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FCC PART 15 SUBPART C
FCC PART 15.249
TEST REPORT

FCC ID: 2BWFC-DI-W30

Report No: CTSL2620530268E02

Product Name: W30 Smart Voice Mouse

Main Test Model: DI-W30

Series Models: -

Applicant: Dongguan Yuli Electronic Technology Co., Ltd

EXECUTIVE SUMMARY

A sample of this product was tested and found to be in compliance with
FCC PART 15C, FCC PART 15 SUBPART C (15.249).

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CTSL Testing (Dongguan) Co., Ltd.
Main company address: Building 1, Houjie Road, Houjie Town, Guangdong Province
Dongguan City, China

Test Report

FCC ID:2BWFC-DI-W30

Applicant Name	Dongguan Yuli Electronic Technology Co., Ltd				
Applicant Address	Room 201, No. 36 Dayoudi Road, Dalang Town, Dongguan City, Guangdong Province, China				
Manufacturer Name	Dongguan Yuli Electronic Technology Co., Ltd				
Manufacturer Address	Room 201, No. 36 Dayoudi Road, Dalang Town, Dongguan City, Guangdong Province, China				
Trade Mark	啸天战虎				
Product name	W30 Smart Voice Mouse				
Main Test Model	DI-W30				
Series Models	-				
Standard	**FCC Part 15 Subpart C (15.249)** **ANSI C63.10:2020**				
Test Location	ISO/IEC 17025 by ILAC-MRA is A2LA 7556.01 CTSL Testing (Dongguan) Co., Ltd. Room 112, Building 1, No. 15, Jiaoyuansongshan, Hetian Village, Houjie Town, Dongguan, Guangdong China				
Receipt Date	2026.05.25	**Test period**	2026.05.26-2026.06.26	**Issue Date**	2026.06.26
Conclusion	**The equipment under test was found to be compliance with the requirements of the standards applied.**				
Performs Testing:	Ethan Zhao	Ethan zhao			
Test Report Reviewer:	Steve Qin	Steve Qin			
Test Report Authorizer:	Alan Li	Alan Li			

(Special seal)

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1. General Information

1.1. General Description of EUT (Equipment Under Test)

Product Information		
Product Name	:	W30 Smart Voice Mouse
Main Test Model	:	DI-W30
Series Models	:	--
Power supply	:	Charging Input: DC 5V 1A by Type-C
Battery	:	DC 3.7V by Internal battery Capacity: 500mAh
Software Version	:	W30 V1.0
Hardware Version	:	D107-AM10-VER01
Equipment Under Test		
Testing sample ID	:	CTSL2620530268-S1 (Engineer sample) CTSL2620530268-S2 (Normal sample)
Test supplied	:	☐ supplied by the manufacturer ☒ supplied by the lab (Auxiliary test equipment supplied by test Lab, Details reference Section 2.6.)
Power supply information	:	Adapter Output: DC 5V
Wireless Specification		
Supported Type	:	2.4G Wireless SRD
Modulation Type	:	GFSK
Transmit data rate	:	1 Mbps
Operation frequency	:	2402-2480MHz
Number of channels	:	40 Channels
Channel separation	:	2MHz
Max Field Strength@3m (Fundamental)	:	92.14 dBμV/m (Peak)
Antenna Gain& type	:	Refer to Section 1.2 of the report.
Sample Type	:	Prototype production
Type of Device	:	☒ Portable Device; ☐ Mobile Device; ☐Modular Device

Note: For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

1.2. Antenna Information

Ant No.	Band	Model Name	Antenna Type	Connector	Gain (dBi)
1	2.4G band	ABANT-F1-5	PCB printed antenna (integrated on PCB)	/	0

Note:
1. The antenna gain is declared by the customer and the laboratory is not responsible for the accuracy of the antenna gain.
2. The test results of this report only apply to the sample as received.

1.3. Information of RF Cable

Cable Loss(dB)	Provided by
1.0	Dongguan Yuli Electronic Technology Co., Ltd

Note:
1. The customer declared the loss value of the RF Cable. and the test results of this report only apply to the sample as received.
2. The laboratory is not responsible for the accuracy of the cable loss.

2. SUMMARY OF TEST

2.1. Test Standards

FCC Rules Part 15.249: Operation within the bands 902-928 MHz, 2400-2483.5 MHz, 5725-5875 MHz, and 24.0-24.25 GHz.
ANSI C63.10:2020: American National Standard for Testing Unlicensed Wireless Devices

2.2. Summary of test result

No.	Description of Test Item	FCC Standard Section	Results
1	Field Strength of Fundamental	§15.249(a)	PASS
2	Radiated Spurious Emissions and Band Edge	§15.205 §15.209 §15.249(a)(c)(d)(e) §15.35(b)	PASS
3	20dB Bandwidth	§15.215(c)	PASS
4	AC Power Line Conducted Emissions	§15.207	PASS
5	Antenna Requirement	§15.203	PASS

Note: “N/A” denotes test is not applicable in this test report.

2.3. Test Facilities

EMC Lab :

A2LA Certificate Number: 7556.01;
CTSL Testing (Dongguan) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.
The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.10 and CISPR 16-1-4:2010.

FCC Designation Number: CN1425;
Test Firm Registration Number:750639;
CTSL Testing (Dongguan) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

Industry Canada Registration Number. Is: 34801;
CAB identifier: CN0192;
CTSL Testing (Dongguan) Co., Ltd. The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing.

Name of Firm : CTSL Testing (Dongguan) Co.,ltd.

EMC test location/satellite location:
Room 112, Building 1, No. 15, Jiaoyuansongshan Hetian Village, Houjie Town Dongguan City, Guangdong, People's Republic of China City, Guangdong, China

2.4. Measurement uncertainty

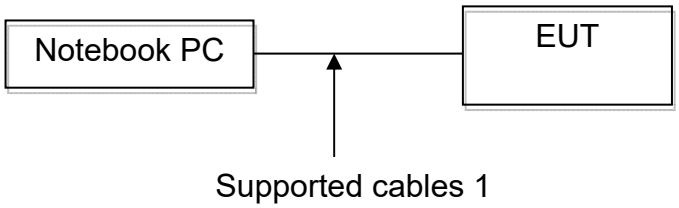
Test Item	Uncertainty
Uncertainty for Conduction emission test	±3.48dB
Uncertainty for spurious emissions test (Below 30MHz)	±1.62 dB
Uncertainty for spurious emissions test (30MHz-1GHz)	±4.60 dB(Polarize: H)
	±4.68 dB(Polarize: V)
Uncertainty for spurious emissions test (1GHz to 25GHz)	±4.96dB
Uncertainty for radio frequency	7×10^{-8}

Note: This uncertainty represents an expanded uncertainty expressed at approximately The 95% confidence level using a coverage factor of k=2.

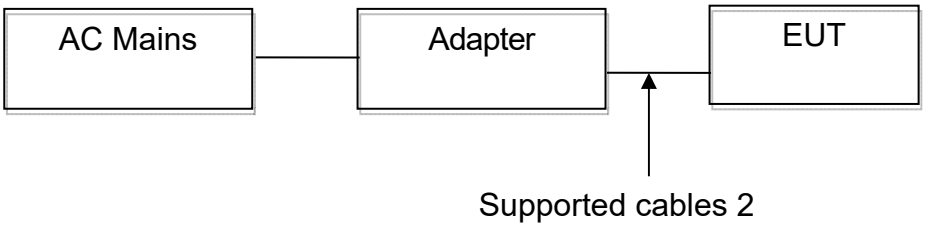
2.5. Block Diagram

For radiated emissions test: EUT was placed on a turn table, which is 0.8 (or 1.5) meter high above ground. EUT was beset into Bluetooth test mode by software before test.

Connect EUT Antenna Terminal, Radiated Spurious Emissions& Band Edge Test



AC Power Line Conducted Emissions& Radiated Emission Test (30-1000MHz):



(**EUT**: W30 Smart Voice Mouse)

2.6. Assistant equipment used for test

Item	Equipment	Brand	Model Name/Type No.	FCC ID	Series No.
1	Notebook PC	-	Inspiron 14R-5421 (Manufacturer: Dell)	-	25TZHW1
2	Adapter	-	MDY-14-ED (supplied by the Lab.)	-	-

Supported cables				
Item	**Shielded Type**	**Ferrite Core**	**Length**	**Note**
1	NO	NO	0.5m	USB Extension Cable, supplied by the Lab.
2	NO	NO	1.5m	USB to Type-C Cable, supplied by the Lab.

2.7. Test mode

Combining all the rates, modulations, and packet types, the Pre-scans had been carried out. The worst-case test mode was selected for the final test as listed below.

Test Item	Modulation Type	Operating Mode	Test Channel
Fundamental	GFSK	Continuous TX	Low / Mid / High
Radiated Spurious Emissions	GFSK	Continuous TX	Low / Mid / High
Band Edge	GFSK	Continuous TX	Low / High
20dB Bandwidth	GFSK	Continuous TX	Low / Mid / High
AC Power Line Conducted Emissions	GFSK	Continuous TX	Worst channel

Note: In radiated measurement, the EUT had been pre-scan on the positioned of each 3 axis (X, Y, Z), the worst case was found when positioned on **X-plane.**

2.8. Channel List

Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
00	**2402**	01	2404	02	2406	03	2408
04	2410	05	2412	06	2414	07	2416
08	2418	09	2420	10	2422	11	2424
12	2426	13	2428	14	2430	15	2432
16	2434	17	2436	18	2438	**19**	**2440**
20	2442	21	2444	22	2446	23	2448
24	2450	25	2452	26	2454	27	2456
28	2458	29	2460	30	2462	31	2464
32	2466	33	2468	34	2470	35	2472
36	2474	37	2476	38	2478	**39**	**2480**

2.9. Power Setting of Test Software

Software Name	bt_tool_v1.1.2		
Frequency (MHz)	2402	2440	2480
GFSK Setting	6	6	6

Note: This information is provided by the applicant.

2.10. Test Equipment

For Conducted Emission Test						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESCI 3	AT005	GUANGZHOU NEM	May 28,26	May 27,27
LISN	Rohde & Schwarz	ENV216	AT006	GUANGZHOU NEM	May 28,26	May 27,27
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	AT007	GUANGZHOU NEM	May 28,26	May 27,27
CE Cable	Times Microwave	LMR195UF-NMNM-1.50M	AT041	GUANGZHOU NEM	May 28,26	May 27,27
Test Software	FARAD	EZ-EMC Ver.3A1.1+	N/A	N/A	N/A	N/A

For Radiated Emission Test (9kHz-30MHz)						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
EMI TestReceiver	Rohde& Schwarz	ESCI 7	AT001	GUANGZHOU NEM	May 28,26	May 27,27
Active Loop Antenna	HCT	6505	AT064	GRG METROLOGY	Mar 22,26	Mar 21,27
Test Software	FARAD	EZ-EMC Ver.3A1.1+	N/A	N/A	N/A	N/A
9kHz-30MHz Cable	Times Microwave	LMR195UF-NMNM-9M	AT045	GUANGZHOU NEM	May 28,26	May 27,27

For Radiated Emissions Test (30MHz-1000MHz)						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
EMI Test Receiver	Rohde& Schwarz	ESCI 7	AT001	GUANGZHOU NEM	May 28,26	May 27,27
Trilog-Broadband Antenna	SCHWARZBECK	VULB 9168	AT002	LISAI	May 30,26	May 29,27
Test Software	FARAD	EZ-EMC Ver.3A1.1+	N/A	N/A	N/A	N/A
30-1000MHz Cable	Times Microwave Systems	LMR195UF-NMRNMR-3.00M+ LMR400UF-NMNM-3.00M+ LMR400UF-NMNM-3.00M	AT042+AT043+AT044	GUANGZHOU NEM	May 28,26	May 27,27

For Radiated Emission test (Above 1000MHz)						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
Horn Antenna 1-18G	SCHWARZBECK	BBHA 9120 D	AT003	LISAI	May 30,26	May 29,27
Horn Antenna 18-40GHz	XIBAO	XB-WDB18-40K	AT064	LISAI	May 30,26	May 29,27
Broadband Preamplifier	SCHWARZBECK	BBV 9718 D	AT004	GUANGZHOU NEM	May 28,26	May 27,27
Low Noise Amplifier	MWRFtest	DLA8-18-40G-2078	AT065	GUANGZHOU NEM	May 28,26	May 27,27
Spectrum Analyzer 40G	Keysight	N9020B	AT066	GUANGZHOU NEM	May 28,26	May 27,27
Spectrum Analyzer 26.5G	Keysight	N9020A	AT050	GUANGZHOU NEM	May 28,26	May 27,27
Radio switching unit	TiGroup	SU319	AT055	N/A	N/A	N/A
Filtering unit	TiGroup	SU319F	AT056	N/A	N/A	N/A
Test Software	BL	BL410-E V25.5 en	N/A	N/A	N/A	N/A
Above 1GHz Cable	Times Microwave Systems	SFT205-NMNM-7.0M+ SFT205-NMNM-2.0M	AT057+ AT058	N/A	N/A	N/A

For Connect EUT Antenna Terminal Test (RF Test system)						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
Spectrum analyzer	Keysight	N9020A	AT050	GUANGZHOU NEM	May 28,26	May 27,27
Power probe unit	Ti Group	SU319P	AT053	GUANGZHOU NEM	May 28,26	May 27,27
Switch unit	Ti Group	SU319S	AT054	N/A	N/A	N/A
Test Software	BL	BL410R 3.5.2.621	N/A	N/A	N/A	N/A

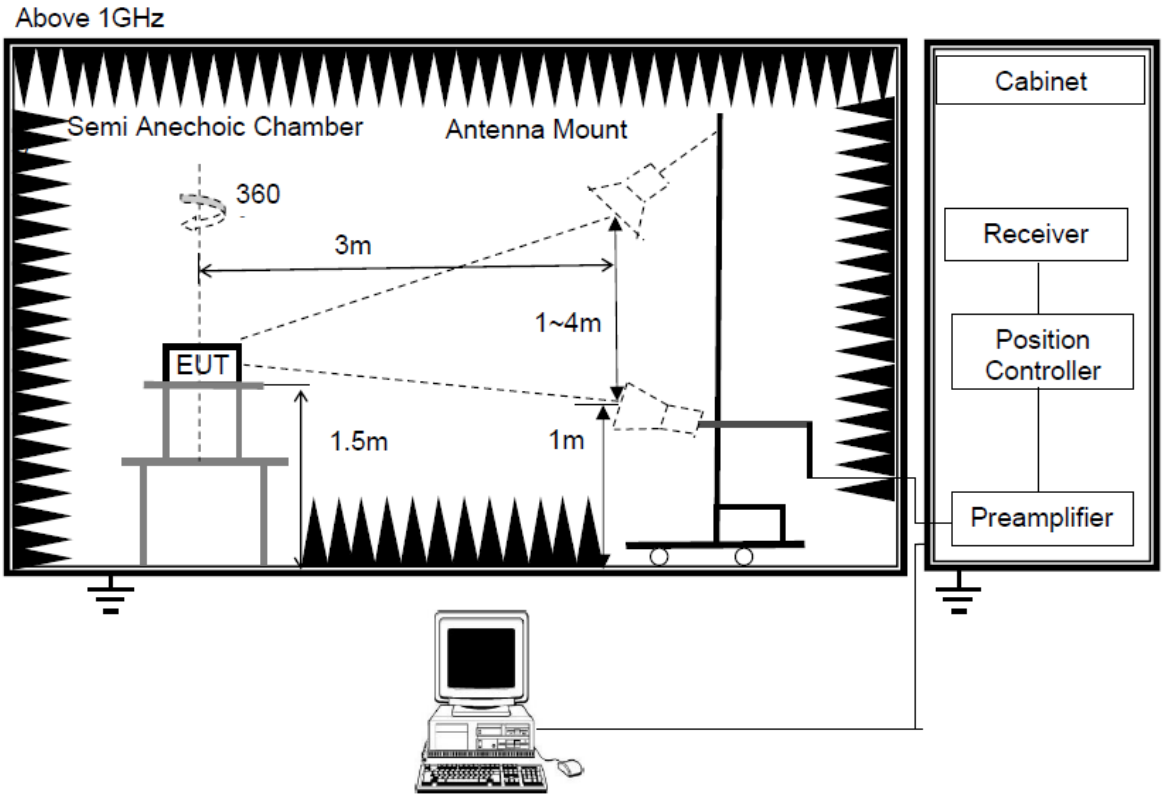
3. FIELD STRENGTH OF FUNDAMENTAL

3.1. Limit

§ 15.249(a) Fundamental Field Strength Limits (at 3 m)			
Frequency band (MHz)	**Fundamental limit (mV/m)**	**Average Limit (dBμV/m)**	**Peak Limit (dBμV/m)**
2400-2483.5MHz	50	94	114
Note: 1. Average Limit (dBμV/m)=20×log[1000×Field Strength (mV/m)]. 2. Peak Limit (dBμV/m) = Average Limit (dBμV/m) +20dB, per §15.35(b).			

3.2. Test Setup

(A) Radiated Emission Test Set-Up, Frequency above 1GHz



3.3. Spectrum Analyzer Setting

Spectrum Parameters	Setting
RBW	≥OBW (Suggested 1MHz)
VBW	3×RBW (Suggested 3MHz)
Start frequency	2400MHz
Stop frequency	2483.5MHz
Sweep Time	Auto
Detector	Peak / Average
Trace Mode	Max Hold

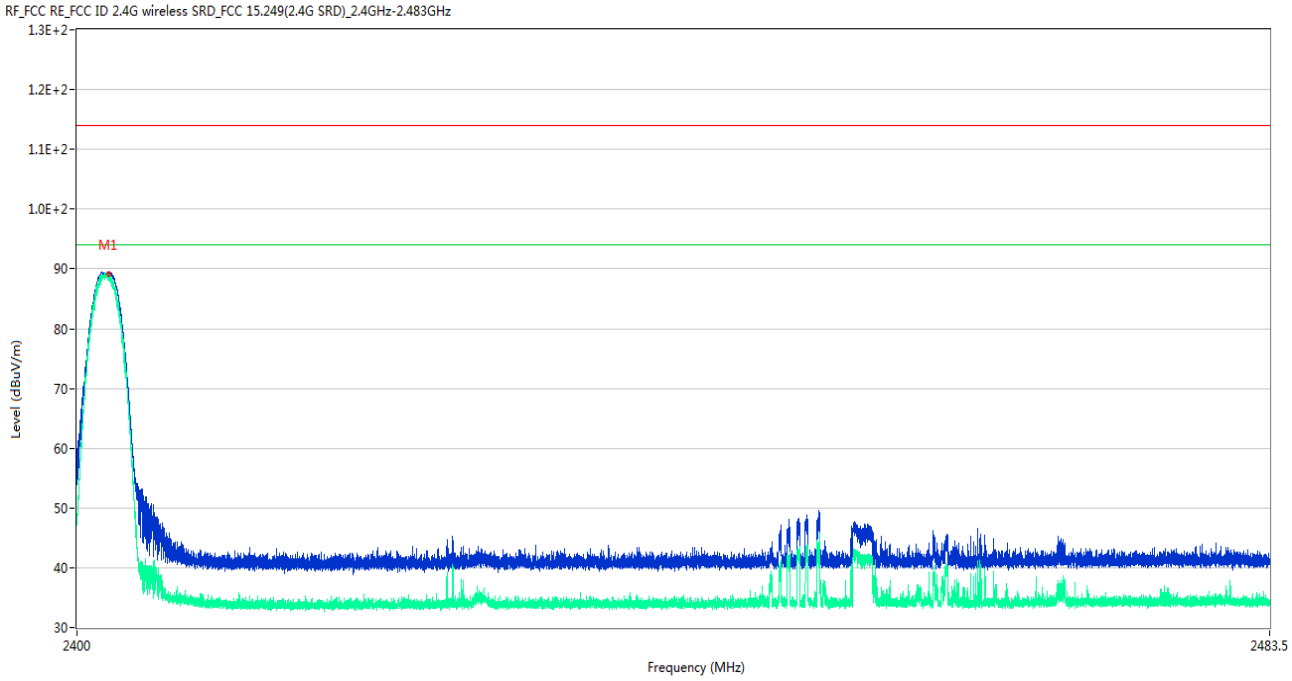
3.4. Test Procedure

a. EUT was placed on a turn table, which is 1.5 meter high above the ground.
b. EUT is set 3 meters away from the receiving antenna, which is mounted on an antenna tower.
c. Spectrum analyzer setting parameters in accordance with section 3.3.
d. Set the EUT transmit continuously with maximum output power.
e. The turn table can rotate 360 degrees to determine the position of the maximum emission level.
f. The antenna can be moved up and down between 1 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on test, record the average and peak value.
g. Repeat above procedures until all channels were measured.
h. Record the results in the test report.
i. recorded in this report.

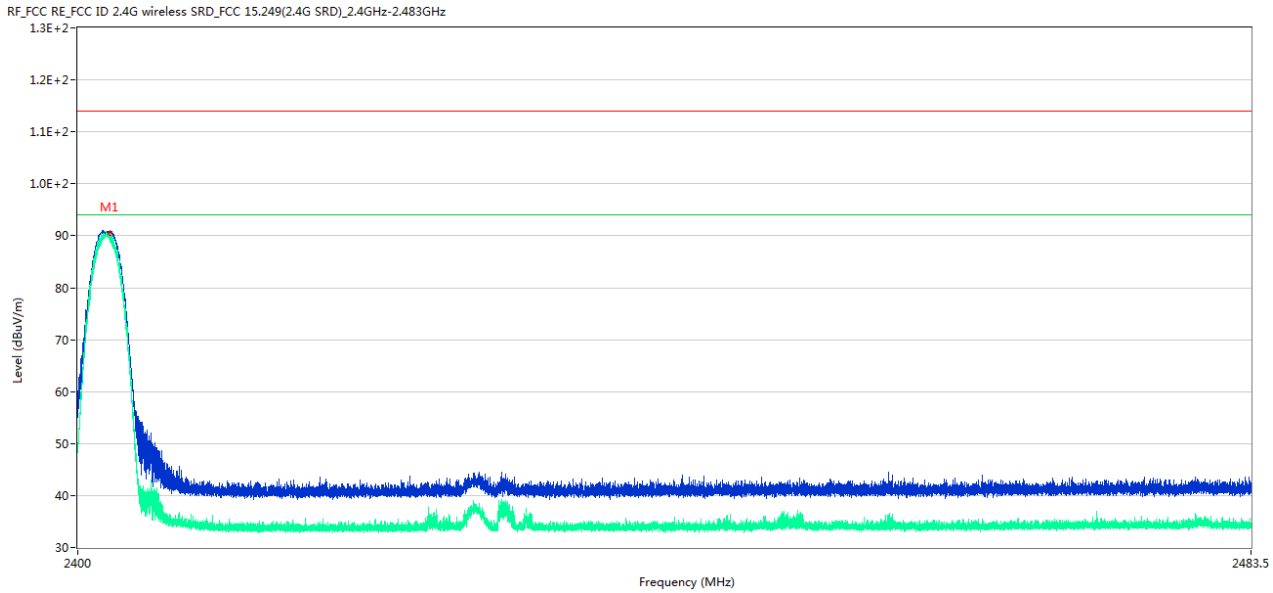
3.5. Test Result

Field Strength of Fundamental@3m						
Frequency MHz	**Field strength of fundamental level (dBμV/m)**	**Limit (dBμV/m)**	**Margin (dB)**	**Detector**	**Polarization**	**Result**
2402	89.48	114.00	24.52	Peak	Vertical	Pass
	88.26	94.00	5.74	Average		
2402	91.02	114.00	22.98	Peak	Horizontal	Pass
	89.38	94.00	4.62	Average		
2440	89.92	114.00	24.08	Peak	Vertical	Pass
	88.42	94.00	5.58	Average		
2440	92.14	114.00	21.86	Peak	Horizontal	Pass
	91.27	94.00	2.73	Average		
2480	88.82	114.00	25.18	Peak	Vertical	Pass
	87.79	94.00	6.21	Average		
2480	91.70	114.00	22.30	Peak	Horizontal	Pass
	90.89	94.00	3.11	Average		

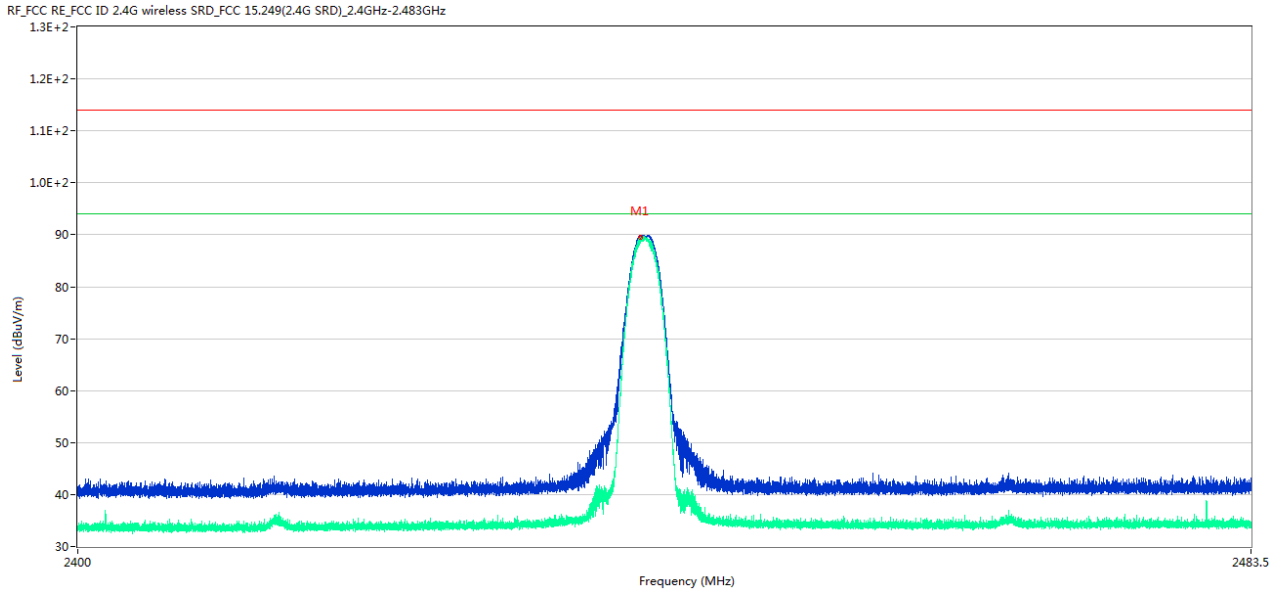
3.6.Original Test record



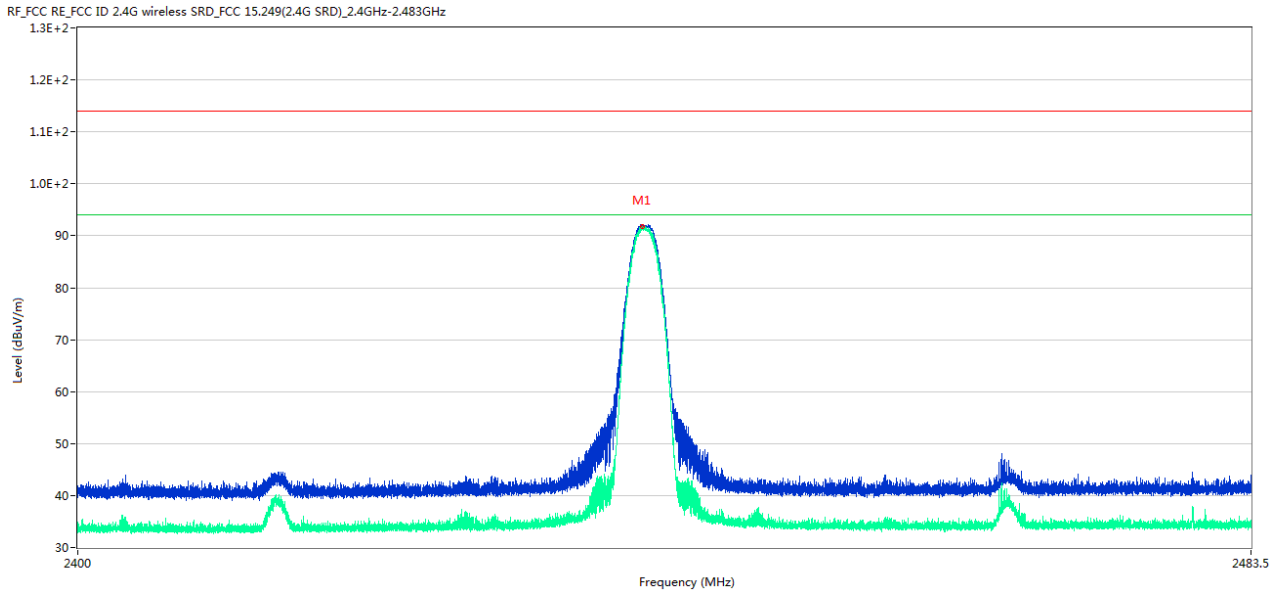
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2402.221	89.48	-19.67	114.0	24.52	Peak	37.90	150	Vertical	Pass



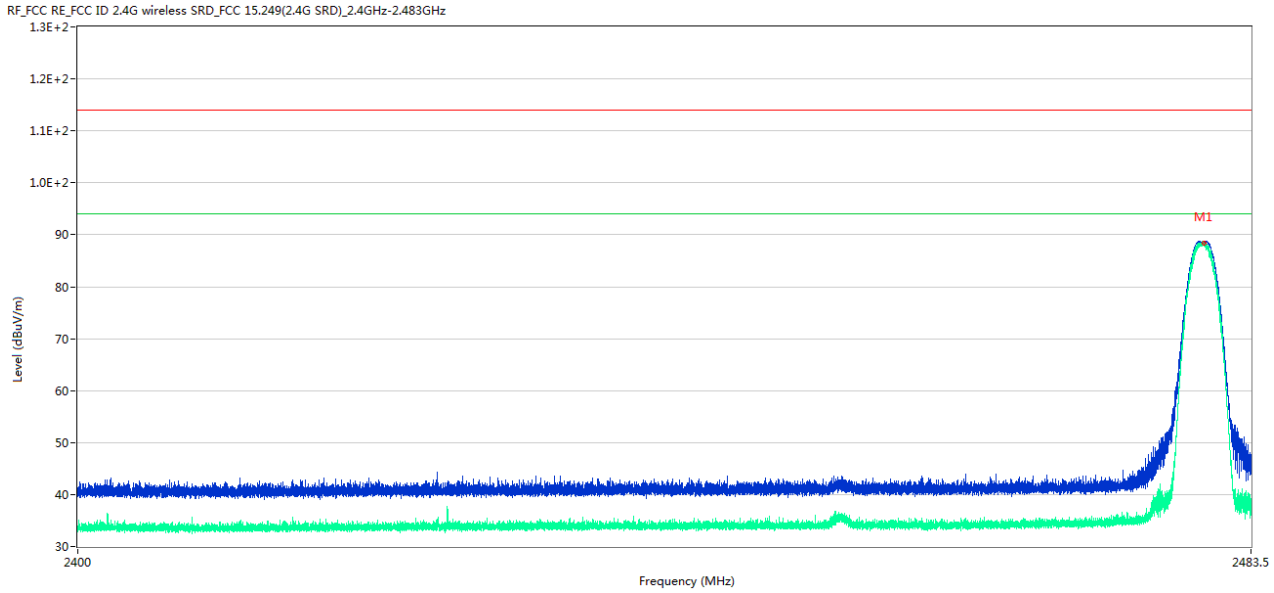
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2402.254	91.02	-19.67	114.0	22.98	Peak	170.30	150	Horizontal	Pass



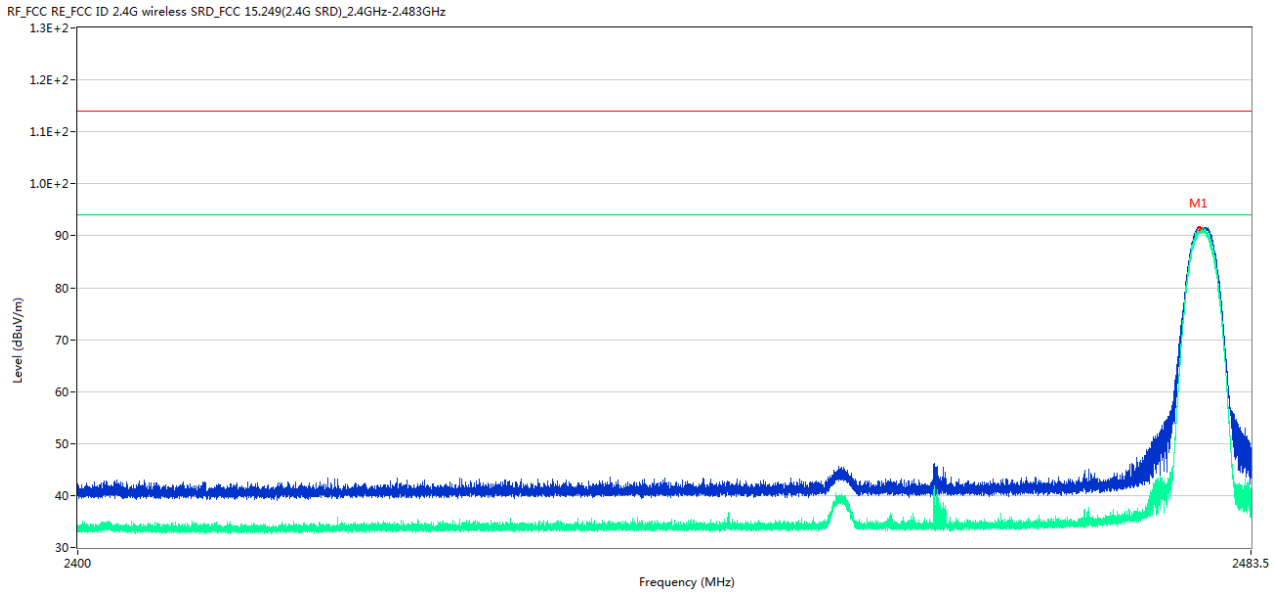
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2439.704	89.92	-19.50	114.0	24.08	Peak	172.80	150	Vertical	Pass



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2439.725	92.14	-19.50	114.0	21.86	Peak	345.50	150	Horizontal	Pass



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2480.227	88.82	-19.49	114.0	25.18	Peak	213.80	150	Vertical	Pass



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2479.839	91.70	-19.49	114.0	22.30	Peak	36.20	150	Horizontal	Pass

4. Radiated Spurious Emissions and Band Edge

4.1. Limit

15.205 Restricted frequency band			
MHZ	MHz	MHZ	GHZ
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(2)

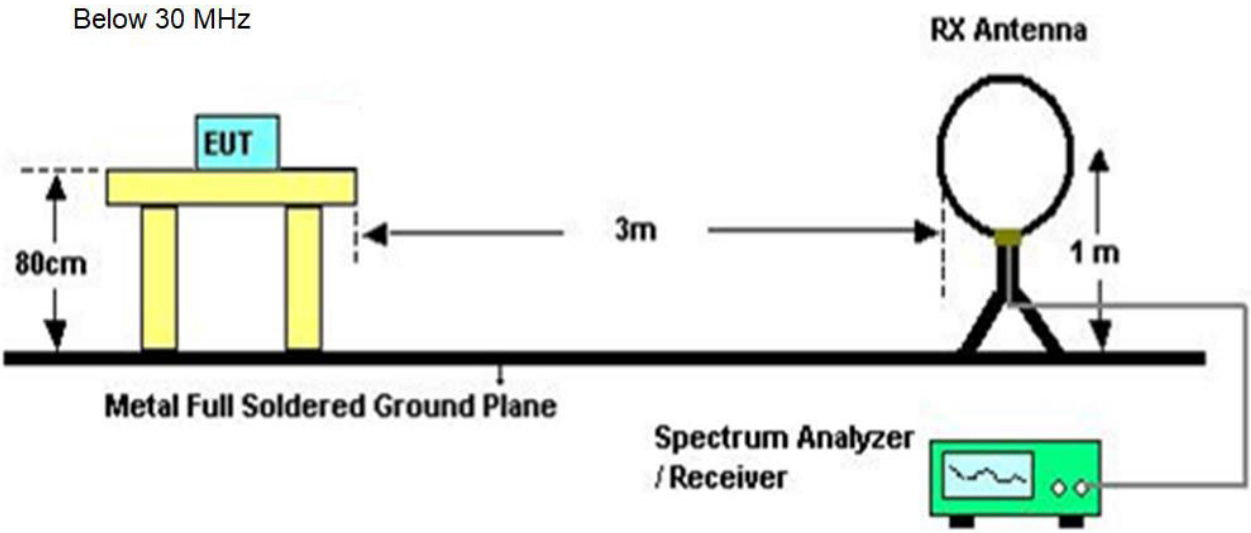
For harmonics and other spurious emissions:
Harmonics: 500 μV/m = 54 dBμV/m (at 3 m)
Other spurious emissions outside the band: comply with general limits in §15.209 (see table below)

§ 15.209 Radiated emission general limits			
Frequency (MHz)	Field Strength(μV/m)	Field Strength (dBμV/m)	Distance(m)
0.009-0.490	2400/F(kHz)	-	300
0.490-1.705	24000/F(kHz)	-	30
1.705-30	30	29.5	30
30-88	100	40.0	3
88-216	150	43.5	3
216-960	200	46.0	3
Above 960	500	54.0	3
Note: Peak measurement may exceed average limit by up to 20 dB per §15.35(b). Restricted bands per §15.205 apply; emissions falling within these bands must meet the §15.209 limits.			

Note:
(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.

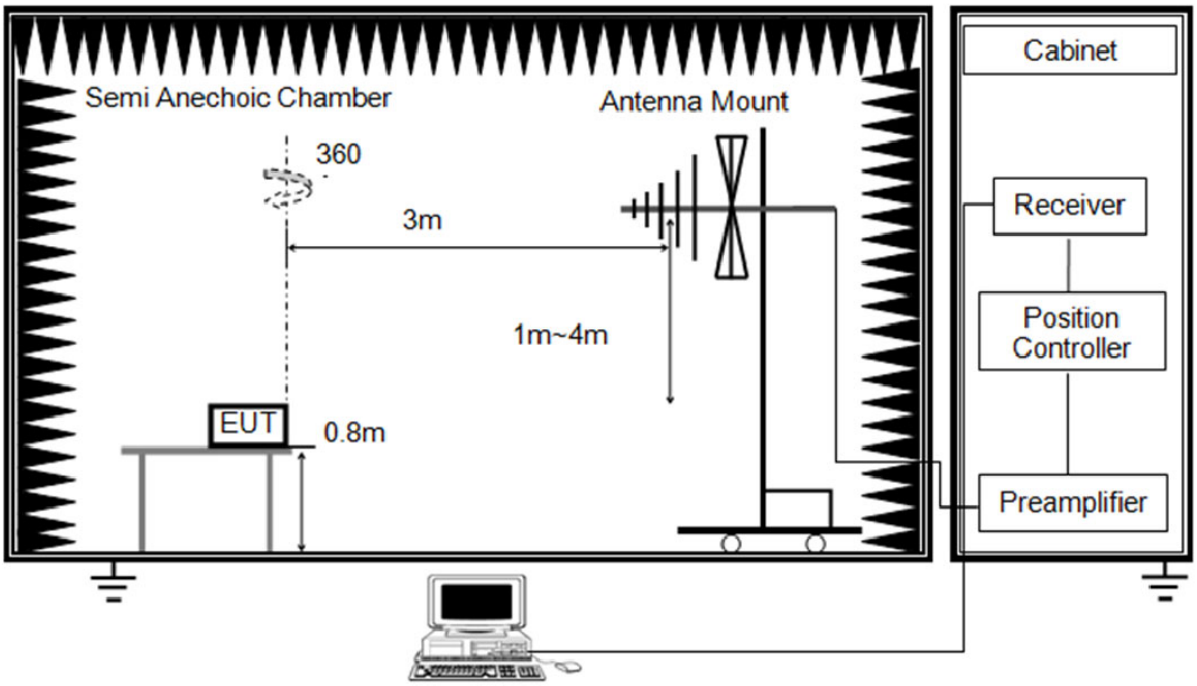
4.2. Test Setup

(B) Radiated Emission Test Set-Up, Frequency Below 30MHz

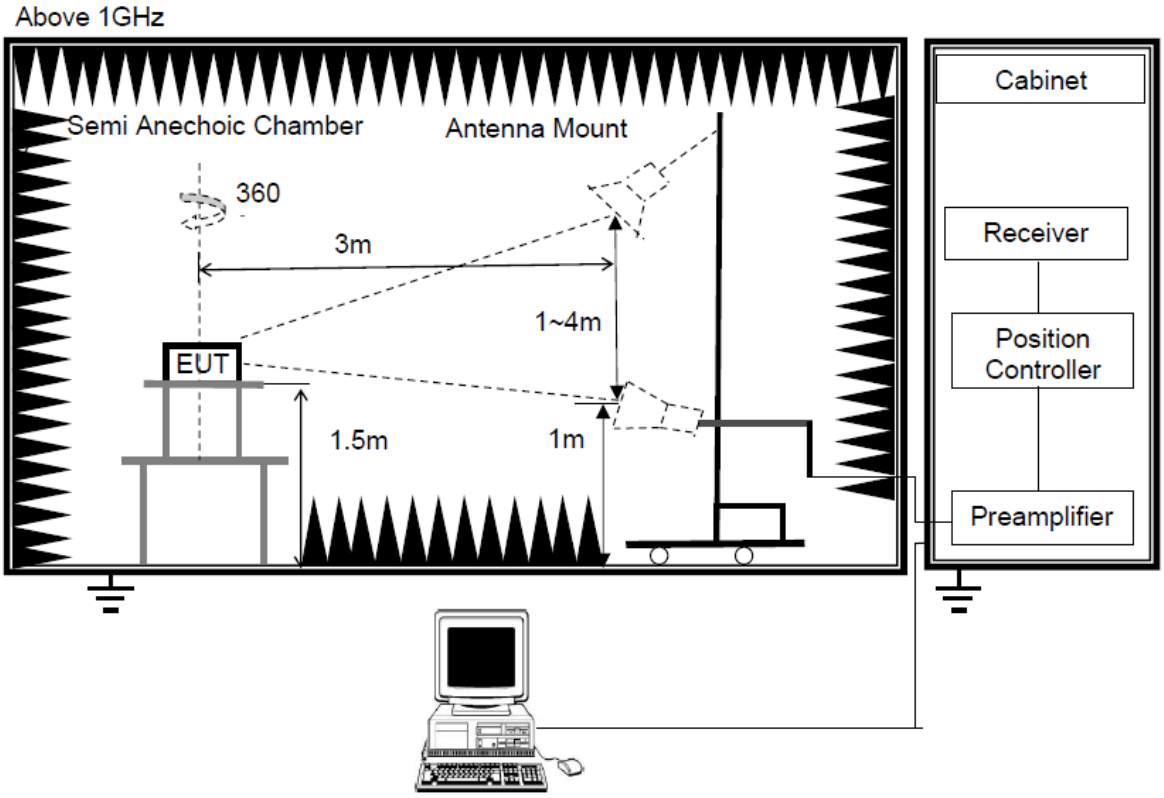


(C) Radiated Emission Test Set-Up, Frequency below 1000MHz

Below 1 GHz and above 30 MHz



(D) Radiated Emission Test Set-Up, Frequency above 1GHz



4.3. Spectrum Analyzer Setting

For 9KHz-150KHz	
Spectrum Parameters	**Setting**
RBW	300Hz (for Peak&AVG)/CISPR 200Hz (for QP)
VBW	300Hz (for Peak&AVG)/CISPR 200Hz (for QP)
Start frequency	9KHz
Stop frequency	150KHz
Sweep Time	Auto
Detector	PEAK/QP/AVG
Trace Mode	Max Hold

Note: For 9KHz-90KHz&110KHz-150KHz,the detector is average,other frequency is CISPR QP detector.

For 150KHz-30MHz	
Spectrum Parameters	**Setting**
RBW	9KHz
VBW	9KHz
Start frequency	150KHz
Stop frequency	30MHz
Sweep Time	Auto
Detector	QP
Trace Mode	Max Hold

Note : For 150KHz-490KHz,the detector is average,other frequency is CISPR QP detector.

For 30MHz-1GHz	
Spectrum Parameters	**Setting**
RBW	120KHz
VBW	300KHz
Start frequency	30MHz
Stop frequency	1GHz
Sweep Time	Auto
Detector	QP
Trace Mode	Max Hold

For Above 1GHz		
Spectrum Parameters	**Setting**	
RBW	1MHz	
VBW	Peak Measurement: 3MHz	Average Measurement: 10Hz (using Peak detector)
Start frequency	1GHz	
Stop frequency	40GHz	
Sweep Time	Auto	
Detector	Peak	Peak with 10Hz VBW (for Average measurement)
Trace Mode	Max Hold	

4.4. Test Procedure

a. Reference: ANSI C63.10:2020, Sections 6.3, 6.6
b. Place the EUT on a non-metallic turntable at 0.8 m (below 1 GHz) or 1.5 m (above 1 GHz) height.
c. Set the EUT to transmit continuously at maximum power.
d. Rotate the turntable 360° and vary antenna height 1–4 m (below 1 GHz) to maximise emissions.
e. For above 1 GHz, antenna height is typically 1.5 m, but can be varied if required.
f. Measure emissions from 9 kHz up to the 10th harmonic of the fundamental (up to 25 GHz).
g. Use Peak and Average detectors (or QP for below 1 GHz) as per section 4.3
h. For band edge measurements, focus on 2310–2390 MHz (low) and 2483.5–2500 MHz (high).
i. Record the highest emissions for each frequency range.

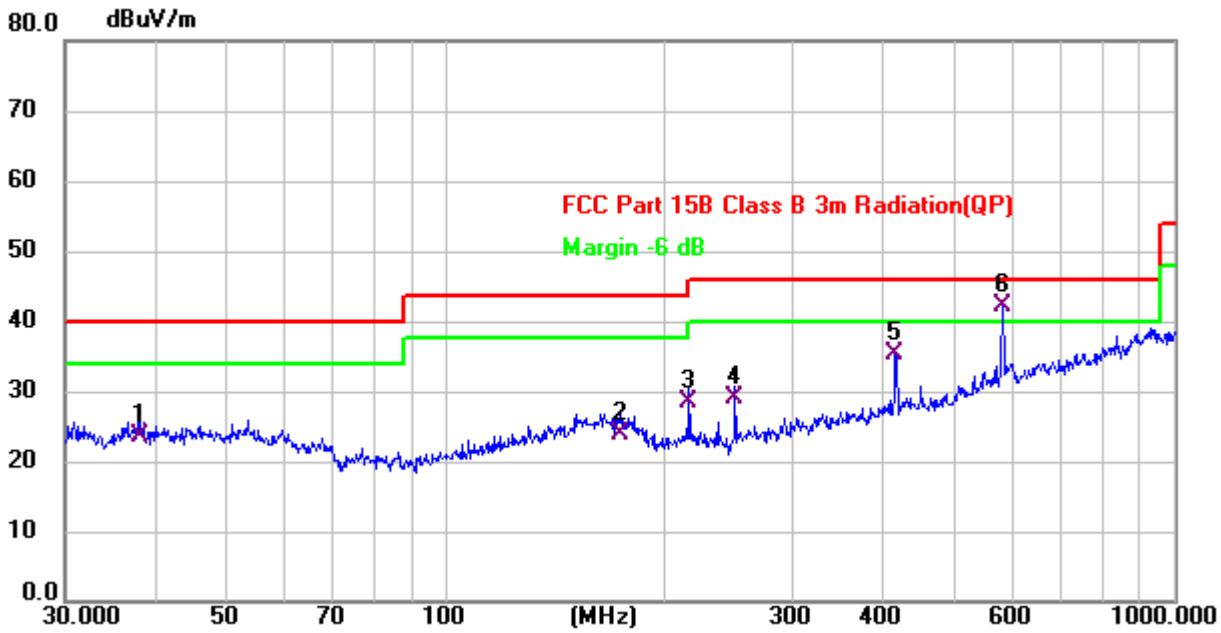
Note:

1. For emissions above 1GHz, if peak level complies with average limit, then the average level is deemed to comply with average limit.
2. The frequency 2402MHz ,2440MHz and 2480MHz is fundamental frequency which no limit, the limit on plots is automatically generated by the software, it's not fundamental limit, we can't remove it.
3. For 30-1000MHz Radiation emissions, GFSK mode all have been tested, only worse case: GFSK mode with CH39 2480MHz is reported. it was conducted under both AC 120V/60Hz and AC 240V/50Hz input voltages. There was no significant change in radiation emission. Only the test data under AC 120V/60Hz voltage was recorded and included in the report.
4. Radiated emission test from 9KHz to 10th harmonic of fundamental was verified, and no emission found except system noise floor in 9KHz to 30MHz and not recorded in this report.
5. The amplitude of 18GHz to 25GHz spurious emissions that are attenuated by more than 20dB below the permissible limit have no need to be reported.
6. Radiated emission test from 25GHz to 40GHz of fundamental was verified, and no emission found except system noise floor in 25GHz to 40GHz and not recorded in this report.

4.5. Test Result

Radiated Emissions 30-1000MHz

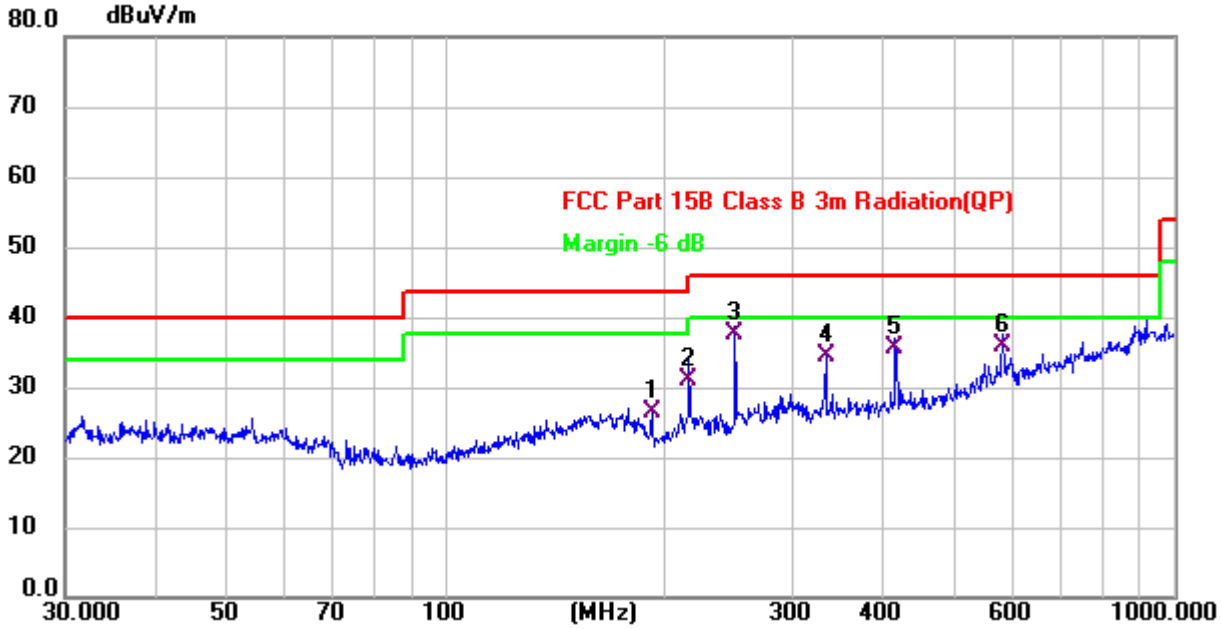
EUT: W30 Smart Voice Mouse
M/N: DI-W30
Test Voltage: Charging Input: DC 5V by Type-C Port
Ant. Pol.: Vertical
Test Mode: TX Mode
Note: only worse case: GFSK mode with CH39 2480MHz is reported
Detailed results are shown below



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna	Verdict
1	37.945	3.49	20.09	40	-16.42	QP	Vertical	Pass
2	173.205	4.5	19.35	43.5	-19.65	QP	Vertical	Pass
3	216.024	10.63	17.81	46	-17.56	QP	Vertical	Pass
4	249.425	10.81	18.14	46	-17.05	QP	Vertical	Pass
5	414.722	12.39	22.8	46	-10.81	QP	Vertical	Pass
6 *	582.742	15.44	26.62	46	-3.94	QP	Vertical	Pass

Remarks: 1). Level (dBμV/m) = Reading (dBμV/m) + Factor (dB/m)
2). Factor(dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-amplifier Gain (dB) (if applicable)
3). Margin(dB) = Limit (dBμV/m) - Level (dBμV/m)
4). No pre-amplifier was used for the 30 MHz – 1 GHz measurement.

EUT: W30 Smart Voice Mouse
M/N: DI-W30
Test Voltage: Charging Input: DC 5V by Type-C Port
Ant. Pol.: Horizontal
Test Mode: TX Mode
Note: only worse case: GFSK mode with CH39 2480MHz is reported
Detailed results are shown below



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna	Verdict
1	91.745	9.83	16.53	43.5	-17.14	QP	Horizontal	Pass
2	216.024	13.24	17.81	46	-14.95	QP	Horizontal	Pass
3 *	249.425	19.53	18.14	46	-8.33	QP	Horizontal	Pass
4	332.519	13.21	21.14	46	-11.65	QP	Horizontal	Pass
5	414.722	12.79	22.8	46	-10.41	QP	Horizontal	Pass
6	582.742	9.22	26.62	46	-10.16	QP	Horizontal	Pass

Remarks: 1). Level (dBμV/m) = Reading (dBμV/m) + Factor (dB/m)
2). Factor(dB/m) = Antenna Factor (dB/m) + Cable loss (dB) – Pre-amplifier Gain (dB) (if applicable)
3). Margin(dB) = Limit (dBμV/m) - Level (dBμV/m)
4). No pre-amplifier was used for the 30 MHz – 1 GHz measurement.

Radiated Emissions Above 1GHz -GFSK

GFSK-CH00 2402MHz										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2212.206	41.12	-19.81	74.0	32.88	Peak	108.00	150	Vertical	Pass
1**	2212.206	31.29	-19.81	54.0	22.71	AV	108.00	150	Vertical	Pass
2	4774.750	48.97	-10.51	74.0	25.03	Peak	144.00	150	Vertical	Pass
2**	4774.750	40.50	-10.51	54.0	13.50	AV	144.00	150	Vertical	Pass
3	4804.250	46.14	-11.06	74.0	27.86	Peak	216.00	150	Vertical	Pass
3**	4804.250	38.64	-11.06	54.0	15.36	AV	216.00	150	Vertical	Pass
4	7206.250	50.27	-6.86	74.0	23.73	Peak	108.00	150	Vertical	Pass
4**	7206.250	42.51	-6.86	54.0	11.49	AV	108.00	150	Vertical	Pass
5	7894.000	53.35	-6.10	74.0	20.65	Peak	324.00	150	Vertical	Pass
5**	7894.000	44.07	-6.10	54.0	9.93	AV	324.00	150	Vertical	Pass
6	17929.001	52.76	1.57	74.0	21.24	Peak	216.00	150	Vertical	Pass
6**	17929.001	44.64	1.57	54.0	9.36	AV	216.00	150	Vertical	Pass

GFSK-CH00 2402MHz										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2319.760	41.43	-19.61	74.0	32.57	Peak	360.00	150	Horizontal	Pass
1**	2319.760	32.24	-19.61	54.0	21.76	AV	360.00	150	Horizontal	Pass
2	4768.250	49.03	-10.55	74.0	24.97	Peak	180.00	150	Horizontal	Pass
2**	4768.250	40.46	-10.55	54.0	13.54	AV	180.00	150	Horizontal	Pass
3	4803.500	46.53	-11.07	74.0	27.47	Peak	72.00	150	Horizontal	Pass
3**	4803.500	38.45	-11.07	54.0	15.55	AV	72.00	150	Horizontal	Pass
4	7206.500	50.73	-6.86	74.0	23.27	Peak	36.00	150	Horizontal	Pass
4**	7206.500	43.71	-6.86	54.0	10.29	AV	36.00	150	Horizontal	Pass
5	7851.000	52.94	-6.39	74.0	21.06	Peak	360.00	150	Horizontal	Pass
5**	7851.000	42.21	-6.39	54.0	11.79	AV	360.00	150	Horizontal	Pass
6	17971.499	52.92	0.44	74.0	21.08	Peak	216.00	150	Horizontal	Pass
6**	17971.499	42.74	0.44	54.0	11.26	AV	216.00	150	Horizontal	Pass

GFSK-CH19 2440MHz										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2233.316	40.73	-19.77	74.0	33.27	Peak	360.00	150	Horizontal	Pass
1**	2233.316	31.51	-19.77	54.0	22.49	AV	360.00	150	Horizontal	Pass
2	4795.250	48.72	-10.85	74.0	25.28	Peak	108.00	150	Horizontal	Pass
2**	4795.250	39.22	-10.85	54.0	14.78	AV	108.00	150	Horizontal	Pass
3	4880.000	53.39	-10.57	74.0	20.61	Peak	108.00	150	Horizontal	Pass
3**	4880.000	48.38	-10.57	54.0	5.62	AV	108.00	150	Horizontal	Pass
4	7320.250	50.09	-6.79	74.0	23.91	Peak	252.00	150	Horizontal	Pass
4**	7320.250	42.92	-6.79	54.0	11.08	AV	252.00	150	Horizontal	Pass
5	7954.750	52.48	-6.34	74.0	21.52	Peak	72.00	150	Horizontal	Pass
5**	7954.750	43.22	-6.34	54.0	10.78	AV	72.00	150	Horizontal	Pass
6	17938.000	52.90	1.55	74.0	21.10	Peak	360.00	150	Horizontal	Pass
6**	17938.000	44.20	1.55	54.0	9.80	AV	360.00	150	Horizontal	Pass

GFSK-CH19 2440MHz										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2175.788	40.83	-20.10	74.0	33.17	Peak	108.00	150	Vertical	Pass
1**	2175.788	30.35	-20.10	54.0	23.65	AV	108.00	150	Vertical	Pass
2	4322.250	49.54	-12.16	74.0	24.46	Peak	324.00	150	Vertical	Pass
2**	4322.250	39.65	-12.16	54.0	14.35	AV	324.00	150	Vertical	Pass
3	4879.500	47.70	-10.56	74.0	26.30	Peak	360.00	150	Vertical	Pass
3**	4879.500	40.14	-10.56	54.0	13.86	AV	360.00	150	Vertical	Pass
4	7319.750	49.63	-6.79	74.0	24.37	Peak	288.00	150	Vertical	Pass
4**	7319.750	43.43	-6.79	54.0	10.57	AV	288.00	150	Vertical	Pass
5	7828.250	52.36	-6.15	74.0	21.64	Peak	360.00	150	Vertical	Pass
5**	7828.250	43.39	-6.15	54.0	10.61	AV	360.00	150	Vertical	Pass
6	17934.500	53.27	1.61	74.0	20.73	Peak	288.00	150	Vertical	Pass
6**	17934.500	44.89	1.61	54.0	9.11	AV	288.00	150	Vertical	Pass

GFSK-CH39 2480MHz										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2298.649	41.07	-19.51	74.0	32.93	Peak	360.00	150	Vertical	Pass
1**	2298.649	30.81	-19.51	54.0	23.19	AV	360.00	150	Vertical	Pass
2	4776.000	48.70	-10.50	74.0	25.30	Peak	216.00	150	Vertical	Pass
2**	4776.000	39.76	-10.50	54.0	14.24	AV	216.00	150	Vertical	Pass
3	4960.250	51.24	-10.87	74.0	22.76	Peak	360.00	150	Vertical	Pass
3**	4960.250	45.87	-10.87	54.0	8.13	AV	360.00	150	Vertical	Pass
4	7440.750	50.05	-6.80	74.0	23.95	Peak	108.00	150	Vertical	Pass
4**	7440.750	42.69	-6.80	54.0	11.31	AV	108.00	150	Vertical	Pass
5	7870.000	52.97	-6.38	74.0	21.03	Peak	108.00	150	Vertical	Pass
5**	7870.000	42.43	-6.38	54.0	11.57	AV	108.00	150	Vertical	Pass
6	17879.501	52.54	1.40	74.0	21.46	Peak	324.00	150	Vertical	Pass
6**	17879.501	43.43	1.40	54.0	10.57	AV	324.00	150	Vertical	Pass

GFSK-CH39 2480MHz										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2268.234	40.91	-19.36	74.0	33.09	Peak	108.00	150	Horizontal	Pass
1**	2268.234	31.56	-19.36	54.0	22.44	AV	108.00	150	Horizontal	Pass
2	4755.750	50.40	-10.49	74.0	23.60	Peak	360.00	150	Horizontal	Pass
2**	4755.750	39.59	-10.49	54.0	14.41	AV	360.00	150	Horizontal	Pass
3	4960.500	54.13	-10.87	74.0	19.87	Peak	324.00	150	Horizontal	Pass
3**	4960.500	49.23	-10.87	54.0	4.77	AV	324.00	150	Horizontal	Pass
4	7440.250	50.41	-6.78	74.0	23.59	Peak	36.00	150	Horizontal	Pass
4**	7440.250	43.15	-6.78	54.0	10.85	AV	36.00	150	Horizontal	Pass
5	7947.750	52.47	-6.20	74.0	21.53	Peak	108.00	150	Horizontal	Pass
5**	7947.750	43.24	-6.20	54.0	10.76	AV	108.00	150	Horizontal	Pass
6	17925.501	52.87	1.30	74.0	21.13	Peak	288.00	150	Horizontal	Pass
6**	17925.501	44.81	1.30	54.0	9.19	AV	288.00	150	Horizontal	Pass

Note:

1. Results (dBuV/m) =Raw Value (dBuV) + Factor (dB/m)
2. Factor (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB) - Pre-amplifier
3. Margin value = Limit - Results.

Radiated Band Edge - GFSK

GFSK-CH00 2402MHz-Low Band Edge										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2323.640	42.08	-19.51	74.0	31.92	Peak	324.00	150	Vertical	Pass
1**	2323.640	30.38	-19.51	54.0	23.62	AV	324.00	150	Vertical	Pass
2	2389.970	39.48	-19.56	74.0	34.52	Peak	216.00	150	Vertical	Pass
2**	2389.970	29.92	-19.56	54.0	24.08	AV	216.00	150	Vertical	Pass
3	2399.980	42.27	-19.64	74.0	31.73	Peak	108.00	150	Vertical	Pass
3**	2399.980	30.28	-19.64	54.0	23.72	AV	108.00	150	Vertical	Pass

GFSK-CH00 2402MHz-Low Band Edge										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2375.835	43.75	-19.63	74.0	30.25	Peak	324.00	150	Horizontal	Pass
1**	2375.835	36.17	-19.63	54.0	17.83	AV	324.00	150	Horizontal	Pass
2	2389.970	38.87	-19.56	74.0	35.13	Peak	144.00	150	Horizontal	Pass
2**	2389.970	30.42	-19.56	54.0	23.58	AV	144.00	150	Horizontal	Pass
3	2399.980	52.59	-19.64	74.0	21.41	Peak	360.00	150	Horizontal	Pass
3**	2399.980	37.39	-19.64	54.0	16.61	AV	360.00	150	Horizontal	Pass

GFSK-CH39 2480MHz-High Band Edge										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2483.485	44.66	-19.50	74.0	29.34	Peak	36.00	150	Horizontal	Pass
1**	2483.485	31.64	-19.50	54.0	22.36	AV	36.00	150	Horizontal	Pass
2	2483.680	45.34	-19.50	74.0	28.66	Peak	72.00	150	Horizontal	Pass
2**	2483.680	31.54	-19.50	54.0	22.46	AV	72.00	150	Horizontal	Pass
3	2496.370	42.34	-19.48	74.0	31.66	Peak	216.00	150	Horizontal	Pass
3**	2496.370	30.57	-19.48	54.0	23.43	AV	216.00	150	Horizontal	Pass

GFSK-CH39 2480MHz-High Band Edge										
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	2483.485	41.11	-19.50	74.0	32.89	Peak	72.00	150	Vertical	Pass
1**	2483.485	30.78	-19.50	54.0	23.22	AV	72.00	150	Vertical	Pass
2	2486.605	42.30	-19.50	74.0	31.70	Peak	216.00	150	Vertical	Pass
2**	2486.605	30.43	-19.50	54.0	23.57	AV	216.00	150	Vertical	Pass
3	2493.100	41.93	-19.49	74.0	32.07	Peak	36.00	150	Vertical	Pass
3**	2493.100	30.35	-19.49	54.0	23.65	AV	36.00	150	Vertical	Pass

Note:

1. Results (dBuV/m) =Raw Value (dBuV) + Factor (dB/m)
2. Factor (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB) - Pre-amplifier
3. Margin value = Limit - Results.

5. 20DB BANDWIDTH

5.1. Limit

According to FCC §15.215(c), for devices operating under the provisions of this section, the 20 dB bandwidth of the emission shall be contained within the frequency band designated in the rule section under which the equipment is operated. No specific minimum bandwidth is required.

If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band (i.e., 2400-2483.5 MHz) in order to minimize the possibility of out-of-band operation.

5.2. Test Setup

5.3. Spectrum Analyzer Setting

20dB Bandwidth	
Spectrum Parameters	**Setting**
RBW	100KHz
VBW	300KHz
Span	3MHz (or sufficient to display the emission)
Sweep Time	Auto
Detector	Peak
Trace Mode	Max Hold

5.4. Test Procedure

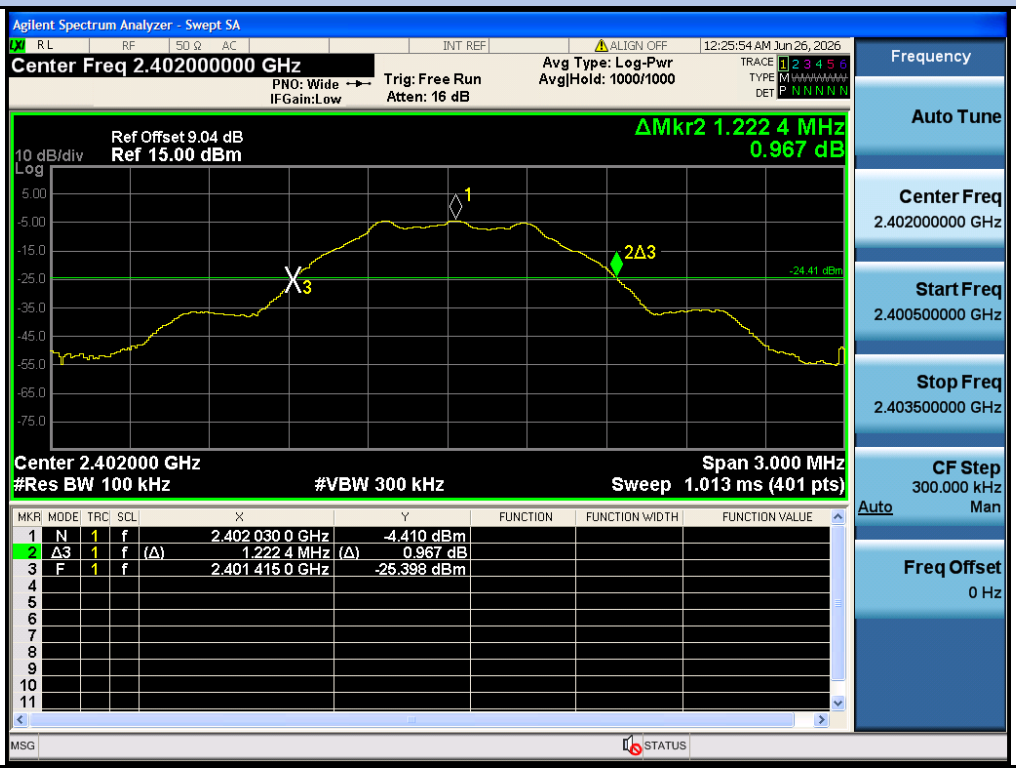
a. The test according to ANSI C63.10 clause Section 6.9.
b. Connect EUT antenna terminal to the spectrum analyzer with RF cable.
c. Spectrum analyzer setting parameters in accordance with section 5.3.
d. Set the EUT to transmit continuously at maximum power on the selected channel.
e. Allow the trace to stabilize, use the “ndB down” function (set to 20 dB) to measure the 20 dB bandwidth.
f. Repeat above procedures until all channels and test modes were measured.
g. Record the results in the test report.

5.5. Test Result

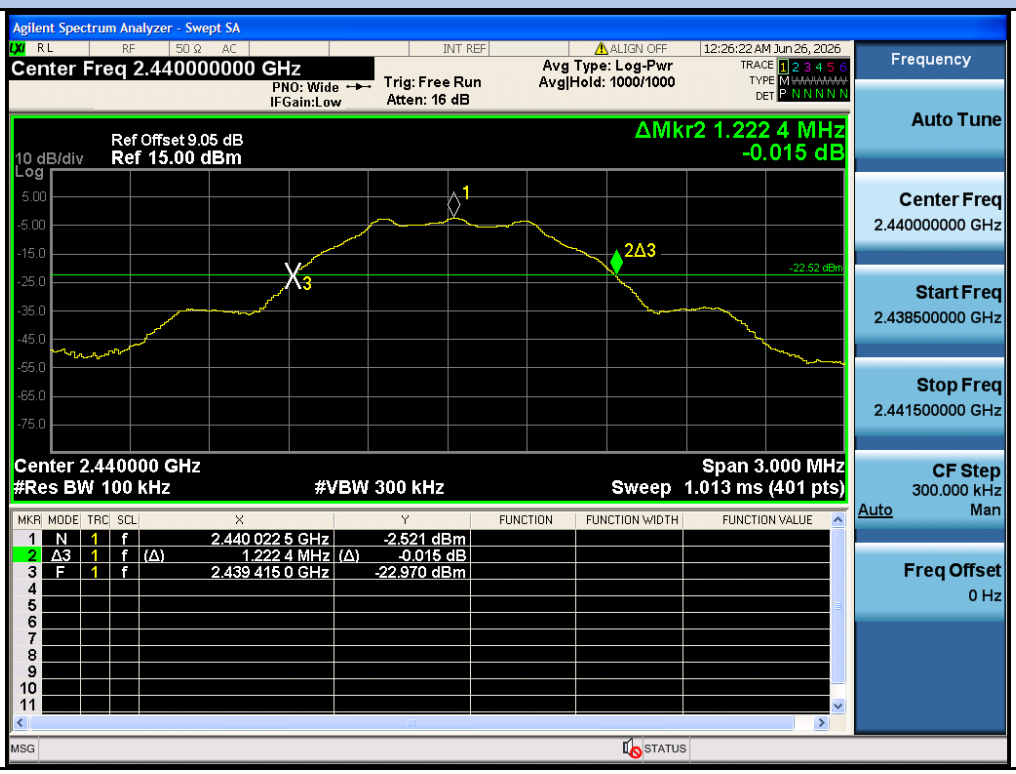
Test Mode	Antenna	Channel& Frequency	20dB Bandwidth	Result
		MHz	MHz	
GFSK	Ant1	CH00 2402	1.222	PASS
		CH19 2440	1.222	
		CH39 2480	1.215	
Note: The measured bandwidth is fully contained within the 2400-2483.5 MHz band.				

5.6.Original Test record

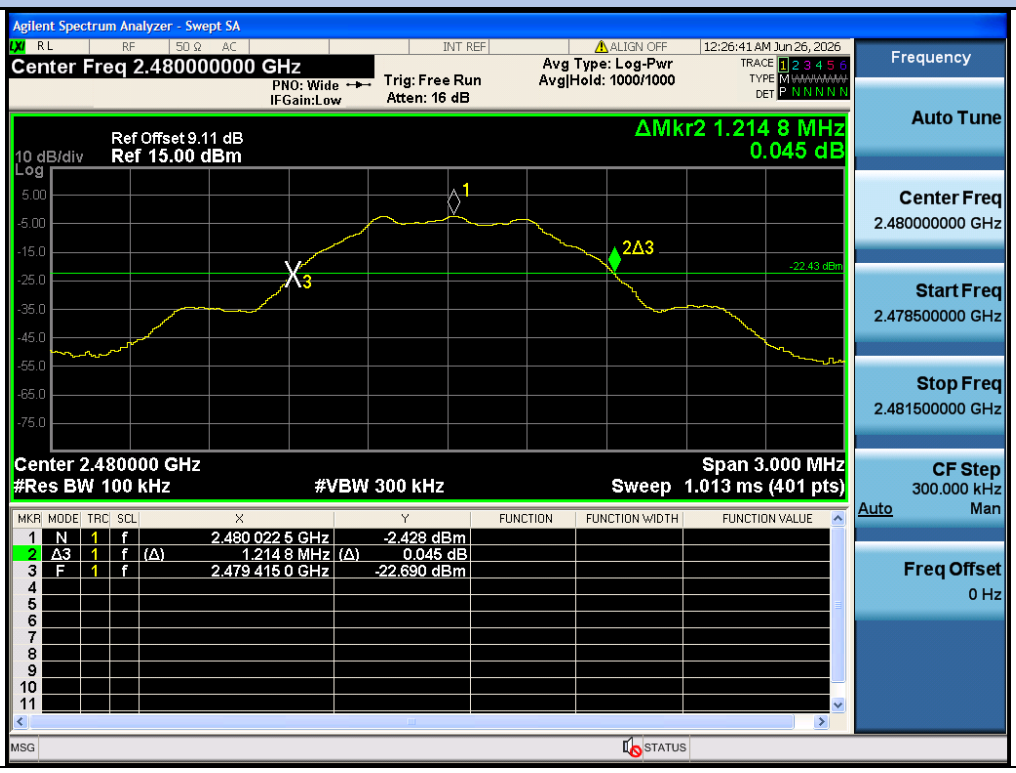
GFSK_Ant1_CH00 2402MHz



GFSK_Ant1_CH19 2440MHz



GFSK_Ant1_CH39 2480MHz



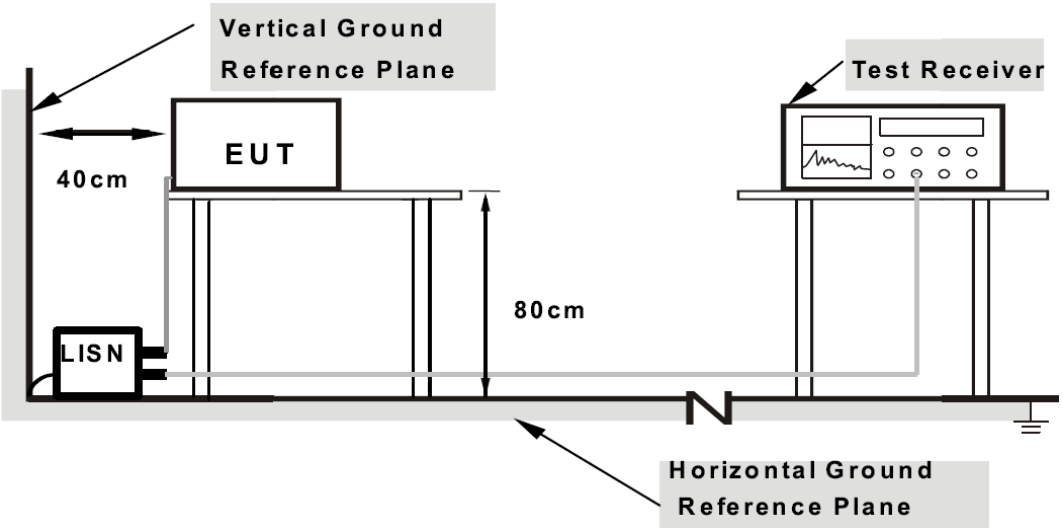
6. AC POWER LINE CONDUCTED EMISSIONS

6.1. Limit

Frequency			Maximum RF Line Voltage	
			Quasi-Peak Level dB(μV)	Average Level dB(μV)
150kHz	~	500kHz	66 ~ 56*	56 ~ 46*
500kHz	~	5MHz	56	46
5MHz	~	30MHz	60	50

Note:
1. * Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

6.2. Test Setup



6.3. Spectrum Analyzer Setting

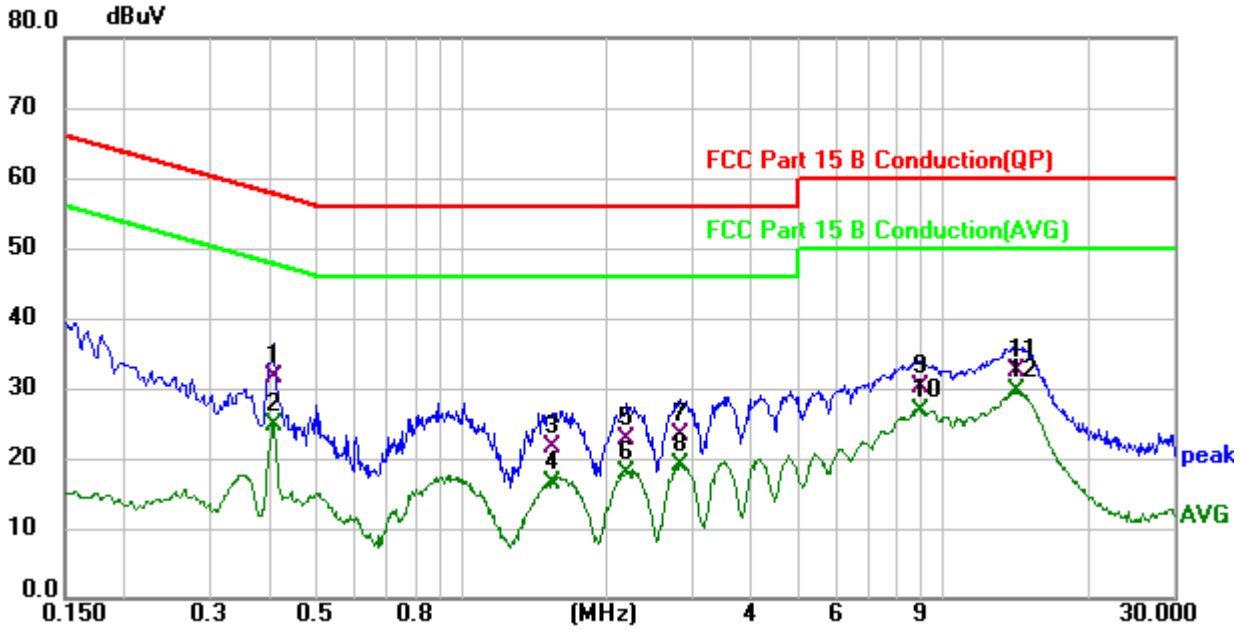
Spectrum Parameters	Setting
RBW	9KHz
VBW	9KHz
Start frequency	150KHz
Stop frequency	30MHz
Sweep Time	Auto
Detector	QP/AVG
Trace Mode	Max Hold

6.4. Test Procedure

a. Reference: ANSI C63.10:2020, Section 6.2.
b. The EUT was placed on a non-metallic table, 80cm above the ground plane.
c. The EUT Power connected to the power mains through a line impedance stabilization network.
d. Provides a 50ohm coupling impedance for the EUT (Please refer the block diagram of the test setup and photographs).
e. Set the EUT transmit continuously with maximum output power.
f. Spectrum analyzer setting parameters in accordance with section 6.3.
g. The AC line is checked to find out the maximum conducted emission. To find the maximum emission levels, the relative positions of equipment and all the interface cables shall be changed according to ANSI C63.10:2020 on Conducted Emission Test.
h. It was conducted under both AC 120V/60Hz and AC 240V/50Hz input voltages, there was no significant change in radiation emission. Only worse case: GFSK mode with CH78 2480MHz with AC 120V/60Hz voltage is reported.

6.5. Test Result

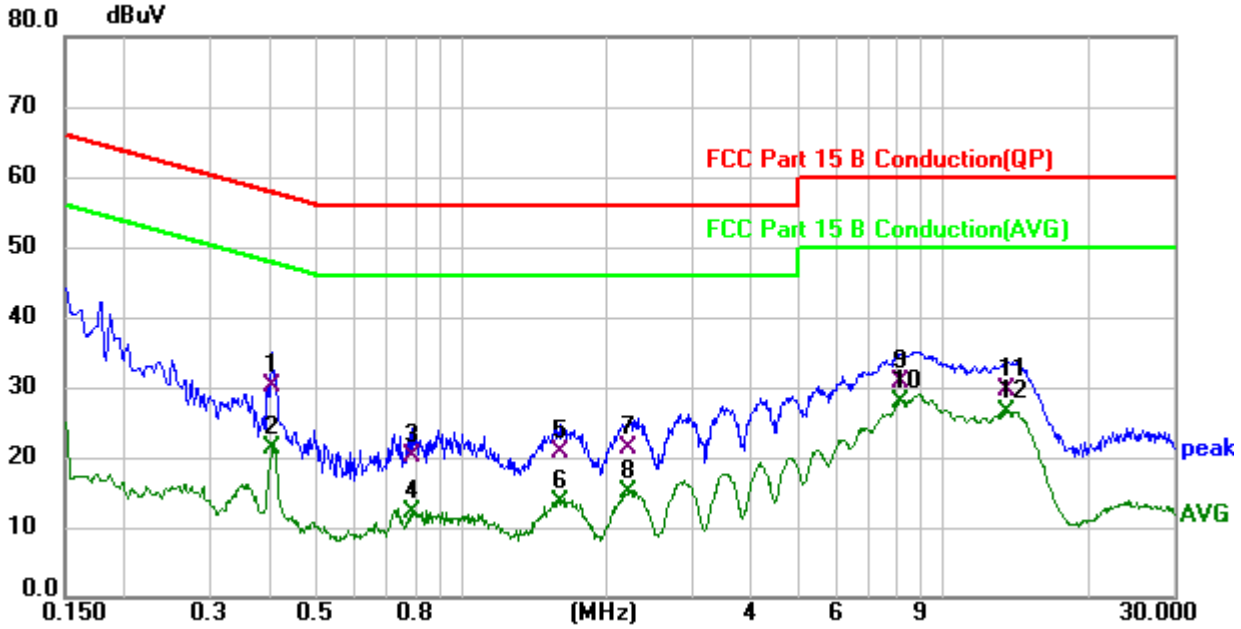
EUT: W30 Smart Voice Mouse
M/N: DI-W30
Test Voltage: Charging Input: DC 5V by Type-C Port
Phase: Live
Test Mode: TX Mode
Note: only worse case: GFSK mode with CH39 2480MHz is reported
Detailed results are shown below



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Verdict
1	0.406	10.81	20.66	57.73	-26.26	QP	Pass
2	0.406	3.94	20.66	47.73	-23.13	AVG	Pass
3	1.546	0.87	20.69	56	-34.44	QP	Pass
4	1.546	-4.14	20.69	46	-29.45	AVG	Pass
5	2.206	2.13	20.69	56	-33.18	QP	Pass
6	2.206	-2.81	20.69	46	-28.12	AVG	Pass
7	2.846	2.52	20.79	56	-32.69	QP	Pass
8	2.846	-1.81	20.79	46	-27.02	AVG	Pass
9	8.922	8.41	21.64	60	-29.95	QP	Pass
10	8.922	5.11	21.64	50	-23.25	AVG	Pass
11	14.15	9.45	23.09	60	-27.46	QP	Pass
12 *	14.15	6.45	23.09	50	-20.46	AVG	Pass

Remark: The test Result=Reading+ Factor
Factor (dB) = LISN insertion loss (dB) + Cable loss (dB)+ Pulse Limiter loss (dB)
If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

EUT: W30 Smart Voice Mouse
M/N: DI-W30
Test Voltage: Charging Input: DC 5V by Type-C Port
Phase: Neutral
Test Mode: TX Mode
Note: only worse case: GFSK mode with CH39 2480MHz is reported
Detailed results are shown below



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector	Verdict
1	0.402	9.29	20.82	57.81	-27.7	QP	Pass
2	0.402	0.44	20.82	47.81	-26.55	AVG	Pass
3	0.79	-0.8	20.86	56	-35.94	QP	Pass
4	0.79	-8.81	20.86	46	-33.95	AVG	Pass
5	1.606	-0.17	20.99	56	-35.18	QP	Pass
6	1.606	-7.43	20.99	46	-32.44	AVG	Pass
7	2.214	0.2	21.05	56	-34.75	QP	Pass
8	2.214	-5.97	21.05	46	-30.92	AVG	Pass
9	8.134	9.31	21.43	60	-29.26	QP	Pass
10 *	8.134	6.57	21.43	50	-22	AVG	Pass
11	13.486	6.86	22.77	60	-30.37	QP	Pass
12	13.486	3.78	22.77	50	-23.45	AVG	Pass

Remark: The test Result=Reading+ Factor
Factor (dB) = LISN insertion loss (dB) + Cable loss (dB)+ Pulse Limiter loss (dB)
If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

7. ANTENNA REQUIREMENTS

7.1. Limit

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

7.2. Test Result

The antennas used for this product is PCB antenna, so compliance with antenna requirements. (Please refer to the **Annex B. EUT Internal Photos** for details)

8.APPENDIX

"EUT of External Photos, EUT Internal Photos & Test Setup Photos" Please refer to the Annex A, Annex B& Annex C document.

CTSL2620530268E Annex A. EUT External Photos
CTSL2620530268E Annex B. EUT Internal Photos
CTSL2620530268E Annex C. Test Setup Photos

----------***End of Test Report***----------