

TEST REPORT

Application No.: SZCR2405001923AT
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, China
Factory: Shenzhen Xinwei intelligent Technology Co., Ltd. Guangming Branch
Address of Factory: Room 301, 401, 501.701,801, 901, Building A, Sunwoda Guangming R&D Base, No.1028 Keyu Road, Tangjia Community, Fenghuang Sreet, Guangming Distict, Shenzhen City, Guangdong Province. P.R. China

Equipment Under Test (EUT):

EUT Name: Stylus Pen
Model No.: AP501U
Trade Mark: Lenovo
FCC ID: O57AP501U
Standard(s) : 47 CFR Part 15, Subpart B
Date of Receipt: 2024-05-27
Date of Test: 2024-05-30 to 2024-06-06
Date of Issue: 2024-06-11

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



Keny Xu
EMC Laboratory Manager





SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

SZEMC-TRF-01 Rev. A/1

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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2024-06-11		Original

Authorized for issue by:				
		<div>Donjon . Huang</div>		
		Donjon Huang/Project Engineer		
		<div>Eric Fu</div>		
		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	15.107(a);Class B	Pass
Radiated Emissions (30MHz-1GHz)		ANSI C63.4:2014	15.109(a);Class B	Pass
Radiated Emissions (Above 1GHz)		ANSI C63.4:2014	15.109(g);Class B	Pass



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4 General Information

4.1 Details of E.U.T.

Power supply:	DC 3.85V from internal rechargeable battery which can be charge by AC/DC adapter
Highest Internal Frequency:	Above 1.2GHz

Remark: The information in this section is provided by the applicant or manufacturer, SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.

4.2 Description of Support Units

Description	Manufacturer	Model No.
Adapter	Lenovo	MC-101
USB cable	kingpower Electronics Co.,Ltd	K235-08646-HO
Portable Tablet Computer	Lenovo	TB330FU

4.3 Measurement Uncertainty

Test Item	Measurement Uncertainty
Conducted Emissions at Mains Terminals (150kHz-30MHz)	$\pm 3.1\text{dB}$
Radiated Emissions (30MHz-1GHz)	$\pm 6.0\text{dB}$ for 3m; $\pm 5.0\text{dB}$ for 10m
Radiated Emissions (Above 1GHz)	$\pm 4.6\text{dB}$

Remark:

The U_{lab} (lab Uncertainty) is less than $U_{\text{CISPR/ETSI}}$ (CISPR/ETSI Uncertainty), so the test results
 – compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
 – non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

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4.4 Test Location

All tests were performed at:

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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 (Member No. 1937)

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. Shenzhen EMC laboratory 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: CN1336

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1336. Test Firm Registration Number: 787754.

• 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	ZhongYu Electron	GB-88	SEM001-06	2022-05-14	2025-05-13
EMI Test Receiver	Rohde&Schwarz	ESCI	SEM004-02	2024-03-14	2025-03-13
Measurement Software	AUDIX	e3 V8.2014-6-27a	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM024-01	2023-07-07	2024-07-06
LISN	Rohde&Schwarz	ENV216	SEM007-01	2023-09-19	2024-09-18
LISN	ETS-LINDGREN	3816/2	SEM007-02	2024-03-14	2025-03-13

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	2023-06-19	2026-06-18
MXE EMI Receiver	Agilent Technologies	N9038A	SEM004-15	2023-10-19	2024-10-18
BiConiLog Antenna	ETS-LINDGREN	3142C	SEM003-01	2023-09-16	2025-09-15
Pre-Amplifier	Agilent Technologies	8447D	SEM005-01	2024-03-14	2025-03-13
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM025-01	2023-07-07	2024-07-06

Radiated Emissions (Above 1GHz)					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
3m Fully-Anechoic Chamber	AUDIX	N/A	SEM001-02	2024-05-11	2027-05-10
Signal Analyzer	Rohde & Schwarz	FSV40	SEM008-04	2024-03-15	2025-03-14
Horn Antenna	Rohde&Schwarz	HF907	SEM003-07	2023-07-23	2025-07-22
Microwave system amplifier	Agilent	83017A	SEM005-25	2023-09-19	2024-09-18
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM026-01	2023-07-07	2024-07-06



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General used equipment					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Humidity/ Temperature Indicator	deli	8838	SEM002-32	2023-07-28	2024-07-27
Humidity/ Temperature Indicator	deli	8838	SEM002-33	2023-07-28	2024-07-27
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2024-03-18	2025-03-17



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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

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: 23.5 °C

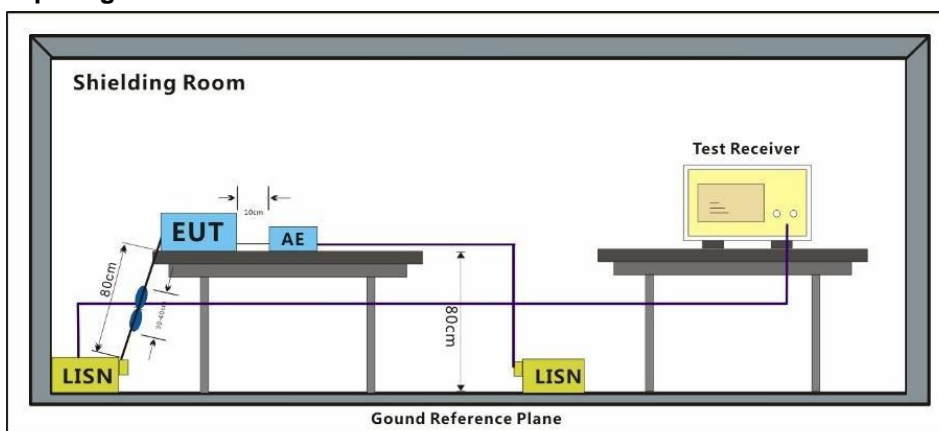
Humidity: 45.5 % RH

Atmospheric Pressure: 1020 mbar

6.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Pre-scan	03	Operation (BT)+Charging: Keep the device under test communicating with other Bluetooth devices and the PC charging.
Final test	04	Operation (BT)+Charging: Keep the device under test communicating with other Bluetooth devices and the adapter charging.

6.1.3 Test Setup Diagram



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6.1.4 Measurement Procedure and 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.

Remark: Level= Read Level+ Cable Loss+ LISN Factor



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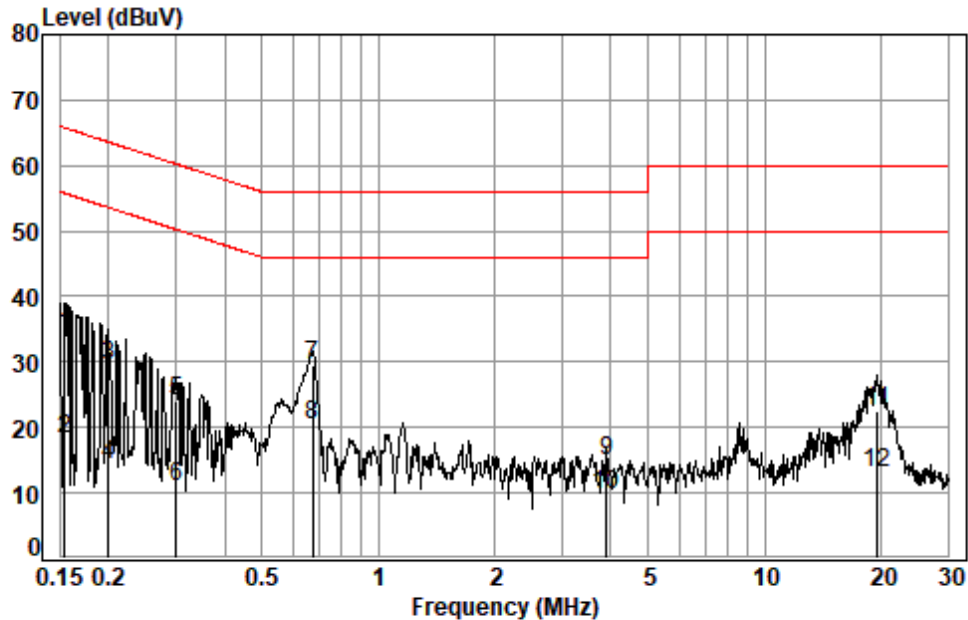
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Test Mode: 04; Line: Live line



Site : Shielding Room
Condition: Line
Job No. : 01923AT
Test mode: 04

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.1540	0.02	9.49	24.46	33.97	65.78	-31.81	QP
2	0.1540	0.02	9.49	8.74	18.25	55.78	-37.53	Average
3	0.2007	0.02	9.47	20.06	29.55	63.58	-34.03	QP
4	0.2007	0.02	9.47	4.70	14.19	53.58	-39.39	Average
5	0.3003	0.03	9.54	14.33	23.90	60.24	-36.34	QP
6	0.3003	0.03	9.54	1.26	10.83	50.24	-39.41	Average
7 *	0.6754	0.05	9.55	19.87	29.47	56.00	-26.53	QP
8 *	0.6754	0.05	9.55	10.88	20.48	46.00	-25.52	Average
9	3.9014	0.08	9.53	5.25	14.86	56.00	-41.14	QP
10	3.9014	0.08	9.53	0.03	9.64	46.00	-36.36	Average
11	19.6354	0.27	10.00	12.10	22.37	60.00	-37.63	QP
12	19.6354	0.27	10.00	2.78	13.05	50.00	-36.95	Average



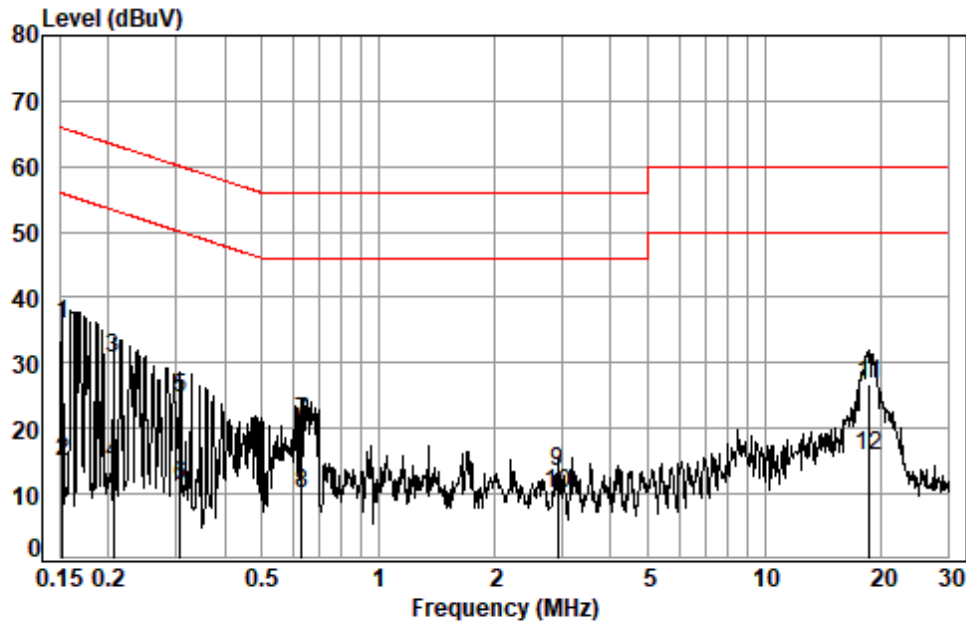
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Test Mode: 04; Line: Neutral Line



Site : Shielding Room
Condition: Neutral
Job No. : 01923AT
Test mode: 04

		Cable	LISN	Read	Limit	Over	
	Freq	Loss	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB
1 *	0.1524	0.02	9.63	26.34	35.99	65.87	-29.88 QP
2	0.1524	0.02	9.63	5.12	14.77	55.87	-41.10 Average
3	0.2061	0.02	9.66	21.17	30.85	63.36	-32.51 QP
4	0.2061	0.02	9.66	4.99	14.67	53.36	-38.69 Average
5	0.3067	0.03	9.70	14.84	24.57	60.06	-35.49 QP
6	0.3067	0.03	9.70	1.49	11.22	50.06	-38.84 Average
7	0.6338	0.04	9.87	10.98	20.89	56.00	-35.11 QP
8	0.6338	0.04	9.87	0.12	10.03	46.00	-35.97 Average
9	2.9152	0.07	9.65	3.60	13.32	56.00	-42.68 QP
10	2.9152	0.07	9.65	0.36	10.08	46.00	-35.92 Average
11	18.7210	0.26	10.16	16.33	26.75	60.00	-33.25 QP
12 *	18.7210	0.26	10.16	5.29	15.71	50.00	-34.29 Average



6.2 Radiated Emissions (30MHz-1GHz)

Test Requirement: 47 CFR Part 15, Subpart B

Test Method: ANSI C63.4:2014

Measurement Distance: 3m

Limit:

FREQUENCY (MHz)	dBμV/m (At 10m)	dBμV/m (At 3m)
	Class B	Class B
30MHz -88MHz	29.5	40.0
88MHz-216MHz	33.1	43.5
216MHz-960MHz	35.6	46.0
960MHz-1000MHz	43.5	54.0
Detector: Peak for pre-scan (120kHz resolution bandwidth) 30M to 1000MHz		

6.2.1 E.U.T. Operation

Operating Environment:

Temperature: 23.5 °C

Humidity: 47.5 % RH

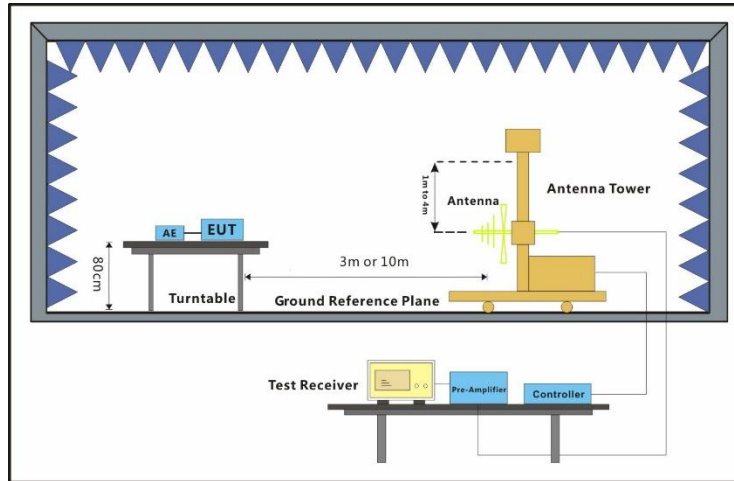
Atmospheric Pressure: 1020 mbar

6.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Pre-scan	03	Operation (BT)+Charging: Keep the device under test communicating with other Bluetooth devices and the PC charging.
Final test	04	Operation (BT)+Charging: Keep the EUT communicating with other Bluetooth devices and the adapter charging.
Final test	05	Operation (BT): Keep the EUT communicating with other Bluetooth devices.



6.2.3 Test Setup Diagram



6.2.4 Measurement Procedure and 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.

Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor



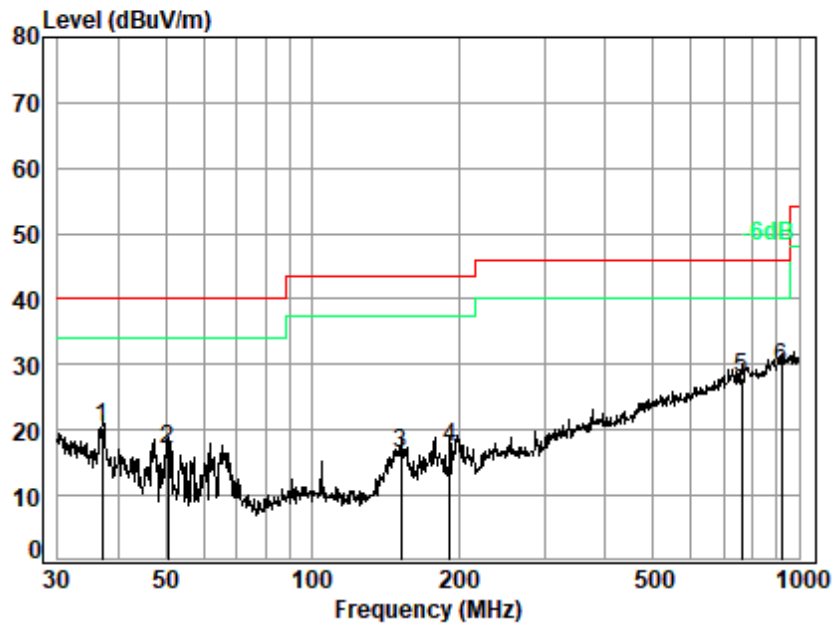
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Test Mode: 04; Polarity: Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No. : 01923AT
Test Mode: 04

	Ant	Cable	Preamp	Read		Limit	Over	
	Freq	Factor	Loss	Factor	Level	Level	Line	Limit Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB
1	37.02	17.74	0.72	27.77	29.56	20.25	40.00	-19.75 QP
2	50.41	12.69	0.83	27.73	31.11	16.90	40.00	-23.10 QP
3	152.13	13.28	1.47	27.37	29.17	16.55	43.50	-26.95 QP
4	191.75	14.26	1.69	27.20	28.47	17.22	43.50	-26.28 QP
5	760.70	26.47	3.70	27.58	25.38	27.97	46.00	-18.03 QP
6 q	922.52	28.19	4.15	26.60	23.84	29.58	46.00	-16.42 QP



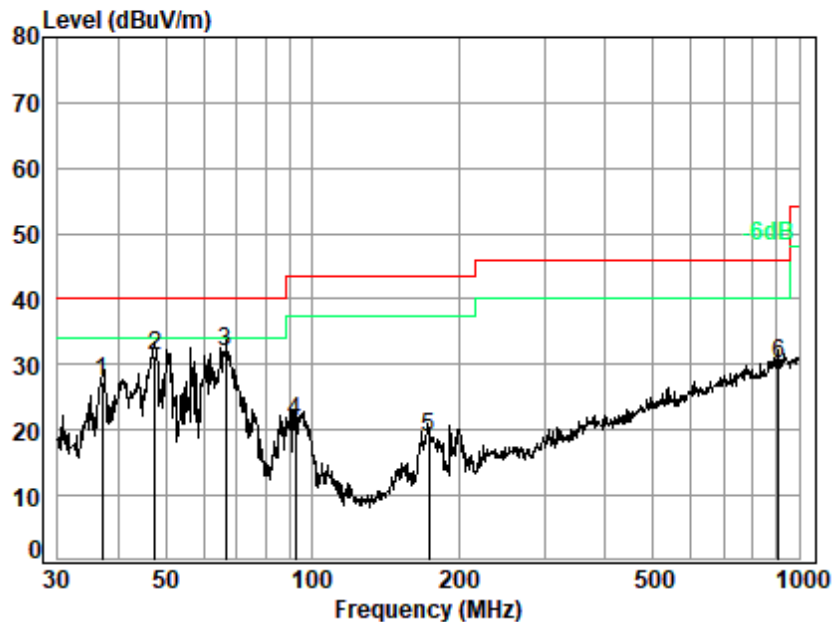
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Test Mode: 04; Polarity: Vertical

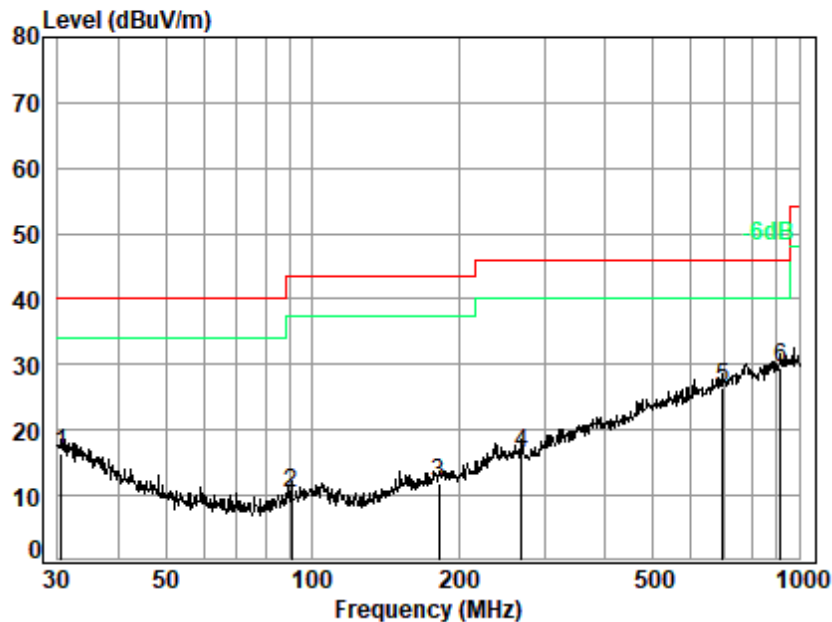


Site : chamber
Condition: 3m VERTICAL
Job No. : 01923AT
Test Mode: 04

	Ant Freq	Cable Factor	Preamp Loss	Read Factor	Level	Limit	Over	
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB
1	37.02	17.74	0.72	27.77	36.55	27.24	40.00	-12.76 QP
2	47.49	13.47	0.81	27.74	44.85	31.39	40.00	-8.61 QP
3 q	66.50	10.87	0.97	27.69	47.66	31.81	40.00	-8.19 QP
4	92.14	11.92	1.14	27.61	35.75	21.20	43.50	-22.30 QP
5	173.21	13.64	1.59	27.28	30.96	18.91	43.50	-24.59 QP
6	906.48	27.87	4.11	26.72	24.88	30.14	46.00	-15.86 QP



Test Mode: 05; Polarity: Horizontal

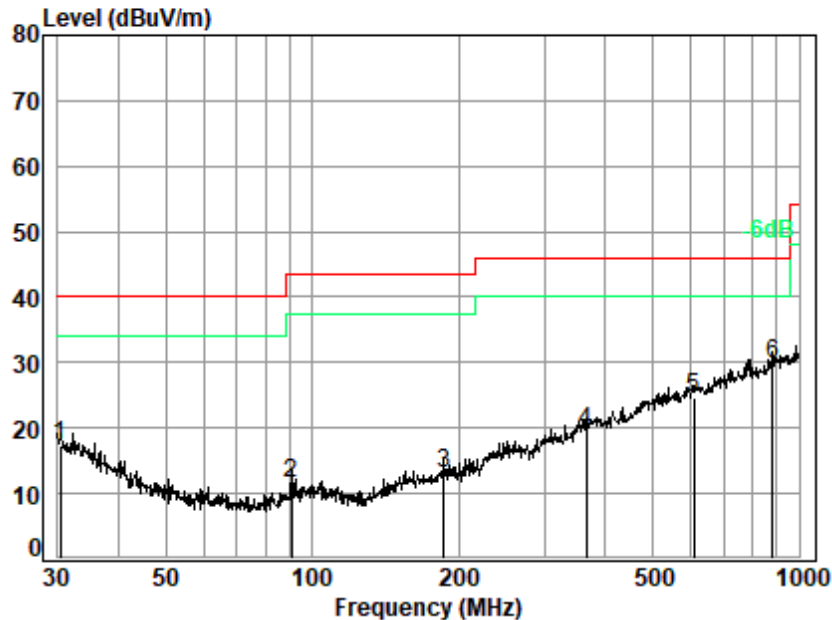


Site : chamber
Condition: 3m HORIZONTAL
Job No. : 01923AT
Test Mode: 05

	Ant	Cable	Preamp	Read		Limit	Over	
Freq	Factor	Loss	Factor	Level	Level	Line	Limit	Remark
MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	30.53	20.95	0.65	27.79	22.75	16.56	40.00	-23.44 QP
2	90.54	11.77	1.13	27.62	25.02	10.30	43.50	-33.20 QP
3	181.92	14.15	1.63	27.25	23.20	11.73	43.50	-31.77 QP
4	269.43	17.10	2.04	26.88	24.21	16.47	46.00	-29.53 QP
5	696.86	25.88	3.50	27.73	24.91	26.56	46.00	-19.44 QP
6 q	916.07	28.06	4.13	26.65	24.10	29.64	46.00	-16.36 QP



Test Mode: 05; Polarity: Vertical



Site : chamber
Condition: 3m VERTICAL
Job No. : 01923AT
Test Mode: 05

	Ant Freq	Cable Factor	Preamp Loss	Read Factor	Level dBuV	Limit dBuV/m	Over Limit	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dB	
1	30.42	21.00	0.64	27.79	23.34	17.19	40.00	-22.81 QP
2	90.54	11.77	1.13	27.62	26.34	11.62	43.50	-31.88 QP
3	186.44	14.30	1.66	27.23	24.35	13.08	43.50	-30.42 QP
4	365.54	20.31	2.42	27.02	23.87	19.58	46.00	-26.42 QP
5	607.79	24.61	3.23	27.95	24.69	24.58	46.00	-21.42 QP
6 q	881.41	27.76	4.04	26.90	24.84	29.74	46.00	-16.26 QP



6.3 Radiated Emissions (Above 1GHz)

Test Requirement: 47 CFR Part 15, Subpart B

Test Method: ANSI C63.4:2014

Measurement Distance: 3m

Limit:

Above 1GHz 74(dBμV/m) peak, 54(dBμV/m) average at 3m distance
83.54(dBμV/m) peak, 63.54(dBμV/m) average at 1m distance

Detector: Peak for pre-scan (1MHz resolution bandwidth) 1GHz to 40GHz

6.3.1 E.U.T. Operation

Operating Environment:

Temperature: 20.8 °C

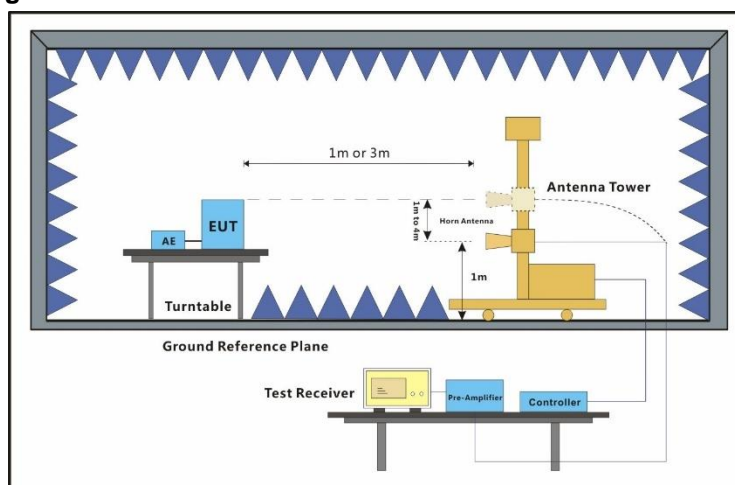
Humidity: 49.3 % RH

Atmospheric Pressure: 1020 mbar

6.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Pre-scan	03	Operation (BT)+Charging: Keep the device under test communicating with other Bluetooth devices and the PC charging.
Final test	04	Operation (BT)+Charging: Keep the EUT communicating with other Bluetooth devices and the adapter charging.
Final test	05	Operation (BT): Keep the EUT communicating with other Bluetooth devices.

6.3.3 Test Setup Diagram



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6.3.4 Measurement Procedure and 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.

The red line show in graphic is the limit in standard used in this section.

Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Test Mode: 04; Polarity: Horizontal

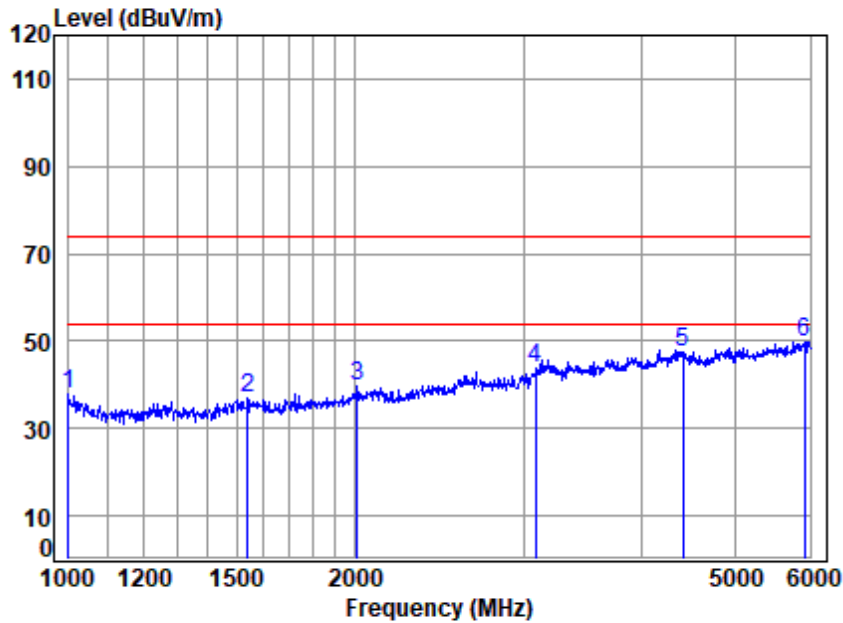


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Site : chamber
Condition: 3m HORIZONTAL
Job No : 01923AT
Mode : 04

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1000.000	3.19	26.30	38.30	46.52	37.71	74.00	-36.29	peak
2	1542.811	4.12	26.97	38.39	44.29	36.99	74.00	-37.01	peak
3	2007.709	4.69	28.83	38.43	44.41	39.50	74.00	-34.50	peak
4	3091.970	5.71	31.38	36.14	42.88	43.83	74.00	-30.17	peak
5	4416.593	7.07	34.60	35.78	41.78	47.67	74.00	-26.33	peak
6 p	5925.216	8.12	34.65	34.93	41.95	49.79	74.00	-24.21	peak



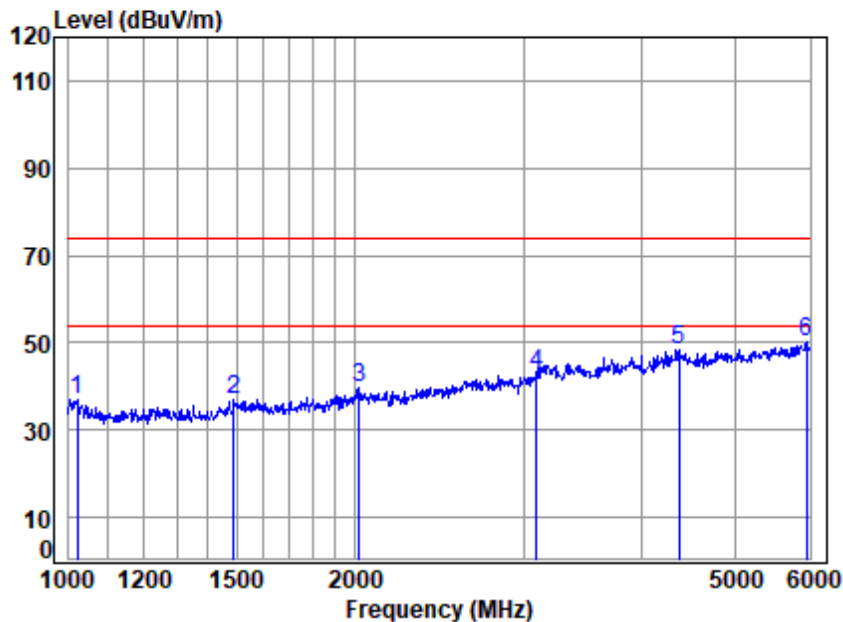
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Test Mode: 04; Polarity: Vertical



Site : chamber
Condition: 3m VERTICAL
Job No : 01923AT
Mode : 04

		Cable	Ant	Preamp	Read		Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1019.905	3.23	25.66	38.30	46.36	36.95	74.00	-37.05	peak
2	1488.503	4.05	26.48	38.39	44.71	36.85	74.00	-37.15	peak
3	2018.530	4.70	28.87	38.40	44.44	39.61	74.00	-34.39	peak
4	3097.515	5.71	31.53	36.14	41.95	43.05	74.00	-30.95	peak
5	4369.367	7.04	34.55	35.82	42.48	48.25	74.00	-25.75	peak
6 p	5946.487	8.13	34.69	34.92	42.10	50.00	74.00	-24.00	peak



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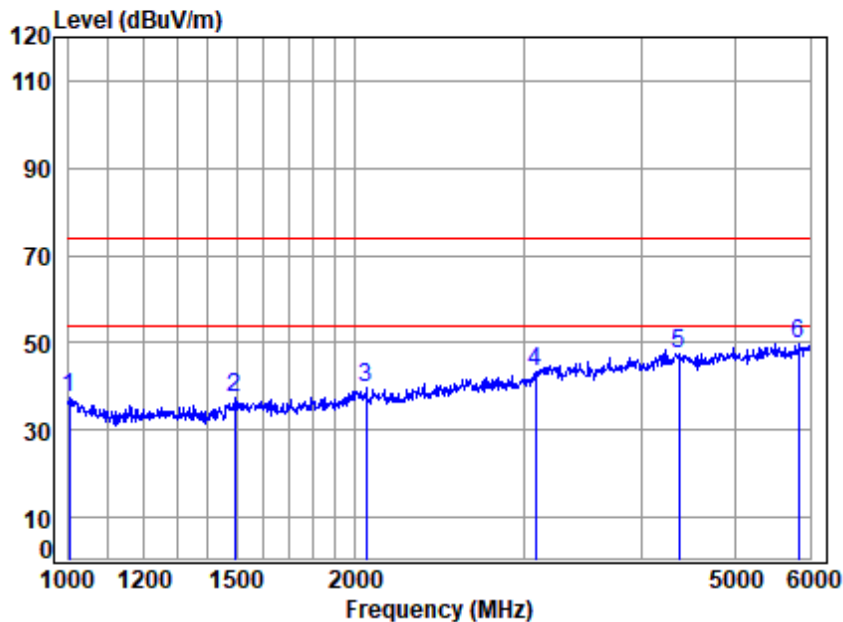
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Test Mode: 05; Polarity: Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No : 01923AT
Mode : 05

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1001.793	3.19	26.24	38.30	46.13	37.26	74.00	-36.74	peak
2	1493.846	4.05	26.63	38.39	45.04	37.33	74.00	-36.67	peak
3	2051.345	4.74	28.99	38.31	44.12	39.54	74.00	-34.46	peak
4	3086.435	5.70	31.22	36.14	42.68	43.46	74.00	-30.54	peak
5	4369.367	7.04	34.55	35.82	41.85	47.62	74.00	-26.38	peak
6 p	5830.433	8.05	34.36	34.98	42.17	49.60	74.00	-24.40	peak



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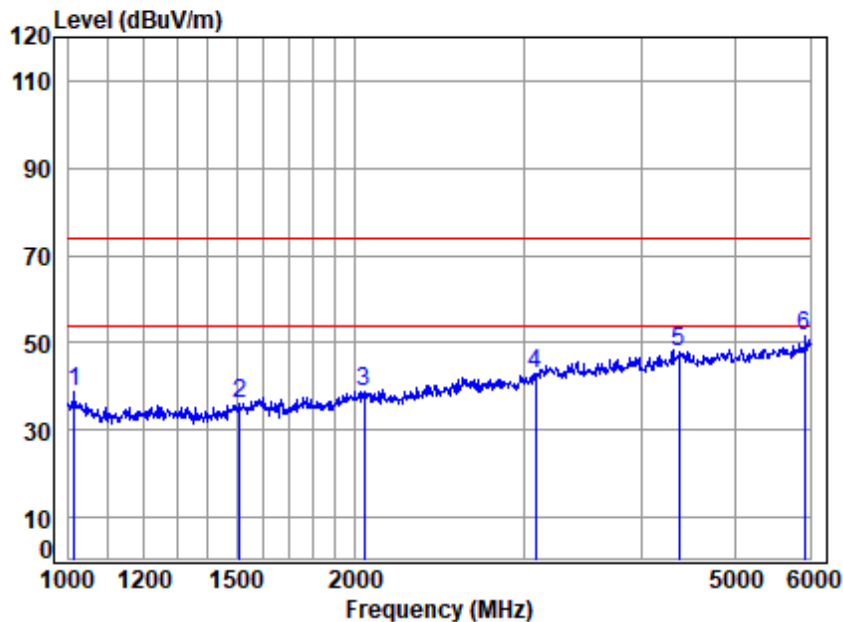
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Report No.: SZCR240500192302

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Test Mode: 05; Polarity: Vertical



Site : chamber
Condition: 3m VERTICAL
Job No : 01923AT
Mode : 05

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1012.621	3.22	25.90	38.30	47.86	38.68	74.00	-35.32	peak
2	1512.700	4.08	26.85	38.39	43.50	36.04	74.00	-37.96	peak
3	2044.007	4.73	28.98	38.33	43.30	38.68	74.00	-35.32	peak
4	3091.970	5.71	31.38	36.14	42.14	43.09	74.00	-30.91	peak
5	4369.367	7.04	34.55	35.82	42.15	47.92	74.00	-26.08	peak
6 p	5925.216	8.12	34.65	34.93	43.54	51.38	74.00	-22.62	peak



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7 Test Setup Photo

Refer to Appendix A.1 - 15B Setup Photos.

- End of the Report -

