



# FCC Test Report

**APPLICANT** : Motorola Mobility LLC  
**EQUIPMENT** : Mobile Cellular Phone  
**BRAND NAME** : Motorola  
**MODEL NAME** : XT1921-6, XT1921-1  
**FCC ID** : IHDT56XC1  
**STANDARD** : FCC 47 CFR FCC Part 15 Subpart B  
**CLASSIFICATION** : Certification

The product was received on Dec. 20, 2017 and testing was completed on Jan. 08, 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.



Approved by: James Huang / Manager

**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
FC7D2001-03	Rev. 01	Initial issue of report	Feb. 14, 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 7.20 dB at 0.158 MHz
3.2	15.109	Radiated Emission	< 15.109 limits	PASS	Under limit 5.30 dB at 43.230 MHz



# 1. General Description

## 1.1. Applicant

Motorola Mobility LLC  
222 W, Merchandise Mart Plaza, Chicago IL 60654 USA

## 1.2. Manufacturer

Motorola Mobility LLC  
222 W, Merchandise Mart Plaza, Chicago IL 60654 USA

## 1.3. Product Feature of Equipment Under Test

Product Feature	
Equipment	Mobile Cellular Phone
Brand Name	Motorola
Model Name	XT1921-6, XT1921-1
FCC ID	IHDT56XC1
EUT supports Radios application	CDMA/EV-DO/GSM/GPRS/EGPRS/WCDMA/HSPA/HSPA+(16QAM uplink is not supported)/DC-HSDPA/LTE WLAN2.4GHz 802.11b/g/n HT20 WLAN5GHz 802.11a/n HT20/HT40 Bluetooth v3.0+EDR/ Bluetooth v4.0 LE/ Bluetooth v4.1 LE/ Bluetooth v4.2 LE
IMEI Code	Conduction: 351838090014372 Radiation: 351838090014356
HW Version	DVT1B
SW Version	Verizon:fastboot_rjames_vzw_oem_vzw_userdebug_8.0.0_ODP27.62_1030_intcfg-test-keys_vzw.tar.gz Retail:fastboot_rjames_oem_userdebug_8.0.0_OPP27.62_1361_intcfg-test-keys_oem.tar.gz
EUT Stage	Identical Prototype

**Remark:**

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. The Model Name : XT1921-6 for "Verizon"; XT1921-1 for "Retail"



### 1.4. Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8MHz 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 25 : 1850.7MHz ~ 1914.3 MHz LTE Band 26 : 814.7 MHz ~ 848.3 MHz LTE Band 30 : 2307.5 MHz ~ 2312.5 MHz LTE Band 38 : 2572.5 MHz ~ 2617.5 MHz LTE Band 41 : 2498.5 MHz ~ 2687.5 MHz LTE Band 66 : 1710.7 MHz ~ 1779.3 MHz CDMA2000 BC0: 824.70 MHz ~ 848.31 MHz CDMA2000 BC1: 1851.25 MHz ~ 1908.75 MHz CDMA2000 BC10 : 817.9 MHz ~ 823.1 MHz 802.11b/g/n: 2412 MHz ~ 2462 MHz 802.11a/n: 5180 MHz ~ 5240 MHz; 5260 MHz ~ 5320 MHz; 5500 MHz~ 5700 MHz ; 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz
Rx Frequency	GSM850: 869.2 MHz ~ 893.8 MHz GSM1900: 1930.2 MHz ~ 1989.8 MHz 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 : 2622.5 MHz ~ 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 25 : 1930.7 MHz ~ 1994.3 MHz LTE Band 26 : 859.7 MHz ~ 893.3 MHz LTE Band 30 : 2352.5 MHz ~2357.5 MHz LTE Band 38 : 2572.5 MHz ~ 2617.5 MHz LTE Band 41 : 2498.5 MHz ~ 2687.5 MHz LTE Band 66 : 2110.7 MHz~ 2179.3 MHz CDMA2000 BC0: 869.70 MHz ~ 893.31 MHz CDMA2000 BC1: 1931.25 MHz ~ 1988.75 MHz CDMA2000 BC10 : 862.9 MHz ~ 868.1 MHz 802.11b/g/n: 2412 MHz ~ 2462 MHz 802.11a/n: 5180 MHz ~ 5240 MHz; 5260 MHz ~ 5320 MHz; 5500 MHz ~ 5700 MHz ;5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz GNSS : 1559 MHz ~ 1610 MHz



	FM : 88 MHz ~ 108 MHz
<b>Antenna Type</b>	WWAN: PIFA Antenna WLAN: PIFA Antenna Bluetooth: PIFA Antenna GNSS: PIFA Antenna FM: External headset Antenna
<b>Type of Modulation</b>	GSM: GMSK GPRS: GMSK EDGE(MCS 0-4): GMSK / (MCS 5-9): 8PSK WCDMA: BPSK (Uplink) HSDPA/DC-HSDPA : QPSK (Uplink) HSUPA : QPSK (Uplink) HSPA+ : 16QAM (16QAM uplink is not supported) DC-HSDPA : 64QAM LTE: QPSK / 16QAM CDMA2000 : QPSK CDMA2000 1xEV-DO : 8PSK 802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11a/g/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) Bluetooth LE : GFSK Bluetooth (1Mbps) : GFSK Bluetooth (2Mbps) : $\pi/4$ -DQPSK Bluetooth (3Mbps) : 8-DPSK GNSS : BPSK FM

### 1.5. Specification of Accessory

Specification of Accessory			
AC Adapter 1	Brand Name	Motorola (Acbel)	Model Name C-P35 (SA18C25300)
	Power Rating	I/P: 100-240 Vac, 300mA, O/P: 5.2Vdc,2000mA	
AC Adapter 2	Brand Name	Motorola (Salom)	Model Name SSW-2919UMTJ C-P35 SPN5945A (SA18C25301)
	Power Rating	I/P: 100-240 Vac, 300mA, O/P: 5.2Vdc,2000mA	
AC Adapter 3	Brand Name	Motorola(Chenyang)	Model Name C-P56 (SA18C22623)
	Power Rating	I/P: 100-240 Vac, 130mA, O/P: 5Vdc,1000mA	
AC Adapter 4	Brand Name	Motorola(Acbel)	Model Name C-P56 (SA18C27121)
	Power Rating	I/P: 100-240 Vac, 130mA, O/P: 5Vdc,1000mA	
Battery	Brand Name	Motorola (Amperex)	Model Name GK40
	Power Rating	3.8Vdc,2685/2800mAh	Type Li-ion
USB Cable	Brand Name	Motorola (Saibao)	Model Name SWT-A083A
	Signal Line Type	1.0 meter, shielded cable, without ferrite core	

### 1.6. Modification of EUT

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





### 1.7. Test Location

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

<b>Test Site</b>	Sporton International (Kunshan) Inc.		
<b>Test Site Location</b>	No.3-2 Ping-Xiang Rd, Kunshan Development Zone Kunshan City Jiangsu Province 215335 China TEL : +86-512-57900158 FAX : +86-512-57900958		
<b>Test Site No.</b>	<b>Sporton Site No.</b>		<b>FCC Test Firm Registration No.</b>
	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 (150 kHz to 30 MHz), radiation (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: GSM850 Idle + Bluetooth Idle + WLAN Idle(2.4G) + USB Cable (Charging from Adapter 1) + Earphone + Battery + Camera(Rear) <Fig. 1>
	Mode 2: GSM1900 Idle + Bluetooth Idle + WLAN Idle(5G) + USB Cable (Charging from Adapter 1) + Earphone + Battery + Camera(Front) <Fig. 1>
	Mode 3: WCDMA Band V Idle + Bluetooth Idle + WLAN Idle(2.4G) + USB Cable (Charging from Adapter 1) + Earphone + Battery + MPEG4 <Fig. 1>
	Mode 4: WCDMA Band II Idle + Bluetooth Idle + WLAN Idle(5G) + USB Cable (Charging from Adapter 1) + Earphone + Battery + GNSS Rx<Fig. 2>
	Mode 5: GSM850 Idle + Bluetooth Idle + WLAN Idle(2.4G) + USB Cable (Charging from Adapter 2) + Earphone + Battery + Camera(Rear) <Fig. 1>
	Mode 6: GSM850 Idle + Bluetooth Idle + WLAN Idle(2.4G) + USB Cable (Charging from Adapter 3) + Earphone + Battery + Camera(Rear) <Fig. 1>
	Mode 7: GSM850 Idle + Bluetooth Idle + WLAN Idle(2.4G) + USB Cable (Charging from Adapter 4) + Earphone + Battery + Camera(Rear) <Fig. 1>
	Mode 8: USB Cable (Charging from Adapter 1) + Earphone + Battery + FM Rx (88MHz) <Fig.3>
	Mode 9: USB Cable (Charging from Adapter 1) + Earphone + Battery + FM Rx (98MHz) <Fig.3>
	Mode 10 : USB Cable (Charging from Adapter 1) + Earphone + Battery + FM Rx (108MHz) <Fig.3>
	Mode 11 : USB Cable (Charging from Adapter 2) + Earphone + Battery + FM Rx (88MHz) <Fig.3>
	Mode 12 : USB Cable (Charging from Adapter 3) + Earphone + Battery + FM Rx (88MHz) <Fig.3>
	Mode 13 : USB Cable (Charging from Adapter 4) + Earphone + Battery + FM Rx (88MHz) <Fig.3>
	Mode 14 : LTE Band 7 Idle + Bluetooth Idle + WLAN Idle(2.4G) + USB Cable(Data Link with Notebook) + Earphone + Battery + GNSS Rx <Fig.4>



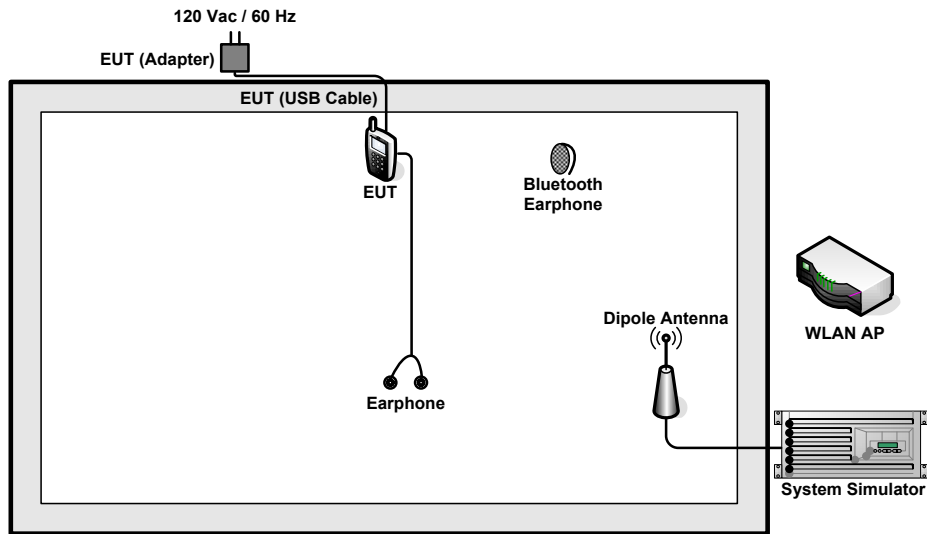
<p>Radiated Emissions &lt; 1GHz</p>	<p>Mode 1: GSM850 Idle + Bluetooth Idle + WLAN Idle(2.4G) + USB Cable (Charging from Adapter 1) + Earphone + Battery + Camera(Rear) &lt;Fig. 1&gt;</p> <p>Mode 2: GSM1900 Idle + Bluetooth Idle + WLAN Idle(5G) + USB Cable (Charging from Adapter 1) + Earphone + Battery + Camera(Front) &lt;Fig. 1&gt;</p> <p>Mode 3: WCDMA Band V Idle + Bluetooth Idle + WLAN Idle(2.4G) + USB Cable (Charging from Adapter 1) + Earphone + Battery + MPEG4&lt;Fig. 1&gt;</p> <p>Mode 4: WCDMA Band II Idle + Bluetooth Idle + WLAN Idle(5G) + USB Cable (Charging from Adapter 1) + Earphone + Battery + GNSS Rx&lt;Fig. 2&gt;</p> <p>Mode 5: GSM850 Idle + Bluetooth Idle + WLAN Idle(2.4G) + USB Cable (Charging from Adapter 2) + Earphone + Battery + Camera(Rear) &lt;Fig. 1&gt;</p> <p>Mode 6: GSM850 Idle + Bluetooth Idle + WLAN Idle(2.4G) + USB Cable (Charging from Adapter 3) + Earphone + Battery + Camera(Rear) &lt;Fig. 1&gt;</p> <p>Mode 7: GSM850 Idle + Bluetooth Idle + WLAN Idle(2.4G) + USB Cable (Charging from Adapter 4) + Earphone + Battery + Camera(Rear) &lt;Fig. 1&gt;</p> <p>Mode 8: USB Cable (Charging from Adapter 1) + Earphone + Battery + FM Rx (88MHz) &lt;Fig.3&gt;</p> <p>Mode 9: USB Cable (Charging from Adapter 1) + Earphone + Battery + FM Rx (98MHz) &lt;Fig.3&gt;</p> <p>Mode 10 : USB Cable (Charging from Adapter 1) + Earphone + Battery + FM Rx (108MHz) &lt;Fig.3&gt;</p> <p>Mode 11 : USB Cable (Charging from Adapter 2) + Earphone + Battery + FM Rx (98MHz) &lt;Fig.3&gt;</p> <p>Mode 12 : USB Cable (Charging from Adapter 3) + Earphone + Battery + FM Rx (98MHz) &lt;Fig.3&gt;</p> <p>Mode 13 : USB Cable (Charging from Adapter 4) + Earphone + Battery + FM Rx (98MHz) &lt;Fig.3&gt;</p> <p>Mode 14 : LTE Band 7 Idle + Bluetooth Idle + WLAN Idle(5G) + USB Cable(Data Link with Notebook) + Earphone + Battery + GNSS Rx &lt;Fig.4&gt;</p>
<p>Radiated Emissions ≥ 1GHz</p>	<p>Mode 1: USB Cable (Charging from Adapter 4) + Earphone + Battery + FM Rx (98MHz) &lt;Fig.3&gt;</p> <p>Mode 2: LTE Band 7 Idle + Bluetooth Idle + WLAN Idle(5G) + USB Cable(Data Link with Notebook) + Earphone + Battery + GNSS Rx &lt;Fig.4&gt;</p>



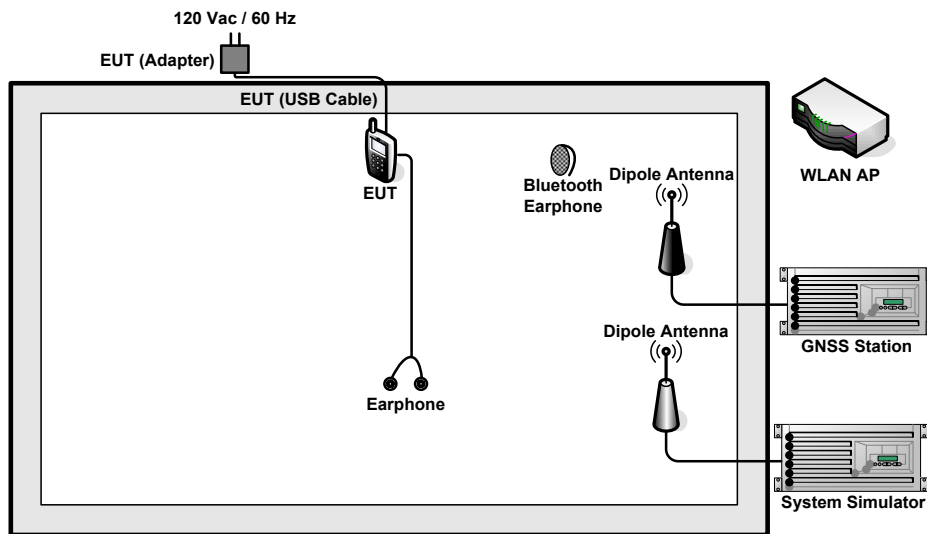
**Remark:**

1. The worst case of AC is mode 1; and the worst case of USB Link mode is mode 14, the test data of these modes were reported.
2. The worst case of RE < 1G is mode 13, and the worst case of USB Link mode is mode 14, the test data of these modes were reported.
3. Data Link with Notebook means data application transferred mode between EUT and Notebook.

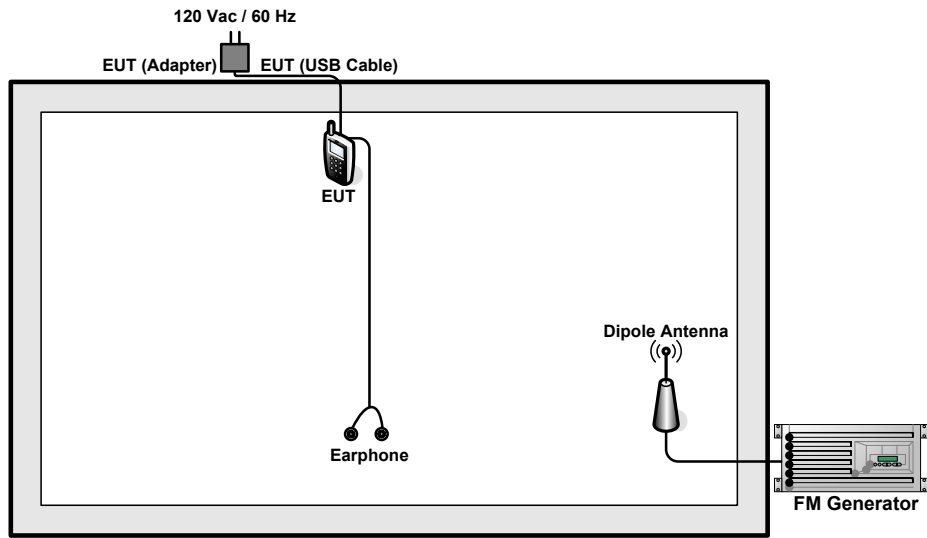
## 2.2. Connection Diagram of Test System



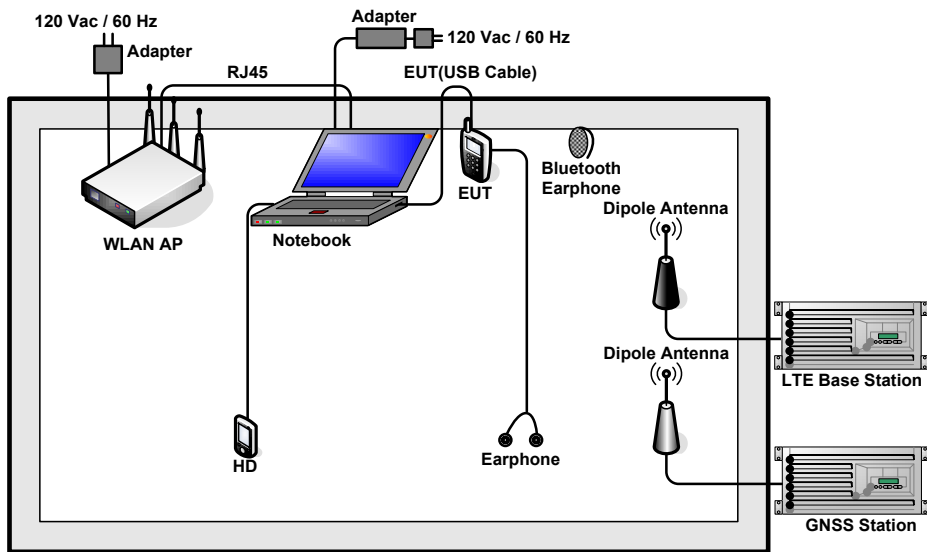
<Fig.1>



<Fig.2>



<Fig.3>



<Fig.4>



### 2.3. Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	LTE Base Station	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m
3.	FM Generator	R&S	SMBV100A	N/A	N/A	Unshielded, 1.8 m
4.	GNSS Station	ADIVIC	MP9000	N/A	N/A	Unshielded, 1.8 m
5.	GNSS Station	RACELOGIC	RLLS03-2RP	N/A	N/A	Unshielded, 1.8 m
6.	WLAN AP	TP-Link	TL-WDR5600	N/A	N/A	Unshielded, 1.8 m
7.	WLAN AP	D-Link	DIR-855	KA2DIR855A2	N/A	Unshielded, 1.8 m
8.	Notebook	Lenovo	G480	N/A	N/A	AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m
9.	Notebook	Lenovo	Y510P	N/A	N/A	AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m
10.	Bluetooth Earphone	Lenovo	LBH308	N/A	N/A	N/A
11.	Hard Disk	Lenovo	F310	FCC DoC	Shielded, 0.5 m	N/A
12.	SD Card	Kingston	8GB	N/A	N/A	N/A
13.	SD Card	SanDisk	Uitra	N/A	N/A	N/A
14.	Earphone	Lenovo	SH100	N/A	N/A	N/A





## **2.4. EUT Operation Test Setup**

The EUT was in GSM or 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 Notebook and EUT via USB cable.
2. Turn on GNSS function to make the EUT receive continuous signals from GNSS station.
3. Turn to Radio frequency channels, FM88 MHz, FM98 MHz, and FM108 MHz, from FM Generator.
4. Execute "Video Player" to play MPEG4 files.
5. Turn on camera to capture images.

### 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.

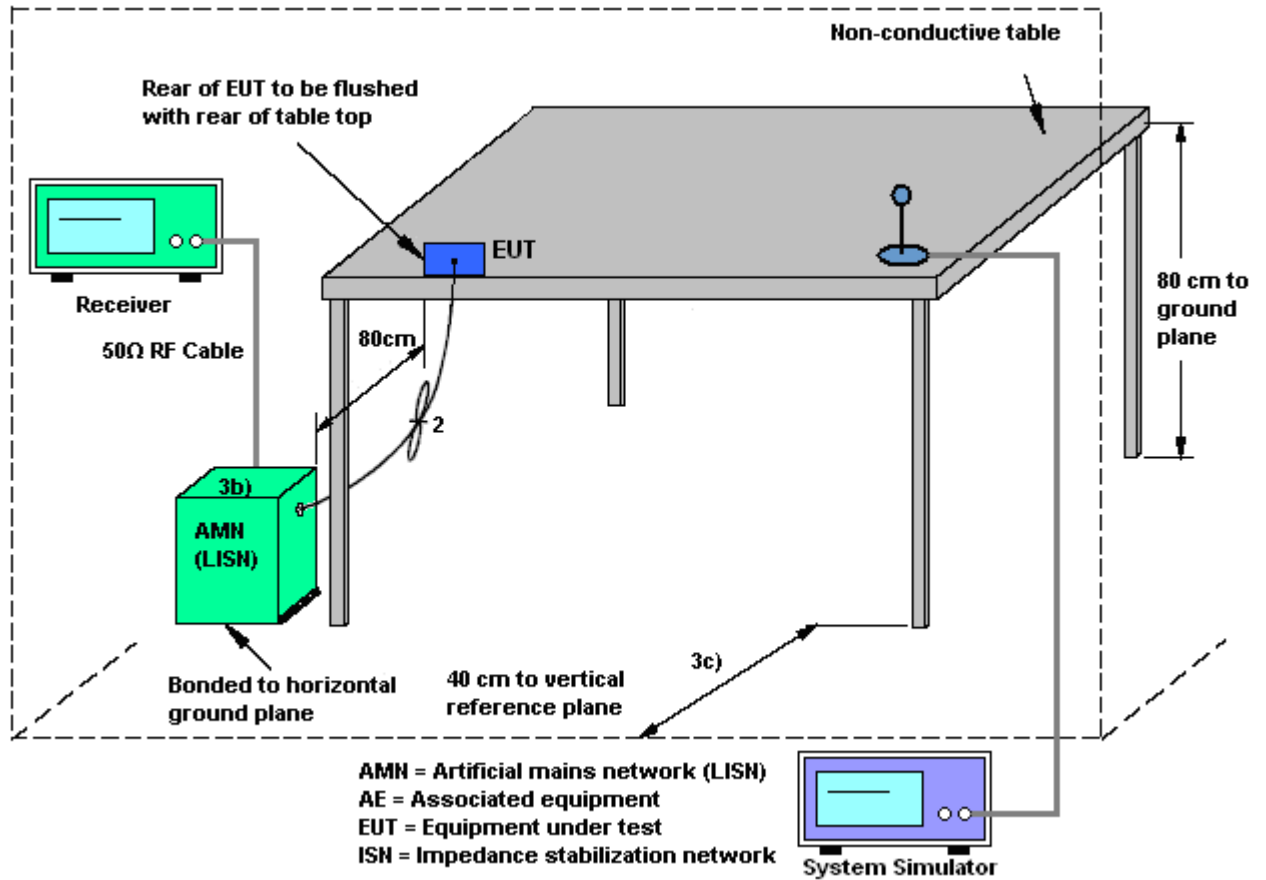
##### 3.1.2 Measuring Instruments

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.

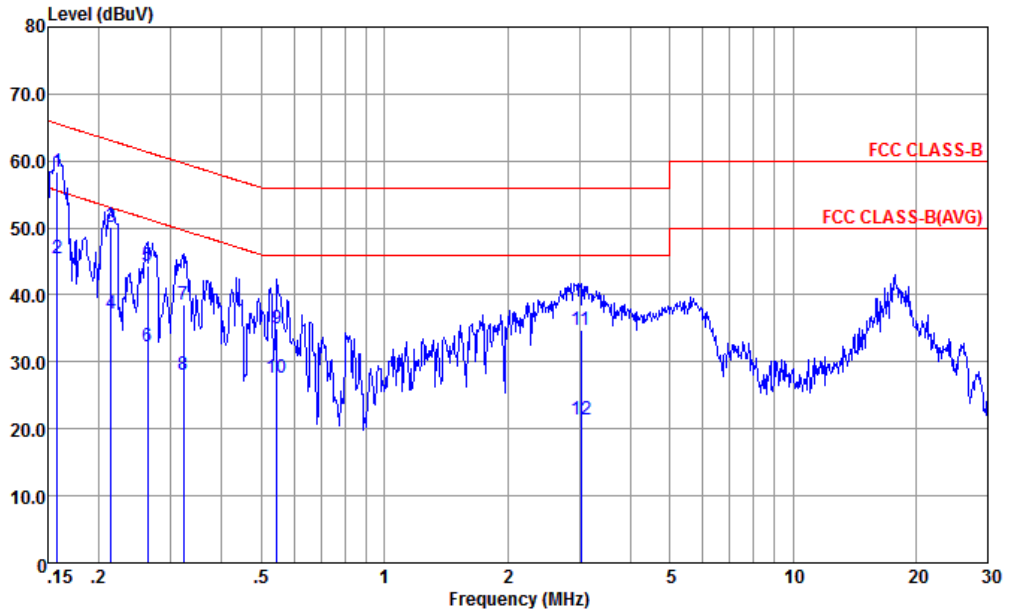
### 3.1.4 Test Setup





3.1.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	22~24°C
Test Engineer :	Amos Zhang	Relative Humidity :	42~46%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	GSM850 Idle + Bluetooth Idle + WLAN Idle(2.4G) + USB Cable (Charging from Adapter 1) + Earphone + Battery + Camera(Rear)		

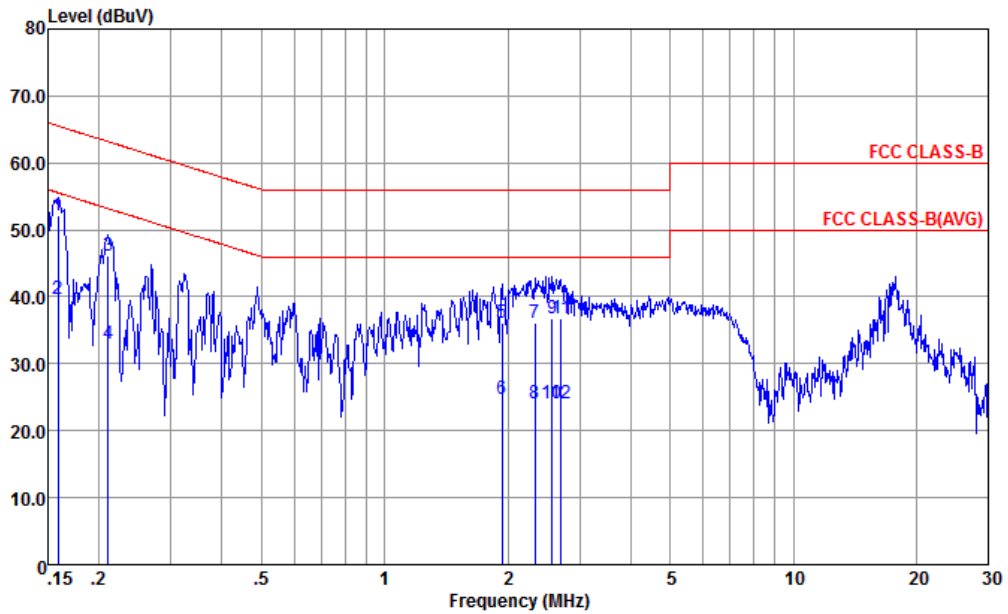


Site : CO01-KS  
 Condition : FCC CLASS-B LISN-L-171013-060103 LINE

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1 *	0.158	58.36	-7.20	65.56	47.60	0.17	10.59	QP
2	0.158	45.56	-10.00	55.56	34.80	0.17	10.59	Average
3	0.214	50.16	-12.89	63.05	39.51	0.20	10.45	QP
4	0.214	37.26	-15.79	53.05	26.61	0.20	10.45	Average
5	0.263	44.45	-16.89	61.34	33.79	0.22	10.44	QP
6	0.263	32.25	-19.09	51.34	21.59	0.22	10.44	Average
7	0.322	38.55	-21.11	59.66	27.90	0.23	10.42	QP
8	0.322	28.15	-21.51	49.66	17.50	0.23	10.42	Average
9	0.546	35.03	-20.97	56.00	24.50	0.26	10.27	QP
10	0.546	27.73	-18.27	46.00	17.20	0.26	10.27	Average
11	3.025	34.71	-21.29	56.00	24.21	0.32	10.18	QP
12	3.025	21.41	-24.59	46.00	10.91	0.32	10.18	Average



Test Mode :	Mode 1	Temperature :	22~24°C
Test Engineer :	Amos Zhang	Relative Humidity :	42~46%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	GSM850 Idle + Bluetooth Idle + WLAN Idle(2.4G) + USB Cable (Charging from Adapter 1) + Earphone + Battery + Camera(Rear)		

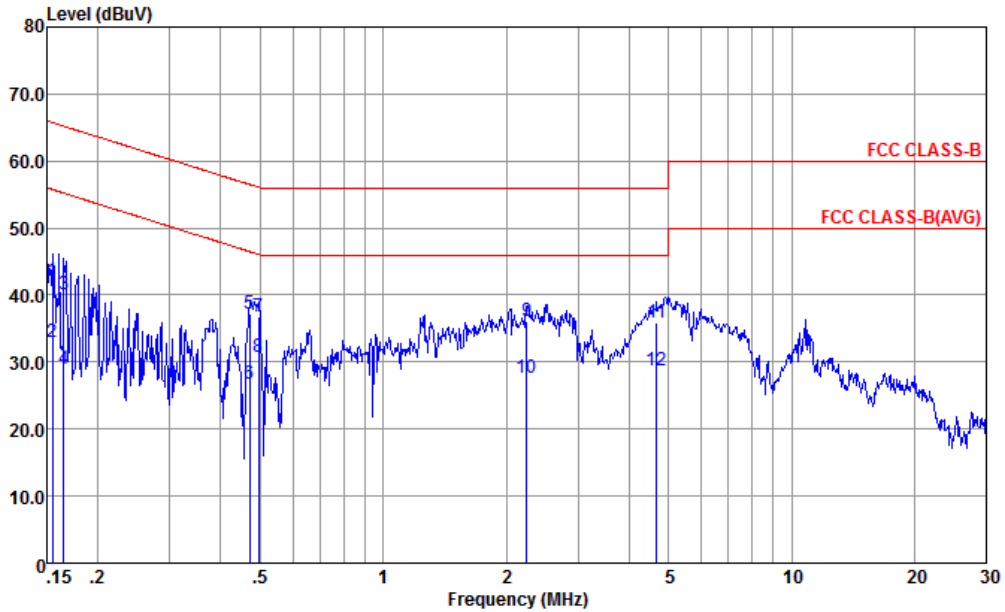


Site : CO01-KS  
 Condition : FCC CLASS-B LISN-N-171013-060103 NEUTRAL

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1 *	0.159	52.07	-13.45	65.52	41.20	0.28	10.59	QP
2	0.159	39.67	-15.85	55.52	28.80	0.28	10.59	Average
3	0.211	46.23	-16.95	63.18	35.50	0.28	10.45	QP
4	0.211	33.03	-20.15	53.18	22.30	0.28	10.45	Average
5	1.939	36.03	-19.97	56.00	25.50	0.32	10.21	QP
6	1.939	24.73	-21.27	46.00	14.20	0.32	10.21	Average
7	2.334	36.13	-19.87	56.00	25.61	0.32	10.20	QP
8	2.334	24.13	-21.87	46.00	13.61	0.32	10.20	Average
9	2.567	36.72	-19.28	56.00	26.19	0.33	10.20	QP
10	2.567	24.02	-21.98	46.00	13.49	0.33	10.20	Average
11	2.707	36.72	-19.28	56.00	26.20	0.33	10.19	QP
12	2.707	24.12	-21.88	46.00	13.60	0.33	10.19	Average



Test Mode :	Mode 14	Temperature :	22~24°C
Test Engineer :	Amos Zhang	Relative Humidity :	42~46%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	LTE Band 7 Idle + Bluetooth Idle + WLAN Idle(2.4G) + USB Cable(Data Link with Notebook) + Earphone + Battery + GNSS Rx		

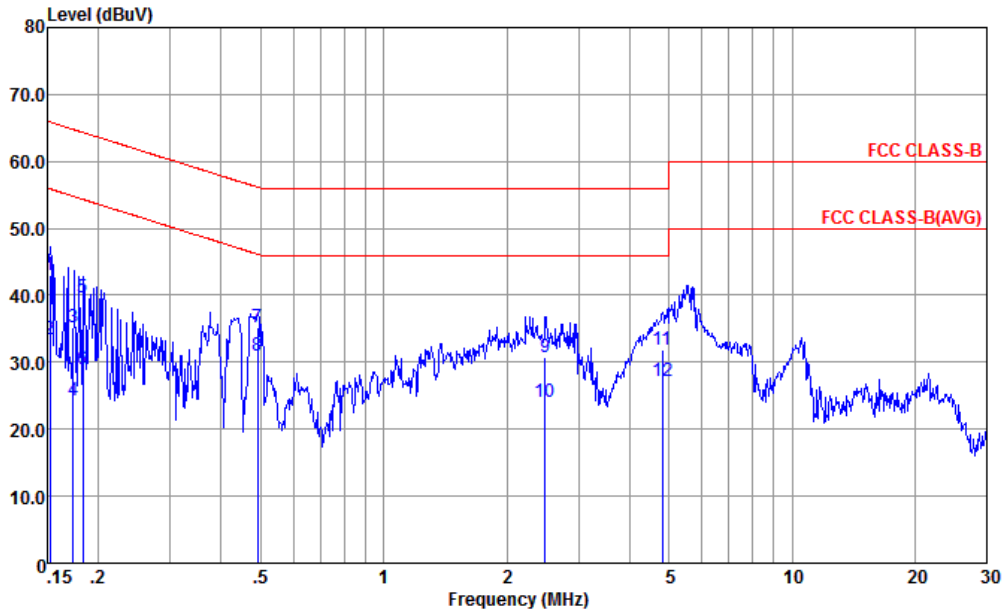


Site : CO01-KS  
 Condition : FCC CLASS-B LISN-L-171013-060103 LINE

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.155	42.06	-23.68	65.74	31.30	0.16	10.60	QP
2	0.155	33.06	-22.68	55.74	22.30	0.16	10.60	Average
3	0.165	40.04	-25.17	65.21	29.31	0.17	10.56	QP
4	0.165	28.94	-26.27	55.21	18.21	0.17	10.56	Average
5	0.471	37.19	-19.30	56.49	26.60	0.26	10.33	QP
6	0.471	26.79	-19.70	46.49	16.20	0.26	10.33	Average
7	0.494	36.87	-19.23	56.10	26.30	0.26	10.31	QP
8 *	0.494	30.77	-15.33	46.10	20.20	0.26	10.31	Average
9	2.249	36.10	-19.90	56.00	25.60	0.29	10.21	QP
10	2.249	27.60	-18.40	46.00	17.10	0.29	10.21	Average
11	4.672	35.78	-20.22	56.00	25.21	0.36	10.21	QP
12	4.672	28.68	-17.32	46.00	18.11	0.36	10.21	Average



Test Mode :	Mode 14	Temperature :	22~24°C
Test Engineer :	Amos Zhang	Relative Humidity :	42~46%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	LTE Band 7 Idle + Bluetooth Idle + WLAN Idle(2.4G) + USB Cable(Data Link with Notebook) + Earphone + Battery + GNSS Rx		



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	0.152	42.99	-22.88	65.87	32.10	0.28	10.61	QP
2	0.152	33.49	-22.38	55.87	22.60	0.28	10.61	Average
3	0.174	35.32	-29.46	64.78	24.50	0.28	10.54	QP
4	0.174	24.32	-30.46	54.78	13.50	0.28	10.54	Average
5	0.183	39.59	-24.74	64.33	28.80	0.28	10.51	QP
6	0.183	28.89	-25.44	54.33	18.10	0.28	10.51	Average
7	0.491	35.10	-21.04	56.14	24.50	0.29	10.31	QP
8 *	0.491	30.90	-15.24	46.14	20.30	0.29	10.31	Average
9	2.487	30.72	-25.28	56.00	20.20	0.32	10.20	QP
10	2.487	24.12	-21.88	46.00	13.60	0.32	10.20	Average
11	4.822	31.86	-24.14	56.00	21.30	0.34	10.22	QP
12	4.822	27.16	-18.84	46.00	16.60	0.34	10.22	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**

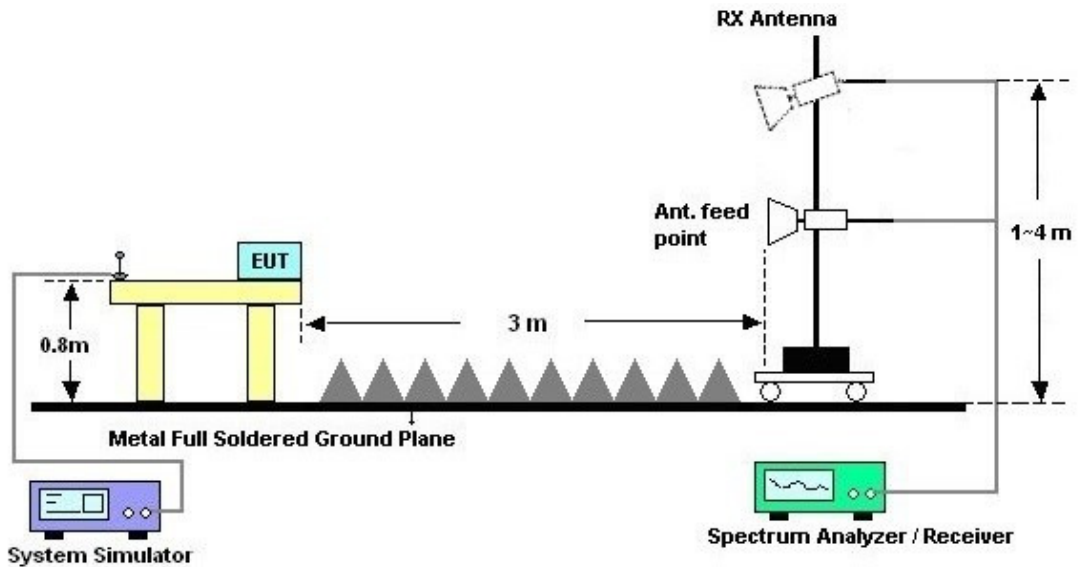
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna 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 (dB $\mu$ V/m) = 20 log Emission level ( $\mu$ V/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



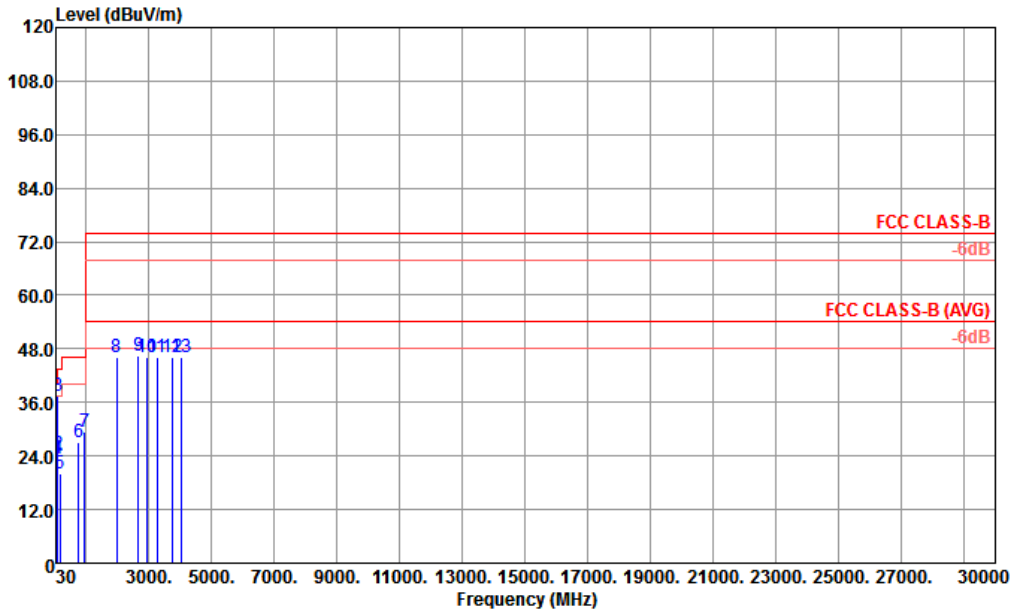
For radiated emissions above 1GHz





3.2.5. Test Result of Radiated Emission

Test Mode :	Mode 13	Temperature :	21~22°C
Test Engineer :	Leo Liao	Relative Humidity :	41~42%
Test Distance :	3m	Polarization :	Horizontal
Function Type :	USB Cable (Charging from Adapter 4) + Earphone + Battery + FM Rx (98MHz)		
Remark :	#3 is Base station (FM option) signal which can be ignored.		

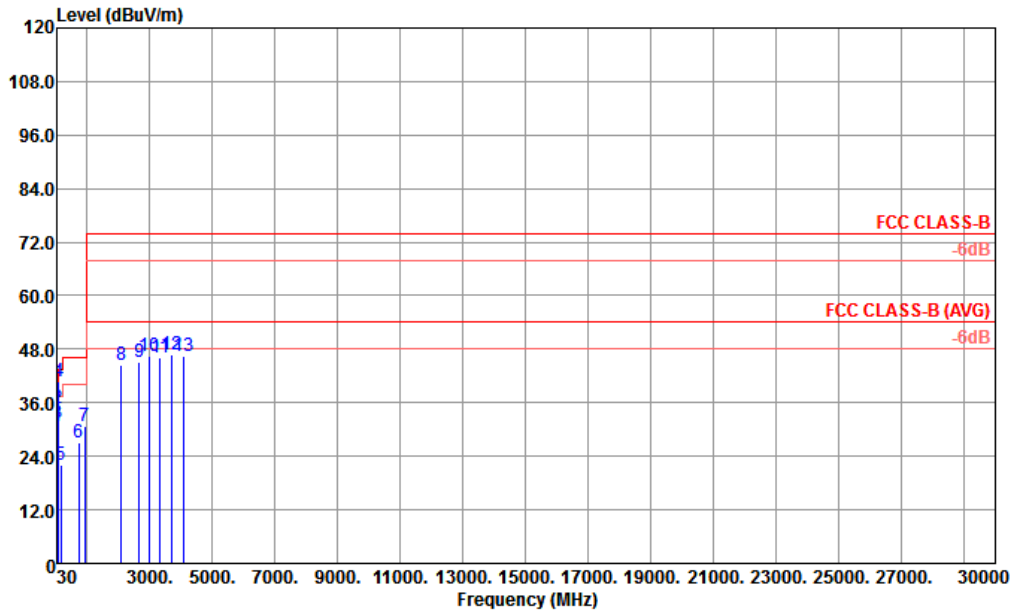


Site : 03CH02-KS  
 Condition : FCC CLASS-B 3m 02 LF ANT HORIZONTAL

	Freq	Level	Over Limit	Limit Line	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	30.27	23.83	-16.17	40.00	29.69	25.60	0.57	32.03	---	---	Peak
2	85.89	24.47	-15.53	40.00	39.85	15.70	0.96	32.04	100	0	Peak
3	98.04	37.41			50.67	17.70	1.00	31.96	---	---	Peak
4	99.39	23.30	-20.20	43.50	36.52	17.70	1.01	31.93	---	---	Peak
5	153.93	20.03	-23.47	43.50	33.23	17.36	1.27	31.83	---	---	Peak
6	760.60	26.92	-19.08	46.00	26.08	26.65	2.78	28.59	---	---	Peak
7	949.60	29.41	-16.59	46.00	24.85	28.50	3.20	27.14	---	---	Peak
8	1978.00	46.01	-27.99	74.00	44.05	30.19	4.61	32.84	---	---	Peak
9	2658.00	46.33	-27.67	74.00	39.54	31.76	5.48	30.45	---	---	Peak
10	2940.00	46.18	-27.82	74.00	37.12	32.40	5.92	29.26	---	---	Peak
11	3264.00	45.96	-28.04	74.00	37.10	33.19	6.23	30.56	---	---	Peak
12	3732.00	46.28	-27.72	74.00	35.24	34.59	6.57	30.12	---	---	Peak
13	4017.00	46.07	-27.93	74.00	34.79	35.12	6.79	30.63	---	---	Peak



Test Mode :	Mode 13	Temperature :	21~22°C
Test Engineer :	Leo Liao	Relative Humidity :	41~42%
Test Distance :	3m	Polarization :	Vertical
Function Type :	USB Cable (Charging from Adapter 4) + Earphone + Battery + FM Rx (98MHz)		
Remark :	#4 is Base station (FM option) signal which can be ignored.		

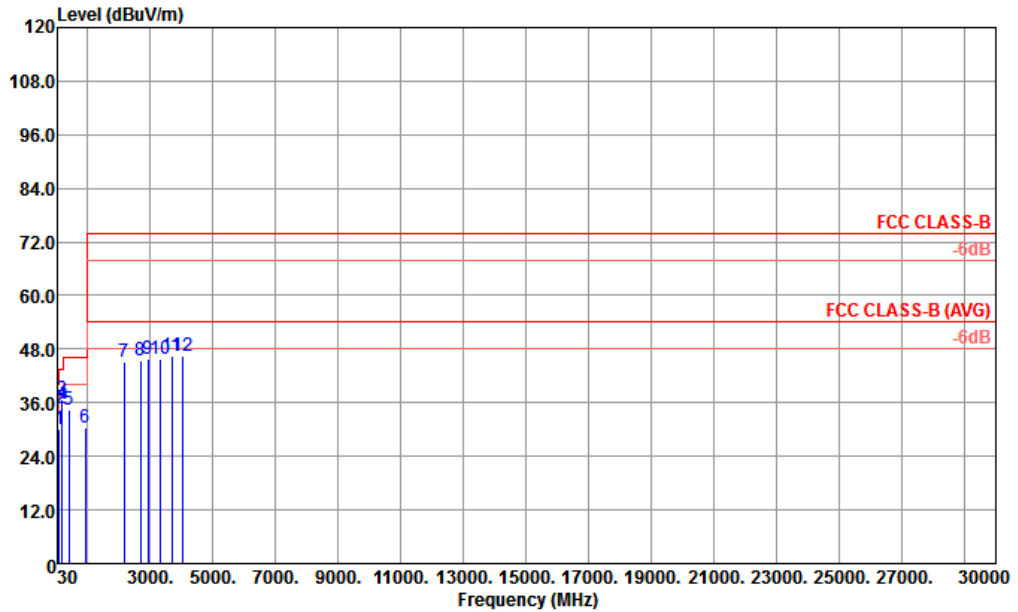


Site : 03CH02-KS  
 Condition : FCC CLASS-B 3m 02 LF ANT VERTICAL

	Freq	Level	Over Limit	Limit Line	ReadAntenna 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	32.97	30.84	-9.16	40.00	37.40	24.87	0.61	32.04	---	---	Peak
2 !	43.23	34.70	-5.30	40.00	45.57	20.57	0.66	32.10	100	0	Peak
3	52.14	31.42	-8.58	40.00	47.68	15.10	0.74	32.10	---	---	Peak
4 !	97.77	40.92			54.38	17.50	1.00	31.96	---	---	Peak
5	165.54	21.97	-21.53	43.50	35.48	16.96	1.32	31.79	---	---	Peak
6	738.20	27.17	-18.83	46.00	26.45	26.63	2.80	28.71	---	---	Peak
7	914.60	30.78	-15.22	46.00	27.27	27.78	3.13	27.40	---	---	Peak
8	2098.00	44.43	-29.57	74.00	42.14	30.65	4.79	33.15	---	---	Peak
9	2656.00	45.17	-28.83	74.00	38.40	31.74	5.48	30.45	---	---	Peak
10	2992.00	46.47	-27.53	74.00	36.80	32.55	5.95	28.83	---	---	Peak
11	3327.00	46.08	-27.92	74.00	36.98	33.28	6.25	30.43	---	---	Peak
12	3711.00	46.81	-27.19	74.00	36.00	34.37	6.55	30.11	---	---	Peak
13	4086.00	46.40	-27.60	74.00	34.92	35.26	7.01	30.79	---	---	Peak



Test Mode :	Mode 14	Temperature :	21~22°C
Test Engineer :	Leo Liao	Relative Humidity :	41~42%
Test Distance :	3m	Polarization :	Horizontal
Function Type :	LTE Band 7 Idle + Bluetooth Idle + WLAN Idle(5G) + USB Cable(Data Link with Notebook) + Earphone + Battery + GNSS Rx		

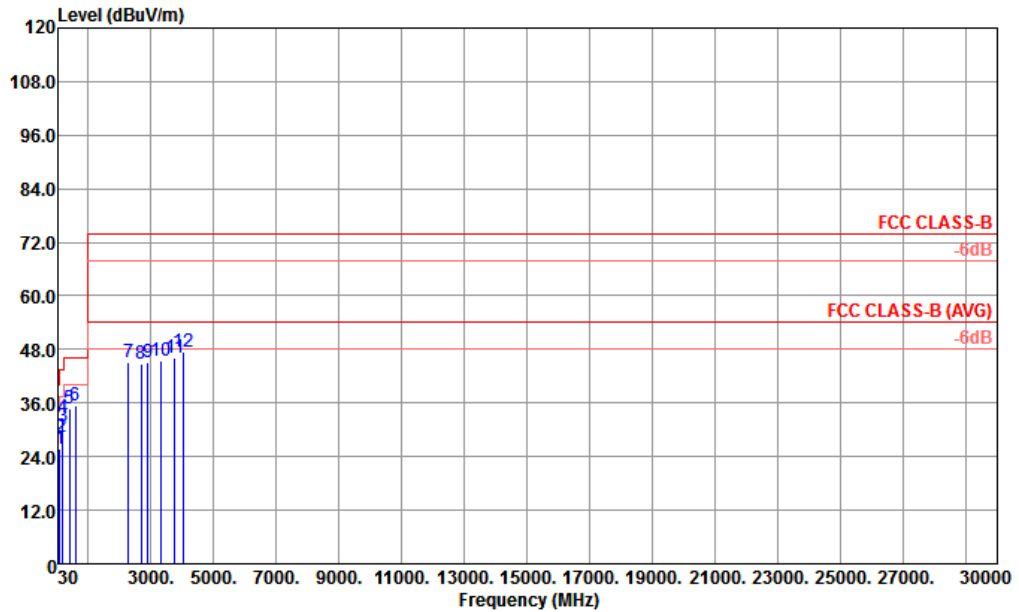


Site : 03CH02-KS  
 Condition : FCC CLASS-B 3m 02 LF ANT HORIZONTAL

	Freq	Level	Over Limit	Limit Line	ReadAntenna 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	84.54	29.96	-10.04	40.00	45.36	15.70	0.95	32.05	---	---	Peak
2	165.81	34.77	-8.73	43.50	48.28	16.96	1.32	31.79	---	---	Peak
3	194.16	36.79	-6.71	43.50	51.06	16.00	1.42	31.69	100	0	Peak
4	195.78	35.75	-7.75	43.50	50.06	15.94	1.43	31.68	---	---	Peak
5	402.90	34.41	-11.59	46.00	37.37	25.66	2.08	30.70	---	---	Peak
6	923.00	30.54	-15.46	46.00	26.80	27.94	3.14	27.34	---	---	Peak
7	2172.00	45.13	-28.87	74.00	42.59	30.88	4.90	33.24	---	---	Peak
8	2694.00	45.33	-28.67	74.00	40.32	31.82	5.60	32.41	---	---	Peak
9	2934.00	45.65	-28.35	74.00	39.19	32.40	5.92	31.86	---	---	Peak
10	3333.00	45.87	-28.13	74.00	38.49	33.28	6.25	32.15	---	---	Peak
11	3696.00	46.56	-27.44	74.00	37.82	34.37	6.53	32.16	---	---	Peak
12	4026.00	46.52	-27.48	74.00	37.02	35.15	6.79	32.44	---	---	Peak



Test Mode :	Mode 14	Temperature :	21~22°C
Test Engineer :	Leo Liao	Relative Humidity :	41~42%
Test Distance :	3m	Polarization :	Vertical
Function Type :	LTE Band 7 Idle + Bluetooth Idle + WLAN Idle(5G) + USB Cable(Data Link with Notebook) + Earphone + Battery + GNSS Rx		



Site : 03CH02-KS  
 Condition : FCC CLASS-B 3m 02 LF ANT VERTICAL

	Freq	Level	Over Limit	Limit Line	ReadAntenna 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	84.54	25.84	-14.16	40.00	41.24	15.70	0.95	32.05	---	---	Peak
2	165.81	28.39	-15.11	43.50	41.90	16.96	1.32	31.79	---	---	Peak
3	194.70	30.66	-12.84	43.50	44.98	15.94	1.43	31.69	---	---	Peak
4	196.05	32.69	-10.81	43.50	47.00	15.94	1.43	31.68	---	---	Peak
5	398.70	34.75	-11.25	46.00	37.92	25.47	2.07	30.71	---	---	Peak
6	598.20	35.33	-10.67	46.00	37.78	24.60	2.62	29.67	100	0	Peak
7	2286.00	45.03	-28.97	74.00	40.61	31.14	5.04	31.76	---	---	Peak
8	2690.00	44.75	-29.25	74.00	37.76	31.79	5.54	30.34	---	---	Peak
9	2902.00	45.16	-28.84	74.00	36.93	32.30	5.90	29.97	---	---	Peak
10	3318.00	45.44	-28.56	74.00	38.08	33.26	6.25	32.15	---	---	Peak
11	3762.00	46.09	-27.91	74.00	37.00	34.70	6.59	32.20	---	---	Peak
12	4029.00	47.42	-26.58	74.00	37.92	35.15	6.79	32.44	---	---	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	Jan. 01, 2018	Apr. 19, 2018	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060103	9kHz~30MHz	Oct. 13, 2017	Jan. 01, 2018	Oct. 12, 2018	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060105	9kHz~30MHz	Oct. 13, 2017	Jan. 01, 2018	Oct. 12, 2018	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP0000008 11	AC 0V~300V, 45Hz~1000Hz	Oct. 12, 2017	Jan. 01, 2018	Oct. 11, 2018	Conduction (CO01-KS)
EMI Test Receiver	R&S	ESR7	101403	9kHz~7GHz; Max 30dBm	Aug. 08, 2017	Jan. 07, 2018~ Jan. 08, 2018	Aug. 07, 2018	Radiation (03CH02-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150208	10Hz~44GHz, MAX 30dB	Apr. 18, 2017	Jan. 07, 2018~ Jan. 08, 2018	Apr. 17, 2018	Radiation (03CH02-KS)
Bilog Antenna	TeseQ	CBL6112D	23182	30MHz~2GHz	Jan. 22, 2017	Jan. 07, 2018~ Jan. 08, 2018	Jan. 21, 2018	Radiation (03CH02-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75957	1GHz~18GHz	Oct. 21, 2017	Jan. 07, 2018~ Jan. 08, 2018	Oct. 20, 2018	Radiation (03CH02-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA170249	15GHz~40GHz	Feb. 15, 2017	Jan. 07, 2018~ Jan. 08, 2018	Feb. 14, 2018	Radiation (03CH02-KS)
Amplifier	MITEQ	TTA1840-35-H G	1887435	18GHz~40GHz	Oct. 12, 2017	Jan. 07, 2018~ Jan. 08, 2018	Oct. 11, 2018	Radiation (03CH02-KS)
Amplifier	SONOMA	310N	187289	9kHz~1GHz	Aug. 07, 2017	Jan. 07, 2018~ Jan. 08, 2018	Aug. 06, 2018	Radiation (03CH02-KS)
Amplifier	Agilent	8449B	3008A02384	1-26.5GHz Gain 30dB	Oct. 12, 2017	Jan. 07, 2018~ Jan. 08, 2018	Oct. 11, 2018	Radiation (03CH02-KS)
AC Power Source	Chroma	61601	61601000247 3	N/A	NCR	Jan. 07, 2018~ Jan. 08, 2018	NCR	Radiation (03CH02-KS)
Turn Table	MF	MF7802	N/A	0~360 degree	NCR	Jan. 07, 2018~ Jan. 08, 2018	NCR	Radiation (03CH02-KS)
Antenna Mast	MF	MF7802	N/A	1 m~4 m	NCR	Jan. 07, 2018~ Jan. 08, 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
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### Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	5.2dB
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### Uncertainty of Radiated Emission Measurement (1GHz ~ 18GHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	4.7dB
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### Uncertainty of Radiated Emission Measurement (18GHz ~ 40GHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	5.3dB
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