



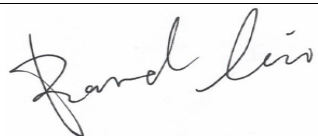
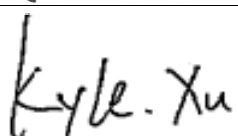
FCC PART 15.249 TEST REPORT

For

Ningbo Pdlux Electronic Technology CO.,LTD.

17F, Commerce building of Ningbo, No 588, south Tiantong road, yinzhou district, Ningbo, China

FCC ID: 2AIWW-PD-165

Report Type: Original Report	Product Name: Microwave Sensor
Report Number:	RKSA231108001-00A
Report Date:	2024-04-24
Reviewed By:	Bard Liu 
Approved By:	Kyle Xu 
Prepared By:	Bay Area Compliance Laboratories Corp. (Kunshan) No.248 Chenghu Road, Kunshan, Jiangsu Province, China Tel: +86-512-86175000 Fax: +86-512-88934268 www.baclcorp.com.cn

Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Kunshan). This report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, or any agency of the U.S.Government.

TABLE OF CONTENTS

GENERAL INFORMATION.....4
 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)4
 OBJECTIVE4
 TEST METHODOLOGY4
 MEASUREMENT UNCERTAINTY.....5
 TEST FACILITY5

SYSTEM TEST CONFIGURATION.....6
 JUSTIFICATION6
 EUT EXERCISE SOFTWARE6
 SUPPORT EQUIPMENT LIST AND DETAILS6
 EXTERNAL I/O CABLE.....6
 BLOCK DIAGRAM OF RADIATION TEST SETUP7

SUMMARY OF TEST RESULTS10

TEST EQUIPMENT LIST11

§1.1307 (B) (3) &§2.1091 – RF EXPOSURE13

FCC§15.203 - ANTENNA REQUIREMENT.....14
 APPLICABLE STANDARD14
 ANTENNA CONNECTED CONSTRUCTION14

FCC §15.207 (A) - AC LINE CONDUCTED EMISSIONS15
 APPLICABLE STANDARD15
 TEST SYSTEM SETUP.....15
 EMI TEST RECEIVER SETUP.....15
 TEST PROCEDURE16
 TEST RESULTS SUMMARY16
 TEST DATA16

FCC§15.205, §15.209&§15.249 - RADIATED EMISSIONS & OUT OF BAND EMISSION.....19
 APPLICABLE STANDARD19
 TEST SYSTEM SETUP.....19
 EMI TEST RECEIVER SETUP.....22
 TEST PROCEDURE22
 TEST RESULTS SUMMARY23
 TEST DATA23

FCC §15.215(C) - 20 DB BANDWIDTH TESTING.....49
 APPLICABLE STANDARD49
 TEST PROCEDURE49
 TEST BLOCK49
 TEST DATA49

EUT PHOTOGRAPHS.....53

TEST SETUP PHOTOGRAPHS54

REPORT REVISION HISTORY

Number of Revisions	Report No.	Version	Issue Date	Description
0	RKSA231108001-00A	R1V1	2024-04-24	Initial Release

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant:	Ningbo Pdlux Electronic Technology CO.,LTD.
Tested Model:	PD-165
Product Name:	Microwave Sensor
Power Supply:	4.75~5.25V _{DC} (Typical: DC 5V)
RF Function:	SRD
Operating Band/Frequency:	24.034~24.216GHz
Maximum Field Strength of Fundamental:	100.61 dB μ V/m @3m
Modulation Type:	CW
Antenna Type:	Integrated patch antenna
★Maximum Antenna Gain:	6.33 dBi

Note: The maximum antenna gain is provided by the applicant.

All measurement and test data in this report was gathered from production sample serial number: RKSA231108001-1 (Assigned by the BACL (Kunshan). The EUT supplied by the applicant was received on 2023-11-08.)

Objective

This type approval report is prepared for *Ningbo Pdlux Electronic Technology CO.,LTD.* in accordance with Part 2-Subpart J, and Part 15-Subparts A and C of the Federal Communication Commission rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209, 15.249 and 15.215 rules.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

Measurement Uncertainty

Item		Uncertainty
AC Power Lines Conducted Emissions		3.19 dB
RF conducted test with spectrum		0.9dB
RF Output Power with Power meter		0.5dB
Radiated emission	9 kHz~150 kHz	3.8dB
	150 kHz~30 MHz	3.4dB
	30MHz~1GHz	6.11dB
	1GHz~6GHz	4.45dB
	6GHz~18GHz	5.23dB
	18GHz~40GHz	5.65dB
	40GHz ~50GHz	4.92dB
	50GHz ~75GHz	5.16dB
75GHz ~100GHz	5.64dB	
Occupied Bandwidth		0.5kHz
Temperature		1.0°C
Humidity		6%

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the No.248 Chenghu Road, Kunshan, Jiangsu Province, China.

Bay Area Compliance Laboratories Corp. (Kunshan) is accredited in accordance with ISO/IEC 17025:2017 by NVLAP (Lab code: 600338-0), and the lab has been recognized as the FCC accredited lab under the KDB 974614 D01, the FCC Designation No.: CN5055.

SYSTEM TEST CONFIGURATION

Justification

Operation Frequency Details:

Channel	Frequency (GHz)
0	24.034
1	24.130
2	24.216

EUT Exercise Software

No software was used during the test.

★Power Level: Default

Note: The power level is declared by the manufacturer.

Support Equipment List and Details

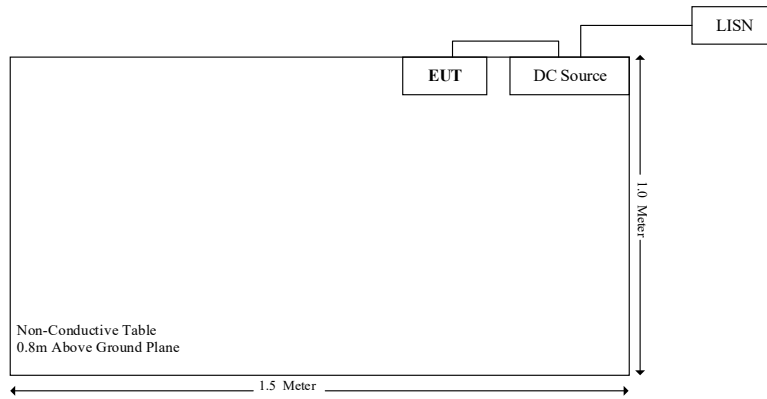
Manufacturer	Description	Model	Serial Number
ZHAOXIN	DC Source	RXN-605D	21R605D0531062

External I/O Cable

Cable Description	Length (m)	From Port	To Port
Power Cable	2.0	EUT	DC Source

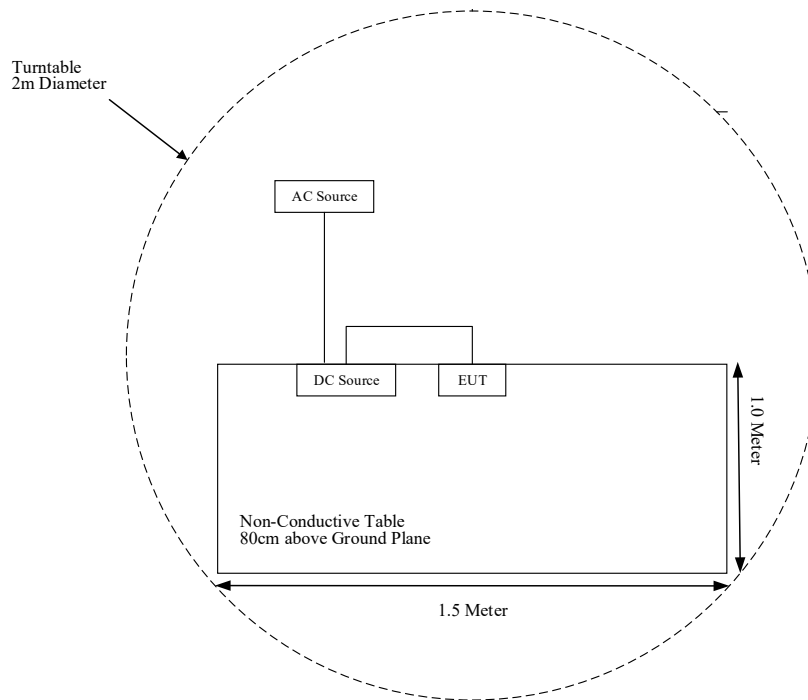
Block Diagram of Radiation Test Setup

For Conducted Emissions:

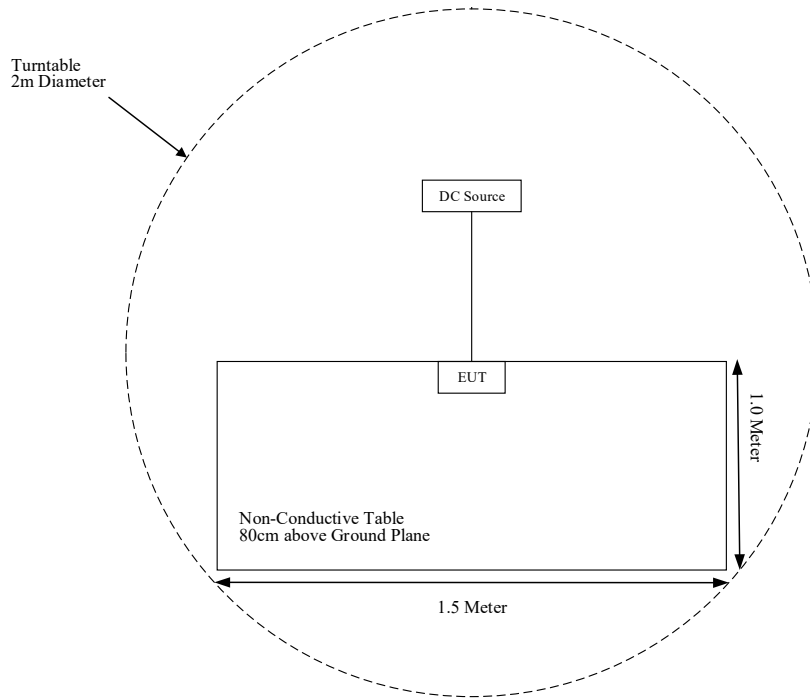


For Radiated Emissions

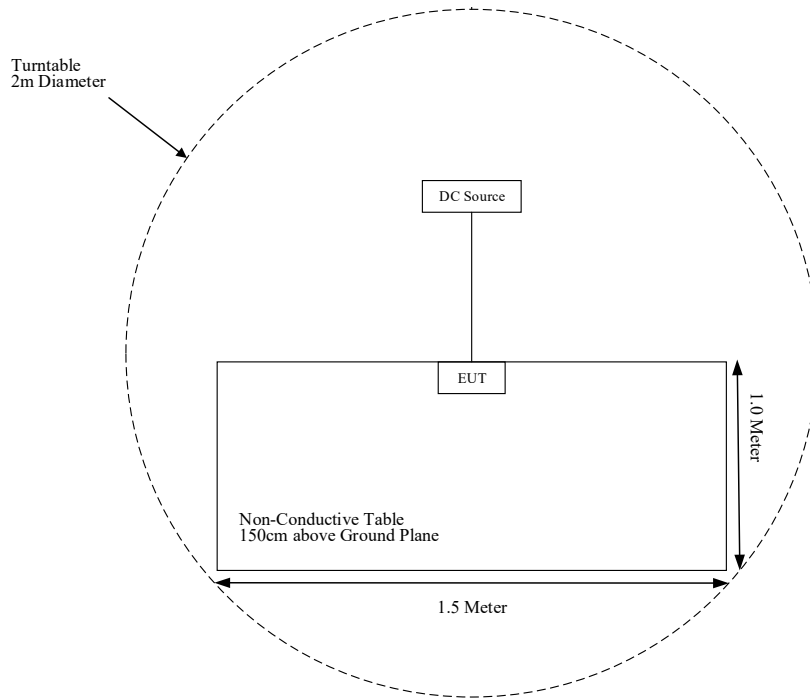
9kHz~30MHz:



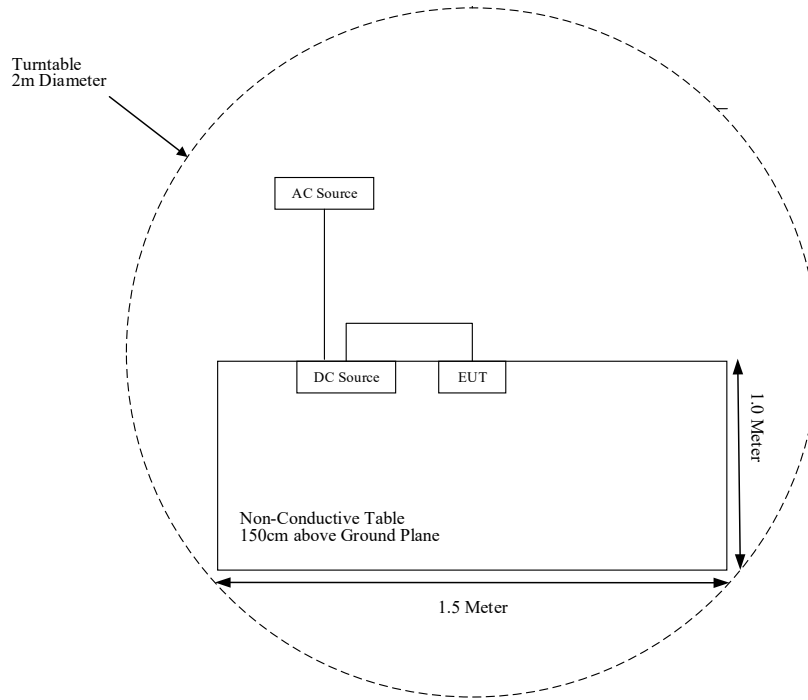
30MHz~1GHz:



1GHz~40GHz:



40 GHz~100 GHz:



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliant
§15.207(a)	AC Line Conducted Emissions	Compliant
15.205, §15.209, §15.249	Radiated Emissions & Out of Band Emission	Compliant
§15.215 (c)	20 dB Bandwidth	Compliant
§1.1307 (b)(3) & §2.1091	RF Exposure	Compliant

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test (Chamber #1)					
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2023-05-23	2024-05-22
Sunol Sciences	Hybrid Antenna	JB3	A090314-1	2023-11-11	2024-11-10
Narda	6dB Attenuator	773-6	10690812-2-1	2023-11-11	2024-11-10
Sonoma Instrument	Amplifier	310N	171205	2023-05-23	2024-05-22
MICRO-COAX	Coaxial Cable	Cable-8	008	2023-05-23	2024-05-22
MICRO-COAX	Coaxial Cable	Cable-9	009	2023-05-23	2024-05-22
MICRO-COAX	Coaxial Cable	Cable-10	010	2023-05-23	2024-05-22
Rohde & Schwarz	Test Software	EMC32	100361	N/A	N/A
Radiated Emission Test (Chamber #2)					
Rohde & Schwarz	EMI Test Receiver	ESU40	100207/040	2023-05-19	2024-05-18
HP	Spectrum Analyzer	8565E	3442A0253	2023-10-25	2024-10-24
Electro-Mechanics	Horn Antenna	3115	9207-3900	2023-06-27	2024-06-26
A.H.Systems, inc	Amplifier	PAM-0118P	512	2023-05-23	2024-05-22
SELECTOR	Amplifier	EM18G40G	060726	2023-05-23	2024-05-22
ETS-LINDGREN	Horn Antenna	3116	2516	2023-12-08	2024-12-07
FMI	Horn Antenna	24245-AB	51	2023-05-23	2024-05-22
HP	Harmonic Mixer	11970U	2332A00837	2023-05-06	2024-05-05
SAGE	WR-15 Rectangular Gain Horn	SAR-2408-15-S2	13563-08	2023-05-06	2024-05-05
HP	Harmonic Mixer	11970V	611	2023-05-06	2024-05-05
SAGE	Horn Antenna	SAR-2309-10-S2	15633-04	2023-05-06	2024-05-05
HP	Harmonic Mixer	11970W	2521A00535	2023-05-06	2024-05-05
Narda	Attenuator	10dB	010	2023-05-23	2024-05-22
Rohde & Schwarz	Auto test Software	EMC32	100361	N/A	N/A
MICRO-COAX	Coaxial Cable	Cable-6	006	2023-05-23	2024-05-22
MICRO-COAX	Coaxial Cable	Cable-11	011	2023-05-23	2024-05-22
MICRO-COAX	Coaxial Cable	Cable-12	012	2023-05-23	2024-05-22
MICRO-COAX	Coaxial Cable	Cable-13	013	2023-05-23	2024-05-22

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted Emission Test					
Rohde & Schwarz	EMI Test Receiver	ESR3	101746	2023-05-23	2024-05-22
ROHDE&SCHWARZ	LISN	ENV216	101115	2023-05-23	2024-05-22
Rohde & Schwarz	Pulse Limiter	ESH3-Z2	0357.8810.5 4	2023-05-23	2024-05-22
MICRO-COAX	Coaxial Cable	Cable-15	015	2023-05-23	2024-05-22
Audix	Test Software	e3	V9	N/A	N/A

Statement of Traceability: Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

§1.1307 (b) (3) & §2.1091 – RF EXPOSURE

Applicable Standard

According to subpart 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

According to KDB 447498 D04 Interim General RF Exposure Guidance

MPE-Based Exemption:

General frequency and separation-distance dependent MPE-based effective radiated power(ERP) thresholds are in Table B.1 [Table 1 of § 1.1307(b)(1)(i)(C)] to support an exemption from further evaluation from 300 kHz through 100 GHz.

Table 1 to § 1.1307(b)(3)(i)(C) - Single RF Sources Subject to Routine Environmental Evaluation

RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	$1,920 R^2$.
1.34-30	$3,450 R^2/f^2$.
30-300	$3.83 R^2$.
300-1,500	$0.0128 R^2f$.
1,500-100,000	$19.2R^2$.

R is the minimum separation distance in meters
 f = frequency in MHz

Result

Frequency (MHz)	★Tune up EIRP (dBm)	ERP		Evaluation Distance (m)	ERP Limit (W)
		(dBm)	(W)		
24034~24216	6.0	3.85	0.0024	0.2	0.768

Note:

1. This device maximum E-Field level is 100.61dBμV/m at 3m, so the EIRP power is 5.41 dBm,
2. EIRP(dBm)=Field Strength of Fundamental(dBuV/m)-95.2
3. The Tune-up power provided by manufacturer

To maintain compliance with the FCC’s RF exposure guidelines, place the equipment at least 20cm from nearby persons.

Result: Compliance

FCC§15.203 - ANTENNA REQUIREMENT

Applicable Standard

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.

Antenna Connected Construction

The EUT has a transmit antenna and a receive antenna which permanently attached to EUT and the antenna gain are 6.33 dBi; fulfill the requirement of this section. Please refer to EUT photos.

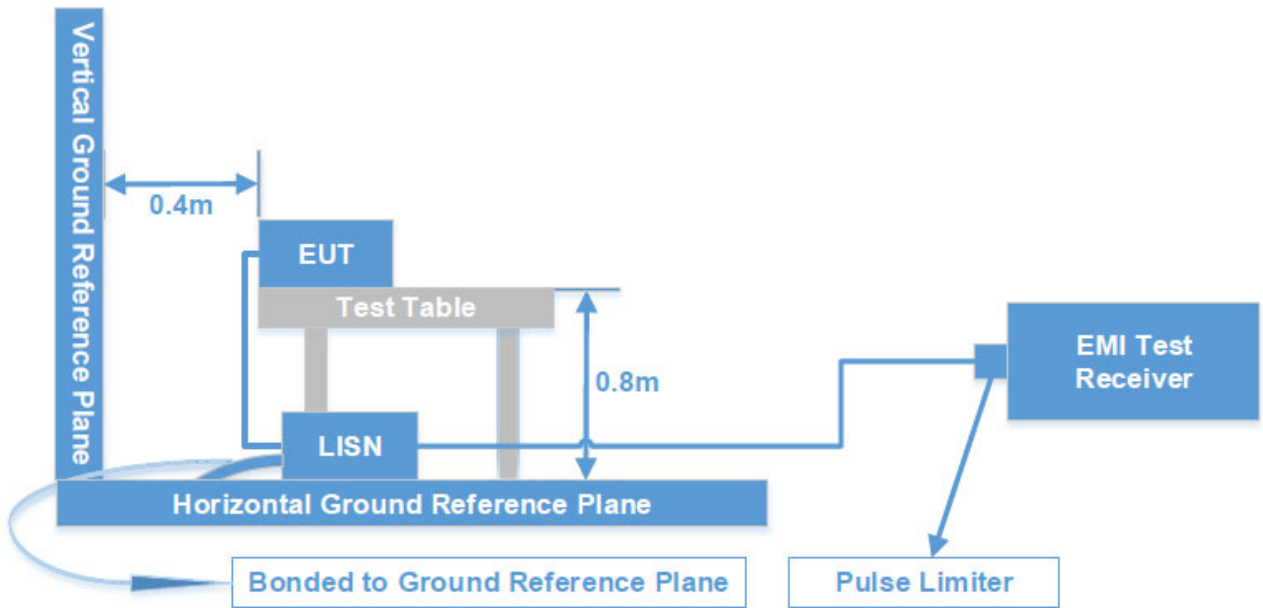
Result: Compliant.

FCC §15.207 (a) - AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC §15.207(a)

Test System Setup



The measurement procedure of EUT setup is according with ANSI C63.10-2013. The related limit was specified in FCC Part 15.207.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	RBW	VBW
150 kHz - 30 MHz	9 kHz	30 kHz

Test Procedure

ANSI C63.10-2013 clause 6.2

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

If the maximum peak value of the emissions is below the average limit, the QP value and average value measurement will not need to be performed and only record the maximum peak measured value to meet the requirements.

Level & Over Limit Calculation

The Level is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation from the Meter Reading. The basic equation is as follows:

$$\text{Factor (dB)} = \text{LISN VDF (dB)} + \text{Cable Loss (dB)} + \text{Transient Limiter Attenuation (dB)}$$

$$\text{Level (dB}\mu\text{V)} = \text{Read level (dB}\mu\text{V)} + \text{Factor (dB)}$$

The “**Over Limit**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, an Over Limit of 7 dB means the emission is 7 dB above the limit. The equation for Over Limit calculation is as follows:

$$\text{Over Limit (dB)} = \text{Level (dB}\mu\text{V)} - \text{Limit (dB}\mu\text{V)}$$

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Title 47, FCC Part 15.207.

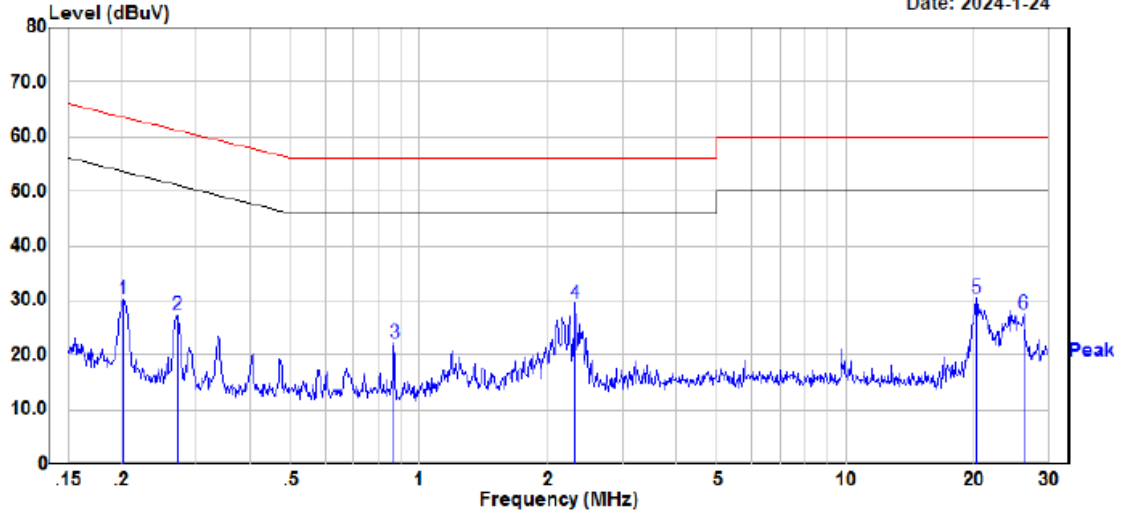
Test Data

Environmental Conditions & Test Information

Temperature:	20.5 °C
Relative Humidity:	40 %
ATM Pressure:	102.7 kPa
Test Date:	2024-01-24
Test Engineer:	Aaron Sun

Test Mode: Transmitting in High channel
AC 120V/60 Hz, Line

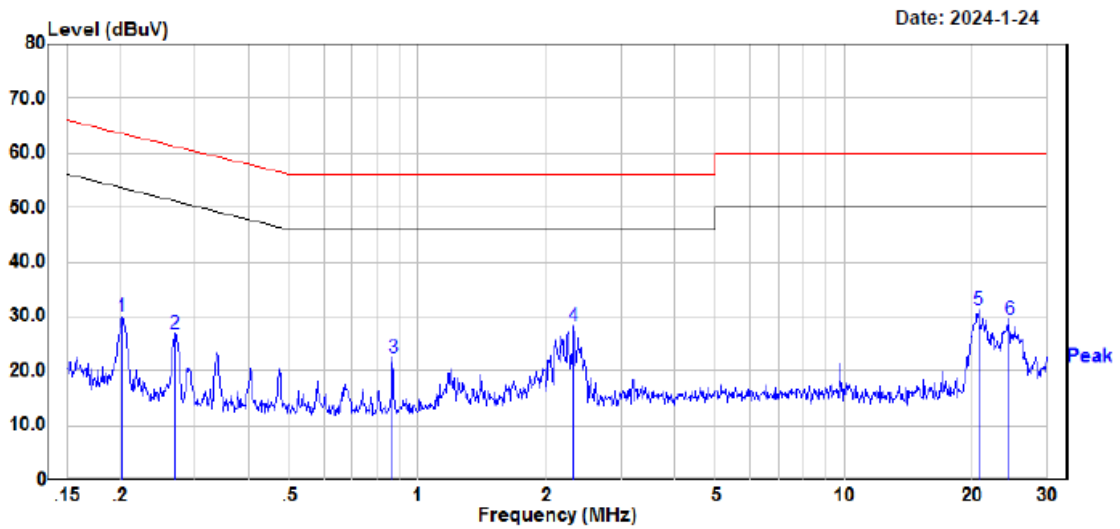
Date: 2024-1-24



Site : CE
 Condition : FCC Part 15.207
 : DET:Peak
 Model : PD-165
 Phase : L
 Voltage : 120V/60Hz
 Mode : Transmitting
 Test Equipment : ENV216,ESR
 Temperature : 20.5°C
 Humidity : 40%
 Atmospheric pressure: 102.7kPa
 Test Engineer : Aaron Sun

	Read Freq	Read Level	Factor	Limit Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.202	10.31	19.95	30.26	63.52	-33.26	Peak
2	0.270	7.21	19.99	27.20	61.11	-33.91	Peak
3	0.871	2.43	19.87	22.30	56.00	-33.70	Peak
4	2.315	9.37	20.22	29.59	56.00	-26.41	Peak
5	20.235	10.71	19.83	30.54	60.00	-29.46	Peak
6	26.092	7.51	19.97	27.48	60.00	-32.52	Peak

AC 120V/60 Hz, Neutral



Site : CE
 Condition : FCC Part 15.207
 : DET:Peak
 Model : PD-165
 Phase : N
 Voltage : 120V/60Hz
 Mode : Transmitting
 Test Equipment : ENV216,ESR
 Temperature : 20.5°C
 Humidity : 40%
 Atmospheric pressure: 102.7kPa
 Test Engineer : Aaron Sun

	Read Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.202	10.12	19.95	30.07	63.52	-33.45	Peak
2	0.269	6.73	19.99	26.72	61.16	-34.44	Peak
3	0.871	2.56	19.87	22.43	56.00	-33.57	Peak
4	2.315	7.96	20.22	28.18	56.00	-27.82	Peak
5	20.643	11.36	19.84	31.20	60.00	-28.80	Peak
6	24.455	9.46	19.94	29.40	60.00	-30.60	Peak

FCC§15.205, §15.209&§15.249 - RADIATED EMISSIONS & OUT OF BAND EMISSION

Applicable Standard

As per FCC§15.249 (a), except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

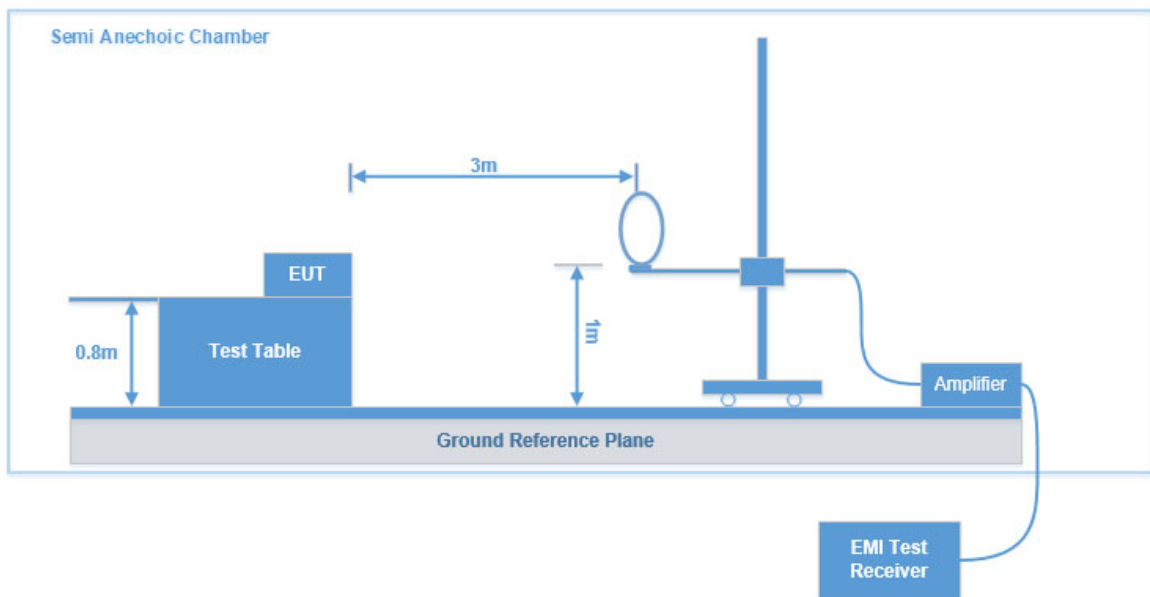
Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902–928 MHz	50	500
2400–2483.5 MHz	50	500
5725–5875 MHz	50	500
24GHz-24.25GHz	250	2500

As per FCC§15.249 (c), Field strength limits are specified at a distance of 3 meters.

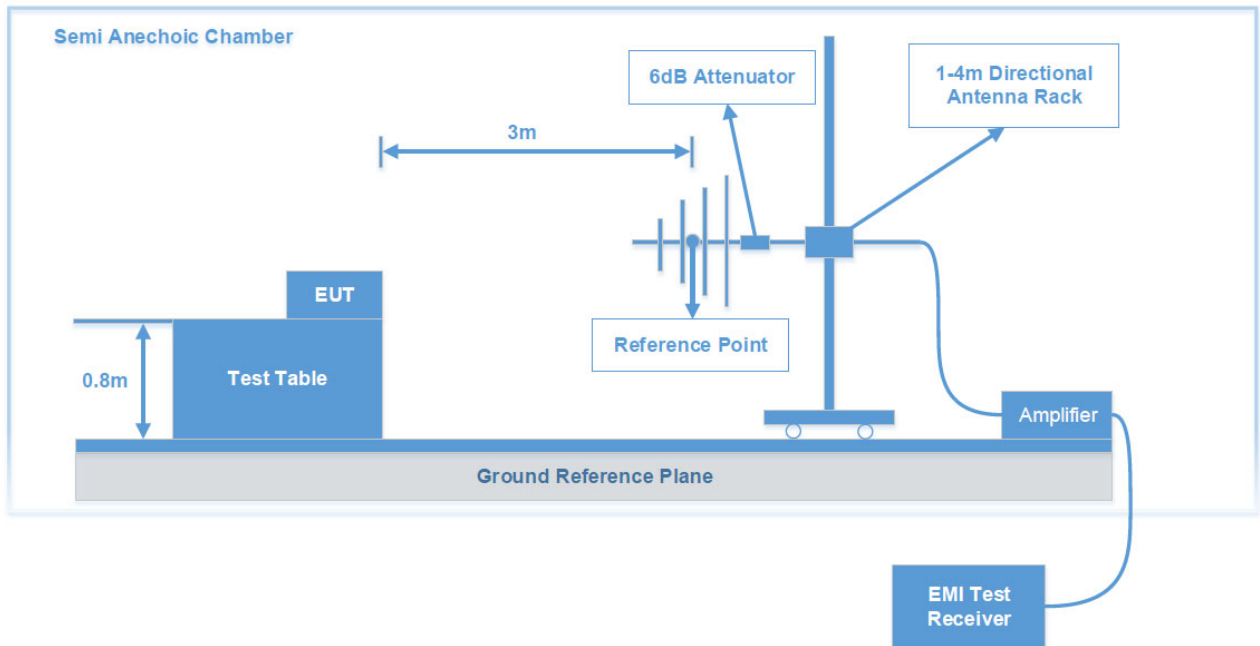
(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

Test System Setup

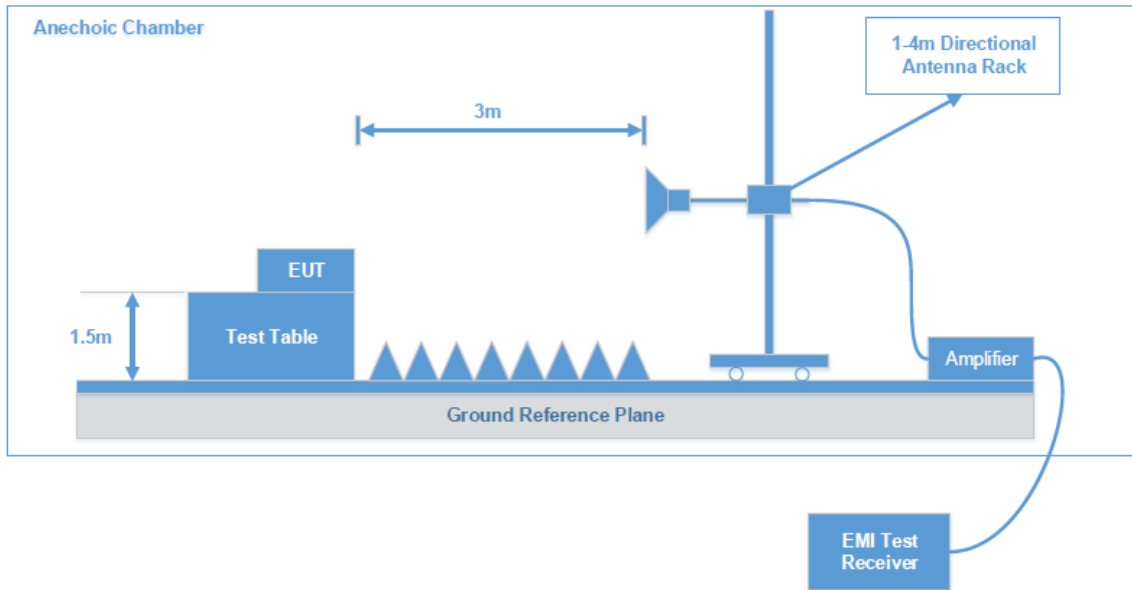
9 kHz~30MHz:



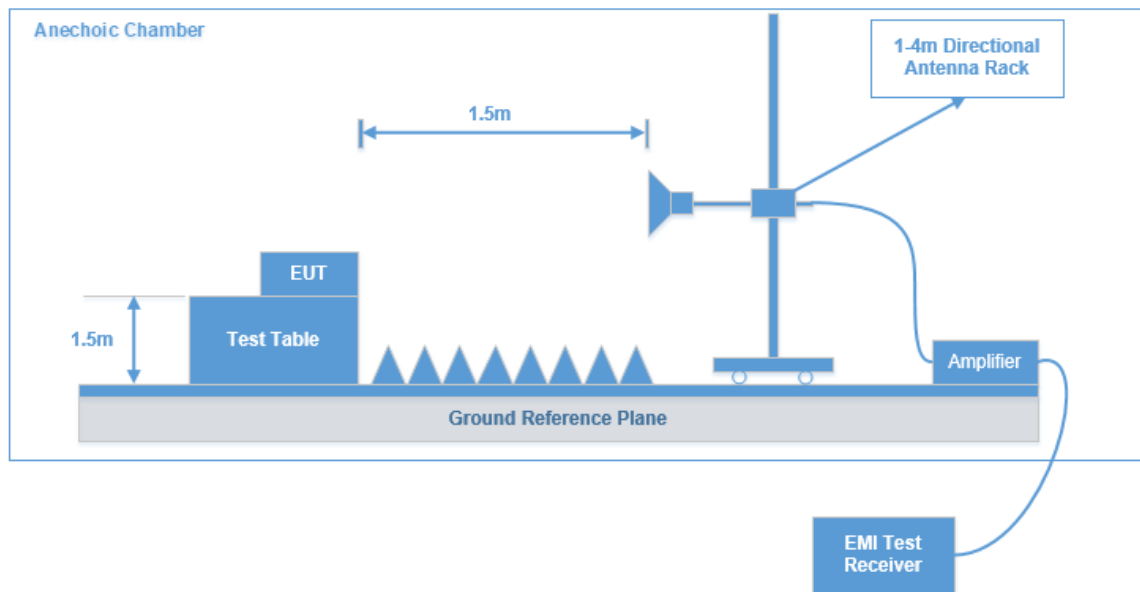
30MHz~1GHz:



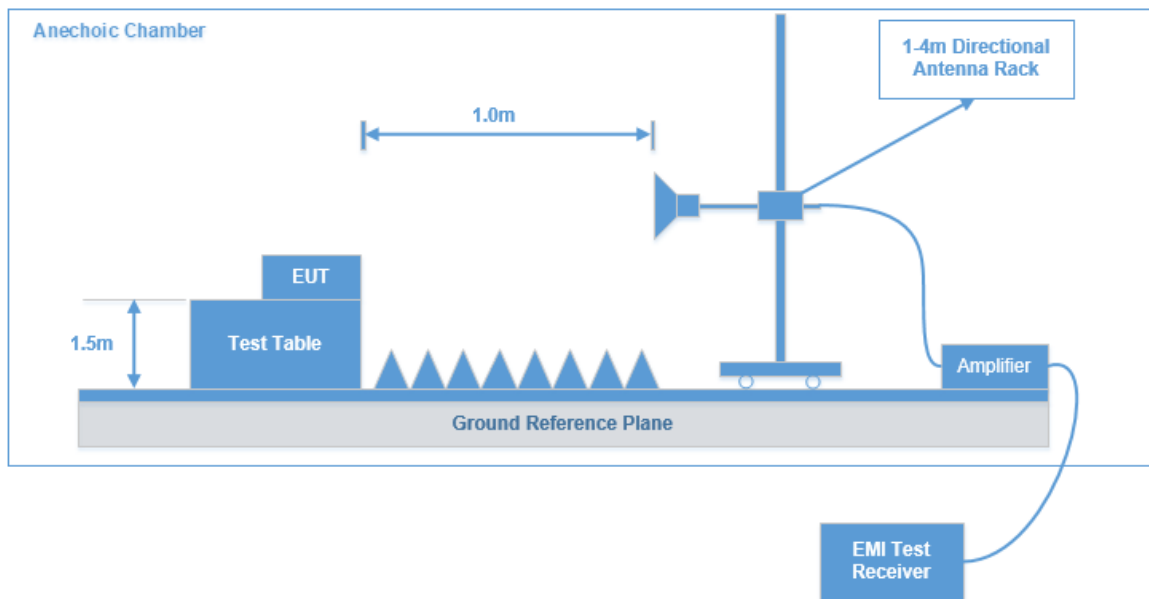
1-18 GHz:



18-40 GHz:



40-100 GHz:



The radiated emission and out of band emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209/15.205 and FCC 15.249 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

For 9kHz-30MHz test, the lowest height of the magnetic antenna shall be 1 m above the ground and three antenna orientations (parallel, perpendicular, and ground-parallel) shall be measured.

EMI Test Receiver Setup

The system was investigated from 9 kHz to 100GHz.

During the radiated emission test, the EMI test Receiver was set with the following configurations:

Frequency Range	RBW	VBW	IF B/W	Detector
9 kHz - 150 kHz	200 Hz	1 kHz	200 Hz	QP/Average
150 kHz - 30 MHz	9 kHz	30 kHz	9 kHz	QP/ Average
30 MHz - 1000 MHz	100 kHz	300 kHz	/	Peak
	/	/	120 kHz	QP
Above 1GHz	1MHz	3 MHz	/	Peak
	1MHz	3 MHz	/	Average

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

If the measured peak level of the emissions that the measuring receiver reading level plus corrected factor is at least 6 dB below the QP emission limit, there's no need to record the measured QP level of the emissions in the report.

Data was recorded in Quasi-peak detection mode for frequency range of 9 kHz-1 GHz except 9–90 kHz, 110–490 kHz, employing an average detector, peak and Average detection modes for frequencies above 1GHz.

According to the requirement of ANSI C63.10-2013, the 18-100GHz test result shall be extrapolated to the specified distance using an extrapolation factor of 20dB/decade from 3m to 1.5m, 1m.

For 18-40GHz, Distance extrapolation factor =20 log (specific distance [3m]/test distance [1.5m]) dB-6.00dB

For 40-100GHz, Distance extrapolation factor =20 log (specific distance [3m]/test distance [1m]) dB-9.54dB

In addition, for above 40GHz, external harmonic mixers are utilized. The antenna is scanned around the entire perimeter surface of the EUT, in both horizontal and vertical polarizations. The mixers and it's RF cables is compose a system for calibration, the conversion factor was added into the test Spectrum Analyzer in testing.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Corrected Amplitude (dB}\mu\text{V/m)} = \text{Meter Reading (dB}\mu\text{V)} + \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} - \text{Amplifier Gain (dB)}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin (dB)} = \text{Limit (dB}\mu\text{V/m)} - \text{Corrected Amplitude (dB}\mu\text{V/m)}$$

Test Results Summary

According to the data in the following table, the EUT complied with the FCC Part 15.209 &15.205 & 15.249.

Test Data

Environmental Conditions & Test Information

Frequency Range:	Below 1 GHz	Above 1 GHz
Temperature:	16.8 °C	20.3 °C~22.5°C
Relative Humidity:	46 %	40%~52 %
ATM Pressure:	102.9 kPa	101.5 kPa~102.5 kPa
Test Date:	2024-01-23	2024-01-22~2024-04-24
Test Engineer:	Joe Zhang	Peter Wang

Test mode: Transmitting

After pre-scan in the X, Y and Z axes of orientation, the worst case in the Y axes of orientation is below:

9 kHz-30 MHz: Transmitting in High channel

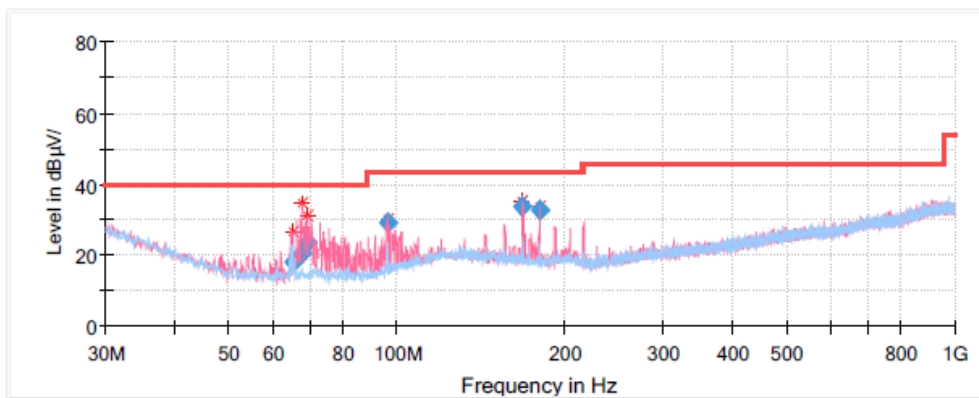
The amplitude of spurious emissions attenuated more than 20 dB below the limit was not be recorded.

30MHz-1GHz:

Low Channel: 24034 MHz

Common Information

Project No:	RKSA231108001
EUT Model:	PD-165
Test Mode:	Transmitting
Standard:	FCC Part 15.249
Test Equipment:	ESCI, JB3, 310N
Temperature:	16.8°C
Humidity:	46%
Barometric Pressure:	102.9kPa
Test Engineer:	Joe Zhang
Test Date:	2024/1/23



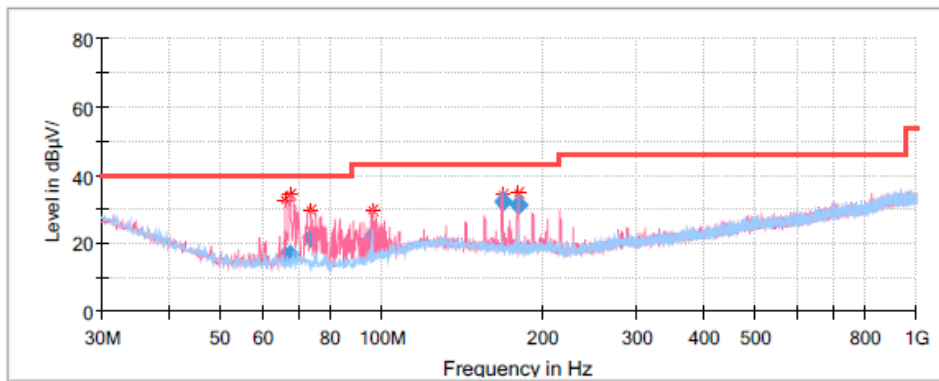
Final Result

Frequency (MHz)	Corrected Amplitude Quasi Peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
64.920000	18.18	40.00	21.82	100.0	V	102.0	-17.1
67.460000	20.55	40.00	19.45	100.0	V	127.0	-16.9
69.040000	23.77	40.00	16.23	100.0	V	146.0	-16.8
95.960000	29.22	43.50	14.28	100.0	V	242.0	-15.7
167.980000	33.57	43.50	9.93	100.0	V	76.0	-12.8
179.980000	32.65	43.50	10.85	100.0	V	205.0	-13.3

Middle Channel: 24130 MHz

Common Information

Project No: RKSA231108001
 EUT Model: PD-165
 Test Mode: Transmitting
 Standard: FCC Part 15.249
 Test Equipment: ESCI, JB3, 310N
 Temperature: 16.8°C
 Humidity: 46%
 Barometric Pressure: 102.9kPa
 Test Engineer: Joe Zhang
 Test Date: 2024/1/23



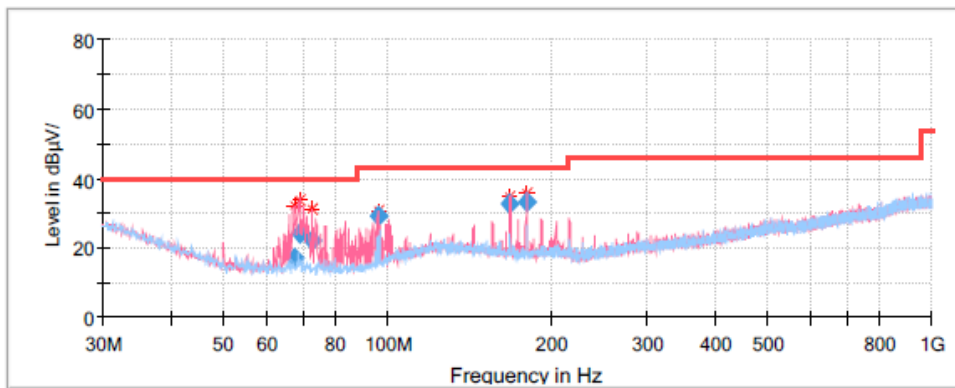
Final Result

Frequency (MHz)	Corrected Amplitude Quasi Peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
66.130000	16.13	40.00	23.87	100.0	V	99.0	-17.1
67.460000	16.82	40.00	23.18	100.0	V	99.0	-16.9
73.890000	21.81	40.00	18.19	100.0	V	0.0	-17.1
96.200000	22.10	43.50	21.40	100.0	V	0.0	-15.4
168.220000	32.40	43.50	11.10	100.0	V	211.0	-12.8
179.860000	31.18	43.50	12.32	100.0	V	54.0	-13.3

High Channel: 24216 MHz

Common Information

Project No: RKSA231108001
 EUT Model: PD-165
 Test Mode: Transmitting
 Standard: FCC Part 15.249
 Test Equipment: ESCI, JB3, 310N
 Temperature: 16.8°C
 Humidity: 46%
 Barometric Pressure: 102.9kPa
 Test Engineer: Joe Zhang
 Test Date: 2024/1/23



Final Result

Frequency (MHz)	Corrected Amplitude Quasi Peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
67.580000	17.24	40.00	22.76	199.0	V	125.0	-17.0
68.920000	24.03	40.00	15.97	100.0	V	34.0	-16.9
72.680000	22.08	40.00	17.92	100.0	V	183.0	-16.9
96.080000	29.29	43.50	14.21	100.0	V	199.0	-15.7
168.100000	32.60	43.50	10.90	100.0	V	88.0	-12.8
179.860000	33.45	43.50	10.05	100.0	V	219.0	-13.3

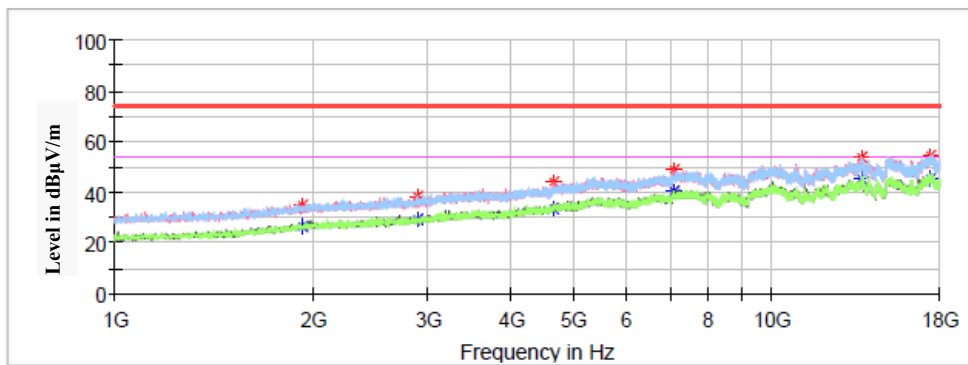
1GHz-18GHz

Low Channel: 24034 MHz

Common Information

Project No.: RKSA231108001
 EUT Model: PD-165
 Test Mode: Low Channel
 Standard: FCC Part 15.249
 Test Equipment: ESU40、3115、PAM-0118P
 Temperature: 20.3℃
 Humidity: 52%
 Atmospheric pressure: 101.5KPa
 Test Engineer: Peter Wang
 Test Date: 2024/01/22

Full Spectrum



Critical Freqs

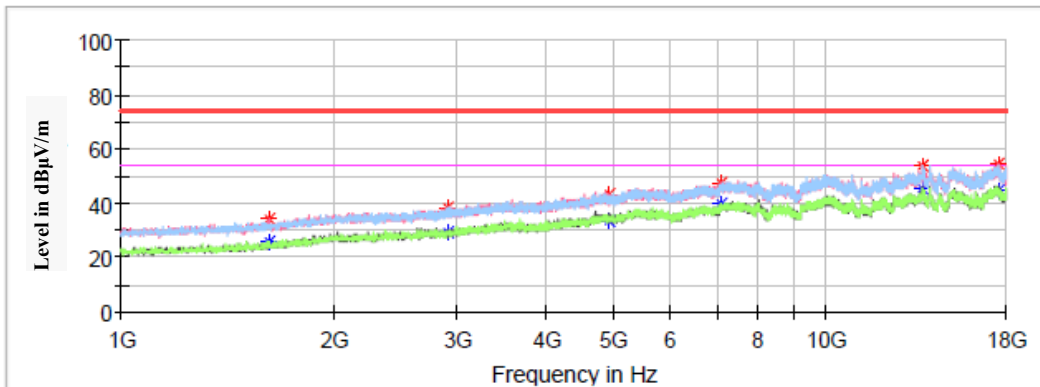
Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
1931.600000	---	26.36	54.00	27.64	V	-11.0
1931.600000	35.21	---	74.00	38.79	V	-11.0
2880.200000	---	29.05	54.00	24.95	H	-8.4
2880.200000	38.40	---	74.00	35.60	H	-8.4
4663.500000	---	33.50	54.00	20.50	H	-3.0
4663.500000	44.17	---	74.00	29.83	H	-3.0
7114.900000	---	40.49	54.00	13.51	V	3.9
7114.900000	49.09	---	74.00	24.91	V	3.9
13731.300000	---	45.44	54.00	8.56	V	10.8
13731.300000	53.58	---	74.00	20.42	V	10.8
17498.500000	---	45.23	54.00	8.77	H	13.6
17498.500000	54.26	---	74.00	19.74	H	13.6

Middle Channel: 24130 MHz

Common Information

Project No.: RKSA231108001
 EUT Model: PD-165
 Test Mode: Middle Channel
 Standard: FCC Part 15.249
 Test Equipment: ESU40、3115、PAM-0118P
 Temperature: 20.3℃
 Humidity: 52%
 Atmospheric pressure: 101.5KPa
 Test Engineer: Peter Wang
 Test Date: 2024/01/22

Full Spectrum



Critical Freqs

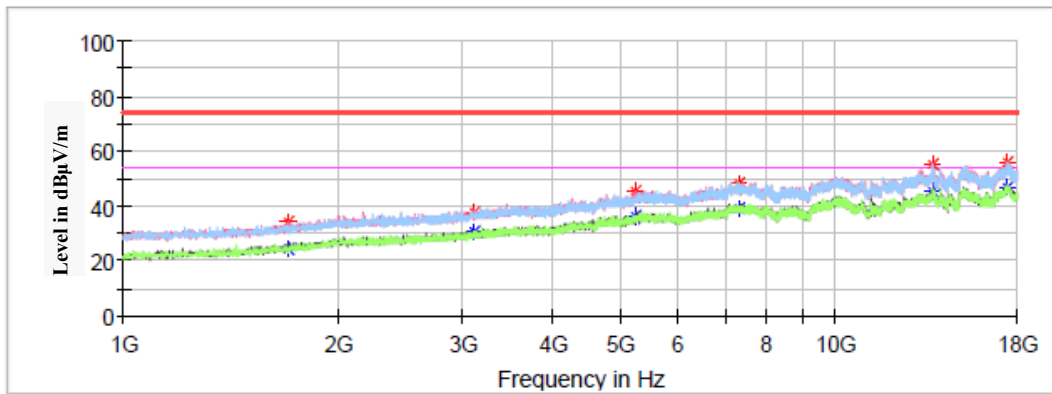
Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
1618.800000	---	25.74	54.00	28.26	H	-13.1
1618.800000	33.93	---	74.00	40.07	H	-13.1
2897.200000	38.80	---	74.00	35.20	H	-8.4
2897.200000	---	29.63	54.00	24.37	H	-8.4
4921.900000	---	33.62	54.00	20.38	V	-1.6
4921.900000	43.52	---	74.00	30.48	V	-1.6
7080.900000	---	39.93	54.00	14.07	V	3.9
7080.900000	47.62	---	74.00	26.38	V	3.9
13688.800000	---	45.47	54.00	8.53	V	10.8
13688.800000	53.78	---	74.00	20.22	V	10.8
17535.900000	---	44.55	54.00	9.45	V	13.5
17535.900000	54.50	---	74.00	19.50	V	13.5

High Channel: 24216 MHz

Common Information

Project No.: RKSA231108001
 EUT Model: PD-165
 Test Mode: High Channel
 Standard: FCC Part 15.249
 Test Equipment: ESU40、3115、PAM - 0118P
 Temperature: 20.3°C
 Humidity: 52%
 Atmospheric pressure: 101.5KPa
 Test Engineer: Peter Wang
 Test Date: 2024/01/22

Full Spectrum

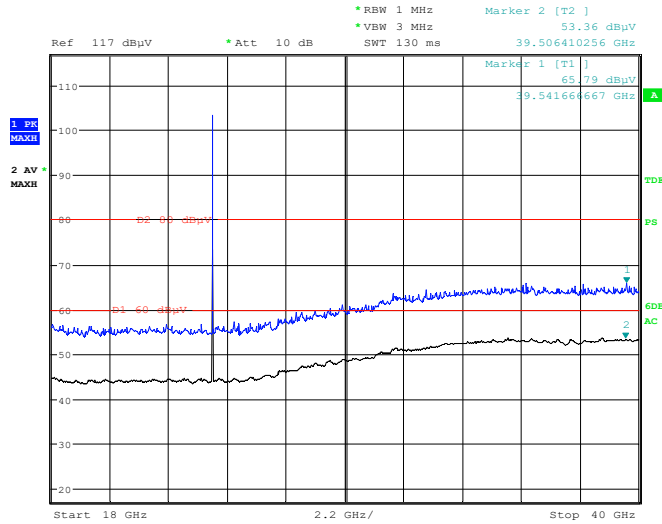


Critical Freqs

Frequency (MHz)	MaxPeak (dB µ V/m)	Average (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
1708.900000	---	24.23	54.00	29.77	H	-12.5
1708.900000	34.53	---	74.00	39.47	H	-12.5
3114.800000	---	30.51	54.00	23.49	V	-7.6
3114.800000	37.96	---	74.00	36.04	V	-7.6
5253.400000	---	36.10	54.00	17.90	V	-0.2
5253.400000	45.68	---	74.00	28.32	V	-0.2
7313.800000	---	38.91	54.00	15.09	H	4.0
7313.800000	48.38	---	74.00	25.62	H	4.0
13721.10000	---	45.53	54.00	8.47	H	10.8
13721.10000	55.18	---	74.00	18.82	H	10.8
17457.70000	---	46.62	54.00	7.38	V	13.5
17457.70000	55.77	---	74.00	18.23	V	13.5

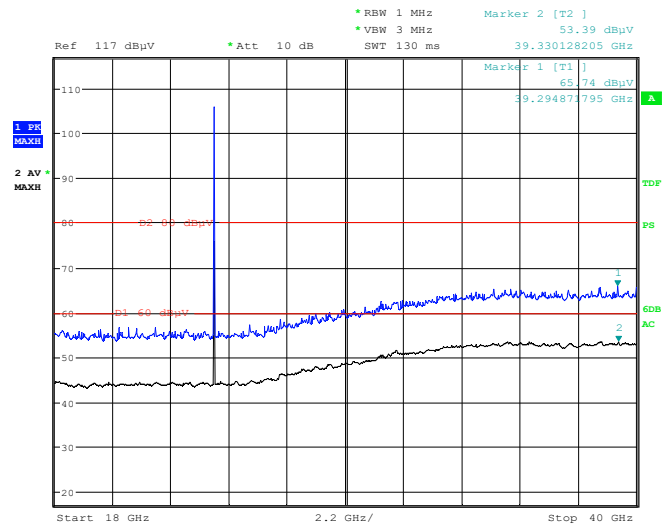
18GHz-40GHz:

Low Channel: 24034 MHz
Horizontal



Project No.: RKSA231108001 Tester: Peter Wang
 Date: 24.APR.2024 21:31:19

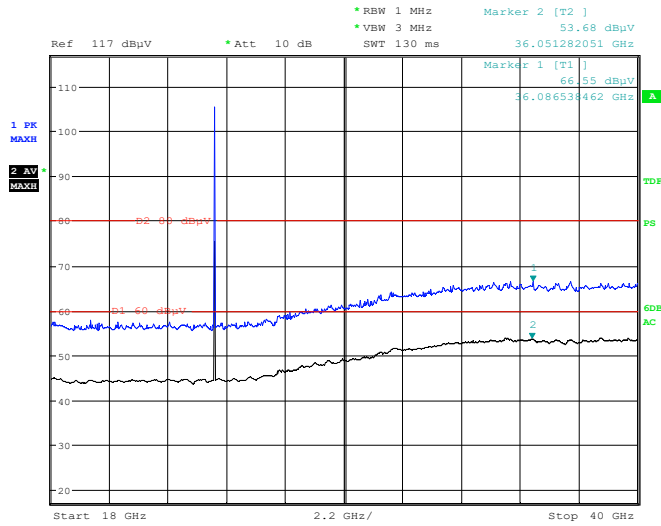
Vertical



Project No.: RKSA231108001 Tester: Peter Wang
 Date: 24.APR.2024 21:46:46

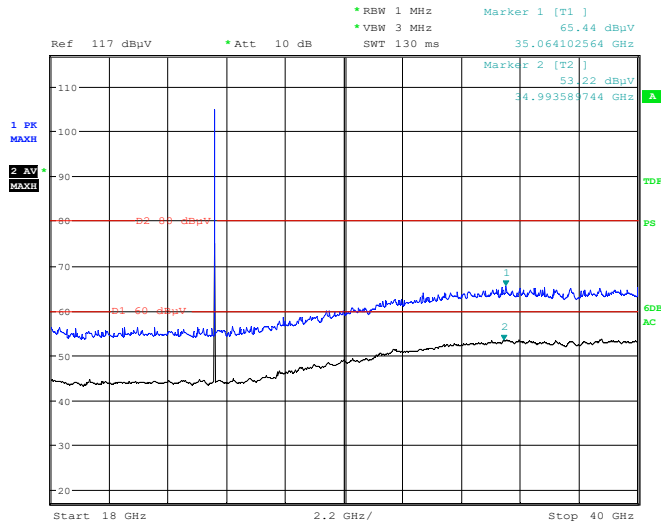
Note: The test distance is 1.5m. The limit is 80dBμV/m(Peak) and 60dBμV/m(Average).

Middle Channel: 24130 MHz Horizontal



Project No.: RKSA231108001 Tester: Peter Wang
Date: 24.APR.2024 20:29:22

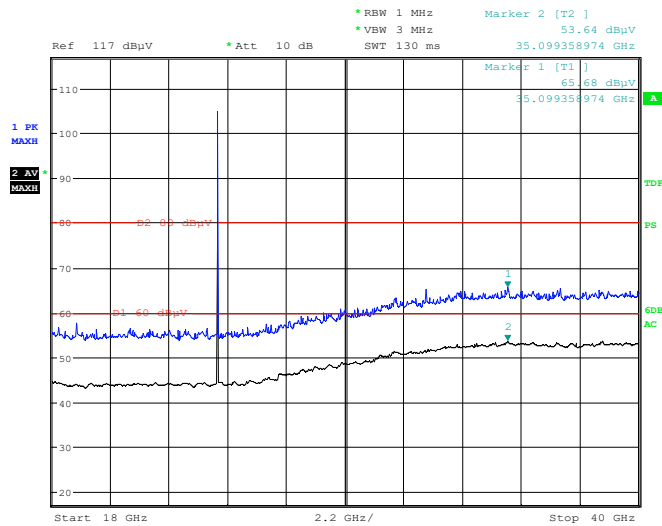
Vertical



Project No.: RKSA231108001 Tester: Peter Wang
Date: 24.APR.2024 20:45:45

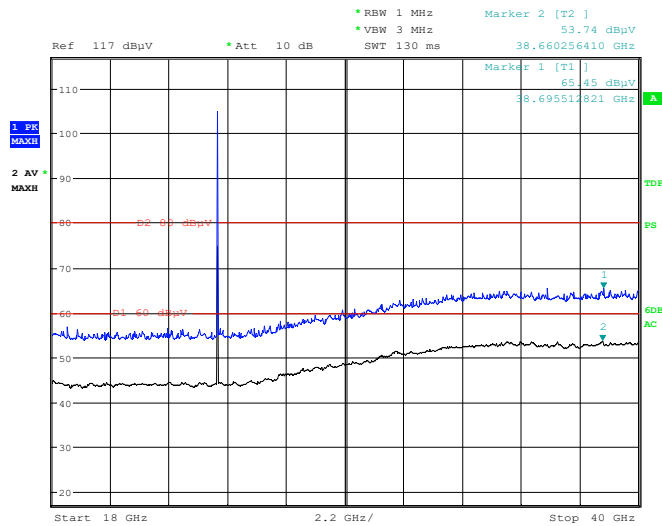
Note: The test distance is 1.5m. The limit is 80dBμV/m(Peak) and 60dBμV/m(Average).

High Channel: 24216 MHz Horizontal



Project No.: RKSA231108001 Tester: Peter Wang
Date: 24.APR.2024 21:00:06

Vertical

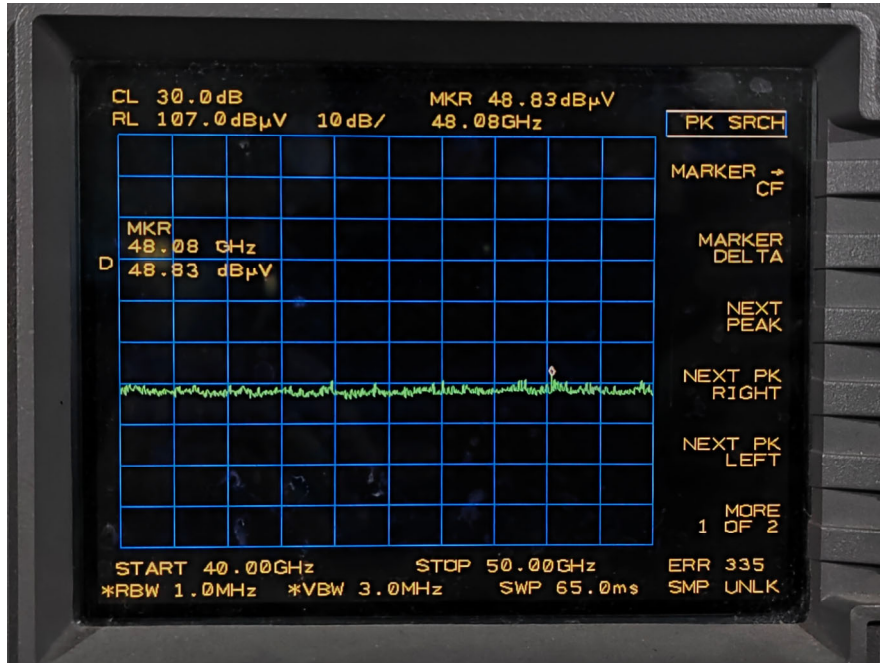


Project No.: RKSA231108001 Tester: Peter Wang
Date: 24.APR.2024 21:15:50

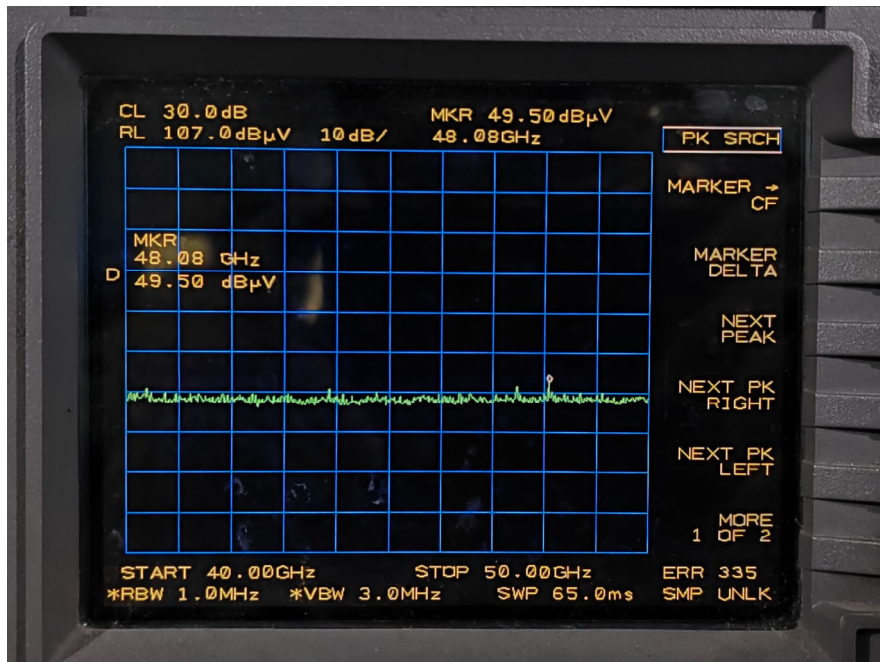
Note: The test distance is 1.5m. The limit is 80dBμV/m(Peak) and 60dBμV/m(Average).

40GHz-50GHz:

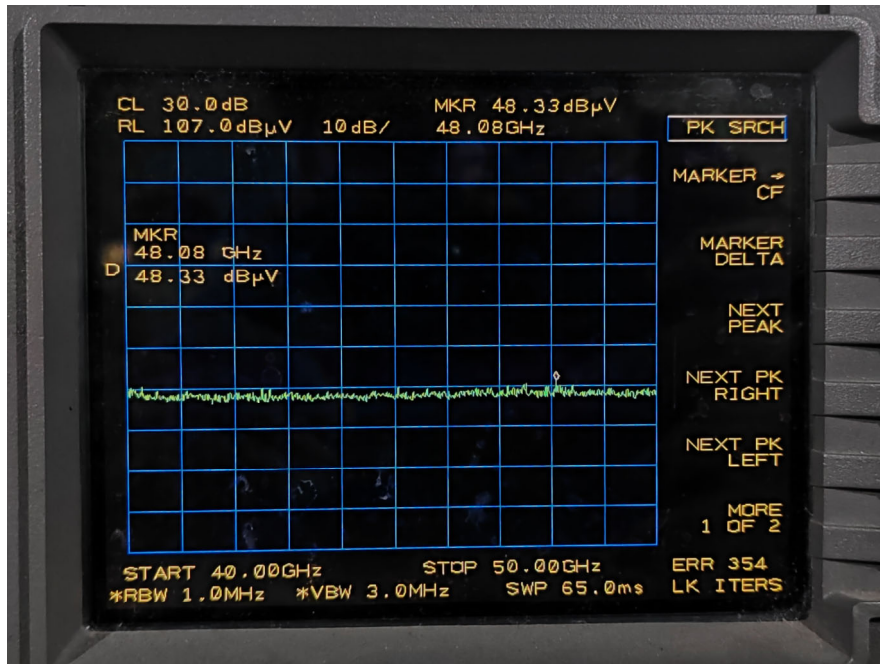
Low Channel: 24034 MHz
Horizontal



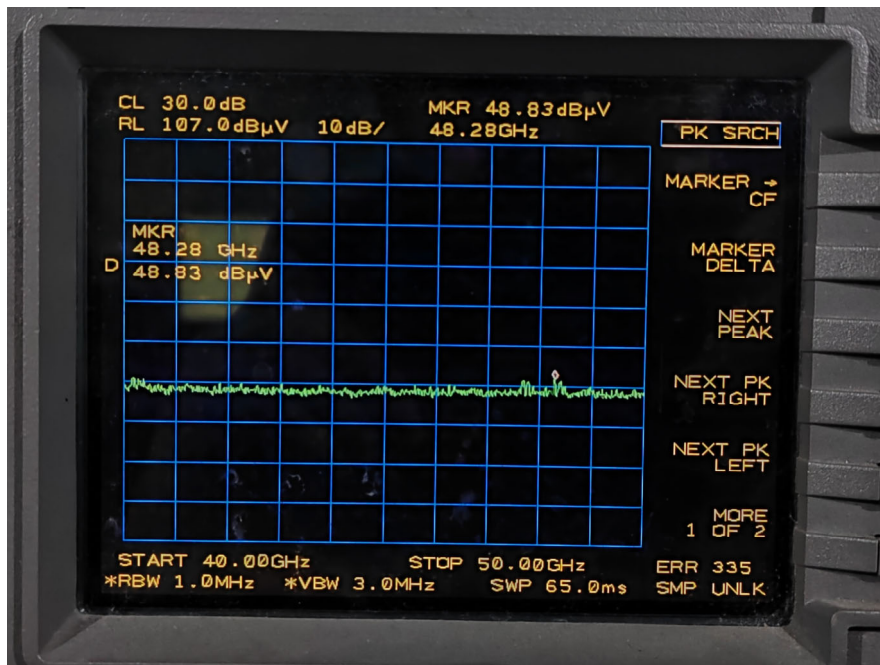
Vertical



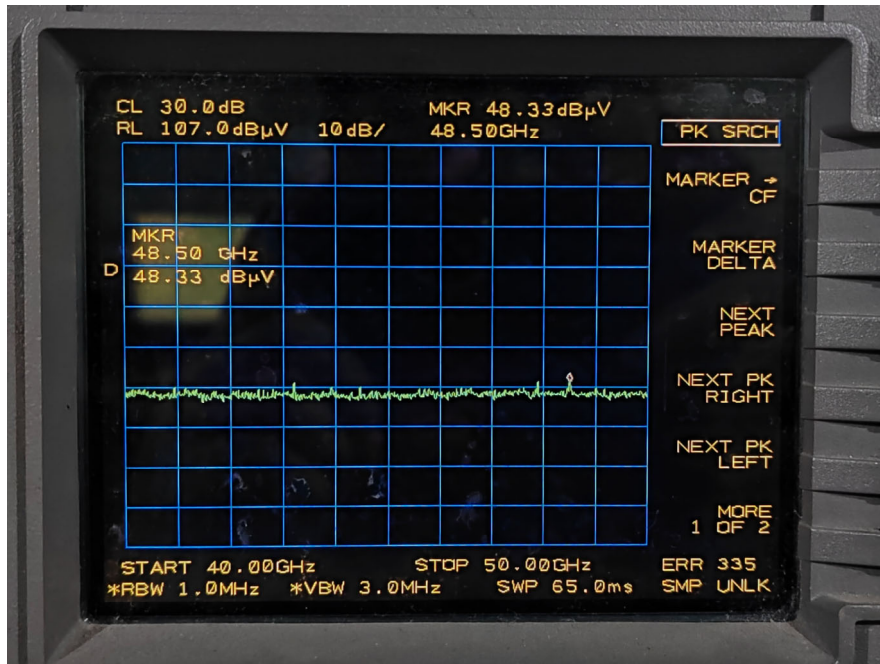
Middle Channel: 24130 MHz
Horizontal



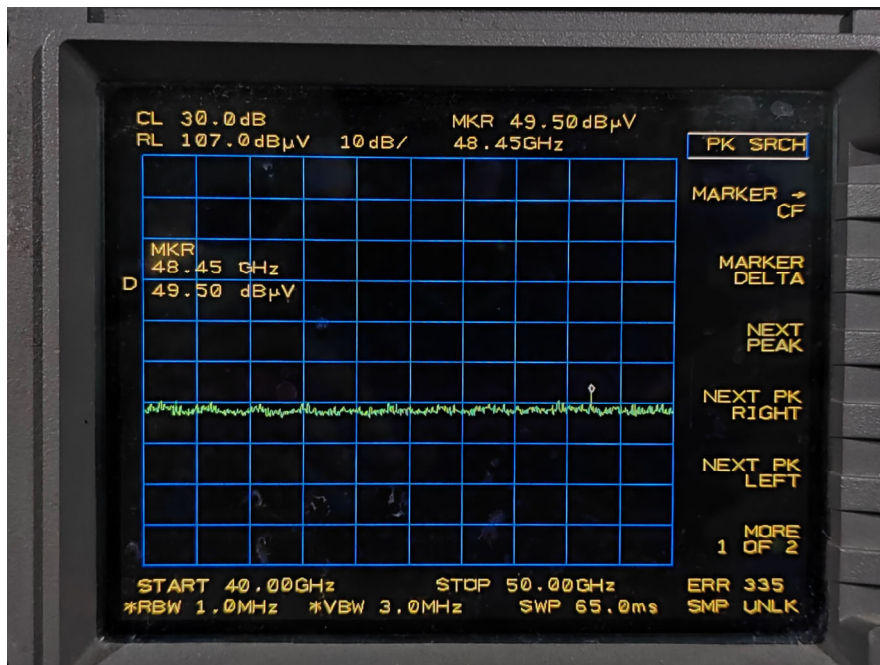
Vertical



**High Channel: 24216 MHz
Horizontal**



Vertical



40GHz-50GHz:

Frequency (MHz)	Corrected Amplitude	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
	Max Peak (dBµV/m)						
Low Channel							
48080	48.83	83.54	34.71	151	H	125	30
48080	49.50	83.54	34.04	154	V	160	30
Middle Channel							
48080	48.33	83.54	35.21	154	H	123	30
48280	48.83	83.54	34.71	157	V	19	30
High Channel							
48500	48.33	83.54	35.21	158	H	32	30
48450	49.50	83.54	34.04	159	V	261	30

Note: The limit on the peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. Therefore, when the measured peak level of the emissions is at least 20 dB below the peak emission limit, there's no need to record the measured AV level of the emissions.

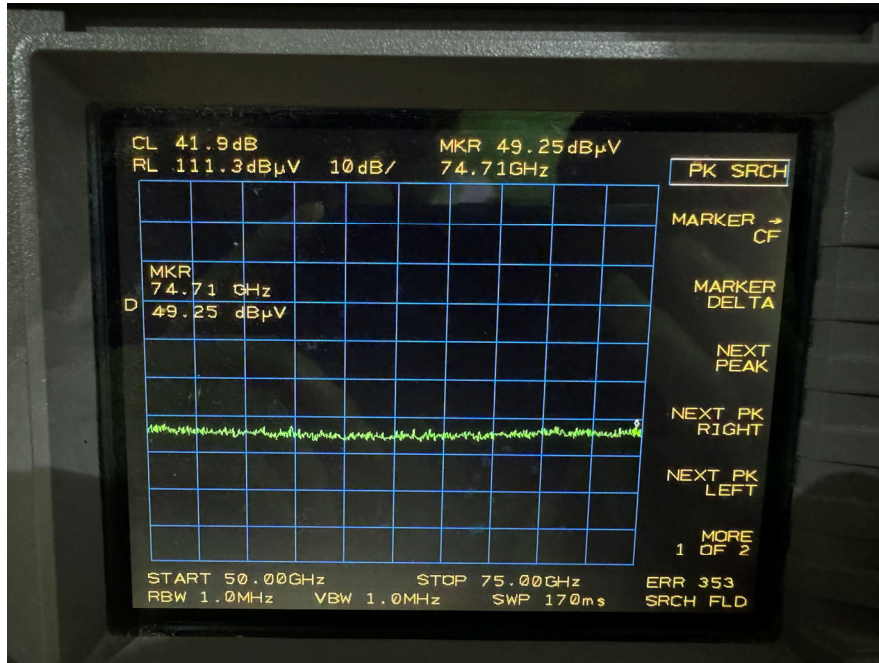
Extrapolation factor of 20dB/decade from 3m to 1.0m

Distance extrapolation factor = 20 log (specific distance [3m]/test distance [1m]) dB

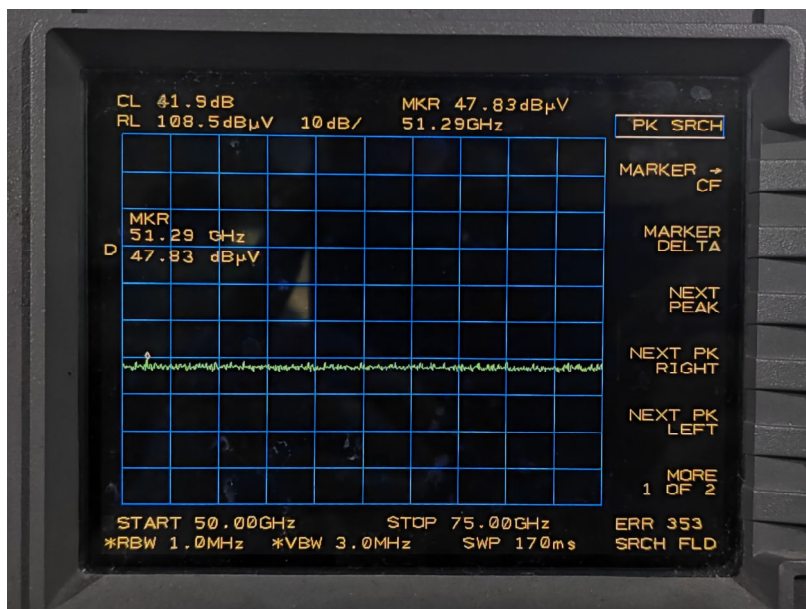
Limit = Specific limits(dBµV/m) + distance extrapolation factor (9.54dB)

50GHz-75GHz:

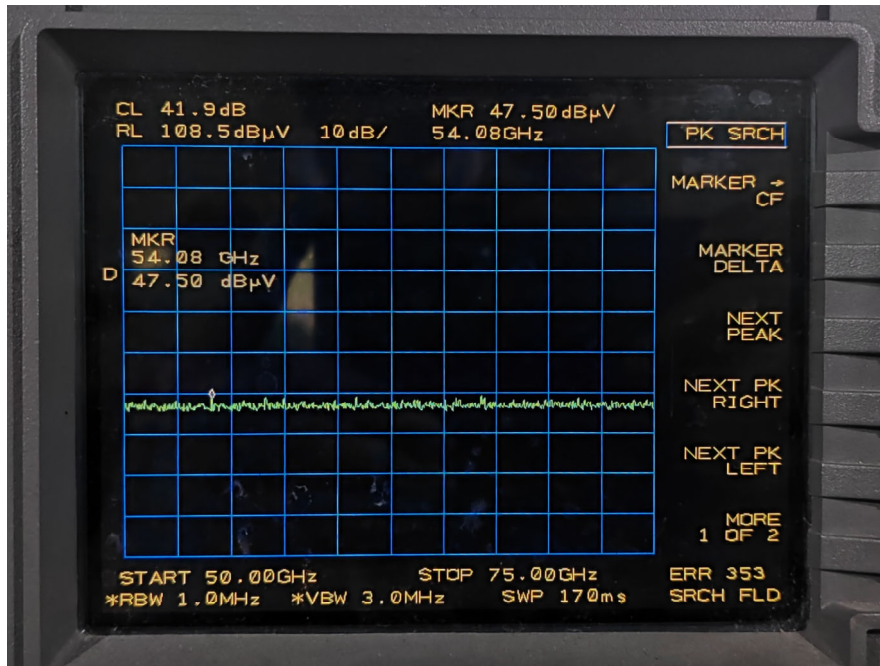
Low Channel: 24034 MHz
Horizontal



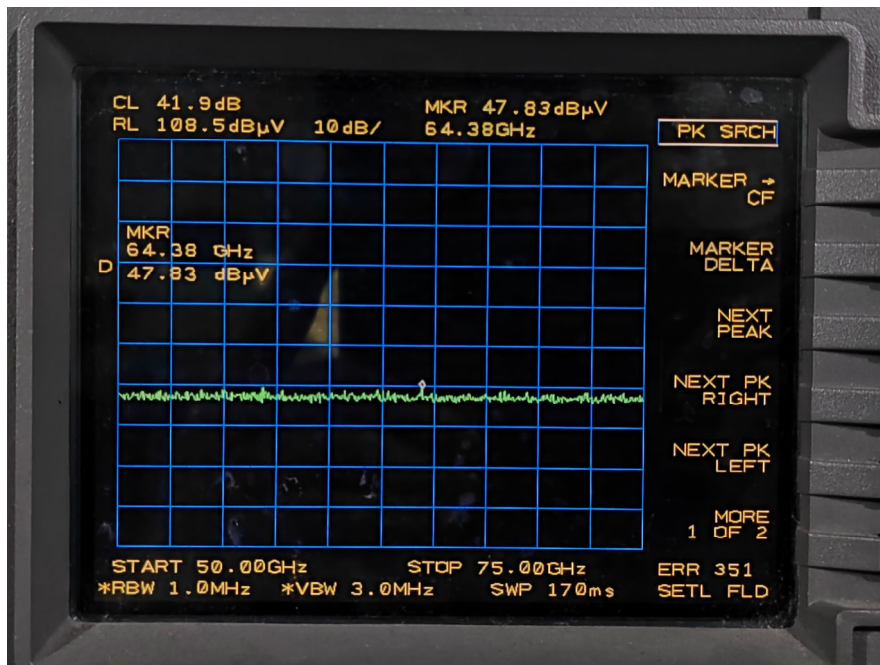
Vertical



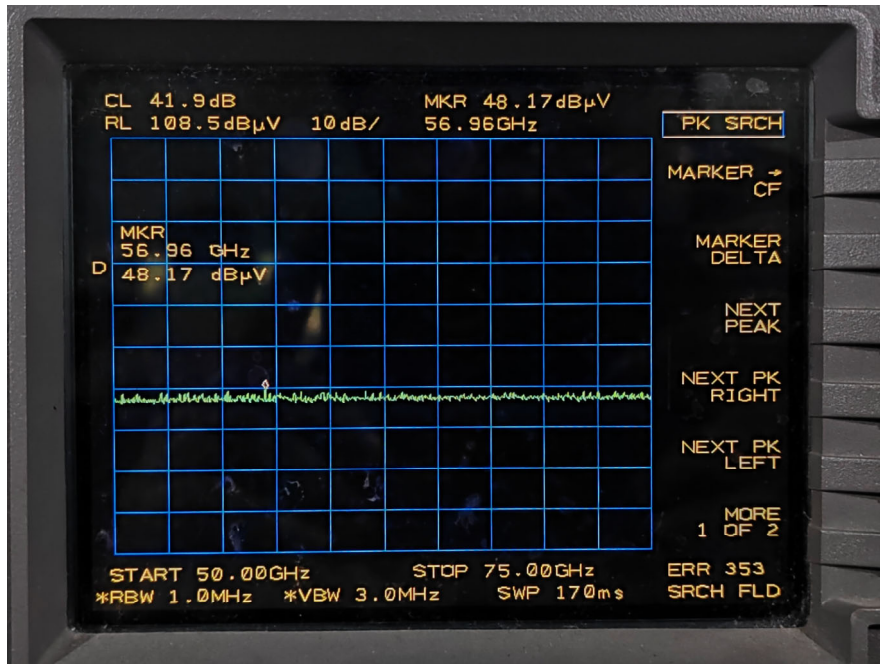
Middle Channel: 24130 MHz
Horizontal



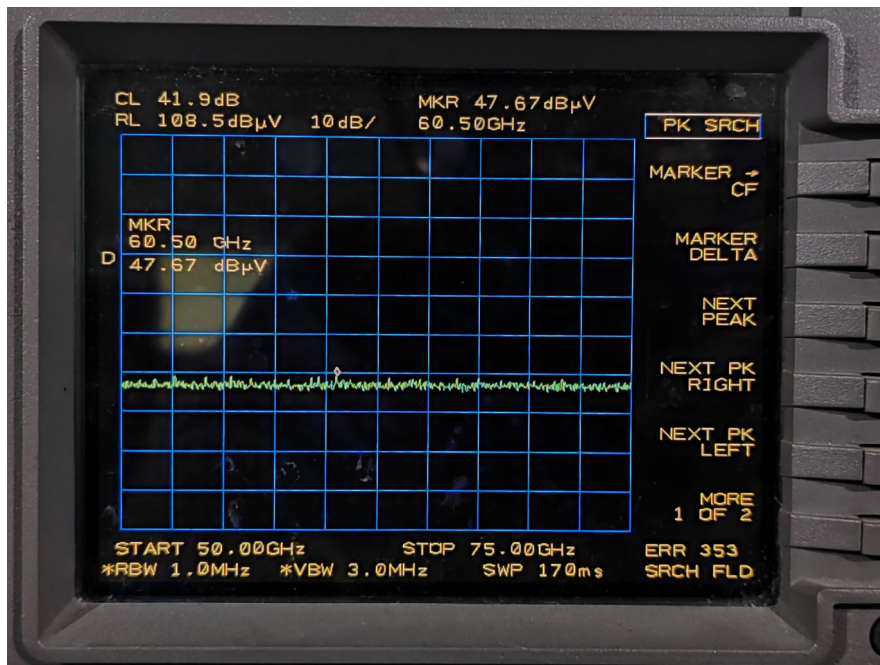
Vertical



**High Channel: 24216 MHz
Horizontal**



Vertical



50GHz-75GHz:

Frequency (MHz)	Corrected Amplitude	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
	Max Peak (dBµV/m)						
Low Channel							
74710	49.25	83.54	34.29	158	H	46	41.9
51290	47.83	83.54	35.71	156	V	125	41.9
Middle Channel							
54080	47.5	83.54	36.04	156	H	85	41.9
64380	47.83	83.54	35.71	157	V	38	41.9
High Channel							
56960	48.17	83.54	35.37	154	H	26	41.9
60500	47.67	83.54	35.87	158	V	168	41.9

Note: The limit on the peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. Therefore, when the measured peak level of the emissions is at least 20 dB below the peak emission limit, there's no need to record the measured AV level of the emissions.

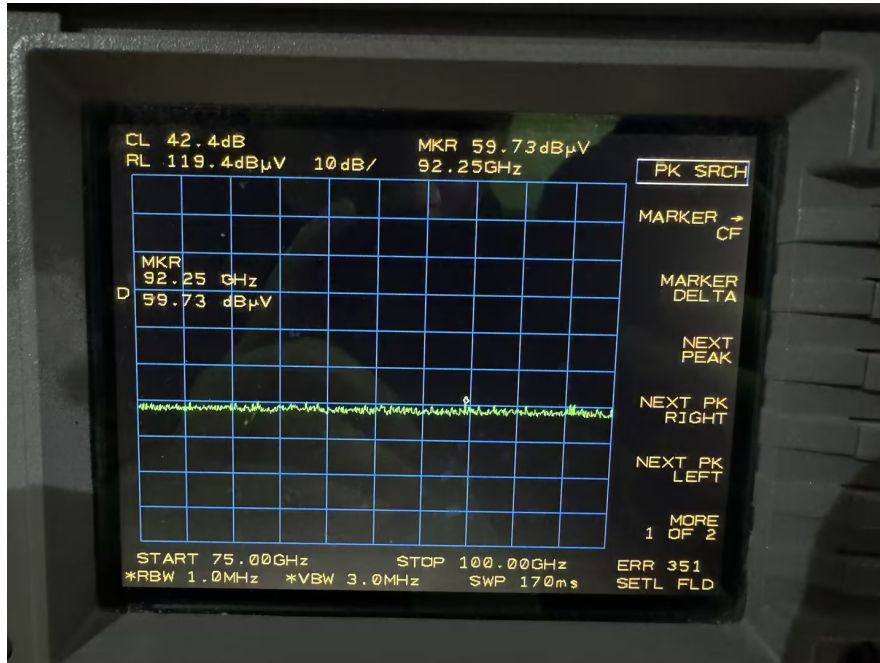
Extrapolation factor of 20dB/decade from 3m to 1.0m

Distance extrapolation factor = 20 log (specific distance [3m]/test distance [1m]) dB

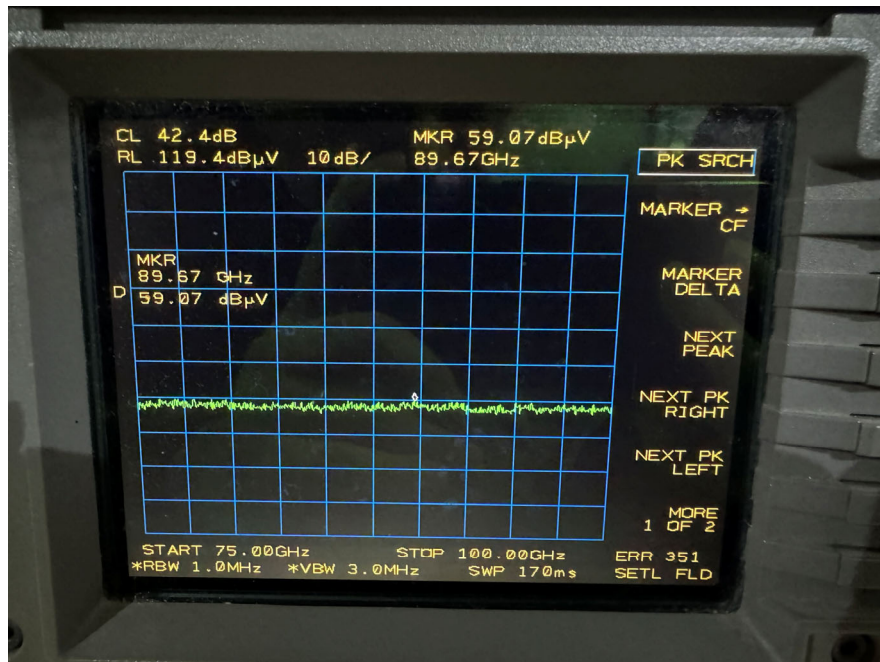
Limit = Specific limits(dBµV/m) + distance extrapolation factor (9.54dB)

75GHz-100GHz:

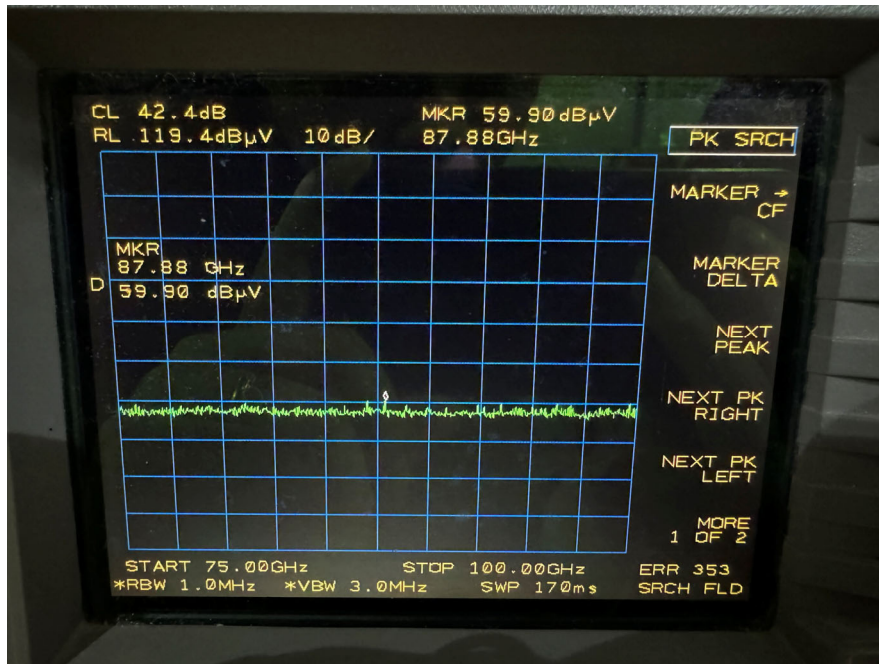
Low Channel: 24034 MHz
Horizontal



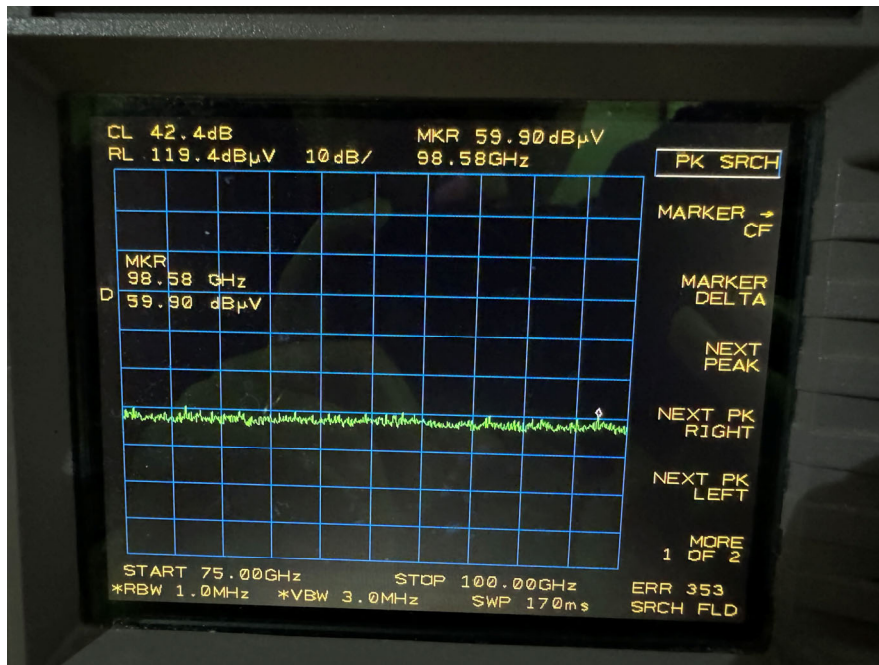
Vertical



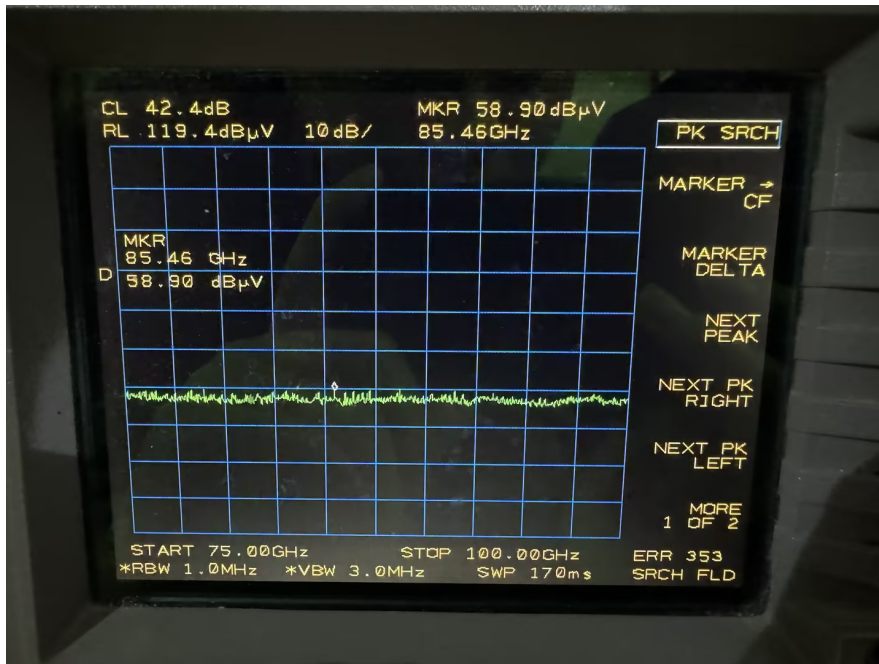
Middle Channel: 24130 MHz
Horizontal



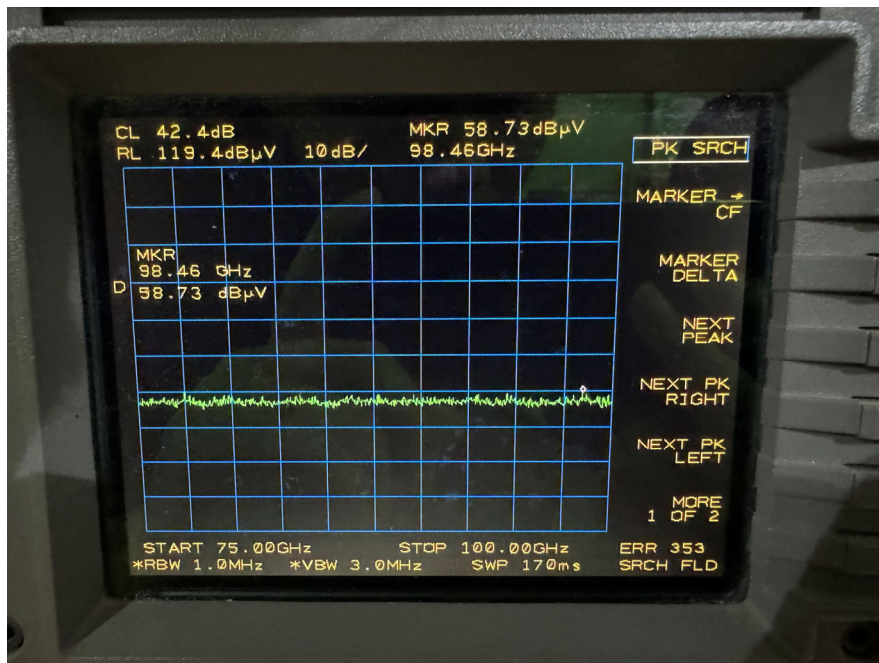
Vertical



**High Channel: 24216MHz
Horizontal**



Vertical



75GHz-100GHz:

Frequency (MHz)	Corrected Amplitude	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
	Max Peak (dBµV/m)						
Low Channel							
92250	59.73	83.54	23.81	153	H	125	42.4
89670	59.07	83.54	24.47	154	V	160	42.4
Middle Channel							
87880	59.90	83.54	23.64	155	H	123	42.4
98580	59.90	83.54	23.64	153	V	19	42.4
High Channel							
85460	58.90	83.54	24.64	156	H	32	42.4
98460	58.73	83.54	24.81	153	V	261	42.4

Note: The limit on the peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. Therefore, when the measured peak level of the emissions is at least 20 dB below the peak emission limit, there's no need to record the measured AV level of the emissions.

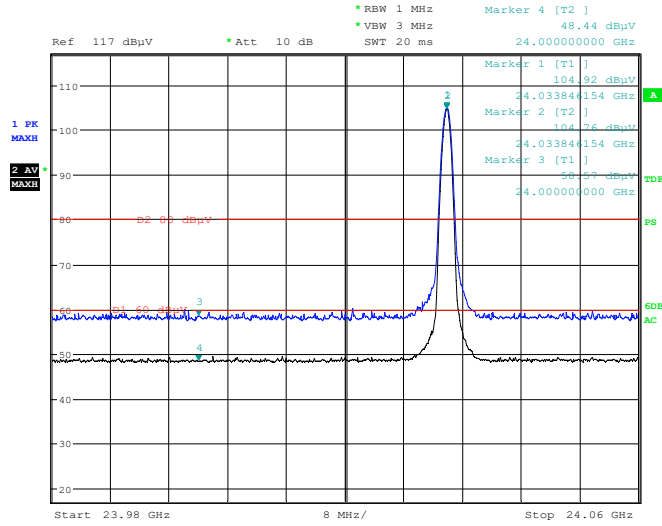
Extrapolation factor of 20dB/decade from 3m to 1.0m

Distance extrapolation factor = 20 log (specific distance [3m]/test distance [1m]) dB

Limit = Specific limits(dBµV/m) + distance extrapolation factor (9.54dB)

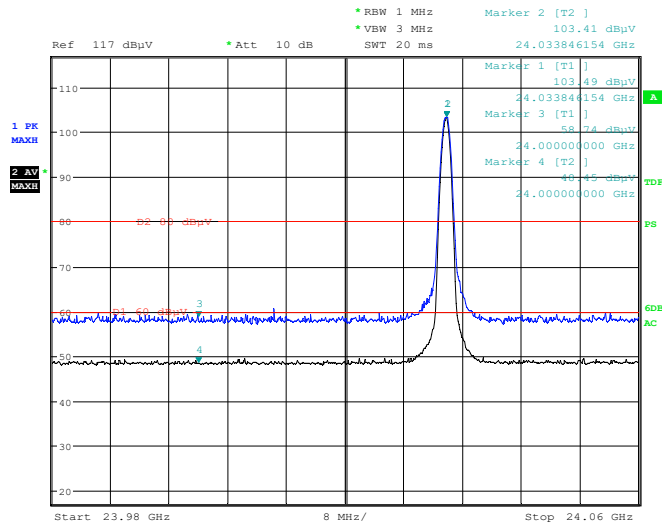
Fundamental and band edge Test:

Low Channel: Horizontal



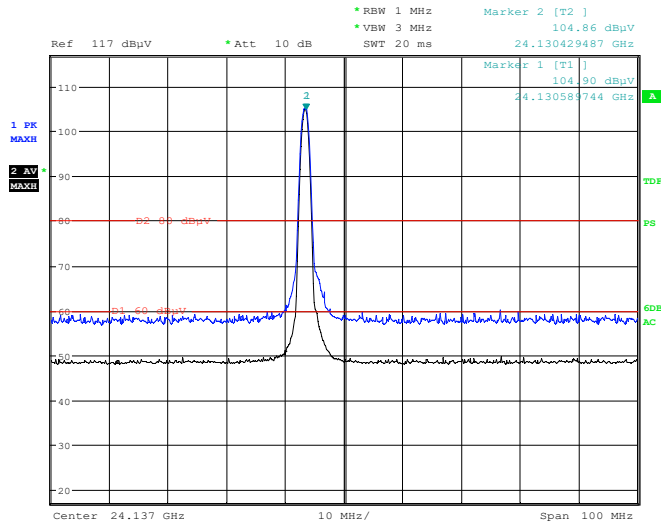
Project No.: RKSA231108001 Tester: Peter Wang
Date: 15.APR.2024 21:58:19

Vertical



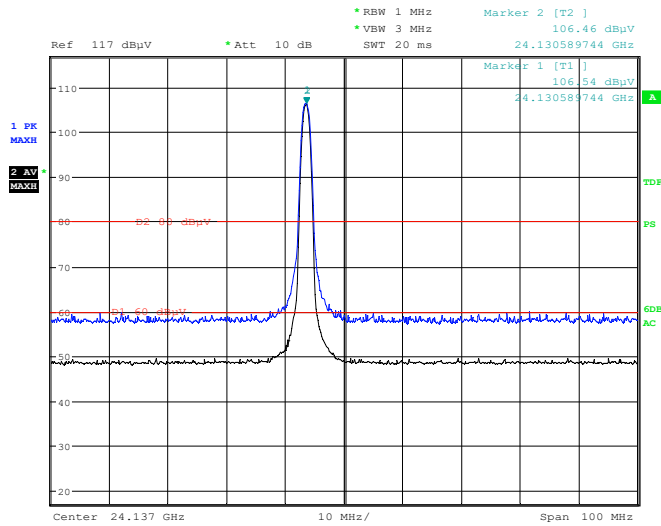
Project No.: RKSA231108001 Tester: Peter Wang
Date: 15.APR.2024 22:10:35

Middle Channel Horizontal



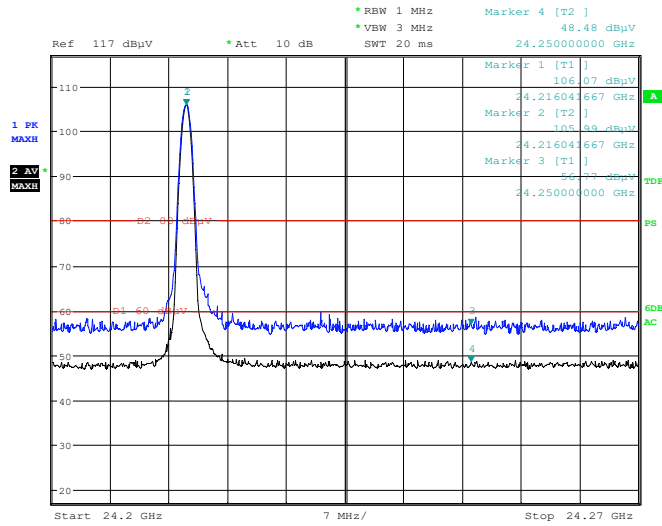
Project No.: RKSA231108001 Tester: Peter Wang
Date: 15.APR.2024 21:20:32

Vertical



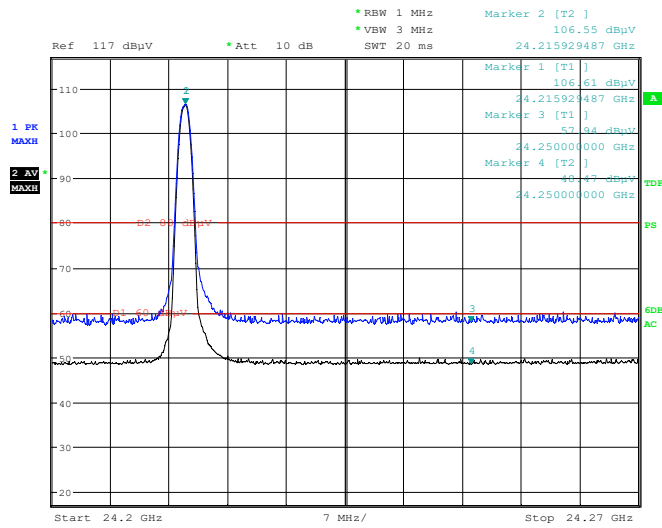
Project No.: RKSA231108001 Tester: Peter Wang
Date: 15.APR.2024 21:22:45

High Channel Horizontal



Project No.: RKSA231108001 Tester: Peter Wang
Date: 15.APR.2024 22:40:19

Vertical



Project No.: RKSA231108001 Tester: Peter Wang
Date: 15.APR.2024 22:55:40

Frequency (MHz)	Corrected Amplitude		Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB/m)
	Max Peak (dBµV/m)	Average (dBµV/m)				
Low channel						
24034	104.92	---	133.96	29.04	H	10.28
24034	---	104.76	113.96	9.2	H	10.28
24034	103.49	---	133.96	30.47	V	10.28
24034	---	103.41	113.96	10.55	V	10.28
24000	58.57	---	80.00	21.43	H	10.27
24000	---	48.44	60.00	11.56	H	10.27
24000	58.74	---	80.00	21.26	V	10.27
24000	---	48.45	60.00	11.55	V	10.27
Middle Channel						
24130	104.9	---	133.96	29.06	H	10.32
24130	---	104.86	113.96	9.10	H	10.32
24130	106.54	---	133.96	27.42	V	10.32
24130	---	106.46	113.96	7.50	V	10.32
High Channel						
24216	106.07	---	133.96	27.89	H	10.34
24216	---	105.99	113.96	7.97	H	10.34
24216	106.61	---	133.96	27.35	V	10.34
24216	---	106.55	113.96	7.41	V	10.34
24250	56.77	---	80.00	23.23	H	10.35
24250	---	48.48	60.00	11.52	H	10.35
24250	57.94	---	80.00	22.06	V	10.35
24250	---	48.47	60.00	11.53	V	10.35

Note: Extrapolation factor of 20dB/decade from 3m to 1.5m
 Distance extrapolation factor = 20 log (specific distance [3m]/test distance [1.5m]) dB
 Limit = Specific limits (dBµV/m) + distance extrapolation factor (6.0 dB)
 So Maximum Field Strength of Fundamental is 106.61 dBµV/m - 6 dB = 100.61 dBµV/m at 3m

FCC §15.215(c) - 20 dB BANDWIDTH TESTING

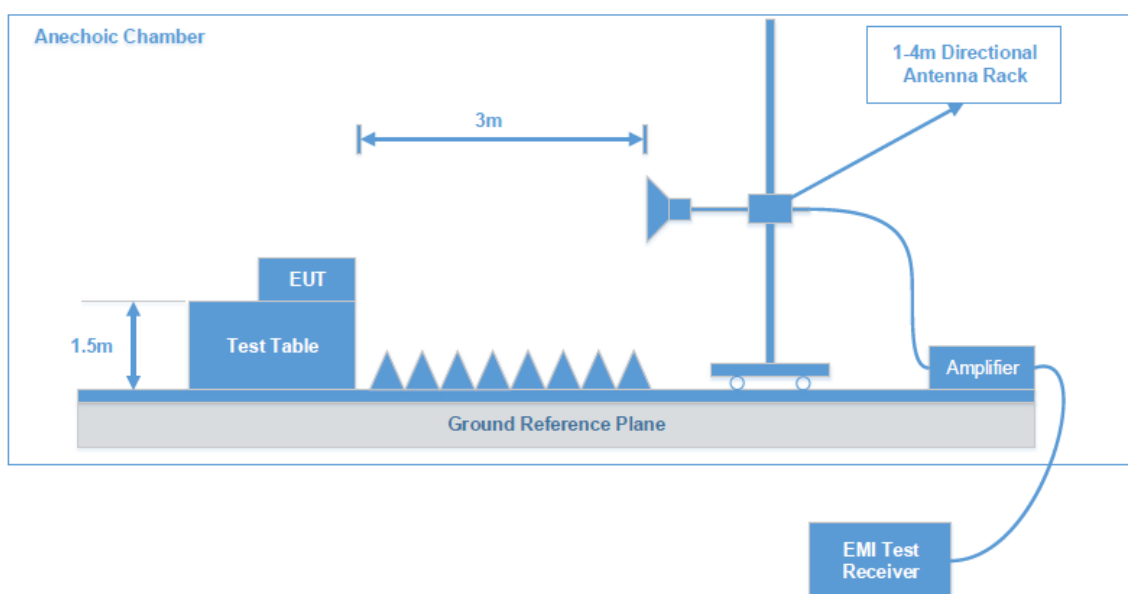
Applicable Standard

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

Test Procedure

1. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.

Test block



Test Data

Environmental Conditions & Test Information

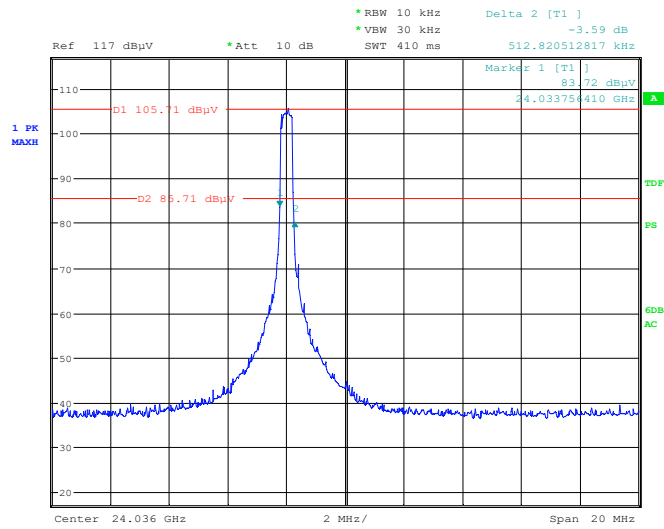
Temperature:	16.8 °C
Relative Humidity:	46 %
ATM Pressure:	102.9 kPa
Test Date:	2024-04-15
Test Engineer:	Peter Wang

Test Result: Compliant.

Test Mode: Transmitting

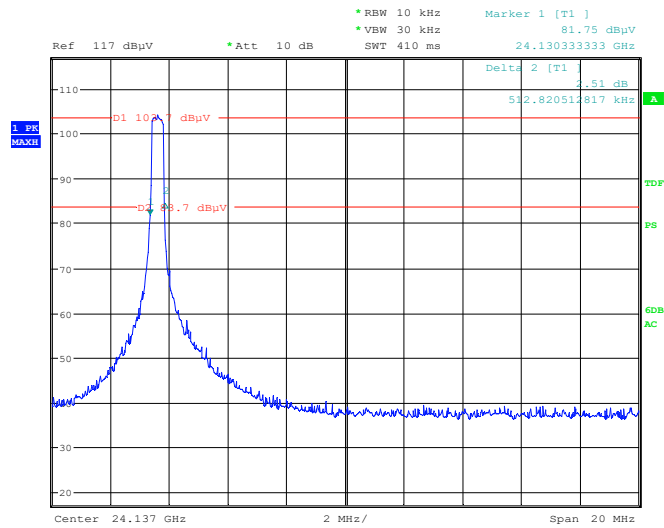
Channel	Frequency (GHz)	20 dB Bandwidth (MHz)
Low	24.034	0.513
Middle	24.130	0.513
High	24.216	0.577

Low Channel



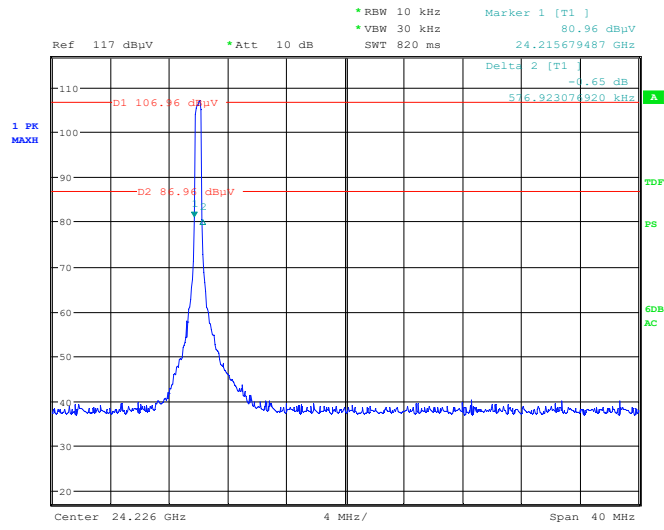
Project No.: RKSA231108001 Tester: Peter Wang
Date: 15.APR.2024 21:41:19

Middle Channel



Project No.: RKSA231108001 Tester: Peter Wang
Date: 15.APR.2024 21:06:12

High Channel



Project No.: RKSA231108001 Tester: Peter Wang
Date: 15.APR.2024 22:25:59

EUT PHOTOGRAPHS

Please refer to the attachment EXHIBIT A-EUT EXTERNAL PHOTOGRAPHS and EXHIBIT B-EUT INTERNAL PHOTOGRAPHS.

TEST SETUP PHOTOGRAPHS

Please refer to the attachment EXHIBIT C-TEST SETUP PHOTOGRAPHS.

Declarations

1. Bay Area Compliance Laboratories Corp. (Kunshan) is not responsible for authenticity of any information provided by the applicant. The information from the applicant that may affect test results are marked with an asterisk “★”.
2. Unless otherwise stated, the results shown in this test report refer only to the sample(s) tested.
3. Unless required by the rule provided by the applicant or product regulations, then decision rule in this report did not consider the uncertainty.
4. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor $k=2$ with the 95.45% confidence interval.
5. This report cannot be reproduced except in full, without prior written approval of Bay Area Compliance Laboratories Corp. (Kunshan).
6. This report is valid only with a valid digital signature. The digital signature may be available only under the adobe software above version 7.0.

******* END OF REPORT *******