

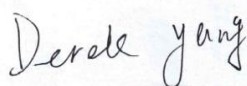
TEST REPORT

Application No.: ZR/2020/50038
Applicant: Guangdong OPPO Mobile Telecommunications Corp., Ltd.
Address of Applicant: NO.18 HaiBin Road, Wusha Village, Chang An Town, DongGuan City, GuangDong,China
Manufacturer: Guangdong OPPO Mobile Telecommunications Corp., Ltd.
Address of Manufacturer: NO.18 HaiBin Road, Wusha Village, Chang An Town, DongGuan City, GuangDong,China
EUT Name: Mobile Phone
Model No.: CPH2089
Trade mark: OPPO
FCC ID: R9C-CPH2089
Standard(s) : 47 CFR Part 15, Subpart B
Date of Receipt: 2020/6/1
Date of Test: 2020/6/1 to 2020/6/30
Date of Issue: 2021/8/12

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

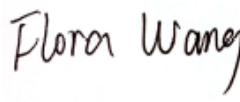



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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2020/8/6		Original
02		2021/5/28	Flora.Wang	1. The test site information of lab B(XI 'AN) added in section 4.5 and 4.6 2.Modify data conversion error of antenna height 3.Update equipment list
03		2021/8/12	Flora.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/2020/5003807, issue date: 2020/8/6), original report shall be invalid.

Authorized for issue by:	
Prepared By	 (Flora Wang) /Project Engineer
Checked By	 (Jim Huang) / 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 Phone		
Model No.:	CPH2089		
Trade Mark:	OPPO		
Hardware Version:	11		
Software Version:	ColorOS V7.2		
Sample Type:	<input checked="" type="checkbox"/> Portable Device, <input type="checkbox"/> Module		
Antenna Type:	<input type="checkbox"/> External, <input checked="" type="checkbox"/> Integrated		
Power Supply:	DC from internal rechargeable battery or from AC/DC adapter Model No.: VCA7JAUH, VCA7JAAH, VCA7JAYH, VCA7JAEH AC Input: 100-240V 50/60Hz DC Output: DC 10V 6.5A.		
Cable:	USB cable: 100cm shielded, Model No.:DL129;DL135 Earphone cable: 115cm unshielded, Model No.:MH147		
Supported Frequency Range	Band	TX	RX
	GSM850	824 to 849 MHz	869 to 894 MHz
	GSM1900	1850 to 1910 MHz	1930 to 1990 MHz
	UMTS Band II	1850 to 1910 MHz	1930 to 1990 MHz
	UMTS Band IV	1710 to 1755 MHz	2110 to 2155 MHz
	UMTS Band V	824 to 849 MHz	869 to 894 MHz
	LTE Band 2	1850 to 1910 MHz	1930 to 1990 MHz
	LTE Band 4	1710 to 1755 MHz	2110 to 2155 MHz
	LTE Band 5	824 to 849 MHz	869 to 894 MHz
	LTE Band 7	2500 to 2570 MHz	2620 to 2690 MHz
	LTE Band 12	699 to 716 MHz	729 to 746 MHz
	LTE Band 17	704 to 716 MHz	734 to 746 MHz
	LTE Band 26	814 to 849 MHz	859 to 894 MHz
	LTE Band 38	2570 to 2620 MHz	2570 to 2620 MHz
	LTE Band 41	2496 to 2690MHz	2496 to 2690MHz
	LTE Band 66	1710 to 1780 MHz	2110 to 2200 MHz
	NR Band N5	824 to 849 MHz	869 to 894 MHz
	NR Band N7	2500 to 2570 MHz	2620 to 2690 MHz
	NR Band N41	2496 to 2690MHz	2496 to 2690MHz

4.2 Description of Support Units

Description	Manufacturer	Model No.	Inventory No.
Laptop	Lenovo	L480	No.XA1402
Mouse	A4TECH	OP-520NU USB	No.XA1403
Router	NETGEAR	R6020	No.XA1401

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 cable b: GSM850 Idle +BT+WLAN +GPS Rx+playing MP4 (SD card) +earphone+battery+Cable+adapter1 c: UMTS Band V Idle +BT+WLAN +GPS Rx+camera (Back) +earphone+battery+Cable+adapter2 d: LTE Band 5 Idle +BT+WLAN +GPS Rx+camera (Back) +earphone+battery+Cable+adapter3 e: LTE Band 12 Idle +BT+WLAN +GPS Rx+camera (Back) +earphone+battery+Cable+adapter4 f: LTE Band 17 Idle +BT+WLAN +GPS Rx+camera (Back) +earphone+battery+Cable+adapter(Worst) g: LTE Band 26 Idle +BT+WLAN +GPS Rx+camera (Back) +earphone+battery+Cable+adapter(Worst) h: NR Band N5 Idle +BT+WLAN +GPS Rx+camera (Back) +earphone+battery+Cable+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)

4.5 Test Location

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

4.6 Test Facility

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

• **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	2019-07-16	2020-07-15
Temperature and humidity meter	MingGao	TH101B	XAW01-01-01	2019-11-28	2020-11-28
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
5G UXM	Keysight	E7515B	XAW01-19-01	2019-08-17	2020-08-16

RSE 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	2019-11-18	2020-11-17
Measurement Software	Tonscend	TS+ RSE V3.0.0.2	XAW02-05-01	NCR	NCR



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Radio communication analyzer	ROHDE&SCHWARZ	CMW 500	XAW01-03-02	2020-04-02	2021-04-01
5G UXM	Keysight	E7515B	XAW01-19-01	2019-08-17	2020-08-16



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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

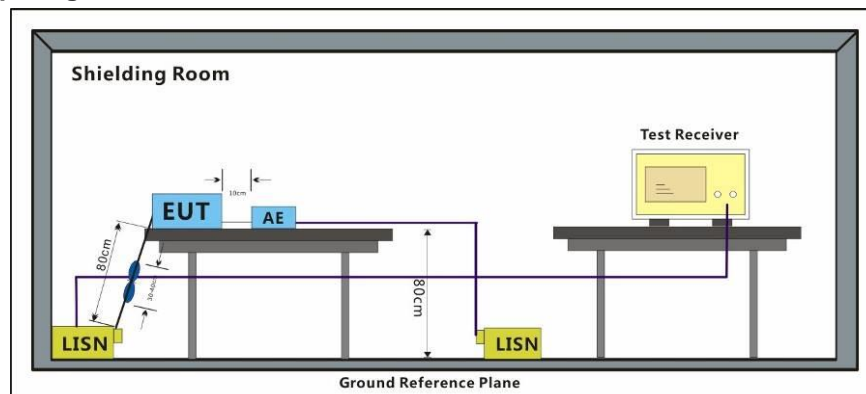
2.1.1 E.U.T. Operation

Operating Environment:

Temperature: 20.3 °C Humidity: 58.1 % RH Atmospheric Pressure: 1005 mbar

The worst case for final test: b: GSM850 Idle +BT+WLAN +GPS Rx+playing MP4 (SD card)
+earphone+battery+ Cable+adapter1

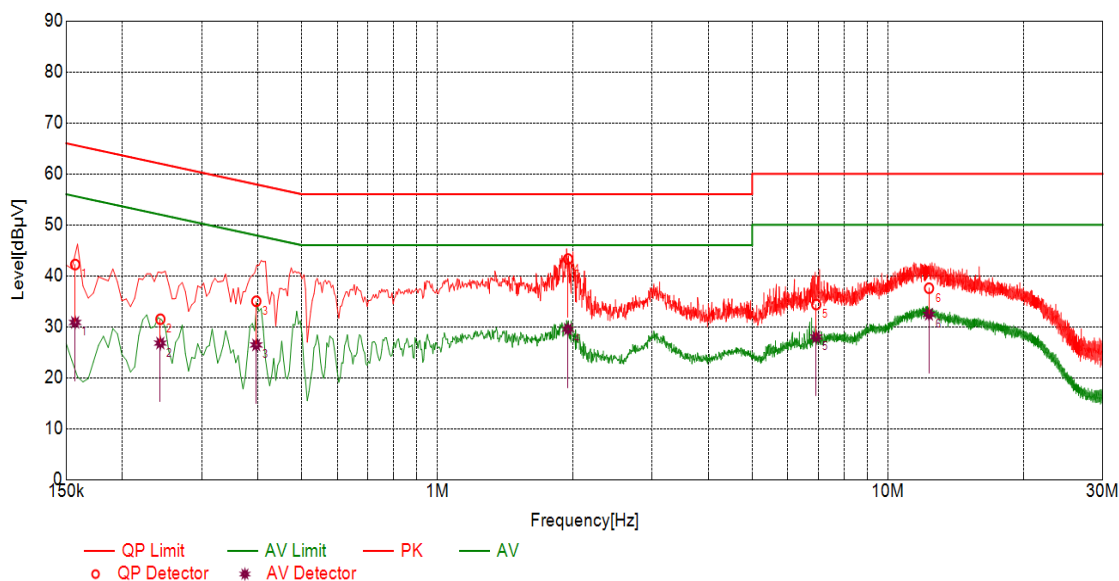
2.1.2 Test Setup Diagram



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.

Mode:b; Line:Live Line



Test Graph

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	0.1571	10.10	42.21	65.61	23.40	30.85	55.61	24.76	L
2	0.2428	10.10	31.48	62.00	30.52	26.79	52.00	25.21	L
3	0.3964	10.10	35.00	57.93	22.93	26.43	47.93	21.50	L
4	1.9503	10.10	43.29	56.00	12.71	29.51	46.00	16.49	L
5	6.9334	10.10	34.36	60.00	25.64	27.99	50.00	22.01	L
6	12.3407	10.10	37.56	60.00	22.44	32.44	50.00	17.56	L

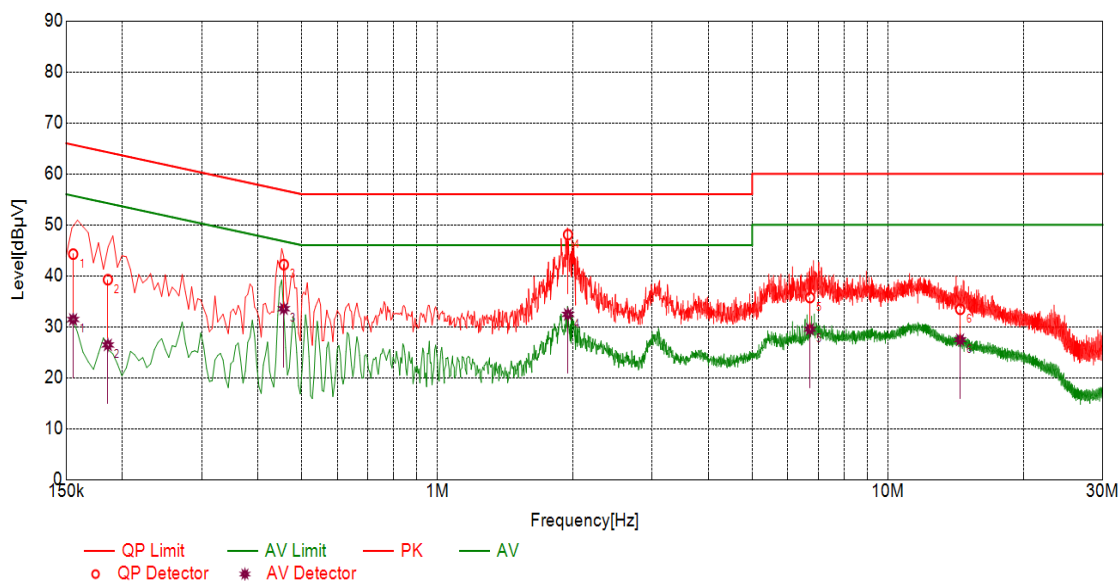


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Mode:b; Line:Neutral Line



Test Graph

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	0.1555	10.10	44.25	65.70	21.45	31.43	55.70	24.27	N
2	0.1857	10.10	39.23	64.22	24.99	26.43	54.22	27.79	N
3	0.4564	10.10	42.19	56.76	14.57	33.54	46.76	13.22	N
4	1.9501	10.10	48.06	56.00	7.94	32.42	46.00	13.58	N
5	6.7171	10.10	35.72	60.00	24.28	29.52	50.00	20.48	N
6	14.4724	10.11	33.43	60.00	26.57	27.45	50.00	22.55	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

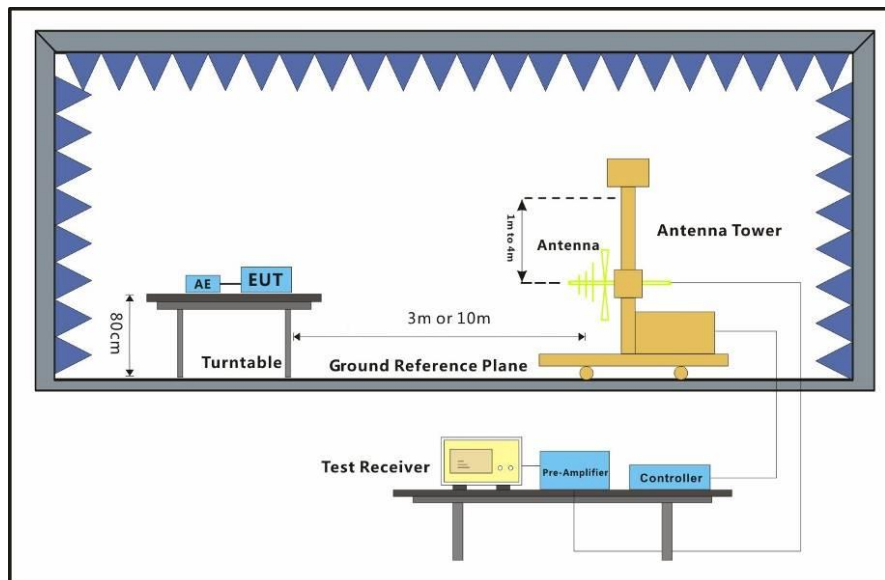
6.2.1 E.U.T. Operation

Operating Environment:

Temperature: 25.4 °C Humidity: 51 % RH Atmospheric Pressure: 1005 mbar

The worst case a: Transfer data between the EUT and the PC+USB cable for final test:

6.2.2 Test Setup Diagram

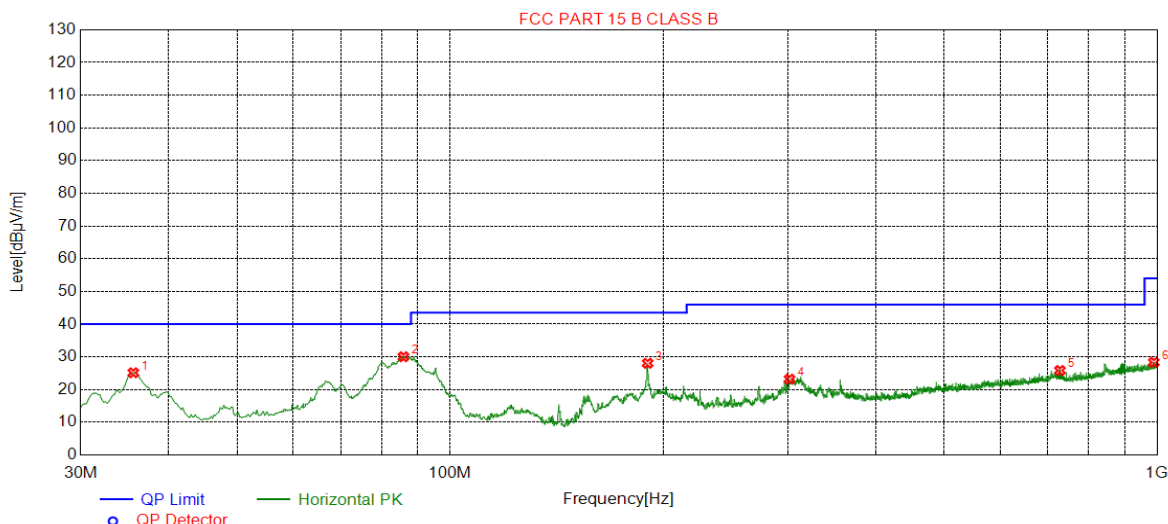


6.2.3 Measurement Data

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: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	35.6271	25.15	-29.76	40.00	14.85	150	257	Horizontal
2	85.8832	30.05	-34.72	40.00	9.95	143	123	Horizontal
3	190.276	28.06	-32.22	43.50	15.44	146	226	Horizontal
4	302.042	23.20	-28.20	46.00	22.80	118	78	Horizontal
5	728.733	25.85	-18.83	46.00	20.15	150	280	Horizontal
6	989.521	28.34	-14.93	54.00	25.66	115	218	Horizontal

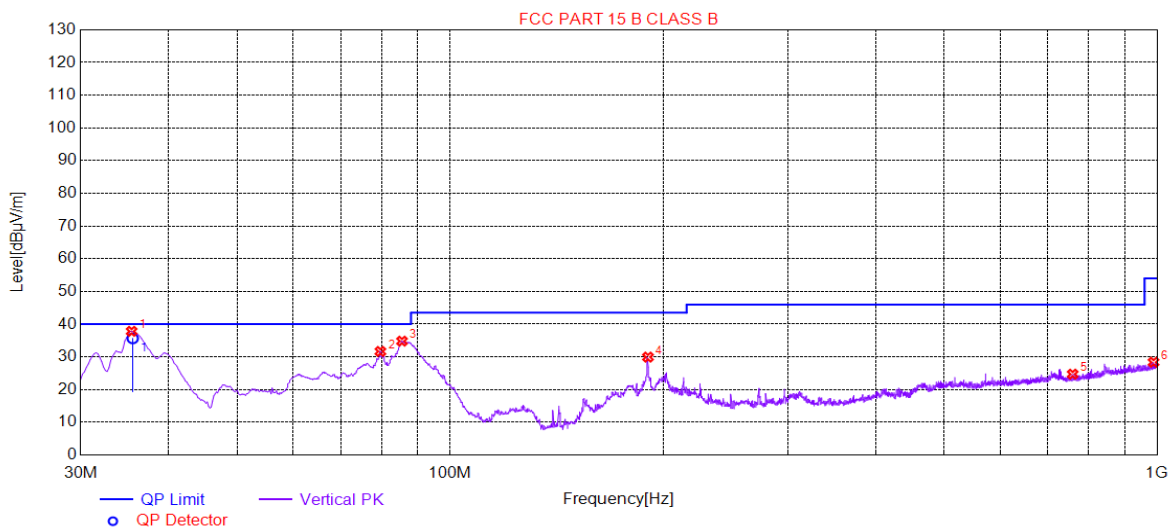


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Mode:a; Polarization:Vertical



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	35.4331	37.83	-29.82	40.00	2.17	204	316	Vertical
2	79.6739	31.67	-36.09	40.00	8.33	275	48	Vertical
3	85.4951	34.82	-34.82	40.00	5.18	292	87	Vertical
4	190.470	29.94	-32.20	43.50	13.56	202	319	Vertical
5	759.585	24.73	-18.23	46.00	21.27	233	1	Vertical
6	988.551	28.36	-14.95	54.00	25.64	220	194	Vertical



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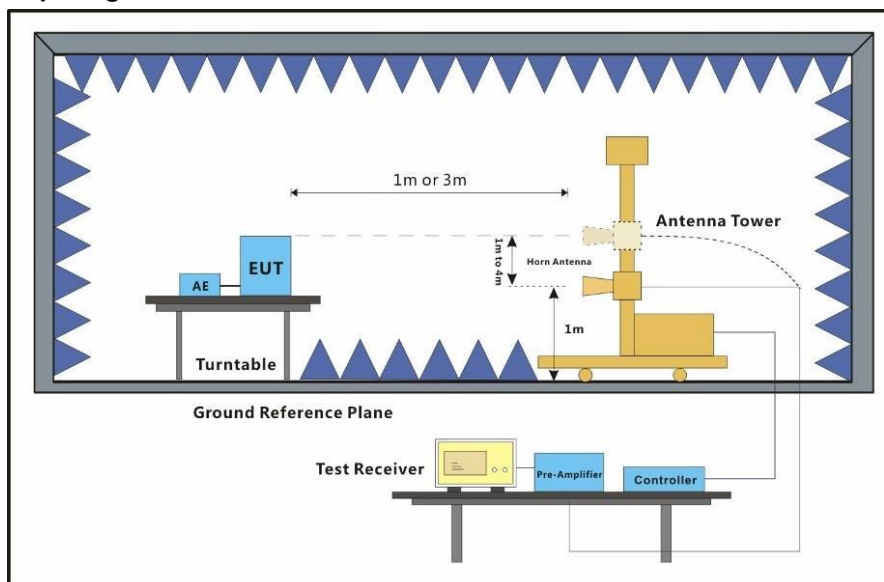
6.3 Radiated Emissions (above 1GHz)

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 to 18000MHz

6.3.1 E.U.T. Operation

Operating Environment:
Temperature: 23.3 °C Humidity: 56.2 % RH Atmospheric Pressure: 1005 mbar
The worst case for final test: b: GSM850 Idle +BT+WLAN +GPS Rx+playing MP4 (SD card) +earphone+battery+ Cable+adapter1

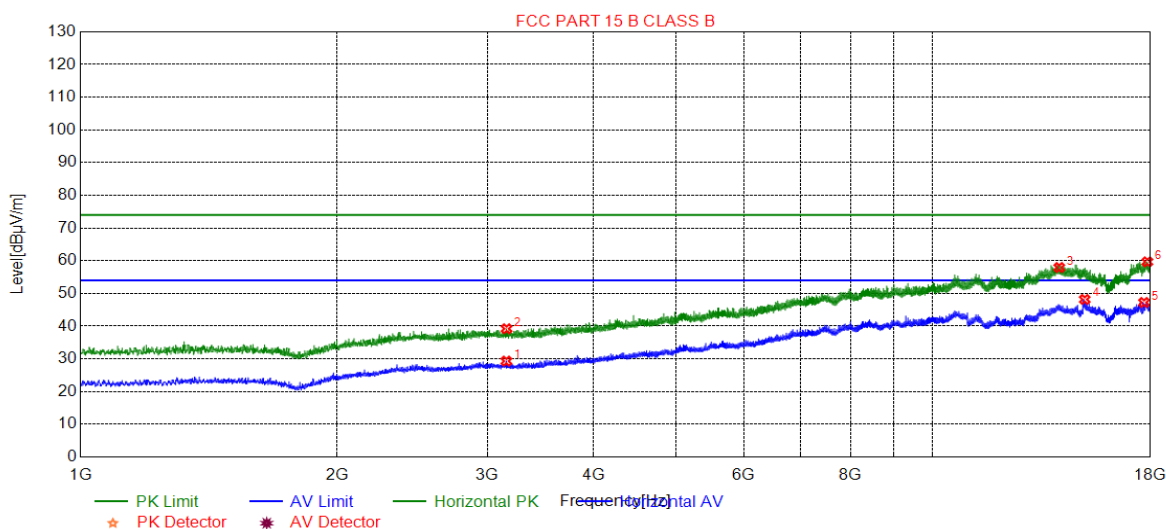
6.3.2 Test Setup Diagram



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: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	3159.10	29.33	-24.20	54.00	24.67	136	119	Horizontal
2	3160.80	39.22	-24.19	74.00	34.78	151	81	Horizontal
3	14067.7	57.94	2.32	74.00	16.06	164	241	Horizontal
4	15069.9	48.18	1.70	54.00	5.82	232	355	Horizontal
5	17688.8	47.25	1.03	54.00	6.75	208	270	Horizontal
6	17849.5	59.68	0.41	74.00	14.32	140	90	Horizontal



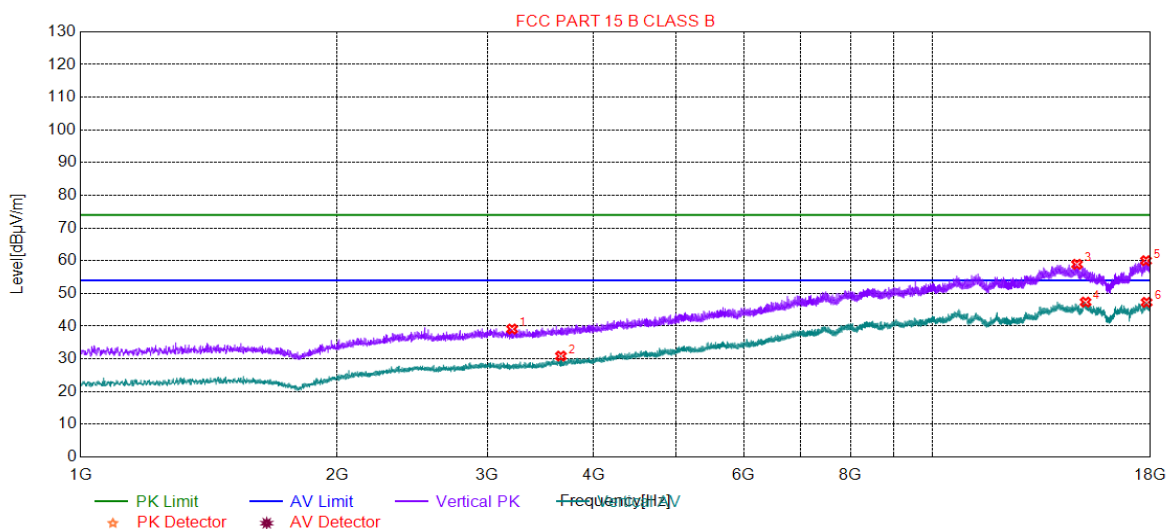
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Mode:b; Polarization:Vertical



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	3208.41	39.12	-24.06	74.00	34.88	272	279	Vertical
2	3660.63	30.86	-22.63	54.00	23.14	200	241	Vertical
3	14758.7	58.92	1.72	74.00	15.08	273	91	Vertical
4	15105.6	47.37	1.62	54.00	6.63	251	344	Vertical
5	17782.3	60.02	0.75	74.00	13.98	156	82	Vertical
6	17811.2	47.29	0.63	54.00	6.71	204	129	Vertical



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7 Photographs

7.1 Test Setup Photos

Refer to Appendix A - Photographs of Set-Up for ZR/2020/50038.

7.2 EUT Constructional Details (EUT Photos)

Please refer to internal and external photo.

- End of the Report -



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