



## SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

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Report No.: SZEM180500375301  
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# TEST REPORT

<b>Application No.:</b>	SZEM1805003753CR
<b>Applicant:</b>	Zhuhai Pantum Electronics Co., Ltd
<b>Address of Applicant:</b>	Area A, 3rd floor, Building No.1, No.3883, Zhuhai Avenue, Zhuhai, Guangdong, China
<b>Manufacturer:</b>	Zhuhai Pantum Electronics Co., Ltd
<b>Address of Manufacturer:</b>	Area A, 3rd floor, Building No.1, No.3883, Zhuhai Avenue, Zhuhai, Guangdong, China
<b>Factory:</b>	Zhuhai Pantum Electronics Co., Ltd
<b>Address of Factory:</b>	Area A, 3rd floor, Building No.1, No.3883, Zhuhai Avenue, Zhuhai, Guangdong, China
<b>Equipment Under Test (EUT):</b>	
<b>EUT Name:</b>	Monochrome Laser Printer
<b>Model No.:</b>	P3500D, P3502D, P3505D, P3506D, P3507D, P3508D, P3509D, P3500DN, P3502DN, P3505DN, P3506DN, P3507DN, P3508DN, P3509DN, P3500DW, P3502DW, P3505DW, P3506DW, P3507DW, P3508DW *
*	Please refer to section 2 of this report which indicates model was actually tested and which were electrically identical.
<b>Trade mark:</b>	PANTUM
<b>FCC ID:</b>	2AEGOPANTUM-3
<b>Standard(s) :</b>	47 CFR Part 15, Subpart C 15.247 (only for Conducted Emissions at AC Power Line and Radiated Spurious Emissions)
<b>Date of Receipt:</b>	2018-05-10
<b>Date of Test:</b>	2018-05-16 to 2018-05-18
<b>Date of Issue:</b>	2018-05-22
<b>Test Result:</b>	Pass*

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



Keny Xu

EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

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<i>Revision Record</i>				
<i>Version</i>	<i>Chapter</i>	<i>Date</i>	<i>Modifier</i>	<i>Remark</i>
01		2018-05-22		<i>Original</i>

<b>Authorized for issue by:</b>			
		 <b>Vincent Chen</b>	
		<b>Vincent Chen /Project Engineer</b>	
		 <b>Eric Fu</b>	
		<b>Eric Fu /Reviewer</b>	

## 2 Test Summary

<b>Radio Spectrum Technical Requirement</b>				
<b>Item</b>	<b>Standard</b>	<b>Method</b>	<b>Requirement</b>	<b>Result</b>
Antenna Requirement	47 CFR Part 15, Subpart C 15.247	N/A	47 CFR Part 15, Subpart C 15.203 & 15.247(c)	Pass

<b>Radio Spectrum Matter Part</b>				
<b>Item</b>	<b>Standard</b>	<b>Method</b>	<b>Requirement</b>	<b>Result</b>
Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.2	47 CFR Part 15, Subpart C 15.207	Pass
Radiated Spurious Emissions	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.4,6.5,6.6	47 CFR Part 15, Subpart C 15.209 & 15.247(d)	Pass

**Remark:**

Model No: P3500D, P3502D, P3505D, P3506D, P3507D, P3508D, P3509D, P3500DN P3502DN, P3505DN, P3506DN, P3507DN, P3508DN, P3509DN, P3500DW, P3502DW, P3505DW, P3506DW, P3507DW, P3508DW

Only the model P3508DW was tested, since the electrical circuit design, layout, components used, internal wiring and functions were identical for the above models, only the below are different.

Model	Speed	Color	Communication Interface
P3500D, P3502D, P3505D, P3506D, P3507D, P3508D, P3509D			USB
P3500DN P3502DN, P3505DN, P3506DN, P3507DN, P3508DN, P3509DN,	33PPM	Various	USB+NET
P3500DW, P3502DW, P3505DW, P3506DW, P3507DW, P3508DW			USB+NET+WIFI

This test report (Ref. No.: SZEM180500375301) is only valid with the original test report (Ref. No.: SZEM150700422401).

Compared with the original report, this report just changed model name.

According to the declaration from the applicant, the models in this report and the models in original report were identical, but changed the data board and power board components.

Considering to the difference, pre-scan were performed on the sample in this report to find the items which can be influential to the result in the original test report for fully retest.

Therefore in this report Conducted Emissions at AC Power Line and Radiated Spurious Emissions were fully retested on model P3508DW and shown the data in this report, other tests please refer to original report SZEM150700422401.

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## 4 General Information

### 4.1 Details of E.U.T.

Power supply:	AC 110-127V, 50/60Hz, 8.0A
Cable:	AC cable:185cm, unshielded USB cable:145cm, unshielded
Internal source:	600MHz
Antenna Gain	2dBi
Antenna Type	Integral Antenna
Channel Spacing	5MHz
Modulation Type	802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) 802.11n(HT20): OFDM (64QAM, 16QAM, QPSK, BPSK)
Number of Channels	802.11b/g/n(HT20):11
Operation Frequency	802.11b/g/n(HT20): 2412MHz to 2462MHz

### 4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Laptop	Lenovo	T430u	REF. No.:SEA1800
Mouse	Lenovo	M-U0025-O	REF. No.:SEA2400
Router	NETGEAR	DGN2200	REF. No.:SEA2200
Software:Pantum P3500	Supplied by client	V1.1	--

### 4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	$7.25 \times 10^{-8}$
2	Duty cycle	0.37%
3	Occupied Bandwidth	3%
4	RF conducted power	0.75dB
5	RF power density	2.84dB
6	Conducted Spurious emissions	0.75dB
7	RF Radiated power	4.5dB (below 1GHz) 4.8dB (above 1GHz)
8	Radiated Spurious emission test	4.5dB (Below 1GHz) 4.8dB (Above 1GHz)
9	Temperature test	1 °C
10	Humidity test	3%
11	Supply voltages	1.5%
12	Time	3%

#### **4.4 Test Location**

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China.  
518057.

Tel: +86 755 2601 2053      Fax: +86 755 2671 0594

No tests were sub-contracted.

#### **4.5 Test Facility**

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

- CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- VCCI**

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

- FCC –Designation Number: CN1178**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

- Industry Canada (IC)**

Two 3m Semi-anechoic chambers and the 10m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1, 4620C-2, 4620C-3.

#### **4.6 Deviation from Standards**

None

#### **4.7 Abnormalities from Standard Conditions**

None

## 5 Equipment List

<b>Conducted Emissions at AC Power Line (150kHz-30MHz)</b>					
<b>Equipment</b>	<b>Manufacturer</b>	<b>Model No</b>	<b>Inventory No</b>	<b>Cal Date</b>	<b>Cal Due Date</b>
Shielding Room	ZhongYu Electron	GB-88	SEM001-06	2017-05-10	2020-05-09
Measurement Software	AUDIX	e3 V5.4.1221d	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM024-01	2017-07-13	2018-07-12
LISN	Rohde & Schwarz	ENV216	SEM007-01	2017-09-27	2018-09-26
LISN	ETS-LINDGREN	3816/2	SEM007-02	2018-04-02	2019-04-01
EMI Test Receiver	Rohde & Schwarz	ESCI	SEM004-02	2018-04-02	2019-04-01

<b>Radiated Spurious Emissions</b>					
<b>Equipment</b>	<b>Manufacturer</b>	<b>Model No</b>	<b>Inventory No</b>	<b>Cal Date</b>	<b>Cal Due Date</b>
3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2018-03-13	2021-03-12
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM026-01	2017-07-13	2018-07-12
Spectrum Analyzer	Rohde & Schwarz	FSU43	SEM004-08	2018-04-02	2019-04-01
BiConiLog Antenna (26-3000MHz)	ETS-Lindgren	3142C	SEM003-01	2017-06-27	2020-06-26
Horn Antenna (1-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2018-04-13	2021-04-12
Horn Antenna(15GHz-40GHz)	Schwarzbeck	BBHA 9170	SEM003-15	2017-10-17	2020-10-16
Pre-amplifier (0.1-1300MHz)	HP	8447D	SEM005-02	2017-09-27	2018-09-26
Low Noise Amplifier(100MHz-18GHz)	Black Diamond Series	BDLNA-0118-352810	SEM005-05	2017-09-27	2018-09-27
Pre-amplifier(18-26GHz)	Rohde & Schwarz	CH14-H052	SEM005-17	2018-04-02	2019-04-01
Pre-amplifier(26GHz-40GHz)	Compliance Directions Systems Inc.	PAP-2640-50	SEM005-08	2018-04-02	2019-04-01
DC Power Supply	Zhao Xin	RXN-305D	SEM011-02	2017-09-27	2018-09-26
Active Loop Antenna	ETS-Lindgren	6502	SEM003-08	2017-08-22	2020-08-21
Band filter	N/A	N/A	SEM023-01	N/A	N/A



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RE in Chamber						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (yyyy-mm-dd)	Cal. Due date (yyyy-mm-dd)
1	10m Semi-Anechoic Chamber	SAEMC	FSAC1018	SEM001-03	2018-03-31	2021-03-30
2	EMI Test Receiver (9k-7GHz)	Rohde & Schwarz	ESR	SEM004-03	2018-04-02	2019-04-01
3	Trilog-Broadband Antenna(30M-1GHz)	Schwarzbeck	VULB9168	SEM003-18	2016-06-29	2019-06-28
4	Pre-amplifier (9kHz-1GHz)	Sonoma Instrument Co	310N	SEM005-04	2018-04-13	2019-04-12
5	Loop Antenna (9kHz-30MHz)	ETS-Lindgren	6502	SEM003-08	2017-08-22	2020-08-21
6	Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
7	Coaxial Cable	SGS	N/A	SEM029-01	2017-07-13	2018-07-12

General used equipment					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-03	2017-09-29	2018-09-28
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2017-09-29	2018-09-28
Humidity/ Temperature Indicator	Mingle	N/A	SEM002-08	2017-09-29	2018-09-28
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2018-04-08	2019-04-07

## **6 Radio Spectrum Technical Requirement**

### **6.1 Antenna Requirement**

#### **6.1.1 Test Requirement:**

47 CFR Part 15, Subpart C 15.203 & 15.247(c)

#### **6.1.2 Conclusion**

Standard 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(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

EUT Antenna:

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 2dBi.

## **7 Radio Spectrum Matter Test Results**

### **7.1 Conducted Emissions at AC Power Line (150kHz-30MHz)**

Test Requirement 47 CFR Part 15, Subpart C 15.207

Test Method: ANSI C63.10 (2013) Section 6.2

Limit:

<b>Frequency of emission(MHz)</b>	<b>Conducted limit(dB<math>\mu</math>V)</b>	
	<b>Quasi-peak</b>	<b>Average</b>
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.

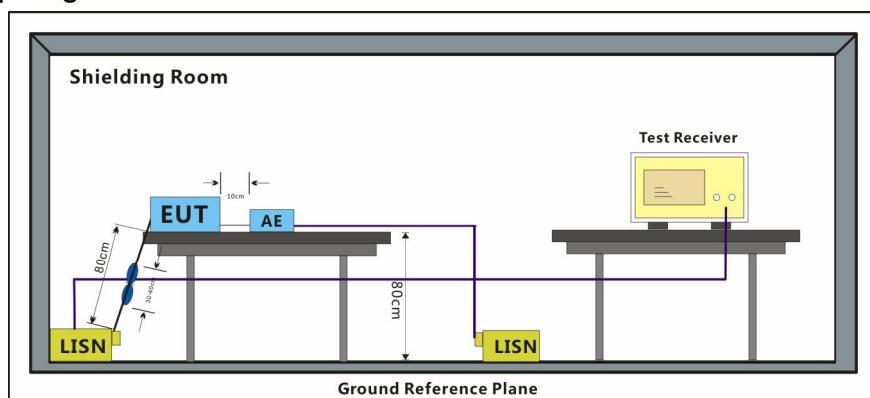
### 7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 21.7 °C      Humidity: 52.2 % RH      Atmospheric Pressure: 1015 mbar

Test mode a:TX mode\_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20). Only the data of worst case is recorded in the report.

### 7.1.2 Test Setup Diagram

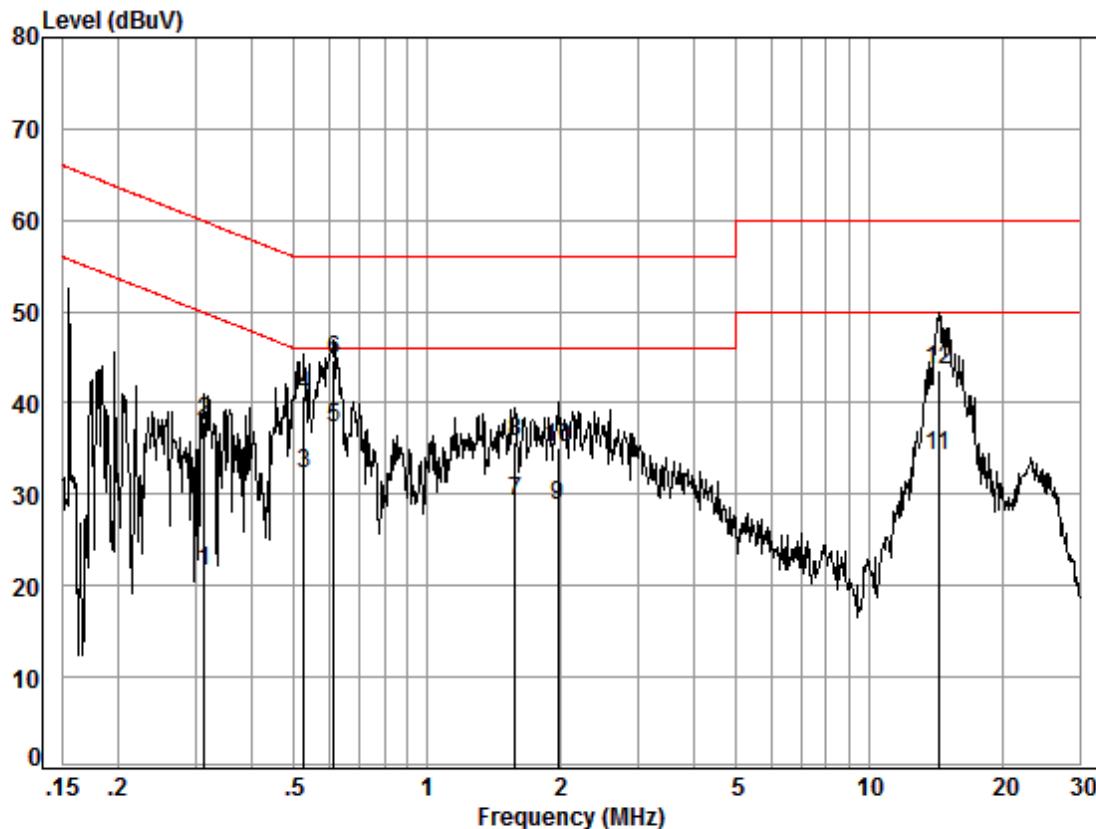


### 7.1.3 Measurement Procedure and Data

- 1) The mains terminal disturbance voltage test was conducted in a shielded room.
- 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50µH + 5ohm linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
- 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,
- 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
- 5) 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 on conducted measurement.

Remark: LISN=Read Level+ Cable Loss+ LISN Factor

Mode:a; Line:Live Line



Site : Shielding Room

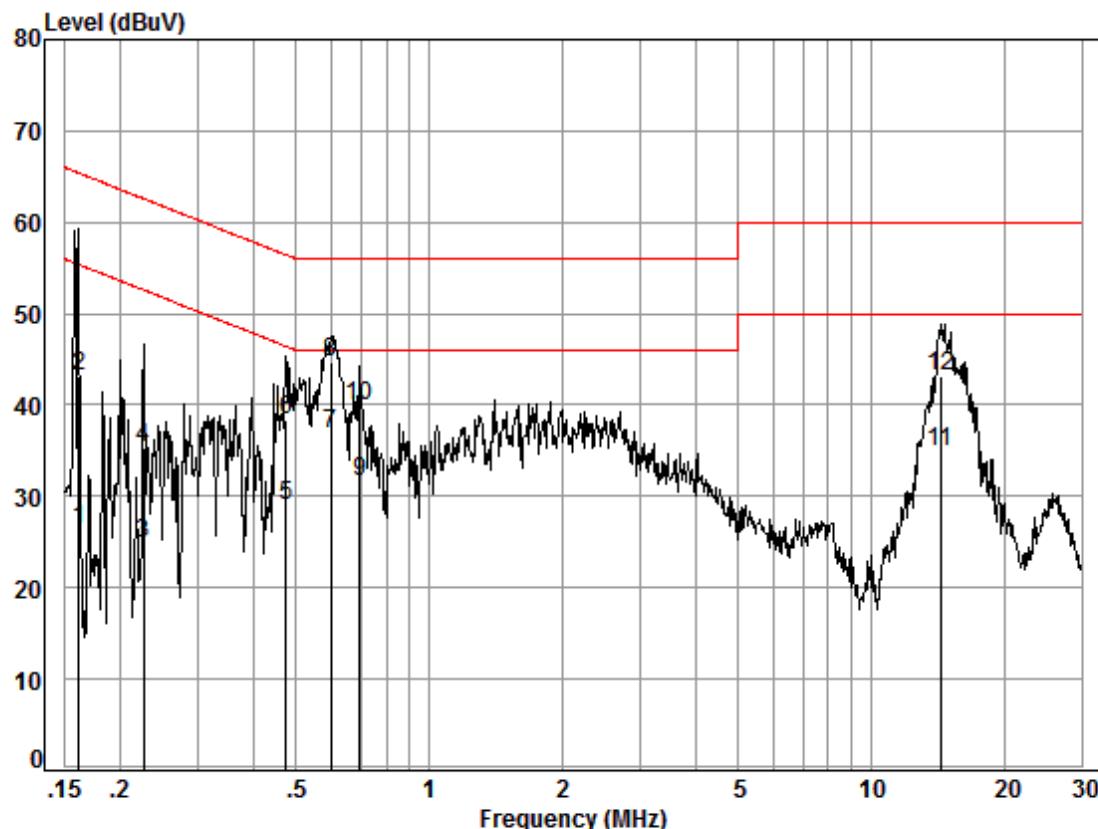
Condition: Line

Job No. : 03753CR

Test mode: a

Freq	Cable	LISN	Read	Limit		Over	Remark
	MHz	Loss	Factor	Level	Level	Line	
1	0.31	0.03	9.51	12.04	21.58	49.88	-28.30 Average
2	0.31	0.03	9.51	28.48	38.02	59.88	-21.86 QP
3	0.53	0.04	9.50	22.69	32.23	46.00	-13.77 Average
4	0.53	0.04	9.50	31.25	40.79	56.00	-15.21 QP
5	0.61	0.06	9.52	27.79	37.37	46.00	-8.63 Average
6	0.61	0.06	9.52	35.15	44.73	56.00	-11.27 QP
7	1.59	0.13	9.51	19.52	29.16	46.00	-16.84 Average
8	1.59	0.13	9.51	26.19	35.83	56.00	-20.17 QP
9	1.98	0.15	9.51	19.10	28.76	46.00	-17.24 Average
10	1.98	0.15	9.51	25.54	35.20	56.00	-20.80 QP
11	14.36	0.24	9.70	24.37	34.31	50.00	-15.69 Average
12	14.36	0.24	9.70	33.70	43.64	60.00	-16.36 QP

Mode:a; Line:Neutral Line



Site : Shielding Room

Condition: Neutral

Job No. : 03753CR

Test mode: a

Freq	Cable	LISN	Read	Limit		Over	Remark
	MHz	Loss	Factor	Level	Level	Line	
1	0.16	0.02	9.59	16.71	26.32	55.38	-29.06 Average
2	0.16	0.02	9.59	33.45	43.06	65.38	-22.32 QP
3	0.23	0.03	9.58	15.19	24.80	52.61	-27.81 Average
4	0.23	0.03	9.58	25.79	35.40	62.61	-27.21 QP
5	0.47	0.04	9.60	19.32	28.96	46.45	-17.49 Average
6	0.47	0.04	9.60	28.63	38.27	56.45	-18.18 QP
7	0.60	0.06	9.62	27.19	36.87	46.00	-9.13 Average
8	0.60	0.06	9.62	35.07	44.75	56.00	-11.25 QP
9	0.70	0.07	9.62	21.87	31.56	46.00	-14.44 Average
10	0.70	0.07	9.62	30.10	39.79	56.00	-16.21 QP
11	14.36	0.24	9.91	24.75	34.90	50.00	-15.10 Average
12	14.36	0.24	9.91	33.04	43.19	60.00	-16.81 QP

## 7.2 Radiated Spurious Emissions

Test Requirement 47 CFR Part 15, Subpart C 15.209 & 15.247(d)

Test Method: ANSI C63.10 (2013) Section 6.4,6.5,6.6

Measurement Distance: 3m

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

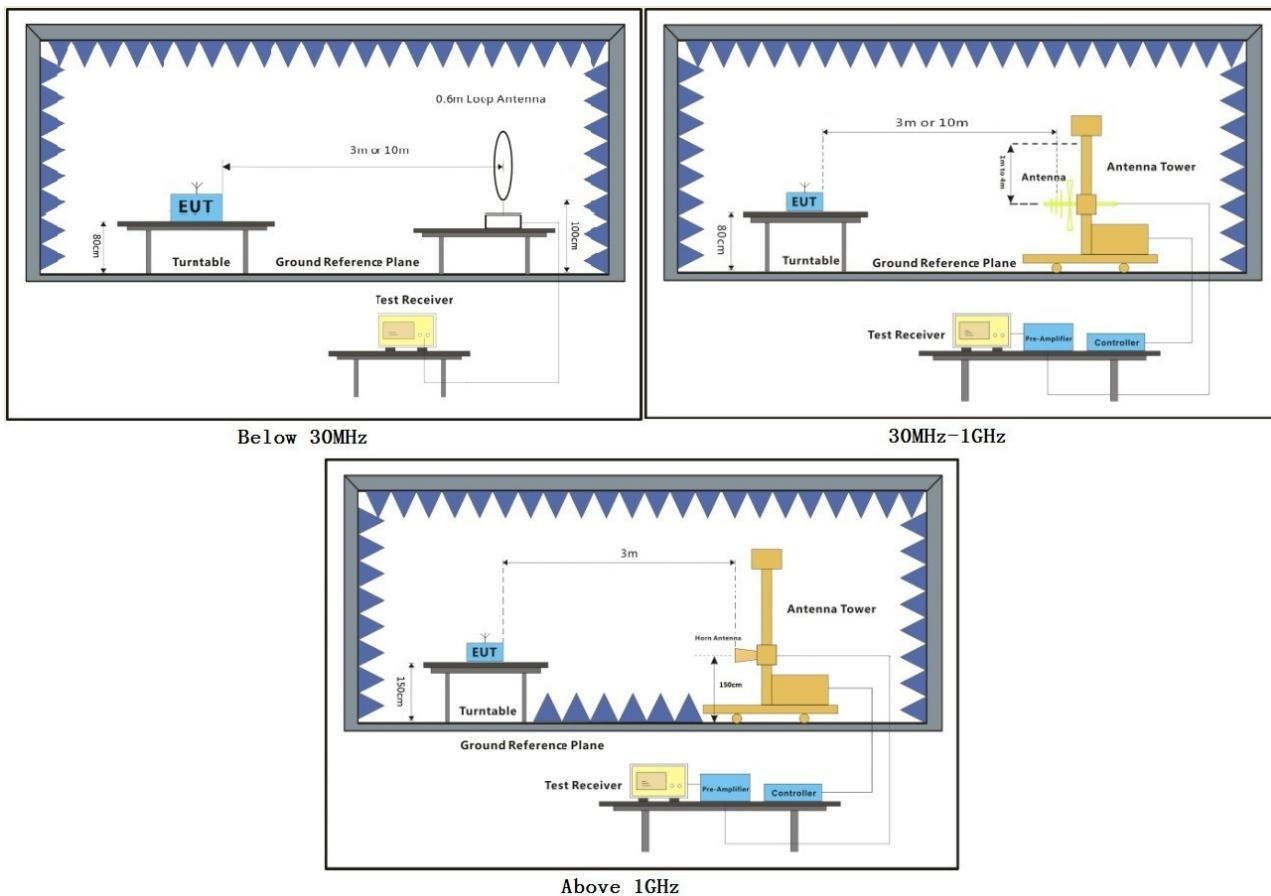
### 7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C      Humidity: 60.1 % RH      Atmospheric Pressure: 1015 mbar

Test mode      a:TX mode\_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20). Only the data of worst case is recorded in the report.

### 7.2.2 Test Setup Diagram



### **7.2.3 Measurement Procedure and Data**

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d. 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.
- e. 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 (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g. 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.
- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.

**Remark:**

- 1) For emission below 1GHz, through pre-scan found the worst case is the lowest channel. Only the worst case is recorded in the report.
- 2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:  
Final Test Level = Receiver Reading + Antenna Factor + Cable Factor - Preamplifier Factor
- 3) Scan from 9kHz to 25GHz, the disturbance above 18GHz and below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.
- 4) For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

### Radiated emission below 1GHz

The test was performed at a 10m test site. According to below formulate and the test data at 10m test distance,

$$L_3 / L_{10} = D_{10} / D_3$$

Note:

$L_3$ : Level @ 3m distance. Unit: uV/m;

$L_{10}$ : Level @ 10m distance. Unit: uV/m;

$D_3$ : 3m distance. Unit: m

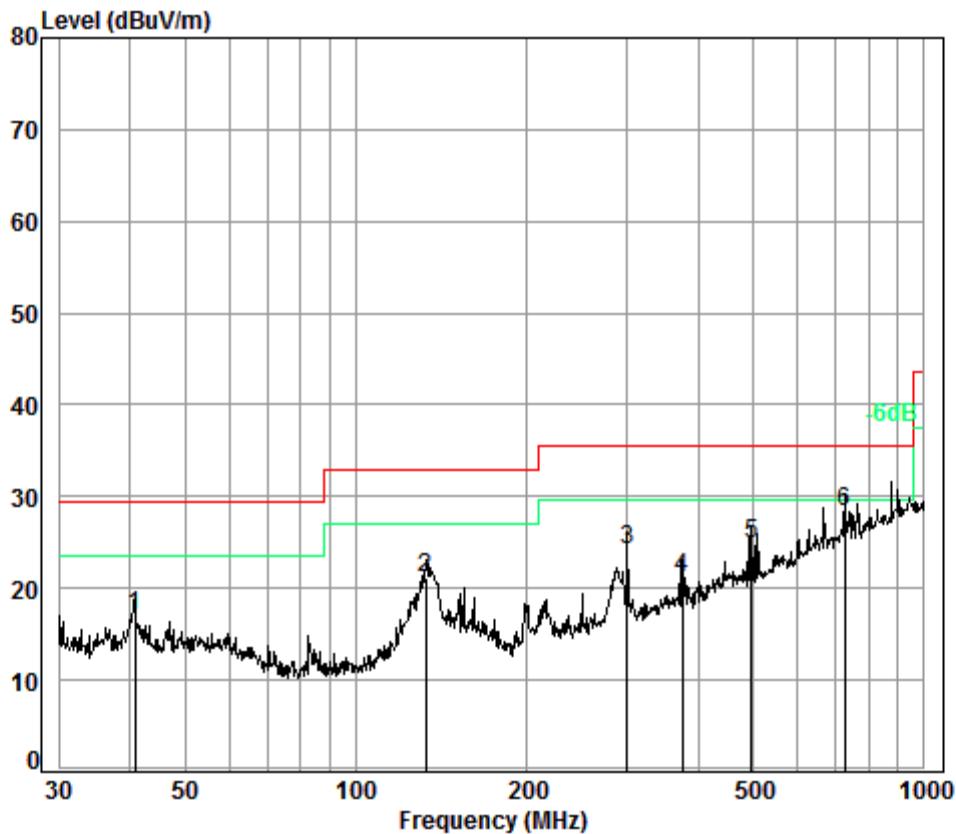
$D_{10}$ : 10m distance. Unit: m

The level at 3m test distance is below:

Mode a:

Frequency (MHz)	Level @ 10m (dBuV/m)	Level @ 10m (uV/m)	Level @ 3m (uV/m)	Level @ 3m (dBuV/m)	Limit @ 3m (dBuV/m)	Margin (dB)	Ant. Polarization
40.99	24.48	16.75	55.83	34.94	40.00	-5.06	V
87.42	21.61	12.04	40.12	32.07	40.00	-7.93	V
137.90	23.83	15.54	51.81	34.29	43.50	-9.21	V
200.69	22.56	13.43	44.76	33.02	43.50	-10.48	V
300.37	24.68	17.14	57.13	35.14	46.00	-10.86	V
375.94	26.12	20.23	67.43	36.58	46.00	-9.42	V
40.84	17.04	7.11	23.71	27.50	40.00	-12.50	H
132.69	21.17	11.44	38.14	31.63	43.50	-11.87	H
300.37	24.11	16.05	53.50	34.57	46.00	-11.43	H
375.94	21.16	11.43	38.10	31.62	46.00	-14.38	H
495.93	24.75	17.28	57.59	35.21	46.00	-10.79	H
724.26	28.29	25.97	86.57	38.75	46.00	-7.25	H

Mode:a; Polarization:Horizontal



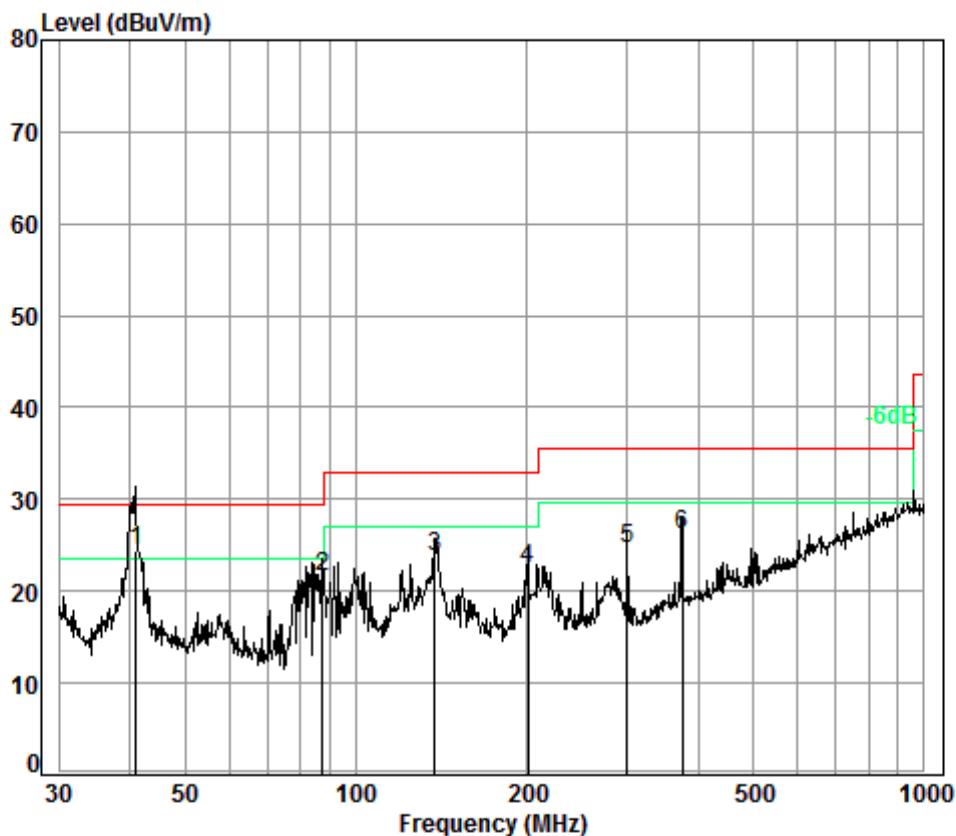
Condition: 10m HORIZONTAL

Job No. : 03753IT

Test Mode: a

Freq	Cable	Ant	Preamp	Read	Limit	Line	Over	
	Loss	Factor	Factor	Level				
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	40.84	6.80	13.25	32.55	29.54	17.04	29.50	-12.46
2	132.69	7.37	12.23	32.55	34.12	21.17	33.00	-11.83
3	300.37	8.05	12.67	32.44	35.83	24.11	35.60	-11.49
4	375.94	8.30	14.41	32.43	30.88	21.16	35.60	-14.44
5	495.93	8.58	16.74	32.42	31.85	24.75	35.60	-10.85
6 pp	724.26	9.20	20.45	32.39	31.03	28.29	35.60	-7.31

Mode:a; Polarization:Vertical



Condition: 10m VERTICAL

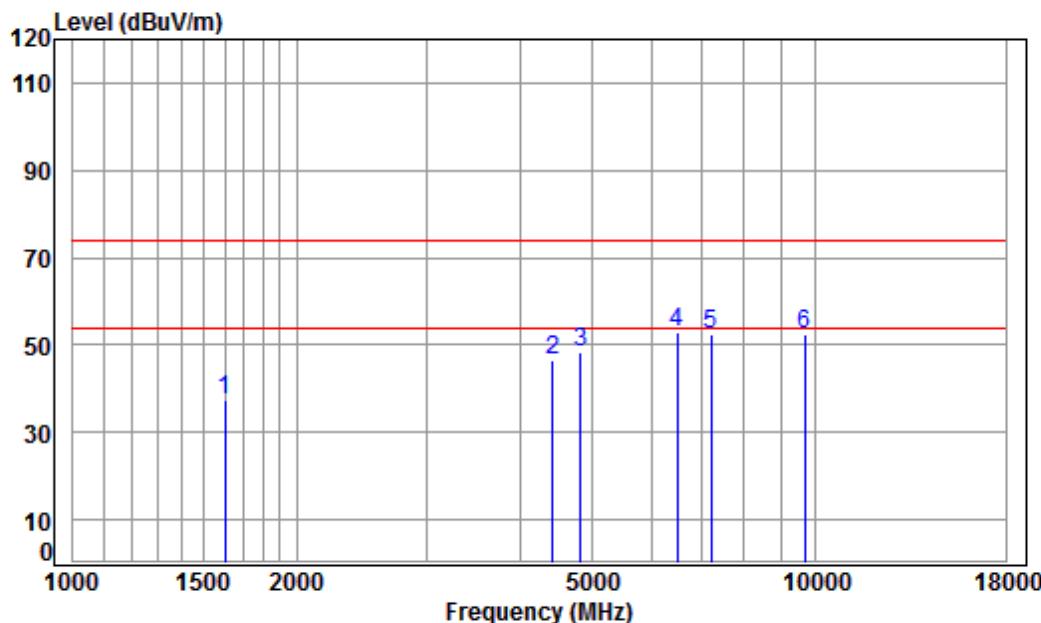
Job No. : 03753IT

Test Mode: a

Freq	Cable	Ant	Preamp	Read	Limit	Over		
	Loss	Factor	Factor	Level				
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 pp	40.99	6.80	13.23	32.55	37.00	24.48	29.50	-5.02
2	87.42	7.18	8.65	32.62	38.40	21.61	29.50	-7.89
3	137.90	7.39	12.61	32.54	36.37	23.83	33.00	-9.17
4	200.69	7.60	9.31	32.53	38.18	22.56	33.00	-10.44
5	300.37	8.05	12.67	32.44	36.40	24.68	35.60	-10.92
6	375.94	8.30	14.41	32.43	35.84	26.12	35.60	-9.48

**Transmitter emission above 1GHz**

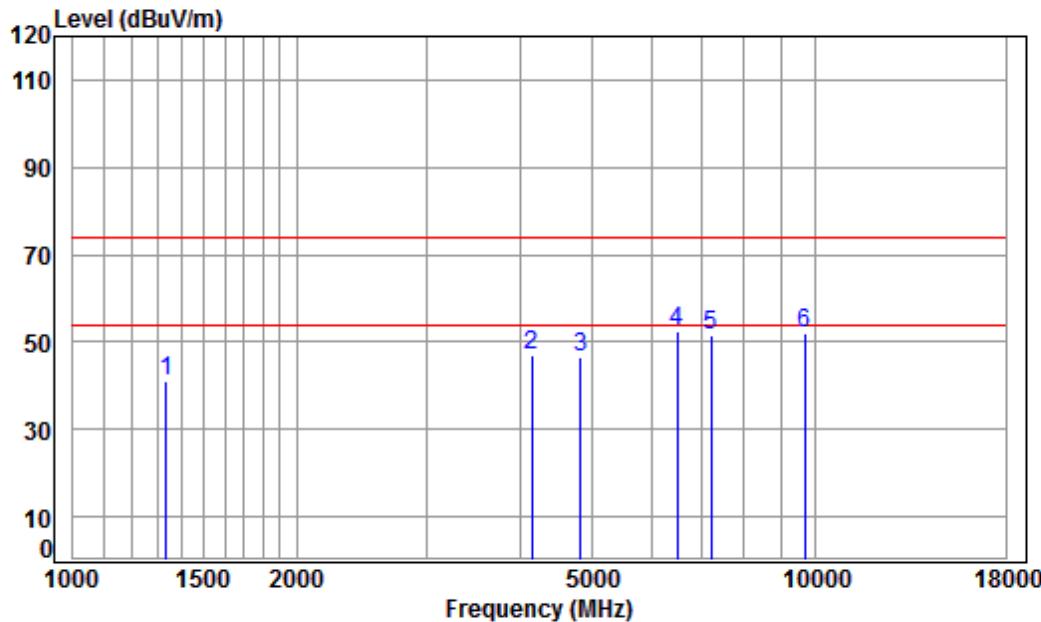
Mode:a; Polarization:Horizontal; Modulation:802.11b; bandwidth:20MHz; Channel:Low



Condition: 3m HORIZONTAL  
Job No : 03753CR/03754CR  
Mode : 2412 TX RSE  
Note : 2.4G WIFI 11B

		Cable Freq	Ant Loss	Preamp Factor	Read Level	Limit Level	Over Line	Over Limit	Remark
		MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	1601.804	5.35	26.26	41.47	47.15	37.29	74.00	-36.71	peak
2	4417.841	7.47	33.60	42.40	47.81	46.48	74.00	-27.52	peak
3	4824.000	7.91	34.19	42.47	48.65	48.28	74.00	-25.72	peak
4 pp	6507.536	11.52	35.12	41.21	47.39	52.82	74.00	-21.18	peak
5	7236.000	10.07	36.40	40.69	46.48	52.26	74.00	-21.74	peak
6	9648.000	10.77	37.53	37.68	41.83	52.45	74.00	-21.55	peak

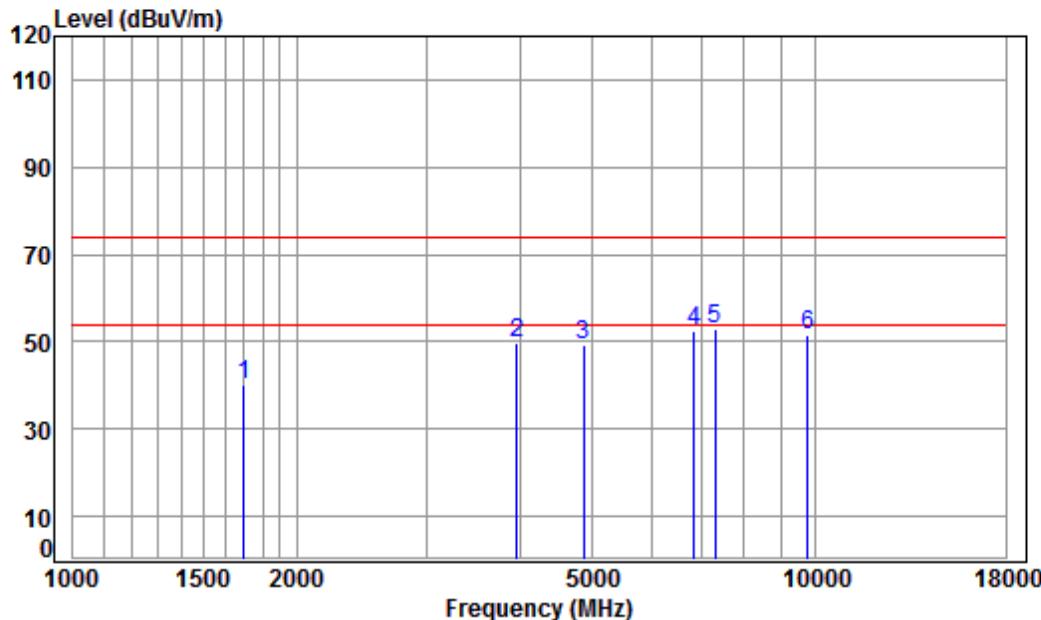
Mode:a; Polarization:Vertical; Modulation:802.11b; bandwidth:20MHz; Channel:Low



Condition: 3m VERTICAL  
Job No : 03753CR/03754CR  
Mode : 2412 TX RSE  
Note : 2.4G WIFI 11B

		Cable Freq	Ant Loss	Preamp Factor	Read Level	Limit Level	Over Line	Over Limit	Remark
		MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	1335.141	4.93	25.11	41.29	52.13	40.88	74.00	-33.12	peak
2	4145.664	7.16	33.60	42.35	48.45	46.86	74.00	-27.14	peak
3	4824.000	7.91	34.19	42.47	47.01	46.64	74.00	-27.36	peak
4 pp	6507.536	11.52	35.12	41.21	47.14	52.57	74.00	-21.43	peak
5	7236.000	10.07	36.40	40.69	45.86	51.64	74.00	-22.36	peak
6	9648.000	10.77	37.53	37.68	41.52	52.14	74.00	-21.86	peak

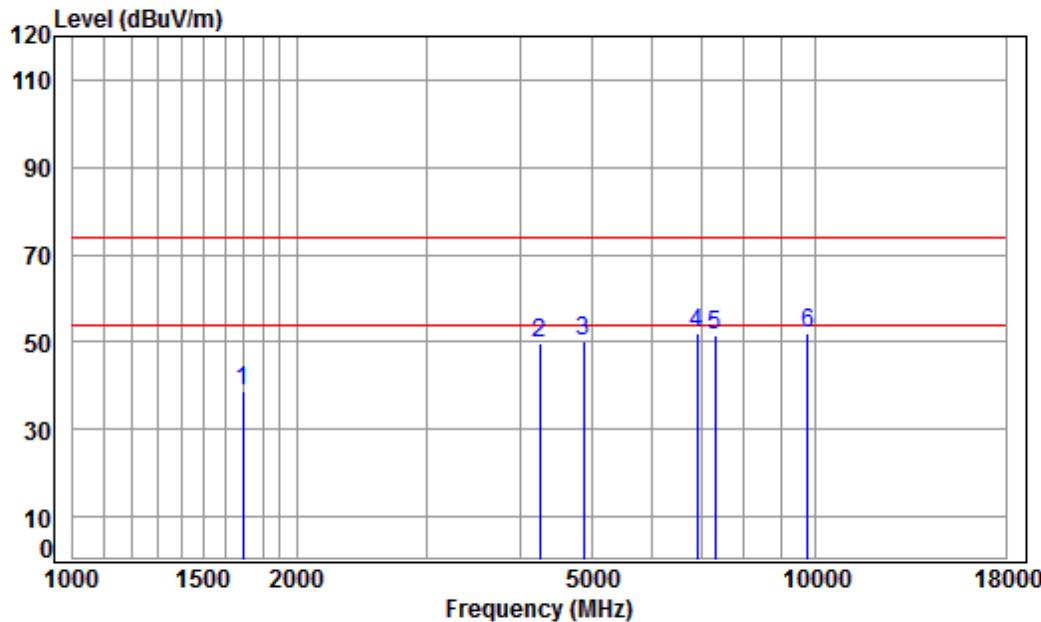
Mode:a; Polarization:Horizontal; Modulation:802.11b; bandwidth:20MHz; Channel:middle



Condition: 3m HORIZONTAL  
Job No : 03753CR/03754CR  
Mode : 2437 TX RSE  
Note : 2.4G WIFI 11B

Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level		Limit Line	Over Limit	Remark
				Level	Level			
1 1697.129	5.23	26.66	38.02	46.14	40.01	74.00	-33.99	peak
2 3958.309	6.94	33.49	38.00	47.47	49.90	74.00	-24.10	peak
3 4874.000	7.96	34.28	38.44	45.33	49.13	74.00	-24.87	peak
4 6855.063	10.53	36.10	37.44	43.25	52.44	74.00	-21.56	peak
5 pp 7311.000	10.05	36.37	37.01	43.40	52.81	74.00	-21.19	peak
6 9748.000	10.82	37.55	35.02	38.23	51.58	74.00	-22.42	peak

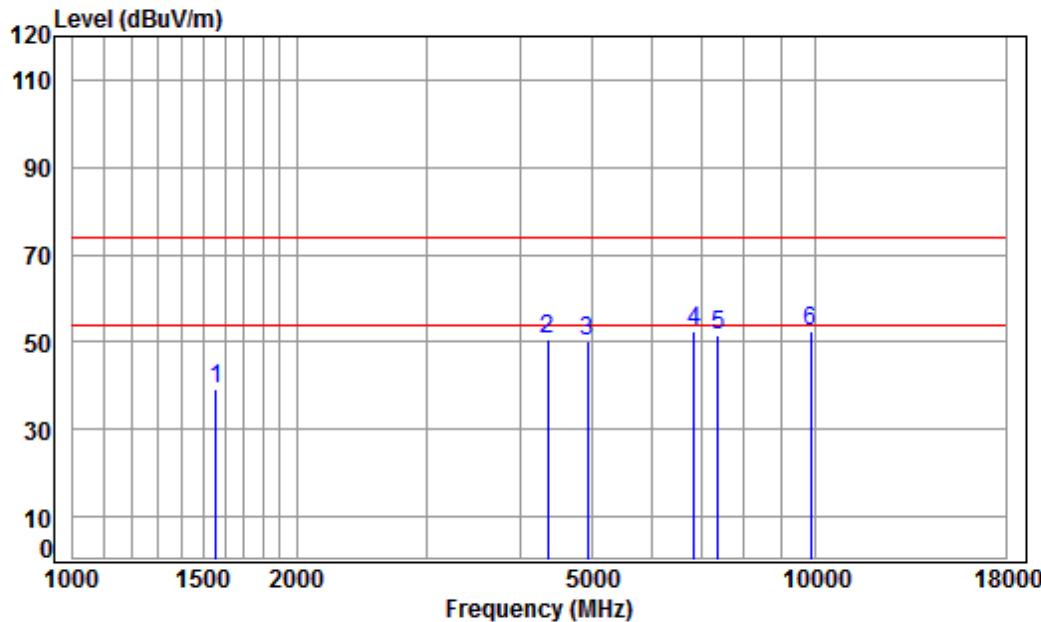
Mode:a; Polarization:Vertical; Modulation:802.11b; bandwidth:20MHz; Channel:middle



Condition: 3m VERTICAL  
Job No : 03753CR/03754CR  
Mode : 2437 TX RSE  
Note : 2.4G WIFI 11B

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1692.231	5.24	26.64	38.02	45.07	38.93	74.00	-35.07	peak
2	4254.921	7.28	33.60	38.14	46.86	49.60	74.00	-24.40	peak
3	4874.000	7.96	34.28	38.44	46.27	50.07	74.00	-23.93	peak
4	6914.763	10.36	36.27	37.38	42.86	52.11	74.00	-21.89	peak
5	7311.000	10.05	36.37	37.01	42.08	51.49	74.00	-22.51	peak
6 pp	9748.000	10.82	37.55	35.02	38.78	52.13	74.00	-21.87	peak

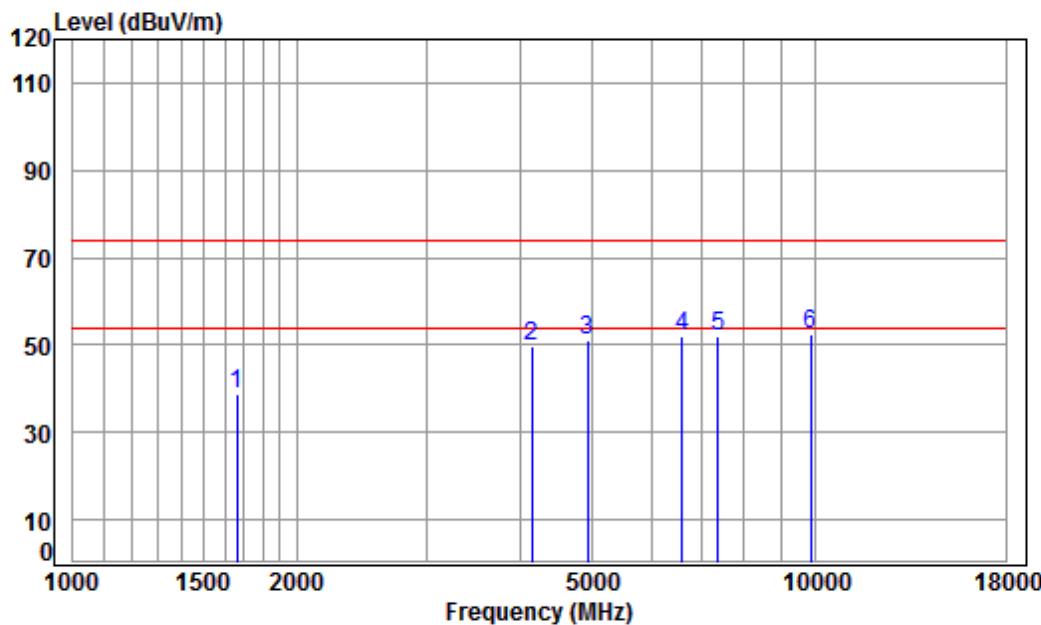
Mode:a; Polarization:Horizontal; Modulation:802.11b; bandwidth:20MHz; Channel:High



Condition: 3m HORIZONTAL  
Job No : 03753CR/03754CR  
Mode : 2462 TX RSE  
Note : 2.4G WIFI 11B

		Cable Freq	Ant Loss	Preamp Factor	Read Level	Limit Level	Over Line	Over Limit	Remark
		MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	1556.169	5.41	26.06	38.04	45.90	39.33	74.00	-34.67	peak
2	4354.454	7.40	33.60	38.19	47.71	50.52	74.00	-23.48	peak
3	4924.000	8.01	34.37	38.47	46.09	50.00	74.00	-24.00	peak
4 pp	6855.063	10.53	36.10	37.44	43.19	52.38	74.00	-21.62	peak
5	7386.000	10.03	36.34	36.94	42.05	51.48	74.00	-22.52	peak
6	9848.000	10.87	37.57	34.97	38.89	52.36	74.00	-21.64	peak

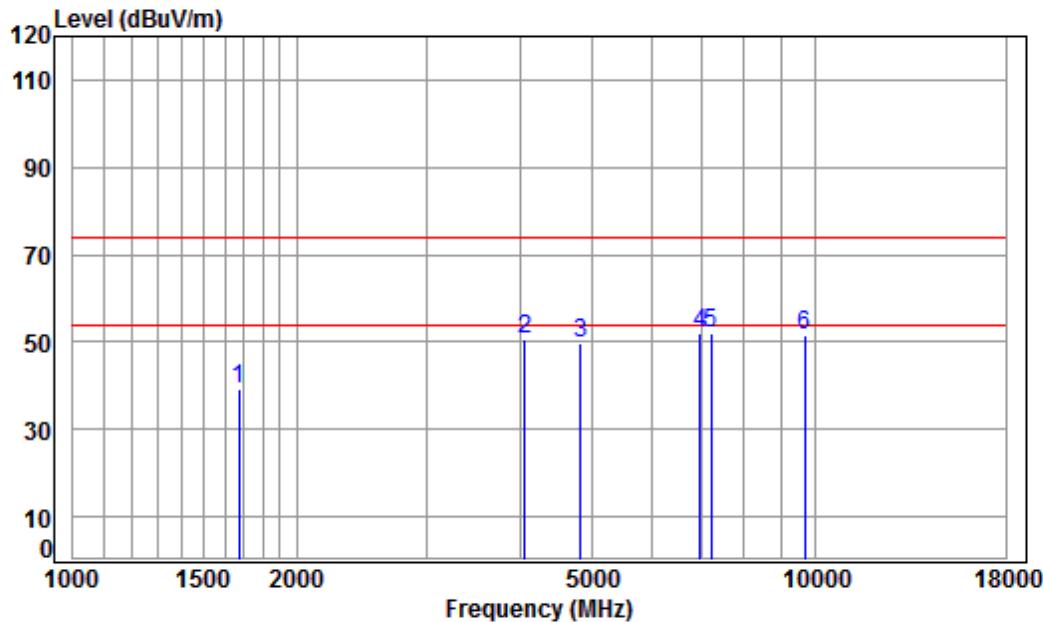
Mode:a; Polarization:Vertical; Modulation:802.11b; bandwidth:20MHz; Channel:High



Condition: 3m VERTICAL  
Job No : 03753CR/03754CR  
Mode : 2462 TX RSE  
Note : 2.4G WIFI 11B

	Cable Freq	Ant Loss	Preamp Factor	Read Level	Limit Level	Over Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	1663.137	5.27	26.52	38.03	44.87	38.63	74.00	-35.37 peak
2	4145.664	7.16	33.60	38.08	47.23	49.91	74.00	-24.09 peak
3	4924.000	8.01	34.37	38.47	47.40	51.31	74.00	-22.69 peak
4	6602.265	11.24	35.39	37.68	43.07	52.02	74.00	-21.98 peak
5	7386.000	10.03	36.34	36.94	42.40	51.83	74.00	-22.17 peak
6 pp	9848.000	10.87	37.57	34.97	38.83	52.30	74.00	-21.70 peak

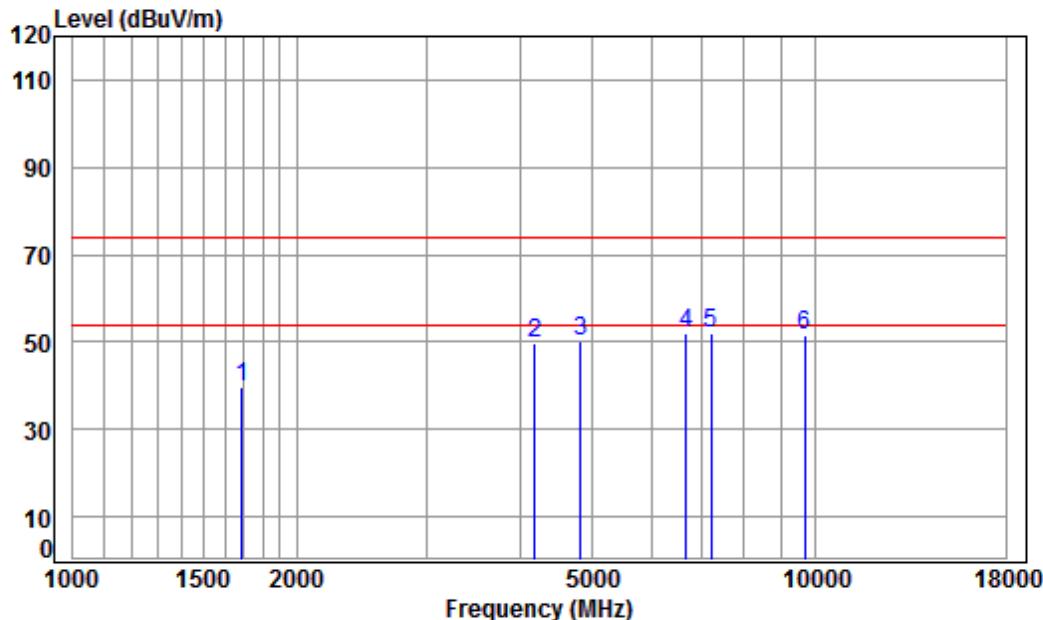
Mode:a; Polarization:Horizontal; Modulation:802.11g; bandwidth:20MHz; Channel:Low



Condition: 3m HORIZONTAL  
Job No : 03753CR/03754CR  
Mode : 2412 TX RSE  
Note : 2.4G WIFI 11G

		Cable Freq	Ant Loss	Preamp Factor	Read Level	Limit Level	Over Line	Over Limit	Remark
		MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	1672.779	5.26	26.56	38.03	45.43	39.22	74.00	-34.78	peak
2	4062.629	7.06	33.60	38.03	47.81	50.44	74.00	-23.56	peak
3	4824.000	7.91	34.19	38.42	46.25	49.93	74.00	-24.07	peak
4 pp	6974.982	10.20	36.43	37.32	42.64	51.95	74.00	-22.05	peak
5	7236.000	10.07	36.40	37.08	42.52	51.91	74.00	-22.09	peak
6	9648.000	10.77	37.53	35.07	38.47	51.70	74.00	-22.30	peak

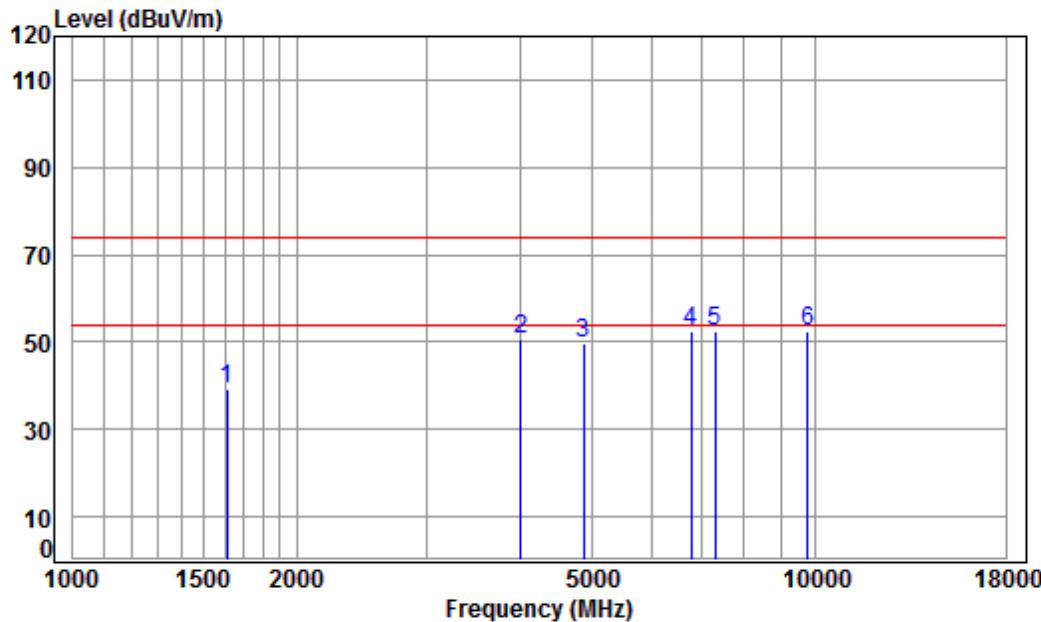
Mode:a; Polarization:Vertical; Modulation:802.11g; bandwidth:20MHz; Channel:Low



Condition: 3m VERTICAL  
Job No : 03753CR/03754CR  
Mode : 2412 TX RSE  
Note : 2.4G WIFI 11G

		Cable Freq	Ant Loss	Preamp Factor	Read Level	Limit Level	Over Line	Over Limit	Remark
		MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	1687.347	5.24	26.62	38.02	45.97	39.81	74.00	-34.19	peak
2	4181.768	7.20	33.60	38.10	47.20	49.90	74.00	-24.10	peak
3	4824.000	7.91	34.19	38.42	46.60	50.28	74.00	-23.72	peak
4 pp	6679.040	11.02	35.61	37.60	43.10	52.13	74.00	-21.87	peak
5	7236.000	10.07	36.40	37.08	42.67	52.06	74.00	-21.94	peak
6	9648.000	10.77	37.53	35.07	38.50	51.73	74.00	-22.27	peak

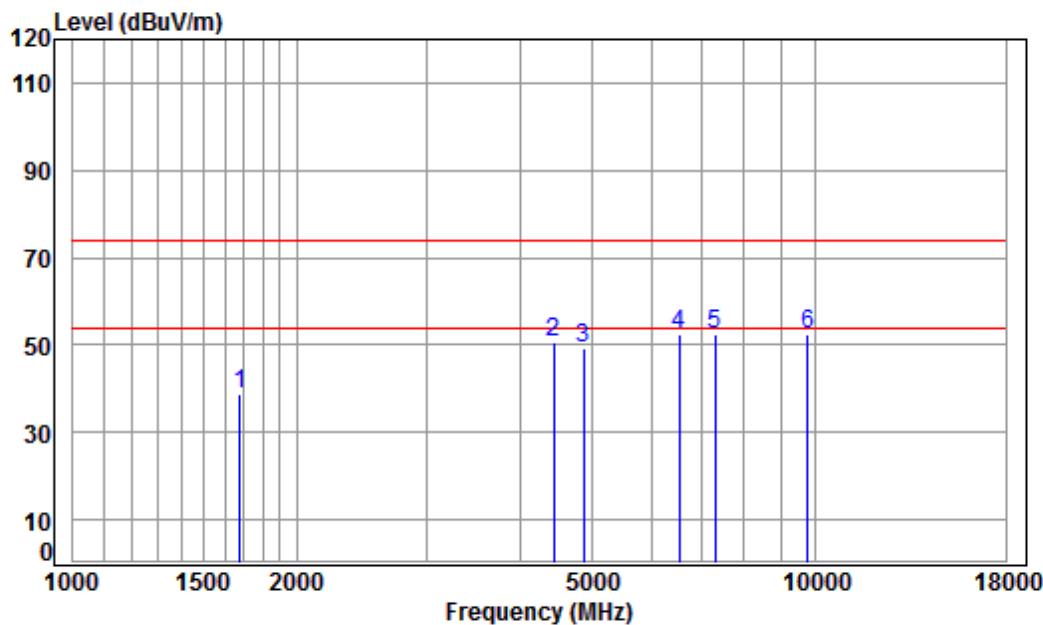
Mode:a; Polarization:Horizontal; Modulation:802.11g; bandwidth:20MHz; Channel:middle



Condition: 3m HORIZONTAL  
Job No : 03753CR/03754CR  
Mode : 2437 TX RSE  
Note : 2.4G WIFI 11G

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1611.091	5.34	26.30	38.03	45.52	39.13	74.00	-34.87	peak
2	4004.339	6.99	33.60	38.00	47.94	50.53	74.00	-23.47	peak
3	4874.000	7.96	34.28	38.44	45.84	49.64	74.00	-24.36	peak
4	6795.879	10.69	35.94	37.49	43.12	52.26	74.00	-21.74	peak
5	7311.000	10.05	36.37	37.01	42.85	52.26	74.00	-21.74	peak
6 pp	9748.000	10.82	37.55	35.02	39.26	52.61	74.00	-21.39	peak

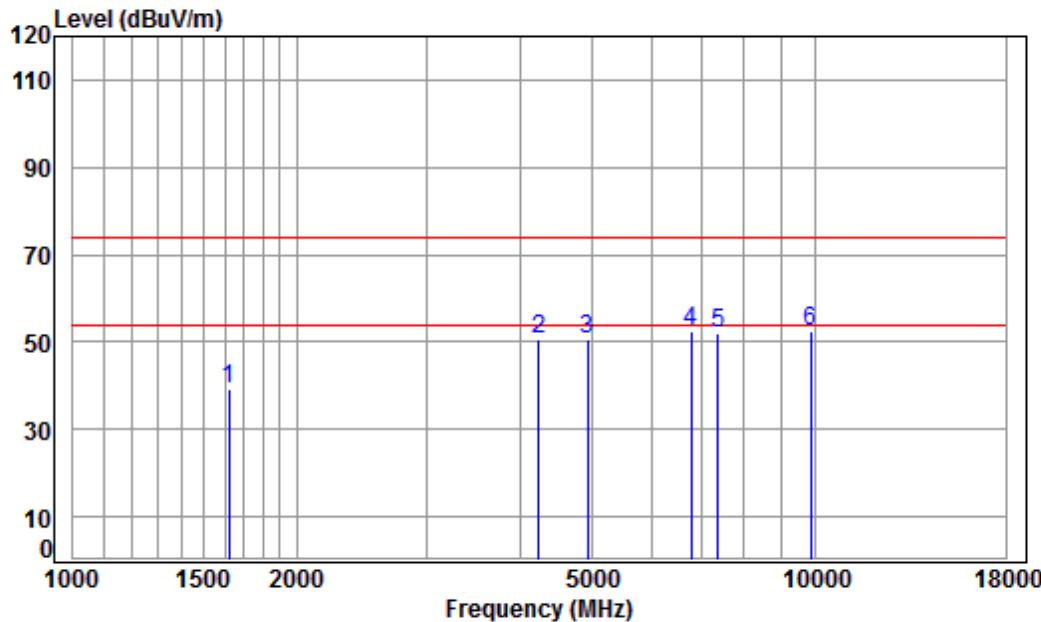
Mode:a; Polarization:Vertical; Modulation:802.11g; bandwidth:20MHz; Channel:middle



Condition: 3m VERTICAL  
Job No : 03753CR/03754CR  
Mode : 2437 TX RSE  
Note : 2.4G WIFI 11G

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1677.621	5.25	26.58	38.03	45.03	38.83	74.00	-35.17	peak
2	4443.453	7.50	33.60	38.24	47.81	50.67	74.00	-23.33	peak
3	4874.000	7.96	34.28	38.44	45.69	49.49	74.00	-24.51	peak
4	6545.263	11.41	35.23	37.74	43.55	52.45	74.00	-21.55	peak
5	7311.000	10.05	36.37	37.01	43.16	52.57	74.00	-21.43	peak
6 pp	9748.000	10.82	37.55	35.02	39.23	52.58	74.00	-21.42	peak

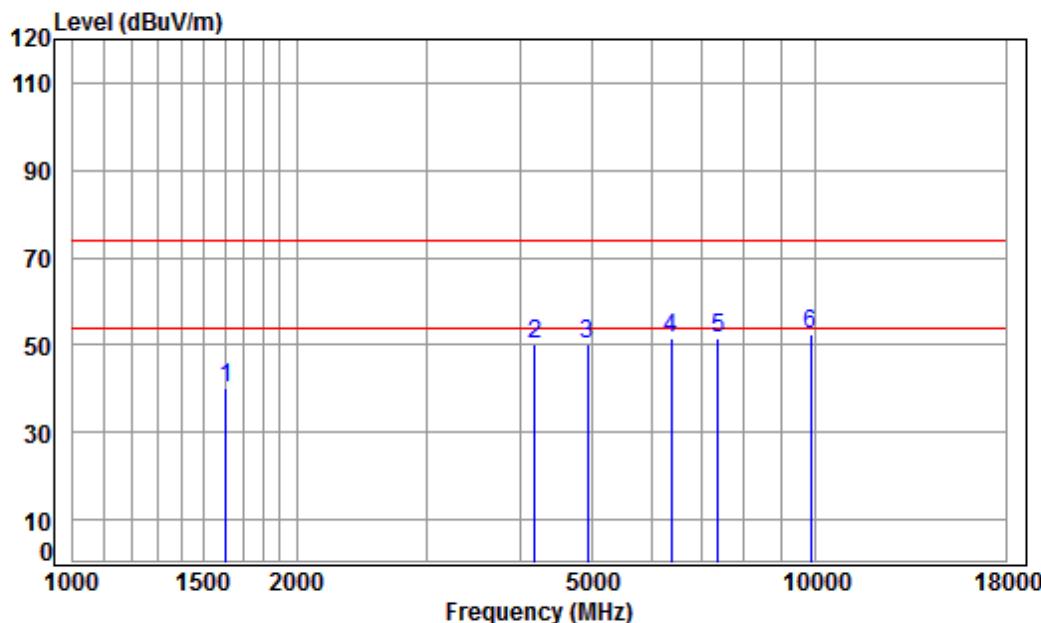
Mode:a; Polarization:Horizontal; Modulation:802.11g; bandwidth:20MHz; Channel:High



Condition: 3m HORIZONTAL  
Job No : 03753CR/03754CR  
Mode : 2462 TX RSE  
Note : 2.4G WIFI 11G

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1620.431	5.32	26.34	38.03	45.50	39.13	74.00	-34.87	peak
2	4230.396	7.26	33.60	38.13	47.98	50.71	74.00	-23.29	peak
3	4924.000	8.01	34.37	38.47	46.66	50.57	74.00	-23.43	peak
4	6795.879	10.69	35.94	37.49	43.34	52.48	74.00	-21.52	peak
5	7386.000	10.03	36.34	36.94	42.68	52.11	74.00	-21.89	peak
6 pp	9848.000	10.87	37.57	34.97	39.07	52.54	74.00	-21.46	peak

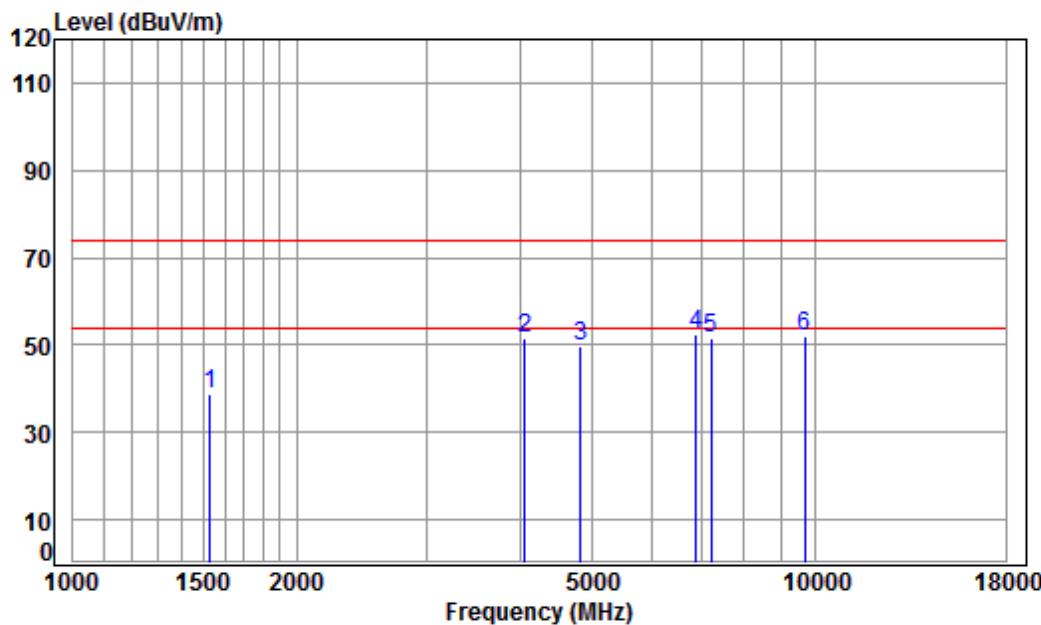
Mode:a; Polarization:Vertical; Modulation:802.11g; bandwidth:20MHz; Channel:High



Condition: 3m VERTICAL  
Job No : 03753CR/03754CR  
Mode : 2462 TX RSE  
Note : 2.4G WIFI 11G

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1606.441	5.34	26.28	38.03	46.47	40.06	74.00	-33.94	peak
2	4181.768	7.20	33.60	38.10	47.27	49.97	74.00	-24.03	peak
3	4924.000	8.01	34.37	38.47	46.15	50.06	74.00	-23.94	peak
4	6395.654	11.34	35.02	37.89	42.90	51.37	74.00	-22.63	peak
5	7386.000	10.03	36.34	36.94	42.08	51.51	74.00	-22.49	peak
6 pp	9848.000	10.87	37.57	34.97	39.16	52.63	74.00	-21.37	peak

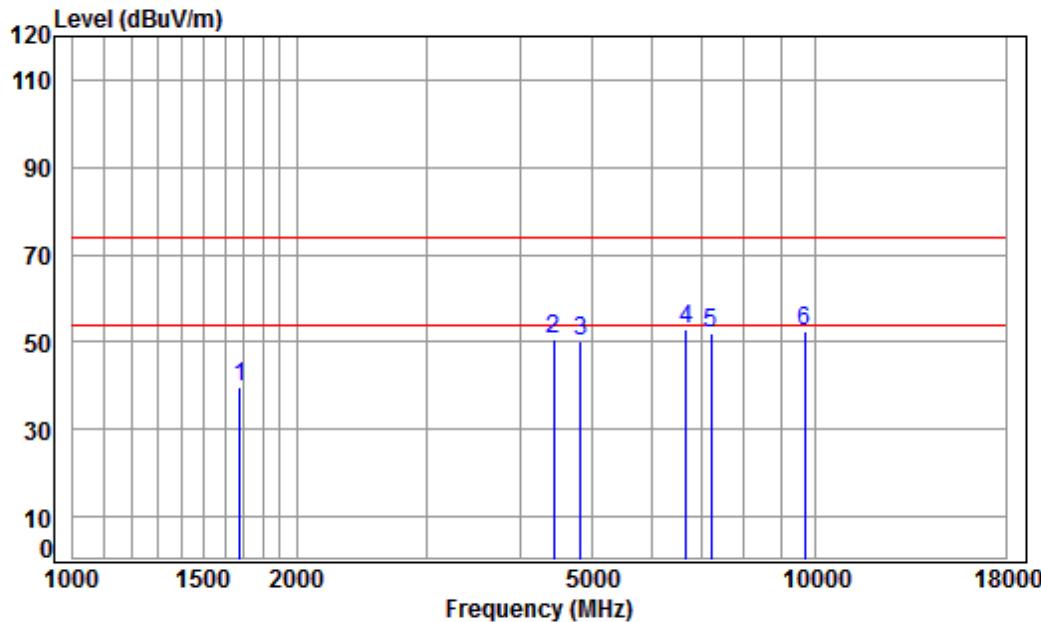
Mode:a; Polarization:Horizontal; Modulation:802.11n; bandwidth:20MHz; Channel:Low



Condition: 3m HORIZONTAL  
Job No : 03753CR/03754CR  
Mode : 2412 TX RSE  
Note : 2.4G WIFI 11N20

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1529.414	5.44	25.94	38.04	45.32	38.66	74.00	-35.34	peak
2	4062.629	7.06	33.60	38.03	48.74	51.37	74.00	-22.63	peak
3	4824.000	7.91	34.19	38.42	45.98	49.66	74.00	-24.34	peak
4 pp	6894.806	10.42	36.21	37.40	43.35	52.58	74.00	-21.42	peak
5	7236.000	10.07	36.40	37.08	42.37	51.76	74.00	-22.24	peak
6	9648.000	10.77	37.53	35.07	38.69	51.92	74.00	-22.08	peak

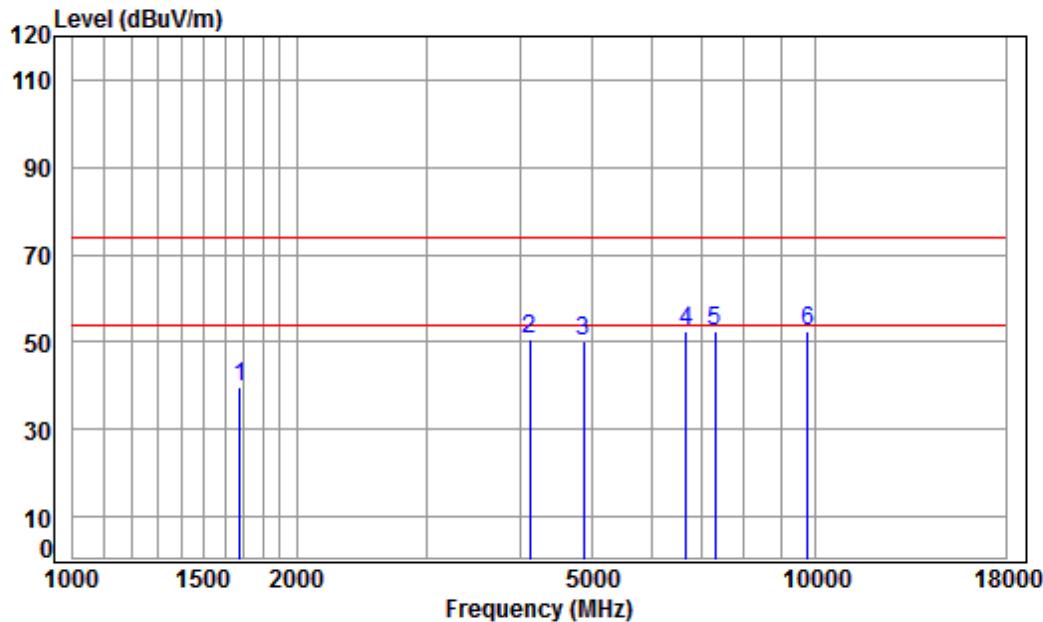
Mode:a; Polarization:Vertical; Modulation:802.11n; bandwidth:20MHz; Channel:Low



Condition: 3m VERTICAL  
Job No : 03753CR/03754CR  
Mode : 2412 TX RSE  
Note : 2.4G WIFI 11N20

		Cable Freq	Ant Loss	Preamp Factor	Read Level	Limit Level	Over Line	Over Limit	Remark
		MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	1677.621	5.25	26.58	38.03	45.72	39.52	74.00	-34.48	peak
2	4443.453	7.50	33.60	38.24	47.56	50.42	74.00	-23.58	peak
3	4824.000	7.91	34.19	38.42	46.69	50.37	74.00	-23.63	peak
4 pp	6679.040	11.02	35.61	37.60	43.88	52.91	74.00	-21.09	peak
5	7236.000	10.07	36.40	37.08	42.66	52.05	74.00	-21.95	peak
6	9648.000	10.77	37.53	35.07	39.31	52.54	74.00	-21.46	peak

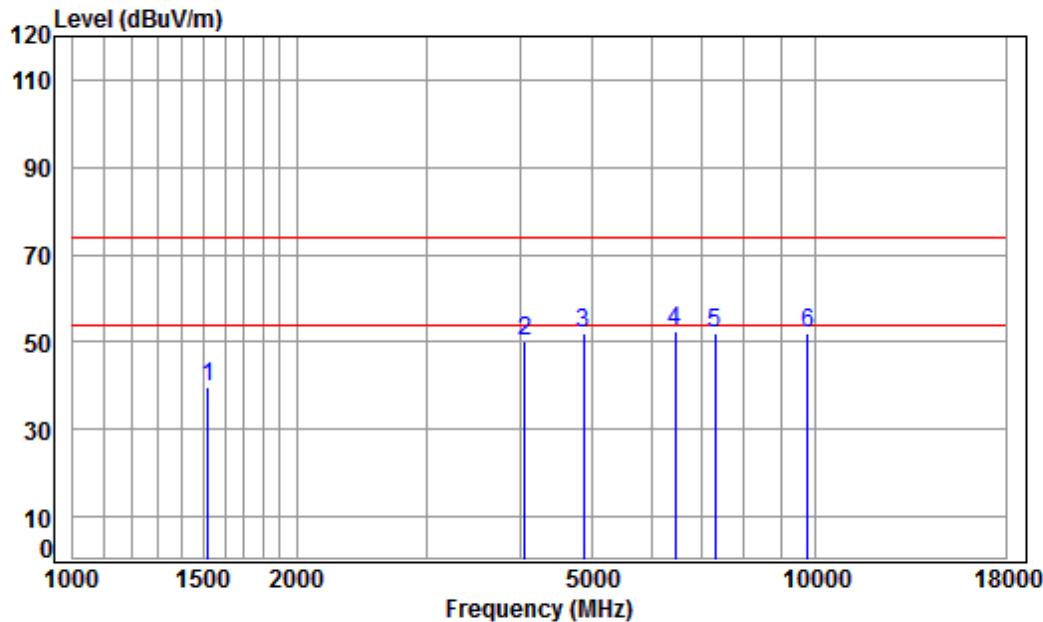
Mode:a; Polarization:Horizontal; Modulation:802.11n; bandwidth:20MHz; Channel:middle



Condition: 3m HORIZONTAL  
Job No : 03753CR/03754CR  
Mode : 2437 TX RSE  
Note : 2.4G WIFI 11N20

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1677.621	5.25	26.58	38.03	45.95	39.75	74.00	-34.25	peak
2	4121.768	7.13	33.60	38.07	47.80	50.46	74.00	-23.54	peak
3	4874.000	7.96	34.28	38.44	46.34	50.14	74.00	-23.86	peak
4 pp	6679.040	11.02	35.61	37.60	43.58	52.61	74.00	-21.39	peak
5	7311.000	10.05	36.37	37.01	43.10	52.51	74.00	-21.49	peak
6	9748.000	10.82	37.55	35.02	39.17	52.52	74.00	-21.48	peak

Mode:a; Polarization:Vertical; Modulation:802.11n; bandwidth:20MHz; Channel:middle



Condition: 3m VERTICAL

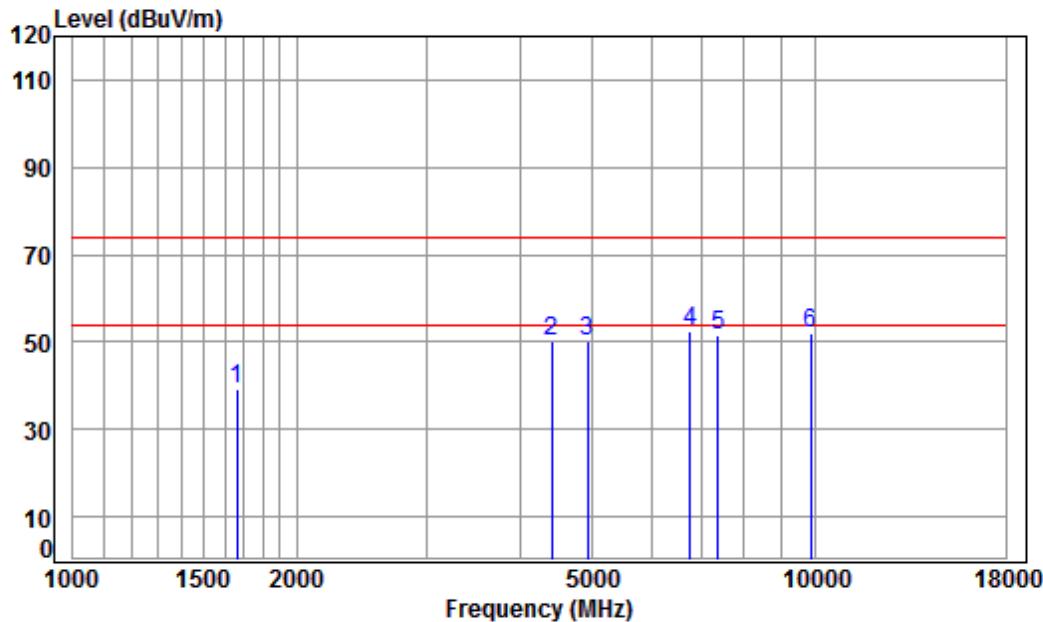
Job No : 03753CR/03754CR

Mode : 2437 TX RSE

Note : 2.4G WIFI 11N20

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1520.598	5.45	25.89	38.04	46.39	39.69	74.00	-34.31	peak
2	4050.904	7.04	33.60	38.03	47.62	50.23	74.00	-23.77	peak
3	4874.000	7.96	34.28	38.44	48.04	51.84	74.00	-22.16	peak
4 pp	6470.026	11.48	35.08	37.81	43.74	52.49	74.00	-21.51	peak
5	7311.000	10.05	36.37	37.01	42.58	51.99	74.00	-22.01	peak
6	9748.000	10.82	37.55	35.02	38.72	52.07	74.00	-21.93	peak

Mode:a; Polarization:Horizontal; Modulation:802.11n; bandwidth:20MHz; Channel:High



Condition: 3m HORIZONTAL  
Job No : 03753CR/03754CR  
Mode : 2462 TX RSE  
Note : 2.4G WIFI 11N20

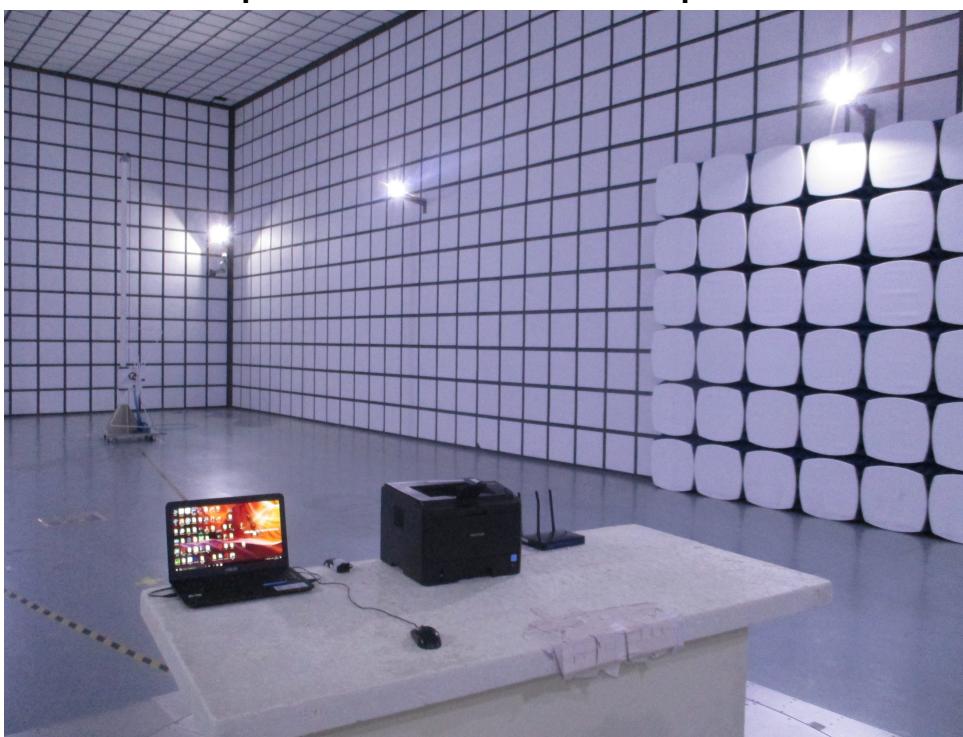
		Cable Freq	Ant Loss	Preamp Factor	Read Level	Limit Level	Over Line	Over Limit	Remark
		MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	1663.137	5.27	26.52	38.03	45.33	39.09	74.00	-34.91	peak
2	4405.090	7.46	33.60	38.22	47.56	50.40	74.00	-23.60	peak
3	4924.000	8.01	34.37	38.47	46.44	50.35	74.00	-23.65	peak
4 pp	6776.265	10.75	35.89	37.51	43.49	52.62	74.00	-21.38	peak
5	7386.000	10.03	36.34	36.94	42.22	51.65	74.00	-22.35	peak
6	9848.000	10.87	37.57	34.97	38.55	52.02	74.00	-21.98	peak

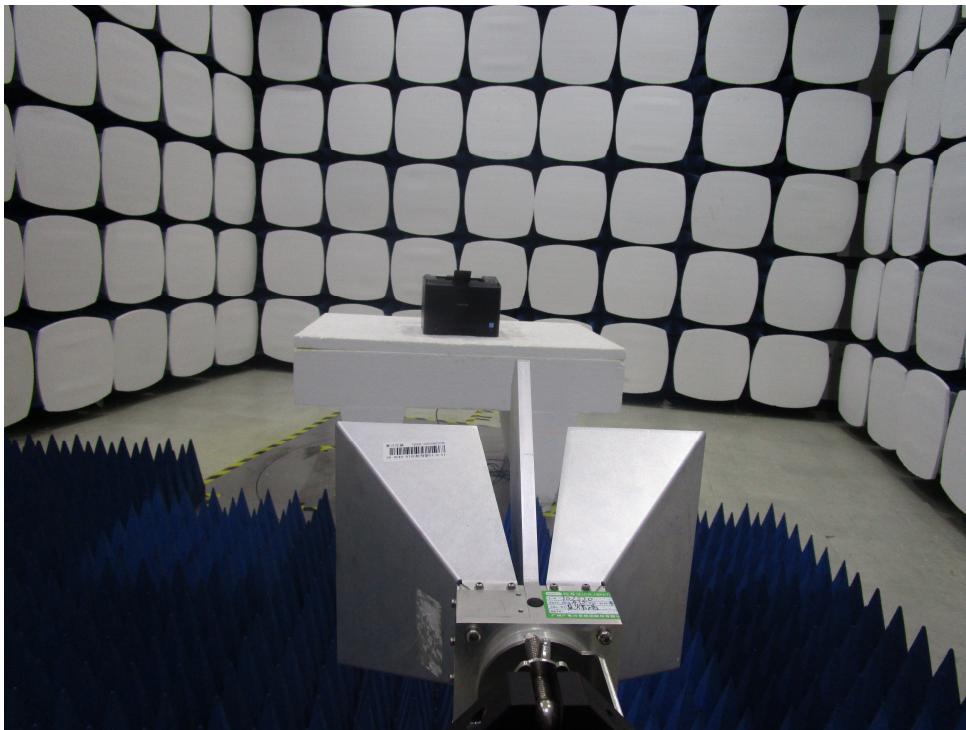
## **8 Photographs**

### **8.1 Conducted Emissions at AC Power Line (150kHz-30MHz) Test Setup**



### **8.2 Radiated Spurious Emissions Test Setup**





- End of the Report -