RF Test Report

For

Applicant Name:	**Shenzhen Qichang Intelligent Technology Co., Ltd**
Address:	Room 510, Building 7, Yunli Intelligent Park, No. 7, Bantian Street, Longgang, Shenzhen，China
EUT Name:	Smart phone
Brand Name:	FOSSiBOT
Model Number:	F109

Issued By

Company Name:	**BTF Testing Lab (Shenzhen) Co., Ltd.**
Address:	F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China
Report Number:	BTF240704R01605
Test Standards:	47 CFR Part 15 Subpart C Section 15.225
FCC ID:	2BAK2-F109
Test Date:	2024-07-07 to 2024-08-10
Date of Issue:	2024-08-11
Test By:	Ssxx.guo/ Tester
Prepared By:	Ace Xie/ Project Engineer
Date:	2024-08-11
Approved By:	Ryan.CJ / EMC Manager
Date:	2024-08-11

Note: All the test results in this report only related to the testing samples. Which can be duplicated completely for the legal use with approval of applicant; it shall not be reproduced except in full without the written approval of BTF Testing Lab (Shenzhen) Co., Ltd., All the objections should be raised within thirty days from the date of issue. To validate the report, you can contact us.

Revision History		
Version	Issue Date	Revisions Content
R_V0	2024-08-11	Original
Note:	*Once the revision has been made, then previous versions reports are invalid.*	

BTF Testing Lab (Shenzhen) Co., Ltd.
F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China

Table of Contents

BTF Testing Lab (Shenzhen) Co., Ltd.
F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China

1. Introduction

1.1 Identification of Testing Laboratory

Company Name:	BTF Testing Lab (Shenzhen) Co., Ltd.
Address:	F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China
Phone Number:	+86-0755-23146130
Fax Number:	+86-0755-23146130

1.2 Identification of the Responsible Testing Location

Test Location:	BTF Testing Lab (Shenzhen) Co., Ltd.
Address:	F101, 201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China
Description:	All measurement facilities used to collect the measurement data are located at F101,201 and 301, Building 1, Block 2, Tantou Industrial Park, Tantou Community, Songgang Street, Bao'an District, Shenzhen, China
FCC Registration Number:	518915
Designation Number:	CN1330

1.3 Laboratory Condition

Ambient Temperature:	20℃ to 25℃
Ambient Relative Humidity:	45% to 55%
Ambient Pressure:	100 kPa to 102 kPa

1.4 Announcement

(1) The test report reference to the report template version v0.

(2) The test report is invalid if not marked with the signatures of the persons responsible for preparing, reviewing and approving the test report.

(3) The test report is invalid if there is any evidence and/or falsification.

(4) This document may not be altered or revised in any way unless done so by BTF and all revisions are duly noted in the revisions section.

(5) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.

(6) The laboratory is only responsible for the data released by the laboratory, except for the part provided by the applicant.

2. Product Information

2.1 Application Information

Company Name:	Shenzhen Qichang Intelligent Technology Co., Ltd
Address:	Room 510, Building 7, Yunli Intelligent Park, No. 7, Bantian Street, Longgang, Shenzhen，China

2.2 Manufacturer Information

Company Name:	Shenzhen Qichang Intelligent Technology Co., Ltd
Address:	Room 510, Building 7, Yunli Intelligent Park, No. 7, Bantian Street, Longgang, Shenzhen，China

2.3 Factory Information

Company Name:	Shenzhen Qichang Intelligent Technology Co., Ltd
Address:	Room 510, Building 7, Yunli Intelligent Park, No. 7, Bantian Street, Longgang, Shenzhen，China

2.4 General Description of Equipment under Test (EUT)

EUT name	Smart phone
Under test model name	F109
Series model name	F109 Pro, F109 P, F109 S, F109 Plus
Description of model name differentiation	Only the model name is different, everything else is the same.
Hardware version	E393_MAIN_PCB_V1.1
Software version	FOSSiBOT_F109_E

2.5 Technical Information

Modulation Type	ASK
Operation Frequency	13.56 MHz
Number of Channel	1
Antenna Type	Inside antenna

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3. Summary of Test Results

3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 15 Subpart C Section 15.225	Operation within the band 13.110-14.010 MHz
2	ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices

3.2 Summary of Test Result

No.	Description	FCC Part No.	Test Result	Test By	Verdict	Remark
1	Antenna Requirement	15.203	--	Chris Liu	Pass	--
2	20dB Bandwidth	15.215	ANNEX A.1	Chris Liu	Pass	--
3	Field Strength of the Fundamental and Mask Measurement	15.225(a)(b)(c)	ANNEX A.2	Chris Liu	Pass	--
4	Conducted Emission	15.207	ANNEX A.3	Chris Liu	Pass	--
5	Radiated Spurious Emission	15.225(d) 15.209	ANNEX A.4	Chris Liu	Pass	--
6	Frequency Stability	15.225(e)	ANNEX A.5	Chris Liu	Pass	

3.3 Uncertainty of Test

The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2 and TR100 028-1/-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Measurement	Value
Occupied Channel Bandwidth	69 KHz
All emissions, radiated(<1GHz)	4.12 dB
Temperature	0.82 °C
Humidity	4.1 %

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4. Test Configuration

4.1 Environment Condition

Environment Parameter	Selected Values During Tests			
	Temperature	Voltage	Relative Humidity	Ambient Pressure
Normal Temperature, Normal Voltage (NTNV)	20°C to 25°C	DC 3.87V from battery	30% to 60%	100 kPa to 102 kPa

4.2 Test Equipment List

Conducted Method Test						
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due	Use
MXA Signal Analyzer	KEYSIGHT	N9020A	MY50410020	2023.11.16	2024.11.15	☒
WIDEBAND RADIO COMMNUNICATION TESTER	Rohde & Schwarz	CMW500	161997	2023.11.16	2024.11.15	☒
ESG VECTOR SIGNAL GENERATOR	Agilent	E4438C	MY45094854	/	/	☒
MXG Vector Signal Generator	Agilent	N5182A	MY46240163	/	/	☒
Adjustable Direct Current Regulated Power Supply	Dongguan Tongmen Electronic Technology Co., LTD	etm-6050c	20211026123	/	/	☒
Programmable constant temperature and humidity box	ZZCKONG	ZZ-K02A	20210928007	2023.11.16	2024.11.15	☒

Radiated Method Test						
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due	Use
SIGNAL ANALYZER	ROHDE&SCHWARZ	FSQ40	100010	2023.11.16	2024.11.15	☒
EMI TEST RECEIVER	ROHDE&SCHWARZ	ESCI7	101032	2023.11.16	2024.11.15	☒
Log periodic antenna	SCHWARZBECK	VULB 9168	01328	2023.11.13	2024.11.12	☒
Horn Antenna	SCHWARZBECK	BBHA9170	01157	2023.11.13	2024.11.12	☒
POSITIONAL CONTROLLER	SKET	PCI-GPIB	/	/	/	☒
RE Cable	REBES Talent	UF2-NMNM-10m	21101570	/	/	☒
RE Cable	REBES Talent	UF2-NMNM-2.5m	21101573	/	/	☒
RE Cable	REBES Talent	UF2-NMNM-1m	21101576	/	/	☒
Coaxial cable Multiflex 141	Schwarzbeck	N/SMA 0.5m	517386	2023.3.24	2024.3.23	☒

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RE Cable	Talent Microwave	A40-2.92M2.92 M-14M	22080539	/	/	☒
RE Cable	Talent Microwave	A81-SMAMNM-14M	22080538	/	/	☒
Preamplifier	SCHWARZBECK	BBV9744	00246	/	/	☒
Horn Antenna	Schwarzbeck	BBHA9120D	2597	2022.5.22	2024.5.21	☒
Broadband Preamplilifier	Schwarzbeck	BBV9718D	00008	2023.3.24	2024.3.23	☒

Conducted disturbance Test						
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due	Use
EMI Receiver	ROHDE&SCHWARZ	ESCI3	101422	2023.11.15	2024.11.14	☒
V-LISN	SCHWARZBECK	NSLK 8127	01073	2023.11.16	2024.11.15	☒
LISN	AFJ	LS16/110VAC	16010020076	2023.02.23	2024.02.22	☒
Coaxial Switcher	SCHWARZBECK	CX210	CX210	/	/	☒
Pulse Limiter	SCHWARZBECK	VTSD 9561-F	00953	/	/	☒
EZ_EMC	Frad	EMC-CON 3A1.1+	/	/	/	☒

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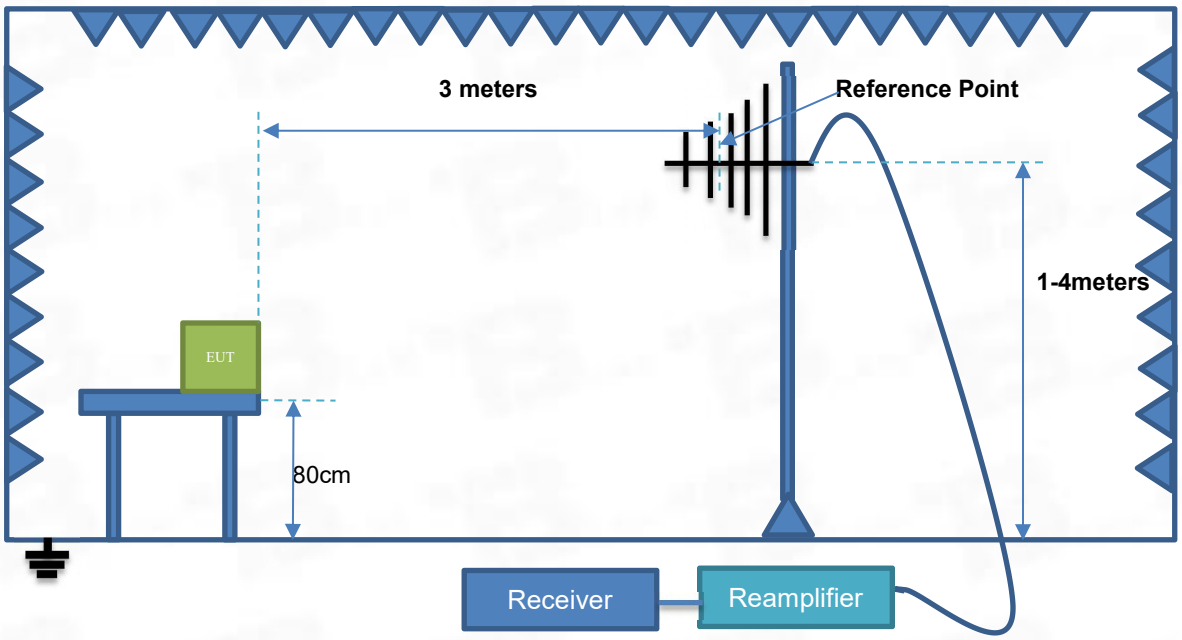
4.3 Test Auxiliary Equipment

Description	Manufacturer	Model	Serial No.	Length	Description	Use
/	/	/	/	/	/	☒

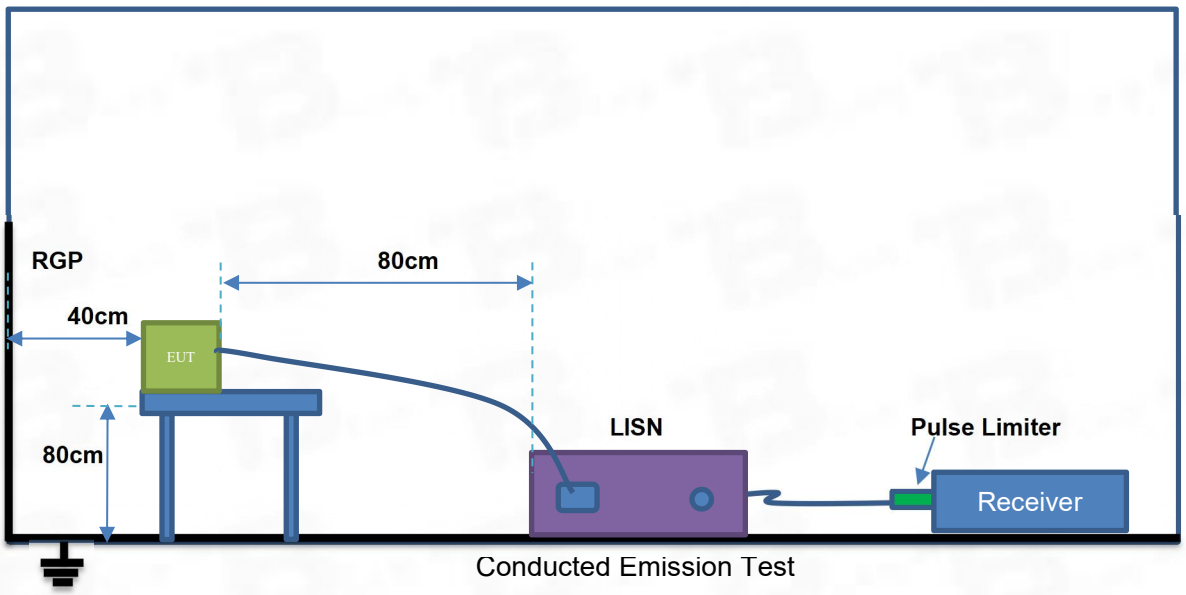
4.4 Test Setup

Test Setup 1



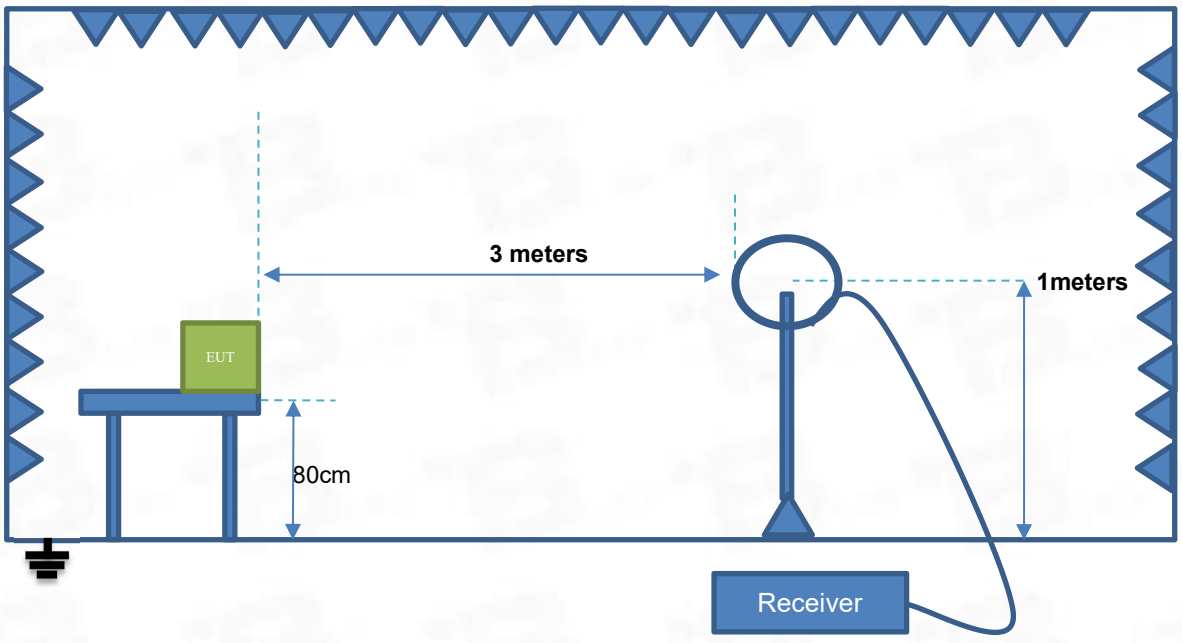
Radiation Test (30MHz – 1GHz)

Test Setup 2



Conducted Emission Test

Test Setup 3



Radiation Test (9k - 30MHz)

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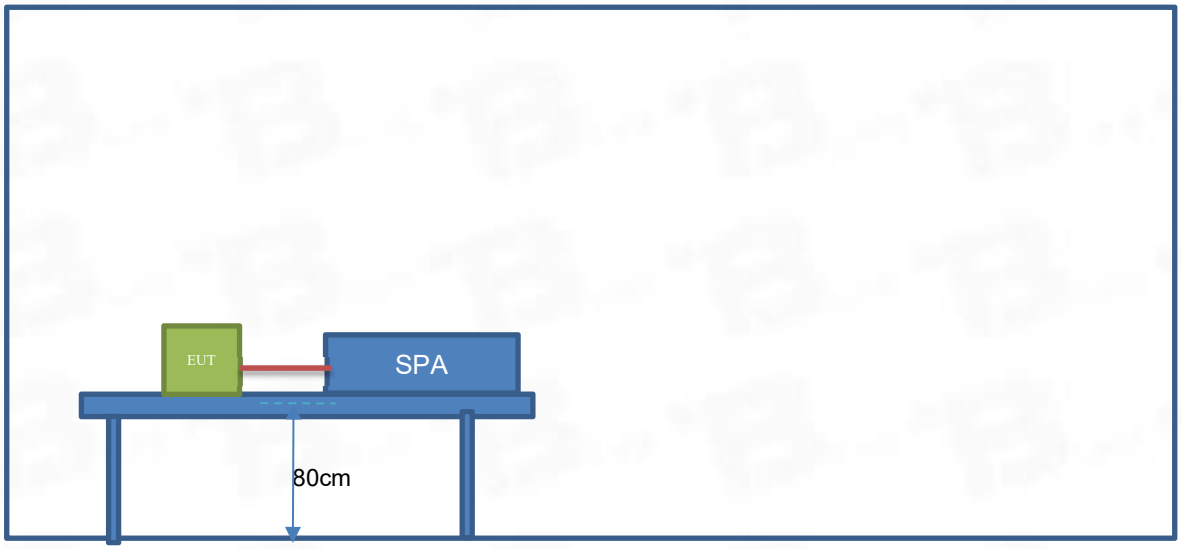
Test Setup 4



5. Test Items

5.1 Antenna Requirements

5.1.1 Relevant Standards

FCC §15.203; RSS-247, 5.4(f)

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. This requirement does not apply to carrier current devices or to devices operated under the provisions of § 15.211, § 15.213, § 15.217, § 15.219, or § 15.221. 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.

5.1.2 Antenna Anti-Replacement Construction

Protected Method	Description
The antenna is embedded in the product.	An embedded in antenna design is used.

Reference Documents	Item
Photo	Please refer to the EUT Photo documents.

5.2 20dB Bandwidth

5.2.1 Limit

Intentional radiators must be designed to ensure that the 20dB emission bandwidth in the specific band 13.553~13.567MHz.

5.2.2 Test Setup

See section 4.4 for test setup 4. The photo of test setup please refer to ANNEX B

5.2.3 Test Procedure

a) The transmitter output was connected to the spectrum analyzer through an attenuator, the path loss was compensated to the results for each measurement.
b) Set to the maximum power setting and enable the EUT transmit continuously.
c) Use the following spectrum analyzer settings:
Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel,
RBW ≥ 1% of the 20 dB bandwidth, VBW ≥ RBW,
Sweep = auto, Detector function = peak, Trace = max hold.
d) Measure and record the results in the test report.

5.2.4 Test Result

Please refer to ANNEX A.1

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5.3 Field Strength of the Fundamental and Mask Measurement

5.3.1 Limit

FCC §15.225(a)(b)(c)

Fundamental frequency(MHz)	Field strength of fundamental (uV/m @30m)	Field strength of fundamental (dBuV/m @3m)
13.553-13.567	15848	124.0
13.410-13.553&13.567-13.710	334	90.5
13.110-13.410&13.710-14.010	106	80.5

Note: Limit dBuV/m @3m =Limit dBuV/m @30m +40*log(30/3)= Limit dBuV/m @30m + 40.

5.3.2 Test Setup

See section 4.4 for test setup 3. The photo of test setup please refer to ANNEX B

5.3.3 Test Procedure

a) The EUT was setup and tested according to ANSI C63.10 requirements.
b) The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
c) 3. The EUT waspositioned such that the distance from antenna to the EUT was 3 meters.
d) The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. Thisis repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10 on radiated measurement.

5.3.4 Test Result

Please refer to ANNEX A.2

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5.4 Conducted Emission

5.4.1 Limit

FCC §15.207; RSS-GEN, 8.8

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50μH/50Ω line impedance stabilization network (LISN).

Frequency range (MHz)	Conducted Limit (dBμV)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
0.50 - 30	60	50

5.4.2 Test Setup

See section 4.4 for test setup 2. The photo of test setup please refer to ANNEX B

5.4.3 Test Procedure

The maximum conducted interference is searched using Peak (PK), if the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. Refer to recorded points and plots below.

Devices subject to Part 15 must be tested for all available U.S. voltages and frequencies (such as a nominal 120 VAC, 50/60 Hz and 240 VAC, 50/60 Hz) for which the device is capable of operation. A device rated for 50/60 Hz operation need not be tested at both frequencies provided the radiated and line conducted emissions are the same at both frequencies.

5.4.4 Test Result

Please refer to ANNEX A.3

NOTE:

1. Results (dBuV) = Reading (dBuV) + Factor (dB)
   The reading level is calculated by software which is not shown in the sheet
2. Factor = Insertion loss + Cable loss
3. Over limit = Results – Limit.

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5.5 Radiated Spurious Emission

5.5.1 Limit

FCC §15.209&15.225

Radiated emission outside the frequency band attenuation below the general limits specified in FCC section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in FCC section 15.205(a), must also comply with the radiated emission limits specified in FCC section 15.209(a). According to FCC section 15.209 (a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

Note:

1. Field Strength (dBμV/m) = 20*log[Field Strength (μV/m)].
2. In the emission tables above, the tighter limit applies at the band edges.
3. For Above 1000 MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.
4. For above 1000 MHz, limit field strength of harmonics: 54dBuV/m@3m (AV) and 74dBuV/m@3m (PK).

5.5.2 Test Setup

See section 4.4 for test setup 1 and 3. The photo of test setup please refer to ANNEX B

5.5.3 Test Procedure

Since the emission limits are specified in terms of radiated field strength levels, measurements performed to demonstrate compliance have traditionally relied on a radiated test configuration. Radiated measurements remain the principal method for demonstrating compliance to the specified limits; however antenna-port conducted measurements are also now acceptable to demonstrate compliance (see below for details). When radiated measurements are utilized, test site requirements and procedures for maximizing and measuring radiated emissions that are described in ANSI C63.10 shall be followed.

Antenna-port conducted measurements may also be used as an alternative to radiated measurements for demonstrating compliance in the restricted frequency bands. If conducted measurements are performed, then proper impedance matching must be ensured and an additional radiated test for cabinet/case spurious

emissions is required.

General Procedure for conducted measurements in restricted bands:
a) Measure the conducted output power (in dBm) using the detector specified (see guidance regarding measurement procedures for determining quasi-peak, peak, and average conducted output power, respectively).
b) Add the maximum transmit antenna gain (in dBi) to the measured output power level to determine the EIRP level (see guidance on determining the applicable antenna gain)
c) Add the appropriate maximum ground reflection factor to the EIRP level (6 dB for frequencies ≤ 30 MHz, 4.7 dB for frequencies between 30 MHz and 1000 MHz, inclusive and 0 dB for frequencies > 1000 MHz).
d) For devices with multiple antenna-ports, measure the power of each individual chain and sum the EIRP of all chains in linear terms (e.g., Watts, mW).
e) Convert the resultant EIRP level to an equivalent electric field strength using the following relationship:

E = EIRP – 20log D + 104.8

where:
E = electric field strength in dBμV/m,
EIRP = equivalent isotropic radiated power in dBm D = specified measurement distance in meters.
f) Compare the resultant electric field strength level to the applicable limit.

g) Perform radiated spurious emission test.

Quasi-Peak measurement procedure

The specifications for measurements using the CISPR quasi-peak detector can be found in Publication 16 of the International Special Committee on Radio Frequency Interference (CISPR) of the International Electrotechnical Commission.
As an alternative to CISPR quasi-peak measurement, compliance can be demonstrated to the applicable emission limits using a peak detector.
Peak power measurement procedure:

Peak emission levels are measured by setting the instrument as follows:
a)RBW = as specified in Table 1.
b)VBW ≥ 3 x RBW.
c)Detector = Peak.
d)Sweep time = auto.
e)Trace mode = max hold.
f)Allow sweeps to continue until the trace stabilizes. (Note that the required measurement time may be longer

for low duty cycle applications).

Table 1—RBW as a function of frequency

Frequency	RBW
9-150 kHz	200-300 Hz
0.15-30 MHz	9-10 kHz
30-1000 MHz	100-120 kHz
> 1000 MHz	1 MHz

If the peak-detected amplitude can be shown to comply with the average limit, then it is not necessary to perform a separate average measurement.

Trace averaging across on and off times of the EUT transmissions followed by duty cycle correction:

If continuous transmission of the EUT (i.e., duty cycle ≥ 98 percent) cannot be achieved and the duty cycle is constant (i.e., duty cycle variations are less than ± 2 percent), then the following procedure shall be used:

a) The EUT shall be configured to operate at the maximum achievable duty cycle.

b) Measure the duty cycle, x, of the transmitter output signal as described in section 6.0.

c) RBW = 1 MHz (unless otherwise specified).

d) VBW ≥ 3 x RBW.

e) Detector = RMS, if span/(# of points in sweep) ≤ (RBW/2). Satisfying this condition may require increasing the number of points in the sweep or reducing the span. If this condition cannot be satisfied, then the detector mode shall be set to peak.

f) Averaging type = power (i.e., RMS).

1) As an alternative, the detector and averaging type may be set for linear voltage averaging.

2) Some instruments require linear display mode in order to use linear voltage averaging. Log or dB averaging shall not be used.

g) Sweep time = auto.

h) Perform a trace average of at least 100 traces.

i) A correction factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100 percent duty cycle. The correction factor is computed as follows:

1) If power averaging (RMS) mode was used in step f), then the applicable correction factor is 10 log(1/x), where x is the duty cycle.

2) If linear voltage averaging mode was used in step f), then the applicable correction factor is 20 log(1/x), where x is the duty cycle.

3) If a specific emission is demonstrated to be continuous (≥ 98 percent duty cycle) rather than turning on and off with the transmit cycle, then no duty cycle correction is required for that emission.

NOTE: Reduction of the measured emission amplitude levels to account for operational duty factor is not

permitted. Compliance is based on emission levels occurring during transmission - not on an average across on and off times of the transmitter.

Determining the applicable transmit antenna gain:

A conducted power measurement will determine the maximum output power associated with a restricted band emission; however, in order to determine the associated EIRP level, the gain of the transmitting antenna (in dBi) must be added to the measured output power (in dBm).
Since the out-of-band characteristics of the EUT transmit antenna will often be unknown, the use of a conservative antenna gain value is necessary. Thus, when determining the EIRP based on the measured conducted power, the upper bound on antenna gain for a device with a single RF output shall be selected as the maximum in-band gain of the antenna across all operating bands, or 2 dBi, whichever is greater. However, for devices that operate in multiple frequency bands while using the same transmit antenna, the highest gain of the antenna within the operating band nearest in frequency to the restricted band emission being measured may be used in lieu of the overall highest gain when the emission is at a frequency that is within 20 percent of the nearest band edge frequency, but in no case shall a value less than 2 dBi be used.
See KDB 662911 for guidance on calculating the additional array gain term when determining the effective antenna gain for a EUT with multiple outputs occupying the same or overlapping frequency ranges in the same band.

Radiated spurious emission test:

An additional consideration when performing conducted measurements of restricted band emissions is that unwanted emissions radiating from the EUT cabinet, control circuits, power leads, or intermediate circuit elements will likely go undetected in a conducted measurement configuration. To address this concern, a radiated test shall be performed to ensure that emissions emanating from the EUT cabinet (rather than the antenna port) also comply with the applicable limits.
For these cabinet radiated spurious emission measurements the EUT transmit antenna may be replaced with a termination matching the nominal impedance of the antenna. Procedures for performing radiated measurements are specified in ANSI C63.10. All detected emissions shall comply with the applicable limits.
The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The Turn Table is actuated to turn from 0° to 360°, and both horizontal and vertical polarizations of the Test Antenna are used to find the maximum radiated power. Mid channels on all channel bandwidth verified. Only the worst RB size/offset presented.
The power of the EUT transmitting frequency should be ignored.

All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.
Use the following spectrum analyzer settings:

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Span = wide enough to fully capture the emission being measured RBW = 1 MHz for f ≥ 1 GHz, 100 kHz for f < 1 GHz
VBW ≥ RBW
Sweep = auto
Detector function = peak Trace = max hold

5.5.4 Test Result

Please refer to ANNEX A.4

NOTE:
1. Results (dBuV) = Reading (dBuV) + Factor (dB)
The reading level is calculated by software which is not shown in the sheet
2. Factor = Insertion loss + Cable loss
3. Over limit = Results – Limit.

5.6 Frequency Stability

5.6.1 Limit

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.

5.6.2 Test Setup

See section 4.4 for test setup 4. The photo of test setup please refer to ANNEX B

5.6.3 Test Procedure

a) The equipment under test was connected to an external power supply.

b) RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators.

c) The EUT was placed inside the temperature chamber.

d) Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25℃ operating frequency as reference frequency.

e) Turn EUT off and set the chamber temperature to -20℃. After the temperature stabilized for approximately 30 minutes recorded the frequency.

f) Repeat step measure with 10℃ increased per stage until the highest temperature of +50℃ reached.

5.6.4 Test Result

Please refer to ANNEX A.5

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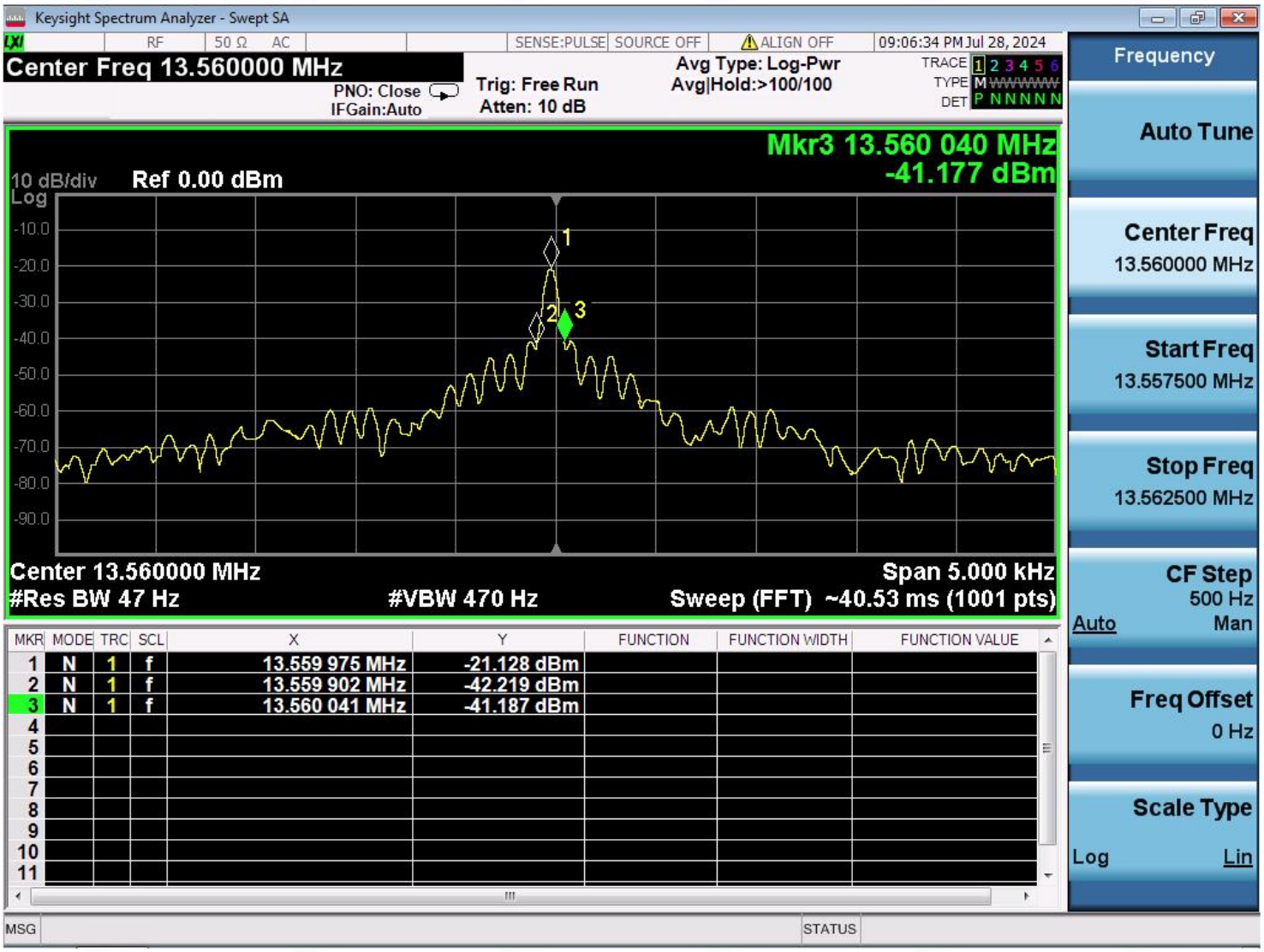
ANNEX A Test Results

A.1 20dB Bandwidth

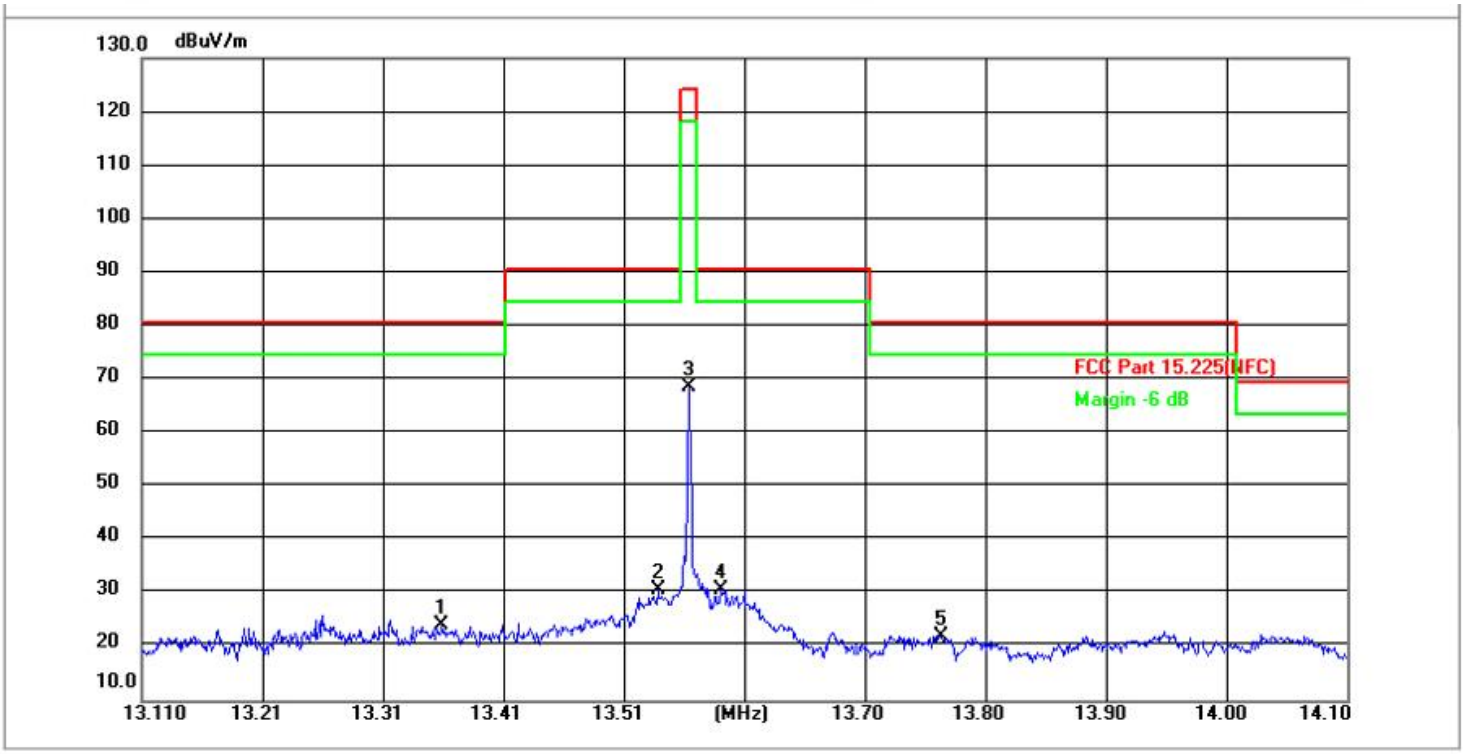
20dB Bandwidth



Frequency Range (MHz)	13.559905MHz ⩽ f_L, f_H⩽ 13.560040MHz
20dB Bandwidth(Hz):	139Hz

A.2 Field Strength of the Fundamental and Mask Measurement

Polarization: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	13.3570	52.61	-28.30	24.31	80.50	-56.19	peak	P
2	13.5342	59.24	-28.33	30.91	90.50	-59.59	peak	P
3 *	13.5600	97.12	-28.33	68.79	124.00	-55.21	peak	P
4	13.5854	59.18	-28.34	30.84	90.50	-59.66	peak	P
5	13.7667	50.65	-28.36	22.29	80.50	-58.21	peak	P

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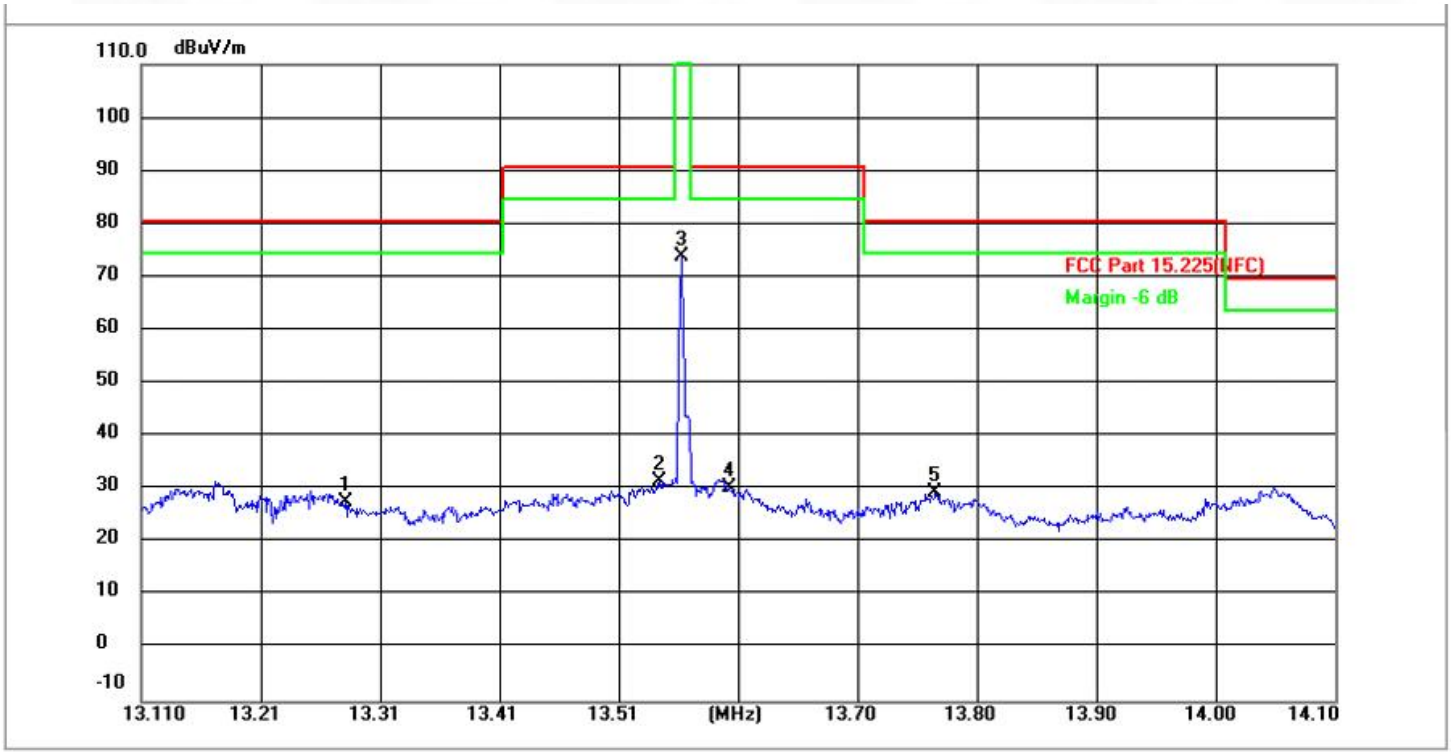
Polarization: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	13.2797	55.95	-28.29	27.66	80.50	-52.84	peak	P
2	13.5401	59.88	-28.33	31.55	90.50	-58.95	peak	P
3 *	13.5573	102.04	-28.33	73.71	124.00	-50.29	peak	P
4	13.5970	58.60	-28.34	30.26	90.50	-60.24	peak	P
5	13.7688	57.73	-28.37	29.36	80.50	-51.14	peak	P

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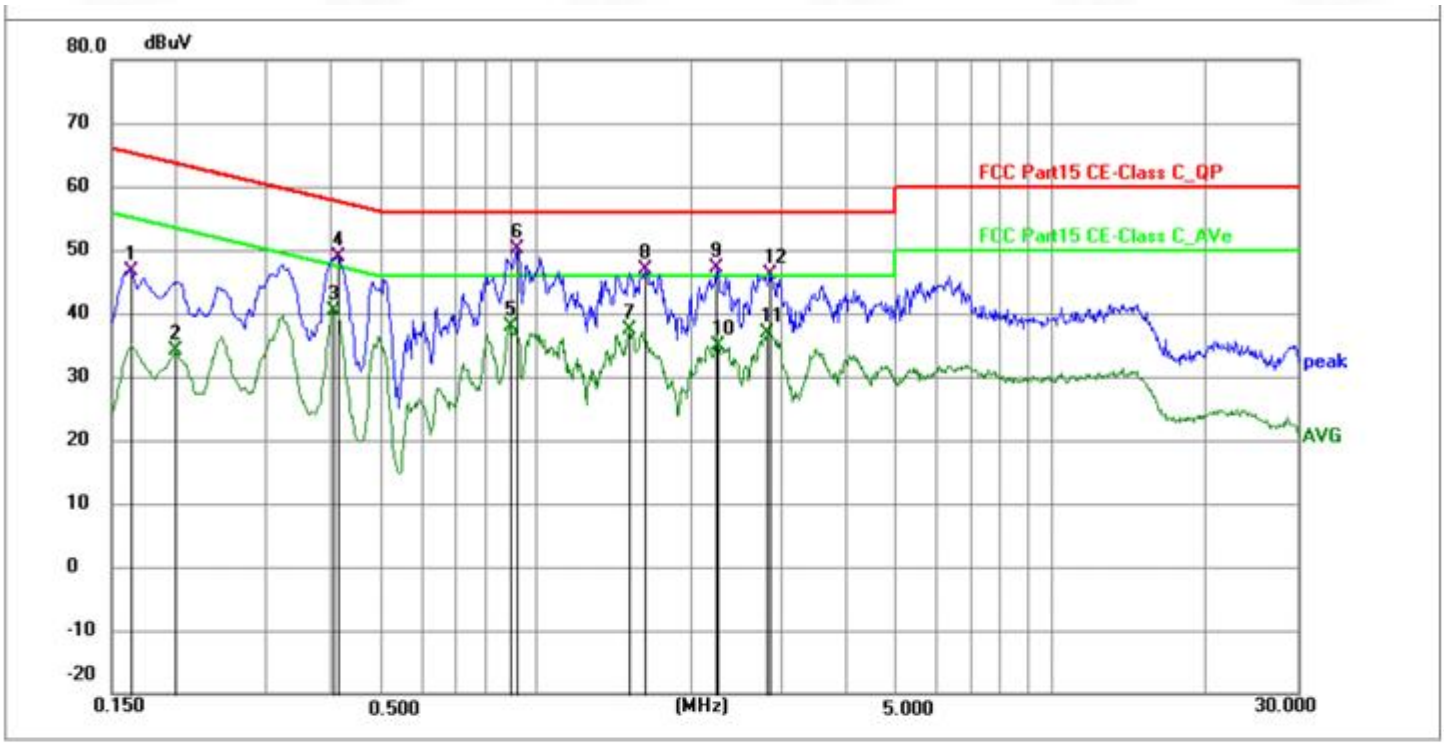
A.3 Conducted Emission

L:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1635	36.27	10.48	46.75	65.28	-18.53	QP	P	
2	0.1995	23.55	10.56	34.11	53.63	-19.52	AVG	P	
3	0.4020	29.77	10.57	40.34	47.81	-7.47	AVG	P	
4	0.4110	38.19	10.57	48.76	57.63	-8.87	QP	P	
5	0.8921	27.22	10.68	37.90	46.00	-8.10	AVG	P	
6 *	0.9193	39.35	10.67	50.02	56.00	-5.98	QP	P	
7	1.5135	26.76	10.66	37.42	46.00	-8.58	AVG	P	
8	1.6305	36.20	10.67	46.87	56.00	-9.13	QP	P	
9	2.2470	36.44	10.68	47.12	56.00	-8.88	QP	P	
10	2.2515	24.33	10.67	35.00	46.00	-11.00	AVG	P	
11	2.8050	26.26	10.68	36.94	46.00	-9.06	AVG	P	
12	2.8500	35.45	10.68	46.13	56.00	-9.87	QP	P	

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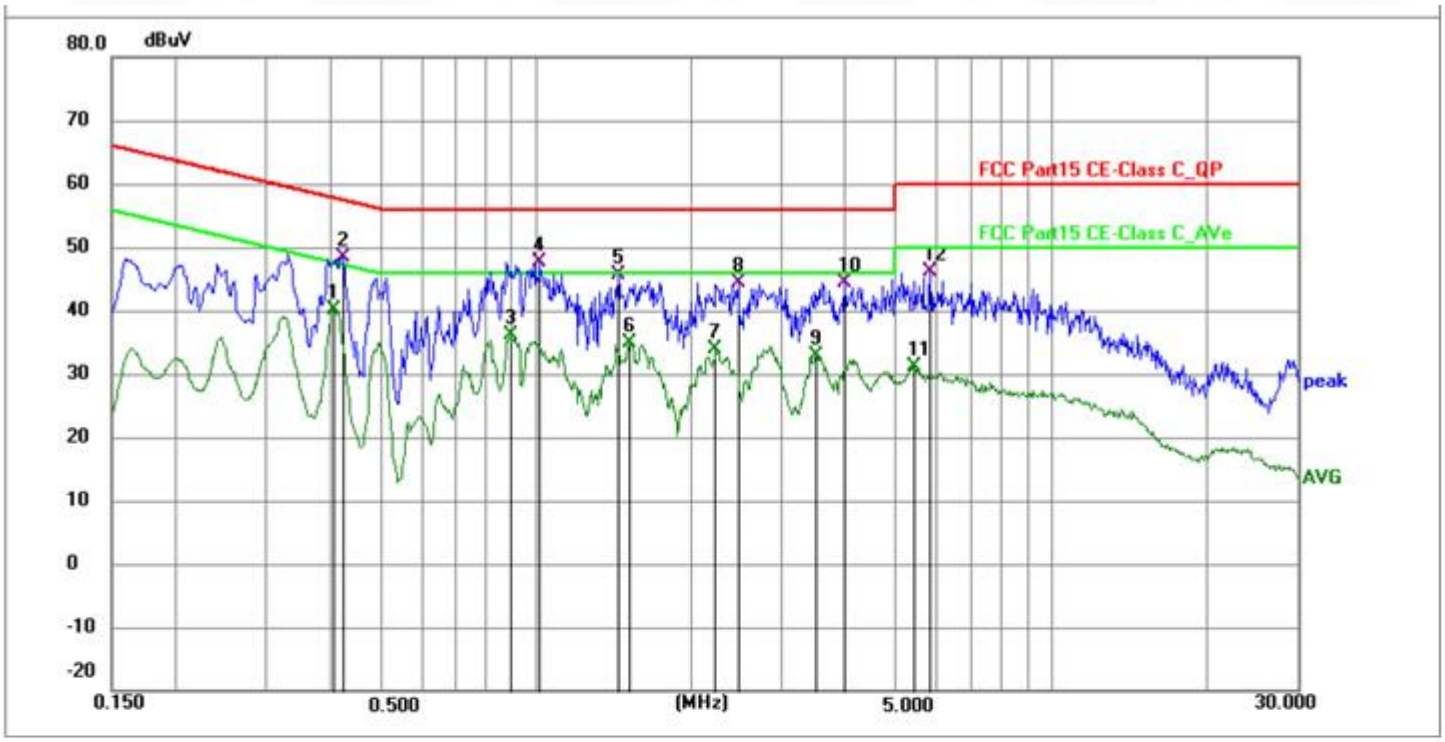
N:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1 *	0.4020	29.60	10.57	40.17	47.81	-7.64	AVG	P	
2	0.4200	37.81	10.57	48.38	57.45	-9.07	QP	P	
3	0.8921	25.56	10.68	36.24	46.00	-9.76	AVG	P	
4	1.0181	36.88	10.66	47.54	56.00	-8.46	QP	P	
5	1.4415	34.98	10.66	45.64	56.00	-10.36	QP	P	
6	1.5135	24.31	10.66	34.97	46.00	-11.03	AVG	P	
7	2.2290	23.14	10.68	33.82	46.00	-12.18	AVG	P	
8	2.4630	33.63	10.67	44.30	56.00	-11.70	QP	P	
9	3.5070	22.36	10.63	32.99	46.00	-13.01	AVG	P	
10	3.9840	33.67	10.68	44.35	56.00	-11.65	QP	P	
11	5.4240	20.29	10.75	31.04	50.00	-18.96	AVG	P	
12	5.8334	35.46	10.76	46.22	60.00	-13.78	QP	P	

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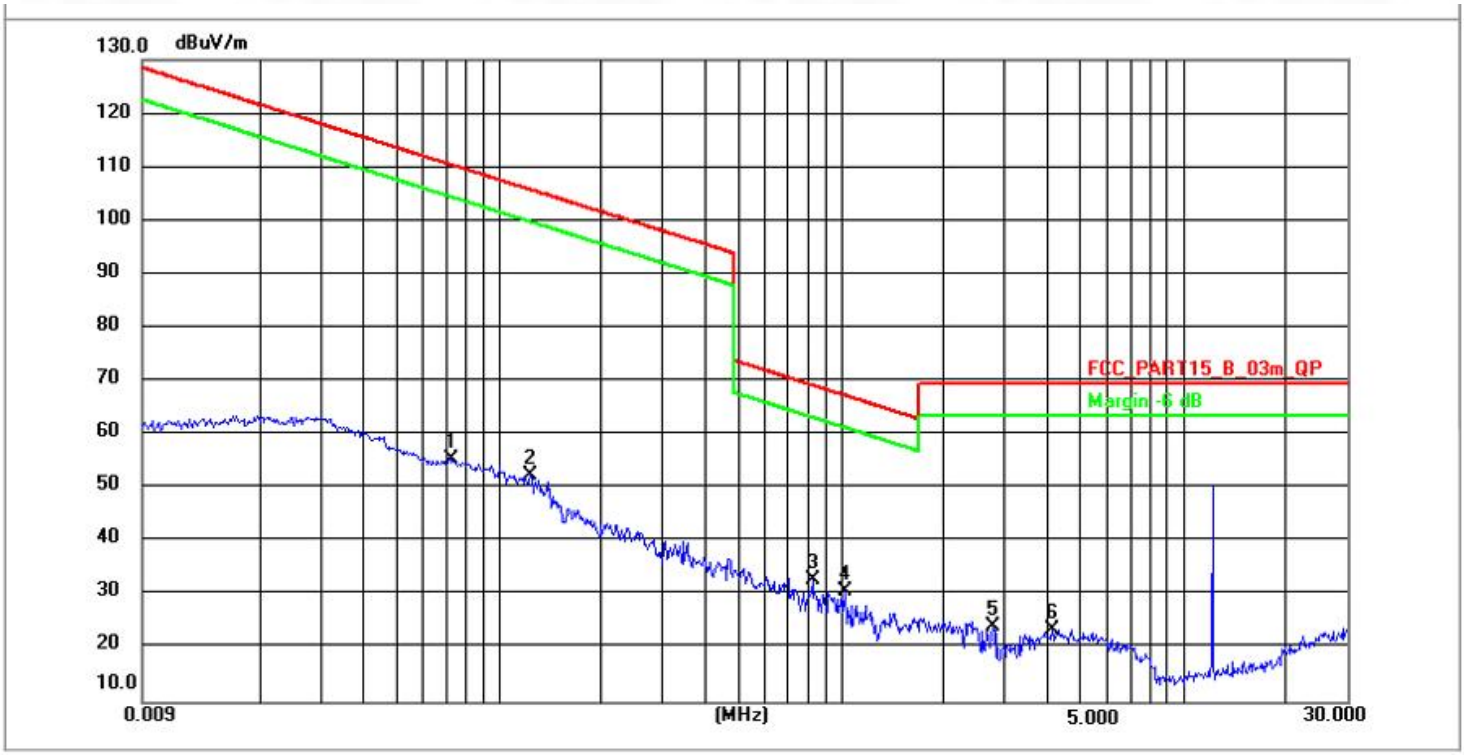
A.4 Radiated Spurious Emission

9KHz – 30MHz

Polarization: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	0.0723	85.82	-30.28	55.54	110.41	-54.87	peak	P
2	0.1226	82.83	-30.23	52.60	105.83	-53.23	peak	P
3 *	0.8217	61.36	-28.41	32.95	69.28	-36.33	peak	P
4	1.0187	58.68	-27.96	30.72	67.40	-36.68	peak	P
5	2.7630	48.65	-24.39	24.26	69.50	-45.24	peak	P
6	4.1283	45.21	-21.59	23.62	69.50	-45.88	peak	P

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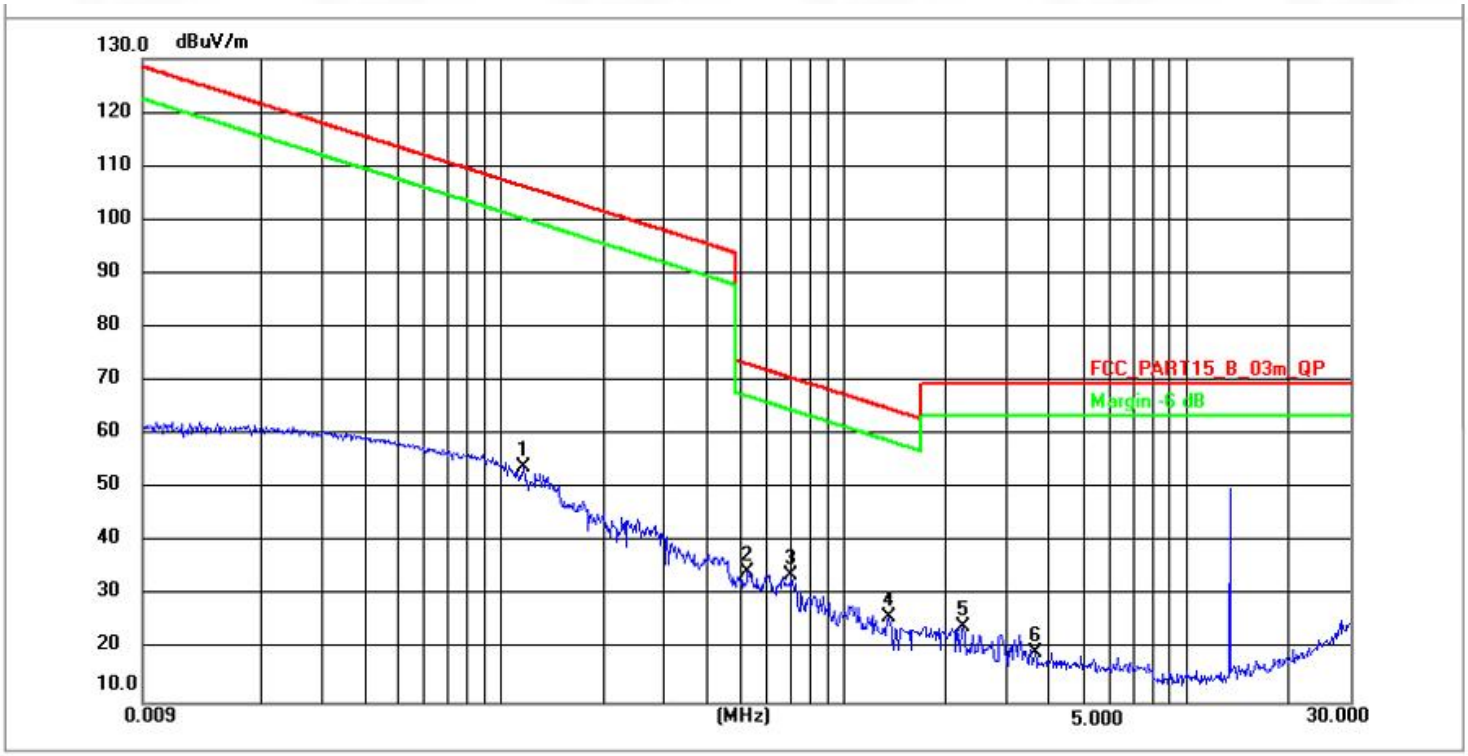
Polarization: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	0.1168	84.05	-30.24	53.81	106.25	-52.44	peak	P
2	0.5281	63.42	-29.07	34.35	73.15	-38.80	peak	P
3 *	0.7072	62.41	-28.66	33.75	70.59	-36.84	peak	P
4	1.3642	53.38	-27.26	26.12	64.85	-38.73	peak	P
5	2.2196	49.65	-25.50	24.15	69.50	-45.35	peak	P
6	3.6111	42.12	-22.65	19.47	69.50	-50.03	peak	P

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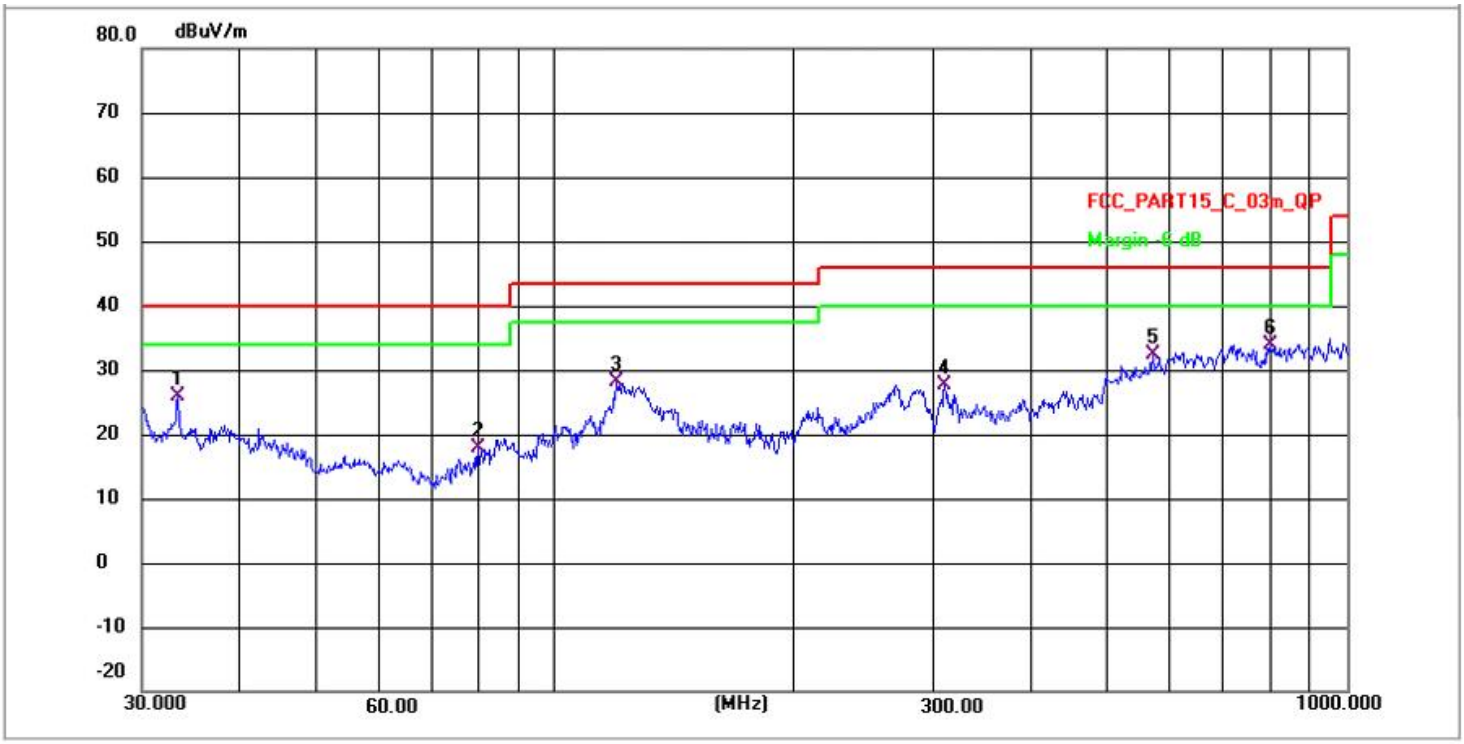
30MHz – 1GHz

Polarization: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	33.3278	35.65	-9.68	25.97	40.00	-14.03	QP	P
2	79.9402	27.13	-9.26	17.87	40.00	-22.13	QP	P
3	119.6456	50.30	-22.29	28.01	43.50	-15.49	QP	P
4	309.9977	48.22	-20.54	27.68	46.00	-18.32	QP	P
5	570.6100	50.86	-18.53	32.33	46.00	-13.67	QP	P
6 *	798.9796	51.80	-17.85	33.95	46.00	-12.05	QP	P

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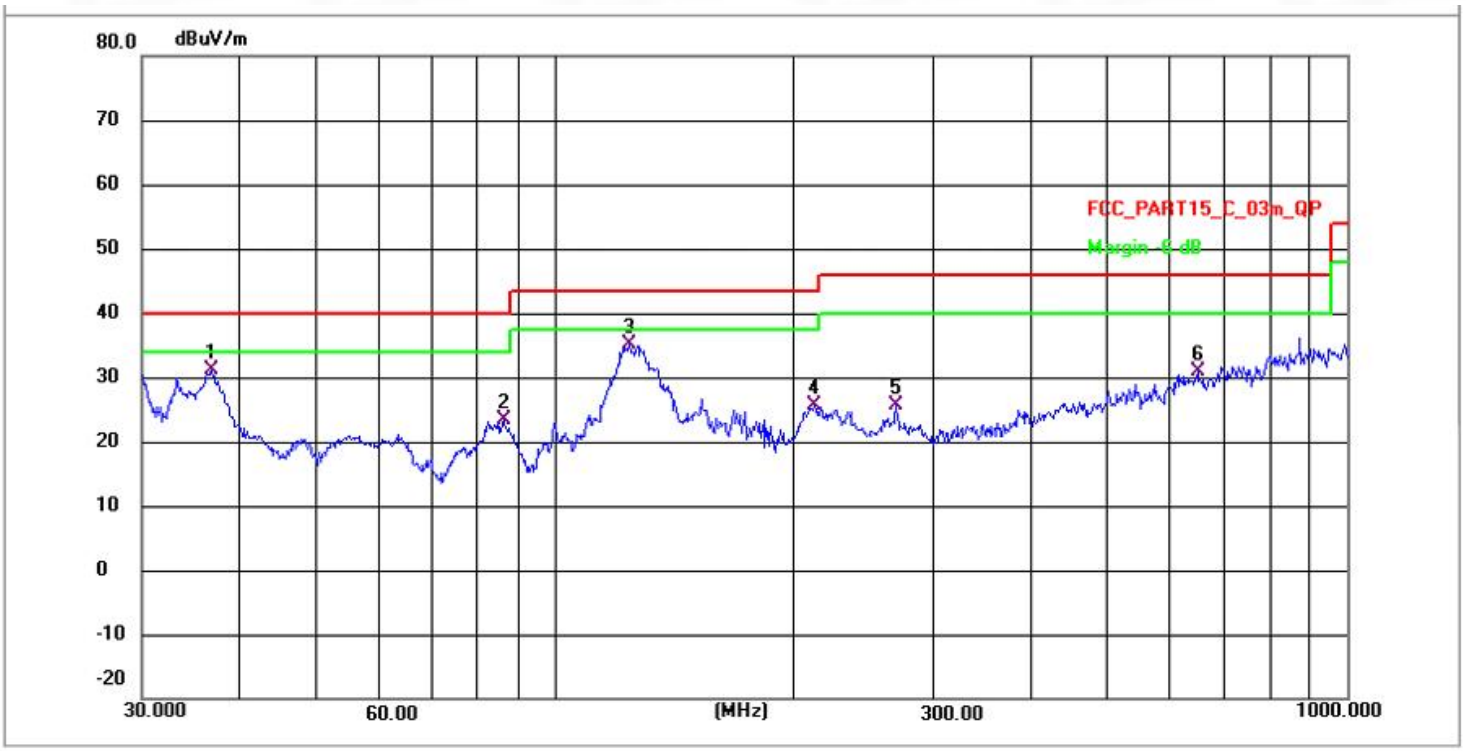
Polarization: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F
1	36.8305	40.69	-9.65	31.04	40.00	-8.96	QP	P
2	86.0490	46.05	-22.68	23.37	40.00	-16.63	QP	P
3 *	124.3508	57.45	-22.24	35.21	43.50	-8.29	QP	P
4	212.6420	47.15	-21.41	25.74	43.50	-17.76	QP	P
5	269.4282	46.45	-20.88	25.57	46.00	-20.43	QP	P
6	648.5216	48.82	-17.98	30.84	46.00	-15.16	QP	P

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A.5 Frequency Stability

Test Enviroment		Frequency Reading(MHz)	Frequency Error(%)	Limit	Result
Voltage	Temperature(℃)				
DC 3.87V	-20	13.56004	-0.00033	±0.01%	Pass
	-10	13.5601	-0.00077	±0.01%	Pass
	0	13.56019	-0.00143	±0.01%	Pass
	10	13.55995	0.00034	±0.01%	Pass
	20	13.5599	0.00071	±0.01%	Pass
	30	13.56004	-0.00033	±0.01%	Pass
	40	13.56013	-0.00099	±0.01%	Pass
	50	13.55997	0.00019	±0.01%	Pass
DC 4.26V	Normal	13.56044	-0.00328	±0.01%	Pass
DC 3.48V	Normal	13.56084	-0.00623	±0.01%	Pass

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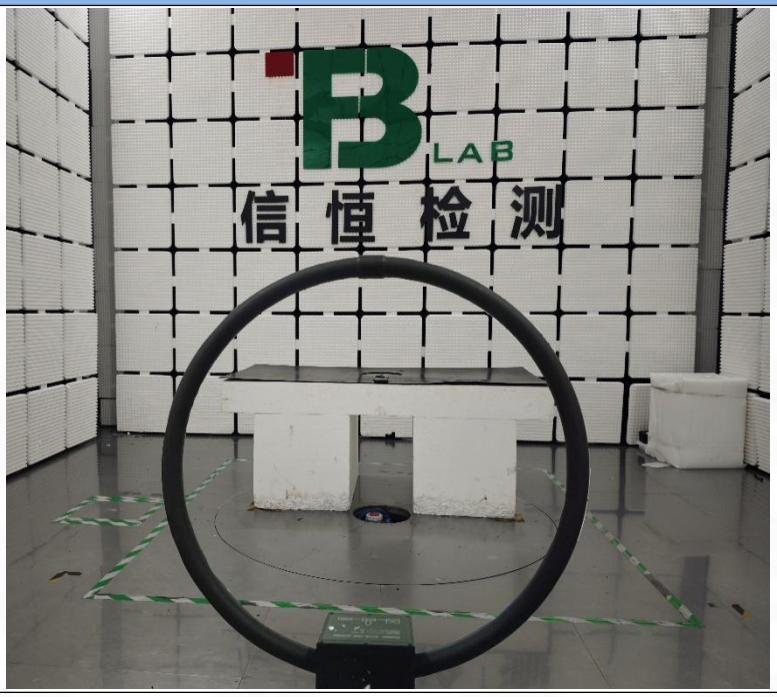
ANNEX B TEST SETUP PHOTOS

Emissions in restricted frequency bands (9kHz to 30MHz)


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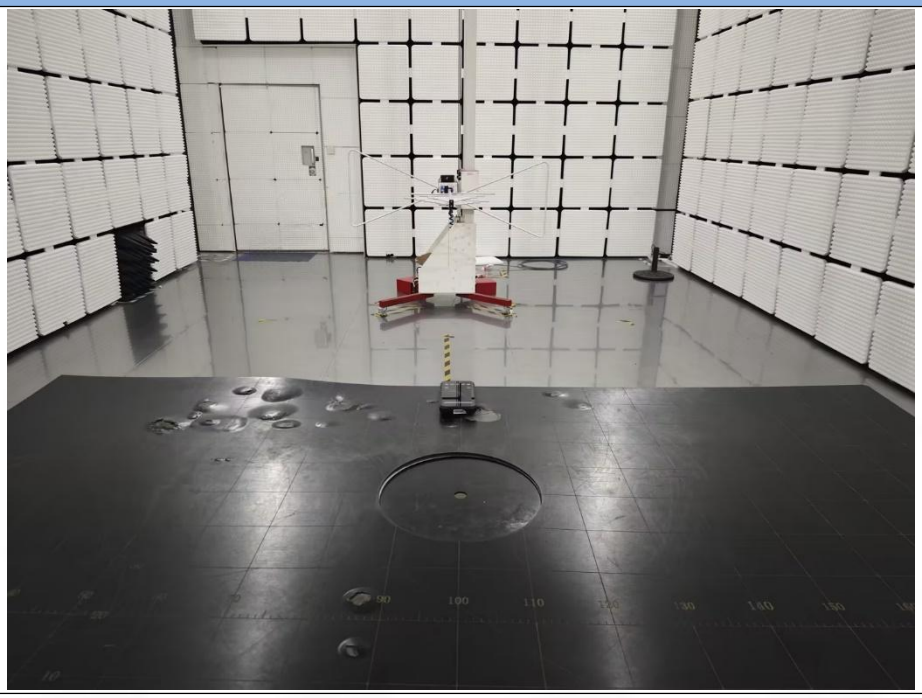
Emissions in restricted frequency bands (30MHz to 1GHz)


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--END OF REPORT--