

# Test Report

**Applicant** : PEAG, LLC dba JLab Audio  
**Address** : 5927 LANDAU CT, Carlsbad, CA 92008, United States  
**Product Name** : Wireless Mouse  
**Brand Mark** :   
**Model** : EPIC MOUSE 2  
**FCC ID** : 2AHYV-EPICM2  
**Report Number** : BLA-EMC-202501-A1003  
**Date of Receipt** : Jan. 6, 2025  
**Date of Test** : Jan. 6, 2025 to Jan. 21, 2025  
**Test Standard** : 47 CFR Part 15, Subpart C 15.249  
**Test Result** : Pass

Compiled by: *Hugh*

Review by: *Sueelle*

Approved by: *Blue Zheng*

Issued Date: Jan. 21, 2025

**BlueAsia of Technical Services(Shenzhen) Co.,Ltd.**

Address: Building C, No. 107, Shihuan Road, Shiyan Sub-District, Baoan District,  
Shenzhen, Guangdong Province, China



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## Revise Record

Version No.	Date	Description
01	Jan. 21, 2025	Original

BlueAsia

## 1 General information

### 1.1 General information

Applicant	PEAG, LLC dba JLab Audio
Address	5927 LANDAU CT, Carlsbad, CA 92008, United States
Manufacturer	GuangDong Simpreal Intelligent Technology Co., Ltd
Address	Room 2408, JiaHong ZhenXing DaSha, DongGuan Avenue #13, DongCheng District, DongGuan City, GuangDong Province, P.R. China
Factory	GuangDong Simpreal Intelligent Technology Co., Ltd
Address	Room 2408, JiaHong ZhenXing DaSha, DongGuan Avenue #13, DongCheng District, DongGuan City, GuangDong Province, P.R. China

### 1.2 General description of EUT

Product name	Wireless Mouse
Model no.	EPIC MOUSE 2
Series model	N/A
Test engineer sample no	BLA-EMC-202501-A10-Mouse
Operation Frequency:	2402MHz-2479MHz
Channel numbers:	16
Channel Spacing:	≥5MHz.
Modulation Type:	GFSK
Antenna Type:	PCB antenna
Antenna Gain:	-0.71dBi(Provided by customer)
Power supply or adapter information	DC3.7V
Hardware Version	V2.0
Software Version	V1.19

*Note: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.*

## 2 Test summary

No.	Test item	FCC Part Section(s)	Test Method(Clause)	Result
1	Antenna Requirement	§15.203	N/A	Pass
2	Conducted Emissions at AC Power Line (150kHz-30MHz)	§15.207	ANSI C63.10-2013 Clause 6.2	Pass
3	20dB Bandwidth	N/A	ANSI C63.10 (2013) Section 6.9	Pass
4	Field Strength of the Fundamental Signal	§15.249(a)	ANSI C63.10-2013 Clause 6.5&6.6	Pass
5	Radiated Emissions	§15.249 (d) §15.209	ANSI C63.10 (2013) Section 6.4,6.5,6.6	Pass
6	Restricted Band Around Fundamental Frequency	§15.205 §15.209	ANSI C63.10 (2013) Section 6.4,6.5,6.6	Pass

## 3 Test Configuration

### 3.1 Test mode

Test Mode <sup>Note 1</sup>	Description
TX	Keep the EUT in continuously transmitting with modulation mode.
RX	Keep the EUT in receiving mode
TX Low channel	Keep the EUT in continuously transmitting mode in low channel
TX middle channel	Keep the EUT in continuously transmitting mode in middle channel
TX high channel	Keep the EUT in continuously transmitting mode in high channel

*Note 1: The EUT was configured to measure its highest possible emission and/or immunity level. The test modes were adapted according to the operation manual for use; the EUT was operated in the engineering mode <sup>Note 2</sup> to fix the TX or Rx frequency that was for the purpose of the measurements.*

*Note 2: Mouse buttons is used. Click the mouse button to enable the EUT under transmission condition continuously at specific channel frequencies individually.*

### 3.2 Operation Frequency each of channel

Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2402MHz	7	2434MHz	13	2464MHz
2	2407MHz	8	2439MHz	14	2469MHz
3	2414MHz	9	2444MHz	15	2474MHz
4	2419MHz	10	2449MHz	16	2479MHz
5	2424MHz	11	2454MHz		
6	2429MHz	12	2459MHz		

### 3.3 Test channel

Channel	Frequency
The lowest channel	2402MHz
The middle channel	2439MHz
The Highest channel	2479MHz

### 3.4 Auxiliary equipment

Device Type	Manufacturer	Model Name	Serial No.	Remark
--	--	--	--	--

**Note:**  
"--" mean no any auxiliary device during testing.

### 3.5 Test environment

Environment	Temperature	Voltage
Normal	25°C	DC 3.7V

## 4 Laboratory information

### 4.1 Laboratory and accreditations

The test facility is recognized, certified, or accredited by the following organizations:

Company name:	BlueAsia of Technical Services(Shenzhen) Co., Ltd.
Address:	Building C, No. 107, Shihuan Road, Shiyan Sub-District, Baoan District, Shenzhen, Guangdong Province, China
CNAS accredited No.:	L9788
A2LA Cert. No.:	5071.01
FCC Designation No.:	CN1252
ISED CAB identifier No.:	CN0028
Telephone:	+86-755-28682673
FAX:	+86-755-28682673

### 4.2 Measurement uncertainty

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=1.96$ .

Parameter	Expanded Uncertainty
Radiated Emission(9kHz-30MHz)	±4.34dB
Radiated Emission(30Mz-1000MHz)	±4.24dB
Radiated Emission(1GHz-18GHz)	±4.68dB
AC Power Line Conducted Emission(150kHz-30MHz)	±3.45dB
Occupied Channel Bandwidth	±5 %
RF output power, conducted	±1.5 dB
Power Spectral Density, conducted	±3.0 dB
Unwanted Emissions, conducted	±3.0 dB
Temperature	±3 °C
Supply voltages	±3 %
Time	±5 %

## 5 Test equipment

### Radiated Spurious Emissions (Below 1GHz)

Equipment	Name	Model	Manufacture	S/N	Cal. Date	Due. Date
BLA-EMC-002-01	Anechoic chamber	9*6*6 chamber	SKET	N/A	2024/3/27	2027/3/26
BLA-EMC-002-02	Control room	966 control room	SKET	N/A	2024/3/27	2027/3/26
BLA-EMC-009	EMI receiver	ESR7	R&S	101199	2024/08/08	2025/08/07
BLA-EMC-043	Loop antenna	FMZB1519B	Schwarzbeck	00102	2024/06/29	2026/06/28
BLA-EMC-065	Broadband antenna	VULB9168	Schwarzbeck	01065P	2024/06/29	2026/06/27
BLA-XC-01	Coaxial Cable	N/A	BlueAsia	V01	N/A	N/A
BLA-XC-02	Coaxial Cable	N/A	BlueAsia	V02	N/A	N/A

### Radiated Spurious Emissions (Above 1GHz)

Equipment	Name	Model	Manufacture	S/N	Cal. Date	Due. Date
BLA-EMC-001-01	Anechoic chamber	9*6*6 chamber	SKET	N/A	2023/11/16	2026/11/15
BLA-EMC-001-02	Control Room	966 control room	SKET	N/A	2023/11/16	2025/11/15
BLA-EMC-008	Spectrum	FSP40	R&S	100817	2024/08/08	2025/08/07
BLA-EMC-012	Broadband antenna	VULB9168	Schwarzbeck	00836 P:00227	2022/10/12	2025/10/11
BLA-EMC-013	Horn Antenna	BBHA9120D	Schwarzbeck	01892	2024/06/29	2026/06/28
BLA-EMC-014	Amplifier	PA_000318G-45	SKET	PA201804 3003	2024/08/08	2025/08/07
BLA-EMC-046	Filter bank	2.4G/5G Filter bank	SKET	N/A	2024/06/28	2025/06/27
BLA-EMC-061	Receiver	ESPI7	R&S	101477	2024/06/28	2025/06/27
BLA-EMC-066	Amplifier	LNPA_30M01 G-30	SKET	SK202106 0801	2024/06/28	2025/06/27
BLA-EMC-086	Amplifier	LNPA_18G40 G-50dB	SKET	SK202207 1301	2024/06/28	2025/06/27
BLA-EMC-087	Horn Antenna	BBHA 9170	Schwarzbeck	1106	2024/06/29	2026/06/28
BLA-XC-03	Coaxial Cable	N/A	BlueAsia	V03	N/A	N/A
BLA-XC-04	Coaxial Cable	N/A	BlueAsia	V04	N/A	N/A

### Conducted Emissions

Equipment	Name	Model	Manufacture	S/N	Cal. Date	Due. Date
BLA-EMC-003-001	Shield room	8*3*3	SKET	N/A	2023/11/16	2025/11/15
BLA-EMC-009	EMI receiver	ESR7	R&S	101199	2024/08/08	2025/08/07
BLA-EMC-011	LISN	ENV216	R&S	101372	2024/08/08	2025/08/07
BLA-EMC-033	Impedance transformer	DC-2GHz	DFXP	N/A	2024/06/28	2025/06/27
BLA-EMC-041	LISN	AT166-2	ATTEN	AKK180600 0003	2024/08/08	2025/08/07
BLA-EMC-045	Impedance stable network	ISNT8-cat 6	TESEQ	53580	2024/08/08	2025/08/07
BLA-EMC-095	Single-channel vehicle artificial power network	NNBM 8124	Schwarzbeck	01045	2024/06/28	2025/06/27
BLA-EMC-096	Single-channel vehicle artificial power network	NNBM 8124	Schwarzbeck	01075	2024/06/28	2025/06/27
BLA-XC-05	Coaxial Cable	N/A	BlueAsia	V05	N/A	N/A

### RF conducted

Equipment	Name	Model	Manufacture	S/N	Cal. Date	Due. Date
BLA-EMC-003-003	Shield room	5*3*3	SKET	N/A	2023/11/16	2025/11/15
BLA-EMC-016	Signal Generator	N5182A	Agilent	MY52420567	2024/06/28	2025/06/27
BLA-EMC-038	Spectrum	N9020A	Agilent	MY49100060	2024/08/08	2025/08/07
BLA-EMC-042	Power sensor	RPR3006W	DARE	14I00889SN042	2024/08/08	2025/08/07
BLA-EMC-044	Radio communication tester	CMW500	R&S	132429	2024/08/08	2025/08/07
BLA-EMC-064	Signal Generator	N5182B	KEYSIGHT	MY58108892	2024/06/28	2025/06/27
BLA-EMC-079	Spectrum	N9020A	Agilent	MY54420161	2024/08/08	2025/08/07
BLA-EMC-088	Audio Analyzer	ATS-1	Audio Precision	ATS141094	2024/06/28	2025/06/27

### Test software

Software No.	Software Name	Manufacture	Software version	Test site
BLA-EMC-S001	EZ-EMC	EZ	EEMC-3A1+	RE(Below 1GHz)
BLA-EMC-S002	EZ-EMC	EZ	EEMC-3A1+	RE(Above 1GHz)
BLA-EMC-S003	EZ-EMC	EZ	EEMC-3A1+	CE
BLA-EMC-S010	MTS 8310	MW	2.0.0.0	RF
BLA-EMC-S011	EHP200A	Narda	Rel 1.94	RF expose

## 6 Test result

### 6.1 Antenna requirement

Test Standard	47 CFR Part 15, Subpart C 15.249
Test Method	N/A

#### 6.1.1 Requirement

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 an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit permanently attached antenna or of a so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

#### EUT antenna:

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is -0.71 dBi.

## 6.2 Conducted emissions at AC power line (150 kHz-30 MHz)

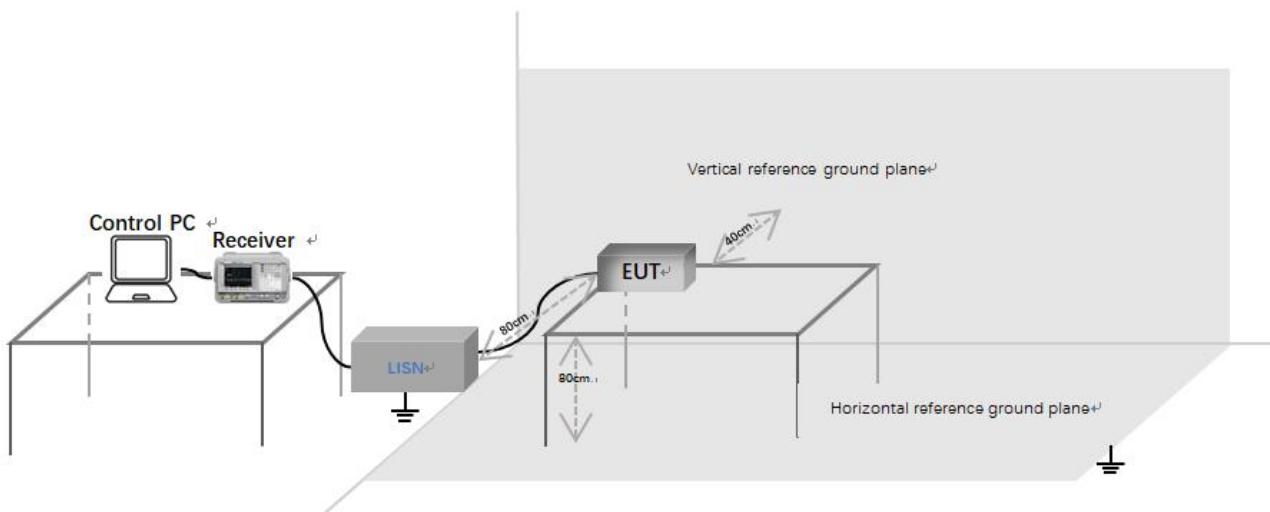
<b>Test Standard</b>	47 CFR Part 15, Subpart C 15.249
<b>Test Method</b>	ANSI C63.10 (2013) Section 6.2
<b>Test Mode (Pre-Scan)</b>	TX
<b>Test Mode (Final Test)</b>	TX

### 6.2.1 Limit

Frequency of emission(MHz)	Conducted limit(dB $\mu$ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\*Decreases with the logarithm of the frequency.

### 6.2.2 Test setup



Description of test setup connection:

- Connect the control PC to the receiver through a USB to GPIB cable;
- The receiver is connected to the LISN through a coaxial line;
- Connect the power port of LISN to the EUT.

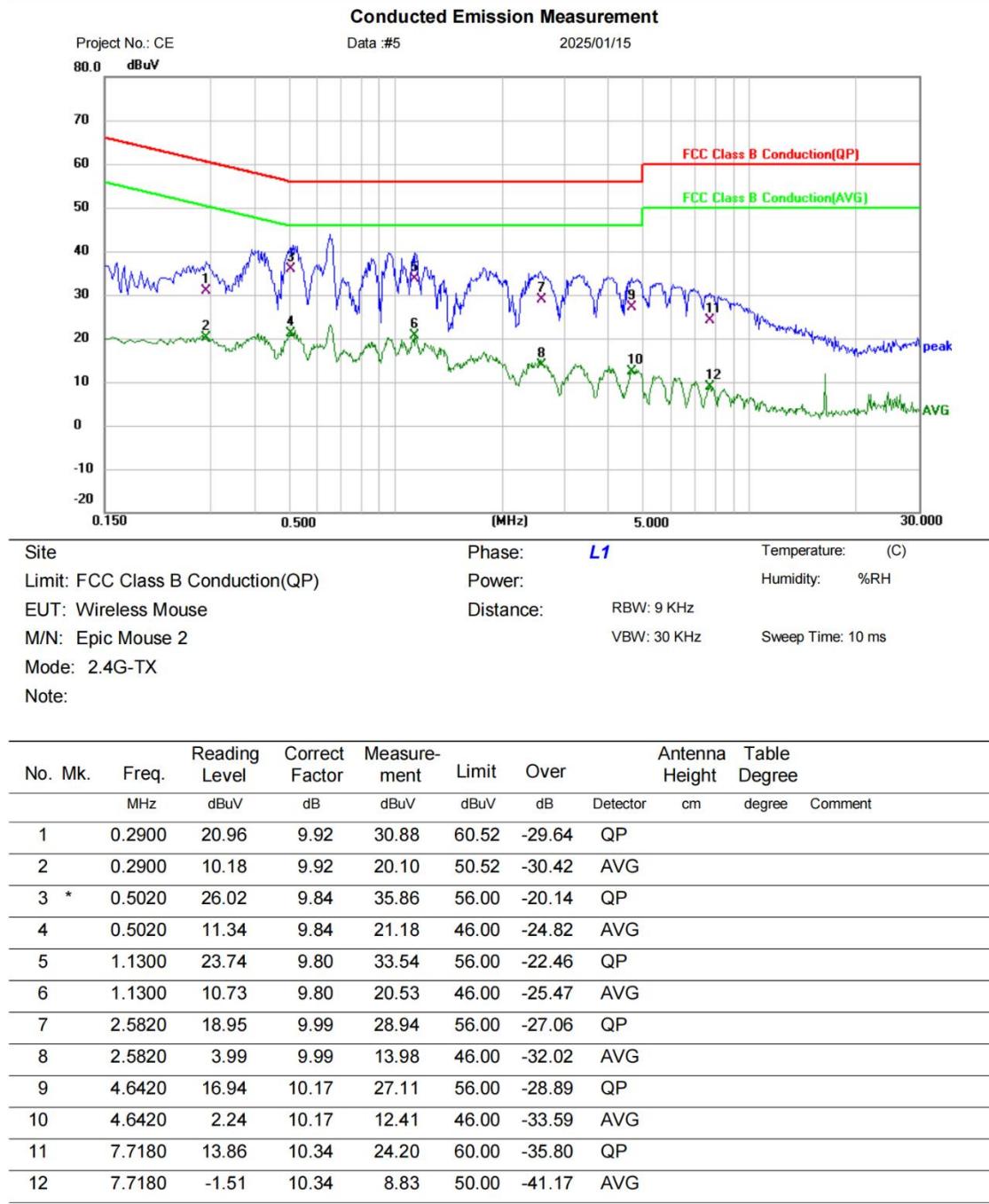
### 6.2.3 Procedure

- 1) The mains terminal disturbance voltage test was conducted in a shielded room.
- 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50H + 5ohm linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
- 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,
- 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
- 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.

LISN=Read Level+ Cable Loss+ LISN Factor

### 6.2.4 Test data

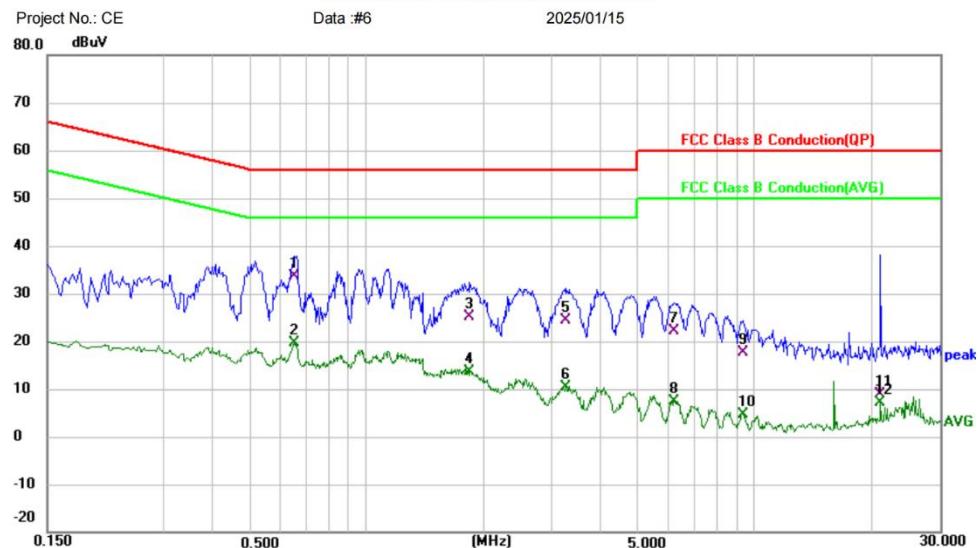
[Test mode: TX]; [Line: Line];[Power:AC120V/60Hz]



**Test Result: Pass**

[Test mode: TX]; [Line: Neutral];[Power:AC120V/60Hz]

#### Conducted Emission Measurement



Site:      Phase: **N**      Temperature: (C)  
 Limit: FCC Class B Conduction(QP)      Power:      Humidity: %RH  
 EUT: Wireless Mouse      Distance:      RBW: 9 KHz  
 M/N: Epic Mouse 2      VBW: 30 KHz      Sweep Time: 10 ms  
 Mode: 2.4G-TX  
 Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	Antenna	Table	Comment
								MHz	dBuV	
1	*	0.6500	23.93	9.78	33.71	56.00	-22.29	QP		
2		0.6500	9.73	9.78	19.51	46.00	-26.49	AVG		
3		1.8460	15.30	9.91	25.21	56.00	-30.79	QP		
4		1.8460	3.71	9.91	13.62	46.00	-32.38	AVG		
5		3.2420	14.32	10.06	24.38	56.00	-31.62	QP		
6		3.2420	0.41	10.06	10.47	46.00	-35.53	AVG		
7		6.2180	11.88	10.22	22.10	60.00	-37.90	QP		
8		6.2180	-2.84	10.22	7.38	50.00	-42.62	AVG		
9		9.3100	7.06	10.56	17.62	60.00	-42.38	QP		
10		9.3100	-5.85	10.56	4.71	50.00	-45.29	AVG		
11		21.1460	-4.24	13.08	8.84	60.00	-51.16	QP		
12		21.1460	-5.98	13.08	7.10	50.00	-42.90	AVG		

**Test Result: Pass**

## 6.3 Field strength of the fundamental signal

<b>Test Standard</b>	47 CFR Part 15, Subpart C 15.249(a)
<b>Test Method</b>	ANSI C63.10 (2013) Section 6.5&6.6
<b>Test Mode (Pre-Scan)</b>	TX
<b>Test Mode (Final Test)</b>	TX

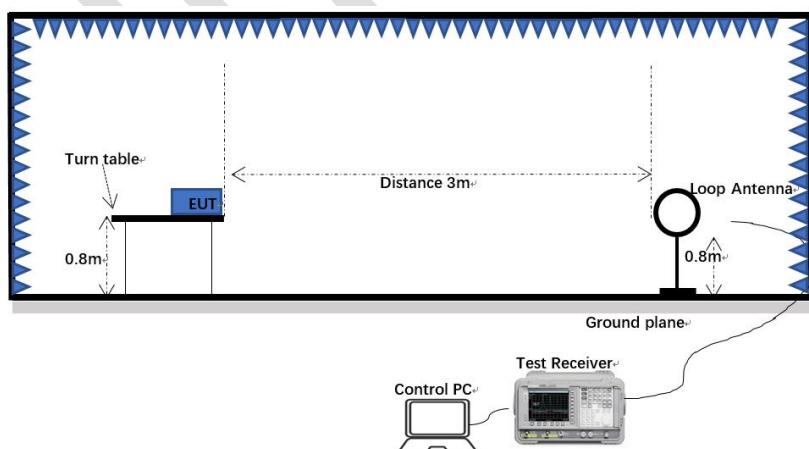
### 6.3.1 Limit

Fundamental frequency(MHz)	Field strength of fundamental(millivolts/meter)	Field strength of harmonics(microvolts/meter)
902-928	50	500
2400-2483.5	50	500
5725-5875	50	500
24000-24250	250	2500

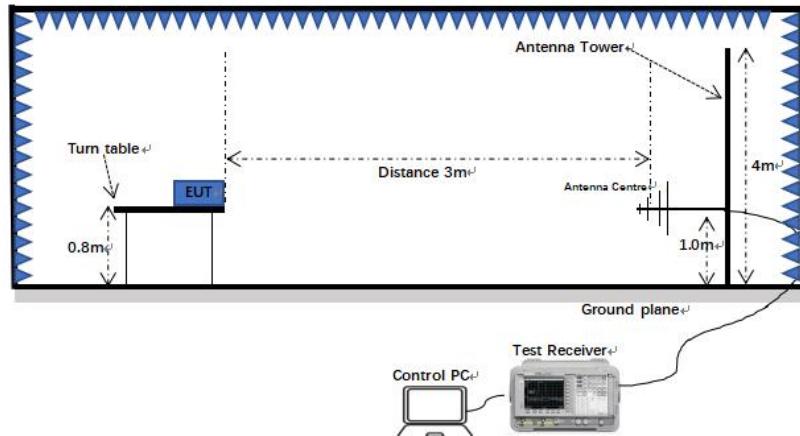
Remark: The frequencies above 1000MHz are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

### 6.3.2 Test setup

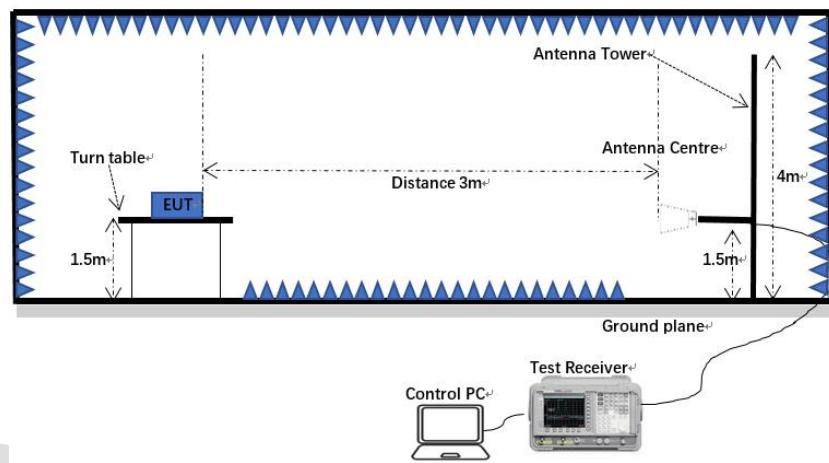
Below 1GHz:



30MHz-1GHz:



Above 1GHz:



### 6.3.3 Procedure

- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum

reading.

- f) The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g) If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- h) Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i) The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j) Repeat above procedures until all frequencies measured was complete.
- k) Level (dB $\mu$ V/m) = Reading Level(dBuV) + Correct Factor (dB)
- l) SA setting: RBW=3MHz, VBW=10MHz , PK detector is for PK value ,RMS detector is for AV value.

### 6.3.4 Test data

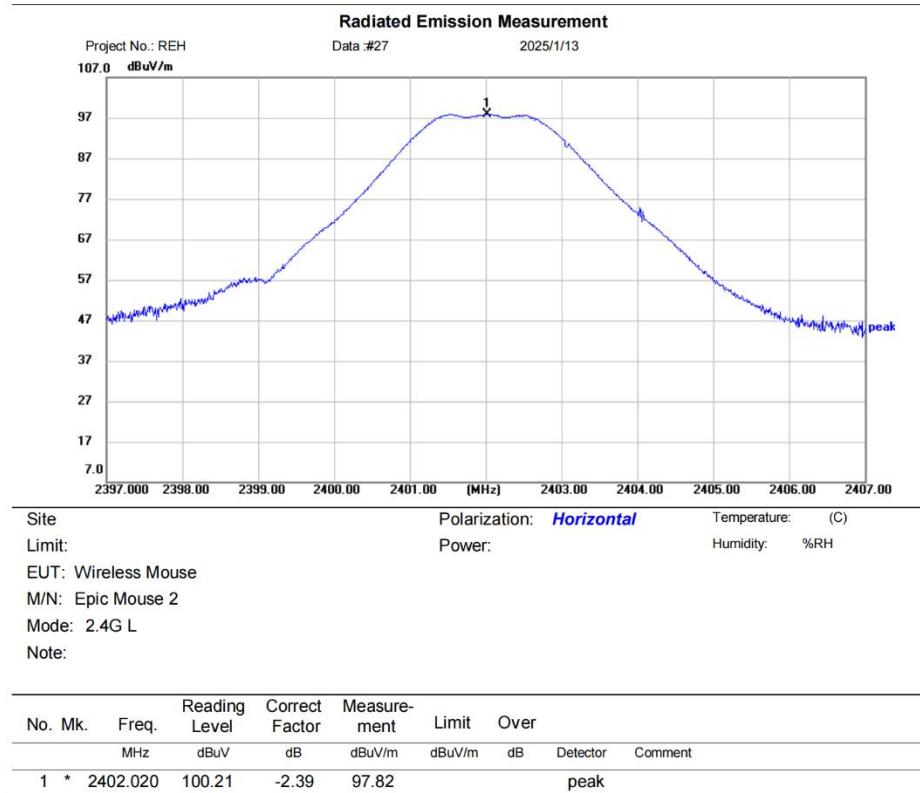
#### Peak value

Frequency (MHz)	Reading Level (dBuV)	Correct Factor (dB)	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Over Limit (dB)	Antenna Polaxis
2402	100.21	-2.39	97.82	114.00	-16.18	H
2402	93.08	-2.39	90.69	114.00	-23.31	V
2439	100.26	-2.65	97.61	114.00	-16.39	H
2439	94.40	-2.65	91.75	114.00	-22.25	V
2479	93.96	-2.89	91.07	114.00	-22.93	H
2479	88.12	-2.89	85.23	114.00	-28.77	V

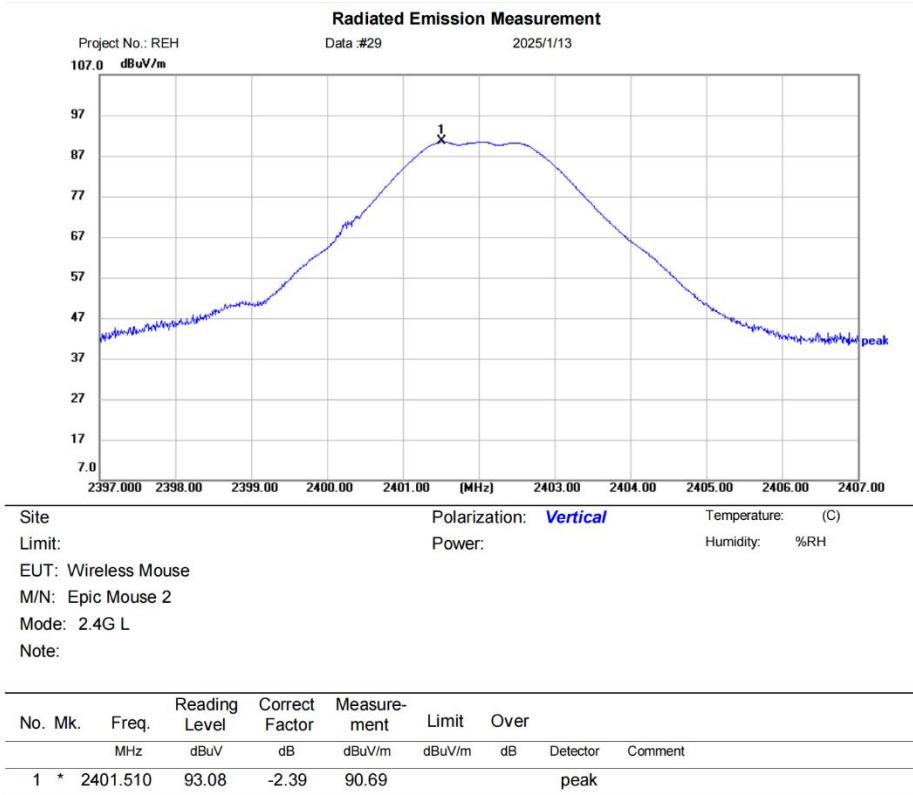
#### Average value

Frequency (MHz)	Reading Level (dBuV)	Correct Factor (dB)	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Over Limit (dB)	Antenna Polaxis
2402	88.39	-2.39	86.00	94.00	-8.00	H
2402	80.97	-2.39	78.58	94.00	-15.42	V
2439	91.98	-2.65	89.33	94.00	-4.67	H
2439	82.54	-2.65	79.89	94.00	-14.11	V
2479	83.34	-2.89	80.45	94.00	-13.55	H
2479	77.66	-2.89	74.77	94.00	-19.23	V

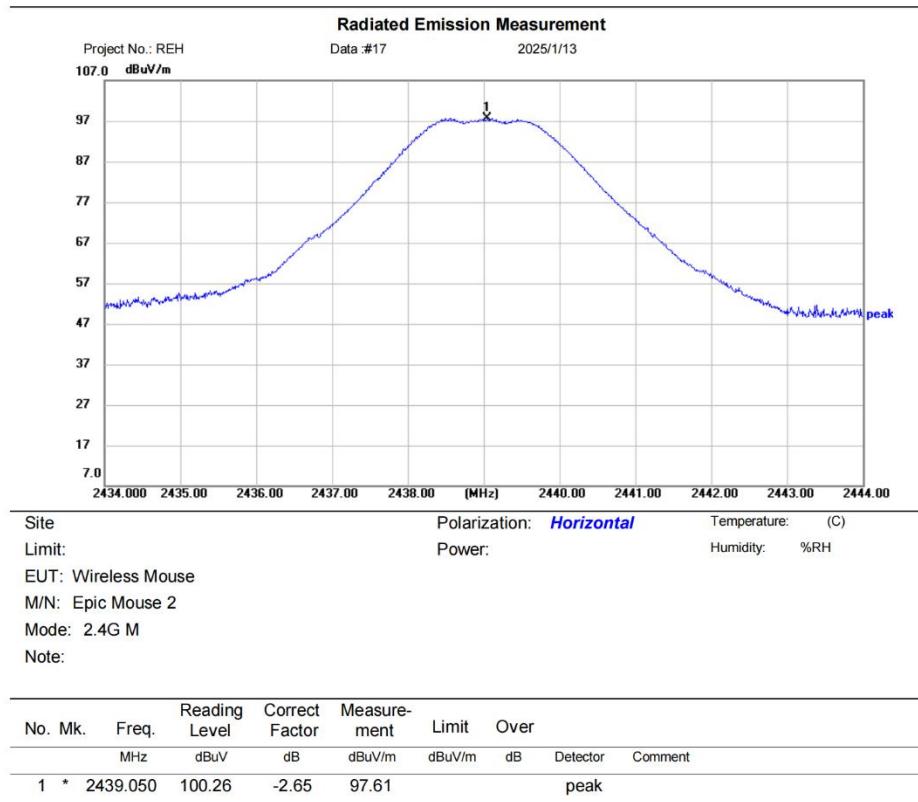
## 2402-Horizontal- Peak



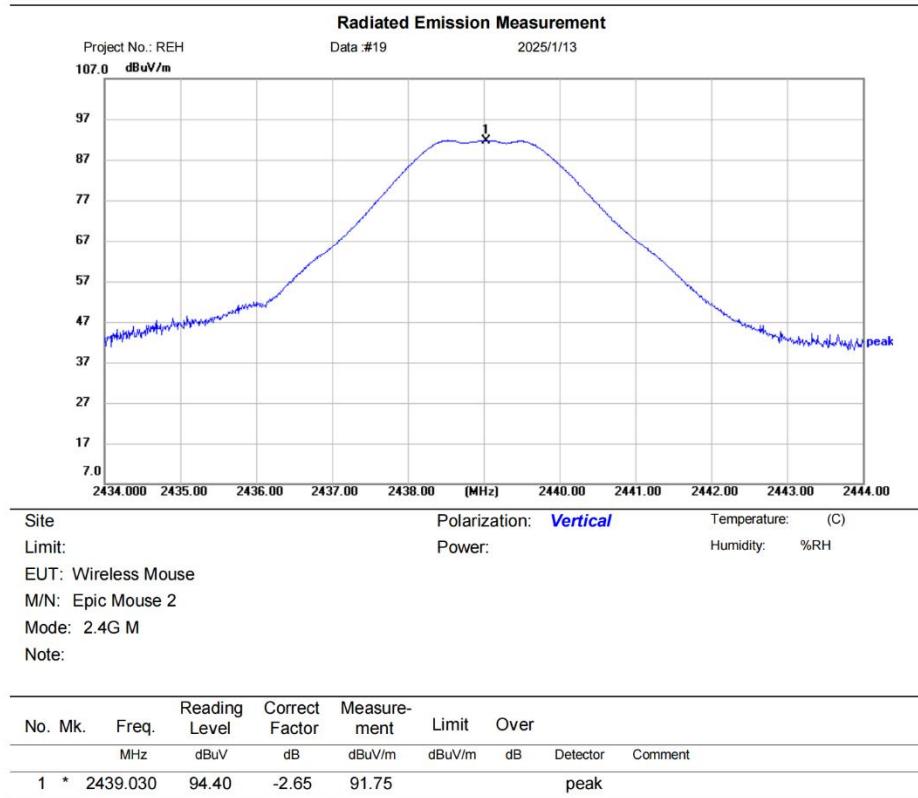
## 2402-Vertical- Peak



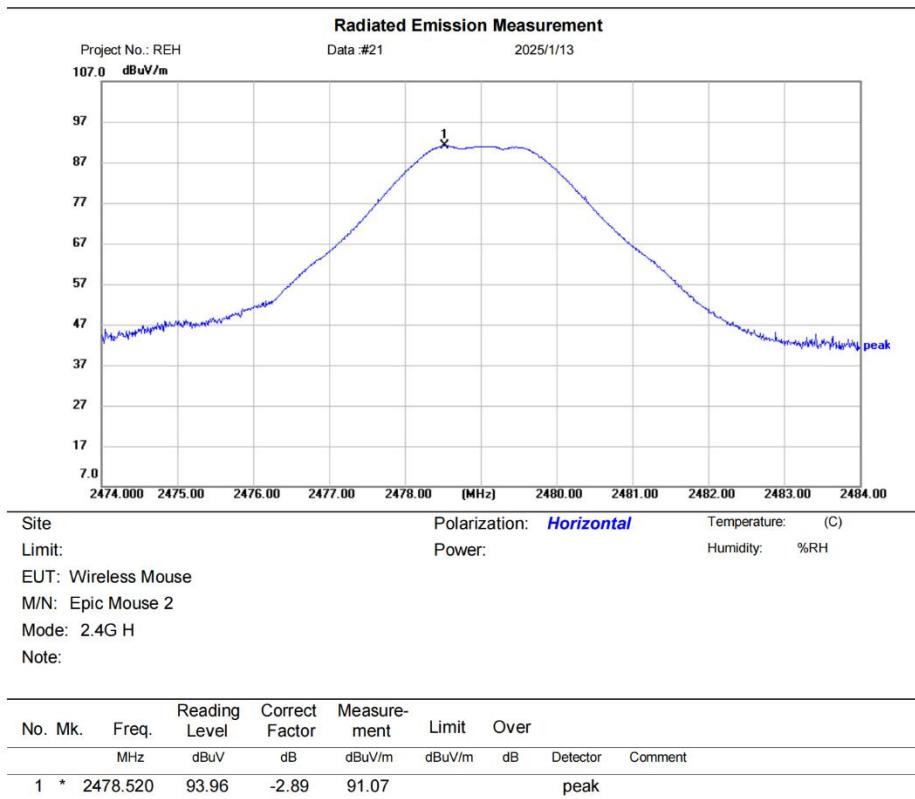
## 2439-Horizontal- Peak



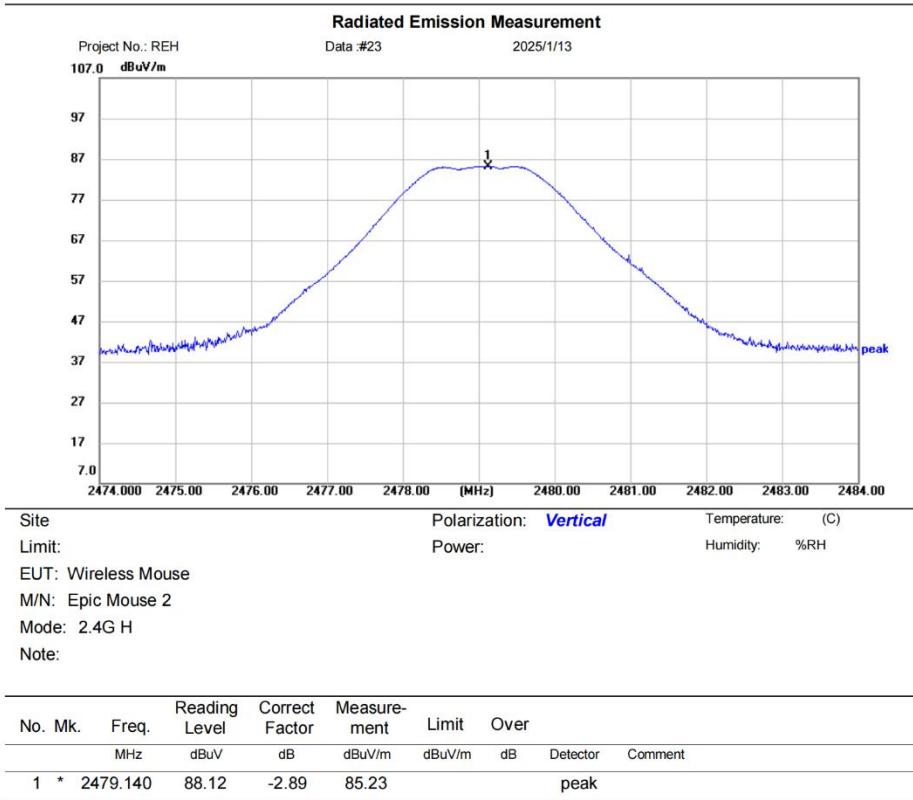
## 2439-Vertical- Peak



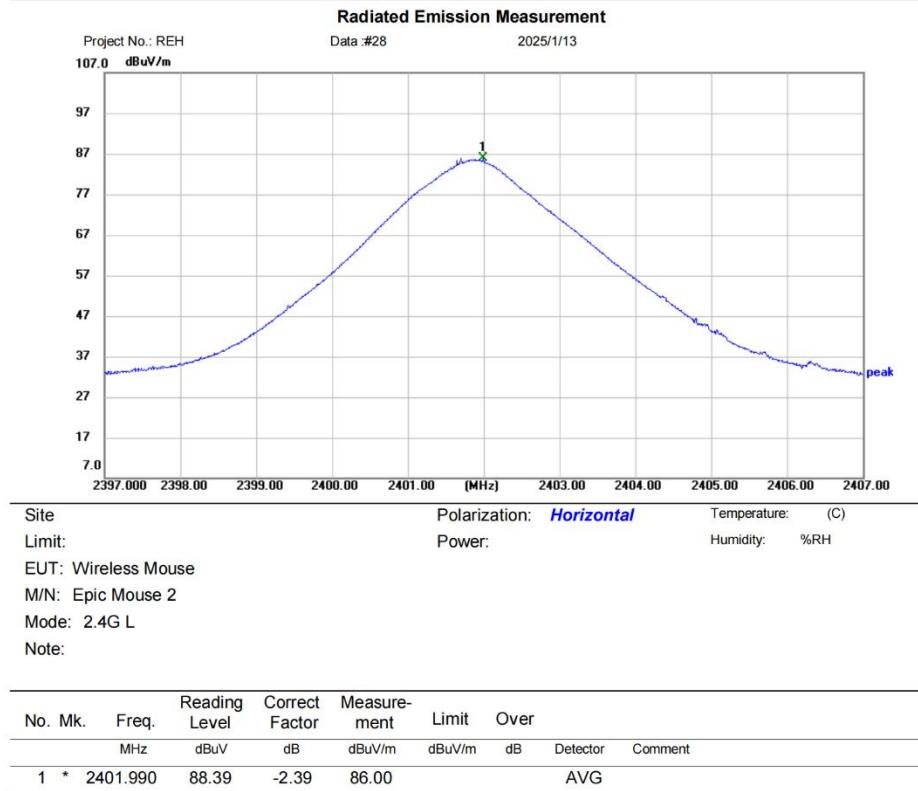
## 2479-Horizontal- Peak



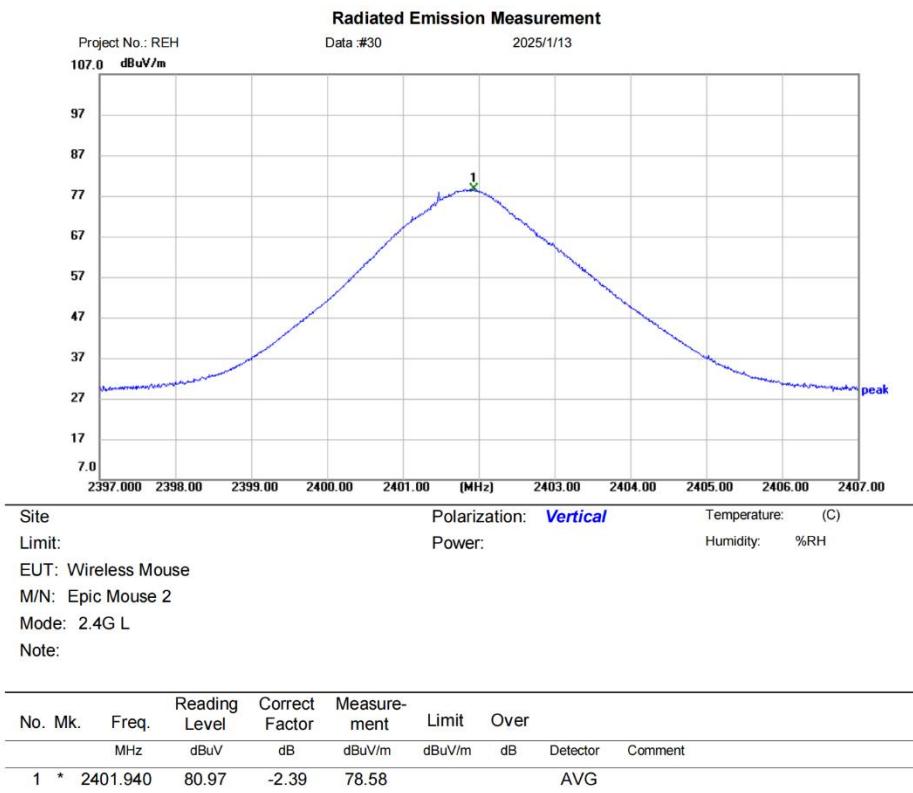
## 2479-Vertical- Peak



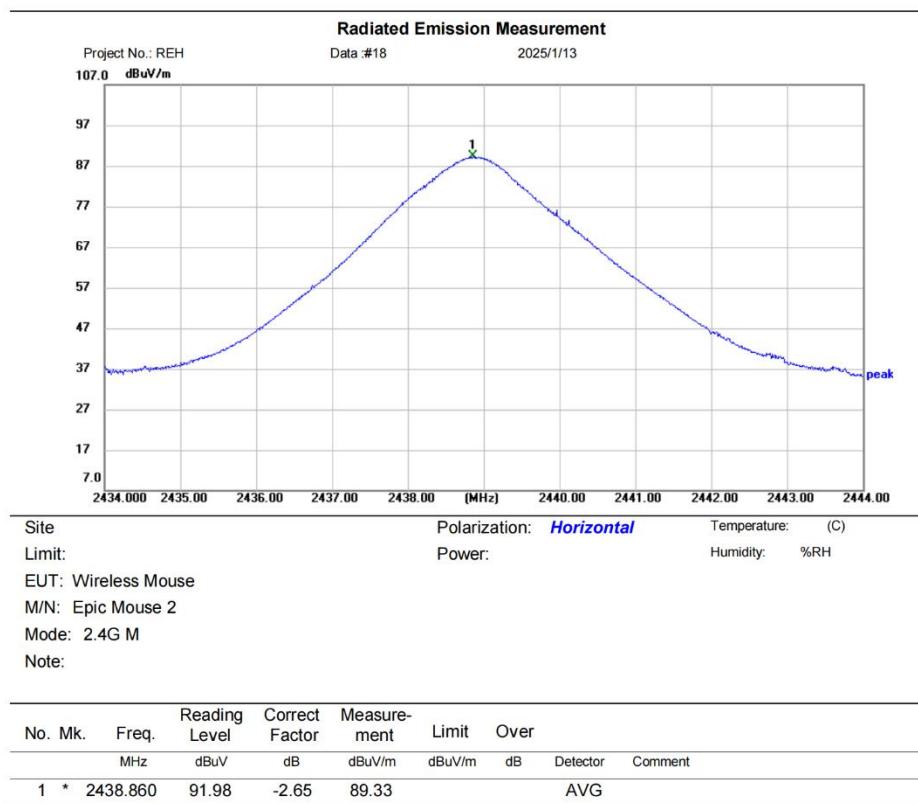
## 2402-Horizontal- Average



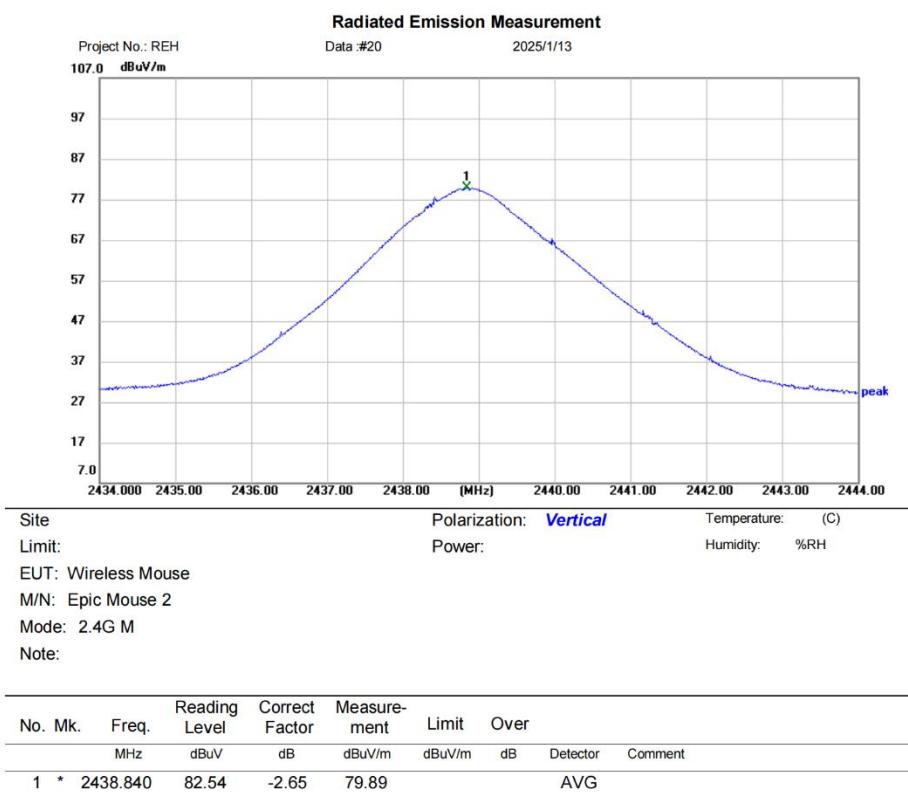
## 2402-Vertical- Average



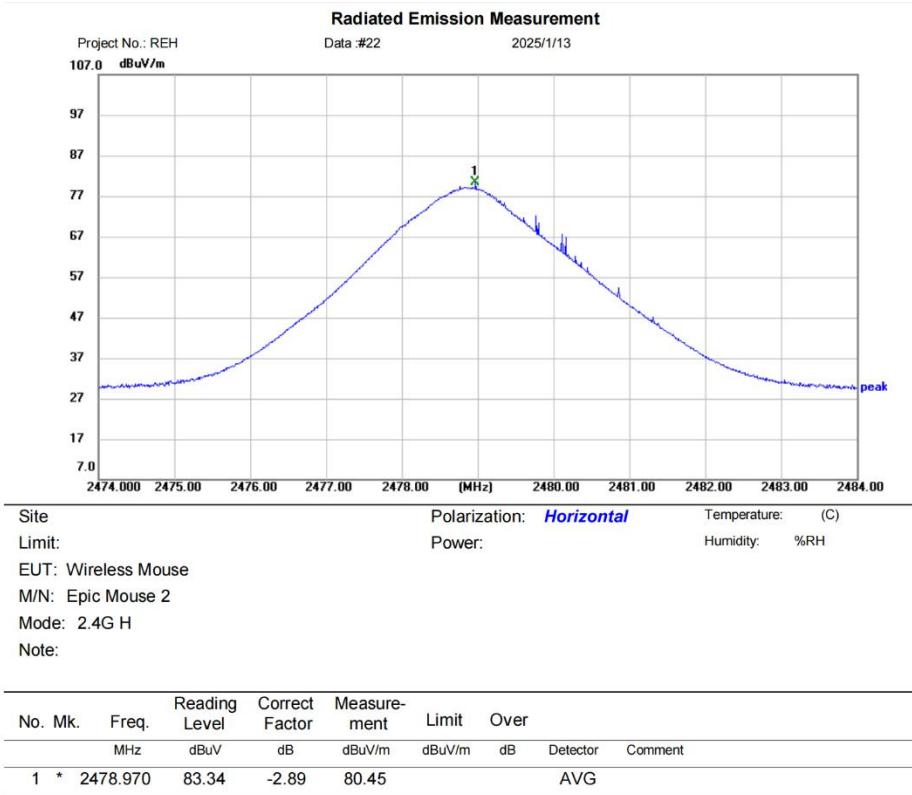
## 2439-Horizontal- Average



## 2439-Vertical- Average



## 2479-Horizontal- Average



## 2479-Vertical- Average

