# FCC and Industry Canada Testing of the DAQRI International Limited Model: DAQRI Compute Pack In accordance with FCC 47 CFR Part 15B and ICES-003

Product Service

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Prepared for: DAQRI LLC
1201 W. 5th St. Suite T-800
Los Angeles
California
90017
United States

FCC ID: 2AEWMDQR002001
IC: TBC

## COMMERCIAL-IN-CONFIDENCE

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| RESPONSIBLE FOR | NAME | DATE | SIGNATURE |
|---|---|---|---|
| Project Management | Steven White | 02 June 2017 | |
| Authorised Signatory | Matthew Russell | 02 June 2017 | |

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD Product Service document control rules.

ENGINEERING STATEMENT
The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC 47 CFR Part 15B and ICES-003. The sample tested was found to comply with the requirements defined in the applied rules.

| RESPONSIBLE FOR | NAME | DATE | SIGNATURE |
|---|---|---|---|
| Testing | Graeme Lawler | 02 June 2017 | |
| Testing | Jack Tuckwell | 02 June 2017 | |

| FCC Accreditation | Industry Canada Accreditation |
|---|---|
| 90987 Octagon House, Fareham Test Laboratory | IC2932B-1 Octagon House, Fareham Test Laboratory |

EXECUTIVE SUMMARY
A sample of this product was tested and found to be in compliance with FCC 47 CFR Part 15B: 2016 and ICES-003: 2016



ACCREDITATION
Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation. Results of tests not covered by our UKAS Accreditation Schedule are marked NUA (Not UKAS Accredited).

TÜV SÜD Product Service
is a trading name of TUV SUD Ltd
Registered in Scotland at East Kilbride,
Glasgow G75 0QF, United Kingdom
Registered number: SC215164

TUV SUD Ltd is a
TÜV SÜD Group Company

Phone: +44 (0) 1489 558100
Fax: +44 (0) 1489 558101
www.tuv-sud.co.uk

TÜV SÜD Product Service
Octagon House
Concorde Way
Fareham
Hampshire PO15 5RL
United Kingdom

Product Service

# Contents

**1 Report Summary ..... 2**

1.1 Report Modification Record ..... 2
1.2 Introduction ..... 2
1.3 Brief Summary of Results ..... 3
1.4 Declaration of Build Status ..... 4
1.5 Product Information ..... 5
1.6 Deviations from the Standard ..... 5
1.7 EUT Modification Record ..... 5
1.8 Test Location ..... 5

**2 Test Details ..... 6**

2.1 AC Power Line Conducted Emissions ..... 6
2.2 Radiated Emissions ..... 10

**3 Measurement Uncertainty ..... 15**

# 1 Report Summary

## 1.1 Report Modification Record

Alterations and additions to this report will be issued to the holders of each copy in the form of a complete document.

| Issue | Description of Change | Date of Issue |
|---|---|---|
| 1 | First Issue | 02 June 2017 |

**Table 1**

## 1.2 Introduction

| | |
|---|---|
| Applicant | DAQRI LLC |
| Manufacturer | DAQRI International Limited |
| Model Number(s) | DAQRI Compute Pack |
| Serial Number(s) | 31A17-7DF-2VBHCJOT91 and OA565-7DF-1CYKOX15JW |
| Hardware Version(s) | DCP DE |
| Software Version(s) | V16 |
| Number of Samples Tested | 2 |
| Test Specification/Issue/Date | FCC 47 CFR Part 15B: 2016<br>ICES-003: 2016 |
| Order Number<br>Date | 108372<br>07-April-2017 |
| Date of Receipt of EUT | 09-January-2017 and 05-April-2017 |
| Start of Test | 09-May-2017 |
| Finish of Test | 09-May-2017 |
| Name of Engineer(s) | Graeme Lawler and Jack Tuckwell |
| Related Document(s) | ANSI C63.4 (2014) |

Product Service

## 1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 15B and ICES-003 is shown below.

| Section | Specification Clause | | Test Description | Result | Comments/Base Standard |
|---|---|---|---|---|---|
| | Part 15B | ICES-003 | | | |
| Configuration: Idle | | | | | |
| 2.1 | 15.107 | 6.1 | AC Power Line Conducted Emissions | Pass | ANSI C63.4 |
| 2.2 | 15.109 | 6.2 | Radiated Emissions | Pass | ANSI C63.4 |

**Table 2**

Product Service

## 1.4 Declaration of Build Status

| | |
|---|---|
| **Manufacturer** | DAQRI International Limited |
| **Country of origin** | USA |
| **UK Agent** | DAQRI LLP |
| **Technical Description** | DAQRI Compute Pack is a mobile computer that powers a lightweight wearable human-machine interface that connects workers in a variety of industries and environments to real time information and augmented work instruction. |
| **Model No** | DAQRI Compute Pack |
| **Part No** | 870-00163 |
| **Serial No** | |
| **Drawing Number** | |
| **Build Status** | DCP DE |
| **Software Issue** | V16 |
| **Hardware Issue** | DCP DE |
| **Highest Internally Generated Frequency** | 5.85GHz |
| **FCC ID** | 2AEWMDQR002001 |
| **Industry Canada ID** | TBC |

| | |
|---|---|
| **Signature** | Dave Williams |
| **Date** | 26 May 2017 |
| **D of B S Serial No** | |

Note: This document has been prepared to enable manufacturers with no mechanism for producing their own Declaration of Build Status, to declare the build state of the equipment submitted for test.

No responsibility will be accepted by TÜV SÜD Product Service as to the accuracy of the information declared in this document by the manufacturer.

## 1.5 Product Information

### 1.5.1 Technical Description

DAQRI Compute Pack is a mobile computer that powers a lightweight wearable human-machine interface that connects workers in a variety of industries and environments to real time information and augmented work instruction.

## 1.6 Deviations from the Standard

No deviations from the applicable test standard were made during testing.

## 1.7 EUT Modification Record

The table below details modifications made to the EUT during the test programme.
The modifications incorporated during each test are recorded on the appropriate test pages.

| Modification State | Description of Modification still fitted to EUT | Modification Fitted By | Date Modification Fitted |
|---|---|---|---|
| Serial Number: 31A17-7DF-2VBHCJOT91 | | | |
| 0 | As supplied by the customer | Not Applicable | Not Applicable |
| Serial Number: OA565-7DF-1CYKOX15JW | | | |
| 0 | As supplied by the customer | Not Applicable | Not Applicable |

**Table 3**

## 1.8 Test Location

TÜV SÜD Product Service conducted the following tests at our Fareham Test Laboratory.

| Test Name | Name of Engineer(s) | Accreditation |
|---|---|---|
| Configuration: Idle | | |
| AC Power Line Conducted Emissions | Graeme Lawler | UKAS |
| Radiated Emissions | Graeme Lawler and Jack Tuckwell | UKAS |

**Table 4**

Office Address:

Octagon House
Concorde Way
Segensworth North
Fareham
Hampshire
PO15 5RL
United Kingdom

# 2 Test Details

## 2.1 AC Power Line Conducted Emissions

### 2.1.1 Specification Reference

FCC 47 CFR Part 15B, Clause 15.107
ICES-003, Clause 6.1

### 2.1.2 Equipment Under Test and Modification State

DAQRI Compute Pack, S/N: 31A17-7DF-2VBHCJOT91 - Modification State 0
DAQRI Compute Pack, S/N: OA565-7DF-1CYKOX15JW - Modification State 0

### 2.1.3 Date of Test

09-May-2017

### 2.1.4 Test Method

The test was performed in accordance with ANSI C63.4, clause 7.

### 2.1.5 Environmental Conditions

| | |
|---|---|
| Ambient Temperature | 16.5 °C |
| Relative Humidity | 36.0 % |

### 2.1.6 Test Results

Idle

Applied supply Voltage: 60 Hz
Applied supply frequency: 120 V AC

| Frequency (MHz) | QP Level (dBuV) | QP Limit (dBuV) | QP Margin (dBuV) | AV Level (dBuV) | AV Limit (dBuV) | AV Margin (dBuV) |
|---|---|---|---|---|---|---|
| 0.150 | 54.5 | 66.0 | -11.5 | 31.3 | 56.0 | -24.7 |
| 0.170 | 58.8 | 65.0 | -6.1 | 42.8 | 55.0 | -12.2 |
| 0.252 | 53.1 | 61.7 | -8.5 | 31.9 | 51.7 | -19.7 |
| 0.281 | 50.4 | 60.8 | -10.4 | 25.5 | 50.8 | -25.3 |
| 0.406 | 36.2 | 57.7 | -21.5 | 21.4 | 47.7 | -26.3 |
| 0.488 | 35.0 | 56.2 | -21.2 | 23.1 | 46.2 | -23.1 |
| 0.602 | 32.9 | 56.0 | -23.1 | 20.0 | 46.0 | -26.0 |
| 1.219 | 30.5 | 56.0 | -25.5 | 16.8 | 46.0 | -29.2 |
| 2.418 | 26.4 | 56.0 | -29.6 | 14.1 | 46.0 | -31.9 |

**Table 5 - Live Line Emission Results**

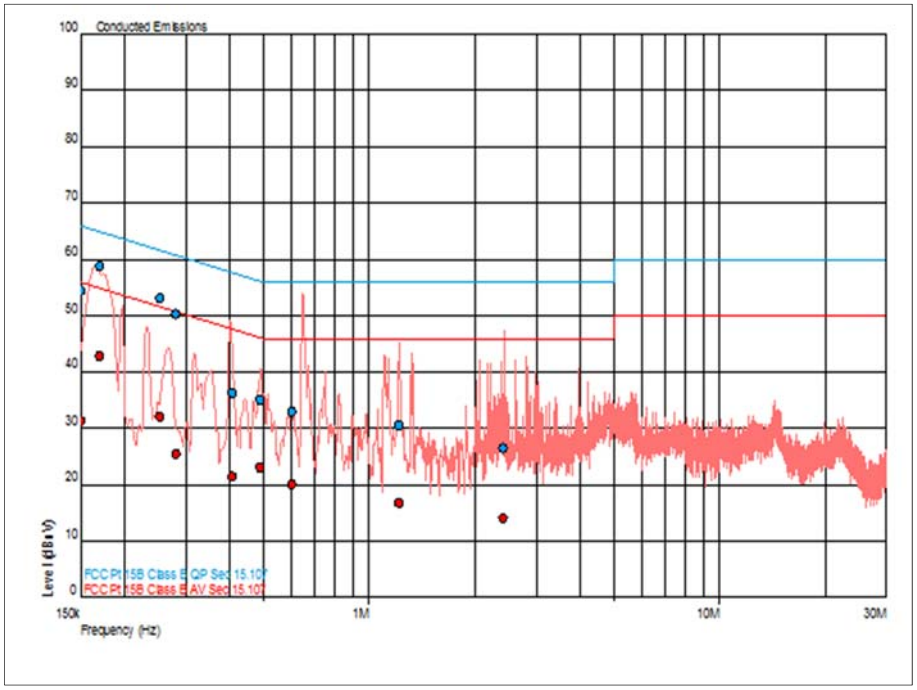


**Figure 1 - Live Line - 150 kHz to 30 MHz**

| Frequency (MHz) | QP Level (dBuV) | QP Limit (dBuV) | QP Margin (dBuV) | AV Level (dBuV) | AV Limit (dBuV) | AV Margin (dBuV) |
|---|---|---|---|---|---|---|
| 0.150 | 51.1 | 66.0 | -14.9 | 29.2 | 56.0 | -26.8 |
| 0.168 | 61.9 | 65.1 | -3.2 | 45.4 | 55.1 | -9.7 |
| 0.251 | 52.5 | 61.7 | -9.2 | 32.9 | 51.7 | -18.8 |
| 0.330 | 53.9 | 59.4 | -5.6 | 30.5 | 49.4 | -18.9 |
| 0.491 | 43.9 | 56.2 | -12.2 | 22.5 | 46.2 | -23.6 |
| 0.938 | 39.7 | 56.0 | -16.3 | 17.0 | 46.0 | -29.0 |
| 1.178 | 46.2 | 56.0 | -9.8 | 24.8 | 46.0 | -21.2 |
| 1.852 | 34.0 | 56.0 | -22.0 | 18.3 | 46.0 | -27.7 |
| 2.092 | 33.6 | 56.0 | -22.4 | 19.3 | 46.0 | -26.7 |

**Table 6 - Neutral Line Emissions Results**

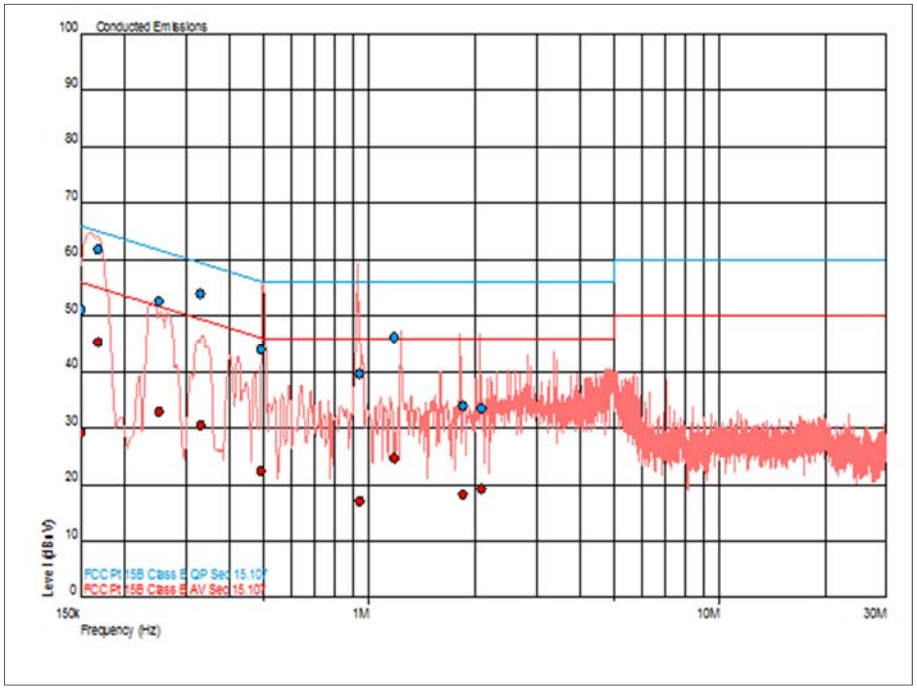


**Figure 2 - Neutral Line – 9 kHz to 30 MHz**

FCC 47 CFR Part 15B, Limit Clause 15.107 and ICES-003, Limit Clause 6.1

| Frequency of Emission (MHz) | Conducted Limit (dBµV) | |
|---|---|---|
| | Quasi-Peak | Average |
| 0.15 to 0.5 | 66 to 56* | 56 to 46* |
| 0.5 to 5 | 56 | 46 |
| 5 to 30 | 60 | 50 |

**Table 7**

*Decreases with the logarithm of the frequency.

### 2.1.7 Test Location and Test Equipment Used

This test was carried out in EMC Chamber 5.

| Instrument | Manufacturer | Type No | TE No | Calibration Period (months) | Calibration Due |
|---|---|---|---|---|---|
| LISN (1 Phase) | Chase | MN 2050 | 336 | 12 | 07-Apr-2018 |
| Screened Room (5) | Rainford | Rainford | 1545 | 36 | 20-Dec-2017 |
| Hygromer | Rotronic | A1 | 2138 | 12 | 02-Feb-2018 |
| Transient Limiter | Hewlett Packard | 11947A | 2378 | 12 | 06-Jul-2017 |
| EMI Test Receiver | Rohde & Schwarz | ESU40 | 3506 | 12 | 12-Nov-2017 |

**Table 8**

## 2.2 Radiated Emissions

### 2.2.1 Specification Reference

FCC 47 CFR Part 15B, Clause 15.109
ICES-003, Clause 6.2

### 2.2.2 Equipment Under Test and Modification State

DAQRI Compute Pack, S/N: 31A17-7DF-2VBHCJOT91 - Modification State 0
DAQRI Compute Pack, S/N: OA565-7DF-1CYKOX15JW - Modification State 0

### 2.2.3 Date of Test

09-May-2017

### 2.2.4 Test Method

The test was performed in accordance with ANSI C63.4, clause 8.

### 2.2.5 Environmental Conditions

| | |
|---|---|
| Ambient Temperature | 16.5 - 22.7 °C |
| Relative Humidity | 28.0 - 37.0 % |

### 2.2.6 Test Results

Idle

Highest frequency generated or used within the EUT: 5825 MHz
Upper frequency test limit: 30 GHz

| Frequency (MHz) | QP Level (dBuV/m) | QP Limit (dBuV/m) | QP Margin (dBuV/m) | Angle(Deg) | Height(m) | Polarity |
|---|---|---|---|---|---|---|
| 30.824 | 20.3 | 40.0 | -19.7 | 127 | 3.42 | Vertical |
| 135.490 | 37.0 | 40.0 | -3.0 | 345 | 1.00 | Vertical |
| 144.472 | 31.5 | 40.0 | -8.5 | 297 | 1.37 | Vertical |
| 173.779 | 39.4 | 40.0 | -0.6 | 139 | 1.00 | Vertical |
| 262.286 | 27.9 | 47.0 | -19.1 | 360 | 1.00 | Vertical |
| 435.603 | 37.2 | 47.0 | -9.8 | 315 | 2.00 | Horizontal |
| 480.883 | 31.3 | 47.0 | -15.7 | 330 | 1.90 | Horizontal |

**Table 9 - 30 MHz to 1 GHz**

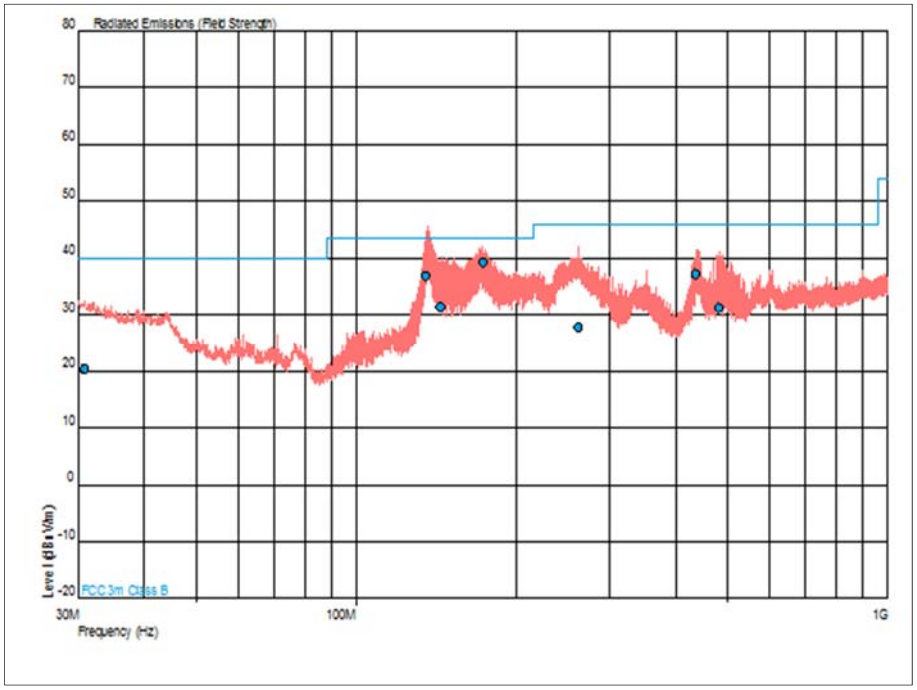


**Figure 3 - 30 MHz to 1 GHz - Horizontal and Vertical**

| Frequency (GHz) | Result (µV/m) | | Limit (µV/m) | | Margin (µV/m) | | Angle (°) | Height (m) | Polarisation |
|---|---|---|---|---|---|---|---|---|---|
| | Peak | Average | Peak | Average | Peak | Average | | | |
| * | | | | | | | | | |

**Table 10 - 1 GHz to 30 GHz**

*No emissions were detected within 10 dB of the limit.

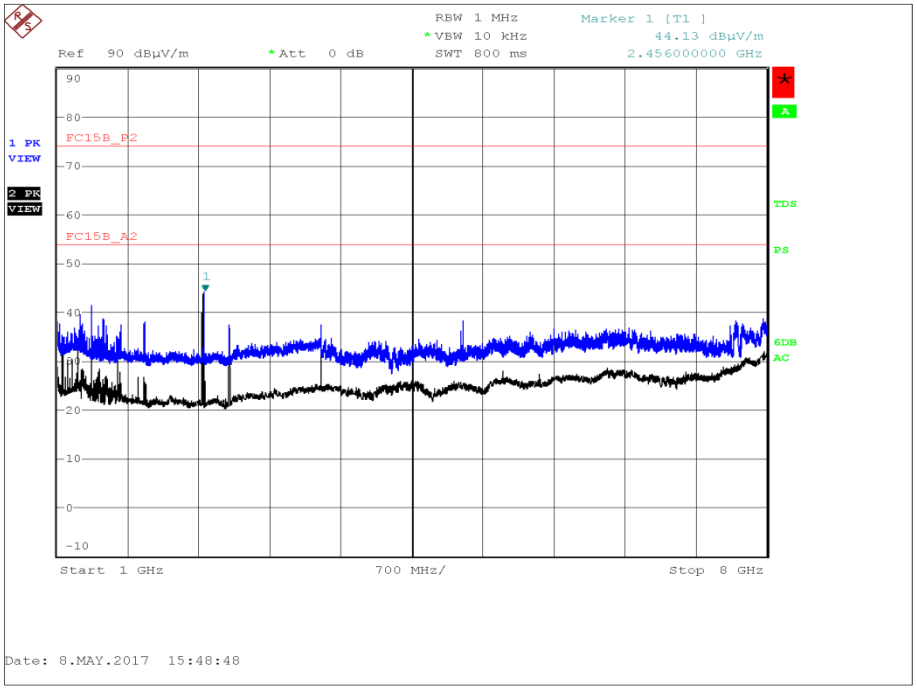


**Figure 4 - 1 GHz to 8 GHz - Horizontal and Vertical**

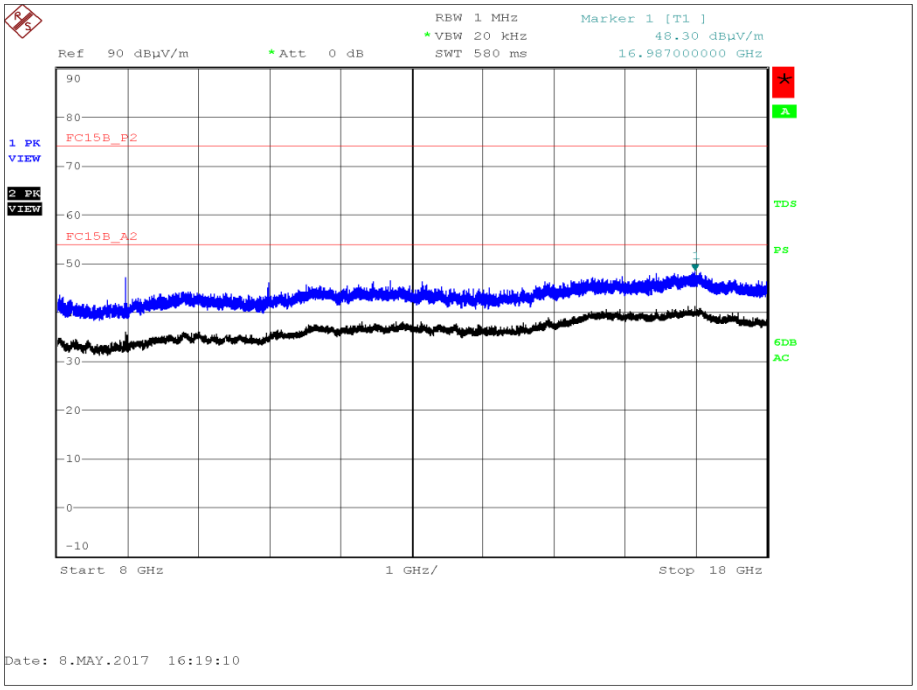


**Figure 5 - 8 GHz to 18 GHz - Horizontal and Vertical**

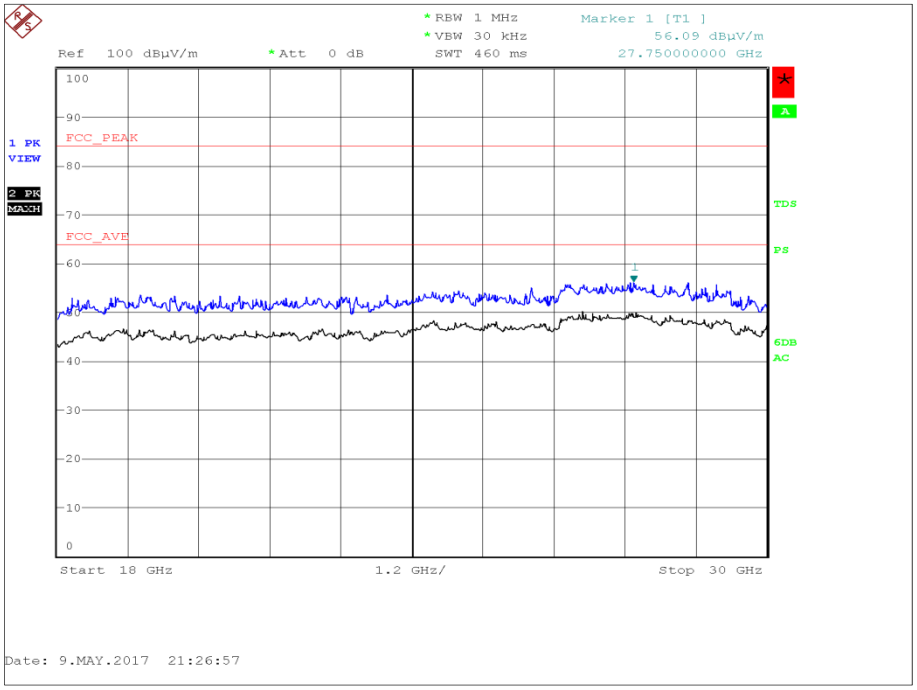


**Figure 6 - 18 GHz to 30 GHz - Horizontal and Vertical**

FCC 47 CFR Part 15B, Limit Clause 15.109

| Frequency of Emission (MHz) | Field Strength (µV/m) |
|---|---|
| 30 to 88 | 100.0 |
| 88 to 216 | 150.0 |
| 216 to 960 | 200.0 |
| Above 960 | 500.0 |

ICES-003, Limit Clause 6.2

| Frequency of Emission (MHz) | Quasi-Peak (dBµV/m) |
|---|---|
| 30 to 88 | 40.0 |
| 88 to 216 | 43.5 |
| 216 to 960 | 46.0 |
| 960 to 1000 | 54.0 |

| Frequency of Emission (MHz) | Field Strength (dBµV/m) | |
|---|---|---|
| | Linear Average Detector | Peak Detector |
| Above 1000 | 54.0 | 74.0 |

### 2.2.7 Test Location and Test Equipment Used

This test was carried out in EMC Chamber 5.

| Instrument | Manufacturer | Type No | TE No | Calibration Period (months) | Calibration Due |
|---|---|---|---|---|---|
| Antenna 18-40GHz (Double Ridge Guide) | Link Microtek Ltd | AM180HA-K-TU2 | 230 | 24 | 12-Feb-2018 |
| Antenna 18-40GHz (Double Ridge Guide) | Q-Par Angus Ltd | QSH 180K | 1511 | 24 | 07-Dec-2018 |
| Pre-Amplifier | Phase One | PS04-0086 | 1533 | 12 | 29-Jul-2017 |
| 18GHz - 40GHz Pre-Amplifier | Phase One | PSO4-0087 | 1534 | 12 | 23-Jan-2018 |
| Screened Room (5) | Rainford | Rainford | 1545 | 36 | 20-Dec-2017 |
| Turntable Controller | Inn-Co GmbH | CO 1000 | 1606 | - | TU |
| Hygromer | Rotronic | A1 | 2138 | 12 | 02-Feb-2018 |
| Signal Generator (10MHz to 40GHz) | Rohde & Schwarz | SMR40 | 3171 | 12 | 02-Nov-2017 |
| Cable (N-N, 8m) | Rhophase | NPS-2302-8000-NPS | 3248 | 12 | 02-May-2018 |
| EMI Test Receiver | Rohde & Schwarz | ESU40 | 3506 | 12 | 12-Nov-2017 |
| Tilt Antenna Mast | maturo Gmbh | TAM 4.0-P | 3916 | - | TU |
| Mast Controller | maturo Gmbh | NCD | 3917 | - | TU |
| Cable 1503 2M 2.92(P)m 2.92(P)m | Rhophase | KPS-1503A-2000-KPS | 4293 | 12 | 23-Jan-2018 |
| Cable (Rx, Km-Km 2m) | Scott Cables | KPS-1501-2000-KPS | 4526 | 6 | 23-Jul-2017 |
| Cable (Yellow, Rx, Km-Km 2m) | Scott Cables | KPS-1501-2000-KPS | 4527 | - | O/P Mon |
| Cable (Yellow, Rx, Km-Km 2m) | Scott Cables | KPS-1501-2000-KPS | 4527 | 6 | 04-Nov-2017 |
| Cable (Rx, SMAm-SMAm 0.5m) | Scott Cables | SLSLL18-SMSM-00.50M | 4528 | 6 | 03-Feb-2017 |
| Double Ridged Waveguide Horn Antenna | ETS-Lindgren | 3117 | 4722 | 12 | 17-Feb-2018 |

**Table 11**

TU - Traceability Unscheduled
O/P Mon – Output Monitored using calibrated equipment

# 3 Measurement Uncertainty

For a 95% confidence level, the measurement uncertainties for defined systems are:

| Test Name | Measurement Uncertainty |
|---|---|
| AC Power Line Conducted Emissions | 150 kHz to 30 MHz, LISN, ±3.7 dB |
| Radiated Emissions | 30 MHz to 1 GHz: ±5.2 dB<br>1 GHz to 40 GHz: ±6.3 dB |

**Table 12**