

FCC PART 15.225

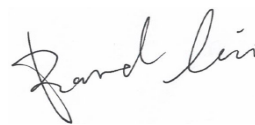
TEST REPORT

For

Miura Systems Ltd

Unit 3, Cliveden Office Village, Lancaster Road, Cressex Industrial Estate, High Wycombe, United Kingdom

FCC ID: 2AO4FMASP01

Report Type: Original Report	Product Name: MASP01
Report Number:	RKSA231206001-00C
Report Date:	2024-05-10
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

REPORT REVISION HISTORY.....	3
GENERAL INFORMATION.....	4
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	4
OBJECTIVE	4
TEST METHODOLOGY	4
MEASUREMENT UNCERTAINTY.....	5
TEST FACILITY	5
SYSTEM TEST CONFIGURATION.....	6
JUSTIFICATION	6
EUT EXERCISE SOFTWARE	6
EQUIPMENT MODIFICATIONS	6
EXTERNAL I/O CABLE.....	6
BLOCK DIAGRAM OF TEST SETUP	6
SUMMARY OF TEST RESULTS	9
TEST EQUIPMENT LIST	10
FCC§15.203 - ANTENNA REQUIREMENT.....	11
APPLICABLE STANDARD	11
ANTENNA CONNECTED CONSTRUCTION	11
FCC §15.207 (A) – AC LINE CONDUCTED EMISSIONS	12
APPLICABLE STANDARD	12
TEST SYSTEM SETUP.....	12
EMI TEST RECEIVER SETUP.....	12
TEST PROCEDURE	12
TEST RESULTS SUMMARY	13
FCC§15.225, §15.205 & §15.209 - RADIATED EMISSIONS TEST	14
APPLICABLE STANDARD	14
TEST SYSTEM SETUP.....	14
EMI TEST RECEIVER SETUP.....	15
TEST RESULTS SUMMARY	16
FCC§15.225(E) - FREQUENCY STABILITY.....	17
APPLICABLE STANDARD	17
TEST PROCEDURE	17
§15.215(C) - 20DB EMISSION BANDWIDTH TESTING	19
REQUIREMENT	19
TEST PROCEDURE	19
APPENDIX - TEST DATA.....	20
AC LINE CONDUCTED EMISSIONS	20
ENVIRONMENTAL CONDITIONS & TEST INFORMATION.....	20
RADIATED EMISSIONS TEST	29
FREQUENCY STABILITY	49
20dB EMISSION BANDWIDTH TESTING.....	50
RF EXPOSURE EVALUATION	51
EUT PHOTOGRAPHS.....	52
TEST SETUP PHOTOGRAPHS	53

REPORT REVISION HISTORY

Number of Revisions	Report No.	Version	Issue Date	Description
0	RKSA231206001-00C	R1V1	2023-05-10	Initial Release

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant:	Miura Systems Ltd
Tested Model:	MASP01
Product Name:	MASP01
HVIN:	MASP01-1, MASP01-2
Power Supply:	DC 5V charging (USB-C or POGO Pins port) or DC 7.4V battery
RF Function:	NFC
Operating Band/Frequency:	13.56 MHz
Antenna Type:	FPC Antenna
★Maximum Antenna Gain:	0 dBi

Adapter Information:

Model: ASSA107w-050200

Input: AC100-240V 50/60Hz 0.45A

Output: 5V, 2.0A, 10.0W

Note: The Maximum Antenna Gain was declared by the manufacturer.

All measurement and test data in this report was gathered from production sample serial number:

RKSA231206001-1(HVIN: MASP01-1)(Assigned by the BACL (Kunshan). The EUT supplied by the applicant was received on 2023-12-06.)

Objective

This Type approval report is prepared for *Miura Systems Ltd* in accordance with Part 2- Subpart J, and Part 15-Subparts A and C of the Federal Communication Commission's rules.

The objective is to determine the Compliance of the EUT with FCC rules, sec 15.203, 15.205, 15.207, 15.209 and 15.225.

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
Radiated emission	9 kHz~150 kHz	3.8 dB
	150 kHz~30 MHz	3.4 dB
	30MHz~1GHz	6.11dB
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

The system was configured for testing in a typical fashion (as normally used by a typical user).

EUT Exercise Software

The EUT is tested in the engineering mode.

Equipment Modifications

No modification on the EUT.

Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
/	50Ω load	/	/

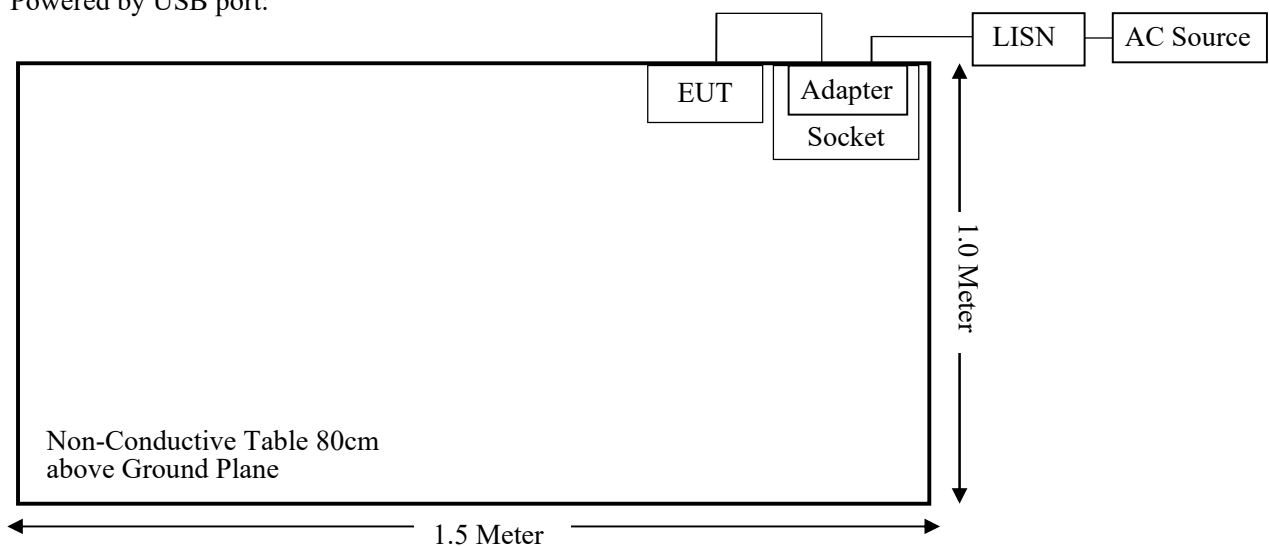
External I/O Cable

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

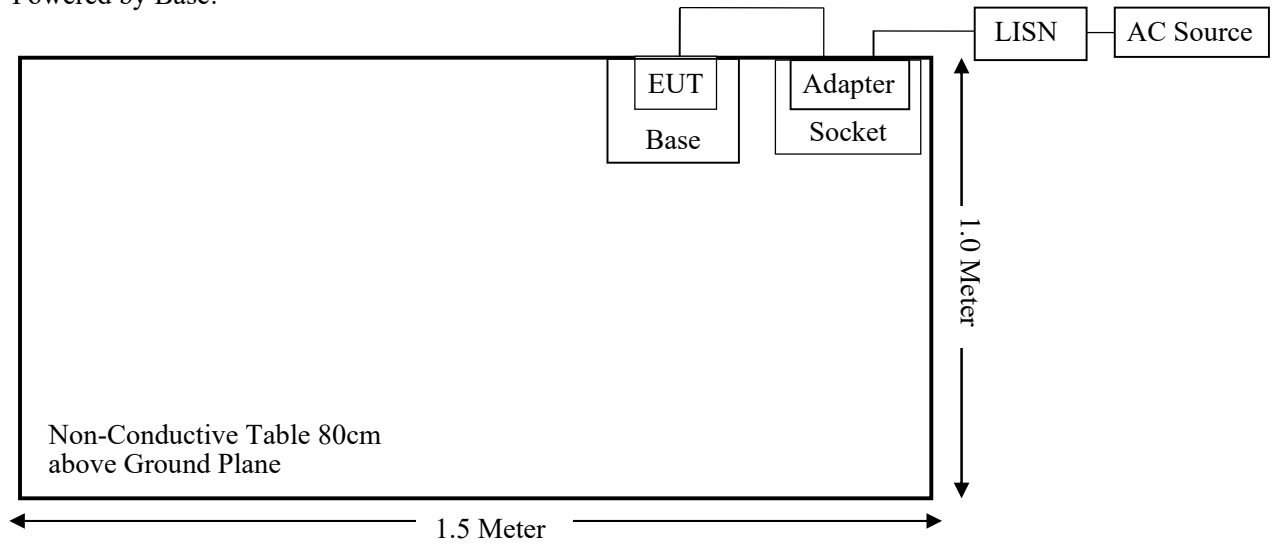
Block Diagram of Test Setup

For Conducted Emissions:

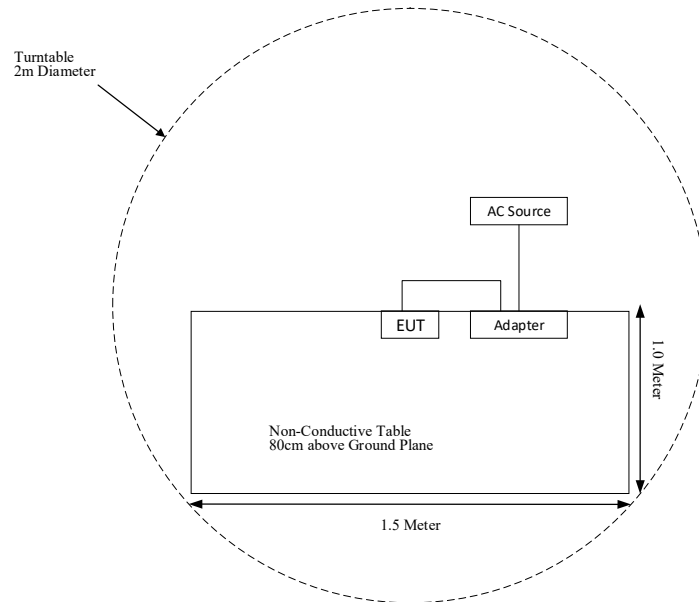
Powered by USB port:



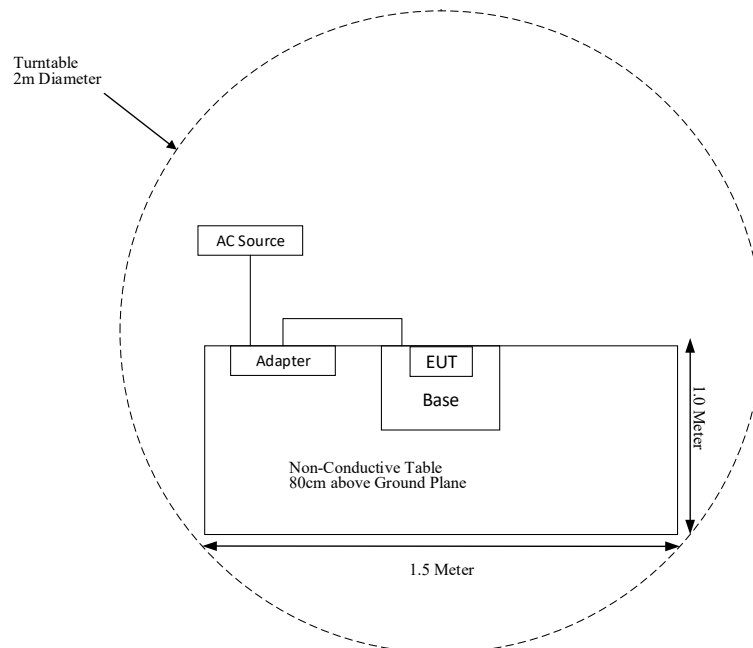
Powered by Base:



For Radiated Emissions (Below 1GHz):
Powered by USB port:



Powered by Base:



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliant
§15.207 (a)	AC Line Conducted Emissions	Compliant
§15.225 §15.209 §15.205	Radiated Emission Test	Compliant
§15.225(e)	Frequency Stability	Compliant
§15.215(c)	20dB Emission Bandwidth Testing	Compliant
§1.1310 §2.1093	RF Exposure	Compliant

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test					
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2023-05-23	2024-05-22
Sunol Sciences	Broadband Antenna	JB3	A090314-1	2023-11-11	2024-11-10
ETS-LINDGREN	Loop Antenna	6512	108100	2023-11-09	2024-11-08
Narda	6dB Attenuator	773-6	10690812-2-1	2023-11-11	2024-11-10
Sonoma Instrument	Pre-amplifier	310N	171205	2023-05-23	2024-05-22
Rohde & Schwarz	Auto Test Software	EMC32	100361	N/A	N/A
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
Frequency Stability					
BACL	Temperature & Humidity Chamber	BTH-150	30023	2023-05-23	2024-05-22
EAST	Regulated DC Power Supply	MCH-303D-II	14070562	2023-10-10	2024-10-09
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2023-05-23	2024-05-22
ETS-LINDGREN	Loop Antenna	6512	108100	2023-11-09	2024-11-08
MICRO-COAX	Coaxial Cable	Cable-10	010	2023-05-23	2024-05-22
Conducted Emission Test					
Rohde & Schwarz	EMI Test Receiver	ESR	1316.3003K03-101746-zn	2023-07-28	2024-07-27
Rohde & Schwarz	LISN	ENV216	101115	2023-05-23	2024-05-22
Audix	Test Software	e3	V9	N/A	N/A
Rohde & Schwarz	Pulse limiter	ESH3-Z2	100552	2023-05-23	2024-05-22
MICRO-COAX	Coaxial Cable	Cable-15	015	2023-05-23	2024-05-22

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

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 an FPC antenna for 13.56 MHz which the antenna gain is 0dBi, the antenna was permanently attached, fulfill the requirement of this section, please refer to the EUT photos.

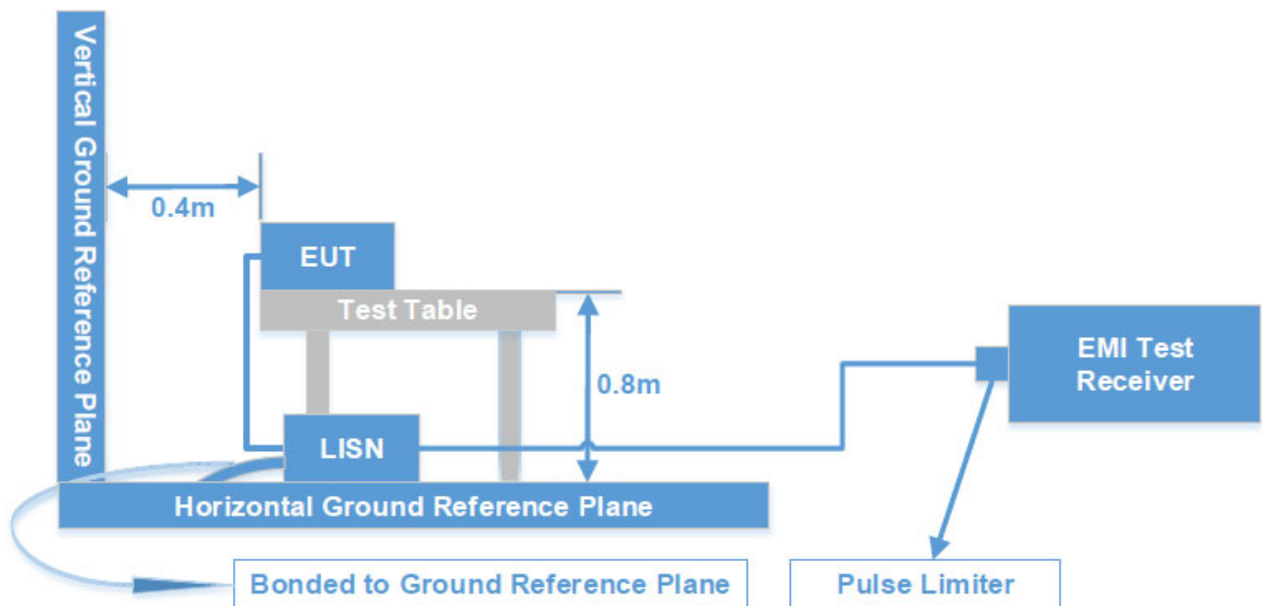
Result: Compliant.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC§15.207(a)

Test System Setup



The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 limits.

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

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:

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

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

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 Part 15.207.

Test Data: See Appendix

FCC§15.225, §15.205 & §15.209 - RADIATED EMISSIONS TEST

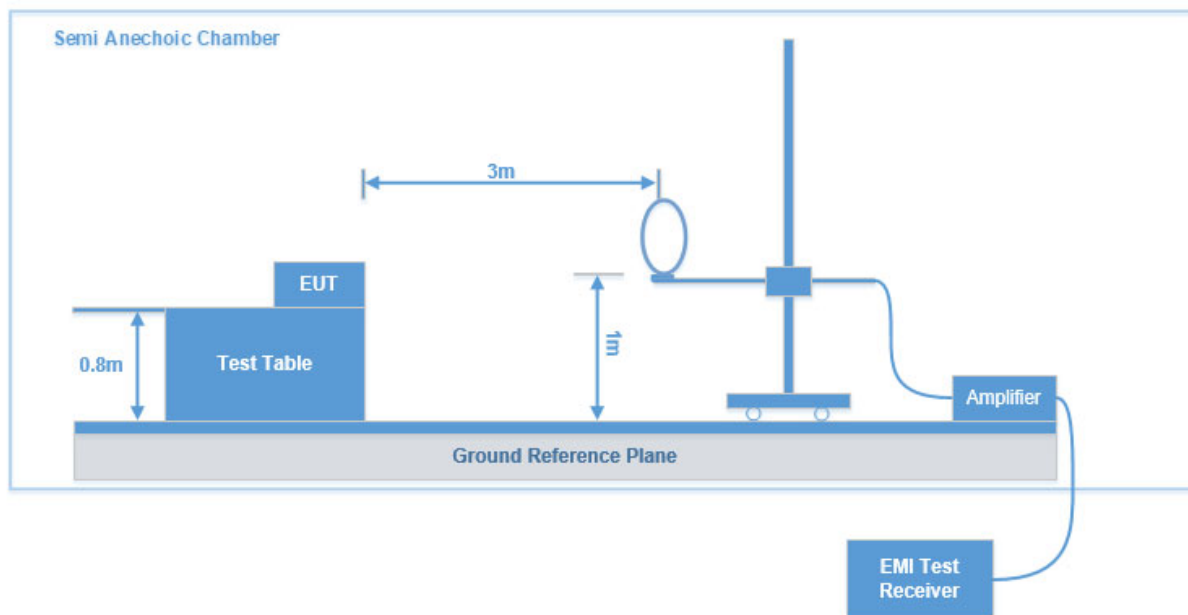
Applicable Standard

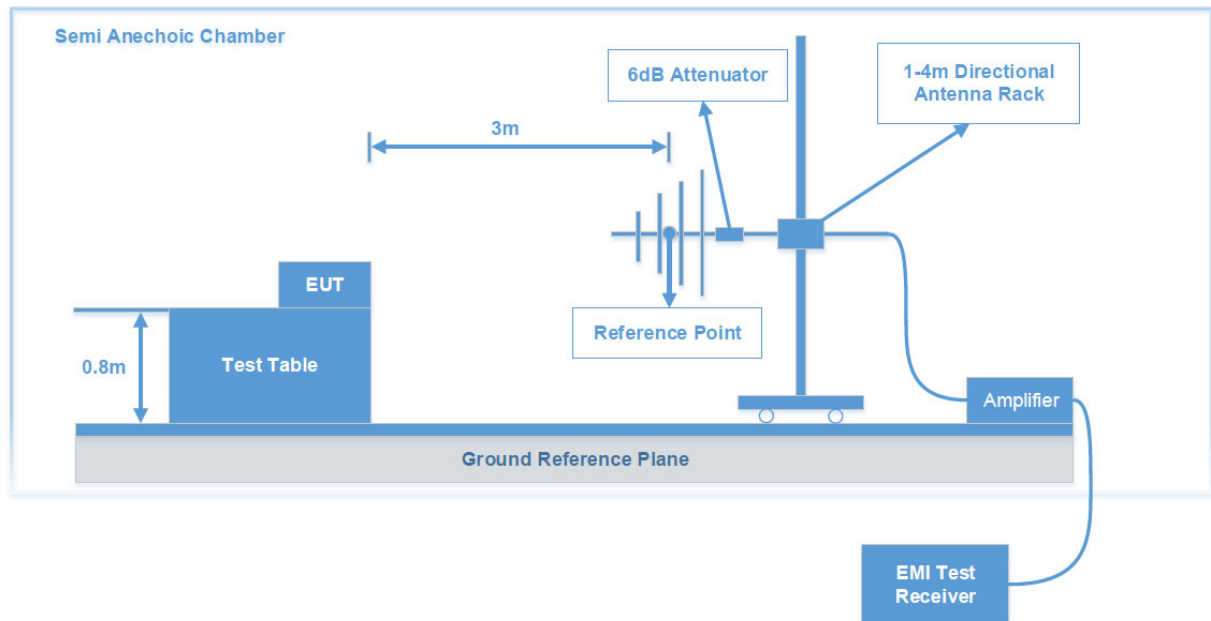
As per FCC Part 15.225

- (a) The field strength of any emissions within the band 13.553–13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.
- (b) Within the bands 13.410–13.553 MHz and 13.567–13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.
- (c) Within the bands 13.110–13.410 MHz and 13.710–14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.
- (d) The field strength of any emissions appearing outside of the 13.110–14.010 MHz band shall not exceed the general radiated emission limits in §15.209.

Test System Setup

9 kHz-30MHz:



30MHz-1GHz:

The radiated emission tests were performed in the 3-meter chamber a test site, using the setup accordance with the ANSI C63.10. The specification used was the FCC Part Subpart C limits.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

According to FCC Rules, 47 CFR 15.33, the EUT emissions were investigated up to 1000 MHz.

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

Frequency Range	RBW	VBW	IF B/W	Measurement
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

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 (dB μ V/m) = Meter Reading (dB μ V) + Antenna Factor (dB/m) + Cable Loss (dB) - 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:

Margin (dB) = Limit (dB μ V/m) – Corrected Amplitude (dB μ V/m)

Test Results Summary

According to the data in the following table, the EUT complied with the FCC Part 15.209, 15.205, 15.225.

Test Data: See Appendix

FCC§15.225(e) - FREQUENCY STABILITY

Applicable Standard

The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency over a temperature variation of -20 degrees to $+50$ degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

Test Procedure

a) Supply the EUT with a nominal ac voltage or install a new or fully charged battery in the EUT. If possible, a dummy load shall be connected to the EUT because an antenna near the metallic walls of an environmental test chamber could affect the output frequency of the EUT. If the EUT is equipped with a permanently attached, adjustable-length antenna, then the EUT shall be placed in the center of the chamber with the antenna adjusted to the shortest length possible. Turn ON the EUT and tune it to one of the number of frequencies shown in 5.6.

b) Couple the unlicensed wireless device output to the measuring instrument by connecting an antenna to the measuring instrument with a suitable length of coaxial cable and placing the measuring antenna near the EUT (e.g., 15 cm away), or by connecting a dummy load to the measuring instrument, through an attenuator if necessary.
NOTE—An instrument that has an adequate level of accuracy as specified by the procuring or regulatory agency is the recommended measuring instrument.

c) Adjust the location of the measurement antenna and the controls on the measurement instrument to obtain a suitable signal level (i.e., a level that will not overload the measurement instrument but is strong enough to allow measurement of the operating or fundamental frequency of the EUT).

d) Turn the EUT OFF and place it inside the environmental temperature chamber. For devices that have oscillator heaters, energize only the heater circuit.

e) Set the temperature control on the chamber to the highest specified in the regulatory requirements for the type of device and allow the oscillator heater and the chamber temperature to stabilize.

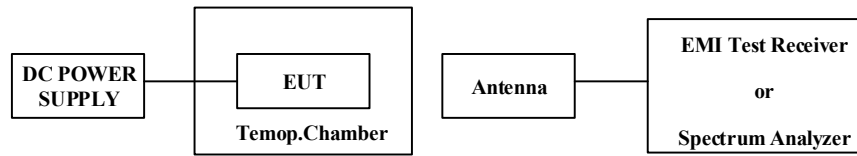
f) While maintaining a constant temperature inside the environmental chamber, turn the EUT ON and record the operating frequency at startup, and at 2 minutes, 5 minutes, and 10 minutes after the EUT is energized. Four measurements in total are made.

g) Measure the frequency at each of frequencies specified in 5.6.

h) Switch OFF the EUT but do not switch OFF the oscillator heater.

i) Lower the chamber temperature by not more than 10°C , and allow the temperature inside the chamber to stabilize.

j) Repeat step f) through step i) down to the lowest specified temperature.



Test Data: See Appendix

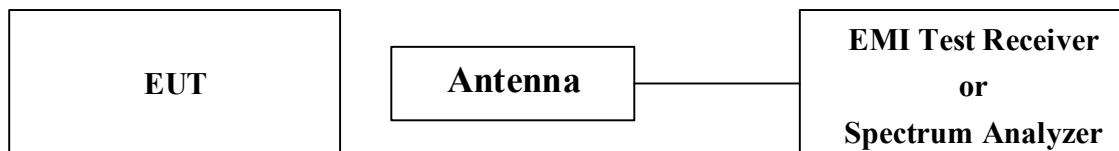
§15.215(c) - 20dB EMISSION BANDWIDTH TESTING

Requirement

Per 15.215 (c) 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. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

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 Data: See Appendix

APPENDIX - TEST DATA

AC LINE CONDUCTED EMISSIONS

Environmental Conditions & Test Information

Test Item:	AC LINE CONDUCTED EMISSIONS
Test Date:	2024-03-20~2024-04-01
Temperature:	16.5 °C~18.8 °C
Relative Humidity:	43 %~65 %
ATM Pressure:	101.1kPa ~102.8kPa
Test Result:	Pass
Test Engineer:	Frank Liu

Test Item:	RADIATED EMISSIONS
	9kHz - 1GHz
Test Date:	2024-03-19~2024-04-12
Temperature:	16.8 °C~17.6 °C
Relative Humidity:	45%~58 %
ATM Pressure:	101.5kPa~102.8kPa
Test Result:	Pass
Test Engineer:	Leah Li

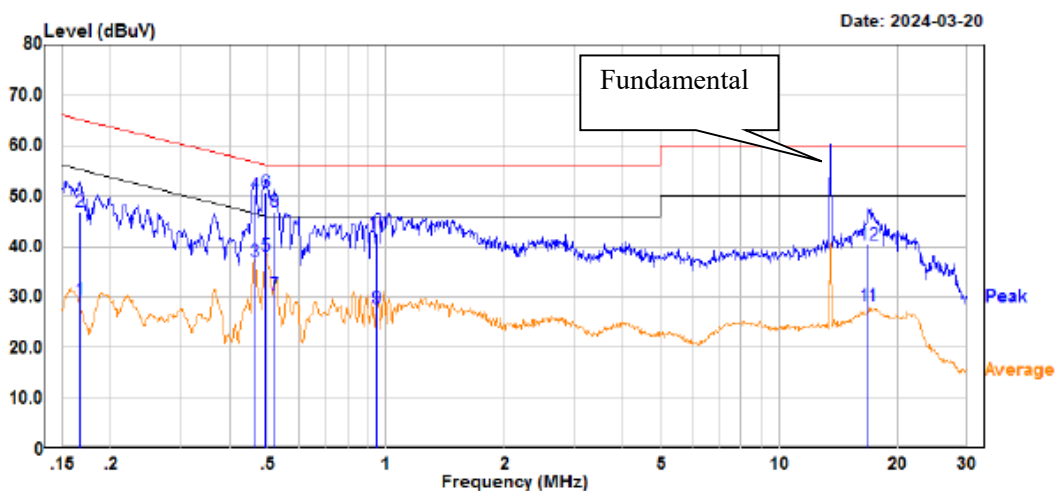
Test Item:	FREQUENCY STABILITY	20DB BANDWIDTH
Test Date:	2024-03-28	2024-04-03
Temperature:	17.0 °C	17.6 °C
Relative Humidity:	47 %	45 %
ATM Pressure:	102.8kPa	102.6kPa
Test Result:	Pass	Pass
Test Engineer:	Leah Li	Leah Li

EUT operation mode: Transmitting

For USB charging:

With antenna:

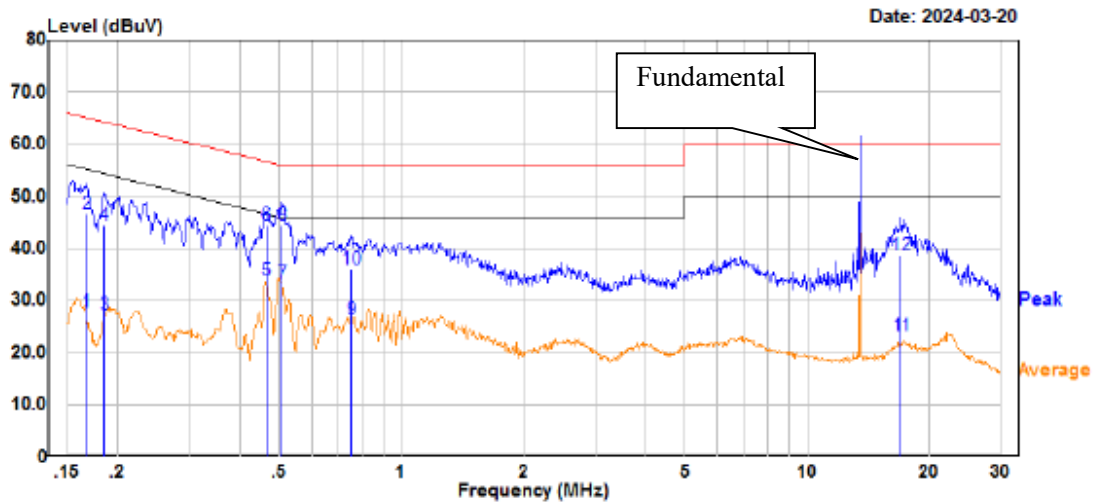
Line:



Trace: 1

Site : CE
Condition : FCC Part 15.207
: DET:Peak
Project No. : RKSA231206001
Model : MASP01
Phase : L
Voltage : 120V/60Hz
Mode : NFC
Test Equipment : ENV216,ESR
Temperature : 16.5℃
Humidity : 43%
Atmospheric pressure: 102.8kPa
Test Engineer : Frank Liu

		Read			Limit	Over	
	Freq	Level	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.167	9.50	19.91	29.41	55.13	-25.72	Average
2	0.167	27.10	19.91	47.01	65.13	-18.12	QP
3	0.465	17.01	20.09	37.10	46.60	-9.50	Average
4	0.465	30.31	20.09	50.40	56.60	-6.20	QP
5	0.494	18.10	20.11	38.21	46.11	-7.90	Average
6	0.494	30.70	20.11	50.81	56.11	-5.30	QP
7	0.519	10.40	20.10	30.50	46.00	-15.50	Average
8	0.519	26.70	20.10	46.80	56.00	-9.20	QP
9	0.948	7.90	19.80	27.70	46.00	-18.30	Average
10	0.948	22.70	19.80	42.50	56.00	-13.50	QP
11	16.828	8.40	19.81	28.21	50.00	-21.79	Average
12	16.828	20.50	19.81	40.31	60.00	-19.69	QP

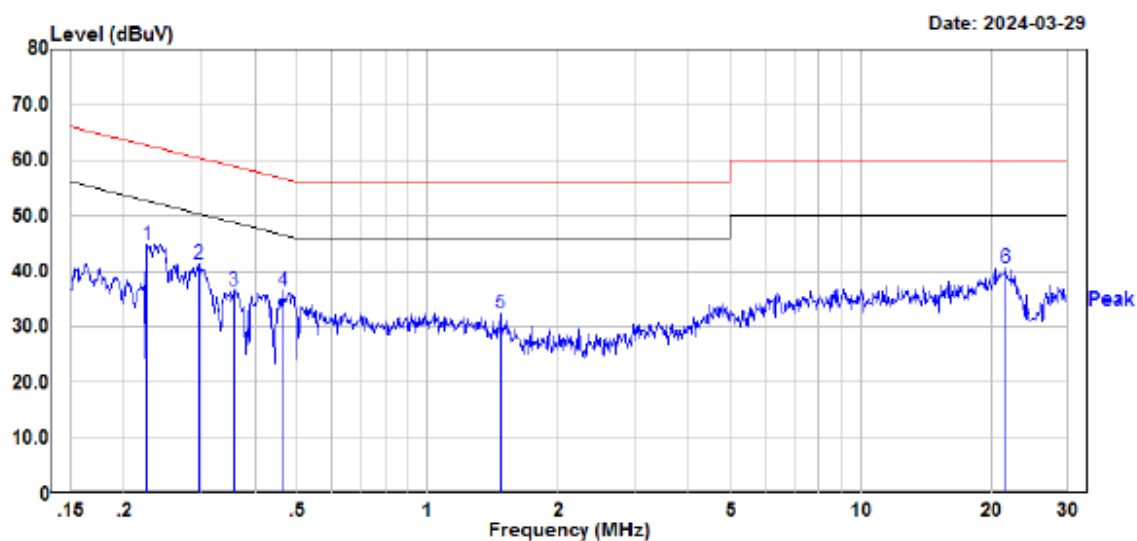
Neutral:

Site : CE
Condition : FCC Part 15.207
: DET:Peak
Project No. : RKSA231206001
Model : MASP01
Phase : N
Voltage : 120V/60Hz
Mode : NFC
Test Equipment : ENV216, ESR
Temperature : 16.5°C
Humidity : 43%
Atmospheric pressure: 102.8kPa
Test Engineer : Frank Liu

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.167	7.80	19.91	27.71	55.09	-27.38	Average
2	0.167	26.70	19.91	46.61	65.09	-18.48	QP
3	0.185	7.30	19.93	27.23	54.26	-27.03	Average
4	0.185	24.60	19.93	44.53	64.26	-19.73	QP
5	0.465	13.71	20.09	33.80	46.60	-12.80	Average
6	0.465	24.51	20.09	44.60	56.60	-12.00	QP
7	0.509	13.30	20.11	33.41	46.00	-12.59	Average
8	0.509	24.40	20.11	44.51	56.00	-11.49	QP
9	0.750	6.30	20.00	26.30	46.00	-19.70	Average
10	0.750	16.10	20.00	36.10	56.00	-19.90	QP
11	16.996	3.49	19.82	23.31	50.00	-26.69	Average
12	16.996	18.89	19.82	38.71	60.00	-21.29	QP

With load (According to KDB174176) :

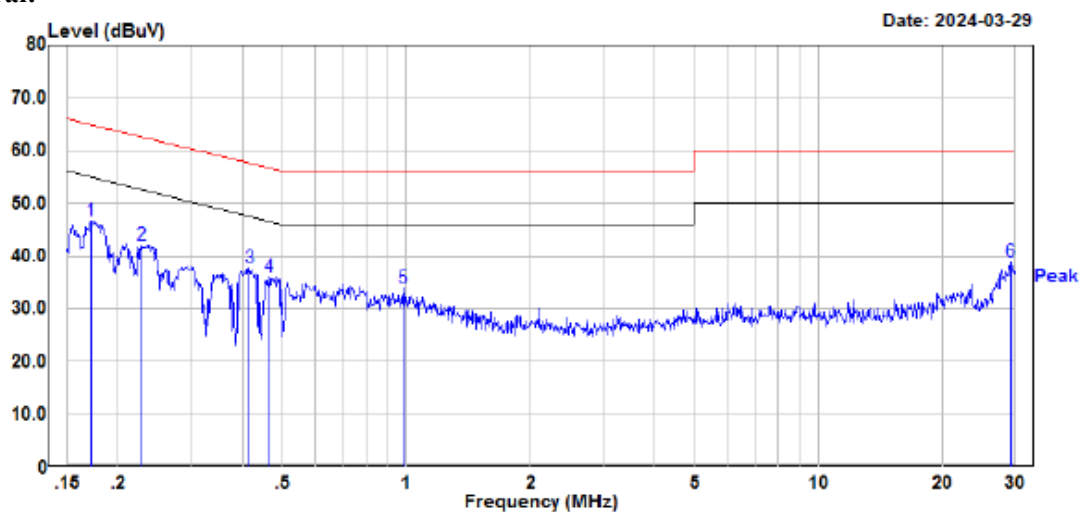
Line:



Site : CE
Condition : FCC Part 15.207
Project No. : RKSA231206001
Model : MASP01
Phase : L
Voltage : 120V/60Hz
Mode : NFC
Test Equipment : ENV216,ESR
Temperature : 17.4℃
Humidity : 65%
Atmospheric pressure: 101.1kPa
Test Engineer : Frank Liu

		Read			Limit	Over	
	Freq	Level	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.226	24.81	19.97	44.78	62.61	-17.83	Peak
2	0.297	21.35	20.01	41.36	60.33	-18.97	Peak
3	0.357	16.43	20.04	36.47	58.80	-22.33	Peak
4	0.463	16.33	20.09	36.42	56.64	-20.22	Peak
5	1.471	12.30	20.00	32.30	56.00	-23.70	Peak
6	21.483	20.78	19.87	40.65	60.00	-19.35	Peak

Neutral:



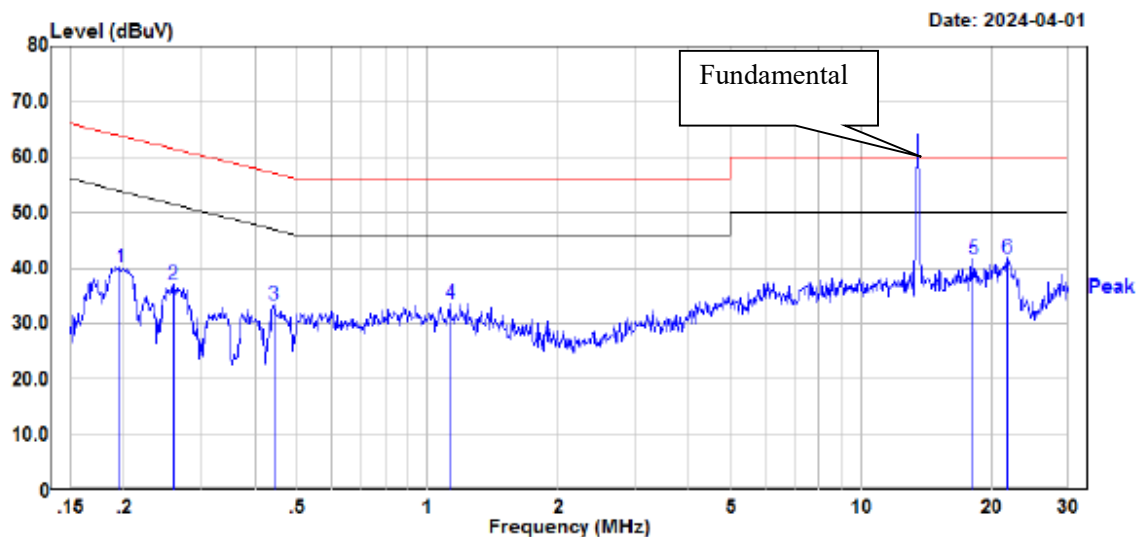
Site : CE
Condition : FCC Part 15.207
Project No. : RKSA231206001
Model : MASP01
Phase : N
Voltage : 120V/60Hz
Mode : NFC
Test Equipment : ENV216,ESR
Temperature : 17.4°C
Humidity : 65%
Atmospheric pressure: 101.1kPa
Test Engineer : Frank Liu

	Read		Limit	Over	
	Freq	Level	Factor	Level	Line
	MHz	dBuV	dB	dBuV	dB
1	0.172	26.71	19.92	46.63	64.88
2	0.228	22.04	19.97	42.01	62.52
3	0.417	17.69	20.07	37.76	57.51
4	0.463	15.84	20.09	35.93	56.64
5	0.982	14.01	19.77	33.78	56.00
6	29.262	18.84	20.01	38.85	60.00

Powered by Base:

With antenna:

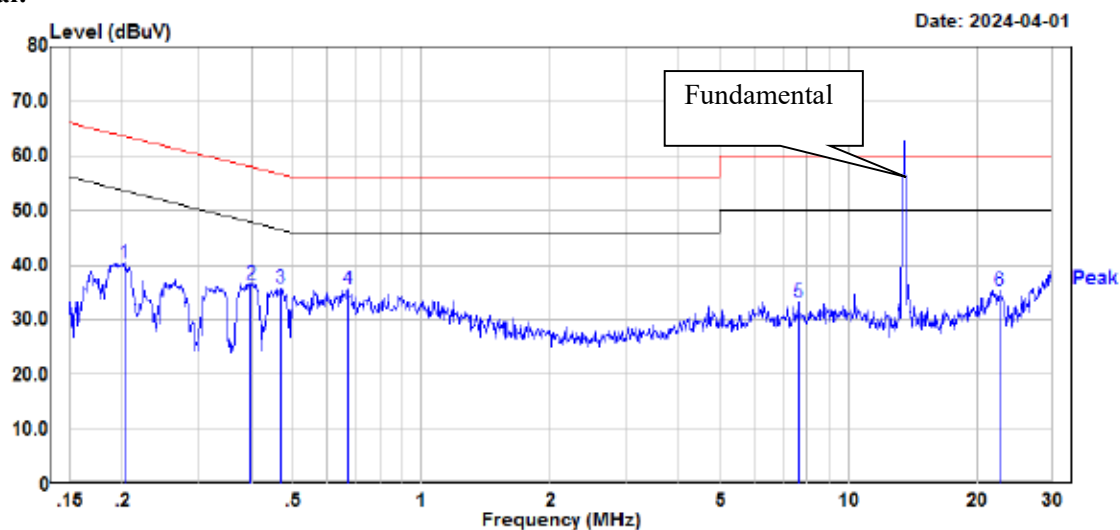
Line:



Site : CE
Condition : FCC Part 15.207
: DET:Peak
Project No. : RKSA231206001
Model : MASP01
Phase : L
Voltage : 120V/60Hz
Mode : NFC
Test Equipment : ENV216,ESR
Temperature : 18.8°C
Humidity : 57%
Atmospheric pressure: 101.5kPa
Test Engineer : Frank Liu

		Read			Limit	Over	
	Freq	Level	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.195	20.16	19.94	40.10	63.81	-23.71	Peak
2	0.260	17.02	19.99	37.01	61.45	-24.44	Peak
3	0.442	13.28	20.09	33.37	57.02	-23.65	Peak
4	1.129	13.89	19.83	33.72	56.00	-22.28	Peak
5	18.134	21.70	19.82	41.52	60.00	-18.48	Peak
6	21.698	22.01	19.87	41.88	60.00	-18.12	Peak

Neutral:

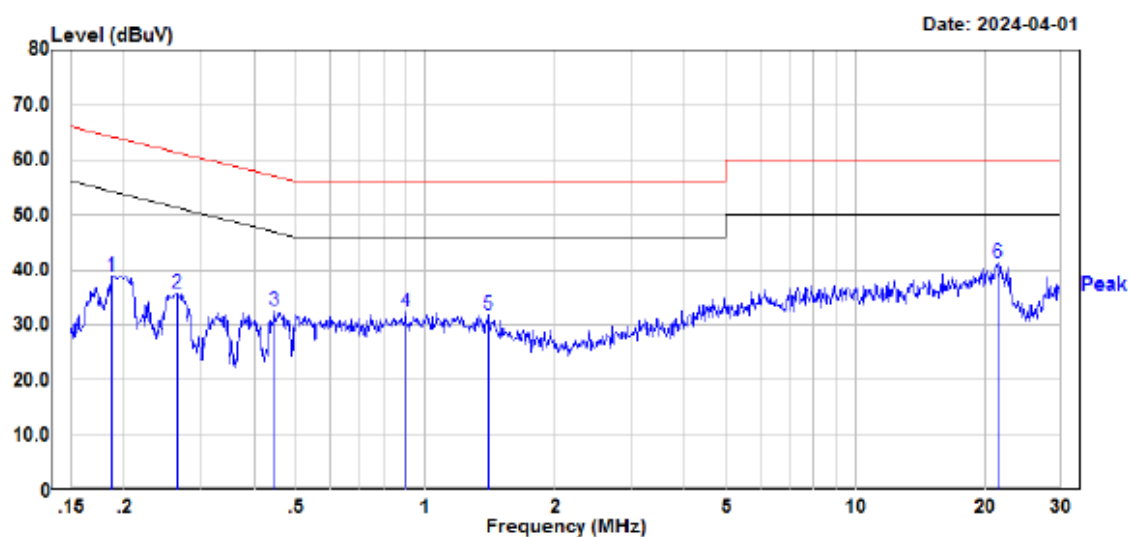


Site : CE
Condition : FCC Part 15.207
: DET:Peak
Project No. : RKSA231206001
Model : MASP01
Phase : N
Voltage : 120V/60Hz
Mode : NFC
Test Equipment : ENV216,ESR
Temperature : 18.8℃
Humidity : 57%
Atmospheric pressure: 101.5kPa
Test Engineer : Frank Liu

		Read			Limit	Over	
	Freq	Level	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.202	20.38	19.95	40.33	63.52	-23.19	Peak
2	0.398	16.46	20.07	36.53	57.89	-21.36	Peak
3	0.467	15.77	20.09	35.86	56.56	-20.70	Peak
4	0.672	15.45	20.07	35.52	56.00	-20.48	Peak
5	7.618	12.94	20.20	33.14	60.00	-26.86	Peak
6	22.468	15.49	19.89	35.38	60.00	-24.62	Peak

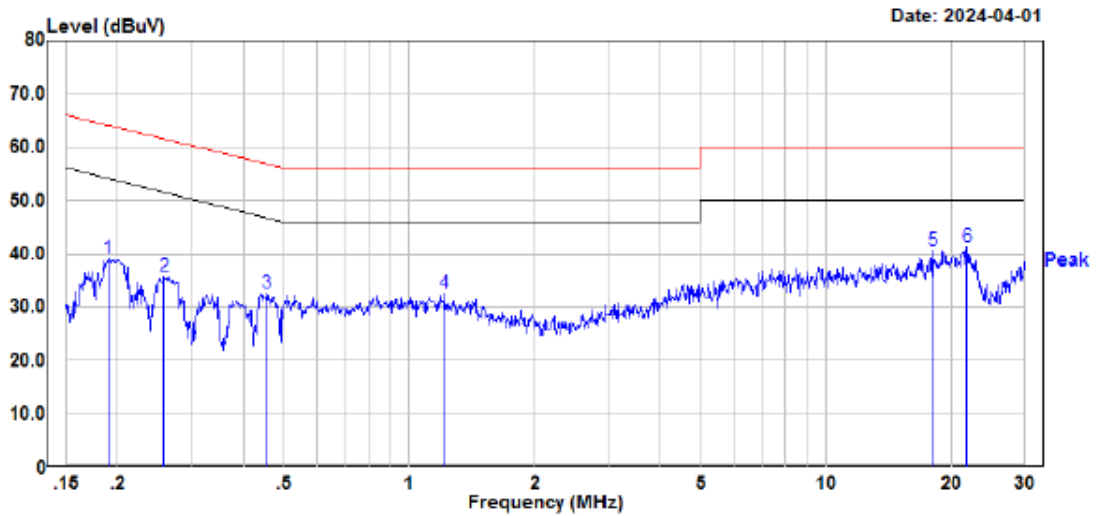
With load: (According to KDB174176)

Line:



Site : CE
Condition : FCC Part 15.207
: DET:Peak
Project No. : RKSA231206001
Model : MASP01
Phase : L
Voltage : 120V/60Hz
Mode : NFC-2
Test Equipment : ENV216,ESR
Temperature : 18.8°C
Humidity : 57%
Atmospheric pressure: 101.5kPa
Test Engineer : Frank Liu

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.187	19.10	19.93	39.03	64.18	-25.15	Peak
2	0.265	15.81	19.99	35.80	61.28	-25.48	Peak
3	0.445	12.50	20.09	32.59	56.98	-24.39	Peak
4	0.898	12.51	19.84	32.35	56.00	-23.65	Peak
5	1.399	11.90	19.97	31.87	56.00	-24.13	Peak
6	21.376	21.49	19.87	41.36	60.00	-18.64	Peak

Neutral:

Site : CE
Condition : FCC Part 15.207
: DET:Peak
Project No. : RKSA231206001
Model : MASP01
Phase : N
Voltage : 120V/60Hz
Mode : NFC-2
Test Equipment : ENV216,ESR
Temperature : 18.8℃
Humidity : 57%
Atmospheric pressure: 101.5kPa
Test Engineer : Frank Liu

	Freq	Read		Limit	Over	Remark
		Level	Factor	Level	Limit	
	MHz	dBuV	dB	dBuV	dBuV	dB
1	0.190	19.15	19.94	39.09	64.05	-24.96 Peak
2	0.258	15.75	19.99	35.74	61.49	-25.75 Peak
3	0.454	12.66	20.09	32.75	56.81	-24.06 Peak
4	1.211	12.81	19.88	32.69	56.00	-23.31 Peak
5	17.954	20.70	19.81	40.51	60.00	-19.49 Peak
6	21.806	21.41	19.87	41.28	60.00	-18.72 Peak

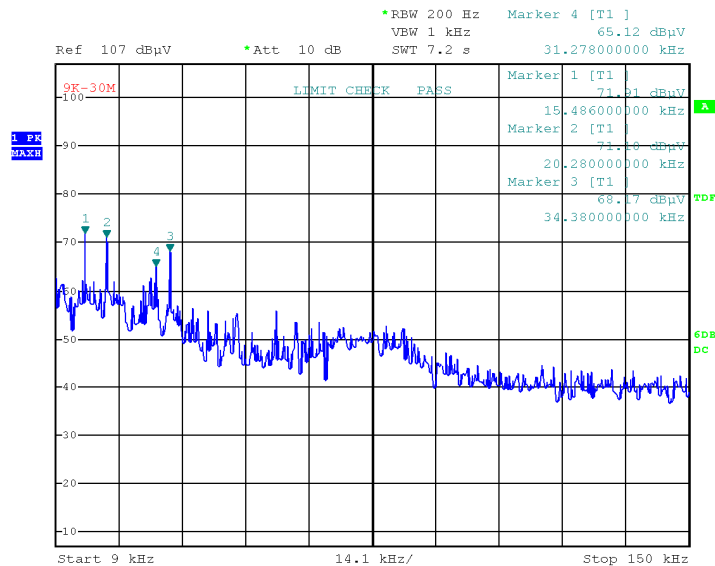
RADIATED EMISSIONS TEST

Test mode: Transmitting

Powered by USB port:

For Ground-parallel

1) 9 kHz~150 kHz:

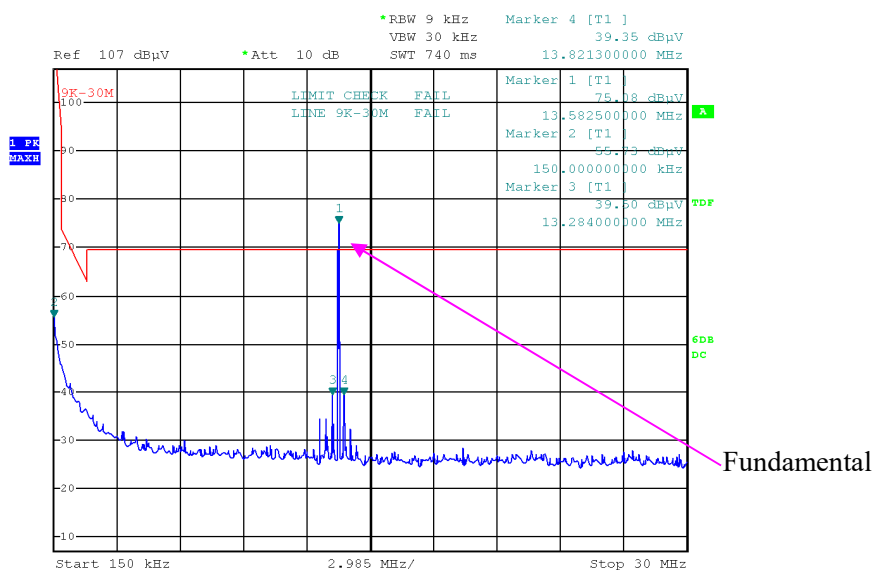


Project No.RKSA231206001
Date: 28.MAR.2024 16:49:06

Tester:Leah Li

Frequency (kHz)	Corrected Amplitude (dBμV/m)@3m	Detector PK/QP/Ave.	Corrected Factor (dB/m)	Limit (dBμV/m)@3m	Margin (dB)
15.49	71.91	PK	51.29	123.80	51.89
20.28	71.10	PK	49.73	121.46	50.36
34.38	68.17	PK	39.44	116.88	48.71
31.28	65.12	PK	49.47	117.70	52.58

2) 150 kHz~30 MHz:

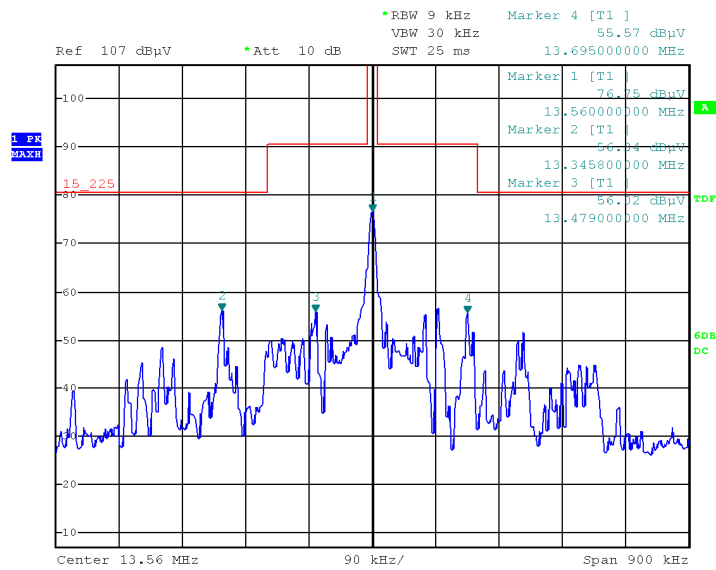


Project No.RKSA231206001
 Date: 28.MAR.2024 17:38:48

Tester:Leah Li

Frequency (MHz)	Corrected Amplitude (dBμV/m)@3m	Detector PK/QP/Ave.	Corrected Factor (dB/m)	Limit (dBμV/m)@3m	Margin (dB)
0.15	55.73	PK	50.90	104.08	48.35

3) 13.11 MHz~14.01 MHz:

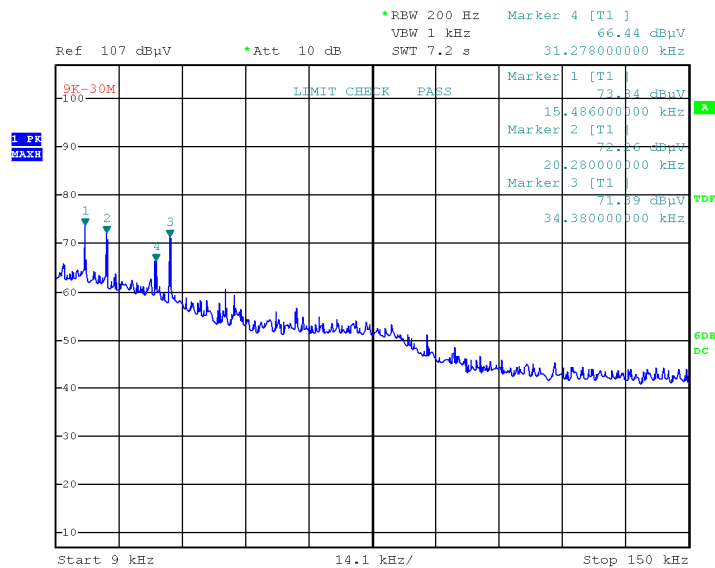


Project No.RKSA231206001
 Date: 12.APR.2024 16:39:40

Tester:Leah Li

Frequency (MHz)	Corrected Amplitude (dBμV/m)@3m	Detector PK/QP/Ave.	Corrected Factor (dB/m)	Limit (dBμV/m)@3m	Margin (dB)
13.56	76.75	PK	6.12	124.00	47.25
13.35	56.34	PK	6.13	80.50	24.16
13.48	56.02	PK	6.12	90.50	34.48
13.7	55.57	PK	6.10	90.50	34.93

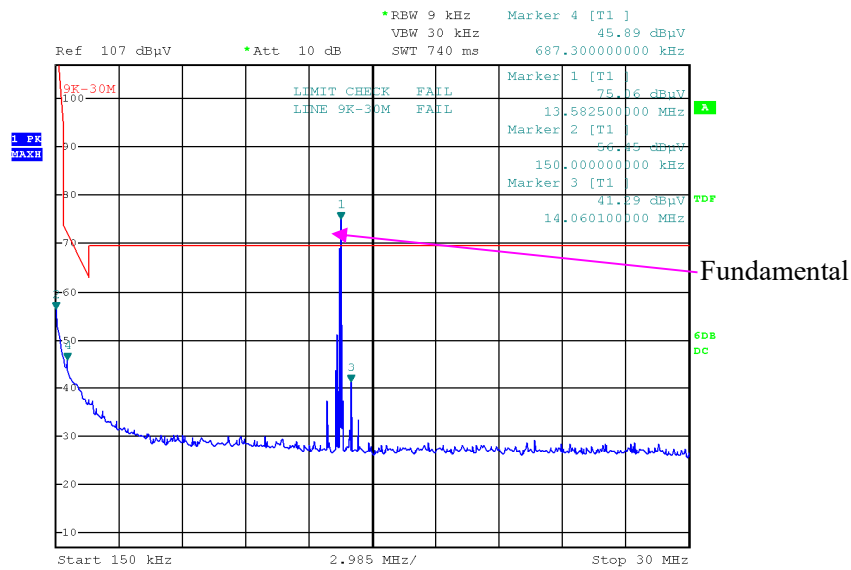
For Parallel
1) 9 kHz~150 kHz:



Project No.RKSA231206001 Tester:Leah Li
Date: 28.MAR.2024 16:53:28

Frequency (kHz)	Corrected Amplitude (dBμV/m)@3m	Detector PK/QP/Ave.	Corrected Factor (dB/m)	Limit (dBμV/m) @3m	Margin (dB)
15.49	73.84	PK	51.26	123.80	49.96
20.28	72.26	PK	49.73	121.46	49.2
34.38	71.39	PK	39.44	116.88	45.49
31.28	66.44	PK	38.98	117.70	51.26

2) 150 kHz~30 MHz:



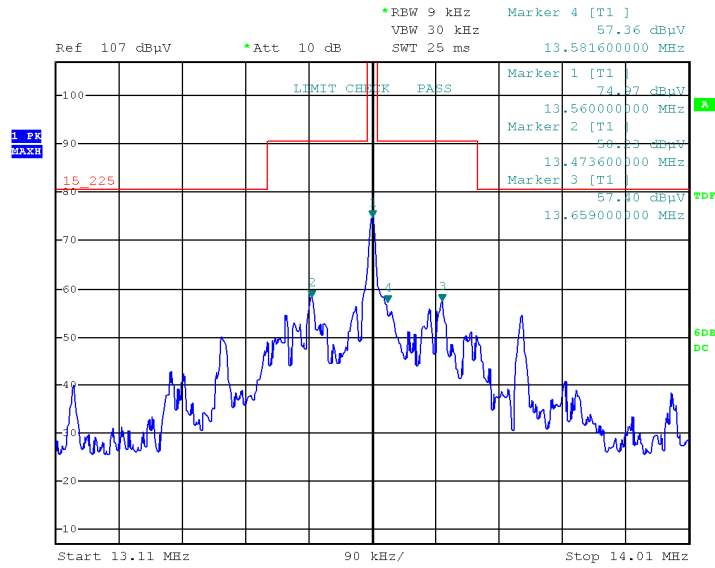
Project No.RKSA231206001

Tester:Leah Li

Date: 28.MAR.2024 17:17:48

Frequency (MHz)	Corrected Amplitude (dBμV/m)@3m	Detector PK/QP/Ave.	Corrected Factor (dB/m)	Limit (dBμV/m)@3m	Margin (dB)
0.15	56.45	PK	50.90	104.08	47.63
14.06	41.29	PK	6.11	69.54	28.25
0.69	45.89	PK	20.73	70.82	24.93

3) 13.11 MHz~14.01 MHz:

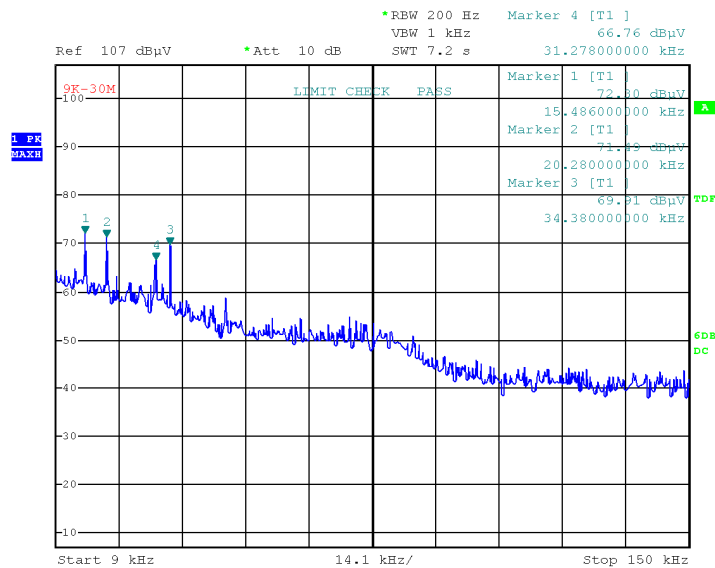


Project No.RKSA231206001
Date: 28.MAR.2024 17:50:24

Tester:Leah Li

Frequency (MHz)	Corrected Amplitude (dBμV/m)@3m	Detector PK/QP/Ave.	Corrected Factor (dB/m)	Limit (dBμV/m)@3m	Margin (dB)
13.56	74.97	PK	6.12	124.00	49.03
13.47	58.23	PK	6.12	90.50	32.27
13.66	57.4	PK	6.11	90.50	33.10
13.58	57.36	PK	6.11	90.50	33.14

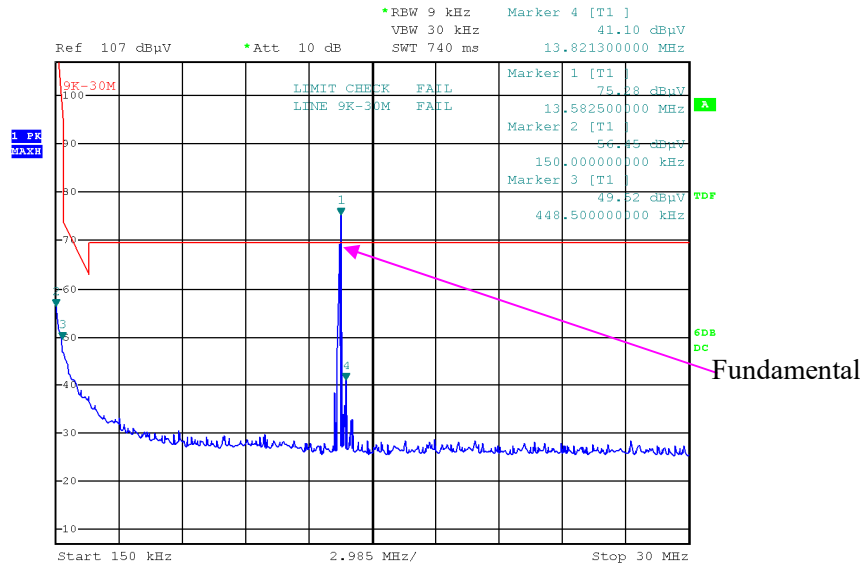
For Perpendicular
1) 9 kHz~150 kHz:



Project No.RKSA231206001 Tester:Leah Li
Date: 28.MAR.2024 16:56:55

Frequency (kHz)	Corrected Amplitude (dBμV/m)@3m	Detector PK/QP/Ave.	Corrected Factor (dB/m)	Limit (dBμV/m)@3m	Margin (dB)
15.49	72.80	PK	51.26	123.80	51.00
20.28	71.49	PK	49.73	121.46	49.97
34.38	69.91	PK	39.44	116.88	46.97
31.28	66.76	PK	38.98	117.70	50.94

2) 150 kHz~30 MHz:



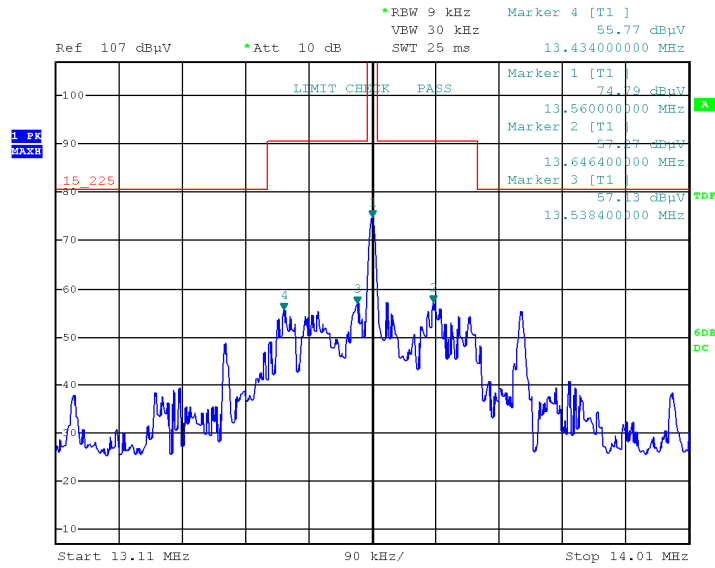
Project No.RKSA231206001

Tester:Leah Li

Date: 28.MAR.2024 17:11:45

Frequency (MHz)	Corrected Amplitude (dBμV/m)@3m	Detector PK/QP/Ave.	Corrected Factor (dB/m)	Limit (dBμV/m)@3m	Margin (dB)
0.15	56.45	PK	50.90	104.08	47.63
0.45	49.52	PK	24.48	94.54	45.02
13.82	41.10	PK	6.09	69.54	28.44

3) 13.11 MHz~14.01 MHz:



Project No.RKSA231206001

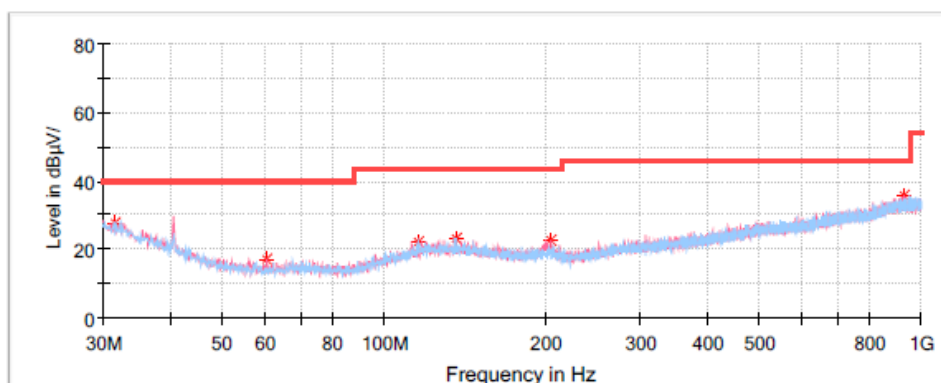
Tester:Leah Li

Date: 28.MAR.2024 17:42:10

Frequency (MHz)	Corrected Amplitude (dBμV/m)@3m	Detector PK/QP/Ave.	Corrected Factor (dB/m)	Limit (dBμV/m)@3m	Margin (dB)
13.56	74.79	PK	6.12	124.00	49.21
13.65	57.27	PK	6.11	90.50	33.23
13.54	57.13	PK	6.12	90.50	33.37
13.43	55.77	PK	6.13	90.50	34.73

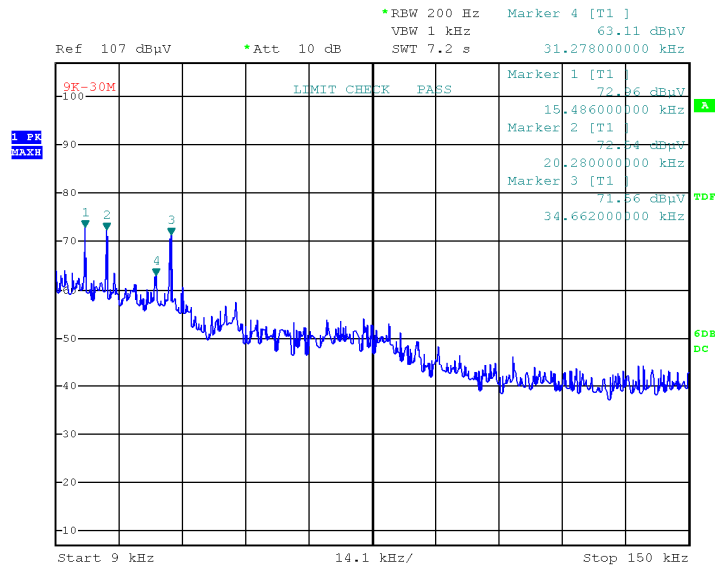
30 MHz ~1 GHz:**Common Information**

Project No:	RKSA231206001
EUT Model:	MASP01
Test Mode:	Mode 1
Standard:	FCC PART 15.247 & FCC PART 15.205 & FCC PART 15.209
Test Equipment:	ESCI, JB3, 310N
Temperature:	16.8°C
Humidity:	49%
Barometric Pressure:	102.5kPa
Test Engineer:	Leah Li
Test Date:	2024/3/19

**Critical_Freqs**

Frequency (MHz)	MaxPeak (dBμ V/m)	Limit (dBμ V/m)	Margin (dB)	Pol	Corr. (dB/m)
31.576250	27.65	40.00	12.35	H	-5.5
60.676250	16.87	40.00	23.13	V	-17.5
115.481250	21.90	43.50	21.60	H	-12.0
135.851250	23.26	43.50	20.24	H	-11.5
203.872500	22.40	43.50	21.10	V	-12.8
927.007500	35.78	46.00	10.22	V	1.4

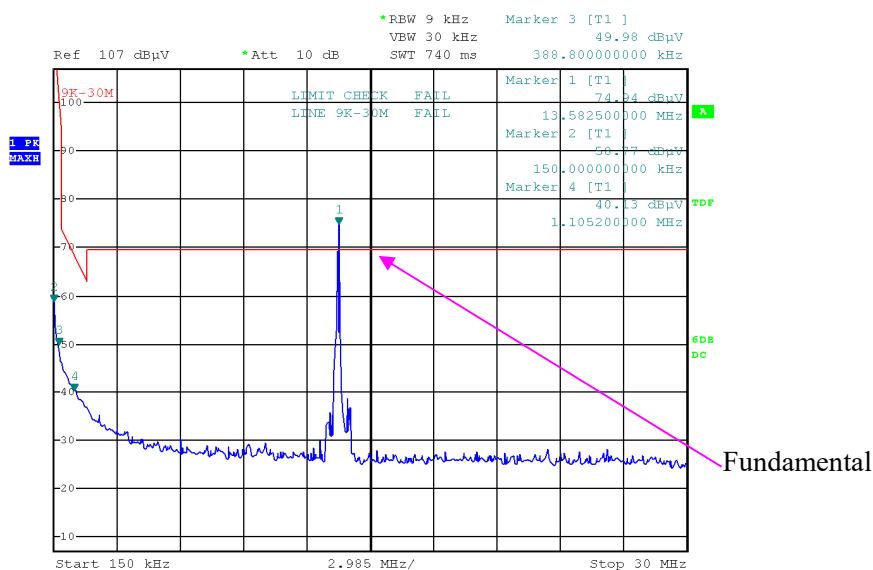
Powered by Base:
For Ground-parallel
1) 9 kHz~150 kHz:



Project No.RKSA231206001 Tester:Leah Li
Date: 2.APR.2024 10:27:37

Frequency (kHz)	Corrected Amplitude (dBμV/m)@3m	Detector PK/QP/Ave.	Corrected Factor (dB/m)	Limit (dBμV/m)@3m	Margin (dB)
15.49	72.96	PK	51.29	123.80	50.84
20.28	72.54	PK	49.73	131.46	58.92
34.66	71.56	PK	39.48	116.81	45.25
31.28	63.11	PK	46.87	117.70	54.59

2) 150 kHz~30 MHz:

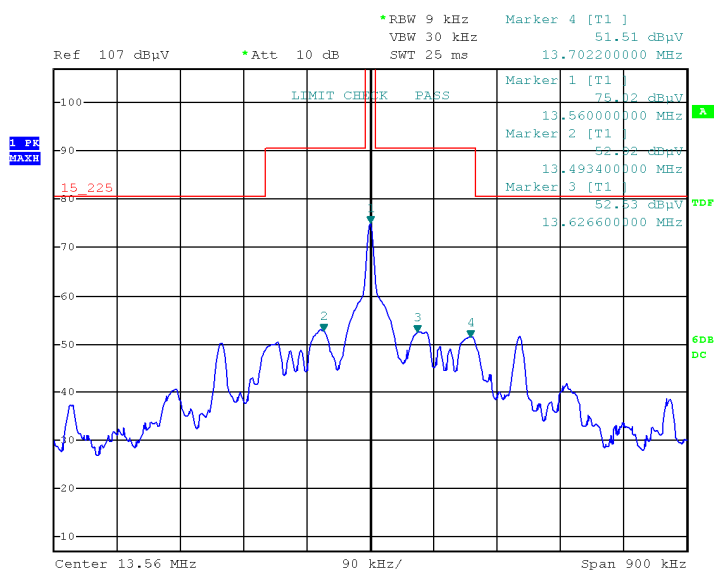


Project No.RKSA231206001
 Date: 2.APR.2024 10:47:58

Tester:Leah Li

Frequency (MHz)	Corrected Amplitude (dBμV/m)@3m	Detector PK/QP/Ave.	Corrected Factor (dB/m)	Limit (dBμV/m)@3m	Margin (dB)
0.15	58.77	PK	50.90	104.08	45.31
0.39	49.98	PK	26.13	95.78	45.80
1.11	40.13	PK	17.19	66.70	26.57

3) 13.11 MHz~14.01 MHz:

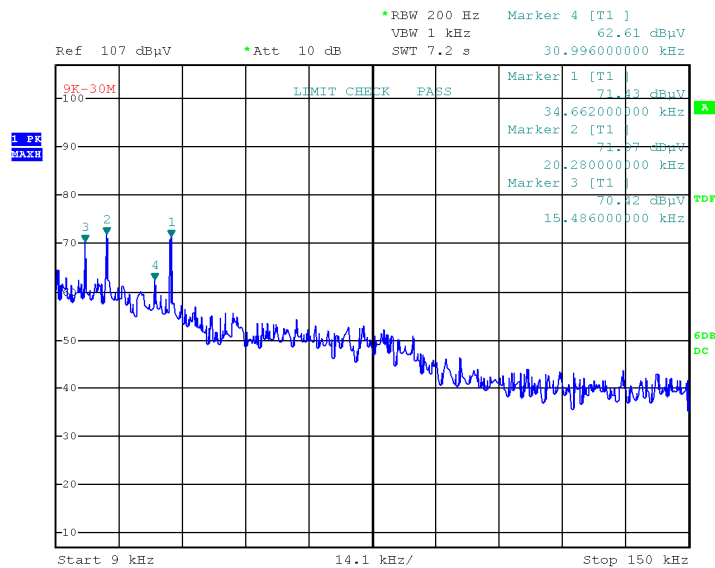


Project No. RKSA231206001
Date: 2.APR.2024 10:45:44

Tester: Leah Li

Frequency (MHz)	Corrected Amplitude (dBμV/m)@3m	Detector PK/QP/Ave.	Corrected Factor (dB/m)	Limit (dBμV/m)@3m	Margin (dB)
13.56	75.02	PK	6.12	124.00	48.98
13.49	52.92	PK	6.12	90.50	37.58
13.63	52.53	PK	6.11	90.50	37.97
13.7	51.51	PK	6.10	90.50	38.99

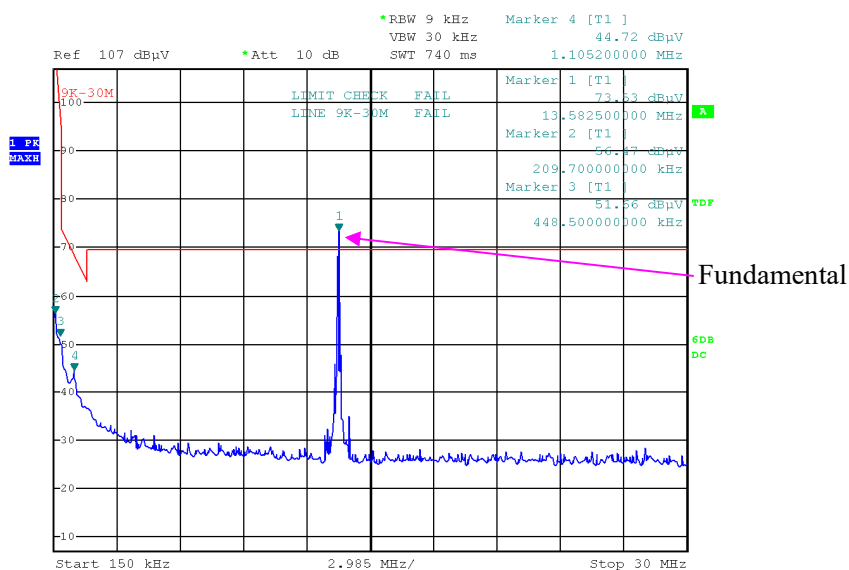
For Parallel
1) 9 kHz~150 kHz:



Project No.RKSA231206001 Tester:Leah Li
Date: 2.APR.2024 10:24:46

Frequency (kHz)	Corrected Amplitude (dBμV/m)@3m	Detector PK/QP/Ave.	Corrected Factor (dB/m)	Limit (dBμV/m)@3m	Margin (dB)
34.66	71.43	PK	39.48	116.81	45.38
20.28	71.97	PK	49.73	121.46	49.49
15.49	70.42	PK	51.29	123.80	53.38
31.00	62.61	PK	50.73	117.78	55.17

2) 150 kHz~30 MHz:

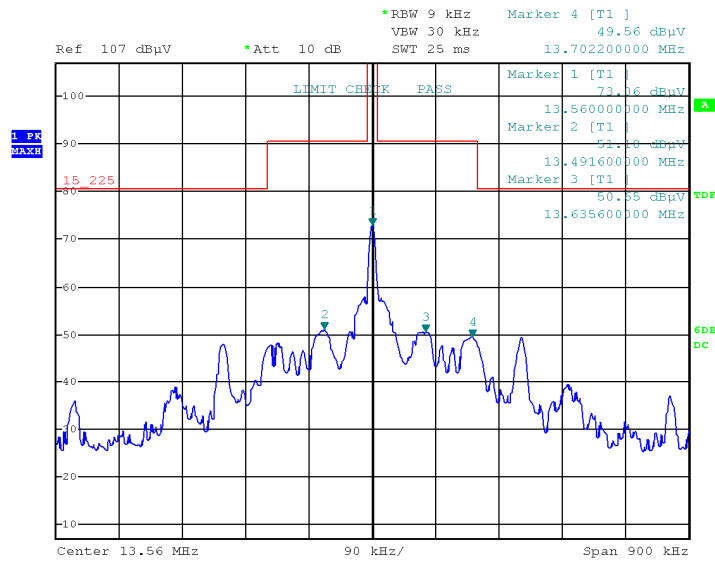


Project No.RKSA231206001
Date: 2.APR.2024 18:54:40

Tester:Leah Li

Frequency (MHz)	Corrected Amplitude (dBμV/m)@3m	Detector PK/QP/Ave.	Corrected Factor (dB/m)	Limit (dBμV/m)@3m	Margin (dB)
0.21	56.47	PK	49.30	101.16	44.69
0.45	51.66	PK	24.48	94.54	42.88
1.11	44.72	PK	17.19	66.70	21.98

3) 13.11 MHz~14.01 MHz:

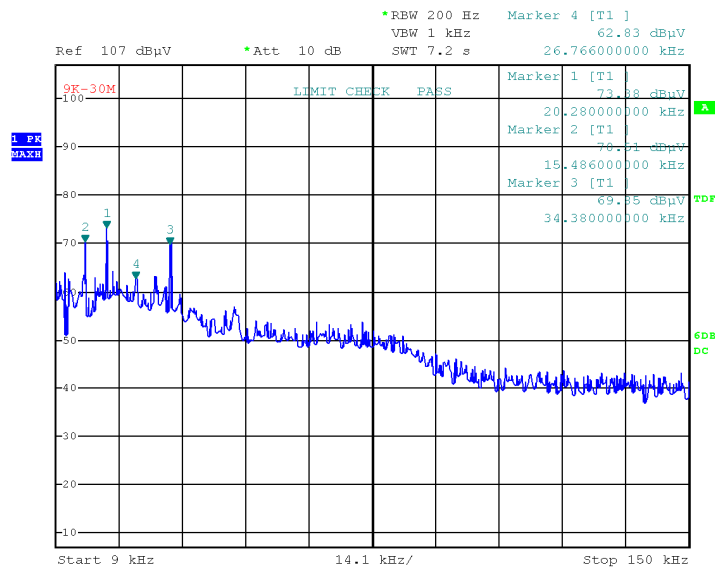


Project No.RKSA231206001
Date: 2.APR.2024 10:56:36

Tester:Leah Li

Frequency (MHz)	Corrected Amplitude (dBμV/m)@3m	Detector PK/QP/Ave.	Corrected Factor (dB/m)	Limit (dBμV/m)@3m	Margin (dB)
13.56	73.06	PK	6.12	124.00	50.94
13.49	51.18	PK	6.12	90.50	39.32
13.64	50.65	PK	6.11	90.50	39.85
13.7	49.56	PK	6.10	90.50	40.94

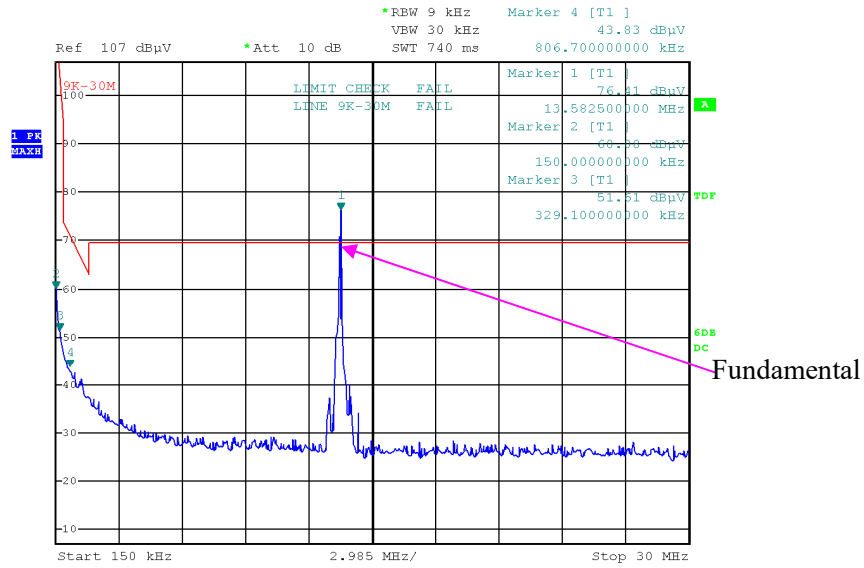
For Perpendicular
1) 9 kHz~150 kHz:



Project No.RKSA231206001 Tester:Leah Li
Date: 2.APR.2024 10:22:32

Frequency (kHz)	Corrected Amplitude (dBμV/m)@3m	Detector PK/QP/Ave.	Corrected Factor (dB/m)	Limit (dBμV/m)@3m	Margin (dB)
20.28	73.38	PK	49.73	121.46	48.08
15.49	70.51	PK	51.29	123.80	53.29
34.38	69.85	PK	39.44	116.88	47.03
26.77	62.83	PK	48.10	119.05	56.22

2) 150 kHz~30 MHz:

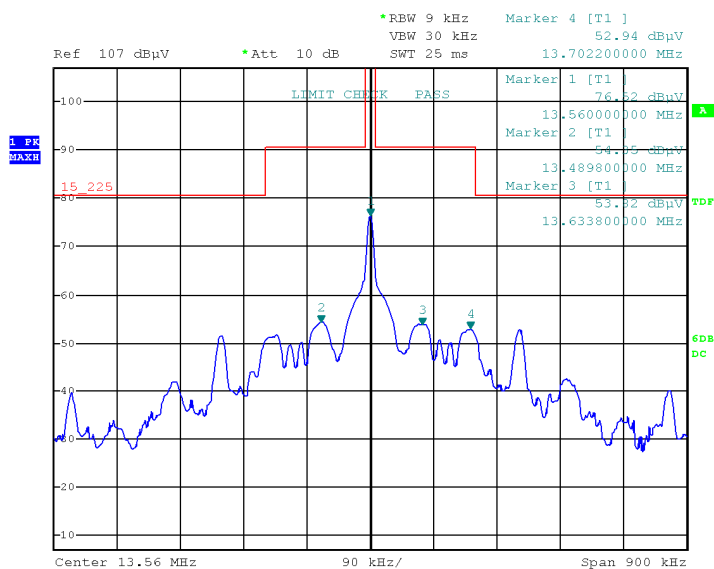


Project No.RKSA231206001
Date: 2.APR.2024 10:50:13

Tester:Leah Li

Frequency (MHz)	Corrected Amplitude (dBμV/m)@3m	Detector PK/QP/Ave.	Corrected Factor (dB/m)	Limit (dBμV/m)@3m	Margin (dB)
0.15	60.08	PK	50.90	104.08	44.00
0.33	51.61	PK	27.78	97.23	45.62
0.81	43.83	PK	19.46	69.43	25.60

3) 13.11 MHz~14.01 MHz:



Project No.RKSA231206001
Date: 2.APR.2024 10:53:05

Tester:Leah Li

Frequency (MHz)	Corrected Amplitude (dBμV/m)@3m	Detector PK/QP/Ave.	Corrected Factor (dB/m)	Limit (dBμV/m)@3m	Margin (dB)
13.56	76.52	PK	6.12	124.00	47.48
13.49	54.35	PK	6.12	90.50	36.15
13.63	53.82	PK	6.11	90.50	36.68
13.7	52.94	PK	6.10	90.50	37.56

30 MHz ~1 GHz:

Common Information

Project No:

EUT Model:

Test Mode:

Standard:

Test Equipment:

Temperature:

Humidity:

Barometric Pressure:

Test Engineer:

Test Date:

RKSA231206001

MASP01

NFC

FCC Part 15.247 & FCC Part 15.205 & FCC Part 15.209

ESCI, JB3, 310N

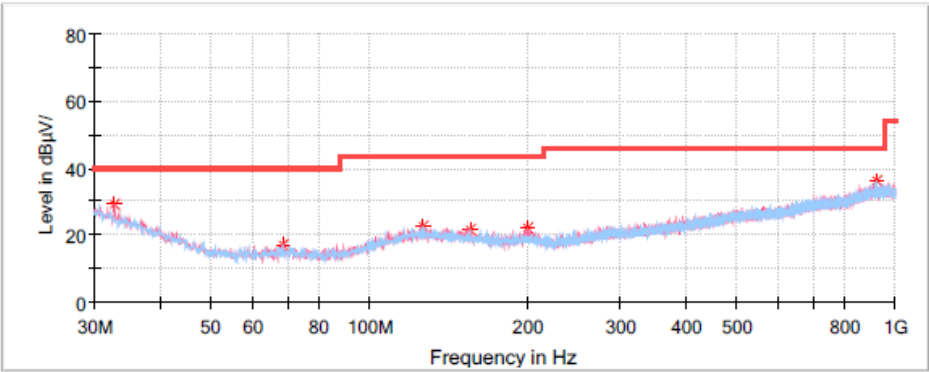
17.4°C

58%

101.5kPa

Leah Li

2024/4/1



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµ V/m)	Limit (dBµ V/m)	Margin (dB)	Pol	Corr. (dB/m)
32.788750	29.16	40.00	10.84	V	-6.3
68.436250	17.35	40.00	22.65	H	-16.9
126.757500	22.54	43.50	20.96	H	-11.3
155.615000	21.63	43.50	21.87	H	-12.3
200.477500	22.07	43.50	21.43	V	-12.6
921.551250	36.08	46.00	9.92	H	1.4

FREQUENCY STABILITY*Test Mode: Transmitting.**Test Result: Compliant*

F₀ = 13.56MHz				
Power Supply(V_{DC})	Temperature (°C)	Measured Frequency (MHz)	Frequency Error (%)	Part 15.225 Limit
7.4	-20	13.5590653	-0.00689	±0.01%
	-10	13.5590528	-0.00699	±0.01%
	0	13.5590453	-0.00704	±0.01%
	10	13.5592536	-0.00550	±0.01%
	20	13.5599525	-0.00035	±0.01%
	30	13.5590605	-0.00693	±0.01%
	40	13.5590459	-0.00704	±0.01%
	50	13.5590523	-0.00699	±0.01%
7.2	20	13.5590475	-0.00702	±0.01%
8.4	20	13.5590636	-0.00691	±0.01%

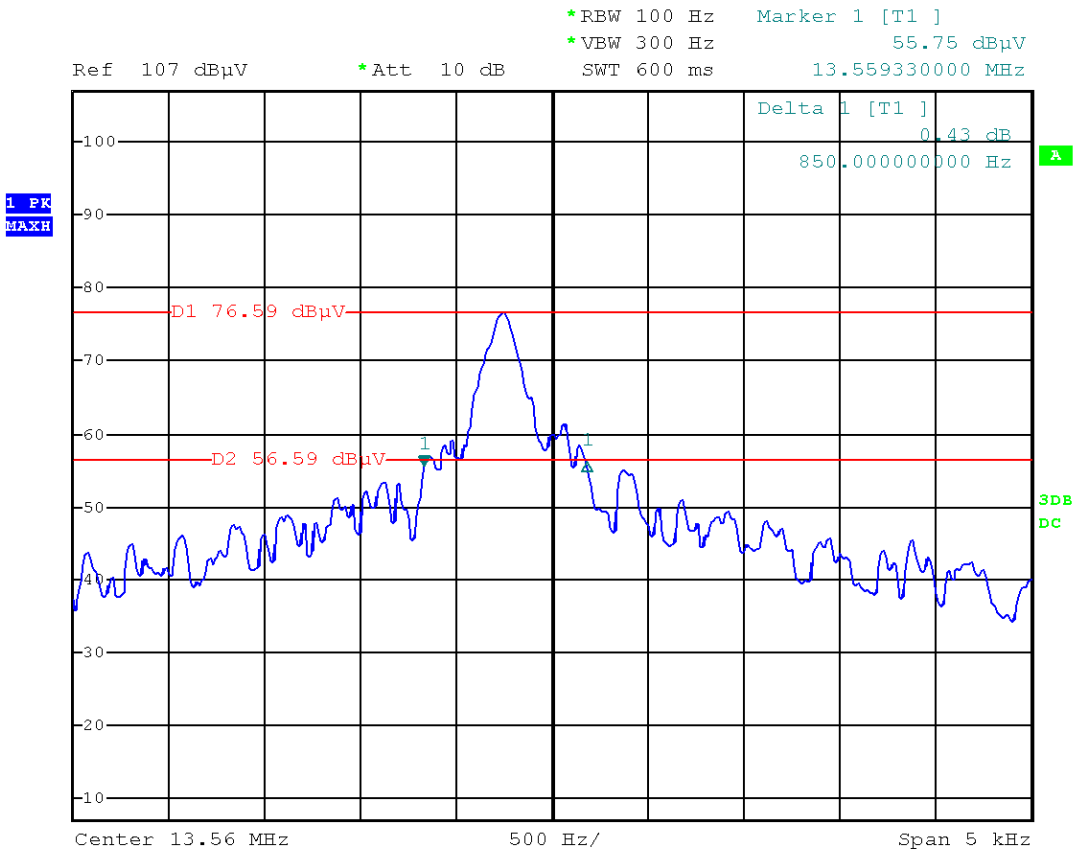
20dB EMISSION BANDWIDTH TESTING

Test Mode: Transmitting

Test Result: Compliant

Frequency (MHz)	20dB Bandwidth (kHz)
13.56	0.85

20dB Bandwidth



Project No.RKSA231206001

Tester:Leah Li

Date: 3.APR.2024 16:41:51

RF EXPOSURE EVALUATION

Applicable Standard

According to KDB447498 D01 General RF Exposure Guidance v06: 4.3. General SAR test exclusion guidance

c) For frequencies below 100 MHz, the following may be considered for SAR test exclusion (also illustrated in Appendix C):

1) For test separation distances > 50 mm and < 200 mm, the power threshold at the corresponding test separation distance at 100 MHz in step b) is multiplied by $[1 + \log(100/f_{\text{MHz}})]$

2) For test separation distances ≤ 50 mm, the power threshold determined by the equation in c) 1) for 50 mm and 100 MHz is multiplied by $\frac{1}{2}$

3) SAR measurement procedures are not established below 100 MHz

Measurement Result:

For NFC, the power of EUT: E Field @3m is 76.75dBuV/m = -18.45 dBm(0.01mW)

Note: $E[\text{dBuV/m}] = \text{EIRP}[\text{dBm}] + 95.2$ for $d = 3$ m.

SAR test exclusion threshold for NFC(13.56MHz) separation distance < 50 mm

$$= [474 * (1 + \log(100/f_{\text{MHz}}))] / 2$$

$$= 443\text{mW}$$

$$> 0.01\text{mW}$$

Result: Compliant

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 E-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 *******