Prismatik Dentalcraft, Inc.
TEST REPORT

SCOPE OF WORK
FCC EMC Evaluation of Orb Smart Sport Mouthguard

REPORT NUMBER
105793599LAX-007

ISSUE DATE
July 9, 2024

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Non-Specific EMC Report Shell Rev. September 2023

EMC TEST REPORT

(FULL COMPLIANCE)

Report Number: 105793599LAX-007
Project Number: G105793599

Original Report Issue Date: July 9, 2024

Model(s) Tested: OSG-001

Standards: **FCC 47CFR Part 15 Subpart B (04/2024)**
Title 47 CFR Part 15 Subpart B: Unintentional Radiators
FCC 47CFR Part 18 (04/2024)
Title 47 CFR Part 18: Industrial, Scientific, and Medical Equipment

Tested by:
Intertek Testing Services NA
25800 Commercentre Drive
Lake Forest, CA 92630
USA

Client:
Prismatik Dentalcraft, Inc.
18651 Von Karman
Irvine, CA 92612
USA

Report prepared by:

Ali I. Yürekli
EMC Staff Engineer

Report reviewed by:

Anderson Soungpanya
EMC Team Leader

Table of Contents

1 Introduction and Conclusion

The tests indicated in section 2.0 were performed on the product constructed as described in section 4.0. The remaining test sections are the verbatim text from the actual data sheets used during the investigation. These test sections include the test name, the specified test Method, a list of the actual Test Equipment Used, documentation Photos, Results and raw Data. No additions, deviations, or exclusions have been made from the standard(s) unless specifically noted.

Based on the results of our investigation, we have concluded the product tested **complies** with the requirements of the standard(s) indicated. The results obtained in this test report pertain only to the item(s) tested. Intertek does not make any claims of compliance for samples or variants which were not tested.

2 Test Summary

Section	Test full name	Result
6	Radiated Emissions (FCC 47CFR Part 15 Subpart B §15.109 Class B, 04/2024) (FCC 47CFR Part 18, §18.305b, 04/2024)	Compliant
7	AC Mains Conducted Emissions (FCC 47CFR Part 15 Subpart B §15.107 Class B, 04/2024) (FCC 47CFR Part 18, §18.307, 04/2024)	Compliant

3 Client Information

This EUT was tested at the request of:

Client: Prismatik Dentalcraft, Inc.
18651 Von Karman
Irvine, CA 92612
USA

Contact: Fernando Vera
Telephone: (562) 852 - 2519
Email: fernando.vera@glidewelldental.com

4 Description of Equipment Under Test and Variant Models

Manufacturer: Prismatik Dentalcraft, Inc.
18651 Von Karman
Irvine, CA 92612
USA

Equipment Under Test			
Description	Manufacturer	Model Number	Serial Number
Smart Sport Mouthguard	Prismatik Dentalcraft	OSG-001	C518, CFB6 *
Charging Case	Prismatik Dentalcraft	N/A	N/A

(*) S/N: C518 was used for testing at both Charging and Battery/Game modes whereas S/N: CFB6 was used for testing at Battery/Game Mode only.

Receive Date:	01/05/2024
Received Condition:	Good
Type:	Production

Description of Equipment Under Test (provided by client)

The product is Orb Smart Sport Mouthguard that can gather biometric data such as heart rate and impact forces. This can help sport players determine if an impact force is severe. It can also be used for feedback on training intensity based on heart rate data. The product is not intended as a medical device and should not be used to make any medical diagnosis.

Equipment Under Test Power Configuration			
Rated Voltage	Rated Current	Rated Frequency	Number of Phases
5 VDC	1 A	-	-
3.7 VDC (provided by Mouthguard internal battery)	15 mA	-	-

Operating modes of the EUT:

No.	Descriptions of EUT Exercising
1	**Charging Mode**: Orb Smart Sport Mouthguard is placed inside the Charging Case to charge its internal battery.
2	**Battery/Game Mode**: Orb Smart Sport Mouthguard is powered by its internal battery and worn by the user to collect biometric data. (For Radiated Emissions testing of EUT as an unintentional radiator, Bluetooth connectivity is turned off after setting the device in Battery/Game mode).

Software used by the EUT:

No.	Description
1	orb_sport_cli flutter, v0

Variant Models:

The following variant models were not tested as part of this evaluation but have been identified by the manufacturer as being electrically identical models, depopulated models, or with reasonable similarity to the model(s) tested. Intertek does not make any claims of compliance for samples or variants which were not tested.

- None

5 System Setup and Method

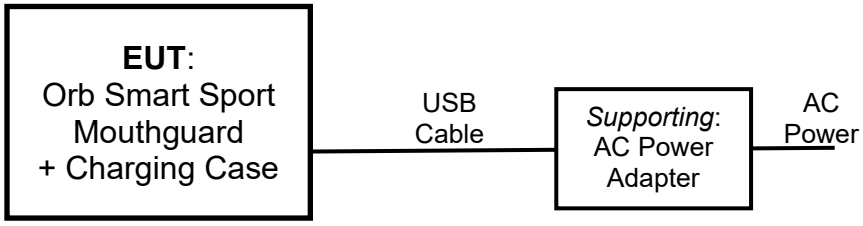
Cables					
ID	Description	Length (m)	Shielding	Ferrites	Termination
1	USB Charging Cable	1.00	No	No	USB micro (charging case) to USB A (AC power adapter)

Support Equipment			
Description	Manufacturer	Model Number	Serial Number
AC Power Adapter	Phihong USA	MQ05A-050A	M0039P231200203A1
Android Tablet	Lenovo	TB125FU	HGR30C8K(74)

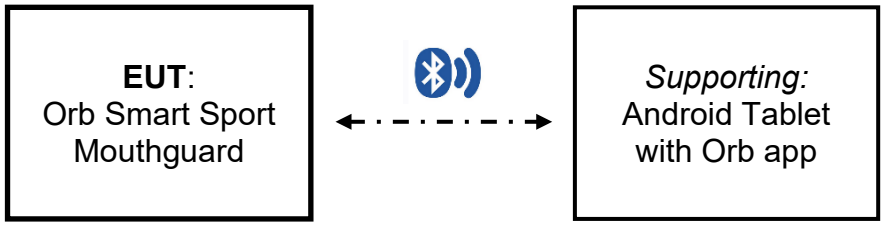
5.1 Method:

Configuration as required by ANSI C63.4:2014 and FCC-MP5.

5.2 EUT Block Diagram:



Test Setup for Charging Mode



Test Setup for Battery/Game Mode

(Note: For Radiated Emissions testing of EUT as an unintentional radiator, its Bluetooth connectivity is turned off after setting it to Battery/Game Mode)

Orb Smart Sport Mouthguard, Charging Case, and AC Power Adapter

Orb Smart Sport Mouthguard

6 Radiated Emissions

6.1 Requirements

FCC §15.109(a)

Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency of Emission (MHz)	Field Strength	
	µV/m	dBµV/m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

FCC §18.305(b)

The field strength levels of emissions which lie outside the bands specified in §18.301, unless otherwise indicated, shall not exceed:

Equipment	Operating frequency	RF Power generated by equipment (Watts)	Field strength limit (µV/m)	Distance (meters)
Any type unless otherwise specified (miscellaneous)	Any ISM Frequency	Below 500	25	300
		500 or more	25 x SQRT(power/500)	300
	Any non-ISM Frequency	Below 500	15	300
		500 or more	15 x SQRT(power/500)	300
Induction cooking ranges	Below 90 kHz	Any	1500	30
	On or above 90 kHz	Any	300	30

25 µV/m @ 300 m = 67.96 dBµV/m @ 3m
15 µV/m @ 300 m = 63.52 dBµV/m @ 3m

6.2 Method

Tests are performed in accordance with ANSI C63.4:2014, and FCC MP-5.

TEST SITE: Lake Forest EMC Lab

Description of Test Site:

The test facility is located at 25791 Commercentre Dr., Lake Forest, CA 92630.

Radiated emission measurements are performed in a 3 meter Semi-Anechoic Chamber, referred to as Site 1. Site 1 is a radio frequency semi-anechoic chamber / Alternate Test Site (ATS) intended to closely simulate the measurement environment as established for the Open Area test Site (OATS). The chamber is a shielded enclosure used to control and maintain a predictable EMI environment within the test region. A lining of RF absorbing material (Absorber) and other anechoic materials are installed over all interior wall and ceiling surfaces as to completely shroud exposed metallic components and disrupt reflective properties. The ground plane is an exposed RF reflective surface. The turntable is flush mounted, 2 meters in diameter, and remotely controlled. The antenna mast can be positioned at 3 meters away from the turntable. The antenna mast is remote controlled and can lower/raise an antenna between 1 – 4 meters. The antenna mast can also rotate between horizontal and vertical polarizations.

Measurement Uncertainty

Measurement	Frequency Range	Expanded Uncertainty (k=2)	U_{cispr}
Radiated Emissions, 3m	30-1000 MHz	4.7 dB	6.3 dB
Radiated Emissions, 3m	1 - 6 GHz	5.1 dB	5.2 dB
Radiated Emissions, 3m	6 – 18 GHz	5.5 dB	5.5 dB

As shown in the table above our radiated emissions U_{lab} is less than the corresponding U_{CISPR} reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required, based on CISPR 32 and CISPR 11 (for 2006 and later revisions) Clause 11.

Sample Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG
Where FS = Field Strength in dBμV/m
RA = Receiver Amplitude (including preamplifier) in dBμV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB/m
AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows.

Assume a receiver reading of 52.0 dBμV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 52.0 dBμV
AF = 7.4 dB/m
CF = 1.6 dB
AG = 29.0 dB
FS = 32 dBμV/m

To convert from dBμV to μV the following was used:

$UF = 10^{(NF / 20)}$ where UF = Net Reading in μV
NF = Net Reading in dBμV

Example:

FS = RA + AF + CF – AG = 52.0 + 7.4 + 1.6 – 29.0 = 32.0
$UF = 10^{(32\ dB\mu V / 20)}$ = 39.8 μV/m

6.3 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
000637	EMC Emissions Chamber	Panashield	3m Chamber	250831-D-2	11/27/2023	11/27/2026
001669	EMI Test Receiver	Rohde & Schwarz	ESW	101636	07/11/2023	07/11/2024
002205	Broadband Hybrid Antenna (30MHz-6GHz)	SunAR RF Motion	JB3	A051221	07/14/2023	07/14/2024
000692	Double-ridged Horn Antenna (1-18 GHz)	ETS Lindgren	3115	00031626	08/25/2023	08/25/2024
002147	Loop Antenna (9 kHz-30 MHz)	ETS Lindgren	6512	00239109	08/23/2023	08/23/2024
002390	RF Cable (30MHz-18GHz)	Rohde & Schwarz	TSPR-B7	101606	11/02/2023	11/02/2024
002324	RF Cable (30MHz-18GHz)	Rohde & Schwarz	TSPR-B7	101596	11/02/2023	11/02/2024
001568	Preamplifier (100kHz - 1 GHz)	Rhode & Schwarz	TS-PR1	102068	01/08/2024	01/08/2025
002159	Humidity/Temperature/Pressure Meter	Testo	622	39525175/0920	08/05/2023	08/05/2024

Software Utilized:

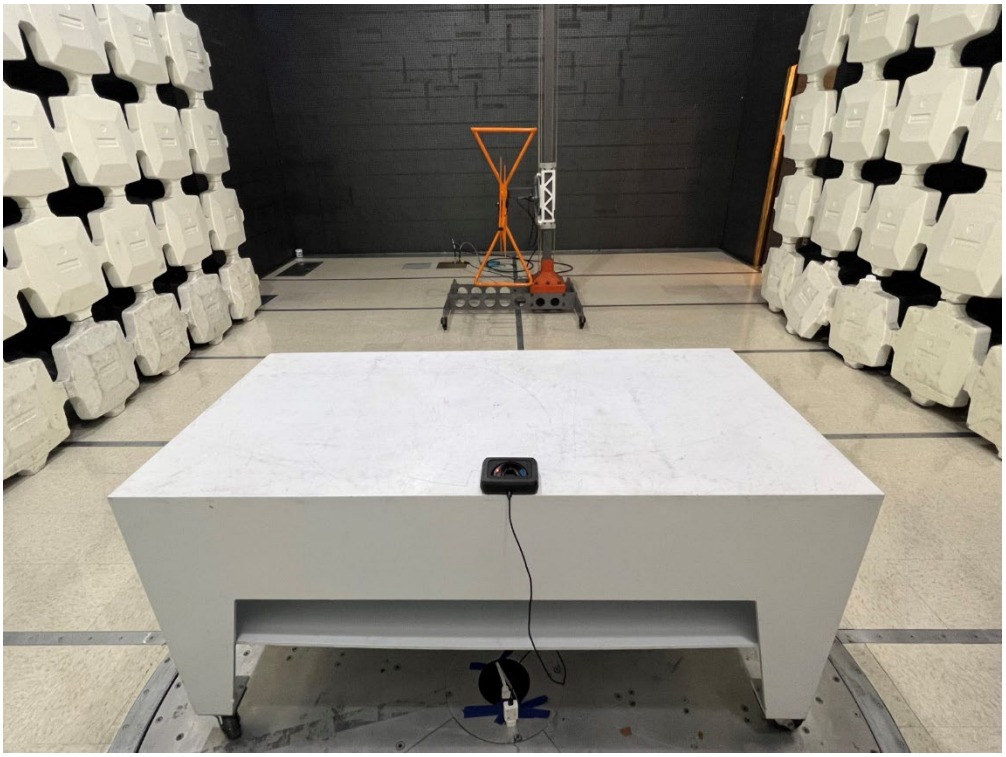
Name	Manufacturer	Version
BAT-EMC	NEXIO	Version 3.19.1.19

6.4 Results:

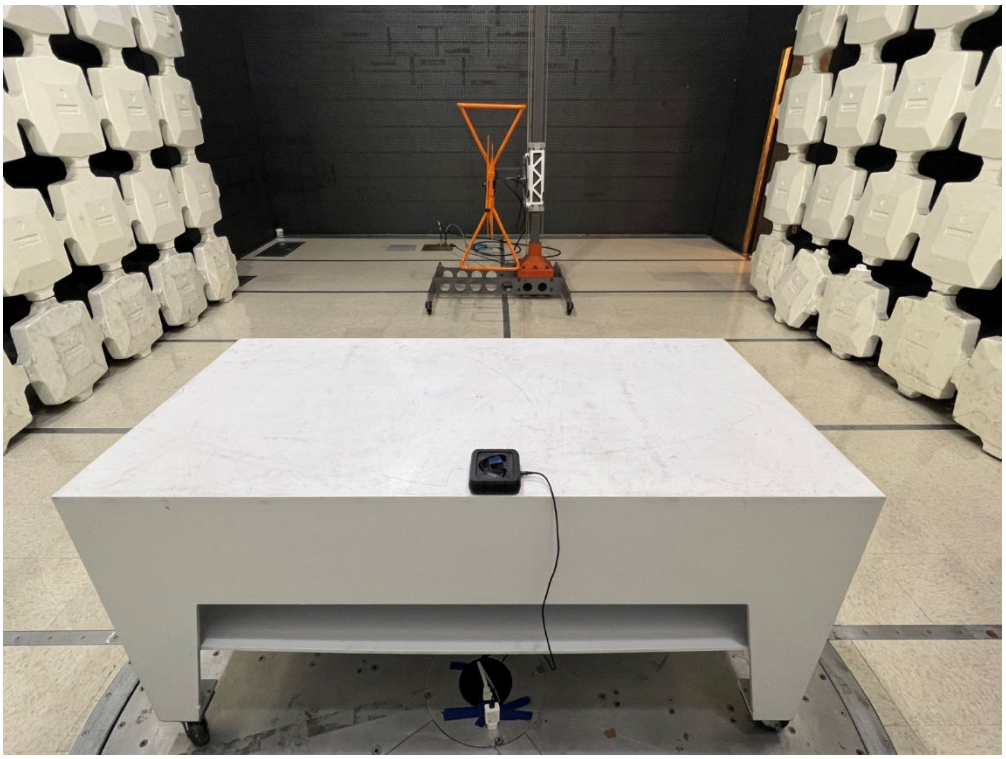
The sample tested was found to Comply.

6.5 Setup Photographs:

Radiated Emissions (30 MHz – 1 GHz), Charging Mode



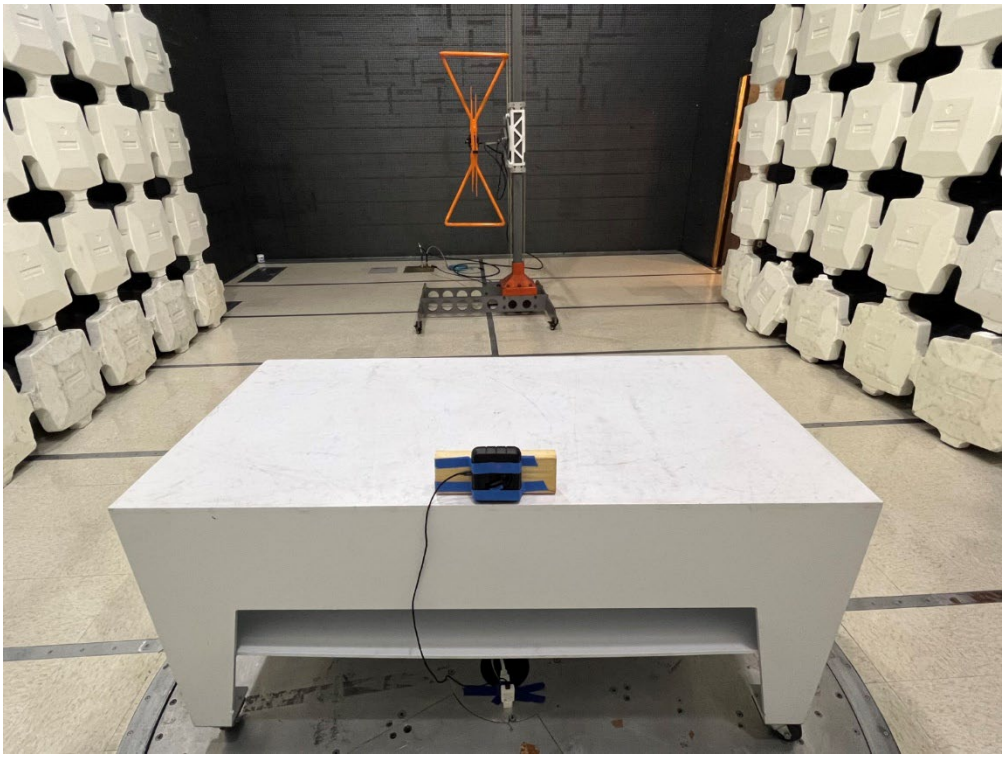
EUT Orientation: X



EUT Orientation: Y

6.5 Setup Photos:

Radiated Emissions (30 MHz – 1 GHz), Charging Mode

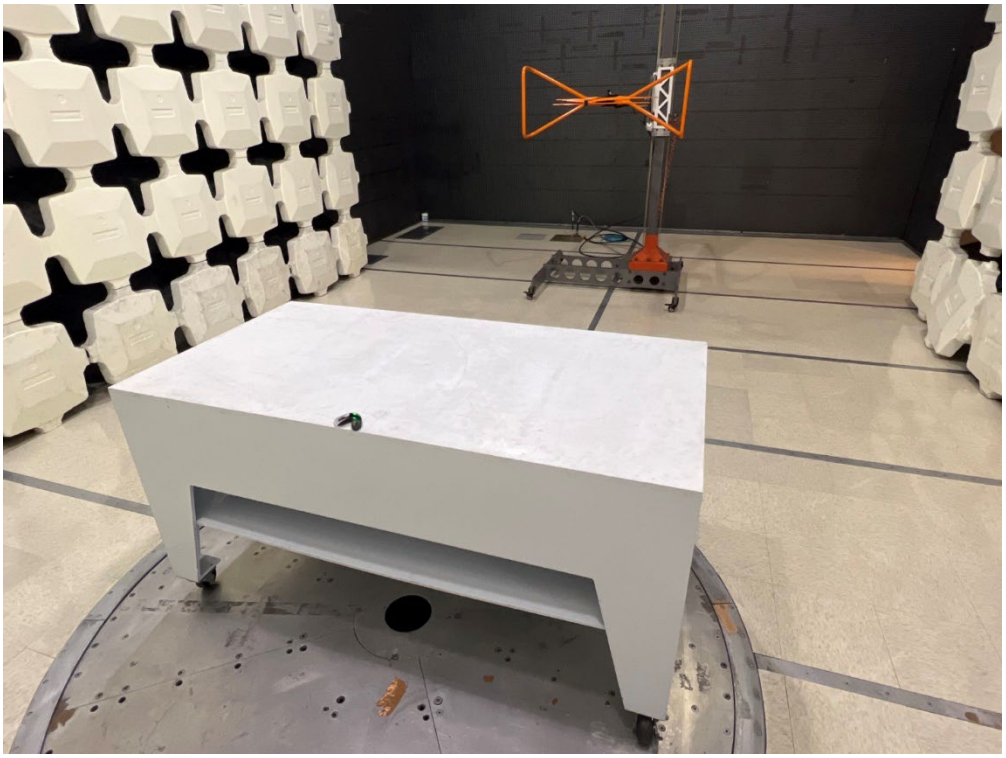


EUT Orientation: Z

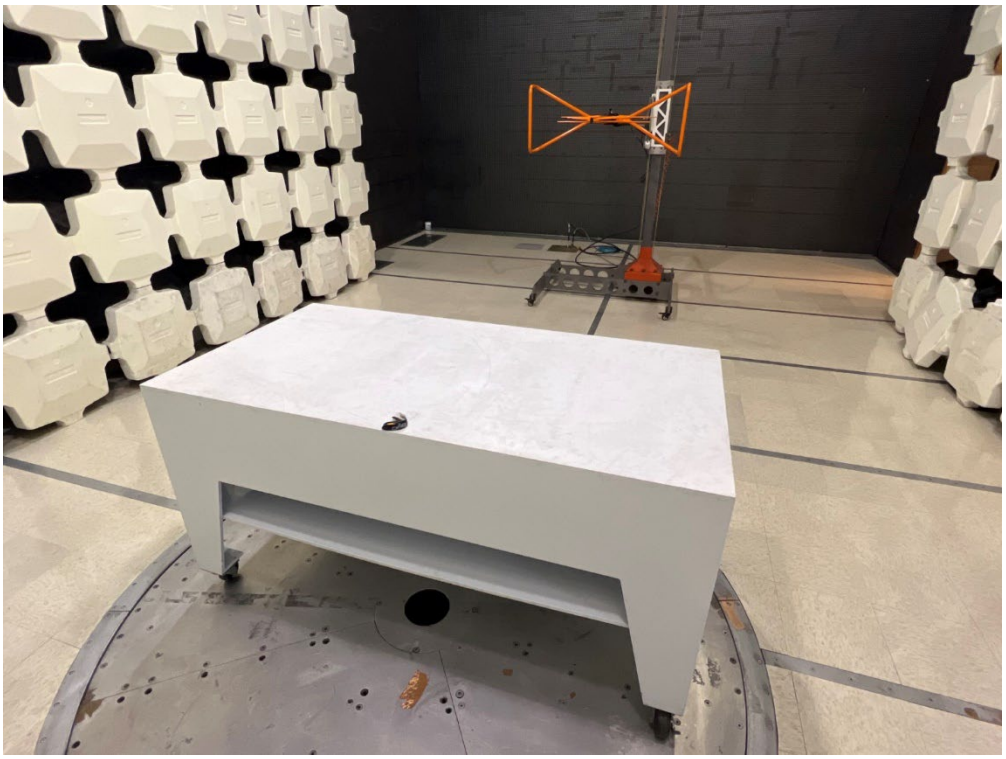
View from Antenna side

6.5 Setup Photos:

Radiated Emissions (30 MHz – 1 GHz), Battery/Game Mode



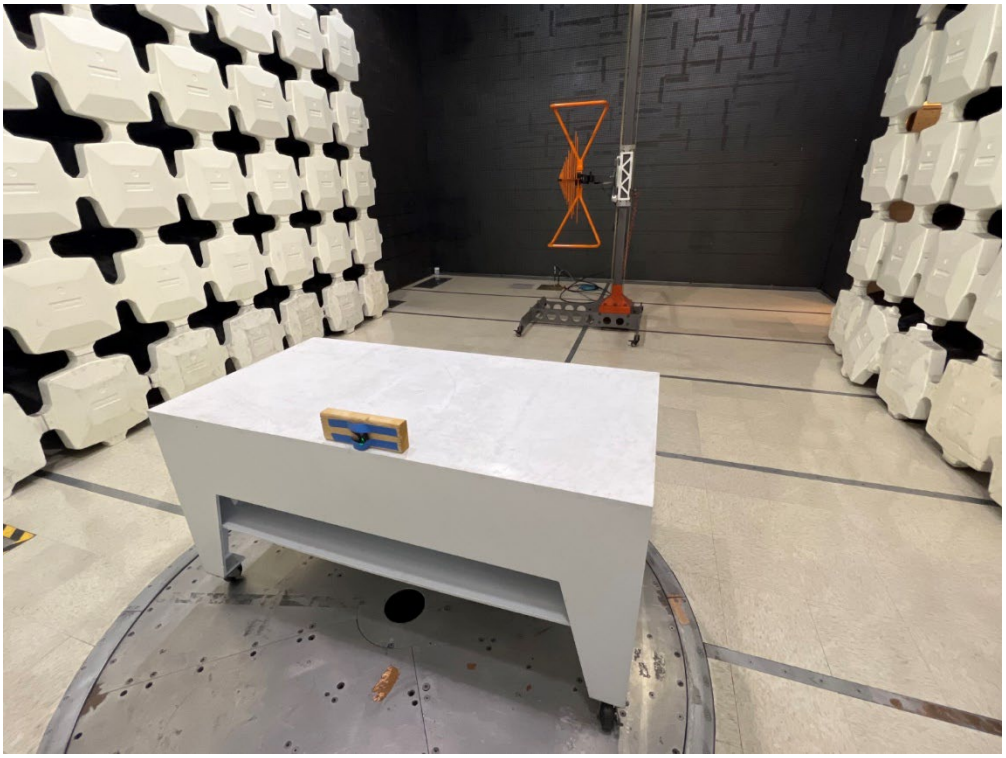
EUT Orientation: X



EUT Orientation: Y

6.5 Setup Photos:

Radiated Emissions (30 MHz – 1 GHz), Battery/Game Mode

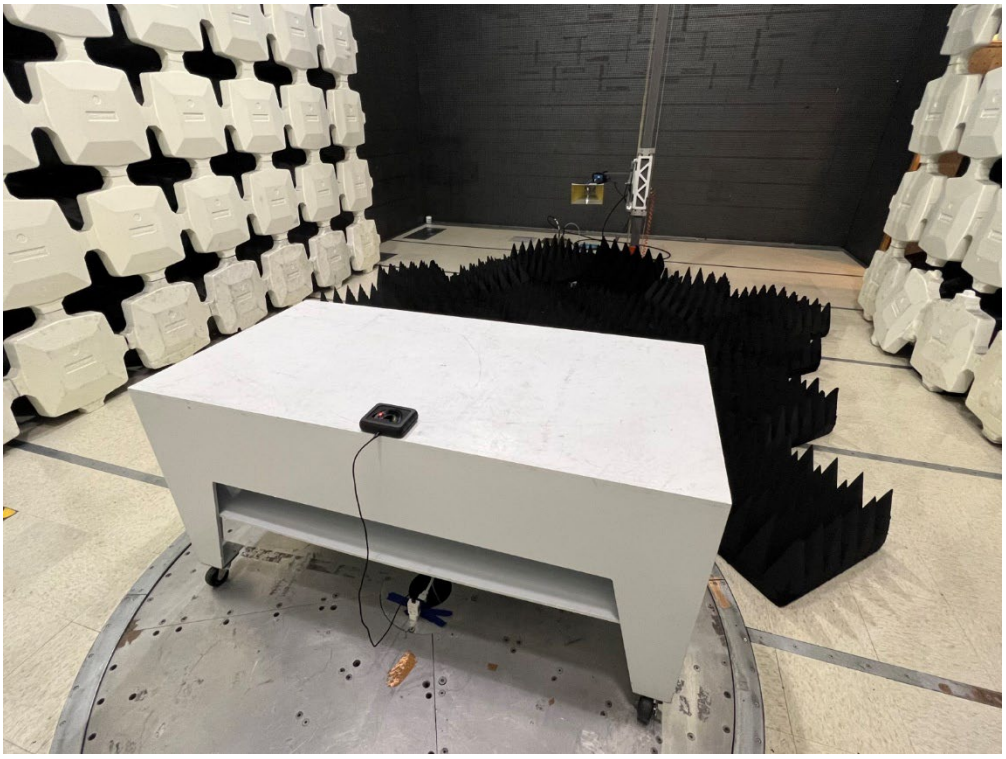


EUT Orientation: Z

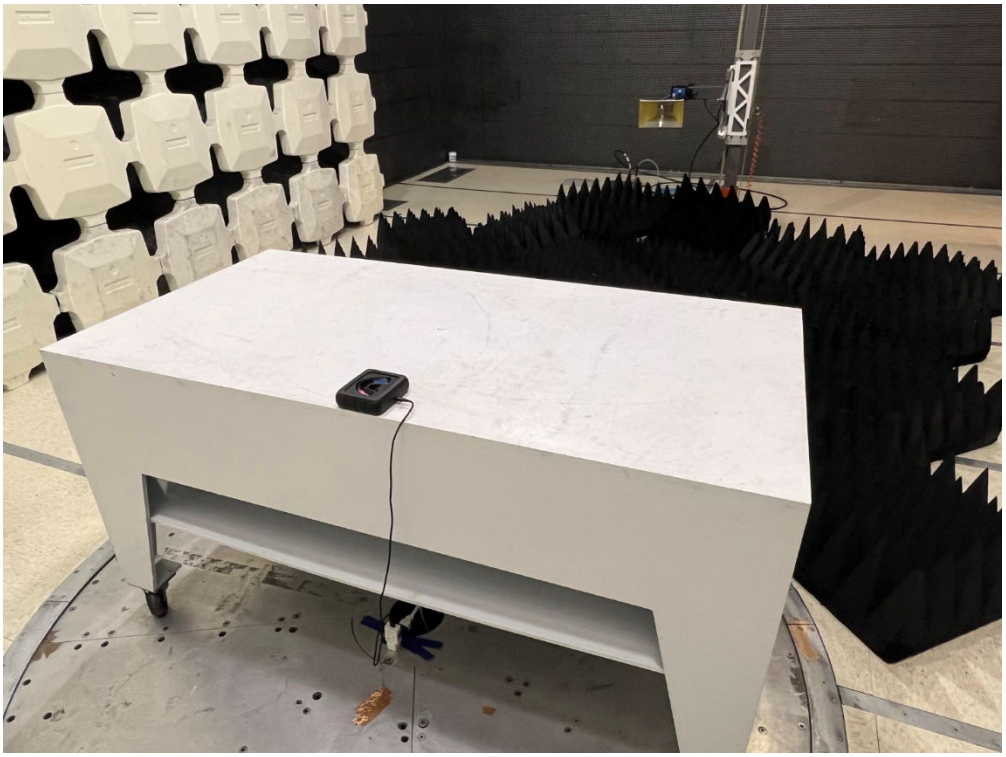
View from Antenna side

6.5 Setup Photos:

Radiated Emissions (1 - 18 GHz), Charging Mode



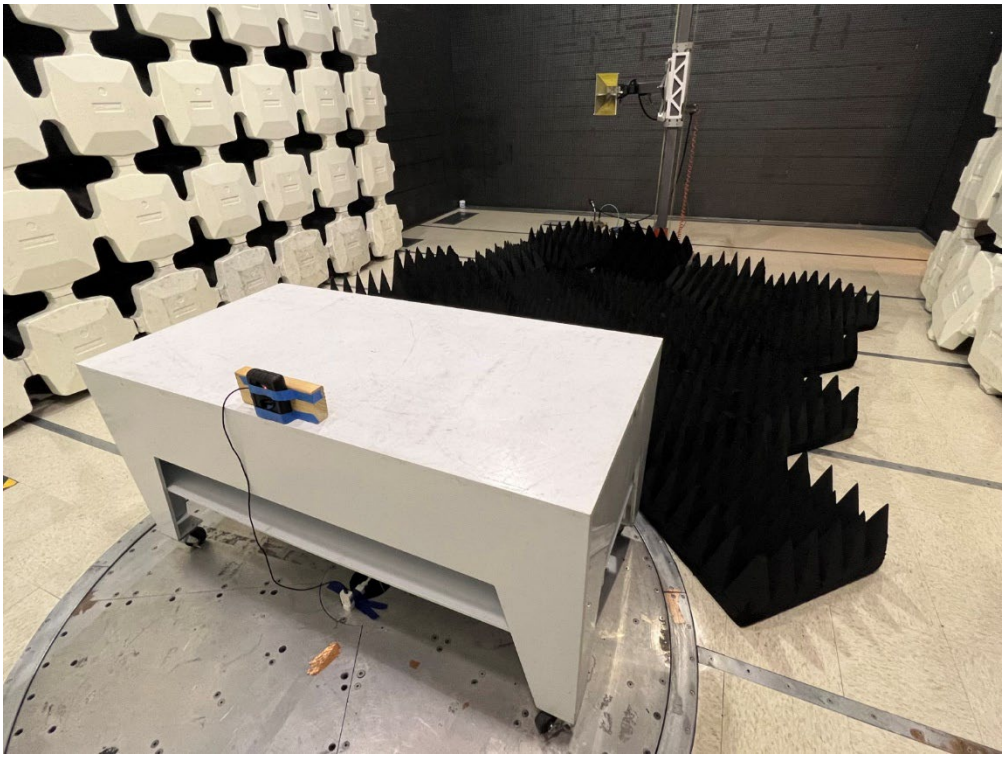
EUT Orientation: X



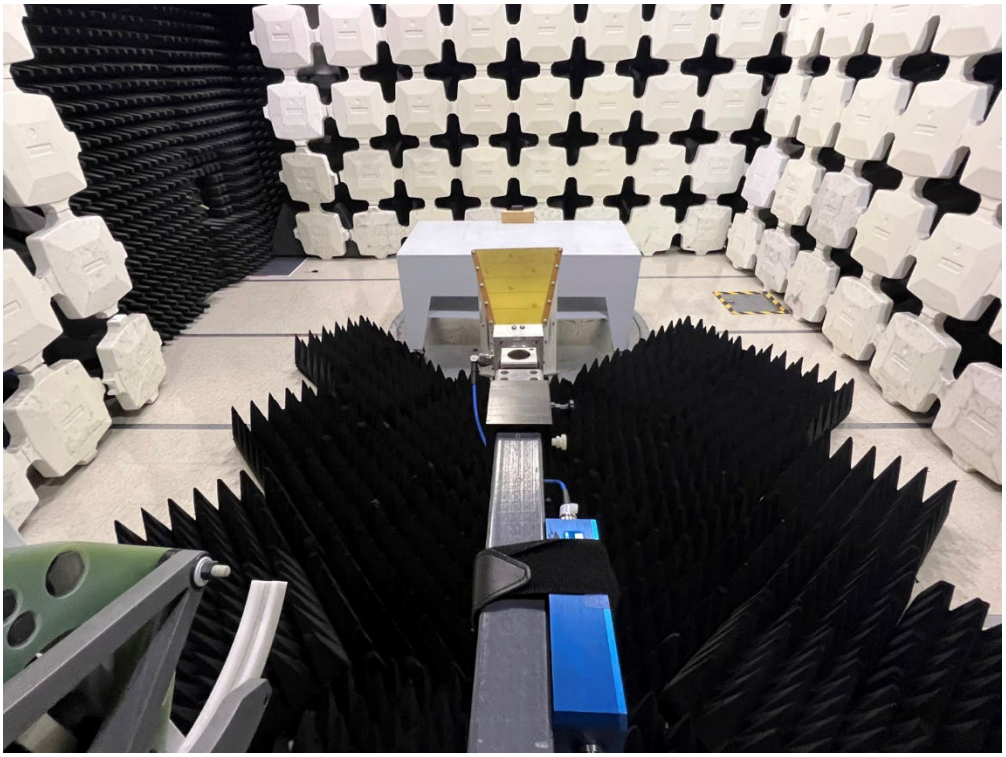
EUT Orientation: Y

6.5 Setup Photos:

Radiated Emissions (1 - 18 GHz), Charging Mode



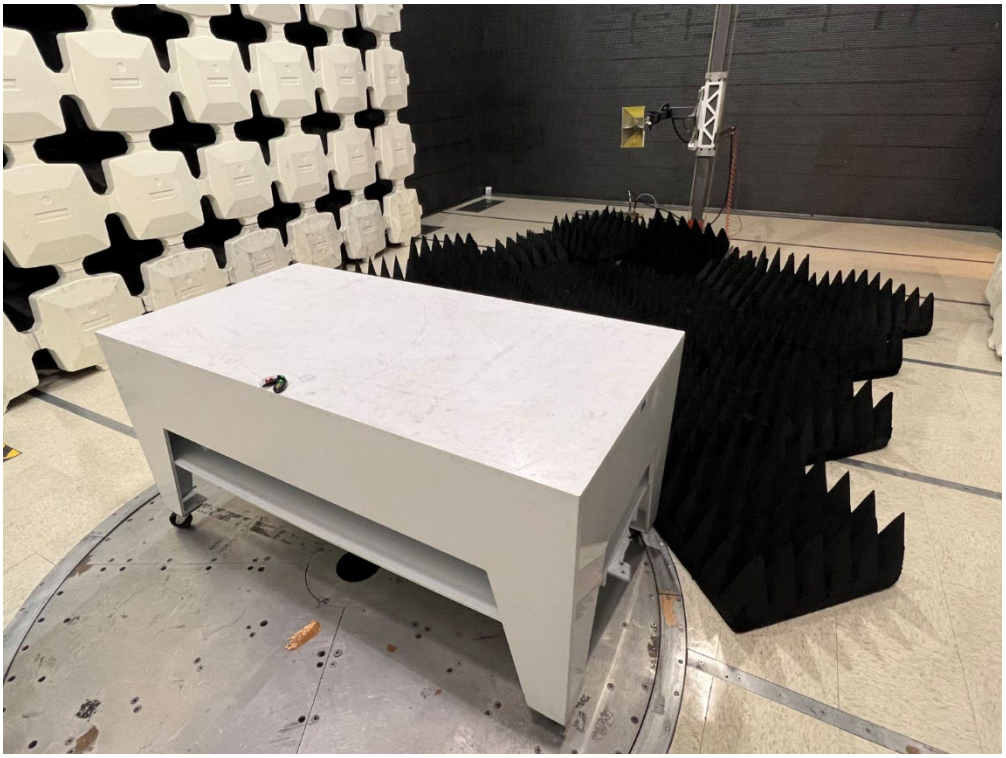
EUT Orientation: Z



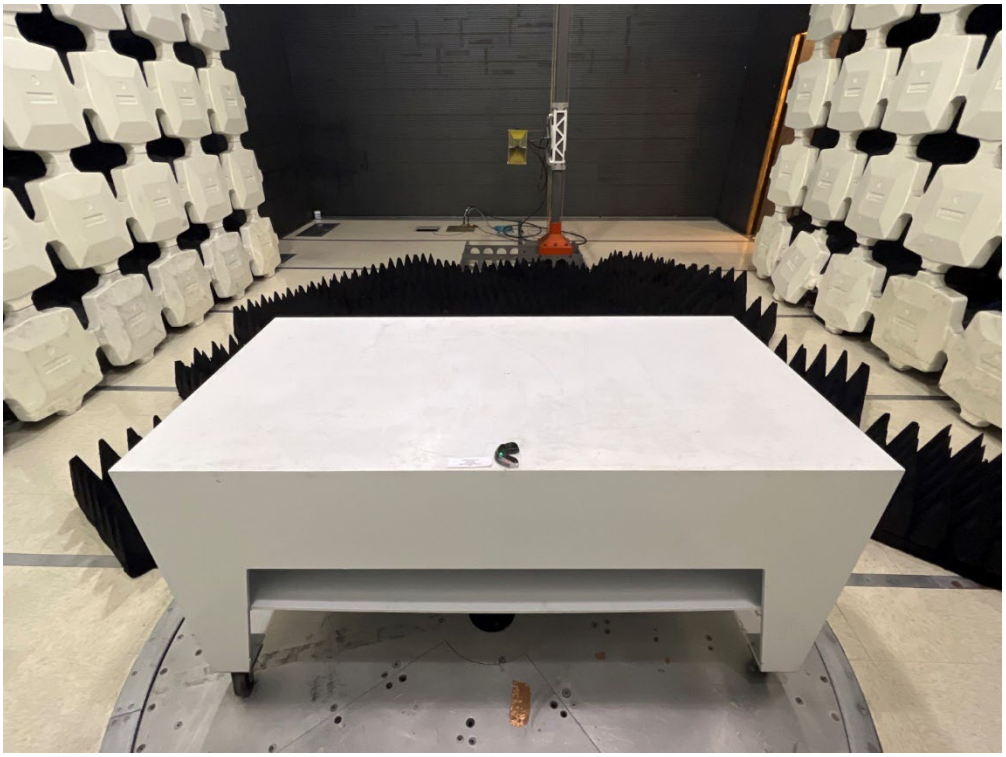
View from Antenna side

6.5 Setup Photos:

Radiated Emissions (1 - 18 GHz), Battery/Game Mode



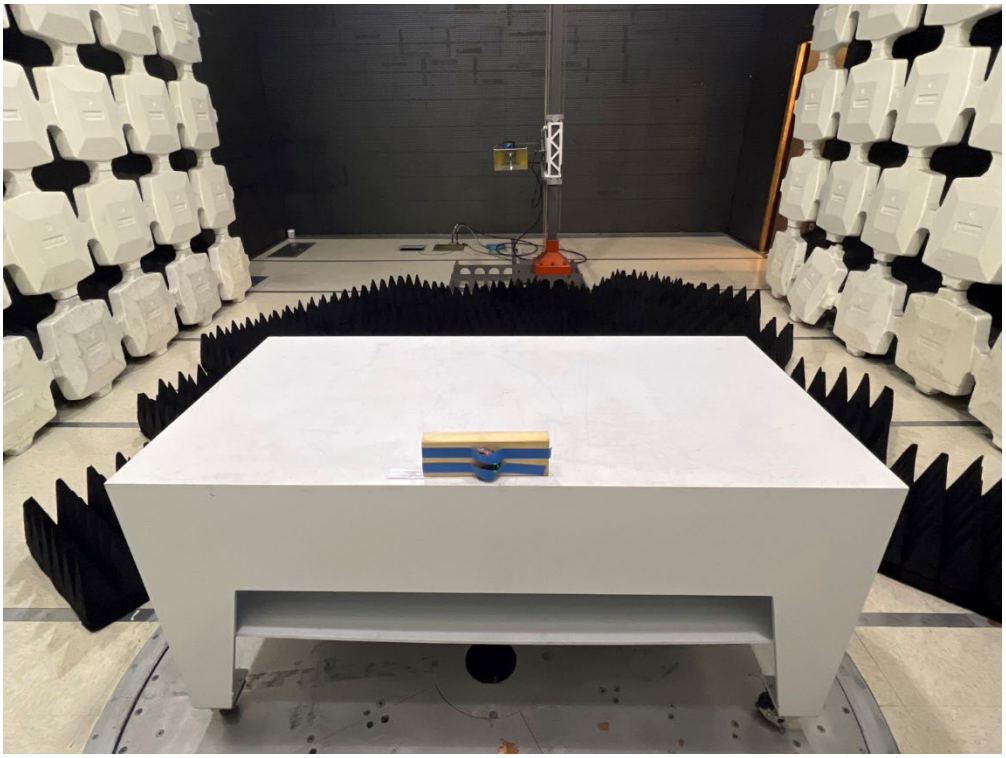
EUT Orientation: X



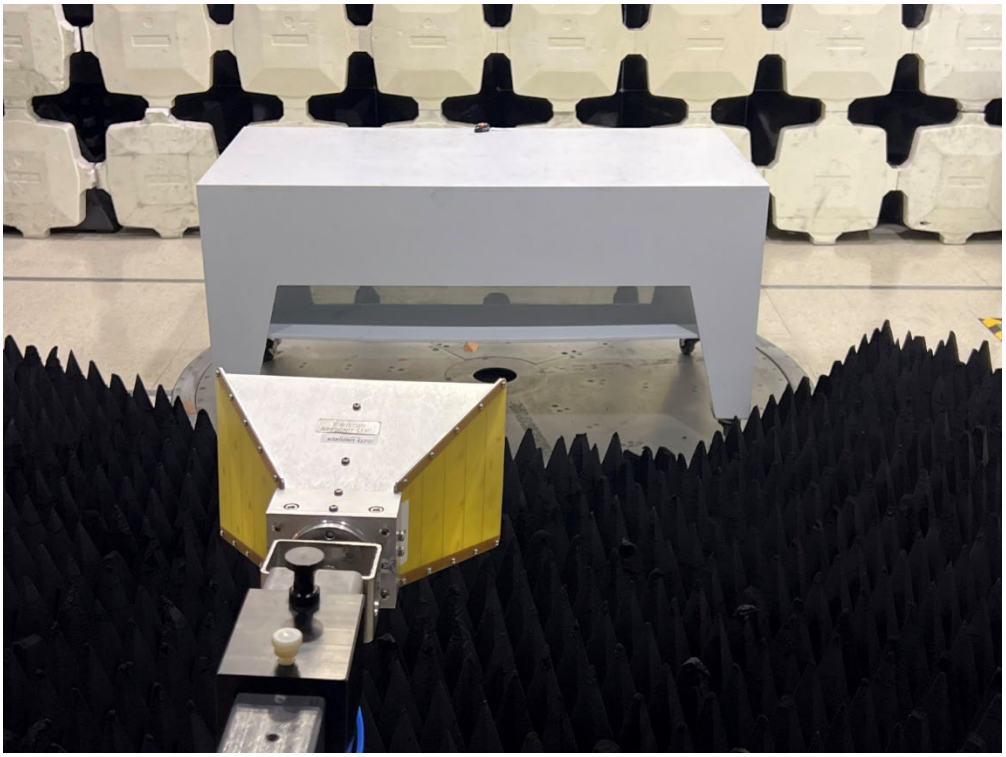
EUT Orientation: Y

6.5 Setup Photos:

Radiated Emissions (1 - 18 GHz), Battery/Game Mode



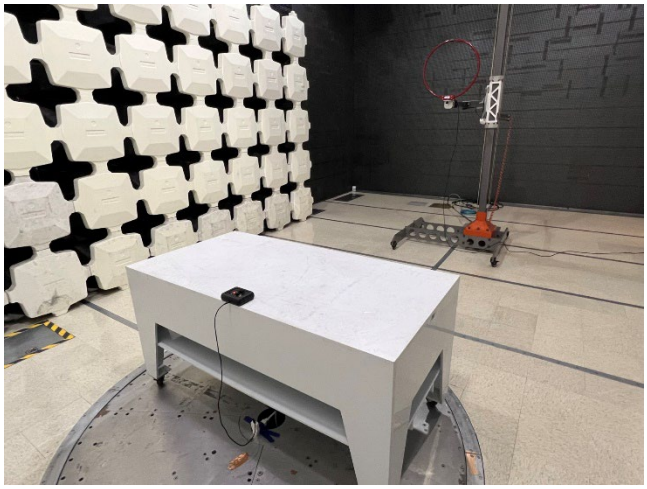
EUT Orientation: Z



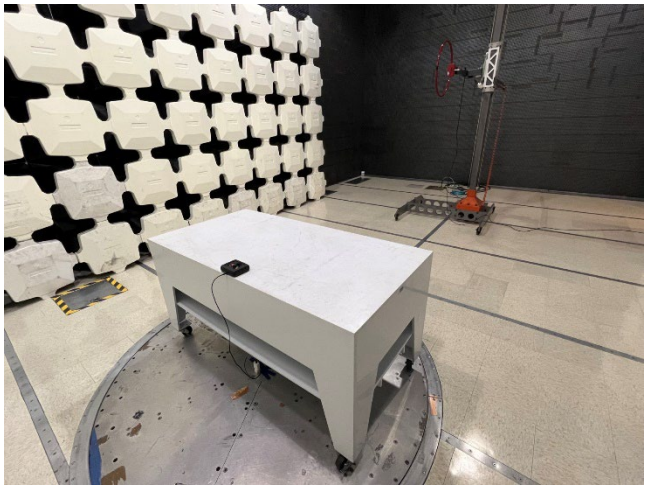
View from Antenna side

6.5 Setup Photos:

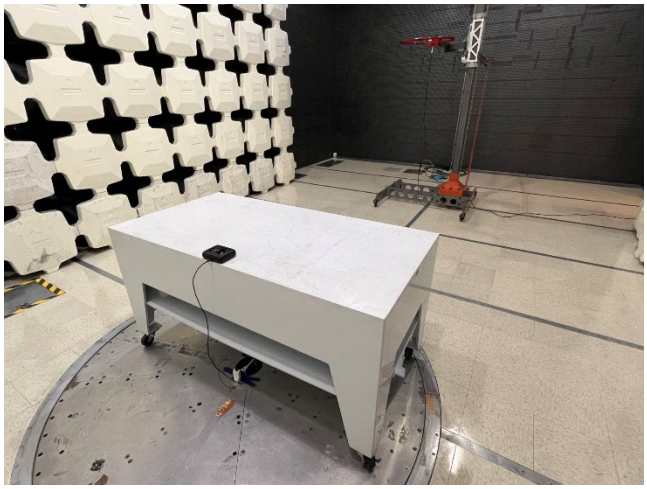
Radiated Emissions (9 kHz - 30 MHz), Charging Mode



Antenna Polarization: Parallel



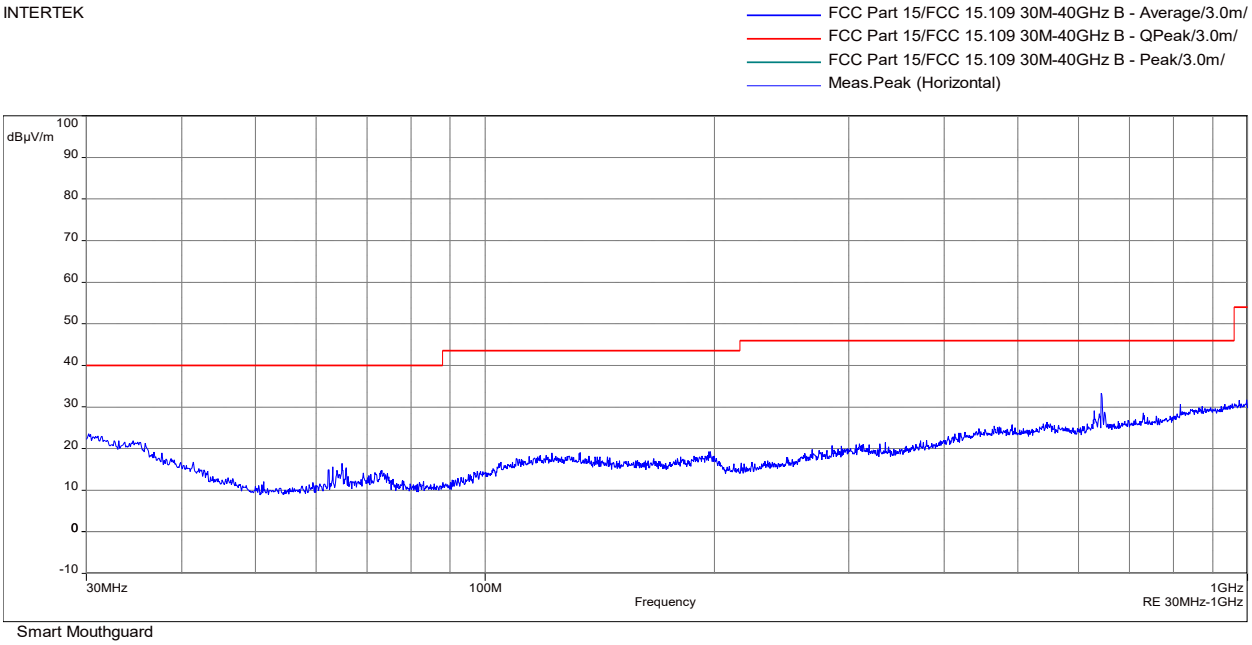
Antenna Polarization: Perpendicular



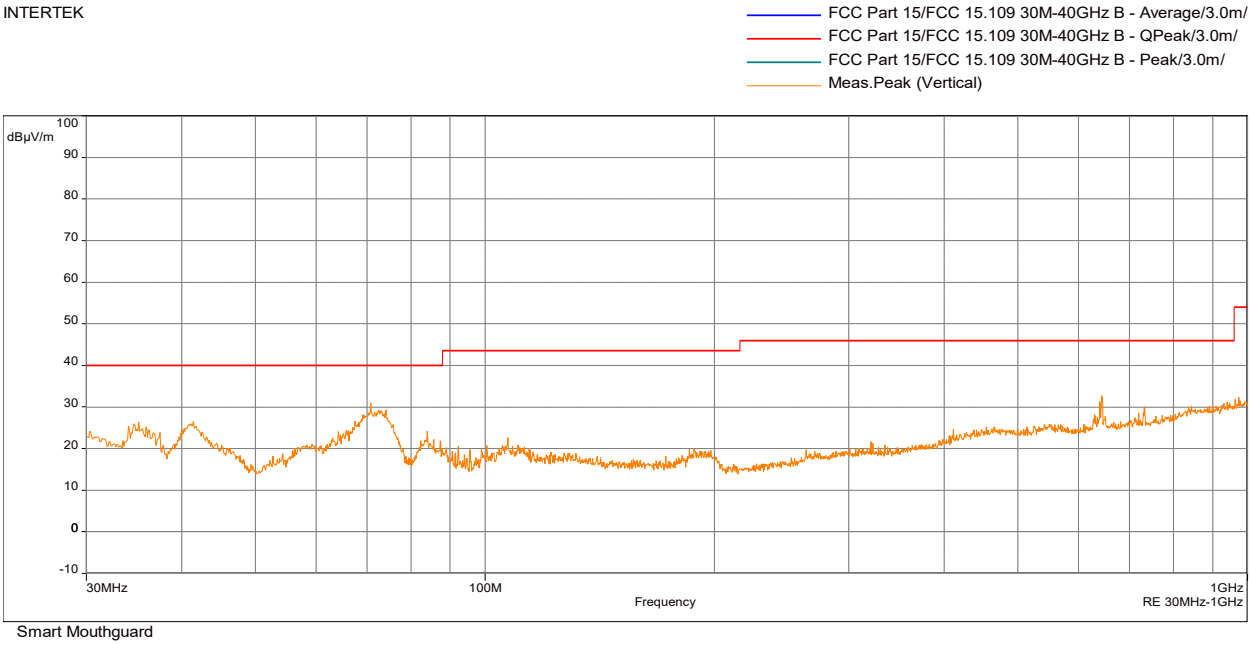
Antenna Polarization: Ground Parallel

6.6 Plots (FCC Part 15, 30 MHz – 1 GHz):

EUT Orientation: X, Charging Mode



Peak Scan - Horizontal Polarization



Peak Scan - Vertical Polarization

6.7 Data (FCC Part 15, 30 MHz – 1 GHz, EUT Orientation X, Charging Mode):

Test Personnel:	Ali I. Yürekli	Test Date:	04/29/2024
Supervising /Reviewing Engineer: (Where Applicable)	N/A		
Product Standard:	FCC Part 15 Subpart B	Limit Applied:	FCC §15.109 Class B
Input Voltage:	120 VAC		
		Ambient Temperature:	20.3 ºC
Pretest Verification	Yes	Relative Humidity:	55.9 %
		Atmospheric Pressure:	990.7 mbar

FCC Part 15 Subpart B Class B, Radiated Emissions (QuasiPeak Horizontal)

Frequency (MHz)	QP Level (dBµV/m)	Limit (dBµV/m)	QP Margin (dB)	Azimuth (°)	Height (m)	Correction Factor (dB)
30.194	14.61	40.00	-25.39	104.25	1.44	-5.47
64.920	1.57	40.00	-38.43	94.25	1.07	-17.56
196.646	11.42	43.50	-32.08	86.75	1.00	-12.15
643.137	28.05	46.00	-17.95	116.75	1.51	-4.16
997.187	19.05	54.00	-34.95	52.25	3.37	0.97

Detectors/Bandwidths (Det/RBW/VBW)= QP/120kHz/500kHz

FCC Part 15 Subpart B Class B, Radiated Emissions (QuasiPeak Vertical)

Frequency (MHz)	QP Level (dBµV/m)	Limit (dBµV/m)	QP Margin (dB)	Azimuth (°)	Height (m)	Correction Factor (dB)
35.141	15.27	40.00	-24.73	358.25	1.20	-8.90
41.446	22.61	40.00	-17.39	148	1.02	-13.55
70.837 *	25.71	40.00	-14.29	199.5	1.02	-17.38
84.029	19.17	40.00	-20.83	116.25	1.02	-18.10
640.033	23.17	46.00	-22.83	96.75	2.39	-4.16
643.913	29.31	46.00	-16.69	183	1.02	-4.17

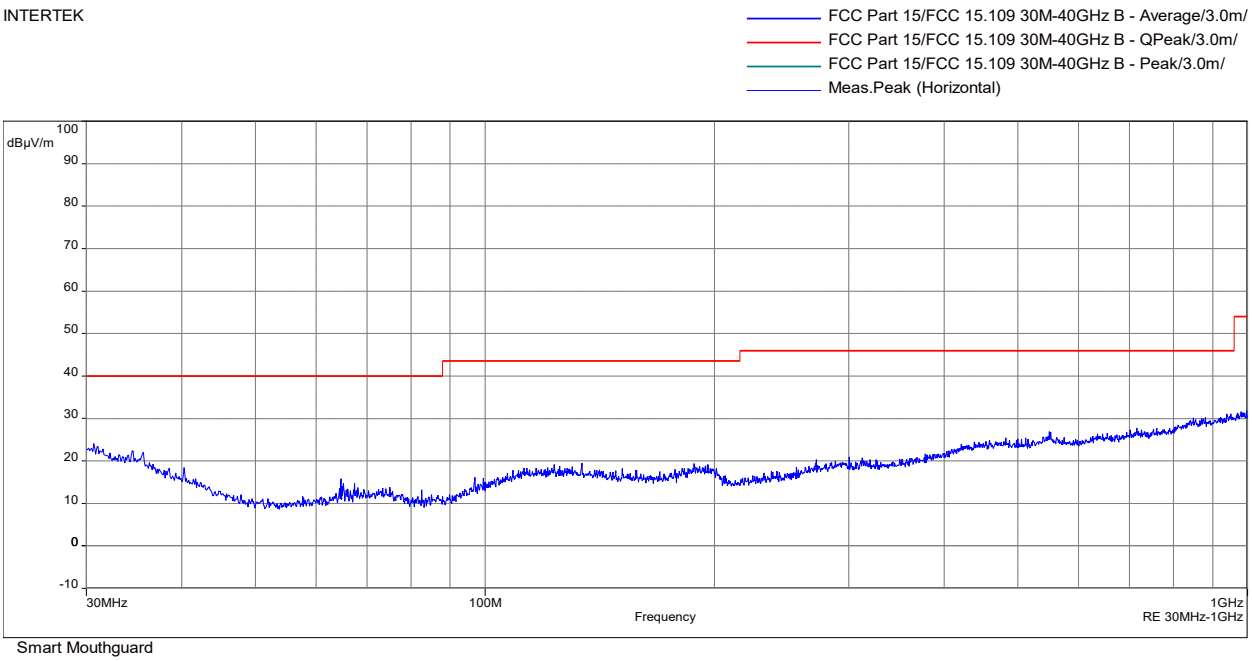
Detectors/Bandwidths (Det/RBW/VBW)= QP/120kHz/500kHz

Test Result: (*)The **EUT PASSED** Radiated Emissions test with –14.29 dB margin at 70.837 MHz.

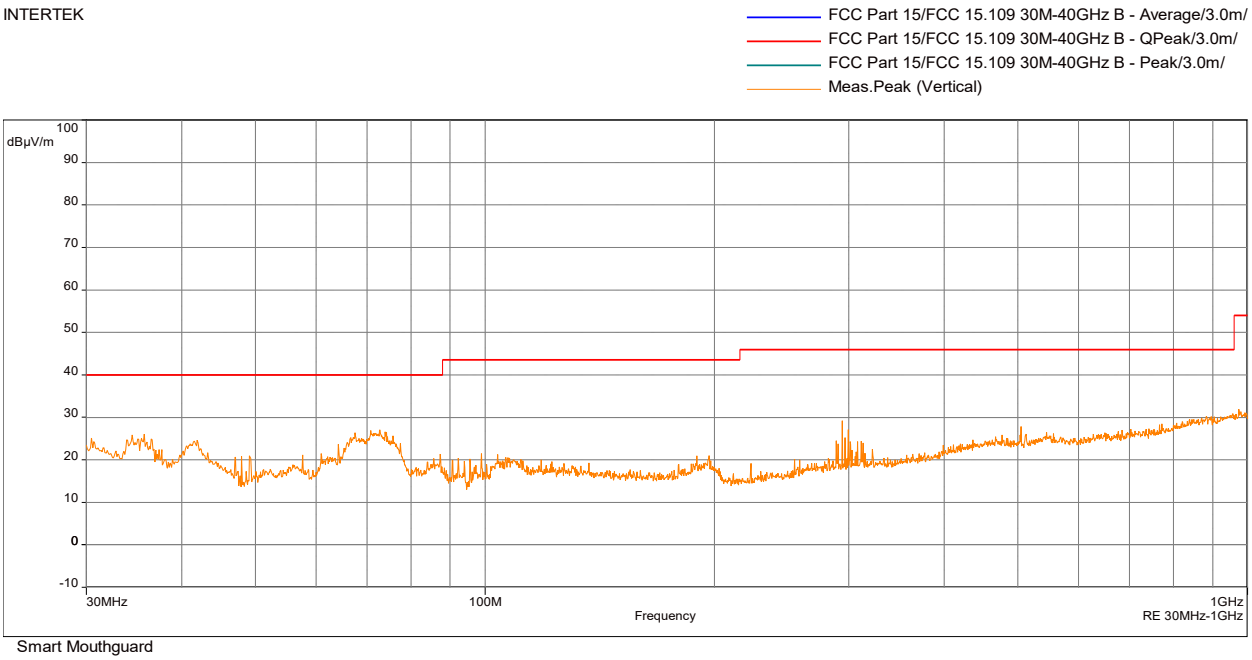
Deviations, Additions, or Exclusions: None

6.8 Plots (FCC Part 15, 30 MHz – 1 GHz):

EUT Orientation: Y, Charging Mode



Peak Scan - Horizontal Polarization



Peak Scan - Vertical Polarization

6.9 Data (FCC Part 15, 30 MHz – 1 GHz, EUT Orientation Y, Charging Mode):

Test Personnel:	Ali I. Yürekli	Test Date:	04/29/2024
Supervising /Reviewing Engineer: (Where Applicable)	N/A		
Product Standard:	FCC Part 15 Subpart B	Limit Applied:	FCC §15.109 Class B
Input Voltage:	120 VAC		
		Ambient Temperature:	20.3 ºC
Pretest Verification	Yes	Relative Humidity:	55.9 %
		Atmospheric Pressure:	990.7 mbar

FCC Part 15 Subpart B Class B, Radiated Emissions (QuasiPeak Horizontal)						
Frequency (MHz)	QP Level (dBµV/m)	Limit (dBµV/m)	QP Margin (dB)	Azimuth (°)	Height (m)	Correction Factor (dB)
30.679	14.30	40.00	-25.70	38.25	3.35	-5.72
64.726	1.55	40.00	-38.45	85.50	1.39	-17.58
133.984	7.82	43.50	-35.68	343.50	1.00	-11.42
997.09	18.99	54.00	-35.01	256.50	2.31	0.97
Detectors/Bandwidths (Det/RBW/VBW)= QP/120kHz/500kHz						

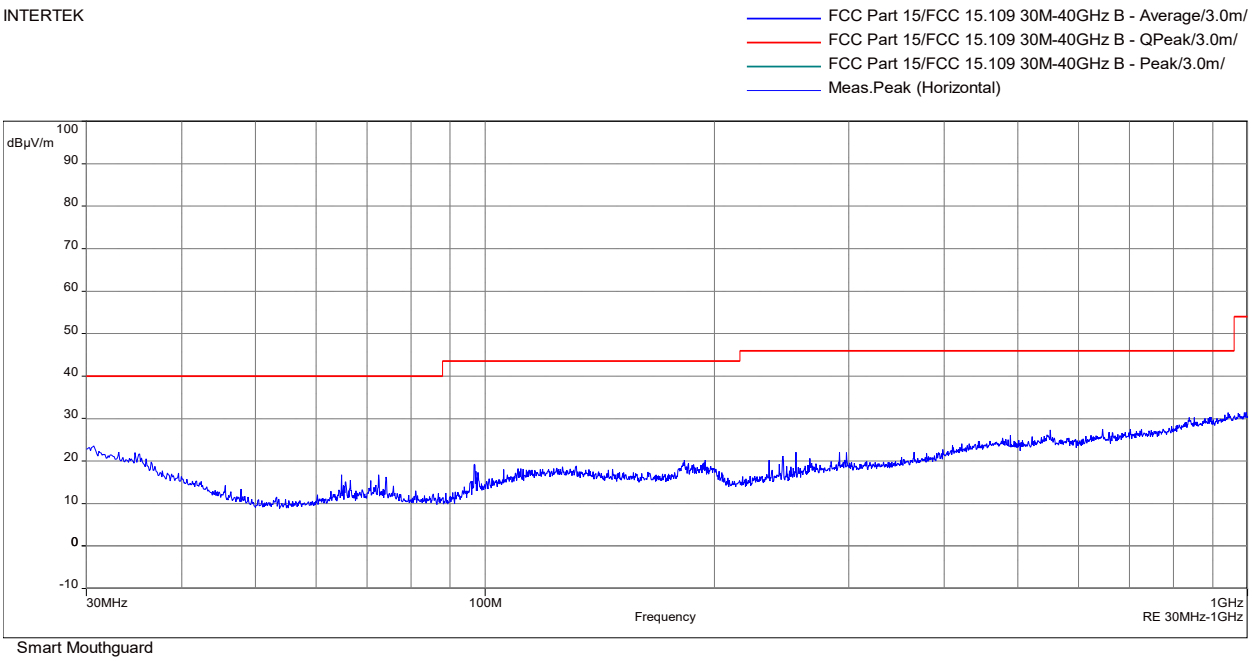
FCC Part 15 Subpart B Class B, Radiated Emissions (QuasiPeak Vertical)						
Frequency (MHz)	QP Level (dBµV/m)	Limit (dBµV/m)	QP Margin (dB)	Azimuth (°)	Height (m)	Correction Factor (dB)
35.723	15.74	40.00	-24.26	112	1.40	-9.36
41.931	19.48	40.00	-20.52	226	1.22	-13.93
49.109	10.37	40.00	-29.63	359.5	1.13	-17.91
72.680 *	23.48	40.00	-16.52	-0.25	1.22	-17.41
294.034	9.14	46.00	-36.86	278	3.78	-10.79
299.369	10.87	46.00	-35.13	308.75	2.68	-10.75
Detectors/Bandwidths (Det/RBW/VBW)= QP/120kHz/500kHz						

Test Result: (*)The **EUT PASSED** Radiated Emissions test with –16.52 dB margin at 72.680 MHz.

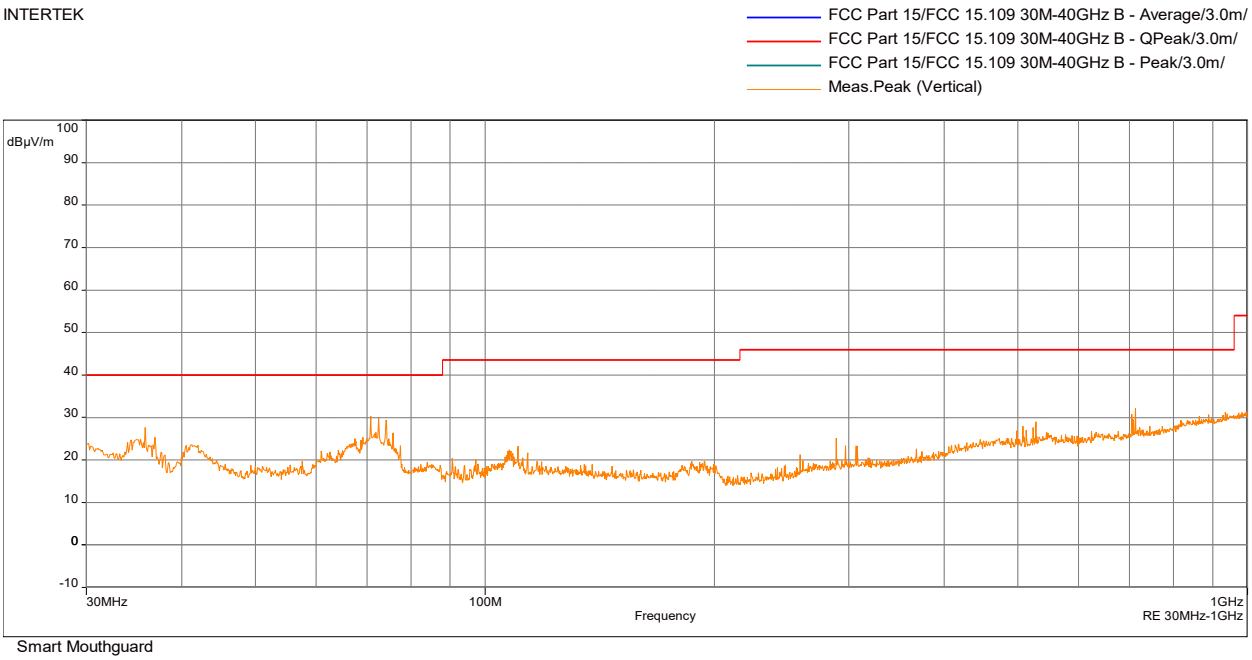
Deviations, Additions, or Exclusions: None

6.10 Plots (FCC Part 15, 30 MHz – 1 GHz):

EUT Orientation: Z, Charging Mode



Peak Scan - Horizontal Polarization



Peak Scan - Vertical Polarization

6.11 Data (FCC Part 15, 30 MHz – 1 GHz, EUT Orientation Z, Charging Mode):

Test Personnel:	Ali I. Yürekli	Test Date:	04/29/2024
Supervising /Reviewing Engineer: (Where Applicable)	N/A		
Product Standard:	FCC Part 15 Subpart B	Limit Applied:	FCC §15.109 Class B
Input Voltage:	120 VAC		
		Ambient Temperature:	20.3 ºC
Pretest Verification	Yes	Relative Humidity:	55.9 %
		Atmospheric Pressure:	990.7 mbar

FCC Part 15 Subpart B Class B, Radiated Emissions (QuasiPeak Horizontal)						
Frequency (MHz)	QP Level (dBµV/m)	Limit (dBµV/m)	QP Margin (dB)	Azimuth (°)	Height (m)	Correction Factor (dB)
30.679	14.69	40.00	-25.31	280.50	1.00	-5.72
64.823	1.93	40.00	-38.07	301.25	1.13	-17.57
72.486	11.37	40.00	-28.63	189.75	3.84	-17.40
194.512	16.15	43.50	-27.35	208.50	1.69	-12.54
255.622	7.62	46.00	-38.38	215.75	1.09	-12.51
996.217	19.15	54.00	-34.85	294.75	2.43	0.96
Detectors/Bandwidths (Det/RBW/VBW)= QP/120kHz/500kHz						

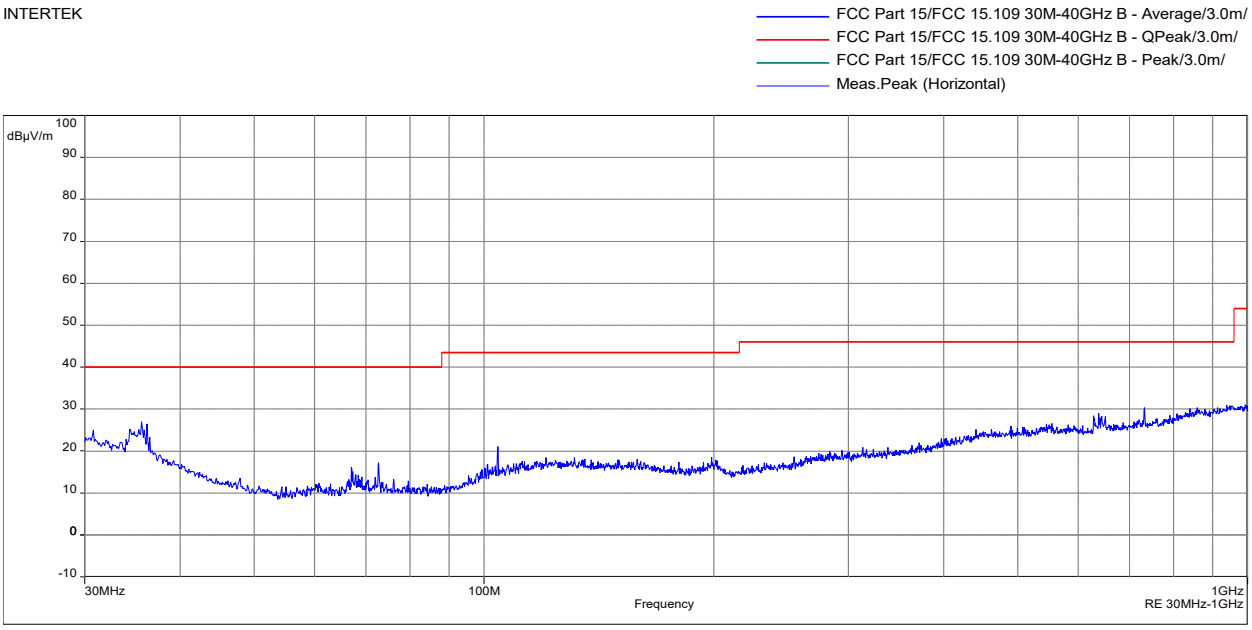
FCC Part 15 Subpart B Class B, Radiated Emissions (QuasiPeak Vertical)						
Frequency (MHz)	QP Level (dBµV/m)	Limit (dBµV/m)	QP Margin (dB)	Azimuth (°)	Height (m)	Correction Factor (dB)
35.820	15.32	40.00	-24.68	163.25	1.28	-9.44
41.252	19.80	40.00	-20.20	146.50	1.05	-13.41
70.837 *	23.78	40.00	-16.22	255.50	1.00	-17.38
527.610	13.11	46.00	-32.89	66.75	2.35	-6.01
705.314	15.60	46.00	-30.40	278.75	1.56	-3.59
713.268	15.89	46.00	-30.11	323.00	3.21	-3.37
Detectors/Bandwidths (Det/RBW/VBW)= QP/120kHz/500kHz						

Test Result: (*)The **EUT PASSED** Radiated Emissions test with –16.22 dB margin at 70.837 MHz.

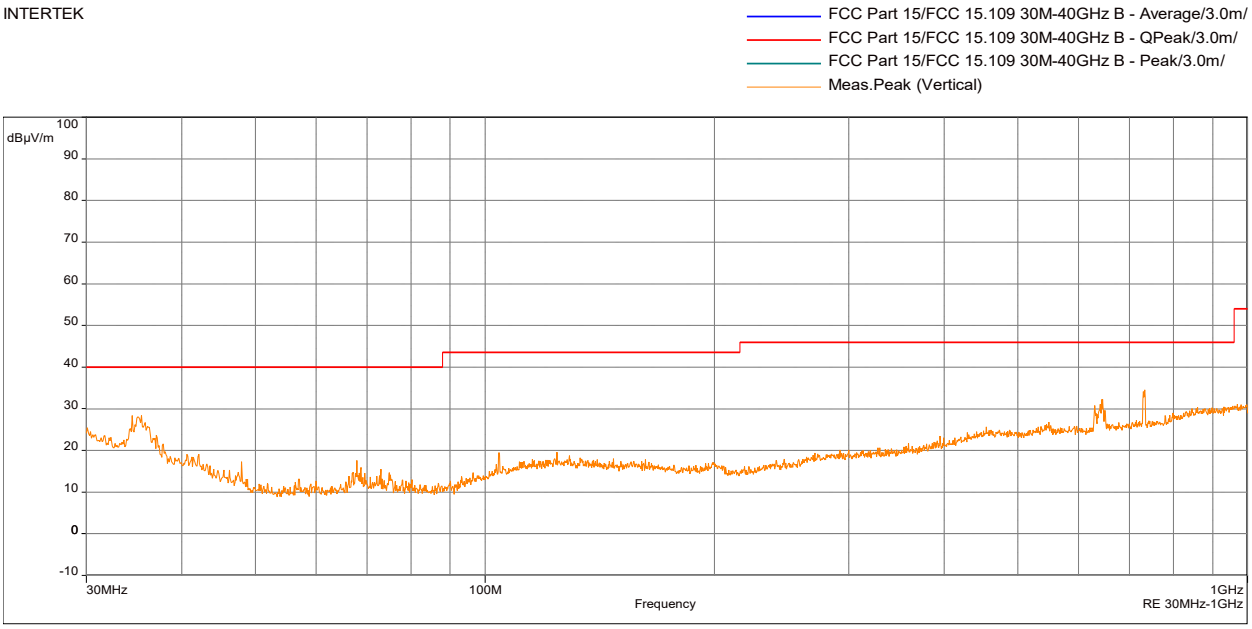
Deviations, Additions, or Exclusions: None

6.12 Plots (FCC Part 15, 30 MHz – 1 GHz):

EUT Orientation: X, Battery/Game Mode



Peak Scan - Horizontal Polarization



Peak Scan - Vertical Polarization

6.13 Data (FCC Part 15, 30 MHz – 1 GHz, EUT Orientation X, Battery/Game Mode):

Test Personnel:	Ali I. Yürekli	Test Date:	01/05/2024
Supervising /Reviewing Engineer: (Where Applicable)	N/A		
Product Standard:	FCC Part 15 Subpart B	Limit Applied:	FCC §15.109 Class B
Input Voltage:	Battery	Ambient Temperature:	17.2 ºC
		Relative Humidity:	44.3 %
Pretest Verification	Yes	Atmospheric Pressure:	998.8 mbar

FCC Part 15 Subpart B Class B, Radiated Emissions (QuasiPeak Horizontal)						
Frequency (MHz)	QP Level (dBµV/m)	Limit (dBµV/m)	QP Margin (dB)	Azimuth (°)	Height (m)	Correction Factor (dB)
35.626	15.44	40	-24.56	131.25	1.03	-8.92
72.777	1.96	40	-38.04	111.75	1.46	-17.53
104.205	14.72	43.5	-28.78	175.75	1.05	-13.90
732.862 *	24.95	46	-21.05	29.50	1.76	-3.28
993.695	18.96	54	-35.04	58.75	2.38	0.54
35.626	15.44	40	-24.56	131.25	1.03	-8.92
Detectors/Bandwidths (Det/RBW/VBW)= QP/120kHz/500kHz						

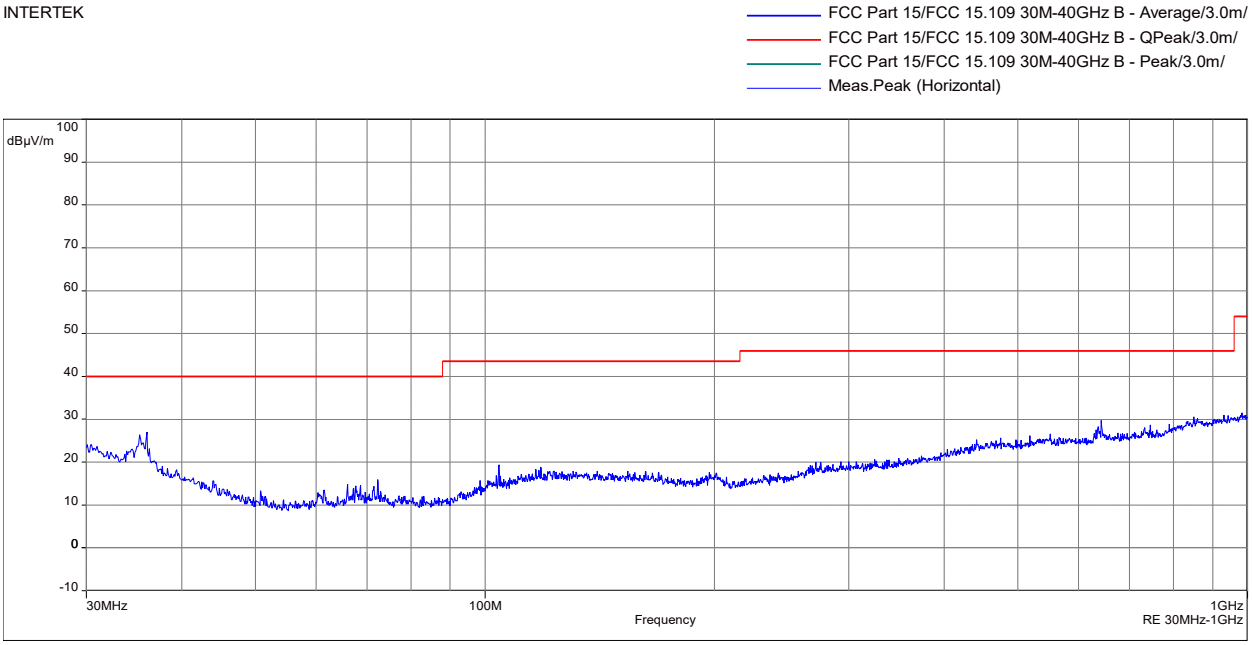
FCC Part 15 Subpart B Class B, Radiated Emissions (QuasiPeak Vertical)						
Frequency (MHz)	QP Level (dBµV/m)	Limit (dBµV/m)	QP Margin (dB)	Azimuth (°)	Height (m)	Correction Factor (dB)
35.432	18.01	40	-21.99	357	1.22	-8.77
641.294	16.50	46	-29.50	73	1.22	-4.35
643.234	16.33	46	-29.67	126.25	1.53	-4.27
645.756	17.34	46	-28.66	150.25	1.97	-4.26
730.146	16.95	46	-29.05	36.25	1.84	-3.28
733.444	16.58	46	-29.42	144.75	1.22	-3.28
Detectors/Bandwidths (Det/RBW/VBW)= QP/120kHz/500kHz						

Test Result: (*)The **EUT PASSED** Radiated Emissions test with –21.05 dB margin at 732.862 MHz.

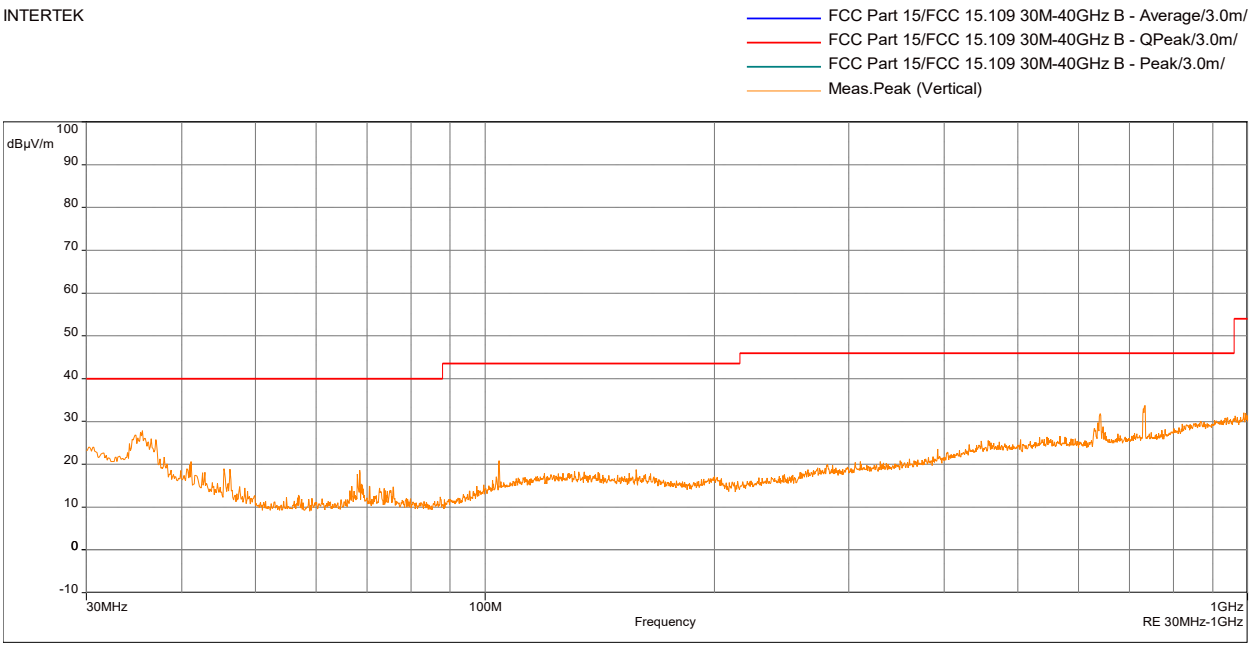
Deviations, Additions, or Exclusions: None

6.15 Plots (FCC Part 15, 30 MHz – 1 GHz):

EUT Orientation: Y, Battery/Game Mode



Peak Scan - Horizontal Polarization



Peak Scan - Vertical Polarization

6.16 Data (FCC Part 15, 30 MHz – 1 GHz, EUT Orientation Y, Battery/Game Mode):

Test Personnel:	Ali I. Yürekli	Test Date:	01/05/2024
Supervising /Reviewing Engineer: (Where Applicable)	N/A		
Product Standard:	FCC Part 15 Subpart B	Limit Applied:	FCC §15.109 Class B
Input Voltage:	Battery		
		Ambient Temperature:	17.2 ºC
Pretest Verification	Yes	Relative Humidity:	44.3 %
		Atmospheric Pressure:	998.8 mbar

FCC Part 15 Subpart B Class B, Radiated Emissions (QuasiPeak Horizontal)						
Frequency (MHz)	QP Level (dBµV/m)	Limit (dBµV/m)	QP Margin (dB)	Azimuth (°)	Height (m)	Correction Factor (dB)
36.014	15.75	40	-24.25	119.25	1	-9.24
72.292	1.92	40	-38.08	311.5	2.04	-17.54
104.302	17.53	43.5	-25.97	273.5	1.02	-13.87
643.04	19.98	46	-26.02	37	3.37	-4.25
983.704	19.09	54	-34.91	323.75	1.2	0.47
Detectors/Bandwidths (Det/RBW/VBW)= QP/120kHz/500kHz						

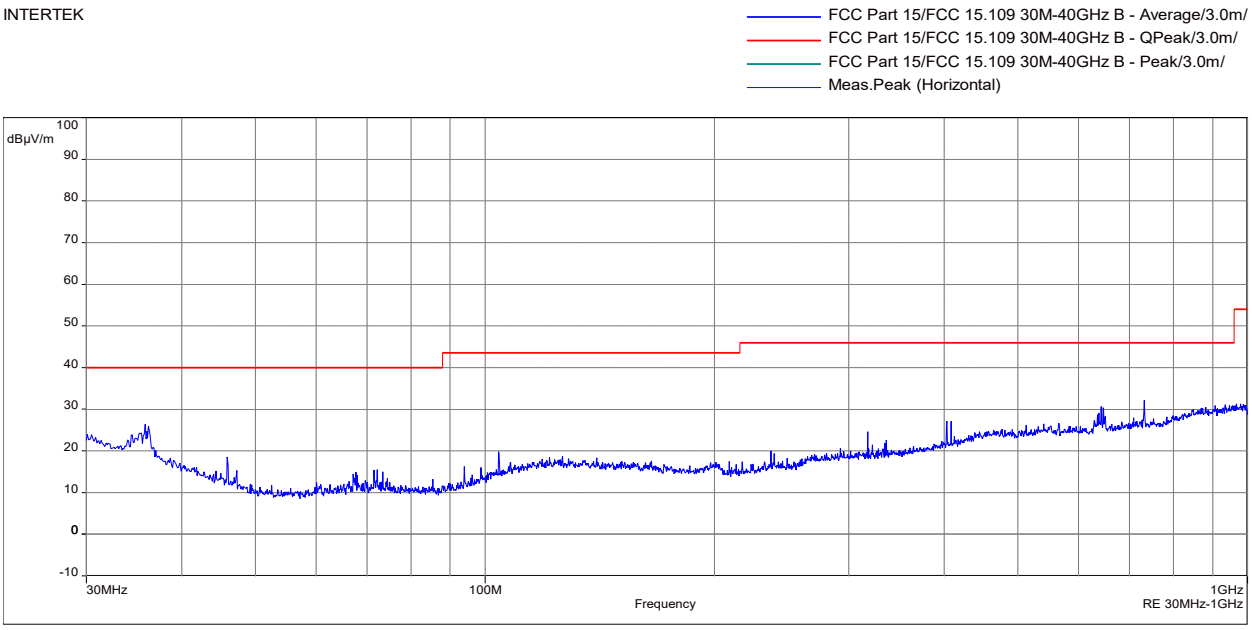
FCC Part 15 Subpart B Class B, Radiated Emissions (QuasiPeak Vertical)						
Frequency (MHz)	QP Level (dBµV/m)	Limit (dBµV/m)	QP Margin (dB)	Azimuth (°)	Height (m)	Correction Factor (dB)
35.529	18.24	40	-21.76	110.25	1.28	-8.84
45.423	5.44	40	-34.56	185.25	1.29	-15.69
68.509	2.90	40	-37.10	300.25	1.26	-17.68
640.615	24.42	46	-21.58	359.75	1.53	-4.31
733.541 *	29.42	46	-16.58	108.5	1.05	-3.27
988.651	19.04	54	-34.96	207.5	1.58	0.56
Detectors/Bandwidths (Det/RBW/VBW)= QP/120kHz/500kHz						

Test Result: (*)The **EUT PASSED** Radiated Emissions test with –16.58 dB margin at 733.541 MHz.

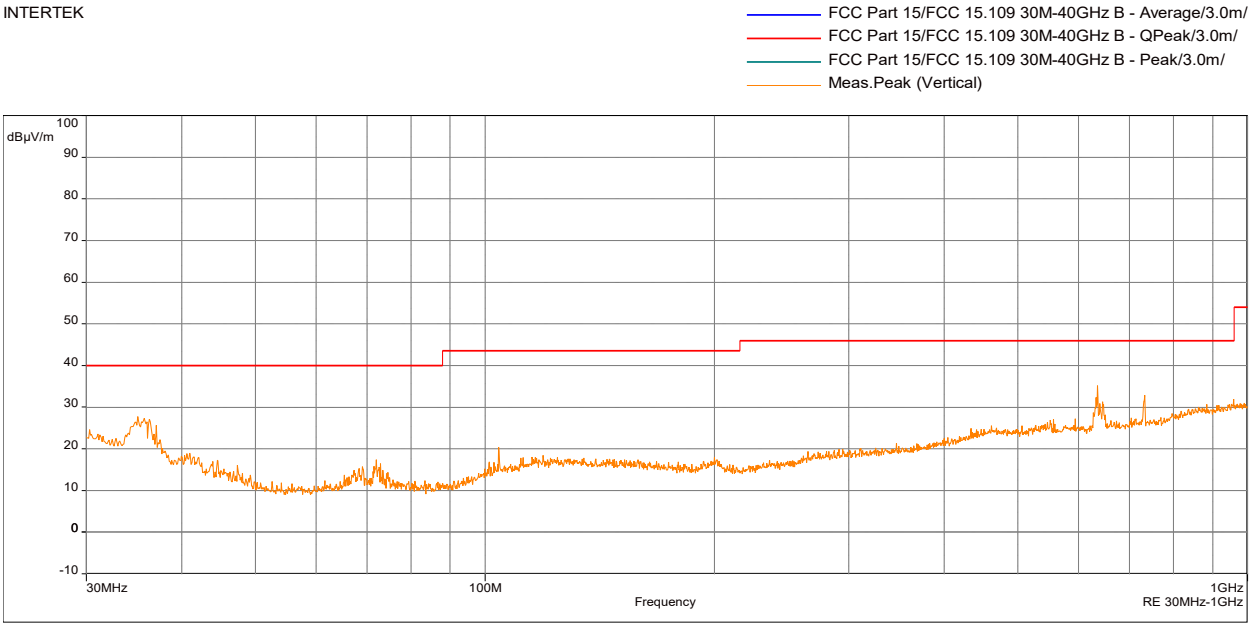
Deviations, Additions, or Exclusions: None

6.17 Plots (FCC Part 15, 30 MHz – 1 GHz):

EUT Orientation: Z, Battery/Game Mode



Peak Scan - Horizontal Polarization



Peak Scan - Vertical Polarization

6.18 Data (FCC Part 15, 30 MHz – 1 GHz, EUT Orientation Z, Battery/Game Mode):

Test Personnel:	Ali I. Yürekli	Test Date:	01/05/2024
Supervising /Reviewing Engineer: (Where Applicable)	N/A		
Product Standard:	FCC Part 15 Subpart B	Limit Applied:	FCC §15.109 Class B
Input Voltage:	Battery	Ambient Temperature:	17.2 ºC
		Relative Humidity:	44.3 %
Pretest Verification	Yes	Atmospheric Pressure:	998.8 mbar

FCC Part 15 Subpart B Class B, Radiated Emissions (QuasiPeak Horizontal)						
Frequency (MHz)	QP Level (dBµV/m)	Limit (dBµV/m)	QP Margin (dB)	Azimuth (°)	Height (m)	Correction Factor (dB)
35.820	15.70	40	-24.30	44.25	1.00	-9.08
403.256	10.43	46	-35.57	330.75	1.69	-8.24
408.591	10.55	46	-35.45	175.75	2.56	-8.06
642.652	18.69	46	-27.31	95.25	3.14	-4.28
646.726	22.23	46	-23.77	124	2.12	-4.30
731.892	20.91	46	-25.09	206	1.46	-3.28
Detectors/Bandwidths (Det/RBW/VBW)= QP/120kHz/500kHz						

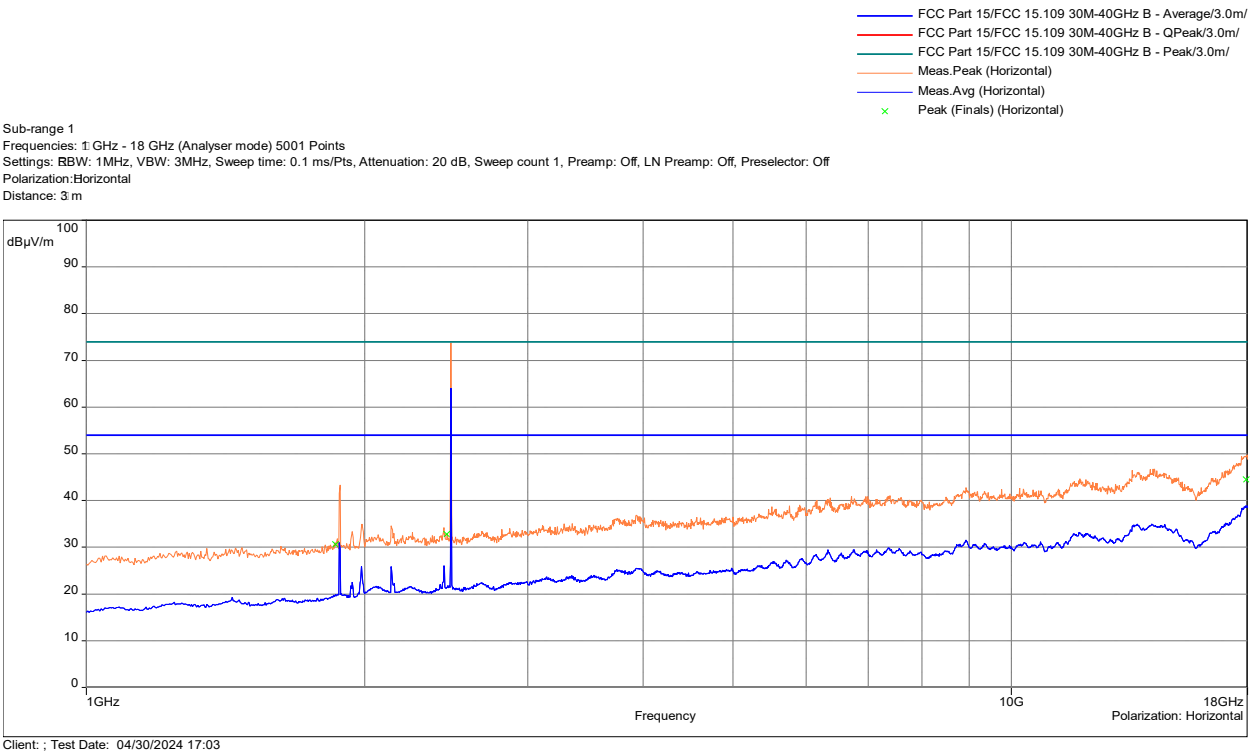
FCC Part 15 Subpart B Class B, Radiated Emissions (QuasiPeak Vertical)						
Frequency (MHz)	QP Level (dBµV/m)	Limit (dBµV/m)	QP Margin (dB)	Azimuth (°)	Height (m)	Correction Factor (dB)
35.044	16.40	40	-23.60	190.75	1.41	-8.46
633.243	20.70	46	-25.30	37.50	2.06	-4.46
635.959	21.43	46	-24.57	345.75	1.02	-4.36
645.077	20.96	46	-25.04	360.00	1.10	-4.34
732.668 *	25.96	46	-20.04	115.50	1.60	-3.28
958.678	18.81	46	-27.19	277.25	1.37	0.27
Detectors/Bandwidths (Det/RBW/VBW)= QP/120kHz/500kHz						

Test Result: (*)The **EUT PASSED** Radiated Emissions test with –20.04 dB margin at 732.668 MHz.

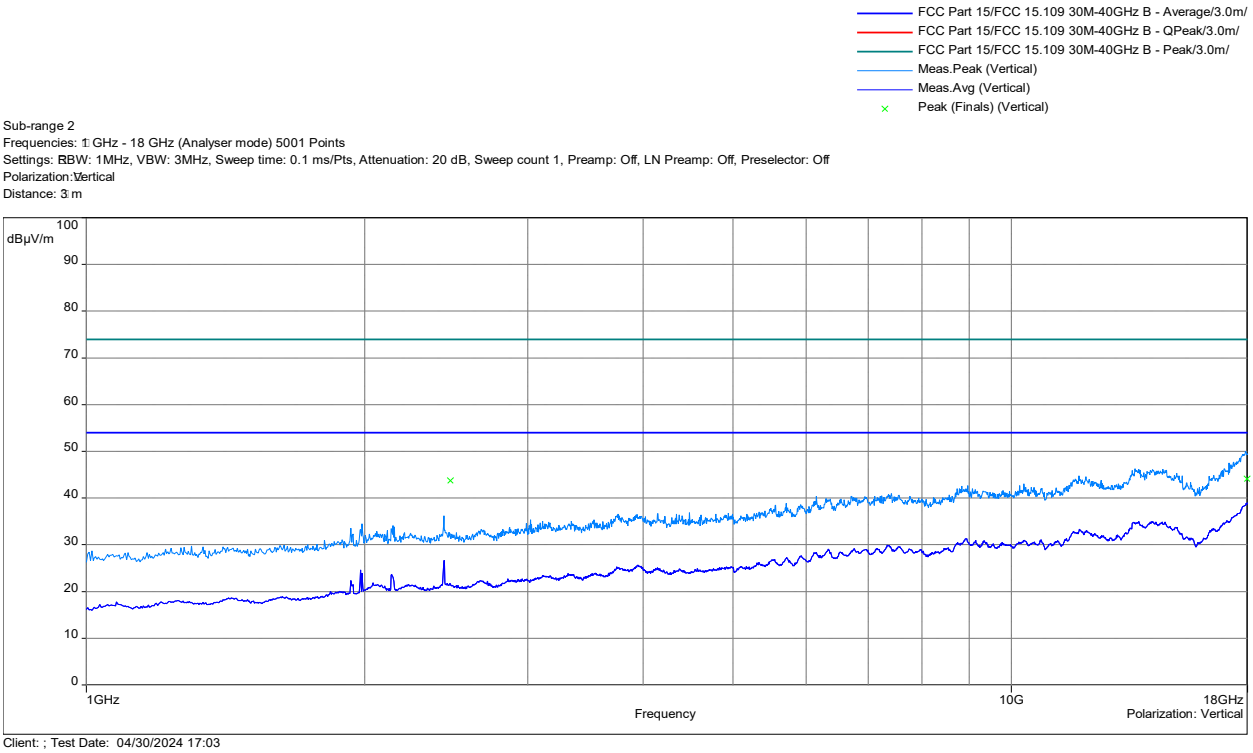
Deviations, Additions, or Exclusions: None

6.19 Plots (FCC Part 15, 1-18 GHz):

EUT Orientation: X, Charging Mode



Peak Scan - Horizontal Polarization



Peak Scan - Vertical Polarization

6.20 Data (FCC Part 15, 1-18 GHz, EUT Orientation X, Charging Mode):

Test Personnel:	Ali I. Yürekli	Test Date:	04/30/2024
Supervising /Reviewing Engineer: (Where Applicable)	N/A		
Product Standard:	FCC Part 15 Subpart B	Limit Applied:	FCC §15.109 Class B
Input Voltage:	120 VAC		
		Ambient Temperature:	21.3 ºC
Pretest Verification	Yes	Relative Humidity:	55.7 %
		Atmospheric Pressure:	989.4 mbar

FCC Part 15 Subpart B Class B, Radiated Emissions (Horizontal)									
Frequency (MHz)	Average Level (dBµV/m)	Average Limit (dBµV/m)	Average Margin (dB)	Peak Level (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)	Azimuth (º)	Height (m)	Correction Factor (dB)
1860.2	17.37	54.00	-36.63	30.58	74.00	-43.42	302.75	2.61	-22.30
2451.0	19.01	54.00	-34.99	32.83	74.00	-41.17	132.75	2.14	-20.13
17948.0	31.06	54.00	-22.94	44.50	74.00	-29.50	327.50	1.74	3.05
Detectors/Bandwidths (Det/RBW/VBW) = 1MHz/3MHz									

FCC Part 15 Subpart B Class B, Radiated Emissions (Vertical)									
Frequency (MHz)	Average Level (dBµV/m)	Average Limit (dBµV/m)	Average Margin (dB)	Peak Level (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)	Azimuth (º)	Height (m)	Correction Factor (dB)
2477.2	18.85	54.00	-35.15	43.69	74.00	-30.31	296.25	1.83	-20.12
17975.0 *	31.32	54.00	-22.68	44.12	74.00	-29.88	360.75	2.85	3.16
Detectors/Bandwidths (Det/RBW/VBW) = 1MHz/3MHz									

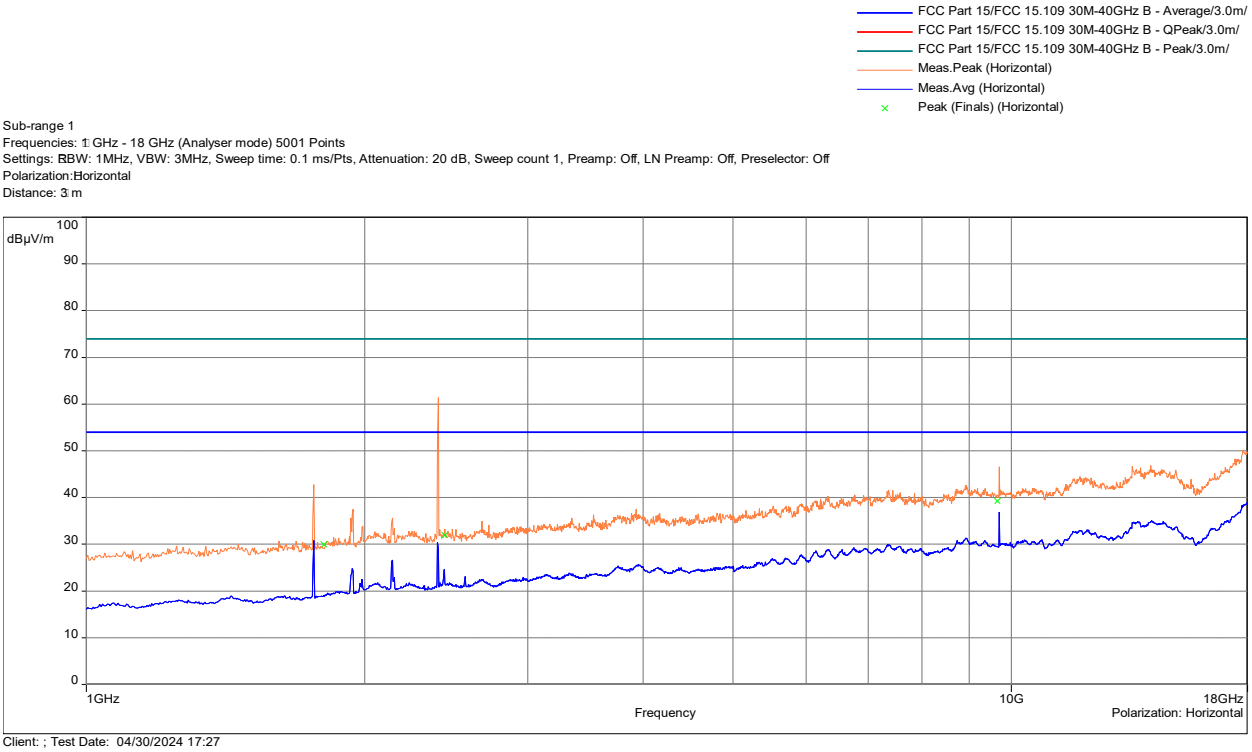
Note: The highest operating frequency of the EUT is 2480 MHz.

Test Result: (*) The **EUT PASSED** the Radiated Emissions test with a margin of -22.68 dB using Average detector at 17975 MHz.

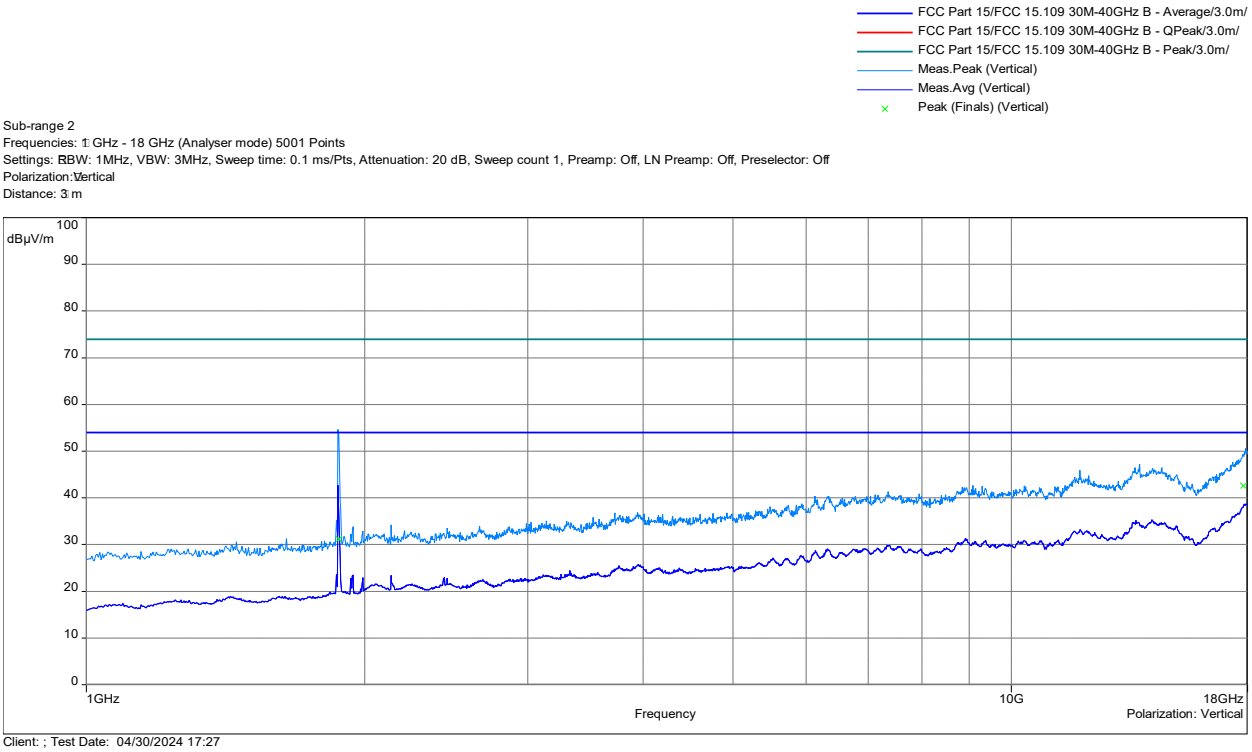
Deviations, Additions, or Exclusions: None

6.21 Plots (FCC Part 15, 1-18 GHz):

EUT Orientation: Y, Charging Mode



Peak Scan - Horizontal Polarization



Peak Scan - Vertical Polarization

6.22 Data (FCC Part 15, 1-18 GHz, EUT Orientation Y, Charging Mode):

Test Personnel:	Ali I. Yürekli	Test Date:	04/30/2024
Supervising /Reviewing Engineer: (Where Applicable)	N/A		
Product Standard:	FCC Part 15 Subpart B	Limit Applied:	FCC §15.109 Class B
Input Voltage:	120 VAC		
		Ambient Temperature:	21.3 ºC
Pretest Verification	Yes	Relative Humidity:	55.7 %
		Atmospheric Pressure:	989.4 mbar

FCC Part 15 Subpart B Class B, Radiated Emissions (Horizontal)									
Frequency (MHz)	Average Level (dBµV/m)	Average Limit (dBµV/m)	Average Margin (dB)	Peak Level (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)	Azimuth (º)	Height (m)	Correction Factor (dB)
1806.6	16.49	54.00	-37.51	29.93	74.00	-44.07	337.75	1.53	-22.70
2441.4	19.00	54.00	-35.00	31.94	74.00	-42.06	117.50	3.96	-20.10
9656.0	26.20	54.00	-27.80	39.22	74.00	-34.78	339.75	3.13	-7.71
Detectors/Bandwidths (Det/RBW/VBW) = 1MHz/3MHz									

FCC Part 15 Subpart B Class B, Radiated Emissions (Vertical)									
Frequency (MHz)	Average Level (dBµV/m)	Average Limit (dBµV/m)	Average Margin (dB)	Peak Level (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)	Azimuth (^{0})	Height (m)	Correction Factor (dB)
1873.4	17.51	54.00	-36.49	31.14	74.00	-42.86	150.50	2.92	-22.10
17805.4 *	29.92	54.00	-24.08	42.62	74.00	-31.38	211.25	3.26	2.60
Detectors/Bandwidths (Det/RBW/VBW) = 1MHz/3MHz									

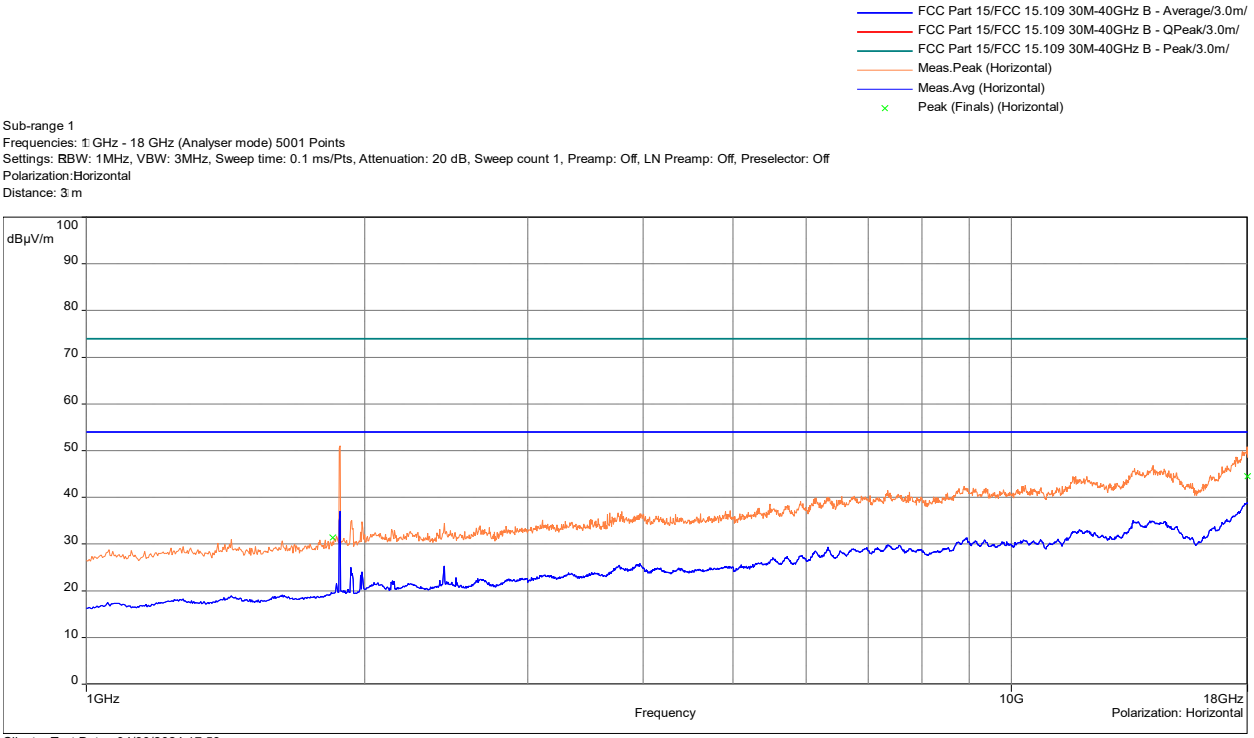
Note: The highest operating frequency of the EUT is 2480 MHz.

Test Result: (*) The **EUT PASSED** the Radiated Emissions test with a margin of -24.08 dB using Average detector at 17805.4 MHz.

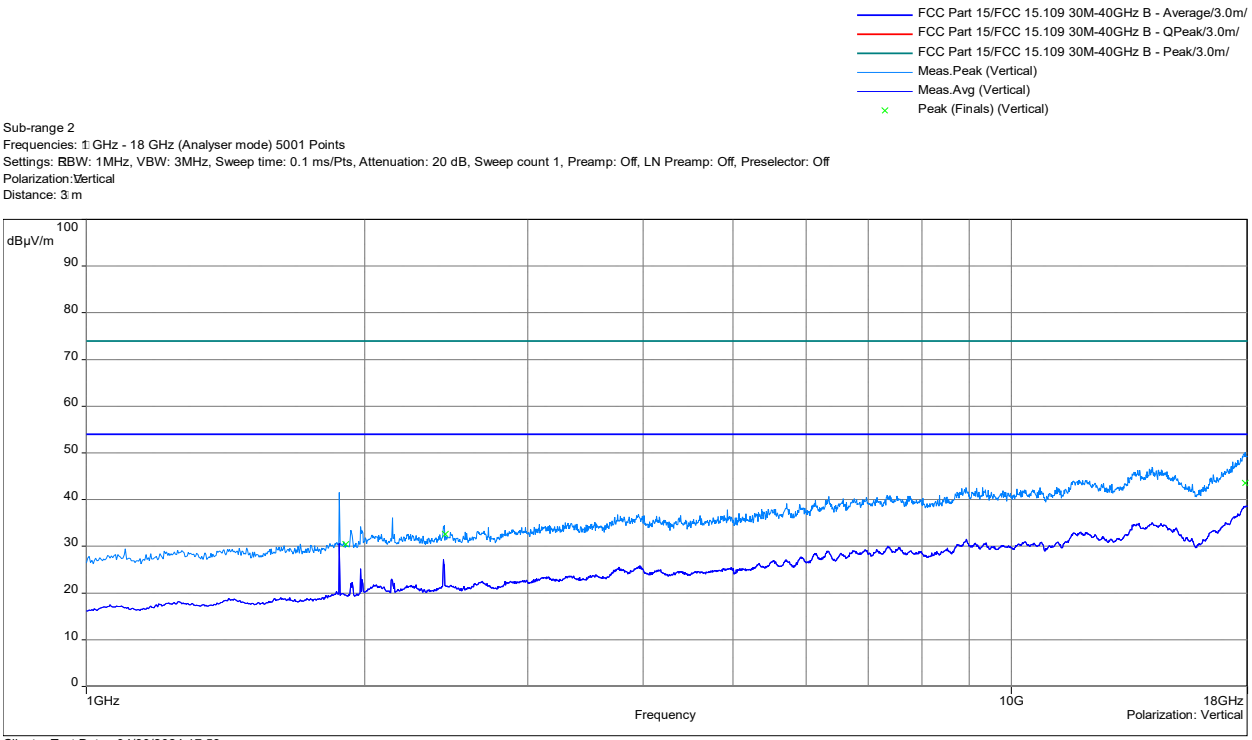
Deviations, Additions, or Exclusions: None

6.23 Plots (FCC Part 15, 1-18 GHz):

EUT Orientation: Z, Charging Mode



Peak Scan - Horizontal Polarization



Peak Scan - Vertical Polarization

6.24 Data (FCC Part 15, 1-18 GHz, EUT Orientation Z, Charging Mode):

Test Personnel:	Ali I. Yürekli	Test Date:	04/30/2024
Supervising /Reviewing Engineer: (Where Applicable)	N/A		
Product Standard:	FCC Part 15 Subpart B	Limit Applied:	FCC §15.109 Class B
Input Voltage:	120 VAC		
		Ambient Temperature:	21.3 ºC
Pretest Verification	Yes	Relative Humidity:	55.7 %
		Atmospheric Pressure:	989.4 mbar

FCC Part 15 Subpart B Class B, Radiated Emissions (Horizontal)

Frequency (MHz)	Average Level (dBµV/m)	Average Limit (dBµV/m)	Average Margin (dB)	Peak Level (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)	Azimuth (º)	Height (m)	Correction Factor (dB)
1846.6	17.22	54	-36.78	31.42	74	-42.58	129.50	3.80	-22.44
17996.0 *	31.48	54	-22.52	44.48	74	-29.52	185.50	2.83	3.25
Detectors/Bandwidths (Det/RBW/VBW) = 1MHz/3MHz									

FCC Part 15 Subpart B Class B, Radiated Emissions (Vertical)

Frequency (MHz)	Average Level (dBµV/m)	Average Limit (dBµV/m)	Average Margin (dB)	Peak Level (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)	Azimuth (º)	Height (m)	Correction Factor (dB)
1908.2	17.18	54.00	-36.82	30.45	74.00	-43.55	39.75	2.92	-21.60
2445.4	19.02	54.00	-34.98	32.65	74.00	-41.35	339.50	3.61	-20.11
17901	30.76	54.00	-23.24	43.55	74.00	-30.45	321.00	2.11	2.92
Detectors/Bandwidths (Det/RBW/VBW) = 1MHz/3MHz									

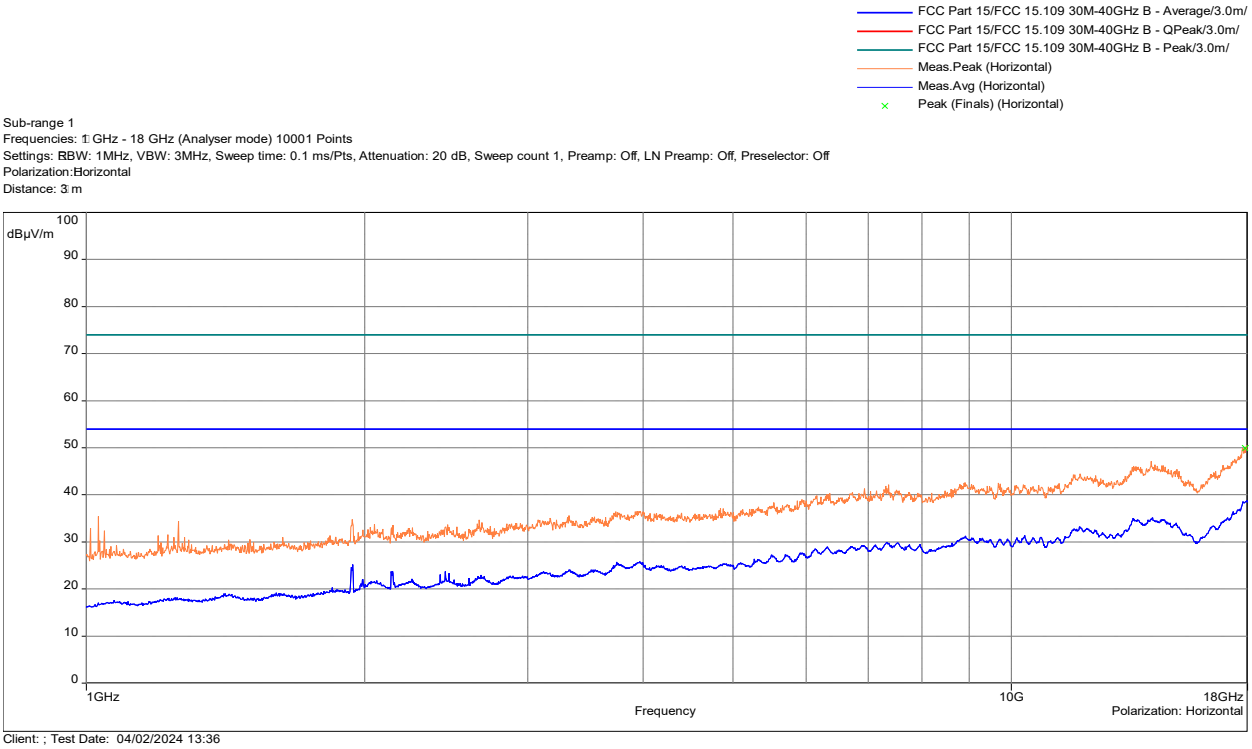
Note: The highest operating frequency of the EUT is 2480 MHz.

Test Result: (*) The **EUT PASSED** the Radiated Emissions test with a margin of -22.52 dB using Average detector at 17996 MHz.

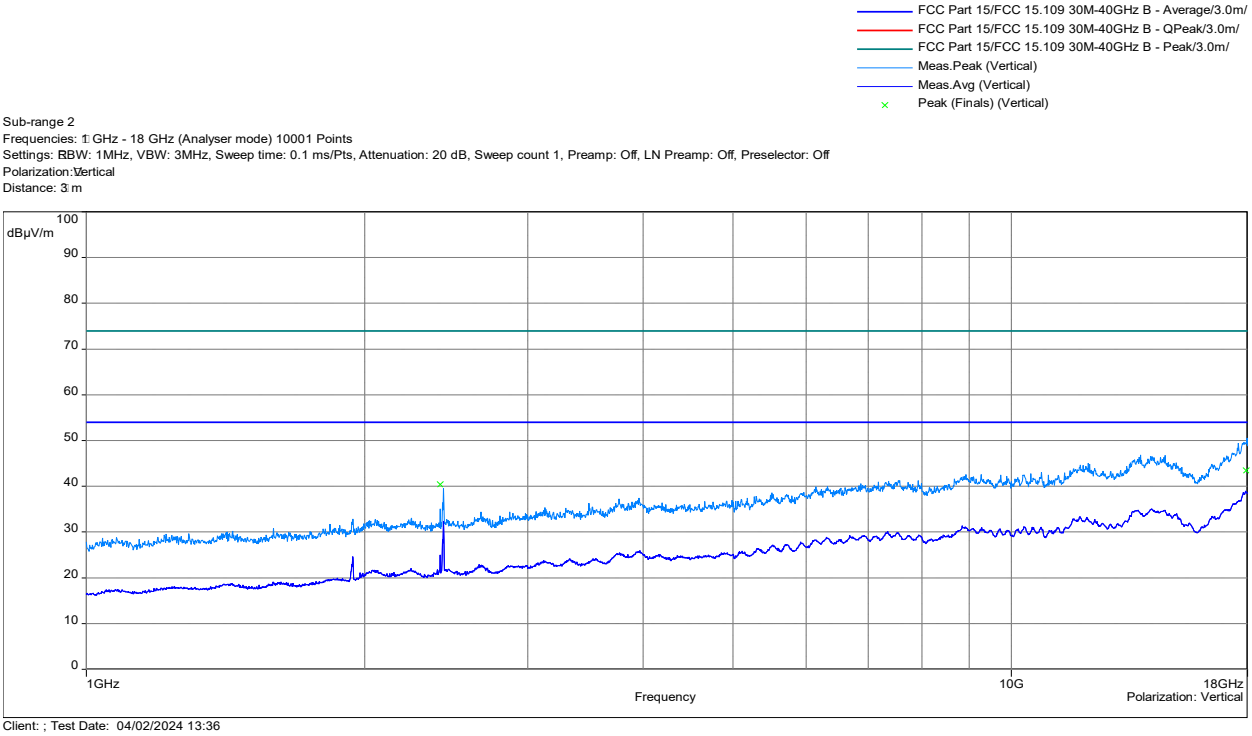
Deviations, Additions, or Exclusions: None

6.25 Plots (FCC Part 15, 1-18 GHz):

EUT Orientation: X, Battery/Game Mode



Peak Scan - Horizontal Polarization



Peak Scan - Vertical Polarization

6.26 Data (FCC Part 15, 1-18 GHz, EUT Orientation X, Battery/Game Mode):

Test Personnel:	Ali I. Yürekli	Test Date:	04/02/2024
Supervising /Reviewing Engineer: (Where Applicable)	N/A		
Product Standard:	FCC Part 15 Subpart B	Limit Applied:	FCC §15.109 Class B
Input Voltage:	Battery		
		Ambient Temperature:	20.3 ºC
Pretest Verification	Yes	Relative Humidity:	47.7 %
		Atmospheric Pressure:	1000.8 mbar

FCC Part 15 Subpart B Class B, Radiated Emissions (Horizontal)

Frequency (MHz)	Average Level (dBµV/m)	Average Limit (dBµV/m)	Average Margin (dB)	Peak Level (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)	Azimuth (º)	Height (m)	Correction Factor (dB)
17903.0 *	36.83	54	-17.17	49.93	74	-24.07	76.25	2.05	2.93
Detectors/Bandwidths (Det/RBW/VBW) = 1MHz/3MHz									

FCC Part 15 Subpart B Class B, Radiated Emissions (Vertical)

Frequency (MHz)	Average Level (dBµV/m)	Average Limit (dBµV/m)	Average Margin (dB)	Peak Level (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)	Azimuth (º)	Height (m)	Correction Factor (dB)
2413.1	19.21	54	-34.79	40.37	74	-33.63	255.25	2.39	-20.09
17938.3	30.72	54	-23.28	43.46	74	-30.54	41.75	1.93	3.02
Detectors/Bandwidths (Det/RBW/VBW) = 1MHz/3MHz									

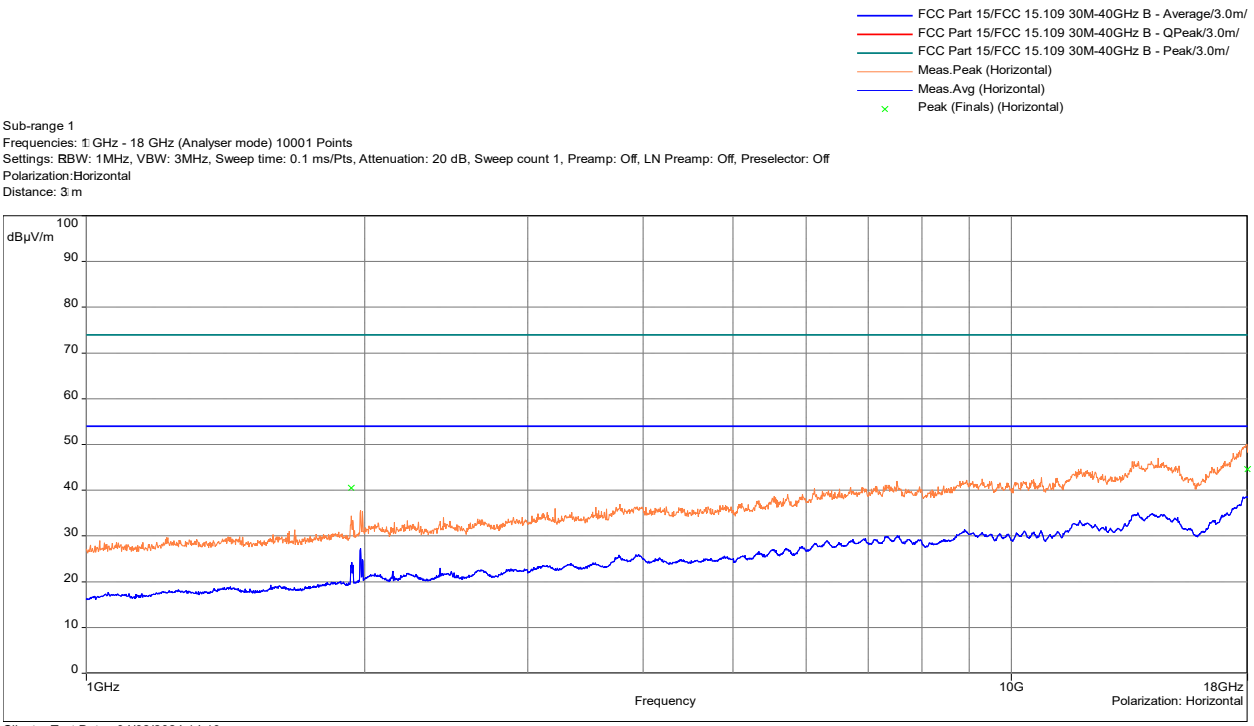
Note: The highest operating frequency of the EUT is 2480 MHz.

Test Result: (*) The **EUT PASSED** the Radiated Emissions test with a margin of -17.17 dB using Average detector at 17903 MHz.

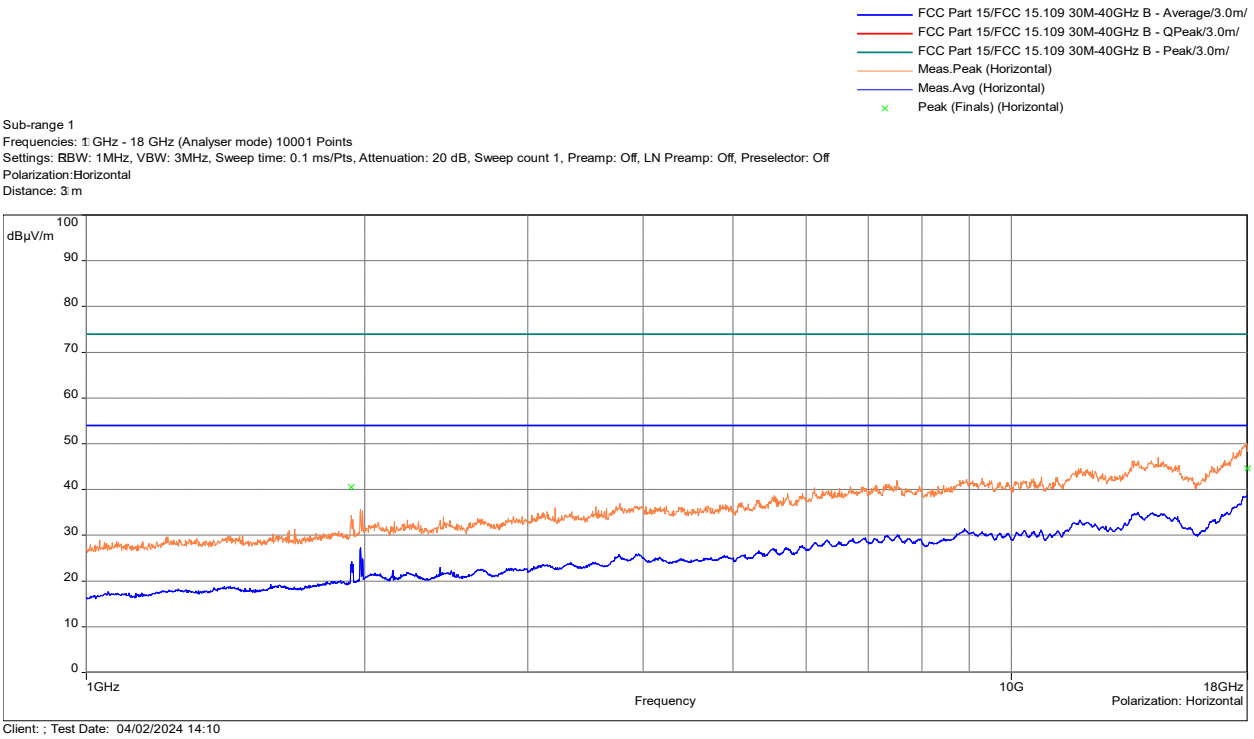
Deviations, Additions, or Exclusions: None

6.27 Plots (FCC Part 15, 1-18 GHz):

EUT Orientation: Y, Battery/Game Mode



Peak Scan - Horizontal Polarization



Peak Scan - Vertical Polarization

6.28 Data (FCC Part 15, 1-18 GHz, EUT Orientation Y, Battery/Game Mode):

Test Personnel:	Ali I. Yürekli	Test Date:	04/02/2024
Supervising /Reviewing Engineer: (Where Applicable)	N/A		
Product Standard:	FCC Part 15 Subpart B	Limit Applied:	FCC §15.109 Class B
Input Voltage:	Battery		
		Ambient Temperature:	20.3 ºC
Pretest Verification	Yes	Relative Humidity:	47.7 %
		Atmospheric Pressure:	1000.8 mbar

FCC Part 15 Subpart B Class B, Radiated Emissions (Horizontal)

Frequency (MHz)	Average Level (dBµV/m)	Average Limit (dBµV/m)	Average Margin (dB)	Peak Level (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)	Azimuth (º)	Height (m)	Correction Factor (dB)
1933.2	23.63	54	-30.37	40.51	74	-33.49	-1.5	1.49	-21.35
17998.0 *	31.59	54	-22.41	44.57	74	-29.43	74	3.37	3.25
Detectors/Bandwidths (Det/RBW/VBW) = 1MHz/3MHz									

FCC Part 15 Subpart B Class B, Radiated Emissions (Vertical)

Frequency (MHz)	Average Level (dBµV/m)	Average Limit (dBµV/m)	Average Margin (dB)	Peak Level (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)	Azimuth (º)	Height (m)	Correction Factor (dB)
1905.1	17.27	54	-36.73	30.61	74	-43.39	8.25	3.46	-21.62
17982.3	31.20	54	-22.80	44.28	74	-29.72	228.25	1.07	3.19
Detectors/Bandwidths (Det/RBW/VBW) = 1MHz/3MHz									

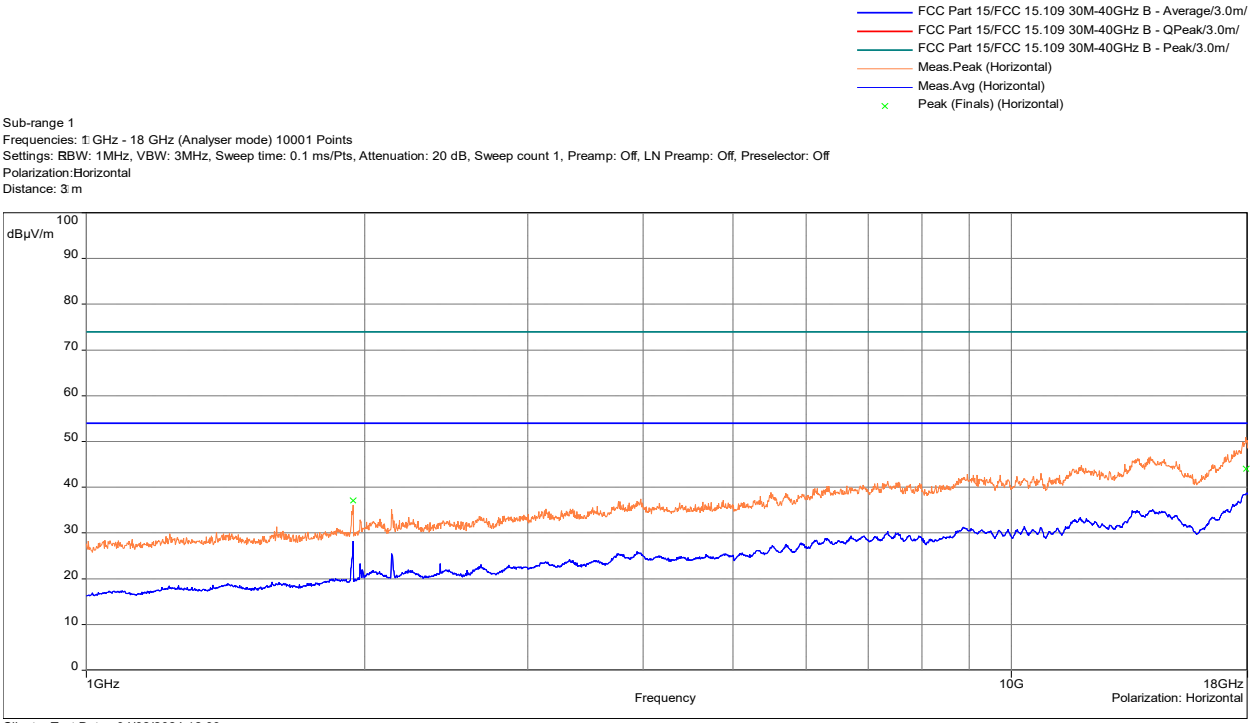
Note: The highest operating frequency of the EUT is 2480 MHz.

Test Result: (*) The **EUT PASSED** the Radiated Emissions test with a margin of -22.41 dB using Average detector at 17998 MHz.

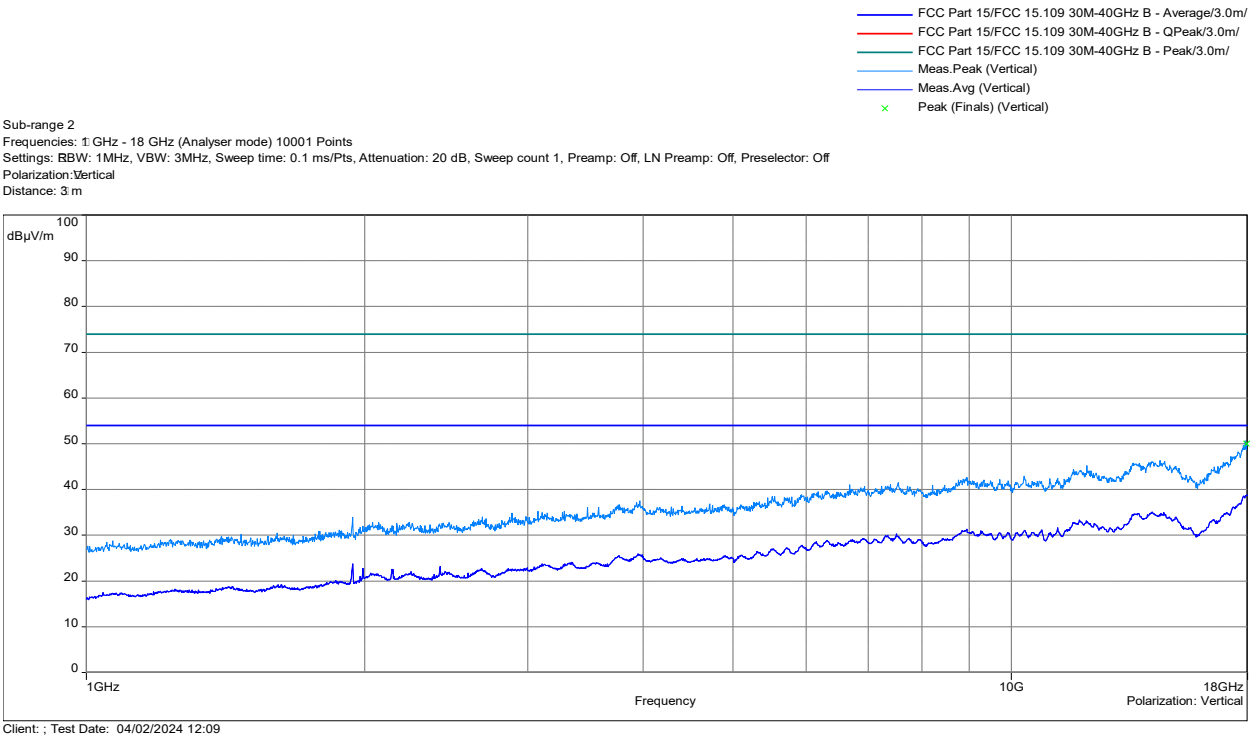
Deviations, Additions, or Exclusions: None

6.29 Plots (FCC Part 15, 1-18 GHz):

EUT Orientation: Z, Battery/Game Mode



Peak Scan - Horizontal Polarization



Peak Scan - Vertical Polarization

6.30 Data (FCC Part 15, 1-18 GHz, EUT Orientation Z, Battery/Game Mode):

Test Personnel:	Ali I. Yürekli	Test Date:	04/02/2024
Supervising /Reviewing Engineer: (Where Applicable)	N/A		
Product Standard:	FCC Part 15 Subpart B	Limit Applied:	FCC §15.109 Class B
Input Voltage:	Battery		
		Ambient Temperature:	20.3 ºC
Pretest Verification	Yes	Relative Humidity:	47.7 %
		Atmospheric Pressure:	1000.8 mbar

FCC Part 15 Subpart B Class B, Radiated Emissions (Horizontal)

Frequency (MHz)	Average Level (dBµV/m)	Average Limit (dBµV/m)	Average Margin (dB)	Peak Level (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)	Azimuth (º)	Height (m)	Correction Factor (dB)
1941.8	18.68	54	-35.32	37.07	74	-36.93	315	2.26	-21.27
17947.0	30.76	54	-23.24	44.06	74	-29.94	231.75	2.89	3.04
Detectors/Bandwidths (Det/RBW/VBW) = 1MHz/3MHz									

FCC Part 15 Subpart B Class B, Radiated Emissions (Vertical)

Frequency (MHz)	Average Level (dBµV/m)	Average Limit (dBµV/m)	Average Margin (dB)	Peak Level (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)	Azimuth (º)	Height (m)	Correction Factor (dB)
17967.0 *	36.99	54	-17.01	50.05	74	-23.95	132.75	2.18	3.12
Detectors/Bandwidths (Det/RBW/VBW) = 1MHz/3MHz									

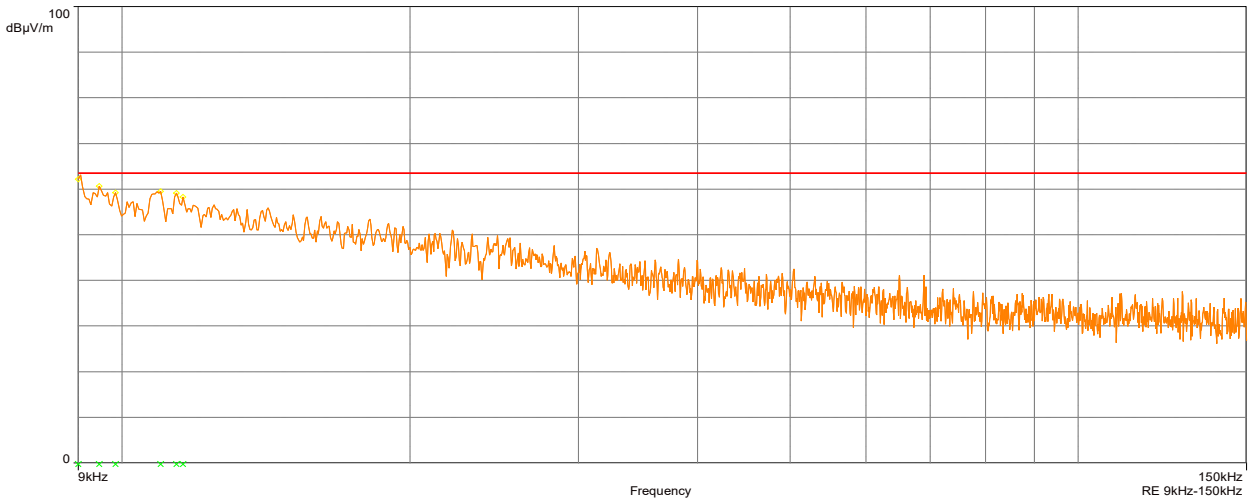
Note: The highest operating frequency of the EUT is 2480 MHz.

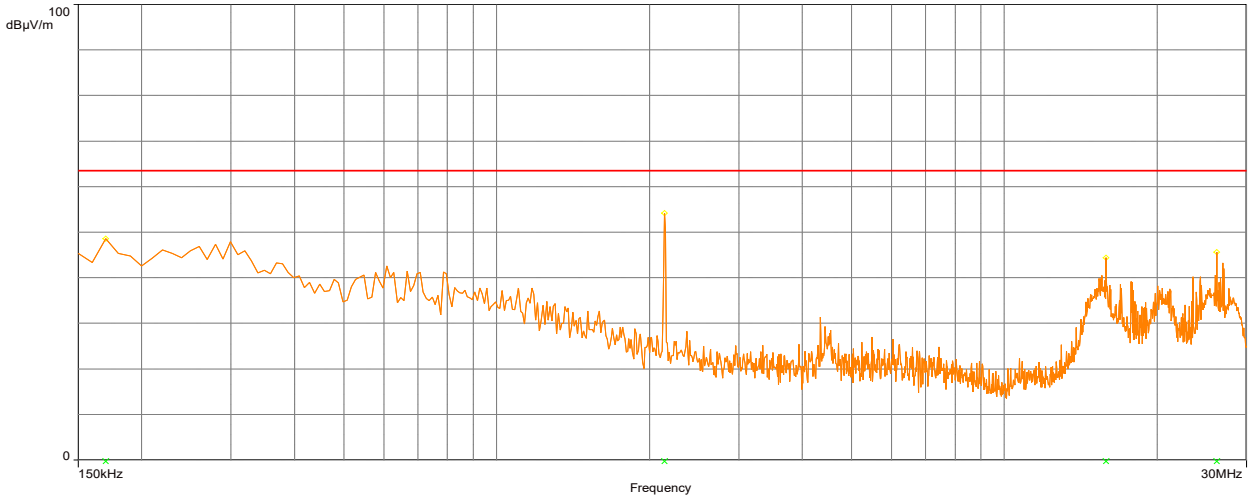
Test Result: (*) The **EUT PASSED** the Radiated Emissions test with a margin of -17.01 dB using Average detector at 17967 MHz.

Deviations, Additions, or Exclusions: None

6.31 Plots (FCC Part 18, 9 kHz – 30 MHz):

Worst Case Peak Emissions @ EUT Orientation: Z, Charging Mode, Antenna: Perpendicular





6.32 Data (FCC Part 18, 9 kHz – 30 MHz, Charging Mode):

Test Personnel:	Ali I. Yürekli	Test Date:	07/03/2024
Supervising /Reviewing Engineer: (Where Applicable)	N/A		
Product Standard:	FCC Part 18	Limit Applied:	FCC §18.305b
Input Voltage:	120 VAC		
		Ambient Temperature:	21.9 ºC
Pretest Verification	Yes	Relative Humidity:	65.2 %
		Atmospheric Pressure:	989.7 mbar

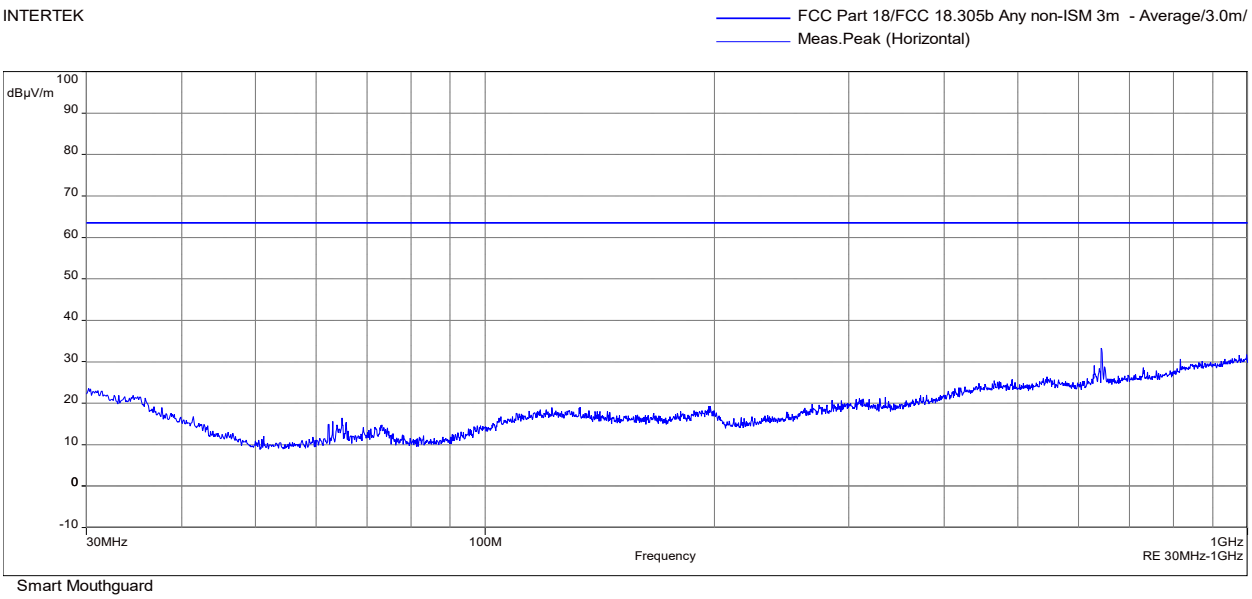
FCC Part 18, Radiated Emissions (Average)							
Frequency (MHz)	AVG Level (dBµV/m)	AVG Limit (dBµV/m)	AVG Margin (dB)	Azimuth (°)	Correction Factor (dB)	EUT Orientation	Antenna Polarization
0.009000	38.90	63.52	-24.62	327.00	55.43	Z	Perpendicular
0.009987	36.93	63.52	-26.59	29.00	54.26	X	Perpendicular
0.150000	41.31	63.52	-22.21	20.00	33.00	Y	Perpendicular
0.159950	38.23	63.52	-25.29	341.00	32.46	X	Ground Parallel
0.169900 *	42.58	63.52	-20.94	118.00	31.89	X	Perpendicular
0.179850	40.28	63.52	-23.24	327.00	31.32	X	Perpendicular
Detectors/Bandwidths (Det/RBW)= (AVG/200Hz&9kHz)							

Test Result: (*) The **EUT PASSED** Radiated Emissions test with –20.94 dB margin at 1.699 MHz.

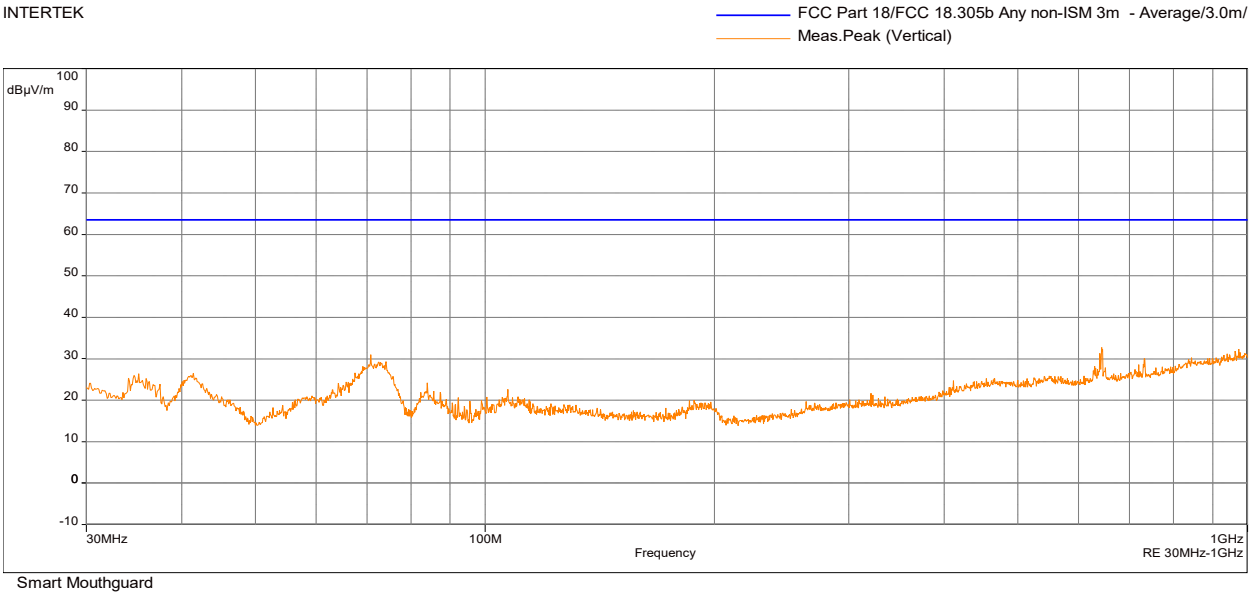
Deviations, Additions, or Exclusions: None

6.33 Plots (FCC Part 18, 30 MHz – 1 GHz):

EUT Orientation: X, Charging Mode



Peak Scan - Horizontal Polarization



Peak Scan - Vertical Polarization

6.34 Data (FCC Part 18, 30 MHz – 1 GHz, EUT Orientation X, Charging Mode):

Test Personnel:	Ali I. Yürekli	Test Date:	04/29/2024
Supervising /Reviewing Engineer: (Where Applicable)	N/A		
Product Standard:	FCC Part 18	Limit Applied:	FCC §18.305b
Input Voltage:	120 VAC		
		Ambient Temperature:	20.3 ºC
Pretest Verification	Yes	Relative Humidity:	55.9 %
		Atmospheric Pressure:	990.7 mbar

FCC Part 18, Radiated Emissions (QuasiPeak Horizontal)						
Frequency (MHz)	QP Level (dBµV/m)	Limit (dBµV/m)	QP Margin (dB)	Azimuth (°)	Height (m)	Correction Factor (dB)
30.194	14.61	63.52	-48.91	104.25	1.44	-5.47
64.92	1.57	63.52	-61.95	94.25	1.07	-17.56
196.646	11.42	63.52	-52.10	86.75	1	-12.15
643.137	28.05	63.52	-35.47	116.75	1.51	-4.16
997.187	19.05	63.52	-44.47	52.25	3.37	0.97
Detectors/Bandwidths (Det/RBW/VBW)= QP/120kHz/500kHz						

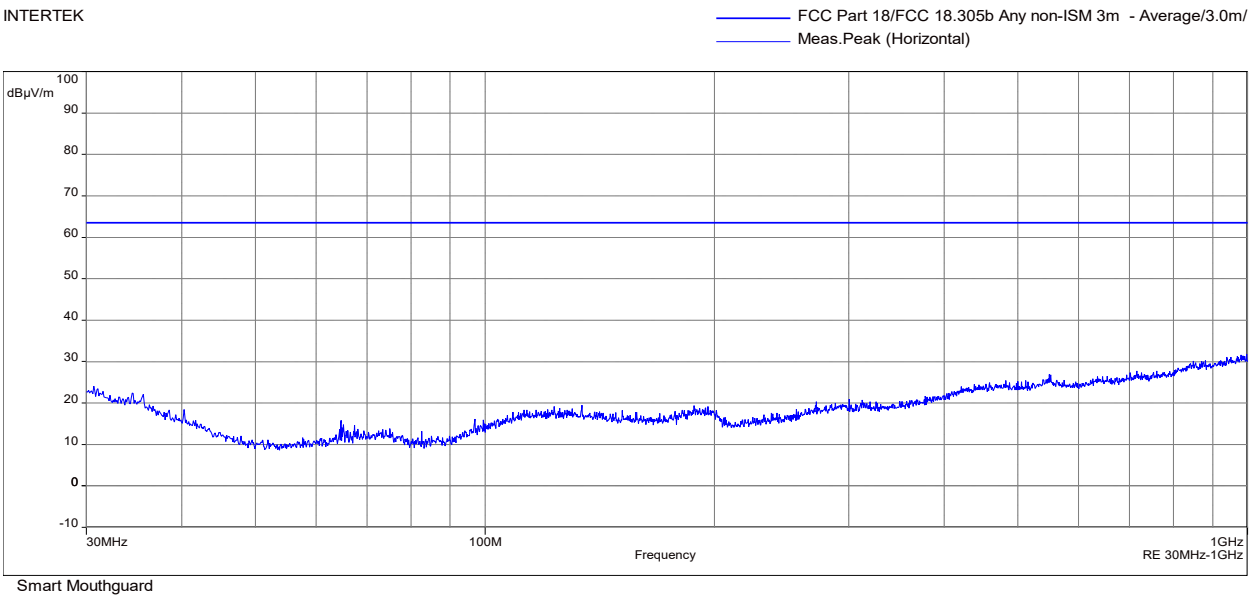
FCC Part 18, Radiated Emissions (QuasiPeak Vertical)						
Frequency (MHz)	QP Level (dBµV/m)	Limit (dBµV/m)	QP Margin (dB)	Azimuth (°)	Height (m)	Correction Factor (dB)
35.141	15.27	63.52	-48.25	358.25	1.2	-8.90
41.446	22.61	63.52	-40.91	148	1.02	-13.55
70.837	25.71	63.52	-37.81	199.5	1.02	-17.38
84.029	19.17	63.52	-44.35	116.25	1.02	-18.10
640.033	23.17	63.52	-40.35	96.75	2.39	-4.16
643.913 *	29.31	63.52	-34.21	183	1.02	-4.17
Detectors/Bandwidths (Det/RBW/VBW)= QP/120kHz/500kHz						

Test Result: (*)The **EUT PASSED** Radiated Emissions test with –34.21 dB margin at 643.913 MHz.

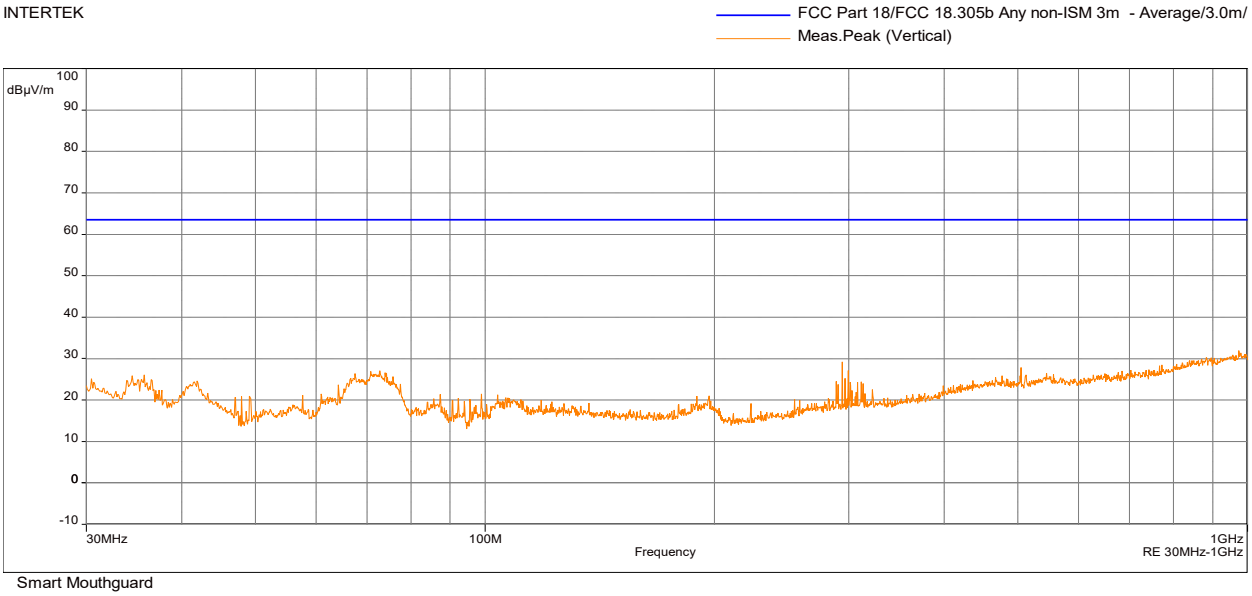
Deviations, Additions, or Exclusions: None

6.35 Plots (FCC Part 18, 30 MHz – 1 GHz):

EUT Orientation: Y, Charging Mode



Peak Scan - Horizontal Polarization



Peak Scan - Vertical Polarization

6.36 Data (FCC Part 18, 30 MHz – 1 GHz, EUT Orientation Y, Charging Mode):

Test Personnel:	Ali I. Yürekli	Test Date:	04/29/2024
Supervising /Reviewing Engineer: (Where Applicable)	N/A		
Product Standard:	FCC Part 18	Limit Applied:	FCC §18.305b
Input Voltage:	120 VAC		
		Ambient Temperature:	20.3 ºC
Pretest Verification	Yes	Relative Humidity:	55.9 %
		Atmospheric Pressure:	990.7 mbar

FCC Part 18, Radiated Emissions (QuasiPeak Horizontal)						
Frequency (MHz)	QP Level (dBµV/m)	Limit (dBµV/m)	QP Margin (dB)	Azimuth (°)	Height (m)	Correction Factor (dB)
30.679	14.30	63.52	-49.22	38.25	3.35	-5.72
64.726	1.55	63.52	-61.97	85.50	1.39	-17.58
133.984	7.82	63.52	-55.70	343.50	1.00	-11.42
997.09	18.99	63.52	-44.53	256.50	2.31	0.97
Detectors/Bandwidths (Det/RBW/VBW)= QP/120kHz/500kHz						

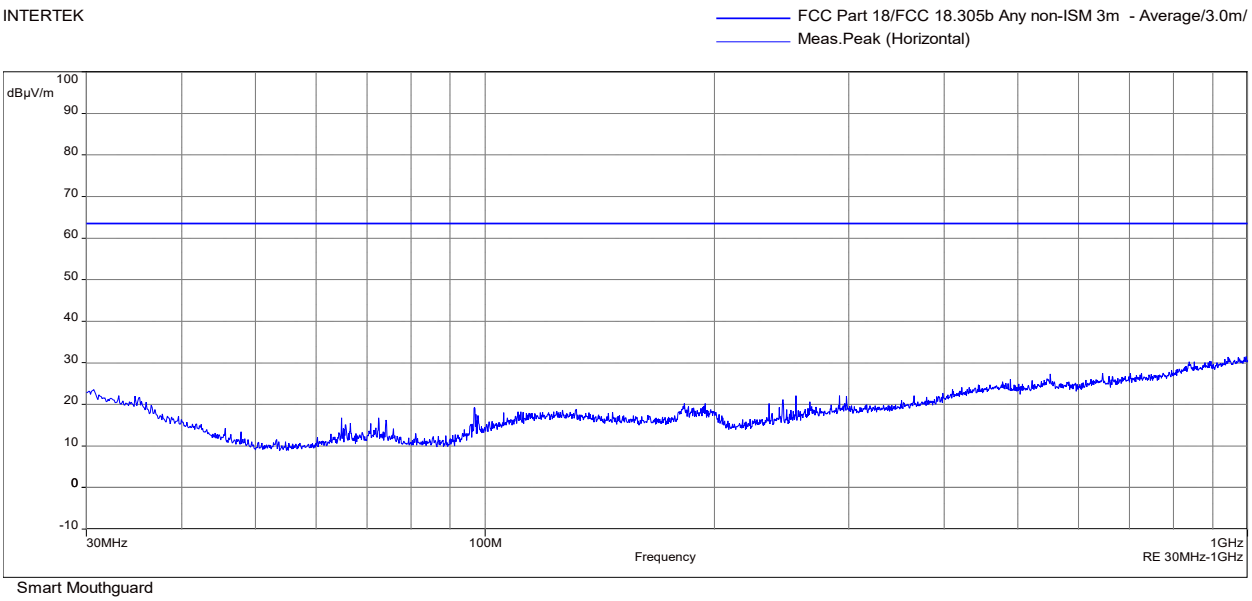
FCC Part 18, Radiated Emissions (QuasiPeak Vertical)						
Frequency (MHz)	QP Level (dBµV/m)	Limit (dBµV/m)	QP Margin (dB)	Azimuth (°)	Height (m)	Correction Factor (dB)
35.723	15.74	63.52	-47.78	112.00	1.40	-9.36
41.931	19.48	63.52	-44.04	226.00	1.22	-13.93
49.109	10.37	63.52	-53.15	359.50	1.13	-17.91
72.680 *	23.48	63.52	-40.04	-0.25	1.22	-17.41
294.034	9.14	63.52	-54.38	278.00	3.78	-10.79
299.369	10.87	63.52	-52.65	308.75	2.68	-10.75
Detectors/Bandwidths (Det/RBW/VBW)= QP/120kHz/500kHz						

Test Result: (*)The **EUT PASSED** Radiated Emissions test with –40.04 dB margin at 72.68 MHz.

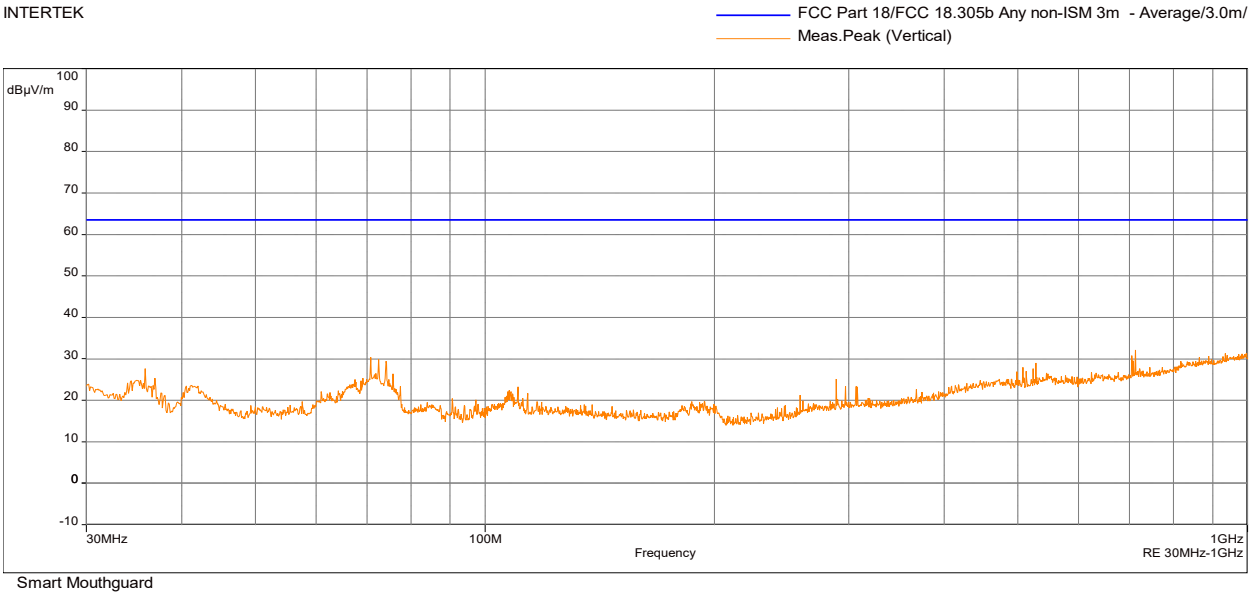
Deviations, Additions, or Exclusions: None

6.37 Plots (FCC Part 18, 30 MHz – 1 GHz):

EUT Orientation: Z, Charging Mode



Peak Scan - Horizontal Polarization



Peak Scan - Vertical Polarization

6.38 Data (FCC Part 18, 30 MHz – 1 GHz, EUT Orientation Z, Charging Mode):

Test Personnel:	Ali I. Yürekli	Test Date:	04/29/2024
Supervising /Reviewing Engineer: (Where Applicable)	N/A		
Product Standard:	FCC Part 18	Limit Applied:	FCC §18.305b
Input Voltage:	120 VAC		
		Ambient Temperature:	20.3 ºC
Pretest Verification	Yes	Relative Humidity:	55.9 %
		Atmospheric Pressure:	990.7 mbar

FCC Part 18, Radiated Emissions (QuasiPeak Horizontal)						
Frequency (MHz)	QP Level (dBµV/m)	Limit (dBµV/m)	QP Margin (dB)	Azimuth (°)	Height (m)	Correction Factor (dB)
30.679	14.69	63.52	-48.83	280.50	1.00	-5.72
64.823	1.93	63.52	-61.59	301.25	1.13	-17.57
72.486	11.37	63.52	-52.15	189.75	3.84	-17.40
194.512	16.15	63.52	-47.37	208.50	1.69	-12.54
255.622	7.62	63.52	-55.90	215.75	1.09	-12.51
996.217	19.15	63.52	-44.37	294.75	2.43	0.96
Detectors/Bandwidths (Det/RBW/VBW)= QP/120kHz/500kHz						

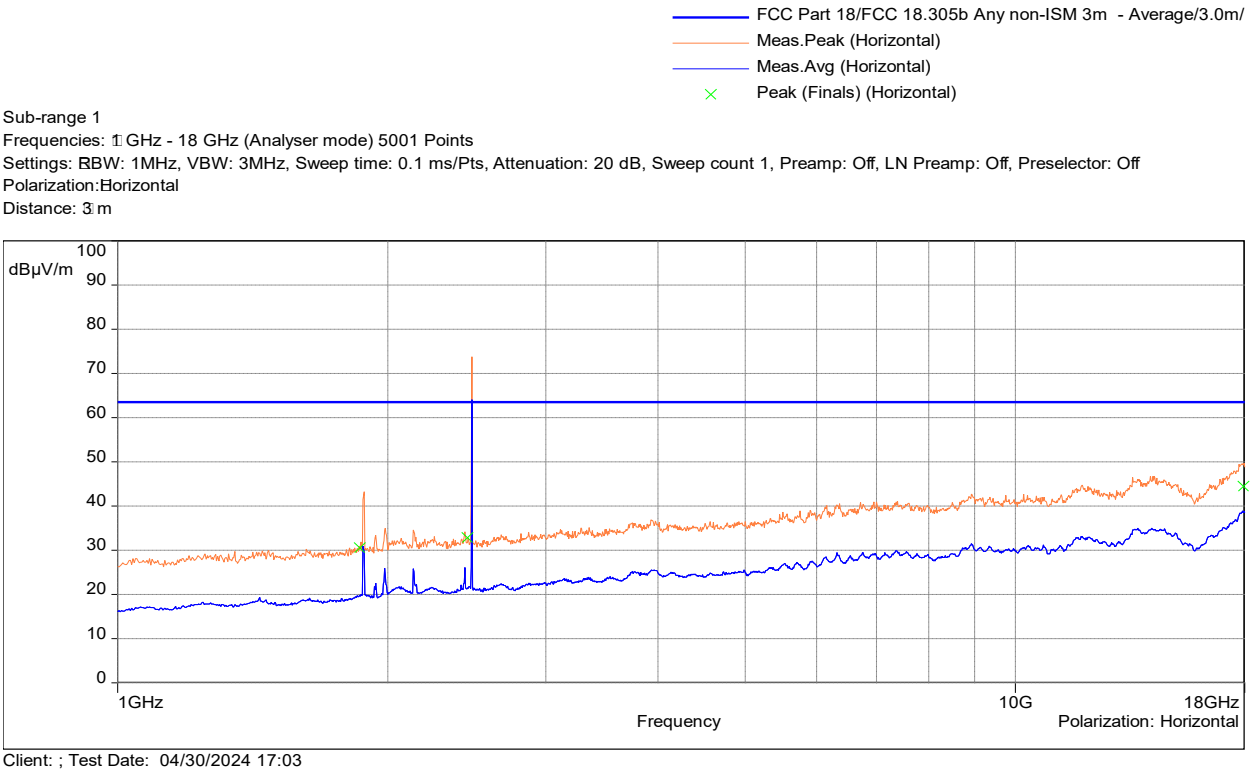
FCC Part 18, Radiated Emissions (QuasiPeak Vertical)						
Frequency (MHz)	QP Level (dBµV/m)	Limit (dBµV/m)	QP Margin (dB)	Azimuth (°)	Height (m)	Correction Factor (dB)
35.82	15.32	63.52	-48.20	163.25	1.28	-9.44
41.252	19.80	63.52	-43.72	146.50	1.05	-13.41
70.837 *	23.78	63.52	-39.74	255.50	1.00	-17.38
527.61	13.11	63.52	-50.41	66.75	2.35	-6.01
705.314	15.60	63.52	-47.92	278.75	1.56	-3.59
713.268	15.89	63.52	-47.63	323.00	3.21	-3.37
Detectors/Bandwidths (Det/RBW/VBW)= QP/120kHz/500kHz						

Test Result: (*)The **EUT PASSED** Radiated Emissions test with –39.74 dB margin at 70.837 MHz.

Deviations, Additions, or Exclusions: None

6.39 Plots (FCC Part 18, 1-18 GHz):

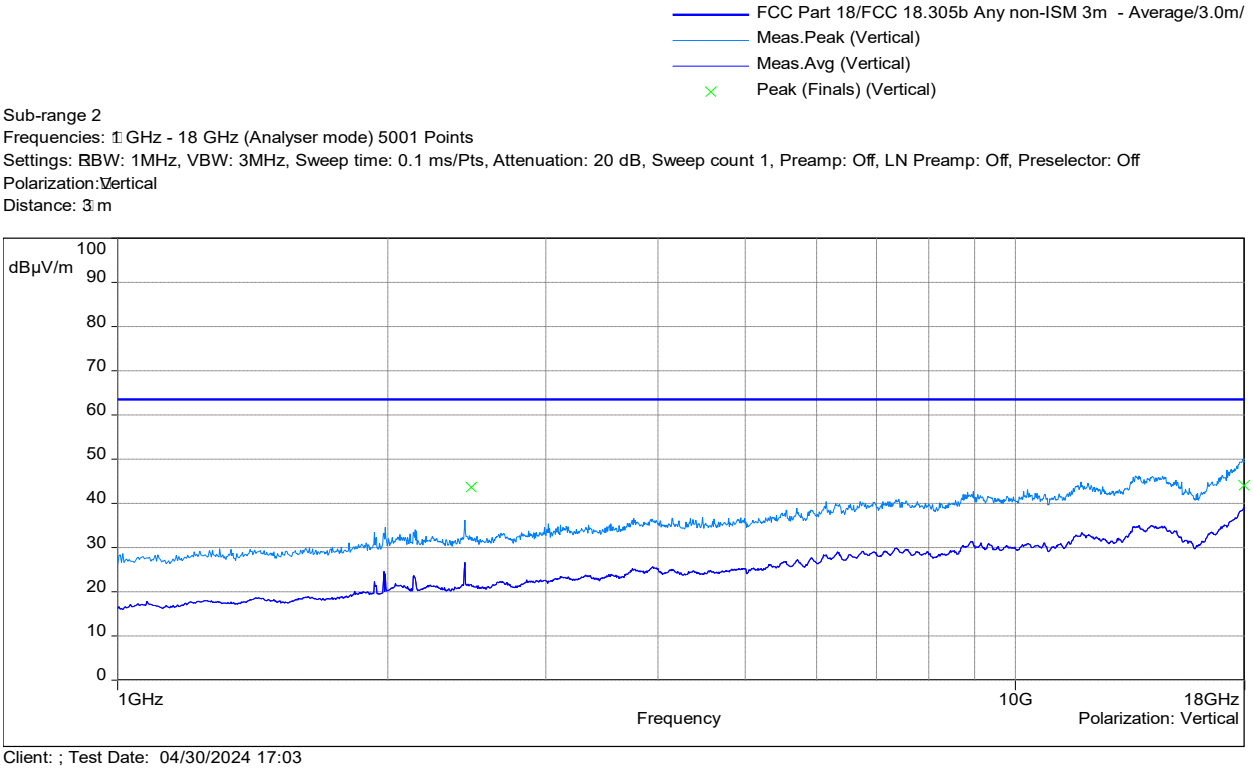
EUT Orientation: X, Charging Mode



Sub-range 1
Frequencies: 1 GHz - 18 GHz (Analyser mode) 5001 Points
Settings: RBW: 1MHz, VBW: 3MHz, Sweep time: 0.1 ms/Pts, Attenuation: 20 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
Polarization: Horizontal
Distance: 3 m

Client: ; Test Date: 04/30/2024 17:03

Peak Scan - Horizontal Polarization



Sub-range 2
Frequencies: 1 GHz - 18 GHz (Analyser mode) 5001 Points
Settings: RBW: 1MHz, VBW: 3MHz, Sweep time: 0.1 ms/Pts, Attenuation: 20 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
Polarization: Vertical
Distance: 3 m

Client: ; Test Date: 04/30/2024 17:03

Peak Scan - Vertical Polarization

6.40 Data (FCC Part 18, 1-18 GHz, EUT Orientation X, Charging Mode):

Test Personnel:	Ali I. Yürekli	Test Date:	04/30/2024
Supervising /Reviewing Engineer: (Where Applicable)	N/A		
Product Standard:	FCC Part 18	Limit Applied:	FCC §18.305(b)
Input Voltage:	120 VAC		
		Ambient Temperature:	21.3 ºC
Pretest Verification	Yes	Relative Humidity:	55.7 %
		Atmospheric Pressure:	989.4 mbar

FCC Part 18, Radiated Emissions (Horizontal)						
Frequency (MHz)	Average Level (dBµV/m)	Average Limit (dBµV/m)	Average Margin (dB)	Azimuth (º)	Height (m)	Correction Factor (dB)
1860.2	17.37	63.52	-46.15	302.75	2.61	-22.3
2451.0	19.01	63.52	-44.51	132.75	2.14	-20.13
17948.0	31.06	63.52	-32.46	327.50	1.74	3.05
Detectors/Bandwidths (Det/RBW/VBW) = AVG/1MHz/3MHz						

FCC Part 18, Radiated Emissions (Vertical)						
Frequency (MHz)	Average Level (dBµV/m)	Average Limit (dBµV/m)	Average Margin (dB)	Azimuth (º)	Height (m)	Correction Factor (dB)
2477.2	18.85	63.52	-44.67	296.25	1.83	-20.12
17975.0 *	31.32	63.52	-32.20	360.75	2.85	3.16
Detectors/Bandwidths (Det/RBW/VBW) = AVG/1MHz/3MHz						

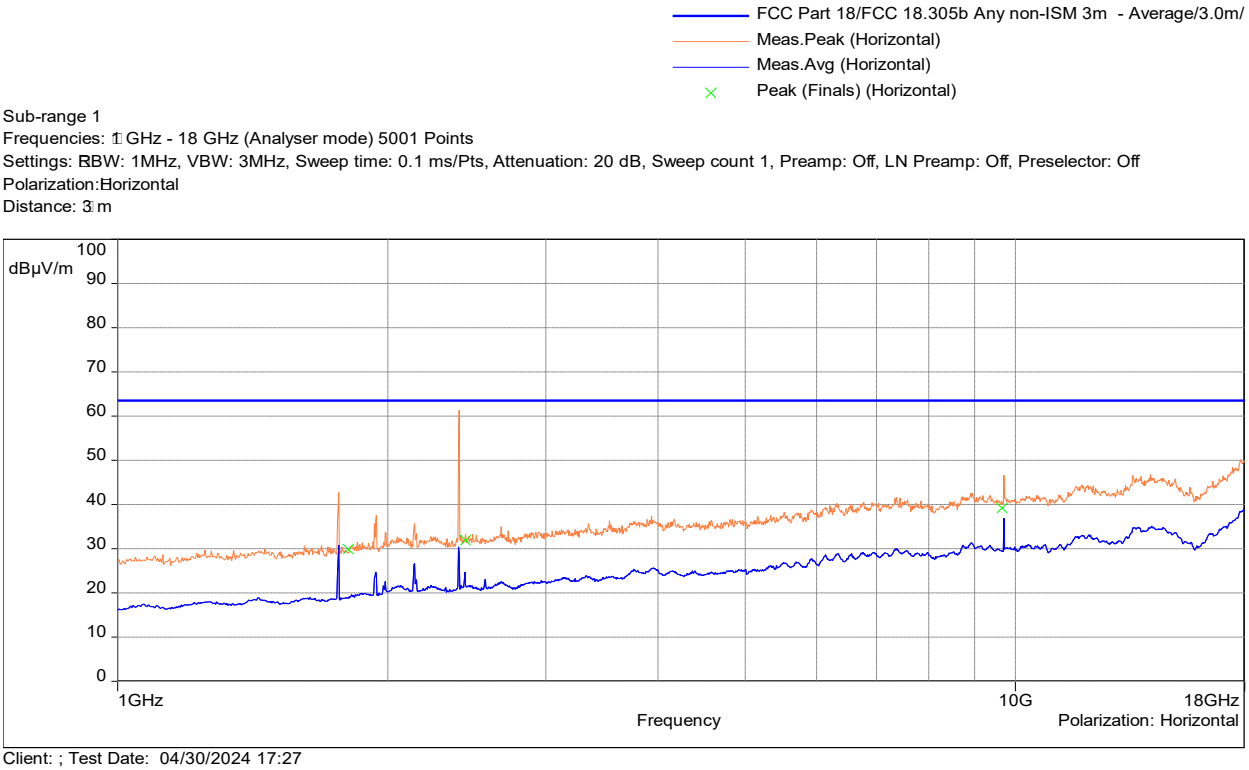
Note: The highest operating frequency of the EUT is 2480 MHz.

Test Result: (*) The **EUT PASSED** the Radiated Emissions test with a margin of –32.20 dB using Average detector at 17975 MHz.

Deviations, Additions, or Exclusions: None

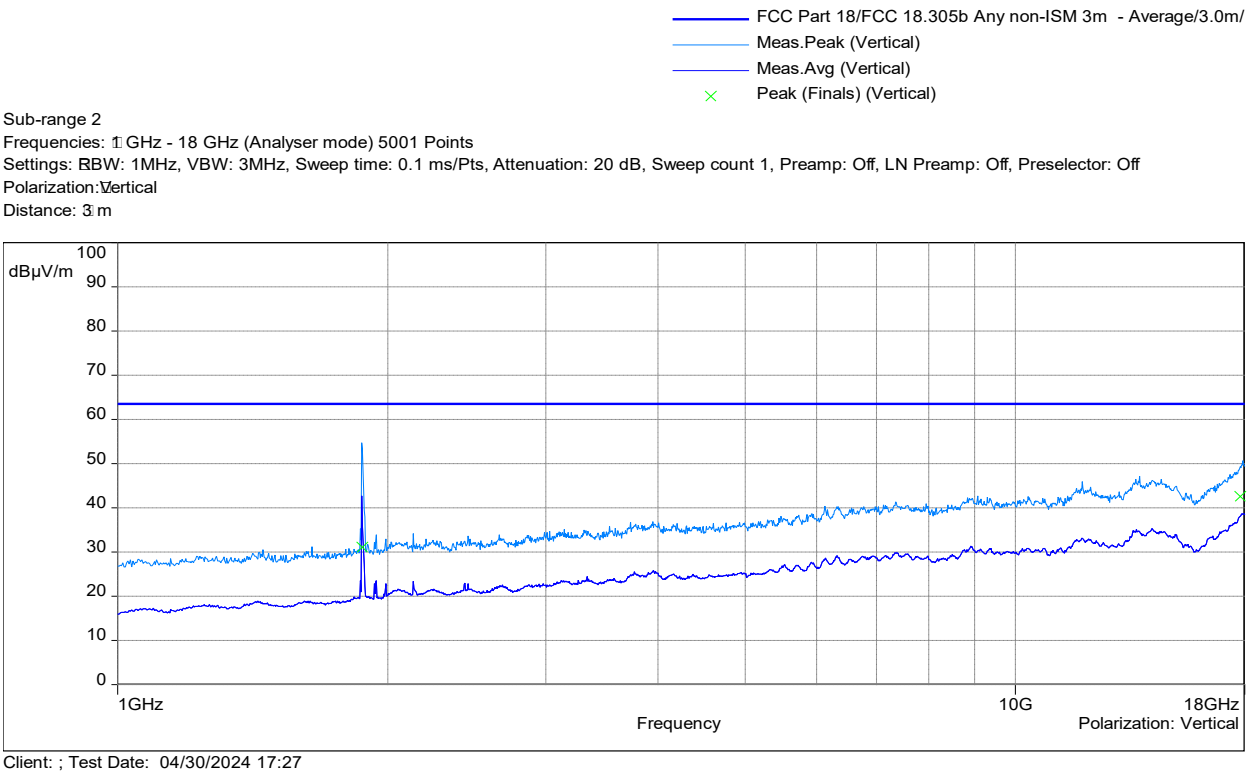
6.41 Plots (FCC Part 18, 1-18 GHz):

EUT Orientation: Y, Charging Mode



Client: ; Test Date: 04/30/2024 17:27

Peak Scan - Horizontal Polarization



Client: ; Test Date: 04/30/2024 17:27

Peak Scan - Vertical Polarization

6.42 Data (FCC Part 18, 1-18 GHz, EUT Orientation Y, Charging Mode):

Test Personnel:	Ali I. Yürekli	Test Date:	04/30/2024
Supervising /Reviewing Engineer: (Where Applicable)	N/A		
Product Standard:	FCC Part 18	Limit Applied:	FCC §18.305(b)
Input Voltage:	120 VAC		
		Ambient Temperature:	21.3 ºC
Pretest Verification	Yes	Relative Humidity:	55.7 %
		Atmospheric Pressure:	989.4 mbar

FCC Part 18, Radiated Emissions (Horizontal)						
Frequency (MHz)	Average Level (dBµV/m)	Average Limit (dBµV/m)	Average Margin (dB)	Azimuth (º)	Height (m)	Correction Factor (dB)
1806.6	16.49	63.52	-47.03	337.75	1.53	-22.70
2441.4	19.00	63.52	-44.52	117.50	3.96	-20.10
9656.0	26.20	63.52	-37.32	339.75	3.13	-7.71
Detectors/Bandwidths (Det/RBW/VBW) = AVG/1MHz/3MHz						

FCC Part 18, Radiated Emissions (Vertical)						
Frequency (MHz)	Average Level (dBµV/m)	Average Limit (dBµV/m)	Average Margin (dB)	Azimuth (^{0})	Height (m)	Correction Factor (dB)
1873.4	17.51	63.52	-46.01	150.5	2.92	-22.10
17805.4 *	29.92	63.52	-33.60	211.25	3.26	2.60
Detectors/Bandwidths (Det/RBW/VBW) = AVG/1MHz/3MHz						

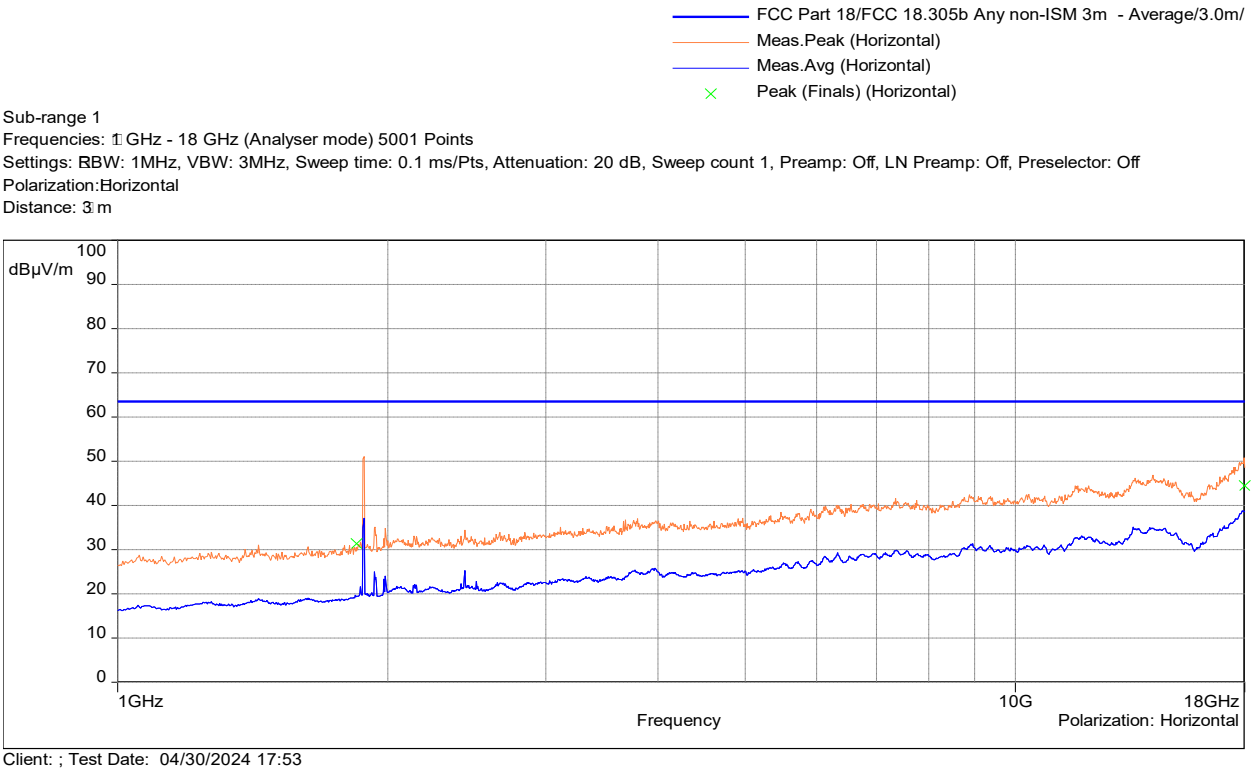
Note: The highest operating frequency of the EUT is 2480 MHz.

Test Result: (*) The **EUT PASSED** the Radiated Emissions test with a margin of –33.60 dB using Average detector at 17805.4 MHz.

Deviations, Additions, or Exclusions: None

6.43 Plots (FCC Part 18, 1-18 GHz):

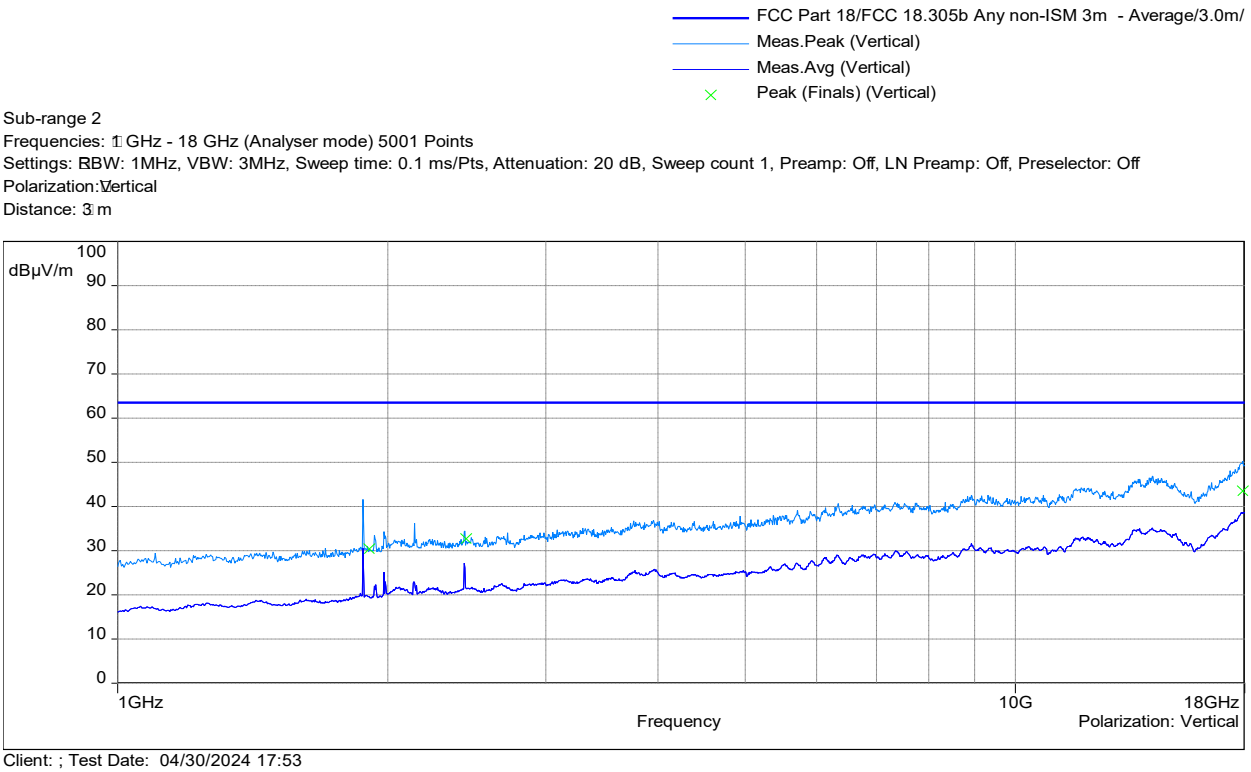
EUT Orientation: Z, Charging Mode



Sub-range 1
Frequencies: 1 GHz - 18 GHz (Analyser mode) 5001 Points
Settings: RBW: 1MHz, VBW: 3MHz, Sweep time: 0.1 ms/Pts, Attenuation: 20 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
Polarization: Horizontal
Distance: 3 m

Client: ; Test Date: 04/30/2024 17:53

Peak Scan - Horizontal Polarization



Sub-range 2
Frequencies: 1 GHz - 18 GHz (Analyser mode) 5001 Points
Settings: RBW: 1MHz, VBW: 3MHz, Sweep time: 0.1 ms/Pts, Attenuation: 20 dB, Sweep count 1, Preamp: Off, LN Preamp: Off, Preselector: Off
Polarization: Vertical
Distance: 3 m

Client: ; Test Date: 04/30/2024 17:53

Peak Scan - Vertical Polarization

6.44 Data (FCC Part 18, 1-18 GHz, EUT Orientation Z, Charging Mode):

Test Personnel:	Ali I. Yürekli	Test Date:	04/30/2024
Supervising /Reviewing Engineer: (Where Applicable)	N/A		
Product Standard:	FCC Part 15 Subpart B	Limit Applied:	FCC §18.305(b)
Input Voltage:	120 VAC	Ambient Temperature:	21.3 ºC
		Relative Humidity:	55.7 %
Pretest Verification	Yes	Atmospheric Pressure:	989.4 mbar

FCC Part 18, Radiated Emissions (Horizontal)						
Frequency (MHz)	Average Level (dBµV/m)	Average Limit (dBµV/m)	Average Margin (dB)	Azimuth (º)	Height (m)	Correction Factor (dB)
1846.6	17.22	63.52	-46.30	129.50	3.80	-22.44
17996.0 *	31.48	63.52	-32.04	185.50	2.83	3.25
Detectors/Bandwidths (Det/RBW/VBW) = AVG/1MHz/3MHz						

FCC Part 18, Radiated Emissions (Vertical)						
Frequency (MHz)	Average Level (dBµV/m)	Average Limit (dBµV/m)	Average Margin (dB)	Azimuth (º)	Height (m)	Correction Factor (dB)
1908.2	17.18	63.52	-46.34	39.75	2.92	-21.6
2445.4	19.02	63.52	-44.50	339.50	3.61	-20.11
17901.0	30.76	63.52	-32.76	321.00	2.11	2.92
Detectors/Bandwidths (Det/RBW/VBW) = AVG/1MHz/3MHz						

Note: The highest operating frequency of the EUT is 2480 MHz.

Test Result: (*) The **EUT PASSED** the Radiated Emissions test with a margin of -32.04 dB using Average detector at 17996 MHz.

Deviations, Additions, or Exclusions: None

7 AC Mains Conducted Emissions

7.1 Requirements

FCC §15.107(a)

Except for Class A digital devices, for equipment 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 or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 µH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the band edges:

Frequency of Emission (MHz)	Conducted limits (dBµV)	
	Quasi-Peak	Average
0.15 – 0.5	66 to 56 *	56 to 46 *
0.5 – 5	56	46
5 – 30	60	50

(*) The limit level decreases with the logarithm of frequency

FCC §18.307

For the following equipment, when 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 or frequencies shall not exceed the limits in the following tables. Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal using a 50 µH/50 ohms line impedance stabilization network (LISN).

(a) All Induction cooking ranges and ultrasonic equipment:

Frequency of Emission (MHz)	Conducted limits (dBµV)	
	Quasi-Peak	Average
0.009 – 0.05	110	-
0.05 – 0.15	90 to 80 *	-
0.15 – 0.5	66 to 56 *	56 to 46 *
0.5 – 5	56	46
5 – 30	60	50

(*) The limit level decreases with the logarithm of frequency.

(b) All other part 18 consumer devices:

Frequency of Emission (MHz)	Conducted limits (dBµV)	
	Quasi-Peak	Average
0.15 – 0.5	66 to 56 *	56 to 46 *
0.5 – 5	56	46
5 – 30	60	50

(*) The limit level decreases with the logarithm of frequency.

7.2 Method

Tests are performed in accordance with ANSI C63.4-2014 and FCC-MP5.

Measurements in the frequency range of 150 kHz to 30 MHz shall be performed with a quasi-peak or average detector instrument that meets the requirements of Section One of CISPR 16. An AMN shall be used to provide a defined impedance at high frequencies across the power feed at the point of measurement of terminal voltage and also to provide isolation of the circuit under test from the ambient noise on the power lines. An AMN defined in CISPR 16 shall be used.

TEST SITE: Lake Forest EMC Lab

The test is performed in the 3meter anechoic chamber located at 25791 Commercentre Drive, Lake Forest, CA 92630. This site meets the requirements of CISPR 16-1.

TEST SETUP

The EUT shall be located so that the distance between the boundary of the EUT and the closest surface of the AMN is 0.8m.

If a flexible mains cord is provided by the manufacturer that is in excess of 1m, the excess cable shall be folded back and forth as far as possible to form a bundle not exceeding 0.4m in length.

The EUT shall be arranged and connected with cables terminated in accordance with the product specification.

Conducted disturbance shall be measured between each current carrying conductor and the reference ground. Each measured values shall be reported.

If EUT is intended for tabletop use, the EUT shall be placed on a table whose top is 0.8m above the ground plane. A vertical, metal reference plane is being placed 0.4m from the EUT. The vertical metal reference-plane is at least 2m by 2m. The EUT shall be kept at least 0.8m from any other metal surface or other ground plane not being part of the EUT. The table shall be constructed of non-conductive materials. Its dimensions are at least 1m by 1.5m but may be extended for larger EUT.

If EUT is floor standing, the floor standing EUT shall be placed on a horizontal metal ground plane and isolated from the ground plane by up to 12 mm of insulating material. The metal ground plane shall extend at least 0.5m beyond the boundaries of the EUT and have minimum dimensions of 2m by 2m.

Equipment setup for conducted disturbance tests shall follow the guidelines of CISPR 16.

Measurement Uncertainty

Measurement	Frequency Range	Expanded Uncertainty (k=2)	U_{cispr}
AC Line Conducted Emissions	150 kHz - 30 MHz	2.8 dB	3.4dB

As shown in the table above our conducted emissions U_{lab} is less than the corresponding U_{CISPR} reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required, based on CISPR 32 and CISPR 11 (for 2006 and later revisions) Clause 11.

Sample Calculations

The following is how net line-conducted readings were determined:

NF = RF + LF + CF + AF
Where NF = Net Reading in dBμV
RF = Reading from receiver in dBμV
LF = LISN or ISN Correction Factor in dB
CF = Cable Correction Factor in dB
AF = Attenuator Loss Factor in dB

To convert from dBμV to μV or mV the following was used:

$UF = 10^{(NF / 20)}$ where UF = Net Reading in μV
NF = Net Reading in dBμV

Example:

NF = RF + LF + CF + AF = 28.5 + 0.2 + 0.4 + 20.0 = 49.1 dBμV
$UF = 10^{(49.1\ dB\mu V / 20)}$ = 285.1 μV/m

7.3 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
001669	EMI Test Receiver	Rohde & Schwarz	ESW	101636	11/07/2023	11/07/2024
001998	LISN	Rohde & Schwarz	ENV216	101451	01/09/2024	01/09/2025
002125	Cable	Fairview Microwave	FMC0101223-600	NA	01/09/2024	01/09/2025
002159	Humidity/Temperature/Pressure Meter	Testo	622	39525175/0920	08/05/2023	08/05/2024

Software Utilized:

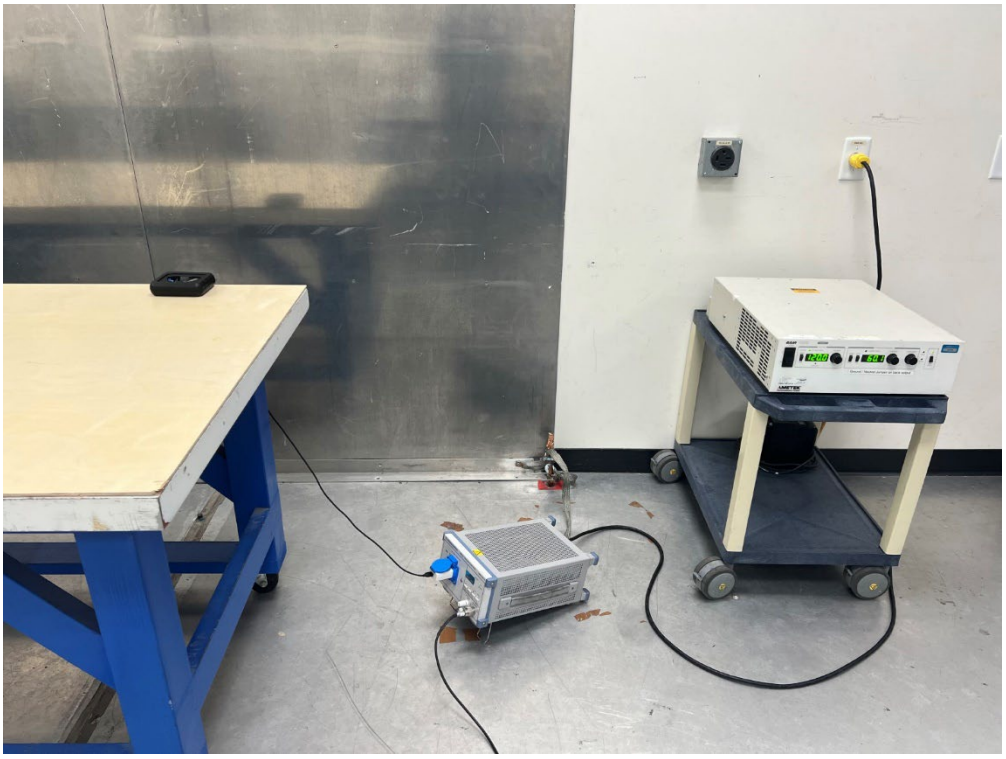
Name	Manufacturer	Version
BAT-EMC	NEXIO	Version 3.19.1.19

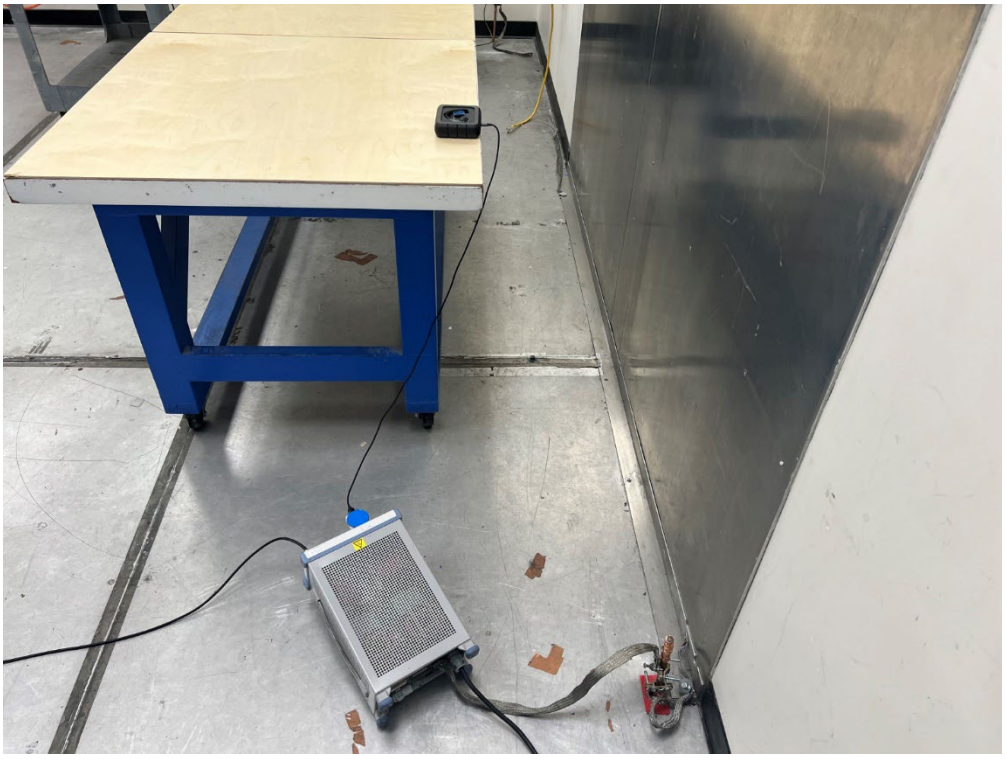
7.4 Results:

The sample tested was found to Comply.

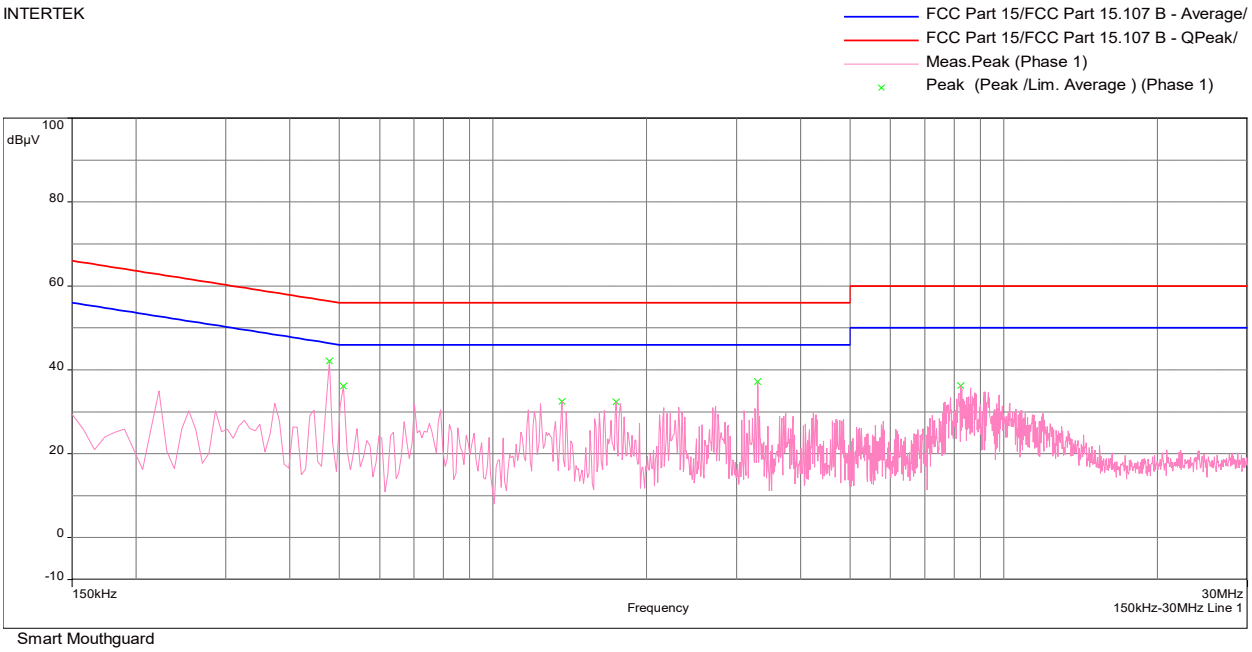
7.5 Setup Photographs:

Conducted Emissions (150 kHz – 30 MHz)

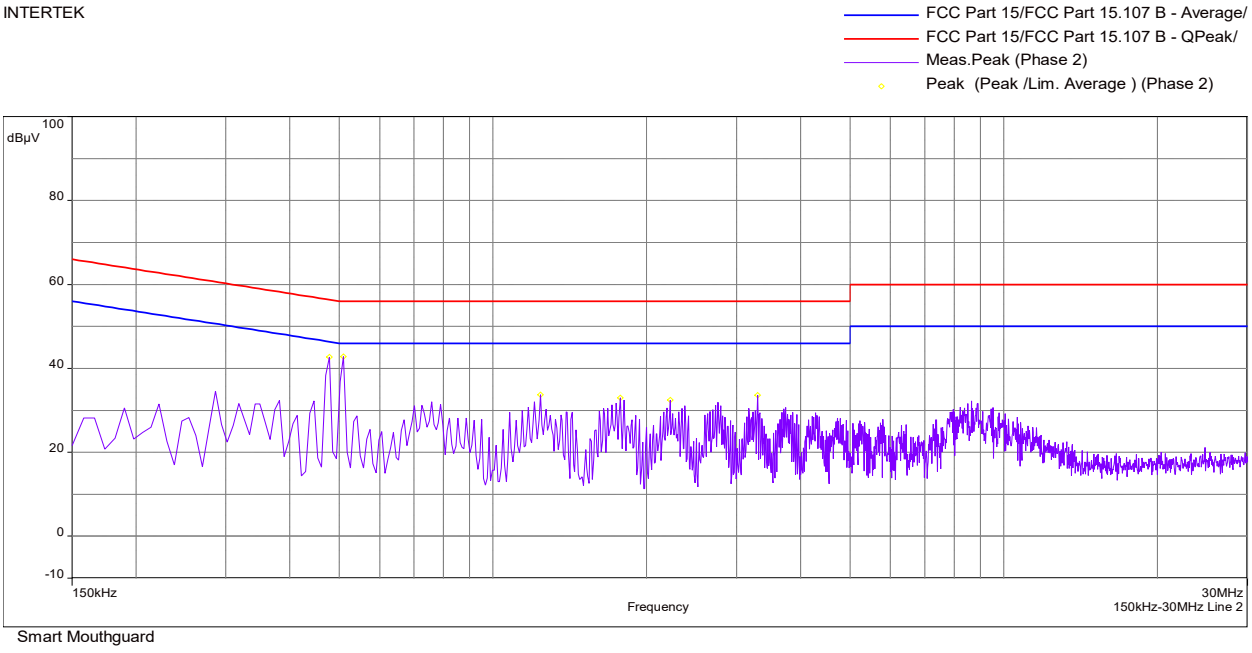




7.6 Plots (FCC Part 15):



Peak Scan - Phase 1



Peak Scan - Phase 2

7.7 Data (FCC Part 15):

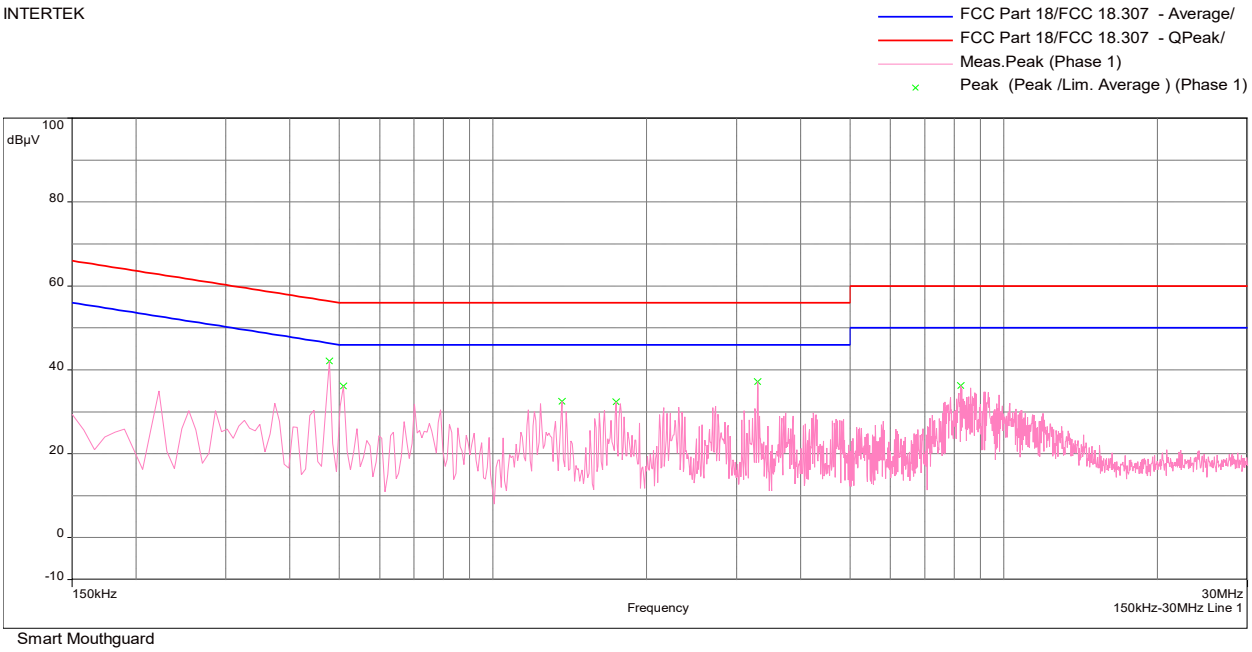
Test Personnel:	Ali I. Yürekli	Test Date:	04/29/2024
Supervising /Reviewing Engineer: (Where Applicable)	N/A		
Product Standard:	FCC Part 15 Subpart B	Limit Applied:	FCC §15.107 Class B
Input Voltage:	120 VAC	Ambient Temperature:	20.3 ºC
		Relative Humidity:	55.9 %
Pretest Verification	Yes	Atmospheric Pressure:	990.7 mbar

FCC §15.107 Class B, Conducted Emissions (Phase 1) – Average and QuasiPeak							
Frequency (MHz)	Average Level (dBµV)	Average Limit (dBµV)	Average Margin (dB)	QuasiPeak Level (dBµV)	QuasiPeak Limit (dBµV)	QuasiPeak Margin (dB)	Correction Factor (dB)
0.506749102	40.77	46.00	-5.23	44.51	56.00	-11.49	9.57
1.391664695	24.91	46.00	-21.09	29.23	56.00	-26.77	9.67
1.712352809	25.52	46.00	-20.48	30.48	56.00	-25.52	9.69
3.297627863	31.95	46.00	-14.05	37.01	56.00	-18.99	9.80
8.201474379	24.36	50.00	-25.64	33.56	60.00	-26.44	10.07
Detectors/Bandwidths (Det/RBW/VBW) = AVE&QP/9kHz/30kHz							

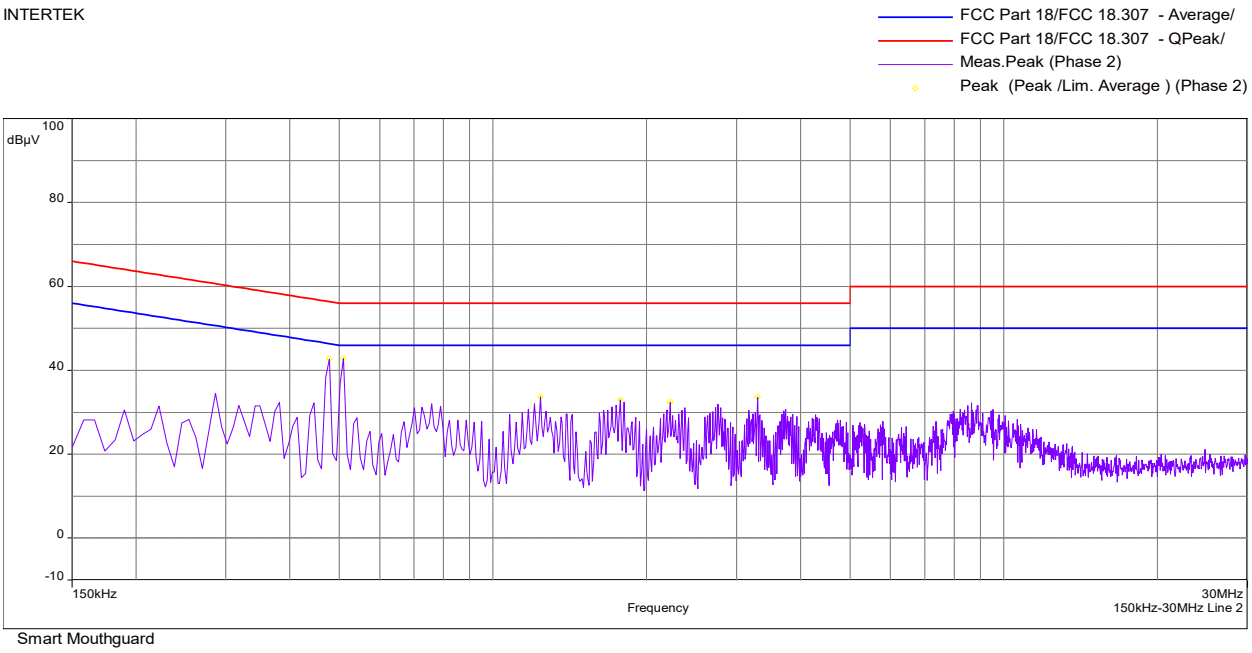
FCC §15.107 Class B, Conducted Emissions (Phase 2) – Average and QuasiPeak							
Frequency (MHz)	Average Level (dBµV)	Average Limit (dBµV)	Average Margin (dB)	QuasiPeak Level (dBµV)	QuasiPeak Limit (dBµV)	QuasiPeak Margin (dB)	Correction Factor (dB)
0.507420488 *	43.57	46.00	-2.43	44.57	56.00	-11.43	9.57
1.206519789	28.57	46.00	-17.43	30.60	56.00	-25.40	9.65
1.745821652	27.88	46.00	-18.12	31.22	56.00	-24.78	9.69
2.25363107	26.33	46.00	-19.67	30.29	56.00	-25.71	9.73
3.297688898	29.63	46.00	-16.37	35.32	56.00	-20.68	9.80
Detectors/Bandwidths (Det/RBW/VBW) = AVE&QP/9kHz/30kHz							

Test Result: (*)The **EUT PASSED** the Conducted Emissions test with a margin of –2.43 dB using Average detector at 0.507420488 MHz.

7.8 Plots (FCC Part 18):



Peak Scan - Phase 1



Peak Scan - Phase 2

7.9 Data (FCC Part 18):

Test Personnel:	Ali I. Yürekli	Test Date:	04/29/2024
Supervising /Reviewing Engineer: (Where Applicable)	N/A		
Product Standard:	FCC Part 18	Limit Applied:	FCC §18.307(b)
Input Voltage:	120 VAC		
		Ambient Temperature:	20.3 ºC
Pretest Verification	Yes	Relative Humidity:	55.9 %
		Atmospheric Pressure:	990.7 mbar

FCC §18.307(b), Conducted Emissions (Phase 1) – Average and QuasiPeak							
Frequency (MHz)	Average Level (dBµV)	Average Limit (dBµV)	Average Margin (dB)	QuasiPeak Level (dBµV)	QuasiPeak Limit (dBµV)	QuasiPeak Margin (dB)	Correction Factor (dB)
0.506749102	40.77	46.00	-5.23	44.51	56.00	-11.49	9.57
1.391664695	24.91	46.00	-21.09	29.23	56.00	-26.77	9.67
1.712352809	25.52	46.00	-20.48	30.48	56.00	-25.52	9.69
3.297627863	31.95	46.00	-14.05	37.01	56.00	-18.99	9.80
8.201474379	24.36	50.00	-25.64	33.56	60.00	-26.44	10.07
Detectors/Bandwidths (Det/RBW/VBW) = AVE&QP/9kHz/30kHz							

FCC §18.307(b, Conducted Emissions (Phase 2) – Average and QuasiPeak)							
Frequency (MHz)	Average Level (dBµV)	Average Limit (dBµV)	Average Margin (dB)	QuasiPeak Level (dBµV)	QuasiPeak Limit (dBµV)	QuasiPeak Margin (dB)	Correction Factor (dB)
0.507420488 *	43.57	46.00	-2.43	44.57	56.00	-11.43	9.57
1.206519789	28.57	46.00	-17.43	30.60	56.00	-25.40	9.65
1.745821652	27.88	46.00	-18.12	31.22	56.00	-24.78	9.69
2.25363107	26.33	46.00	-19.67	30.29	56.00	-25.71	9.73
3.297688898	29.63	46.00	-16.37	35.32	56.00	-20.68	9.80
Detectors/Bandwidths (Det/RBW/VBW) = AVE&QP/9kHz/30kHz							

Test Result: (*) The **EUT PASSED** the Conducted Emissions test with a margin of –2.43 dB using Average detector at 0.507420488 MHz.

8 Revision History

Revision Level	Date	Report Number	Prepared By	Reviewed By	Notes
0	July 9, 2024	105793599LAX-007	AiY	AS	Original Issue