



## TEST REPORT

**Application No.:** AR/2021/40009  
**Applicant:** Fibocom Wireless Inc.  
**Address of Applicant:** 1101, Tower A, Building 6, Shenzhen International Innovation Valley, Dashi 1st Rd, Nanshan, Shenzhen, China  
**Manufacturer:** Fibocom Wireless Inc.  
**Address of Manufacturer:** 1101, Tower A, Building 6, Shenzhen International Innovation Valley, Dashi 1st Rd, Nanshan, Shenzhen, China  
**EUT Description:** 5G module  
**Model No.:** FG360-NA  
**Trade Mark:** Fibocom  
**FCC ID:** ZMOFG360NA  
**Standard(s) :** 47 CFR Part 15, Subpart B  
**Date of Receipt:** 2021/5/7  
**Date of Test:** 2021/5/7 to 2021/6/7  
**Date of Issue:** 2021/6/7

<b>Test Result:</b>	<b>Pass*</b>
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\* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Simon Ling  
Wireless Laboratory Manager



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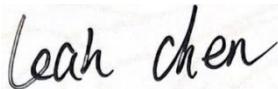
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<b>Revision Record</b>				
<b>Version</b>	<b>Chapter</b>	<b>Date</b>	<b>Modifier</b>	<b>Remark</b>
01		2021/6/7		Original

<b>Authorized for issue by:</b>	
<b>Prepared By</b>	 (Leah Chen) / Engineer
<b>Checked By</b>	 (Daniel Wang) / Reviewer

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## Test Summary

<b>Emission Part</b>				
<b>Item</b>	<b>Standard</b>	<b>Method</b>	<b>Requirement</b>	<b>Result</b>
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

<b>Internal Source</b>	<b>Upper Frequency</b>
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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## 1 General Information

Product Name:	5G module		
Model No.(EUT):	FG360-NA		
Trade Mark:	Fibocom		
Hardware Version:	V1.0		
Software Version:	81103.7000.30.02.01.09		
Frequency Bands:	Band	Tx (MHz)	Rx (MHz)
	WCDMA Band II	1850~1910	1930~1990
	WCDMA Band IV	1710~1755	2110~2155
	WCDMA Band V	824~849	869~894
	LTE Band 2	1850~1910	1930~1990
	LTE Band 4	1710~1755	2110~2155
	LTE Band 5	824~849	869~894
	LTE Band 7	2500~2570	2620~2690
	LTE Band 12	699~716	729~746
	LTE Band 13	777~787	746~756
	LTE Band 14	788~798	746~756
	LTE Band 17	704~716	734~746
	LTE Band 25	1850~1915	1930~1995
	LTE Band 26	814~849	859~894
	LTE Band 30	2305~2315	2350~2360
	LTE Band 41	2496~2690	2496~2690
	LTE Band 48	3550~3700	3550~3700
	LTE Band 66	1710~1780	2110~2200
	LTE Band 71	663~698	617~652
	LTE CA_41C	2496~2690	2496~2690

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**1.1 Description of Support Units**

Description	Manufacturer	Model No.	Inventory No.
Router	NETGEAR	R6020	No.XA1401
Computer	Lenovo	L480	No.XA1402
Mouse	A4TECH	OP-520NU USB	No.XA1403

**1.2 Test Location**

All tests were performed at:

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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:	Leah Chen, Ken Liu, Andy Yao

No tests were sub-contracted.

**1.3 Test Facility**

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

**• 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.****1.4 Deviation from Standards**

None

**1.5 Abnormalities from Standard Conditions**

None

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## 2 Emission Test Results

### 2.1 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: 18.9 °C      Humidity: 55.1 % RH      Atmospheric Pressure: 1000 mbar

Pretest these modes to find the worst case:

- a: WCDMA Band V Idle
- b: LTE Band 5 Idle
- c: LTE Band 12 Idle
- d: LTE Band 13 Idle
- e: LTE Band 14 Idle
- f: LTE Band 17 Idle
- g: LTE Band 26 Idle

The worst case for final test: b: LTE Band 5 Idle

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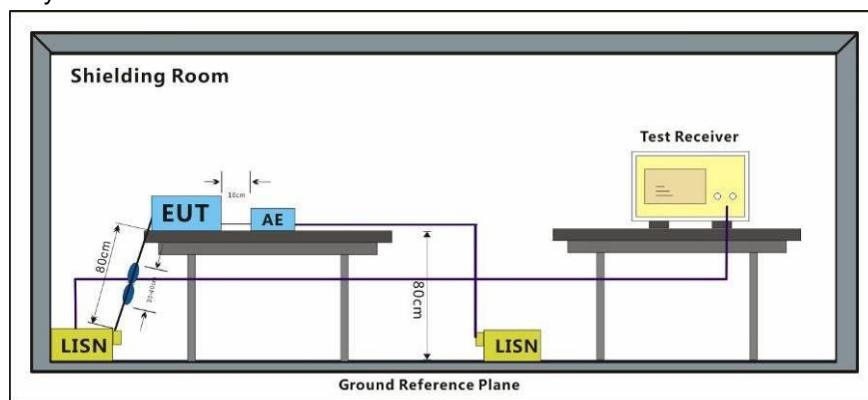
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### 2.1.2 Test Setup Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.



### 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.

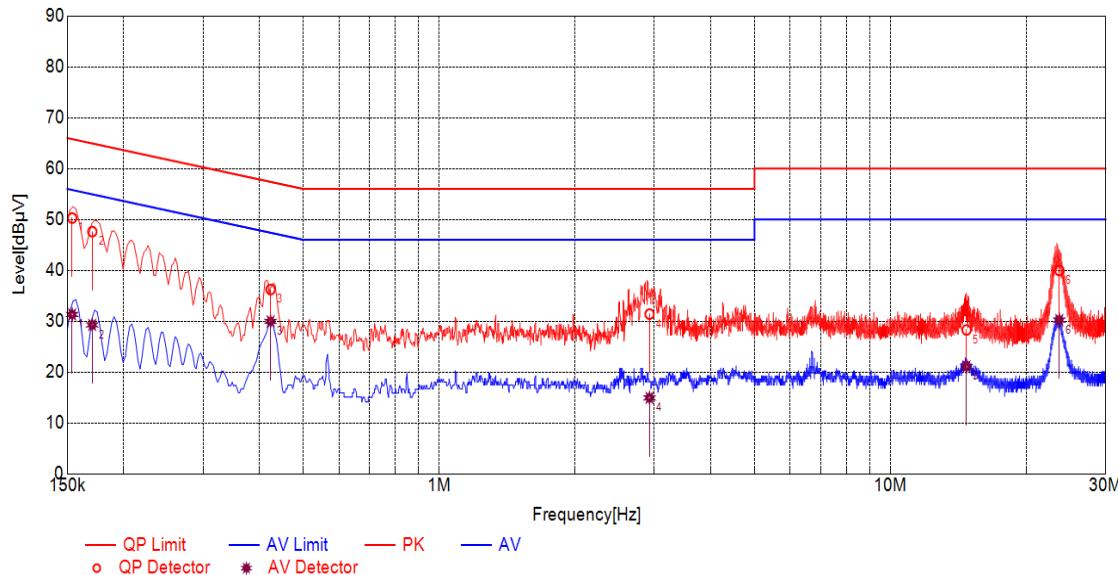
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Mode:b; Line:Live Line

**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]
1	0.1538	10.10	50.27	65.79	15.52	31.32	55.79	24.47
2	0.1704	10.10	47.61	64.94	17.33	29.27	54.94	25.67
3	0.4233	10.10	36.23	57.38	21.15	29.96	47.38	17.42
4	2.9263	10.10	31.40	56.00	24.60	14.93	46.00	31.07
5	14.7498	10.11	28.29	60.00	31.71	21.10	50.00	28.90
6	23.6870	10.11	39.97	60.00	20.03	30.22	50.00	19.78

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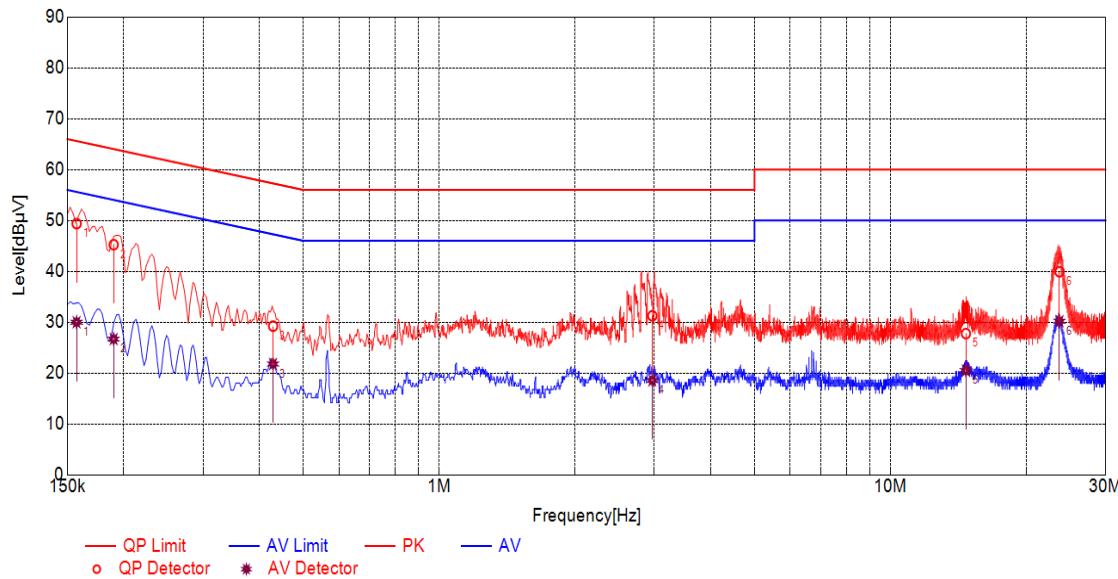
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Mode:b; Line:Neutral Line

**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]
1	0.1573	10.10	49.38	65.61	16.23	29.99	55.61	25.62
2	0.1901	10.10	45.24	64.03	18.79	26.68	54.03	27.35
3	0.4287	10.10	29.23	57.28	28.05	21.78	47.28	25.50
4	2.9682	10.10	31.26	56.00	24.74	18.57	46.00	27.43
5	14.7023	10.11	27.77	60.00	32.23	20.49	50.00	29.51
6	23.7058	10.11	39.92	60.00	20.08	30.19	50.00	19.81

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## 2.2 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 $\mu$ V/m) quasi-peak
88MHz-216MHz	43.5(dB $\mu$ V/m) quasi-peak
216MHz-960MHz	46.0(dB $\mu$ V/m) quasi-peak
960MHz-1000MHz	54.0(dB $\mu$ V/m) quasi-peak
Detector:	Peak for pre-scan (120kHz resolution bandwidth) 30M to1000MHz

### 2.2.1 E.U.T. Operation

#### Operating Environment:

Temperature: 25 °C      Humidity: 66.5 % RH      Atmospheric Pressure: 1010 mbar

Pretest these modes to find the worst case:  
a: WCDMA Band V Idle  
b: LTE Band 5 Idle  
c: LTE Band 12 Idle  
d: LTE Band 13 Idle  
e: LTE Band 14 Idle  
f: LTE Band 17 Idle  
g: LTE Band 26 Idle

The worst case for final test: d: LTE Band 13 Idle

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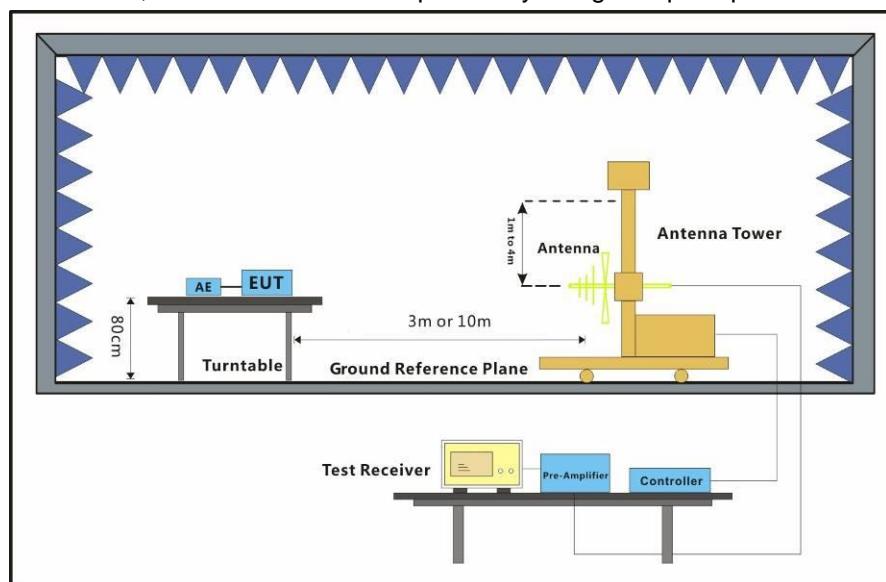
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### 2.2.2 Test Setup Procedures

1. The EUT was placed in a semi Anechoic Chamber as show below
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna height is adjusted between 1 to 4 meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. Set the test-receiver system to Peak Detect Function with specified bandwidth with Maximum Hold Mode, and the trace was allowed to stabilize.
7. If the emission level of the EUT in peak mode was 6 dB lower than the limit specified, peak values of EUT will be reported. Otherwise, the emission will be repeated by using the quasi-peak method and reported.



### 2.2.3 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.

The three polarities of X,Y,Z were measured by EUT, but only the worst data had been displayed.

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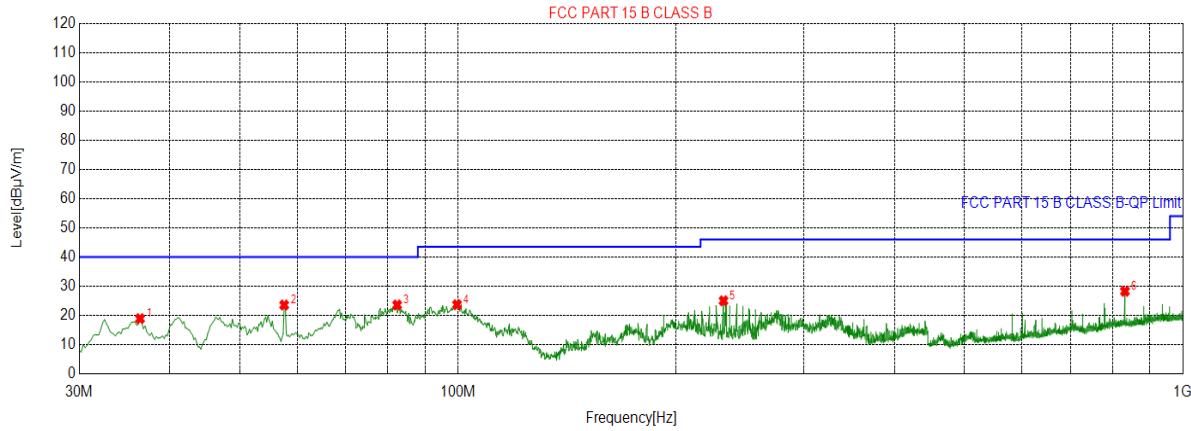


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Mode:d; Polarization:Horizontal



● QP Detector

**Suspected List**

<b>Suspected List</b>								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	36.4033	18.90	-23.50	40.00	21.10	152	249	Horizontal
2	57.5535	23.57	-22.49	40.00	16.43	174	56	Horizontal
3	82.3905	23.58	-26.63	40.00	16.42	258	243	Horizontal
4	99.6599	23.68	-22.95	43.50	19.82	187	268	Horizontal
5	232.382	25.01	-21.36	46.00	20.99	174	0	Horizontal
6	831.962	28.28	-8.66	46.00	17.72	259	169	Horizontal

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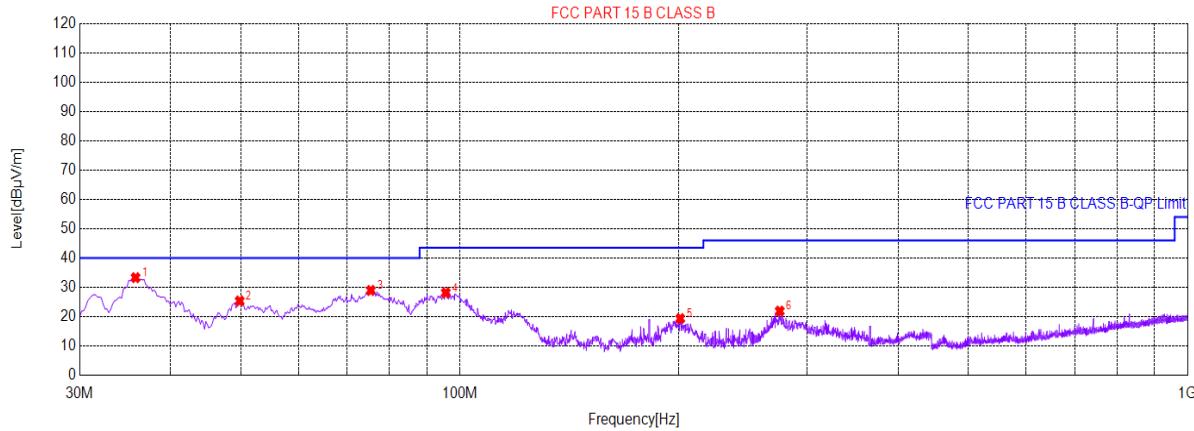


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Mode:d; Polarization:Vertical



• QP Detector

**Suspected List**

<b>Suspected List</b>								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	35.8212	33.29	-23.68	40.00	6.71	252	356	Vertical
2	49.7920	25.35	-21.36	40.00	14.65	271	299	Vertical
3	75.4051	28.95	-26.24	40.00	11.05	189	276	Vertical
4	95.5851	28.15	-23.60	43.50	15.35	187	230	Vertical
5	200.754	19.35	-22.45	43.50	24.15	254	12	Vertical
6	275.071	21.90	-19.95	46.00	24.10	321	105	Vertical

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## 2.3 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 $\mu$ V/m) peak, 54(dB $\mu$ V/m) average  
Detector: Peak for pre-scan (1000kHz resolution bandwidth) 1000M to18000MHz

### 2.3.1 E.U.T. Operation

Operating Environment:

Temperature: 21.7 °C Humidity: 56.4 % RH Atmospheric Pressure: 1010 mbar

Pretest these modes to find the worst case:  
a: WCDMA Band V Idle  
b: LTE Band 5 Idle  
c: LTE Band 12 Idle  
d: LTE Band 13 Idle  
e: LTE Band 14 Idle  
f: LTE Band 17 Idle  
g: LTE Band 26 Idle

The worst case for final test: b: LTE Band 5 Idle

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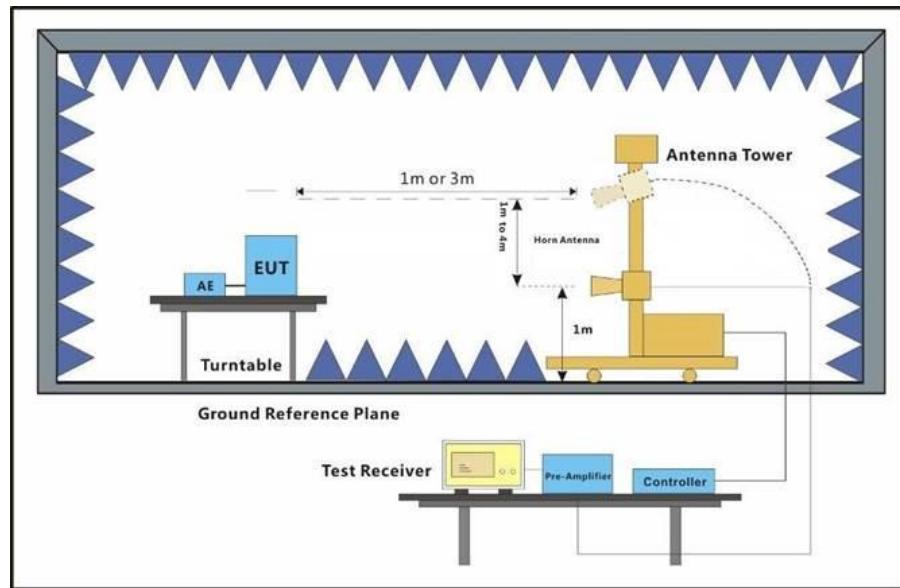
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### 2.3.2 Test Setup Procedures

1. The EUT was placed in a full Anechoic Chamber as show below
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna height is adjusted between 1 to 4 meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. Set the test-receiver system to Peak and AV Detect Function with specified bandwidth with Maximum Hold Mode, and the trace was allowed to stabilize.



### 2.3.3 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.

The three polarities of X,Y,Z were measured by EUT, but only the worst data had been displayed.

Scan from 1GHz to 30GHz, the disturbance above 18GHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed.

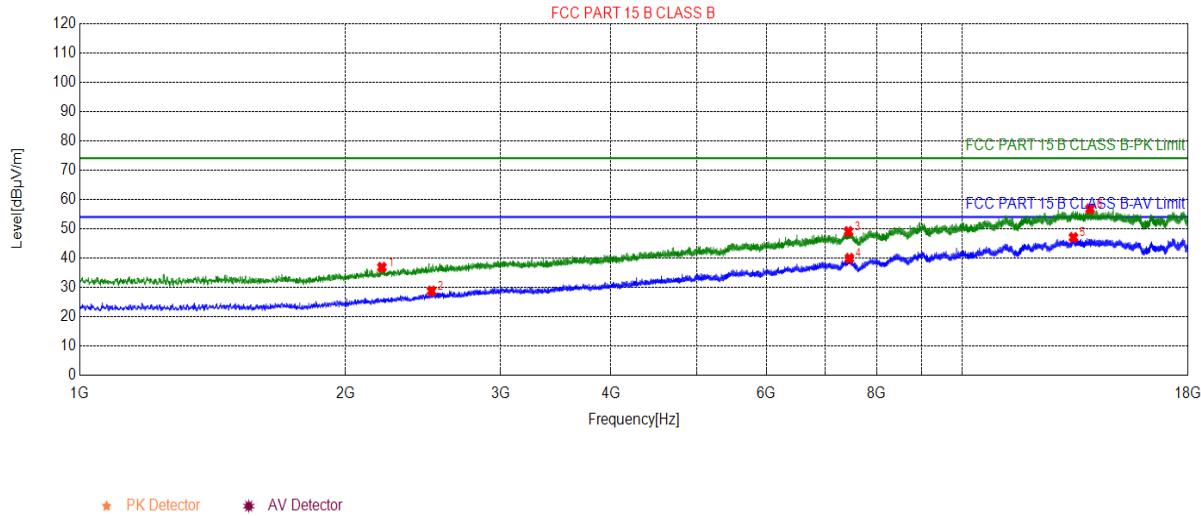
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Mode:b; Polarization:Horizontal

**Suspected List**

Suspected List								
NO.	Freq. [MHz]	Level [dB $\mu$ V/m]	Factor [dB]	Limit [dB $\mu$ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2200.26	36.83	-26.31	74.00	37.17	251	260	Horizontal
2	2504.57	28.74	-24.99	54.00	25.26	174	255	Horizontal
3	7430.57	49.03	-8.19	74.00	24.97	198	214	Horizontal
4	7449.27	39.90	-8.08	54.00	14.10	254	9	Horizontal
5	13364.7	47.00	1.85	54.00	7.00	274	199	Horizontal
6	13957.1	56.76	3.18	74.00	17.24	321	150	Horizontal

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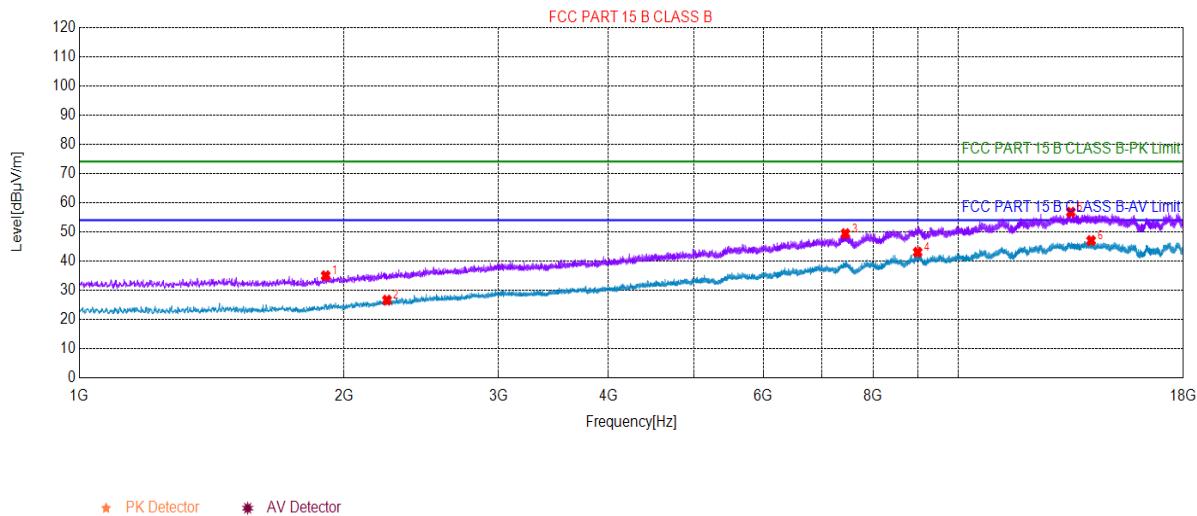


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Mode:b; Polarization:Vertical



## Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dB $\mu$ V/m]	Factor [dB]	Limit [dB $\mu$ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1906.99	34.95	-27.92	74.00	39.05	174	39	Vertical
2	2239.36	26.60	-26.25	54.00	27.40	165	314	Vertical
3	7438.22	49.37	-8.15	74.00	24.63	178	1	Vertical
4	8986.99	43.01	-4.71	54.00	10.99	125	221	Vertical
5	13423.3	56.69	2.15	74.00	17.31	184	61	Vertical
6	14155.2	46.98	3.00	54.00	7.02	351	360	Vertical

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### 3 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	2020-09-11	2021-09-10
Artificial network	ROHDE&SCHWARZ	ENV216	XAW01-04-01	2020-08-04	2021-08-03
5G UXM	Keysight	E7515B	XAW01-19-02	2020-09-11	2021-09-10
Temperature and humidity meter	MingGao	TH101B	XAW01-01-01	2020-11-06	2021-11-05
Measurement Software	Tonscend	TS+ CE V2.5	XAW02-05-02	NCR	NCR

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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	2021-04-01	2022-03-31
Spectrum Analyzer	Keysight	N9020B	XAW01-11-03	2021-04-01	2022-03-31
Radio communication analyzer	ROHDE&SCHWARZ	CMW 500	XAW01-03-02	2021-04-01	2022-03-31
Test receiver	ROHDE&SCHWARZ	ESR	XAW01-08-01	2020-09-11	2021-09-10
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	2020-10-26	2021-10-25
Amplifier	Tonscend	TAP01018048	XAW01-41-02	2020-10-26	2021-10-25
Amplifier	Tonscend	TAP18040048	XAW01-41-03	2020-10-27	2021-10-26
Amplifier	Shanghai Steed	YX28980930	XAW01-41-06	2020-10-26	2021-10-25
5G UXM	Keysight	E7515B	XAW01-04-01	2020-09-11	2021-09-10
Temperature and humidity meter	MingGao	TH101B	XAW01-01-01	2020-11-06	2021-11-05
Measurement Software	Tonscend	TS+ RE V3.0.0.2	XAW02-05-01	NCR	NCR

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## 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)

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## 5 Photographs

### 5.1 Test Setup

Refer to Appendix A Setup Photos.

### 5.2 EUT Constructional Details (EUT Photos)

Refer to Photographs of EUT Constructional Details

- End of the Report -

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