

Report No.: ZR/2020/6002806

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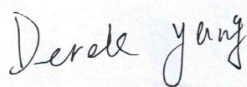
# TEST REPORT

**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:** 2020/7/13

|                     |              |
|---------------------|--------------|
| <b>Test Result:</b> | <b>Pass*</b> |
|---------------------|--------------|

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

### 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:

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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 Communication Tester                   | 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 Communication Tester  | 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           | Agilent Technologies 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   |



## 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 |

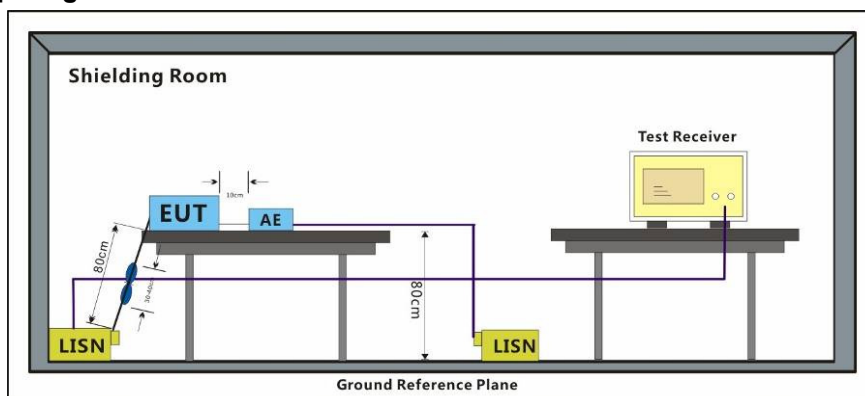
#### E.U.T. Operation

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

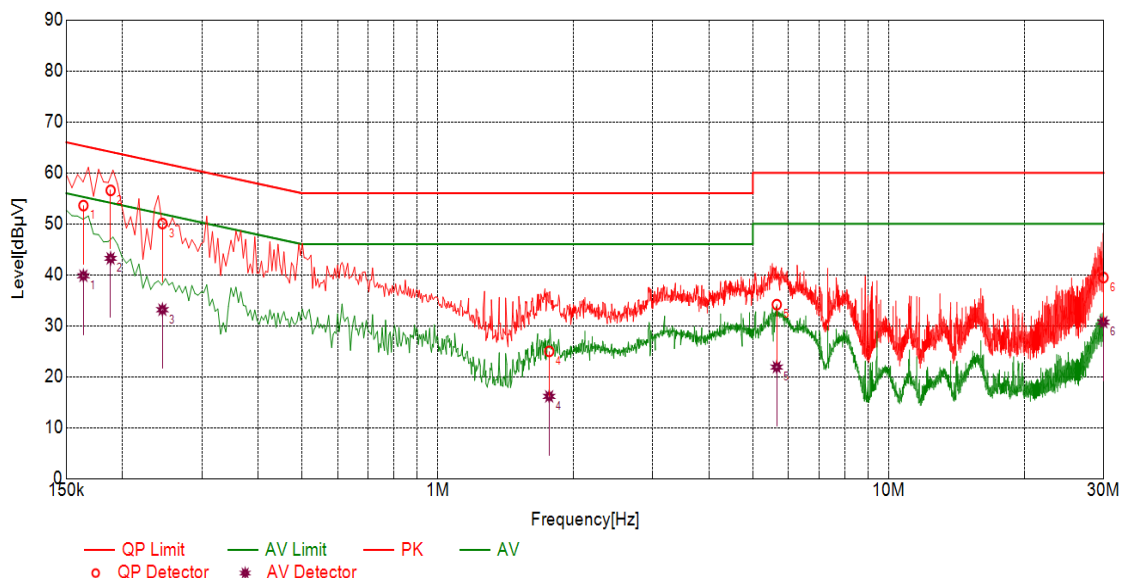
An initial pre-scan was performed with peak detector. Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected.



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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    |

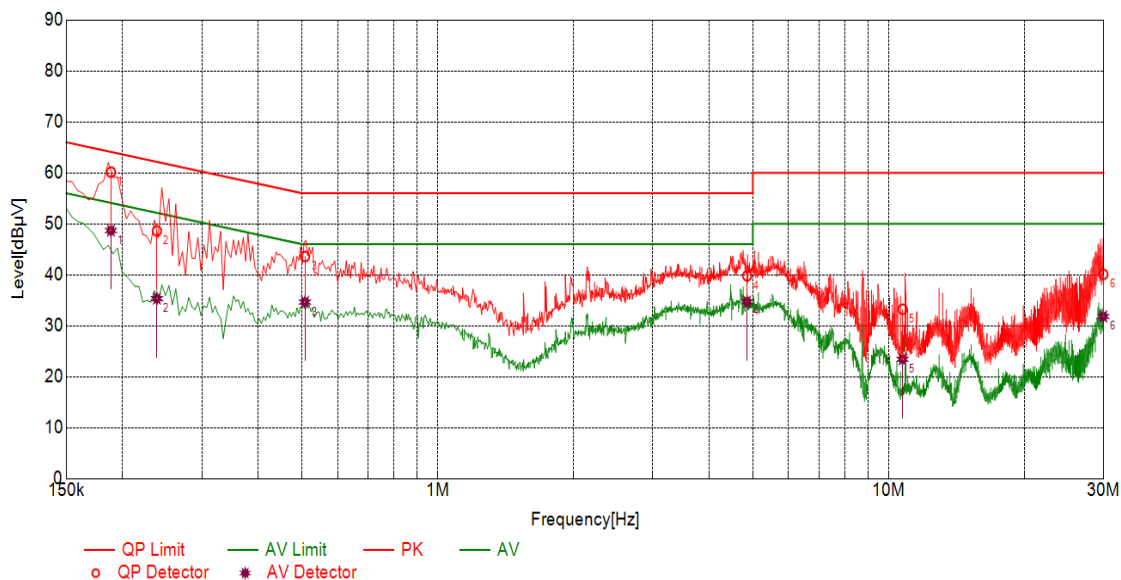


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Mode:b; Line:Neutral Line



### 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

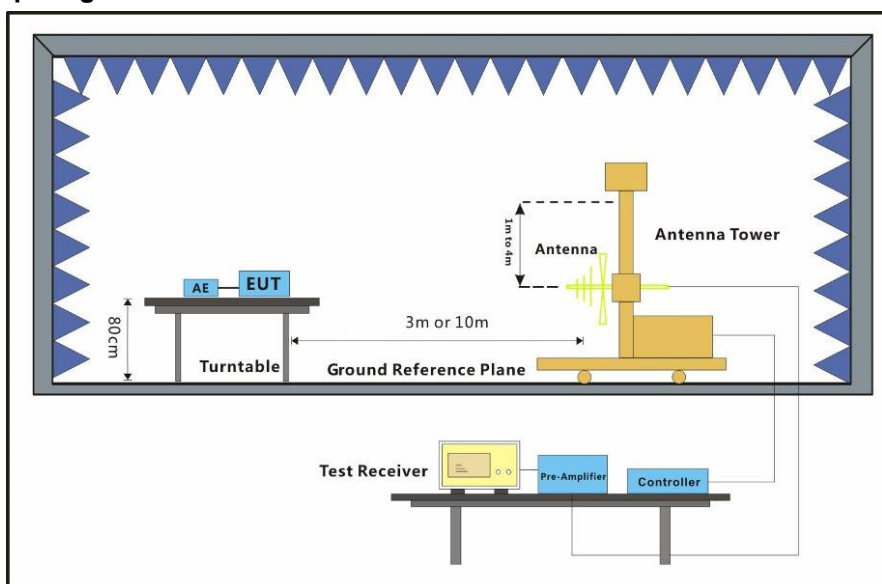
### E.U.T. Operation

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.

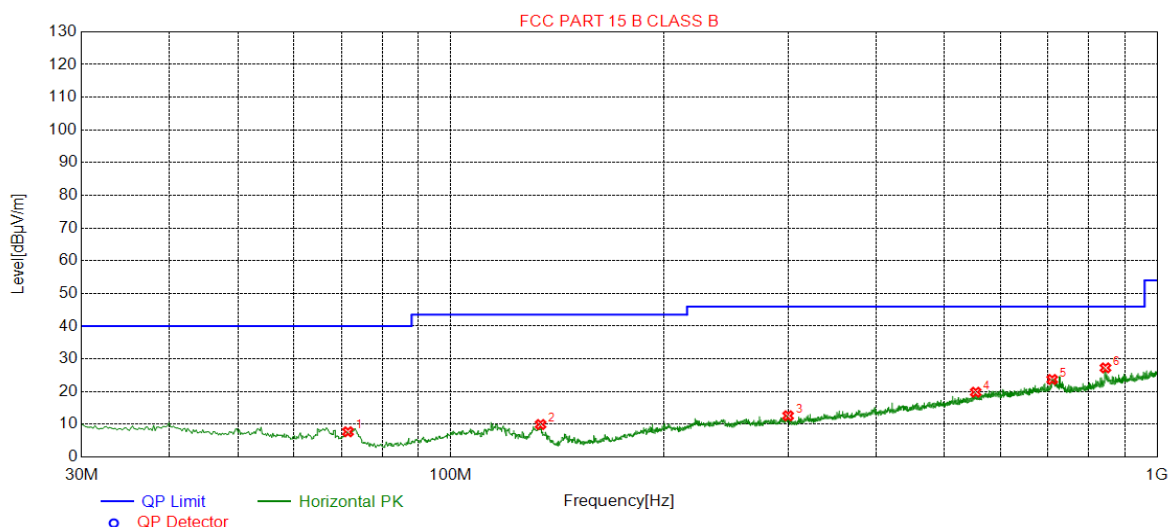


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Mode:b; Polarization:Horizontal



### 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 |

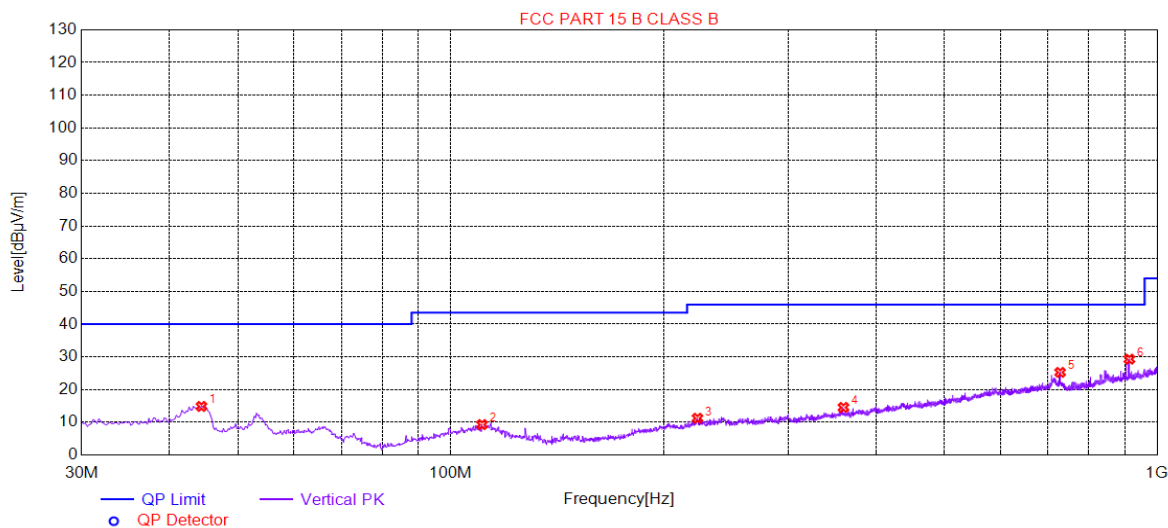


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Mode:b; Polarization:Vertical



### 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

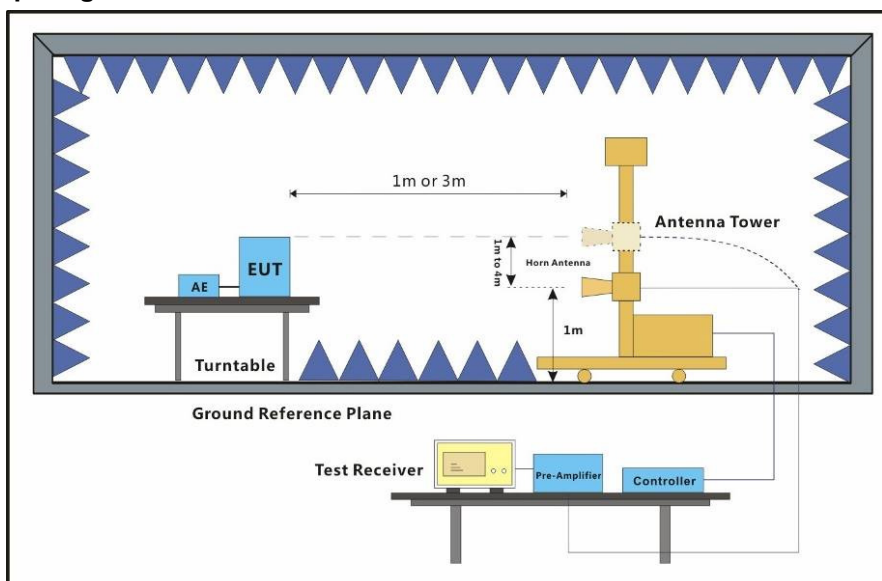
#### E.U.T. Operation

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:

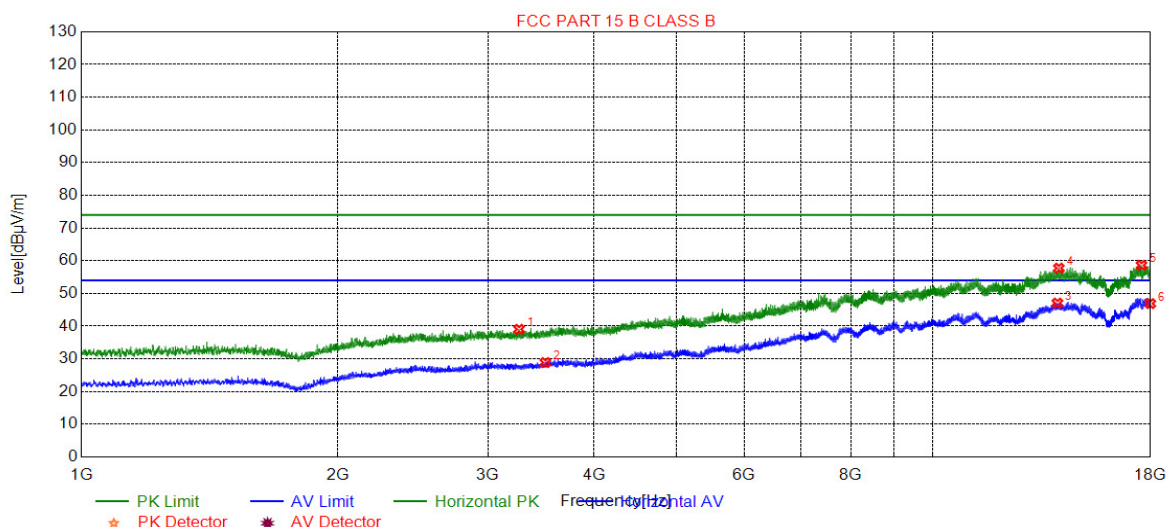
#### Test Setup Diagram



#### 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.

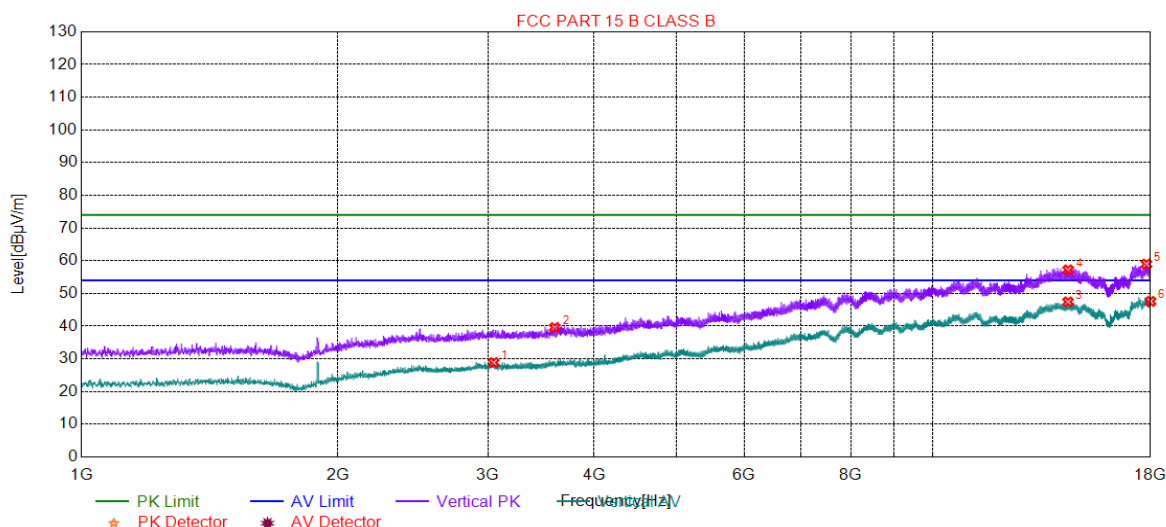
Mode:b; Polarization:Horizontal



#### 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 -



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