



TEST REPORT

No. I18D00006-EMC01

For

**Client : Lenovo (Shanghai) Electronics Technology
Co., Ltd**

Production: Portable Tablet Computer

Model Name : Lenovo TB-8504X

Hardware Version: Lenovo Tablet TB-8504X

Software Version: TB-8504X_RF01_170520

Brand: Lenovo

FCC ID: O57TB8504X

Issued date: 2018-01-31

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of ECIT Shanghai.

Test Laboratory:

ECIT Shanghai, East China Institute of Telecommunications

Add: 7F, G Area, No.668, Beijing East Road, Huangpu District, Shanghai, P. R. China

Tel: (+86)-021-63843300, E-Mail: welcome@ecit.org.cn

Revision Version

Report Number	Revision	Date	Memo
I18D00006-EMC01	00	2018-01-31	Initial creation of test report

CONTENTS

1. TEST LABORATORY	5
1.1. TESTING LOCATION	5
1.2. TESTING ENVIRONMENT	5
1.3. PROJECT DATA	5
1.4. SIGNATURE	5
2. CLIENT INFORMATION	6
2.1. APPLICANT INFORMATION	6
2.2. MANUFACTURER INFORMATION	6
3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE)	7
3.1. ABOUT EUT	7
3.2. INTERNAL IDENTIFICATION OF EUT USED DURING THE TEST	7
3.3. INTERNAL IDENTIFICATION OF AE USED DURING THE TEST	7
4. REFERENCE DOCUMENTS.....	8
4.1 REFERENCE DOCUMENTS FOR TESTING	8
5. TEST RESULTS.....	9
5.1 SUMMARY OF TEST RESULTS	9
5.2 STATEMENTS.....	9
6. TEST EQUIPMENT UTILIZED	10
6.1 RADIATED EMISSION EQUIPMENT LIST	10
6.1 AC CONDUCTED EMISSION EQUIPMENT LIST	10
7. SYSTEM CONFIGURATION DURING TEST	11
7.1 TEST MODE.....	11
7.2 CONNECTION DIAGRAM OF TEST SYSTEM.....	12
8. MEASUREMENT RESULTS	13
8.1 RADIATED EMISSION 30MHZ-12.75GHZ	13

8.2 CONDUCTED EMISSION..... 17

ANNEX A ACCREDITATION CERTIFICATE 19

1. Test Laboratory

1.1. Testing Location

Company Name: ECIT Shanghai, East China Institute of Telecommunications
Address: 7F, G Area, No. 668, Beijing East Road, Huangpu District, Shanghai,
P. R. China
Postal Code: 200001
Telephone: 86-21-63843300
Fax: 86-21-63843301
FCC registration No: 489729

1.2. Testing Environment

Normal Temperature: 15-35°C
Relative Humidity: 30-60%RH

1.3. Project data

Project Leader: Xu Yuting
Testing Start Date: 01-10, 2018
Testing End Date: 01-19, 2018

1.4. Signature



Tong Daocheng

(Prepared this test report)



You Jinjun

(Reviewed this test report)



Zheng Zhongbin

Director of the laboratory

(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name: Lenovo (Shanghai) Electronics Technology Co., Ltd
Address : NO.68 BUILDING, 199 FENJU RD, China (Shanghai) Pilot Free Trade
Zone, 200131, CHINA
Telephone: 18116117205
Postcode: NA

2.2. Manufacturer Information

Company Name: Lenovo PC HK Limited
Address : 23/F, Lincoln House, Taikoo Place 979 King's Road, Quarry Bay,
Hong Kong
Telephone: 18116117205
Postcode: NA

3. Equipment under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

EUT Description	Portable Tablet Computer
Model name	Lenovo TB-8504X
GSM Frequency Band	GSM850/GSM1900/GSM900/GSM1800
UMTS Frequency Band	WCDMA Band I /Band II /Band V /Band VIII
LTE Frequency Band	FDD 1/3/5/7/8/20,TDD 38/40
Additional Communication Function	BT 1.2,2.0,2.1,EDR,3.0,4.0/WIFI 802.11b,g,n

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version	Date of receipt
N05	863768030010431/ 863768030012411	Lenovo Tablet TB-8504X	TB-8504X_RF01_1 70520	2018-01-10

*EUT ID: is used to identify the test sample in the lab internally.

3.3. Internal Identification of AE used during the test

AE ID*	Description	Model	SN	Remark
CA03	Adapter	C-P56	NA	100-240V~50/60Hz 0.13A
UA02	USB Cable	NA	NA	NA
AE1	Desktop PC	OptiPlex 790 DT	X8RP1 A01 APCC	NA
AE2	Notebook PC	DELL Latitude E5250	NA	NA
AE3	LAN Cable	NA	NA	NA
AE4	VGA Cable	NA	NA	NA
AE5	RS232 Cable	NA	NA	NA
AE6	Keyboard	KB212-B	CN-0Y88XT-6589 0-12I-005Q-A00	NA
AE7	Mouse	MS111-P	CN-011D3V-7158 1-19J-1A64	NA
AE8	SanDisk Ultra32GB	microSDHC UHS-I	NA	NA

*AE ID: is used to identify the test sample in the lab internally.

4. Reference Documents

4.1 Reference Documents for testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
FCC Part 15, Subpart B	Radio frequency devices	10-1-10 Edition
ANSI C63.4	Method of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2014

5. Test Results

5.1 Summary of Test Results

Items	Test List	Clause in FCC rules	Verdict
1	Radiated Emission	15.109(a)	Pass
2	Conducted Emission	15.107(a)	Pass

5.2 Statements

The Lenovo TB-8504X, manufactured by Lenovo PC HK Limited is a new product for testing. ECIT performed test cases which identified with Pass/Fail/Inc result in section 5.1.

ECIT has verified that the compliance of the tested device specified in section 3 of this test report is successfully evaluated according to the procedure and test methods as defined in type certification requirement listed in section 4 of this test report.

6. Test Equipment Utilized

6.1 Radiated Emission Equipment list

No.	Name	Type	Series Number	Producer	Cal. Date	Cal. interval
1	Universal Radio Communication	CMU200	123126	R&S	2017-05-11	1 Year
2	Test Receiver	ESU40	100307	R&S	2017-05-11	1 Year
3	Trilog Antenna	VULB9163	VULB9163-515	Schwarzbeck	2017-02-25	3 Year
4	Double Ridged Guide	ETS-3117	00135890	ETS	2017-01-11	3 Year
5	EMI Test Software	EMC32 V9.15	NA	R&S	NA	NA

6.1 AC Conducted Emission Equipment list

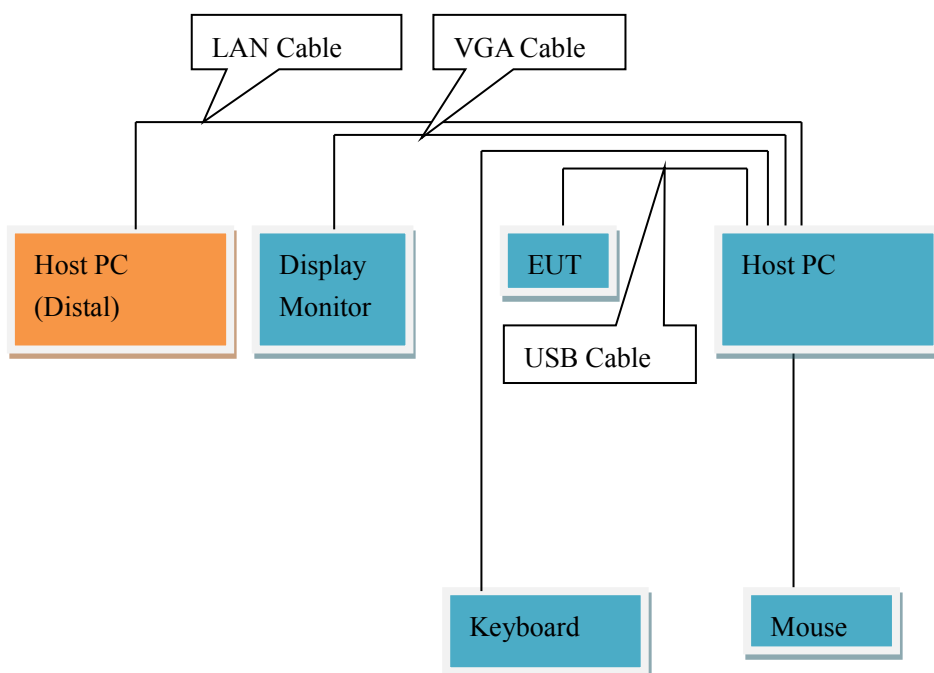
No.	Name	Type	Series Number	Producer	Cal. Date	Cal. interval
1	Universal Radio	CMU200	123123	R&S	2017-05-11	1 Year
2	Test Receiver	ESCI	101235	R&S	2017-05-11	1 Year
3	2-Line V-Network	ENV216	101380	R&S	2017-05-11	1 Year
4	EMI Test Software	EMC32 V9.12	NA	R&S	NA	NA

7. System Configuration during Test

7.1 Test Mode

Test Item	Function Type
AC Conducted Emission	Mode 1: USB cable (Data Link with PC) <Figure 1> Mode 2: Adapter charging <Figure 2>
Radiated Emission	Mode 1: USB cable (Data Link with PC) <Figure 1> Mode 2: Adapter charging <Figure 2>
Remark: 1. All test modes are performed, only the worst cases test data are recorded in this report. 2. Data Link with PC means data application transferred mode between EUT and PC.	

7.2 Connection Diagram of Test System



<Figure 1>



<Figure 2>

8. Measurement Results

Only the worst test result was shown in this report.

8.1 Radiated Emission 30MHz-12.75GHz

Method of Measurement

For 30-1000MHz, the EUT was placed on the top of a rotating 0.8-m table above the ground at a semi-anechoic chamber. The distance between the EUT and the received antenna was 3 meters. The table was rotated 360 degree and the received antenna mounted on a variable-height antenna tower was varied from 1m to 4m to find the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna were set during the measurement. Tested in accordance with the procedures of ANSI C63.4-2014, section 8.3.

For 1000-12750MHz, The maximal emission value was acquired by adjusting the antenna height, The table was rotated 360 degree to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna were set during the measurement.

Limits for Radiated Emission at a measuring distance of 3m

Frequency Range (MHz)	Quasi-Peak (dBuV/m)
30-88	40
88-216	43.5
216-960	46
Above 960	54

Frequency Range (MHz)	Peak (dBuV/m)	Average (dBuV/m)
Above 1000	74	54

Test conditions

Frequency Range (MHz)	RBW/VBW	Sweep Time (s)
30-1000	120KHz/300KHz	Auto
1000-12750	1MHz/3MHz	Auto

Uncertainty Measurement

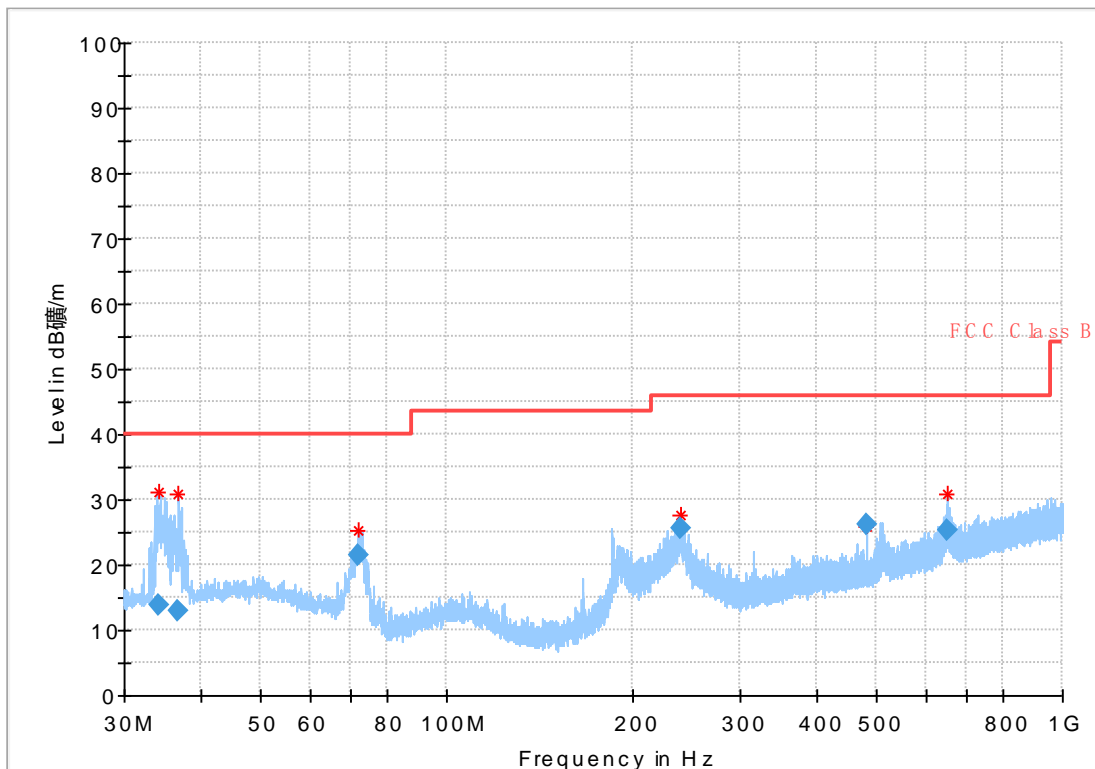
The measurement uncertainty(30MHz-1000MHz) is 5.48 dB (k=2).

The measurement uncertainty(1000MHz-6000MHz) is 5.20 dB (k=2).

Test Results

Mode 1: USB cable (Data Link with PC)

Frequency Range: 30MHz – 1GHz



Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
34.021675	13.92	40.00	26.08	1000.0	120.000	100.0	V	270.0	-22.0
36.756504	13.08	40.00	26.92	1000.0	120.000	106.0	V	258.0	-21.6
71.739949	21.58	40.00	18.42	1000.0	120.000	175.0	H	125.0	-25.4
240.036704	25.51	46.00	20.49	1000.0	120.000	125.0	H	248.0	-23.5
480.003509	26.03	46.00	19.97	1000.0	120.000	100.0	V	153.0	-17.6
651.949347	25.37	46.00	20.63	1000.0	120.000	181.0	H	257.0	-13.7

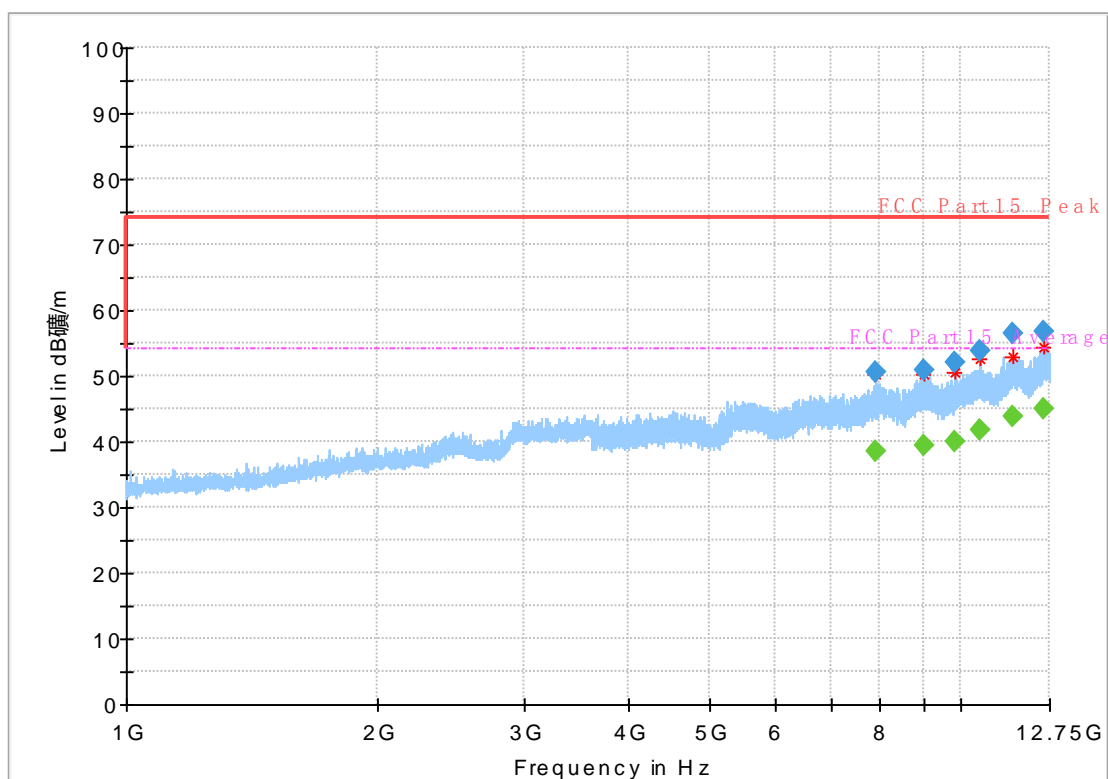
Note:

1. Emission level(QP)=Raw value by receiver + Corr(Antenna factor + cable loss - preamplifier gain)
2. The raw value is used to calculate by software which is not shown in the sheet.
3. Margin=limit value – emission level.

Mode 1: USB cable (Data Link with PC)

Frequency Range:

1GHz –12.75GHz



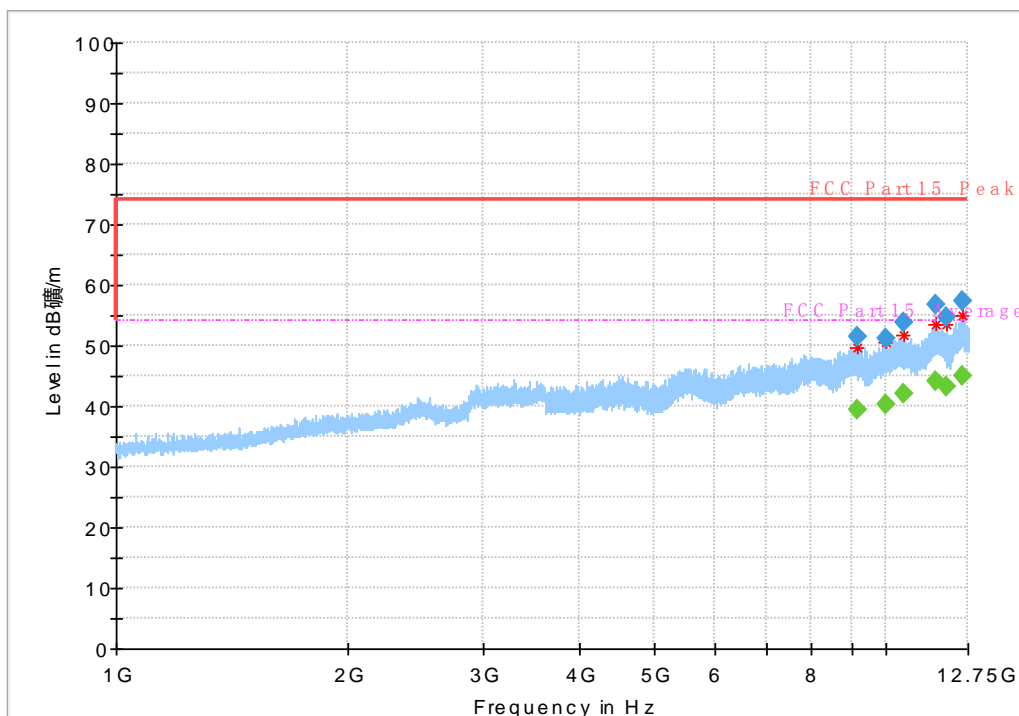
Final Result

Frequency (MHz)	MaxPeak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin	Meas. Time	Bandwidth (h)	Height (t)	Polarization (l)	Azimuth	Corr. (dB)
7901.342267	---	38.66	54.00	15.34	50.0	1000.000	200.0	H	292.0	8.8
7901.342267	50.73	---	74.00	23.27	50.0	1000.000	200.0	H	292.0	8.8
9028.806134	50.90	---	74.00	23.10	50.0	1000.000	100.0	H	-20.0	10.3
9028.806134	---	39.50	54.00	14.50	50.0	1000.000	100.0	H	-20.0	10.3
9796.429000	52.17	---	74.00	21.83	50.0	1000.000	200.0	H	265.0	11.1
9796.429000	---	40.04	54.00	13.96	50.0	1000.000	200.0	H	265.0	11.1
10551.377534	53.95	---	74.00	20.05	50.0	1000.000	100.0	H	241.0	13.1
10551.377534	---	41.80	54.00	12.20	50.0	1000.000	100.0	H	241.0	13.1
11508.083267	56.45	---	74.00	17.55	50.0	1000.000	200.0	H	22.0	15.1
11508.083267	---	43.89	54.00	10.11	50.0	1000.000	200.0	H	22.0	15.1
12553.507933	---	45.00	54.00	9.00	50.0	1000.000	200.0	H	348.0	16.7
12553.507933	56.82	---	74.00	17.18	50.0	1000.000	200.0	H	348.0	16.7

Note:

1. Emission level(peak or average)=Raw value by receiver + Corr(Antenna factor+ cable loss - preamplifier gain)
2. The raw value is used to calculate by software which is not shown in the sheet.
3. Margin=limit value – emission level.

Frequency Range: 1GHz –12.75GHz



Final Result

Frequency (MHz)	MaxPeak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin	Meas. Time	Bandwidth (h)	Height (t)	Polarization (l)	Azimuth (uth)	Corr. (dB)
9185.926734	51.36	---	74.00	22.64	50.0	1000.000	200.0	V	117.0	10.4
9185.926734	---	39.45	54.00	14.55	50.0	1000.000	200.0	V	117.0	10.4
9986.065333	---	40.20	54.00	13.80	50.0	1000.000	200.0	V	352.0	11.3
9986.065333	51.22	---	74.00	22.78	50.0	1000.000	200.0	V	352.0	11.3
10526.406333	53.85	---	74.00	20.15	50.0	1000.000	200.0	V	63.0	13.1
10526.406333	---	41.93	54.00	12.07	50.0	1000.000	200.0	V	63.0	13.1
11570.433866	56.66	---	74.00	17.34	50.0	1000.000	100.0	V	81.0	15.2
11570.433866	---	44.00	54.00	10.00	50.0	1000.000	100.0	V	81.0	15.2
11958.027266	---	43.29	54.00	10.71	50.0	1000.000	200.0	V	135.0	14.9
11958.027266	54.56	---	74.00	19.44	50.0	1000.000	200.0	V	135.0	14.9
12567.062267	57.26	---	74.00	16.74	50.0	1000.000	100.0	V	127.0	16.7
12567.062267	---	45.07	54.00	8.93	50.0	1000.000	100.0	V	127.0	16.7

Note:

1. Emission level(peak or average)=Raw value by receiver + Corr(Antenna factor+ cable loss - preamplifier gain)
2. The raw value is used to calculate by software which is not shown in the sheet.
3. Margin=limit value – emission level.

Test Engineer :
Tong Daocheng

8.2 Conducted Emission

Method of Measurement

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies with the band 150 kHz to 30MHz shall not exceed the limits. Both lines of the power mains connected to the EUT were checked for maximum conducted interference. Tested in accordance with the procedures of ANSI C63.4-2014, section 7.3

Limit of Conducted Emission

Frequency Range (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency

Test Condition in Charging Mode

Voltage (V)	Frequency (Hz)	RBW	Sweep Time (s)
120	60	9 KHz	Auto

Uncertainty Measurement

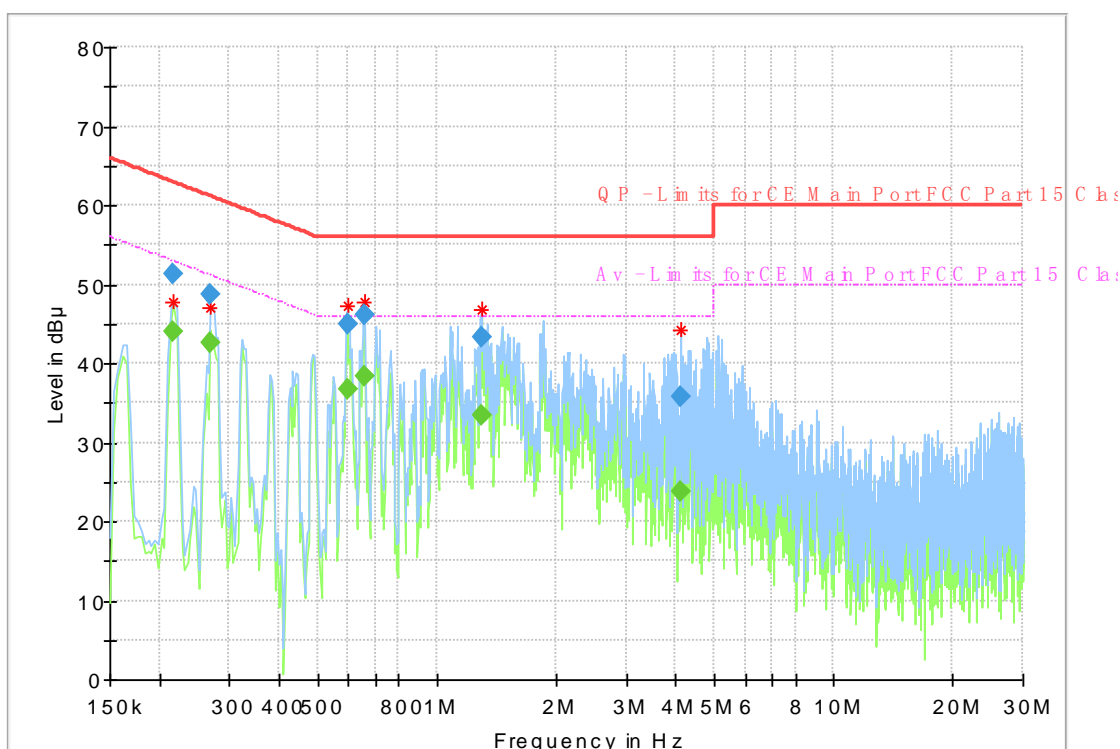
The measurement uncertainty is 3.68dB (k=2).

Test Results

Mode 1: USB cable (Data Link with PC)

Frequency Range:

150kHz – 30MHz



Frequency (MHz)	QuasiPeak (dB µV)	Average (dB µV)	Limit (dB µV)	Margin (dB)	Meas. Time	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.217162	---	44.04	52.93	8.89	1000.0	9.000	L1	ON	9.6
0.217162	51.26	---	62.93	11.67	1000.0	9.000	L1	ON	9.6
0.269400	---	42.68	51.14	8.46	1000.0	9.000	L1	ON	9.6
0.269400	48.66	---	61.14	12.48	1000.0	9.000	L1	ON	9.6
0.594019	---	36.76	46.00	9.24	1000.0	9.000	L1	ON	9.6
0.594019	44.98	---	56.00	11.02	1000.0	9.000	L1	ON	9.6
0.657450	---	38.46	46.00	7.54	1000.0	9.000	L1	ON	9.7
0.657450	46.05	---	56.00	9.95	1000.0	9.000	L1	ON	9.7
1.291762	---	33.44	46.00	12.56	1000.0	9.000	L1	ON	9.7
1.291762	43.41	---	56.00	12.59	1000.0	9.000	L1	ON	9.7
4.101394	---	23.82	46.00	22.18	1000.0	9.000	L1	ON	9.7
4.101394	35.68	---	56.00	20.32	1000.0	9.000	L1	ON	9.7

Note:

1. Emission level(quasi-peak or Average peak)=Raw value by receiver + Corr(Insertion loss+cable loss)
2. The raw value is used to calculate by software which is not shown in the sheet.
3. Margin=limit value – emission level.
4. L1 and N line is all have been tested, the result of them is synthesized in the above data diagram.

Test Engineer :

Tong Daocheng

Annex A Accreditation Certificate



Accredited Laboratory

A2LA has accredited

EAST CHINA INSTITUTE OF TELECOMMUNICATIONS

Shanghai, People's Republic of China

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009).



Presented this 15th day of March 2017.



President and CEO
For the Accreditation Council
Certificate Number 3682.01
Valid to February 28, 2019

For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.

*****END OF REPORT*****