

FCC PART 15.249

TEST REPORT

For

SHENZHEN MINJUN ELECTRONIC Technology CO., LTD

Libang technology Park, 3rdXitianIndustrialZone, Guangming New District, Shenzhen, 518106 China

FCC ID: 2AI2E-SEEMEE

Report Type: Original Report	Product Name: SEEMEE RADER TAILLIGHT
Report Number:	RKSA240624001-00A
Report Date:	2024-09-18
Reviewed By:	Jenny Yang
Approved By:	Kyle Xu
Test Laboratory:	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.

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REPORT REVISION HISTORY

Number of Revisions	Report No.	Version	Test Date	Issue Date	Description
0	RKSA240624001-00A	R1V1	2024-07-05 to 2024-09-06	2024-09-18	Initial Release

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant:	SHENZHEN MINJUN ELECTRONIC Technology CO., LTD
Tested Model:	SEEMEE R300
Series Model:	SEEMEE RC30, SEEMEE 100AD
Model Difference:	Model Name
Product Name:	SEEMEE RADER TAILLIGHT
Power Supply:	DC 3.6V powered by battery or DC 5V charging from adapter
RF Function:	24G SRD
Operating Band/Frequency:	24.09 GHz - 24.21 GHz
Maximum Field Strength of Fundamental:	102.40 dB μ V/m @3m
Modulation Type:	FMCW
Antenna Type:	Patch Array antenna
★Maximum Antenna Gain:	10.8 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: RKSA240624001-1. (Assigned by the BACL. The EUT supplied by the applicant was received on 2024-06-24)

Objective

This type approval report is prepared for *SHENZHEN MINJUN 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, 15.215 and 15.249 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)
1	24.09
2	24.15
3	24.21

EUT Exercise Software

Engineer Mode was used during the test.

★Power level: Default

Note: The power level was declared by the applicant.

Support Equipment List and Details

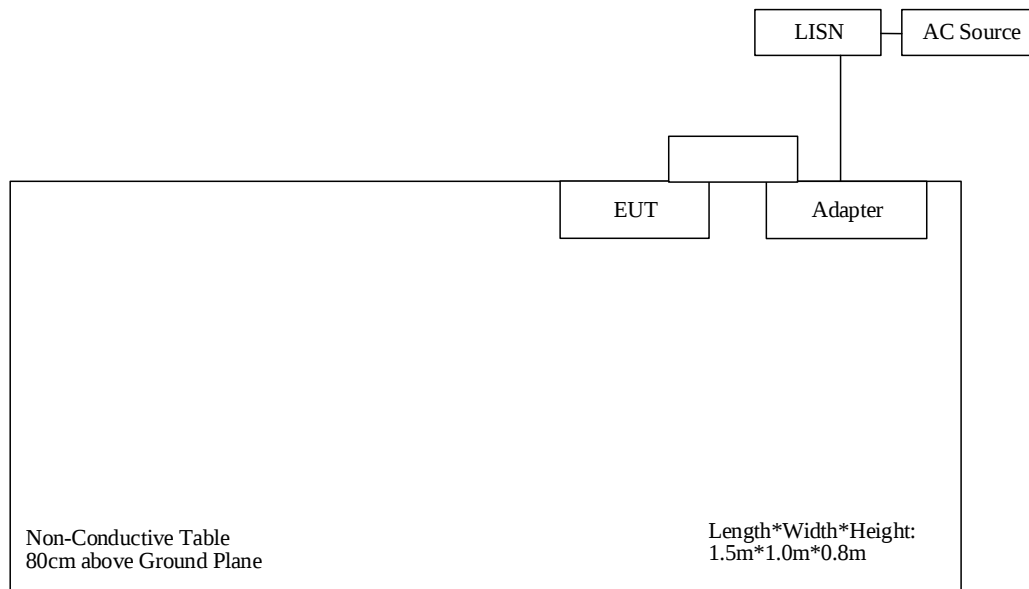
Manufacturer	Description	Model	Serial Number
Power on Tools Co.,Ltd	Adapter	DA-00051000UL001	/

External I/O Cable

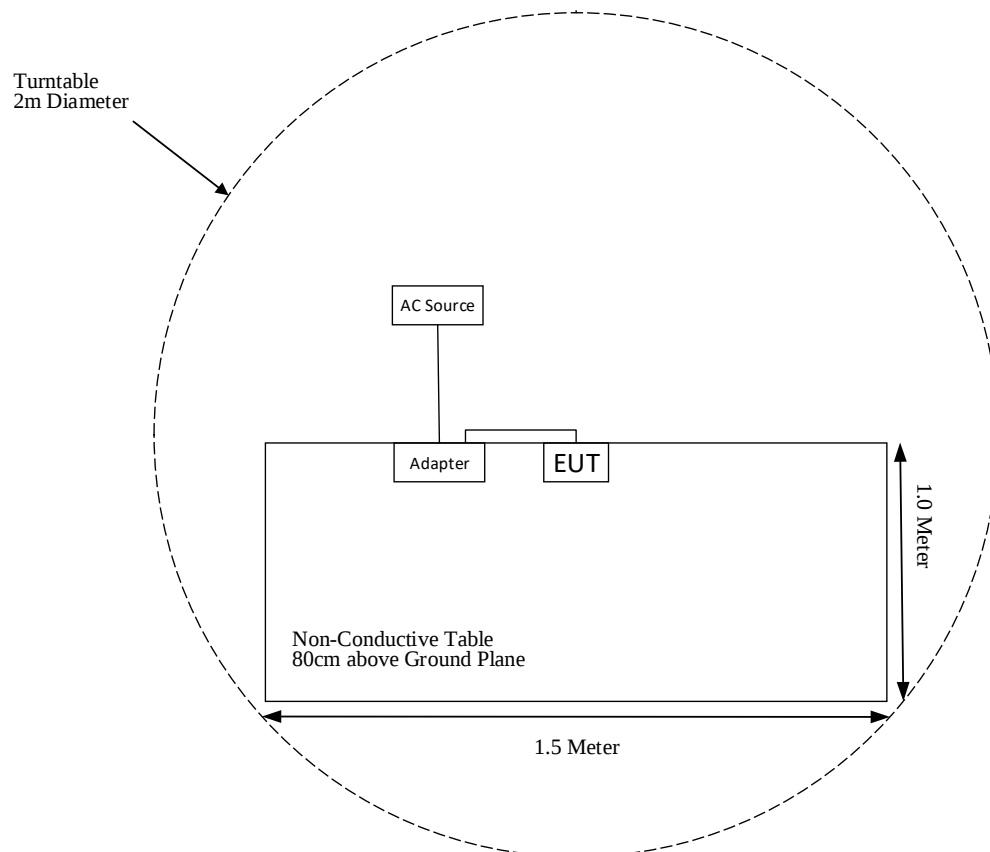
Cable Description	Length (m)	From Port	To
Power Cable 1	1.0	Adapter	LISN/AC Source
Power Cable 2	1.0	EUT	Adapter

Block Diagram of Test Setup

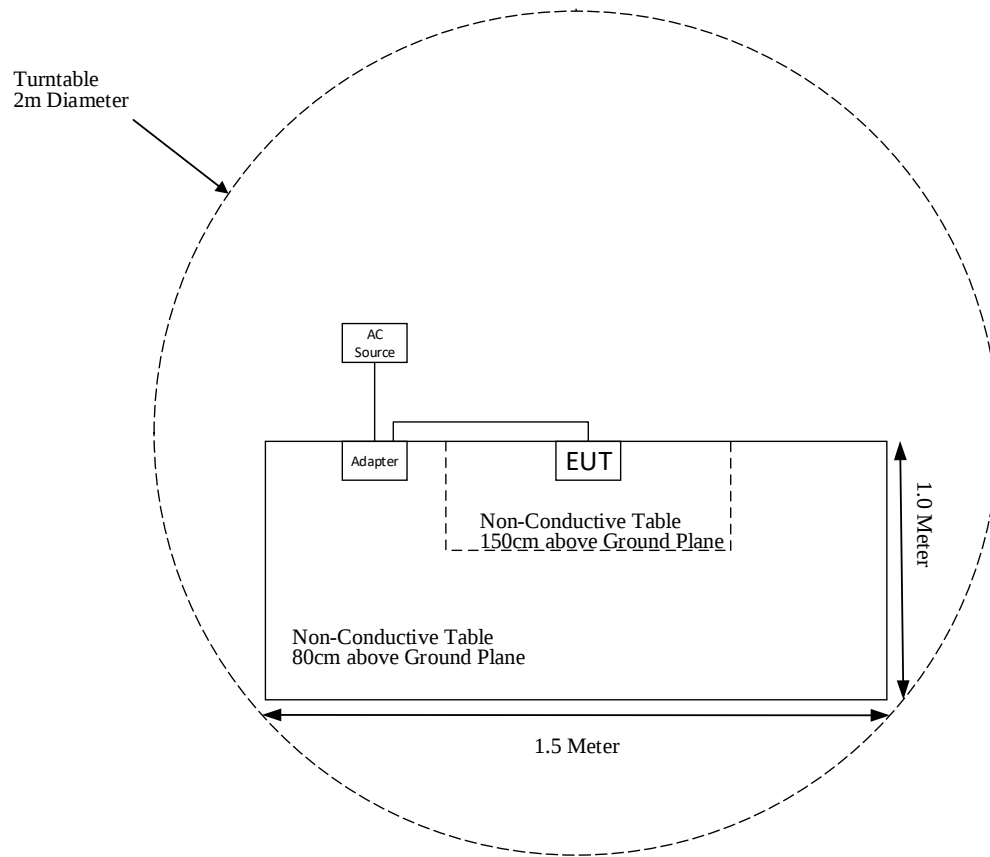
For Conducted Emissions:



For Radiated Emissions(Below 1GHz):



For Radiated Emissions(Above 1GHz):



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

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	2024-04-23	2025-04-22
Sunol Sciences	Hybrid Antenna	JB3	A090314-1	2023-11-11	2024-11-10
Sonoma Instrument	Pre-amplifier	310N	171205	2024-04-23	2025-04-22
Rohde & Schwarz	Auto test Software	EMC32	100361	N/A	N/A
MICRO-COAX	Coaxial Cable	Cable-8	008	2024-04-23	2025-04-22
MICRO-COAX	Coaxial Cable	Cable-9	009	2024-04-23	2025-04-22
MICRO-COAX	Coaxial Cable	Cable-10	010	2024-04-23	2025-04-22
ETS-LINDGREN	Loop Antenna	6512	108100	2023-11-09	2024-11-08
Narda	6 dB Attenuator	773-6	10690812-2-1	2023-11-11	2024-11-10
Radiated Emission Test (Chamber 2#)					
Rohde & Schwarz	EMI Test Receiver	ESU40	100207	2024-04-25	2025-04-24
ETS-LINDGREN	Horn Antenna	3115	9207-3900	2023-06-27	2026-06-26
ETS-LINDGREN	Horn Antenna	3116	2516	2023-12-08	2024-12-07
A.H.Systems, inc	Amplifier	PAM-0118P	512	2024-04-25	2025-04-24
SELECTOR	Amplifier	EM18G40G	060726	2024-04-25	2025-04-24
Rohde & Schwarz	Auto test Software	EMC32	100361	N/A	N/A
MICRO-COAX	Coaxial Cable	Cable-11	011	2024-04-25	2025-04-24
MICRO-COAX	Coaxial Cable	Cable-12	012	2024-04-25	2025-04-24
MICRO-COAX	Coaxial Cable	Cable-13	013	2024-04-25	2025-04-24
FMI	Horn Antenna	24245-AB	51	N/A	N/A
HP	Harmonic Mixer	11970U	2332A00837	N/A	N/A
SAGE	WR-15 Rectangular Gain Horn	SAR-2408-15-S2	13563-08	N/A	N/A
HP	Harmonic Mixer	11970V	611	N/A	N/A
SAGE	Horn Antenna	SAR-2309-10-S2	15633-04	N/A	N/A
HP	Harmonic Mixer	11970W	2521A00535	N/A	N/A
Narda	Attenuator	10dB	10dB-01	2024-04-24	2025-04-23
Rohde & Schwarz	Auto test Software	EMC32	100361	N/A	N/A
MICRO-COAX	Coaxial Cable	Cable-6	006	2024-04-25	2025-04-24

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted Emission Test					
Rohde & Schwarz	EMI Test Receiver	ESR	1316.3003K03-101746-zn	2024-04-23	2025-04-22
Rohde & Schwarz	LISN	ENV216	101115	2024-04-23	2025-04-22
Audix	Test Software	e3	V9	N/A	N/A
Rohde & Schwarz	Pulse limiter	ESH3-Z2	100552	N/A	N/A
MICRO-COAX	Coaxial Cable	Cable-15	015	2024-04-23	2025-04-22

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).

FCC§15.203 - ANTENNA REQUIREMENT

Applicable Standard

For intentional device, according to §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used.

Antenna Connector Construction

The EUT has an internal Patch Array antenna for SRD, which was permanently attached to the EUT, antenna gain is 10.8 dBi, fulfill the requirement of this section, please refer to the EUT photos.

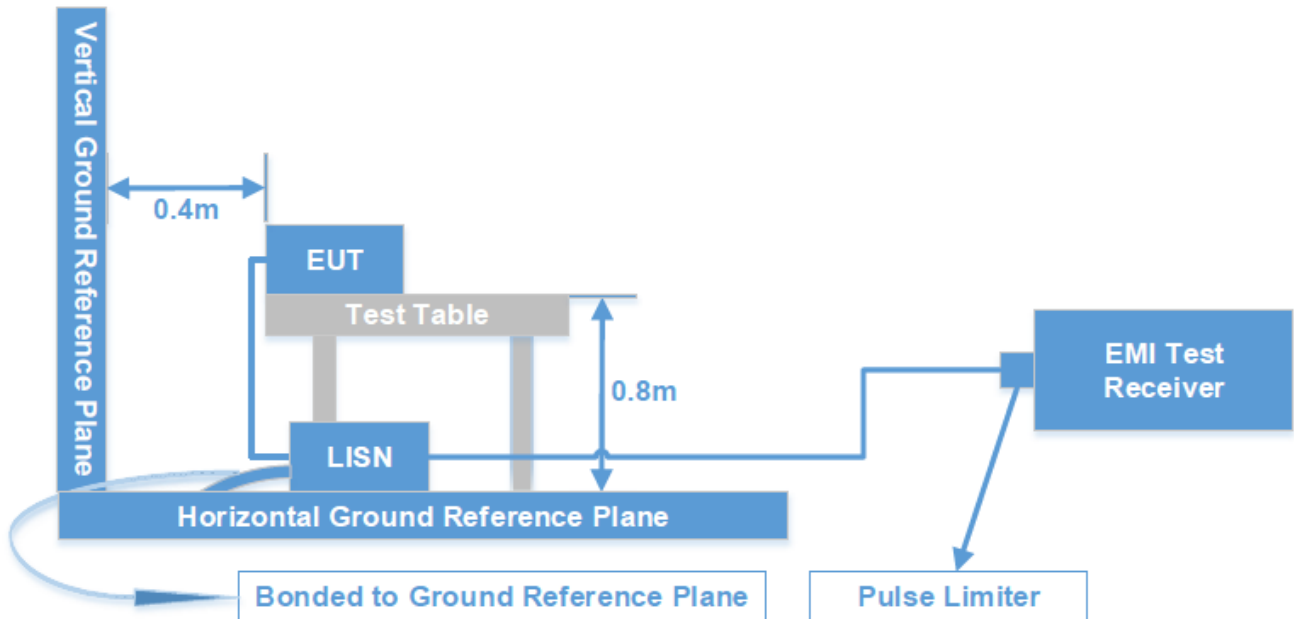
Result: Compliant.

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

During the conducted emission test, the EUT was connected to the outlet of the LISN.

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:

Factor (dB) = LISN VDF (dB) + Cable Loss (dB) + Transient Limiter Attenuation (dB)

Level (dBμV) = Read level (dBμV) + 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:

Over Limit (dB) = Level (dBμV) - Limit (dBμV)

Test Results Summary

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

Test Data: See Appendix

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:

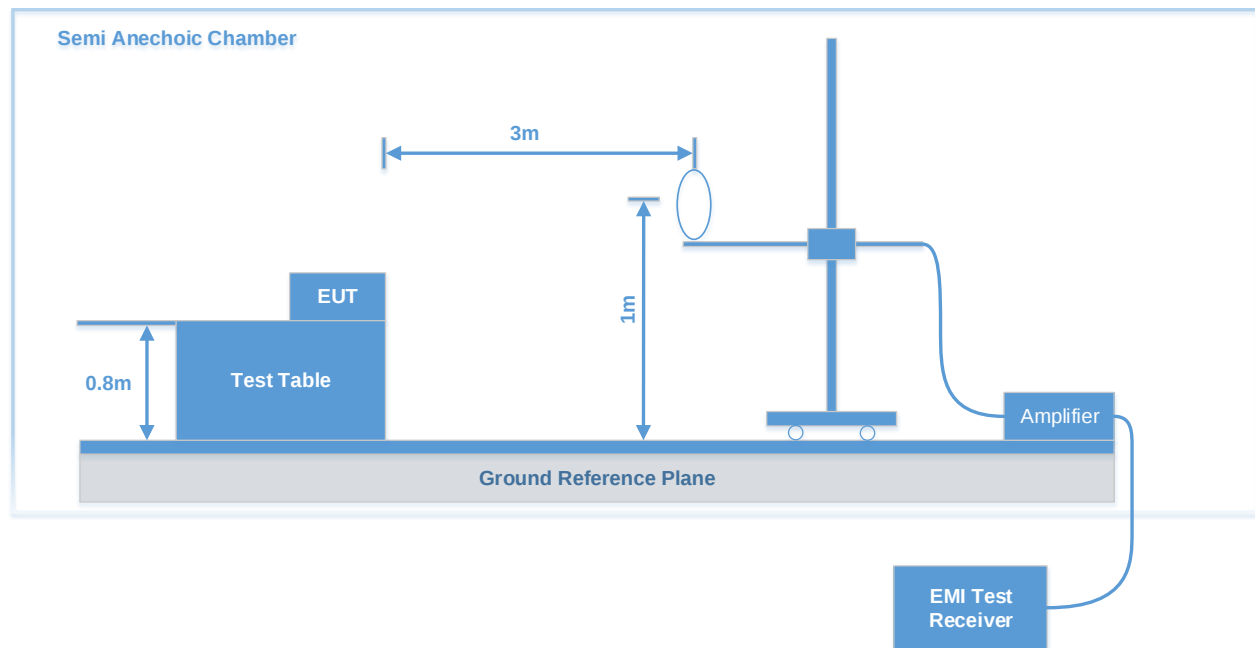
Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902–928 MHz	50	500
2400–2483.5 MHz	50	500
5725–5875 MHz	50	500
24GHz-24.25GHz	250	2500

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

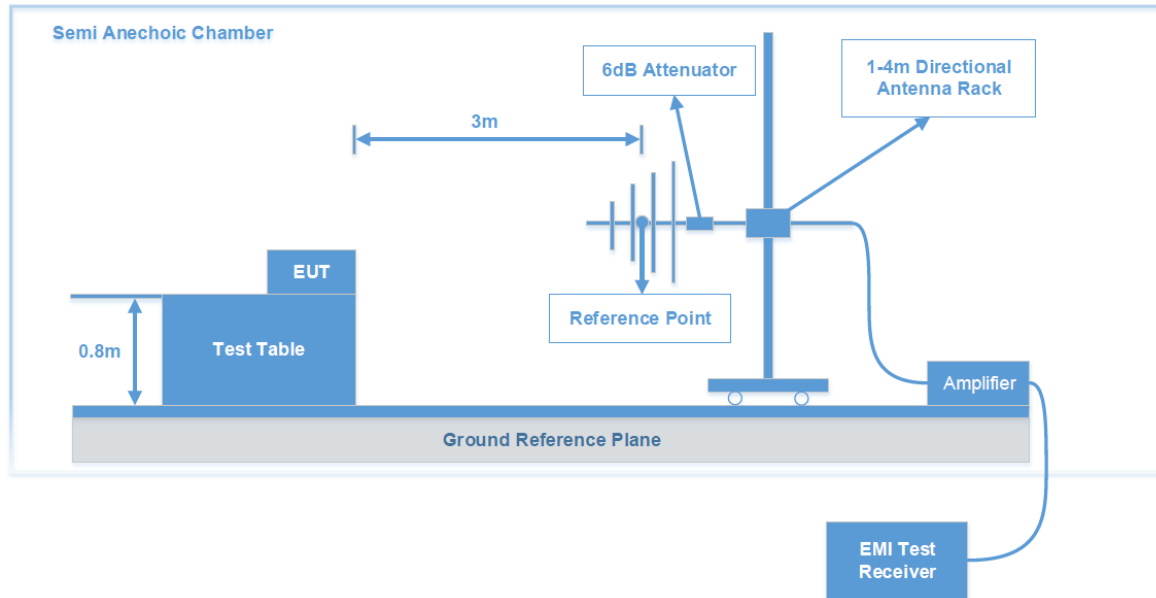
(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

Test System Setup

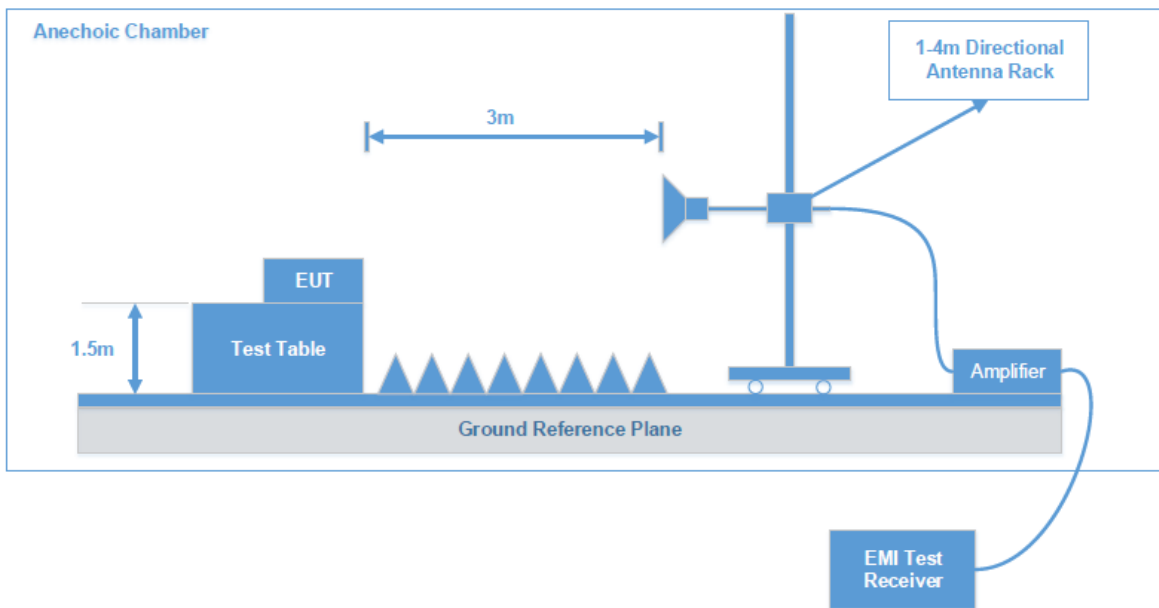
9 kHz - 30 MHz:

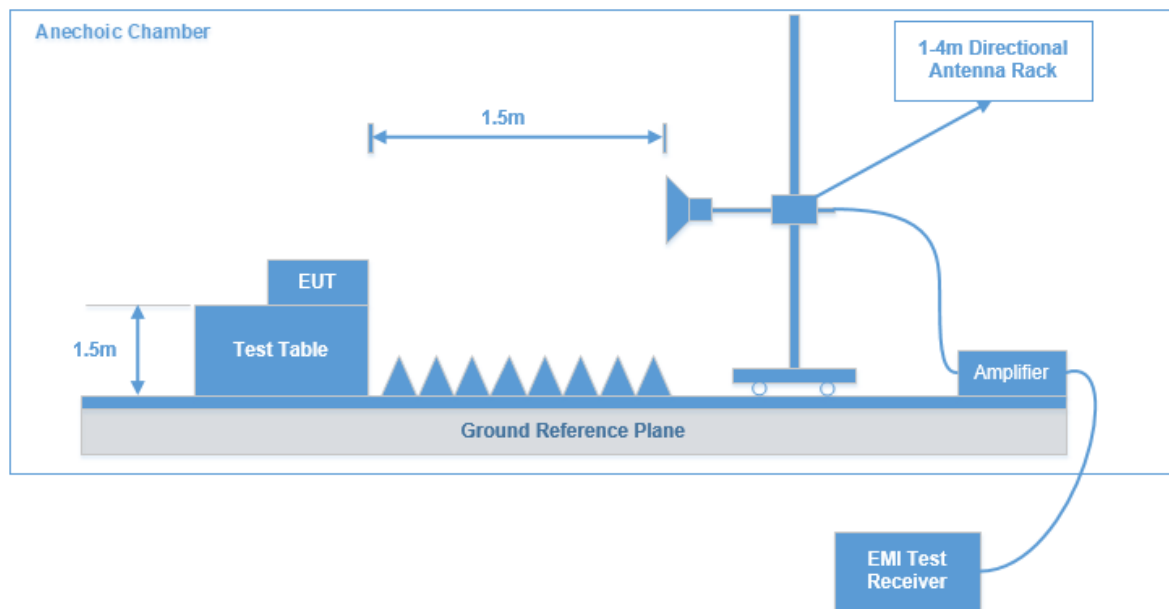
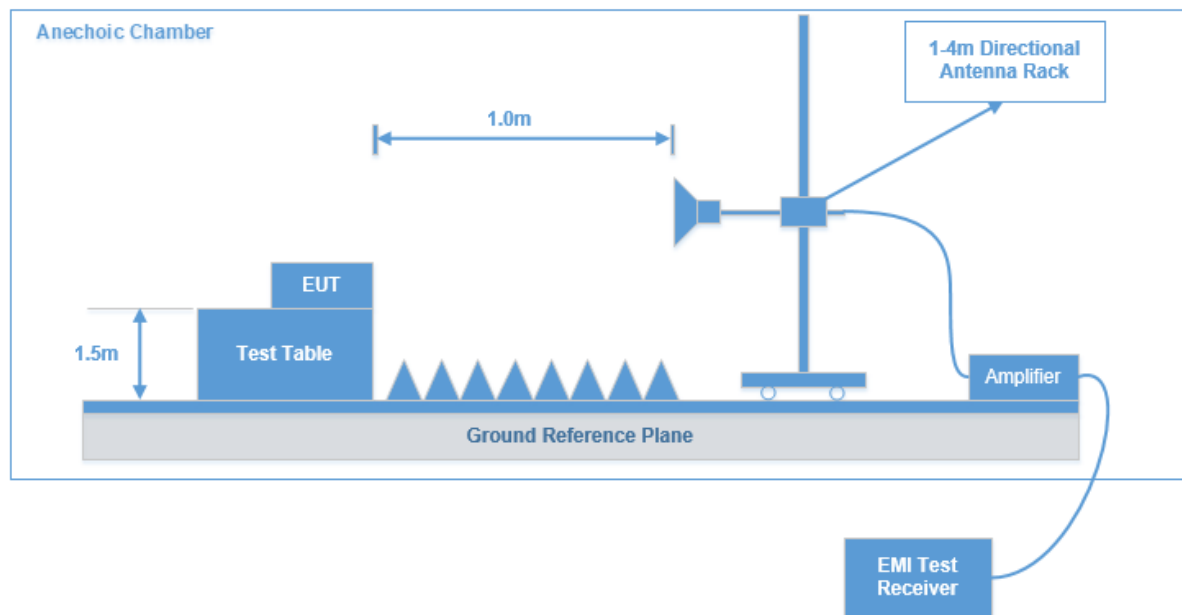


30 MHz - 1 GHz:



1 GHz - 18 GHz:



18 GHz - 40 GHz:**40 GHz - 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.

Test Equipment Setup

The system was investigated from 9 kHz to 100 GHz.

During the radiated emission test, the EMI test receiver Setup 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

Note: If the maximized peak measured value complies with under the QP/Average limit more than 6dB, then it is unnecessary to perform a QP/Average measurement.

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 10 dB below the QP emission limit, there's no need to record the measured QP level of the emissions in the report.

For 9 kHz-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.

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:

Corrected Amplitude (dBμV/m) = Meter Reading (dBμV) + Antenna Factor (dB/m) + Cable Loss (dB) - Amplifier Gain (dB)

Note: The QuasiPeak (dBμV/m), MaxPeak (dBμV/m), Average (dBμV/m) which shown in the data table are all Corrected Amplitude.

The “**Margin/ Over Limit**” 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:

Margin (dB) = Limit (dBμV/m) – Corrected Amplitude (dBμV/m)
Over Limit (dB) = Level (dBμV/m) - Limit (dBμV/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: See Appendix

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. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT on the test table without connection to measurement instrument. Turn on the EUT. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

Test Data: See Appendix

APPENDIX - TEST DATA

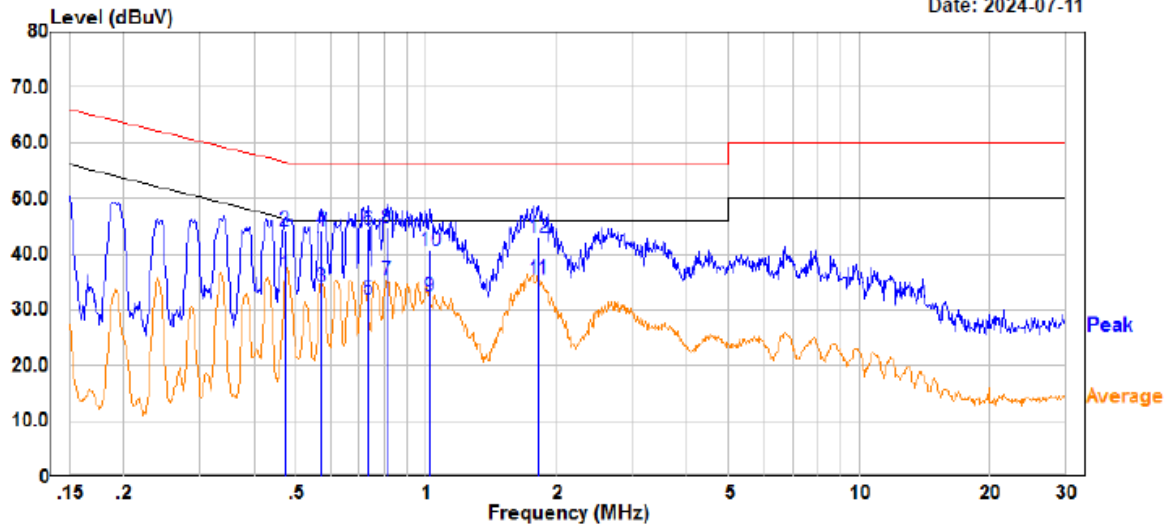
Environmental Conditions & Test Information

Test Item:	CONDUCTED EMISSIONS	RADIATED EMISSIONS	
		9 kHz – 1 GHz	1 GHz – 18 GHz
Test Date:	2024-07-11	2024-07-05	2024-07-16
Temperature:	26.8 °C	22.3 °C	24.3 °C
Relative Humidity:	58 %	46 %	52 %
ATM Pressure:	100.4 kPa	100.7 kPa	100.5 kPa
Test Result:	Pass	Pass	Pass
Test Engineer:	Leah Li	Grace Luo	Klein Zhu

Test Item:	RADIATED EMISSIONS		BAND EDGE	20 DB BANDWIDTH TESTING
	18 GHz – 40 GHz	40 GHz – 100 GHz		
Test Date:	2024-09-06	2024-09-06	2024-09-06	2024-09-06
Temperature:	25.3 °C	25.3 °C	25.3 °C	25.3 °C
Relative Humidity:	55 %	55 %	55 %	55 %
ATM Pressure:	100.4 kPa	100.4 kPa	100.4 kPa	100.4 kPa
Test Result:	Pass	Pass	Pass	Pass
Test Engineer:	Hugh Wu	Hugh Wu	Hugh Wu	Hugh Wu

CONDUCTED EMISSIONS*EUT operation mode:***Line:**

Date: 2024-07-11



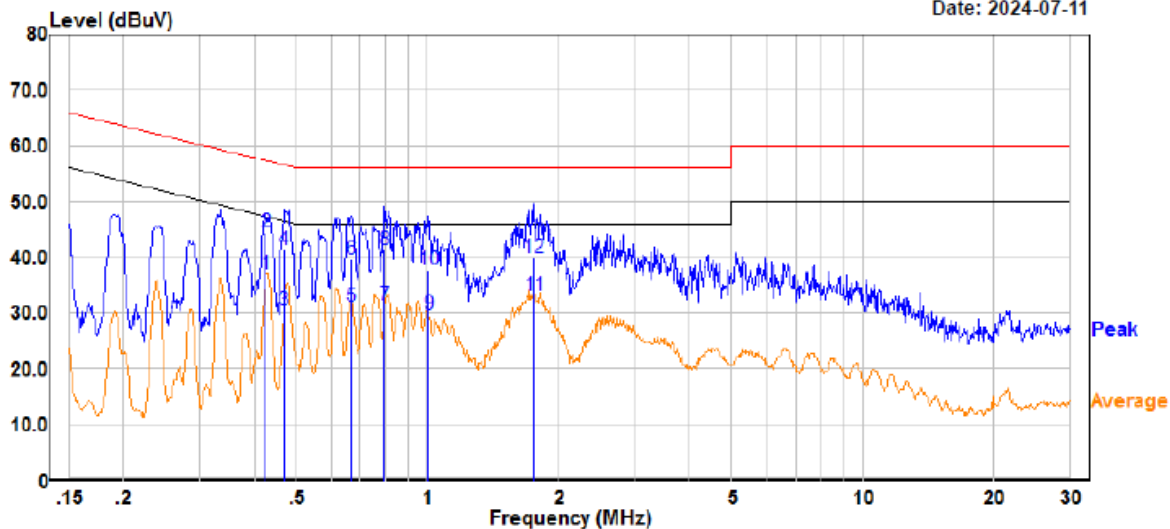
Trace: 1

Site : CE
 Condition : FCC Part 15.207
 : DET:Peak
 Project No. : RKSA240624001
 Model : SEEMEE R300
 Phase : L
 Voltage : 120V/60Hz
 Mode : SRD
 Test Equipment : ENV216,ESR
 Temperature : 26.8°C
 Humidity : 58%
 Atmospheric pressure: 100.4kPa
 Test Engineer : Leah Li

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBUV	dB	dBUV	dBUV	dB	
1	0.472	16.40	20.19	36.59	46.48	-9.89	Average
2	0.472	24.10	20.19	44.29	56.48	-12.19	QP
3	0.570	14.00	20.10	34.10	46.00	-11.90	Average
4	0.570	24.20	20.10	44.30	56.00	-11.70	QP
5	0.732	11.90	20.03	31.93	46.00	-14.07	Average
6	0.732	24.50	20.03	44.53	56.00	-11.47	QP
7	0.809	15.30	19.93	35.23	46.00	-10.77	Average
8	0.809	24.70	19.93	44.63	56.00	-11.37	QP
9	1.017	12.70	19.73	32.43	46.00	-13.57	Average
10	1.017	21.00	19.73	40.73	56.00	-15.27	QP
11	1.813	15.51	20.09	35.60	46.00	-10.40	Average
12	1.813	23.01	20.09	43.10	56.00	-12.90	QP

Neutral:

Date: 2024-07-11



Trace: 1

Site : CE
Condition : FCC Part 15.207
: DET:Peak
Project No. : RKSA240624001
Model : SEEMEE R300
Phase : N
Voltage : 120V/60Hz
Mode : SRD
Test Equipment : ENV216,ESR
Temperature : 26.8℃
Humidity : 58%
Atmospheric pressure: 100.4kPa
Test Engineer : Leah Li

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.425	16.80	20.22	37.02	47.35	-10.33	Average
2	0.425	24.20	20.22	44.42	57.35	-12.93	QP
3	0.467	10.20	20.20	30.40	46.56	-16.16	Average
4	0.467	21.10	20.20	41.30	56.56	-15.26	QP
5	0.669	11.21	20.07	31.28	46.00	-14.72	Average
6	0.669	19.61	20.07	39.68	56.00	-16.32	QP
7	0.797	11.40	19.94	31.34	46.00	-14.66	Average
8	0.797	21.50	19.94	41.44	56.00	-14.56	QP
9	1.007	10.00	19.72	29.72	46.00	-16.28	Average
10	1.007	18.08	19.72	37.80	56.00	-18.20	QP
11	1.751	13.00	20.07	33.07	46.00	-12.93	Average
12	1.751	19.80	20.07	39.87	56.00	-16.13	QP

RADIATED EMISSIONS

Test Result: Compliant

EUT operation mode: Transmitting

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

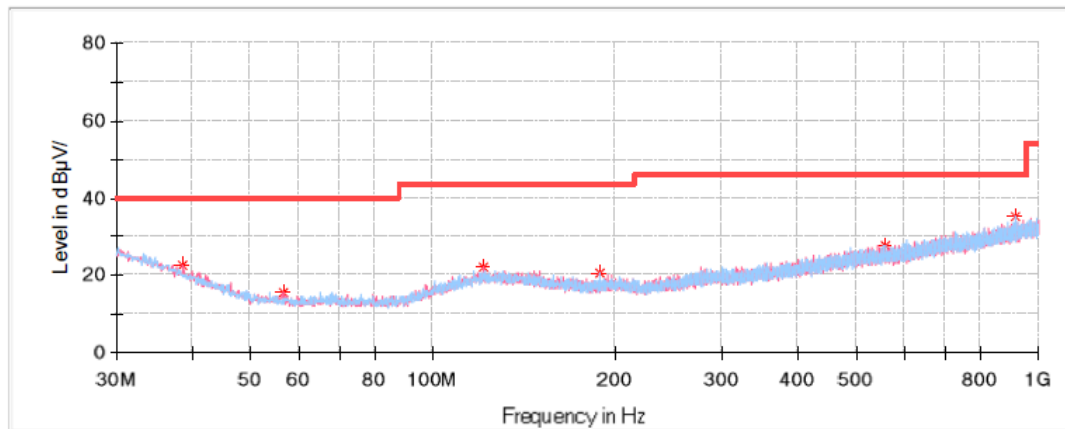
For 9 kHz-30MHz, the amplitude of spurious emissions attenuated more than 20 dB below the limit was not be recorded.

30 MHz - 1 GHz:

Frequency: 24.09 GHz

Common Information

Project No:	RKSA240624001
Test Mode:	TX
Standard:	FCC Part 15.205 & FCC Part 15.209 & FCC Part 15.249
Test Engineer:	Grace Luo

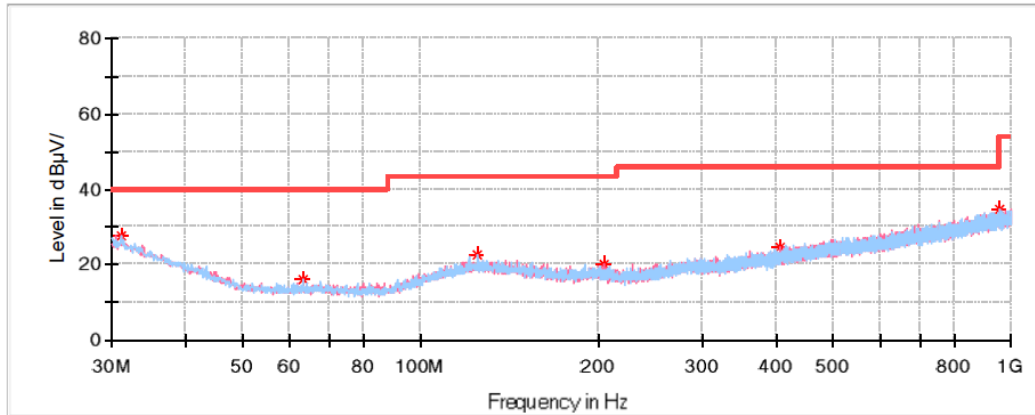


Critical_Freqs

Frequency (MHz)	MaxPeak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Pol	Corr. (dB/m)
38.608750	22.42	40.00	17.58	V	-10.5
56.432500	15.83	40.00	24.17	V	-17.3
121.301250	22.11	43.50	21.39	V	-10.9
189.080000	20.58	43.50	22.92	H	-12.6
556.710000	27.88	46.00	18.12	H	-4.7
913.791250	34.99	46.00	11.01	H	1.2

Frequency: 24.15 GHz**Common Information**

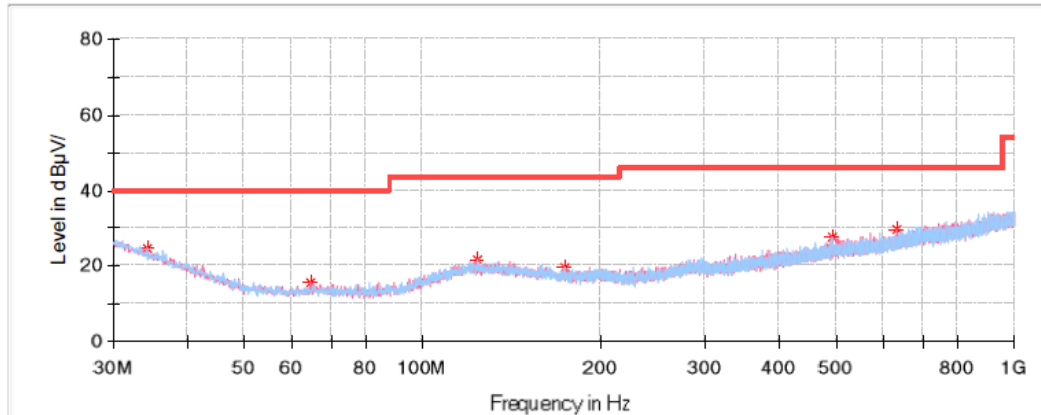
Project No: RKSA240624001
Test Mode: TX
Standard: FCC Part 15.205 & FCC Part 15.209 & FCC Part 15.249
Test Engineer: Grace Luo

**Critical Freqs**

Frequency (MHz)	MaxPeak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Pol	Corr. (dB/m)
31.091250	27.81	40.00	12.19	H	-5.5
63.343750	16.06	40.00	23.94	H	-17.4
125.060000	22.54	43.50	20.96	H	-11.0
204.600000	20.13	43.50	23.37	V	-12.5
405.511250	24.89	46.00	21.11	V	-7.8
954.167500	34.55	46.00	11.45	H	1.8

Frequency: 24.21 GHz**Common Information**

Project No: RKSA240624001
Test Mode: TX
Standard: FCC Part 15.205 & FCC Part 15.209 & FCC Part 15.249
Test Engineer: Grace Luo

**Critical_Freqs**

Frequency (MHz)	MaxPeak (dB µ V/m)	Limit (dB µ V/m)	Margin (dB)	Pol	Corr. (dB/m)
34.243750	24.73	40.00	15.27	H	-7.6
64.435000	15.52	40.00	24.48	V	-17.3
123.483750	21.74	43.50	21.76	H	-11.0
173.317500	19.83	43.50	23.67	H	-12.7
491.598750	27.54	46.00	18.46	H	-5.6
633.340000	29.70	46.00	16.30	V	-3.5

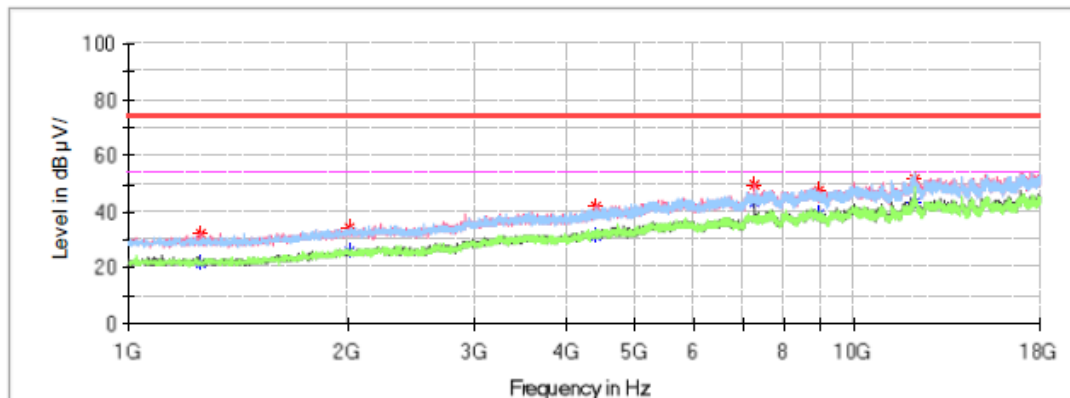
1 GHz – 18 GHz

Frequency: 24.09 GHz

Common Information

Project No.: RKSA240624001
Test Mode: SRD
Standard: FCC Part 15.205&FCC Part 15.209&FCC Part 15.249
Test Engineer: Klein Zhu

Full Spectrum

**Critical Freqs**

Frequency (MHz)	MaxPeak (dB μV/m)	Average (dB μV/m)	Limit (dB μV/m)	Margin (dB)	Pol	Corr. (dB/m)
1260.100000	31.95	---	74.00	42.05	V	-15.1
1260.100000	---	21.66	54.00	32.34	V	-15.1
2020.000000	34.45	---	74.00	39.55	V	-11.7
2020.000000	---	25.67	54.00	28.33	V	-11.7
4400.000000	42.01	---	74.00	31.99	V	-4.6
4400.000000	---	31.52	54.00	22.48	V	-4.6
7276.400000	49.80	---	74.00	24.20	V	3.3
7276.400000	---	43.57	54.00	10.43	V	3.3
8905.000000	47.58	---	74.00	26.42	V	5.4
8905.000000	---	39.33	54.00	14.67	V	5.4
12135.000000	---	43.09	54.00	10.91	H	9.2
12135.000000	51.52	---	74.00	22.48	H	9.2

Frequency: 24.15 GHz

Common Information

Project No.:

RKSA240624001

Test Mode:

SRD

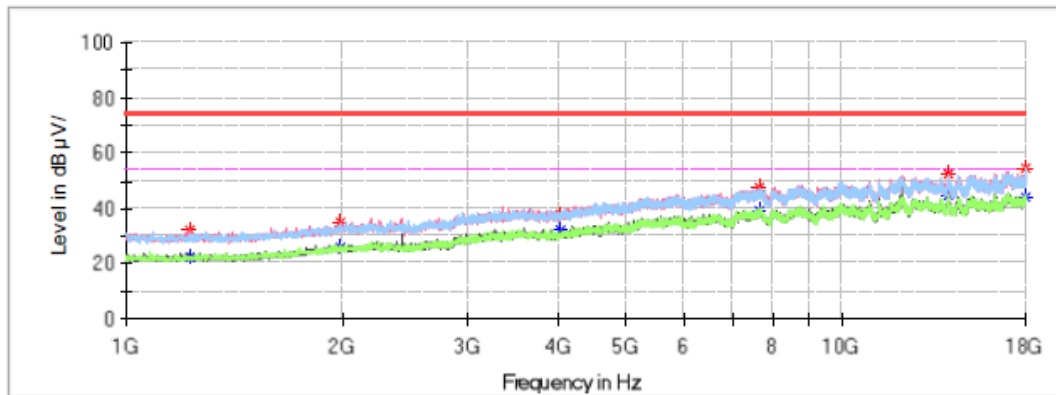
Standard:

FCC Part 15.205&FCC Part 15.209&FCC Part 15.249

Test Engineer:

Klein Zhu

Full Spectrum

**Critical Freqs**

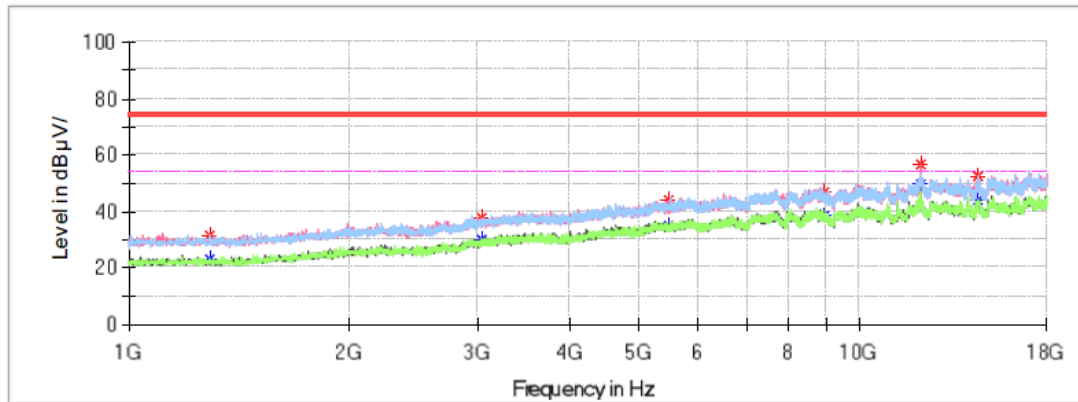
Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Pol	Corr. (dB/m)
1224.400000	32.47	---	74.00	41.53	V	-15.1
1224.400000	---	22.43	54.00	31.57	V	-15.1
1994.500000	34.73	---	74.00	39.27	V	-11.8
1994.500000	---	26.09	54.00	27.91	V	-11.8
4034.500000	---	31.98	54.00	22.02	V	-5.8
4034.500000	37.50	---	74.00	36.50	V	-5.8
7645.300000	47.89	---	74.00	26.11	V	3.9
7645.300000	---	39.45	54.00	14.55	V	3.9
14001.600000	52.23	---	74.00	21.77	H	9.8
14001.600000	---	44.71	54.00	9.29	H	9.8
17998.300000	---	44.09	54.00	9.91	H	12.0
17998.300000	54.36	---	74.00	19.64	H	12.0

Frequency: 24.21 GHz

Common Information

Project No.: RKSA240624001
Test Mode: SRD
Standard: FCC Part 15.205&FCC Part 15.209&FCC Part 15.249
Test Engineer: Klein Zhu

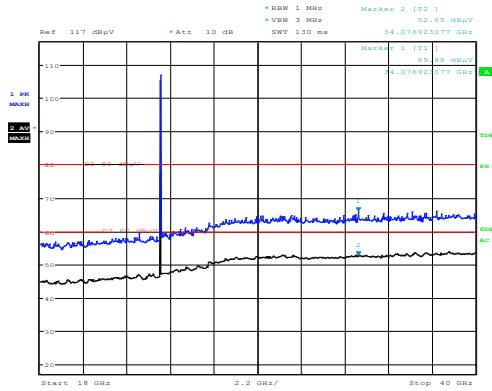
Full Spectrum

**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)
1289.000000	---	23.08	54.00	30.92	H	-15.0
1289.000000	31.17	---	74.00	42.83	H	-15.0
3034.900000	---	29.78	54.00	24.22	V	-8.3
3034.900000	37.89	---	74.00	36.11	V	-8.3
5488.000000	43.71	---	74.00	30.29	V	-0.4
5488.000000	---	34.85	54.00	19.15	V	-0.4
8950.900000	---	38.38	54.00	15.62	V	5.4
8950.900000	46.95	---	74.00	27.05	V	5.4
12085.700000	---	49.38	54.00	4.62	V	9.1
12085.700000	56.52	---	74.00	17.48	V	9.1
14491.200000	---	44.05	54.00	9.95	H	9.4
14491.200000	52.57	---	74.00	21.43	H	9.4

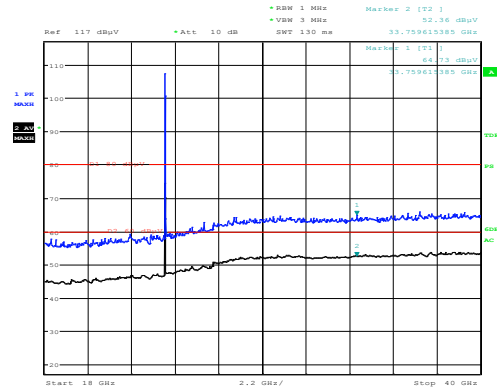
18 GHz - 40 GHz:

Frequency: 24.09 GHz
Horizontal



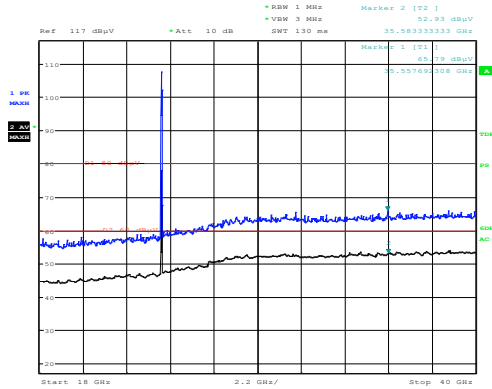
Project No.: RKSA240624001 Tester: Hugh Wu
Date: 6.SEP.2024 13:43:06

Vertical



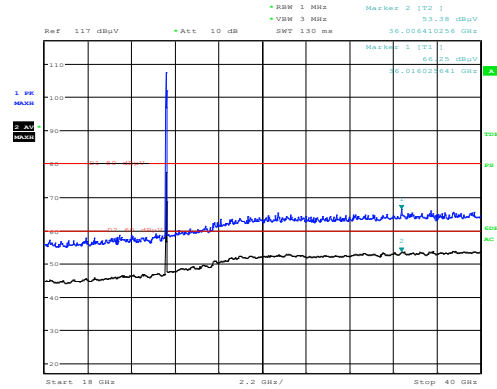
Project No.: RKSA240624001 Tester: Hugh Wu
Date: 6.SEP.2024 13:37:23

Frequency: 24.15 GHz
Horizontal



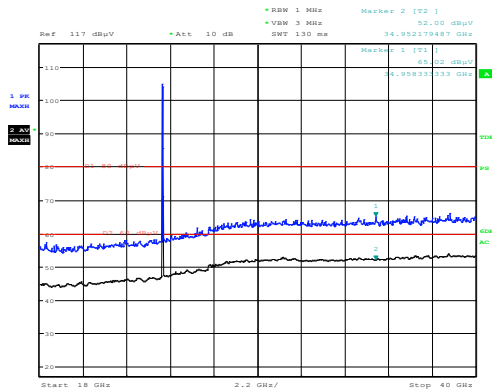
Project No.: RKSA240624001 Tester: Hugh Wu
Date: 6.SEP.2024 18:00:02

Vertical



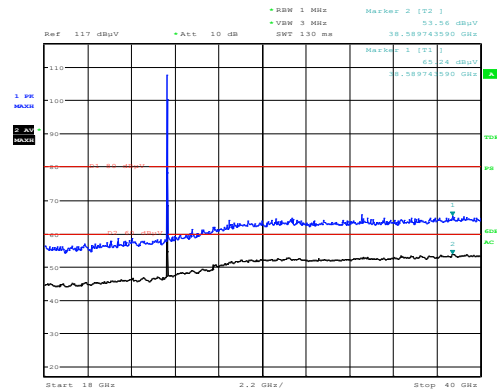
Project No.: RKSA240624001 Tester: Hugh Wu
Date: 6.SEP.2024 18:14:27

Frequency: 24.21 GHz
Horizontal



Project No.: RKSA240624001 Tester: Hugh Wu
Date: 6.SEP.2024 19:21:54

Vertical



Project No.: RKSA240624001 Tester: Hugh Wu
Date: 6.SEP.2024 19:36:11

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

Frequency: 24.15 GHz (Worst case)**40 GHz - 50 GHz:**

Frequency (MHz)	Corrected Amplitude		Limit (dBμV/m)	Margin (dB)	Pol	Antenna Factor	Mixer Conversion Loss (dB/m)
	Max Peak (dBμV/m)	Average (dBμV/m)					
41870	66.67	/	83.54	16.87	H	38.6	23
41870	/	49.55	63.54	13.99	H	38.6	23

50 GHz - 75 GHz:

Frequency (MHz)	Corrected Amplitude		Limit (dBμV/m)	Margin (dB)	Pol	Antenna Factor	Mixer Conversion Loss (dB/m)
	Max Peak (dBμV/m)	Average (dBμV/m)					
53500	67.78	/	83.54	15.76	H	40.7	34
53500	/	52.64	63.54	10.9	H	40.7	34

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 = $20 \log(\text{specific distance [3m]}/\text{test distance [1m]})$ dB

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

75 GHz - 100 GHz:

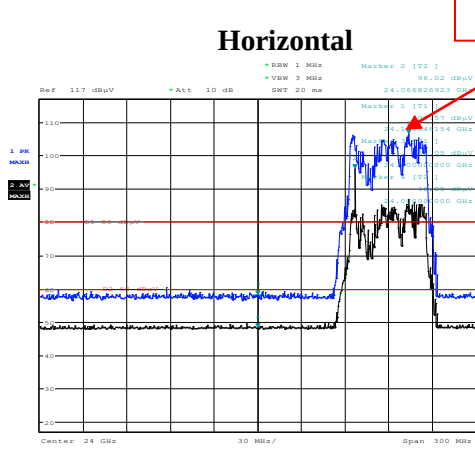
Frequency (MHz)	Corrected Amplitude		Limit (dBμV/m)	Margin (dB)	Pol	Antenna Factor	Mixer Conversion Loss (dB/m)
	Max Peak (dBμV/m)	Average (dBμV/m)					
85710	77.41	/	83.54	6.13	H	44.5	42.4
85710	/	59.64	63.54	3.9	H	44.5	42.4

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

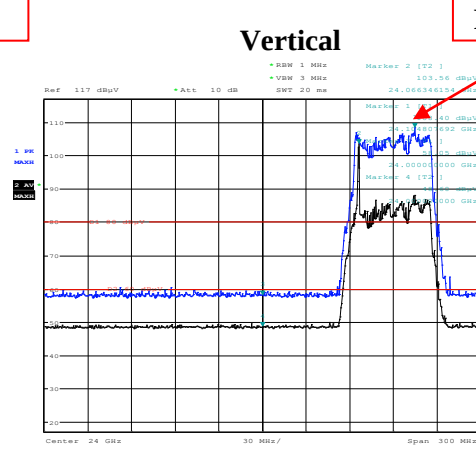
Distance extrapolation factor = $20 \log(\text{specific distance [3m]}/\text{test distance [1.0m]})$ dB

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

Fundamental and band edge Test



Fundamental



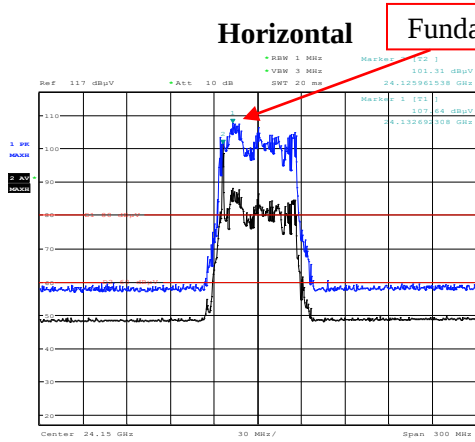
Fundamental

Project No.: RKSA240624001
Date: 6.SEP.2024 16:15:49

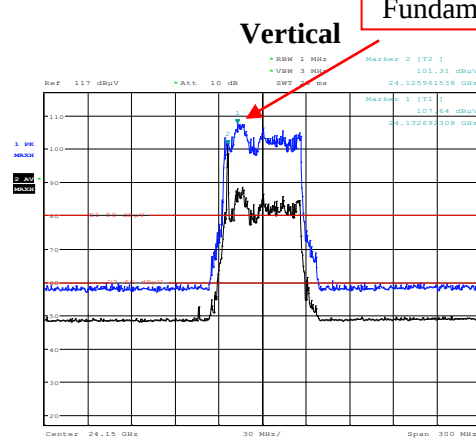
Tester: Hugh Wu

Project No.: RKSA240624001
Date: 6.SEP.2024 16:30:45

Tester: Hugh Wu



Fundamental



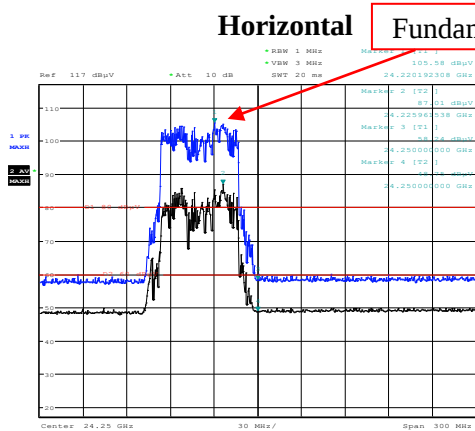
Fundamental

Project No.: RKSA240624001
Date: 6.SEP.2024 17:30:33

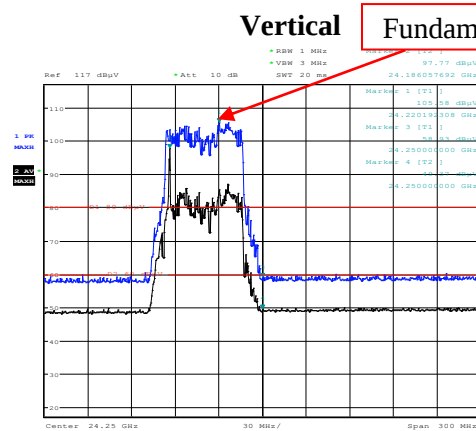
Tester: Hugh Wu

Project No.: RKSA240624001
Date: 6.SEP.2024 17:43:32

Tester: Hugh Wu



Fundamental



Fundamental

Project No.: RKSA240624001
Date: 6.SEP.2024 18:46:57

Tester: Hugh Wu

Project No.: RKSA240624001
Date: 6.SEP.2024 18:59:57

Tester: Hugh Wu

Frequency (GHz)	Pol	Average Field strength of fundamental@1.5m (dBuV/m)	Peak Field strength of fundamental @1.5m (dBuV/m)	Average Field strength of fundamental@ 3m (dBuV/m)	Peak Field strength of fundamental @3m (dBuV/m)	Limit@3m (dBuV/m)	Margin
24.09	H	/	106.57	/	100.57	127.96	27.39
	H	96.02	/	90.02	/	107.96	17.94
	V	/	108.4	/	102.40	127.96	25.56
	V	103.56	/	97.56	/	107.96	10.4
24.15	H	/	107.64	/	101.64	127.96	26.32
	H	101.31	/	95.31	/	107.96	12.65
	V	/	107.64	/	101.64	127.96	26.32
	V	101.31	/	95.31	/	107.96	12.65
24.21	H	/	105.58	/	99.58	127.96	28.38
	H	87.01	/	81.01	/	107.96	26.95
	V	/	105.58	/	99.58	127.96	28.38
	V	97.77	/	91.77	/	107.96	16.19

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
Low channel								
24000	58.05	---	80	21.95	150	H	58	9.4
24000	---	48.25	60	11.75	150	H	58	9.4
24000	58.05	---	80	21.95	150	V	58	9.5
24000	---	48.6	60	11.4	150	V	58	9.5
High Channel								
24250	58.24	---	80	21.76	150	H		9.4
24250	---	48.75	60	11.25	150	H	58	9.4
24250	58.93	---	80	21.07	150	V	58	9.5
24250	---	49.37	60	10.63	150	V	58	9.5

Note: Extrapolation factor of 20dB/decade from 3m to 1.5m

Distance extrapolation factor = $20 \log (\text{specific distance [3m]}/\text{test distance [1.5m]})$ dB

Limit = Specific limits(dBμV/m) + distance extrapolation factor (6 dB)

So Maximum Field Strength of Fundamental is 102.40 dBμV/m at 3m

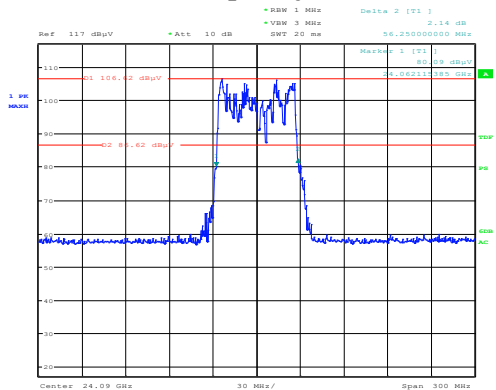
20 dB BANDWIDTH TESTING

Test Result: Compliant.

Test Mode: Transmitting

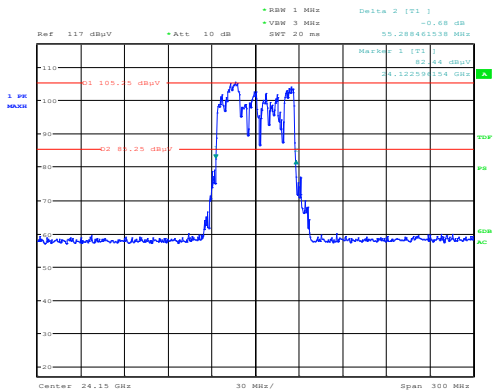
Frequency (GHz)	20 dB BANDWIDTH (MHz)
24.09	56.25
24.15	55.29
24.21	55.29

Frequency: 24.09



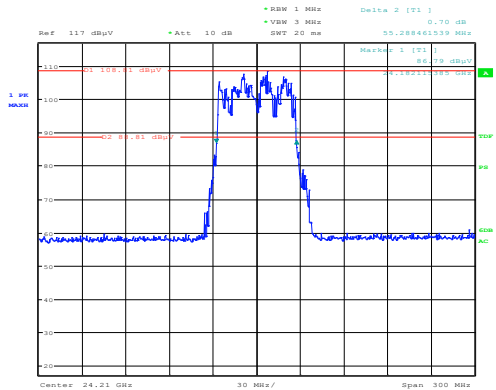
Project No.: RKSA240624001 Tester: Hugh Wu
Date: 6.SEP.2024 19:47:14

Frequency: 24.15



Project No.: RKSA240624001 Tester: Hugh Wu
Date: 6.SEP.2024 17:16:27

Frequency: 24.21



Project No.: RKSA240624001 Tester: Hugh Wu
Date: 6.SEP.2024 19:06:23

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. The laboratory is not responsible for the authenticity of any information provided by the applicant. Information from the applicant that may affect test results is marked with “★”.
2. The test data was only valid for the test sample(s).
3. 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.
4. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.
5. 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.

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