



FCC TEST REPORT

FCC ID: 2AP3A-OPTIMA

On Behalf of

A-Technology Ltd.

POS-terminal

Model No.: Optima

Prepared for : A-Technology Ltd.
Address : Bld 1, Butyrskaya street 67, Moscow, Russian Federation 127015

Prepared By : Shenzhen Alpha Product Testing Co., Ltd.
Address : Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103,
Shenzhen, Guangdong, China

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Date of Report : June 22, 2018
Version Number : REV0

Contents

	Page
1 TEST SUMMARY	5
2 GENERAL INFORMATION	6
2.1 GENERAL DESCRIPTION OF EUT	6
2.2 TEST MODE	7
2.3 DESCRIPTION OF SUPPORT UNITS.....	7
2.4 TEST FACILITY.....	8
2.5 ADDITIONAL INSTRUCTIONS	9
3 TEST INSTRUMENTS LIST	10
4 TEST RESULTS AND MEASUREMENT DATA	10
4.1 ANTENNA REQUIREMENT	11
4.2 CONDUCTED EMISSIONS	12
4.3 CONDUCTED PEAK OUTPUT POWER	15
4.4 CHANNEL BANDWIDTH	16
4.5 POWER SPECTRAL DENSITY.....	19
4.6 BAND EDGES.....	22
4.6.1 <i>Conducted Emission Method</i>	<i>22</i>
4.6.2 <i>Radiated Emission Method</i>	<i>25</i>
4.7 SPURIOUS EMISSION.....	30
4.7.1 <i>Conducted Emission Method</i>	<i>30</i>
4.7.2 <i>Radiated Emission Method</i>	<i>35</i>
5 TEST SETUP PHOTO.....	50
6 EUT CONSTRUCTIONAL DETAILS.....	52

TEST REPORT DECLARATION

Applicant : A-Technology Ltd.
 Address : Bld 1, Butyrskaya street 67, Moscow, Russian Federation 127015
 Manufacturer : A-Technology Ltd.
 Address : Bld 1, Butyrskaya street 67, Moscow, Russian Federation 127015
 EUT Description : POS-terminal
 (A) Model No. : Optima
 (B) Trademark : N/A

Measurement Standard Used:

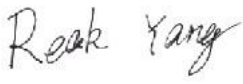
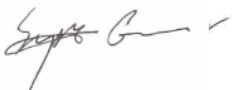
FCC Rules and Regulations Part 15 Subpart C Section 15.247: 2016,

ANSI C63.10-2013

The device described above is tested by Shenzhen Alpha Product Testing Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C limits both conducted and radiated emissions. The test results are contained in this test report and Shenzhen Alpha Product Testing Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

After the test, our opinion is that EUT compliance with the requirement of the above standards.

This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Shenzhen Alpha Product Testing Co., Ltd.

Tested by (name + signature).....:	Reak Yang Project Engineer	 -----
Approved by (name + signature).....:	Simple Guan Project Manager	 -----
Date of issue.....	June 19, 2018	

Revision History

Revision	Issue Date	Revisions	Revised By
00	June 22, 2018	Initial released Issue	Simple Guan

1 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

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

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


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%.

2 General Information

2.1 General Description of EUT

Product Name:	POS-terminal
Model No.:	Optima
Test Model No:	Optima
<i>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.</i>	
Sample(s) Status:	Engineer sample
Quantity of tested samples	1
Serial No.:	N/A
Tested Sample(s) ID:	N/A
Hardware Version:	V1.1
Software Version:	V1.0
Operation Frequency:	802.11b/802.11g/802.11n(HT20): 2412MHz~2462MHz (SISO) 802.11n(HT40): 2422MHz~2452MHz (SISO)
Channel numbers:	802.11b/802.11g /802.11n(HT20): 11 802.11(HT40): 7
Channel separation:	5MHz
Modulation technology:	802.11b: Direct Sequence Spread Spectrum (DSSS) 802.11g/802.11n(HT20)/802.11n(HT40): Orthogonal Frequency Division Multiplexing (OFDM)
Antenna Type:	PIFA Antenna
Antenna gain:	2.0dBi
Power supply:	12V  3.0A (Powered by an approved adaptor)

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	X	

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

Setting output power (Max)			
802.11b	802.11g	802.11n(HT20)	802.11n(HT40)
8dBm	10dBm	10dBm	9dBm

2.2 Test mode

Transmitting mode	Keep the EUT in continuously transmitting mode
<p><i>Remark: During the test, the duty cycle >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></p>	

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:				
Per-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

2.3 Description of Support Units

Accessories1	:	AC/DC ADAPTER
Manufacturer	:	SHAN SHUNDE GUANYUDA POWER SUPPLY CO., LTD
Model	:	GM42-120300-D
Power supply	:	Input: AC 100-240V, 50/60Hz, 1.5A Output: 12V $\overline{=}$, 3.0A

2.4 Test Facility

Shenzhen Alpha Product Testing Co., Ltd

Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103, Shenzhen, Guangdong, China

June 21, 2018 File on Federal Communication Commission

Registration Number: 293961

July 25, 2017 Certificated by IC

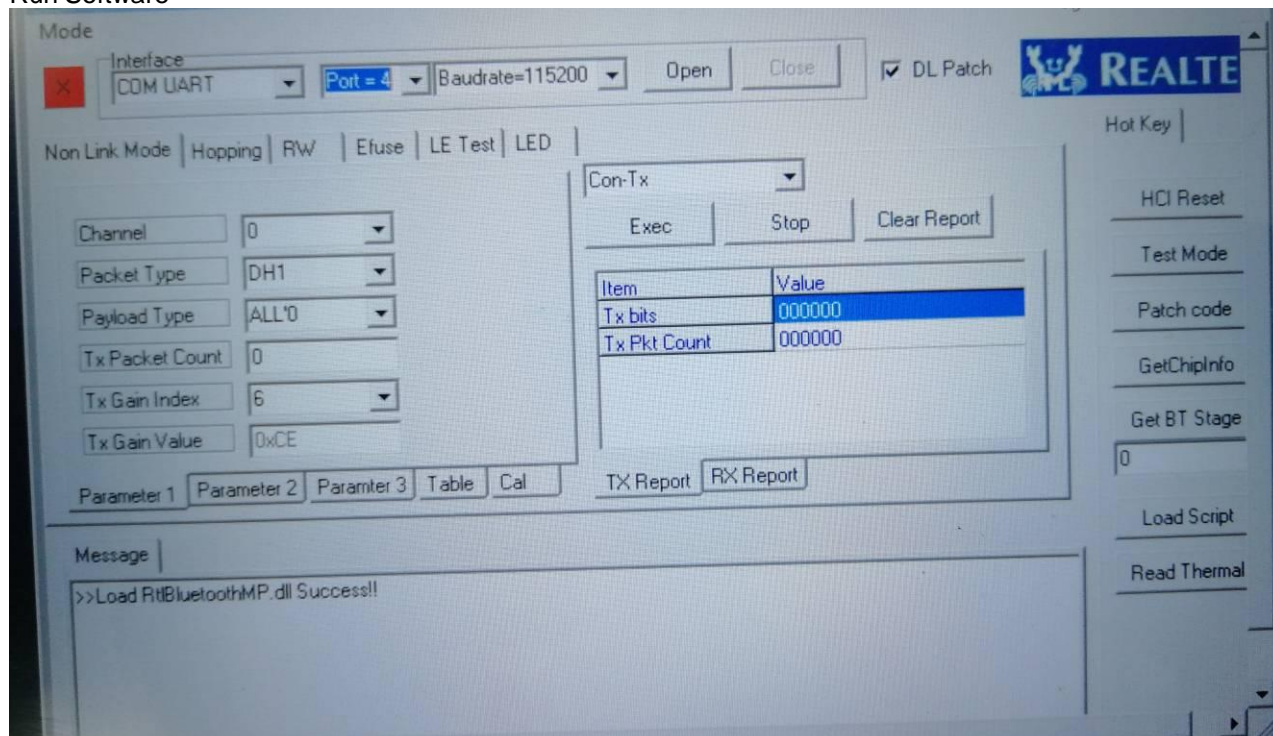
Registration Number: 12135A

2.5 Additional instructions

Software (Used for test) from client

Mode	Special software is used. The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.		
Power level setup in software			
Test Software Name	MP_Kit_RTL11n		
Test Software Version	v0.04		
Support Units (Software installation media)	Description	Manufacturer	Model
	LCD TV	PHILIPS	AU1A1212002906
Mode	Channel	Frequency (MHz)	Soft Set
802.11b/g/n(HT20)	CH1	2412	TX level is built-in set parameters and cannot be changed and selected.
	CH6	2437	
802.11n(HT40)	CH11	2462	
	CH3	2422	
	CH6	2437	
	CH9	2452	

Run Software

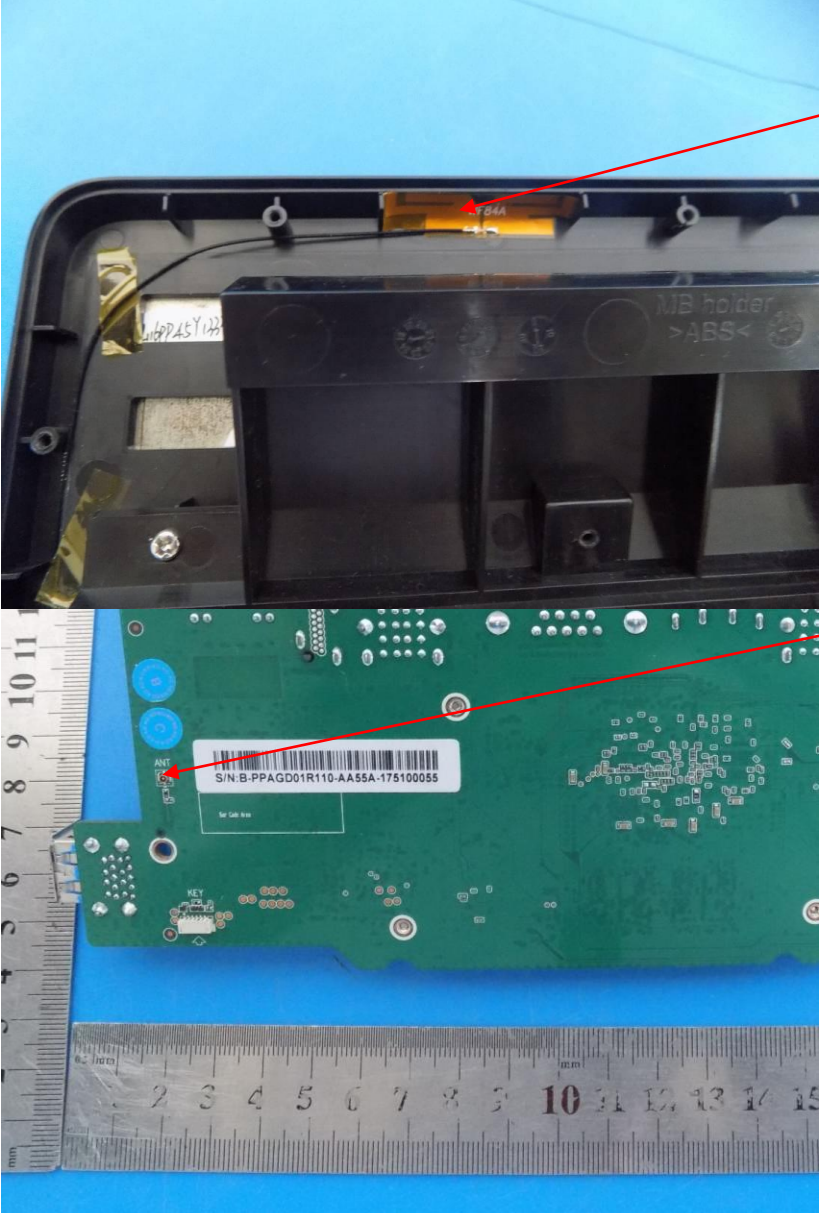


3 Test Instruments list

Equipment	Manufacture	Model No.	Serial No.	Last cal.	Cal Interval
3m Semi-Anechoic	ETS-LINDGREN	N/A	SEL0017	2017.09.22	1Year
Spectrum analyzer	Agilent	E4407B	MY46185649	2017.09.22	1Year
Receiver	R&S	ESCI	1166.5950K03-1011	2017.09.22	1Year
Receiver	R&S	ESCI	101202	2017.09.22	1Year
Bilog Antenna	Schwarzbeck	VULB 9168	VULB9168-438	2016.09.30	2Year
Horn Antenna	EMCO	3115	640201028-06	2016.09.30	2Year
Active Loop Antenna	Beijing Daze	ZN30900A	SEL0097	2016.09.30	2Year
Cable	Resenberger	N/A	No.1	2017.09.22	1Year
Cable	SCHWARZBECK	N/A	No.2	2017.09.22	1Year
Cable	SCHWARZBECK	N/A	No.3	2017.09.22	1Year
Pre-amplifier	Schwarzbeck	BBV9743	9743-019	2017.09.22	1Year
Pre-amplifier	R&S	AFS33-18002650-30-8P-44	SEL0080	2017.09.22	1Year
Temperature controller	Terchy	MHQ	120	2017.09.22	1Year
L.I.S.N.#1	Schwarzbeck	NSLK8126	8126466	2017.09.22	1Year
L.I.S.N.#2	ROHDE&SCHWARZ	ENV216	101043	2017.09.22	1 Year
20db Attenuator	ICPROBING	IATS1	82347	2017.09.22	1 Year
18-40 Horn Antenna	18-40G antenna	Sas-574	571	2018-3-15	3 Year
Power Meter	Anritsu	ML2487A	6K00001491	2017.09.22	1 Year

4 Test results and Measurement Data

4.1 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.
E.U.T Antenna:	The antenna is PIFA antenna, the best case gain of the antenna is 2.0dBi
	
	WIFI Antenna
	Antenna connector

4.2 Conducted Emissions

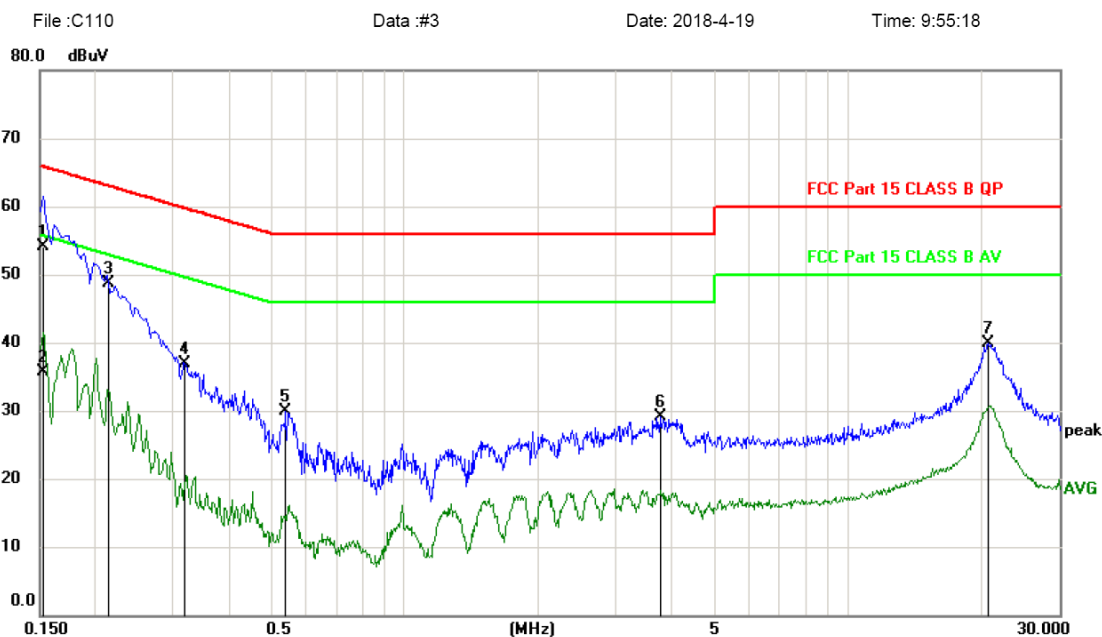
Test Requirement:	FCC Part15 C Section 15.207														
Test Method:	ANSI C63.10:2013														
Test Frequency Range:	150KHz to 30MHz														
Class / Severity:	Class B														
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto														
Limit:	<table border="1"> <thead> <tr> <th rowspan="2">Frequency range (MHz)</th> <th colspan="2">Limit (dBuV)</th> </tr> <tr> <th>Quasi-peak</th> <th>Average</th> </tr> </thead> <tbody> <tr> <td>0.15-0.5</td> <td>66 to 56*</td> <td>56 to 46*</td> </tr> <tr> <td>0.5-5</td> <td>56</td> <td>46</td> </tr> <tr> <td>5-30</td> <td>60</td> <td>50</td> </tr> </tbody> </table> <p>* Decreases with the logarithm of the frequency.</p>	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
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													
Test setup:	<p><i>Remark</i> E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</p>														
Test procedure:	<ol style="list-style-type: none"> 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

Test result for 802.11g (Channel 2462MHz), AC 120V/ 60Hz

Line:

Conducted Emission Measurement



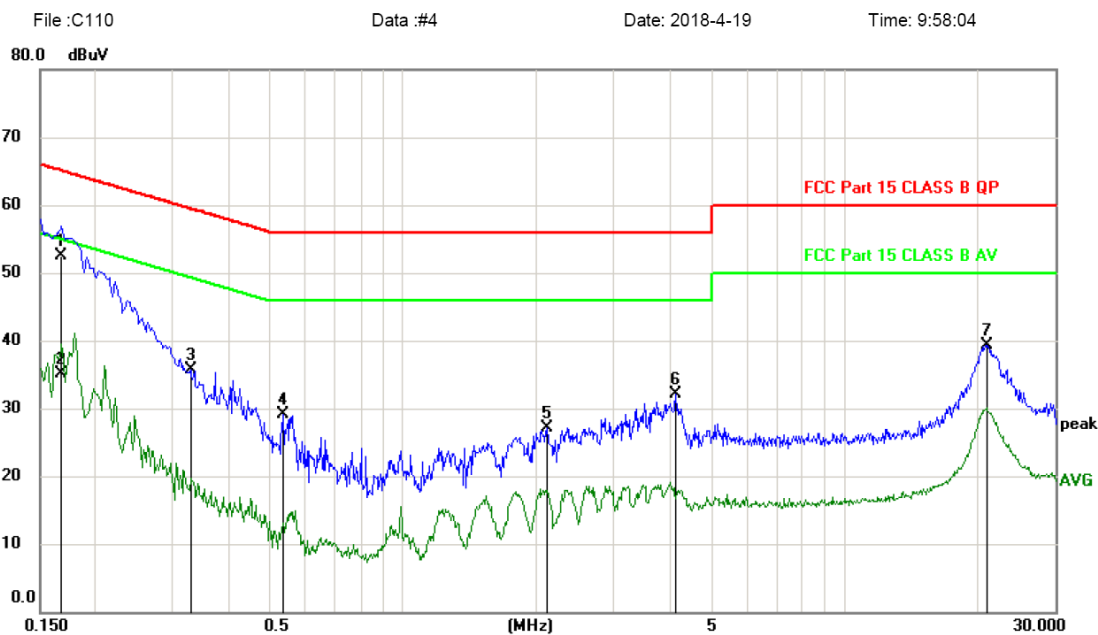
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	*	0.1530	44.38	9.73	54.11	65.84	-11.73	QP	
2		0.1530	25.99	9.73	35.72	55.84	-20.12	AVG	
3		0.2139	38.97	9.75	48.72	63.05	-14.33	peak	
4		0.3183	27.15	9.77	36.92	59.75	-22.83	peak	
5		0.5400	20.07	9.79	29.86	56.00	-26.14	peak	
6		3.7620	18.99	10.10	29.09	56.00	-26.91	peak	
7		20.7930	29.44	10.54	39.98	60.00	-20.02	peak	

*:Maximum data x:Over limit !:over margin

Note: Measurement=Reading Level+Correc Factor. Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

Test result for 802.11g (Channel 2462MHz), AC 120V/ 60Hz
Neutral:

Conducted Emission Measurement



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	*	0.1680	42.70	9.73	52.43	65.06	-12.63	QP	
2		0.1680	25.35	9.73	35.08	55.06	-19.98	AVG	
3		0.3300	25.99	9.77	35.76	59.45	-23.69	peak	
4		0.5340	19.25	9.79	29.04	56.00	-26.96	peak	
5		2.1120	17.09	9.93	27.02	56.00	-28.98	peak	
6		4.1430	22.04	10.15	32.19	56.00	-23.81	peak	
7		20.9340	28.75	10.54	39.29	60.00	-20.71	peak	

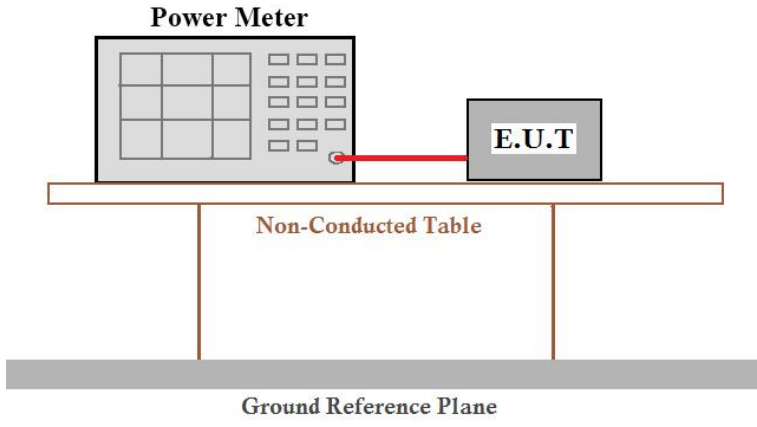
*:Maximum data x:Over limit !:over margin

Note: Measurement=Reading Level+Correc Factor. Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

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.

4.3 Conducted Peak Output Power

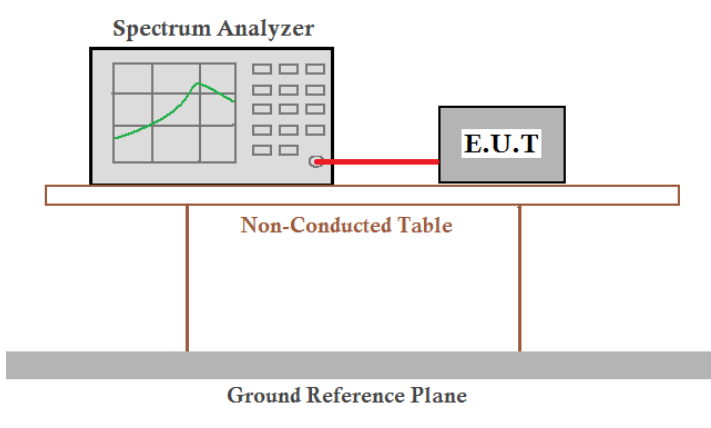
Test Requirement:	FCC Part15 C Section 15.247 (b)(3)
Test Method:	ANSI C63.10:2013 and KDB558074 D01 DTS Meas Guidance V04
Limit:	30dBm
Test setup:	 <p>The diagram illustrates the test setup. A Power Meter is connected to an E.U.T. (Equipment Under Test) via a red cable. Both are placed on a Non-Conducted Table, which is supported by two 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

Measurement Data

ANT0:

Test CH	Peak Output Power (dBm)				Limit(dBm)	Result
	802.11b	802.11g	802.11n(HT20)	802.11n(HT40)		
Lowest	6.45	8.01	8.03	7.77	30.00	Pass
Middle	6.38	8.27	7.25	7.30		
Highest	6.16	8.31	7.37	7.21		

4.4 Channel Bandwidth

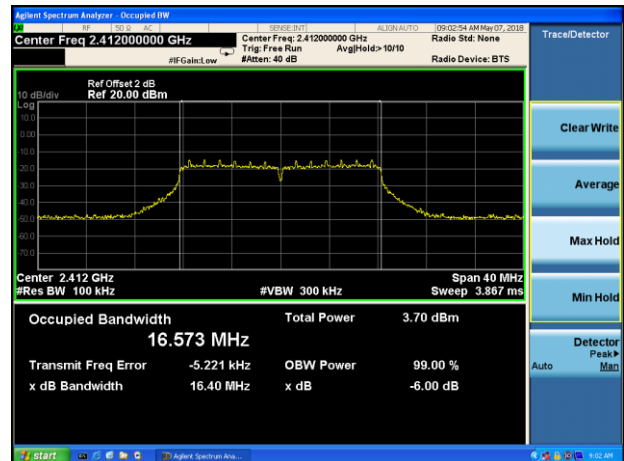
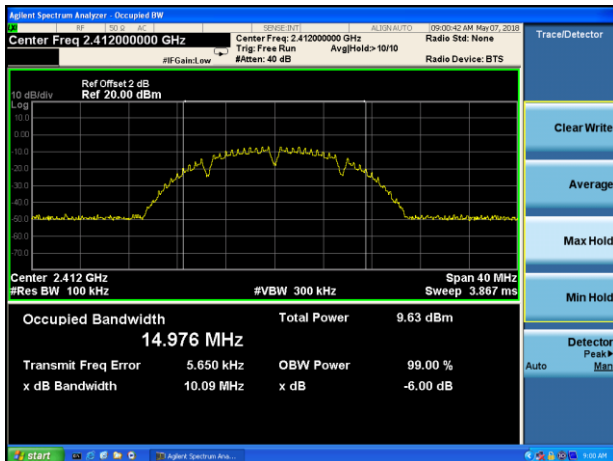
Test Requirement:	FCC Part15 C Section 15.247 (a)(2)
Test Method:	ANSI C63.10:2013 and KDB558074 D01 DTS Meas Guidance V04
Limit:	>500KHz
Test setup:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both are placed on a 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

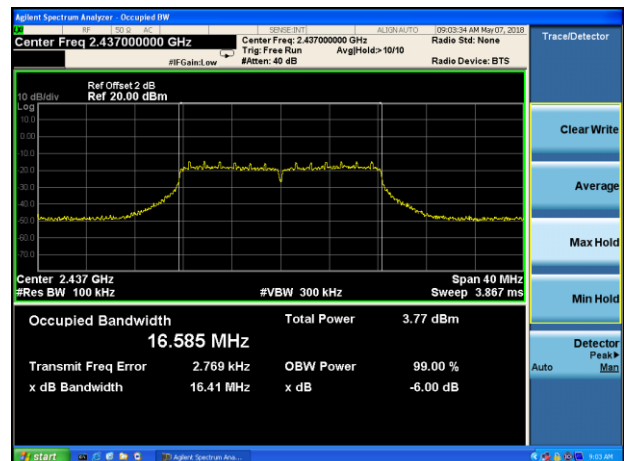
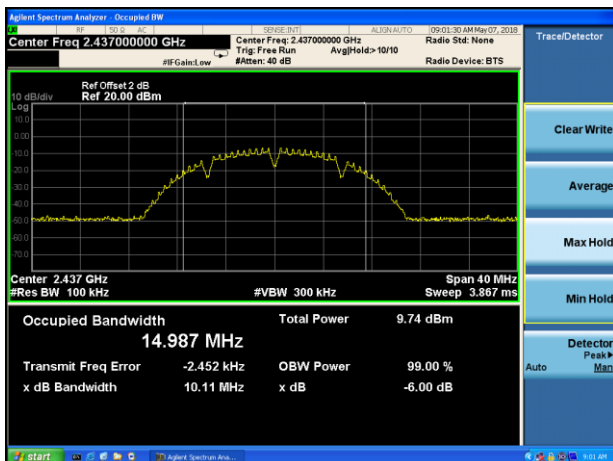
Test CH	Channel Bandwidth (MHz)				Limit(KHz)	Result
	802.11b	802.11g	802.11n(HT20)	802.11n(HT40)		
Lowest	10.09	16.40	17.59	35.15	>500	Pass
Middle	10.11	16.41	17.62	35.35		
Highest	8.02	16.43	17.63	36.38		

Test plot as follows:

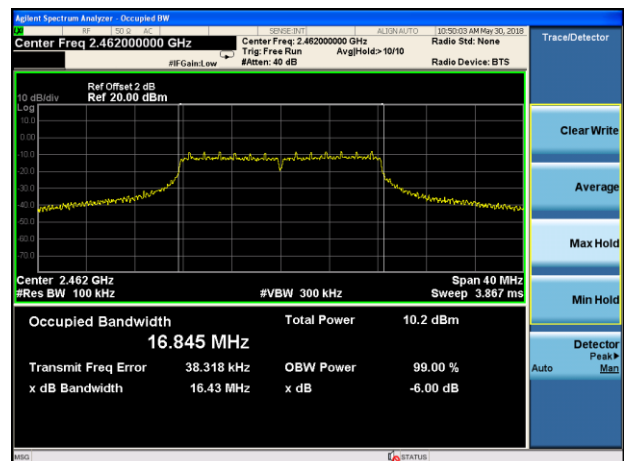
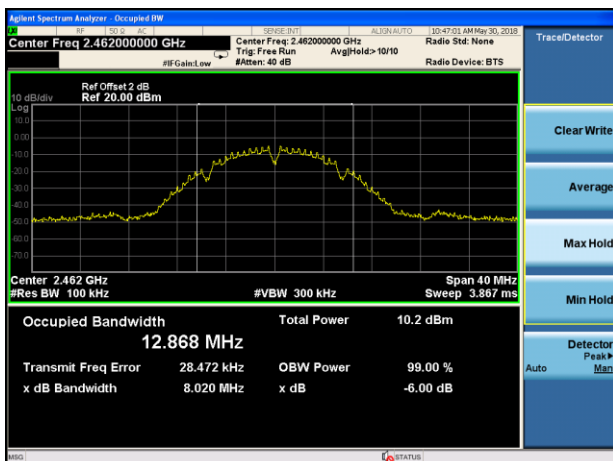
802.11b **802.11g**



Lowest channel

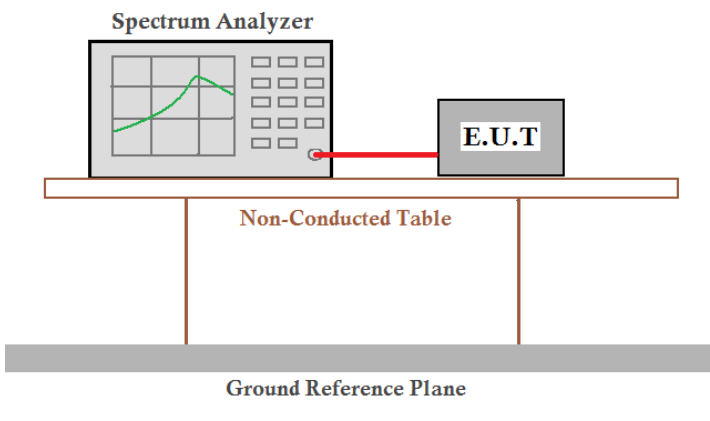


Middle channel



Highest channel

4.5 Power Spectral Density

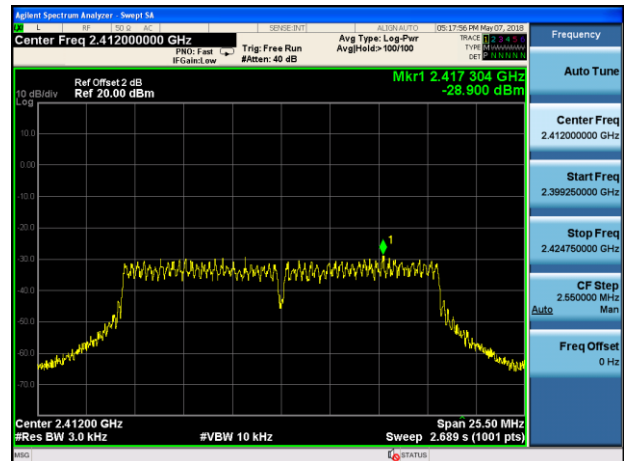
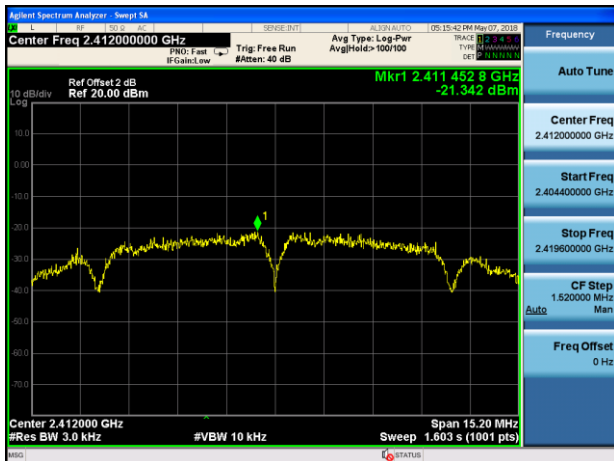
Test Requirement:	FCC Part15 C Section 15.247 (e)
Test Method:	ANSI C63.10:2013 and KDB558074 D01 DTS Meas Guidance V04
Limit:	8dBm/3KHz
Test setup:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both are placed on a Non-Conducted 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

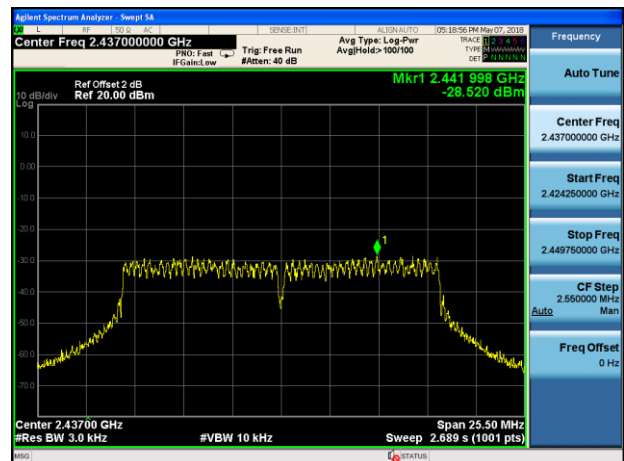
Test CH	Power Spectral Density (dBm)				Limit(dBm/3kHz)	Result
	802.11b	802.11g	802.11n(HT20)	802.11n(HT40)		
Lowest	-21.342	-28.900	-29.636	-31.778	8.00	Pass
Middle	-20.519	-28.522	-28.583	-33.112		
Highest	-18.811	-22.952	-22.695	-28.277		

Test plot as follows:

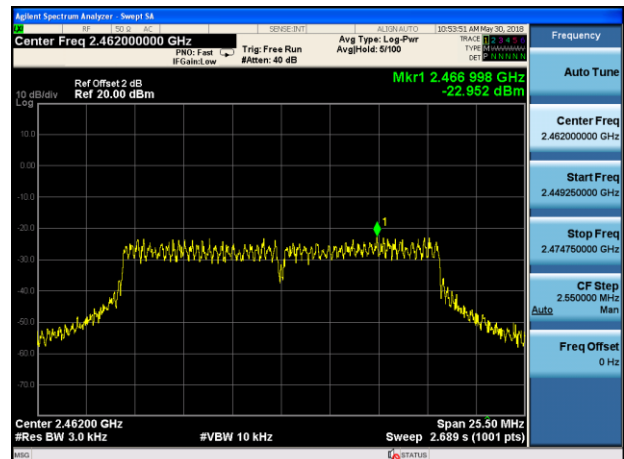
802.11b	802.11g
---------	---------



Lowest channel



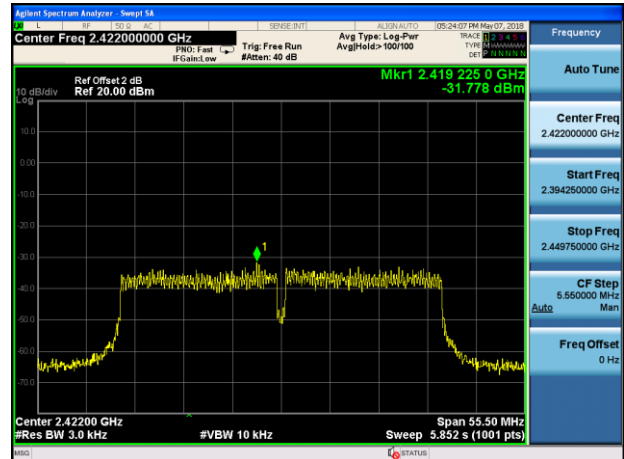
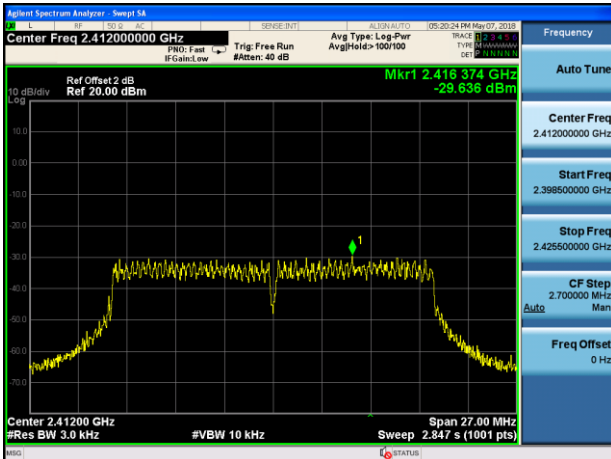
Middle channel



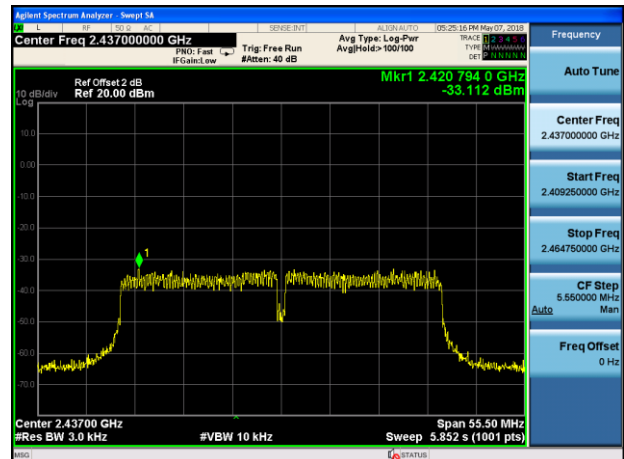
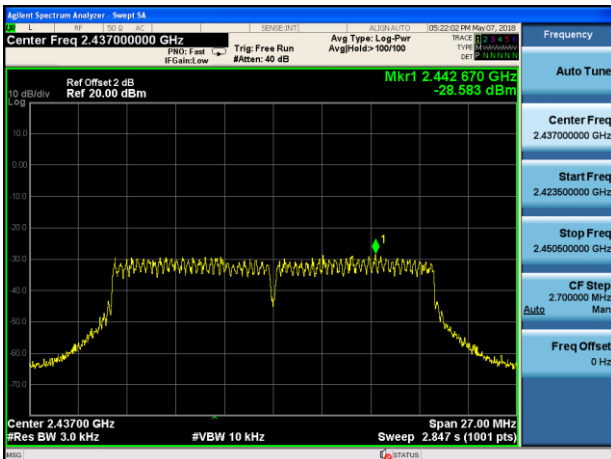
Highest channel

802.11n(HT20)

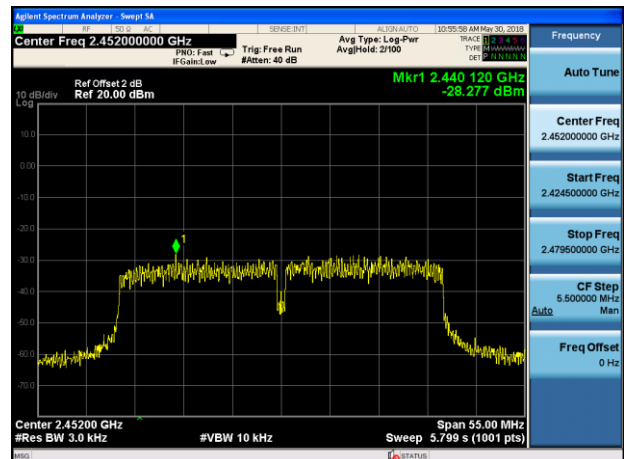
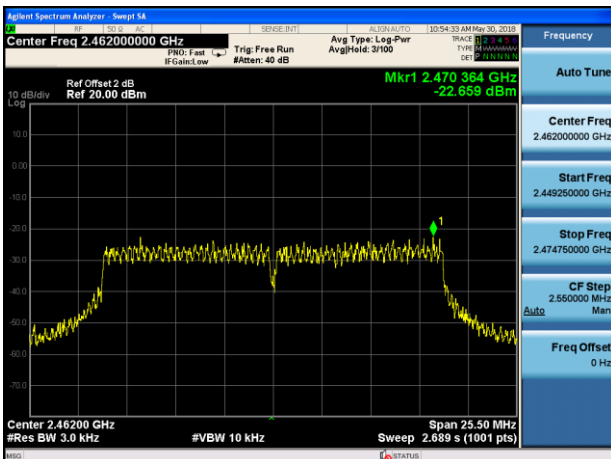
802.11n(HT40)



Lowest channel



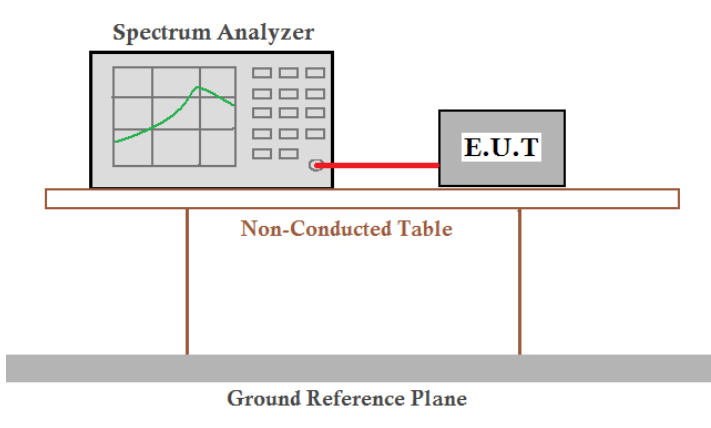
Middle channel



Highest channel

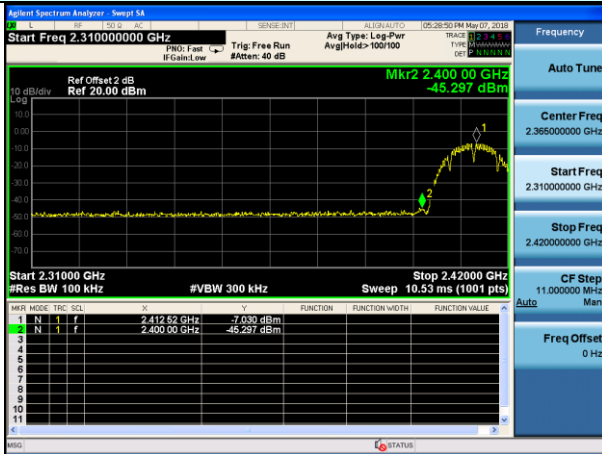
4.6 Band edges

4.6.1 Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	ANSI C63.10:2013 and 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:	 <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

Test plot as follows:

Test mode: 802.11b

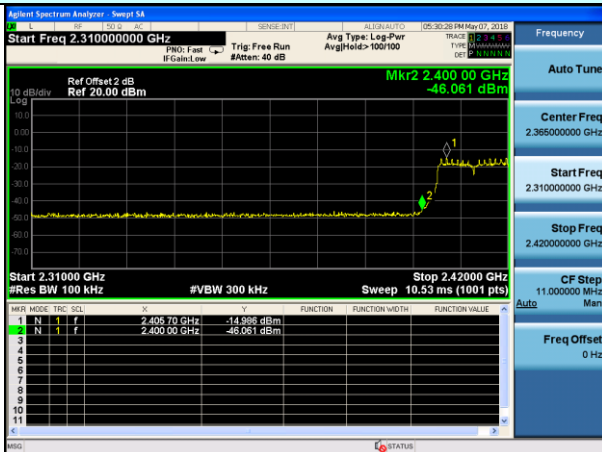


Lowest channel

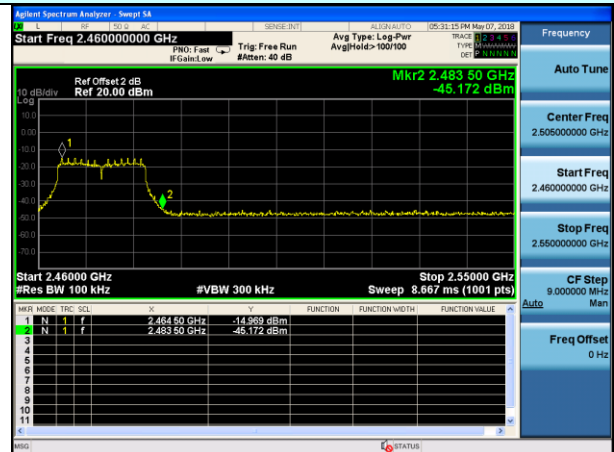


Highest channel

Test mode: 802.11g

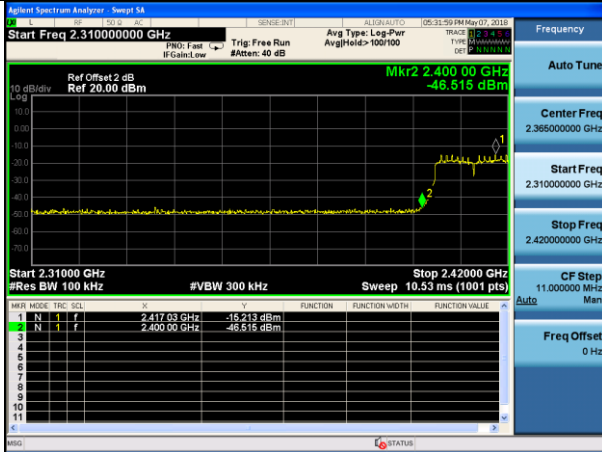


Lowest channel

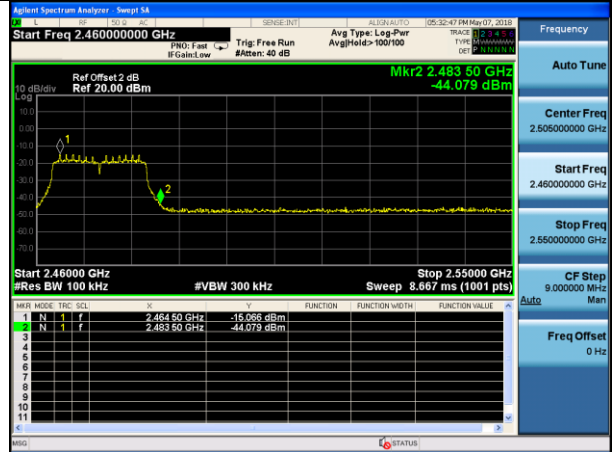


Highest channel

Test mode: 802.11n(HT20)

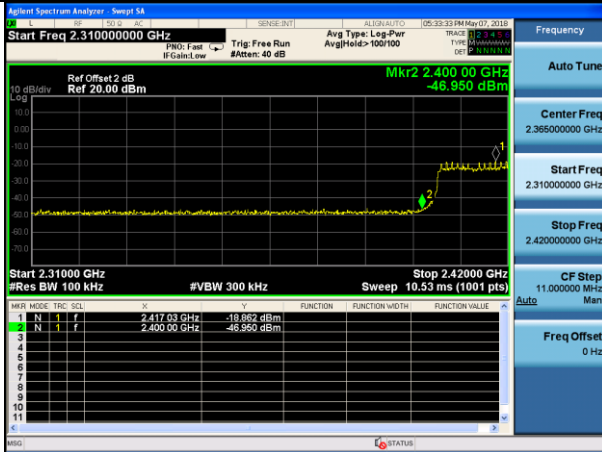


Lowest channel

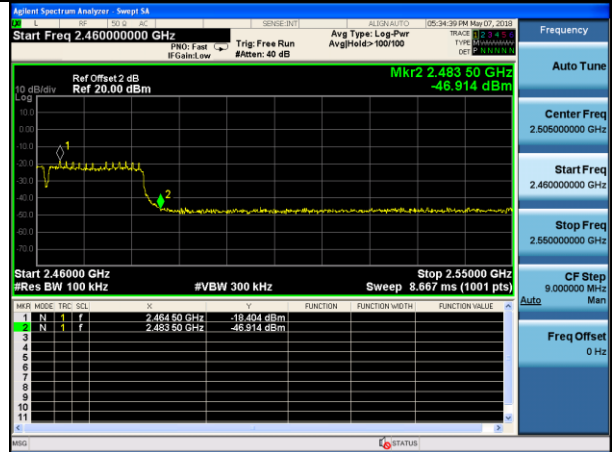


Highest channel

Test mode: 802.11n(HT40)

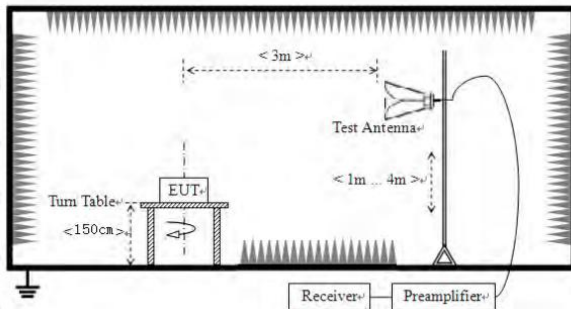


Lowest channel



Highest channel

4.6.2 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
		RMS	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"> 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
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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
2390.00	45.64	27.59	5.38	34.01	44.60	74	-29.40	Horizontal
2400.00	51.31	27.58	5.39	34.01	50.27	74	-23.73	Horizontal
2390.00	46.76	27.59	5.38	34.01	45.72	74	-28.28	Vertical
2400.00	50.41	27.58	5.39	34.01	49.37	74	-24.63	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	35.72	27.59	5.38	34.01	34.68	54	-19.32	Horizontal
2400.00	37.42	27.58	5.39	34.01	36.38	54	-17.62	Horizontal
2390.00	35.64	27.59	5.38	34.01	34.60	54	-19.40	Vertical
2400.00	38.29	27.58	5.39	34.01	37.25	54	-16.75	Vertical

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

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	45.55	27.53	5.47	33.92	44.63	74	-29.37	Horizontal
2500.00	50.64	27.55	5.49	29.93	53.75	74	-20.25	Horizontal
2483.50	46.72	27.53	5.47	33.92	45.80	74	-28.20	Vertical
2500.00	50.35	27.55	5.49	29.93	53.46	74	-20.54	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	35.32	27.53	5.47	33.92	34.40	54	-19.60	Horizontal
2500.00	36.96	27.55	5.49	29.93	40.07	54	-13.93	Horizontal
2483.50	35.66	27.53	5.47	33.92	34.74	54	-19.26	Vertical
2500.00	37.96	27.55	5.49	29.93	41.07	54	-12.93	Vertical

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Pre-amplifier 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)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2390.00	45.41	27.59	5.38	34.01	44.37	74	-29.63	Horizontal
2400.00	50.85	27.58	5.39	34.01	49.81	74	-24.19	Horizontal
2390.00	46.27	27.59	5.38	34.01	45.23	74	-28.77	Vertical
2400.00	50.58	27.58	5.39	34.01	49.54	74	-24.46	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	35.34	27.59	5.38	34.01	34.30	54	-19.70	Horizontal
2400.00	37.07	27.58	5.39	34.01	36.03	54	-17.97	Horizontal
2390.00	36.18	27.59	5.38	34.01	35.14	54	-18.86	Vertical
2400.00	38.28	27.58	5.39	34.01	37.24	54	-16.76	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)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	45.92	27.53	5.47	33.92	45.00	74	-29.00	Horizontal
2500.00	50.91	27.55	5.49	29.93	54.02	74	-19.98	Horizontal
2483.50	46.22	27.53	5.47	33.92	45.30	74	-28.70	Vertical
2500.00	50.42	27.55	5.49	29.93	53.53	74	-20.47	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	38.15	27.53	5.47	33.92	37.23	54	-16.77	Horizontal
2500.00	36.31	27.55	5.49	29.93	39.42	54	-14.58	Horizontal
2483.50	39.60	27.53	5.47	33.92	38.68	54	-15.32	Vertical
2500.00	36.54	27.55	5.49	29.93	39.65	54	-14.35	Vertical

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Pre-amplifier 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)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2390.00	46.02	27.59	5.38	34.01	44.98	74	-29.02	Horizontal
2400.00	50.76	27.58	5.39	34.01	49.72	74	-24.28	Horizontal
2390.00	46.51	27.59	5.38	34.01	45.47	74	-28.53	Vertical
2400.00	49.59	27.58	5.39	34.01	48.55	74	-25.45	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	35.30	27.59	5.38	34.01	34.26	54	-19.74	Horizontal
2400.00	37.09	27.58	5.39	34.01	36.05	54	-17.95	Horizontal
2390.00	35.62	27.59	5.38	34.01	34.58	54	-19.42	Vertical
2400.00	38.40	27.58	5.39	34.01	37.36	54	-16.64	Vertical

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

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	47.97	27.53	5.47	33.92	47.05	74	-26.95	Horizontal
2500.00	47.09	27.55	5.49	29.93	50.20	74	-23.80	Horizontal
2483.50	50.07	27.53	5.47	33.92	49.15	74	-24.85	Vertical
2500.00	48.40	27.55	5.49	29.93	51.51	74	-22.49	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	38.55	27.53	5.47	33.92	37.63	54	-16.37	Horizontal
2500.00	35.73	27.55	5.49	29.93	38.84	54	-15.16	Horizontal
2483.50	40.09	27.53	5.47	33.92	39.17	54	-14.83	Vertical
2500.00	36.21	27.55	5.49	29.93	39.32	54	-14.68	Vertical

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Pre-amplifier 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)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2390.00	48.33	27.59	5.38	34.01	47.29	74	-26.71	Horizontal
2400.00	46.75	27.58	5.39	34.01	45.71	74	-28.29	Horizontal
2390.00	49.88	27.59	5.38	34.01	48.84	74	-25.16	Vertical
2400.00	48.71	27.58	5.39	34.01	47.67	74	-26.33	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	36.03	27.59	5.38	34.01	34.99	54	-19.01	Horizontal
2400.00	37.01	27.58	5.39	34.01	35.97	54	-18.03	Horizontal
2390.00	35.65	27.59	5.38	34.01	34.61	54	-19.39	Vertical
2400.00	38.65	27.58	5.39	34.01	37.61	54	-16.39	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)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	48.09	27.53	5.47	33.92	47.17	74	-26.83	Horizontal
2500.00	46.68	27.55	5.49	29.93	49.79	74	-24.21	Horizontal
2483.50	50.04	27.53	5.47	33.92	49.12	74	-24.88	Vertical
2500.00	47.78	27.55	5.49	29.93	50.89	74	-23.11	Vertical

Average value:

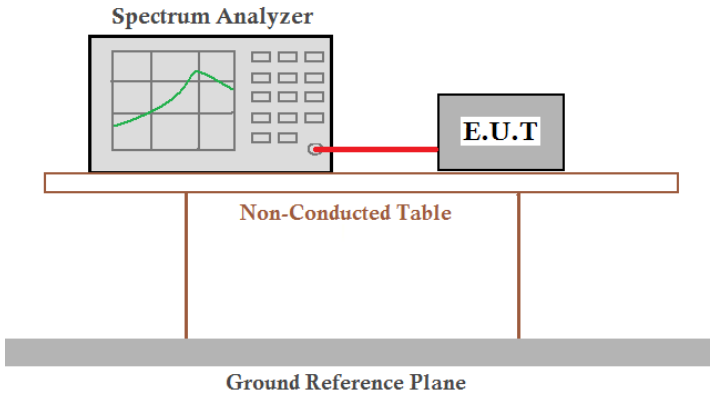
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	38.98	27.53	5.47	33.92	38.06	54	-15.94	Horizontal
2500.00	35.63	27.55	5.49	29.93	38.74	54	-15.26	Horizontal
2483.50	40.19	27.53	5.47	33.92	39.27	54	-14.73	Vertical
2500.00	36.12	27.55	5.49	29.93	39.23	54	-14.77	Vertical

Remark:

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

4.7 Spurious Emission

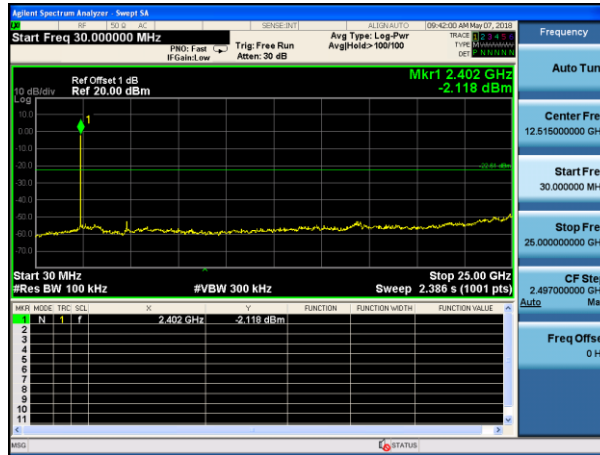
4.7.1 Conducted Emission Method

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	ANSI C63.10:2013 and 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:	 <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

Test plot as follows:

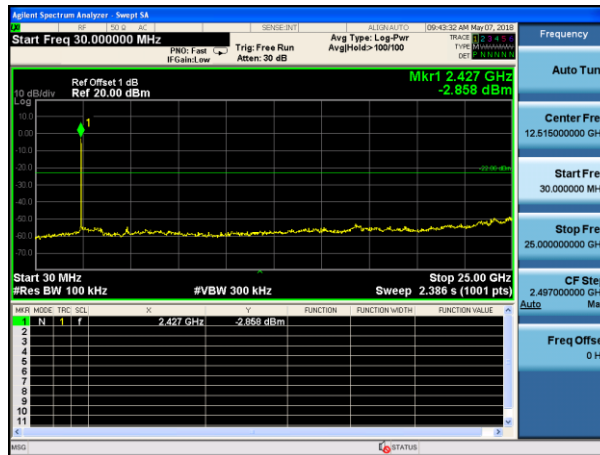
Test mode:	802.11b
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Lowest channel



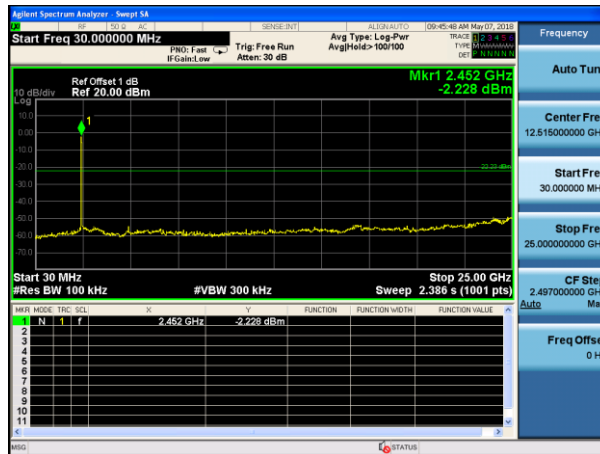
30MHz~25GHz

Middle channel



30MHz~25GHz

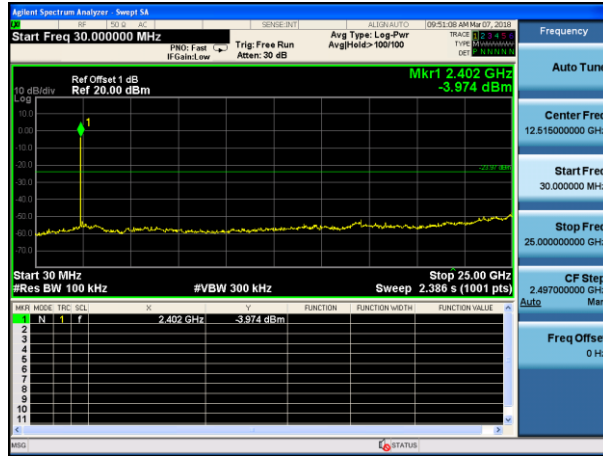
Highest channel



30MHz~25GHz

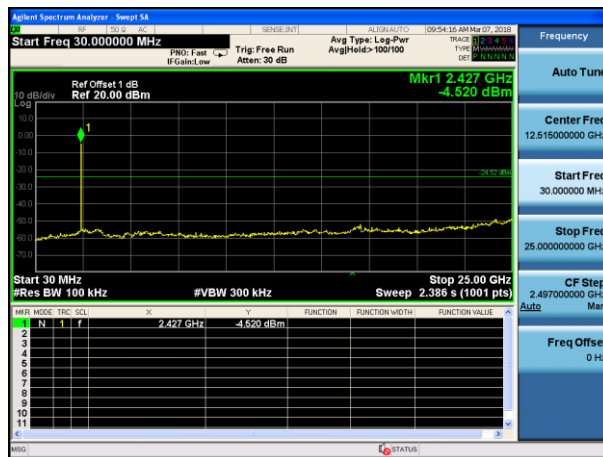
Test mode:	802.11g
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Lowest channel



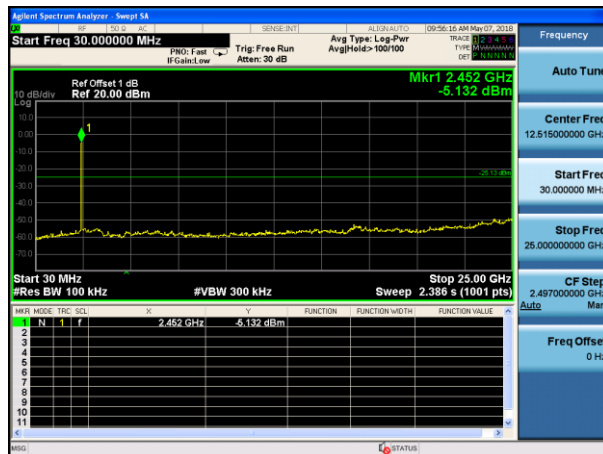
30MHz~25GHz

Middle channel



30MHz~25GHz

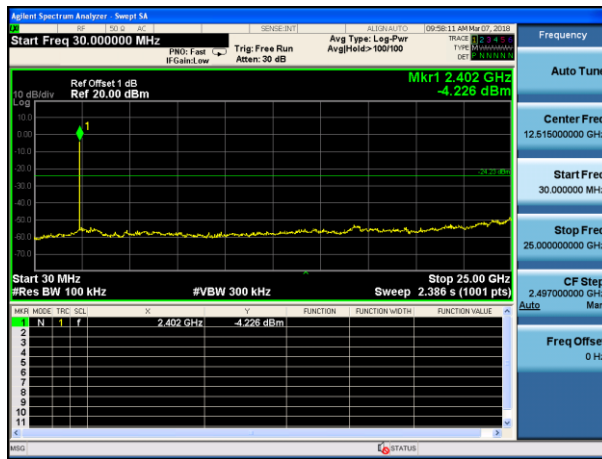
Highest channel



30MHz~25GHz

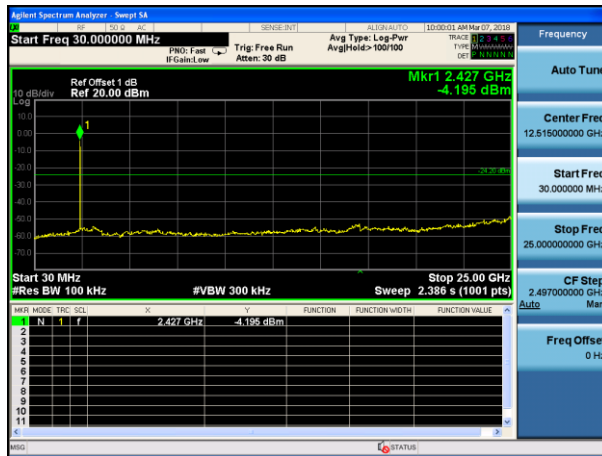
Test mode: 802.11n(HT20)

Lowest channel



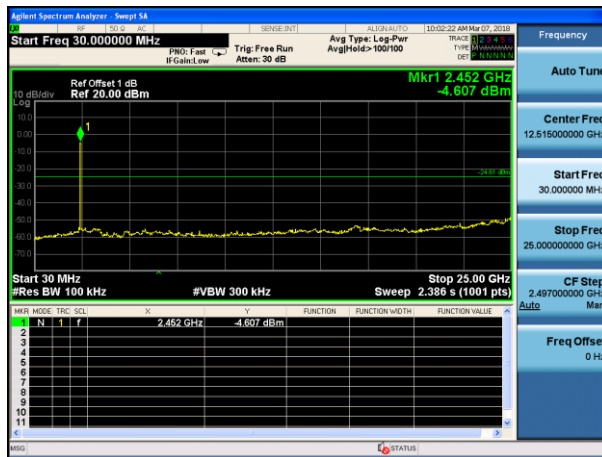
30MHz~25GHz

Middle channel



30MHz~25GHz

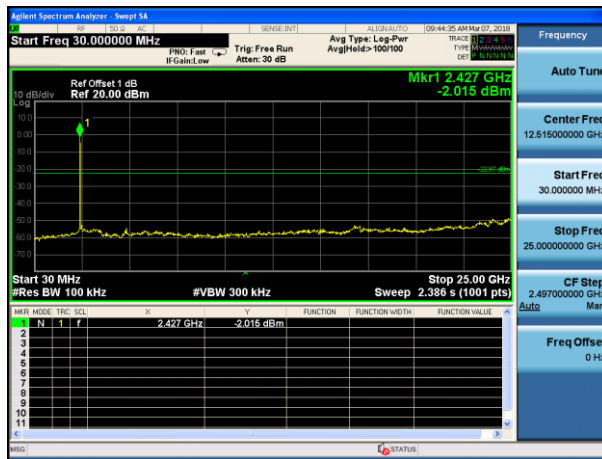
Highest channel



30MHz~25GHz

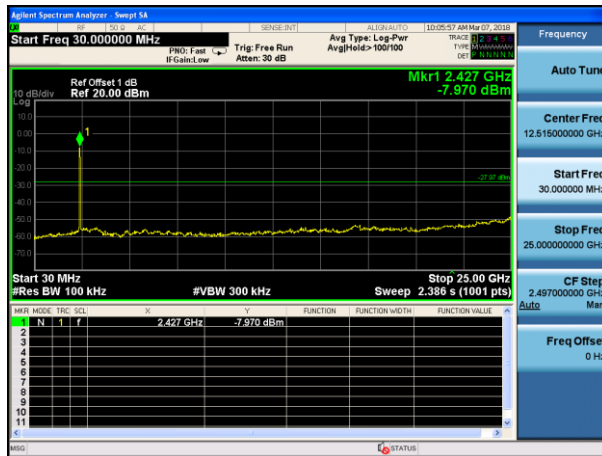
Test mode: 802.11n(HT40)

Lowest channel



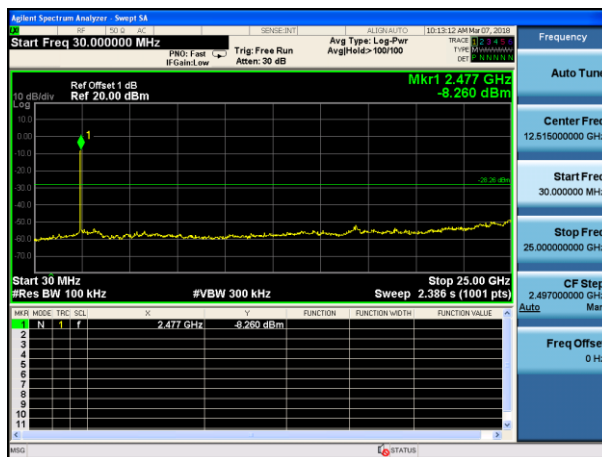
30MHz~25GHz

Middle channel



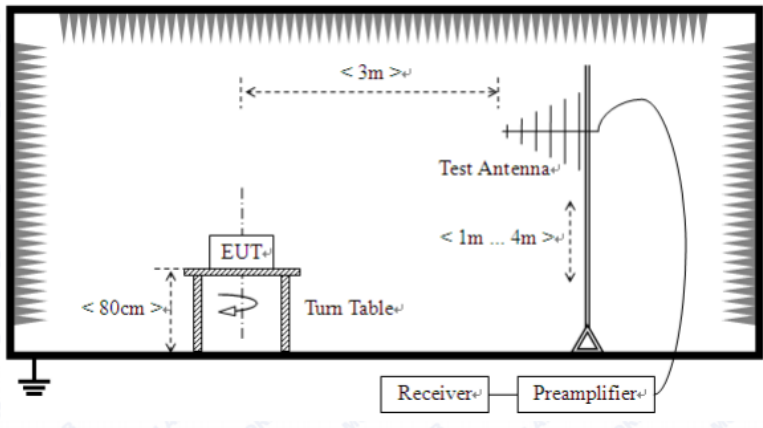
30MHz~25GHz

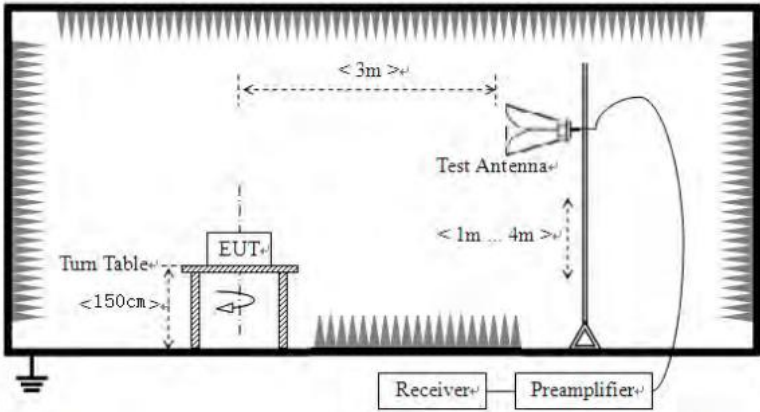
Highest channel



30MHz~25GHz

4.7.2 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209				
Test Method:	ANSI C63.10:2013				
Test Frequency Range:	30MHz to 25GHz				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Value
	9kHz- 150kHz	Quasi-peak	200Hz	1kHz	Quasi-peak Value
	150kHz- 30MHz	Quasi-peak	9kHz	30kHz	Quasi-peak Value
	30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
RMS		1MHz	3MHz	Average	
Limit:	Frequency	Limit (dBuV/m @3m)		Value	
	0.009-0.490MHz	2400/F(KHz)		300	
	0.490-1.705MHz	24000/F(KHz)		30	
	1.705-30MHz	30		30	
	30MHz-88MHz	40.00		Quasi-peak	
	88MHz-216MHz	43.50		Quasi-peak	
	216MHz-960MHz	46.00		Quasi-peak	
	960MHz-1GHz	54.00		Quasi-peak	
	Above 1GHz	54.00		Average	
74.00		Peak			
Test setup:	Below 1GHz				
	 <p>The diagram illustrates the test setup for frequencies below 1 GHz. It shows an Equipment Under Test (EUT) placed on a turn table, which is 80 cm above the ground. A test antenna is positioned 3 meters away from the EUT and at a height of 1 to 4 meters. The antenna is connected to a preamplifier and then a receiver. The entire setup is enclosed in a shielded chamber.</p>				
Above 1GHz					

	
Test Procedure:	<ol style="list-style-type: none"> 1. The EUT was placed on the top of a rotating table (0.8 meters below 1G and 1.5 meters 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. 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

Remark:

1. Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis which it is worse case.
2. The test data below 30MHz is too lower than the limit, so not show in this report.
3. This Report only show the test plots of the worst case.

Measurement Data

■ Test result for 802.11g (Channel 2462MHz), AC 120V/ 60Hz

■ **Below 1GHz**

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
34.40	34.68	11.25	0.6	30.07	16.46	40.00	-23.54	Vertical
96.10	28.90	11.35	1.16	29.72	11.69	40.00	-28.31	Vertical
104.54	29.93	11.8	1.23	29.67	13.29	43.50	-30.21	Vertical
189.74	39.48	9.7	1.79	29.24	21.73	43.50	-21.77	Vertical
296.18	32.73	13.4	2.34	29.98	18.49	46.00	-27.51	Vertical
556.77	24.42	18.51	3.55	29.3	17.18	46.00	-28.82	Vertical
34.28	25.73	11.25	0.6	30.07	7.51	40.00	-32.49	Horizontal
89.59	28.12	10.6	1.11	29.75	10.08	43.50	-33.42	Horizontal
104.54	33.05	11.8	1.23	29.67	16.41	46.00	-29.59	Horizontal
197.89	34.01	10.2	1.83	29.21	16.83	46.00	-29.17	Horizontal
338.40	30.06	14.26	2.57	29.79	17.10	46.00	-28.90	Horizontal
614.21	23.73	19.37	3.77	29.29	17.58	46.00	-28.42	Horizontal

■ 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	38.76	31.79	8.62	32.1	47.07	74.00	-26.93	Vertical
7236.00	32.89	36.19	11.68	31.97	48.79	74.00	-25.21	Vertical
9648.00	32.15	38.07	14.16	31.56	52.82	74.00	-21.18	Vertical
12060.00	*					74.00		Vertical
14472.00	*					74.00		Vertical
16884.00	*					74.00		Vertical
4824.00	37.69	31.79	8.62	32.1	46.00	74.00	-28.00	Horizontal
7236.00	32.73	36.19	11.68	31.97	48.63	74.00	-25.37	Horizontal
9648.00	31.91	38.07	14.16	31.56	52.58	74.00	-21.42	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	26.38	31.79	8.62	32.1	34.69	54.00	-19.31	Vertical
7236.00	20.96	36.19	11.68	31.97	36.86	54.00	-17.14	Vertical
9648.00	19.74	38.07	14.16	31.56	40.41	54.00	-13.59	Vertical
12060.00	*					54.00		Vertical
14472.00	*					54.00		Vertical
16884.00	*					54.00		Vertical
4824.00	31.19	31.79	8.62	32.1	39.50	54.00	-14.50	Horizontal
7236.00	23.31	36.19	11.68	31.97	39.21	54.00	-14.79	Horizontal
9648.00	19.45	38.07	14.16	31.56	40.12	54.00	-13.88	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 – Pre-amplifier 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	37.82	31.85	8.66	32.12	46.21	74.00	-27.79	Vertical
7311.00	34.11	36.37	11.71	31.91	50.28	74.00	-23.72	Vertical
9748.00	32.58	38.27	14.25	31.56	53.54	74.00	-20.46	Vertical
12185.00	*					74.00		Vertical
14622.00	*					74.00		Vertical
17059.00	*					74.00		Vertical
4874.00	38.13	31.85	8.66	32.12	46.52	74.00	-27.48	Horizontal
7311.00	32.78	36.37	11.71	31.91	48.95	74.00	-25.05	Horizontal
9748.00	33.60	38.27	14.25	31.56	54.56	74.00	-19.44	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	28.70	31.85	8.66	32.12	37.09	54.00	-16.91	Vertical
7311.00	21.29	36.37	11.71	31.91	37.46	54.00	-16.54	Vertical
9748.00	23.00	38.27	14.25	31.56	43.96	54.00	-10.04	Vertical
12185.00	*					54.00		Vertical
14622.00	*					54.00		Vertical
17059.00	*					54.00		Vertical
4874.00	28.85	31.85	8.66	32.12	37.24	54.00	-16.76	Horizontal
7311.00	21.74	36.37	11.71	31.91	37.91	54.00	-16.09	Horizontal
9748.00	22.35	38.27	14.25	31.56	43.31	54.00	-10.69	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 – Pre-amplifier Factor*
2. *“*”, means this data is the 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	43.25	31.9	8.7	32.15	51.70	74.00	-22.30	Vertical
7386.00	33.90	36.49	11.76	31.83	50.32	74.00	-23.68	Vertical
9848.00	35.98	38.62	14.31	31.77	57.14	74.00	-16.86	Vertical
12310.00	*					74.00		Vertical
14772.00	*					74.00		Vertical
17234.00	*					74.00		Vertical
4924.00	42.07	31.9	8.7	32.15	50.52	74.00	-23.48	Horizontal
7386.00	33.13	36.49	11.76	31.83	49.55	74.00	-24.45	Horizontal
9848.00	33.15	38.62	14.31	31.77	54.31	74.00	-19.69	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	33.65	31.9	8.7	32.15	42.10	54.00	-11.90	Vertical
7386.00	24.53	36.49	11.76	31.83	40.95	54.00	-13.05	Vertical
9848.00	24.35	38.62	14.31	31.77	45.51	54.00	-8.49	Vertical
12310.00	*					54.00		Vertical
14772.00	*					54.00		Vertical
17234.00	*					54.00		Vertical
4924.00	32.78	31.9	8.7	32.15	41.23	54.00	-12.77	Horizontal
7386.00	21.93	36.49	11.76	31.83	38.35	54.00	-15.65	Horizontal
9848.00	22.12	38.62	14.31	31.77	43.28	54.00	-10.72	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 – Pre-amplifier 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	38.78	31.79	8.62	32.1	47.09	74.00	-26.91	Vertical
7236.00	32.59	36.19	11.68	31.97	48.49	74.00	-25.51	Vertical
9648.00	31.71	38.07	14.16	31.56	52.38	74.00	-21.62	Vertical
12060.00	*					74.00		Vertical
14472.00	*					74.00		Vertical
16884.00	*					74.00		Vertical
4824.00	38.20	31.79	8.62	32.1	46.51	74.00	-27.49	Horizontal
7236.00	33.07	36.19	11.68	31.97	48.97	74.00	-25.03	Horizontal
9648.00	30.97	38.07	14.16	31.56	51.64	74.00	-22.36	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	27.35	31.79	8.62	32.1	35.66	54.00	-18.34	Vertical
7236.00	22.58	36.19	11.68	31.97	38.48	54.00	-15.52	Vertical
9648.00	21.89	38.07	14.16	31.56	42.56	54.00	-11.44	Vertical
12060.00	*					54.00		Vertical
14472.00	*					54.00		Vertical
16884.00	*					54.00		Vertical
4824.00	27.83	31.79	8.62	32.1	36.14	54.00	-17.86	Horizontal
7236.00	22.21	36.19	11.68	31.97	38.11	54.00	-15.89	Horizontal
9648.00	21.02	38.07	14.16	31.56	41.69	54.00	-12.31	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 – Pre-amplifier Factor*
2. *“*”, means this data is 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	37.53	31.85	8.66	32.12	45.92	74.00	-28.08	Vertical
7311.00	33.12	36.37	11.71	31.91	49.29	74.00	-24.71	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	38.75	31.85	8.66	32.12	47.14	74.00	-26.86	Horizontal
7311.00	31.64	36.37	11.71	31.91	47.81	74.00	-26.19	Horizontal
9748.00	32.85	38.27	14.25	31.56	53.81	74.00	-20.19	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	28.59	31.85	8.66	32.12	36.98	54.00	-17.02	Vertical
7311.00	21.86	36.37	11.71	31.91	38.03	54.00	-15.97	Vertical
9748.00	22.03	38.27	14.25	31.56	42.99	54.00	-11.01	Vertical
12185.00	*					54.00		Vertical
14622.00	*					54.00		Vertical
17059.00	*					54.00		Vertical
4874.00	28.94	31.85	8.66	32.12	37.33	54.00	-16.67	Horizontal
7311.00	21.67	36.37	11.71	31.91	37.84	54.00	-16.16	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 – Pre-amplifier Factor*
2. *“*”, means this data is 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	42.46	31.9	8.7	32.15	50.91	74.00	-23.09	Vertical
7386.00	33.29	36.49	11.76	31.83	49.71	74.00	-24.29	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	43.25	31.9	8.7	32.15	51.70	74.00	-22.30	Horizontal
7386.00	32.58	36.49	11.76	31.83	49.00	74.00	-25.00	Horizontal
9848.00	32.04	38.62	14.31	31.77	53.20	74.00	-20.80	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	34.49	31.9	8.7	32.15	42.94	54.00	-11.06	Vertical
7386.00	23.32	36.49	11.76	31.83	39.74	54.00	-14.26	Vertical
9848.00	24.73	38.62	14.31	31.77	45.89	54.00	-8.11	Vertical
12310.00	*					54.00		Vertical
14772.00	*					54.00		Vertical
17234.00	*					54.00		Vertical
4924.00	32.74	31.9	8.7	32.15	41.19	54.00	-12.81	Horizontal
7386.00	22.22	36.49	11.76	31.83	38.64	54.00	-15.36	Horizontal
9848.00	21.83	38.62	14.31	31.77	42.99	54.00	-11.01	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 – Pre-amplifier 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	42.32	31.79	8.62	32.1	50.63	74.00	-23.37	Vertical
7236.00	34.09	36.19	11.68	31.97	49.99	74.00	-24.01	Vertical
9648.00	35.98	38.07	14.16	31.56	56.65	74.00	-17.35	Vertical
12060.00	*					74.00		Vertical
14472.00	*					74.00		Vertical
16884.00	*					74.00		Vertical
4824.00	42.69	31.79	8.62	32.1	51.00	74.00	-23.00	Horizontal
7236.00	32.55	36.19	11.68	31.97	48.45	74.00	-25.55	Horizontal
9648.00	32.32	38.07	14.16	31.56	52.99	74.00	-21.01	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	33.75	31.79	8.62	32.1	42.06	54.00	-11.94	Vertical
7236.00	23.65	36.19	11.68	31.97	39.55	54.00	-14.45	Vertical
9648.00	24.49	38.07	14.16	31.56	45.16	54.00	-8.84	Vertical
12060.00	*					54.00		Vertical
14472.00	*					54.00		Vertical
16884.00	*					54.00		Vertical
4824.00	32.22	31.79	8.62	32.1	40.53	54.00	-13.47	Horizontal
7236.00	22.03	36.19	11.68	31.97	37.93	54.00	-16.07	Horizontal
9648.00	22.11	38.07	14.16	31.56	42.78	54.00	-11.22	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
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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	42.44	31.85	8.66	32.12	50.83	74.00	-23.17	Vertical
7311.00	33.56	36.37	11.71	31.91	49.73	74.00	-24.27	Vertical
9748.00	36.49	38.27	14.25	31.56	57.45	74.00	-16.55	Vertical
12185.00	*					74.00		Vertical
14622.00	*					74.00		Vertical
17059.00	*					74.00		Vertical
4874.00	43.24	31.85	8.66	32.12	51.63	74.00	-22.37	Horizontal
7311.00	33.00	36.37	11.71	31.91	49.17	74.00	-24.83	Horizontal
9748.00	31.94	38.27	14.25	31.56	52.90	74.00	-21.10	Horizontal
12185.00	*					74.00		Horizontal
14622.00	*					74.00		Horizontal
17059.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4874.00	33.72	31.85	8.66	32.12	42.11	54.00	-11.89	Vertical
7311.00	24.13	36.37	11.71	31.91	40.30	54.00	-13.70	Vertical
9748.00	24.13	38.27	14.25	31.56	45.09	54.00	-8.91	Vertical
12185.00	*					54.00		Vertical
14622.00	*					54.00		Vertical
17059.00	*					54.00		Vertical
4874.00	32.44	31.85	8.66	32.12	40.83	54.00	-13.17	Horizontal
7311.00	21.70	36.37	11.71	31.91	37.87	54.00	-16.13	Horizontal
9748.00	22.09	38.27	14.25	31.56	43.05	54.00	-10.95	Horizontal
12185.00	*					54.00		Horizontal
14622.00	*					54.00		Horizontal
17059.00	*					54.00		Horizontal

Remark:

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

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	42.18	31.9	8.7	32.15	50.63	74.00	-23.37	4924.00
7386.00	33.80	36.49	11.76	31.83	50.22	74.00	-23.78	7386.00
9848.00	36.21	38.62	14.31	31.77	57.37	74.00	-16.63	9848.00
12310.00	*					74.00		Vertical
14772.00	*					74.00		Vertical
17234.00	*					74.00		Vertical
4924.00	42.75	31.9	8.7	32.15	51.20	74.00	-22.80	Horizontal
7386.00	33.01	36.49	11.76	31.83	49.43	74.00	-24.57	Horizontal
9848.00	32.16	38.62	14.31	31.77	53.32	74.00	-20.68	Horizontal
12310.00	*					74.00		Horizontal
14772.00	*					74.00		Horizontal
17234.00	*					74.00		Horizontal

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4924.00	34.19	31.9	8.7	32.15	42.64	54.00	-11.36	Vertical
7386.00	23.66	36.49	11.76	31.83	40.08	54.00	-13.92	Vertical
9848.00	24.75	38.62	14.31	31.77	45.91	54.00	-8.09	Vertical
12310.00	*					54.00		Vertical
14772.00	*					54.00		Vertical
17234.00	*					54.00		Vertical
4924.00	32.68	31.9	8.7	32.15	41.13	54.00	-12.87	Horizontal
7386.00	22.35	36.49	11.76	31.83	38.77	54.00	-15.23	Horizontal
9848.00	22.52	38.62	14.31	31.77	43.68	54.00	-10.32	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 – Pre-amplifier 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)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4844.00	42.54	31.81	8.63	32.11	50.87	74.00	-23.13	Vertical
7266.00	33.80	36.28	11.69	31.94	49.83	74.00	-24.17	Vertical
9688.00	35.96	38.13	14.21	31.52	56.78	74.00	-17.22	Vertical
12060.00	*					74.00		Vertical
14472.00	*					74.00		Vertical
16884.00	*					74.00		Vertical
4844.00	42.74	31.81	8.63	32.11	51.07	74.00	-22.93	Horizontal
7266.00	32.59	36.28	11.69	31.94	48.62	74.00	-25.38	Horizontal
9688.00	32.06	38.13	14.21	31.52	52.88	74.00	-21.12	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	34.42	31.81	8.63	32.11	42.75	54.00	-11.25	Vertical
7266.00	24.27	36.28	11.69	31.94	40.30	54.00	-13.70	Vertical
9688.00	24.80	38.13	14.21	31.52	45.62	54.00	-8.38	Vertical
12060.00	*					54.00		Vertical
14472.00	*					54.00		Vertical
16884.00	*					54.00		Vertical
4844.00	32.26	31.81	8.63	32.11	40.59	54.00	-13.41	Horizontal
7266.00	21.86	36.28	11.69	31.94	37.89	54.00	-16.11	Horizontal
9688.00	22.24	38.13	14.21	31.52	43.06	54.00	-10.94	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 – Pre-amplifier 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)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4874.00	42.18	31.85	8.66	32.12	50.57	74.00	-23.43	Vertical
7311.00	33.11	36.37	11.71	31.91	49.28	74.00	-24.72	Vertical
9748.00	36.37	38.27	14.25	31.56	57.33	74.00	-16.67	Vertical
12185.00	*					74.00		Vertical
14622.00	*					74.00		Vertical
17059.00	*					74.00		Vertical
4874.00	42.84	31.85	8.66	32.12	51.23	74.00	-22.77	Horizontal
7311.00	32.80	36.37	11.71	31.91	48.97	74.00	-25.03	Horizontal
9748.00	32.14	38.27	14.25	31.56	53.10	74.00	-20.90	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	33.29	31.85	8.66	32.12	41.68	54.00	-12.32	Vertical
7311.00	23.52	36.37	11.71	31.91	39.69	54.00	-14.31	Vertical
9748.00	24.68	38.27	14.25	31.56	45.64	54.00	-8.36	Vertical
12185.00	*					54.00		Vertical
14622.00	*					54.00		Vertical
17059.00	*					54.00		Vertical
4874.00	32.67	31.85	8.66	32.12	41.06	54.00	-12.94	Horizontal
7311.00	21.92	36.37	11.71	31.91	38.09	54.00	-15.91	Horizontal
9748.00	21.57	38.27	14.25	31.56	42.53	54.00	-11.47	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
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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	42.25	31.88	8.68	32.13	50.68	74.00	-23.32	Vertical
7356.00	33.56	36.45	11.75	31.86	49.90	74.00	-24.10	Vertical
9808.00	36.17	38.43	14.29	31.68	57.21	74.00	-16.79	Vertical
12310.00	*					74.00		Vertical
14772.00	*					74.00		Vertical
17234.00	*					74.00		Vertical
4904.00	42.66	31.88	8.68	32.13	51.09	74.00	-22.91	Horizontal
7356.00	32.56	36.45	11.75	31.86	48.90	74.00	-25.10	Horizontal
9808.00	31.66	38.43	14.29	31.68	52.70	74.00	-21.30	Horizontal
12310.00	*					74.00		Horizontal
14772.00	*					74.00		Horizontal
17234.00	*					74.00		Horizontal

Average value:

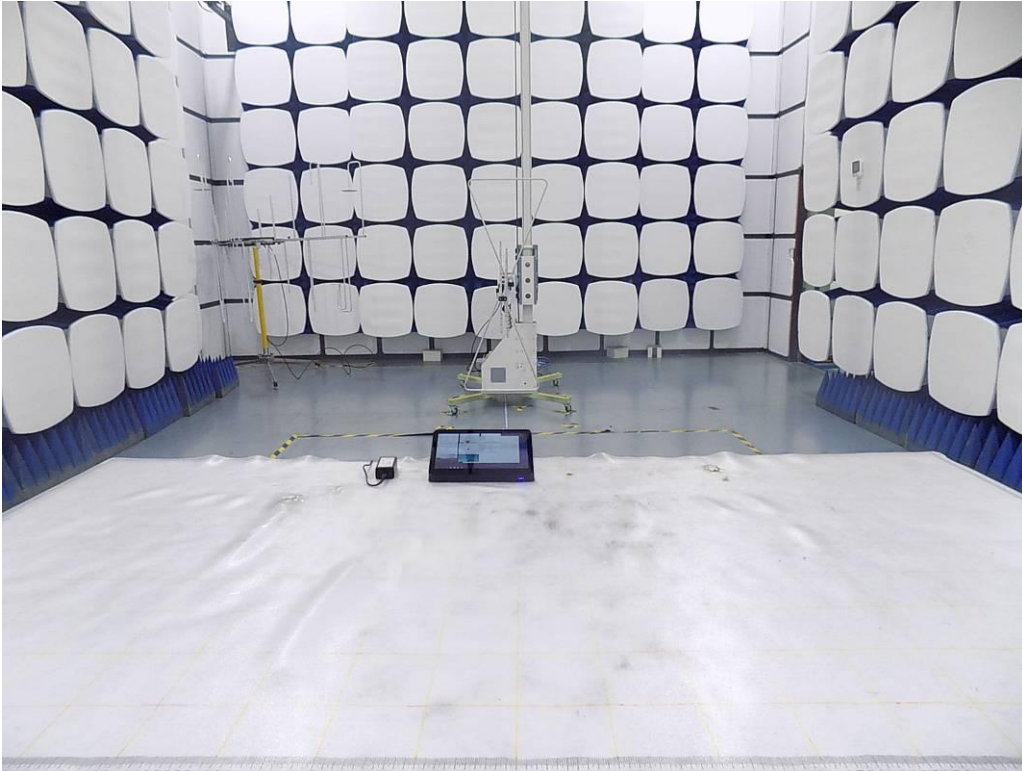
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4904.00	34.03	31.88	8.68	32.13	42.46	54.00	-11.54	Vertical
7356.00	22.76	36.45	11.75	31.86	39.10	54.00	-14.90	Vertical
9808.00	24.77	38.43	14.29	31.68	45.81	54.00	-8.19	Vertical
12310.00	*					54.00		Vertical
14772.00	*					54.00		Vertical
17234.00	*					54.00		Vertical
4904.00	32.70	31.88	8.68	32.13	41.13	54.00	-12.87	Horizontal
7356.00	22.13	36.45	11.75	31.86	38.47	54.00	-15.53	Horizontal
9808.00	21.49	38.43	14.29	31.68	42.53	54.00	-11.47	Horizontal
12310.00	*					54.00		Horizontal
14772.00	*					54.00		Horizontal
17234.00	*					54.00		Horizontal

Remark:

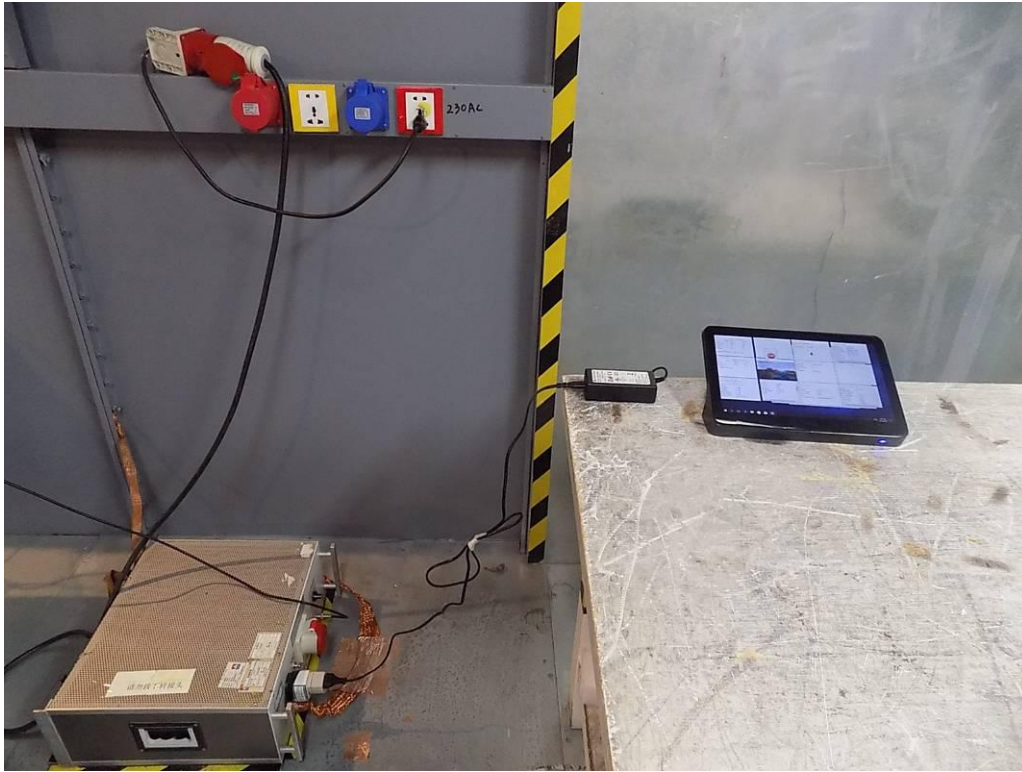
- 1 Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
- 2 “*”, means this data is the too weak instrument of signal is unable to test.

5 Test Setup Photo

Radiated Emission



Conducted Emission



6 EUT Constructional Details

Please refer to report T1880563 08.

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