

Report No.: ZR/2020/6002806-01

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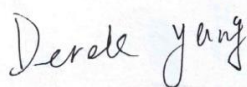
TEST REPORT

Application No.: ZR/2020/60028
Applicant: Fibocom Wireless Inc.
Address of Applicant: 5/F, Tower A, Technology Building II, 1057 Nanhai Avenue, Shenzhen, China
Manufacturer: Fibocom Wireless Inc.
Address of Manufacturer: 5/F, Tower A, Technology Building II, 1057 Nanhai Avenue, Shenzhen, China
EUT Name: LTE Module
Model No.: SQ808-NA
Trade mark: Fibocom
Standard(s) : 47 CFR Part 15, Subpart B
Date of Receipt: 2020/6/24
Date of Test: 2020/6/24 to 2020/7/13
Date of Issue: 2021/5/26

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		2021/5/26	Sherlock Fang	1.Add test site Information 2. Modify data conversion error of antenna height 3.Update equipment list

Authorized for issue by:		
Prepared By	 (Sherlock Fang) /Project 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 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

4.2 Test modes

Pretest these modes to find the worst case and show the worse data in the test items:

- a: GSM 850 Idle+BT+WLAN
- b: GSM 1900 Idle+BT+WLAN
- c: WCDMA Band II Idle+BT+WLAN
- d: WCDMA Band IV Idle+BT+WLAN
- e: WCDMA Band V Idle+BT+WLAN
- f: LTE band 2 Idle+BT+WLAN
- g: LTE band 4 Idle+BT+WLAN
- h: LTE band 5 Idle+BT+WLAN
- i: LTE band 7 Idle+BT+WLAN
- j: LTE band 12 Idle+BT+WLAN
- k: LTE band 13 Idle+BT+WLAN
- l: LTE band 17 Idle+BT+WLAN
- m: LTE band 25 Idle+BT+WLAN
- n: LTE band 26 Idle+BT+WLAN
- n: LTE band 41 Idle+BT+WLAN
- o: LTE band 66 Idle+BT+WLAN

4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Conduction Emission	$\pm 3.0\text{dB}$ (150kHz to 30MHz)
2	Radiated Emission	$\pm 4.8\text{dB}$ (Below 1GHz)
		$\pm 4.8\text{dB}$ (1GHz to 6GHz)
		$\pm 4.5\text{dB}$ (6GHz to 18GHz)
		$\pm 5.02\text{dB}$ (Above 18GHz)



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4.4 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.



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4.5 Test Facility

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

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.

4.6 Deviation from Standards

None

4.7 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
Radio communication analyzer	ROHDE&SCHWARZ	CMW 500	XAW01-03-02	2020-04-02	2021-04-01
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



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
Radio communication analyzer	ROHDE&SCHWARZ	CMW 500	XAW01-03-02	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
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+ RE V3.0.0.2	XAW02-05-01	NCR	NCR



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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

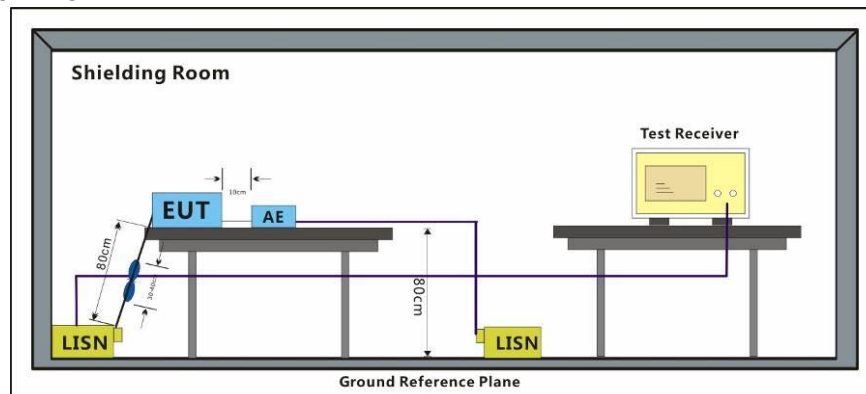
E.U.T. Operation

Operating Environment:

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

The worst case b: GSM 1900 Idle+BT+WLAN
for final test:

Test Setup Diagram

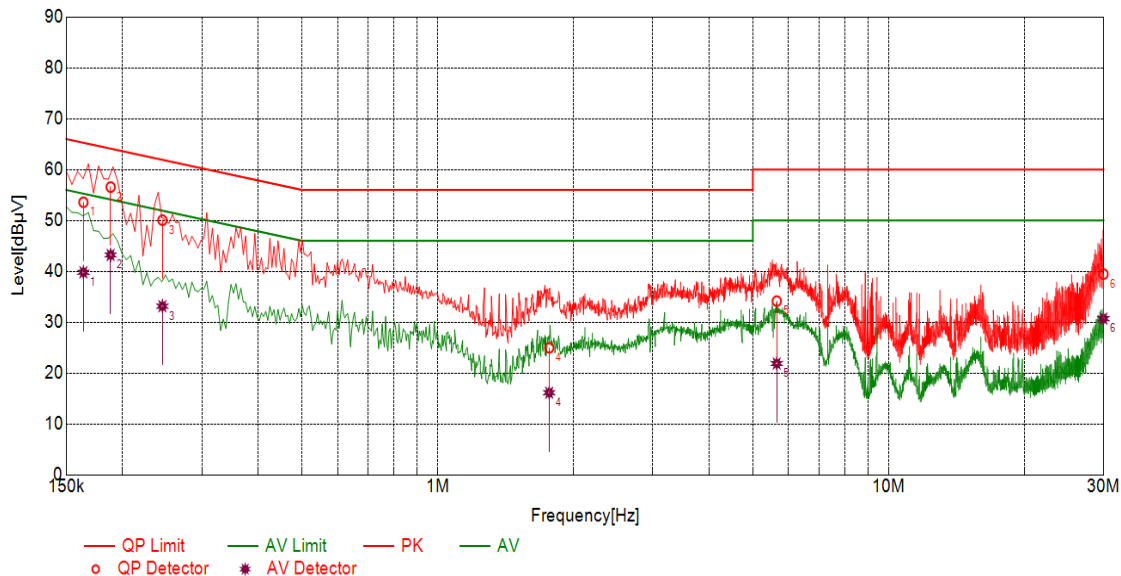


Measurement Data

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	0.1638	10.10	53.58	65.27	11.69	39.80	55.27	15.47	L
2	0.1882	10.10	56.56	64.12	7.56	43.22	54.12	10.90	L
3	0.2452	10.10	50.06	61.92	11.86	33.14	51.92	18.78	L
4	1.7672	10.10	24.98	56.00	31.02	16.14	46.00	29.86	L
5	5.6479	10.10	34.15	60.00	25.85	21.88	50.00	28.12	L
6	29.9556	10.11	39.46	60.00	20.54	30.70	50.00	19.30	L



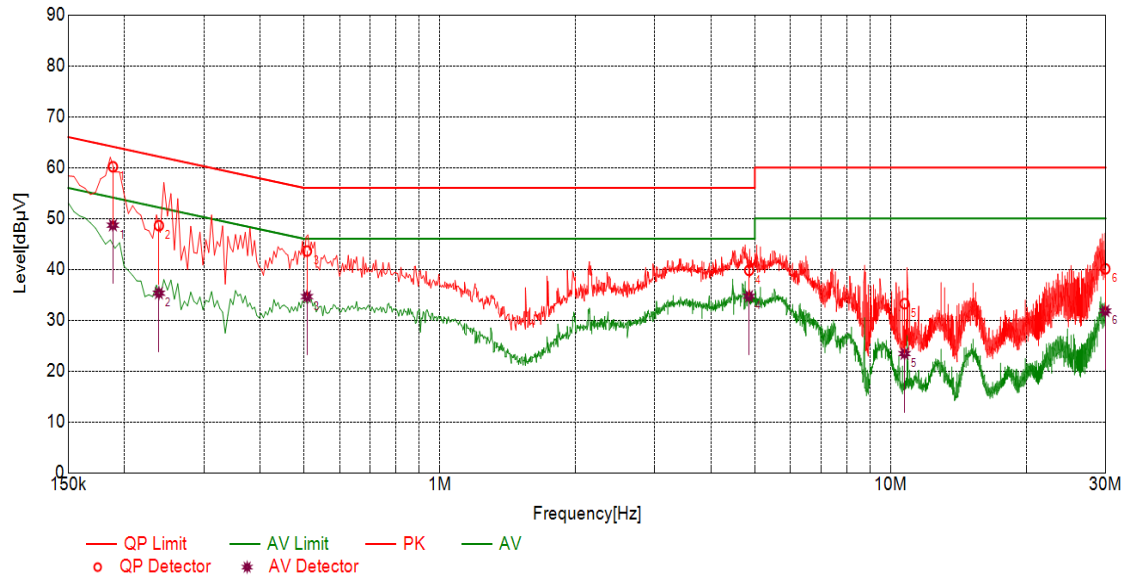
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Mode:b; Line:Neutral Line



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	0.1885	10.10	60.15	64.10	3.95	48.67	54.10	5.43	N
2	0.2384	10.10	48.59	62.15	13.56	35.32	52.15	16.83	N
3	0.5078	10.10	43.59	56.00	12.41	34.64	46.00	11.36	N
4	4.8546	10.10	39.81	56.00	16.19	34.72	46.00	11.28	N
5	10.7377	10.10	33.25	60.00	26.75	23.42	50.00	26.58	N
6	29.9360	10.11	40.10	60.00	19.90	31.82	50.00	18.18	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(dB μ V/m) quasi-peak
88MHz-216MHz	43.5(dB μ V/m) quasi-peak
216MHz-960MHz	46.0(dB μ V/m) quasi-peak
960MHz-1000MHz	54.0(dB μ V/m) quasi-peak
Detector:	Peak for pre-scan (120kHz resolution bandwidth) 30M to1000MHz

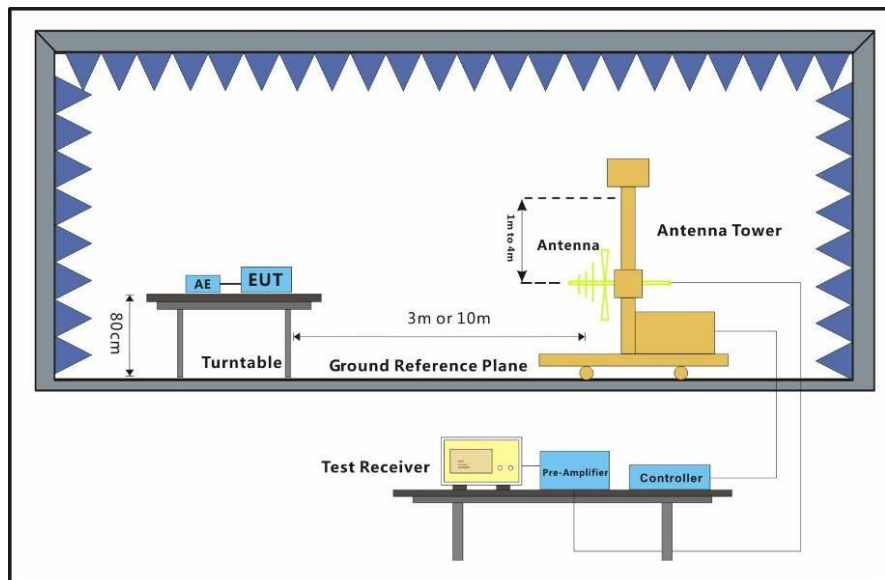
E.U.T. Operation

Operating Environment:

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

The worst case b: GSM 1900 Idle+BT+WLAN
for final test:

Test Setup Diagram

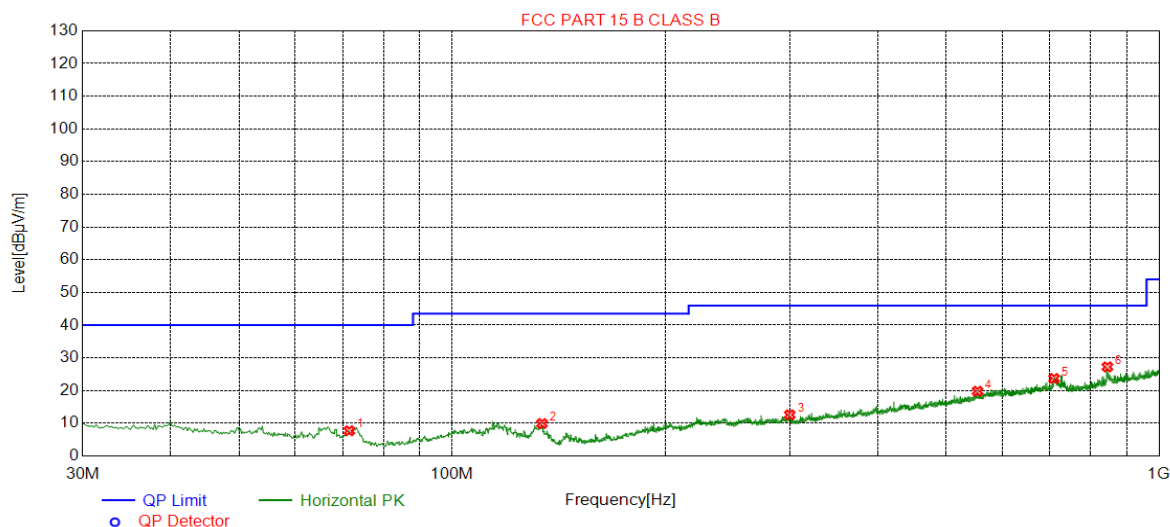


Measurement Data

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.



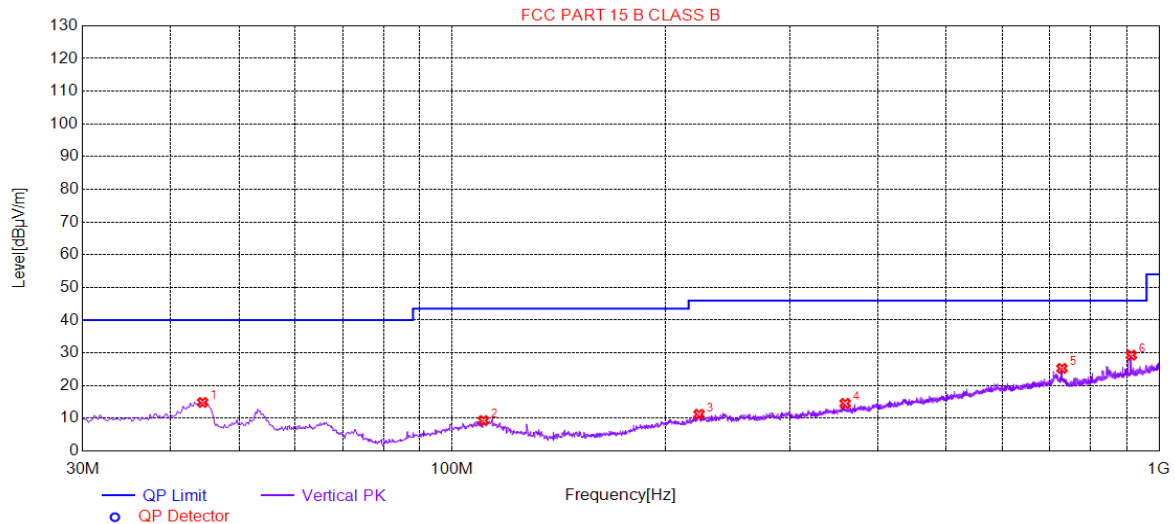
Mode:b; Polarization:Horizontal



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	71.5243	7.72	-34.66	40.00	32.28	182	225	Horizontal
2	134.004	9.94	-35.26	43.50	33.56	107	38	Horizontal
3	300.296	12.62	-28.25	46.00	33.38	168	96	Horizontal
4	553.516	19.82	-21.94	46.00	26.18	130	205	Horizontal
5	710.300	23.72	-19.27	46.00	22.28	159	346	Horizontal
6	844.963	27.26	-16.97	46.00	18.74	165	6	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	44.3589	14.86	-30.16	40.00	25.14	285	299	Vertical
2	110.720	9.31	-32.11	43.50	34.19	220	158	Vertical
3	223.456	11.25	-30.61	46.00	34.75	166	210	Vertical
4	359.671	14.55	-26.61	46.00	31.45	188	14	Vertical
5	728.927	25.27	-18.83	46.00	20.73	173	108	Vertical
6	913.458	29.32	-15.88	46.00	16.68	293	226	Vertical



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(dB μ V/m) peak, 54(dB μ V/m) average
Detector: Peak for pre-scan (1000kHz resolution bandwidth) 1000M to18000MHz

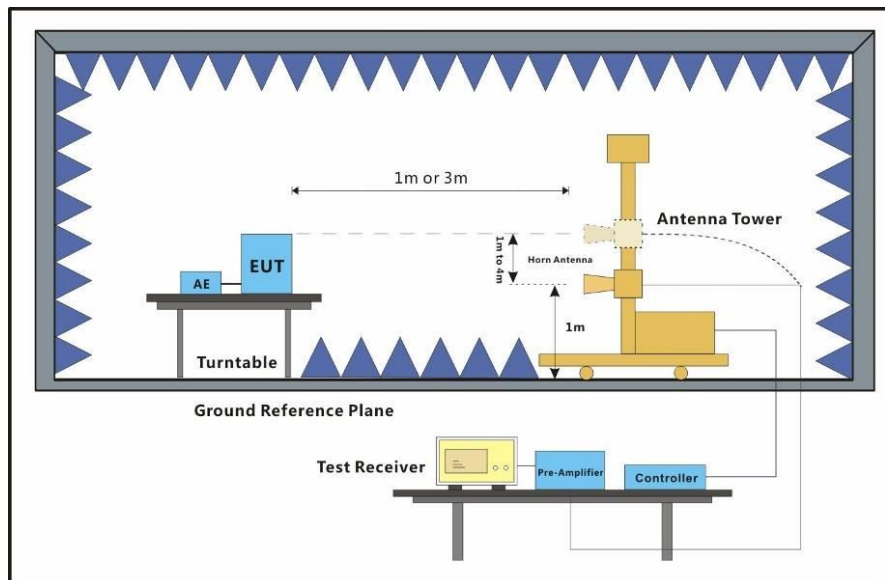
E.U.T. Operation

Operating Environment:

Temperature: 23.3 °C Humidity: 56.2 % RH Atmospheric Pressure: 1005 mbar

The worst case b: GSM 1900 Idle+BT+WLAN
for final test:

Test Setup Diagram

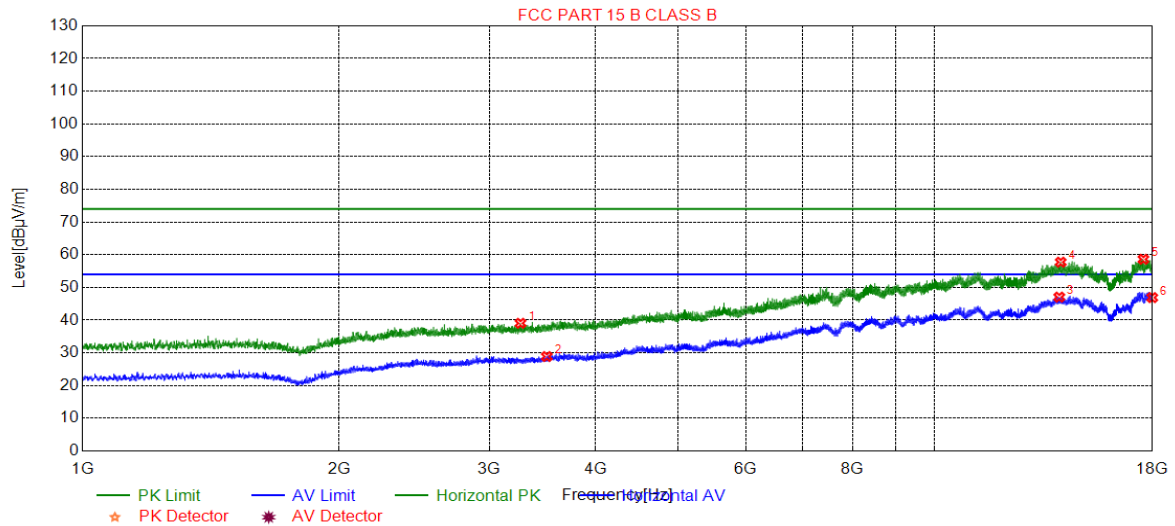


Measurement Data

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

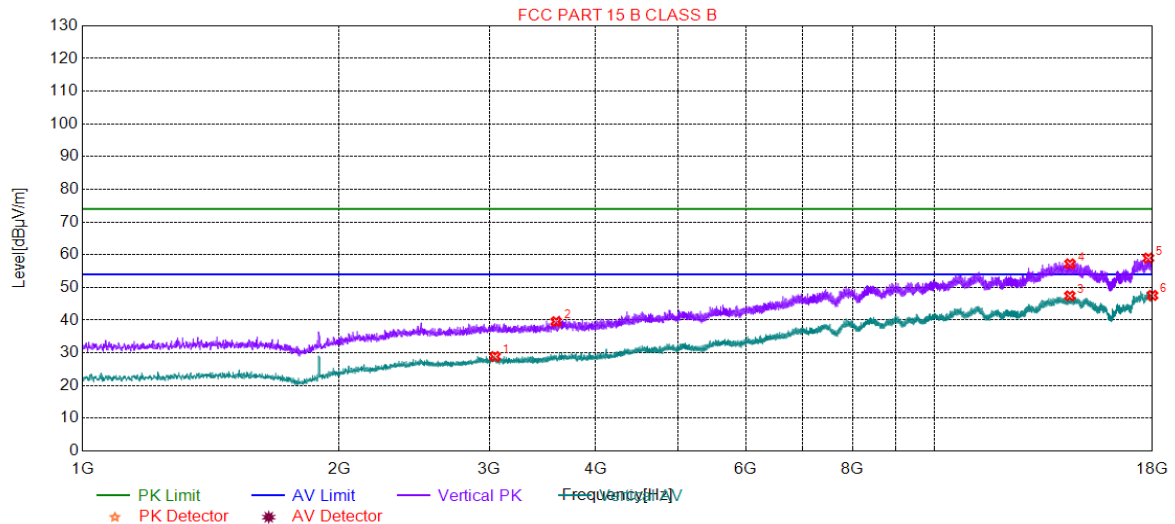


Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	3264.51	39.06	-23.88	74.00	34.94	186	128	Horizontal
2	3505.07	28.89	-23.58	54.00	25.11	225	166	Horizontal
3	13993.7	47.06	2.24	54.00	6.94	164	316	Horizontal
4	14048.1	57.75	2.30	74.00	16.25	143	90	Horizontal
5	17564.7	58.63	1.24	74.00	15.37	228	16	Horizontal
6	17987.2	46.91	-0.26	54.00	7.09	138	90	Horizontal



Mode:b; Polarization:Vertical



Suspected List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	3047.75	28.88	-24.44	54.00	25.12	169	118	Vertical
2	3594.32	39.56	-22.76	74.00	34.44	186	81	Vertical
3	14398.3	47.43	1.96	54.00	6.57	156	43	Vertical
4	14402.6	57.22	1.95	74.00	16.78	196	194	Vertical
5	17800.2	58.99	0.69	74.00	15.01	291	270	Vertical
6	17999.1	47.58	-0.31	54.00	6.42	278	43	Vertical



7 Photographs

7.1 EUT Constructional Details (Set-up Photos)

Refer to Appendix A - Photographs of Set-Up for ZR/2020/60028.

7.2 EUT Constructional Details (EUT Photos)

Please refer to internal and external photo.

- End of the Report -

