



Report No.: ZR/2020/5002706

Page: 1 of 19

TEST REPORT

Application No.: ZR/2020/50027
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-X306X
Trade mark: Lenovo
FCC ID: O57TBX306X
Standard(s) : 47 CFR Part 15, Subpart B
 ANSI C63.4:2014
Date of Receipt: 2020/5/25
Date of Test: 2020/5/26 to 2020/6/14
Date of Issue: 2020/6/26

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



SGS-CSTC Standards Technical Services Co., Ltd.
Shenzhen Branch (China) Service Laboratory

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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2020/6/26		Original

Authorized for issue by:			
			
		(Mike Hu) /Project Engineer	
			
		(David Chen) /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 General Description of EUT

EUT Description::	Portable Tablet Computer
Model No.:	Lenovo TB-X306X
Trade Mark:	Lenovo
Hardware Version:	Lenovo TB-X306X
Software Version:	TB-X306X_RF01_200620
Sample Type:	☒ Portable Device, ☐ Module
Antenna Type:	☐ External, ☒ 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

Pretest these modes to find the worst case and show the worse data in the test items:	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)
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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:

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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
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	2019-07-12	2020-07-11
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	2016-06-29	2020-06-28
Pre-amplifier	Sonoma Instrument Co	310N	SEM005-04	2020-03-13	2021-03-12

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	AgilentTechnologies 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)

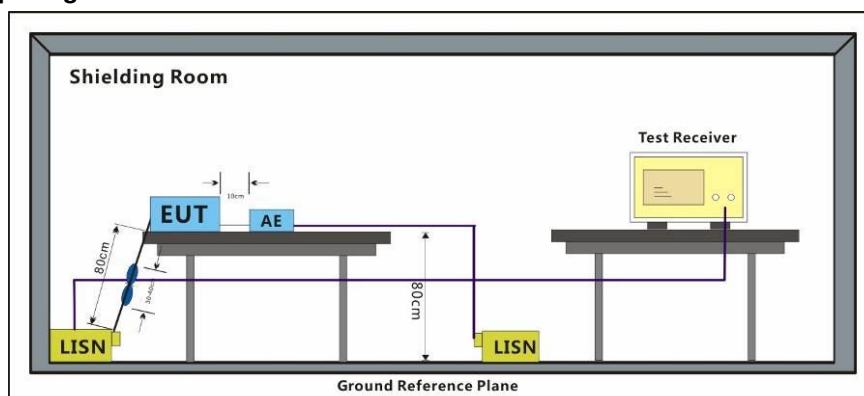
Test Requirement:	47 CFR Part 15, Subpart B
Test Method:	ANSI C63.4:2014
Frequency Range:	150kHz to 30MHz
Limit:	
0.15M-0.5MHz	66dB(μV)-56dB(μV) quasi-peak, 56dB(μV)-46dB(μV) average
0.5M-5MHz	56dB(μV) quasi-peak, 46dB(μV) average
5M-30MHz	60dB(μV) quasi-peak, 50dB(μV) average
Detector:	Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz

2.1.1 E.U.T. Operation

Operating Environment:

Temperature: 20.3 °C Humidity: 58.1 % RH Atmospheric Pressure: 1005 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.

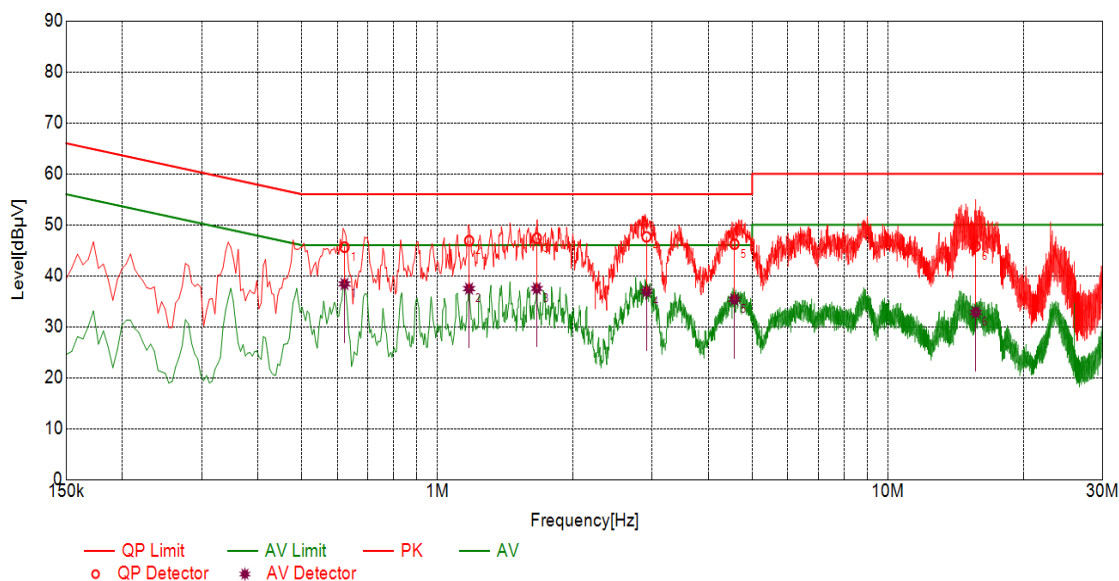


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Mode:f; Line:Live Line



Test Graph

Final Data List

NO.	Freq. [MHz]	Factor [dB]	QP Value	QP Limit	QP Margin	AV Value	AV Limit	AV Margin	Type
1	0.6223	10.10	45.61	56.00	10.39	38.40	46.00	7.60	L
2	1.1765	10.10	46.87	56.00	9.13	37.48	46.00	8.52	L
3	1.6631	10.10	47.36	56.00	8.64	37.50	46.00	8.50	L
4	2.9123	10.10	47.64	56.00	8.36	36.92	46.00	9.08	L
5	4.5653	10.10	46.20	56.00	9.80	35.37	46.00	10.63	L
6	15.6751	10.11	45.82	60.00	14.18	32.83	50.00	17.17	L

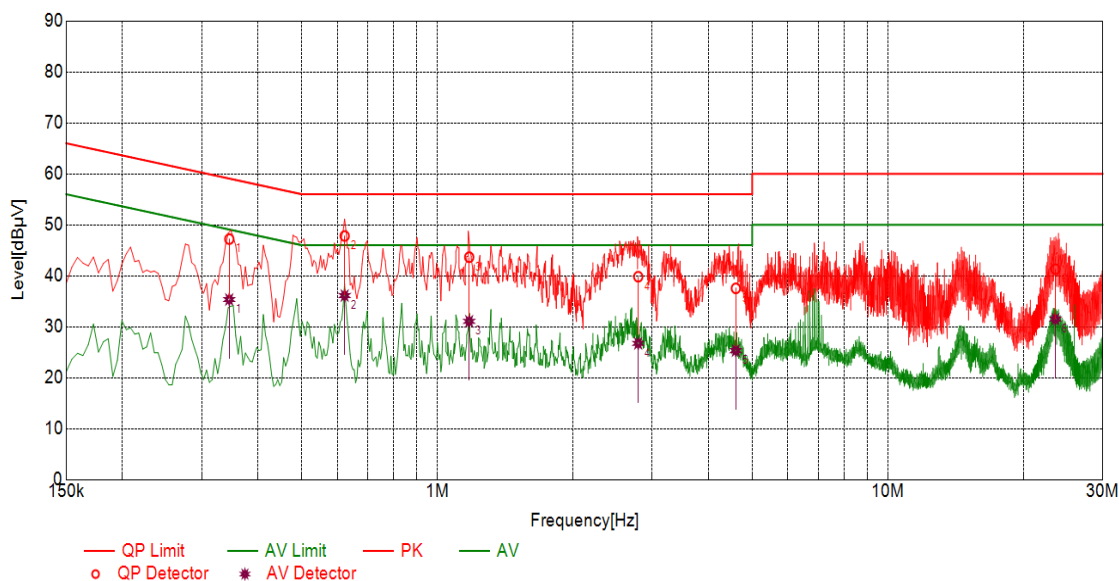


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Mode:f; Line:Neutral Line



Test Graph

Final Data List

NO.	Freq. [MHz]	Factor [dB]	QP Value	QP Limit	QP Margin	AV Value	AV Limit	AV Margin	Type
1	0.3453	10.10	47.20	59.07	11.87	35.34	49.07	13.73	N
2	0.6228	10.10	47.81	56.00	8.19	36.11	46.00	9.89	N
3	1.1769	10.10	43.65	56.00	12.35	31.07	46.00	14.93	N
4	2.7919	10.10	39.82	56.00	16.18	26.73	46.00	19.27	N
5	4.5978	10.10	37.54	56.00	18.46	25.32	46.00	20.68	N
6	23.5467	10.11	41.29	60.00	18.71	31.50	50.00	18.50	N



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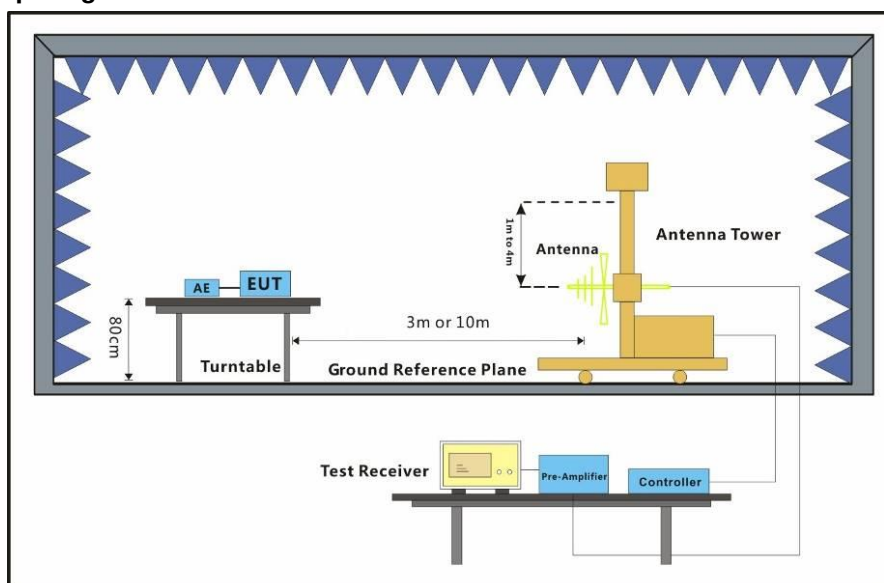
6.2 Radiated Emissions (30MHz-1GHz)

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: 25.4 °C Humidity: 51 % RH Atmospheric Pressure: 1005 mbar
The worst case a: Transfer data between the EUT1 and the PC+USB cable1
for final test:

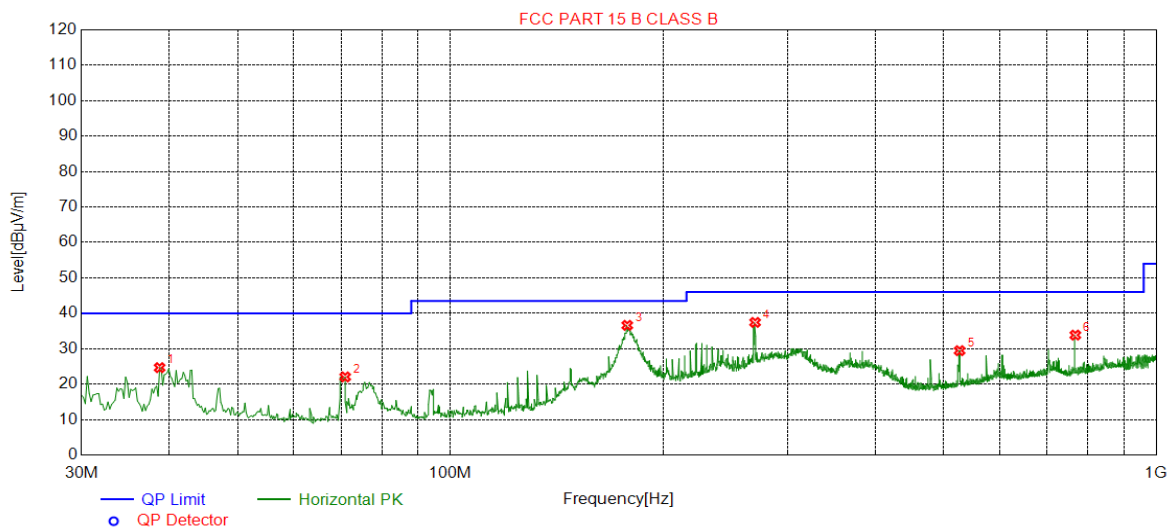
2.1.5 Test Setup Diagram



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.

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	38.7317	24.66	-28.75	40.00	15.34	200	215	Horizontal
2	70.9422	22.05	-34.56	40.00	17.95	100	70	Horizontal
3	178.051	36.60	-33.44	43.50	6.90	200	110	Horizontal
4	270.220	37.43	-29.17	46.00	8.57	100	175	Horizontal
5	526.545	29.45	-22.64	46.00	16.55	200	253	Horizontal
6	768.123	33.85	-18.13	46.00	12.15	100	59	Horizontal



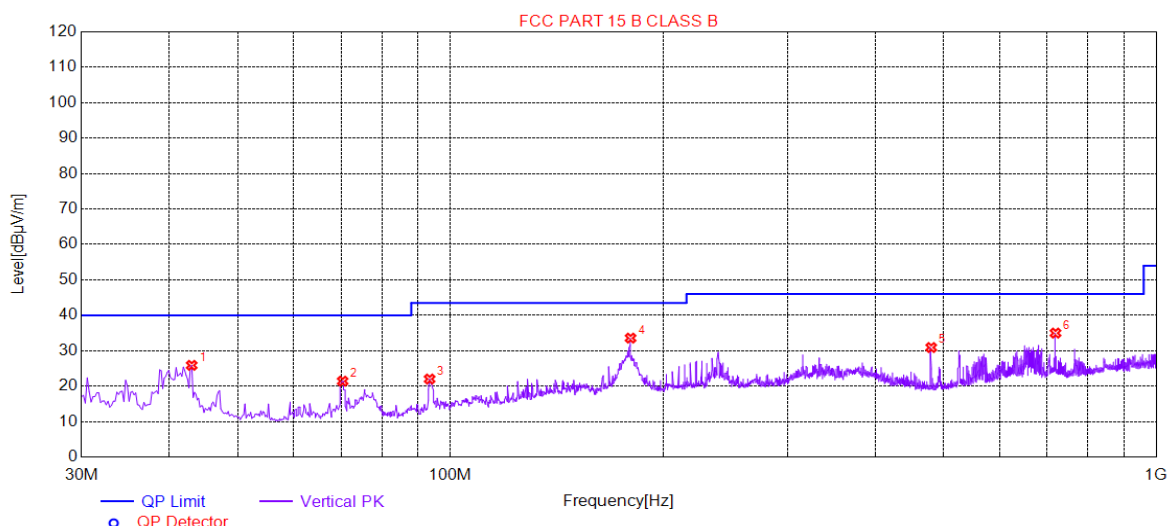
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Mode:a Polarization:Vertical



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	43.0006	25.88	-29.59	40.00	14.12	100	288	Vertical
2	70.3601	21.41	-34.46	40.00	18.59	200	14	Vertical
3	93.4507	22.01	-33.14	43.50	21.49	200	14	Vertical
4	179.992	33.57	-33.29	43.50	9.93	200	52	Vertical
5	479.976	30.91	-23.82	46.00	15.09	100	338	Vertical
6	720.002	34.98	-19.04	46.00	11.02	100	323	Vertical



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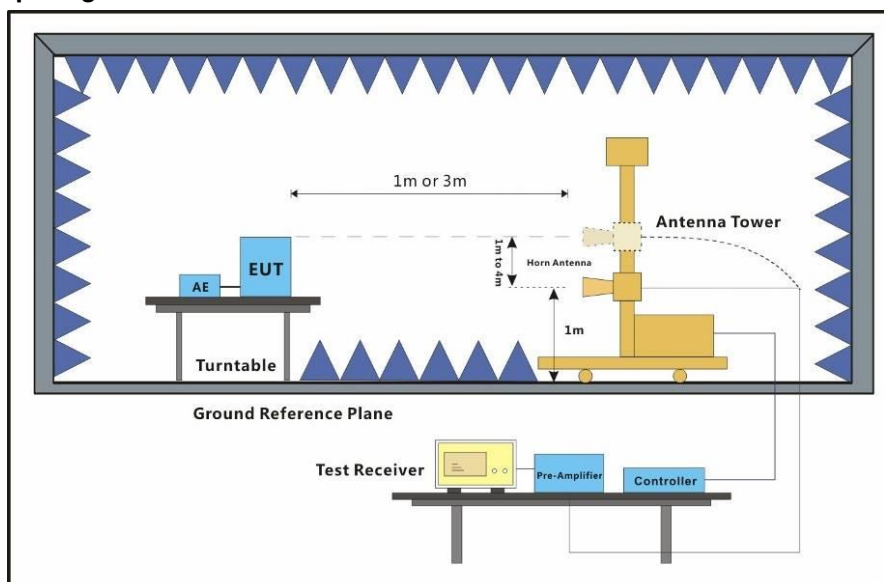
6.3 Radiated Emissions (above 1GHz)

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: 23.3 °C Humidity: 56.2 % RH Atmospheric Pressure: 1005 mbar
The worst case f: BT+FM+WLAN+GPS Rx+earphone+EUT1+Cable(Worst)+adapter(worst)
for final test:

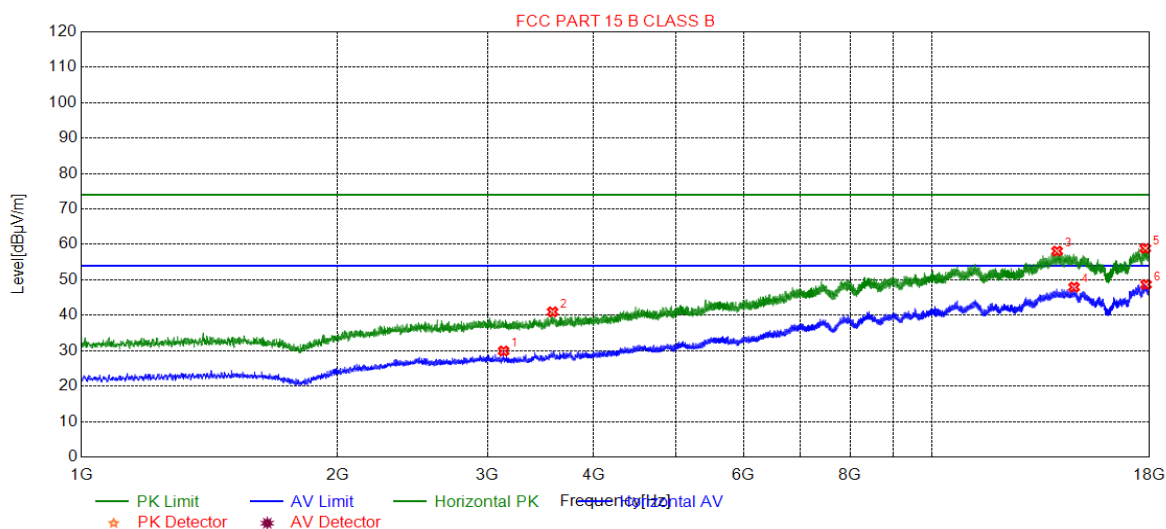
2.1.8 Test Setup Diagram



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.

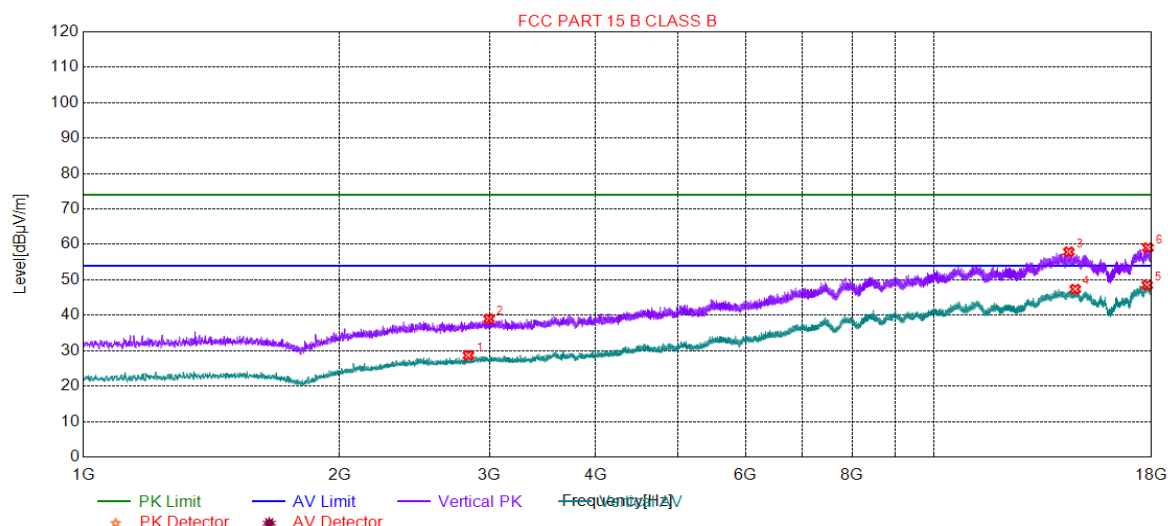
Mode:f; Polarization:Horizontal



Suspected List

Suspected List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	3134.45	29.93	-24.26	54.00	24.07	100	155	Horizontal
2	3579.02	40.98	-22.90	74.00	33.02	200	91	Horizontal
3	14013.3	58.12	2.26	74.00	15.88	100	269	Horizontal
4	14671.2	47.95	1.66	54.00	6.05	100	80	Horizontal
5	17788.3	58.88	0.73	74.00	15.12	100	80	Horizontal
6	17827.4	48.68	0.53	54.00	5.32	200	166	Horizontal

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	2834.39	28.69	-25.06	54.00	25.31	200	318	Vertical
2	2996.74	38.99	-24.53	74.00	35.01	200	91	Vertical
3	14387.3	57.91	1.95	74.00	16.09	100	193	Vertical
4	14638.0	47.38	1.63	54.00	6.62	100	156	Vertical
5	17785.7	48.49	0.74	54.00	5.51	200	318	Vertical
6	17824.0	59.08	0.55	74.00	14.92	200	16	Vertical

7 Photographs

7.1 Test Setup

Refer to Appendix A - Photographs of Set-Up for ZR/2020/50027.

7.2 EUT Constructional Details (EUT Photos)

Please refer to internal and external photo.

- End of the Report -

