



Report No.: ZR/2020/5000106-01  
Page: 1 of 19

# TEST REPORT

**Application No.:** ZR/2020/50001  
**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-X306F  
**Trade mark:** Lenovo  
**FCC ID:** O57TBX306F  
**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:** 2021/8/11

<b>Test Result:</b>	<b>Pass*</b>
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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		2020/5/22		Original
02		2021/5/31	James Qin	1. Modify data conversion error of antenna height 2. Updated equipment list
03		2021/8/11	James Qin	1. Updated Support Units, Test facility and Test Location.

<b>Authorized for issue by:</b>	
<b>Prepared By</b>	 <b>(James Qin) / Engineer</b>
<b>Checked By</b>	 <b>(Jim Huang) / Reviewer</b>



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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-X306F
Trade Mark:	Lenovo
Hardware Version:	Lenovo TB-X306F
Software Version:	TB-X306F_RF01_200529
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.
Router	NETGEAR	R6020	No.XA1401
Computer	Lenovo	L480	No.XA1402
Mouse	A4TECH	OP-520NU USB	No.XA1403

### 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	± 4.8dB (Below 1GHz)
		± 4.8dB (1GHz to 6GHz)
		± 4.5dB (6GHz to 18GHz)
		± 5.02dB (Above 18GHz)



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#### 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

• **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	XAW01-08-05	2020-04-12	2021-04-11
Artificial network	ROHDE&SCHWARZ	ENV216	XAW01-04-03	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	2020-04-02	2021-04-01



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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	2020-04-02	2021-04-01
Test receiver	ROHDE&SCHWARZ	ESR	XAW01-08-05	2020-04-12	2021-04-11
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	2020-04-02	2021-04-01



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## 6 Emission Test Results

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

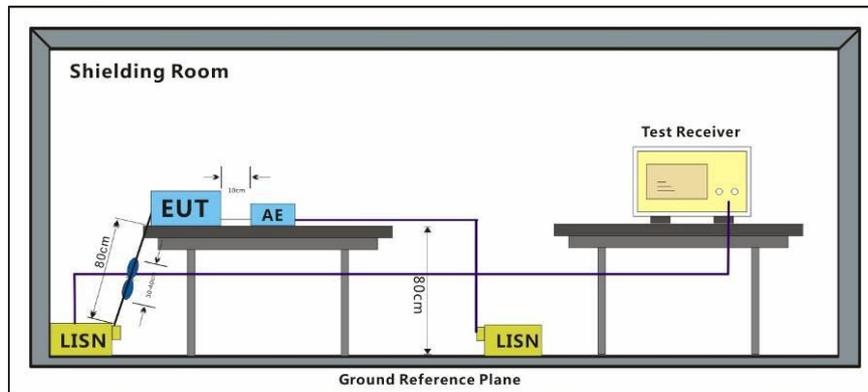
Test Requirement:	47 CFR Part 15, Subpart B
Test Method:	ANSI C63.4:2014
Frequency Range:	150kHz to 30MHz
Limit:	
0.15M-0.5MHz	66dB(μV)-56dB(μV) quasi-peak, 56dB(μV)-46dB(μV) average
0.5M-5MHz	56dB(μV) quasi-peak, 46dB(μV) average
5M-30MHz	60dB(μV) quasi-peak, 50dB(μV) average
Detector:	Peak for pre-scan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

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

Operating Environment:

Temperature: 22.3 °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:

#### 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.

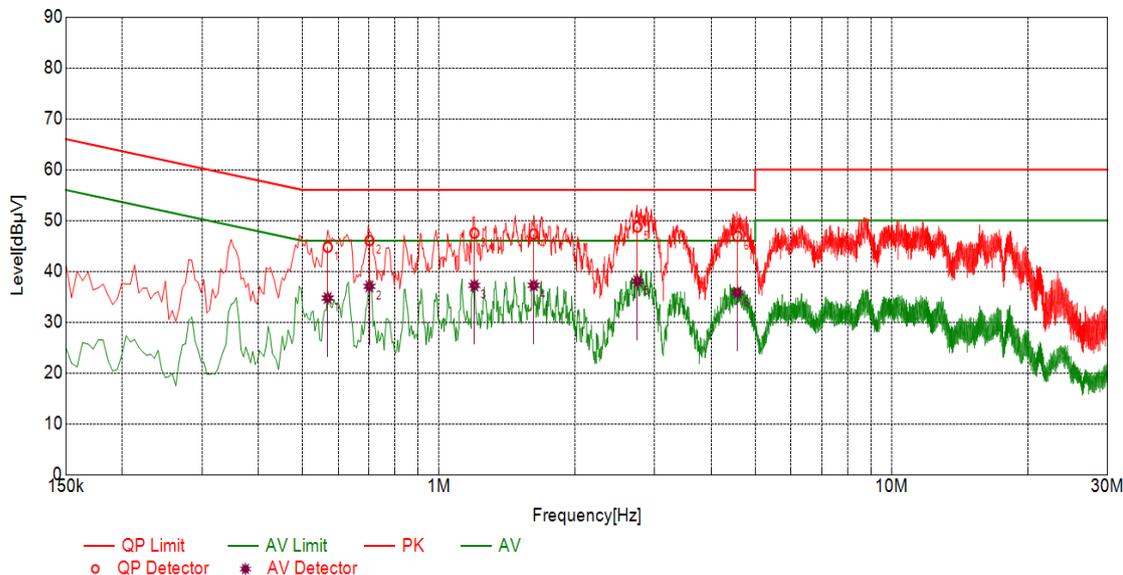


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Mode:f; Line:Live Line



**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	0.5685	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

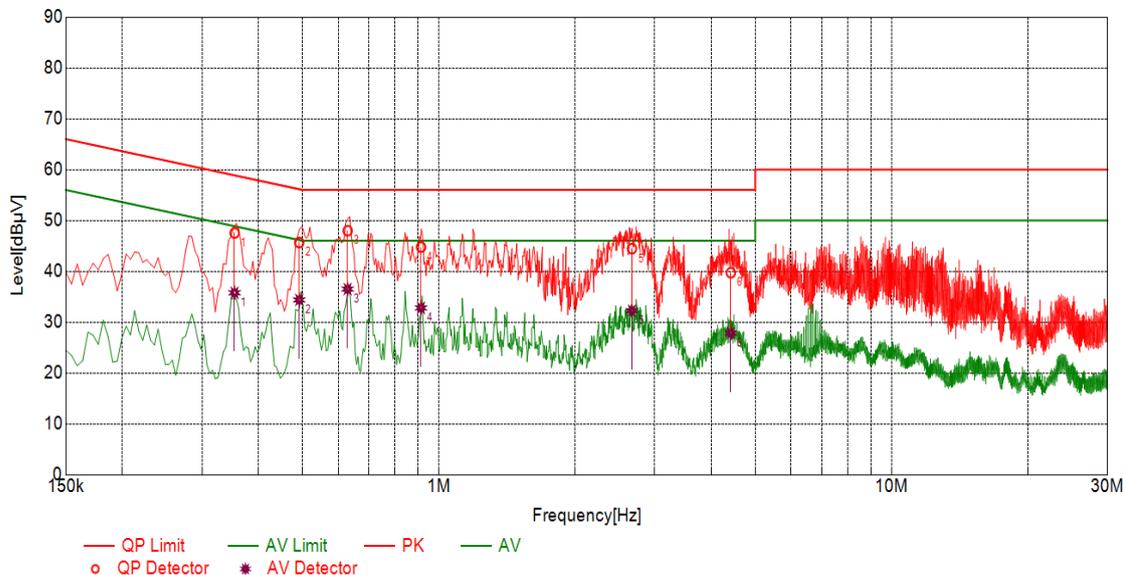


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Mode:f; Line:Neutral Line



**Test Graph**

Final Data List									
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	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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 中国·深圳·科技园中区M-10栋一号厂房 邮编: 518057 t (86-755) 26012053 f (86-755) 26710594 sgs.china@sgs.com

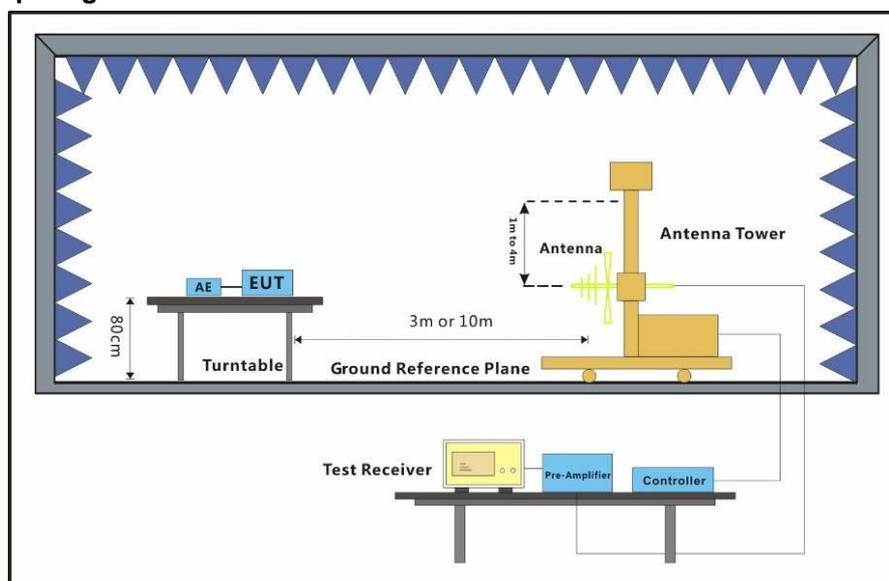
## 6.2 Radiated Emissions (30MHz-1GHz)

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: 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:

### 6.2.2 Test Setup Diagram



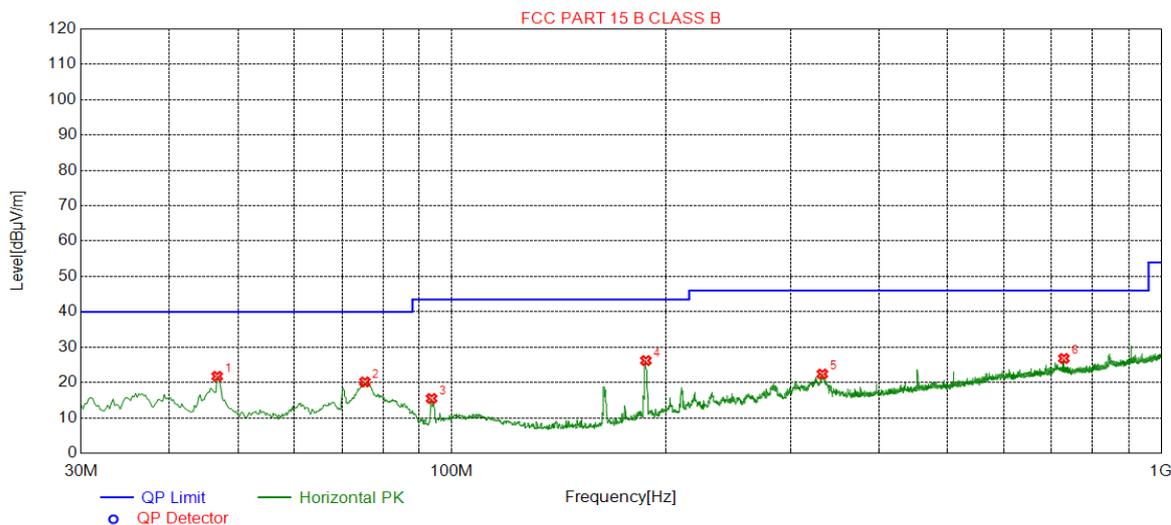
### 6.2.3 Measurement Data

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



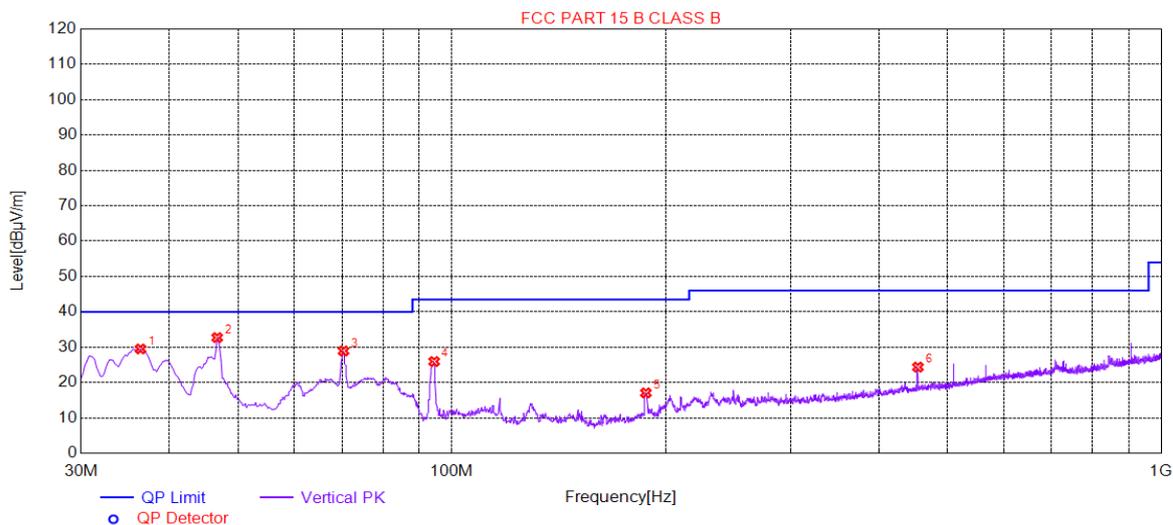
**Suspected List**

Suspected List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	46.6873	21.77	-30.41	40.00	18.23	108	300	Horizontal
2	75.4051	20.17	-35.32	40.00	19.83	158	14	Horizontal
3	93.6447	15.49	-33.11	43.50	28.01	170	28	Horizontal
4	187.753	26.21	-32.48	43.50	17.29	236	104	Horizontal
5	332.894	22.42	-27.33	46.00	23.58	107	270	Horizontal
6	729.121	26.80	-18.82	46.00	19.20	186	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	223	26	Vertical
2	46.6873	32.72	-30.41	40.00	7.28	253	142	Vertical
3	70.3601	28.93	-34.46	40.00	11.07	164	259	Vertical
4	94.4209	25.95	-32.98	43.50	17.55	189	175	Vertical
5	187.753	17.07	-32.48	43.50	26.43	178	257	Vertical
6	453.974	24.37	-24.32	46.00	21.63	247	1	Vertical



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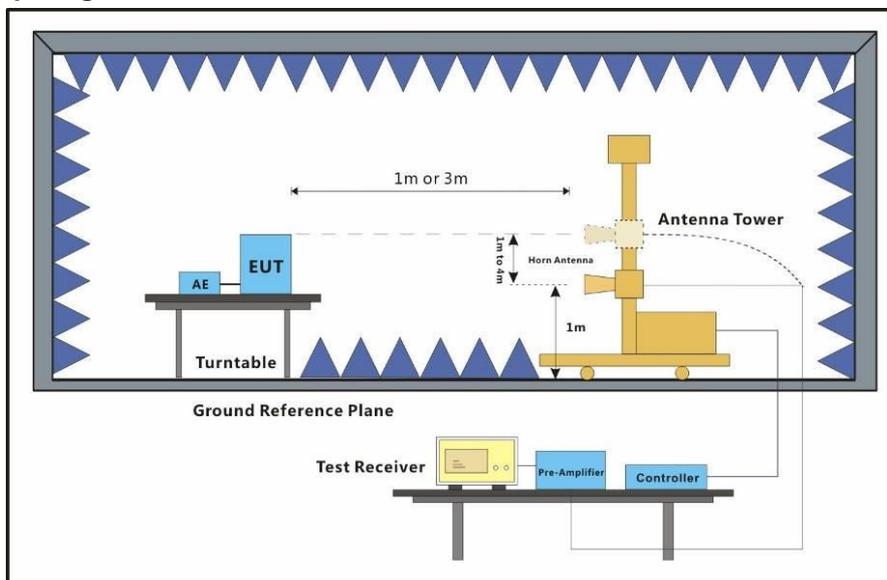
### 6.3 Radiated Emissions (above 1GHz)

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

#### 6.3.1 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:

#### 6.3.2 Test Setup Diagram



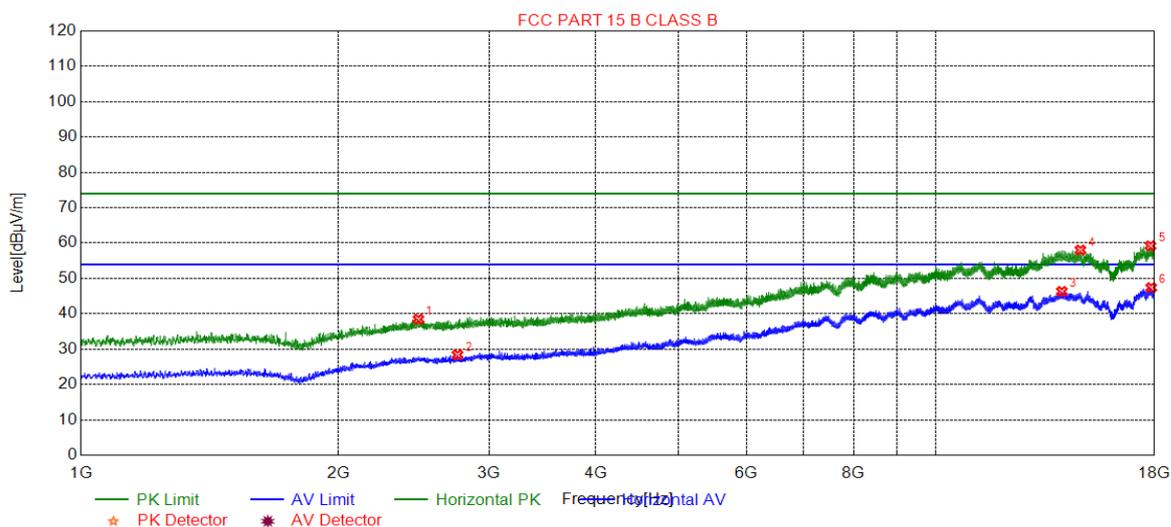
#### 6.3.3 Measurement Data

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.



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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	159	307	Horizontal
2	2756.18	28.41	-25.37	54.00	25.59	144	358	Horizontal
3	14022.6	46.33	2.27	54.00	7.67	226	77	Horizontal
4	14742.6	58.05	1.71	74.00	15.95	249	54	Horizontal
5	17804.4	59.23	0.66	74.00	14.77	165	344	Horizontal
6	17841.0	47.40	0.46	54.00	6.60	203	230	Horizontal



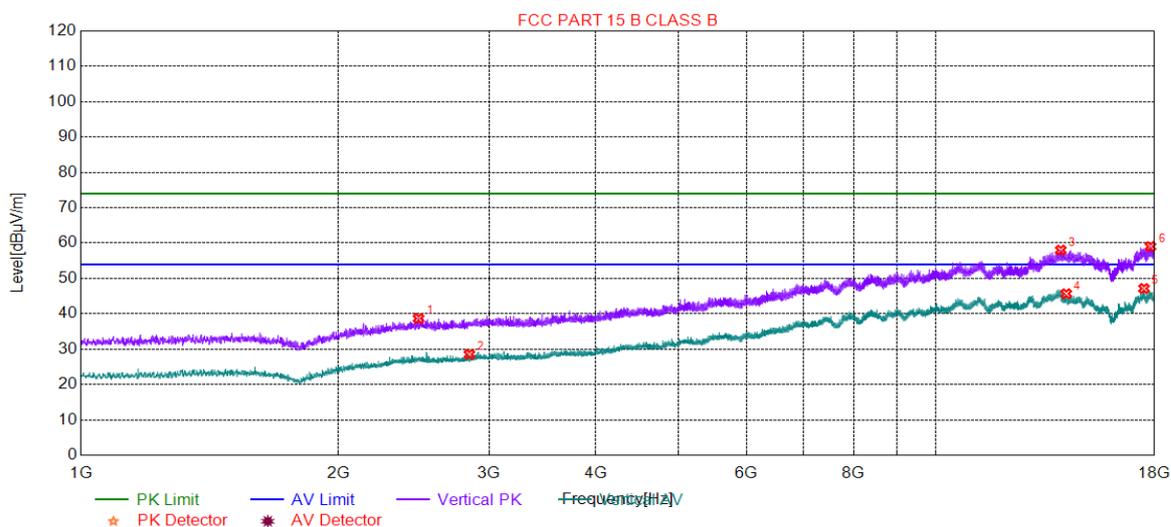
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Mode:f; Polarization:Vertical



**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	205	39	Vertical
2	2845.44	28.54	-25.01	54.00	25.46	245	358	Vertical
3	13983.5	58.02	2.23	74.00	15.98	199	358	Vertical
4	14190.1	45.68	2.10	54.00	8.32	150	154	Vertical
5	17495.0	47.16	1.58	54.00	6.84	194	208	Vertical
6	17804.4	59.03	0.66	74.00	14.97	295	131	Vertical



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## 7 Photographs

### 7.1 Test Setup

Refer to Appendix A - Photographs of Set-Up for ZR/2020/50001.

### 7.2 EUT Constructional Details (EUT Photos)

Please refer to internal and external photo.

- End of the Report -



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