

Report No.: ZR/2020/6002806

Page: 1 of 17

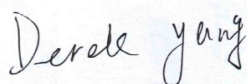
TEST REPORT

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: 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) /Project Engineer	
			
		(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 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

4.2 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
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4.3 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%



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4.4 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.

4.5 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 17025:2017 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.

4.6 Deviation from Standards

None

4.7 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	2020-05-10	2023-05-09
Measurement Software	AUDIX	e3 V5.4.1221d	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM024-01	2019-07-13	2020-07-12
				2020-07-12	2021-07-11
LISN	Rohde & Schwarz	ENV216	SEM007-01	2019-09-25	2020-09-24
LISN	ETS-LINDGREN	3816/2	SEM007-02	2020-03-13	2021-03-12
EMI Test Receiver	Rohde & Schwarz	ESCI	SEM004-02	2020-03-13	2021-03-12
Wideband Radio CommunicationTester	Rohde & Schwarz	CMW500	W005-02	2020-01-03	2021-01-02

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	2019-07-13	2020-07-12
				2020-07-12	2021-07-11
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	2016-06-30	2020-06-29
				2020-06-29	2024-06-28
Pre-amplifier	Sonoma Instrument Co	310N	SEM005-04	2020-03-13	2021-03-12
Wideband Radio CommunicationTester	Rohde & Schwarz	CMW500	W005-02	2020-01-03	2021-01-02

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	2019-07-13	2020-07-12
				2020-07-12	2021-07-11
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
Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	W005-02	2020-01-03	2021-01-02

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



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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

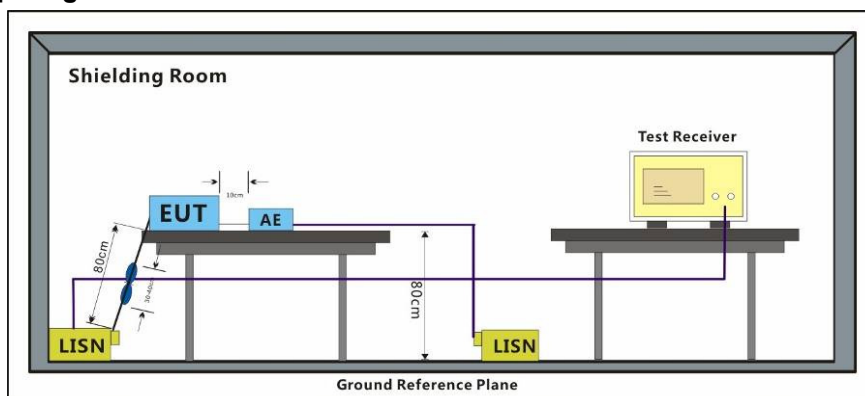
Operating Environment:

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

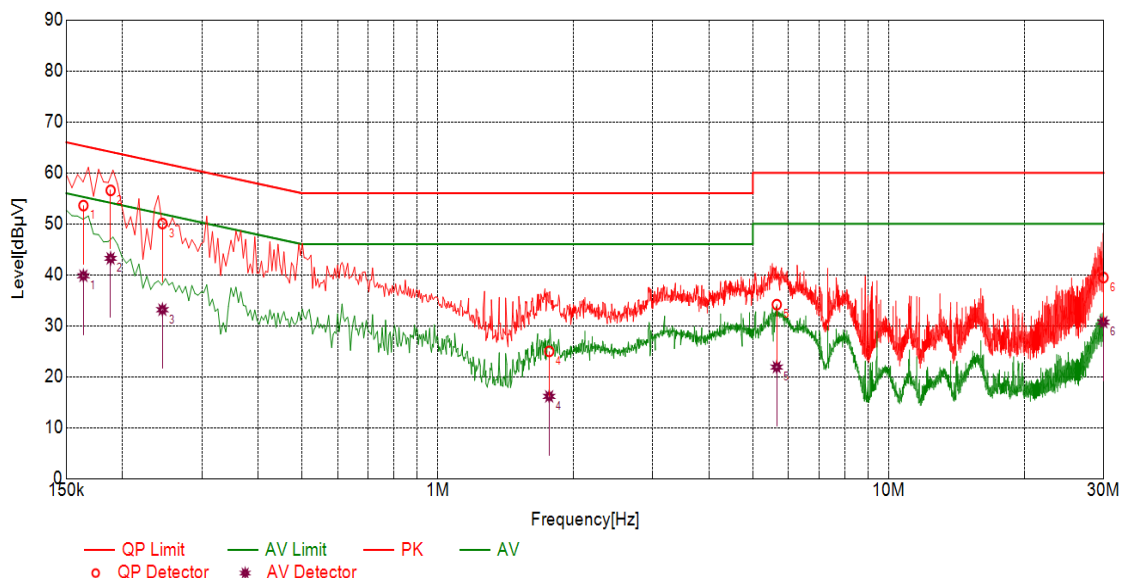
An initial pre-scan was performed with peak detector. Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected.



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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

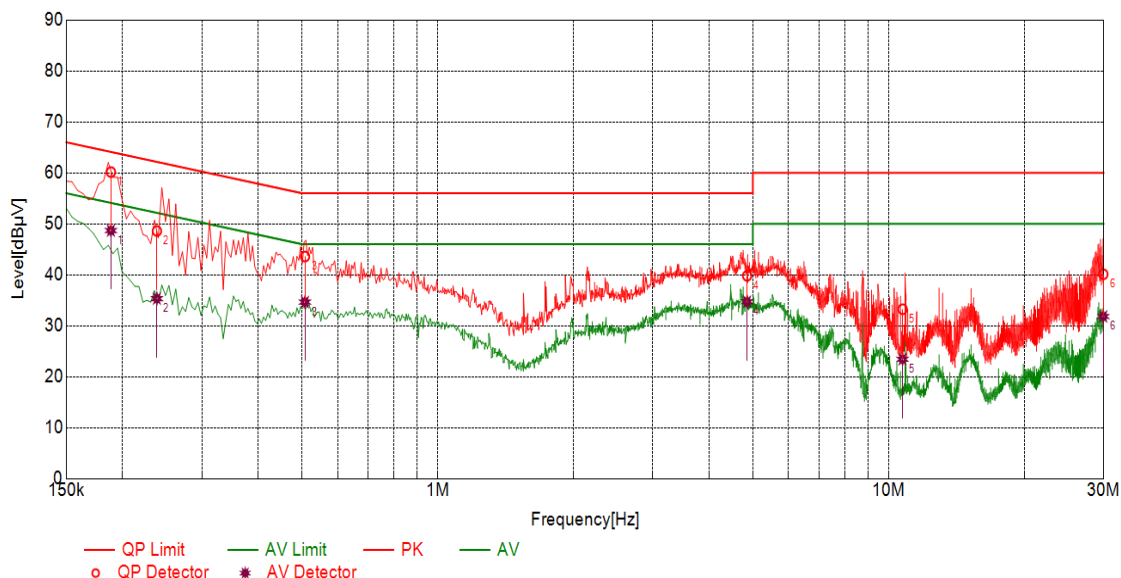


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Mode:b; Line:Neutral Line



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



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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

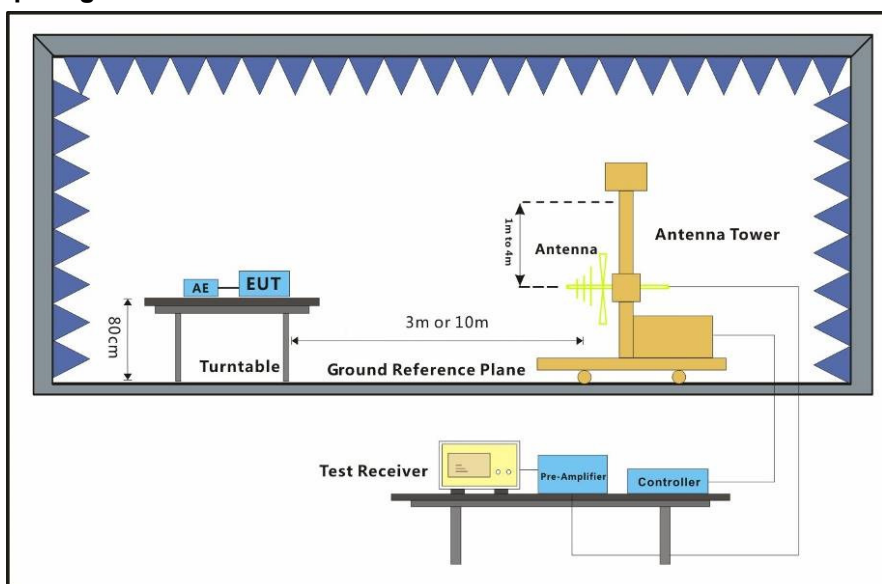
E.U.T. Operation

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.

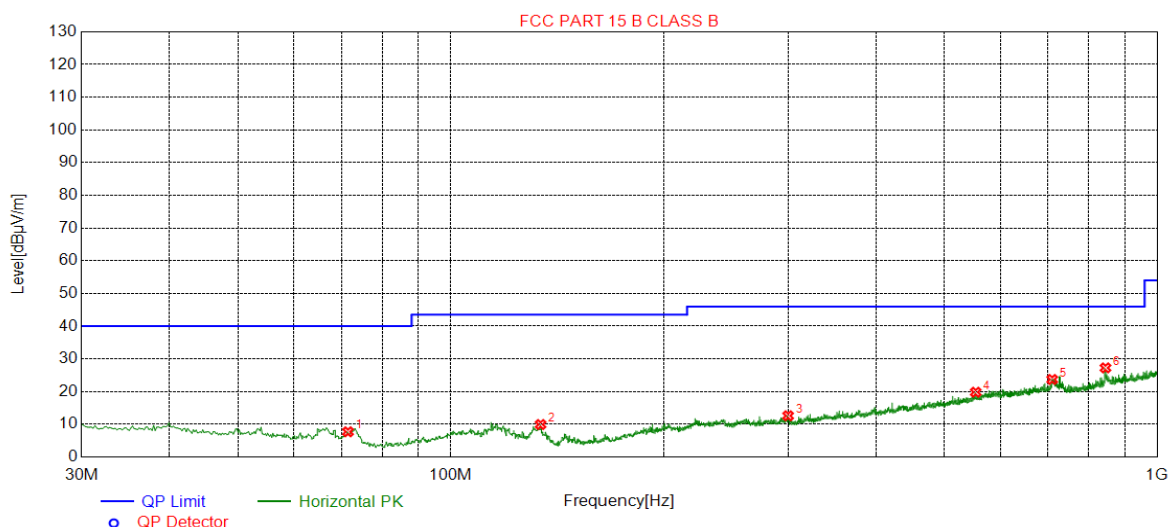


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Mode:b; Polarization:Horizontal



Suspected List

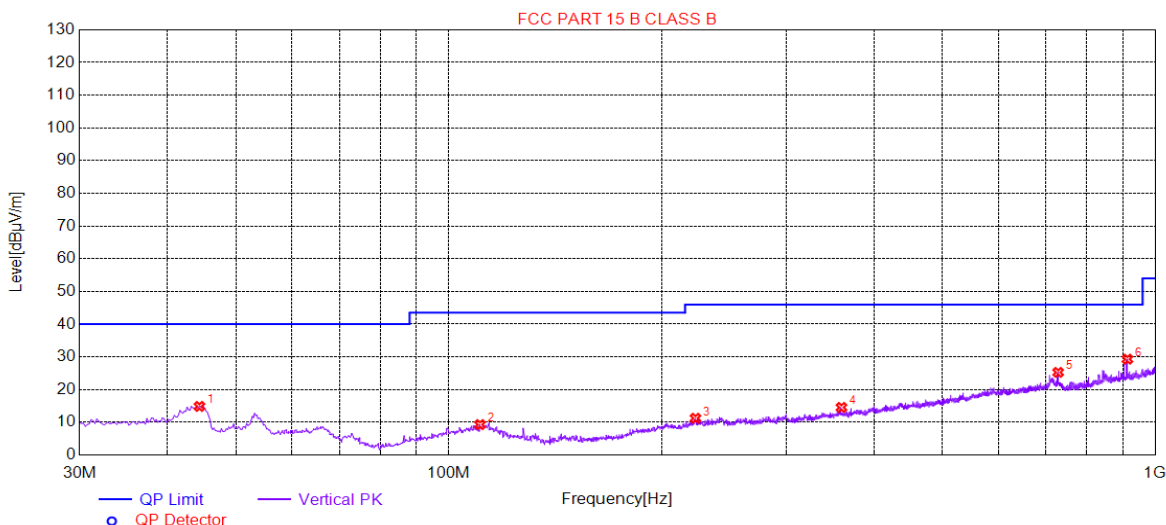
Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	71.5243	7.72	-34.66	40.00	32.28	200	225	Horizontal
2	134.004	9.94	-35.26	43.50	33.56	200	38	Horizontal
3	300.296	12.62	-28.25	46.00	33.38	100	96	Horizontal
4	553.516	19.82	-21.94	46.00	26.18	100	205	Horizontal
5	710.300	23.72	-19.27	46.00	22.28	200	346	Horizontal
6	844.963	27.26	-16.97	46.00	18.74	200	6	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	44.3589	14.86	-30.16	40.00	25.14	100	299	Vertical
2	110.720	9.31	-32.11	43.50	34.19	100	158	Vertical
3	223.456	11.25	-30.61	46.00	34.75	100	210	Vertical
4	359.671	14.55	-26.61	46.00	31.45	100	14	Vertical
5	728.927	25.27	-18.83	46.00	20.73	200	108	Vertical
6	913.458	29.32	-15.88	46.00	16.68	200	226	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

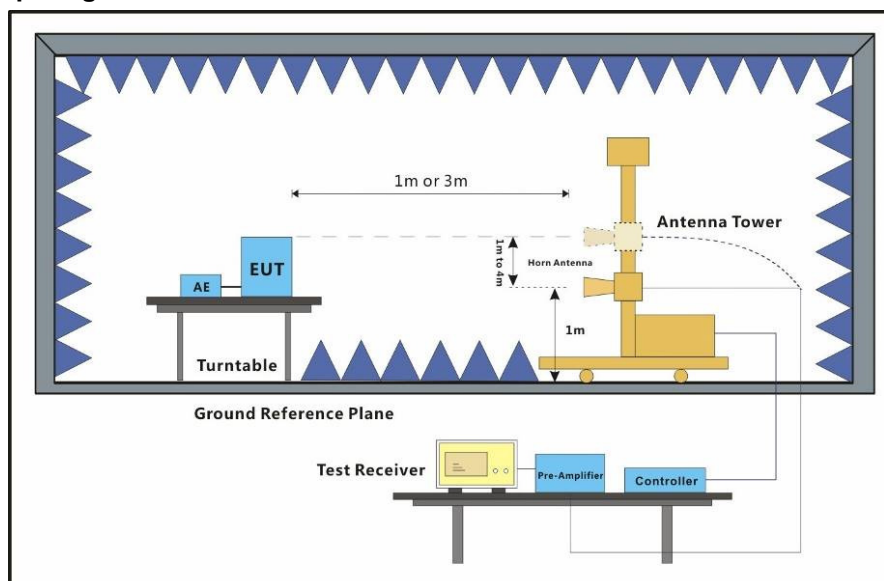
E.U.T. Operation

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:

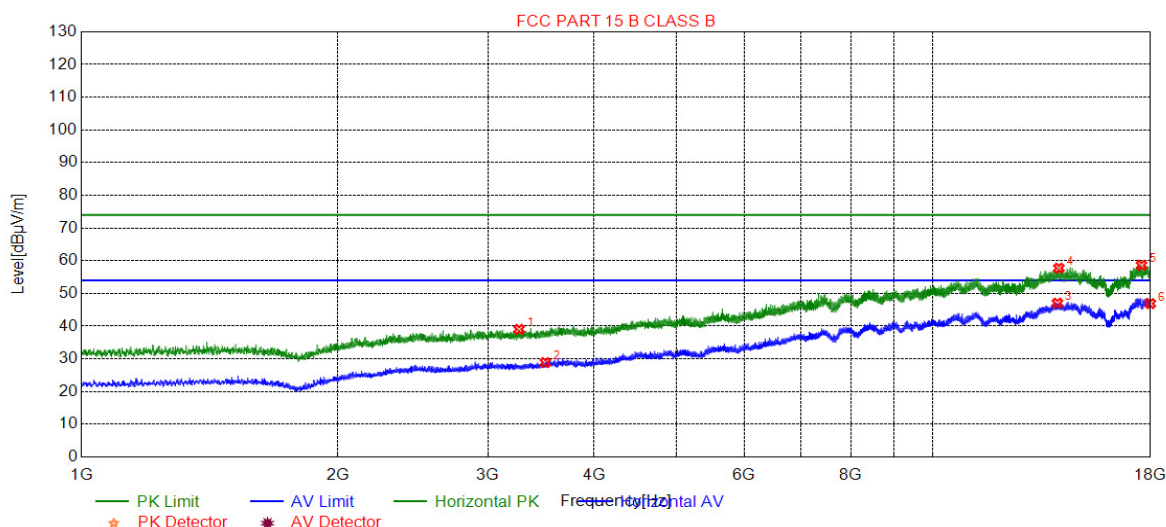
Test Setup Diagram



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.

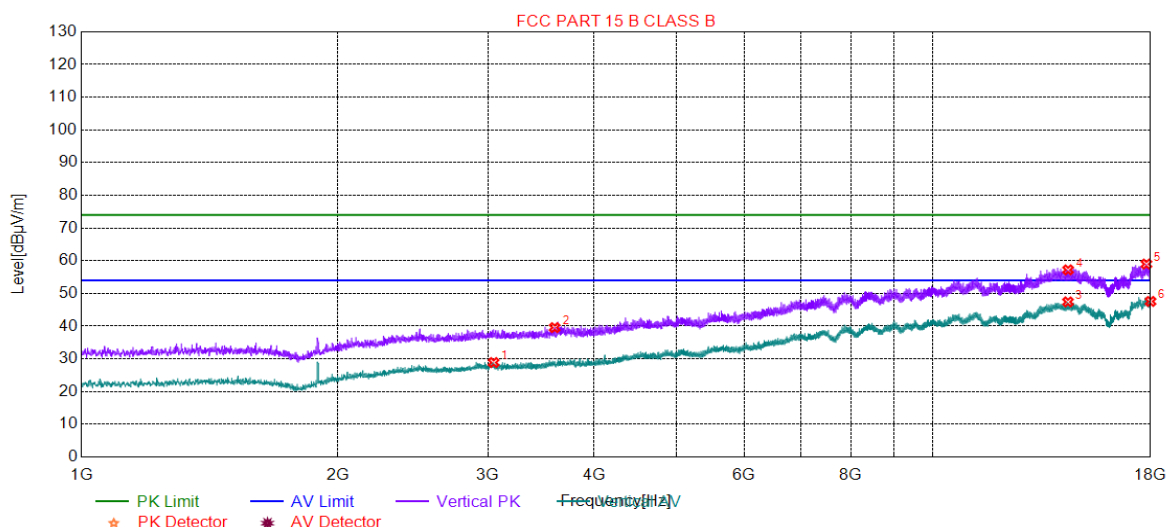
Mode:b; Polarization:Horizontal



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	100	128	Horizontal
2	3505.07	28.89	-23.58	54.00	25.11	100	166	Horizontal
3	13993.7	47.06	2.24	54.00	6.94	100	316	Horizontal
4	14048.1	57.75	2.30	74.00	16.25	100	90	Horizontal
5	17564.7	58.63	1.24	74.00	15.37	100	16	Horizontal
6	17987.2	46.91	-0.26	54.00	7.09	100	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	100	118	Vertical
2	3594.32	39.56	-22.76	74.00	34.44	100	81	Vertical
3	14398.3	47.43	1.96	54.00	6.57	100	43	Vertical
4	14402.6	57.22	1.95	74.00	16.78	100	194	Vertical
5	17800.2	58.99	0.69	74.00	15.01	100	270	Vertical
6	17999.1	47.58	-0.31	54.00	6.42	100	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 -

