

# Test Report

|                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                      |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|--|
| <b>Product</b>                                                                                                                                                                                                                                                                                                    | Nest Rack                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                      |  |
| <b>Name and address of the applicant</b>                                                                                                                                                                                                                                                                          | Stryde limited<br>Chertsey Road, Sunbury upon Thames,<br>Middlesex TW16 7BP - UK                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                      |  |
| <b>Name and address of the manufacturer</b>                                                                                                                                                                                                                                                                       | Stryde limited<br>Chertsey Road, Sunbury upon Thames,<br>Middlesex TW16 7BP - UK                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                      |  |
| <b>Model</b>                                                                                                                                                                                                                                                                                                      | Nest Rack                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                      |  |
| <b>Rating</b>                                                                                                                                                                                                                                                                                                     | 230V 30A 50/60 Hz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                      |  |
| <b>Trademark</b>                                                                                                                                                                                                                                                                                                  | Stryde                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                      |  |
| <b>Serial number</b>                                                                                                                                                                                                                                                                                              | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                      |  |
| <b>Additional information</b>                                                                                                                                                                                                                                                                                     | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                      |  |
| <b>Tested according to</b>                                                                                                                                                                                                                                                                                        | <b>FCC Part 15B</b><br>Other Class B Digital Device<br><b>ISED Canada ICES-001, Issue 6</b><br>ISM Devices, Wireless Power Transfer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                      |  |
| <b>Order number</b>                                                                                                                                                                                                                                                                                               | 399723                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                      |  |
| <b>Tested in period</b>                                                                                                                                                                                                                                                                                           | 2019-02-01 – 2019-04-30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                      |  |
| <b>Issue date</b>                                                                                                                                                                                                                                                                                                 | 2021.02.08                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                      |  |
| <b>Name and address of the testing laboratory</b>                                                                                                                                                                                                                                                                 | <div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="text-align: center;"> <br/> Instituttveien 6<br/>Kjeller, Norway </div> <div style="text-align: center;"> CAB Number:<br/> FCC: NO0001<br/> ISED: NO0470<br/><br/> TEL: +47 22 96 03 30<br/> FAX: +47 22 96 05 50 </div> <div style="text-align: center;"> <br/> ILAC-MRA </div> <div style="text-align: center;"> <br/> NORWEGIAN<br/>ACCREDITATION<br/>TEST 033 </div> </div> |                                                                                                                      |  |
| An accredited technical test executed under the Norwegian accreditation scheme                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                      |  |
| <br>Prepared by [Jan G Eriksen]                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <br>Approved by [Frode Sveinsen] |  |
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## REPORT Revisions

| Revision # | Date       | Order # | Description                                                  |
|------------|------------|---------|--------------------------------------------------------------|
| 00         | 2019-06-12 | 361696  | First issued                                                 |
| 01         | 2020-04-20 | 361696  | Updating of Test Instruments Table                           |
| 02         | 2020-11-12 | 399723  | Changed applicant from Western Geco to Stryde                |
| 03         | 2020-11-30 | 400 174 | Updated measurements as power supply and PC has been changed |
| 04         | 2021-02-08 | 400 174 | Corrected FCC ID                                             |

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# 1 INFORMATION

## 1.1 Test Item

|                                  |                                                                                                       |
|----------------------------------|-------------------------------------------------------------------------------------------------------|
| Name                             | Nest Rack                                                                                             |
| FCC ID                           | 2AV78-NRACK                                                                                           |
| Model/version                    | Nest Rack V3                                                                                          |
| Serial number                    | -                                                                                                     |
| Hardware identity and/or version | -                                                                                                     |
| Software identity and/or version | -                                                                                                     |
| Frequency Range                  | Wireless Power Transfer: 110 – 205 kHz<br>RFID: 13.56 MHz                                             |
| Tunable Bands                    | None                                                                                                  |
| Number of Channels               | WPT: NA                                                                                               |
| Operating Modes                  | WPT: Charging/Non-charging                                                                            |
| Type of Modulation               | WPT – none<br>(load modulation is performed from Receiver part to transmit data to Transmitting part) |
| User Frequency Adjustment        | None                                                                                                  |
| Rated Output Power               | NA                                                                                                    |
| Type of Power Supply             | Input Voltage: 230V 50/60 Hz 30A                                                                      |
| Antenna Connector                | NA                                                                                                    |
| Desktop Charger                  | NA                                                                                                    |

### Description of Test Item

The EUT is an inductive charger for Seismic Loggers. The EUT is a 6½ feet high rack which consists of a power supply, an industrial computer, one switch, and 6 shelves where in each 90 loggers can be charged simultaneously, i.e. a total of 540 loggers can be charged simultaneously in the rack. The rack also has a monitor for local operation and status reading.

The power to each shelf can be switched on/off either locally with manual switches (fuses) or remotely from an operator PC. Communication with the rack from the PC is done over an optical link. It is believed that in almost all cases operation of the rack will be done remotely.

This is an industrial device that will **not** be deployed in household or resident areas. It will only be deployed in industrial areas, and in addition it will be installed inside a commercial container together with several (up to 6) other devices.

## **1.2 Test Environment**

### **1.2.1 Normal test condition**

|                      |                |
|----------------------|----------------|
| Temperature:         | 21.1 – 22.7 °C |
| Relative humidity:   | 35 - 45 %      |
| Normal test voltage: | 230 V 60Hz     |

The values are the limit registered during the test period.

## **1.3 Test Engineer(s)**

Tore Løvlien

## **1.4 Test Equipment**

See list of test equipment in clause 4.

## 2 TEST REPORT SUMMARY

### 2.1 General

All measurements are traceable to national standards.

The tests were conducted for the purpose of demonstrating compliance with FCC CFR 47 Part 15B.

Tests were performed in accordance with ANSI C63.4-2014.

Radiated tests were made in a semi-anechoic chamber at measuring distances of 3m and 10m.

A description of the test facility is on file with the FCC.

☒ New Submission

☒ Production Unit

☐ Class II Permissive Change

☐ Pre-production Unit

**JAB** Equipment Code

☐ Family Listing



#### THIS TEST REPORT APPLIES ONLY TO THE ITEM(S) AND CONFIGURATIONS TESTED.

Deviations from, additions to, or exclusions from the test specifications are described in "Summary of Test Data".

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## 2.2 Test Summary

| Name of test                   | FCC Part 15 reference | Result |
|--------------------------------|-----------------------|--------|
| Supply Voltage Variations      | 15.31(e)              | Pass   |
| Power Line Conducted Emission  | 15.107(a)             | Pass   |
| The field strength of emission | 15.109                | Pass   |

## 2.3 Description of modification for Modification Filing

Not applicable.

## 2.4 Comments

All ports were populated during spurious emission measurements.

Power supply variation within 85% to 115% of nominal value has no influence on measured values.

## 2.5 Family List Rational

Not Applicable.

### 3 TEST RESULTS

#### 3.1 Power Line Conducted Emissions

Para. No.: 15.107 (a)

Test Performed By: Jan G Eriksen

Date of Test: 2018.12.07

Measurement procedure: ANSI C63.4-2014 using 50  $\mu$ H/50 ohms LISN.

Test Results: Complies.

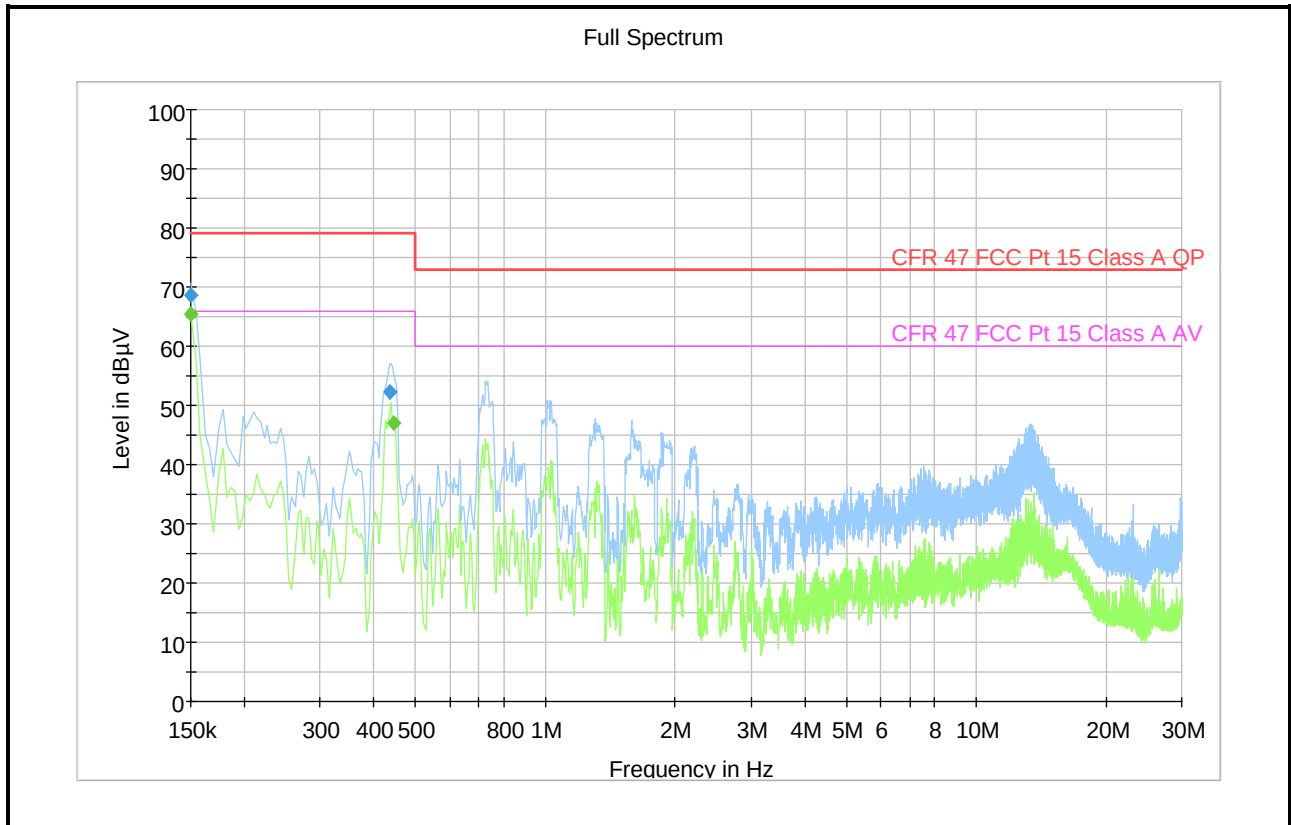
Test Equipment: 7, 8, 9, 10 (see Clause 4)

Measurement Data: See table below and attached graph (Peak detector).

Measurement Data:

| Frequency (MHz) | QuasiPeak (dB $\mu$ V) | Average (dB $\mu$ V) | Limit (dB $\mu$ V) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line | Filter |
|-----------------|------------------------|----------------------|--------------------|-------------|-----------------|-----------------|------|--------|
| 0.150           | 68.7                   | ---                  | 79.0               | 10.3        | 1000            | 9               | N    | OFF    |
| 0.150           | ---                    | 65.5                 | 66.0               | 0.5         | 1000            | 9               | N    | OFF    |
| 0.436           | 52.4                   | ---                  | 79.0               | 26.6        | 1000            | 9               | N    | OFF    |
| 0.444           | ---                    | 47.1                 | 66.0               | 18.9        | 1000            | 9               | N    | OFF    |

# Mains conducted spurious emissions



## 3.2 Field strength of emissions

FCC Part 15.109

Test Results: **Complies**

Test Equipment: **1, 6, 9, 10 (see Clause 4)**

Measurement Data:

### Charging mode - Radiated emission 30 – 1000 MHz

Detector: Quasi-Peak

Measuring distance 10 meters.

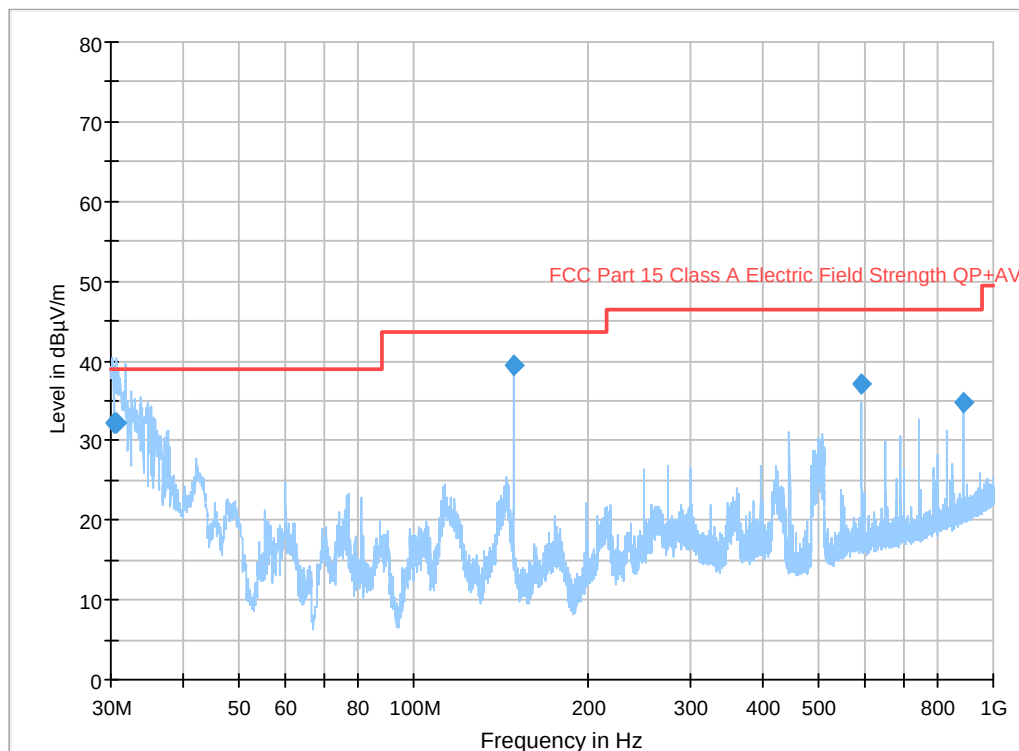
Measured according to FCC setup, method, and Class A limits.

Measurement Data:

| Frequency  | Operational condition | Field strength | Measuring distance | Limit CISPR Cl. A | Margin |
|------------|-----------------------|----------------|--------------------|-------------------|--------|
| MHz        |                       | dB $\mu$ V/m   | metres             | dB $\mu$ V/m      | dB     |
| 30.361970  | Charging              | 32.2           | 10                 | 39.0              | 6.8    |
| 30.637894  | Charging              | 32.2           | 10                 | 39.0              | 6.8    |
| 148.499778 | Charging              | 39.4           | 10                 | 43.5              | 4.1    |
| 593.999911 | Charging              | 37.0           | 10                 | 46.4              | 9.6    |
| 891.000167 | Charging              | 34.8           | 10                 | 46.4              | 11.6   |

See attached graphs.

Full Spectrum



Charging mode: 30-1000 MHz

# Charging mode - Radiated emission 1000 – 12000 MHz.

Detector: Peak/Average

Measuring distance 3 meters.

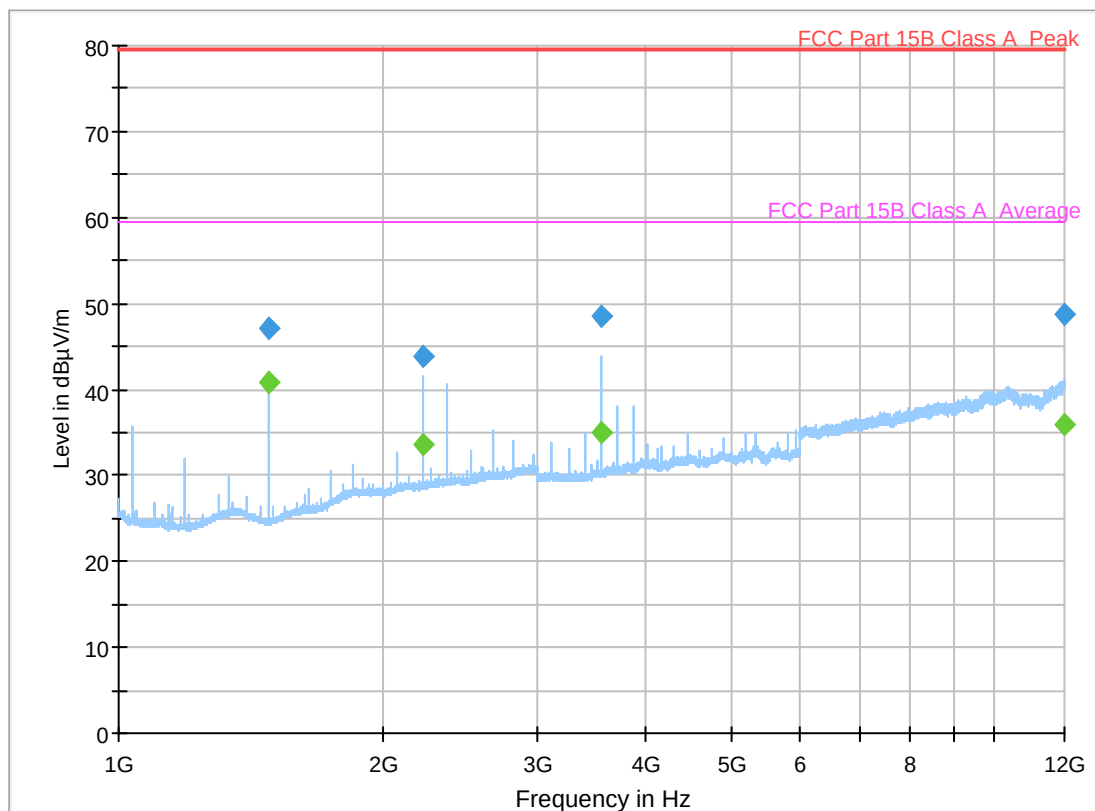
Measured according to CISPR setup, method, and Class B limits.

## Measurement Data Horizontal Polarisation:

| Frequency    | Operational condition | Field strength Peak | Field strength Average | Limit Peak FCC cl. A | Limit Avg. FCC cl. A | Margin Peak | Margin Average |
|--------------|-----------------------|---------------------|------------------------|----------------------|----------------------|-------------|----------------|
| MHz          |                       | dBμV/m              | dBμV/m                 | dBμV/m               | dBμV/m               | dB          | dB             |
| 1485.003000  | Charging              | 47.20               | ---                    | 79.5                 | ---                  | 32.3        | ---            |
| 1485.003000  | Charging              | ---                 | 40.89                  | ---                  | 59.5                 | ---         | 18.6           |
| 2227.497000  | Charging              | ---                 | 33.68                  | ---                  | 59.5                 | ---         | 25.8           |
| 2227.497000  | Charging              | 43.86               | ---                    | 79.5                 | ---                  | 35.6        | ---            |
| 3564.001500  | Charging              | 48.60               | ---                    | 79.5                 | ---                  | 30.9        | ---            |
| 3564.001500  | Charging              | ---                 | 34.91                  | ---                  | 59.5                 | ---         | 24.6           |
| 11993.632273 | Charging              | ---                 | 35.84                  | ---                  | 59.5                 | ---         | 23.7           |
| 11993.632273 | Charging              | 48.78               | ---                    | 79.5                 | ---                  | 30.7        | ---            |

See attached graphs.

Full Spectrum



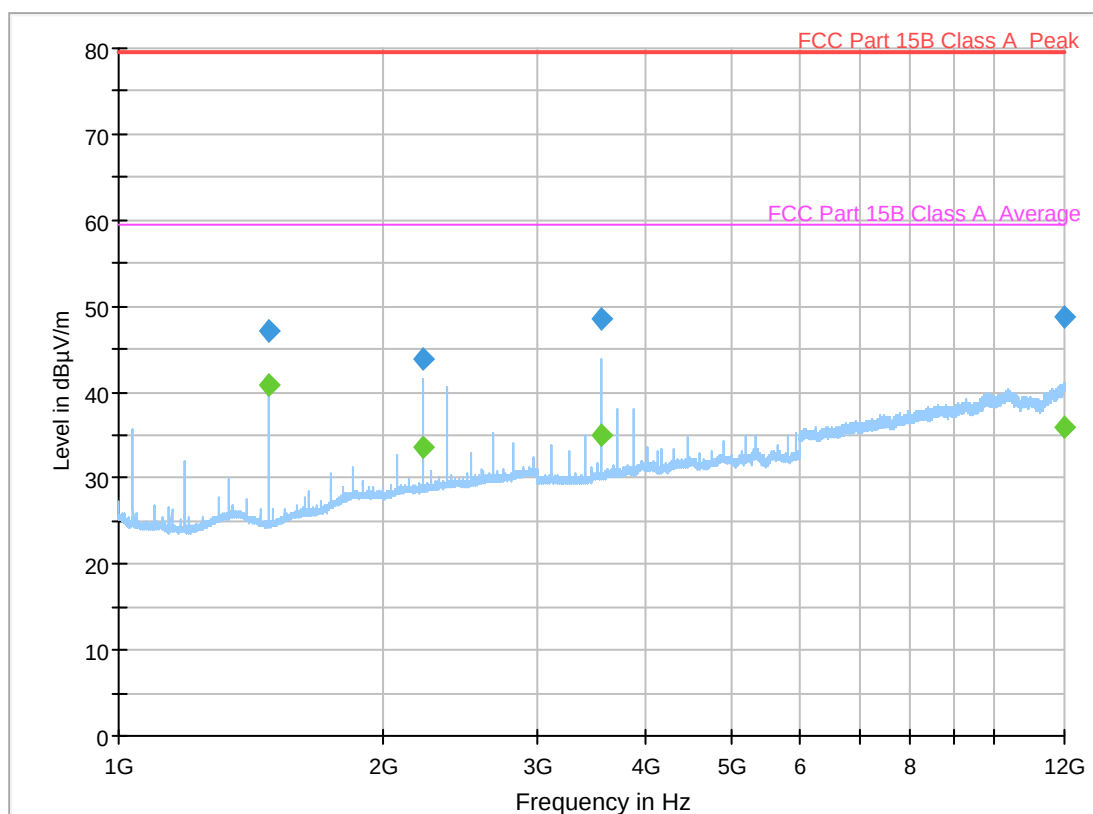
## 1000-12000 MHz, Horizontal polarization

#### Measurement Data Vertical Polarisation:

| Frequency    | Operational condition | Field strength Peak | Field strength Average | Limit Peak FCC15.109 | Limit Avg. FCC15.109 | Margin Peak | Margin Average |
|--------------|-----------------------|---------------------|------------------------|----------------------|----------------------|-------------|----------------|
| MHz          |                       | dBμV/m              | dBμV/m                 | dBμV/m               | dBμV/m               | dB          | dB             |
| 1485.003000  | Charging              | 47.2                | ---                    | 79.5                 | ---                  | 32.3        | ---            |
| 1485.003000  | Charging              | ---                 | 40.9                   | ---                  | 59.5                 | ---         | 18.6           |
| 2227.497000  | Charging              | ---                 | 33.7                   | ---                  | 59.5                 | ---         | 25.8           |
| 2227.497000  | Charging              | 43.9                | ---                    | 79.5                 | ---                  | 35.6        | ---            |
| 3564.001500  | Charging              | 48.6                | ---                    | 79.5                 | ---                  | 30.90       | ---            |
| 3564.001500  | Charging              | ---                 | 34.9                   | ---                  | 59.5                 | ---         | 24.6           |
| 11993.632273 | Charging              | ---                 | 35.8                   | ---                  | 59.5                 | ---         | 23.7           |
| 11993.632273 | Charging              | 48.8                | ---                    | 79.5                 | ---                  | 30.7        | ---            |

See attached graphs.

Full Spectrum



#### 1000-12000 MHz, Vertical polarization

## 4 LIST OF TEST EQUIPMENT

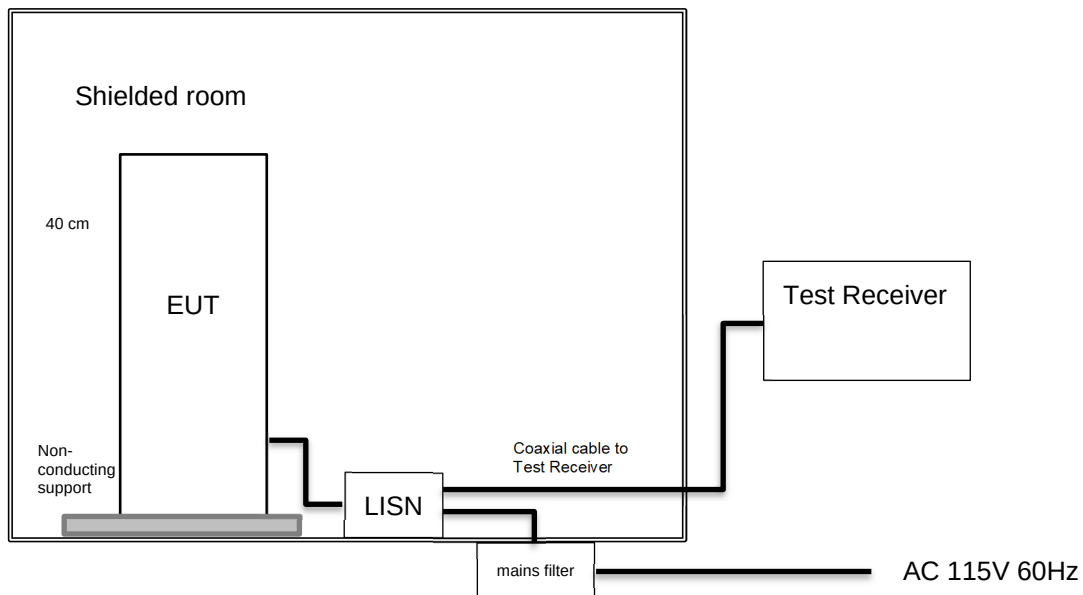
To facilitate inclusion on each page of the test equipment used for related tests, each item of test equipment and ancillaries are identified (numbered) by the Test Laboratory.

| No.   | Model number       | Description                     | Manufacturer           | Ref. no. | Cal. date         | Cal. Due          |
|-------|--------------------|---------------------------------|------------------------|----------|-------------------|-------------------|
| 1     | ESU40              | Measuring Receiver              | Rohde & Schwarz        | LR-1639  | 2019.01 & 2020.02 | 2020.01 & 2021.02 |
| 2     | JB3                | BiLog Antenna                   | Sunol Sciences         | N-4525   | 2017.09 & 2020.03 | 2020.09 & 2023.03 |
| 3     | SI 310             | Preamplifier<br>9kHz – 1000 MHz | Sonoma Instruments     | LR-1680  | 2018.07 & 2019.07 | 2019.07 & 2020.07 |
| 4     | 3117-PA            | Double Ridged<br>Horn Antenna   | EMCO                   | LR-1717  | 2017.05           | 2020.05           |
| 5     | 3117-Preamp        | Preamplifier 3117 PA            | EMCO                   | LR-1757  | 2020.02           | 2021.02           |
| 6     | HFH2-Z2            | Loop Antenna                    | Rohde & Schwarz        | LR-1660  | 2016.11 & 2019.06 | 2019.11 & 2022.06 |
| 7     | ESCI               | Measuring Receiver              | Rohde & Schwarz        | N-4259   | 2017.10 & 2019.10 | 2019.10 & 2021.10 |
| 8     | ESH2-Z5            | AMN                             | Rohde & Schwarz        | N-4097   | 2018.03           | 2020.03           |
| 9 *)  | 10001 iX Series II | AC Power Source /<br>Analyzer   | California Instruments | LR-1549  | 2015.05           | 2020.05           |
| 10 *) | Fluke 87 V         | Multimeter                      | Fluke                  | N-4672   | 2018.11           | 2020.11           |

\*) Instruments 9 and 10 were used to generate the AC Input voltage to the EUT and performing control measurement of level and frequency, respectively.

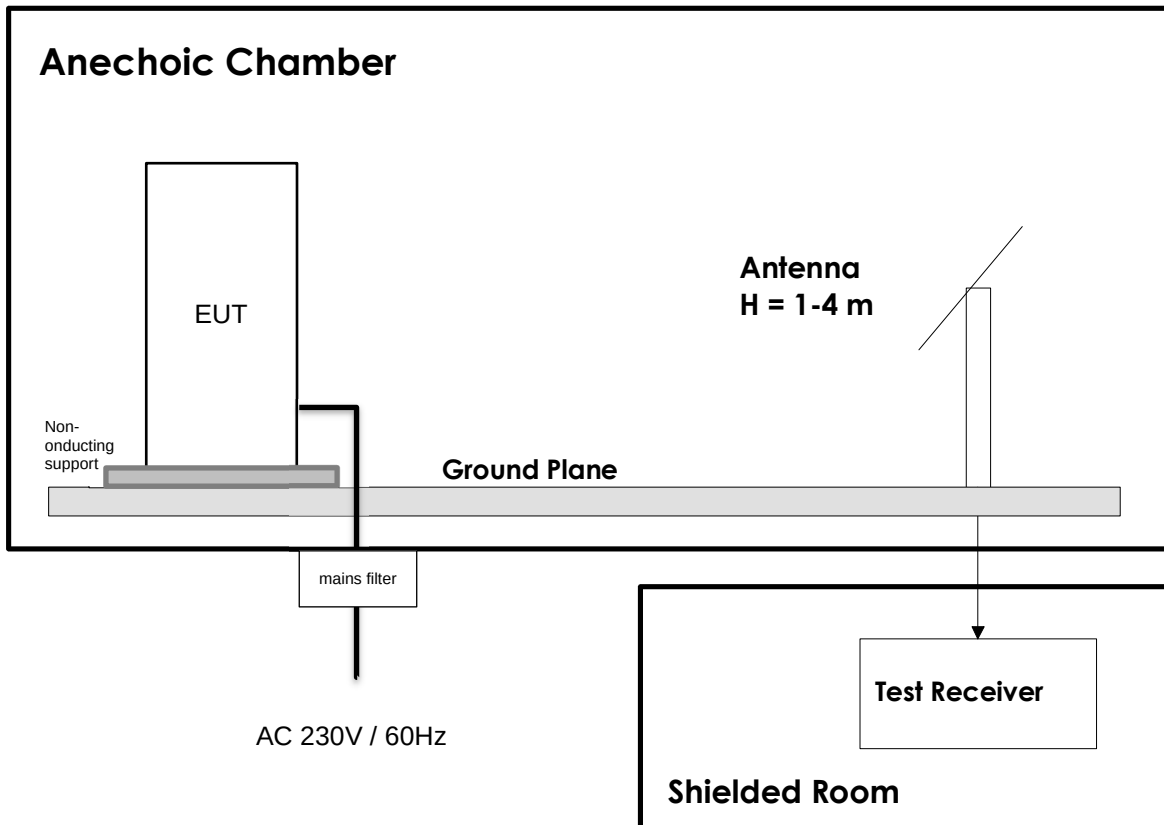
## 5 BLOCK DIAGRAM

### 5.1 Power Line Conducted Emission



The test was performed with the EUT placed on a pallet inside the EMC chamber.  
The test receiver was located outside the EMC chamber.

## 5.2 Test Site Radiated Emission



All tests were performed with the EUT placed on a pallet (approx. 10 cm) at the ground plane. This test setup is used for all radiated emissions tests. For all frequencies, the measuring distance is 3m. Emissions above 1 GHz are measured with a Spectrum Analyzer and Horn Antenna and with the preamplifier after the antenna. Tests above 1GHz were performed with the floor between the EUT and the measuring antenna covered by floor absorbers.