

TEST REPORT

Application No: ZR/202070004
Applicant: LG Electronics USA, Inc.
Address of Applicant: 111 Sylvan Avenue, North Building Englewood Cliffs, NJ 07632
Manufacturer: Huaqin Telecom Technology Co.,Ltd.
Address of Manufacturer: No.1 Building, No.9 Building, No.399,Keyuan Road,Zhangjiang Hi-tech Park,Shanghai,P.R.China
EUT Name: Mobile handset
Model No.: LM-K520EMW
Trade mark: LG
Standard(s) : 47 CFR Part 15, Subpart B
Date of Receipt: 2020/7/2
Date of Test: 2020/7/3 to 2020/7/23
Date of Issue: 2020/7/31

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

Authorized Signature:

Derek Yang
Wireless Laboratory Manager



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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2020/7/31		Original

Authorized for issue by:			
		<i>Mike Hu</i>	
		(Mike Hu) /Project Engineer	
		<i>David Chen</i>	
		(David Chen) /Reviewer	



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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



3 Contents

	Page
1 COVER PAGE	1
2 TEST SUMMARY	3
3 CONTENTS	4
4 GENERAL INFORMATION	5
4.1 GENERAL DESCRIPTION OF EUT	5
4.2 DESCRIPTION OF SUPPORT UNITS	5
4.3 TEST MODES	6
4.4 MEASUREMENT UNCERTAINTY	6
4.5 TEST LOCATION	7
4.6 TEST FACILITY	7
4.7 DEVIATION FROM STANDARDS	7
4.8 ABNORMALITIES FROM STANDARD CONDITIONS	7
5 EQUIPMENT LIST	8
6 EMISSION TEST RESULTS	10
6.1 CONDUCTED EMISSIONS AT MAINS TERMINALS (150KHZ-30MHZ)	10
6.1.1 <i>E.U.T. Operation</i>	10
6.1.2 <i>Test Setup Diagram</i>	10
6.1.3 <i>Measurement Data</i>	10
6.2 RADIATED EMISSIONS (30MHZ-1GHZ)	13
6.2.1 <i>E.U.T. Operation</i>	13
6.2.2 <i>Test Setup Diagram</i>	13
6.2.3 <i>Measurement Data</i>	13
6.3 RADIATED EMISSIONS (ABOVE 1GHZ)	16
6.3.1 <i>E.U.T. Operation</i>	16
6.3.2 <i>Test Setup Diagram</i>	16
6.3.3 <i>Measurement Data</i>	16
7 PHOTOGRAPHS	19
7.1 TEST SETUP PHOTOS	19
7.2 EUT CONSTRUCTIONAL DETAILS (EUT PHOTOS)	19



4 General Information

4.1 General Description of EUT

EUT Description::	Mobile handset
Model No.:	LM-K520EMW
Trade Mark:	LG
Sample Type:	<input checked="" type="checkbox"/> Portable Device, <input type="checkbox"/> Module
Antenna Type:	<input type="checkbox"/> External, <input checked="" type="checkbox"/> Integrated

Battery			
Battery	ATL	BL-T51	3.87V; 3900mAh
Earphone			
Earphone	Cresyn	EAB64468444	
USB Cable			
USB Cable1	Ningbo Broad	DC15WB-G	1.0m shielded cable without core
USB Cable2	Luxshare	DC15WX-G	1.0m shielded cable without core
Adapter			
Adapter1 (US)	Phihong	MCS-V02WH	I/P: 100-240 Vac, 0.4A ,50/60HZ O/P: 5Vdc 2A
Adapter2 (US)	Aohai	MCS-V02WA2	I/P: 100-240 Vac, 0.4A ,50/60HZ O/P: 5Vdc 2A
Adapter3 (US)	Sunlin	MCS-V02WR	I/P: 100-240 Vac, 0.4A ,50/60HZ O/P: 5Vdc 2A

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



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4.3 Test modes

Pretest these modes to find the worst case and show the worse data in the test items:	a: Transfer data between the EUT and the PC+USB cable1 b: Transfer data between the EUT and the PC+USB cable2 c: GSM 850 Idle+BT+WLAN+USB cable(worst)+GPS RX+FM RX+playing MP4+earphone+Adaptor1 d: GSM 1900 Idle+BT+WLAN+USB cable(worst)+GPS RX+FM RX+camera(Front)+earphone+Adaptor2 e: WCDMA Band II Idle+BT+WLAN+USB cable(worst)+GPS RX+FM RX+camera(rear)+earphone+Adaptor3 f: WCDMA Band V Idle+BT+WLAN +USB cable(worst)+GPS RX+FM RX+earphone+Adaptor(worst)
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4.4 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%



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4.5 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.

4.6 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.

4.7 Deviation from Standards

None

4.8 Abnormalities from Standard Conditions

None



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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	2020-05-10	2023-05-09
Measurement Software	AUDIX	e3 V5.4.1221d	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM024-01	2020-07-11	2021-07-10
				2019-07-12	2020-07-11
LISN	Rohde & Schwarz	ENV216	SEM007-01	2019-09-25	2020-09-24
LISN	ETS-LINDGREN	3816/2	SEM007-02	2020-03-13	2021-03-12
EMI Test Receiver	Rohde & Schwarz	ESCI	SEM004-02	2020-03-13	2021-03-12

Radiated Emissions (30MHz-1GHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
10m Semi-Anechoic Chamber	SAEMC	FSAC1018	SEM001-03	2019-03-31	2021-03-30
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM029-01	2020-07-11	2021-07-10
				2019-07-12	2020-07-11
EMI Test Receiver (9kHz-7GHz)	Rohde & Schwarz	ESR	SEM004-03	2020-03-13	2021-03-12
Trilog-Broadband Antenna(30MHz-1GHz)	Schwarzbeck	VULB9168	SEM003-18	2020-06-29	2024-06-28
Pre-amplifier	Sonoma Instrument Co	310N	SEM005-04	2020-03-13	2021-03-12

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	2020-07-11	2021-07-10
				2019-07-12	2020-07-11
EXA Spectrum Analyzer	AgilentTechnologies Inc	N9010A	SEM004-09	2020-03-13	2021-03-12
Horn Antenna(1-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2020-03-13	2021-03-12
Pre-Amplifier(0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	SEM004-11	2019-09-27	2020-09-26



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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	2019-09-27	2020-09-26
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2019-09-27	2020-09-26
Humidity/ Temperature Indicator	Mingle	N/A	SEM002-08	2019-09-27	2020-09-26
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2020-03-13	2021-03-12



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6 Emission Test Results

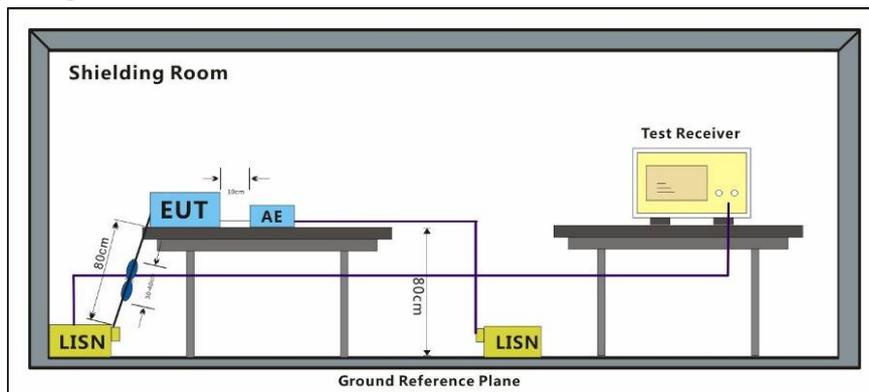
6.1 Conducted Emissions at Mains Terminals (150kHz-30MHz)

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

2.1.1 E.U.T. Operation

Operating Environment:	
Temperature:	20.3 °C Humidity: 58.1 % RH Atmospheric Pressure: 1005 mbar
The worst case for final test:	e: WCDMA Band V Idle+BT+WLAN +USB cable(worst)+GPS RX+FM RX+earphone+Adaptor(worst)

2.1.2 Test Setup Diagram

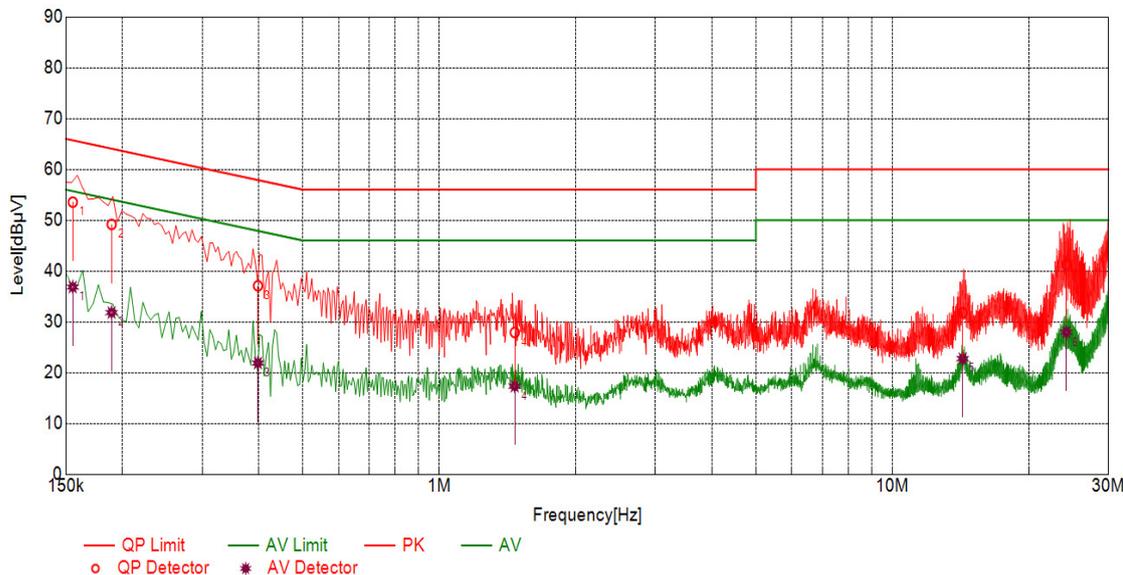


2.1.3 Measurement Data

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:e; Line:Live Line



Test Graph

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]	Type
1	0.1554	10.10	53.56	65.71	12.15	36.83	55.71	18.88	L
2	0.1893	10.10	49.17	64.07	14.90	31.82	54.07	22.25	L
3	0.3982	10.10	37.09	57.89	20.80	21.90	47.89	25.99	L
4	1.4679	10.10	27.91	56.00	28.09	17.33	46.00	28.67	L
5	14.2958	10.11	31.82	60.00	28.18	22.77	50.00	27.23	L
6	24.2012	10.11	41.28	60.00	18.72	27.94	50.00	22.06	L

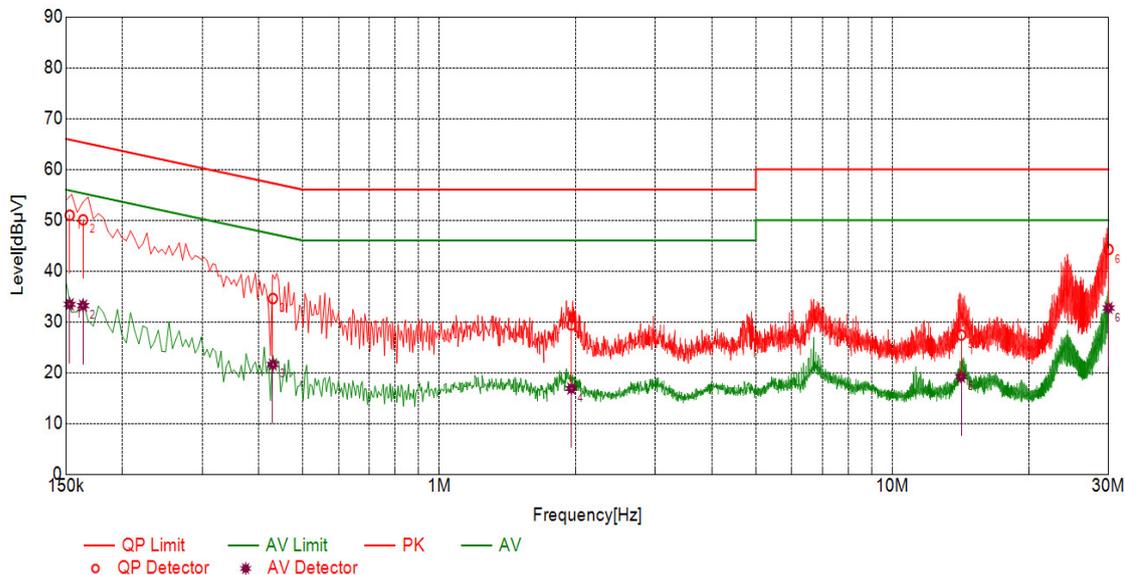


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Mode:e; Line:Neutral Line



Test Graph

Final Data List									
NO.	Freq. [MHz]	Factor [dB]	QP Value	QP Limit	QP Margin	AV Value	AV Limit	AV Margin	Type
1	0.1530	10.10	50.99	65.83	14.84	33.46	55.83	22.37	N
2	0.1638	10.10	50.07	65.27	15.20	33.19	55.27	22.08	N
3	0.4296	10.10	34.59	57.26	22.67	21.61	47.26	25.65	N
4	1.9572	10.10	29.39	56.00	26.61	16.88	46.00	29.12	N
5	14.1892	10.11	27.39	60.00	32.61	19.18	50.00	30.82	N
6	29.9989	10.11	44.26	60.00	15.74	32.73	50.00	17.27	N



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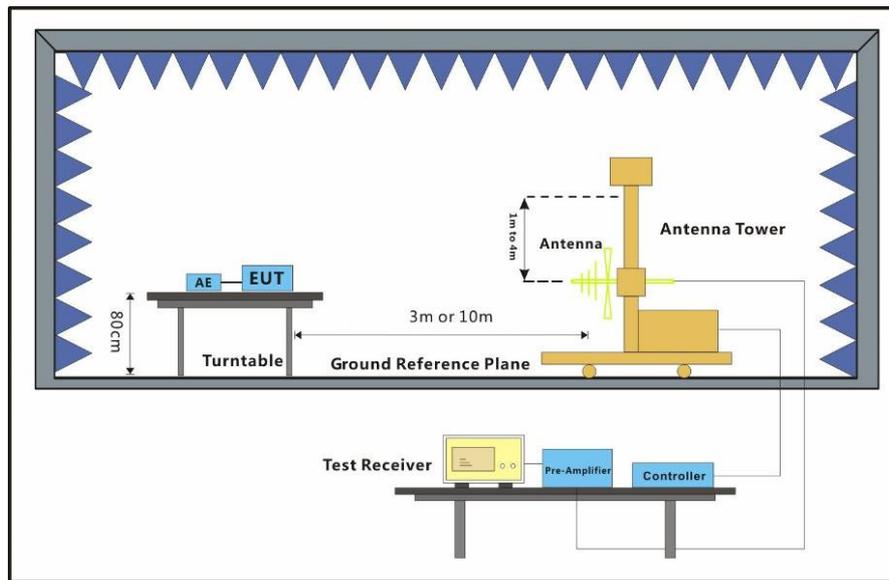
6.2 Radiated Emissions (30MHz-1GHz)

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(dBμV/m) quasi-peak
 88MHz-216MHz 43.5(dBμV/m) quasi-peak
 216MHz-960MHz 46.0(dBμV/m) quasi-peak
 960MHz-1000MHz 54.0(dBμV/m) quasi-peak
 Detector: Peak for pre-scan (120kHz resolution bandwidth) 30M to1000MHz

2.1.4 E.U.T. Operation

Operating Environment:
 Temperature: 25.4 °C Humidity: 51 % RH Atmospheric Pressure: 1005 mbar
 The worst case a: Transfer data between the EUT and the PC+USB cable1
 for final test:

2.1.5 Test Setup Diagram

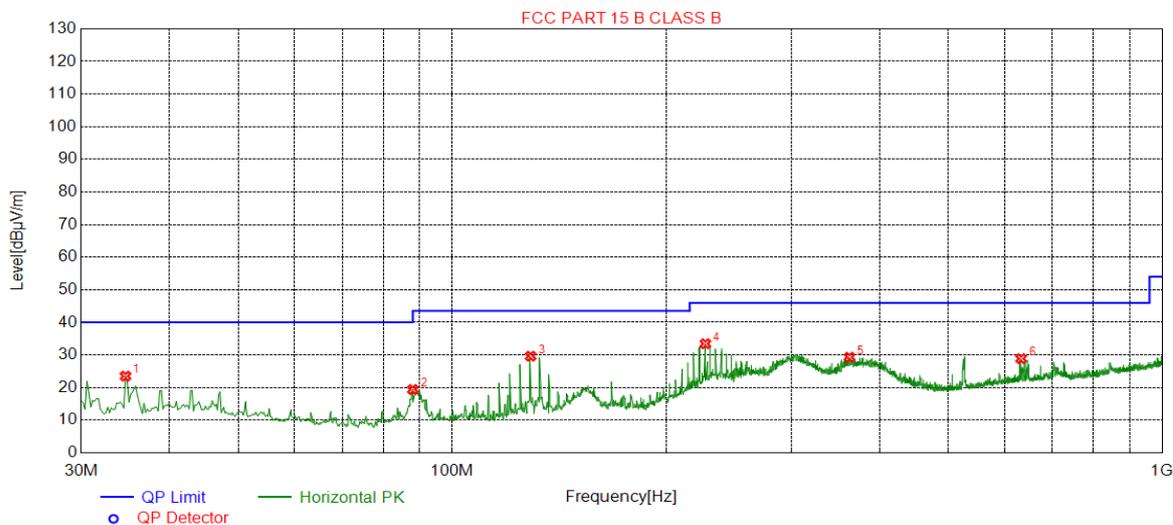


2.1.6 Measurement Data

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:a; Polarization:Horizontal



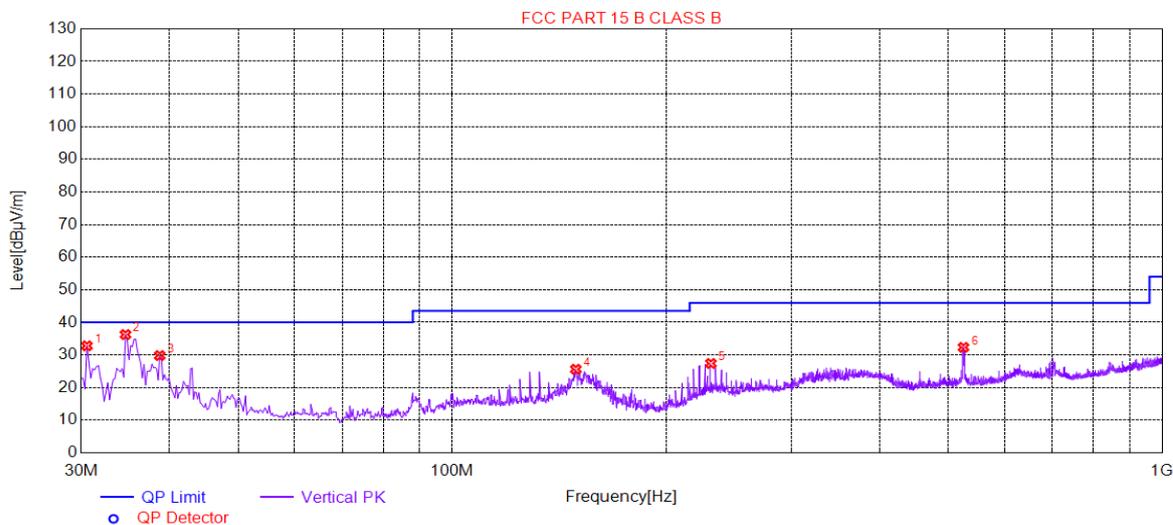
Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	34.6569	23.53	-29.97	40.00	16.47	200	310	Horizontal
2	88.0176	19.43	-34.20	43.50	24.07	200	255	Horizontal
3	128.959	29.65	-34.92	43.50	13.85	200	64	Horizontal
4	227.337	33.47	-30.49	46.00	12.53	100	51	Horizontal
5	362.776	29.32	-26.53	46.00	16.68	100	48	Horizontal
6	632.878	28.90	-20.24	46.00	17.10	100	54	Horizontal



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Mode:a; Polarization:Vertical



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	30.5821	32.82	-30.07	40.00	7.18	100	76	Vertical
2	34.6569	36.28	-29.97	40.00	3.72	100	85	Vertical
3	38.7317	29.84	-28.75	40.00	10.16	100	300	Vertical
4	149.333	25.65	-35.11	43.50	17.85	100	0	Vertical
5	231.412	27.42	-30.36	46.00	18.58	200	14	Vertical
6	524.993	32.35	-22.68	46.00	13.65	100	338	Vertical



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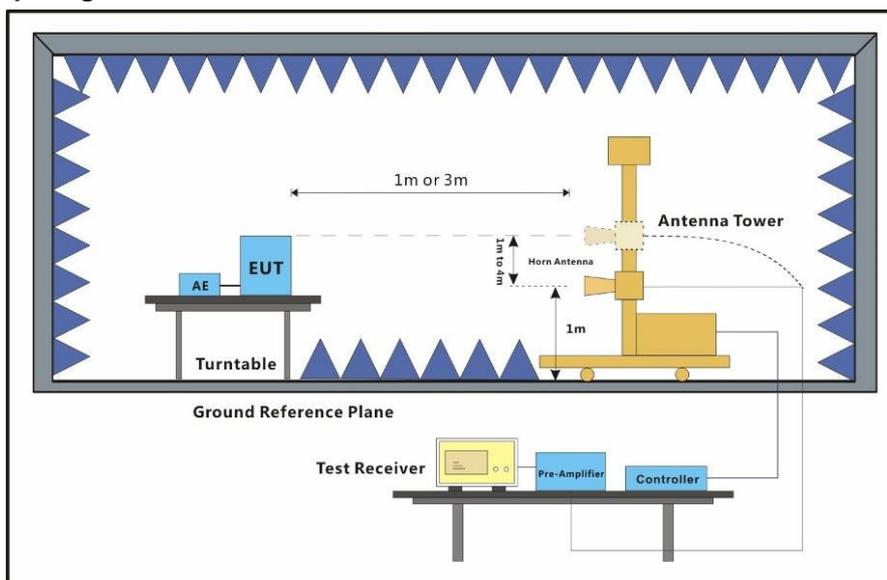
6.3 Radiated Emissions (above 1GHz)

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(dBμV/m) peak, 54(dBμV/m) average
 Detector: Peak for pre-scan (1000kHz resolution bandwidth) 100M to18000MHz

2.1.7 E.U.T. Operation

Operating Environment:
 Temperature: 23.3 °C Humidity: 56.2 % RH Atmospheric Pressure: 1005 mbar
 The worst case e: WCDMA Band V Idle+BT+WLAN +USB cable(worst)+GPS RX+FM
 for final test: RX+earphone+Adaptor(worst)

2.1.8 Test Setup Diagram

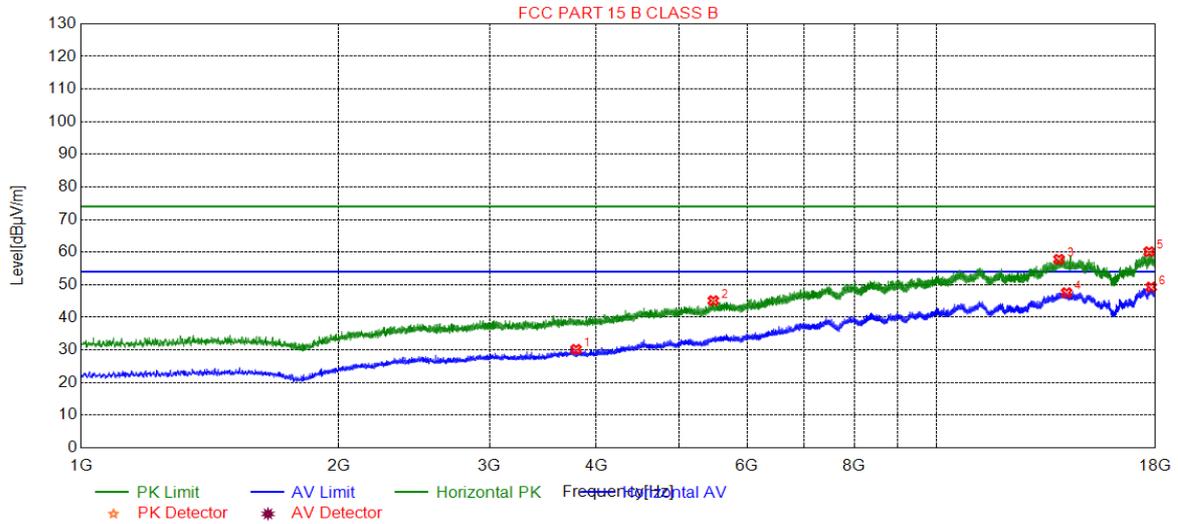


2.1.9 Measurement Data

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



Suspected List

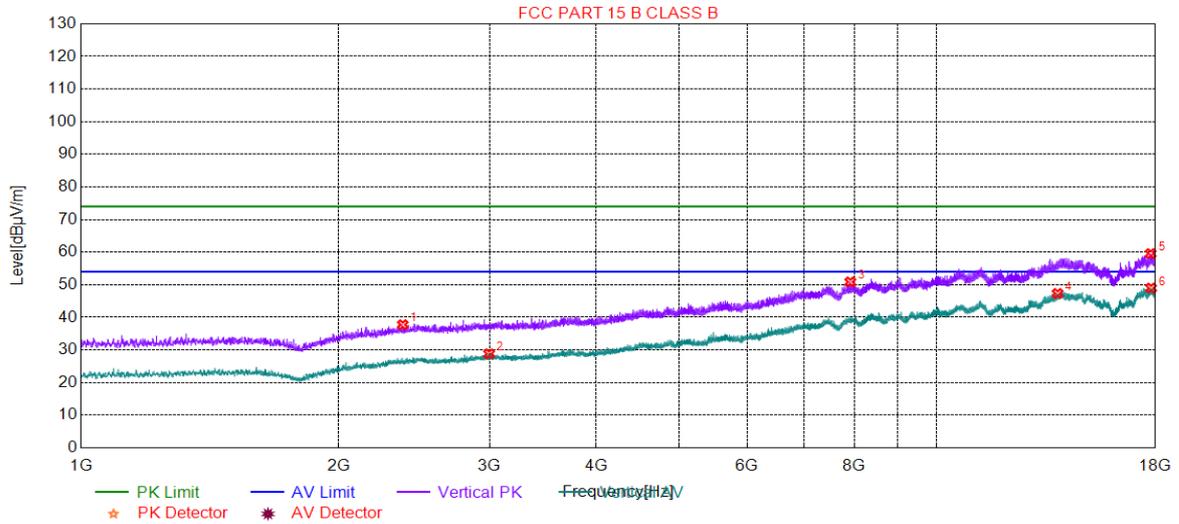
Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	3787.28	30.20	-22.19	54.00	23.80	200	156	Horizontal
2	5478.87	45.14	-16.10	74.00	28.86	100	355	Horizontal
3	13883.2	57.82	2.10	74.00	16.18	200	42	Horizontal
4	14171.4	47.57	2.15	54.00	6.43	200	344	Horizontal
5	17694.8	60.15	1.03	74.00	13.85	200	231	Horizontal
6	17788.3	49.30	0.73	54.00	4.70	200	4	Horizontal



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Mode:e; Polarization:Vertical



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2376.21	37.77	-26.57	74.00	36.23	100	242	Vertical
2	2997.59	28.84	-24.53	54.00	25.16	100	90	Vertical
3	7920.19	50.87	-8.64	74.00	23.13	100	90	Vertical
4	13833.9	47.34	1.91	54.00	6.66	200	156	Vertical
5	17768.7	59.58	0.80	74.00	14.42	200	156	Vertical
6	17786.6	49.00	0.74	54.00	5.00	100	204	Vertical



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7 Photographs

7.1 Test Setup Photos

Refer to Photographs of Appendix A - Photographs of Set-Up for ZR/2020/70004

7.2 EUT Constructional Details (EUT Photos)

Refer to Photographs of EUT Constructional Details

- End of the Report -



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