EMC Test Report	
For:	**MysteryVibe Limited**
Product:	**Tenuto Mini**
Model:	**6907**
FCC ID:	**2AHVA-6907**
Project Engineer:	**Malcolm Musgrave**
Approval Signatory:	**Dan Tiroke**

Document Reference:	**4843 FR**

Issue Number:	**Date:**	**Test Report Revisions History:**
1	5th June 2023	Original Report Issued

UKAS Accredited:	1871
FCC Registered:	UK2006
KC Lab ID:	UK 1871
Canada CAB ID:	UK0005

Eurofins E&E Hursley Limited
Trafalgar House, Trafalgar Close
Chandlers Ford, Eastleigh
Hampshire, SO53 4BW
United Kingdom

1871

Phone: +44 (0) 23 8027 1111
e-mail: adminhursley@eurofins.com
www.eurofins.co.uk/hursley

Contents

1.0 OVERVIEW

1.1 Introduction

The equipment under test (EUT) as described within this document was submitted for testing as agreed with the customer.

1.2 Objective

The purpose of the test was to measure and report the EUT against limits and methods of the requested standards as listed in section 2.0 Test Summary.

1.3 Product Modifications

None to sample submitted.

1.4 Conclusion

The EUT met the emission requirements of the tests defined in section 2.0 Test Summary.

This report relates to the sample tested and may not represent the entire population. It is valid only for the product identified, either in part or in full, to the standards and/or tests covered in this document.

1.5 EMC Test Lab Reference

Eurofins E&E Hursley File: 4843

1.6 Test Deviations

None.

2.0 TEST SUMMARY

2.1 Summary

The EUT, as described and reported within this document, complies with the applied requested sections of the standards listed below.

The EUT met the **emissions** test requirements of the following standards:			
Description	**General Standard**	**Referenced Standard**	**Status**
Radiated Emissions	FCC/CFR 47:Part 15B 15.109 and 15.107	ANSI C63.4:2014, Class B	Pass
Conducted Emissions	FCC/CFR 47:Part 15C 15.247 and 15.209	ANSI C63.10:2013, Class B	Pass

Note(s):

- The highest internal operating frequency declared by the manufacturer is 2480MHz.

3.0 EQUIPMENT AND TEST DETAILS

3.1 General

Product (EUT):	Tenuto Mini		
Model:	6907	**Serial Number:**	10005
Sample Build:	Production Sample		
EUT Power:	Battery Powered / 110V/60Hz (while charging via PSU)		
Customer Test Plan:	Not Applicable		
Alternate Models:	Not Applicable		
EUT Manufacturer:	MysteryVibe Limited		
Customer Name:	MysteryVibe Limited		
Customer Address:	The Dairy South Shoelands Farm Offices Puttenham Surrey GU10 1HL United Kingdom		
Test Commissioned By:	Charlie Blackham, Sulis Consultants Limited		
Date EUT Received:	3rd May 2023		
Test Date(s):	3rd to 4th May and 18th May 2023		
EMC Measurement Site:	Eurofins E&E Hursley Limited		
	Trafalgar Close, Chandlers Ford, Hampshire, United Kingdom		
Product Category:	Personal Vibrator Toy		

3.2 EUT Description

The EUT is a personal vibrator toy.

3.3 Support Equipment

Description	Manufacturer	Model	Serial Number
PSU	Apple	A1399	Not Applicable

3.4 EUT Test Exerciser

The EUT operates inside the 2400 – 2483.5MHz band:

- 79 channels with centre frequencies on 1MHz spacing from 2402 to 2480MHz inclusive
- The device includes a rechargeable LiIon battery and is charged from external mains to 5V dc power supply.

The following test frequencies were used to cover the full band of operation of the device:

Test Channel	Description
Top	Continuous transmit on 2480MHz
Middle	Continuous transmit on 2440MHz
Bottom	Continuous transmit on 2402MHz

3.5 EUT Test Configuration #1

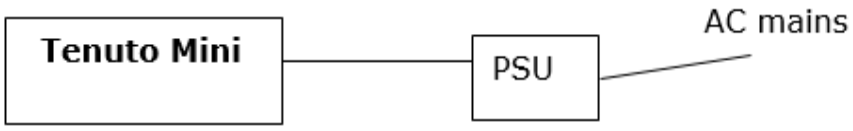


Figure 1: EMC test configuration (charging)

4.0 TEST RESULTS

4.1 Radiated Emissions (Worst Case)

4.1.1 Test Parameters

A profile scan was taken using an EMI receiver at a distance of three metres on eight azimuths of the EUT in both the vertical and horizontal polarisation of the field in a semi-anechoic chamber.

Using the pre-scan results as a guide, each emission from the EUT was maximised. Measurements were carried out at a distance of three metres using the specified detector in a CISPR 16-1-4 compliant semi-anechoic chamber. Antenna and turntable positions were then finally adjusted to produce the maximum emission levels. The worst-case results are reported below.

Test Equipment						
#ID	CP	Manufacturer	Type	Serial Number	Description	Calibration Due Date
750	1	Global	CISPR16	1	11 x 7 x 6.2m, chamber	22/12/2023
893	1	Rohde & Schwarz	ESW 44	103044	EMI test receiver	11/11/2023
053	1	HP	8449B	3008A01394	Pre-amplifier (1.0-26.5GHz)	24/10/2023
073	3	Schwarzbeck	BBHA9120B	237	Horn Antenna (1-10GHz)	20/05/2024
676	3	Schwarzbeck	BBHA9120C	576	Horn Antenna (2-18GHz)	20/05/2024
762	3	Schwarzbeck	VULB9162	129	30-7000MHz	04/03/2024
Test Equipment Software						
#ID	CP	Manufacturer	Type		Description	Calibration Due Date
856	0	Rohde & Schwarz	Software	0	EMC32 v11.30.0	Not required

Environmental Test Conditions		
Frequency	**Below 1GHz**	**Above 1GHz**
Temperature	23.4° Celsius	22.3° Celsius
Relative Humidity	44%	36%
Atmospheric Pressure	1014.4 millibars	1026.3 millibars
Test Dates:	4th May 2023	3rd May 2023
Test Engineer:	Malcolm Musgrave	Malcolm Musgrave

Note: “Calibration due date” means the instrument is certified within UKAS or traceable calibration certificate. “Internal” means the instrument is calibrated using Eurofins Hursley procedures. “Not required” means the asset does not require calibration. “CP” is the interval period [year] prescribed for external calibration.

4.1.2 Test Configuration

Please refer to EUT Test Configuration #1.

4.1.3 Set-up Photos

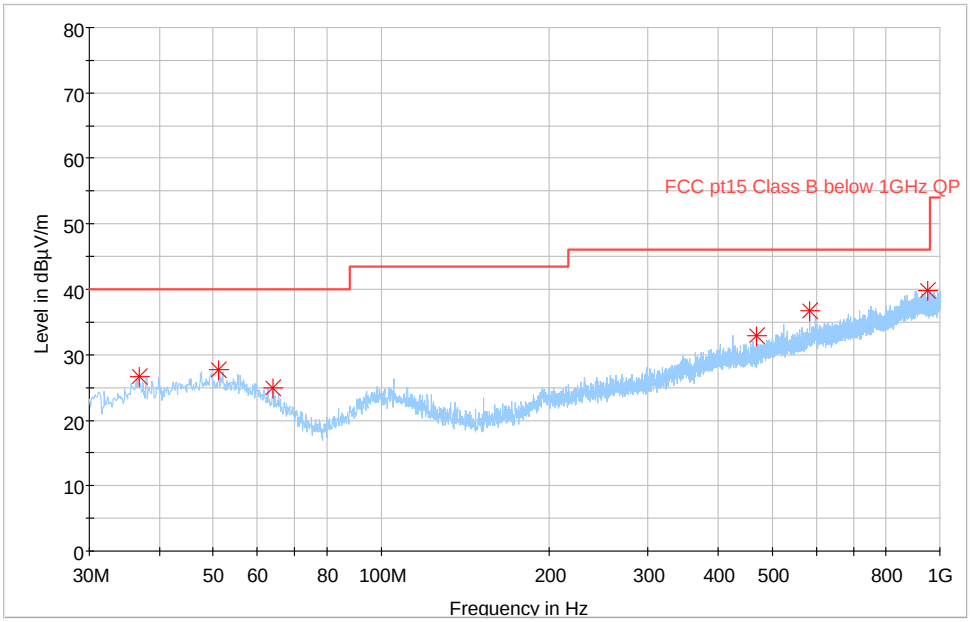
Radiated Emissions; Below 1GHz

Radiated Emissions; Above 1GHz

4.1.4 Profile; 30MHz to 1GHz, Top Channel, 2480MHz, X Orientation

Maximum peak hold trace with quasi-peak values (◆)
Peak measurements (✳)

30MHz to 1GHz, Top Channel, 2480MHz, X Orientation



4.1.5 Data; 30MHz to 1GHz, Top Channel, 2480MHz, X Orientation

No measurements were taken based on the max peak data values high margins relative to the limit lines.

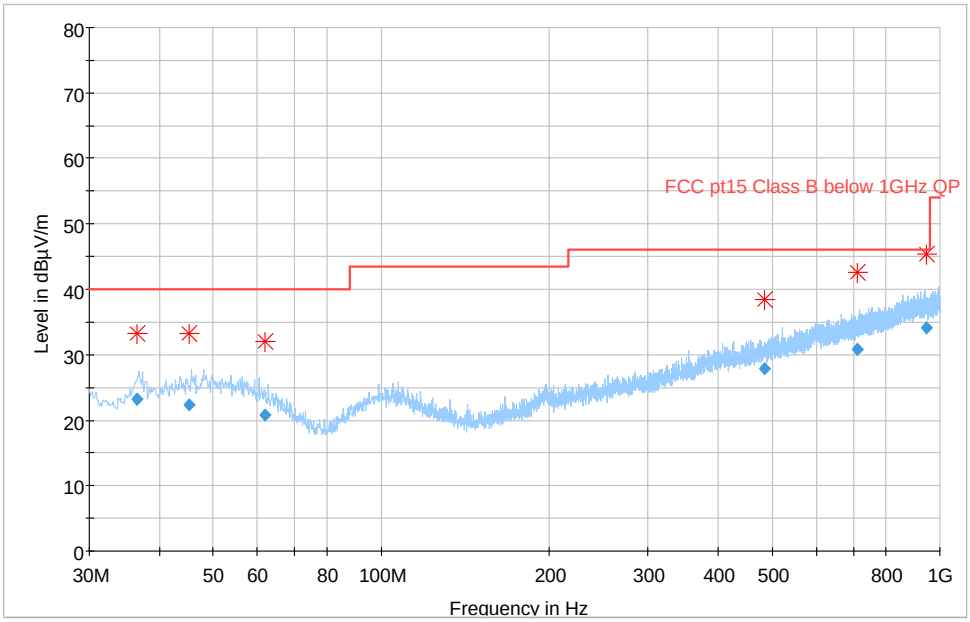
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the FCC/CISPR Class B limits and take into account the correction factor*. Measurements made according to the CISPR test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: Path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.6 Profile; 30MHz to 1GHz, Middle Channel, 2440MHz, X Orientation

Maximum peak hold trace with quasi-peak values (◆)
Peak measurements (✳)

30MHz to 1GHz, Middle Channel, 2440MHz, X Orientation



4.1.7 Data; 30MHz to 1GHz, Middle Channel, 2440MHz, X Orientation

Emission Frequency	Measured Quasi-Peak Value	Class B Specified Quasi-Peak Limit	Pass Margin	Antenna Polarisation	Antenna Height	Turntable Azimuth	
MHz	dBµV/m	dBµV/m	dB	H/V	cm	deg	Status
36.429590	23.22	40.00	16.78	V	105.0	300.0	Pass
45.305186	22.29	40.00	17.71	V	161.0	179.0	Pass
61.900313	20.83	40.00	19.17	H	210.0	151.0	Pass
484.766281	27.84	46.00	18.16	H	218.0	331.0	Pass
712.278096	30.87	46.00	15.13	V	255.0	117.0	Pass
943.491235	34.19	46.00	11.81	H	224.0	57.0	Pass

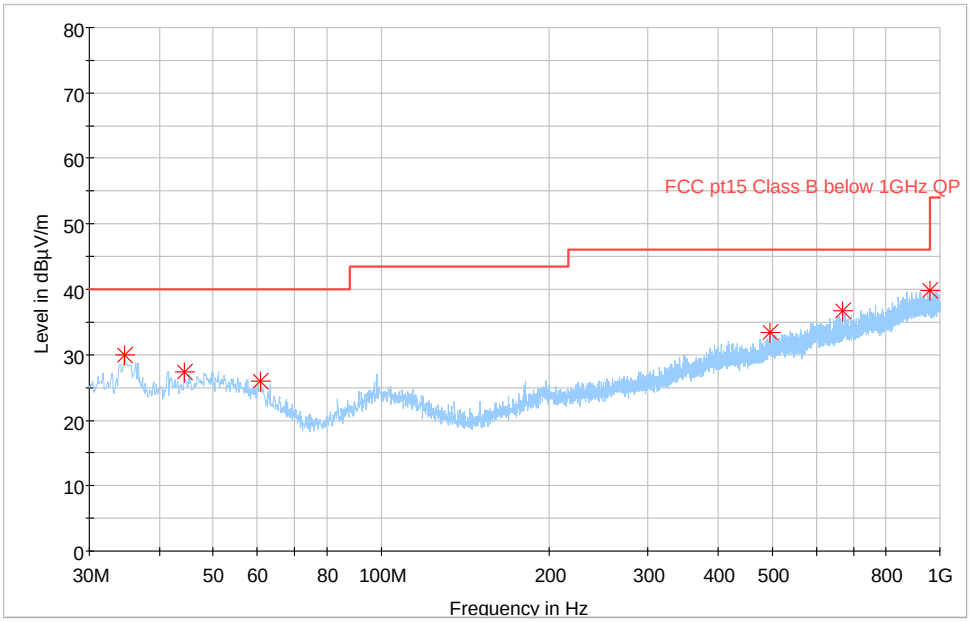
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the FCC/CISPR Class B limits and take into account the correction factor*. Measurements made according to the CISPR test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: Path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.8 Profile; 30MHz to 1GHz, Middle Channel, 2440MHz, X Orientation, Charging Cable

Maximum peak hold trace with quasi-peak values (◆)
Peak measurements (✳)

30MHz to 1GHz, Middle Channel, 2440MHz, X Orientation, Charging Cable



4.1.9 Data; 30MHz to 1GHz, Middle Channel, 2440MHz, X Orientation, Charging Cable

No measurements were taken based on the max peak data values high margins relative to the limit lines.

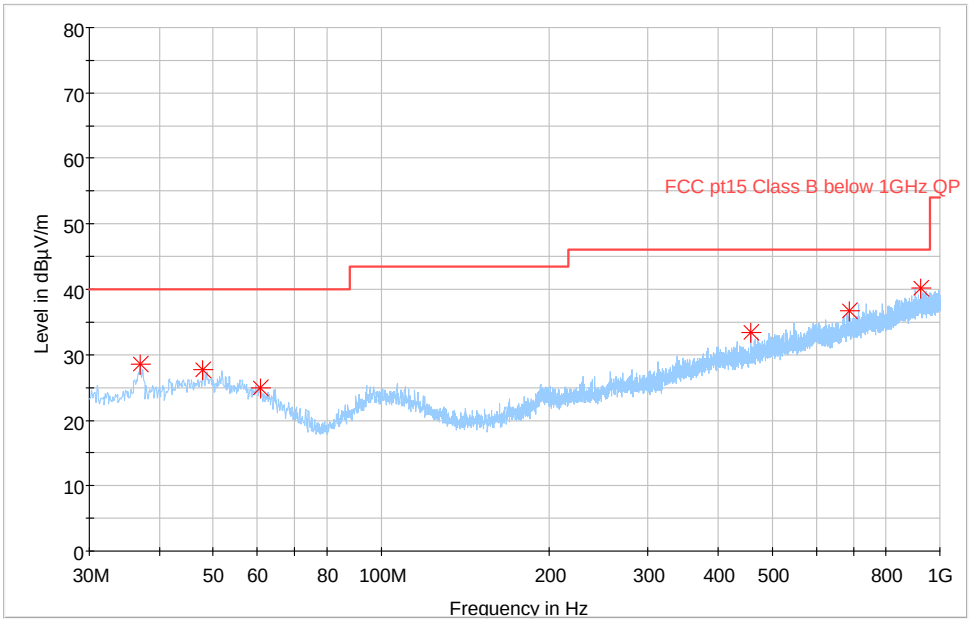
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the FCC/CISPR Class B limits and take into account the correction factor*. Measurements made according to the CISPR test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: Path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.10 Profile; 30MHz to 1GHz, Middle Channel, 2440MHz, Y Orientation

Maximum peak hold trace with quasi-peak values (◆)
Peak measurements (✳)

30MHz to 1GHz, Middle Channel, 2440MHz, Y Orientation



4.1.11 Data; 30MHz to 1GHz, Middle Channel, 2440MHz, Y Orientation

No measurements were taken based on the max peak data values high margins relative to the limit lines.

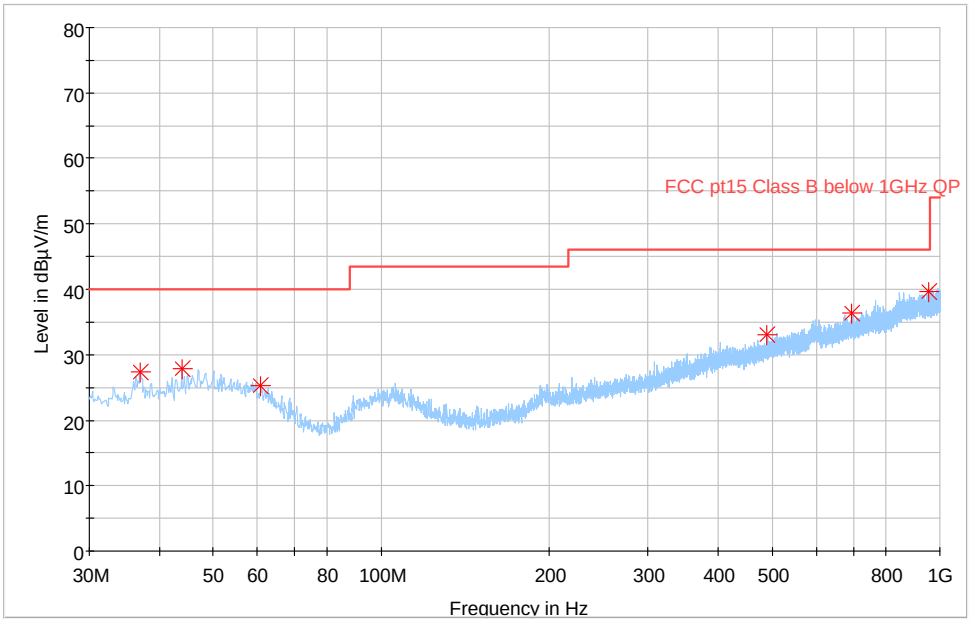
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the FCC/CISPR Class B limits and take into account the correction factor*. Measurements made according to the CISPR test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: Path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.12 Profile; 30MHz to 1GHz, Middle Channel, 2440MHz, Z Orientation

Maximum peak hold trace with quasi-peak values (◆)
Peak measurements (✳)

30MHz to 1GHz, Middle Channel, 2440MHz, Z Orientation



4.1.13 Data; 30MHz to 1GHz, Middle Channel, 2440MHz, Z Orientation

No measurements were taken based on the max peak data values high margins relative to the limit lines.

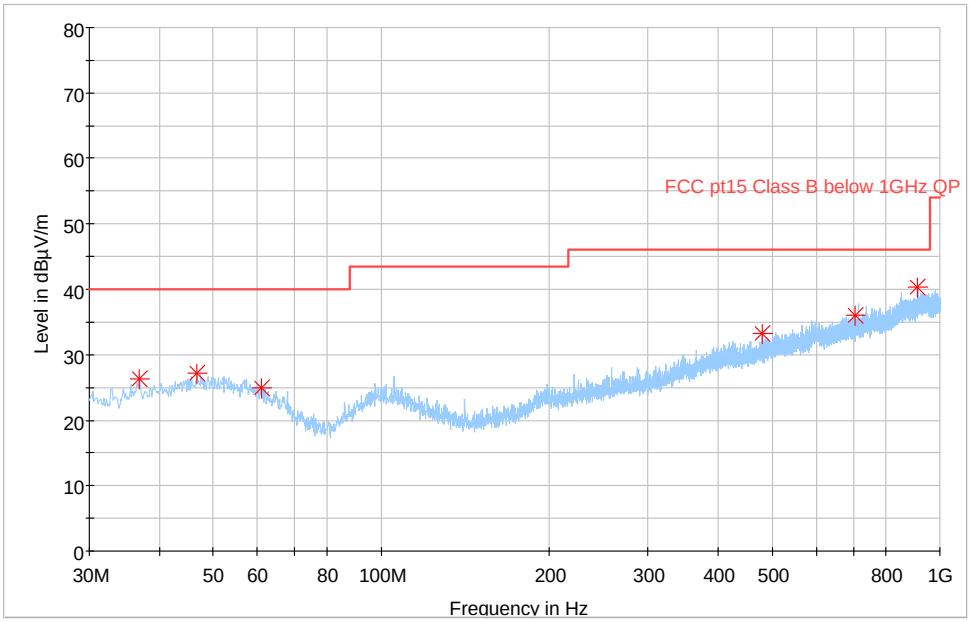
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the FCC/CISPR Class B limits and take into account the correction factor*. Measurements made according to the CISPR test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: Path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.14 Profile; 30MHz to 1GHz, Bottom Channel, 2402MHz, X Orientation

Maximum peak hold trace with quasi-peak values (◆)
Peak measurements (✳)

30MHz to 1GHz; Bottom Channel, 2402MHz, X Orientation



4.1.15 Data; 30MHz to 1GHz, Bottom Channel, 2402MHz, X Orientation

No measurements were taken based on the max peak data values high margins relative to the limit lines.

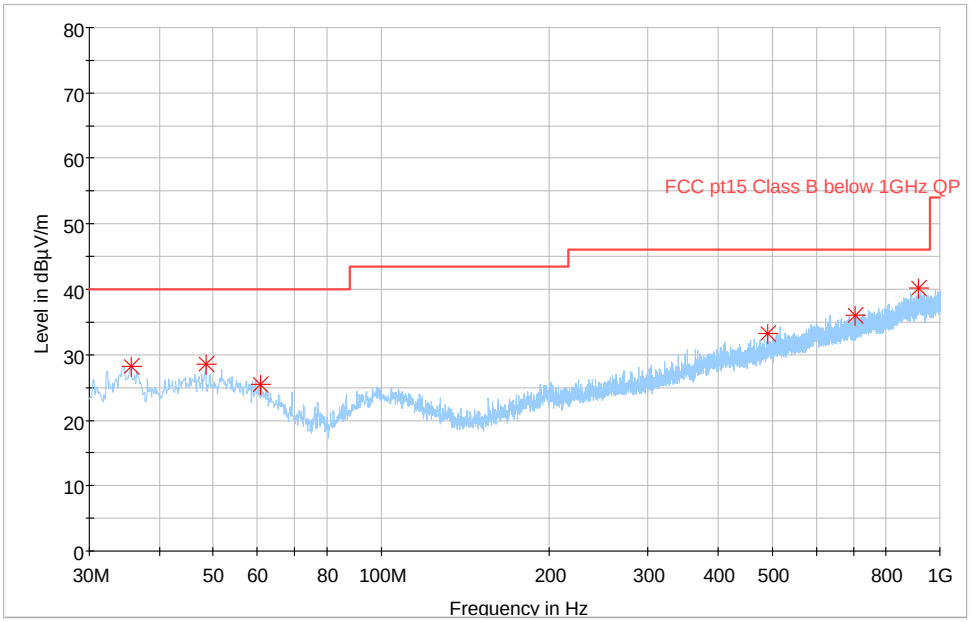
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the FCC/CISPR Class B limits and take into account the correction factor*. Measurements made according to the CISPR test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: Path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.16 Profile; 30MHz to 1GHz, Receive Mode, X Orientation

Maximum peak hold trace with quasi-peak values (◆)
Peak measurements (✳)

30MHz to 1GHz, Receive Mode, X Orientation



4.1.17 Data; 30MHz to 1GHz, Receive Mode, X Orientation

No measurements were taken based on the max peak data values high margins relative to the limit lines.

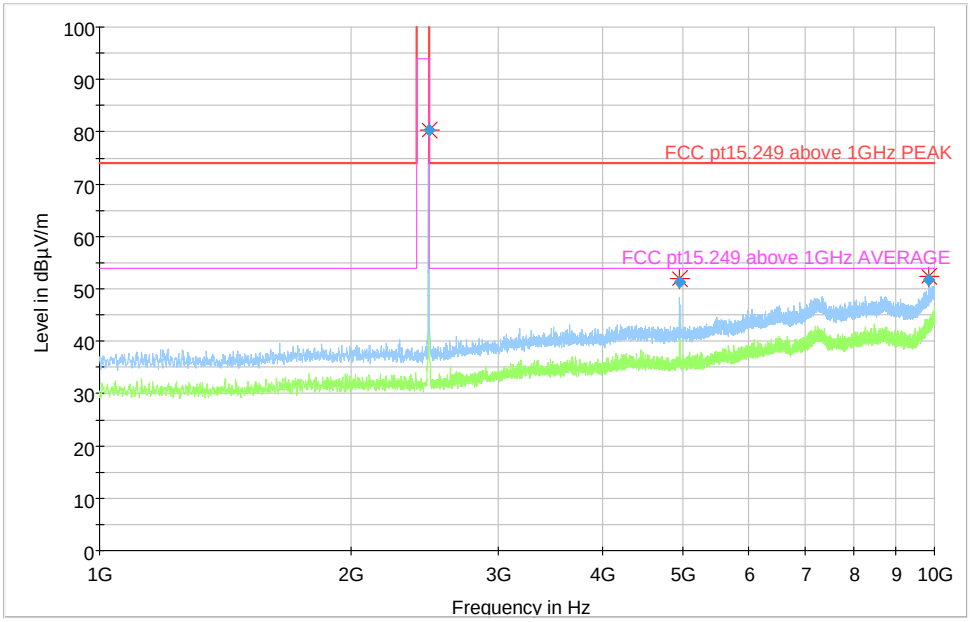
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the FCC/CISPR Class B limits and take into account the correction factor*. Measurements made according to the CISPR test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: Path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.18 Profile; 1 to 10GHz, Top Channel, 2480MHz, Z Orientation

Maximum hold trace with peak values (◆)
Peak measurements (✳)
Average measurements (◆)

1 to 10GHz, Top Channel, 2480MHz, Z Orientation



4.1.19 Data; 1 to 10GHz, Top Channel, 2480MHz, Z Orientation

Frequency	Peak	CISPR Average	FCC 15.249 AV Limit	Margin	Height	Pol	Azimuth	Corr.	
MHz	dBµV/	dBµV/m	dBµV/m	dB	cm	H/V	Deg	dB/m	Status
2479.375000	80.34	---	94.00	13.66	128.0	V	182.0	-6.2	Pass
4957.750000	51.34	---	54.00	2.66	268.0	H	290.0	0.1	Pass
9831.250000	51.71	---	54.00	2.29	159.0	V	67.0	6.5	Pass

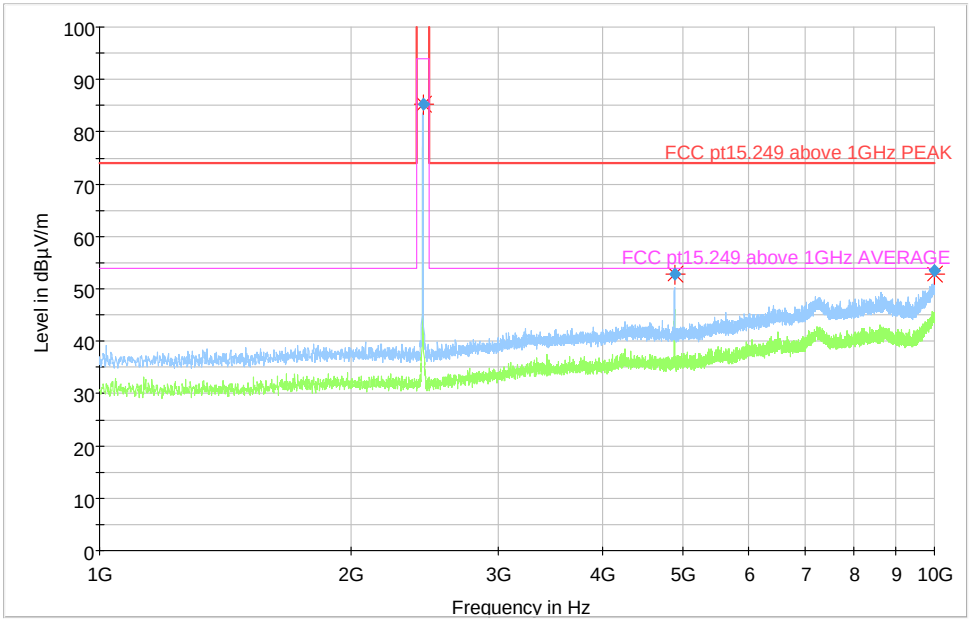
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the FCC 15.249 limits and take into account the correction factor*. Measurements made according to the CISPR test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.20 Profile; 1 to 10GHz, Middle Channel, 2440MHz, X Orientation

Maximum hold trace with peak values (◆)
Peak measurements (✳)
Average measurements (◆)

1 to 10GHz, Middle Channel, 2440MHz, X Orientation



4.1.21 Data; 1 to 10GHz, Middle Channel, 2440MHz, X Orientation

Frequency	Peak	CISPR Average	FCC 15.249 AV Limit	Margin	Height	Pol	Azimuth	Corr.	
MHz	dBµV/	dBµV/m	dBµV/m	dB	cm	H/V	Deg	dB/m	Status
2440.000000	85.36	---	94.00	8.64	269.0	H	0.0	-6.2	Pass
4882.375000	52.91	---	54.00	1.09	235.0	H	208.0	-0.1	Pass
9998.875000	53.46	---	54.00	0.54	256.0	H	216.0	8.1	Pass

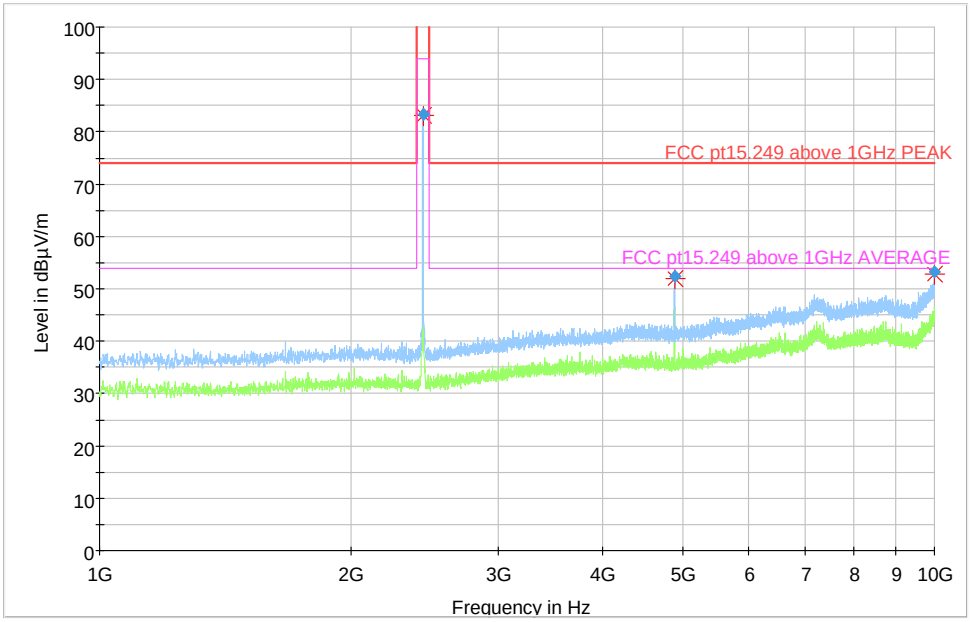
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the FCC 15.249 limits and take into account the correction factor*. Measurements made according to the CISPR test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.22 Profile; 1 to 10GHz, Middle Channel, 2440MHz, Y Orientation

Maximum hold trace with peak values (◆)
Peak measurements (✳)
Average measurements (◆)

1 to 10GHz, Middle Channel, 2440MHz, Y Orientation



4.1.23 Data; 1 to 10GHz, Middle Channel, 2440MHz, Y Orientation

Frequency	Peak	CISPR Average	FCC 15.249 AV Limit	Margin	Height	Pol	Azimuth	Corr.	
MHz	dBµV/	dBµV/m	dBµV/m	dB	cm	H/V	Deg	dB/m	Status
2440.000000	83.25	---	94.00	10.75	157.0	V	333.0	-6.2	Pass
4882.375000	52.33	---	54.00	1.67	192.0	H	339.0	-0.1	Pass
9989.875000	53.35	---	54.00	0.65	400.0	V	42.0	8.0	Pass

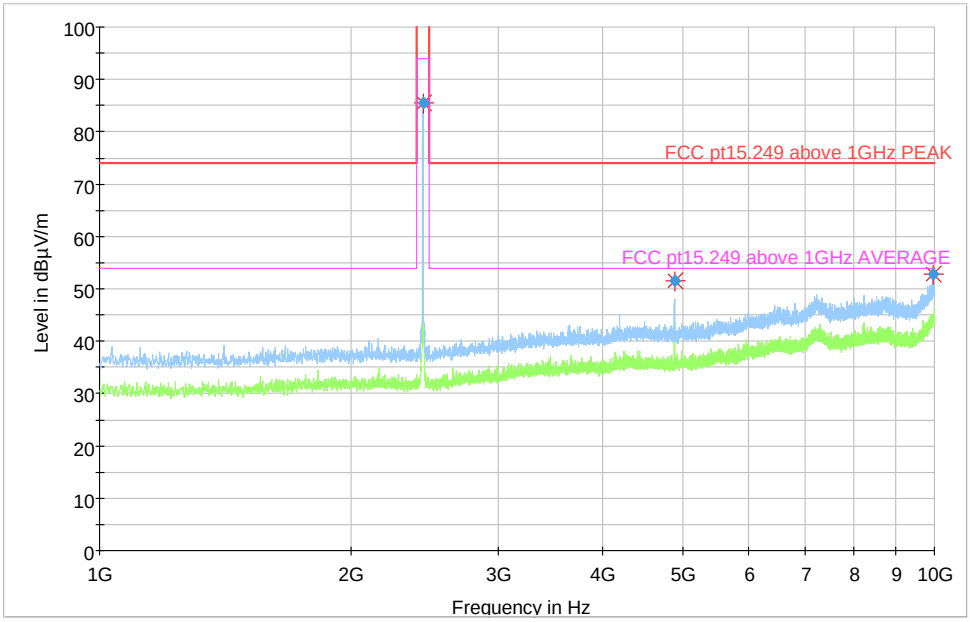
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the FCC 15.249 limits and take into account the correction factor*. Measurements made according to the CISPR test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.24 Profile; 1 to 10GHz, Middle Channel, 2440MHz, Z Orientation

Maximum hold trace with peak values (◆)
Peak measurements (✳)
Average measurements (◆)

1 to 10GHz, Middle Channel, 2440MHz, Z Orientation



4.1.25 Data; 1 to 10GHz, Middle Channel, 2440MHz, Z Orientation

Frequency	Peak	CISPR Average	FCC 15.249 AV Limit	Margin	Height	Pol	Azimuth	Corr.	
MHz	dBµV/	dBµV/m	dBµV/m	dB	cm	H/V	Deg	dB/m	Status
2440.000000	85.60	---	94.00	8.40	112.0	V	341.0	-6.2	Pass
4882.375000	51.48	---	54.00	2.52	314.0	V	270.0	-0.1	Pass
9979.750000	52.90	---	54.00	1.10	105.0	H	344.0	7.9	Pass

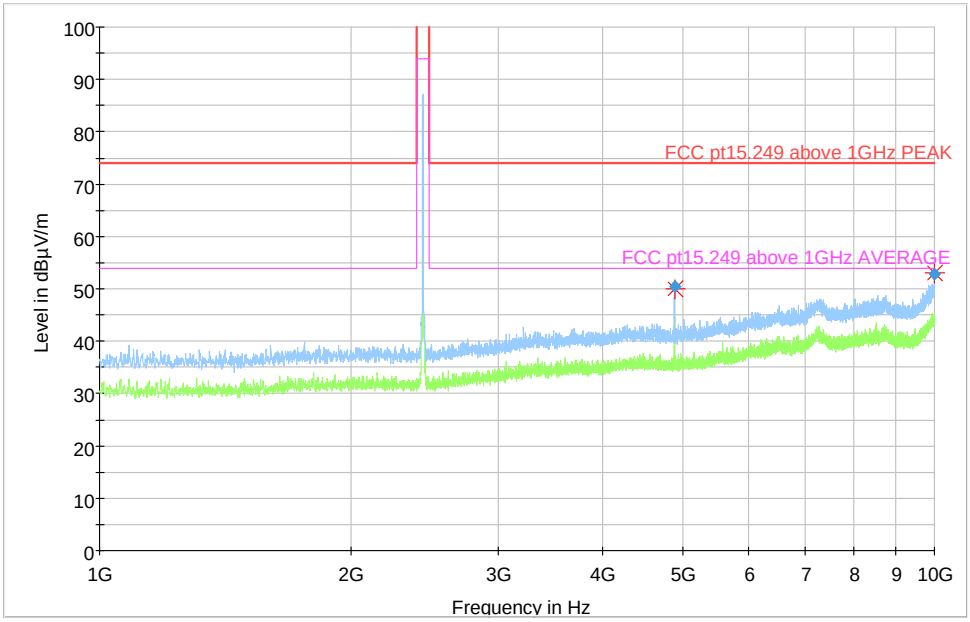
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the FCC 15.249 limits and take into account the correction factor*. Measurements made according to the CISPR test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.26 Profile; 1 to 10GHz, Middle Channel, 2440MHz, X Orientation, Charging Cable

Maximum hold trace with peak values (◆)
Peak measurements (✳)
Average measurements (◆)

1 to 10GHz, Middle Channel, 2440MHz, X Orientation, Charging Cable



4.1.27 Data; 1 to 10GHz, Middle Channel, 2440MHz, X Orientation, Charging Cable

Frequency	Peak	CISPR Average	FCC 15.249 AV Limit	Margin	Height	Pol	Azimuth	Corr.	
MHz	dBµV/	dBµV/m	dBµV/m	dB	cm	H/V	Deg	dB/m	Status
4882.375000	50.37	---	54.00	3.63	191.0	V	358.0	-0.1	Pass
9992.125000	52.79	---	54.00	1.21	125.0	H	337.0	8.0	Pass

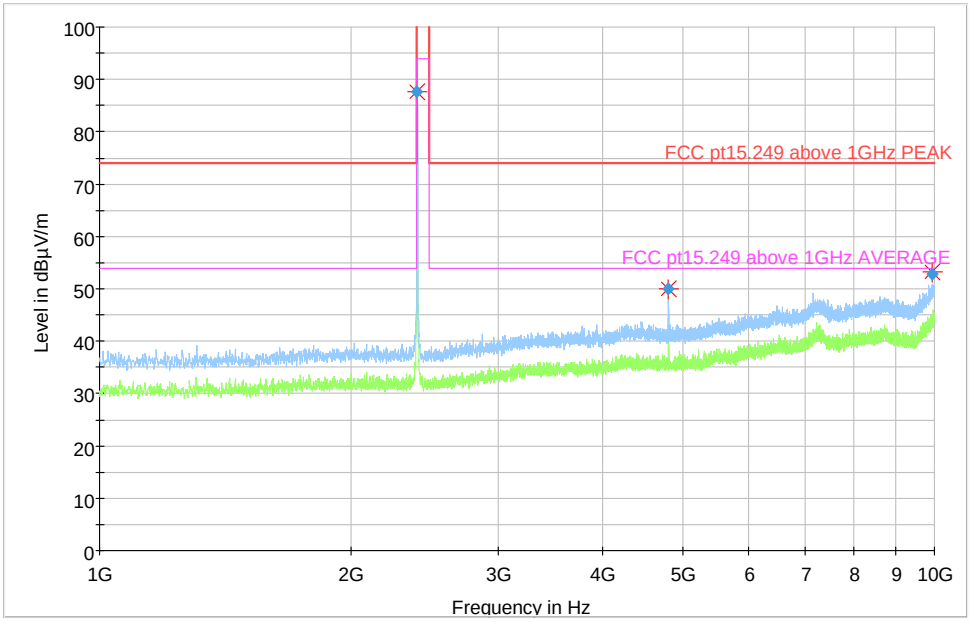
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the FCC 15.249 limits and take into account the correction factor*. Measurements made according to the CISPR test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.28 Profile; 1 to 10GHz, Bottom Channel, 2402MHz, Z Orientation

Maximum hold trace with peak values (◆)
Peak measurements (✳)
Average measurements (◆)

1 to 10GHz, Bottom Channel, 2402MHz, Z Orientation



4.1.29 Data; 1 to 10GHz, Bottom Channel, 2402MHz, Z Orientation

Frequency	Peak	CISPR Averag	FCC 15.249 AV Limit	Margin	Height	Pol	Azimuth	Corr.	
MHz	dBµV/	dBµV/	dBµV/m	dB	cm	H/V	Deg	dB/m	Status
2401.750000	87.74	---	94.00	6.26	160.0	V	30.0	-6.2	Pass
4805.875000	49.92	---	54.00	4.08	108.0	H	293.0	-0.3	Pass
9948.250000	52.86	---	54.00	1.14	179.0	V	68.0	7.6	Pass

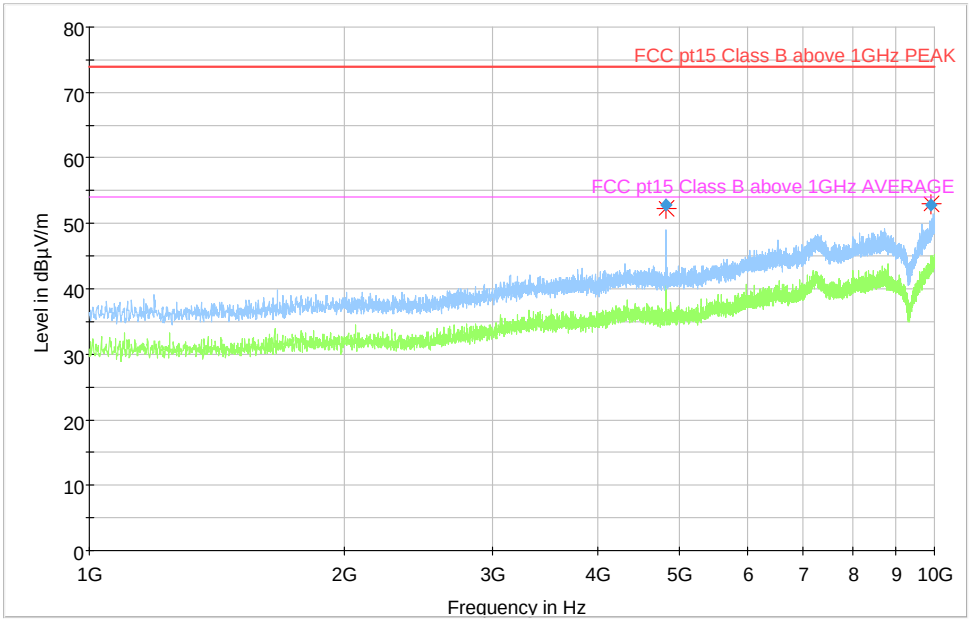
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the FCC 15.249 limits and take into account the correction factor*. Measurements made according to the CISPR test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.30 Profile; 1 to 10GHz, Receive Mode, Z Orientation, Charging Cable

Maximum hold trace with peak values (◆)
Peak measurements (✳)
Average measurements (◆)

1 to 10GHz, Receive Mode, Z Orientation, Charging Cable



4.1.31 Data; 1 to 10GHz, Receive Mode, Z Orientation, Charging Cable

Frequency	Peak	CISPR Average	Class B Limit	Margin	Height	Pol	Azimuth	Corr.	
MHz	dBµV/m	dBµV/m	dBµV/m	dB	cm	H/V	Deg	dB/m	Status
4806.115294	52.75	---	54.00	1.25	216.0	H	260.0	-0.3	Pass
9909.449766	52.76	---	54.00	1.24	295.0	V	51.0	7.2	Pass

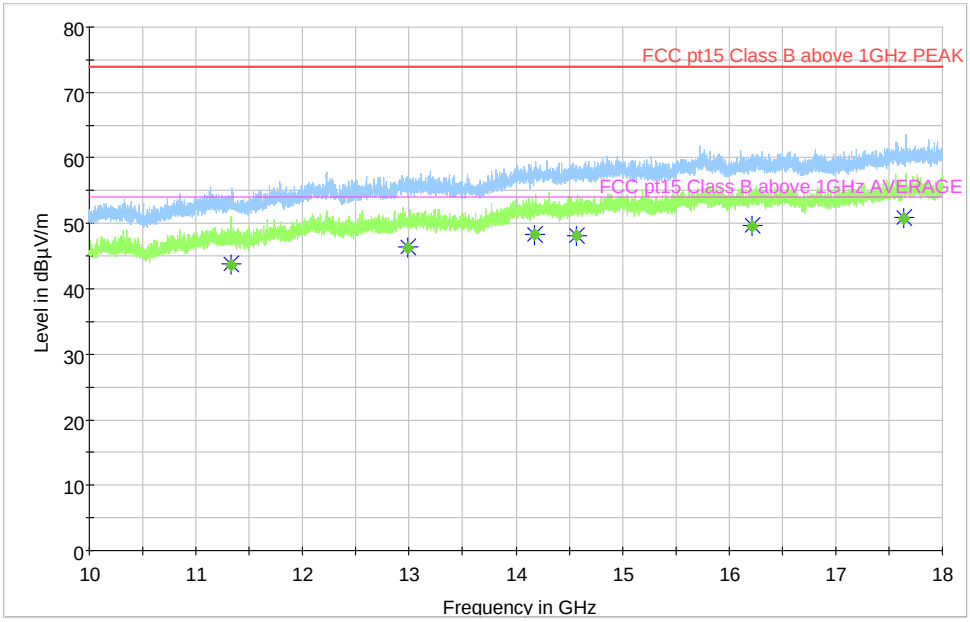
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the FCC 15.249 limits and take into account the correction factor*. Measurements made according to the CISPR test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.32 Profile; 10 to 18GHz, Top Channel, 2480MHz, Z Orientation

Maximum hold trace with peak values (◆)
Peak measurements (✳)
Average measurements (◆)

10 to 18GHz, Top Channel, 2480MHz, Z Orientation



4.1.33 Data; 10 to 18GHz, Top Channel, 2480MHz, Z Orientation

Frequency	Peak	CISPR Average	Class B Limit	Margin	Height	Pol	Azimuth	Corr.	
MHz	dBµV/m	dBµV/m	dBµV/m	dB	cm	H/V	Deg	dB/m	Status
11331.47821	---	43.72	54.00	10.28	364.0	H	336.0	12.7	Pass
12988.02498	---	46.30	54.00	7.70	222.0	V	69.0	15.8	Pass
14178.08481	---	48.25	54.00	5.75	298.0	H	283.0	17.9	Pass
14568.40897	---	48.16	54.00	5.84	249.0	H	182.0	17.8	Pass
16212.06138	---	49.60	54.00	4.40	234.0	V	81.0	18.7	Pass
17638.90200	---	50.81	54.00	3.19	285.0	H	166.0	20.4	Pass

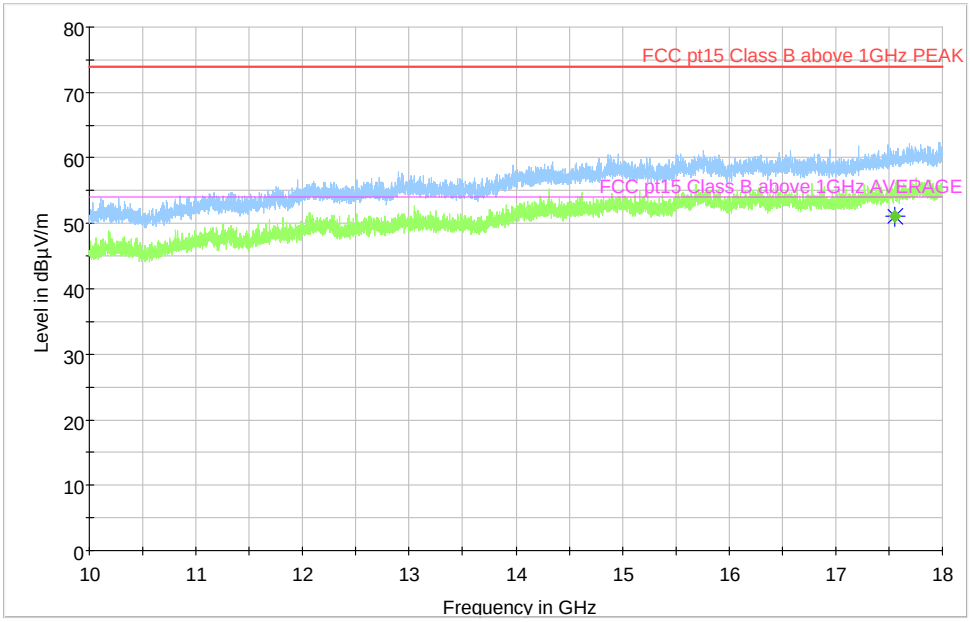
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the FCC 15.249 limits and take into account the correction factor*. Measurements made according to the CISPR test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.34 Profile; 10 to 18GHz, Top Channel, 2480MHz, Z Orientation, Charging Cable

Maximum hold trace with peak values (◆)
Peak measurements (✳)
Average measurements (◆)

10 to 18GHz, Top Channel, 2480MHz, Z Orientation, Charging Cable



4.1.35 Data; 10 to 18GHz, Top Channel, 2480MHz, Z Orientation, Charging Cable

Frequency	Peak	CISPR Average	Class B Limit	Margin	Height	Pol	Azimuth	Corr.	
MHz	dBµV/m	dBµV/m	dBµV/m	dB	cm	H/V	Deg	dB/m	Status
17555.24507	---	51.02	54.00	2.98	294.0	H	140.0	20.4	Pass

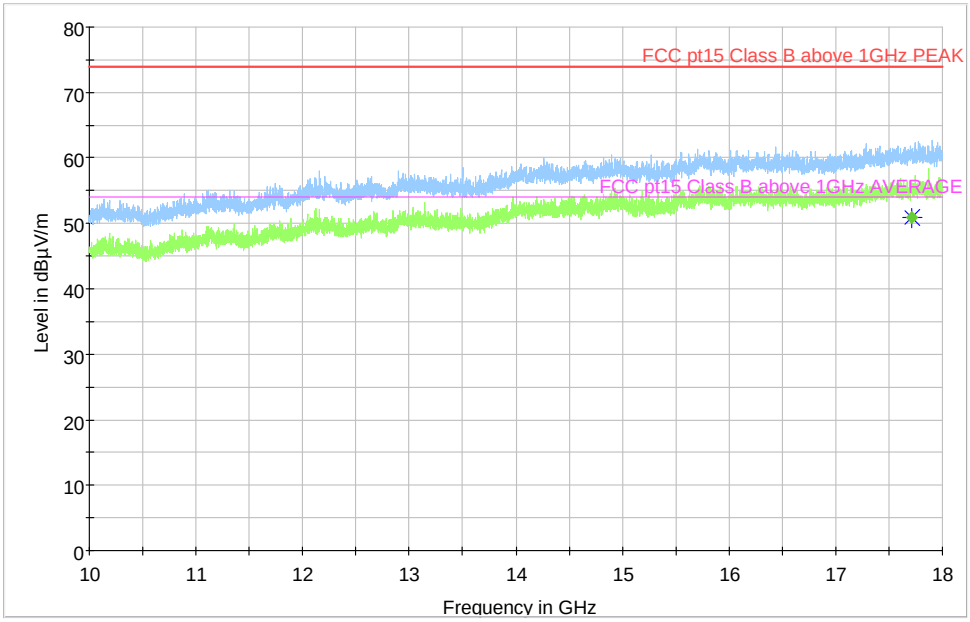
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the FCC 15.249 limits and take into account the correction factor*. Measurements made according to the CISPR test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.36 Profile; 10 to 18GHz, Bottom Channel, 2402MHz, Z Orientation

Maximum hold trace with peak values (◆)
Peak measurements (✳)
Average measurements (◆)

10 to 18GHz, Bottom Channel, 2402MHz, Z Orientation



4.1.37 Data; 10 to 18GHz, Bottom Channel, 2402MHz, Z Orientation

Frequency	Peak	CISPR Average	Class B Limit	Margin	Height	Pol	Azimuth	Corr.	
MHz	dBµV/m	dBµV/m	dBµV/m	dB	cm	H/V	Deg	dB/m	Status
17712.52815	---	50.95	54.00	3.05	352.0	V	337.0	20.5	Pass

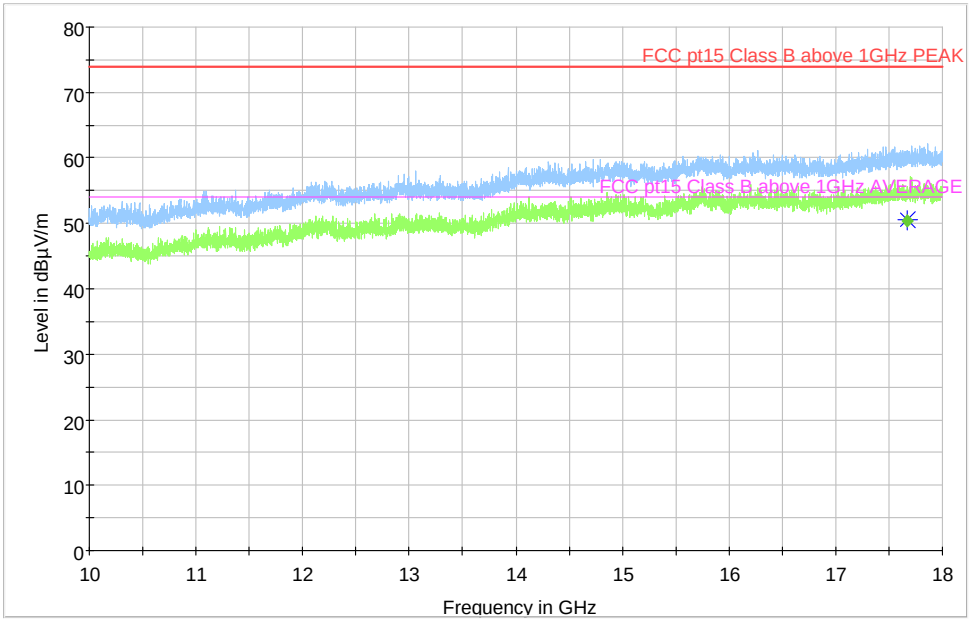
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the FCC 15.249 limits and take into account the correction factor*. Measurements made according to the CISPR test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.38 Profile; 10 to 18GHz, Middle Channel, 2440MHz, X Orientation

Maximum hold trace with peak values (◆)
Peak measurements (✳)
Average measurements (◆)

10 to 18GHz, Middle Channel, 2440MHz, X Orientation



4.1.39 Data; 10 to 18GHz, Middle Channel, 2440MHz, X Orientation

Frequency	Peak	CISPR Average	Class B Limit	Margin	Height	Pol	Azimuth	Corr.	
MHz	dBµV/m	dBµV/m	dBµV/m	dB	cm	H/V	Deg	dB/m	Status
17666.08679	---	50.47	54.00	3.53	229.0	H	307.0	20.4	Pass

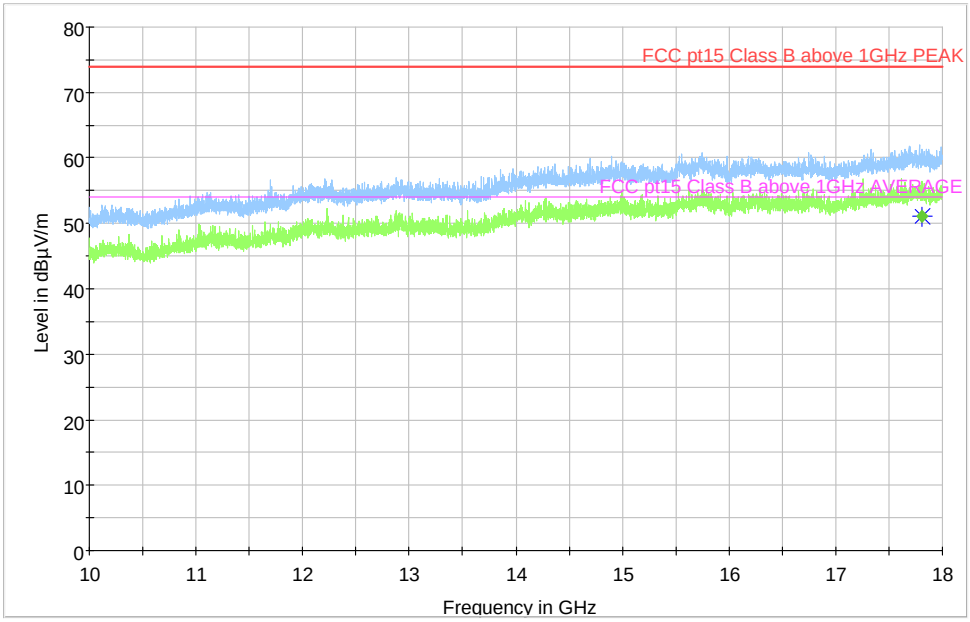
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the FCC 15.249 limits and take into account the correction factor*. Measurements made according to the CISPR test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.40 Profile; 10 to 18GHz, Middle Channel, 2440MHz, Y Orientation

Maximum hold trace with peak values (◆)
Peak measurements (✳)
Average measurements (◆)

10 to 18GHz, Middle Channel, 2440MHz, Y Orientation



4.1.41 Data; 10 to 18GHz, Middle Channel, 2440MHz, Y Orientation

Frequency	Peak	CISPR Average	Class B Limit	Margin	Height	Pol	Azimuth	Corr.	
MHz	dBµV/m	dBµV/m	dBµV/m	dB	cm	H/V	Deg	dB/m	Status
17808.08021	---	51.06	54.00	2.94	118.0	V	119.0	20.6	Pass

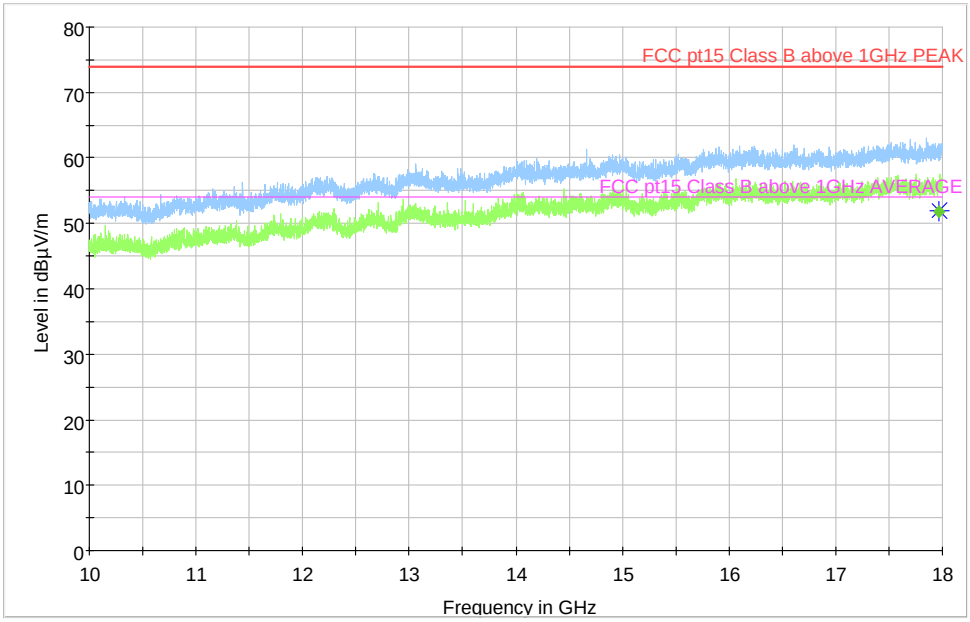
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the FCC 15.249 limits and take into account the correction factor*. Measurements made according to the CISPR test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.42 Profile; 10 to 18GHz, Middle Channel, 2440MHz, Z Orientation

Maximum hold trace with peak values (◆)
Peak measurements (✳)
Average measurements (◆)

10 to 18GHz, Middle Channel, 2440MHz, Z Orientation



4.1.43 Data; 10 to 18GHz, Middle Channel, 2440MHz, Z Orientation

Frequency	Peak	CISPR Average	Class B Limit	Margin	Height	Pol	Azimuth	Corr.	
MHz	dBµV/m	dBµV/m	dBµV/m	dB	cm	H/V	Deg	dB/m	Status
17966.43622	---	51.85	54.00	2.15	337.0	H	288.0	20.8	Pass

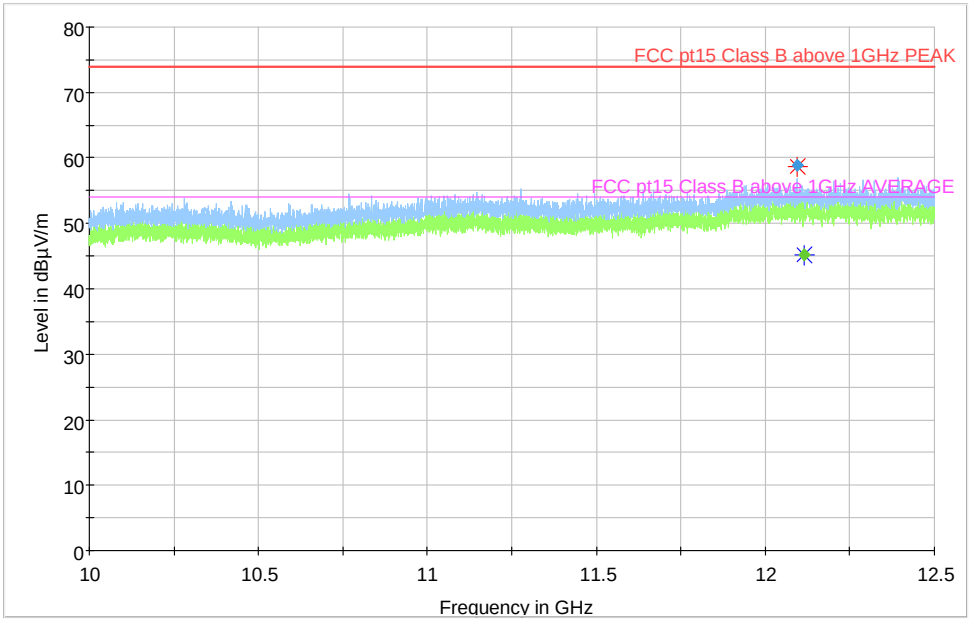
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the FCC 15.249 limits and take into account the correction factor*. Measurements made according to the CISPR test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.44 Profile; 10 to 18GHz, Receive Mode, Z Orientation, Charging Cable

Maximum hold trace with peak values (◆)
Peak measurements (✳)
Average measurements (◆)

10 to 18GHz, Receive Mode, Z Orientation, Charging Cable



4.1.45 Data; 10 to 18GHz, Receive Mode, Z Orientation, Charging Cable

Frequency	Peak	CISPR Average	Class B Limit	Margin	Height	Pol	Azimuth	Corr.	
MHz	dBµV/m	dBµV/m	dBµV/m	dB	cm	H/V	Deg	dB/m	Status
12095.67705	58.82	---	74.00	15.18	108.0	H	167.0	13.7	Pass
12112.99411	---	45.21	54.00	8.79	284.0	H	289.0	13.8	Pass

V = Vertical / H = Horizontal

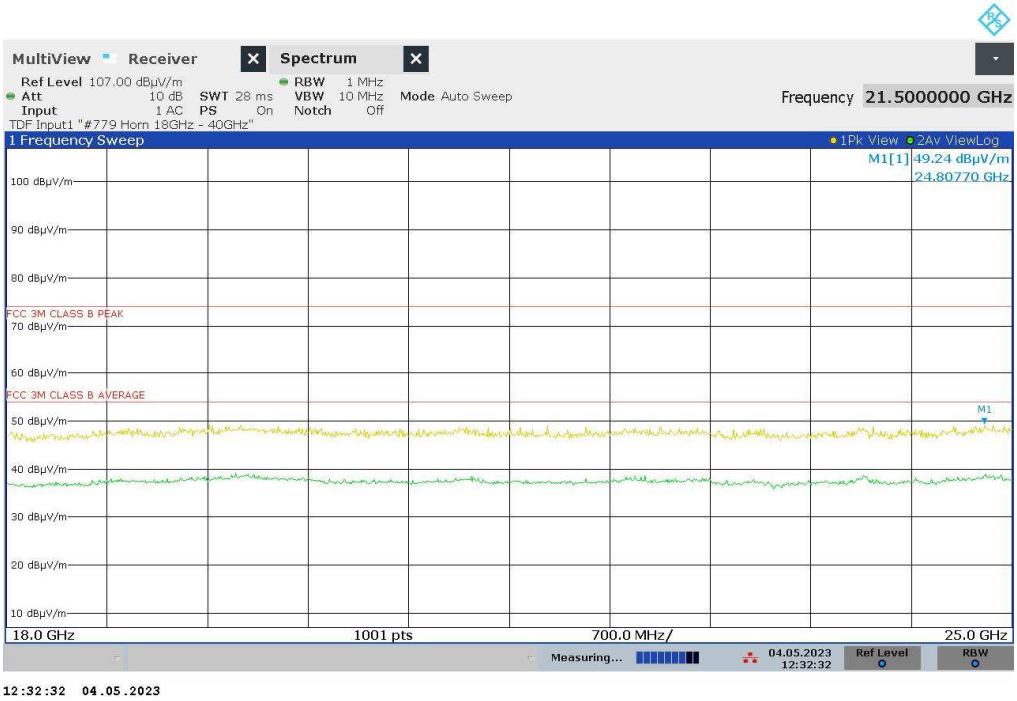
The measurements reported are the highest emissions relative to the FCC 15.249 limits and take into account the correction factor*. Measurements made according to the CISPR test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.46 Profile; 18 to 25GHz, Top Channel, 2480MHz, Y Orientation

Maximum hold trace with peak values (▽)

Maximum hold trace with average values (▼)

18 to 25GHz, Top Channel, 2480MHz, Y Orientation



4.1.47 Data; 18 to 25GHz, Top Channel, 2480MHz, Y Orientation

No measurements were taken based on the max peak data values high margins relative to the limit lines.

V = Vertical / H = Horizontal

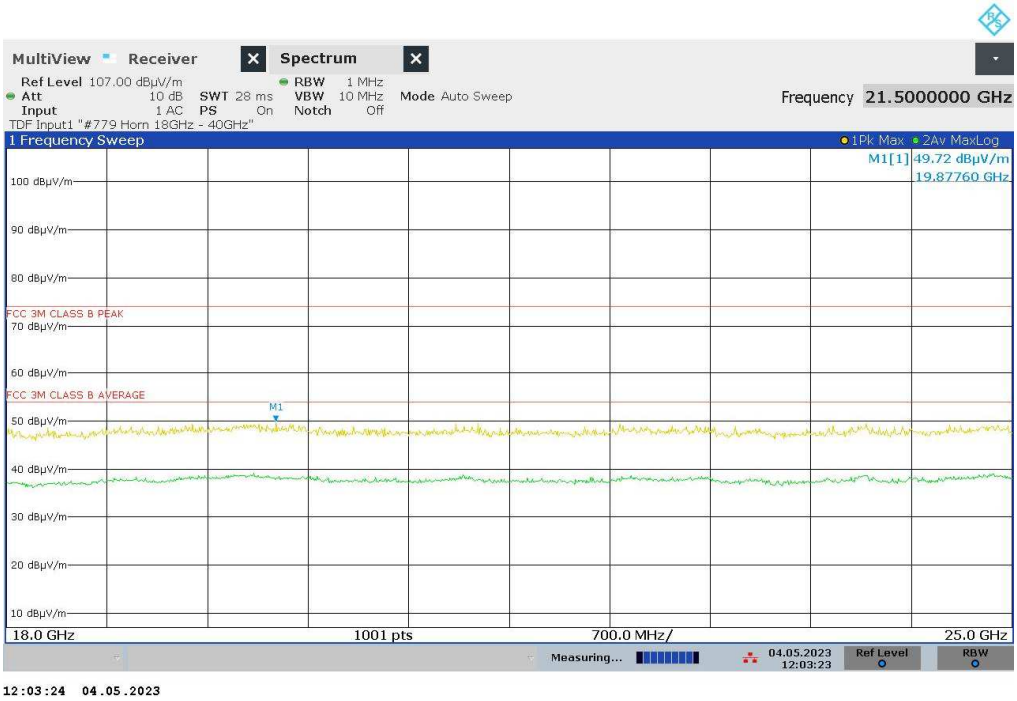
The measurements reported are the highest emissions relative to the FCC 15.249 limits and take into account the correction factor*. Measurements made according to the CISPR test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.48 Profile; 18 to 25GHz, Middle Channel, 2440MHz, X Orientation

Maximum hold trace with peak values (▽)

Maximum hold trace with average values (▼)

18 to 25GHz, Middle Channel, 2440MHz, X Orientation



4.1.49 Data; 18 to 25GHz, Middle Channel, 2440MHz, X Orientation

No measurements were taken based on the max peak data values high margins relative to the limit lines.

V = Vertical / H = Horizontal

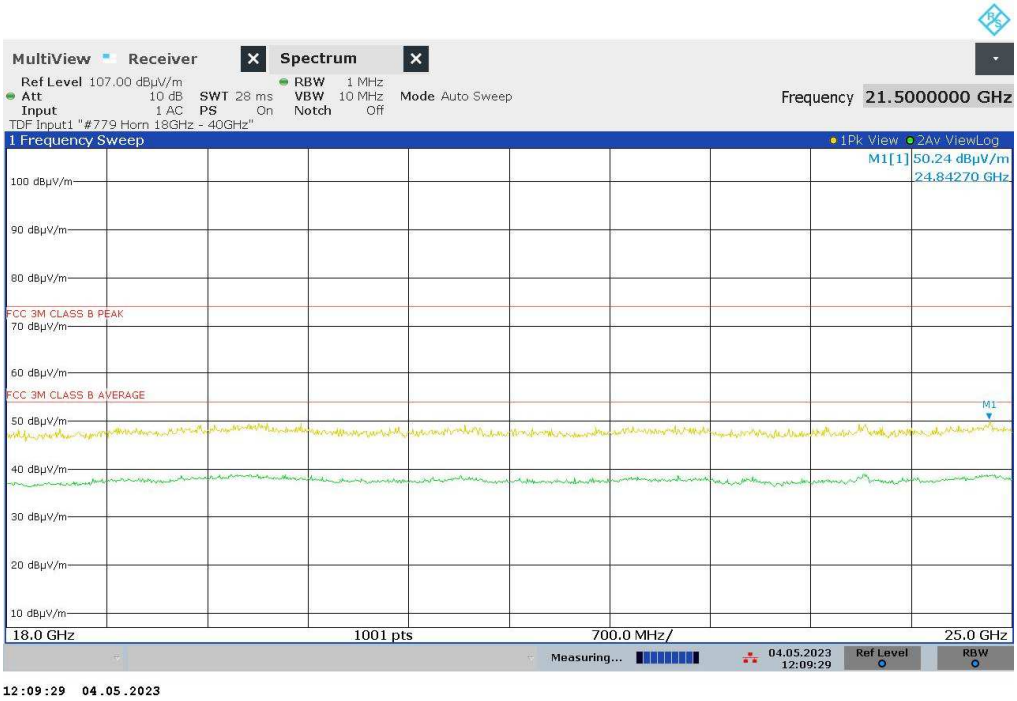
The measurements reported are the highest emissions relative to the FCC 15.249 limits and take into account the correction factor*. Measurements made according to the CISPR test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.50 Profile; 18 to 25GHz, Middle Channel, 2440MHz, Y Orientation

Maximum hold trace with peak values (▽)

Maximum hold trace with average values (▼)

18 to 25GHz, Middle Channel, 2440MHz, Y Orientation



4.1.51 Data; 18 to 25GHz, Middle Channel, 2440MHz, Y Orientation

No measurements were taken based on the max peak data values high margins relative to the limit lines.

V = Vertical / H = Horizontal

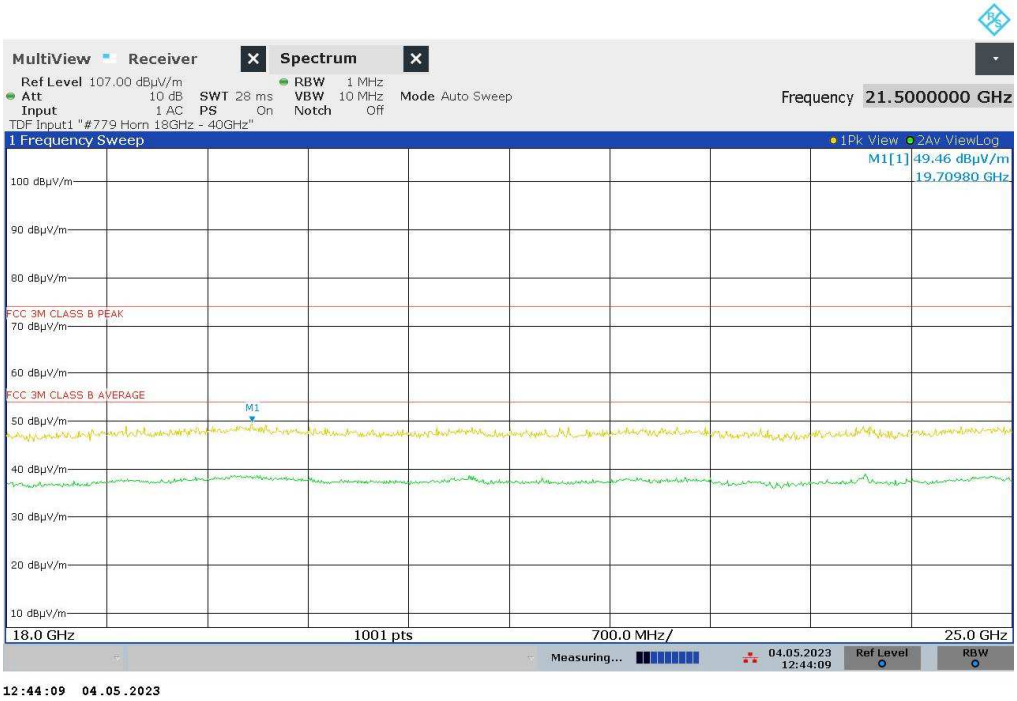
The measurements reported are the highest emissions relative to the FCC 15.249 limits and take into account the correction factor*. Measurements made according to the CISPR test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.52 Profile; 18 to 25GHz, Middle Channel, 2440MHz, Y Orientation, Charging Cable

Maximum hold trace with peak values (▽)

Maximum hold trace with average values (▼)

18 to 25GHz, Middle Channel, 2440MHz, Y Orientation, Charging Cable



4.1.53 Data; 18 to 25GHz, Middle Channel, 2440MHz, Y Orientation, Charging Cable

No measurements were taken based on the max peak data values high margins relative to the limit lines.

V = Vertical / H = Horizontal

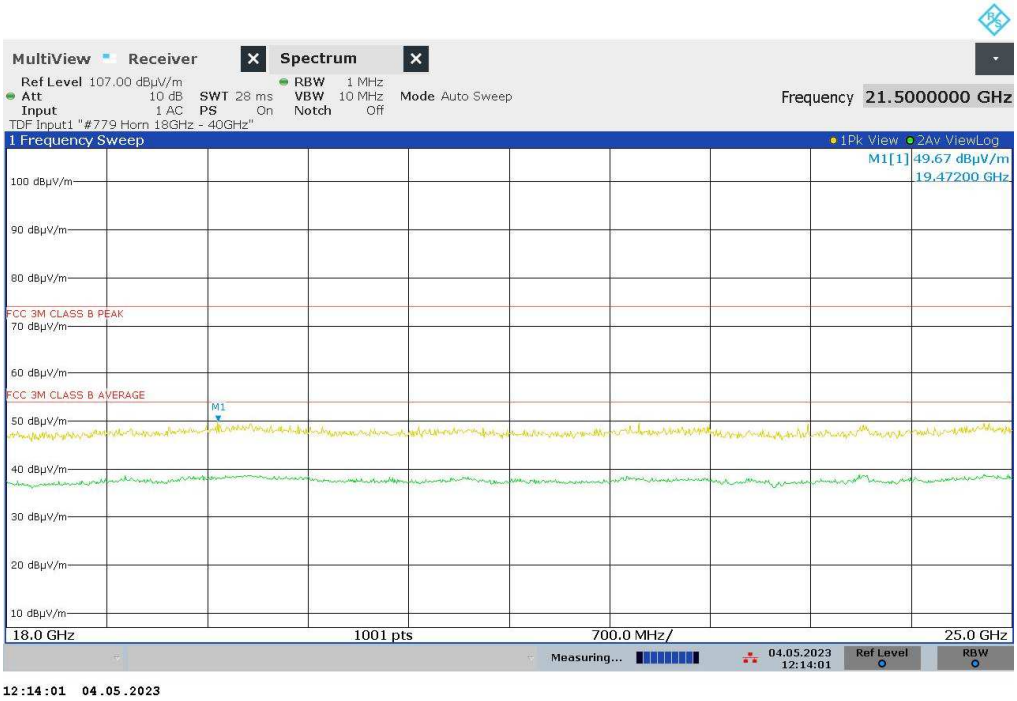
The measurements reported are the highest emissions relative to the FCC 15.249 limits and take into account the correction factor*. Measurements made according to the CISPR test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.54 Profile; 18 to 25GHz, Middle Channel, 2440MHz, Z Orientation

Maximum hold trace with peak values (▽)

Maximum hold trace with average values (▼)

18 to 25GHz, Middle Channel, 2440MHz, Z Orientation



4.1.55 Data; 18 to 25GHz, Middle Channel, 2440MHz, Z Orientation

No measurements were taken based on the max peak data values high margins relative to the limit lines.

V = Vertical / H = Horizontal

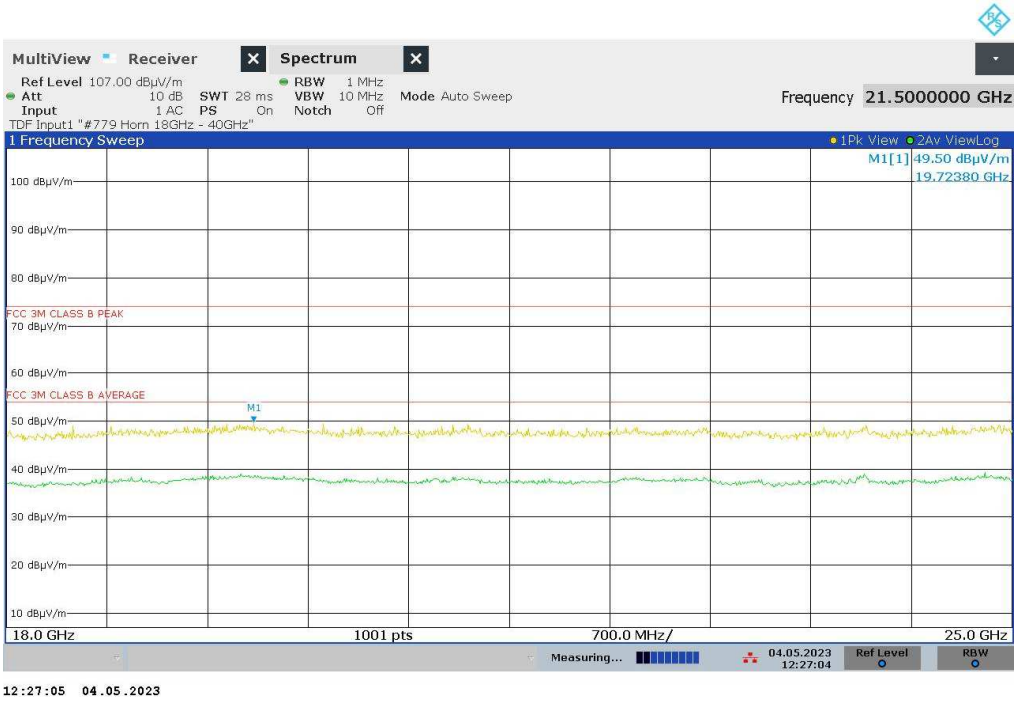
The measurements reported are the highest emissions relative to the FCC 15.249 limits and take into account the correction factor*. Measurements made according to the CISPR test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.56 Profile; 18 to 25GHz, Bottom Channel, 2402MHz, Y Orientation

Maximum hold trace with peak values (▽)

Maximum hold trace with average values (▼)

18 to 25GHz, Bottom Channel, 2402MHz, Y Orientation



4.1.57 Data; 18 to 25GHz, Bottom Channel, 2402MHz, Y Orientation

No measurements were taken based on the max peak data values high margins relative to the limit lines.

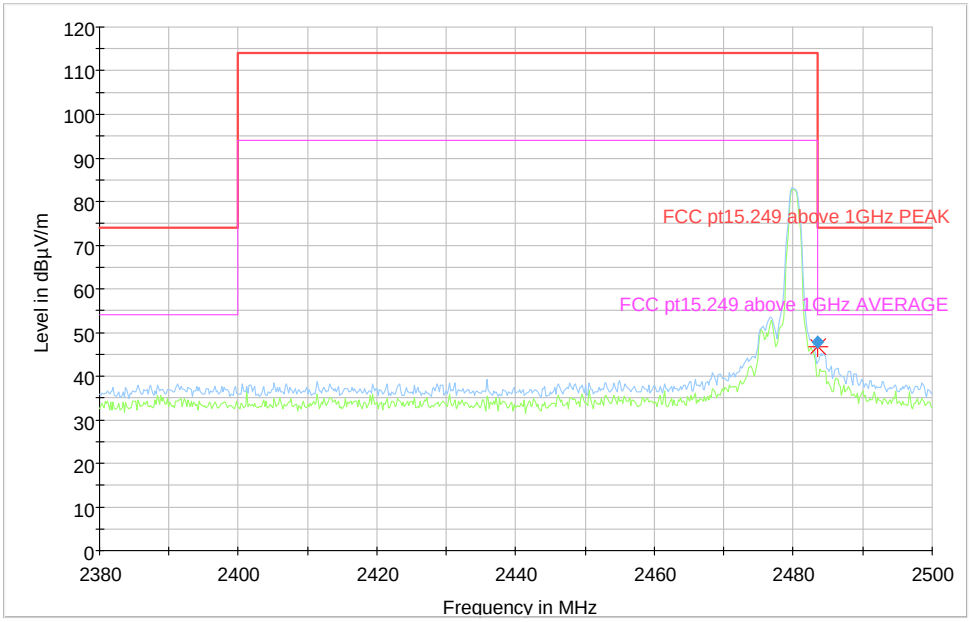
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the FCC 15.249 limits and take into account the correction factor*. Measurements made according to the CISPR test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.58 Profile; Band Edge, Top Channel, 2480MHz, Z Orientation

Maximum hold trace with peak values (◆)
Peak measurements (✳)
Average measurements (◆)

Band Edge, Top Channel, 2480MHz, Z Orientation



4.1.59 Data; Band Edge, Top Channel, 2480MHz, Z Orientation

Frequency	Peak	CISPR Average	Class B Limit	Margin	Height	Pol	Azimuth	Corr.	
MHz	dBµV/m	dBµV/m	dBµV/m	dB	cm	H/V	Deg	dB/m	Status
2483.500000	47.79	---	74.00	26.21	173.0	V	183.0	-6.2	Pass

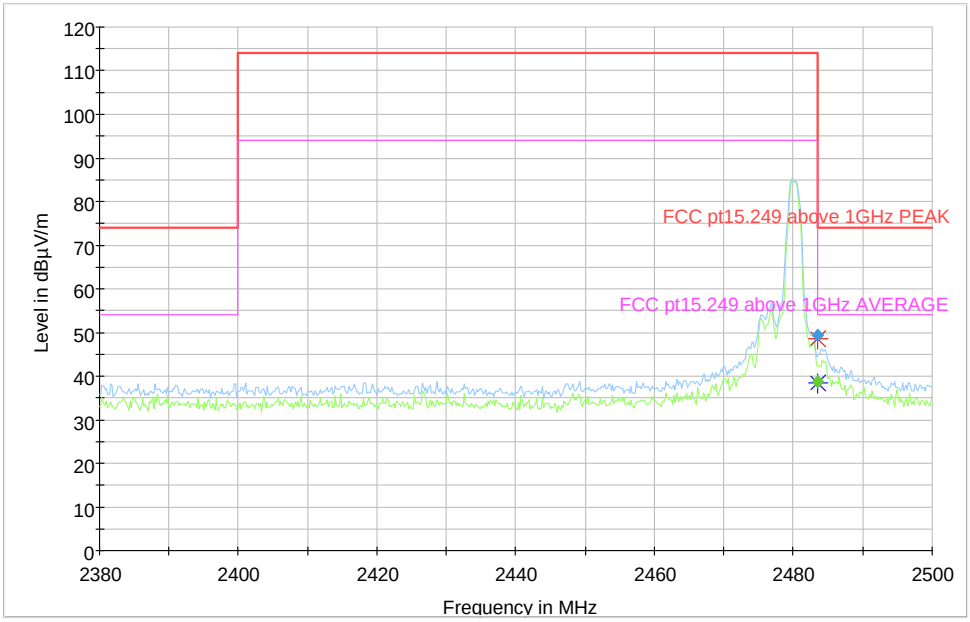
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the 15.249 limits and take into account the correction factor*.
The transmit power met the 15.249 limit when measured with a peak detector, so an average measurement was not required.
Measurements made according to the ANSI C63.4 test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.60 Profile; Band Edge, Top Channel, 2480MHz, Z Orientation, Charging Cable

Maximum hold trace with peak values (◆)
Peak measurements (✳)
Average measurements (◆)

Band Edge, Top Channel, 2480MHz, Z Orientation, Charging Cable



4.1.61 Data; Band Edge, Top Channel, 2480MHz, Z Orientation, Charging Cable

Frequency	Peak	CISPR Average	Class B Limit	Margin	Height	Pol	Azimuth	Corr.	
MHz	dBµV/m	dBµV/m	dBµV/m	dB	cm	H/V	Deg	dB/m	Status
2483.500000	---	38.61	54.00	15.39	226.0	V	187.0	-6.2	Pass
2483.500000	49.42	---	74.00	24.59	232.0	V	191.0	-6.2	Pass

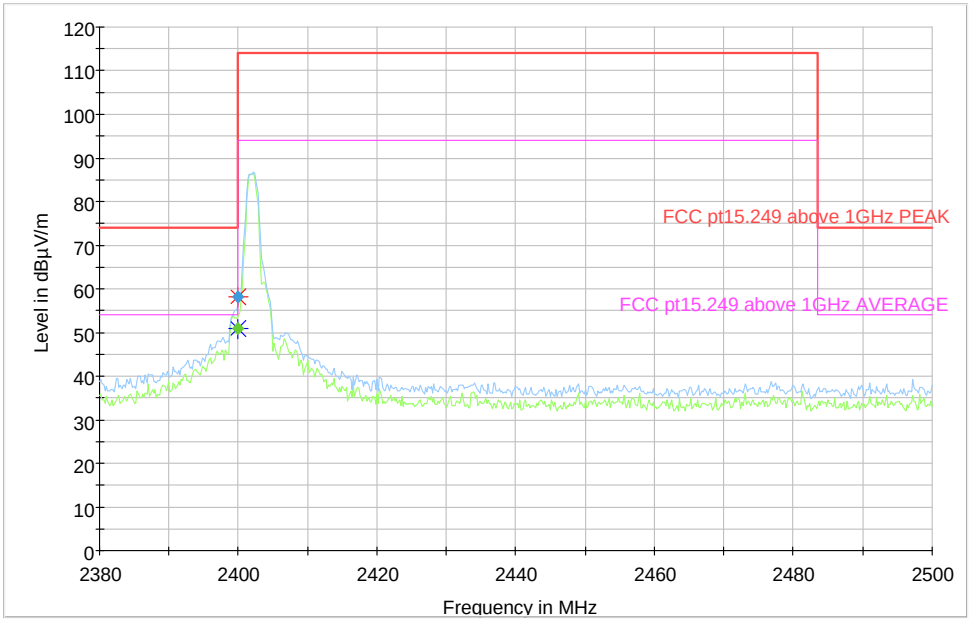
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the 15.249 limits and take into account the correction factor*.
The transmit power met the 15.249 limit when measured with a peak detector, so an average measurement was not required.
Measurements made according to the ANSI C63.4 test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.62 Profile; Band Edge, Bottom Channel, 2402MHz, Z Orientation

Maximum hold trace with peak values (◆)
Peak measurements (✳)
Average measurements (◆)

Band Edge, Bottom Channel, 2402MHz, Z Orientation



4.1.63 Data; Band Edge, Bottom Channel, 2402MHz, Z Orientation

Frequency	Peak	CISPR Average	Class B Limit	Margin	Height	Pol	Azimuth	Corr.	
MHz	dBµV/m	dBµV/m	dBµV/m	dB	cm	H/V	Deg	dB/m	Status
2400.000000	---	50.97	54.00	3.03	129.0	V	212.0	-6.2	Pass
2400.000000	58.11	---	74.00	15.89	131.0	V	194.0	-6.2	Pass

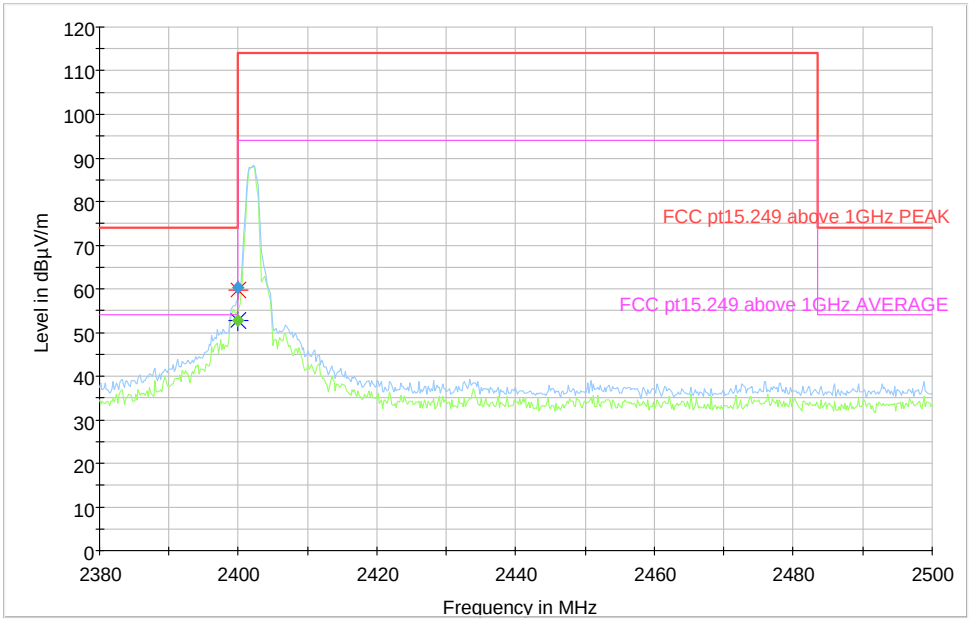
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the 15.249 limits and take into account the correction factor*.
The transmit power met the 15.249 limit when measured with a peak detector, so an average measurement was not required.
Measurements made according to the ANSI C63.4 test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.64 Profile; Band Edge, Bottom Channel, 2402MHz, Z Orientation, Charging Cable

Maximum hold trace with peak values (◆)
Peak measurements (✳)
Average measurements (◆)

Band Edge, Bottom Channel, 2402MHz, Z Orientation, Charging Cable



4.1.65 Data; Band Edge, Bottom Channel, 2402MHz, Z Orientation, Charging Cable

Frequency	Peak	CISPR Average	Class B Limit	Margin	Height	Pol	Azimuth	Corr.	
MHz	dBµV/m	dBµV/m	dBµV/m	dB	cm	H/V	Deg	dB/m	Status
2400.000000	---	52.80	54.00	1.20	131.0	V	221.0	-6.2	Pass
2400.000000	60.29	---	74.00	13.71	132.0	V	220.0	-6.2	Pass

V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the 15.249 limits and take into account the correction factor*.
The transmit power met the 15.249 limit when measured with a peak detector, so an average measurement was not required.
Measurements made according to the ANSI C63.4 test standard and Eurofins Hursley test procedure RAD-01.
*Correction factor (dB) = cable and antenna losses as summed positive values (dB) – pre-amp gain where applicable (dB).
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).
Note: path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.2 Conducted Emissions

4.2.1 Test Parameters

A filtered supply was fed to the EUT via a 50Ω/50µH Artificial Mains Network (AMN). The AMN was bonded to a conductive ground plane. Line and neutral phases were measured separately.

An EMI receiver was set to scan between 0.15MHz and 30.0MHz with a 20s measurement time. A CISPR Average and Quasi-Peak trace was generated and compared to the limits and take into account the correction factor. Measurements made according to the test standard and Eurofins Hursley test procedure CON-02.

Test Equipment						
#ID	CP	Manufacturer	Type	Serial Number	Description	Calibration Due Date
652	1	TFA	weather station	Jupiter	Neptune Weather Station	02/11/2023
750	1	Global	CISPR16	1	11 x 7 x 6.2m, chamber	22/12/2023
674	1	Rohde & Schwarz	ESH3-Z5	838576-018	1 phase LISN ANSI&CISPR	16/09/2023
252	1	Rohde & Schwarz	ESH3-Z2	08970	10dB pulse limiter	27/05/2023
480	1	0	Cable BNC	0	Cable BNC	10/02/2024
679	1	Gauss	TDEIM30M	1510003	30MHz TD receiver	18/04/2024
Test Equipment Software						
#ID	CP	Manufacturer	Type		Description	Calibration Due Date
857	0	Gauss	Software	0	TDMI 30 v5.00	Not required

Environmental Test Conditions	
Temperature	22.3° Celsius
Relative Humidity	43%
Atmospheric Pressure	1031.5 millibars
Test Date:	18th May 2023
Test Engineer:	Graeme Lawler

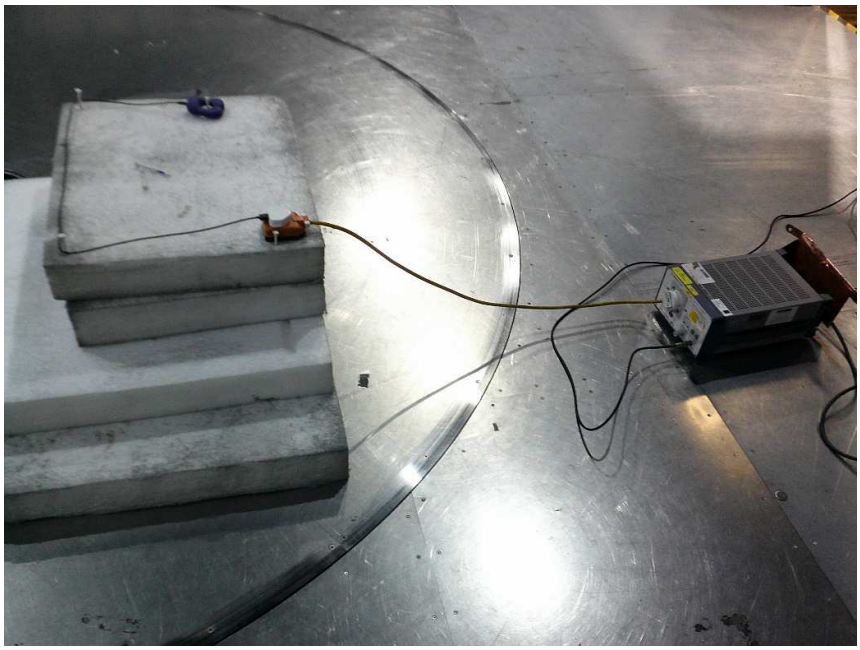
Note: “Calibration due date” means the instrument is certified within UKAS or traceable calibration certificate. “Internal” means the instrument is calibrated using Eurofins Hursley procedures. “Not required” means the asset does not require calibration. “CP” is the interval period [year] prescribed for external calibration.

4.2.2 Test Configuration

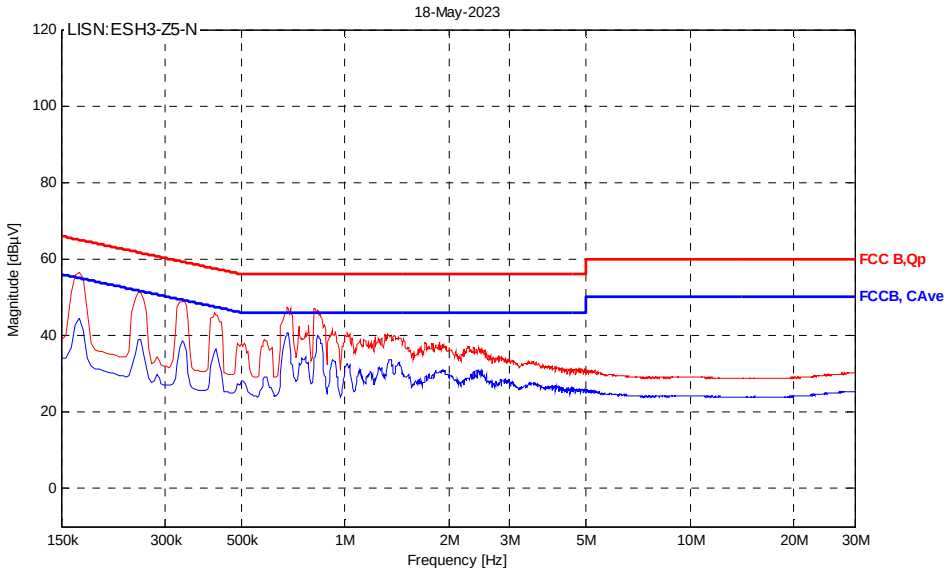
Please refer to EUT Test Configuration #1.

4.2.3 Set-up Photos

Conducted Emissions



4.2.4 Profile; Mains Neutral, EUT Charging



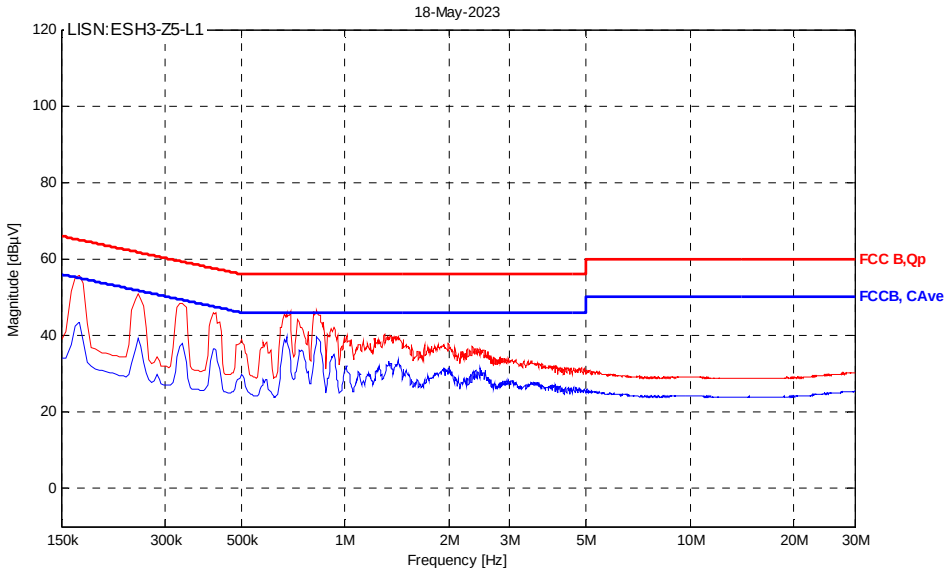
4.2.5 Data; Mains Neutral, EUT Charging

Quasi-peak value (dBµV)				
Frequency	**Measured**	**Class B Limit**	**Margin**	**Status**
169.277 kHz	56.56	65.00	8.43	Pass
340.939 kHz	49.41	59.18	9.77	Pass
679.493 kHz	47.19	56.00	8.81	Pass
813.007 kHz	47.00	56.00	9.00	Pass
1.304 MHz	40.43	56.00	15.57	Pass
2.291 MHz	36.97	56.00	19.03	Pass
3.636 MHz	32.54	56.00	23.46	Pass
6.349 MHz	29.56	60.00	30.44	Pass
10.574 MHz	29.18	60.00	30.82	Pass
29.891 MHz	30.29	60.00	29.71	Pass

CISPR Average value (dBµV)				
Frequency	**Measured**	**Class B Limit**	**Margin**	**Status**
169.277 kHz	44.56	55.00	10.43	Pass
336.170 kHz	38.52	49.30	10.78	Pass
684.261 kHz	40.61	46.00	5.39	Pass
832.081 kHz	39.77	46.00	6.23	Pass
1.347 MHz	33.82	46.00	12.18	Pass
2.472 MHz	30.91	46.00	15.09	Pass
3.607 MHz	27.19	46.00	18.81	Pass
6.173 MHz	24.48	50.00	25.52	Pass
10.574 MHz	24.20	50.00	25.80	Pass
29.981 MHz	25.40	50.00	24.60	Pass

The measured value takes into account the correction factor.
Correction factor (dB) = cable, AMN, and pulse limiter losses as summed positive values (dB)
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).

4.2.6 Profile; Mains Line, EUT Charging



4.2.7 Data; Mains Line, EUT Charging

Quasi-peak value (dBµV)				
Frequency	**Measured**	**Class B Limit**	**Margin**	**Status**
169.277 kHz	55.77	65.00	9.22	Pass
336.170 kHz	48.27	59.30	11.03	Pass
693.798 kHz	46.20	56.00	9.80	Pass
827.312 kHz	46.57	56.00	9.43	Pass
1.299 MHz	40.14	56.00	15.86	Pass
2.339 MHz	37.04	56.00	18.96	Pass
3.612 MHz	32.68	56.00	23.32	Pass
6.125 MHz	29.58	60.00	30.42	Pass
10.397 MHz	29.14	60.00	30.86	Pass
29.194 MHz	30.31	60.00	29.69	Pass

CISPR Average value (dBµV)				
Frequency	**Measured**	**Class B Limit**	**Margin**	**Status**
169.277 kHz	43.57	55.00	11.43	Pass
417.233 kHz	36.57	47.50	10.93	Pass
674.725 kHz	39.56	46.00	6.44	Pass
827.312 kHz	39.59	46.00	6.41	Pass
1.419 MHz	33.46	46.00	12.54	Pass
2.468 MHz	31.37	46.00	14.63	Pass
3.655 MHz	27.66	46.00	18.34	Pass
6.154 MHz	24.59	50.00	25.41	Pass
10.736 MHz	24.17	50.00	25.83	Pass
30.000 MHz	25.42	50.00	24.58	Pass

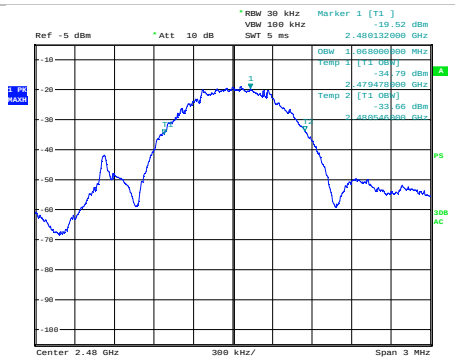
The measured value takes into account the correction factor.
Correction factor (dB) = cable, AMN, and pulse limiter losses as summed positive values (dB)
The recorded measured value (dB) = measured receiver value (dB) + correction factor (dB).

5.0 Annex – Occupied Bandwidth

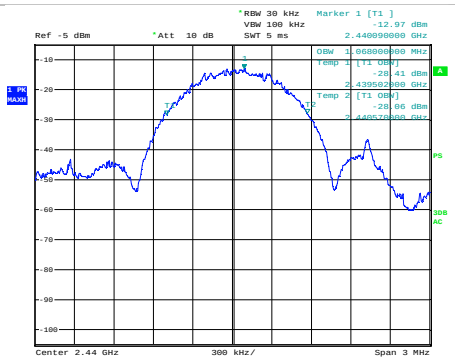
99% occupied bandwidth measured using the inbuilt function in the spectrum analyser.

Channel	Occupied Bandwidth	Requirement	Result
2402	1060	None	For information
2440	1056	None	For information
2480	1056	None	For information

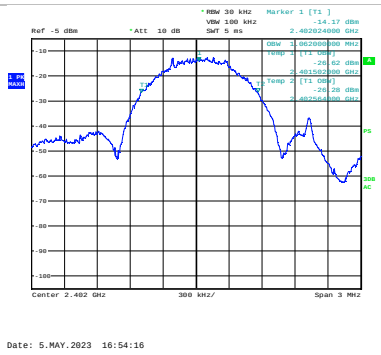
5.1.1 Profile; Occupied Bandwidth



Top Channel; 2480MHz



Middle Channel; 2440MHz



Bottom Channel; 2402MHz

Occupied Bandwidth

5.1.2 Test equipment

Description	Manufacturer	Name	Serial Number	Calibration certificate Or Calibration due
Spectrum Analyser	Rohde & Schwarz	ESCI 7	HEMC #289	20/09/2023

6.0 MEASUREMENT UNCERTAINTIES

Emissions tests

For all emissions tests, measurement uncertainties have been calculated in line with the requirements of CISPR 16-4-2 to give a confidence level of greater than 95%. In all cases the laboratories calculated uncertainty values (known as Ulab) are equal to or are less than the expected uncertainty values contained in CISPR 16-4-2 (known as Ucispr). Below is a list of the laboratories calculated measurement uncertainties:

Conducted emissions:

Via AMN/LISN:	±3.27dB (9kHz – 150kHz), ±3.27dB (150kHz – 30MHz)
Via AAN/ISN:	±5.00dB (150kHz – 30MHz)
Via CVP:	±3.47dB (150kHz – 30MHz)
Via CP:	±2.69dB (150kHz – 30MHz)
Via 100 Ω:	±2.68dB (150kHz – 30MHz)
Clicks:	±2.83dB (150kHz – 30MHz)
Harmonics:	±1.42% (100Hz – 2kHz)
Flicker:	±1.76% (worst case for all parameters)

Radiated emissions:

H-Field:	±2.84dB (9kHz – 3MHz), ±2.92dB (3MHz – 30MHz)
D = 3.0 m (Horizontal):	±3.91dB (30MHz – 1GHz SAC), ±3.82dB (30MHz – 1GHz FAC)
D = 3.0 m (Vertical):	±5.22dB (30MHz – 1GHz SAC), ±3.82dB (30MHz – 1GHz FAC)
D = 3.0 m:	±5.13dB (1GHz – 6GHz SAC), ±5.15dB (1GHz – 10GHz SAC), ±3.64dB (10GHz – 18GHz SAC), ±3.10dB (18GHz – 40GHz SAC). ±3.05dB (1GHz – 6GHz FAC)

Radiated spurious emissions (RSE):

±1.71dB (30MHz – 1GHz), ±1.81dB (1 – 12.75GHz), ±2.07dB (12.75 – 18GHz)

Immunity tests

For IEC 61000-4-2, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-8, IEC 61000-4-9, IEC 61000-4-11 tests, the following applies:

Measurement uncertainty has been calculated or calibrated for the various required parameters to provide a confidence level of 95% (k=2). These parameters have been compared to the basic standard tolerance requirements for each of the various parameters.
In all cases the calculated or calibrated uncertainty meets the basic standard requirements.

For IEC 61000-4-3, IEC 61000-4-6 tests, the following applies:

Measurement uncertainty has been calculated to provide a confidence level of 95%, or k=2, but this has not been applied to the applied test level, therefore the applied test level has an uncertainty of ±50%. This is in accordance with CENELEC and other international guidance.

In the case of Maritime equipment tested to EN/IEC 60945, there is a specific requirement that the applied test level be increased by the calculated measurement uncertainty. This is done by applying a coverage factor of k=1.64, which provides a 95% confidence that the applied test level has been achieved.

Test Results - Decision Rules

As the decision is generally inherent in the standard for Commercial EMC a simple acceptance rule can be applied. The following statement will be added to EMC quotes and reports. "The Decision Rule is applied on the basis of CISPR16-4-2 and/or EN61000-4-x (TR61000-1-6) These standards provide guidance on how to calculate and apply measurement uncertainty whilst providing maximum uncertainties allowance. Due consideration will also be given to JCGM 106:2012, ILAC-G8:09/2019 and LAB 48. This laboratory has demonstrated by calibrating its equipment and facilities, and calculating its own uncertainties, that it complies with the above requirements and therefore no allowance of uncertainties has been given to the tolerances." Where a result is considered marginal in respect of its proximity to the limit line, for example, the customer would be made aware of situation so that they can make an informed decision on how to proceed.

Published 02/08/2022

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