

EMC Test Report	
For:	Sensium Healthcare Limited
Product:	SH202220 - US Home Bridge
Model:	SH202220-US
	
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Approval Signatory:	Andy Coombes

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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: 3599

Customer Test Plan: SH-VVD-ENG-0082 SH202220 - US Home Bridge FCC Module Integration Test Plan

1.6 Test Deviations

None.

The latest editions of test standards were used in place of those listed on Eurofins E&E Hursley Limited's accreditation schedule.

2.0 TEST SUMMARY

2.1 Summary

The EUT, as described and reported within this document, complies with the applied 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
KDB 996369 D04	FCC KDB Article 996369, Part D04: October 13 2020		Pass
Radiated emissions	47 CFR § 15.249 (a)		Pass
	47 CFR § 22.917 (a)		Pass
	§ 24.238 (a)		Pass
	§ 27.53 (g)		Pass
	§ 27.53 (h) (1)		Pass
Carrier power	47 CFR § 15.249 (a)		Pass
	47 CFR § 24.232 (c)		Pass
	47 CFR § 27.50 (d) (4)		Pass
	47 CFR § 22.913 (a) (5)		Pass
	47 CFR § 27.50 (c) (10)		Pass
Harmonics	47 CFR § 15.249 (a)		Pass

Note(s):

- The highest internal operating frequency declared by the manufacturer is 1909.3MHz.

3.0 EQUIPMENT AND TEST DETAILS

3.1 General

Product (EUT):	Model:	Serial Number:
SH202220 - US Home Bridge	SH202220-US	CC:59:3E:AB:00:EB
Sample Build:	Production Sample	
EUT Power:	110V/60Hz	
Alternate Models:	Not Applicable	
EUT Manufacturer:	Sensium Healthcare Limited	
Customer Name:	Sensium Healthcare Limited	
Customer Address:	115 Olympic Avenue	
	Building 3	
	Milton Park	
	Abingdon	
	Oxfordshire	
	OX14 4SA	
	United Kingdom	
Test Commissioned By:	Chris Nunn	
Date EUT Received:	16 th November 2021	
Test Date(s):	16 th to 17 th November 2021	
EMC Measurement Site:	Eurofins E&E Hursley Limited	
	Trafalgar Close, Chandlers Ford, Hampshire, United Kingdom	
Product Category:	IT and Multimedia Electrical Equipment	

3.2 EUT Description

The SH202220 Sensium Bridge is part of the SensiumVitals® Patient Monitoring System.

The Wireless Monitoring System is intended for use by health care professionals for routine surveillance of patient physiological parameters to include pulse rate, respiratory rate, axillary temperature, posture and activity in hospital and home settings. Data is transmitted wirelessly to a central location. Notifications can be prospectively set to notify healthcare professionals to excursions outside of selected parameters.

The device is not intended to be used on critical care patients and is intended to supplement vital signs monitoring by healthcare professionals, not to replace current standards of care. The device is intended for use on general care patients and on patients who are 18 years of age or older.

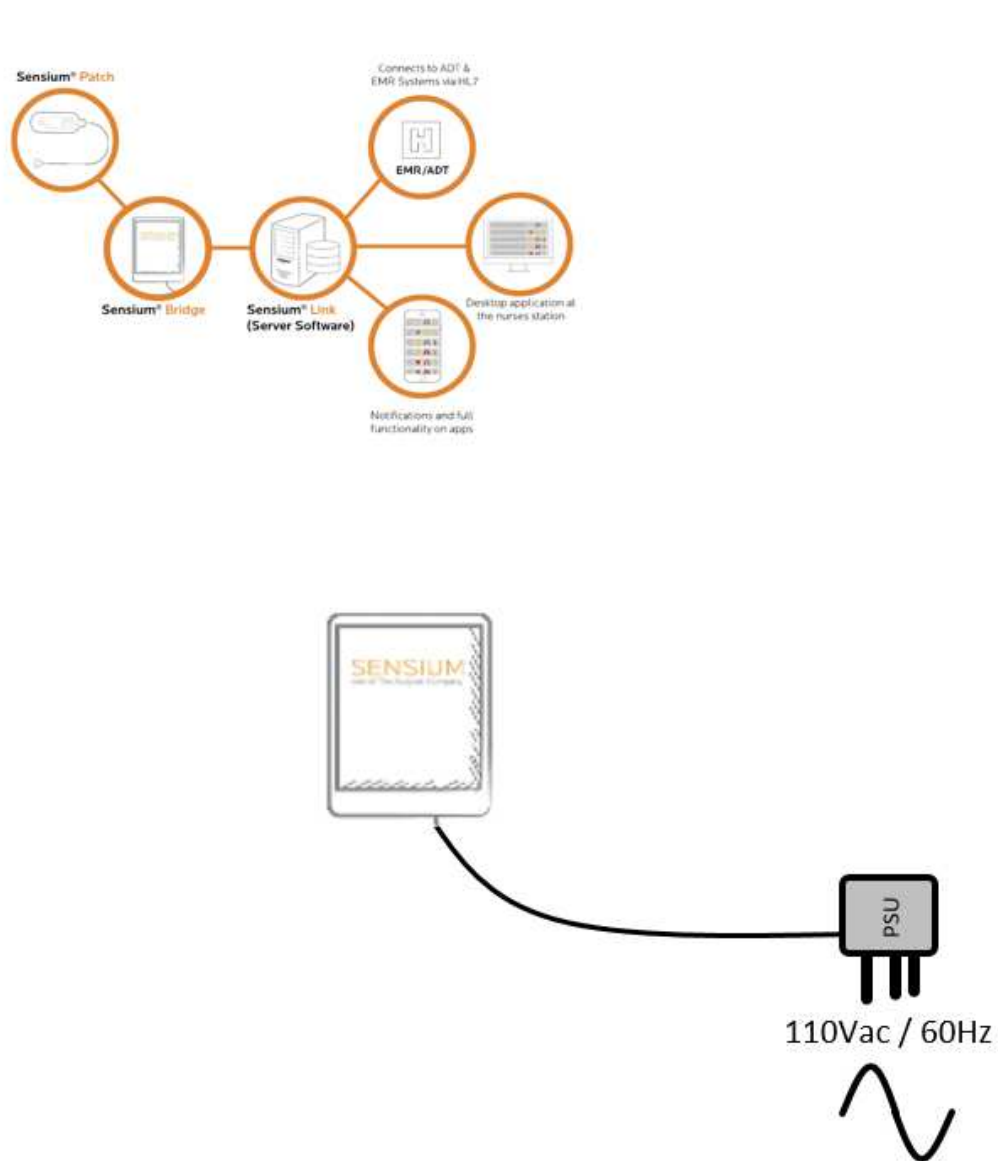
3.3 Support Equipment

Description	Manufacturer	Model	Serial Number
Laptop	Toshiba Portégé	Z30-A-1FD	9E137840H

3.4 EUT Test Exerciser

Laptop used to set-up transmit frequencies, internal memory set to read / write loop every ten seconds, Laptop removed for test.

3.5 EUT Test Configuration #1



4.0 TEST RESULTS

4.1 Radiated Emissions

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. Cable 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	11/11/2021
456	1	Rohde & Schwarz	ESCI7	1144573407	EMI test receiver	27/08/2022
762	3	Schwarzbeck	VULB9162	129	30-7000MHz	04/03/2024
762a	3	Schwarzbeck	DGA 9552N	0	6dB attenuator for #762	04/03/2024
651	1	Rohde & Schwarz	ESIB 40 no.2	100262	40GHz receiver	01/12/2021
073	3	Schwarzbeck	BBHA9120B	237	Horn antenna (1-10GHz)	20/05/2024
053	1	HP	8449B	3008A01394	Pre-amplifier (1.0-26.5GHz) (with #516)	15/10/2021
676	3	Schwarzbeck	BBHA 9120 C	576	2-18GHz Horn	20/05/2024
Test Equipment Software						
#ID	CP	Manufacturer	Type		Description	Calibration Due Date
856	0	Rohde & Schwarz	Software	0	EMC32 v10.50.10	Not required

Environmental Test Conditions	
Temperature	22 and 25.4° Celsius
Relative Humidity	30 and 38%
Atmospheric Pressure	1025.6 and 1028.2 millibars
Test Date:	16 th and 17 th November 2021
Test Engineer:	Richard Pennell

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.

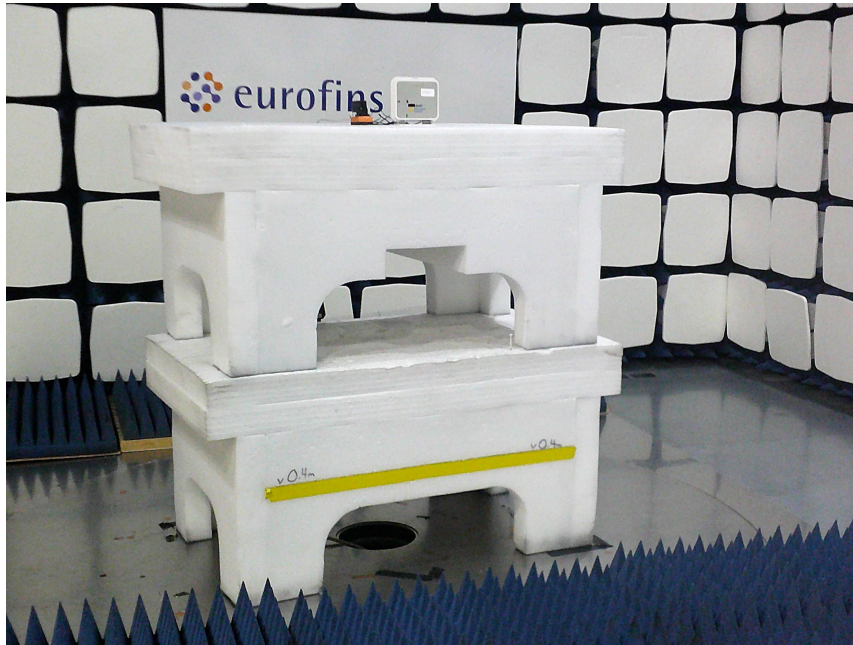
4.1.3 Set-up Photos

Radiated Emissions; Below 1GHz



4.1.4 Set-up Photos (Continued)

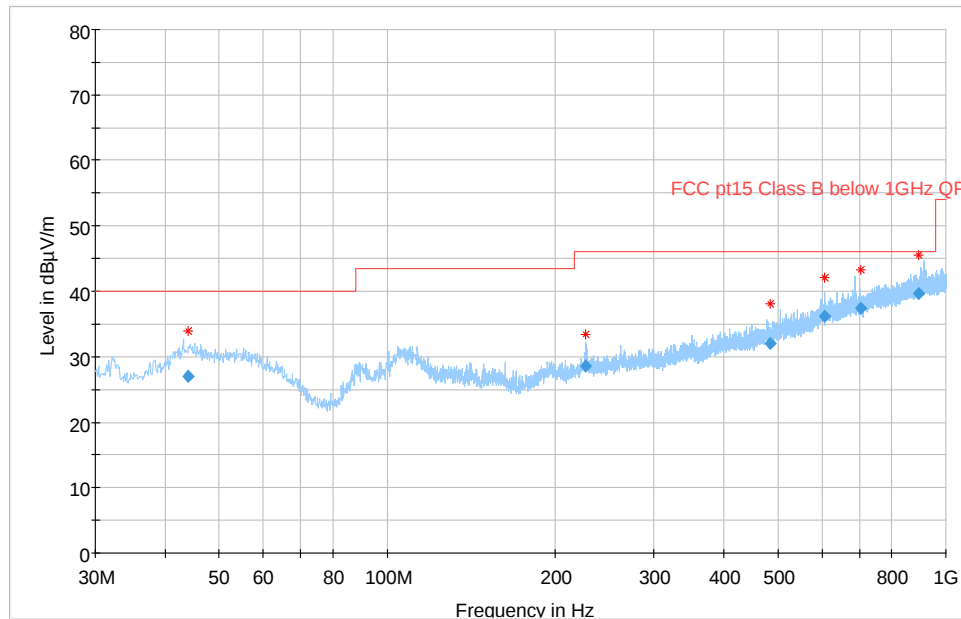
Radiated Emissions; Above 1GHz



4.1.5 Profile; 30MHz to 1GHz, Idle Mode

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

30MHz to 1GHz, Idle Mode



4.1.6 Data; 30MHz to 1GHz, Idle Mode

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
44.046971	27.05	40.00	12.95	V	240.0	214.0	Pass
226.748869	28.62	46.00	17.38	H	119.0	125.0	Pass
485.095242	32.01	46.00	13.99	H	250.0	144.0	Pass
608.158820	36.15	46.00	9.85	V	400.0	174.0	Pass
704.542918	37.32	46.00	8.68	H	115.0	248.0	Pass
893.274621	39.66	46.00	6.34	V	200.0	34.0	Pass

V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the 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).

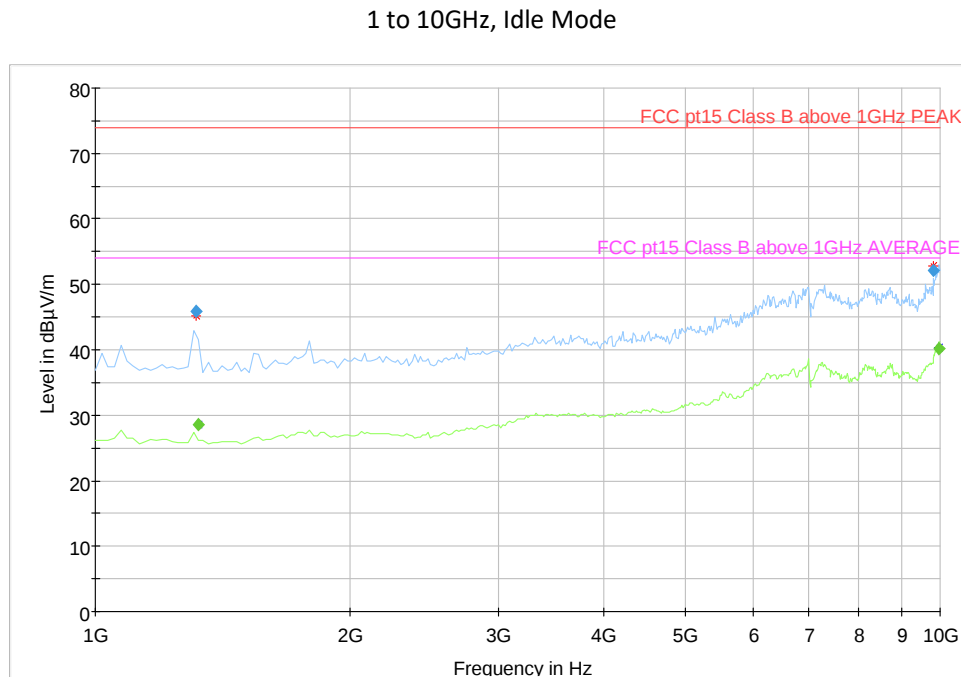
Note: Path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.7 Profile; 1 to 10GHz, Idle Mode

Maximum hold trace with peak values (◆)

Peak measurements (✱)

Average measurements (◆)



4.1.8 Data; 1 to 10GHz, Idle Mode

Frequency	Peak	CISPR Average	Limit	Margin	Height	Pol	Azimuth	Corr.	
MHz	dBµV/m	dBµV/m	dBµV/m	dB	cm	H/V	Deg	dB/m	Status
1317.152596	45.87	---	74.00	28.13	100.0	V	31.0	-9.3	Pass
1322.913245	---	28.57	54.00	25.43	100.0	V	20.0	-9.3	Pass
9828.402359	52.12	---	74.00	21.88	308.0	H	279.0	5.5	Pass
9979.622780	---	40.24	54.00	13.76	132.0	V	0.0	7.0	Pass

V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the 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).

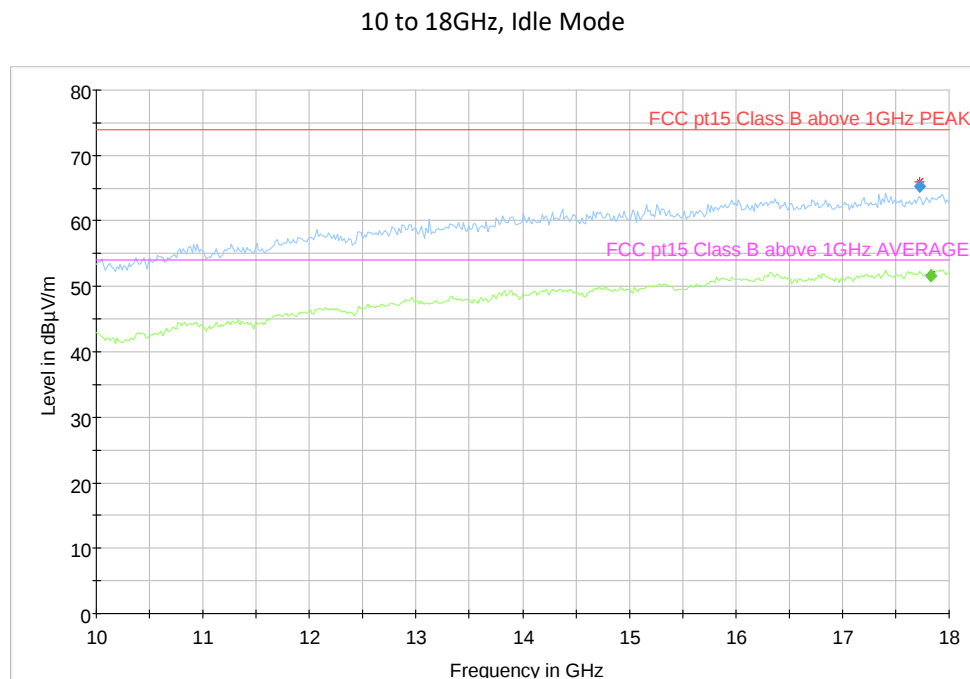
Note: path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.9 Profile; 10 to 18GHz, Idle Mode

Maximum hold trace with peak values (◆)

Peak measurements (✱)

Average measurements (◆)



4.1.10 Data; 10 to 18GHz, Idle Mode

Frequency	Peak	CISPR Average	Limit	Margin	Height	Pol	Azimuth	Corr.	
MHz	dBµV/m	dBµV/m	dBµV/m	dB	cm	H/V	Deg	dB/m	Status
17723.38054	65.22	---	74.00	8.78	400.0	V	148.0	19.2	Pass
17832.32235	---	51.65	54.00	2.35	315.0	V	0.0	19.3	Pass

V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the 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).

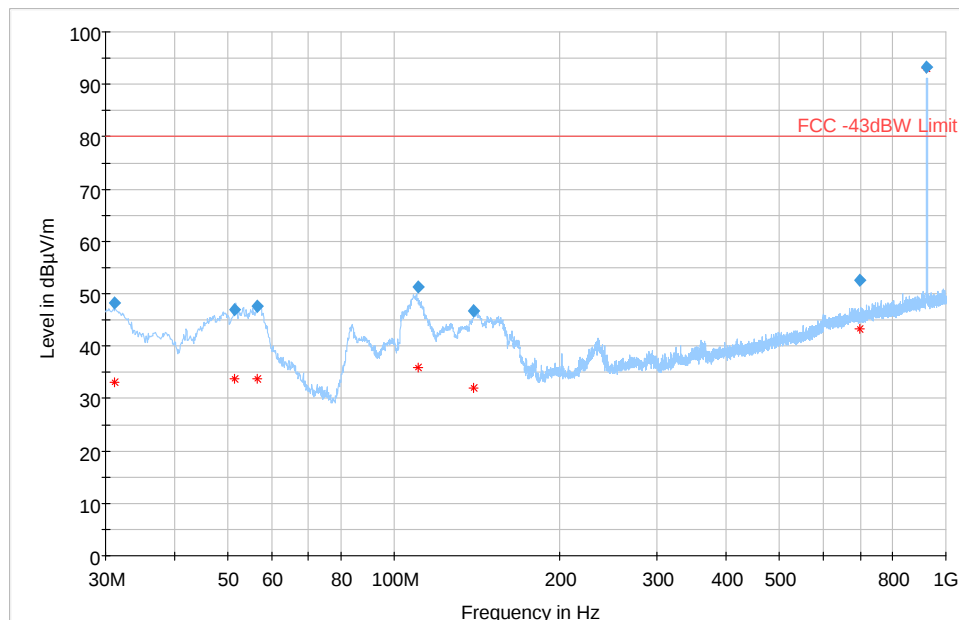
Note: path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.11 Profile; 30MHz to 1GHz, Mode 1 (925MHz and 1850.7MHz)

Maximum peak hold trace with quasi-peak values (◆)

Peak measurements (*)

30MHz to 1GHz, Mode 1 (925MHz and 1850.7MHz)



4.1.12 Data; 30MHz to 1GHz, Mode 1 (925MHz and 1850.7MHz)

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
31.129470	48.22	80.00	31.78	V	100.0	210.0	Pass
51.421985	46.90	80.00	33.10	V	247.0	166.0	Pass
56.444071	47.68	80.00	32.32	V	129.0	312.0	Pass
110.337575	51.29	80.00	28.71	H	173.0	96.0	Pass
139.270490	46.82	80.00	33.18	H	115.0	105.0	Pass
698.643875	52.60	80.00	27.40	H	387.0	282.0	Pass

V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the 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.

4.1.13 Data; Carrier power, Mode 1 (925MHz and 1850.7MHz)

Frequency	Peak		Height	Pol	Azimuth	
MHz	dB μ V/m	dBm	cm	H/V	Deg	Status
924.957649	93.38	-4.00dBm	116.0	H	171.0	Pass

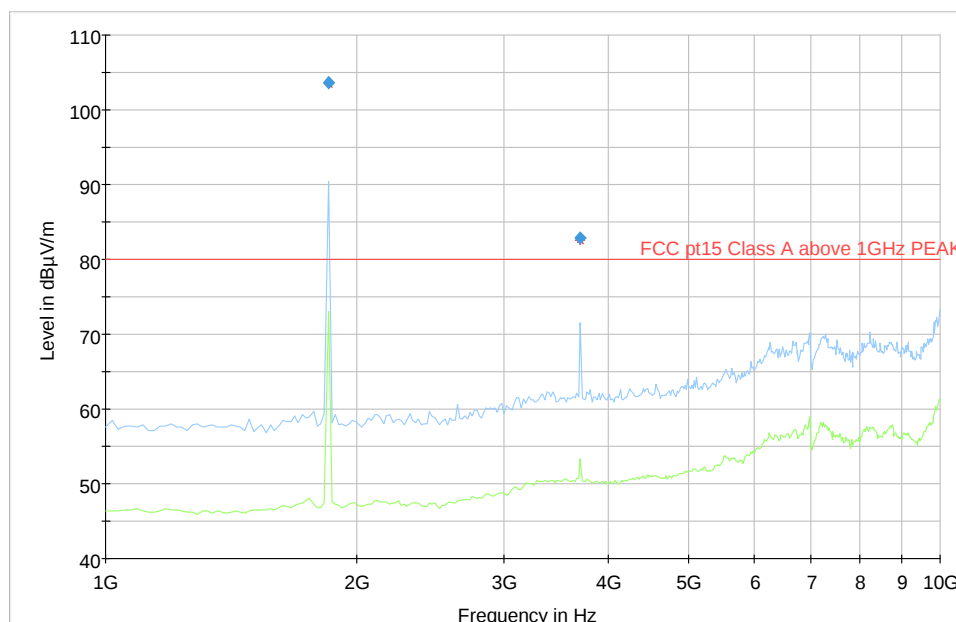
4.1.14 Profile; 1 to 10GHz, Mode 1 (925MHz and 1850.7MHz)

Maximum hold trace with peak values (◆)

Peak measurements (✱)

Average measurements (◆)

1 to 10GHz, Mode 1 (925MHz and 1850.7MHz)



4.1.15 Data; 1 to 10GHz, Mode 1 (925MHz and 1850.7MHz)

Frequency	Peak	CISPR Average	Limit	Margin	Height	Pol	Azimuth	
MHz	dBμV/m	dBμV/m	dBμV/m	dB	cm	H/V	Deg	Status
3701.14105	78.76		80.00	1.24	239.0	V	32.0	Pass

V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the 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 Data; Carrier power, Mode 1 (925MHz and 1850.7MHz)

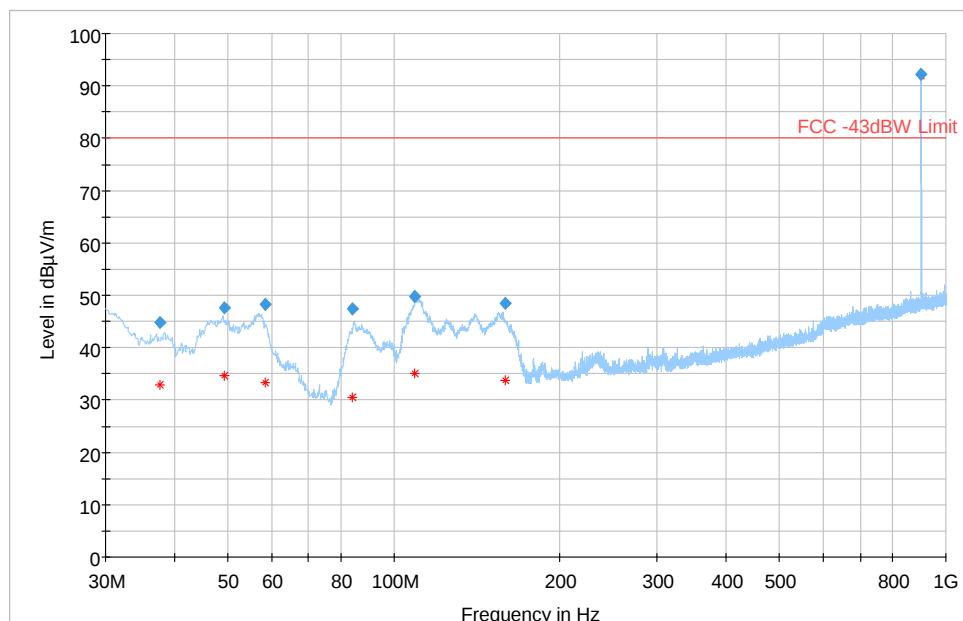
Frequency	Peak		Height	Pol	Azimuth	
MHz	dBμV/m	dBm	cm	H/V	Deg	Status
1851.490767	117.52	22.29dB	171.0	V	0.0	Pass

4.1.17 Profile; 30MHz to 1GHz, Mode 2 (902.2MHz and 1754.3MHz)

Maximum peak hold trace with quasi-peak values (◆)

Peak measurements (*)

30MHz to 1GHz, Mode 2 (925MHz and 1850.7MHz)



4.1.18 Data; 30MHz to 1GHz, Mode 2 (902.2MHz and 1754.3MHz)

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
37.582747	44.73	80.00	35.27	V	136.0	348.0	Pass
49.378917	47.64	80.00	32.36	V	105.0	185.0	Pass
58.335697	48.30	80.00	31.70	V	100.0	304.0	Pass
84.154154	47.35	80.00	32.65	V	105.0	54.0	Pass
109.201800	49.86	80.00	30.14	H	129.0	117.0	Pass
158.747884	48.44	80.00	31.56	H	105.0	263.0	Pass

V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the 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.

4.1.19 Data; Carrier Power, Mode 2 (902.2MHz and 1754.3MHz)

Frequency	Peak		Height	Pol	Azimuth	
MHz	dBμV/m	dBm	cm	H/V	Deg	Status
902.258382	92.17	-5.21	1156.0	H	166.0	Pass

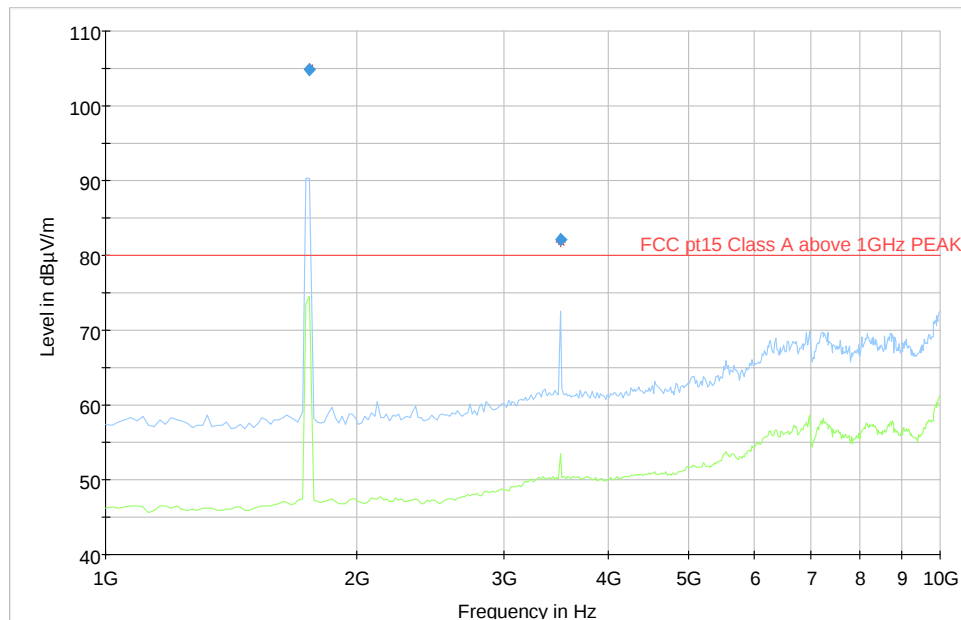
4.1.20 Profile; 1 to 10GHz, Mode 2 (902.2MHz and 1754.3MHz)

Maximum hold trace with peak values (◆)

Peak measurements (✱)

Average measurements (◆)

1 to 10GHz, Mode 2 (902.2MHz and 1754.3MHz)



4.1.21 Data; 1 to 10GHz, Mode 2 (902.2MHz and 1754.3MHz)

Frequency	Peak	CISPR Average	Limit	Margin	Height	Pol	Azimuth	Corr.	
MHz	dBμV/m	dBμV/m	dBμV/m	dB	cm	H/V	Deg	dB/m	Status
3508.946755	77.46	---	80.00	Harmo	211.0	V	36.0		Pass

V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the 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.

4.1.22 Data; Carrier Power 1 to 10GHz, Mode 2 (902.2MHz and 1754.3MHz)

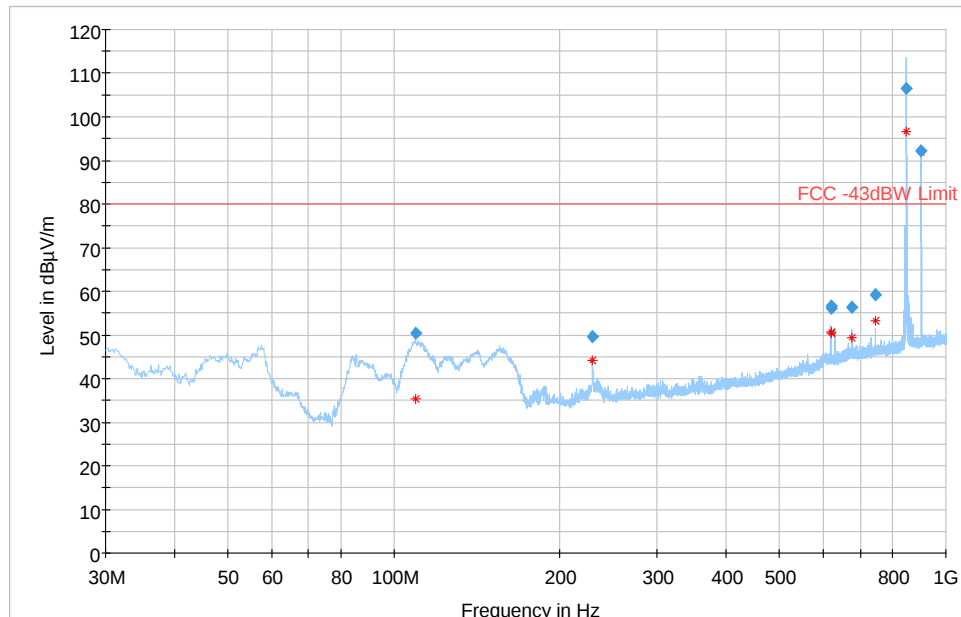
Frequency	Peak		Height	Pol	Azimuth	
MHz	dBμV/m	dBm	cm	H/V	Deg	Status
1755.137623	119.22	23.99dBm	196.0	V	0.0	Pass

4.1.23 Profile; 30MHz to 1GHz, Mode 3 (848MHz and 902.2MHz)

Maximum peak hold trace with quasi-peak values (◆)

Peak measurements (*)

30MHz to 1GHz, Mode 3 (848MHz and 902.2MHz)



4.1.24 Data; 30MHz to 1GHz, Mode 3 (848MHz and 902.2MHz)

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
109.596593	50.34	80.00	29.66	H	206.0	110.0	Pass
229.112034	49.57	80.00	30.43	V	190.0	14.0	Pass
619.058252	56.11	80.00	23.89	H	132.0	347.0	Pass
619.112087	56.60	80.00	23.40	H	122.0	163.0	Pass
676.365472	56.35	80.00	23.65	H	115.0	348.0	Pass
744.624230	59.26	80.00	20.74	H	105.0	315.0	Pass

V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the 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.

4.1.25 Data; Carrier power, 30MHz to 1GHz, Mode 3 (848MHz and 902.2MHz)

Frequency	Peak		Height	Pol	Azimuth	
MHz	dB μ V/m	dBm	cm	H/V	Deg	Status
848.157891	119.66	22.8dBm	172.0	H	74.0	Pass
902.25275	92.11	-5.27dBm	157.0	H	167.0	Pass

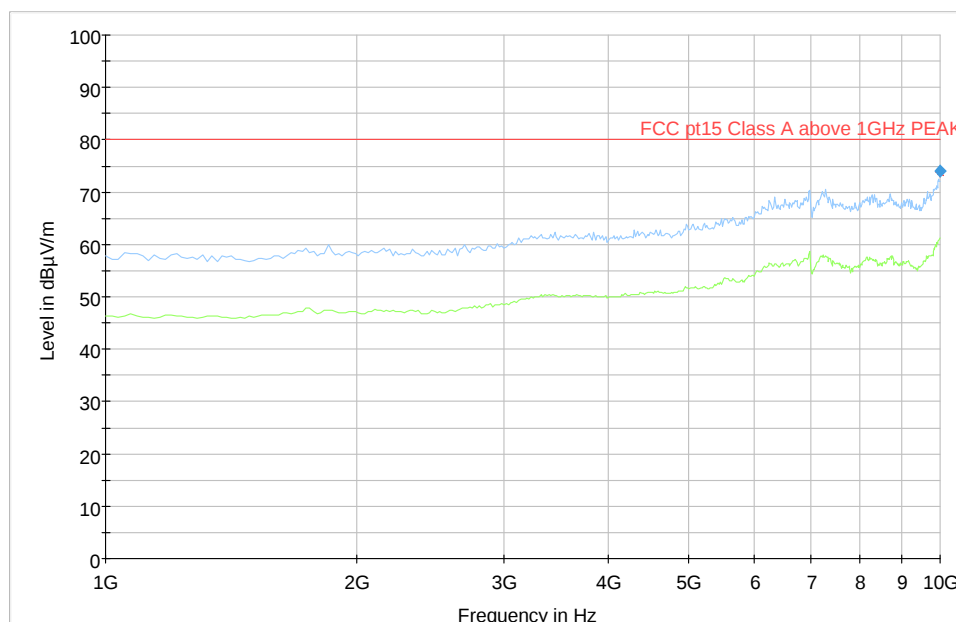
4.1.26 Profile; 1 to 10GHz, Mode 3 (848MHz and 902.2MHz)

Maximum hold trace with peak values (◆)

Peak measurements (✱)

Average measurements (◆)

1 to 10GHz, Mode 3 (848MHz and 902.2MHz)



4.1.27 Data; 1 to 10GHz, Mode 3 (848MHz and 902.2MHz)

Frequency	Peak	CISPR Average	Limit	Margin	Height	Pol	Azimuth	Corr.	
MHz	dBμV/m	dBμV/m	dBμV/m	dB	cm	H/V	Deg	dB/m	Status
9990.284785	74.00	---	80.00	6.00	314.0	H	63.0	27.1	Pass

V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the 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).

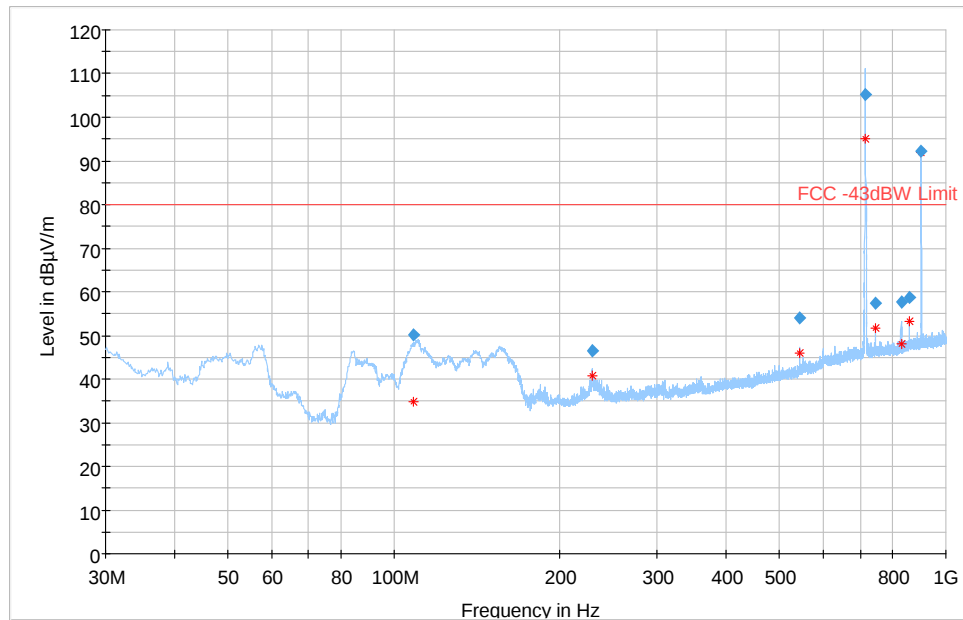
Note: path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.28 Profile; 30MHz to 1GHz, Mode 4 (715.3MHz and 902.2MHz)

Maximum peak hold trace with quasi-peak values (◆)

Peak measurements (*)

30MHz to 1GHz, Mode 4 (715.3MHz and 902.2MHz)



4.1.29 Data; 30MHz to 1GHz, Mode 4 (715.3MHz and 902.2MHz)

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
108.242118	50.07	80.00	29.93	H	139.0	72.0	Pass
229.142985	46.48	80.00	33.52	V	176.0	267.0	Pass
543.381653	54.04	80.00	25.96	V	118.0	248.0	Pass
744.665848	57.34	80.00	22.66	V	164.0	125.0	Pass
829.894650	57.56	80.00	22.44	H	166.0	183.0	Pass
859.218010	58.70	80.00	21.30	H	122.0	329.0	Pass

V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the 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.

4.1.30 Data; Carrier power, 30MHz to 1GHz, Mode 4 (715.2MHz and 902.2MHz)

Frequency	Peak		Height	Pol	Azimuth	
MHz	dB μ V/m	dBm	cm	H/V	Deg	Status
715.264764	113.17	15.79dBm	206.0	H	290.0	Pass
902.261222	92.2	-5.18dBm	156.0	H	167.0	Pass

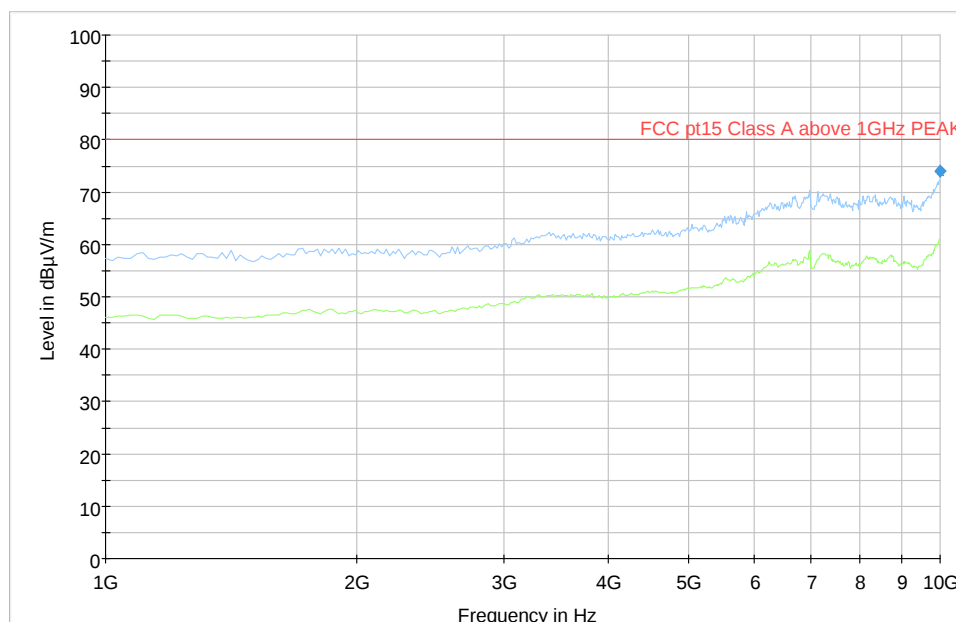
4.1.31 Profile; 1 to 10GHz, Mode 4 (848MHz and 902.2MHz)

Maximum hold trace with peak values (◆)

Peak measurements (✱)

Average measurements (◆)

1 to 10GHz, Mode 4 (715.3MHz and 902.2MHz)



4.1.32 Data; 1 to 10GHz, Mode 4 (848MHz and 902.2MHz)

Frequency	Peak	CISPR Average	Limit	Margin	Height	Pol	Azimuth	Corr.	
MHz	dBμV/m	dBμV/m	dBμV/m	dB	cm	H/V	Deg	dB/m	Status
9991.654448	74.01	---	80.00	5.99	372.0	V	131.0	27.1	Pass

V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the 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).

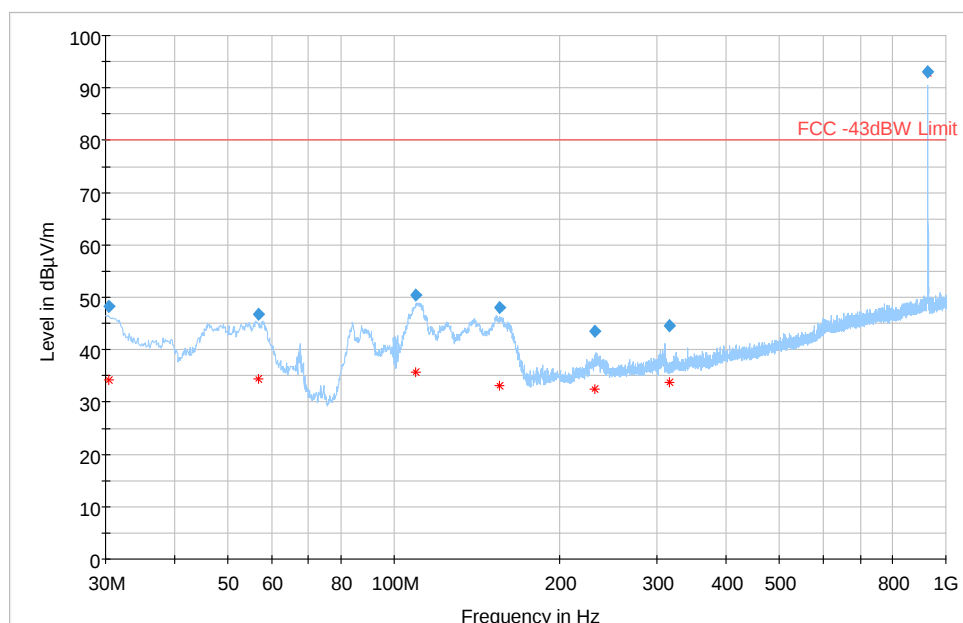
Note: path losses are factored into the limit value, and given by the test standard. Chamber calibration data contributes to the measurement uncertainty figure.

4.1.33 Profile; 30MHz to 1GHz, Mode 5 (927.8MHz and 1909.3MHz)

Maximum peak hold trace with quasi-peak values (◆)

Peak measurements (*)

30MHz to 1GHz, Mode 5 (927.8MHz and 1909.3MHz)



4.1.34 Data; 30MHz to 1GHz, Mode 5 (927.8MHz and 1909.3MHz)

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
30.382717	48.25	80.00	31.75	V	100.0	266.0	Pass
56.808903	46.82	80.00	33.18	V	234.0	128.0	Pass
109.618697	50.43	80.00	29.57	H	182.0	85.0	Pass
155.228218	47.98	80.00	32.02	H	135.0	265.0	Pass
230.804242	43.40	80.00	36.60	V	267.0	52.0	Pass
315.881371	44.57	80.00	35.43	V	122.0	280.0	Pass

V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the 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.

4.1.35 Data; Carrier power, 30MHz to 1GHz, Mode 5 (927.8MHz and 1909.3MHz)

Frequency	Peak		Height	Pol	Azimuth	
MHz	dBμV/m	dBm	cm	H/V	Deg	Status
927.757105	92.99	-4.89	115.0	H	170.0	Pass

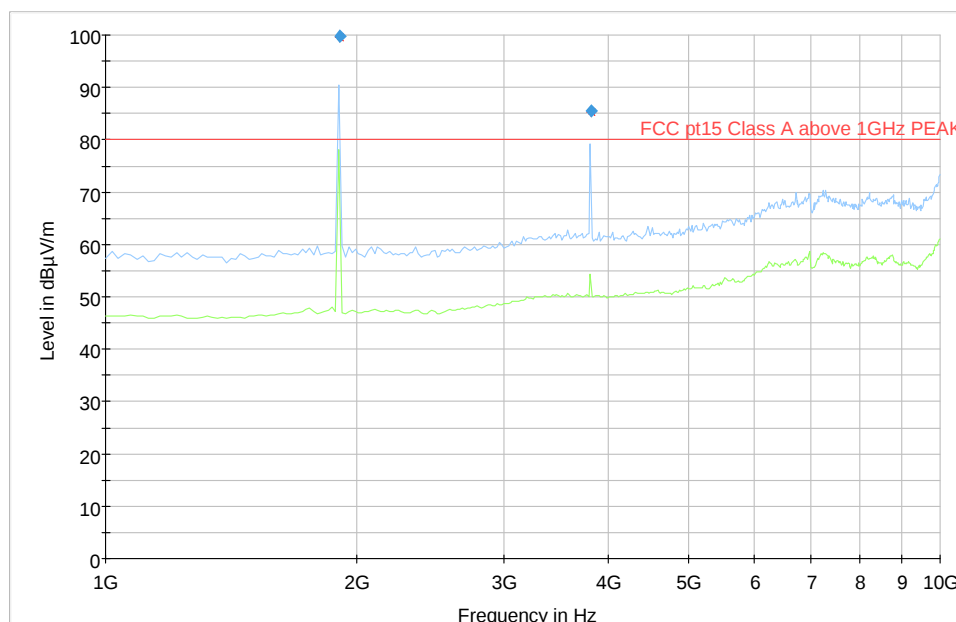
4.1.36 Profile; 1 to 10GHz, Mode 5 (927.8MHz and 1909.3MHz)

Maximum hold trace with peak values (◆)

Peak measurements (✱)

Average measurements (◆)

1 to 10GHz, Mode 5 (927.8MHz and 1909.3MHz)



4.1.37 Data; 1 to 10GHz, Mode 5 (927.8MHz and 1909.3MHz)

Frequency	Peak	CISPR Average	Limit	Margin	Height	Pol	Azimuth	
MHz	dBμV/m	dBμV/m	dBμV/m	dB	cm	H/V	Deg	Status
3818.403832	78.59		80.00	1.41	245.0	V	62.0	Pass

V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the 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.

4.1.38 Data; Carrier power, 1 to 10GHz, Mode 5 (927.8MHz and 1909.3MHz)

Frequency	Peak		Height	Pol	Azimuth	
MHz	dBμV/m	dBm	cm	H/V	Deg	Status
1910.283577	119.95	24.72	162.0	V	0.0	Pass

5.0 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 U_{lab}) are equal to or are less than the expected uncertainty values contained in CISPR 16-4-2 (known as U_{cispr}). 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)

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.

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.

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