EMC Test Report	
For:	**MysteryVibe Limited**
Product:	**MysteryVibe**
Model:	**Tenuto 2**
Project Engineer:	**Chris Novak**
Approval Signatory:	**Dan Tiroke**

Document Reference:	**3913 FR**

Issue Number:	**Date:**	**Test Report Revisions History:**
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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: 3913

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 FCC/CFR 47:Part 15C 15.247 and 15.209	ANSI C63.4:2014, Class B ANSI C63.10:2013, Class B	Pass
Conducted Emissions			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):	MysteryVibe		
Model:	Tenuto 2	**Serial Number:**	001*
Sample Build:	Production Sample		
EUT Power:	Battery powered		
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:	Mr Charlie Blackham (Sulis Consultants)		
Date EUT Received:	28th March 2021 and again on 22nd April 2022		
Test Date(s):	22nd to 25th April 2022		
EMC Measurement Site:	Eurofins E&E Hursley Limited		
	Trafalgar Close, Chandlers Ford, Hampshire, United Kingdom		
Product Category:	Personal Vibrator Toy		

*Note: Serial number designated by Eurofins E&E Hursley.

3.2 EUT Description

The EUT is a personal vibrator toy.

3.3 Support Equipment

Description	Manufacturer	Model	Serial Number
Not Applicable	Not Applicable	Not Applicable	Not Applicable

3.4 EUT Test Exerciser

The EUT was powered on and put into testing mode. It was tested in three separate modes:

1. Bottom Channel; 2402MHz
2. Middle Channel; 2440MHz
3. Top Channel; 2480MHz

The EUT was tested in three axis and the worst-case results are shown below.

3.5 EUT Test Configuration #1

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. 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	14/12/2022
893	1	Rohde & Schwarz	ESW44	103044	EMI test receiver	24/09/2022
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)	19/10/2022
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	18.9 to 20.3° Celsius
Relative Humidity	36 to 43%
Atmospheric Pressure	1018.2 to 1031.6 millibars
Test Dates:	28th March and 25th April 2022
Test Engineers:	Joshua Mullane, Richard Pennell and Chris Novak

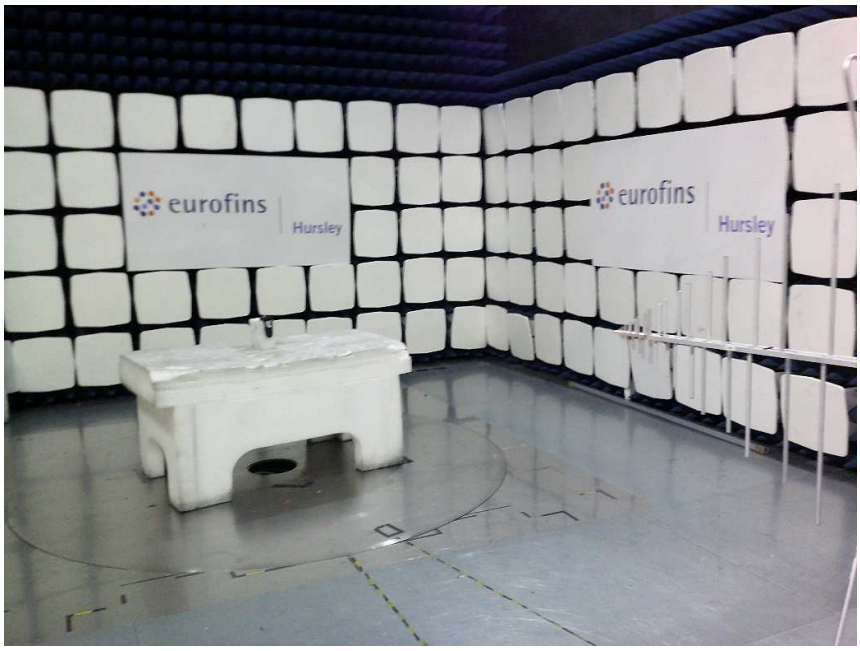
Note: “Calibration due date” means the instrument is certified within UKAS or traceable calibration certificate. “Internal” means the instrument is calibrated using Eurofins Hursley procedures. “Not required” means the asset does not require calibration. “CP” is the interval period [year] prescribed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

4.1.2 Test Configuration

Please refer to EUT Test Configuration #1.

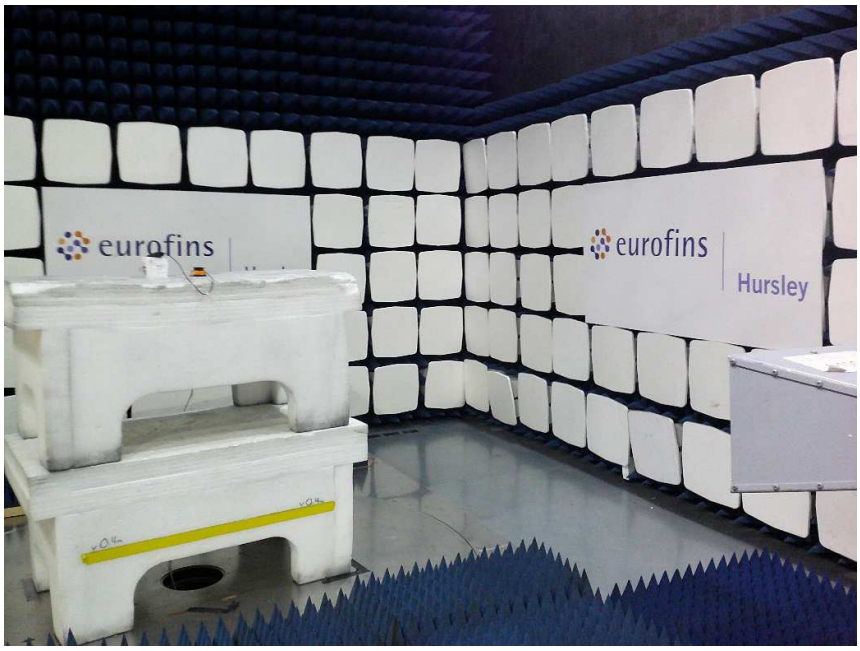
4.1.3 Set-up Photos

Radiated Emissions; Below 1GHz



4.1.4 Set-up Photos (Continued)

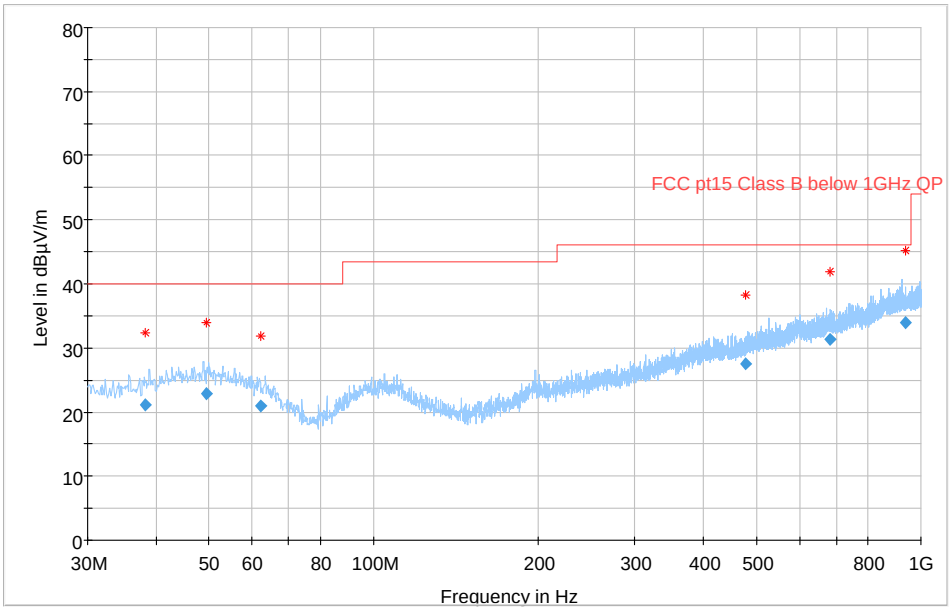
Radiated Emissions; Above 1GHz



4.1.5 Profile; 30MHz to 1GHz, Top Channel; 2480MHz, Y-Axis

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

30MHz to 1GHz



4.1.6 Data; 30MHz to 1GHz, Top Channel; 2480MHz, Y-Axis

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
38.159542	21.10	40.00	18.90	V	359.0	110.0	Pass
49.543745	22.94	40.00	17.06	H	115.0	123.0	Pass
62.103078	20.96	40.00	19.04	V	132.0	178.0	Pass
478.508439	27.60	46.00	18.40	H	122.0	127.0	Pass
682.962794	31.29	46.00	14.71	H	278.0	137.0	Pass
935.260103	33.91	46.00	12.09	H	105.0	265.0	Pass

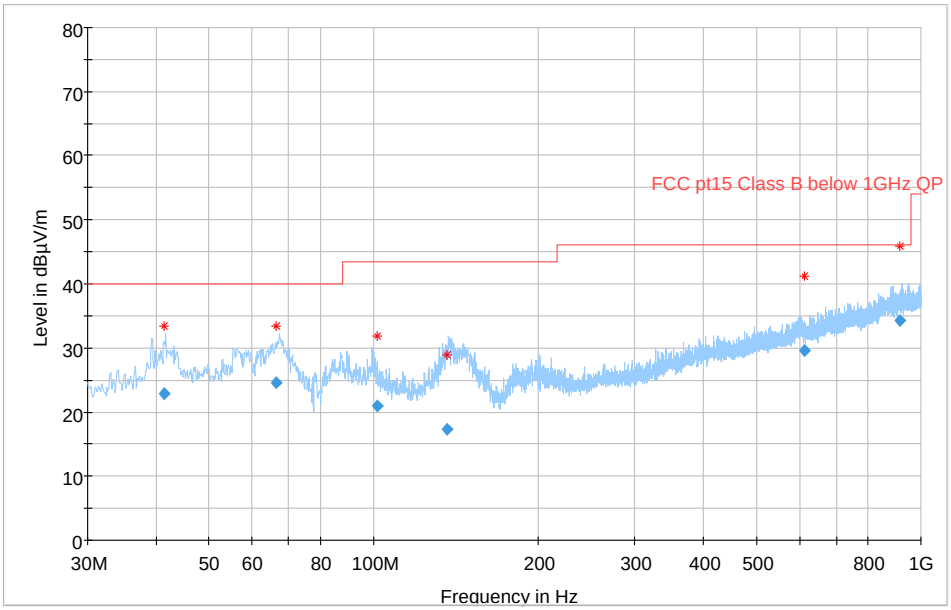
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the FCC Class B limits and take into account the correction factor*. 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.

4.1.7 Profile; 30MHz to 1GHz, Top Channel; 2480MHz, Y-Axis, Charging

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

30MHz to 1GHz



4.1.8 Data; 30MHz to 1GHz, Top Channel; 2480MHz, Y-Axis, Charging

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
41.366738	22.77	40.00	17.23	V	109.0	228.0	Pass
66.266705	24.62	40.00	15.38	V	100.0	311.0	Pass
101.670092	20.95	43.50	22.55	V	186.0	248.0	Pass
136.190849	17.33	43.50	26.17	V	297.0	59.0	Pass
613.441928	29.66	46.00	16.34	H	287.0	350.0	Pass
915.396010	34.36	46.00	11.64	V	198.0	290.0	Pass

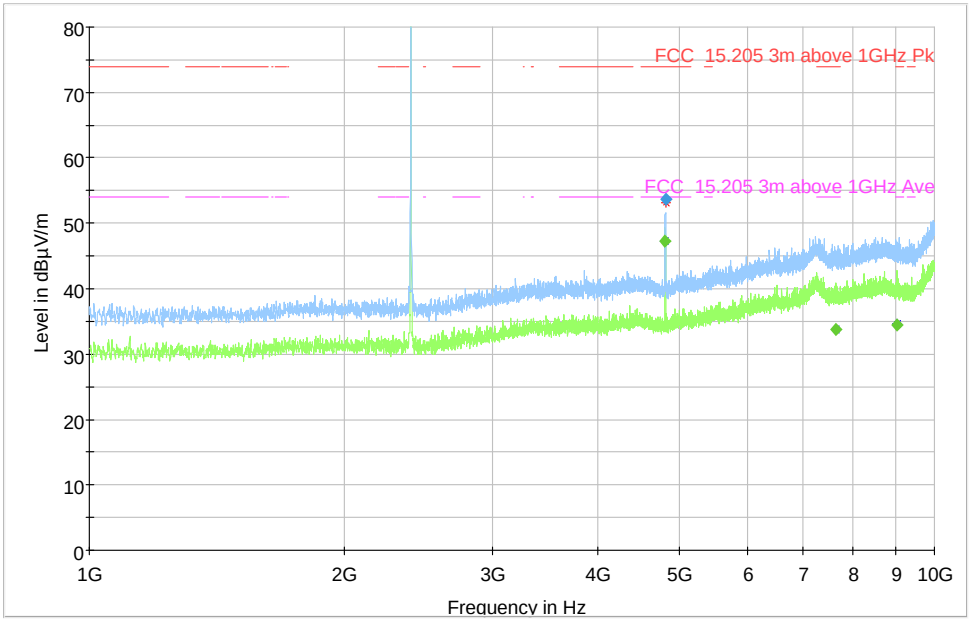
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the FCC Class B limits and take into account the correction factor*. 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.

4.1.9 Profile; 1 to 10GHz, Tx, Bottom Channel, Z-Axis

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

1 to 10GHz, Tx, Bottom Channel, Z-Axis



4.1.10 Data; 1 to 10GHz, Tx, Bottom Channel, Z-Axis

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
4803.625000	---	47.21	54.00	6.79	184.0	H	353.0	-1.2	Pass
4804.750000	53.64	---	74.00	20.36	182.0	H	355.0	-1.2	Pass
7643.125000	---	33.75	54.00	20.25	386.0	V	10.0	3.2	Pass
9024.625000	---	34.51	54.00	19.49	201.0	H	3.0	3.1	Pass

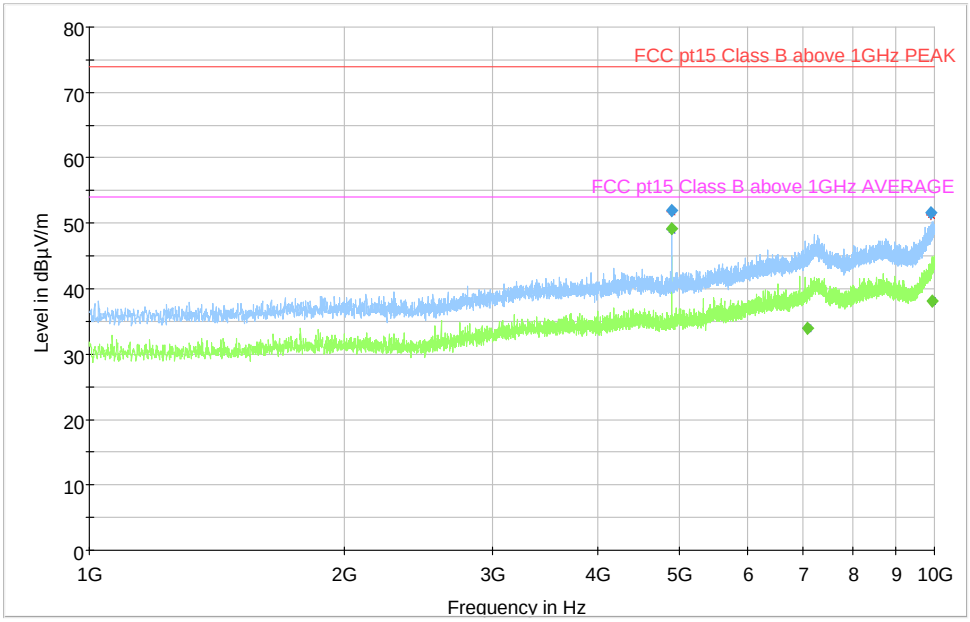
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the FCC 15.205 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; 1 to 10GHz, Rx, Charging

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

1 to 10GHz, Rx, Charging



4.1.12 Data; 1 to 10GHz, RX, Charging

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
4881.795217	51.98	---	74.00	22.02	160.0	V	120.0	-0.9	Pass
4882.069851	---	49.11	54.00	4.89	162.0	V	120.0	-0.9	Pass
7080.379021	---	33.90	54.00	20.10	252.0	V	28.0	3.6	Pass
9920.471083	51.69	---	74.00	22.31	275.0	H	104.0	6.4	Pass
9943.184208	---	38.15	54.00	15.85	396.0	V	77.0	6.6	Pass

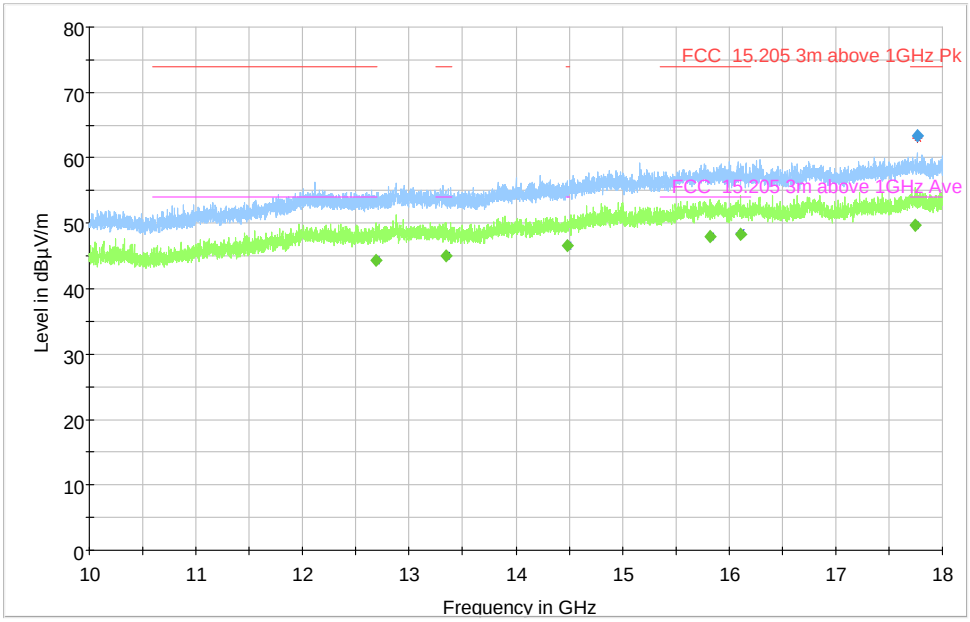
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the FCC 15.205 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 Profile; 10 to 18GHz, Tx, Middle Channel, X-Axis

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

10 to 18GHz, Tx, Middle Channel, X-Axis



4.1.14 Data; 10 to 18GHz, Tx, Middle Channel, X-Axis

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
12685.00000	---	44.38	54.00	9.62	215.0	V	185.0	13.8	Pass
13350.00000	---	45.06	54.00	8.94	171.0	H	11.0	15.1	Pass
14488.00000	---	46.55	54.00	7.45	348.0	H	289.0	16.4	Pass
15817.00000	---	47.95	54.00	6.05	299.0	V	333.0	16.8	Pass
16106.00000	---	48.39	54.00	5.61	115.0	H	0.0	17.1	Pass
17748.00000	---	49.67	54.00	4.33	206.0	V	271.0	19.2	Pass
17761.00000	63.30	---	74.00	10.70	276.0	H	65.0	19.2	Pass

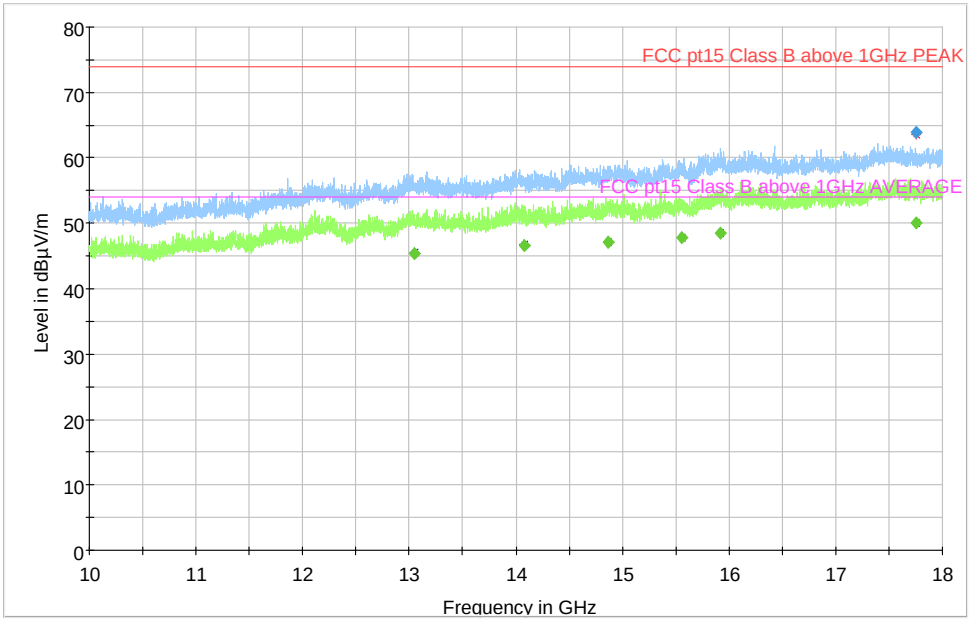
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the FCC 15.205 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.

4.1.15 Profile; 10 to 18GHz, Tx, Middle Channel, X-Axis, FCC

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

10 to 18GHz, Tx, Middle Channel, X-Axis, FCC



4.1.16 Data; 10 to 18GHz, Tx, Middle Channel, X-Axis, FCC

Frequency	Peak	CISPR Average	FCC Limit	Margin	Height	Pol	Azimuth	Corr.	
MHz	dBµV/m	dBµV/m	dBµV/m	dB	cm	H/V	Deg	dB/m	Status
13051.46667	---	45.43	54.00	8.57	138.0	V	79.0	14.8	Pass
14076.08199	---	46.66	54.00	7.34	232.0	H	57.0	16.2	Pass
14860.90856	---	47.10	54.00	6.90	298.0	H	157.0	16.4	Pass
15556.65962	---	47.76	54.00	6.24	136.0	V	324.0	16.6	Pass
15913.33197	---	48.41	54.00	5.60	276.0	H	101.0	16.9	Pass
17756.31969	63.85	---	74.00	10.15	342.0	V	166.0	19.2	Pass
17758.02528	---	50.00	54.00	4.00	105.0	V	280.0	19.2	Pass

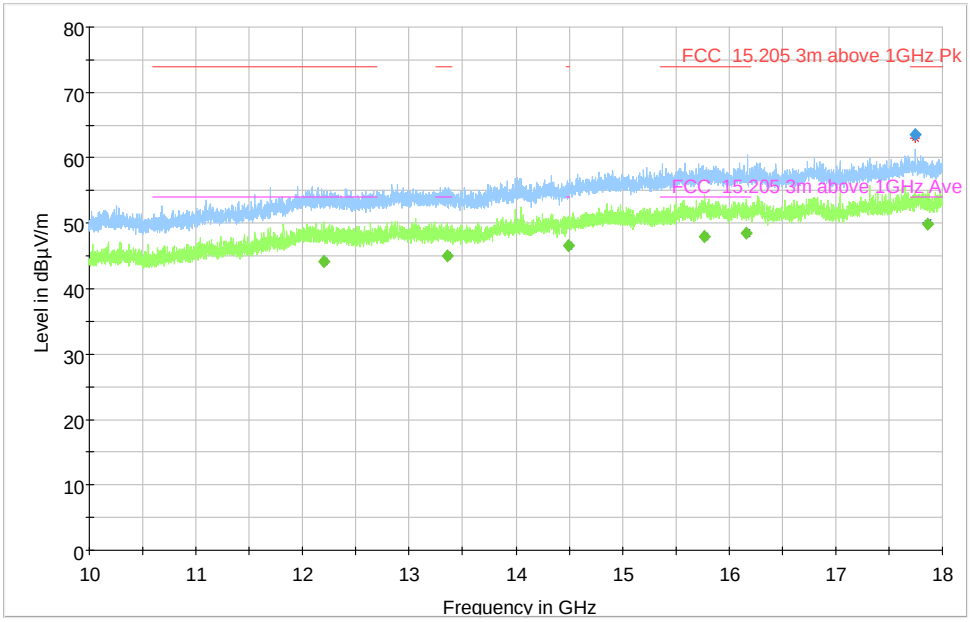
V = Vertical / H = Horizontal

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

4.1.17 Profile; 10 to 18GHz, Tx, Middle Channel, X-Axis, Charging

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

10 to 18GHz, Tx, Middle Channel, X-Axis, Charging



4.1.18 Data; 10 to 18GHz, Tx, Middle Channel, X-Axis, Charging

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
12199.00000	---	44.08	54.00	9.92	330.0	H	206.0	12.8	Pass
13357.00000	---	44.94	54.00	9.06	231.0	V	3.0	15.1	Pass
14492.00000	---	46.55	54.00	7.45	100.0	H	130.0	16.4	Pass
15774.00000	---	47.93	54.00	6.07	290.0	V	197.0	16.8	Pass
16158.00000	---	48.52	54.00	5.48	154.0	H	30.0	17.2	Pass
17743.00000	63.49	---	74.00	10.51	296.0	V	311.0	19.2	Pass
17864.00000	---	49.92	54.00	4.08	251.0	H	297.0	19.3	Pass

V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the FCC 15.205 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.

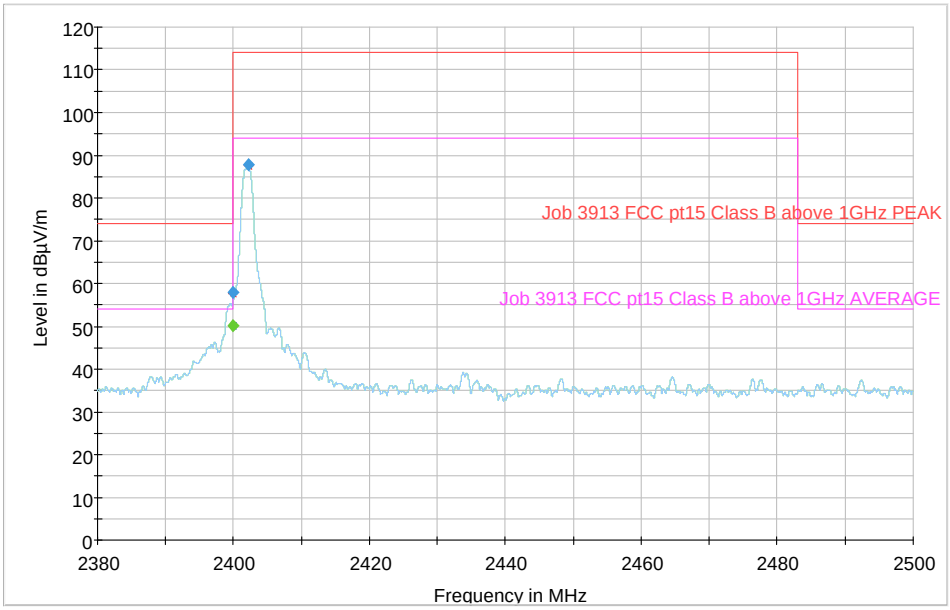
4.1.19 Profile; Transmit Power and Band Edge, Bottom Channel, X-Axis 2402MHz

Maximum hold trace with peak values (◆)

Peak measurements (✳)

Average measurements (◆)

Transmit Power and Band Edge, Bottom Channel, X-Axis 2402MHz



4.1.20 Data; Transmit Power and Band Edge, Bottom Channel, X-Axis 2402MHz

Frequency	Peak	CISPR Average	FCC Limit	Margin	Height	Pol	Azimuth	Corr.	
MHz	dBµV/m	dBµV/m	dBµV/m	dB	cm	H/V	Deg	dB/m	Status
2399.998000	---	50.22	54.00	3.78	126.0	V	47.0	-6.7	Pass
2399.998000	57.85	---	74.00	16.15	124.0	V	44.0	-6.7	Pass
2402.254000	87.82	---	94.00	26.18	112.0	V	45.0	-6.7	Pass

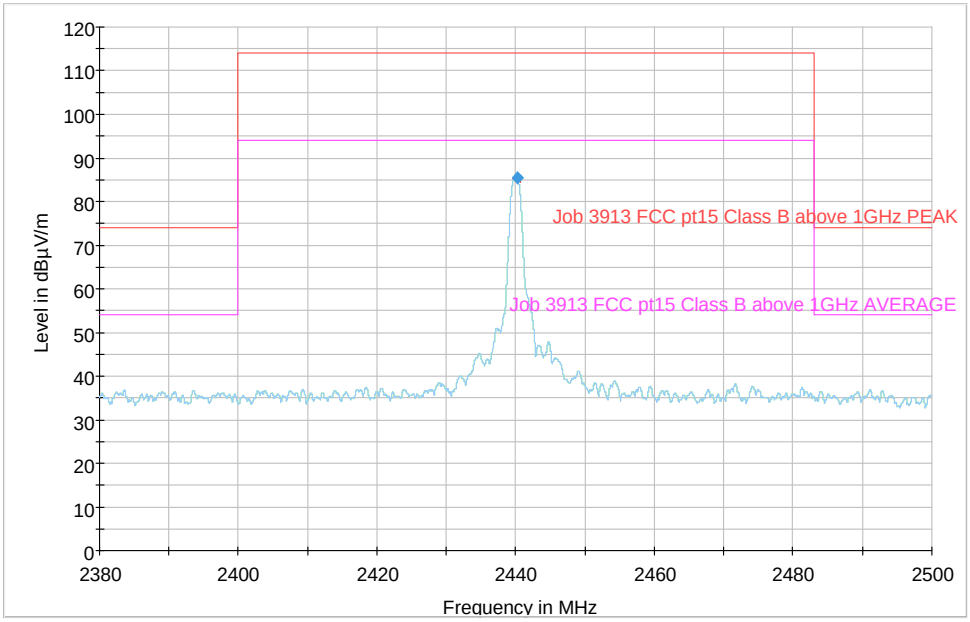
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the FCC 15.209 and 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.

4.1.21 Profile; Transmit Power, Middle Channel, X-Axis 2440MHz

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

Transmit Power, Middle Channel, X-Axis 2440MHz



4.1.22 Data; Transmit Power, Middle Channel, X-Axis 2440MHz

Frequency	Peak	CISPR Average	FCC Limit	Margin	Height	Pol	Azimuth	Corr.	
MHz	dBµV/m	dBµV/m	dBµV/m	dB	cm	H/V	Deg	dB/m	Status
2440.234000	85.41	---	94.00	8.59	163.0	V	226.0	-6.7	Pass

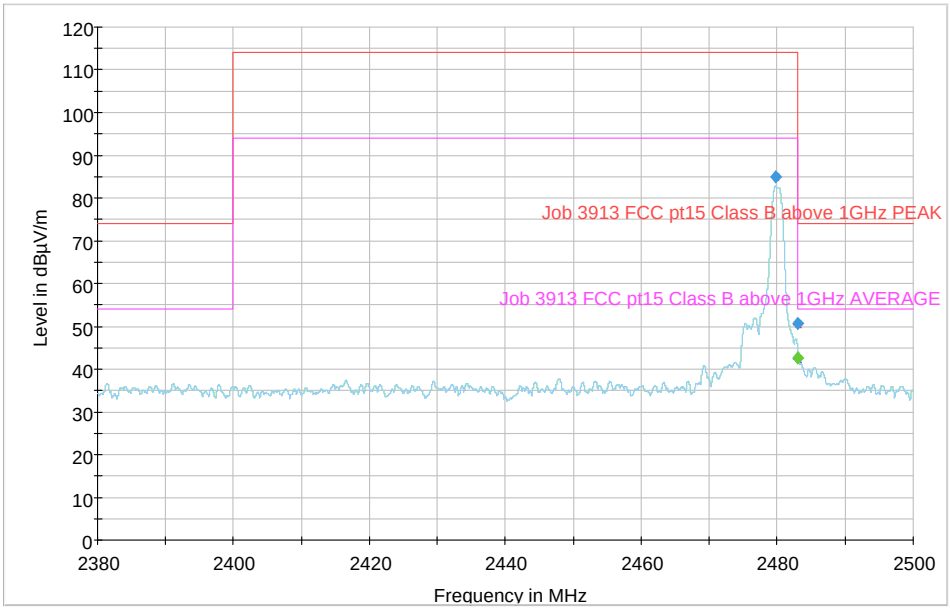
V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the FCC 15.249 limits and take into account the correction factor*. 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.

4.1.23 Profile; Transmit Power and Band Edge, Top Channel, X-Axis 2480MHz

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

Transmit Power and Band Edge, Top Channel, X-Axis 2480MHz



4.1.24 Data; Transmit Power and Band Edge, Top Channel, X-Axis 2480MHz

Frequency	Peak	CISPR Average	FCC Limit	Margin	Height	Pol	Azimuth	Corr.	
MHz	dBµV/m	dBµV/m	dBµV/m	dB	cm	H/V	Deg	dB/m	Status
2479.744000	84.96	---	94.00	9.04	118.0	V	300.0	-6.7	Pass
2483.002000	---	42.48	54.00	11.52	119.0	V	302.0	-6.7	Pass
2483.002000	50.63	---	74.00	23.37	115.0	V	304.0	-6.7	Pass

V = Vertical / H = Horizontal

The measurements reported are the highest emissions relative to the FCC 15.209 and 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 (Worst Case)

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
785	0	EH	Ground plane	0	Ground plane work area	Not required
699	1	Gauss	TDEMI30M	1506001	Time domain conducted receiver	16/09/2023
674	1	Rohde & Schwarz	ESH3-Z5	838576-018	1 phase LISN ANSI&CISPR	16/09/2022
252	1	Rohde & Schwarz	ESH 3 Z2	08970	10dB pulse limiter	28/05/2022
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	21.3° Celsius
Relative Humidity	37%
Atmospheric Pressure	1006.6 millibars
Test Date:	22nd April 2022
Test Engineer:	Malcolm Musgrave

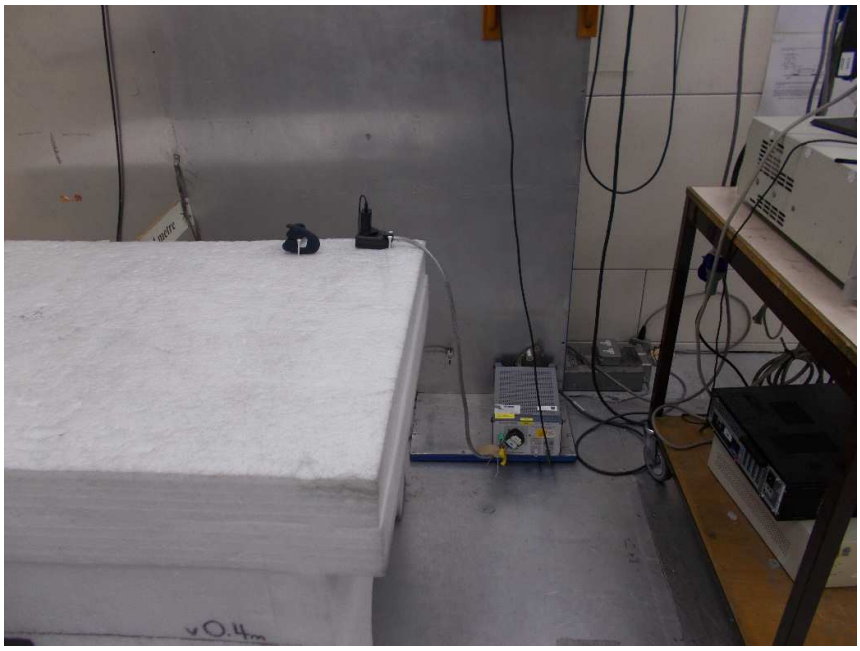
Note: “Calibration due date” means the instrument is certified within UKAS or traceable calibration certificate. “Internal” means the instrument is calibrated using Eurofins Hursley procedures. “Not required” means the asset does not require calibration. “CP” is the interval period [year] prescribed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

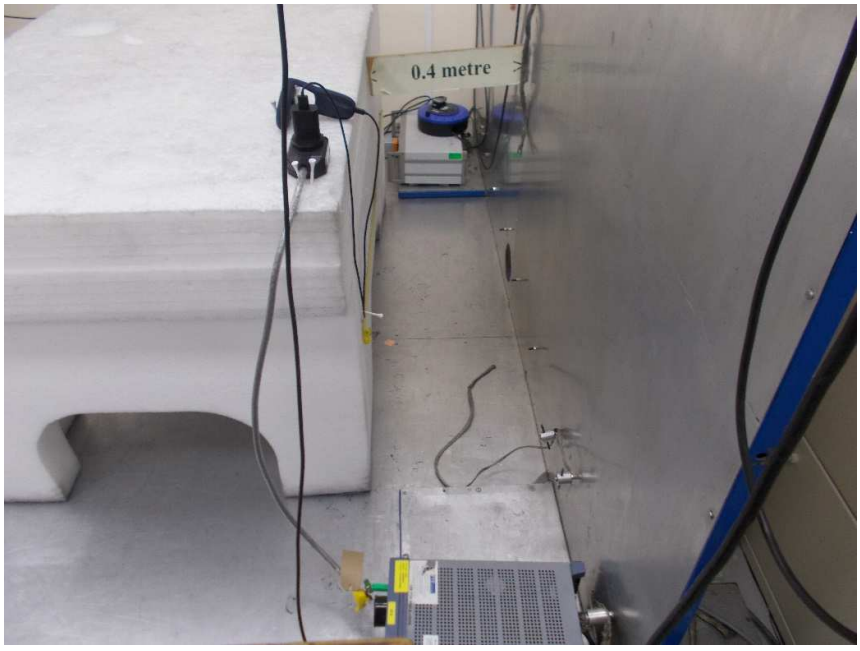
4.2.2 Test Configuration

Please refer to EUT Test Configuration #1.

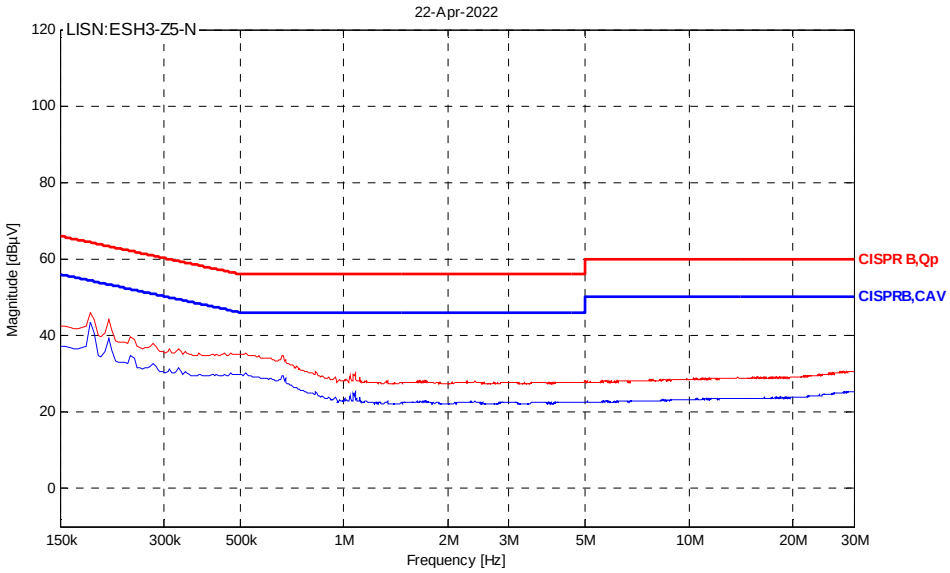
4.2.3 Set-up Photos

Conducted Emissions





4.2.4 Profile; Mains Neutral, Bottom Channel; 2402MHz



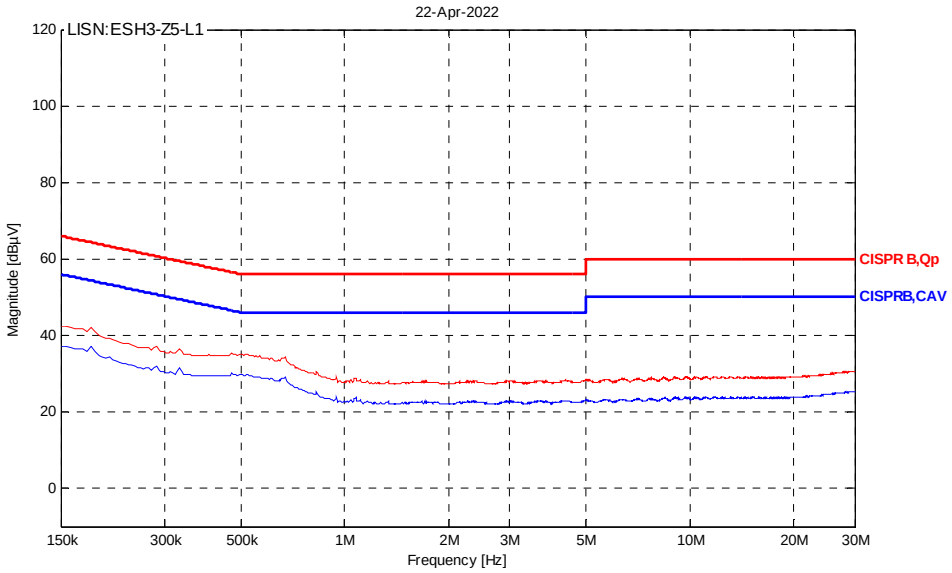
4.2.5 Data; Mains Neutral, Bottom Channel; 2402MHz

Quasi-peak value (dBµV)				
Frequency	**Measured**	**Class B Limit**	**Margin**	**Status**
183.582 kHz	46.05	64.32	18.27	Pass
9.925 MHz	28.62	60.00	31.38	Pass
15.023 MHz	28.93	60.00	31.07	Pass
20.030 MHz	29.17	60.00	30.83	Pass
25.003 MHz	29.90	60.00	30.10	Pass
29.991 MHz	30.62	60.00	29.38	Pass

CISPR Average value (dBµV)				
Frequency	**Measured**	**Class B Limit**	**Margin**	**Status**
183.582 kHz	43.42	54.32	10.91	Pass
9.863 MHz	23.27	50.00	26.73	Pass
15.023 MHz	23.66	50.00	26.34	Pass
19.882 MHz	23.79	50.00	26.21	Pass
24.974 MHz	24.55	50.00	25.45	Pass
29.976 MHz	25.28	50.00	24.72	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, Bottom Channel; 2402MHz



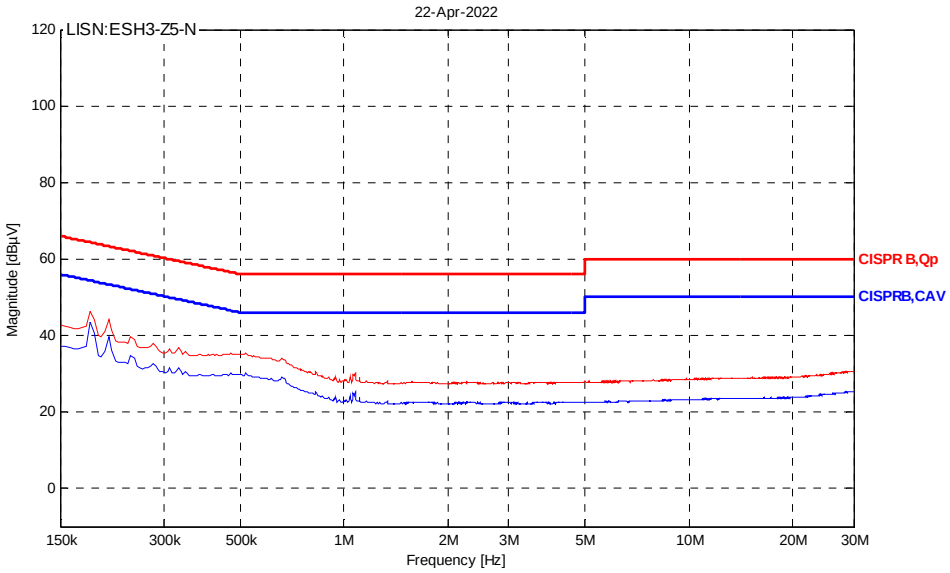
4.2.7 Data; Mains Line, Bottom Channel; 2402MHz

Quasi-peak value (dBµV)				
Frequency	**Measured**	**Class B Limit**	**Margin**	**Status**
498.295 kHz	35.19	56.03	20.84	Pass
9.763 MHz	29.23	60.00	30.77	Pass
11.842 MHz	29.30	60.00	30.70	Pass
15.905 MHz	29.19	60.00	30.81	Pass
25.003 MHz	29.85	60.00	30.15	Pass
29.914 MHz	30.61	60.00	29.39	Pass

CISPR Average value (dBµV)				
Frequency	**Measured**	**Class B Limit**	**Margin**	**Status**
498.295 kHz	29.90	46.03	16.13	Pass
9.820 MHz	23.89	50.00	26.11	Pass
11.866 MHz	23.93	50.00	26.07	Pass
19.829 MHz	23.80	50.00	26.20	Pass
24.655 MHz	24.53	50.00	25.47	Pass
29.981 MHz	25.30	50.00	24.70	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).

4.2.8 Profile; Mains Neutral, Middle Channel; 2440MHz



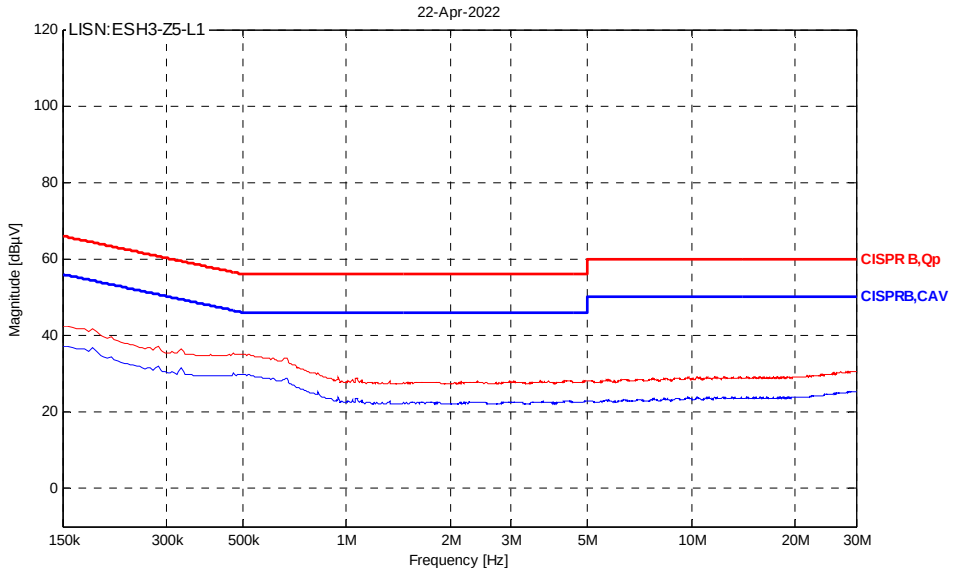
4.2.9 Data; Mains Neutral, Middle Channel; 2440MHz

Quasi-peak value (dBµV)				
Frequency	**Measured**	**Class B Limit**	**Margin**	**Status**
183.582 kHz	46.14	64.32	18.18	Pass
9.854 MHz	28.66	60.00	31.34	Pass
15.023 MHz	28.91	60.00	31.09	Pass
18.575 MHz	29.13	60.00	30.87	Pass
24.574 MHz	29.83	60.00	30.17	Pass
29.285 MHz	30.59	60.00	29.41	Pass

CISPR Average value (dBµV)				
Frequency	**Measured**	**Class B Limit**	**Margin**	**Status**
183.582 kHz	43.40	54.32	10.92	Pass
9.868 MHz	23.20	50.00	26.80	Pass
15.023 MHz	23.62	50.00	26.38	Pass
19.701 MHz	23.79	50.00	26.21	Pass
24.951 MHz	24.52	50.00	25.48	Pass
29.805 MHz	25.29	50.00	24.71	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).

4.2.10 Profile; Mains Line, Middle Channel; 2440MHz



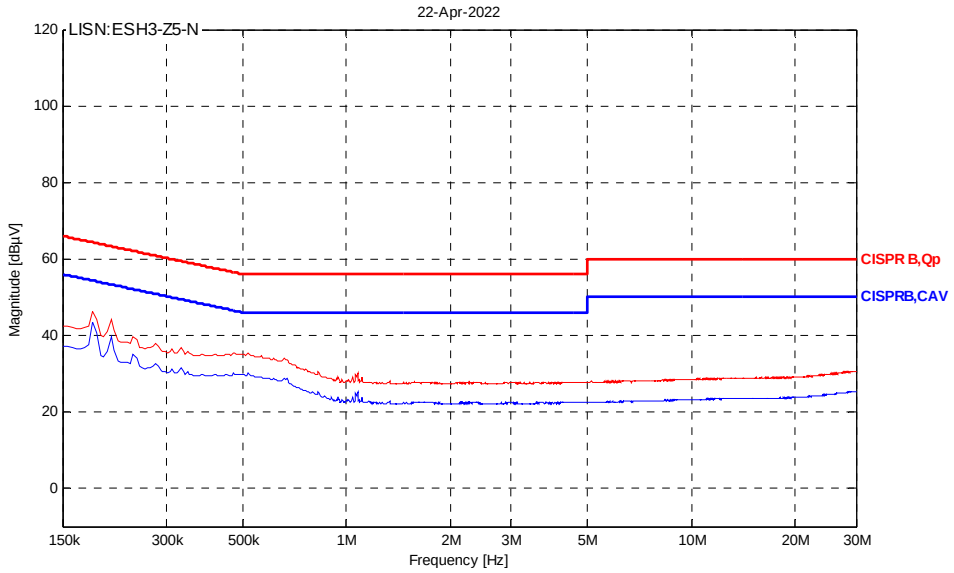
4.2.11 Data; Mains Line, Middle Channel; 2440MHz

Quasi-peak value (dBµV)				
Frequency	**Measured**	**Class B Limit**	**Margin**	**Status**
498.295 kHz	35.18	56.03	20.85	Pass
9.835 MHz	28.94	60.00	31.06	Pass
11.222 MHz	29.14	60.00	30.86	Pass
20.034 MHz	29.15	60.00	30.85	Pass
24.645 MHz	29.84	60.00	30.16	Pass
29.938 MHz	30.62	60.00	29.38	Pass

CISPR Average value (dBµV)				
Frequency	**Measured**	**Class B Limit**	**Margin**	**Status**
498.295 kHz	29.92	46.03	16.11	Pass
9.797 MHz	23.66	50.00	26.34	Pass
12.500 MHz	23.83	50.00	26.17	Pass
19.920 MHz	23.79	50.00	26.21	Pass
24.960 MHz	24.54	50.00	25.46	Pass
29.995 MHz	25.28	50.00	24.72	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).

4.2.12 Profile; Mains Neutral, Top Channel; 2480MHz



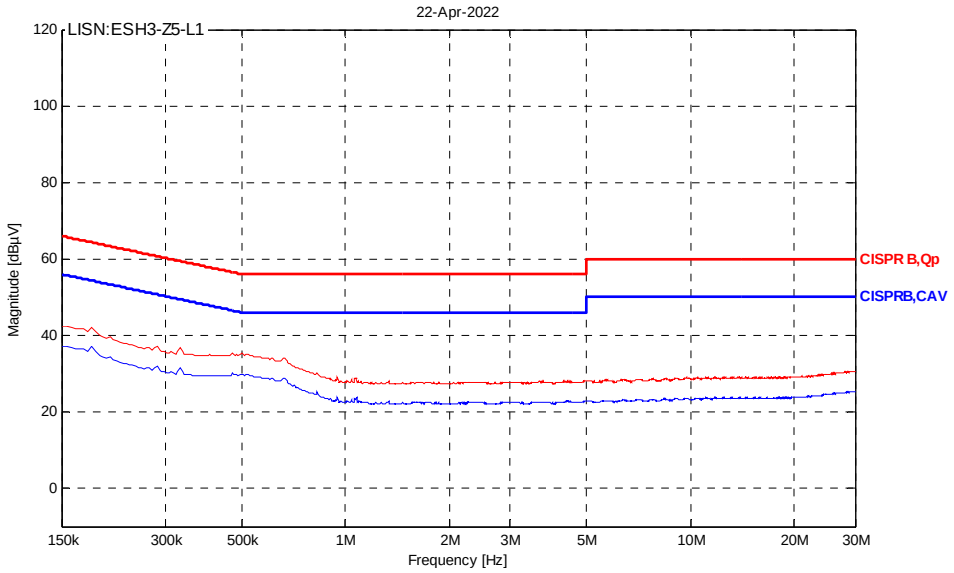
4.2.13 Data; Mains Neutral, Top Channel; 2480MHz

Quasi-peak value (dBµV)				
Frequency	**Measured**	**Class B Limit**	**Margin**	**Status**
183.582 kHz	46.15	64.32	18.17	Pass
9.878 MHz	28.56	60.00	31.44	Pass
13.368 MHz	28.91	60.00	31.09	Pass
19.863 MHz	29.16	60.00	30.84	Pass
24.893 MHz	29.86	60.00	30.14	Pass
29.695 MHz	30.58	60.00	29.42	Pass

CISPR Average value (dBµV)				
Frequency	**Measured**	**Class B Limit**	**Margin**	**Status**
183.582 kHz	43.49	54.32	10.83	Pass
9.878 MHz	23.20	50.00	26.80	Pass
15.023 MHz	23.65	50.00	26.35	Pass
19.948 MHz	23.78	50.00	26.22	Pass
25.003 MHz	24.57	50.00	25.43	Pass
29.991 MHz	25.25	50.00	24.75	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).

4.2.14 Profile; Mains Line, Top Channel; 2480MHz



4.2.15 Data; Mains Line, Top Channel; 2480MHz

Quasi-peak value (dBµV)				
Frequency	**Measured**	**Class B Limit**	**Margin**	**Status**
498.295 kHz	35.21	56.03	20.82	Pass
9.825 MHz	28.94	60.00	31.06	Pass
13.926 MHz	29.05	60.00	30.95	Pass
20.030 MHz	29.15	60.00	30.85	Pass
24.621 MHz	29.83	60.00	30.17	Pass
29.948 MHz	30.64	60.00	29.36	Pass

CISPR Average value (dBµV)				
Frequency	**Measured**	**Class B Limit**	**Margin**	**Status**
498.295 kHz	29.87	46.03	16.16	Pass
9.778 MHz	23.57	50.00	26.43	Pass
12.500 MHz	23.76	50.00	26.24	Pass
19.777 MHz	23.78	50.00	26.22	Pass
24.917 MHz	24.52	50.00	25.48	Pass
29.752 MHz	25.28	50.00	24.72	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 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)

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.

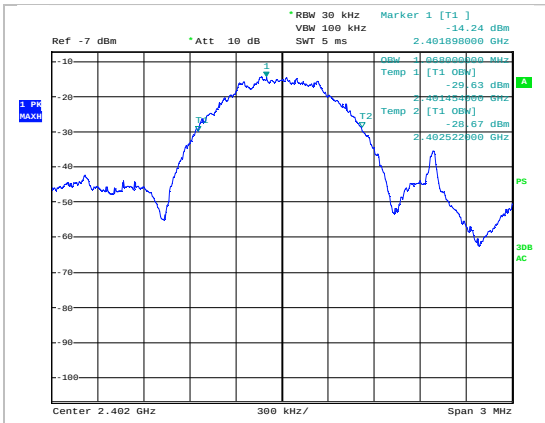
Published 17/01/2022

6.0 Annex – Occupied Bandwidth

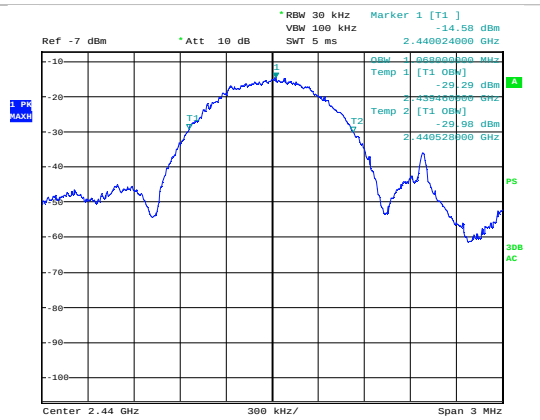
99% occupied bandwidth measured using the inbuilt function in the spectrum analyser.

Channel	Occupied Bandwidth (kHz)	Requirement	Result
2402	1068	None	For
2440	1068	None	For
2480	1062	None	For

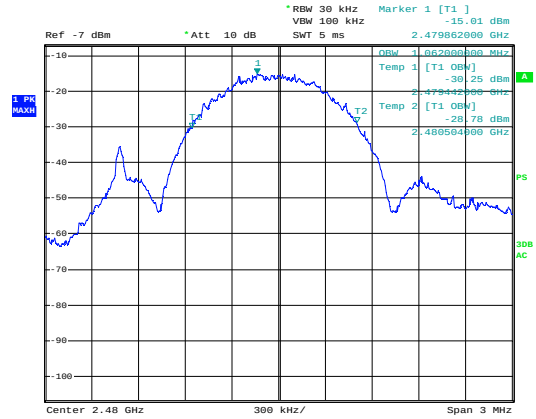
6.1.1 Profile; Occupied Bandwidth



Bottom Channel; 2402MHz



Middle Channel; 2440MHz



Top Channel; 2480MHz

Occupied Bandwidth

6.1.2 Test equipment

Description	Manufacturer	Name	Serial Number	Calibration certificate Or Calibration due
Spectrum Analyser	Rohde & Schwarz	ESCI 7	HEMC #289	14/09/2022

End of Document