

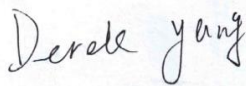
TEST REPORT

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) : FCC CFR Title 47, Part 15, Subpart B, Class B
 ANSI C63.4-2014
Date of Receipt: 2020/5/25
Date of Test: 2020/5/26 to 2020/6/14
Date of Issue: 2021/8/12

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



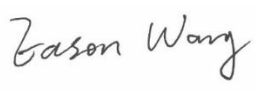
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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2020/6/26		Original
02		2021/5/28	Eason Wang	1. The test site information of lab B(XI 'AN) added in section 4.5 and 4.6 2. Modify data conversion error of antenna height 3. Update equipment list
03		2021/8/12	Eason Wang	1. Update Support Units. 2. Remove the information of lab A(SZ) in section 4.5 and 4.6

*This report supersedes our previous report ZR/2020/5002706, issued on 2020/6/26, which is hereby deemed null and void.

Authorized for issue by:		
Prepared By		 (Eason Wang) /Engineer
Checked By		 (Jim Huang) / Reviewer

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



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)
---	---

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%



4.5 Test Location

Company:	SGS-CSTC STANDARDS TECHNICAL SERVICES (XI 'AN) CO., LTD.
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:	Ben Huang, Leah Chen

4.6 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.**

4.7 Deviation from Standards

None

4.8 Abnormalities from Standard Conditions

None



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5 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	2019-09-07	2020-09-06
Artificial network	ROHDE&SCHWARZ	ENV216	XAW01-04-01	2019-12-11	2020-12-10
Temperature and humidity meter	MingGao	TH101B	XAW01-01-01	2019-12-06	2020-12-05
Measurement Software	Tonscend	TS+ CE V2.5	XAW02-05-02	NCR	NCR
Radio communication analyzer	ROHDE&SCHWARZ	CMW 500	XAW01-03-02	2019-06-27	2020-06-26



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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	2019-06-27	2020-06-26
Test receiver	ROHDE&SCHWARZ	ESR	XAW01-08-01	2019-09-07	2020-09-06
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
Filter bank	Tonscend	JS0806-F	XAW03-05-01	NCR	NCR
Filter bank	Tonscend	JS0806s	XAW03-05-02	NCR	NCR
Amplifier	Tonscend	TAP00903040	XAW01-41-01	2019-11-18	2020-11-17
Amplifier	Tonscend	TAP01018048	XAW01-41-02	2019-11-18	2020-11-17
Amplifier	Tonscend	TAP18040048	XAW01-41-03	2019-12-03	2020-12-02
Amplifier	Shanghai Steed	YX28980930	XAW01-41-06	2019-11-18	2020-11-17
Temperature and humidity meter	MingGao	TH101B	XAW01-01-01	2019-12-06	2020-12-05
Measurement Software	Tonscend	TS+ RSE V3.0.0.2	XAW02-05-01	NCR	NCR
Radio communication analyzer	ROHDE&SCHWARZ	CMW 500	XAW01-03-02	2019-06-27	2020-06-26



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6 Emission Test Results

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

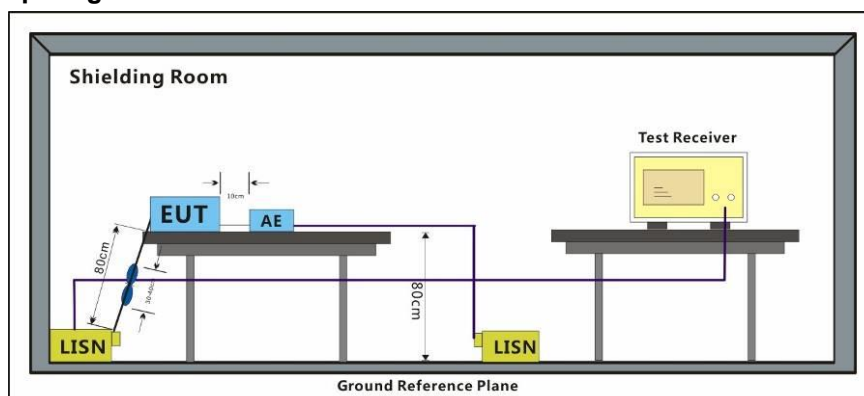
Test Requirement:	47 CFR Part 15, Subpart B
Test Method:	ANSI C63.4:2014
Frequency Range:	150kHz to 30MHz
Limit:	
0.15M-0.5MHz	66dB(μV)-56dB(μV) quasi-peak, 56dB(μV)-46dB(μV) average
0.5M-5MHz	56dB(μV) quasi-peak, 46dB(μV) average
5M-30MHz	60dB(μV) quasi-peak, 50dB(μV) average
Detector:	Peak for pre-scan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

6.1.1 E.U.T. Operation

Operating Environment:

Temperature: 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:

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.

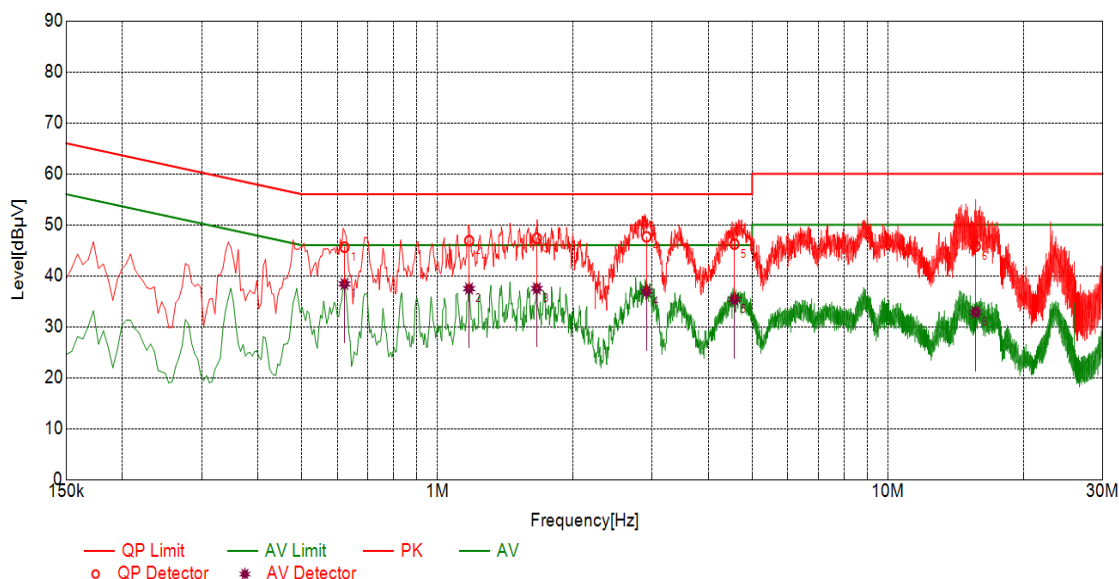


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Mode:f; Line:Live Line



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]	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



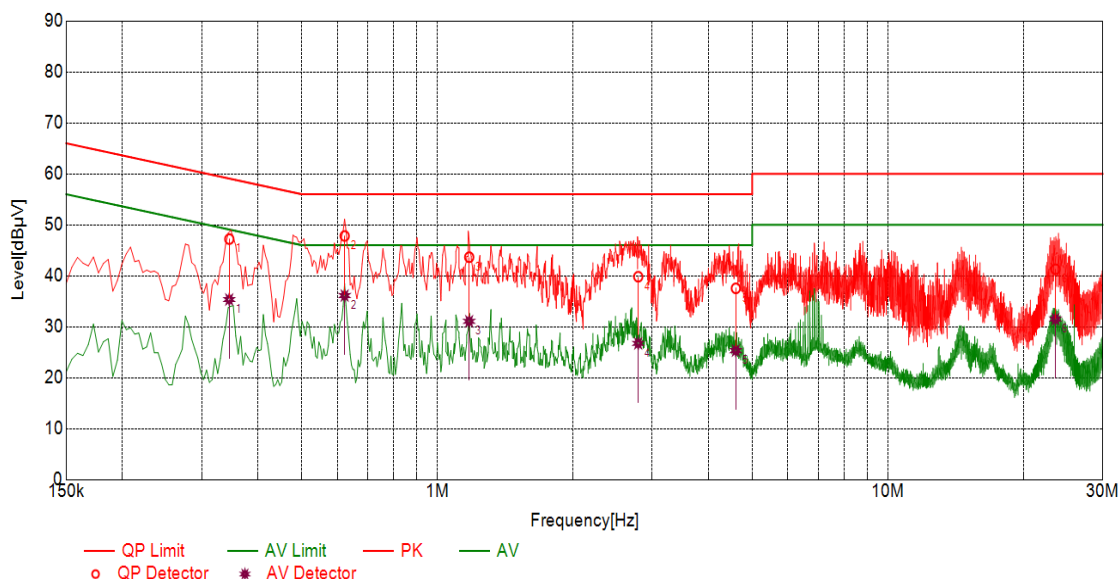
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Mode:f; Line:Neutral Line



Test Graph

Final Data List

NO.	Freq. [MHz]	Factor [dB]	QP Value [dBμV]	QP Limit [dBμV]	QP Margin [dB]	AV Value [dBμV]	AV Limit [dBμV]	AV Margin [dB]	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

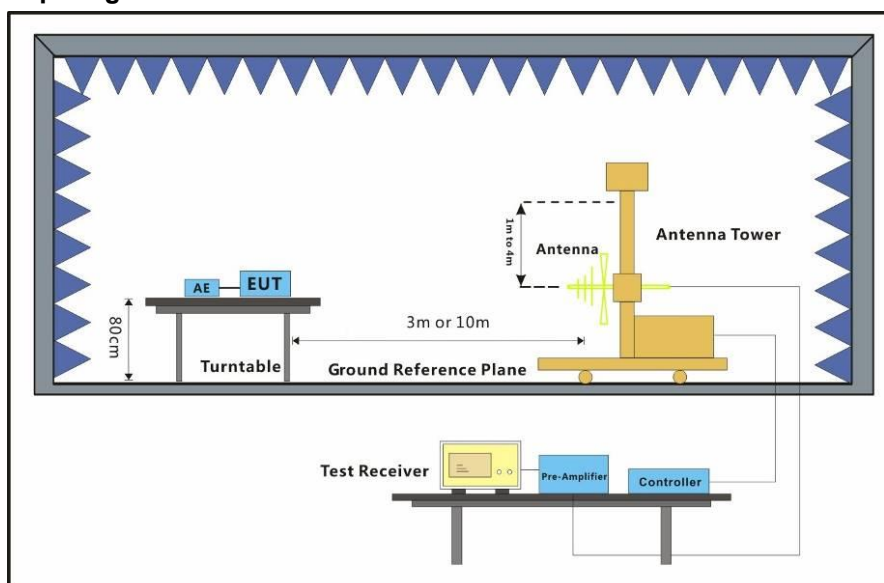
6.2.1 E.U.T. Operation

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:

6.2.2 Test Setup Diagram



6.2.3 Measurement Data

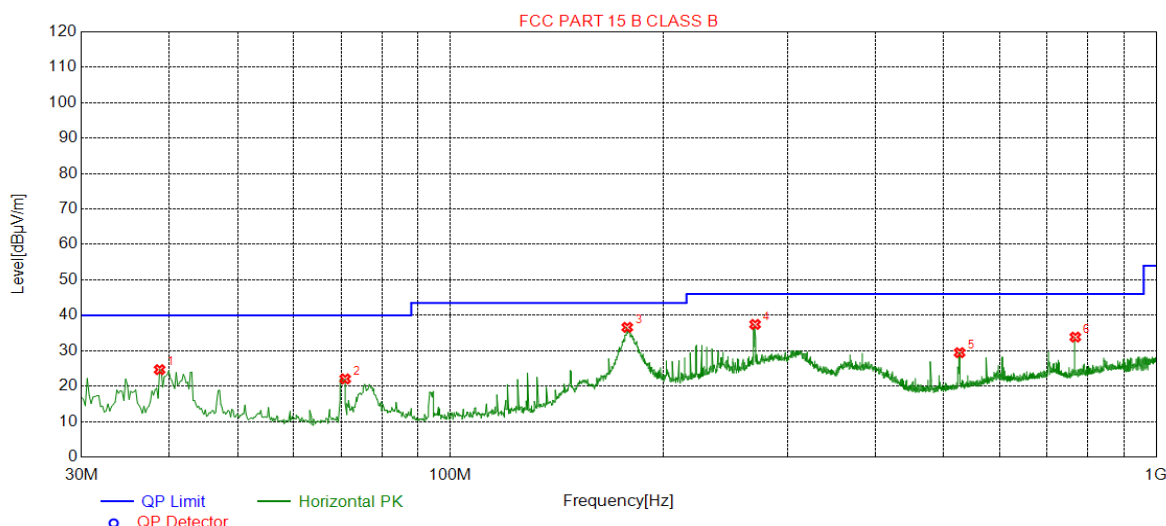
An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities.



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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	38.7317	24.66	-28.75	40.00	15.34	247	215	Horizontal
2	70.9422	22.05	-34.56	40.00	17.95	235	70	Horizontal
3	178.051	36.60	-33.44	43.50	6.90	179	110	Horizontal
4	270.220	37.43	-29.17	46.00	8.57	156	175	Horizontal
5	526.545	29.45	-22.64	46.00	16.55	236	253	Horizontal
6	768.123	33.85	-18.13	46.00	12.15	122	59	Horizontal



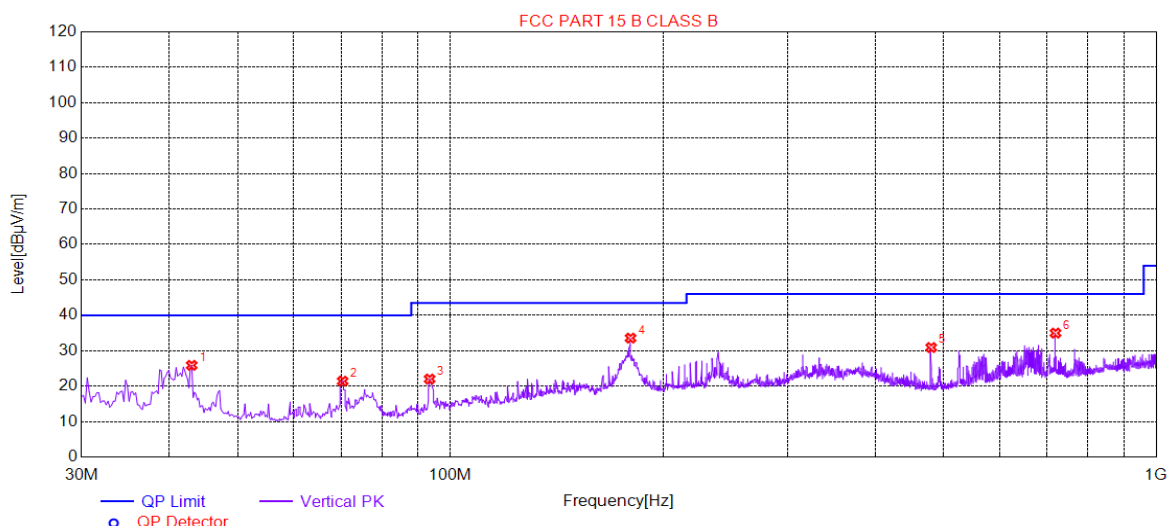
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Mode:a Polarization:Vertical



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	259	288	Vertical
2	70.3601	21.41	-34.46	40.00	18.59	242	14	Vertical
3	93.4507	22.01	-33.14	43.50	21.49	281	14	Vertical
4	179.992	33.57	-33.29	43.50	9.93	240	52	Vertical
5	479.976	30.91	-23.82	46.00	15.09	168	338	Vertical
6	720.002	34.98	-19.04	46.00	11.02	158	323	Vertical



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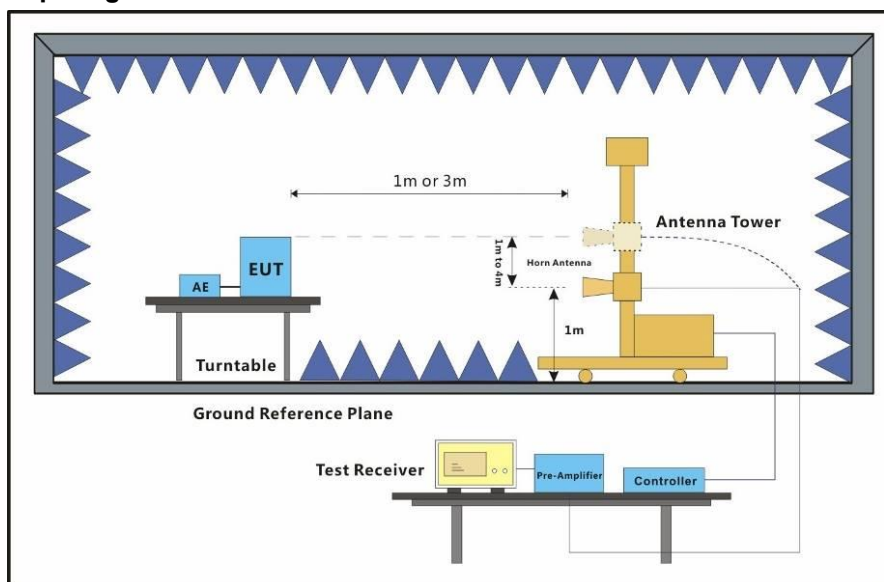
6.3 Radiated Emissions (above 1GHz)

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

6.3.1 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:

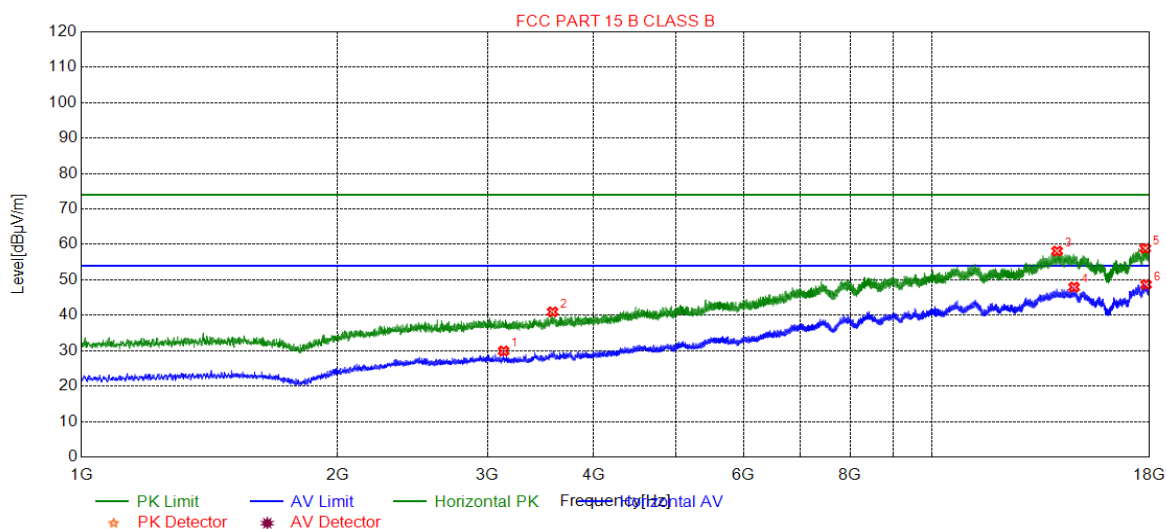
6.3.2 Test Setup Diagram



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.

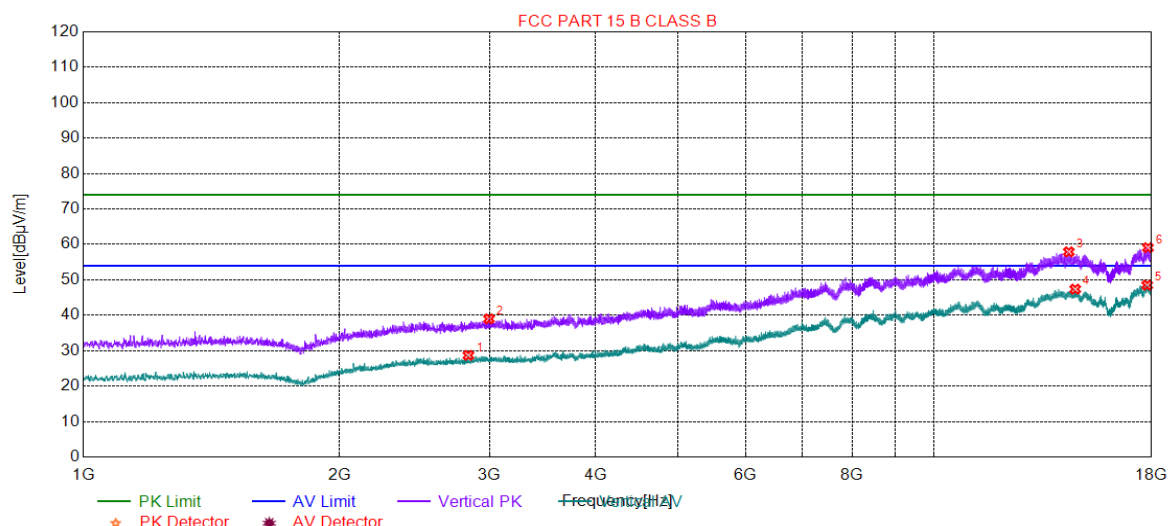
Mode:f; Polarization:Horizontal



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	223	155	Horizontal
2	3579.02	40.98	-22.90	74.00	33.02	131	91	Horizontal
3	14013.3	58.12	2.26	74.00	15.88	147	269	Horizontal
4	14671.2	47.95	1.66	54.00	6.05	172	80	Horizontal
5	17788.3	58.88	0.73	74.00	15.12	207	80	Horizontal
6	17827.4	48.68	0.53	54.00	5.32	229	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	164	318	Vertical
2	2996.74	38.99	-24.53	74.00	35.01	264	91	Vertical
3	14387.3	57.91	1.95	74.00	16.09	257	193	Vertical
4	14638.0	47.38	1.63	54.00	6.62	264	156	Vertical
5	17785.7	48.49	0.74	54.00	5.51	182	318	Vertical
6	17824.0	59.08	0.55	74.00	14.92	226	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 -



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