TEST REPORT

FCC PART 15 SUBPART C 15.225

RSS-210 ISSUE 9 ANNEX B.6

Test report

On Behalf of

Shenzhen Huafurui Technology Co., Ltd.

For

Smart Phone

Model No.: QUEST

FCC ID: 2AHZ5QUEST

Prepared for :	**Shenzhen Huafurui Technology Co., Ltd.** **Unit 1401 &1402, 14/F, Jin qi zhi gu mansion (No. 4 building of Chong wen Garden), Crossing of the Liu xian street and Tang ling road, Tao yuan street, Nan shan district, Shenzhen,P.R. China**
Prepared By :	**Shenzhen HUAK Testing Technology Co., Ltd.** **1F, B2 Building, Junfeng Zhongcheng Zhizao Innovation Park, Fuhai Street, Bao'an District, Shenzhen City, China**
Date of Test:	**Dec. 28, 2018~Jan. 09, 2019**
Date of Report:	**Feb. 18, 2019**
Report Number:	**HK1812211959E**

TEST RESULT CERTIFICATION

Applicant's name ..... :	Shenzhen Huafurui Technology Co., Ltd.
Address..... :	Unit 1401 &1402, 14/F, Jin qi zhi gu mansion (No. 4 building of Chong wen Garden), Crossing of the Liu xian street and Tang ling road, Tao yuan street, Nan shan district, Shenzhen,P.R. China
Manufacture's Name..... :	Shenzhen Huafurui Technology Co., Ltd.
Address..... :	Unit 1401 &1402, 14/F, Jin qi zhi gu mansion (No. 4 building of Chong wen Garden), Crossing of the Liu xian street and Tang ling road, Tao yuan street, Nan shan district, Shenzhen,P.R. China
Factory's Name	Shenzhen Huafurui Technology Co., Ltd.
Address..... :	Unit 1401 &1402, 14/F, Jin qi zhi gu mansion (No. 4 building of Chong wen Garden), Crossing of the Liu xian street and Tang ling road, Tao yuan street, Nan shan district, Shenzhen,P.R. China
Product description	Smart Phone
Brand Name	CUBOT
Mode Name	QUEST
Standards ..... :	FCC Rules and Regulations Part 15 Subpart C Section 15.225, RSS-210 issue 9 Annex B.6 ANSI C63.10: 2013

Date of Test ..... :	
Date (s) of performance of tests..... :	**Dec. 28, 2018~Jan. 09, 2019**
Date of Issue ..... :	**Feb. 18, 2019**
Test Result ..... :	**Pass**

Testing Engineer **:** Gary Qian

(Gary Qian)

Technical Manager **:** Eden Hu

(Eden Hu)

Authorized Signatory **:** Jason Zhou

(Jason Zhou)

Revision	Issue Date	Revisions	Revised By
V1.0	Feb. 18, 2019	Initial Issue	Jason Zhou

TABLE OF CONTENTS

1. TEST SUMMARY

1.1 TEST PROCEDURES AND RESULTS

FCC/IC RULES	DESCRIPTION OF TEST	RESULT
FCC Part 15.225 RSS-210 ISSUE 9 ANNEX B.6	Radiated Emission	Compliant
FCC Part 15.207 RSS-GEN ISSUE 5	Conducted Emission	Compliant
FCC Part 15.225 RSS-210 ISSUE 9 ANNEX B.6	Frequency Tolerance	Compliant
FCC Part 15.225 RSS-210 ISSUE 9 ANNEX B.6	bandwidth	Compliant

1.2 TEST FACILITY

1.2.1 Address of the test laboratory

Shenzhen HUAK Testing Technology Co., Ltd.

Add.:1F, B2 Building, Junfeng Zhongcheng Zhizao Innovation Park,Heping Community, Fuhai Street, Bao'an District, Shenzhen, China

There is one 3m semi-anechoic chamber and two line conducted labs for final test. The Test Sites meet the requirements in documents ANSI C63.4 and CISPR 32/EN 55032 requirements.

1.2.2 Laboratory accreditation

The test facility is recognized, certified, or accredited by the following organizations:

IC Registration No.: 21210

The 3m alternate test site of Shenzhen HUAK Testing Technology Co., Ltd. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration No.: 21210 on May 24, 2016.

FCC Registration No.: CN1229

Test Firm Registration Number : 616276

1.3 MEASUREMENT UNCERTAINTY

Measurement Uncertainty

Conducted Emission Expanded Uncertainty	=	2.23dB, k=2
Radiated emission expanded uncertainty(9kHz-30MHz)	=	3.08dB, k=2
Radiated emission expanded uncertainty(30MHz-1000MHz)	=	4.42dB, k=2
Radiated emission expanded uncertainty(Above 1GHz)	=	4.06dB, k=2

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Operating Frequency(NFC)	13.56MHz
Modulation(NFC)	ASK
Antenna Type(NFC)	Integral antenna
Antenna Gain(NFC)	0dBi
Hardware Version	A799_MAIN_PCB_V1.1
Software Version	CUBOT_CUBOT_QUEST_8123C_V01_20181122
Power Supply:	DC3.85V by Built-in Li-ion Battery

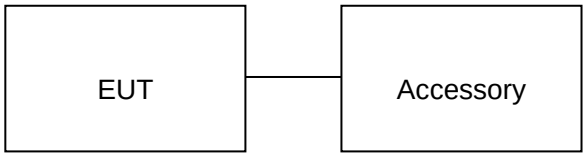
2.2 OPERATION OF EUT DURING TESTING

NO.	TEST MODE DESCRIPTION
1	Transmitting

Note:
1. All the test had been tested with full charging, only the result of the worst case was recorded in the report, if no other cases.
2.For Radiated Emission, 3axis were chosen for testing for each applicable mode.

2.3 DESCRIPTION OF TEST SETUP

Configure :



Item	Equipment	Model No.	ID or Specification	Remark
1	Smart Phone	QUEST	2AHZ5QUEST	EUT
2	Adapter	QUEST	DC 5.0V 2A	Accessory
3	Battery	QUEST	DC3.85V/ 4000mAh	Accessory
4	USB	N/A	N/A	Accessory

2.4 MEASUREMENT INSTRUMENTS LIST

Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
L.I.S.N. Artificial Mains Network	R&S	ENV216	HKE-002	Dec. 27, 2018	Dec. 26, 2019
Receiver	R&S	ESCI 7	HKE-010	Dec. 27, 2018	Dec. 26, 2019
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Dec. 27, 2018	Dec. 26, 2019
Spectrum analyzer	R&S	FSP40	HKE-025	Dec. 27, 2018	Dec. 26, 2019
Spectrum analyzer	Agilent	N9020A	HKE-048	Dec. 27, 2018	Dec. 26, 2019
Preamplifier	Schwarzbeck	BBV 9743	HKE-006	Dec. 27, 2018	Dec. 26, 2019
EMI Test Receiver	Rohde & Schwarz	ESCI 7	HKE-010	Dec. 27, 2018	Dec. 26, 2019
Bilog Broadband Antenna	Schwarzbeck	VULB9163	HKE-012	Dec. 27, 2018	Dec. 26, 2019
Loop Antenna	Schwarzbeck	FMZB 1519 B	HKE-014	Dec. 27, 2018	Dec. 26, 2019
Pre-amplifier	EMCI	EMC051845SE	HKE-015	Dec. 27, 2018	Dec. 26, 2019
Pre-amplifier	Agilent	83051A	HKE-016	Dec. 27, 2018	Dec. 26, 2019
EMI Test Software EZ-EMC	Tonscend	JS1120-B Version	HKE-083	Dec. 27, 2018	Dec. 26, 2019
Shielded room	Shiel Hong	4*3*3	HKE-039	Dec. 27, 2017	Dec. 26, 2020

3. RADIATED EMISSION

3.1TEST LIMIT

Within the 13.110MHz-14.010MHz band

Frequencies (MHz)	Field Strength at 30m (microvolts/meter)	Field Strength at 30m (dBuV/m)	Field Strength at 3m (dBuV/m)
13.553~13.567	15.848	84	124
13.410~13.553 13.567~13.710	334	50.5	90.5
13.110~13.410 13.710~14.010	106	40.5	80.5

According to 15.35, on any frequency or frequencies below or equal to 1000 MHz, the limits Shown are based on measuring equipment employing a CISPR quasi-peak detector function and related measurement bandwidths, unless otherwise specified the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test.

Outside of the 13.110MHz-14.010MHz band

Frequency (MHz)	Distance Meters	Field Strengths Limit	
		μV/m	dB(μV)/m
0.009 ~ 0.490	300	2400/F(kHz)	---
0.490 ~ 1.705	30	24000/F(kHz)	---
1.705 ~ 30	30	30	---
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	Other:74.0 dB(μV)/m (Peak) 54.0 dB(μV)/m (Average)	

Remark: (1) Emission level dBμV = 20 log Emission level μV/m

(2) The smaller limit shall apply at the cross point between two frequency bands.

(3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

3.2. MEASUREMENT PROCEDURE

1. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High - Low scan is not required in this case.

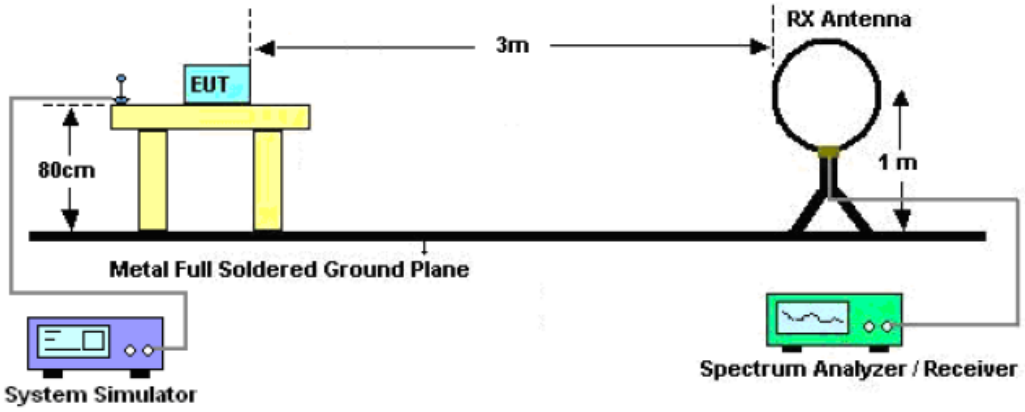
The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP
Start ~Stop Frequency	1GHz~26.5GHz 1MHz/1MHz for Peak, 1MHz/10Hz for Average

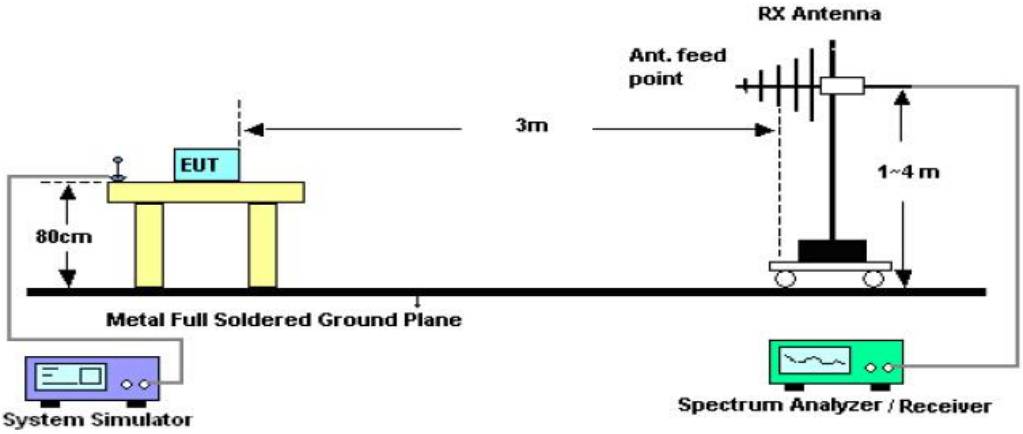
Receiver Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP

3.3. TEST SETUP

Radiated Emission Test-Setup Frequency Below 30MHz



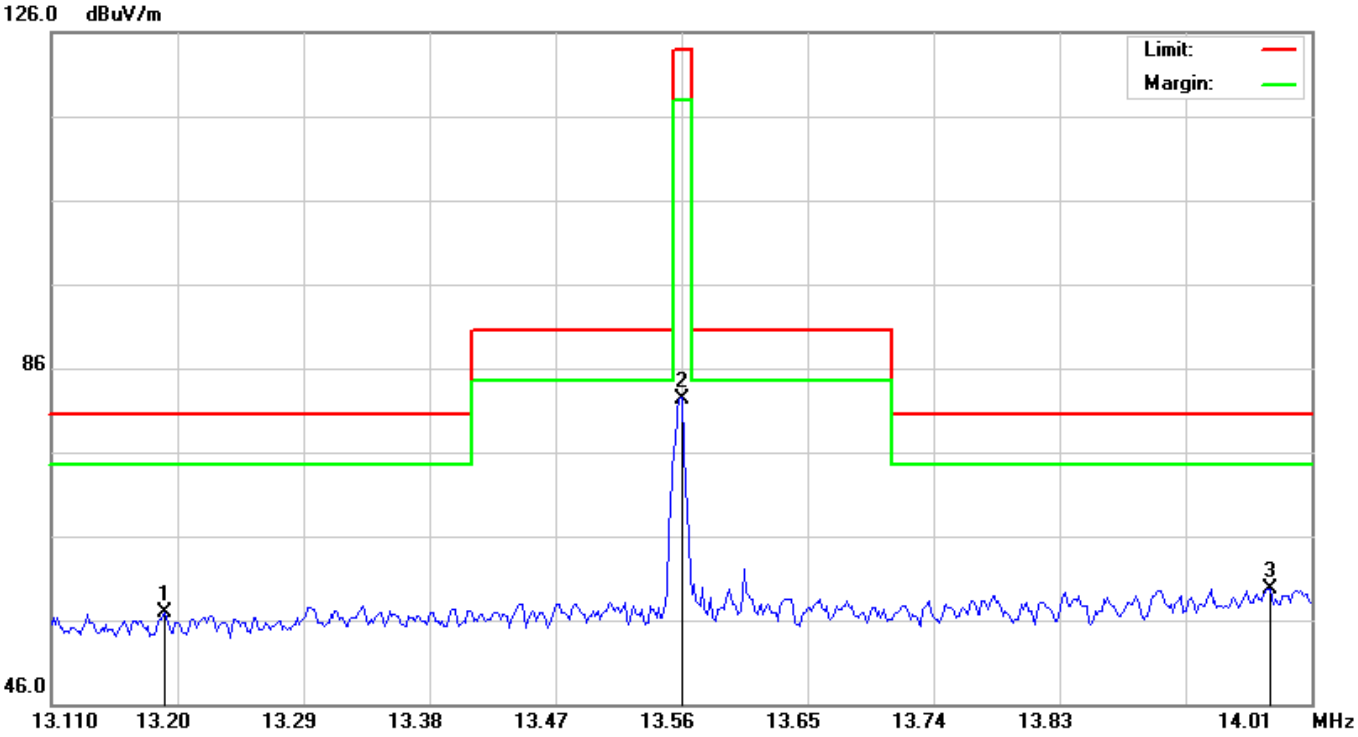
RADIATED EMISSION TEST SETUP 30MHz-1000MHz



3.4. TEST RESULT

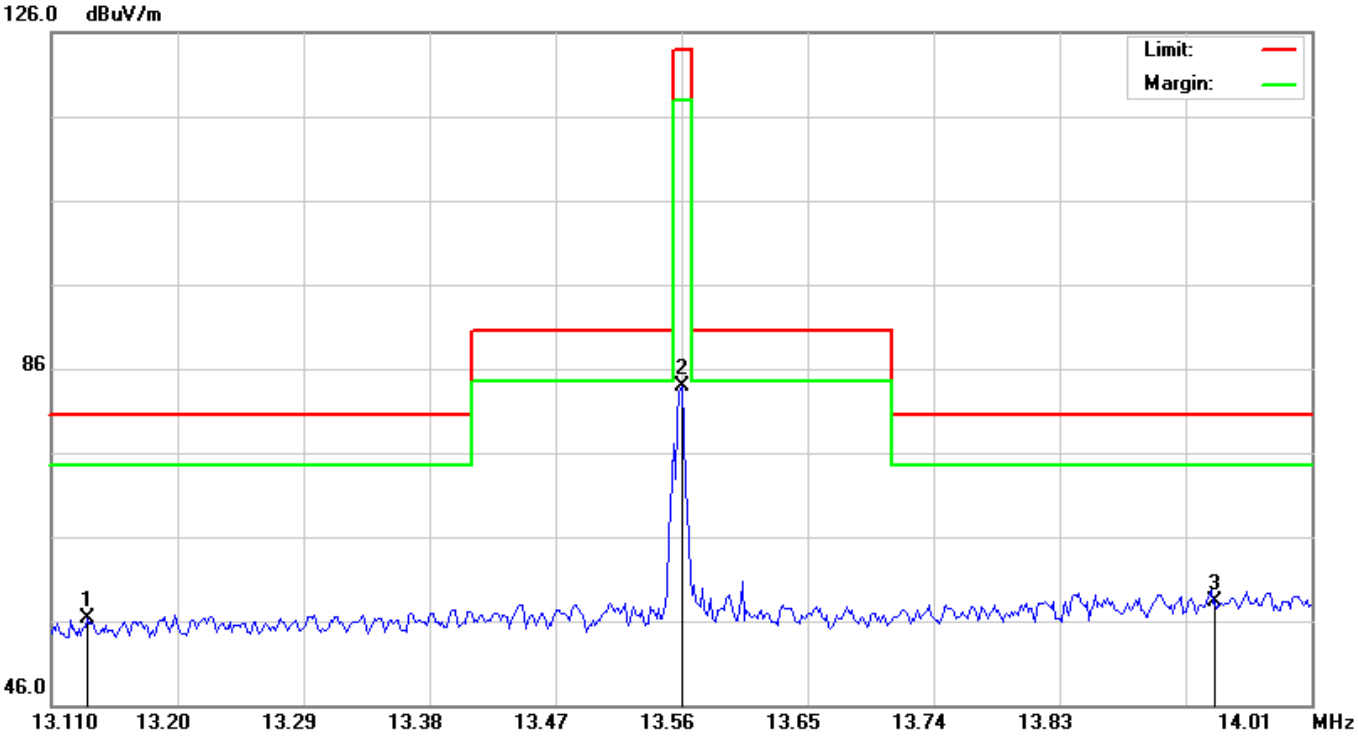
RADIATED EMISSION BELOW 30MHZ

EUT：	Smart Phone	Model Name	QUEST
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC3.85V
Test Mode ：	Mode 1	Polarization :	Face



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB		cm	degree	
1		13.1910	-8.09	65.00	56.91	80.50	-23.59	peak			
2		13.5600	17.40	65.00	82.40	124.00	-41.60	peak			
3	*	13.9800	-5.21	65.00	59.79	80.50	-20.71	peak			

EUT：	Smart Phone	Model Name	QUEST
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC3.85V
Test Mode ：	Mode 1	Polarization :	Side

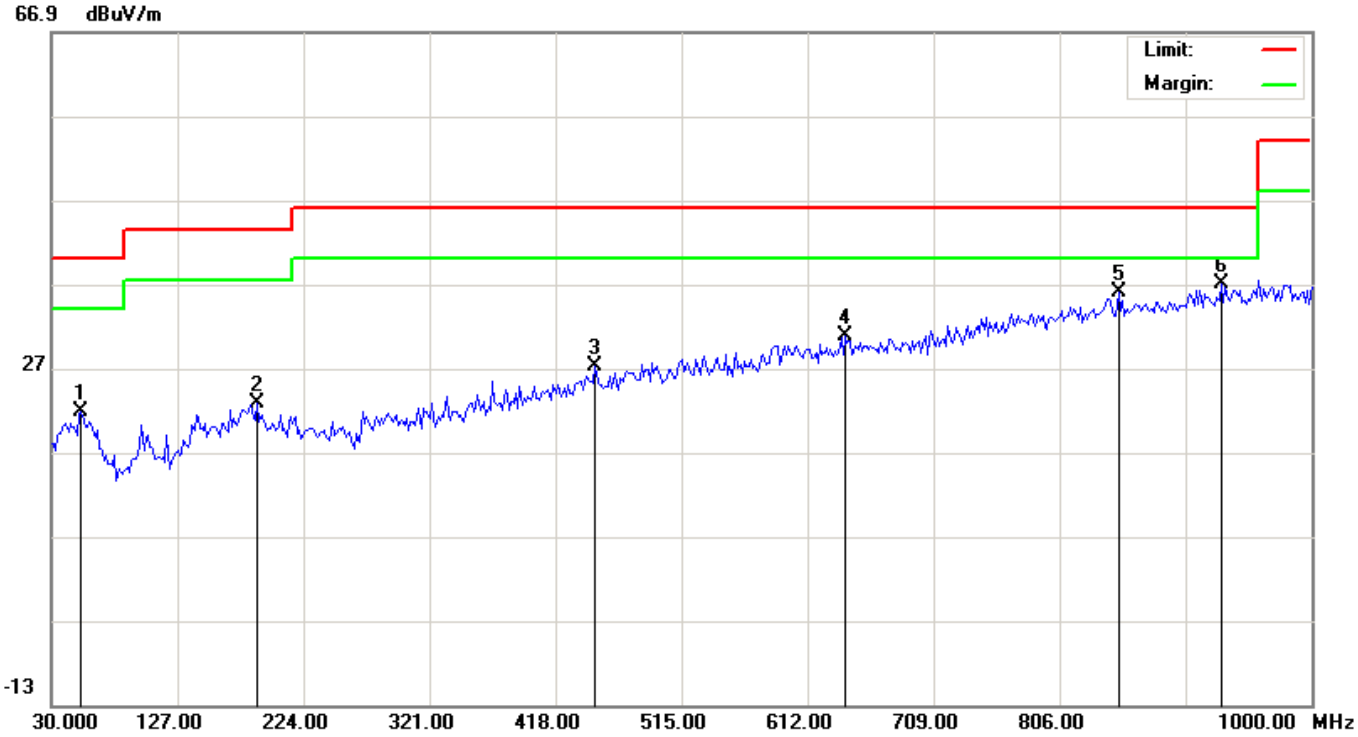


No.	Mk.	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB		cm	degree	
1		13.1355	-8.71	65.00	56.29	80.50	-24.21	peak			
2		13.5600	18.90	65.00	83.90	124.00	-40.10	peak			
3	*	13.9410	-6.74	65.00	58.26	80.50	-22.24	peak			

Note: Other emissions from 9 kHz to 30 MHz are considered as ambient noise. No recording in the test report.

RADIATED EMISSION 30MHz- 1GHZ

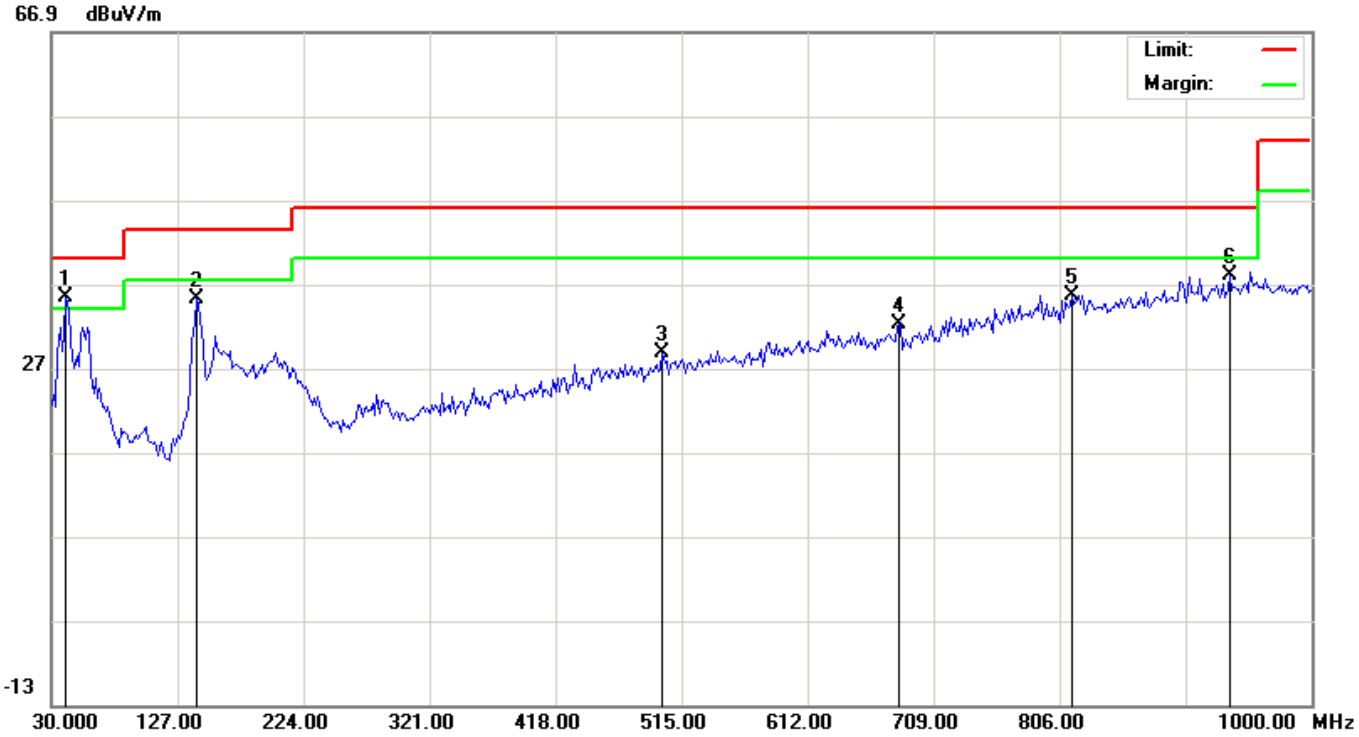
EUT：	Smart Phone	Model Name	QUEST
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC3.85V
Test Mode ：	Mode 1	Polarization :	Horizontal



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		52.6333	0.65	21.14	21.79	40.00	-18.21	peak			
2		188.4333	4.83	17.91	22.74	43.50	-20.76	peak			
3		448.7167	1.22	25.96	27.18	46.00	-18.82	peak			
4		641.1000	0.87	29.84	30.71	46.00	-15.29	peak			
5		851.2667	2.05	33.94	35.99	46.00	-10.01	peak			
6	*	930.4833	2.08	34.97	37.05	46.00	-8.95	peak			

RESULT: PASS

EUT：	Smart Phone	Model Name	QUEST
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC3.85V
Test Mode ：	Mode 1	Polarization :	Vertical



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	41.3167	13.83	21.60	35.43	40.00	-4.57	peak			
2		141.5500	15.02	20.22	35.24	43.50	-8.26	peak			
3		500.4500	1.65	27.15	28.80	46.00	-17.20	peak			
4		683.1332	1.72	30.49	32.21	46.00	-13.79	peak			
5		815.7000	2.29	33.41	35.70	46.00	-10.30	peak			
6		936.9500	2.87	35.04	37.91	46.00	-8.09	peak			

RESULT: PASS

Note:

Factor=Antenna Factor + Cable loss, Margin=Result-Limit.

The “Factor” value can be calculated automatically by software of measurement system.

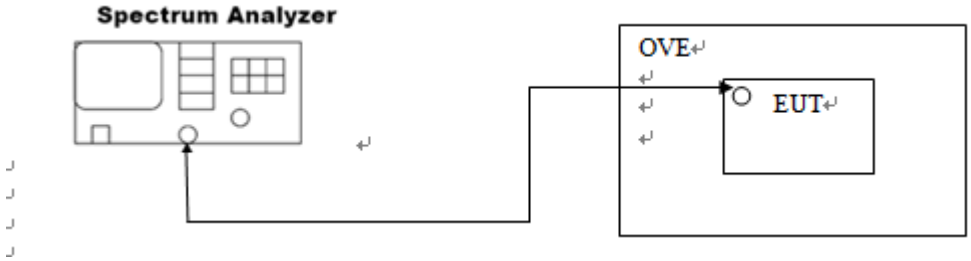
The mode 1 is the worst case, and only the data of the worst case recorded in this test report.

4. FREQUENCY STABILITY

4.1. MEASUREMENT PROCEDURE

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on the operation frequency.
3. Set SPA Centre Frequency = Operation Frequency, RBW= 1 KHz, VBW≥3×RBW.
4. Set SPA Trace 1 Max hold, then View.
5. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
6. Extreme temperature rule is -20°C~50°C.

8.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



4.3. MEASUREMENT RESULTS

Operating frequency: 13.56MHz

Voltage vs. Frequency Stability (Test Temperature: 20℃)

Voltage(V)	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit(MHz)	Conclusion
3.85	13.56065	0.00067	0.001356	PASS
3.27	13.56067			
4.40	13.56063			

Temperature vs. Frequency Stability (Test Voltage: 3.85V)

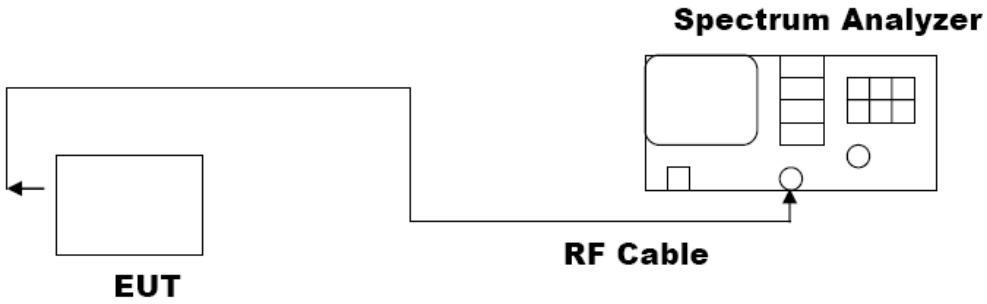
Temperature	Measurement Frequency (MHz)	Max. Deviation (MHz)	Limit(MHz)	Conclusion
- 20℃	13.56062	0.00067	0.001356	PASS
-10℃	13.56063			
0℃	13.56067			
10℃	13.56064			
20℃	13.56060			
30℃	13.56067			
40℃	13.56065			
50℃	13.56061			

5. BANDWIDTH

5.1. MEASUREMENT PROCEDURE

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on the operation frequency.
3. Set SPA Centre Frequency = Operation Frequency, RBW= 10 KHz, VBW≥3×RBW.
4. Set SPA Trace 1 Max hold, then View.

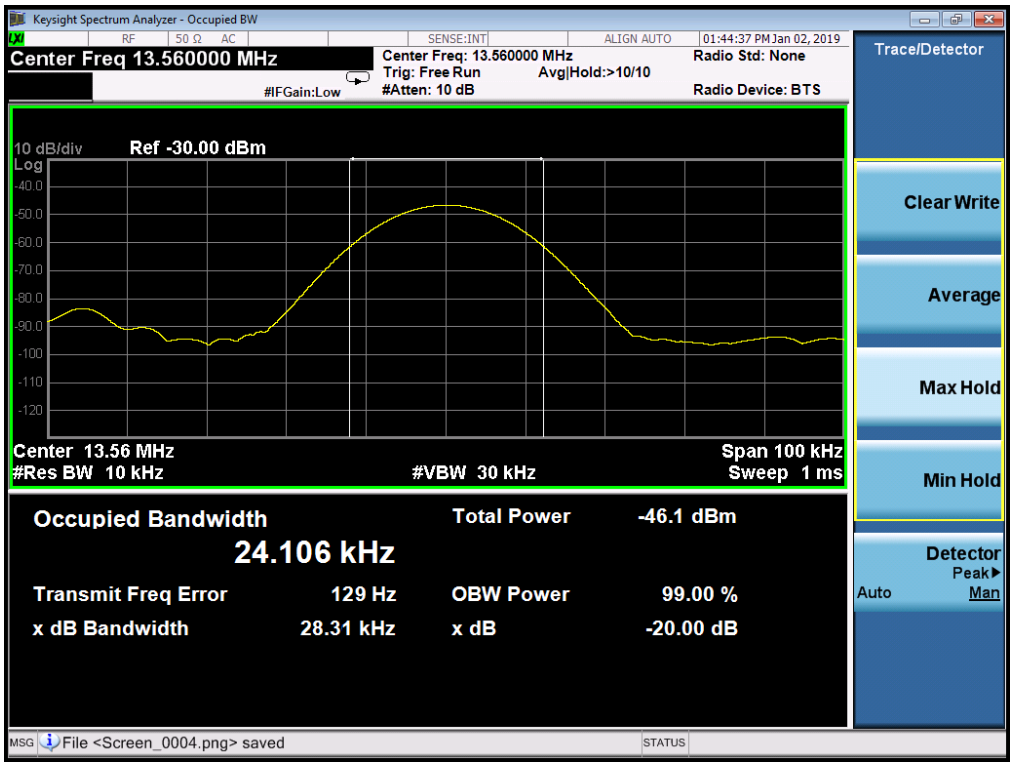
5.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



5.3. MEASUREMENT RESULTS

TEST ITEM	BANDWIDTH
TEST MODE	Mode1

Test Data (kHz)		Criteria
Occupied Bandwidth	24.106	PASS
-20dB Bandwidth	28.31	PASS



6. LINE CONDUCTED EMISSION TEST

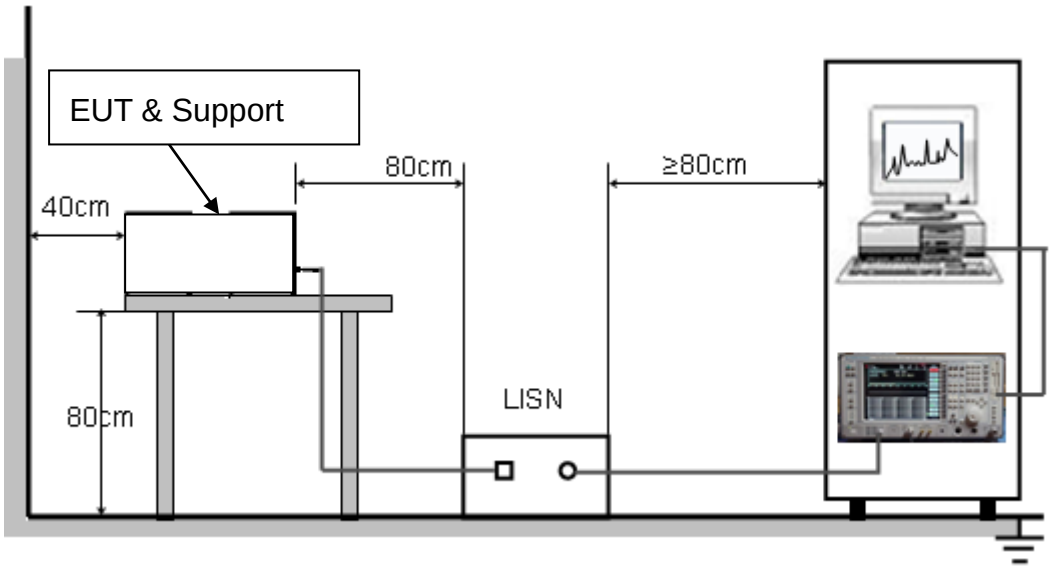
6.1. LIMITS OF LINE CONDUCTED EMISSION TEST

Frequency	Maximum RF Line Voltage	
	Q.P.(dBuV)	Average(dBuV)
150kHz~500kHz	66-56	56-46
500kHz~5MHz	56	46
5MHz~30MHz	60	50

Note:

1. The lower limit shall apply at the transition frequency.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

6.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



6.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
2. Support equipment, if needed, was placed as per ANSI C63.10.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
4. All support equipments received AC120V/60Hz power from a LISN, if any.
5. The EUT received charging voltage by adapter which received 120V/60Hzpower by a LISN..
6. The test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.
9. The test mode(s) were scanned during the preliminary test.

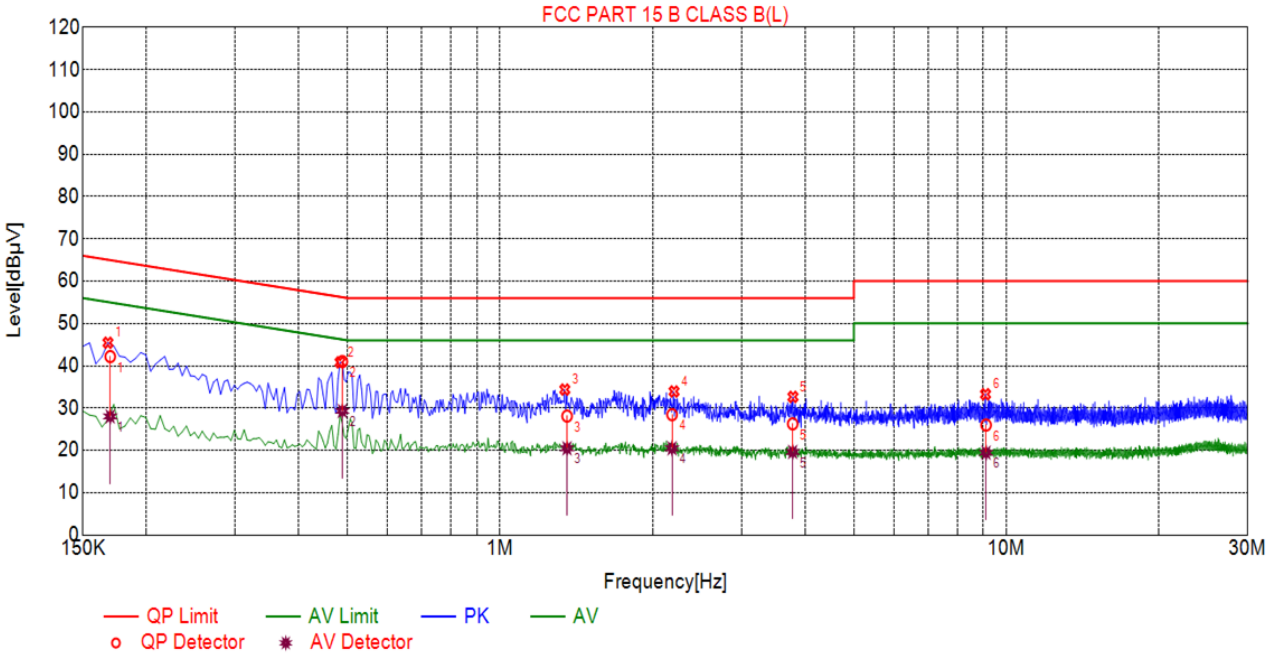
Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

6.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
2. A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less –2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
3. The test data of the worst case condition(s) was reported on the Summary Data page.

6.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

LINE CONDUCTED EMISSION TEST LINE 1-L

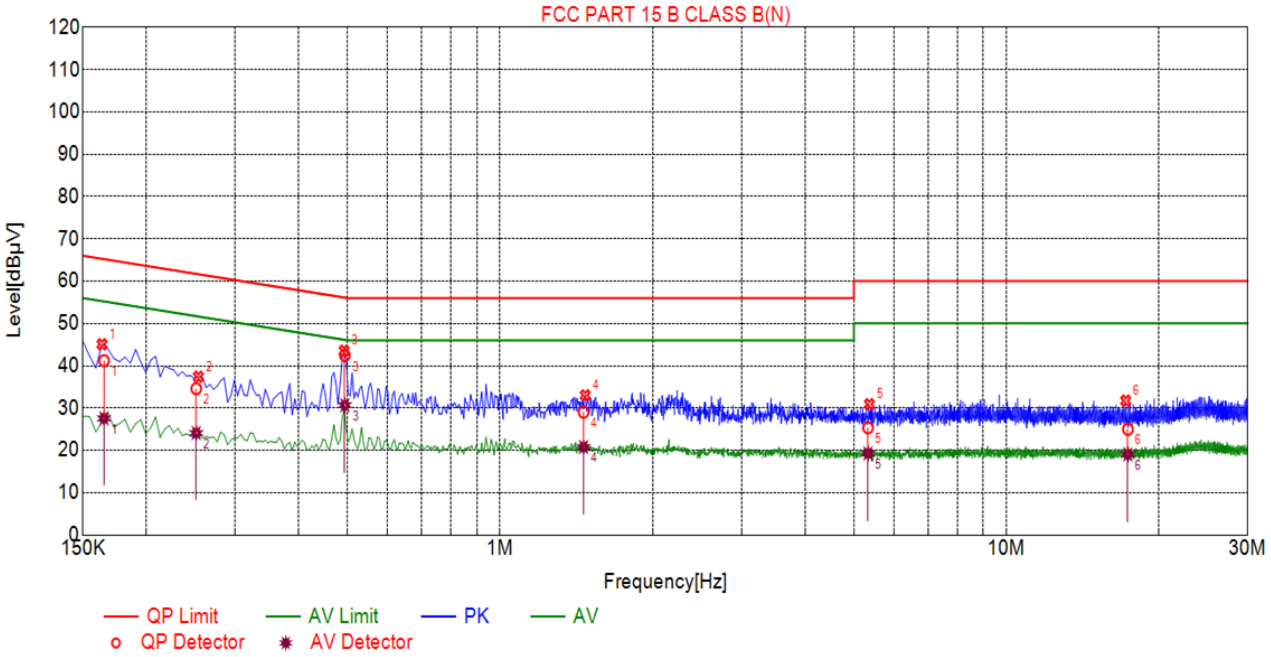


Suspected List						
NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Detector
1	0.1680	45.43	10.01	65.06	19.63	PK
2	0.4830	40.80	10.04	56.29	15.49	PK
3	1.3425	34.38	10.10	56.00	21.62	PK
4	2.2065	33.92	10.17	56.00	22.08	PK
5	3.7905	32.64	10.25	56.00	23.36	PK
6	9.1005	33.27	10.11	60.00	26.73	PK

Final Data List								
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]
1	0.1697	10.02	42.18	64.98	22.80	28.03	54.98	26.95
2	0.4878	10.04	41.01	56.20	15.19	29.32	46.20	16.88
3	1.3559	10.10	28.12	56.00	27.88	20.49	46.00	25.51
4	2.1862	10.16	28.44	56.00	27.56	20.49	46.00	25.51
5	3.7851	10.25	26.28	56.00	29.72	19.63	46.00	26.37
6	9.1221	10.11	25.99	60.00	34.01	19.45	50.00	30.55

RESULT: PASS

Line Conducted Emission Test Line 2-N



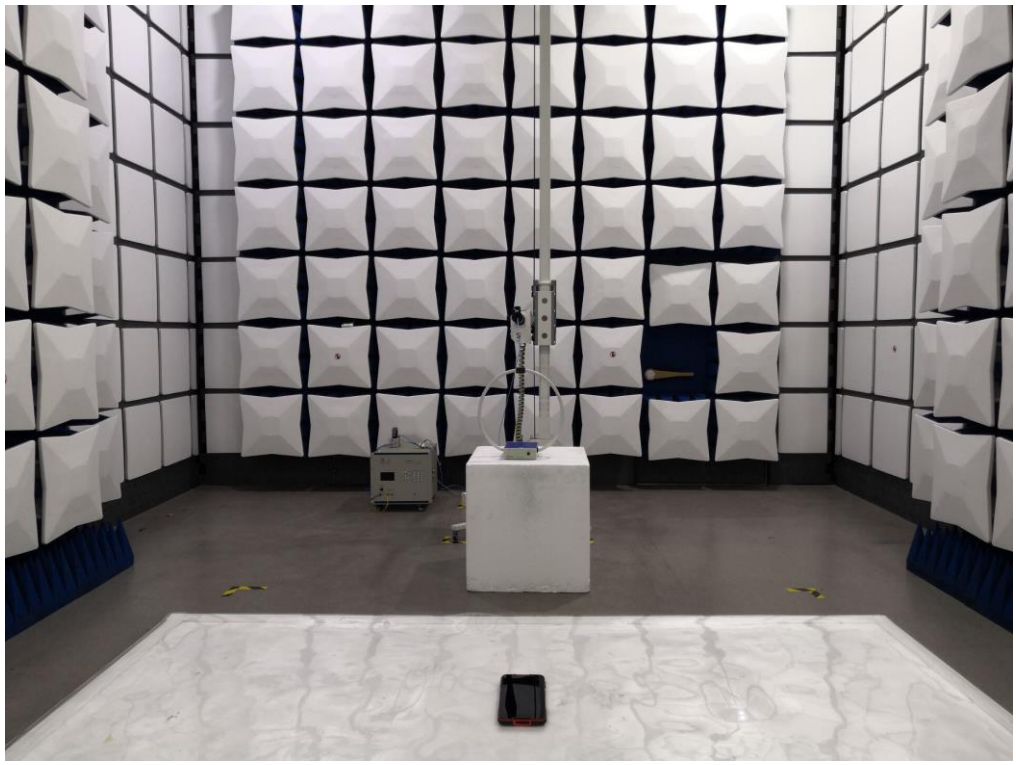
Suspected List						
NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Detector
1	0.1635	45.08	9.98	65.28	20.20	PK
2	0.2535	37.42	10.04	61.64	24.22	PK
3	0.4920	43.56	10.04	56.13	12.57	PK
4	1.4730	33.01	10.10	56.00	22.99	PK
5	5.3655	30.91	10.26	60.00	29.09	PK
6	17.2230	31.75	10.01	60.00	28.25	PK

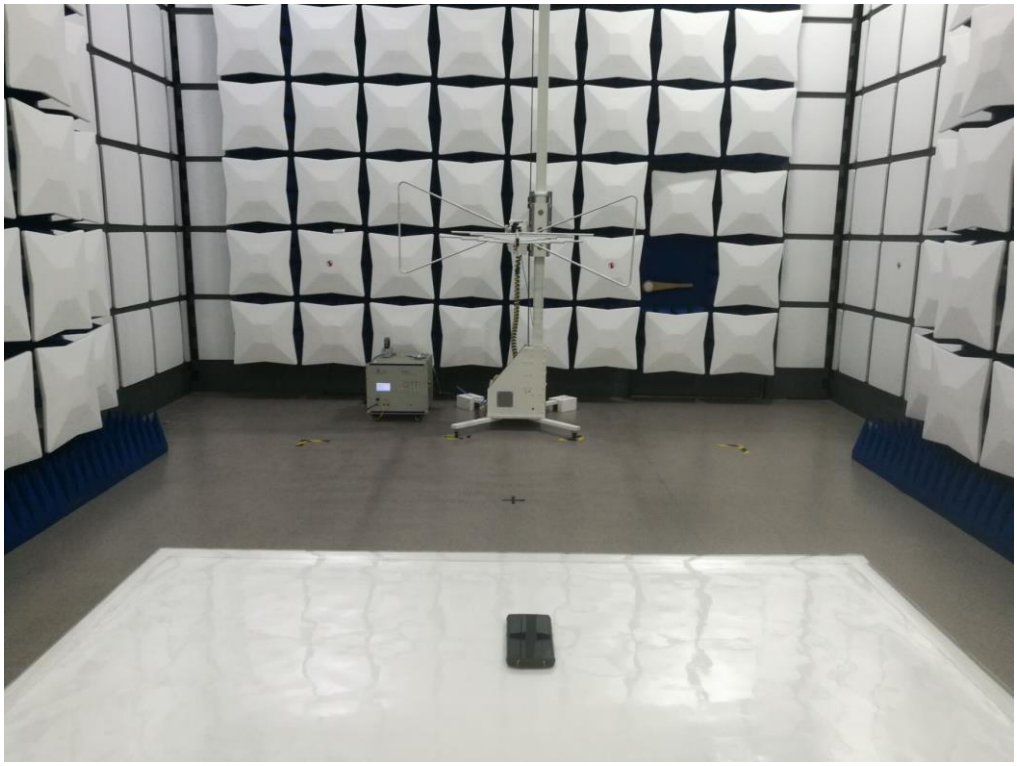
Final Data List								
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]
1	0.1650	9.99	41.21	65.21	24.00	27.57	55.21	27.64
2	0.2510	10.04	34.60	61.73	27.13	24.11	51.73	27.62
3	0.4935	10.04	42.45	56.11	13.66	30.68	46.11	15.43
4	1.4618	10.10	29.05	56.00	26.95	20.79	46.00	25.21
5	5.3326	10.26	25.33	60.00	34.67	19.29	50.00	30.71
6	17.3900	10.01	24.99	60.00	35.01	19.03	50.00	30.97

RESULT: PASS

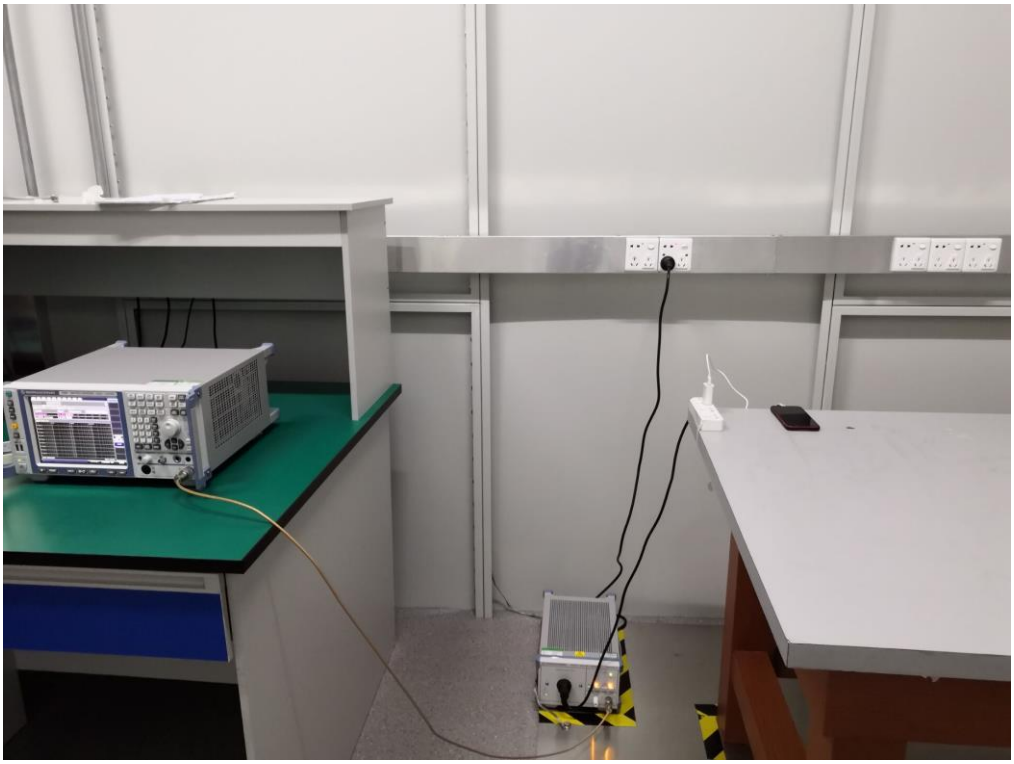
APPENDIX A: PHOTOGRAPHS OF TEST SETUP

RADIATED EMISSION TEST SETUP BELOW 1GHz





FCC LINE CONDUCTED EMISSION TEST SETUP



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