

TEST REPORT

Application No.: ZR/2020/60019
Applicant: Lenovo(Shanghai) Electronics Technology Co., Ltd.
Address of Applicant: Section 304-305, Building No. 4, # 222, Meiyue Road, China (Shanghai) Pilot Free Trade Zone
Manufacturer: Lenovo PC HK Limited
Address of Manufacturer: 23/F, Lincoln House, Taikoo Place 979 King's Road, Quarry Bay, Hong Kong P.R.China
EUT Name: Portable Tablet Computer
Model No.: Lenovo TB-X306FA
Trade mark: Lenovo
FCC ID: O57TBX306FA
Standard(s) : 47 CFR Part 15, Subpart B
Date of Receipt: 2020/5/7
Date of Test: 2020/5/10 to 2020/5/20
Date of Issue: 2020/07/21

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		2020/07/21		Original

Authorized for issue by:			
		<i>Mike Hu</i>	
		(Mike Hu) /Project Engineer	
		<i>David Chen</i>	
		(David Chen) /Reviewer	

Remark:

There difference between Lenovo TB-X306F and Lenovo TB-X306FA,

They are only difference on BOM and Software:

They have different model and different software version for different market, But the hardware circuitry is same. It will not change the radio frequency conformance of original model,all other data copy from the original report(Report No:ZR/2020/5000106).



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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 General Description of EUT

EUT Description::	Portable Tablet Computer
Model No.:	Lenovo TB-X306FA
Trade Mark:	Lenovo
Hardware Version:	Lenovo TB-X306FA
Software Version:	TB-X306FA_RF01_200714
Sample Type:	<input checked="" type="checkbox"/> Portable Device, <input type="checkbox"/> Module
Antenna Type:	<input type="checkbox"/> External, <input checked="" type="checkbox"/> Integrated
Power Supply:	DC 3.86V from internal rechargeable battery or from AC/DC adapter Model No.: SC-41 AC Input: 100-240V 50/60Hz 0.3A DC Output: DC 5V 2A
Cable:	USB cable: 100cm shielded

Battery			
Battery1	Lenovo(SCUD)	L19D1P32	3.86V; 5000mAh
Battery2	Lenovo(ATL)	L19D1P32	3.86V; 5000mAh
USB Cable			
USB Cable1	Lenovo(LiQi)	L50B-052000100	1.0m shielded cable without core
USB Cable2	Lenovo(Saibao)	S50B-052200100	1.0m shielded cable without core
Adapter			
Adapter1 (US)	Lenovo(Salom)	SC-41	I/P: 100-240 Vac, 300mA ,50/60HZ O/P: 5Vdc 2000mA
Adapter2 (US)	Lenovo(Acbel)	SC-41	I/P: 100-240 Vac, 300mA ,50/60HZ O/P: 5Vdc 2000mA
Smart Charging Station			
Smart Charging Station1	Lenovo	Lenovo CD-100	I/P: 5Vdc 2000mA O/P: 5Vdc 2000mA
USB Cable for Smart Charging Station			
USB Cable	Lenovo(Saibao)	S53B-053000120	1.2m shielded cable without core
Lenovo Smart Dock			
Lenovo Smart Dock	Lenovo	Lenovo HA-200	I/P: 12V 2A O/P: 5V 1.5A
Adapter For Smart Dock			
Adapter	Chenyang	CYSE20-120200U	I/P: 100-240 Vac, 600mA ,50/60HZ O/P: 12Vdc 2000mA



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4.2 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

4.3 Test modes

<p>Pretest these modes to find the worst case and show the worse data in the test items:</p>	<p>a: Transfer data between the EUT1 and the PC+USB cable1 b: Transfer data between the EUT1 and the PC+USB cable2 c: BT+WLAN+GPS Rx+playing MP4 (SD card)+earphone+EUT1+Cable(Worst)+adapter1 d: BT+WLAN+GPS Rx+camera (Front)+earphone+EUT1+Cable(Worst)+adapter2 e: BT+WLAN+GPS Rx+camera (Back)+earphone+EUT1+Cable(Worst)+adapter(worst) f: BT+FM+WLAN+GPS Rx+earphone+EUT1+Cable(Worst)+adapter(worst) g: BT+WLAN+GPS Rx+playing MP4 (SD card)+earphone+EUT1+Smart charging station h: Smart Dock+ BT+WLAN+GPS Rx+playing MP4 (SD card) +earphone +EUT1 i: Worst mode+EUT2+adapter(Worst)</p>
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4.4 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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4.5 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 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.

4.7 Deviation from Standards

None

4.8 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	2019-07-12	2020-07-11
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

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
MXE EMI receiver	KEYSIGHT	N9038A	SEM004-15	2019-12-16	2020-12-15
BiConiLog Antenna	ETS-LINDGREN	3142C	SEM003-01	2017-06-27	2020-06-26
Pre-amplifier	Agilent Technologies	8447D	SEM005-01	2020-04-01	2021-03-31

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	2019-07-12	2020-07-11
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



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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	2019-09-27	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

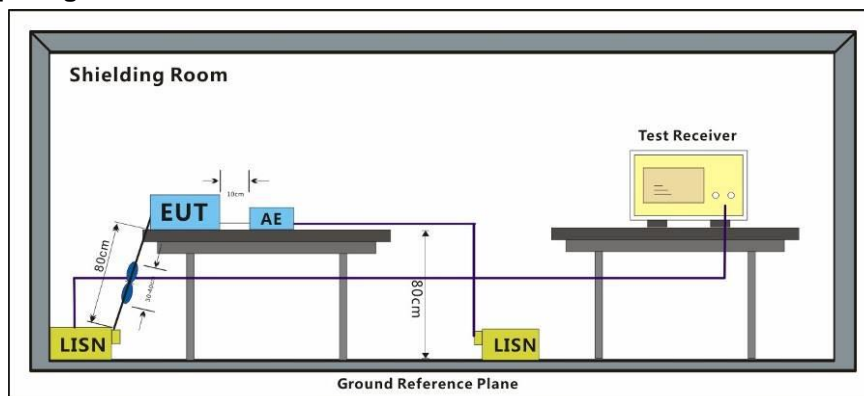
6.1 Conducted Emissions at Mains Terminals (150kHz-30MHz)

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

2.1.1 E.U.T. Operation

Operating Environment:
 Temperature: 22.3 °C Humidity: 54.1 % RH Atmospheric Pressure: 1010 mbar
 The worst case f: BT+FM+WLAN+GPS Rx+earphone+EUT1+Cable(Worst)+adapter(worst)
 for final test:

2.1.2 Test Setup Diagram



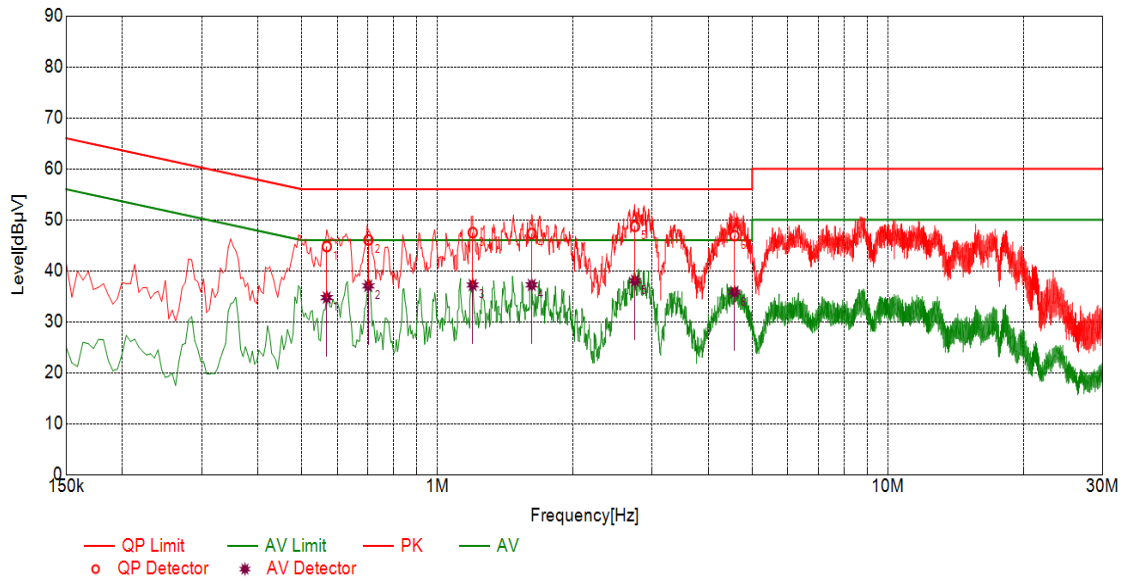
2.1.3 Measurement Data

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:f; Line:Live Line



Test Graph

Final Data List									
NO.	Freq. [MHz]	Factor [dB]	QP Value	QP Limit	QP Margin	AV Value	AV Limit	AV Margin	Type
1	0.5685	10.10	44.75	56.00	11.25	34.74	46.00	11.26	L
2	0.7029	10.10	46.04	56.00	9.96	37.03	46.00	8.97	L
3	1.1982	10.10	47.50	56.00	8.50	37.21	46.00	8.79	L
4	1.6205	10.10	47.32	56.00	8.68	37.23	46.00	8.77	L
5	2.7468	10.10	48.72	56.00	7.28	38.04	46.00	7.96	L
6	4.5673	10.10	46.89	56.00	9.11	35.81	46.00	10.19	L

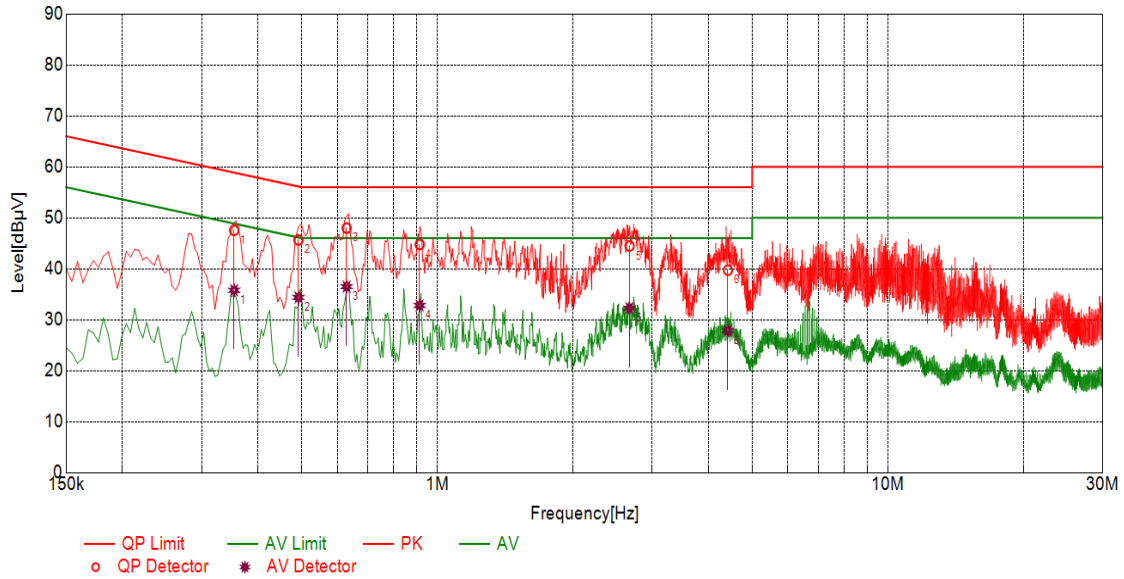


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Mode:f; Line:Neutral Line



Test Graph

Final Data List									
NO.	Freq. [MHz]	Factor [dB]	QP Value	QP Limit	QP Margin	AV Value	AV Limit	AV Margin	Type
1	0.3540	10.10	47.54	58.87	11.33	35.78	48.87	13.09	N
2	0.4918	10.10	45.66	56.14	10.48	34.38	46.14	11.76	N
3	0.6291	10.10	47.98	56.00	8.02	36.50	46.00	9.50	N
4	0.9136	10.10	44.77	56.00	11.23	32.81	46.00	13.19	N
5	2.6705	10.10	44.47	56.00	11.53	32.27	46.00	13.73	N
6	4.4146	10.10	39.72	56.00	16.28	27.84	46.00	18.16	N



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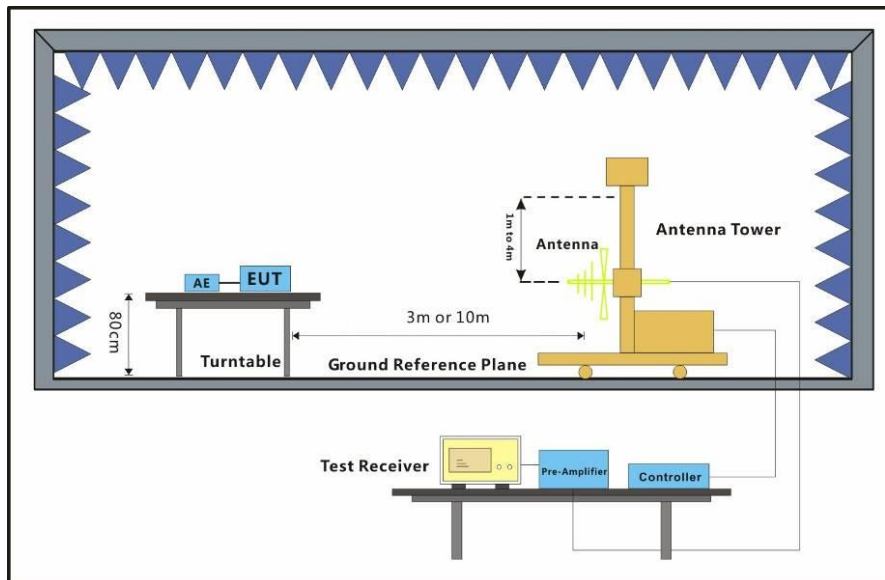
6.2 Radiated Emissions (30MHz-1GHz)

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

2.1.4 E.U.T. Operation

Operating Environment:
 Temperature: 22.4 °C Humidity: 52 % RH Atmospheric Pressure: 1010 mbar
 The worst case a: Transfer data between the EUT1 and the PC+USB cable1
 for final test:

2.1.5 Test Setup Diagram



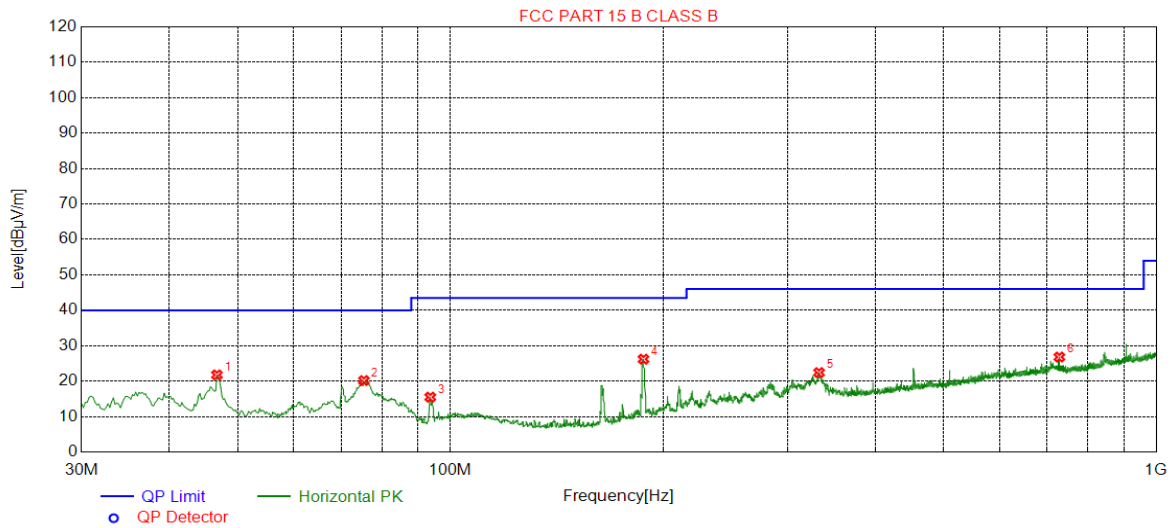
2.1.6 Measurement Data

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:a; Polarization:Horizontal



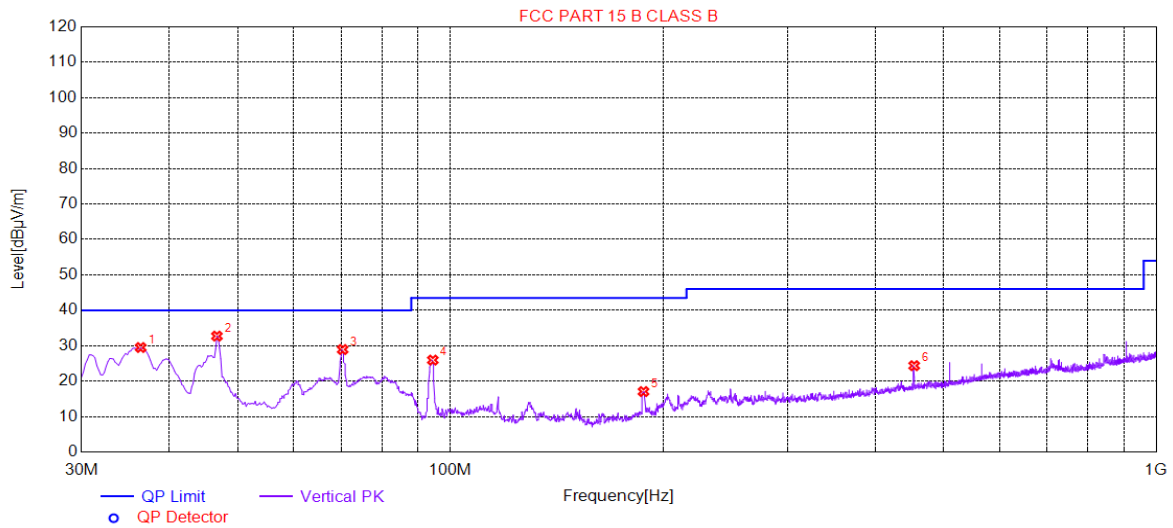
Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	46.6873	21.77	-30.41	40.00	18.23	100	300	Horizontal
2	75.4051	20.17	-35.32	40.00	19.83	200	14	Horizontal
3	93.6447	15.49	-33.11	43.50	28.01	200	28	Horizontal
4	187.753	26.21	-32.48	43.50	17.29	200	104	Horizontal
5	332.894	22.42	-27.33	46.00	23.58	100	270	Horizontal
6	729.121	26.80	-18.82	46.00	19.20	100	21	Horizontal



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Mode:a; Polarization:Vertical



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	36.4033	29.50	-29.51	40.00	10.50	100	26	Vertical
2	46.6873	32.72	-30.41	40.00	7.28	200	142	Vertical
3	70.3601	28.93	-34.46	40.00	11.07	100	259	Vertical
4	94.4209	25.95	-32.98	43.50	17.55	100	175	Vertical
5	187.753	17.07	-32.48	43.50	26.43	100	257	Vertical
6	453.974	24.37	-24.32	46.00	21.63	100	1	Vertical



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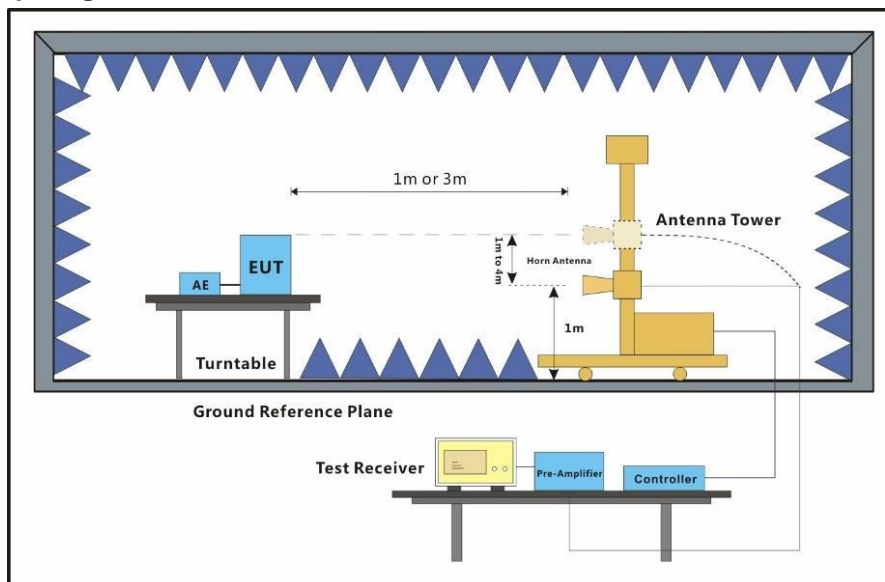
6.3 Radiated Emissions (above 1GHz)

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 to18000MHz

2.1.7 E.U.T. Operation

Operating Environment:
 Temperature: 22.4 °C Humidity: 52 % RH Atmospheric Pressure: 1010 mbar
 The worst case f: BT+FM+WLAN+GPS Rx+earphone+EUT1+Cable(Worst)+adapter(worst)
 for final test:

2.1.8 Test Setup Diagram



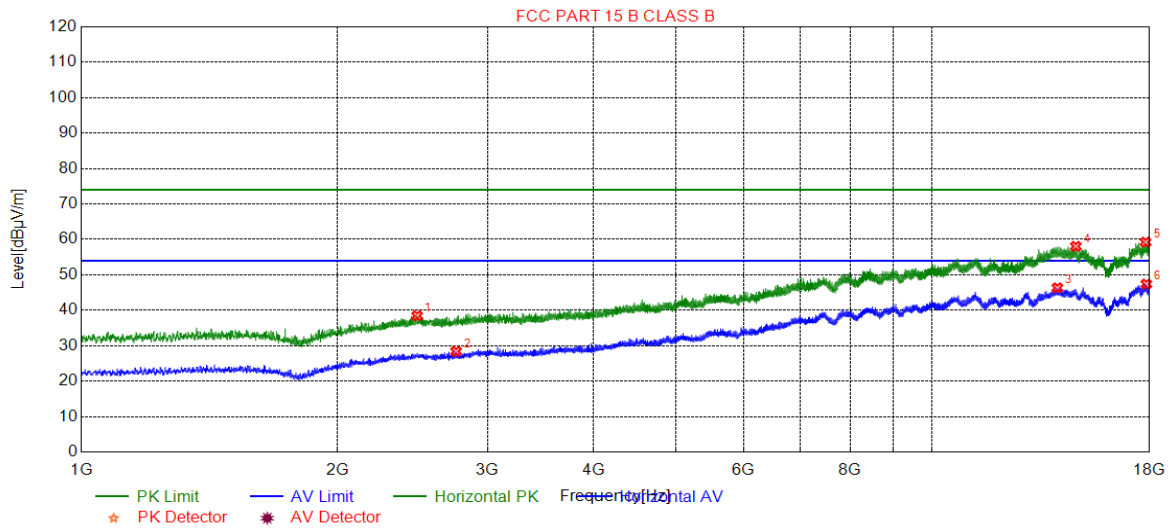
2.1.9 Measurement Data

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.



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Mode:f; Polarization:Horizontal



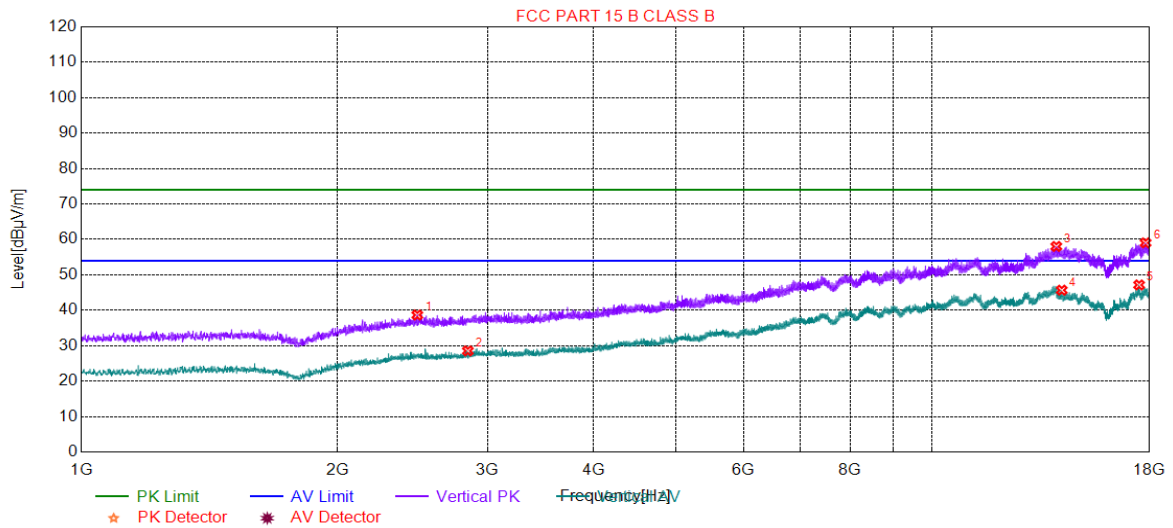
Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2480.77	38.46	-25.97	74.00	35.54	100	307	Horizontal
2	2756.18	28.41	-25.37	54.00	25.59	200	358	Horizontal
3	14022.6	46.33	2.27	54.00	7.67	100	77	Horizontal
4	14742.6	58.05	1.71	74.00	15.95	200	54	Horizontal
5	17804.4	59.23	0.66	74.00	14.77	100	344	Horizontal
6	17841.0	47.40	0.46	54.00	6.60	100	230	Horizontal



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Mode:f; Polarization:Vertical



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	2481.62	38.67	-25.97	74.00	35.33	100	39	Vertical
2	2845.44	28.54	-25.01	54.00	25.46	200	358	Vertical
3	13983.5	58.02	2.23	74.00	15.98	200	358	Vertical
4	14190.1	45.68	2.10	54.00	8.32	100	154	Vertical
5	17495.0	47.16	1.58	54.00	6.84	200	208	Vertical
6	17804.4	59.03	0.66	74.00	14.97	200	131	Vertical



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7 Photographs

7.1 Test Setup

Refer to Appendix A - Photographs of Set-Up for ZR/2020/60019.

7.2 EUT Constructional Details (EUT Photos)

Please refer to internal and external photo.

- End of the Report -



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