



TEST REPORT

Test Report No.: UL-EMC-RP14277658JD01A V2.3

Manufacturer : Nemauro Pharma Limited
Type of Equipment : Broadband Data Transmission system / Medical Electrical Equipment
Model No. : sugarBEAT
FCC ID : 2A8VFAA
Test Standard : 47CFR15.107 and 47CFR15.109
Test Result : Complied

Version 2.3 supersedes all previous versions

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2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above standards.
4. The test results in this report are traceable to the national or international standards.

Date of issue:

15 December 2022

Checked by:

Adam Brown
Laboratory Test Engineer

Company Signatory:

Matthew Owen
Operations Leader



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UKAS is one of the signatories to the International Laboratory Accreditation Co-operation (ILAC) Arrangement for the mutual recognition of test reports.
The tests reported herein have been performed in accordance with its terms of accreditation.

UL International (UK) Ltd

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1. CUSTOMER DETAILS

Company Name:	Nemauro Pharma Limited
Address:	Advanced Technology Innovation Centre 5 Oakwood Drive Loughborough Leicestershire LE11 3QF United Kingdom

2. SUMMARY OF TESTING

2.1. Test Specification

Reference:	47CFR15.107 and 47CFR15.109
Title:	Code of Federal Regulations - Title 47 (Telecommunication): Part 15 (Radio Frequency Devices) - Subpart B (Unintentional Radiators) – Sections 15.107 and 15.109 October 1, 2020 Edition (including all applicable amendments up to August 24, 2022)
Site Registration:	621311/UK2011

2.2. Summary of Test Results

FCC Reference	Measurement Type	Port	Result
15.107	Conducted Emissions	AC Mains Input / Output Ports	Complied
15.109	Radiated Emissions	Enclosure	Complied

2.3. Location of Testing

All the measurements described in this report were performed at the premises of UL International (UK) Ltd, Unit 1 Horizon, Wade Road, Kingsland Business Park, Basingstoke, Hampshire RG24 8AH.

2.4. Deviations from the Test Specification

For the measurements contained within this test report, there were no deviations from, additions to, or exclusions from the test specification identified above, nor from the requirements defined in the basic standards called up within it.

3. EQUIPMENT UNDER TEST (EUT)**3.1. Description of EUT**

The EUT was a Bluetooth Low Energy enabled, non-invasive, continuous blood glucose monitor.

3.2. Identification of Equipment under Test (EUT)

ID#	Description	Brand Name	Model No	Serial No
E1	Continuous Glucose Monitor	sugarBEAT	sugarBEAT	120722-02
E2	AC to DC Power Adapter	POWER SOLVE	KSA29B0500210D5	None Stated
E3	Docking Station	sugarBEAT	sugarBEAT	None Stated

3.3. Port Identification

Port	Description	Possible Length (m)	Type	Connector
Glucose Monitor				
P1.1	Enclosure	Not Applicable	Enclosure	Not Applicable
P1.2	Charging Pads	Direct Connection	DC Power Input	Contact Pads
AC to DC Power Adapter				
P2.1	Enclosure	Not Applicable	Enclosure	Not Applicable
P2.2	AC Power Input	Direct Connection	AC Power Input	IEC Type A
P2.3	USB	< 3	DC Power Output	USB Type-A
Docking Station				
P3.1	Enclosure	Not Applicable	Enclosure	Not Applicable
P3.2	USB	< 3	DC Power Input	Micro USB
P3.3	Glucose Monitor Charging Pins	Direct Connection	DC Power Output	Contact Pins

3.4. Operating Modes

Mode Reference	Definition
Charging	The Glucose Monitor was placed in its Docking Station and charging from an AC to DC power adapter.

3.5. Configuration and Peripherals

Description:	Please refer to the Test Configuration and Photograph section for schematic drawing(s) and/or photograph(s) of the test configuration(s) employed in the course of testing.
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3.6. Modifications

No modifications were made to the EUT during the course of testing.

3.7. Additional Information Related to Testing

Equipment Category:	Broadband Data Transmission system / Medical Electrical Equipment
Intended Operating Environment:	Residential
Intended Installation:	Docking Station & AC to DC Power Adapter: Tabletop Glucose Monitor: Body-worn
Cycle Time:	5 Seconds
Power Supply Requirement(s):	5 VDC supplied from an AC to DC Power Adapter powered at 120 VAC, 60 Hz
Weight:	Glucose Monitor: 7 g AC to DC Power Adapter: 50 g Docking Station: 54 g
Dimensions:	Glucose Monitor: 42 mm x 29mm x 9mm AC to DC Power Adapter: 38mm x 36mm x 37mm Docking Station: 85mm x 75mm x 28mm
Hardware Version Number:	04
Software Version Number:	T.0.17.0.5 (92) DM mmol/l
Firmware Version Number:	SB_6_0_Test_F_4.bin (4.6.0)
FCC ID Number:	2A8VFAA
Highest Internally Generated Operating Frequency:	2483.5 MHz

4. SUPPORT EQUIPMENT

4.1. Identification of Support Equipment

Description	Manufacturer	Model No	Serial No
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No support equipment was used during the course of testing.

4.2. Interconnecting Cables

Cable Type	Shielded	Length (m)	Ferrite	Connection 1	Connection 2
USB	Yes	1.25	No	AC to DC Power Adapter	Docking Station

5. MEASUREMENT UNCERTAINTY AND DECISION RULE

5.1. Overview

5.1.1. No measurement can ever be perfect and those imperfections give rise to error. Consequently, the result of a measurement is only an approximation to the value of the measurand (the specific quantity subject to measurement) and is only complete when accompanied by a statement regarding the uncertainty of approximation.

5.1.2. Note that compliance is determined solely upon the results of compliance measurements and does not take into account measurement uncertainties. The measurement uncertainty values quoted in this report are for information only as they do not influence the associated test results.

5.2. Method of Calculation

The methods used to calculate the uncertainties included within this test report are in line with those recommended within the various measurement specifications. Where measurement specifications do not include guidelines for the evaluation of measurement uncertainty, the published guidance of the United Kingdom Accreditation Service (UKAS) is followed.

5.3. Equipment Accuracy and Decision Rule

Measurement system instrumentation with an accuracy specification meeting the accuracy specification limits or that has an uncertainty within prescribed limits detailed in the specification or standard shall be used. When providing a statement of conformity to a technical specification or standard, unless inherent in the requested technical specification or standard, the decision rule applied shall be the Accuracy Method (as defined in IEC Guide 115) in determining compliance. The measurement result is considered in conformance with the requirement criteria if it is within the prescribed limit.

6. MEASUREMENTS, EXAMINATIONS AND DERIVED RESULTS

6.1. General Comments

6.1.1. This section contains the test result sheets for the measurements listed in Section **2.2. Summary of Test Results (above)**.

6.1.2. The measurement uncertainties stated in the test result sheets were calculated in accordance with documented best practice and represent a confidence level of 95%. Where only confidence level is given, it has been demonstrated that the relevant items of test equipment used meet the specified requirements in the standard with at least this level of confidence.

6.1.3. Please refer to Section **5. Measurement Uncertainty and Decision Rule** on page **9** for details of our treatment of measurement uncertainty.

RADIATED EMISSIONS - TEST RESULTS

This test is covered by the scope of UL International (UK) Ltd's UKAS Accreditation under ISO/IEC 17025:2017.

GENERAL INFORMATION

JOB NUMBER:	14277658JD01	TEST SITE ID:	Site 51
EUT:	sugarBEAT	TEMPERATURE:	21 °C to 22 °C
TEST ENGINEER:	Pawel Zackiewicz and Chris Bate	RELATIVE HUMIDITY:	54 % to 55 %
DATE OF TEST:	30 Aug 2022	ATMOSPHERIC PRESSURE:	1023mb to 1023 mb
FIELD TYPE:	Electric Field	MEASUREMENT DISTANCE:	3 Metres
UNCERTAINTY:	< 1 GHz: ± 3.91 dB > 1 GHz: ± 3.45 dB	EQUIPMENT CLASS:	Class B
MEASUREMENT UNITS:	dBµV/m	TEST ENVIRONMENT:	Test Site

TEST SPECIFICATION DETAILS

The EUT has been configured and tested in accordance with the methods and procedures detailed within the following basic standard:

REFERENCE:	ANSI C63.4:2014
TITLE:	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

COMMENTS

○ Measurements were performed in a semi-anechoic chamber, at distances of 3 metres. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable.

Below 1 GHz, maximum emission levels were determined by height searching the measurement antenna over the range 1 metre to 4 metres.

Above 1 GHz, the orientation of the EUT emanating the highest emission levels was determined using exploratory measurements with an antenna and spectrum analyser prior to the formal measurements. For the final test, emissions the EUT was rotated whilst positioned in the previously determined worst case orientation only.

○ The recorded disturbance level (field strength) was calculated from the level indicated by the measuring receiver, adjusted by a correction factor (CF in dB), calculated using the formula:

$$CF (dB) = CAtt (dB) + AF (dB/m) - PGain (dB)$$

Where:

CAtt (dB): Conducted Path Attenuation (Cables + Attenuators)

AF (dB/m): Antenna Factor

PGain (dB): External Preamplifier Gain

DEVIATIONS FROM TEST SPECIFICATION

There were no deviations from the test configuration and measurement arrangements defined in the test specification (identified above).

EUT RELATED

OPERATING MODE:	Charging
FUNCTION(S) MONITORED:	Not Applicable

MEASUREMENT RESULTS

No.	Frequency (MHz)	Polarisation	Detector	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Graph No.	Result
1	47.449	Vertical	Quasi-Peak	16.4	40.0	23.6	GPH\14277658JD01\001	Complied
2	59.699	Vertical	Quasi-Peak	11.1	40.0	28.9	GPH\14277658JD01\001	Complied
3	77.869	Vertical	Quasi-Peak	21.8	40.0	18.2	GPH\14277658JD01\001	Complied
4	144.735	Vertical	Quasi-Peak	25.8	43.5	17.7	GPH\14277658JD01\001	Complied
5	197.331	Vertical	Quasi-Peak	26.0	43.5	17.5	GPH\14277658JD01\001	Complied
6	233.514	Vertical	Quasi-Peak	24.5	46.0	21.5	GPH\14277658JD01\001	Complied
7	381.353	Horizontal	Quasi-Peak	17.3	46.0	28.8	GPH\14277658JD01\001	Complied
8	838.731	Vertical	Quasi-Peak	24.8	46.0	21.2	GPH\14277658JD01\001	Complied
9	1000 to 12750	Refer to Note 1					GPH\14277658JD01\002 to 005	Complied

NOTES

1	No emissions were noted above the noise floor of the measurement system; therefore, no further measurements were made.
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TEST EQUIPMENT USED

UL ID	INSTRUMENT DESCRIPTION	MODEL NUMBER	CALIBRATION DUE	INTERVAL
A3196	Radiated Emissions Software	EMC32 V10.50.10	Calibration not required	N/A
K0031	3m Semi-Anechoic Chamber 1	N/A	14 Feb 2023	12
M2049	44 GHz EMI Test Receiver	ESW44	01 Jun 2023	12
A2959	Trilog Broadband Antenna	VULB 9163	03 Feb 2023	12
A3047	6 dB attenuator - 5W	N/A	Calibrated as part of system	N/A
C1872	8 metre N-male to N-male RF cable	Sucoflex 104A	13 May 2023	12
C1823	15 metre N-male to N-male RF cable	Sucoflex 104A	15 Aug 2023	12
C1830	2 metre N-male to N-male RF cable	Sucoflex 104A	15 Aug 2023	12
A3157	3 dB Attenuator	1812 BW-N3 W5	15 Aug 2023	12
A3149	10 MHz to 1.3 GHz Low Noise Pre-Amplifier	LNA - 1330	15 Aug 2023	12
C1768	1 metre N-male to N-male RF cable	SA90-195-1MTR	16 May 2023	12
A3076	3 dB Attenuator	1812 BW-N3 W5+	15 Aug 2023	12
A2949	500 MHz to 18 GHz Pre-amplifier	PAM-118A	21 Sep 2022	12
C1801	2 metre N-male to N-male RF cable	SA90-195-2MTR	16 May 2023	12
C1671	5 metre N-male to N-male RF cable	SA90-195-5MTR	16 May 2023	12
A208241	1 -10 GHz Horn Antenna	BBHA 9120 B	04 Aug 2023	12
A208371	7.5 - 18 GHz Horn Antenna	HWRD 750	07 Jun 2023	12
C220215	1 metre N-male to SMA-male RF cable	MFR57500	15 Aug 2023	12

CONDUCTED EMISSIONS - TEST RESULTS

This test is covered by the scope of UL International (UK) Ltd's UKAS Accreditation under ISO/IEC 17025:2017.

GENERAL INFORMATION

JOB NUMBER:	14277658JD01	TEST SITE ID:	Site 56
EUT:	sugarBEAT	TEMPERATURE:	24 °C To 24 °C
TEST ENGINEER:	Chris Bate	RELATIVE HUMIDITY:	54 % To 55 %
DATE OF TEST:	02 Sep 2022	ATMOSPHERIC PRESSURE:	1013 mb To 1013 mb
UNCERTAINTY:	± 1.96 dB	EQUIPMENT CLASS:	Class B
EUT CATEGORY:	Not Applicable	MEASUREMENT METHOD:	LISN (AC)
PORT UNDER TEST:	AC Power Input	EUT SUPPLY VOLTAGE:	120 VAC / 60 Hz

TEST SPECIFICATION DETAILS

The EUT has been configured and tested in accordance with the methods and procedures detailed within the following basic standard:

REFERENCE:	ANSI C63.4:2014
TITLE:	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

COMMENTS

The recorded disturbance level (voltage) was calculated from the level indicated by the measuring receiver, adjusted by a correction factor (CF in dB), calculated using the formula:

$$CF (dB) = CAtt (dB) + PLAtt (dB) + VDF (dB)$$

Where:

CAtt (dB): Conducted Path Attenuation (Cables + Attenuators)

PLAtt (dB): Pulse Limiter Attenuation

VDF (dB): Voltage Division Factor of LISN

DEVIATIONS FROM TEST SPECIFICATION

There were no deviations from the test configuration and measurement arrangements defined in the test specification (identified above).

EUT RELATED

OPERATING MODE:	Charging
FUNCTION(S) MONITORED:	Not Applicable

MEASUREMENT RESULTS

No.	Frequency (MHz)	Line	Detector	Level (dBμV)	Limit (dBμV)	Margin (dB)	Graph No.	Result
1	0.150	Live	CISPR Average	18.9	56.0	37.1	GPH\14277658JD01\006	Complied
2	0.150	Live	Quasi-Peak	24.3	66.0	41.7	GPH\14277658JD01\006	Complied
3	0.528	Live	CISPR Average	25.2	46.0	20.8	GPH\14277658JD01\006	Complied
4	0.569	Live	Quasi-Peak	27.4	56.0	28.6	GPH\14277658JD01\006	Complied
5	0.850	Live	Quasi-Peak	23.6	56.0	32.4	GPH\14277658JD01\006	Complied
6	0.852	Live	CISPR Average	21.6	46.0	24.4	GPH\14277658JD01\006	Complied
7	1.678	Live	Quasi-Peak	21.4	56.0	34.6	GPH\14277658JD01\006	Complied
8	1.680	Live	CISPR Average	19.4	46.0	26.6	GPH\14277658JD01\006	Complied
9	4.157	Live	Quasi-Peak	20.6	56.0	35.5	GPH\14277658JD01\006	Complied
10	4.157	Live	CISPR Average	18.6	46.0	27.4	GPH\14277658JD01\006	Complied
11	15.914	Live	CISPR Average	16.0	50.0	34.0	GPH\14277658JD01\006	Complied
12	15.920	Live	Quasi-Peak	17.9	60.0	42.2	GPH\14277658JD01\006	Complied
13	28.642	Live	CISPR Average	17.1	50.0	32.9	GPH\14277658JD01\006	Complied
14	28.642	Live	Quasi-Peak	19.0	60.0	41.0	GPH\14277658JD01\006	Complied

MEASUREMENT RESULTS

No.	Frequency (MHz)	Line	Detector	Level (dBµV)	Limit (dBµV)	Margin (dB)	Graph No.	Result
15	0.155	Neutral	Quasi-Peak	24.8	65.8	41.0	GPH\14277658JD01\007	Complied
16	0.200	Neutral	CISPR Average	18.9	53.6	34.7	GPH\14277658JD01\007	Complied
17	0.431	Neutral	CISPR Average	18.9	47.2	28.3	GPH\14277658JD01\007	Complied
18	0.431	Neutral	Quasi-Peak	21.1	57.2	36.1	GPH\14277658JD01\007	Complied
19	0.566	Neutral	Quasi-Peak	20.6	56.0	35.4	GPH\14277658JD01\007	Complied
20	0.569	Neutral	CISPR Average	15.8	46.0	30.2	GPH\14277658JD01\007	Complied
21	0.985	Neutral	CISPR Average	14.2	46.0	31.8	GPH\14277658JD01\007	Complied
22	0.987	Neutral	Quasi-Peak	16.1	56.0	39.9	GPH\14277658JD01\007	Complied
23	7.566	Neutral	Quasi-Peak	18.1	60.0	42.0	GPH\14277658JD01\007	Complied
24	7.616	Neutral	CISPR Average	16.2	50.0	33.8	GPH\14277658JD01\007	Complied
25	13.560	Neutral	CISPR Average	16.5	50.0	33.5	GPH\14277658JD01\007	Complied
26	13.562	Neutral	Quasi-Peak	18.8	60.0	41.2	GPH\14277658JD01\007	Complied
27	28.642	Neutral	CISPR Average	16.5	50.0	33.5	GPH\14277658JD01\007	Complied
28	28.642	Neutral	Quasi-Peak	18.1	60.0	41.9	GPH\14277658JD01\007	Complied

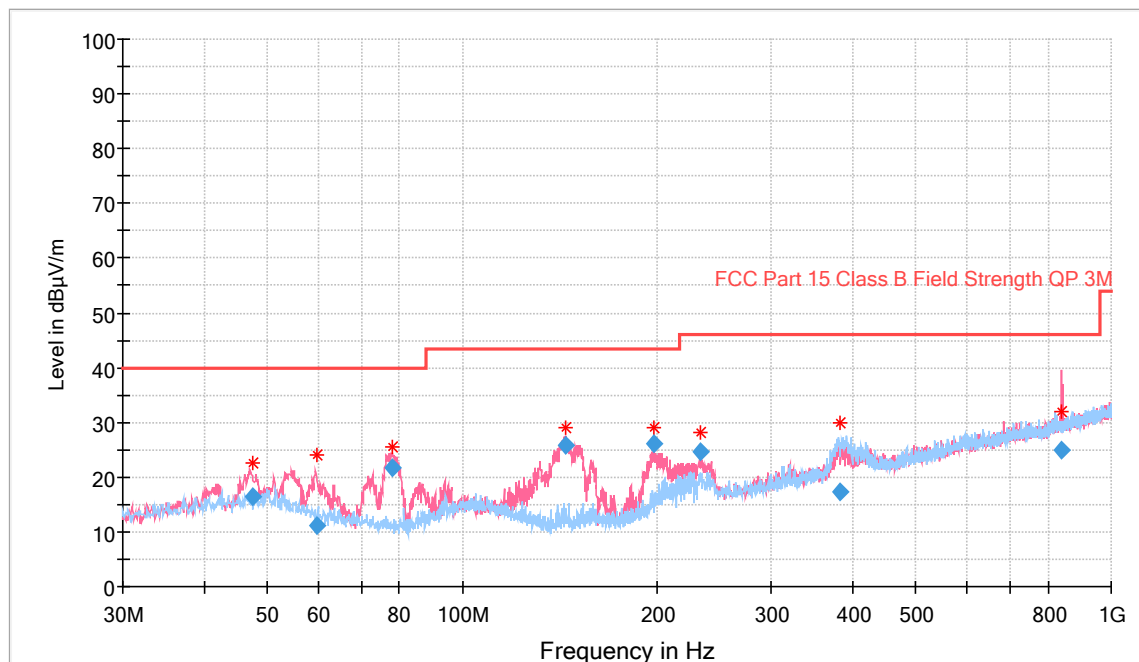
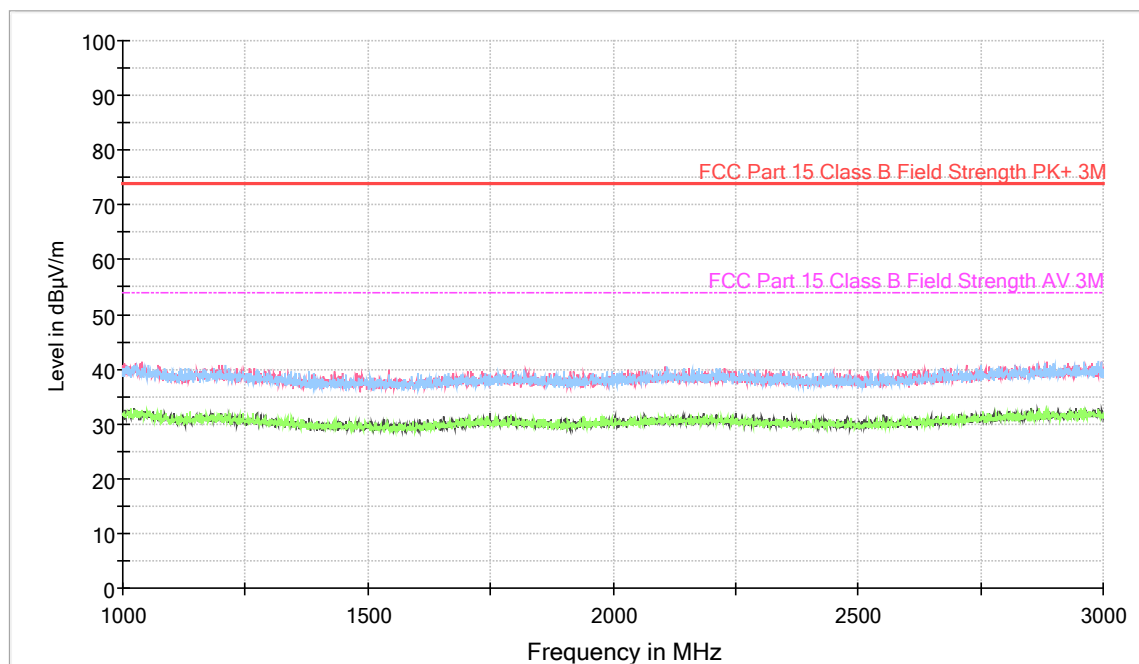
TEST EQUIPMENT USED

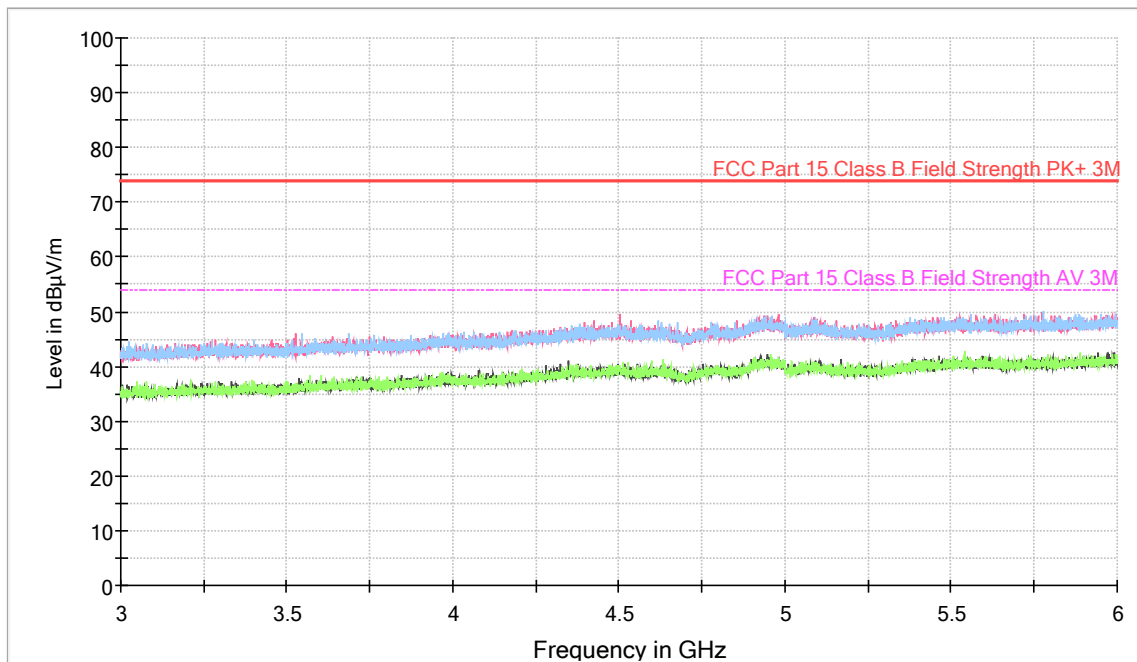
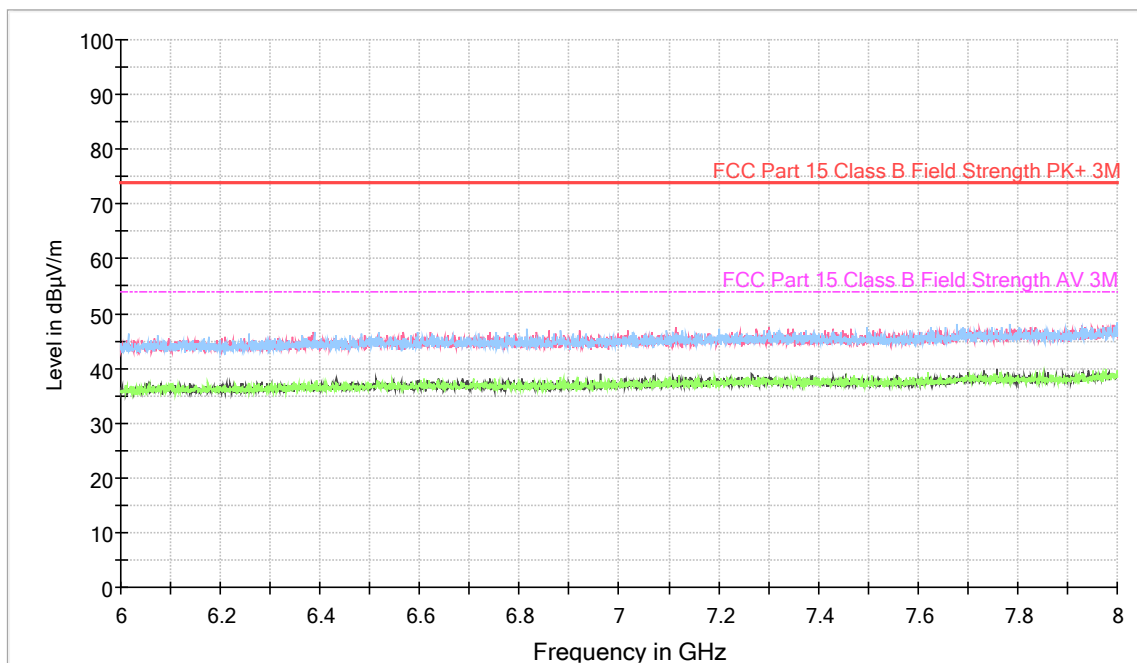
UL ID	INSTRUMENT DESCRIPTION	MODEL NUMBER	CALIBRATION DUE	INTERVAL
A3197	Conducted Emissions Software	EMC32 V10.40.10	Calibration not required	N/A
K0036	Conducted Emissions / Immunity Test Laboratory 2	N/A	Calibration not required	N/A
M2046	Thermo-Hygrometer	608-H1	09 Dec 2022	12
M2051	3.6 GHz EMI Test Receiver	ESR3	21 Oct 2022	12
N0613	Site 56 Test PC	Motherboard Asus Z97-P	Calibration not required	N/A
A1828	N-Type Pulse Limiter	ESH3-Z2	04 Nov 2022	12
C1619	Type N - Coaxial Cable	Sucoflex 104A	04 Nov 2022	12
A2883	Single Phase LISN	ENV216	05 Jan 2023	12
A3261	Matched LISN Power Cable Assembly	None Stated	28 Mar 2023	12

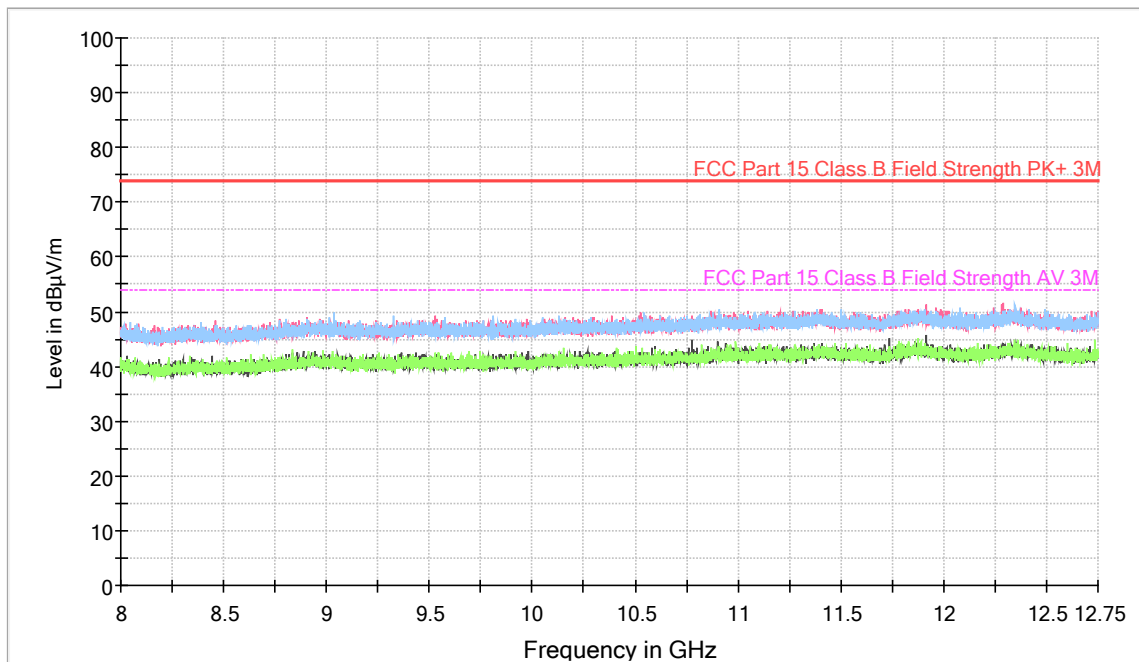
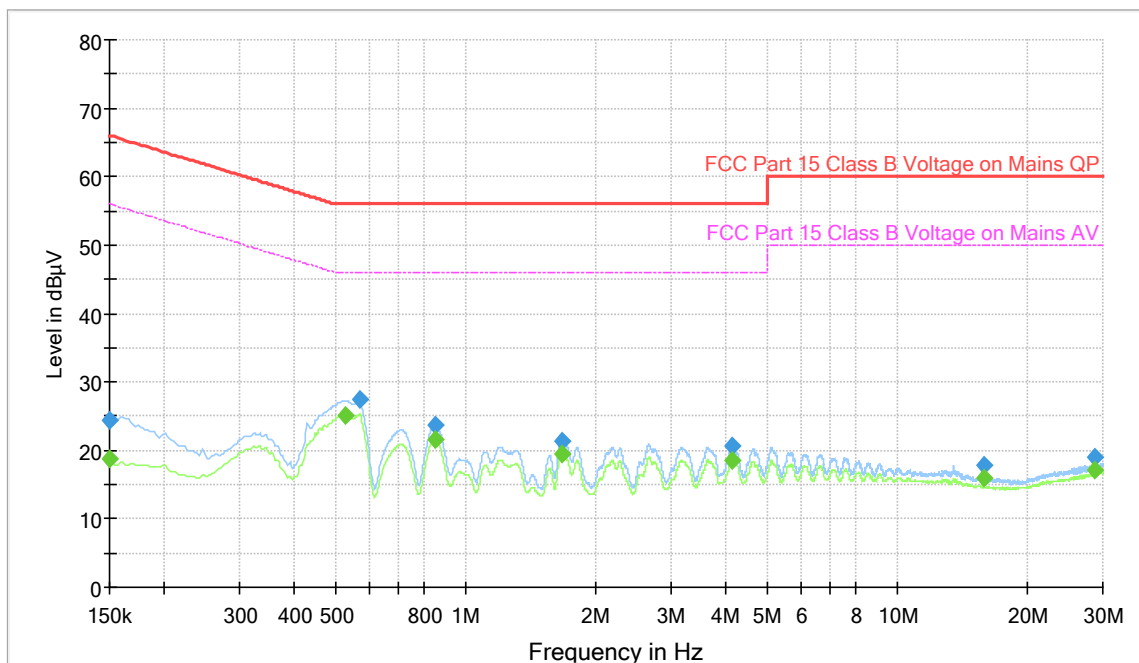
7. GRAPHICAL TEST RESULTS

7.1. This section contains the graphical results for the measurements listed in Section **2.2. Summary of Test Results** (above).

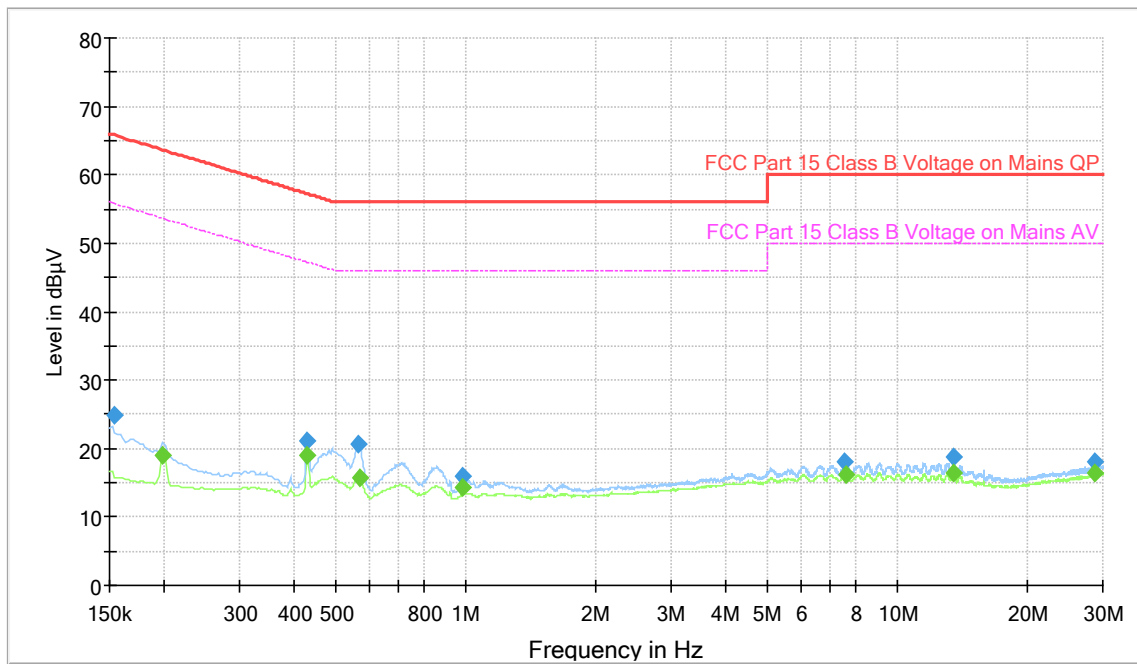
Graph Reference Number	Title
GPH\14277658JD01\001	Radiated Emissions (30 MHz to 1 GHz)
GPH\14277658JD01\002	Radiated Emissions (1 GHz to 3 GHz)
GPH\14277658JD01\003	Radiated Emissions (3 GHz to 6 GHz)
GPH\14277658JD01\004	Radiated Emissions (6 GHz to 8 GHz)
GPH\14277658JD01\005	Radiated Emissions (8 GHz to 12.75 GHz)
GPH\14277658JD01\006	Conducted Emissions (150 kHz to 30 MHz) – Live
GPH\14277658JD01\007	Conducted Emissions (150 kHz to 30 MHz) – Neutral

GPH\14277658JD01\001 - Radiated Emissions (30 MHz to 1 GHz)**GPH\14277658JD01\002 - Radiated Emissions (1 GHz to 3 GHz)**

GPH\14277658JD01\003 - Radiated Emissions (3 GHz to 6 GHz)**GPH\14277658JD01\004 - Radiated Emissions (6 GHz to 8 GHz)**

GPH\14277658JD01\005 - Radiated Emissions (8 GHz to 12.75 GHz)**GPH\14277658JD01\006 - Conducted Emissions (150 kHz to 30 MHz) – Live**

GPH\14277658JD01\007 - Conducted Emissions (150 kHz to 30 MHz) – Neutral



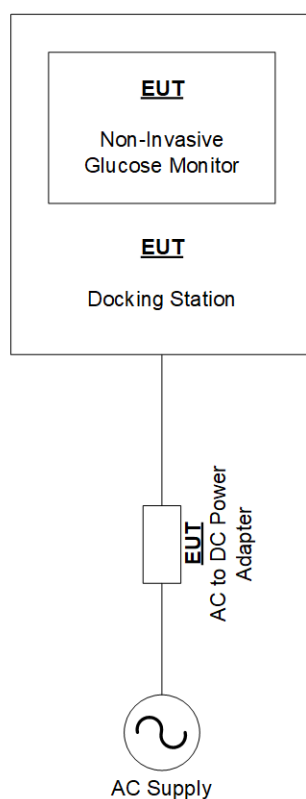
8. TEST CONFIGURATION DRAWING

8.1. This section contains the Test Configuration Drawings for the measurements listed in Section 7: Measurements, Examinations and Derived Results.

Test Configuration Reference Number	Title
DRG\14277658JD01\001	Schematic Diagram of the EUT, Support Equipment and Interconnecting Cables Used During Testing

DRG\14277658JD01\001 - Schematic Diagram of the EUT, Support Equipment and Interconnecting Cables Used During Testing

Configuration of EUT and Local Support Equipment



9. REPORT REVISION HISTORY

9.1. This section contains the report revision history.

Version Number	Revision Details		
	Page No(s)	Clause	Details
1.0	-	-	Initial Version.
2.0	1, 7	Cover, 3.7	Updated FCC ID to 2A8VFAA
2.1	1, 5, 7	Front Cover, 2.1, 2.2, 3.7	Removed references to ICES-003
2.2	1	Front Cover	Removed HVIN and PMN
2.3	-	9	Removed Clause 9. Photographs of EUT