



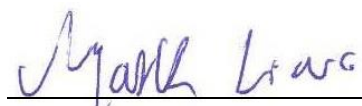
Radio Frequency Exposure

Applicant : Micro-Star Int'l Co., Ltd.
Address : No.69, Lide St., Zhonghe Dist.,
New Taipei City 235 Taiwan
Equipment : Wireless Mouse
Model No. : MS-8ZBC
Trade Name : msi
FCC ID : I4L-MS-8ZBC

I HEREBY CERTIFY THAT :

The sample was received on Sep. 04, 2024 and the testing was completed on Sep. 16, 2024 at CerpPASS Technology Corp. The test result refers exclusively to the test presented test model / sample. Without written approval of CerpPASS Technology Corp., the test report shall not be reproduced except in full.

Approved by:


Mark Liao / Supervisor

Laboratory Accreditation:

CerpPASS Technology Corporation Test Laboratory





CONTENTS

- 1. Summary of Test Procedure and Test Results 4
 - 1.1. Applicable Standards 4
- 2. Test Configuration of Equipment under Test 5
 - 2.1. Feature of Equipment under Test..... 5
 - 2.2. General Information of Test 6
 - 2.3. Measurement Uncertainty 6
- 3. Test Equipment and Ancillaries Used for Tests 7
- 4. Radio Frequency Exposure 8
 - 4.1. Applicable Standards 8
 - 4.2. EUT Specification 9
 - 4.3. Test Result..... 9



History of this test report

Report No.	Issued Date	Description
24090067-TRFCC03	Oct. 09, 2024	Original



1. Summary of Test Procedure and Test Results

1.1. Applicable Standards

FCC Rules and Regulations Part 2.1091

FCC Rule	Description of Test	Result
2.1091	Radio Frequency Exposure	PASS

*The lab has reduced the uncertainty risk factor from test equipment, environment and staff technicians which according to the standard on contract. Therefore, the test result will only be determined by standard requirement, measurement uncertainty evaluation is not considered.



2. Test Configuration of Equipment under Test

2.1. Feature of Equipment under Test

Operation Frequency Range	2400MHz-2483.5MHz
Center Frequency Range	SRD: 2403MHz-2477MHz BLE: 2402MHz-2480MHz
Modulation Type	SRD: GFSK BLE: GFSK
Modulation Technology	SRD: DTS BLE: DTS
Data Rate	SRD: GFSK: 1Mbps BLE: GFSK: 1Mbps
Antenna Type	PCB Antenna
Antenna Gain	1.43 dBi
Battery	Shenzhen Heng xun Energy Technology Co., Ltd. \ HX 582728
USB Cable	msi \ VERSA 300 ELITE USB Cable

Note: For more details, please refer to the User's manual of the EUT.



2.2. General Information of Test

☒ Test Site	CerpPASS Technology Corporation Test Laboratory Address: No.10, Ln. 2, Lianfu St., Luzhu Dist., Taoyuan City 33848, Taiwan (R.O.C.) Tel: +886-3-3226-888 Fax: +886-3-3226-881	
	FCC	TW1439, TW1079
	IC	4934E-1, 4934E-2
Frequency Range Investigated	Conducted: from 150kHz to 30 MHz Radiation: from 9 kHz to 25,000MHz	
Test Distance	The test distance of radiated emission from antenna to EUT is 3 M.	

Test Item	Test Site	Test period	Environmental Conditions	Tested By
RF Conducted	RFCON01-NK	2024/09/15	26.5°C / 47%	Leon Huang
RF Conducted	RFCON01-NK	2024/09/16	26.9°C / 45%	Leon Huang

2.3. Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))

Measurement Item	Uncertainty
AC Power Line Conduction(150K~30MHz)	±3.12dB
Radiated Spurious Emission(9KHz~30MHz)	±3.5dB
Radiated Spurious Emission(30MHz~1GHz)	±5.1dB
Radiated Spurious Emission(1GHz~40GHz)	±5.2dB
Conducted Spurious Emission	±2.1dB
6dB Bandwidth	±5.4%
20dB Bandwidth	±4.4%
Occupied Bandwidth	±4.5%
Peak Output Power(Conducted Power Meter)	±1.1dB
Dwell Time / Deactivation Time	±7.6%
Power Spectral Density	±2.0dB
Duty Cycle	±3.5%



3. Test Equipment and Ancillaries Used for Tests

Test Item	RF Conducted				
Test Site	RFCON01-NK				
Instrument	Manufacturer	Model No	Serial No	Calibration Date	Valid Date
CAX Signal Analyzer	KEYSIGHT	N9000B	MY57100339	2023/11/06	2024/11/05
Power Meter	Anritsu	ML2495A	1224005	2024/02/17	2025/02/16
Power Sensor	Anritsu	MA2411B	1207295	2024/02/17	2025/02/16
Attenuator	KEYSIGHT	8491B	MY39250703	2024/02/20	2025/02/19



4. Radio Frequency Exposure

4.1. Applicable Standards

<input type="checkbox"/> §1.1307(b)(3)(i)(A)	The available maximum time-averaged power is no more than 1 mW, regardless of separation distance.																																																	
<input type="checkbox"/> §1.1307(b)(3)(i)(c)	<p>ERP is below a threshold calculated based on the distance , R between the person and the antenna / radiating structure, where $R > \lambda / 2 \pi$.</p> <p>TABLE B.1—THRESHOLDS FOR SINGLE RF SOURCES SUBJECT TO ROUTINE ENVIRONMENTAL EVALUATION</p> <table border="1" data-bbox="564 607 1267 898"> <thead> <tr> <th colspan="3">RF Source Frequency</th> <th colspan="3">Minimum Distance</th> <th>Threshold ERP</th> </tr> <tr> <th>f_L MHz</th> <th></th> <th>f_H MHz</th> <th>$\lambda_L / 2\pi$</th> <th></th> <th>$\lambda_H / 2\pi$</th> <th>W</th> </tr> </thead> <tbody> <tr> <td>0.3</td> <td>–</td> <td>1.34</td> <td>159 m</td> <td>–</td> <td>35.6 m</td> <td>$1,920 R^2$</td> </tr> <tr> <td>1.34</td> <td>–</td> <td>30</td> <td>35.6 m</td> <td>–</td> <td>1.6 m</td> <td>$3,450 R^2/f^2$</td> </tr> <tr> <td>30</td> <td>–</td> <td>300</td> <td>1.6 m</td> <td>–</td> <td>159 mm</td> <td>$3.83 R^2$</td> </tr> <tr> <td>300</td> <td>–</td> <td>1,500</td> <td>159 mm</td> <td>–</td> <td>31.8 mm</td> <td>$0.0128 R^2f$</td> </tr> <tr> <td>1,500</td> <td>–</td> <td>100,000</td> <td>31.8 mm</td> <td>–</td> <td>0.5 mm</td> <td>$19.2R^2$</td> </tr> </tbody> </table> <p>Subscripts L and H are low and high; λ is wavelength. From § 1.1307(b)(3)(i)(C), modified by adding Minimum Distance columns.</p>	RF Source Frequency			Minimum Distance			Threshold ERP	f_L MHz		f_H MHz	$\lambda_L / 2\pi$		$\lambda_H / 2\pi$	W	0.3	–	1.34	159 m	–	35.6 m	$1,920 R^2$	1.34	–	30	35.6 m	–	1.6 m	$3,450 R^2/f^2$	30	–	300	1.6 m	–	159 mm	$3.83 R^2$	300	–	1,500	159 mm	–	31.8 mm	$0.0128 R^2f$	1,500	–	100,000	31.8 mm	–	0.5 mm	$19.2R^2$
RF Source Frequency			Minimum Distance			Threshold ERP																																												
f_L MHz		f_H MHz	$\lambda_L / 2\pi$		$\lambda_H / 2\pi$	W																																												
0.3	–	1.34	159 m	–	35.6 m	$1,920 R^2$																																												
1.34	–	30	35.6 m	–	1.6 m	$3,450 R^2/f^2$																																												
30	–	300	1.6 m	–	159 mm	$3.83 R^2$																																												
300	–	1,500	159 mm	–	31.8 mm	$0.0128 R^2f$																																												
1,500	–	100,000	31.8 mm	–	0.5 mm	$19.2R^2$																																												
<input checked="" type="checkbox"/> § 1.1307(b)(3)(i)(B).	<p>Device operates between 300 MHz and 6 GHz and the maximum time-averaged power or effective radiated power (ERP), whichever is greater, $\leq P_{th}$</p> $P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$ <p>Where</p> $x = -\log_{10} \left(\frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right) \text{ and } f \text{ is in GHz;}$ <p>and</p> $ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases}$ <p>d = the separation distance (cm);</p>																																																	



4.2. EUT Specification

Frequency band (Operating)	<input type="checkbox"/> WLAN: 2412MHz ~ 2462MHz <input type="checkbox"/> WLAN: 5150MHz ~ 5250MHz <input type="checkbox"/> WLAN: 5250MHz ~ 5350MHz <input type="checkbox"/> WLAN: 5470MHz ~ 5725MHz <input type="checkbox"/> WLAN: 5725MHz ~ 5850MHz <input checked="" type="checkbox"/> SRD: 2403MHz ~ 2477MHz <input checked="" type="checkbox"/> BLE: 2402MHz ~ 2480MHz
Device category	<input checked="" type="checkbox"/> Portable (<20cm separation) <input type="checkbox"/> Mobile (>20cm separation)
Antenna diversity	<input checked="" type="checkbox"/> Single antenna <input type="checkbox"/> Multiple antennas <input type="checkbox"/> Tx diversity <input type="checkbox"/> Rx diversity <input type="checkbox"/> Tx/Rx diversity
Evaluation applied	<input type="checkbox"/> Blanket 1 mW Blanket Exemption <input checked="" type="checkbox"/> MPE-based Exemption <input type="checkbox"/> SAR-based Exemption
Remark:	
SRD: The maximum conducted output power is <u>3.81dBm (2.404mW)</u> at <u>2477MHz</u> (with <u>1.43dBi antenna gain.</u>)	
BLE: The maximum conducted output power is <u>3.75dBm (2.371mW)</u> at <u>2480MHz</u> (with <u>1.43dBi antenna gain.</u>)	

4.3. Test Result

SRD									
CH Freq. (MHz)	Max. Conducted output power (dBm)	Max. Tune up power (dBm)	Max. Tune up power (mW)	ANT Gain (dBi)	Max. Tune up e.i.r.p. Power (dBm)	Max. Tune up e.r.p. Power (dBm)	Max. Tune up e.r.p. Power (mW)	Distance (mm)	SAR test exclusion thresholds (mW)
2403-2477	3.81	4.31	2.70	1.43	5.74	3.59	2.29	5	2.72

BLE									
CH Freq. (MHz)	Max. Conducted output power (dBm)	Max. Tune up power (dBm)	Max. Tune up power (mW)	ANT Gain (dBi)	Max. Tune up e.i.r.p. Power (dBm)	Max. Tune up e.r.p. Power (dBm)	Max. Tune up e.r.p. Power (mW)	Distance (mm)	SAR test exclusion thresholds (mW)
2402-2480	3.75	4.25	2.66	1.43	5.68	3.53	2.25	5	2.72

No non-compliance noted.

-----THE END OF REPORT-----