FCC Test Report

Report No.: AGC00803231005FR03

FCC ID	:	2AKHJ-MD360
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	Wireless Mouse
BRAND NAME	:	N/A
MODEL NAME	:	MD360
CLIENT	:	Shenzhen Hangshi Electronic Technology Co., Ltd
DATE OF ISSUE	:	Nov. 23, 2023
STANDARD(S)	:	FCC Part 15 Subpart C Section 15.249
REPORT VERSION	:	V1.0

*A*ttestation of *G*lobal Compliance (Shenzhen) Co., Ltd

Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Nov. 23, 2023	Valid	Initial release

TABLE OF CONTENTS

1. VERIFICATION OF CONFORMITY

Applicant	Shenzhen Hangshi Electronic Technology Co., Ltd
Address	2nd Floor, A1 Building, G Area, Democracy West Industry Area, Shajing Town, Bao'an District, Shenzhen, China.
Manufacturer	Shenzhen Hangshi Electronic Technology Co., Ltd
Address	2nd Floor, A1 Building, G Area, Democracy West Industry Area, Shajing Town, Bao'an District, Shenzhen, China.
Factory	Shenzhen Hangshi Electronic Technology Co., Ltd
Address	2nd Floor, A1 Building, G Area, Democracy West Industry Area, Shajing Town, Bao'an District, Shenzhen, China.
Product Designation	Wireless Mouse
Brand Name	N/A
Test Model	MD360
Series Model	N/A
Declaration of Difference	N/A
Date of receipt of test item	Oct. 24, 2023
Date of test	Oct. 24, 2023 - Nov. 23, 2023
Deviation	None
Condition of Test Sample	Normal
Test Result	Pass
Report Template	AGCRT-US-BR/RF

Note: The test results of this report relate only to the tested sample identified in this report.

Prepared By	Cool Cheng (Project Engineer)	Nov. 23, 2023
Reviewed By	Calvin Liu (Reviewer)	Nov. 23, 2023
Approved By	Max Zhang (Authorized Officer)	Nov. 23, 2023

2. GENERAL INFORMATION

2.1. PRODUCT DESCRIPTION

A major technical description of EUT is described as following

Operation Frequency	2.403 GHz to 2.480GHz
Maximum field strength	96.52dBuV/m(peak)@3m
Modulation	GFSK
Number of channels	16
Hardware Version	V1.0
Software Version	V3.0
Antenna Designation	PCB Antenna
Antenna Gain	2.34dBi
Power Supply	DC 3.7V by battery or DC 5V by adapter

2.2. TABLE OF CARRIER FREQUENCYS

Frequency Band	Channel Number	Frequency	Channel Number	Frequency
2400~2483.5MHz	1	2403	9	2441
	2	2407	10	2445
	3	2414	11	2453
	4	2419	12	2456
	5	2422	13	2463
	6	2426	14	2466
	7	2436	15	2473
	8	2439	16	2480

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 = ±2.9 dB
- Uncertainty of Radiated Emission below 1GHz, Uc = ±3.9 dB
- Uncertainty of Radiated Emission above 1GHz, Uc = ±4.9 dB
- Uncertainty of Occupied Channel Bandwidth: Uc = ±2 %

4. DESCRIPTION OF TEST MODES

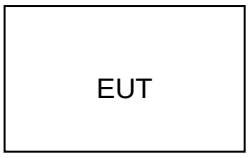
NO.	TEST MODE DESCRIPTION
1	Low channel GFSK
2	Middle channel GFSK
3	High channel GFSK

Note: 1. All the test modes can be supply by battery, 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 used fully-charged battery when tested.

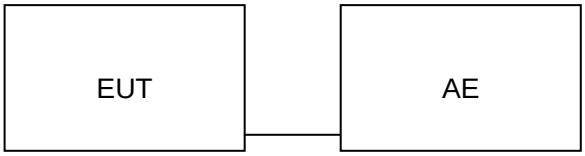
5. SYSTEM TEST CONFIGURATION

5.1. CONFIGURATION OF EUT SYSTEM

Configure 1:



Configure 2:



5.2. EQUIPMENT USED IN EUT SYSTEM

The following peripheral devices and interface cables were connected during the measurement:

☒ Test Accessories Come From The Laboratory

No.	Equipment	Model No.	Manufacturer	Specification Information	Cable
1	Adapter	Jinbaotong	K-T10E0502000E	--	--
2	Redmi Notebook PC	Redmi	XMA2002-AB	--	1.2m,unshielded
3	Huawei Notebook Adapter	Huawei	HW-200325CP0	--	1.2m,unshielded

☐ Test Accessories Come From The Manufacturer

No.	Equipment	Model No.	Manufacturer	Specification Information	Cable
1	--	--	--	--	--

5.3. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.249(a) §15.209	Radiated Emission	Compliant
§15.249(d)	Band Edges	Compliant
§15.207	Conduction Emission	Compliant
§15.215	Band Width	Compliant

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

7. TEST EQUIPMENT LIST

● RF Conducted Test System

Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
☒	AGC-ER-E036	Spectrum Analyzer	Agilent	N9020A	MY49100060	2023-06-01	2024-05-31
☒	AGC-ER-E062	Power Sensor	Agilent	U2021XA	MY54110007	2023-03-03	2024-03-02
☒	AGC-ER-E063	Power Sensor	Agilent	U2021XA	MY54110009	2023-03-03	2024-03-02
☒	AGC-EM-A152	6dB Attenuator	Eeatsheep	LM-XX-6-5W	N/A	2023-06-09	2024-06-08
☒	AGC-ER-E083	Signal Generator	Agilent	E4421B	US39340815	2023-06-01	2024-05-31
☒	N/A	RF Connection Cable	N/A	1#	N/A	Each time	N/A
☒	N/A	RF Connection Cable	N/A	2#	N/A	Each time	N/A

● Radiated Spurious Emission

Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
☐	AGC-EM-E046	EMI Test Receiver	R&S	ESCI	10096	2023-02-18	2024-02-17
☒	AGC-EM-E116	EMI Test Receiver	R&S	ESCI	100034	2023-06-03	2024-06-02
☒	AGC-EM-E061	Spectrum Analyzer	Agilent	N9010A	MY53470504	2023-06-01	2024-05-31
☒	AGC-EM-E086	Loop Antenna	ZHINAN	ZN30900C	18051	2022-03-12	2024-03-11
☒	AGC-EM-E001	Wideband Antenna	SCHWARZBECK	VULB9168	D69250	2023-05-11	2025-05-10
☒	AGC-EM-E029	Broadband Ridged Horn Antenna	ETS	3117	00034609	2023-03-23	2024-03-22
☒	AGC-EM-E082	Horn Antenna	SCHWARZBECK	BBHA 9170	#768	2023-09-24	2025-09-23
☒	AGC-EM-E146	Pre-amplifier	ETS	3117-PA	00246148	2022-08-04	2024-08-03
☒	AGC-EM-A119	2.4G Filter	SongYi	N/A	N/A	2023-06-01	2024-05-31
☒	AGC-EM-A138	6dB Attenuator	Eeatsheep	LM-XX-6-5W	N/A	2023-06-09	2024-06-08
☐	AGC-EM-A139	6dB Attenuator	Eeatsheep	LM-XX-6-5W	N/A	2023-06-09	2024-06-08

● AC Power Line Conducted Emission

Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
☒	AGC-EM-E045	EMI Test Receiver	R&S	ESPI	101206	2023-06-03	2024-06-02
☒	AGC-EM-E023	AMN	R&S	100086	ESH2-Z5	2023-06-03	2024/06/02
☒	AGC-EM-A130	6dB Attenuator	Eeatsheep	LM-XX-6-5W	DC-6GZ	2023-06-09	2024-06-08

● Test Software					
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Version Information
☒	AGC-EM-S001	CE Test System	R&S	ES-K1	V1.71
☒	AGC-EM-S003	RE Test System	FARA	EZ-EMC	V.RA-03A
☒	AGC-ER-S012	BT/WIFI-Test System	Tonscend	JS1120-2	2.6
☒	AGC-EM-S011	RSE Test System	Tonscend	TS+-Ver2.1(JS36-RSE)	4.0.0.0

8. RADIATED EMISSION

8.1TEST LIMIT

Standard FCC15.249

Fundamental Frequency	Field Strength of Fundamental (millivolts/meter)	Field Strength of Harmonics (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 (MHz)	Distance Meters	Field Strengths Limit	
		μV/m	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 dBμV = 20 log Emission level μV/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.

8.2. MEASUREMENT PROCEDURE

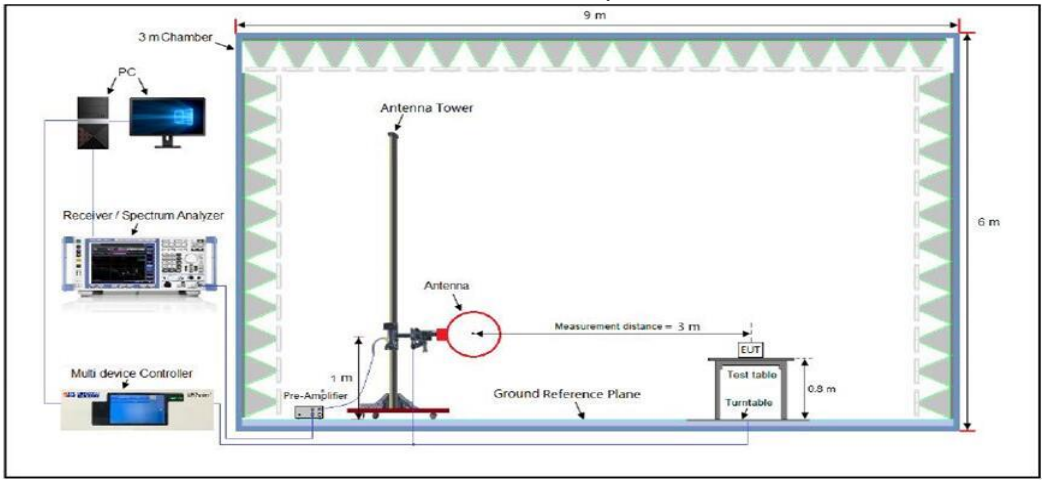
1. The measuring distance of 3m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation(Below 1GHz)
2. The measuring distance of 3m shall used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation(Above 1GHz)
3. The height of the test antenna shall vary between 1m to 4m.Both horizontal and vertical polarization Of the antenna are set to make the measurement.
4. The initial step in collecting radiated emission data is a receive peak detector mode. Pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
5. All readings are peak unless otherwise stated QP in column of Note. Peak denoted that the Peak reading compliance with the QP limits and then QP Mode measurement didn't perform(Below 1GHz)
6. All readings are Peak mode value unless otherwise stated AVG in column of Note. If the Peak mode measured value compliance with the Peak limits and lower than AVG Limits, the EUT shall be deemed to meet Peak & AVG limits and then only Peak mode was measured, but AVG mode didn't perform.(Above 1GHz)

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

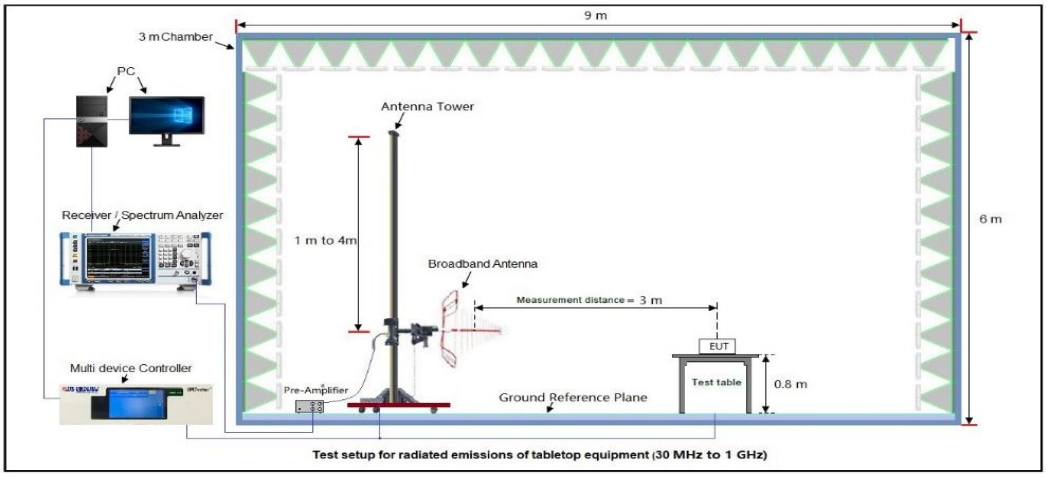
Spectrum Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP
Start ~Stop Frequency	Fundamental: 2.4~2.483GHz RBW 2MHz/ VBW 6MHz for Peak, RBW 2MHz/ VBW 10Hz for Average Harmonics: 1GHz~25GHz RBW 1MHz/ VBW 3MHz for Peak, RBW 1MHz/ VBW 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

8.3. TEST SETUP

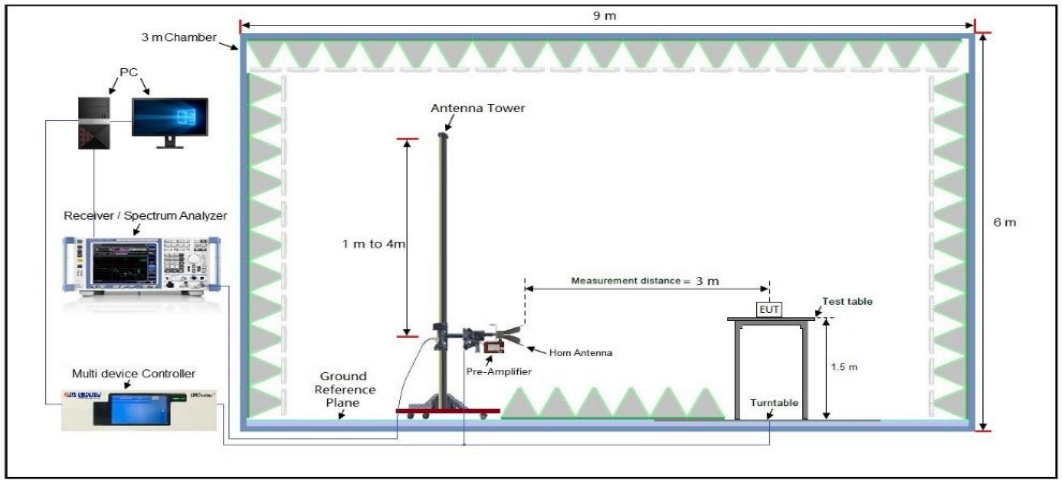
Radiated Emission Test Setup 9KHz-30MHz



Radiated Emission Test Setup 30MHz-1000MHz



Radiated Emission Test Setup Above 1000MHz



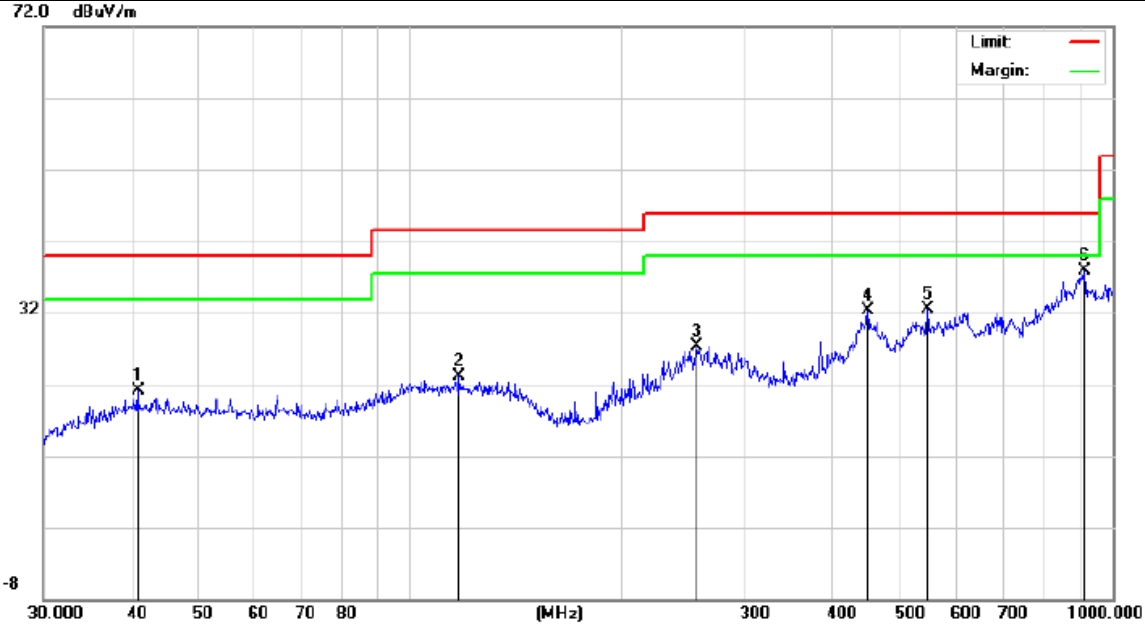
8.4. TEST RESULT

RADIATED EMISSION BELOW 30MHz

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

RADIATED EMISSION 30MHz- 1GHZ

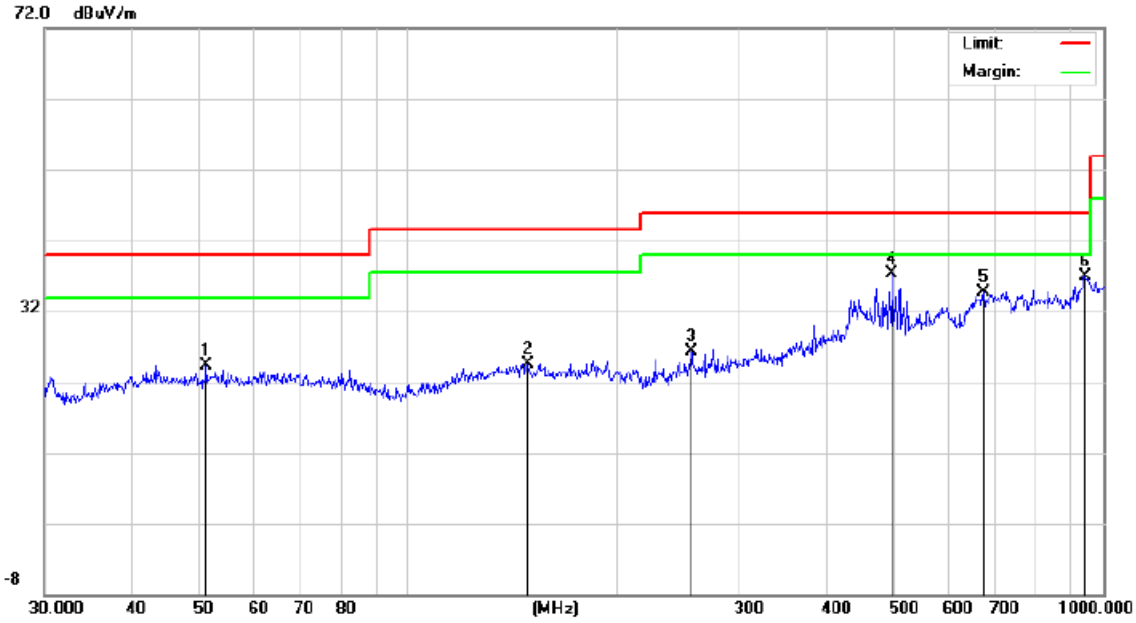
EUT	Wireless Mouse	Model Name	MD360
Temperature	23.6°C	Relative Humidity	61.4%
Pressure	1010 hPa	Test Voltage	DC 3.7V
Test Mode	Mode 3	Polarization	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		40.8446	7.25	13.84	21.09	40.00	-18.91	peak
2		117.3603	6.76	16.37	23.13	43.50	-20.37	peak
3		255.6231	12.38	14.93	27.31	46.00	-18.69	peak
4		447.9822	7.42	24.82	32.24	46.00	-13.76	peak
5		545.1826	8.43	23.98	32.41	46.00	-13.59	peak
6	*	912.8620	7.89	30.00	37.89	46.00	-8.11	peak

RESULT: PASS

EUT	Wireless Mouse	Model Name	MD360
Temperature	23.6°C	Relative Humidity	61.4%
Pressure	1010 hPa	Test Voltage	DC 3.7V
Test Mode	Mode 3	Polarization	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		51.3005	7.29	17.01	24.30	40.00	-15.70	peak
2		148.4410	6.36	18.20	24.56	43.50	-18.94	peak
3		255.6231	8.87	17.53	26.40	46.00	-19.60	peak
4	*	497.6765	13.23	24.07	37.30	46.00	-8.70	peak
5		672.8444	7.09	27.63	34.72	46.00	-11.28	peak
6		942.1305	6.01	30.91	36.92	46.00	-9.08	peak

RESULT: PASS

Note: 1. Factor=Antenna Factor + Cable loss, Margin= Limit -Level.

2. The “Factor” value can be calculated automatically by software of measurement system.

FIELD STRENGTH OF FUNDAMENTAL

EUT：	Wireless Mouse	Model Name	MD360
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Modulation ：	GFSK	Polarization：	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
2403	82.13	13.46	95.59	114	-18.41	peak
2403	65.41	13.46	78.87	94	-15.13	AVG
2441	82.03	13.88	95.91	114	-18.09	peak
2441	64.95	13.88	78.83	94	-15.17	AVG
2480	82.41	14.11	96.52	114	-17.48	peak
2480	64.69	14.11	78.80	94	-15.20	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT：	Wireless Mouse	Model Name	MD360
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Modulation ：	GFSK	Polarization：	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
2403	78.62	13.46	92.08	114	-21.92	peak
2403	61.48	13.46	74.94	94	-19.06	AVG
2441	79.66	13.88	93.54	114	-20.46	peak
2441	62.03	13.88	75.91	94	-18.09	AVG
2480	79.98	14.11	94.09	114	-19.91	peak
2480	63.74	14.11	77.85	94	-16.15	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

RADIATED EMISSION ABOVE 1GHZ FOR BR/EDR

EUT：	Wireless Mouse	Model Name	MD360
Temperature：	23.6°C	Relative Humidity	61.4%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	Mode 1	Polarization：	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4806	45.36	7.12	52.48	74	-21.52	peak
4806	34.28	7.12	41.40	54	-12.60	AVG
7209	41.05	9.84	50.89	74	-23.11	peak
7209	30.27	9.84	40.11	54	-13.89	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT：	Wireless Mouse	Model Name	MD360
Temperature：	23.6°C	Relative Humidity	61.4%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	Mode 1	Polarization：	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4806	45.26	7.12	52.38	74	-21.62	peak
4806	35.18	7.12	42.30	54	-11.70	AVG
7209	39.64	9.84	49.48	74	-24.52	peak
7209	28.31	9.84	38.15	54	-15.85	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT：	Wireless Mouse	Model Name	MD360
Temperature：	23.6°C	Relative Humidity	61.4%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	Mode 2	Polarization：	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4882	44.29	7.12	51.41	74	-22.59	peak
4882	36.24	7.12	43.36	54	-10.64	AVG
7323	40.15	9.84	49.99	74	-24.01	peak
7323	29.85	9.84	39.69	54	-14.31	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT：	Wireless Mouse	Model Name	MD360
Temperature：	23.6°C	Relative Humidity	61.4%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	Mode 2	Polarization：	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4882	45.28	7.12	52.40	74	-21.60	peak
4882	32.54	7.12	39.66	54	-14.34	AVG
7323	40.35	9.84	50.19	74	-23.81	peak
7323	28.46	9.84	38.30	54	-15.70	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT：	Wireless Mouse	Model Name	MD360
Temperature：	23.6°C	Relative Humidity	61.4%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	Mode 3	Polarization：	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4960	45.36	7.12	52.48	74	-21.52	peak
4960	36.24	7.12	43.36	54	-10.64	AVG
7440	40.25	9.84	50.09	74	-23.91	peak
7440	31.42	9.84	41.26	54	-12.74	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT：	Wireless Mouse	Model Name	MD360
Temperature：	23.6°C	Relative Humidity	61.4%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	Mode 3	Polarization：	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4960	44.19	7.12	51.31	74	-22.69	peak
4960	33.47	7.12	40.59	54	-13.41	AVG
7440	38.42	9.84	48.26	74	-25.74	peak
7440	27.15	9.84	36.99	54	-17.01	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=Measurement-Limit.
The “Factor” value can be calculated automatically by software of measurement system.

9. BAND EDGE EMISSION

9.1TEST LIMIT

Frequency Band	Limit of the Field Strength (dBμV/m)	
	Peak	Average
f≤2400MHz	74	54
f≥2483.5MHz	74	54

9.2. 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.

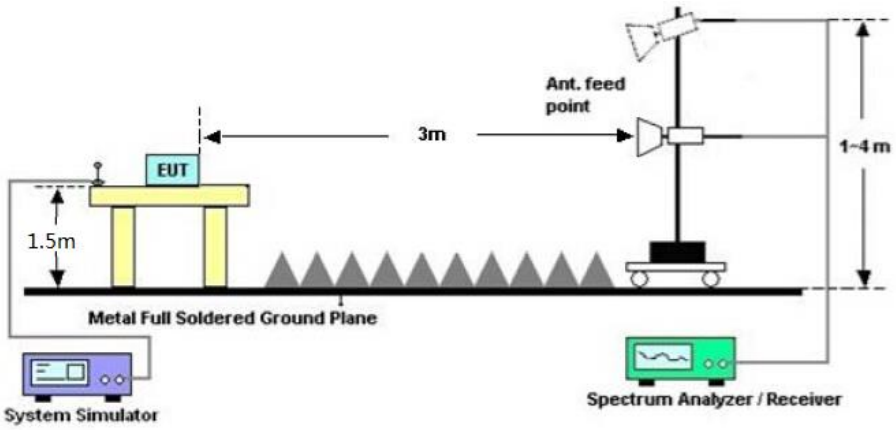
2. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission: (a) PEAK: RBW=1MHz, VBW=3MHz / Sweep=AUTO

(b) AVERAGE: RBW=1MHz ; VBW=1/on time / Sweep=AUTO

3. Other procedures refer to clause 8.2.

9.3 TEST SETUP

RADIATED EMISSION TEST SETUP



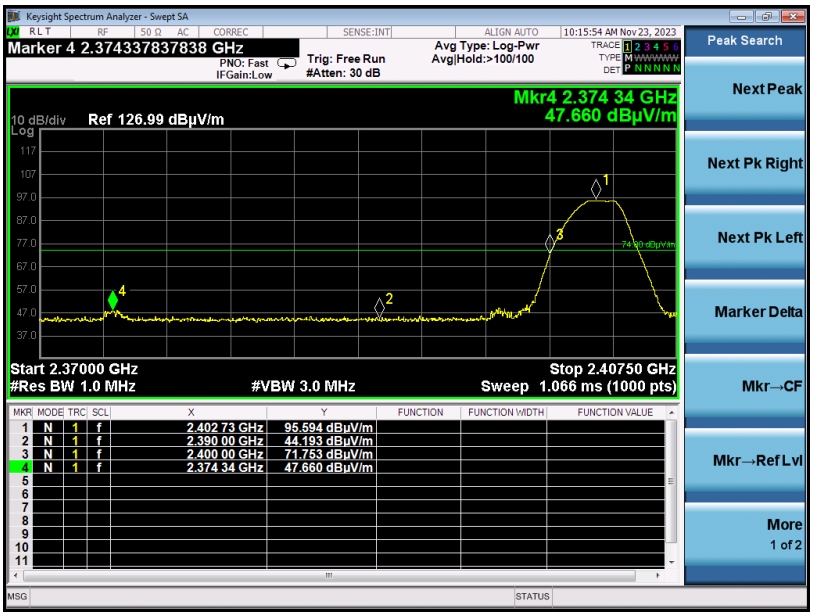
9.4 TEST RESULT

Note:

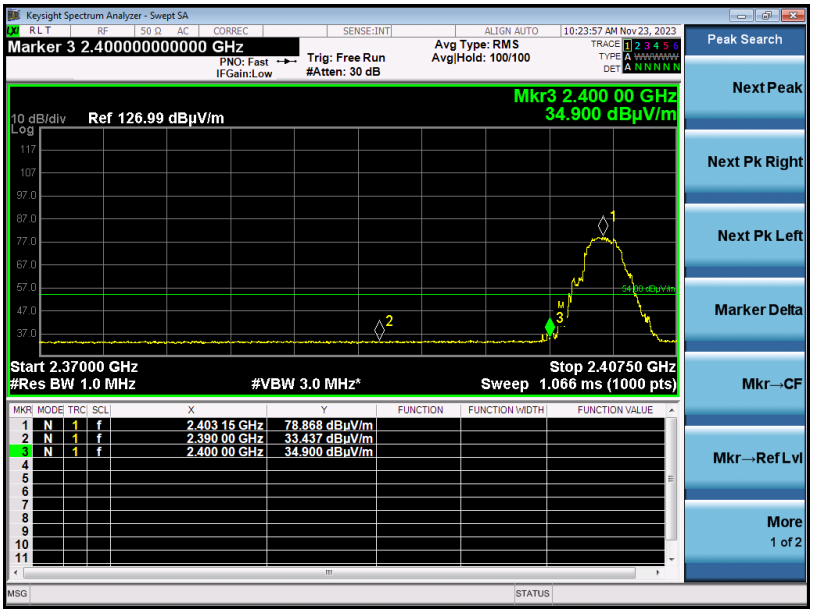
1. Factor=Antenna Factor + Cable loss - Amplifier gain. Field Strength=Factor + Reading level
2. The factor had been edited in the “Input Correction” of the Spectrum Analyzer. So the Amplitude of test plots is equal to Reading level plus the Factor in dB. Use the A dB(μV) to represent the Amplitude.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

EUT：	Wireless Mouse	Model Name	MD360
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC5V
Test Mode ：	Mode 1	Polarization：	Horizontal

Peak Value

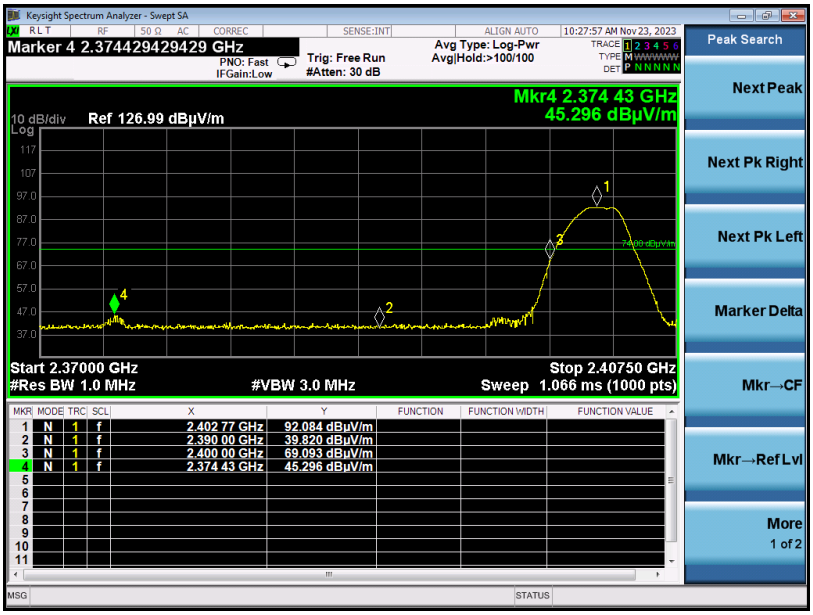


Average Value



EUT：	Wireless Mouse	Model Name	MD360
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC5V
Test Mode ：	Mode 1	Polarization：	Vertical

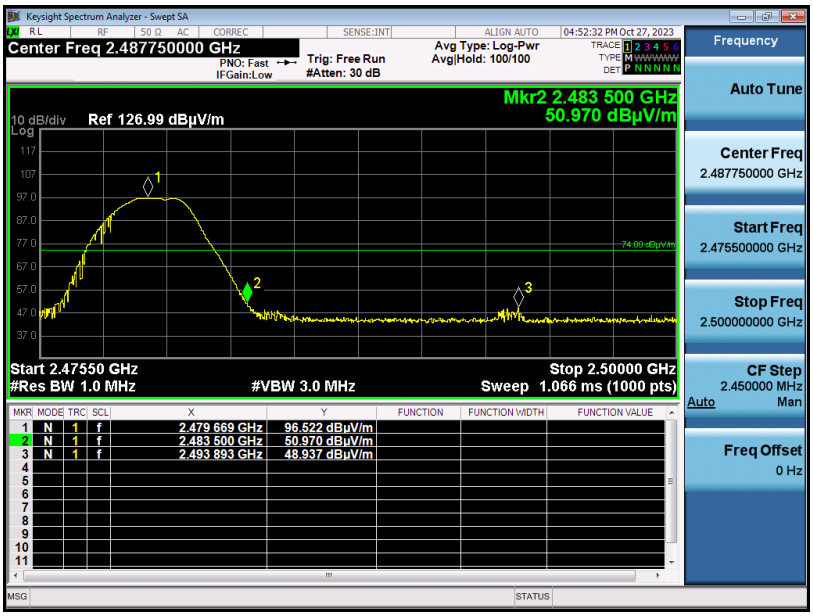
Peak Value



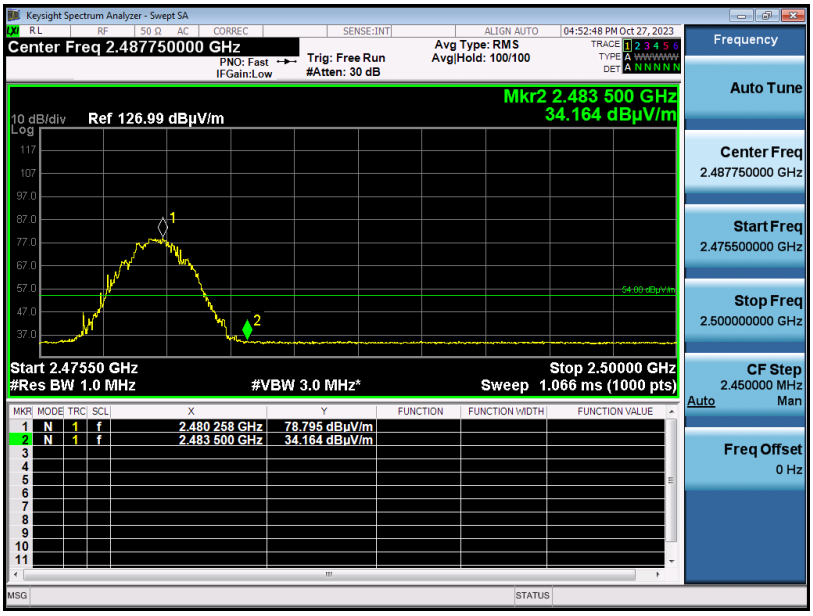
Average Value

EUT：	Wireless Mouse	Model Name	MD360
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC5V
Test Mode ：	Mode 3	Polarization：	Horizontal

Peak Value

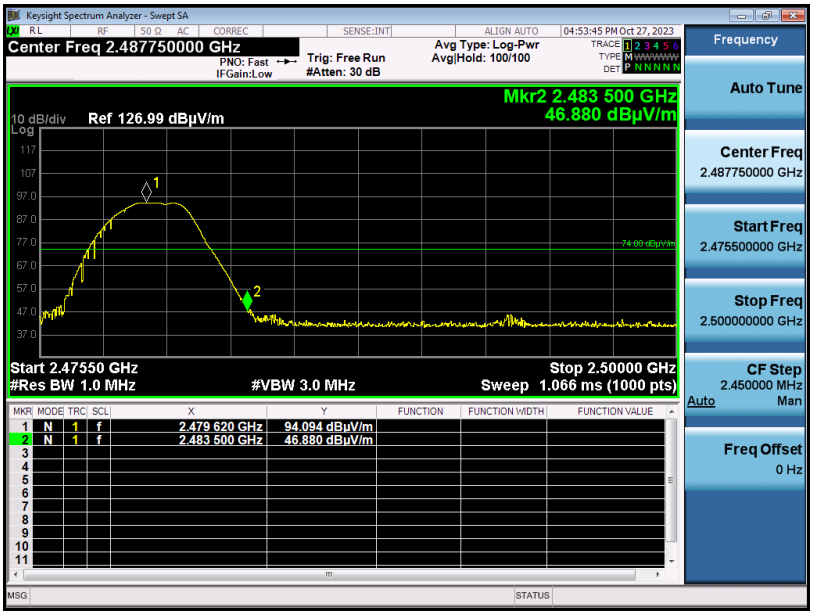


Average Value



EUT：	Wireless Mouse	Model Name	MD360
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC5V
Test Mode ：	Mode 3	Polarization：	Vertical

Peak Value



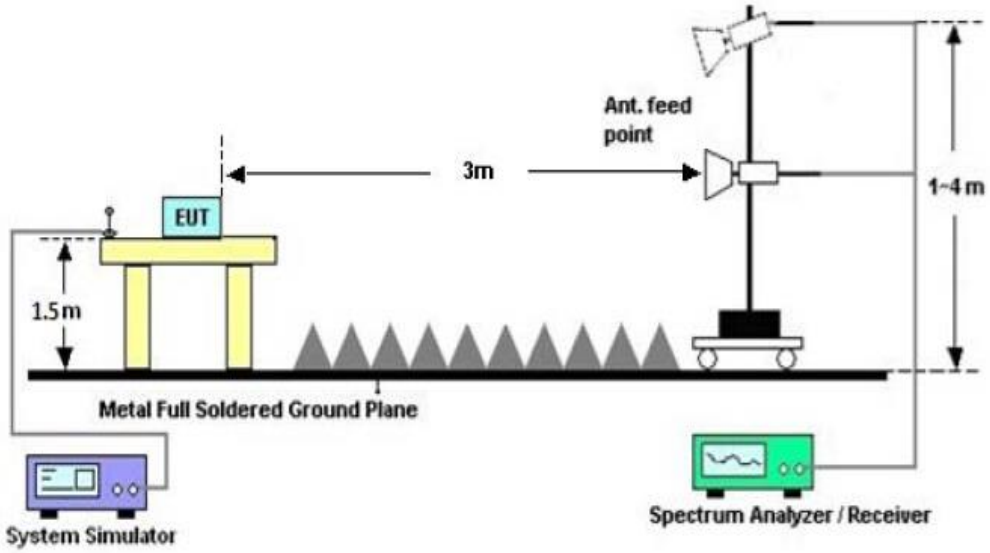
Average Value

10. 20DB BANDWIDTH

10.1. MEASUREMENT PROCEDURE

1. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
2. Set Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hoping channel
   RBW ≥ 1% of the 20 dB bandwidth, VBW ≥ 3RBW; Sweep = auto; Detector function = peak
3. Set SPA Trace 1 Max hold, then View.

10.2. TEST SET-UP



10.3. LIMITS AND MEASUREMENT RESULTS

TEST ITEM	20DB BANDWIDTH
TEST MODULATION	GFSK

Test Data (MHz)		Criteria
Low Channel	2.364	PASS
Middle Channel	2.357	PASS
High Channel	2.350	PASS

TEST PLOT OF BANDWIDTH FOR LOW CHANNEL

TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL

TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL

11. FCC LINE CONDUCTED EMISSION TEST

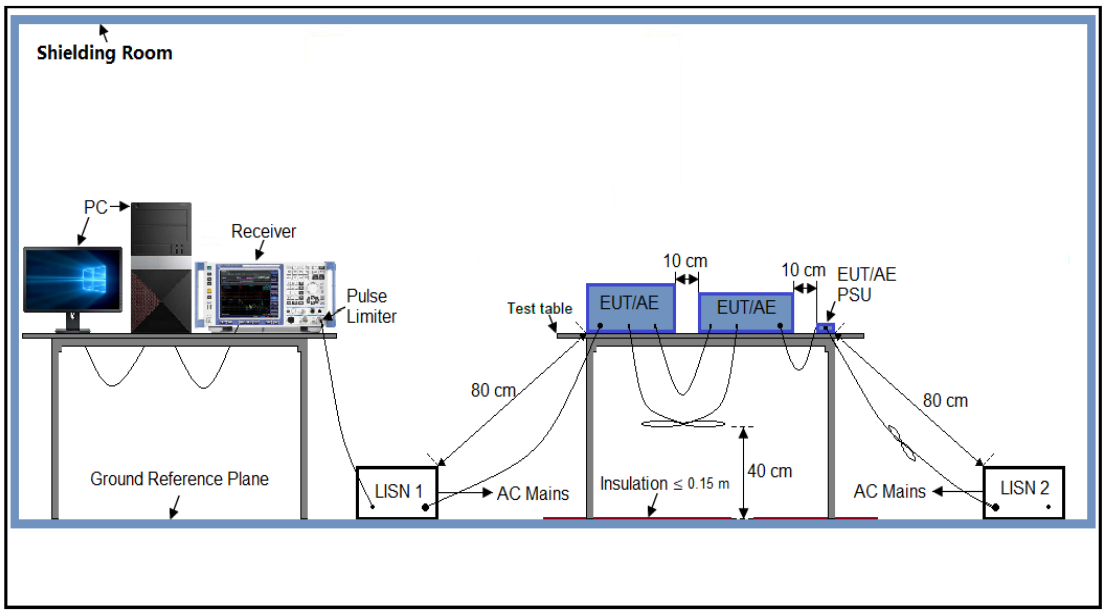
11.1. LIMITS OF LINE CONDUCTED EMISSION TEST

Frequency	Maximum RF Line Voltage	
	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 0.50 MHz.

11.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



11.3. 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 C63.10-2013 (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 C63.10-2013.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10-2013.
4. All support equipments received AC120V/60Hz power from a LISN, if any.
5. The EUT received DC 5V power by adapter which received AC120V/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.

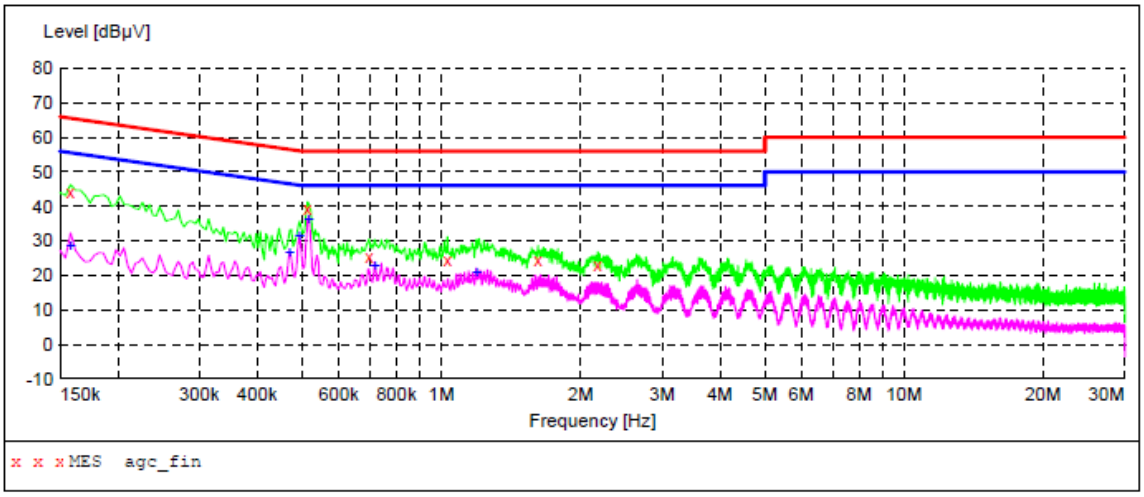
Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

11.4. 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.

11.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

AC Power Line Conducted Emission Test			
Test Mode	Mode 3	LISN Line	Hot Side



MEASUREMENT RESULT: "agc_fin"

2023/10/25 14:14

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.158000	44.10	6.1	66	21.5	QP	L1
0.514000	39.30	6.2	56	16.7	QP	L1
0.698000	25.50	6.2	56	30.5	QP	L1
1.030000	24.40	6.2	56	31.6	QP	L1
1.618000	24.30	6.2	56	31.7	QP	L1
2.178000	23.10	6.3	56	32.9	QP	L1

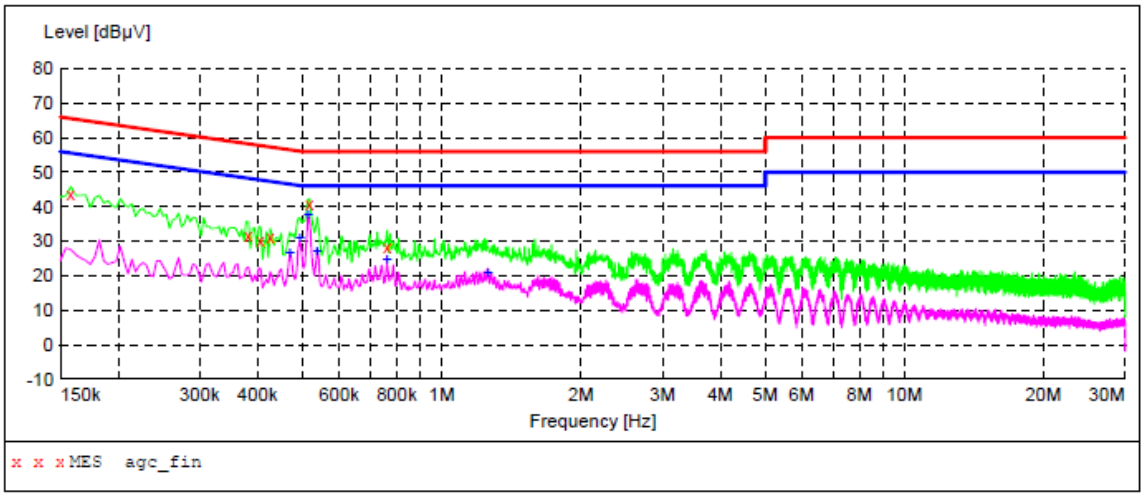
MEASUREMENT RESULT: "agc_fin2"

2023/10/25 14:14

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.158000	28.70	6.1	56	26.9	AV	L1
0.470000	27.00	6.1	47	19.5	AV	L1
0.494000	31.50	6.1	46	14.6	AV	L1
0.518000	36.50	6.2	46	9.5	AV	L1
0.718000	23.00	6.2	46	23.0	AV	L1
1.190000	21.20	6.2	46	24.8	AV	L1

RESULT: PASS

AC Power Line Conducted Emission Test			
Test Mode	Mode 3	LISN Line	Neutral Side



MEASUREMENT RESULT: "agc_fin"

2023/10/25 14:17

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.158000	43.70	6.1	66	21.9	QP	N
0.382000	31.60	6.1	58	26.6	QP	N
0.406000	30.40	6.1	58	27.3	QP	N
0.426000	31.10	6.1	57	26.2	QP	N
0.518000	40.70	6.2	56	15.3	QP	N
0.762000	28.10	6.2	56	27.9	QP	N

MEASUREMENT RESULT: "agc_fin2"

2023/10/25 14:17

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.470000	26.70	6.1	47	19.8	AV	N
0.494000	31.40	6.1	46	14.7	AV	N
0.514000	37.80	6.2	46	8.2	AV	N
0.538000	27.20	6.2	46	18.8	AV	N
0.762000	24.70	6.2	46	21.3	AV	N
1.258000	20.90	6.2	46	25.1	AV	N

RESULT: PASS

Appendix I: Photographs of Test Setup

Refer to the Report No.: AGC00803231005AP02

Appendix II: Photographs of Test EUT

Refer to the Report No.: AGC00803231005AP03

----END OF REPORT----

Conditions of Issuance of Test Reports

1. All samples and goods are accepted by the Attestation of Global Compliance (Shenzhen) Co., Ltd (the "Company") solely for testing and reporting in accordance with the following terms and conditions. The company provides its services on the basis that such terms and conditions constitute express agreement between the company and any person, firm or company requesting its services (the "Clients").

2. Any report issued by Company as a result of this application for testing services (the "Report") shall be issued in confidence to the Clients and the Report will be strictly treated as such by the Company. It may not be reproduced either in its entirety or in part and it may not be used for advertising or other unauthorized purposes without the written consent of the Company. The Clients to whom the Report is issued may, however, show or send it, or a certified copy thereof prepared by the Company to its customer, supplier or other persons directly concerned. The Company will not, without the consent of the Clients, enter into any discussion or correspondence with any third party concerning the contents of the Report, unless required by the relevant governmental authorities, laws or court orders.

3.The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.

4. In the event of the improper use of the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.

5. Samples submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.

6. The Company will not be liable for or accept responsibility for any loss or damage however arising from the use of information contained in any of its Reports or in any communication whatsoever about its said tests or investigations.

7.Clients wishing to use the Report in court proceedings or arbitration shall inform the Company to that effect prior to submitting the sample for testing.

8. The Company is not responsible for recalling the electronic version of the original report when any revision is made to them. The Client assumes the responsibility to providing the revised version to any interested party who uses them.

9. Subject to the variable length of retention time for test data and report stored hereinto as otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of the test report for a period of six years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after retention period. Under no circumstances shall we be liable for damage of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.