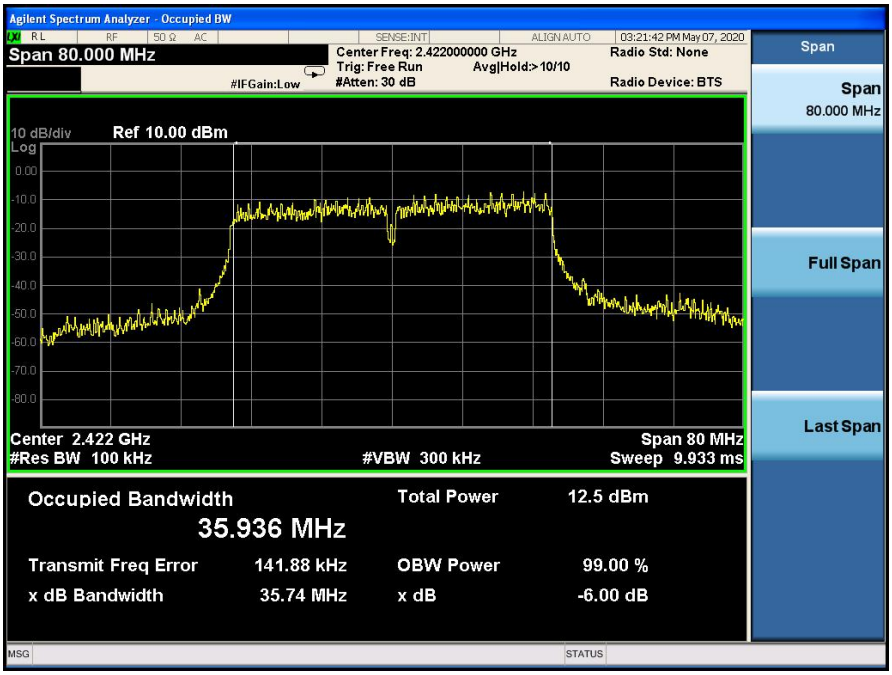


802.11n(HT20) Middle Channel

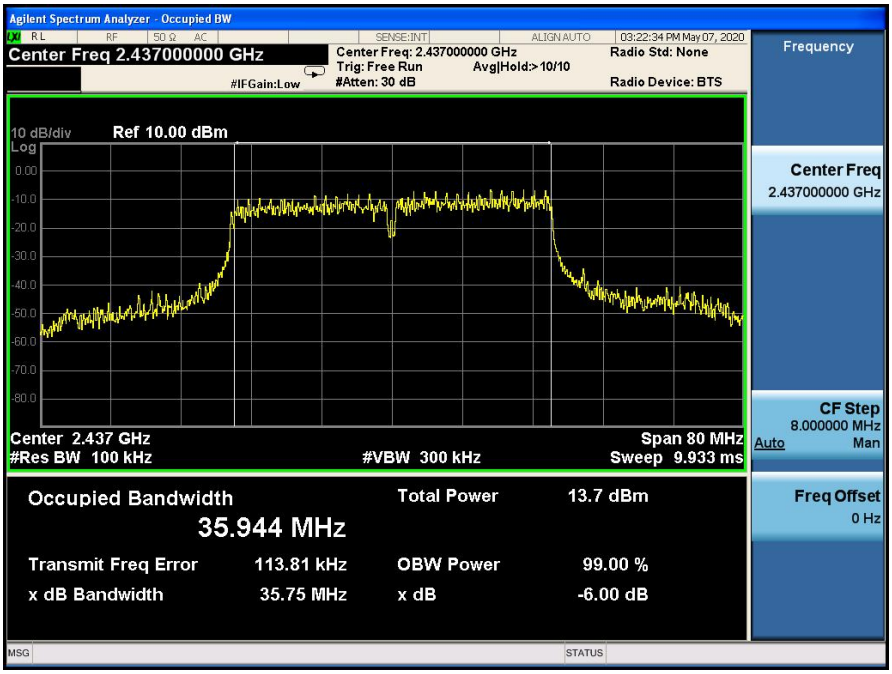
802.11n(HT20) High Channel



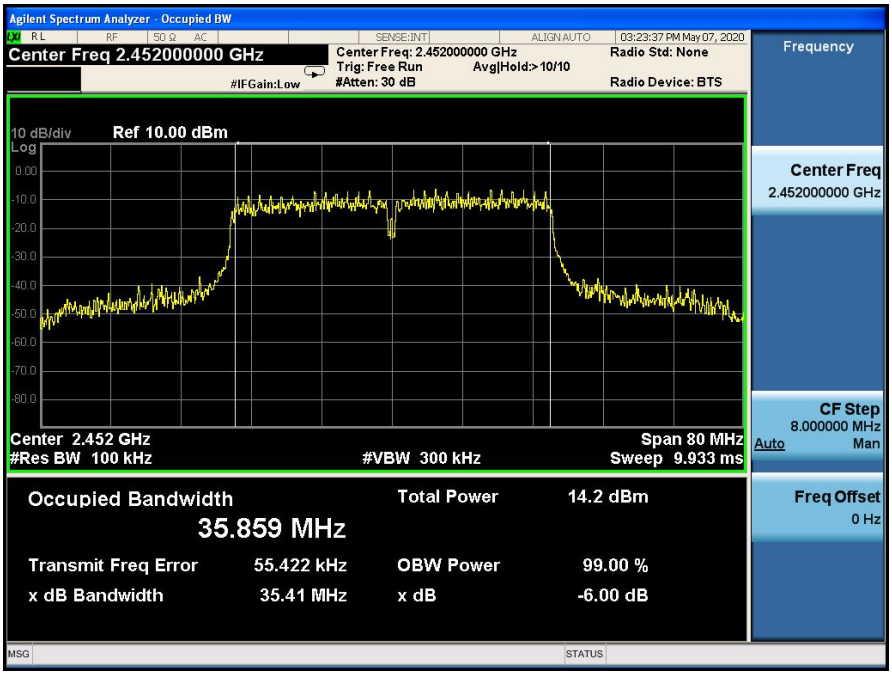
802.11n(HT40) Low Channel



802.11n(HT40) Middle Channel



802.11n(HT40) High Channel



9. MAXIMUM PEAK AND AVERAGE OUTPUT POWER

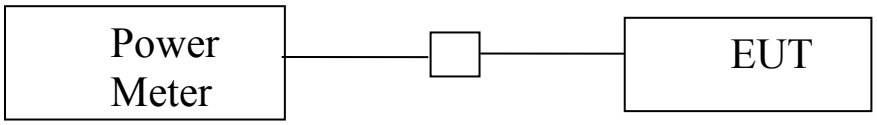
9.1 TEST LIMIT

The Maximum Peak Output Power Measurement is 30dBm.

9.2 TEST PROCEDURES

The transmitter output (antenna port) was connected to the power meter.
According to KDB558074 D01 DTS Measurement Guidance Section 9.1 Maximum peak conducted output power, 9.1.2 the maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall utilize a fast-responding diode detector.
According to KDB558074 D01 DTS Measurement Guidance Section 9.2 Maximum average conducted output power, 9.2.3.1 Method AVGPM (Measurement using an RF average power meter)
(a) As an alternative to spectrum analyzer or EMI receiver measurements, measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the conditions listed below are satisfied.
1) The EUT is configured to transmit continuously, or to transmit with a constant duty factor.
2) At all times when the EUT is transmitting, it shall be transmitting at its maximum power control level.
3) The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.
(b) If the transmitter does not transmit continuously, measure the duty cycle (x) of the transmitter output signal as described in Section 6.0.
(c) Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.
(d) Adjust the measurement in dBm by adding 10log (1/x), where x is the duty cycle to the measurement result.

9.3 TEST SETUP LAYOUT



9.4 TEST RESULT AND DATA

PASS
Please refer to following table.

Temperature :	22 ℃	Humidity:	56%	Pressure:	101.45KPa
Test By:		Bing	Test Date :	May 07, 2020	

Frequency MHz	Data Rate Mbps	Peak Output Power dBm	Limit dBm
IEE 802.11b Mode（CCK, Antenna Gain=0dBi）			
Low Channel： 2412	1	14.53	30
Middle Channel：2437	1	14.66	30
High Channel： 2462	1	14.83	30
IEE 802.11g Mode （OFDM, Antenna Gain=0dBi）			
Low Channel： 2412	6	19.32	30
Middle Channel：2437	6	19.87	30
High Channel： 2462	6	19.63	30
IEE 802.11n（HT20）Mode （OFDM, Antenna Gain=0dBi）			
Low Channel： 2412	6.5	19.47	30
Middle Channel：2437	6.5	19.04	30
High Channel： 2462	6.5	19.42	30
IEE 802.11n（HT40）Mode （OFDM, Antenna Gain=0dBi）			
Low Channel： 2422	13.5	18.77	30
Middle Channel：2437	13.5	18.38	30
High Channel： 2452	13.5	18.62	30

10. POWER SPECTRAL DENSITY

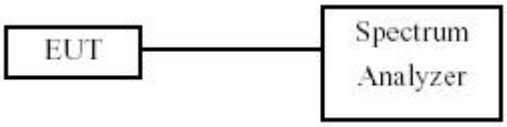
10.1 TEST LIMIT

The Maximum of Power Spectral Density Measurement is 8dBm

10.2 TEST PROCEDURES

g. The transmitter output was connected to spectrum analyzer.
h. The spectrum analyzer’ s resolution bandwidth were set at 3KHz RBW and 30KHz VBW as that of the fundamental frequency. Set the sweep time=auto couple.
i. The power spectral density was measured and recorded.

10.3 TEST SETUP LAYOUT



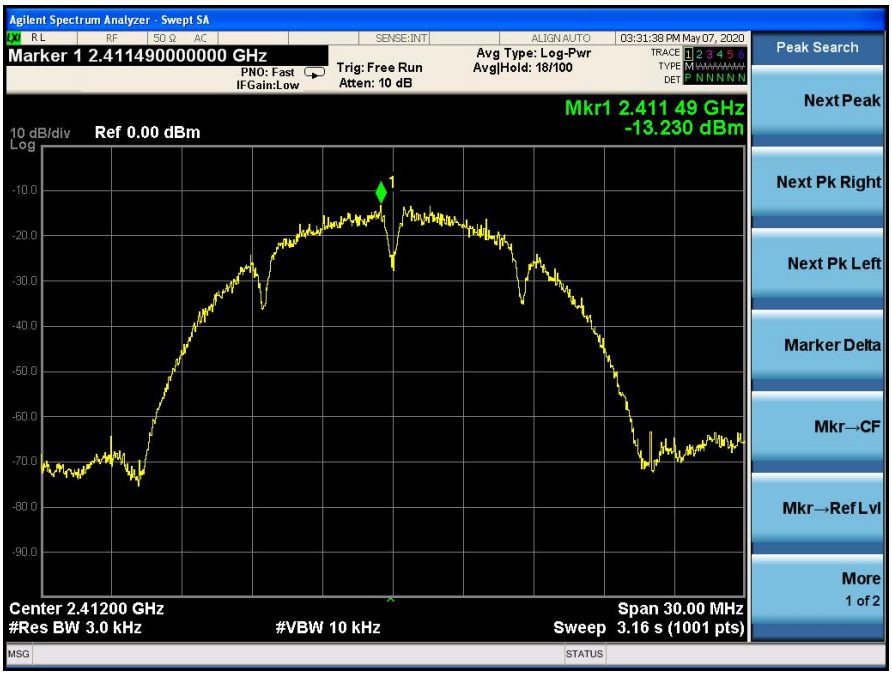
10.4 TEST RESULT AND DATA

PASS
Please refer to following table.

Temperature :	22 ℃	Humidity:	56%	Pressure:	101.45KPa
Test By:		Bing	Test Date :	May 07, 2020	

Frequency MHz	Data Rate Mbps	PSD dBm/3kHz	Limit dBm/3kHz
IEE 802.11b Mode （CCK）			
Low Channel： 2412	1	-13.230	8
Middle Channel：2437	1	-10.635	8
High Channel： 2462	1	-10.610	8
IEE 802.11g Mode （OFDM）			
Low Channel： 2412	6	-18.573	8
Middle Channel：2437	6	-17.701	8
High Channel： 2462	6	-16.473	8
IEE 802.11n（HT20 Mode （OFDM）			
Low Channel： 2412	6.5	-21.597	8
Middle Channel：2437	6.5	-18.533	8
High Channel： 2462	6.5	-17.488	8
IEE 802.11n（HT40 Mode （OFDM）			
Low Channel： 2422	13.5	-20.248	8
Middle Channel：2437	13.5	-19.870	8
High Channel： 2452	13.5	-19.518	8

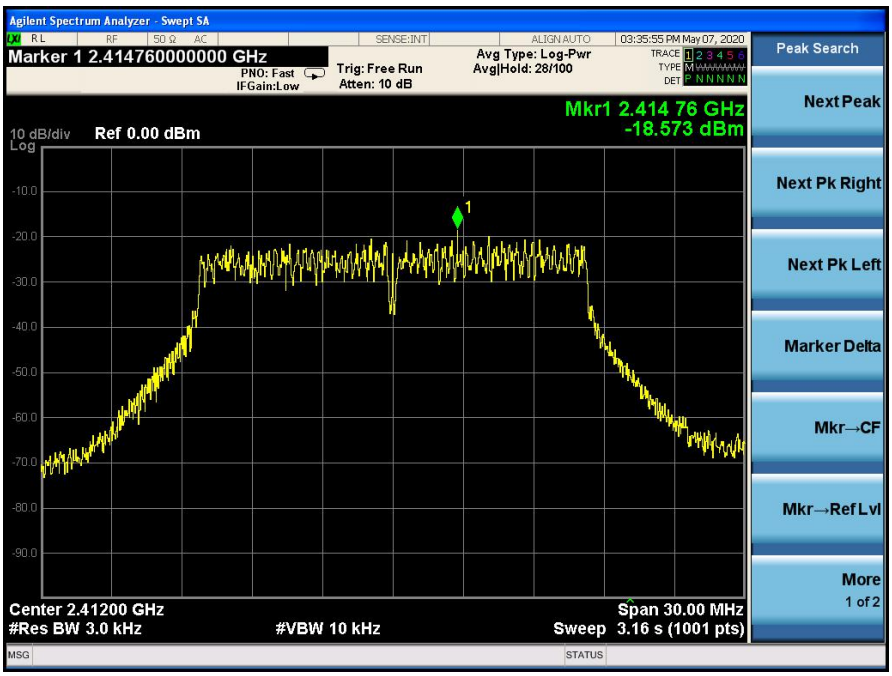
802.11b Low Channel



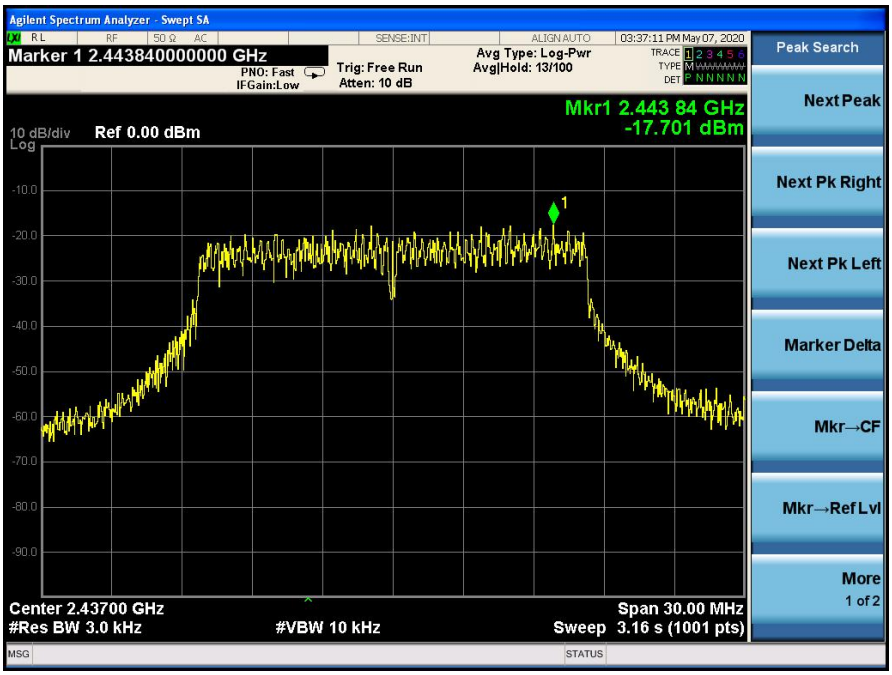
802.11b Middle Channel

802.11b High Channel

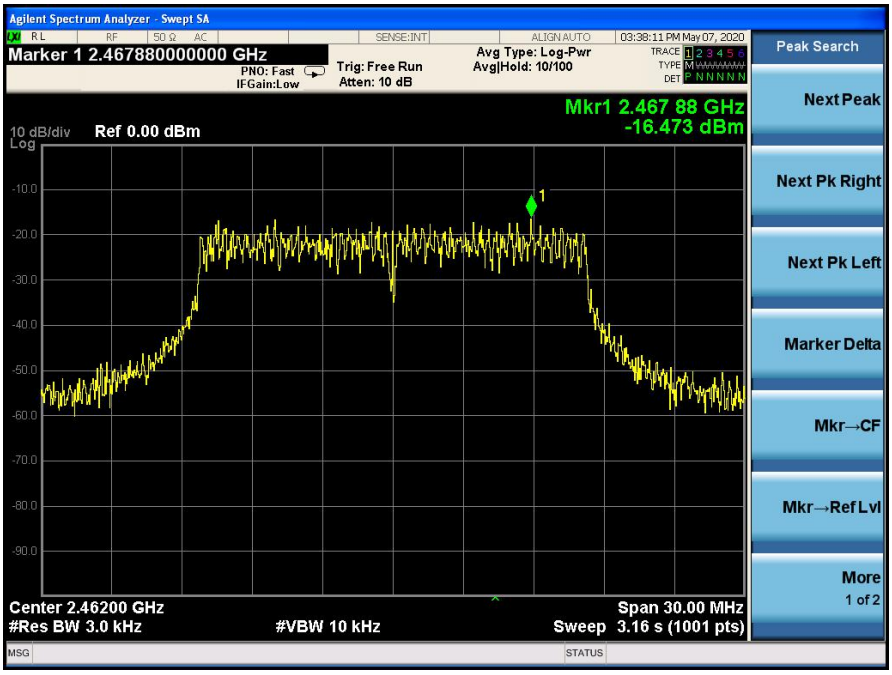
802.11g Low Channel



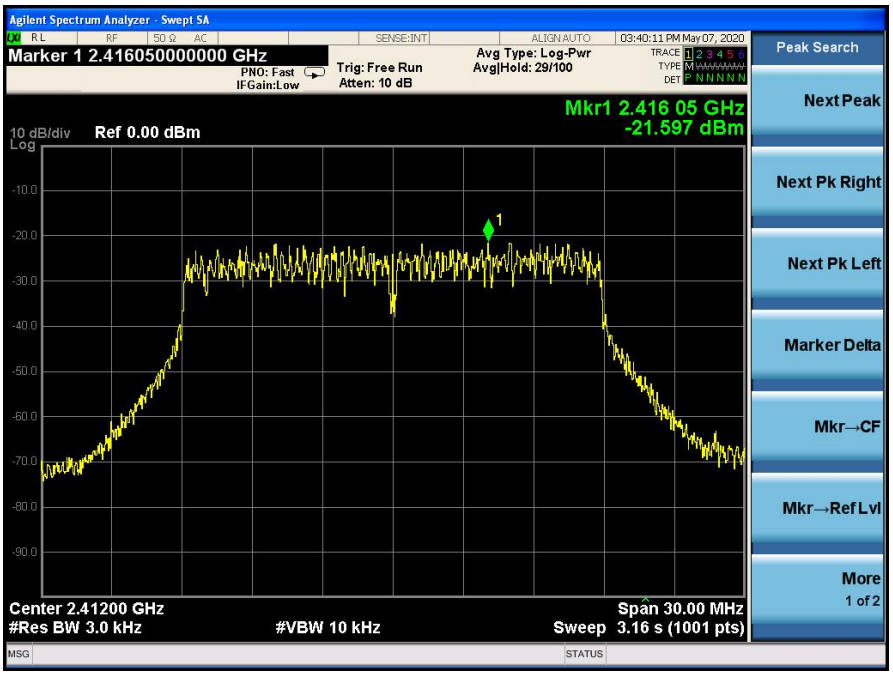
802.11g Middle Channel



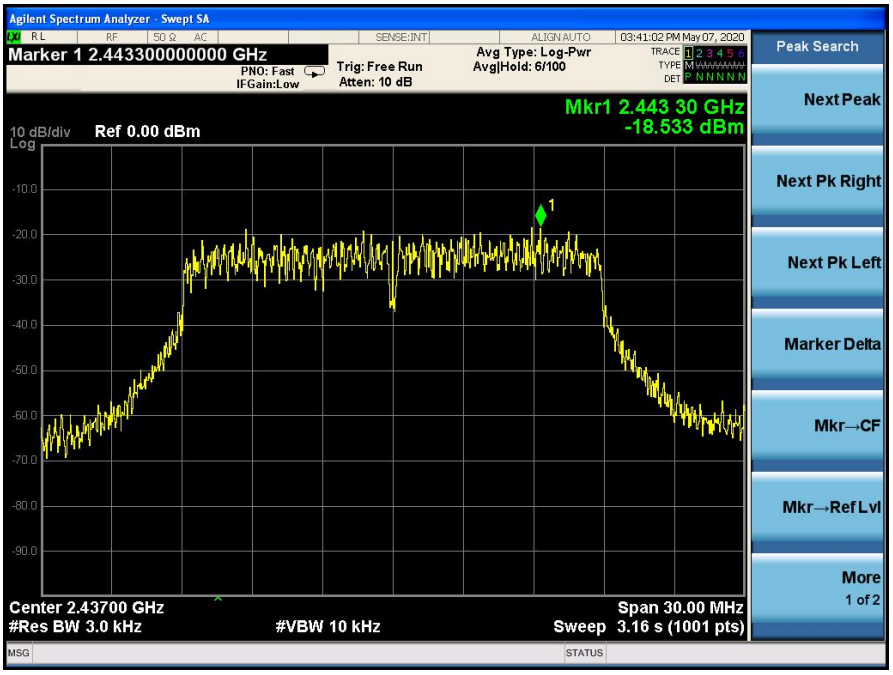
802.11g High Channel



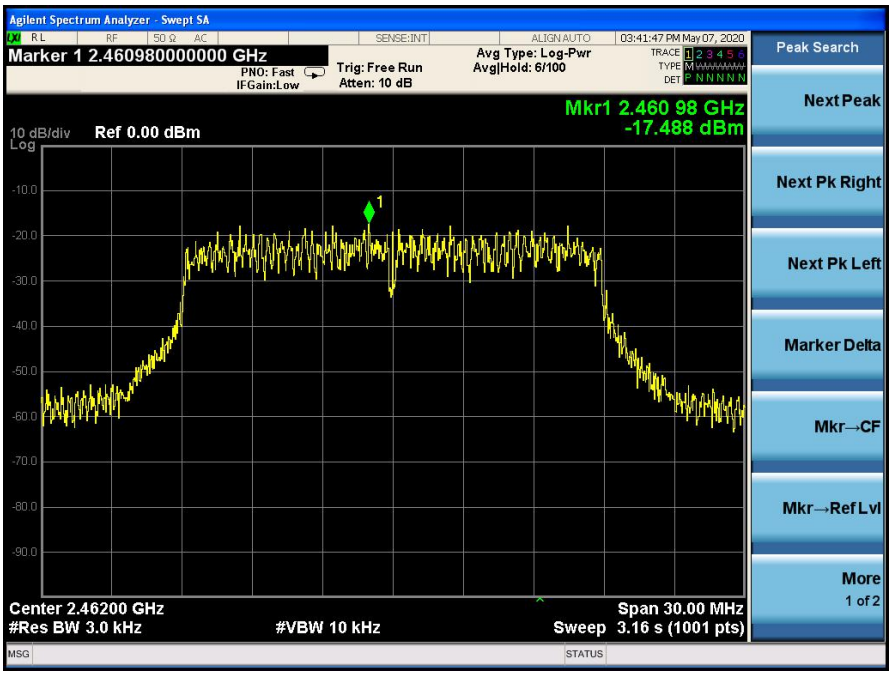
802.11n(HT20) Low Channel



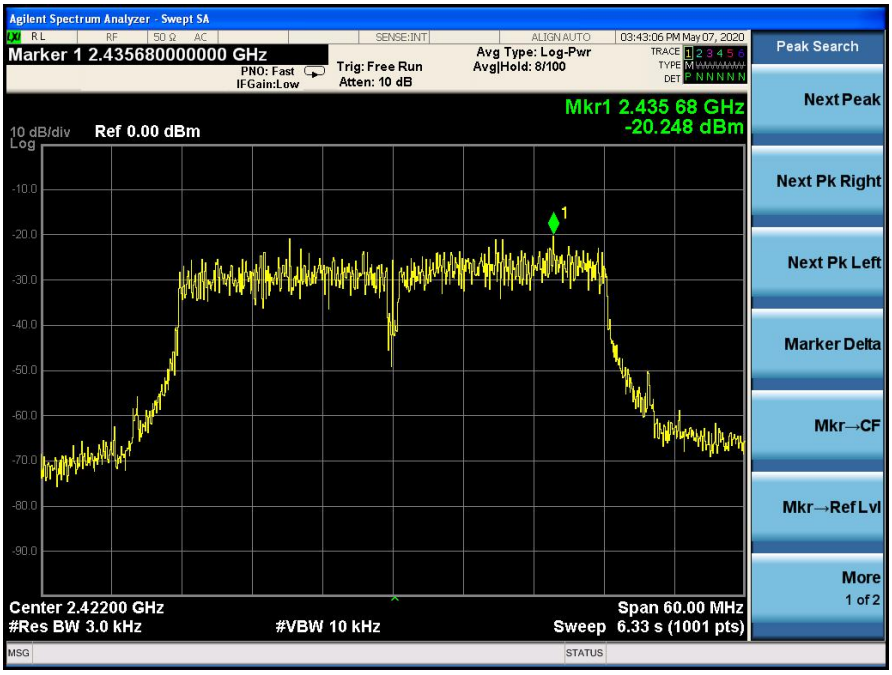
802.11n(HT20) Middle Channel



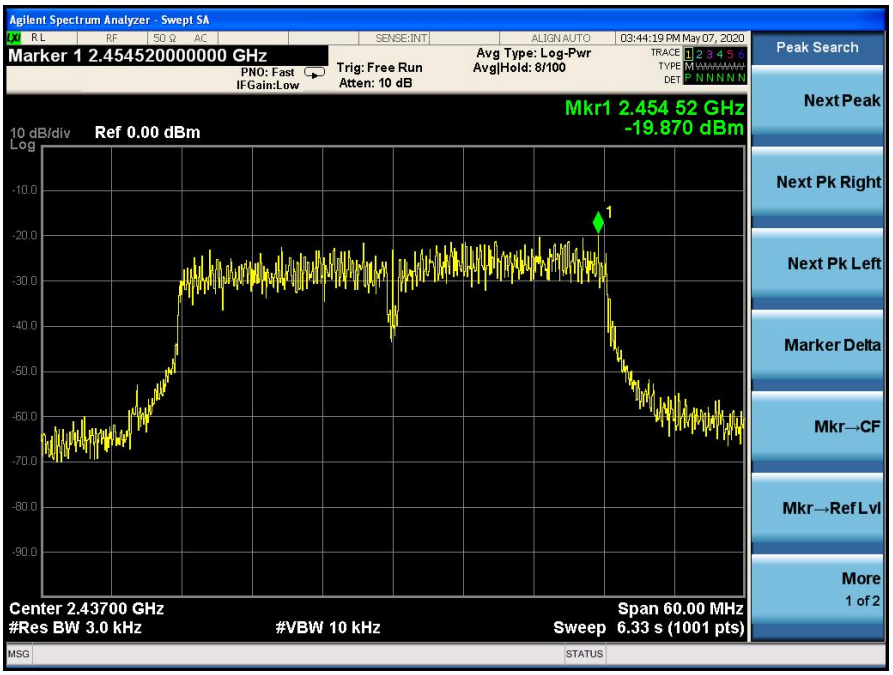
802.11n(HT20) High Channel



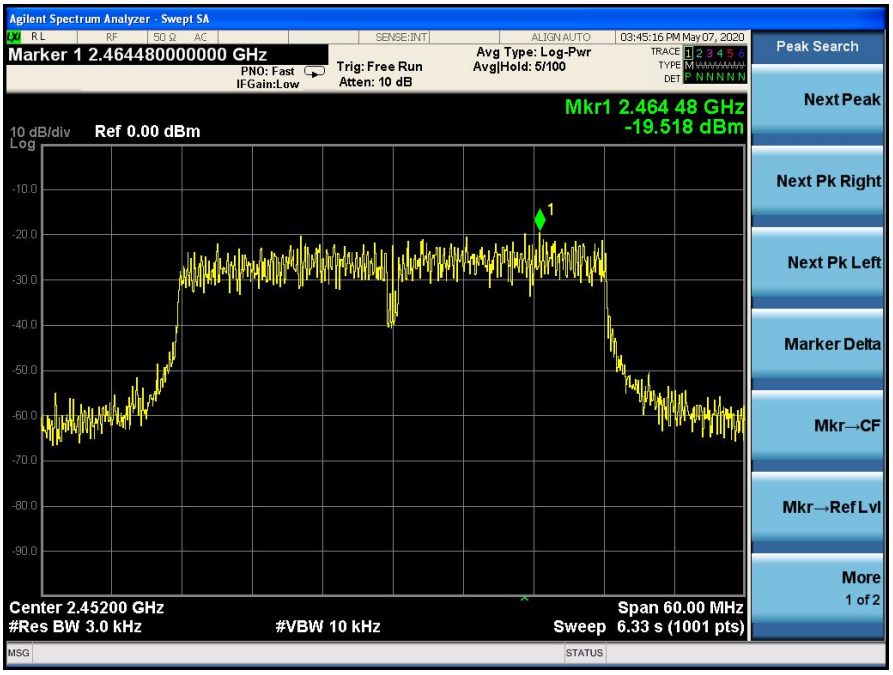
802.11n(HT40) Low Channel



802.11n(HT40) Middle Channel



802.11n(HT40) High Channel



11. BAND EDGES MEASUREMENT

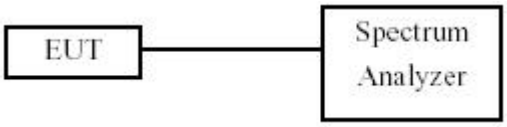
11.1 TEST LIMIT

Below －20dB of the highest emission level of operating band (In 100 kHz Resolution Bandwidth)

11.2 TEST PROCEDURE

a. The transmitter output was connected to the spectrum analyzer via a low lose cable.
b. Set RBW of spectrum analyzer to 100 KHz and VBW of spectrum analyzer to 300 KHz with convenient frequency span including 100 KHz bandwidth from band edge.
c. Peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20dB relative to the maximum measured in-band peak PSD level.
d. The band edges was measured and recorded.

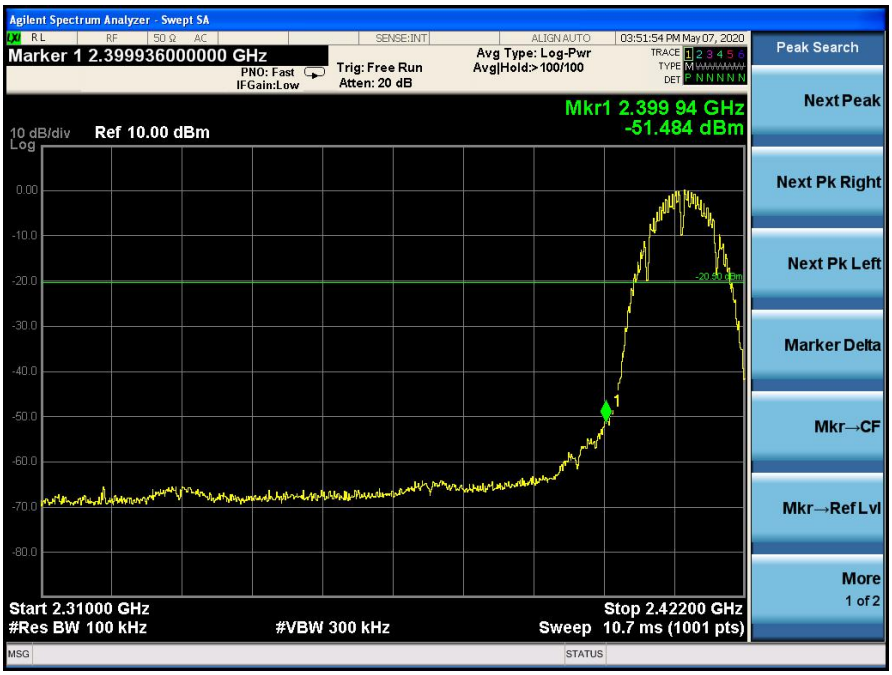
11.3 TEST SETUP LAYOUT



11.4 TEST RESULT AND DATA

PASS
Please refer to following table.

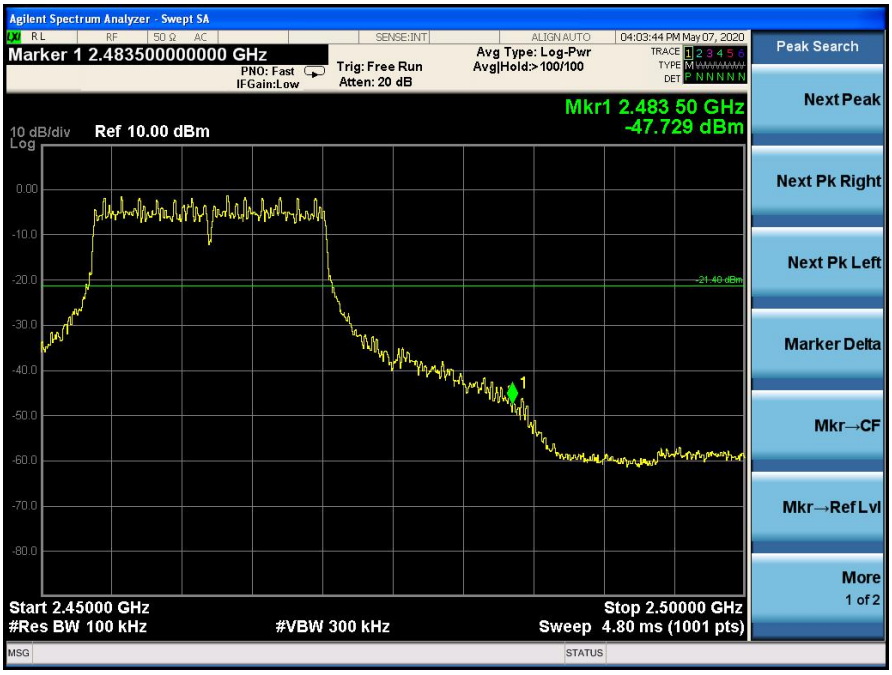
802.11b Low Channel



802.11b High Channel

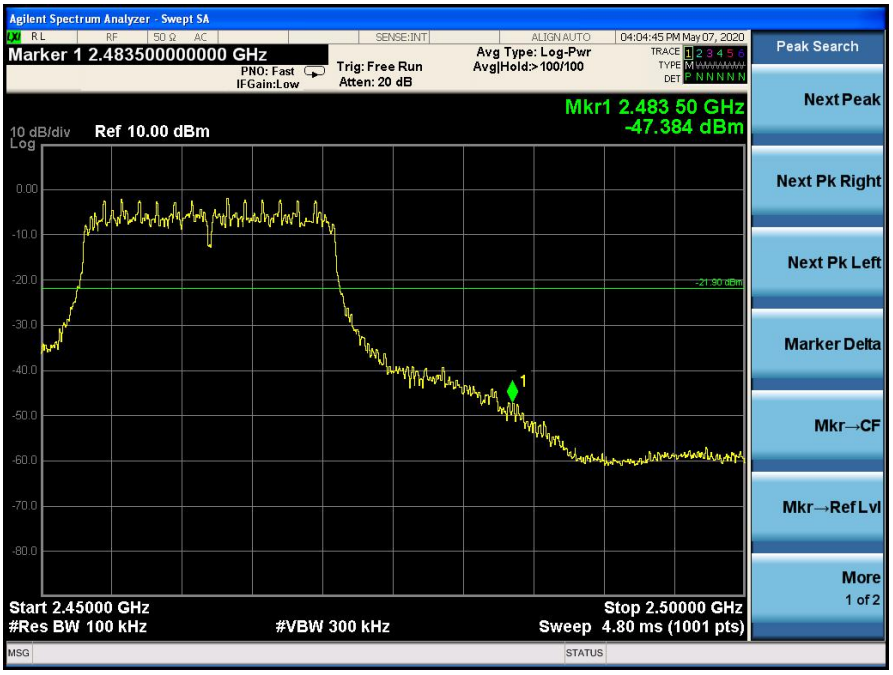
802.11g Low Channel

802.11g High Channel



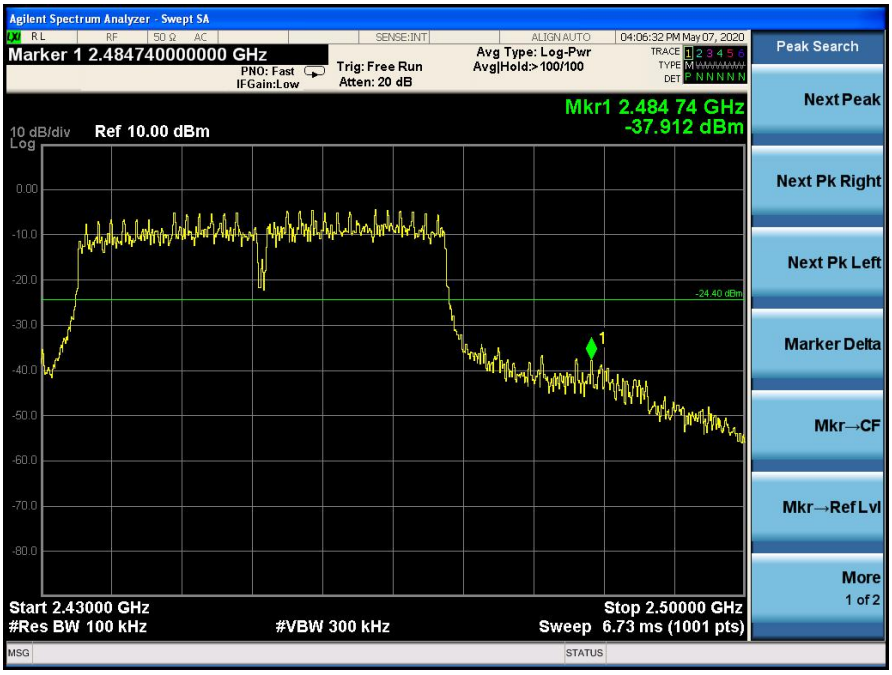
802.11n(HT20) Low Channel

802.11n(HT20) High Channel



802.11n(HT40) Low Channel

802.11n(HT40) High Channel



12. RESTRICTED BANDS OF OPERATION

Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.09000 – 0.11000	16.42000 – 16.42300	399.9 – 410.0	4.500 – 5.150
0.49500 – 0.505**	16.69475 – 16.69525	608.0 – 614.0	5.350 – 5.460
2.17350 – 2.19050	16.80425 – 16.80475	960.0 – 1240.0	7.250 – 7.750
4.12500 – 4.12800	25.50000 – 25.67000	1300.0 – 1427.0	8.025 – 8.500
4.17725 – 4.17775	37.50000 – 38.25000	1435.0 – 1626.5	9.000 – 9.200
4.20725 – 4.20775	73.00000 – 74.60000	1645.5 – 1646.5	9.300 – 9.500
6.21500 – 6.21800	74.80000 – 75.20000	1660.0 – 1710.0	10.600 – 12.700
6.26775 – 6.26825	108.00000 – 121.94000	1718.8 – 1722.2	13.250 – 13.400
6.31175 – 6.31225	123.00000 – 138.00000	2200.0 – 2300.0	14.470 – 14.500
8.29100 – 8.29400	149.90000 – 150.05000	2310.0 – 2390.0	15.350 – 16.200
8.36200 – 8.36600	156.52475 – 156.52525	2483.5 – 2500.0	17.700 – 21.400
8.37625 – 8.38675	156.70000 – 156.90000	2655.0 – 2900.0	22.010 – 23.120
8.41425 – 8.41475	162.01250 – 167.17000	3260.0 – 3267.0	23.600 – 24.000
12.29000 – 12.29300	167.72000 – 173.20000	3332.0 – 3339.0	31.200 – 31.800
12.51975 – 12.52025	240.00000 – 285.00000	3345.8 – 3358.0	36.430 – 36.500
12.57675 – 12.57725	322.00000 – 335.40000	3600.0 – 4400.0	Above 38.6
13.36000 – 13.41000			

**: Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz

12.1 LABELING REQUIREMENT

The device shall bear the following statement in a conspicuous location on the device: This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

--END---