

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: 2021/8/15

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
02		2021/6/1	Eason Wang	1. The test site information of lab B(XI 'AN) added in section 4.5 and 4.6 2. Modify data conversion error of antenna height 3. Update equipment list
03		2021/8/15	Eason Wang	1. Update Support Units. 2. Remove the information of lab A(SZ) in section 4.5 and 4.6

*This test report supersedes the original report (report No.: ZR/2020/5000902, issue date: 2020/8/10), original report shall be invalid.

Authorized for issue by:	
Prepared By	<i>Eason Wang</i> (Eason Wang) /Engineer
Checked By	<i>Jim Huang</i> (Jim Huang) /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



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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.
Router	NETGEAR	R6020	No.XA1401
Computer	Lenovo	L480	No.XA1402
Mouse	A4TECH	OP-520NU USB	No.XA1403

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 b: Transfer data between the EUT and the PC+USB cable2 c: Telecom Idle+BT+WLAN +GPS Rx+playing MP4 (SD card) +earphone1+battery1+Cable(worst)+adapter1 d: Telecom Idle+BT+WLAN +GPS Rx+playing MP4 (SD card) +earphone2+battery2+ Cable(worst)+adapter2 e: Telecom Idle+BT+WLAN +GPS Rx+camera (Front) +earphone(worst)+battery(worst)+ Cable(worst)+adapter3 f: Telecom Idle+BT+WLAN +GPS Rx+camera (Back) +earphone(worst)+battery(worst)+ Cable(worst)+adapter4 g: GSM 850+BT+WLAN +GPS Rx+earphone(worst)+battery(worst)+</p>
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	Cable(worst)+adapter5 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	± 4.8dB (Below 1GHz)
		± 4.8dB (1GHz to 6GHz)
		± 4.5dB (6GHz to 18GHz)
		± 5.02dB (Above 18GHz)



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4.5 Test Location

Lab B:

Company:	SGS-CSTC STANDARDS TECHNICAL SERVICES (XI 'AN) CO., LTD.
Address:	1/F, Unit D, Building 1, Kanghong Orange Technology Park, No.137, Keyuan 3rd Road, Fengdong New City, Xi'an, Shaanxi China
Post code:	710086
Test engineer:	Ben Huang, Leah Chen

Remark: All tests were performed at Lab B.

4.6 Test Facility

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

Lab B:

- **A2LA (Certificate No. 4854.01)**

SGS-CSTC STANDARDS TECHNICAL SERVICES (XI 'AN) CO., LTD. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4854.01.

- **FCC –Designation Number: CN1271.**

4.7 Deviation from Standards

None

4.8 Abnormalities from Standard Conditions

None



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5 Equipment List

CE Test System					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Shielding Room	Brilliant-emc	N/A	XAW03-35-01	2019-09-11	2022-09-10
Test receiver	ROHDE&SCHWARZ	ESR	XAW01-08-01	2019-09-07	2020-09-06
Artificial network	ROHDE&SCHWARZ	ENV216	XAW01-04-01	2019-12-11	2020-12-10
Temperature and humidity meter	MingGao	TH101B	XAW01-01-01	2019-12-06	2020-12-05
Measurement Software	Tonscend	TS+ CE V2.5	XAW02-05-02	NCR	NCR
Radio communication analyzer	ROHDE&SCHWARZ	CMW 500	XAW01-03-02	2020-04-02	2021-04-01



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RE Test System					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Semi-Anechoic Chamber	Brilliant-emc	N/A	XAW03-35-01	2019-09-11	2022-09-10
MXA signal analyzer	Keysight	N9020A	XAW01-06-01	2020-04-02	2021-04-01
Test receiver	ROHDE&SCHWARZ	ESR	XAW01-08-01	2019-09-07	2020-09-06
Receiving antenna (30MHz-3GHz)	Schwarzbeck	VULB 9163	XAW01-09-01	2019-10-13	2021-10-12
Receiving antenna (1GHz~18GHz)	Schwarzbeck	BBHA 9120D	XAW01-09-02	2019-10-13	2021-10-12
Receiving antenna (15GHz~40GHz)	Schwarzbeck	BBHA 9170	XAW01-09-03	2019-10-13	2021-10-12
Directional antenna rack controller	Max-Full	MF-7802BS	XAW03-03-01	NCR	NCR
High-speed antenna rack controller	Max-Full	MF-7802	XAW03-04-01	NCR	NCR
Filter bank	Tonscend	JS0806-F	XAW03-05-01	NCR	NCR
Filter bank	Tonscend	JS0806s	XAW03-05-02	NCR	NCR
Amplifier	Tonscend	TAP00903040	XAW01-41-01	2019-11-18	2020-11-17
Amplifier	Tonscend	TAP01018048	XAW01-41-02	2019-11-18	2020-11-17
Amplifier	Tonscend	TAP18040048	XAW01-41-03	2019-12-03	2020-12-02
Amplifier	Shanghai Steed	YX28980930	XAW01-41-06	2019-11-18	2020-11-17
Temperature and humidity meter	MingGao	TH101B	XAW01-01-01	2019-12-06	2020-12-05
Measurement Software	Tonscend	TS+ RSE V3.0.0.2	XAW02-05-01	NCR	NCR
Radio communication analyzer	ROHDE&SCHWARZ	CMW 500	XAW01-03-02	2020-04-02	2021-04-01



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6 Emission Test Results

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

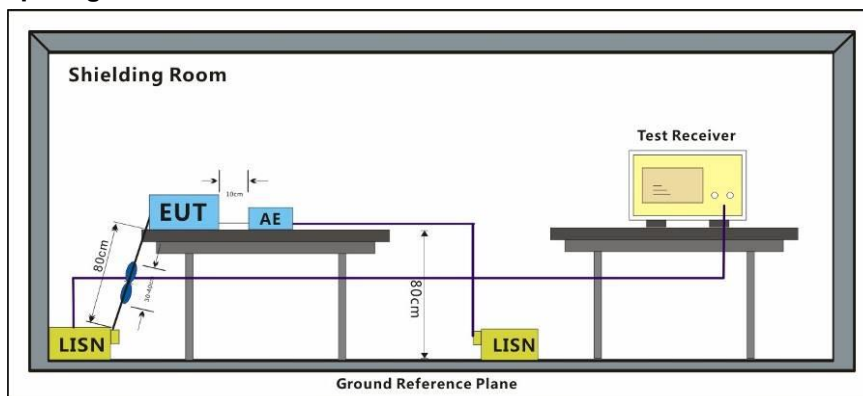
Test Requirement:	47 CFR Part 15, Subpart B
Test Method:	ANSI C63.4:2014
Frequency Range:	150kHz to 30MHz
Limit:	
0.15M-0.5MHz	66dB(μV)-56dB(μV) quasi-peak, 56dB(μV)-46dB(μV) average
0.5M-5MHz	56dB(μV) quasi-peak, 46dB(μV) average
5M-30MHz	60dB(μV) quasi-peak, 50dB(μV) average
Detector:	Peak for pre-scan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

6.1.1 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				

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.

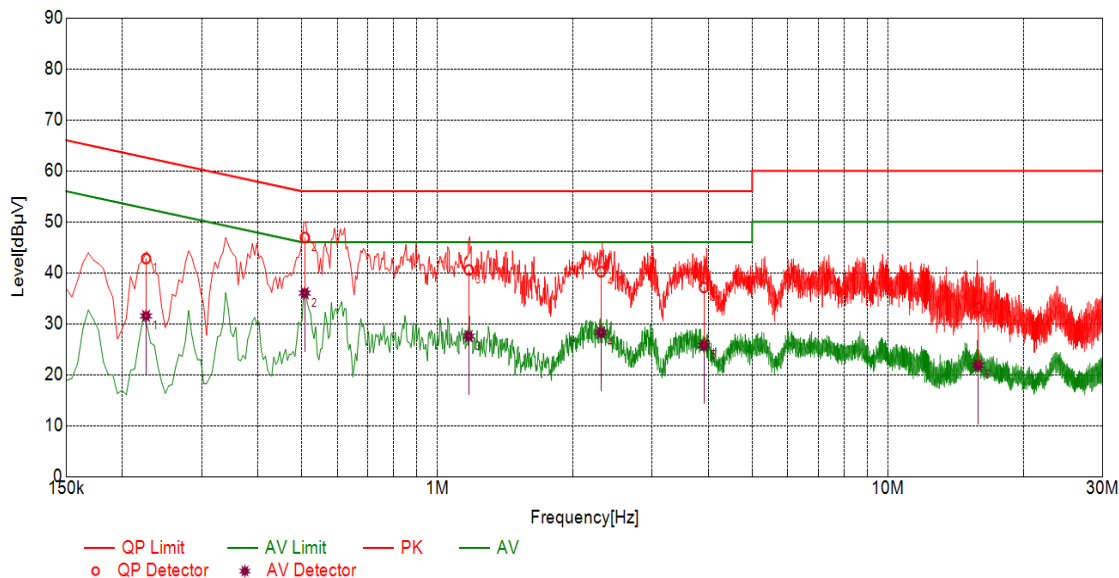


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Mode:c; Line:Live Line



Test Graph

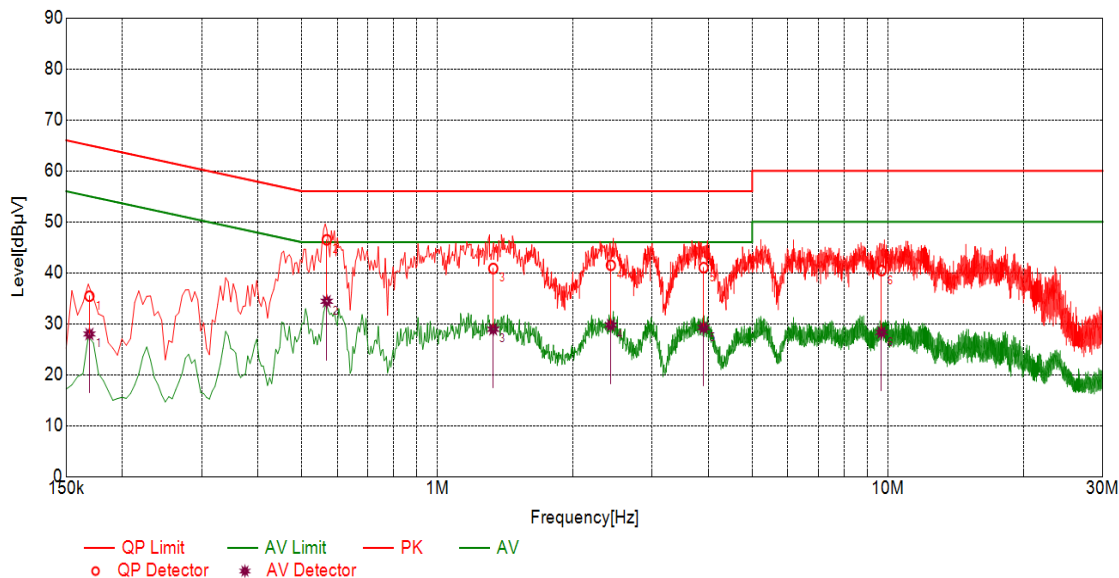
Final Data List									
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Type
1	0.2257	10.10	42.80	62.60	19.80	31.53	52.60	21.07	L
2	0.5080	10.10	46.92	56.00	9.08	36.01	46.00	9.99	L
3	1.1746	10.10	40.56	56.00	15.44	27.56	46.00	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 [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Value [dBµV]	AV Limit [dBµV]	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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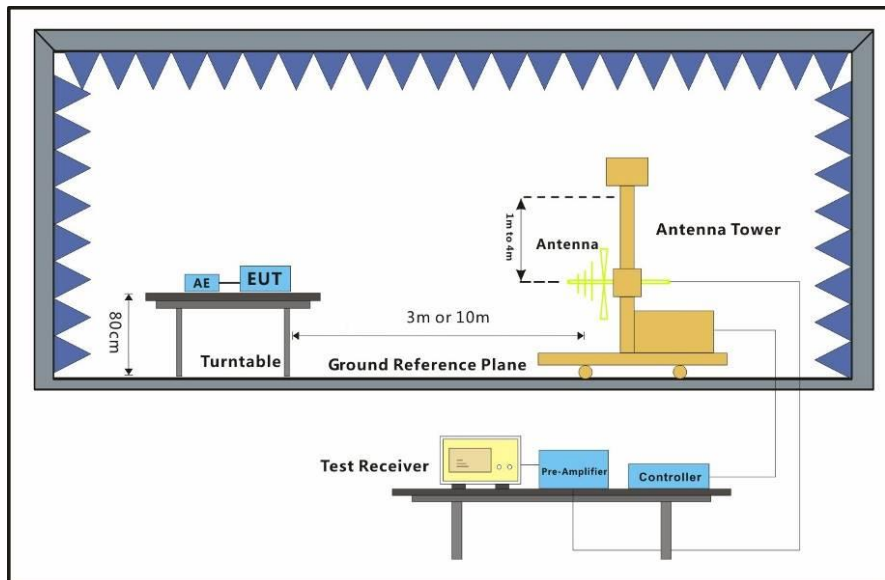
6.2 Radiated Emissions (30MHz-1GHz)

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

6.2.1 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:

6.2.2 Test Setup Diagram



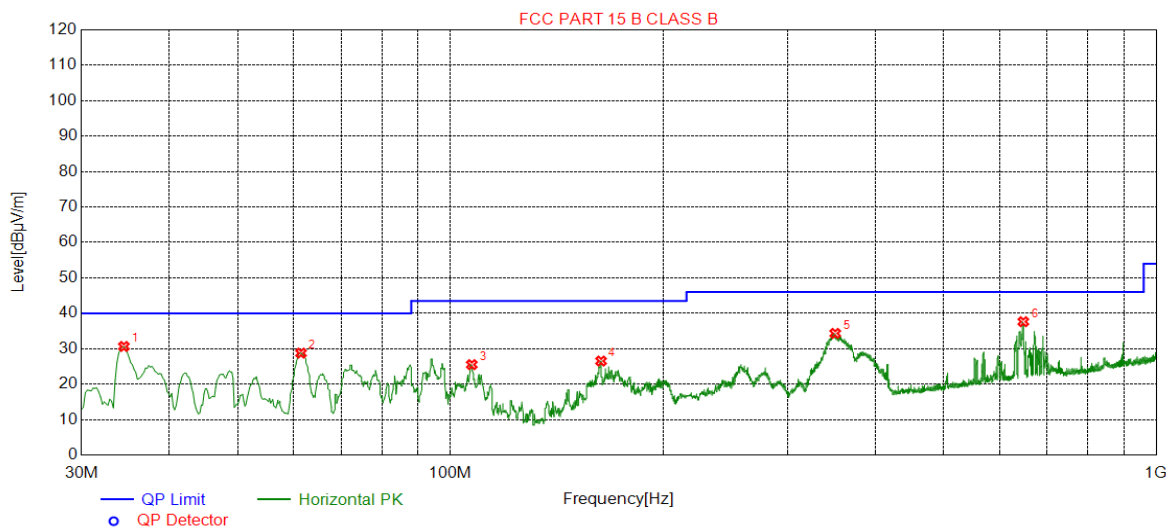
6.2.3 Measurement Data

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.



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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	218	121	Horizontal
2	61.4343	28.76	-32.23	40.00	11.24	159	133	Horizontal
3	107.227	25.51	-32.00	43.50	17.99	149	238	Horizontal
4	163.498	26.53	-34.42	43.50	16.97	193	74	Horizontal
5	350.940	34.33	-26.84	46.00	11.67	129	96	Horizontal
6	648.207	37.63	-20.05	46.00	8.37	219	22	Horizontal

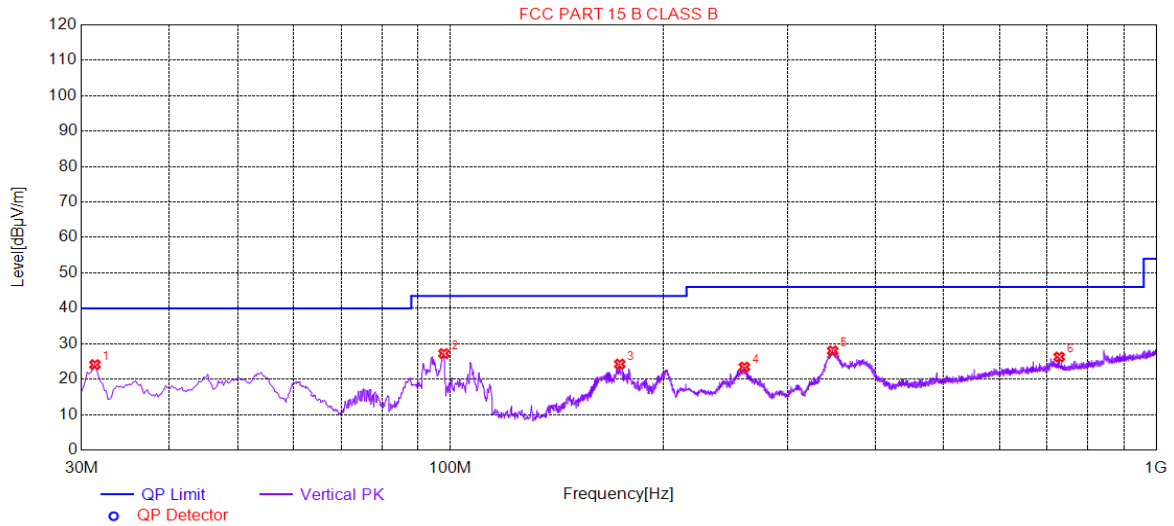


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Mode:b; Polarization:Vertical



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	169	346	Vertical
2	97.9136	27.23	-32.37	43.50	16.27	177	84	Vertical
3	173.782	24.24	-33.76	43.50	19.26	214	318	Vertical
4	260.906	23.43	-29.35	46.00	22.57	295	312	Vertical
5	348.029	27.99	-26.92	46.00	18.01	235	3	Vertical
6	728.733	26.27	-18.83	46.00	19.73	266	346	Vertical



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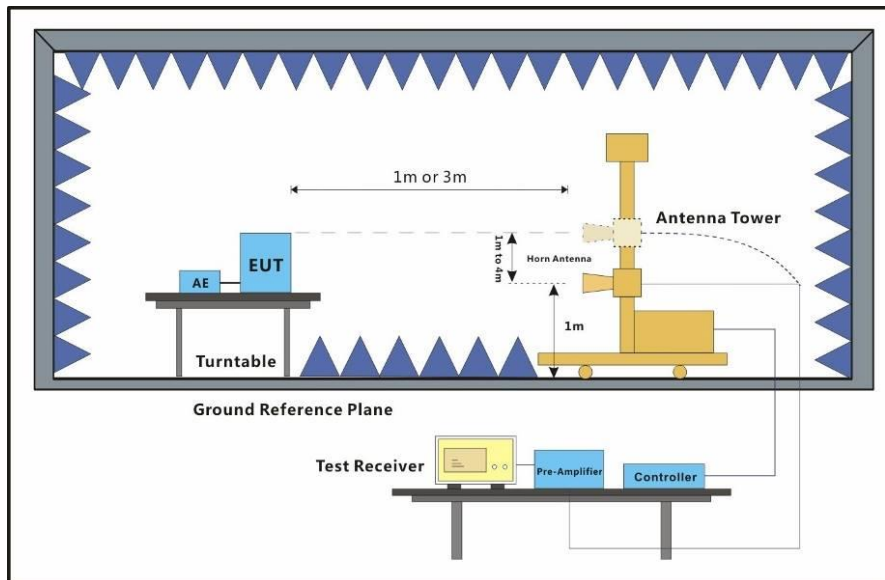
6.3 Radiated Emissions (above 1GHz)

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) 100M to18000MHz

6.3.1 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

6.3.2 Test Setup Diagram



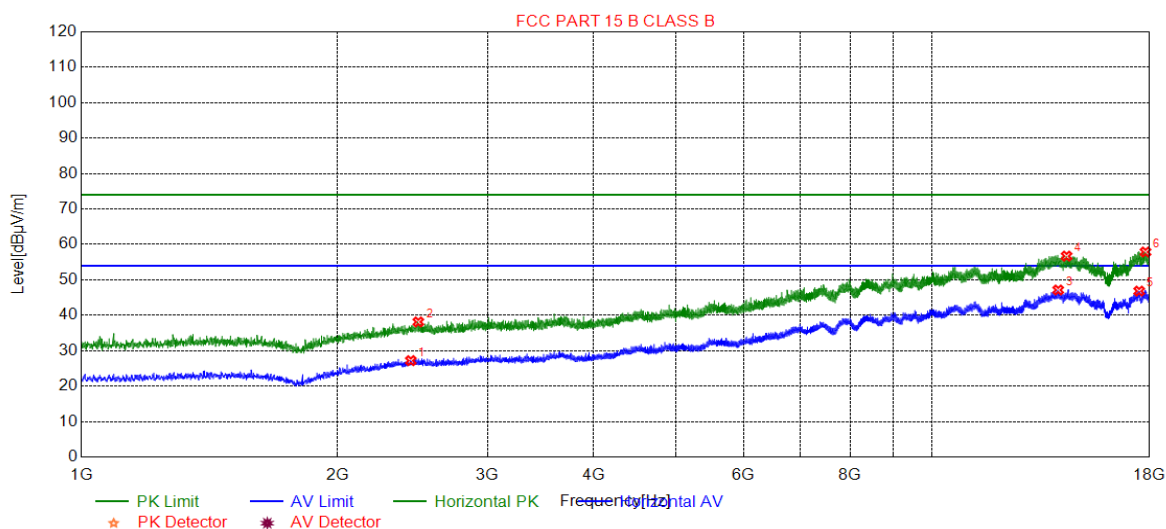
6.3.3 Measurement Data

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.



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Mode:g; Polarization:Horizontal



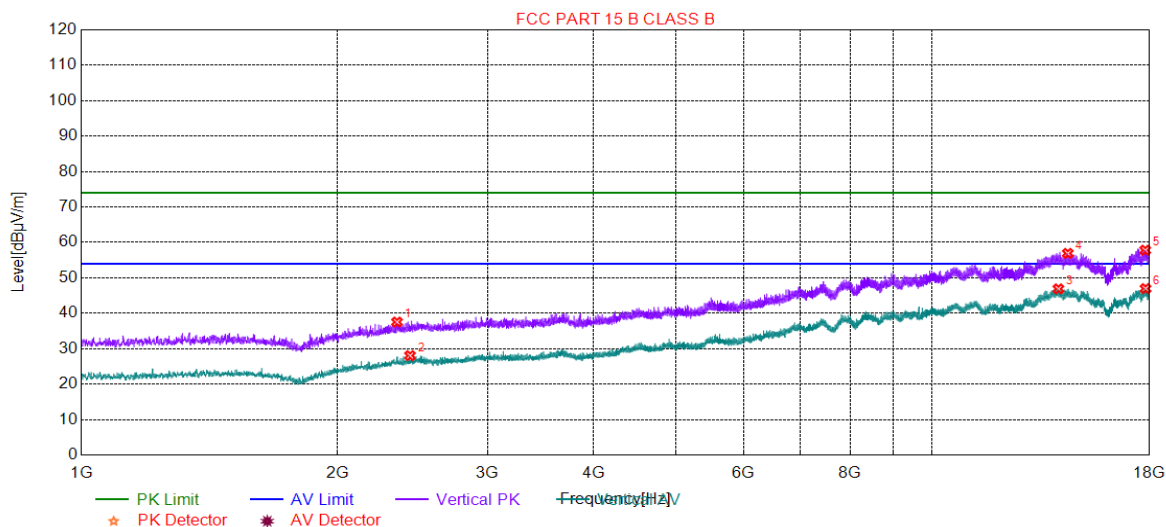
Suspected List

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	119	79	Horizontal
2	2488.42	38.13	-25.92	74.00	35.87	131	231	Horizontal
3	14054.9	47.14	2.31	54.00	6.86	241	117	Horizontal
4	14378.8	56.70	1.94	74.00	17.30	157	193	Horizontal
5	17498.4	46.83	1.62	54.00	7.17	175	79	Horizontal
6	17799.3	57.86	0.69	74.00	16.14	229	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	165	167	Vertical
2	2433.17	28.05	-26.28	54.00	25.95	258	54	Vertical
3	14063.4	46.89	2.32	54.00	7.11	281	54	Vertical
4	14424.7	56.91	1.86	74.00	17.09	288	357	Vertical
5	17786.6	57.81	0.74	74.00	16.19	157	130	Vertical
6	17801.9	46.96	0.68	54.00	7.04	188	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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