



TEST REPORT

Applicant Name : Seeed Technology Co., Ltd
Address : 9F, G3 Building, TCL International E City, Zhongshanyuan Road,
Nanshan District, Shenzhen, Guangdong Province, P.R.C
Report Number : SZNS211025-54608E-00A
FCC ID: Z4T-RESERVER-A

Test Standard (s)
FCC PART 15.247

Sample Description

Product: reServer-X86-A1135
Trademark: Seeed Studio
Tested Model: reServer-I51135(64G+512G/z)
Multiple Product and Model: reServer-X86-A1115, reServer-I31115(xx+yy/z);
reServer-X86-A1125, reServer-I31125(xx+yy/z)
reServer-X86-A1135, reServer-I51135(xx+yy/z)
(Note: xx: DDR, 8G/16G/32G/64G
yy: SSD, 128G/256G/512G; z: wifi module)
Date Received: 2021-10-20
Date of Test: 2021-10-22 to 2022-04-18
Report Date: 2022-04-18

Test Result:	Pass*
--------------	-------

* In the configuration tested, the EUT complied with the standards above.

Prepared and Checked By:

Ting Lü
EMC Engineer

Approved By:

Candy Li
EMC Engineer

Note: This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk "★".

Shenzhen Accurate Technology Co., Ltd. is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with an asterisk "★". Customer model name, addresses, names, trademarks etc. are not considered data.

This report cannot be reproduced except in full, without prior written approval of the Company. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. 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.

Shenzhen Accurate Technology Co., Ltd.

1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China
Tel: +86 755-26503290 Fax: +86 755-26503396 Web: www.atc-lab.com

TABLE OF CONTENTS

GENERAL INFORMATION	3
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	3
OBJECTIVE	3
TEST METHODOLOGY	3
MEASUREMENT UNCERTAINTY	4
TEST FACILITY	4
SYSTEM TEST CONFIGURATION	5
DESCRIPTION OF TEST CONFIGURATION	5
EUT EXERCISE SOFTWARE	5
SPECIAL ACCESSORIES	5
EQUIPMENT MODIFICATIONS	5
SUPPORT EQUIPMENT LIST AND DETAILS	6
EXTERNAL I/O CABLE	6
BLOCK DIAGRAM OF TEST SETUP	7
SUMMARY OF TEST RESULTS	9
TEST EQUIPMENT LIST	10
FCC §15.247 (i) & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)	11
FCC §15.203 – ANTENNA REQUIREMENT	12
APPLICABLE STANDARD	12
ANTENNA CONNECTOR CONSTRUCTION	12
FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS	13
APPLICABLE STANDARD	13
EUT SETUP	13
EMI TEST RECEIVER SETUP	13
TEST PROCEDURE	13
TRANSD FACTOR & MARGIN CALCULATION	14
TEST DATA	14
FCC §15.205, §15.209 & §15.247(d) – RADIATED EMISSIONS	19
APPLICABLE STANDARD	19
EUT SETUP	19
EMI TEST RECEIVER & SPECTRUM ANALYZER SETUP	20
TEST PROCEDURE	20
FACTOR & MARGIN CALCULATION	20
TEST DATA	20
FCC §15.247(b) (1) - PEAK OUTPUT POWER MEASUREMENT	28
APPLICABLE STANDARD	28
TEST PROCEDURE	28
TEST DATA	28

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	reServer-X86-A1135	
Trademark	Seeed Studio	
Tested Model	reServer-I51135(64G+512G/z)	
Multiple Product and Model	reServer-X86-A1115	reServer-I31115(xx+yy/z)
	reServer-X86-A1125	reServer-I31125(xx+yy/z)
	reServer-X86-A1135	reServer-I51135(xx+yy/z)
	(Note: xx: DDR, 8G/16G/32G/64G; yy: SSD, 128G/256G/512G; z: wifi module)	
Model difference	Please refer to the DoS letter	
Frequency Range	Bluetooth: 2402~2480MHz	
Maximum conducted Peak output power	Bluetooth: 3.27dBm	
Modulation Technique	Bluetooth: GFSK, $\pi/4$ -DQPSK, 8DPSK	
Antenna Specification*	External Antenna: 2.13dBi (provided by the applicant)	
Voltage Range	DC 12V from adapter.	
Sample serial number	SZNS211025-54608E-RF-S1	
Sample/EUT Status	Good condition	
Adapter 1 information	Model: HA-1600-12 Input: 100-240V~1.7A 50/60Hz, Output: DC 12V, 5A	
Adapter 2 information	Model: PA-1061-81 Input: 100-240V~, 50/60Hz 1.6A Output: DC 12V, 5A, 60W	

Objective

This test report is in accordance with Part 2-Subpart J, 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, section 15.203, 15.205, 15.207, 15.209 and 15.247 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.

All emissions measurement was performed at Shenzhen Accurate Technology Co., Ltd. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		5%
RF Frequency		0.082×10^{-7}
RF output power, conducted		0.73dB
Unwanted Emission, conducted		1.6dB
AC Power Lines Conducted Emissions		2.72dB
Emissions, Radiated	9kHz - 30MHz	2.66dB
	30MHz - 1GHz	4.28dB
	1GHz - 18GHz	4.98dB
	18GHz - 26.5GHz	5.06dB
	26.5GHz - 40GHz	4.72dB
Temperature		1°C
Humidity		6%
Supply voltages		0.4%

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Test Facility

The test site used by Shenzhen Accurate Technology Co., Ltd. to collect test data is located on the 1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No.: 708358, the FCC Designation No.: CN1189. Accredited by American Association for Laboratory Accreditation (A2LA) The Certificate Number is 429 7.01.

Listed by Innovation, Science and Economic Development Canada (ISED), the Registration Number is 5077A.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in an engineering mode and support modes as below, which provided by manufacturer.

Modulation	Packet Type (Maximum Payload)	Data Rate (Mbps)
GFSK	DH5	1
$\pi/4$ -DQPSK	2DH5	2
8DPSK	3DH5	3

EUT Exercise Software

Software of “app DRTU”* provided by manufacturer.

The device was tested with the Power level is 7*.

Special Accessories

No special accessory.

Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

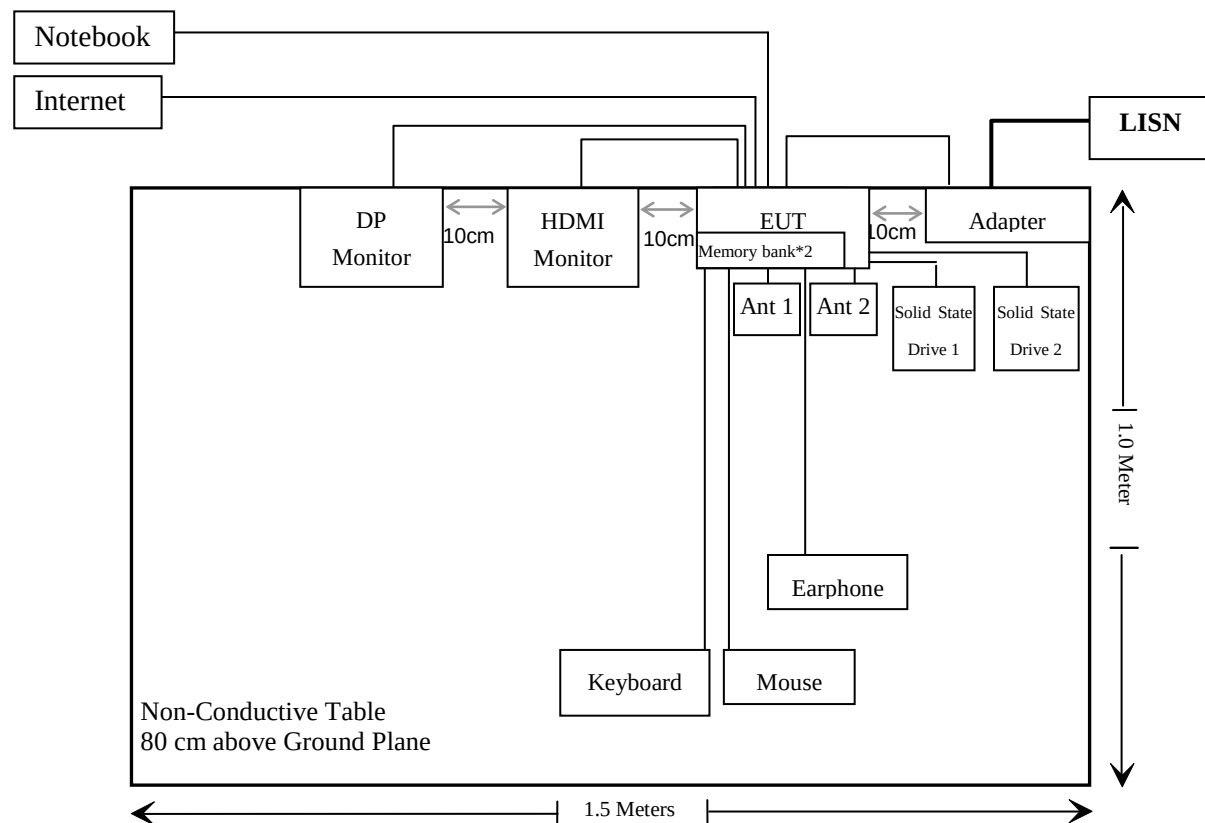
Manufacturer	Description	Model	Serial Number
DELL	Keyboard	L100	CN0RH66658985C018C
DELL	Mouse	MOC5UG	Unknown
PHILIPS	DP Monitor	275M7C	Unknown
DELL	HDMI Monitor	ST2310f	Unknown
ZHIKE	Solid State Drive 1	U300	USA210510105
ZHIKE	Solid State Drive 2	U300	USA210510106
BORY	NVME PCIE SSD	Unknown	800295763
Kingston	Memory bank 1	9905700-E15.AO OG	Unknown
Kingston	Memory bank 2	99P5711-002.AO OG	Unknown
Unknown	M.2 PCI-E	YX-520	2106H520A 128GA 18829
SCI	Earphone	SCRC-130A	Unknown
Lenovo	Notebook	T430	Unknown

External I/O Cable

Cable Description	Length (m)	From Port	To
Unshielded Detachable DC output Cable	1.15	Adapter 1	EUT
Unshielded Detachable DC output Cable	1.0	Adapter2	EUT
Unshielded Detachable AC power Cable	1.0	EUT	Adapter 1
Unshielded Detachable AC power Cable	1.5	EUT	Adapter 2
Shielded Detachable HDMI Cable	1.75	EUT	HDMI Monitor
Shielded Detachable DP Cable	1.75	EUT	DP Monitor
Unshielded Detachable USB Cable	1.5	EUT	Mouse
Unshielded Detachable USB Cable	1.5	EUT	Keyboard
Unshielded Detachable RJ45 Cable 1	3	Internet	EUT
Unshielded Detachable RJ45 Cable 2	3	Notebook	EUT
Unshielded Detachable earphone Cable	0.75	EUT	Earphone

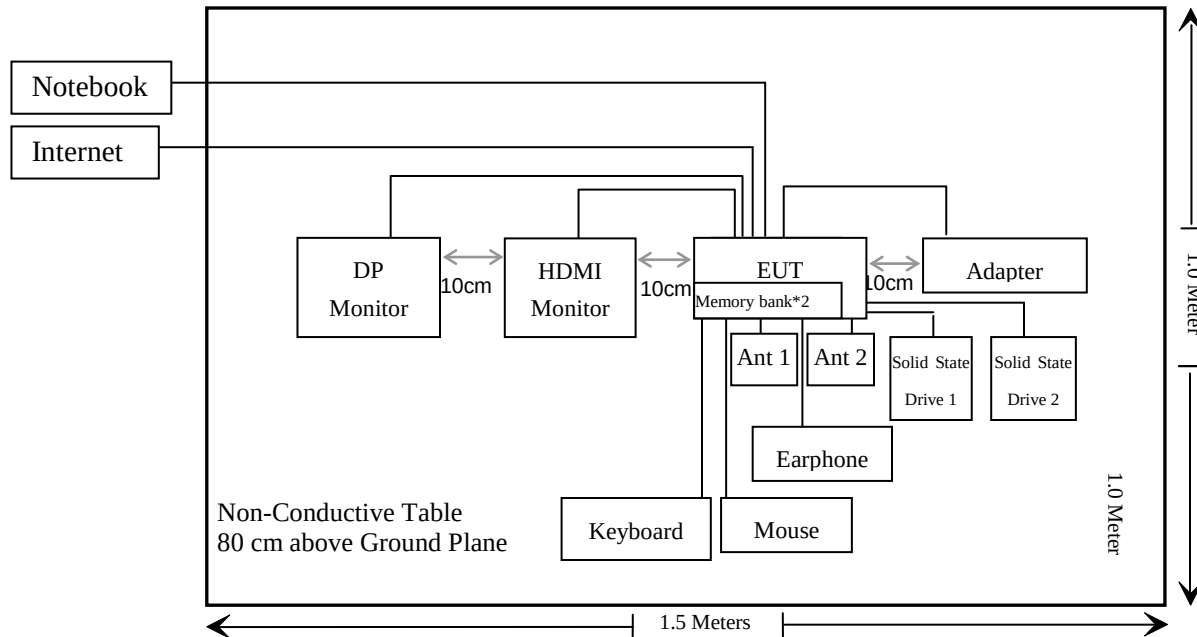
Block Diagram of Test Setup

For conducted emission:

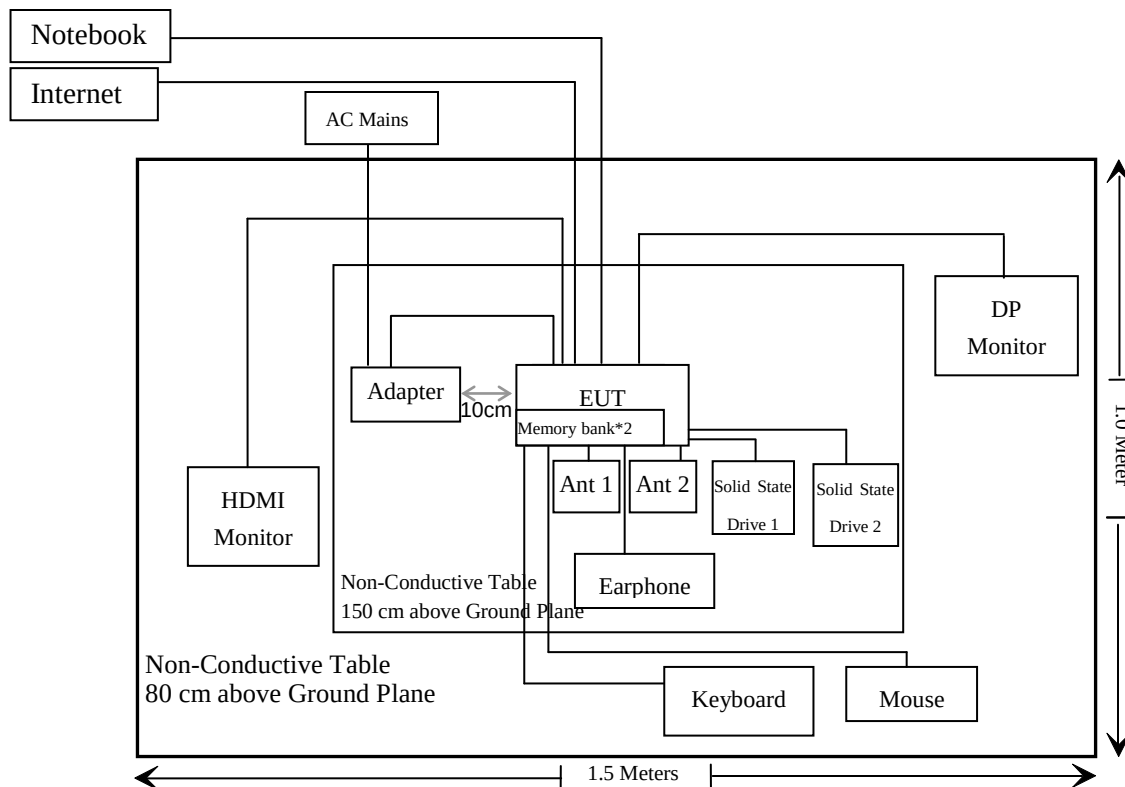


For Radiated Emission:

Below 1GHz:



Above 1GHz:



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
FCC §15.247 (i), §2.1091	Maximum Permissible Exposure(MPE)	Compliant
§15.203	Antenna Requirement	Compliant
§15.207(a)	AC Line Conducted Emissions	Compliant
§15.205, §15.209 & §15.247(d)	Radiated Emissions	Compliant
§15.247(a)(1)	20 dB Emission Bandwidth & 99% Occupied Bandwidth	Compliant*
§15.247(a)(1)	Channel Separation Test	Compliant*
§15.247(a)(1)(iii)	Time of Occupancy (Dwell Time)	Compliant*
§15.247(a)(1)(iii)	Quantity of hopping channel Test	Compliant*
§15.247(b)(1)	Peak Output Power Measurement	Compliant* (Note*)
§15.247(d)	Band edges	Compliant*

Compliant*: This device contains one same PCBA Module Radio unit, which certified with product model of ODYSSEY-I51135(64G+512G/z), FCC ID: Z4T-ODYSSEY-A, please refers to report: SZNS211008-51520E-00A.

Note: Per pre-test for all models, and the worst case about maximum emission is model of reServer-I51135(64G+512G/z), which was recorded in this report.

Note*: The EUT had been tested and verified the RF parameters consistently with the PCBA Module.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted Emissions Test					
Rohde& Schwarz	EMI Test Receiver	ESCI	100784	2021/02/03	2022/02/02
R & S	L.I.S.N.	ENV216	101314	2020/12/25	2021/12/24
Anritsu Corp	50Ω Coaxial Switch	MP59B	6200506474	2020/12/25	2021/12/24
Unknown	RF Coaxial Cable	N-2m	No.2	2020/12/25	2021/12/24
Conducted Emission Test Software: e3 19821b (V9)					
Radiated Emissions Test					
Rohde& Schwarz	Test Receiver	ESR	102725	2020/12/25	2021/12/24
Rohde&Schwarz	Spectrum Analyzer	FSV40	101949	2021/5/18	2022/5/17
SONOMA INSTRUMENT	Amplifier	310 N	186131	2020/12/25	2021/12/24
A.H. Systems, inc.	Preamplifier	PAM-0118P	531	2021/11/9	2022/11/8
Quinstar	Amplifier	QLW-184055 36-J0	15964001002	2020/11/28	2021/11/27
Anritsu Corp	50 Coaxial Switch	MP59B	6100237248	2020/12/25	2021/12/24
Schwarzbeck	Bilog Antenna	VULB9163	9163-323	2020/01/05	2023/01/04
Schwarzbeck	Horn Antenna	BBHA9120D	9120D-1067	2020/01/05	2023/01/04
Schwarzbeck	HORN ANTENNA	BBHA9170	9170-359	2020/01/05	2023/01/04
Wainwright	High Pass Filter	WHKX3.6/18 G-10SS	5	2020/12/25	2021/12/24
Unknown	RF Coaxial Cable	N-5m	No.3	2020/12/25	2021/12/24
Unknown	RF Coaxial Cable	N-1m	No.5	2020/12/25	2021/12/24
Unknown	RF Coaxial Cable	N-10m	No.7	2020/11/09	2021/11/08
Unknown	RF Coaxial Cable	N-2m	No.8	2020/11/09	2021/11/08
Radiated Emission Test Software: e3 19821b (V9)					
RF Conducted Test					
Rohde & Schwarz	Open Switch and Control Unit	OSP120 + OSP-B157	101244 + 100866	2021/12/13	2022/12/12
WEINSCHL	10dB Attenuator	5324	AU 3842	Each time	
Unknown	RF Coaxial Cable	No.32	RF-02	Each time	

*** Statement of Traceability:** Shenzhen Accurate Technology Co., Ltd. attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FCC §15.247 (i) & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)**Applicable Standard**

According to subpart 15.247 (i) and 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.

Limits for General Population/Uncontrolled Exposure

Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm²)	Averaging Time (Minutes)
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f ²)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density

Result**Calculated Formulary:**

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

S = power density (in appropriate units, e.g. mW/cm²)

P = power input to the antenna (in appropriate units, e.g., mW).

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain.

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

Frequency (MHz)	Antenna Gain		Tune up conducted power		Evaluation Distance (cm)	Power Density (mW/cm²)	MPE Limit (mW/cm²)
	(dBi)	(numeric)	(dBm)	(mW)			
2402-2480	2.13	1.63	3.5	2.24	20	0.0007	1

Note: 1. The tune up conducted power was declared by the applicant.

2. The BT and Wi-Fi can not transmit at the same time.

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

Result: Compliant.

FCC §15.203 – ANTENNA REQUIREMENT

Applicable Standard

According to FCC § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Antenna Connector Construction

The EUT has one external Antenna arrangement for Bluetooth, which was used a unique coupling and the antenna gain is 2.13dBi, fulfill the requirement of this section. Please refer to the EUT photos.

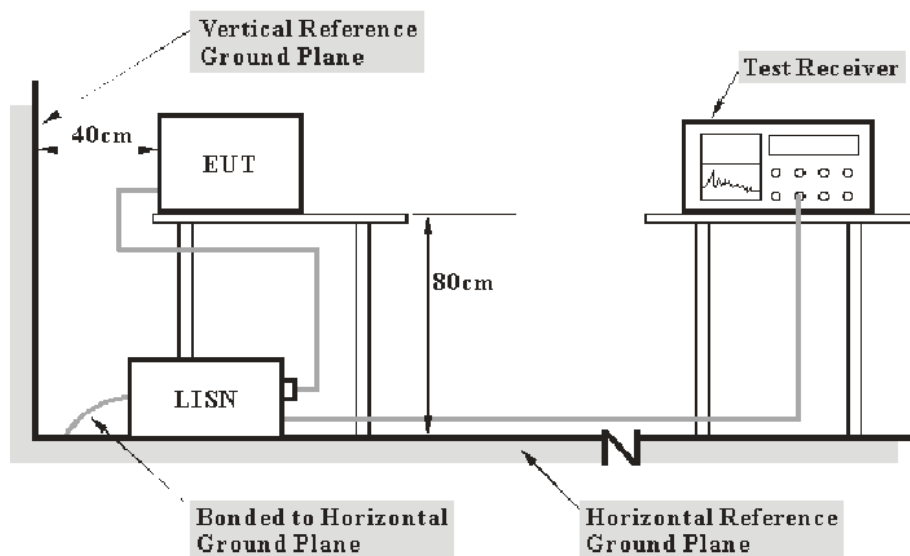
Result: Compliant.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC §15.207(a)

EUT Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

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	IF B/W
150 kHz – 30 MHz	9 kHz

Test Procedure

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

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

All final data was recorded in the Quasi-peak and average detection mode.

Transd Factor & Margin Calculation

The Transd factor is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss. The basic equation is as follows:

$$\text{Transd Factor} = \text{LISN VDF} + \text{Cable Loss}$$

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 below the limit. The equation for calculation is as follows:

$$\begin{aligned}\text{Over Limit} &= \text{Level} - \text{Limit} \\ \text{Level} &= \text{Read Level} + \text{Factor}\end{aligned}$$

Test Data

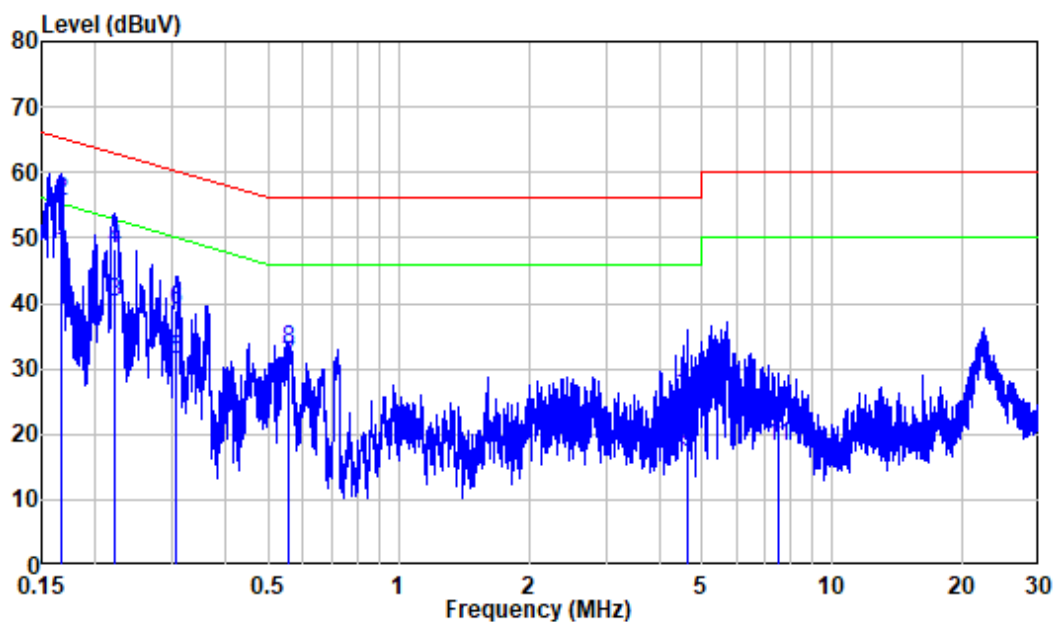
Environmental Conditions

Temperature:	25 °C
Relative Humidity:	64 %
ATM Pressure:	101.0 kPa

The testing was performed by Bin Duan on 2021-11-18.

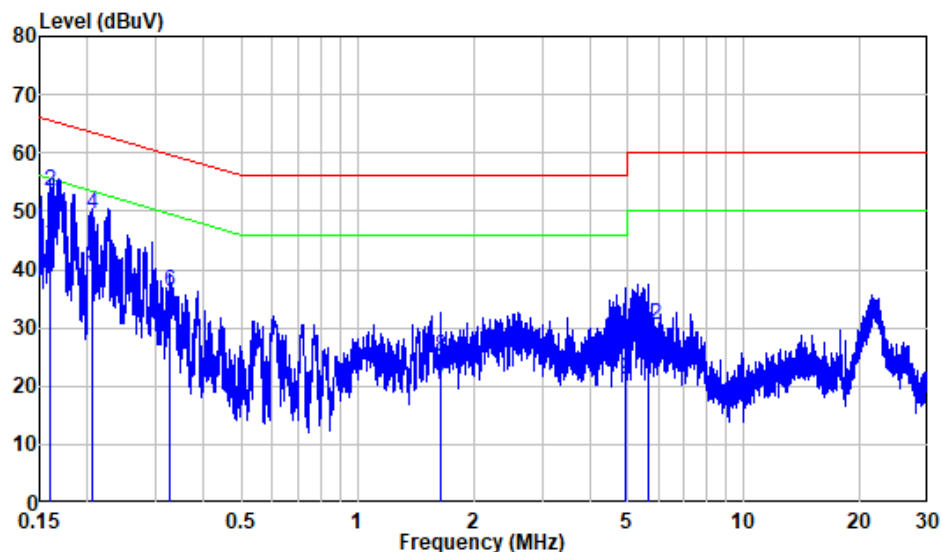
EUT operation mode: Transmitting

Adapter 1:
AC 120V/60 Hz, Line



Site : Shielding Room
 Condition: Line
 Mode : BT
 Model : reServer-I51135 (64G+512G/z)

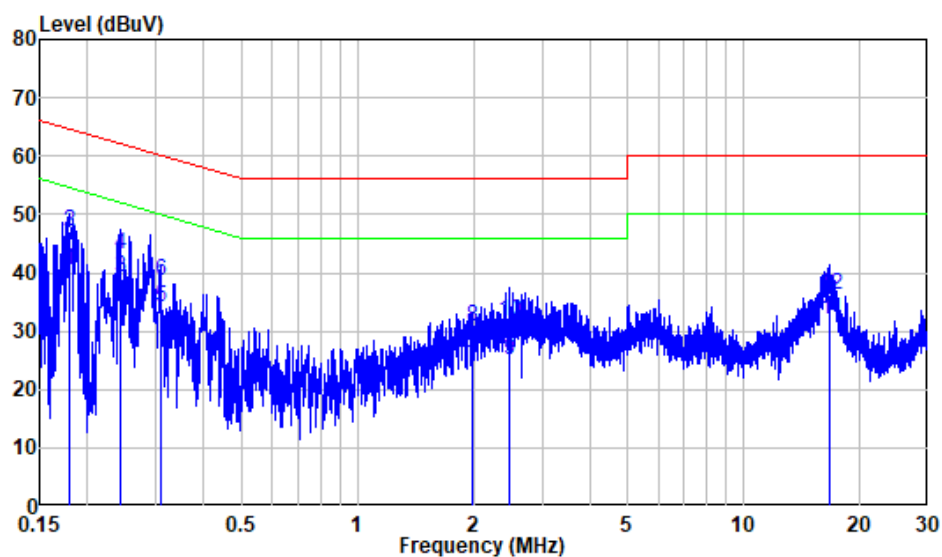
	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.167	9.86	37.88	47.74	55.13	-7.39	Average
2	0.167	9.86	45.76	55.62	65.13	-9.51	QP
3	0.221	9.80	30.49	40.29	52.78	-12.49	Average
4	0.221	9.80	38.65	48.45	62.78	-14.33	QP
5	0.308	9.80	21.67	31.47	50.04	-18.57	Average
6	0.308	9.80	29.13	38.93	60.04	-21.11	QP
7	0.554	9.81	20.77	30.58	46.00	-15.42	Average
8	0.554	9.81	23.08	32.89	56.00	-23.11	QP
9	4.635	9.98	7.32	17.30	46.00	-28.70	Average
10	4.635	9.98	16.06	26.04	56.00	-29.96	QP
11	7.476	10.07	8.09	18.16	50.00	-31.84	Average
12	7.476	10.07	12.91	22.98	60.00	-37.02	QP

AC 120V/60 Hz, Neutral

Site : Shielding Room
 Condition: Neutral
 Mode : BT
 Model : reServer-I51135 (64G+512G/z)

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.159	9.92	34.38	44.30	55.50	-11.20	Average
2	0.159	9.92	43.58	53.50	65.50	-12.00	QP
3	0.205	10.00	30.88	40.88	53.39	-12.51	Average
4	0.205	10.00	39.39	49.39	63.39	-14.00	QP
5	0.327	9.95	21.61	31.56	49.51	-17.95	Average
6	0.327	9.95	26.13	36.08	59.51	-23.43	QP
7	1.641	9.92	10.32	20.24	46.00	-25.76	Average
8	1.641	9.92	15.08	25.00	56.00	-31.00	QP
9	4.926	10.05	11.10	21.15	46.00	-24.85	Average
10	4.926	10.05	18.22	28.27	56.00	-27.73	QP
11	5.638	10.06	11.97	22.03	50.00	-27.97	Average
12	5.638	10.06	20.41	30.47	60.00	-29.53	QP

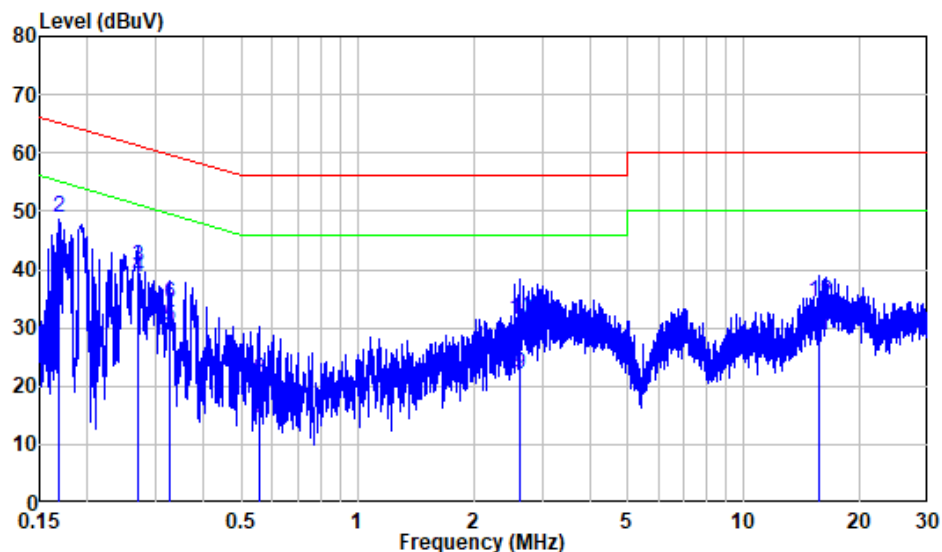
Adapter 2:
AC 120V/60 Hz, Line



Site : Shielding Room
 Condition: Line
 Mode : BT
 Model : reServer-I51135 (64G+512G/z)

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.179	9.84	30.57	40.41	54.54	-14.13	Average
2	0.179	9.84	37.16	47.00	64.54	-17.54	QP
3	0.243	9.80	29.39	39.19	52.01	-12.82	Average
4	0.243	9.80	33.28	43.08	62.01	-18.93	QP
5	0.308	9.80	24.32	34.12	50.02	-15.90	Average
6	0.308	9.80	28.77	38.57	60.02	-21.45	QP
7	1.972	9.92	13.98	23.90	46.00	-22.10	Average
8	1.972	9.92	20.83	30.75	56.00	-25.25	QP
9	2.475	9.92	15.25	25.17	46.00	-20.83	Average
10	2.475	9.92	21.70	31.62	56.00	-24.38	QP
11	16.705	10.11	21.94	32.05	50.00	-17.95	Average
12	16.705	10.11	26.14	36.25	60.00	-23.75	QP

AC 120V/60 Hz, Neutral



Site : Shielding Room
Condition: Neutral
Mode : BT
Model : reServer-I51135 (64G+512G/z)

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.168	9.94	29.51	39.45	55.07	-15.62	Average
2	0.168	9.94	38.93	48.87	65.07	-16.20	QP
3	0.270	9.97	30.38	40.35	51.13	-10.78	Average
4	0.270	9.97	28.61	38.58	61.13	-22.55	QP
5	0.325	9.95	20.21	30.16	49.57	-19.41	Average
6	0.325	9.95	24.05	34.00	59.57	-25.57	QP
7	0.556	9.91	4.47	14.38	46.00	-31.62	Average
8	0.556	9.91	11.07	20.98	56.00	-35.02	QP
9	2.636	9.97	12.11	22.08	46.00	-23.92	Average
10	2.636	9.97	21.50	31.47	56.00	-24.53	QP
11	15.666	10.08	18.51	28.59	50.00	-21.41	Average
12	15.666	10.08	24.24	34.32	60.00	-25.68	QP

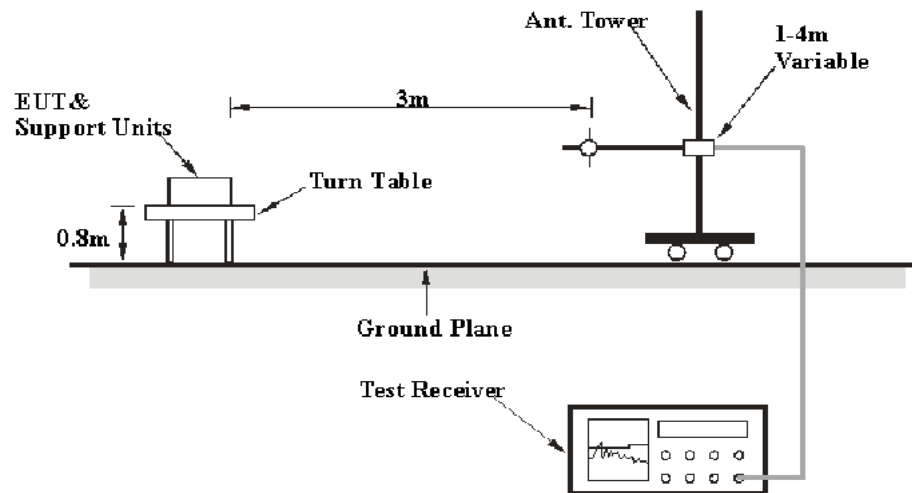
FCC §15.205, §15.209 & §15.247(d) – RADIATED EMISSIONS

Applicable Standard

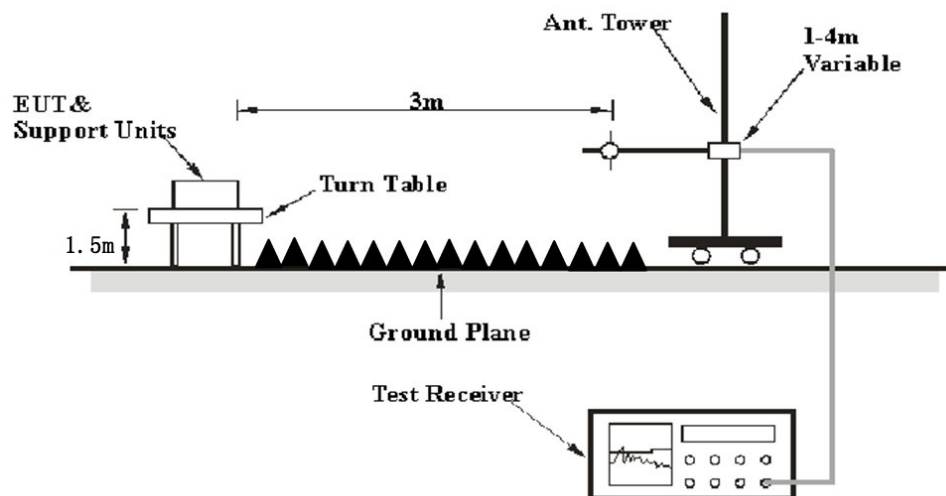
FCC §15.205; §15.209; §15.247(d)

EUT Setup

Below 1 GHz:



Above 1GHz:



The radiated emission tests were performed in the 3 meters, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209 and FCC 15.247 limits.

EMI Test Receiver & Spectrum Analyzer Setup

The EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Measurement
30 MHz – 1000 MHz	100 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1 MHz	3 MHz	/	PK
	1 MHz	10 Hz	/	Average

Test Procedure

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

All final data was recorded in Quasi-peak detection mode for frequency range of 30 MHz -1 GHz and peak and Average detection modes for frequencies above 1 GHz.

Factor & Margin Calculation

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

$$\text{Factor} = \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

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

$$\begin{aligned} \text{Over Limit} &= \text{Result} / \text{Corrected Amplitude} - \text{Limit} \\ \text{Result} / \text{Corrected Amplitude} &= \text{Read Level} + \text{Factor} \end{aligned}$$

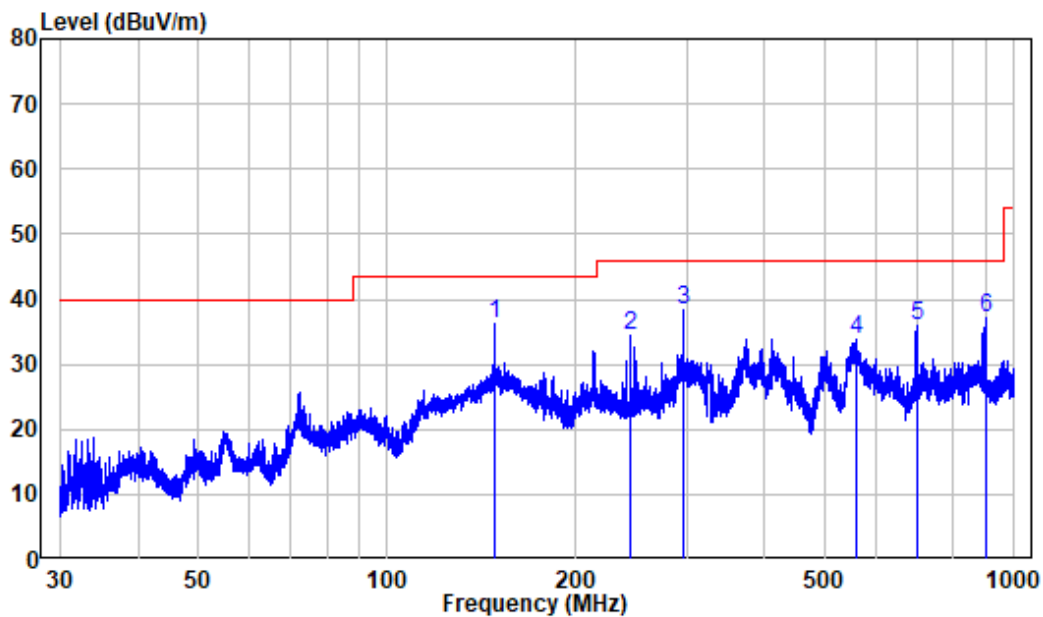
Test Data

Environmental Conditions

Temperature:	23-25 °C
Relative Humidity:	49-64 %
ATM Pressure:	101.0 kPa

The testing was performed by Chao Mo on 2021-11-16 for below 1GHz and by Chao Mo on 2021-11-22 for above 1GHz.

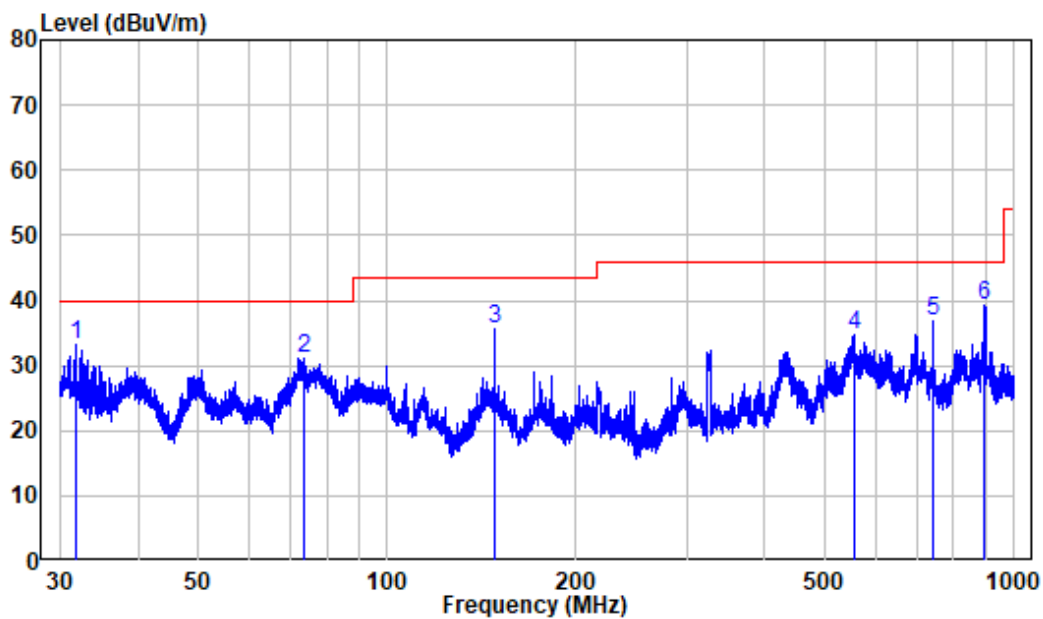
EUT operation mode: Transmitting (Scan with GFSK, $\pi/4$ -DQPSK, 8DPSK mode, the worst case is GFSK as below)

30MHz-1GHz:**Adapter 1:****Horizontal:**

Site : chamber
Condition: 3m HORIZONTAL
Job No. : SZNS211025-54608E-RF
Test Mode: BT
Note : Adapter 1#

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	148.51	-21.63	57.90	36.27	43.50	-7.23	Peak
2	243.70	-18.64	53.10	34.46	46.00	-11.54	Peak
3	296.96	-16.77	55.21	38.44	46.00	-7.56	Peak
4	561.18	-11.96	45.85	33.89	46.00	-12.11	Peak
5	699.92	-11.37	47.22	35.85	46.00	-10.15	Peak
6	899.75	-8.12	45.21	37.09	46.00	-8.91	Peak

Vertical

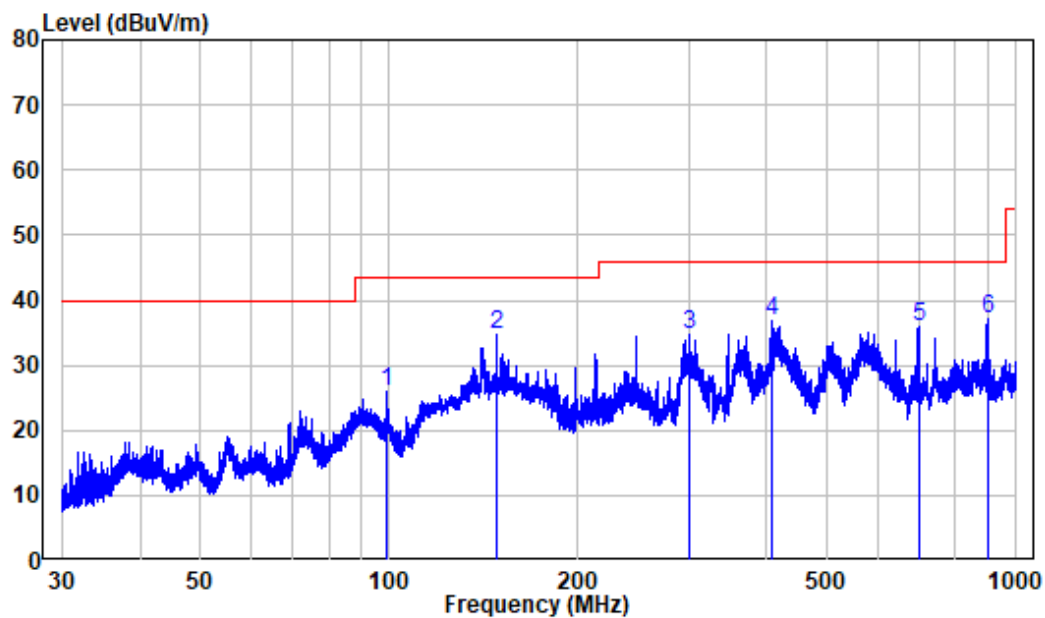


Site : chamber
Condition: 3m VERTICAL
Job No. : SZNS211025-54608E-RF
Test Mode: BT
Note : Adapter 1#

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	31.80	-20.15	53.38	33.23	40.00	-6.77	Peak
2	73.71	-22.03	53.23	31.20	40.00	-8.80	Peak
3	148.51	-21.63	57.18	35.55	43.50	-7.95	Peak
4	555.56	-12.20	46.87	34.67	46.00	-11.33	Peak
5	742.58	-11.14	48.09	36.95	46.00	-9.05	Peak
6	896.60	-8.25	47.57	39.32	46.00	-6.68	Peak

Adapter 2:

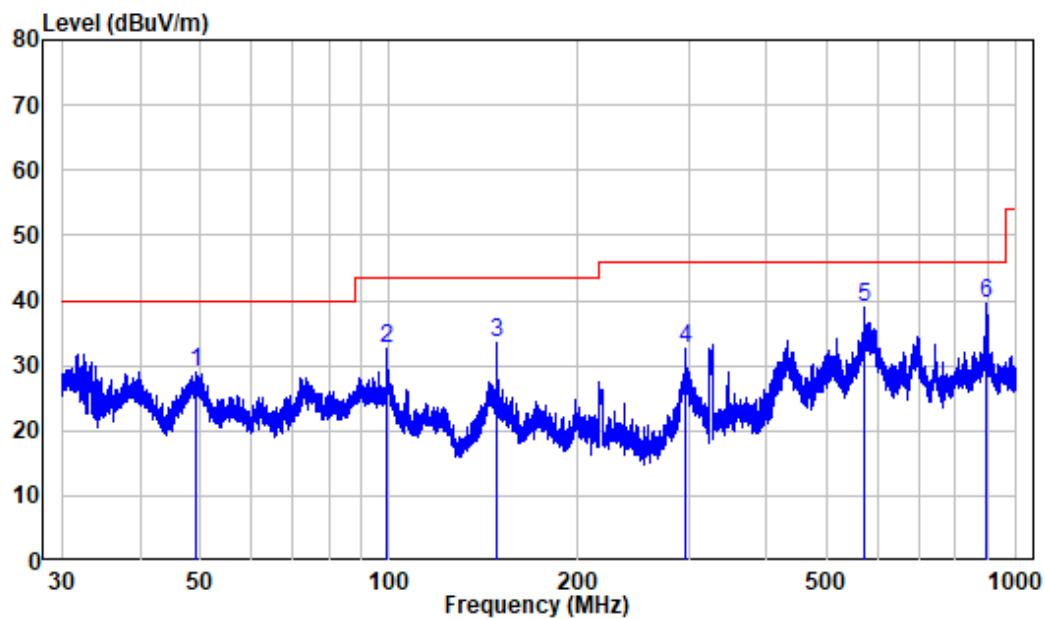
Horizontal:



Site : chamber
Condition: 3m HORIZONTAL
Job No. : SZNS211025-54608E-RF
Test Mode: BT
Note : Adapter 2#

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	99.01	-19.37	45.48	26.11	43.50	-17.39	Peak
2	148.51	-21.63	56.21	34.58	43.50	-8.92	Peak
3	300.24	-16.59	51.32	34.73	46.00	-11.27	Peak
4	408.95	-15.32	52.13	36.81	46.00	-9.19	Peak
5	699.92	-11.37	47.38	36.01	46.00	-9.99	Peak
6	899.75	-8.12	45.21	37.09	46.00	-8.91	Peak

Vertical



Site : chamber
Condition: 3m VERTICAL
Job No. : SZNS211025-54608E-RF
Test Mode: BT
Note : Adapter 2#

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	49.12	-17.28	46.27	28.99	40.00	-11.01	Peak
2	99.01	-19.37	52.04	32.67	43.50	-10.83	Peak
3	148.51	-21.63	55.22	33.59	43.50	-9.91	Peak
4	297.09	-16.77	49.28	32.51	46.00	-13.49	Peak
5	572.87	-11.46	50.53	39.07	46.00	-6.93	Peak
6	897.00	-8.24	47.72	39.48	46.00	-6.52	Peak

Above 1GHz:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/QP/Ave.		Height (m)	Polar (H/V)				
Low channel									
2310	50.82	PK	73	1.4	H	-6.84	43.98	74	-30.02
2310	49.34	PK	158	1.9	V	-6.84	42.5	74	-31.5
2390	53.34	PK	155	1.9	H	-6.44	46.9	74	-27.1
2390	51.8	PK	237	2.0	V	-6.44	45.36	74	-28.64
4804	41.32	PK	155	1.6	H	2.81	44.13	74	-29.87
4804	40.55	PK	156	1.4	V	2.81	43.36	74	-30.64
Middle channel									
4882	40.8	PK	357	1.6	H	3.04	43.84	74	-30.16
4882	39.09	PK	40	2.0	V	3.04	42.13	74	-31.87
High channel									
2483.5	52.07	PK	217	1.7	V	-5.96	46.11	74	-27.89
2483.5	50.99	PK	109	1.3	V	-5.96	45.03	74	-28.97
2500	49.21	PK	73	1.4	H	-5.88	43.33	74	-30.67
2500	48.04	PK	209	1.5	V	-5.88	42.16	74	-31.84
4960	40.51	PK	343	2.1	H	3.29	43.8	74	-30.2
4960	39.15	PK	325	1.1	V	3.29	42.44	74	-31.56

Note:

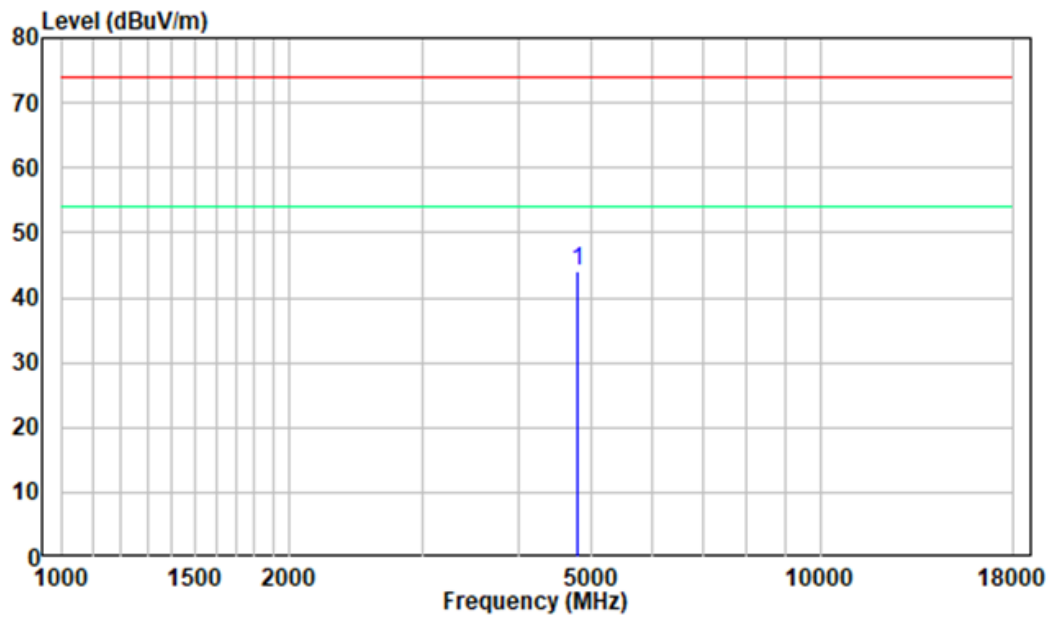
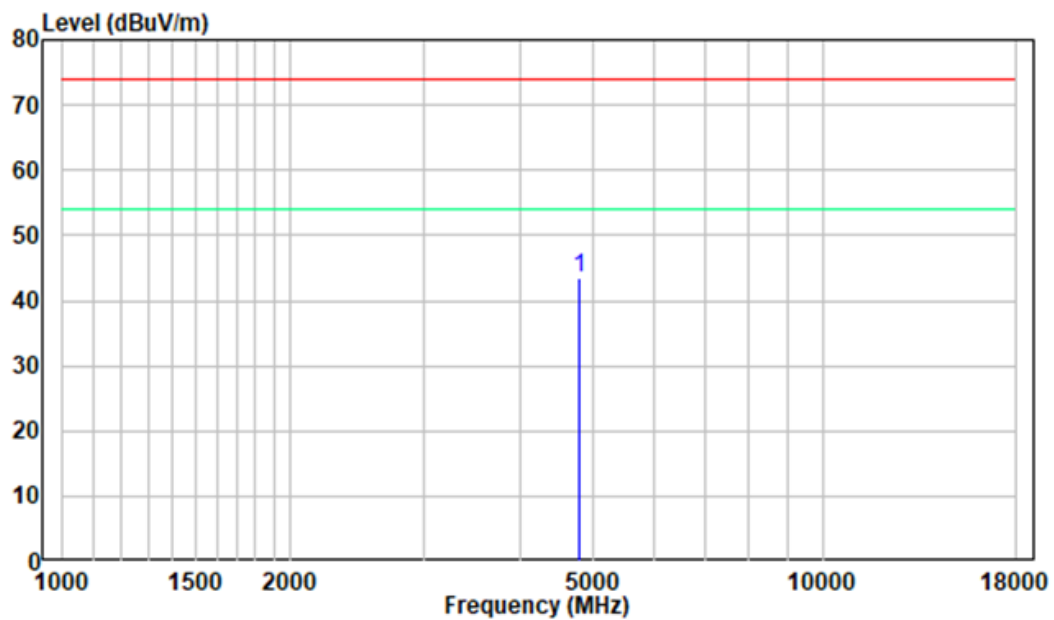
Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor

Absolute Level (Corrected Amplitude) = Factor + Reading

Margin = Absolute Level (Corrected Amplitude) – Limit

The other spurious emission which is in the noise floor level was not recorded.

The test result of peak was 20dB below to the limit of peak, which can be compliant to the average limit, so just peak value was recorded.

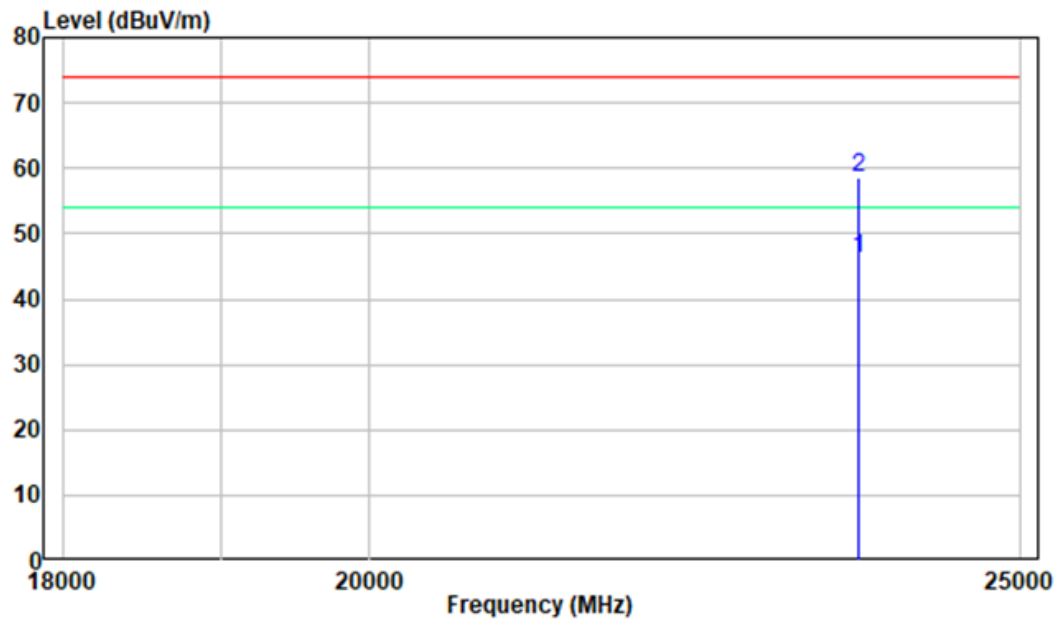
1-18GHz**Pre-scan plots:****Low Channel****Horizontal:****Vertical:**

18-25GHz

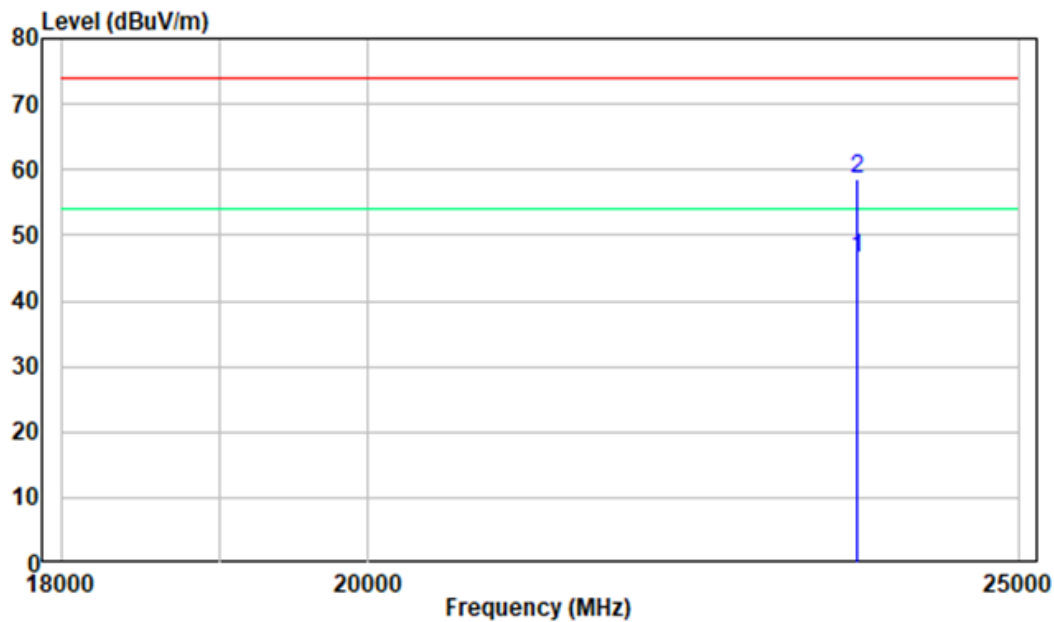
Pre-scan plots:

Low Channel

Horizontal:



Vertical:



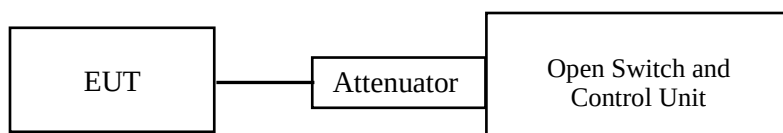
FCC §15.247(b) (1) - PEAK OUTPUT POWER MEASUREMENT

Applicable Standard

According to §15.247(b) (1), for frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725–5850 MHz band: 1 watt. And for all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 watts.

Test Procedure

1. Place the EUT on a bench and set in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to one test equipment.
3. Add a correction factor to the display.



Test Data

Environmental Conditions

Temperature:	23 °C
Relative Humidity:	55 %
ATM Pressure:	101.0 kPa

The testing was performed by Key Pei on 2022-04-18.

EUT operation mode: Transmitting

Test Result: Compliant.

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
DH1	Ant1	2402	1.67	<=20.97	PASS
		2441	1.70	<=20.97	PASS
		2480	1.62	<=20.97	PASS
2DH1	Ant1	2402	3.05	<=20.97	PASS
		2441	2.94	<=20.97	PASS
		2480	2.90	<=20.97	PASS
3DH1	Ant1	2402	3.18	<=20.97	PASS
		2441	3.31	<=20.97	PASS
		2480	3.38	<=20.97	PASS

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