

TEST REPORT

Application No: ZR/2020/50009
Applicant: Motorola Mobility LLC
Address of Applicant: 222 W Merchandise Mart Plaza, Suite 1800, Chicago IL 60654, USA
Manufacturer: Company Name: Motorola Mobility LLC
Address of Manufacturer: 222 W Merchandise Mart Plaza, Suite 1800, Chicago IL 60654, USA
EUT Description: Mobile Cellular Phone
Model No.: XT2081-1
Type Name: MC369
Trade Mark: Motorola
FCC ID: IHDT56ZD1
Standard(s) : 47 CFR Part 15, Subpart B
Date of Receipt: 2020/7/9
Date of Test: 2020/7/10 to 2020/7/26
Date of Issue: 2020/8/10

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		2020/8/10		Original

Authorized for issue by:				
		<i>Mike Hu</i>		
		(Mike Hu) /Project Engineer		
		<i>David Chen</i>		
		(David Chen) /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 General Description of EUT

EUT Description::	Mobile Cellular Phone
Model No.:	XT2081-1
Trade Mark:	MC369
Hardware Version:	DVT2-2
Software Version:	QPZ30.30-Q3
Sample Type:	<input checked="" type="checkbox"/> Portable Device, <input type="checkbox"/> Module
Antenna Type:	<input type="checkbox"/> External, <input checked="" type="checkbox"/> Integrated

Battery			
Battery1	ATL	JK50	3.8V; 5000mAh
Battery2	Sunwoda	JK50	3.8V; 5000mAh
USB Cable			
USB Cable1	Yihuaxing	T365-005B	1.0m non-shielded cable without core
USB Cable2	SUNTOPS	336229	1.0m non-shielded cable without core
Adapter			
Adapter1	Chenyang	SC-41 (US)	I/P: 100-240 Vac, 300mA ,50/60HZ O/P: 5Vdc 2000mA
	Chenyang	SC-42 (EU)	I/P: 100-240 Vac, 300mA ,50/60HZ O/P: 5Vdc 2000mA
	Chenyang	SC-43 (UK)	I/P: 100-240 Vac, 300mA ,50/60HZ O/P: 5Vdc 2000mA
	Chenyang	SC-46 (AR)	I/P: 100-240 Vac, 300mA ,50/60HZ O/P: 5Vdc 2000mA
Adapter2	Acbel	SC-41 (US)	I/P: 100-240 Vac, 300mA ,50/60HZ O/P: 5Vdc 2000mA
	Acbel	SC-42 (EU)	I/P: 100-240 Vac, 300mA ,50/60HZ O/P: 5Vdc 2000mA
	Acbel	SC-46 (AR)	I/P: 100-240 Vac, 300mA ,50/60HZ O/P: 5Vdc 2000mA
Adapter3	Salom	SC-41 (US)	I/P: 100-240 Vac, 300mA ,50/60HZ O/P: 5Vdc 2000mA
	Salom	SC-42 (EU)	I/P: 100-240 Vac, 300mA ,50/60HZ O/P: 5Vdc 2000mA
	Salom	SC-46 (AR)	I/P: 100-240 Vac, 300mA ,50/60HZ O/P: 5Vdc 2000mA
	Salom	SC-47 (BR)	I/P: 100-240 Vac, 300mA ,50/60HZ O/P: 5Vdc 2000mA
	Salom/Flex	SC-47 (BR Local build)	I/P: 100-240 Vac, 300mA ,50/60HZ O/P: 5Vdc 2000mA



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Adapter4	Chenyang	MC-101(US)	I/P: 100-240 Vac, 300mA ,50/60HZ O/P: 5Vdc 2000mA
	Chenyang	MC-102(EU)	I/P: 100-240 Vac, 300mA ,50/60HZ O/P: 5Vdc 2000mA
	Chenyang	MC-103(UK)	I/P: 100-240 Vac, 300mA ,50/60HZ O/P: 5Vdc 2000mA
	Chenyang	MC-106(AR)	I/P: 100-240 Vac, 300mA ,50/60HZ O/P: 5Vdc 2000mA
	Chenyang	MC-107(BR)	I/P: 100-240 Vac, 300mA ,50/60HZ O/P: 5Vdc 2000mA

Adapter5	Salcomp	MC-101(US)	I/P: 100-240 Vac, 300mA ,50/60HZ O/P: 5Vdc 2000mA
	Salcomp	MC-102(EU)	I/P: 100-240 Vac, 300mA ,50/60HZ O/P: 5Vdc 2000mA
	Salcomp	MC-103(UK)	I/P: 100-240 Vac, 300mA ,50/60HZ O/P: 5Vdc 2000mA
	Salcomp	MC-106(AR)	I/P: 100-240 Vac, 300mA ,50/60HZ O/P: 5Vdc 2000mA

earphone			
Earphone 1	Juwei	JWEP1123-T03	1.2 meter, non-shielded cable, with w/o ferrite core
Earphone 2	New Leader	EM10-IN	1.2 meter, non-shielded cable, with w/o ferrite core

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 Test modes

<p>Pretest these modes to find the worst case and show the worse data in the test items:</p>	<p>a: Transfer data between the EUT and the PC+USB cable1</p> <p>b: Transfer data between the EUT and the PC+USB cable2</p> <p>c: Telecom Idle+BT+WLAN +GPS Rx+playing MP4 (SD card) +earphone1+battery1+Cable(worst)+adapter1</p> <p>d: Telecom Idle+BT+WLAN +GPS Rx+playing MP4 (SD card) +earphone2+battery2+ Cable(worst)+adapter2</p> <p>e: Telecom Idle+BT+WLAN +GPS Rx+camera (Front) +earphone(worst)+battery(worst)+ Cable(worst)+adapter3</p> <p>f: Telecom Idle+BT+WLAN +GPS Rx+camera (Back) +earphone(worst)+battery(worst)+ Cable(worst)+adapter4</p> <p>g: GSM 850+BT+WLAN +GPS Rx+earphone(worst)+battery(worst)+ Cable(worst)+adapter5</p>
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	h: WCDMA Band V+BT+WLAN +GPS Rx+earphone(worst)+battery(worst)+Cable(worst)+adapter(Worst) i: LTE Band 5+BT+WLAN +GPS Rx+earphone+battery+Cable(worst)+adapter(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 17025:2017 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	2019-06-13	2022-06-12
Measurement Software	AUDIX	e3 V5.4.1221d	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM024-01	2020-07-10	2021-07-09
LISN	Rohde & Schwarz	ENV216	SEM007-01	2019-09-24	2020-09-23
LISN	ETS-LINDGREN	3816/2	SEM007-02	2020-04-01	2021-03-12
EMI Test Receiver	Rohde & Schwarz	ESCI	SEM004-02	2020-03-24	2021-03-23

Radiated Emissions (30MHz-1GHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
3m Semi-Anechoic Chamber	ETS-LINDGREN	NA	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	2020-07-10	2021-07-09
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	2019-08-08	2022-08-07
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	2020-07-10	2021-07-09
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)

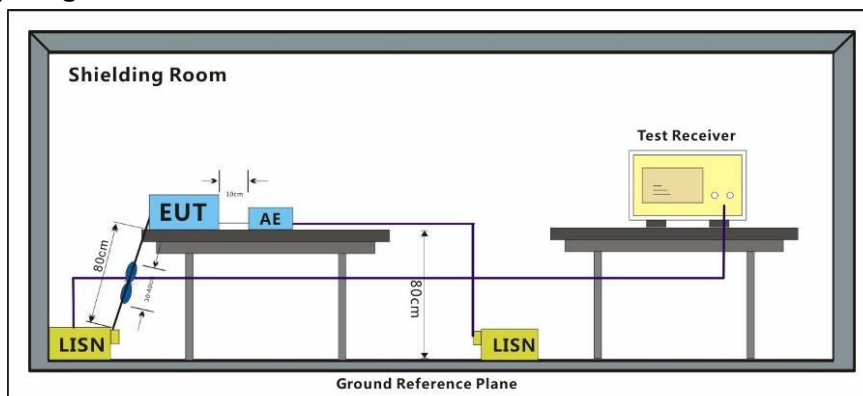
Test Requirement:	47 CFR Part 15, Subpart B
Test Method:	ANSI C63.4:2014
Frequency Range:	150kHz to 30MHz
Limit:	
0.15M-0.5MHz	66dB(μV)-56dB(μV) quasi-peak, 56dB(μV)-46dB(μV) average
0.5M-5MHz	56dB(μV) quasi-peak, 46dB(μV) average
5M-30MHz	60dB(μV) quasi-peak, 50dB(μV) average
Detector:	Peak for pre-scan (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:	c: Telecom Idle+BT+WLAN +GPS Rx+playing MP4 (SD card) +earphone1+battery1+Cable(worst)+adapter1				

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.

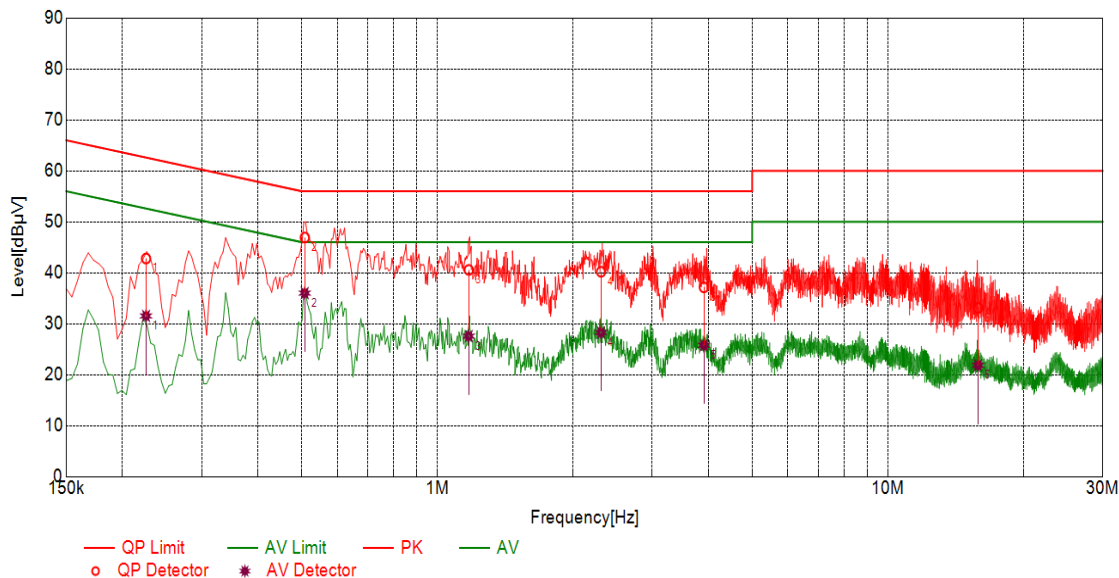


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Mode:c; Line:Live Line



Test Graph

Final Data List									
NO.	Freq. [MHz]	Factor [dB]	QP Value [dB]	QP Limit [dB]	QP Margin [dB]	AV Value [dB]	AV Limit [dB]	AV Margin [dB]	Type
1	0.2257	10.10	42.80	62.60	19.80	31.53	52.60	21.07	L
2	0.5080	10.10	46.92	56.00	9.08	36.01	46.00	9.99	L
3	1.1746	10.10	40.56	56.00	15.44	27.56	46.00	18.44	L
4	2.3088	10.10	40.20	56.00	15.80	28.28	46.00	17.72	L
5	3.9057	10.10	37.14	56.00	18.86	25.77	46.00	20.23	L
6	15.8582	10.11	33.10	60.00	26.90	21.85	50.00	28.15	L

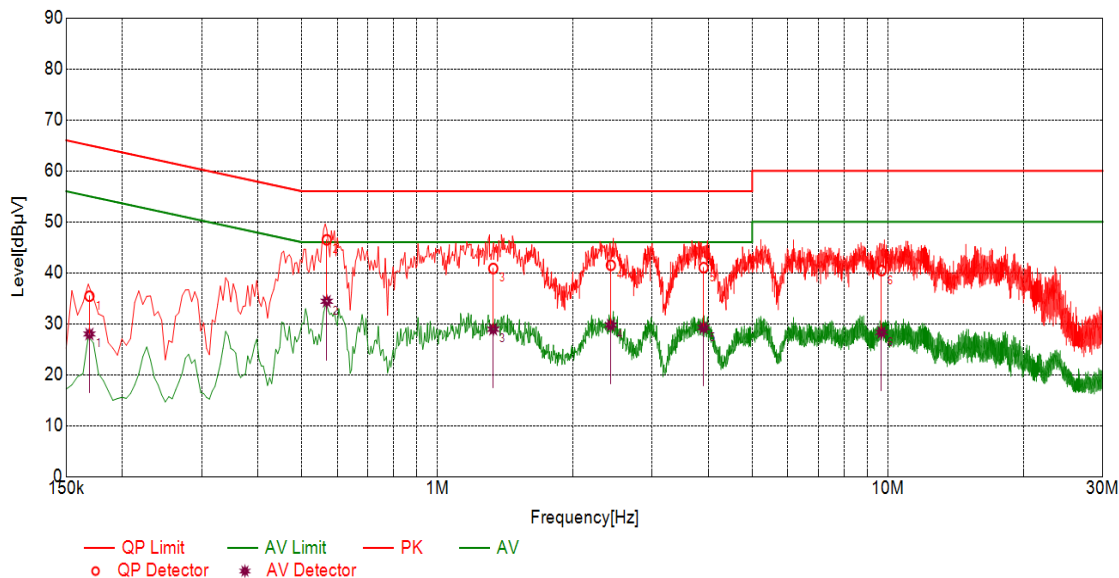


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Mode:c; Line:Neutral Line



Test Graph

Final Data List									
NO.	Freq. [MHz]	Factor [dB]	QP Value [dB]	QP Limit [dB]	QP Margin [dB]	AV Value [dB]	AV Limit [dB]	AV Margin [dB]	Type
1	0.1690	10.10	35.41	65.01	29.60	27.98	55.01	27.03	N
2	0.5684	10.10	46.47	56.00	9.53	34.41	46.00	11.59	N
3	1.3308	10.10	40.84	56.00	15.16	28.92	46.00	17.08	N
4	2.4275	10.10	41.48	56.00	14.52	29.73	46.00	16.27	N
5	3.9003	10.10	41.01	56.00	14.99	29.25	46.00	16.75	N
6	9.6833	10.10	40.44	60.00	19.56	28.31	50.00	21.69	N



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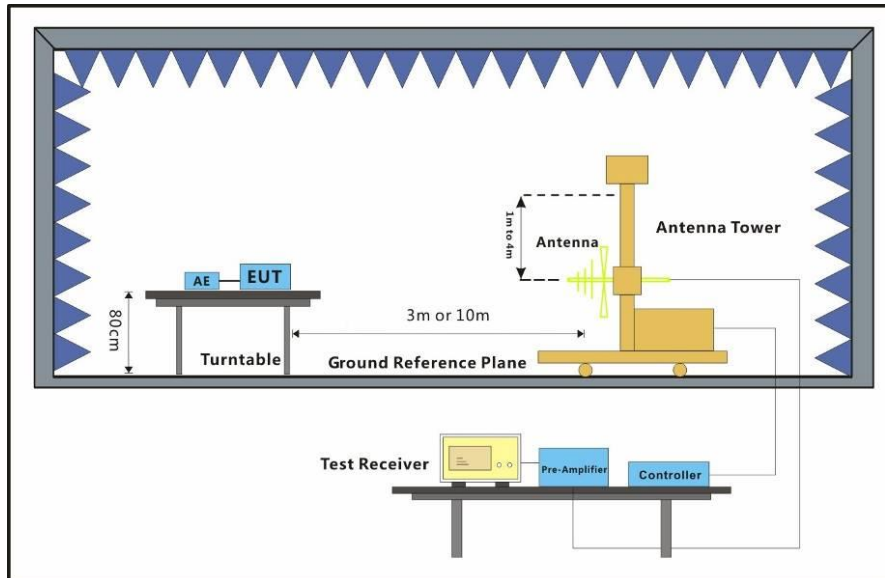
6.2 Radiated Emissions (30MHz-1GHz)

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 b: Transfer data between the EUT and the PC+USB cable2
 for final test:

2.1.5 Test Setup Diagram



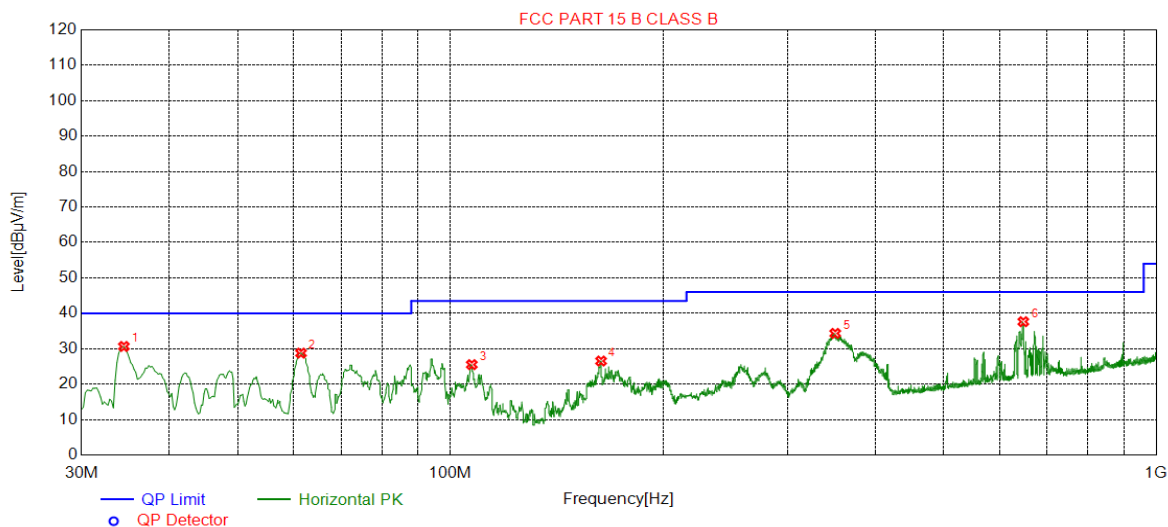
2.1.6 Measurement Data

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.



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Mode:b; Polarization:Horizontal



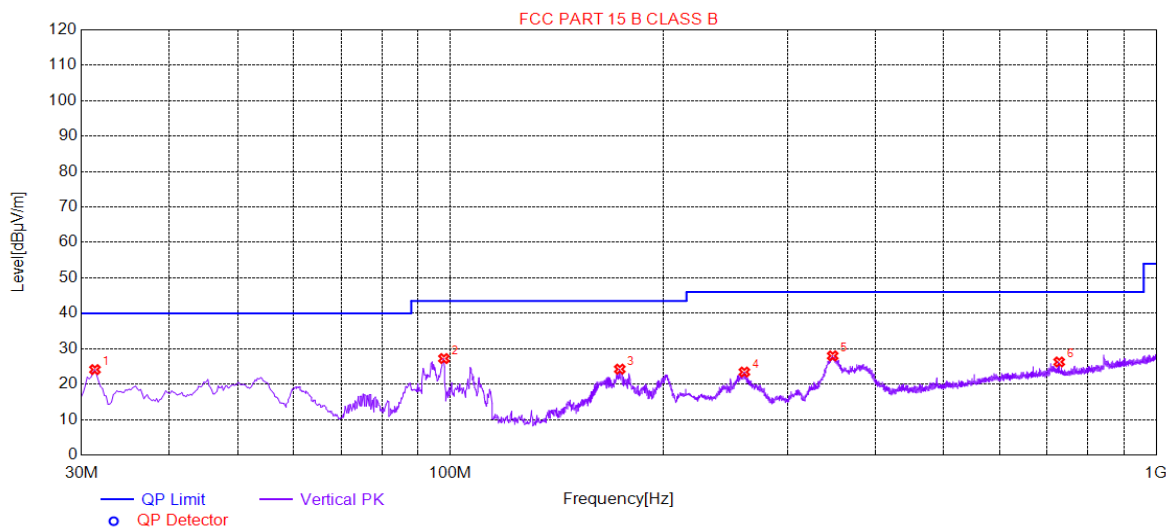
Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	34.4629	30.64	-29.97	40.00	9.36	200	121	Horizontal
2	61.4343	28.76	-32.23	40.00	11.24	200	133	Horizontal
3	107.227	25.51	-32.00	43.50	17.99	200	238	Horizontal
4	163.498	26.53	-34.42	43.50	16.97	200	74	Horizontal
5	350.940	34.33	-26.84	46.00	11.67	100	96	Horizontal
6	648.207	37.63	-20.05	46.00	8.37	200	22	Horizontal



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Mode:b; Polarization:Vertical



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	31.3583	24.11	-30.05	40.00	15.89	100	346	Vertical
2	97.9136	27.23	-32.37	43.50	16.27	100	84	Vertical
3	173.782	24.24	-33.76	43.50	19.26	100	318	Vertical
4	260.906	23.43	-29.35	46.00	22.57	200	312	Vertical
5	348.029	27.99	-26.92	46.00	18.01	100	3	Vertical
6	728.733	26.27	-18.83	46.00	19.73	100	346	Vertical



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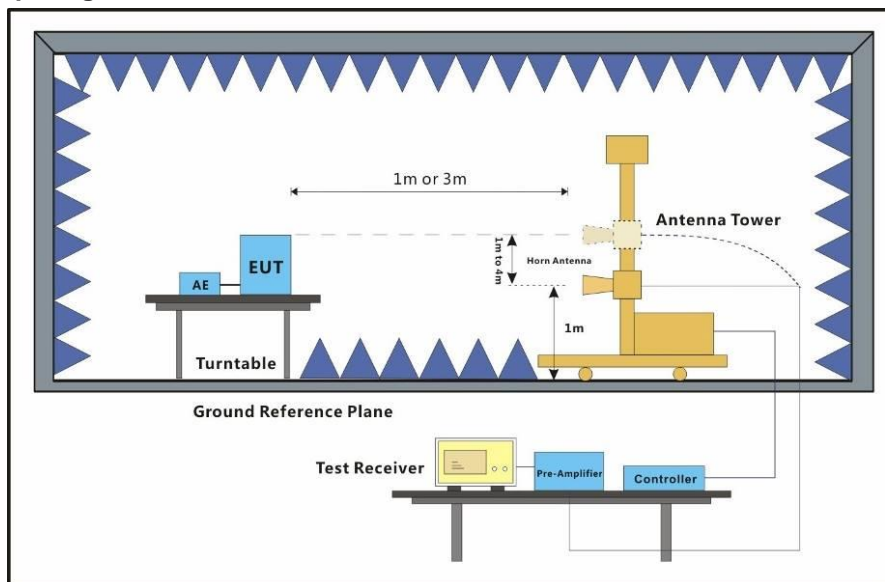
6.3 Radiated Emissions (above 1GHz)

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) 1000M 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 g: GSM 850+BT+WLAN +GPS Rx+earphone(worst)+battery(worst)+
 for final test: Cable(worst)+adapter5

2.1.8 Test Setup Diagram



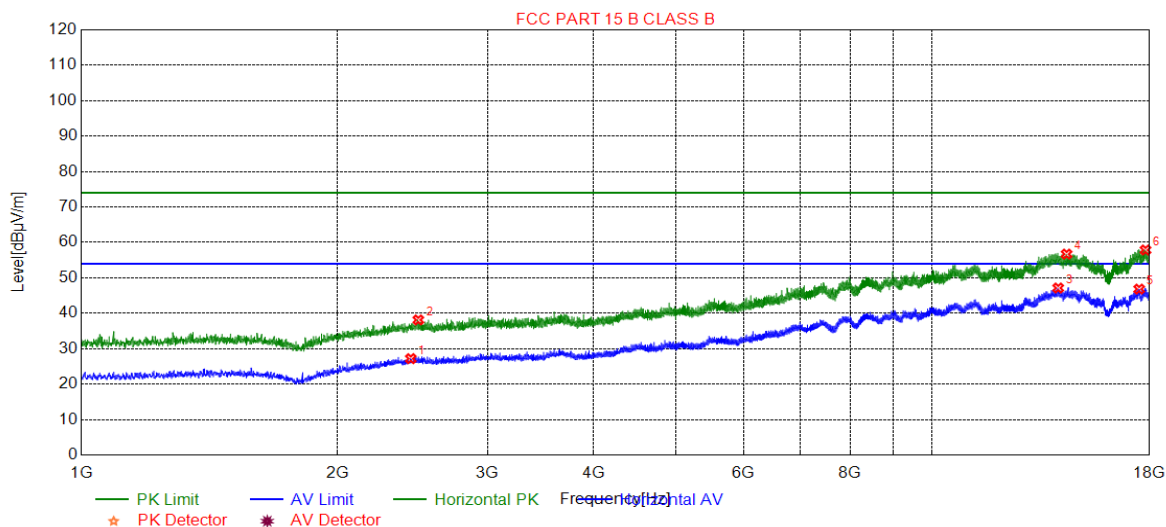
2.1.9 Measurement Data

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.



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Mode:g; Polarization:Horizontal



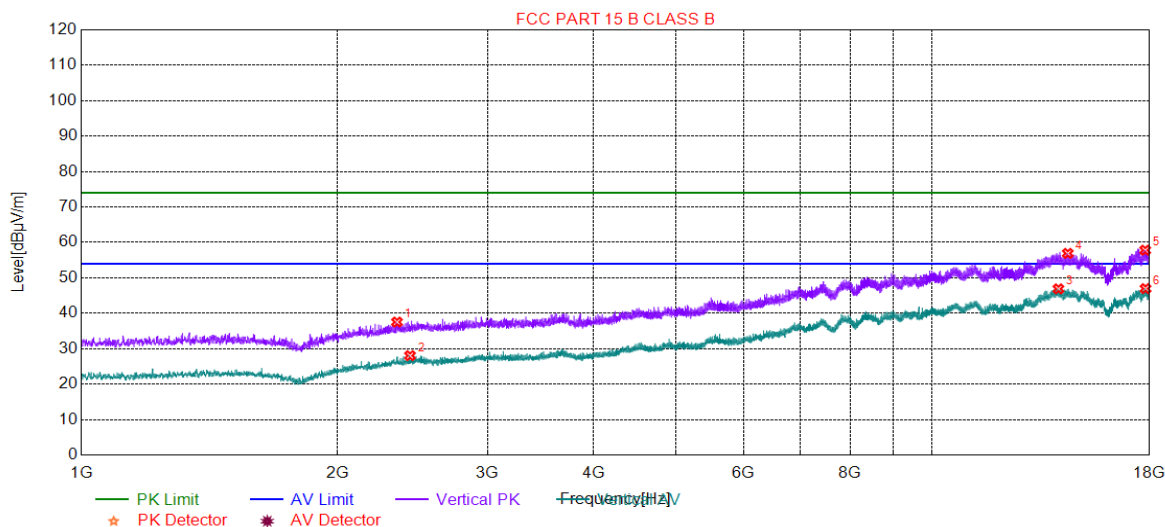
Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2438.27	27.20	-26.25	54.00	26.80	100	79	Horizontal
2	2488.42	38.13	-25.92	74.00	35.87	100	231	Horizontal
3	14054.9	47.14	2.31	54.00	6.86	100	117	Horizontal
4	14378.8	56.70	1.94	74.00	17.30	100	193	Horizontal
5	17498.4	46.83	1.62	54.00	7.17	100	79	Horizontal
6	17799.3	57.86	0.69	74.00	16.14	100	231	Horizontal



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Mode:g; Polarization:Vertical



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2349.01	37.53	-26.67	74.00	36.47	100	167	Vertical
2	2433.17	28.05	-26.28	54.00	25.95	100	54	Vertical
3	14063.4	46.89	2.32	54.00	7.11	100	54	Vertical
4	14424.7	56.91	1.86	74.00	17.09	100	357	Vertical
5	17786.6	57.81	0.74	74.00	16.19	100	130	Vertical
6	17801.9	46.96	0.68	54.00	7.04	100	130	Vertical



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7 Photographs

7.1 Test Setup

Please refer to Appendix A - Photographs of Set-Up for ZR202050009.

7.2 EUT Constructional Details (EUT Photos)

Please refer to internal and external photo.

- End of the Report -



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