

# **FCC Test Report**

Report No.: AGC00803220801FE03

FCC ID : 2AKHJ-MW179

**APPLICATION PURPOSE** : Original Equipment

**PRODUCT DESIGNATION**: Wireless Mouse

**BRAND NAME** : N/A

**MODEL NAME** : MW179, MW179-T01, MW179-T02, MW179-T03, MW179-T04, MW179-T05, MW179-T06, M801

**APPLICANT**: Shenzhen Hangshi Technology Co., Ltd

**DATE OF ISSUE** : Aug. 20, 2022

STANDARD(S)

TEST PROCEDURE(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	/	Aug. 20, 2022	Valid	Initial Release

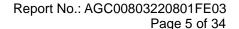


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## 1. VERIFICATION OF CONFORMITY

Applicant	Shenzhen Hangshi Technology Co., Ltd	
Address	Hangshi Technology Park, Democracy West Industry Area, Shajing Town, Bao'an District, Shenzhen, China	
Manufacturer	Shenzhen Hangshi Technology Co., Ltd	
Address	Hangshi Technology Park, Democracy West Industry Area, Shajing Town, Bao'an District, Shenzhen, China	
Factory	Shenzhen Hangshi Technology Co., Ltd	
Address	Hangshi Technology Park, Democracy West Industry Area, Shajing Town, Bao'an District, Shenzhen, China	
Product Designation Wireless Mouse		
Brand Name	lame N/A	
Test Model MW179		
Series Model MW179-T01, MW179-T02, MW179-T03, MW179-T04, MW179-T05, MW M801		
Difference description All the series models are the same as the test model except for the model		
Date of test	Aug. 05, 2022 to Aug. 20, 2022	
Deviation	No any deviation from the test method	
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 C63.10 (2013) 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 15.249.

Alan Duan
(Project Engineer)

Reviewed By

Calvin Liu
(Reviewer)

Aug. 20, 2022

Approved By

Max Zhang
(Authorized Officer)

Aug. 20, 2022



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## 2. GENERAL INFORMATION

# 2.1. PRODUCT DESCRIPTION

A major technical description of EUT is described as following

Operation Frequency	2405 MHz to 2475 MHz
Maximum field strength	76.10dBuV/m(average)@3m
Modulation	GFSK
Number of channels 8	
Antenna Gain -1.2dBi	
Antenna Designation PCB Antenna (Met 15.203 Antenna requirement)	
Hardware Version V01	
Software Version V02	
Power Supply DC 3.7V by battery or DC 5V by adapter	



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#### 2.2. TABLE OF CARRIER FREQUENCY

Channel Number	Frequency (MHz)
1	2405
2	2411
3	2417
4	2451
5	2457
6	2463
7	2469
8	2475



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## 3. MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement y ±U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

- Uncertainty of Conducted Emission, Uc = ±3.2 dB
- Uncertainty of Radiated Emission below 1GHz, Uc = ±3.9 dB
- Uncertainty of Radiated Emission above 1GHz, Uc = ±4.8 dB
- Uncertainty of Occupied Channel Bandwidth: Uc = ±2 %



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# 4. DESCRIPTION OF TEST MODES

NO.	TEST MODE DESCRIPTION
1	Low channel GFSK
2	Middle channel GFSK
3	High channel GFSK

#### Note:

- 1. Only the result of the worst case was recorded in the report, if no other cases.
- 2. For Radiated Emission, 3axis were chosen for testing for each applicable mode.
- 3. The EUT adjusts the frequency through the button.



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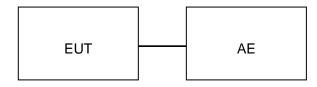
## 5. SYSTEM TEST CONFIGURATION

## **5.1. CONFIGURATION OF EUT SYSTEM**

Radiated Emission Configure:



Conducted Emission Configure:



#### **5.2 EQUIPMENT USED IN TESTED SYSTEM**

Item	Equipment	Model No.	ID or Specification	Remark
1	Wireless Mouse	MW179	2AKHJ-MW179	EUT
2	Huawei Notebook PC	D15	N/A	AE
3	Adapter	HW-200325CP0	N/A	AE

## **5.3. SUMMARY OF TEST RESULTS**

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.249&15.209	Radiated Emission	Compliant
§15.249	Band Edges	Compliant
§15.215	20dB bandwidth	Compliant
§15.207	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	Mar. 28, 2022	Mar. 27, 2023
LISN	R&S	ESH2-Z5	100086	Jun. 08, 2022	Jun. 07, 2023

## TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	Mar. 28, 2022	Mar. 27, 2023
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Nov. 17, 2021	Nov. 16, 2022
2.4GHz Fliter	EM Electronics	2400-2500MHz	N/A	Mar. 23, 2022	Mar. 22, 2024
Attenuator	ZHINAN	E-002	N/A	Sep. 03, 2020	Sep. 02, 2022
Horn antenna	SCHWARZBECK	BBHA 9170	#768	Oct. 31, 2021	Oct. 30, 2023
Active loop antenna (9K-30MHz)	ZHINAN	ZN30900C	18051	Mar. 12, 2022	Mar. 11, 2024
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	Apr. 23, 2021	Apr. 22, 2023
Broadband Preamplifier	ETS LINDGREN	3117PA	00225134	Sep. 03, 2020	Sep. 02, 2022
ANTENNA	SCHWARZBECK	VULB9168	494	Jan. 08, 2021	Jan. 07, 2023



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## 7. RADIATED EMISSION

#### 7.1TEST LIMIT

#### Standard FCC15.249

Fundamental Frequency	Field Strength of Fundamental	Field Strength of Harmonics	
	(millivolts/meter)	(microvolts/meter)	
900-928MHz	50	500	
2400-2483.5MHz	50	500	
5725-5875MHz	50	500	
24.0-24.25GHz	250	2500	

#### Standard FCC 15.209

Frequency	Distance	Field Strengths Limit			
(MHz)	Meters	μ <b>V/m</b>	dB(μV)/m		
0.009 ~ 0.490	300	2400/F(kHz)			
0.490 ~ 1.705	30	24000/F(kHz)			
1.705 ~ 30	30	30			
30 ~ 88	3	100	40.0		
88 ~ 216	3	150	43.5		
216 ~ 960	3	200	46.0		
960 ~ 1000	3	500	54.0		
Above 1000	3	Other:74.0 dB(μV)/m (Peak) 54.0 dB(μV)/m (Average)			

Remark:

- (1) Emission level dB  $\mu$  V = 20 log Emission level  $\mu$  V/m
- (2) The smaller limit shall apply at the cross point between two frequency bands.
- (3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.



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#### 7.2. MEASUREMENT PROCEDURE

- 1. The EUT was placed on the top of the turntable 0.8 or 1.5 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 above 1GHz, use minimum resolution bandwidth of 1 MHz. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
- 7. 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.
- 8.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.
- 9. 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.
- 10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High Low scan is not required in this case.



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

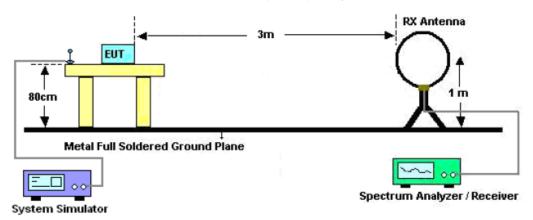
Spectrum Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP
	1GHz~26.5GHz
Start ~Stop Frequency	RBW 2.4MHz/ VBW 8MHz for Peak,
	RBW 2.4MHz/10Hz for Average

Receiver Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP

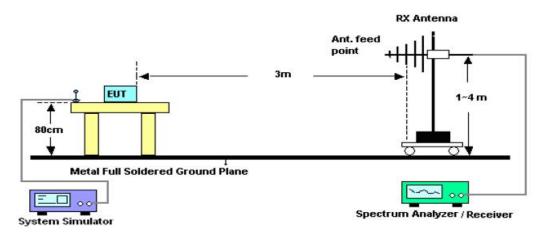


#### 7.3. TEST SETUP

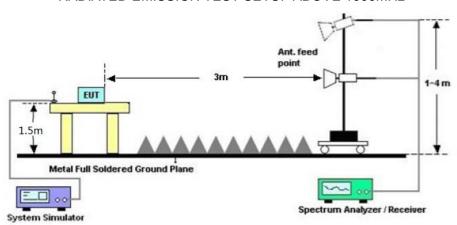
## Radiated Emission Test-Setup Frequency Below 30MHz



#### RADIATED EMISSION TEST SETUP 30MHz-1000MHz



## RADIATED EMISSION TEST SETUP ABOVE 1000MHz





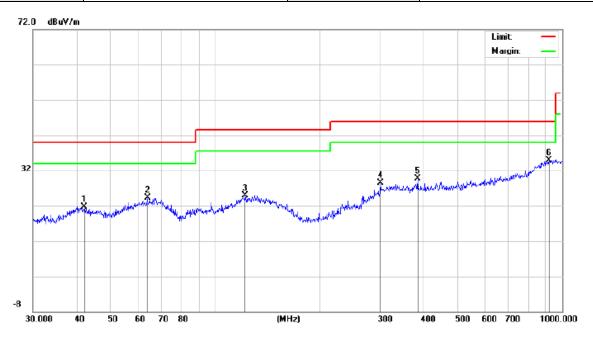
#### 7.4. TEST RESULT

## **RADIATED EMISSION BELOW 30MHZ**

No emission found between lowest internal used/generated frequencies to 30MHz.

#### **RADIATED EMISSION 30MHz-1GHZ**

EUT:	Wireless Mouse	Model Name. :	MW179
Temperature:	20℃	Relative Humidity:	55%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
Test Mode :	Mode 1	Polarization :	Horizontal



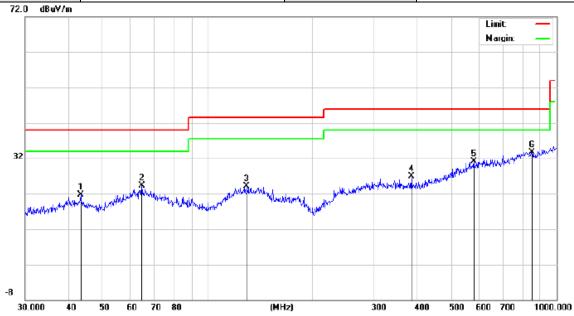
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		42.1542	4.96	16.80	21.76	40.00	-18.24	peak
2		63.9827	5.62	18.73	24.35	40.00	-15.65	peak
3		122.4039	4.95	19.93	24.88	43.50	-18.62	peak
4		300.3672	5.98	22.44	28.42	46.00	-17.58	peak
5		383.9318	7.05	22.64	29.69	46.00	-16.31	peak
6	*	916.0687	5.08	29.88	34.96	46.00	-11.04	peak

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Tel: +86-755 2523 4088 E-mail: agc@agccert.com Web: http://www.agccert.com/



EUT:	Wireless Mouse	Model Name. :	MW179
Temperature:	20℃	Relative Humidity:	55%
Pressure:	1010 hPa	Test Voltage :	DC 3.7V
Test Mode :	Mode 1	Polarization :	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB	dBuV/m	dBuV/m	dB	Detector
1		43.2017	6.17	15.54	21.71	40.00	-18.29	peak
2		64.6594	6.31	17.98	24.29	40.00	-15.71	peak
3		129.4677	5.10	19.09	24.19	43.50	-19.31	peak
4		383.9318	6.80	20.06	26.86	46.00	-19.14	peak
5		578.6699	5.76	25.32	31.08	46.00	-14.92	peak
6	*	851.0353	5.26	28.53	33.79	46.00	-12.21	peak

## **RESULT: PASS**

## Note:

Factor=Antenna Factor + Cable loss, Over=Measurement-Limit.

The "Factor" value can be calculated automatically by software of measurement system.



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## FIELD STRENGTH OF FUNDAMENTAL

EUT:	Wireless Mouse	Model Name. :	MW179
Temperature:	23.5℃	Relative Humidity:	55%
Pressure:	1010 hPa	Test Voltage :	DC 3.7V
Test Modulation :	GFSK	Polarization :	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type	
2405	86.66	-9.61	77.05	114.00	-36.95	peak	
2405	84.60	-9.61	74.99	94.00	-19.01	AVG	
2451	85.96	-9.61	76.35	114.00	-37.65	peak	
2451	74.18	-9.61	64.57	94.00	-29.43	AVG	
2475	84.80	-9.61	75.19	114.00	-38.81	peak	
2475 82.71 -9.61 73.10 94.00 -20.90 AVG							
Remark:							
Factor = Ante	Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT:	Wireless Mouse	Model Name. :	MW179
Temperature:	23.5℃	Relative Humidity:	55%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
Test Modulation :	GFSK	Polarization :	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type	
2405	87.76	-9.61	78.15	114.00	-35.85	peak	
2405	85.71	-9.61	76.10	94.00	-17.90	AVG	
2451	79.24	-9.61	69.63	114.00	-44.37	peak	
2451	71.36	-9.61	61.75	94.00	-32.25	AVG	
2475	84.19	-9.61	74.58	114.00	-39.42	peak	
2475 82.17 -9.61 72.56 94.00 -21.44 AVG							
Remark:							
Factor = Ante	Factor = Antenna Factor + Cable Loss – Pre-amplifier.						



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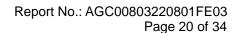
#### **RADIATED EMISSION ABOVE 1GHZ**

EUT:	Wireless Mouse	Model Name. :	MW179
Temperature:	23.5℃	Relative Humidity:	55%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
Test Mode :	Mode 1	Polarization :	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4810	48.65	3.76	52.41	74.00	-21.59	peak
4810	43.57	3.76	47.33	54.00	-6.67	AVG
7215	42.58	8.17	50.75	74.00	-23.25	peak
7215 38.69 8.17 46.86 54.00 -7.14 AVG						
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT:	Wireless Mouse	Model Name. :	MW179
Temperature:	23.5℃	Relative Humidity:	55%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
Test Mode :	Mode 1	Polarization :	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4810	47.96	3.76	51.72	74.00	-22.28	peak
4810	43.84	3.76	47.60	54.00	-6.40	AVG
7215	42.15	8.17	50.32	74.00	-23.68	peak
7215	37.57	8.17	45.74	54.00	-8.26	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						



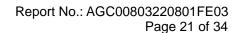


EUT:	Wireless Mouse	Model Name. :	MW179
Temperature:	23.5℃	Relative Humidity:	55%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
Test Mode :	Mode 2	Polarization:	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4902	47.16	3.78	50.94	74.00	-23.06	peak
4902	43.59	3.78	47.37	54.00	-6.63	AVG
7353	43.84	8.23	52.07	74.00	-21.93	peak
7353 39.68 8.23 47.91 54.00 -6.09 AVG						
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT:	Wireless Mouse	Model Name. :	MW179
Temperature:	23.5℃	Relative Humidity:	55%
Pressure:	1010 hPa	Test Voltage :	DC 3.7V
Test Mode :	Mode 2	Polarization:	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Value Type
4902	48.93	3.78	52.71	74.00	-21.29	peak
4902	42.64	3.78	46.42	54.00	-7.58	AVG
7353	44.18	8.23	52.41	74.00	-21.59	peak
7353 39.92 8.23 48.15 54.00 -5.85 AVG						
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						





EUT:	Wireless Mouse	Model Name. :	MW179
Temperature:	23.5℃	Relative Humidity:	55%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
Test Mode :	Mode 3	Polarization :	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4950	47.88	3.81	51.69	74.00	-22.31	peak
4950	44.24	3.81	48.05	54.00	-5.95	AVG
7425	42.16	8.27	50.43	74.00	-23.57	peak
7425 38.67 8.27 46.94 54.00 -7.06 AVG						
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT:	Wireless Mouse	Model Name. :	MW179
Temperature:	23.5℃	Relative Humidity:	55%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
Test Mode :	Mode 3	Polarization:	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	value Type
4950	48.67	3.81	52.48	74.00	-21.52	peak
4950	43.16	3.81	46.97	54.00	-7.03	AVG
7425	44.53	8.27	52.80	74.00	-21.20	peak
7425 40.28 8.27 48.55 54.00 -5.45 AVG						
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

**Note:** Other emissions from 8G to 25 GHz are considered as ambient noise. No recording in the test report. Factor=Antenna Factor + Cable loss - Amplifier gain, Margin=Level-Limit.

The "Factor" value can be calculated automatically by software of measurement system.



## 8. BAND EDGE EMISSION

#### **8.1TEST LIMIT**

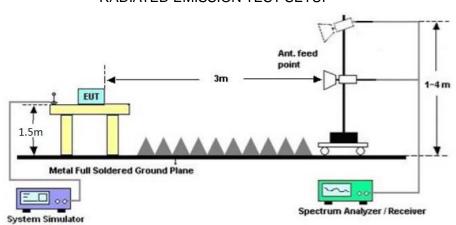
	Limit of the Field Strength (dBμV/m)			
Frequency Band	Peak	Average		
f≤2390MHz	74	54		
f≥2483.5MHz	74	54		

#### **8.2. MEASUREMENT PROCEDURE**

- 1. The EUT operates at transmitting mode. The operate channel is tested to verify the largest transmission and spurious emissions power at the continuous transmission mode.
- 2. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission: (a) PEAK: RBW=1MHz, VBW=3MHz / Sweep=AUTO
- (b) AVERAGE: RBW=1MHz; VBW=1/on time(1KHz) / Sweep=AUTO
- 3. Other procedures refer to clause 7.2.

#### 8.3 TEST SETUP

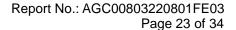
#### RADIATED EMISSION TEST SETUP



#### **8.4 TEST RESULT**

#### Note:

- 1. Factor=Antenna Factor + Cable loss Amplifier gain. Field Strength=Factor + Reading level
- 2. The factor had been edited in the "Input Correction" of the Spectrum Analyzer. So the Amplitude of test plots is equal to Reading level plus the Factor in dB. Use the A dB( $\mu$ V) to represent the Amplitude. Use the F dB( $\mu$ V/m) to represent the Field Strength. So A=F.

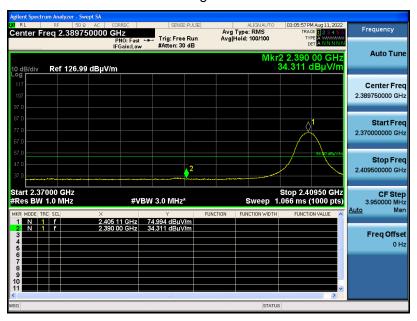




EUT:	Wireless Mouse	Model Name. :	MW179
Temperature:	23.5℃	Relative Humidity:	55%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
Test Mode :	Mode 1	Polarization :	Horizontal

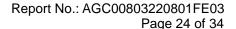


## Average Value



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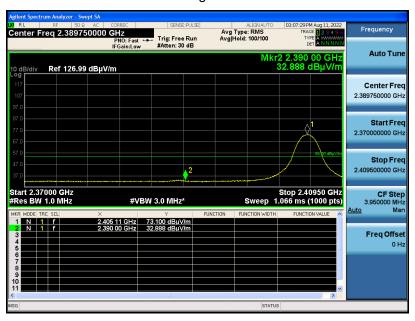


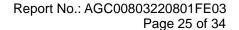


EUT:	Wireless Mouse	Model Name. :	MW179
Temperature:	23.5℃	Relative Humidity:	55%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
Test Mode :	Mode 1	Polarization :	Vertical



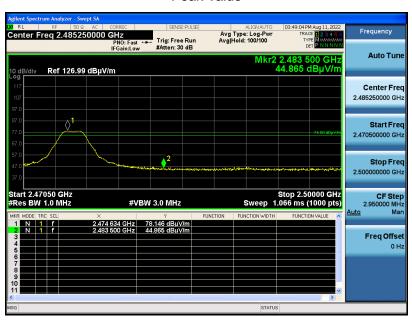
## Average Value



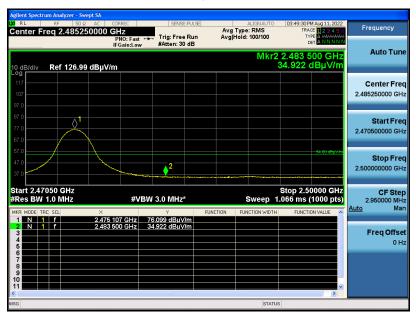




EUT:	Wireless Mouse	Model Name. :	MW179
Temperature:	23.5℃	Relative Humidity:	55%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
Test Mode :	Mode 3	Polarization :	Horizontal



## Average Value



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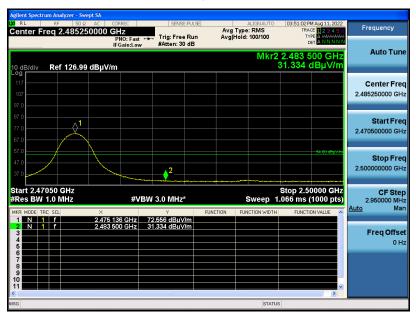
Tel: +86-755 2523 4088 E-mail: agc@agccert.com Web: http://www.agccert.com/

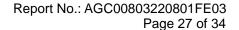


EUT:	Wireless Mouse	Model Name. :	MW179
Temperature:	23.5℃	Relative Humidity:	55%
Pressure :	1010 hPa	Test Voltage :	DC 3.7V
Test Mode :	Mode 3	Polarization :	Vertical



## Average Value





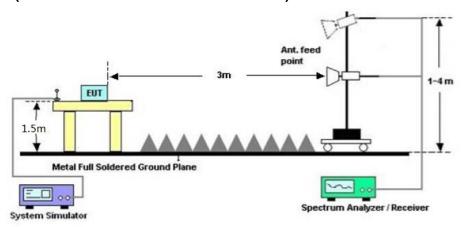


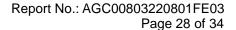
## 9. 20DB BANDWIDTH

## 9.1. MEASUREMENT PROCEDURE

- 1. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
- 2. Set SPA Centre Frequency = Operation Frequency, RBW= 100 KHz, VBW ≥ 3×RBW.
- 3. Set SPA Trace 1 Max hold, then View.

# 9.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)





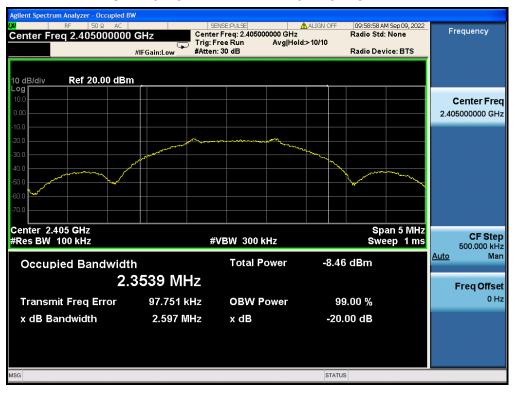


#### 9.3. MEASUREMENT RESULTS

TEST ITEM	20DB BANDWIDTH
TEST MODULATION	GFSK

Test Data (MHz)	Criteria	
Low Channel	2.597	PASS
Middle Channel	2.601	PASS
High Channel	2.603	PASS

#### TEST PLOT OF BANDWIDTH FOR LOW CHANNEL





#### TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



#### TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL





## 10. FCC LINE CONDUCTED EMISSION TEST

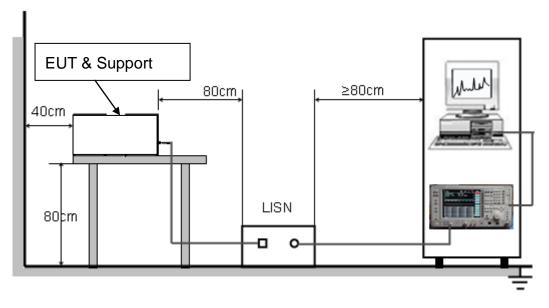
## 10.1. LIMITS OF LINE CONDUCTED EMISSION TEST

Francisco	Maximum RF Line Voltage				
Frequency	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 0.50MHz.

## 10.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST





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#### 10.3. 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 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 C63.10 (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 C63.10.
- 3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
- 4. All support equipments received AC120VV/60Hz power from a LISN, if any.
- 5. The EUT received charging voltage by adapter which received 120V/60Hzpower 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.

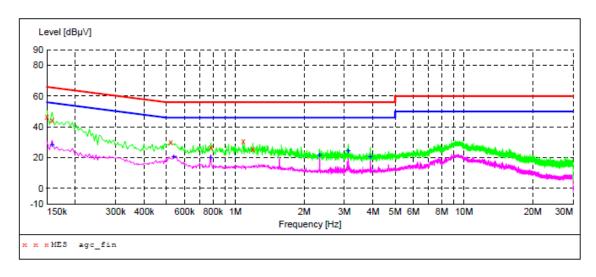
## 10.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

- 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.



#### 10.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

# Line Conducted Emission Test Line 1-L



## MEASUREMENT RESULT: "agc fin"

2	0	2	2	/	8	/	1	5			2	1	:	1	7		
			_		_	_		_	_	_	_					-	

Fr	equency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0	.150000	46.70	6.9	66	19.3	QP	L1
0	.158000	44.10	6.8	66	21.5	QP	L1
0	.522000	29.90	5.4	56	26.1	QP	L1
0	.782000	26.50	5.4	56	30.5	QP	L1
1	.082000	30.40	5.5	56	25.6	QP	L1
1	.194000	25.60	5.7	56	30.4	QP	L1

# MEASUREMENT RESULT: "agc fin2"

2022/8/15 21:16

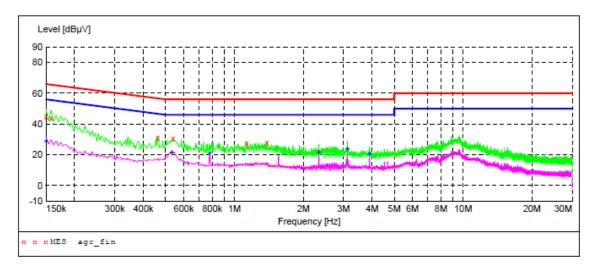
2022/0/13 21	.10					
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.158000	28.30	6.8	56	27.3	AV	L1
0.538000	20.60	5.4	46	25.4	AV	L1
0.782000	20.40	5.4	46	25.6	AV	L1
2.338000	21.60	6.5	46	24.4	AV	L1
3.118000	24.40	6.5	46	21.6	AV	L1
3.898000	20.60	6.5	46	25.4	AV	L1

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## Line Conducted Emission Test Line 2-N



# MEASUREMENT RESULT: "agc\_fin"

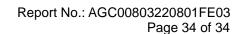
20	22/8/15 21: Frequency MHz		Transd dB	Limit dBµV	Margin dB	Detector	Line
	0.150000	44.90	6.9	66		QP	N
	0.158000	43.90	6.8	66	21.7	QP	N
	0.462000	31.00	5.5	57		QP	N
	0.538000	30.50	5.4	56	25.5	QP	N
	1.126000	27.30	5.6	56	28.7	QP	N
	1.386000	27.80	5.9	56	28.2	QP	N

## MEASUREMENT RESULT: "agc fin2"

2022/8/15 21:21											
-	cy Level Hz dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line					
0.1500	00 29.10	6.9	56	26.9	AV	N					
0.5340	00 21.70	5.4	46	24.3	AV	N					
0.7780	00 21.20	5.4	46	24.8	AV	N					
2.3380	00 21.70	6.5	46	24.3	AV	N					
3.1180	00 23.80	6.5	46	22.2	AV	N					
3.8980	00 20.60	6.5	46	25.4	AV	N					

#### **RESULT: PASS**

All test modes had been pre-tested. The mode 1 is the worst case and recorded in the report.





## APPENDIX A: PHOTOGRAPHS OF TEST SETUP

Refer to the Report No.: AGC00803220801AP02

APPENDIX B: PHOTOGRAPHS OF THE EUT

Refer to the Report No.: AGC00803220801AP03

----END OF REPORT----



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