

FCC PART 15C TEST REPORT FOR CERTIFICATION

On Behalf of

Sony Group Corporation

System Name: Sound Bar

Model No.: HT-SD40

Active Speaker System: SA-SD40

Active Subwoofer: SA-WSD40

EUT Name	EUT Model No.
Active Subwoofer	SA-WSD40

FCC ID: AK8SAWSD40

Prepared for : Sony Group Corporation

1-7-1 Konan Minato-ku Tokyo, 108-0075 Japan

Prepared By : Audix Technology (Shenzhen) Co., Ltd.

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**TESTING****NVLAP LAB CODE 200372-0**

Report Number : ACS-F21280

Date of Test : Sep.15 ~ Oct.19, 2021

Date of Report : Oct.21, 2021

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TEST REPORT

Applicant : Sony Group Corporation
Manufacturer : Sony Group Corporation
System Name : Sound Bar
Model No. : HT-SD40
Active Speaker System : SA-SD40
Active Subwoofer : SA-WSD40
FCC ID : AK8SAWSD40
(A) EUT Name : Active Subwoofer
(B) EUT Model No. : SA-WSD40
(C) Test Voltage : AC 120V/60Hz

Tested for comply with:

FCC CFR47 Part 15 Subpart C
Test procedure used: ANSI C63.10: 2013;
KDB 558074 D01v05r01

The device described above is tested by AUDIX TECHNOLOGY (SHENZHEN) CO., LTD. to confirm comply with all the FCC Part 15 Subpart C requirements. The test results are contained in this test report and AUDIX TECHNOLOGY (SHENZHEN) CO., LTD. is assumed full responsibility for the accuracy and completeness of these tests. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements. This report contains data that are not covered by the NVLAP accreditation.

This Report is made under FCC Part 2.1074. No modifications were required during testing to bring this product into compliance.

This report applies to single evaluation of one sample of above mentioned product. And shall not be reproduced in part without written approval of Audix Technology (Shenzhen) Co., Ltd..

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

Date of Test : Sep.15 ~ Oct.19, 2021 Report of date: Oct.21, 2021

Prepared by : Brave Zhang Reviewed by : Sunny Lu
Brave Zhang / Assistant Sunny Lu / Deputy Manager



Approved & Authorized Signer: David Jin

1. SUMMARY OF STANDARDS AND RESULTS

1.1. Description of Standards and Results

The EUT has been tested according to the applicable standards as referenced below.

EMISSION		
Description of Test Item	Standard	Results
Power Line Conducted Emission Test	FCC Part 15: 15.207 ANSI C63.10 :2013	PASS
Radiated Emission Test	FCC Part 15: 15.209 FCC Part 15: 15.205 FCC Part 15: 15.247(d) ANSI C63.10 : 2013	PASS
Conducted Spurious Emissions	FCC Part 15: 15.247(d) ANSI C63.10 : 2013	PASS
Carrier Frequency Separation Test	FCC Part 15: 15.247(a)(2) ANSI C63.10 : 2013	N/A
6dB & 99% Bandwidth Test	FCC Part 15: 15.247(b)(3) ANSI C63.10 : 2013	PASS
Maximum Peak Output Power Test	FCC Part 15: 15.247(d) ANSI C63.10 : 2013	PASS
Band Edge Compliance Test	FCC Part 15: 15.247(e) ANSI C63.10 : 2013	PASS
Power Spectral Density Test	FCC Part 15: 15.207 ANSI C63.10 :2013	PASS
Note: Measurement uncertainty affection to the result is considered, the EUT is technically compliant with standard requirements.		

2. GENERAL INFORMATION

2.1. Description of Equipment Under Test

Applicant	Sony Group Corporation
Applicant Address	1-7-1 Konan Minato-ku Tokyo, 108-0075 Japan
Manufacturer	Sony Group Corporation
Manufacturer Address	1-7-1 Konan Minato-ku Tokyo, 108-0075 Japan
System Name	Sound Bar
Model No.	HT-SD40
Active Speaker System	SA-SD40
Active Subwoofer	SA-WSD40
EUT Name	Active Subwoofer
EUT Model No.	SA-WSD40
FCC ID	AK8SAWSD40
Radio	General 2.4GHz wireless
Frequency Range	2404-2476MHz
Type of Modulation	GFSK
Channel Separation	2MHz
Remote Control	Manufacturer: Sony; Model: RMT-AH513U
Power Cable	Unshielded, Detachable, 1.5m (2 pins)
Optical Cable	Unshielded, Detachable, 1.5m
HDMI Cable	Shielded, Detachable, 1.5m (with two cores)
Hardware version	V1
Software version	R1.04
Sample Type	Prototype production
Date of Receipt	Sep.13,2021
Date of Test	Sep.15 ~ Oct.19, 2021
The Product covered in this report is Active Subwoofer; This product consists of Active Speaker System (SA-SD40) and Active Subwoofer (SA-WSD40).	

Antenna System	
Type of Antenna	PCB Antenna
Antenna Peak Gain	Sound Bar BT=2.1 dBi Subwoofer SRD=2.95 dBi Sound Bar SRD=4.23 dBi

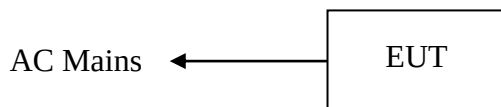
2.2. Channel list of EUT

Channel list	Frequency	Channel list	Frequency
1	2404MHz	20	2442MHz
2	2406MHz	21	2444MHz
3	2408MHz	22	2446MHz
4	2410MHz	23	2448MHz
5	2412MHz	24	2450MHz
6	2414MHz	25	2452MHz
7	2416MHz	26	2454MHz
8	2418MHz	27	2456MHz
9	2420MHz	28	2458MHz
10	2422MHz	29	2460MHz
11	2424MHz	30	2462MHz
12	2426MHz	31	2464MHz
13	2428MHz	32	2466MHz
14	2430MHz	33	2468MHz
15	2432MHz	34	2470MHz
16	2434MHz	35	2472MHz
17	2436MHz	36	2474MHz
18	2438MHz	37	2476MHz
19	2440MHz	--	--

2.3. Tested Supporting System Details

None

2.4. Block Diagram of connection between EUT and simulators



(EUT: Active Subwoofer)

2.5. Test information

A Special Test Software(Syncomm Debug Tool v21.03.24) was used to control EUT work in Continuous TX mode(GFSK modulation), and select test channel. This device do not support MIMO.

Tested mode, channel, and Power setting information			
Mode	Channel	Power setting	Frequency (MHz)
Tx Mode GFSK modulation	Low :CH 0	RF Power=0x0F RF iCurrent=0xF1	2404
	Middle: CH19		2440
	High: CH37		2476

Remark: The radiated emission, power line conducted emission and bandedge compliance tested use the sample with serial number 000062, the conductive test items use the sample with serial number 000017.

2.6. Test Facility

Site Description

Audix Technology (Shenzhen) Co., Ltd.

Name of Firm

: No. 6, Kefeng Road, Science & Technology Park,
Nanshan District , Shenzhen, Guangdong, China

EMC Lab.

Certificated by ISED, Canada
: Company Number: 5183A
CAB identifier: CN0034
Valid Date: Mar.31, 2022

Certificated by FCC, USA
: Designation No.: CN5022
Valid Date: Mar.31, 2022

Accredited by NVLAP, USA
: NVLAP Code: 200372-0
Valid Date: Mar.31, 2022

2.7. Measurement Uncertainty (95% confidence levels, k=2)

Test Item	Uncertainty
Uncertainty for Conduction emission test in No. 1 Conduction	2.6dB(150kHz to 30MHz)
Uncertainty for Radiation Emission test in 3m chamber	3.2dB(30~200MHz, Polarization: H)
	3.6dB(30~200MHz, Polarization: V)
	3.4dB(200M~1GHz, Polarization: H)
	3.4dB(200M~1GHz, Polarization: V)
Uncertainty for Radiation Emission test in 3m chamber (1GHz~18GHz)	5.0dB(1GHz~6GHz)
	5.2dB(6GHz~18GHz)
Uncertainty for Conduction Spurious emission test	2.0dB
Uncertainty for Output power test	0.8dB
Uncertainty for Bandwidth test	83kHz
Uncertainty for DC power test	1.0%
Uncertainty for test site temperature and humidity	0.6℃
	3%

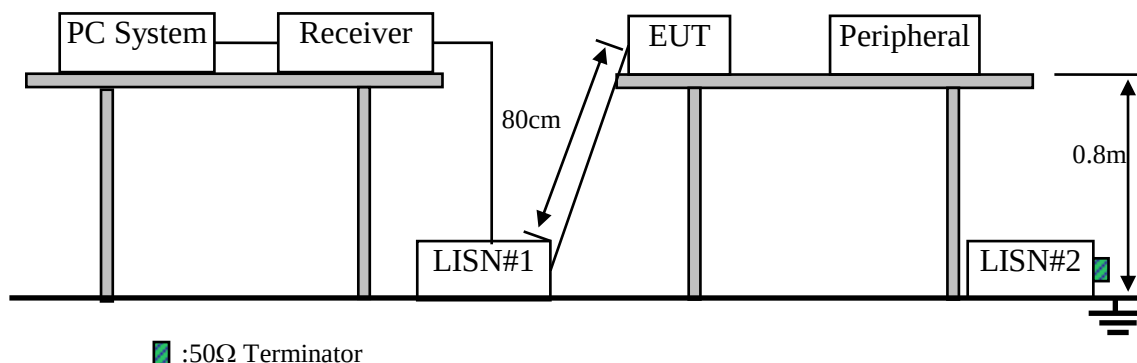
3. POWER LINE CONDUCTED EMISSION TEST

3.1. Test Equipments

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	1# Shielding Room	AUDIX	N/A	N/A	May.17,18	5 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESCI	100842	Apr.07,21	1 Year
3.	L.I.S.N.#1	Rohde & Schwarz	ENV216	102160	Oct.09,21	1 Year
4.	A.M.N	Kyoritsu	KNW-403D	8-1750-2	Apr.07,21	1 Year
5.	Terminator	Hubersuhner	50Ω	No.1	Apr.06,21	1 Year
6.	Terminator	Hubersuhner	50Ω	No.2	Apr.06,21	1 Year
7.	RF Cable	EMCI	EMCCFD300-BM-NM-2000	190422	Apr.08,21	1 Year
8.	Test Software	AUDIX	e3	6.100913a	N/A	N/A

Note: N/A means Not applicable.

3.2. Block Diagram of Test Setup



3.3. Power Line Conducted Emission Test Limits

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Notes: 1. * Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

3. Emission Level (dBμV) = Factor (L.I.S.N.) (dB) + Cable Loss (dB) + Reading (Receiver) (dBμV)

3.4.Configuration of EUT on Test

The following equipment are installed on Power Line Conducted Emission Test to meet the commission requirement and operating regulations in a manner which tends to maximize its emission characteristics in a normal application.

3.4.1.Sound Bar (EUT)

Model Number : HT-SD40

Serial Number : N/A

3.4.2.Support Equipment: As Tested Supporting System Details, in Section 2.2.

3.5.Operating Condition of EUT

3.5.1.Setup the EUT and simulator as shown as Section 3.2.

3.5.2.Turn on the power of all equipments.

3.5.3.PC run test software to control EUT work in Tx mode.

3.6.Test Procedure

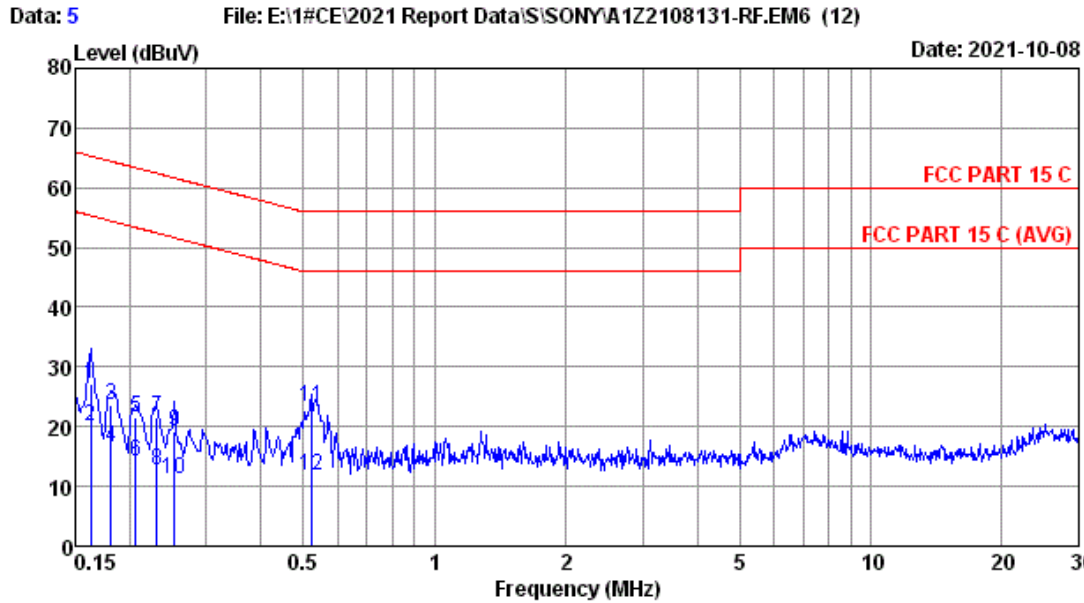
The EUT was placed on a non-metallic table, 80cm above the ground plane. The EUT Power Via AC unit connected to the power mains through a line impedance stabilization network (L.I.S.N. 1#). This provides a 50 ohm coupling impedance for the EUT (Please refer the block diagram of the test setup and photographs). The AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.10: 2013 on Conducted Emission Test.

The bandwidth of test receiver (R & S ESCI) is set at 9kHz.

The frequency range from 150kHz to 30MHz is checked.

3.7.Power Line Conducted Emission Test Results

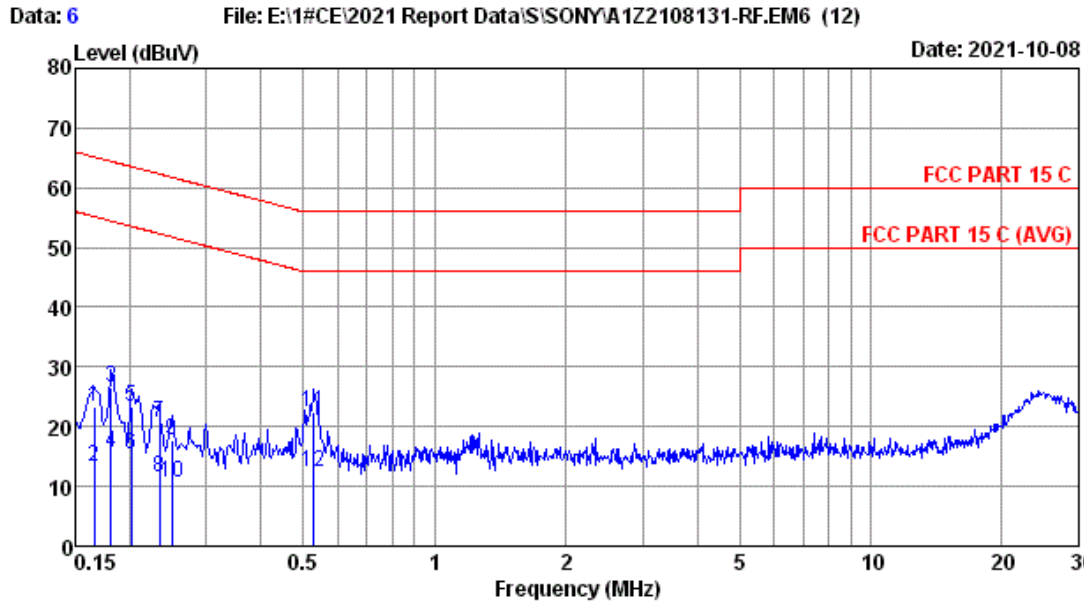
PASS. (All emissions not reported below are too low against the prescribed limits.)



Site no :1# Conduction Data No :5
 Dis./Lisn :2020 ENV216-L LISN phase:
 Limit :FCC PART 15 C
 Env./Ins. :24.7°C/56% Engineer :Evan
 Power Rating :AC 120V/60Hz
 Test Mode :Subwoofer:Generic 2.4G

No	Freq (MHz)	LISN Factor (dB)	Cable loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.162	9.70	0.01	17.45	27.16	65.34	38.18	QP
2	0.162	9.70	0.01	10.40	20.11	55.34	35.23	Average
3	0.182	9.70	0.01	13.90	23.61	64.42	40.81	QP
4	0.182	9.70	0.01	6.80	16.51	54.42	37.91	Average
5	0.206	9.70	0.01	11.80	21.51	63.36	41.85	QP
6	0.206	9.70	0.01	4.50	14.21	53.36	39.15	Average
7	0.230	9.70	0.01	11.70	21.41	62.44	41.03	QP
8	0.230	9.70	0.01	3.00	12.71	52.44	39.73	Average
9	0.253	9.70	0.01	9.40	19.11	61.64	42.53	QP
10	0.253	9.70	0.01	1.50	11.21	51.64	40.43	Average
11	0.521	9.70	0.01	13.60	23.31	56.00	32.69	QP
12	0.521	9.70	0.01	2.10	11.81	46.00	34.19	Average

Remarks: 1.Emission Level=LISN Factor+Cable Loss+Reading.
 2.If the average limit is met when using a quasi-peak detector.
 the EUT shall be deemed to meet both limits and measurement
 with average detector is unnecessary.



Site no :1# Conduction Data No :6
 Dis./Lisn :2020 ENV216-N LISN phase:
 Limit :FCC PART 15 C
 Env./Ins. :24.7°C/56% Engineer :Evan
 Power Rating :AC 120V/60Hz
 Test Mode :Subwoofer:Generic 2.4G

No	Freq (MHz)	LISN Factor (dB)	Cable loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.166	9.70	0.01	13.73	23.44	65.16	41.72	QP
2	0.166	9.70	0.01	3.70	13.41	55.16	41.75	Average
3	0.182	9.70	0.01	16.84	26.55	64.42	37.87	QP
4	0.182	9.70	0.01	5.80	15.51	54.42	38.91	Average
5	0.202	9.70	0.01	13.51	23.22	63.54	40.32	QP
6	0.202	9.70	0.01	5.51	15.22	53.54	38.32	Average
7	0.234	9.70	0.01	10.94	20.65	62.30	41.65	QP
8	0.234	9.70	0.01	1.90	11.61	52.30	40.69	Average
9	0.249	9.70	0.01	8.04	17.75	61.78	44.03	QP
10	0.249	9.70	0.01	1.04	10.75	51.78	41.03	Average
11	0.529	9.70	0.01	12.64	22.35	56.00	33.65	QP
12	0.529	9.70	0.01	2.64	12.35	46.00	33.65	Average

Remarks: 1.Emission Level=LISN Factor+Cable Loss+Reading.
 2.If the average limit is met when using a quasi-peak detector.
 the EUT shall be deemed to meet both limits and measurement
 with average detector is unnecessary.

4. RADIATED EMISSION MEASUREMENT

4.1. Test Equipment

Frequency range: 30~1000MHz

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	3#Chamber(NSA)	AUDIX	N/A	N/A	May.02,21	1 Year
2.	3#Chamber(SE)	AUDIX	N/A	N/A	May.17,18	5 Year
3.	Signal Analyzer	Rohde & Schwarz	FSV30	104050	Apr.07,21	1 Year
4.	EMI Test Receiver	Rohde & Schwarz	ESR7	101547	Apr.07,21	1 Year
5.	Amplifier	HP	8447D	2944A11159	Apr.07,21	1 Year
6.	Bi log Antenna	TESEQ	CBL6112D	25237	Dec.22,20	1 Year
7.	NSA Cable	HUBER+SUHNER	CFD400NL-LW	No.3	Oct.09,21	1 Year
8.	Coaxial Switch	Anritsu	MP59B	6201397223	Apr.07,21	1 Year
9.	Test Software	AUDIX	e3	6.100913a	N/A	N/A

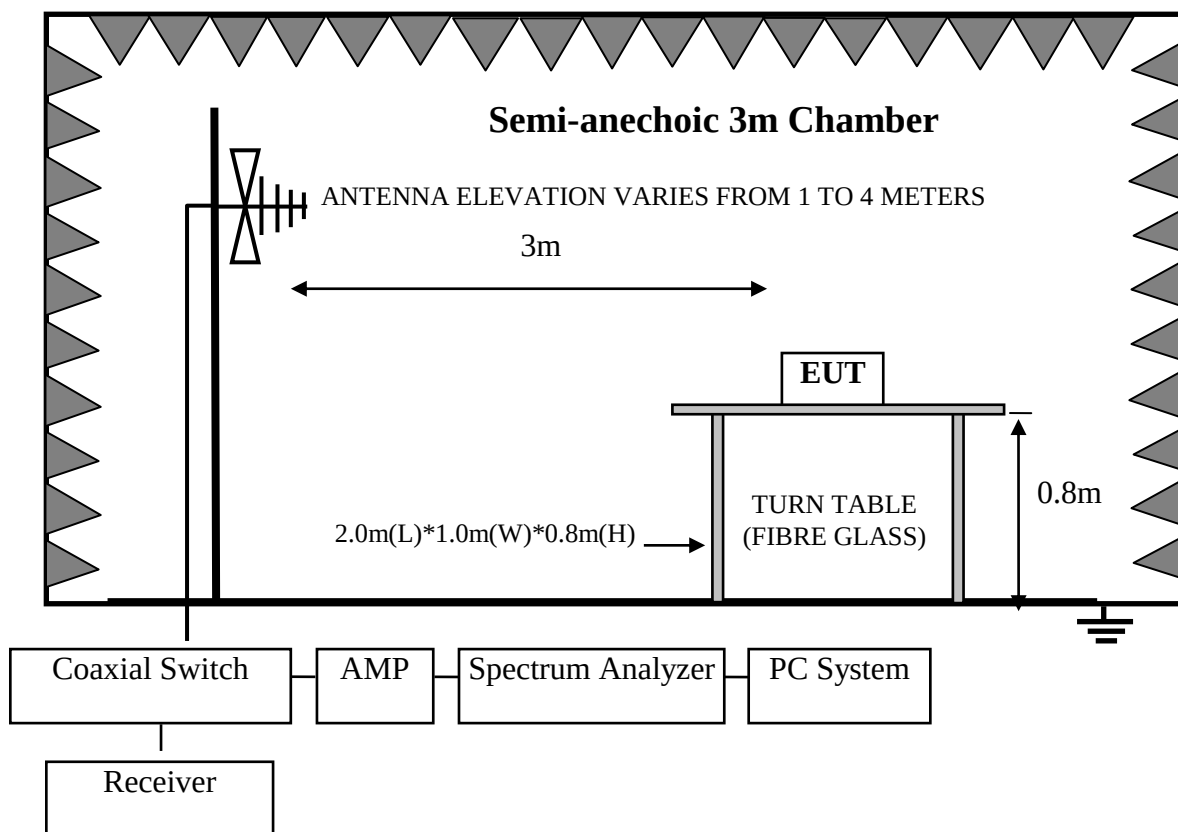
Note: N/A means Not applicable.

Frequency range: above 1000MHz

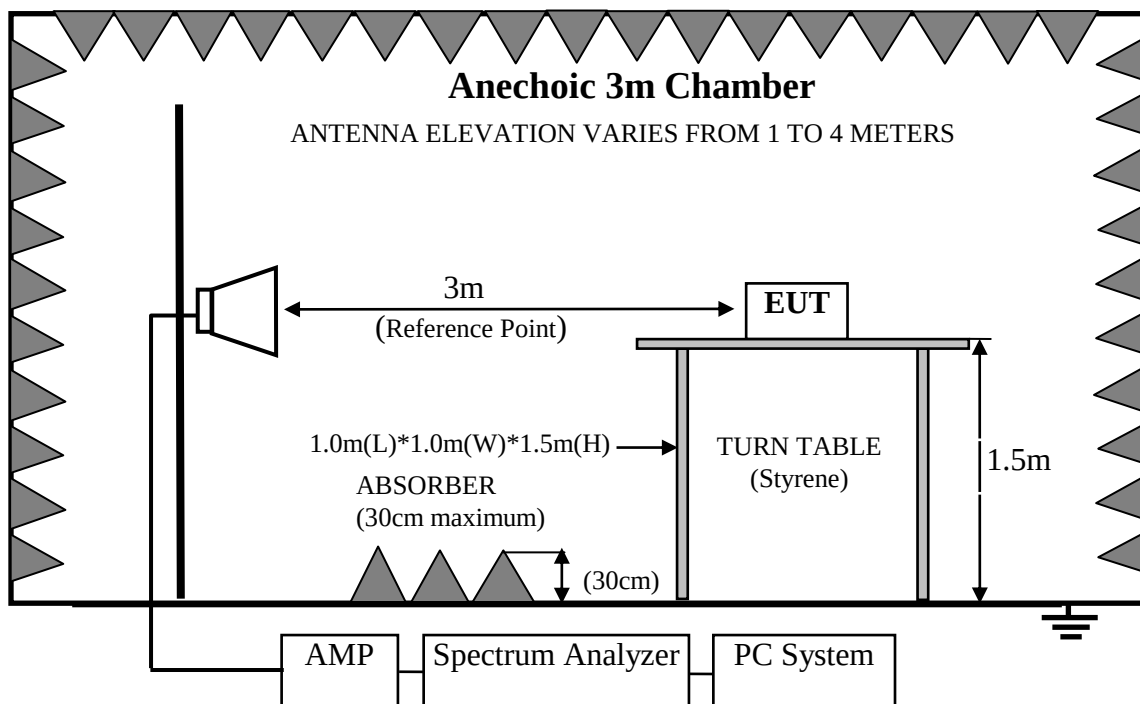
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	3#Chamber(Svswr)	AUDIX	N/A	N/A	Apr.14,21	1 Year
2.	3#Chamber(SE)	AUDIX	N/A	N/A	May.17,18	5 Year
3.	Signal Analyzer	Rohde & Schwarz	FSV30	104050	Apr.07,21	1 Year
4.	Horn Antenna	ETC	MCTD 1209	DRH15F03006	Jul.26,21	1 Year
5.	Amplifier	Agilent	83017A	MY53270084	Oct.11,20	1 Year
6.	Amplifier	Agilent	83017A	MY53270084	Oct.09,21	1 Year
7.	RF Cable	Hubersuhner	SUCOFLEX-106	505238/6	Apr.07,21	1 Year
8.	Test Software	AUDIX	e3	6.100913a	N/A	N/A

Note: N/A means Not applicable.

4.2. Block Diagram of Test Setup For frequency range 30MHz-1000MHz



For frequency range 1GHz-25GHz



4.3. Radiated Emission Limit Standard:

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		$\mu\text{V/m}$	$\text{dB}(\mu\text{V})/\text{m}$
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000MHz	3	74.0 $\text{dB}(\mu\text{V})/\text{m}$ (Peak) 54.0 $\text{dB}(\mu\text{V})/\text{m}$ (Average)	

Remark : (1) Emission level $\text{dB}\mu\text{V} = 20 \log$ Emission level $\mu\text{V/m}$

(2) Emission Level ($\text{dB}\mu\text{V/m}$) = Reading (Receiver) ($\text{dB}\mu\text{V}$) + Antenna Factor (dB/m) + Cable Loss (dB)

Emission Level ($\text{dB}\mu\text{V/m}$) = Reading (Spectrum) ($\text{dB}\mu\text{V}$) + Antenna Factor (dB/m) – Amp Factor (dB) + Cable Loss (dB)(above 1000MHz)

(3) The smaller limit shall apply at the cross point between two frequency bands.

(4) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

(5) The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

4.4. EUT Configuration on Test

The following equipment are installed on Radiated Emission Test to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

4.4.1. Sound Bar (EUT)

Model Number : HT-SD40

Serial Number : N/A

4.5. Operating Condition of EUT

4.5.1. Setup the EUT and simulator as shown as Section 4.2.

4.5.2. Turn on the power of all equipments.

4.5.3. Let EUT work in Tx mode.

4.6. Test Procedure

Frequency below 30MHz:

The EUT setup on the turn table which has 0.8 m height to the ground. The turn table rotated 360 degrees and antenna fixed to 1 m to find the maximum emission level. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10-2013 regulation.

EUT and its simulators are placed on a turn table, which is 0.8 meter high above ground for frequency 30MHz~1000MHz, 1.5 meter high above ground for frequency above 1GHz and put the absorbing with 2.4m(L)*2.4m(W)*0.3m(H) on the ground . The turn table can rotate 360 degrees to determine the position of the maximum emission level. Power on the EUT and let it working in test mode, then test it. EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna for frequency 30MHz~1000MHz, and the Horn antenna is used as receiving antenna for frequency above 1GHz. Both horizontal and vertical polarization of the

antenna is set on Test. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.10-2013 on radiated emission Test.

This test was performed with EUT in X, Y, Z position, and the worse case was found when EUT in X position as the test photo indicated.

The bandwidth of the EMI test receiver (R&S ESR7) is set at 120kHz for frequency range from 30MHz to 1000 MHz.

The bandwidth of the Spectrum's RBW is set at 1MHz and VBW is set at 3MHz for peak emissions measurement above 1GHz.

The frequency range from 30MHz to 10th harmonic (25GHz) are checked. and no any emissions were found from 18GHz to 25 GHz, So the radiated emissions from 18GHz to 25GHz were not record.

4.7. Radiated Emission Test Results

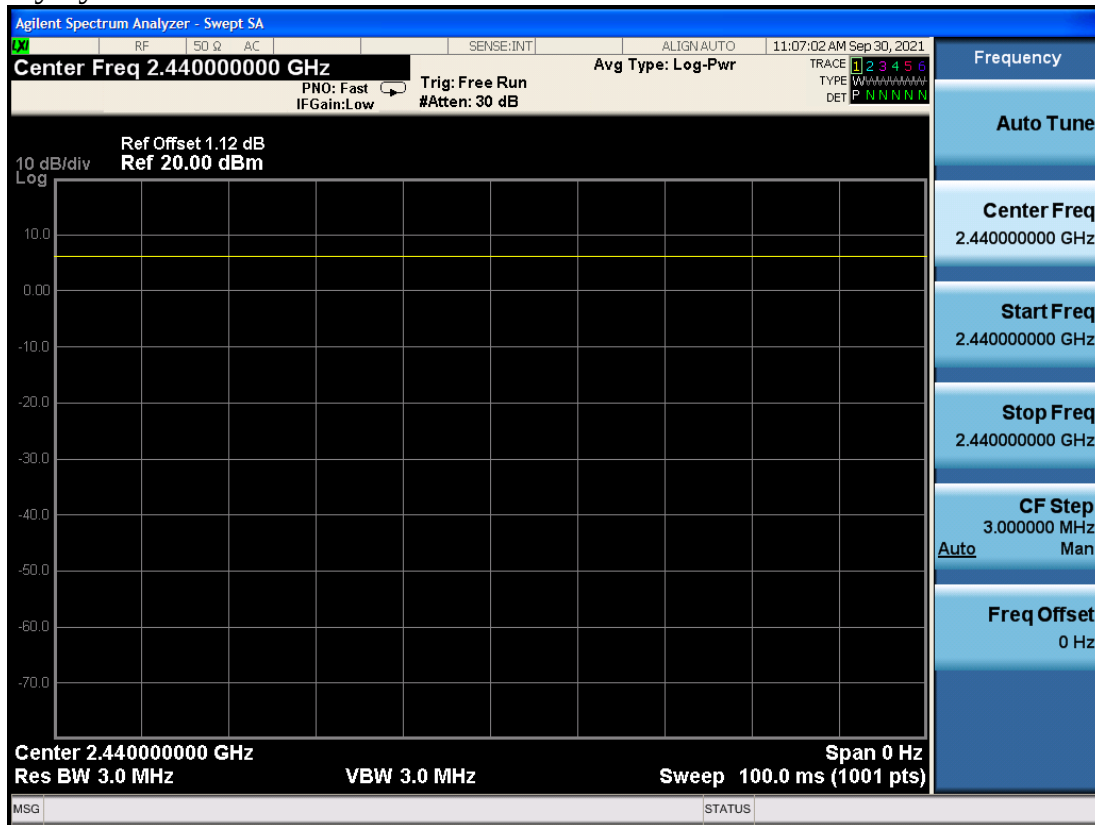
PASS.

All the emissions from 30MHz to 25GHz were comply with the 15.209 Limit.

Note 1: For emissions above 1GHz, if peak level comply with average limit, then the average level is deemed to comply with average limit.

Note 2: The emissions (9kHz~30MHz) not reported for there is no emission be found.

Duty cycle



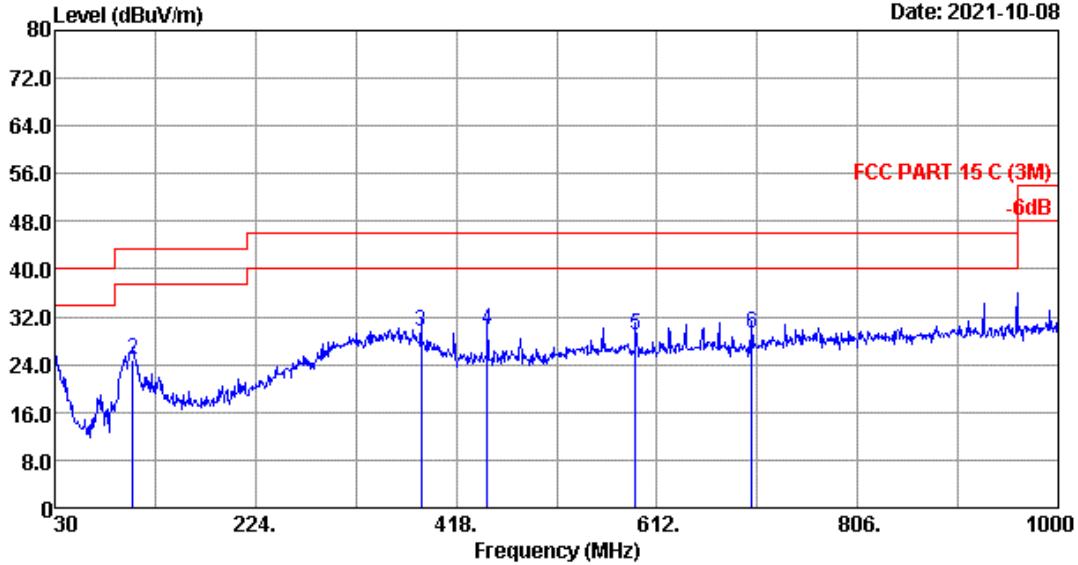
Note: The duty cycle of the test signal is 100%.

Frequency: 30MHz~1GHz

Data: 5

File: E:\2021 Report Data\SONYA1Z2108131-RF.EM6 (12)

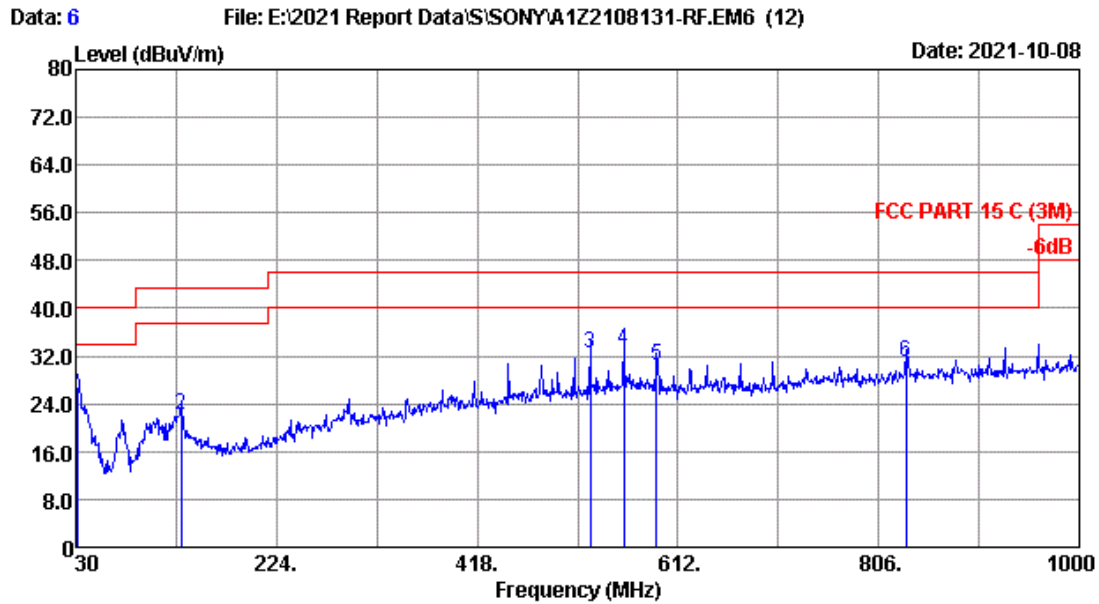
Date: 2021-10-08



Site no. : 3m Chamber Data no. : 5
 Dis. / Ant. : 3m 2020 CBL6112D-25237 Ant. pol. : HORIZONTAL
 Limit : FCC PART 15 C (3M)
 Env. / Ins. : 23.5°C/52% Engineer : Jack
 Power rating : AC 120V/60Hz
 Test Mode : Subwoofer: Generic 2.4G

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	30.000	24.80	0.63	-1.04	24.39	40.00	15.61	QP
2	105.660	17.54	1.05	6.20	24.79	43.50	18.71	QP
3	384.050	21.02	1.98	6.60	29.60	46.00	16.40	QP
4	448.070	22.55	2.18	4.98	29.71	46.00	16.29	QP
5	591.630	24.29	2.55	2.22	29.06	46.00	16.94	QP
6	704.150	24.78	2.81	1.73	29.32	46.00	16.68	QP

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Site no.	: 3m Chamber	Data no.	: 6
Dis. / Ant.	: 3m 2020 CBL6112D-25237	Ant. pol.	: VERTICAL
Limit	: FCC PART 15 C (3M)		
Env. / Ins.	: 23.5°C/52%	Engineer	: Jack
Power rating	: AC 120V/60Hz		
Test Mode	: Subwoofer: Generic 2.4G		

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Emission		Limits (dBuV/m)	Margin (dB)	Remark
				Reading (dBuV)	Level (dBuV/m)			
1	30.970	24.26	0.64	1.97	26.87	40.00	13.13	QP
2	131.850	17.76	1.15	3.19	22.10	43.50	21.40	QP
3	527.610	23.98	2.40	6.19	32.57	46.00	13.43	QP
4	559.620	24.60	2.48	5.89	32.97	46.00	13.03	QP
5	591.630	24.29	2.55	3.70	30.54	46.00	15.46	QP
6	832.190	25.89	3.19	2.03	31.11	46.00	14.89	QP

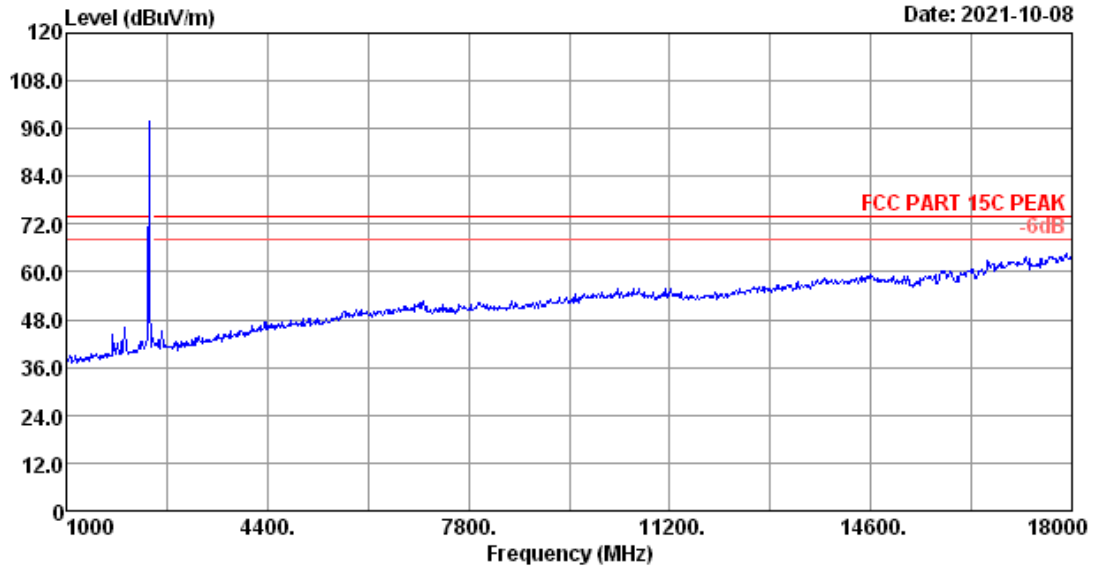
Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

Frequency: 1GHz~18GHz

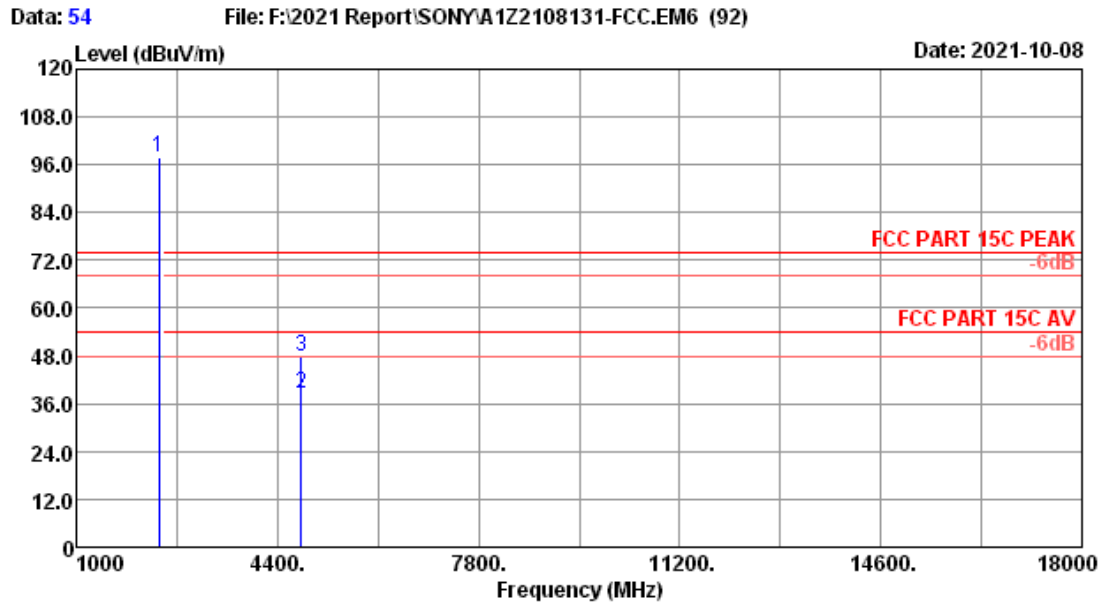
Data: 53

File: F:\2021 Report\SONYA1Z2108131-FCC.EM6 (92)

Date: 2021-10-08



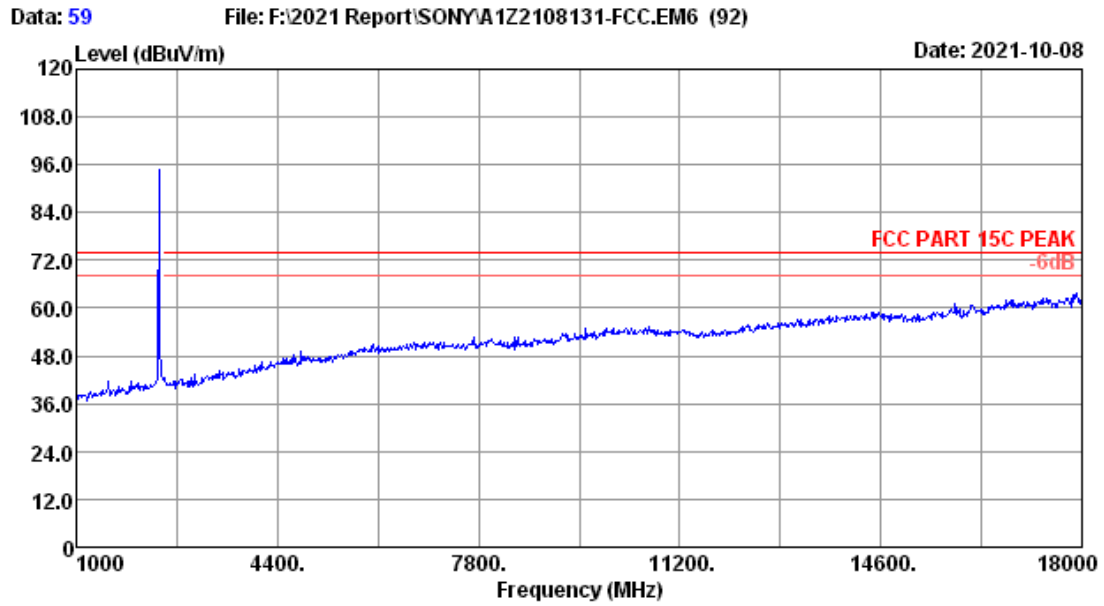
Site no.	: 3m Chamber	Data no.	: 53
Dis. / Ant.	: 3m 2021 MCTD1209-3006	Ant. pol.	: VERTICAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 23.8°C/53.5%	Engineer	: Winter
Power rating	: AC 120V/60Hz		
Test Mode	: Subwoofer: SRD 2404MHz ANT A Tx		



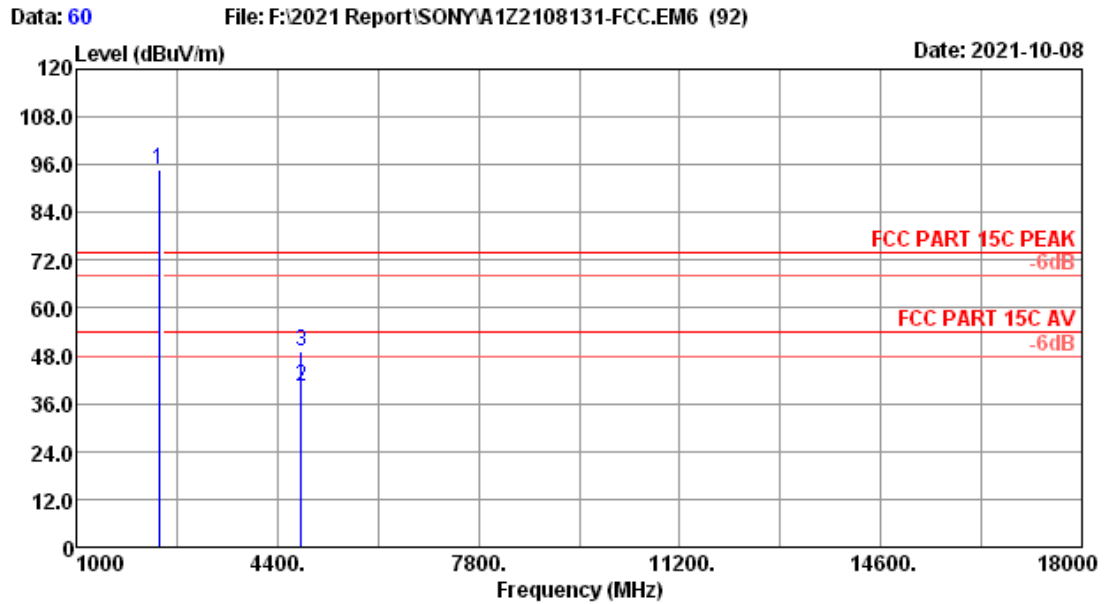
Site no. : 3m Chamber Data no. : 54
 Dis. / Ant. : 3m 2021 MCTD1209-3006 Ant. pol. : VERTICAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : 23.8°C/53.5% Engineer : Winter
 Power rating : AC 120V/60Hz
 Test Mode : Subwoofer: SRD 2404MHz ANT A Tx

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2404.00	27.93	1.66	103.37	35.24	97.72	-----	-----	Peak
2	4808.00	32.69	2.66	37.48	34.46	38.37	54.00	15.63	Average
3	4808.00	32.69	2.66	46.74	34.46	47.63	74.00	26.37	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 -Amp factor.
 2. The emission levels that are 20dB below the official
 limit are not reported.



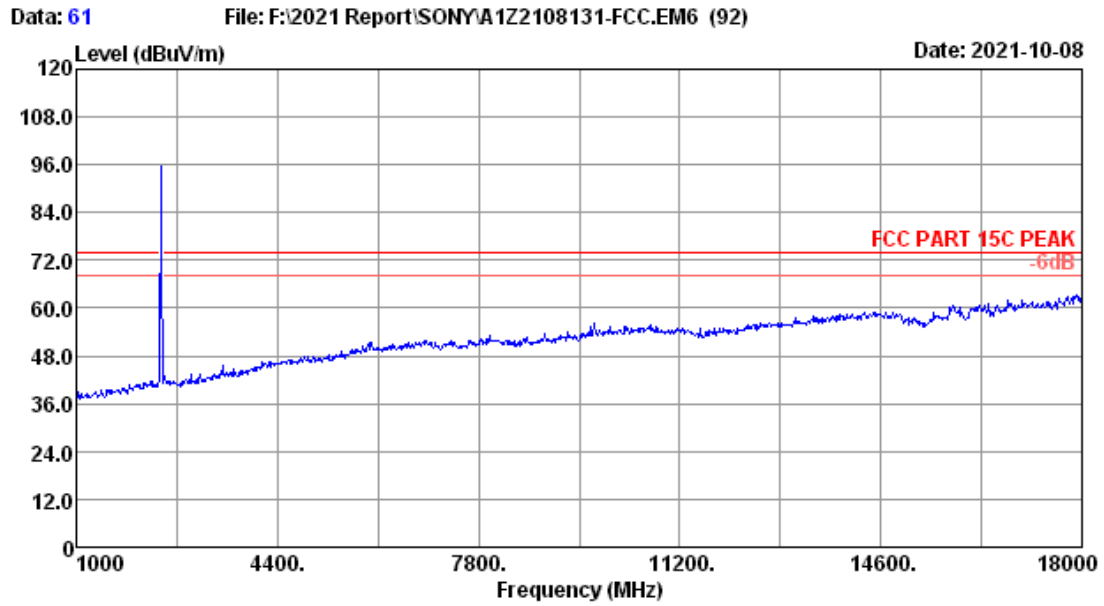
Site no.	: 3m Chamber	Data no.	: 59
Dis. / Ant.	: 3m 2021 MCTD1209-3006	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 23.8°C/53.5%	Engineer	: Winter
Power rating	: AC 120V/60Hz		
Test Mode	: Subwoofer: SRD 2404MHz ANT A Tx		



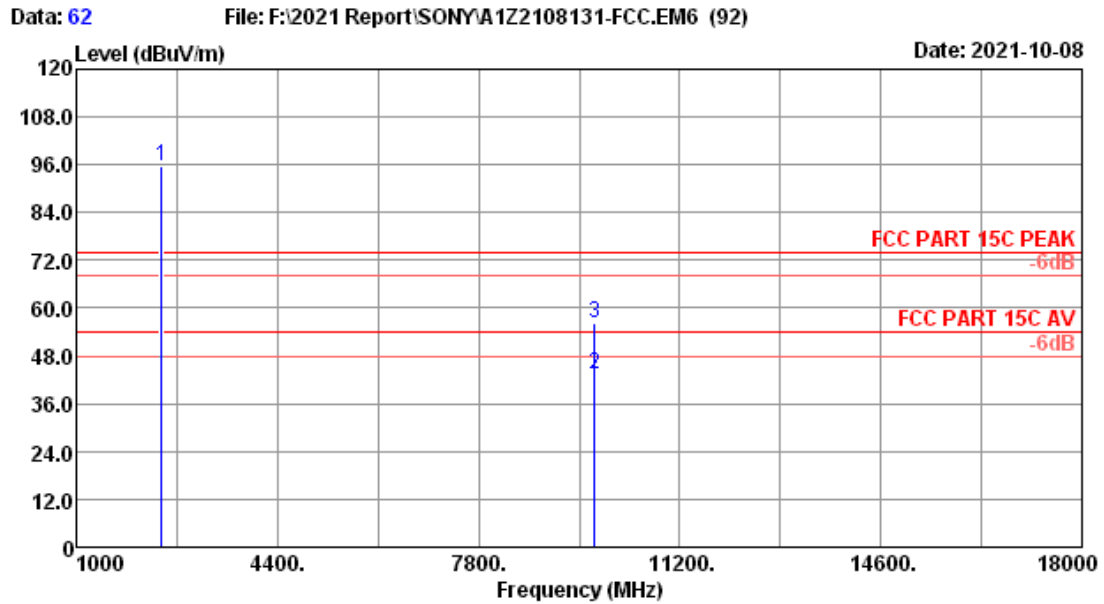
Site no. : 3m Chamber Data no. : 60
 Dis. / Ant. : 3m 2021 MCTD1209-3006 Ant. pol. : HORIZONTAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : 23.8°C/53.5% Engineer : Winter
 Power rating : AC 120V/60Hz
 Test Mode : Subwoofer: SRD 2404MHz ANT A Tx

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2404.00	27.93	1.66	100.44	35.24	94.79	-----	-----	Peak
2	4808.00	32.69	2.66	39.47	34.46	40.36	54.00	13.64	Average
3	4808.00	32.69	2.66	48.13	34.46	49.02	74.00	24.98	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 -Amp factor.
 2. The emission levels that are 20dB below the official
 limit are not reported.



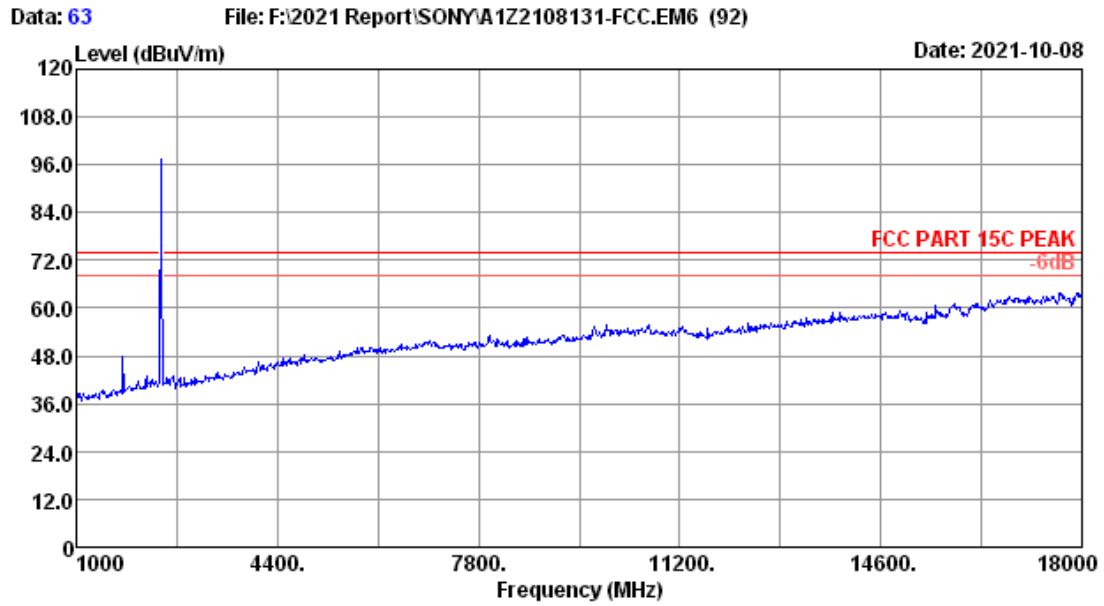
Site no.	: 3m Chamber	Data no.	: 61
Dis. / Ant.	: 3m 2021 MCTD1209-3006	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 23.8°C/53.5%	Engineer	: Winter
Power rating	: AC 120V/60Hz		
Test Mode	: Subwoofer: SRD 2440MHz ANT A Tx		



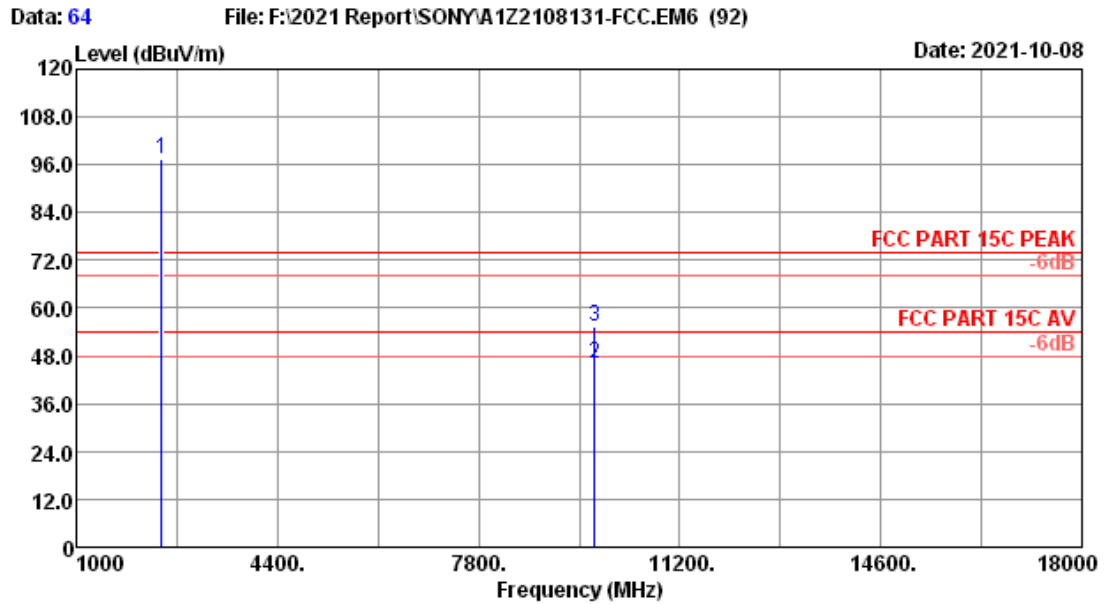
Site no. : 3m Chamber Data no. : 62
 Dis. / Ant. : 3m 2021 MCTD1209-3006 Ant. pol. : HORIZONTAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : 23.8°C/53.5% Engineer : Winter
 Power rating : AC 120V/60Hz
 Test Mode : Subwoofer: SRD 2440MHz ANT A Tx

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2440.00	28.00	1.68	101.06	35.24	95.50	-----	-----	Peak
2	9760.00	37.56	3.94	36.28	34.53	43.25	54.00	10.75	Average
3	9760.00	37.56	3.94	49.22	34.53	56.19	74.00	17.81	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 -Amp factor.
 2. The emission levels that are 20dB below the official
 limit are not reported.



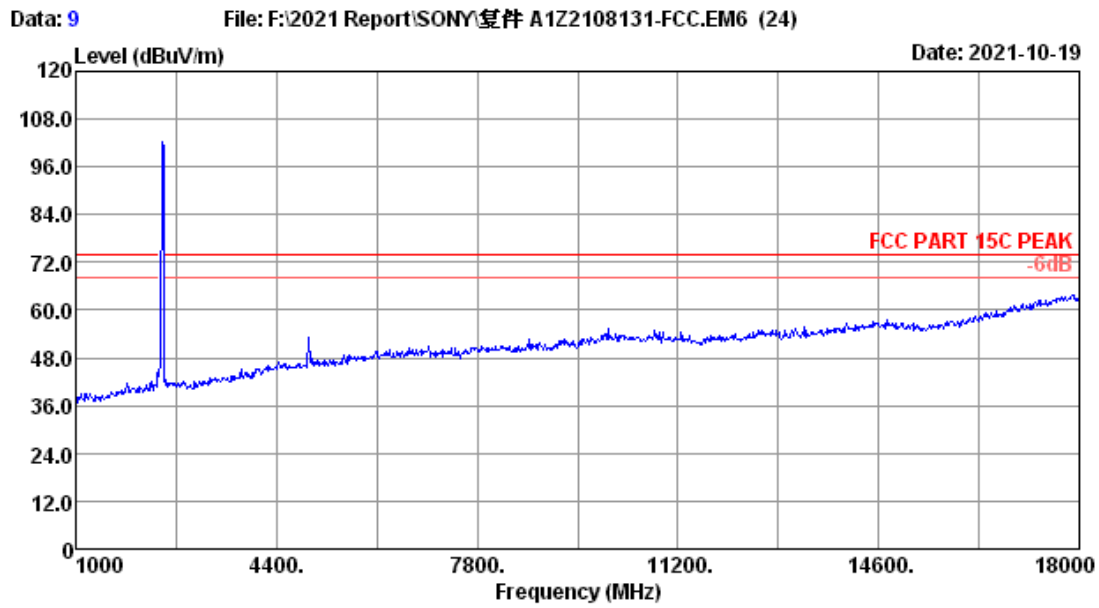
Site no.	: 3m Chamber	Data no.	: 63
Dis. / Ant.	: 3m 2021 MCTD1209-3006	Ant. pol.	: VERTICAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 23.8°C/53.5%	Engineer	: Winter
Power rating	: AC 120V/60Hz		
Test Mode	: Subwoofer: SRD 2440MHz ANT A Tx		



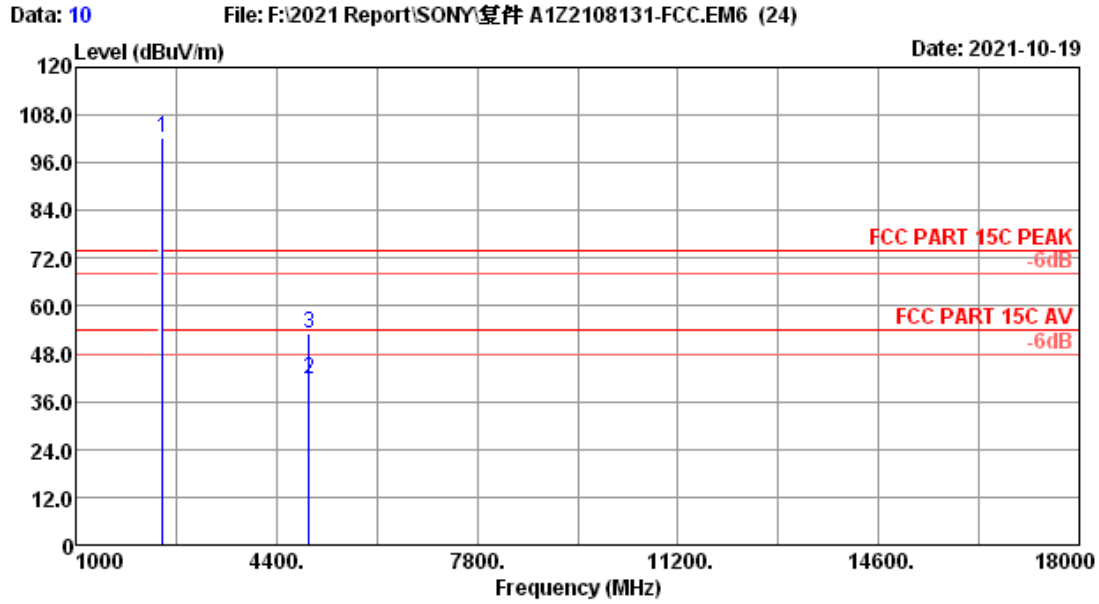
Site no. : 3m Chamber Data no. : 64
 Dis. / Ant. : 3m 2021 MCTD1209-3006 Ant. pol. : VERTICAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : 23.8°C/53.5% Engineer : Winter
 Power rating : AC 120V/60Hz
 Test Mode : Subwoofer: SRD 2440MHz ANT A Tx

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2440.00	28.00	1.68	103.07	35.24	97.51	-----	-----	Peak
2	9760.00	37.56	3.94	39.15	34.53	46.12	54.00	7.88	Average
3	9760.00	37.56	3.94	48.24	34.53	55.21	74.00	18.79	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 -Amp factor.
 2. The emission levels that are 20dB below the official
 limit are not reported.



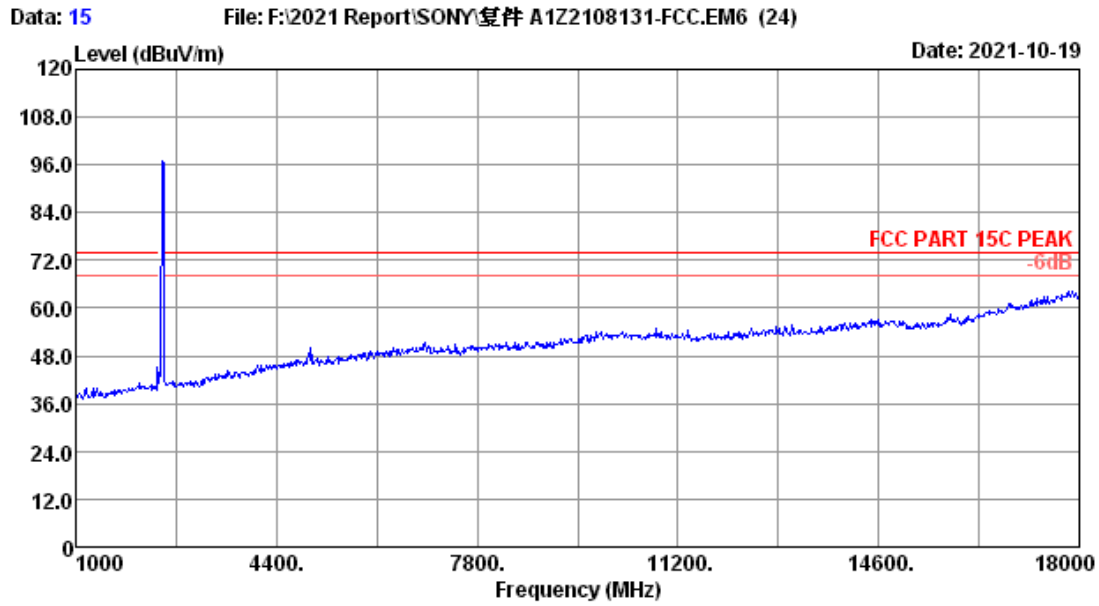
Site no.	: 3m Chamber	Data no.	: 9
Dis. / Ant.	: 3m 2021 MCTD1209-3006	Ant. pol.	: VERTICAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 23.8°C/53.5%	Engineer	: Winter
Test Mode	: Subwoofer: SRD 2476MHz ANT & Tx		



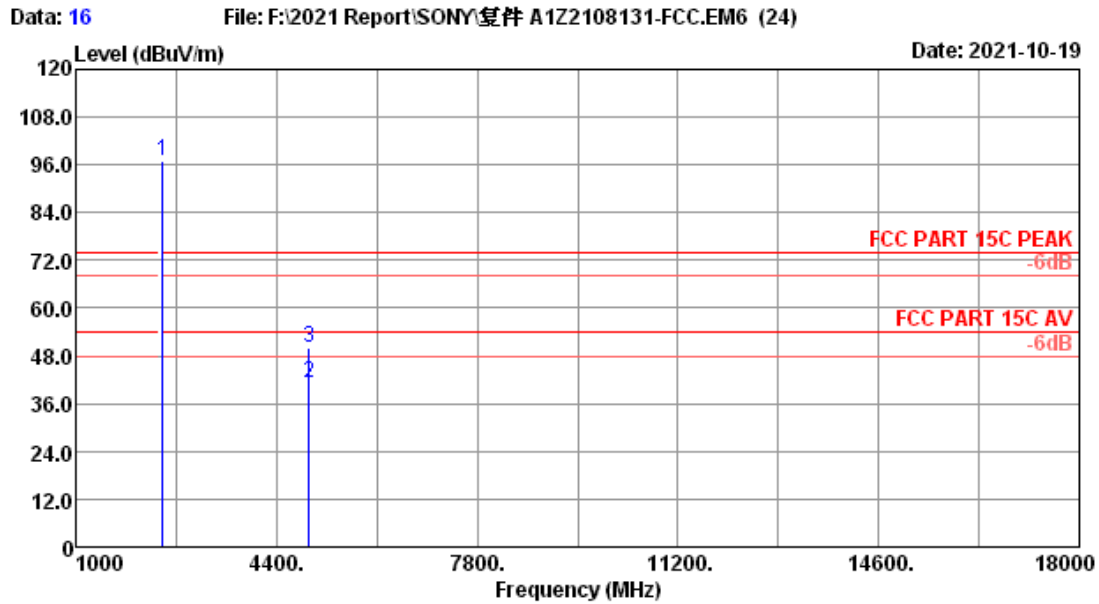
Site no. : 3m Chamber Data no. : 10
 Dis. / Ant. : 3m 2021 MCTD1209-3006 Ant. pol. : VERTICAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : 23.8°C/53.5% Engineer : Winter
 Test Mode : Subwoofer: SRD 2476MHz ANT & Tx

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2476.00	28.07	1.69	107.83	35.25	102.34	-----	-----	Peak
2	4952.00	32.77	2.73	40.65	34.49	41.66	54.00	12.34	Average
3	4952.00	32.77	2.73	52.13	34.49	53.14	74.00	20.86	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 -Amp factor.
 2. The emission levels that are 20dB below the official
 limit are not reported.



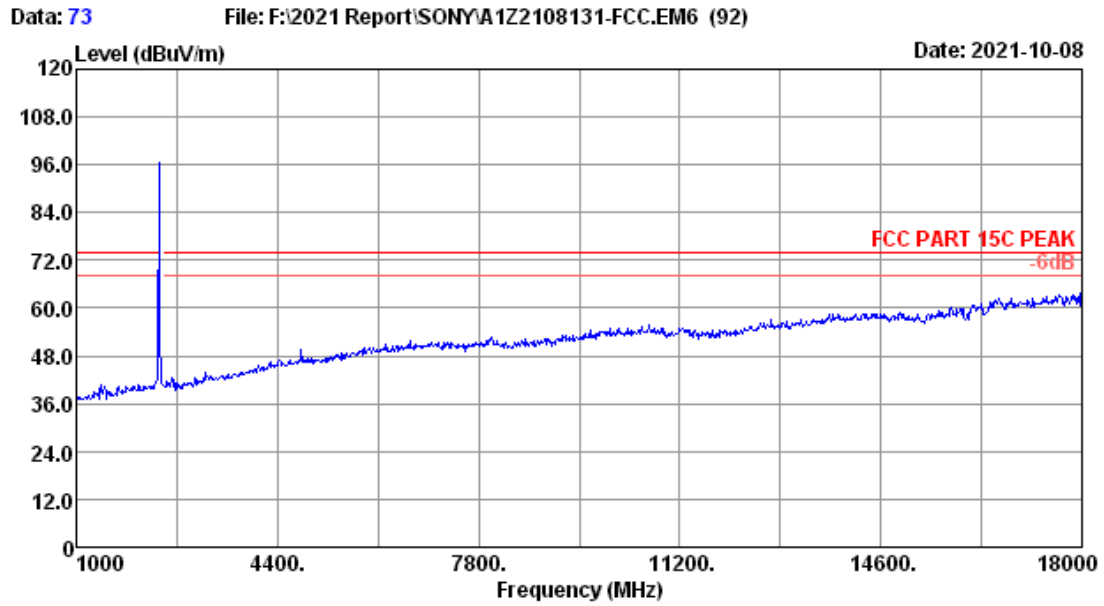
Site no.	: 3m Chamber	Data no.	: 15
Dis. / Ant.	: 3m 2021 MCTD1209-3006	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 23.8°C/53.5%	Engineer	: Winter
Test Mode	: Subwoofer: SRD 2476MHz	ANT & Tx	



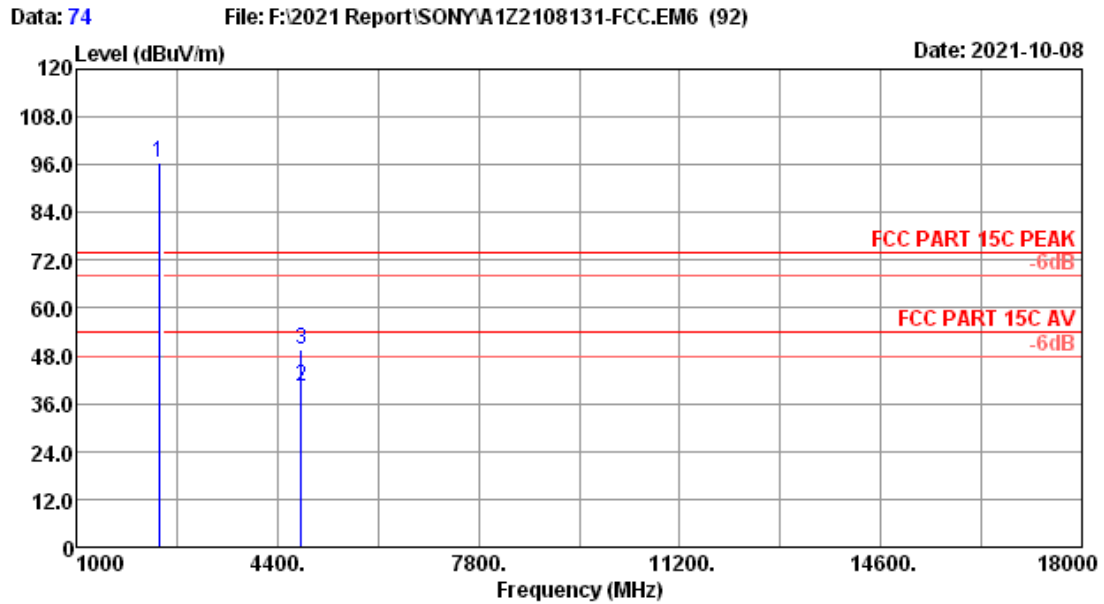
Site no. : 3m Chamber Data no. : 16
 Dis. / Ant. : 3m 2021 MCTD1209-3006 Ant. pol. : HORIZONTAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : 23.8°C/53.5% Engineer : Winter
 Test Mode : Subwoofer: SRD 2476MHz ANT & Tx

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2476.00	28.07	1.69	102.40	35.25	96.91	-----	-----	Peak
2	4952.00	32.77	2.73	40.25	34.49	41.26	54.00	12.74	Average
3	4952.00	32.77	2.73	48.97	34.49	49.98	74.00	24.02	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 -Amp factor.
 2. The emission levels that are 20dB below the official
 limit are not reported.



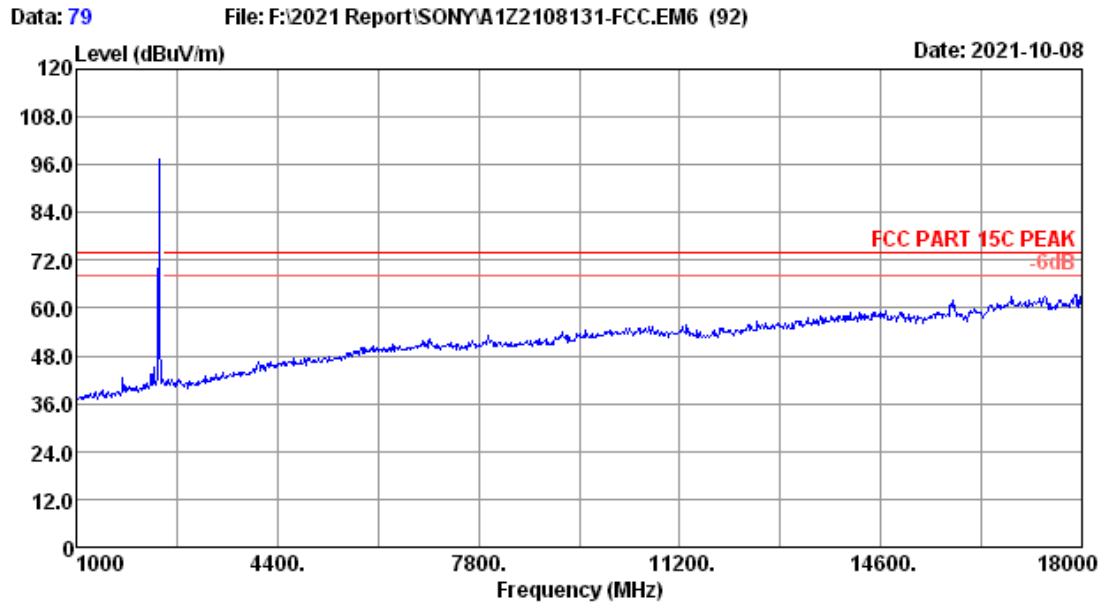
Site no.	: 3m Chamber	Data no.	: 73
Dis. / Ant.	: 3m 2021 MCTD1209-3006	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 23.8°C/53.5%	Engineer	: Winter
Power rating	: AC 120V/60Hz		
Test Mode	: Subwoofer: SRD 2404MHz ANT B Tx		



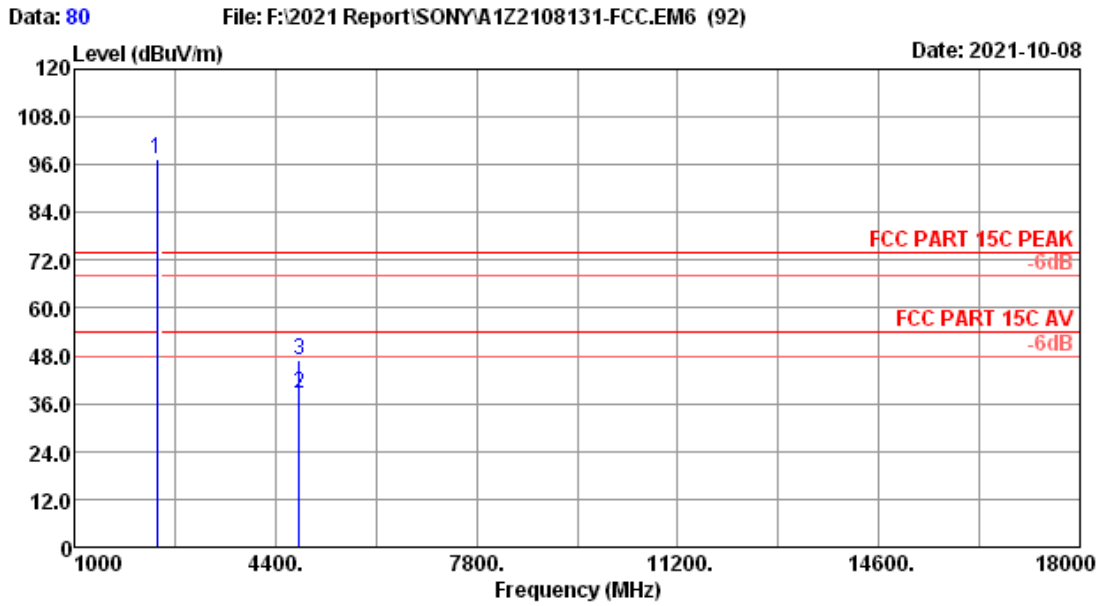
Site no. : 3m Chamber Data no. : 74
 Dis. / Ant. : 3m 2021 MCTD1209-3006 Ant. pol. : HORIZONTAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : 23.8°C/53.5% Engineer : Winter
 Power rating : AC 120V/60Hz
 Test Mode : Subwoofer: SRD 2404MHz ANT B Tx

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2404.00	27.93	1.66	102.27	35.24	96.62	-----	-----	Peak
2	4808.00	32.69	2.66	39.26	34.46	40.15	54.00	13.85	Average
3	4808.00	32.69	2.66	48.74	34.46	49.63	74.00	24.37	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 -Amp factor.
 2. The emission levels that are 20dB below the official
 limit are not reported.



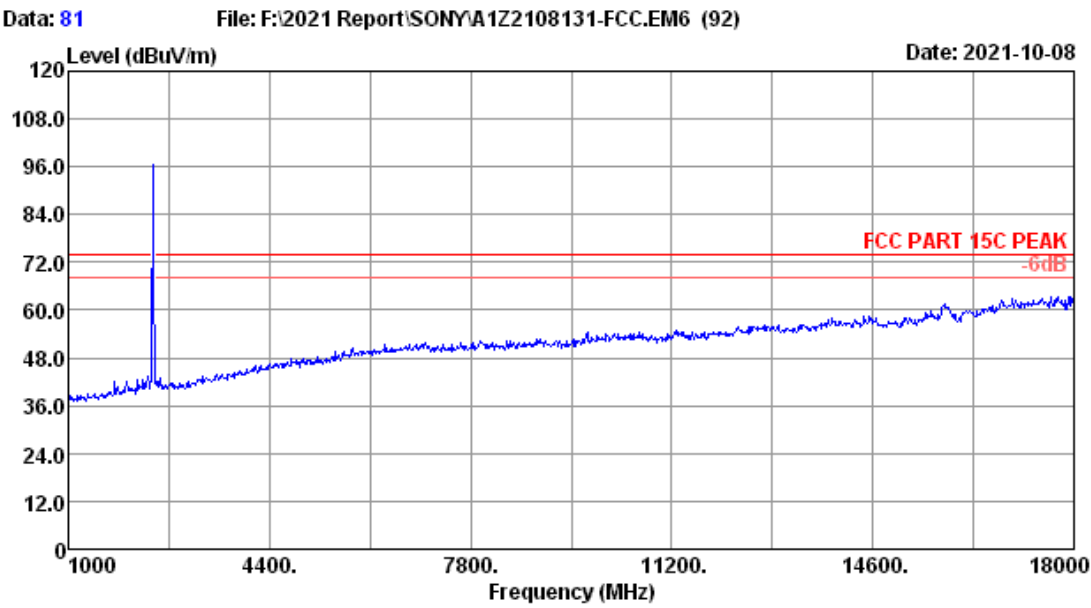
Site no.	: 3m Chamber	Data no.	: 79
Dis. / Ant.	: 3m 2021 MCTD1209-3006	Ant. pol.	: VERTICAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 23.8°C/53.5%	Engineer	: Winter
Power rating	: AC 120V/60Hz		
Test Mode	: Subwoofer: SRD 2404MHz ANT B Tx		



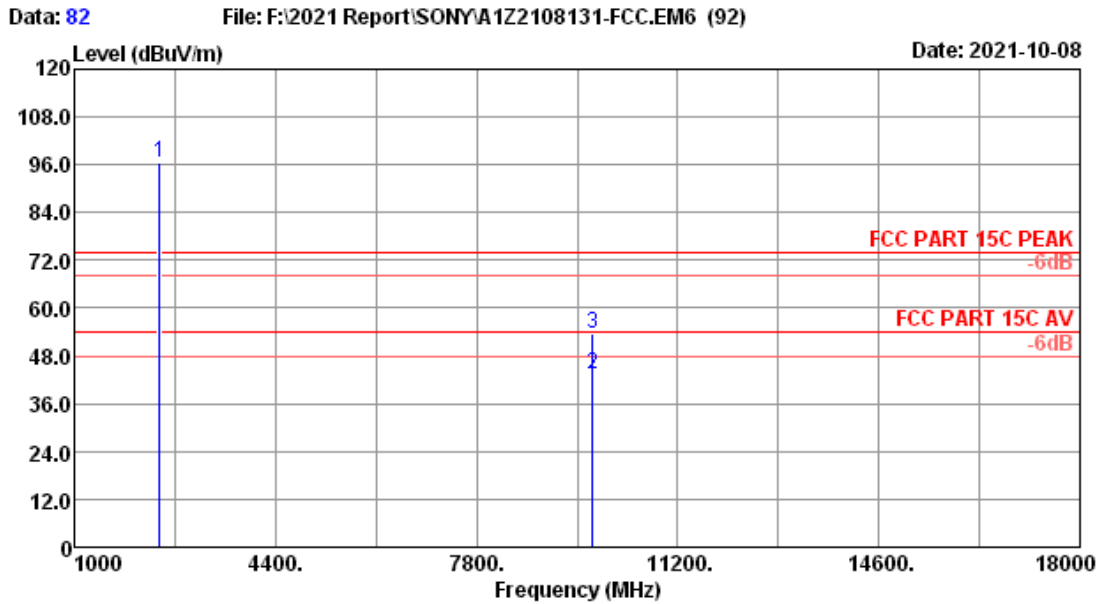
Site no. : 3m Chamber Data no. : 80
 Dis. / Ant. : 3m 2021 MCTD1209-3006 Ant. pol. : VERTICAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : 23.8°C/53.5% Engineer : Winter
 Power rating : AC 120V/60Hz
 Test Mode : Subwoofer: SRD 2404MHz ANT B Tx

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2404.00	27.93	1.66	102.88	35.24	97.23	-----	-----	Peak
2	4808.00	32.69	2.66	37.42	34.46	38.31	54.00	15.69	Average
3	4808.00	32.69	2.66	46.21	34.46	47.10	74.00	26.90	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 -Amp factor.
 2. The emission levels that are 20dB below the official
 limit are not reported.



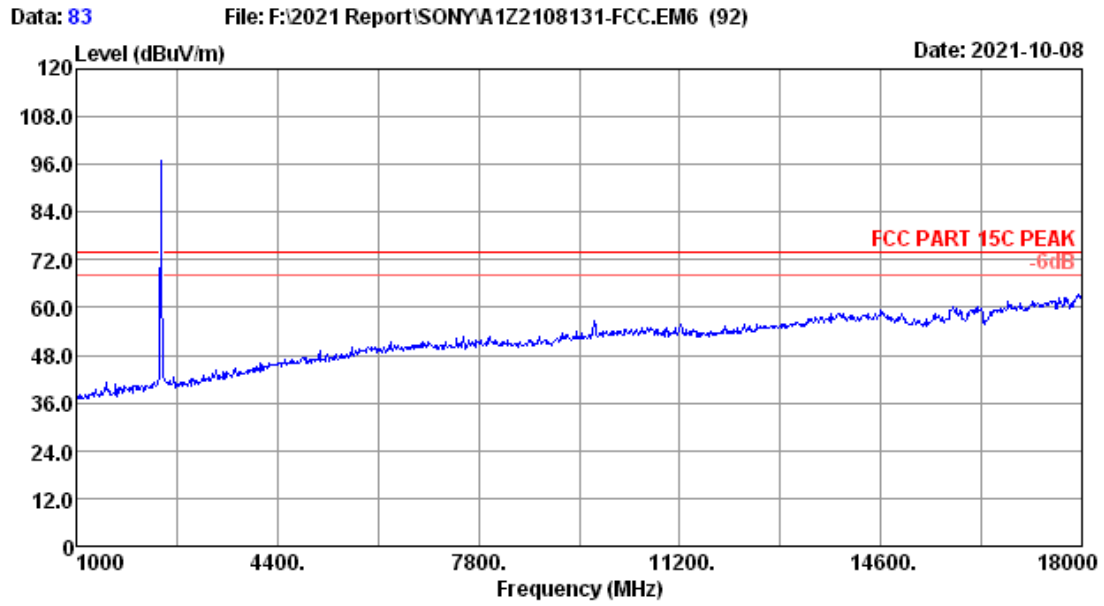
Site no.	: 3m Chamber	Data no.	: 81
Dis. / Ant.	: 3m 2021 MCTD1209-3006	Ant. pol.	: VERTICAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 23.8°C/53.5%	Engineer	: Winter
Power rating	: AC 120V/60Hz		
Test Mode	: Subwoofer: SRD 2440MHz ANT B Tx		



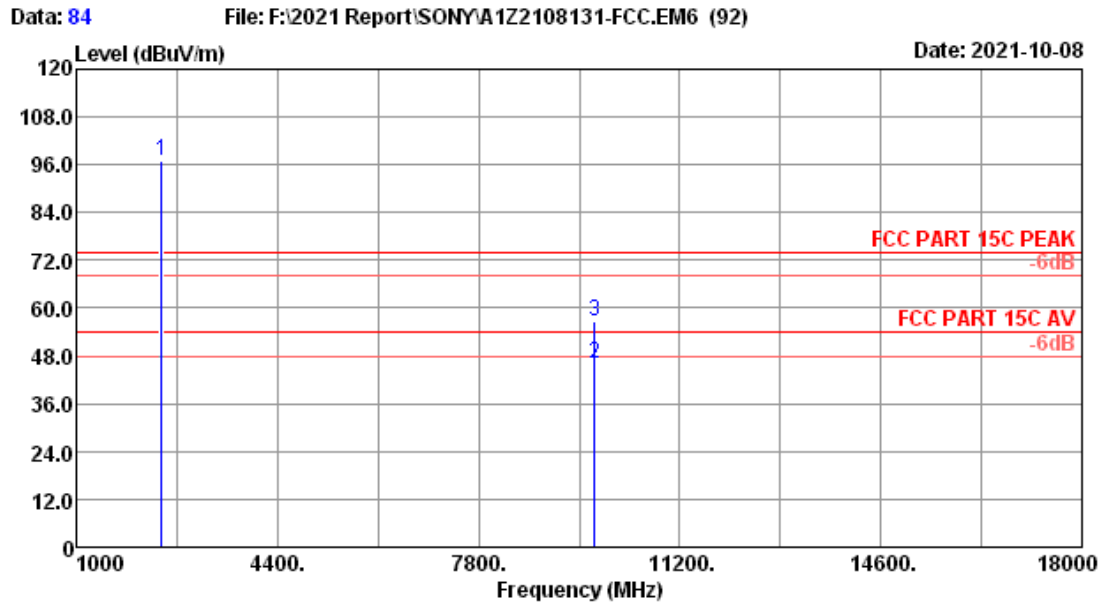
Site no. : 3m Chamber Data no. : 82
 Dis. / Ant. : 3m 2021 MCTD1209-3006 Ant. pol. : VERTICAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : 23.8°C/53.5% Engineer : Winter
 Power rating : AC 120V/60Hz
 Test Mode : Subwoofer: SRD 2440MHz ANT B Tx

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2440.00	28.00	1.68	102.26	35.24	96.70	-----	-----	Peak
2	9760.00	37.56	3.94	36.58	34.53	43.55	54.00	10.45	Average
3	9760.00	37.56	3.94	46.49	34.53	53.46	74.00	20.54	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 -Amp factor.
 2. The emission levels that are 20dB below the official
 limit are not reported.



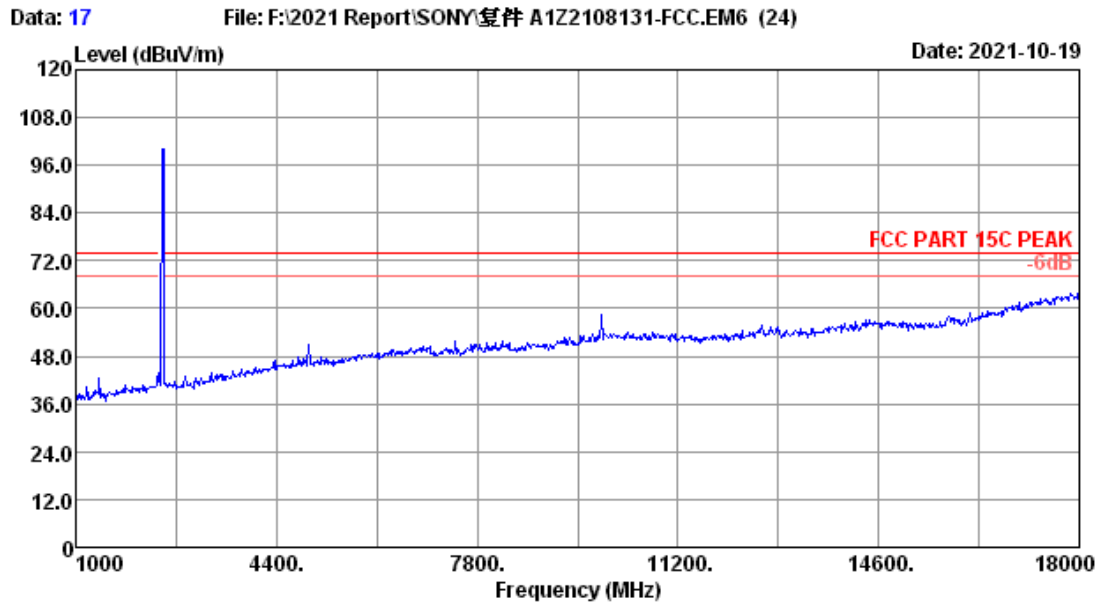
Site no.	: 3m Chamber	Data no.	: 83
Dis. / Ant.	: 3m 2021 MCTD1209-3006	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 23.8°C/53.5%	Engineer	: Winter
Power rating	: AC 120V/60Hz		
Test Mode	: Subwoofer: SRD 2440MHz ANT B Tx		



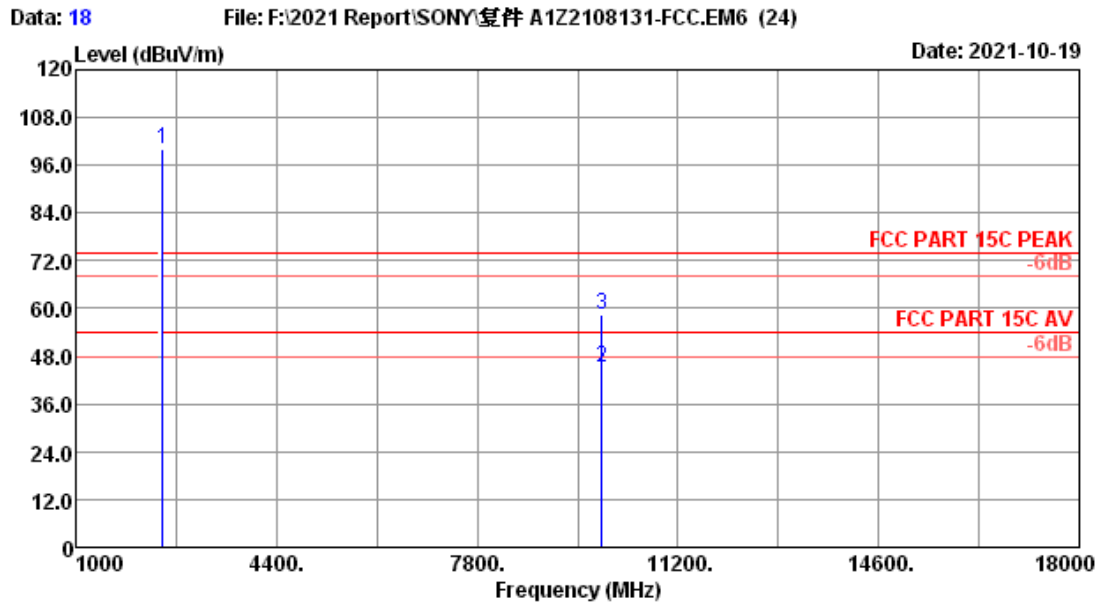
Site no. : 3m Chamber Data no. : 84
 Dis. / Ant. : 3m 2021 MCTD1209-3006 Ant. pol. : HORIZONTAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : 23.8°C/53.5% Engineer : Winter
 Power rating : AC 120V/60Hz
 Test Mode : Subwoofer: SRD 2440MHz ANT B Tx

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2440.00	28.00	1.68	102.41	35.24	96.85	-----	-----	Peak
2	9760.00	37.56	3.94	39.23	34.53	46.20	54.00	7.80	Average
3	9760.00	37.56	3.94	49.49	34.53	56.46	74.00	17.54	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 -Amp factor.
 2. The emission levels that are 20dB below the official
 limit are not reported.



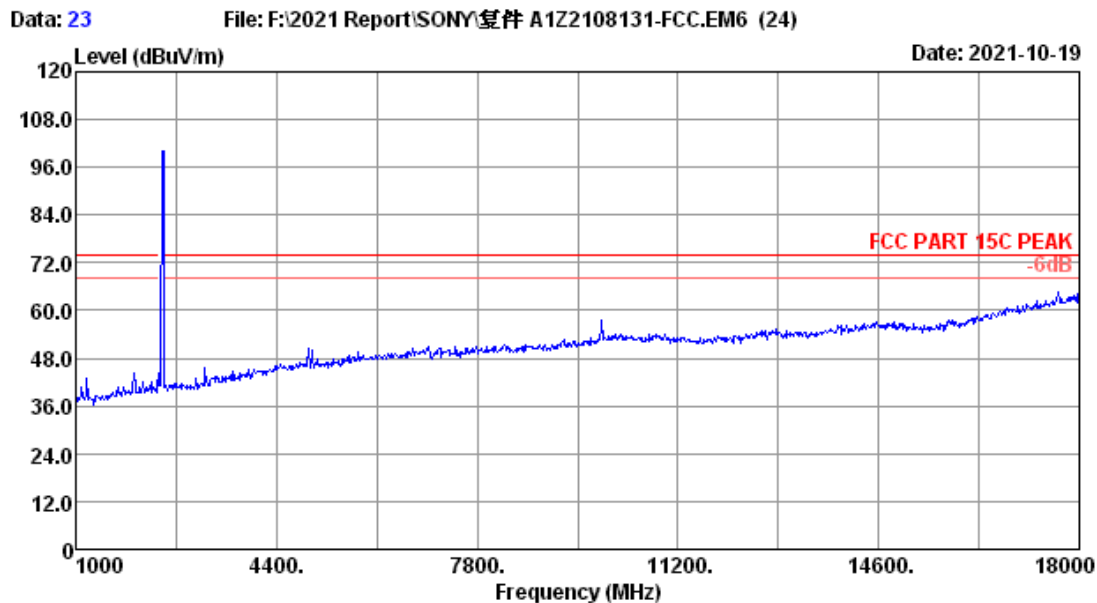
Site no.	: 3m Chamber	Data no.	: 17
Dis. / Ant.	: 3m 2021 MCTD1209-3006	Ant. pol.	: HORIZONTAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 23.8°C/53.5%	Engineer	: Winter
Test Mode	: Subwoofer: SRD 2476MHz	ANT B Tx	



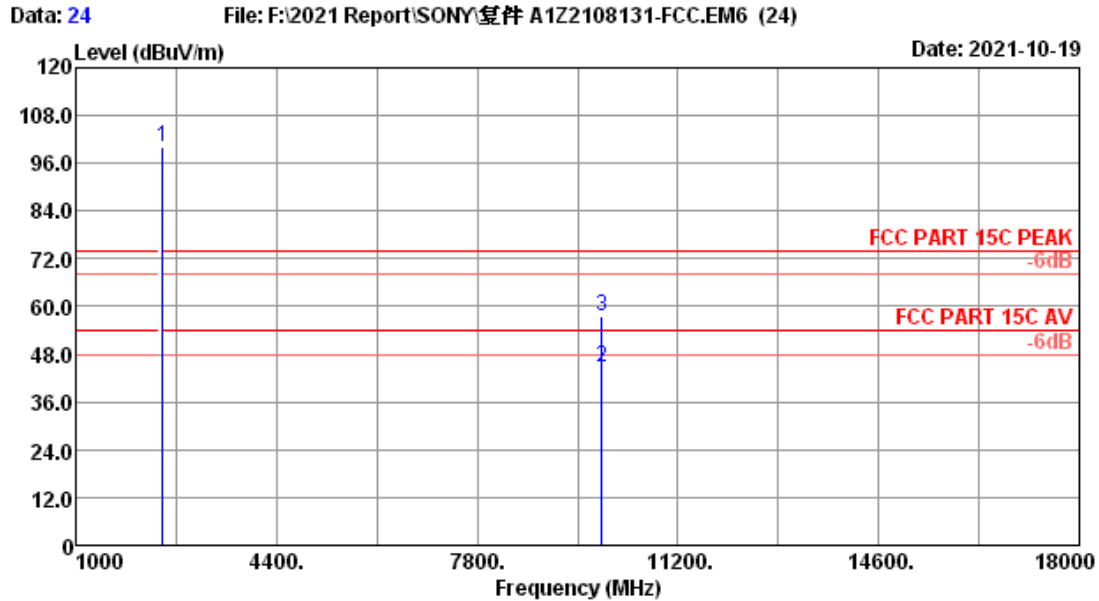
Site no. : 3m Chamber Data no. : 18
 Dis. / Ant. : 3m 2021 MCTD1209-3006 Ant. pol. : HORIZONTAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : 23.8°C/53.5% Engineer : Winter
 Test Mode : Subwoofer: SRD 2476MHz ANT B Tx

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2476.00	28.07	1.69	105.62	35.25	100.13	-----	-----	Peak
2	9904.00	37.65	3.98	38.08	34.40	45.31	54.00	8.69	Average
3	9904.00	37.65	3.98	51.05	34.40	58.28	74.00	15.72	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 -Amp factor.
 2. The emission levels that are 20dB below the official
 limit are not reported.



Site no.	: 3m Chamber	Data no.	: 23
Dis. / Ant.	: 3m 2021 MCTD1209-3006	Ant. pol.	: VERTICAL
Limit	: FCC PART 15C PEAK		
Env. / Ins.	: 23.8°C/53.5%	Engineer	: Winter
Test Mode	: Subwoofer: SRD 2476MHz ANT B Tx		



Site no. : 3m Chamber Data no. : 24
 Dis. / Ant. : 3m 2021 MCTD1209-3006 Ant. pol. : VERTICAL
 Limit : FCC PART 15C PEAK
 Env. / Ins. : 23.8°C/53.5% Engineer : Winter
 Test Mode : Subwoofer: SRD 2476MHz ANT B Tx

No.	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Amp factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2476.00	28.07	1.69	105.61	35.25	100.12	-----	-----	Peak
2	9904.00	37.65	3.98	37.36	34.40	44.59	54.00	9.41	Average
3	9904.00	37.65	3.98	50.24	34.40	57.47	74.00	16.53	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading
 -Amp factor.
 2. The emission levels that are 20dB below the official
 limit are not reported.

5. CONDUCTED SPURIOUS EMISSIONS

5.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	PXA Signal Analyzer	Agilent	N9030A	MY51380221	Apr.07,21	1 Year
2.	Attenuator	Agilent	8491B	MY39269201	Oct.12,20	1 Year
3.	Attenuator	Agilent	8491B	MY39269201	Oct.09,21	1 Year
4.	RF Cable	Hubersuhner	SUCOFLEX-106	505238/6	Apr.07,21	1 Year

5.2. Block Diagram of Test Setup



5.3. Limit

In any 100kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.

5.4. Test Procedure

Use the test method described in ANSI C63.10:

The transmitter output was connected to a spectrum analyzer, The resolution bandwidth is set to 100 kHz, The video bandwidth is set to 300 kHz and measure all the emissions With peak detector.

5.5. Test result

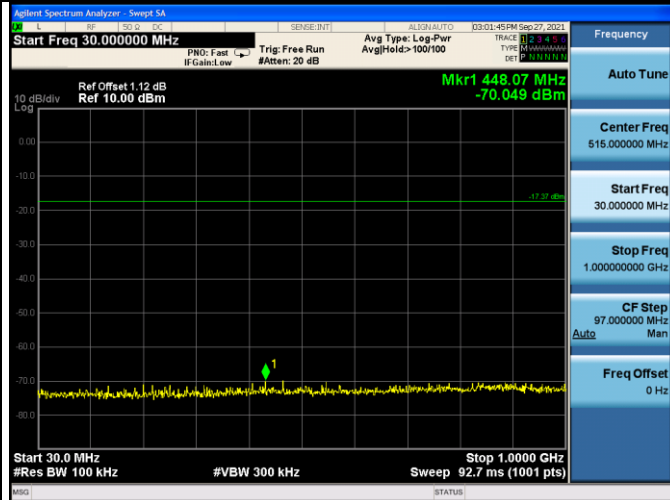
PASS (The testing data was attached in the next pages.)

EUT: Active Subwoofer		
M/N: SA-WSD40		
Test date: 2021-09-27 ~ 10-19	Pressure: 102.1±1.0 kpa	Humidity: 53.2±3.0%
Tested by: Lynn	Test site: RF site	Temperature: 22.3±0.6°C

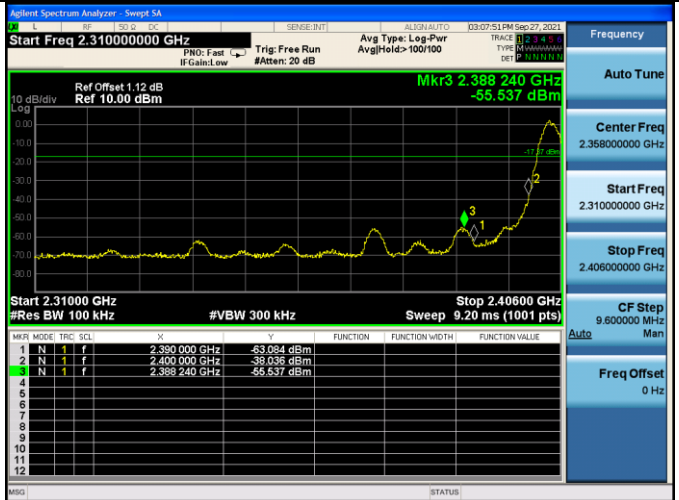
ANT A

GFSK

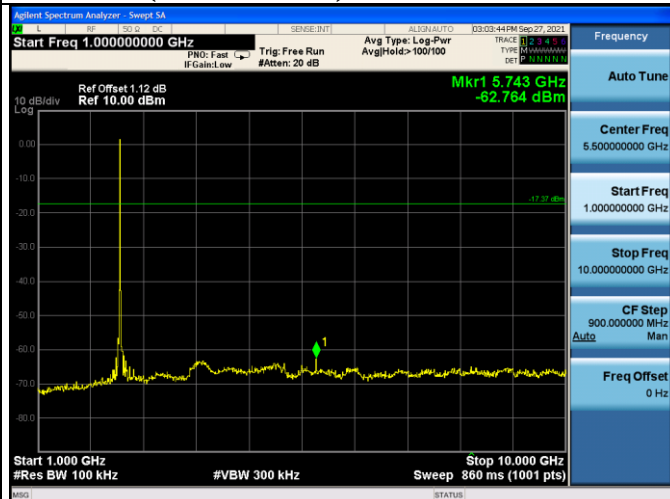
2404MHz(30MHz-1GHz)



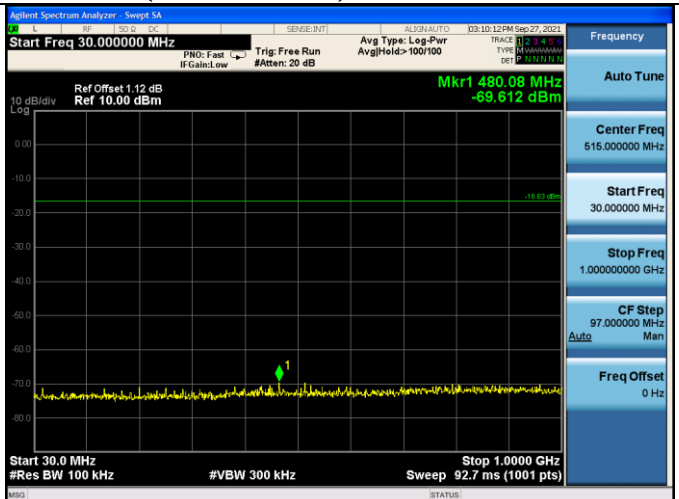
2404MHz(2.31GHz-2.405GHz)



2404MHz(1GHz-10GHz)



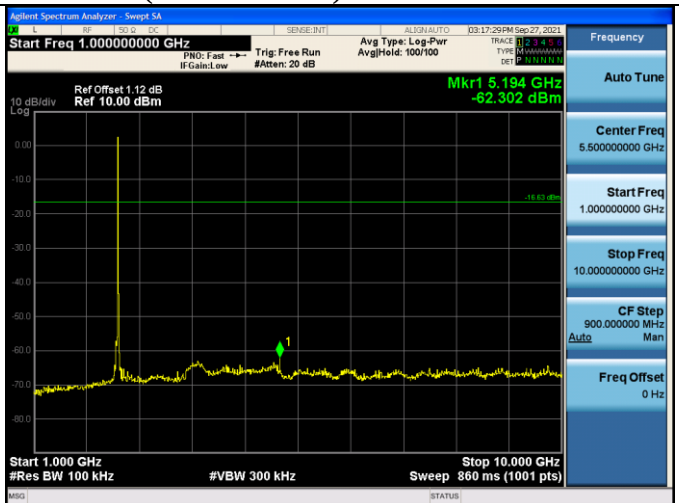
2440MHz(30MHz-1GHz)



2404MHz(10GHz-26GHz)



2440MHz(1GHz-10GHz)



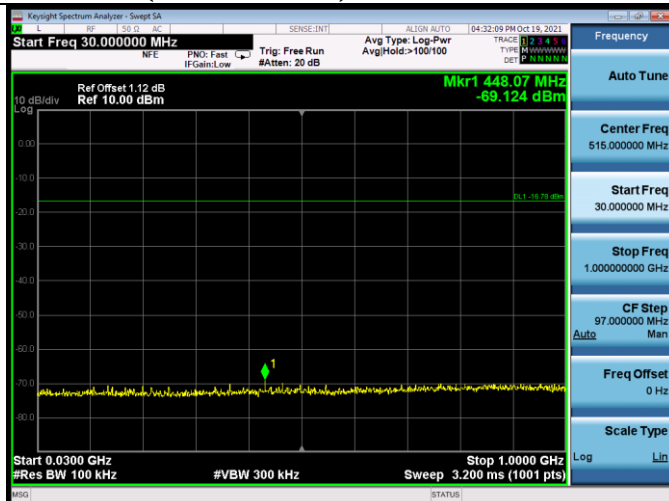
2440MHz(10GHz-26GHz)



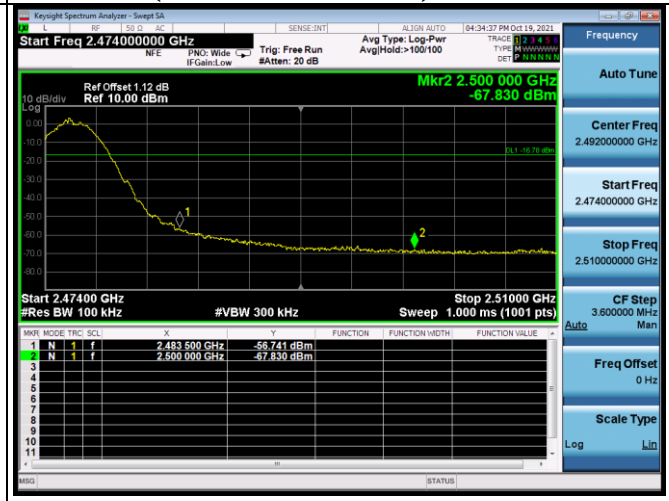
2476MHz(10GHz-26GHz)



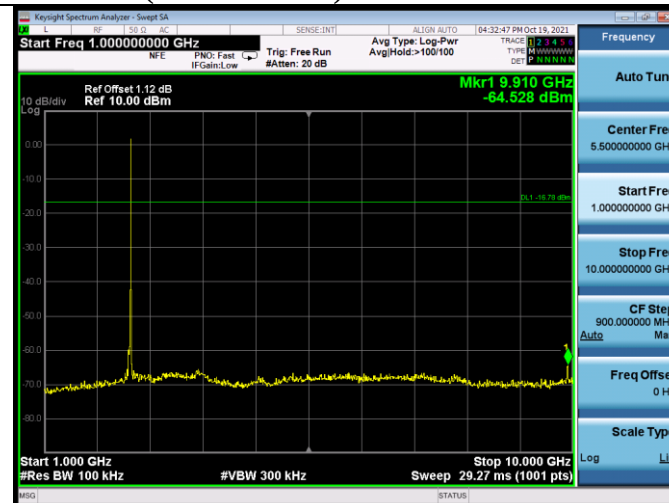
2476MHz(30MHz-1GHz)



2476MHz(2.477GHz-2.51GHz)



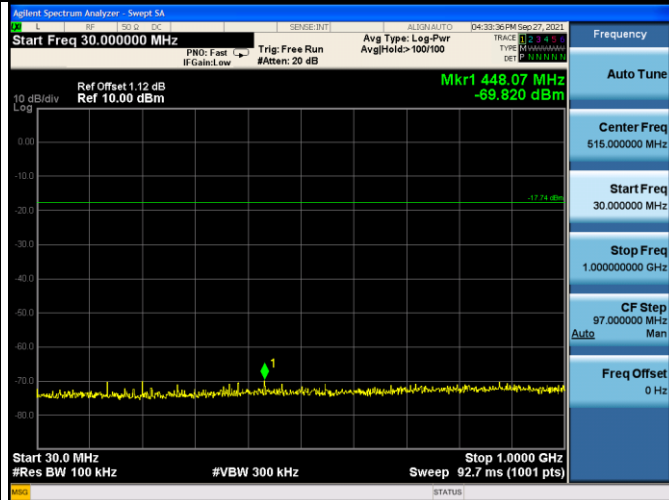
2476MHz(1GHz-10GHz)



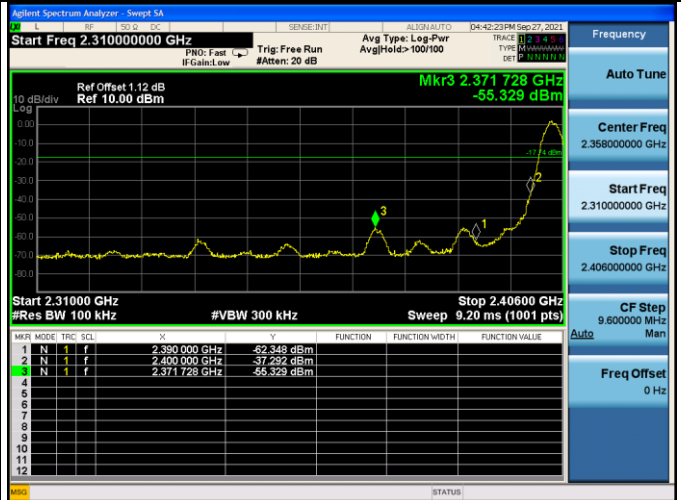
ANT B

GFSK

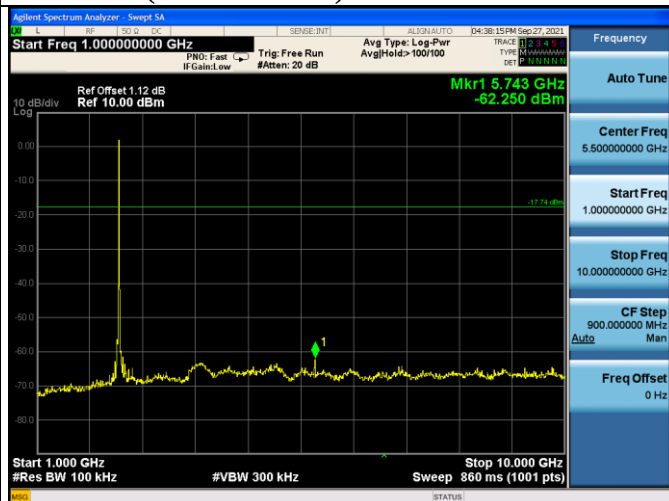
2404MHz(30MHz-1GHz)



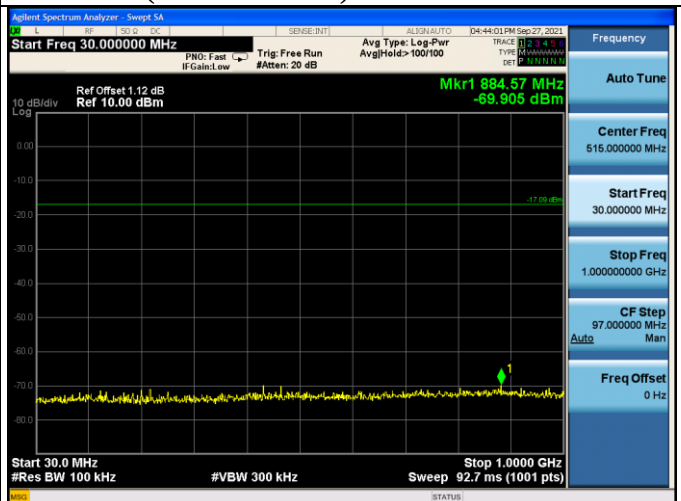
2404MHz(2.31GHz-2.405GHz)



2404MHz(1GHz-10GHz)



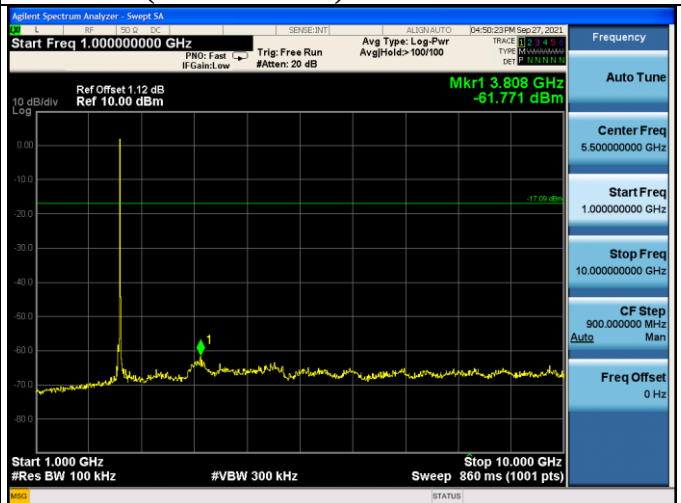
2440MHz(30MHz-1GHz)



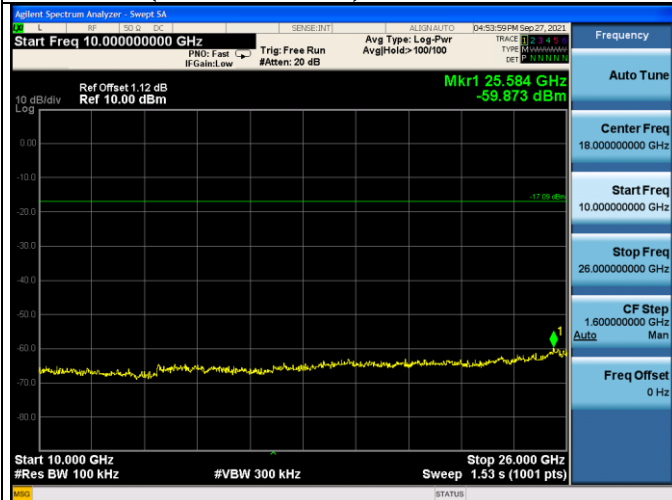
2404MHz(10GHz-26GHz)



2440MHz(1GHz-10GHz)



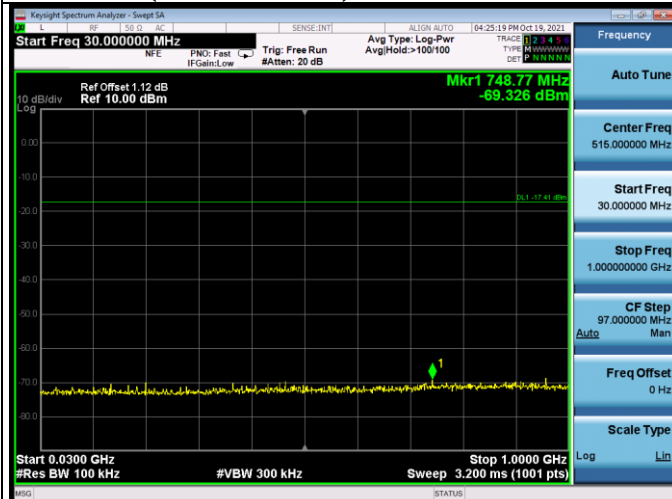
2440MHz(10GHz-26GHz)



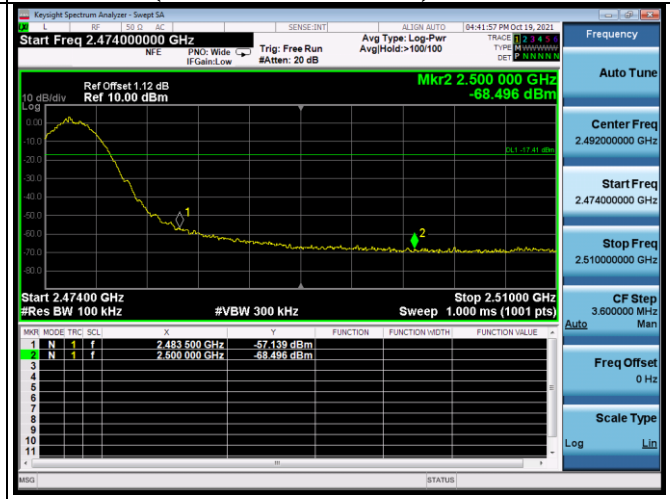
2476MHz(10GHz-26GHz)



2476MHz(30MHz-1GHz)



2476MHz(2.477GHz-2.51GHz)



2476MHz(1GHz-10GHz)

