

FCC Test Report

APPLICANT : TCL Communication Ltd.
EQUIPMENT : HSUPA/HSDPA/UMTS Tri Band/GSM Quad
Band/LTE 7 band mobile phone
BRAND NAME : Vodafone
MODEL NAME : VFD 900
FCC ID : 2ACCJN007
STANDARD : FCC 47 CFR FCC Part 15 Subpart B
CLASSIFICATION : Certification

The product was received on Dec. 14, 2015 and testing was completed on Mar. 24, 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
FC5D1401	Rev. 01	Initial issue of report	Apr. 14, 2016



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 1.91 dB at 0.570 MHz
3.2	15.109	Radiated Emission	< 15.109 limits	PASS	Under limit 5.30 dB at 30.000 MHz for Quasi-Peak



1. General Description

1.1. Applicant

TCL Communication Ltd.

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

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	HSUPA/HSDPA/UMTS Tri Band/GSM Quad Band/LTE 7 band mobile phone
Brand Name	Vodafone
Model Name	VFD 900
FCC ID	2ACCJN007
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/ 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: 357066070004395 Radiation: 357066070005160
HW Version	PIO
SW Version	V3HT1
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 LTE Band 5 : 824.7 MHz ~ 848.3 MHz LTE Band 7 : 2502.5 MHz ~ 2567.5 MHz LTE Band 38 : 2572.5 MHz ~ 2617.5 MHz 802.11b/g/n: 2412 MHz ~ 2472 MHz 802.11a/n/ac: 5180 MHz ~ 5240 MHz; 5260 MHz ~ 5320 MHz; 5500 MHz ~ 5720 MHz ; 5745 MHz ~ 5805 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 LTE Band 5 : 869.7 MHz ~ 893.3 MHz LTE Band 7 : 2622.5 MHz~ 2687.5 MHz LTE Band 38 : 2572.5 MHz ~ 2617.5 MHz 802.11b/g/n: 2412 MHz ~ 2472 MHz 802.11a/n/ac: 5180 MHz ~ 5240 MHz; 5260 MHz ~ 5320 MHz; 5500 MHz ~ 5720 MHz ; 5745 MHz ~ 5805 MHz Bluetooth: 2402 MHz ~ 2480 MHz GPS : 1.57542 GHz Glonass: 1602 MHz + $n \times 0.5625\text{MHz}$ ($n=-7,-6,-5,...,0,...,6$) NFC : 13.56 MHz
Antenna Type	WWAN : LDS Antenna WLAN : LDS Antenna Bluetooth : LDS Antenna GPS/Glonass : IFA Antenna NFC : Loop Antenna
Type of Modulation	GSM/GPRS: GMSK EDGE(MCS 0-4): GMSK / (MCS 5-9): 8PSK WCDMA: QPSK (Uplink) HSDPA / DC-HSDPA: QPSK (Uplink) HSUPA: QPSK (Uplink) DC-HSDPA: 64QAM HSPA+: 16QAM(uplink is not supported) 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 v4.1 LE : GFSK Bluetooth v4.2 LE : GFSK Bluetooth (1Mbps) : GFSK Bluetooth (2Mbps) : $\pi/4$ -DQPSK Bluetooth (3Mbps) : 8-DPSK GPS/Glonass : BPSK NFC: ASK

1.5. Specification of Accessory

Specification of Accessory				
AC Adapter	Brand Name	N/A	Model Name	QC10US
	Power Rating	I/P: 100-240Vac, 500mA, O/P: 5.0Vdc, 2A, / 9.0Vdc, 1.67A		
	Manufacturer	BYD	P/N	CBA0060AG1C1
Battery	Brand Name	ALCATEL ONETOUCH	Model Name	TLp030F2
	Power Rating	3.84Vdc, 3000mAh		
	Manufacturer	SCUD	P/N	CAC3000013C2
USB Cable 1	Brand Name	N/A	Model Name	CDA0000043C8
	Signal Line Type	1.01m shielded without core		
	Manufacturer	PUAN	P/N	N/A
USB Cable 2	Brand Name	N/A	Model Name	CDA0000043C2 CDA0000087C2
	Signal Line Type	1.00m shielded without core		
	Manufacturer	Shenghua	P/N	N/A
Earphone	Brand Name	N/A	Model Name	WH60
	Signal Line Type	1.24m non-shielded without core		
	Manufacturer	Lianchuang	P/N	N/A

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 Registration No.
	CO01-KS	03CH03-KS	306251

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).

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 connected with notebook)	☒	☒	☒

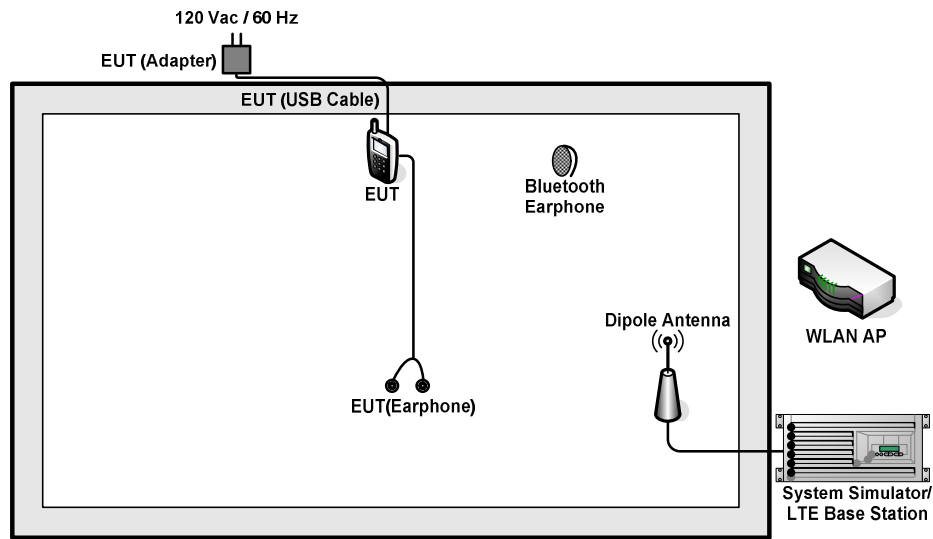
Abbreviations:

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

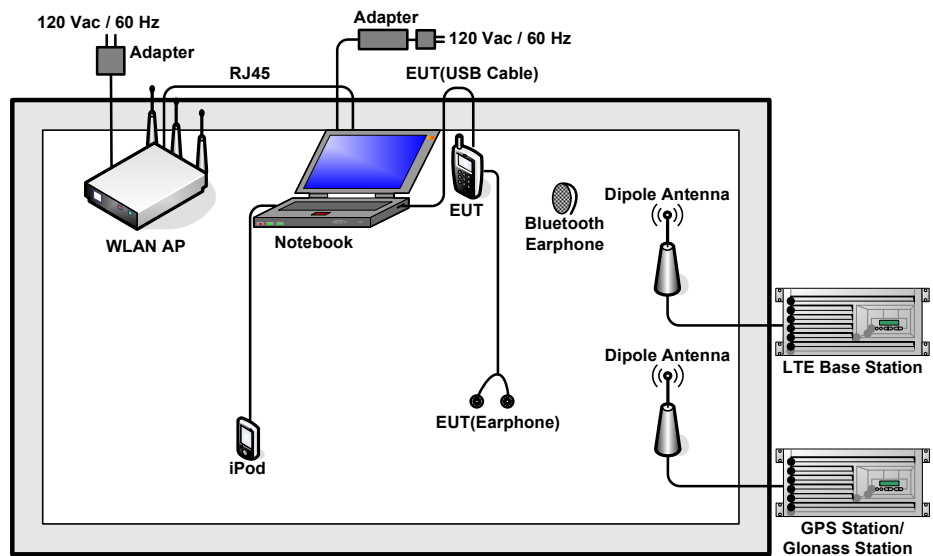
Test Items	EUT Configure Mode	Function Type
AC Conducted Emission	1/2	Mode 1: GSM850 Idle + Bluetooth Idle + WLAN (2.4G) Idle + USB Cable 1(Charging from Adapter) + Earphone + Camera (Rear) <Fig.1> Mode 2: GSM1900 Idle + Bluetooth Idle + WLAN (5G) Idle + USB Cable 2(Charging from Adapter) + Earphone + Camera (Front) <Fig.1> Mode 3: WCDMA Band V Idle + Bluetooth Idle + WLAN (2.4G) Idle + USB Cable 1(Charging from Adapter) + Earphone + MPEG4 <Fig.1> Mode 4: LTE Band 5 Idle + Bluetooth Idle + WLAN (5G) Idle + USB Cable 1(Charging from Adapter) + Earphone + NFC On <Fig.1> Mode 5: LTE Band 7 Idle + Bluetooth Idle + WLAN (2.4G) Idle + USB Cable 1(Data Link with Notebook) + Earphone + Glonass Rx <Fig.2> Mode 6: LTE Band 38 Idle + Bluetooth Idle + WLAN (5G) Idle + USB Cable 2(Data Link with Notebook) + Earphone + GPS Rx <Fig.2>
Radiated Emissions < 1GHz	1/2	Mode 1: GSM850 Idle + Bluetooth Idle + WLAN (2.4G) Idle + USB Cable 1(Charging from Adapter) + Earphone + Camera (Rear) <Fig.1> Mode 2: GSM1900 Idle + Bluetooth Idle + WLAN (5G) Idle + USB Cable 2(Charging from Adapter) + Earphone + Camera (Front) <Fig.1> Mode 3: WCDMA Band V Idle + Bluetooth Idle + WLAN (2.4G) Idle + USB Cable 1(Charging from Adapter) + Earphone + MPEG4 <Fig.1> Mode 4: LTE Band 5 Idle + Bluetooth Idle + WLAN (5G) Idle + USB Cable 1(Charging from Adapter) + Earphone + NFC On <Fig.1> Mode 5: LTE Band 7 Idle + Bluetooth Idle + WLAN (2.4G) Idle + USB Cable 1(Data Link with Notebook) + Earphone + Glonass Rx <Fig.2> Mode 6: LTE Band 38 Idle + Bluetooth Idle + WLAN (5G) Idle + USB Cable 2(Data Link with Notebook) + Earphone + GPS Rx <Fig.2>

Test Items	EUT Configure Mode	Function Type
Radiated Emissions $\geq 1\text{GHz}$	1/2	Mode 1 : GSM1900 Idle + Bluetooth Idle + WLAN (5G) Idle + USB Cable 2(Charging from Adapter) + Earphone + Camera (Front) <Fig.1> Mode 2 : LTE Band 7 Idle + Bluetooth Idle + WLAN (2.4G) Idle + USB Cable 1(Data Link with Notebook) + Earphone + Glonass Rx <Fig.2>
Remark: 1. The worst case of AC is mode 3, and the USB Link mode of AC is mode 6, the test data of these modes were reported. 2. The worst case of RE < 1G is mode 2, and the USB Link mode of RE is mode 5, 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>

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	RLLS03-2RP	N/A	N/A	Unshielded, 1.8 m
5.	WLAN AP	D-Link	DIR-855	KA2DIR855A2	N/A	Unshielded, 1.8 m
6.	WLAN AP	ASUSTek	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded, 2.7 m with Core
7.	Notebook	Lenovo	G480	N/A	N/A	AC I/P: Unshielded, 0.9 m DC O/P: Shielded, 1.8 m
8.	Bluetooth Earphone	Lenovo	LBH-301	2010DP1340	N/A	N/A
9.	Bluetooth Earphone	Nokia	BH-102	PYAHS-107W	N/A	N/A
10.	SD Card	Kingston	4GB	N/A	N/A	N/A
11.	iPod	Apple	A1199	FCC DoC	Shielded, 1.0 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 was 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. Execute "Video Player" to play MPEG4 files.
3. Turn on camera to capture images.
4. Turn on GPS/Glonass function to make the EUT receive continuous signals from GPS/Glonass station.
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.

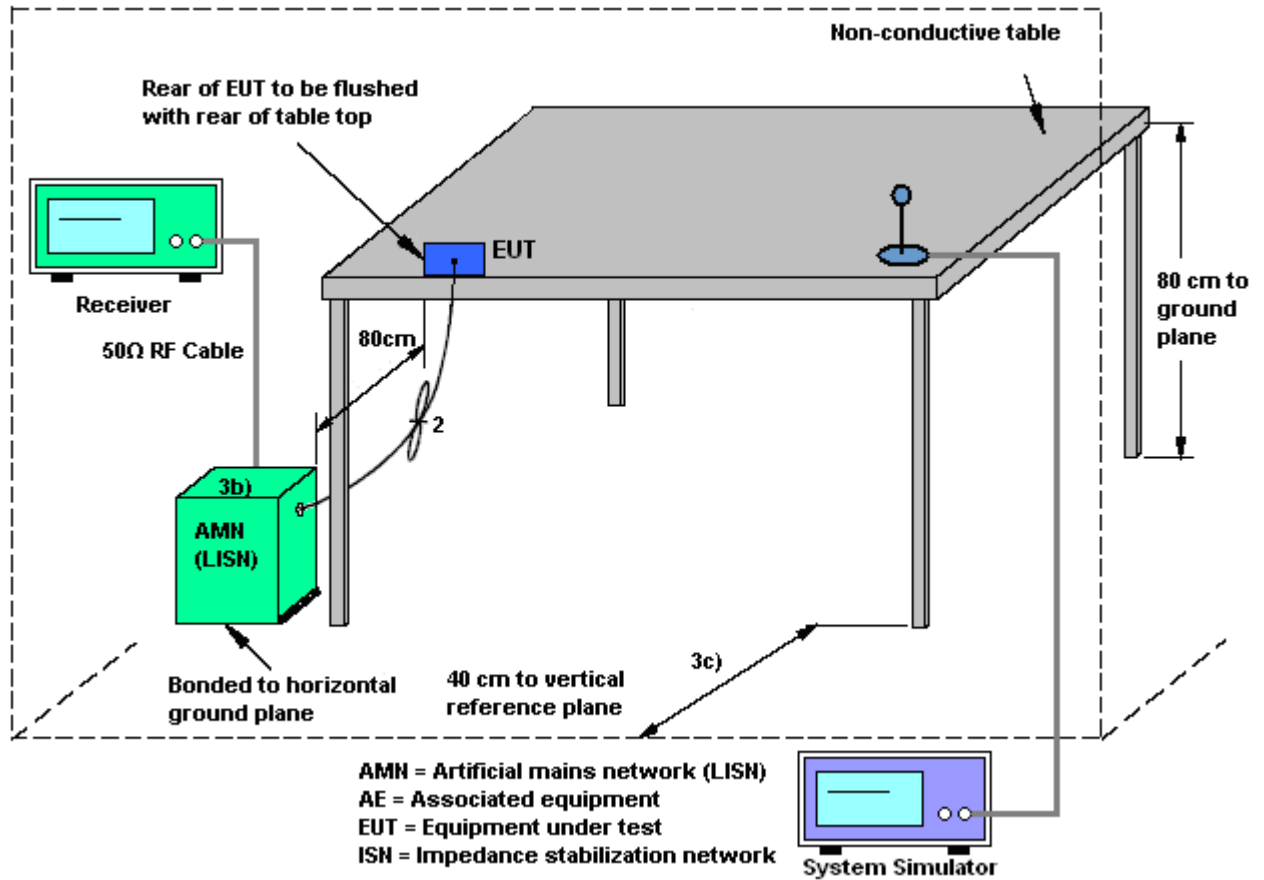
3.1.2 Measuring Instruments

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.

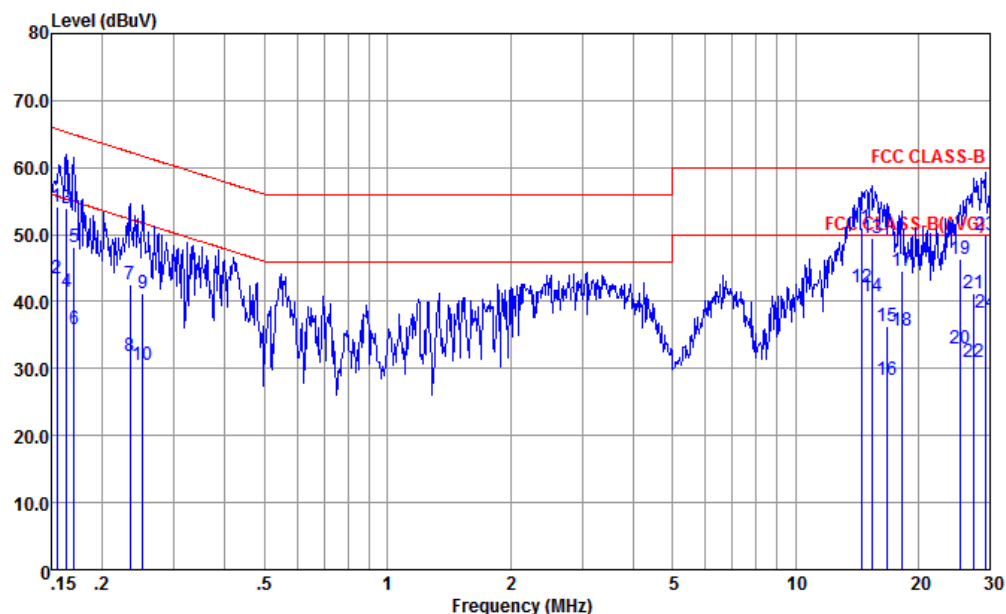
3.1.4 Test Setup





3.1.5 Test Result of AC Conducted Emission

Test Mode :	Mode 3	Temperature :	22~24℃
Test Engineer :	Amos Zhang	Relative Humidity :	44~46%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WCDMA Band V Idle + Bluetooth Idle + WLAN (2.4G) Idle + USB Cable 1(Charging from Adapter) + Earphone + MPEG4		

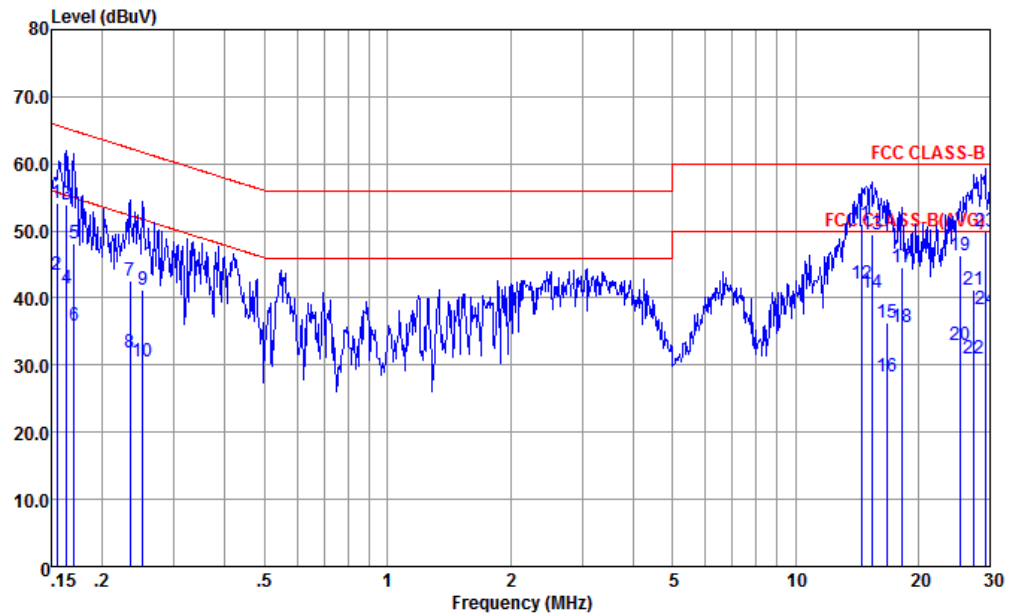


Site : CO01-KS
Condition : FCC CLASS-B LISN-L-20151024 LINE
Project : (FC) 5D1401
mode : Mode 3

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.15	54.20	-11.55	65.75	43.59	0.50	10.11	QP
2	0.15	43.50	-12.25	55.75	32.89	0.50	10.11	Average
3	0.16	53.95	-11.35	65.30	43.40	0.44	10.11	QP
4	0.16	41.35	-13.95	55.30	30.80	0.44	10.11	Average
5	0.17	48.11	-16.83	64.94	37.60	0.39	10.12	QP
6	0.17	35.81	-19.13	54.94	25.30	0.39	10.12	Average
7	0.23	42.56	-19.74	62.30	32.20	0.22	10.14	QP
8	0.23	31.76	-20.54	52.30	21.40	0.22	10.14	Average
9	0.25	41.16	-20.57	61.73	30.80	0.22	10.14	QP
10	0.25	30.56	-21.17	51.73	20.20	0.22	10.14	Average
11	14.52	50.93	-9.07	60.00	40.30	0.26	10.37	QP
12 *	14.52	42.03	-7.97	50.00	31.40	0.26	10.37	Average
13	15.39	49.46	-10.54	60.00	38.80	0.26	10.40	QP
14	15.39	40.76	-9.24	50.00	30.10	0.26	10.40	Average
15	16.75	36.30	-23.70	60.00	25.60	0.26	10.44	QP
16	16.75	28.30	-21.70	50.00	17.60	0.26	10.44	Average
17	18.23	44.55	-15.45	60.00	33.80	0.27	10.48	QP
18	18.23	35.55	-14.45	50.00	24.80	0.27	10.48	Average



Test Mode :	Mode 3	Temperature :	22~24℃
Test Engineer :	Amos Zhang	Relative Humidity :	44~46%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WCDMA Band V Idle + Bluetooth Idle + WLAN (2.4G) Idle + USB Cable 1(Charging from Adapter) + Earphone + MPEG4		

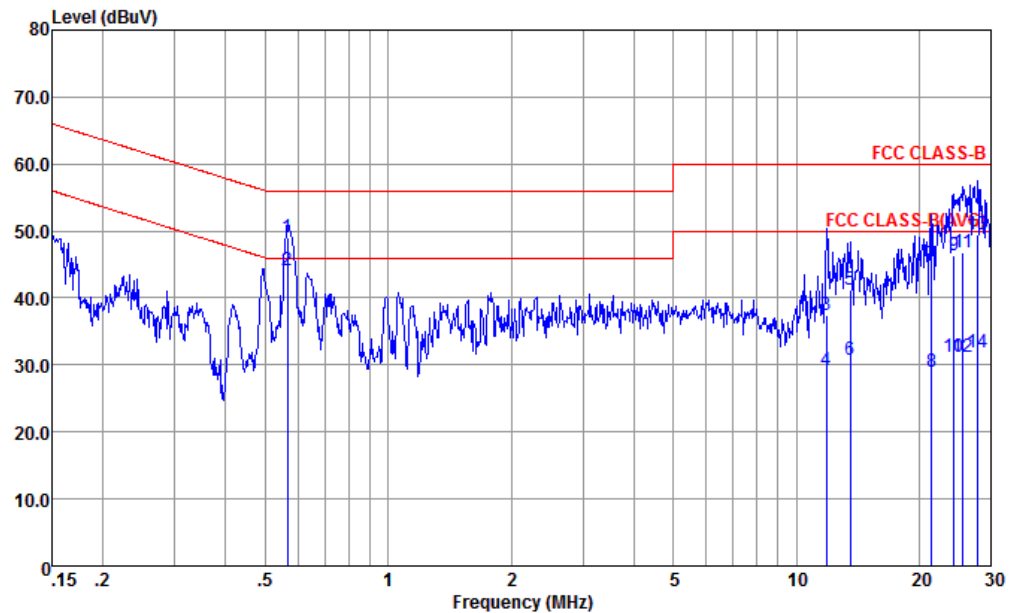


Site : CO01-KS
Condition : FCC CLASS-B LISN-L-20151024 LINE
Project : (FC) 5D1401
mode : Mode 3

	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
		dBuV	dB	dBuV	dBuV	dB	dB	
19	25.32	46.42	-13.58	60.00	35.50	0.22	10.70	QP
20	25.32	33.02	-16.98	50.00	22.10	0.22	10.70	Average
21	27.27	41.29	-18.71	60.00	30.30	0.22	10.77	QP
22	27.27	30.89	-19.11	50.00	19.90	0.22	10.77	Average
23	29.22	49.97	-10.03	60.00	38.90	0.23	10.84	QP
24	29.22	38.37	-11.63	50.00	27.30	0.23	10.84	Average



Test Mode :	Mode 3	Temperature :	22~24℃
Test Engineer :	Amos Zhang	Relative Humidity :	44~46%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WCDMA Band V Idle + Bluetooth Idle + WLAN (2.4G) Idle + USB Cable 1(Charging from Adapter) + Earphone + MPEG4		

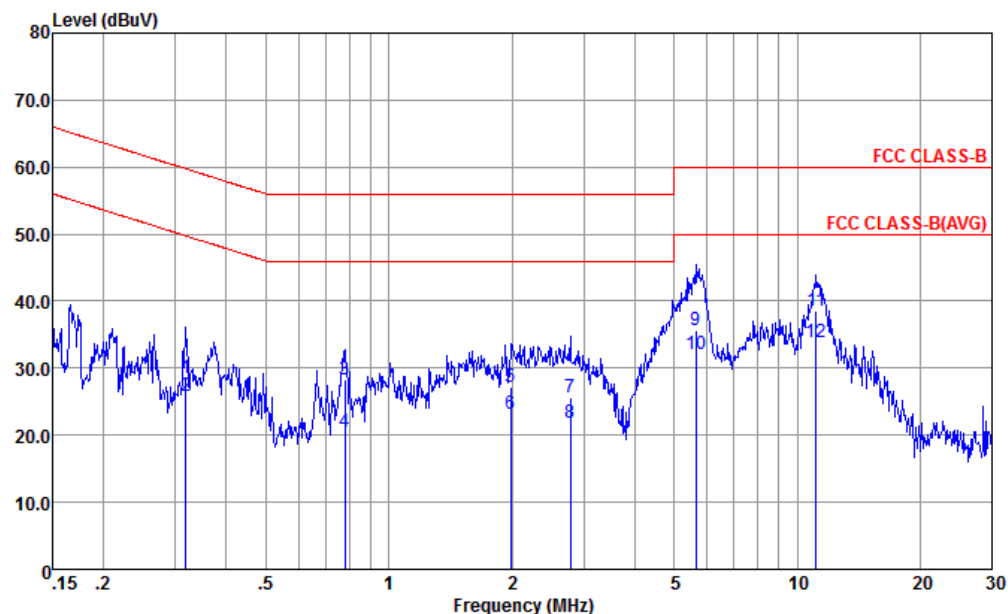


Site : CO01-KS
Condition : FCC CLASS-B LISN-N-20151024 NEUTRAL
Project : (FC) 5D1401
mode : Mode 3

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.57	48.99	-7.01	56.00	38.50	0.33	10.16	QP
2 *	0.57	44.09	-1.91	46.00	33.60	0.33	10.16	Average
3	11.87	37.49	-22.51	60.00	26.90	0.28	10.31	QP
4	11.87	29.29	-20.71	50.00	18.70	0.28	10.31	Average
5	13.56	41.12	-18.88	60.00	30.50	0.27	10.35	QP
6	13.56	30.82	-19.18	50.00	20.20	0.27	10.35	Average
7	21.49	45.03	-14.97	60.00	34.20	0.25	10.58	QP
8	21.49	29.03	-20.97	50.00	18.20	0.25	10.58	Average
9	24.40	46.41	-13.59	60.00	35.50	0.24	10.67	QP
10	24.40	31.21	-18.79	50.00	20.30	0.24	10.67	Average
11	25.59	46.75	-13.25	60.00	35.80	0.24	10.71	QP
12	25.59	31.25	-18.75	50.00	20.30	0.24	10.71	Average
13	27.86	49.53	-10.47	60.00	38.50	0.24	10.79	QP
14	27.86	31.83	-18.17	50.00	20.80	0.24	10.79	Average



Test Mode :	Mode 6	Temperature :	22~24℃
Test Engineer :	Amos Zhang	Relative Humidity :	44~46%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	LTE Band 38 Idle + Bluetooth Idle + WLAN (5G) Idle + USB Cable 2(Data Link with Notebook) + Earphone + GPS Rx		

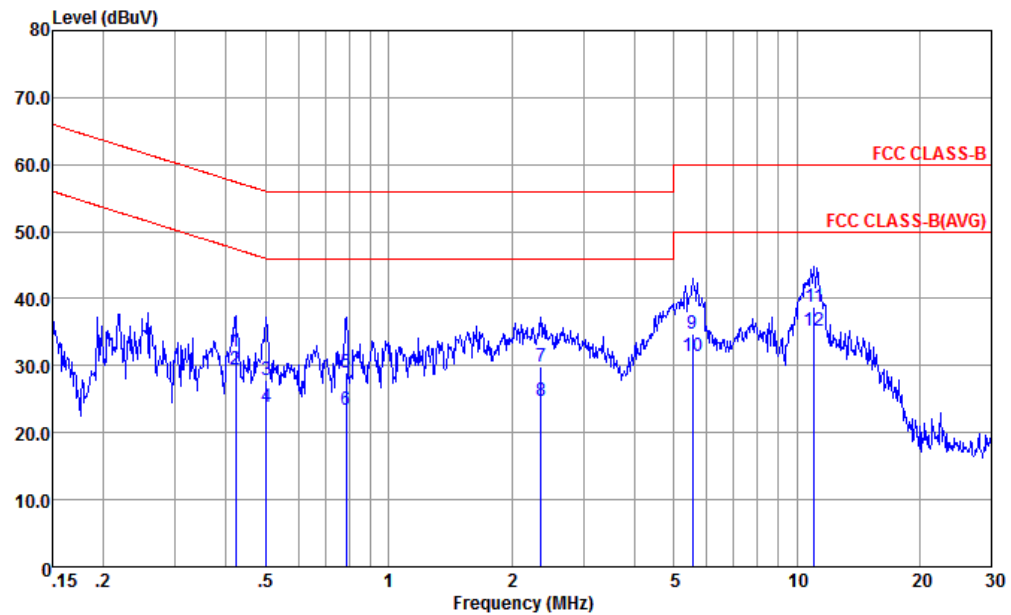


Site : CO01-KS
Condition : FCC CLASS-B LISN-L-20151024 LINE
Project : (FC) 5D1401
mode : Mode 6

	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.32	28.58	-31.17	59.75	18.19	0.23	10.16	QP
2	0.32	25.78	-23.97	49.75	15.39	0.23	10.16	Average
3	0.78	28.19	-27.81	56.00	17.80	0.24	10.15	QP
4	0.78	20.59	-25.41	46.00	10.20	0.24	10.15	Average
5	1.99	27.12	-28.88	56.00	16.80	0.18	10.14	QP
6	1.99	23.12	-22.88	46.00	12.80	0.18	10.14	Average
7	2.78	25.63	-30.37	56.00	15.30	0.18	10.15	QP
8	2.78	21.73	-24.27	46.00	11.40	0.18	10.15	Average
9	5.65	35.60	-24.40	60.00	25.21	0.20	10.19	QP
10	5.65	32.20	-17.80	50.00	21.81	0.20	10.19	Average
11	11.14	38.45	-21.55	60.00	27.91	0.25	10.29	QP
12 *	11.14	33.95	-16.05	50.00	23.41	0.25	10.29	Average



Test Mode :	Mode 6	Temperature :	22~24℃
Test Engineer :	Amos Zhang	Relative Humidity :	44~46%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	LTE Band 38 Idle + Bluetooth Idle + WLAN (5G) Idle + USB Cable 2(Data Link with Notebook) + Earphone + GPS Rx		



Site : C001-KS
Condition : FCC CLASS-B LISN-N-20151024 NEUTRAL
Project : (FC) 5D1401
mode : Mode 6

	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.42	31.99	-25.43	57.42	21.50	0.32	10.17	QP
2	0.42	29.39	-18.03	47.42	18.90	0.32	10.17	Average
3	0.50	27.88	-28.12	56.00	17.40	0.32	10.16	QP
4	0.50	23.88	-22.12	46.00	13.40	0.32	10.16	Average
5	0.79	28.90	-27.10	56.00	18.40	0.35	10.15	QP
6	0.79	23.30	-22.70	46.00	12.80	0.35	10.15	Average
7	2.36	29.92	-26.08	56.00	19.39	0.38	10.15	QP
8	2.36	24.82	-21.18	46.00	14.29	0.38	10.15	Average
9	5.56	34.73	-25.27	60.00	24.20	0.34	10.19	QP
10	5.56	31.43	-18.57	50.00	20.90	0.34	10.19	Average
11	11.02	38.77	-21.23	60.00	28.20	0.28	10.29	QP
12 *	11.02	35.27	-14.73	50.00	24.70	0.28	10.29	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

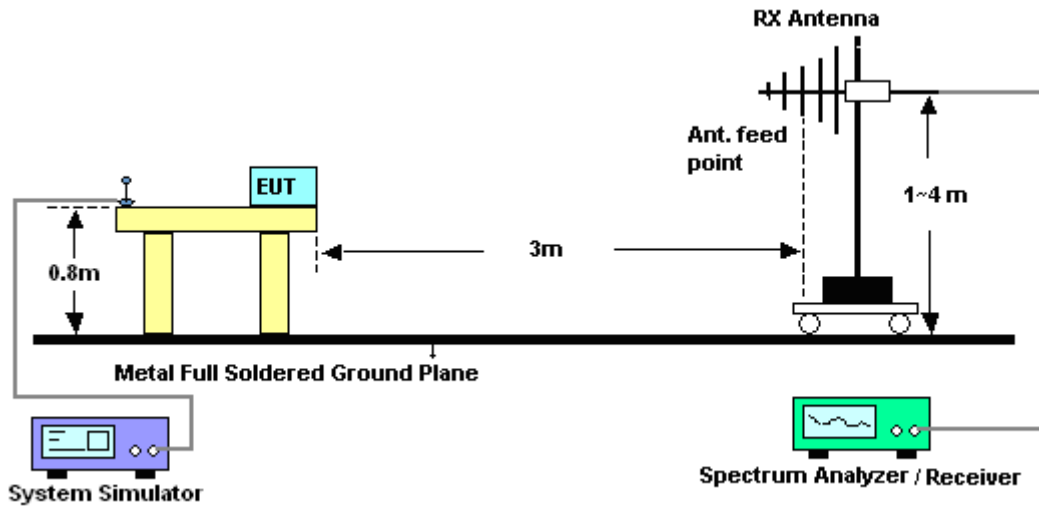
The measuring equipment is listed in the section 4 of this test report.

3.2.3. Test Procedures

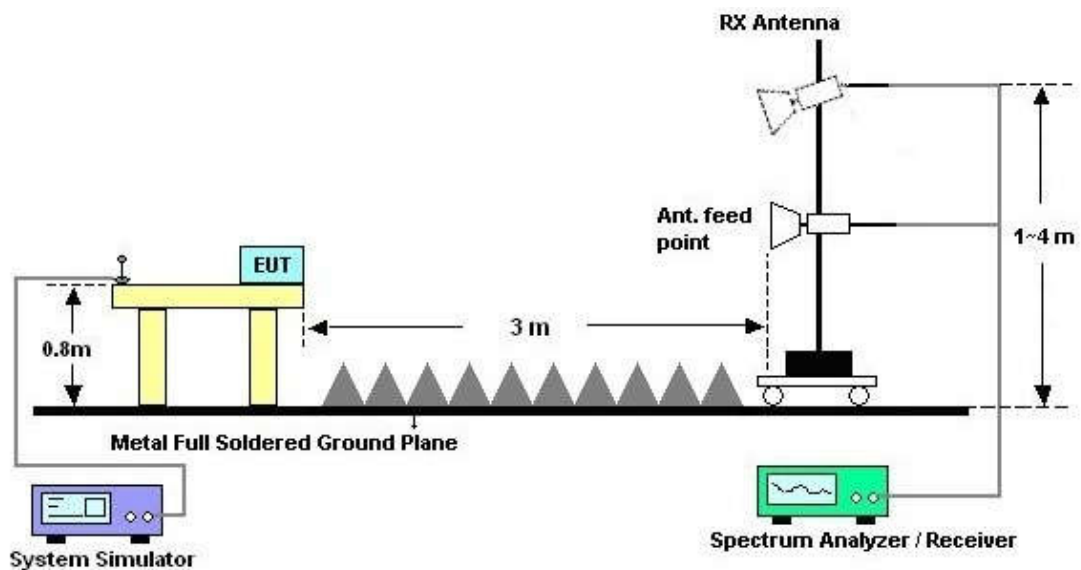
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna 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 μ V/m) = 20 log Emission level (μ V/m)
9. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamplifier Factor = Level

3.2.4. Test Setup of Radiated Emission

For radiated emissions from 30MHz to 1GHz



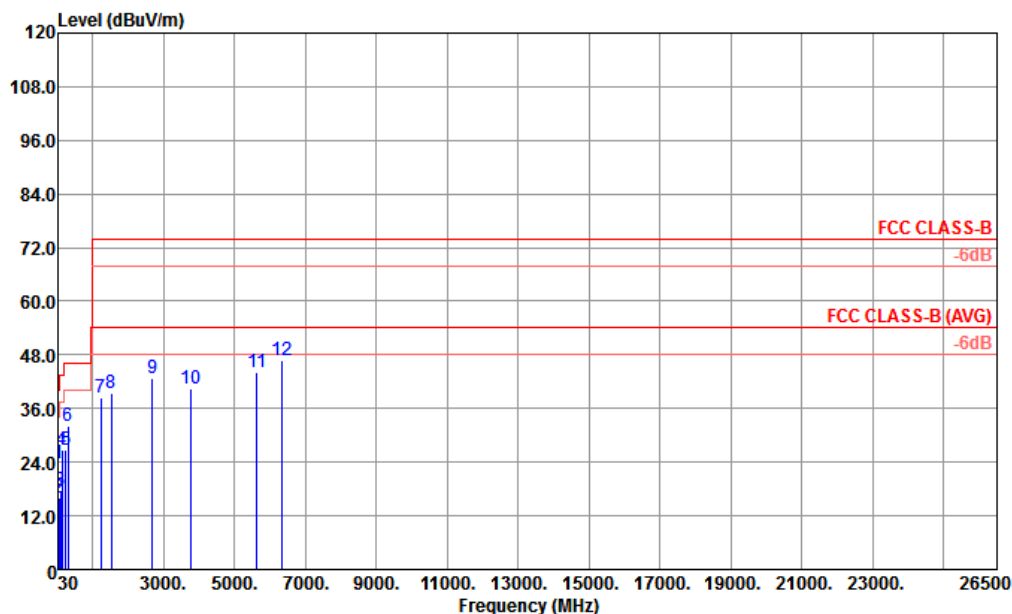
For radiated emissions above 1GHz





3.2.5. Test Result of Radiated Emission

Test Mode :	Mode 2	Temperature :	21~22°C
Test Engineer :	Bord Li	Relative Humidity :	41~42%
Test Distance :	3m	Polarization :	Horizontal
Function Type :	GSM1900 Idle + Bluetooth Idle + WLAN (5G) Idle + USB Cable 2(Charging from Adapter) + Earphone + Camera (Front)		



Site

: 03CH03-KS

Condition

: FCC CLASS-B 3m LF ANT (NEW) HORIZONTAL

Project

: (FC) 5D1401

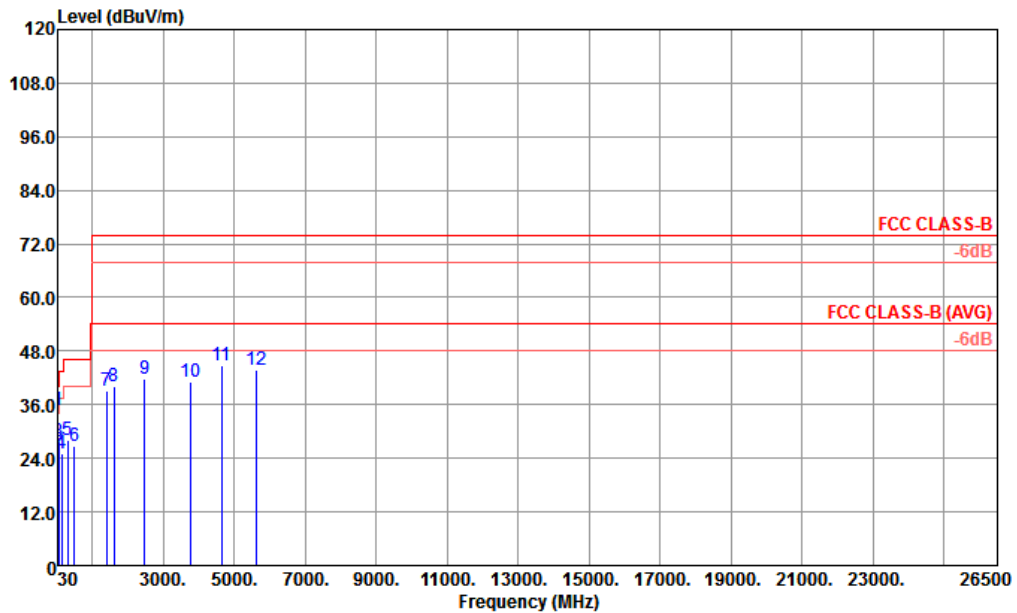
Mode

: 2

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg		
1	30.34	23.86	-16.14	40.00	35.66	18.60	0.66	31.06	---	---	Peak	HORIZONTAL
2	67.06	16.06	-23.94	40.00	38.19	7.48	0.99	30.60	---	---	Peak	HORIZONTAL
3	96.30	17.67	-25.83	43.50	34.19	12.70	1.18	30.40	---	---	Peak	HORIZONTAL
4	141.35	26.66	-16.84	43.50	41.94	13.68	1.44	30.40	---	---	Peak	HORIZONTAL
5	255.20	26.91	-19.09	46.00	42.27	13.37	1.77	30.50	---	---	Peak	HORIZONTAL
6	310.40	32.06	-13.94	46.00	45.32	15.09	2.17	30.52	283	152	Peak	HORIZONTAL
7	1246.00	38.43	-35.57	74.00	47.77	24.80	3.86	38.00	---	---	Peak	HORIZONTAL
8	1530.00	39.37	-34.63	74.00	47.05	25.43	4.37	37.48	---	---	Peak	HORIZONTAL
9	2698.00	42.89	-31.11	74.00	45.80	28.03	5.92	36.86	---	---	Peak	HORIZONTAL
10	3760.00	40.51	-33.49	74.00	40.73	29.30	6.95	36.47	---	---	Peak	HORIZONTAL
11	5640.00	44.02	-29.98	74.00	39.74	32.00	8.50	36.22	---	---	Peak	HORIZONTAL
12	6348.00	46.88	-27.12	74.00	42.27	32.22	8.98	36.59	---	---	Peak	HORIZONTAL



Test Mode :	Mode 2	Temperature :	21~22°C
Test Engineer :	Bord Li	Relative Humidity :	41~42%
Test Distance :	3m	Polarization :	Vertical
Function Type :	GSM1900 Idle + Bluetooth Idle + WLAN (5G) Idle + USB Cable 2(Charging from Adapter) + Earphone + Camera (Front)		

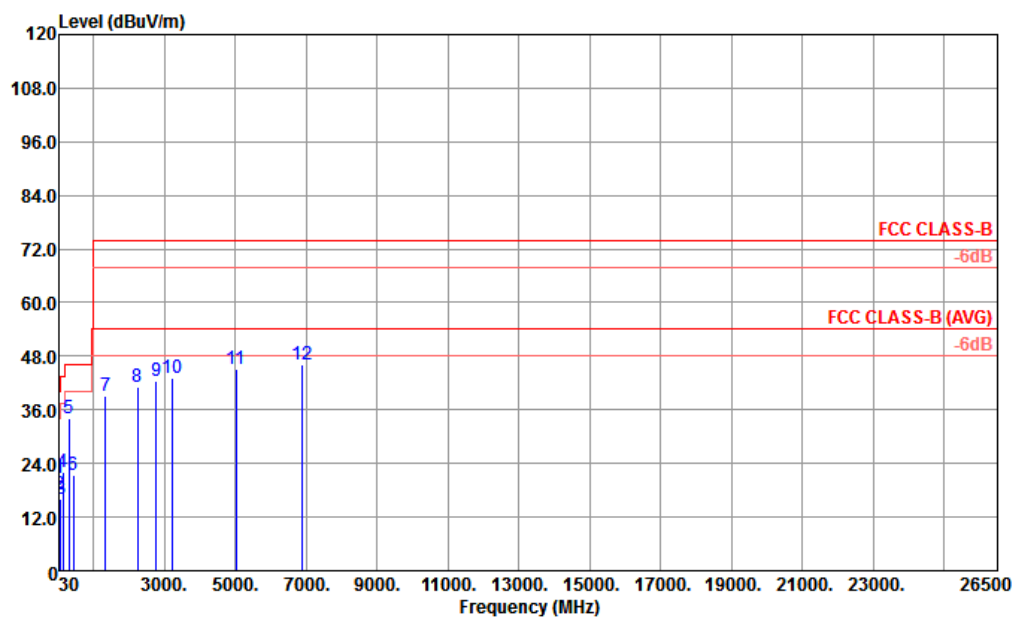


Site : 03CH03-KS
Condition : FCC CLASS-B 3m LF ANT (NEW) VERTICAL
Project : (FC) 5D1401
Mode : 2

	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	30.00	34.70	-5.30	40.00	46.55	18.60	0.65	31.10	100	286	QP	VERTICAL
2	42.58	25.85	-14.15	40.00	42.53	13.36	0.80	30.84	---	---	Peak	VERTICAL
3	68.59	27.70	-12.30	40.00	49.55	7.76	0.99	30.60	---	---	Peak	VERTICAL
4	146.96	25.06	-18.44	43.50	40.24	13.76	1.46	30.40	---	---	Peak	VERTICAL
5	308.00	28.21	-17.79	46.00	41.51	15.06	2.16	30.52	---	---	Peak	VERTICAL
6	511.20	26.59	-19.41	46.00	35.78	18.36	2.83	30.38	---	---	Peak	VERTICAL
7	1410.00	38.96	-35.04	74.00	47.09	25.30	4.16	37.59	---	---	Peak	VERTICAL
8	1620.00	40.12	-33.88	74.00	47.49	25.52	4.51	37.40	---	---	Peak	VERTICAL
9	2474.00	41.95	-32.05	74.00	45.56	27.64	5.69	36.94	---	---	Peak	VERTICAL
10	3760.00	41.28	-32.72	74.00	41.50	29.30	6.95	36.47	---	---	Peak	VERTICAL
11	4652.00	44.81	-29.19	74.00	42.60	31.24	7.64	36.67	---	---	Peak	VERTICAL
12	5640.00	43.70	-30.30	74.00	39.42	32.00	8.50	36.22	---	---	Peak	VERTICAL



Test Mode :	Mode 5	Temperature :	21~22°C
Test Engineer :	Bord Li	Relative Humidity :	41~42%
Test Distance :	3m	Polarization :	Horizontal
Function Type :	LTE Band 7 Idle + Bluetooth Idle + WLAN (2.4G) Idle + USB Cable 1(Data Link with Notebook) + Earphone + Glonass Rx		



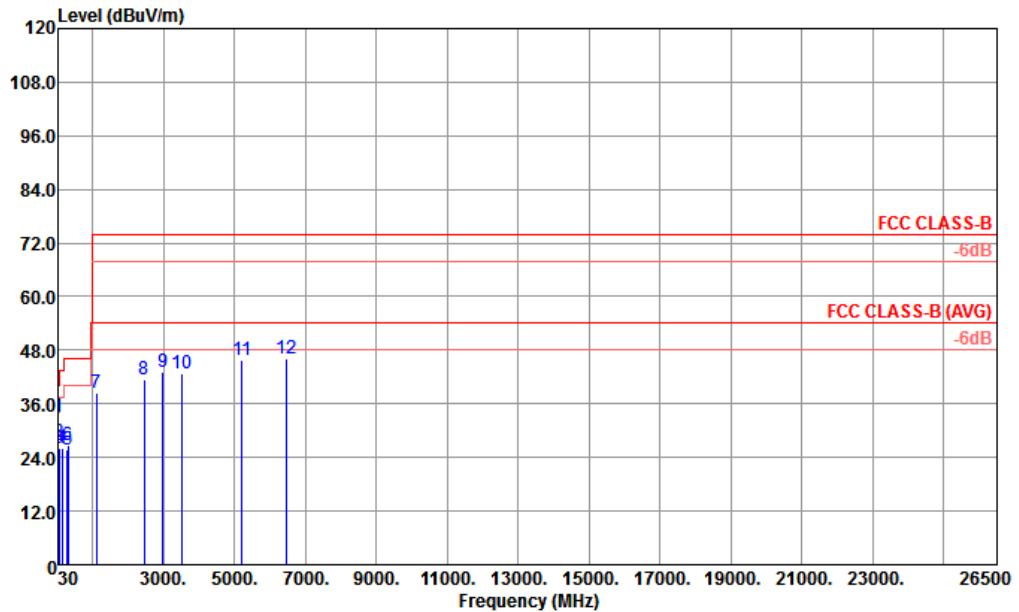
Site : 03CH03-KS
Condition : FCC CLASS-B 3m LF ANT (NEW) HORIZONTAL

Project : (FC) 5D1401
Mode : 5

	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	30.34	20.81	-19.19	40.00	32.61	18.60	0.66	31.06	---	---	Peak	HORIZONTAL
2	43.60	17.19	-22.81	40.00	34.11	13.08	0.82	30.82	---	---	Peak	HORIZONTAL
3	85.93	16.08	-23.92	40.00	34.91	10.54	1.13	30.50	---	---	Peak	HORIZONTAL
4	152.91	21.97	-21.53	43.50	37.26	13.62	1.49	30.40	---	---	Peak	HORIZONTAL
5	324.00	33.95	-12.05	46.00	46.96	15.33	2.21	30.55	112	76	Peak	HORIZONTAL
6	439.20	21.37	-24.63	46.00	31.98	17.32	2.61	30.54	---	---	Peak	HORIZONTAL
7	1350.00	39.12	-34.88	74.00	47.61	25.15	4.07	37.71	---	---	Peak	HORIZONTAL
8	2260.00	40.98	-33.02	74.00	45.95	26.64	5.40	37.01	---	---	Peak	HORIZONTAL
9	2766.00	42.60	-31.40	74.00	45.42	28.08	5.98	36.88	---	---	Peak	HORIZONTAL
10	3240.00	43.23	-30.77	74.00	45.22	28.57	6.45	37.01	---	---	Peak	HORIZONTAL
11	5028.00	45.23	-28.77	74.00	42.01	31.81	8.01	36.60	---	---	Peak	HORIZONTAL
12	6908.00	46.27	-27.73	74.00	40.62	32.88	9.35	36.58	---	---	Peak	HORIZONTAL



Test Mode :	Mode 5	Temperature :	21~22°C
Test Engineer :	Bord Li	Relative Humidity :	41~42%
Test Distance :	3m	Polarization :	Vertical
Function Type :	LTE Band 7 Idle + Bluetooth Idle + WLAN (2.4G) Idle + USB Cable 1(Data Link with Notebook) + Earphone + Glonass Rx		



Site : 03CH03-KS
Condition : FCC CLASS-B 3m LF ANT (NEW) VERTICAL
Project : (FC) 5D1401
Mode : 5

	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	30.17	33.13	-6.87	40.00	44.98	18.60	0.65	31.10	157	16	QP	VERTICAL
2	42.41	27.53	-12.47	40.00	44.21	13.36	0.80	30.84	---	---	Peak	VERTICAL
3	60.94	26.22	-13.78	40.00	49.02	6.88	0.92	30.60	---	---	Peak	VERTICAL
4	156.14	25.93	-17.57	43.50	41.38	13.44	1.51	30.40	---	---	Peak	VERTICAL
5	288.00	25.82	-20.18	46.00	39.78	14.50	2.04	30.50	---	---	Peak	VERTICAL
6	324.00	26.78	-19.22	46.00	39.79	15.33	2.21	30.55	---	---	Peak	VERTICAL
7	1108.00	38.28	-35.72	74.00	48.43	24.60	3.63	38.38	---	---	Peak	VERTICAL
8	2456.00	41.37	-32.63	74.00	45.15	27.51	5.67	36.96	---	---	Peak	VERTICAL
9	2986.00	43.04	-30.96	74.00	45.46	28.38	6.18	36.98	---	---	Peak	VERTICAL
10	3524.00	42.87	-31.13	74.00	43.84	28.97	6.73	36.67	---	---	Peak	VERTICAL
11	5220.00	45.64	-28.36	74.00	42.08	31.86	8.20	36.50	---	---	Peak	VERTICAL
12	6452.00	46.08	-27.92	74.00	41.39	32.24	9.06	36.61	---	---	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	Mar. 24, 2016	Sep. 09, 2016	Radiation (03CH03-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150244	10Hz~44GHz	Jun. 05, 2015	Mar. 24, 2016	Jun. 04, 2016	Radiation (03CH03-KS)
Bilog Antenna	TeseQ	CBL6112D	23182	25MHz~2GHz	Mar. 12, 2016	Mar. 24, 2016	Mar. 11, 2017	Radiation (03CH03-KS)
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1356	1GHz~18GHz	Jun. 25, 2015	Mar. 24, 2016	Jun. 24, 2016	Radiation (03CH03-KS)
SHF-EHF Horn	com-power	AH-840	101070	18GHz~40GHz	Oct. 10, 2015	Mar. 24, 2016	Oct. 09, 2016	Radiation (03CH03-KS)
Amplifier	Burgeon	BPA-530	102212	0.01MHz~3000 MHz	Aug. 10, 2015	Mar. 24, 2016	Aug. 09, 2016	Radiation (03CH03-KS)
Amplifier	Agilent	8449B	3008A02370	1GHz~26.5GHz	Oct. 24, 2015	Mar. 24, 2016	Oct. 23, 2016	Radiation (03CH03-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Mar. 24, 2016	NCR	Radiation (03CH03-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Mar. 24, 2016	NCR	Radiation (03CH03-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Mar. 24, 2016	NCR	Radiation (03CH03-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	May 04, 2015	Mar. 14, 2016	May 03, 2016	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060103	9kHz~30MHz	Oct. 24, 2015	Mar. 14, 2016	Oct. 23, 2016	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060105	9kHz~30MHz	Oct. 24, 2015	Mar. 14, 2016	Oct. 23, 2016	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP0000008 11	AC 0V~300V, 45Hz~1000Hz	Oct. 24, 2015	Mar. 14, 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% ($U = 2U_c(y)$)	2.3dB
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

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