

TEST REPORT

Product Name : Bluetooth Wireless 2D Barcode Scanner
Brand Mark : N/A
Model No. : U2-B
U1, U2, U3, U4, U5, U6, U7, U8, U9, U10,
U11, U12, U13, U14, U15, U16, U17,
U18, U19, U20, U21, U22, U23, U24,
U25, U26, U27, U28, U29, U30, V1, V2,
Extension modeo : V3, V5, V6, V7, V8, V9, V10, V11, V12,
V13, V14, V15, V16, W1, W2, W3, W4,
W5, W6, W7, W8, W9, W10, W11, W12,
W13, W14, W15, W16, W17, W18, W19,
W20, W21, W22, W23, W25, W26, X10W
Report Number : BLA-EMC-202402-A4703
FCC ID : 2A5HC-U2-B
Date of Sample Receipt : 2024/2/29
Date of Test : 2024/2/29 to 2024/4/24
Date of Issue : 2024/4/24
Test Standard : 47 CFR Part 15, Subpart C 15.249
Test Result : Pass

Prepared for:

Sycreader Guangzhou Co.,Ltd.**502#,A15,400 Xincheng Avenue, Zengcheng District Guangzhou**

Prepared by:

BlueAsia of Technical Services(Shenzhen) Co.,Ltd.**Building C, No. 107, Shihuan Road, Shiyan Sub-District, Baoan District,
Shenzhen, Guangdong Province, China****TEL: +86-755-23059481**

Compiled by:

Jozu

Approved by:

Blue Zheng

Review by:

Sue

Date:

2024/4/24



REPORT REVISE RECORD

Version No.	Date	Description
00	2024/4/24	Original

BlueAsia

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1 TEST SUMMARY

Test item	Test Requirement	Test Method	Class/Severity	Result
Radiated Emissions	47 CFR Part 15, Subpart C 15.249	ANSI C63.10 (2013) Section 6.4&6.5&6.6	47 CFR Part 15, Subpart C 15.209 & 15.249 (a),(d)	Pass
Restricted Band Around Fundamental Frequency	47 CFR Part 15, Subpart C 15.249	ANSI C63.10 (2013) Section 6.4&6.5&6.6	47 CFR Part 15, Subpart C 15.205 & 15.249(d) & 15.209	Pass
Field Strength of the Fundamental Signal (15.249(a))	47 CFR Part 15, Subpart C 15.249	ANSI C63.10 (2013) Section 6.5&6.6	47 CFR Part 15, Subpart C 15.249(a)	Pass
20dB Bandwidth	47 CFR Part 15, Subpart C 15.249	ANSI C63.10 (2013) Section 6.9	47 CFR Part 15, Subpart C 15.215	Pass
Antenna Requirement	47 CFR Part 15, Subpart C 15.249	N/A	47 CFR Part 15, Subpart C 15.203	Pass
Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart C 15.249	ANSI C63.10 (2013) Section 6.2	47 CFR Part 15, Subpart C 15.207	Pass

2 GENERAL INFORMATION

Applicant	Sycreader Guangzhou Co.,Ltd.
Address	502#,A15,400 Xincheng Avenue, ZengchengDistrict Guangzhou
Manufacturer	Sycreader Guangzhou Co.,Ltd.
Address	502#,A15,400 Xincheng Avenue, ZengchengDistrict Guangzhou
Factory	N/A
Address	N/A
Product Name	Bluetooth Wireless 2D Barcode Scanner
Test Model No.	U2-B
Extension mode	U1, U2, U3, U4, U5, U6, U7, U8, U9, U10, U11, U12, U13, U14, U15, U16, U17, U18, U19, U20, U21, U22, U23, U24, U25, U26, U27, U28, U29, U30, V1, V2, V3, V5, V6, V7, V8, V9, V10, V11, V12, V13, V14, V15, V16, W1, W2, W3, W4, W5, W6, W7, W8, W9, W10, W11, W12, W13, W14, W15, W16, W17, W18, W19, W20, W21, W22, W23, W25, W26, X10W
Note	That all models are electrically identical, only model no. and color is different.

3 GENERAL DESCRIPTION OF E.U.T.

Hardware Version	N/A																																																																																
Software Version	N/A																																																																																
Channel Spacing:	1MHz																																																																																
Frequency Range:	2402MHz~2480MHz																																																																																
Modulation Type:	GFSK																																																																																
Number of Channels:	79 (declared by the client) <table><tr><td>2402</td><td>2422</td><td>2442</td><td>2462</td></tr><tr><td>2403</td><td>2423</td><td>2443</td><td>2463</td></tr><tr><td>2404</td><td>2424</td><td>2444</td><td>2464</td></tr><tr><td>2405</td><td>2425</td><td>2445</td><td>2465</td></tr><tr><td>2406</td><td>2426</td><td>2446</td><td>2466</td></tr><tr><td>2407</td><td>2427</td><td>2447</td><td>2467</td></tr><tr><td>2408</td><td>2428</td><td>2448</td><td>2468</td></tr><tr><td>2409</td><td>2429</td><td>2449</td><td>2469</td></tr><tr><td>2410</td><td>2430</td><td>2450</td><td>2470</td></tr><tr><td>2411</td><td>2431</td><td>2451</td><td>2471</td></tr><tr><td>2412</td><td>2432</td><td>2452</td><td>2472</td></tr><tr><td>2413</td><td>2433</td><td>2453</td><td>2473</td></tr><tr><td>2414</td><td>2434</td><td>2454</td><td>2474</td></tr><tr><td>2415</td><td>2435</td><td>2455</td><td>2475</td></tr><tr><td>2416</td><td>2436</td><td>2456</td><td>2476</td></tr><tr><td>2417</td><td>2437</td><td>2457</td><td>2477</td></tr><tr><td>2418</td><td>2438</td><td>2458</td><td>2478</td></tr><tr><td>2419</td><td>2439</td><td>2459</td><td>2479</td></tr><tr><td>2420</td><td>2440</td><td>2460</td><td>2480</td></tr><tr><td>2421</td><td>2441</td><td>2461</td><td></td></tr></table>	2402	2422	2442	2462	2403	2423	2443	2463	2404	2424	2444	2464	2405	2425	2445	2465	2406	2426	2446	2466	2407	2427	2447	2467	2408	2428	2448	2468	2409	2429	2449	2469	2410	2430	2450	2470	2411	2431	2451	2471	2412	2432	2452	2472	2413	2433	2453	2473	2414	2434	2454	2474	2415	2435	2455	2475	2416	2436	2456	2476	2417	2437	2457	2477	2418	2438	2458	2478	2419	2439	2459	2479	2420	2440	2460	2480	2421	2441	2461	
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2420	2440	2460	2480																																																																														
2421	2441	2461																																																																															
Antenna Type:	Metal ANT																																																																																
Antenna Gain:	3dBi(Provided by the applicant)																																																																																
Power Supply:	DC3.7V																																																																																

4 TEST ENVIRONMENT

Environment	Temperature	Voltage
Normal	25°C	DC3.7V

5 TEST MODE

TEST MODE	TEST MODE DESCRIPTION
Transmitting mode	Keep the EUT in continuously transmitting mode with modulation.

6 MEASUREMENT UNCERTAINTY

Parameter	Expanded Uncertainty (Confidence of 95%)
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 %
Unwanted Radiated Emission (30MHz ~ 1000MHz)	±4.35 dB
Unwanted Radiated Emission (1GHz ~ 18GHz)	±4.44 dB
AC Power Line Conducted Emission(150kHz-30MHz)	±3.45dB

7 DESCRIPTION OF SUPPORT UNIT

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

Note:

--" means no any support device during testing.

8 LABORATORY LOCATION

All tests were performed at:
BlueAsia of Technical Services(Shenzhen) Co., Ltd.
Building C, No. 107, Shihuan Road, Shiyao Sub-District, Baoan District, Shenzhen, Guangdong Province, China
Telephone: TEL: +86-755-28682673 FAX: +86-755-28682673
No tests were sub-contracted.

9 TEST INSTRUMENTS LIST

Test Equipment Of Radiated Spurious Emissions					
Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
Chamber 1	SKET	966	N/A	2023/11/16	2026/11/15
Chamber 2	SKET	966	N/A	2021/07/20	2024/07/19
Spectrum	R&S	FSP40	100817	2023/08/30	2024/08/29
Receiver	R&S	ESR7	101199	2023/08/30	2024/08/29
Receiver	R&S	ESPI7	101477	2023/07/07	2024/07/06
broadband Antenna	Schwarzbeck	VULB9168	00836 P:00227	2022/10/12	2025/10/11
Horn Antenna	Schwarzbeck	BBHA9120D	01892 P:00331	2022/09/13	2025/09/12
Horn Antenna	Schwarzbeck	BBHA 9170	1106	2022/04/24	2024/04/23
Amplifier	SKET	LNPA_30M01G-30	SK2021060801	2023/07/07	2024/07/06
Amplifier	SKET	PA-000318G-45	N/A	2023/08/30	2024/08/29
Amplifier	SKET	LNPA_18G40G-50	SK2022071301	2023/07/14	2024/07/13
Filter group	SKET	2.4G/5G Filter group r	N/A	2023/07/07	2024/07/06
EMI software	EZ	EZ-EMC	EEMC-3A1	N/A	N/A
Loop antenna	SCHNARZBECK	FMZB1519B	00102	2022/09/14	2025/09/13
1kHz calibration audio source	SKET	MCS-ABT-C35	N/A	2023/09/04	2024/09/03
Free Field Microphone	SKET	MG5 MP 663	0414	2023/09/04	2024/09/03
Audio shielding box	SKET	SB-ABT-C35	N/A	2023/03/30	2024/03/29
Controller	SKET	N/A	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-02	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-03	N/A	N/A	N/A
Coaxial Cable	BlueAsia	BLA-XC-01	N/A	N/A	N/A
Signal Generator DTV	ECREDIX	DSG-1000	N/A	N/A	N/A

Test Equipment Of Conducted Emissions at AC Power Line (150kHz-30MHz)

Equipment	Manufacturer	Model	S/N	Cal.Date	Cal.Due
Shield room	SKET	833	N/A	2023/11/16	2025/11/15
Receiver	R&S	ESPI3	101082	2023/08/30	2024/08/29
LISN	R&S	ENV216	3560.6550.15	2023/08/30	2024/08/29
LISN	AT	AT166-2	AKK1806000003	2023/08/30	2024/08/29
ISN	TESEQ	ISNT8-cat6	53580	2023/08/30	2024/08/29
Single-channel vehicle artificial power network	Schwarzbeck	NNBM 8124	01045	2023/07/07	2024/07/06
Single-channel vehicle artificial power network	Schwarzbeck	NNBM 8124	01075	2023/07/07	2024/07/06
EMI software	EZ	EZ-EMC	EEMC-3A1	N/A	N/A

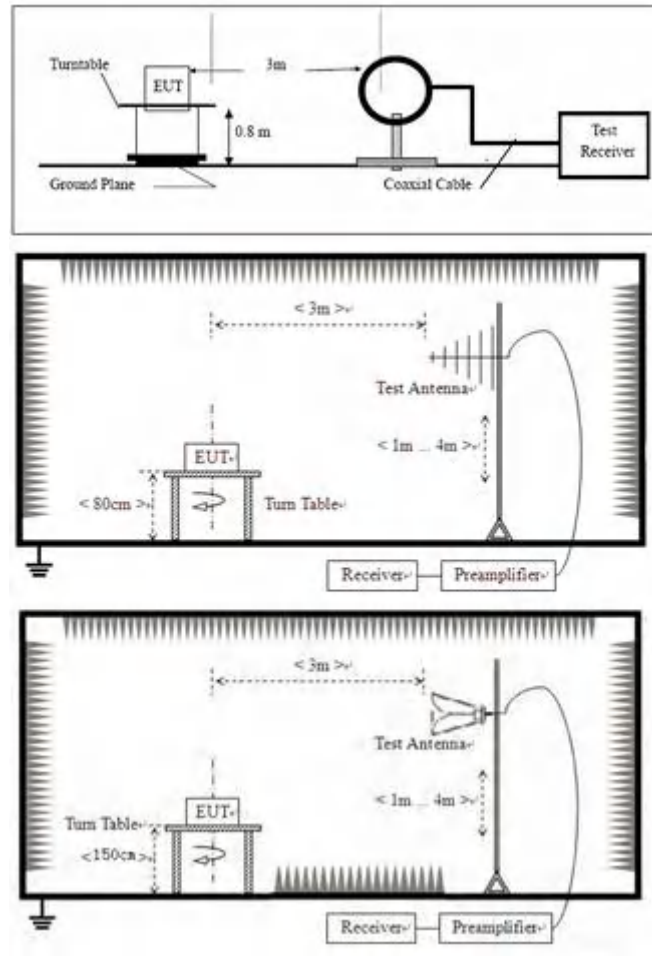
10 RADIATED EMISSIONS

Test Standard	47 CFR Part 15, Subpart C 15.249
Test Method	ANSI C63.10 (2013) Section 6.4&6.5&6.6
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Jozu
Temperature	25℃
Humidity	60%

10.1 LIMITS

Frequency	Field strength (microvolt/meter)	Limit (dBμV/m)	Remark	Measurement distance (m)
0.009MHz-0.490MHz	2400/F (kHz)	-	-	300
0.490MHz-1.705MHz	24000/F (kHz)	-	-	30
1.705MHz-30MHz	30	-	-	30
30MHz-88MHz	100	40.0	Quasi-peak	3
88MHz-216MHz	150	43.5	Quasi-peak	3
216MHz-960MHz	200	46.0	Quasi-peak	3
960MHz-1GHz	500	54.0	Quasi-peak	3
Above 1GHz	500	54.0	Average	3

10.2 BLOCK DIAGRAM OF TEST SETUP



10.3 PROCEDURE\

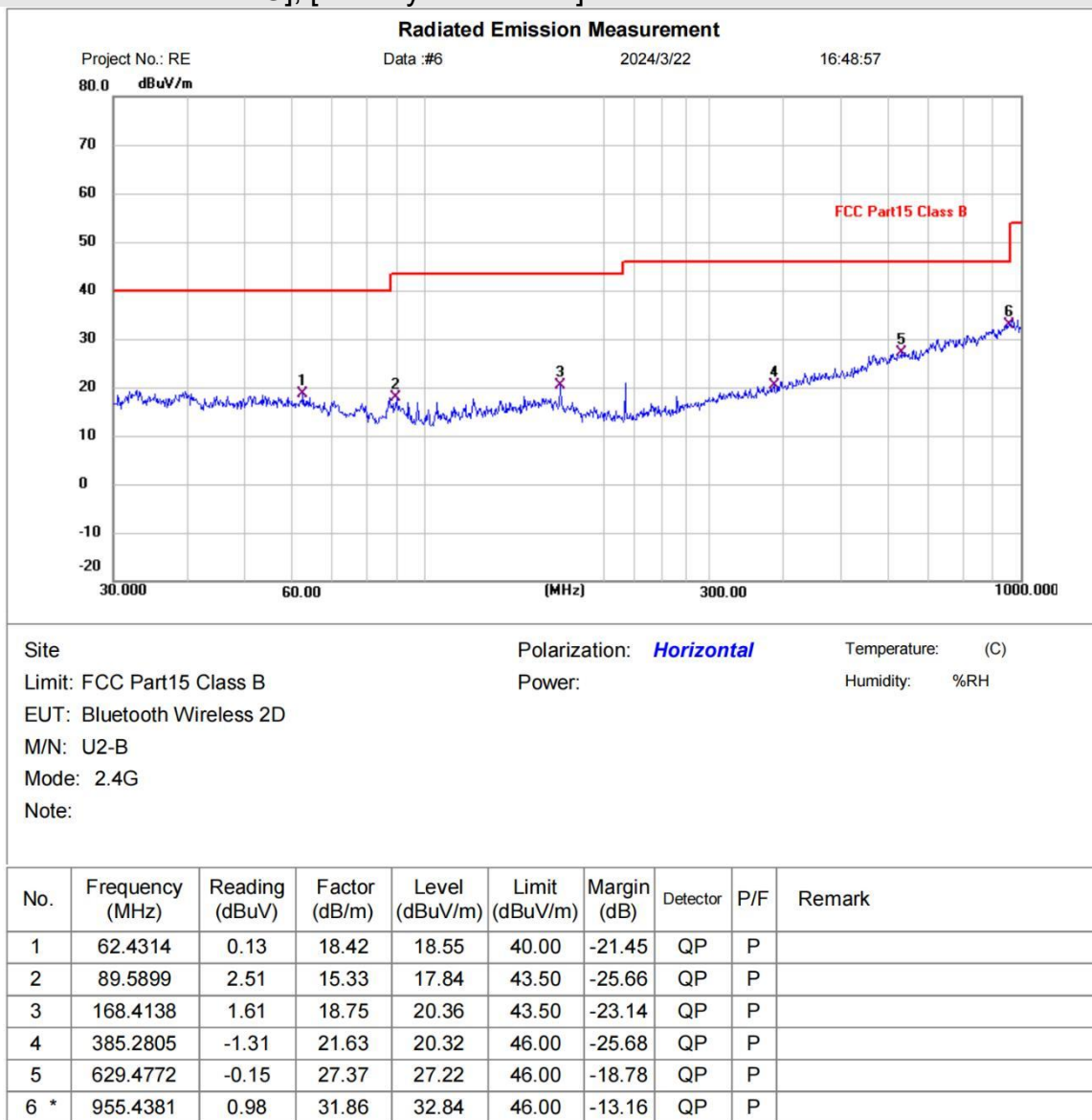
- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 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.
- c. 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.
- d. 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.
- e. 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.

Remark:

- 1) For emission below 1GHz, through pre-scan found the worst case is the lowest channel. Only the worst case is recorded in the report.
- 2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
$$\text{Final Test Level} = \text{Receiver Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Preamplifier Factor}$$
- 3) Scan from 9kHz to 25GHz, the disturbance above 12.75GHz and below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported. fundamental frequency is blocked by filter, and only spurious emission is shown.
- 4) For frequencies above 1GHz, the field strength limits 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. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

10.4 TEST DATA

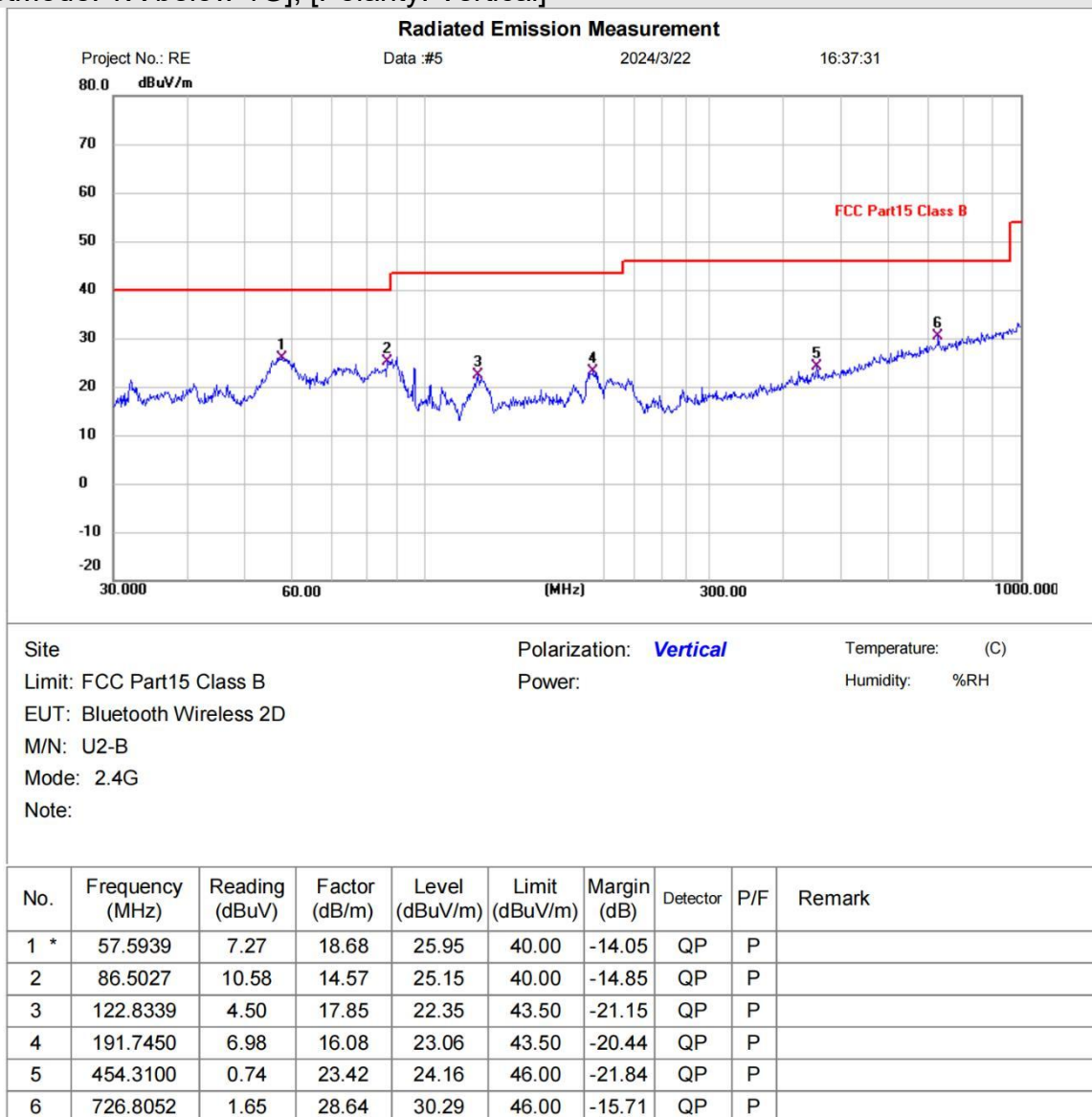
[TestMode: TX below 1G]; [Polarity: Horizontal]



*:Maximum data x:Over limit !:over margin

Test Result: Pass

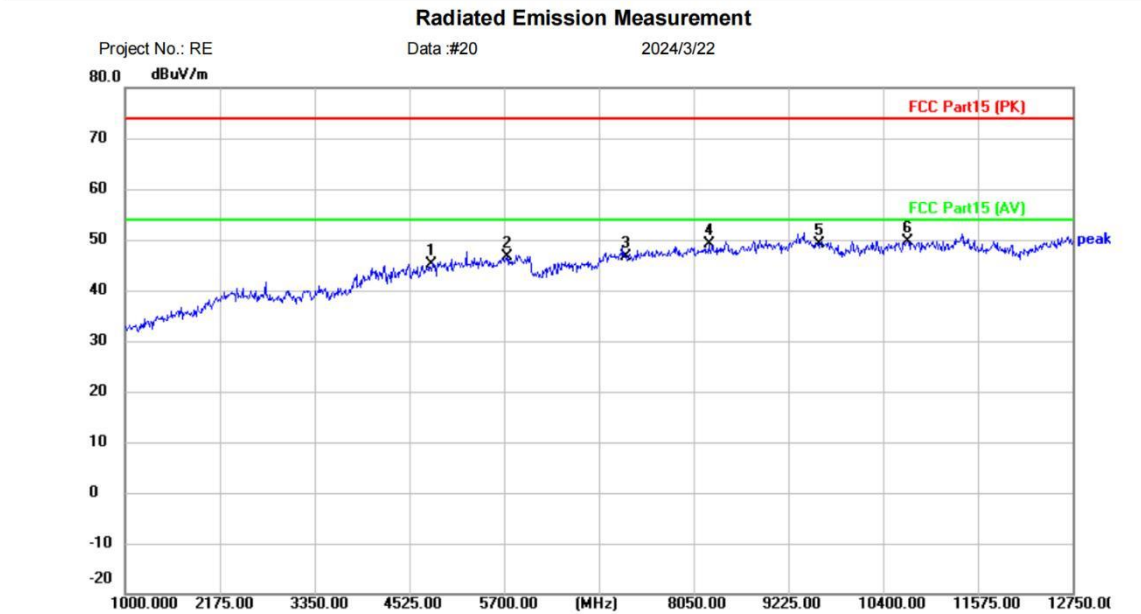
[TestMode: TX below 1G]; [Polarity: Vertical]



*:Maximum data x:Over limit !:over margin

Test Result: Pass

[TestMode: TX low channel]; [Polarity: Horizontal]



Site: Polarization: **Horizontal** Temperature: (C)
Limit: FCC Part15 (PK) Power: Humidity: %RH
EUT: Bluetooth Wireless 2D
M/N: U-2B
Mode: 2.4G-2402
Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4804.000	39.50	5.64	45.14	74.00	-28.86	peak	
2		5735.250	38.41	8.11	46.52	74.00	-27.48	peak	
3		7206.000	37.40	9.24	46.64	74.00	-27.36	peak	
4		8238.000	39.20	9.86	49.06	74.00	-24.94	peak	
5		9608.000	36.86	12.31	49.17	74.00	-24.83	peak	
6	*	10705.50	36.43	13.12	49.55	74.00	-24.45	peak	

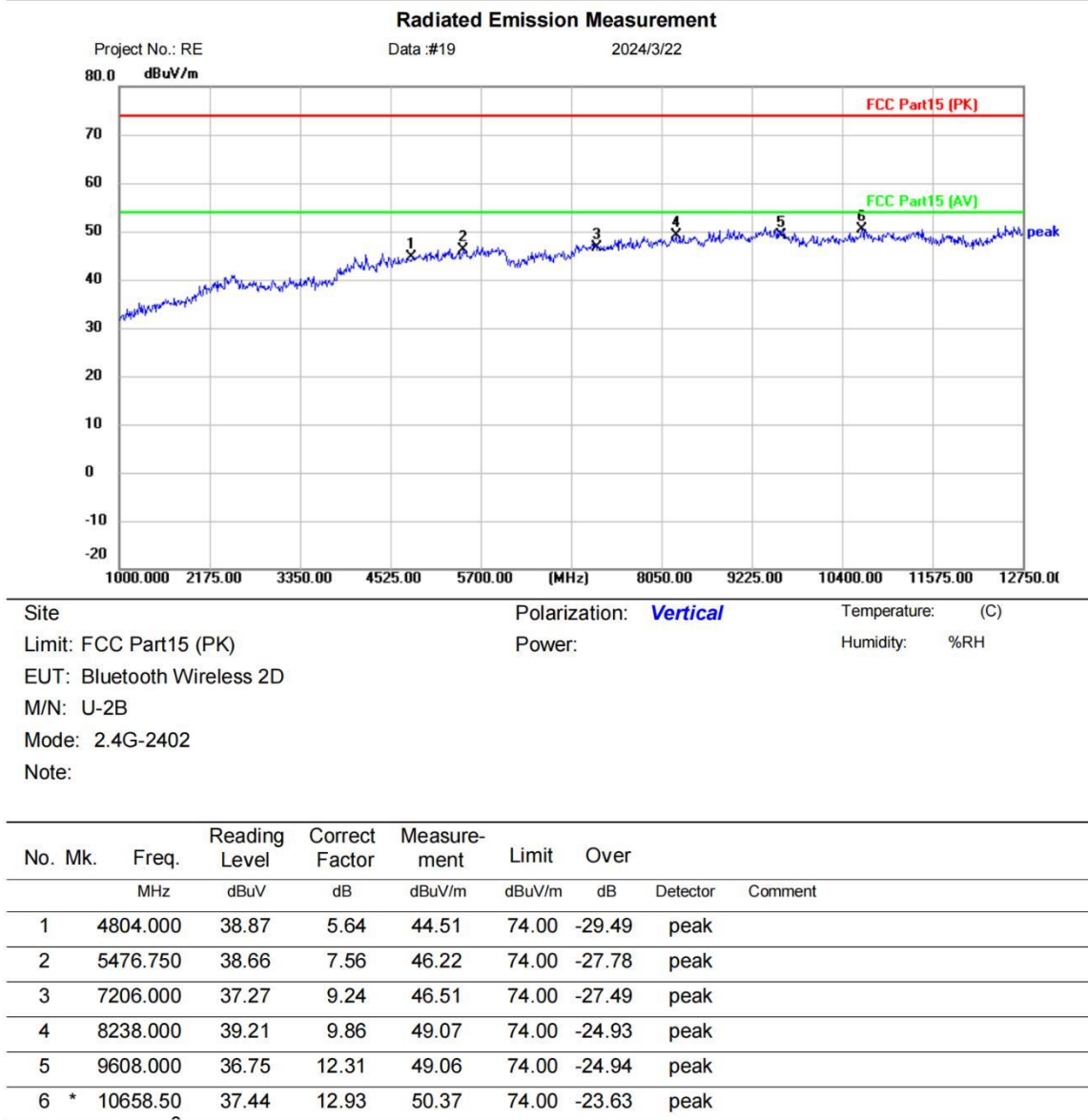
*:Maximum data x:Over limit !:over margin <Reference Only

Receiver: ESR_1 Spectrum Analyzer: FSP40

Antenna: EZ 9120D 1G-18G Engineer Signature:

Test Result: Pass

[TestMode: TX low channel]; [Polarity: Vertical]

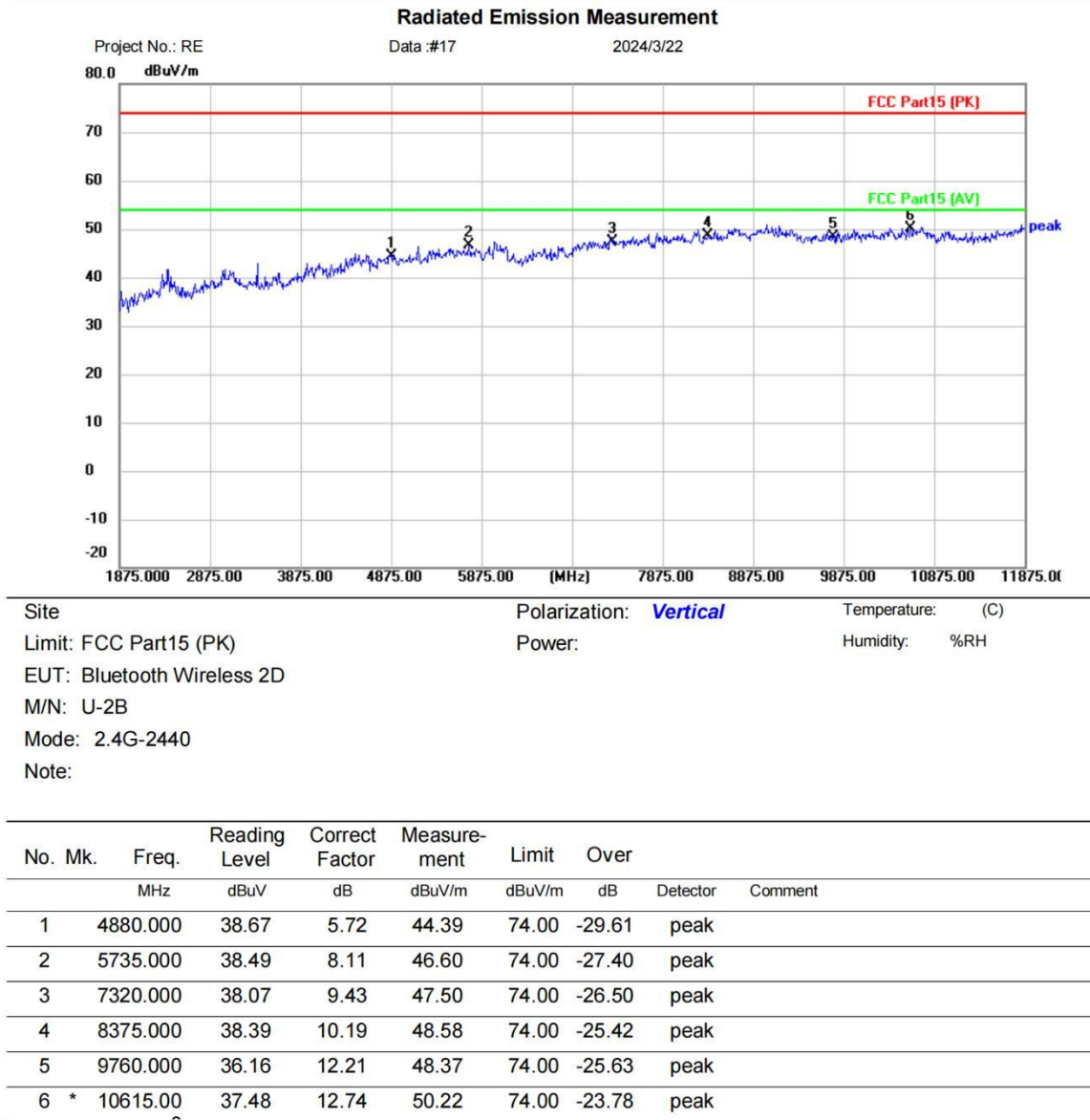


*:Maximum data x:Over limit !:over margin <Reference Only

Receiver: ESR_1 Spectrum Analyzer: FSP40
Antenna: EZ 9120D 1G-18G Engineer Signature:

Test Result: Pass

[TestMode: TX mid channel]; [Polarity: Vertical]

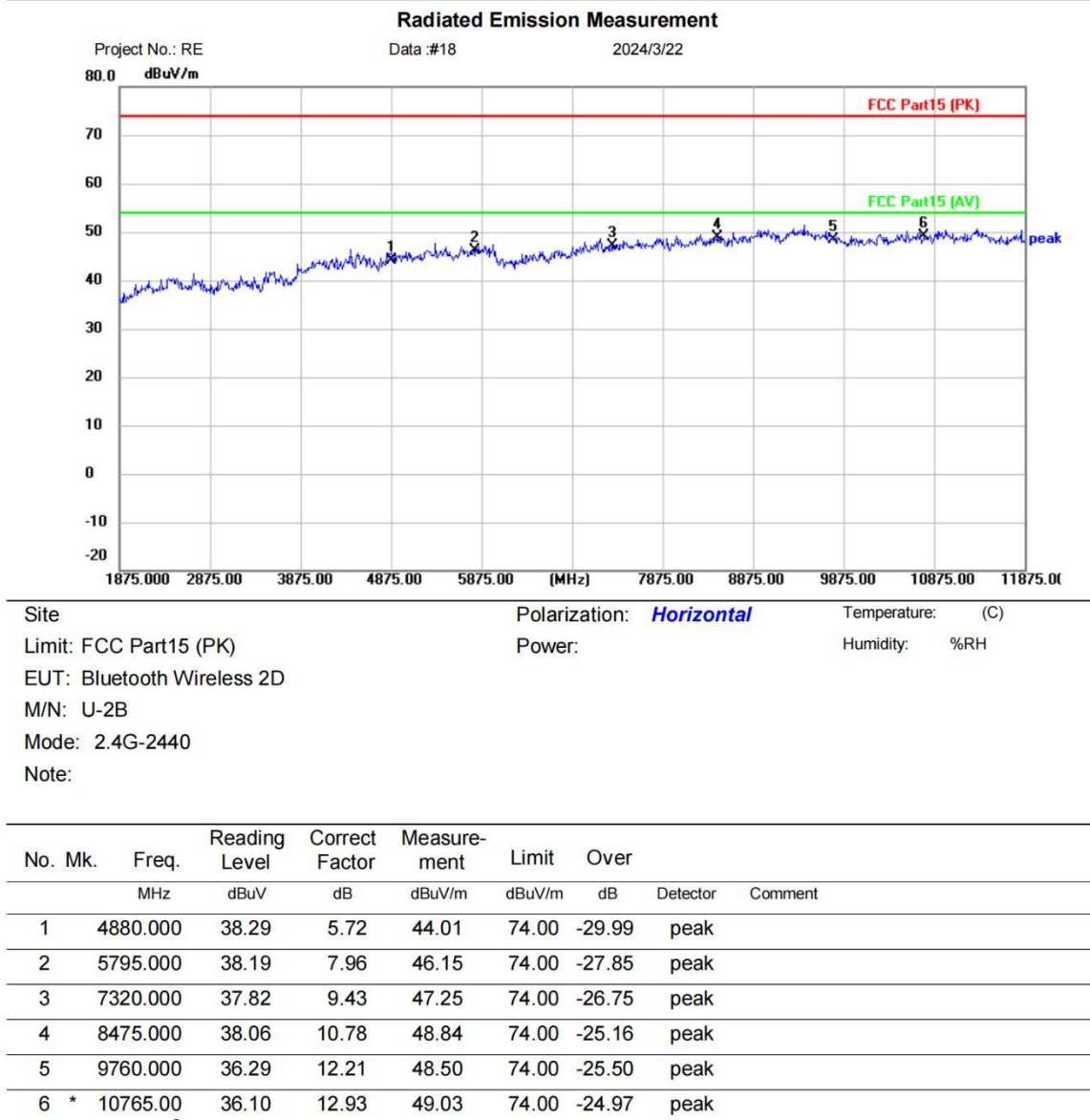


*:Maximum data x:Over limit !:over margin <Reference Only

Receiver: ESR_1 Spectrum Analyzer: FSP40
Antenna: EZ 9120D 1G-18G Engineer Signature:

Test Result: Pass

[TestMode: TX mid channel]; [Polarity: Horizontal]

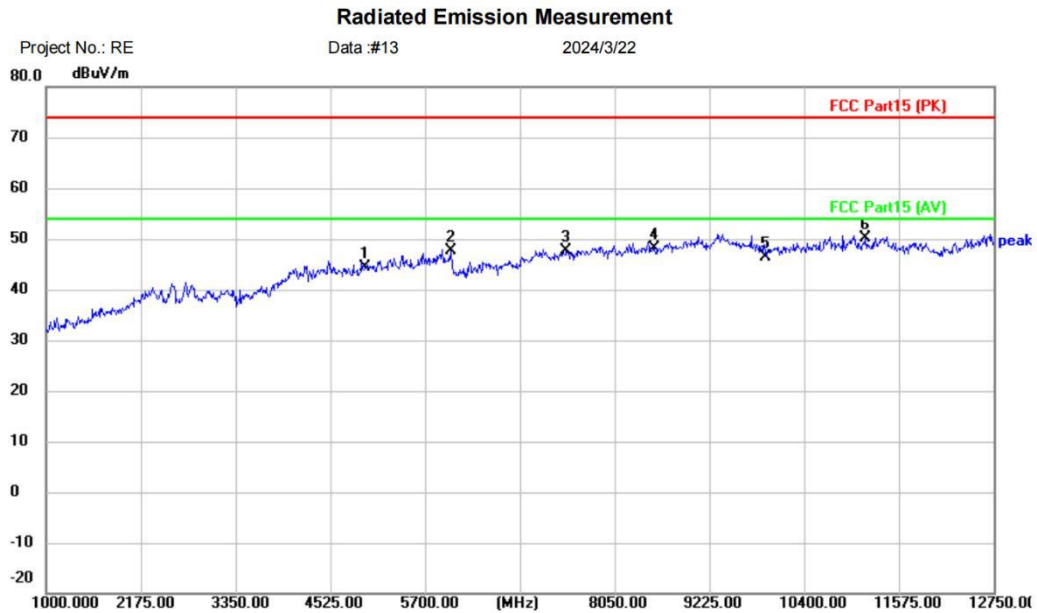


*:Maximum data x:Over limit !:over margin (Reference Only)

Receiver: ESR_1 Spectrum Analyzer: FSP40
Antenna: EZ 9120D 1G-18G Engineer Signature:

Test Result: Pass

[TestMode: TX high channel]; [Polarity: Vertical]



Site: Polarization: **Vertical** Temperature: (C)
Limit: FCC Part15 (PK) Power: Humidity: %RH
EUT: Bluetooth Wireless 2D
M/N: U-2B
Mode: 2.4G-2480
Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		4960.000	37.74	6.60	44.34	74.00	-29.66	peak	
2		6017.250	41.98	5.63	47.61	74.00	-26.39	peak	
3		7440.000	38.03	9.64	47.67	74.00	-26.33	peak	
4		8543.500	36.96	11.18	48.14	74.00	-25.86	peak	
5		9920.000	34.29	12.14	46.43	74.00	-27.57	peak	
6	*	11163.75	37.39	12.73	50.12	74.00	-23.88	peak	

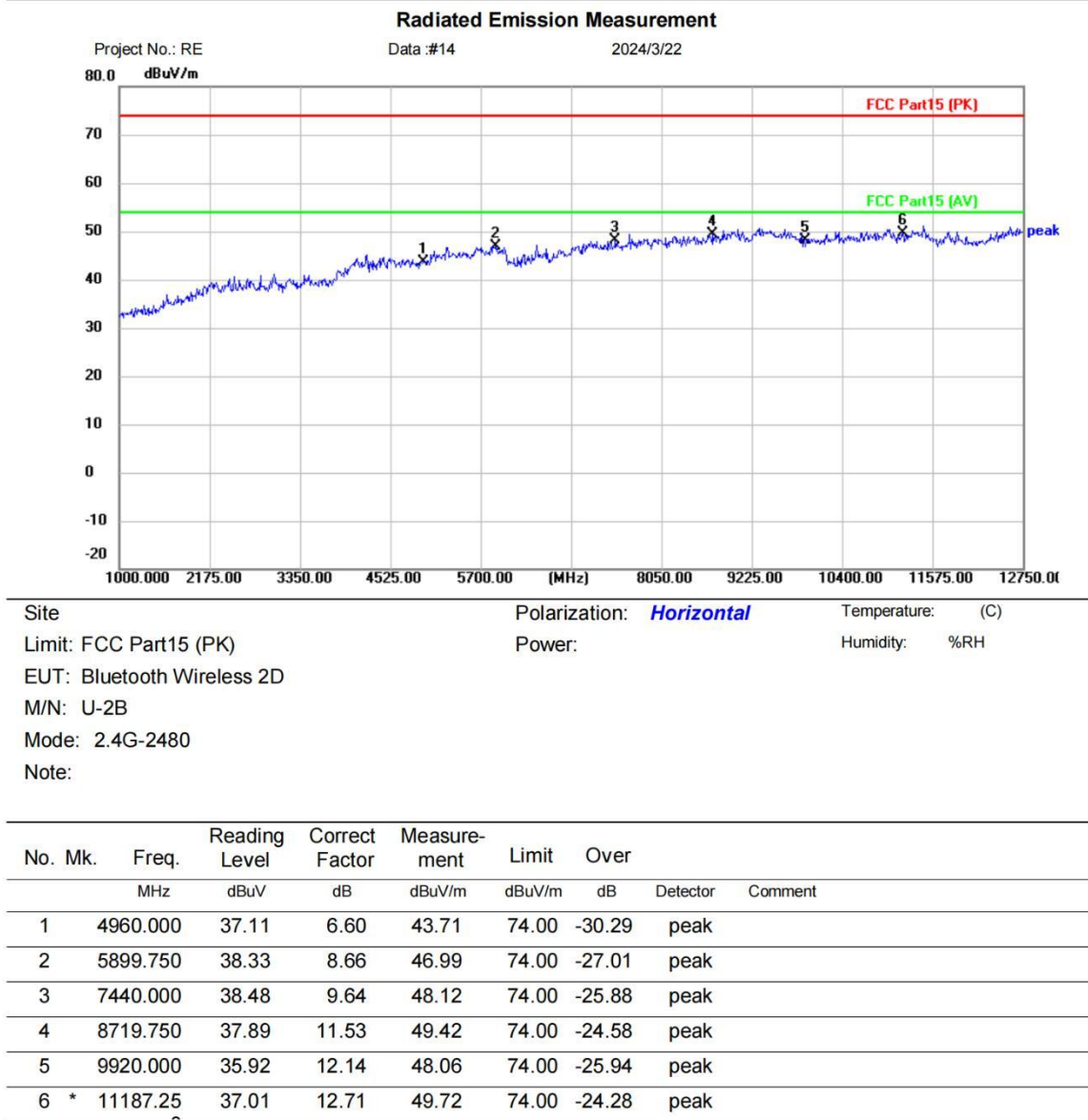
*:Maximum data x:Over limit !:over margin <Reference Only

Receiver: ESR_1 Spectrum Analyzer: FSP40

Antenna: EZ 9120D 1G-18G Engineer Signature:

Test Result: Pass

[TestMode: TX high channel]; [Polarity: Horizontal]



*:Maximum data x:Over limit !:over margin (Reference Only)

Receiver: ESR_1 Spectrum Analyzer: FSP40

Antenna: EZ 9120D 1G-18G Engineer Signature:

Test Result: Pass

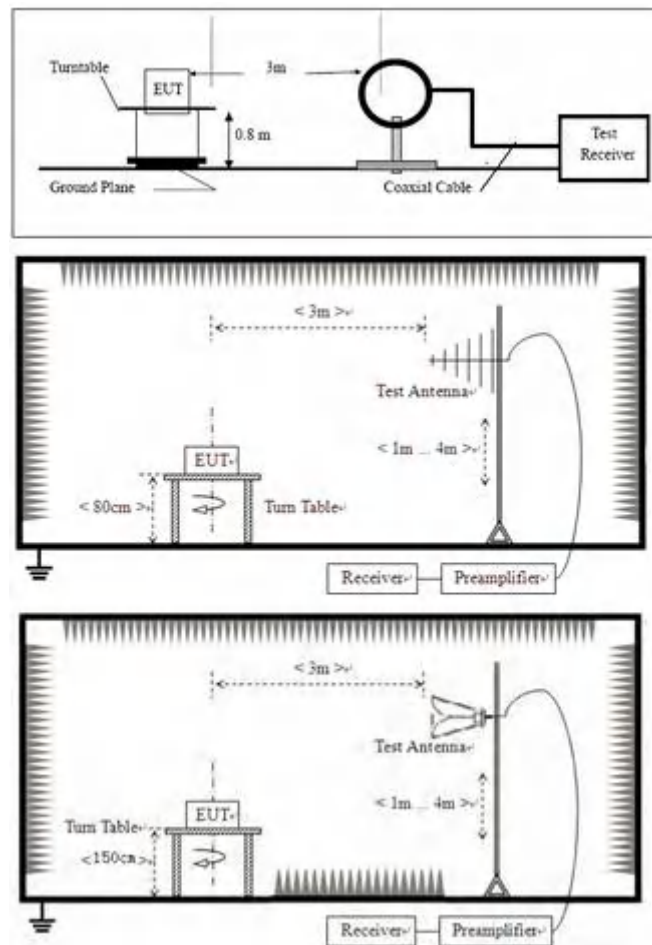
11 RESTRICTED BAND AROUND FUNDAMENTAL FREQUENCY

Test Standard	47 CFR Part 15, Subpart C 15.249
Test Method	ANSI C63.10 (2013) Section 6.4&6.5&6.6
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Jozu
Temperature	25°C
Humidity	60%

11.1 LIMITS

Frequency	Limit (dB μ V/m @3m)	Remark
30MHz-88MHz	40.0	Quasi-peak Value
88MHz-216MHz	43.5	Quasi-peak Value
216MHz-960MHz	46.0	Quasi-peak Value
960MHz-1GHz	54.0	Quasi-peak Value
Above 1GHz	54.0	Average Value
	74.0	Peak Value

11.2 BLOCK DIAGRAM OF TEST SETUP



11.3 PROCEDURE

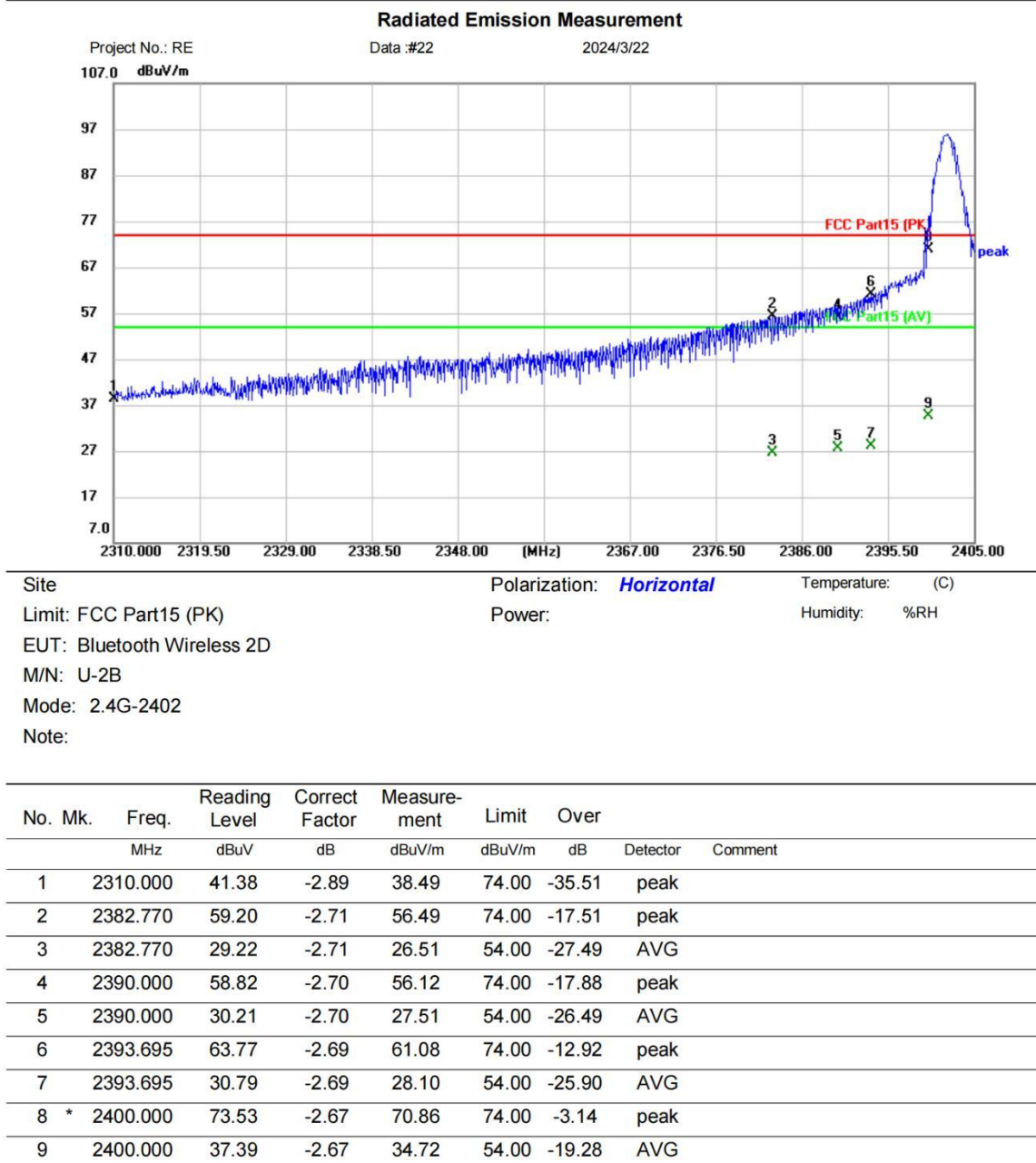
- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters 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.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- 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.
- Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

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11.4 TEST DATA

[TestMode: TX low channel]; [Polarity: Horizontal]



*:Maximum data x:Over limit !:over margin

<Reference Only

Receiver: ESR_1

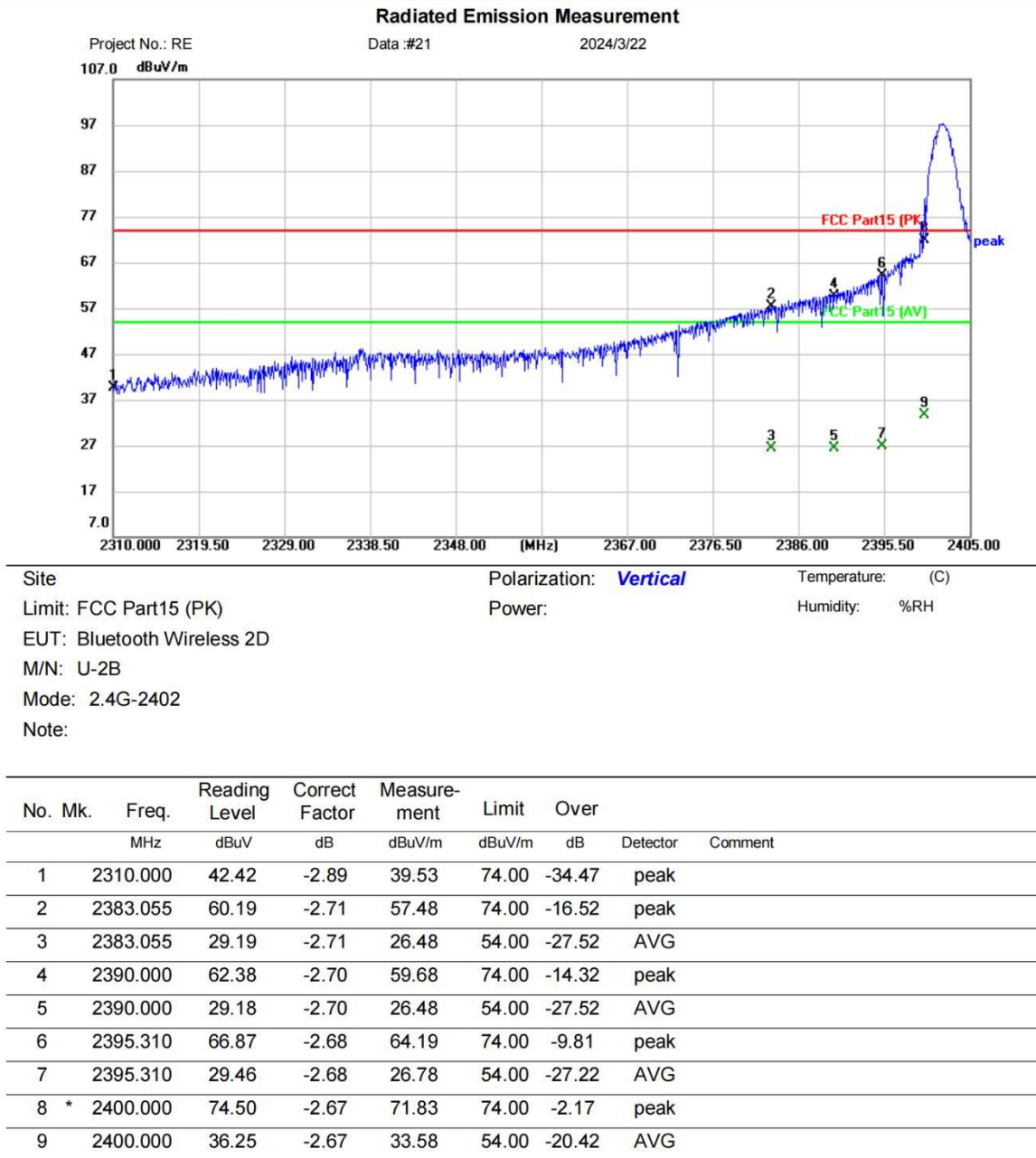
Spectrum Analyzer: FSP40

Antenna: EZ 9120D 1G-18G

Engineer Signature:

Test Result: Pass

[TestMode: TX low channel]; [Polarity: Vertical]

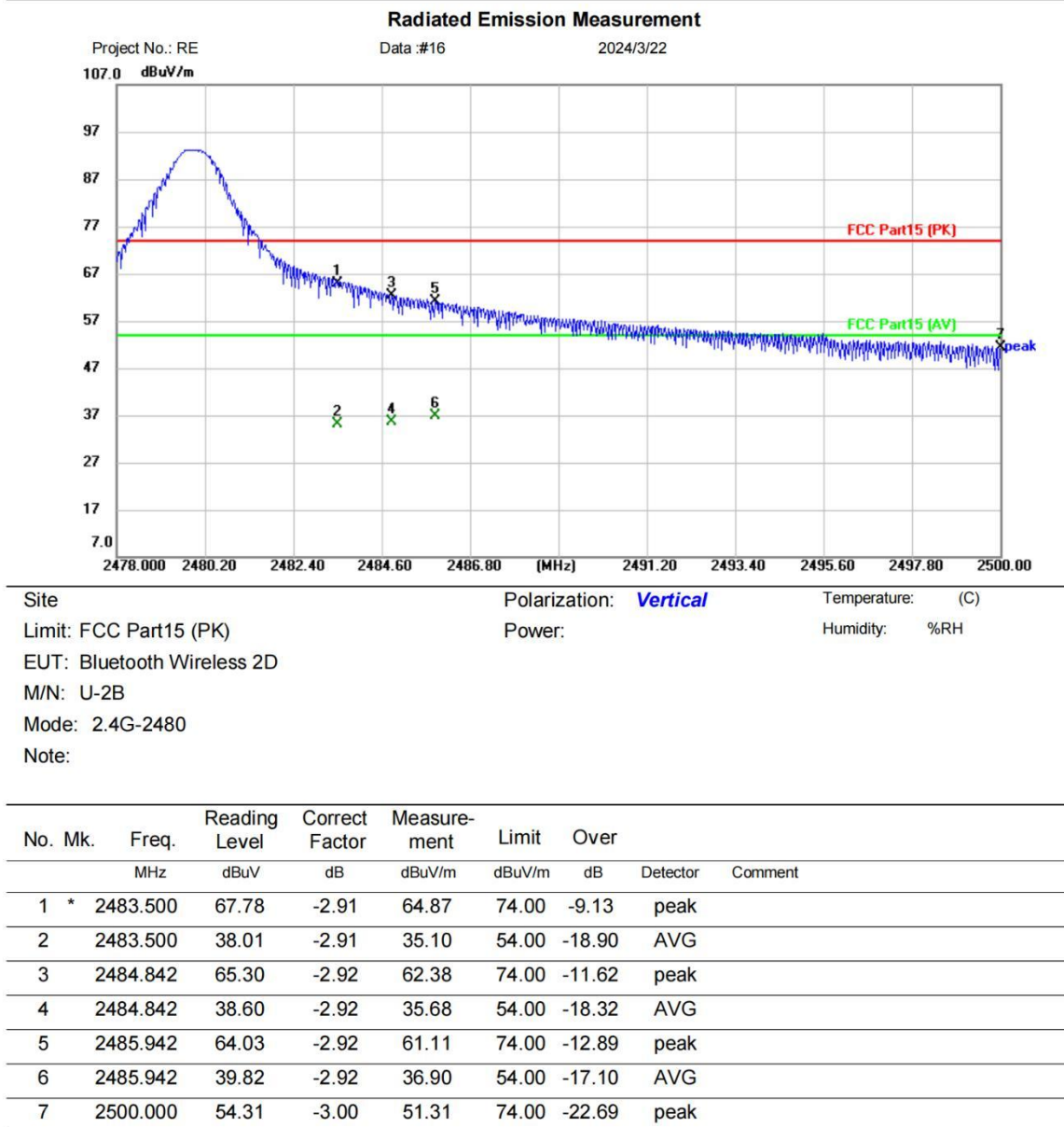


*:Maximum data x:Over limit !:over margin (Reference Only)

Receiver: ESR_1 Spectrum Analyzer: FSP40
Antenna: EZ 9120D 1G-18G Engineer Signature:

Test Result: Pass

[TestMode: TX high channel]; [Polarity: Vertical]

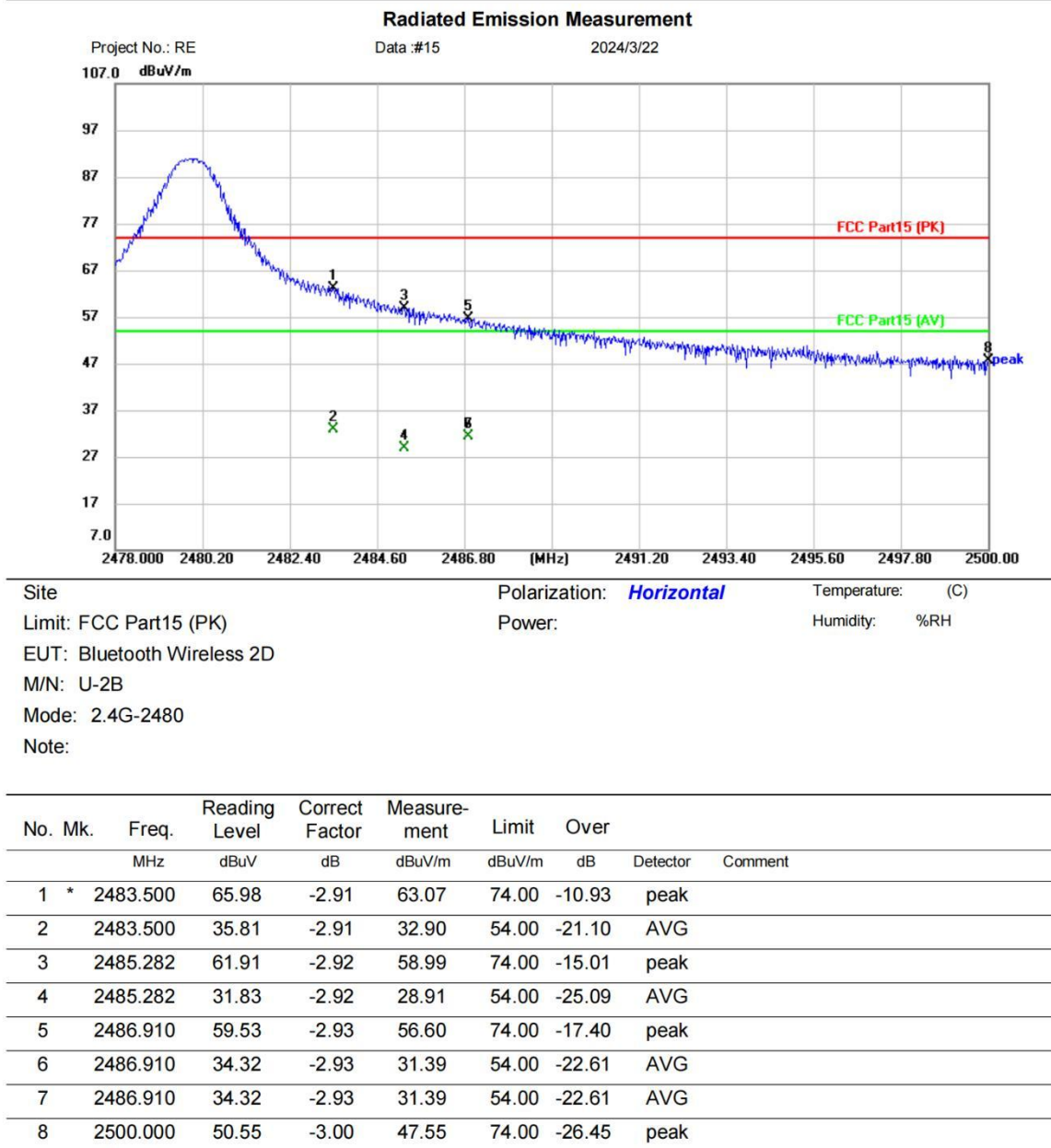


*:Maximum data x:Over limit !:over margin <Reference Only

Receiver: ESR_1 Spectrum Analyzer: FSP40
Antenna: EZ 9120D 1G-18G Engineer Signature:

Test Result: Pass

[TestMode: TX high channel]; [Polarity: Horizontal]



*:Maximum data x:Over limit !:over margin

⟨Reference Only

Receiver: ESR_1

Spectrum Analyzer: FSP40

Antenna: EZ 9120D 1G-18G

Engineer Signature:

Test Result: Pass

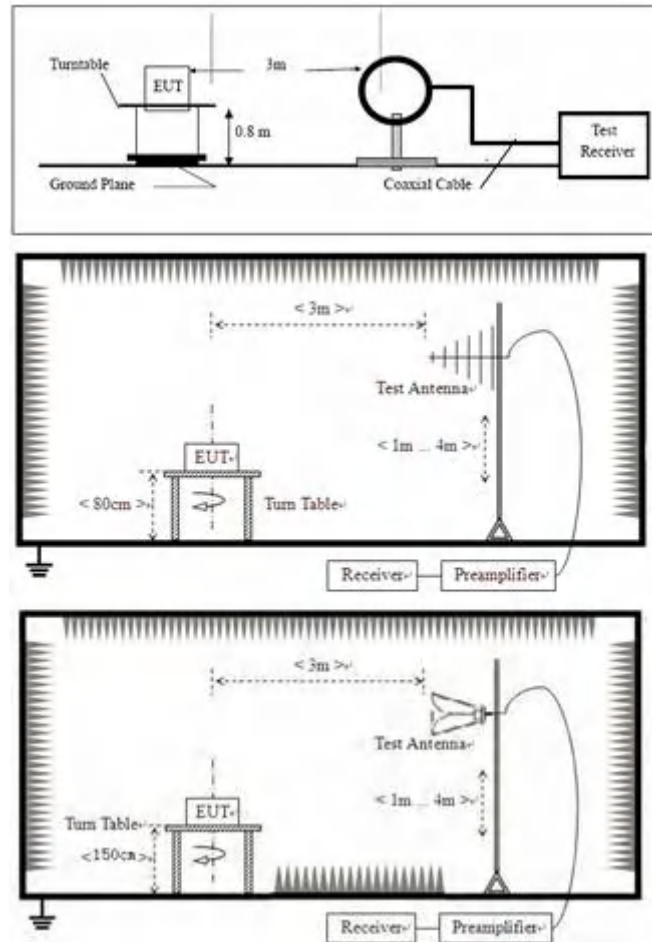
12 FIELD STRENGTH OF THE FUNDAMENTAL SIGNAL (15.249(A))

Test Standard	47 CFR Part 15, Subpart C 15.249
Test Method	ANSI C63.10 (2013) Section 6.5&6.6
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Jozu
Temperature	25℃
Humidity	60%

12.1 LIMITS

Frequency	Limit (dBμV/m @3m)	Remark
2400MHz-2483.5MHz	94.0	Average Value
	114.0	Peak Value

12.2 BLOCK DIAGRAM OF TEST SETUP



12.3 PROCEDURE

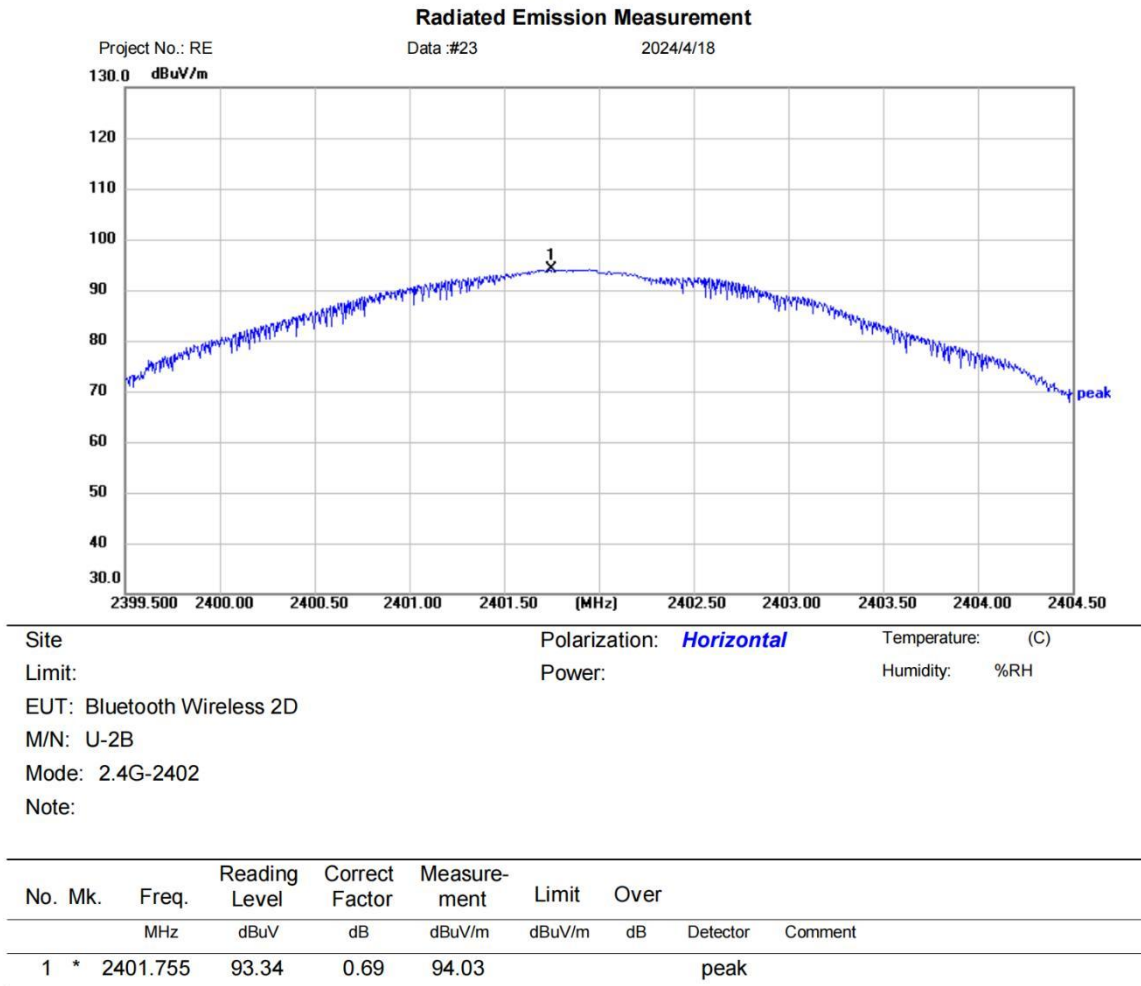
- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters 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.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- 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.
- Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

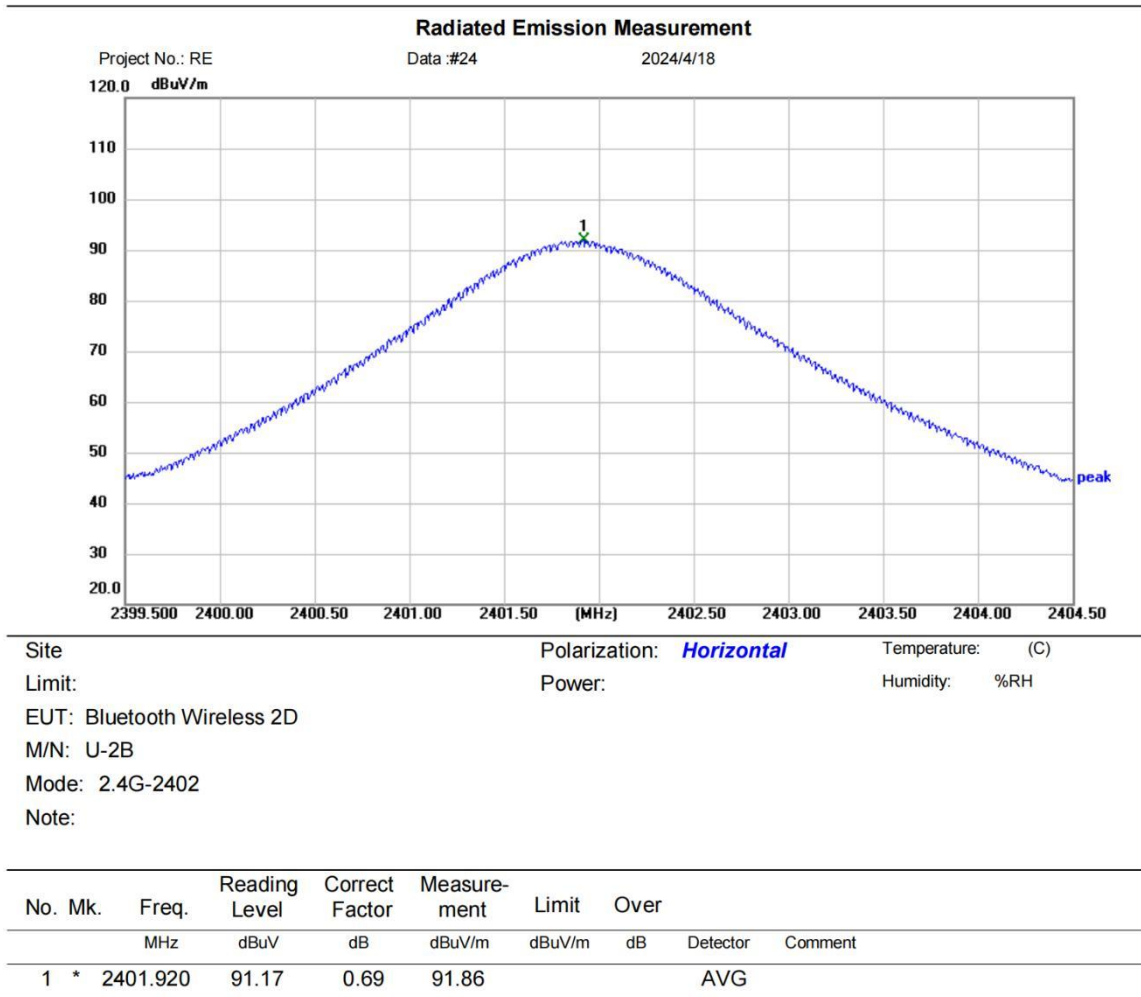
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12.4 TEST DATA

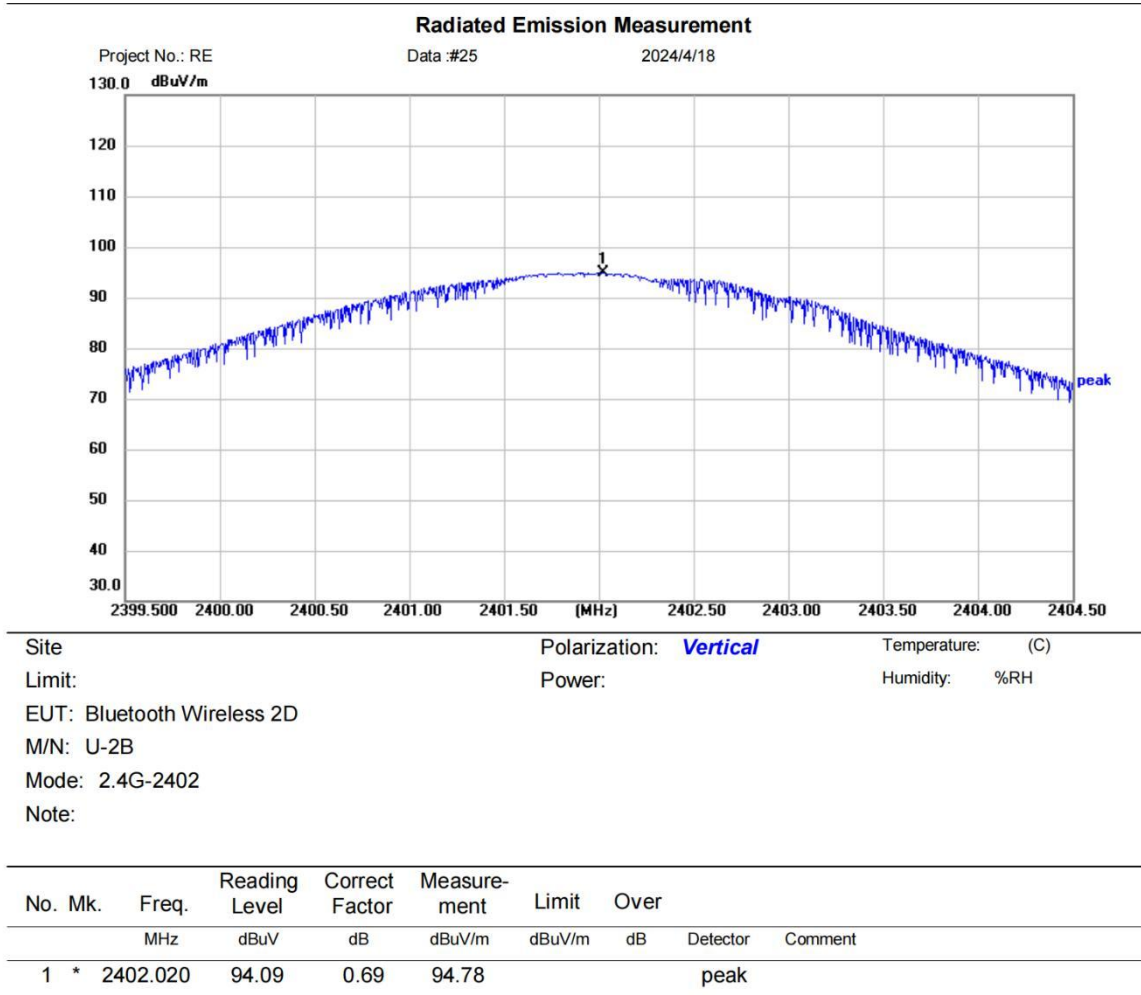
2402 Horizontal peak:



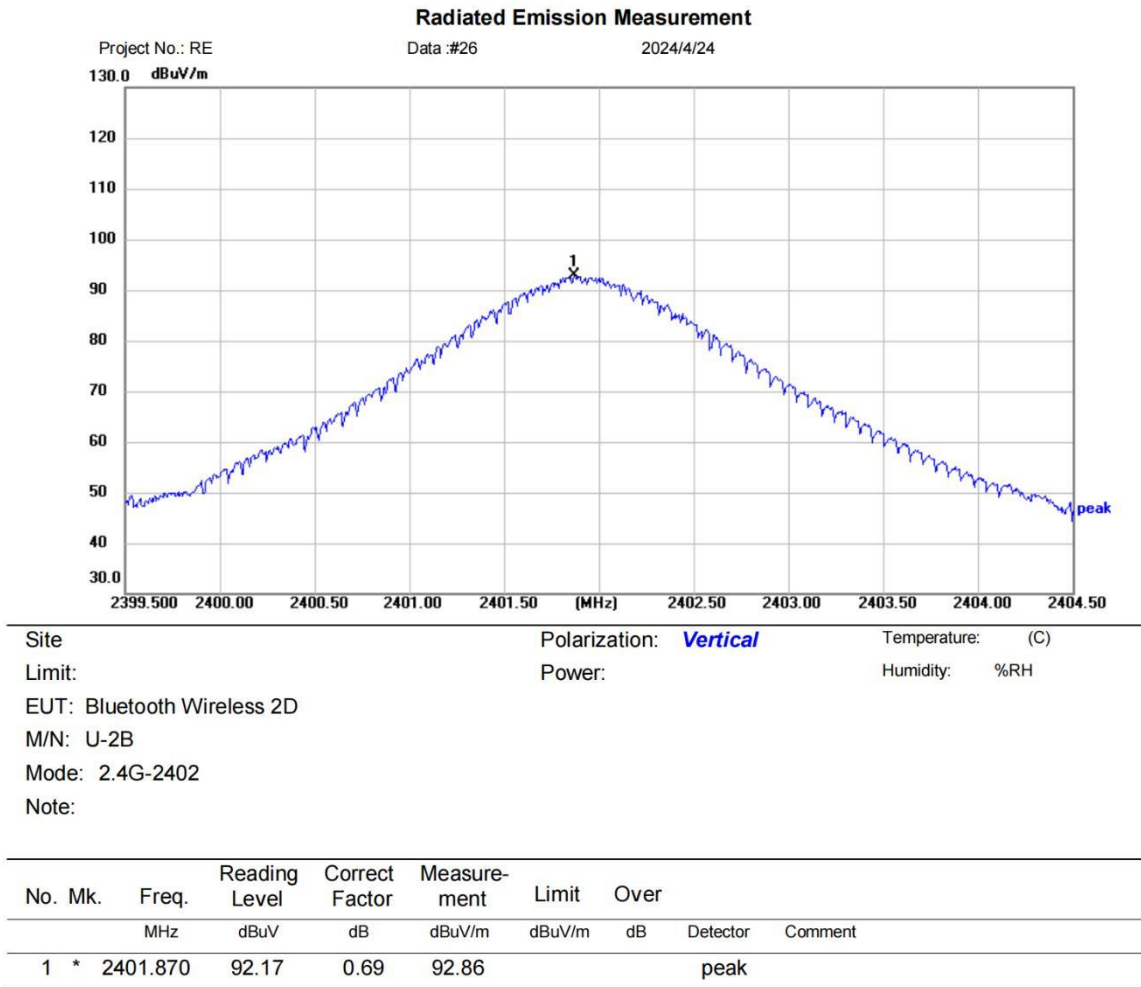
Horizontal AVG:



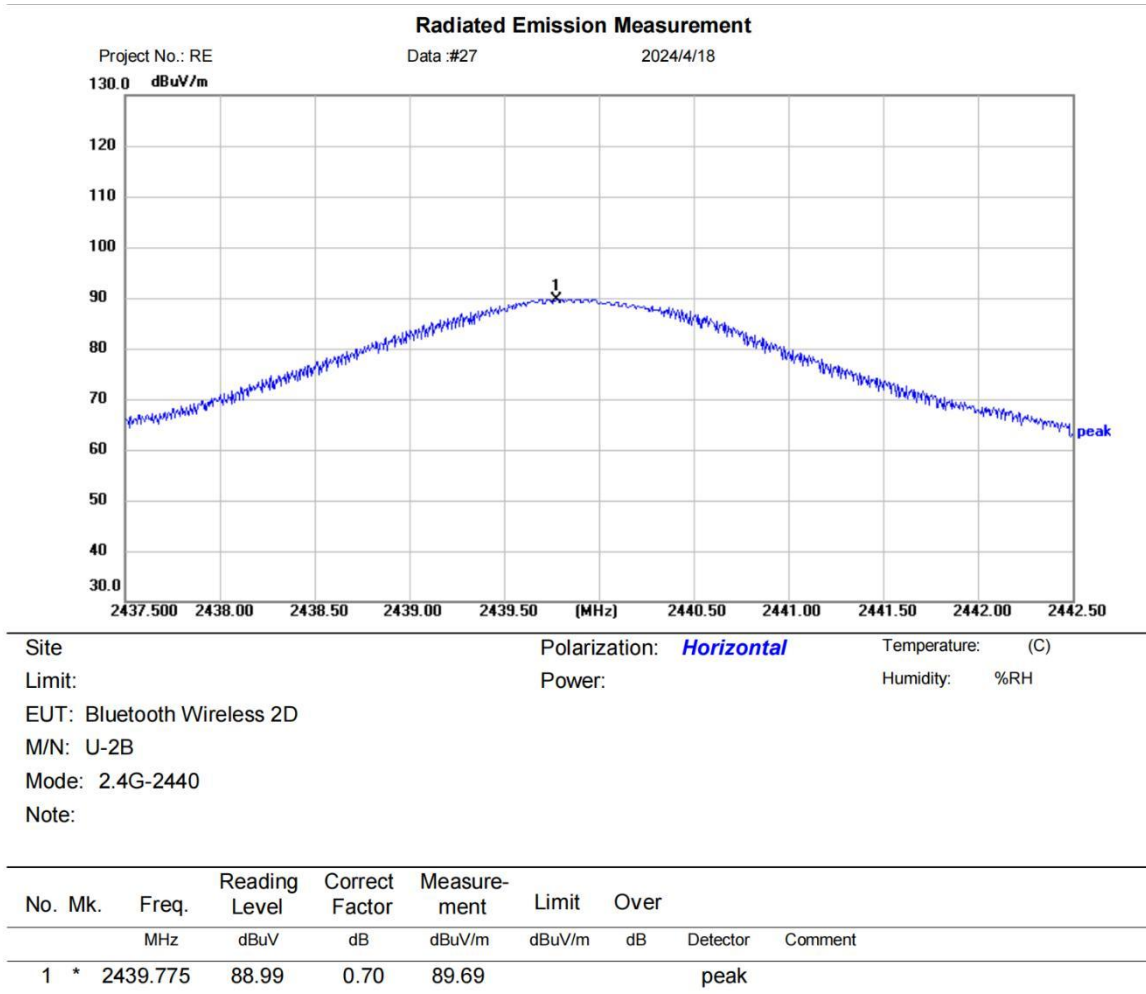
Vertical peak



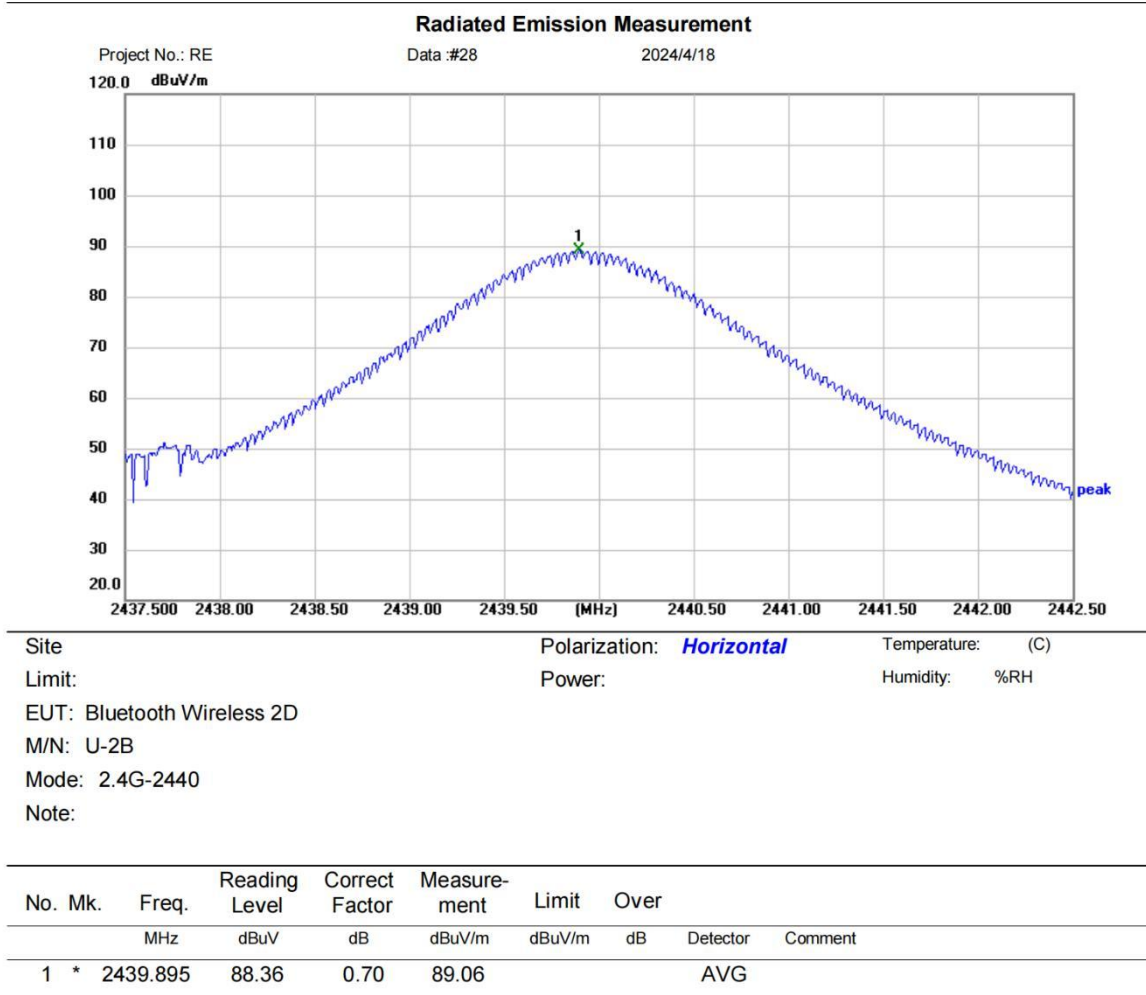
Vertical AVG



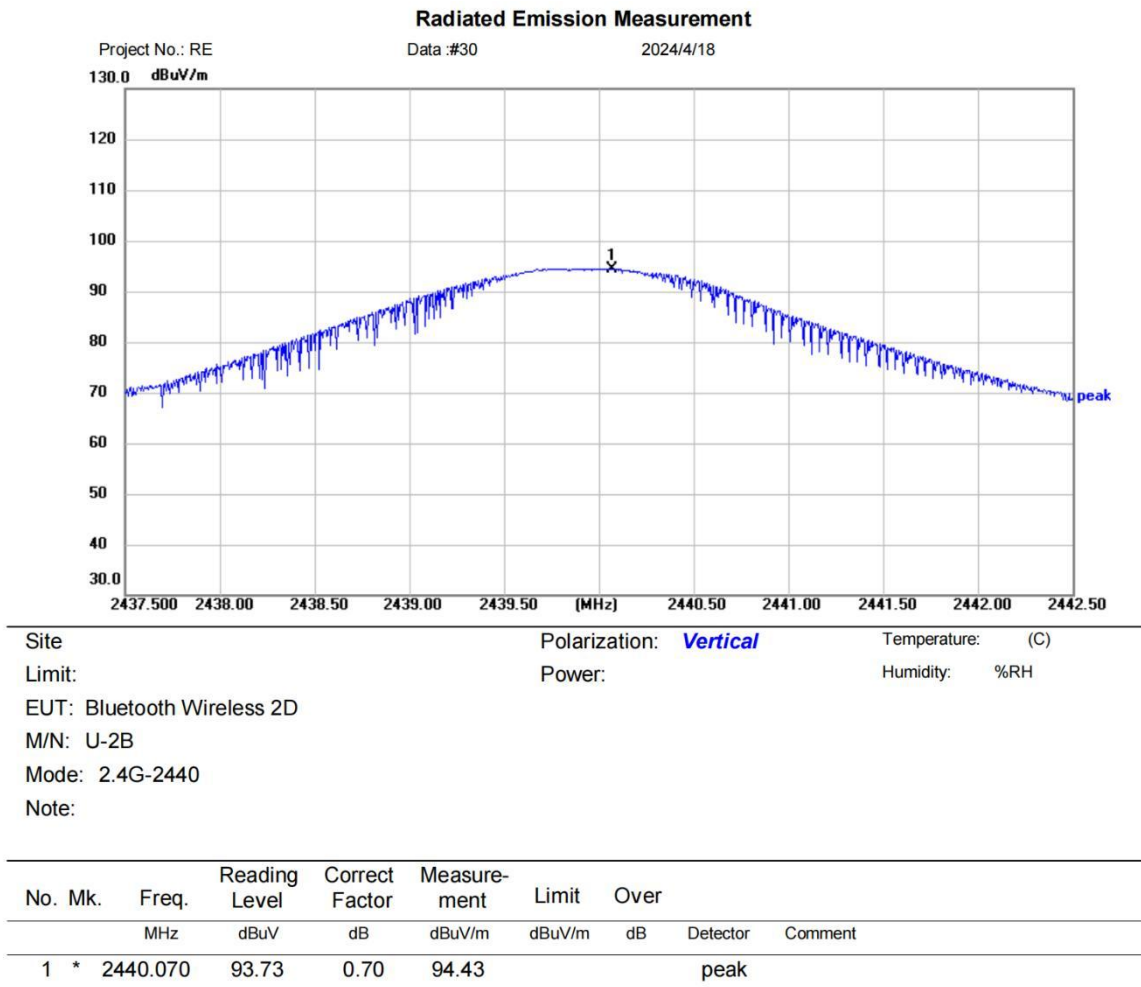
2440 Horizontal peak



Horizontal AVG

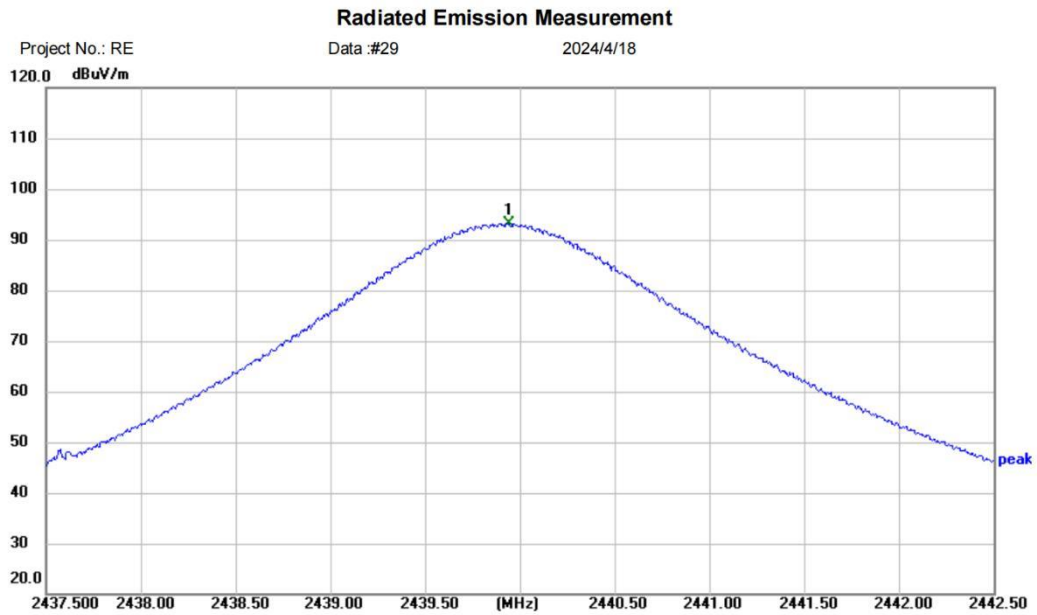


Vertical peak



*:Maximum data x:Over limit !:over margin (Reference Only)
 Receiver: ESR_1 Spectrum Analyzer: FSP40

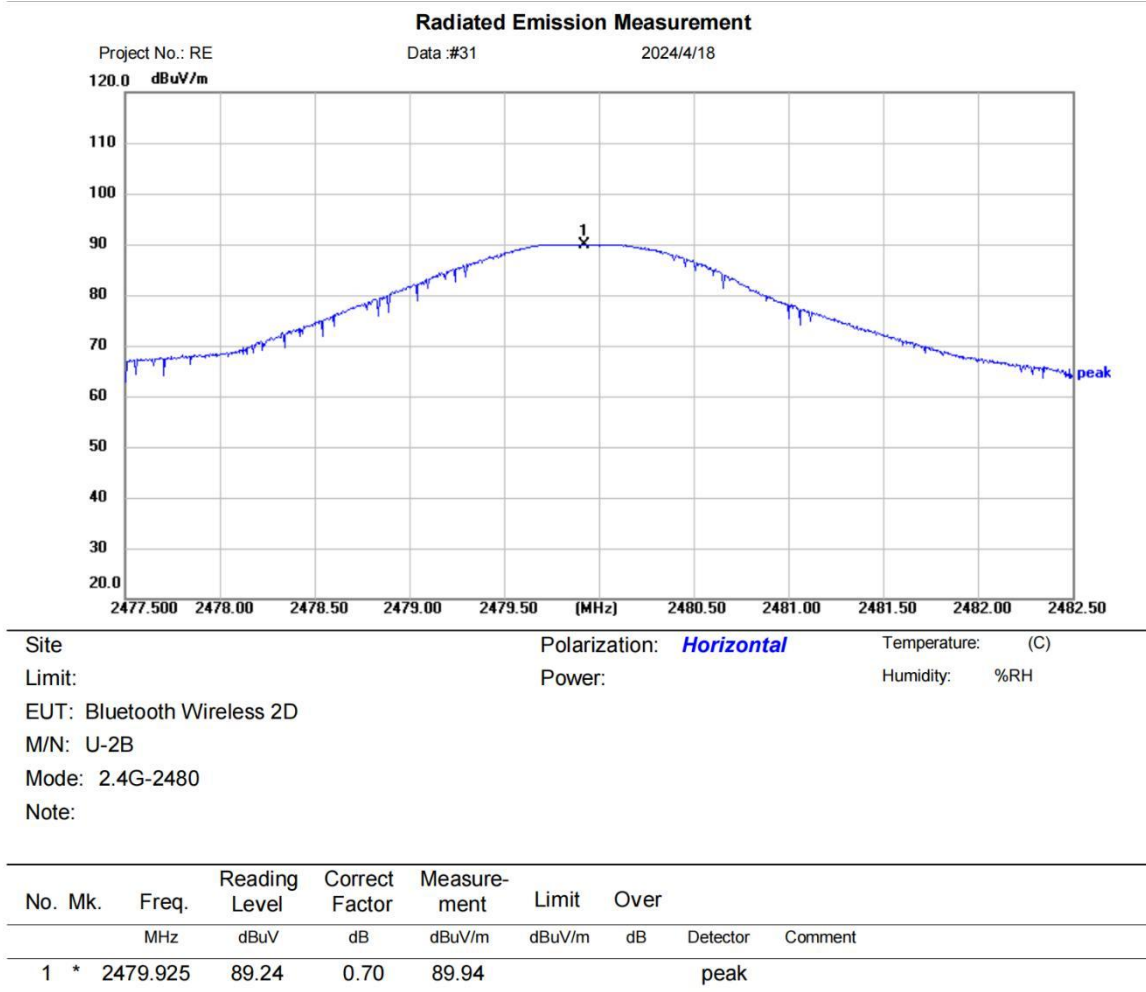
Vertical AVG



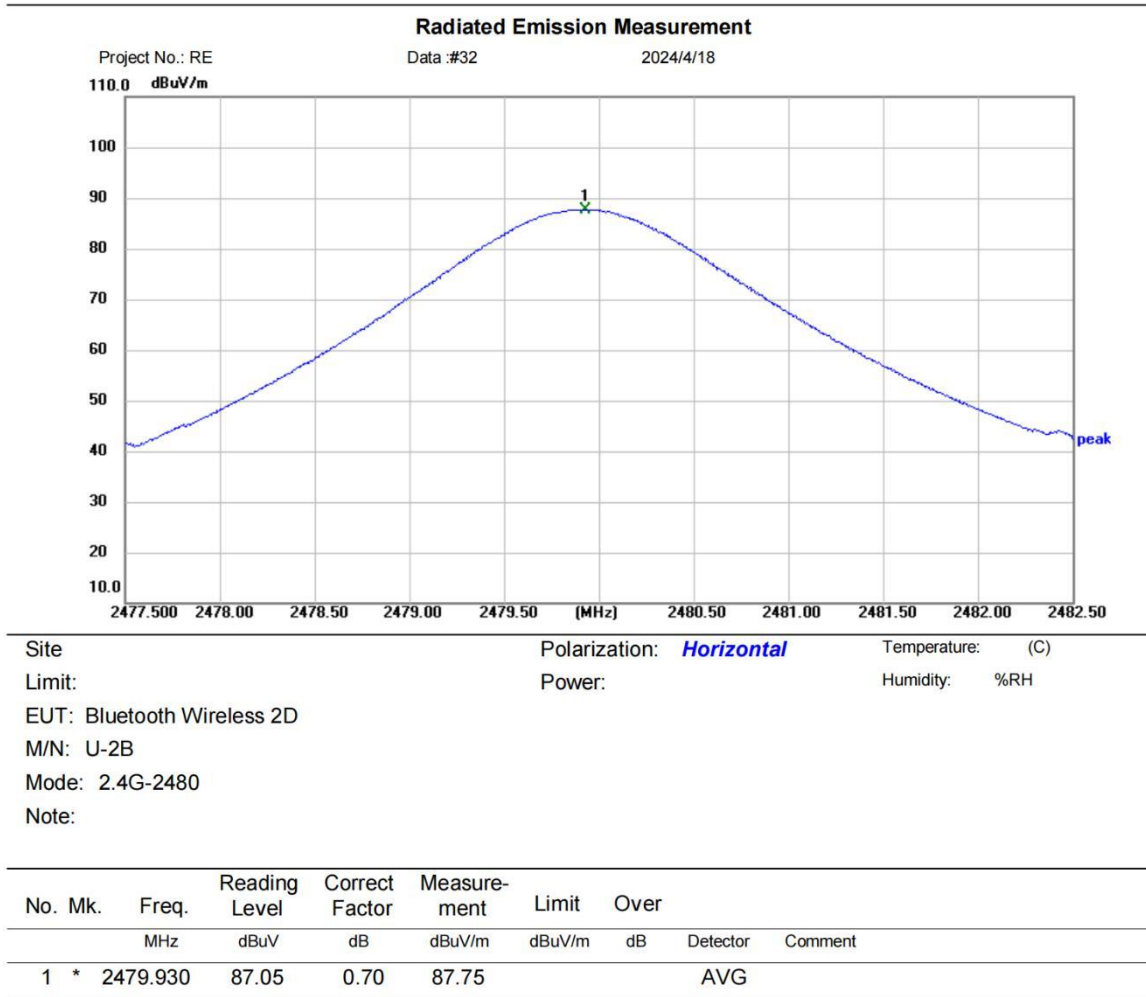
Site	Polarization: Vertical	Temperature: (C)
Limit:	Power:	Humidity: %RH
EUT: Bluetooth Wireless 2D		
M/N: U-2B		
Mode: 2.4G-2440		
Note:		

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2439.945	92.51	0.70	93.21			AVG	

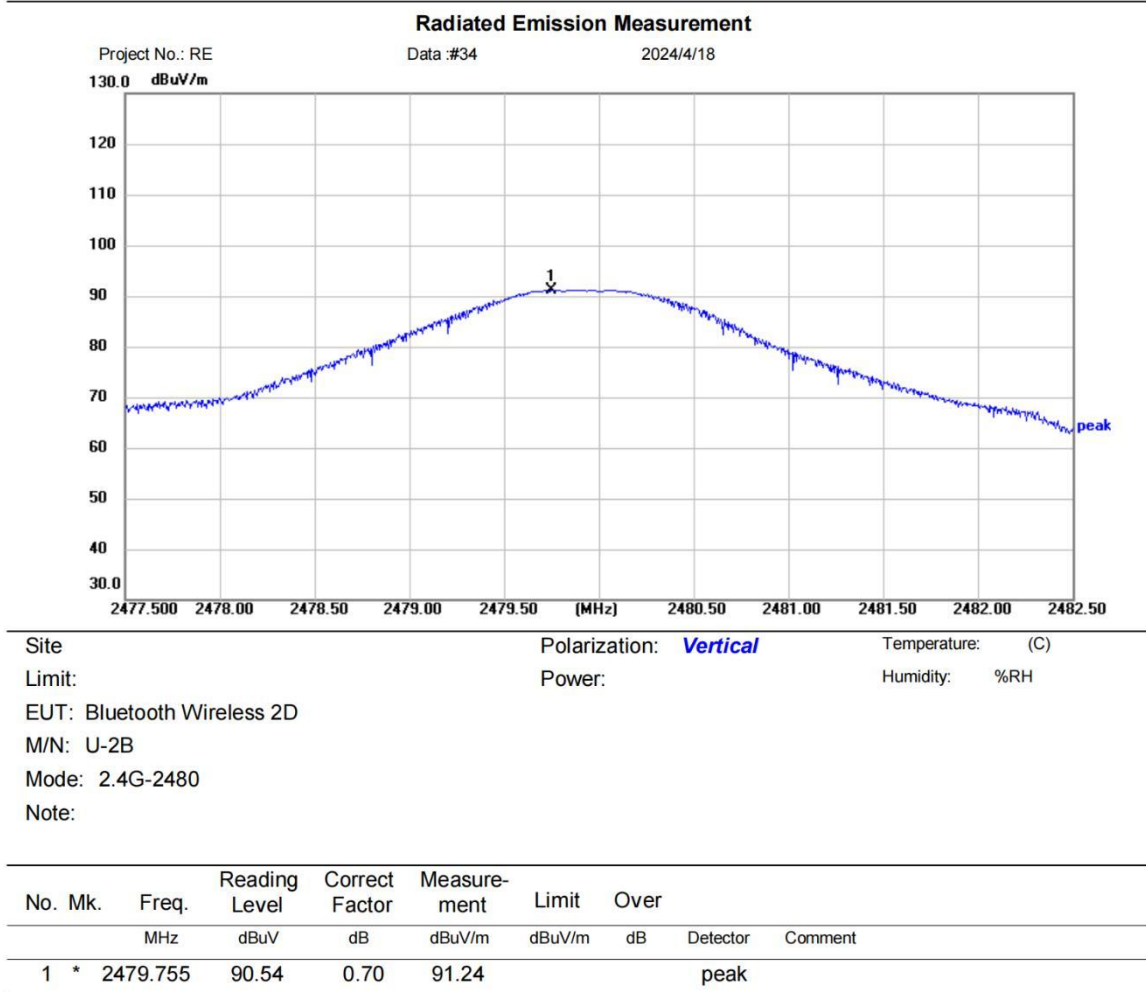
2480 Horizontal peak



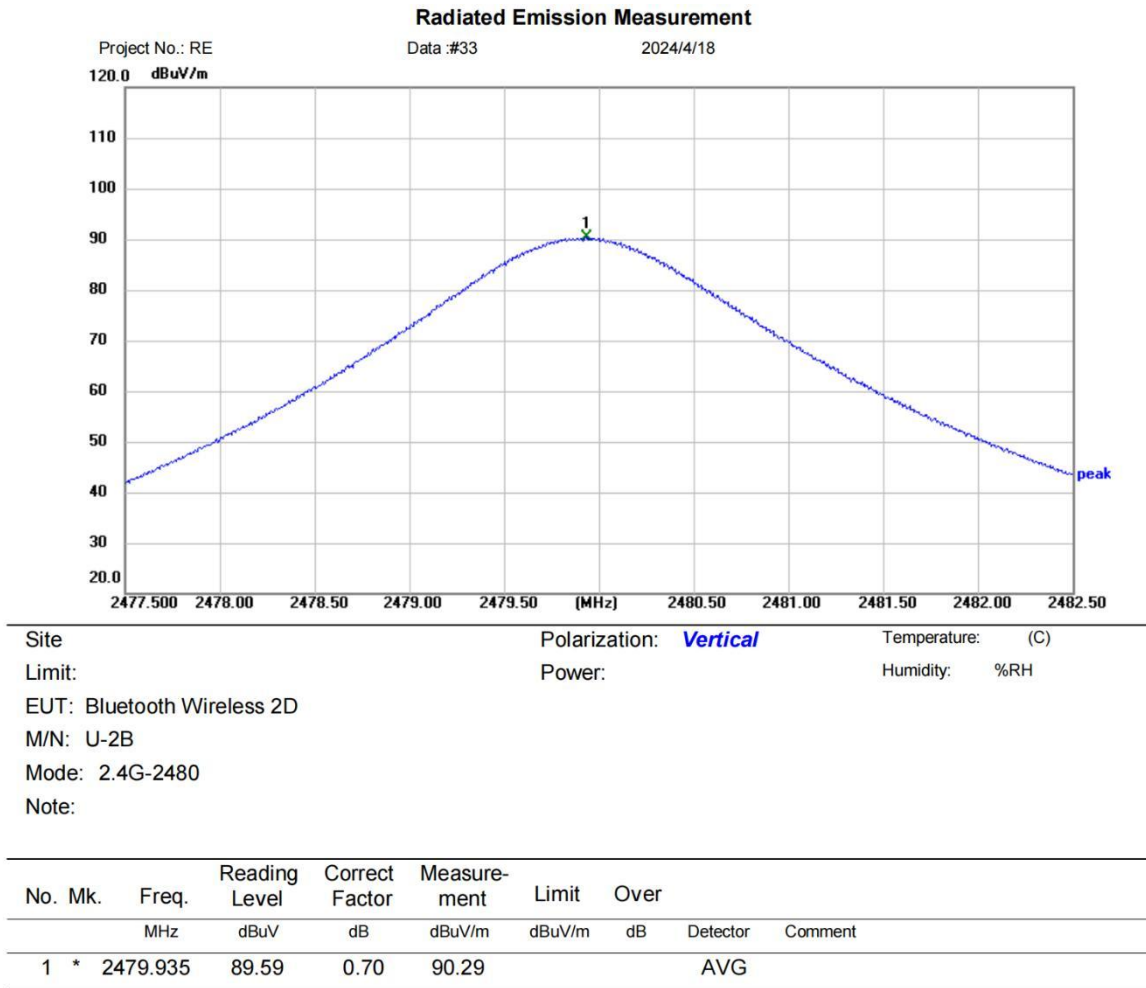
Horizontal AVG



Vertical peak



Vertical AVG



NOTE: RBW >20dB BW VBW >=RBW, PK detector is for PK value, RMS detector is for AV value.

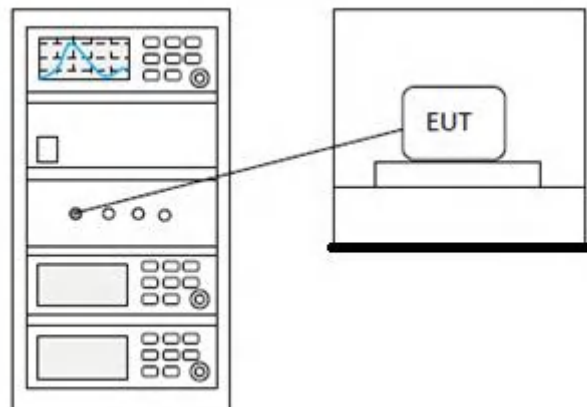
13 20DB BANDWIDTH

Test Standard	47 CFR Part 15, Subpart C 15.249
Test Method	ANSI C63.10 (2013) Section 6.9
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Jozu
Temperature	25℃
Humidity	60%

13.1 LIMITS

Limit:	N/A
--------	-----

13.2 BLOCK DIAGRAM OF TEST SETUP



13.3 TEST DATA

Pass: Please Refer To Appendix: Appendix1 For Details

14 ANTENNA REQUIREMENT

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

14.1 CONCLUSION

Standard 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 an 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 3dBi.

15 CONDUCTED EMISSIONS AT AC POWER LINE (150KHZ-30MHZ)

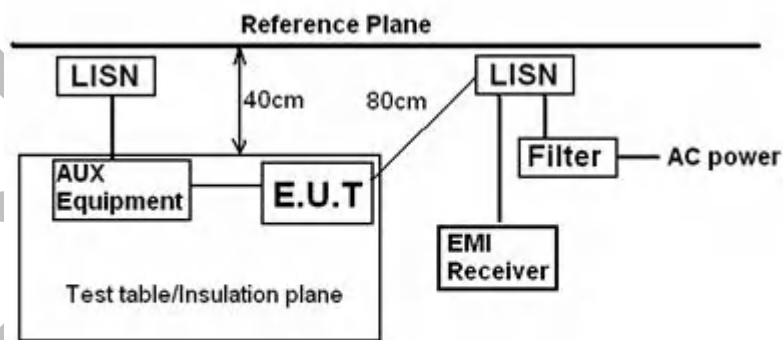
Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 6.2
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Jozu
Temperature	25°C
Humidity	60%

15.1 LIMITS

Frequency of emission(MHz)	Conducted limit(dBμV)	
	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.

15.2 BLOCK DIAGRAM OF TEST SETUP



Remark:
E.U.T: Equipment Under Test
LISN: Line Impedance Stabilization Network
Test table height=0.8m

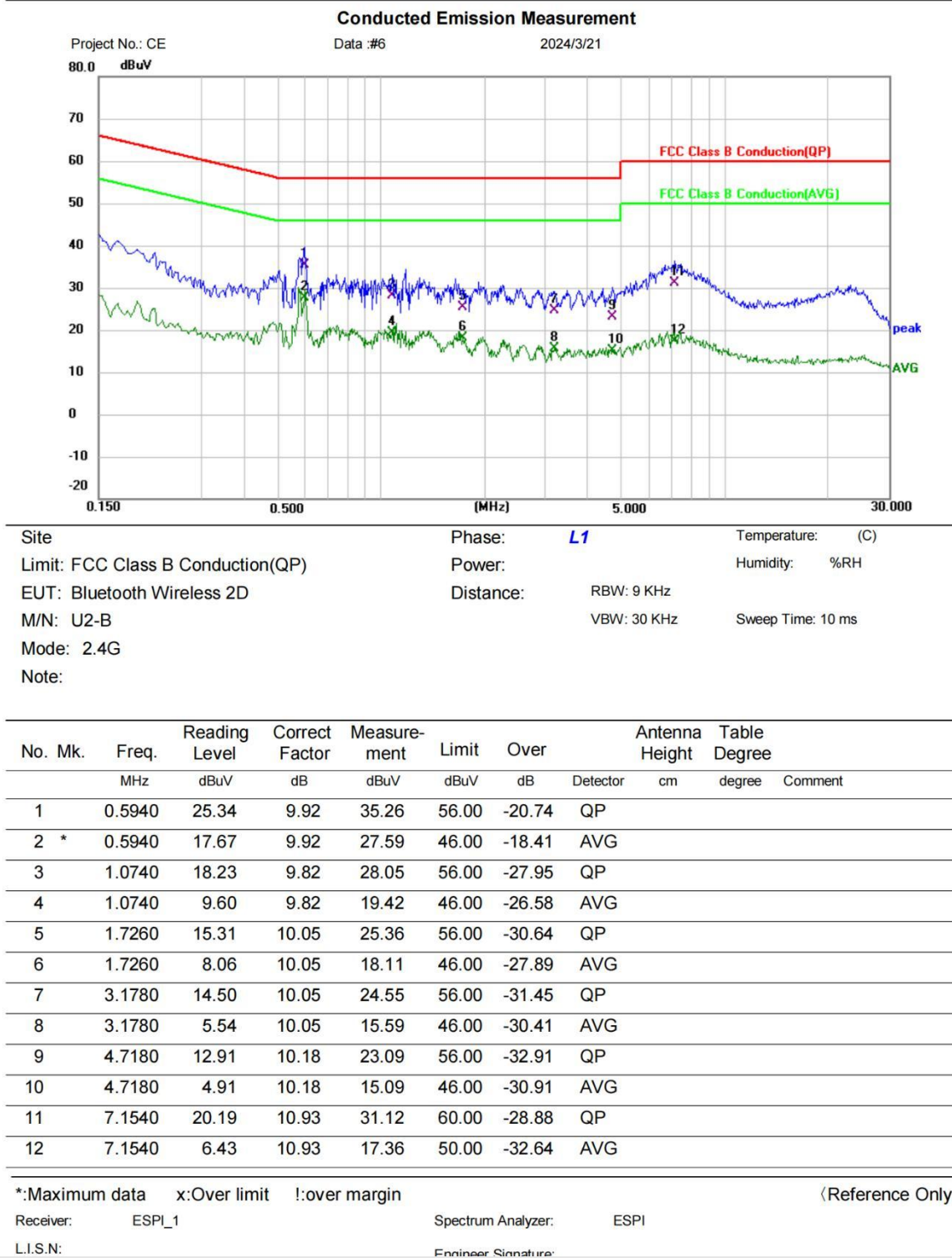
15.3 PROCEDURE

- 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.
- Remark: $LISN = Read\ Level + Cable\ Loss + LISN\ Factor$

15.4 TEST DATA

[TestMode: Tx]; [Line: Line] ;[Power:AC120V/60Hz]



Test Result: Pass

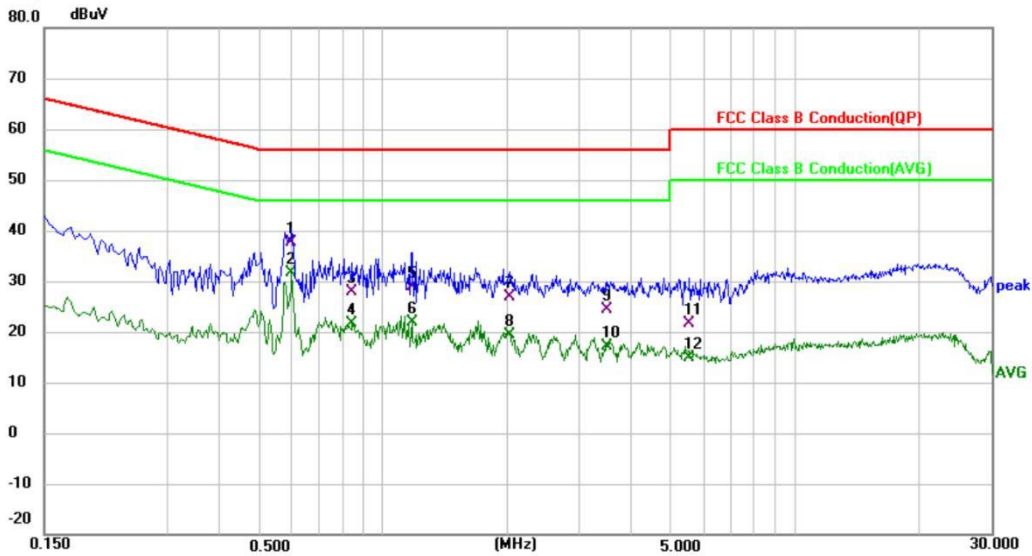
[TestMode: Tx]; [Line: Neutral] ;[Power:AC120V/60Hz]

Conducted Emission Measurement

Project No.: CE

Data :#5

2024/3/21



Site

Limit: FCC Class B Conduction(QP)

EUT: Bluetooth Wireless 2D

M/N: U2-B

Mode: 2.4G

Note:

Phase:

N

Power:

Distance:

RBW: 9 KHz

VBW: 30 KHz

Temperature: (C)

Humidity: %RH

Sweep Time: 10 ms

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Antenna Height cm	Table Degree	Detector	Comment
1		0.5980	27.81	9.86	37.67	56.00	-18.33			QP	
2	*	0.5980	21.77	9.86	31.63	46.00	-14.37			AVG	
3		0.8420	17.98	9.90	27.88	56.00	-28.12			QP	
4		0.8420	11.71	9.90	21.61	46.00	-24.39			AVG	
5		1.1780	18.97	9.89	28.86	56.00	-27.14			QP	
6		1.1780	12.01	9.89	21.90	46.00	-24.10			AVG	
7		2.0260	16.81	10.02	26.83	56.00	-29.17			QP	
8		2.0260	9.42	10.02	19.44	46.00	-26.56			AVG	
9		3.4940	14.34	10.05	24.39	56.00	-31.61			QP	
10		3.4940	7.19	10.05	17.24	46.00	-28.76			AVG	
11		5.5620	11.03	10.55	21.58	60.00	-38.42			QP	
12		5.5620	4.40	10.55	14.95	50.00	-35.05			AVG	

*:Maximum data x:Over limit !:over margin

<Reference Only

Receiver: ESPI_1

Spectrum Analyzer: ESPI

L.I.S.N:

Engineer Signature:

Test Result: Pass

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss.

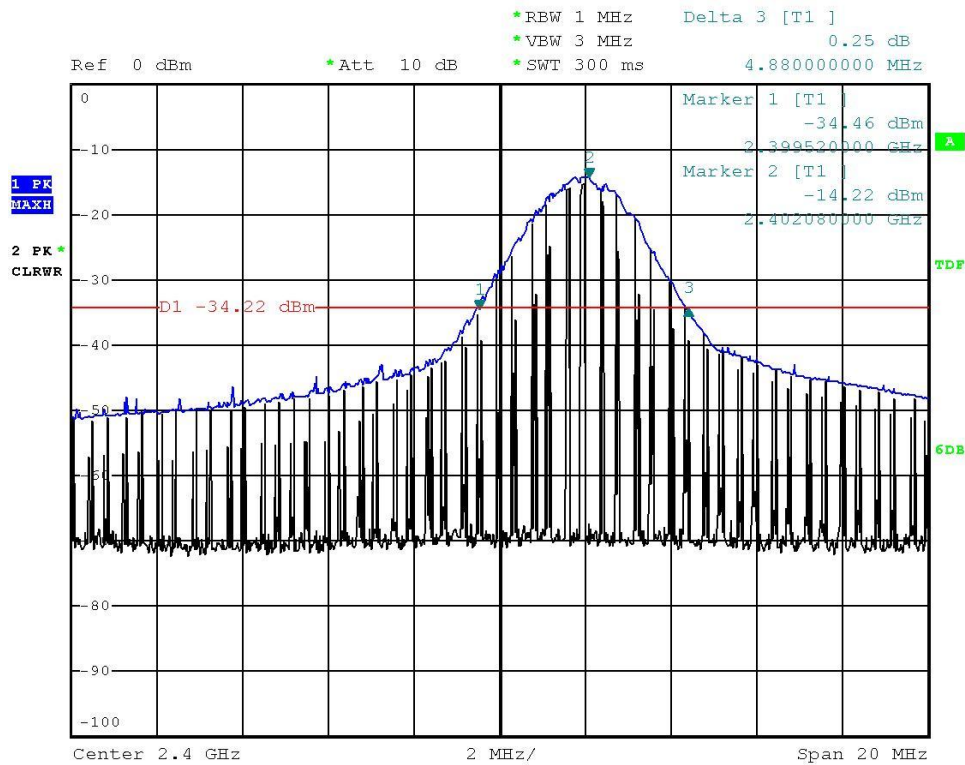
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16 APPENDIX1

-20dB Bandwidth

Condition	Mode	Frequency (MHz)	Antenna	-20 dB Bandwidth (MHz)	Verdict
NVNT	GFSK	2402	Ant1	4.88	Pass
NVNT	GFSK	2440	Ant1	4.20	Pass
NVNT	GFSK	2480	Ant1	3.52	Pass

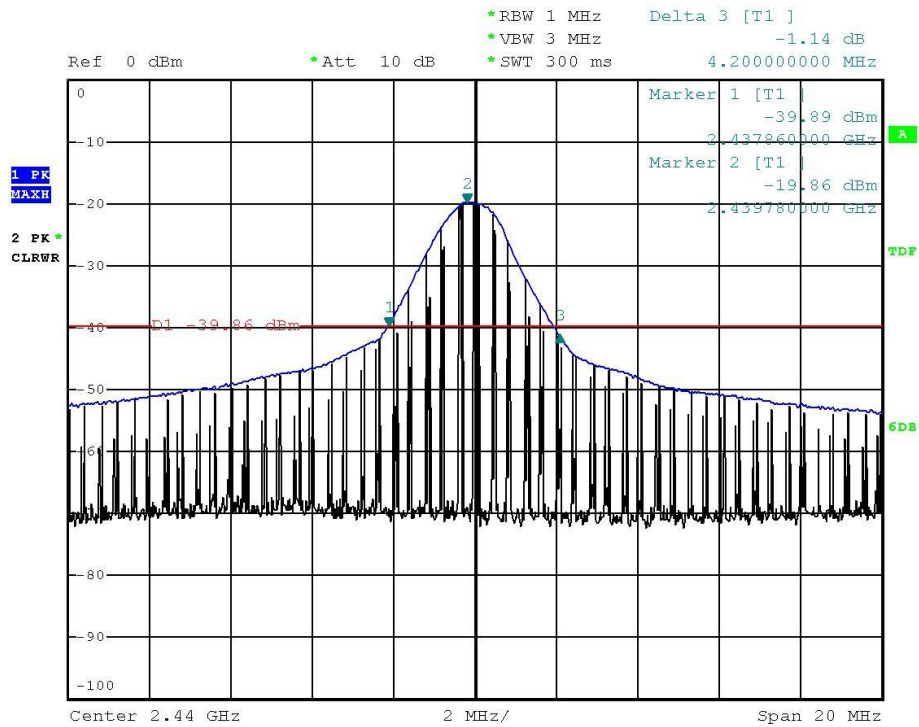
-20dB Bandwidth NVNT GFSK 2402MHz Ant1



jjjj

Date: 21.MAR.2024 18:05:29

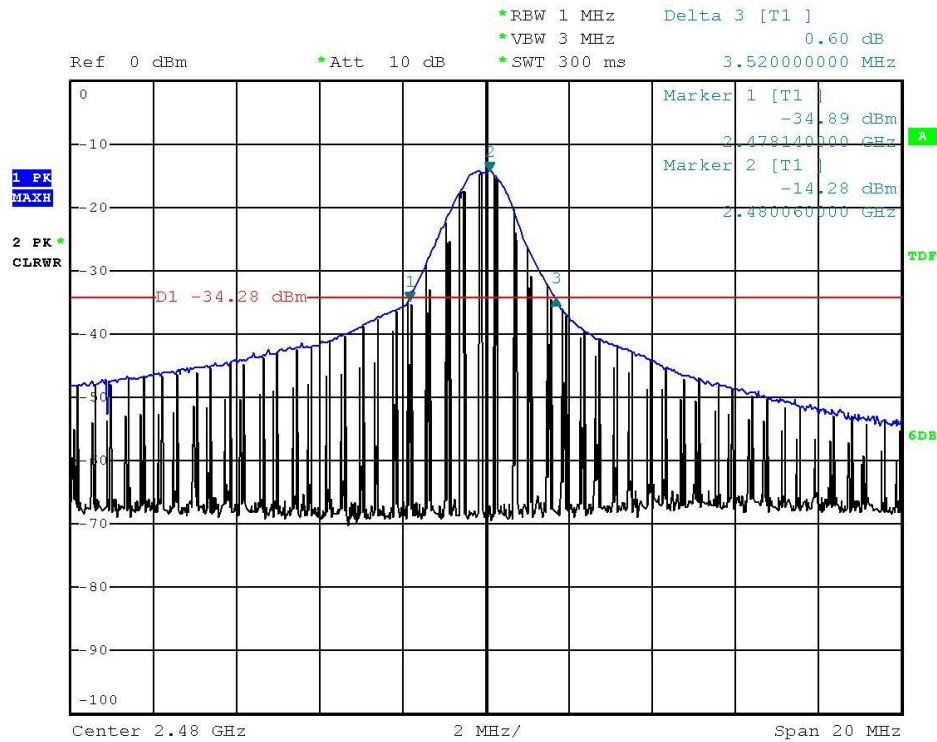
-20dB Bandwidth NVNT GFSK 2440MHz Ant1



jjjj

Date: 21.MAR.2024 18:08:01

-20dB Bandwidth NVNT GFSK 2480MHz Ant1

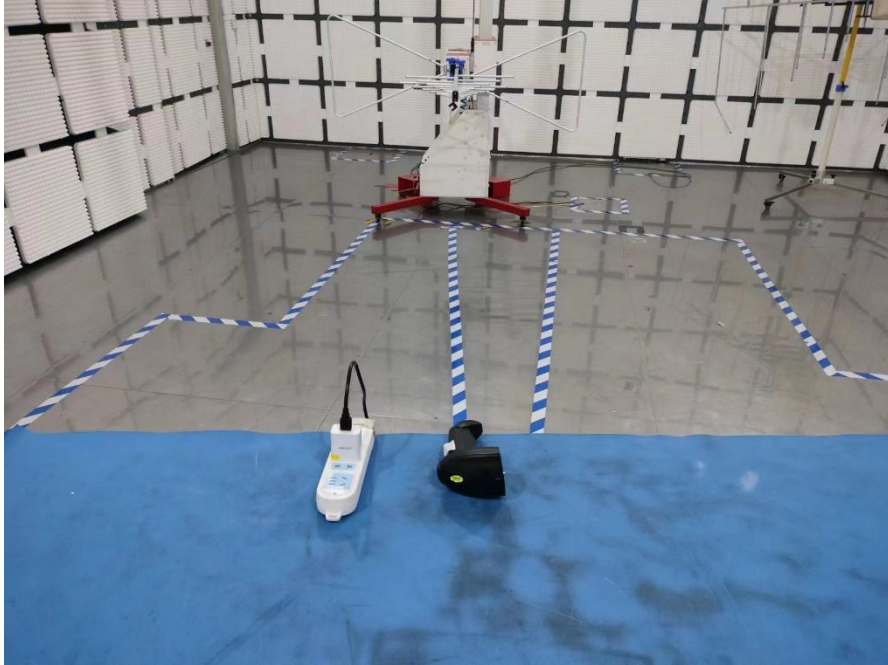


jjjj

Date: 21.MAR.2024 18:09:14

APPENDIX A: PHOTOGRAPHS OF TEST SETUP

Radiated Emissions



Conducted Emissions at AC Power Line (150kHz-30MHz)



APPENDIX B: PHOTOGRAPHS OF EUT

Reference to the test report No. BLA-EMC-202402-A4701

----END OF REPORT----

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