FCC Report (WIFI)

Applicant:	SETPLEX LLC
Address of Applicant:	1 Braker Ave Suit.290, White Plains, New York, 10601, United States
Manufacturer:	Shenzhen SDMC Technology Co.,Ltd
Address of Manufacturer:	7/F,W2-A,Hi-Tech,Industrial Park,Nanshan District,Shenzhen, China,518027

Equipment Under Test (EUT)

Product Name:	OTT Set-top Box
Model No.:	SPA-210
FCC ID:	2ALPR-SPA210
Applicable standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.247
Date of sample receipt:	May 14, 2018
Date of Test:	May 15-21, 2018
Date of report issued:	May 21, 2018
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	*May 21, 2018*	*Original*

Prepared By:	Bill. Yuan	***Date:***	*May 21, 2018*
	Project Engineer		
Check By:	Andy. wu	***Date:***	*May 21, 2018*
	Reviewer		

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4 Test Summary

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

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

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

Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	9kHz ~ 30MHz	± 4.34dB	(1)
Radiated Emission	30MHz ~ 1000MHz	± 4.24dB	(1)
Radiated Emission	1GHz ~ 26.5GHz	± 4.68dB	(1)
AC Power Line Conducted Emission	0.15MHz ~ 30MHz	± 3.45dB	(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:	OTT Set-top Box
Model No.:	SPA-210
Serial No.:	180400100001
Test sample(s) ID:	GTS201805000063-1
Sample(s) Status	Engineer sample
Hardware version:	V1
Software version:	V7.2.4
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(H20)/802.11n(HT40): Orthogonal Frequency Division Multiplexing (OFDM)
Antenna Type:	Integral Antenna
Antenna gain:	1.0dBi (Declare by Applicant)
Power supply:	Switching Adapter Model: DSA-12CB-05 050200 Input: AC 100-240V, 50/60Hz, 0.5A Output: DC 5V, 2A

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.
Remark: During the test, the dutycycle >98%, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.	

We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:

Pre-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.

Mode	802.11b	802.11g	802.11n(HT20)	802.11n(HT40)
Data rate	1Mbps	6Mbps	6.5Mbps	13Mbps

5.3 Description of Support Units

None

5.4 Test Facility

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

● **FCC —Registration No.: 381383**

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. Registration 381383, January 08, 2018.

● **Industry Canada (IC) —Registration No.: 9079A-2**

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-2, August 15, 2016.

5.5 Test Location

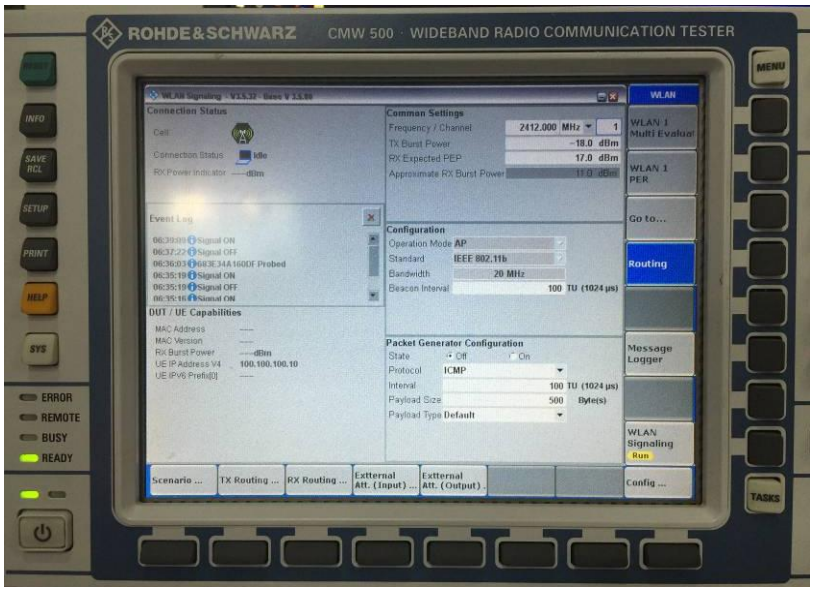
All tests were performed at:

Global United Technology Services Co., Ltd.
Address: No. 301-309, 3/F., Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102
Tel: 0755-27798480
Fax: 0755-27798960

5.6 Additional Instructions

EUT Fixed Frequency Settings:

Power level setup			
Support Units	Description	Manufacturer	Model
	Wideband Radio Communication Tester	Rohde & Schwarz	CMW 500
Mode	Channel	Frequency (MHz)	Level Set
802.11b/g/n(HT20)	CH1	2412	TX level : Maximum
	CH6	2437	
	CH11	2462	
802.11n(HT40)	CH3	2422	
	CH6	2437	
	CH9	2452	



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	Spectrum Analyzer	Agilent	E4440A	GTS533	June 28 2017	June 27 2018
4	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	June 28 2017	June 27 2018
5	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June 28 2017	June 27 2018
6	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	9120D-829	GTS208	June 28 2017	June 27 2018
7	Horn Antenna	ETS-LINDGREN	3160	GTS217	June 28 2017	June 27 2018
8	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
9	Coaxial Cable	GTS	N/A	GTS213	June 28 2017	June 27 2018
10	Coaxial Cable	GTS	N/A	GTS211	June 28 2017	June 27 2018
11	Coaxial cable	GTS	N/A	GTS210	June 28 2017	June 27 2018
12	Coaxial Cable	GTS	N/A	GTS212	June 28 2017	June 27 2018
13	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June 28 2017	June 27 2018
14	Amplifier(2GHz-20GHz)	HP	8349B	GTS206	June 28 2017	June 27 2018
15	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June 28 2017	June 27 2018
16	Band filter	Amindeon	82346	GTS219	June 28 2017	June 27 2018
17	Power Meter	Anritsu	ML2495A	GTS540	June 28 2017	June 27 2018
18	Power Sensor	Anritsu	MA2411B	GTS541	June 28 2017	June 27 2018
19	Loop Antenna	ZHINAN	ZN30900A	GTS534	June 28 2017	June 27 2018

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.16 2014	May.15 2019
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June 28 2017	June 27 2018
3	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June 28 2017	June 27 2018
4	Artificial Mains Network	SCHWARZBECK MESS	NSLK8127	GTS226	June 28 2017	June 27 2018
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 28 2017	June 27 2018

General used equipment:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Barometer	ChangChun	DYM3	GTS257	June 28 2017	June 27 2018

7 Test results and Measurement Data

7.1 Antenna requirement

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

15.203 requirement:

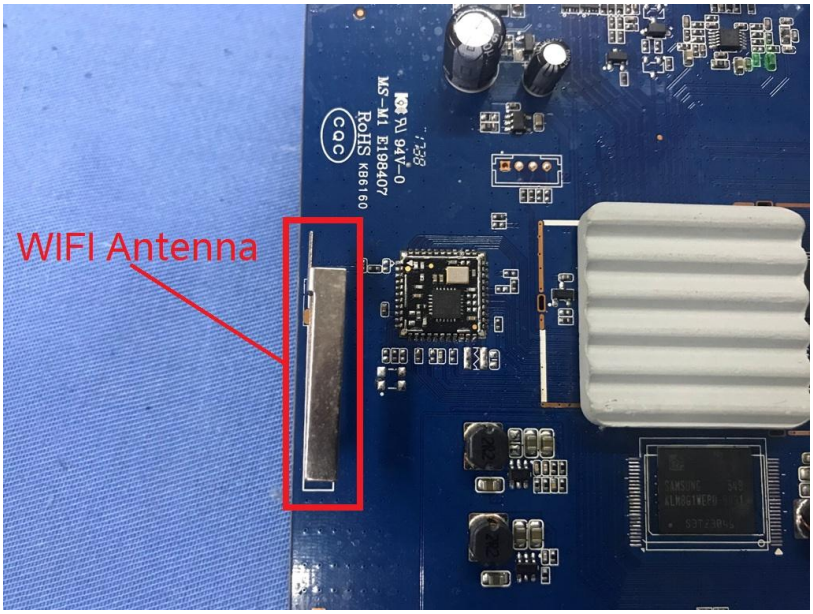
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

15.247(c) (1)(i) requirement:

(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

EUT Antenna:

The antenna is integral antenna, the best case gain of the antenna is 1.0dBi.



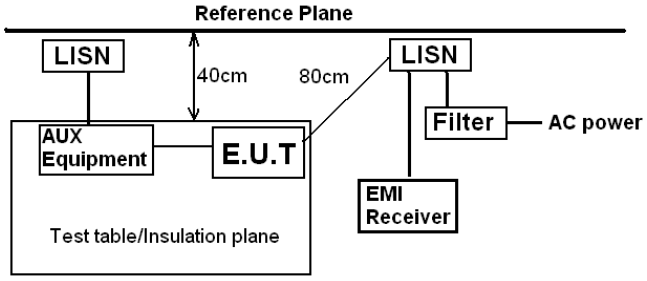
7.2 Conducted Emissions

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

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

* Decreases with the logarithm of the frequency.

Test setup:



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

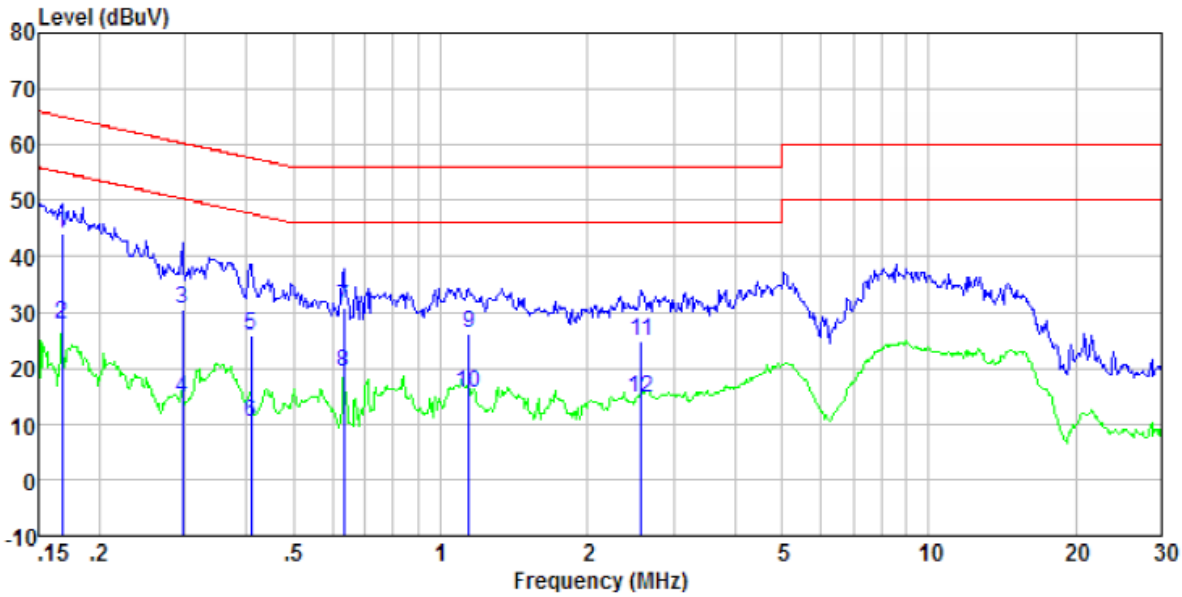
Test procedure:

1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.
2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).
3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10:2013 on conducted measurement.

Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

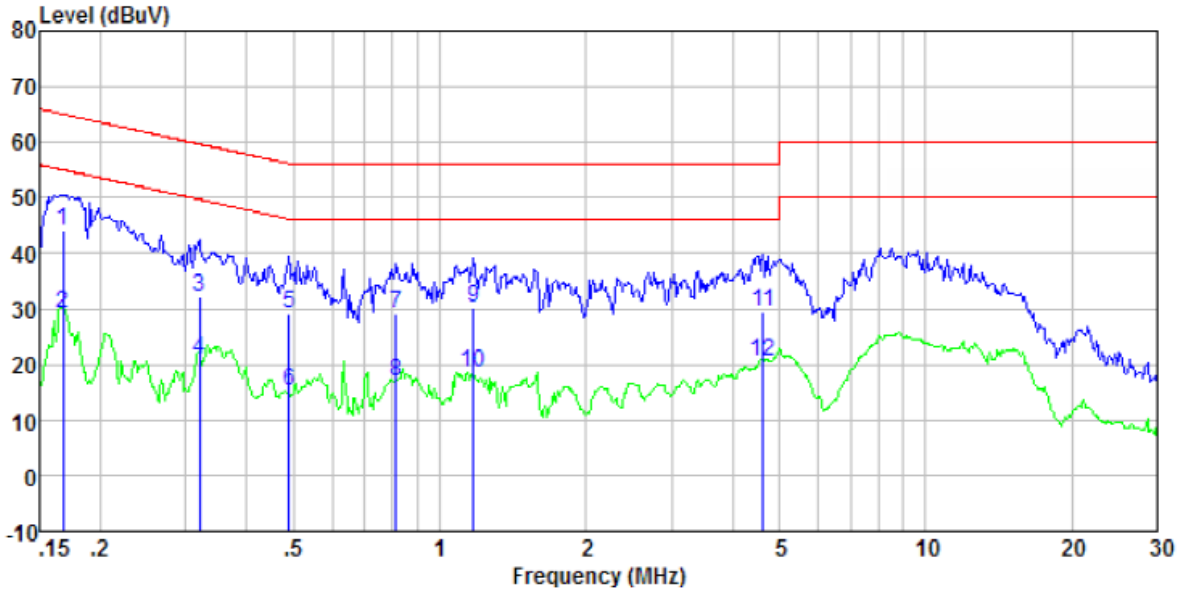
Measurement data

Line:



Freq MHz	Reading level dBuV	LISN/ISN factor dB/m	Cable loss dB	Level dBuV	Limit level dBuV	Over limit dB	Remark
0.17	43.50	0.40	0.09	43.99	65.08	-21.09	QP
0.17	27.32	0.40	0.09	27.81	55.08	-27.27	Average
0.30	30.00	0.40	0.10	30.50	60.37	-29.87	QP
0.30	14.10	0.40	0.10	14.60	50.37	-35.77	Average
0.41	25.53	0.35	0.11	25.99	57.68	-31.69	QP
0.41	9.80	0.35	0.11	10.26	47.68	-37.42	Average
0.63	30.58	0.28	0.12	30.98	56.00	-25.02	QP
0.63	18.70	0.28	0.12	19.10	46.00	-26.90	Average
1.14	25.83	0.20	0.15	26.18	56.00	-29.82	QP
1.14	15.17	0.20	0.15	15.52	46.00	-30.48	Average
2.58	24.37	0.20	0.18	24.75	56.00	-31.25	QP
2.58	14.05	0.20	0.18	14.43	46.00	-31.57	Average

Neutral:

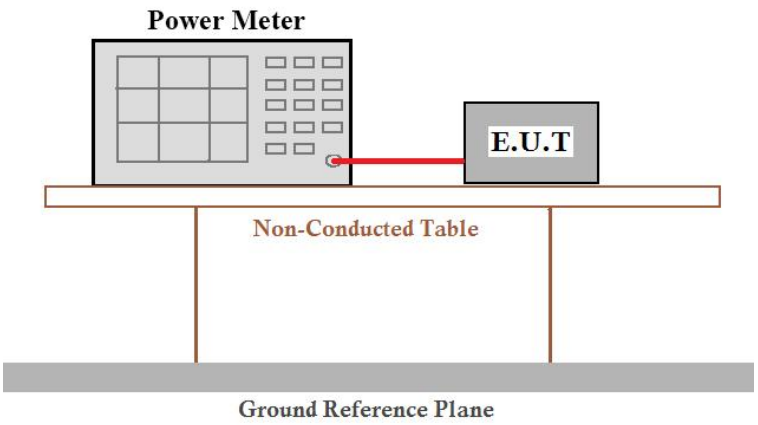


Freq MHz	Reading level dBuV	LISN/ISN factor dB/m	Cable loss dB	Level dBuV	Limit level dBuV	Over limit dB	Remark
0.17	43.78	0.40	0.09	44.27	65.08	-20.81	QP
0.17	28.75	0.40	0.09	29.24	55.08	-25.84	Average
0.32	31.82	0.39	0.10	32.31	59.71	-27.40	QP
0.32	20.53	0.39	0.10	21.02	49.71	-28.69	Average
0.49	28.59	0.32	0.11	29.02	56.19	-27.17	QP
0.49	14.67	0.32	0.11	15.10	46.19	-31.09	Average
0.81	28.92	0.23	0.14	29.29	56.00	-26.71	QP
0.81	16.56	0.23	0.14	16.93	46.00	-29.07	Average
1.17	29.72	0.20	0.16	30.08	56.00	-25.92	QP
1.17	18.27	0.20	0.16	18.63	46.00	-27.37	Average
4.62	29.29	0.20	0.17	29.66	56.00	-26.34	QP
4.62	20.14	0.20	0.17	20.51	46.00	-25.49	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.*

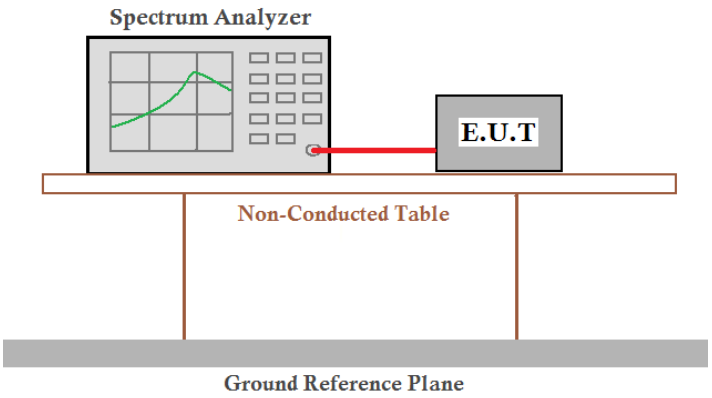
7.3 Conducted Peak Output Power

Test Requirement:	FCC Part15 C Section 15.247 (b)(3)
Test Method:	KDB558074 D01 DTS Meas Guidance V04
Limit:	30dBm
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	Peak Output Power (dBm)				Limit(dBm)	Result
	802.11b	802.11g	802.11n(HT20)	802.11n(HT40)		
Lowest	17.30	16.87	15.56	14.67	29.57	Pass
Middle	17.56	16.88	15.54	14.16		
Highest	16.88	17.14	15.69	14.98		

7.4 Channel Bandwidth

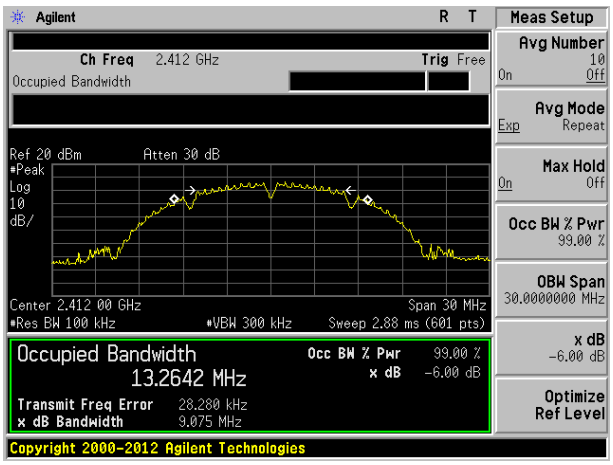
Test Requirement:	FCC Part15 C Section 15.247 (a)(2)
Test Method:	KDB558074 D01 DTS Meas Guidance V04
Limit:	>500KHz
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data

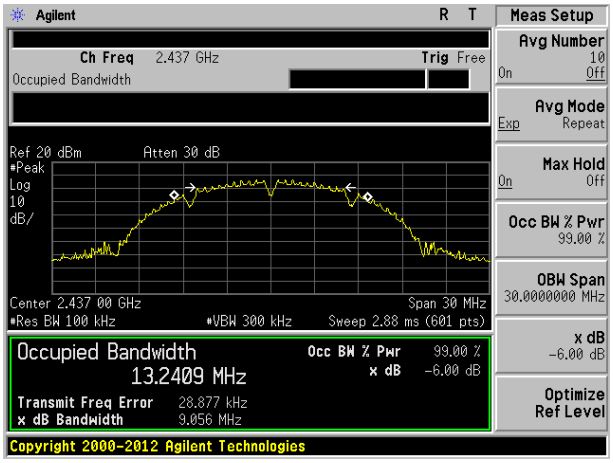
Test CH	Channel Bandwidth (MHz)				Limit(KHz)	Result
	802.11b	802.11g	802.11n(HT20)	802.11n(HT40)		
Lowest	9.075	16.419	17.576	35.793	>500	Pass
Middle	9.056	16.394	17.360	35.520		
Highest	8.617	16.404	17.358	35.859		

Test plot as follows:

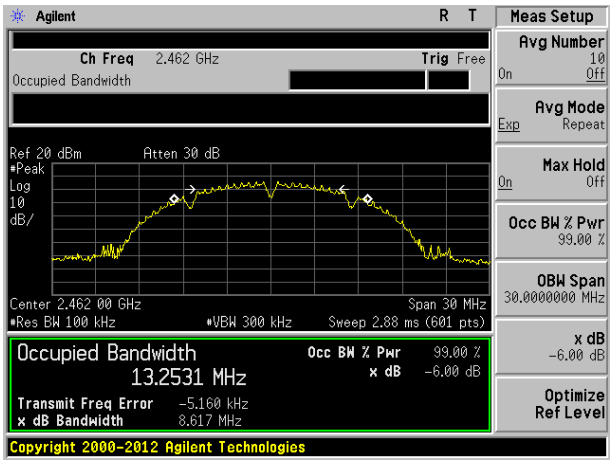
Test mode:	802.11b



Lowest channel

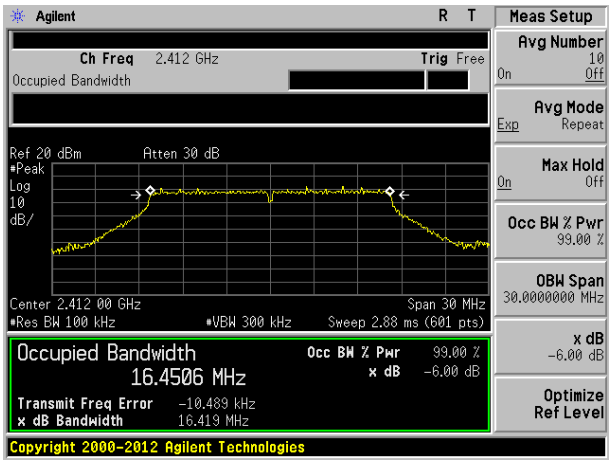


Middle channel

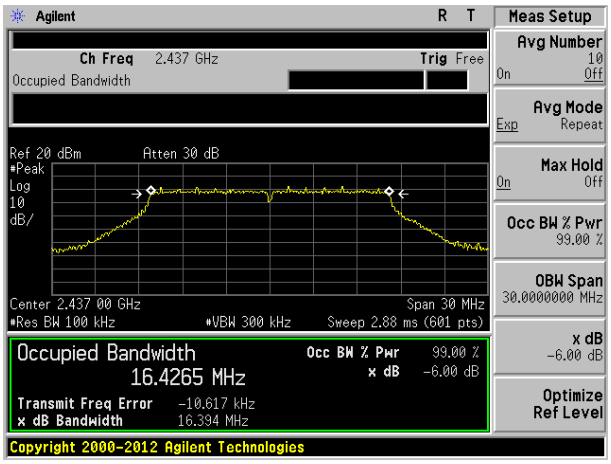


Highest channel

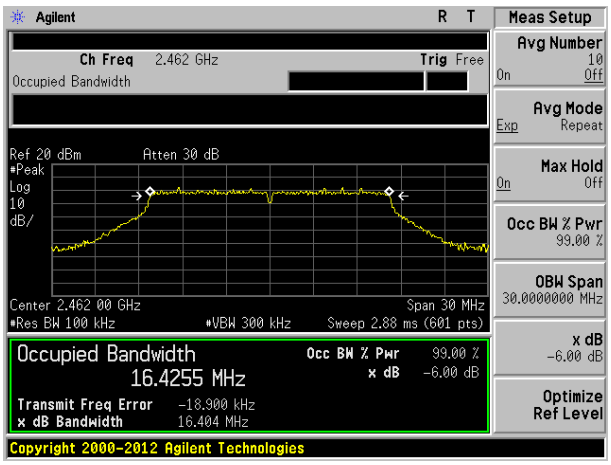
Test mode:	802.11g



Lowest channel

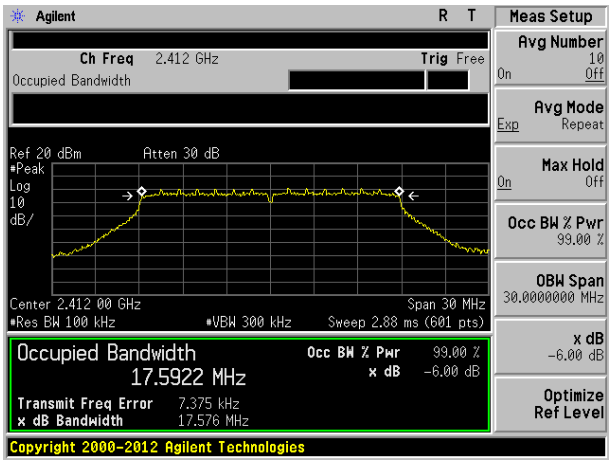


Middle channel

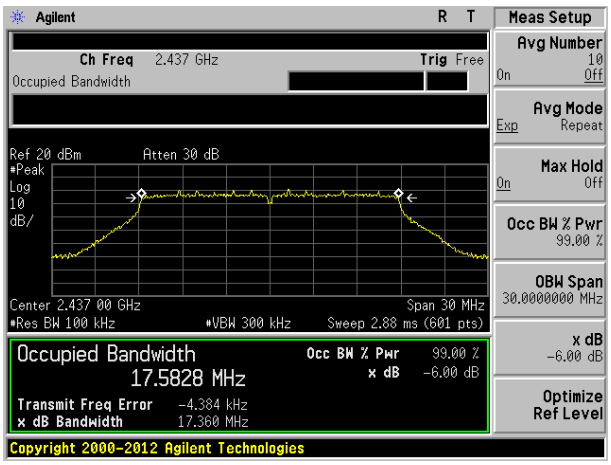


Highest channel

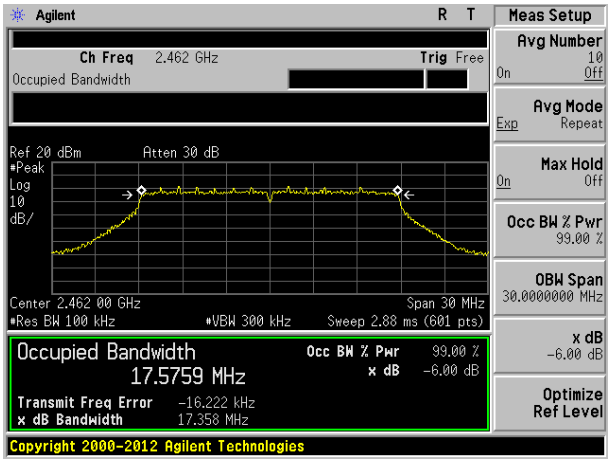
Test mode:	802.11n(HT20)



Lowest channel

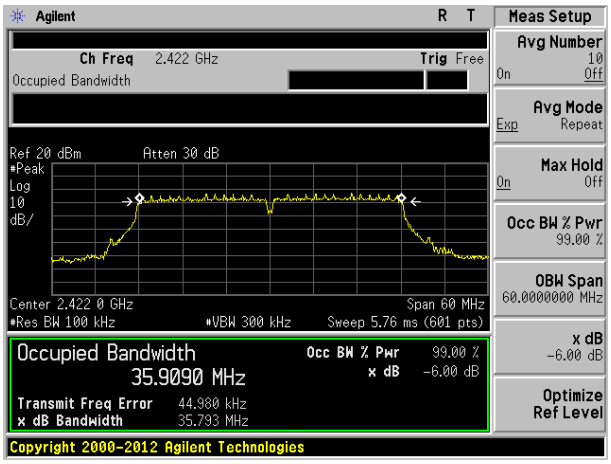


Middle channel

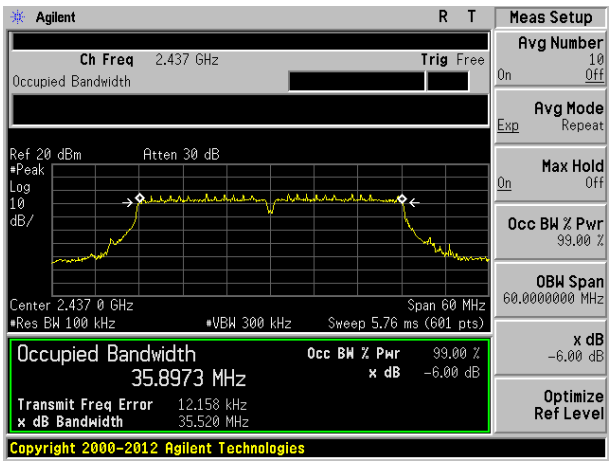


Highest channel

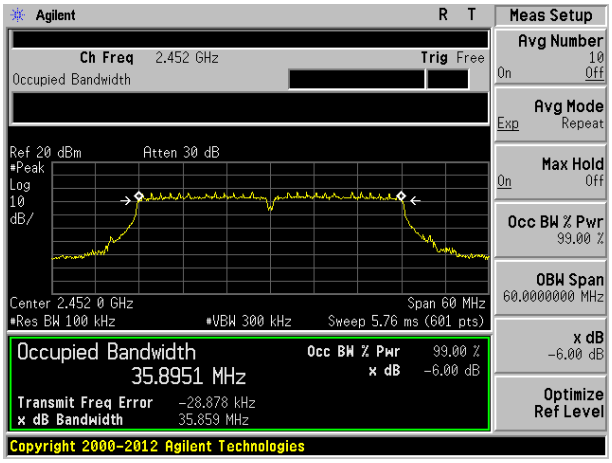
Test mode:	802.11n(HT40)



Lowest channel

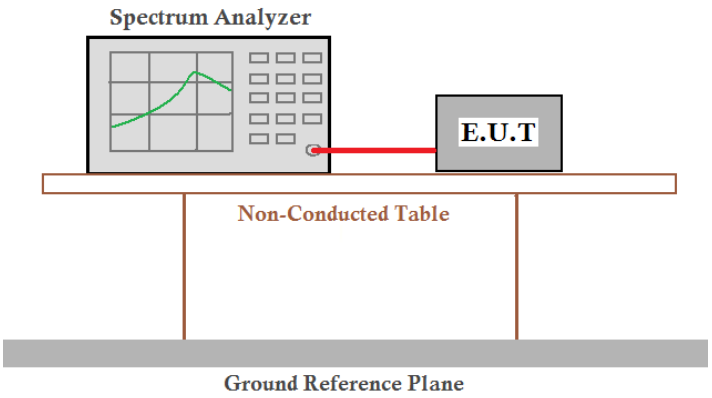


Middle channel



Highest channel

7.5 Power Spectral Density

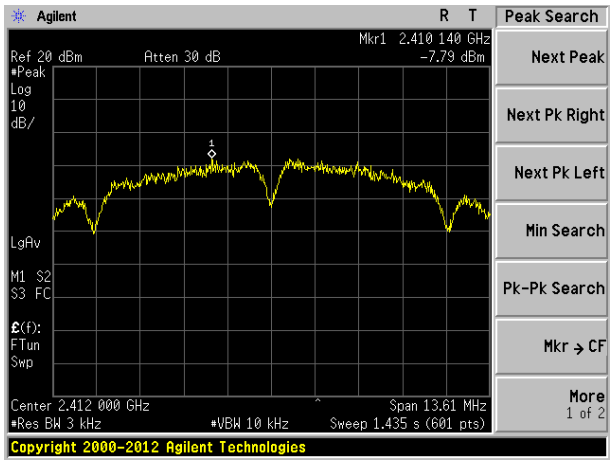
Test Requirement:	FCC Part15 C Section 15.247 (e)
Test Method:	KDB558074 D01 DTS Meas Guidance V04
Limit:	8dBm/3kHz
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data

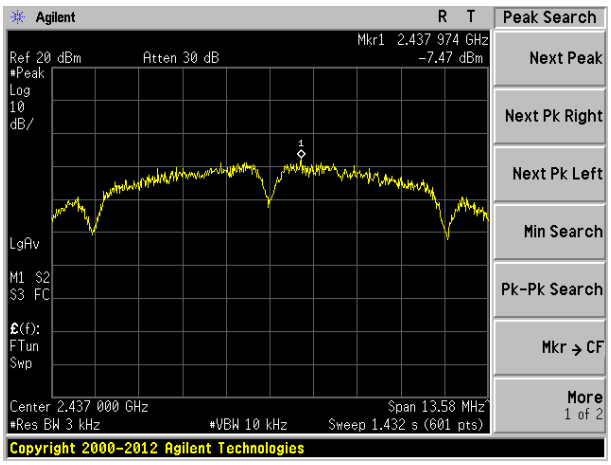
Test CH	Power Spectral Density (dBm)				Limit (dBm/3kHz)	Result
	802.11b	802.11g	802.11n(HT20)	802.11n(HT40)		
Lowest	-7.79	-11.85	-13.67	-17.12	8.00	Pass
Middle	-7.47	-11.92	-13.81	-18.03		
Highest	-7.46	-11.41	-13.22	-17.57		

Test plot as follows:

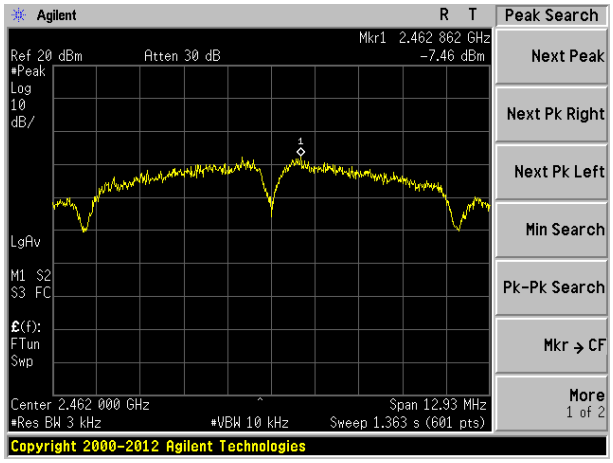
Test mode:	802.11b



Lowest channel

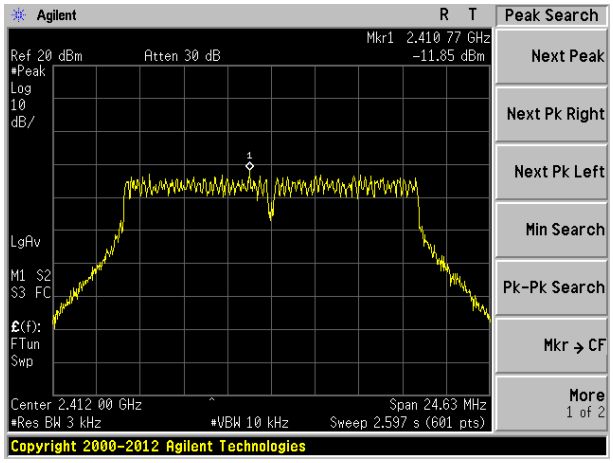


Middle channel

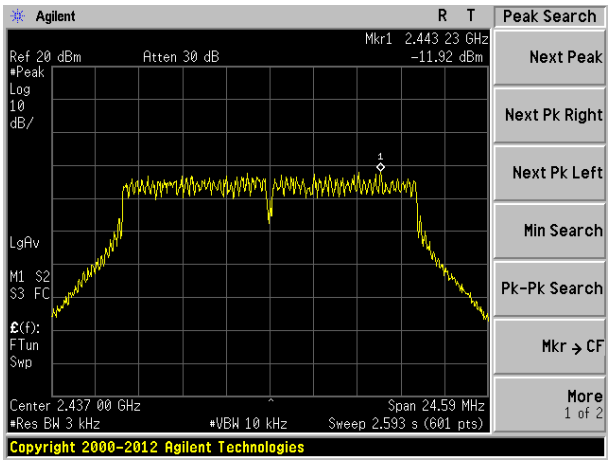


Highest channel

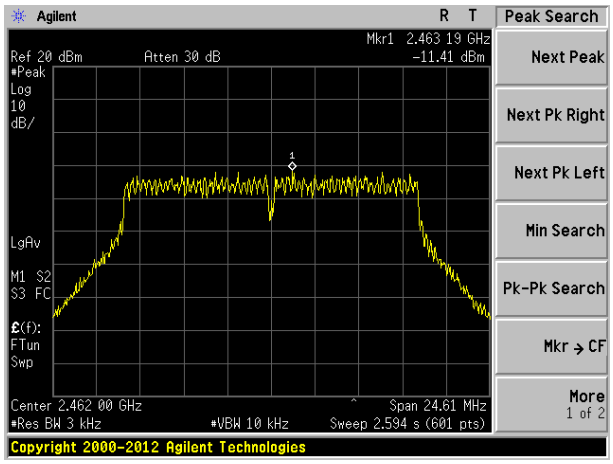
Test mode:	802.11g



Lowest channel

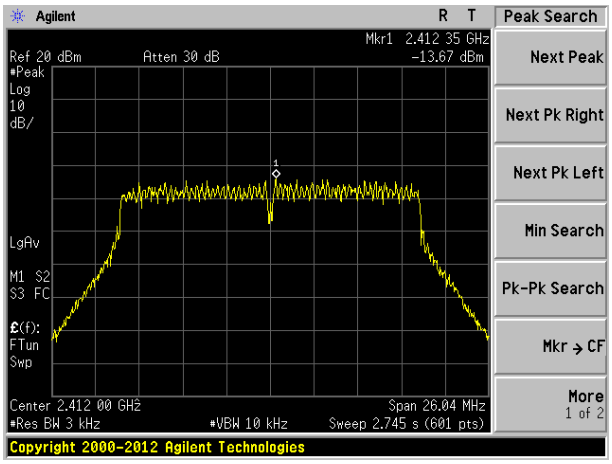


Middle channel

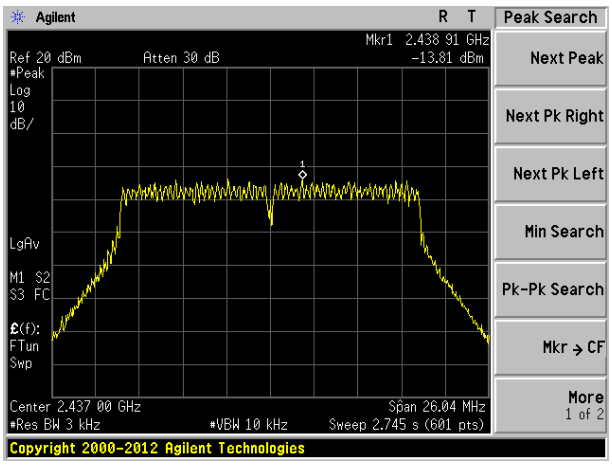


Highest channel

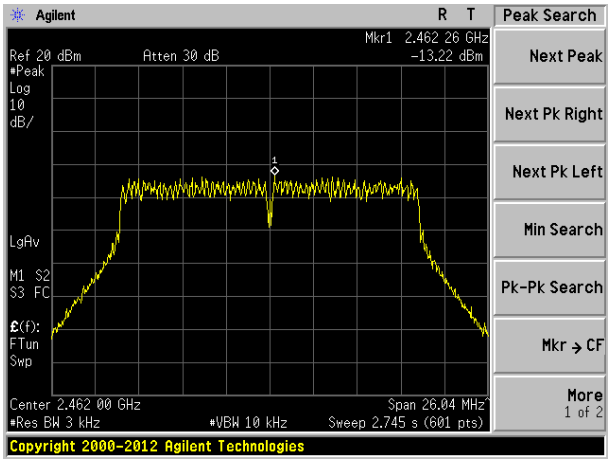
Test mode:	802.11n(HT20)



Lowest channel

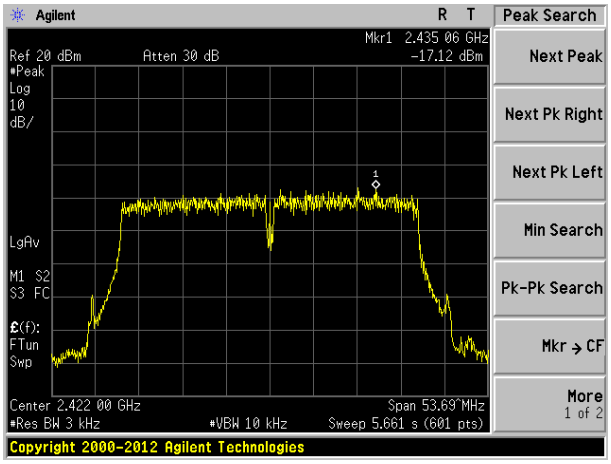


Middle channel

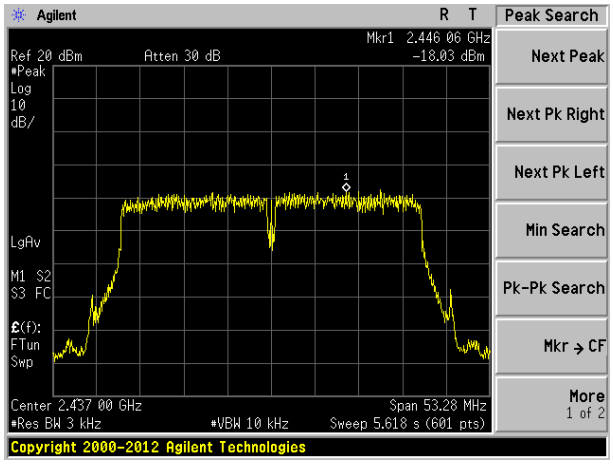


Highest channel

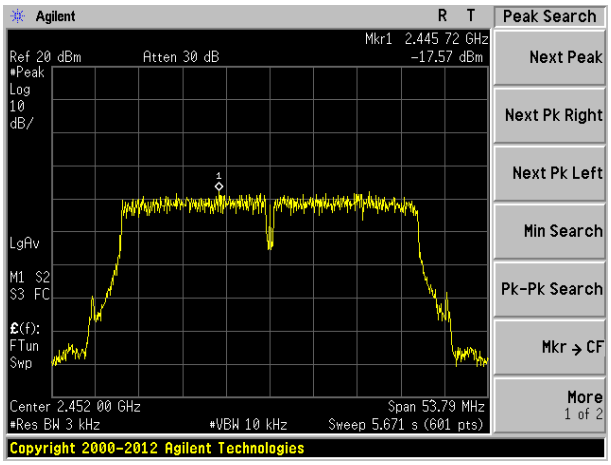
Test mode:	802.11n(HT40)



Lowest channel



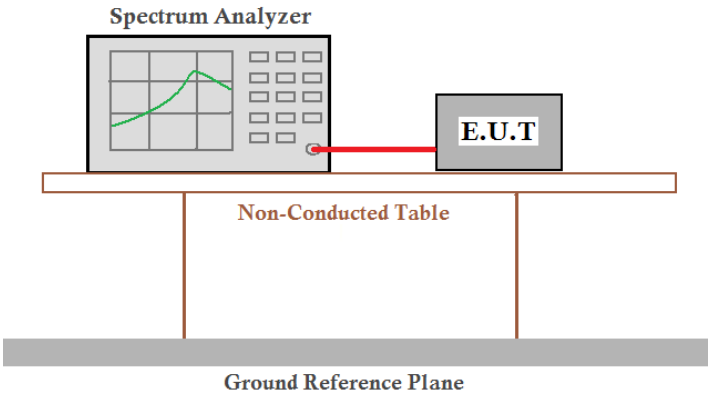
Middle channel



Highest channel

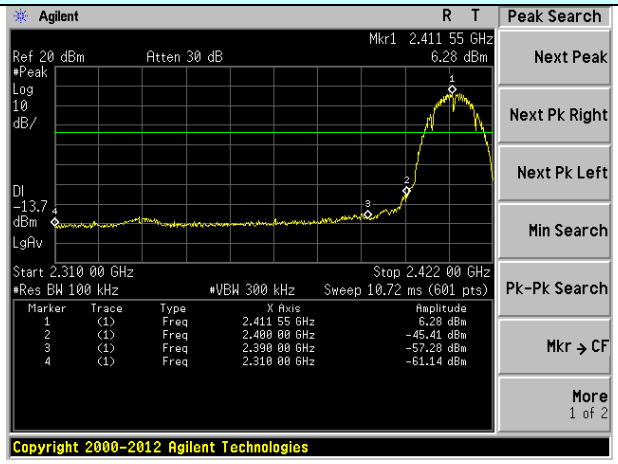
7.6 Band Edges

7.6.1 Conducted Emission Method

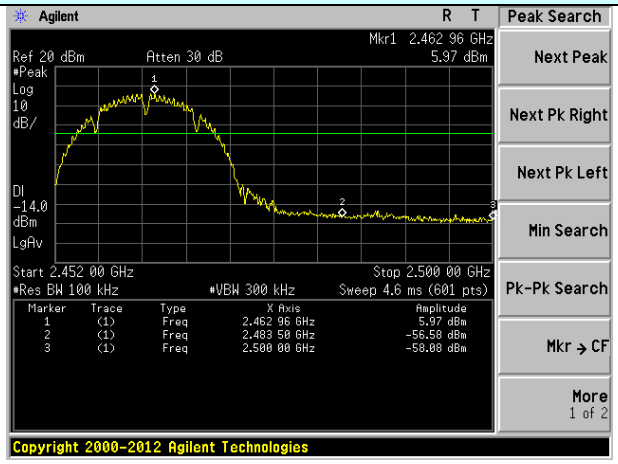
Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	KDB558074 D01 DTS Meas Guidance V04
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Test plot as follows:

Test mode:	802.11b

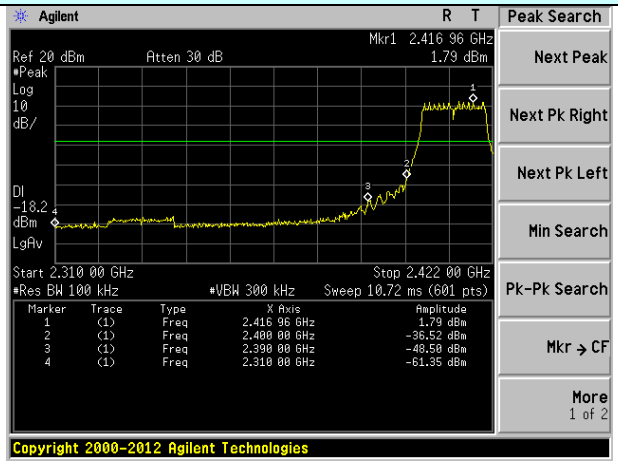


Lowest channel

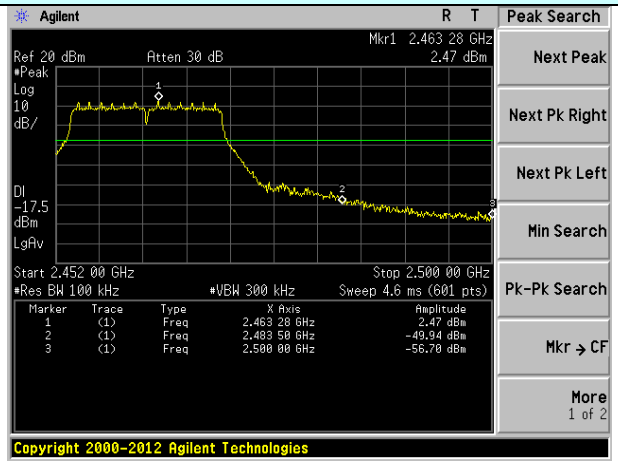


Highest channel

Test mode:	802.11g

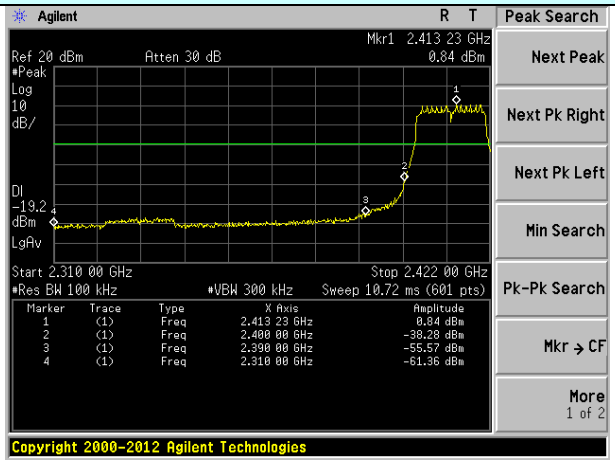


Lowest channel

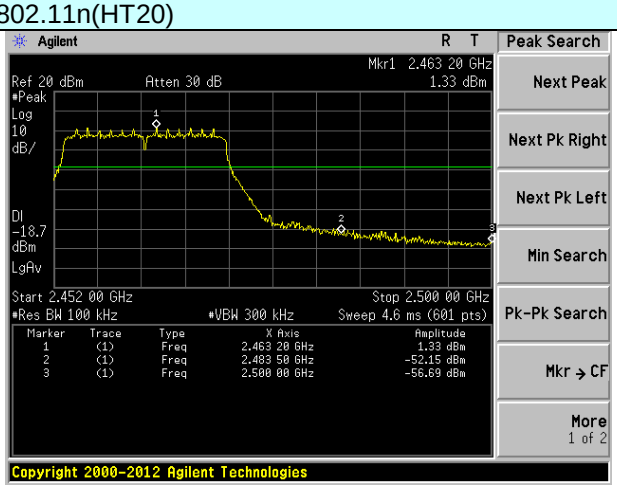


Highest channel

Test mode:	802.11n(HT20)

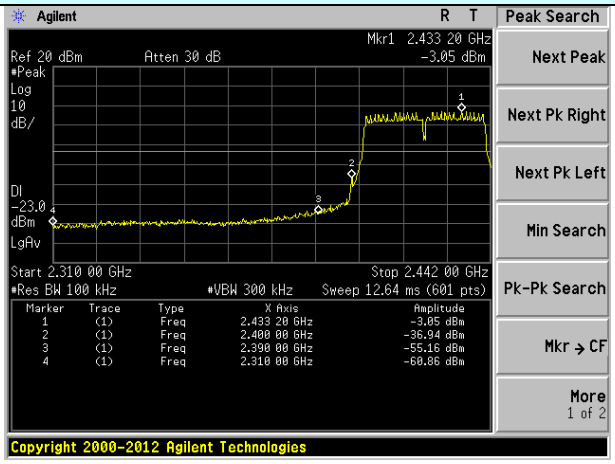


Lowest channel

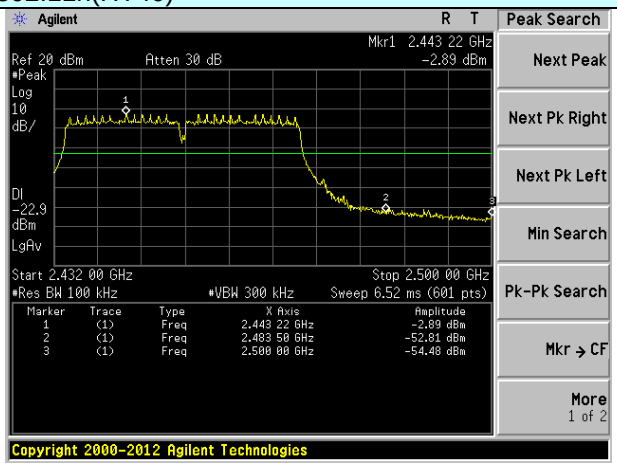


Highest channel

Test mode:	802.11n(HT40)



Lowest channel



Highest channel

7.6.2 Radiated Emission Method

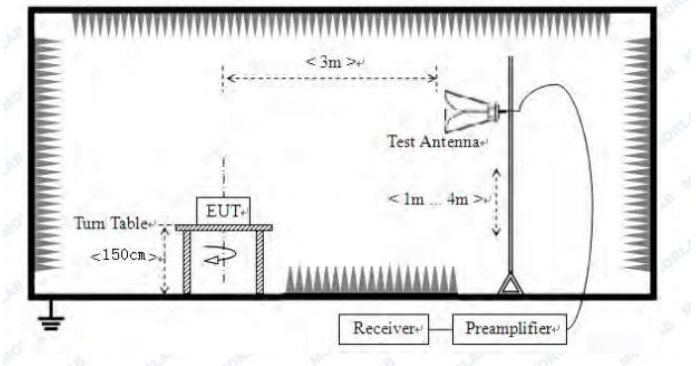
Test Requirement:	FCC Part15 C Section 15.209 and 15.205
Test Method:	ANSI C63.10:2013
Test Frequency Range:	All of the restrict bands were tested, only the worst band's (2310MHz to 2500MHz) data was showed.
Test site:	Measurement Distance: 3m
Receiver setup:	

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:

1. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
7. The radiation measurements are performed in X, Y, Z axis positioning. And found the Y axis positioning which it is worse case, only the test worst case mode is recorded in the report.

Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement data:

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

Test mode:	802.11b	Test channel:	Lowest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2390.00	51.51	27.59	5.38	34.01	50.47	74.00	-23.53	Horizontal
2400.00	60.48	27.58	5.39	34.01	59.44	74.00	-14.56	Horizontal
2390.00	53.19	27.59	5.38	34.01	52.15	74.00	-21.85	Vertical
2400.00	62.24	27.58	5.39	34.01	61.20	74.00	-12.80	Vertical

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2390.00	38.31	27.59	5.38	34.01	37.27	54.00	-16.73	Horizontal
2400.00	46.59	27.58	5.39	34.01	45.55	54.00	-8.45	Horizontal
2390.00	40.12	27.59	5.38	34.01	39.08	54.00	-14.92	Vertical
2400.00	47.71	27.58	5.39	34.01	46.67	54.00	-7.33	Vertical

Test mode:	802.11b	Test channel:	Highest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	52.11	27.53	5.47	33.92	51.19	74.00	-22.81	Horizontal
2500.00	47.98	27.55	5.49	29.93	51.09	74.00	-22.91	Horizontal
2483.50	54.34	27.53	5.47	33.92	53.42	74.00	-20.58	Vertical
2500.00	50.47	27.55	5.49	29.93	53.58	74.00	-20.42	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	38.66	27.53	5.47	33.92	37.74	54.00	-16.26	Horizontal
2500.00	34.79	27.55	5.49	29.93	37.90	54.00	-16.10	Horizontal
2483.50	40.59	27.53	5.47	33.92	39.67	54.00	-14.33	Vertical
2500.00	36.66	27.55	5.49	29.93	39.77	54.00	-14.23	Vertical

Remark:

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

Test mode:	802.11g	Test channel:	Lowest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2390.00	50.50	27.59	5.38	34.01	49.46	74.00	-24.54	Horizontal
2400.00	59.13	27.58	5.39	34.01	58.09	74.00	-15.91	Horizontal
2390.00	52.11	27.59	5.38	34.01	51.07	74.00	-22.93	Vertical
2400.00	60.62	27.58	5.39	34.01	59.58	74.00	-14.42	Vertical

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2390.00	37.60	27.59	5.38	34.01	36.56	54.00	-17.44	Horizontal
2400.00	45.77	27.58	5.39	34.01	44.73	54.00	-9.27	Horizontal
2390.00	39.32	27.59	5.38	34.01	38.28	54.00	-15.72	Vertical
2400.00	46.80	27.58	5.39	34.01	45.76	54.00	-8.24	Vertical

Test mode:	802.11g	Test channel:	Highest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	50.67	27.53	5.47	33.92	49.75	74.00	-24.25	Horizontal
2500.00	46.86	27.55	5.49	29.93	49.97	74.00	-24.03	Horizontal
2483.50	52.69	27.53	5.47	33.92	51.77	74.00	-22.23	Vertical
2500.00	49.16	27.55	5.49	29.93	52.27	74.00	-21.73	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	37.79	27.53	5.47	33.92	36.87	54.00	-17.13	Horizontal
2500.00	34.11	27.55	5.49	29.93	37.22	54.00	-16.78	Horizontal
2483.50	39.63	27.53	5.47	33.92	38.71	54.00	-15.29	Vertical
2500.00	35.94	27.55	5.49	29.93	39.05	54.00	-14.95	Vertical

Remark:

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

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

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2390.00	50.52	27.59	5.38	34.01	49.48	74.00	-24.52	Horizontal
2400.00	59.15	27.58	5.39	34.01	58.11	74.00	-15.89	Horizontal
2390.00	52.12	27.59	5.38	34.01	51.08	74.00	-22.92	Vertical
2400.00	60.64	27.58	5.39	34.01	59.60	74.00	-14.40	Vertical

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2390.00	37.61	27.59	5.38	34.01	36.57	54.00	-17.43	Horizontal
2400.00	45.78	27.58	5.39	34.01	44.74	54.00	-9.26	Horizontal
2390.00	39.34	27.59	5.38	34.01	38.30	54.00	-15.70	Vertical
2400.00	46.82	27.58	5.39	34.01	45.78	54.00	-8.22	Vertical

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

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	50.69	27.53	5.47	33.92	49.77	74.00	-24.23	Horizontal
2500.00	46.88	27.55	5.49	29.93	49.99	74.00	-24.01	Horizontal
2483.50	52.72	27.53	5.47	33.92	51.80	74.00	-22.20	Vertical
2500.00	49.18	27.55	5.49	29.93	52.29	74.00	-21.71	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	37.80	27.53	5.47	33.92	36.88	54.00	-17.12	Horizontal
2500.00	34.12	27.55	5.49	29.93	37.23	54.00	-16.77	Horizontal
2483.50	39.65	27.53	5.47	33.92	38.73	54.00	-15.27	Vertical
2500.00	35.95	27.55	5.49	29.93	39.06	54.00	-14.94	Vertical

Remark:

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

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

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2390.00	49.46	27.59	5.38	34.01	48.42	74.00	-25.58	Horizontal
2400.00	57.73	27.58	5.39	34.01	56.69	74.00	-17.31	Horizontal
2390.00	50.98	27.59	5.38	34.01	49.94	74.00	-24.06	Vertical
2400.00	58.94	27.58	5.39	34.01	57.90	74.00	-16.10	Vertical

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2390.00	36.85	27.59	5.38	34.01	35.81	54.00	-18.19	Horizontal
2400.00	44.91	27.58	5.39	34.01	43.87	54.00	-10.13	Horizontal
2390.00	38.49	27.59	5.38	34.01	37.45	54.00	-16.55	Vertical
2400.00	45.86	27.58	5.39	34.01	44.82	54.00	-9.18	Vertical

Test mode:	802.11n(HT40)	Test channel:	Highest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	49.17	27.53	5.47	33.92	48.25	74.00	-25.75	Horizontal
2500.00	45.70	27.55	5.49	29.93	48.81	74.00	-25.19	Horizontal
2483.50	50.98	27.53	5.47	33.92	50.06	74.00	-23.94	Vertical
2500.00	47.80	27.55	5.49	29.93	50.91	74.00	-23.09	Vertical

Average value:

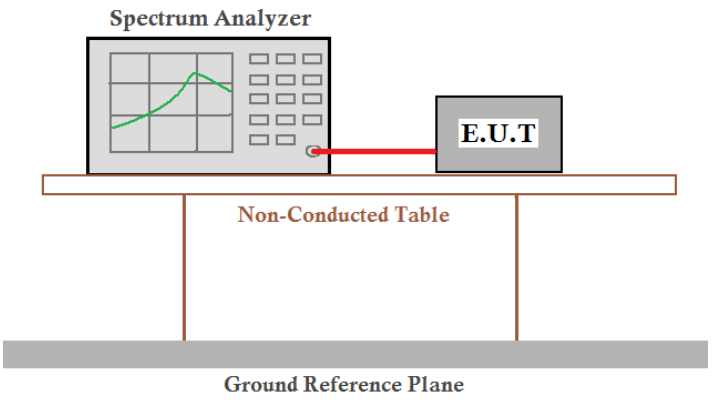
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	36.88	27.53	5.47	33.92	35.96	54.00	-18.04	Horizontal
2500.00	33.40	27.55	5.49	29.93	36.51	54.00	-17.49	Horizontal
2483.50	38.63	27.53	5.47	33.92	37.71	54.00	-16.29	Vertical
2500.00	35.20	27.55	5.49	29.93	38.31	54.00	-15.69	Vertical

Remark:

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

7.7 Spurious Emission

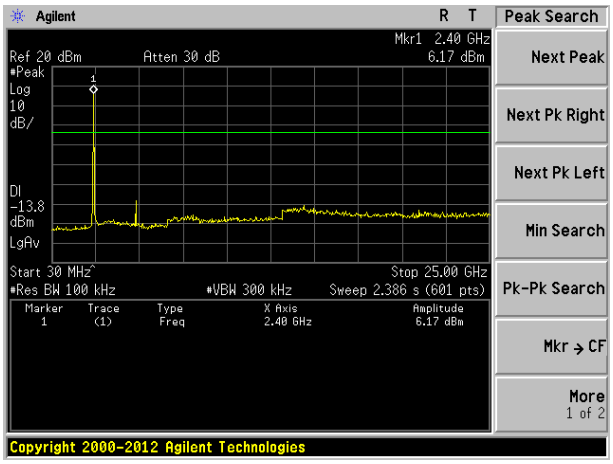
7.7.1 Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	KDB558074 D01 DTS Meas Guidance V04
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Test plot as follows:

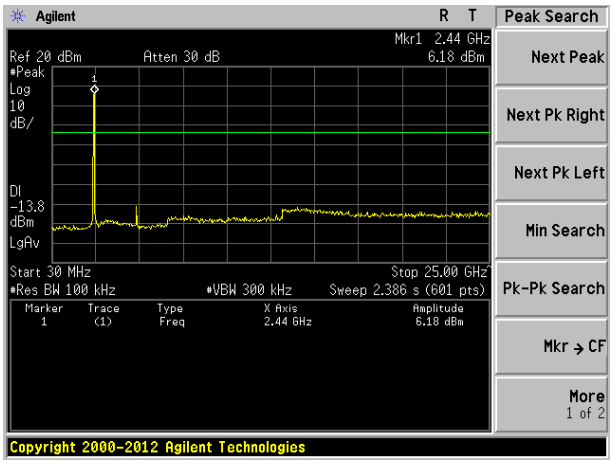
Test mode:	802.11b

Lowest channel



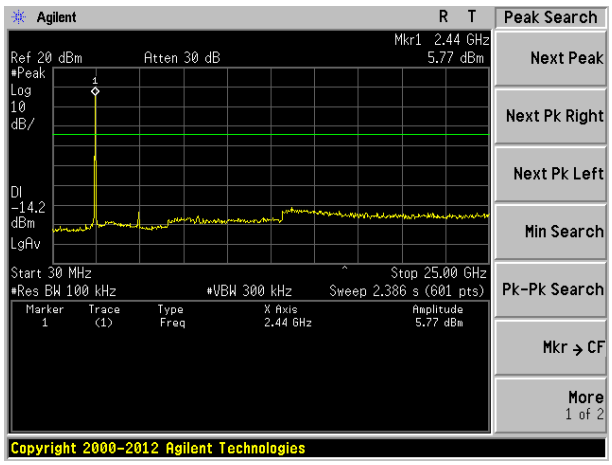
30MHz~25GHz

Middle channel



30MHz~25GHz

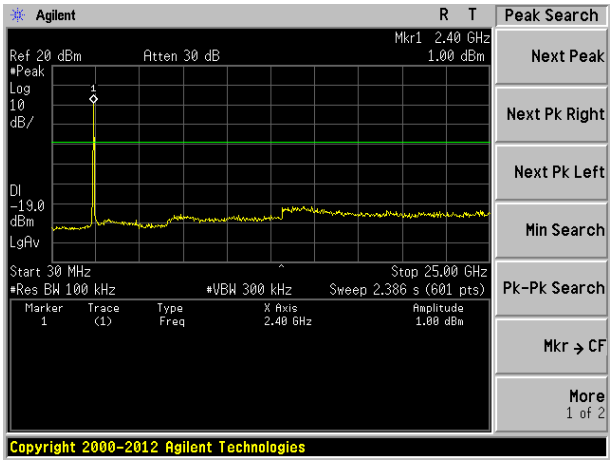
Highest channel



30MHz~25GHz

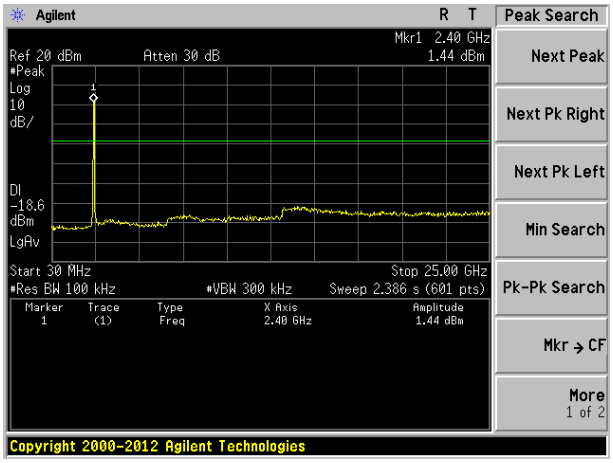
Test mode:	802.11g

Lowest channel



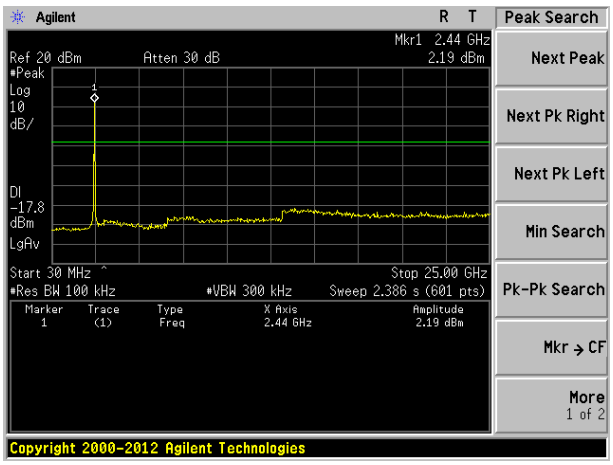
30MHz~25GHz

Middle channel



30MHz~25GHz

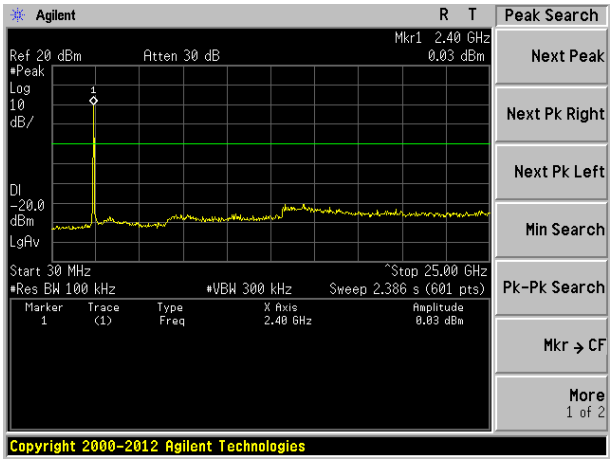
Highest channel



30MHz~25GHz

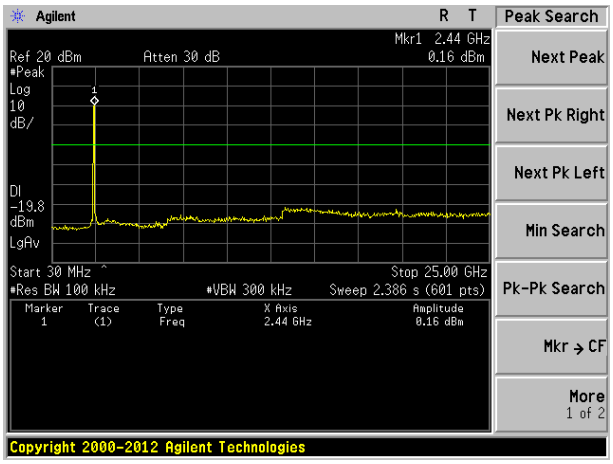
Test mode:	802.11n(HT20)

Lowest channel



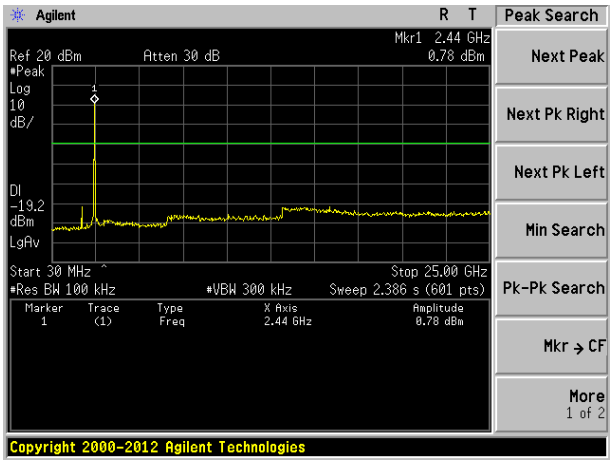
30MHz~25GHz

Middle channel



30MHz~25GHz

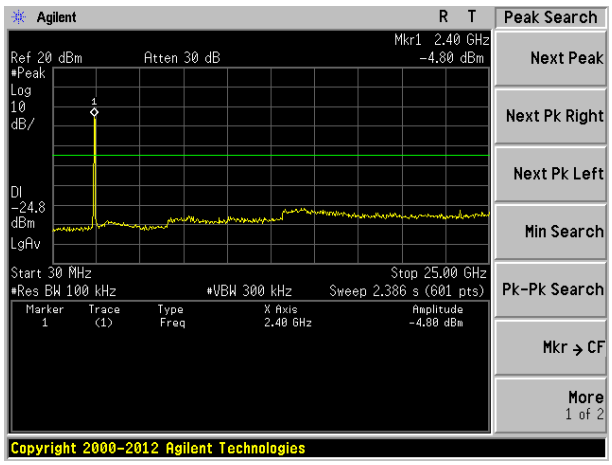
Highest channel



30MHz~25GHz

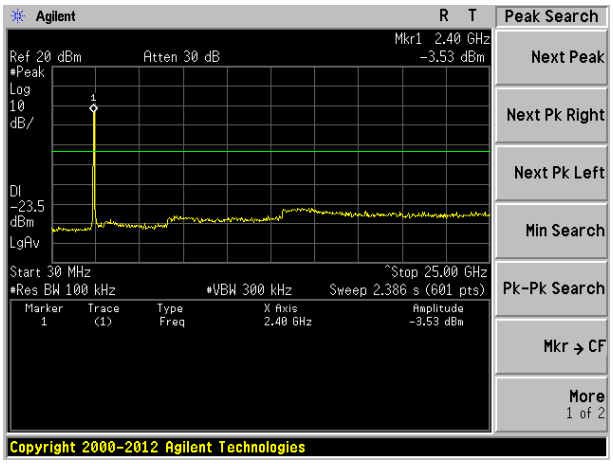
Test mode:	802.11n(HT40)

Lowest channel



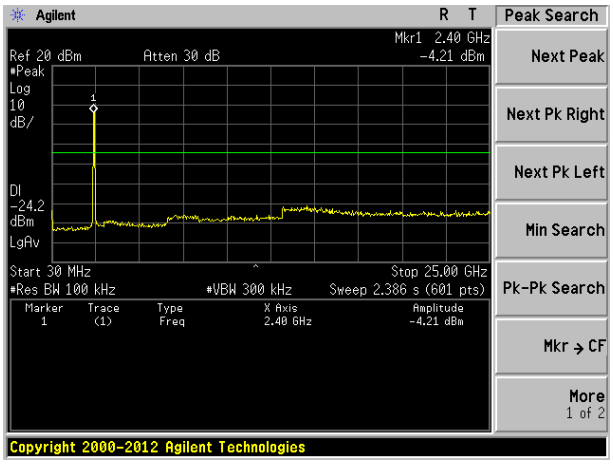
30MHz~25GHz

Middle channel



30MHz~25GHz

Highest channel



30MHz~25GHz

7.7.2 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209
Test Method:	ANSI C63.10:2013
Test Frequency Range:	9kHz to 25GHz
Test site:	Measurement Distance: 3m

Receiver setup:

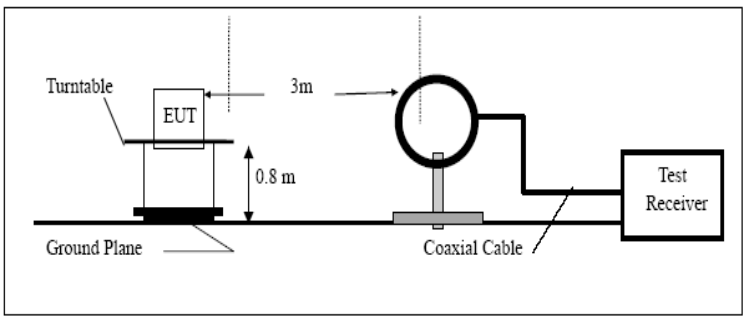
Frequency	Detector	RBW	VBW	Value
9KHz-150KHz	Quasi-peak	200Hz	600Hz	Quasi-peak
150KHz-30MHz	Quasi-peak	9KHz	30KHz	Quasi-peak
30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak
Above 1GHz	Peak	1MHz	3MHz	Peak
	Peak	1MHz	10Hz	Average

Limit:

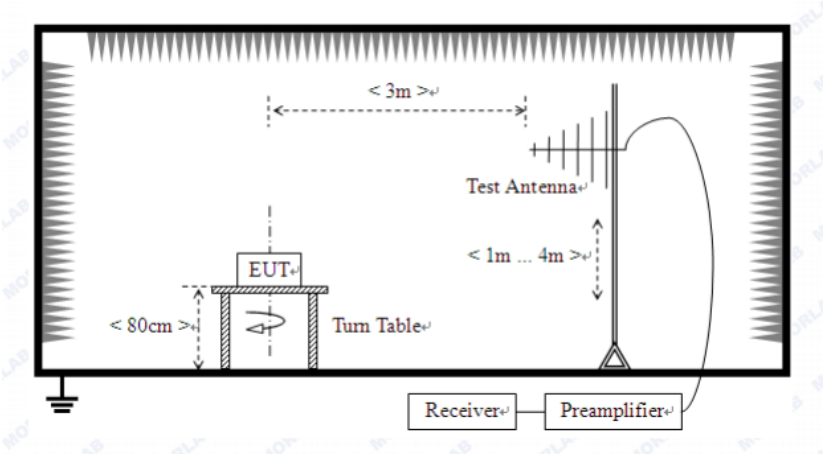
Frequency	Limit (uV/m)	Value	Measurement Distance
0.009MHz-0.490MHz	2400/F(KHz)	QP	300m
0.490MHz-1.705MHz	24000/F(KHz)	QP	300m
1.705MHz-30MHz	30	QP	30m
30MHz-88MHz	100	QP	3m
88MHz-216MHz	150	QP	
216MHz-960MHz	200	QP	
960MHz-1GHz	500	QP	
Above 1GHz	500	Average	
	5000	Peak	

Test setup:

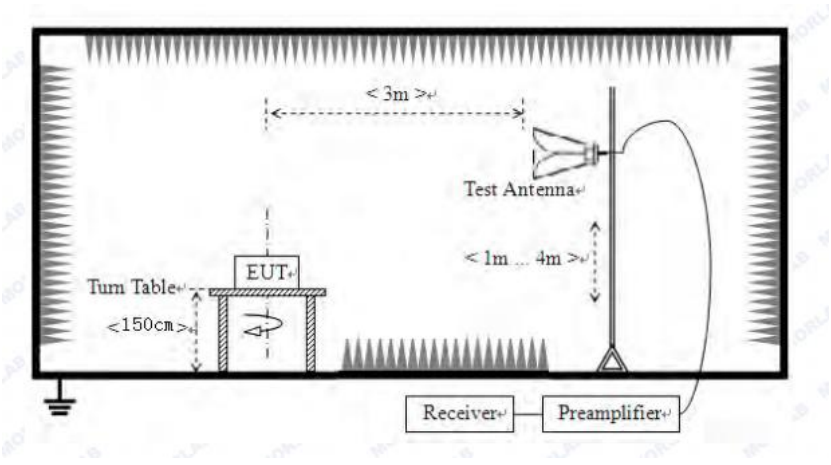
Below 30MHz



Below 1GHz


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

Above 1GHz


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

Test Procedure:	1. The EUT was placed on the top of a rotating table (0.8m for below 1G and 1.5m for above 1G) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test 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.

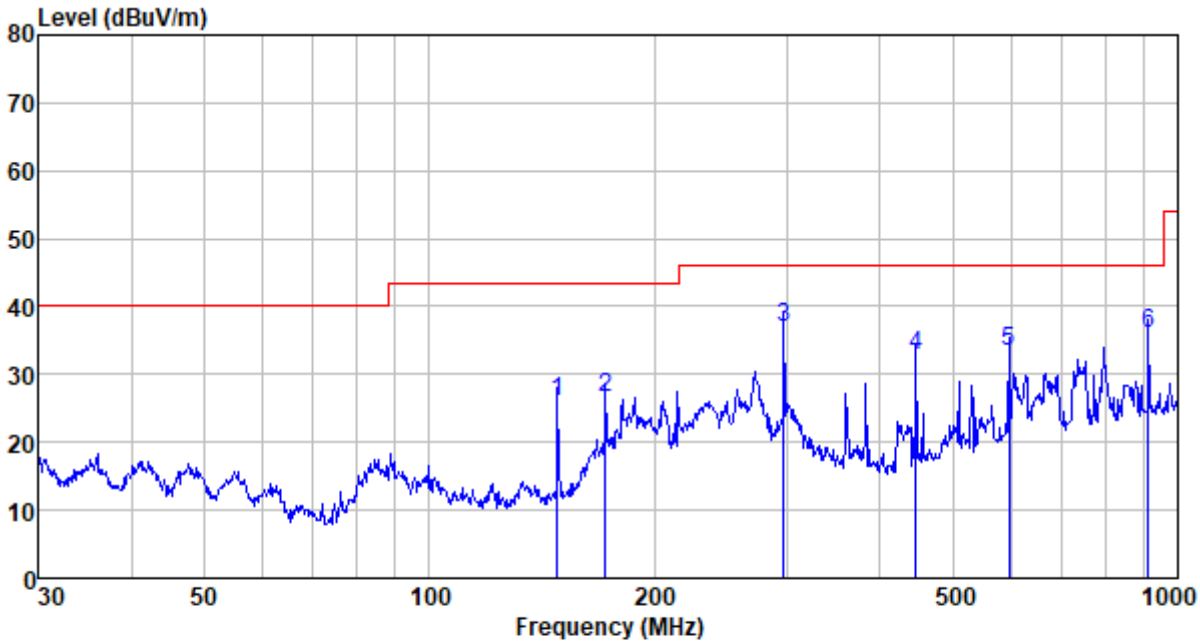
Measurement data:

■ **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.

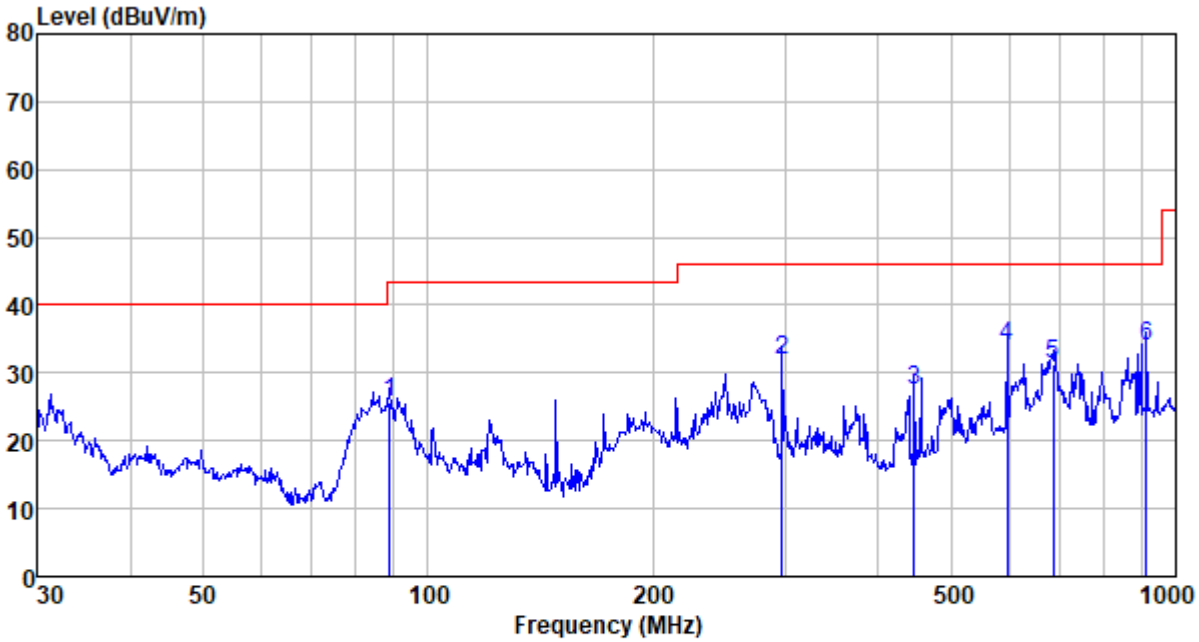
■ **Below 1GHz**

Horizontal:



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
148.441	53.86	7.57	1.56	37.07	25.92	43.50	-17.58	QP
171.995	53.57	8.57	1.70	37.20	26.64	43.50	-16.86	QP
297.224	58.58	13.53	2.35	37.42	37.04	46.00	-8.96	QP
446.414	50.79	16.28	3.07	37.52	32.62	46.00	-13.38	QP
595.133	47.89	19.39	3.70	37.54	33.44	46.00	-12.56	QP
912.862	46.38	22.35	4.90	37.59	36.04	46.00	-9.96	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
88.964	50.93	10.32	1.10	36.63	25.72	43.50	-17.78	QP
297.224	53.48	13.53	2.35	37.42	31.94	46.00	-14.06	QP
446.414	45.59	16.28	3.07	37.52	27.42	46.00	-18.58	QP
595.133	48.28	19.39	3.70	37.54	33.83	46.00	-12.17	QP
684.745	45.25	19.58	4.04	37.62	31.25	46.00	-14.75	QP
912.862	44.42	22.35	4.90	37.59	34.08	46.00	-11.92	QP

■ **Above 1GHz**

Test mode:	802.11b	Test channel:	Lowest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4824.00	39.61	31.79	8.62	32.10	47.92	74.00	-26.08	Vertical
7236.00	33.79	36.19	11.68	31.97	49.69	74.00	-24.31	Vertical
9648.00	32.41	38.07	14.16	31.56	53.08	74.00	-20.92	Vertical
12060.00	*					74.00		Vertical
14472.00	*					74.00		Vertical
16884.00	*					74.00		Vertical
4824.00	38.39	31.79	8.62	32.10	46.70	74.00	-27.30	Horizontal
7236.00	33.59	36.19	11.68	31.97	49.49	74.00	-24.51	Horizontal
9648.00	32.01	38.07	14.16	31.56	52.68	74.00	-21.32	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	28.75	31.79	8.62	32.10	37.06	54.00	-16.94	Vertical
7236.00	22.67	36.19	11.68	31.97	38.57	54.00	-15.43	Vertical
9648.00	22.76	38.07	14.16	31.56	43.43	54.00	-10.57	Vertical
12060.00	*					54.00		Vertical
14472.00	*					54.00		Vertical
16884.00	*					54.00		Vertical
4824.00	27.96	31.79	8.62	32.10	36.27	54.00	-17.73	Horizontal
7236.00	22.18	36.19	11.68	31.97	38.08	54.00	-15.92	Horizontal
9648.00	21.77	38.07	14.16	31.56	42.44	54.00	-11.56	Horizontal
12060.00	*					54.00		Horizontal
14472.00	*					54.00		Horizontal
16884.00	*					54.00		Horizontal

Remark:

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

Test mode:	802.11b	Test channel:	Middle

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4874.00	38.79	31.85	8.66	32.12	47.18	74.00	-26.82	Vertical
7311.00	33.93	36.37	11.71	31.91	50.10	74.00	-23.90	Vertical
9748.00	33.48	38.27	14.25	31.56	54.44	74.00	-19.56	Vertical
12185.00	*					74.00		Vertical
14622.00	*					74.00		Vertical
17059.00	*					74.00		Vertical
4874.00	39.35	31.85	8.66	32.12	47.74	74.00	-26.26	Horizontal
7311.00	32.62	36.37	11.71	31.91	48.79	74.00	-25.21	Horizontal
9748.00	33.39	38.27	14.25	31.56	54.35	74.00	-19.65	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	29.68	31.85	8.66	32.12	38.07	54.00	-15.93	Vertical
7311.00	22.26	36.37	11.71	31.91	38.43	54.00	-15.57	Vertical
9748.00	22.74	38.27	14.25	31.56	43.70	54.00	-10.30	Vertical
12185.00	*					54.00		Vertical
14622.00	*					54.00		Vertical
17059.00	*					54.00		Vertical
4874.00	29.50	31.85	8.66	32.12	37.89	54.00	-16.11	Horizontal
7311.00	21.72	36.37	11.71	31.91	37.89	54.00	-16.11	Horizontal
9748.00	23.11	38.27	14.25	31.56	44.07	54.00	-9.93	Horizontal
12185.00	*					54.00		Horizontal
14622.00	*					54.00		Horizontal
17059.00	*					54.00		Horizontal

Remark:

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

Test mode:	802.11b	Test channel:	Highest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4924.00	43.91	31.90	8.70	32.15	52.36	74.00	-21.64	Vertical
7386.00	34.35	36.49	11.76	31.83	50.77	74.00	-23.23	Vertical
9848.00	36.59	38.62	14.31	31.77	57.75	74.00	-16.25	Vertical
12310.00	*					74.00		Vertical
14772.00	*					74.00		Vertical
17234.00	*					74.00		Vertical
4924.00	43.37	31.90	8.70	32.15	51.82	74.00	-22.18	Horizontal
7386.00	33.33	36.49	11.76	31.83	49.75	74.00	-24.25	Horizontal
9848.00	32.79	38.62	14.31	31.77	53.95	74.00	-20.05	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	34.90	31.90	8.70	32.15	43.35	54.00	-10.65	Vertical
7386.00	24.29	36.49	11.76	31.83	40.71	54.00	-13.29	Vertical
9848.00	25.11	38.62	14.31	31.77	46.27	54.00	-7.73	Vertical
12310.00	*					54.00		Vertical
14772.00	*					54.00		Vertical
17234.00	*					54.00		Vertical
4924.00	33.78	31.90	8.70	32.15	42.23	54.00	-11.77	Horizontal
7386.00	22.73	36.49	11.76	31.83	39.15	54.00	-14.85	Horizontal
9848.00	22.07	38.62	14.31	31.77	43.23	54.00	-10.77	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.*

Test mode:	802.11g	Test channel:	lowest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4824.00	38.75	31.79	8.62	32.10	47.06	74.00	-26.94	Vertical
7236.00	33.24	36.19	11.68	31.97	49.14	74.00	-24.86	Vertical
9648.00	32.02	38.07	14.16	31.56	52.69	74.00	-21.31	Vertical
12060.00	*					74.00		Vertical
14472.00	*					74.00		Vertical
16884.00	*					74.00		Vertical
4824.00	37.66	31.79	8.62	32.10	45.97	74.00	-28.03	Horizontal
7236.00	33.12	36.19	11.68	31.97	49.02	74.00	-24.98	Horizontal
9648.00	31.65	38.07	14.16	31.56	52.32	74.00	-21.68	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	27.96	31.79	8.62	32.10	36.27	54.00	-17.73	Vertical
7236.00	22.14	36.19	11.68	31.97	38.04	54.00	-15.96	Vertical
9648.00	22.39	38.07	14.16	31.56	43.06	54.00	-10.94	Vertical
12060.00	*					54.00		Vertical
14472.00	*					54.00		Vertical
16884.00	*					54.00		Vertica
4824.00	27.28	31.79	8.62	32.10	35.59	54.00	-18.41	Horizontal
7236.00	21.72	36.19	11.68	31.97	37.62	54.00	-16.38	Horizontal
9648.00	21.42	38.07	14.16	31.56	42.09	54.00	-11.91	Horizontal
12060.00	*					54.00		Horizontal
14472.00	*					54.00		Horizontal
16884.00	*					54.00		Horizontal

Remark:

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

Test mode:	802.11g	Test channel:	Middle

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4874.00	38.08	31.85	8.66	32.12	46.47	74.00	-27.53	Vertical
7311.00	33.48	36.37	11.71	31.91	49.65	74.00	-24.35	Vertical
9748.00	33.16	38.27	14.25	31.56	54.12	74.00	-19.88	Vertical
12185.00	*					74.00		Vertical
14622.00	*					74.00		Vertical
17059.00	*					74.00		Vertical
4874.00	38.75	31.85	8.66	32.12	47.14	74.00	-26.86	Horizontal
7311.00	32.23	36.37	11.71	31.91	48.40	74.00	-25.60	Horizontal
9748.00	33.09	38.27	14.25	31.56	54.05	74.00	-19.95	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	29.03	31.85	8.66	32.12	37.42	54.00	-16.58	Vertical
7311.00	21.83	36.37	11.71	31.91	38.00	54.00	-16.00	Vertical
9748.00	22.43	38.27	14.25	31.56	43.39	54.00	-10.61	Vertical
12185.00	*					54.00		Vertical
14622.00	*					54.00		Vertical
17059.00	*					54.00		Vertical
4874.00	28.93	31.85	8.66	32.12	37.32	54.00	-16.68	Horizontal
7311.00	21.33	36.37	11.71	31.91	37.50	54.00	-16.50	Horizontal
9748.00	22.82	38.27	14.25	31.56	43.78	54.00	-10.22	Horizontal
12185.00	*					54.00		Horizontal
14622.00	*					54.00		Horizontal
17059.00	*					54.00		Horizontal

Remark:

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

Test mode:	802.11g	Test channel:	Highest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4924.00	42.68	31.90	8.70	32.15	51.13	74.00	-22.87	Vertical
7386.00	33.58	36.49	11.76	31.83	50.00	74.00	-24.00	Vertical
9848.00	36.04	38.62	14.31	31.77	57.20	74.00	-16.80	Vertical
12310.00	*					74.00		Vertical
14772.00	*					74.00		Vertical
17234.00	*					74.00		Vertical
4924.00	42.33	31.90	8.70	32.15	50.78	74.00	-23.22	Horizontal
7386.00	32.65	36.49	11.76	31.83	49.07	74.00	-24.93	Horizontal
9848.00	32.28	38.62	14.31	31.77	53.44	74.00	-20.56	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	33.77	31.90	8.70	32.15	42.22	54.00	-11.78	Vertical
7386.00	23.54	36.49	11.76	31.83	39.96	54.00	-14.04	Vertical
9848.00	24.58	38.62	14.31	31.77	45.74	54.00	-8.26	Vertical
12310.00	*					54.00		Vertical
14772.00	*					54.00		Vertical
17234.00	*					54.00		Vertical
4924.00	32.81	31.90	8.70	32.15	41.26	54.00	-12.74	Horizontal
7386.00	22.08	36.49	11.76	31.83	38.50	54.00	-15.50	Horizontal
9848.00	21.58	38.62	14.31	31.77	42.74	54.00	-11.26	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.*

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

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4824.00	38.47	31.79	8.62	32.10	46.78	74.00	-27.22	Vertical
7236.00	33.07	36.19	11.68	31.97	48.97	74.00	-25.03	Vertical
9648.00	31.89	38.07	14.16	31.56	52.56	74.00	-21.44	Vertical
12060.00	*					74.00		Vertical
14472.00	*					74.00		Vertical
16884.00	*					74.00		Vertical
4824.00	37.42	31.79	8.62	32.10	45.73	74.00	-28.27	Horizontal
7236.00	32.96	36.19	11.68	31.97	48.86	74.00	-25.14	Horizontal
9648.00	31.53	38.07	14.16	31.56	52.20	74.00	-21.80	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	27.70	31.79	8.62	32.10	36.01	54.00	-17.99	Vertical
7236.00	21.97	36.19	11.68	31.97	37.87	54.00	-16.13	Vertical
9648.00	22.27	38.07	14.16	31.56	42.94	54.00	-11.06	Vertical
12060.00	*					54.00		Vertical
14472.00	*					54.00		Vertical
16884.00	*					54.00		Vertical
4824.00	27.06	31.79	8.62	32.10	35.37	54.00	-18.63	Horizontal
7236.00	21.57	36.19	11.68	31.97	37.47	54.00	-16.53	Horizontal
9648.00	21.31	38.07	14.16	31.56	41.98	54.00	-12.02	Horizontal
12060.00	*					54.00		Horizontal
14472.00	*					54.00		Horizontal
16884.00	*					54.00		Horizontal

Remark:

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

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

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4874.00	37.84	31.85	8.66	32.12	46.23	74.00	-27.77	Vertical
7311.00	33.34	36.37	11.71	31.91	49.51	74.00	-24.49	Vertical
9748.00	33.05	38.27	14.25	31.56	54.01	74.00	-19.99	Vertical
12185.00	*					74.00		Vertical
14622.00	*					74.00		Vertical
17059.00	*					74.00		Vertical
4874.00	38.56	31.85	8.66	32.12	46.95	74.00	-27.05	Horizontal
7311.00	32.10	36.37	11.71	31.91	48.27	74.00	-25.73	Horizontal
9748.00	32.99	38.27	14.25	31.56	53.95	74.00	-20.05	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	28.81	31.85	8.66	32.12	37.20	54.00	-16.80	Vertical
7311.00	21.69	36.37	11.71	31.91	37.86	54.00	-16.14	Vertical
9748.00	22.33	38.27	14.25	31.56	43.29	54.00	-10.71	Vertical
12185.00	*					54.00		Vertical
14622.00	*					54.00		Vertical
17059.00	*					54.00		Vertical
4874.00	28.75	31.85	8.66	32.12	37.14	54.00	-16.86	Horizontal
7311.00	21.21	36.37	11.71	31.91	37.38	54.00	-16.62	Horizontal
9748.00	22.73	38.27	14.25	31.56	43.69	54.00	-10.31	Horizontal
12185.00	*					54.00		Horizontal
14622.00	*					54.00		Horizontal
17059.00	*					54.00		Horizontal

Remark:

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

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

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4924.00	42.28	31.90	8.70	32.15	50.73	74.00	-23.27	4924.00
7386.00	33.32	36.49	11.76	31.83	49.74	74.00	-24.26	7386.00
9848.00	35.85	38.62	14.31	31.77	57.01	74.00	-16.99	9848.00
12310.00	*					74.00		Vertical
14772.00	*					74.00		Vertical
17234.00	*					74.00		Vertical
4924.00	41.99	31.90	8.70	32.15	50.44	74.00	-23.56	Horizontal
7386.00	32.43	36.49	11.76	31.83	48.85	74.00	-25.15	Horizontal
9848.00	32.12	38.62	14.31	31.77	53.28	74.00	-20.72	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	33.40	31.90	8.70	32.15	41.85	54.00	-12.15	Vertical
7386.00	23.30	36.49	11.76	31.83	39.72	54.00	-14.28	Vertical
9848.00	24.40	38.62	14.31	31.77	45.56	54.00	-8.44	Vertical
12310.00	*					54.00		Vertical
14772.00	*					54.00		Vertical
17234.00	*					54.00		Vertical
4924.00	32.49	31.90	8.70	32.15	40.94	54.00	-13.06	Horizontal
7386.00	21.86	36.49	11.76	31.83	38.28	54.00	-15.72	Horizontal
9848.00	21.42	38.62	14.31	31.77	42.58	54.00	-11.42	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.*

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

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4844.00	38.12	31.81	8.63	32.11	46.45	74.00	-27.55	Vertical
7266.00	32.85	36.28	11.69	31.94	48.88	74.00	-25.12	Vertical
9688.00	31.73	38.13	14.21	31.52	52.55	74.00	-21.45	Vertical
12060.00	*					74.00		Vertical
14472.00	*					74.00		Vertical
16884.00	*					74.00		Vertical
4844.00	37.13	31.81	8.63	32.11	45.46	74.00	-28.54	Horizontal
7266.00	32.77	36.28	11.69	31.94	48.80	74.00	-25.20	Horizontal
9688.00	31.39	38.13	14.21	31.52	52.21	74.00	-21.79	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
4844.00	27.38	31.81	8.63	32.11	35.71	54.00	-18.29	Vertical
7266.00	21.76	36.28	11.69	31.94	37.79	54.00	-16.21	Vertical
9688.00	22.12	38.13	14.21	31.52	42.94	54.00	-11.06	Vertical
12060.00	*					54.00		Vertical
14472.00	*					54.00		Vertical
16884.00	*					54.00		Vertical
4844.00	26.78	31.81	8.63	32.11	35.11	54.00	-18.89	Horizontal
7266.00	21.39	36.28	11.69	31.94	37.42	54.00	-16.58	Horizontal
9688.00	21.17	38.13	14.21	31.52	41.99	54.00	-12.01	Horizontal
12060.00	*					54.00		Horizontal
14472.00	*					54.00		Horizontal
16884.00	*					54.00		Horizontal

Remark:

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

Test mode:	802.11n(HT40)	Test channel:	Middle

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4874.00	37.55	31.85	8.66	32.12	45.94	74.00	-28.06	Vertical
7311.00	33.15	36.37	11.71	31.91	49.32	74.00	-24.68	Vertical
9748.00	32.92	38.27	14.25	31.56	53.88	74.00	-20.12	Vertical
12185.00	*					74.00		Vertical
14622.00	*					74.00		Vertical
17059.00	*					74.00		Vertical
4874.00	38.31	31.85	8.66	32.12	46.70	74.00	-27.30	Horizontal
7311.00	31.94	36.37	11.71	31.91	48.11	74.00	-25.89	Horizontal
9748.00	32.87	38.27	14.25	31.56	53.83	74.00	-20.17	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	28.55	31.85	8.66	32.12	36.94	54.00	-17.06	Vertical
7311.00	21.51	36.37	11.71	31.91	37.68	54.00	-16.32	Vertical
9748.00	22.21	38.27	14.25	31.56	43.17	54.00	-10.83	Vertical
12185.00	*					54.00		Vertical
14622.00	*					54.00		Vertical
17059.00	*					54.00		Vertical
4874.00	28.52	31.85	8.66	32.12	36.91	54.00	-17.09	Horizontal
7311.00	21.06	36.37	11.71	31.91	37.23	54.00	-16.77	Horizontal
9748.00	22.62	38.27	14.25	31.56	43.58	54.00	-10.42	Horizontal
12185.00	*					54.00		Horizontal
14622.00	*					54.00		Horizontal
17059.00	*					54.00		Horizontal

Remark:

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

Test mode:	802.11n(HT40)	Test channel:	Highest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4904.00	41.79	31.88	8.68	32.13	50.22	74.00	-23.78	Vertical
7356.00	33.01	36.45	11.75	31.86	49.35	74.00	-24.65	Vertical
9808.00	35.63	38.43	14.29	31.68	56.67	74.00	-17.33	Vertical
12310.00	*					74.00		Vertical
14772.00	*					74.00		Vertical
17234.00	*					74.00		Vertical
4904.00	41.57	31.88	8.68	32.13	50.00	74.00	-24.00	Horizontal
7356.00	32.15	36.45	11.75	31.86	48.49	74.00	-25.51	Horizontal
9808.00	31.91	38.43	14.29	31.68	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
4904.00	32.94	31.88	8.68	32.13	41.37	54.00	-12.63	Vertical
7356.00	22.99	36.45	11.75	31.86	39.33	54.00	-14.67	Vertical
9808.00	24.19	38.43	14.29	31.68	45.23	54.00	-8.77	Vertical
12310.00	*					54.00		Vertical
14772.00	*					54.00		Vertical
17234.00	*					54.00		Vertical
4904.00	32.10	31.88	8.68	32.13	40.53	54.00	-13.47	Horizontal
7356.00	21.60	36.45	11.75	31.86	37.94	54.00	-16.06	Horizontal
9808.00	21.22	38.43	14.29	31.68	42.26	54.00	-11.74	Horizontal
12310.00	*					54.00		Horizontal
14772.00	*					54.00		Horizontal
17234.00	*					54.00		Horizontal

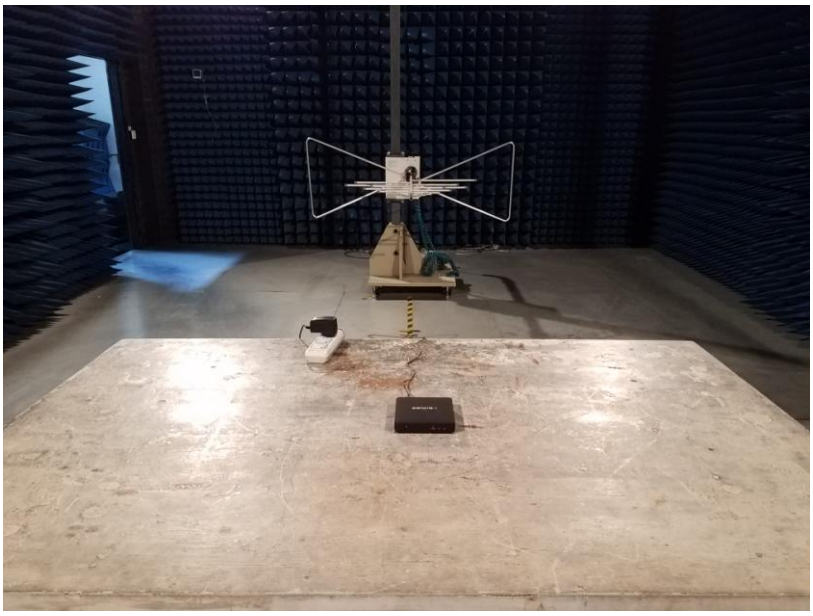
Remark:

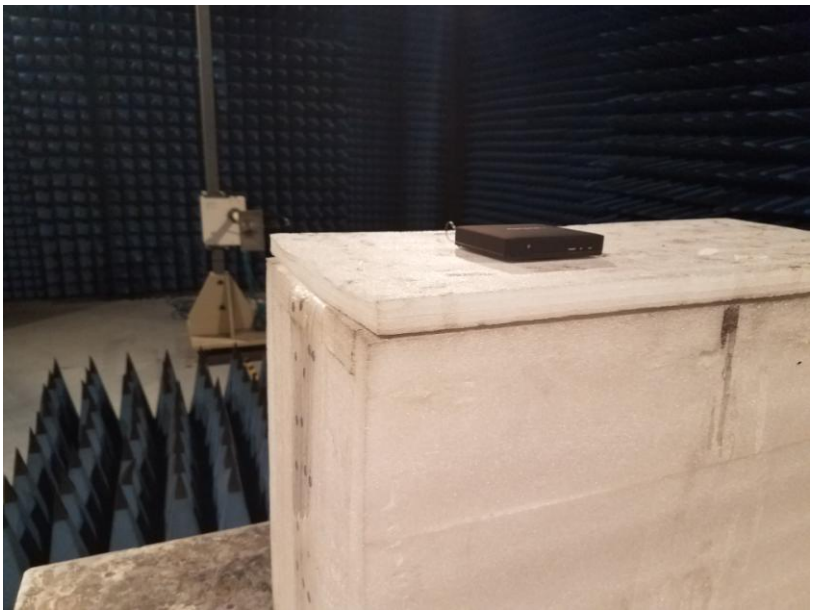
1 Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

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

8 Test Setup Photo

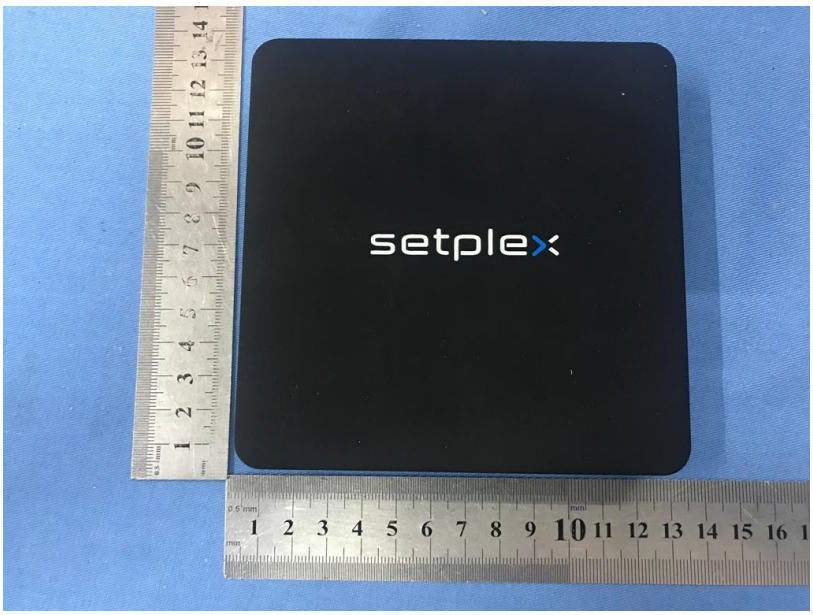
Radiated Emission





Conducted Emission

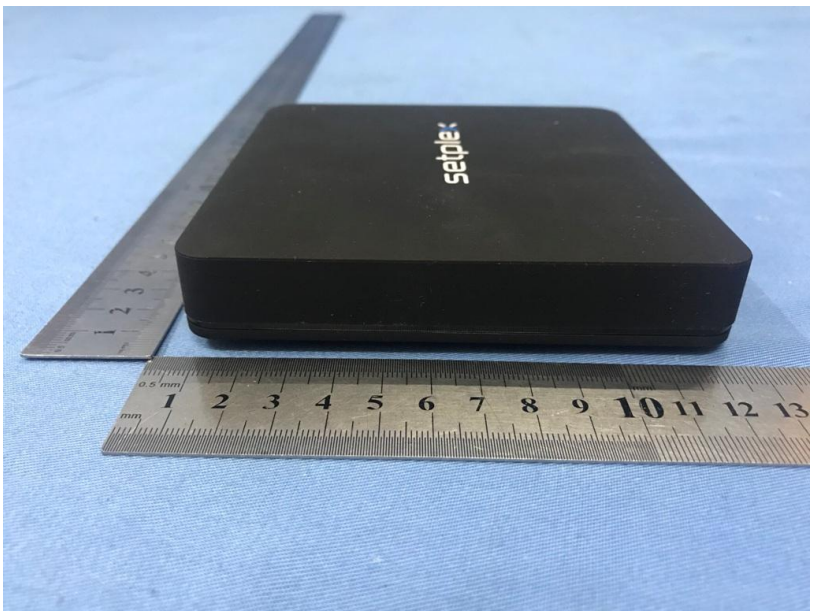
9 EUT Constructional Details

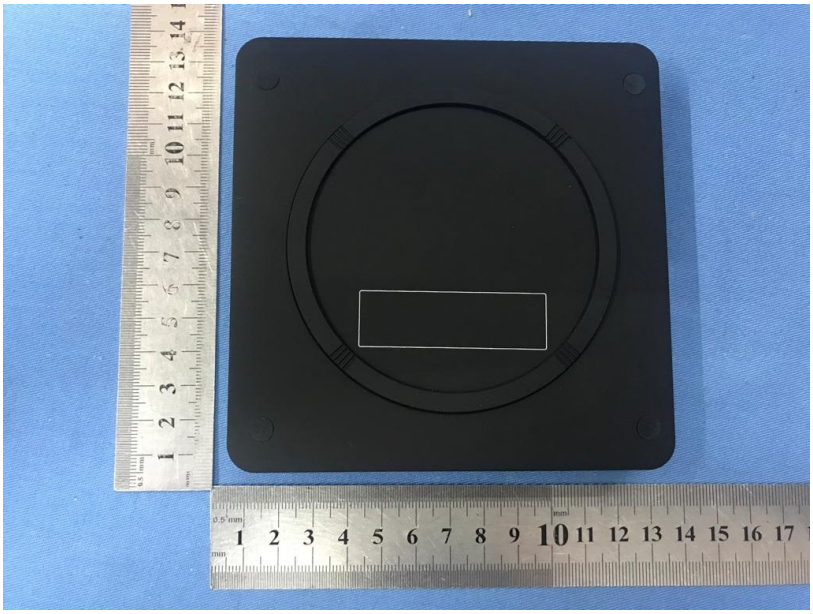


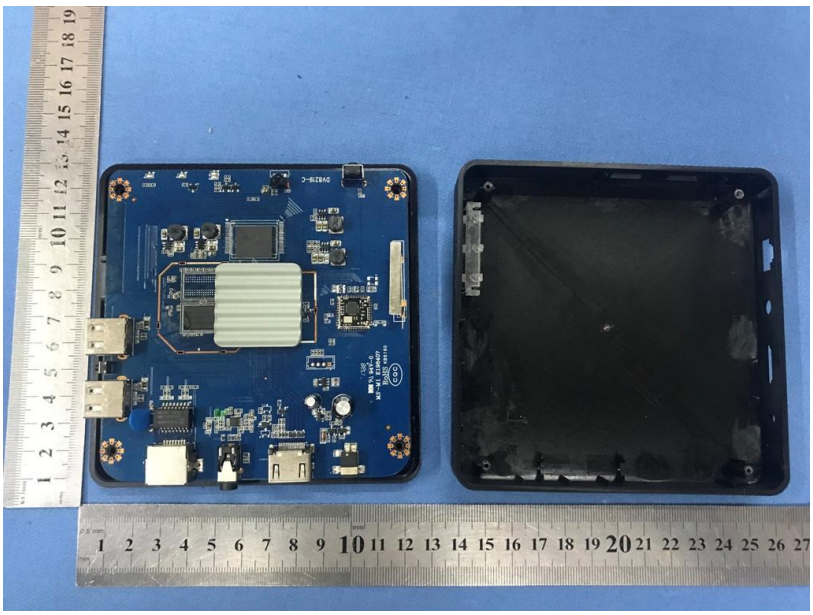
setplex
POWER
IR
NET

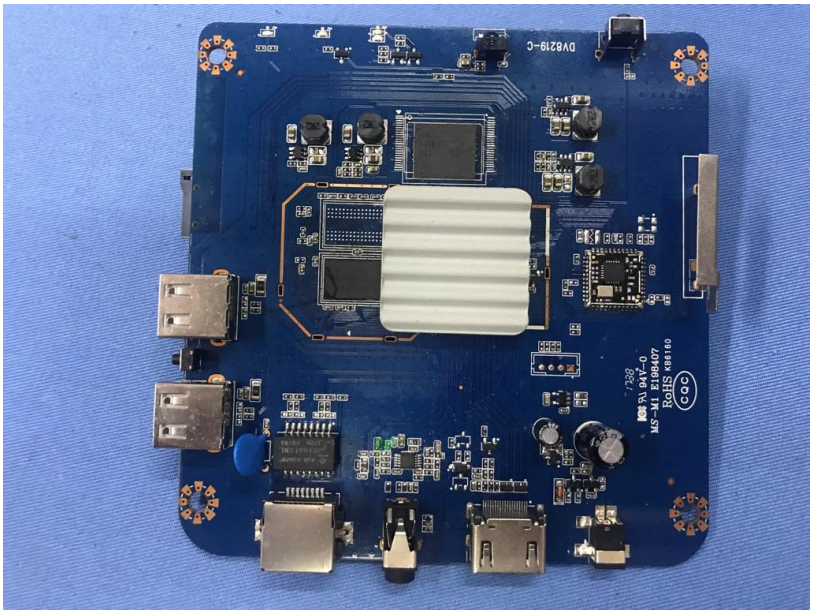
setplex
TF CARD
USB
USB

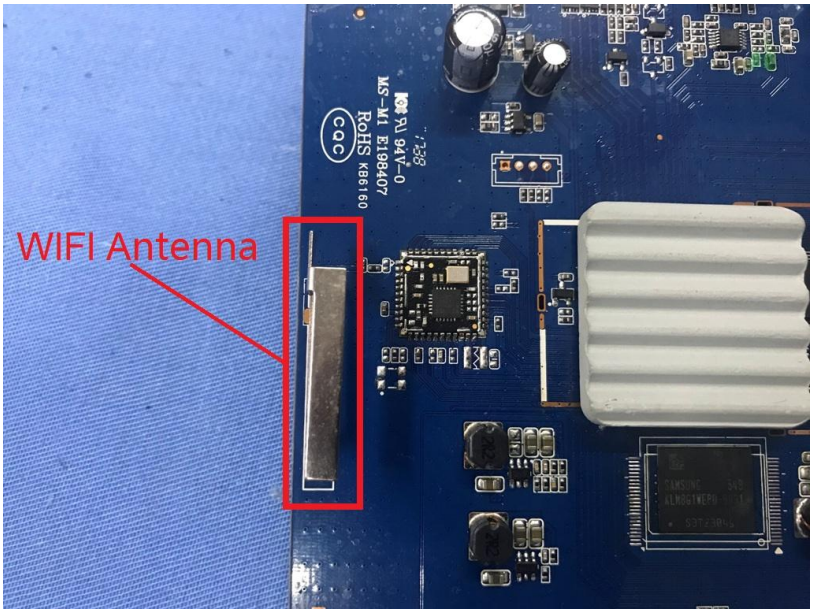
AV
HDMI
5V⎓2A

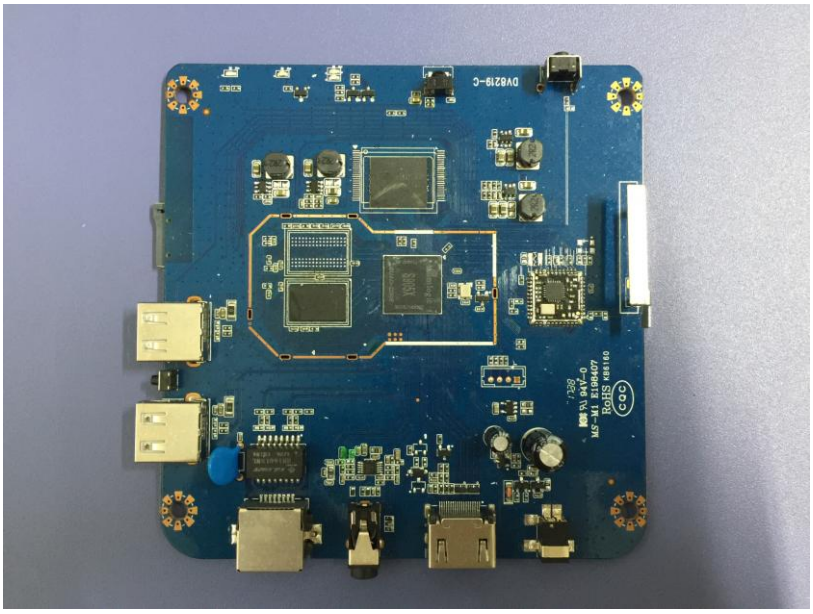


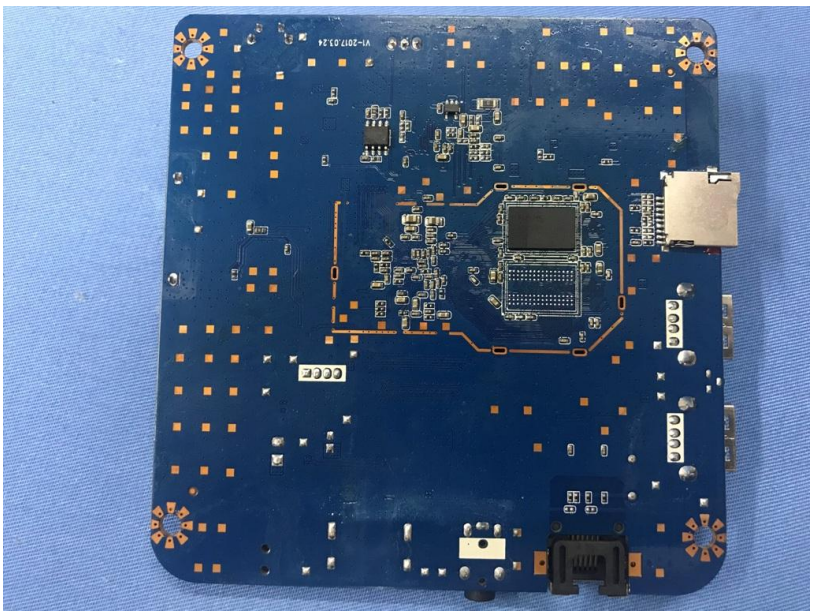







WIFI Antenna





DVE Switching Adapter
MODEL: DSA-12CB-05 050200
INPUT: 100-240V ~ 50/60Hz 0.5A
OUTPUT: +5V 2A
EFFICIENCY LEVEL: VI
ITE LPS
81GJ
E135856
LISTED
Made In China 4317HB (G)
No.5 Pao-Kao Road Hsin-Tien Taipei 231 Taiwan

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