

TEST REPORT

For

All-in-one Wireless Presence Sensor

Model Number: LWR02

FCC ID: 2AFIW-LWR02

Report Number : WT268500670

Test Laboratory : Shenzhen Academy of Metrology and Quality
Inspection
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The "Important statement" on the back of the report's first page is part of the document, and copies without it are incomplete.

Revision History

No	Date	Remark
V1.0	2026.04.14	Initial issue

TEST REPORT DECLARATION

Applicant : GL Technologies (Hong Kong) Limited
Address : Unit 601, Building 5W, Hong Kong Science Park, Shatin, N.T.,
Hong Kong
Manufacturer : GL Technologies (Hong Kong) Limited
Address : Unit 601, Building 5W, Hong Kong Science Park, Shatin, N.T.,
Hong Kong
EUT Description : All-in-one Wireless Presence Sensor
Model No. : LWR02
Trade mark : Lafaer
FCC ID : 2AFIW-LWR02

Test Standards:

FCC Part 15 Subpart C

The EUT described above is tested by Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory to determine the maximum emissions from the EUT. Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory is assumed full responsibility for the accuracy of the test results, unless they depend on the manufacturer information. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10-2020+Cor.1-2023 and the energy emitted by the sample EUT tested as described in this report is in compliance with FCC Rules Part 15.207, 15.209, 15.249.

The test report is valid for above tested sample only and shall not be reproduced in part without written approval of the laboratory.

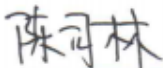
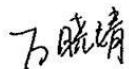
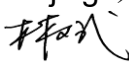
Project Engineer:	 (Chen Silin 陈司林)	Date:	<u>Apr. 14, 2026</u>
Checked by:	 (Wan Xiaojing 万晓婧)	Date:	<u>Apr. 14, 2026</u>
Approved by:	 (Lin Bin 林斌)	Date:	<u>Apr. 14, 2026</u>

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1. TEST RESULTS SUMMARY

Table 1 Test Results Summary

Test Items	FCC Rules	Test Results
Field Strength of Fundamental and Radiated Spurious Emission	15.249 (a) 15.209 15.205	Pass
20 dB Bandwidth	15.215	Pass
Antenna Requirement	15.203	Pass

Remark: "N/A" means "Not applicable."

2. GENERAL INFORMATION

2.1. Report information

This report is not a certificate of quality; it only applies to the sample of the specific product/equipment given at the time of its testing. The results are not used to indicate or imply that they are application to the similar items. In addition, such results must not be used to indicate or imply that SMQ approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that SMQ in any way guarantees the later performance of the product/equipment.

The sample/s mentioned in this report is/are supplied by Applicant, SMQ therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture or any information supplied.

Additional copies of the report are available to the Applicant at an additional fee. No third part can obtain a copy of this report through SMQ, unless the applicant has authorized SMQ in writing to do so.

The lab will not be liable for any loss or damage resulting for false, inaccurate, inappropriate or incomplete product information provided by the applicant/manufacturer.

2.2. Laboratory Accreditation and Relationship to Customer

The testing report were performed by the Shenzhen Academy of Metrology and quality Inspection EMC Laboratory (Guangdong EMC compliance testing center), in their facilities located at NETC Building, No.4 Tongfa Rd., Xili, Nanshan, Shenzhen, China. At the time of testing, Laboratory is accredited by the following organizations:

China National Accreditation Service for Conformity Assessment (CNAS) accredits the Laboratory for conformance to FCC standards, EMC international standards and EN standards. The Registration Number is CNAS L0579.

The Laboratory is Accredited Testing Laboratory of FCC with Designation number CN1165 and Site registration number 582918.

The Laboratory is registered to perform emission tests with Innovation, Science and Economic Development (ISED), and the registration number is 11177A.

The Laboratory is registered to perform emission tests with VCCI, and the registration number are C-20048, G20076, R-20077, R-20078 and T-20047.

The Laboratory is Accredited Testing Laboratory of American Association for

Laboratory Accreditation (A2LA) and certificate number is 3292.01.

2.3. Measurement Uncertainty

Conducted Emission

9 kHz~150 kHz $U=\pm 3.7$ dB k=2

150 kHz~30MHz $U=\pm 3.3$ dB k=2

Radiated Emission

30MHz~1000MHz $U=\pm 4.3$ dB k=2

1GHz~6GHz $U=\pm 4.6$ dB k=2

6GHz~100GHz $U=\pm 5.1$ dB k=2

3. PRODUCT DESCRIPTION

NOTE: The extreme test conditions for temperature and antenna gain were declared by the manufacturer.

3.1. EUT Description

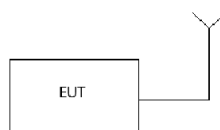
Description : All-in-one Wireless Presence Sensor
Manufacturer : GL Technologies (Hong Kong) Limited
Model Number : LWR02
Operate Frequency : 24- 24.25 GHz
Antenna Designation : Patch Antenna 4.78 dBi
Modulation : FMCW
Operating Voltage : DC 3 V

Remark: /

3.2. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: **2AFIW-LWR02** filing to comply with Section 15.207, 15.209, 15.249 of the FCC Part 15 Subpart C.

3.3. Block Diagram of EUT Configuration



Setup of test

3.4. Operating Condition of EUT

The Radiated spurious emission measurements were carried out in semi-anechoic chamber with 3-meter and 0.5-meter test range, and EUT is rotated on three test planes to find out the worst emission (X plane).

Test Mode1: 24 GHz radar TX

3.5. Directional Antenna Gain

Directional gain need NOT to be considered.

3.6. Support Equipment List

Table 2 Support Equipment List

Name	Model No	S/N	Manufacturer
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3.7. Test Conditions

Date of test: Mar. 18, 2026- Apr. 08, 2026

Date of EUT Receive: Mar. 10, 2026

Temperature: 20 °C - 23 °C

Relative Humidity: 48%-52%

3.8. Special Accessories

Not available for this EUT intended for grant.

3.9. Equipment Modifications

Not available for this EUT intended for grant.

4. TEST EQUIPMENT USED

Table 3 Test Equipment

No.	Equipment	Manufacturer	Model No.	Calibration Due Date	Calibrated Interval
SB20321	EMI Test Receiver	R&S	FSW43	Apr.17, 2026	1 Year
SB12724/11	Loop Antenna	R&S	HFH2-Z2	Apr.22, 2026	1 Year
SB3955	Broadband Antenna	SCHWARZBECK	VULB9163	Aug.24, 2026	1 Year
SB9422/16	Horn Antenna	R&S	HF907	Mar.04, 2026	1 Year
SB18871	Pre-Amplifier	R&S	SCU18F	Mar.04, 2026	1 Year
SB8501/11	Antenna	R&S	3160-09	Feb.01, 2029	3 Years
SB8501/12	Antenna	R&S	3160-10	Feb.01, 2029	3 Years
SB8501/16	Pre-Amplifier	R&S	SCU-26	Jan.03, 2027	1 Year
SB9059	Pre-Amplifier	R&S	SCU-40	Aug.10, 2026	1 Year
SB18844	Semi Anechoic Chamber	Albatross	3mSAC	Jan.25, 2027	1 Year
SB20447/02	Multiplier Unit	R&S	TC-MX60	N/A	N/A
SB20321/04	Receive Unit	R&S	TC-RSE60	N/A	N/A
SB20321/05	Receive Unit	R&S	TC-RSE90	N/A	N/A
SB20321/06	Receive Unit	R&S	TC-RSE140	N/A	N/A

5. FIELD STRENGTH OF FUNDAMENTAL AND RADIATED SPURIOUS EMISSION

5.1. Test Standard and Limit

5.1.1. Test Standard

CFR 47 (FCC) part 15.205, 15.209, 15.249

5.1.2. Test Limit

Table 4 the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (millivolts/meter) at 3m	Field strength of fundamental (dBμV/m) at 3m Average limits	Field strength of fundamental (dBμV/m) at 3m Peak limits ^{note2}
24.0-24.25 GHz	250	107.96	127.96

Fundamental frequency	Field strength of harmonics (microvolts/meter) at 3m	Field strength of harmonics (dBμV/m) at 3m	Field strength of harmonics (dBμV/m) at 0.5m Average limits ^{note1}	Field strength of harmonics (dBμV/m) at 0.5m Peak limits ^{note2}
24.0-24.25 GHz	2500	67.96	83.52	103.52

Note1: Limit=67.9588+20 Log(3/0.5)=83.52 dBμV/m)

Note2: 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.

Table 5 Radiation Emission Test Limit for FCC (9KHz-1GHz)

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
960~1000	500	3

Table 6 Radiation Emission Test Limit for FCC (Above 1G)

Frequency (MHz)	(dBuV/m) (at 3 meters)	
	PEAK	AVERAGE
Above 1000	74	54

* The lower limit shall apply at the transition frequency.

* Below 42 GHz the test distance is 3m.

* Above 42 GHz the test distance is 0.5m.

Table 7 Restricted Band Radiated Emission

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 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 -	2483.5 - 2500	17.7-21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01-23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6-24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2-31.8
12.51975 -	167.72 - 173.2	3345.8 - 3358	36.43-36.5
12.52025	240 - 285	3600 - 4400	(²)
12.57675 -	322 - 335.4		
12.57725			
13.36 - 13.41			

¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

² Above 38.6

5.2. Test Procedure

1. The testing follows the guidelines in ANSI C63.10.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. For measurement below 1GHz, the EUT was placed on a turntable with 0.8 meter, above ground. For measurement above 1 GHz, test at FAR, the EUT is placed on a non-conductive table, which is 1.5 meter above ground.
4. The EUT was set 1 or 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the

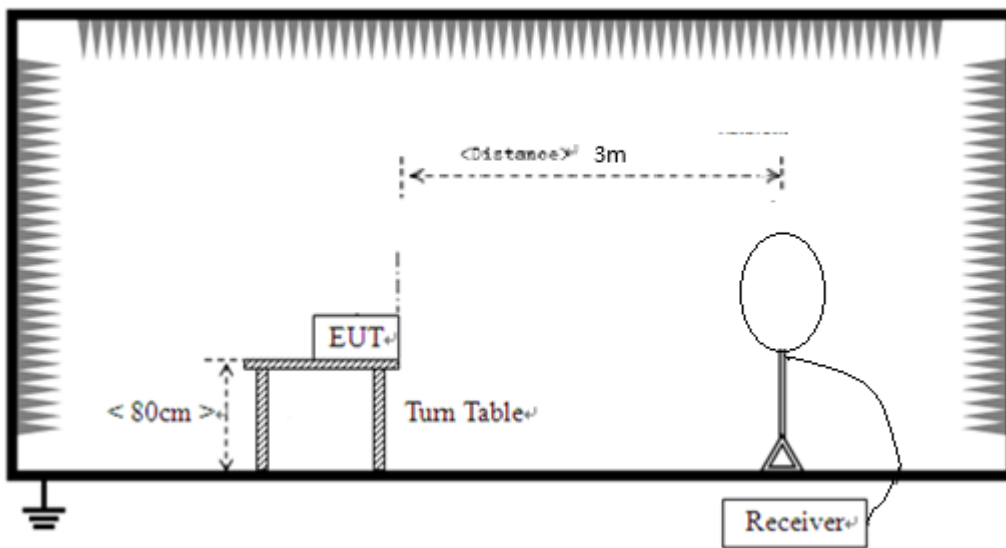
quasi-peak detector and reported.

7. Use the following spectrum analyzer settings:

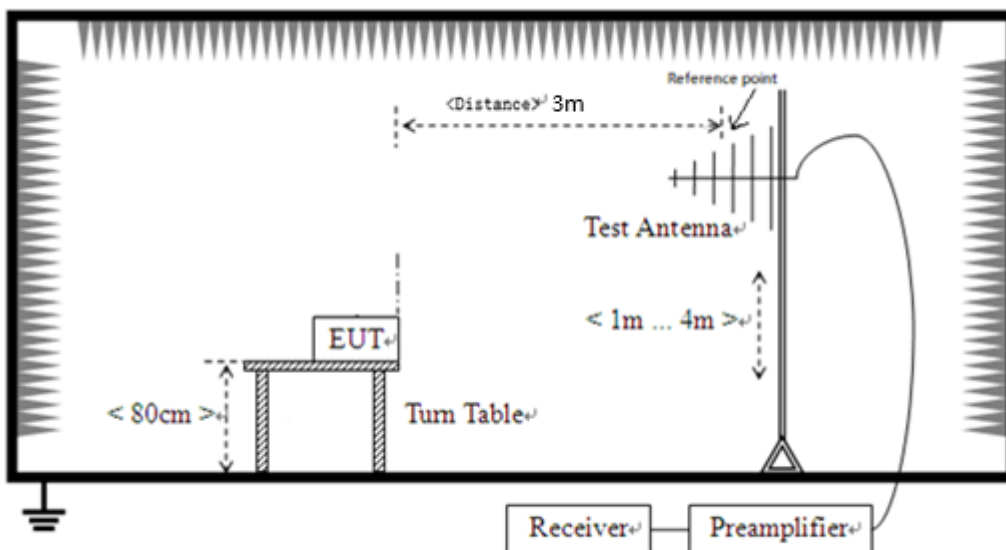
- (1) Span shall wide enough to fully capture the emission being measured;
- (2) Set RBW=100 kHz for $f < 1$ GHz; VBW $\geq$ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
- (3) Set RBW = 1 MHz, VBW= 3MHz for $f > 1$ GHz for peak measurement.
Set RBW = 1 MHz, and VBW= 1/T (on time) for average measurement.

5.3. Test Setup

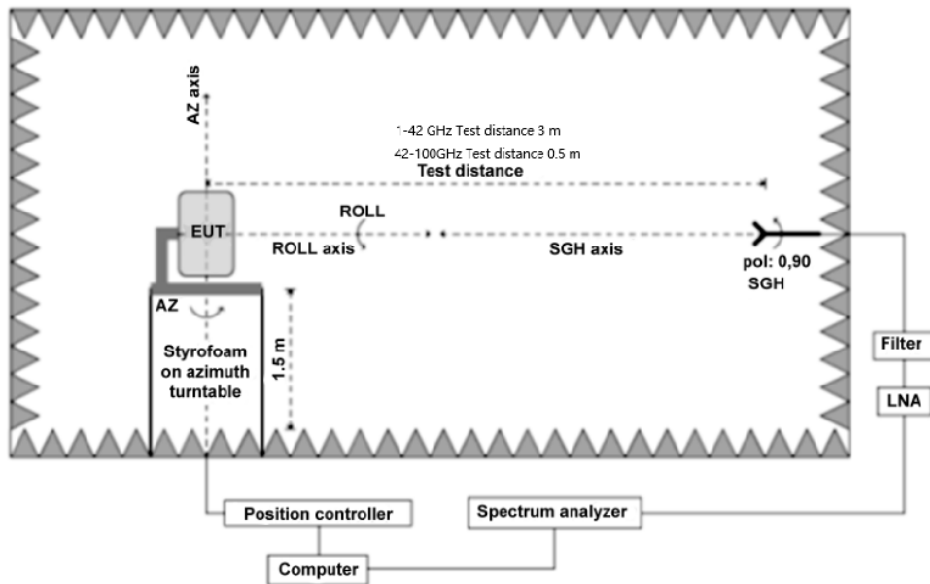
9kHz- 30MHz



30MHz- 1GHz



Above: 1GHz



5.4. Test Data

Table 8 Field strength of fundamental

Test Mode	Distance (m)	Measured Filed Strength of fundamental (dBμV/m)	Desensitization Factor(dB)	Final Filed Strength of fundamental (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Polarity (Horizontal/ Vertical)	Verdict	Note
Test Mode 1	3	99.496	0.03	99.526	127.96	28.434	Vertical	PASS	Peak
Test Mode 1	3	61.953	0.03	61.983	107.96	45.977	Vertical	PASS	AV

FMCW desensitization factor = $-20 \cdot \log(a) = -20 \cdot \log(0.9986) = 0.03$
 $T_{\text{Chirp}} = 800 \mu\text{s}$ was declared by the manufacturer.

$$\alpha = \frac{1}{\left(1 + \left[\left(\frac{2 \times \ln(2)}{\pi}\right)^2 \times \left(\frac{BW_{\text{Chirp}}}{T_{\text{Chirp}} \times RBW^2}\right)^2\right]\right)^{0.25}}$$

α is the reduction in amplitude
 BW_{Chirp} is the FMCW Chirp Bandwidth
 T_{Chirp} is the FMCW Chirp Time
 B is the 3 dB IF Bandwidth = RBW

9 kHz-30MHz

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

Table 9 Radiated Emission Test Data 9k Hz-30MHz

Frequency (MHz)	Cable Loss +preamp (dB)	Antenna Factor (dB)	Reading (dBμV/m)	Level (dBμV/m)	Polarity (H/V)	Limit (dBμV/m)	Margin (dB)	Note
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--
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30MHz-1GHz

Worst case is shown below for 30MHz-1GHz only.

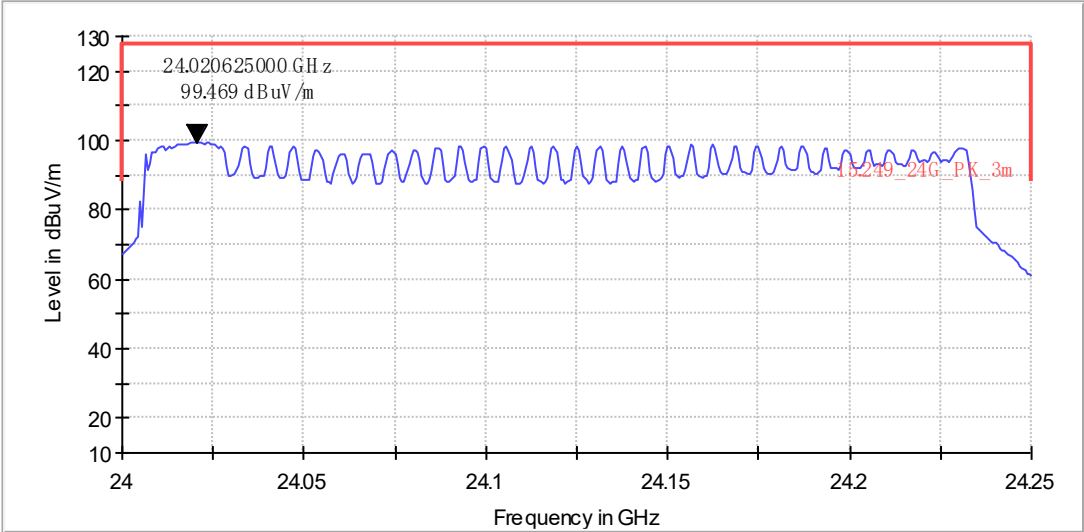
The emissions don't show in following result tables are more than 20dB below the limits.

Table 10 Radiated Emission Test Data 30MHz-1GHz

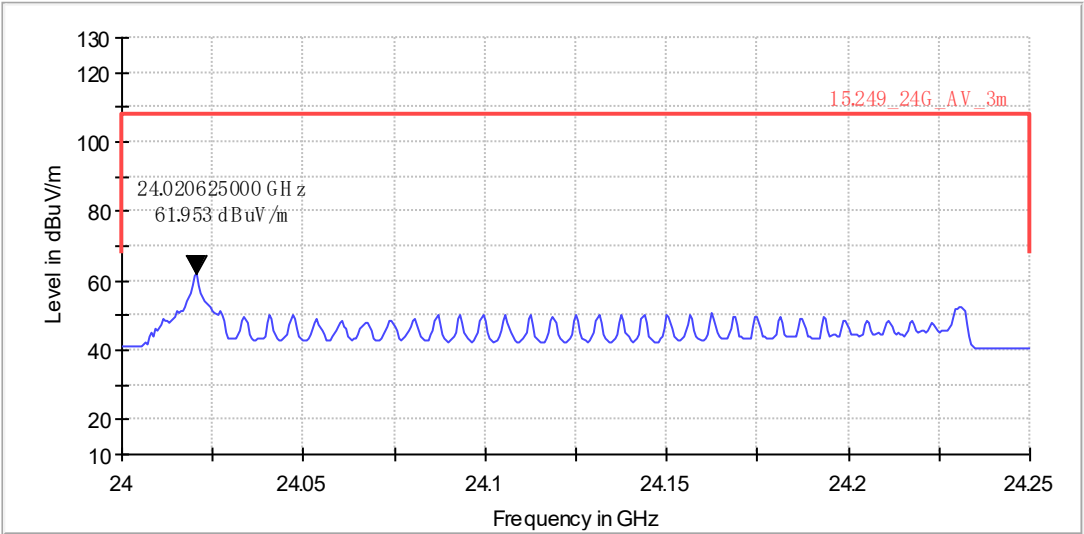
Frequency (MHz)	Cable Loss +preamp (dB)	Antenna Factor (dB)	Reading (dBμV/m)	Level (dBμV/m)	Polarity (Horizontal/ Vertical)	Limit (dBμV/m)	Margin (dB)	Note
36.499	0.6	12.3	4.7	17.6	Vertical	40.0	22.4	QP
37.663	0.7	12.3	5.2	18.2	Vertical	40.0	21.8	QP
39.603	0.6	12.3	5.2	18.1	Vertical	40.0	21.9	QP
58.518	0.8	13.0	1.3	15.1	Vertical	40.0	24.9	QP
75.687	1.0	7.8	13.8	22.6	Vertical	40.0	17.4	QP
240.005	1.9	12.1	5.9	19.9	Vertical	46.0	26.1	QP
39.215	0.6	12.3	2.6	15.5	Horizontal	40.0	24.5	QP
52.310	0.7	13.3	0.9	14.9	Horizontal	40.0	25.1	QP
57.839	0.8	13.0	1.0	14.8	Horizontal	40.0	25.2	QP
100.519	1.1	13.2	1.1	15.4	Horizontal	43.5	28.1	QP
240.005	1.9	12.1	2.9	16.9	Horizontal	46.0	29.1	QP
567.186	2.9	16.6	-0.2	19.3	Horizontal	46.0	26.7	QP

Remark: Emission level (dBuV)=Read Value(dBuV/m) + Antenna Factor(dB)+ Cable Loss +preamp(dB)

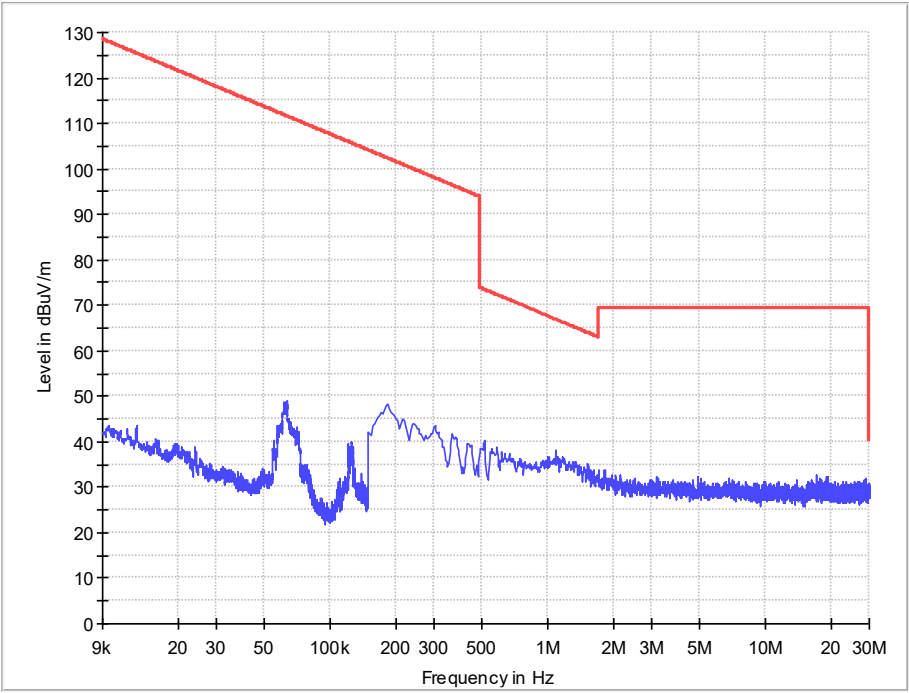
Filed Strength of fundamental_PK



Filed Strength of fundamental_AV

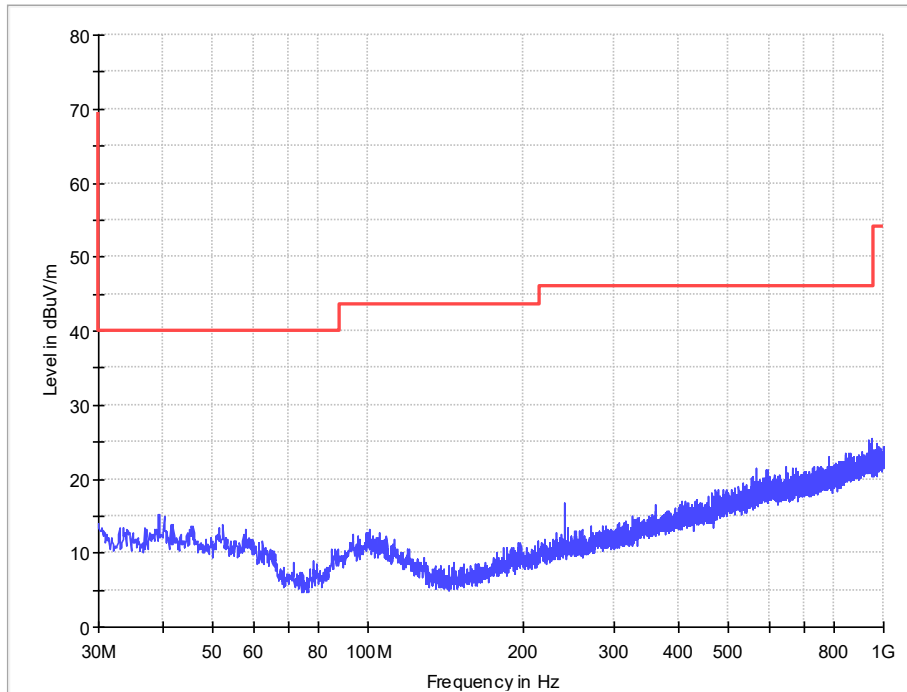


9kHz-30MHz
Horizontal

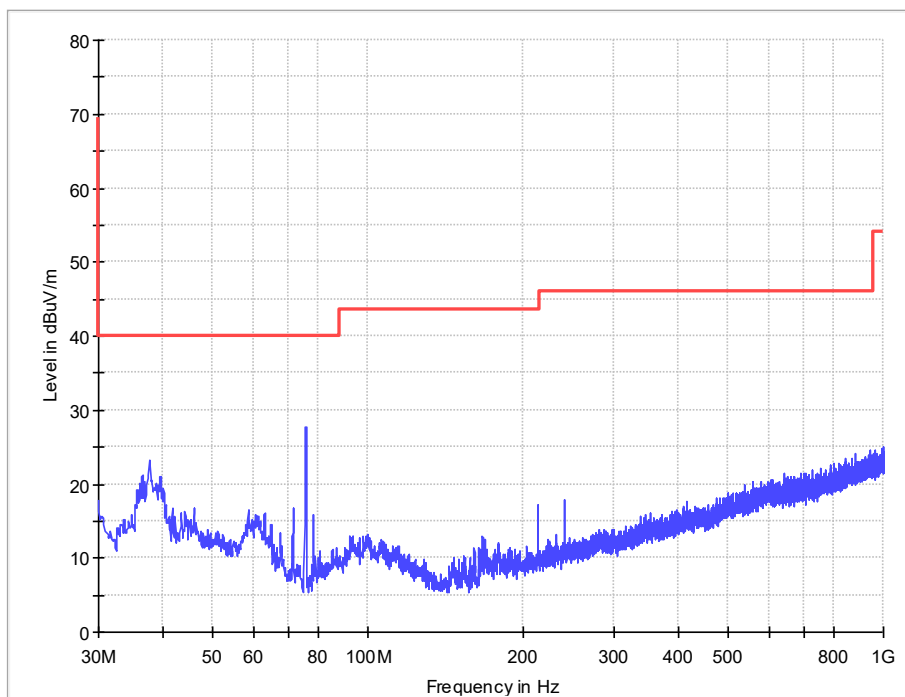


30MHz-1GHz

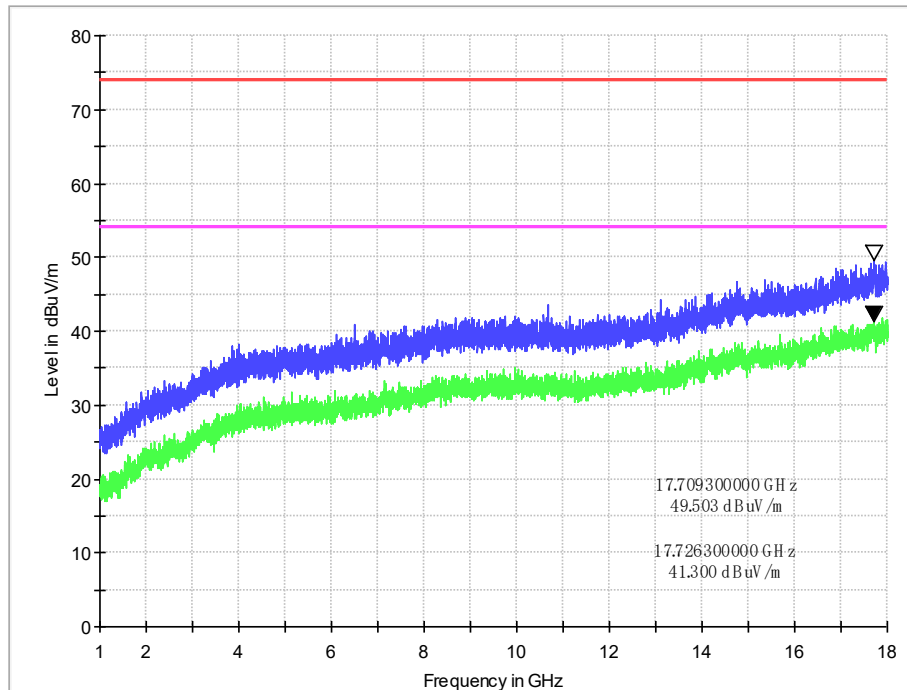
Horizontal



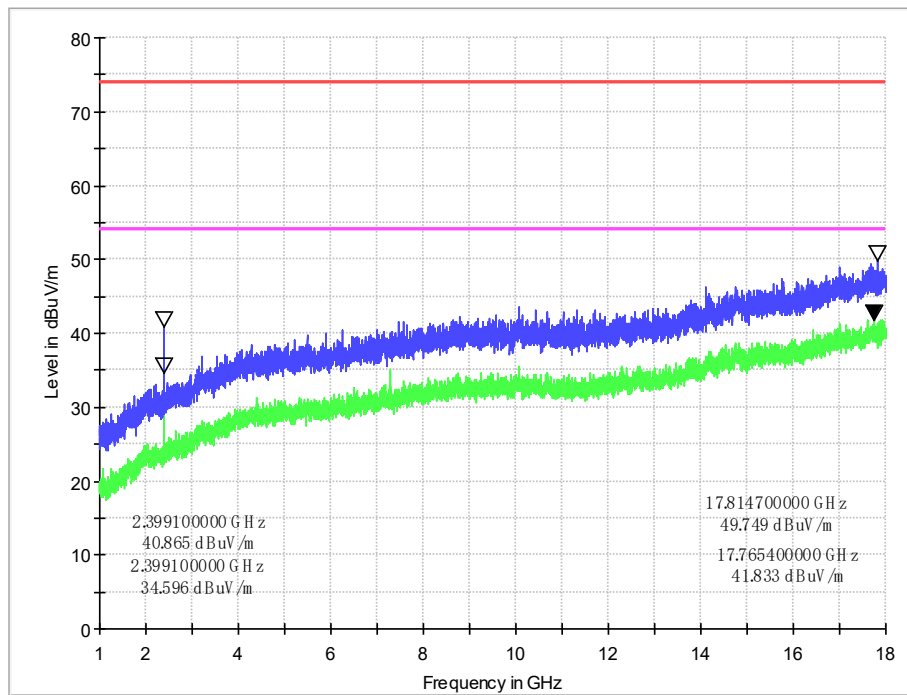
Vertical



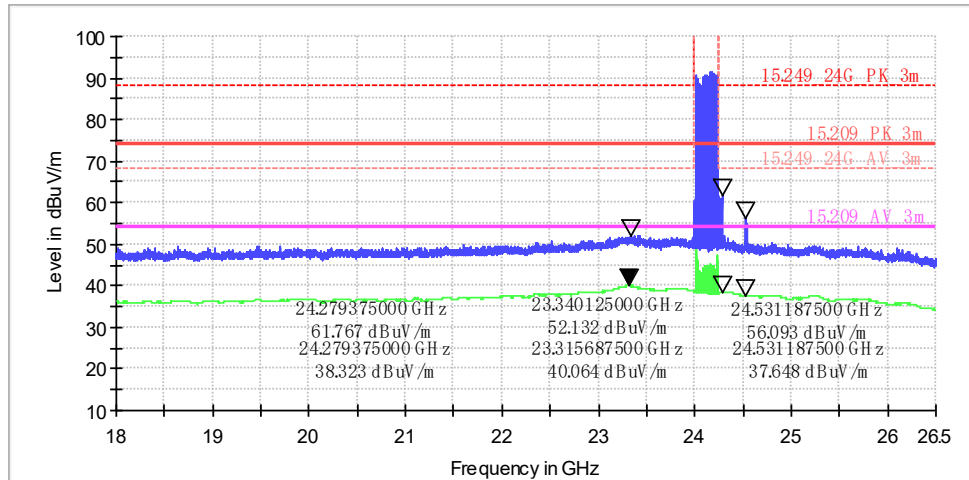
1-18GHz
Horizontal



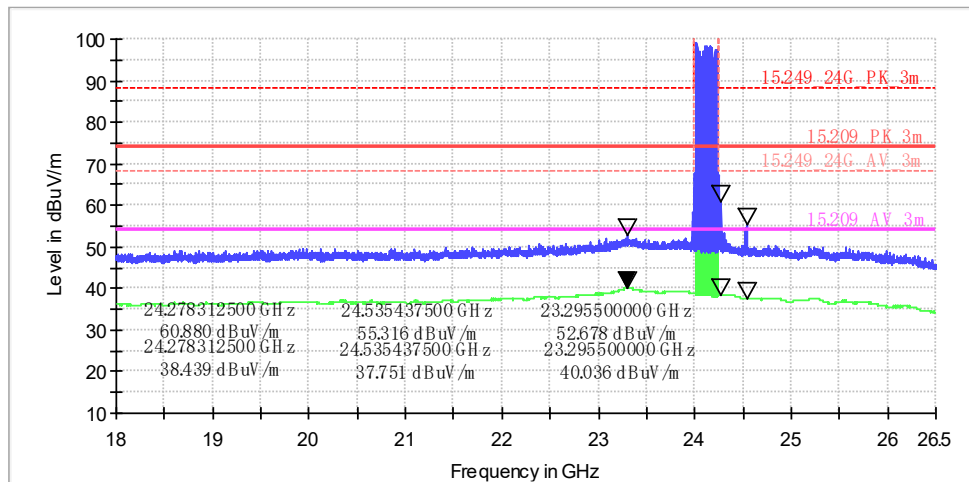
Vertical



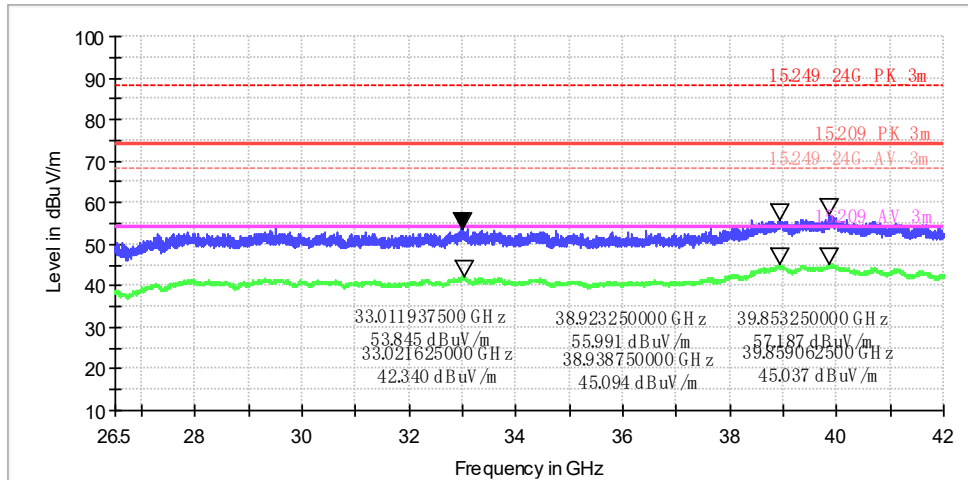
18- 26.5GHz Horizontal



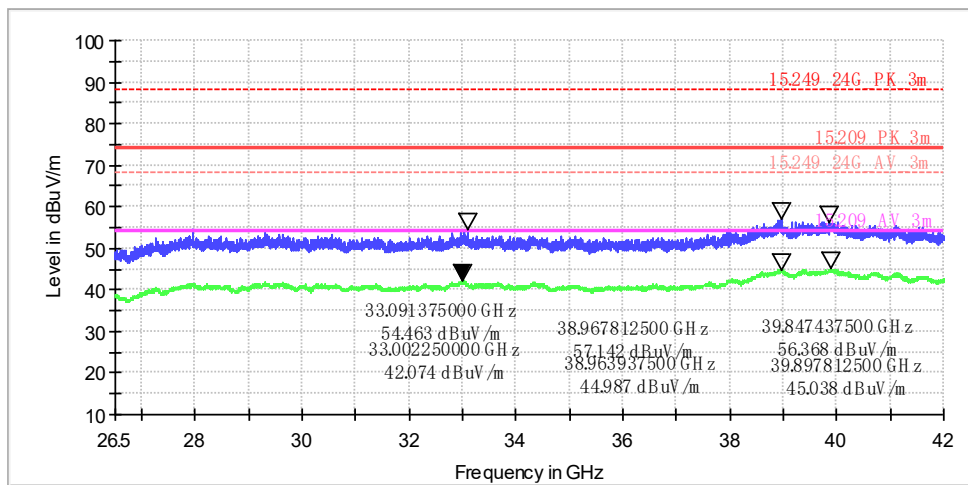
Vertical



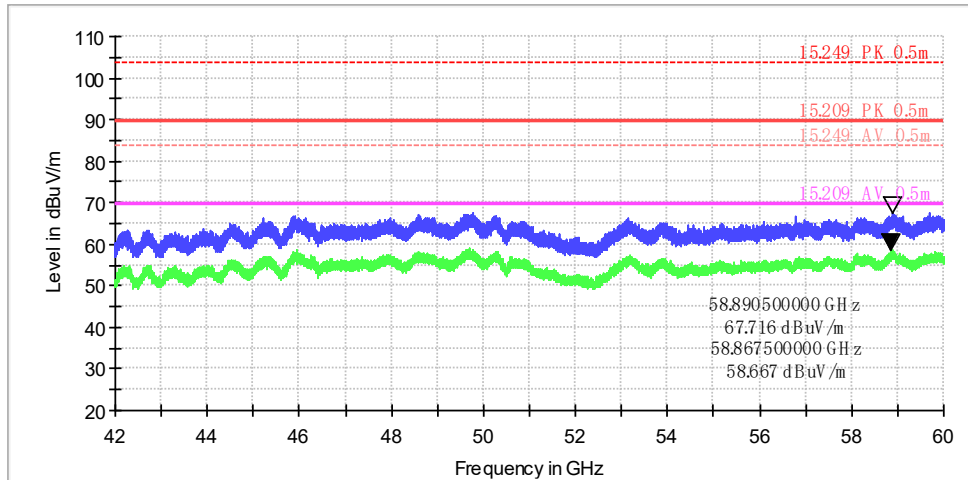
26.5- 42GHz Horizontal



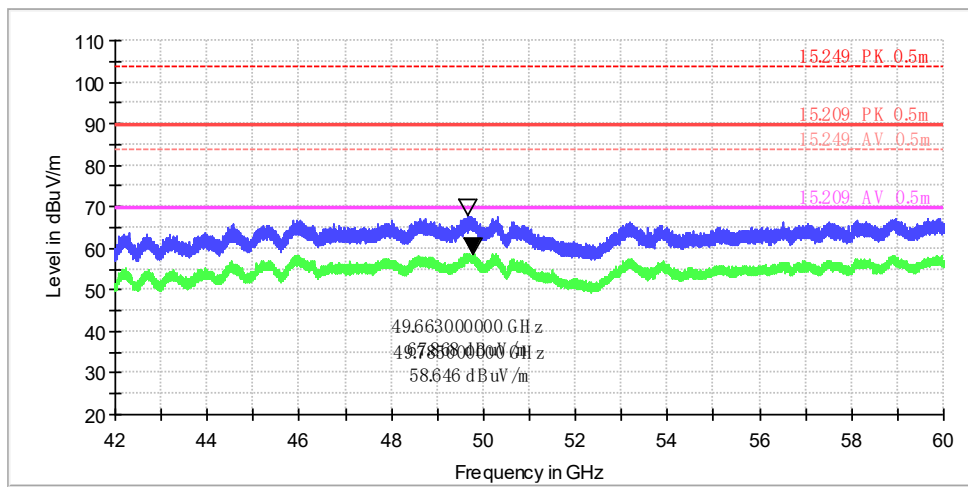
Vertical



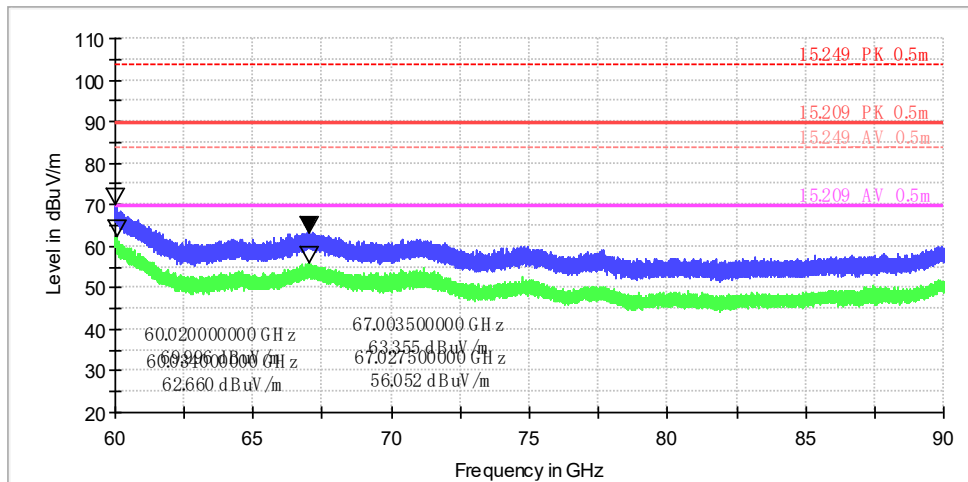
42- 60GHz Horizontal



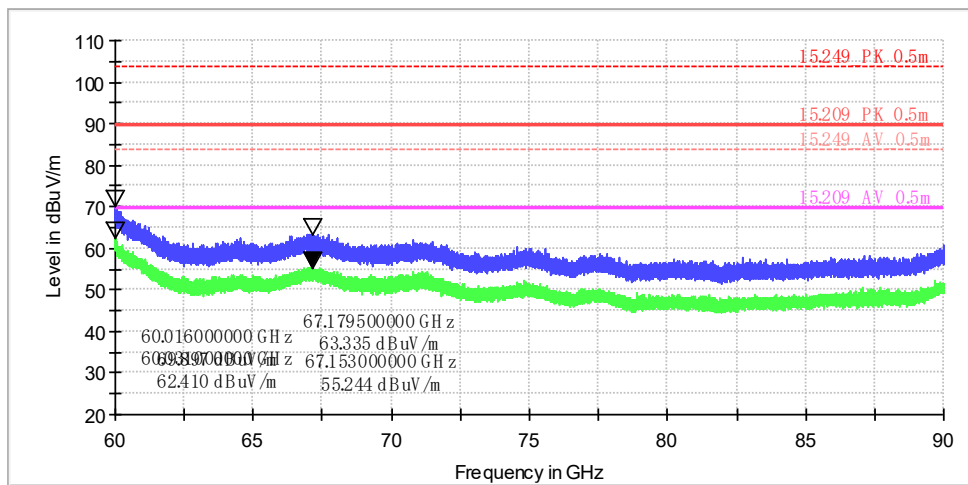
Vertical



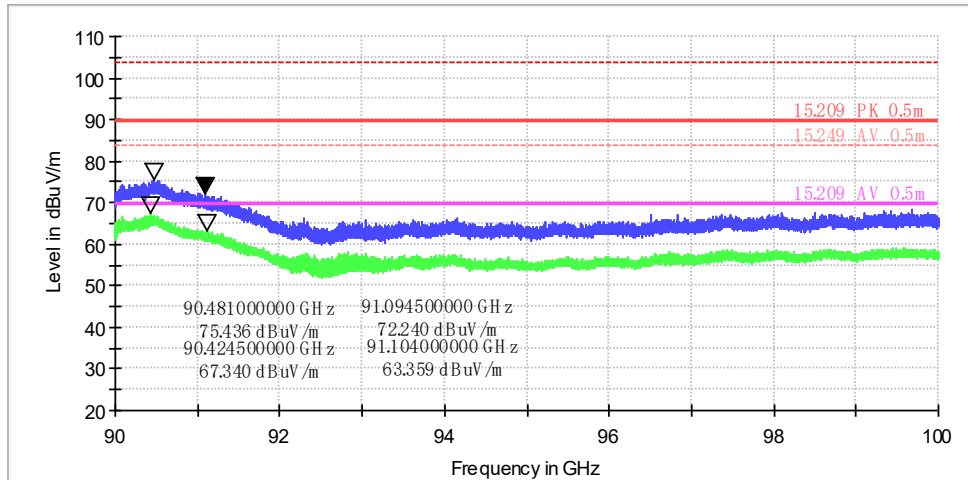
60- 90GHz Horizontal



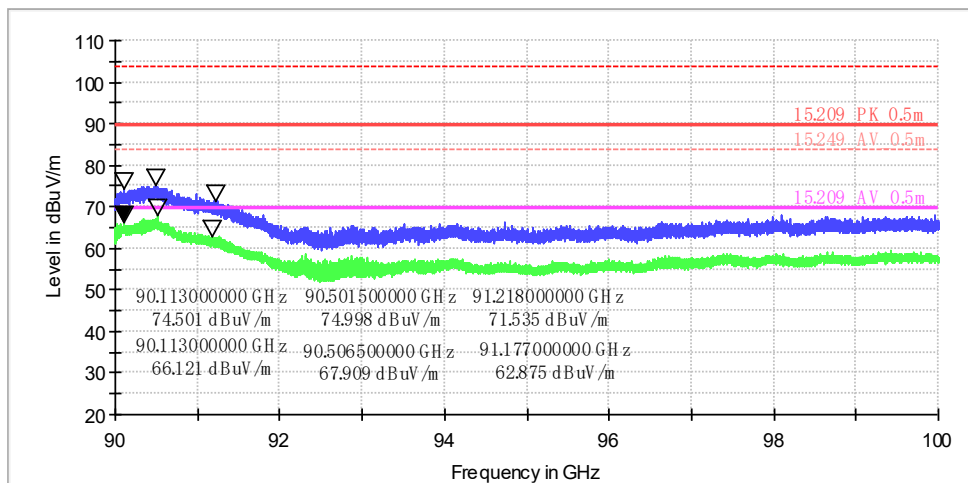
Vertical



90- 100GHz Horizontal

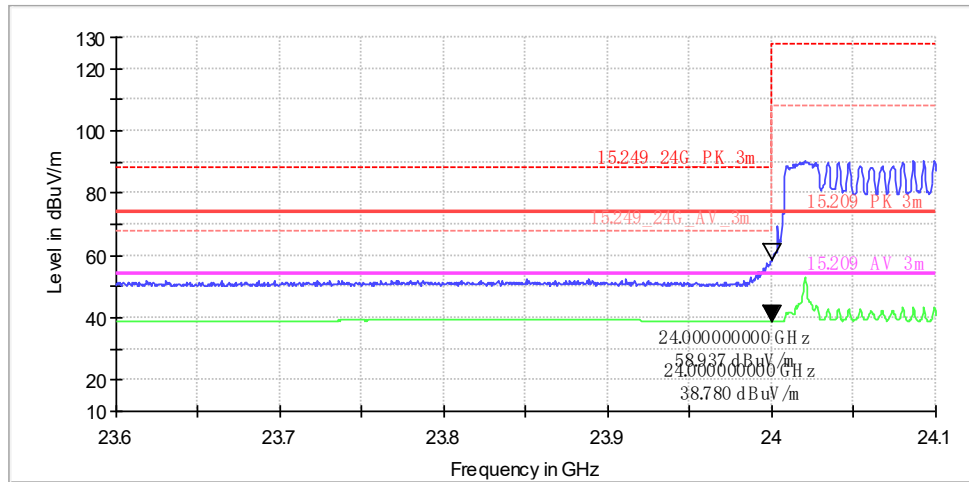


Vertical

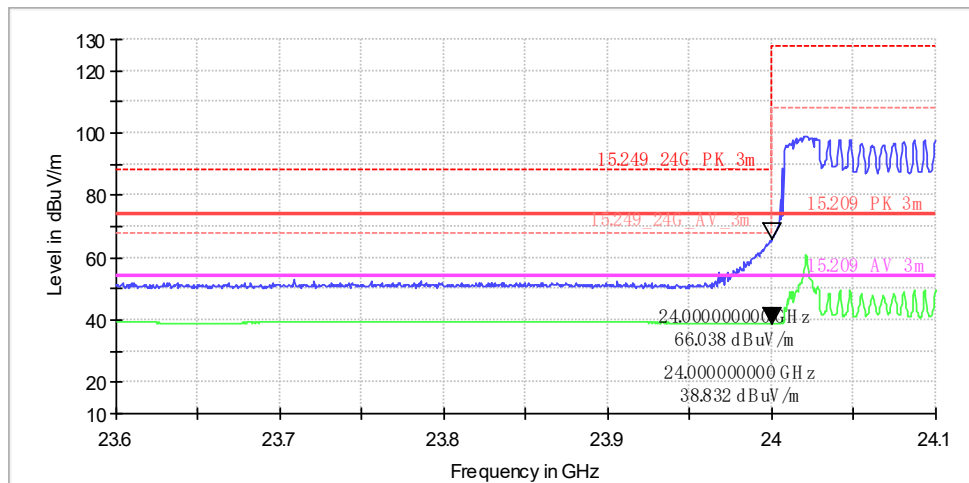


Restricted Band Radiated Emission

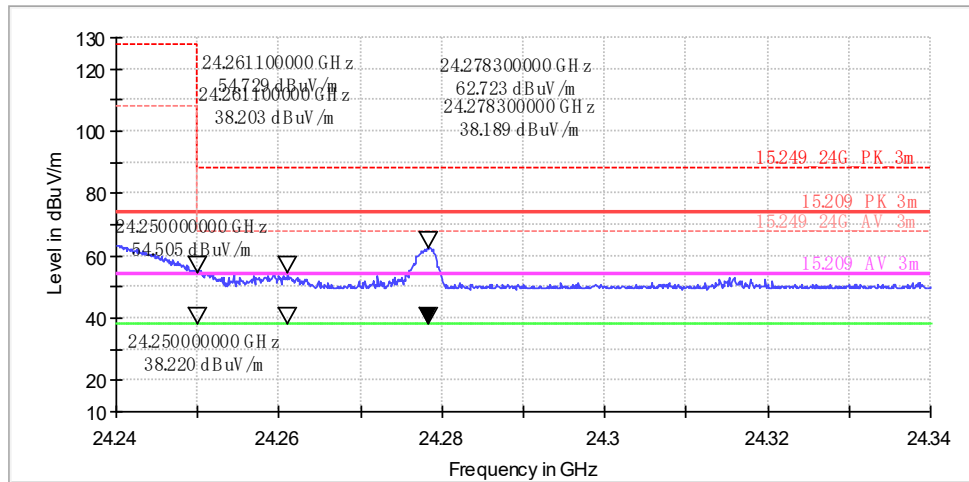
Horizontal



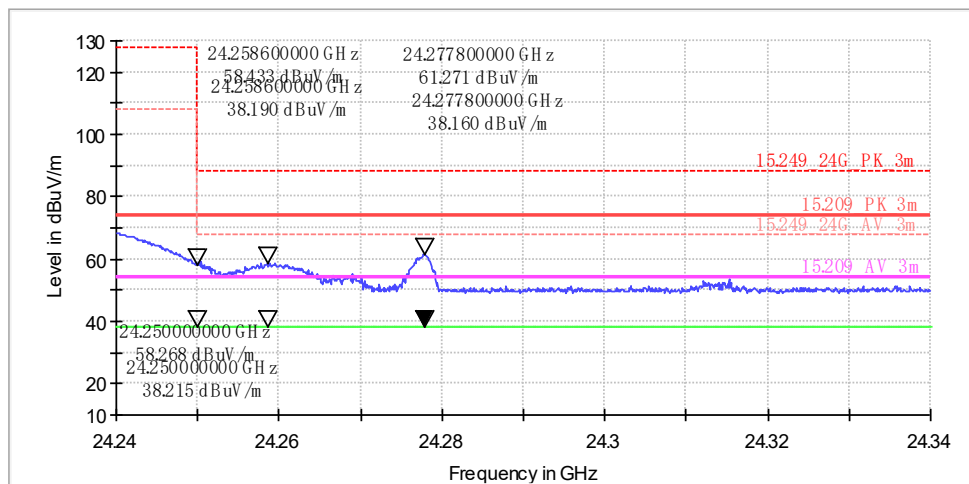
Vertical



Horizontal



Vertical



6. 20DB BANDWIDTH

6.1. Test Standard and Limit

6.1.1. Test Standard

CFR 47 (FCC) part 15.215

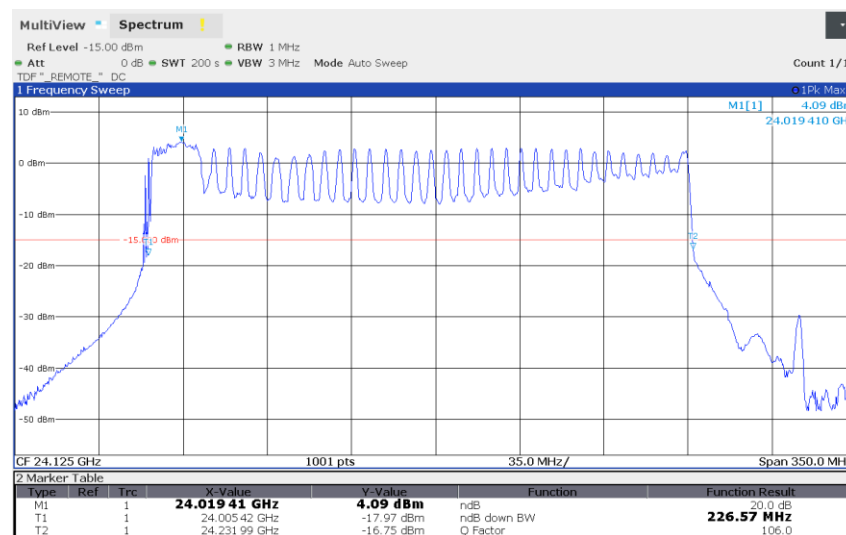
6.2. Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 3 MHz RBW and $VBW \geq RBW$. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

6.3. Test Data

Table 11 20dB Bandwidth Test Data

Test Mode	20dB EBW[MHz]	FL[GHz]	FH[GHz]	Verdict
Test Mode 1	226.57	24.00542	24.23199	PASS



7. ANTENNA REQUIREMENTS

15.203 requirements:

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. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

7.1. Antenna Connector

Antenna Connector is on the PCB within enclosure and not accessible to user.

END OF REPORT