

FCC Test Report

APPLICANT : BlackBerry Ltd.
EQUIPMENT : GSM Quad-band/HSPA-UMTS
Penta-band/LTE Deca-band mobile phone
BRAND NAME : BlackBerry
MODEL NAME : BBA100-1
MARKETING NAME : DTEK60
FCC ID : L6ABBA1001
STANDARD : FCC 47 CFR FCC Part 15 Subpart B
CLASSIFICATION : Certification

The product was received on Jul. 20, 2016 and testing was completed on Aug. 17, 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.



Prepared by: James Huang / Manager



Approved by: Jones Tsai / Manager



SPORTON INTERNATIONAL (KUNSHAN) INC.
No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P. R. China



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FC672002	Rev. 01	Initial issue of report	Aug. 23, 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 3.54 dB at 15.307 MHz
3.2	15.109	ICES003 Section 6.2	Radiated Emission	< 15.109 limits < ICES003 6.2 limits	PASS	Under limit 3.65 dB at 30.000 MHz



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/HSPA-UMTS Penta-band/LTE Deca-band mobile phone
Brand Name	BlackBerry
Model Name	BBA100-1
Marketing Name	DTEK60
FCC ID	L6ABBA1001
EUT supports Radios application	GSM/GPRS/EGPRS/WCDMA/HSPA/ HSPA+(16QAM uplink is not supported)/DC-HSDPA/LTE/NFC/ WLAN 2.4GHz 802.11b/g/n HT20/ 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: 004402243144106/004402243144346 Radiation: 004402243143512/004402243144346
HW Version	PIO
SW Version	AAF884
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 17 : 706.5 MHz ~ 713.5 MHz 802.11b/g/n: 2412 MHz ~ 2462 MHz 802.11a/n/ac: 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 : 2622.5MHz ~ 2687.5 MHz LTE Band 12 : 729.7 MHz ~ 745.3 MHz LTE Band 17 : 736.5 MHz ~ 743.5 MHz 802.11b/g/n: 2412 MHz ~ 2462 MHz 802.11a/n/ac: 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 : LDS Antenna WLAN : LDS Antenna Bluetooth : LDS Antenna GPS/Glonass : LDS Antenna NFC : Loop 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 (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) : $\pi/4$ -DQPSK Bluetooth (3Mbps) : 8-DPSK GPS/Glonass : BPSK NFC: ASK
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1.5. Specification of Accessory

Specification of Accessory				
AC Adapter 1	Brand Name	N/A	Model Name	QC10US
	Power Rating	I/P: 100-240Vac, 500mA, O/P: 5Vdc, 2000mA/9Vdc, 1670mA		
	Manufacturer	BYD	S/N	CBA0060AGHC1
AC Adapter 2	Brand Name	N/A	Model Name	QC10EU
	Power Rating	I/P: 100-240Vac, 500mA, O/P: 5Vdc, 2000mA/9Vdc, 1670mA		
	Manufacturer	BYD	S/N	CBA0060AAHC1
AC Adapter 3	Brand Name	N/A	Model Name	QC10UK
	Power Rating	I/P: 100-240Vac, 500mA, O/P: 5Vdc, 2000mA/9Vdc, 1670mA		
	Manufacturer	BYD	S/N	CBA0060ABHC1
AC Adapter 4	Brand Name	N/A	Model Name	QC10AU
	Power Rating	I/P: 100-240Vac, 500mA, O/P: 5Vdc, 2000mA/9Vdc, 1670mA		
	Manufacturer	BYD	S/N	CBA0060ACHC1
Battery 1	Brand Name	N/A	Model Name	TLp030F2
	Power Rating	3.84Vdc, 3000mAh		
	Manufacturer	SCUD	S/N	CAC3000027C2
Battery 2	Brand Name	N/A	Model Name	TLp030F1
	Power Rating	3.84Vdc, 3000mAh		
	Manufacturer	BYD	S/N	CAC3000026C1
USB Cable	Brand Name	N/A	Model Name	CDA0000078CF
	Signal Line Type	1.00m shielded without core		
Earphone	Brand Name	N/A	Model Name	CCB0045A16C3
	Signal Line Type	1.24m non-shielded without core		

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)	☒	☒	☒
2.	Data application transferred mode (EUT with notebook)	☒	☒	☒

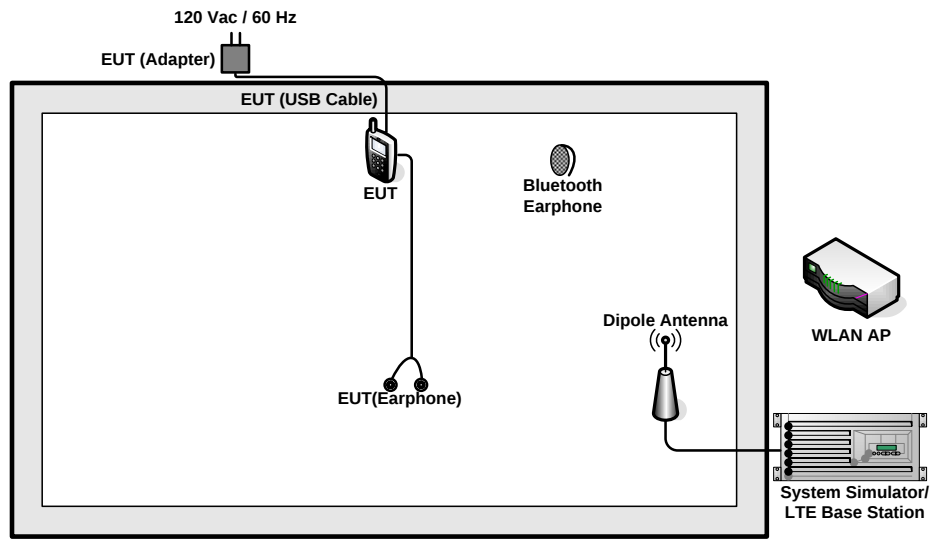
Abbreviations:

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

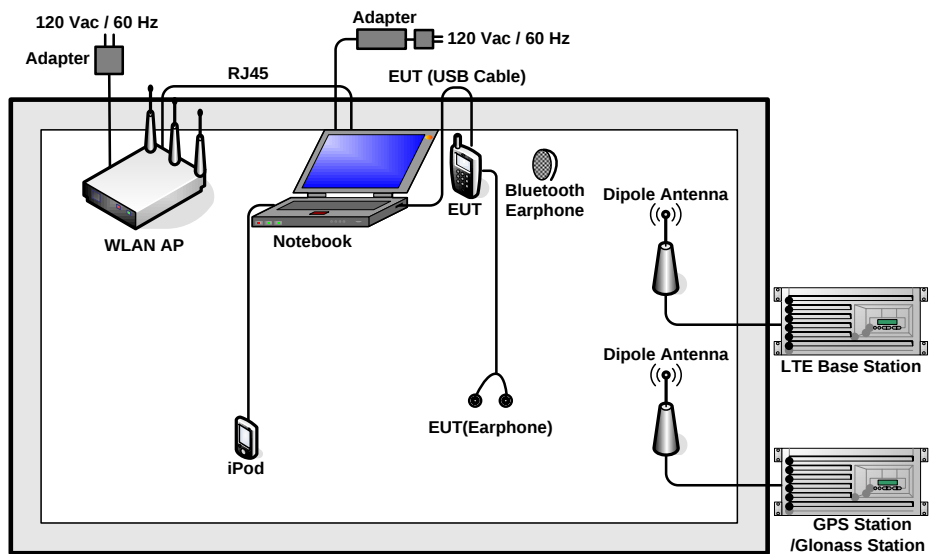
Test Items	EUT Configure Mode	Function Type
AC Conducted Emission	1/2	Mode 1: GSM850 Idle + Bluetooth Idle + WLAN (2.4G) Idle + USB Cable (Charging from Adapter) + Earphone + Battery 1 + Camera (Rear) <Fig.1> Mode 2: GSM1900 Idle + Bluetooth Idle + WLAN (5G) Idle + USB Cable (Charging from Adapter) + Earphone + Battery 1 + Camera (Front) <Fig.1> Mode 3: WCDMA Band V Idle + Bluetooth Idle + WLAN (2.4G) Idle + USB Cable (Charging from Adapter) + Earphone + Battery 1 + MPEG4 <Fig.1> Mode 4: LTE Band 4 Idle + Bluetooth Idle + WLAN (5G) Idle + USB Cable (Charging from Adapter) + Earphone + Battery 1 + NFC On <Fig.1> Mode 5: LTE Band 2 Idle + Bluetooth Idle + WLAN (2.4G) Idle + USB Cable (EUT eMMC Data Link to Notebook) + Earphone + Battery 1 + Glonass Rx<Fig.2> Mode 6: LTE Band 7 Idle + Bluetooth Idle + WLAN (5G) Idle + USB Cable (Notebook Data Link to EUT eMMC) + Earphone + Battery 1 + GPS Rx <Fig.2> Mode 7: LTE Band 12 Idle + Bluetooth Idle + WLAN (2.4G) Idle + USB Cable (EUT SD card Data Link to Notebook) + Earphone + Battery 1 + GPS Rx<Fig.2> Mode 8: LTE Band 17 Idle + Bluetooth Idle + WLAN (5G) Idle + USB Cable (Notebook Data Link to EUT SD card) + Earphone + Battery 1 + GPS Rx<Fig.2> Mode 9: LTE Band 4 Idle + Bluetooth Idle + WLAN (5G) Idle + USB Cable (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 (Charging from Adapter) + Earphone + Battery 1 + Camera (Rear) <Fig.1> Mode 2: GSM1900 Idle + Bluetooth Idle + WLAN (5G) Idle + USB Cable (Charging from Adapter) + Earphone + Battery 1 + Camera (Front) <Fig.1> Mode 3: WCDMA Band V Idle + Bluetooth Idle + WLAN (2.4G) Idle + USB Cable (Charging from Adapter) + Earphone + Battery 1 + MPEG4 <Fig.1> Mode 4: LTE Band 4 Idle + Bluetooth Idle + WLAN (5G) Idle + USB Cable (Charging from Adapter) + Earphone + Battery 1 + NFC On <Fig.1> Mode 5: LTE Band 2 Idle + Bluetooth Idle + WLAN (2.4G) Idle + USB Cable (EUT eMMC Data Link to Notebook) + Earphone + Battery 1 + Glonass Rx <Fig.2> Mode 6: LTE Band 7 Idle + Bluetooth Idle + WLAN (5G) Idle + USB Cable (Notebook Data Link to EUT eMMC) + Earphone + Battery 1 + GPS Rx <Fig.2> Mode 7: LTE Band 12 Idle + Bluetooth Idle + WLAN (2.4G) Idle + USB Cable (EUT SD card Data Link to Notebook) + Earphone + Battery 1 + GPS Rx<Fig.2> Mode 8: LTE Band 17 Idle + Bluetooth Idle + WLAN (5G) Idle + USB Cable (Notebook Data Link to EUT SD card) + Earphone + Battery 1 + GPS Rx<Fig.2> Mode 9: WCDMA Band V Idle + Bluetooth Idle + WLAN (2.4G) Idle + USB Cable (Charging from Adapter) + Earphone + Battery 2 + MPEG4<Fig.1>
Radiated Emissions ≥ 1GHz	1/2	Mode 1: WCDMA Band V Idle + Bluetooth Idle + WLAN (2.4G) Idle + USB Cable (Charging from Adapter) + Earphone + Battery 2 + MPEG4 <Fig.1> Mode 2: LTE Band 7 Idle + Bluetooth Idle + WLAN (5G) Idle + USB Cable (Notebook Data Link to EUT eMMC) + Earphone + Battery 1 + GPS Rx<Fig.2>
Remark: 1. The worst case of AC is mode 4; and the USB Link mode of AC is mode 7, only the test data of this mode was reported. 2. The worst case of RE < 1G is mode 9; and the USB Link mode of RE is mode 6, only the test data of this mode was reported.		

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.	Bluetooth Earphone	Lenovo	LBH301	2010DP1340	N/A	N/A
6.	WLAN AP	LINKSYS	WRT600N	Q87-WRT600NV11	N/A	Unshielded, 1.8 m
7.	WLAN AP	D-Link	DIR-855	KA2DIR855A2	N/A	Unshielded, 1.8 m
8.	Bluetooth Earphone	Nokia	BH-106	QTLBH-106	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.

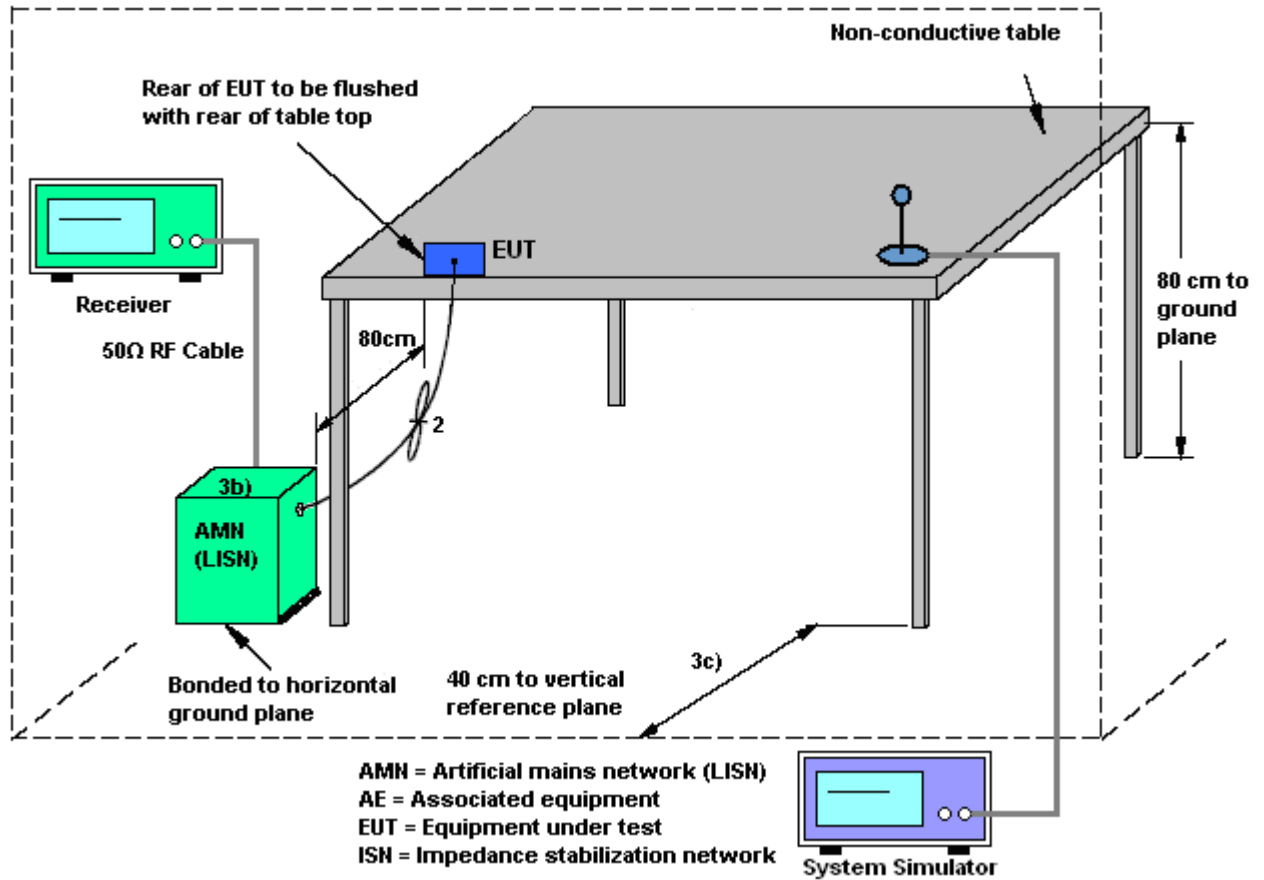
3.1.2 Measuring Instruments

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

3.1.3 Test Procedure

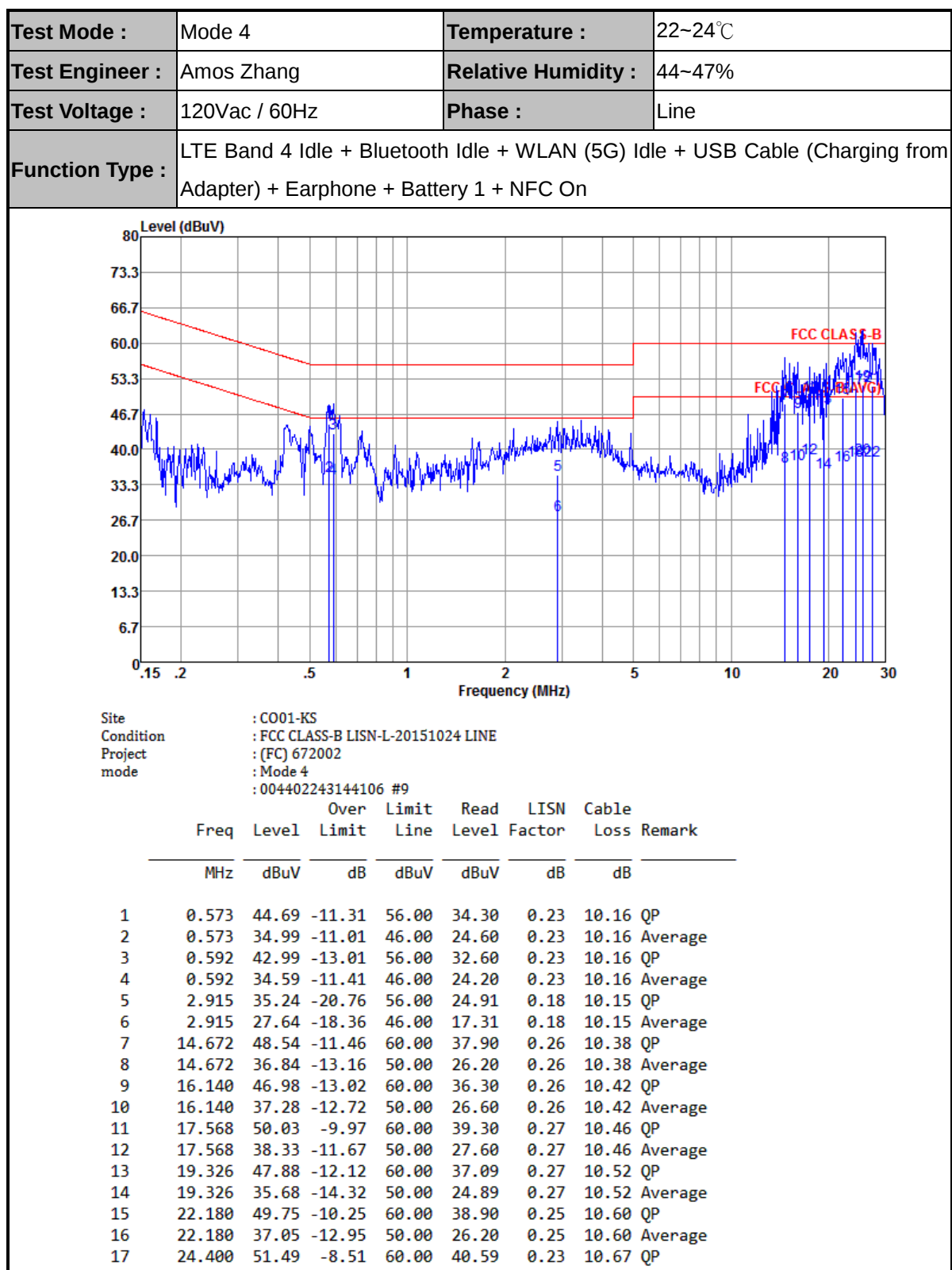
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
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



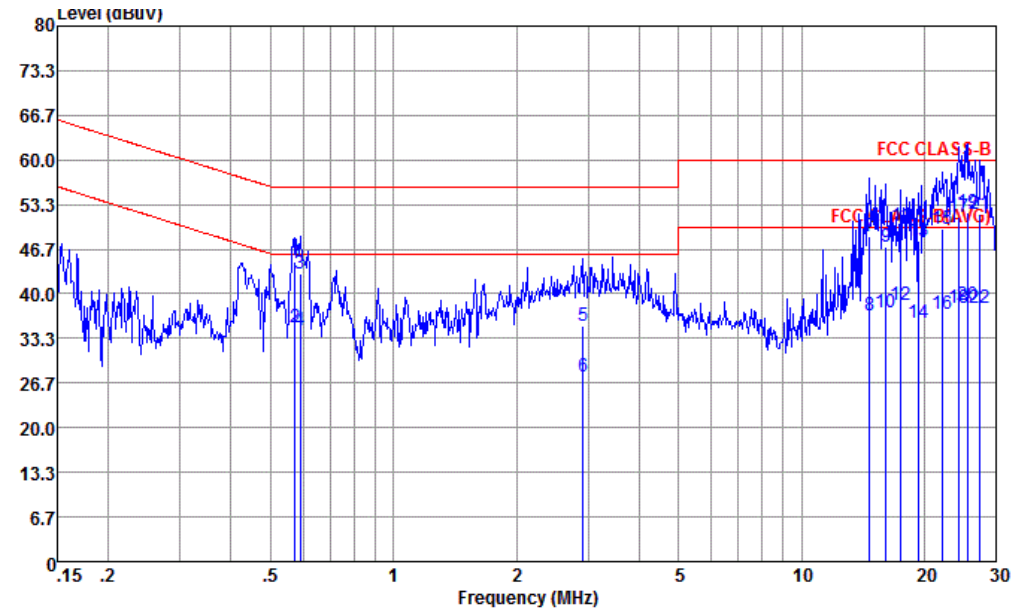


3.1.5 Test Result of AC Conducted Emission





Test Mode :	Mode 4	Temperature :	22~24℃
Test Engineer :	Amos Zhang	Relative Humidity :	44~47%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	LTE Band 4 Idle + Bluetooth Idle + WLAN (5G) Idle + USB Cable (Charging from Adapter) + Earphone + Battery 1 + NFC On		

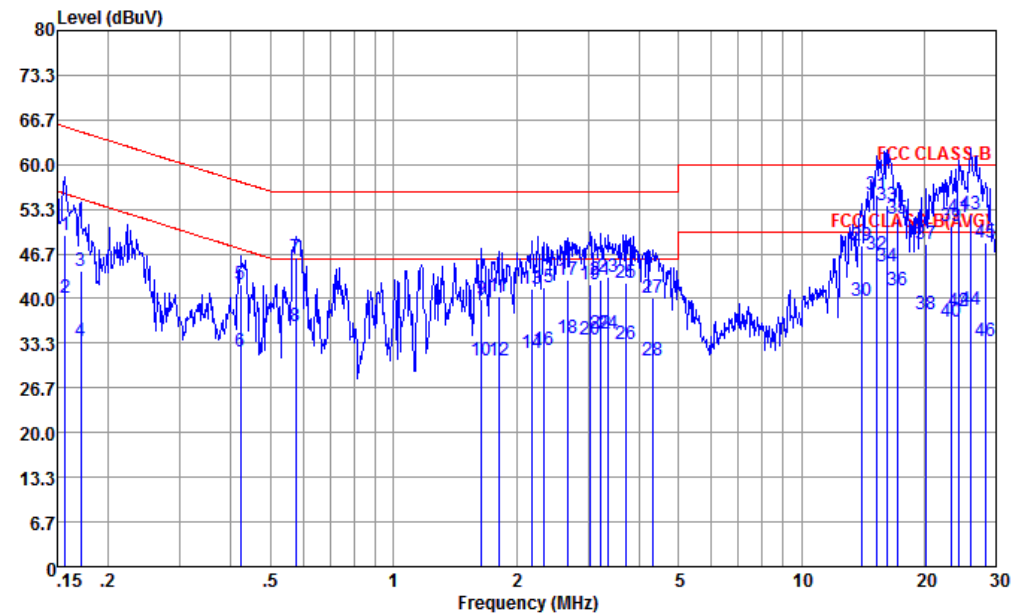


Site : CO01-KS
Condition : FCC CLASS-B LISN-L-20151024 LINE
Project : (FC) 672002
mode : Mode 4
: 004402243144106 #9

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
18	24.400	37.99	-12.01	50.00	27.09	0.23	10.67	Average
19 *	25.456	52.22	-7.78	60.00	41.30	0.22	10.70	QP
20	25.456	38.22	-11.78	50.00	27.30	0.22	10.70	Average
21	27.416	51.90	-8.10	60.00	40.91	0.22	10.77	QP
22	27.416	37.90	-12.10	50.00	26.91	0.22	10.77	Average



Test Mode :	Mode 4	Temperature :	22~24°C
Test Engineer :	Amos Zhang	Relative Humidity :	44~47%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	LTE Band 4 Idle + Bluetooth Idle + WLAN (5G) Idle + USB Cable (Charging from Adapter) + Earphone + Battery 1 + NFC On		

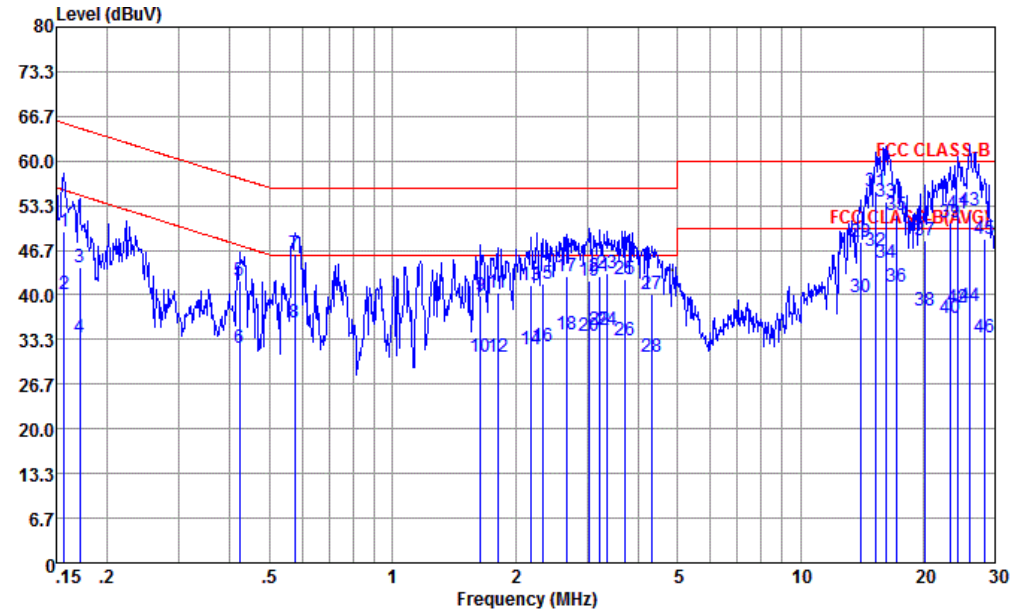


Site : CO01-KS
Condition : FCC CLASS-B LISN-N-20151024 NEUTRAL
Project : (FC) 672002
mode : Mode 4
: 004402243144106 #9

	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.156	49.51	-16.14	65.65	39.10	0.30	10.11	QP
2	0.156	40.01	-15.64	55.65	29.60	0.30	10.11	Average
3	0.171	44.02	-20.88	64.90	33.60	0.30	10.12	QP
4	0.171	33.62	-21.28	54.90	23.20	0.30	10.12	Average
5	0.421	42.09	-15.33	57.42	31.60	0.32	10.17	QP
6	0.421	32.09	-15.33	47.42	21.60	0.32	10.17	Average
7	0.576	46.09	-9.91	56.00	35.60	0.33	10.16	QP
8	0.576	35.79	-10.21	46.00	25.30	0.33	10.16	Average
9	1.645	39.82	-16.18	56.00	29.30	0.38	10.14	QP
10	1.645	30.82	-15.18	46.00	20.30	0.38	10.14	Average
11	1.810	40.42	-15.58	56.00	29.90	0.38	10.14	QP
12	1.810	30.82	-15.18	46.00	20.30	0.38	10.14	Average
13	2.178	41.42	-14.58	56.00	30.90	0.38	10.14	QP
14	2.178	31.82	-14.18	46.00	21.30	0.38	10.14	Average
15	2.334	41.62	-14.38	56.00	31.09	0.38	10.15	QP
16	2.334	32.42	-13.58	46.00	21.89	0.38	10.15	Average
17	2.664	42.82	-13.18	56.00	32.30	0.37	10.15	QP



Test Mode :	Mode 4	Temperature :	22~24℃
Test Engineer :	Amos Zhang	Relative Humidity :	44~47%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	LTE Band 4 Idle + Bluetooth Idle + WLAN (5G) Idle + USB Cable (Charging from Adapter) + Earphone + Battery 1 + NFC On		

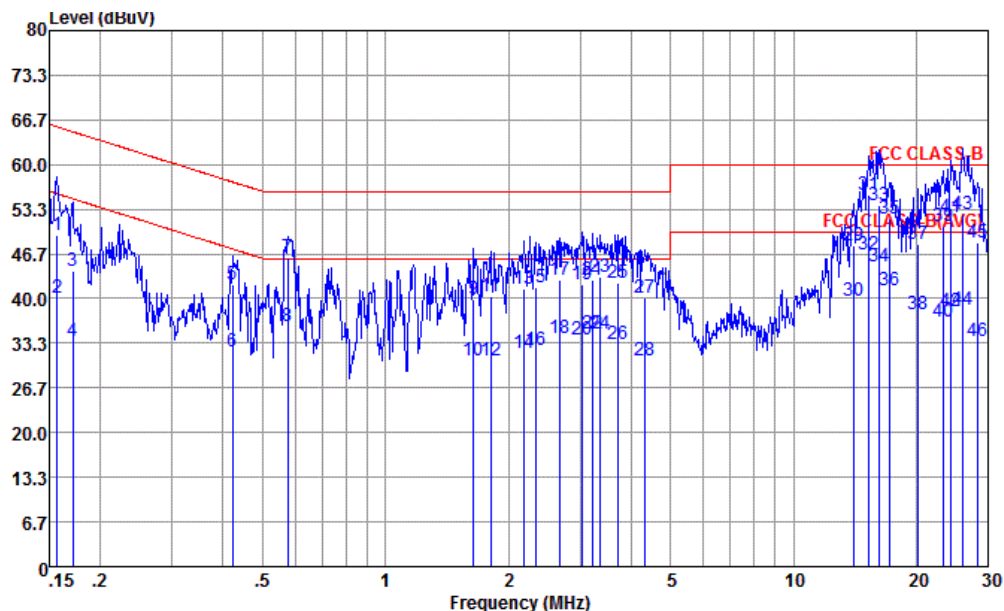


Site : CO01-KS
Condition : FCC CLASS-B LISN-N-20151024 NEUTRAL
Project : (FC) 672002
mode : Mode 4
: 004402243144106 #9

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
18	2.664	34.12	-11.88	46.00	23.60	0.37	10.15	Average
19	3.041	42.13	-13.87	56.00	31.61	0.37	10.15	QP
20	3.041	33.83	-12.17	46.00	23.31	0.37	10.15	Average
21	3.224	42.83	-13.17	56.00	32.30	0.37	10.16	QP
22	3.224	34.83	-11.17	46.00	24.30	0.37	10.16	Average
23	3.364	43.13	-12.87	56.00	32.60	0.37	10.16	QP
24	3.364	34.83	-11.17	46.00	24.30	0.37	10.16	Average
25	3.720	42.43	-13.57	56.00	31.90	0.37	10.16	QP
26	3.720	33.13	-12.87	46.00	22.60	0.37	10.16	Average
27	4.338	40.13	-15.87	56.00	29.60	0.36	10.17	QP
28	4.338	30.73	-15.27	46.00	20.20	0.36	10.17	Average
29	14.063	47.94	-12.06	60.00	37.31	0.27	10.36	QP
30	14.063	39.74	-10.26	50.00	29.11	0.27	10.36	Average
31	15.307	55.46	-4.54	60.00	44.79	0.27	10.40	QP
32 *	15.307	46.46	-3.54	50.00	35.79	0.27	10.40	Average
33	16.226	53.99	-6.01	60.00	43.31	0.26	10.42	QP
34	16.226	44.79	-5.21	50.00	34.11	0.26	10.42	Average
35	17.199	51.81	-8.19	60.00	41.10	0.26	10.45	QP
36	17.199	41.31	-8.69	50.00	30.60	0.26	10.45	Average
37	20.270	48.09	-11.91	60.00	37.30	0.25	10.54	QP



Test Mode :	Mode 4	Temperature :	22~24℃
Test Engineer :	Amos Zhang	Relative Humidity :	44~47%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	LTE Band 4 Idle + Bluetooth Idle + WLAN (5G) Idle + USB Cable (Charging from Adapter) + Earphone + Battery 1 + NFC On		

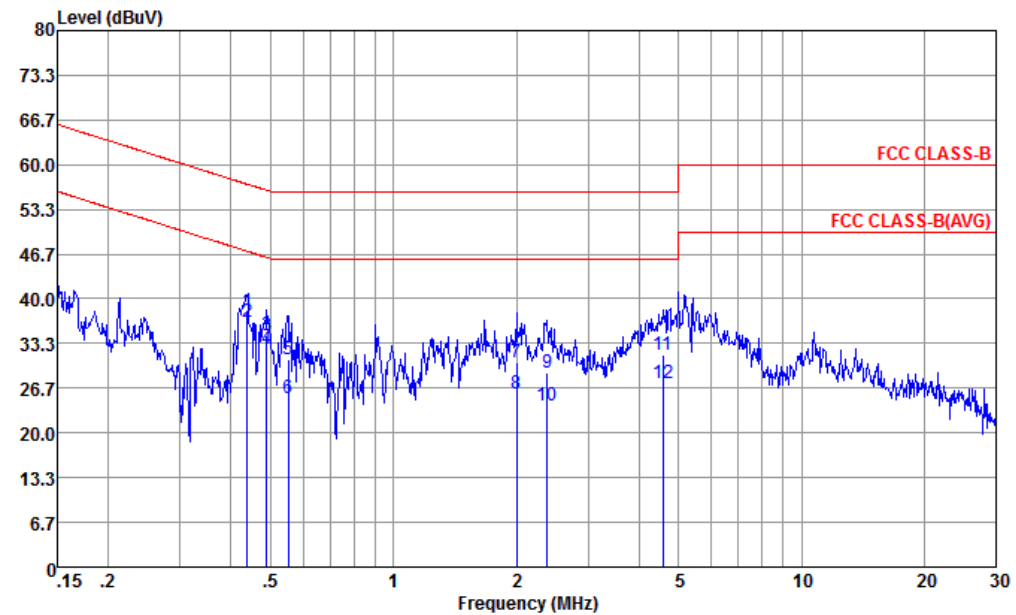


Site : CO01-KS
Condition : FCC CLASS-B LISN-N-20151024 NEUTRAL
Project : (FC) 672002
mode : Mode 4
: 004402243144106 #9

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV		dBuV	dBuV	dB	dB	
38	20.270	37.69	-12.31	50.00	26.90	0.25	10.54	Average
39	23.263	50.78	-9.22	60.00	39.91	0.24	10.63	QP
40	23.263	36.48	-13.52	50.00	25.61	0.24	10.63	Average
41	24.400	52.21	-7.79	60.00	41.30	0.24	10.67	QP
42	24.400	38.21	-11.79	50.00	27.30	0.24	10.67	Average
43	26.001	52.56	-7.44	60.00	41.60	0.24	10.72	QP
44	26.001	38.26	-11.74	50.00	27.30	0.24	10.72	Average
45	28.302	48.25	-11.75	60.00	37.20	0.24	10.81	QP
46	28.302	33.65	-16.35	50.00	22.60	0.24	10.81	Average



Test Mode :	Mode 7	Temperature :	22~24°C
Test Engineer :	Amos Zhang	Relative Humidity :	44~47%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	LTE Band 12 Idle + Bluetooth Idle + WLAN (2.4G) Idle + USB Cable (EUT SD card Data Link to Notebook) + Earphone + Battery 1 + GPS Rx		

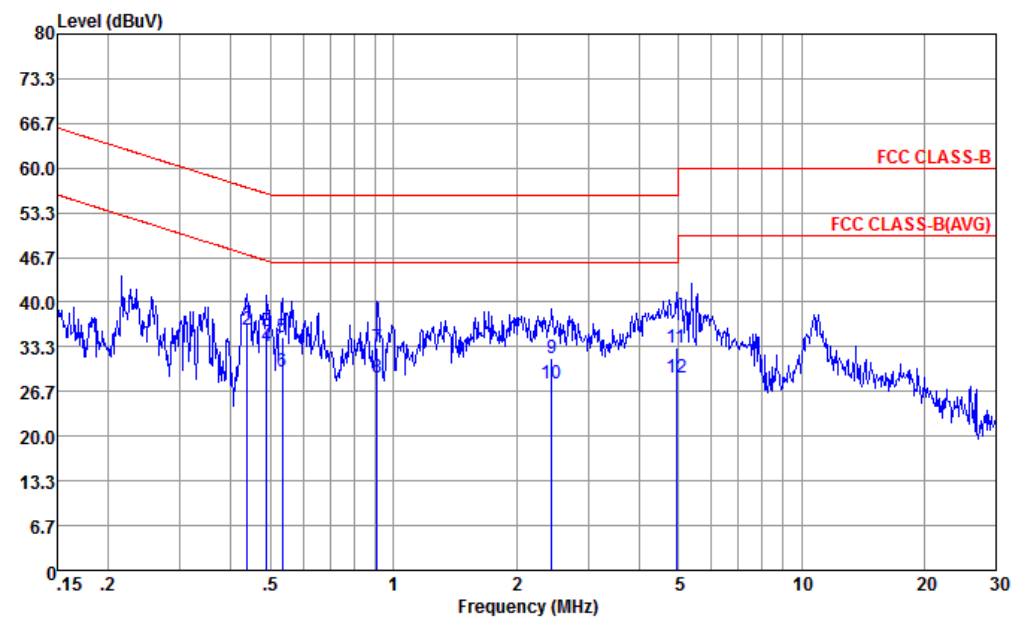


Site : CO01-KS
Condition : FCC CLASS-B LISN-L-20151024 LINE
Project : (FC) 672002
mode : Mode 7
: 004402243144106 #9

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.437	38.00	-19.11	57.11	27.60	0.23	10.17	QP
2 *	0.437	36.60	-10.51	47.11	26.20	0.23	10.17	Average
3	0.489	34.59	-21.60	56.19	24.20	0.23	10.16	QP
4	0.489	32.49	-13.70	46.19	22.10	0.23	10.16	Average
5	0.552	30.99	-25.01	56.00	20.60	0.23	10.16	QP
6	0.552	25.19	-20.81	46.00	14.80	0.23	10.16	Average
7	2.001	30.62	-25.38	56.00	20.30	0.18	10.14	QP
8	2.001	25.92	-20.08	46.00	15.60	0.18	10.14	Average
9	2.384	28.93	-27.07	56.00	18.60	0.18	10.15	QP
10	2.384	24.13	-21.87	46.00	13.80	0.18	10.15	Average
11	4.574	31.66	-24.34	56.00	21.29	0.19	10.18	QP
12	4.574	27.46	-18.54	46.00	17.09	0.19	10.18	Average



Test Mode :	Mode 7	Temperature :	22~24°C
Test Engineer :	Amos Zhang	Relative Humidity :	44~47%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	LTE Band 12 Idle + Bluetooth Idle + WLAN (2.4G) Idle + USB Cable (EUT SD card Data Link to Notebook) + Earphone + Battery 1 + GPS Rx		



Site : CO01-KS
Condition : FCC CLASS-B LISN-N-20151024 NEUTRAL
Project : (FC) 672002
mode : Mode 7
: 004402243144106 #9

	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.437	37.09	-20.02	57.11	26.60	0.32	10.17	QP
2 *	0.437	35.99	-11.12	47.11	25.50	0.32	10.17	Average
3	0.489	35.68	-20.51	56.19	25.20	0.32	10.16	QP
4	0.489	33.38	-12.81	46.19	22.90	0.32	10.16	Average
5	0.535	34.69	-21.31	56.00	24.21	0.32	10.16	QP
6	0.535	29.69	-16.31	46.00	19.21	0.32	10.16	Average
7	0.914	33.10	-22.90	56.00	22.60	0.36	10.14	QP
8	0.914	28.70	-17.30	46.00	18.20	0.36	10.14	Average
9	2.448	31.72	-24.28	56.00	21.19	0.38	10.15	QP
10	2.448	27.82	-18.18	46.00	17.29	0.38	10.15	Average
11	4.926	33.14	-22.86	56.00	22.60	0.36	10.18	QP
12	4.926	28.74	-17.26	46.00	18.20	0.36	10.18	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

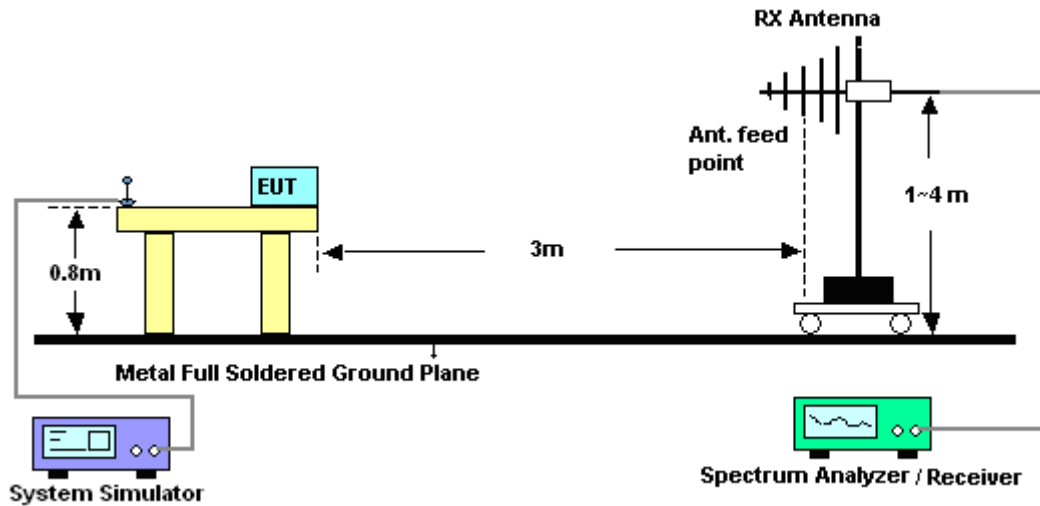
The measuring equipment is listed in the section 4 of this test report.

3.2.3. Test Procedures

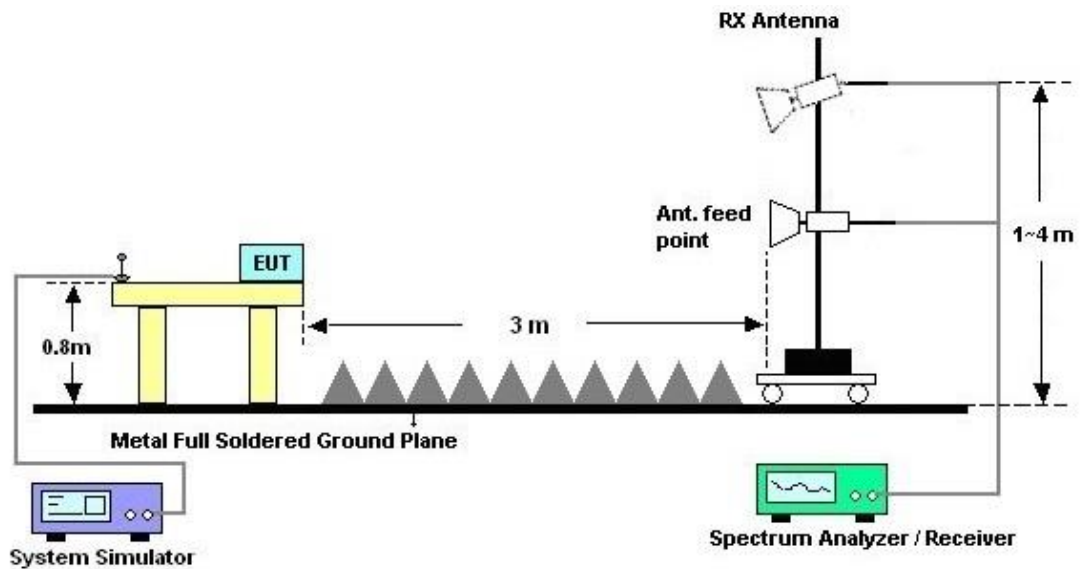
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna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

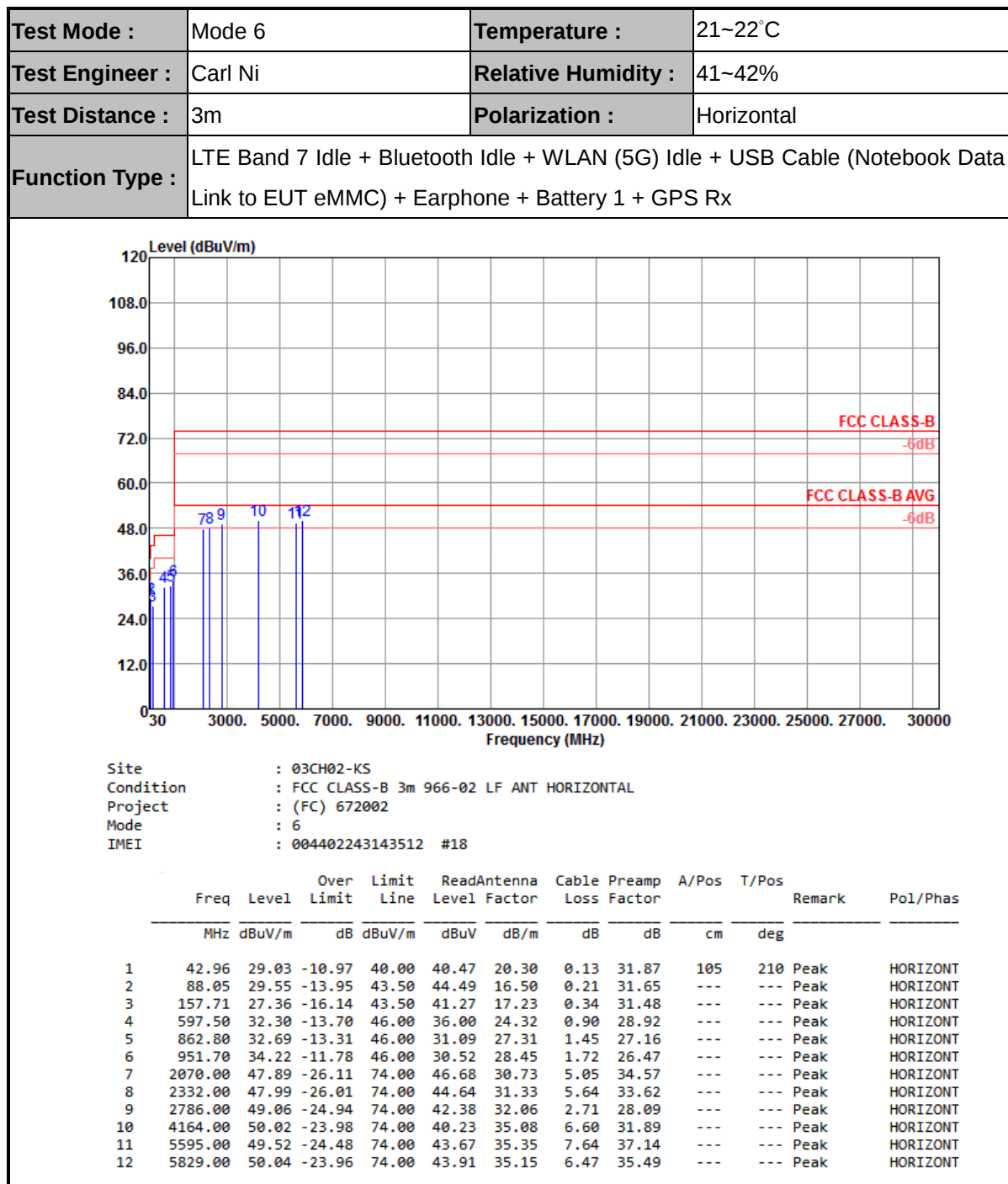


For radiated emissions above 1GHz



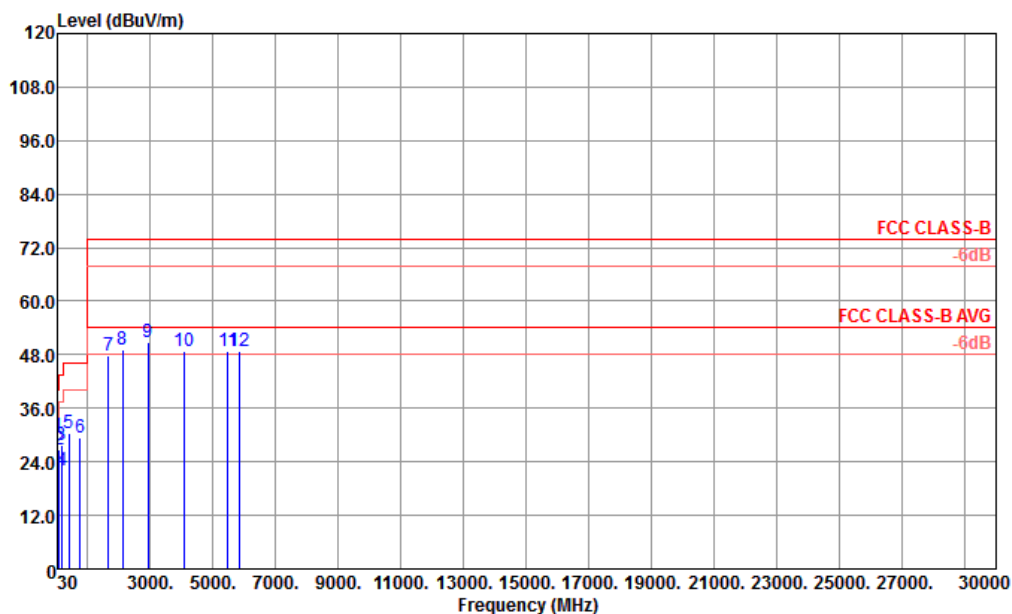


3.2.5. Test Result of Radiated Emission





Test Mode :	Mode 6	Temperature :	21~22°C
Test Engineer :	Carl Ni	Relative Humidity :	41~42%
Test Distance :	3m	Polarization :	Vertical
Function Type :	LTE Band 7 Idle + Bluetooth Idle + WLAN (5G) Idle + USB Cable (Notebook Data Link to EUT eMMC) + Earphone + Battery 1 + GPS Rx		

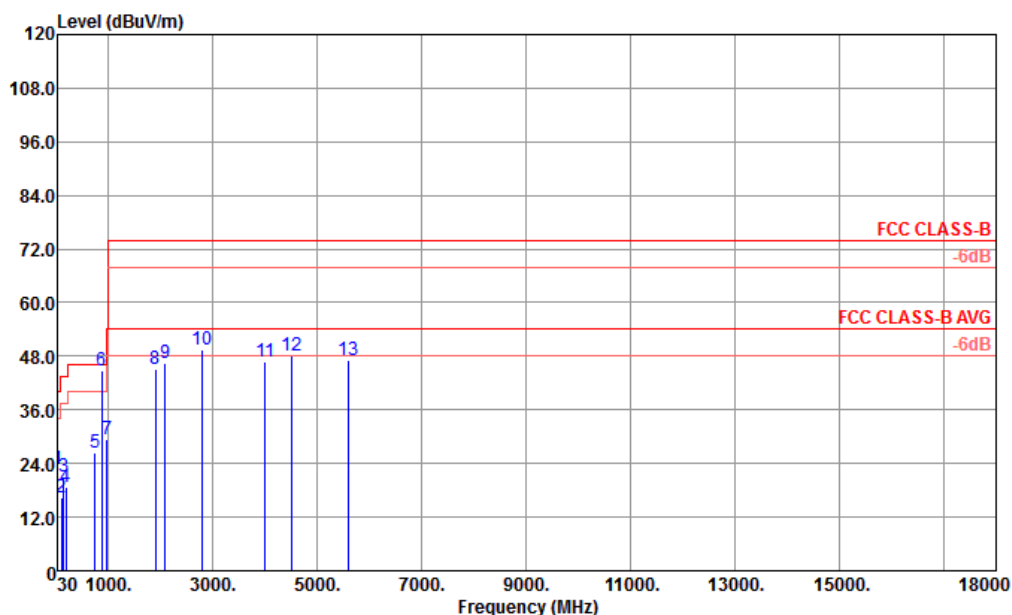


Site : 03CH02-KS
Condition : FCC CLASS-B 3m 966-02 LF ANT VERTICAL
Project : (FC) 672002
Mode : 6
IMEI : 004402243143512 #18

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Cable Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phas	
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	42.96	29.67	-10.33	40.00	41.11	20.30	0.13	31.87	105	111	Peak VERTICAL
2	88.05	26.60	-16.90	43.50	41.54	16.50	0.21	31.65	---	---	Peak VERTICAL
3	153.12	27.58	-15.92	43.50	41.25	17.51	0.33	31.51	---	---	Peak VERTICAL
4	190.38	22.04	-21.46	43.50	37.19	15.76	0.40	31.31	---	---	Peak VERTICAL
5	399.40	30.40	-15.60	46.00	34.74	25.30	0.92	30.56	---	---	Peak VERTICAL
6	757.10	29.26	-16.74	46.00	29.61	26.26	1.38	27.99	---	---	Peak VERTICAL
7	1660.00	47.71	-26.29	74.00	50.66	29.07	4.28	36.30	---	---	Peak VERTICAL
8	2104.00	49.08	-24.92	74.00	47.54	30.85	5.20	34.51	---	---	Peak VERTICAL
9	2924.00	50.82	-23.18	74.00	43.71	32.39	3.00	28.28	---	---	Peak VERTICAL
10	4068.00	48.95	-25.05	74.00	39.57	34.93	6.24	31.79	---	---	Peak VERTICAL
11	5478.00	48.84	-25.16	74.00	43.17	35.24	7.10	36.67	---	---	Peak VERTICAL
12	5856.00	48.64	-25.36	74.00	42.41	35.10	6.35	35.22	---	---	Peak VERTICAL



Test Mode :	Mode 9	Temperature :	21~22°C
Test Engineer :	Carl Ni	Relative Humidity :	41~42%
Test Distance :	3m	Polarization :	Horizontal
Function Type :	WCDMA Band V Idle + Bluetooth Idle + WLAN (2.4G) Idle + USB Cable (Charging from Adapter) + Earphone + Battery 2 + MPEG4		
Remark :	#6 is system simulator signal which can be ignored.		

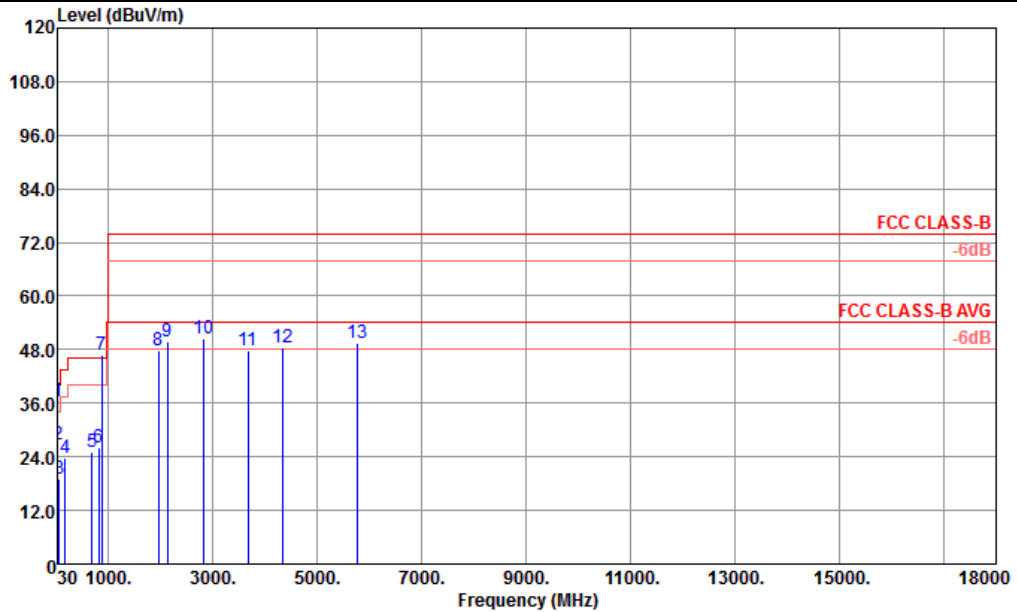


Site : 03CH02-KS
Condition : FCC CLASS-B 3m 966-02 LF ANT HORIZONTAL
Project : (FC) 672002
Mode : 9
IMEI : 004402243144346/01 #15

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phas
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg		
1	32.70	22.62	-17.38	40.00	28.95	25.30	0.11	31.74	155	62	Peak	HORIZONTAL
2	104.79	16.38	-27.12	43.50	29.43	18.24	0.24	31.53	---	---	Peak	HORIZONTAL
3	146.64	21.07	-22.43	43.50	34.61	17.66	0.32	31.52	---	---	Peak	HORIZONTAL
4	189.30	18.66	-24.84	43.50	33.87	15.76	0.39	31.36	---	---	Peak	HORIZONTAL
5	745.20	26.39	-19.61	46.00	26.83	26.25	1.34	28.03	---	---	Peak	HORIZONTAL
6	882.40	44.68			42.65	27.46	1.59	27.02	---	---	Peak	HORIZONTAL
7	983.20	29.43	-24.57	54.00	24.46	29.28	1.85	26.16	---	---	Peak	HORIZONTAL
8	1904.00	45.28	-28.72	74.00	46.39	29.64	4.52	35.27	---	---	Peak	HORIZONTAL
9	2098.00	46.36	-27.64	74.00	44.82	30.85	5.20	34.51	---	---	Peak	HORIZONTAL
10	2804.00	49.33	-24.67	74.00	42.14	32.10	2.71	27.62	---	---	Peak	HORIZONTAL
11	4002.00	46.68	-27.32	74.00	37.46	34.86	6.10	31.74	---	---	Peak	HORIZONTAL
12	4515.00	48.17	-25.83	74.00	39.39	35.28	4.74	31.24	---	---	Peak	HORIZONTAL
13	5601.00	47.08	-26.92	74.00	41.21	35.37	7.64	37.14	---	---	Peak	HORIZONTAL



Test Mode :	Mode 9	Temperature :	21~22°C
Test Engineer :	Carl Ni	Relative Humidity :	41~42%
Test Distance :	3m	Polarization :	Vertical
Function Type :	WCDMA Band V Idle + Bluetooth Idle + WLAN (2.4G) Idle + USB Cable (Charging from Adapter) + Earphone + Battery 2 + MPEG4		
Remark :	#7 is system simulator signal which can be ignored.		



Site : 03CH02-KS
 Condition : FCC CLASS-B 3m 966-02 LF ANT VERTICAL
 Project : (FC) 672002
 Mode : 9
 IMEI : 004402243144346/01 #15

	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 !	30.00	36.35	-3.65	40.00	42.19	25.80	0.11	31.75	150	36	Peak VERTICAL
2	40.53	26.68	-13.32	40.00	36.50	21.90	0.13	31.85	---	---	Peak VERTICAL
3	67.80	19.21	-20.79	40.00	37.93	12.85	0.18	31.75	---	---	Peak VERTICAL
4	184.71	23.63	-19.87	43.50	38.92	15.94	0.39	31.62	---	---	Peak VERTICAL
5	689.90	25.05	-20.95	46.00	25.72	26.48	1.15	28.30	---	---	Peak VERTICAL
6	823.60	26.00	-20.00	46.00	25.25	26.89	1.42	27.56	---	---	Peak VERTICAL
7 *	881.70	46.90			44.89	27.45	1.59	27.03	---	---	Peak VERTICAL
8	1972.00	47.87	-26.13	74.00	48.05	30.21	4.47	34.86	---	---	Peak VERTICAL
9	2130.00	49.68	-24.32	74.00	47.88	30.91	5.35	34.46	---	---	Peak VERTICAL
10	2832.00	50.39	-23.61	74.00	43.18	32.18	2.81	27.78	---	---	Peak VERTICAL
11	3675.00	47.77	-26.23	74.00	38.62	34.17	6.24	31.26	---	---	Peak VERTICAL
12	4332.00	48.48	-25.52	74.00	39.44	35.19	5.34	31.49	---	---	Peak VERTICAL
13	5784.00	49.35	-24.65	74.00	43.14	35.22	6.75	35.76	---	---	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	Aug. 17, 2016	Sep. 09, 2016	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060103	9kHz~30MHz	Oct. 24, 2015	Aug. 17, 2016	Oct. 23, 2016	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060105	9kHz~30MHz	Oct. 24, 2015	Aug. 17, 2016	Oct. 23, 2016	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP0000008 11	AC 0V~300V, 45Hz~1000Hz	Oct. 24, 2015	Aug. 17, 2016	Oct. 23, 2016	Conduction (CO01-KS)
EMI Test Receiver	R&S	ESR7	101403	9kHz~7GHz; Max 30dBm	Sep. 10, 2015	Aug. 17, 2016	Sep. 09, 2016	Radiation (03CH02-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150208	10Hz~44GHz; Max 30dB	Apr. 22, 2016	Aug. 17, 2016	Apr. 21, 2017	Radiation (03CH02-KS)
Bilog Antenna	TeseQ	CBL6112D	37879	30MHz~2GHz	Sep. 12, 2015	Aug. 17, 2016	Sep. 11, 2016	Radiation (03CH02-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75957	1GHz~18GHz	Nov. 07, 2015	Aug. 17, 2016	Nov. 06, 2016	Radiation (03CH02-KS)
SHF-EHF Horn	com-power	AH-840	101070	18GHz~40GHz	Oct. 10, 2015	Aug. 17, 2016	Oct. 09, 2016	Radiation (03CH02-KS)
Amplifier	com-power	PA-103A	161069	1kHz~1000MHz / 32 dB	Apr. 22, 2016	Aug. 17, 2016	Apr. 21, 2017	Radiation (03CH02-KS)
Amplifier	Agilent	8449B	3008A02384	1GHz~26.5GHz	Oct. 24, 2015	Aug. 17, 2016	Oct. 23, 2016	Radiation (03CH02-KS)
Amplifier	MITEQ	TTA1840-35-H G	1887435	18GHz~40GHz	Jan. 20, 2016	Aug. 17, 2016	Jan. 19, 2017	Radiation (03CH02-KS)
AC Power Source	Chroma	61601	61601000247 3	N/A	NCR	Aug. 17, 2016	NCR	Radiation (03CH02-KS)
Turn Table	MF	MF7802	N/A	0~360 degree	NCR	Aug. 17, 2016	NCR	Radiation (03CH02-KS)
Antenna Mast	MF	MF7802	N/A	1 m~4 m	NCR	Aug. 17, 2016	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% ($U = 2U_c(y)$)	2.3dB
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	5.1dB
--	-------

Uncertainty of Radiated Emission Measurement (1GHz ~ 18GHz)

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

Uncertainty of Radiated Emission Measurement (18GHz~40GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	5.1dB
--	-------