

FCC Test Report

APPLICANT : BlackBerry Ltd.
EQUIPMENT : GSM Quad-band / UMTS FIVE bands / LTE
eleven bands mobile phone
BRAND NAME : BlackBerry
MODEL NAME : RJE181LW
MARKETING NAME : DTEK50
FCC ID : L6ARJE180LW
STANDARD : FCC 47 CFR FCC Part 15 Subpart B
CLASSIFICATION : Certification

The product was received on May 09, 2016 and testing was completed on Jun. 21, 2016. 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.



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TABLE OF CONTENTS

REVISION HISTORY	3
SUMMARY OF TEST RESULT	4
1. GENERAL DESCRIPTION	5
1.1. Applicant.....	5
1.2. Manufacturer	5
1.3. Product Feature of Equipment Under Test	5
1.4. Product Specification of Equipment Under Test	6
1.5. Specification of Accessory	7
1.6. Modification of EUT	8
1.7. Test Location	8
1.8. Applicable Standards	8
2. TEST CONFIGURATION OF EQUIPMENT UNDER TEST	9
2.1. Test Mode	9
2.2. Connection Diagram of Test System	12
2.3. Support Unit used in test configuration and system.....	13
2.4. EUT Operation Test Setup	14
3. TEST RESULT	15
3.1. Test of AC Conducted Emission Measurement	15
3.2. Test of Radiated Emission Measurement	21
4. LIST OF MEASURING EQUIPMENT	25
5. UNCERTAINTY OF EVALUATION	26
APPENDIX A. SETUP PHOTOGRAPHS	



REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FC611504-06	Rev. 01	Initial issue of report	Jul. 12, 2016



SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.107	ICES003 Section 6.1	AC Conducted Emission	< 15.107 limits < ICES003 6.1 limits	PASS	Under limit 6.11 dB at 0.540 MHz
3.2	15.109	ICES003 Section 6.2	Radiated Emission	< 15.109 limits < ICES003 6.2 limits	PASS	Under limit 4.30 dB at 314.000 MHz for Quasi-Peak



1. General Description

1.1. Applicant

BlackBerry Ltd.

2200 University Ave E., Waterloo, ON, CAN. N2K0A7

1.2. Manufacturer

TCL Communication Ltd.

5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park, Pudong Area Shanghai, P.R. China. 201203

1.3. Product Feature of Equipment Under Test

Product Feature	
Equipment	GSM Quad-band / UMTS FIVE bands / LTE eleven bands mobile phone
Brand Name	BlackBerry
Model Name	RJE181LW
Marketing Name	DTEK50
FCC ID	L6ARJE180LW
EUT supports Radios application	GSM/GPRS/EGPRS/WCDMA/HSPA/DC-HSDPA/ HSPA+(16QAM uplink is not supported)/LTE/NFC 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 v4.2 LE
IMEI Code	Conduction: 004402243119983 Radiation: 004402243119983
HW Version	PIO
SW Version	AAF295
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

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 5 : 824.7 MHz ~ 848.3 MHz LTE Band 2 : 1850.7 MHz ~ 1909.3 MHz LTE Band 4 : 1710.7 MHz ~ 1754.3 MHz LTE Band 7: 2502.5 MHz ~ 2567.5 MHz LTE Band 12 : 699.7 MHz ~ 715.3 MHz LTE Band 30 : 2307.5 MHz ~ 2312.5 MHz LTE Band 17 : 706.5 MHz ~ 713.5 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 NFC : 13.56 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 5 : 869.7 MHz ~ 893.3 MHz LTE Band 2 : 1930.7 MHz ~ 1989.3 MHz LTE Band 4 : 2110.7 MHz ~ 2154.3 MHz LTE Band 7: 2622.5 MHz~ 2687.5 MHz LTE Band 12 : 729.7 MHz ~ 745.3 MHz LTE Band 30 : 2352.5 MHz ~2357.5 MHz LTE Band 17 : 736.5 MHz ~ 743.5 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 GPS : 1.57542 GHz Glonass: 1602 MHz + n× 0.5625MHz (n=-7,-6,-5,...0,...,6) NFC : 13.56 MHz
Antenna Type	WWAN : IFA Antenna WLAN : IFA Antenna Bluetooth : IFA Antenna GPS/Glonass : IFA Antenna NFC : FPC Antenna
Type of Modulation	GSM: GMSK GPRS: GMSK EDGE(MCS 0-4): GMSK / (MCS 5-9): 8PSK WCDMA: QPSK (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 v4.0 LE : GFSK Bluetooth v4.2 LE : GFSK Bluetooth (1Mbps) : GFSK Bluetooth (2Mbps) : π /4-DQPSK Bluetooth (3Mbps) : 8-DPSK GPS/Glonass : BPSK NFC: ASK
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1.5. Specification of Accessory

Specification of Accessory				
AC Adapter	Brand Name	N/A	Model Name	UC13US
	Power Rating	I/P: 100 - 240Vac 0.5A, O/P:5V 2.0A		
	Manufacturer	BYD		
	P/N	CBA0059AG4C1		
Battery 1	Brand Name	N/A	Model Name	TLp026EJ
	Power Rating	3.85V 2610mAh		
	Manufacturer	COSLIGHT		
	P/N	CAC2610010CJ		
Battery 2	Brand Name	N/A	Model Name	TLp026E2
	Power Rating	3.84V 2610mAh		
	Manufacturer	SCUD		
	P/N	CAC2610011C2		
USB Cable 1	Brand Name	NA	Model Name	NA
	Signal Line Type	1.0 meter, shielded cable, without ferrite core		
	P/N	CDA0000043C8		
USB Cable 2	Brand Name	NA	Model Name	NA
	Signal Line Type	1.0 meter, shielded cable, without ferrite core		
	P/N	CDA0000043C2		
Earphone	Brand Name	LIANCHUANG	Model Name	NA
	Signal Line Type	1.25 meter, non-shielded cable, without ferrite core		
	P/N	CCB0045A15C3		

1.6. Modification of EUT

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

1.7. Test Location

Test Site	SPORTON INTERNATIONAL (KUNSHAN) INC.		
Test Site Location	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P. R. China TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958		
Test Site No.	Sporton Site No.		FCC/IC Registration No.
	CO01-KS	03CH02-KS	418269/4086E

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
- ♦ IC ICES-003 Issue 6
- ♦ IC RSS-Gen Issue 4

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).

The following tables are showing the test modes as the worst cases and recorded in this report.

Item	EUT Configuration	Test Condition		
		EMI AC	EMI RE<1G	EMI RE≥1G
1.	Charging Mode (EUT with adapter)	☒	☒	Note1
2.	Data application transferred mode (EUT with notebook)	☒	☒	☒

Abbreviations:

- EMI AC: AC conducted emissions
- EMI RE ≥ 1G: EUT radiated emissions ≥ 1GHz
- EMI RE < 1G: EUT radiated emissions < 1GHz

Note 1: Testing for this mode is not required or not the worst case.

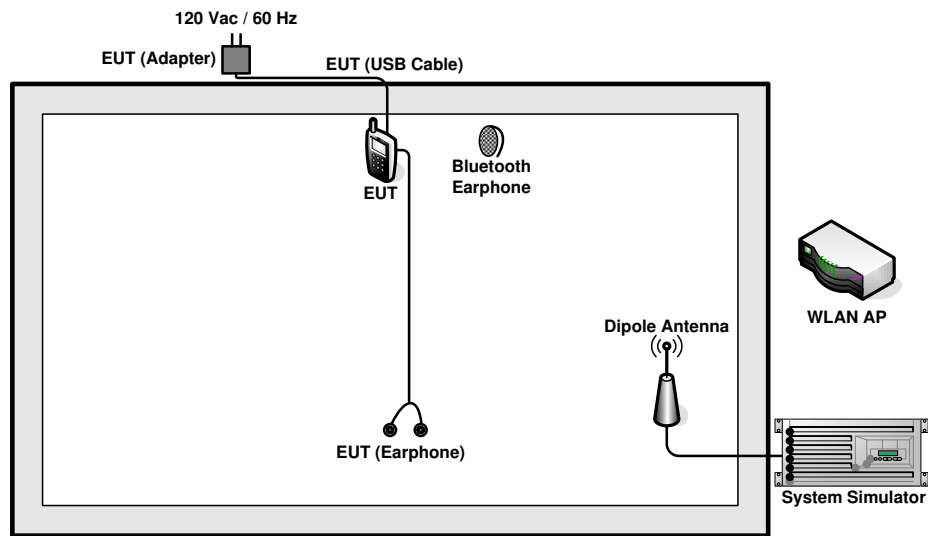
Remark: For signal above 1GHz, the worst case was test item 2.

Test Items	EUT Configure Mode	Function Type
AC Conducted Emission	1/2	Mode 1 : GSM850 Idle + Bluetooth Idle + WLAN (2.4G) Idle + USB Cable 1 (Charging from Adapter) + Earphone + Battery 1 + Camera (Rear)<Fig.1> Mode 2 : GSM1900 Idle + Bluetooth Idle + WLAN (5G) Idle + USB Cable 2 (Charging from Adapter) + Earphone + Battery 1 + Camera (Front)<Fig.1> Mode 3 : WCDMA Band V Idle + Bluetooth Idle + WLAN (2.4G) Idle + USB Cable 2 (Charging from Adapter) + Earphone + Battery 1 + MPEG4<Fig.1> Mode 4 : WCDMA Band II Idle + Bluetooth Idle + WLAN (5G) Idle + USB Cable 2 (Charging from Adapter) + Earphone + Battery 1 + NFC On<Fig.1> Mode 5 : LTE Band 4 Idle + Bluetooth Idle + WLAN (2.4G) Idle + USB Cable 1 (Data Link with Notebook) + Earphone + Battery 1 + Glonass Rx<Fig.2> Mode 6 : LTE Band 7 Idle + Bluetooth Idle + WLAN (5G) Idle + USB Cable 2 (Data Link with Notebook) + Earphone + Battery 1 + GPS Rx<Fig.2> Mode 7 : WCDMA Band II Idle + Bluetooth Idle + WLAN (5G) Idle + USB Cable 2 (Charging from Adapter) + Earphone + Battery 2 + NFC On<Fig.1>
Radiated Emissions < 1GHz	1/2	Mode 1 : GSM850 Idle + Bluetooth Idle + WLAN (2.4G) Idle + USB Cable 1 (Charging from Adapter) + Earphone + Battery 1 + Camera (Rear) <Fig.1> Mode 2 : GSM1900 Idle + Bluetooth Idle + WLAN (5G) Idle + USB Cable 2 (Charging from Adapter) + Earphone + Battery 1 + Camera (Front) <Fig.1> Mode 3 : WCDMA Band V Idle + Bluetooth Idle + WLAN (2.4G) Idle + USB Cable 2 (Charging from Adapter) + Earphone + Battery 1 + MPEG4<Fig.1> Mode 4 : WCDMA Band II Idle + Bluetooth Idle + WLAN (5G) Idle + USB Cable 2 (Charging from Adapter) + Earphone + Battery 1 + NFC On<Fig.1> Mode 5 : LTE Band 4 Idle + Bluetooth Idle + WLAN (2.4G) Idle + USB Cable 1 (Data Link with Notebook) + Earphone + Battery 1 + Glonass Rx<Fig.2> Mode 6 : LTE Band 7 Idle + Bluetooth Idle + WLAN (5G) Idle + USB Cable 2 (Data Link with Notebook) + Earphone + Battery 1 + GPS Rx<Fig.2> Mode 7 : LTE Band 4 Idle + Bluetooth Idle + WLAN (2.4G) Idle + USB Cable 1 (Data Link with Notebook) + Earphone + Battery 2 + Glonass Rx<Fig.2>

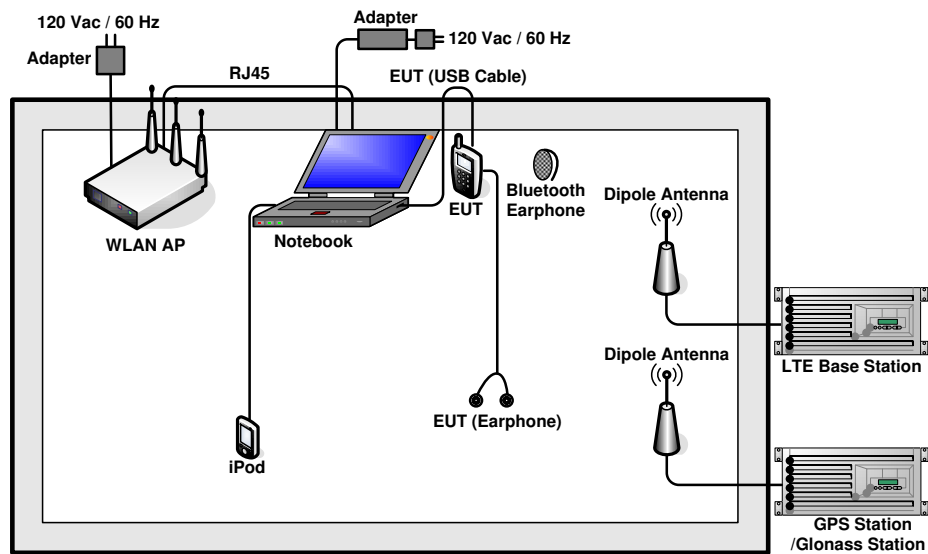


Radiated Emissions $\geq 1\text{GHz}$	2	Mode 1 : LTE Band 4 Idle + Bluetooth Idle + WLAN (2.4G) Idle + USB Cable 1 (Data Link with Notebook) + Earphone + Battery 1 + Glonass Rx<Fig.2>
Remark: 1. The worst case of AC is mode 4; and the USB Link mode of AC is mode 5, only the test data of this mode was reported. 2. The worst case of RE < 1G is mode 5; only the test data of this mode was 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>

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	Anritus	MT8820C	N/A	N/A	Unshielded, 1.8 m
3.	GPS Station	ADIVIC	MP9000	N/A	N/A	Unshielded, 1.8 m
4.	Glonass Station	RACELOGIC	RLLS03-2P	N/A	N/A	Unshielded, 1.8 m
5.	WLAN AP	ASUSTek	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded, 1.8 m
6.	WLAN AP	D-Link	DIR-855	KA2DIR855A2	N/A	Unshielded, 1.8 m
7.	Bluetooth Earphone	Lenovo	LBH505	N/A	N/A	N/A
8.	Bluetooth Earphone	Lenovo	LBH301	N/A	N/A	N/A
9.	Notebook	Lenovo	G480	N/A	N/A	AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m
10.	Notebook	DELL	Latitude3440	N/A	N/A	AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m
11.	SD Card	Kingston	4GB	N/A	N/A	N/A
12.	SD Card	SanDisk	Uitra	N/A	N/A	N/A
13.	iPod	Apple	A1199	FCC DoC	Shielded, 1.2 m	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 GPS/Glonass function to make the EUT receive continuous signals from GPS/Glonass station.
3. Execute "Video player" to play MPEG4 files.
4. Turn on camera to capture images.
5. Turn on NFC function.

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.

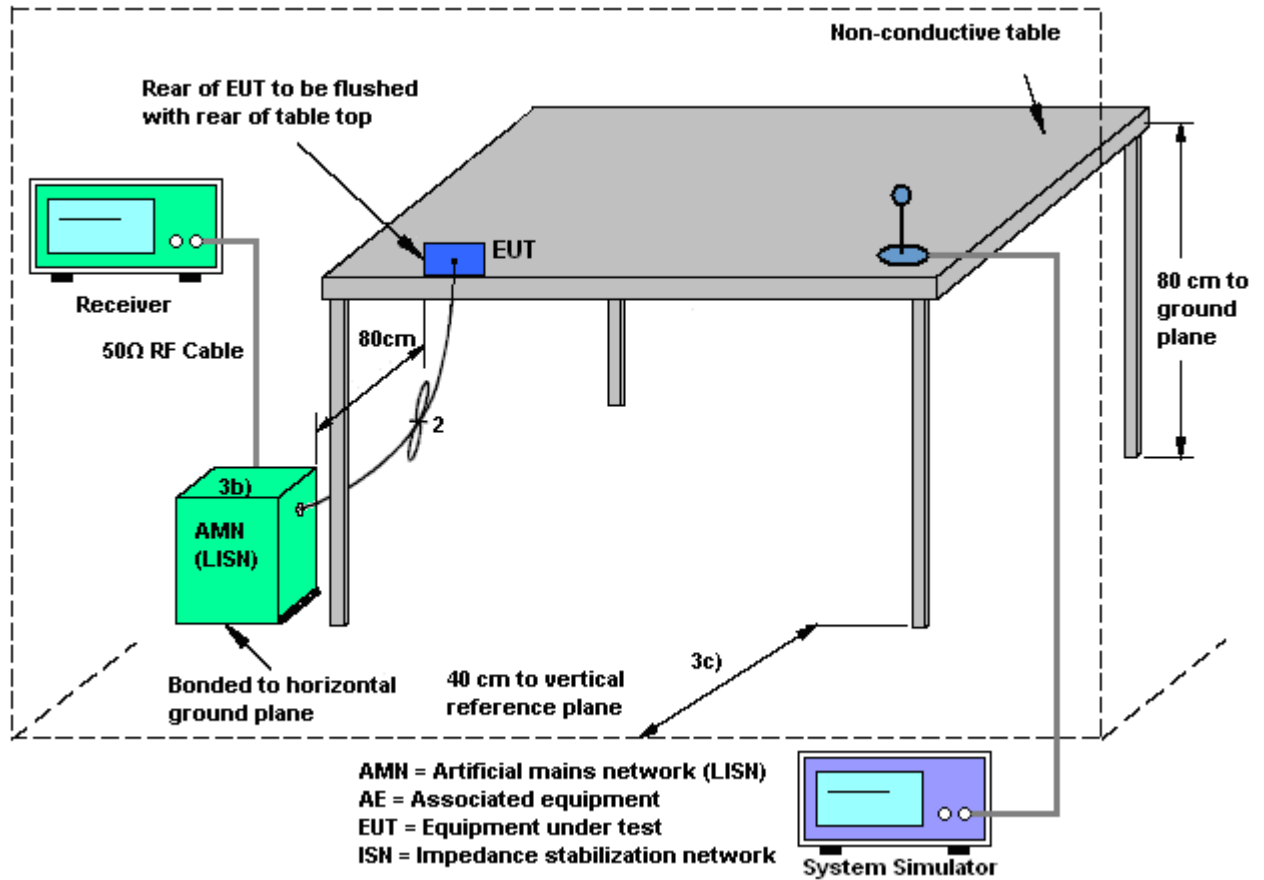
3.1.2 Measuring Instruments

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.

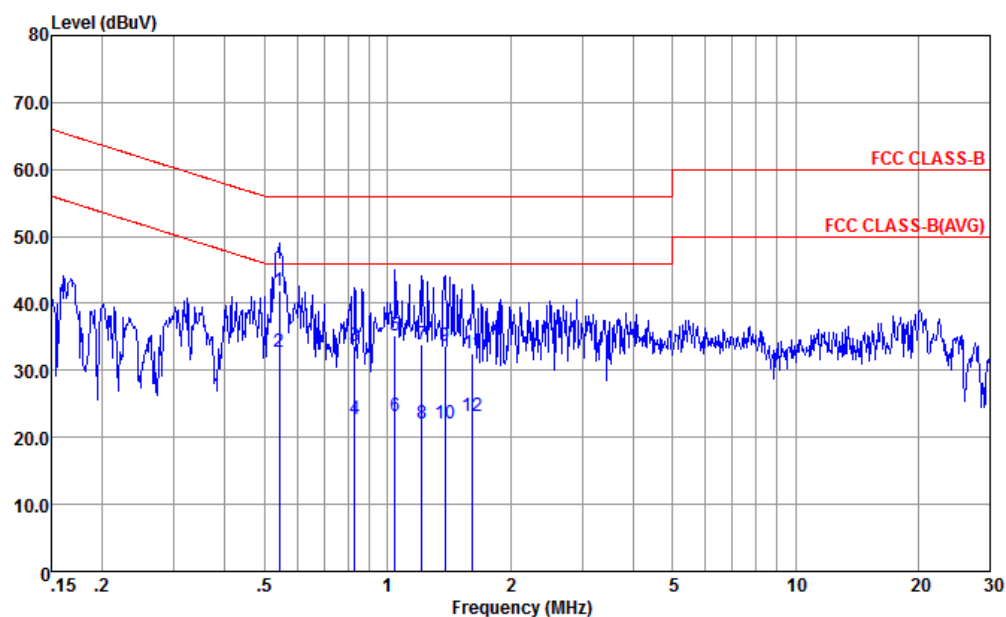
3.1.4 Test Setup





3.1.5 Test Result of AC Conducted Emission

Test Mode :	Mode 4	Temperature :	22~24℃
Test Engineer :	Amos Zhang	Relative Humidity :	43~47%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WCDMA Band II Idle + Bluetooth Idle + WLAN (5G) Idle + USB Cable 2 (Charging from Adapter) + Earphone + Battery 1 + NFC On		

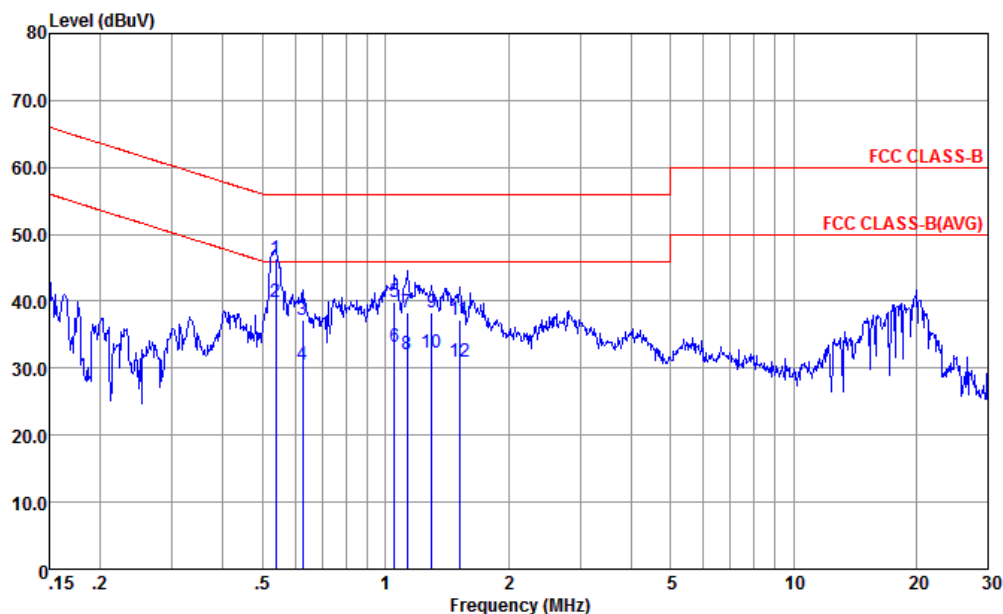


Site : CO01-KS
Condition : FCC CLASS-B LISN-L-20151024 LINE
Project : (FC) 611504-06
mode : Mode 4

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.54	41.99	-14.01	56.00	31.60	0.23	10.16	QP
2 *	0.54	32.69	-13.31	46.00	22.30	0.23	10.16	Average
3	0.83	33.59	-22.41	56.00	23.21	0.24	10.14	QP
4	0.83	22.69	-23.31	46.00	12.31	0.24	10.14	Average
5	1.04	35.18	-20.82	56.00	24.79	0.25	10.14	QP
6	1.04	23.28	-22.72	46.00	12.89	0.25	10.14	Average
7	1.22	33.97	-22.03	56.00	23.60	0.23	10.14	QP
8	1.22	21.97	-24.03	46.00	11.60	0.23	10.14	Average
9	1.38	33.66	-22.34	56.00	23.30	0.22	10.14	QP
10	1.38	22.16	-23.84	46.00	11.80	0.22	10.14	Average
11	1.62	32.64	-23.36	56.00	22.30	0.20	10.14	QP
12	1.62	23.14	-22.86	46.00	12.80	0.20	10.14	Average



Test Mode :	Mode 4	Temperature :	22~24℃
Test Engineer :	Amos Zhang	Relative Humidity :	43~47%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WCDMA Band II Idle + Bluetooth Idle + WLAN (5G) Idle + USB Cable 2 (Charging from Adapter) + Earphone + Battery 1 + NFC On		

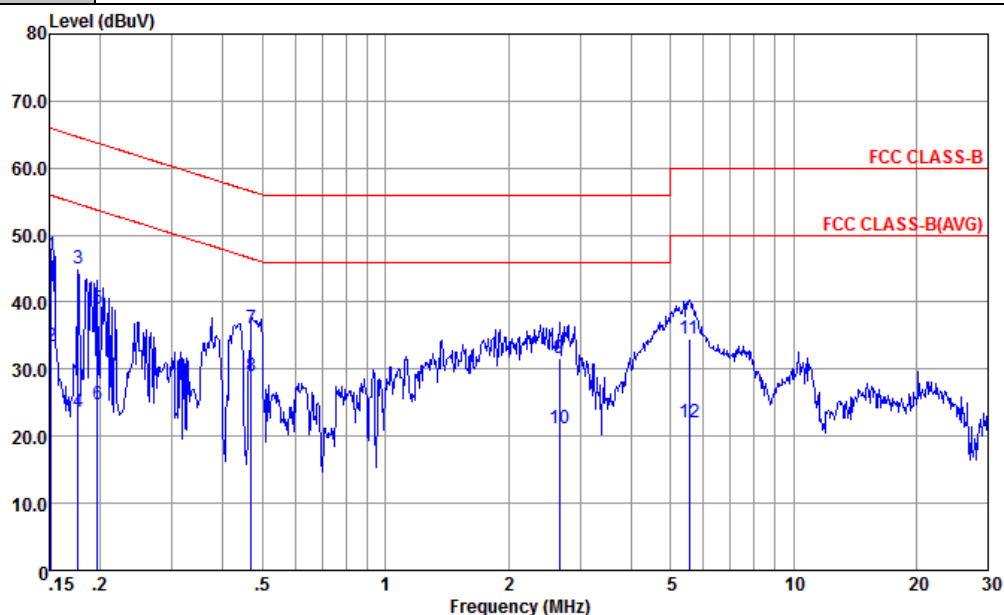


Site : CO01-KS
Condition : FCC CLASS-B LISN-N-20151024 NEUTRAL
Project : (FC) 611504-06
mode : Mode 4

	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.54	46.39	-9.61	56.00	35.91	0.32	10.16	QP
2 *	0.54	39.89	-6.11	46.00	29.41	0.32	10.16	Average
3	0.63	37.29	-18.71	56.00	26.80	0.33	10.16	QP
4	0.63	30.59	-15.41	46.00	20.10	0.33	10.16	Average
5	1.05	39.81	-16.19	56.00	29.30	0.37	10.14	QP
6	1.05	33.11	-12.89	46.00	22.60	0.37	10.14	Average
7	1.13	38.31	-17.69	56.00	27.80	0.37	10.14	QP
8	1.13	32.11	-13.89	46.00	21.60	0.37	10.14	Average
9	1.30	38.41	-17.59	56.00	27.90	0.37	10.14	QP
10	1.30	32.41	-13.59	46.00	21.90	0.37	10.14	Average
11	1.52	37.32	-18.68	56.00	26.80	0.38	10.14	QP
12	1.52	31.02	-14.98	46.00	20.50	0.38	10.14	Average



Test Mode :	Mode 5	Temperature :	22~24°C
Test Engineer :	Amos Zhang	Relative Humidity :	43~47%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	LTE Band 4 Idle + Bluetooth Idle + WLAN (2.4G) Idle + USB Cable 1 (Data Link with Notebook) + Earphone + Battery 1 + Glonass Rx		

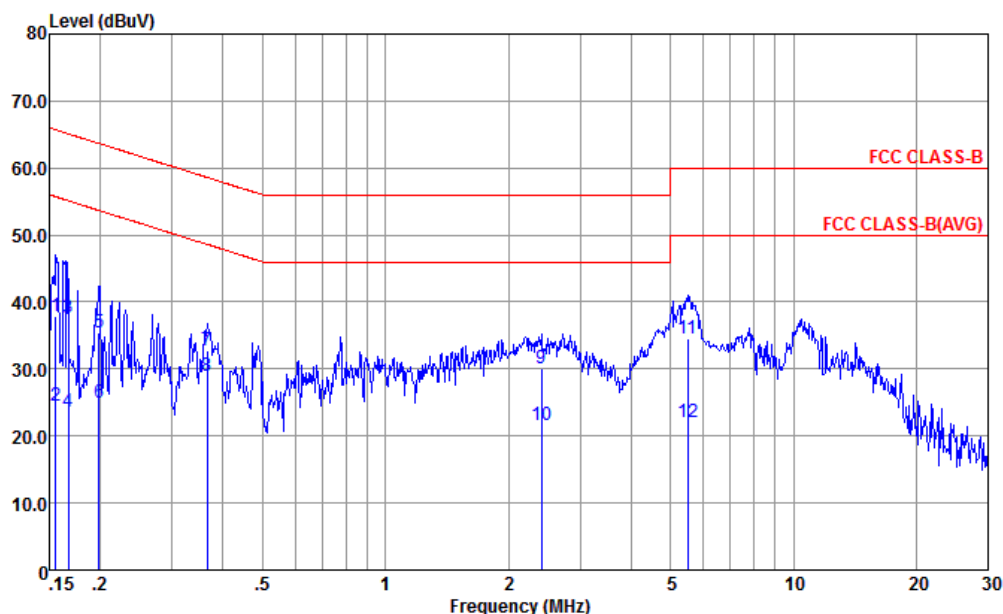


Site : CO01-KS
Condition : FCC CLASS-B LISN-L-20151024 LINE
Project : (FC) 611504-06
mode : Mode 5

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.15	46.93	-18.98	65.91	36.30	0.52	10.11	QP
2	0.15	33.53	-22.38	55.91	22.90	0.52	10.11	Average
3	0.18	45.07	-19.57	64.64	34.60	0.35	10.12	QP
4	0.18	23.67	-30.97	54.64	13.20	0.35	10.12	Average
5	0.20	38.97	-24.79	63.76	28.60	0.24	10.13	QP
6	0.20	24.67	-29.09	53.76	14.30	0.24	10.13	Average
7	0.47	35.99	-20.55	56.54	25.60	0.23	10.16	QP
8 *	0.47	28.89	-17.65	46.54	18.50	0.23	10.16	Average
9	2.66	31.63	-24.37	56.00	21.30	0.18	10.15	QP
10	2.66	21.23	-24.77	46.00	10.90	0.18	10.15	Average
11	5.56	34.59	-25.41	60.00	24.20	0.20	10.19	QP
12	5.56	21.99	-28.01	50.00	11.60	0.20	10.19	Average



Test Mode :	Mode 5	Temperature :	22~24℃
Test Engineer :	Amos Zhang	Relative Humidity :	43~47%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	LTE Band 4 Idle + Bluetooth Idle + WLAN (2.4G) Idle + USB Cable 1 (Data Link with Notebook) + Earphone + Battery 1 + Glonass Rx		



Site : CO01-KS
Condition : FCC CLASS-B LISN-N-20151024 NEUTRAL
Project : (FC) 611504-06
mode : Mode 5

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.16	37.91	-27.78	65.69	27.50	0.30	10.11	QP
2	0.16	24.61	-31.08	55.69	14.20	0.30	10.11	Average
3	0.17	37.72	-27.38	65.10	27.30	0.30	10.12	QP
4	0.17	23.62	-31.48	55.10	13.20	0.30	10.12	Average
5	0.20	35.34	-28.33	63.67	24.90	0.31	10.13	QP
6	0.20	24.94	-28.73	53.67	14.50	0.31	10.13	Average
7	0.37	32.78	-25.83	58.61	22.30	0.32	10.16	QP
8 *	0.37	29.08	-19.53	48.61	18.60	0.32	10.16	Average
9	2.41	30.12	-25.88	56.00	19.59	0.38	10.15	QP
10	2.41	21.72	-24.28	46.00	11.19	0.38	10.15	Average
11	5.51	34.63	-25.37	60.00	24.10	0.34	10.19	QP
12	5.51	22.13	-27.87	50.00	11.60	0.34	10.19	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

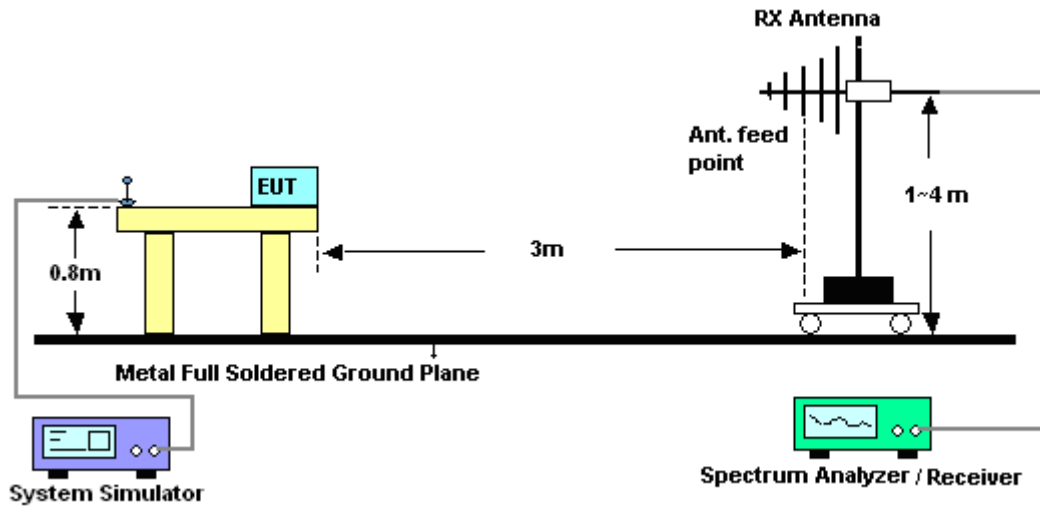
The measuring equipment is listed in the section 4 of this test report.

3.2.3. Test Procedures

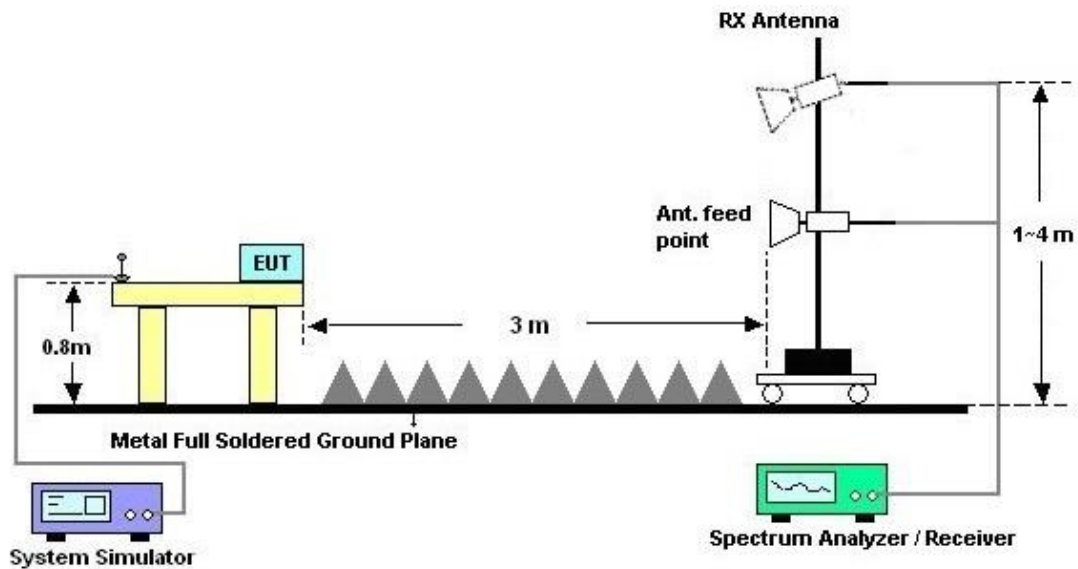
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna 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



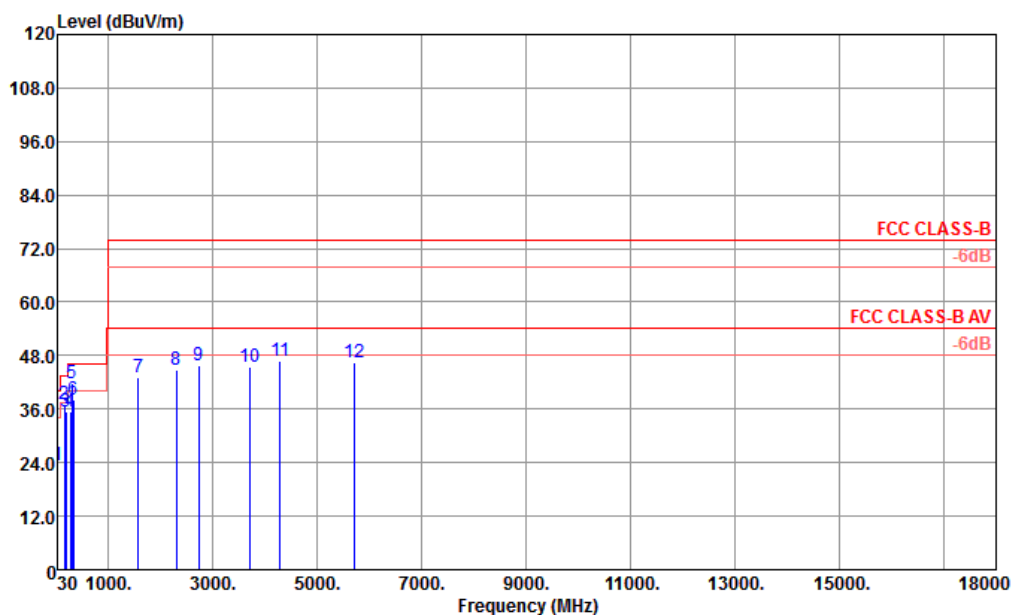
For radiated emissions above 1GHz





3.2.5. Test Result of Radiated Emission

Test Mode :	Mode 5	Temperature :	22~23°C
Test Engineer :	Jun Liu	Relative Humidity :	43~45%
Test Distance :	3m	Polarization :	Horizontal
Function Type :	LTE Band 4 Idle + Bluetooth Idle + WLAN (2.4G) Idle + USB Cable 1 (Data Link with Notebook) + Earphone + Battery 1 + Glonass Rx		

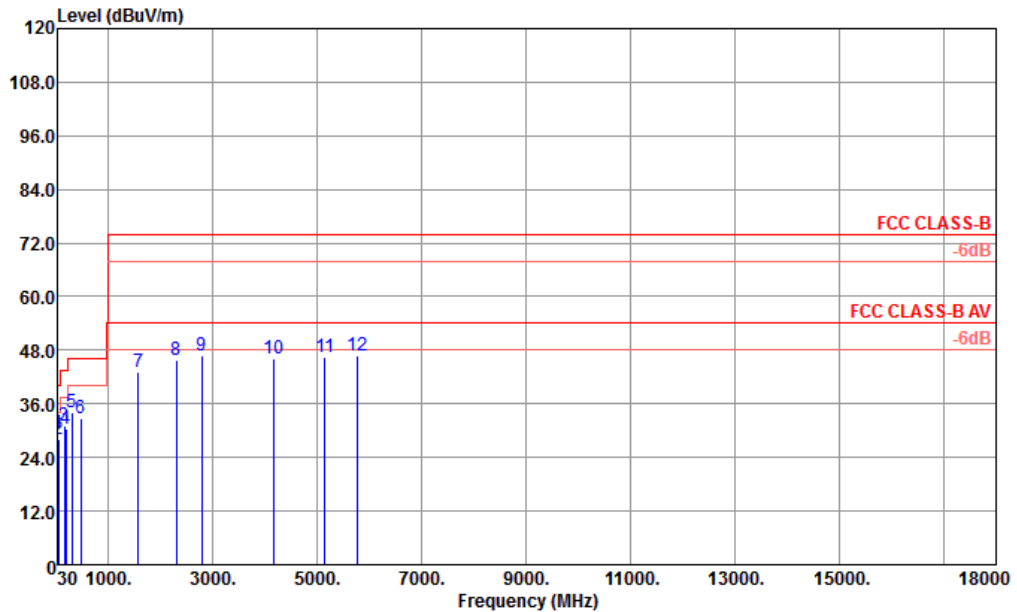


Site : 03CH02-KS
 Condition : FCC CLASS-B 3m 966-02 LF ANT HORIZONTAL
 Project : (FC) 611504-06
 Mode : 5
 IMEI : #5 002000000000000

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	Pol/Phas
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor	cm	deg	
			dB	dBuV/m	dBuV	dB/m	dB	dB			
1	33.78	23.39	-16.61	40.00	29.41	24.80	0.12	30.94	---	---	Peak HORIZONTAL
2	165.81	37.15	-6.35	43.50	50.34	16.86	0.35	30.40	---	---	Peak HORIZONTAL
3	195.78	35.52	-7.98	43.50	50.03	15.48	0.41	30.40	---	---	Peak HORIZONTAL
4	285.42	35.29	-10.71	46.00	47.54	17.69	0.56	30.50	---	---	Peak HORIZONTAL
5	314.00	41.70	-4.30	46.00	53.10	18.50	0.63	30.53	100	0	Peak HORIZONTAL
6	344.10	38.06	-7.94	46.00	47.94	20.00	0.71	30.59	---	---	Peak HORIZONTAL
7	1584.00	43.21	-30.79	74.00	46.48	28.91	4.05	36.23	---	---	Peak HORIZONTAL
8	2306.00	44.90	-29.10	74.00	41.68	31.31	5.67	33.76	---	---	Peak HORIZONTAL
9	2744.00	45.91	-28.09	74.00	40.04	31.99	2.91	29.03	---	---	Peak HORIZONTAL
10	3720.00	45.48	-28.52	74.00	36.19	34.37	6.34	31.42	---	---	Peak HORIZONTAL
11	4293.00	46.65	-27.35	74.00	37.35	35.17	5.76	31.63	---	---	Peak HORIZONTAL
12	5712.00	46.58	-27.42	74.00	40.60	35.31	7.23	36.56	---	---	Peak HORIZONTAL



Test Mode :	Mode 5	Temperature :	22~23°C
Test Engineer :	Jun Liu	Relative Humidity :	43~45%
Test Distance :	3m	Polarization :	Vertical
Function Type :	LTE Band 4 Idle + Bluetooth Idle + WLAN (2.4G) Idle + USB Cable 1 (Data Link with Notebook) + Earphone + Battery 1 + Glonass Rx		



Site : 03CH02-KS
Condition : FCC CLASS-B 3m 966-02 LF ANT VERTICAL
Project : (FC) 611504-06
Mode : 5
IMEI : #5 002000000000000

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	A/Pos	T/Pos	Remark	Pol/Phas
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	42.96	29.48	-10.52	40.00	39.89	20.30	0.13	30.84	100	102	Peak VERTICAL
2	56.46	28.18	-11.82	40.00	44.79	13.90	0.16	30.67	---	---	Peak VERTICAL
3	165.54	31.01	-12.49	43.50	44.20	16.86	0.35	30.40	---	---	Peak VERTICAL
4	194.16	30.58	-12.92	43.50	45.00	15.58	0.40	30.40	---	---	Peak VERTICAL
5	314.00	34.10	-11.90	46.00	45.50	18.50	0.63	30.53	---	---	Peak VERTICAL
6	479.90	32.76	-13.24	46.00	38.88	23.40	0.92	30.44	---	---	Peak VERTICAL
7	1584.00	42.97	-31.03	74.00	46.24	28.91	4.05	36.23	---	---	Peak VERTICAL
8	2302.00	45.83	-28.17	74.00	42.61	31.31	5.67	33.76	---	---	Peak VERTICAL
9	2798.00	46.95	-27.05	74.00	39.76	32.10	2.71	27.62	---	---	Peak VERTICAL
10	4176.00	46.15	-27.85	74.00	36.36	35.10	6.60	31.91	---	---	Peak VERTICAL
11	5151.00	46.33	-27.67	74.00	39.98	34.93	6.57	35.15	---	---	Peak VERTICAL
12	5766.00	46.86	-27.14	74.00	40.74	35.24	6.91	36.03	---	---	Peak VERTICAL



4. List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EMI Test Receiver	R&S	ESR7	101403	9kHz~7GHz; Max 30dBm	Sep. 10, 2015	Jun. 21, 2016	Sep. 09, 2016	Radiation (03CH02-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150208	10Hz~44GHz; Max 30dB	Apr. 22, 2016	Jun. 21, 2016	Apr. 21, 2017	Radiation (03CH02-KS)
Bilog Antenna	TeseQ	CBL6112D	37879	30MHz~2GHz	Sep. 12, 2015	Jun. 21, 2016	Sep. 11, 2016	Radiation (03CH02-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75957	1GHz~18GHz	Nov. 07, 2015	Jun. 21, 2016	Nov. 06, 2016	Radiation (03CH02-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA170249	15GHz~40GHz	Mar. 03, 2016	Jun. 21, 2016	Mar. 02, 2017	Radiation (03CH02-KS)
Amplifier	com-power	PA-103A	161069	1kHz~1000MHz / 32 dB	Apr. 22, 2016	Jun. 21, 2016	Apr. 21, 2017	Radiation (03CH02-KS)
Amplifier	Agilent	8449B	3008A02384	1~26.5GHz Gain 30dB	Oct. 24, 2015	Jun. 21, 2016	Oct. 23, 2016	Radiation (03CH02-KS)
AC Power Source	Chroma	61601	61601000247 3	N/A	NCR	Jun. 21, 2016	NCR	Radiation (03CH02-KS)
Turn Table	MF	MF7802	N/A	0~360 degree	NCR	Jun. 21, 2016	NCR	Radiation (03CH02-KS)
Antenna Mast	MF	MF7802	N/A	1 m~4 m	NCR	Jun. 21, 2016	NCR	Radiation (03CH02-KS)
EMI Test Receiver	R&S	ESR7	101403	9kHz~7GHz; Max 30dBm	Sep. 10, 2015	Jun. 21, 2016	Sep. 09, 2016	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060103	9kHz~30MHz	Oct. 24, 2015	Jun. 21, 2016	Oct. 23, 2016	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060105	9kHz~30MHz	Oct. 24, 2015	Jun. 21, 2016	Oct. 23, 2016	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP0000008 11	AC 0V~300V, 45Hz~1000Hz	Oct. 24, 2015	Jun. 21, 2016	Oct. 23, 2016	Conduction (CO01-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% ($U = 2Uc(y)$)	2.3 dB
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.1dB
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Uncertainty of Radiated Emission Measurement (1GHz ~ 18GHz)

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