

Report No.: HR/2020/3002307

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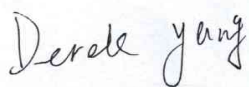
TEST REPORT

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: 2020/7/13

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

Authorized for issue by:				
		Mike Hu		
		(Mike Hu) /Project Engineer		
		David Chen		
		(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::	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.
Laptop	Lenovo	T430u	REF. No.SEA1800
Mouse	Lenovo	M-U0025-O	REF. No.:SEA2400
Router	NETGEAR	DGN2200	REF. No.SEA2200

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
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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%



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	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	2019-07-11	2020-07-10
LISN	Rohde & Schwarz	ENV216	SEM007-01	2019-09-24	2020-09-23
LISN	ETS-LINDGREN	3816/2	SEM007-02	2020-04-01	2021-03-31
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
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	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	2016-06-29	2020-06-28
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	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



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



6 Emission Test Results

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

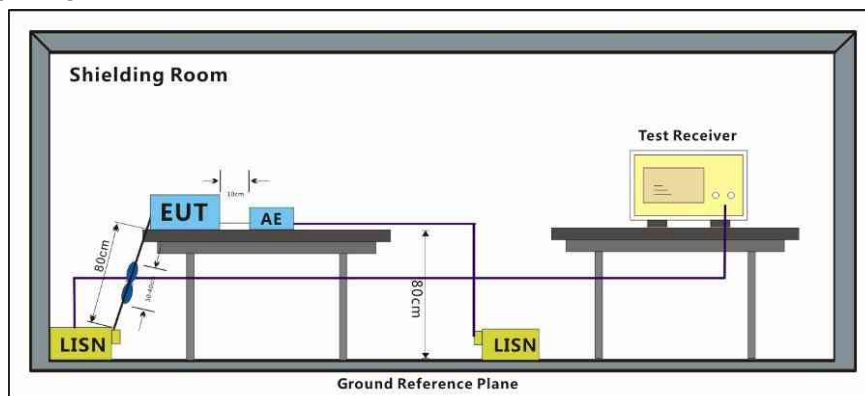
Test Requirement:	47 CFR Part 15, Subpart B
Test Method:	ANSI C63.4:2014
Frequency Range:	150kHz to 30MHz
Limit:	
0.15M-0.5MHz	66dB(μV)-56dB(μV) quasi-peak, 56dB(μV)-46dB(μV) average
0.5M-5MHz	56dB(μV) quasi-peak, 46dB(μV) average
5M-30MHz	60dB(μV) quasi-peak, 50dB(μV) average
Detector:	Peak for pre-scan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

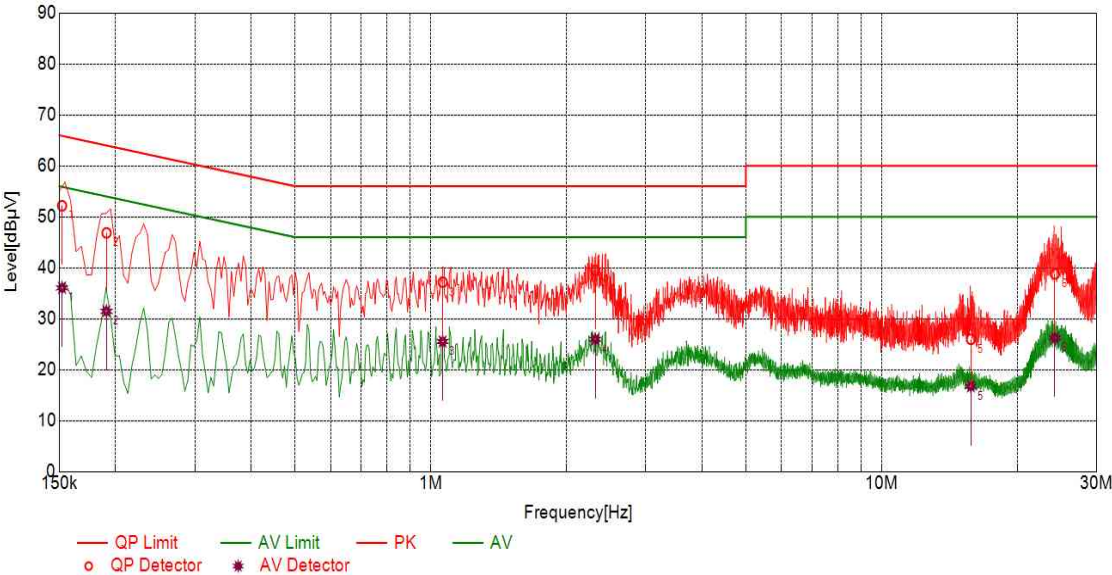
2.1.2 Test Setup Diagram



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.

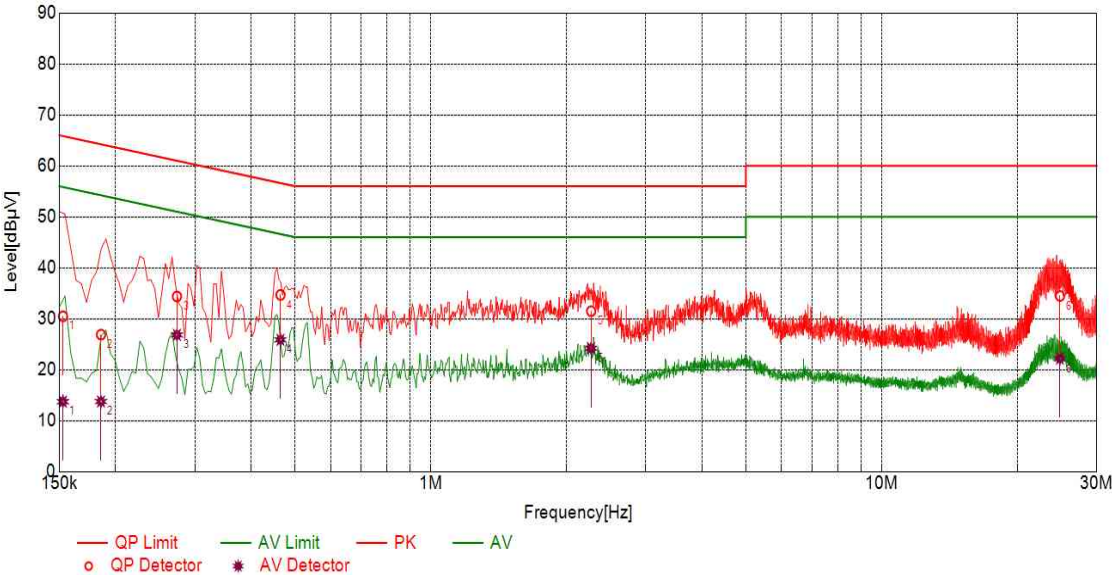
Mode:b; Line:Live Line



Test Graph

Final Data List									
NO.	Freq. [MHz]	Factor [dB]	QP Value	QP Limit	QP Margin	AV Value	AV Limit	AV Margin	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

Mode:b; 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	0.1529	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

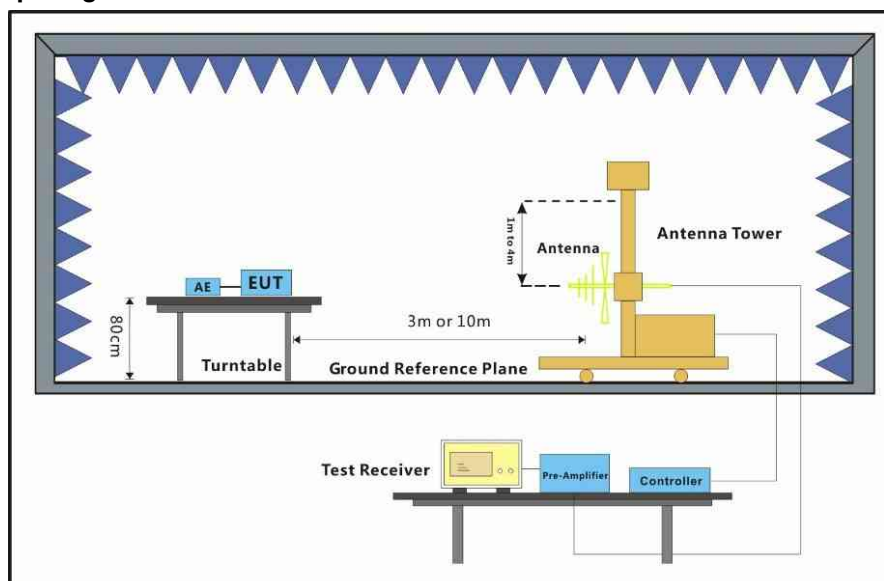
2.1.4 E.U.T. Operation

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:

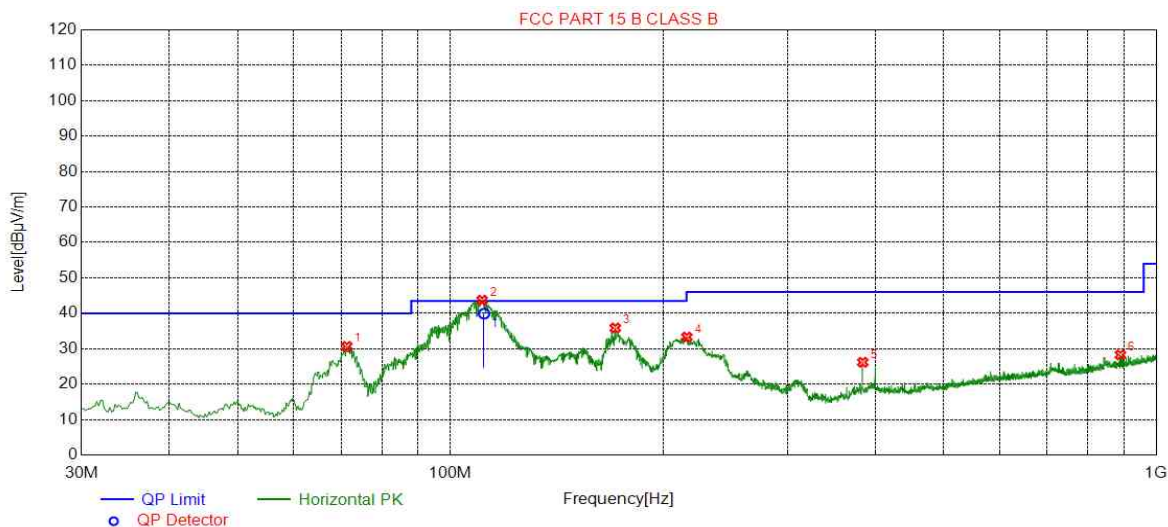
2.1.5 Test Setup Diagram



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.

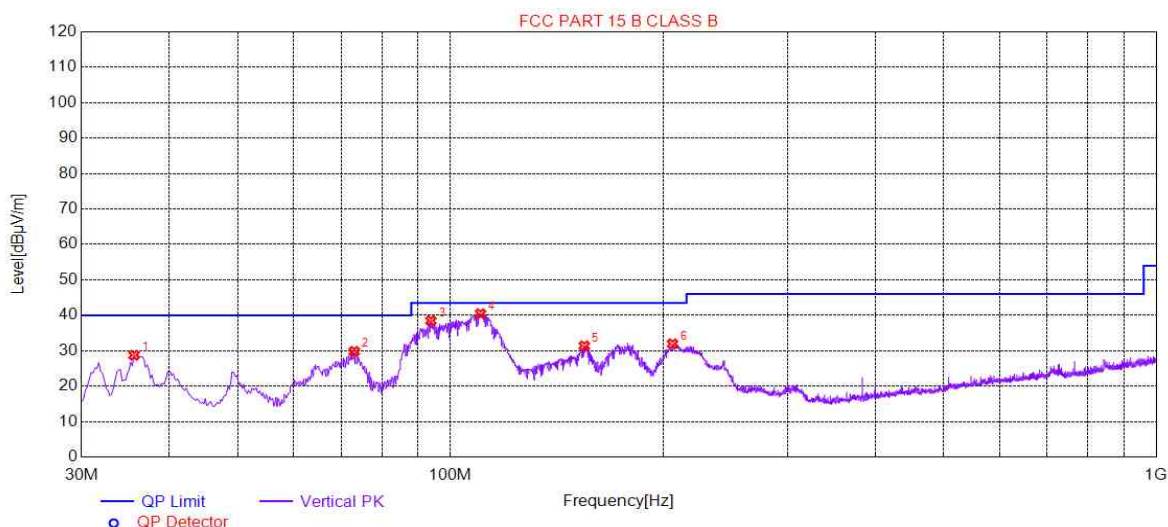
Mode:e; Polarization:Horizontal



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	200	63	Horizontal
2	110.914	43.68	-32.14	43.50	-0.18	200	251	Horizontal
3	171.260	35.86	-33.95	43.50	7.64	200	221	Horizontal
4	216.277	33.28	-30.81	46.00	12.72	100	233	Horizontal
5	383.926	26.18	-25.95	46.00	19.82	100	128	Horizontal
6	889.786	28.26	-16.20	46.00	17.74	200	14	Horizontal

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	100	43	Vertical
2	73.0766	29.82	-34.92	40.00	10.18	100	285	Vertical
3	93.8388	38.47	-33.08	43.50	5.03	100	91	Vertical
4	110.332	40.45	-32.05	43.50	3.05	100	107	Vertical
5	154.767	31.36	-34.87	43.50	12.14	100	344	Vertical
6	206.381	31.95	-31.05	43.50	11.55	100	243	Vertical



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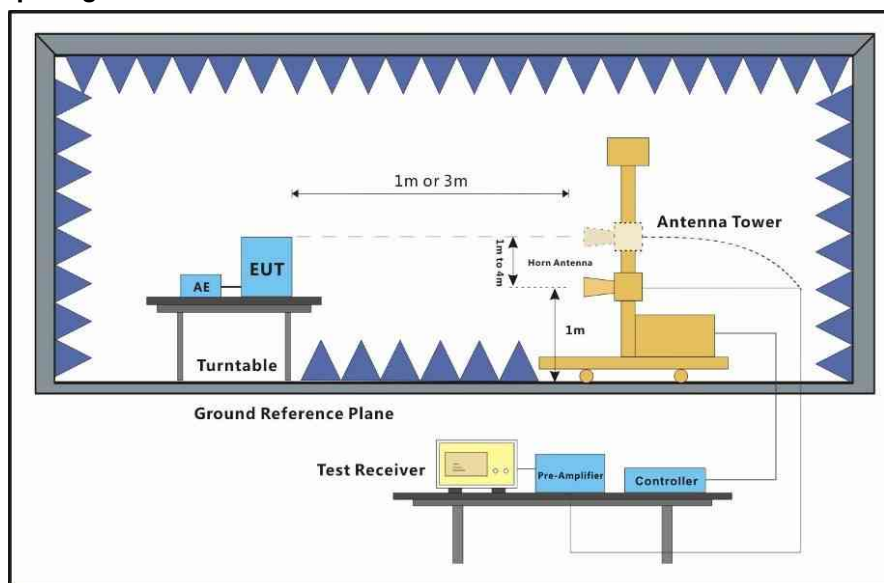
6.3 Radiated Emissions (above 1GHz)

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

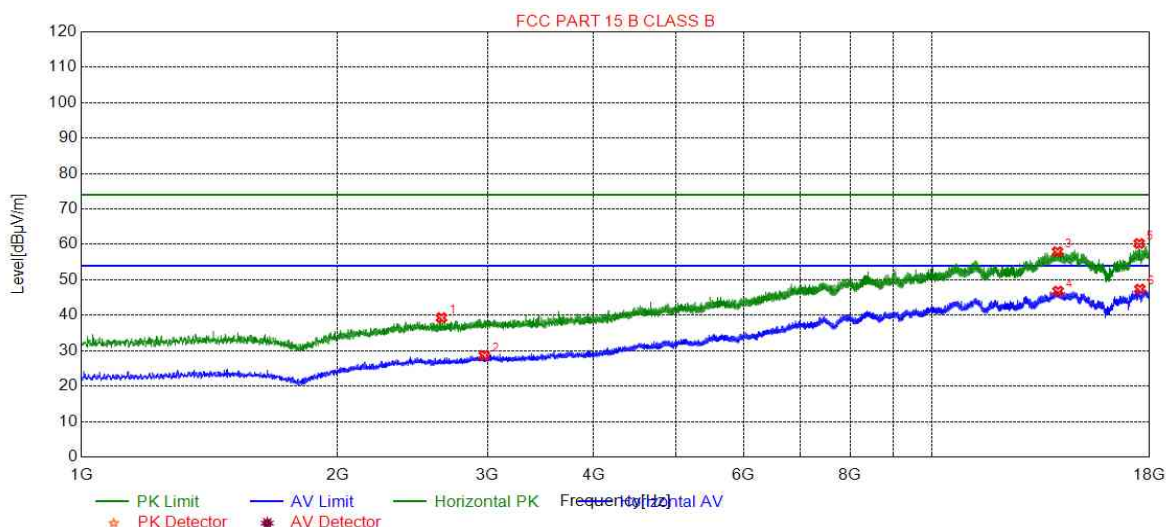


2.1.9 Measurement Data

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	100	231	Horizontal
2	2974.64	28.67	-24.58	54.00	25.33	100	79	Horizontal
3	14028.6	57.93	2.27	74.00	16.07	200	130	Horizontal
4	14050.7	46.81	2.30	54.00	7.19	200	16	Horizontal
5	17496.7	60.26	1.60	74.00	13.74	200	288	Horizontal
6	17530.7	47.40	1.45	54.00	6.60	200	288	Horizontal



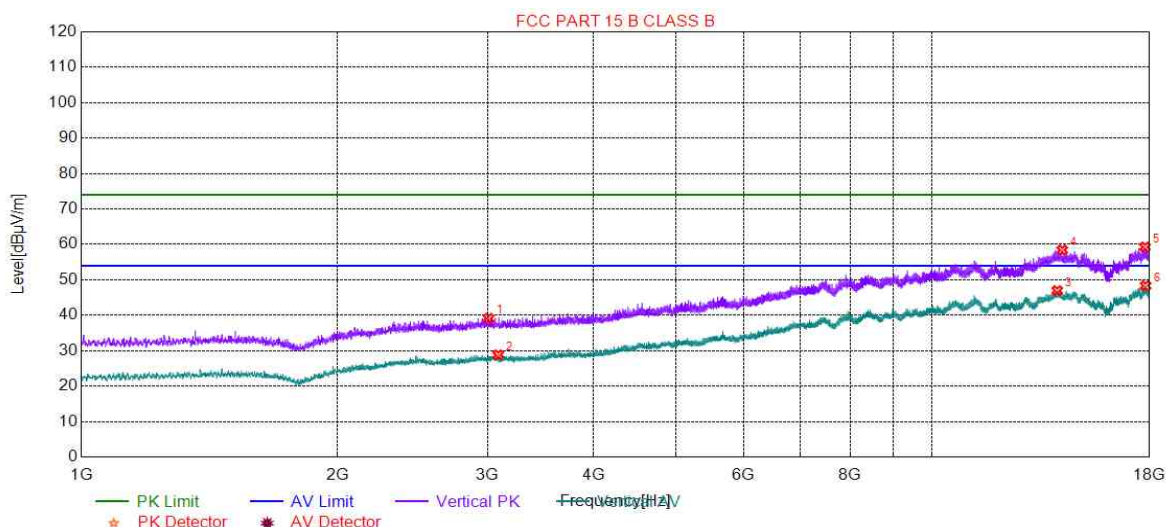
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SGS-CSTC Standards Technical Services Co., Ltd.
Shenzhen Branch Testing Center for Laboratory

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, China 518057 t (86-755) 26012053 f (86-755) 26710594 www.sgs.com.cn
中国·深圳·科技园中区M-10栋一号厂房 邮编: 518057 t (86-755) 26012053 f (86-755) 26710594 sgs.china@sgs.com

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	200	250	Vertical
2	3088.55	28.82	-24.37	54.00	25.18	200	212	Vertical
3	14016.7	46.95	2.26	54.00	7.05	100	150	Vertical
4	14210.5	58.41	2.05	74.00	15.59	100	150	Vertical
5	17778.9	59.28	0.76	74.00	14.72	100	37	Vertical
6	17804.4	48.33	0.66	54.00	5.67	200	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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