

TEST REPORT

Applicant: FCC: Magtek Incorporated
IC: MagTek Inc

Address of Applicant: FCC: 1710 Apollo Court, seal beach, California 90740, United States
IC: 1710 Apollo Court Seal Beach CA 90740 United States

Manufacturer: FCC: Magtek Incorporated
IC: MagTek Inc

Address of Manufacturer: FCC: 1710 Apollo Court, seal beach, California 90740, United States
IC: 1710 Apollo Court Seal Beach CA 90740 United States

Equipment Under Test (EUT)

Product Name: DynaGlass

Model No.: 40000102, 40000101

Trade Mark: MAGTEK

FCC ID: U73-40000102

IC: 23169-40000102

Applicable standards: FCC CFR Title 47 Part 15 Subpart C Section 15.247
RSS-Gen Issue 5
RSS-247 Issue 2

Date of sample receipt: July 07, 2020

Date of Test: July 08, 2020-August 31, 2020

Date of report issued: August 31, 2020

Test Result : PASS *

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

Authorized Signature:

A circular blue ink stamp from Global United Technology Services Co., Ltd. is visible. The stamp contains the text "GTS", "GLOBAL UNITED TECHNOLOGY SERVICES CO., LTD.", and "LABORATORY TESTING". Overlaid on the stamp is a handwritten signature in blue ink, which appears to read "Robinson Lo".

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	August 31, 2020	Original

Prepared By:



Date:

August 31, 2020

Project Engineer

Check By:



Date:

August 31, 2020

Reviewer

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4 Test Summary

Test Item	Section	Result
Antenna requirement	FCC part 15.203/15.247 (c) RSS-Gen Section 8.3	Pass
AC Power Line Conducted Emission	FCC part 15.207 RSS-Gen Section 8.8	Pass
Conducted Peak Output Power	FCC part 15.247 (b)(3) RSS-247 Section 5.4(d)	Pass
Channel Bandwidth & 99% OCB	FCC part 15.247 (a)(2) RSS-247 Section 5.2(a) & 6.7	Pass
Power Spectral Density	FCC part 15.247 (e) RSS-247 Section 5.2(b)	Pass
Band Edge	FCC part 15.247(d) RSS-247 Section 5.5	Pass
Spurious Emission	FCC part 15.205/15.209 RSS-Gen Section 3.3 & 8.9 & 8.10	Pass
Frequency stability	RSS-Gen Section 6.11& Section 8.11	PASS

Remark: Test according to ANSI C63.10:2013 and RSS-Gen

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

Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
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:	DynaGlass
Model No.:	40000102, 40000101
Test Model No:	40000102
Remark: All above models are identical in the same PCB layout, interior structure and electrical circuits. The differences are appearance color and model name for commercial purpose.	
S/N:	B90A998
Hardware version:	DynaGlass_AND_V040 DynaGlass_PAY_V040
Software version:	Android:0.9.05; Max32550-LCS+:1.0.0
Test sample(s) ID:	GTS202007000071-1
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(HT20) Orthogonal Frequency Division Multiplexing (OFDM)
Antenna Type:	Integral Antenna
Antenna gain:	1.67dBi(declare by applicant)
Power supply:	DC 5V or DC 7.4V 1850mAh 13.69Wh by Li-ion battery

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
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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

Manufacturer	Description	Model	Serial Number
Lenovo	Notebook PC	E40-80	N/A
Apple	PC	A1278	C1MN99ERDTY3

5.4 Deviation from Standards

None.

5.5 Abnormalities from Standard Conditions

None.

5.6 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

5.7 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.

Address: No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102

Tel: 0755-27798480

Fax: 0755-27798960

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. 02 2020	July. 01 2025
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. 25 2020	June. 24 2021
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June. 25 2020	June. 24 2021
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	June. 25 2020	June. 24 2021
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	June. 25 2020	June. 24 2021
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	June. 25 2020	June. 24 2021
9	Coaxial Cable	GTS	N/A	GTS211	June. 25 2020	June. 24 2021
10	Coaxial cable	GTS	N/A	GTS210	June. 25 2020	June. 24 2021
11	Coaxial Cable	GTS	N/A	GTS212	June. 25 2020	June. 24 2021
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June. 25 2020	June. 24 2021
13	Amplifier(2GHz-20GHz)	HP	84722A	GTS206	June. 25 2020	June. 24 2021
14	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June. 25 2020	June. 24 2021
15	Band filter	Amindeon	82346	GTS219	June. 25 2020	June. 24 2021
16	Power Meter	Anritsu	ML2495A	GTS540	June. 25 2020	June. 24 2021
17	Power Sensor	Anritsu	MA2411B	GTS541	June. 25 2020	June. 24 2021
18	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	June. 25 2020	June. 24 2021
19	Splitter	Agilent	11636B	GTS237	June. 25 2020	June. 24 2021
20	Loop Antenna	ZHINAN	ZN30900A	GTS534	June. 25 2020	June. 24 2021
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. 25 2020	June. 24 2021

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. 25 2020	June. 24 2021
3	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June. 25 2020	June. 24 2021
4	ENV216 2-L-V-NETZNACHB.DE	ROHDE&SCHWARZ	ENV216	GTS226	June. 25 2020	June. 24 2021
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. 25 2020	June. 24 2021
8	Absorbing clamp	Elektronik-Feinmechanik	MDS21	GTS229	June. 25 2020	June. 24 2021
9	ISN	SCHWARZBECK	NTFM 8158	GTD565	June. 25 2020	June. 24 2021

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. 25 2020	June. 24 2021
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 25 2020	June. 24 2021
3	Spectrum Analyzer	Agilent	E4440A	GTS533	June. 25 2020	June. 24 2021
4	MXG vector Signal Generator	Agilent	N5182A	GTS567	June. 25 2020	June. 24 2021
5	ESG Analog Signal Generator	Agilent	E4428C	GTS568	June. 25 2020	June. 24 2021
6	USB RF Power Sensor	DARE	RPR3006W	GTS569	June. 25 2020	June. 24 2021
7	RF Switch Box	Shongyi	RFSW3003328	GTS571	June. 25 2020	June. 24 2021
8	Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	GTS572	June. 25 2020	June. 24 2021

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. 25 2020	June. 24 2021
2	Barometer	ChangChun	DYM3	GTS255	June. 25 2020	June. 24 2021

7 Test results and Measurement Data

7.1 Antenna requirement

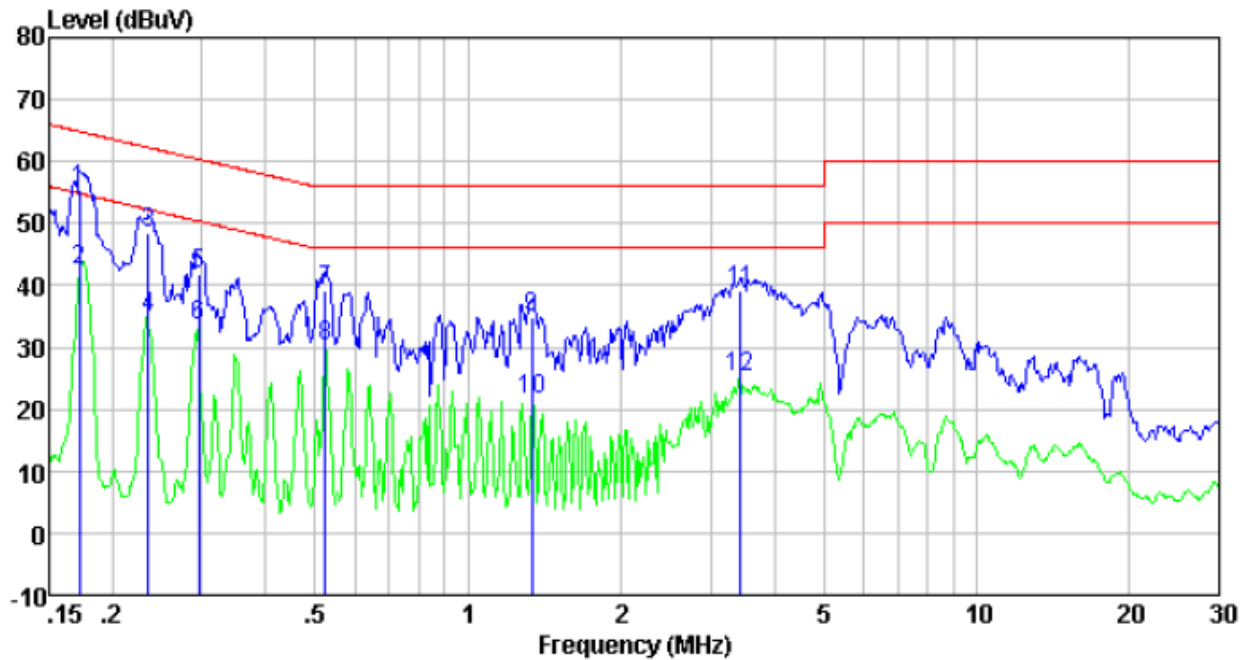
Standard requirement:	FCC Part15 C Section 15.203 /247(c)
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique 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.	
Standard requirement:	RSS-Gen Section 8.3
A transmitter can only be sold or operated with antennas with which it was approved. When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on measurement or on data from the antenna manufacturer. For transmitters of RF output power of 10 milliwatts or less, only the portion of the antenna gain that is in excess of 6 dBi (6 dB above isotropic gain) shall be added to the measured RF output power to demonstrate compliance with the radiated power limits specified in the applicable standard. For transmitters of output power greater than 10 milliwatts, the total antenna gain shall be added to the measured RF output power to demonstrate compliance to the specified radiated power	
EUT Antenna:	
<i>The antenna is Integral antenna, the best case gain of the antenna is 1.67dBi, reference to the appendix II for details</i>	

7.2 Conducted Emissions

Test Requirement:	FCC Part15 C Section 15.207 RSS-Gen Section 8.8						
Test Method:	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:	Reference Plane LISN AUX Equipment E.U.T 40cm 80cm Test table/Insulation plane LISN Filter AC power EMI Receiver Remark: E.U.T: Equipment Under Test LISN: Line Impedance 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.						
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 results:	Pass						

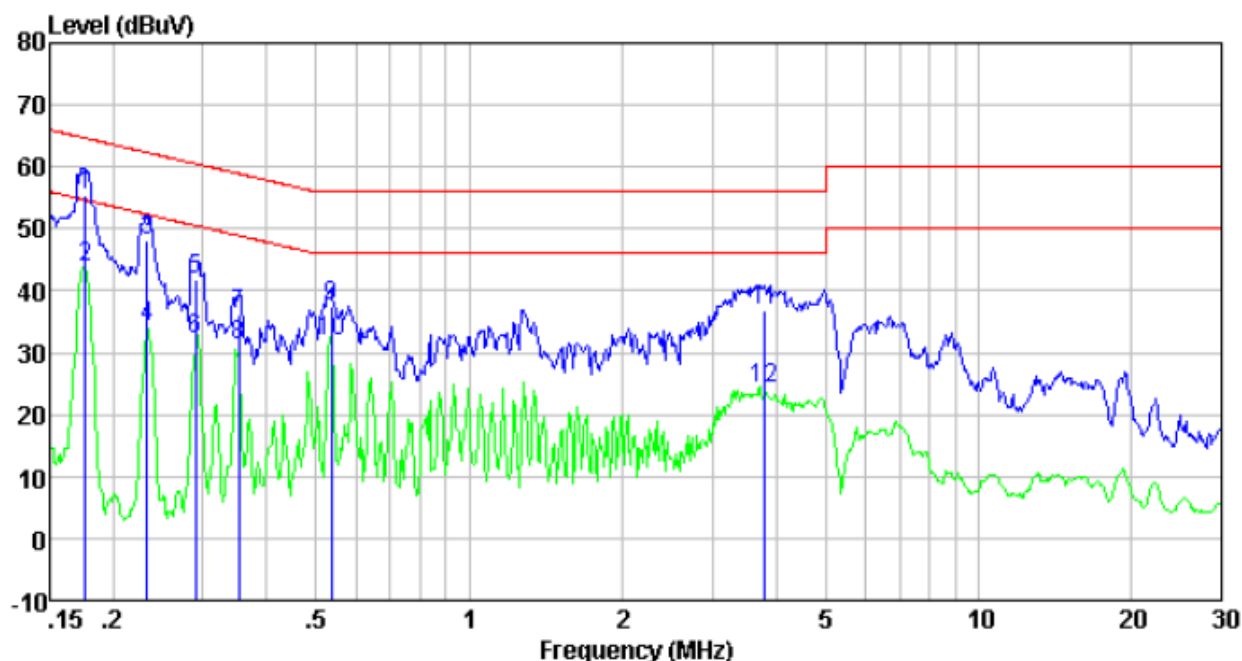
Measurement data

Line:



Freq. MHz	Read Level dBuV	Factor dB/m	Level dBuV	Limit Line dBuV	Over Limit dB	Remark
0.17	34.90	20.49	55.39	64.86	-9.47	QP
0.17	21.98	20.49	42.47	54.86	-12.39	Average
0.24	27.84	20.51	48.35	62.26	-13.91	QP
0.24	14.43	20.51	34.94	52.26	-17.32	Average
0.30	21.19	20.50	41.69	60.37	-18.68	QP
0.30	12.93	20.50	33.43	50.37	-16.94	Average
0.52	18.68	20.42	39.10	56.00	-16.90	QP
0.52	9.76	20.42	30.18	46.00	-15.82	Average
1.34	14.52	20.36	34.88	56.00	-21.12	QP
1.34	1.18	20.36	21.54	46.00	-24.46	Average
3.44	18.79	20.38	39.17	56.00	-16.83	QP
3.44	4.82	20.38	25.20	46.00	-20.80	Average

Neutral:

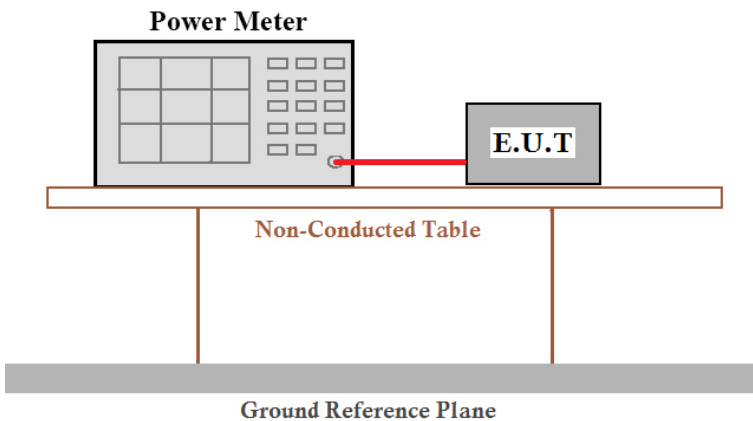


Freq. MHz	Read Level dBuV	Factor dB/m	Level dBuV	Limit Line dBuV	Over Limit dB	Remark
0.18	35.04	20.49	55.53	64.68	-9.15	QP
0.18	23.37	20.49	43.86	54.68	-10.82	Average
0.23	27.45	20.51	47.96	62.35	-14.39	QP
0.23	13.50	20.51	34.01	52.35	-18.34	Average
0.29	21.36	20.50	41.86	60.54	-18.68	QP
0.29	11.58	20.50	32.08	50.54	-18.46	Average
0.35	15.79	20.47	36.26	58.91	-22.65	QP
0.35	10.83	20.47	31.30	48.91	-17.61	Average
0.53	17.14	20.41	37.55	56.00	-18.45	QP
0.53	11.30	20.41	31.71	46.00	-14.29	Average
3.80	16.48	20.38	36.86	56.00	-19.14	QP
3.80	3.78	20.38	24.16	46.00	-21.84	Average

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

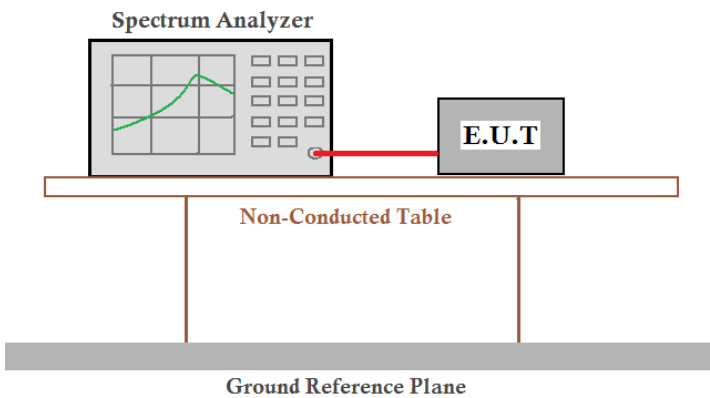
Test Requirement :	FCC Part15 C Section 15.247 (b)(3) RSS-247 Section 5.4(d)
Test Method :	KDB558074 D01 DTS Meas Guidance v05r02 ANSI C63.10:2013 and RSS-Gen
Limit:	30dBm 36dBm(4W for e.i.r.p)
Test setup:	 The diagram illustrates the test setup. A Power Meter is connected to an E.U.T (Equipment Under Test) via a red cable. Both are placed on a Non-Conducted Table, which is supported by a Ground Reference Plane.
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	12.53	13.47	13.72	30.00	Pass
Middle	13.22	14.27	14.10		
Highest	12.75	13.60	13.94		

Test CH	e.i.r.p (dBm)			Limit(dBm)	Result
	802.11b	802.11g	802.11n(HT20)		
Lowest	14.20	15.14	15.39	36	Pass
Middle	14.89	15.94	15.77		
Highest	14.42	15.27	15.61		

7.4 Channel Bandwidth & 99% Occupy Bandwidth

Test Requirement :	FCC Part15 C Section 15.247 (a)(2) RSS-Gen Section 6.7 & RSS-247 Section 5.2(a)
Test Method :	KDB558074 D01 DTS Meas Guidance v05r02 ANSI C63.10:2013 and RSS-Gen
Limit:	>500KHz
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected via a red cable to an Equipment Under Test (E.U.T.). Both are placed on a Non-Conducted Table. Below the table is a Ground Reference Plane.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data

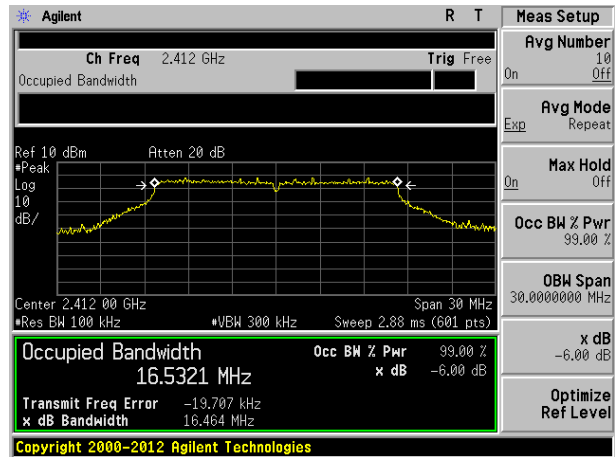
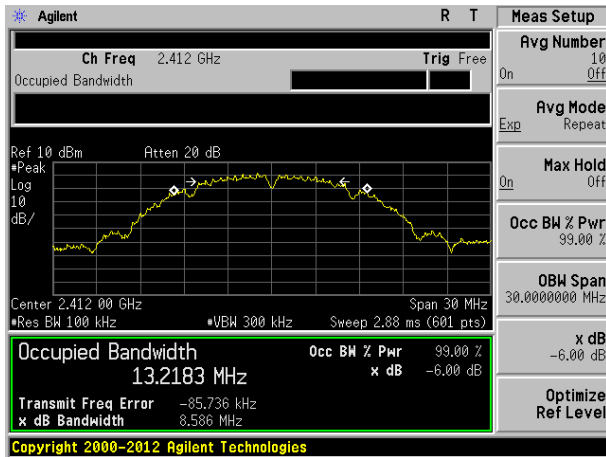
Test CH	Channel Bandwidth (MHz)			Limit(KHz)	Result
	802.11b	802.11g	802.11n(HT20)		
Lowest	8.586	16.464	17.607	>500	Pass
Middle	8.564	16.342	17.621		
Highest	8.591	16.367	17.704		

Test CH	99% Occupy Bandwidth (MHz)			Result
	802.11b	802.11g	802.11n(HT20)	
Lowest	13.2757	16.7685	17.8336	Pass
Middle	12.9944	16.6411	17.6844	
Highest	12.9018	16.7162	17.7934	

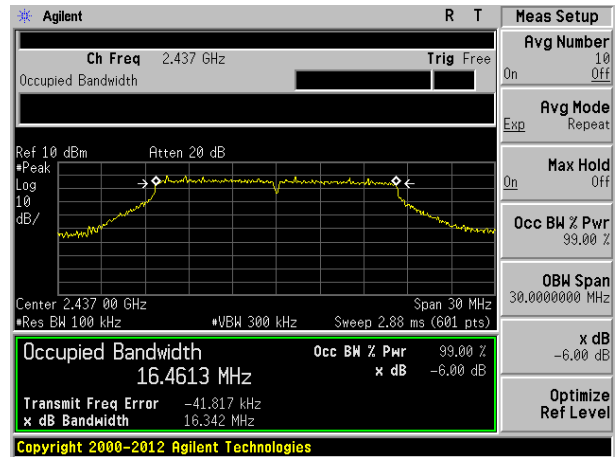
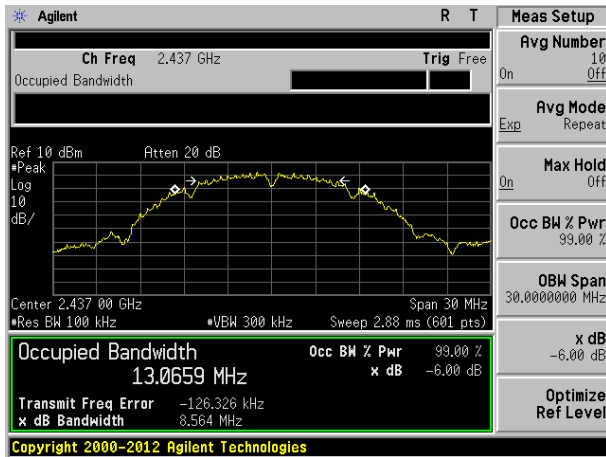
Test plot as follows:

-6dB BW:

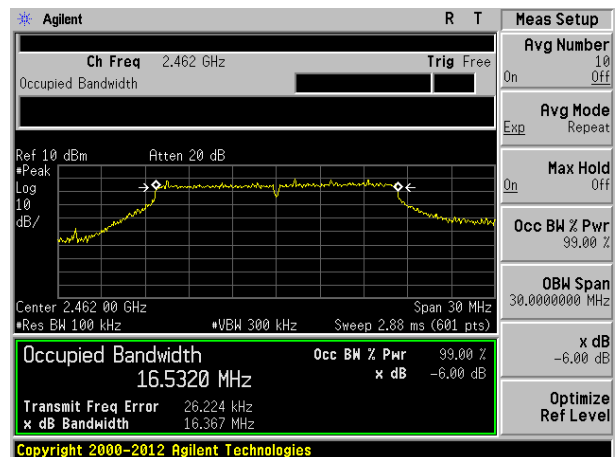
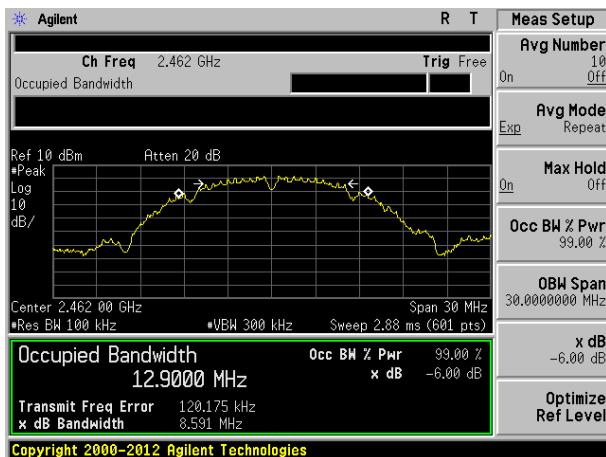
Test mode:	802.11b	Test mode:	802.11g
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Lowest channel

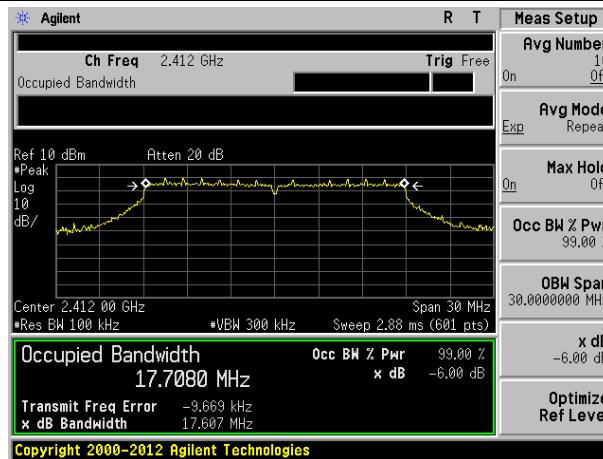


Middle channel

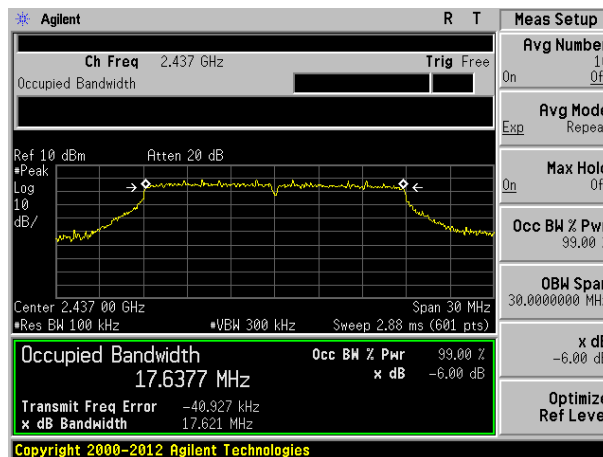


Highest channel

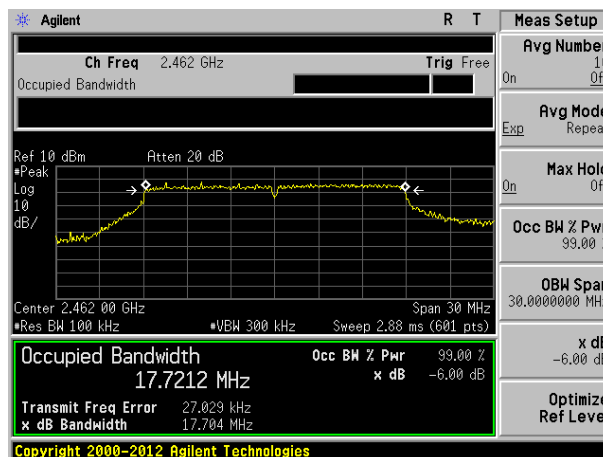
Test mode:	802.11n(HT20)
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Lowest channel



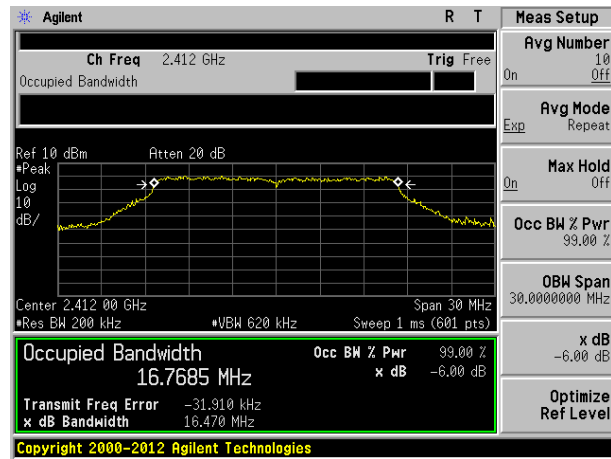
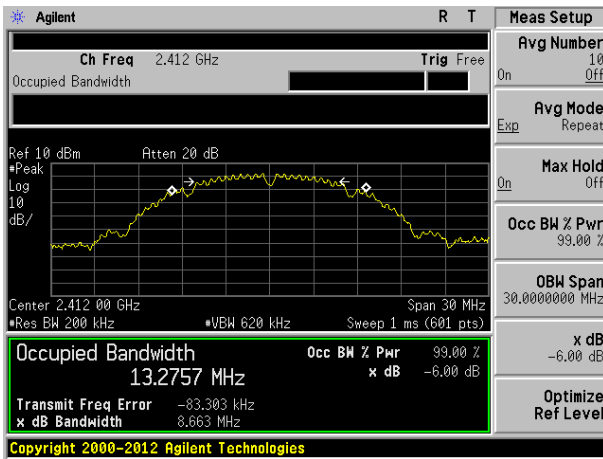
Middle channel



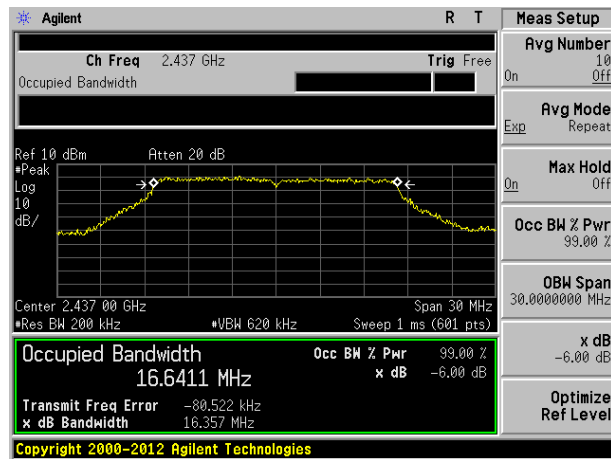
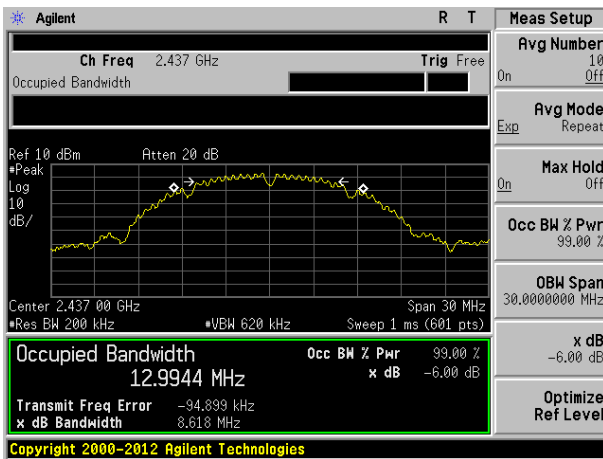
Highest channel

99% BW:

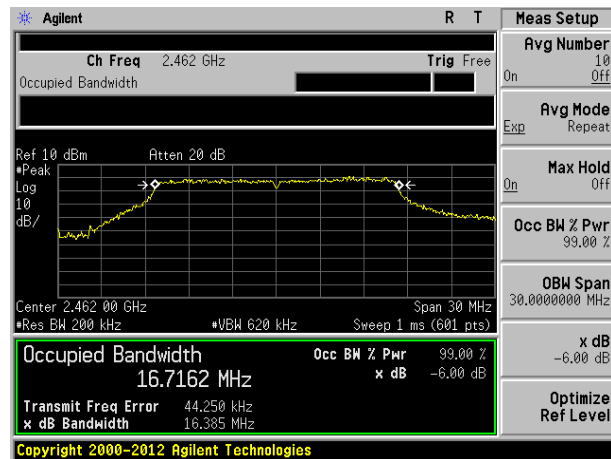
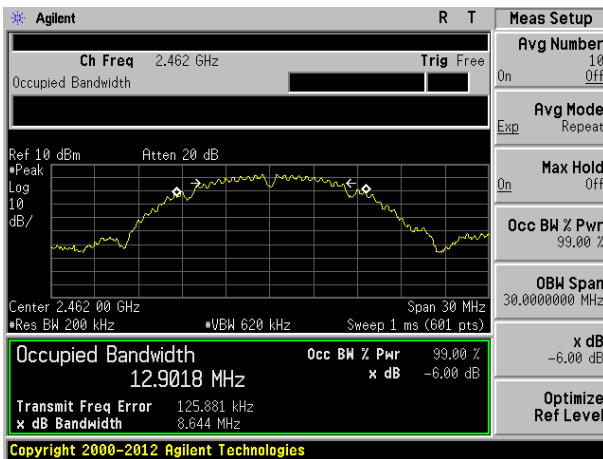
Test mode:	802.11b	Test mode:	802.11g
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Lowest channel



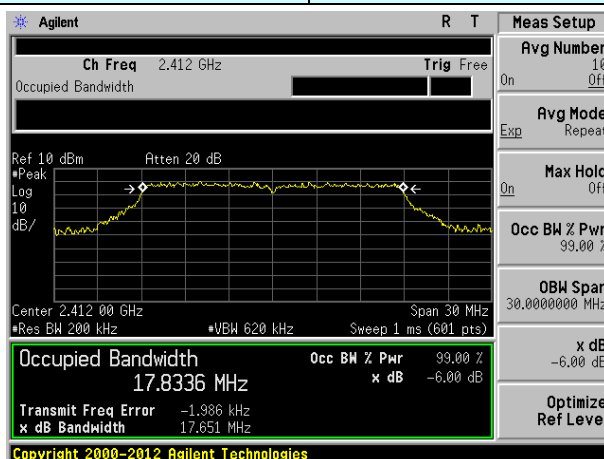
Middle channel



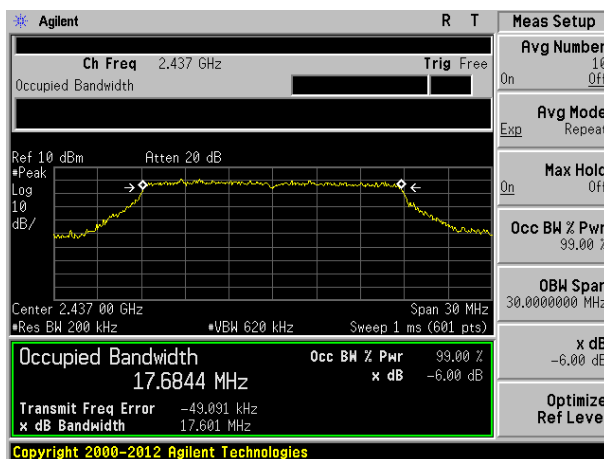
Highest channel

Test mode:

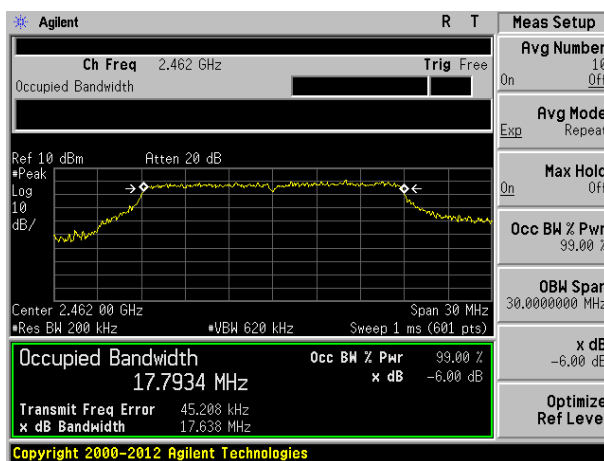
802.11n(HT20)



Lowest channel

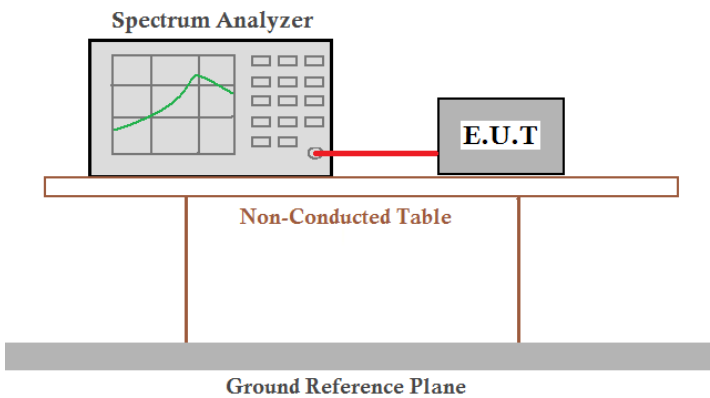


Middle channel



Highest channel

7.5 Power Spectral Density

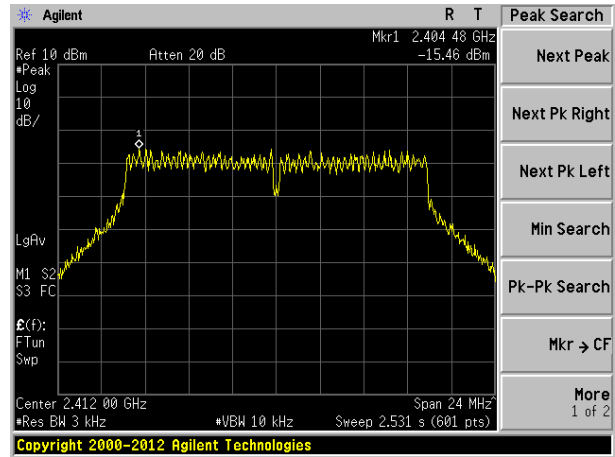
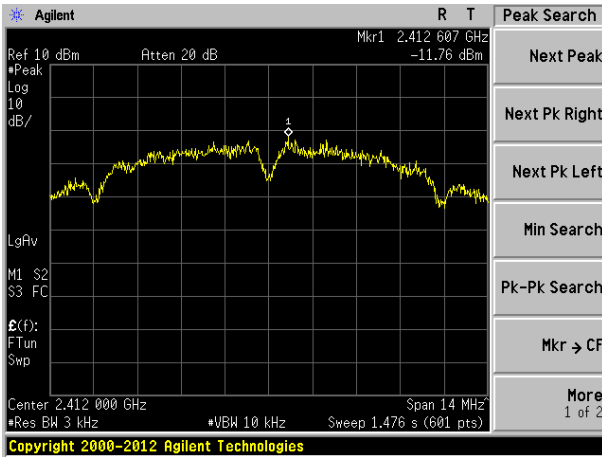
Test Requirement:	FCC Part15 C Section 15.247 (e) RSS-247 Section 5.2(b)
Test Method:	KDB558074 D01 DTS Meas Guidance v05r02 ANSI C63.10:2013 and RSS-Gen
Limit:	8dBm/3kHz
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data

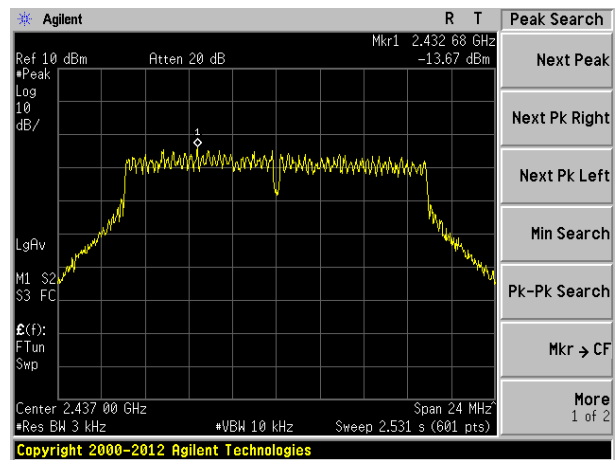
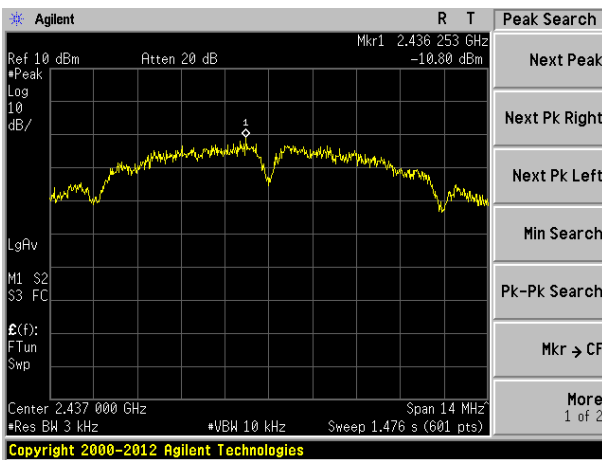
Test CH	Power Spectral Density (dBm/3kHz)			Limit (dBm/3kHz)	Result
	802.11b	802.11g	802.11n(HT20)		
Lowest	-11.76	-15.46	-14.04	8.00	Pass
Middle	-10.80	-13.67	-15.25		
Highest	-12.12	-16.02	-15.59		

Test plot as follows:

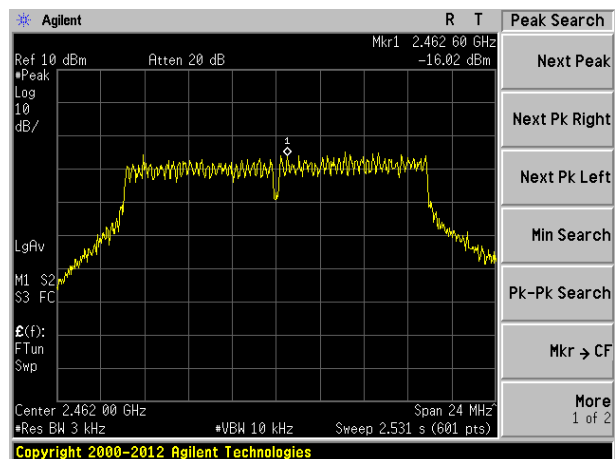
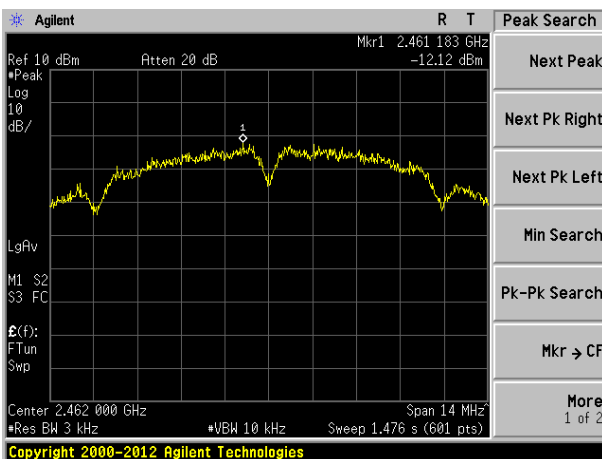
Test mode:	802.11b	Test mode:	802.11g
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Lowest channel

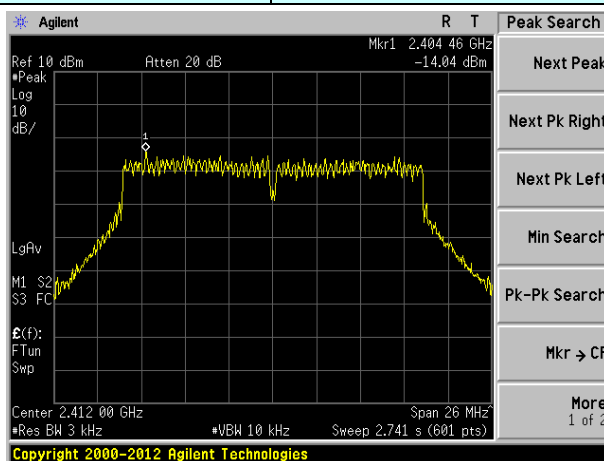


Middle channel

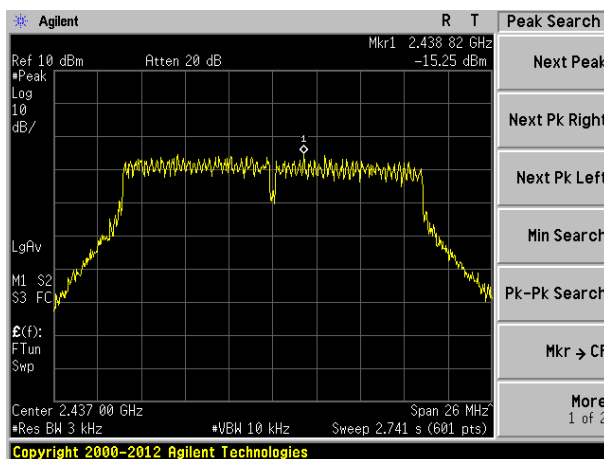


Highest channel

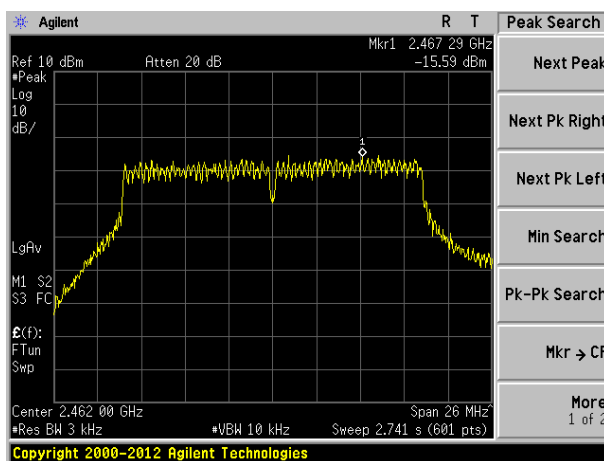
Test mode:	802.11n(HT20)
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Lowest channel



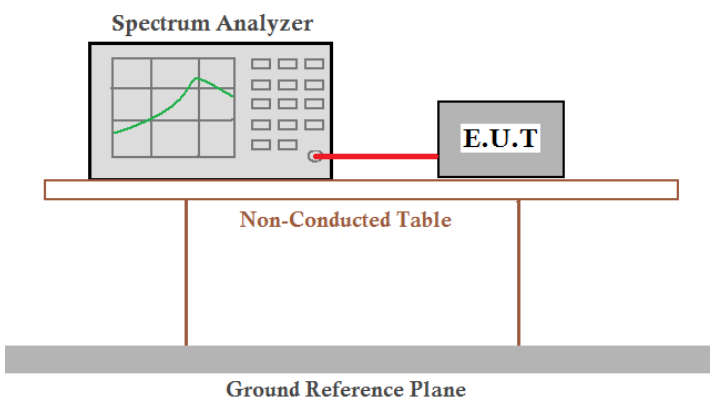
Middle channel



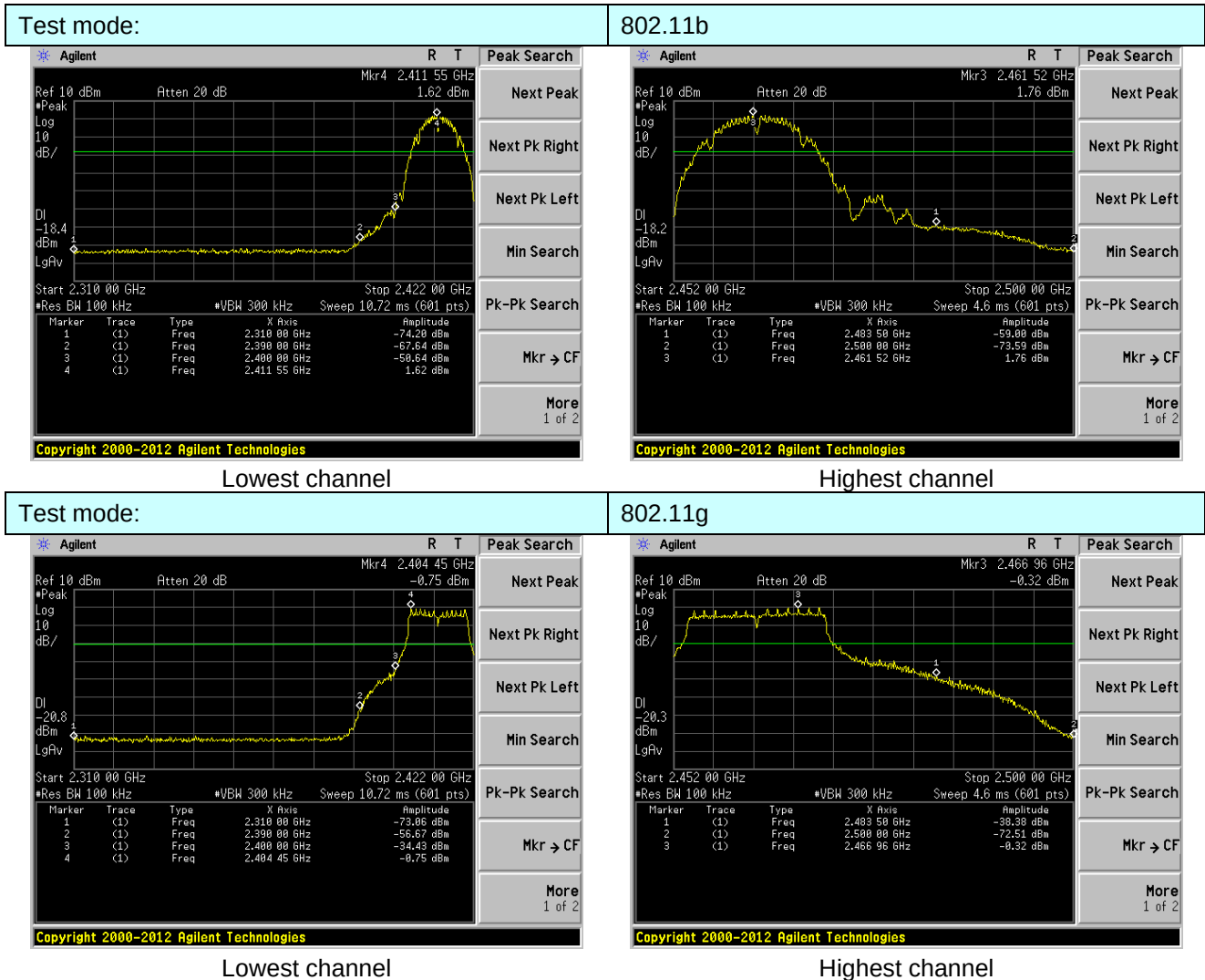
Highest channel

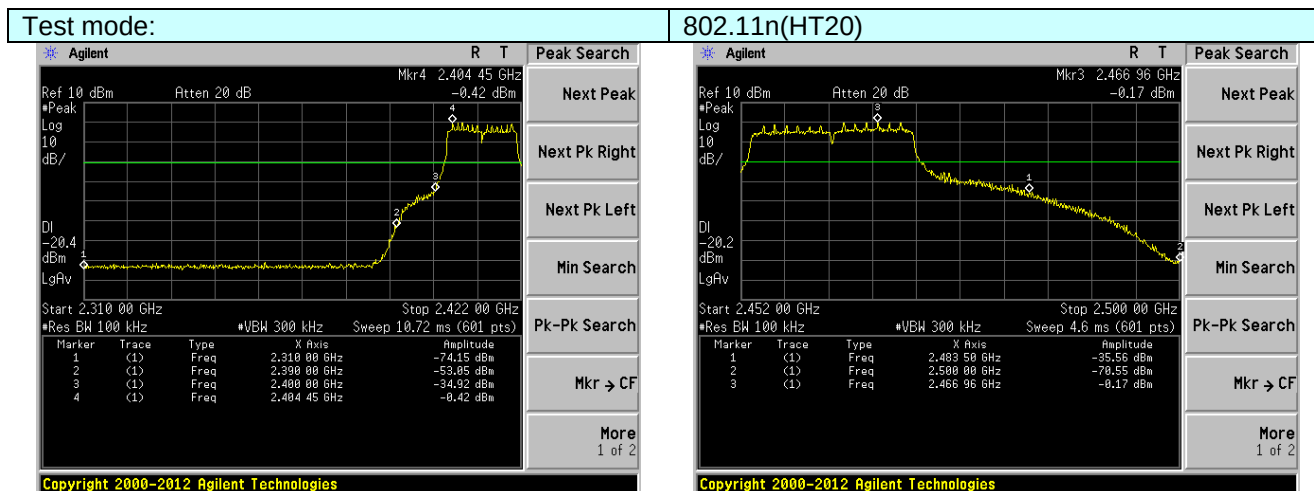
7.6 Band edges

7.6.1 Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.247 (d) RSS-247 Section 5.5
Test Method:	KDB558074 D01 DTS Meas Guidance v05r02 ANSI C63.10:2013 & RSS-Gen
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:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T are placed on a Non-Conducted Table. The table is supported by two vertical legs and sits on a Ground Reference Plane.
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:

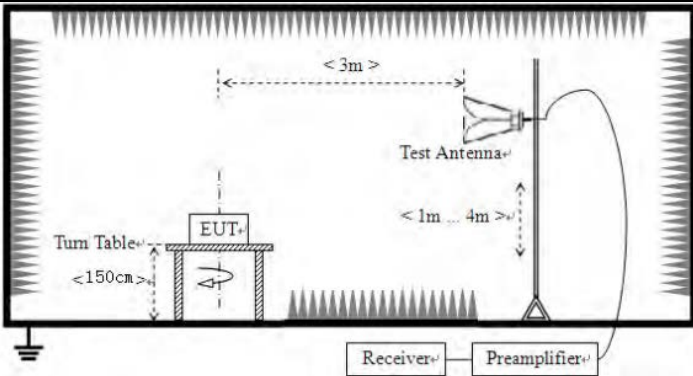




Lowest channel

Highest channel

7.6.2 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209 and 15.205 RSS-247 3.3 & RSS-Gen Section 8.9				
Test Method:	ANSI C63.10: 2013 & RSS-Gen				
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:

Test mode:	802.11b	Test channel:	Lowest
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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	39.16	27.14	6.19	42.04	30.45	74.00	-43.55	Horizontal
2390.00	47.34	27.37	6.31	42.11	38.91	74.00	-35.09	Horizontal
2310.00	37.67	27.14	6.19	42.04	28.96	74.00	-45.04	Vertical
2390.00	48.47	27.37	6.31	42.11	40.04	74.00	-33.96	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	29.64	27.14	6.19	42.04	20.93	54.00	-33.07	Horizontal
2390.00	36.67	27.37	6.31	42.11	28.24	54.00	-25.76	Horizontal
2310.00	28.26	27.14	6.19	42.04	19.55	54.00	-34.45	Vertical
2390.00	38.60	27.37	6.31	42.11	30.17	54.00	-23.83	Vertical

Test mode:	802.11b	Test channel:	Highest
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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	47.75	27.66	6.45	42.01	39.85	74.00	-34.15	Horizontal
2500.00	40.38	27.70	6.47	42.00	32.55	74.00	-41.45	Horizontal
2483.50	47.51	27.66	6.45	42.01	39.61	74.00	-34.39	Vertical
2500.00	41.45	27.70	6.47	42.00	33.62	74.00	-40.38	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	36.63	27.66	6.45	42.01	28.73	54.00	-25.27	Horizontal
2500.00	33.21	27.70	6.47	42.00	25.38	54.00	-28.62	Horizontal
2483.50	37.35	27.66	6.45	42.01	29.45	54.00	-24.55	Vertical
2500.00	31.99	27.70	6.47	42.00	24.16	54.00	-29.84	Vertical

Test mode:	802.11g	Test channel:	Lowest
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2310.00	39.29	27.14	6.19	42.04	30.58	74.00	-43.42	Horizontal
2390.00	47.51	27.37	6.31	42.11	39.08	74.00	-34.92	Horizontal
2310.00	37.80	27.14	6.19	42.04	29.09	74.00	-44.91	Vertical
2390.00	48.67	27.37	6.31	42.11	40.24	74.00	-33.76	Vertical

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2310.00	29.73	27.14	6.19	42.04	21.02	54.00	-32.98	Horizontal
2390.00	36.77	27.37	6.31	42.11	28.34	54.00	-25.66	Horizontal
2310.00	28.36	27.14	6.19	42.04	19.65	54.00	-34.35	Vertical
2390.00	38.71	27.37	6.31	42.11	30.28	54.00	-23.72	Vertical

Test mode:	802.11g	Test channel:	Highest
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Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	47.93	27.66	6.45	42.01	40.03	74.00	-33.97	Horizontal
2500.00	40.51	27.70	6.47	42.00	32.68	74.00	-41.32	Horizontal
2483.50	47.71	27.66	6.45	42.01	39.81	74.00	-34.19	Vertical
2500.00	41.61	27.70	6.47	42.00	33.78	74.00	-40.22	Vertical

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	36.74	27.66	6.45	42.01	28.84	54.00	-25.16	Horizontal
2500.00	33.29	27.70	6.47	42.00	25.46	54.00	-28.54	Horizontal
2483.50	37.47	27.66	6.45	42.01	29.57	54.00	-24.43	Vertical
2500.00	32.08	27.70	6.47	42.00	24.25	54.00	-29.75	Vertical

Test mode:	802.11n(HT20)	Test channel:	Lowest
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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	39.53	27.14	6.19	42.04	30.82	74.00	-43.18	Horizontal
2390.00	47.83	27.37	6.31	42.11	39.40	74.00	-34.60	Horizontal
2310.00	38.06	27.14	6.19	42.04	29.35	74.00	-44.65	Vertical
2390.00	49.06	27.37	6.31	42.11	40.63	74.00	-33.37	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	29.90	27.14	6.19	42.04	21.19	54.00	-32.81	Horizontal
2390.00	36.97	27.37	6.31	42.11	28.54	54.00	-25.46	Horizontal
2310.00	28.55	27.14	6.19	42.04	19.84	54.00	-34.16	Vertical
2390.00	38.93	27.37	6.31	42.11	30.50	54.00	-23.50	Vertical

Test mode:	802.11n(HT20)	Test channel:	Highest
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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	48.28	27.66	6.45	42.01	40.38	74.00	-33.62	Horizontal
2500.00	40.78	27.70	6.47	42.00	32.95	74.00	-41.05	Horizontal
2483.50	48.10	27.66	6.45	42.01	40.20	74.00	-33.80	Vertical
2500.00	41.92	27.70	6.47	42.00	34.09	74.00	-39.91	Vertical

Average value:

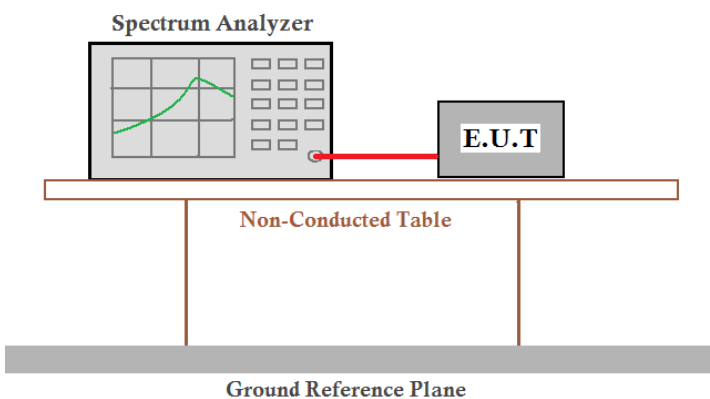
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	36.95	27.66	6.45	42.01	29.05	54.00	-24.95	Horizontal
2500.00	33.45	27.70	6.47	42.00	25.62	54.00	-28.38	Horizontal
2483.50	37.70	27.66	6.45	42.01	29.80	54.00	-24.20	Vertical
2500.00	32.25	27.70	6.47	42.00	24.42	54.00	-29.58	Vertical

Remarks:

- Only the worst case Main Antenna test data.
- The pre-test were performed on lowest, middle and highest frequencies, only the worst case's (lowest and highest frequencies) data was showed.
- Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
- The emission levels of other frequencies are very lower than the limit and not show in test report.

7.7 Spurious Emission

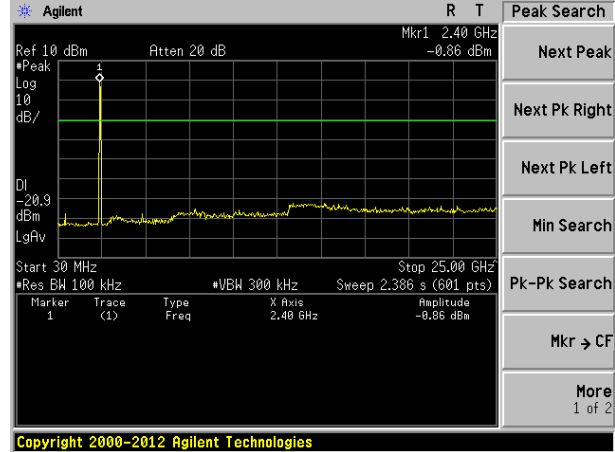
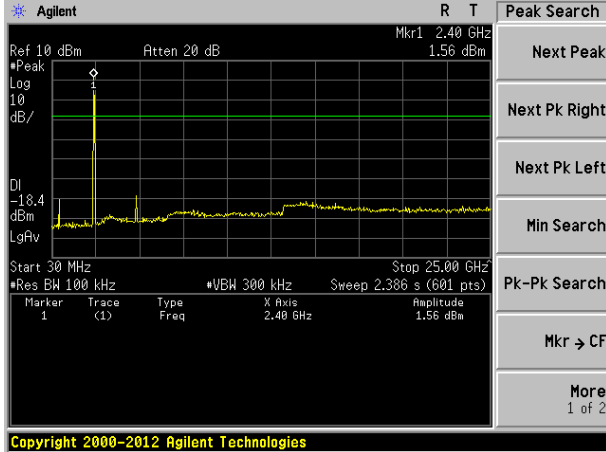
7.7.1 Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.247 (d) RSS-247 Section 5.5
Test Method:	KDB558074 D01 DTS Meas Guidance v05r02 ANSI C63.10:2013 & RSS-Gen
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:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. The table is supported by a Ground Reference Plane.
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:

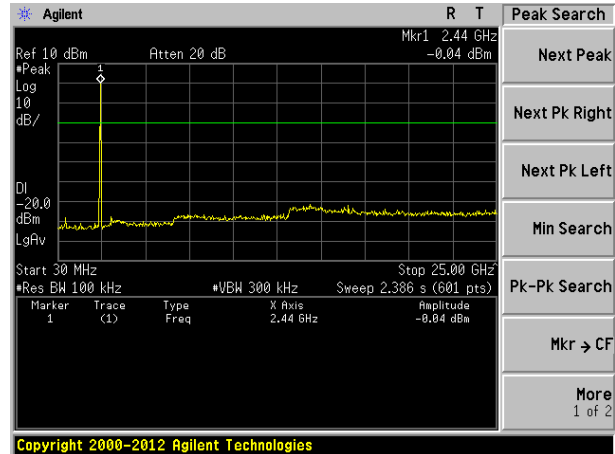
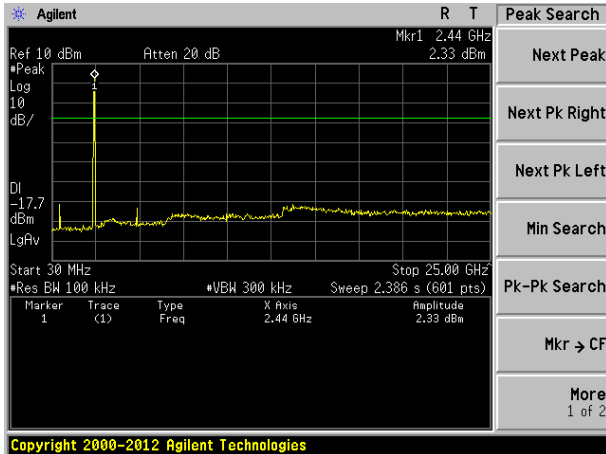
Test mode:	802.11b	Test mode:	802.11g
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Lowest channel



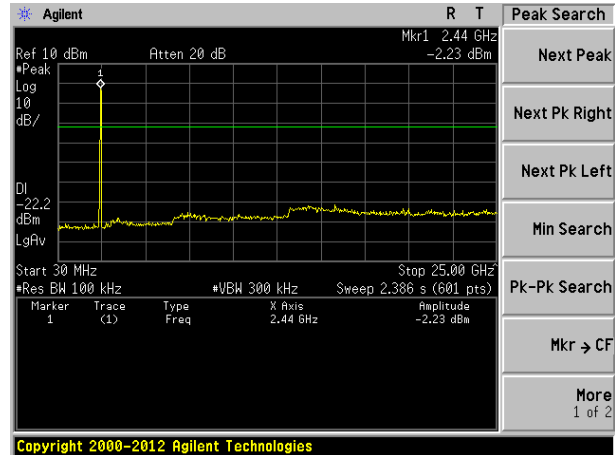
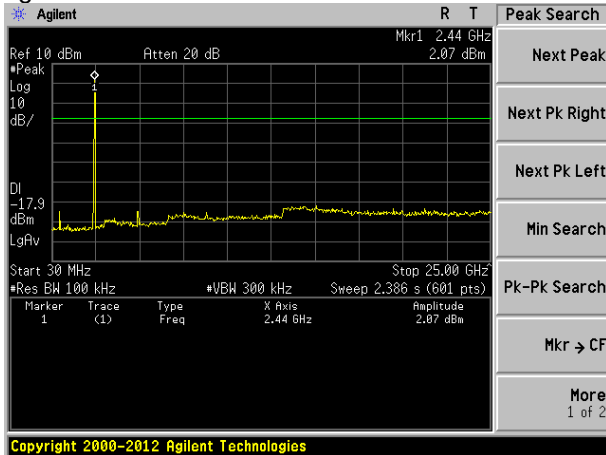
30MHz~25GHz

Middle channel



30MHz~25GHz

Highest channel

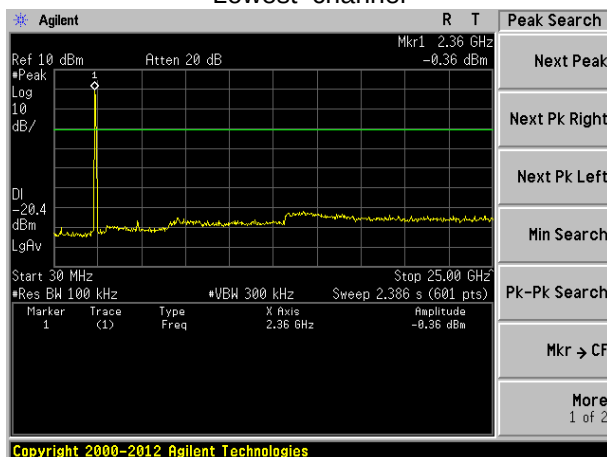


30MHz~25GHz

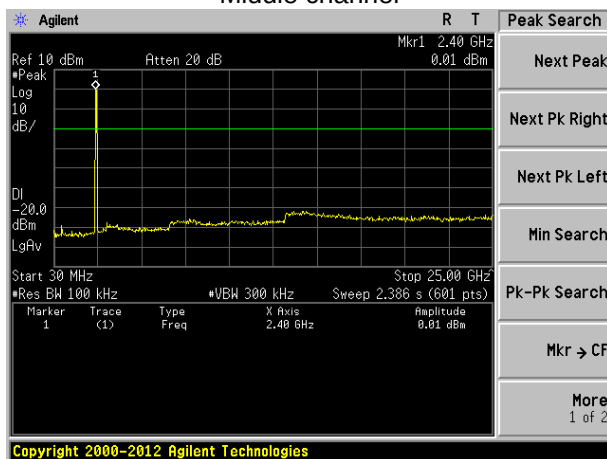
Test mode:

802.11n(HT20)

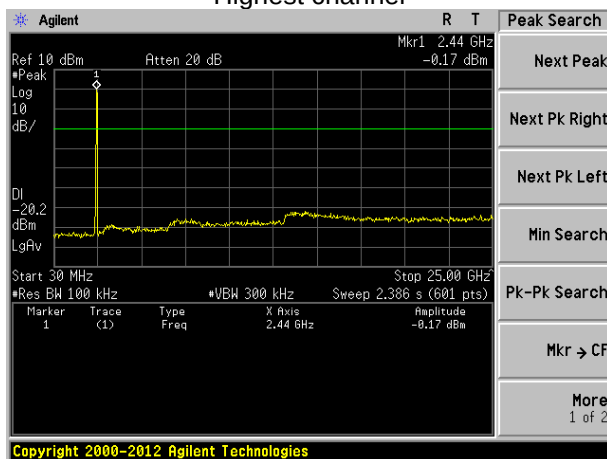
Lowest channel



30MHz~25GHz
Middle channel



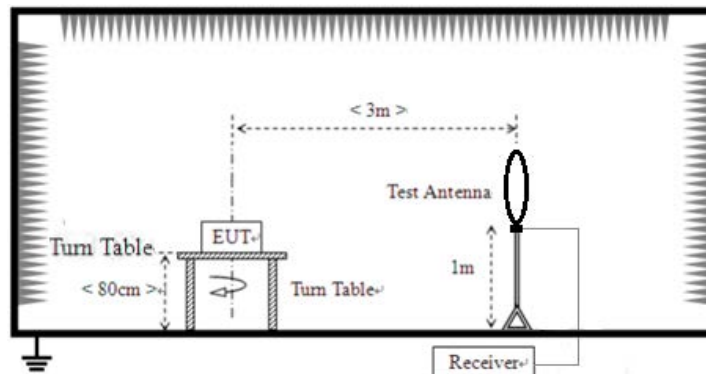
30MHz~25GHz
Highest channel



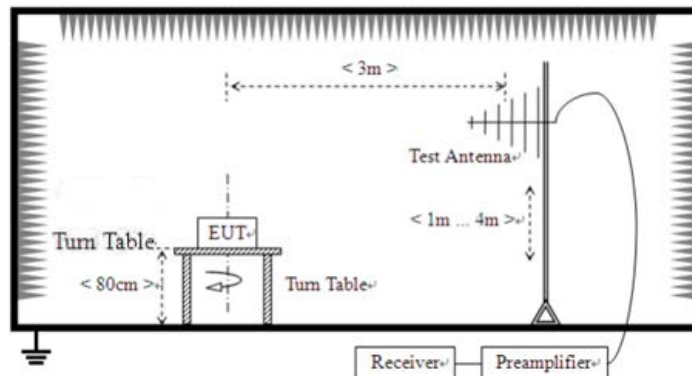
30MHz~25GHz

7.7.2 Radiated Emission Method

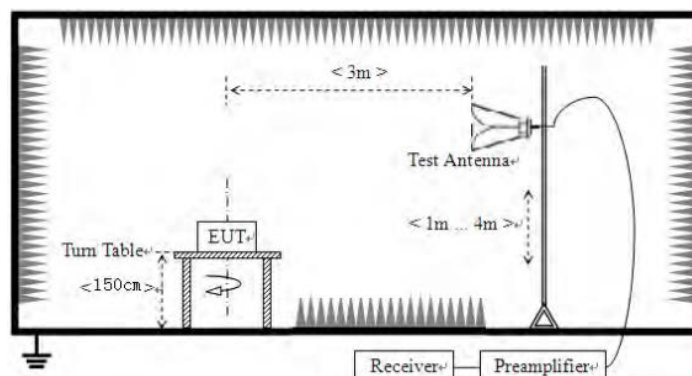
Test Requirement:	FCC Part15 C Section 15.209 RSS-247 Section 3.3 & RSS-Gen Section 8.9																												
Test Method:	ANSI C63.10: 2013 & RSS-Gen																												
Test Frequency Range:	9kHz to 25GHz																												
Test site:	Measurement Distance: 3m																												
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	120KHz	300KHz	Quasi-peak																								
	Above 1GHz	Peak	1MHz	3MHz	Peak																								
		Peak	1MHz	10Hz	Average																								
FCC Limit:	<table><tr><th>Frequency (MHz)</th><th>Field strength (microvolts/meter)</th><th>Measurement distance (meters)</th></tr><tr><td>0.009-0.490</td><td>2400/F(kHz)</td><td>300</td></tr><tr><td>0.490-1.705</td><td>24000/F(kHz)</td><td>30</td></tr><tr><td>1.705-30.0</td><td>30</td><td>30</td></tr><tr><td>30-88</td><td>100**</td><td>3</td></tr><tr><td>88-216</td><td>150**</td><td>3</td></tr><tr><td>216-960</td><td>200**</td><td>3</td></tr><tr><td>Above 960</td><td>500</td><td>3</td></tr></table> The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.					Frequency (MHz)	Field strength (microvolts/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
Frequency (MHz)	Field strength (microvolts/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																											
IC Limit:	Table 5 – General field strength limits at frequencies above 30 MHz <table><tr><th>Frequency (MHz)</th><th>Field strength (µV/m at 3 m)</th></tr><tr><td>30 – 88</td><td>100</td></tr><tr><td>88 – 216</td><td>150</td></tr><tr><td>216 – 960</td><td>200</td></tr><tr><td>Above 960</td><td>500</td></tr></table> Table 6 – General field strength limits at frequencies below 30 MHz <table><tr><th>Frequency</th><th>Magnetic field strength (H-Field) (µA/m)</th><th>Measurement distance (m)</th></tr><tr><td>9 - 490 kHz ¹</td><td>6.37/F (F in kHz)</td><td>300</td></tr><tr><td>490 - 1705 kHz</td><td>63.7/F (F in kHz)</td><td>30</td></tr><tr><td>1.705 - 30 MHz</td><td>0.08</td><td>30</td></tr></table> Note 1: The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.					Frequency (MHz)	Field strength (µV/m at 3 m)	30 – 88	100	88 – 216	150	216 – 960	200	Above 960	500	Frequency	Magnetic field strength (H-Field) (µA/m)	Measurement distance (m)	9 - 490 kHz ¹	6.37/F (F in kHz)	300	490 - 1705 kHz	63.7/F (F in kHz)	30	1.705 - 30 MHz	0.08	30		
Frequency (MHz)	Field strength (µV/m at 3 m)																												
30 – 88	100																												
88 – 216	150																												
216 – 960	200																												
Above 960	500																												
Frequency	Magnetic field strength (H-Field) (µA/m)	Measurement distance (m)																											
9 - 490 kHz ¹	6.37/F (F in kHz)	300																											
490 - 1705 kHz	63.7/F (F in kHz)	30																											
1.705 - 30 MHz	0.08	30																											
Test setup:	For radiated emissions from 9kHz to 30MHz																												



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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 voltage:	AC120V 60Hz					
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar
Test voltage:	AC 120V, 60Hz					
Test results:	Pass					

Remarks:

1. Only the worst case Main Antenna test data.
2. 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:

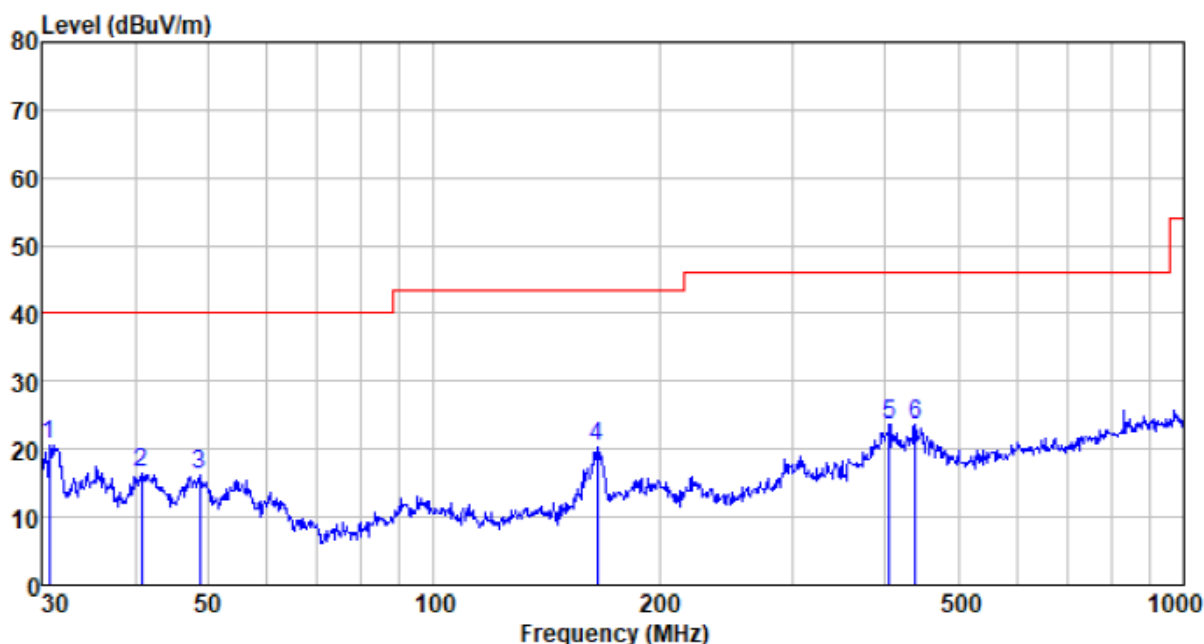
■ 9kHz~30MHz

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

■ Below 1GHz

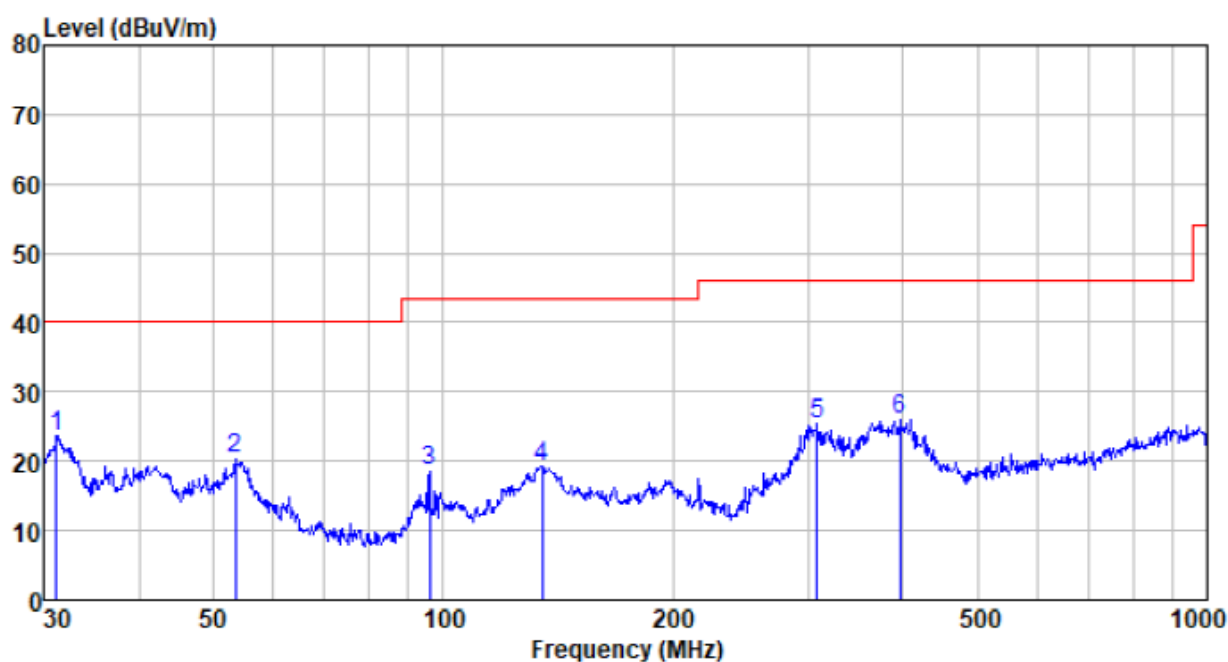
Pre-scan all test modes, found worst case at 802.11b 2462MHz, and so only show the test result of 802.11b 2462MHz

Horizontal:



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamplifier factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
30.745	43.97	11.22	0.56	35.06	20.69	40.00	-19.31	QP
40.702	39.39	12.21	0.67	35.70	16.57	40.00	-23.43	QP
48.672	39.44	12.29	0.76	36.12	16.37	40.00	-23.63	QP
164.908	47.38	8.40	1.66	37.16	20.28	43.50	-23.22	QP
404.667	42.93	15.42	2.88	37.52	23.71	46.00	-22.29	QP
438.655	41.86	16.16	3.04	37.52	23.54	46.00	-22.46	QP

Vertical:



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
31.180	46.91	11.22	0.56	35.09	23.60	40.00	-16.40	QP
53.505	43.99	11.93	0.80	36.23	20.49	40.00	-19.51	QP
96.099	42.48	11.65	1.16	36.69	18.60	43.50	-24.90	QP
134.559	46.88	7.82	1.47	36.98	19.19	43.50	-24.31	QP
308.913	46.77	13.76	2.41	37.43	25.51	46.00	-20.49	QP
396.242	45.44	15.25	2.83	37.52	26.00	46.00	-20.00	QP

■ Above 1GHz

Test mode:	802.11b	Test channel:	Lowest
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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	37.92	31.79	8.62	32.10	46.23	74.00	-27.77	Vertical
7236.00	32.72	36.19	11.68	31.97	48.62	74.00	-25.38	Vertical
9648.00	31.64	38.07	14.16	31.56	52.31	74.00	-21.69	Vertical
12060.00	*					74.00		Vertical
14472.00	*					74.00		Vertical
16884.00	*					74.00		Vertical
4824.00	36.96	31.79	8.62	32.10	45.27	74.00	-28.73	Horizontal
7236.00	32.65	36.19	11.68	31.97	48.55	74.00	-25.45	Horizontal
9648.00	31.30	38.07	14.16	31.56	51.97	74.00	-22.03	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	27.19	31.79	8.62	32.10	35.50	54.00	-18.50	Vertical
7236.00	21.64	36.19	11.68	31.97	37.54	54.00	-16.46	Vertical
9648.00	22.03	38.07	14.16	31.56	42.70	54.00	-11.30	Vertical
12060.00	*					54.00		Vertical
14472.00	*					54.00		Vertical
16884.00	*					54.00		Vertical
4824.00	26.62	31.79	8.62	32.10	34.93	54.00	-19.07	Horizontal
7236.00	21.28	36.19	11.68	31.97	37.18	54.00	-16.82	Horizontal
9648.00	21.09	38.07	14.16	31.56	41.76	54.00	-12.24	Horizontal
12060.00	*					54.00		Horizontal
14472.00	*					54.00		Horizontal
16884.00	*					54.00		Horizontal

Test mode:	802.11b	Test channel:	Middle
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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	37.39	31.85	8.66	32.12	45.78	74.00	-28.22	Vertical
7311.00	33.05	36.37	11.71	31.91	49.22	74.00	-24.78	Vertical
9748.00	32.84	38.27	14.25	31.56	53.80	74.00	-20.20	Vertical
12185.00	*					74.00		Vertical
14622.00	*					74.00		Vertical
17059.00	*					74.00		Vertical
4874.00	38.17	31.85	8.66	32.12	46.56	74.00	-27.44	Horizontal
7311.00	31.84	36.37	11.71	31.91	48.01	74.00	-25.99	Horizontal
9748.00	32.80	38.27	14.25	31.56	53.76	74.00	-20.24	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	28.39	31.85	8.66	32.12	36.78	54.00	-17.22	Vertical
7311.00	21.41	36.37	11.71	31.91	37.58	54.00	-16.42	Vertical
9748.00	22.13	38.27	14.25	31.56	43.09	54.00	-10.91	Vertical
12185.00	*					54.00		Vertical
14622.00	*					54.00		Vertical
17059.00	*					54.00		Vertical
4874.00	28.39	31.85	8.66	32.12	36.78	54.00	-17.22	Horizontal
7311.00	20.97	36.37	11.71	31.91	37.14	54.00	-16.86	Horizontal
9748.00	22.55	38.27	14.25	31.56	43.51	54.00	-10.49	Horizontal
12185.00	*					54.00		Horizontal
14622.00	*					54.00		Horizontal
17059.00	*					54.00		Horizontal

Test mode:	802.11b	Test channel:	Highest
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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	41.49	31.90	8.70	32.15	49.94	74.00	-24.06	Vertical
7386.00	32.82	36.49	11.76	31.83	49.24	74.00	-24.76	Vertical
9848.00	35.50	38.62	14.31	31.77	56.66	74.00	-17.34	Vertical
12310.00	*					74.00		Vertical
14772.00	*					74.00		Vertical
17234.00	*					74.00		Vertical
4924.00	41.33	31.90	8.70	32.15	49.78	74.00	-24.22	Horizontal
7386.00	31.99	36.49	11.76	31.83	48.41	74.00	-25.59	Horizontal
9848.00	31.79	38.62	14.31	31.77	52.95	74.00	-21.05	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	32.67	31.90	8.70	32.15	41.12	54.00	-12.88	Vertical
7386.00	22.81	36.49	11.76	31.83	39.23	54.00	-14.77	Vertical
9848.00	24.06	38.62	14.31	31.77	45.22	54.00	-8.78	Vertical
12310.00	*					54.00		Vertical
14772.00	*					54.00		Vertical
17234.00	*					54.00		Vertical
4924.00	31.87	31.90	8.70	32.15	40.32	54.00	-13.68	Horizontal
7386.00	21.44	36.49	11.76	31.83	37.86	54.00	-16.14	Horizontal
9848.00	21.10	38.62	14.31	31.77	42.26	54.00	-11.74	Horizontal
12310.00	*					54.00		Horizontal
14772.00	*					54.00		Horizontal
17234.00	*					54.00		Horizontal

Test mode:	802.11g	Test channel:	lowest
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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	37.74	31.79	8.62	32.10	46.05	74.00	-27.95	Vertical
7236.00	32.60	36.19	11.68	31.97	48.50	74.00	-25.50	Vertical
9648.00	31.56	38.07	14.16	31.56	52.23	74.00	-21.77	Vertical
12060.00	*					74.00		Vertical
14472.00	*					74.00		Vertical
16884.00	*					74.00		Vertical
4824.00	36.81	31.79	8.62	32.10	45.12	74.00	-28.88	Horizontal
7236.00	32.56	36.19	11.68	31.97	48.46	74.00	-25.54	Horizontal
9648.00	31.23	38.07	14.16	31.56	51.90	74.00	-22.10	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	27.03	31.79	8.62	32.10	35.34	54.00	-18.66	Vertical
7236.00	21.53	36.19	11.68	31.97	37.43	54.00	-16.57	Vertical
9648.00	21.95	38.07	14.16	31.56	42.62	54.00	-11.38	Vertical
12060.00	*					54.00		Vertical
14472.00	*					54.00		Vertical
16884.00	*					54.00		Vertical
4824.00	26.48	31.79	8.62	32.10	34.79	54.00	-19.21	Horizontal
7236.00	21.18	36.19	11.68	31.97	37.08	54.00	-16.92	Horizontal
9648.00	21.01	38.07	14.16	31.56	41.68	54.00	-12.32	Horizontal
12060.00	*					54.00		Horizontal
14472.00	*					54.00		Horizontal
16884.00	*					54.00		Horizontal

Test mode:	802.11g	Test channel:	Middle
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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	37.24	31.85	8.66	32.12	45.63	74.00	-28.37	Vertical
7311.00	32.95	36.37	11.71	31.91	49.12	74.00	-24.88	Vertical
9748.00	32.78	38.27	14.25	31.56	53.74	74.00	-20.26	Vertical
12185.00	*					74.00		Vertical
14622.00	*					74.00		Vertical
17059.00	*					74.00		Vertical
4874.00	38.05	31.85	8.66	32.12	46.44	74.00	-27.56	Horizontal
7311.00	31.76	36.37	11.71	31.91	47.93	74.00	-26.07	Horizontal
9748.00	32.74	38.27	14.25	31.56	53.70	74.00	-20.30	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	28.26	31.85	8.66	32.12	36.65	54.00	-17.35	Vertical
7311.00	21.32	36.37	11.71	31.91	37.49	54.00	-16.51	Vertical
9748.00	22.07	38.27	14.25	31.56	43.03	54.00	-10.97	Vertical
12185.00	*					54.00		Vertical
14622.00	*					54.00		Vertical
17059.00	*					54.00		Vertical
4874.00	28.27	31.85	8.66	32.12	36.66	54.00	-17.34	Horizontal
7311.00	20.89	36.37	11.71	31.91	37.06	54.00	-16.94	Horizontal
9748.00	22.49	38.27	14.25	31.56	43.45	54.00	-10.55	Horizontal
12185.00	*					54.00		Horizontal
14622.00	*					54.00		Horizontal
17059.00	*					54.00		Horizontal

Test mode:	802.11g	Test channel:	Highest
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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	41.24	31.90	8.70	32.15	49.69	74.00	-24.31	Vertical
7386.00	32.66	36.49	11.76	31.83	49.08	74.00	-24.92	Vertical
9848.00	35.38	38.62	14.31	31.77	56.54	74.00	-17.46	Vertical
12310.00	*					74.00		Vertical
14772.00	*					74.00		Vertical
17234.00	*					74.00		Vertical
4924.00	41.11	31.90	8.70	32.15	49.56	74.00	-24.44	Horizontal
7386.00	31.85	36.49	11.76	31.83	48.27	74.00	-25.73	Horizontal
9848.00	31.68	38.62	14.31	31.77	52.84	74.00	-21.16	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	32.44	31.90	8.70	32.15	40.89	54.00	-13.11	Vertical
7386.00	22.66	36.49	11.76	31.83	39.08	54.00	-14.92	Vertical
9848.00	23.95	38.62	14.31	31.77	45.11	54.00	-8.89	Vertical
12310.00	*					54.00		Vertical
14772.00	*					54.00		Vertical
17234.00	*					54.00		Vertical
4924.00	31.67	31.90	8.70	32.15	40.12	54.00	-13.88	Horizontal
7386.00	21.30	36.49	11.76	31.83	37.72	54.00	-16.28	Horizontal
9848.00	21.00	38.62	14.31	31.77	42.16	54.00	-11.84	Horizontal
12310.00	*					54.00		Horizontal
14772.00	*					54.00		Horizontal
17234.00	*					54.00		Horizontal

Test mode:	802.11n(HT20)	Test channel:	Lowest
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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	37.94	31.79	8.62	32.10	46.25	74.00	-27.75	Vertical
7236.00	32.73	36.19	11.68	31.97	48.63	74.00	-25.37	Vertical
9648.00	31.65	38.07	14.16	31.56	52.32	74.00	-21.68	Vertical
12060.00	*					74.00		Vertical
14472.00	*					74.00		Vertical
16884.00	*					74.00		Vertical
4824.00	36.98	31.79	8.62	32.10	45.29	74.00	-28.71	Horizontal
7236.00	32.67	36.19	11.68	31.97	48.57	74.00	-25.43	Horizontal
9648.00	31.31	38.07	14.16	31.56	51.98	74.00	-22.02	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	27.21	31.79	8.62	32.10	35.52	54.00	-18.48	Vertical
7236.00	21.65	36.19	11.68	31.97	37.55	54.00	-16.45	Vertical
9648.00	22.04	38.07	14.16	31.56	42.71	54.00	-11.29	Vertical
12060.00	*					54.00		Vertical
14472.00	*					54.00		Vertical
16884.00	*					54.00		Vertical
4824.00	26.64	31.79	8.62	32.10	34.95	54.00	-19.05	Horizontal
7236.00	21.29	36.19	11.68	31.97	37.19	54.00	-16.81	Horizontal
9648.00	21.09	38.07	14.16	31.56	41.76	54.00	-12.24	Horizontal
12060.00	*					54.00		Horizontal
14472.00	*					54.00		Horizontal
16884.00	*					54.00		Horizontal

Test mode:	802.11n(HT20)	Test channel:	Middle
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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	37.40	31.85	8.66	32.12	45.79	74.00	-28.21	Vertical
7311.00	33.06	36.37	11.71	31.91	49.23	74.00	-24.77	Vertical
9748.00	32.85	38.27	14.25	31.56	53.81	74.00	-20.19	Vertical
12185.00	*					74.00		Vertical
14622.00	*					74.00		Vertical
17059.00	*					74.00		Vertical
4874.00	38.19	31.85	8.66	32.12	46.58	74.00	-27.42	Horizontal
7311.00	31.85	36.37	11.71	31.91	48.02	74.00	-25.98	Horizontal
9748.00	32.81	38.27	14.25	31.56	53.77	74.00	-20.23	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	28.41	31.85	8.66	32.12	36.80	54.00	-17.20	Vertical
7311.00	21.42	36.37	11.71	31.91	37.59	54.00	-16.41	Vertical
9748.00	22.14	38.27	14.25	31.56	43.10	54.00	-10.90	Vertical
12185.00	*					54.00		Vertical
14622.00	*					54.00		Vertical
17059.00	*					54.00		Vertical
4874.00	28.40	31.85	8.66	32.12	36.79	54.00	-17.21	Horizontal
7311.00	20.97	36.37	11.71	31.91	37.14	54.00	-16.86	Horizontal
9748.00	22.55	38.27	14.25	31.56	43.51	54.00	-10.49	Horizontal
12185.00	*					54.00		Horizontal
14622.00	*					54.00		Horizontal
17059.00	*					54.00		Horizontal

Test mode:	802.11n(HT20)	Test channel:	Highest
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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	41.52	31.90	8.70	32.15	49.97	74.00	-24.03	4924.00
7386.00	32.84	36.49	11.76	31.83	49.26	74.00	-24.74	7386.00
9848.00	35.51	38.62	14.31	31.77	56.67	74.00	-17.33	9848.00
12310.00	*					74.00		Vertical
14772.00	*					74.00		Vertical
17234.00	*					74.00		Vertical
4924.00	41.35	31.90	8.70	32.15	49.80	74.00	-24.20	Horizontal
7386.00	32.01	36.49	11.76	31.83	48.43	74.00	-25.57	Horizontal
9848.00	31.80	38.62	14.31	31.77	52.96	74.00	-21.04	Horizontal
12310.00	*					74.00		Horizontal
14772.00	*					74.00		Horizontal
17234.00	*					74.00		Horizontal

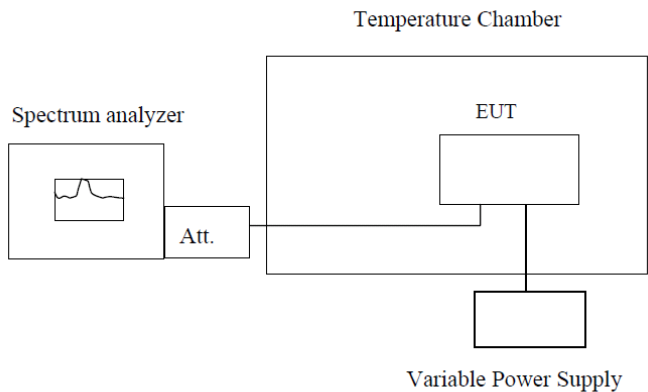
Average value:

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	32.70	31.90	8.70	32.15	41.15	54.00	-12.85	Vertical
7386.00	22.83	36.49	11.76	31.83	39.25	54.00	-14.75	Vertical
9848.00	24.08	38.62	14.31	31.77	45.24	54.00	-8.76	Vertical
12310.00	*					54.00		Vertical
14772.00	*					54.00		Vertical
17234.00	*					54.00		Vertical
4924.00	31.89	31.90	8.70	32.15	40.34	54.00	-13.66	Horizontal
7386.00	21.46	36.49	11.76	31.83	37.88	54.00	-16.12	Horizontal
9848.00	21.11	38.62	14.31	31.77	42.27	54.00	-11.73	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 emission levels of other frequencies are very lower than the limit and not show in test report.

7.8 Frequency stability

Test Requirement:	RSS-Gen Section 6.11& Section 8.11
Test Method:	ANSI C63.10: 2013 & RSS-Gen
Limit:	Manufactures of devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified
Test Procedure:	The EUT was setup to ANSI C63.10, 2013; tested to 2.1055 for compliance to RSS-Gen requirements.
Test setup:	 Note : Measurement setup for testing on Antenna connector
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Remark: Set the EUT transmits at un-modulation mode to test frequency stability.

Measurement data:

Frequency stability versus Temp.						
Power Supply: DC 7.4V						
Temp. (°C)	Operating Frequency (MHz)	0 minute Measured Frequency (MHz)	2 minute Measured Frequency (MHz)	5 minute Measured Frequency (MHz)	10 minute Measured Frequency (MHz)	Pass /Fail
-30	2412	2412.307	2412.712	2412.866	2412.028	Pass
	2437	2437.678	2437.099	2437.220	2437.153	Pass
	2462	2462.705	2462.829	2462.081	2462.619	Pass
-20	2412	2412.183	2412.306	2412.471	2412.655	Pass
	2437	2437.805	2437.601	2437.238	2437.778	Pass
	2462	2462.934	2462.152	2462.841	2462.066	Pass
-10	2412	2412.280	2412.026	2412.128	2412.023	Pass
	2437	2437.158	2437.973	2437.570	2437.160	Pass
	2462	2462.467	2462.384	2462.938	2462.543	Pass
0	2412	2412.993	2412.728	2412.679	2412.808	Pass
	2437	2437.859	2437.715	2437.840	2437.788	Pass
	2462	2462.419	2462.548	2462.971	2462.907	Pass
10	2412	2412.349	2412.743	2412.950	2412.336	Pass
	2437	2437.517	2437.788	2437.608	2437.966	Pass
	2462	2462.393	2462.585	2462.144	2462.995	Pass
20	2412	2412.516	2412.215	2412.224	2412.754	Pass
	2437	2437.151	2437.011	2437.784	2437.543	Pass
	2462	2462.520	2462.137	2462.838	2462.763	Pass
30	2412	2412.442	2412.633	2412.005	2412.801	Pass
	2437	2437.082	2437.747	2437.634	2437.192	Pass
	2462	2462.116	2462.315	2462.978	2462.689	Pass
40	2412	2412.668	2412.746	2412.684	2412.273	Pass
	2437	2437.284	2437.398	2437.378	2437.083	Pass
	2462	2462.816	2462.058	2462.701	2462.058	Pass
50	2412	2412.835	2412.601	2412.248	2412.386	Pass
	2437	2437.479	2437.751	2437.029	2437.988	Pass
	2462	2462.770	2462.420	2462.632	2462.897	Pass

Frequency stability versus Voltage						
Temperature: 25°C						
Power Supply (VDC)	Operating Frequency (MHz)	0 minute Measured Frequency (MHz)	2 minute Measured Frequency (MHz)	5 minute Measured Frequency (MHz)	10 minute Measured Frequency (MHz)	Pass /Fail
7.8	2412	2412.394	2412.103	2412.579	2412.588	Pass
	2437	2437.461	2437.240	2437.126	2437.724	Pass
	2462	2462.549	2462.674	2462.024	2462.561	Pass
6.6	2412	2412.939	2412.518	2412.480	2412.056	Pass
	2437	2437.464	2437.225	2437.005	2437.593	Pass
	2462	2462.780	2462.396	2462.397	2462.410	Pass

8 Test Setup Photo

Reference to the **appendix I** for details.

9 EUT Constructional Details

Reference to the **appendix II** for details.

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