

Prüfbericht-Nr.: <i>Test report no.:</i>	CN21MXOM 003	Auftrags-Nr.: <i>Order no.:</i>	168308028	Seite 1 von 22 Page 1 of 22
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	2021-03-02	
Auftraggeber: <i>Client:</i>	Lenovo (Beijing) Limited 201-H2-6, Floor 2, Building 2, No.6 Shangdi West Road, Haidian District, Beijing 100085, P.R.China			
Prüfgegenstand: <i>Test item:</i>	Lenovo Go Multi-Device Mouse			
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	MB605T (Trademark: Lenovo)			
Auftrags-Inhalt: <i>Order content:</i>	Test Report			
Prüfgrundlage: <i>Test specification:</i>	FCC CFR Title 47, Part 15, Subpart C, Section 15.207 FCC CFR Title 47, Part 15, Subpart C, Section 15.209			
Wareneingangsdatum: <i>Date of sample receipt:</i>	2021-03-19	Please refer to Photo Document		
Prüfmuster-Nr.: <i>Test sample no.:</i>	A003017280-003~004 A003017280-006~009			
Prüfzeitraum: <i>Testing period:</i>	2021-03-19 – 2021-04-08			
Ort der Prüfung: <i>Place of testing:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft von: <i>tested by:</i>	genehmigt von: <i>authorized by:</i>			
Datum: <i>Date:</i> 2021-04-16	Ausstellungsdatum: <i>Issue date:</i> 2021-04-16			
Stellung / Position:	Senior Project Manager	Stellung / Position: Technical Certifier		
Sonstiges / Other:	FCC ID: A5MMB605T			
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>		Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>		
* Legende: 1 = sehr gut 2 = gut 3 = befriedigend 4 = ausreichend 5 = mangelhaft P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet * Legend: 1 = very good 2 = good 3 = satisfactory 4 = sufficient 5 = poor P(ass) = passed a.m. test specification(s) F(ail) = failed a.m. test specification(s) N/A = not applicable N/T = not tested				
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>				

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Prüfbericht - Nr.: CN21MXOM 003
Test Report No.

Seite 2 von 22
Page 2 of 22

Test Summary

5.1.1 ANTENNA REQUIREMENT

RESULT: Pass

5.1.2 RADIATED SPURIOUS EMISSION

RESULT: Pass

5.1.3 CONDUCTED EMISSION ON AC MAINS

RESULT: Pass

Table of Contents

1	GENERAL REMARKS	4
1.1	COMPLEMENTARY MATERIALS	4
2	TEST SITES	5
2.1	TEST FACILITIES	5
2.2	LIST OF TEST AND MEASUREMENT INSTRUMENTS.....	5
2.3	TRACEABILITY	6
2.4	CALIBRATION	6
2.5	MEASUREMENT UNCERTAINTY.....	6
2.6	LOCATION OF ORIGINAL DATA.....	6
2.7	STATUS OF FACILITY USED FOR TESTING.....	6
3	GENERAL PRODUCT INFORMATION	7
3.1	PRODUCT FUNCTION AND INTENDED USE.....	7
3.2	RATINGS AND SYSTEM DETAILS	7
3.3	INDEPENDENT OPERATION MODES	7
3.4	NOISE GENERATING AND NOISE SUPPRESSING PARTS.....	7
3.5	SUBMITTED DOCUMENTS.....	7
4	TEST SET-UP AND OPERATION MODES	8
4.1	PRINCIPLE OF CONFIGURATION SELECTION	8
4.2	TEST OPERATION AND TEST SOFTWARE.....	8
4.3	SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT	8
4.4	COUNTERMEASURES TO ACHIEVE EMC COMPLIANCE	8
4.5	TEST SETUP DIAGRAM	9
5	TEST RESULTS	10
5.1	TRANSMITTER REQUIREMENT & TEST SUITES	10
5.1.1	<i>Antenna Requirement</i>	<i>10</i>
5.1.2	<i>Radiated Spurious Emission</i>	<i>11</i>
5.1.3	<i>Conducted Emission on AC Mains.....</i>	<i>19</i>
6	PHOTOGRAPHS OF THE TEST SET-UP	22
7	LIST OF TABLES.....	22

1 General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix A: Photographs of the Test Set-up

2 Test Sites

2.1 Test Facilities

TÜV Rheinland (Shenzhen) Co., Ltd.

362 Huanguan Road Middle Longhua District, Shenzhen 518110 People's Republic of China

FCC Accreditation Designation No.: CN1260

ISED wireless device testing laboratory: 25069

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Unwanted Emission Testing (TS9975)				
Equipment	Manufacturer	Model	Serial No.	Cal. until
EMI Test Receiver	R&S	ESR 7	102021	2021-08-11
Signal Analyzer	R&S	FSV 40	101439	2021-08-10
System Controller Interface	R&S	SCI-100	S10010038	N/A
Filterbank	R&S	Wlan	100759	2021-08-10
OSP	R&S	OSP 120	102040	N/A
Pre-amplifier	R&S	SCU08F1	08320031	2021-08-10
Amplifier	R&S	SCU-18F	180070	2021-08-10
Amplifier	R&S	SCU40A	100475	2021-09-10
Trilog Broadband Antenna (30 MHz - 7 GHz)	Schwarzbeck	VULB 9162	193	2022-08-08
Double-Ridged Antenna (1 -18 GHz)	ETS-LINDGREN	3117	00218717	2022-08-08
Wideband Ridged Horn Antenna (18-40 GHz)	Steatite	QMS-00880	19067	2022-08-08
Active Loop Antenna	Schwarzbeck	FMZB 1513	302	2022-09-13
Wideband Ridged Horn Antenna (12-18 GHz)	Steatite	QMS-00208	18313	2021-09-02
Test software	R&S	EMC32 (V10.60.10)	N/A	N/A
Control PC	Dell	OptiPlex 7050	36NV9P2	N/A
3m Semi-Anechoic Chamber	Albatross	SAC-3m	APC17151-SAC	2021-07-06

Conducted Emission				
Equipment	Manufacturer	Model No.	Serial No.	Cal. Until
EMI Test Receiver	R&S	ESR3	102428	2021-08-16
Artificial Mains Network	R&S	ENV216	102333	2021-08-16
EMC32 test software	R&S	EMC32(Ver.10.50.00)	N/A	N/A

2.3 Traceability

All measurement equipment calibrations are traceable to NIM (National Institute of Metrology) or where calibration is performed in other countries, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

2.5 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements as below table.

Parameter	Uncertainty
Radiated Emission of Transmitter, valid up to 26.5 GHz	±6 dB
Radiated Emission of Receiver, valid up to 26.5 GHz	±6 dB
Conducted Emission, (9kHz to 150kHz)/(150kHz to 30MHz)	±3.70 dB / ±3.30 dB

2.6 Location of Original Data

The original copies of all test data taken during actual testing were attached at Appendix A of this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Shenzhen) Co., Ltd. file for certification follow-up purposes.

2.7 Status of Facility Used for Testing

The TÜV Rheinland (Shenzhen) Co., Ltd. Test facility located at 362 Huanguan Road Middle Longhua District, Shenzhen 518110 People's Republic of China is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

3 General Product Information

3.1 Product Function and Intended Use

The EUT is a Lenovo Go Multi-Device Mouse, which supports Bluetooth low energy, 2.4GHz wireless and wireless charging (WPT) technologies.

For details refer to the User Manual, Technical Description and Circuit Diagram.

3.2 Ratings and System Details

Table 2: Technical Specification of EUT

General Information of EUT	Value
Kind of Equipment:	Lenovo Go Multi-Device Mouse
Type Designation:	MB605T
Trademark:	Lenovo
FCC ID:	A5MMB605T
Operating Voltage:	Internal battery operated (3.7Vdc)
Technical Specification of WPT	
Frequency Range:	110~205KHz
Type of Modulation:	ASK
Wireless Charging Rated Power:	5W

3.3 Independent Operation Modes

The basic operation modes are:

- A. Charging by Wireless charger (Qi)

3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

3.5 Submitted Documents

- Application Form

- ID Label and Location Info

4 Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

Radio Spectrum: The equipment under test (EUT) was configured at its highest power output in order to measure its highest possible radiation and conducted level. The test modes were adapted accordingly in reference to the instructions for use.

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5. All tests were performed according to the procedures in ANSI C63.10: 2013.

According to clause 3.2, all tests were performed on model MB605T in this report.

4.3 Special Accessories and Auxiliary Equipment

Table 3: Auxiliary Equipment Used during Test

Description	Manufacturer	Model	S/N	Rating
Wireless charger	BestBuy	EE5829BLKPRI	N/A	N/A
Adapter	HUAWEI	HW-050100C0	N/A	N/A

4.4 Countermeasures to Achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Technical Construction File (TCF).

No additional measures were employed to achieve compliance.

4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test (Below 1GHz)

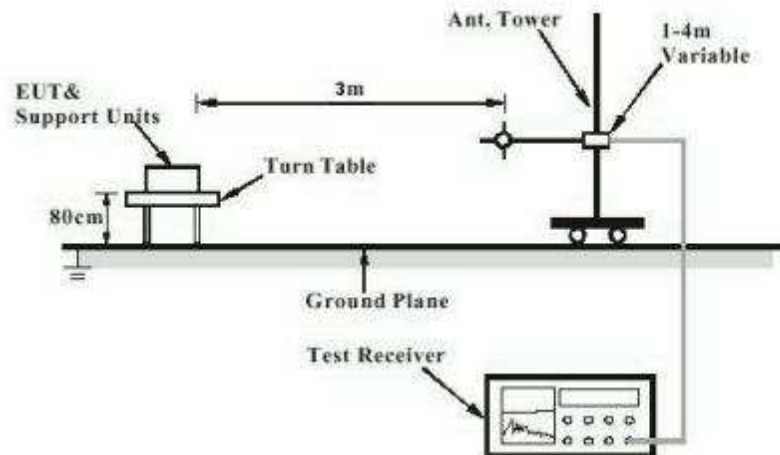
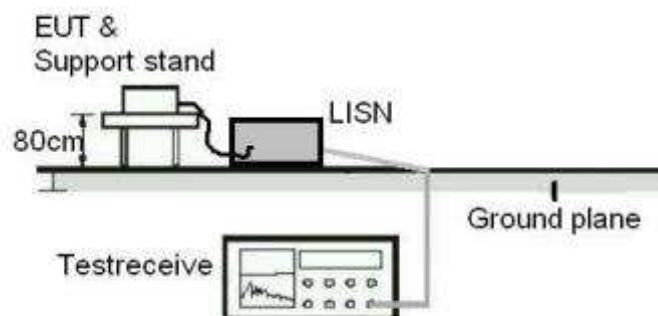


Diagram of Measurement Configuration for Mains Conduction Measurement



5 Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

RESULT:

Pass

Test Specification

Test standard : FCC Part 15.203

According to the manufacturer declared, the EUT has an internal antenna, and the antenna is permanent attachment and no consideration of replacement.

Therefore the EUT is considered sufficient to comply with the provision.

Refer to EUT Photo for further details.

5.1.2 Radiated Spurious Emission

RESULT:

Pass

Test Specification

Test standard	: FCC Part 15.209 & 15.205
Basic standard	: ANSI C63.10: 2013
Limits	: Refer to 15.209(a)
Kind of test site	: 3m Semi-anechoic Chamber

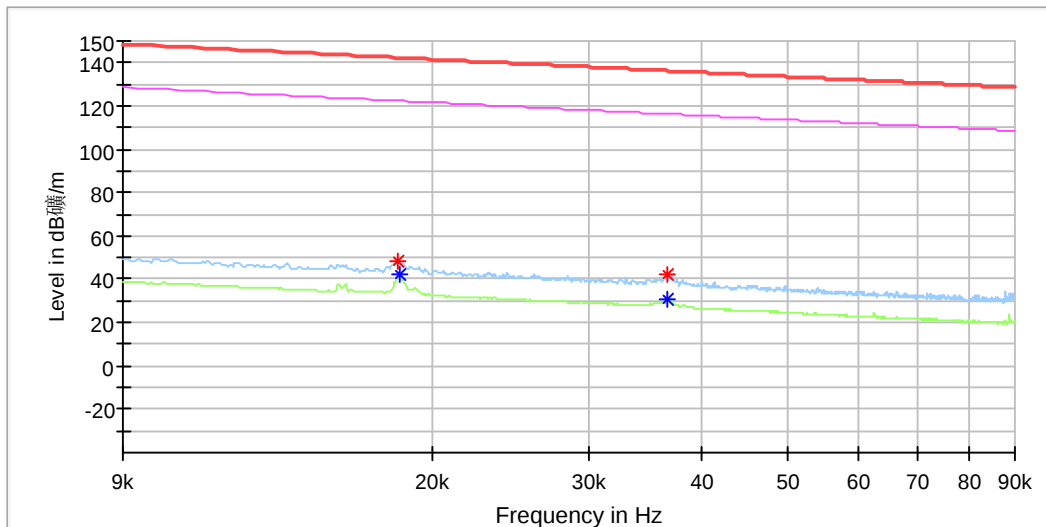
Test Setup

Date of testing	: 2021-04-01
Input voltage	: wireless charger operated (120Vac, 60Hz)
Operation mode	: A
Test channel	: Low / Middle / High
Ambient temperature	: 22 °C
Relative humidity	: 52 %
Atmospheric pressure	: 101 kPa

For details refer to following test result.

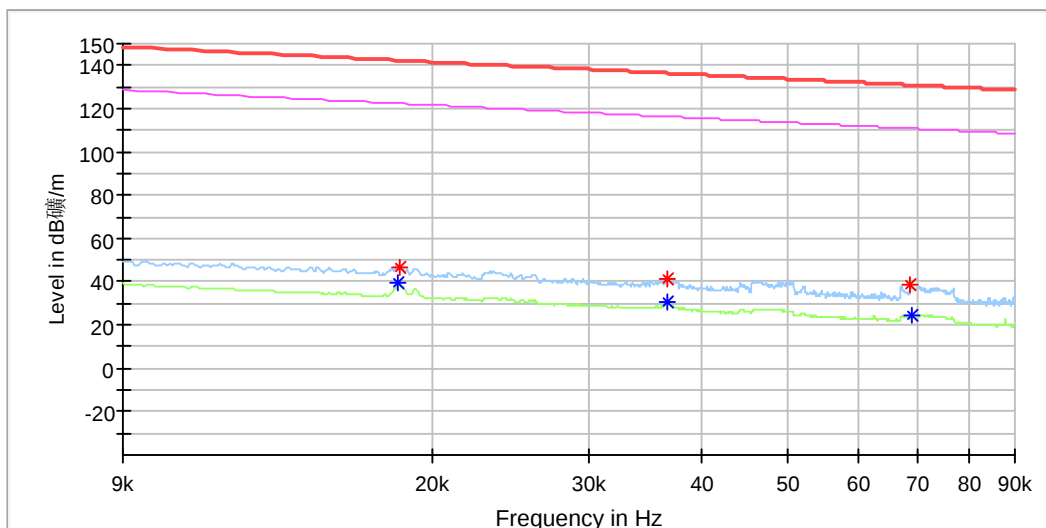
9KHz – 90KHz

X axis



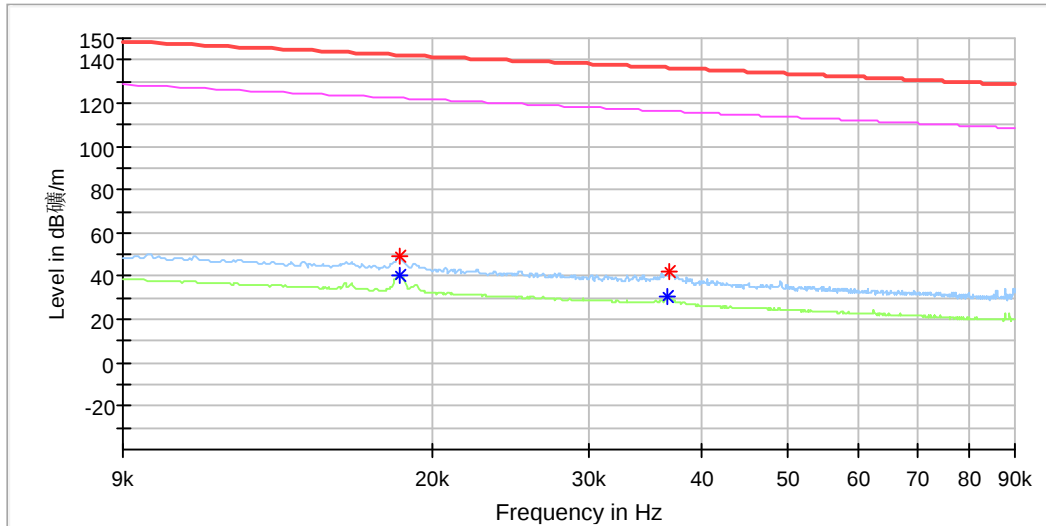
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
0.018315	48.75	---	142.33	93.58	100.0	X	354.0	20.0
0.018373	---	42.26	122.31	80.05	100.0	X	354.0	20.0
0.036656	---	30.66	116.31	85.65	100.0	X	354.0	20.0
0.036771	41.97	---	136.28	94.31	100.0	X	103.0	20.0

Y axis



Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
0.018315	---	39.59	122.33	82.75	100.0	Y	229.0	20.0
0.018431	46.92	---	142.28	95.36	100.0	Y	229.0	20.0
0.036771	41.08	---	136.28	95.20	100.0	Y	332.0	20.0
0.036771	---	30.52	116.28	85.76	100.0	Y	332.0	20.0
0.068709	38.70	---	130.85	92.15	100.0	Y	332.0	20.0
0.068998	---	24.52	110.82	86.29	100.0	Y	307.0	20.0

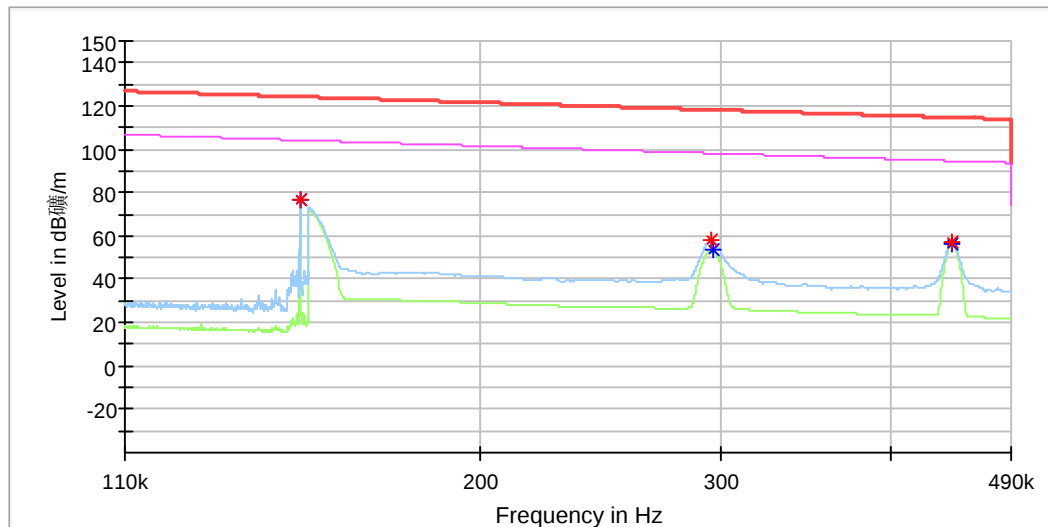
Z axis



Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
0.018373	49.29	---	142.31	93.02	100.0	Z	35.0	20.0
0.018431	---	40.65	122.28	81.63	100.0	Z	35.0	20.0
0.036714	---	30.68	116.30	85.61	100.0	Z	108.0	20.0
0.036945	42.22	---	136.24	94.02	100.0	Z	84.0	20.0

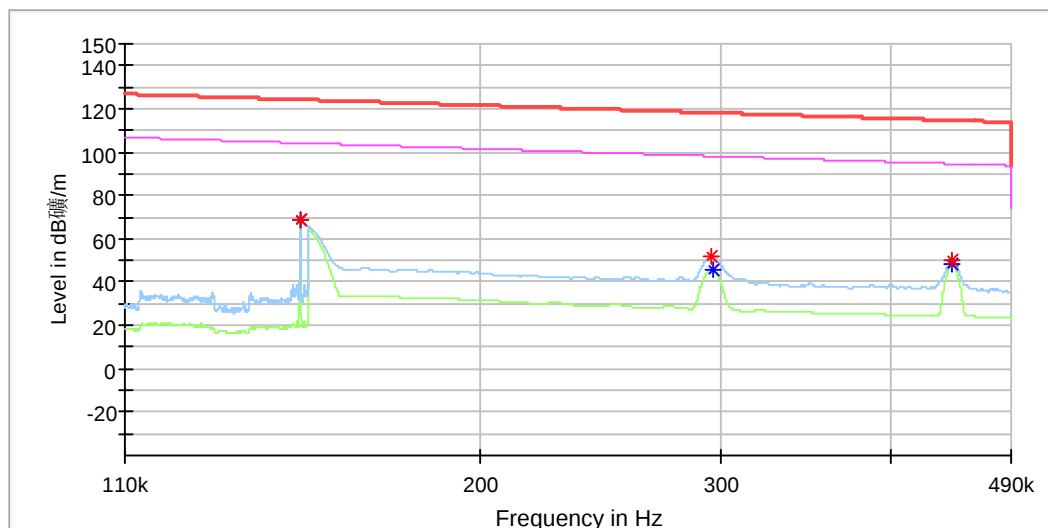
110KHz – 490KHz

X axis



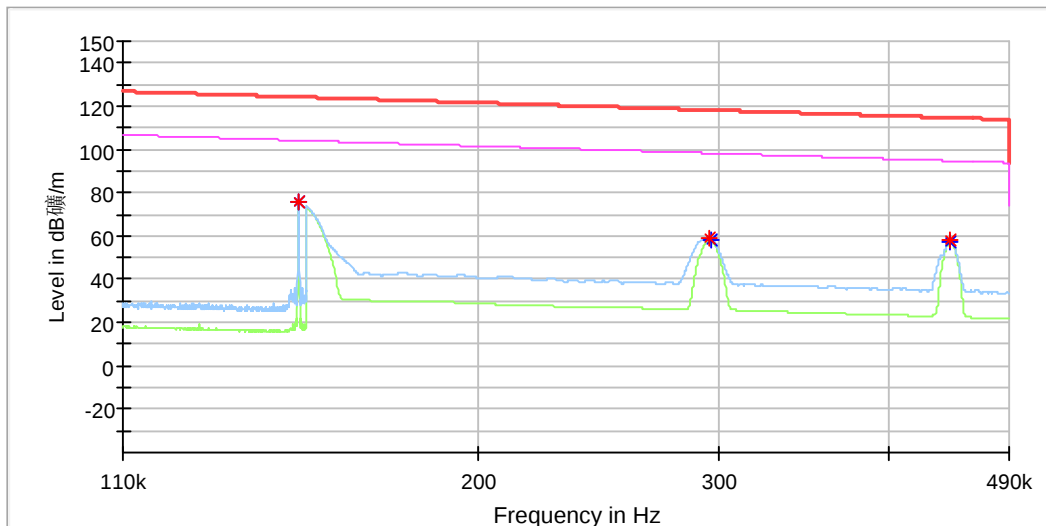
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
0.147857	76.89	---	124.20	47.31	100.0	X	132.0	20.1
0.147886	---	76.49	104.20	27.71	100.0	X	132.0	20.1
0.295714	57.94	---	118.18	60.24	100.0	X	174.0	20.1
0.296443	---	53.29	98.16	44.88	100.0	X	174.0	20.1
0.443857	56.84	---	114.66	57.82	100.0	X	174.0	20.1
0.444100	---	55.96	94.65	38.69	100.0	X	174.0	20.1

Y axis



Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
0.147886	69.00	---	124.20	55.19	100.0	Y	229.0	20.1
0.147886	---	68.42	104.20	35.78	100.0	Y	229.0	20.1
0.295472	51.92	---	118.19	66.27	100.0	Y	278.0	20.1
0.296443	---	45.71	98.16	52.45	100.0	Y	278.0	20.1
0.443857	50.17	---	114.66	64.49	100.0	Y	251.0	20.1
0.443857	---	48.26	94.66	46.40	100.0	Y	251.0	20.1

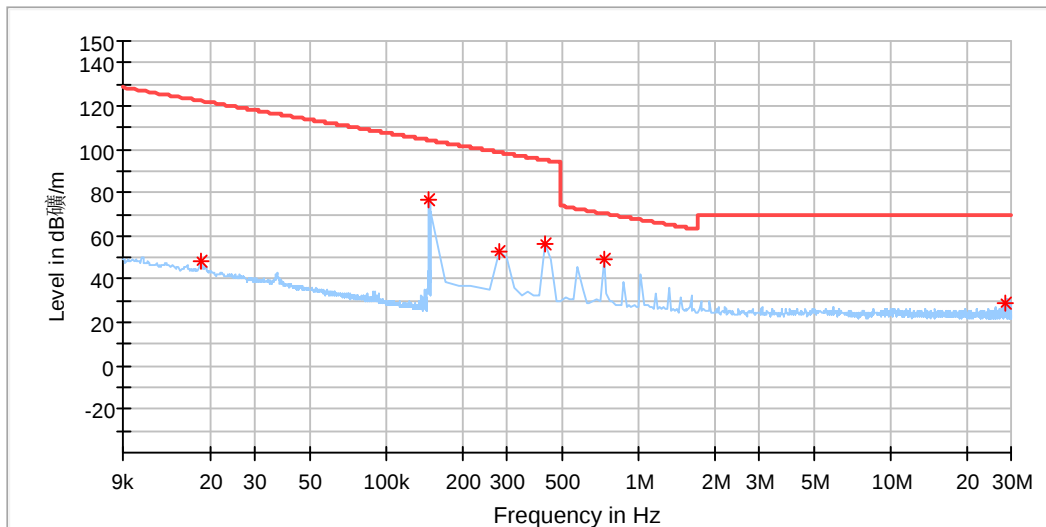
Z axis



Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
0.147914	76.00	---	124.20	48.20	100.0	Z	151.0	20.1
0.147914	---	75.89	104.20	28.31	100.0	Z	151.0	20.1
0.295957	58.64	---	118.18	59.54	100.0	Z	171.0	20.1
0.296200	---	57.84	98.17	40.33	100.0	Z	171.0	20.1
0.443614	58.08	---	114.66	56.58	100.0	Z	144.0	20.1
0.443857	---	57.48	94.66	37.18	100.0	Z	144.0	20.1

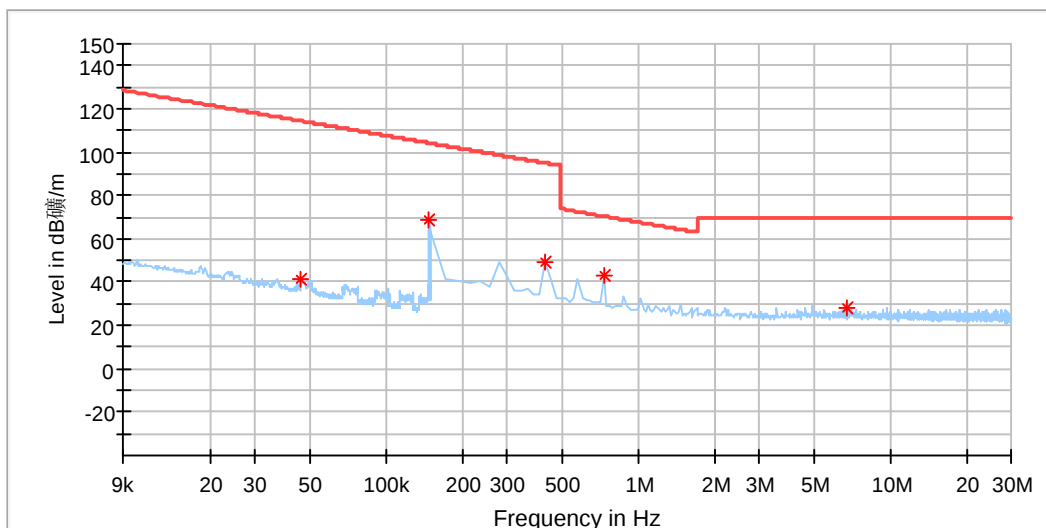
9KHz – 30MHz

X axis



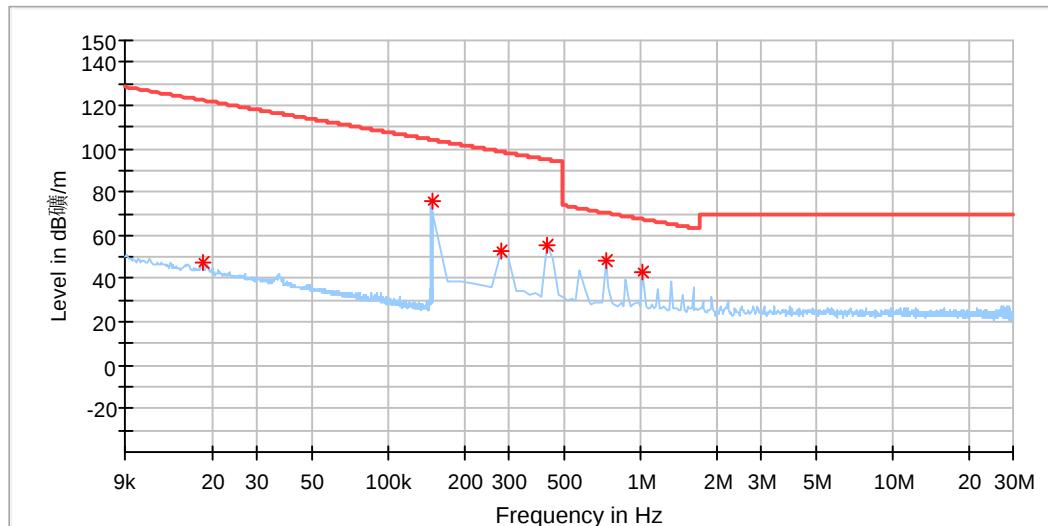
Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
0.018366	48.65	122.31	73.66	100.0	X	0.0	20.1
0.147885	76.89	104.20	27.31	100.0	X	154.0	20.1
0.277929	53.08	98.72	45.65	100.0	X	176.0	20.1
0.427179	56.33	94.99	38.67	100.0	X	151.0	20.1
0.725679	49.64	70.40	20.76	100.0	X	151.0	20.1
28.251643	29.03	69.50	40.47	100.0	X	6.0	20.7

Y axis



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
0.045861	41.63	114.36	72.73	100.0	Y	0.0	20.1
0.147885	68.84	104.20	35.36	100.0	Y	227.0	20.1
0.427179	49.03	94.99	45.96	100.0	Y	257.0	20.1
0.725679	42.71	70.40	27.69	100.0	Y	283.0	20.1
6.653036	28.26	69.50	41.24	100.0	Y	307.0	20.3

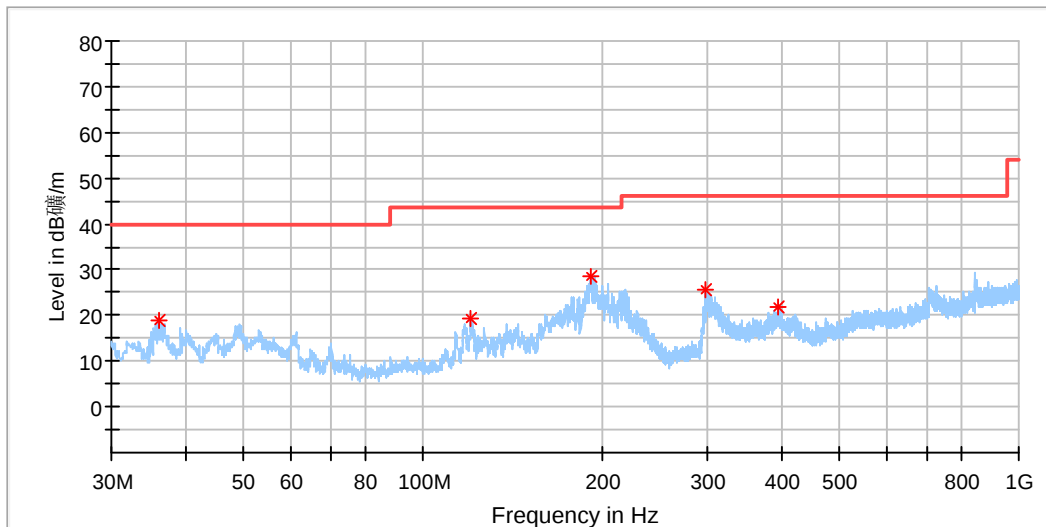
Z axis



Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
0.018467	47.44	122.26	74.82	100.0	Z	324.0	20.1
0.147986	75.98	104.19	28.21	100.0	Z	149.0	20.1
0.277929	52.82	98.72	45.90	100.0	Z	229.0	20.1
0.427179	55.23	94.99	39.76	100.0	Z	156.0	20.1
0.725679	48.25	70.40	22.15	100.0	Z	156.0	20.1
1.024179	42.86	67.41	24.55	100.0	Z	132.0	20.1

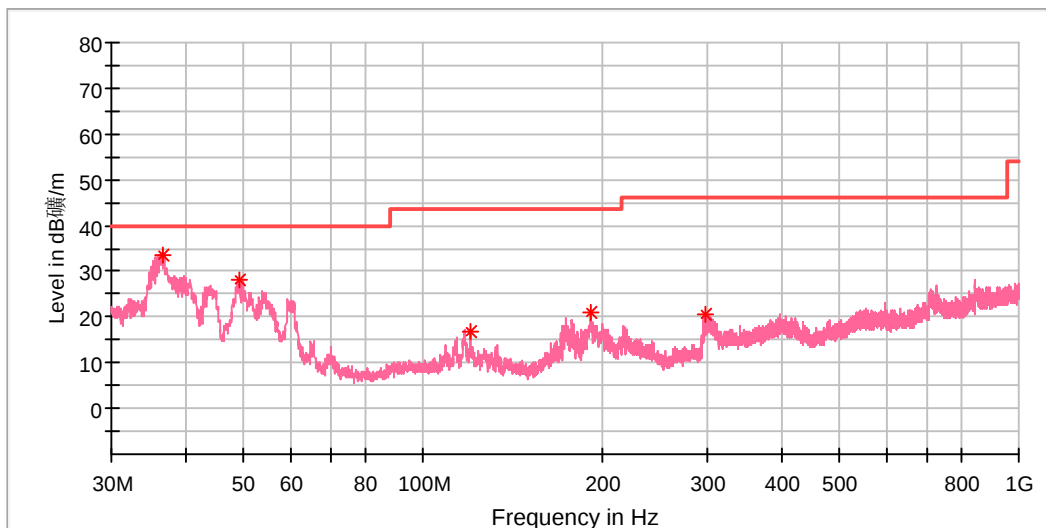
30MHz - 1GHz

Horizontal



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
35.965500	18.90	40.00	21.10	100.0	H	279.0	-21.9
120.355500	19.26	43.50	24.24	100.0	H	354.0	-21.1
191.068500	28.49	43.50	15.01	100.0	H	64.0	-19.8
298.932500	25.75	46.00	20.25	100.0	H	95.0	-16.7
395.496000	21.65	46.00	24.35	100.0	H	104.0	-14.2

Vertical



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
36.547500	33.61	40.00	6.39	100.0	V	78.0	-21.6
49.254500	27.95	40.00	12.05	100.0	V	6.0	-18.6
120.258500	16.99	43.50	26.51	100.0	V	0.0	-21.1
190.923000	21.08	43.50	22.42	100.0	V	144.0	-19.8
299.029500	20.69	46.00	25.31	100.0	V	229.0	-16.7

5.1.3 Conducted Emission on AC Mains

RESULT:**Pass****Test Specification**

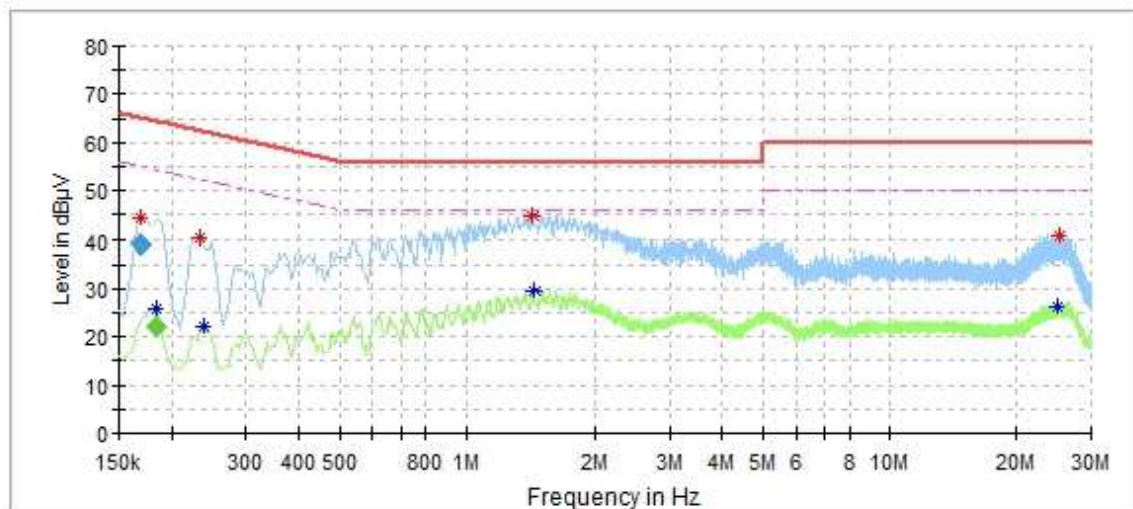
Test standard	: FCC Part 15.207
Basic standard	: ANSI C63.10: 2013
Frequency range	: 150KHz - 30MHz
Limits	: FCC Part 15.207(a)
Kind of test site	: Shielded Room

Test Setup

Date of testing	: 2021-04-02
Input voltage	: wireless charger operated (120Vac, 60Hz)
Operation mode	: A
Earthing	: Not connected
Ambient temperature	: 23.1 °C
Relative humidity	: 52 %
Atmospheric pressure	: 101 kPa

For details refer to following test result.

L Line



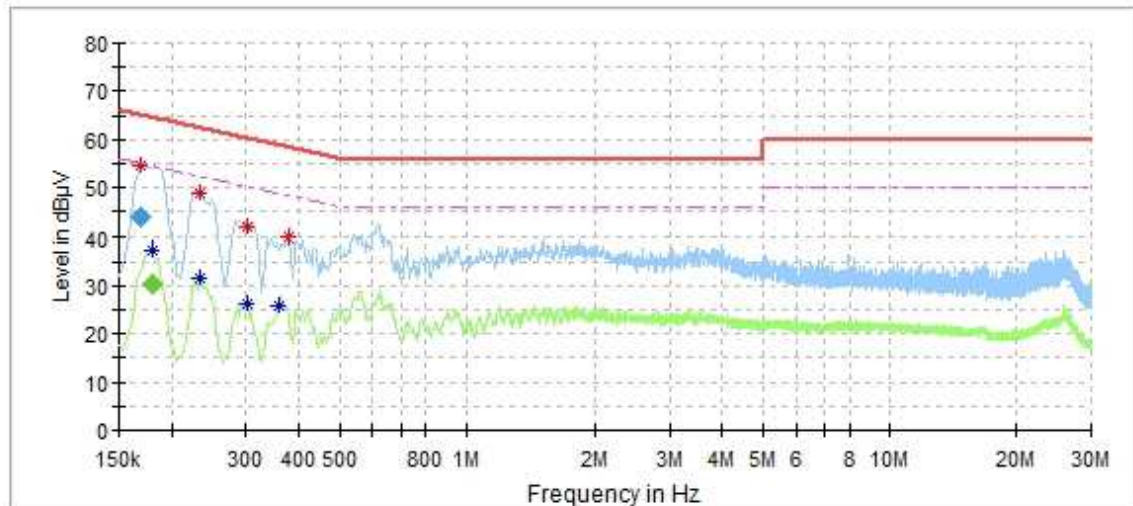
Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.168500	44.20	---	64.77	20.57	L1	10
0.184500	---	25.83	54.58	28.75	L1	10
0.234000	40.21	---	62.31	22.10	L1	10
0.238000	---	22.29	52.17	29.88	L1	10
1.436000	44.83	---	56.00	11.17	L1	10
1.444000	---	29.55	46.00	16.45	L1	10
24.952000	---	26.34	50.00	23.66	L1	10
25.344000	40.47	---	60.00	19.53	L1	10

Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.168500	39.06	---	65.03	25.97	200.0	9.000	L1	10
0.184500	---	22.23	54.28	32.05	200.0	9.000	L1	10

N Line



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.168500	54.68	---	64.96	10.28	N	10
0.180500	---	37.47	54.58	17.11	N	10
0.234000	---	31.68	52.31	20.63	N	10
0.234000	48.97	---	62.31	13.34	N	10
0.302000	---	26.24	50.19	23.95	N	10
0.302000	41.72	---	60.19	18.47	N	10
0.358000	---	25.67	48.78	23.10	N	10
0.378000	39.76	---	58.32	18.56	N	10

Final Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.168500	43.84	---	65.03	21.20	200.0	9.000	N	10
0.180500	---	30.38	54.46	24.08	200.0	9.000	N	10

6 Photographs of the Test Set-Up

For photographs of the test set-up, refer to the appendix A.

7 List of Tables

Table 1: List of Test and Measurement Equipment.....	5
Table 2: Technical Specification of EUT	7
Table 3: Auxiliary Equipment Used during Test	8