TEST REPORT

Applicant Name:	Shenzhen Youmi Intelligent Technology Co., Ltd.
Address:	406-407 Jinqi Zhigu Building, 4/F, 1 Tangling Road, Nanshan District, Shenzhen City, China
Report Number:	2401Y99438E-RF-00C
FCC ID:	2ATZ4-GA20N2

Test Standard (s)

FCC PART 15.225

Sample Description

Product Type:	Smart phone
Model No.:	PG4RBG100
Multiple Model(s) No.:	PG4RB100A
Trade Mark:	UMIDIGI
Date Received:	2024/10/17
Issue Date:	2024/12/05

Test Result:	Pass▲

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

Prepared and Checked By:

Jim Cheng

RF Engineer

Approved By:

Nancy Wang

RF Supervisor

Note: The information marked # is provided by the applicant, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report. Customer model name, addresses, names, trademarks etc. are included.

This report may contain data that are not covered by the NVLAP accreditation and are marked with an asterisk "▼".

TABLE OF CONTENTS

DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	2401Y99438E-RF-00C	Original Report	2024/12/05

GENERALINFORMATION

Product Description for Equipment under Test (EUT)

Product	Smart phone
Tested Model	PG4RBG100
Multiple Model(s)	PG4RB100A
Frequency Range	13.56 MHz
E-field Strength	70.48dBuV/m@3m
Modulation Technique	ASK
Voltage Range	DC 5V/9V/12V charging from Adapter or DC 3.89V from battery
Sample serial number	2SY1-4 for Conducted Emissions Test 2SY1-5 for Radiated Emissions Test (Assigned by BACL, Shenzhen)
Sample/EUT Status	Good condition
Adapter Information	Model: QZ-02002AC00 Input: AC100-240V, 50/60Hz, 0.5A Output: DC 5.0V, 3.0A(15.0W) or DC 9.0V, 2.22A or DC 12.0V, 1.67A(20.0W Max.)
Note: The Multiple models are electrically identical with the test model except for model name and sales channels. Please refer to the declaration letter# for more detail, which was provided by manufacturer.	

Objective

This Type approval report is in accordance with Part 2- Subpart J, and Part 15-Subparts A and C of the Federal Communication Commissions rules.

The objective is to determine the compliance of the EUT with FCC rules, section 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.

All emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Each test item follows test standards and with no deviation.

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		109.2kHz(k=2, 95% level of confidence)
RF Frequency		56.6Hz(k=2, 95% level of confidence)
AC Power Lines Conducted Emissions	9kHz-150kHz	3.63dB(k=2, 95% level of confidence)
	150kHz-30MHz	3.66dB(k=2, 95% level of confidence)
Radiated Emissions	0.009MHz~30MHz	3.60dB(k=2, 95% level of confidence)
	30MHz~200MHz (Horizontal)	5.32dB(k=2, 95% level of confidence)
	30MHz~200MHz (Vertical)	5.43dB(k=2, 95% level of confidence)
	200MHz~1000MHz (Horizontal)	5.77dB(k=2, 95% level of confidence)
	200MHz~1000MHz (Vertical)	5.73dB(k=2, 95% level of confidence)
Temperature		±1℃
Humidity		±1%
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 Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 5F(B-West) , 6F, 7F, the 3rd Phase of Wan Li Industrial Building D, Shihua Rd, FuTian Free Trade Zone, Shenzhen, China.

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 715558, the FCC Designation No. : CN5045.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

EUT Exercise Software

No Exercise Software was used.

Equipment Modifications

No modification on the EUT.

Support Equipment List and Details

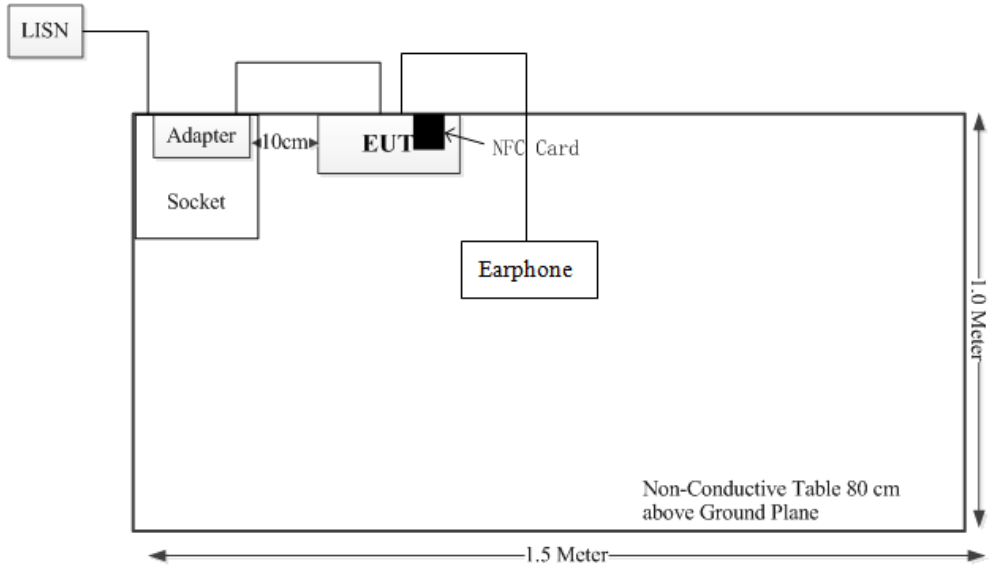
Manufacturer	Description	Model	Serial Number
Unknown	Socket	Unknown	Unknown
Unknown	Card	Unknown	Unknown
Unknown	Earphone	Unknown	Unknown

External I/O Cable

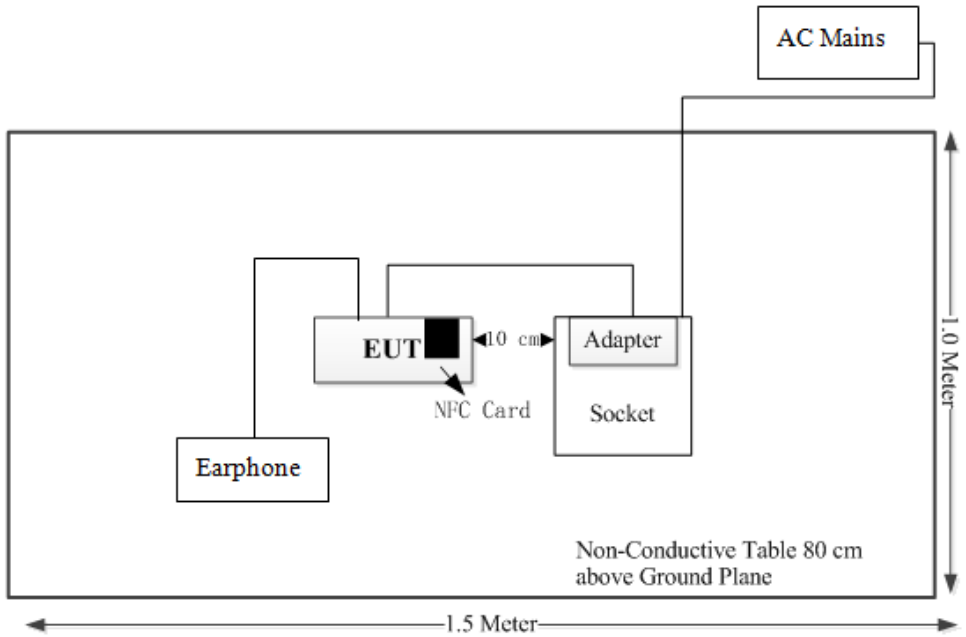
Cable Description	Length (m)	From Port	To
Un-shielding Detachable USB Cable	0.8	EUT	Adapter
Shielded Un-detachable AC Cable	1.5	Receptacle	LISN/AC Mains
Un-shielding Detachable Audio Cable	1.0	Earphone	EUT

Block Diagram of Test Setup

For Conducted Emission:



For Radiated Emissions:



SUMMARY OF TEST RESULTS

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

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted Emissions Test					
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2024/01/16	2025/01/15
Rohde & Schwarz	LISN	ENV216	101613	2024/01/16	2025/01/15
Rohde & Schwarz	Transient Limiter	ESH3Z2	DE25985	2024/05/21	2025/05/20
Unknown	CE Cable	Unknown	UF A210B-1-0720-504504	2024/05/21	2025/05/20
Audix	EMI Test software	E3	191218(V9)	NCR	NCR
Radiated Emission Test					
Rohde & Schwarz	EMI Test Receiver	ESR3	102455	2024/01/16	2025/01/15
Sonoma instrument	Pre-amplifier	310 N	186238	2024/05/21	2025/05/20
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2023/07/20	2026/07/19
Unknown	Cable	Chamber A Cable 1	N/A	2024/06/18	2025/06/17
Unknown	Cable	XH500C	J-10M-A	2024/06/18	2025/06/17
BACL	Active Loop Antenna	1313-1A	4031911	2024/05/14	2027/05/13
Unknown	Cable	2Y194	0735	2024/05/21	2025/05/20
Unknown	Cable	PNG214	1354	2024/05/21	2025/05/20
Audix	EMI Test software	E3	19821b(V9)	NCR	NCR
Frequency Stability					
Rohde & Schwarz	EMI Test Receiver	ESR3	102455	2024/01/16	2025/01/15
BACL	Temperature & Humidity Chamber	BTH-150-40	30145	2024/01/16	2025/01/15
instek	DC Power Supply	GPS-3030DD	EM832096	NCR	NCR
Fluke	Digital Multimeter	287	19000011	2024/05/21	2025/05/20
BACL	Active Loop Antenna	1313-1A	4031911	2024/05/14	2027/05/13
Unknown	Cable	2Y194	0735	2024/05/21	2025/05/20
Unknown	Cable	PNG214	1354	2024/05/21	2025/05/20

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) 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

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.

Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

Antenna Connected Construction

The EUT has one internal antenna arrangement for NFC which was permanently attached; fulfill the requirement of this section. Please refer to the EUT photos.

Result: Compliant.

FCC§1.1310 & §2.1093- RF EXPOSURE

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/$f_{(MHz)}$)]

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 ½

3) SAR measurement procedures are not established below 100 MHz

Measurement Result

For NFC, the power of EUT: E Field@3m is 70.48dBuV/m = -24.72dBm (0.003mW)
Note: E[dBμV/m] = EIRP[dBm] + 95.2 for d = 3 m.

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

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

= 443mW

>0.003mW

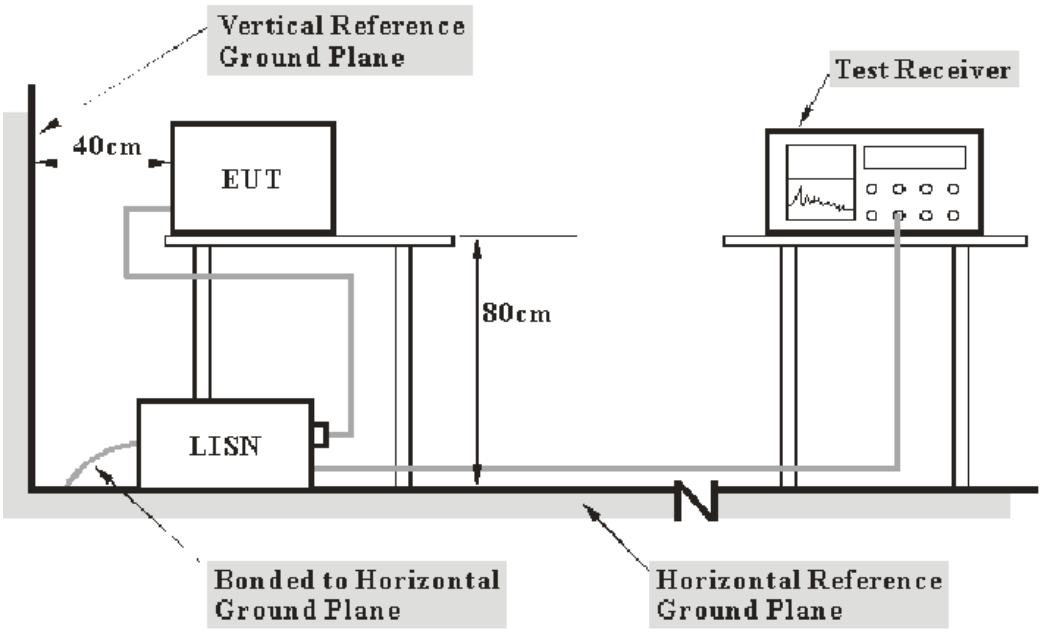
Result: Compliant.

FCC §15.207 - AC LINE CONDUCTED EMISSION

Applicable Standard

FCC§15.207

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

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

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 30MHz.

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

Frequency Range	IF B/W
150 kHz – 30MHz	9 kHz

Test Procedure

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.

Factor & Over Limit Calculation

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

Factor = LISN VDF + 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:

Over Limit = Level – Limit
Level = Read Level + Factor

Note: The term "cable loss" refers to the combination of a cable and a 10dB transient limiter (attenuator).

Test Data

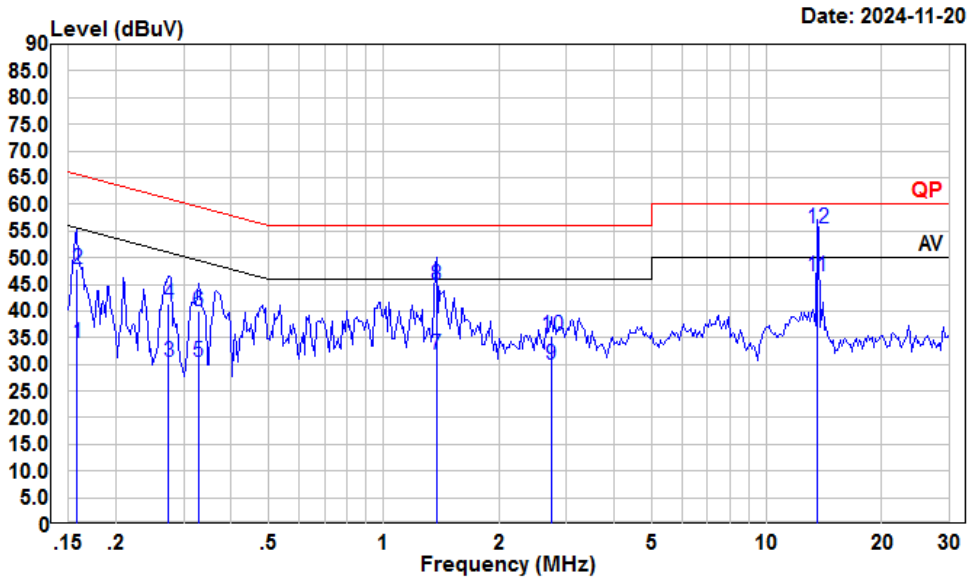
Environmental Conditions

Temperature:	24 ℃
Relative Humidity:	62 %
ATM Pressure:	101 kPa

The testing was performed by Macy Shi on 2024-11-20.

Test mode: Transmitting

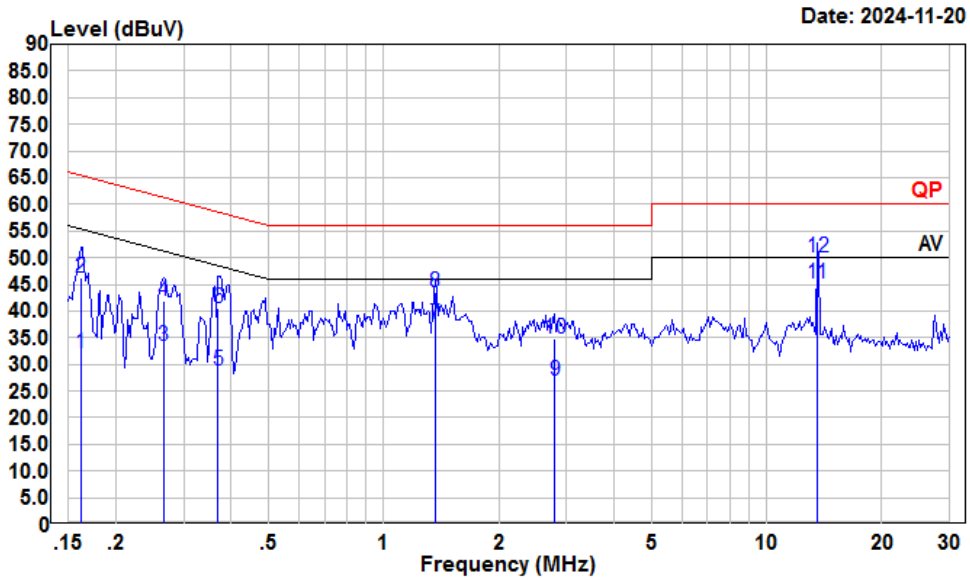
AC 120 V/60 Hz, Line



Condition: Line
Project : 2401Y99438E-RF
tester : Macy.shi
Note : Transmitting

	Freq	Read Level	LISN Level	Factor	Cable Loss	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	dB	dBuV	dB	
1	0.158	13.02	34.02	10.88	10.12	55.56	-21.54	Average
2	0.158	26.97	47.97	10.88	10.12	65.56	-17.59	QP
3	0.274	9.58	30.37	10.70	10.09	50.98	-20.61	Average
4	0.274	20.61	41.40	10.70	10.09	60.98	-19.58	QP
5	0.329	9.78	30.54	10.64	10.12	49.49	-18.95	Average
6	0.329	19.29	40.05	10.64	10.12	59.49	-19.44	QP
7	1.374	11.28	31.92	10.49	10.15	46.00	-14.08	Average
8	1.374	24.19	44.83	10.49	10.15	56.00	-11.17	QP
9	2.736	9.19	29.82	10.46	10.17	46.00	-16.18	Average
10	2.736	14.82	35.45	10.46	10.17	56.00	-20.55	QP
11	13.560	25.70	46.52	10.60	10.22	50.00	-3.48	Average
12	13.560	34.60	55.42	10.60	10.22	60.00	-4.58	QP

AC 120V/ 60 Hz, Neutral



Condition: Neutral
Project : 2401Y99438E-RF
tester : Macy.shi
Note : Transmitting

	Freq	Read Level	LISN Level	Factor	Cable Loss	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	dB	dBuV	dB	
1	0.162	11.45	32.11	10.55	10.11	55.38	-23.27	Average
2	0.162	25.49	46.15	10.55	10.11	65.38	-19.23	QP
3	0.266	12.98	33.56	10.49	10.09	51.25	-17.69	Average
4	0.266	21.40	41.98	10.49	10.09	61.25	-19.27	QP
5	0.369	8.25	28.96	10.60	10.11	48.52	-19.56	Average
6	0.369	19.94	40.65	10.60	10.11	58.52	-17.87	QP
7	1.359	16.57	37.40	10.68	10.15	46.00	-8.60	Average
8	1.359	22.66	43.49	10.68	10.15	56.00	-12.51	QP
9	2.794	6.44	27.02	10.40	10.18	46.00	-18.98	Average
10	2.794	14.26	34.84	10.40	10.18	56.00	-21.16	QP
11	13.560	24.20	45.22	10.80	10.22	50.00	-4.78	Average
12	13.560	28.90	49.92	10.80	10.22	60.00	-10.08	QP

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.

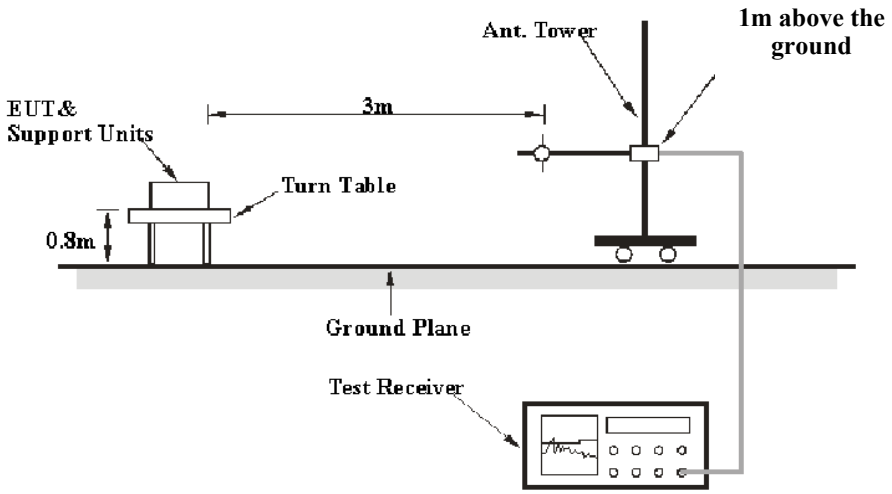
(b) Within the bands 13.410–13.553 MHz and 13.567–13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.

(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.

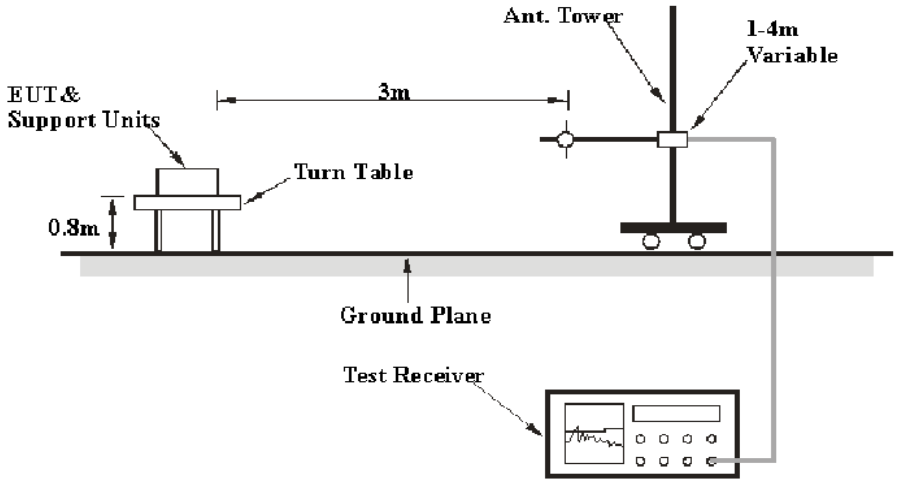
EUT Setup

9 kHz-30MHz:



Note: Antenna is set up at 1m during test for below 30MHz.

30MHz-1GHz:



The radiated emission tests were performed in the 3-meter chamber a test site, using the setup accordance with the ANSI C63.10-2013.

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	Video B/W	IF B/W	Measurement
9 kHz – 150 kHz	/	/	200 Hz	QP
	300 Hz	1 kHz	/	PK
150 kHz – 30 MHz	/	/	9 kHz	QP
	10 kHz	30 kHz	/	PK
30 MHz – 1000 MHz	/	/	120 kHz	QP
	100 kHz	300 kHz	/	PK

All final data was recorded in Quasi-peak detection mode except for the frequency bands 9–90 kHz, 110–490 kHz, average detection modes for frequency bands 9–90 kHz and 110–490 kHz.

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

Factor & Over Limit/Margin Calculation

The Level 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:

Factor = Antenna Factor + Cable Loss- Amplifier Gain
Level= Read Level + Factor

The "**Over Limit**" 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:

Over Limit = Level – Limit

Test Data

Environmental Conditions

Temperature:	22 ℃
Relative Humidity:	54 %
ATM Pressure:	101 kPa

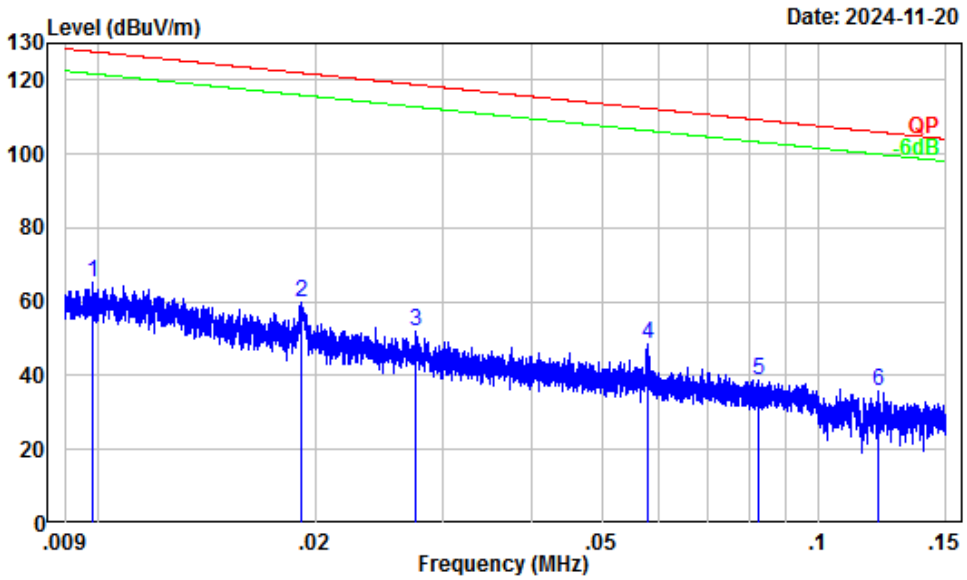
The testing was performed by Anson Su on 2024-11-20.

Test mode: Transmitting (Pre-scan in the X, Y and Z axes of orientation, the worst case of z-axis orientation were recorded)

1) Spurious Emissions (9 kHz~30 MHz):

Part 15 Section 15.31(f)(2) (9kHz-30MHz)
Limit @ 3m=Limit @ 300m-40*log(3(m)/300(m))
Limit @ 3m=Limit @ 30m-40*log(3(m)/30(m))

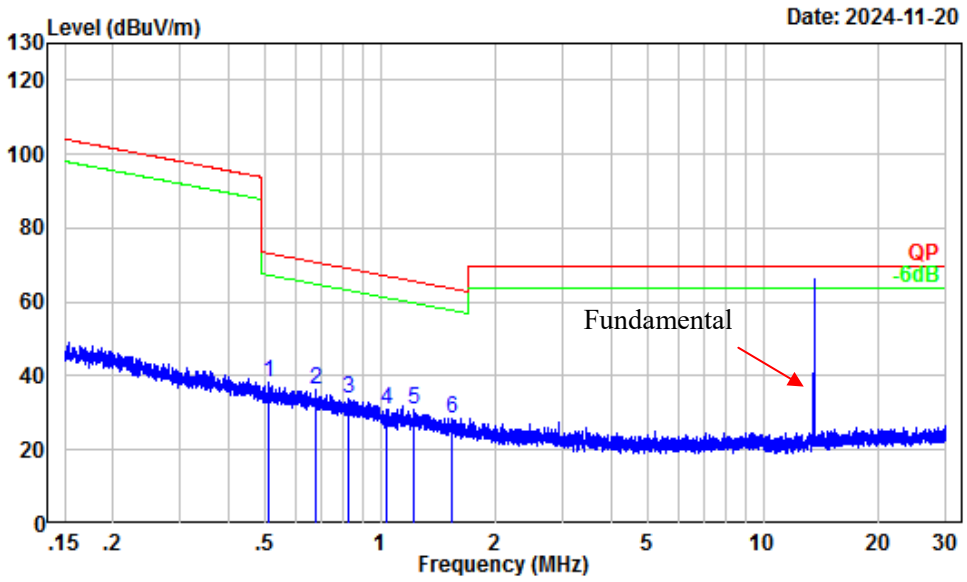
Ground-parallel
9 kHz~150 kHz



Site : Chamber A
Condition : 3m
Project Number: 2401Y99438E-RF
Test Mode : Transmitting
Note : Ground-parallel
Tester : Anson Su

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	0.01	37.82	27.27	65.09	127.75	-62.66	Peak
2	0.02	33.02	26.89	59.91	121.96	-62.05	Peak
3	0.03	28.73	23.19	51.92	118.80	-66.88	Peak
4	0.06	22.01	26.33	48.34	112.36	-64.02	Peak
5	0.08	18.77	19.88	38.65	109.26	-70.61	Peak
6	0.12	16.07	19.98	36.05	105.95	-69.90	Peak

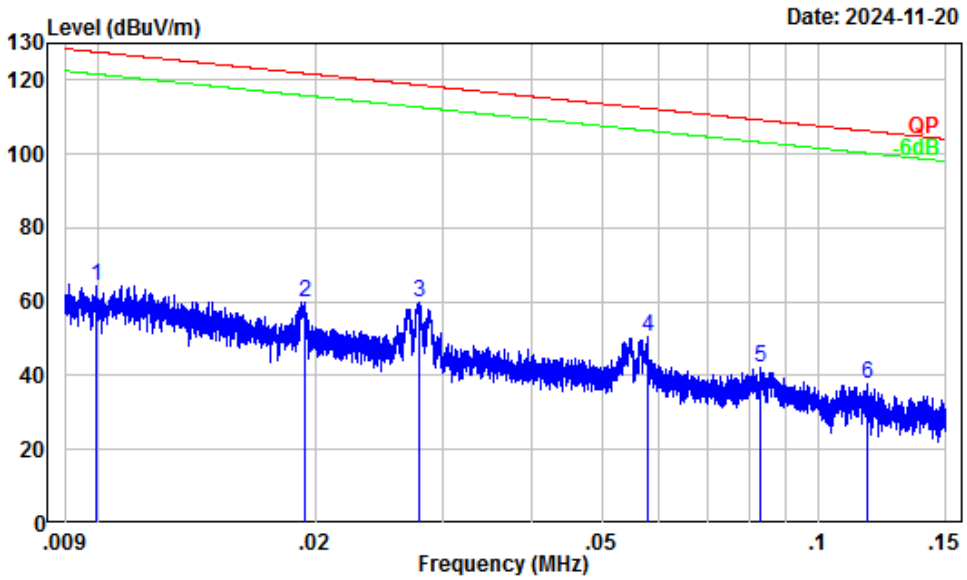
150 kHz~30 MHz



Site : Chamber A
Condition : 3m
Project Number: 2401Y99438E-RF
Test Mode : Transmitting
Note : Ground-parallel
Tester : Anson Su

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	0.51	3.36	34.93	38.29	73.44	-35.15	Peak
2	0.68	1.38	35.04	36.42	70.95	-34.53	Peak
3	0.83	-0.30	33.94	33.64	69.17	-35.53	Peak
4	1.04	-1.74	32.76	31.02	67.09	-36.07	Peak
5	1.22	-2.36	33.02	30.66	65.70	-35.04	Peak
6	1.54	-3.46	32.04	28.58	63.66	-35.08	Peak

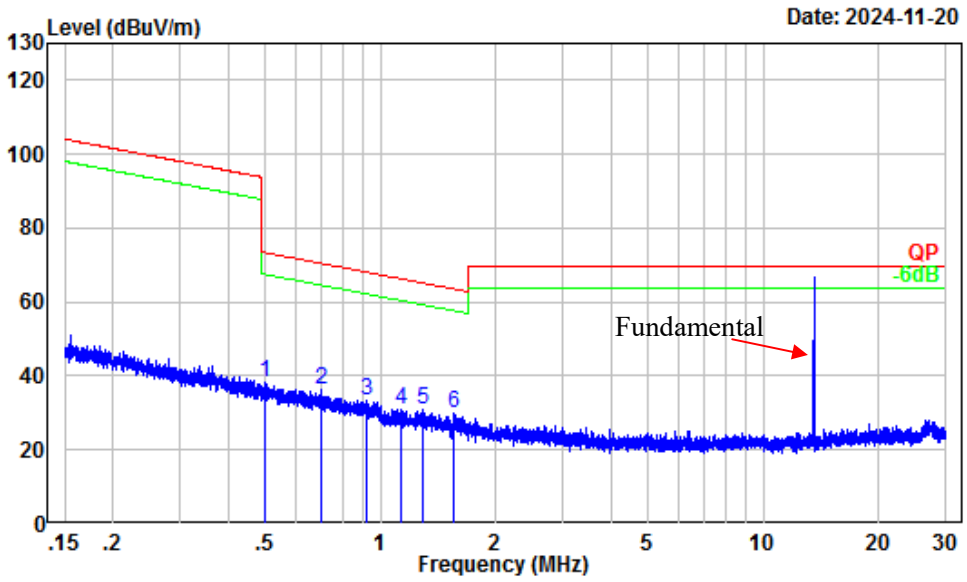
Perpendicular
9 kHz~150 kHz



Site : Chamber A
Condition : 3m
Project Number: 2401Y99438E-RF
Test Mode : Transmitting
Note : Perpendicular
Tester : Anson Su

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	0.01	37.72	26.50	64.22	127.63	-63.41	Peak
2	0.02	32.91	26.78	59.69	121.86	-62.17	Peak
3	0.03	28.52	31.27	59.79	118.67	-58.88	Peak
4	0.06	22.02	28.34	50.36	112.37	-62.01	Peak
5	0.08	18.72	23.54	42.26	109.21	-66.95	Peak
6	0.12	16.28	21.27	37.55	106.28	-68.73	Peak

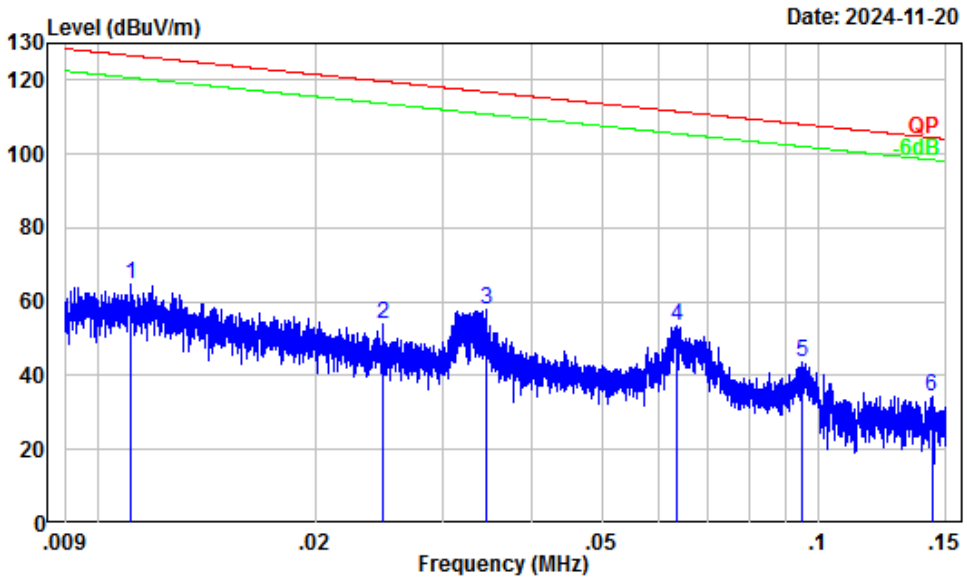
150 kHz~30 MHz



Site : Chamber A
Condition : 3m
Project Number: 2401Y99438E-RF
Test Mode : Transmitting
Note : Perpendicular
Tester : Anson Su

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	0.50	3.52	34.86	38.38	73.66	-35.28	Peak
2	0.70	1.07	35.08	36.15	70.62	-34.47	Peak
3	0.92	-1.01	34.35	33.34	68.19	-34.85	Peak
4	1.13	-2.04	32.95	30.91	66.40	-35.49	Peak
5	1.29	-2.60	33.35	30.75	65.21	-34.46	Peak
6	1.56	-3.54	33.36	29.82	63.53	-33.71	Peak

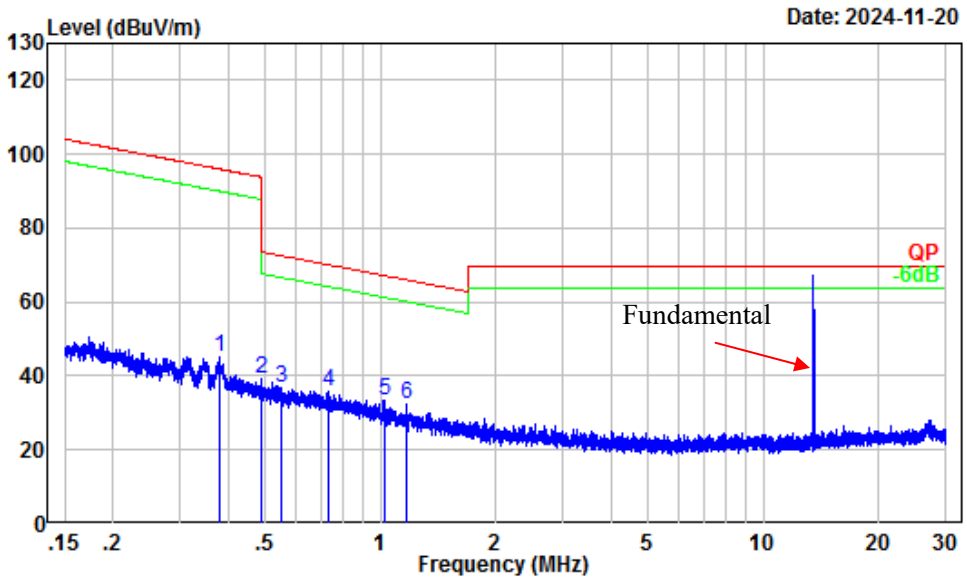
Parallel
9 kHz~150 kHz



Site : Chamber A
Condition : 3m
Project Number: 2401Y99438E-RF
Test Mode : Transmitting
Note : Parallel
Tester : Anson Su

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	0.01	37.12	27.48	64.60	126.68	-62.08	Peak
2	0.02	30.12	24.01	54.13	119.70	-65.57	Peak
3	0.03	26.48	31.16	57.64	116.84	-59.20	Peak
4	0.06	21.25	32.07	53.32	111.55	-58.23	Peak
5	0.09	17.55	25.97	43.52	108.05	-64.53	Peak
6	0.14	15.03	19.13	34.16	104.47	-70.31	Peak

150 kHz~30 MHz

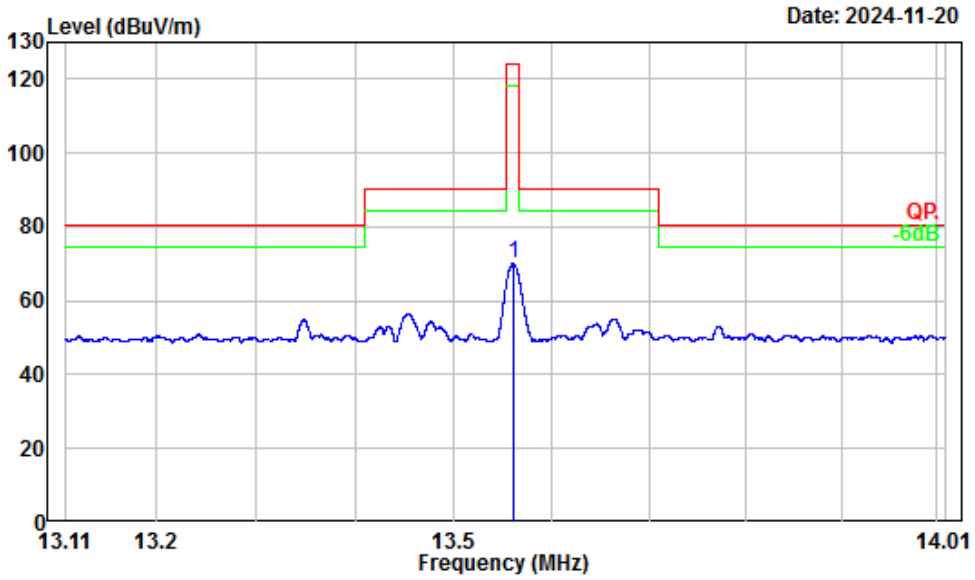


Site : Chamber A
Condition : 3m
Project Number: 2401Y99438E-RF
Test Mode : Transmitting
Note : Parallel
Tester : Anson Su

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	0.38	5.98	39.03	45.01	95.97	-50.96	Peak
2	0.49	3.75	35.34	39.09	93.85	-54.76	Peak
3	0.55	2.85	34.14	36.99	72.74	-35.75	Peak
4	0.73	0.69	35.06	35.75	70.22	-34.47	Peak
5	1.02	-1.67	34.95	33.28	67.28	-34.00	Peak
6	1.17	-2.19	34.61	32.42	66.07	-33.65	Peak

2) Emission Mask & Fundamental:

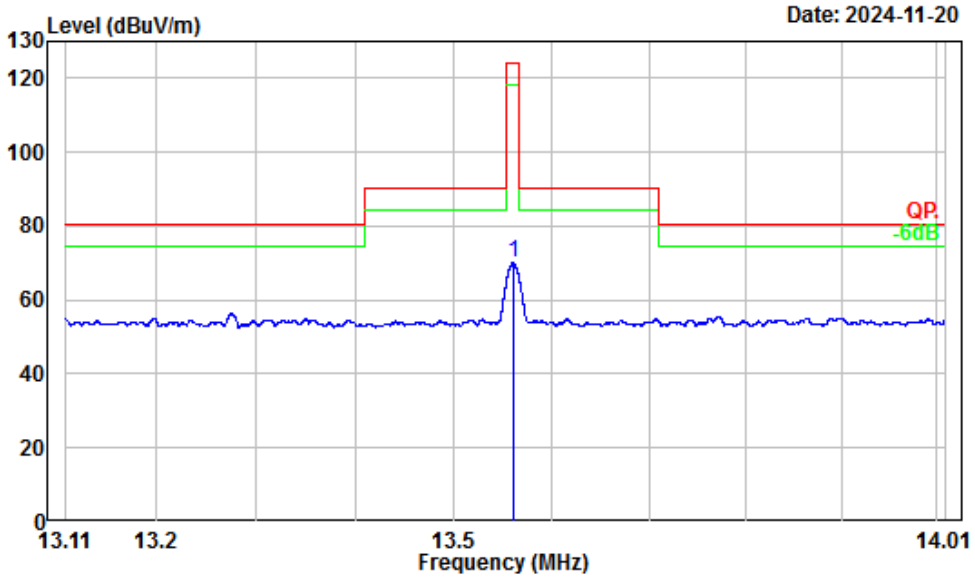
Ground-parallel



Site : Chamber A
Condition : 3m
Project Number: 2401Y99438E-RF
Test Mode : Transmitting
Note : Ground-parallel
Tester : Anson Su

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	13.56	-5.69	75.71	70.02	124.00	-53.98	Peak

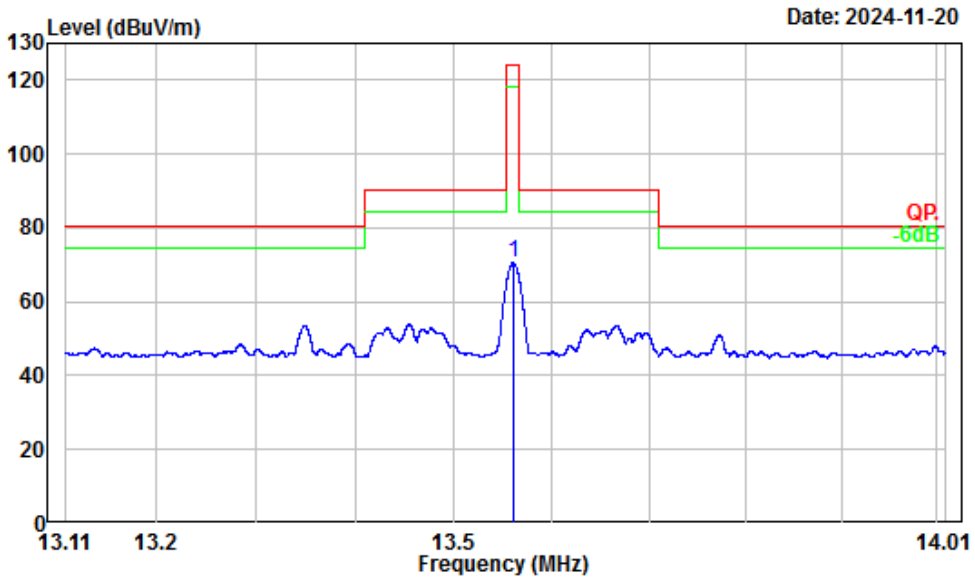
Perpendicular



Site : Chamber A
Condition : 3m
Project Number: 2401Y99438E-RF
Test Mode : Transmitting
Note : Perpendicular
Tester : Anson Su

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	13.56	-5.69	75.66	69.97	124.00	-54.03	Peak

Parallel

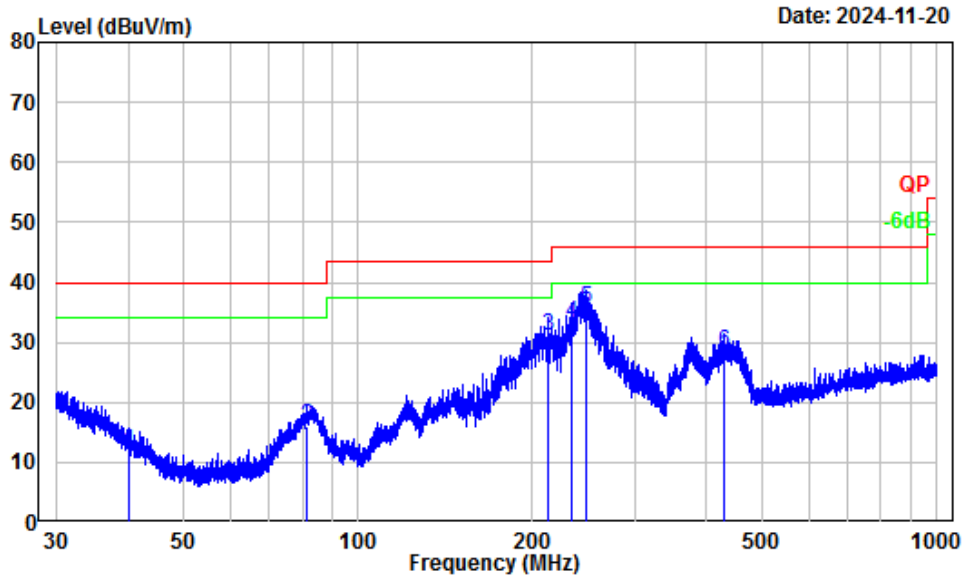


Site : Chamber A
Condition : 3m
Project Number: 2401Y99438E-RF
Test Mode : Transmitting
Note : Parallel
Tester : Anson Su

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	13.56	-5.69	76.17	70.48	124.00	-53.52	Peak

3) Spurious Emissions (30 MHz~1GHz):

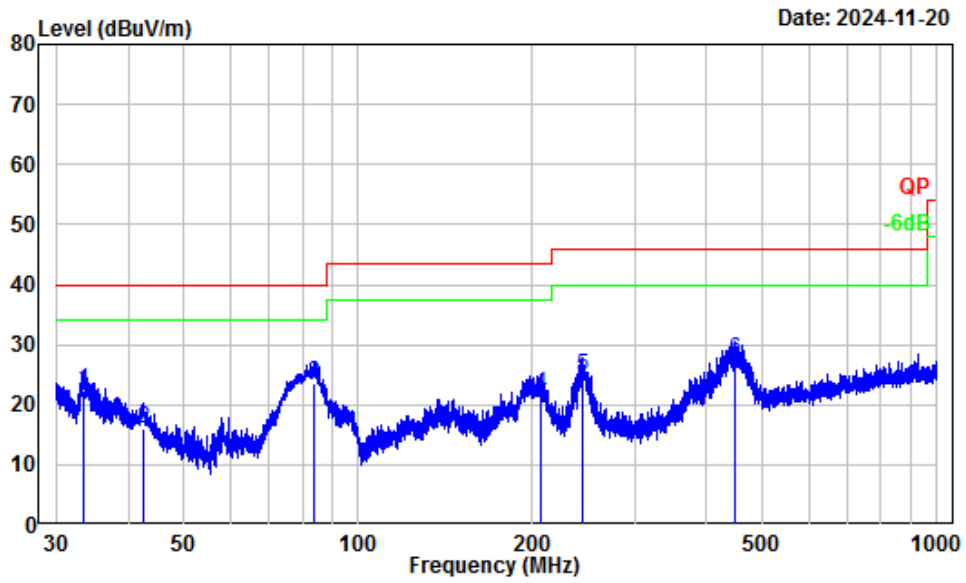
Horizontal



Site : Chamber A
Condition : 3m Horizontal
Project Number: 2401Y99438E-RF
Test Mode : Transmitting
Tester : Anson Su

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	40.06	-12.42	24.22	11.80	40.00	-28.20	QP
2	81.35	-18.00	33.92	15.92	40.00	-24.08	QP
3	212.83	-14.13	45.11	30.98	43.50	-12.52	QP
4	234.07	-13.61	46.81	33.20	46.00	-12.80	QP
5	246.92	-13.16	48.84	35.68	46.00	-10.32	QP
6	428.02	-7.84	36.34	28.50	46.00	-17.50	QP

Vertical



Site : Chamber A
Condition : 3m Vertical
Project Number: 2401Y99438E-RF
Test Mode : Transmitting
Tester : Anson Su

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	33.44	-7.89	30.14	22.25	40.00	-17.75	QP
2	42.51	-14.23	30.34	16.11	40.00	-23.89	QP
3	83.93	-18.09	41.61	23.52	40.00	-16.48	QP
4	207.12	-13.69	35.56	21.87	43.50	-21.63	QP
5	243.80	-13.24	38.02	24.78	46.00	-21.22	QP
6	448.97	-7.54	35.10	27.56	46.00	-18.44	QP

FCC§15.225(e) - FREQUENCY STABILITY

Applicable Standard

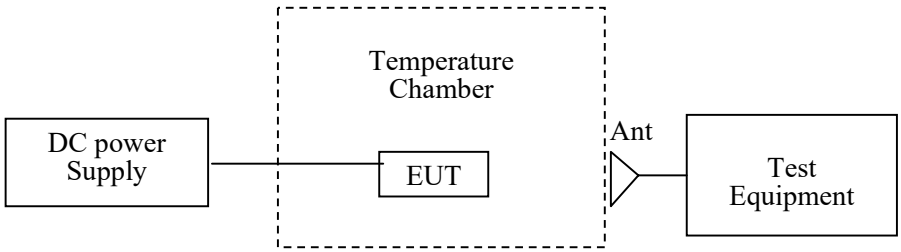
The frequency tolerance of the carrier signal shall be maintained within ±0.01% of the operating frequency over a temperature variation of −20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature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

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and inductive antenna was connected to a Spectrum Analyzer. The EUT was placed inside the temperature chamber.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the Spectrum Analyzer.

Frequency Stability vs. Voltage: An external DC power supply Source. The voltage was set to 115% of the nominal value and was then decreased until the transmitter light no longer illuminated; i.e., the end point. The output frequency was recorded for each voltage.



Test Data

Environmental Conditions

Temperature:	22 ℃
Relative Humidity:	54 %
ATM Pressure:	101 kPa

The testing was performed by Anson Su on 2024-11-21.

Test Mode: Transmitting

Test Result: Pass

Test Item	Temperature (℃)	Voltage (V_{DC})	Measured frequency (MHz)	Frequency Error (%)	Limit (%)
Frequency Stability vs. Temperature	-20	3.89	13.56106	0.0078	0.01
	-10	3.89	13.56124	0.0091	0.01
	0	3.89	13.56102	0.0075	0.01
	10	3.89	13.56114	0.0084	0.01
	20	3.89	13.56122	0.0090	0.01
	30	3.89	13.56103	0.0076	0.01
	40	3.89	13.56115	0.0085	0.01
	50	3.89	13.56126	0.0093	0.01
Frequency Stability vs. Voltage	20	3.50	13.56111	0.0082	0.01
	20	4.48	13.56131	0.0097	0.01

Note: the extreme voltage was declared by the applicant.

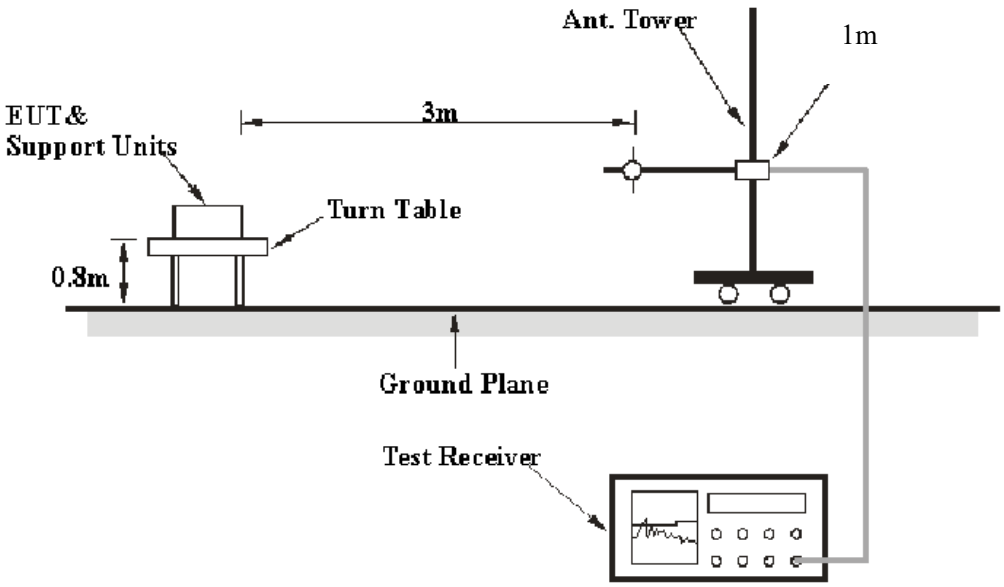
FCC§15.215(c) - 20dBEMISSION BANDWIDTH

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

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

Environmental Conditions

Temperature:	22 ℃
Relative Humidity:	54 %
ATM Pressure:	101 kPa

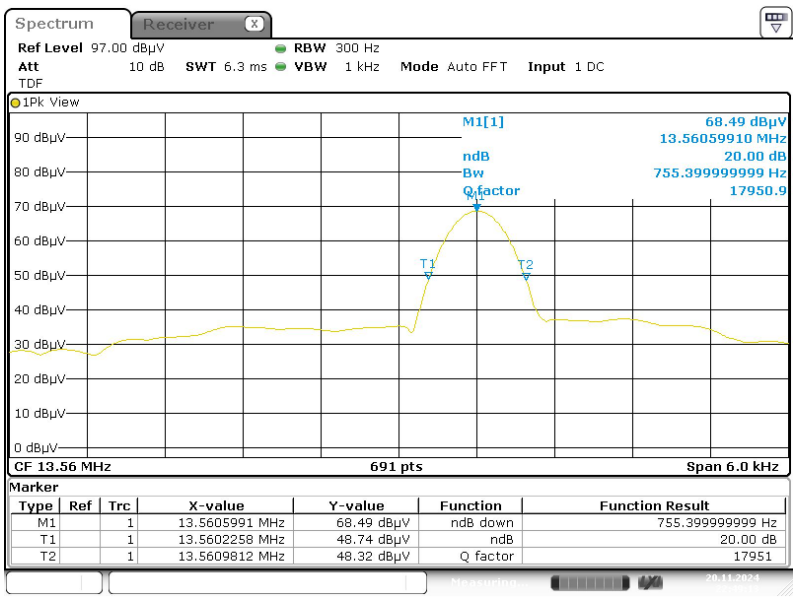
The testing was performed by Anson Su on 2024-11-20.

Test Mode: Transmitting

Test Result: Pass

Test Frequency (MHz)	20dB Bandwidth (kHz)
13.56	0.755

20 dB Emission Bandwidth



EUT PHOTOGRAPHS

Please refer to the attachment 2401Y99438E-RF External photo and 2401Y99438E-RF Internal photo.

TEST SETUP PHOTOGRAPHS

Please refer to the attachment 2401Y99438E-RFD Test Setup photo.

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