Prüfbericht-Nr.: *Test report no.:*	**CN22TXRS 003**	**Auftrags-Nr.:** *Order no.:*	**168387330**	**Seite 1 von 18** *Page 1 of 18*
Kunden-Referenz-Nr.: *Client reference no.:*	**N/A**	**Auftragsdatum:** *Order date:*	2022-08-22	
Auftraggeber: *Client:*	**Primax Electronics Ltd.** No. 669, Ruey Kuang Road, Neihu, Taipei, Taiwan			
Prüfgegenstand: *Test item:*	Lenovo Professional Wireless Rechargeable Mouse			
Bezeichnung / Typ-Nr.: *Identification / Type no.:*	MOBTP0L (Trademark: Lenovo)			
Auftrags-Inhalt: *Order content:*	Test Report			
Prüfgrundlage: *Test specification:*	FCC CFR Title 47, Part 15, Subpart C, Section 15.249 RSS-210 Issue 10 RSS-Gen Issue 5			
Wareneingangsdatum: *Date of sample receipt:*	2022-08-31	Please refer to Photo Document		
Prüfmuster-Nr.: *Test sample no:*	A003327545-007~008 A003328181-003~004 A003327545-080~081			
Prüfzeitraum: *Testing period:*	2022-09-06 – 2022-09-14			
Ort der Prüfung: *Place of testing:*	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüflaboratorium: *Testing laboratory:*	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüfergebnis*: *Test result*:*	Pass			
geprüft von: *tested by:*	Lin Lin	**genehmigt von:** *authorized by:*	Hardy Suo	
Datum: *Date:* 2022-09-30		**Ausstellungsdatum:** *Issue date:* 2022-09-30		
Stellung / *Position:*	Senior Project Manager	**Stellung** / *Position:*	Reviewer	
Sonstiges / *Other:*	FCC ID: EMJMMOBTP0L IC: 4251A-MMOBTP0L HVIN: MOBTP0L			

Zustand des Prüfgegenstandes bei Anlieferung: Prüfmuster vollständig und unbeschädigt
Condition of the test item at delivery: *Test item complete and undamaged*

* 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.
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.
V05

Test Summary

5.1.1 ANTENNA REQUIREMENT
RESULT: Pass

5.1.2 FIELD STRENGTH OF FUNDAMENTAL AND HARMONICS
RESULT: Pass

5.1.3 20DB AND 99% BANDWIDTH
RESULT: Pass

5.1.4 BAND EDGE
RESULT: Pass

5.1.5 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 7
3 GENERAL PRODUCT INFORMATION 8
3.1 PRODUCT FUNCTION AND INTENDED USE 8
3.2 RATINGS AND SYSTEM DETAILS 8
3.3 INDEPENDENT OPERATION MODES 8
3.4 NOISE GENERATING AND NOISE SUPPRESSING PARTS 9
3.5 SUBMITTED DOCUMENTS 9
4 TEST SET-UP AND OPERATION MODES 10
4.1 PRINCIPLE OF CONFIGURATION SELECTION 10
4.2 TEST OPERATION AND TEST SOFTWARE 10
4.3 SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT 10
4.4 COUNTERMEASURES TO ACHIEVE EMC COMPLIANCE 10
4.5 TEST SETUP DIAGRAM 11
5 TEST RESULTS 13
5.1 TRANSMITTER REQUIREMENT & TEST SUITES 13
5.1.1 Antenna Requirement 13
5.1.2 Field strength of fundamental and harmonics 14
5.1.3 20dB and 99% Bandwidth 15
5.1.4 Band Edge 16
5.1.5 Conducted Emission on AC Mains 17
6 PHOTOGRAPHS OF THE TEST SET-UP 18
7 LIST OF TABLES 18

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

Appendix B: Test Results

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

Radio Spectrum Testing (TS8997)				
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Cal. until**
Signal Analyzer	R&S	FSV 40	101441	2023-08-01
OSP	R&S	OSP 150	101017	2022-12-02
Control PC	DELL	OptiPlex 7050	FTJZ9P2	N/A
Test Software	R&S	WMS32 (V11.00.00)	N/A	N/A
Power Meter	R&S	NRP2	107105	2022-12-02
Wideband Power Sensor	R&S	NRP-Z81	105677	2023-08-01
Shielding Room 8#	Albatross	SR8	APC17151-SR8	2024-06-22
Unwanted Emission Testing (TS9975)				
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Cal. until**
EMI Test Receiver	R&S	ESR 7	102021	2023-08-02
Signal Analyzer	R&S	FSV 40	101439	2023-08-01
System Controller Interface	R&S	SCI-100	S10010038	N/A
Filterbank	R&S	Wlan	100759	2023-08-01
OSP	R&S	OSP 120	102040	N/A
Pre-amplifier	R&S	SCU08F1	08320031	2023-08-02
Amplifier	R&S	SCU-18F	180070	2023-08-02
Amplifier	R&S	SCU40A	100475	2023-08-02
Trilog Broadband Antenna (30 MHz - 7 GHz)	Schwarzbeck	VULB 9162	193	2024-08-06
Double-Ridged Antenna (1 -18 GHz)	ETS-LINDGREN	3117	00218717	2024-08-06
Wideband Ridged Horn Antenna (18-40 GHz)	Steatite	QMS-00880	19067	2024-08-27
Active Loop Antenna	Schwarzbeck	FMZB 1513	302	2023-08-06
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	2024-06-22

Conducted Emission				
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Until**
EMI Test Receiver	R&S	ESR3	102428	2023-07-31
Artificial Mains Network	R&S	ENV216	102333	2023-08-01
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 basics 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 (k=2)
RF output power, conducted	± 0.99 dB
Occupied Channel Bandwidth	± 2.08 %
RF power density, conducted	± 0.99 dB
Unwanted Emissions, conducted	± 0.89 dB
Radiated Emission of Transmitter, valid up to 26.5 GHz	±4.17 dB
Radiated Emission of Receiver, valid up to 26.5 GHz	±4.17 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 & B 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 Professional Wireless Rechargeable Mouse, which supports Bluetooth low energy and 2.4GHz wireless 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 Professional Wireless Rechargeable Mouse
Type Designation:	MOBTP0L
Trademark:	Lenovo
FCC ID:	EMJMMOBTP0L
IC:	4251A-MMOBTP0L
HVIN:	MOBTP0L
Operating Voltage:	Internal battery operated (3.7Vdc) or Charging by PC USB Port (PC input voltage 120Vac, 60Hz)
Battery:	Model: TE-PL403035 Rating: 3.7Vdc, 380mAh
Operating Temperature Range:	0 °C ~ +45 °C
Technical Specification of 2.4GHz	
Frequency Range:	2402 MHz to 2480 MHz
Type of Modulation:	GFSK
Channel Number:	79 channels
Channel Separation:	1 MHz
Antenna Type:	Chip Antenna
Antenna Gain:	1.05 dBi Max.

3.3 Independent Operation Modes

The basic operation modes are:

A. 2.4GHz transmitting mode
   1. Low channel
   2. Middle channel
   3. High channel

B. On, Charging + 2.4G

C. Off

3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

3.5 Submitted Documents

- Application Form
- User Manual
- FCC/IC 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.

Table 3: Test environments

Environment Parameter	Values During Tests		
	Temperature	Voltage (Battery operated)	Relative Humidity
NTNV	25°C±2°C	3.7Vdc	Ambient

Table 4: Test channel and frequency of 2.4GHz

Mode	Test Channels (MHz)	Remark
Transmitting	L/M/H: 2402MHz, 2440MHz, 2480MHz	--

4.3 Special Accessories and Auxiliary Equipment

Table 5: Auxiliary Equipment Used during Test

Description	Manufacturer	Model	S/N	Rating
Laptop	Lenovo	T480	PF-16A6N8	N/A
Portable Laptop	Lenovo	ThinkPad T480	10Q67059	N/A
Dongle	Lenovo	RG95	N/A	N/A
Adapter	MI	MDY-10-EX	N/A	Output: DC 5V, 3A

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)

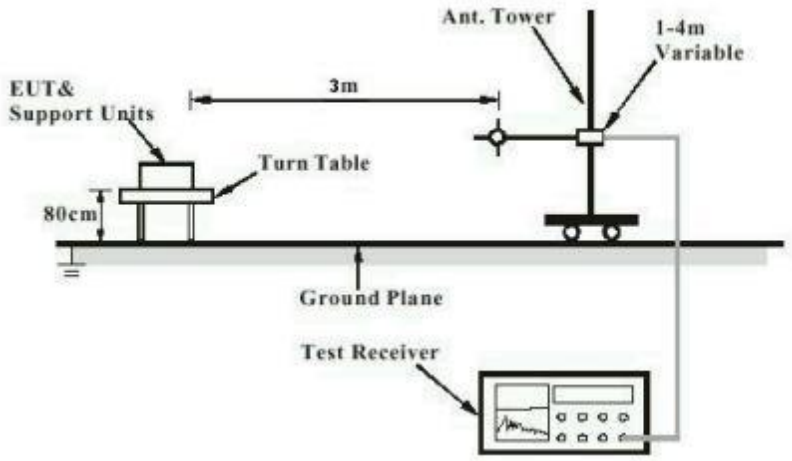


Diagram of Measurement Configuration for Radiation Test (Above 1GHz)

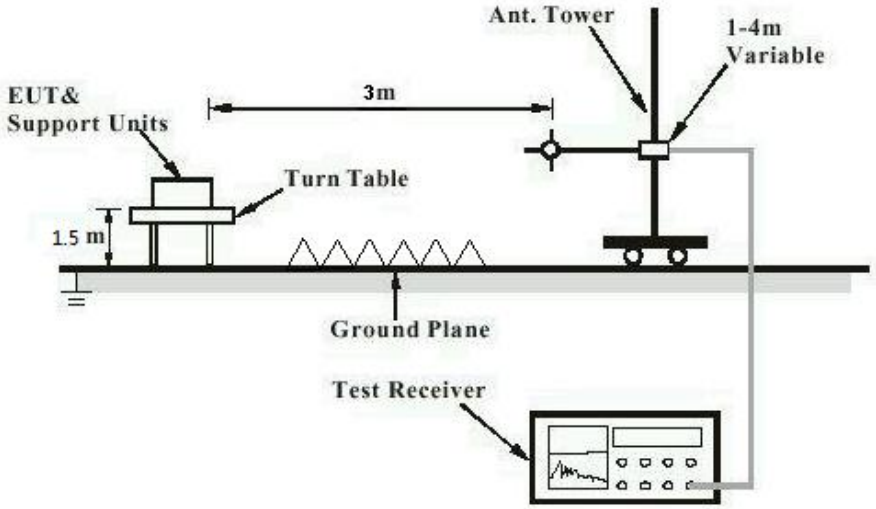


Diagram of Measurement Configuration for Mains Conduction Measurement

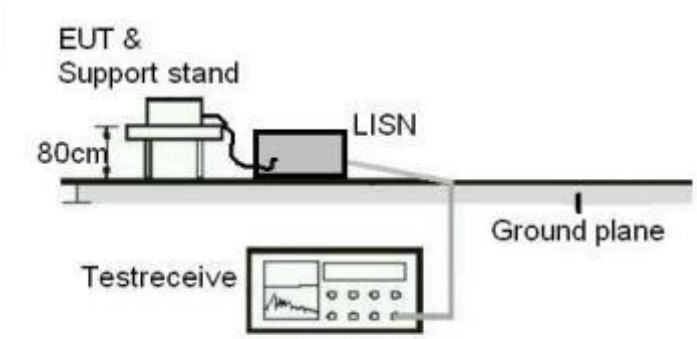
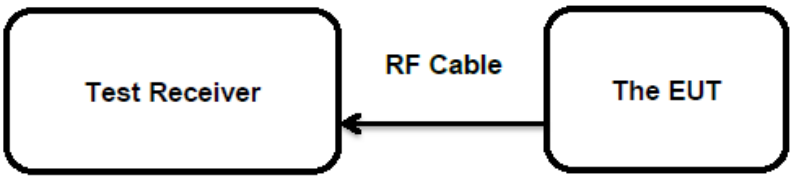


Diagram of Measurement Configuration for Conducted Transmitter Measurement



5 Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.203 RSS-Gen Section 6.8

According to the manufacturer declared, the EUT has a Chip antenna, the gain of antenna is 1.05 dBi, which that 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 Field strength of fundamental and harmonics

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.249(a) (d) (e) RSS-210 Section B.10
Basic standard	:	ANSI C63.10: 2013
Limits	:	FCC Part 15.249(a) (d) (e) & 15.209(a) RSS-210 Section B.10 (a) & (b) RSS-Gen Section 8.9
Kind of test site	:	3m Semi-anechoic Chamber

Test Setup

Date of testing	:	2022-09-14
Input voltage	:	Internal battery operated
Operation mode	:	A
Test channel	:	Low / Middle / High
Ambient temperature	:	Refer to test result
Relative humidity	:	Refer to test result
Atmospheric pressure	:	101 kPa

Note: Testing was carried out within frequency range 9kHz to the tenth harmonics. Only the worst case spurious emissions configuration of the each mode were reported.

For the measurement records, refer to the appendix B.

5.1.3 20dB and 99% Bandwidth

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.215 RSS-Gen Section 6.7
Basic standard	:	ANSI C63.10: 2013
Limits	:	Within assigned band
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	2022-09-09
Input voltage	:	Internal battery operated
Operation mode	:	A
Test channel	:	Low / Middle / High
Ambient temperature	:	24.2 ℃
Relative humidity	:	53 %
Atmospheric pressure	:	101 kPa

For the measurement records, refer to the appendix B.

5.1.4 Band Edge

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.249(a) (d) (e) & 15.209 & 15.205 RSS-210 Section B.10 (a) & (b) RSS-Gen Section 8.9 & 8.10
Basic standard	:	ANSI C63.10: 2013
Limits	:	FCC Part 15.249(a) (d) (e) & 15.209 & 15.205 RSS-Gen Table 5 & 7
Kind of test site	:	3m Semi-anechoic Chamber

Test Setup

Date of testing	:	2022-09-14
Input voltage	:	Internal battery operated
Operation mode	:	A
Test channel	:	Low / Middle / High
Ambient temperature	:	Refer to test result
Relative humidity	:	Refer to test result
Atmospheric pressure	:	101 kPa

For the measurement records, refer to the appendix B.

5.1.5 Conducted Emission on AC Mains

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.207(a) RSS-Gen Section 8.8
Basic standard	:	ANSI C63.10: 2013
Frequency range	:	0.15 – 30MHz
Limits	:	FCC Part 15.207(a) RSS-Gen Table 4
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	2022-09-06
Input voltage	:	Charging by PC USB Port (PC input voltage 120Vac, 60Hz)
Operation mode	:	B
Earthing	:	Not connected
Ambient temperature	:	24.3 ℃
Relative humidity	:	52.8 %
Atmospheric pressure	:	101 kPa

For the measurement records, refer to the appendix B.

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.....8
Table 3: Test environments.....10
Table 4: Test channel and frequency of 2.4GHz.....10
Table 5: Auxiliary Equipment Used during Test.....10