FCC Report (WIFI)

Applicant:	Shenzhen QR Technology Development Corporation Limited
Address of Applicant:	Floor 3, Building 7, Zhengzhong Industrial Park, Dayang Community, Fuhai, Bao'an District, Shenzhen, Guangdong Province, China
Manufacturer:	Shenzhen QR Technology Development Corporation Limited
Address of Manufacturer:	Floor 3, Building 7, Zhengzhong Industrial Park, Dayang Community, Fuhai, Bao'an District, Shenzhen, Guangdong Province, China
Factory:	Shenzhen QR Technology Development Corporation Limited
Address of Factory:	Floor 3, Building 7, Zhengzhong Industrial Park, Dayang Community, Fuhai, Bao'an District, Shenzhen, Guangdong Province, China

Equipment Under Test (EUT)

Product Name:	X10
Model No.:	X10
Trade Mark:	N/A
FCC ID:	2AVVO-X10
Applicable standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.247 KDB558074 D01 DTS Meas Guidance V05r02
Date of sample receipt:	March 02, 2020
Date of Test:	March 02- March 11, 2020
Date of report issued:	March 11, 2020
Test Result :	PASS *

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Robinson Lo
Laboratory Manager

This results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

2 Version

Version No.	Date	Description
00	*March 11, 2020*	*Original*

Prepared By: ***Date:*** *March 11, 2020*

Project Engineer

Check By: ***Date:*** *March 11, 2020*

Reviewer

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4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203/15.247 (c)	Pass
AC Power Line Conducted Emission	15.207	Pass
Conducted Peak Output Power	15.247 (b)(3)	Pass
Channel Bandwidth	15.247 (a)(2)	Pass
Power Spectral Density	15.247 (e)	Pass
Band Edge	15.247(d)	Pass
Spurious Emission	15.205/15.209	Pass

Remark: Test according to ANSI C63.10:2013.

Pass: The EUT complies with the essential requirements in the standard.

Measurement Uncertainty

Test Item	Measurement Uncertainty	Notes
Conducted Peak Output Power	0.65dB	(1)
Power Spectral Density	1.31dB	(1)
Unwanted Emission, conducted	2.8dB	(1)
Radiated Emission (30MHz-200MHz)	3.8039dB	(1)
Radiated Emission (200MHz-1GHz)	3.9679dB	(1)
Radiated Emission (1GHz-18GHz)	4.29dB	(1)
Radiated Emission (18GHz-40GHz)	3.30dB	(1)
AC Power Line Conducted Emission (0.15MHz ~ 30MHz)	3.44dB	(1)
Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.		

5 General Information

5.1 General Description of EUT

Product Name:	X10
Model No.:	X10
Test Model No:	X10
Remark: N/A	
Serial No.:	Q500ML
Hardware version:	HV1.0
Software version:	SV1.0
Test sample(s) ID:	GTS202003000007-1
Sample(s) Status	Engineer sample
Channel numbers:	802.11b/802.11g /802.11n(HT20): 11
Channel separation:	5MHz
Modulation technology:	802.11b: Direct Sequence Spread Spectrum (DSSS) 802.11g/802.11n(H20): Orthogonal Frequency Division Multiplexing (OFDM)
Antenna Type:	FPCB antenna
Antenna gain:	1.0dBi
Adapter	Model: JYSY021A-0501500U AC Power Input: 100-240V~ 50/60Hz 0.3A Output: DC5V 1.5A
Power supply:	AC 120V / 60Hz

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 (MHz)**
	802.11b/802.11g/802.11n(HT20)
Lowest channel	2412MHz
Middle channel	2437MHz
Highest channel	2462MHz

5.2 Test mode

Transmitting mode	Keep the EUT in continuously transmitting mode

Remark: During the test, the dutycycle >98%, 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	802.11n(HT20)
Data rate	1Mbps	6Mbps	6.5Mbps

5.3 Description of Support Units

None

5.4 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

● **FCC —Registration No.: 381383**

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. Registration 381383.

● **IC —Registration No.: 9079A**

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A

● **NVLAP (LAB CODE:600179-0)**

Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP). LAB CODE:600179-0

5.5 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.
No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone,
Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102

Telephone: +86 (0) 755 2779 8480

Fax: +86 (0) 755 2779 8960

5.6 Additional Instructions

EUT Software Settings:

Mode	Special software is used. The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.		
Test Software Name	DRTU Version 1.7.7-02972		
Mode	Channel	Frequency (MHz)	Software Set
802.11b/g/n(HT20)	CH1	2412	TX level : default
	CH6	2437	
	CH11	2462	

6 Test Instruments list

Radiated Emission:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	July. 03 2015	July. 02 2020
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	June. 26 2019	June. 25 2020
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June. 26 2019	June. 25 2020
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	June. 26 2019	June. 25 2020
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	June. 26 2019	June. 25 2020
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	June. 26 2019	June. 25 2020
9	Coaxial Cable	GTS	N/A	GTS211	June. 26 2019	June. 25 2020
10	Coaxial cable	GTS	N/A	GTS210	June. 26 2019	June. 25 2020
11	Coaxial Cable	GTS	N/A	GTS212	June. 26 2019	June. 25 2020
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June. 26 2019	June. 25 2020
13	Amplifier(2GHz-20GHz)	HP	84722A	GTS206	June. 26 2019	June. 25 2020
14	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June. 26 2019	June. 25 2020
15	Band filter	Amindeon	82346	GTS219	June. 26 2019	June. 25 2020
16	Power Meter	Anritsu	ML2495A	GTS540	June. 26 2019	June. 25 2020
17	Power Sensor	Anritsu	MA2411B	GTS541	June. 26 2019	June. 25 2020
18	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	June. 26 2019	June. 25 2020
19	Splitter	Agilent	11636B	GTS237	June. 26 2019	June. 25 2020
20	Loop Antenna	ZHINAN	ZN30900A	GTS534	June. 26 2019	June. 25 2020
21	Breitband hornantenne	SCHWARZBECK	BBHA 9170	GTS579	Oct. 19 2019	Oct. 18 2020
22	Amplifier	TDK	PA-02-02	GTS574	Oct. 19 2019	Oct. 18 2020
23	Amplifier	TDK	PA-02-03	GTS576	Oct. 19 2019	Oct. 18 2020
24	PSA Series Spectrum Analyzer	Rohde & Schwarz	FSP	GTS578	June. 26 2019	June. 25 2020

Conducted Emission						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	GTS252	May.15 2019	May.14 2022
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 26 2019	June. 25 2020
3	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June. 26 2019	June. 25 2020
4	Artificial Mains Network	SCHWARZBECK MESS	NSLK8127	GTS226	June. 26 2019	June. 25 2020
5	Coaxial Cable	GTS	N/A	GTS227	N/A	N/A
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Thermo meter	KTJ	TA328	GTS233	June. 26 2019	June. 25 2020
8	Absorbing clamp	Elektronik-Feinmechanik	MDS21	GTS229	June. 26 2019	June. 25 2020
9	ISN	SCHWARZBECK	NTFM 8158	GTD565	June. 26 2019	June. 25 2020

RF Conducted Test:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	MXA Signal Analyzer	Agilent	N9020A	GTS566	June. 26 2019	June. 25 2020
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 26 2019	June. 25 2020
3	Spectrum Analyzer	Agilent	E4440A	GTS533	June. 26 2019	June. 25 2020
4	MXG vector Signal Generator	Agilent	N5182A	GTS567	June. 26 2019	June. 25 2020
5	ESG Analog Signal Generator	Agilent	E4428C	GTS568	June. 26 2019	June. 25 2020
6	USB RF Power Sensor	DARE	RPR3006W	GTS569	June. 26 2019	June. 25 2020
7	RF Switch Box	Shongyi	RFSW3003328	GTS571	June. 26 2019	June. 25 2020
8	Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	GTS572	June. 26 2019	June. 25 2020

General used equipment:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Humidity/ Temperature Indicator	KTJ	TA328	GTS243	June. 26 2019	June. 25 2020
2	Barometer	ChangChun	DYM3	GTS255	June. 26 2019	June. 25 2020

7 Test results and Measurement Data

7.1 Antenna requirement

Standard requirement:	FCC Part15 C Section 15.203 /247(c)

15.203 requirement:

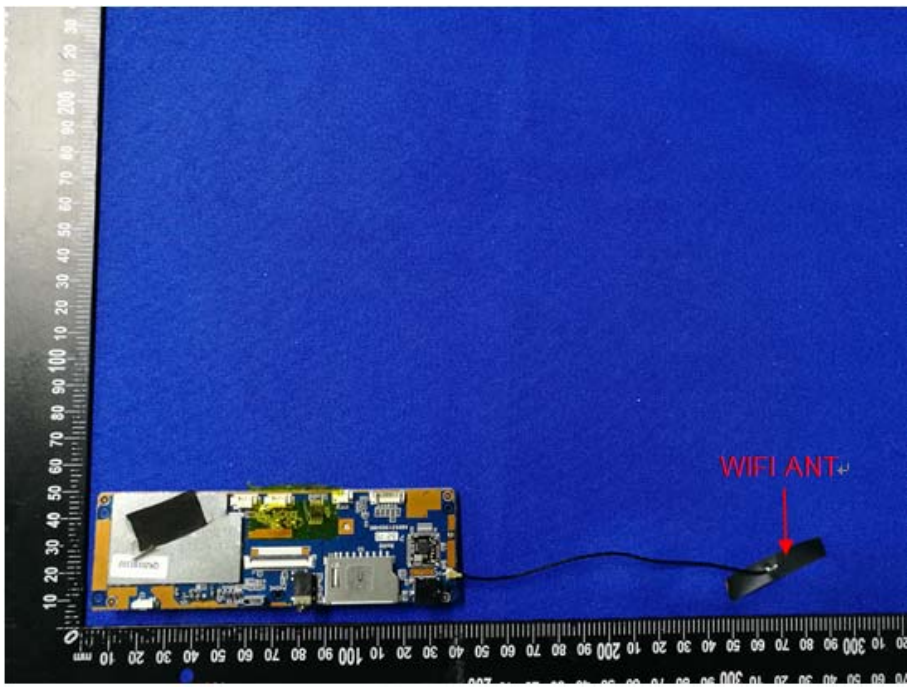
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit 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 FPCB antenna, the best case gain of the antenna is 1.0dBi.



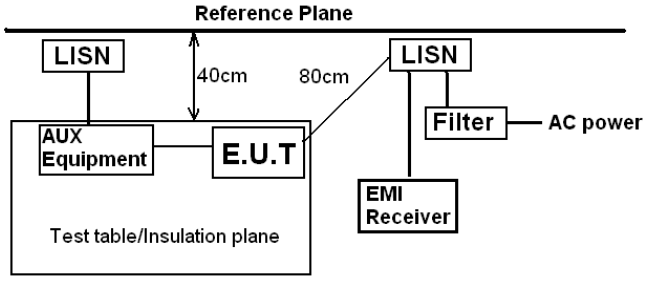
7.2 Conducted Emissions

Test Requirement:	FCC Part15 C Section 15.207
Test Method:	Clause 6.2 of ANSI C63.10:2013
Test Frequency Range:	150KHz to 30MHz
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto
Limit:	

Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

Test setup:



Remark:
E.U.T: Equipment Under Test
LISN: Line Impedence Stabilization Network
Test table height=0.8m

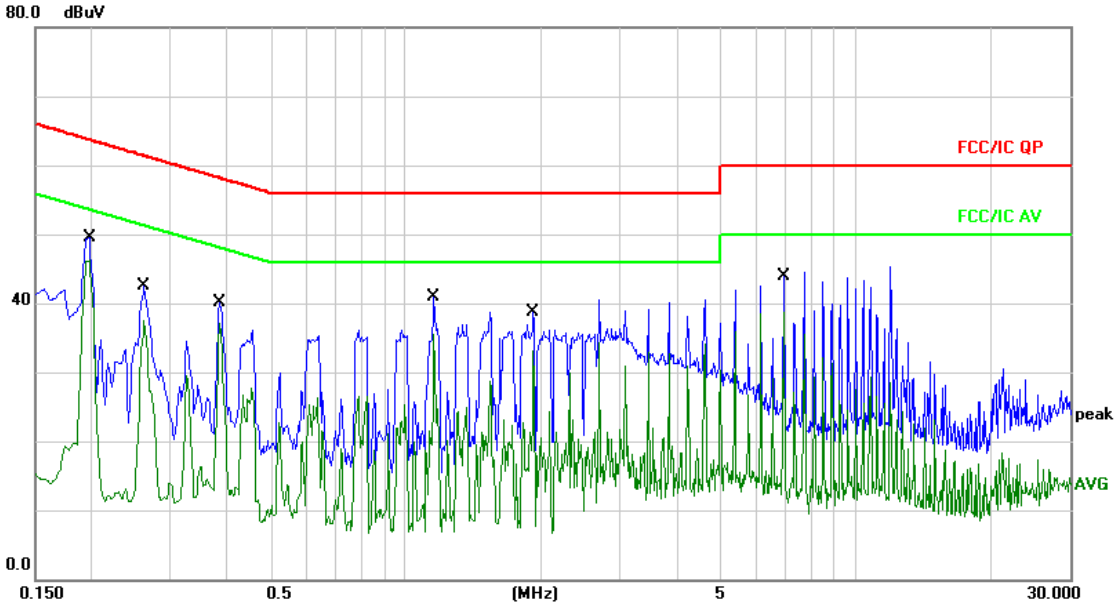
Test procedure:

1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.
2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).
3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10:2013 on conducted measurement.
4. The EUT was 0.8 meters from the horizontal ground plane and 0.4 meters from the vertical 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.
5. 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.
6. 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.
7. LISN at least 80 cm from nearest part of EUT chassis.
8. For the actual test configuration, please refer to the related Item –EUT

	Test Photos.					
Test Instruments:	Refer to section 6.0 for details					
Test mode:	Refer to section 5.2 for details					
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar
Test voltage:	AC 120V, 60Hz					
Test results:	Pass					

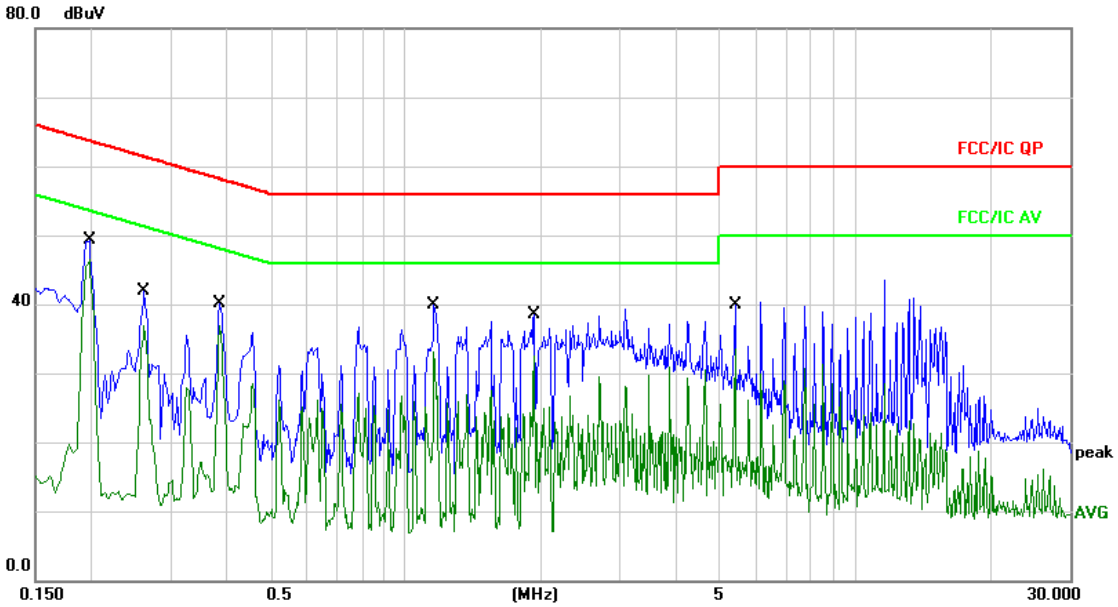
Measurement data

Line:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1980	39.45	10.06	49.51	63.69	-14.18	QP	
2	*	0.1980	36.19	10.06	46.25	53.69	-7.44	AVG	
3		0.2620	32.34	10.08	42.42	61.36	-18.94	QP	
4		0.2620	27.33	10.08	37.41	51.36	-13.95	AVG	
5		0.3860	30.01	10.10	40.11	58.15	-18.04	QP	
6		0.3860	26.91	10.10	37.01	48.15	-11.14	AVG	
7		1.1580	30.67	10.17	40.84	56.00	-15.16	QP	
8		1.1580	25.29	10.17	35.46	46.00	-10.54	AVG	
9		1.9260	28.54	10.18	38.72	56.00	-17.28	QP	
10		1.9260	22.84	10.18	33.02	46.00	-12.98	AVG	
11		6.9380	34.32	10.10	44.42	60.00	-15.58	QP	
12		6.9380	28.64	10.10	38.74	50.00	-11.26	AVG	

Neutral:

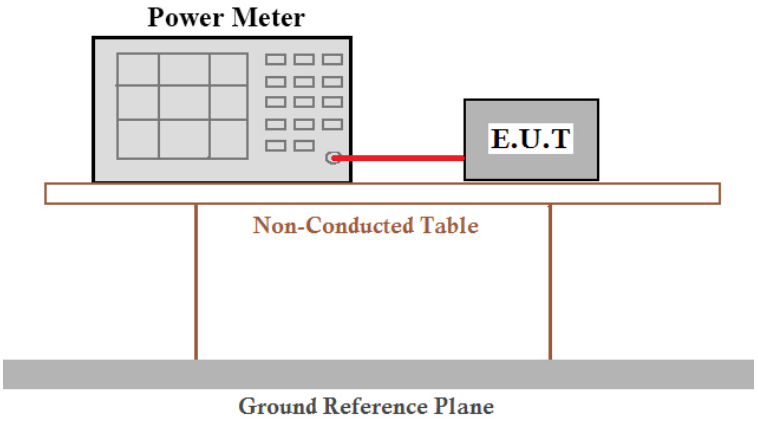


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1980	39.15	10.06	49.21	63.69	-14.48	QP	
2	*	0.1980	36.36	10.06	46.42	53.69	-7.27	AVG	
3		0.2620	31.72	10.08	41.80	61.36	-19.56	QP	
4		0.2620	26.89	10.08	36.97	51.36	-14.39	AVG	
5		0.3860	29.99	10.10	40.09	58.15	-18.06	QP	
6		0.3860	26.86	10.10	36.96	48.15	-11.19	AVG	
7		1.1580	29.82	10.17	39.99	56.00	-16.01	QP	
8		1.1580	22.93	10.17	33.10	46.00	-12.90	AVG	
9		1.9300	28.22	10.18	38.40	56.00	-17.60	QP	
10		1.9300	22.29	10.18	32.47	46.00	-13.53	AVG	
11		5.4020	30.27	10.13	40.40	60.00	-19.60	QP	
12		5.4020	23.32	10.13	33.45	50.00	-16.55	AVG	

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 =Receiver Read level + LISN Factor + Cable Loss
4. *If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.*

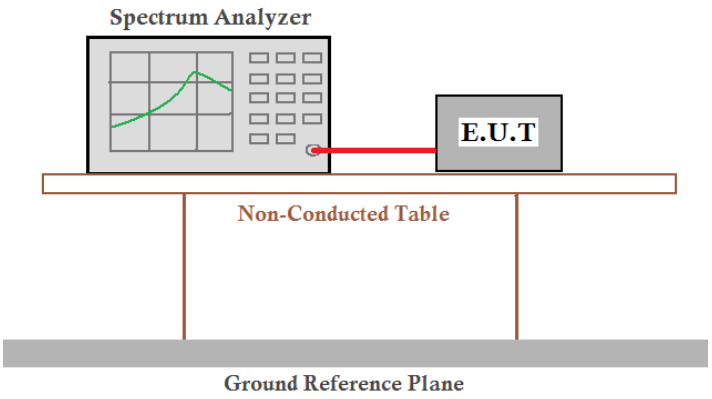
7.3 Conducted Peak Output Power

Test Requirement:	FCC Part15 C Section 15.247 (b)(3)
Test Method:	Clause 8.3 of KDB558074 D01 DTS Meas Guidance V05r02
Limit:	30dBm
Test setup:	
Test procedure:	1.The Eut was directly connected to the power meter.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data

Test CH	Peak Output Power (dBm)			Limit(dBm)	Result
	802.11b	802.11g	802.11n(HT20)		
Lowest	12.21	11.76	10.17	30.00	Pass
Middle	12.68	11.83	10.95		
Highest	12.35	11.35	10.46		

7.4 Channel Bandwidth

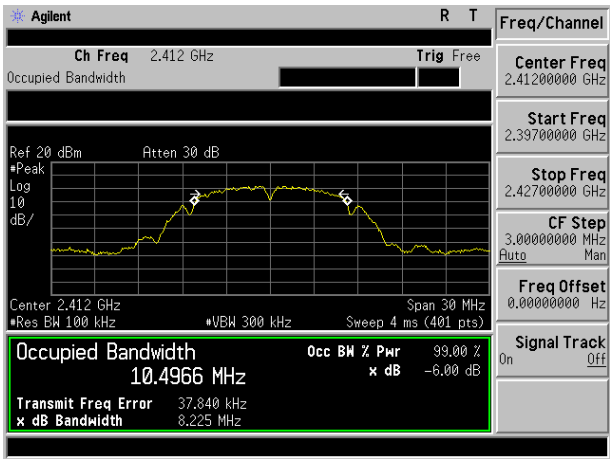
Test Requirement:	FCC Part15 C Section 15.247 (a)(2)
Test Method:	Clause 8.2 of KDB558074 D01 DTS Meas Guidance V05r02 and Subclause 11.8 of ANSI C63.10.
Limit:	>500KHz
Test setup:	
Test procedure:	The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described above (i.e., RBW = 100 kHz, VBW⩾3RBW, peak detector with maximum hold) is implemented by the instrumentation function. When using this capability, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be⩾6 dB.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data

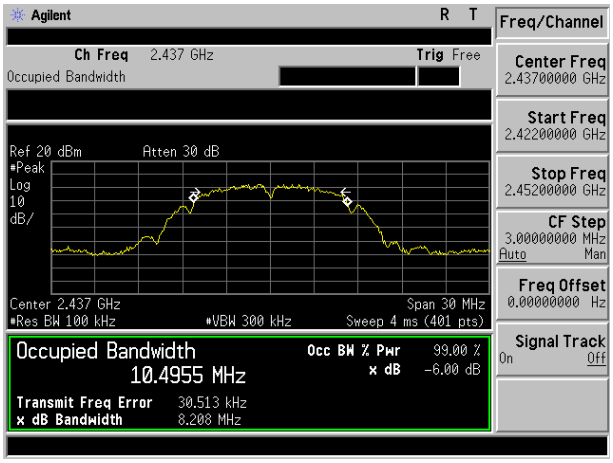
Test CH	Channel Bandwidth (MHz)			Limit(KHz)	Result
	802.11b	802.11g	802.11n(HT20)		
Lowest	8.225	16.458	17.639	>500	Pass
Middle	8.208	16.452	17.604		
Highest	8.560	16.501	17.591		

Test plot as follows:

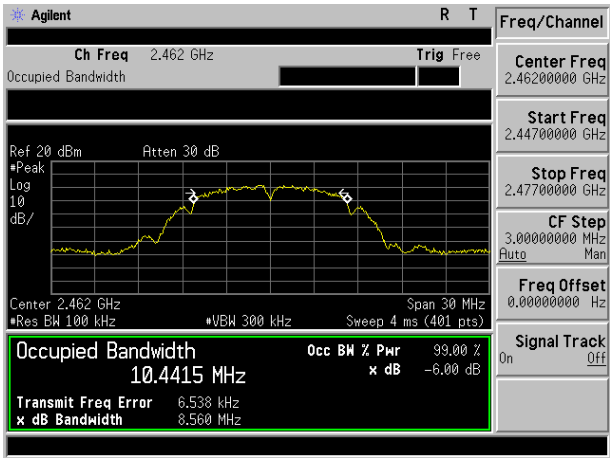
Test mode:	802.11b



Lowest channel

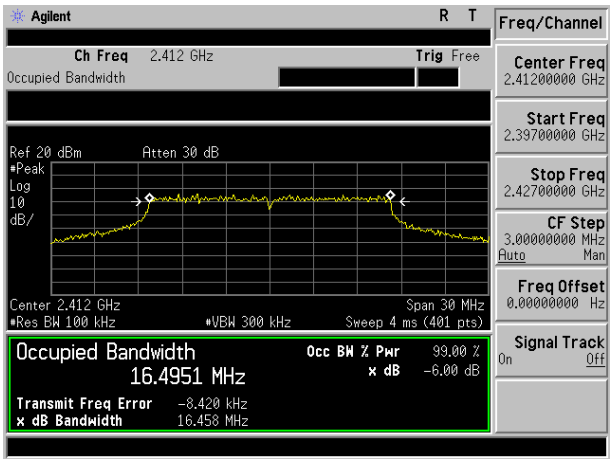


Middle channel

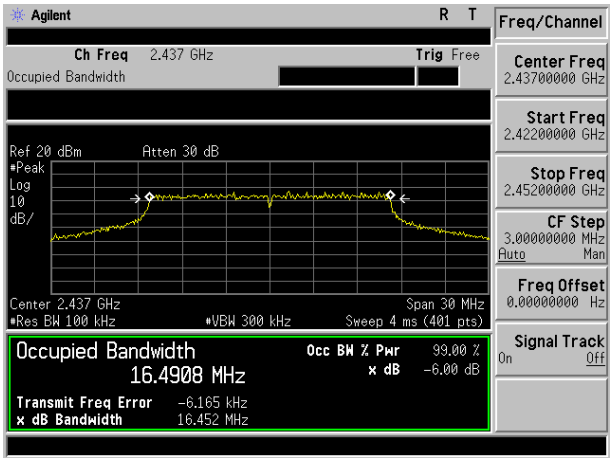


Highest channel

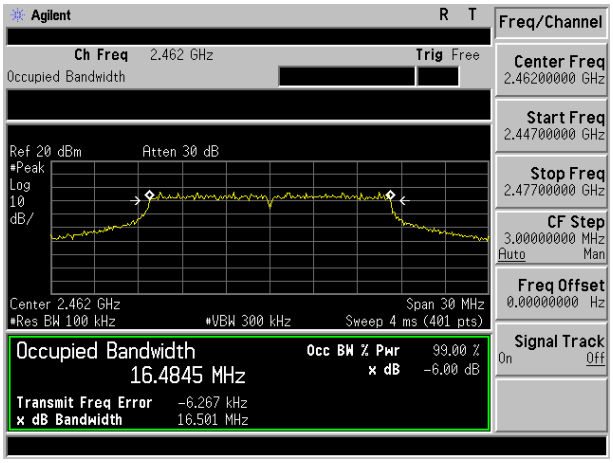
Test mode:	802.11g



Lowest channel

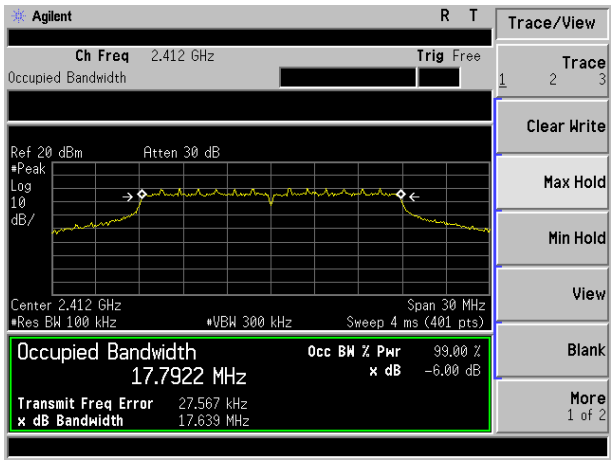


Middle channel

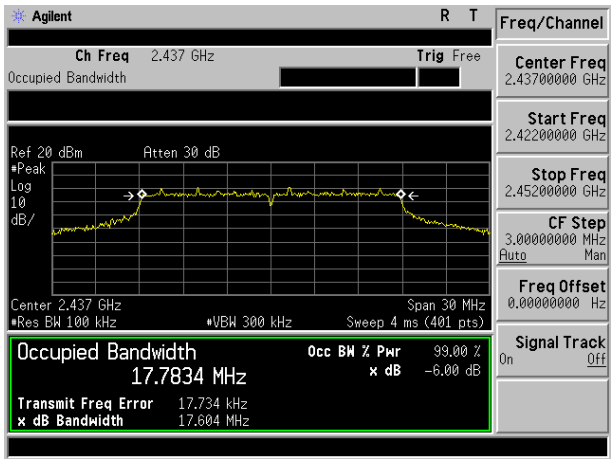


Highest channel

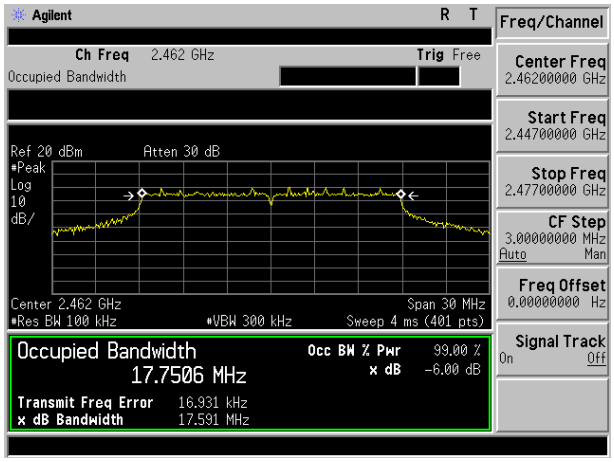
Test mode:	802.11n(HT20)



Lowest channel

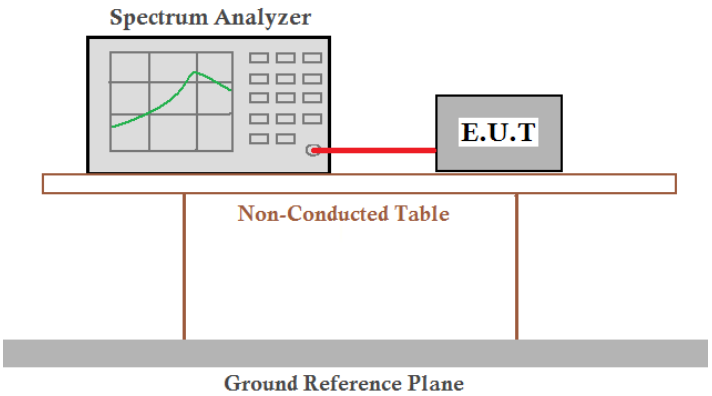


Middle channel



Highest channel

7.5 Power Spectral Density

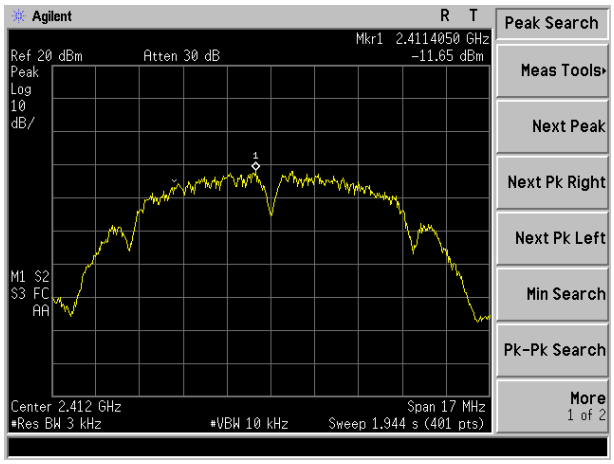
Test Requirement:	FCC Part15 C Section 15.247 (e)
Test Method:	Clause 8.4 of KDB 558074 D01 15.247 Meas Guidance v05r02 and subclause 11.10 of ANSI C63.10
Limit:	8dBm/3kHz
Test setup:	
Test procedure:	1.Set analyzer center frequency to DTS channel center frequency. 2.Set the span to 1.5 times the DTS channel bandwidth. 3.Set the 100 kHz ⩾ RBW ⩾3 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. 10.If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data

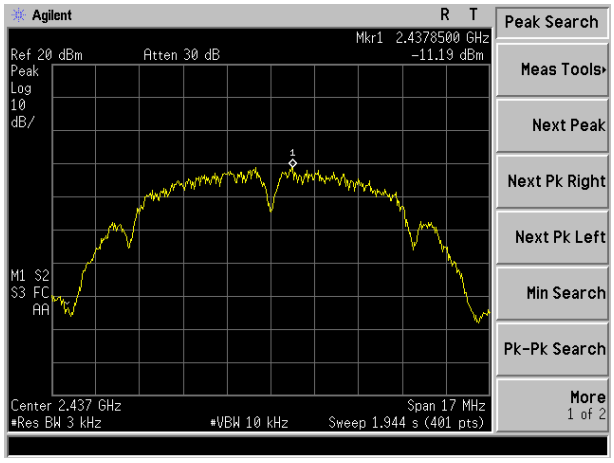
Test CH	Power Spectral Density (dBm)			Limit (dBm/3kHz)	Result
	802.11b	802.11g	802.11n(HT20)		
Lowest	-11.65	-17.47	-15.42	8.00	Pass
Middle	-11.19	-15.72	-14.99		
Highest	-11.69	-16.39	-15.58		

Test plot as follows:

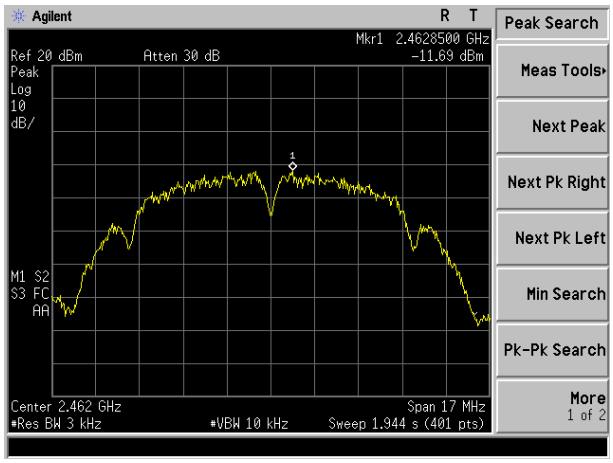
Test mode:	802.11b



Lowest channel

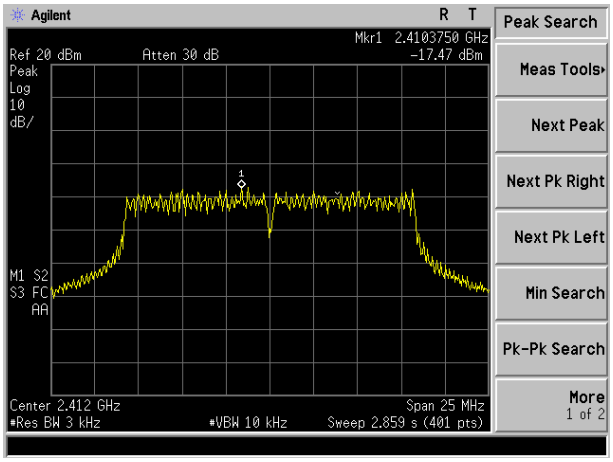


Middle channel

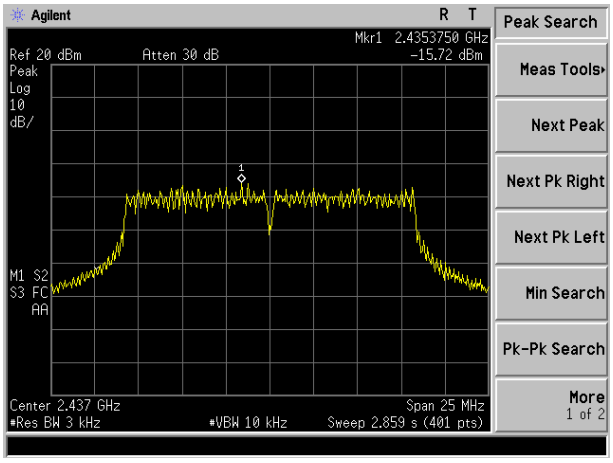


Highest channel

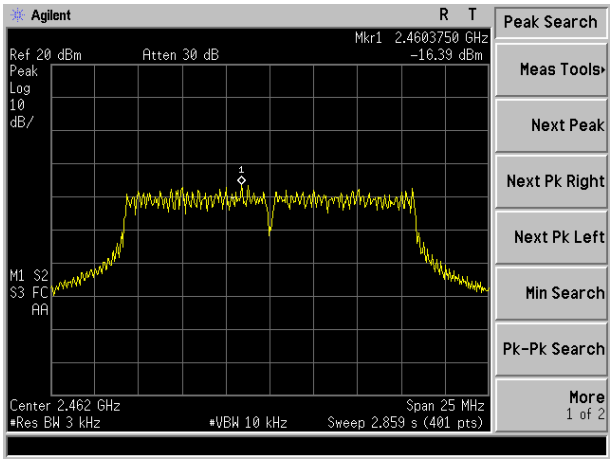
Test mode:	802.11g



Lowest channel

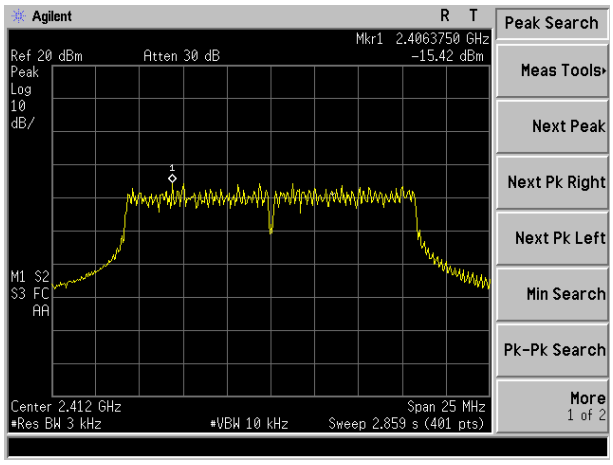


Middle channel

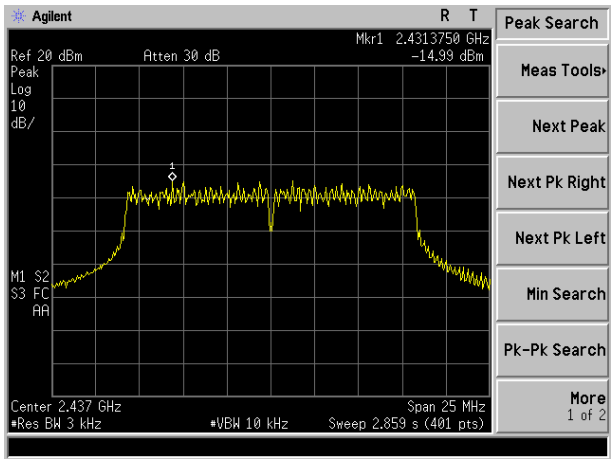


Highest channel

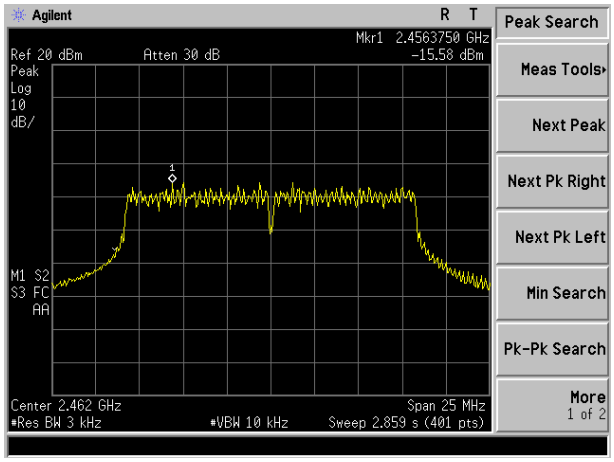
Test mode:	802.11n(HT20)



Lowest channel



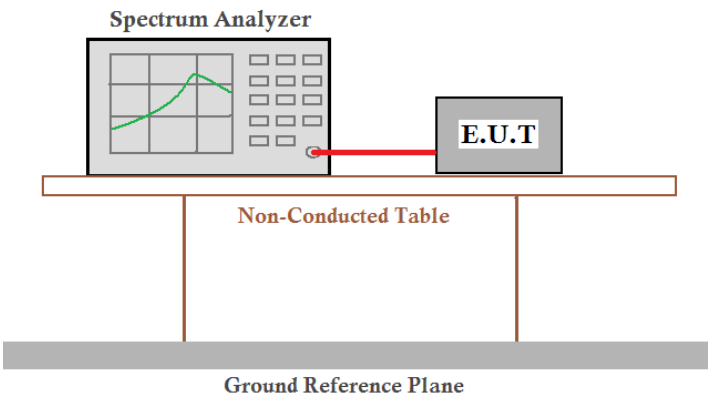
Middle channel



Highest channel

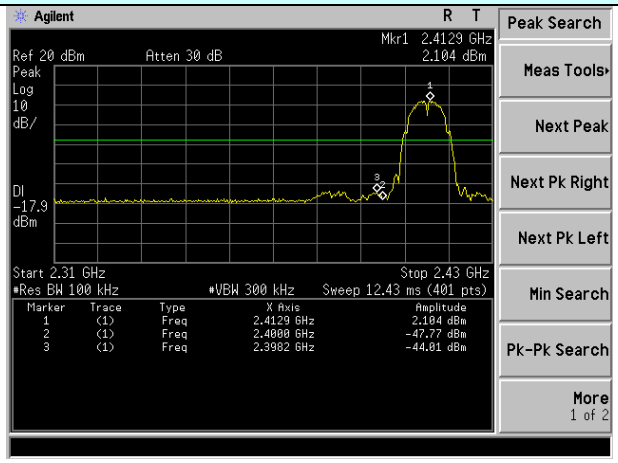
7.6 Band edges

7.6.1 Conducted Emission Method

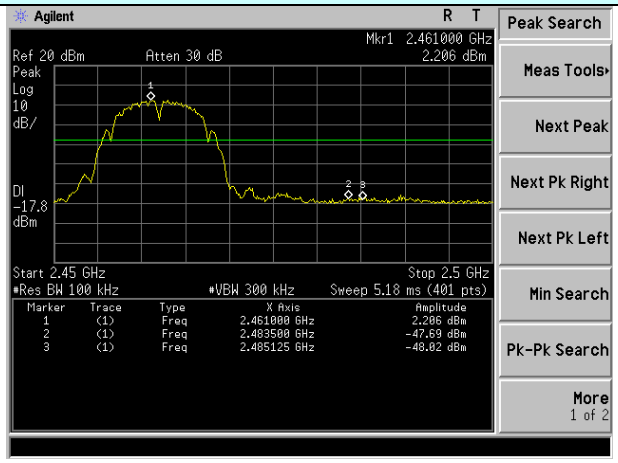
Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	Clause 8.7 of KDB558074 D01 DTS Meas Guidance V05r02 and subclause 11.13 of ANSI C63.10
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that 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.
Test setup:	
Test procedure:	The EUT which is powered by the AC Line, is connected to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. In order to make an accurate measurement, set the span greater than RBW.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Test plot as follows:

Test mode:	802.11b

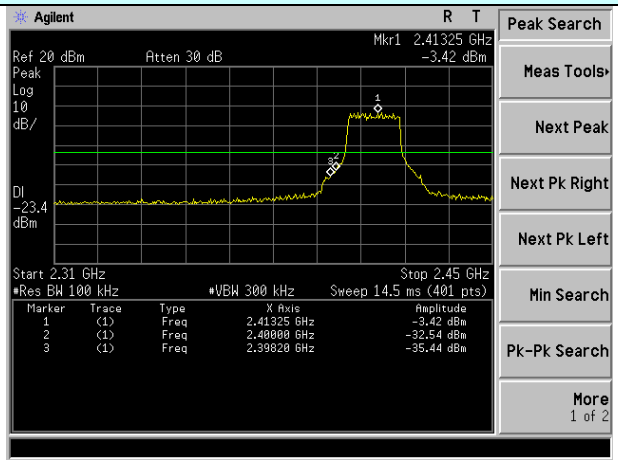


Lowest channel

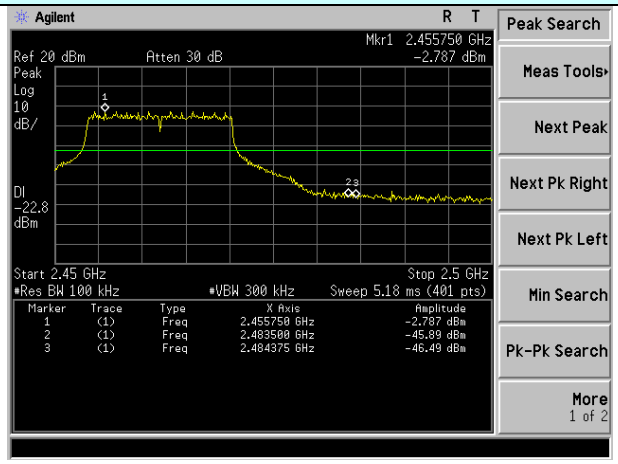


Highest channel

Test mode:	802.11g

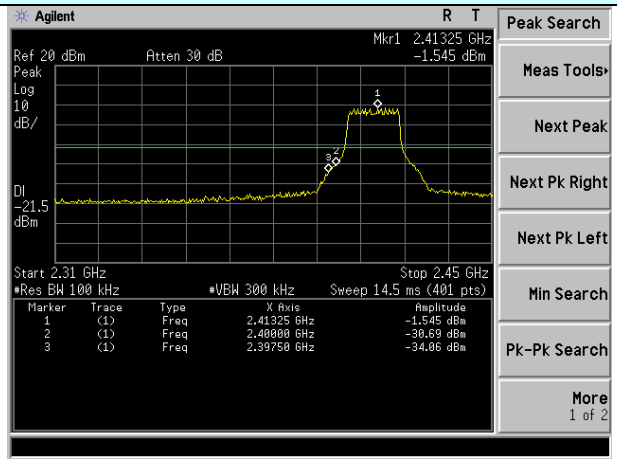


Lowest channel

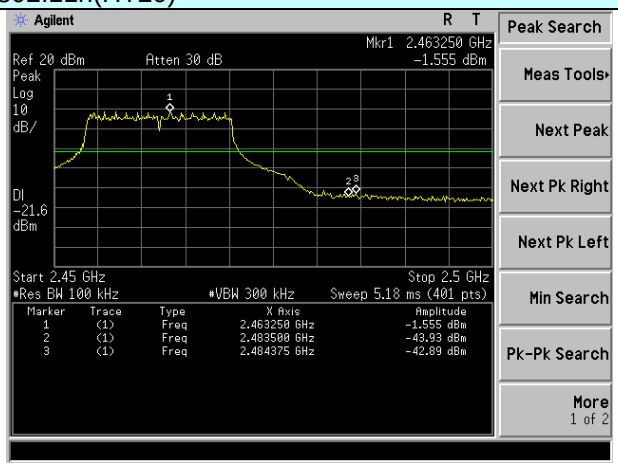


Highest channel

Test mode:	802.11n(HT20)



Lowest channel



Highest channel

7.6.2 Radiated Emission Method

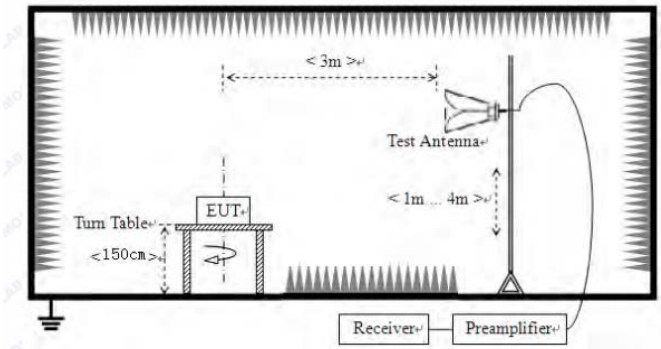
Test Requirement:	FCC Part15 C Section 15.209 and 15.205
Test Method:	Clause 6 of ANSI C63.10:2013
Test Frequency Range:	All of the restrict bands were tested, only the worst band's (2310MHz to 2500MHz) data was showed.
Test site:	Measurement Distance: 3m
Receiver setup:	

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

Limit:

Frequency	Limit (dBuV/m @3m)	Value
Above 1GHz	54.00	Average
	74.00	Peak

Test setup:



Test Procedure:

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.
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. 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.
4. 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.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. 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.
7. The radiation measurements are performed in X, Y, Z axis positioning. And found the Y axis positioning which it is worse case, only the test worst case mode is recorded in the report.

Test Instruments:	Refer to section 6.0 for details

Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement data:

Remark: The pre-test were performed on lowest, middle and highest frequencies, only the worst case's (lowest and highest frequencies) data was showed.

Test mode:	802.11b	Test channel:	Lowest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2390.00	38.26	27.91	5.30	24.64	46.83	74.00	-27.17	Horizontal
2400.00	41.35	27.59	5.38	24.71	49.61	74.00	-24.39	Horizontal
2390.00	41.69	27.91	5.30	24.64	50.26	74.00	-23.74	Vertical
2400.00	40.05	27.59	5.38	24.71	48.31	74.00	-25.69	Vertical

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2390.00	24.47	27.91	5.30	24.64	33.04	54.00	-20.96	Horizontal
2400.00	32.97	27.59	5.38	24.71	41.23	54.00	-12.77	Horizontal
2390.00	24.66	27.91	5.30	24.64	33.23	54.00	-20.77	Vertical
2400.00	30.99	27.59	5.38	24.71	39.25	54.00	-14.75	Vertical

Test mode:	802.11b	Test channel:	Highest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	39.35	27.53	5.47	24.80	47.55	74.00	-26.45	Horizontal
2500.00	43.23	27.55	5.49	24.86	51.41	74.00	-22.59	Horizontal
2483.50	38.70	27.53	5.47	24.80	46.90	74.00	-27.10	Vertical
2500.00	39.51	27.55	5.49	24.86	47.69	74.00	-26.31	Vertical

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	34.59	27.53	5.47	24.80	42.79	54.00	-11.21	Horizontal
2500.00	35.10	27.55	5.49	24.86	43.28	54.00	-10.72	Horizontal
2483.50	33.46	27.53	5.47	24.80	41.66	54.00	-12.34	Vertical
2500.00	36.28	27.55	5.49	24.86	44.46	54.00	-9.54	Vertical

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

Test mode:	802.11g	Test channel:	Lowest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2310.00	34.40	27.91	5.30	24.64	42.97	74.00	-31.03	Horizontal
2390.00	35.87	27.59	5.38	24.71	44.13	74.00	-29.87	Horizontal
2310.00	33.30	27.91	5.30	24.64	41.87	74.00	-32.13	Vertical
2390.00	36.24	27.59	5.38	24.71	44.50	74.00	-29.50	Vertical

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2310.00	27.80	27.91	5.30	24.64	36.37	54.00	-17.63	Horizontal
2390.00	35.05	27.59	5.38	24.71	43.31	54.00	-10.69	Horizontal
2310.00	28.40	27.91	5.30	24.64	36.97	54.00	-17.03	Vertical
2390.00	32.04	27.59	5.38	24.71	40.30	54.00	-13.70	Vertical

Test mode:	802.11g	Test channel:	Highest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	39.83	27.53	5.47	24.80	48.03	74.00	-25.97	Horizontal
2500.00	38.27	27.55	5.49	24.86	46.45	74.00	-27.55	Horizontal
2483.50	39.64	27.53	5.47	24.80	47.84	74.00	-26.16	Vertical
2500.00	41.17	27.55	5.49	24.86	49.35	74.00	-24.65	Vertical

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	28.60	27.53	5.47	24.80	36.80	54.00	-17.20	Horizontal
2500.00	24.05	27.55	5.49	24.86	32.23	54.00	-21.77	Horizontal
2483.50	25.40	27.53	5.47	24.80	33.60	54.00	-20.40	Vertical
2500.00	26.74	27.55	5.49	24.86	34.92	54.00	-19.08	Vertical

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

Test mode:	802.11n(HT20)	Test channel:	Lowest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2310.00	40.32	27.91	5.30	24.64	48.89	74.00	-25.11	Horizontal
2390.00	45.69	27.59	5.38	24.71	53.95	74.00	-20.05	Horizontal
2310.00	42.66	27.91	5.30	24.64	51.23	74.00	-22.77	Vertical
2390.00	40.15	27.59	5.38	24.71	48.41	74.00	-25.59	Vertical

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2310.00	28.29	27.91	5.30	24.64	36.86	54.00	-17.14	Horizontal
2390.00	33.58	27.59	5.38	24.71	41.84	54.00	-12.16	Horizontal
2310.00	30.07	27.91	5.30	24.64	38.64	54.00	-15.36	Vertical
2390.00	30.98	27.59	5.38	24.71	39.24	54.00	-14.76	Vertical

Test mode:	802.11n(HT20)	Test channel:	Highest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	39.00	27.53	5.47	24.80	47.20	74.00	-26.80	Horizontal
2500.00	39.39	27.55	5.49	24.86	47.57	74.00	-26.43	Horizontal
2483.50	39.50	27.53	5.47	24.80	47.70	74.00	-26.30	Vertical
2500.00	40.43	27.55	5.49	24.86	48.61	74.00	-25.39	Vertical

Average value:

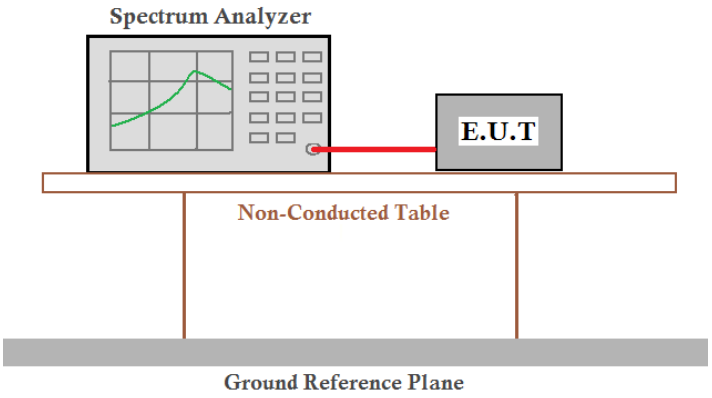
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	30.00	27.53	5.47	24.80	38.20	54.00	-15.80	Horizontal
2500.00	29.41	27.55	5.49	24.86	37.59	54.00	-16.41	Horizontal
2483.50	29.45	27.53	5.47	24.80	37.65	54.00	-16.35	Vertical
2500.00	29.01	27.55	5.49	24.86	37.19	54.00	-16.81	Vertical

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

7.7 Spurious Emission

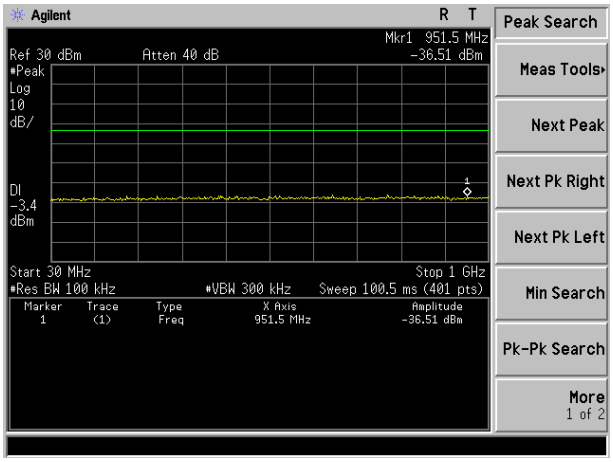
7.7.1 Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	Clause 6 of KDB558074 D01 DTS Meas Guidance V05r02 and subclause 6.7 of ANSI C63.10
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.
Test setup:	
Test Procedure:	The EUT which is powered by the Battery, is connected to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. In order to make an accurate measurement, set the span greater than RBW.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

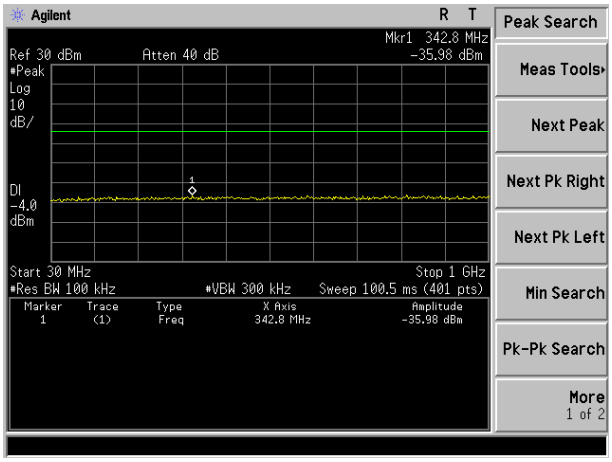
Test plot as follows:

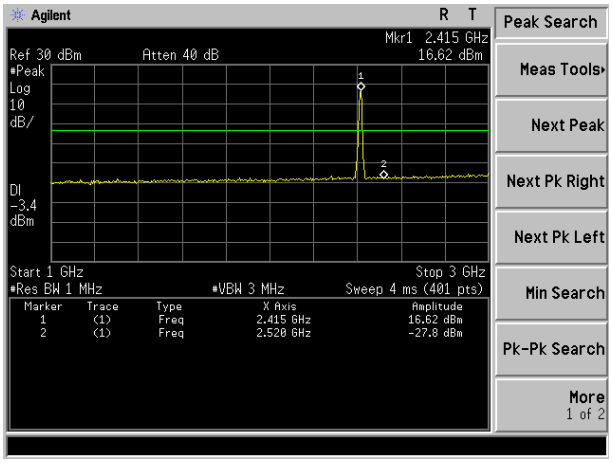
Test mode:

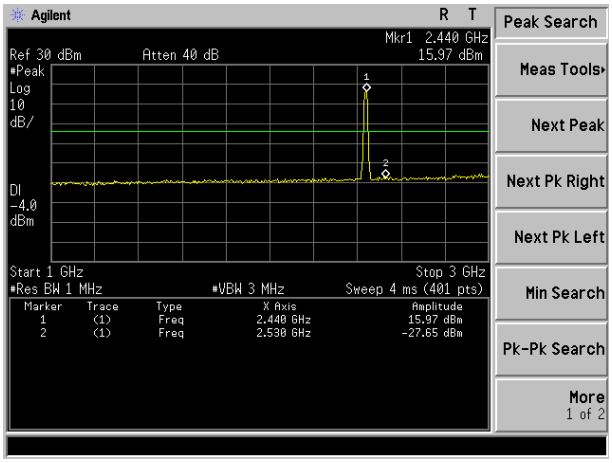
802.11b-Low Channel 2412MHz

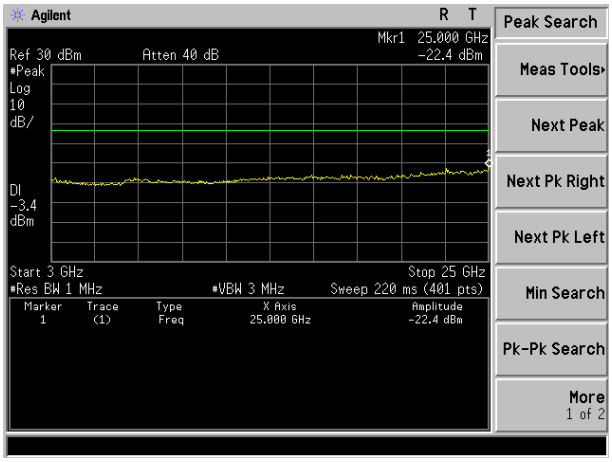


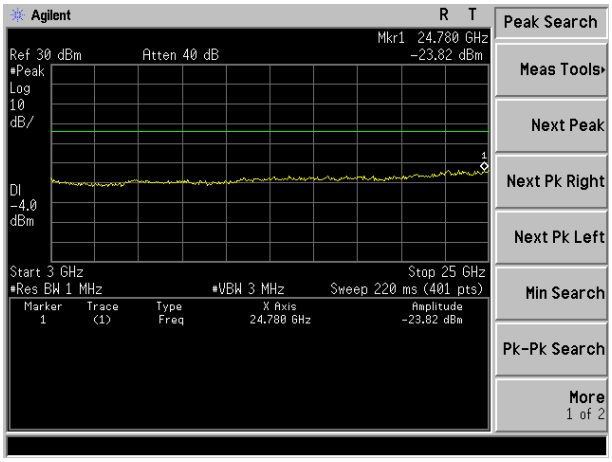
802.11b-Middle Channel 2437MHz





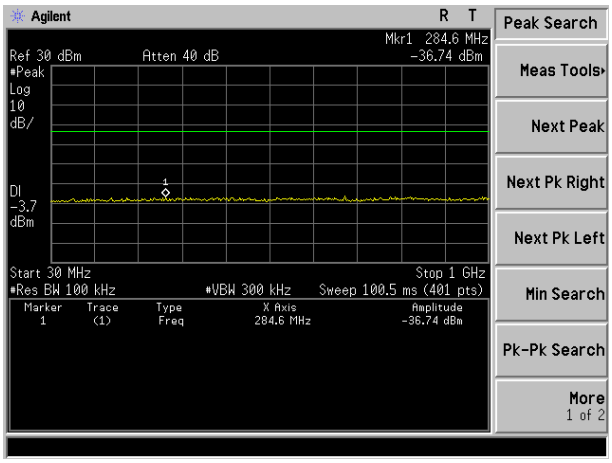




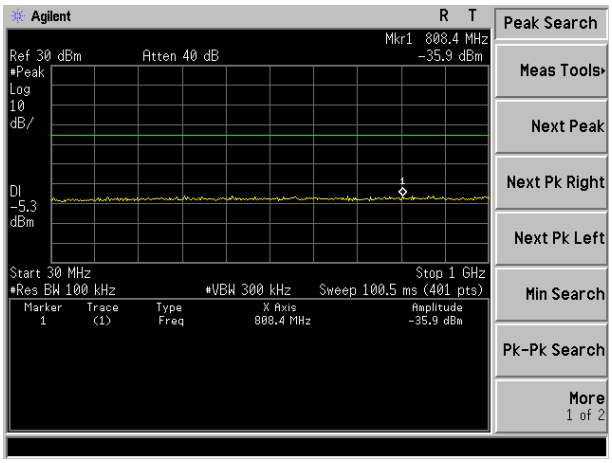


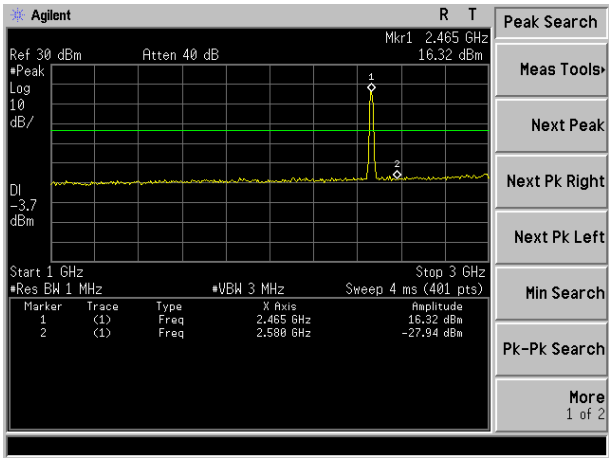
Test mode:

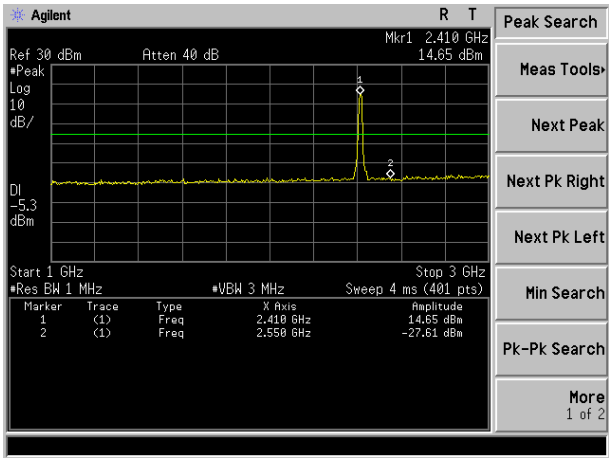
802.11b-High Channel 2462MHz

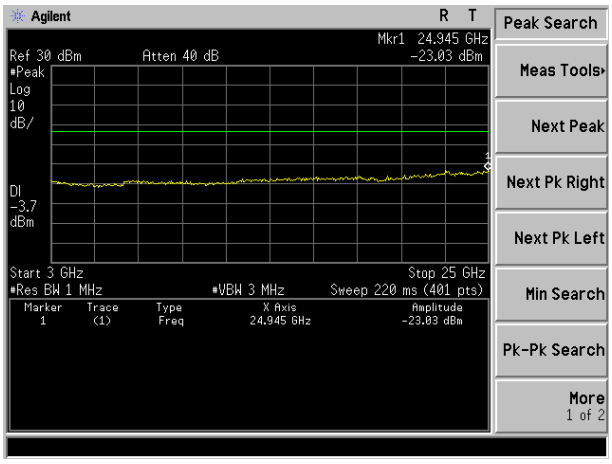


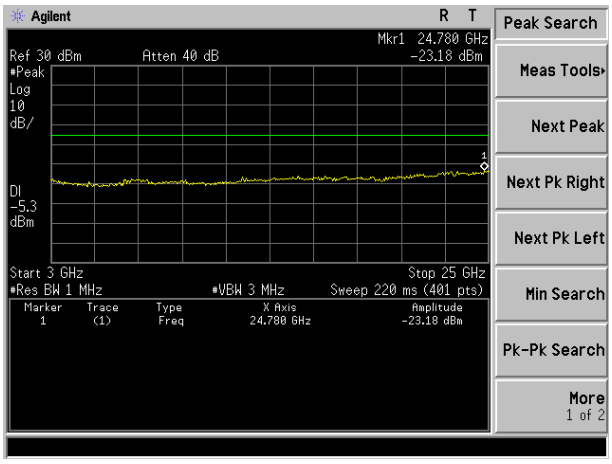
802.11g-Low Channel 2412MHz





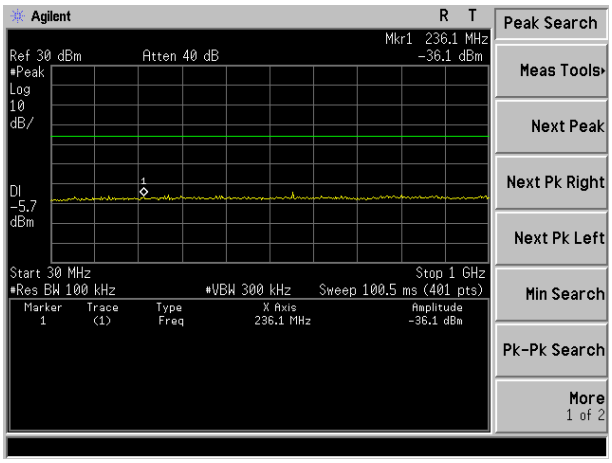




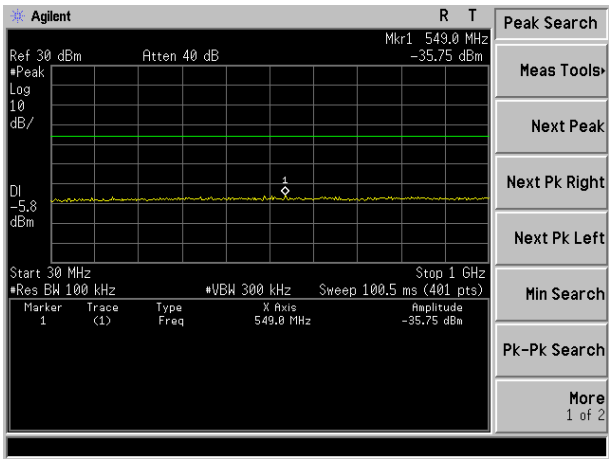


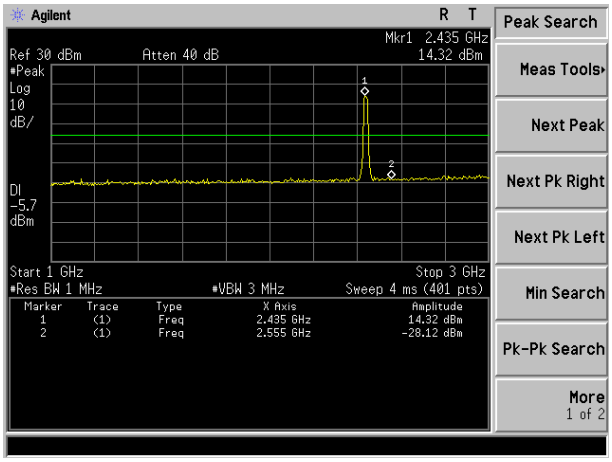
Test mode:

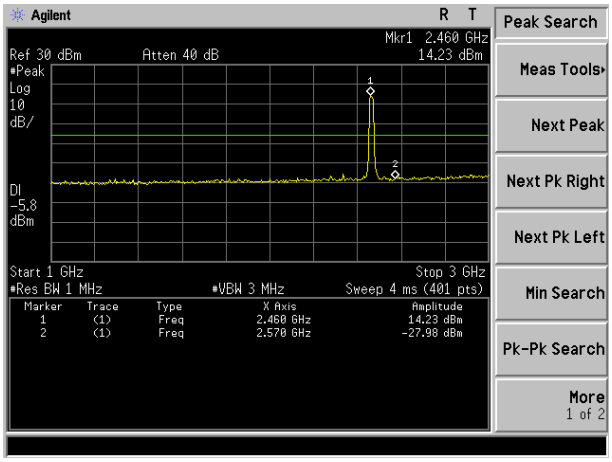
802.11g-Middle Channel 2437MHz

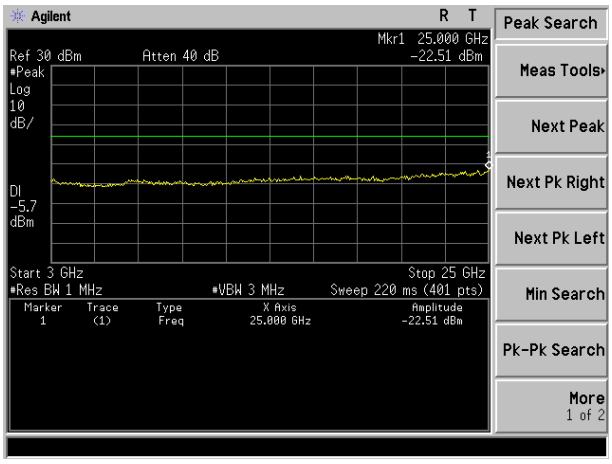


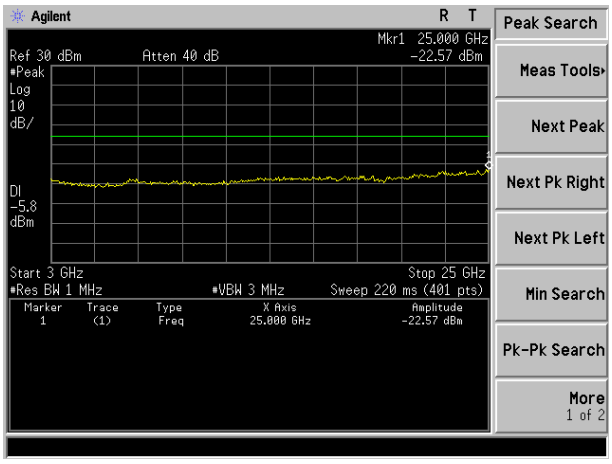
802.11g-High Channel 2462MHz





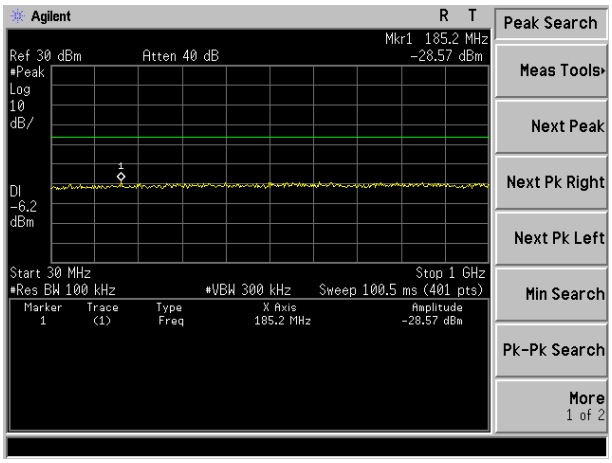




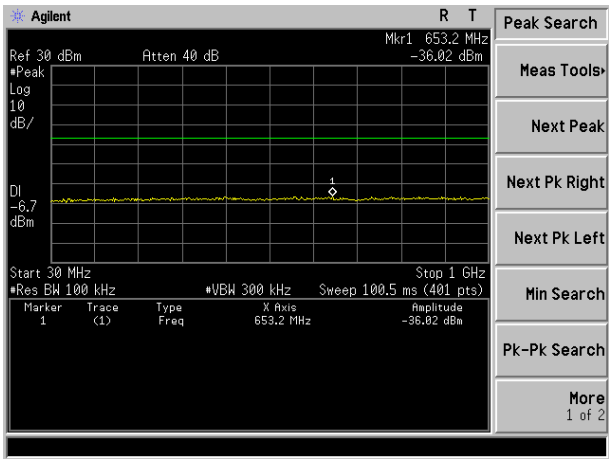


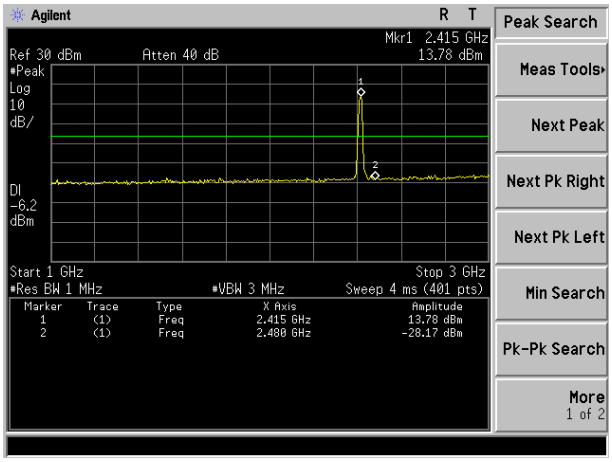
Test mode:

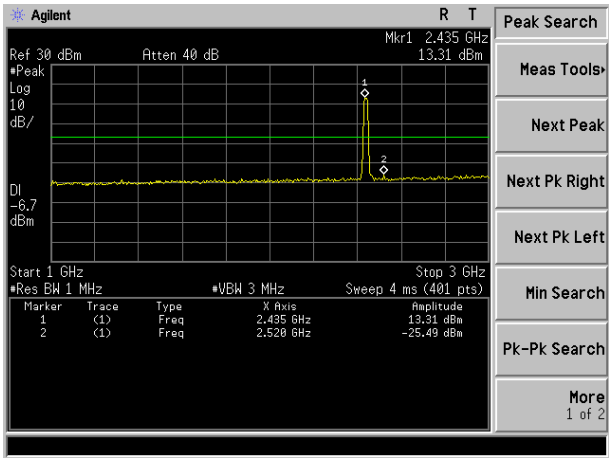
802.11n20-Low Channel 2412MHz

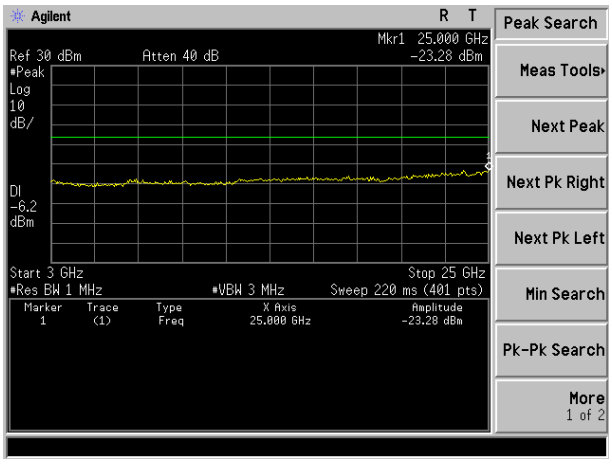


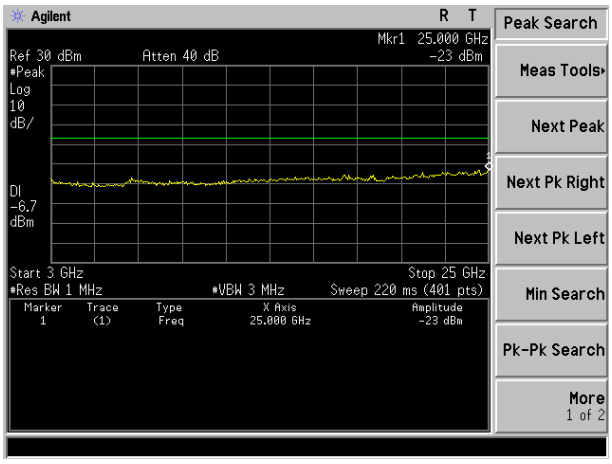
802.11n20-Middle Channel 2437MHz





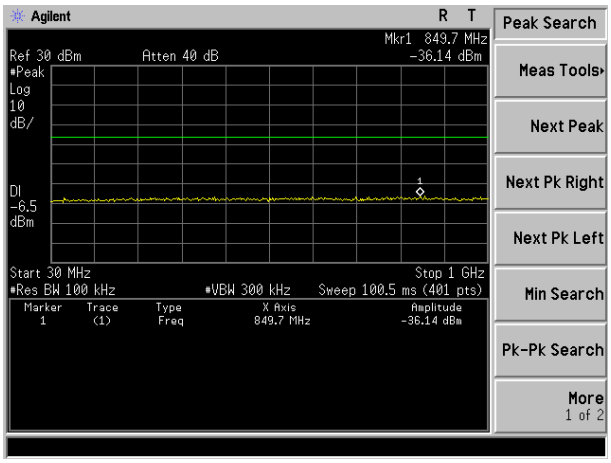


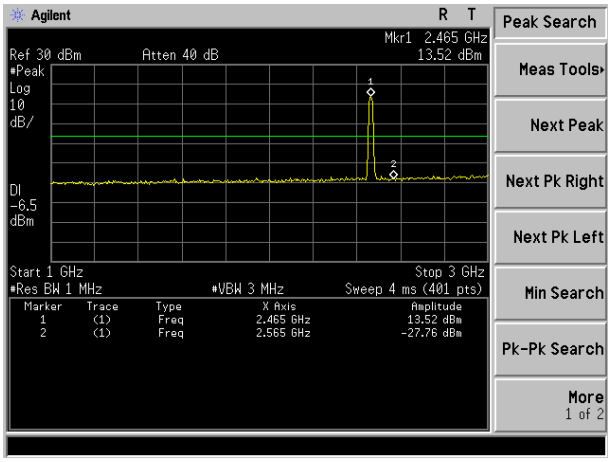


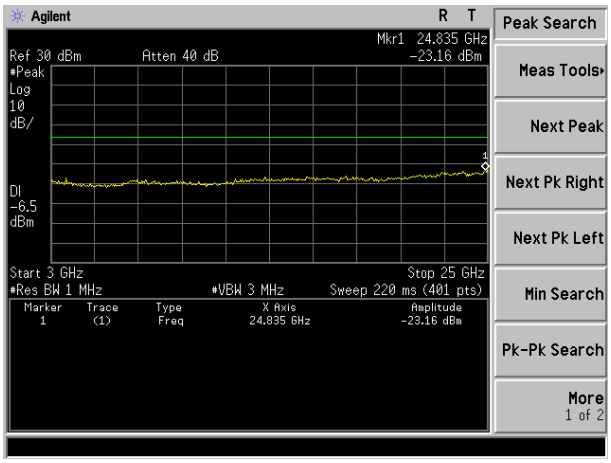


Test mode:

802.11n20-High Channel 2462MHz







7.7.2 Radiated Emission Method

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:

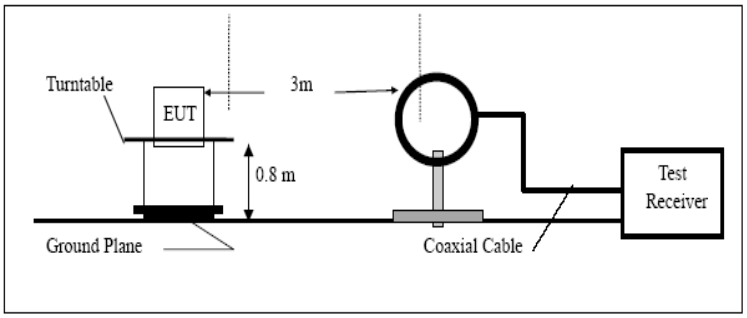
Frequency	Detector	RBW	VBW	Value
9KHz-150KHz	Quasi-peak	200Hz	600Hz	Quasi-peak
150KHz-30MHz	Quasi-peak	9KHz	30KHz	Quasi-peak
30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak
Above 1GHz	Peak	1MHz	3MHz	Peak
	Peak	1MHz	10Hz	Average

Limit:

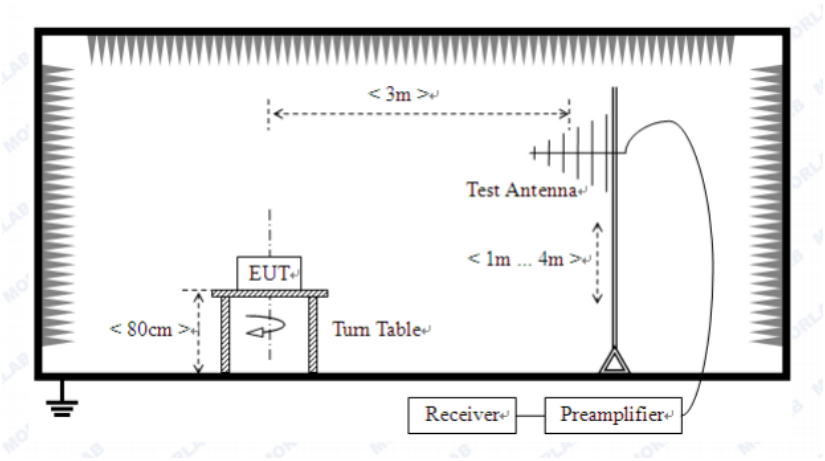
Frequency	Limit (uV/m)	Value	Measurement Distance
0.009MHz-0.490MHz	2400/F(KHz)	QP	300m
0.490MHz-1.705MHz	24000/F(KHz)	QP	300m
1.705MHz-30MHz	30	QP	30m
30MHz-88MHz	100	QP	3m
88MHz-216MHz	150	QP	
216MHz-960MHz	200	QP	
960MHz-1GHz	500	QP	
Above 1GHz	500	Average	
	5000	Peak	

Test setup:

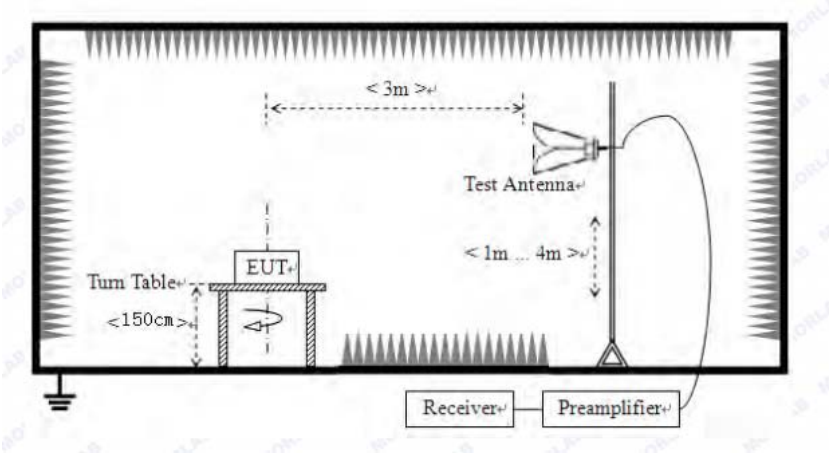
Below 30MHz



Below 1GHz


< 3m >
Test Antenna
< 1m ... 4m >
EUT
< 80cm >
Turn Table
Receiver
Preamplifier

Above 1GHz


< 3m >
Test Antenna
< 1m ... 4m >
EUT
Turn Table
<150cm >
Receiver
Preamplifier

Test Procedure:	1. The EUT was placed on the top of a rotating table (0.8m for below 1G and 1.5m for above 1G) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. 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. 4. 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. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. 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.					
Test Instruments:	Refer to section 6.0 for details					
Test mode:	Refer to section 5.2 for details					
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar
Test voltage:	AC 120V, 60Hz					
Test results:	Pass					

Remark:

Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis which it is worse case.

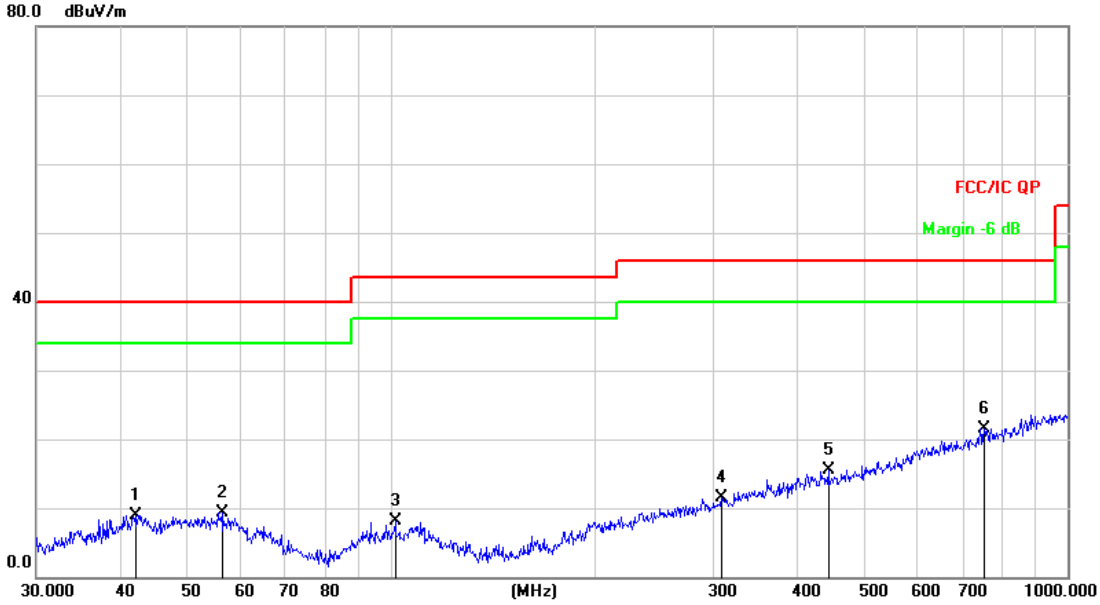
Measurement data:

■ **9kHz~30MHz**

The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

■ **Below 1GHz**

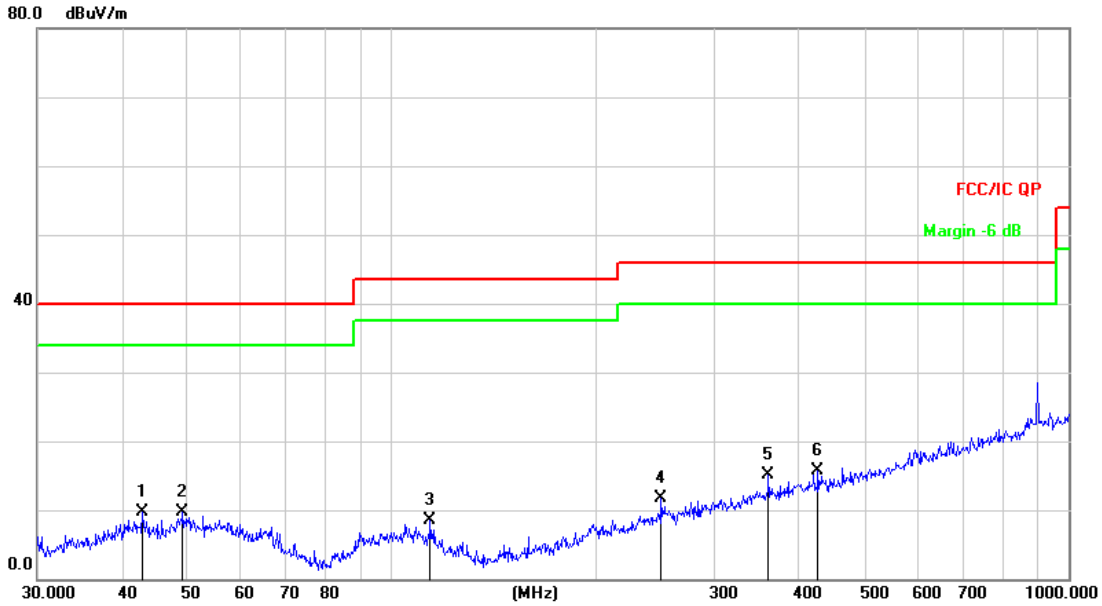
Horizontal:



Remark:
1. Final Level = Reading Level + Correct Factor

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		42.0066	24.07	-15.09	8.98	40.00	-31.02	QP
2		56.3948	24.86	-15.49	9.37	40.00	-30.63	QP
3		101.6443	24.55	-16.38	8.17	43.50	-35.33	QP
4		308.9126	23.49	-11.92	11.57	46.00	-34.43	QP
5		443.2943	23.98	-8.52	15.46	46.00	-30.54	QP
6	*	752.7432	23.28	-1.76	21.52	46.00	-24.48	QP

Vertical:



Remark:
1. Final Level = Reading Level + Correct Factor

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1	*	42.8998	24.74	-14.95	9.79	40.00	-30.21	QP
2		49.1865	24.46	-14.67	9.79	40.00	-30.21	QP
3		114.1138	25.65	-17.09	8.56	43.50	-34.94	QP
4		250.3012	25.42	-13.75	11.67	46.00	-34.33	QP
5		360.4476	25.57	-10.40	15.17	46.00	-30.83	QP
6		426.5210	24.46	-8.73	15.73	46.00	-30.27	QP

■ **Above 1GHz**

Test mode:	802.11b	Test channel:	Lowest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4824.00	39.54	31.79	8.62	32.10	47.85	74.00	-26.15	Vertical
7236.00	33.72	36.19	11.68	31.97	49.62	74.00	-24.38	Vertical
9648.00	32.33	38.07	14.16	31.56	53.00	74.00	-21.00	Vertical
12060.00	*					74.00		Vertical
14472.00	*					74.00		Vertical
16884.00	*					74.00		Vertical
4824.00	38.62	31.79	8.62	32.10	46.93	74.00	-27.07	Horizontal
7236.00	32.97	36.19	11.68	31.97	48.87	74.00	-25.13	Horizontal
9648.00	32.05	38.07	14.16	31.56	52.72	74.00	-21.28	Horizontal
12060.00	*					74.00		Horizontal
14472.00	*					74.00		Horizontal
16884.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4824.00	27.69	31.79	8.62	32.10	36.00	54.00	-18.00	Vertical
7236.00	21.51	36.19	11.68	31.97	37.41	54.00	-16.59	Vertical
9648.00	21.03	38.07	14.16	31.56	41.70	54.00	-12.30	Vertical
12060.00	*					54.00		Vertical
14472.00	*					54.00		Vertical
16884.00	*					54.00		Vertical
4824.00	27.43	31.79	8.62	32.10	35.74	54.00	-18.26	Horizontal
7236.00	21.17	36.19	11.68	31.97	37.07	54.00	-16.93	Horizontal
9648.00	20.32	38.07	14.16	31.56	40.99	54.00	-13.01	Horizontal
12060.00	*					54.00		Horizontal
14472.00	*					54.00		Horizontal
16884.00	*					54.00		Horizontal

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *"*", means this data is the too weak instrument of signal is unable to test*
3. *The frequency emission of peak points that did not show above the forms are at least 20dB below the limit, the frequency emission is mainly from the environment noise.*

Test mode:	802.11b	Test channel:	Middle

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4874.00	37.80	31.85	8.66	32.12	46.19	74.00	-27.81	Vertical
7311.00	32.88	36.37	11.71	31.91	49.05	74.00	-24.95	Vertical
9748.00	32.45	38.27	14.25	31.56	53.41	74.00	-20.59	Vertical
12185.00	*					74.00		Vertical
14622.00	*					74.00		Vertical
17059.00	*					74.00		Vertical
4874.00	38.20	31.85	8.66	32.12	46.59	74.00	-27.41	Horizontal
7311.00	31.67	36.37	11.71	31.91	47.84	74.00	-26.16	Horizontal
9748.00	32.54	38.27	14.25	31.56	53.50	74.00	-20.50	Horizontal
12185.00	*					74.00		Horizontal
14622.00	*					74.00		Horizontal
17059.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4874.00	30.89	31.85	8.66	32.12	39.28	54.00	-14.72	Vertical
7311.00	23.74	36.37	11.71	31.91	39.91	54.00	-14.09	Vertical
9748.00	23.24	38.27	14.25	31.56	44.20	54.00	-9.80	Vertical
12185.00	*					54.00		Vertical
14622.00	*					54.00		Vertical
17059.00	*					54.00		Vertical
4874.00	30.36	31.85	8.66	32.12	38.75	54.00	-15.25	Horizontal
7311.00	22.85	36.37	11.71	31.91	39.02	54.00	-14.98	Horizontal
9748.00	24.09	38.27	14.25	31.56	45.05	54.00	-8.95	Horizontal
12185.00	*					54.00		Horizontal
14622.00	*					54.00		Horizontal
17059.00	*					54.00		Horizontal

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *"*", means this data is the too weak instrument of signal is unable to test.*
3. *The frequency emission of peak points that did not show above the forms are at least 20dB below the limit, the frequency emission is mainly from the environment noise.*

Test mode:	802.11b	Test channel:	Highest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4924.00	44.54	31.90	8.70	32.15	52.99	74.00	-21.01	Vertical
7386.00	34.81	36.49	11.76	31.83	51.23	74.00	-22.77	Vertical
9848.00	36.39	38.62	14.31	31.77	57.55	74.00	-16.45	Vertical
12310.00	*					74.00		Vertical
14772.00	*					74.00		Vertical
17234.00	*					74.00		Vertical
4924.00	43.47	31.90	8.70	32.15	51.92	74.00	-22.08	Horizontal
7386.00	33.62	36.49	11.76	31.83	50.04	74.00	-23.96	Horizontal
9848.00	33.16	38.62	14.31	31.77	54.32	74.00	-19.68	Horizontal
12310.00	*					74.00		Horizontal
14772.00	*					74.00		Horizontal
17234.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4924.00	37.74	31.90	8.70	32.15	46.19	54.00	-7.81	Vertical
7386.00	27.27	36.49	11.76	31.83	43.69	54.00	-10.31	Vertical
9848.00	27.56	38.62	14.31	31.77	48.72	54.00	-5.28	Vertical
12310.00	*					54.00		Vertical
14772.00	*					54.00		Vertical
17234.00	*					54.00		Vertical
4924.00	36.49	31.90	8.70	32.15	44.94	54.00	-9.06	Horizontal
7386.00	25.25	36.49	11.76	31.83	41.67	54.00	-12.33	Horizontal
9848.00	24.45	38.62	14.31	31.77	45.61	54.00	-8.39	Horizontal
12310.00	*					54.00		Horizontal
14772.00	*					54.00		Horizontal
17234.00	*					54.00		Horizontal

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *"*", means this data is the too weak instrument of signal is unable to test.*
3. *The frequency emission of peak points that did not show above the forms are at least 20dB below the limit, the frequency emission is mainly from the environment noise.*

Test mode:	802.11g	Test channel:	lowest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4824.00	38.62	31.79	8.62	32.10	46.93	74.00	-27.07	Vertical
7236.00	32.76	36.19	11.68	31.97	48.66	74.00	-25.34	Vertical
9648.00	31.35	38.07	14.16	31.56	52.02	74.00	-21.98	Vertical
12060.00	*					74.00		Vertical
14472.00	*					74.00		Vertical
16884.00	*					74.00		Vertical
4824.00	37.27	31.79	8.62	32.10	45.58	74.00	-28.42	Horizontal
7236.00	32.53	36.19	11.68	31.97	48.43	74.00	-25.57	Horizontal
9648.00	30.94	38.07	14.16	31.56	51.61	74.00	-22.39	Horizontal
12060.00	*					74.00		Horizontal
14472.00	*					74.00		Horizontal
16884.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4824.00	27.83	31.79	8.62	32.10	36.14	54.00	-17.86	Vertical
7236.00	21.68	36.19	11.68	31.97	37.58	54.00	-16.42	Vertical
9648.00	22.11	38.07	14.16	31.56	42.78	54.00	-11.22	Vertical
12060.00	*					54.00		Vertical
14472.00	*					54.00		Vertical
16884.00	*					54.00		Vertica
4824.00	27.02	31.79	8.62	32.10	35.33	54.00	-18.67	Horizontal
7236.00	21.19	36.19	11.68	31.97	37.09	54.00	-16.91	Horizontal
9648.00	20.81	38.07	14.16	31.56	41.48	54.00	-12.52	Horizontal
12060.00	*					54.00		Horizontal
14472.00	*					54.00		Horizontal
16884.00	*					54.00		Horizontal

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *"*", means this data is the too weak instrument of signal is unable to test.*
3. *The frequency emission of peak points that did not show above the forms are at least 20dB below the limit, the frequency emission is mainly from the environment noise.*

Test mode:	802.11g	Test channel:	Middle

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4874.00	38.36	31.85	8.66	32.12	46.75	74.00	-27.25	Vertical
7311.00	32.86	36.37	11.71	31.91	49.03	74.00	-24.97	Vertical
9748.00	33.00	38.27	14.25	31.56	53.96	74.00	-20.04	Vertical
12185.00	*					74.00		Vertical
14622.00	*					74.00		Vertical
17059.00	*					74.00		Vertical
4874.00	38.90	31.85	8.66	32.12	47.29	74.00	-26.71	Horizontal
7311.00	32.24	36.37	11.71	31.91	48.41	74.00	-25.59	Horizontal
9748.00	32.89	38.27	14.25	31.56	53.85	74.00	-20.15	Horizontal
12185.00	*					74.00		Horizontal
14622.00	*					74.00		Horizontal
17059.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4874.00	29.38	31.85	8.66	32.12	37.77	54.00	-16.23	Vertical
7311.00	23.23	36.37	11.71	31.91	39.40	54.00	-14.60	Vertical
9748.00	22.59	38.27	14.25	31.56	43.55	54.00	-10.45	Vertical
12185.00	*					54.00		Vertical
14622.00	*					54.00		Vertical
17059.00	*					54.00		Vertical
4874.00	30.04	31.85	8.66	32.12	38.43	54.00	-15.57	Horizontal
7311.00	21.27	36.37	11.71	31.91	37.44	54.00	-16.56	Horizontal
9748.00	23.62	38.27	14.25	31.56	44.58	54.00	-9.42	Horizontal
12185.00	*					54.00		Horizontal
14622.00	*					54.00		Horizontal
17059.00	*					54.00		Horizontal

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *"*", means this data is the too weak instrument of signal is unable to test.*
3. *The frequency emission of peak points that did not show above the forms are at least 20dB below the limit, the frequency emission is mainly from the environment noise.*

Test mode:	802.11g	Test channel:	Highest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4924.00	43.05	31.90	8.70	32.15	51.50	74.00	-22.50	Vertical
7386.00	33.50	36.49	11.76	31.83	49.92	74.00	-24.08	Vertical
9848.00	36.30	38.62	14.31	31.77	57.46	74.00	-16.54	Vertical
12310.00	*					74.00		Vertical
14772.00	*					74.00		Vertical
17234.00	*					74.00		Vertical
4924.00	42.53	31.90	8.70	32.15	50.98	74.00	-23.02	Horizontal
7386.00	32.48	36.49	11.76	31.83	48.90	74.00	-25.10	Horizontal
9848.00	32.10	38.62	14.31	31.77	53.26	74.00	-20.74	Horizontal
12310.00	*					74.00		Horizontal
14772.00	*					74.00		Horizontal
17234.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4924.00	34.23	31.90	8.70	32.15	42.68	54.00	-11.32	Vertical
7386.00	24.01	36.49	11.76	31.83	40.43	54.00	-13.57	Vertical
9848.00	24.42	38.62	14.31	31.77	45.58	54.00	-8.42	Vertical
12310.00	*					54.00		Vertical
14772.00	*					54.00		Vertical
17234.00	*					54.00		Vertical
4924.00	33.23	31.90	8.70	32.15	41.68	54.00	-12.32	Horizontal
7386.00	22.04	36.49	11.76	31.83	38.46	54.00	-15.54	Horizontal
9848.00	21.36	38.62	14.31	31.77	42.52	54.00	-11.48	Horizontal
12310.00	*					54.00		Horizontal
14772.00	*					54.00		Horizontal
17234.00	*					54.00		Horizontal

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *"*", means this data is the too weak instrument of signal is unable to test.*
3. *The frequency emission of peak points that did not show above the forms are at least 20dB below the limit, the frequency emission is mainly from the environment noise.*

Test mode:	802.11n(HT20)	Test channel:	Lowest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4824.00	37.95	31.79	8.62	32.10	46.26	74.00	-27.74	Vertical
7236.00	33.29	36.19	11.68	31.97	49.19	74.00	-24.81	Vertical
9648.00	32.86	38.07	14.16	31.56	53.53	74.00	-20.47	Vertical
12060.00	*					74.00		Vertical
14472.00	*					74.00		Vertical
16884.00	*					74.00		Vertical
4824.00	38.38	31.79	8.62	32.10	46.69	74.00	-27.31	Horizontal
7236.00	34.14	36.19	11.68	31.97	50.04	74.00	-23.96	Horizontal
9648.00	31.47	38.07	14.16	31.56	52.14	74.00	-21.86	Horizontal
12060.00	*					74.00		Horizontal
14472.00	*					74.00		Horizontal
16884.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4824.00	29.51	31.79	8.62	32.10	37.82	54.00	-16.18	Vertical
7236.00	24.79	36.19	11.68	31.97	40.69	54.00	-13.31	Vertical
9648.00	23.27	38.07	14.16	31.56	43.94	54.00	-10.06	Vertical
12060.00	*					54.00		Vertical
14472.00	*					54.00		Vertical
16884.00	*					54.00		Vertical
4824.00	28.30	31.79	8.62	32.10	36.61	54.00	-17.39	Horizontal
7236.00	23.54	36.19	11.68	31.97	39.44	54.00	-14.56	Horizontal
9648.00	22.73	38.07	14.16	31.56	43.40	54.00	-10.60	Horizontal
12060.00	*					54.00		Horizontal
14472.00	*					54.00		Horizontal
16884.00	*					54.00		Horizontal

Remark:

1. Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

2. "", means this data is the too weak instrument of signal is unable to test.*

3. The frequency emission of peak points that did not show above the forms are at least 20dB below the limit, the frequency emission is mainly from the environment noise.

Test mode:	802.11n(HT20)	Test channel:	Middle

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4874.00	39.33	31.85	8.66	32.12	47.72	74.00	-26.28	Vertical
7311.00	34.76	36.37	11.71	31.91	50.93	74.00	-23.07	Vertical
9748.00	33.30	38.27	14.25	31.56	54.26	74.00	-19.74	Vertical
12185.00	*					74.00		Vertical
14622.00	*					74.00		Vertical
17059.00	*					74.00		Vertical
4874.00	39.77	31.85	8.66	32.12	48.16	74.00	-25.84	Horizontal
7311.00	33.45	36.37	11.71	31.91	49.62	74.00	-24.38	Horizontal
9748.00	34.94	38.27	14.25	31.56	55.90	74.00	-18.10	Horizontal
12185.00	*					74.00		Horizontal
14622.00	*					74.00		Horizontal
17059.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4874.00	30.28	31.85	8.66	32.12	38.67	54.00	-15.33	Vertical
7311.00	22.75	36.37	11.71	31.91	38.92	54.00	-15.08	Vertical
9748.00	22.25	38.27	14.25	31.56	43.21	54.00	-10.79	Vertical
12185.00	*					54.00		Vertical
14622.00	*					54.00		Vertical
17059.00	*					54.00		Vertical
4874.00	31.02	31.85	8.66	32.12	39.41	54.00	-14.59	Horizontal
7311.00	23.59	36.37	11.71	31.91	39.76	54.00	-14.24	Horizontal
9748.00	22.16	38.27	14.25	31.56	43.12	54.00	-10.88	Horizontal
12185.00	*					54.00		Horizontal
14622.00	*					54.00		Horizontal
17059.00	*					54.00		Horizontal

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *"*", means this data is the too weak instrument of signal is unable to test.*
3. The frequency emission of peak points that did not show above the forms are at least 20dB below the limit, the frequency emission is mainly from the environment noise.

Test mode:	802.11n(HT20)	Test channel:	Highest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4924.00	41.62	31.90	8.70	32.15	50.07	74.00	-23.93	Vertical
7386.00	34.10	36.49	11.76	31.83	50.52	74.00	-23.48	Vertical
9848.00	37.43	38.62	14.31	31.77	58.59	74.00	-15.41	Vertical
12310.00	*					74.00		Vertical
14772.00	*					74.00		Vertical
17234.00	*					74.00		Vertical
4924.00	42.67	31.90	8.70	32.15	51.12	74.00	-22.88	Horizontal
7386.00	32.94	36.49	11.76	31.83	49.36	74.00	-24.64	Horizontal
9848.00	32.17	38.62	14.31	31.77	53.33	74.00	-20.67	Horizontal
12310.00	*					74.00		Horizontal
14772.00	*					74.00		Horizontal
17234.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4924.00	34.68	31.90	8.70	32.15	43.13	54.00	-10.87	Vertical
7386.00	24.20	36.49	11.76	31.83	40.62	54.00	-13.38	Vertical
9848.00	22.74	38.62	14.31	31.77	43.90	54.00	-10.10	Vertical
12310.00	*					54.00		Vertical
14772.00	*					54.00		Vertical
17234.00	*					54.00		Vertical
4924.00	33.58	31.90	8.70	32.15	42.03	54.00	-11.97	Horizontal
7386.00	23.43	36.49	11.76	31.83	39.85	54.00	-14.15	Horizontal
9848.00	22.50	38.62	14.31	31.77	43.66	54.00	-10.34	Horizontal
12310.00	*					54.00		Horizontal
14772.00	*					54.00		Horizontal
17234.00	*					54.00		Horizontal

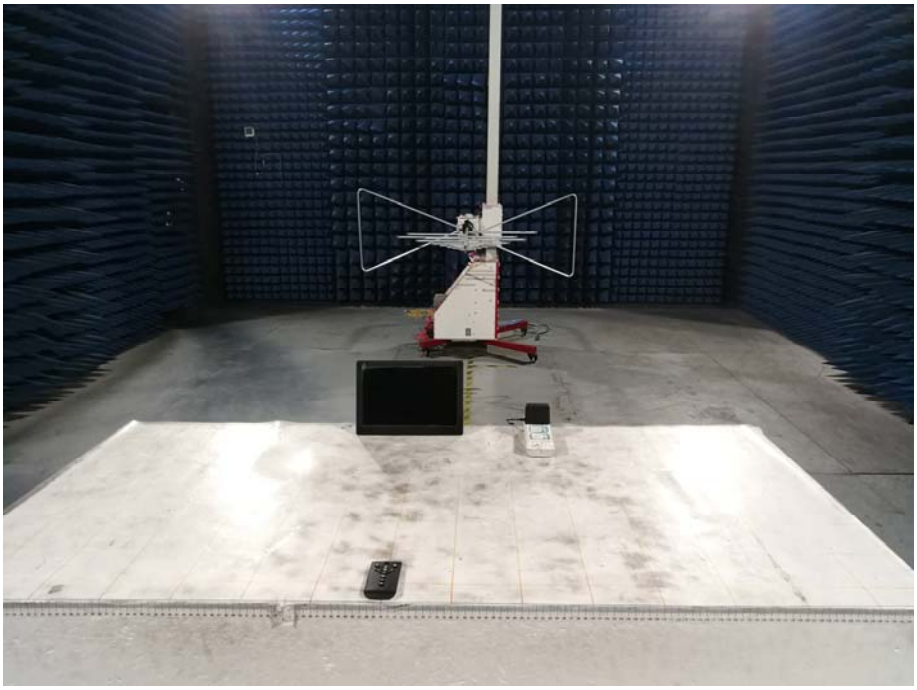
Remark:

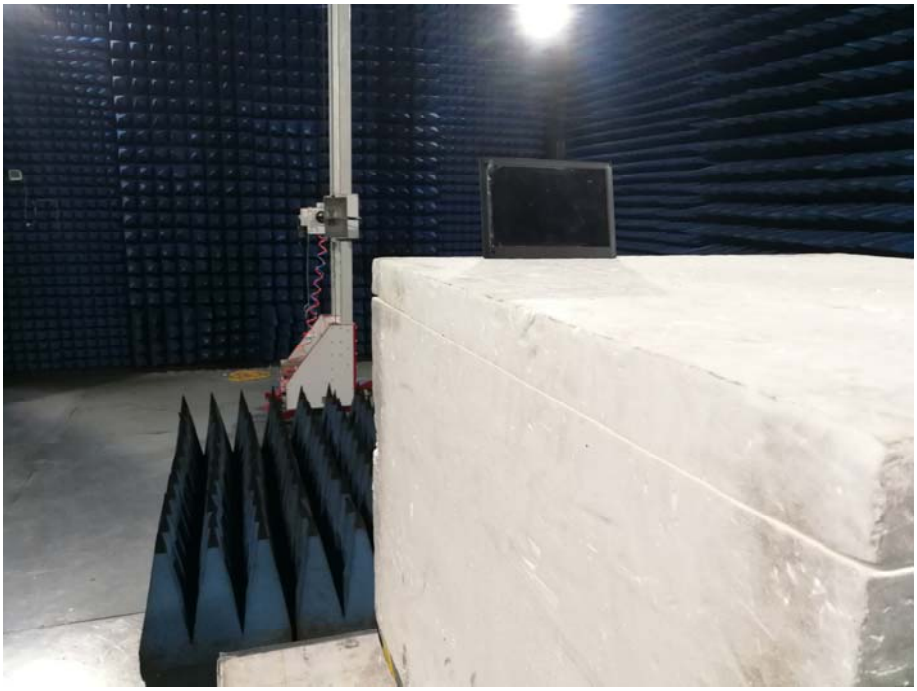
1 Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

2 "", means this data is the too weak instrument of signal is unable to test.*

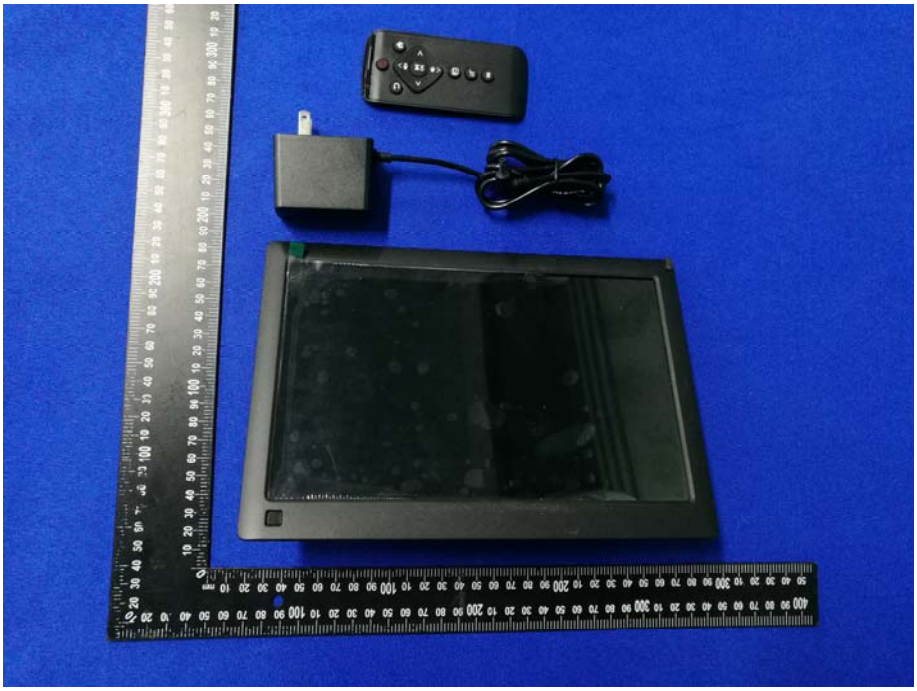
3. The frequency emission of peak points that did not show above the forms are at least 20dB below the limit, the frequency emission is mainly from the environment noise.

8 Test Setup Photo





9 EUT Constructional Details



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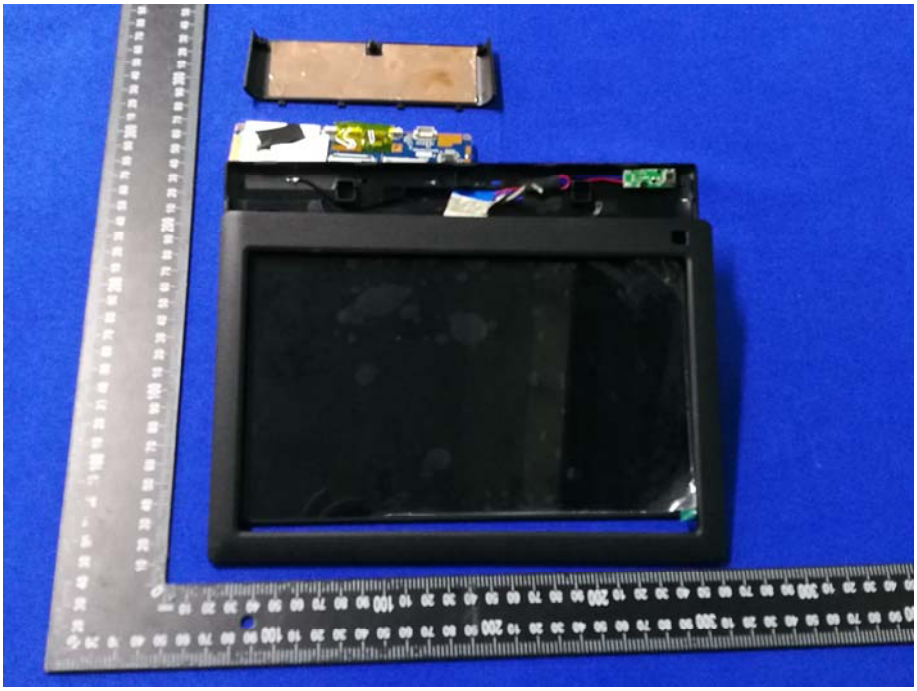

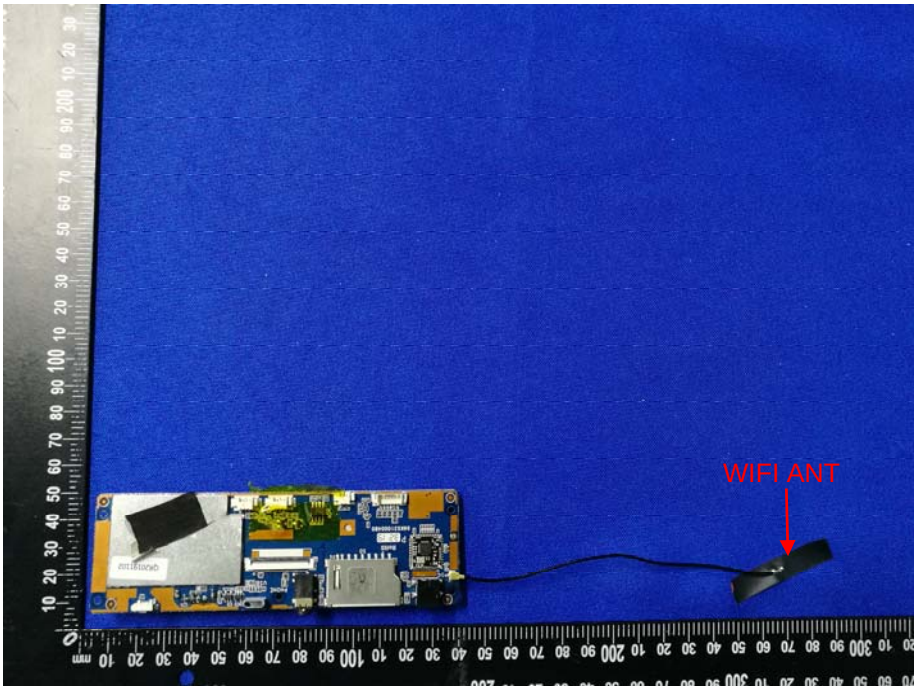
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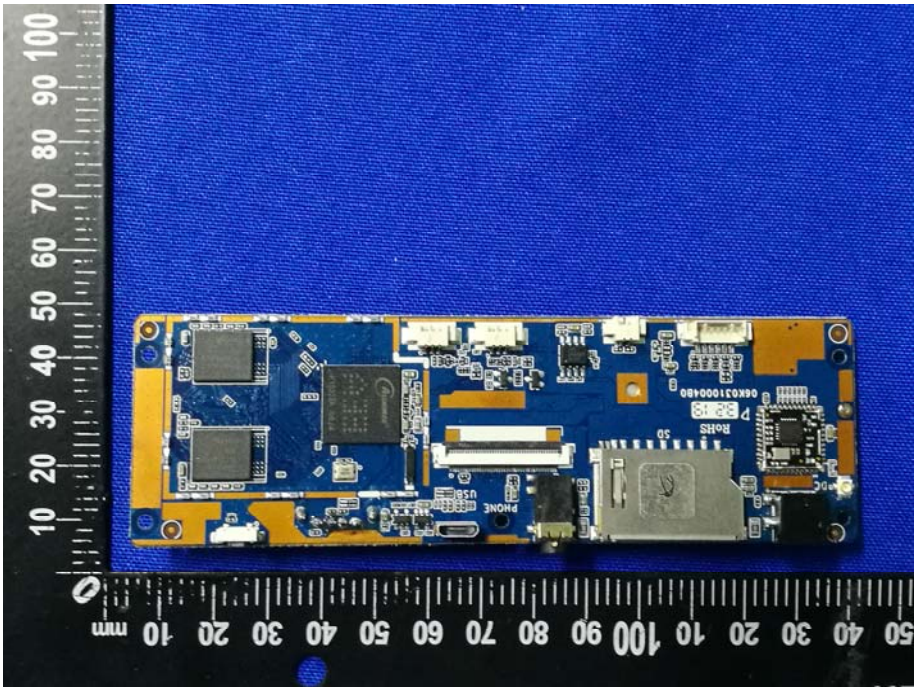

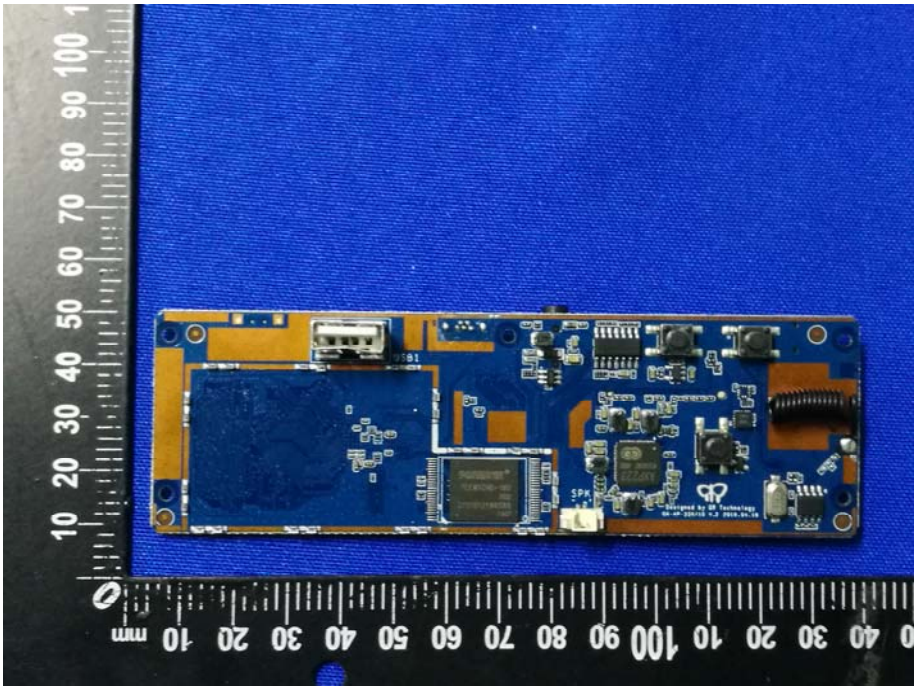

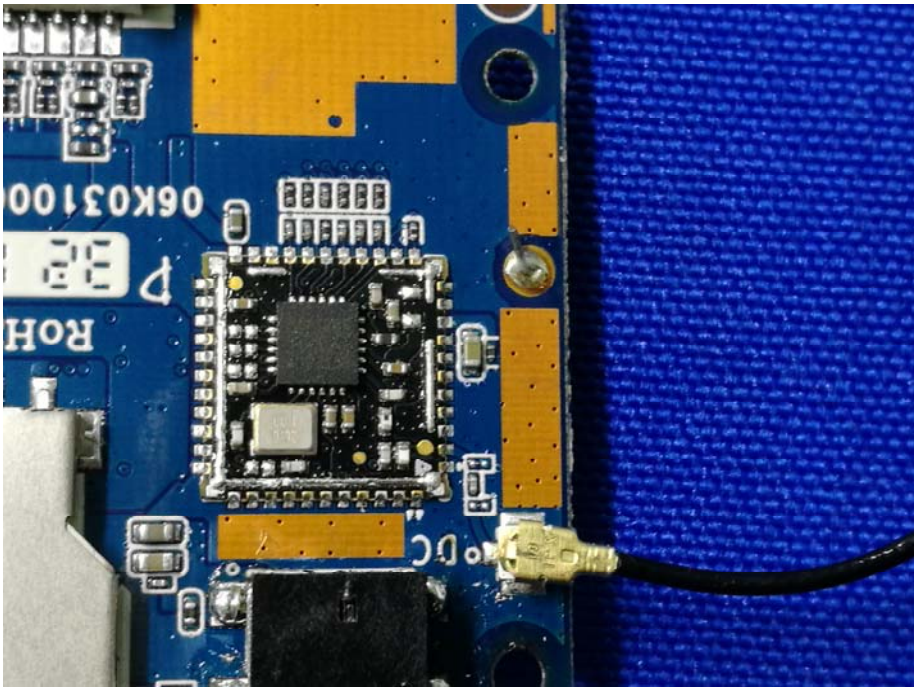

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