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Report No.: HR/2018/A000906
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TEST REPORT

Application No.: HR/2018/A0009
Applicant: Unimax communications
Address of Applicant: 18201 McDurmott St. West Suite E, Irvine, CA 92614
Manufacturer: Unimaxcomm
Address of Manufacturer: Room 602, Building-B, Shenzhen Software Park T3, Hi-Tech Park South, Nan Shan District, Shenzhen, China
Factory: Unimaxcomm
Address of Factory: Room 602, Building-B, Shenzhen Software Park T3, Hi-Tech Park South, Nan Shan District, Shenzhen, China
Equipment Under Test (EUT):
EUT Name: Smartphone
Model No.: U504TL
Trade mark: UMX
Standard(s) : 47 CFR Part 15, Subpart B
Date of Receipt: 2018-10-30
Date of Test: 2018-11-03 to 2018-11-14
Date of Issue: 2018-11-16

Test Result:	Pass
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* In the configuration tested, the EUT complied with the standards specified above.



Keny Xu

EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2018-11-16		Original

Authorized for issue by:			
		 _____ Leo Lai /Project Engineer	
		 _____ Eric Fu /Reviewer	

2 Test Summary

Emission Part				
Item	Standard	Method	Requirement	Result
Conducted Emissions at Mains Terminals (150kHz-30MHz)	47 CFR Part 15, Subpart B	ANSI C63.4:2014	Class B	Pass
Radiated Emissions (30MHz-1GHz)	47 CFR Part 15, Subpart B	ANSI C63.4:2014	Class B	Pass
Radiated Emissions (above 1GHz)	47 CFR Part 15, Subpart B	ANSI C63.4:2014	Class B	Pass

Internal Source	Upper Frequency
Below 1.705MHz	30MHz
1.705MHz to 108MHz	1GHz
108MHz to 500MHz	2GHz
500MHz to 1GHz	5GHz
Above 1GHz	5th harmonic of the highest frequency or 40GHz, whichever is lower

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4 General Information

4.1 Details of E.U.T.

Power supply:	DC 3.8V from internal battery or AC/DC adapter Adapter Model No.: BLJ05L050070U-U Input: 100-240V ~ 50/60Hz 0.15A Output: DC 5V 700mA
Cable:	USB cable: 100cm shielded

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Laptop	Lenovo	T430u	REF. No.SEA1800
Mouse	Lenovo	M-U0025-O	REF. No.:SEA2400
Router	NETGEAR	DGN2200	REF. No.SEA2200

4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Conduction Emission	± 3.0dB (150kHz to 30MHz)
2	Radiated Emission	± 4.5dB (30MHz-1GHz)
		± 4.8dB (1GHz-6GHz)
3	Temperature test	± 1 °C
4	Humidity test	± 3%

4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China.
518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

4.5 Test Facility

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

- **CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- **VCCI**

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

- **FCC –Designation Number: CN1178**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

- **Innovation, Science and Economic Development Canada**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

5 Equipment List

Conducted Emissions at Mains Terminals (150kHz-30MHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Shielding Room	ChangZhou ZhongYu	GB-88	SEM001-06	2017-05-10	2020-05-09
Measurement Software	AUDIX	e3 V5.4.1221d	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM024-01	2018-07-12	2019-07-11
LISN	Rohde & Schwarz	ENV216	SEM007-01	2018-09-25	2019-09-24
LISN	ETS-LINDGREN	3816/2	SEM007-02	2018-04-02	2019-04-01
EMI Test Receiver	Rohde & Schwarz	ESCI	SEM004-02	2018-04-02	2019-04-01

Radiated Emissions (30MHz-1GHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEM001-01	2017-08-05	2020-08-04
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM025-01	2018-07-12	2019-07-11
EMI Test Receiver	Agilent Technologies	N9038A	SEM004-05	2018-09-25	2019-09-24
BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEM003-01	2017-06-27	2020-06-26
Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEM005-01	2018-04-02	2019-04-01

Radiated Emissions (above 1GHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2018-03-13	2021-03-12
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM026-01	2018-07-12	2019-07-11
EXA Spectrum Analyzer	Agilent Technologies Inc	N9010A	SEM004-09	2018-04-13	2019-04-12
Horn Antenna(1-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2018-04-13	2021-04-12
Pre-Amplifier (0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	SEM004-11	2018-09-27	2019-09-26

General used equipment					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-03	2018-09-27	2019-09-26
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2018-09-27	2019-09-26
Humidity/ Temperature Indicator	Mingle	N/A	SEM002-08	2018-09-27	2019-09-26
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2018-04-08	2019-04-07

6 Emission Test Results

6.1 Conducted Emissions at Mains Terminals (150kHz-30MHz)

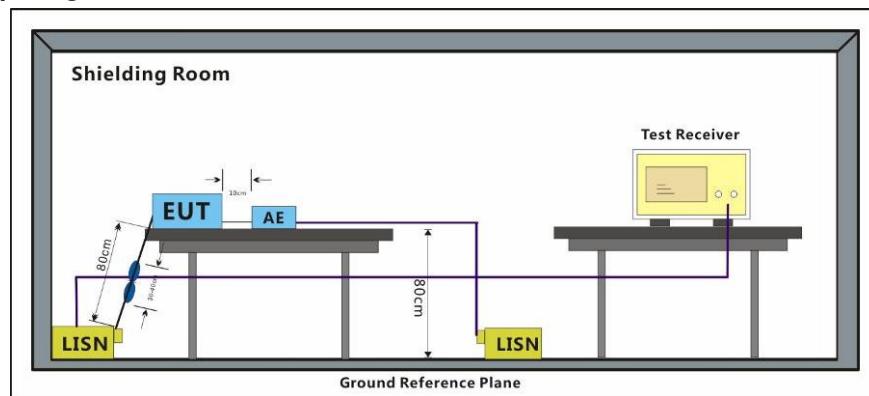
Test Requirement:	47 CFR Part 15, Subpart B
Test Method:	ANSI C63.4:2014
Frequency Range:	150kHz to 30MHz
Limit:	
0.15M-0.5MHz	66dB(μV)-56dB(μV) quasi-peak, 56dB(μV)-46dB(μV) average
0.5M-5MHz	56dB(μV) quasi-peak, 46dB(μV) average
5M-30MHz	60dB(μV) quasi-peak, 50dB(μV) average
Detector:	Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz

6.1.1 E.U.T. Operation

Operating Environment:

Temperature:	20.4 °C	Humidity:	51.6 % RH	Atmospheric Pressure:	1010 mbar
Pretest these modes to find the worst case:	e: Telecom Idle + BT + WLAN + GPS Rx + playing MP4 (SD card) + earphone + battery + adapter				
	f: Telecom Idle + BT + WLAN + GPS Rx + camera (Front) + earphone + battery + adapter				
	g: Telecom Idle + BT + WLAN + GPS Rx + camera (Back) + earphone + battery + adapter				
	h: Transfer data between the EUT and the PC(SD card)				
	i: WCDMA Band II + BT + WLAN + GPS Rx + earphone + battery				
The worst case for final test:	e: Telecom Idle + BT + WLAN + GPS Rx + playing MP4 (SD card) + earphone + battery + adapter				

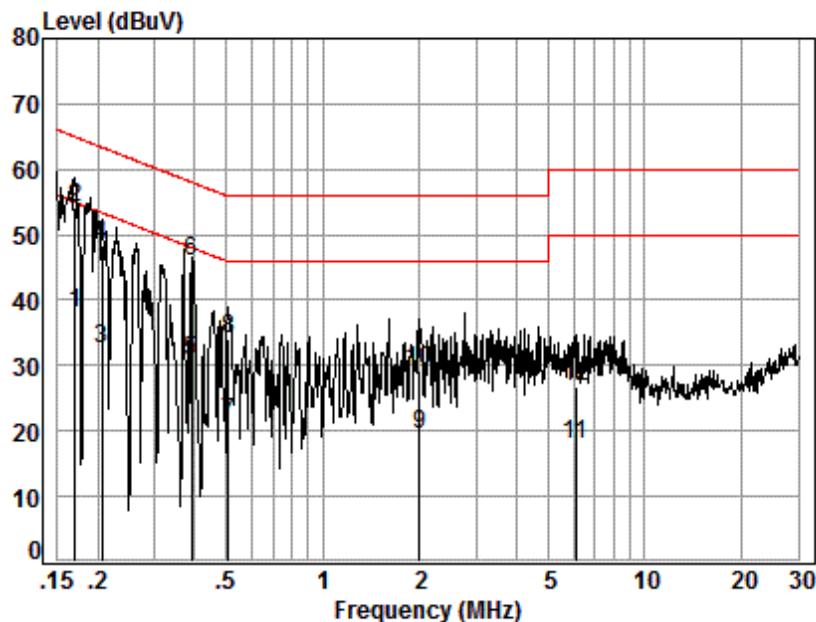
6.1.2 Test Setup Diagram



6.1.3 Measurement Data

An initial pre-scan was performed with peak detector. Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected.

Mode:j; Line:Live Line



Site : Shielding Room

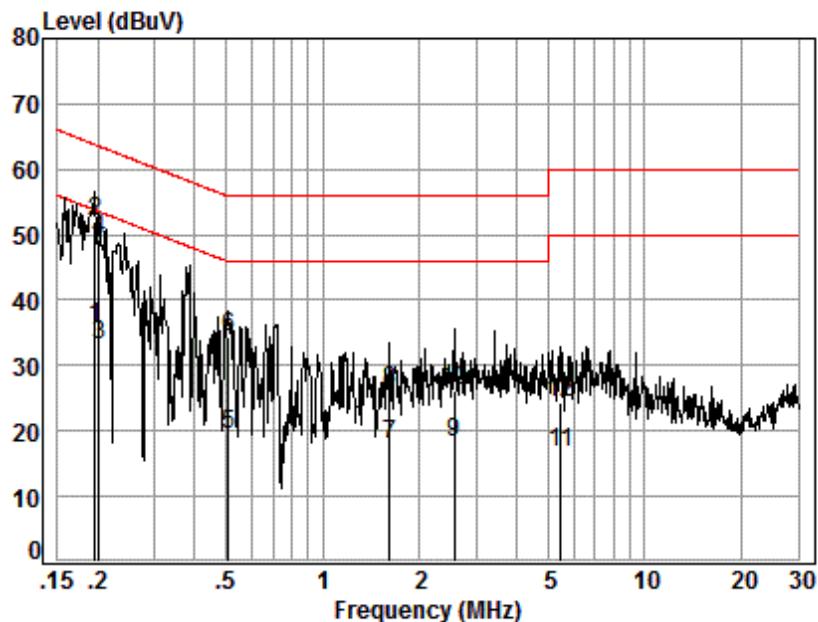
Condition: Line

Job No. : A0009

Test mode: e

Freq	Cable	LISN	Read	Limit	Over	Remark	
	Loss	Factor	Level	Level	Line		
	MHz	dB	dB	dBuV	dBuV	dB	
1	0.17	0.02	9.66	28.49	38.17	54.99	-16.82 Average
2	0.17	0.02	9.66	44.41	54.09	64.99	-10.90 QP
3	0.21	0.02	9.66	22.92	32.60	53.36	-20.76 Average
4	0.21	0.02	9.66	38.62	48.30	63.36	-15.06 QP
5	0.39	0.05	9.67	20.89	30.61	48.03	-17.42 Average
6	0.39	0.05	9.67	36.14	45.86	58.03	-12.17 QP
7	0.51	0.06	9.67	11.49	21.22	46.00	-24.78 Average
8	0.51	0.06	9.67	24.45	34.18	56.00	-21.82 QP
9	2.00	0.16	9.72	9.54	19.42	46.00	-26.58 Average
10	2.00	0.16	9.72	19.45	29.33	56.00	-26.67 QP
11	6.12	0.17	9.76	8.09	18.02	50.00	-31.98 Average
12	6.12	0.17	9.76	16.97	26.90	60.00	-33.10 QP

Mode:j; Line:Neutral Line



Site : Shielding Room

Condition: Neutral

Job No. : A0009

Test mode: e

Freq	Cable	LISN	Read	Limit	Over	Remark	
	Loss	Factor	Level	Level	Line		
	MHz	dB	dB	dBuV	dBuV	dB	
1	0.20	0.02	9.64	26.24	35.90	53.76	-17.86 Average
2	0.20	0.02	9.64	42.26	51.92	63.76	-11.84 QP
3	0.20	0.02	9.64	23.51	33.17	53.54	-20.37 Average
4	0.20	0.02	9.64	39.59	49.25	63.54	-14.29 QP
5	0.51	0.06	9.64	9.66	19.36	46.00	-26.64 Average
6	0.51	0.06	9.64	24.68	34.38	56.00	-21.62 QP
7	1.61	0.14	9.70	7.97	17.81	46.00	-28.19 Average
8	1.61	0.14	9.70	16.42	26.26	56.00	-29.74 QP
9	2.55	0.16	9.68	8.48	18.32	46.00	-27.68 Average
10	2.55	0.16	9.68	16.36	26.20	56.00	-29.80 QP
11	5.51	0.17	9.72	6.79	16.68	50.00	-33.32 Average
12	5.51	0.17	9.72	14.44	24.33	60.00	-35.67 QP

6.2 Radiated Emissions (30MHz-1GHz)

Test Requirement: 47 CFR Part 15, Subpart B

Test Method: ANSI C63.4:2014

Frequency Range: 30MHz to 1GHz

Measurement Distance: 3m

Limit:

30MHz -88MHz 40.0(dB μ V/m) quasi-peak

88MHz-216MHz 43.5(dB μ V/m) quasi-peak

216MHz-960MHz 46.0(dB μ V/m) quasi-peak

960MHz-1000MHz 54.0(dB μ V/m) quasi-peak

Detector: Peak for pre-scan (120kHz resolution bandwidth) 30M to1000MHz

6.2.1 E.U.T. Operation

Operating Environment:

Temperature: 24.4 °C Humidity: 60.4 % RH Atmospheric Pressure: 1015 mbar

Pretest these modes to find the worst case: e: Telecom Idle + BT + WLAN + GPS Rx + playing MP4 (SD card) + earphone + battery + adapter

f: Telecom Idle + BT + WLAN + GPS Rx + camera (Front) + earphone + battery + adapter

g: Telecom Idle + BT + WLAN + GPS Rx + camera (Back) + earphone + battery + adapter

h: Transfer data between the EUT and the PC(SD card)

i: WCDMA Band II + BT + WLAN + GPS Rx + earphone + battery

j: WCDMA Band VI + BT + WLAN + GPS Rx + earphone + battery

k: WCDMA Band V + BT + WLAN + GPS Rx + earphone + battery

l: LTE band 2 + BT + WLAN + GPS Rx + earphone + battery + adapter

m: LTE band 4 + BT + WLAN + GPS Rx + earphone + battery + adapter

n: LTE band 12 + BT + WLAN + GPS Rx + earphone + battery + adapter

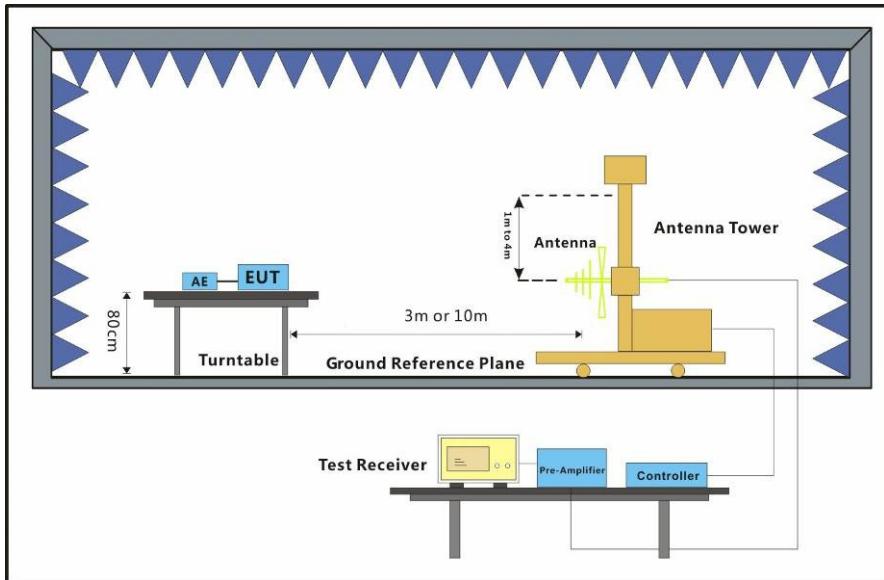
o: LTE band 66 + BT + WLAN + GPS Rx + earphone + battery + adapter

p: LTE band 71 + BT + WLAN + GPS Rx + earphone + battery + adapter

e: Telecom Idle + BT + WLAN + GPS Rx + playing MP4 (SD card) + earphone + battery + adapter

The worst case for final test:

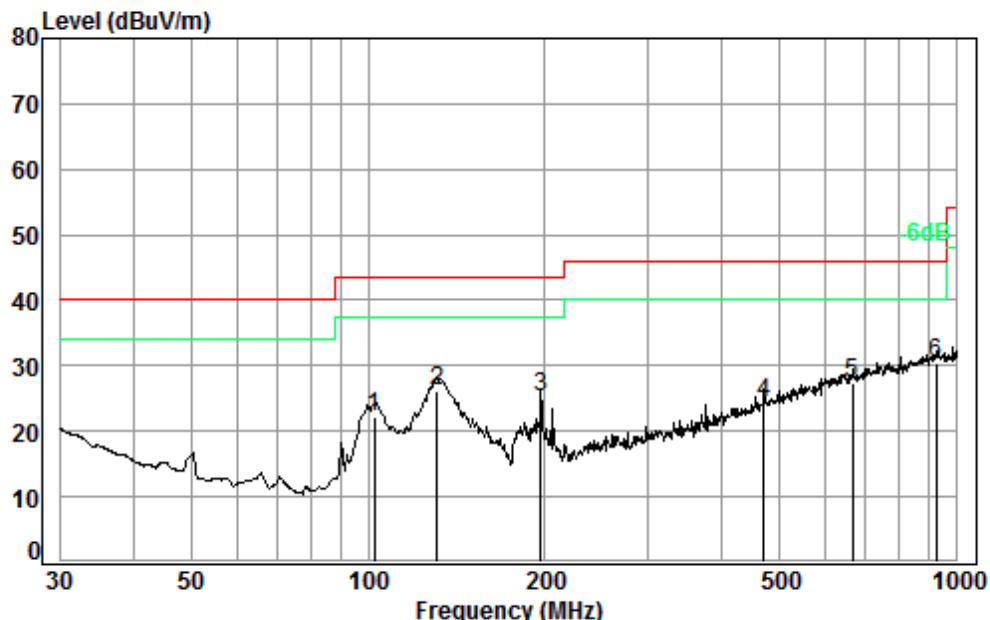
6.2.2 Test Setup Diagram



6.2.3 Measurement Data

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities.

Mode:e; Polarization:Horizontal



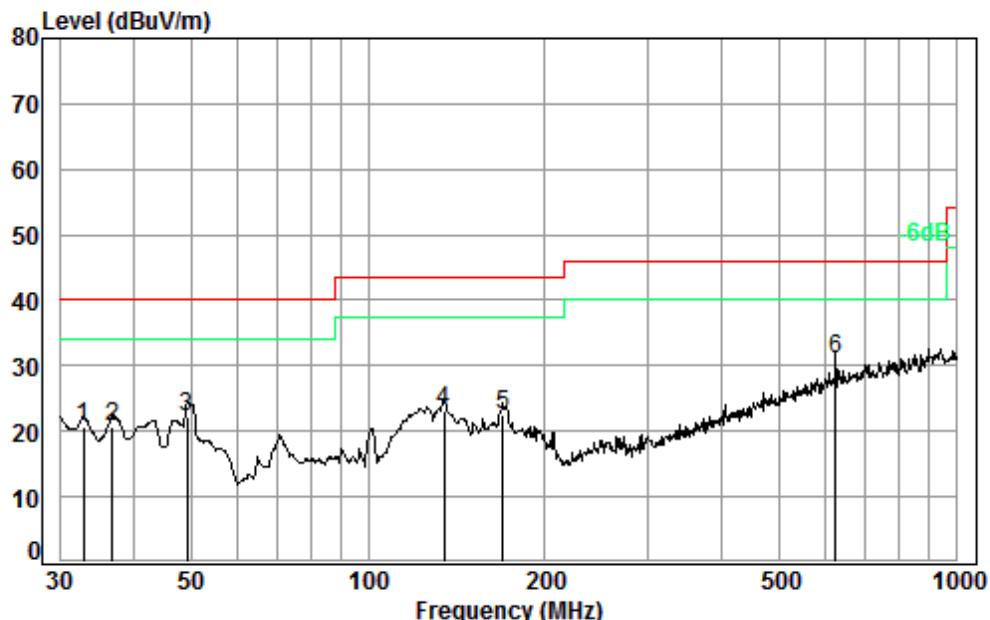
Condition: 3m HORIZONTAL

Job No. : A0009

Test mode: e

Freq	Cable	Ant	Preamp	Read	Limit	Over		
	Loss	Factor	Factor	Level				
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	102.72	1.21	13.87	27.51	34.72	22.29	43.50	-21.21
2	130.84	1.28	13.44	27.52	38.99	26.19	43.50	-17.31
3	196.51	1.39	16.40	27.53	35.12	25.38	43.50	-18.12
4	470.52	2.49	24.00	27.84	25.77	24.42	46.00	-21.58
5	665.80	2.84	27.48	27.60	24.78	27.50	46.00	-18.50
6 pp	922.52	3.62	29.92	27.00	23.82	30.36	46.00	-15.64

Mode:e; Polarization:Vertical



Condition: 3m VERTICAL

Job No. : A0009

Test mode: e

Freq	Cable	Ant	Preamp	Read	Limit	Over		
	Loss	Factor	Factor	Level				
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	32.86	0.60	20.92	27.66	26.73	20.59	40.00	-19.41
2	36.77	0.60	18.97	27.64	28.67	20.60	40.00	-19.40
3	49.36	0.79	14.39	27.60	34.72	22.30	40.00	-17.70
4	134.56	1.29	13.55	27.52	35.69	23.01	43.50	-20.49
5	169.60	1.35	15.70	27.52	32.87	22.40	43.50	-21.10
6 pp	622.89	2.75	26.92	27.66	29.01	31.02	46.00	-14.98

6.3 Radiated Emissions (above 1GHz)

Test Requirement: 47 CFR Part 15, Subpart B

Test Method: ANSI C63.4:2014

Frequency Range: Above 1GHz

Measurement Distance: 3m

Limit:

Above 1GHz 74(dB μ V/m) peak, 54(dB μ V/m) average

Detector: Peak for pre-scan (1000kHz resolution bandwidth) 1000M to18000MHz

6.3.1 E.U.T. Operation

Operating Environment:

Temperature: 24.4 °C Humidity: 60.4 % RH Atmospheric Pressure: 1015 mbar

Pretest these modes to find the worst case: e: Telecom Idle + BT + WLAN + GPS Rx + playing MP4 (SD card) + earphone + battery + adapter

f: Telecom Idle + BT + WLAN + GPS Rx + camera (Front) + earphone + battery + adapter

g: Telecom Idle + BT + WLAN + GPS Rx + camera (Back) + earphone + battery + adapter

h: Transfer data between the EUT and the PC(SD card)

i: WCDMA Band II + BT + WLAN + GPS Rx + earphone + battery

j: WCDMA Band VI + BT + WLAN + GPS Rx + earphone + battery

k: WCDMA Band V + BT + WLAN + GPS Rx + earphone + battery

l: LTE band 2 + BT + WLAN + GPS Rx + earphone + battery + adapter

m: LTE band 4 + BT + WLAN + GPS Rx + earphone + battery + adapter

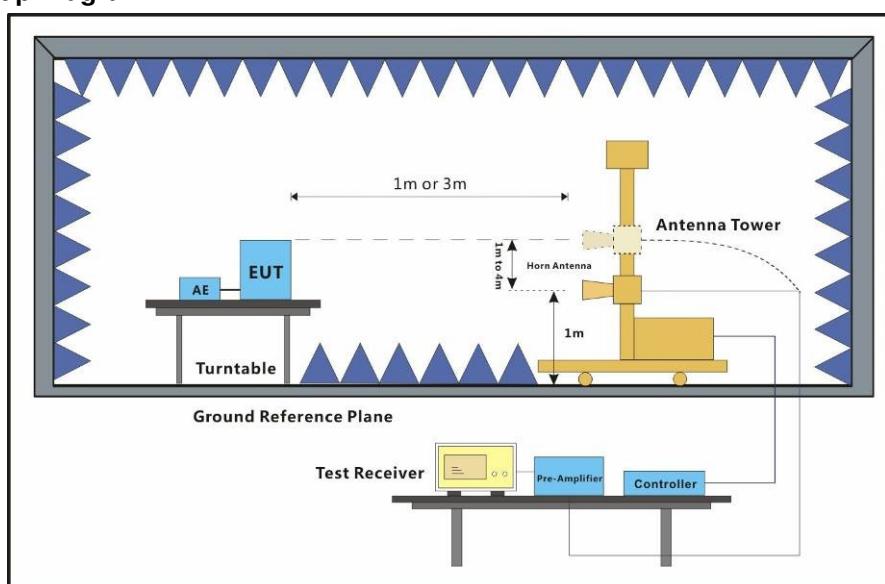
n: LTE band 12 + BT + WLAN + GPS Rx + earphone + battery + adapter

o: LTE band 66 + BT + WLAN + GPS Rx + earphone + battery + adapter

p: LTE band 71 + BT + WLAN + GPS Rx + earphone + battery + adapter

The worst case for final test: e: Telecom Idle + BT + WLAN + GPS Rx + playing MP4 (SD card) + earphone + battery + adapter

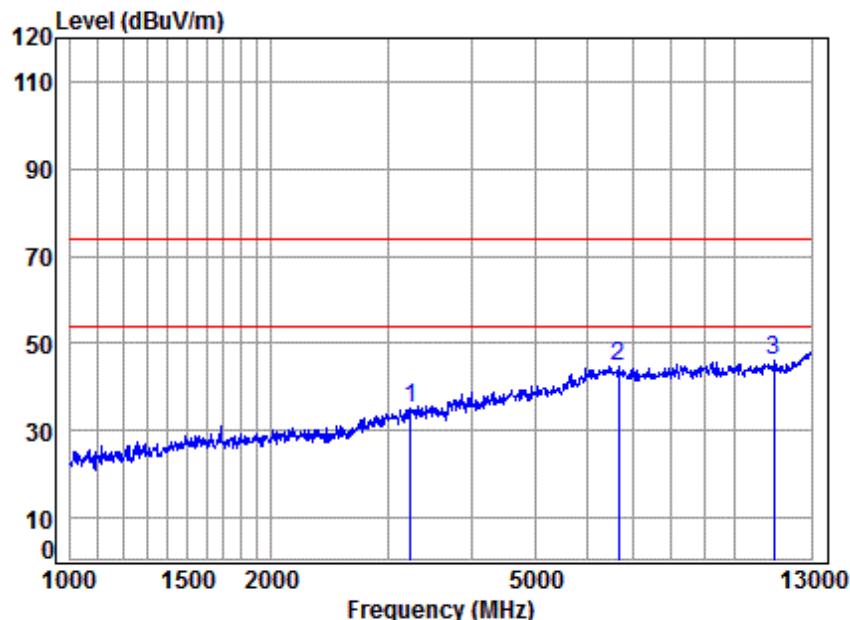
6.3.2 Test Setup Diagram



6.3.3 Measurement Data

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Average measurements were conducted based on the peak sweep graph. The EUT was measured by Horn antenna with 2 orthogonal polarities.

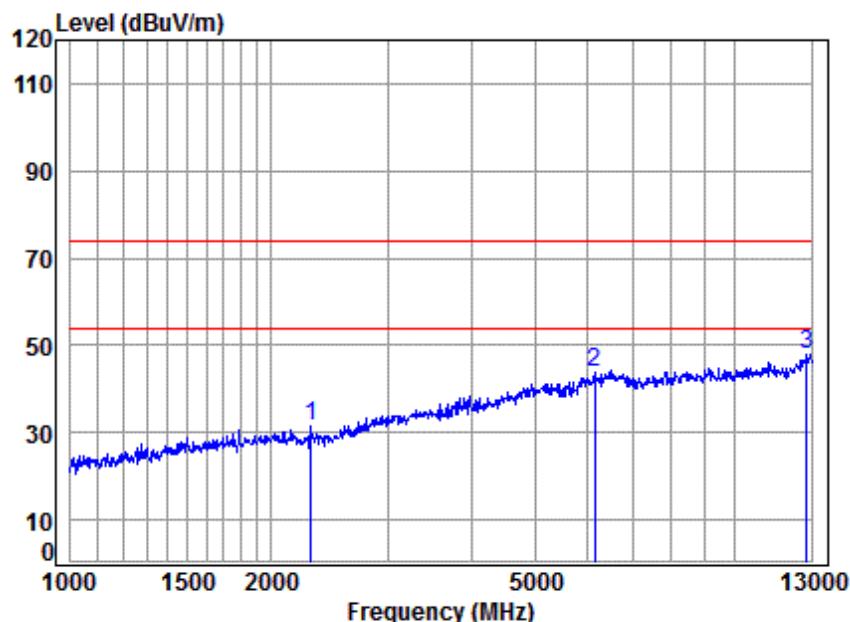
Mode:e; Polarization:Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No : A0009
Mode : e

		Cable Freq	Ant Loss	Preamp Factor	Read Level	Limit Level	Line Level	Over Limit	Remark
		MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	3245.637	6.23	31.31	42.16	39.80	35.18	74.00	-38.82	Peak
2	6672.953	11.04	35.71	41.09	39.05	44.71	74.00	-29.29	Peak
3	11405.970	12.05	37.88	38.14	34.08	45.87	74.00	-28.13	Peak

Mode:e; Polarization:Vertical



Site : chamber
Condition: 3m VERTICAL
Job No : A0009
Mode : e

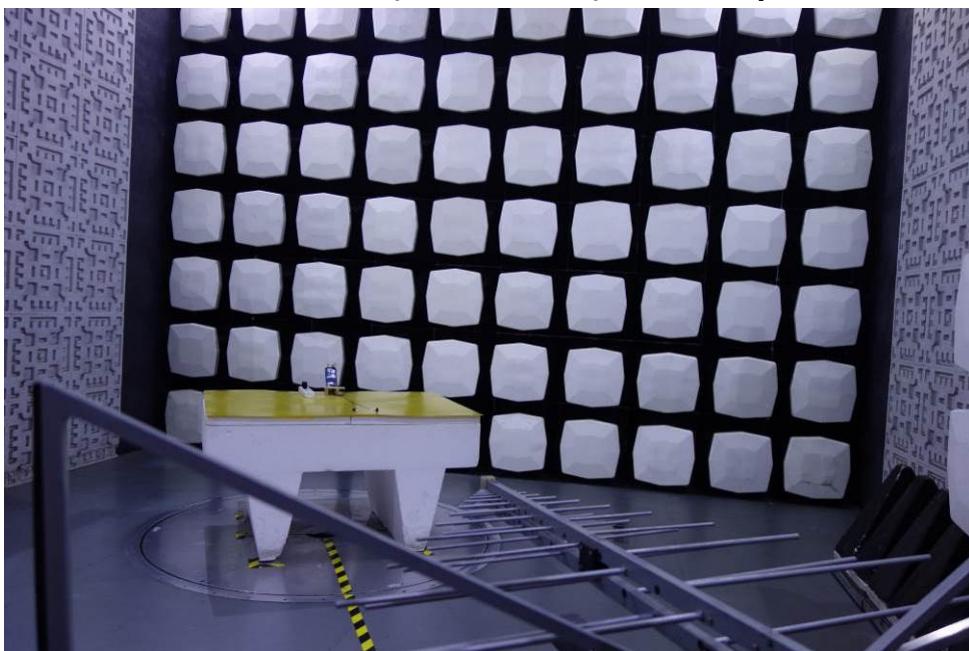
		Cable Freq	Ant Loss	Preamp Factor	Read Level	Limit Level	Line Limit	Over Limit	Remark
		MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2295.713	5.34	28.36	41.83	39.61	31.48	74.00	-42.52	Peak
2	6131.376	10.83	35.24	41.50	39.17	43.74	74.00	-30.26	Peak
3	12801.470	12.99	38.20	38.50	35.03	47.72	74.00	-26.28	Peak

7 Photographs

7.1 Conducted Emissions at Mains Terminals (150kHz-30MHz) Test Setup



7.2 Radiated Emissions (30MHz-1GHz) Test Setup



7.3 EUT Constructional Details (EUT Photos)

Refer to Appendix A - Photographs of EUT Constructional Details for HR/2018/A0009.

- End of the Report -