



EUROFINS ELECTRICAL TESTING SERVICE (SHENZHEN) CO., LTD.

EMC TEST- REPORT

FCC Compliance Test Report for

Product name: Mini PC

Model name: LarkBox X

FCC ID: 2AHLZ-LARKBOXX

TEST REPORT NUMBER: EFGX22030020-IE-01-E02



Eurofins Electrical Testing Service (Shenzhen) Co., Ltd.
1st Floor, Building 2, Chungu, Meisheng Huigu Science and Technology Park,
No. 83 Dabao Road, Bao'an District, Shenzhen, P. R. China

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1 General Information

1.1 Notes


The results of this test report relate exclusively to the item tested as specified in chapter “Description of test item” and are not transferable to any other test items.

Eurofins Electrical Testing Service (Shenzhen) Co., Ltd. is not responsible for any generalisations and conclusions drawn from this report. Any modification of the test item can lead to invalidity of test results and this test report may therefore be not applicable to the modified test item.

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Operator:

2022-03-11	Bruce Zheng / Project Engineer	
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Date	Eurofins-Lab.	Name / Title	Signature
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Technical responsibility for area of testing:

2022-03-11	Tom Tian / EMC Supervisor
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Date	Eurofins-Lab.	Name / Title	Signature
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1.2 Testing laboratory

Eurofins Electrical Testing Service (Shenzhen) Co., Ltd.

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1.3 Details of approval holder

Name : CHUWI TECHNOLOGY (ShenZhen) CO., LIMITED
Address : 2 Floor Building 3 LiJinCheng Industrial park the east of Gongye road LongHua, Shenzhen, China
Telephone : +86 755 29706511
Fax : N/A

1.4 Details of manufacturer

Name : CHUWI TECHNOLOGY (ShenZhen) CO., LIMITED
Address : 2 Floor Building 3 LiJinCheng Industrial park the east of Gongye road LongHua, Shenzhen, China
Telephone : +86 755 29706511
Fax : N/A

1.5 Application details

Date of receipt of test item : 2022-03-01
Date of receipt of test sample : 2022-03-01
Date of test : 2022-03-01 to 2022-03-10
Date of issue : 2022-03-11

1.6 Test item

Product type : Mini PC
Model name : LarkBox X
Brand name : CHUWI
Sample ID : 220301-126-002
Ratings : 100-240V~, 19V DC 3.42A
Test voltage : 120V~ 60Hz
Additional information : ./.

(General disclaimer:

The above sample(s) and sample information was/were submitted and identified on behalf of the applicant. Eurofins assures objectivity and impartiality of the test, and fulfills the obligation of confidentiality for applicant's commercial information and technical documents.)

1.7 Test standards

FCC 47 CFR Part 15, Subpart B

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2 Technical test

2.1 Summary of test results

No deviations from the technical specification(s) were ascertained in the course of the tests performed.



or

The deviations as specified were ascertained in the course of the tests performed.



2.2 Test environment

Temperature	:	15	...	35°C
Relative humidity content	:	30	...	60%
Air pressure	:	86	...	103kPa

2.3 Test mode

TM1: USB Link + Type C Link+ HDMI Link + LAN Link + Mouse + Keyboard + Earphone

2.4 List of Test equipment

EQUIPMENT ID	EQUIPMENT NAME	MODEL NO.	CAL. DUE DATE
23-2-13-05	EMI Test Receiver	ESR3	2022-03-15
23-2-13-06	LISN	NNLK 8127 RC	2022-03-15
23-2-10-16	Attenuator	VTSD 9561-F	2022-03-16
23-2-13-01	EMI Test Receiver	ESR7	2022-03-15
23-2-13-02	Signal Analyzer	N9020B-544	2022-03-15
23-2-12-02	TRILOG Broadband Antenna	VULB9168	2022-04-27
23-2-12-03	Horn Antenna	3117	2022-05-11
23-2-12-04	Horn Antenna	BBHA 9170	2022-05-11
23-2-10-01	Preamplifier	BBV9745	2022-03-16
23-2-10-02	Preamplifier	TAP01018048	2022-03-16
23-2-10-03	Preamplifier	TAP18040048	2022-03-22
23-2-10-14	Switch and Control Unit	ERIT-E-JS0806-SF1	N/A
23-2-18-005	Test software	TS+VER2.1-JS32-CE	N/A
23-2-18-007	Test software	TS+VER2.1-JS32-RE	N/A
23-2-10-69	PC	M4000E-16	N/A
23-2-10-70	LED Monitor	D18215FD0	N/A
23-2-10-71	PC	M4000E-16	N/A
23-2-10-72	LED Monitor	V193HQV	N/A

2.5 System Measurement Uncertainty

System Measurement Uncertainty	
Test Items	Extended Uncertainty
Uncertainty for Radiated Emission in 3m chamber 30MHz-1000MHz	Horizontal: 4.56dB; Vertical: 4.55dB;
Uncertainty for Radiated Emission in 3m chamber 1000MHz-6000MHz	Horizontal: 4.22dB; Vertical: 4.21dB;
Uncertainty for Conducted Emission 150kHz-30MHz	1.96dB
Uncertainty for Conducted Emission 150kHz-30MHz (for test using High Voltage Probe TK9420(VT9420))	2.18 dB

2.6 Test results

 1st test

 test after modification

 production test

Test case	Subclause	Required	Test passed	Test failed
Conducted Emission	FCC part 15.107 ANSI C63.4: 2014	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Radiated Emission	FCC part 15.109 ANSI C63.4: 2014	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

3 Emission Test

3.1 Radiated emission

This clause lays down the general requirements for the measurement of Radiated disturbance produced at the space of apparatus.

3.1.1 Limits

Frequency range	Limits at 3m
MHz	dB ($\mu\text{V}/\text{m}$)
30 to 88	40.0
88 to 216	43.5
216 to 960	46.0
Above 960	54.0

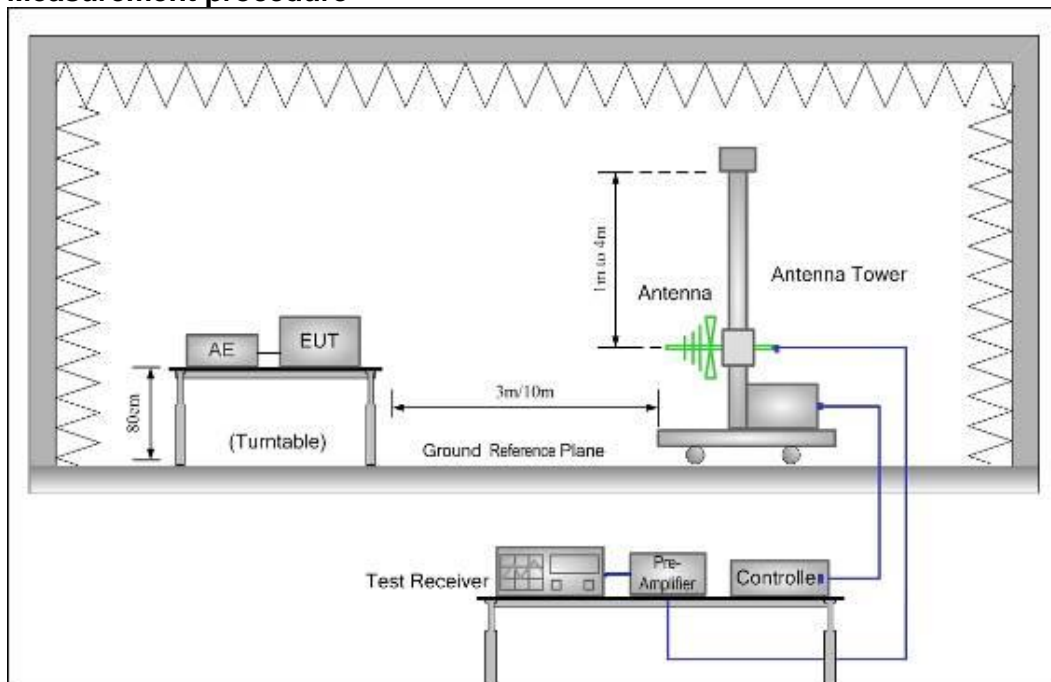
The tighter limit applies at the band edges.

Note 1: Result Level= Read Level + Corrector Factor

Note 2: Below 1GHz: Corrector factor = Antenna Factor + Cable Loss - Amplifier Gain.

Note 3: Above 1GHz: Corrector factor = Antenna Factor + Cable Loss- Amplifier Gain.

3.1.2 Measurement procedure



1. The radiated emissions test was conducted in a semi-anechoic chamber. The EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.

2. Before get the final emission results with quasi-peak(QP) detector, a pre-scan was performed with the peak(PK) detector to find out the maximum emission data plots of the EUT.

3. The frequencies of maximum emission were determined in the final radiated emissions measurement, the physical arrangement of the test system and associated cabling was varied in order to determine the effect on the EUT's emissions in amplitude, direction and frequency. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization. Test was performed at 3 m distance.

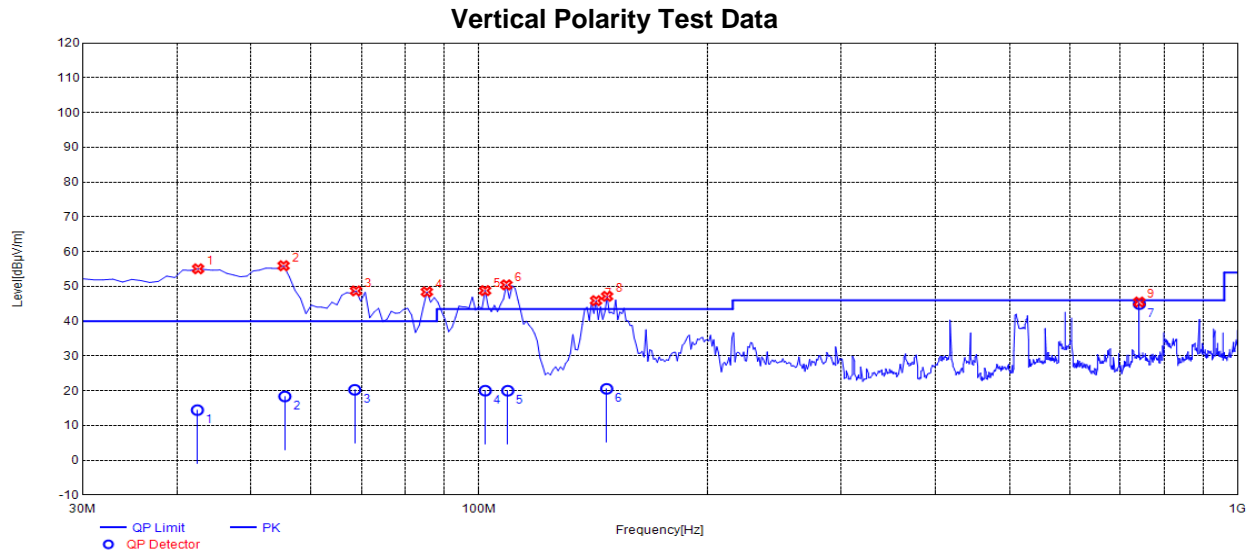
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3.1.3 Test environment

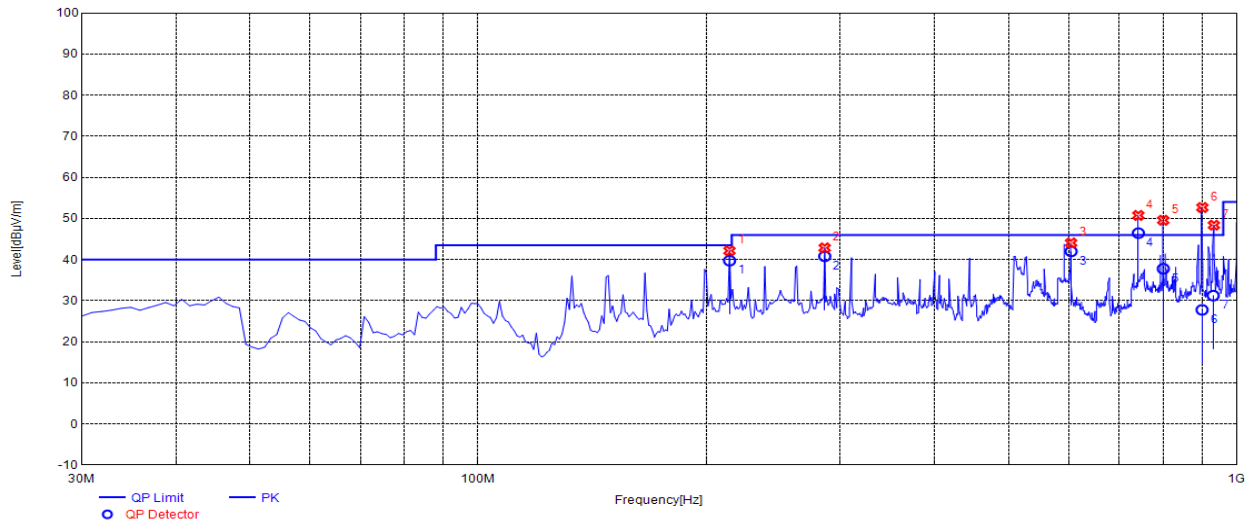
Temperature : 24.6 °C
 Relative humidity content : 57.6 %
 Air pressure : 101.5 kPa

3.1.4 Results Below 1GHz



NO.	Freq. [MHz]	Factor [dB/m]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	42.5221	-16.13	14.44	40.00	25.56	117.5	339.1	Vertical
2	55.4539	-15.95	18.36	40.00	21.64	145.9	29	Vertical
3	68.5539	-17.57	20.28	40.00	19.72	106.1	15.9	Vertical
4	101.8637	-20.00	20.03	43.50	23.47	105.7	96.4	Vertical
5	109.0795	-19.28	20.02	43.50	23.48	106	10.8	Vertical
6	147.2784	-15.90	20.56	43.50	22.94	126.1	312.3	Vertical
7	741.7431	-7.06	44.92	46.00	1.08	189.8	287.6	Vertical

Horizontal Polarity Test Data



NO.	Freq. [MHz]	Factor [dB/m]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	214.4845	-19.17	39.74	43.50	3.76	100	43	Horizontal
2	286.3363	-15.68	40.81	46.00	5.19	100	18	Horizontal
3	604.8148	-8.97	42.01	46.00	3.99	100	332	Horizontal
4	741.7321	-7.06	45.77	46.00	0.23	105.5	275.4	Horizontal
5	800.0151	-6.00	37.77	46.00	8.23	121.9	36	Horizontal
6	900.0092	-5.33	27.78	46.00	18.22	117.6	267.4	Horizontal
7	930.9240	-4.97	31.24	46.00	14.76	118.1	176.3	Horizontal

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Above 1GHz

Vertical Polarity Test Data

PK Final Data List								
NO.	Freq. [MHz]	Factor [dB/m]	PK Value [dB μ V/m]	PK Limit [dB μ V/m]	PK Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1442.4424	-26.09	37.53	74.00	36.47	100	242	Vertical
2	2412.4124	-20.93	40.79	74.00	33.21	100	190	Vertical
3	3297.2973	-18.88	42.88	74.00	31.12	100	12	Vertical
4	6377.3774	-13.13	47.74	74.00	26.26	100	282	Vertical
5	9185.1852	-11.00	47.67	74.00	26.33	100	254	Vertical
6	15158.1582	-2.74	53.50	74.00	20.50	100	56	Vertical

AV Final Data List								
NO.	Freq. [MHz]	Factor [dB/m]	AV Value [dB μ V/m]	AV Limit [dB μ V/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1442.4424	-26.09	24.48	54.00	29.52	100	242	Vertical
2	2412.4124	-20.93	28.44	54.00	25.56	100	190	Vertical
3	3297.2973	-18.88	30.08	54.00	23.92	100	12	Vertical
4	6377.3774	-13.13	34.23	54.00	19.77	100	282	Vertical
5	9185.1852	-11.00	35.19	54.00	18.81	100	254	Vertical
6	15158.1582	-2.74	39.68	54.00	14.32	100	56	Vertical

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Horizontal Polarity Test Data

PK Final Data List								
NO.	Freq. [MHz]	Factor [dB/m]	PK Value [dB μ V/m]	PK Limit [dB μ V/m]	PK Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1442.4424	-26.09	36.76	74.00	37.24	100	261	Horizontal
2	1969.9700	-21.95	40.96	74.00	33.04	100	179	Horizontal
3	3212.2122	-18.93	42.32	74.00	31.68	100	246	Horizontal
4	4420.4204	-16.10	45.24	74.00	28.76	100	18	Horizontal
5	6241.2412	-13.15	47.73	74.00	26.27	100	18	Horizontal
6	11992.9930	-5.21	51.98	74.00	22.02	100	81	Horizontal

AV Final Data List								
NO.	Freq. [MHz]	Factor [dB/m]	AV Value [dB μ V/m]	AV Limit [dB μ V/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1442.4424	-26.09	23.72	54.00	30.28	100	261	Horizontal
2	1969.9700	-21.95	27.72	54.00	26.28	100	179	Horizontal
3	3212.2122	-18.93	30.25	54.00	23.75	100	246	Horizontal
4	4420.4204	-16.10	32.06	54.00	21.94	100	18	Horizontal
5	6241.2412	-13.15	33.91	54.00	20.09	100	18	Horizontal
6	11992.9930	-5.21	38.93	54.00	15.07	100	81	Horizontal

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3.2 Conducted Emission

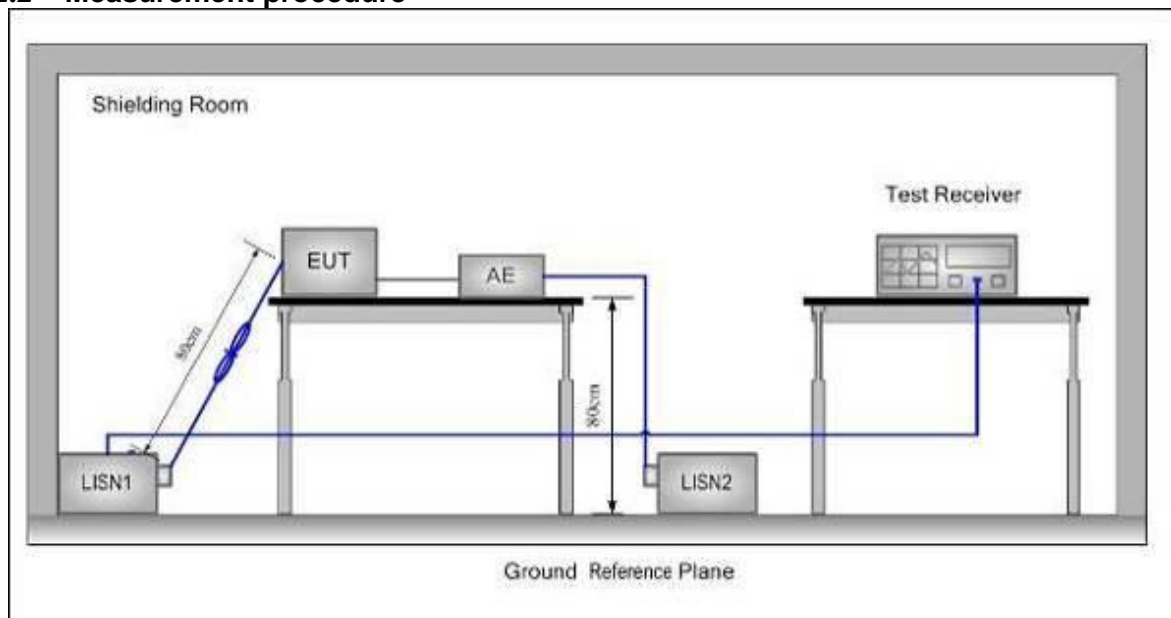
This clause lays down the general requirements for the measurement of disturbance voltage produced at the terminals of apparatus.

3.2.1 Limits

Frequency range MHz	At mains terminals dB (μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

Note 1: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 30 MHz.
 Note 2: The lower limit is applicable at the transition frequency.

3.2.2 Measurement procedure

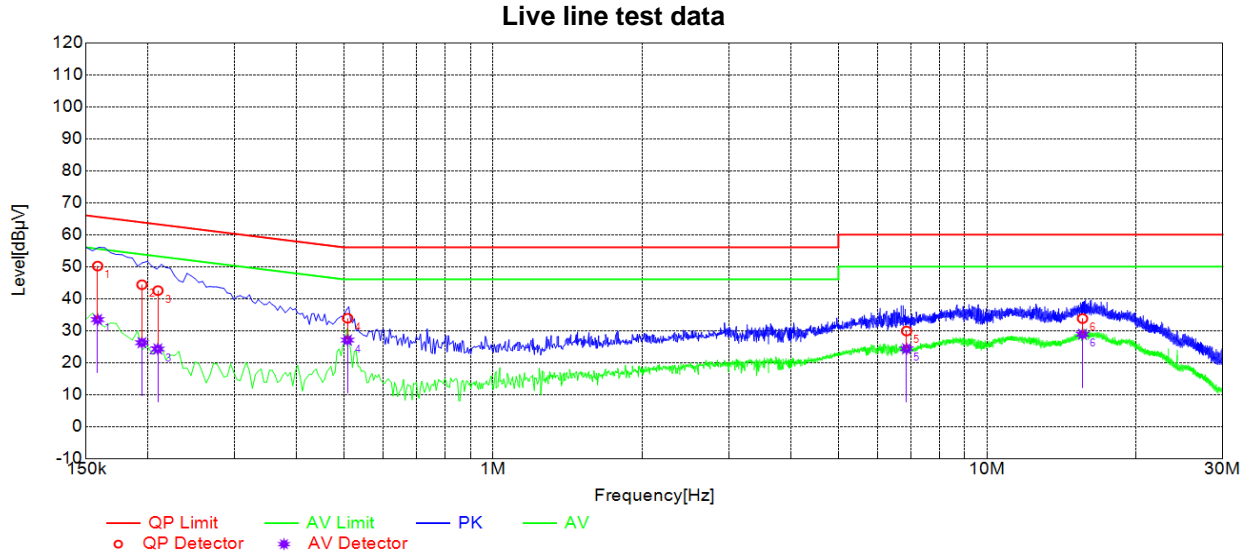


1. The mains terminal disturbance voltage was measured with the EUT in a shielded room.
2. The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a $(50 \mu\text{H} + 5 \Omega) \parallel 50 \Omega$ linear impedance. The power cables of all other units of the EUT was connected to a second LISN, which was bonded to the ground reference plane in the same way as the LISN for the unit being measured.
3. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.

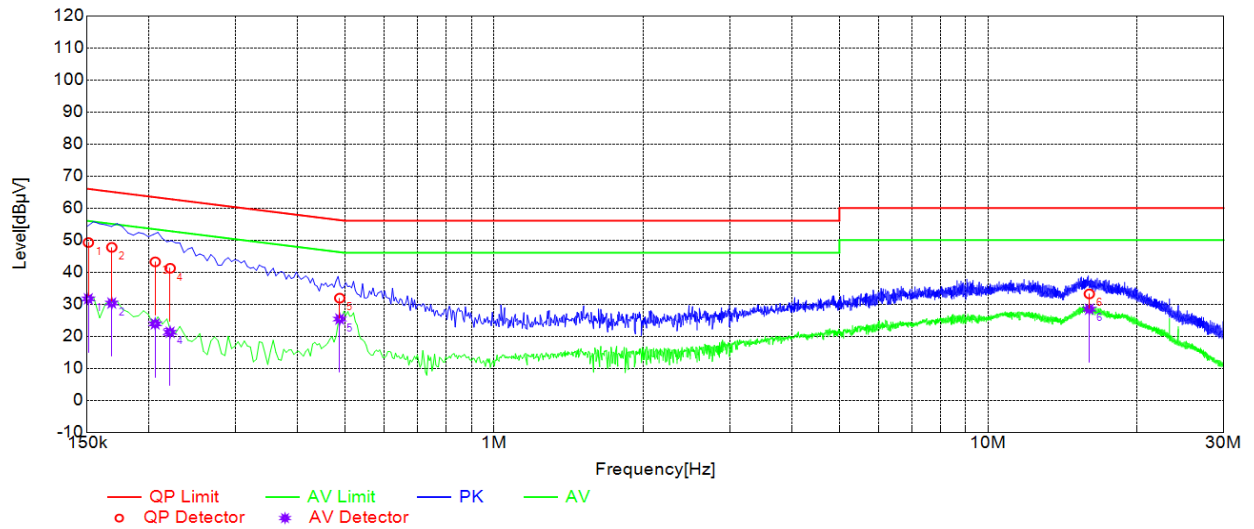
3.2.3 Test environment

Temperature : 25.2 °C
 Relative humidity content : 57.1 %
 Air pressure : 101.5 kPa

3.2.4 Results -Measurement Data



NO.	Freq. [MHz]	Factor [dB]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Verdict
1	0.1582	10.25	50.17	65.56	15.39	33.44	55.56	22.12	PASS
2	0.1945	10.24	44.34	63.84	19.50	26.21	53.84	27.63	PASS
3	0.2095	10.24	42.50	63.22	20.72	24.24	53.22	28.98	PASS
4	0.5073	10.27	33.86	56.00	22.14	27.02	46.00	18.98	PASS
5	6.8685	10.46	29.87	60.00	30.13	24.32	50.00	25.68	PASS
6	15.6033	10.67	33.75	60.00	26.25	28.85	50.00	21.15	PASS

Neutral line test data


NO.	Freq. [MHz]	Factor [dB]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Verdict
1	0.1508	10.24	49.24	65.96	16.72	31.65	55.96	24.31	PASS
2	0.1682	10.24	47.73	65.05	17.32	30.34	55.05	24.71	PASS
3	0.2059	10.24	43.19	63.37	20.18	23.85	53.37	29.52	PASS
4	0.2208	10.24	41.20	62.79	21.59	21.23	52.79	31.56	PASS
5	0.4867	10.27	31.87	56.22	24.35	25.35	46.22	20.87	PASS
6	16.0292	10.64	33.19	60.00	26.81	28.43	50.00	21.57	PASS

---End of Report---