FCC Test Report

APPLICANT	:	Lenovo(Shanghai) Electronics Technology Co., Ltd.
EQUIPMENT	:	Notebook Computer
BRAND NAME	:	Lenovo
MODEL NAME	:	Lenovo YB-J912L
FCC ID	:	O57YBJ912L
STANDARD	:	FCC 47 CFR FCC Part 15 Subpart B
CLASSIFICATION	:	Certification

The product was received on Jan. 03, 2018 and testing was completed on Mar. 24, 2018. We, Sporton International (Kunshan) Inc., would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI C63.4-2014 and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International (Kunshan) Inc., the test report shall not be reproduced except in full.

James Huang

Approved by: James Huang / Manager

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TESTING
NVLAP LAB CODE 600155-0

Sporton International (Kunshan) Inc.
No.3-2 Ping-Xiang Rd, Kunshan Development Zone Kunshan City Jiangsu Province 215335 China

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FC810315	Rev. 01	Initial issue of report	Mar. 30, 2018
FC810315	Rev. 02	Remove the ”GPS/GLONASS” function description on page 6 and 7	Apr. 08, 2018

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.107	AC Conducted Emission	< 15.107 limits	PASS	Under limit 6.17 dB at 2.099 MHz
3.2	15.109	Radiated Emission	< 15.109 limits	PASS	Under limit 3.39 dB at 65.89 MHz for Quasi-Peak

1. General Description

1.1. Applicant

Lenovo(Shanghai) Electronics Technology Co., Ltd.
NO.68 BUILDING, 199 FENJU RD, Pilot Free Trade Zone, 200131, China

1.2. Manufacturer

Lenovo PC HK Limited
23/F, Lincoln House, Taikoo Place 979 King's Road, Quarry Bay, Hong Kong

1.3. Product Feature of Equipment Under Test

Product Feature	
Equipment	Notebook Computer
Brand Name	Lenovo
Model Name	Lenovo YB-J912L
FCC ID	O57YBJ912L
EUT supports Radios application	WCDMA/HSPA/HSPA+ (16QAM uplink is not supported)/ DC-HSDPA/LTE WLAN 2.4GHz 802.11b/g/n HT20/HT40 WLAN 5GHz 802.11a/n HT20/HT40 WLAN 5GHz 802.11ac VHT20/VHT40/VHT80 Bluetooth v3.0+EDR/ Bluetooth v4.0 LE/ Bluetooth v4.1 LE/ Bluetooth v4.2 LE
IMEI Code	Conduction: N/A Radiation: 863212030116203 for Sample 1 863212030115510 for Sample 2 863212030115452 for Sample 3
HW Version	Lenovo YB-J912L
SW Version	Windows 10
EUT Stage	Identical Prototype

1.4. Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	WCDMA Band V: 826.4 MHz ~ 846.6 MHz WCDMA Band IV : 1712.4 MHz ~ 1752.6 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz LTE Band 2 : 1850.7 MHz ~ 1909.3 MHz LTE Band 4 : 1710.7 MHz ~ 1754.3 MHz LTE Band 5 : 824.7 MHz ~ 848.3 MHz LTE Band 7 : 2502.5 MHz ~ 2567.5 MHz LTE Band 12 : 699.7 MHz ~ 715.3 MHz LTE Band 13 : 779.5 MHz ~ 784.5 MHz LTE Band 17 : 706.5 MHz ~ 713.5 MHz LTE Band 26 : 814.7MHz ~ 848.3 MHz LTE Band 30 : 2307.5 MHz ~ 2312.5 MHz LTE Band 38 : 2572.5MHz ~ 2617.5MHz LTE Band 41 : 2498.5 MHz ~ 2687.5 MHz LTE Band 66 : 1710.7 MHz ~ 1779.3 MHz 802.11b/g/n: 2412 MHz ~ 2472 MHz 802.11a/n/ac: 5180 MHz ~ 5240 MHz; 5260 MHz ~ 5320 MHz; 5500 MHz ~ 5720 MHz 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz
Rx Frequency	WCDMA Band V: 871.4 MHz ~ 891.6 MHz WCDMA Band IV : 2112.4 MHz ~ 2152.6 MHz WCDMA Band II: 1932.4 MHz ~ 1987.6 MHz LTE Band 2 : 1930.7 MHz ~ 1989.3 MHz LTE Band 4 : 2110.7 MHz ~ 2154.3 MHz LTE Band 5 : 869.7 MHz ~ 893.3 MHz LTE Band 7 : 2622.5MHz ~ 2687.5 MHz LTE Band 12 : 729.7 MHz ~ 745.3 MHz LTE Band 13 : 748.5 MHz ~ 753.5 MHz LTE Band 17 : 736.5 MHz ~ 743.5 MHz LTE Band 26 : 859.7MHz ~ 893.3MHz LTE Band 30 : 2352.5 MHz ~ 2357.5 MHz LTE Band 38 : 2572.5MHz ~ 2617.5MHz LTE Band 41 : 2498.5 MHz ~ 2687.5 MHz LTE Band 66 : 2110.7 MHz~ 2199.3 MHz 802.11b/g/n: 2412 MHz ~ 2472 MHz 802.11a/n/ac: 5180 MHz ~ 5240 MHz; 5260 MHz ~ 5320 MHz; 5500 MHz ~ 5720 MHz 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz
Antenna Type	WWAN : Fixed Internal Antenna WLAN : PIFA Antenna Bluetooth : PIFA Antenna

Type of Modulation	WCDMA : BPSK (Uplink) HSDPA/DC-HSDPA : QPSK (Uplink) HSUPA : QPSK (Uplink) HSPA+ : 16QAM(Uplink is not supported) DC-HSDPA : 64QAM LTE: QPSK / 16QAM 802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11a/g/n/ac : OFDM (BPSK / QPSK / 16QAM / 64QAM /256QAM) Bluetooth LE : GFSK Bluetooth (1Mbps) : GFSK Bluetooth (2Mbps) : π /4-DQPSK Bluetooth (3Mbps) : 8-DPSK

1.5. Component List

There are three samples under test, the differences of them are shown in the table below.
Based on the similarity of three samples, sample 1 perform full test and sample 2/3 verify the worse cases for EMC test items.

Object	Sample 1	Sample 2	Sample 3
CPU	intel core i7-7Y75;3.6GHz;FCBGA1515	CPU;i5-7Y54;3.2GHz; FCBGA1515	CPU;m3-7Y30;2.6GHz; FCBGA151
DDR/LPDDR3	Samsung K3QF4F40BM-AGCF	Micron MT52L256M64D2PP-107 WT:B	Samsung K3QF3F30BM-AGCF
SSD	Toshiba 512GB, BiCS3 PCIE Gen3 2lane	Toshiba 256GB, BiCS3 PCIE Gen3 2lane	Toshiba 128GB, BiCS3 PCIE Gen3 2lane
LCM	BOE;10.8WQ;TV108QDM-NL0	INX;10.8WQ; P108SFA-AF2	BOE;10.8WQ; TV108QDM-NL0
Sub TP	Laibo	GIS	Laibo
Camera	Oflime	Chicony	Oflime
Battery	SWD+ATL	SCUD + Veken	SWD+ATL

1.6. Modification of EUT

No modifications are made to the EUT during all test items.

1.7. Test Location

Sporton International (Kunshan) Inc. is accredited to ISO 17025 by National Voluntary Laboratory Accreditation Program (NVLAP code: 600155-0) and the FCC designation No. is CN5013.

Test Site	Sporton International (Kunshan) Inc.		
Test Site Location	No.3-2 Ping-Xiang Rd, Kunshan Development Zone Kunshan City Jiangsu Province 215335 China TEL : +86-512-57900158 FAX : +86-512-57900958		
Test Site No.	**Sporton Site No.**		**FCC Test Firm Registration No.**
	CO01-KS	03CH02-KS	630927

Note: The test site complies with ANSI C63.4 2014 requirement.

1.8. Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC 47 CFR FCC Part 15 Subpart B
- ANSI C63.4-2014

Remark: All test items were verified and recorded according to the standards and without any deviation during the test.

2. Test Configuration of Equipment Under Test

2.1. Test Mode

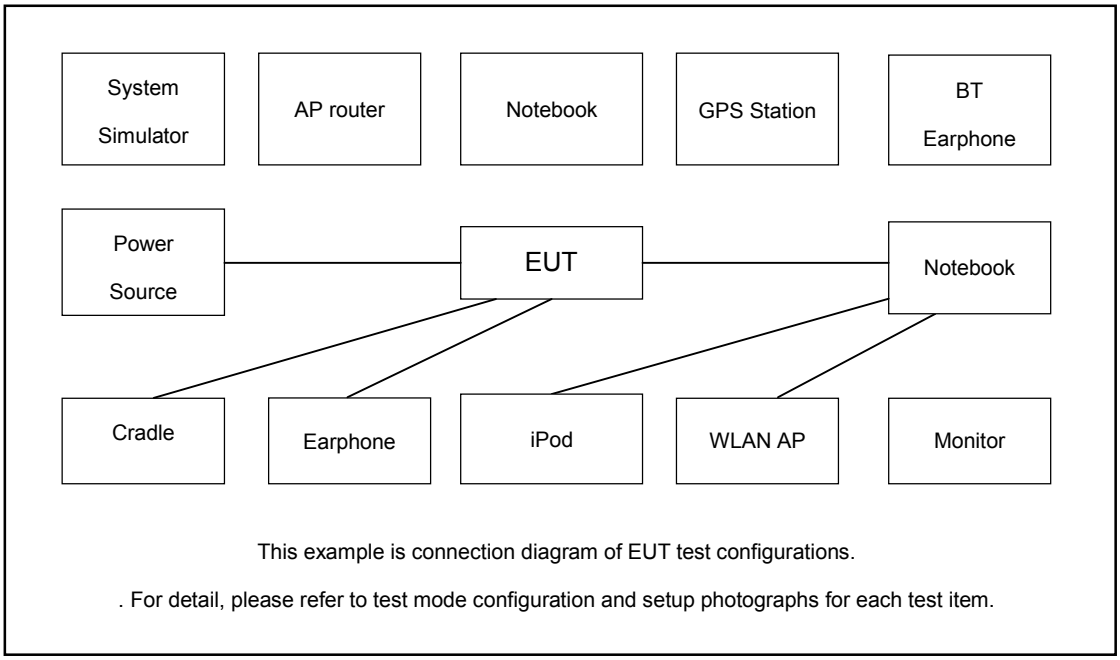
The EUT has been associated with peripherals pursuant to ANSI C63.4-2014 and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (30MHz to the 5th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

Test Items	Function Type
AC Conducted Emission	Mode 1 : WCDMA Band 2 Idle + WLAN (2.4G) Idle + Bluetooth Idle + USB Link with U-Disk form Type C port 2 + Camera + Play H Plane + Adapter 1 With Type C Cable 1 + Type C port 1 for Sample 1 Mode 2 : LTE Band 4 Idle + WLAN (5G) Idle + Bluetooth Idle + USB Link with U-Disk form Type C port 1 + Camera + MPEG4/Color Bar + Adapter 1 With Type C Cable 1 + Type C port 2 for Sample 1 Mode 3 : LTE Band 7 Idle + WLAN (5G Band IV) Idle + Bluetooth L Idle + USB Link with U-Disk form Type C port 2 + Camera + Play H Plane + Adapter 2 With Type C Cable 2 + Type C port 1 for Sample 1 Mode 4 : LTE Band 12 Idle + WLAN (2.4G) Idle + Bluetooth Idle + Video with Type C port 2 + Camera + Play H Plane + Adapter 1 With Type C Cable 1 + Type C port 1 for Sample 1 Mode 5 : LTE Band 38 Idle + WLAN (2.4G) Idle + Bluetooth Idle with BT pen + Video with Type C port 1 + Camera + Play H Plane + Adapter 1 With Type C Cable 1 + Type C port 2 for Sample 1 Mode 6 : LTE Band 38 Idle + WLAN (2.4G) Idle + Bluetooth Idle with BT pen + Video with Type C port 1 + Camera + Play H Plane + Adapter 1 With Type C Cable 1 + Type C port 2 for Sample 2 Mode 7 : LTE Band 38 Idle + WLAN (2.4G) Idle + Bluetooth Idle with BT pen + Video with Type C port 1 + Camera + Play H Plane + Adapter 1 With Type C Cable 1 + Type C port 2 for Sample 3

Radiated Emissions< 1GHz	Mode 1 : WCDMA Band 2 Idle + WLAN (2.4G) Idle + Bluetooth Idle + USB Link with U-Disk form Type C port 2 + Camera + Play H Plane + Adapter 1 With Type C Cable 1 + Type C port 1 for Sample 1 Mode 2 : LTE Band 4 Idle + WLAN (5G) Idle + Bluetooth Idle with BT pen + USB Link with Type C port 1 + MPEG4/Color Bar + Camera + Adapter 1 With Type C Cable 1 + Type C port 2 for Sample 1 Mode 3 : LTE Band 7 Idle + WLAN (5G Band IV) Idle + Bluetooth Idle + USB Link with U-Disk form Type C port 2 + Play H Plane + Camera + Adapter 2 With Type C Cable 2 + Type C port 1 for Sample 1 Mode 4 : LTE Band 12 Idle + WLAN (2.4G) Idle + Bluetooth Idle + Video with Type C port 2 + Play H Plane + Camera + Adapter 1 With Type C Cable 1 + Type C port 1 for Sample 1 Mode 5 : LTE Band 38 Idle + WLAN (2.4G) Idle + Bluetooth Idle + Video with Type C port 1 + Play H Plane + Camera + Adapter 1 With Type C Cable 1 + Type C port 2 for Sample 1 Mode 6 : LTE Band 41 Idle + WLAN (2.4G) Idle + Bluetooth Idle + Video with Type C port 1 + Camera + Video with Type C port 1 for Sample 1 Mode 7 : WCDMA Band 2 Idle + WLAN (2.4G) Idle + Bluetooth Idle + USB Link with U-Disk form Type C port 2 + Camera + Play H Plane + Adapter 1 With Type C Cable 1 + Type C port 1 for Sample 2 Mode 8 : WCDMA Band 2 Idle + WLAN (2.4G) Idle + Bluetooth Idle + USB Link with U-Disk form Type C port 2 + Camera + Play H Plane + Adapter 1 With Type C Cable 1 + Type C port 1 for Sample 3
Radiated Emissions ≥ 1GHz	Mode 1 : WCDMA Band 2 Idle + WLAN (2.4G) Idle + Bluetooth Idle + USB Link with U-Disk form Type C port 2 + Camera + Play H Plane + Adapter 1 With Type C Cable 1 + Type C port 1 for Sample 1
Remark: **1.** The worst case of AC is mode 5; only the test data of this mode was reported. **2.** The worst case of RE is mode 1; only the test data of this mode was reported.	

2.2. Connection Diagram of Test System



This example is connection diagram of EUT test configurations.

. For detail, please refer to test mode configuration and setup photographs for each test item.

Conduction Test Setup											
No.	**Wireless Station**	**Connection Type**	**Test Mode**								
			1	**2**	**3**	**4**	**5**	**6**	**7**		
A1	System Simulator	WCDMA/LTE	X	X	X	X	X	X	X		
A2	BT Earphone/BT Pen	Bluetooth	X	X	X	X	X	X	X		
A3	AP router	WiFi	X	X	X	X	X	X	X		
No.	**Power Source**	**Connection Type**	**1**	**2**	**3**	**4**	**5**	**6**	**7**		
B1	AC : 120V/60Hz	AC Power Cable	X	X	X	X	X	X	X		
No.	**Setup Peripherals**	**Connection Type**	**1**	**2**	**3**	**4**	**5**	**6**	**7**		
C1	SD Card	SD I/O interface without cable	X	X	X	X	X	X	X		
C2	Earphone	Earphone jack	X	X	X	X	X	X	X		
C3	Monitor	Type C to DP cable				X	X	X	X		
C4	U Disk	USB	X	X	X						

RE Test Setup													
No.	Wireless Station	Connection Type	Test Mode										
			1	2	3	4	5	6	7	8			
A1	System Simulator	WCDMA/LTE	X	X	X	X	X	X	X	X			
A2	BT Earphone/BT pen	Bluetooth	X	X	X	X	X	X	X	X			
A3	AP router	WiFi	X	X	X	X	X	X	X	X			
No.	**Power Source**	**Connection Type**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**			
B1	AC :120V/60Hz	AC Power Cable	X	X	X	X	X	X	X	X			
No.	**Setup Peripherals**	**Connection Type**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**			
C1	U disk	USB link	X	X	X				X	X			
C2	SD Card	SD I/O interface without cable	X	X	X	X	X	X	X	X			
C3	Monitor	Type C to DP cable				X	X	X					
C4	Monitor	Type C to HDMI cable						X					

2.3. Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	LTE Base Station	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m
2.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
3.	WLAN AP	TP-Link	TL-WDR5600	N/A	N/A	Unshielded, 1.8 m
4.	WLAN AP	D-Link	DIR-855	KA2DIR855A2	N/A	Unshielded, 1.8 m
5.	Bluetooth Earphone	Lenovo	LBH308	N/A	N/A	N/A
6.	Monitor	Dell	P2715QT	N/A	N/A	Unshielded, 1.8 m
7.	Monitor	Dell	IN1940MWb	FCC DoC	N/A	N/A
8.	Monitor	Philips	DBDM3275UP	N/A	N/A	Unshielded, 1.8 m
9.	U Disk	Kingston	DTSE9 G2 16GB	N/A	N/A	N/A
10.	U Disk	SanDisk	SDCZ51-004G	N/A	N/A	N/A
11.	SD Card	SanDisk	Uitra	N/A	N/A	N/A
12.	SD Card	Kingston	8GB	N/A	N/A	N/A
13.	Type C turn DP Cable	Dell	N/A	N/A	N/A	N/A
14.	Type C turn HDMI Cable	Dell	N/A	N/A	N/A	N/A
15.	DP Cable	Dell	N/A	N/A	N/A	N/A
16.	HDMI Cable	Dell	N/A	N/A	N/A	N/A

2.4. EUT Operation Test Setup

The EUT was in WCDMA or LTE idle mode during the testing. The EUT was synchronized to the BCCH, and is in continuous receiving mode by setting system simulator's paging reorganization.

At the same time, the EUT was attached to the Bluetooth earphone or WLAN AP, and the following programs installed in the EUT were programmed during the test.

1. Data application is transferred between U Disk and EUT via USB Type C cable.
2. Turn on camera to capture images.
3. Execute "H Pattern" to show H Pattern via HDMI or DP Cable on the Monitor.
4. Connect LCD Monitor via HDMI or DP Cable.
5. Execute "Video Player" to play MPEG4 files.

3. Test Result

3.1. Test of AC Conducted Emission Measurement

3.1.1 Limits of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of emission (MHz)	Conducted limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

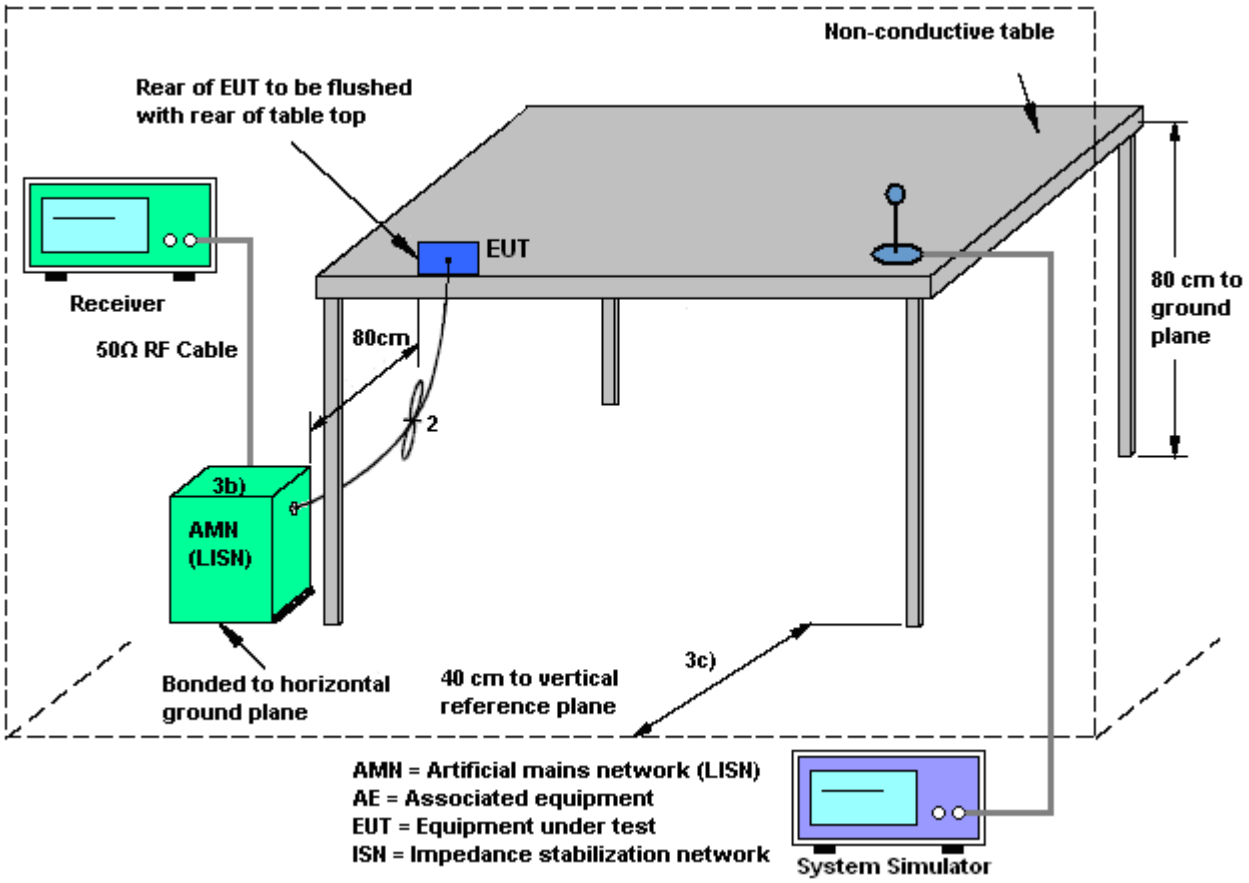
3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.1.3 Test Procedure

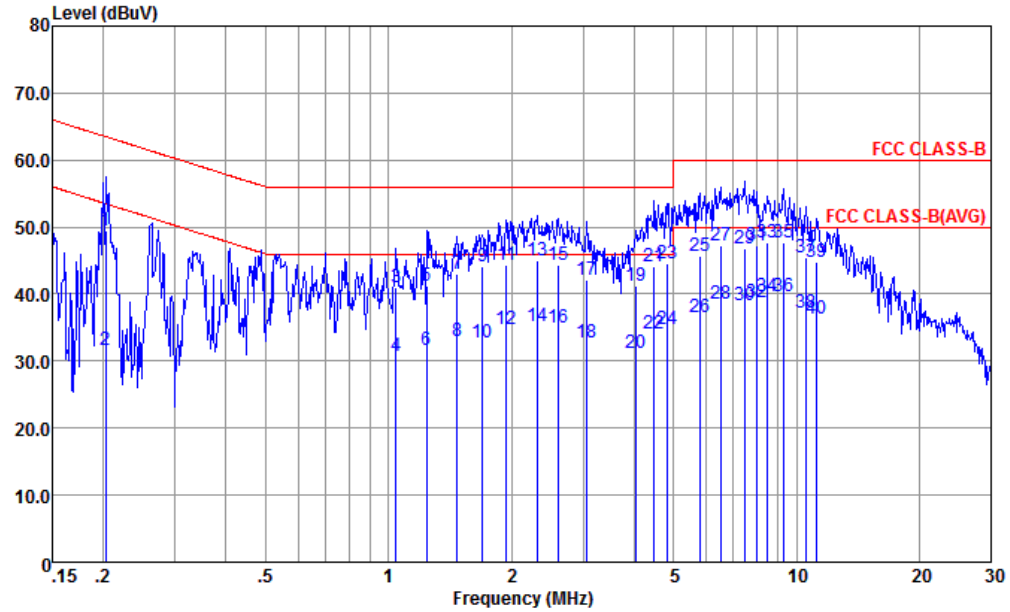
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

3.1.4 Test Setup



3.1.5 Test Result of AC Conducted Emission

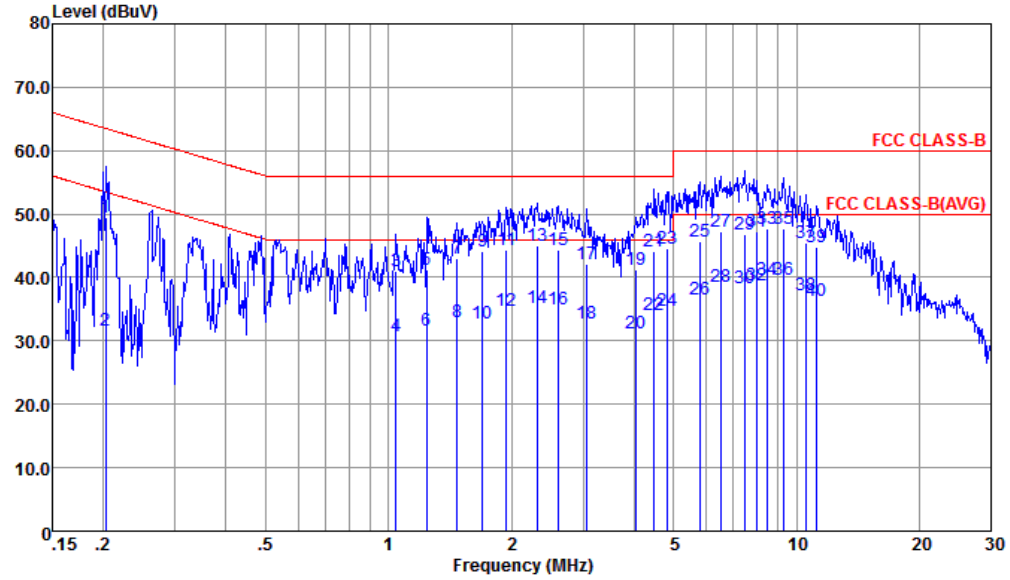
Test Mode :	Mode 5	**Temperature :**	20.6~21.2℃
Test Engineer :	Amos Zhang	**Relative Humidity :**	39~42%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	LTE Band 38 Idle + WLAN (2.4G) Idle + Bluetooth Idle with BT pen + Video with Type C port 1 + Camera + Play H Plane + Adapter 1 With Type C Cable 1 + Type C port 2 for Sample 1		



Site : CO01-KS
Condition : FCC CLASS-B LISN-L-171013-060103 LINE

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.203	49.46	-14.03	63.49	38.81	0.20	10.45	QP
2	0.203	31.56	-21.93	53.49	20.91	0.20	10.45	Average
3	1.043	40.98	-15.02	56.00	30.61	0.26	10.11	QP
4	1.043	30.68	-15.32	46.00	20.31	0.26	10.11	Average
5	1.242	41.21	-14.79	56.00	30.80	0.27	10.14	QP
6	1.242	31.71	-14.29	46.00	21.30	0.27	10.14	Average
7	1.472	43.04	-12.96	56.00	32.60	0.27	10.17	QP
8	1.472	33.04	-12.96	46.00	22.60	0.27	10.17	Average
9	1.698	44.06	-11.94	56.00	33.59	0.28	10.19	QP
10	1.698	32.76	-13.24	46.00	22.29	0.28	10.19	Average
11	1.949	44.29	-11.71	56.00	33.80	0.28	10.21	QP
12	1.949	34.69	-11.31	46.00	24.20	0.28	10.21	Average
13	2.321	45.10	-10.90	56.00	34.60	0.30	10.20	QP
14	2.321	35.30	-10.70	46.00	24.80	0.30	10.20	Average
15	2.608	44.40	-11.60	56.00	33.89	0.31	10.20	QP
16	2.608	35.00	-11.00	46.00	24.49	0.31	10.20	Average
17	3.058	42.11	-13.89	56.00	31.61	0.32	10.18	QP

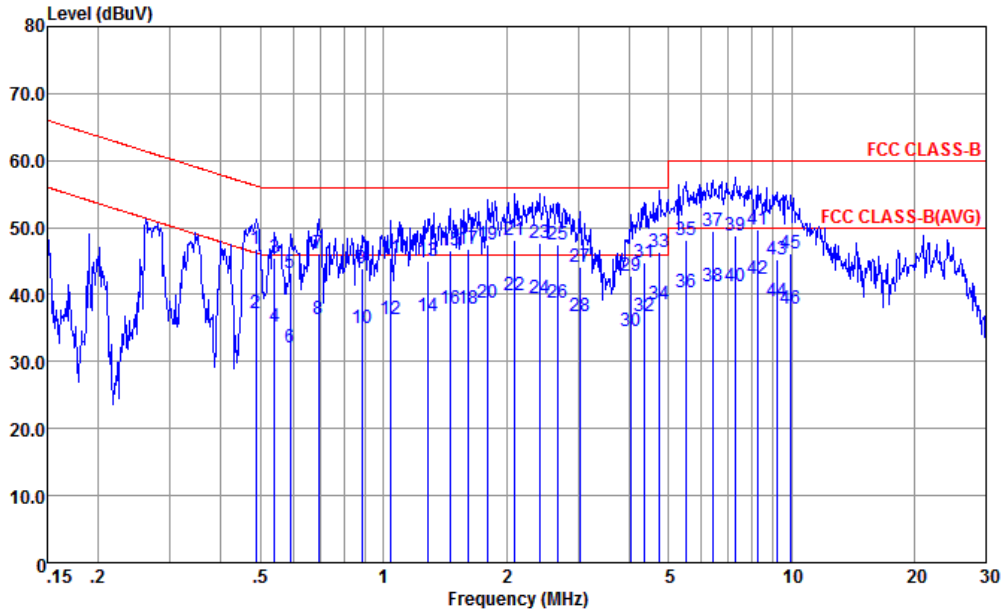
Test Mode :	Mode 5	Temperature :	20.6~21.2℃
Test Engineer :	Amos Zhang	Relative Humidity :	39~42%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	LTE Band 38 Idle + WLAN (2.4G) Idle + Bluetooth Idle with BT pen + Video with Type C port 1 + Camera + Play H Plane + Adapter 1 With Type C Cable 1 + Type C port 2 for Sample 1		



Site : CO01-KS
Condition : FCC CLASS-B LISN-L-171013-060103 LINE

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
18	3.058	32.81	-13.19	46.00	22.31	0.32	10.18	Average
19	4.027	41.12	-14.88	56.00	30.60	0.35	10.17	QP
20	4.027	31.12	-14.88	46.00	20.60	0.35	10.17	Average
21	4.478	44.06	-11.94	56.00	33.50	0.36	10.20	QP
22	4.478	34.16	-11.84	46.00	23.60	0.36	10.20	Average
23	4.822	44.49	-11.51	56.00	33.90	0.37	10.22	QP
24	4.822	34.79	-11.21	46.00	24.20	0.37	10.22	Average
25	5.805	45.58	-14.42	60.00	34.90	0.36	10.32	QP
26	5.805	36.58	-13.42	50.00	25.90	0.36	10.32	Average
27	6.523	47.29	-12.71	60.00	36.61	0.35	10.33	QP
28	6.523	38.49	-11.51	50.00	27.81	0.35	10.33	Average
29	7.446	46.78	-13.22	60.00	36.10	0.35	10.33	QP
30	7.446	38.28	-11.72	50.00	27.60	0.35	10.33	Average
31	7.977	47.28	-12.72	60.00	36.60	0.35	10.33	QP
32	7.977	38.88	-11.12	50.00	28.20	0.35	10.33	Average
33	8.501	47.78	-12.22	60.00	37.10	0.35	10.33	QP
34 *	8.501	39.58	-10.42	50.00	28.90	0.35	10.33	Average
35	9.302	47.78	-12.22	60.00	37.10	0.35	10.33	QP
36	9.302	39.58	-10.42	50.00	28.90	0.35	10.33	Average
37	10.564	45.48	-14.52	60.00	34.80	0.34	10.34	QP
38	10.564	37.28	-12.72	50.00	26.60	0.34	10.34	Average
39	11.198	44.88	-15.12	60.00	34.21	0.32	10.35	QP
40	11.198	36.28	-13.72	50.00	25.61	0.32	10.35	Average

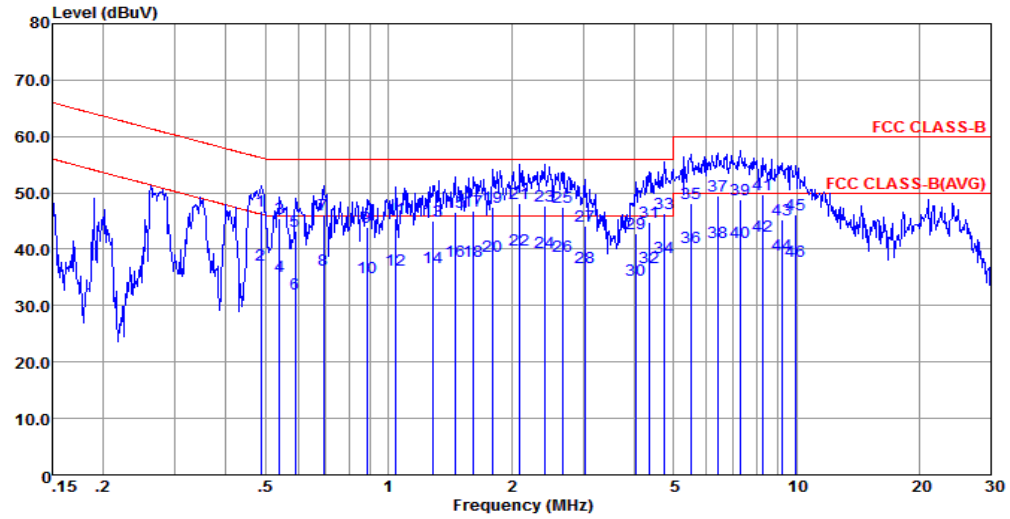
Test Mode :	Mode 5	**Temperature :**	20.6~21.2℃
Test Engineer :	Amos Zhang	**Relative Humidity :**	39~42%
Test Voltage :	120Vac / 60Hz	**Phase :**	Neutral
Function Type :	LTE Band 38 Idle + WLAN (2.4G) Idle + Bluetooth Idle with BT pen + Video with Type C port 1 + Camera + Play H Plane + Adapter 1 With Type C Cable 1 + Type C port 2 for Sample 1		



Site : CO01-KS
Condition : FCC CLASS-B LISN-N-171013-060103 NEUTRAL

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.486	46.81	-9.42	56.23	36.20	0.29	10.32	QP
2	0.486	37.21	-9.02	46.23	26.60	0.29	10.32	Average
3	0.541	45.36	-10.64	56.00	34.80	0.29	10.27	QP
4	0.541	35.16	-10.84	46.00	24.60	0.29	10.27	Average
5	0.592	43.13	-12.87	56.00	32.60	0.30	10.23	QP
6	0.592	32.13	-13.87	46.00	21.60	0.30	10.23	Average
7	0.694	46.06	-9.94	56.00	35.60	0.30	10.16	QP
8	0.694	36.36	-9.64	46.00	25.90	0.30	10.16	Average
9	0.885	43.91	-12.09	56.00	33.50	0.31	10.10	QP
10	0.885	35.01	-10.99	46.00	24.60	0.31	10.10	Average
11	1.043	45.52	-10.48	56.00	35.10	0.31	10.11	QP
12	1.043	36.32	-9.68	46.00	25.90	0.31	10.11	Average
13	1.289	44.96	-11.04	56.00	34.50	0.31	10.15	QP
14	1.289	36.66	-9.34	46.00	26.20	0.31	10.15	Average
15	1.456	46.58	-9.42	56.00	36.09	0.32	10.17	QP
16	1.456	37.78	-8.22	46.00	27.29	0.32	10.17	Average
17	1.619	46.80	-9.20	56.00	36.30	0.32	10.18	QP

Test Mode :	Mode 5	**Temperature :**	20.6~21.2℃
Test Engineer :	Amos Zhang	**Relative Humidity :**	39~42%
Test Voltage :	120Vac / 60Hz	**Phase :**	Neutral
Function Type :	LTE Band 38 Idle + WLAN (2.4G) Idle + Bluetooth Idle with BT pen + Video with Type C port 1 + Camera + Play H Plane + Adapter 1 With Type C Cable 1 + Type C port 2 for Sample 1		



Site : CO01-KS
Condition : FCC CLASS-B LISN-N-171013-060103 NEUTRAL
Project : (FC) 810315

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	dB	
18		1.619	37.80	-8.20	46.00	27.30	0.32	10.18	Average
19		1.800	47.42	-8.58	56.00	36.90	0.32	10.20	QP
20		1.800	38.82	-7.18	46.00	28.30	0.32	10.20	Average
21		2.099	48.13	-7.87	56.00	37.60	0.32	10.21	QP
22	*	2.099	39.83	-6.17	46.00	29.30	0.32	10.21	Average
23		2.409	47.72	-8.28	56.00	37.20	0.32	10.20	QP
24		2.409	39.42	-6.58	46.00	28.90	0.32	10.20	Average
25		2.664	47.42	-8.58	56.00	36.90	0.33	10.19	QP
26		2.664	38.82	-7.18	46.00	28.30	0.33	10.19	Average
27		3.025	44.11	-11.89	56.00	33.60	0.33	10.18	QP
28		3.025	36.71	-9.29	46.00	26.20	0.33	10.18	Average
29		4.027	42.70	-13.30	56.00	32.19	0.34	10.17	QP
30		4.027	34.60	-11.40	46.00	24.09	0.34	10.17	Average
31		4.361	44.83	-11.17	56.00	34.30	0.34	10.19	QP
32		4.361	36.83	-9.17	46.00	26.30	0.34	10.19	Average
33		4.746	46.46	-9.54	56.00	35.90	0.34	10.22	QP
34		4.746	38.46	-7.54	46.00	27.90	0.34	10.22	Average
35		5.535	48.12	-11.88	60.00	37.50	0.33	10.29	QP
36		5.535	40.22	-9.78	50.00	29.60	0.33	10.29	Average
37		6.420	49.56	-10.44	60.00	38.90	0.33	10.33	QP
38		6.420	41.26	-8.74	50.00	30.60	0.33	10.33	Average
39		7.290	48.75	-11.25	60.00	38.10	0.32	10.33	QP
40		7.290	41.25	-8.75	50.00	30.60	0.32	10.33	Average
41		8.235	49.74	-10.26	60.00	39.10	0.31	10.33	QP
42		8.235	42.44	-7.56	50.00	31.80	0.31	10.33	Average
43		9.204	45.14	-14.86	60.00	34.50	0.31	10.33	QP
44		9.204	38.94	-11.06	50.00	28.30	0.31	10.33	Average
45		9.966	46.23	-13.77	60.00	35.60	0.30	10.33	QP
46		9.966	37.93	-12.07	50.00	27.30	0.30	10.33	Average

3.2. Test of Radiated Emission Measurement

3.2.1. Limit of Radiated Emission

The emissions from an unintentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

3.2.2. Measuring Instruments

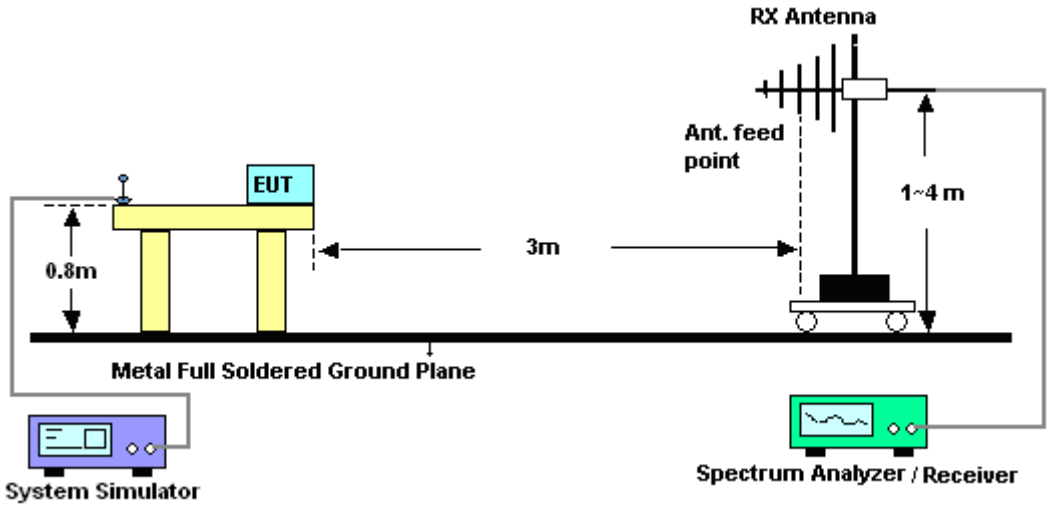
The measuring equipment is listed in the section 4 of this test report.

3.2.3. Test Procedures

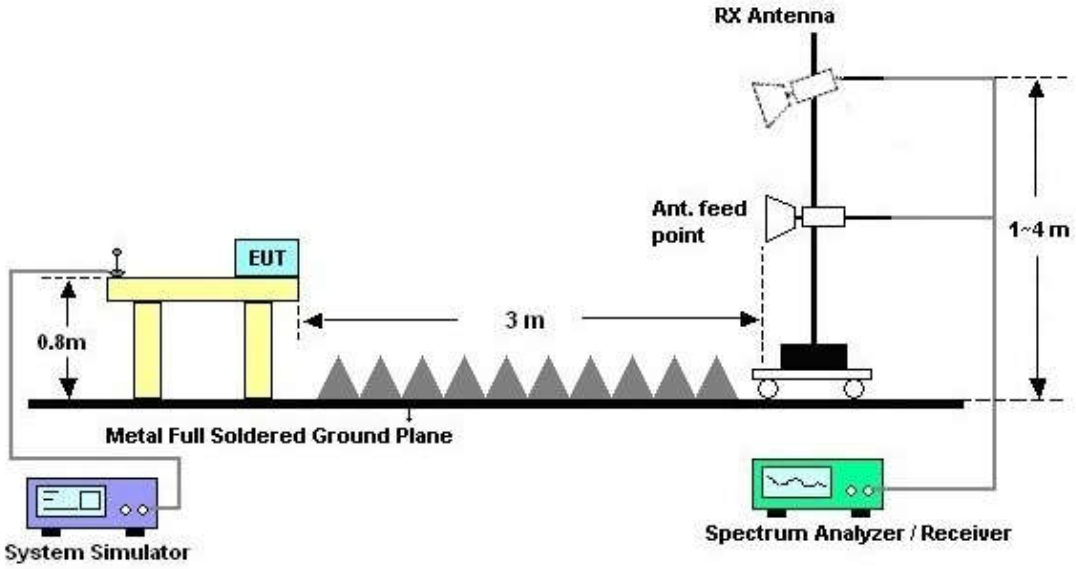
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna is a Bi-Log antenna and its height is adjusted between one to four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode (RBW=120kHz/VBW=300kHz for frequency below 1GHz; RBW=1MHz VBW=3MHz (Peak), RBW=1MHz/VBW=10Hz (Average) for frequency above 1GHz).
7. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, peak values of EUT will be reported. Otherwise, the emission will be repeated by using the quasi-peak method and reported.
8. Emission level (dBμV/m) = 20 log Emission level (μV/m)
9. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

3.2.4. Test Setup of Radiated Emission

For radiated emissions from 30MHz to 1GHz

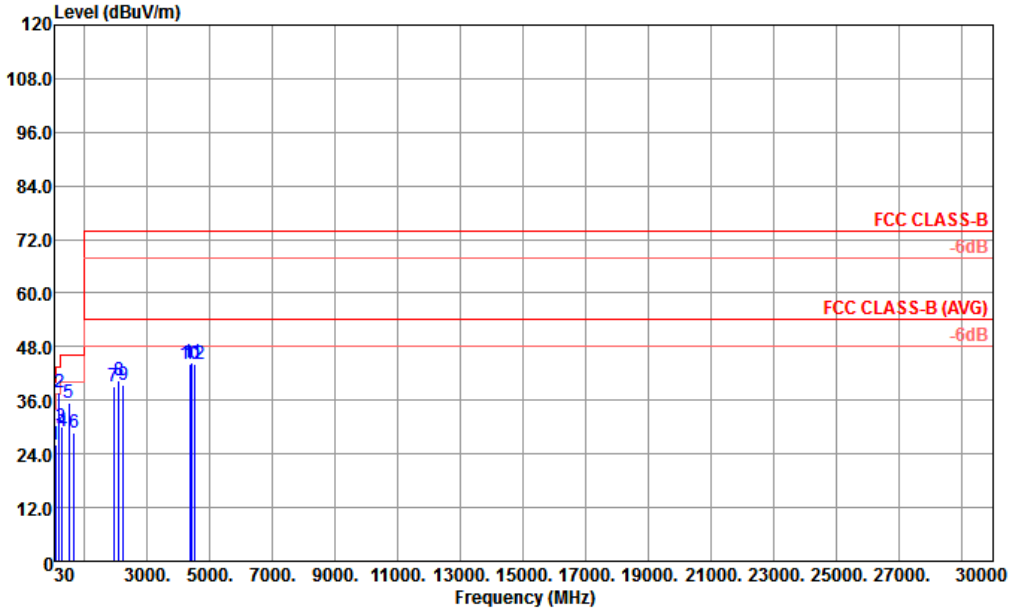


For radiated emissions above 1GHz



3.2.5. Test Result of Radiated Emission

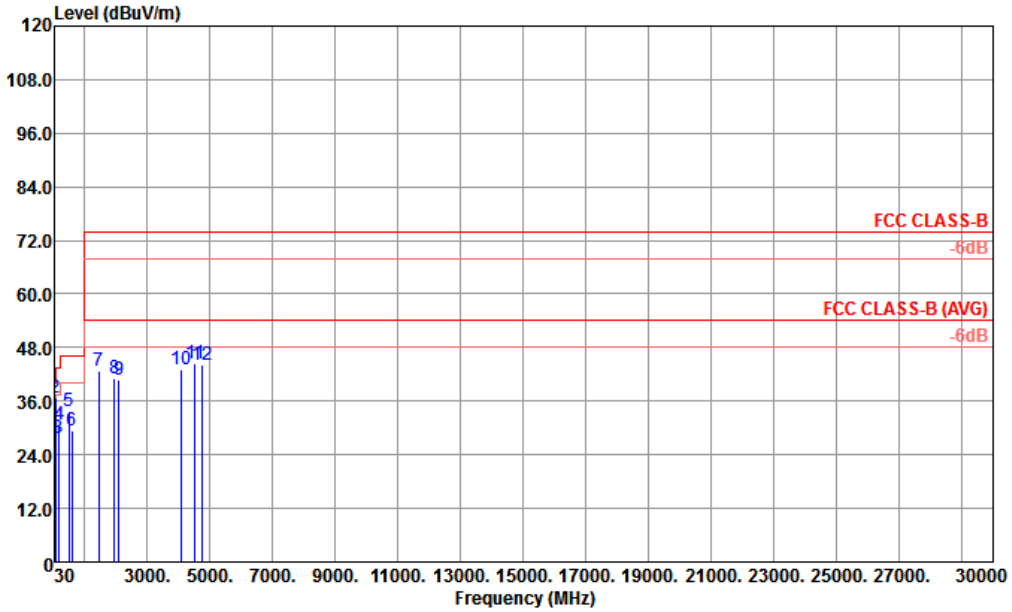
Test Mode :	Mode 1	**Temperature :**	21~22°C
Test Engineer :	Carl Ni	**Relative Humidity :**	41~42%
Test Distance :	3m	**Polarization :**	Horizontal
Function Type :	WCDMA Band 2 Idle + WLAN (2.4G) Idle + Bluetooth Idle + USB Link with U-Disk form Type C port 2 + Camera + Play H Plane + Adapter 1 With Type C Cable 1 + Type C port 1 for Sample 1		



Site : 03CH02-KS
Condition : FCC CLASS-B 3m LF 47610 HORIZONTAL

		Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
		MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1		68.80	25.98	-14.02	40.00	44.85	12.31	0.85	32.03	---	---	Peak
2	!	190.05	37.75	-5.75	43.50	53.04	15.00	1.41	31.70	100	0	Peak
3		249.22	30.21	-15.79	46.00	41.70	18.31	1.75	31.55	---	---	Peak
4		280.26	28.92	-17.08	46.00	39.46	18.90	1.85	31.29	---	---	Peak
5		503.36	35.38	-10.62	46.00	39.70	23.58	2.39	30.29	---	---	Peak
6		654.68	28.84	-17.16	46.00	30.43	25.00	2.69	29.28	---	---	Peak
7		1932.00	39.16	-34.84	74.00	67.12	29.84	4.56	62.36	---	---	Peak
8		2090.00	40.35	-33.65	74.00	67.32	30.59	4.75	62.31	---	---	Peak
9		2224.00	39.60	-34.40	74.00	65.88	31.03	4.97	62.28	---	---	Peak
10		4356.00	43.97	-30.03	74.00	63.14	35.66	7.17	62.00	---	---	Peak
11		4425.00	44.34	-29.66	74.00	63.39	35.77	7.20	62.02	---	---	Peak
12		4524.00	44.25	-29.75	74.00	62.91	35.89	7.45	62.00	---	---	Peak

Test Mode :	Mode 1	Temperature :	21~22°C
Test Engineer :	Carl Ni	Relative Humidity :	41~42%
Test Distance :	3m	Polarization :	Vertical
Function Type :	WCDMA Band 2 Idle + WLAN (2.4G) Idle + Bluetooth Idle + USB Link with U-Disk form Type C port 2 + Camera + Play H Plane + Adapter 1 With Type C Cable 1 + Type C port 1 for Sample 1		



Site : 03CH02-KS
Condition : FCC CLASS-B 3m LF 47610 VERTICAL

		Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
		MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1		31.94	27.30	-12.70	40.00	34.85	23.88	0.60	32.03	---	---	Peak
2	!	65.89	36.61	-3.39	40.00	55.50	12.34	0.85	32.08	126	6	QP
3		162.89	27.84	-15.66	43.50	42.35	15.98	1.31	31.80	---	---	Peak
4		193.93	30.75	-12.75	43.50	45.86	15.16	1.42	31.69	---	---	Peak
5		504.33	33.69	-12.31	46.00	37.97	23.61	2.39	30.28	---	---	Peak
6		592.60	29.53	-16.47	46.00	31.98	24.65	2.61	29.71	---	---	Peak
7		1440.00	42.63	-31.37	74.00	72.38	28.75	3.95	62.45	---	---	Peak
8		1942.00	41.16	-32.84	74.00	69.12	29.84	4.56	62.36	---	---	Peak
9		2092.00	40.88	-33.12	74.00	67.81	30.59	4.79	62.31	---	---	Peak
10		4089.00	42.99	-31.01	74.00	62.61	35.26	7.01	61.89	---	---	Peak
11		4515.00	44.52	-29.48	74.00	63.24	35.89	7.39	62.00	---	---	Peak
12		4770.00	44.07	-29.93	74.00	62.12	35.69	7.69	61.43	---	---	Peak

4. List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	Apr. 20, 2017	Mar. 20, 2018	Apr. 19, 2018	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060103	9kHz~30MHz	Oct. 13, 2017	Mar. 20, 2018	Oct. 12, 2018	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060105	9kHz~30MHz	Oct. 13, 2017	Mar. 20, 2018	Oct. 12, 2018	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	AC 0V~300V, 45Hz~1000Hz	Oct. 12, 2017	Mar. 20, 2018	Oct. 11, 2018	Conduction (CO01-KS)
EMI Test Receiver	R&S	ESR7	101403	9kHz~7GHz; Max 30dBm	Aug. 08, 2017	Mar. 24, 2018	Aug. 07, 2018	Radiation (03CH02-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150208	10Hz~44GHz, MAX 30dB	Apr. 18, 2017	Mar. 24, 2018	Apr. 17, 2018	Radiation (03CH02-KS)
Bilog Antenna	TeseQ	CBL6112D	23188	30MHz-2GHz	Apr. 25, 2017	Mar. 24, 2018	Apr. 24, 2018	Radiation (03CH02-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75957	1GHz~18GHz	Oct. 21, 2017	Mar. 24, 2018	Oct. 20, 2018	Radiation (03CH02-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA170249	15GHz~40GHz	Feb. 07, 2018	Mar. 24, 2018	Feb. 06, 2019	Radiation (03CH02-KS)
Amplifier	SONOMA	310N	187289	9kHz~1GHz	Aug. 07, 2017	Mar. 24, 2018	Aug. 06, 2018	Radiation (03CH02-KS)
Amplifier	Agilent	8449B	3008A02384	1-26.5GHz Gain 30dB	Oct. 12, 2017	Mar. 24, 2018	Oct. 11, 2018	Radiation (03CH02-KS)
Amplifier	MITEQ	TTA1840-35-HG	1887435	18GHz~40GHz	Oct. 12, 2017	Mar. 24, 2018	Oct. 11, 2018	Radiation (03CH02-KS)
AC Power Source	Chroma	61601	616010002473	N/A	NCR	Mar. 24, 2018	NCR	Radiation (03CH02-KS)
Turn Table	MF	MF7802	N/A	0~360 degree	NCR	Mar. 24, 2018	NCR	Radiation (03CH02-KS)
Antenna Mast	MF	MF7802	N/A	1 m~4 m	NCR	Mar. 24, 2018	NCR	Radiation (03CH02-KS)

NCR: No Calibration Required

5. Uncertainty of Evaluation

Uncertainty of Conducted Emission Measurement (150 kHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.3dB

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.5dB

Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.2dB

Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.7dB