

# TEST REPORT

**Applicant:** Shenzhen HAWK-EYE Aerial Photography Tech Company Limited

**Address of Applicant:** 202 Zhongzheng Fortune Building Baoan Avenue Nr. 6093 Fuyong Baoan, Shenzhen, China

**Manufacturer:** Shenzhen HAWK-EYE Aerial Photography Tech Company Limited

**Address of Manufacturer:** 202 Zhongzheng Fortune Building Baoan Avenue Nr. 6093 Fuyong Baoan, Shenzhen, China

**Factory:** Shenzhen Xinsifang Electronic Company limited.

**Address of Factory:** 6 Floor, B Building, Songyuan Chuangxin keji Town, Zhangge community, Guannan Street, Baoan district, Shenzhen, China.

## Equipment Under Test (EUT)

**Product Name:** Atction Camera 4K/60Fps

**Model No.:** FIREFLY X, FIREFLY XS, FIREFLY X PLUS, FIREFLY X Pro, FIREFLY 9, FIREFLY 9S, FIREFLY 11, FIREFLY11S, FIREFLY11 PLUS, FIREFLY11 Fro

**FCC ID:** 2AGM3-FIREFLYX

**Applicable standards:** FCC CFR Title 47 Part 15 Subpart C Section 15.247

**Date of sample receipt:** November 18, 2019

**Date of Test:** November 18-20, 2019

**Date of report issued:** November 21, 2019

**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	November 21, 2019	Original

Prepared By:



Date:

November 21, 2019

Project Engineer

Check By:



Date:

November 21, 2019

Reviewer

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## 4 Test Summary

Test Item	Section	Result
Antenna requirement	FCC part 15.203/15.247 (c)	Pass
AC Power Line Conducted Emission	FCC part 15.207	N/A
Conducted Peak Output Power	FCC part 15.247 (b)(3)	Pass
Channel Bandwidth & 99% OCB	FCC part 15.247 (a)(2)	Pass
Power Spectral Density	FCC part 15.247 (e)	Pass
Band Edge	FCC part 15.247(d)	Pass
Spurious Emission	FCC part 15.205/15.209	Pass

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

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

### 4.1 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:	Atction Camera 4K/60Fps
Model No.:	FIREFLY X, FIREFLY XS, FIREFLY X PLUS, FIREFLY X Pro, FIREFLY 9, FIREFLY 9S, FIREFLY 11, FIREFLY11S, FIREFLY11 PLUS, FIREFLY11 Fro
Test Model No:	FIREFLY X
Remark: All above models are identical in the same PCB layout, interior structure and electrical circuits. The differences are color and model name for commercial purpose.	
Serial No.:	HE191100000F
Test sample(s) ID:	GTS201911000103-1
Sample(s) Status:	Engineer sample
Operation Frequency:	2412MHz~2462MHz(802.11b/g/n(HT20)) 2422MHz~2452MHz(802.11n(HT40))
Channel Numbers:	802.11b/802.11g /802.11n(HT20): 11 802.11n(HT40):7
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:	2dBi(declare by applicant)
Power Supply:	Rechargeable Li-ion Battery: DC3.85V 1200mAh 4.62Wh
Test Voltage:	DC3.85V

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)	802.11n(HT40)
Lowest channel	2412MHz	2422MHz
Middle channel	2437MHz	2437MHz
Highest channel	2462MHz	2452MHz

## 5.2 Test mode

Transmitting mode	Keep the EUT in continuously transmitting mode
<i>Remark: During the test, the dutycycle &gt;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.</i>	

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)	802.11n(HT40)
Data rate	1Mbps	6Mbps	6.5Mbps	13Mbps

## 5.3 Description of Support Units

None.

## 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

## 5.8 Additional instructions

Test Software	Special test command provided by manufacturer
Power level setup	Default

## 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



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	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 26 2019	June. 25 2020
9	Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	GTS572	June. 26 2019	June. 25 2020

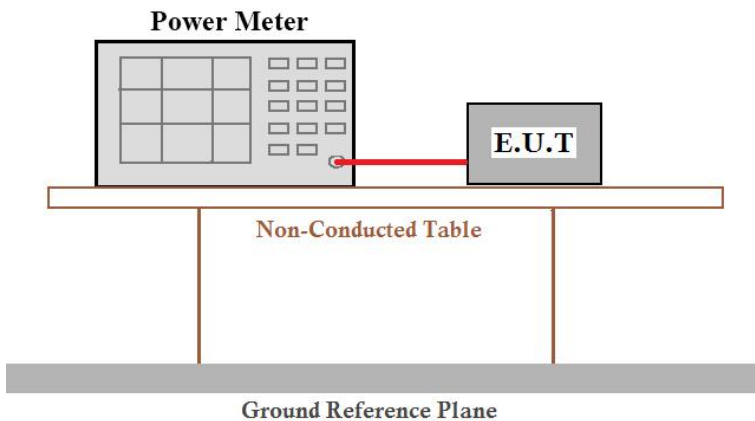
General used equipment:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Humidity/ Temperature Indicator	KTJ	TA328	GTS243	June. 26 2019	June. 25 2020
2	Barometer	ChangChun	DYM3	GTS255	June. 26 2019	June. 25 2020

## 7 Test results and Measurement Data

### 7.1 Antenna requirement

Standard requirement:	FCC Part15 C Section 15.203 /247(c)
<b>15.203 requirement:</b> 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.	
<b>15.247(c) (1)(i) requirement:</b> (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:	
<i>The antenna is integral antenna, the best case gain of the antenna is 2dBi, reference to the appendix II for details</i>	

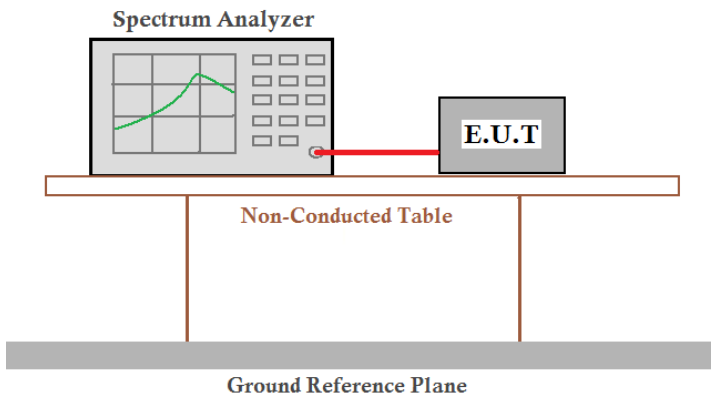
## 7.2 Conducted Peak Output Power

Test Requirement:	FCC Part15 C Section 15.247 (b)(3)
Test Method:	KDB558074 D01 DTS Meas Guidance V05r02
Limit:	30dBm
Test setup:	 <p>The diagram illustrates the test setup. A Power Meter is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Power Meter and the E.U.T. are placed on a Non-Conducted Table. Below the table is a Ground Reference Plane.</p>
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)	802.11n(HT40)		
Lowest	7.56	7.43	6.57	6.16	30.00	Pass
Middle	7.57	7.22	6.63	6.19		
Highest	7.59	7.32	6.64	6.63		

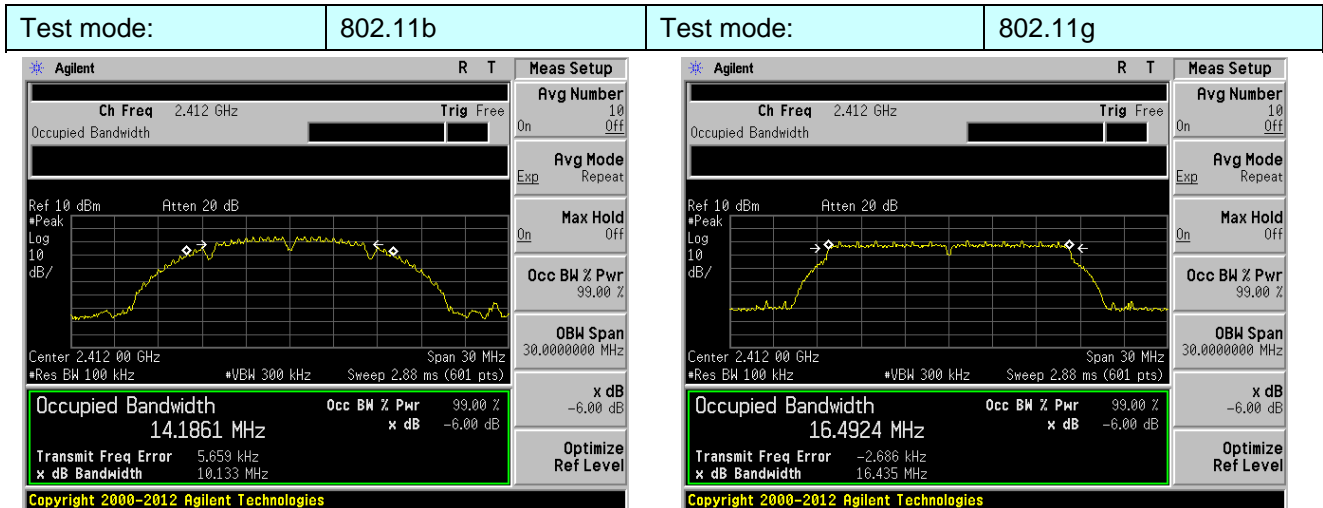
## 7.3 Channel Bandwidth

Test Requirement:	FCC Part15 C Section 15.247 (a)(2)
Test Method:	KDB558074 D01 DTS Meas Guidance V05r02
Limit:	>500KHz
Test setup:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer 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.</p>
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

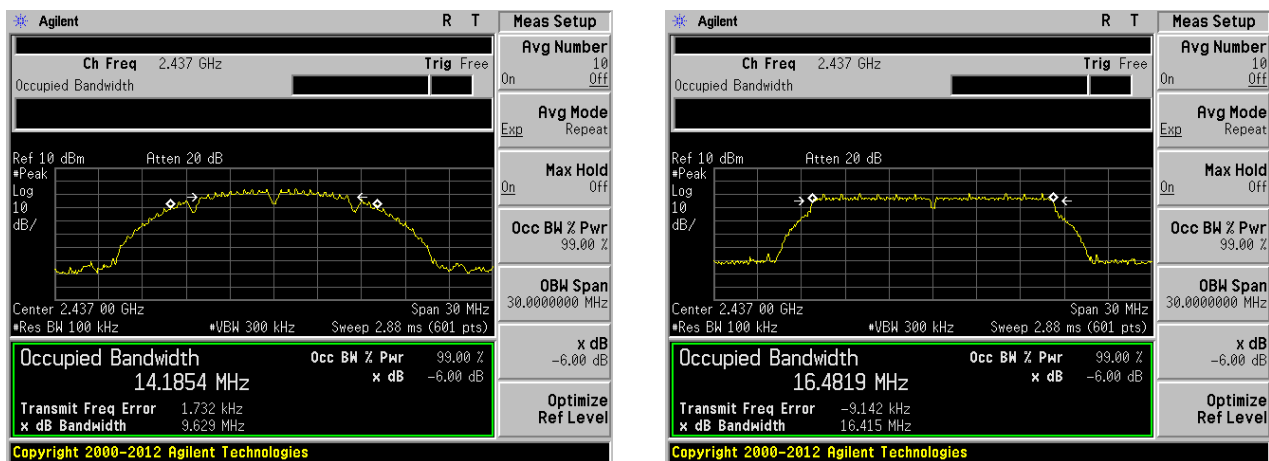
## Measurement Data

Test CH	Channel Bandwidth (MHz)				Limit(KHz)	Result
	802.11b	802.11g	802.11n(HT20)	802.11n(HT40)		
Lowest	10.133	16.435	17.630	36.069	>500	Pass
Middle	9.629	16.415	17.633	36.183		
Highest	9.635	16.415	17.622	36.200		

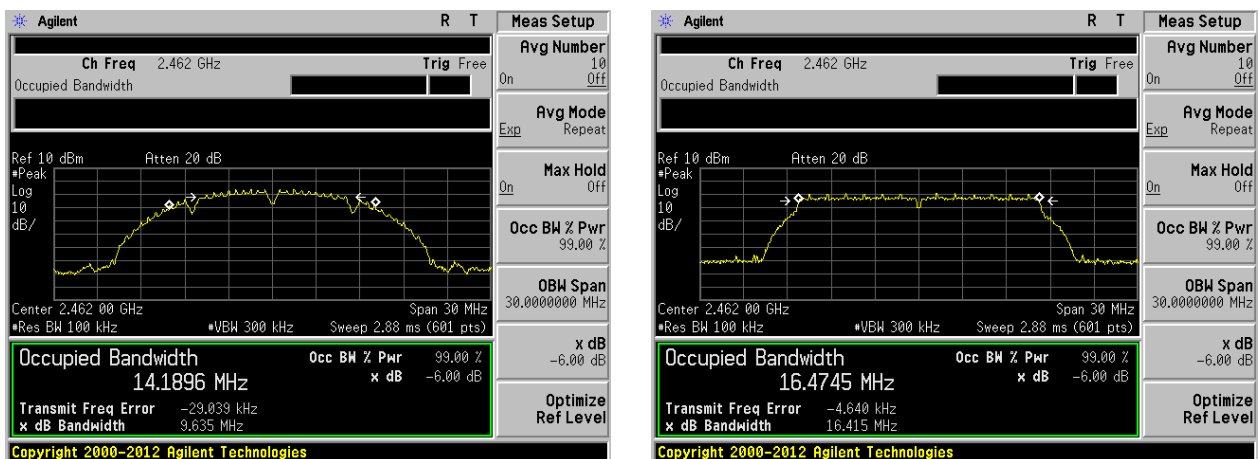
Test plot as follows:



Lowest channel

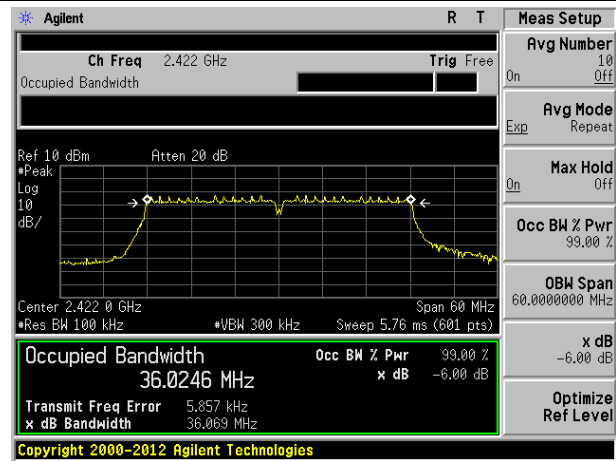
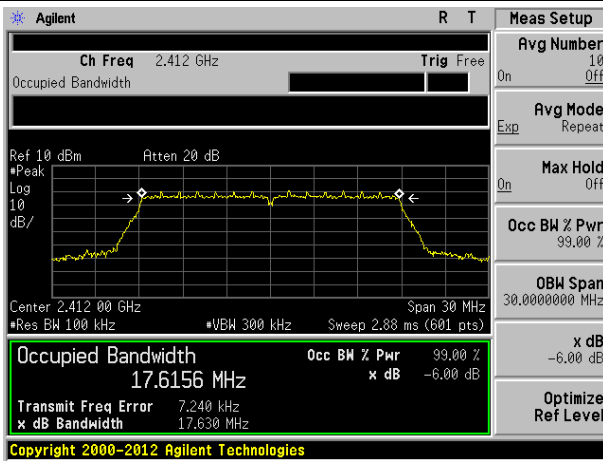


Middle channel

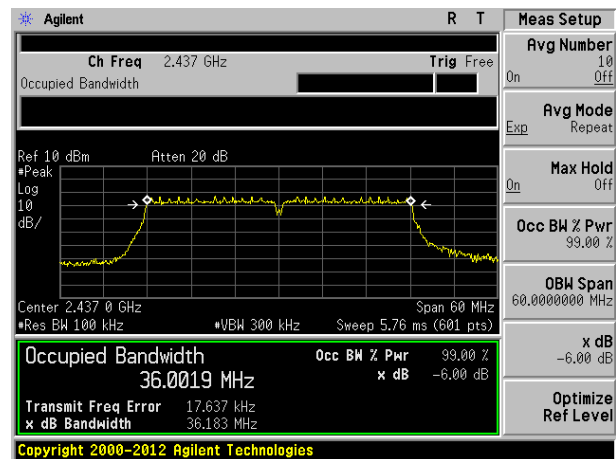
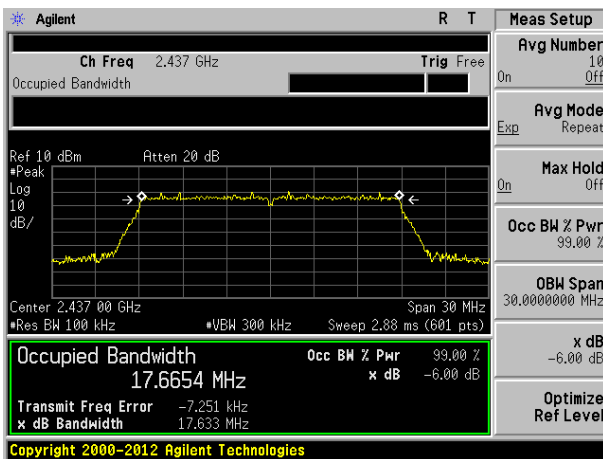


Highest channel

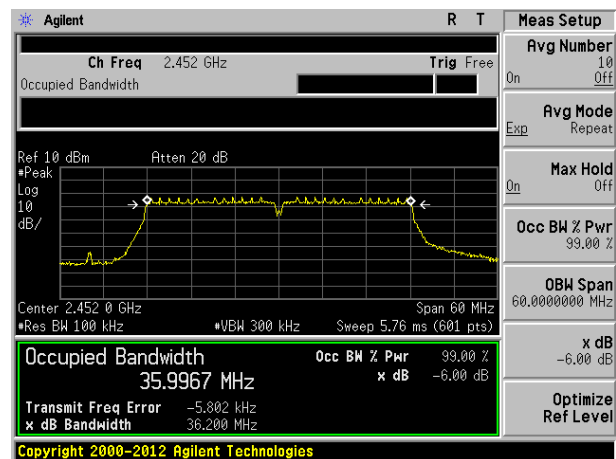
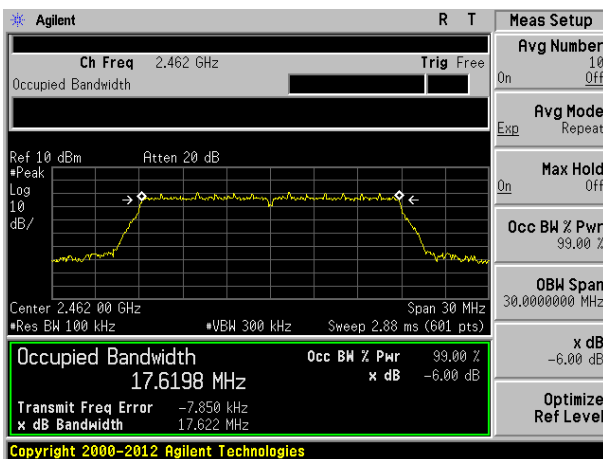
Test mode:	802.11n(HT20)	Test mode:	802.11n(HT40)
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Lowest channel

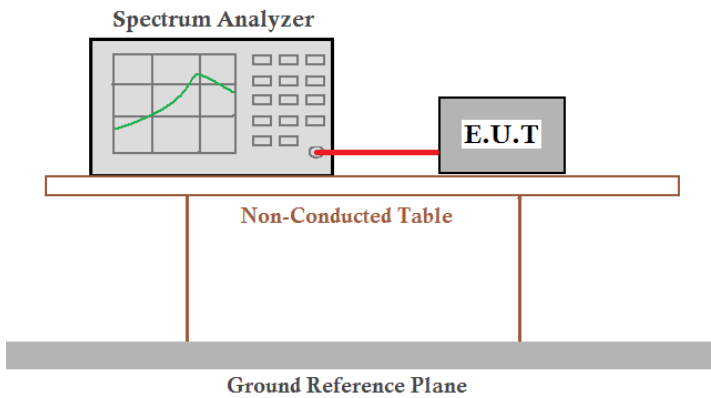


Middle channel



Highest channel

## 7.4 Power Spectral Density

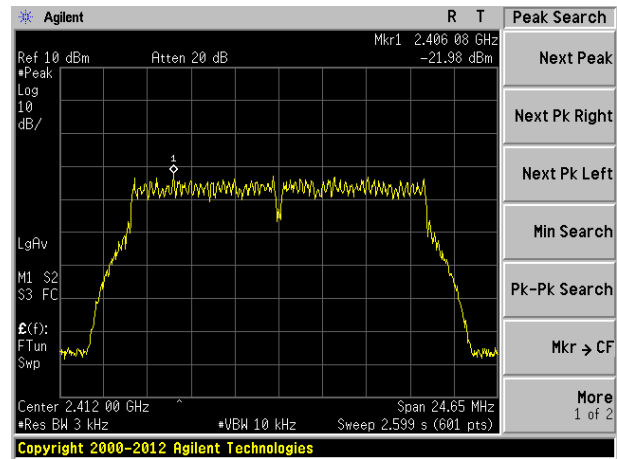
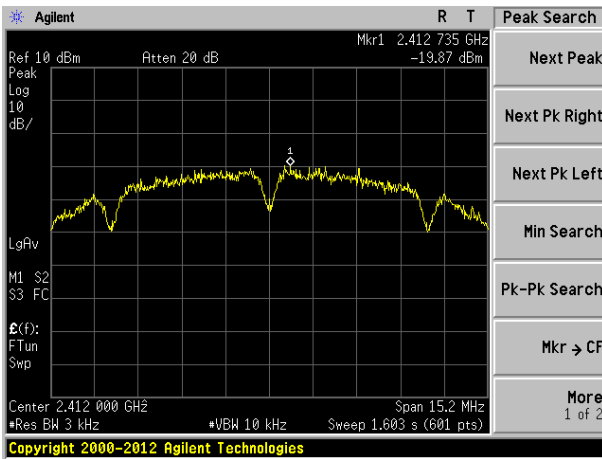
Test Requirement:	FCC Part15 C Section 15.247 (e)
Test Method:	KDB558074 D01 DTS Meas Guidance V05r02
Limit:	8dBm/3kHz
Test setup:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. The table is supported by a Ground Reference Plane.</p>
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

### Measurement Data

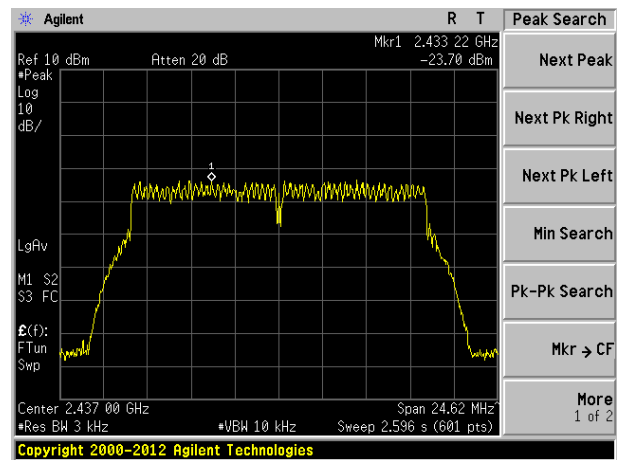
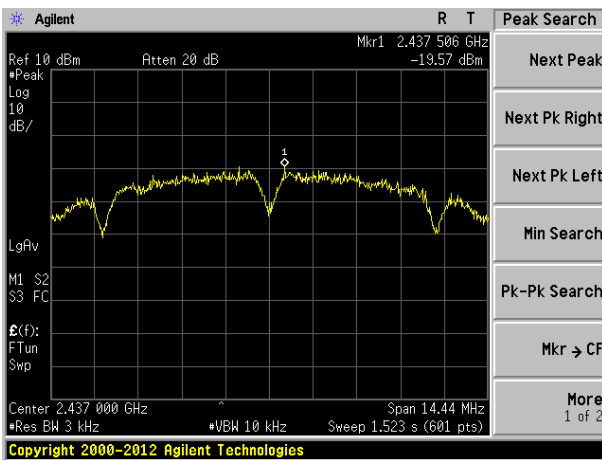
Test CH	Power Spectral Density (dBm/3kHz)				Limit (dBm/3kHz)	Result
	802.11b	802.11g	802.11n(HT20)	802.11n(HT40)		
Lowest	-19.87	-21.98	-24.36	-26.82	8.00	Pass
Middle	-19.57	-23.70	-22.65	-27.89		
Highest	-18.75	-23.17	-24.14	-27.16		

Test plot as follows:

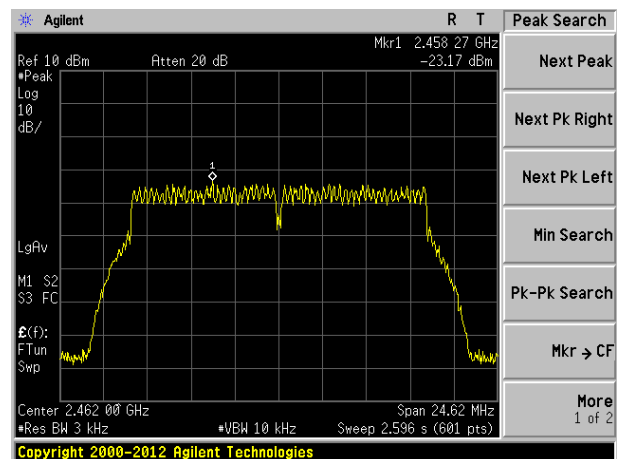
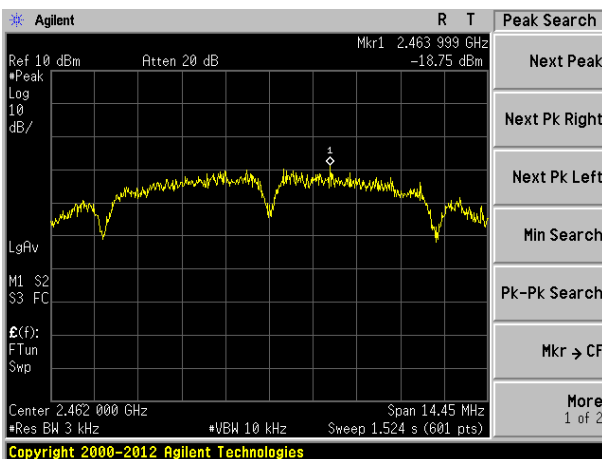
Test mode:	802.11b	Test mode:	802.11g
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Lowest channel



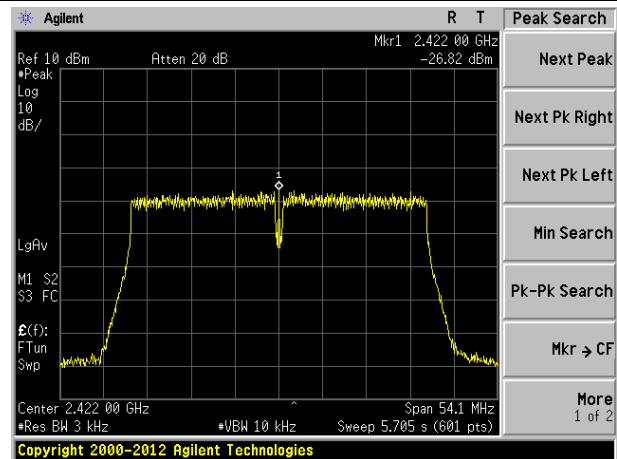
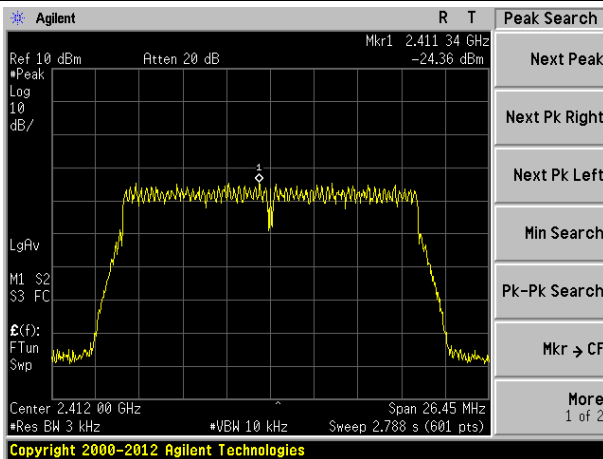
Middle channel



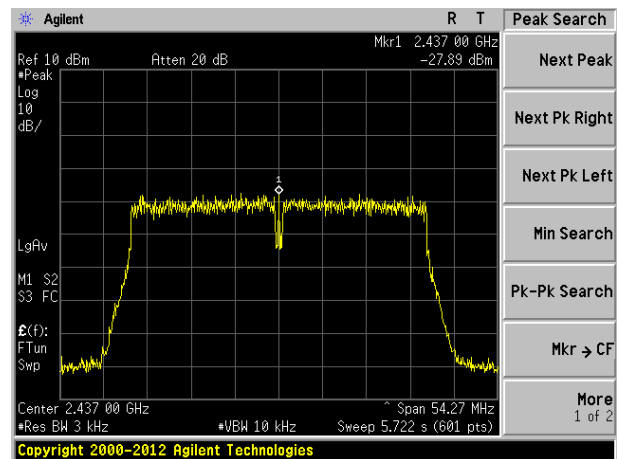
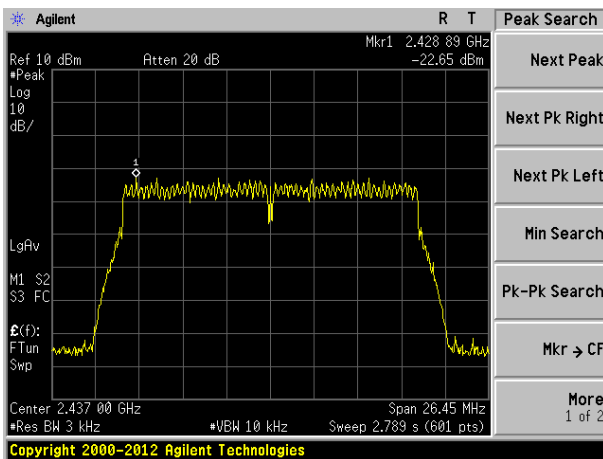
Highest channel



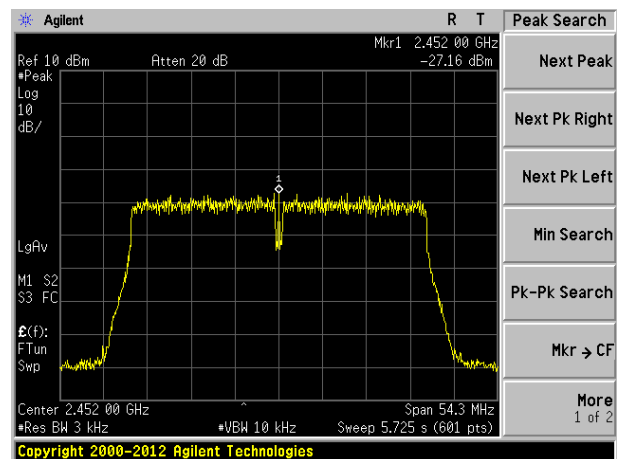
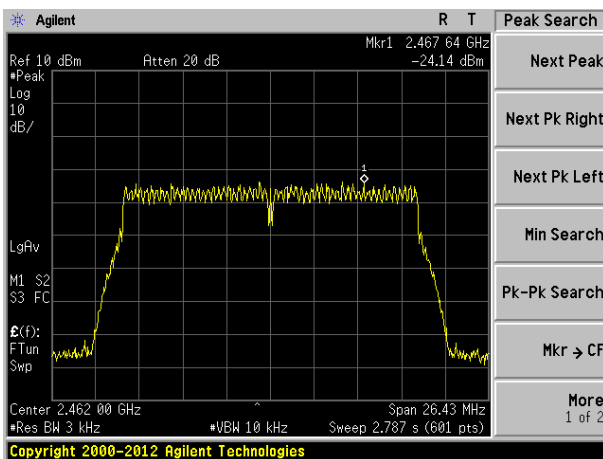
Test mode:	802.11n(HT20)	Test mode:	802.11n(HT40)
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Lowest channel



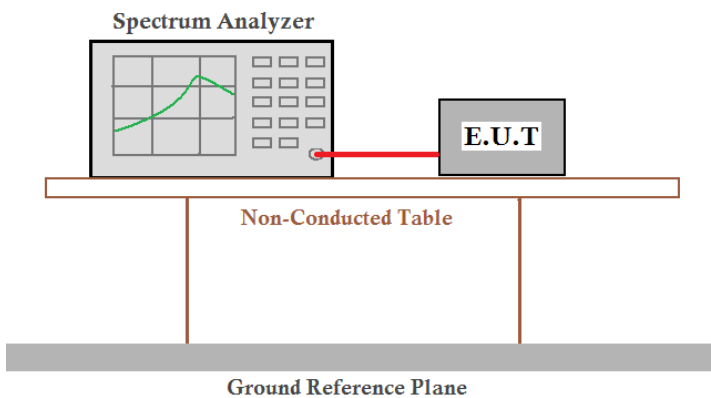
Middle channel



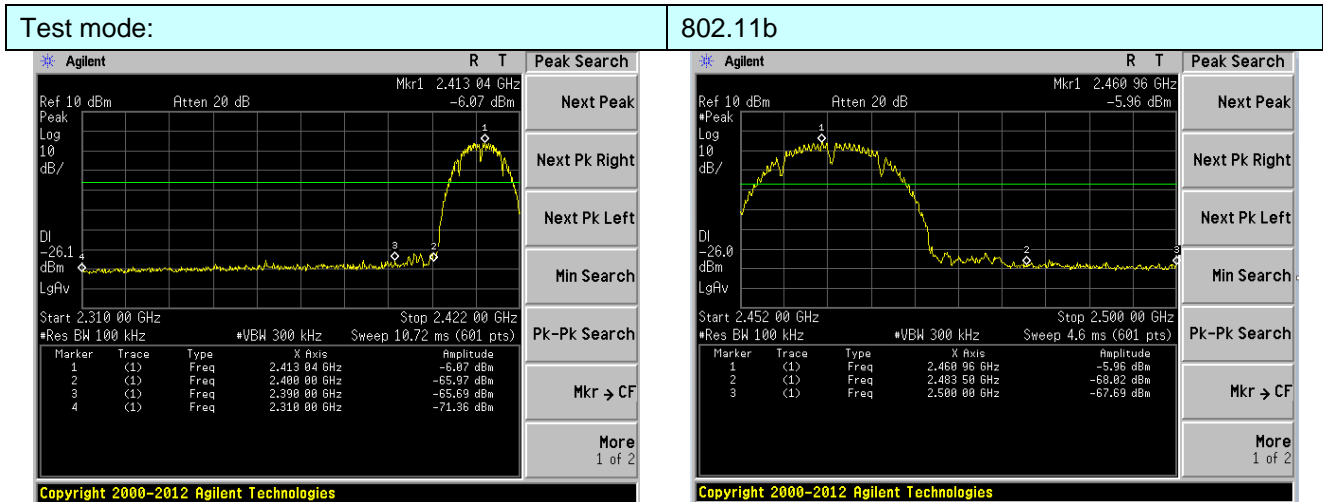
Highest channel

## 7.5 Band edges

### 7.5.1 Conducted Emission Method

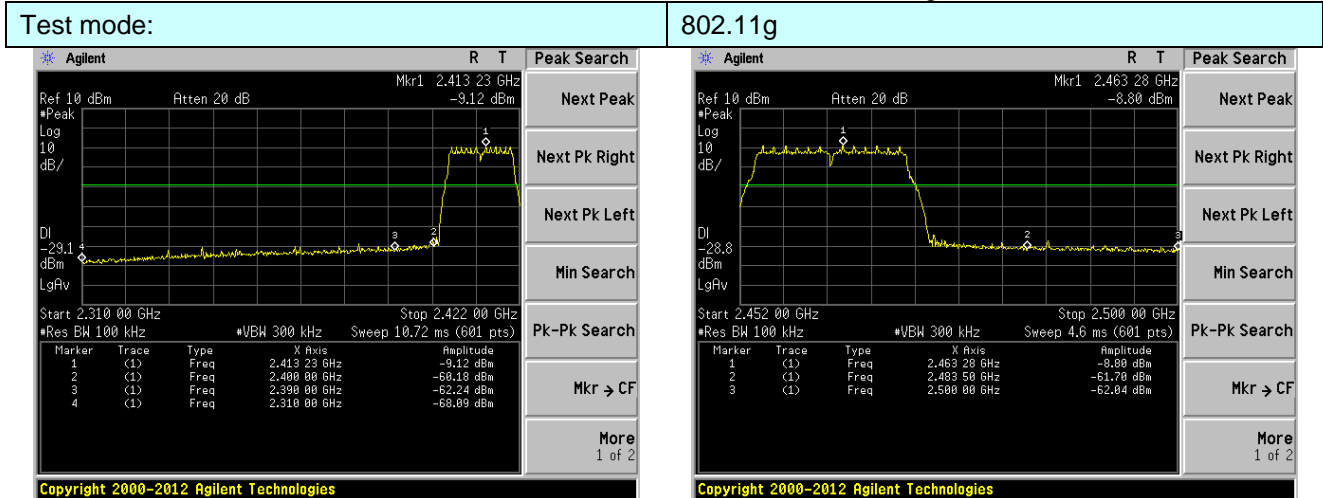
Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	KDB558074 D01 DTS Meas Guidance V05r02
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall 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:	 <p>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. Below the table is a Ground Reference Plane.</p>
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:



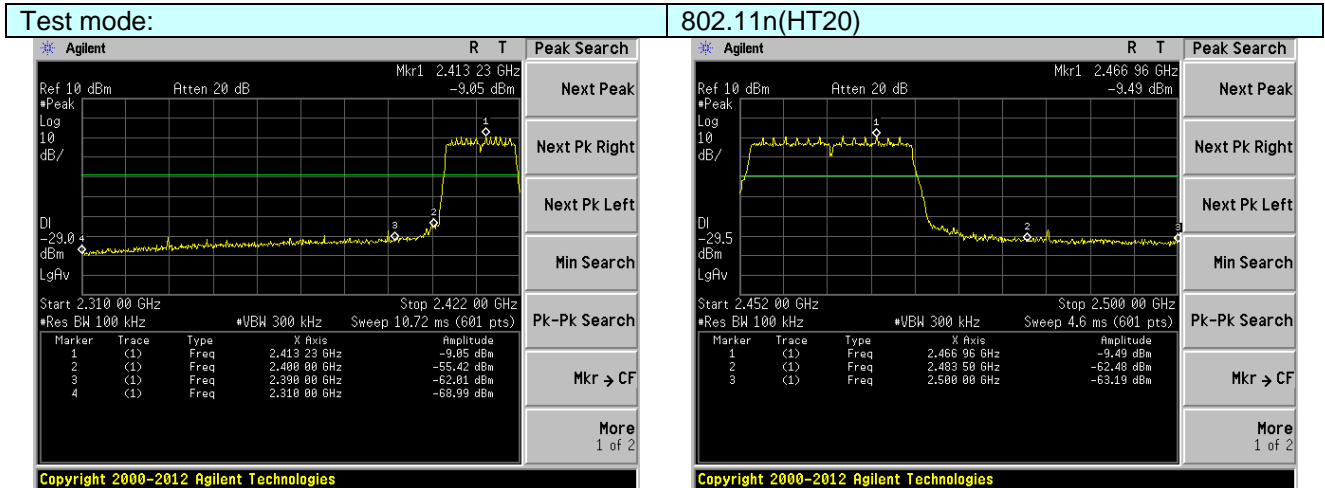
Lowest channel

Highest channel



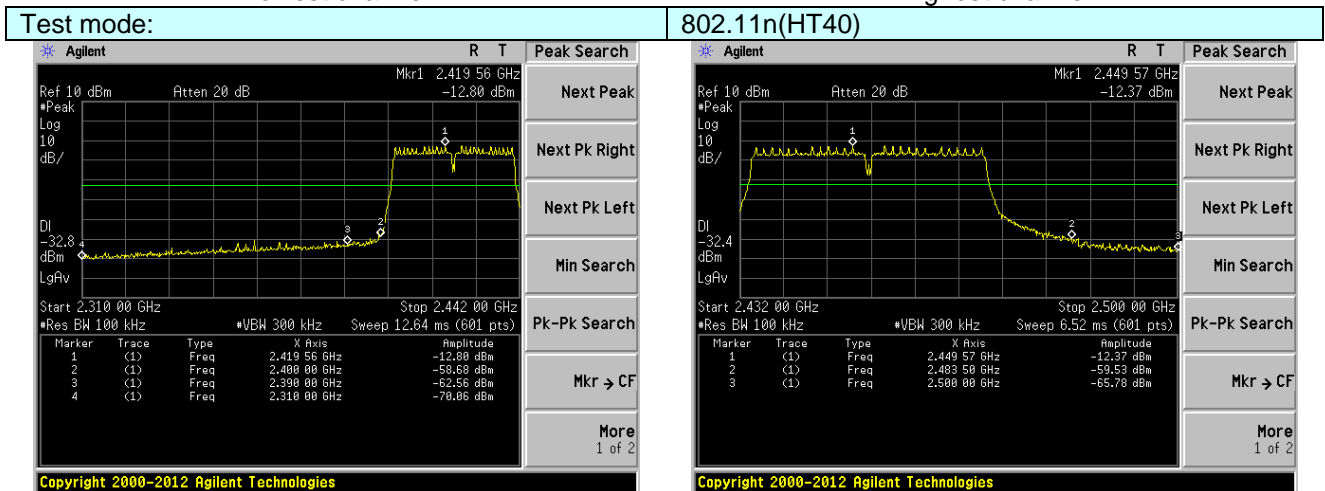
Lowest channel

Highest channel



Lowest channel

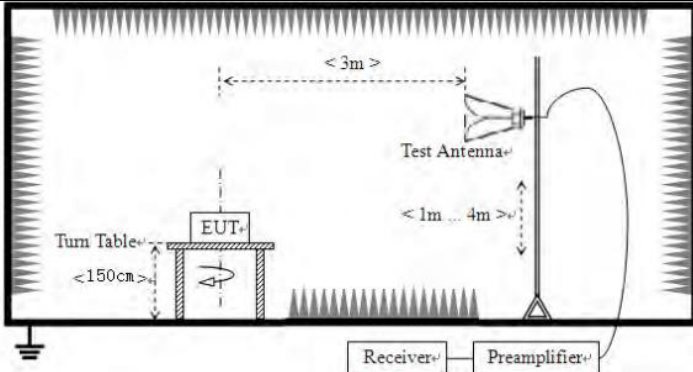
Highest channel



Lowest channel

Highest channel

## 7.5.2 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209 and 15.205				
Test Method:	ANSI C63.10:2013				
Test Frequency Range:	All of the restrict bands were tested, only the worst band's (2310MHz to 2500MHz) data was showed.				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Value
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Average	1MHz	3MHz	Average
Limit:	Frequency		Limit (dBuV/m @3m)		Value
	Above 1GHz		54.00		Average
			74.00		Peak
Test setup:					
Test Procedure:	<ol style="list-style-type: none"><li>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.</li><li>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.</li><li>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.</li><li>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.</li><li>5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li><li>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.</li><li>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.</li></ol>				
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)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2310.00	39.76	27.14	6.19	42.04	31.05	74.00	-42.95	Horizontal
2390.00	48.14	27.37	6.31	42.11	39.71	74.00	-34.29	Horizontal
2310.00	38.31	27.14	6.19	42.04	29.60	74.00	-44.40	Vertical
2390.00	49.43	27.37	6.31	42.11	41.00	74.00	-33.00	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	30.07	27.14	6.19	42.04	21.36	54.00	-32.64	Horizontal
2390.00	37.15	27.37	6.31	42.11	28.72	54.00	-25.28	Horizontal
2310.00	28.73	27.14	6.19	42.04	20.02	54.00	-33.98	Vertical
2390.00	39.14	27.37	6.31	42.11	30.71	54.00	-23.29	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)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	48.61	27.66	6.45	42.01	40.71	74.00	-33.29	Horizontal
2500.00	41.04	27.70	6.47	42.00	33.21	74.00	-40.79	Horizontal
2483.50	48.48	27.66	6.45	42.01	40.58	74.00	-33.42	Vertical
2500.00	42.22	27.70	6.47	42.00	34.39	74.00	-39.61	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	37.14	27.66	6.45	42.01	29.24	54.00	-24.76	Horizontal
2500.00	33.61	27.70	6.47	42.00	25.78	54.00	-28.22	Horizontal
2483.50	37.92	27.66	6.45	42.01	30.02	54.00	-23.98	Vertical
2500.00	32.41	27.70	6.47	42.00	24.58	54.00	-29.42	Vertical

**Notes:**

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
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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	39.40	27.14	6.19	42.04	30.69	74.00	-43.31	Horizontal
2390.00	47.66	27.37	6.31	42.11	39.23	74.00	-34.77	Horizontal
2310.00	37.93	27.14	6.19	42.04	29.22	74.00	-44.78	Vertical
2390.00	48.85	27.37	6.31	42.11	40.42	74.00	-33.58	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	29.81	27.14	6.19	42.04	21.10	54.00	-32.90	Horizontal
2390.00	36.86	27.37	6.31	42.11	28.43	54.00	-25.57	Horizontal
2310.00	28.45	27.14	6.19	42.04	19.74	54.00	-34.26	Vertical
2390.00	38.82	27.37	6.31	42.11	30.39	54.00	-23.61	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	48.10	27.66	6.45	42.01	40.20	74.00	-33.80	Horizontal
2500.00	40.64	27.70	6.47	42.00	32.81	74.00	-41.19	Horizontal
2483.50	47.90	27.66	6.45	42.01	40.00	74.00	-34.00	Vertical
2500.00	41.76	27.70	6.47	42.00	33.93	74.00	-40.07	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	36.84	27.66	6.45	42.01	28.94	54.00	-25.06	Horizontal
2500.00	33.37	27.70	6.47	42.00	25.54	54.00	-28.46	Horizontal
2483.50	37.58	27.66	6.45	42.01	29.68	54.00	-24.32	Vertical
2500.00	32.16	27.70	6.47	42.00	24.33	54.00	-29.67	Vertical

**Notes:**

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
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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	39.48	27.14	6.19	42.04	30.77	74.00	-43.23	Horizontal
2390.00	47.76	27.37	6.31	42.11	39.33	74.00	-34.67	Horizontal
2310.00	38.01	27.14	6.19	42.04	29.30	74.00	-44.70	Vertical
2390.00	48.97	27.37	6.31	42.11	40.54	74.00	-33.46	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	29.86	27.14	6.19	42.04	21.15	54.00	-32.85	Horizontal
2390.00	36.92	27.37	6.31	42.11	28.49	54.00	-25.51	Horizontal
2310.00	28.51	27.14	6.19	42.04	19.80	54.00	-34.20	Vertical
2390.00	38.88	27.37	6.31	42.11	30.45	54.00	-23.55	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)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	48.20	27.66	6.45	42.01	40.30	74.00	-33.70	Horizontal
2500.00	40.72	27.70	6.47	42.00	32.89	74.00	-41.11	Horizontal
2483.50	48.02	27.66	6.45	42.01	40.12	74.00	-33.88	Vertical
2500.00	41.86	27.70	6.47	42.00	34.03	74.00	-39.97	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	36.90	27.66	6.45	42.01	29.00	54.00	-25.00	Horizontal
2500.00	33.42	27.70	6.47	42.00	25.59	54.00	-28.41	Horizontal
2483.50	37.65	27.66	6.45	42.01	29.75	54.00	-24.25	Vertical
2500.00	32.21	27.70	6.47	42.00	24.38	54.00	-29.62	Vertical

**Notes:**

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(HT40)	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	39.61	27.14	6.19	42.04	30.90	74.00	-43.10	Horizontal
2390.00	47.94	27.37	6.31	42.11	39.51	74.00	-34.49	Horizontal
2310.00	38.15	27.14	6.19	42.04	29.44	74.00	-44.56	Vertical
2390.00	49.19	27.37	6.31	42.11	40.76	74.00	-33.24	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	29.96	27.14	6.19	42.04	21.25	54.00	-32.75	Horizontal
2390.00	37.03	27.37	6.31	42.11	28.60	54.00	-25.40	Horizontal
2310.00	28.62	27.14	6.19	42.04	19.91	54.00	-34.09	Vertical
2390.00	39.00	27.37	6.31	42.11	30.57	54.00	-23.43	Vertical

Test mode:	802.11n(HT40)	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	48.39	27.66	6.45	42.01	40.49	74.00	-33.51	Horizontal
2500.00	40.87	27.70	6.47	42.00	33.04	74.00	-40.96	Horizontal
2483.50	48.24	27.66	6.45	42.01	40.34	74.00	-33.66	Vertical
2500.00	42.03	27.70	6.47	42.00	34.20	74.00	-39.80	Vertical

## Average value:

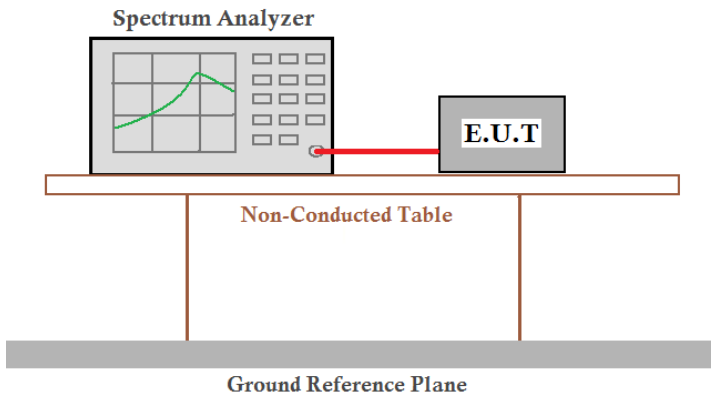
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	37.02	27.66	6.45	42.01	29.12	54.00	-24.88	Horizontal
2500.00	33.51	27.70	6.47	42.00	25.68	54.00	-28.32	Horizontal
2483.50	37.78	27.66	6.45	42.01	29.88	54.00	-24.12	Vertical
2500.00	32.31	27.70	6.47	42.00	24.48	54.00	-29.52	Vertical

## Notes:

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.

## 7.6 Spurious Emission

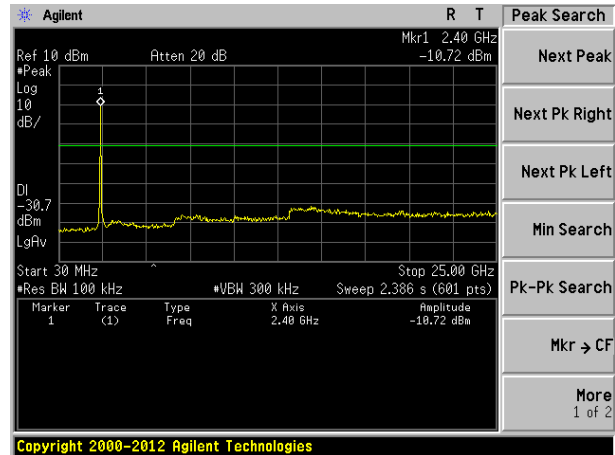
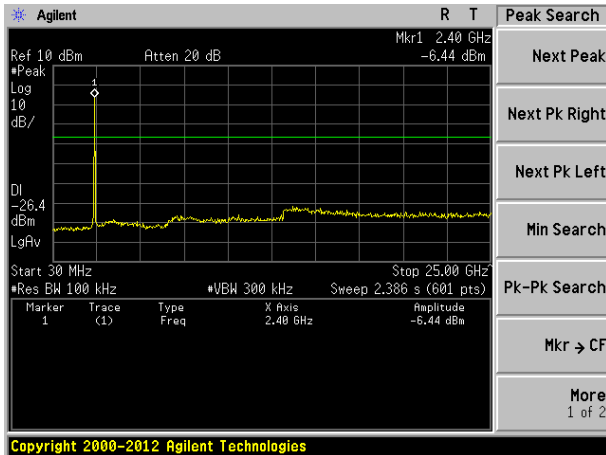
### 7.6.1 Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	KDB558074 D01 DTS Meas Guidance V05r02
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:	 <p>The diagram illustrates the test setup for conducted emission measurement. A Spectrum Analyzer is connected via a red cable to an E.U.T. (Equipment Under Test). Both are placed on a Non-Conducted Table, which is supported by two vertical legs. Below the table is a Ground Reference Plane, represented by a thick grey bar.</p>
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:

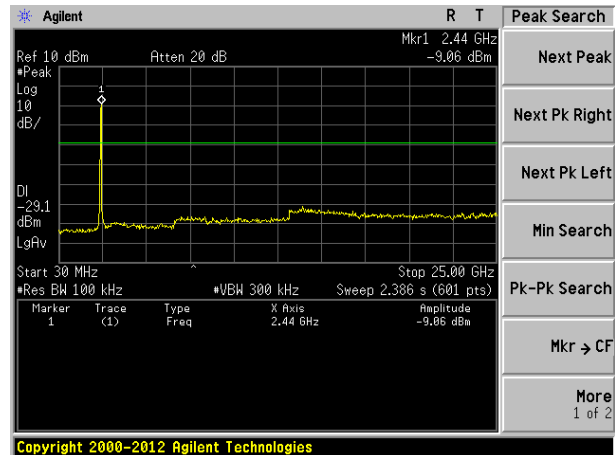
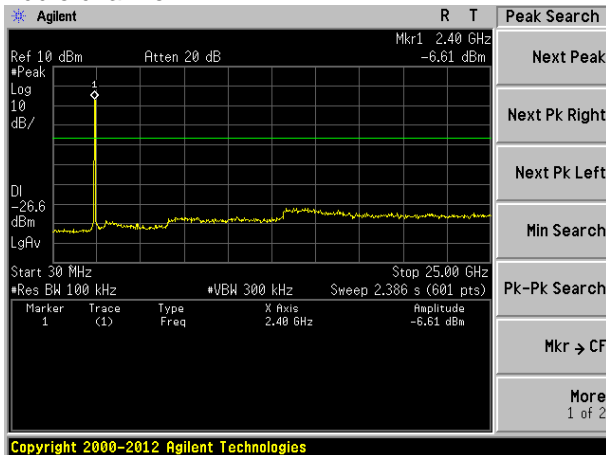
Test mode:	802.11b	Test mode:	802.11g
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Lowest channel



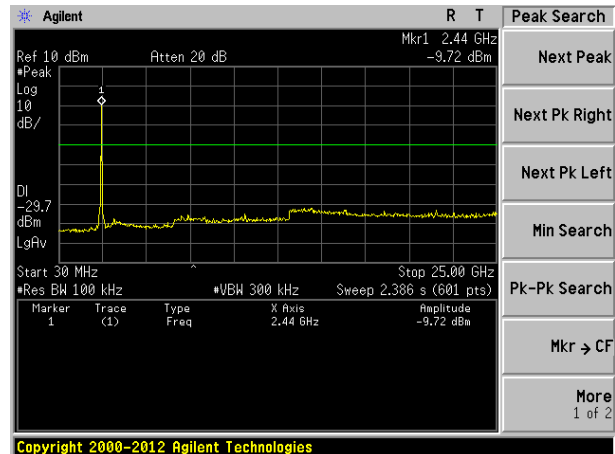
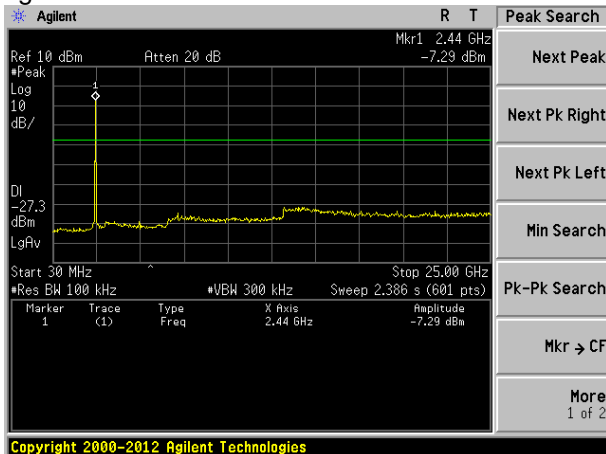
30MHz~25GHz

Middle channel



30MHz~25GHz

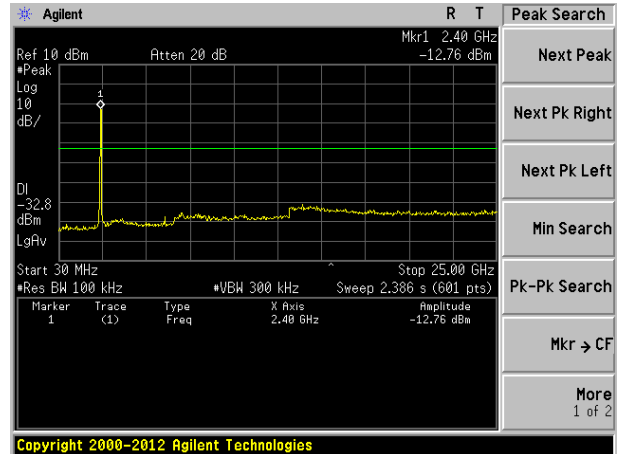
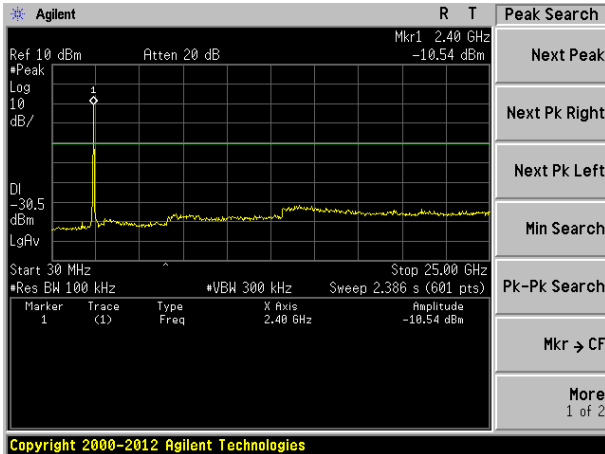
Highest channel



30MHz~25GHz

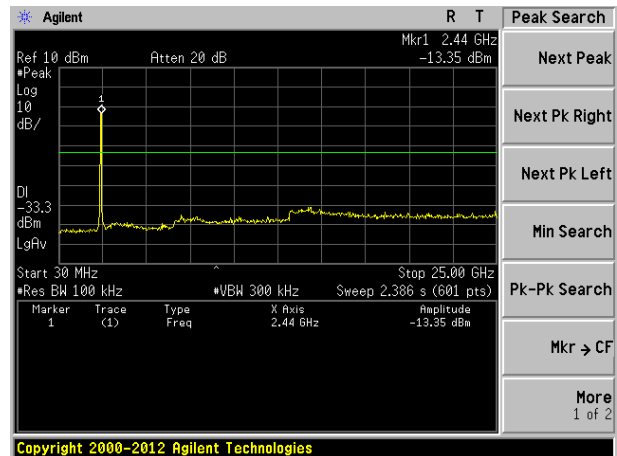
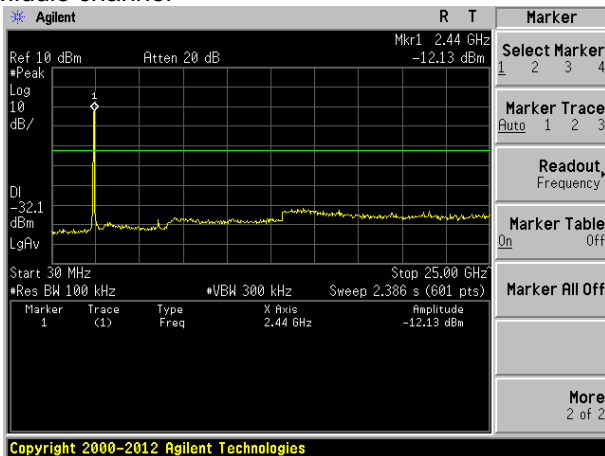
Test mode:	802.11n(HT20)	Test mode:	802.11n(HT40)
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## Lowest channel



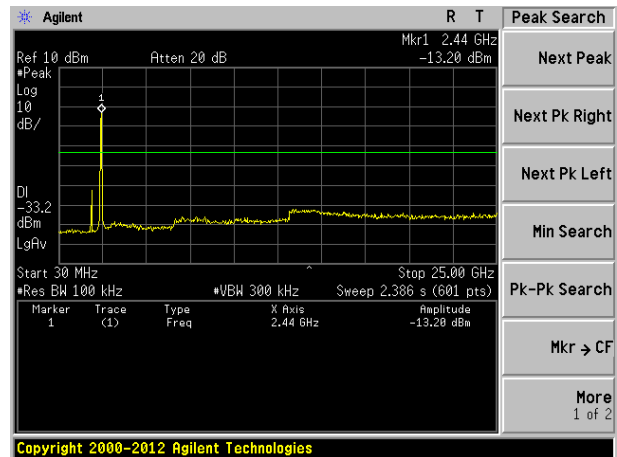
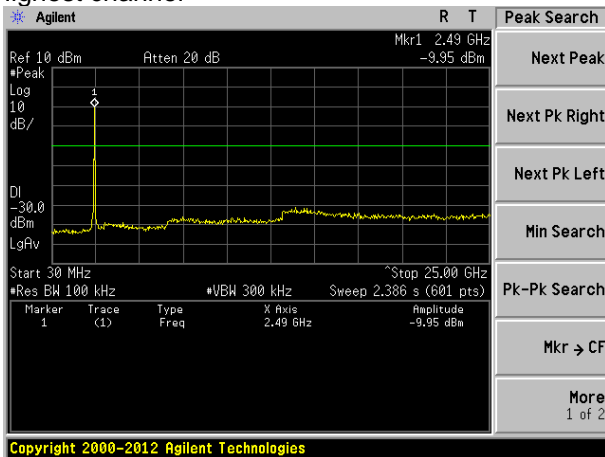
30MHz~25GHz

## Middle channel



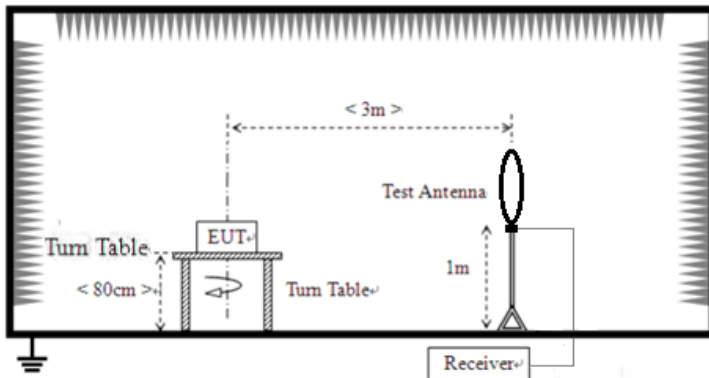
30MHz~25GHz

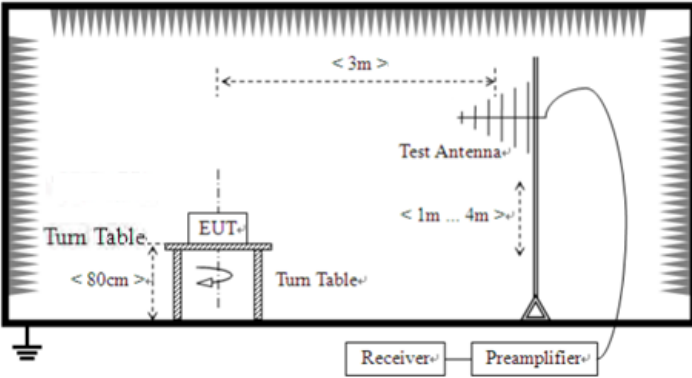
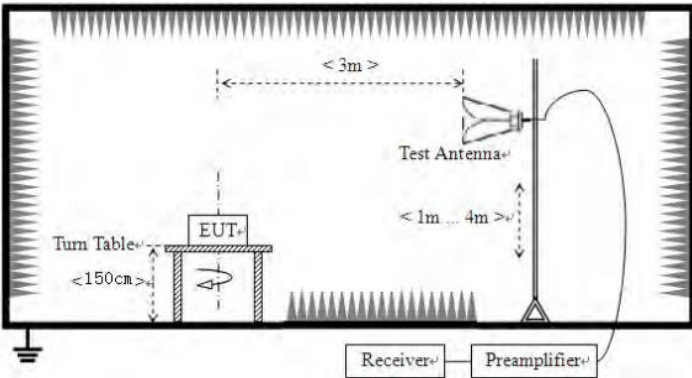
## Highest channel



30MHz~25GHz

## 7.6.2 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	120KHz	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:	For radiated emissions from 9kHz to 30MHz				
	<div></div>				
	For radiated emissions from 30MHz to 1GHz				

	 <p>For radiated emissions above 1GHz</p> 
<p>Test Procedure:</p>	<ol style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>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.</li> <li>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.</li> <li>5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li> <li>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.</li> </ol>
<p>Test Instruments:</p>	<p>Refer to section 6.0 for details</p>
<p>Test mode:</p>	<p>Refer to section 5.2 for details</p>

Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar
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:

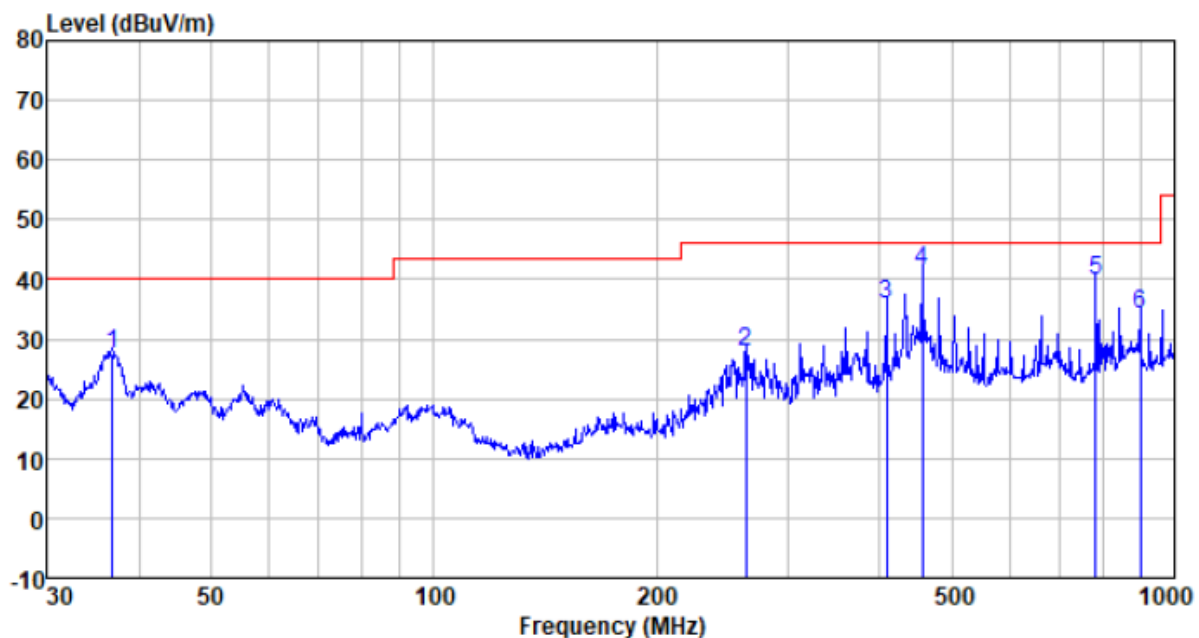
### ■ 9kHz~30MHz

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

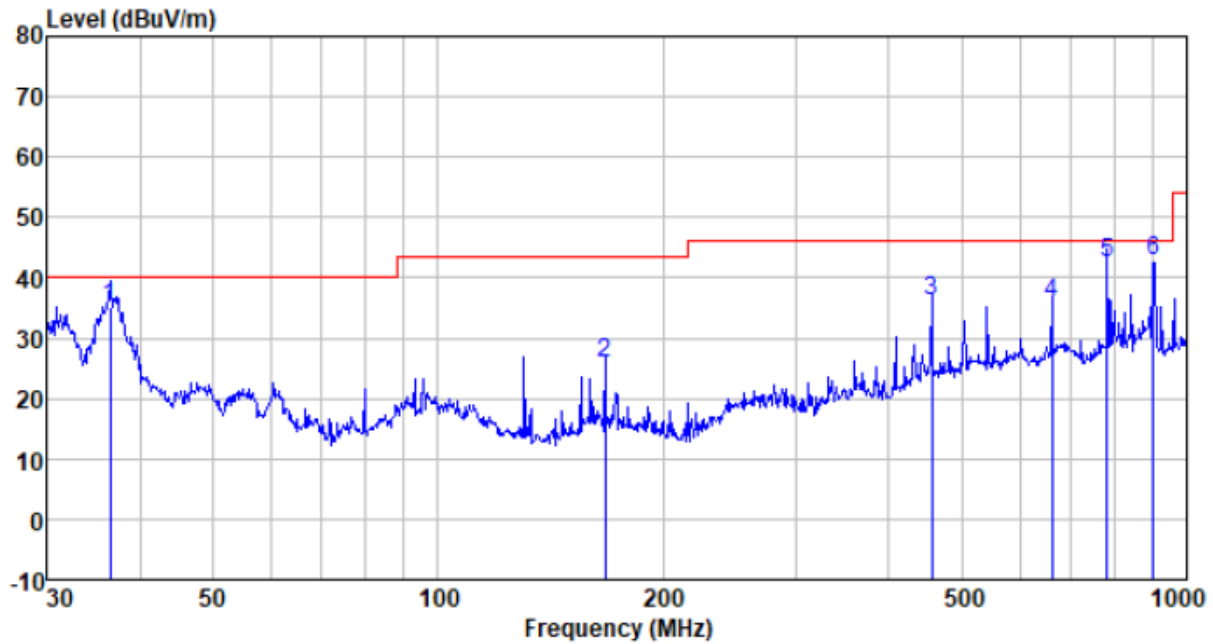
#### Horizontal:

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



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV	Limit level dBuV/m	Over limit dB	Remark
36.766	50.65	11.64	0.63	35.47	27.45	40.00	-12.55	QP
263.819	50.36	12.58	2.19	37.39	27.74	46.00	-18.26	QP
408.946	54.80	15.50	2.90	37.52	35.68	46.00	-10.32	QP
455.906	59.51	16.48	3.11	37.51	41.59	46.00	-4.41	QP
782.345	51.91	21.09	4.40	37.62	39.78	46.00	-6.22	QP
900.147	44.58	22.30	4.85	37.60	34.13	46.00	-11.87	QP

Vertical:



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV	Limit level dBuV/m	Over limit dB	Remark
36.509	58.42	11.61	0.62	35.45	35.20	40.00	-4.80	QP
167.237	52.77	8.44	1.67	37.17	25.71	43.50	-17.79	QP
455.906	54.23	16.48	3.11	37.51	36.31	46.00	-9.69	QP
661.151	49.78	19.56	3.95	37.60	35.69	46.00	-10.31	QP
782.345	54.45	21.09	4.40	37.62	42.32	46.00	-3.68	QP
903.309	53.36	22.30	4.87	37.60	42.93	46.00	-3.07	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	39.47	31.79	8.62	32.10	47.78	74.00	-26.22	Vertical
7236.00	33.70	36.19	11.68	31.97	49.60	74.00	-24.40	Vertical
9648.00	32.34	38.07	14.16	31.56	53.01	74.00	-20.99	Vertical
12060.00	*					74.00		Vertical
14472.00	*					74.00		Vertical
16884.00	*					74.00		Vertical
4824.00	38.27	31.79	8.62	32.10	46.58	74.00	-27.42	Horizontal
7236.00	33.51	36.19	11.68	31.97	49.41	74.00	-24.59	Horizontal
9648.00	31.95	38.07	14.16	31.56	52.62	74.00	-21.38	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	28.62	31.79	8.62	32.10	36.93	54.00	-17.07	Vertical
7236.00	22.58	36.19	11.68	31.97	38.48	54.00	-15.52	Vertical
9648.00	22.70	38.07	14.16	31.56	43.37	54.00	-10.63	Vertical
12060.00	*					54.00		Vertical
14472.00	*					54.00		Vertical
16884.00	*					54.00		Vertical
4824.00	27.85	31.79	8.62	32.10	36.16	54.00	-17.84	Horizontal
7236.00	22.11	36.19	11.68	31.97	38.01	54.00	-15.99	Horizontal
9648.00	21.71	38.07	14.16	31.56	42.38	54.00	-11.62	Horizontal
12060.00	*					54.00		Horizontal
14472.00	*					54.00		Horizontal
16884.00	*					54.00		Horizontal

Notes:

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.

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	38.67	31.85	8.66	32.12	47.06	74.00	-26.94	Vertical
7311.00	33.86	36.37	11.71	31.91	50.03	74.00	-23.97	Vertical
9748.00	33.42	38.27	14.25	31.56	54.38	74.00	-19.62	Vertical
12185.00	*					74.00		Vertical
14622.00	*					74.00		Vertical
17059.00	*					74.00		Vertical
4874.00	39.25	31.85	8.66	32.12	47.64	74.00	-26.36	Horizontal
7311.00	32.55	36.37	11.71	31.91	48.72	74.00	-25.28	Horizontal
9748.00	33.34	38.27	14.25	31.56	54.30	74.00	-19.70	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	29.57	31.85	8.66	32.12	37.96	54.00	-16.04	Vertical
7311.00	22.19	36.37	11.71	31.91	38.36	54.00	-15.64	Vertical
9748.00	22.69	38.27	14.25	31.56	43.65	54.00	-10.35	Vertical
12185.00	*					54.00		Vertical
14622.00	*					54.00		Vertical
17059.00	*					54.00		Vertical
4874.00	29.40	31.85	8.66	32.12	37.79	54.00	-16.21	Horizontal
7311.00	21.65	36.37	11.71	31.91	37.82	54.00	-16.18	Horizontal
9748.00	23.06	38.27	14.25	31.56	44.02	54.00	-9.98	Horizontal
12185.00	*					54.00		Horizontal
14622.00	*					54.00		Horizontal
17059.00	*					54.00		Horizontal

## Notes:

1. *Final Level* = Receiver Read level + Antenna Factor + Cable Loss – Pre-amplifier Factor
2. “\*”, means this data is too weak instrument of signal is unable to test.

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	43.71	31.90	8.70	32.15	52.16	74.00	-21.84	Vertical
7386.00	34.22	36.49	11.76	31.83	50.64	74.00	-23.36	Vertical
9848.00	36.50	38.62	14.31	31.77	57.66	74.00	-16.34	Vertical
12310.00	*					74.00		Vertical
14772.00	*					74.00		Vertical
17234.00	*					74.00		Vertical
4924.00	43.19	31.90	8.70	32.15	51.64	74.00	-22.36	Horizontal
7386.00	33.22	36.49	11.76	31.83	49.64	74.00	-24.36	Horizontal
9848.00	32.71	38.62	14.31	31.77	53.87	74.00	-20.13	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	34.71	31.90	8.70	32.15	43.16	54.00	-10.84	Vertical
7386.00	24.16	36.49	11.76	31.83	40.58	54.00	-13.42	Vertical
9848.00	25.02	38.62	14.31	31.77	46.18	54.00	-7.82	Vertical
12310.00	*					54.00		Vertical
14772.00	*					54.00		Vertical
17234.00	*					54.00		Vertical
4924.00	33.62	31.90	8.70	32.15	42.07	54.00	-11.93	Horizontal
7386.00	22.63	36.49	11.76	31.83	39.05	54.00	-14.95	Horizontal
9848.00	21.99	38.62	14.31	31.77	43.15	54.00	-10.85	Horizontal
12310.00	*					54.00		Horizontal
14772.00	*					54.00		Horizontal
17234.00	*					54.00		Horizontal

**Notes:**

1. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamp Factor*
2. *“\*” , means this data is the too weak instrument of signal is unable to test.*

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	39.32	31.79	8.62	32.10	47.63	74.00	-26.37	Vertical
7236.00	33.60	36.19	11.68	31.97	49.50	74.00	-24.50	Vertical
9648.00	32.27	38.07	14.16	31.56	52.94	74.00	-21.06	Vertical
12060.00	*					74.00		Vertical
14472.00	*					74.00		Vertical
16884.00	*					74.00		Vertical
4824.00	38.14	31.79	8.62	32.10	46.45	74.00	-27.55	Horizontal
7236.00	33.43	36.19	11.68	31.97	49.33	74.00	-24.67	Horizontal
9648.00	31.88	38.07	14.16	31.56	52.55	74.00	-21.45	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	28.48	31.79	8.62	32.10	36.79	54.00	-17.21	Vertical
7236.00	22.49	36.19	11.68	31.97	38.39	54.00	-15.61	Vertical
9648.00	22.64	38.07	14.16	31.56	43.31	54.00	-10.69	Vertical
12060.00	*					54.00		Vertical
14472.00	*					54.00		Vertical
16884.00	*					54.00		Vertical
4824.00	27.73	31.79	8.62	32.10	36.04	54.00	-17.96	Horizontal
7236.00	22.03	36.19	11.68	31.97	37.93	54.00	-16.07	Horizontal
9648.00	21.65	38.07	14.16	31.56	42.32	54.00	-11.68	Horizontal
12060.00	*					54.00		Horizontal
14472.00	*					54.00		Horizontal
16884.00	*					54.00		Horizontal

**Notes:**

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.*

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	38.54	31.85	8.66	32.12	46.93	74.00	-27.07	Vertical
7311.00	33.78	36.37	11.71	31.91	49.95	74.00	-24.05	Vertical
9748.00	33.37	38.27	14.25	31.56	54.33	74.00	-19.67	Vertical
12185.00	*					74.00		Vertical
14622.00	*					74.00		Vertical
17059.00	*					74.00		Vertical
4874.00	39.15	31.85	8.66	32.12	47.54	74.00	-26.46	Horizontal
7311.00	32.48	36.37	11.71	31.91	48.65	74.00	-25.35	Horizontal
9748.00	33.28	38.27	14.25	31.56	54.24	74.00	-19.76	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	29.46	31.85	8.66	32.12	37.85	54.00	-16.15	Vertical
7311.00	22.11	36.37	11.71	31.91	38.28	54.00	-15.72	Vertical
9748.00	22.64	38.27	14.25	31.56	43.60	54.00	-10.40	Vertical
12185.00	*					54.00		Vertical
14622.00	*					54.00		Vertical
17059.00	*					54.00		Vertical
4874.00	29.30	31.85	8.66	32.12	37.69	54.00	-16.31	Horizontal
7311.00	21.58	36.37	11.71	31.91	37.75	54.00	-16.25	Horizontal
9748.00	23.01	38.27	14.25	31.56	43.97	54.00	-10.03	Horizontal
12185.00	*					54.00		Horizontal
14622.00	*					54.00		Horizontal
17059.00	*					54.00		Horizontal

**Notes:**

1. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamp Factor*
2. *“\*”*, means this data is the too weak instrument of signal is unable to test.

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	43.49	31.90	8.70	32.15	51.94	74.00	-22.06	Vertical
7386.00	34.08	36.49	11.76	31.83	50.50	74.00	-23.50	Vertical
9848.00	36.40	38.62	14.31	31.77	57.56	74.00	-16.44	Vertical
12310.00	*					74.00		Vertical
14772.00	*					74.00		Vertical
17234.00	*					74.00		Vertical
4924.00	43.01	31.90	8.70	32.15	51.46	74.00	-22.54	Horizontal
7386.00	33.10	36.49	11.76	31.83	49.52	74.00	-24.48	Horizontal
9848.00	32.62	38.62	14.31	31.77	53.78	74.00	-20.22	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	34.51	31.90	8.70	32.15	42.96	54.00	-11.04	Vertical
7386.00	24.03	36.49	11.76	31.83	40.45	54.00	-13.55	Vertical
9848.00	24.93	38.62	14.31	31.77	46.09	54.00	-7.91	Vertical
12310.00	*					54.00		Vertical
14772.00	*					54.00		Vertical
17234.00	*					54.00		Vertical
4924.00	33.45	31.90	8.70	32.15	41.90	54.00	-12.10	Horizontal
7386.00	22.51	36.49	11.76	31.83	38.93	54.00	-15.07	Horizontal
9848.00	21.90	38.62	14.31	31.77	43.06	54.00	-10.94	Horizontal
12310.00	*					54.00		Horizontal
14772.00	*					54.00		Horizontal
17234.00	*					54.00		Horizontal

**Notes:**

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.

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	39.13	31.79	8.62	32.10	47.44	74.00	-26.56	Vertical
7236.00	33.48	36.19	11.68	31.97	49.38	74.00	-24.62	Vertical
9648.00	32.19	38.07	14.16	31.56	52.86	74.00	-21.14	Vertical
12060.00	*					74.00		Vertical
14472.00	*					74.00		Vertical
16884.00	*					74.00		Vertical
4824.00	37.98	31.79	8.62	32.10	46.29	74.00	-27.71	Horizontal
7236.00	33.32	36.19	11.68	31.97	49.22	74.00	-24.78	Horizontal
9648.00	31.81	38.07	14.16	31.56	52.48	74.00	-21.52	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	28.30	31.79	8.62	32.10	36.61	54.00	-17.39	Vertical
7236.00	22.37	36.19	11.68	31.97	38.27	54.00	-15.73	Vertical
9648.00	22.55	38.07	14.16	31.56	43.22	54.00	-10.78	Vertical
12060.00	*					54.00		Vertical
14472.00	*					54.00		Vertical
16884.00	*					54.00		Vertical
4824.00	27.58	31.79	8.62	32.10	35.89	54.00	-18.11	Horizontal
7236.00	21.92	36.19	11.68	31.97	37.82	54.00	-16.18	Horizontal
9648.00	21.57	38.07	14.16	31.56	42.24	54.00	-11.76	Horizontal
12060.00	*					54.00		Horizontal
14472.00	*					54.00		Horizontal
16884.00	*					54.00		Horizontal

**Notes:**

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.*

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	38.39	31.85	8.66	32.12	46.78	74.00	-27.22	Vertical
7311.00	33.68	36.37	11.71	31.91	49.85	74.00	-24.15	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	39.02	31.85	8.66	32.12	47.41	74.00	-26.59	Horizontal
7311.00	32.40	36.37	11.71	31.91	48.57	74.00	-25.43	Horizontal
9748.00	33.22	38.27	14.25	31.56	54.18	74.00	-19.82	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	29.31	31.85	8.66	32.12	37.70	54.00	-16.30	Vertical
7311.00	22.02	36.37	11.71	31.91	38.19	54.00	-15.81	Vertical
9748.00	22.57	38.27	14.25	31.56	43.53	54.00	-10.47	Vertical
12185.00	*					54.00		Vertical
14622.00	*					54.00		Vertical
17059.00	*					54.00		Vertical
4874.00	29.18	31.85	8.66	32.12	37.57	54.00	-16.43	Horizontal
7311.00	21.50	36.37	11.71	31.91	37.67	54.00	-16.33	Horizontal
9748.00	22.95	38.27	14.25	31.56	43.91	54.00	-10.09	Horizontal
12185.00	*					54.00		Horizontal
14622.00	*					54.00		Horizontal
17059.00	*					54.00		Horizontal

## Notes:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamp Factor
2. “\*”, means this data is the too weak instrument of signal is unable to test.



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	43.22	31.90	8.70	32.15	51.67	74.00	-22.33	Vertical
7386.00	33.91	36.49	11.76	31.83	50.33	74.00	-23.67	Vertical
9848.00	36.28	38.62	14.31	31.77	57.44	74.00	-16.56	Vertical
12310.00	*					74.00		Vertical
14772.00	*					74.00		Vertical
17234.00	*					74.00		Vertical
4924.00	42.78	31.90	8.70	32.15	51.23	74.00	-22.77	Horizontal
7386.00	32.95	36.49	11.76	31.83	49.37	74.00	-24.63	Horizontal
9848.00	32.51	38.62	14.31	31.77	53.67	74.00	-20.33	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	34.26	31.90	8.70	32.15	42.71	54.00	-11.29	Vertical
7386.00	23.87	36.49	11.76	31.83	40.29	54.00	-13.71	Vertical
9848.00	24.81	38.62	14.31	31.77	45.97	54.00	-8.03	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	22.36	36.49	11.76	31.83	38.78	54.00	-15.22	Horizontal
9848.00	21.79	38.62	14.31	31.77	42.95	54.00	-11.05	Horizontal
12310.00	*					54.00		Horizontal
14772.00	*					54.00		Horizontal
17234.00	*					54.00		Horizontal

## Notes:

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.

Test mode:	802.11n(HT40)	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
4844.00	38.42	31.81	8.63	32.11	46.75	74.00	-27.25	Vertical
7266.00	33.03	36.28	11.69	31.94	49.06	74.00	-24.94	Vertical
9688.00	31.87	38.13	14.21	31.52	52.69	74.00	-21.31	Vertical
12060.00	*					74.00		Vertical
14472.00	*					74.00		Vertical
16884.00	*					74.00		Vertical
4844.00	37.38	31.81	8.63	32.11	45.71	74.00	-28.29	Horizontal
7266.00	32.93	36.28	11.69	31.94	48.96	74.00	-25.04	Horizontal
9688.00	31.51	38.13	14.21	31.52	52.33	74.00	-21.67	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)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4844.00	27.65	31.81	8.63	32.11	35.98	54.00	-18.02	Vertical
7266.00	21.94	36.28	11.69	31.94	37.97	54.00	-16.03	Vertical
9688.00	22.25	38.13	14.21	31.52	43.07	54.00	-10.93	Vertical
12060.00	*					54.00		Vertical
14472.00	*					54.00		Vertical
16884.00	*					54.00		Vertical
4844.00	27.02	31.81	8.63	32.11	35.35	54.00	-18.65	Horizontal
7266.00	21.54	36.28	11.69	31.94	37.57	54.00	-16.43	Horizontal
9688.00	21.29	38.13	14.21	31.52	42.11	54.00	-11.89	Horizontal
12060.00	*					54.00		Horizontal
14472.00	*					54.00		Horizontal
16884.00	*					54.00		Horizontal

Notes:

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.

Test mode:	802.11n(HT40)	Test channel:	Middle
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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
4874.00	37.80	31.85	8.66	32.12	46.19	74.00	-27.81	Vertical
7311.00	33.31	36.37	11.71	31.91	49.48	74.00	-24.52	Vertical
9748.00	33.03	38.27	14.25	31.56	53.99	74.00	-20.01	Vertical
12185.00	*					74.00		Vertical
14622.00	*					74.00		Vertical
17059.00	*					74.00		Vertical
4874.00	38.52	31.85	8.66	32.12	46.91	74.00	-27.09	Horizontal
7311.00	32.07	36.37	11.71	31.91	48.24	74.00	-25.76	Horizontal
9748.00	32.98	38.27	14.25	31.56	53.94	74.00	-20.06	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)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4874.00	28.77	31.85	8.66	32.12	37.16	54.00	-16.84	Vertical
7311.00	21.66	36.37	11.71	31.91	37.83	54.00	-16.17	Vertical
9748.00	22.31	38.27	14.25	31.56	43.27	54.00	-10.73	Vertical
12185.00	*					54.00		Vertical
14622.00	*					54.00		Vertical
17059.00	*					54.00		Vertical
4874.00	28.71	31.85	8.66	32.12	37.10	54.00	-16.90	Horizontal
7311.00	21.19	36.37	11.71	31.91	37.36	54.00	-16.64	Horizontal
9748.00	22.71	38.27	14.25	31.56	43.67	54.00	-10.33	Horizontal
12185.00	*					54.00		Horizontal
14622.00	*					54.00		Horizontal
17059.00	*					54.00		Horizontal

**Notes:**

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. “\*”, means this data is too weak for the instrument as the signal is unable to be tested.

Test mode:	802.11n(HT40)	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
4904.00	42.21	31.88	8.68	32.13	50.64	74.00	-23.36	Vertical
7356.00	33.28	36.45	11.75	31.86	49.62	74.00	-24.38	Vertical
9808.00	35.82	38.43	14.29	31.68	56.86	74.00	-17.14	Vertical
12310.00	*					74.00		Vertical
14772.00	*					74.00		Vertical
17234.00	*					74.00		Vertical
4904.00	41.93	31.88	8.68	32.13	50.36	74.00	-23.64	Horizontal
7356.00	32.39	36.45	11.75	31.86	48.73	74.00	-25.27	Horizontal
9808.00	32.08	38.43	14.29	31.68	53.12	74.00	-20.88	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
4904.00	33.33	31.88	8.68	32.13	41.76	54.00	-12.24	Vertical
7356.00	23.25	36.45	11.75	31.86	39.59	54.00	-14.41	Vertical
9808.00	24.37	38.43	14.29	31.68	45.41	54.00	-8.59	Vertical
12310.00	*					54.00		Vertical
14772.00	*					54.00		Vertical
17234.00	*					54.00		Vertical
4904.00	32.43	31.88	8.68	32.13	40.86	54.00	-13.14	Horizontal
7356.00	21.82	36.45	11.75	31.86	38.16	54.00	-15.84	Horizontal
9808.00	21.38	38.43	14.29	31.68	42.42	54.00	-11.58	Horizontal
12310.00	*					54.00		Horizontal
14772.00	*					54.00		Horizontal
17234.00	*					54.00		Horizontal

## Notes:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamp Factor
2. “\*”, means this data is too weak instrument of signal is unable to test.

## 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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