FCC Test Report

Report No.: AGC00803230101FE04

FCC ID	:	2AKHJ-MD165BK
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	Wireless Mouse
BRAND NAME	:	N/A
MODEL NAME	:	MD165
APPLICANT	:	Shenzhen Hangshi Electronic Technology Co., Ltd
DATE OF ISSUE	:	Jan. 11, 2023
STANDARD(S) **TEST PROCEDURE(S)**	:	FCC Part 15 Rules
REPORT VERSION	:	V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd

REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Jan. 11, 2023	Valid	Initial Release

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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	MD165
Date of receipt of test item	Jan. 04, 2023
Date of test	Jan. 04, 2023 to Jan. 11, 2023
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.

Prepared By	Alan Duan (Project Engineer)	Jan. 11, 2023
Reviewed By	Calvin Liu (Reviewer)	Jan. 11, 2023
Approved By	Max Zhang (Authorized Officer)	Jan. 11, 2023

2. GENERAL INFORMATION

2.1. PRODUCT DESCRIPTION

A major technical description of EUT is described as following

Operation Frequency	2403 MHz to 2480 MHz
Maximum field strength	85.34dBuV/m(average)@3m
Modulation	GFSK
Number of channels	16
Antenna Gain	2.34dBi
Antenna Designation	PCB Antenna (Met 15.203 Antenna requirement)
Hardware Version	V1.0
Software Version	V1.0
Power Supply	DC 3.7V by battery or DC 5V by adapter

2.2. TABLE OF CARRIER FREQUENCY

Channel Number	Frequency (MHz)	Channel Number	Frequency (MHz)
1	2403	9	2441
2	2407	10	2445
3	2414	11	2453
4	2419	12	2459
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 = ±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 %

4. DESCRIPTION OF TEST MODES

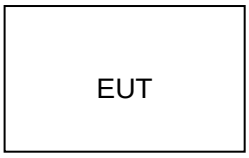
NO.	TEST MODE DESCRIPTION
1	Low channel GFSK
2	Middle channel GFSK
3	High channel GFSK

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.

5. SYSTEM TEST CONFIGURATION

5.1. CONFIGURATION OF EUT SYSTEM

Radiated Emission Configure:



5.2 EQUIPMENT USED IN TESTED SYSTEM

Item	Equipment	Model No.	ID or Specification	Remark
1	Wireless Mouse	MD165	2AKHJ-MD165BK	EUT

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

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. 09, 2022	Jun. 08, 2023
Test software	R&S	ES-K1	Ver.V1.71	N/A	N/A

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	Aug. 04, 2022	Aug. 03, 2023
Signal Analyzer	Aglient	N9020A	MY52090123	Aug. 04, 2022	Aug. 03, 2023
2.4GHz Filter	EM Electronics	N/A	N/A	Mar. 18, 2022	Mar. 19, 2024
Attenuator	ZHINAN	E-002	N/A	Aug. 04, 2022	Aug. 03, 2024
Horn Antenna	SCHWARZBEC	BBHA9170	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	3117	00034609	Apr. 23, 2021	Apr. 22, 2023
Double-Ridged Waveguide Horn	ETS	3117	00154520	Sep. 06, 2021	Sep. 05, 2023
Preamplifier Assembly	ETS	3117PA	00225134	Sep. 01, 2022	Sep. 02, 2024
Wideband Antenna	SCHWARZBECK	VULB9168	VULB9168-494	Jan. 08, 2021	Jan. 07, 2023
Test software	FARA	EZ-EMC	Ver.RA-03A	N/A	N/A
Test software	Tonscend	JS32-RE	Ver.2.5	N/A	N/A

7. RADIATED EMISSION

7.1TEST 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.

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.

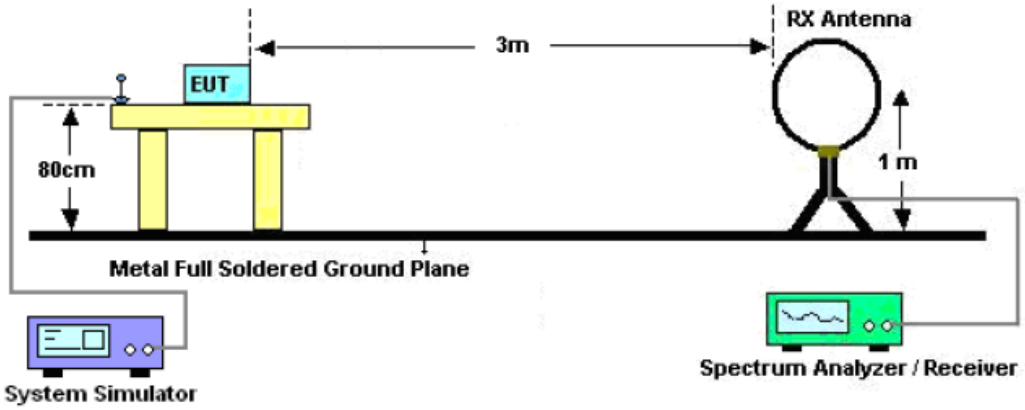
The following table is the setting of spectrum analyzer and receiver.

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	1GHz~26.5GHz RBW 2.4MHz/ VBW 8MHz for Peak, RBW 2.4MHz/10Hz for Average

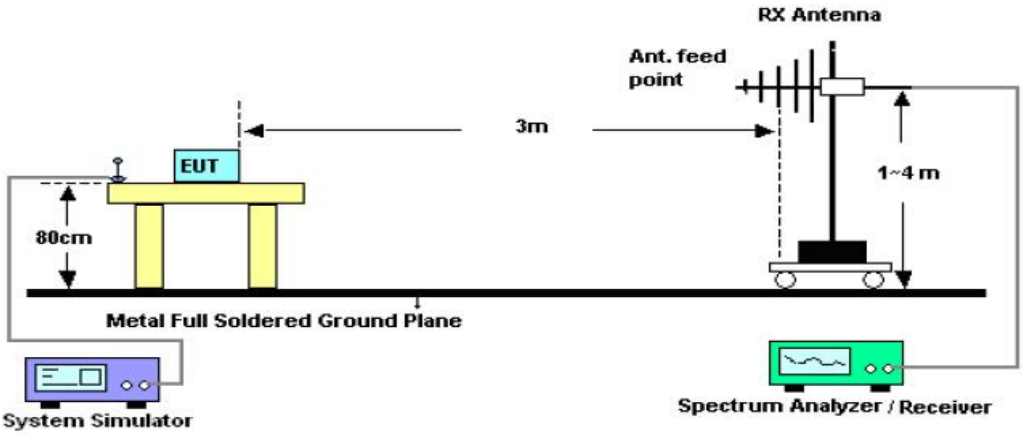
Receiver Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP

7.3. TEST SETUP

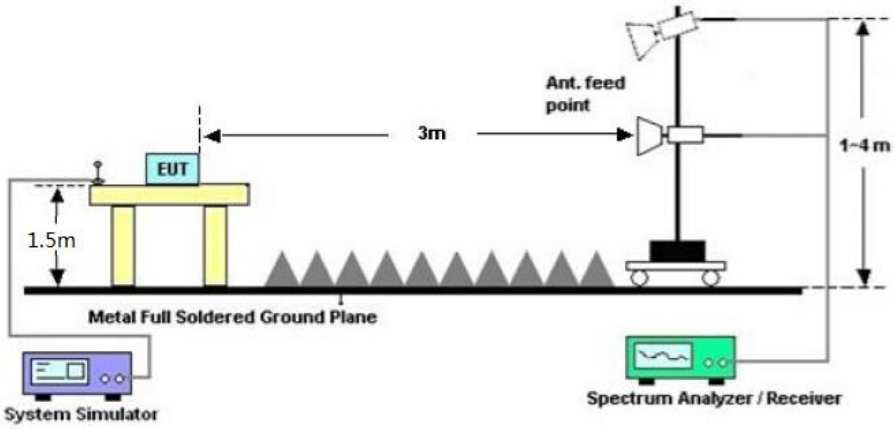
Radiated Emission Test-Setup Frequency Below 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



RADIATED EMISSION TEST SETUP ABOVE 1000MHz



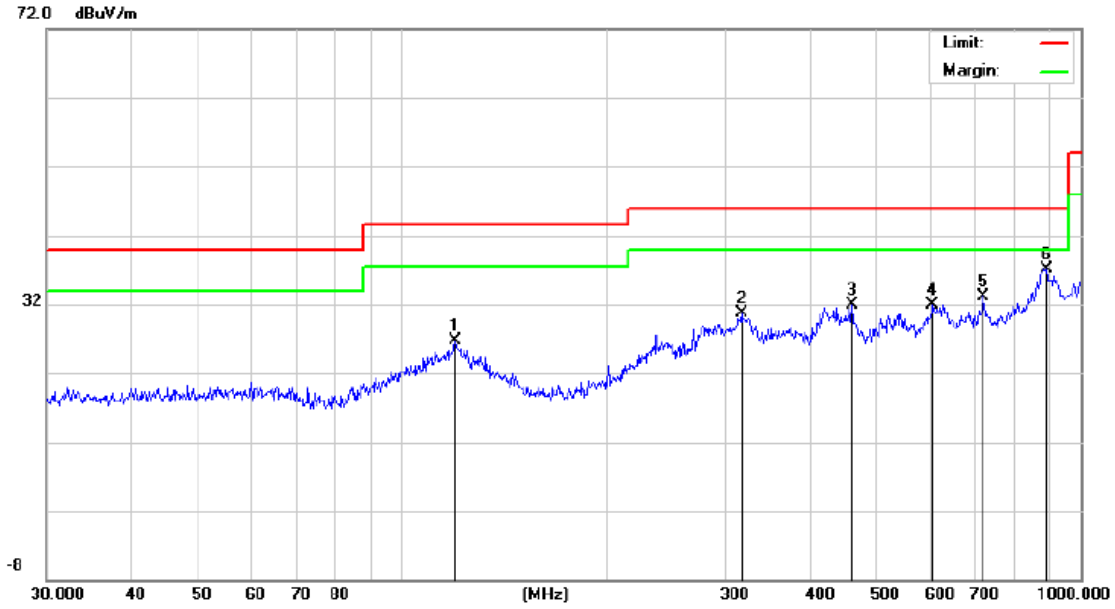
7.4. TEST RESULT

RADIATED EMISSION BELOW 30MHZ

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

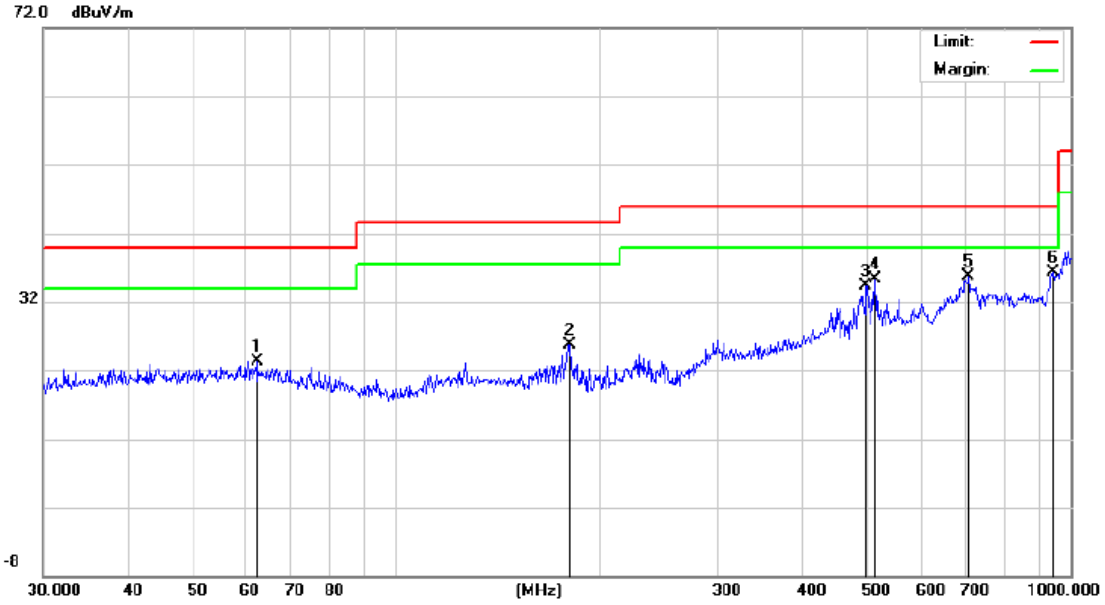
RADIATED EMISSION 30MHz- 1GHZ

EUT：	Wireless Mouse	Model Name. ：	MD165
Temperature：	23.1℃	Relative Humidity：	66%
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	dB/m	dB	Detector
1		119.8555	4.74	21.87	26.61	43.50	-16.89	peak
2		316.5889	4.63	26.16	30.79	46.00	-15.21	peak
3		460.7271	5.69	26.27	31.96	46.00	-14.04	peak
4		605.6592	5.47	26.41	31.88	46.00	-14.12	peak
5		719.1994	6.47	26.73	33.20	46.00	-12.80	peak
6	*	890.7278	5.60	31.50	37.10	46.00	-8.90	peak

EUT：	Wireless Mouse	Model Name. ：	MD165
Temperature：	23.1℃	Relative Humidity：	66%
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	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		62.2128	6.40	16.97	23.37	40.00	-16.63	peak
2		180.6488	9.25	16.45	25.70	43.50	-17.80	peak
3		497.6765	10.32	24.07	34.39	46.00	-11.61	peak
4		513.6331	11.79	23.49	35.28	46.00	-10.72	peak
5		706.6999	6.10	29.66	35.76	46.00	-10.24	peak
6	*	942.1305	5.21	31.02	36.23	46.00	-9.77	peak

RESULT: PASS

Note:

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

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

FIELD STRENGTH OF FUNDAMENTAL

EUT：	Wireless Mouse	Model Name. ：	MD165
Temperature：	23.1℃	Relative Humidity：	66%
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	94.95	-9.61	85.34	114.00	-28.66	peak
2403	77.40	-9.61	67.79	94.00	-26.21	AVG
2441	92.72	-9.61	83.11	114.00	-30.89	peak
2441	72.16	-9.61	62.55	94.00	-31.45	AVG
2480	93.89	-9.61	84.28	114.00	-29.72	peak
2480	78.08	-9.61	68.47	94.00	-25.53	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT：	Wireless Mouse	Model Name. ：	MD165
Temperature：	23.1℃	Relative Humidity：	66%
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	91.16	-9.61	81.55	114.00	-32.45	peak
2403	72.02	-9.61	62.41	94.00	-31.59	AVG
2441	89.97	-9.61	80.36	114.00	-33.64	peak
2441	74.94	-9.61	65.33	94.00	-28.67	AVG
2480	90.68	-9.61	81.07	114.00	-32.93	peak
2480	77.59	-9.61	67.98	94.00	-26.02	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

RADIATED EMISSION ABOVE 1GHZ

EUT：	Wireless Mouse	Model Name. ：	MD165
Temperature：	23.1℃	Relative Humidity：	66%
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	48.33	3.76	52.09	74.00	-21.91	peak
4806	43.21	3.76	46.97	54.00	-7.03	AVG
7209	42.11	8.17	50.28	74.00	-23.72	peak
7209	38.75	8.17	46.92	54.00	-7.08	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT：	Wireless Mouse	Model Name. ：	MD165
Temperature：	23.1℃	Relative Humidity：	66%
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	47.65	3.76	51.41	74.00	-22.59	peak
4806	43.35	3.76	47.11	54.00	-6.89	AVG
7209	42.26	8.17	50.43	74.00	-23.57	peak
7209	37.78	8.17	45.95	54.00	-8.05	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT：	Wireless Mouse	Model Name. ：	MD165
Temperature：	23.1℃	Relative Humidity：	66%
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	47.56	3.78	51.34	74.00	-22.66	peak
4882	43.89	3.78	47.67	54.00	-6.33	AVG
7323	43.53	8.23	51.76	74.00	-22.24	peak
7323	39.22	8.23	47.45	54.00	-6.55	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT：	Wireless Mouse	Model Name. ：	MD165
Temperature：	23.1℃	Relative Humidity：	66%
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	48.86	3.78	52.64	74.00	-21.36	peak
4882	42.97	3.78	46.75	54.00	-7.25	AVG
7323	44.54	8.23	52.77	74.00	-21.23	peak
7323	39.23	8.23	47.46	54.00	-6.54	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT：	Wireless Mouse	Model Name. ：	MD165
Temperature：	23.1℃	Relative Humidity：	66%
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	47.55	3.81	51.36	74.00	-22.64	peak
4960	44.37	3.81	48.18	54.00	-5.82	AVG
7440	42.26	8.27	50.53	74.00	-23.47	peak
7440	38.79	8.27	47.06	54.00	-6.94	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT：	Wireless Mouse	Model Name. ：	MD165
Temperature：	23.1℃	Relative Humidity：	66%
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	48.33	3.81	52.14	74.00	-21.86	peak
4960	43.52	3.81	47.33	54.00	-6.67	AVG
7440	44.44	8.27	52.71	74.00	-21.29	peak
7440	40.19	8.27	48.46	54.00	-5.54	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

Frequency Band	Limit of the Field Strength (dBμV/m)	
	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.

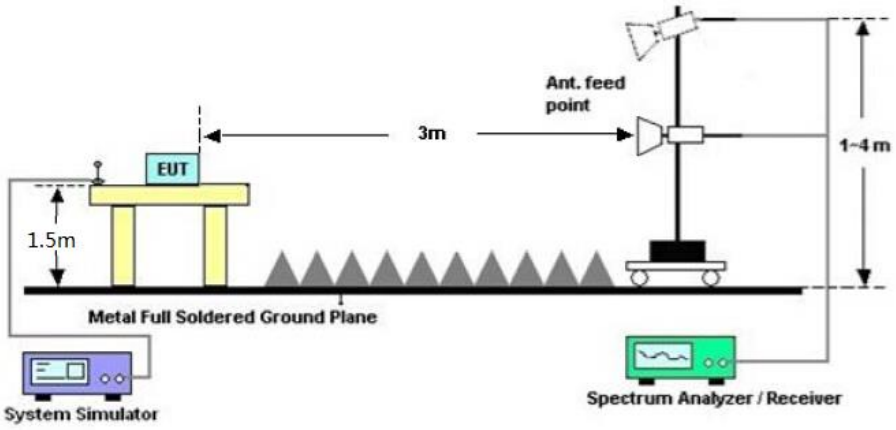
2. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission: (a) PEAK: RBW=1MHz, VBW=3MHz / Sweep=AUTO

(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



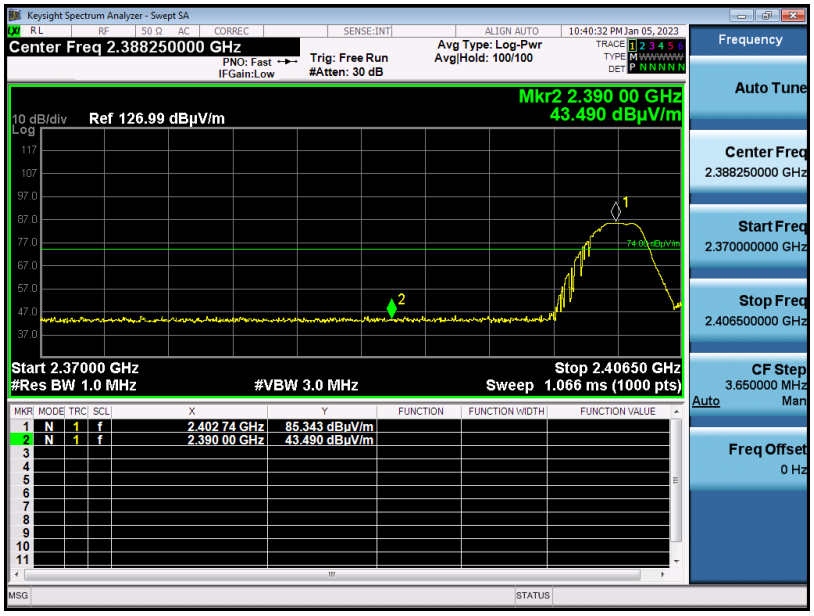
8.4 TEST RESULT

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(μV) to represent the Amplitude. Use the F dB(μV/m) to represent the Field Strength. So A=F

EUT：	Wireless Mouse	Model Name. ：	MD165
Temperature：	23.1℃	Relative Humidity：	66%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	Mode 1	Polarization：	Horizontal

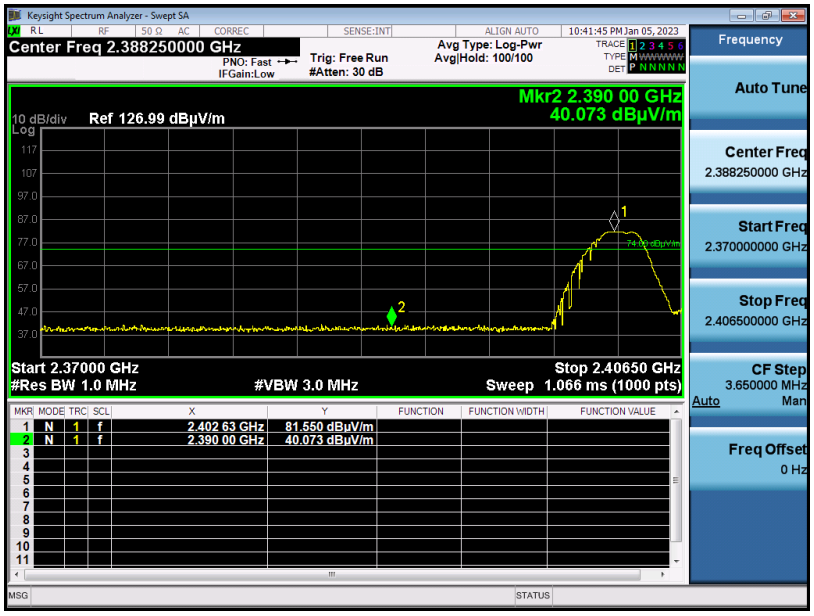
Peak Value



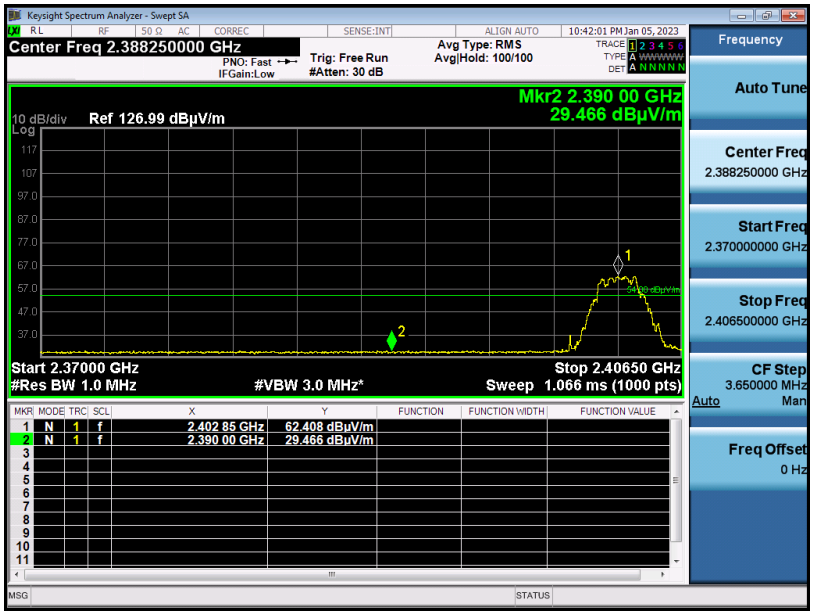
Average Value

EUT：	Wireless Mouse	Model Name. ：	MD165
Temperature：	23.1℃	Relative Humidity：	66%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	Mode 1	Polarization：	Vertical

Peak Value

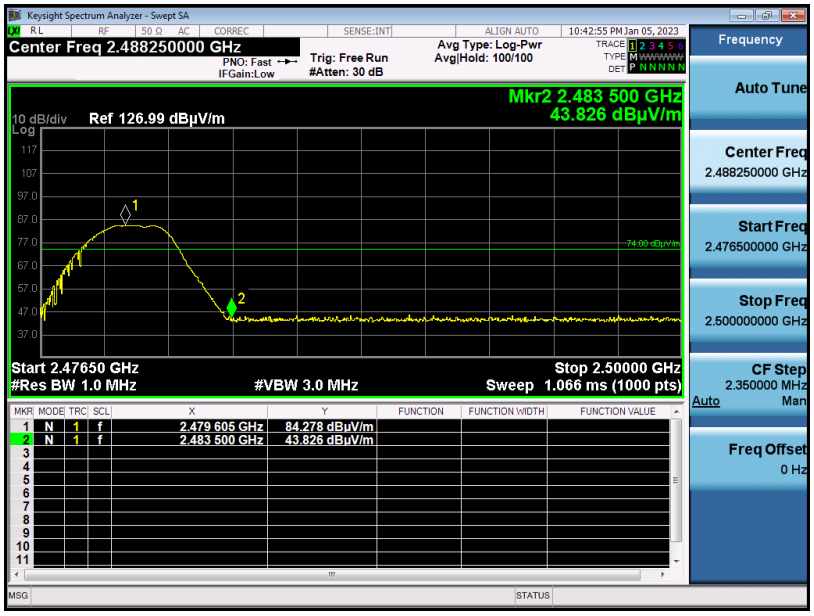


Average Value



EUT：	Wireless Mouse	Model Name. ：	MD165
Temperature：	23.1℃	Relative Humidity：	66%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	Mode 3	Polarization：	Horizontal

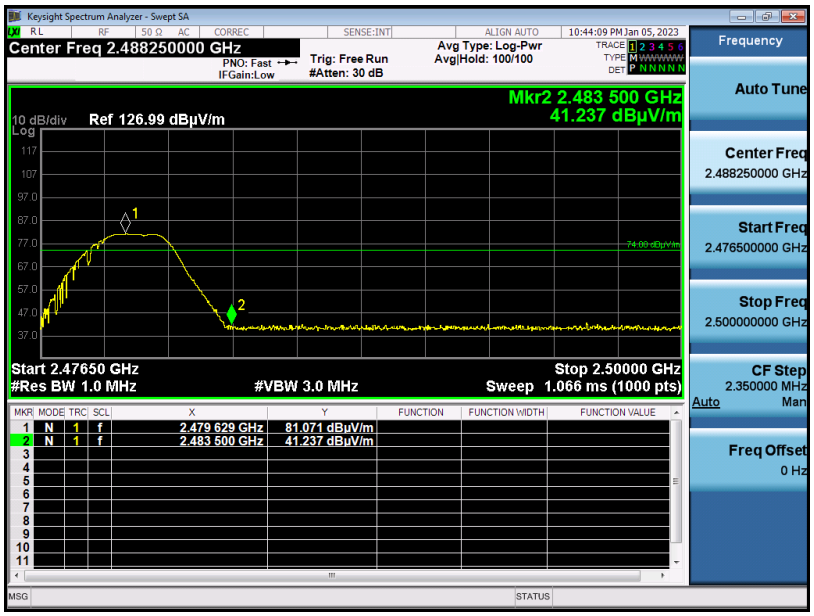
Peak Value



Average Value

EUT：	Wireless Mouse	Model Name. ：	MD165
Temperature：	23.1℃	Relative Humidity：	66%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	Mode 3	Polarization：	Vertical

Peak Value



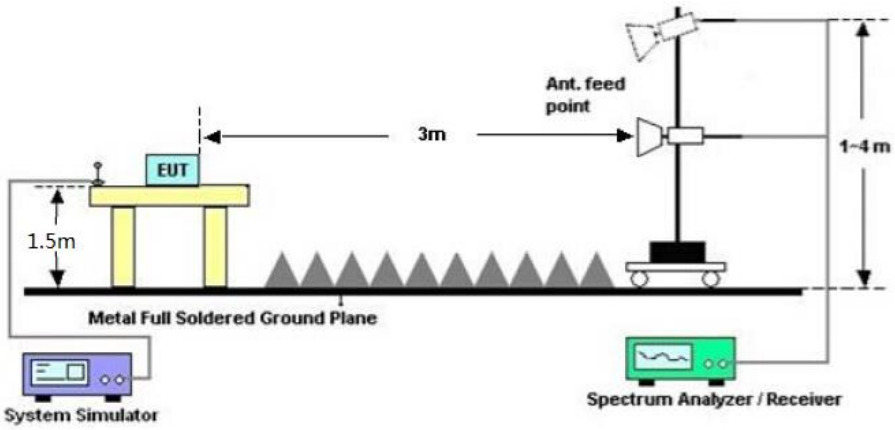
Average Value

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= 30 KHz, VBW≥1×RBW.
3. Set SPA Trace 1 Max hold, then View.

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



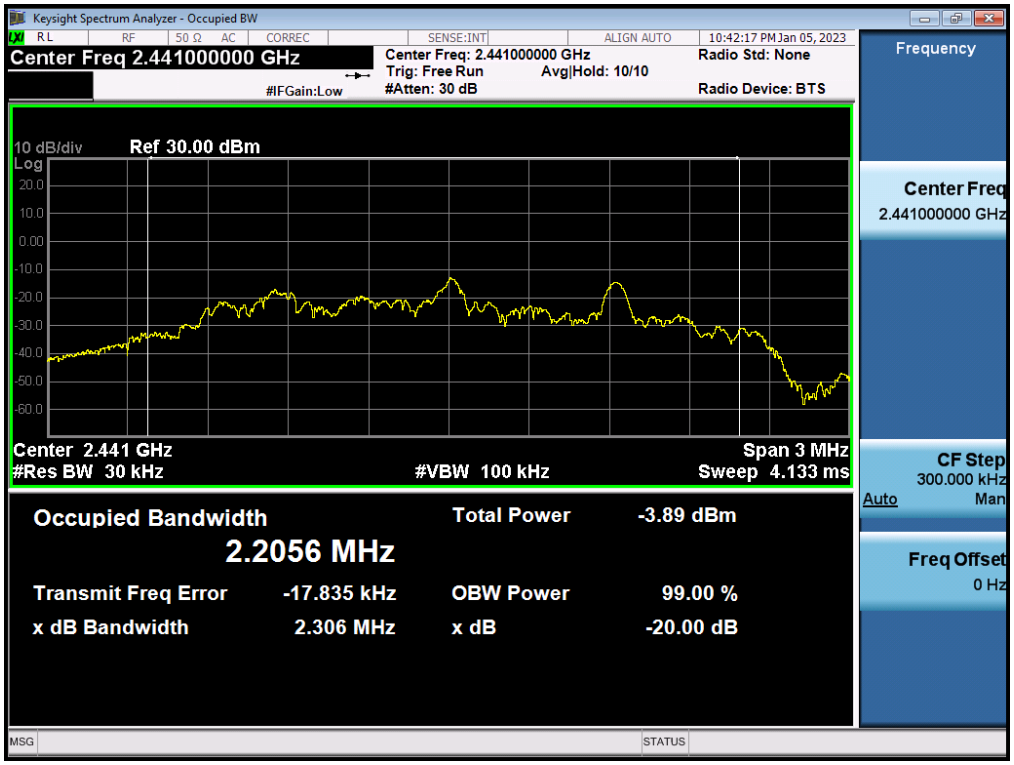
9.3. MEASUREMENT RESULTS

TEST ITEM	20DB BANDWIDTH
TEST MODULATION	GFSK

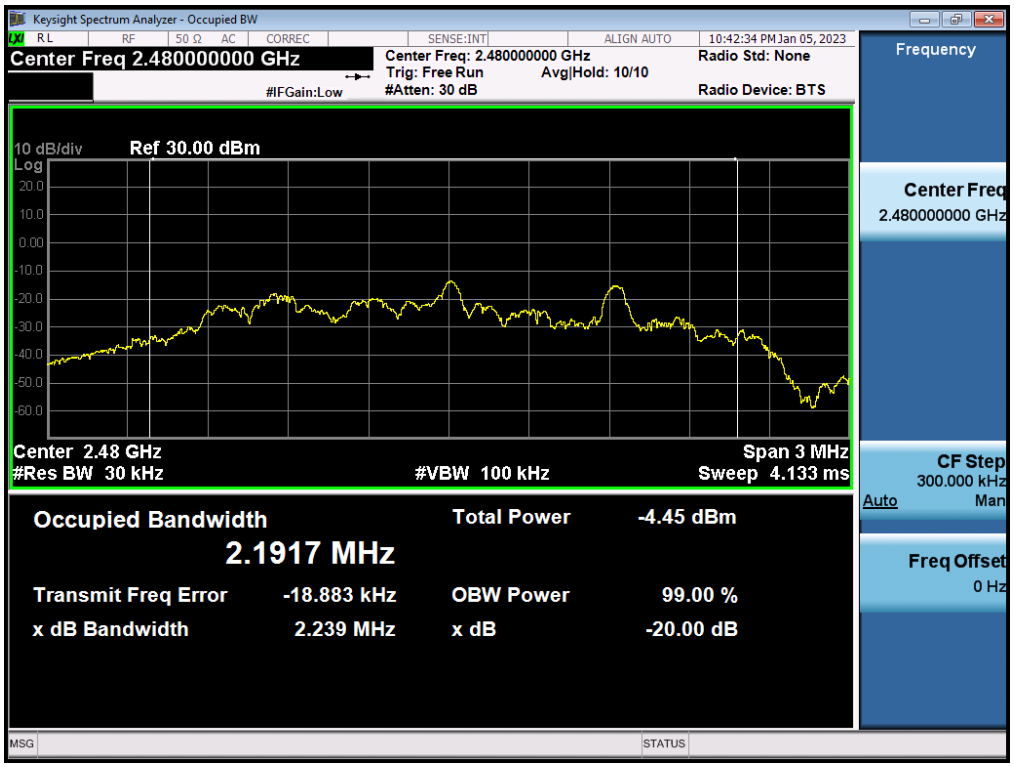
Test Data (MHz)		Criteria
Low Channel	2.335	PASS
Middle Channel	2.306	PASS
High Channel	2.239	PASS

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

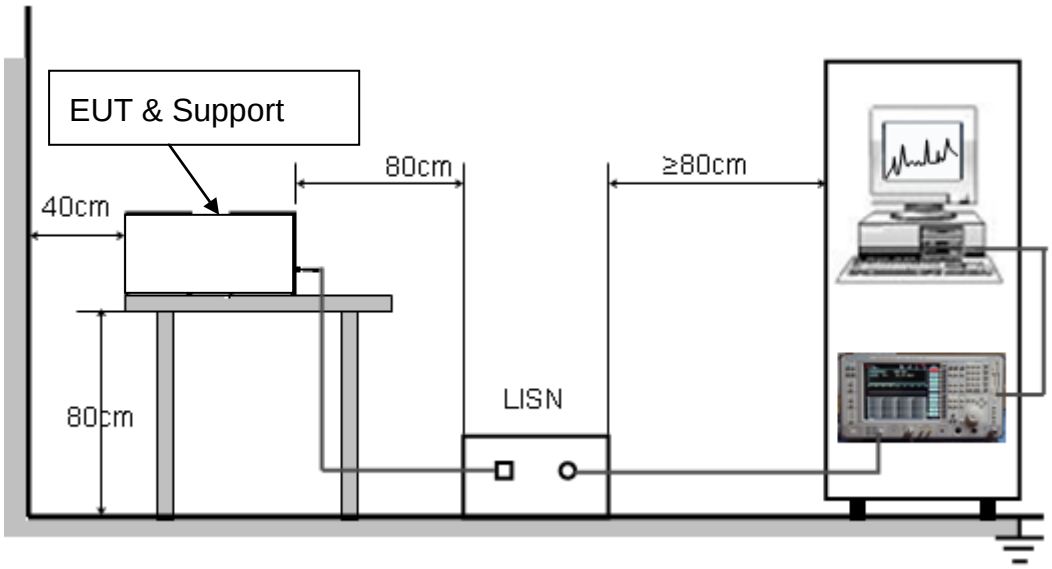
10.1. LIMITS OF LINE CONDUCTED EMISSION TEST

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 0.50MHz.

10.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



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.

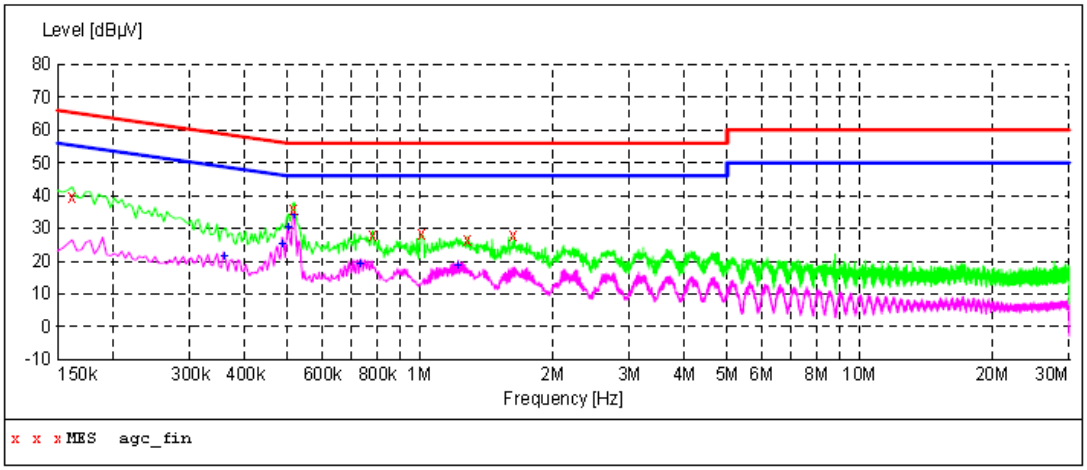
Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

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"

2023/1/9 9:41

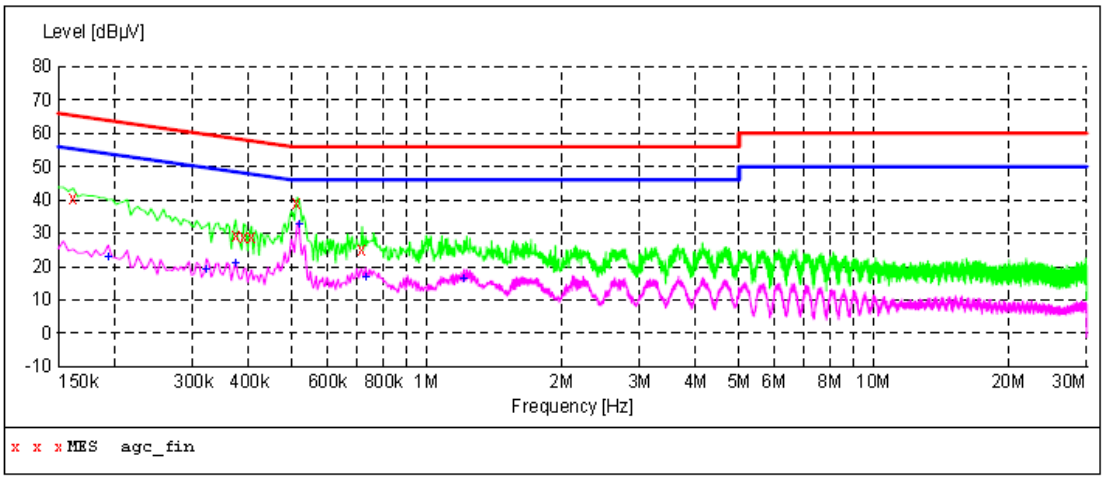
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.162000	39.50	6.8	65	25.9	QP	L1
0.518000	36.00	5.4	56	20.0	QP	L1
0.782000	28.10	5.4	56	17.9	QP	L1
1.010000	28.50	5.4	56	27.5	QP	L1
1.286000	26.30	5.8	56	29.7	QP	L1
1.638000	27.70	6.2	56	28.3	QP	L1

MEASUREMENT RESULT: "agc_fin2"

2023/1/9 9:40

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.358000	21.20	5.8	49	27.6	AV	L1
0.486000	25.00	5.4	46	21.2	AV	L1
0.502000	30.40	5.4	46	15.6	AV	L1
0.518000	34.00	5.4	46	12.0	AV	L1
0.734000	19.10	5.4	46	26.9	AV	L1
1.222000	18.50	5.7	46	27.5	AV	L1

Line Conducted Emission Test Line 2-N



MEASUREMENT RESULT: "agc_fin"

2023/1/9 9:36

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.162000	40.60	6.8	65	24.8	QP	N
0.374000	29.30	5.8	58	29.1	QP	N
0.390000	29.00	5.7	58	29.1	QP	N
0.406000	28.70	5.7	58	29.0	QP	N
0.514000	39.10	5.4	56	16.9	QP	N
0.718000	24.90	5.4	56	31.1	QP	N

MEASUREMENT RESULT: "agc_fin2"

2023/1/9 9:36

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.194000	22.70	6.6	54	31.2	AV	N
0.322000	19.20	5.9	50	30.5	AV	N
0.374000	21.00	5.8	48	27.4	AV	N
0.518000	32.70	5.4	46	13.3	AV	N
0.730000	16.80	5.4	46	29.2	AV	N
1.214000	16.20	5.7	46	29.8	AV	N

RESULT: PASS

All test modes had been pre-tested. The mode 2 is the worst case and recorded in the report.

APPENDIX A: PHOTOGRAPHS OF TEST SETUP

Refer to the Report No.: AGC00803230101AP01

APPENDIX B: PHOTOGRAPHS OF THE EUT

Refer to the Report No.: AGC00803230101AP02

----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.