

TEST REPORT

Application No.: ZR/2019/C0037
Applicant: SEOWONINTECH CO., LTD
Address of Applicant: 69, LS-ro 115beon-gil, Gunpo-si, Gyeonggi-do
Manufacturer: SEOWONINTECH CO., LTD
Address of Manufacturer: 69, LS-ro 115beon-gil, Gunpo-si, Gyeonggi-do
Equipment Under Test (EUT):
EUT Name: Out Door CPE
Model No.: SLC-120S41OGA
FCC ID: V7MSLC-120S41OGA
Standard(s) : 47 CFR Part 15, Subpart B
Date of Receipt: 2020/1/3
Date of Test: 2020/1/3 to 2020/3/10
Date of Issue: 2020/3/10

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.

Keny Xu

Keny Xu
EMC Laboratory Manager



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Shenzhen Branch EMC Laboratory

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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2020-03-10		Original

Authorized for issue by:			
			
		Damon Su /Project Engineer	
			
		Eric Fu /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 Details of E.U.T.

Power Supply:	DC 48V from PoE Power Supply Model No.: PIF-4800045-1KMW AC Input: 100-240V 50/60Hz 0.6A DC Output: DC 48V 0.45A.
Test Voltage:	AC 120V/60Hz
Cable:	Adapter AC cable: 150cm unshielded

4.2 Description of Support Units

None

4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Conduction Emission	$\pm 3.0\text{dB}$ (150kHz to 30MHz)
2	Radiated Emission	$\pm 4.5\text{dB}$ (30MHz-1GHz)
		$\pm 4.8\text{dB}$ (1GHz-6GHz)
3	Temperature test	$\pm 1^\circ\text{C}$
4	Humidity test	$\pm 3\%$



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Member of the SGS Group (SGS SA)

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:

- **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	2019-06-13	2022-06-12
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM024-01	2019-07-11	2020-07-10
LISN	Rohde & Schwarz	ENV216	SEM007-01	2019-09-24	2020-09-23
LISN	ETS-LINDGREN	3816/2	SEM007-02	2019-04-01	2020-03-31
EMI Test Receiver	Rohde & Schwarz	ESCI	SEM004-02	2019-04-01	2020-03-31

Radiated Emissions (30MHz-1GHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEM001-01	2017-08-05	2020-08-04
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM025-01	2019-07-11	2020-07-10
EMI Test Receiver	Agilent Technologies	N9038A	SEM004-05	2019-09-24	2020-09-23
BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEM003-01	2017-06-27	2020-06-26
Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEM005-01	2019-04-01	2020-03-31

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	2019-07-11	2020-07-10
EXA Spectrum Analyzer	Agilent Technologies Inc	N9010A	SEM004-12	2019-04-12	2020-04-11
Horn Antenna(1-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2018-04-13	2021-04-12
Pre-Amplifier (0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	SEM004-11	2019-09-24	2020-09-23



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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	2019-09-26	2020-09-25
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2019-09-26	2020-09-25
Humidity/ Temperature Indicator	Mingle	N/A	SEM002-08	2019-09-26	2020-09-25
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2019-04-04	2020-04-03



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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

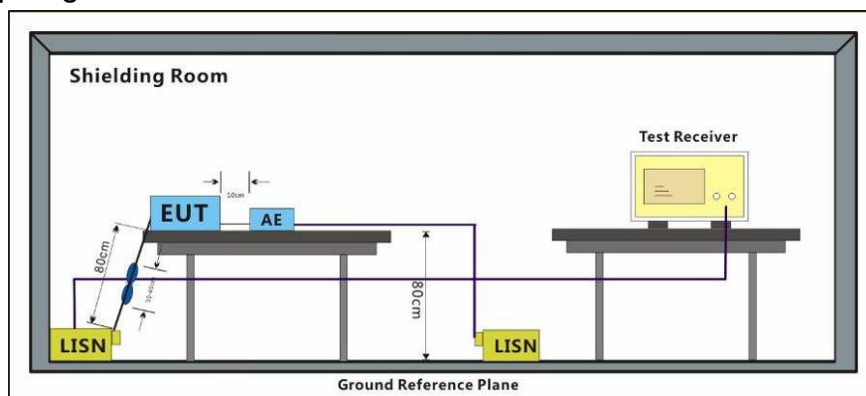
6.1.1 E.U.T. Operation

Operating Environment:

Temperature: 22.1 °C Humidity: 46.5 % RH Atmospheric Pressure: 1020 mbar

Test mode: a: Idle mode_keep the EUT working in LTE Band41 idle mode.

6.1.2 Test Setup Diagram



6.1.3 Measurement Data

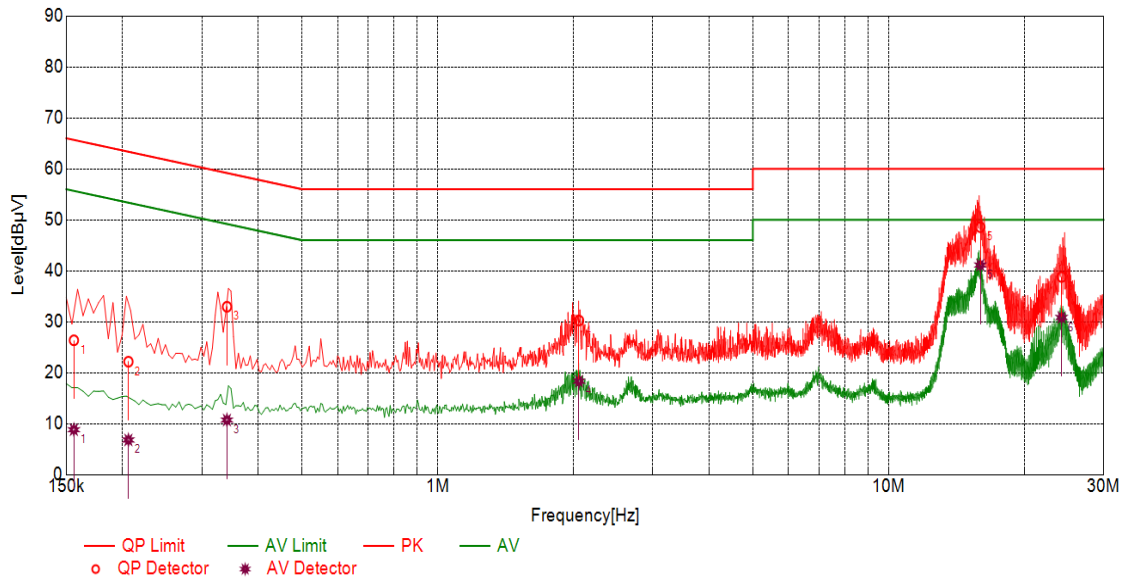
An initial pre-scan was performed with peak detector. Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected.



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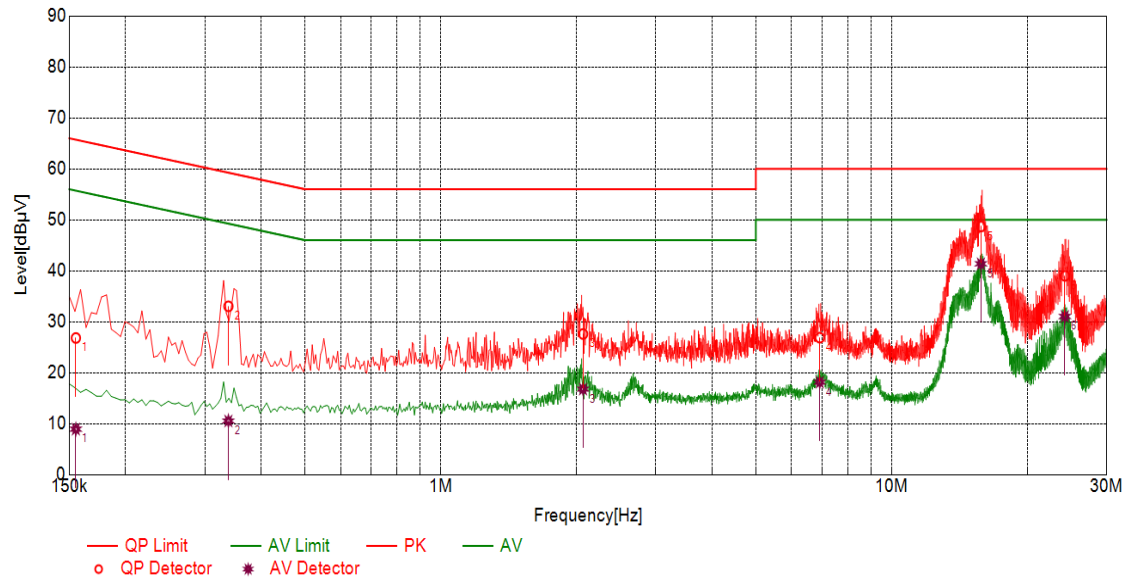
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Mode:a; Line:Live Line



NO.	Freq. [MHz]	Factor [dB]	QP Value	QP Limit	QP Margin	AV Value	AV Limit	AV Margin	Type
1	0.1560	10.10	26.36	65.67	39.31	8.81	55.67	46.86	L
2	0.2061	10.10	22.17	63.36	41.19	6.80	53.36	46.56	L
3	0.3409	10.10	32.95	59.18	26.23	10.71	49.18	38.47	L
4	2.0576	10.10	30.24	56.00	25.76	18.34	46.00	27.66	L
5	15.9752	10.11	48.56	60.00	11.44	41.12	50.00	8.88	L
6	24.1917	10.11	38.79	60.00	21.21	30.83	50.00	19.17	L

Mode:a; Line:Neutral Line



NO.	Freq. [MHz]	Factor [dB]	QP Value	QP Limit	QP Margin	AV Value	AV Limit	AV Margin	Type
1	0.1552	10.10	26.81	65.72	38.91	8.92	55.72	46.80	N
2	0.3382	10.10	33.03	59.25	26.22	10.53	49.25	38.72	N
3	2.0689	10.10	27.60	56.00	28.40	16.78	46.00	29.22	N
4	6.9289	10.10	26.87	60.00	33.13	18.13	50.00	31.87	N
5	15.7782	10.11	48.69	60.00	11.31	41.38	50.00	8.62	N
6	24.2265	10.11	39.01	60.00	20.99	31.04	50.00	18.96	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(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 to 1000MHz

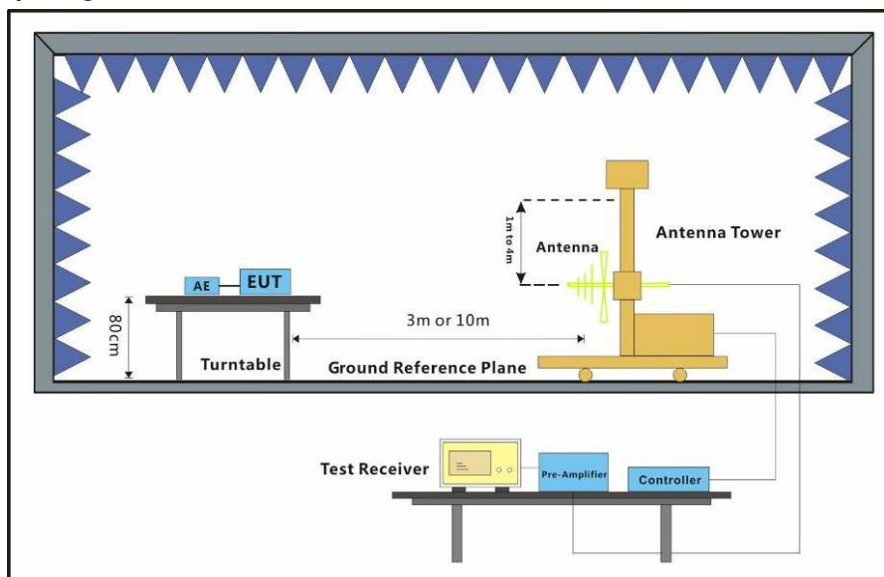
6.2.1 E.U.T. Operation

Operating Environment:

Temperature: 23 °C Humidity: 52 % RH Atmospheric Pressure: 1020 mbar

Test mode: a: Idle mode_keep the EUT working in LTE Band41 idle mode.

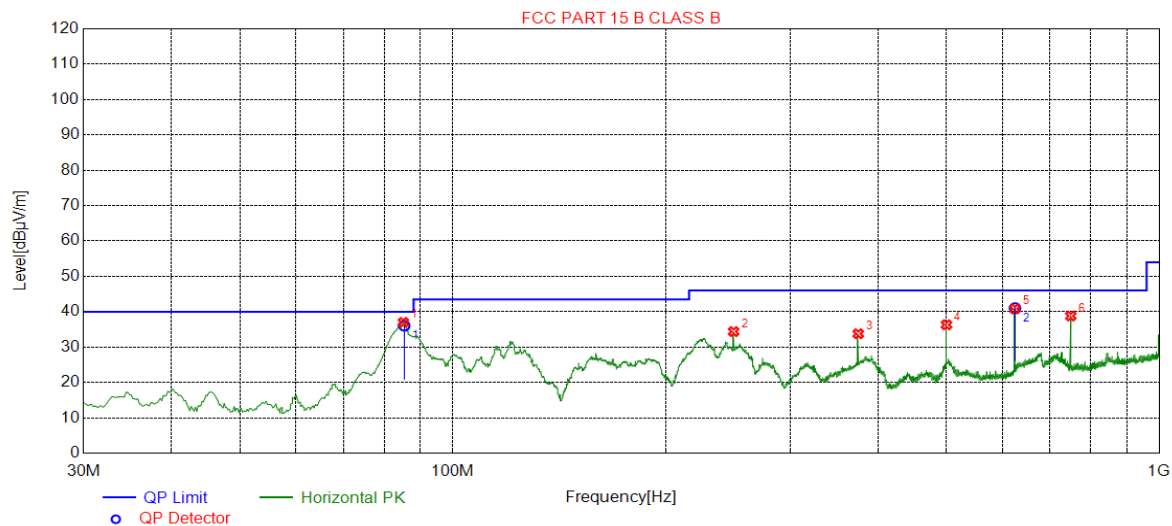
6.2.2 Test Setup Diagram



6.2.3 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.

Mode:a; Polarization:Horizontal



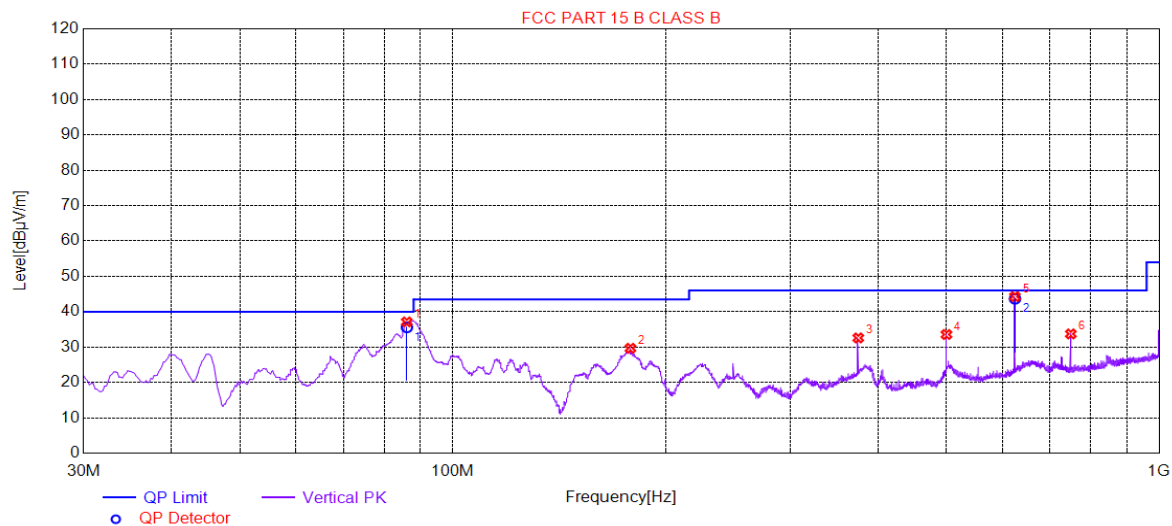
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	85.3390	-34.85	36.03	40.00	3.97	196.8	78.9	Horizontal
2	624.923	-20.33	41.05	46.00	4.95	118.6	331.2	Horizontal
3	375.001	33.78	-26.20	46.00	12.22	100	120	Horizontal
4	499.962	36.32	-23.32	46.00	9.68	100	243	Horizontal
5	624.923	40.79	-20.33	46.00	5.21	100	330	Horizontal
6	749.884	38.79	-18.33	46.00	7.21	100	131	Horizontal



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Mode:a; Polarization:Vertical



NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	86.0912	-34.67	35.57	40.00	4.43	117.2	177.5	Vertical
2	624.923	-20.33	43.66	46.00	2.34	101	88.9	Vertical
3	375.001	32.59	-26.20	46.00	13.41	100	14	Vertical
4	499.962	33.56	-23.32	46.00	12.44	100	37	Vertical
5	624.923	44.27	-20.33	46.00	1.73	100	87	Vertical
6	749.884	33.73	-18.33	46.00	12.27	200	54	Vertical



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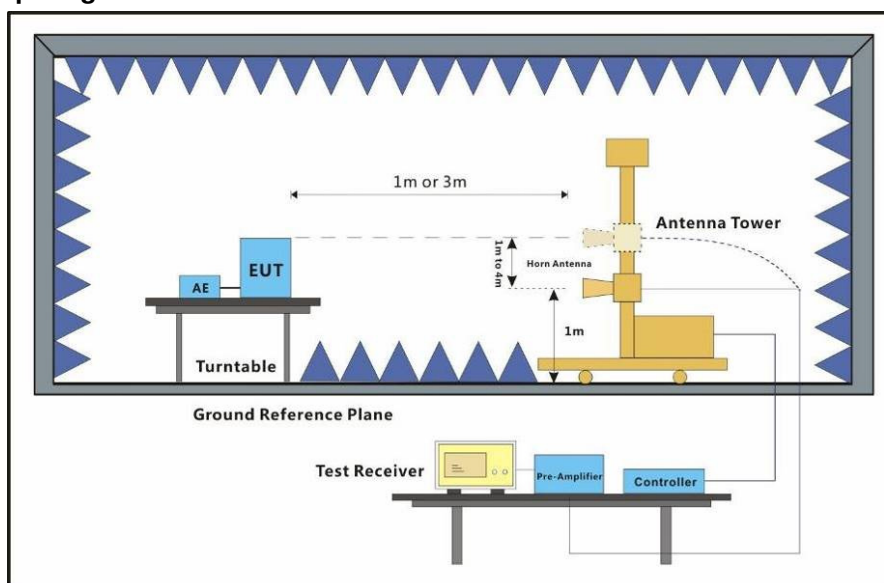
6.3 Radiated Emissions (above 1GHz)

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

6.3.1 E.U.T. Operation

Operating Environment:
Temperature: 23 °C Humidity: 52 % RH Atmospheric Pressure: 1020 mbar
Test mode: a: Idle mode_keep the EUT working in LTE Band41 idle mode.

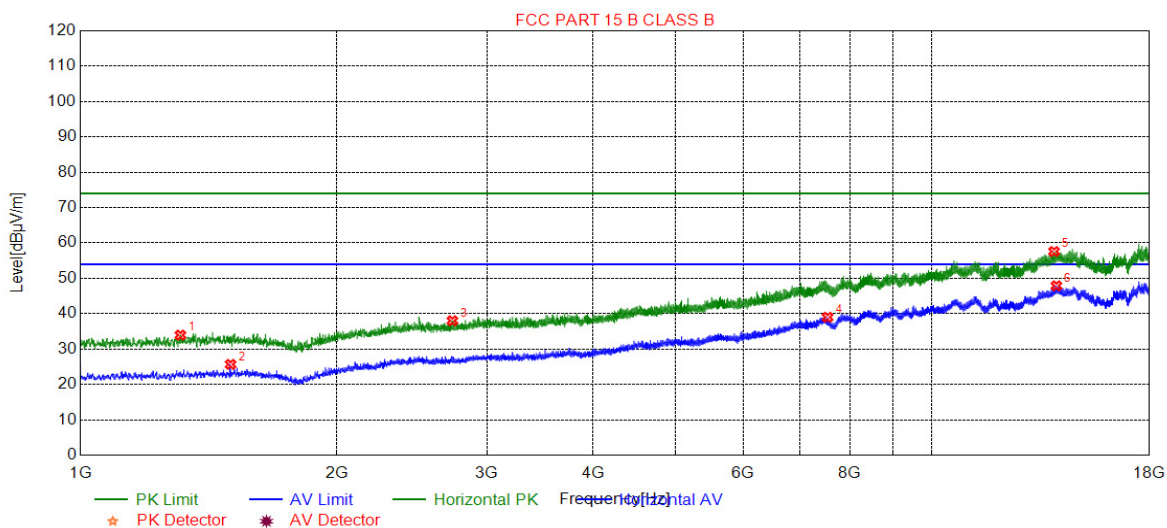
6.3.2 Test Setup Diagram



6.3.3 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.

Mode:a; Polarization:Horizontal



NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1310.26	33.96	-30.71	74.00	40.04	100	360	Horizontal
2	1500.67	25.67	-30.43	54.00	28.33	200	68	Horizontal
3	2733.23	38.01	-25.45	74.00	35.99	100	18	Horizontal
4	7537.67	39.00	-9.63	54.00	15.00	100	220	Horizontal
5	13904.4	57.59	2.17	74.00	16.41	100	270	Horizontal
6	13992.8	47.89	2.24	54.00	6.11	200	170	Horizontal

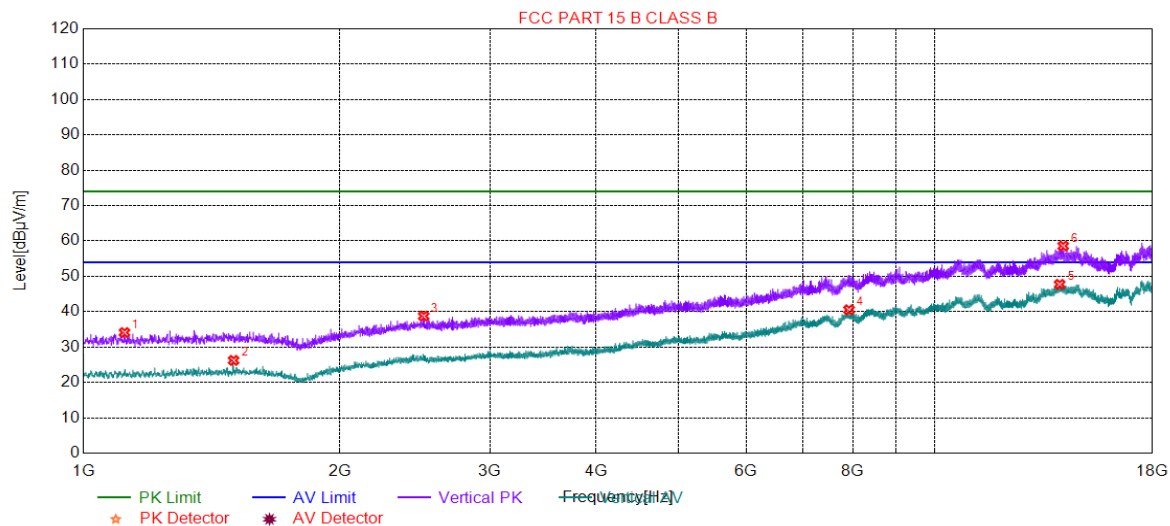


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Mode:a; Polarization:Vertical



NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1117.30	34.11	-31.46	74.00	39.89	100	0	Vertical
2	1500.67	26.24	-30.43	54.00	27.76	100	89	Vertical
3	2508.82	38.76	-25.86	74.00	35.24	100	89	Vertical
4	7922.74	40.54	-8.62	54.00	13.46	200	140	Vertical
5	14002.2	47.73	2.24	54.00	6.27	100	89	Vertical
6	14137.4	58.58	2.25	74.00	15.42	100	292	Vertical



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7 Photographs

7.1 Test Setup

Please Refer to Test setup photos for details.

7.2 EUT Constructional Details (EUT Photos)

Please Refer to external and internal photos for details.

- End of the Report -



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