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Report No.: SZEM170100023102  
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# TEST REPORT

**Application No.:** SZEM1701000231RG  
**Applicant:** Huawei Technologies Co.,Ltd.  
**Address of Applicant:** Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C  
**Manufacturer:** Huawei Technologies Co.,Ltd.  
**Address of Manufacturer:** Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C

**Equipment Under Test (EUT):**  
**EUT Name:** LTE USB Stick  
**Model No.:** 604HW  
**Trade Mark:** HUAWEI  
**FCC ID:** QIS604HW  
**Standards:** 47 CFR Part 15,Subpart B:2016  
**Date of Receipt:** 2017-01-10  
**Date of Test:** 2017-01-16 to 2017-01-18  
**Date of Issue:** 2017-01-19

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



Jack Zhang  
EMC Laboratory Manager

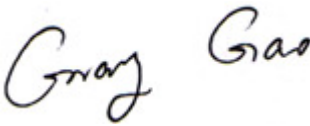

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The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

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<b>Revision Record</b>				
<b>Version</b>	<b>Chapter</b>	<b>Date</b>	<b>Modifier</b>	<b>Remark</b>
01		2017-01-19		Original

<b>Authorized for issue by:</b>			
<b>Tested By</b>			2017-01-18
	_____ Gray /Project Engineer		_____ Date
<b>Checked By</b>			2017-01-19
	_____ Eric /Reviewer		_____ Date



## 2 Test Summary

Emission Part				
Item	Standard	Method	Requirement	Result
Radiated Disturbance (30MHz-1GHz)	47 CFR Part 15,Subpart B:2016	ANSI C63.4:2014	Class B	Pass
Conducted Disturbance at Mains Terminals (150kHz-30MHz)	47 CFR Part 15,Subpart B:2016	ANSI C63.4:2014	Class B	Pass
Radiated Disturbance (above 1GHz)	47 CFR PART 15,Subpart B:2015	ANSI C63.4:2014	Class B	Pass

InternalSource	UpperFrequency
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 Details of E.U.T.

Power Supply: USB 5V power supply by PC  
Cable: USB cable: 80cm shield

### 4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Laptop	Lenovo	T430u	REF. No.SEA1800
Router	NETGEAR	DGN2200	REF. No.SEA2200

### 4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Conduction emission	3.45dB (9kHz to 150kHz)
		3.0dB (150kHz to 30MHz)
2	Radiated Power	3.64dB
3	Radiated emission	4.5dB (30MHz-1GHz )
		4.8dB (1GHz-6GHz )
4	Radiated Immunity	1.64dB
5	Conducted Immunity	0.96dB
6	ESD	6 %
7	EFT (Electrical Fast Transients)	5 %
8	Surge Immunity	5 %
9	Voltage Dips and Interruptions	4 %
10	20 system	1.5dB
11	Temperature test	1 °C
12	Humidity test	3%
13	DC power test	0.5 %



#### 4.4 Standards Applicable for Testing

Table 1 : Tests Carried Out Under 47 CFR Part 15,Subpart B:2016

Item	Status
Conducted Disturbance at Mains Terminals(150kHz-30MHz)	√
Radiated Disturbance(30MHz-1GHz)	√
Radiated Disturbance(above 1GHz)	√

- × Indicates that the test is not applicable
- √ Indicates that the test is applicable



#### **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 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-823, R-4188, T-1153 and C-2383 respectively.

• **FCC – Registration No.: 556682**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 556682.

• **Industry Canada (IC)**

Two 3m Semi-anechoic chambers and the 10m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1, 4620C-2, 4620C-3.

#### **4.7 Deviation from Standards**

None

#### **4.8 Abnormalities from Standard Conditions**

None

## 5 Equipment List

<b>Radiated Disturbance(30MHz-1GHz)</b>					
<b>Equipment</b>	<b>Manufacturer</b>	<b>Model No</b>	<b>Inventory No</b>	<b>Cal Date</b>	<b>Cal Due Date</b>
10m Semi-Anechoic Chamber	SAEMC	FSAC1018	SEM001-03	2016-05-13	2017-05-13
EMI Test Receiver (9k-3GHz)	Rohde & Schwarz	ESR	SEM004-03	2016-04-25	2017-04-25
Trilog-Broadband Antenna (30M-1GHz)	Schwarzbeck	VULB9168	SEM003-18	2016-06-29	2019-06-29
Pre-amplifier	Sonoma Instrument Co	310N	SEM005-03	2016-07-06	2017-07-06

<b>Conducted Disturbance at Mains Terminals(150kHz-30MHz)</b>					
<b>Equipment</b>	<b>Manufacturer</b>	<b>Model No</b>	<b>Inventory No</b>	<b>Cal Date</b>	<b>Cal Due Date</b>
Shielding Room	ChangZhou ZhongYu	GB-88	SEM001-06	2016-05-13	2017-05-13
LISN	Rohde & Schwarz	ENV216	SEM007-01	2016-10-09	2017-10-09
LISN	ETS-LINDGREN	3816/2	SEM007-02	2016-04-25	2017-04-25
EMI Test Receiver	Rohde & Schwarz	ESCI	SEM004-02	2016-04-25	2017-04-25

<b>Radiated Disturbance(above 1GHz)</b>						
<b>Item</b>	<b>Equipment</b>	<b>Manufacturer</b>	<b>Model No</b>	<b>Inventory No</b>	<b>Cal Date</b>	<b>Cal Due Date</b>
1	3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2016-05-13	2017-05-13
2	EXA Spectrum Analyzer	Agilent Technologies Inc	N9010A	SEM004-09	2016-07-19	2017-07-19
3	Horn Antenna (1-18GHz)	Rohde & Schwarz	HF907	SEM003-06	2015-06-14	2018-06-14
4	Low Noise Amplifier	Black Diamond Series	BDLNA-0118-352810	SEM005-05	2016-10-09	2017-10-09





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	2016-10-12	2017-10-12
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2016-10-12	2017-10-12
Humidity/ Temperature Indicator	Mingle	N/A	SEM002-08	2016-10-12	2017-10-12
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2016-05-18	2017-05-18

## 6 Emission Test Results

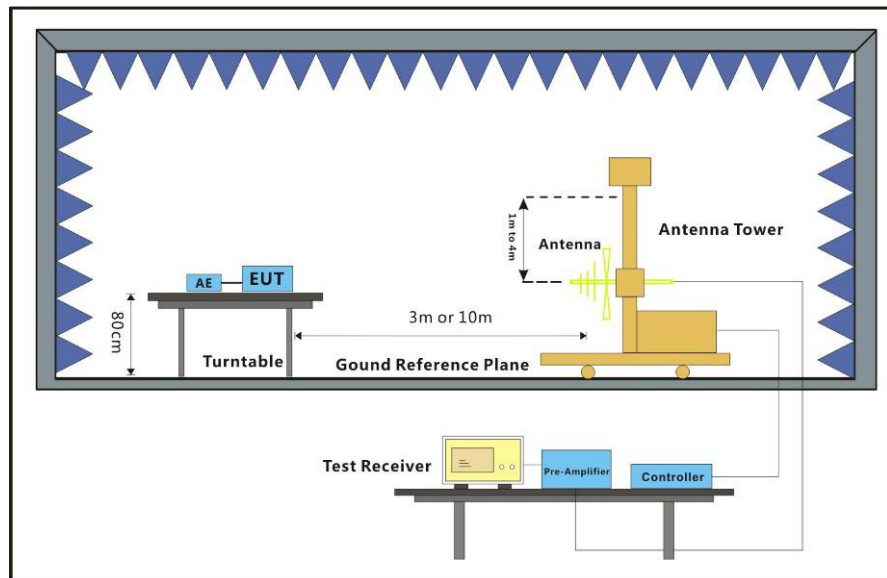
### 6.1 Radiated Disturbance(30MHz-1GHz)

Test Requirement:	47 CFR Part 15,Subpart B:2016
Test Method:	ANSI C63.4:2014
Frequency Range:	30MHz to 1GHz
Measurement Distance:	10m
Limit:	
30MHz -88MHz	29.5(dBμV/m) quasi-peak
88MHz-216MHz	33.1(dBμV/m) quasi-peak
216MHz-960MHz	35.6(dBμV/m) quasi-peak
960MHz-1000MHz	43.5(dBμV/m) quasi-peak
Detector:	Peak for pre-scan (120kHz resolution bandwidth) 30M to1000MHz

#### 6.1.1 E.U.T. Operation

Operating Environment:			
Temperature:	25.0 °C	Humidity:	55 % RH
		Atmospheric Pressure:	1005 mbar
Pretest these mode to find the worst case:	a: connect PC mode		
	b: LTE (Idle) + PC connect mode		
The worst case for final test:	a: connect PC mode		

#### 6.1.2 Test Setup Diagram

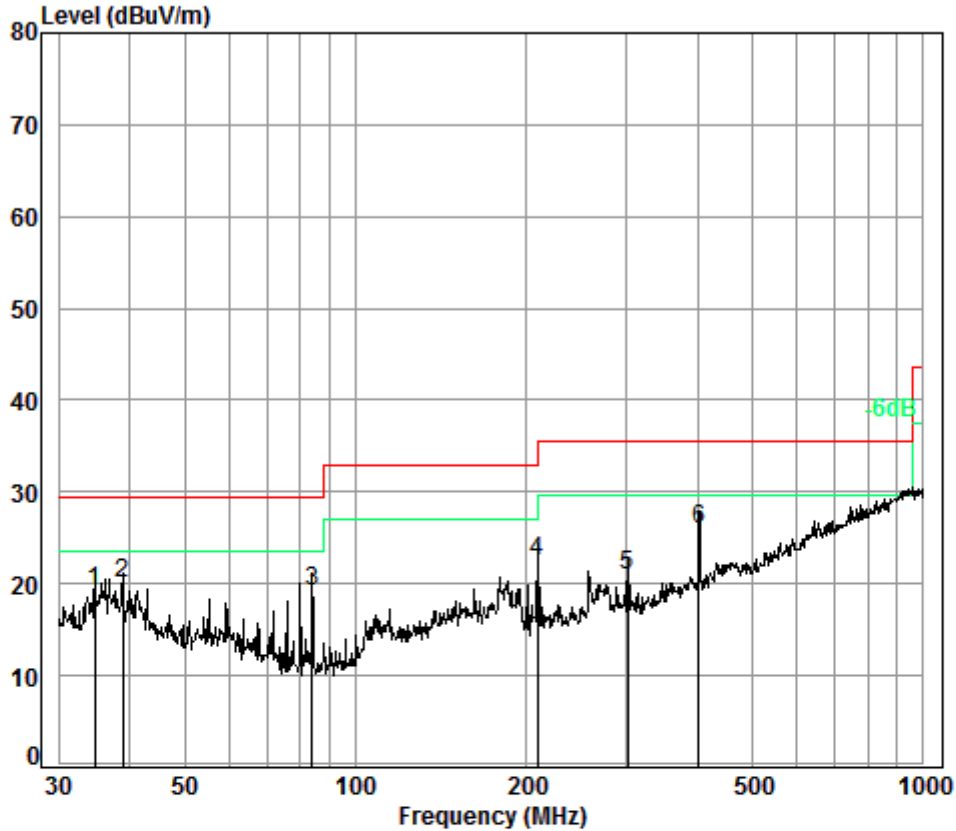


#### 6.1.3 Measurement Data

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.



Mode:a;Polarization:Vertical



Condition: 10m VERTICAL

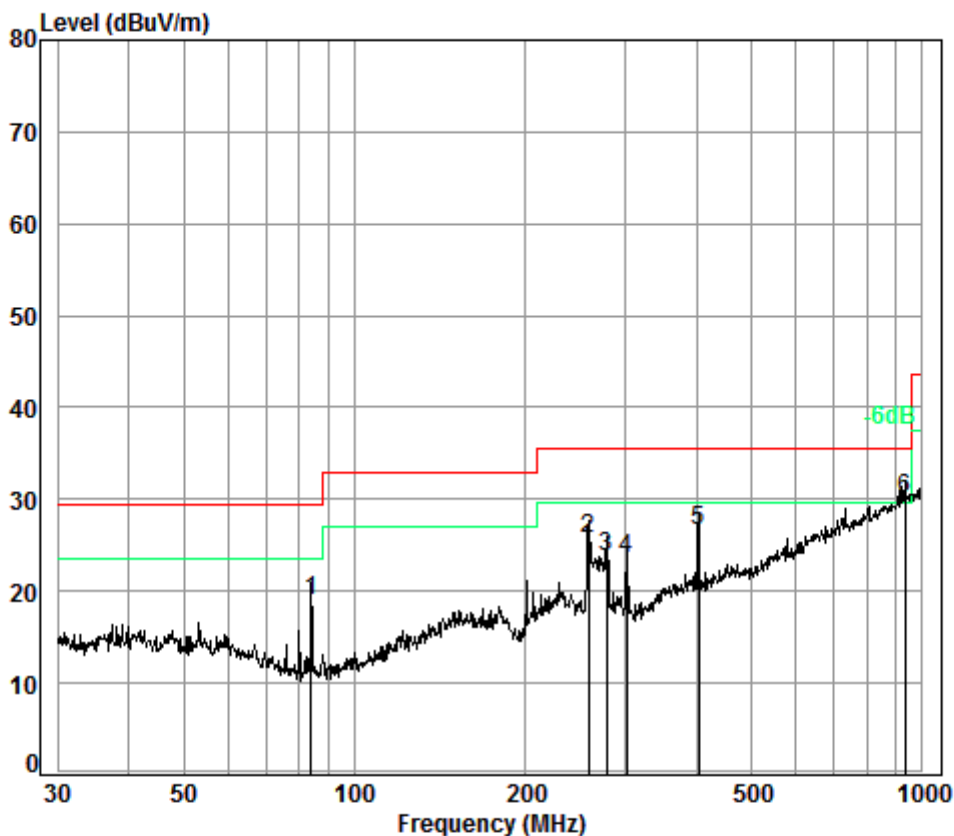
Job No. : 00231RG

Test Mode: a

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Limit Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	34.76	7.30	12.63	32.80	32.14	19.27	29.50	-10.23
2 pp	38.89	7.30	13.18	32.80	32.41	20.09	29.50	-9.41
3	83.82	7.74	8.60	32.80	35.71	19.25	29.50	-10.25
4	209.31	8.74	9.51	32.80	36.89	22.34	33.00	-10.66
5	301.42	9.31	12.70	32.80	31.68	20.89	35.60	-14.71
6	401.84	9.61	14.91	32.70	34.18	26.00	35.60	-9.60



Mode:a;Polarization:Horizontal



Condition: 10m HORIZONTAL  
Job No. : 00231RG  
Test Mode: a

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	83.82	7.74	8.60	32.80	35.45	18.99	29.50	-10.51
2	258.33	8.97	11.44	32.80	38.10	25.71	35.60	-9.89
3	278.07	9.13	12.10	32.80	35.40	23.83	35.60	-11.77
4	301.42	9.31	12.70	32.80	34.40	23.61	35.60	-11.99
5	403.25	9.62	14.95	32.70	34.75	26.62	35.60	-8.98
6 pp	932.27	12.06	22.61	32.60	28.06	30.13	35.60	-5.47

## 6.2 Conducted Disturbance at Mains Terminals(150kHz-30MHz)

Test Requirement:	47 CFR Part 15, Subpart B:2016
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

### 6.2.1 E.U.T. Operation

Operating Environment:

Temperature: 25.0 °C      Humidity: 56 % RH      Atmospheric Pressure: 1020 mbar

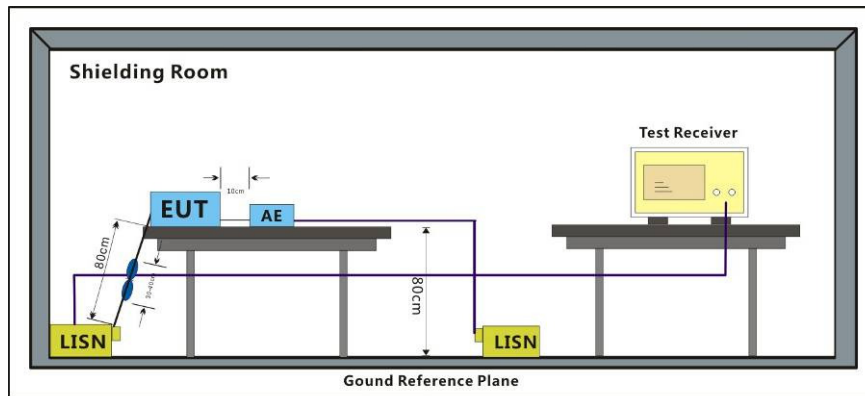
Pretest these mode to find the worst case:

- a: connect PC mode
- b: LTE (Idle) + PC connect mode

The worst case for final test:

- a: connect PC mode

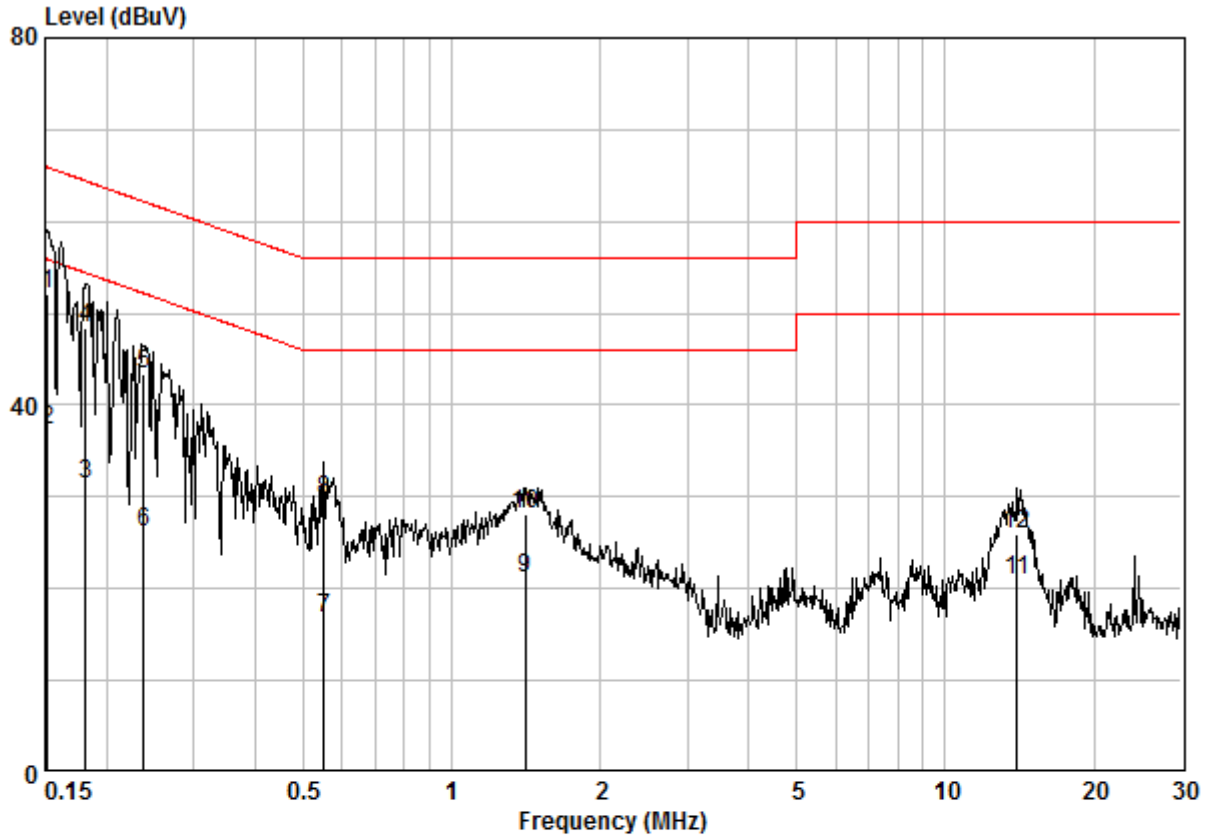
### 6.2.2 Test Setup Diagram



### 6.2.3 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.

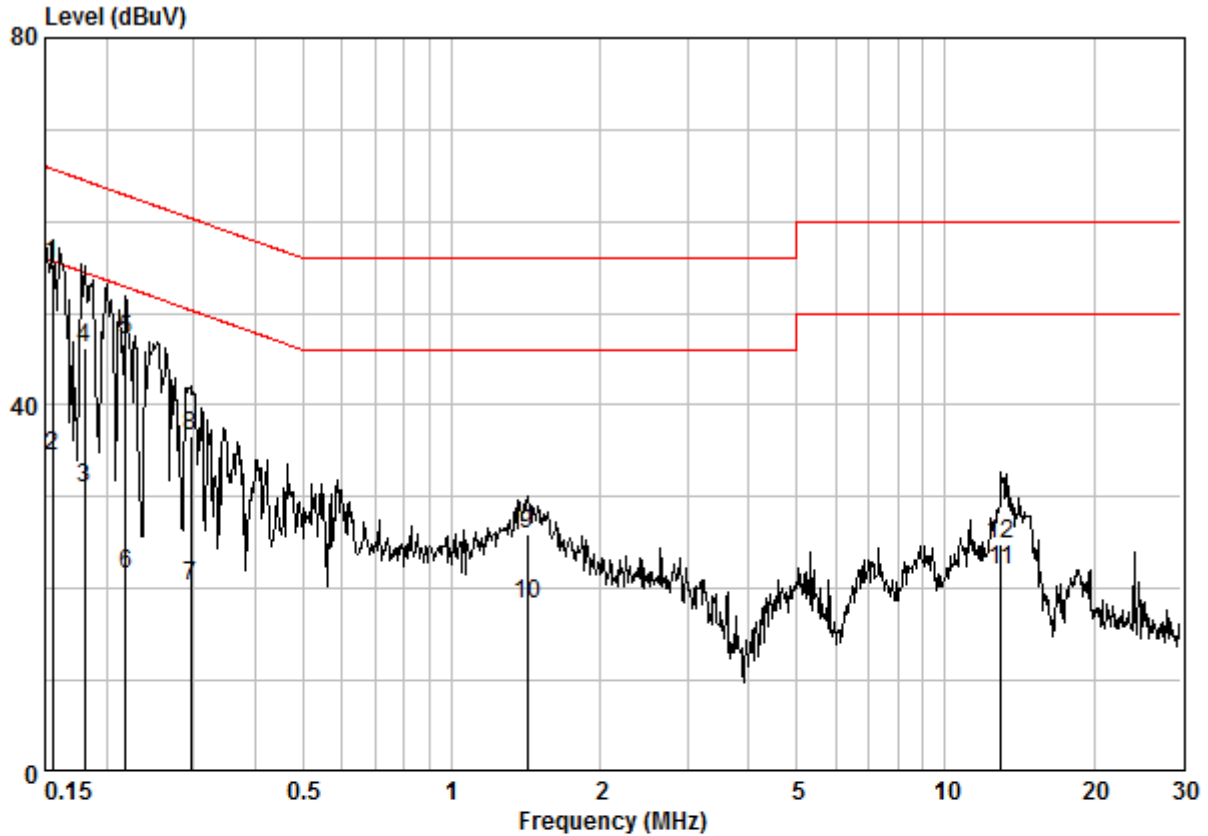
Mode:a;Line:Neutral Line



Site : Shielding Room  
Condition : CE NEUTRAL  
Job No. : 0231RG  
Test Mode : a

	Freq	Cable Loss	LISN Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1 @	0.15160	0.02	9.64	42.44	52.10	65.91	-13.81	QP
2	0.15160	0.02	9.64	27.56	37.22	55.91	-18.70	AVERAGE
3	0.18152	0.02	9.63	21.67	31.32	54.42	-23.09	AVERAGE
4	0.18152	0.02	9.63	38.70	48.35	64.42	-16.07	QP
5	0.23784	0.02	9.63	33.80	43.45	62.17	-18.72	QP
6	0.23784	0.02	9.63	16.54	26.19	52.17	-25.98	AVERAGE
7	0.55226	0.02	9.63	7.16	16.81	46.00	-29.19	AVERAGE
8	0.55226	0.02	9.63	19.93	29.58	56.00	-26.42	QP
9	1.411	0.03	9.65	11.44	21.12	46.00	-24.88	AVERAGE
10	1.411	0.03	9.65	18.44	28.11	56.00	-27.89	QP
11	13.989	0.15	9.95	10.76	20.86	50.00	-29.14	AVERAGE
12	13.989	0.15	9.95	15.82	25.92	60.00	-34.08	QP

Mode:a;Line:Live Line



Site : Shielding Room  
 Condition : CE LINE  
 Job No. : 0231RG  
 Test Mode : a

	Freq	Cable Loss	LISN Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1 @	0.15567	0.02	9.64	45.73	55.39	65.69	-10.30	QP
2	0.15567	0.02	9.64	24.86	34.52	55.69	-21.17	AVERAGE
3	0.18056	0.02	9.64	21.27	30.93	54.46	-23.53	AVERAGE
4	0.18056	0.02	9.64	36.56	46.22	64.46	-18.23	QP
5	0.21851	0.02	9.64	37.33	46.99	62.88	-15.89	QP
6	0.21851	0.02	9.64	12.00	21.66	52.88	-31.21	AVERAGE
7	0.29554	0.02	9.64	10.70	20.36	50.37	-30.01	AVERAGE
8	0.29554	0.02	9.64	27.05	36.71	60.37	-23.65	QP
9	1.426	0.03	9.66	16.26	25.95	56.00	-30.05	QP
10	1.426	0.03	9.66	8.55	18.24	46.00	-27.76	AVERAGE
11	12.988	0.15	9.92	12.00	22.07	50.00	-27.93	AVERAGE
12	12.988	0.15	9.92	14.69	24.76	60.00	-35.24	QP



**6.3 Radiated Disturbance(above 1GHz)**

Test Requirement: 47 CFR PART 15,Subpart B:2015  
Test Method: ANSI C63.4:2014  
Frequency Range: Above 1GHz  
Limit:  
Above 1GHz 74(dBµV/m) peak, 54(dBµV/m) average  
Detector: Peak for pre-scan (1000kHz resolution bandwidth) 1000M to18000MHz

**6.3.1 E.U.T. Operation**

Operating Environment:						
Temperature:	25.0 °C	Humidity:	56 % RH	Atmospheric Pressure:	1020	mbar
Pretest these mode to find the worst case:	a: connect PC mode b: LTE (Idle) + PC connect mode					
The worst case for final test:	b: LTE (Idle) + PC connect mode					

**6.3.2 Measurement Data**

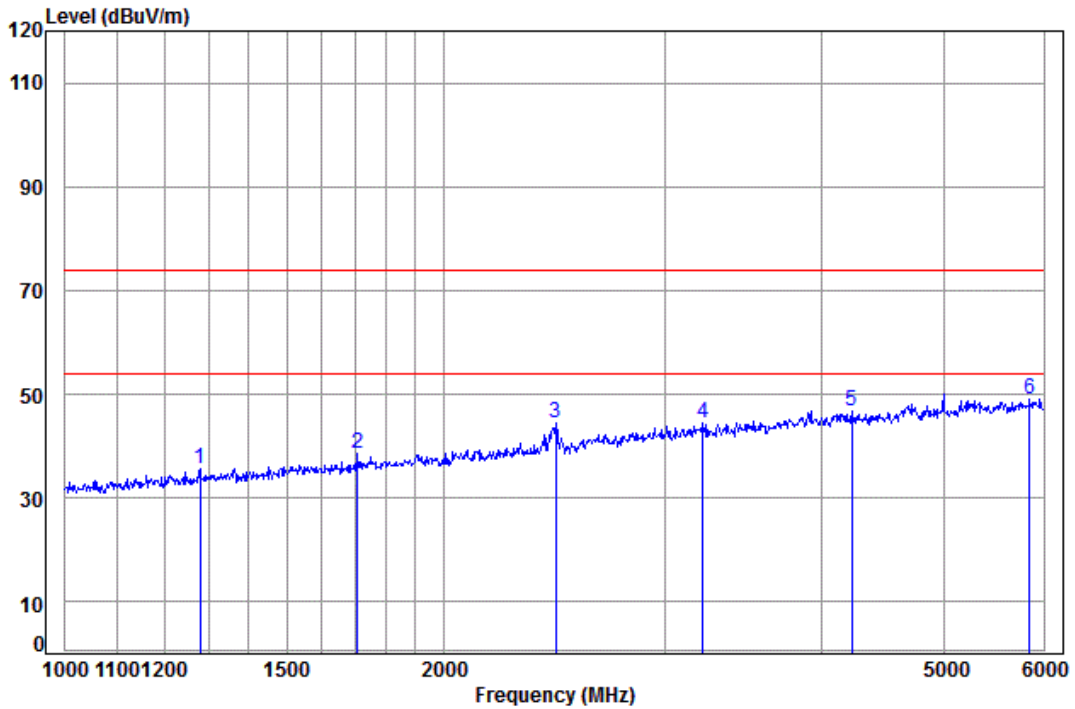
Remark:

1. An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the peak measurements were shown in the report.
2. The disturbance from 6GHz to 18GHz was very low, and the below is the highest frequency could be found when testing, so only the below frequency had been displayed.





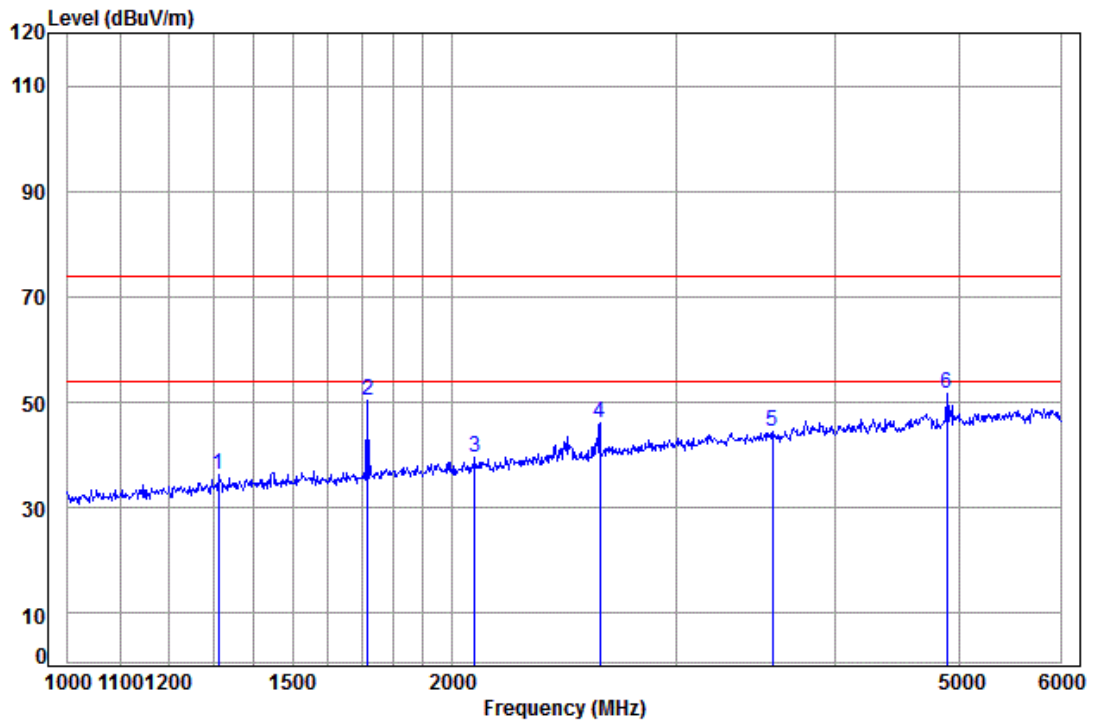
Mode:b;Polarization:Horizontal



Condition: 3m HORIZONTAL  
Job No: : 0231RG  
Mode: : b

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dB
1	1280.516	4.19	24.86	38.04	44.64	35.65	74.00 -38.35
2	1708.706	4.71	26.71	38.08	45.39	38.73	74.00 -35.27
3	2453.883	5.39	29.27	38.15	48.08	44.59	74.00 -29.41
4	3216.286	6.10	31.71	38.32	45.05	44.54	74.00 -29.46
5	4223.122	6.97	33.60	38.80	44.97	46.74	74.00 -27.26
6 pp	5851.364	8.61	34.61	39.01	44.82	49.03	74.00 -24.97

Mode:b;Polarization:Vertical



Condition: 3m VERTICAL

Job No: : 0231RG

Mode: : b

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	1313.043	4.24	25.01	38.04	44.95	36.16	74.00	-37.84
2	1717.915	4.72	26.74	38.08	56.99	50.37	74.00	-23.63
3	2084.693	5.09	28.10	38.11	44.37	39.45	74.00	-34.55
4	2612.697	5.54	29.86	38.17	48.99	46.22	74.00	-27.78
5	3568.514	6.36	32.40	38.50	44.14	44.40	74.00	-29.60
6 pp	4891.500	7.85	34.31	39.06	48.40	51.50	74.00	-22.50