Prüfbericht-Nr.: *Test report no.*:	**CN24FNH4 001**	**Auftrags-Nr.:** *Order no.*:	168494490	Seite 1 von 17 *Page 1 of 17*
Kunden-Referenz-Nr.: *Client reference no.*:	N/A	**Auftragsdatum:** *Order date:*	2024-07-15	
Auftraggeber: *Client*:	Xiamen R&T Plumbing Technology Co.,LTD. No.18, HouXiang Road, HaiCang District,Xiamen,361028, China			
Prüfgegenstand: *Test item*:	Microwave sensor			
Bezeichnung / Typ-Nr.: *Identification / Type no.*:	HFR48-G-B5-J (Trademark: R&T)			
Auftrags-Inhalt: *Order content*:	Test Report			
Prüfgrundlage: *Test specification*:	FCC CFR Title 47, Part 15, Subpart C, Section 15.249 RSS-210 Issue 10 December 2019 RSS-Gen Issue 5 March 2019			

Wareneingangsdatum: *Date of sample receipt*:	2024-07-16	Please refer to Photo Document
Prüfmuster-Nr.: *Test sample no:*	A003768958-001~003	
Prüfzeitraum: *Testing period*:	2024-07-20 - 2024-07-23	
Ort der Prüfung: *Place of testing*:	TÜV Rheinland (Shenzhen) Co., Ltd.	
Prüflaboratorium: *Testing laboratory:*	TÜV Rheinland (Shenzhen) Co., Ltd.	
Prüfergebnis*: *Test result**:	Pass	

geprüft von: tested by:	X Chris Chen Signed by: Chris Chen	**genehmigt von:** *authorized by*:	X Lin Lin Signed by: Lin Lin
Datum: *Date:* 2024-08-01		**Ausstellungsdatum:** *Issue date:* 2024-08-01	
Stellung / Position:	Sachverständige(r)/Expert	**Stellung** / Position:	Sachverständige(r)/Expert

Sonstiges / *Other*:	FCC ID: 2AW23-F48G00 IC: 31226-F48G00, HVIN: HFR48-G-B5-J

Zustand des Prüfgegenstandes bei Anlieferung: *Condition of the test item at delivery*:	Prüfmuster vollständig und unbeschädigt *Test item complete and undamaged*

* Legende:	P(ass) = entspricht o.g. Prüfgrundlage(n)	F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
* *Legend:*	*P(ass) = passed a.m. test specification(s)*	*F(ail) = failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

Prüfbericht-Nr.: CN24FNH4 001
Test report no.:

Anmerkungen
Remarks

1	Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben. Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden. *The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system.* *Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.*
2	Wie vertraglich vereinbart, wurde dieses Dokument nur digital unterzeichnet. Der TÜV Rheinland hat nicht überprüft, welche rechtlichen oder sonstigen diesbezüglichen Anforderungen für dieses Dokument gelten. Diese Überprüfung liegt in der Verantwortung des Benutzers dieses Dokuments. Auf Verlangen des Kunden kann der TÜV Rheinland die Gültigkeit der digitalen Signatur durch ein gesondertes Dokument bestätigen. Diese Anfrage ist an unseren Vertrieb zu richten. Eine Umweltgebühr für einen solchen zusätzlichen Service wird erhoben. Informationen zur Verifizierung der Authentizität unserer Dokumente erhalten Sie auf folgender Webseite: go.tuv.com/digital-signature *As contractually agreed, this document has been signed digitally only. TUV Rheinland has not verified and unable to verify which legal or other pertaining requirements are applicable for this document. Such verification is within the responsibility of the user of this document. Upon request by its client, TUV Rheinland can confirm the validity of the digital signature by a separate document. Such request shall be addressed to our Sales department. An environmental fee for such additional service will be charged. For information on verifying the authenticity of our documents, please visit the following website: go.tuv.com/digital-signature*
3	Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben. Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt. *Test clauses with remark of * are subcontracted to qualified subcontractors and descripted under the respective test clause in the report.* *Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.*
4	Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnisen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird. Zu weiteren Informationen bezueglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019. *The decision rule for statements of conformity, based on numerical measurement results, in this test report is based on the "Zero Guard Band Rule" and "Simple Acceptance" in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report. For additional information to the resulting risk based of this decision rule please refer to ILAC G8:2019.*

Test Summary

5.1.1 ANTENNA REQUIREMENT
RESULT: Pass

5.1.2 FIELD STRENGTH OF FUNDAMENTAL AND HARMONICS
RESULT: Pass

5.1.3 20DB AND 99% BANDWIDTH
RESULT: Pass

5.1.4 BAND EDGE
RESULT: Pass

Table of Contents

1 General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix A: Test Results of FCC Part 15C

Appendix B: Photographs of the Test Set-up

2 Test Sites

2.1 Test Facilities

TÜV Rheinland (Shenzhen) Co., Ltd.
No.362, Huanguan Middle Road, Songyuansha Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China

FCC Registration No.: CN1260

ISED wireless device testing laboratory: 25069

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Unwanted Emission Testing (TS9975)					
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Cal. Date**	**Cal. until**
EMI Test Receiver	R&S	ESR 7	102021	2023-07-26	2024-07-25
Signal Analyzer	R&S	FSV 40	101439	2023-07-26	2024-07-25
System Controller Interface	R&S	SCI-100	S10010038	N/A	N/A
Filterbank	R&S	Wlan	100759	2023-07-26	2024-07-25
OSP	R&S	OSP 120	102040	N/A	N/A
Pre-amplifier	R&S	SCU08F1	08320031	2023-07-26	2024-07-25
Amplifier	R&S	SCU-18F	180070	2023-07-26	2024-07-25
Amplifier	R&S	SCU40A	100475	2023-07-26	2024-07-25
Trilog Broadband Antenna (30 MHz - 7 GHz)	Schwarzbeck	VULB 9162	193	2022-08-07	2024-08-06
Double-Ridged Antenna (1 -18 GHz)	ETS-LINDGREN	3117	00218717	2022-08-07	2024-08-06
Wideband Ridged Horn Antenna (18-40 GHz)	Steatite	QMS-00880	19067	2022-08-28	2024-08-27
Active Loop Antenna	Schwarzbeck	FMZB 1513	302	2022-08-07	2024-08-06
Test software	R&S	EMC32 (V10.60.10)	N/A	N/A	N/A
Control PC	Dell	OptiPlex 7050	36NV9P2	N/A	N/A
3m Semi-Anechoic Chamber	Albatross	SAC-3m	APC17151-SAC	2024-06-21	2025-06-20

2.3 Traceability

All measurement equipment calibrations are traceable to NIM (National Institute of Metrology) or where calibration is performed in other countries, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basics using in house standards or comparisons.

2.5 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions measurements as below table.

Table 2: Measurement Uncertainty

Parameter	Uncertainty (k=2)
Occupied Channel Bandwidth	± 2.08 %
RF power density, conducted	± 0.99 dB
Unwanted Emissions, conducted	± 0.89 dB
All emissions, radiated	± 4.17 dB

2.6 Location of Original Data

The original copies of all test data taken during actual testing were attached at Appendix A & B of this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Shenzhen) Co., Ltd. file for certification follow-up purposes.

2.7 Status of Facility Used for Testing

The TÜV Rheinland (Shenzhen) Co., Ltd. Test facility located at No.362, Huanguan Middle Road, Songyuansha Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

3 General Product Information

3.1 Product Function and Intended Use

The EUT is a **Microwave sensor**, which supports 24GHz wireless technology.

For details refer to the User Manual, Technical Description and Circuit Diagram.

3.2 Ratings and System Details

Table 3: Technical Specification of EUT

General Information of EUT	**Value**
Kind of Equipment:	Microwave sensor
Type Designation:	HFR48-G-B5-J
Trademark:	R&T
FCC ID:	2AW23-F48G00
IC:	31226-F48G00
HVIN:	HFR48-G-B5-J
Operating Voltage:	DC 5V
Testing Voltage:	DC 5V from DC source
Technical Specification of Microwave module	
Frequency Range:	24.05 - 24.25 GHz
Type of Modulation:	FMCW
Operate Frequency Range:	200MHz
Antenna Type:	PCB Layout Antenna
Antenna Gain:	12.00 dBi(Provided by the Client)

3.3 Independent Operation Modes

The basic operation modes are:

A. On, 24GHz transmitting mode (Microwave module)
B. On, 24GHz connecting mode
C. Off

3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

3.5 Submitted Documents

- Application Form
- Operation Description
- Schematics
- Parts List
- ID Label and Location Info
- Block Diagram
- PCB Layout

4 Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

Radio Spectrum: The equipment under test (EUT) was configured at its highest power output in order to measure its highest possible radiation and conducted level. The test modes were adapted accordingly in reference to the instructions for use.

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5. All tests were performed according to the procedures in ANSI C63.10: 2013.

Table 4: Test Environments

Environment Parameter	Values During Tests		
	Temperature	Voltage	Relative Humidity
NTNV	25°C±2°C	5Vdc	Ambient

Table 5: Test Channel and Frequency

Mode	Test Channels (GHz)	Remark
Transmitting	24.05 to 24.25 GHz	--

4.3 Special Accessories and Auxiliary Equipment

Table 6: Auxiliary Equipment Used During Test

Description	Manufacturer	Model	S/N	Rating
DC power Supply	Topward	3303D	809332	0-30 Volts, 0-3 Amps

4.4 Countermeasures to Achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Technical Construction File (TCF).

No additional measures were employed to achieve compliance.

4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test (Below 1GHz)

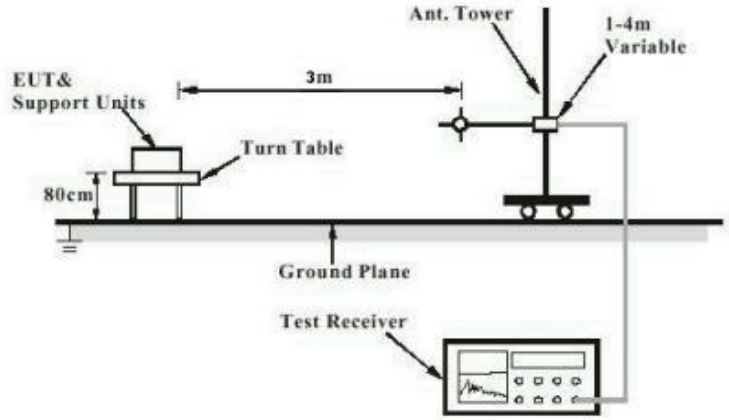


Diagram of Measurement Configuration for Radiation Test (1-40GHz)

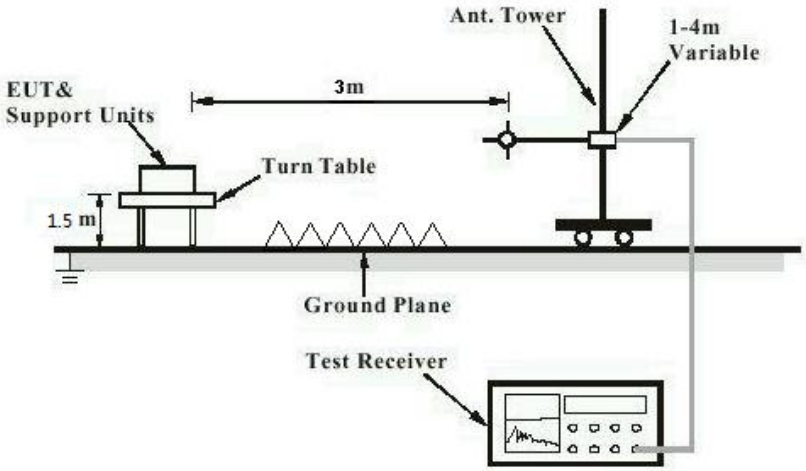


Diagram of Measurement Configuration for Radiation Test (40-100GHz)

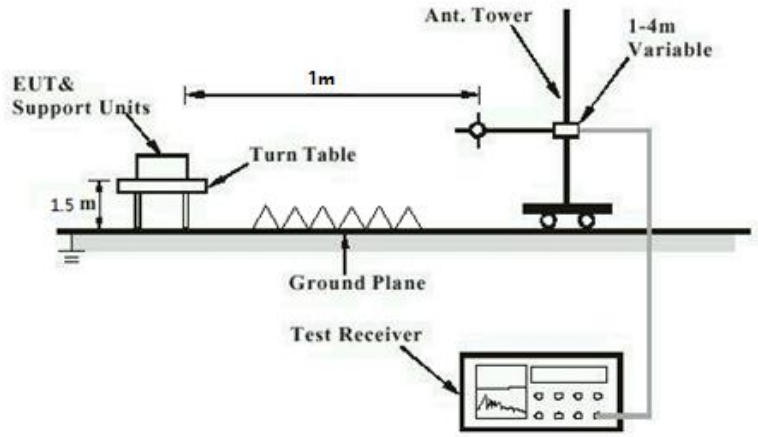
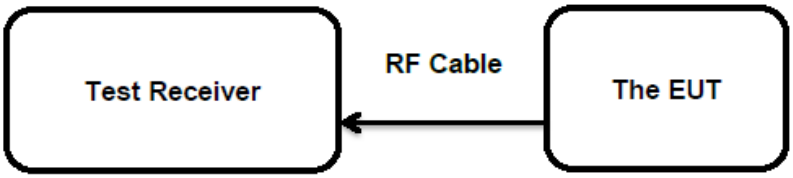


Diagram of Measurement Configuration for Conducted Transmitter Measurement



5 Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

RESULT: **Pass**

Test Specification

Test standard : FCC Part 15.203
RSS-Gen Section 6.8

According to the manufacturer declared, the EUT has a PCB Layout antenna, the gain of antenna is 12.00 dBi, which that permanent attachment and no consideration of replacement.

Therefore the EUT is considered sufficient to comply with the provision.

Refer to EUT Photo for further details.

5.1.2 Field strength of fundamental and harmonics

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.249(a) (d) (e) RSS-210 Section B.10
Basic standard	:	ANSI C63.10: 2013
Limits	:	FCC Part 15.249(a) (d) (e) & 15.209(a) RSS-210 Section B.10 (a) & (b) RSS-Gen Section 8.9
Kind of test site	:	3m Semi-anechoic Chamber

Test Setup

Date of testing	:	2024-07-20 to 2024-07-23
Input voltage	:	DC 5V
Operation mode	:	A
Ambient temperature	:	23 ℃
Relative humidity	:	53 %
Atmospheric pressure	:	101 kPa

Note: Testing was carried out within frequency range 9kHz to the tenth harmonics. Only the worst case spurious emissions configuration of the each mode were reported.

For the measurement records, refer to the appendix A.

5.1.3 20dB and 99% Bandwidth

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.215 RSS-Gen Section 6.7
Basic standard	:	ANSI C63.10: 2013
Limits	:	Within assigned band
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	2024-07-23
Input voltage	:	DC 5V
Operation mode	:	A
Ambient temperature	:	23 ℃
Relative humidity	:	53 %
Atmospheric pressure	:	101 kPa

For the measurement records, refer to the appendix A.

5.1.4 Band Edge

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.249(a) (d) (e) & 15.209 & 15.205 RSS-210 Section B.10 (a) & (b) RSS-Gen Section 8.9 & 8.10
Basic standard	:	ANSI C63.10: 2013
Limits	:	FCC Part 15.249(a) (d) (e) & 15.209 & 15.205 RSS-Gen Table 5 & 7
Kind of test site	:	3m Semi-anechoic Chamber

Test Setup

Date of testing	:	2024-07-23
Input voltage	:	DC 5V
Operation mode	:	A
Ambient temperature	:	23 ℃
Relative humidity	:	53 %
Atmospheric pressure	:	101 kPa

For the measurement records, refer to the appendix A.

6 Photographs of the Test Set-Up

For photographs of the test set-up, refer to the appendix B.

7 List of Tables

Appendix A: Test Results of FCC Part 15C

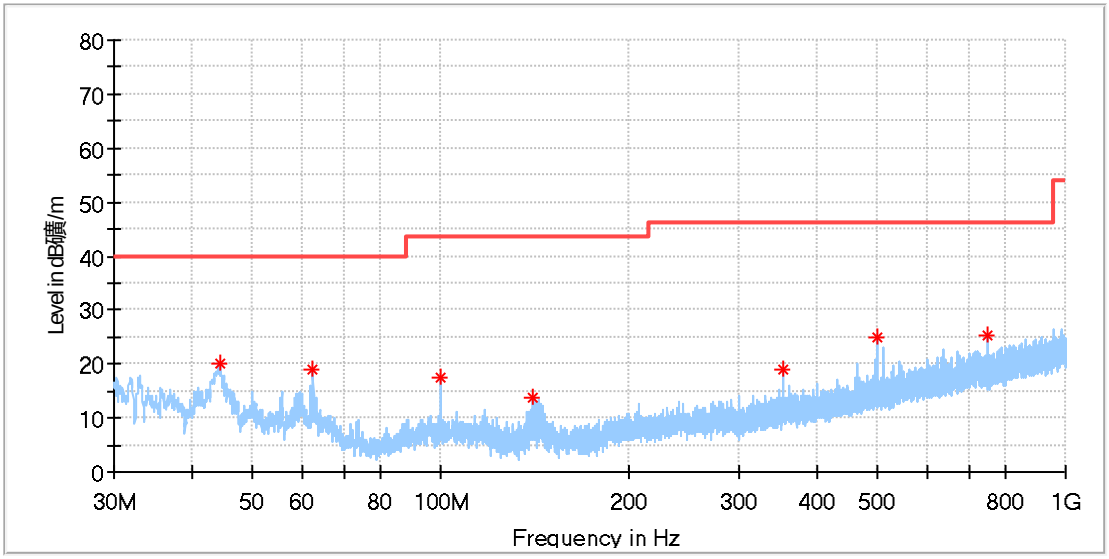
Appendix A.1: Test Results of Field strength of fundamental & harmonics

30MHz - 1GHz

Test distance@3m

EUT Information

EUT Name:	Microwave Sensor
Model:	HFR48-G-B5-J
Test Mode:	24GHz
Order No/Sample No:	168494490A003768958-003
Test Voltage:	DC 5V
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.249
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

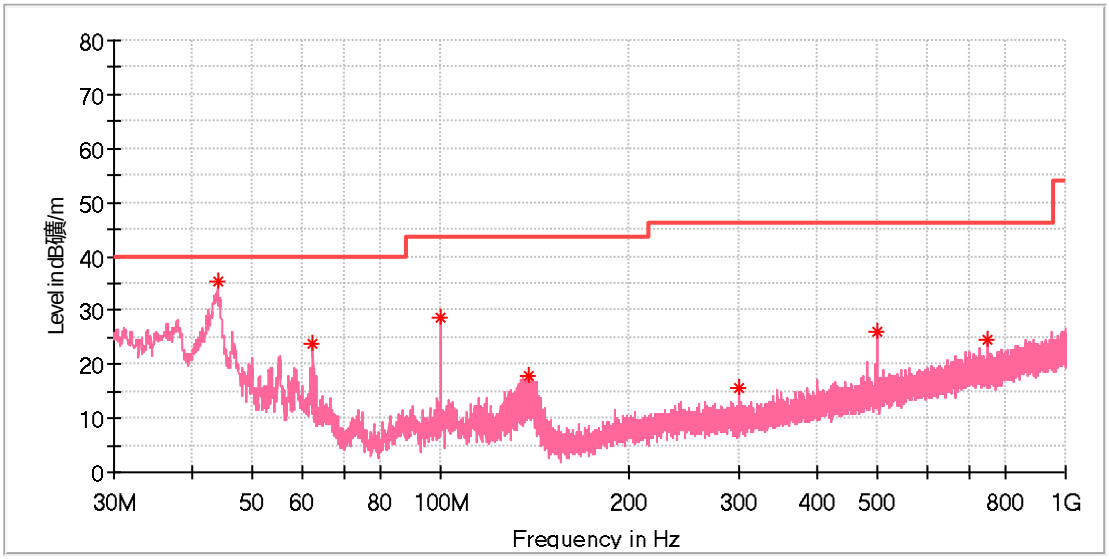
Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
44.438077	20.03	40.00	19.97	100.0	H	229.0	-19.3
62.495000	18.87	40.00	21.13	100.0	H	0.0	-19.9
99.989231	17.41	43.50	26.09	100.0	H	309.0	-19.3
140.654615	13.89	43.50	29.61	100.0	H	302.0	-22.6
352.002692	19.09	46.00	26.91	100.0	H	6.0	-15.1
500.002308	24.93	46.00	21.07	100.0	H	270.0	-12.2
750.038462	25.25	46.00	20.75	100.0	H	112.0	-7.6

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	Microwave Sensor
Model:	HFR48-G-B5-J
Test Mode:	24GHz
Order No/Sample No:	168494490A003768958-003
Test Voltage:	DC 5V
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.249
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
43.915769	35.31	40.00	4.69	100.0	V	262.0	-19.4
62.495000	23.63	40.00	16.37	100.0	V	238.0	-19.9
99.989231	28.49	43.50	15.01	100.0	V	188.0	-19.3
138.490769	17.97	43.50	25.53	100.0	V	5.0	-22.5
299.995769	15.78	46.00	30.22	100.0	V	342.0	-16.6
500.002308	26.16	46.00	19.84	100.0	V	246.0	-12.2
750.038462	24.52	46.00	21.48	100.0	V	238.0	-7.6

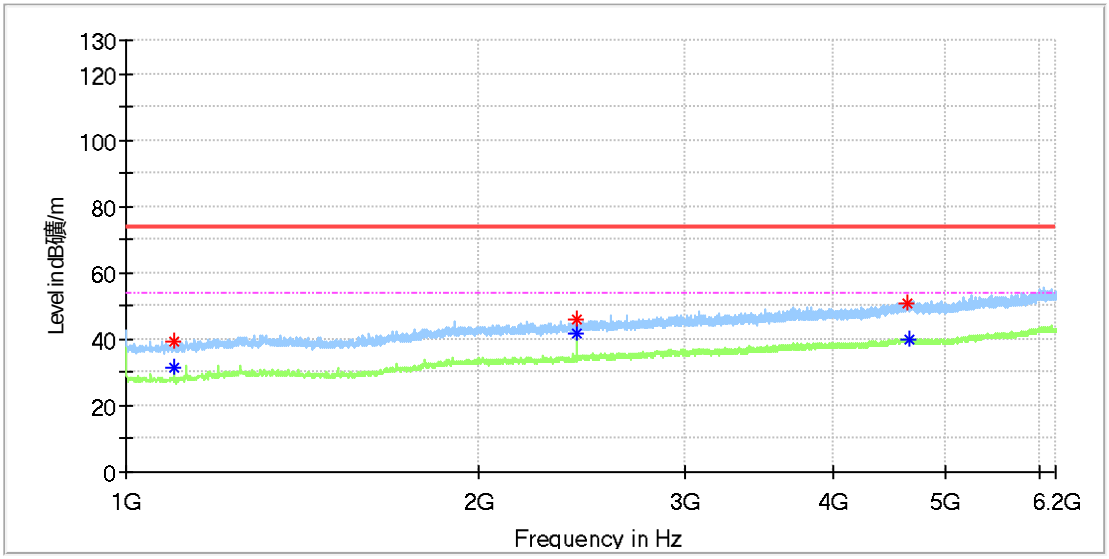
Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

1GHz - 18GHz
Test distance@3m

EUT Information

EUT Name:	Microwave Sensor
Model:	HFR48-G-B5-J
Test Mode:	24GHz
Order No/Sample No:	168494490A003768958-003
Test Voltage:	DC 5V
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.249
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1099.500000	39.35	---	74.00	34.65	150.0	H	142.0	-0.2
1099.500000	---	31.57	54.00	22.43	150.0	H	142.0	-0.2
2425.500000	45.85	---	74.00	28.15	150.0	H	153.0	7.2
2426.000000	---	41.69	54.00	12.31	150.0	H	153.0	7.2
4643.500000	51.06	---	74.00	22.94	150.0	H	335.0	12.0
4647.500000	---	40.10	54.00	13.90	150.0	H	184.0	12.0

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	Microwave Sensor
Model:	HFR48-G-B5-J
Test Mode:	24GHz
Order No/Sample No:	168494490A003768958-003
Test Voltage:	DC 5V
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.249
Tested By:	Kei Zhang
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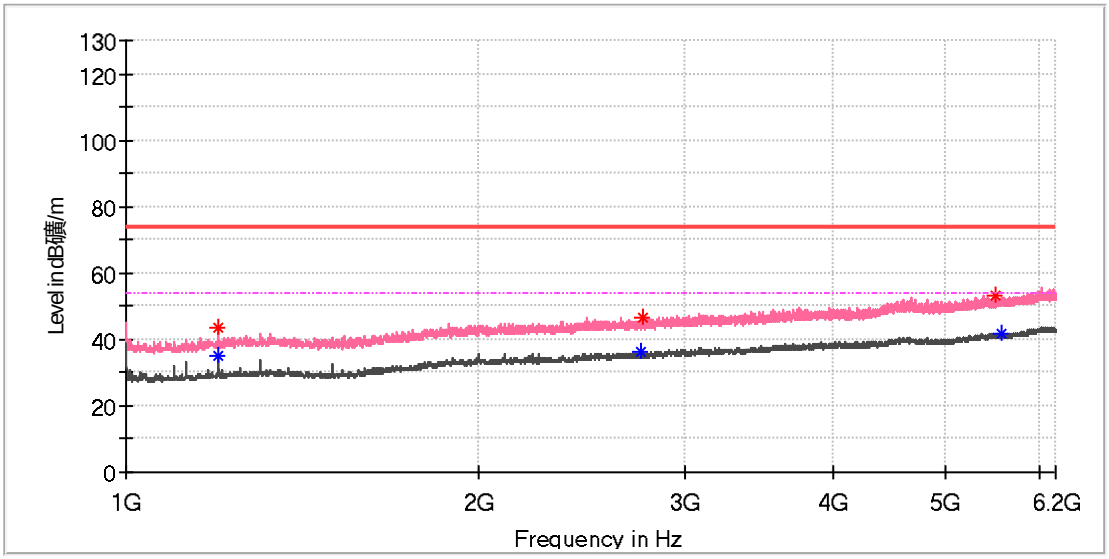

Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1199.500000	43.65	---	74.00	30.35	150.0	V	116.0	1.1
1200.000000	---	34.97	54.00	19.03	150.0	V	247.0	1.1
2749.500000	---	36.21	54.00	17.79	150.0	V	278.0	7.8
2757.500000	46.50	---	74.00	27.50	150.0	V	267.0	7.9
5503.500000	52.94	---	74.00	21.06	150.0	V	79.0	13.7
5576.500000	---	41.96	54.00	12.04	150.0	V	79.0	13.8

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	Microwave Sensor
Model:	HFR48-G-B5-J
Test Mode:	24GHz
Order No/Sample No:	168494490A003768958-003
Test Voltage:	DC 5V
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.249
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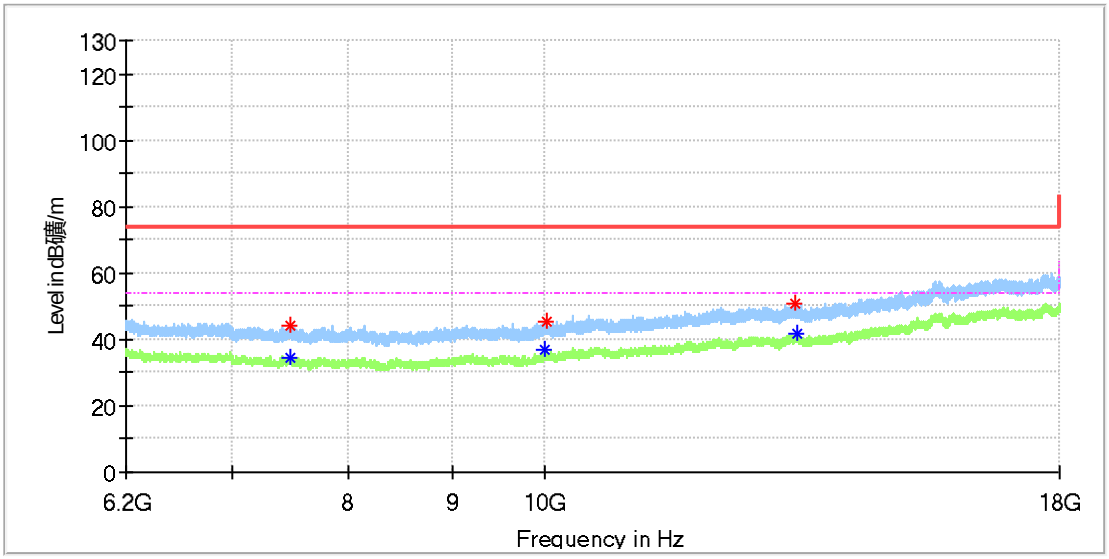


Critical_Freqs

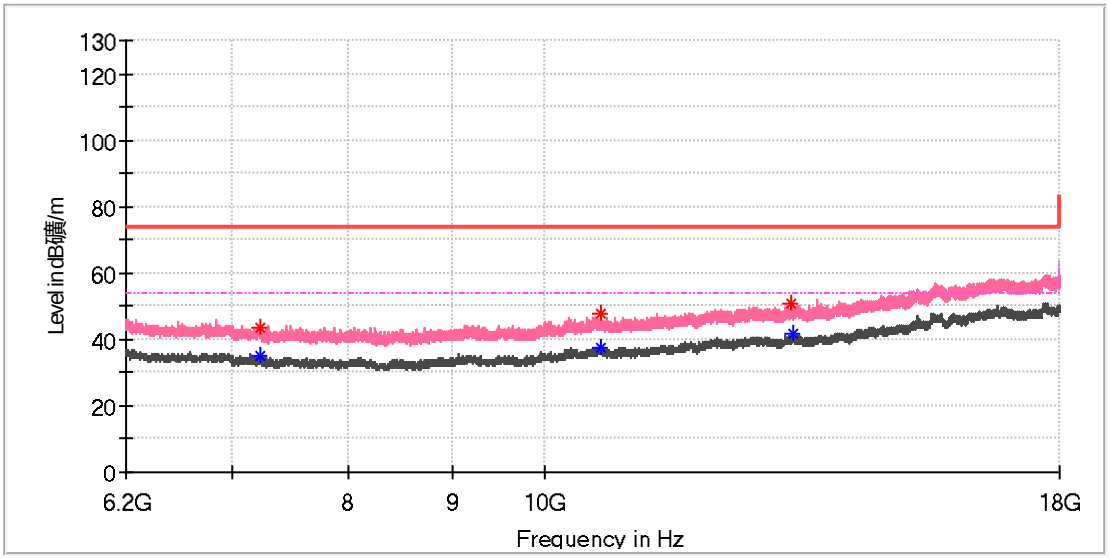
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7482.758333	---	34.60	54.00	19.40	150.0	H	244.0	8.7
7483.741667	44.25	---	74.00	29.75	150.0	H	196.0	8.7
10004.516667	---	37.11	54.00	16.89	150.0	H	357.0	11.1
10021.725000	45.28	---	74.00	28.72	150.0	H	31.0	11.1
13294.258333	50.92	---	74.00	23.08	150.0	H	346.0	15.5
13345.391667	---	41.89	54.00	12.11	150.0	H	134.0	15.5

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	Microwave Sensor
Model:	HFR48-G-B5-J
Test Mode:	24GHz
Order No/Sample No:	168494490A003768958-003
Test Voltage:	DC 5V
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.249
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7224.633333	43.68	---	74.00	30.32	150.0	V	188.0	8.7
7226.600000	---	35.10	54.00	18.90	150.0	V	353.0	8.7
10653.025000	47.52	---	74.00	26.48	150.0	V	117.0	12.0
10661.875000	---	37.75	54.00	16.25	150.0	V	18.0	11.9
13258.858333	50.50	---	74.00	23.50	150.0	V	18.0	15.5
13271.641667	---	41.58	54.00	12.42	150.0	V	55.0	15.5

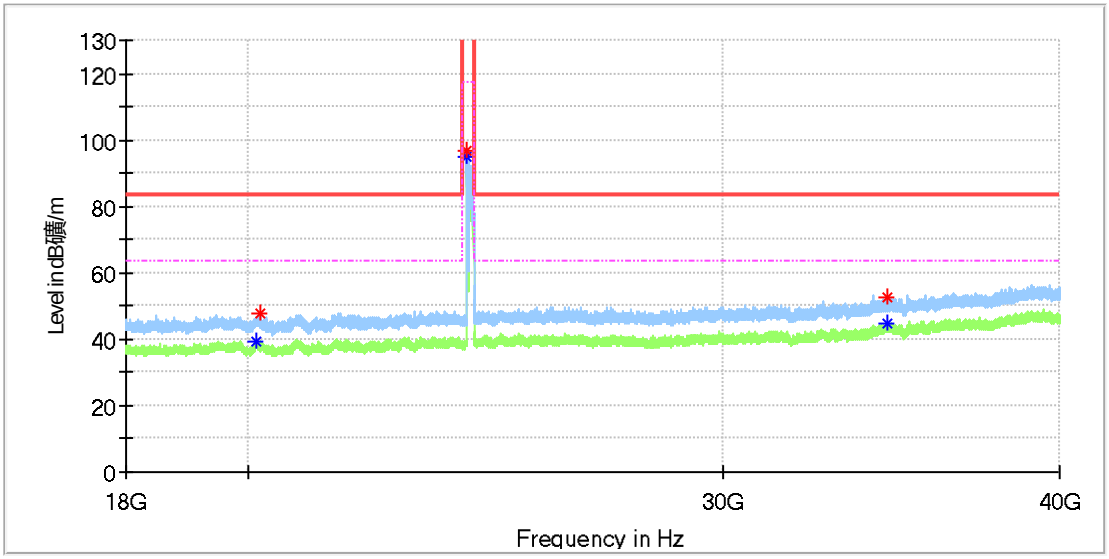
Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

18GHz - 40GHz
Test distance@1m

EUT Information

EUT Name:	Microwave Sensor
Model:	HFR48-G-B5-J
Test Mode:	24GHz
Order No/Sample No:	168494490A003768958-003
Test Voltage:	DC 5V
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.249
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
20129.875000	---	39.47	63.54	24.07	100.0	H	179.0	-12.9
20178.000000	47.75	---	83.54	35.79	100.0	H	6.0	-12.8
24092.625000	---	95.02	117.50	22.48	100.0	H	294.0	-10.1
24096.750000	96.89	---	137.50	40.61	100.0	H	277.0	-10.1
34517.875000	52.63	---	83.54	30.91	100.0	H	29.0	-8.7
34533.687500	---	44.98	63.54	18.56	100.0	H	21.0	-8.7

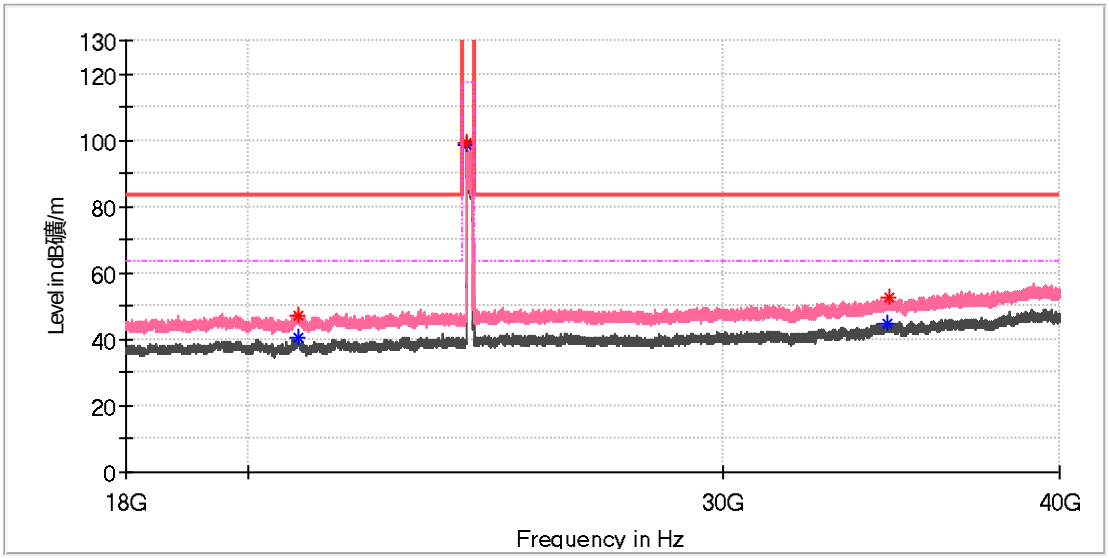
Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

Note: Field Strength @ 1m = (Field Strengh @ 3m) + 9.54 dB
Fundamental Emission@3m = 96.89dBuV/m@1m - 9.54dB = 87.35dBuV/m@3m

EUT Information

EUT Name:	Microwave Sensor
Model:	HFR48-G-B5-J
Test Mode:	24GHz
Order No/Sample No:	168494490A003768958-003
Test Voltage:	DC 5V
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.249
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
20851.062500	---	40.32	63.54	23.22	100.0	V	335.0	-12.3
20854.500000	47.37	---	83.54	36.17	100.0	V	0.0	-12.3
24084.375000	99.09	---	137.50	38.41	100.0	V	243.0	-10.1
24094.687500	---	98.51	117.50	18.99	100.0	V	191.0	-10.1
34539.187500	---	44.94	63.54	18.60	100.0	V	300.0	-8.7
34555.000000	52.72	---	83.54	30.82	100.0	V	16.0	-8.7

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

Note: Field Strength @ 1m = (Field Strengh @ 3m) + 9.54 dB

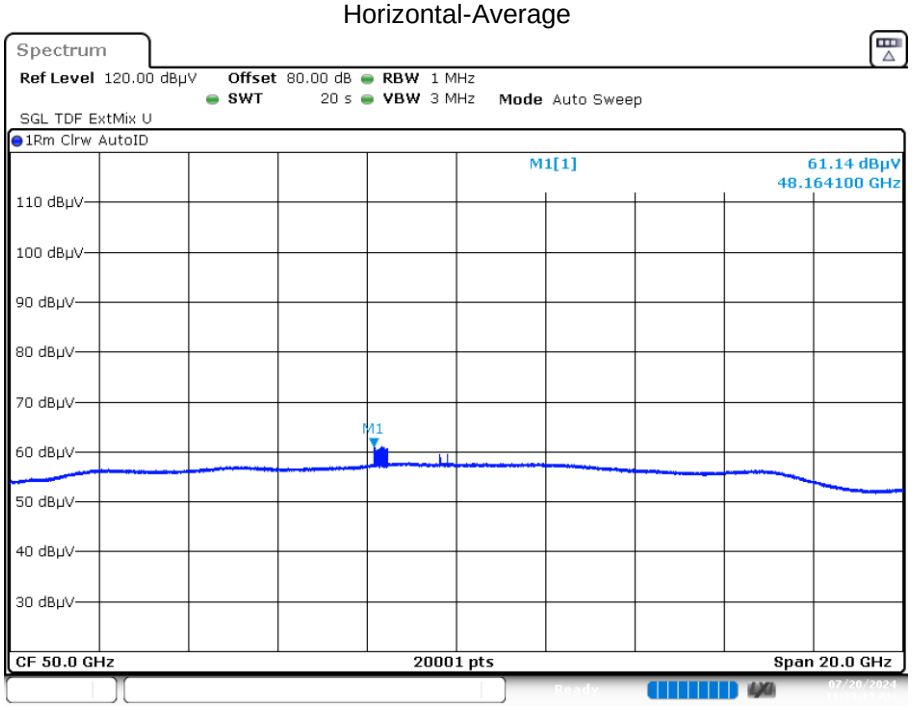
Fundamental Emission@3m = 99.09dBuV/m@1m - 9.54dB = 89.55dBuV/m@3m

40GHz - 60GHz

PK Limit: 97.54 dBµV/m at 1m

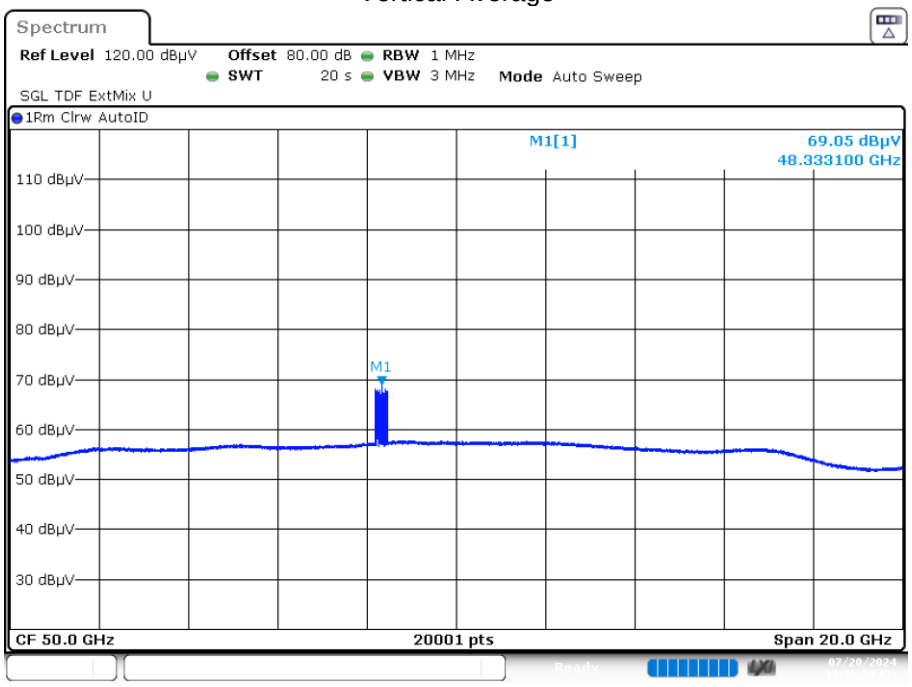
AV Limit: 77.54 dBµV/m at 1m

Horizontal-Average



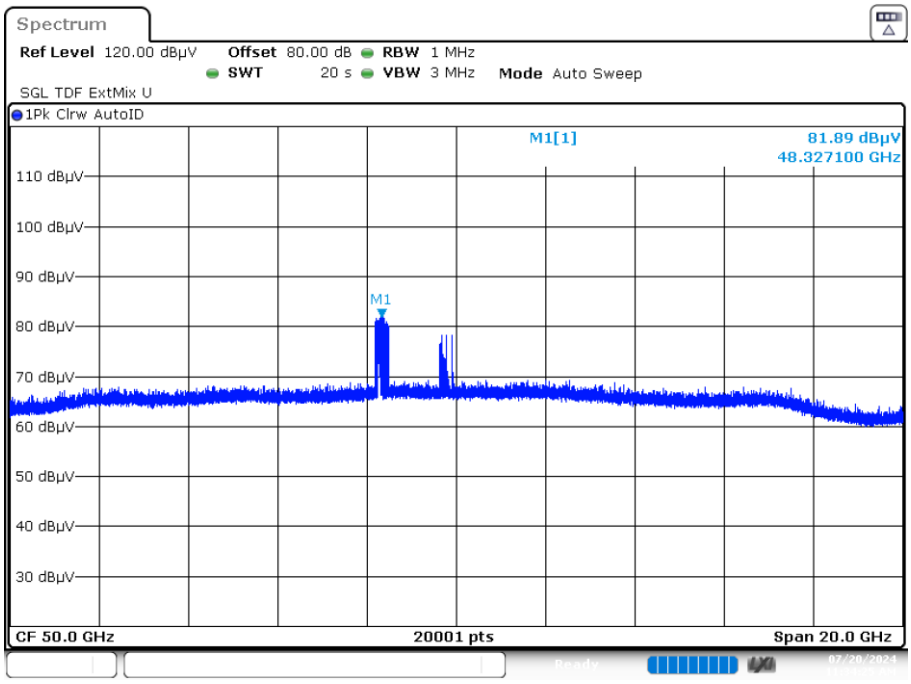
Date: 20.JUL.2024 11:33:13

Vertical-Average



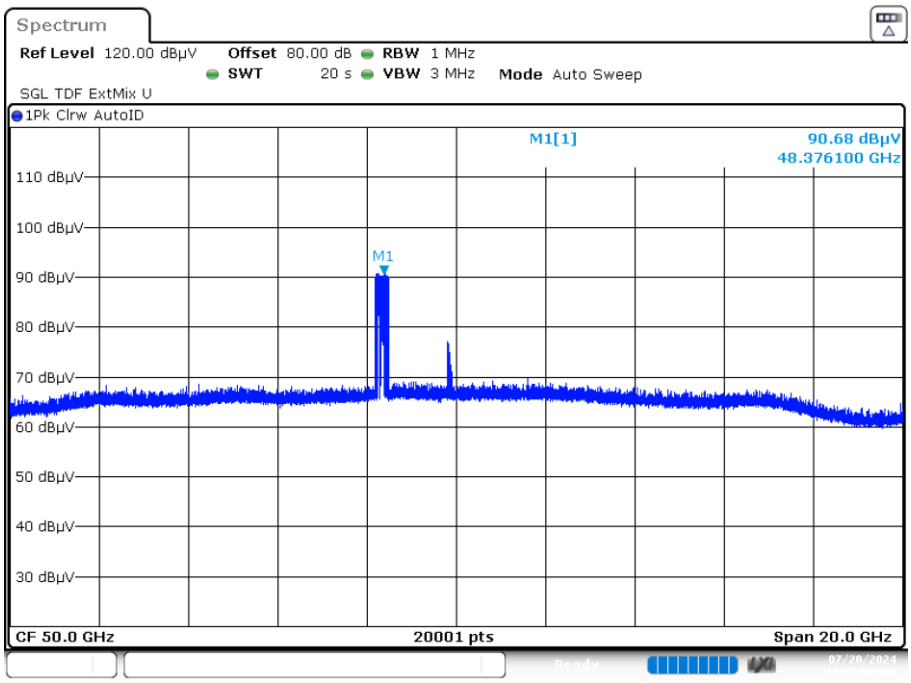
Date: 20.JUL.2024 11:36:20

Horizontal-Peak



Date: 20.JUL.2024 11:34:25

Vertical-Peak



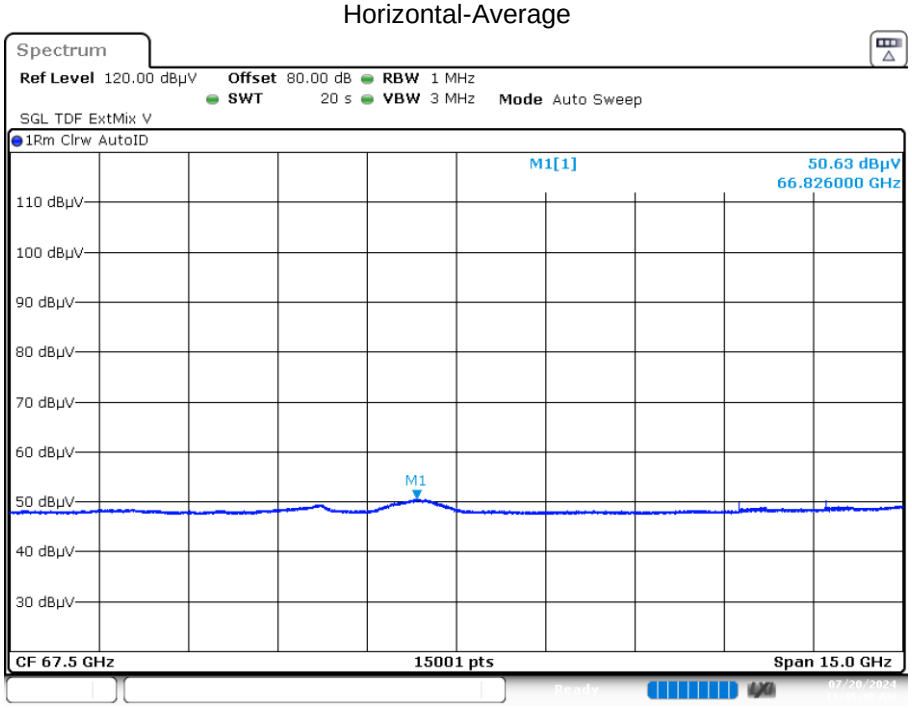
Date: 20.JUL.2024 11:38:04

60GHz - 75GHz

PK Limit: 97.54 dBµV/m at 1m

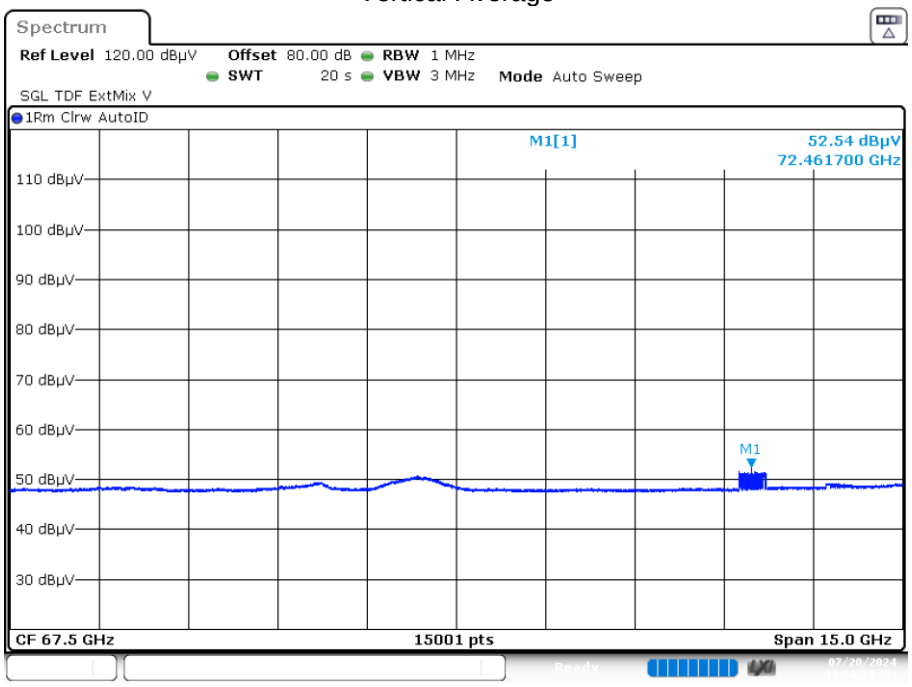
AV Limit: 77.54 dBµV/m at 1m

Horizontal-Average



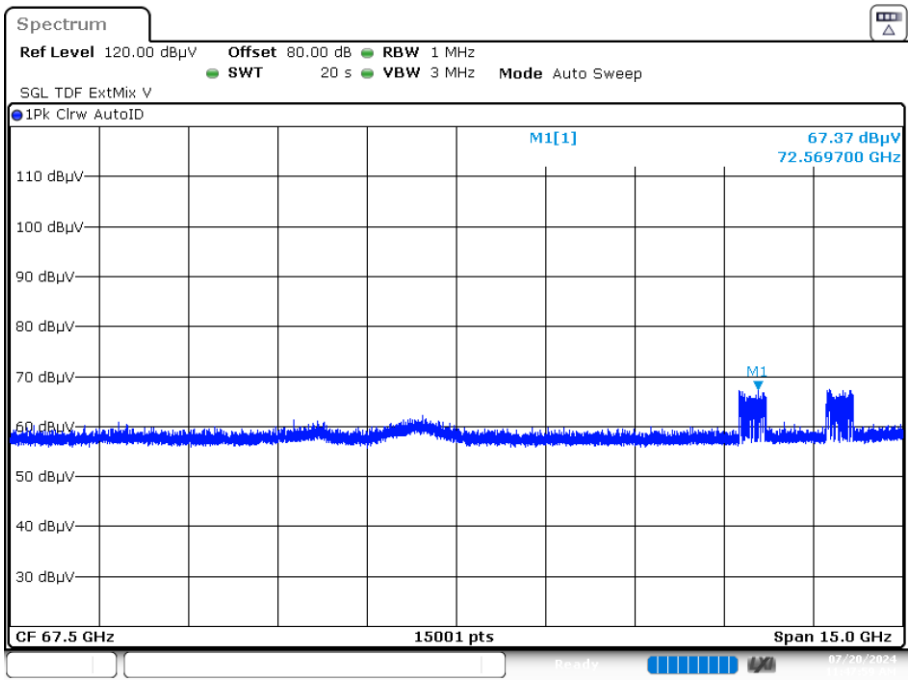
Date: 20.JUL.2024 11:46:49

Vertical-Average



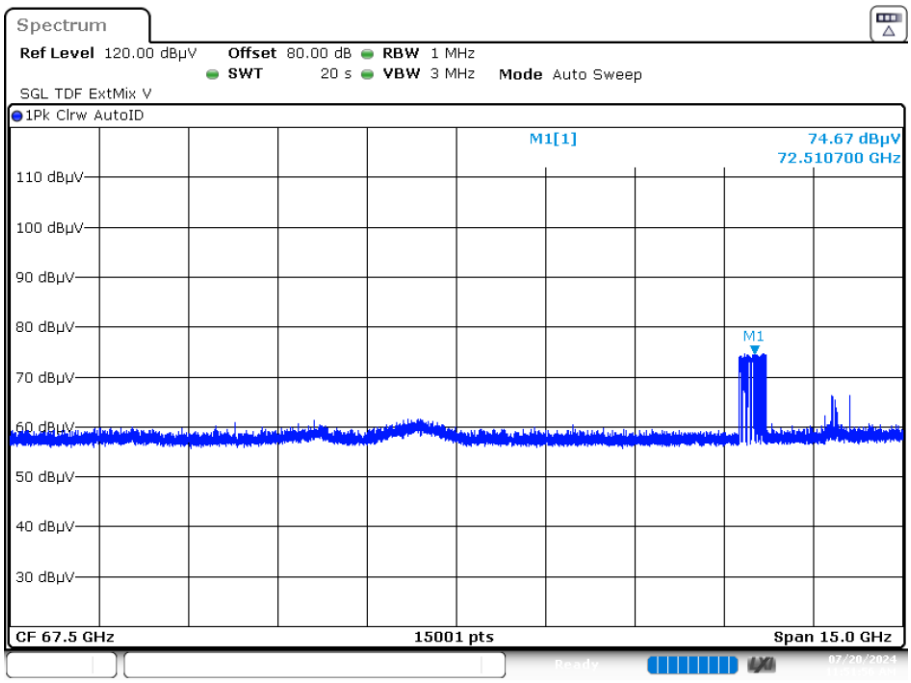
Date: 20.JUL.2024 11:50:24

Horizontal-Peak



Date: 20.JUL.2024 11:47:59

Vertical-Peak



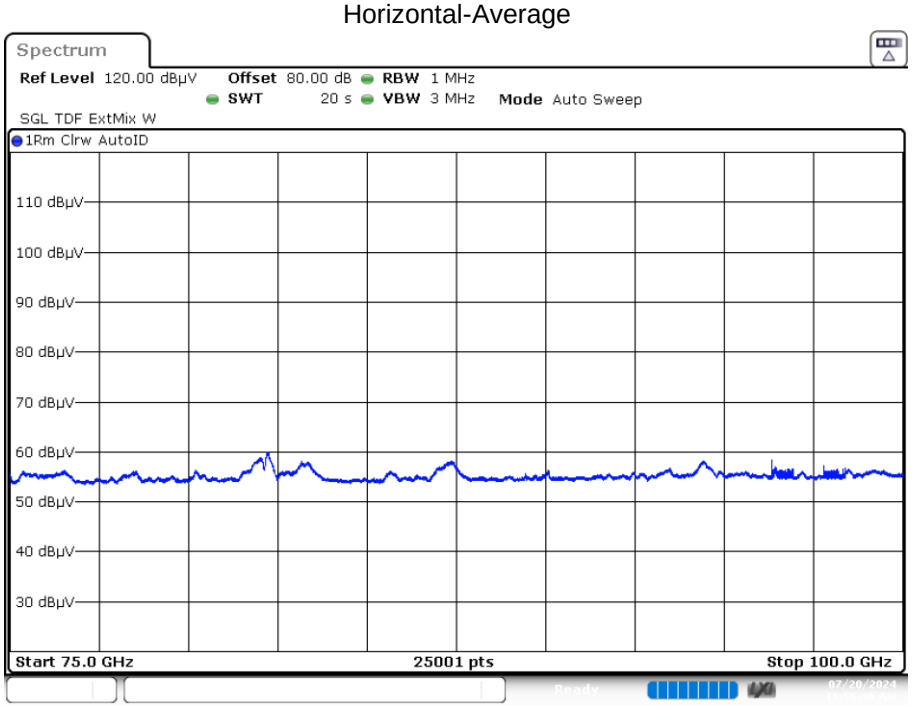
Date: 20.JUL.2024 11:51:56

75GHz - 100GHz

PK Limit: 97.54 dBµV/m at 1m

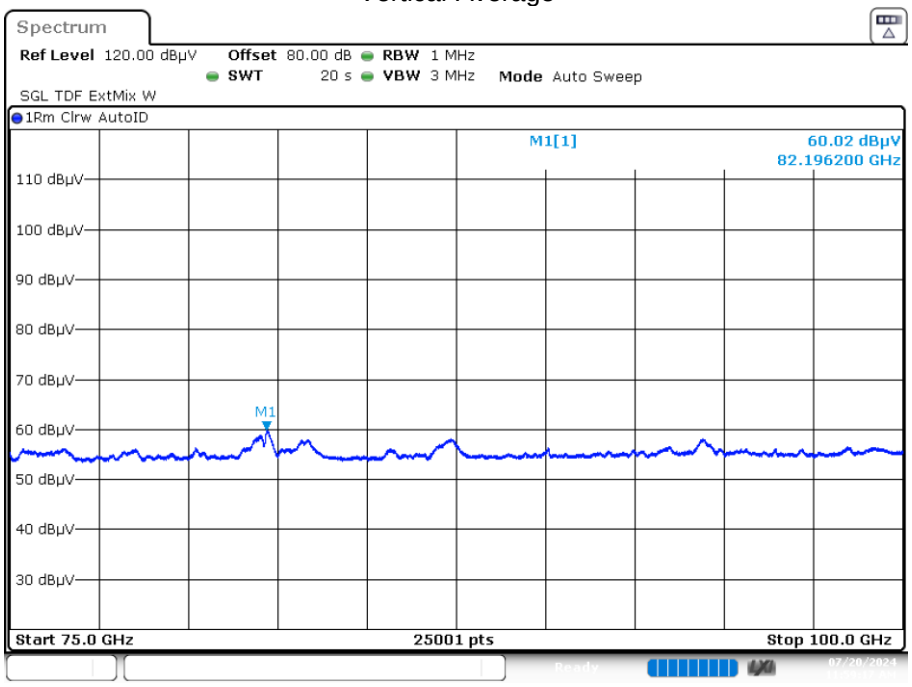
AV Limit: 77.54 dBµV/m at 1m

Horizontal-Average



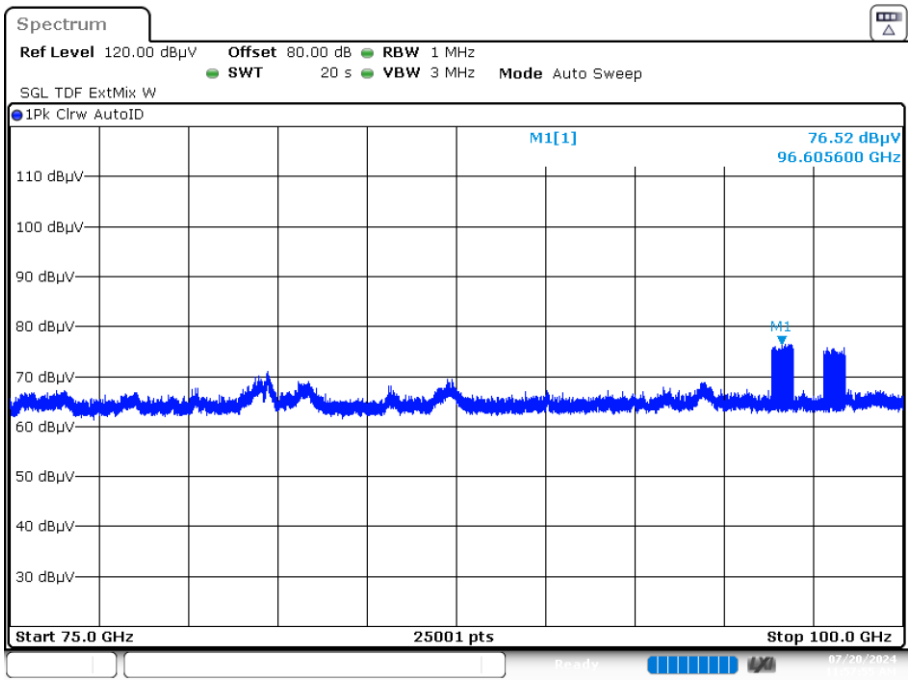
Date: 20.JUL.2024 11:56:46

Vertical-Average



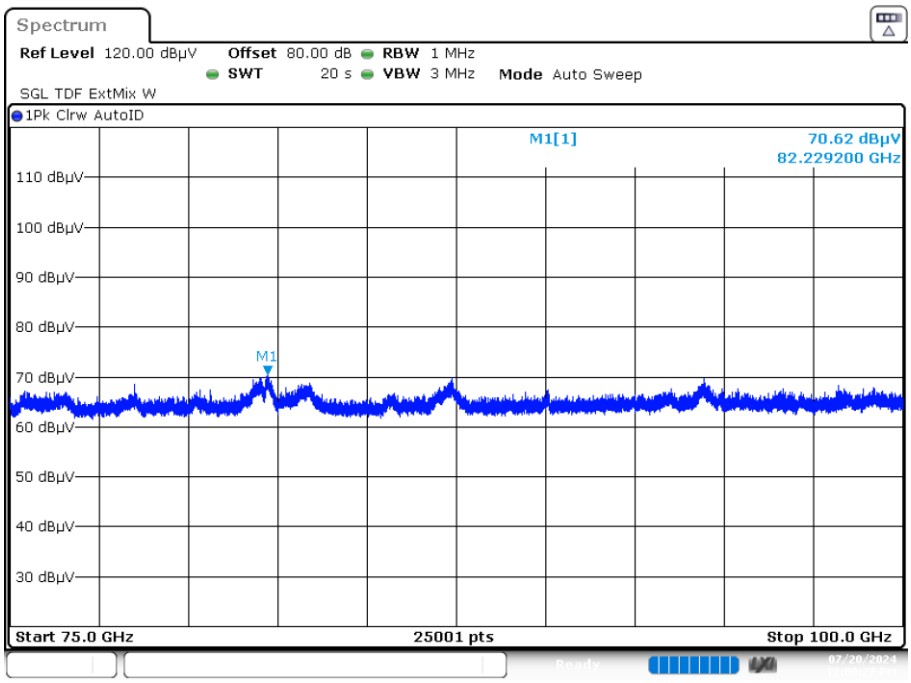
Date: 20.JUL.2024 11:59:17

Horizontal-Peak



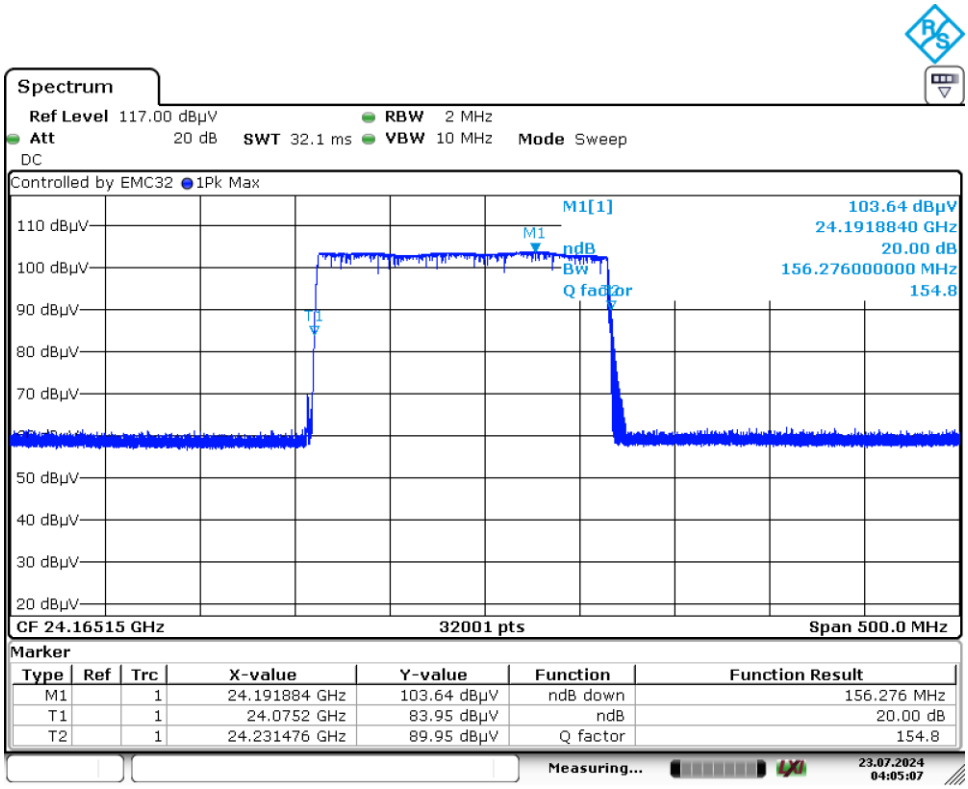
Date: 20.JUL.2024 11:57:55

Vertical-Peak



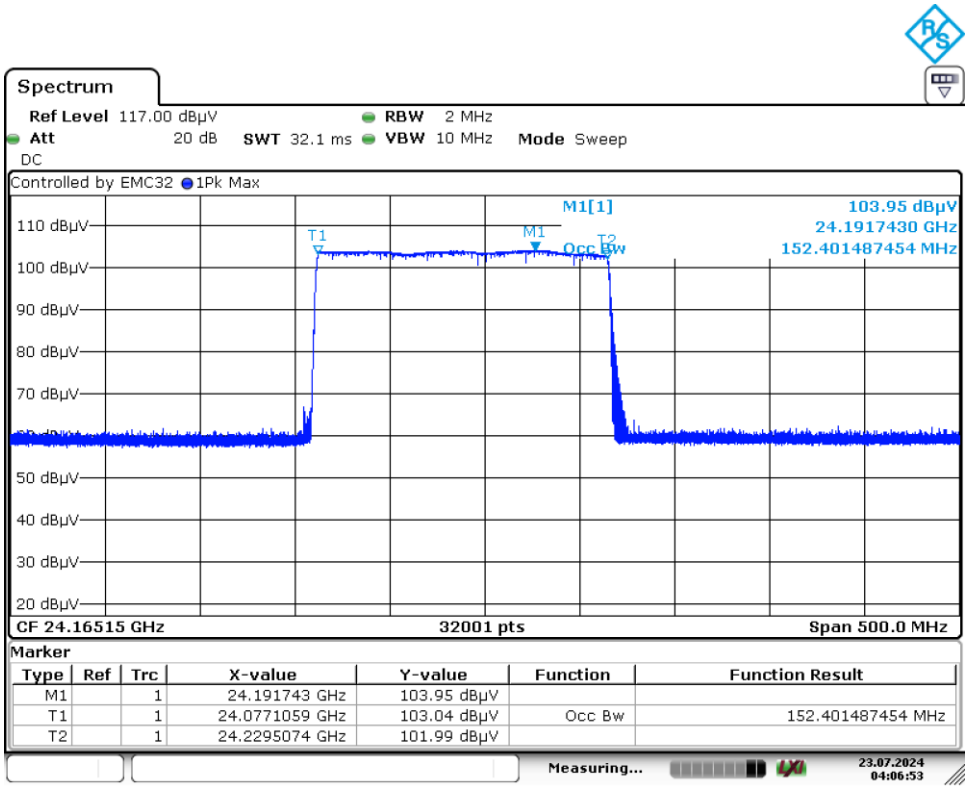
Date: 20.JUL.2024 12:00:27

Appendix A.2: Test Results of 20dB Bandwidth



Date: 23.JUL.2024 04:05:08

Appendix A.3: Test Results of 99% Bandwidth



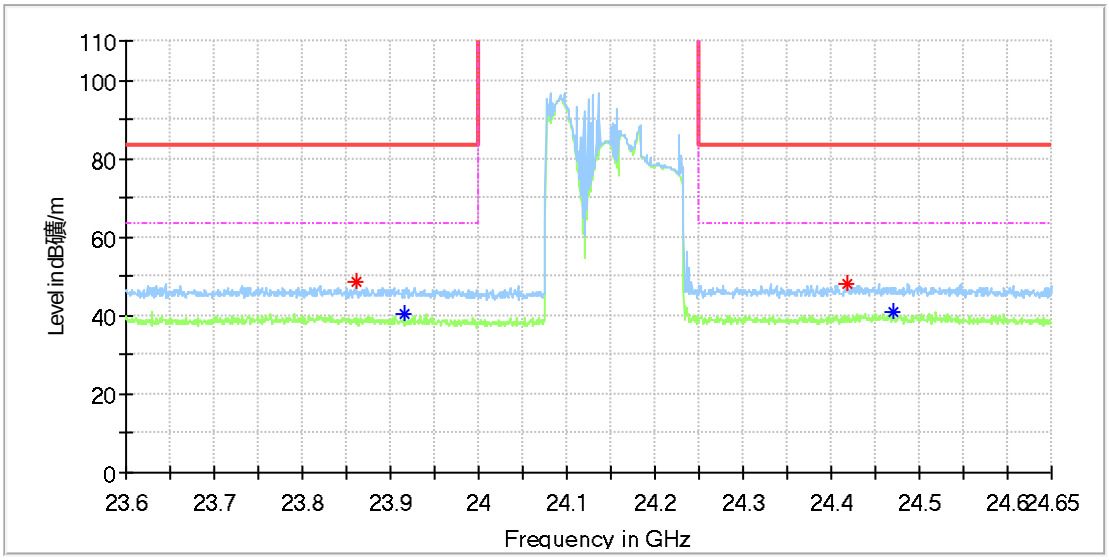
Date: 23.JUL.2024 04:06:54

Appendix A.4: Test Results of Band Edge

Test Distance@1m

EUT Information

EUT Name:	Microwave Sensor
Model:	HFR48-G-B5-J
Test Mode:	24GHz
Order No/Sample No:	168494490A003768958-003
Test Voltage:	DC 5V
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.249
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
23860.250000	48.38	---	83.54	35.16	100.0	H	58.0	-10.1
23915.937500	---	40.66	63.54	22.88	100.0	H	277.0	-10.1
24417.125000	48.30	---	83.54	35.24	100.0	H	199.0	-10.1
24470.750000	---	40.87	63.54	22.67	100.0	H	36.0	-10.2

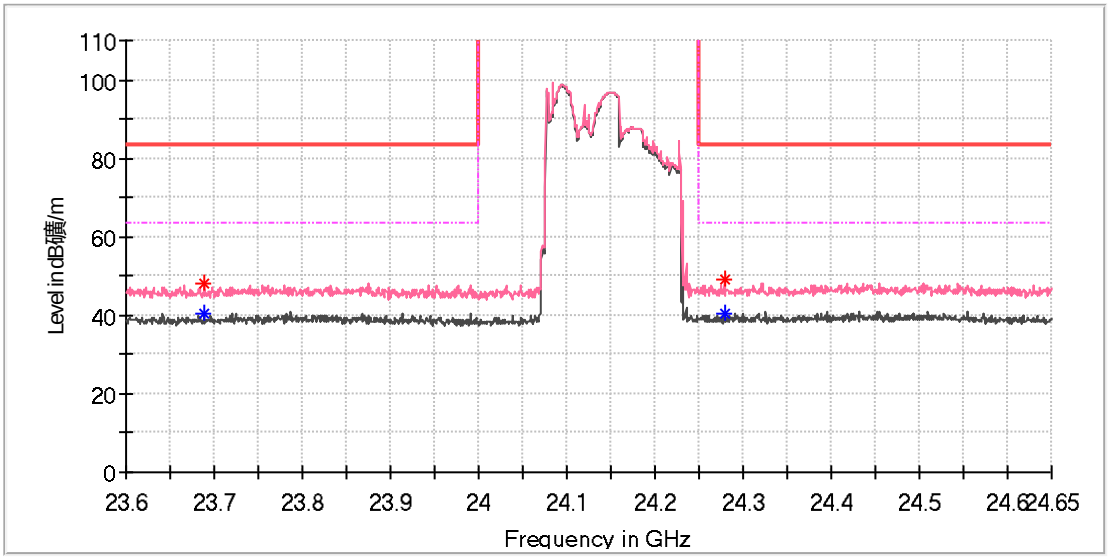
Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

Note: Limit and Field Strength @ 1m = (Field Strengh @ 3m) + 9.54 dB

EUT Information

EUT Name:	Microwave Sensor
Model:	HFR48-G-B5-J
Test Mode:	24GHz
Order No/Sample No:	168494490A003768958-003
Test Voltage:	DC 5V
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.249
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
23688.375000	---	40.36	63.54	23.18	100.0	V	324.0	-10.2
23688.375000	48.01	---	83.54	35.53	100.0	V	324.0	-10.2
24278.937500	---	40.47	63.54	23.07	100.0	V	257.0	-10.1
24278.937500	49.18	---	83.54	34.36	100.0	V	257.0	-10.1

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

Note: Limit and Field Strength @ 1m = (Field Strengh @ 3m) + 9.54 dB