

Report No.: HR/2020/3002307-01

Page: 1 of 20

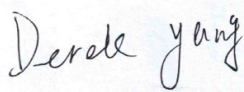
TEST REPORT

Application No.: HR/2020/30023
Applicant: Reliance Communications, LLC
Address of Applicant: 91 Colin Drive, Unit 1 Holbrook, NY 11741
Manufacturer: Unimaxcomm
Address of Manufacturer: Room 602, Floor 6th, Building B, Software Park T3, Hi-Tech Park South, Nanshan District, Shenzhen, P.R. China 518057
EUT Name: Smart phone
Model No.: RC545L
Trade mark: Orbic
FCC ID: 2ABGH-RC545L
Standard(s) : 47 CFR Part 15, Subpart B
Date of Receipt: 2020/4/16
Date of Test: 2020/4/16 to 2020/6/3
Date of Issue: 2021/5/28

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



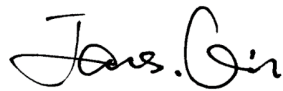
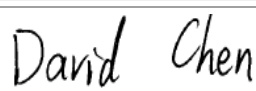
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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2020/7/13		Original
02		2021/5/28	James Qin	1. Modify data conversion error of antenna height 2. Updated equipment list

Authorized for issue by:		
Prepared By		 (James Qin) / Engineer
Checked By		 (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



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4 General Information

4.1 General Description of EUT

EUT Description::	Smart phone
Model No.:	RC545L
Trade Mark:	Orbic
Hardware Version:	V1.1
Software Version:	ORB545L_V.1.0.7_BVZPP
Sample Type:	☒ Portable Device, ☐ Module
Antenna Type:	☐ External, ☒ Integrated
Power Supply:	DC from internal rechargeable battery or from AC/DC adapter Model No.: TPA-5950100UU AC Input: 100-240V 50/60Hz 0.2A DC Output: DC 5V 1A
Cable:	USB cable: 80cm shielded

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

Pretest these modes to find the worst case and show the worse data in the test items:	e: Transfer data between the EUT and the PC+USB cable b: GSM850 Idle+BT+WLAN +GPS Rx+playing MP4 (SD card) +earphone+battery+Cable+adapter c: WCDMA Band V Idle+BT+WLAN +GPS Rx+playing MP4 (SD card) +earphone+battery+ Cable+adapter d: LTE B5 Idle+BT+WLAN +GPS Rx+camera (Front) +earphone+battery+ Cable+adapter e: LTE B13 Idle+BT+WLAN +GPS Rx+camera (Back) +earphone+battery+ Cable+adapter
---	---

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

Lab A:

Company:	SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch
Address:	No. 1 Workshop, M-10, Middle section, Science & Technology Park, Shenzhen, Guangdong, China
Post code:	518057

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

Lab A:

• 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.

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	2019-07-16	2020-07-15
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

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



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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



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

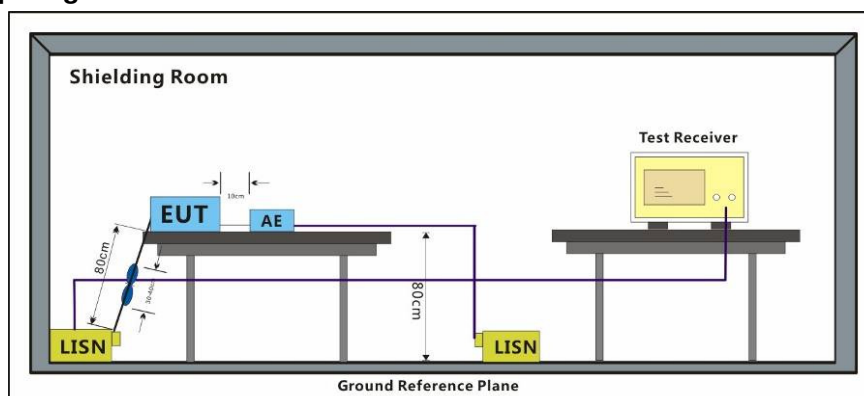
2.1.1 E.U.T. Operation

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+adapter

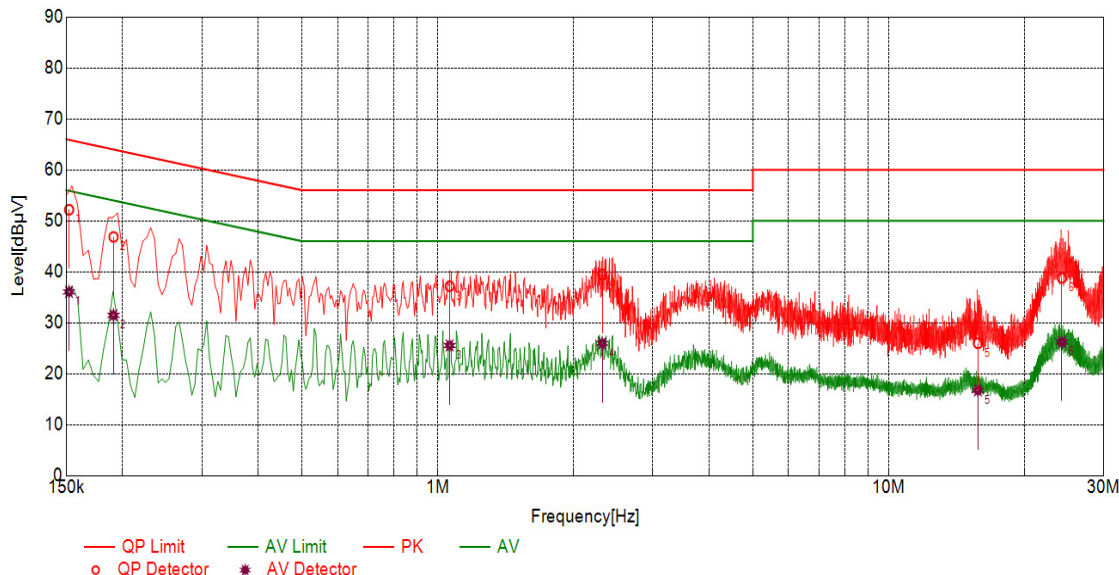
2.1.2 Test Setup Diagram



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

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	0.1522	10.10	52.18	65.88	13.70	36.05	55.88	19.83	L
2	0.1910	10.10	46.84	63.99	17.15	31.46	53.99	22.53	L
3	1.0629	10.10	37.17	56.00	18.83	25.54	46.00	20.46	L
4	2.3169	10.10	39.49	56.00	16.51	25.96	46.00	20.04	L
5	15.7798	10.11	25.97	60.00	34.03	16.73	50.00	33.27	L
6	24.2310	10.11	38.78	60.00	21.22	26.22	50.00	23.78	L

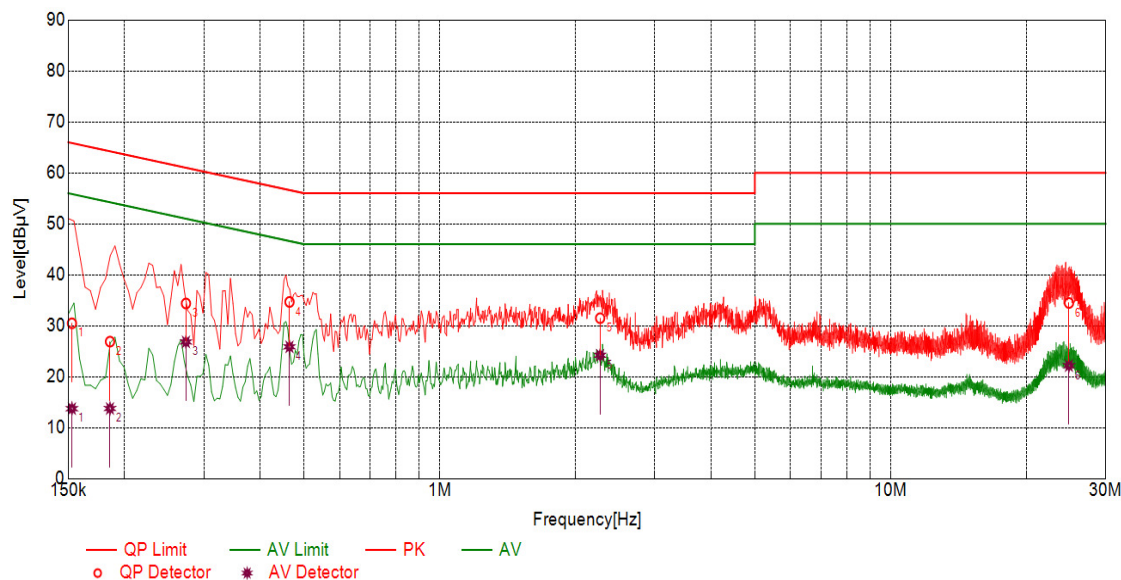


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Mode:b; Line:Neutral Line



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	0.1529	10.10	30.48	65.84	35.36	13.73	55.84	42.11	N
2	0.1857	10.10	26.89	64.22	37.33	13.76	54.22	40.46	N
3	0.2737	10.10	34.37	61.01	26.64	26.82	51.01	24.19	N
4	0.4644	10.10	34.68	56.61	21.93	25.86	46.61	20.75	N
5	2.2685	10.10	31.49	56.00	24.51	24.21	46.00	21.79	N
6	24.8607	10.11	34.47	60.00	25.53	22.17	50.00	27.83	N

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

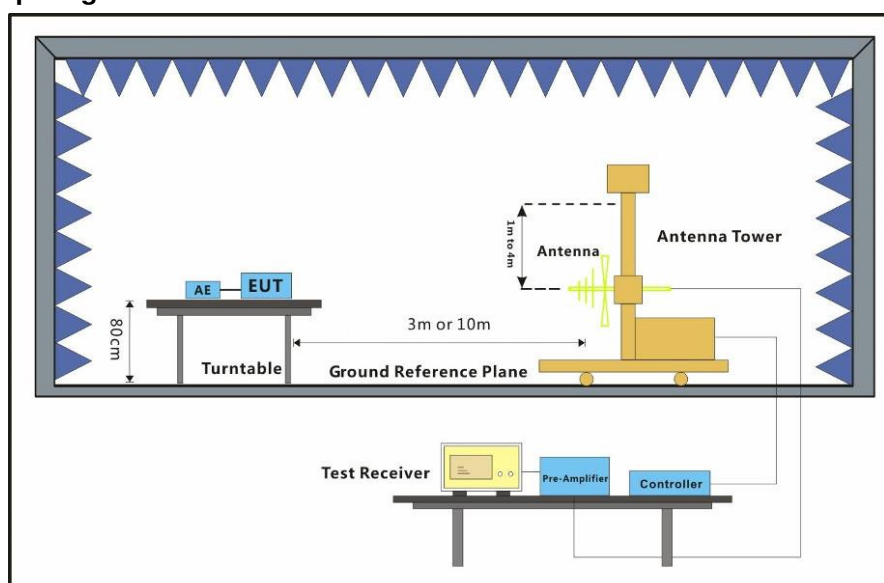
2.1.4 E.U.T. Operation

Operating Environment:

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

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

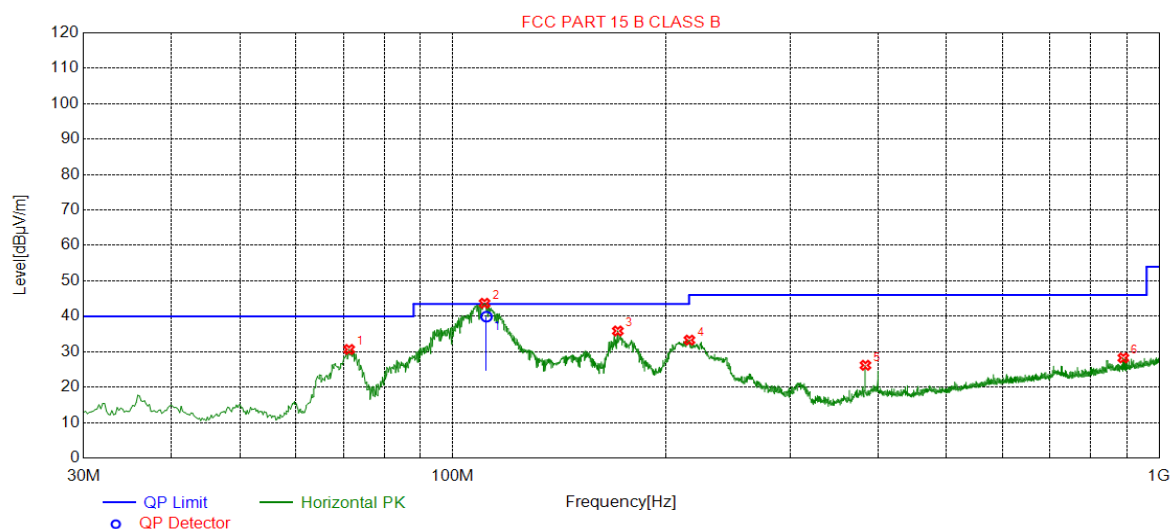
2.1.5 Test Setup Diagram



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: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	71.3303	30.64	-34.63	40.00	9.36	185	63	Horizontal
2	110.914	43.68	-32.14	43.50	-0.18	245	251	Horizontal
3	171.260	35.86	-33.95	43.50	7.64	149	221	Horizontal
4	216.277	33.28	-30.81	46.00	12.72	219	233	Horizontal
5	383.926	26.18	-25.95	46.00	19.82	135	128	Horizontal
6	889.786	28.26	-16.20	46.00	17.74	216	14	Horizontal

Final Data List

Final Data List								
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	111.594	-32.25	39.89	43.50	3.61	175.4	239.9	Horizontal

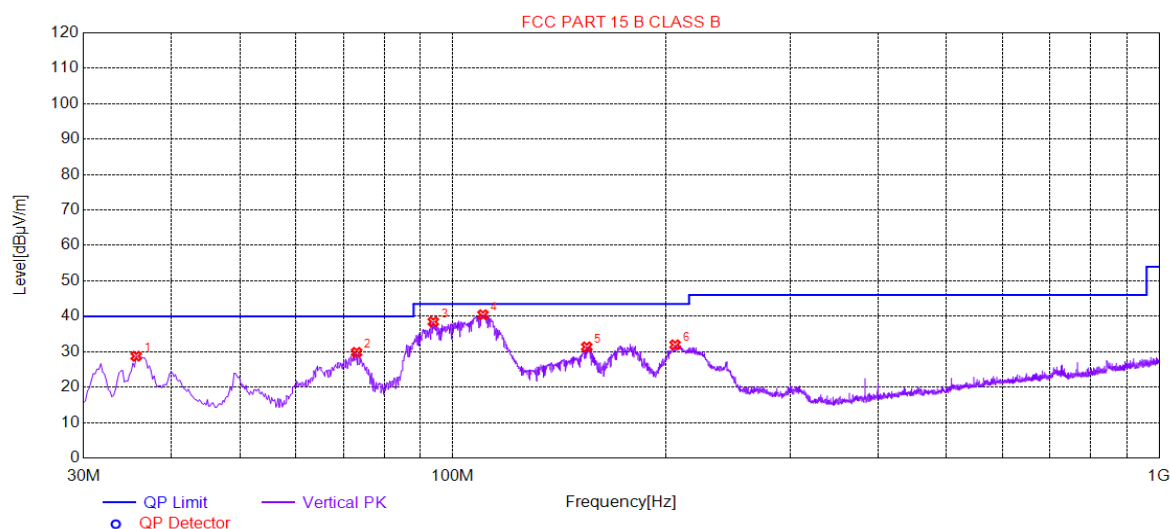


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Mode:e; Polarization:Vertical



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	35.6271	28.74	-29.76	40.00	11.26	246	43	Vertical
2	73.0766	29.82	-34.92	40.00	10.18	274	285	Vertical
3	93.8388	38.47	-33.08	43.50	5.03	219	91	Vertical
4	110.332	40.45	-32.05	43.50	3.05	211	107	Vertical
5	154.767	31.36	-34.87	43.50	12.14	210	344	Vertical
6	206.381	31.95	-31.05	43.50	11.55	280	243	Vertical



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6.3 Radiated Emissions (above 1GHz)

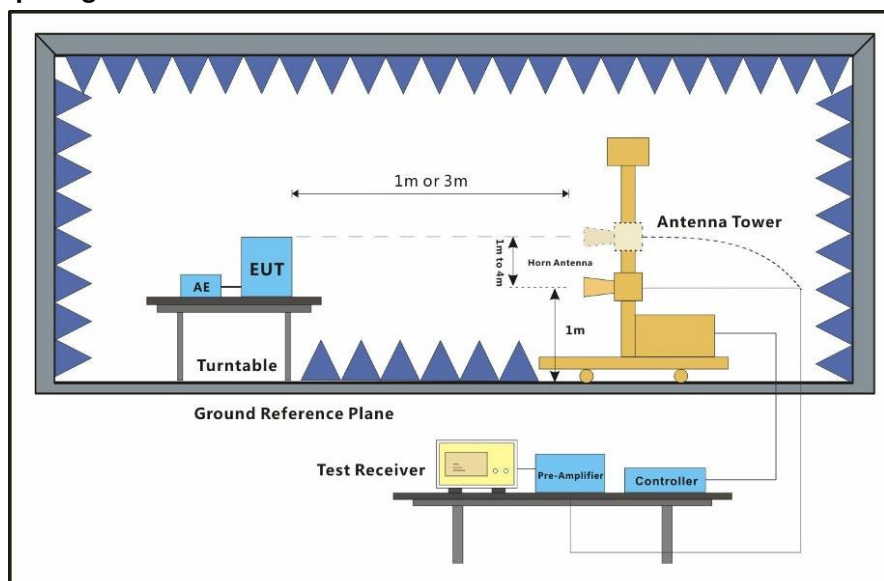
Test Requirement:	47 CFR Part 15, Subpart B
Test Method:	ANSI C63.4:2014
Frequency Range:	Above 1GHz
Measurement Distance:	3m
Limit:	
Above 1GHz	74(dBμV/m) peak, 54(dBμV/m) average
Detector:	Peak for pre-scan (1000kHz resolution bandwidth) 1000M to18000MHz

2.1.7 E.U.T. Operation

Operating Environment:

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

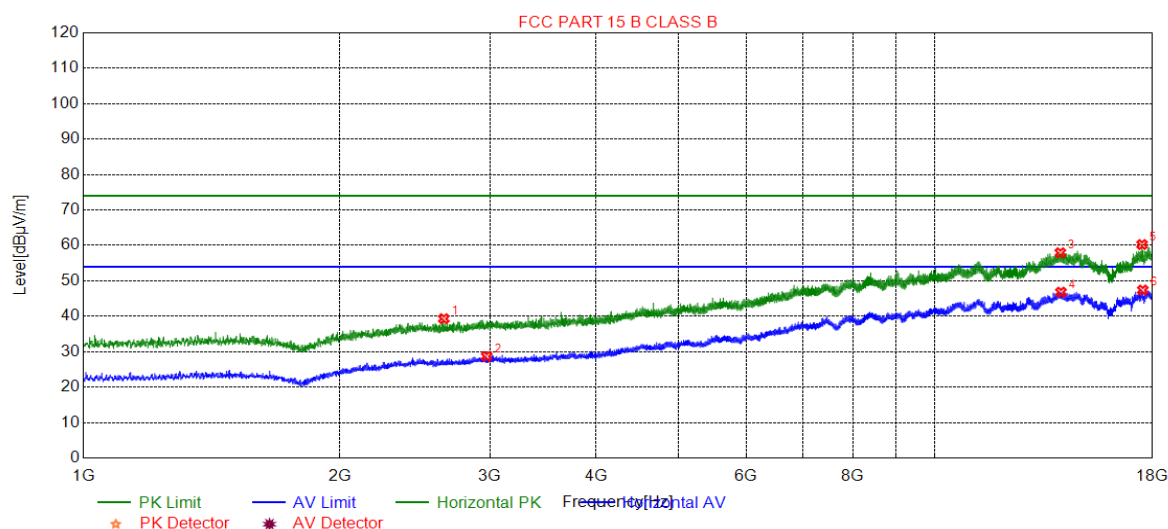
2.1.8 Test Setup Diagram



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.

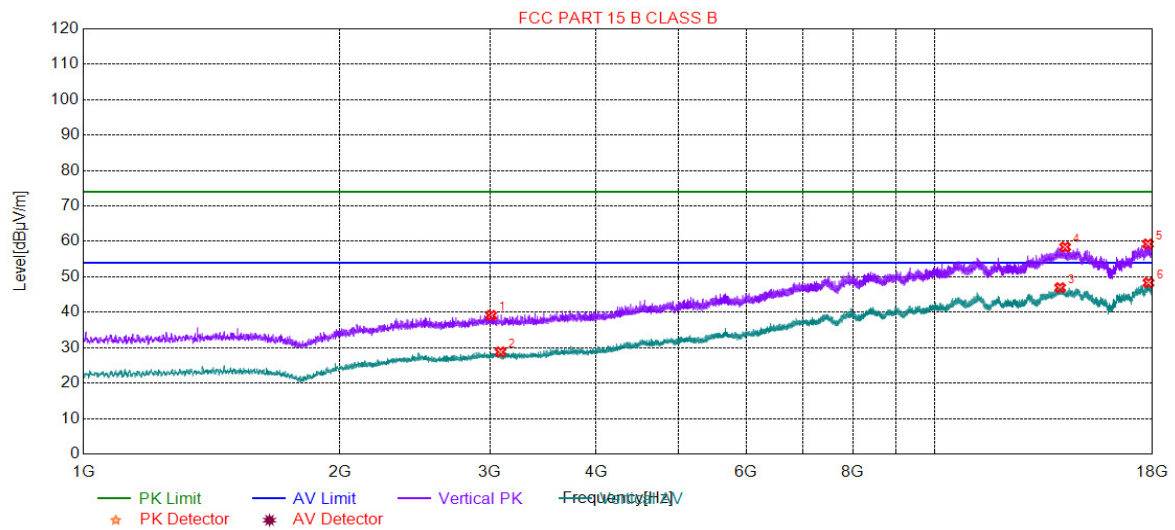
Mode:b; Polarization:Horizontal



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2649.08	39.32	-25.75	74.00	34.68	239	231	Horizontal
2	2974.64	28.67	-24.58	54.00	25.33	219	79	Horizontal
3	14028.6	57.93	2.27	74.00	16.07	121	130	Horizontal
4	14050.7	46.81	2.30	54.00	7.19	170	16	Horizontal
5	17496.7	60.26	1.60	74.00	13.74	242	288	Horizontal
6	17530.7	47.40	1.45	54.00	6.60	106	288	Horizontal

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	3010.35	39.13	-24.50	74.00	34.87	282	250	Vertical
2	3088.55	28.82	-24.37	54.00	25.18	175	212	Vertical
3	14016.7	46.95	2.26	54.00	7.05	286	150	Vertical
4	14210.5	58.41	2.05	74.00	15.59	261	150	Vertical
5	17778.9	59.28	0.76	74.00	14.72	199	37	Vertical
6	17804.4	48.33	0.66	54.00	5.67	153	92	Vertical

7 Photographs

7.1 Set-up Photos

Please refer to Photographs of Set-Up for HR/2020/30023

7.2 EUT Constructional Details (EUT Photos)

Please refer to internal and external photo.

- End of the Report -



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