

FCC Test Report

Report No.: AGC07102190301FE01

APPLICATION PURPOSE : Original Equipment
PRODUCT DESIGNATION : Wireless Dongle
BRAND NAME : N/A
MODEL NAME : 9811USB
CLIENT : SHENZHEN LOYAL ELECTRONICS CO., LTD.
DATE OF ISSUE : Mar. 13, 2019
STANDARD(S) : FCC Part 15 Rules
REPORT VERSION : V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd

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REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Mar. 13, 2019	Valid	Initial Release

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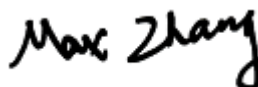
1. VERIFICATION OF CONFORMITY

Applicant	SHENZHEN LOYAL ELECTRONICS CO., LTD.
Address	No.5, 1ST INDUSTRIAL AREA OF SHANMEN, SONGGANG, BAOAN, SHENZHEN, CHINA
Manufacturer	SHENZHEN LOYAL ELECTRONICS CO., LTD.
Address	No.5, 1ST INDUSTRIAL AREA OF SHANMEN, SONGGANG, BAOAN, SHENZHEN, CHINA
Factory	SHENZHEN LOYAL ELECTRONICS CO., LTD.
Address	No.5, 1ST INDUSTRIAL AREA OF SHANMEN, SONGGANG, BAOAN, SHENZHEN, CHINA
Product Designation	Wireless Dongle
Brand Name	N/A
Test Model	9811USB
Date of test	Mar. 07, 2019 to Mar. 13, 2019
Deviation	None
Condition of Test Sample	Normal
Test Result	Pass
Report Template	AGCRT-US-BR/RF

We hereby certify that:

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2014) and the energy emitted by the sample EUT tested as described in this report is in compliance with radiated emission limits of FCC Rules Part 15 subpart B.

Tested By



Max Zhang(Zhang Yi)

Mar. 13, 2019

Reviewed By



Bart Xie(Xie Xiaobin)

Mar. 13, 2019

Approved By



Forrest Lei(Lei Yonggang)
 Authorized Officer

Mar. 13, 2019

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2. GENERAL INFORMATION

2.1. PRODUCT DESCRIPTION

A major technical description of EUT is described as following

Hardware Version	V39
Software Version	V0
Highest Operate Frequency	2480MHz(Radiated emission up to 12.5GHz)
Power Supply	DC 5V

2.2. RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended to comply with Section 15.107&109 of the FCC Part 15, Subpart B Rules.

2.3. TEST METHODOLOGY

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4 (2014). Radiated testing was performed at an antenna to EUT distance 3 meters.

2.4. SPECIAL ACCESSORIES

Refer to section 5.1.

2.5. EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

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3. MEASUREMENT UNCERTAINTY

The uncertainty is calculated using the methods suggested in the “Guide to the Expression of Uncertainty in measurement” (GUM) published by CISPR and ANSI.

- Uncertainty of Conducted Emission, $U_c = \pm 3.2$ dB
- Uncertainty of Radiated Emission below 1GHz, $U_c = \pm 3.9$ dB
- Uncertainty of Radiated Emission above 1GHz, $U_c = \pm 4.8$ dB

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4. DESCRIPTION OF TEST MODES

NO.	TEST MODE DESCRIPTION
1	Date exchange with PC

Note: All the test modes had been tested, the mode 1 was the worst case recorded in the test report.

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5. SYSTEM TEST CONFIGURATION

5.1. EQUIPMENT USED IN EUT SYSTEM

Item	Equipment	Model No.	ID or Specification	Remark
1	Wireless Dongle	9811USB	2AAVD-9811USBV20	EUT
2	PC	HP Pavilion 15	N/A	Support
3	PC adapter	HP 4411SS G4	DC19V/4.74A	Support

5.2. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.109	Radiated Emission	Compliant
§15.107	Conducted Emission	Compliant

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6. TEST FACILITY

Test Site	Attestation of Global Compliance (Shenzhen) Co., Ltd
Location	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Designation Number	CN1259
FCC Test Firm Registration Number	975832
A2LA Cert. No.	5054.02
Description	Attestation of Global Compliance(Shenzhen) Co., Ltd is accredited by A2LA

TEST EQUIPMENT OF CONDUCTED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESPI	101206	Jun. 12, 2018	Jun. 11, 2019
LISN	R&S	ESH2-Z5	100086	Aug. 28, 2018	Aug. 27, 2019

TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	Jun. 12, 2018	Jun. 11, 2019
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Dec. 20, 2018	Dec. 19, 2019
Attenuator	Weinachel Corp	58-30-33	N/A	Jun. 12, 2018	Jun. 11, 2019
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	May. 26, 2018	May. 25, 2020
Broadband Preamplifier	ETS LINDGREN	3117PA	00225134	Oct. 25, 2018	Oct. 24, 2019
ANTENNA	SCHWARZBECK	VULB9168	D69250	Sep. 28, 2017	Sep. 27, 2019

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7. RADIATED EMISSION

7.1. MEASUREMENT PROCEDURE

1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions below 1GHz, use 120KHz RBW and VBW \geq 3RBW for QP reading.
7. For emissions above 1GHz, use 1MHz RBW and 3MHz VBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
8. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
9. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
10. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
11. Only the worst case is reported.

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The following table is the setting of spectrum analyzer and receiver.

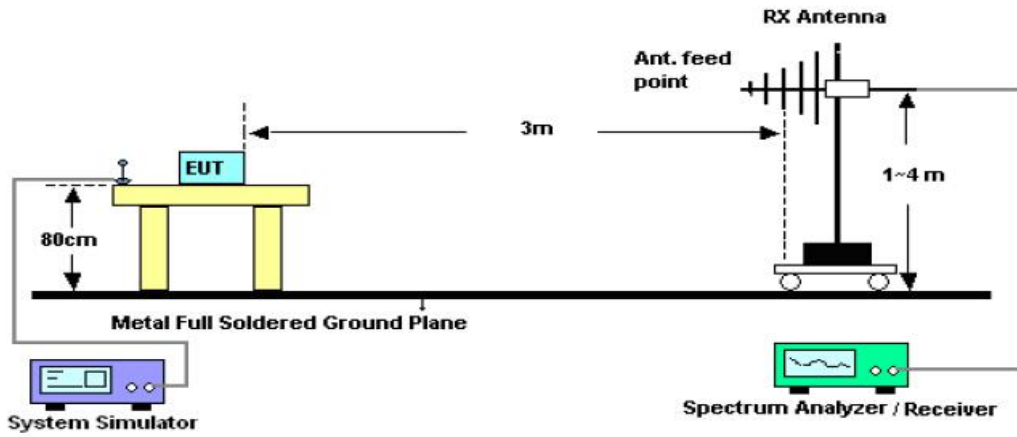
Spectrum Parameter	Setting
Start ~Stop Frequency	30MHz~1000MHz/RBW 120KHz for QP
Start ~Stop Frequency	1GHz~30GHz 1MHz/3MHz for Peak, 1MHz/10Hz for Average

Receiver Parameter	Setting
Start ~Stop Frequency	30MHz~1000MHz/RBW 120KHz for QP

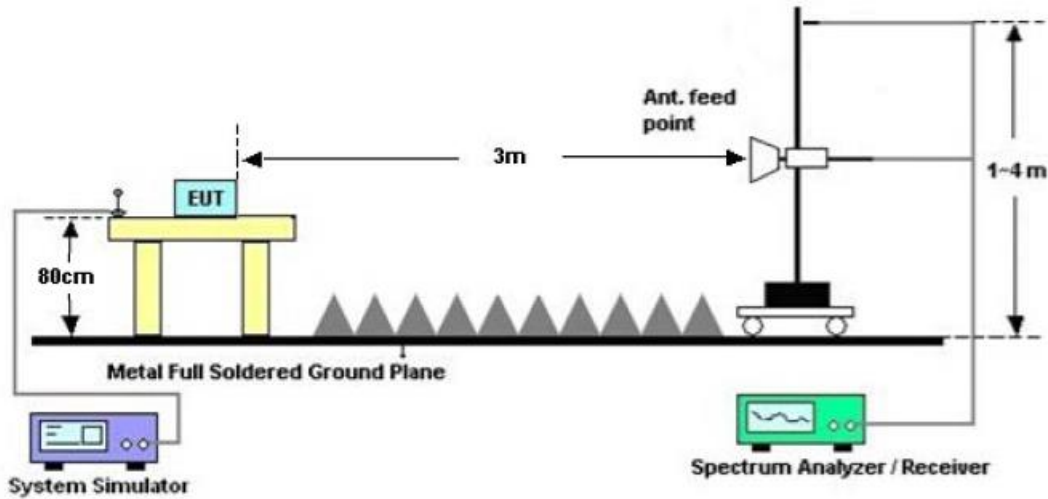
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7.2. TEST SETUP

RADIATED EMISSION TEST SETUP 30MHz-1000MHz



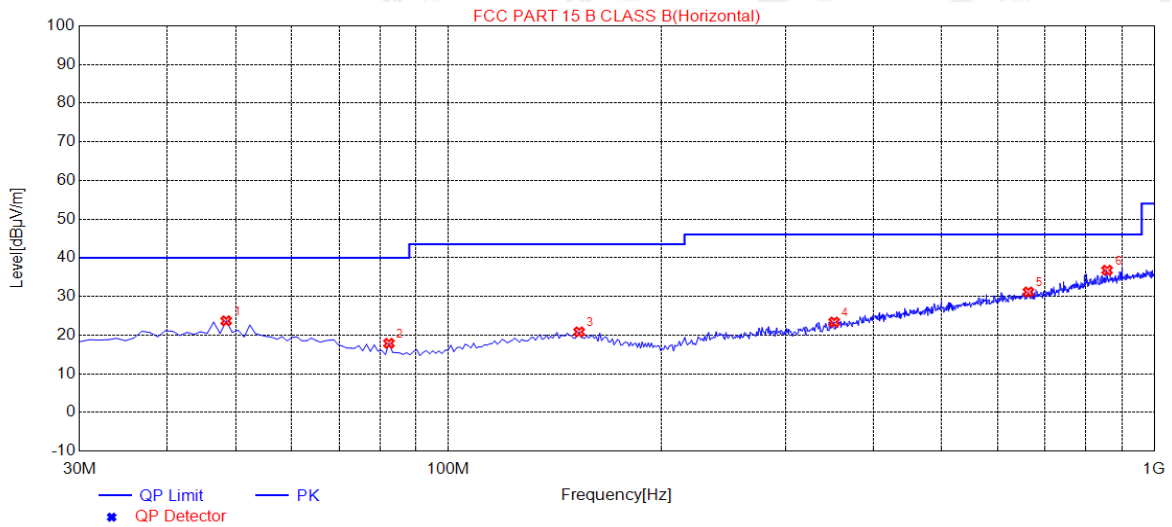
RADIATED EMISSION TEST SETUP ABOVE 1000MHz



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7.3. TEST RESULT

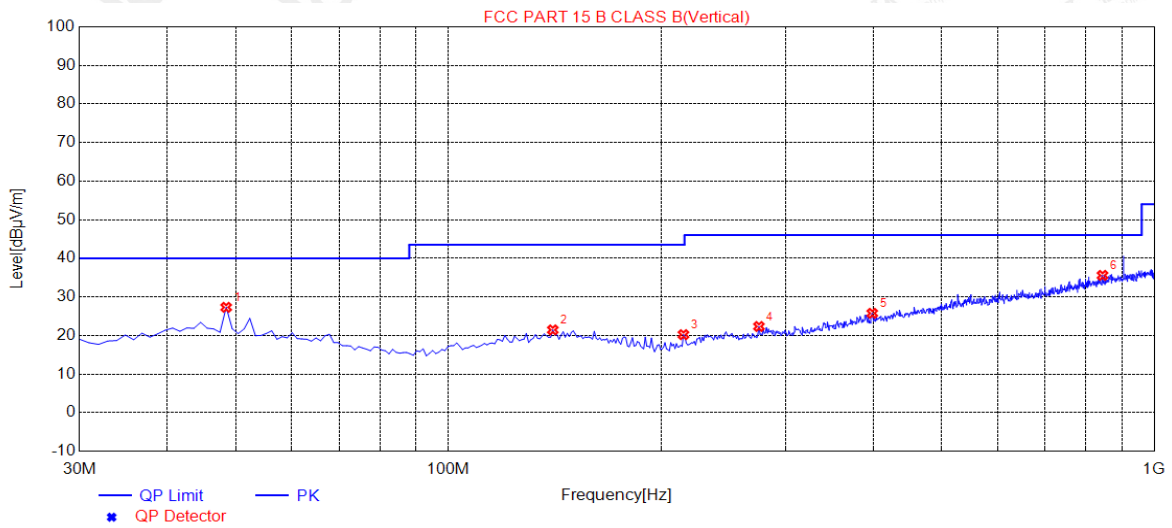
RADIATED EMISSION BELOW 1GHZ-Horizontal



Suspected Data List								
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	48.4300	23.68	14.71	40.00	16.32	150	70	Horizontal
2	82.3800	17.86	10.17	40.00	22.14	100	260	Horizontal
3	153.1900	20.82	14.91	43.50	22.68	100	20	Horizontal
4	352.0400	23.36	17.92	46.00	22.64	150	10	Horizontal
5	663.4100	31.15	25.35	46.00	14.85	200	250	Horizontal
6	857.4100	36.77	29.47	46.00	9.23	100	320	Horizontal

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RADIATED EMISSION BELOW 1GHZ-Vertical



Suspected Data List								
NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	48.4300	27.29	14.71	40.00	12.71	100	70	Vertical
2	140.5800	21.44	14.88	43.50	22.06	150	110	Vertical
3	215.2700	20.21	12.98	43.50	23.29	200	190	Vertical
4	275.4100	22.33	15.88	46.00	23.67	100	110	Vertical
5	398.6000	25.74	19.73	46.00	20.26	100	10	Vertical
6	844.8000	35.57	29.19	46.00	10.43	200	300	Vertical

RESULT: PASS

- Note:** 1. Factor=Antenna Factor + Cable loss - Amplifier gain, Margin=Measurement-Limit.
2. The "Factor" value can be calculated automatically by software of measurement system.
3. Emissions range from 1GHz to 12.5GHz have 20dB margin. No recording in the test report.

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8. FCC LINE CONDUCTED EMISSION TEST

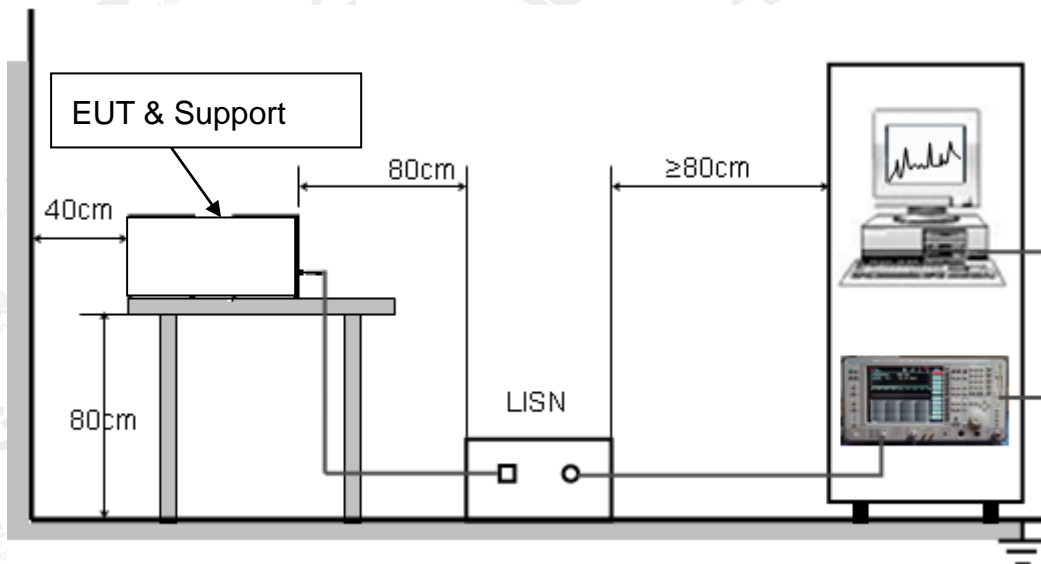
8.1. LIMITS OF LINE CONDUCTED EMISSION TEST

Frequency	Maximum RF Line Voltage	
	Q.P.(dBuV)	Average(dBuV)
150kHz~500kHz	66-56	56-46
500kHz~5MHz	56	46
5MHz~30MHz	60	50

Note:

1. The lower limit shall apply at the transition frequency.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

8.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



8.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's

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manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.

2. Support equipment, if needed, was placed as per ANSI C63.4.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
4. All support equipments received AC120V/60Hz power from a LISN, if any.
5. The EUT received DC charging voltage by PC which received 120V/60Hz power by a LISN..
6. The test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.
9. The test mode(s) were scanned during the preliminary test.

Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

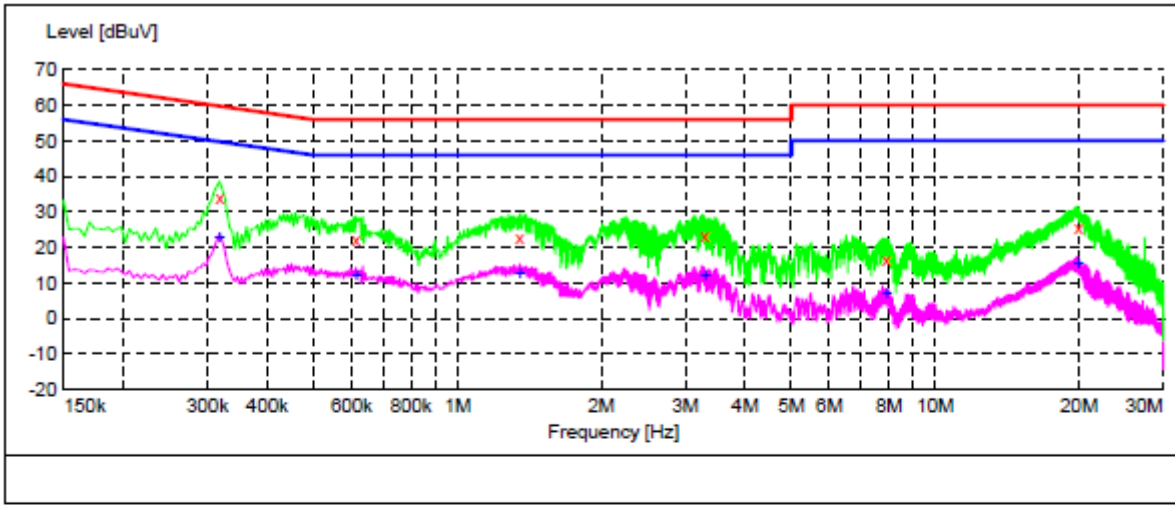
8.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
2. A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less -2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
3. The test data of the worst case condition(s) was reported on the Summary Data page.

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8.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

Line Conducted Emission Test Line 1-L



MEASUREMENT RESULT: "TEST_fin"

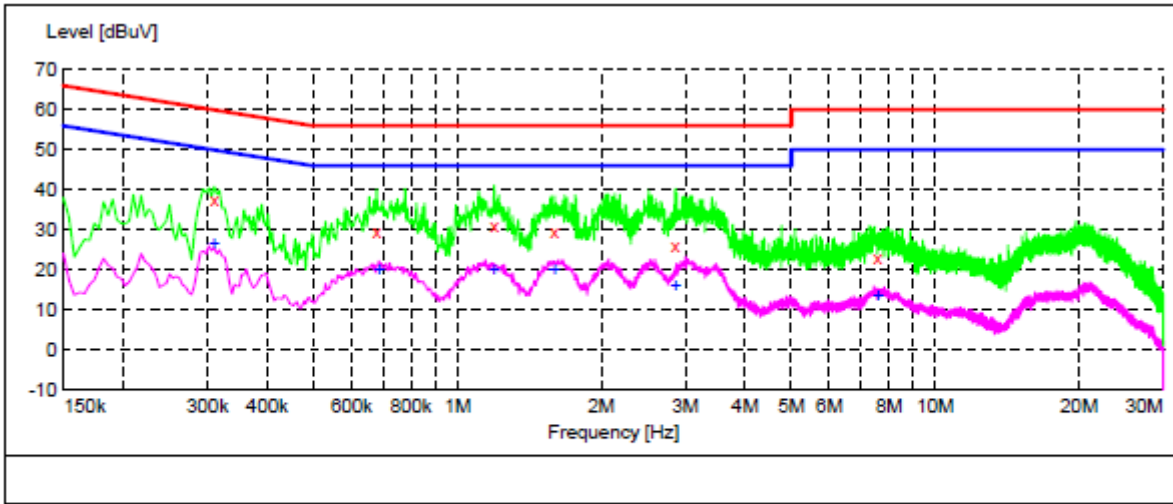
Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.318000	34.00	10.2	60	25.8	QP	L1	FLO
0.614000	22.00	10.3	56	34.0	QP	L1	FLO
1.350000	22.60	10.4	56	33.4	QP	L1	FLO
3.290000	23.50	10.4	56	32.5	QP	L1	FLO
7.902000	16.60	10.7	60	43.4	QP	L1	FLO
19.942000	25.40	11.0	60	34.6	QP	L1	FLO

MEASUREMENT RESULT: "TEST_fin2"

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.318000	22.60	10.2	50	27.2	AV	L1	FLO
0.614000	12.20	10.3	46	33.8	AV	L1	FLO
1.350000	12.70	10.4	46	33.3	AV	L1	FLO
3.290000	12.00	10.4	46	34.0	AV	L1	FLO
7.902000	7.20	10.7	50	42.8	AV	L1	FLO
19.942000	15.20	11.0	50	34.8	AV	L1	FLO

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Line Conducted Emission Test Line 2-N



MEASUREMENT RESULT: "TEST_fin"

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.310000	37.40	10.2	60	22.6	QP	N	FLO
0.678000	29.60	10.3	56	26.4	QP	N	FLO
1.194000	30.90	10.4	56	25.1	QP	N	FLO
1.598000	29.70	10.4	56	26.3	QP	N	FLO
2.858000	25.80	10.4	56	30.2	QP	N	FLO
7.582000	23.20	10.6	60	36.8	QP	N	FLO

MEASUREMENT RESULT: "TEST_fin2"

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.310000	26.40	10.2	50	23.6	AV	N	FLO
0.686000	19.80	10.3	46	26.2	AV	N	FLO
1.194000	20.10	10.4	46	25.9	AV	N	FLO
1.598000	19.80	10.4	46	26.2	AV	N	FLO
2.858000	15.90	10.4	46	30.1	AV	N	FLO
7.582000	13.50	10.6	50	36.5	AV	N	FLO

RESULT: PASS

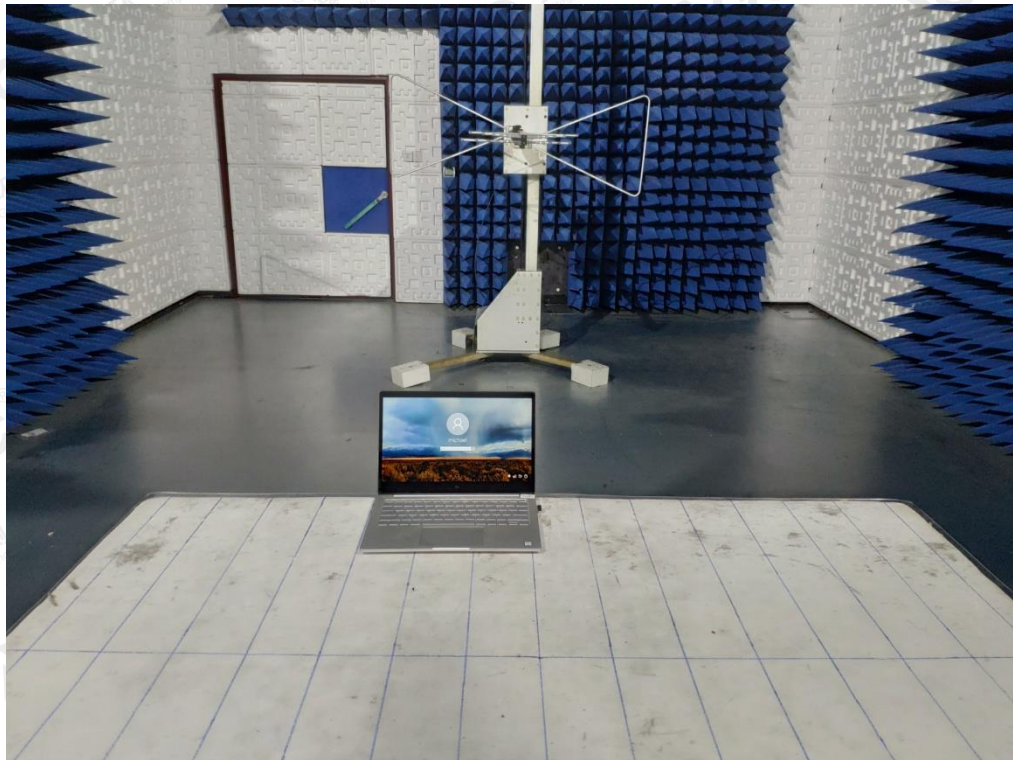
Note: All the test modes had been tested, the mode 1 was the worst case. Only the data of the worst case would be record in this test report.

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APPENDIX A: PHOTOGRAPHS OF TEST SETUP
FCC LINE CONDUCTED EMISSION TEST SETUP

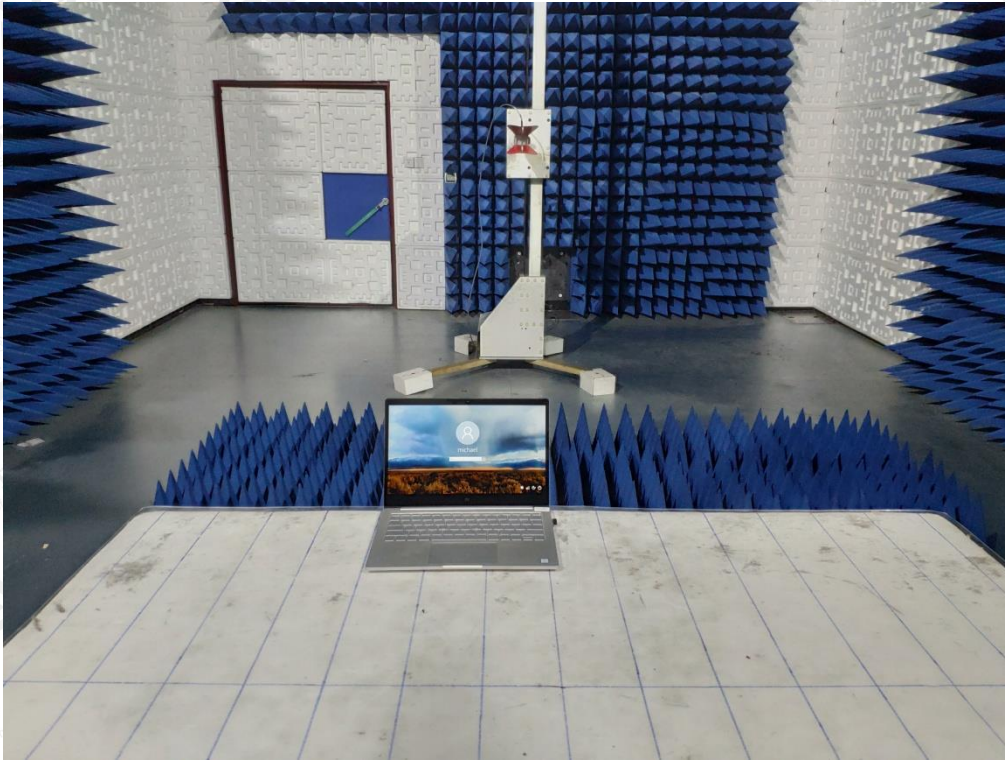


FCC RADIATED EMISSION TEST SETUP BELOW 1GHZ



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FCC RADIATED EMISSION TEST SETUP ABOVE 1GHZ



----END OF REPORT----

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