# FCC 47 CFR PART 15 SUBPART C
# INDUSTRY CANADA RSS-210 ISSUE 8

## CERTIFICATION TEST REPORT

**FOR**

**Fibar Swipe**

**MODEL NUMBER: FGGC-001**

**FCC ID: 2AA9MFFGGC001**
**IC: 20430-FGGC001**

**REPORT NUMBER: 10937760A**

**ISSUE DATE: May 13, 2016**

*Prepared for*
**Fibar Group sp. z.o.o**
**Ul. Lotnicza 1**
**Poznań, Poland 60-453**

*Prepared by*
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NVLAP Lab code: 100414-0

## Revision History

| Rev. | Issue Date | Revisions | Revised By |
|---|---|---|---|
| -- | April 27, 2016 | Initial Issue | V Sabalvaro |
| REV1 | May 2, 2016 | Editorial Changes | V Sabalvaro |

# TABLE OF CONTENTS

# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** Fibar Group sp. z.o.o
Ul. Lotnicza 1
Poznań, Poland 60-453

**EUT DESCRIPTION:** Radio Controller

**MODEL:** FGGC-001

**SERIAL NUMBER:** Non serialized

**DATE TESTED:** February 26 – April 15, 2016

| APPLICABLE STANDARDS | |
|---|---|
| **STANDARD** | **TEST RESULTS** |
| CFR 47 Part 15 Subpart C | Pass |
| INDUSTRY CANADA RSS-210 Issue 8 Annex A2.9 | Pass |
| INDUSTRY CANADA RSS-GEN Issue 4 | Pass |

UL LLC tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL LLC based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

**Note:** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For
UL LLC By:

Bart Mucha
Staff Engineer

UL LLC

Tested By:

Vincent Sabalvaro
EMC WISE Engineer
Consumer Technology
UL LLC

# 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2013, FCC CFR 47 Part 2, FCC CFR 47 Part 15, RSS-GEN Issue 4, and RSS-210 Issue 8.

# 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 333 Pfingsten Road, Northbrook, IL 60062 USA.

UL NBK is accredited by NVLAP, Laboratory Code 100414-0. The full scope of accreditation can be viewed at http://ts.nist.gov

# 4. CALIBRATION AND UNCERTAINTY

## 4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

## 4.2. SAMPLE CALCULATION

Sample Calculations
Radiated Field Strength and Conducted Emissions data contained within this report is calculated on the following basis:
Field Strength (dBuV/m) = Meter Reading (dBuV) + AF (dB/m) - Gain (dB) + Cable Loss (dB)
Conducted Voltage (dBuV) = Meter Reading (dBuV) + Cable Loss (dB) + LISN IL (dB)
Conducted Current (dBuA) = Meter Reading (dBuV) + Cable Loss (dB) - Transducer Factor (dBohms)

## 4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

| Test | Range | Equipment | Uncertainty k=2 |
|---|---|---|---|
| Radiated Emissions | 30-200MHz | Bicon 10m Horz | 4.27dB |
| Radiated Emissions | 30-200MHz | Bicon 10m Vert | 4.28dB |
| Radiated Emissions | 200-1000MHz | LogP 10m Horz | 3.33dB |
| Radiated Emissions | 200-1000MHz | LogP 10m Vert | 3.39dB |
| Radiated Emissions | 30-200MHz | Bicon 3m Horz | 3.30dB |
| Radiated Emissions | 30-130MHz | Bicon 3m Vert | 4.84dB |
| Radiated Emissions | 130-200MHz | Bicon 3m Vert | 4.94dB |
| Radiated Emissions | 200-1000MHz | LogP 3m Horz | 3.46dB |
| Radiated Emissions | 200-1000MHz | LogP 3m Vert | 4.98dB |
| Radiated Emissions | 1-6GHz | Horn | 5.02dB |
| Radiated Emissions | 6-18GHz | Horn | 5.34dB |
| Radiated Emissions | 18-26GHz | Horn | 6.60dB |
| Conducted Ant Port | 30MHz-26GHz | Spectrum Analyzer | 2.94 |
| Conducted Emissions | 150k-30MHz | LISN | 2.29dB |

Uncertainty figures are valid to a confidence level of 95%.

# 5. EQUIPMENT UNDER TEST

## 5.1. DESCRIPTION OF EUT

The EUT is a 916MHz transceiver. It is DC powered. The transmitter utilizes Z-wave technologies to communicate with other devices for home automation.
The radio device is manufactured by Fibar Group S.A.

## 5.2. MAXIMUM OUTPUT E-FIELD STRENGTH

The transmitter has a maximum output peak E-field as follows:

| Frequency Range (MHz) | Mode | Configuration | Output QP E-field Strength (dBuV/m) |
|---|---|---|---|
| 908.4-916 | TX | Battery | 87.62 |
| 908.4-916 | TX | External 5VDC | 88.06 |

## 5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an impedance matched quarter-wave embedded antenna designed as a trace on the PCB.

## 5.4. WORST-CASE CONFIGURATION AND MODE

The EUT, Swipe, was set in worst axis as found in preliminary testing. Z-axis is the worst axis.

## 5.5. DESCRIPTION OF TEST SETUP

**SUPPORT EQUIPMENT**

| Support Equipment List | | | | |
|---|---|---|---|---|
| **Description** | **Manufacturer** | **Model** | **Serial Number** | **FCC ID** |
| Power Supply (Generic) | Volgen | HK-U-050A120-US | - | - |

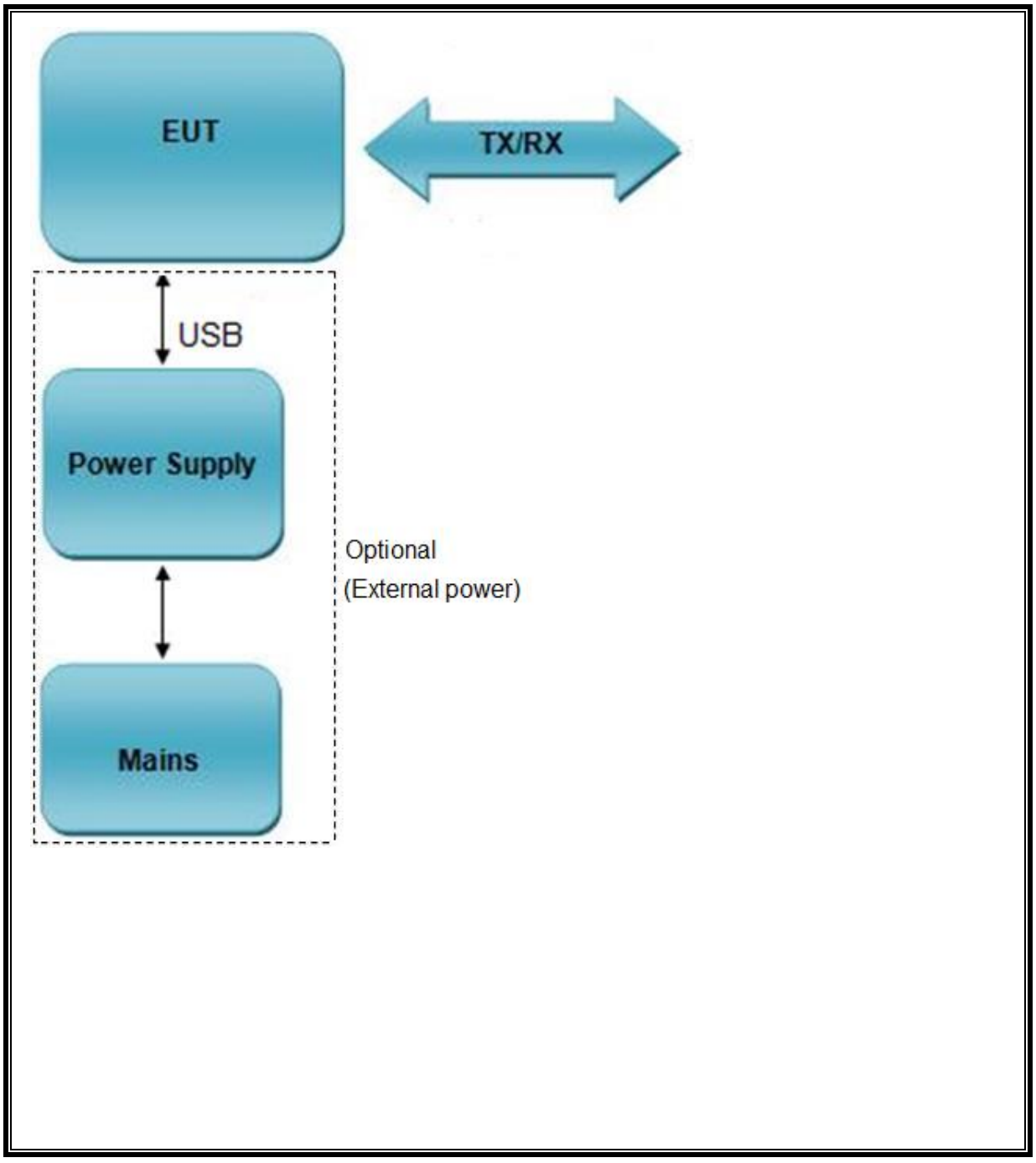
**I/O CABLES**

| I/O Cable List | | | | | | |
|---|---|---|---|---|---|---|
| **Cable No** | **Port** | **# of identical ports** | **Connector Type** | **Cable Type** | **Cable Length (m)** | **Remarks** |
| 0 | Enclosure | - | Non-Electrical | - | - | None |
| 1 | DC | 2 | Wire | USB | >3m | None |

**TEST SETUP**

The EUT is programmed for continuous TX mode

**SETUP DIAGRAM FOR TESTS**



# 6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

| Test Equipment List | | | | | |
|---|---|---|---|---|---|
| **Description** | **Manufacturer** | **Model** | **T No.** | **Cal Date** | **Cal Due** |
| Radiated Software | UL | UL EMC | Ver 9.5, Nov, 2015 | | |
| Conducted Software | UL | UL EMC | Ver 9.5, Nov 2015 | | |
| EMI Test Receiver | Rohde & Schwarz | ESR | EMC4377 | 4/20/2015 | 4/20/2016 |
| Transient Limiter | Electro-Metrics | EM7600-2 | EMC4224 | N/A | N/A |
| HighPass Filter | Solar Electronics | 2803-150 | EMC4327 | N/A | N/A |
| Attenuator | HP | 8494B | 2831A0083 | N/A | N/A |
| LISN - L1 | Solar | 8602-50-TS-50-N | EMC4052 | 2/16/2016 | 2/28/2017 |
| LISN - L2 | Solar | 8602-50-TS-50-N | EMC4064 | 2/16/2016 | 2/28/2017 |
| Signal Analyzer | Agilent | PXA | EMC4360 | 1/8/2016 | 1/31/2017 |
| Near Field Probe | EMCO | 7405 | 1270 | N/A | N/A |
| Test Receiver | Rhode & Schwarz | ESCI | EMC4328 | 11/18/2015 | 11/30/2016 |
| Log-P Antenna | Chase | UPA6109 | EMC4258 | 4/27/2015 | 4/30/2016 |
| Bicon Antenna | Chase | UPA6106A | EMC4078 | 12/28/2015 | 12/31/2016 |
| Loop Antenna | ETS-Lindgren | 6502 | 0021021 | 7/31/2015 | 7/31/2016 |
| Antenna Array | UL | BOMS | EMC4276 | 12/1/2015 | 12/31/2016 |
| Test Receiver | Rhode & Schwarz | ESU | EMC4323 | 1/2/2016 | 1/31/2017 |
| | | | | | |
| | | | | | |
| | | | | | |

# 7. TEST RESULTS

## 7.1. 20 dB AND 99% BANDWIDTH

**LIMITS**

None; for reporting purposes only.

## TEST PROCEDURE

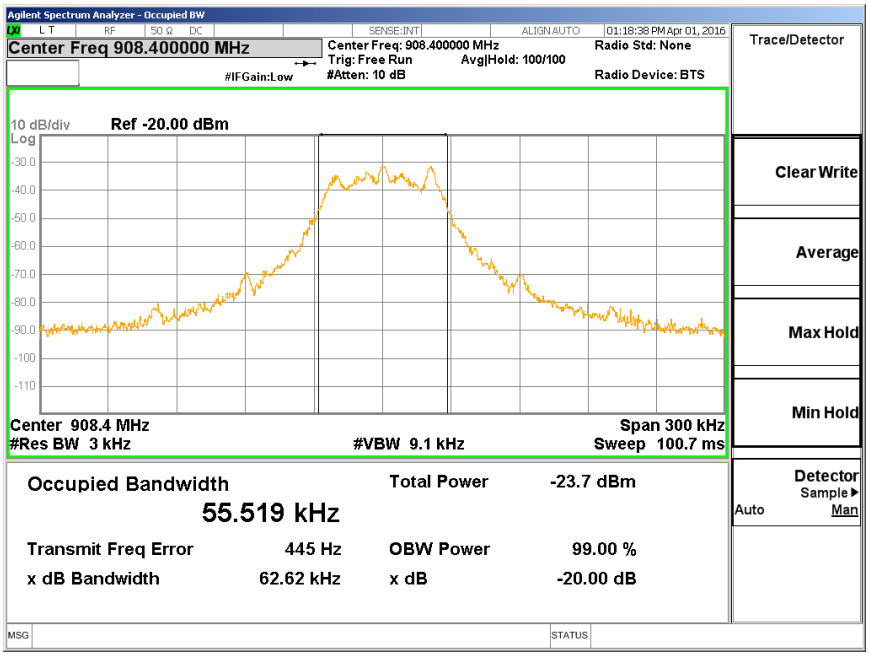
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the Occupied bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

### RESULTS

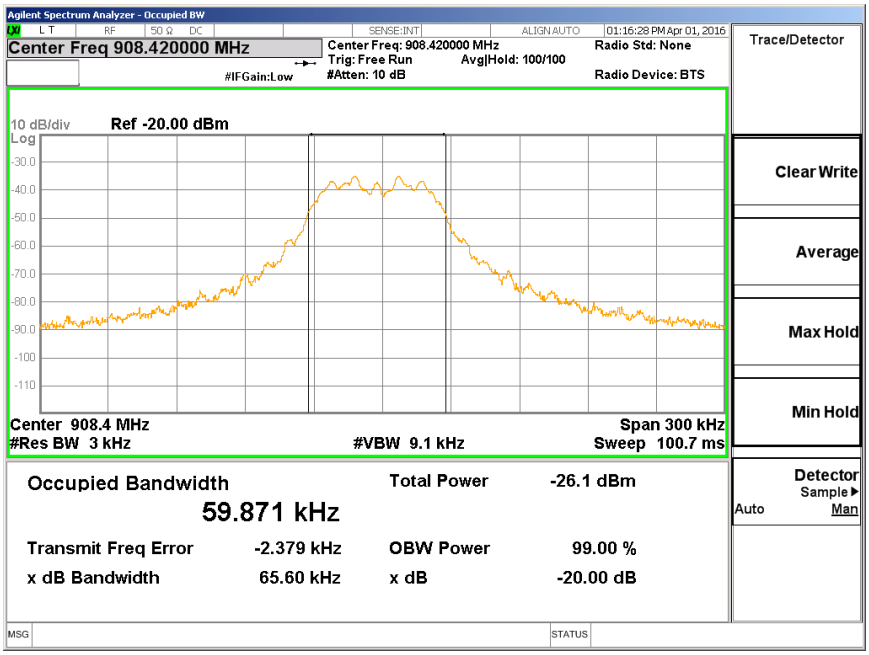
| Channel | Frequency (MHz) | 20 dB Bandwidth (kHz) | 99% Bandwidth (kHz) |
|---|---|---|---|
| Low | 908.4 | 55.995 | 55.519 |
| Middle | 908.42 | 59.602 | 59.871 |
| High | 916 | 78.410 | 73.115 |

### 7.1.1. 99% BANDWIDTH

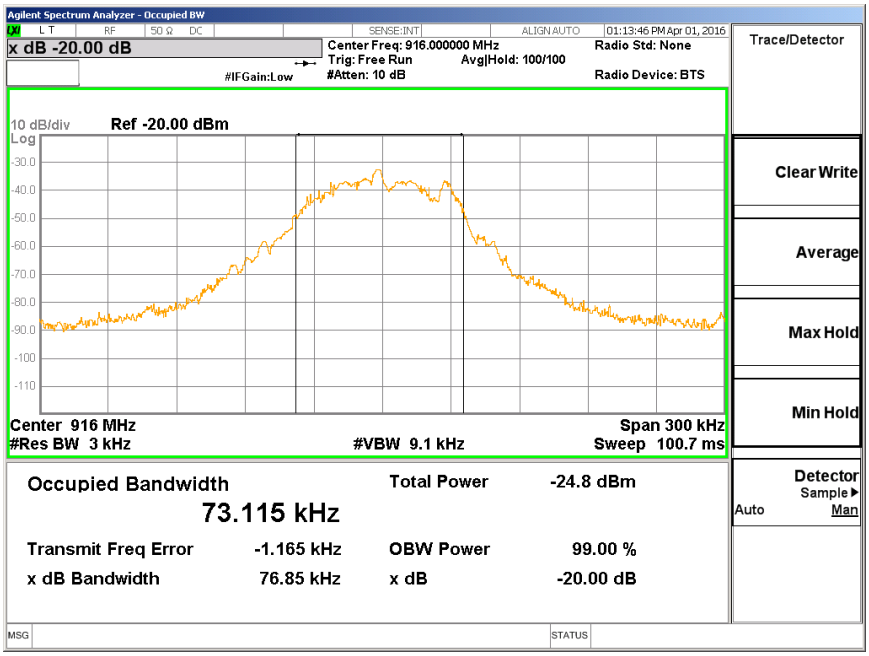
99% BANDWIDTH LOW CH



99% BANDWIDTH MID CH

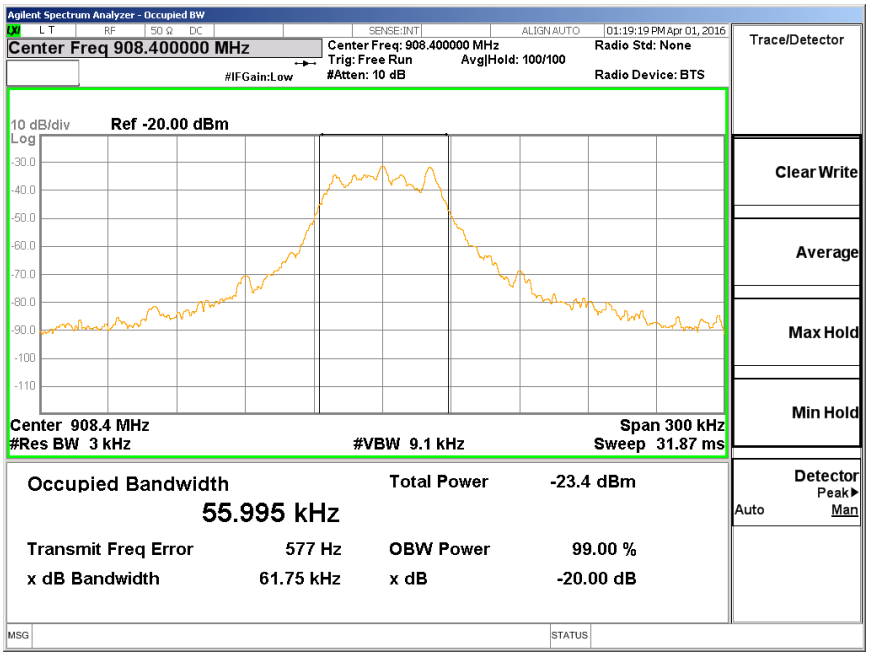


99% BANDWIDTH HIGH CH

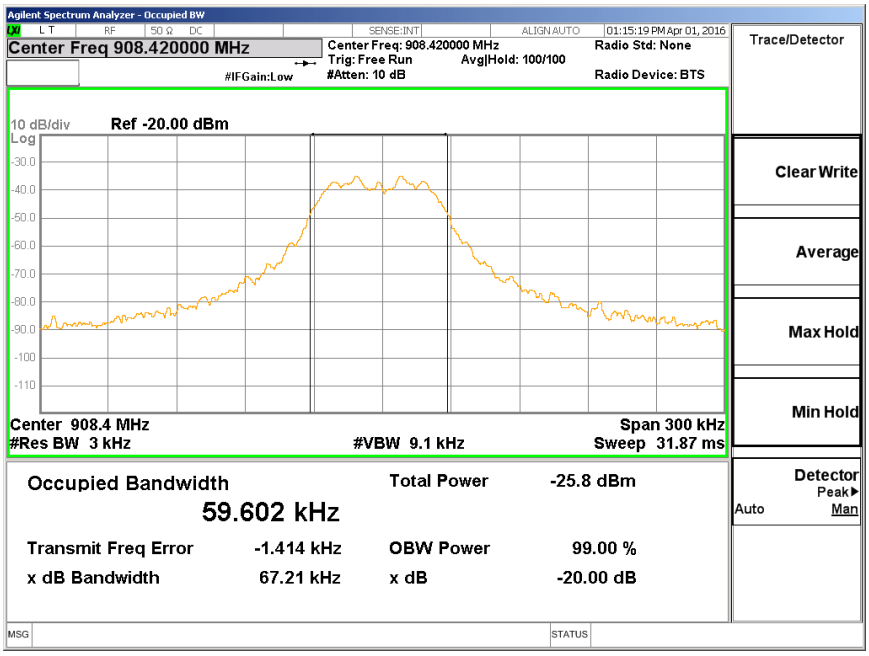


## 7.1.2. 20dB BANDWIDTH

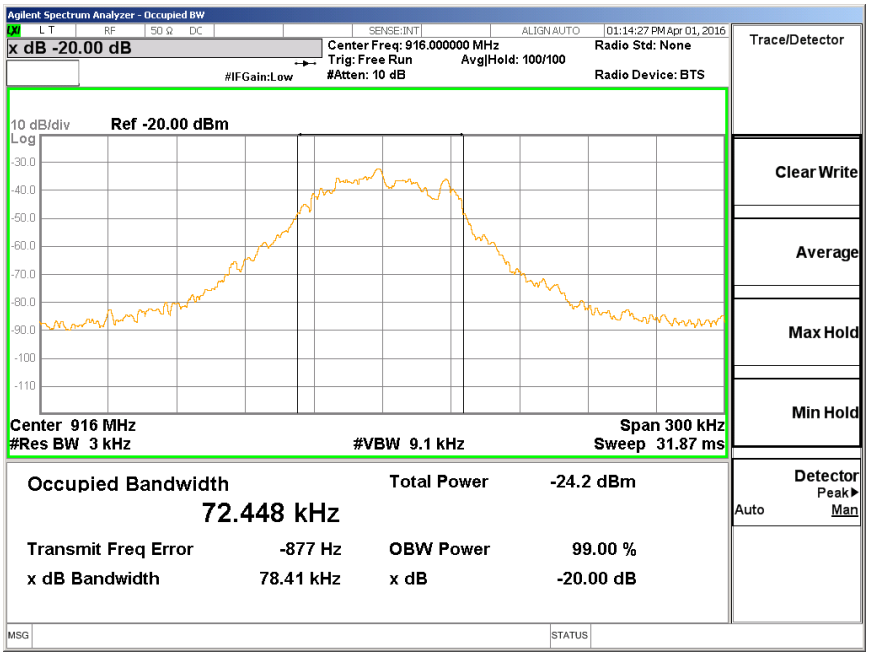
20dB BANDWIDTH LOW CH



20dB BANDWIDTH MID CH



20dB BANDWIDTH HIGH CH



## 7.2. RADIATED EMISSIONS

**LIMIT**

IC RSS-210, A2.9
FCC 15.249

Operation within the bands 902–928 MHz, 2400–2483.5 MHz, 5725–5875 MHZ, and 24.0–24.25 GHz.
(a) Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

| Fundamental frequency | Field strength of fundamental (millivolts/meter) | Field strength of harmonics (microvolts/meter) |
|---|---|---|
| 902–928 MHz | 50 | 500 |
| 2400–2483.5 MHz | 50 | 500 |
| 5725–5875 MHz | 50 | 500 |
| 24.0–24.25 GHz | 250 | 2500 |

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is the lesser attenuation.

| Frequency (MHz) | Field strength (microvolts/meter) | Measurement distance (meters) |
|---|---|---|
| 0.009–0.490 | 2400/F(kHz) | 300 |
| 0.490–1.705 | 24000/F(kHz) | 30 |
| 1.705–30.0 | 30 | 30 |
| 30–88 | 100 ** | 3 |
| 88–216 | 150 ** | 3 |
| 216–960 | 200 ** | 3 |
| Above 960 | 500 | 3 |

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54–72 MHz, 76–88 MHz, 174–216 MHz or 470–806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§15.231 and 15.241.

**RESULTS**

C63.4 sect. 4.2.2(e) Average voltage measurements using spectrum analyzer reduced video bandwidth

PK: RBW 1MHz, VBW 1MHz
AV: RBW 1MHz, VBW 10Hz

## 7.2.1. FUNDAMENTAL FREQUENCY RADIATED EMISSION

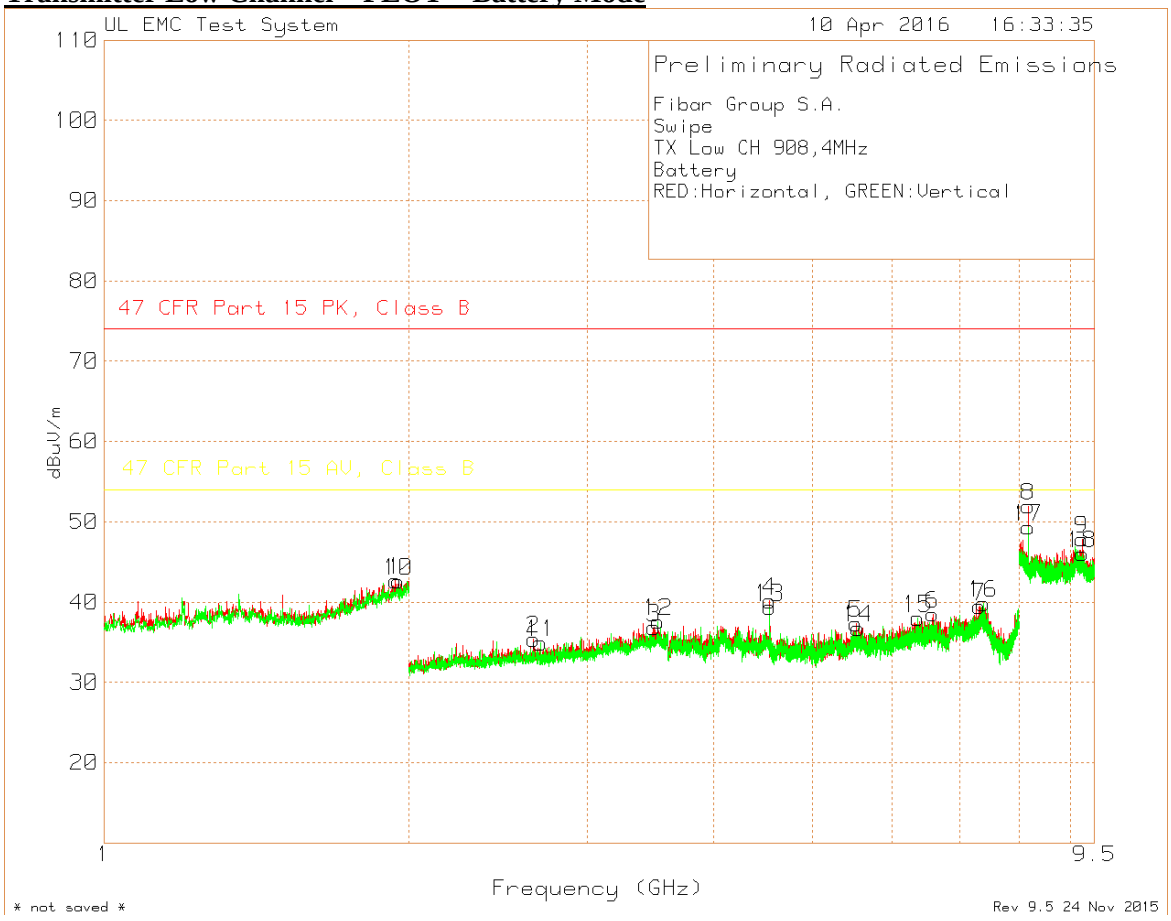
Fibar
Swipe
Z-Axis
TX Fundamentals, Power Setting: -16dBm

| Test Frequency (MHz) | Meter Reading (dBuV) | Detector | Antenna Factor (dB/m) | Gain/Loss (dBm) | Corrected Reading dB(uVolts/ meter) | TX PK Limit | Margin (dB) | TX Avg Limit | Margin (dB) | Azimuth [Degs] | Height [cm] | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Battery Mode** | | | | | | | | | | | | |
| 908.404813 | 53.07 | Pk | 23.4 | 9.8 | 86.27 | 114 | -27.73 | - | - | 144 | 101 | H |
| 908.404813 | 52.95 | Qp | 23.4 | 9.8 | 86.15 | - | - | 94 | -7.85 | 144 | 101 | H |
| 908.372 | 42.46 | Pk | 23.4 | 9.8 | 75.66 | 114 | -38.34 | - | - | 107 | 176 | V |
| 908.372 | 42.08 | Qp | 23.4 | 9.8 | 75.28 | - | - | 94 | -18.72 | 107 | 176 | V |
| | | | | | | | | | | | | |
| 908.436563 | 53.47 | Pk | 23.4 | 9.8 | 86.67 | 114 | -27.33 | - | - | 146 | 102 | H |
| 908.436563 | 53.35 | Qp | 23.4 | 9.8 | 86.55 | - | - | 94 | -7.45 | 146 | 102 | H |
| 908.437125 | 42.62 | Pk | 23.4 | 9.8 | 75.82 | 114 | -38.18 | - | - | 100 | 176 | V |
| 908.437125 | 42.5 | Qp | 23.4 | 9.8 | 75.7 | - | - | 94 | -18.3 | 100 | 176 | V |
| | | | | | | | | | | | | |
| 915.976375 | 51.86 | Pk | 23.4 | 9.8 | 85.06 | 114 | -28.94 | - | - | 146 | 101 | H |
| 915.976375 | 51.66 | Qp | 23.4 | 9.8 | 84.86 | - | - | 94 | -9.14 | 146 | 101 | H |
| 915.999063 | 41.62 | Pk | 23.4 | 9.8 | 74.82 | 114 | -39.18 | - | - | 22 | 179 | V |
| 915.999063 | 41.33 | Qp | 23.4 | 9.8 | 74.53 | - | - | 94 | -19.47 | 22 | 179 | V |
| **External 5VDC Mode** | | | | | | | | | | | | |
| 908.413925 | 53.68 | Pk | 23.4 | 9.8 | 86.88 | 114 | -27.12 | - | - | 309 | 101 | H |
| 908.413925 | 53.56 | Qp | 23.4 | 9.8 | 86.76 | - | - | 94 | -7.24 | 309 | 101 | H |
| 908.3928 | 41.39 | Pk | 23.4 | 9.8 | 74.59 | 114 | -39.41 | - | - | 49 | 190 | V |
| 908.3928 | 41.09 | Qp | 23.4 | 9.8 | 74.29 | - | - | 94 | -19.71 | 49 | 190 | V |
| | | | | | | | | | | | | |
| 908.429613 | 53.4 | Pk | 23.4 | 9.8 | 86.6 | 114 | -27.4 | - | - | 305 | 101 | H |
| 908.429613 | 53.29 | Qp | 23.4 | 9.8 | 86.49 | - | - | 94 | -7.51 | 305 | 101 | H |
| 908.4188 | 41.68 | Pk | 23.4 | 9.8 | 74.88 | 114 | -39.12 | - | - | 47 | 188 | V |
| 908.4188 | 41.36 | Qp | 23.4 | 9.8 | 74.56 | - | - | 94 | -19.44 | 47 | 188 | V |
| | | | | | | | | | | | | |
| 915.98425 | 52.42 | Pk | 23.4 | 9.8 | 85.62 | 114 | -28.38 | - | - | 307 | 167 | H |
| 915.98425 | 52.26 | Qp | 23.4 | 9.8 | 85.46 | - | - | 94 | -8.54 | 307 | 167 | H |
| 915.988688 | 39.9 | Pk | 23.4 | 9.8 | 73.1 | 114 | -40.9 | - | - | 47 | 182 | V |
| 915.988688 | 39.72 | Qp | 23.4 | 9.8 | 72.92 | - | - | 94 | -21.08 | 47 | 182 | V |

Pk - Peak detector

## 7.2.2. HARMONICS AND SPURIOUS EMISSIONS ABOVE 1GHz

**Transmitter Low Channel – PLOT – Battery Mode**



## Transmitter Low Channel – DATA – Battery Mode

Fibar Group S.A.
Swipe
TX Low CH 908,4MHz
Battery
Trace Markers

| Marker No. | Test Frequency (GHz) | Meter Reading dBuV | Detector | Antenna Factor dBm | Gain/Loss (dB) | Corrected Reading dBuV/m | PK Limit | PK Margin (dB) | AV Limit | AV Margin (dB) | Azimuth [Degs] | Height [cm] | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.939 | 65.72 | Pk | 31.4 | -54.43 | 42.69 | 74 | -31.31 | 54 | -11.31 | 0-360 | 100 | H |
| 2 | 2.655 | 64.06 | Pk | 22.2 | -50.87 | 35.39 | 74 | -38.61 | 54 | -18.61 | 0-360 | 100 | H |
| 3 | 3.491 | 63.7 | Pk | 23.5 | -50.36 | 36.84 | 74 | -37.16 | 54 | -17.16 | 0-360 | 100 | H |
| 4 | 4.542 | 64.17 | Pk | 27.8 | -51.81 | 40.16 | 74 | -33.84 | 54 | -13.84 | 0-360 | 101 | H |
| 5 | 5.525 | 58.83 | Pk | 28.2 | -49.71 | 37.32 | 74 | -36.68 | 54 | -16.68 | 0-360 | 101 | H |
| 6 | 6.578 | 56.71 | Pk | 28.9 | -47.08 | 38.53 | 74 | -35.47 | 54 | -15.47 | 0-360 | 101 | H |
| 7 | 7.315 | 54.89 | Pk | 30.6 | -46.01 | 39.48 | 74 | -34.52 | 54 | -14.52 | 0-360 | 149 | H |
| 8 | 8.1755 | 64.34 | Pk | 36.3 | -48.68 | 51.96 | 74 | -22.04 | 54 | -2.04 | 0-360 | 150 | H |
| 9 | 9.2353 | 59.29 | Pk | 36.4 | -47.84 | 47.85 | 74 | -26.15 | 54 | -6.15 | 0-360 | 100 | H |
| 10 | 1.952 | 65.37 | Pk | 31.5 | -54.26 | 42.61 | 74 | -31.39 | 54 | -11.39 | 0-360 | 150 | V |
| 11 | 2.698 | 63.72 | Pk | 22.1 | -50.9 | 34.92 | 74 | -39.08 | 54 | -19.08 | 0-360 | 100 | V |
| 12 | 3.522 | 64.07 | Pk | 23.4 | -49.89 | 37.58 | 74 | -36.42 | 54 | -16.42 | 0-360 | 150 | V |
| 13 | 4.542 | 63.36 | Pk | 27.8 | -51.81 | 39.35 | 74 | -34.65 | 54 | -14.65 | 0-360 | 100 | V |
| 14 | 5.552 | 57.99 | Pk | 28.3 | -49.52 | 36.77 | 74 | -37.23 | 54 | -17.23 | 0-360 | 100 | V |
| 15 | 6.359 | 56.39 | Pk | 29.2 | -47.61 | 37.98 | 74 | -36.02 | 54 | -16.02 | 0-360 | 150 | V |
| 16 | 7.381 | 55.41 | Pk | 31.1 | -46.66 | 39.85 | 74 | -34.15 | 54 | -14.15 | 0-360 | 150 | V |
| 17 | 8.1755 | 61.71 | Pk | 36.3 | -48.68 | 49.33 | 74 | -24.67 | 54 | -4.67 | 0-360 | 150 | V |
| 18 | 9.2428 | 57.66 | Pk | 36.4 | -48.01 | 46.05 | 74 | -27.95 | 54 | -7.95 | 0-360 | 150 | V |

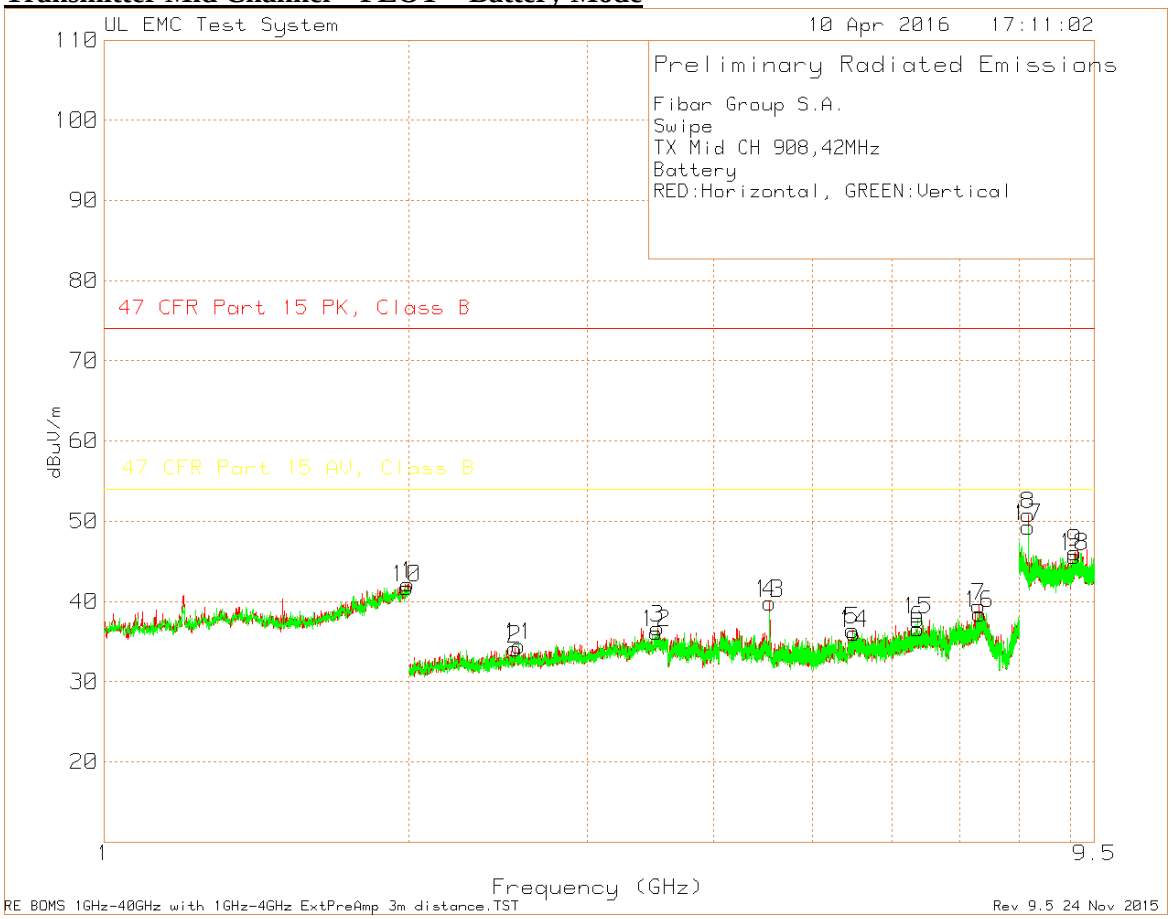
Pk - Peak detector

Measurement Data

| Test Frequency (GHz) | Meter Reading dBuV | Detector | Antenna Factor dBm | Gain/Loss (dB) | Corrected Reading dBuV/m | PK Limit | PK Margin (dB) | AV Limit | AV Margin (dB) | Azimuth [Degs] | Height [cm] | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8.1756 | 67.44 | Pk | 36.3 | -48.68 | 55.06 | 74 | -18.94 | - | - | 232 | 140 | H |
| 8.1756 | 62.77 | Av | 36.3 | -48.68 | 50.39 | - | - | 54 | -3.61 | 232 | 140 | H |
| 8.1757 | 66.93 | Pk | 36.3 | -48.68 | 54.55 | 74 | -19.45 | - | - | 146 | 228 | V |
| 8.1756 | 61.76 | Av | 36.3 | -48.68 | 49.38 | - | - | 54 | -4.62 | 146 | 228 | V |

Pk - Peak detector
Av - Linear Average detection

**Transmitter Mid Channel – PLOT – Battery Mode**



## Transmitter Mid Channel – DATA – Battery Mode

Fibar Group S.A.
Swipe
TX Mid CH 908,42MHz
Battery
Trace Markers

| Marker No. | Test Frequency (GHz) | Meter Reading dBuV | Detector | Antenna Factor dBm | Gain/Loss (dB) | Corrected Reading dBuV/m | PK Limit | PK Margin (dB) | AV Limit | AV Margin (dB) | Azimuth [Degs] | Height [cm] | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.995 | 64.49 | Pk | 31.7 | -54.02 | 42.17 | 74 | -31.83 | 54 | -11.83 | 0-360 | 100 | H |
| 2 | 2.545 | 62.85 | Pk | 22.2 | -50.93 | 34.12 | 74 | -39.88 | 54 | -19.88 | 0-360 | 150 | H |
| 3 | 3.519 | 63.19 | Pk | 23.4 | -49.9 | 36.69 | 74 | -37.31 | 54 | -17.31 | 0-360 | 100 | H |
| 4 | 4.542 | 63.82 | Pk | 27.8 | -51.81 | 39.81 | 74 | -34.19 | 54 | -14.19 | 0-360 | 101 | H |
| 5 | 5.484 | 58.42 | Pk | 28.1 | -50.1 | 36.42 | 74 | -37.58 | 54 | -17.58 | 0-360 | 149 | H |
| 6 | 6.358 | 54.99 | Pk | 29.2 | -47.61 | 36.58 | 74 | -37.42 | 54 | -17.42 | 0-360 | 101 | H |
| 7 | 7.304 | 54.95 | Pk | 30.5 | -46 | 39.45 | 74 | -34.55 | 54 | -14.55 | 0-360 | 101 | H |
| 13 | 4.542 | 63.82 | Pk | 27.8 | -51.81 | 39.81 | 74 | -34.19 | 54 | -14.19 | 0-360 | 101 | H |
| 8 | 8.1755 | 63.2 | Pk | 36.3 | -48.68 | 50.82 | 74 | -23.18 | 54 | -3.18 | 0-360 | 100 | H |
| 9 | 9.0913 | 58.5 | Pk | 36.2 | -48.57 | 46.13 | 74 | -27.87 | 54 | -7.87 | 0-360 | 100 | H |
| 10 | 1.99 | 64.07 | Pk | 31.7 | -54.04 | 41.73 | 74 | -32.27 | 54 | -12.27 | 0-360 | 100 | V |
| 11 | 2.568 | 63.21 | Pk | 22.2 | -50.94 | 34.47 | 74 | -39.53 | 54 | -19.53 | 0-360 | 100 | V |
| 12 | 3.51 | 62.66 | Pk | 23.5 | -50.03 | 36.13 | 74 | -37.87 | 54 | -17.87 | 0-360 | 100 | V |
| 14 | 5.502 | 57.74 | Pk | 28.2 | -49.89 | 36.05 | 74 | -37.95 | 54 | -17.95 | 0-360 | 100 | V |
| 15 | 6.359 | 56.15 | Pk | 29.2 | -47.61 | 37.74 | 74 | -36.26 | 54 | -16.26 | 0-360 | 150 | V |
| 16 | 7.317 | 53.88 | Pk | 30.6 | -46.01 | 38.47 | 74 | -35.53 | 54 | -15.53 | 0-360 | 150 | V |
| 17 | 8.1755 | 61.68 | Pk | 36.3 | -48.68 | 49.3 | 74 | -24.7 | 54 | -4.7 | 0-360 | 100 | V |
| 18 | 9.0748 | 58.38 | Pk | 36.2 | -48.96 | 45.62 | 74 | -28.38 | 54 | -8.38 | 0-360 | 100 | V |

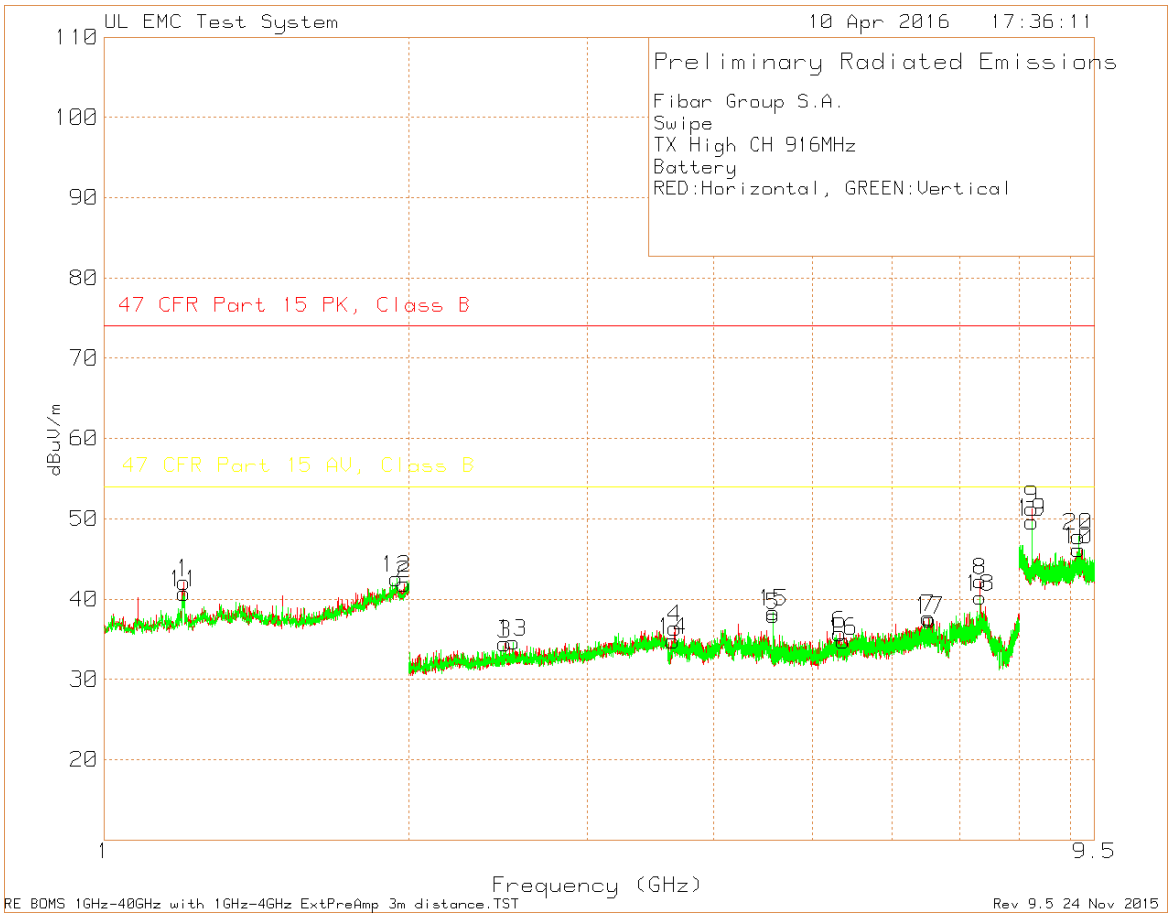
Pk - Peak detector

Measurement Data

| Test Frequency (GHz) | Meter Reading dBuV | Detector | Antenna Factor dBm | Gain/Loss (dB) | Corrected Reading dBuV/m | PK Limit | PK Margin (dB) | AV Limit | AV Margin (dB) | Azimuth [Degs] | Height [cm] | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8.1761 | 66.68 | Pk | 36.3 | -48.69 | 54.29 | 74 | -19.71 | - | - | 229 | 100 | H |
| 8.1757 | 61.66 | Av | 36.3 | -48.68 | 49.28 | - | - | 54 | -4.72 | 229 | 100 | H |
| 8.1759 | 66.07 | Pk | 36.3 | -48.69 | 53.68 | 74 | -20.32 | - | - | 169 | 100 | V |
| 8.1757 | 60.73 | Av | 36.3 | -48.68 | 48.35 | - | - | 54 | -5.65 | 169 | 100 | V |

Pk - Peak detector
Av - Linear Average detection

**Transmitter High Channel – PLOT – Battery Mode**



## Transmitter High Channel – DATA – Battery Mode

Fibar Group S.A.
Swipe
TX High CH 916MHz
Battery
Trace Markers

| Marker No. | Test Frequency (GHz) | Meter Reading dBuV | Detector | Antenna Factor dBm | Gain/Loss (dB) | Corrected Reading dBuV/m | PK Limit | PK Margin (dB) | AV Limit | AV Margin (dB) | Azimuth [Degs] | Height [cm] | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.199 | 71.11 | Pk | 28.3 | -57.31 | 42.1 | 74 | -31.9 | 54 | -11.9 | 0-360 | 150 | H |
| 2 | 1.979 | 64.31 | Pk | 31.7 | -54.12 | 41.89 | 74 | -32.11 | 54 | -12.11 | 0-360 | 100 | H |
| 3 | 2.487 | 63.64 | Pk | 22.1 | -51.3 | 34.44 | 74 | -39.56 | 54 | -19.56 | 0-360 | 150 | H |
| 4 | 3.661 | 62.38 | Pk | 23.4 | -49.36 | 36.42 | 74 | -37.58 | 54 | -17.58 | 0-360 | 150 | H |
| 5 | 4.58 | 62.09 | Pk | 27.7 | -51.85 | 37.94 | 74 | -36.06 | 54 | -16.06 | 0-360 | 100 | H |
| 6 | 5.327 | 57.32 | Pk | 28 | -49.63 | 35.69 | 74 | -38.31 | 54 | -18.31 | 0-360 | 149 | H |
| 7 | 6.516 | 55.92 | Pk | 29 | -47.25 | 37.67 | 74 | -36.33 | 54 | -16.33 | 0-360 | 149 | H |
| 8 | 7.329 | 57.62 | Pk | 30.7 | -46.06 | 42.26 | 74 | -31.74 | 54 | -11.74 | 0-360 | 149 | H |
| 9 | 8.2438 | 63.37 | Pk | 36.4 | -48.49 | 51.28 | 74 | -22.72 | 54 | -2.72 | 0-360 | 150 | H |
| 10 | 9.1603 | 58.26 | Pk | 36.3 | -48.39 | 46.17 | 74 | -27.83 | 54 | -7.83 | 0-360 | 100 | H |
| 11 | 1.199 | 69.75 | Pk | 28.3 | -57.31 | 40.74 | 74 | -33.26 | 54 | -13.26 | 0-360 | 150 | V |
| 12 | 1.944 | 65.5 | Pk | 31.4 | -54.34 | 42.56 | 74 | -31.44 | 54 | -11.44 | 0-360 | 100 | V |
| 13 | 2.533 | 63.36 | Pk | 22.2 | -50.94 | 34.62 | 74 | -39.38 | 54 | -19.38 | 0-360 | 150 | V |
| 14 | 3.646 | 61.08 | Pk | 23.3 | -49.57 | 34.81 | 74 | -39.19 | 54 | -19.19 | 0-360 | 100 | V |
| 15 | 4.58 | 62.52 | Pk | 27.7 | -51.85 | 38.37 | 74 | -35.63 | 54 | -15.63 | 0-360 | 150 | V |
| 16 | 5.369 | 56.74 | Pk | 28 | -49.94 | 34.8 | 74 | -39.2 | 54 | -19.2 | 0-360 | 150 | V |
| 17 | 6.533 | 55.66 | Pk | 29 | -47.24 | 37.42 | 74 | -36.58 | 54 | -16.58 | 0-360 | 100 | V |
| 18 | 7.328 | 55.58 | Pk | 30.7 | -46.04 | 40.24 | 74 | -33.76 | 54 | -13.76 | 0-360 | 150 | V |
| 19 | 8.2438 | 61.71 | Pk | 36.4 | -48.49 | 49.62 | 74 | -24.38 | 54 | -4.38 | 0-360 | 100 | V |
| 20 | 9.1603 | 59.91 | Pk | 36.3 | -48.39 | 47.82 | 74 | -26.18 | 54 | -6.18 | 0-360 | 100 | V |

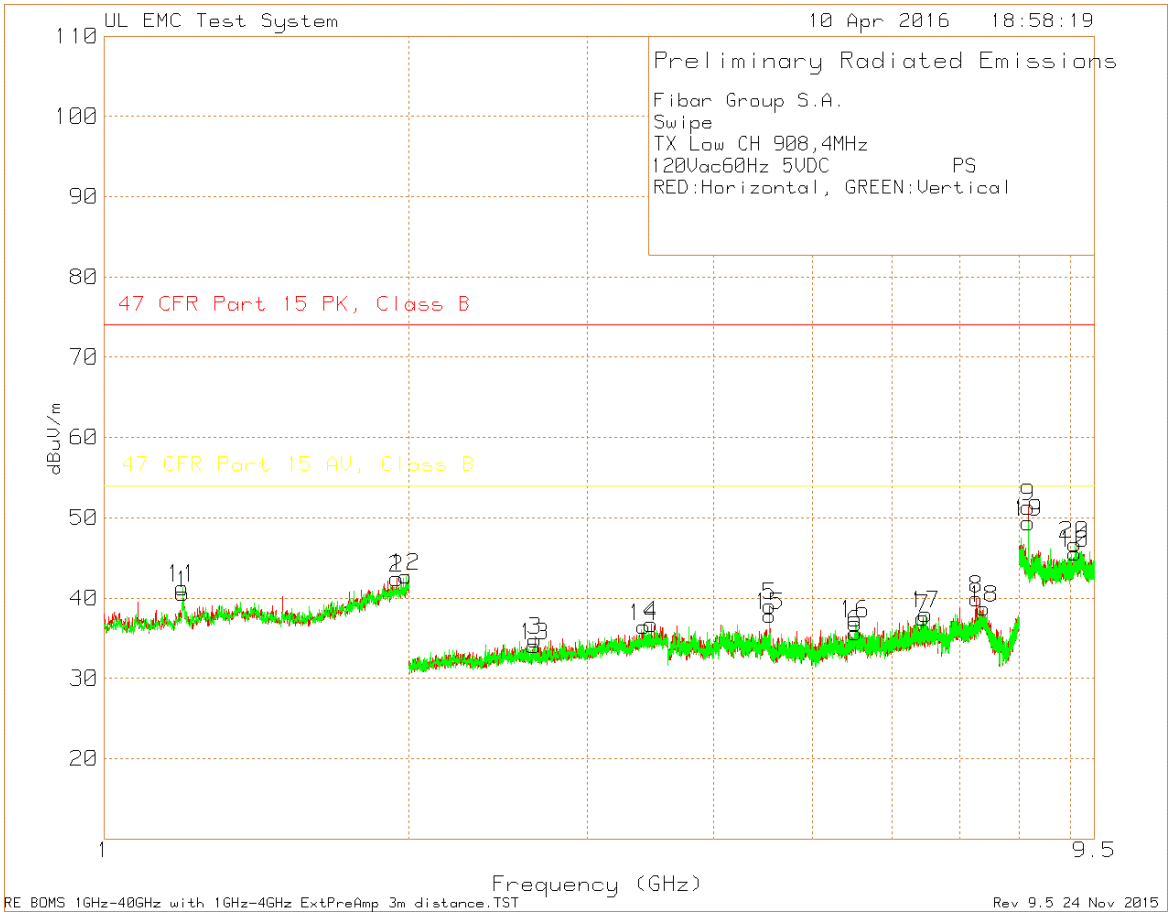
Pk - Peak detector

Measurement Data

| Test Frequency (GHz) | Meter Reading dBuV | Detector | Antenna Factor dBm | Gain/Loss (dB) | Corrected Reading dBuV/m | PK Limit | PK Margin (dB) | AV Limit | AV Margin (dB) | Azimuth [Degs] | Height [cm] | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8.244 | 66.76 | Pk | 36.4 | -48.48 | 54.68 | 74 | -19.32 | - | - | 234 | 111 | H |
| 8.244 | 62.03 | Av | 36.4 | -48.48 | 49.95 | - | - | 54 | -4.05 | 234 | 111 | H |
| 8.2438 | 65.71 | Pk | 36.4 | -48.49 | 53.62 | 74 | -20.38 | - | - | 168 | 100 | V |
| 8.244 | 59.63 | Av | 36.4 | -48.48 | 47.55 | - | - | 54 | -6.45 | 168 | 100 | V |

Pk - Peak detector
Av - Linear Average detection

**Transmitter Low Channel – PLOT – EXT 5VDC Mode**



## Transmitter Low Channel – DATA – External 5VDC Mode

Fibar Group S.A.
Swipe
TX Low CH 908,4MHz
120Vac60Hz 5VDC PS
Trace Markers

| Marker No. | Test Frequency (GHz) | Meter Reading dBuV | Detector | Antenna Factor dBm | Gain/Loss (dB) | Corrected Reading dBuV/m | PK Limit | PK Margin (dB) | AV Limit | AV Margin (dB) | Azimuth [Degs] | Height [cm] | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.196 | 69.61 | Pk | 28.3 | -57.32 | 40.59 | 74 | -33.41 | 54 | -13.41 | 0-360 | 150 | H |
| 2 | 1.946 | 65.27 | Pk | 31.5 | -54.31 | 42.46 | 74 | -31.54 | 54 | -11.54 | 0-360 | 100 | H |
| 3 | 2.663 | 63.41 | Pk | 22.2 | -50.84 | 34.77 | 74 | -39.23 | 54 | -19.23 | 0-360 | 100 | H |
| 4 | 3.47 | 63.87 | Pk | 23.5 | -50.6 | 36.77 | 74 | -37.23 | 54 | -17.23 | 0-360 | 150 | H |
| 5 | 4.542 | 63.07 | Pk | 27.8 | -51.81 | 39.06 | 74 | -34.94 | 54 | -14.94 | 0-360 | 100 | H |
| 6 | 5.518 | 57.19 | Pk | 28.2 | -49.72 | 35.67 | 74 | -38.33 | 54 | -18.33 | 0-360 | 149 | H |
| 7 | 6.433 | 55.93 | Pk | 29.2 | -47.59 | 37.54 | 74 | -36.46 | 54 | -16.46 | 0-360 | 100 | H |
| 8 | 7.268 | 55.75 | Pk | 30.2 | -46.02 | 39.93 | 74 | -34.07 | 54 | -14.07 | 0-360 | 100 | H |
| 9 | 8.1755 | 63.74 | Pk | 36.3 | -48.68 | 51.36 | 74 | -22.64 | 54 | -2.64 | 0-360 | 150 | H |
| 10 | 9.0845 | 58.09 | Pk | 36.2 | -48.7 | 45.59 | 74 | -28.41 | 54 | -8.41 | 0-360 | 150 | H |
| 11 | 1.195 | 70.32 | Pk | 28.3 | -57.32 | 41.3 | 74 | -32.7 | 54 | -12.7 | 0-360 | 150 | V |
| 12 | 1.985 | 65.1 | Pk | 31.7 | -54.07 | 42.73 | 74 | -31.27 | 54 | -11.27 | 0-360 | 150 | V |
| 13 | 2.659 | 62.7 | Pk | 22.2 | -50.85 | 34.05 | 74 | -39.95 | 54 | -19.95 | 0-360 | 150 | V |
| 14 | 3.411 | 63.33 | Pk | 23.5 | -50.38 | 36.45 | 74 | -37.55 | 54 | -17.55 | 0-360 | 150 | V |
| 15 | 4.542 | 61.85 | Pk | 27.8 | -51.81 | 37.84 | 74 | -36.16 | 54 | -16.16 | 0-360 | 150 | V |
| 16 | 5.515 | 58.39 | Pk | 28.2 | -49.74 | 36.85 | 74 | -37.15 | 54 | -17.15 | 0-360 | 150 | V |
| 17 | 6.476 | 56.32 | Pk | 29.1 | -47.42 | 38 | 74 | -36 | 54 | -16 | 0-360 | 100 | V |
| 18 | 7.387 | 54.47 | Pk | 31.1 | -46.82 | 38.75 | 74 | -35.25 | 54 | -15.25 | 0-360 | 150 | V |
| 19 | 8.1755 | 61.79 | Pk | 36.3 | -48.68 | 49.41 | 74 | -24.59 | 54 | -4.59 | 0-360 | 100 | V |
| 20 | 9.0845 | 59.22 | Pk | 36.2 | -48.7 | 46.72 | 74 | -27.28 | 54 | -7.28 | 0-360 | 100 | V |

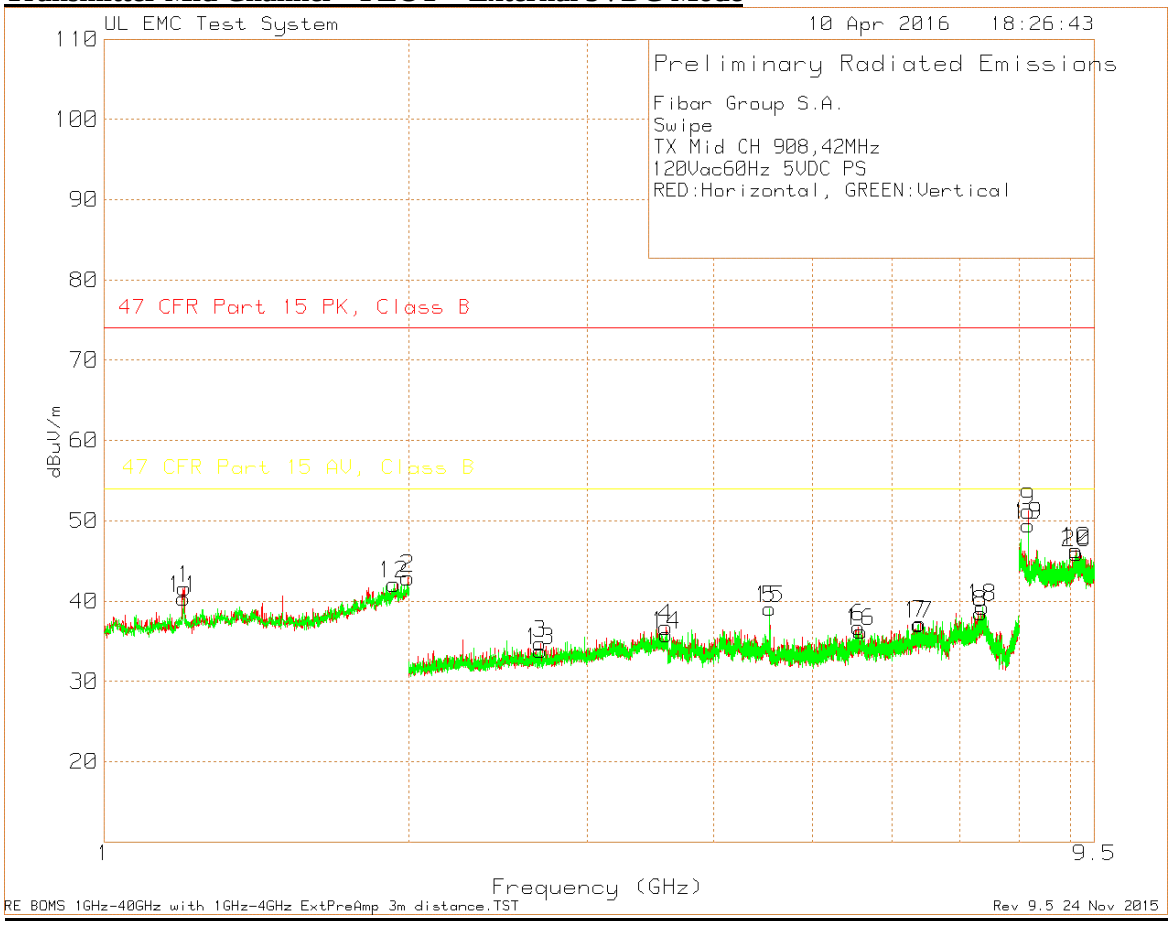
Pk - Peak detector

Measurement Data

| Test Frequency (GHz) | Meter Reading dBuV | Detector | Antenna Factor dBm | Gain/Loss (dB) | Corrected Reading dBuV/m | PK Limit | PK Margin (dB) | AV Limit | AV Margin (dB) | Azimuth [Degs] | Height [cm] | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8.1755 | 67.61 | Pk | 36.3 | -48.68 | 55.23 | 74 | -18.77 | - | - | 227 | 125 | H |
| 8.1756 | 63.34 | Av | 36.3 | -48.68 | 50.96 | - | - | 54 | -3.04 | 227 | 125 | H |
| 8.1758 | 65.64 | Pk | 36.3 | -48.68 | 53.26 | 74 | -20.74 | - | - | 164 | 100 | V |
| 8.1756 | 60.19 | Av | 36.3 | -48.68 | 47.81 | - | - | 54 | -6.19 | 164 | 100 | V |

Pk - Peak detector
Av - Average detection

**Transmitter Mid Channel – PLOT – External 5VDC Mode**



## Transmitter Mid Channel – DATA – External 5VDC Mode

Fibar Group S.A.
Swipe
TX Mid CH 908,42MHz
120Vac60Hz 5VDC PS
Trace Markers

| Marker No. | Test Frequency (GHz) | Meter Reading dBuV | Detector | Antenna Factor dBm | Gain/Loss (dB) | Corrected Reading dBuV/m | PK Limit | PK Margin (dB) | AV Limit | AV Margin (dB) | Azimuth [Degs] | Height [cm] | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.2 | 70.62 | Pk | 28.3 | -57.31 | 41.61 | 74 | -32.39 | 54 | -12.39 | 0-360 | 150 | H |
| 2 | 1.995 | 65.22 | Pk | 31.7 | -54.02 | 42.9 | 74 | -31.1 | 54 | -11.1 | 0-360 | 100 | H |
| 3 | 2.695 | 63.53 | Pk | 22.1 | -50.88 | 34.75 | 74 | -39.25 | 54 | -19.25 | 0-360 | 150 | H |
| 4 | 3.586 | 64.03 | Pk | 23.2 | -50.49 | 36.74 | 74 | -37.26 | 54 | -17.26 | 0-360 | 100 | H |
| 5 | 4.542 | 63.08 | Pk | 27.8 | -51.81 | 39.07 | 74 | -34.93 | 54 | -14.93 | 0-360 | 100 | H |
| 6 | 5.556 | 57.96 | Pk | 28.3 | -49.49 | 36.77 | 74 | -37.23 | 54 | -17.23 | 0-360 | 149 | H |
| 7 | 6.389 | 55.68 | Pk | 29.2 | -47.67 | 37.21 | 74 | -36.79 | 54 | -16.79 | 0-360 | 100 | H |
| 8 | 7.339 | 54.01 | Pk | 30.7 | -46.19 | 38.52 | 74 | -35.48 | 54 | -15.48 | 0-360 | 100 | H |
| 9 | 8.1755 | 63.64 | Pk | 36.3 | -48.68 | 51.26 | 74 | -22.74 | 54 | -2.74 | 0-360 | 99 | H |
| 10 | 9.1123 | 58.44 | Pk | 36.2 | -48.32 | 46.32 | 74 | -27.68 | 54 | -7.68 | 0-360 | 99 | H |
| 11 | 1.198 | 69.34 | Pk | 28.3 | -57.31 | 40.33 | 74 | -33.67 | 54 | -13.67 | 0-360 | 150 | V |
| 12 | 1.933 | 65.21 | Pk | 31.4 | -54.49 | 42.12 | 74 | -31.88 | 54 | -11.88 | 0-360 | 150 | V |
| 13 | 2.696 | 62.62 | Pk | 22.1 | -50.89 | 33.83 | 74 | -40.17 | 54 | -20.17 | 0-360 | 150 | V |
| 14 | 3.589 | 63.12 | Pk | 23.2 | -50.5 | 35.82 | 74 | -38.18 | 54 | -18.18 | 0-360 | 100 | V |
| 15 | 4.542 | 63.1 | Pk | 27.8 | -51.81 | 39.09 | 74 | -34.91 | 54 | -14.91 | 0-360 | 100 | V |
| 16 | 5.585 | 57.31 | Pk | 28.4 | -49.49 | 36.22 | 74 | -37.78 | 54 | -17.78 | 0-360 | 100 | V |
| 17 | 6.374 | 55.51 | Pk | 29.2 | -47.6 | 37.11 | 74 | -36.89 | 54 | -16.89 | 0-360 | 150 | V |
| 18 | 7.365 | 54.67 | Pk | 30.9 | -46.34 | 39.23 | 74 | -34.77 | 54 | -14.77 | 0-360 | 150 | V |
| 19 | 8.1755 | 61.83 | Pk | 36.3 | -48.68 | 49.45 | 74 | -24.55 | 54 | -4.55 | 0-360 | 150 | V |
| 20 | 9.1265 | 57.98 | Pk | 36.3 | -48.27 | 46.01 | 74 | -27.99 | 54 | -7.99 | 0-360 | 100 | V |

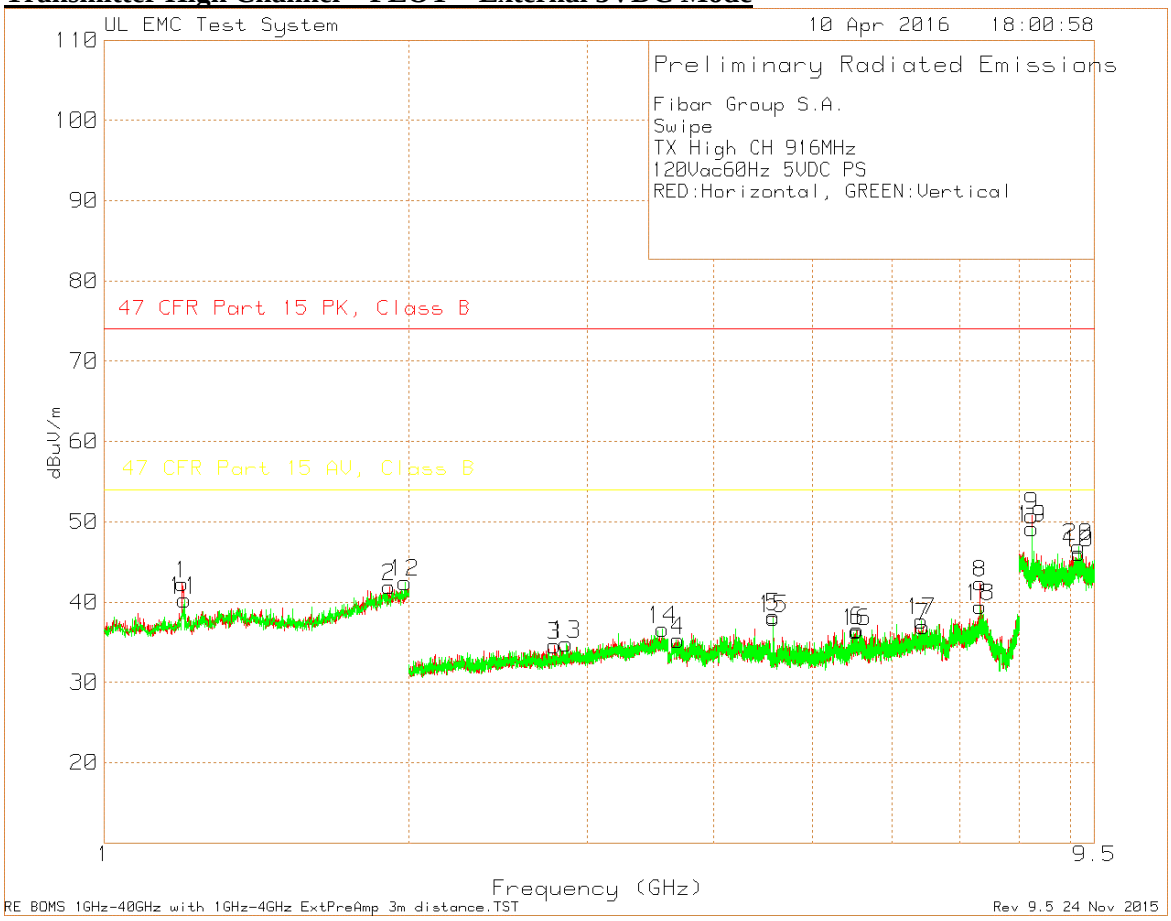
Pk - Peak detector

Measurement Data

| Test Frequency (GHz) | Meter Reading dBuV | Detector | Antenna Factor dBm | Gain/Loss (dB) | Corrected Reading dBuV/m | PK Limit | PK Margin (dB) | AV Limit | AV Margin (dB) | Azimuth [Degs] | Height [cm] | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8.1758 | 66.92 | Pk | 36.3 | -48.68 | 54.54 | 74 | -19.46 | - | - | 229 | 125 | H |
| 8.1757 | 62.41 | Av | 36.3 | -48.68 | 50.03 | - | - | 54 | -3.97 | 229 | 125 | H |
| 8.1756 | 66.27 | Pk | 36.3 | -48.68 | 53.89 | 74 | -20.11 | - | - | 98 | 122 | V |
| 8.1757 | 60.58 | Av | 36.3 | -48.68 | 48.2 | - | - | 54 | -5.8 | 98 | 122 | V |

Pk - Peak detector
Av - Average detection

**Transmitter High Channel – PLOT – External 5VDC Mode**



## Transmitter High Channel – DATA – External 5VDC Mode

Fibar Group S.A.
Swipe
TX High CH 916MHz
120Vac60Hz 5VDC PS
Trace Markers

| Marker No. | Test Frequency (GHz) | Meter Reading dBuV | Detector | Antenna Factor dBm | Gain/Loss (dB) | Corrected Reading dBuV/m | PK Limit | PK Margin (dB) | AV Limit | AV Margin (dB) | Azimuth [Degs] | Height [cm] | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.194 | 71.33 | Pk | 28.3 | -57.33 | 42.3 | 74 | -31.7 | 54 | -11.7 | 0-360 | 150 | H |
| 2 | 1.912 | 65.34 | Pk | 31.3 | -54.69 | 41.95 | 74 | -32.05 | 54 | -12.05 | 0-360 | 150 | H |
| 3 | 2.784 | 63.1 | Pk | 22.2 | -50.72 | 34.58 | 74 | -39.42 | 54 | -19.42 | 0-360 | 150 | H |
| 4 | 3.687 | 60.99 | Pk | 23.5 | -49.24 | 35.25 | 74 | -38.75 | 54 | -18.75 | 0-360 | 150 | H |
| 5 | 4.58 | 62.35 | Pk | 27.7 | -51.85 | 38.2 | 74 | -35.8 | 54 | -15.8 | 0-360 | 100 | H |
| 6 | 5.543 | 57.78 | Pk | 28.3 | -49.58 | 36.5 | 74 | -37.5 | 54 | -17.5 | 0-360 | 100 | H |
| 7 | 6.432 | 55.35 | Pk | 29.2 | -47.59 | 36.96 | 74 | -37.04 | 54 | -17.04 | 0-360 | 100 | H |
| 8 | 7.328 | 57.71 | Pk | 30.7 | -46.04 | 42.37 | 74 | -31.63 | 54 | -11.63 | 0-360 | 149 | H |
| 9 | 8.2445 | 62.86 | Pk | 36.4 | -48.48 | 50.78 | 74 | -23.22 | 54 | -3.22 | 0-360 | 100 | H |
| 10 | 9.1693 | 58.09 | Pk | 36.3 | -48.27 | 46.12 | 74 | -27.88 | 54 | -7.88 | 0-360 | 150 | H |
| 11 | 1.2 | 69.28 | Pk | 28.3 | -57.31 | 40.27 | 74 | -33.73 | 54 | -13.73 | 0-360 | 150 | V |
| 12 | 1.982 | 64.88 | Pk | 31.7 | -54.1 | 42.48 | 74 | -31.52 | 54 | -11.52 | 0-360 | 150 | V |
| 13 | 2.86 | 63.04 | Pk | 22.4 | -50.64 | 34.8 | 74 | -39.2 | 54 | -19.2 | 0-360 | 100 | V |
| 14 | 3.56 | 63.76 | Pk | 23.3 | -50.45 | 36.61 | 74 | -37.39 | 54 | -17.39 | 0-360 | 100 | V |
| 15 | 4.58 | 62.13 | Pk | 27.7 | -51.85 | 37.98 | 74 | -36.02 | 54 | -16.02 | 0-360 | 150 | V |
| 16 | 5.531 | 57.84 | Pk | 28.2 | -49.67 | 36.37 | 74 | -37.63 | 54 | -17.63 | 0-360 | 100 | V |
| 17 | 6.412 | 56.05 | Pk | 29.2 | -47.58 | 37.67 | 74 | -36.33 | 54 | -16.33 | 0-360 | 150 | V |
| 18 | 7.329 | 54.81 | Pk | 30.7 | -46.06 | 39.45 | 74 | -34.55 | 54 | -14.55 | 0-360 | 100 | V |
| 19 | 8.2438 | 61.27 | Pk | 36.4 | -48.49 | 49.18 | 74 | -24.82 | 54 | -4.82 | 0-360 | 150 | V |
| 20 | 9.1603 | 59.05 | Pk | 36.3 | -48.39 | 46.96 | 74 | -27.04 | 54 | -7.04 | 0-360 | 100 | V |

Pk - Peak detector

Measurement Data

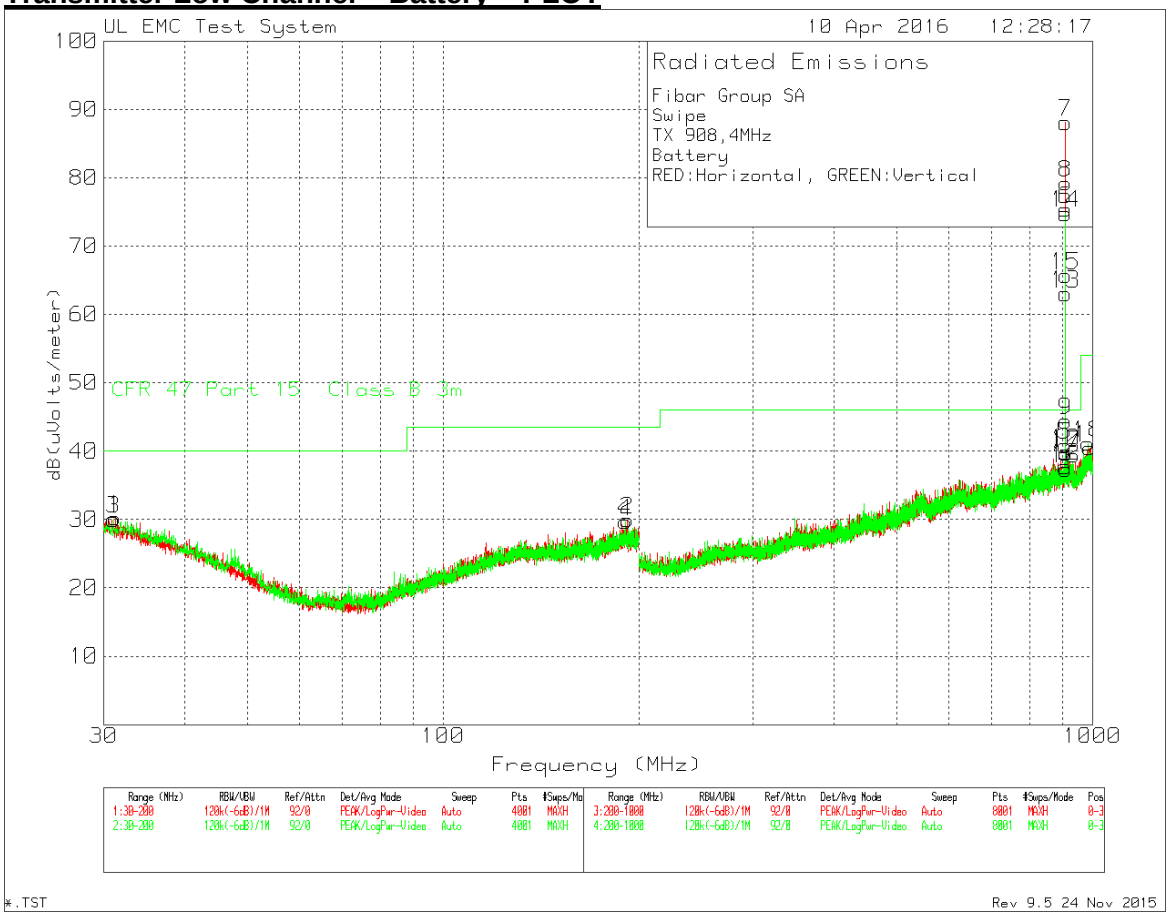
| Test Frequency (GHz) | Meter Reading dBuV | Detector | Antenna Factor dBm | Gain/Loss (dB) | Corrected Reading dBuV/m | PK Limit | PK Margin (dB) | AV Limit | AV Margin (dB) | Azimuth [Degs] | Height [cm] | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8.2438 | 67.15 | Pk | 36.4 | -48.49 | 55.06 | 74 | -18.94 | - | - | 231 | 119 | H |
| 8.244 | 62.36 | Av | 36.4 | -48.48 | 50.28 | - | - | 54 | -3.72 | 231 | 119 | H |
| 8.244 | 66.25 | Pk | 36.4 | -48.48 | 54.17 | 74 | -19.83 | - | - | 92 | 118 | V |
| 8.244 | 60.19 | Av | 36.4 | -48.48 | 48.11 | - | - | 54 | -5.89 | 92 | 118 | V |

Pk - Peak detector
Av - Average detection

### 7.2.3. WORST-CASE BELOW 1 GHz

**SPURIOUS EMISSIONS 30 TO 1000 MHz**

**Transmitter Low Channel – Battery – PLOT**




All visible emissions are at least 6dB below the limit or under the noise floor, therefore no further measurement needed. The transmit signal remains within the 902-928MHz operational band, outside of the restricted bands 15.205.

## Transmitter Low Channel – Battery – DATA

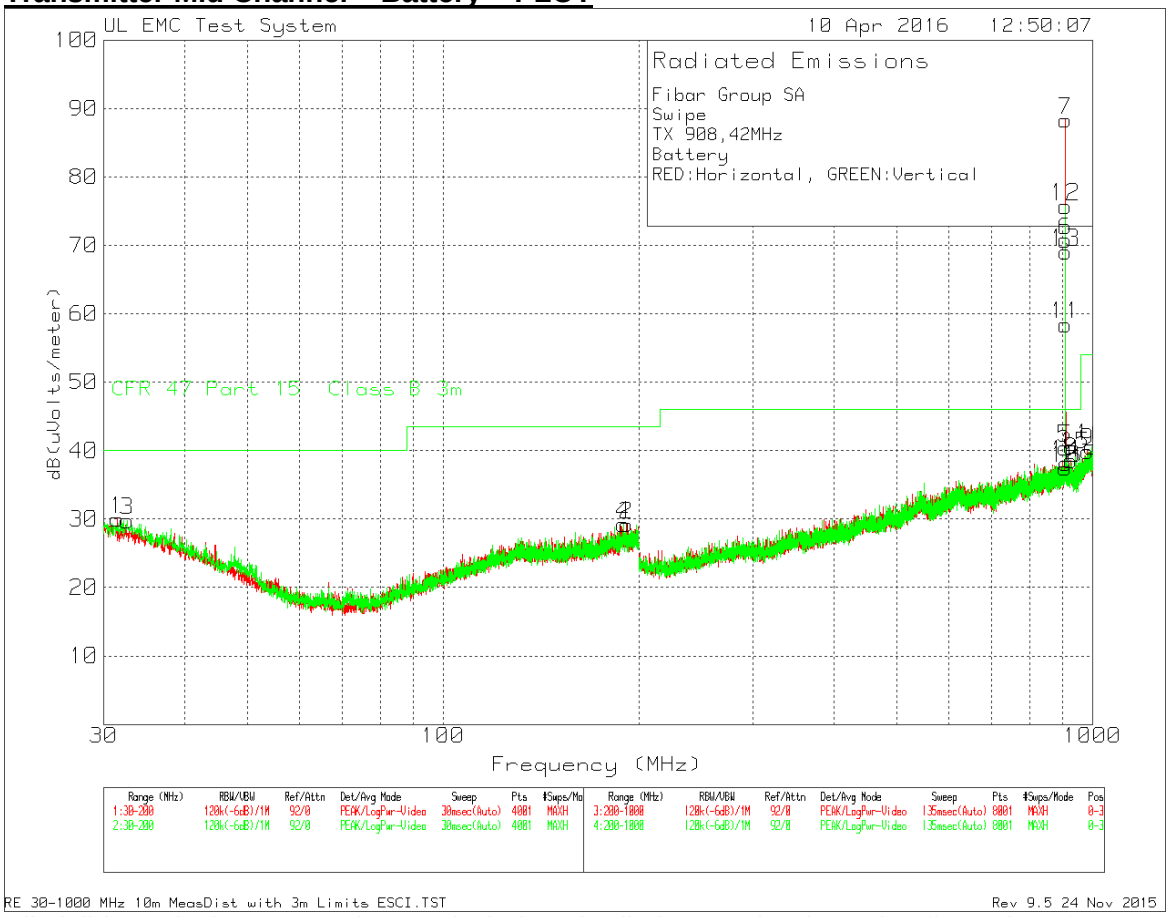
Fibar Group S.A.
Swipe
TX 908,4MHz
Battery
Trace Markers

| Marker No. | Test Frequency (MHz) | Meter Reading (dBuV) | Detector | Antenna Factor dBm | Gain/Loss (dBm) | 10M to 3M Factor dB | Corrected Reading dB(uVolts/ meter) | Qp Limit | Margin (dB) | Azimuth [Degs] | Height [cm] | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 31.2325 | 32.04 | Pk | 17.7 | -30 | 10.5 | 30.24 | 40 | -9.76 | 0-360 | 241 | H |
| 2 | 192.18 | 32.38 | Pk | 16 | -28.9 | 10.5 | 29.98 | 43.52 | -13.54 | 0-360 | 241 | H |
| 3 | 31.0625 | 31.74 | Pk | 17.8 | -30 | 10.5 | 30.04 | 40 | -9.96 | 0-360 | 251 | V |
| 4 | 190.82 | 32.11 | Pk | 16 | -28.9 | 10.5 | 29.71 | 43.52 | -13.81 | 0-360 | 398 | V |
| 5* | 908.2 | 33.83 | Pk | 23.2 | -26.7 | 10.5 | 40.83 | * | * | 0-360 | 100 | H |
| 6* | 908.3 | 68.39 | Pk | 23.2 | -26.7 | 10.5 | 75.39 | * | * | 0-360 | 100 | H |
| 7 | 908.5 | 81.09 | Pk | 23.2 | -26.7 | 10.5 | 88.09 | 46.02 | 42.07 | 0-360 | 100 | H |
| 8* | 908.6 | 72.25 | Pk | 23.2 | -26.7 | 10.5 | 79.25 | * | * | 0-360 | 100 | H |
| 9* | 908.7 | 37.42 | Pk | 23.2 | -26.7 | 10.5 | 44.42 | * | * | 0-360 | 100 | H |
| 10 | 909.7 | 32.77 | Pk | 23.2 | -26.6 | 10.5 | 39.87 | 46.02 | -6.15 | 0-360 | 100 | H |
| 11 | 989 | 30.97 | Pk | 24.6 | -25.6 | 10.5 | 40.47 | 53.97 | -13.5 | 0-360 | 100 | H |
| 12* | 908.2 | 30.77 | Pk | 23.2 | -26.7 | 10.5 | 37.77 | * | * | 0-360 | 199 | V |
| 13* | 908.3 | 56.03 | Pk | 23.2 | -26.7 | 10.5 | 63.03 | * | * | 0-360 | 299 | V |
| 14 | 908.5 | 67.8 | Pk | 23.2 | -26.7 | 10.5 | 74.8 | 46.02 | 28.78 | 0-360 | 299 | V |
| 15* | 908.6 | 58.71 | Pk | 23.2 | -26.7 | 10.5 | 65.71 | * | * | 0-360 | 399 | V |
| 16* | 908.7 | 30.39 | Pk | 23.2 | -26.7 | 10.5 | 37.39 | * | * | 0-360 | 299 | V |
| 17 | 911.1 | 32.46 | Pk | 23.2 | -26.5 | 10.5 | 39.66 | 46.02 | -6.36 | 0-360 | 199 | V |
| 18 | 983.6 | 31.75 | Pk | 24.6 | -25.7 | 10.5 | 41.15 | 53.97 | -12.82 | 0-360 | 103 | V |

Pk - Peak detector
* - Transmit Signal Bandedge Markers

All visible emissions are at least 6dB below the limit or under the noise floor, therefore no further measurement needed. The transmit signal remains within the 902-928MHz operational band, outside of the restricted bands 15.205.

**Transmitter Mid Channel – Battery – PLOT**




All visible emissions are at least 6dB below the limit or under the noise floor, therefore no further measurement needed. The transmit signal remains within the 902-928MHz operational band, outside of the restricted bands 15.205.

## Transmitter Mid Channel – Battery – DATA

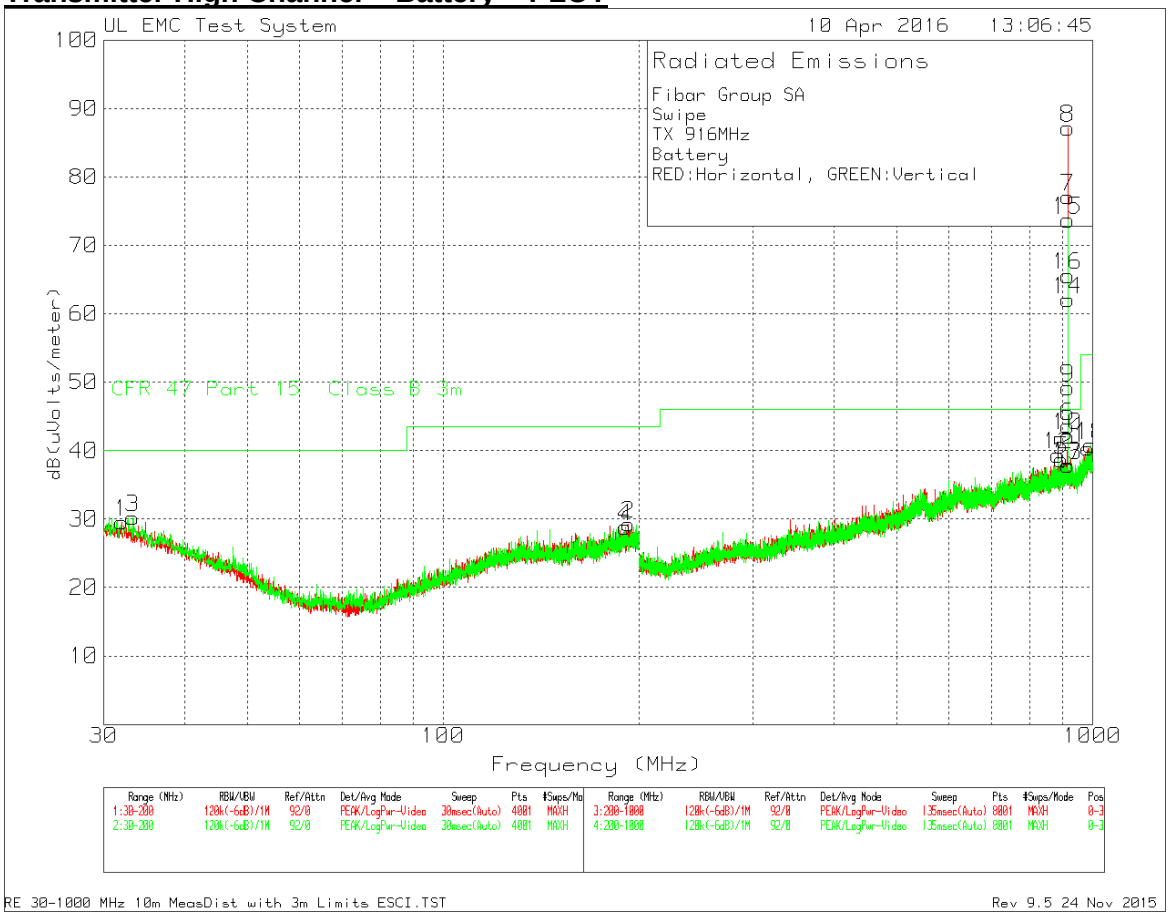
Fibar Group S.A.
Swipe
TX 908,42MHz
Battery
Trace Markers

| Marker No. | Test Frequency (MHz) | Meter Reading (dBuV) | Detector | Antenna Factor dBm | Gain/Loss (dBm) | 10M to 3M Factor dB | Corrected Reading dB(uVolts/ meter) | Qp Limit | Margin (dB) | Azimuth [Degs] | Height [cm] | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 31.4875 | 31.89 | Pk | 17.6 | -30 | 10.5 | 29.99 | 40 | -10.01 | 0-360 | 398 | H |
| 2 | 191.585 | 31.59 | Pk | 16 | -28.9 | 10.5 | 29.19 | 43.52 | -14.33 | 0-360 | 398 | H |
| 3 | 32.5925 | 32.16 | Pk | 17.1 | -30 | 10.5 | 29.76 | 40 | -10.24 | 0-360 | 398 | V |
| 4 | 189.5875 | 31.7 | Pk | 16 | -29 | 10.5 | 29.2 | 43.52 | -14.32 | 0-360 | 101 | V |
| 5* | 908.2 | 33.39 | Pk | 23.2 | -26.7 | 10.5 | 40.39 | * | * | 0-360 | 299 | H |
| 6* | 908.3 | 63.74 | Pk | 23.2 | -26.7 | 10.5 | 70.74 | * | * | 0-360 | 100 | H |
| 7 | 908.5 | 81.31 | Pk | 23.2 | -26.7 | 10.5 | 88.31 | 46.02 | 42.29 | 0-360 | 100 | H |
| 8* | 926.2 | 31.52 | Pk | 23.1 | -26.6 | 10.5 | 38.52 | * | * | 0-360 | 399 | H |
| 9 | 981.9 | 30.7 | Pk | 24.5 | -25.8 | 10.5 | 39.9 | 53.97 | -14.07 | 0-360 | 399 | H |
| 10* | 908.2 | 30.44 | Pk | 23.2 | -26.7 | 10.5 | 37.44 | * | * | 0-360 | 102 | V |
| 11* | 908.3 | 51.39 | Pk | 23.2 | -26.7 | 10.5 | 58.39 | * | * | 0-360 | 399 | V |
| 12 | 908.5 | 68.67 | Pk | 23.2 | -26.7 | 10.5 | 75.67 | 46.02 | 29.65 | 0-360 | 299 | V |
| 13* | 908.6 | 62.02 | Pk | 23.2 | -26.7 | 10.5 | 69.02 | * | * | 0-360 | 299 | V |
| 14* | 908.7 | 31.19 | Pk | 23.2 | -26.7 | 10.5 | 38.19 | * | * | 0-360 | 299 | V |
| 15 | 940.1 | 32.92 | Pk | 22.5 | -26.5 | 10.5 | 39.42 | 46.02 | -6.6 | 0-360 | 199 | V |
| 16 | 995.7 | 31.18 | Pk | 24.4 | -25.5 | 10.5 | 40.58 | 53.97 | -13.39 | 0-360 | 199 | V |

Pk - Peak detector
* - Transmit Signal Bandedge Markers

All visible emissions are at least 6dB below the limit or under the noise floor, therefore no further measurement needed. The transmit signal remains within the 902-928MHz operational band, outside of the restricted bands 15.205.

**Transmitter High Channel – Battery – PLOT**




All visible emissions are at least 6dB below the limit or under the noise floor, therefore no further measurement needed. The transmit signal remains within the 902-928MHz operational band, outside of the restricted bands 15.205.

## Transmitter High Channel – Battery – DATA

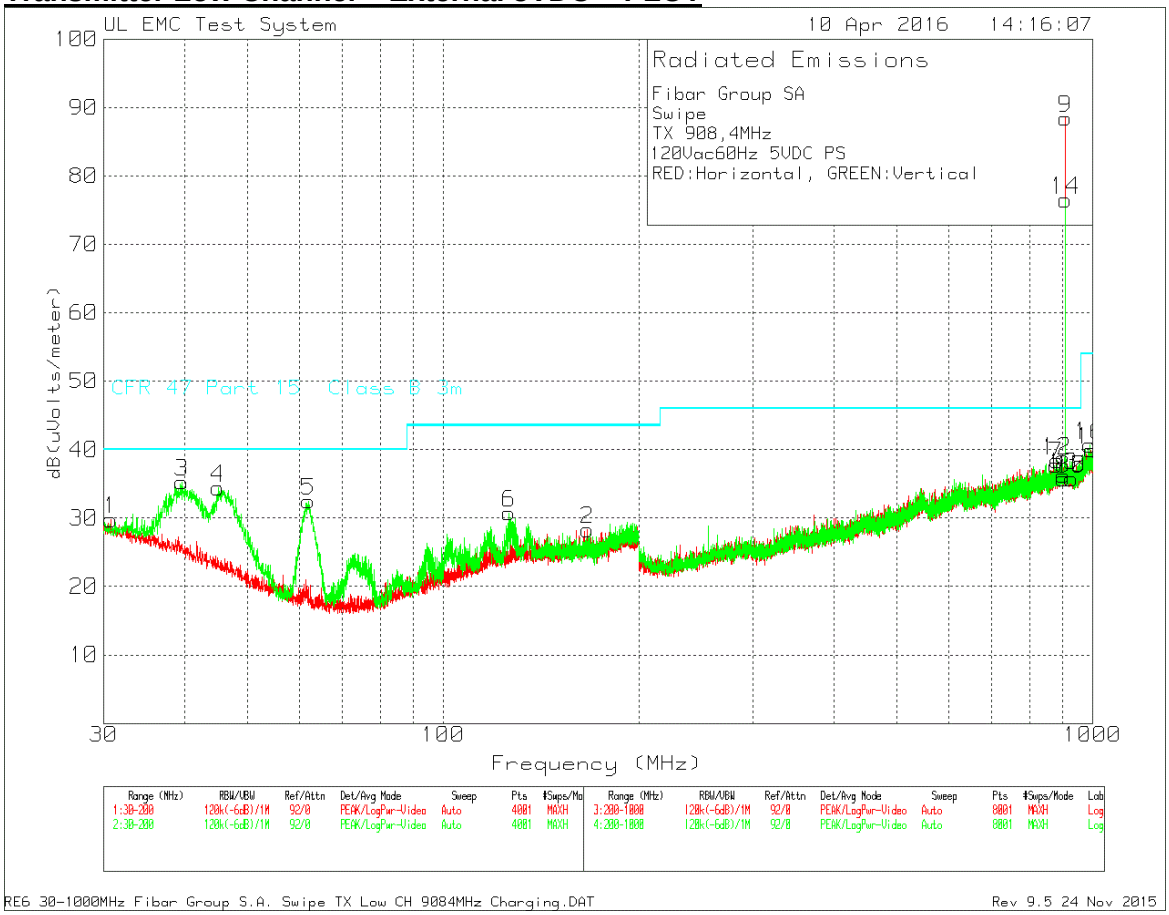
Fibar Group S.A.
Swipe
TX 916MHz
Battery
Trace Markers

| Marker No. | Test Frequency (MHz) | Meter Reading (dBuV) | Detector | Antenna Factor dBm | Gain/Loss (dBm) | 10M to 3M Factor dB | Corrected Reading dB(uVolts/ meter) | Qp Limit | Margin (dB) | Azimuth [Degs] | Height [cm] | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 31.9975 | 31.77 | Pk | 17.3 | -30 | 10.5 | 29.57 | 40 | -10.43 | 0-360 | 251 | H |
| 2 | 192.945 | 31.58 | Pk | 16 | -28.8 | 10.5 | 29.28 | 43.52 | -14.24 | 0-360 | 101 | H |
| 3 | 33.2725 | 32.81 | Pk | 16.9 | -30 | 10.5 | 30.21 | 40 | -9.79 | 0-360 | 251 | V |
| 4 | 190.6075 | 31.33 | Pk | 16 | -29 | 10.5 | 28.83 | 43.52 | -14.69 | 0-360 | 251 | V |
| 5 | 895.2 | 31.95 | Pk | 22.9 | -26.7 | 10.5 | 38.65 | 46.02 | -7.37 | 0-360 | 199 | H |
| 6 | 915.8 | 36.99 | Pk | 23 | -26.9 | 10.5 | 43.59 | * | * | 0-360 | 299 | H |
| 7 | 915.9 | 70.52 | Pk | 23 | -26.9 | 10.5 | 77.12 | * | * | 0-360 | 299 | H |
| 8 | 916.1 | 80.65 | Pk | 23 | -27 | 10.5 | 87.15 | 46.02 | 41.13 | 0-360 | 102 | H |
| 9 | 916.3 | 42.7 | Pk | 23 | -27 | 10.5 | 49.2 | * | * | 0-360 | 102 | H |
| 10 | 916.4 | 35.68 | Pk | 23 | -27 | 10.5 | 42.18 | * | * | 0-360 | 299 | H |
| 11 | 984.3 | 30.84 | Pk | 24.7 | -25.7 | 10.5 | 40.34 | 53.97 | -13.63 | 0-360 | 199 | H |
| 12 | 885 | 33.07 | Pk | 22.6 | -26.8 | 10.5 | 39.37 | 46.02 | -6.65 | 0-360 | 103 | V |
| 13* | 915.8 | 31.26 | Pk | 23 | -26.9 | 10.5 | 37.86 | * | * | 0-360 | 299 | V |
| 14* | 915.9 | 55.48 | Pk | 23 | -26.9 | 10.5 | 62.08 | * | * | 0-360 | 399 | V |
| 15 | 916.1 | 67.2 | Pk | 23 | -27 | 10.5 | 73.7 | 46.02 | 27.68 | 0-360 | 299 | V |
| 16* | 916.2 | 59.11 | Pk | 23 | -27 | 10.5 | 65.61 | * | * | 0-360 | 299 | V |
| 17* | 916.3 | 31.31 | Pk | 23 | -27 | 10.5 | 37.81 | * | * | 0-360 | 299 | V |
| 18 | 994.1 | 31.49 | Pk | 24.4 | -25.6 | 10.5 | 40.79 | 53.97 | -13.18 | 0-360 | 199 | V |

Pk - Peak detector
* - Transmit Signal Bandedge Markers

All visible emissions are at least 6dB below the limit or under the noise floor, therefore no further measurement needed. The transmit signal remains within the 902-928MHz operational band, outside of the restricted bands 15.205.

**Transmitter Low Channel – External 5VDC – PLOT**




The transmit signal remains within the 902-928MHz operational band, outside of the restricted bands 15.205.

## Transmitter Low Channel – External 5VDC – DATA

Fibar Group S.A.
Swipe
TX 908,4MHz
120Vac60Hz 5VDC PS
Trace Markers

| Marker No. | Test Frequency (MHz) | Meter Reading (dBuV) | Detector | Antenna Factor dBm | Gain/Loss (dBm) | 10M to 3M Factor dB | Corrected Reading dB(uVolts/ meter) | Qp Limit | Margin (dB) | Azimuth [Degs] | Height [cm] | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 30.765 | 31.39 | Pk | 17.9 | -30 | 10.5 | 29.79 | 40 | -10.21 | 0-360 | 398 | H |
| 2 | 166.85 | 32.31 | Pk | 14.9 | -29.4 | 10.5 | 28.31 | 43.52 | -15.21 | 0-360 | 398 | H |
| 3 | 39.605 | 40.27 | Pk | 14.5 | -30 | 10.5 | 35.27 | 40 | -4.73 | 0-360 | 101 | V |
| 4 | 45.0025 | 41.49 | Pk | 12.4 | -30 | 10.5 | 34.39 | 40 | -5.61 | 0-360 | 101 | V |
| 5 | 62.0025 | 45.19 | Pk | 6.7 | -29.9 | 10.5 | 32.49 | 40 | -7.51 | 0-360 | 251 | V |
| 6 | 126.305 | 36.15 | Pk | 13.8 | -29.7 | 10.5 | 30.75 | 43.52 | -12.77 | 0-360 | 101 | V |
| 7 | 877.8 | 31.64 | Pk | 22.7 | -26.9 | 10.5 | 37.94 | 46.02 | -8.08 | 0-360 | 399 | H |
| 8* | 908.2 | 36.89 | Pk | 23.2 | -26.7 | 10.5 | 43.89 | * | * | 0-360 | 100 | H |
| 9* | 908.3 | 68.93 | Pk | 23.2 | -26.7 | 10.5 | 75.93 | * | * | 0-360 | 299 | H |
| 10 | 908.4 | 81.45 | Pk | 23.2 | -26.7 | 10.5 | 88.45 | 46.02 | 42.43 | 0-360 | 100 | H |
| 11* | 908.6 | 71.16 | Pk | 23.2 | -26.7 | 10.5 | 78.16 | * | * | 0-360 | 100 | H |
| 12* | 908.7 | 38.55 | Pk | 23.2 | -26.7 | 10.5 | 45.55 | * | * | 0-360 | 100 | H |
| 13 | 990.8 | 30.36 | Pk | 24.6 | -25.6 | 10.5 | 39.86 | 53.97 | -14.11 | 0-360 | 299 | H |
| 14 | 881.9 | 31.99 | Pk | 22.7 | -26.8 | 10.5 | 38.39 | 46.02 | -7.63 | 0-360 | 199 | V |
| 15* | 908.2 | 31.33 | Pk | 23.2 | -26.7 | 10.5 | 38.33 | * | * | 0-360 | 299 | V |
| 16* | 908.3 | 57.54 | Pk | 23.2 | -26.7 | 10.5 | 64.54 | * | * | 0-360 | 399 | V |
| 17 | 908.4 | 69.47 | Pk | 23.2 | -26.7 | 10.5 | 76.47 | 46.02 | 30.45 | 0-360 | 299 | V |
| 18* | 908.6 | 59.23 | Pk | 23.2 | -26.7 | 10.5 | 66.23 | * | * | 0-360 | 399 | V |
| 19* | 908.7 | 30.8 | Pk | 23.2 | -26.7 | 10.5 | 37.8 | * | * | 0-360 | 299 | V |
| 20 | 990.1 | 31.15 | Pk | 24.6 | -25.6 | 10.5 | 40.65 | 53.97 | -13.32 | 0-360 | 299 | V |

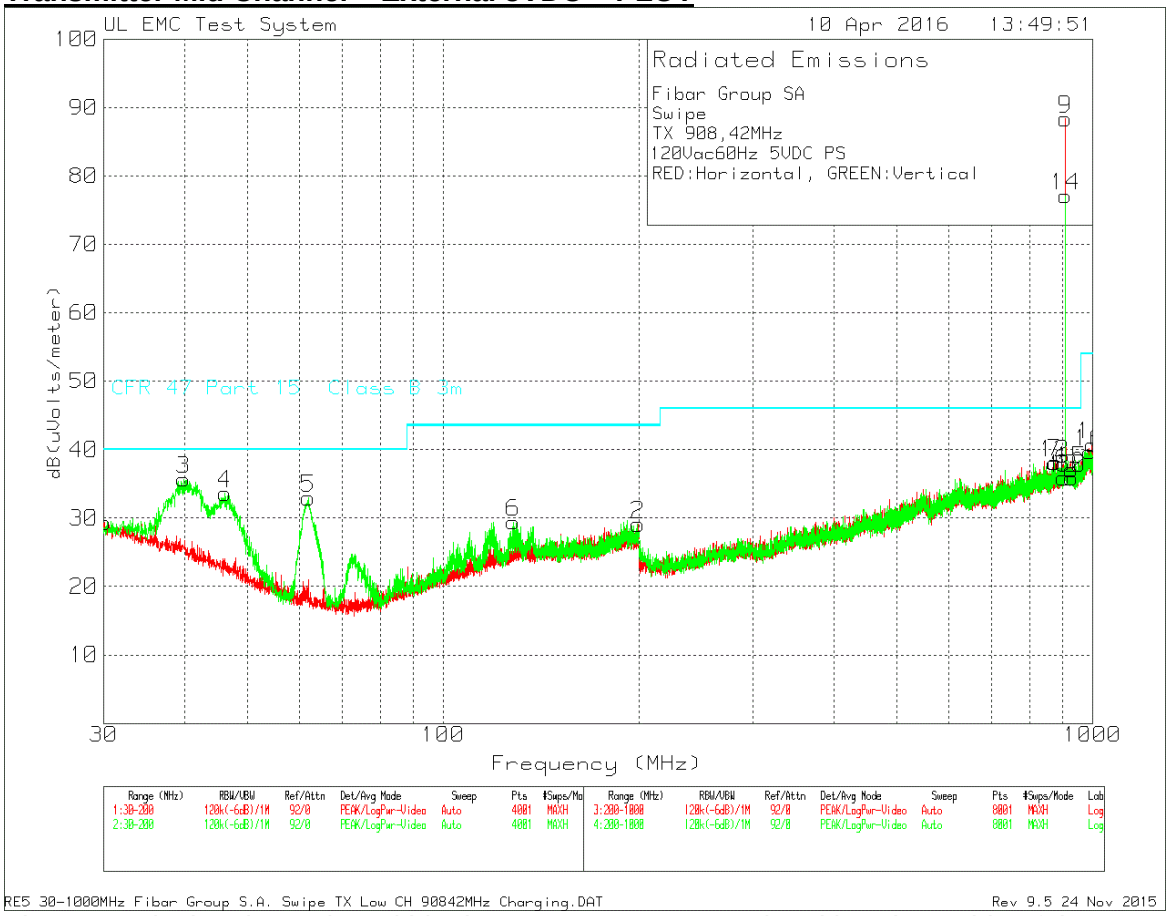
Pk - Peak detector
* - Transmit Singal Bandedge Markers

| Test Frequency (MHz) | Meter Reading (dBuV) | Detector | Antenna Factor dBm | Gain/Loss (dBm) | 10M to 3M Factor dB | Corrected Reading dB(uVolts/ meter) | Qp Limit | Margin (dB) | Azimuth [Degs] | Height [cm] | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 40.2513 | 34.24 | Qp | 14.3 | -30 | 10.5 | 29.04 | 40 | -10.96 | 26 | 104 | V |
| 45.76875 | 37.34 | Qp | 12.1 | -30 | 10.5 | 29.94 | 40 | -10.06 | 0 | 104 | V |

Qp - Quasi-Peak detector

The transmit signal remains within the 902-928MHz operational band, outside of the restricted bands 15.205.

**Transmitter Mid Channel – External 5VDC – PLOT**




The transmit signal remains within the 902-928MHz operational band, outside of the restricted bands 15.205.

## Transmitter Mid Channel – External 5VDC – DATA

Fibar Group S.A.
Swipe
TX 908,42MHz
120Vac60Hz 5VDC PS
Trace Markers

| Marker No. | Test Frequency (MHz) | Meter Reading (dBuV) | Detector | Antenna Factor dBm | Gain/Loss (dBm) | 10M to 3M Factor dB | Corrected Reading dB(uVolts/ meter) | Qp Limit | Margin (dB) | Azimuth [Degs] | Height [cm] | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 30.085 | 30.65 | Pk | 18.2 | -30 | 10.5 | 29.35 | 40 | -10.65 | 0-360 | 100 | H |
| 2 | 199.49 | 31.29 | Pk | 16 | -28.7 | 10.5 | 29.09 | 43.52 | -14.43 | 0-360 | 251 | H |
| 3 | 39.86 | 40.79 | Pk | 14.4 | -30 | 10.5 | 35.69 | 40 | -4.31 | 0-360 | 101 | V |
| 4 | 46.15 | 41.19 | Pk | 11.9 | -30 | 10.5 | 33.59 | 40 | -6.41 | 0-360 | 101 | V |
| 5 | 62.045 | 45.63 | Pk | 6.7 | -29.9 | 10.5 | 32.93 | 40 | -7.07 | 0-360 | 251 | V |
| 6 | 128.2175 | 34.62 | Pk | 14 | -29.7 | 10.5 | 29.42 | 43.52 | -14.1 | 0-360 | 101 | V |
| 7 | 875.1 | 31.95 | Pk | 22.8 | -27.1 | 10.5 | 38.15 | 46.02 | -7.87 | 0-360 | 299 | H |
| 8* | 908 | 31.58 | Pk | 23.2 | -26.7 | 10.5 | 38.58 | * | * | 0-360 | 100 | H |
| 9* | 908.1 | 42.62 | Pk | 23.2 | -26.7 | 10.5 | 49.62 | * | * | 0-360 | 100 | H |
| 10 | 908.5 | 81.34 | Pk | 23.2 | -26.7 | 10.5 | 88.34 | 46.02 | 42.32 | 0-360 | 100 | H |
| 11* | 908.9 | 41.6 | Pk | 23.2 | -26.7 | 10.5 | 48.6 | * | * | 0-360 | 100 | H |
| 12* | 909 | 32.55 | Pk | 23.2 | -26.6 | 10.5 | 39.65 | * | * | 0-360 | 100 | H |
| 13 | 998.3 | 31.36 | Pk | 24.3 | -25.4 | 10.5 | 40.76 | 53.97 | -13.21 | 0-360 | 100 | H |
| 14 | 873.7 | 31.77 | Pk | 22.8 | -27 | 10.5 | 38.07 | 46.02 | -7.95 | 0-360 | 199 | V |
| 15* | 908.2 | 33.77 | Pk | 23.2 | -26.7 | 10.5 | 40.77 | * | * | 0-360 | 199 | V |
| 16* | 908.3 | 53.22 | Pk | 23.2 | -26.7 | 10.5 | 60.22 | * | * | 0-360 | 399 | V |
| 17 | 908.5 | 70.11 | Pk | 23.2 | -26.7 | 10.5 | 77.11 | 46.02 | 31.09 | 0-360 | 399 | V |
| 18* | 908.6 | 64.14 | Pk | 23.2 | -26.7 | 10.5 | 71.14 | * | * | 0-360 | 399 | V |
| 19* | 908.7 | 35.8 | Pk | 23.2 | -26.7 | 10.5 | 42.8 | * | * | 0-360 | 299 | V |
| 20 | 974.8 | 31.15 | Pk | 24.2 | -26.1 | 10.5 | 39.75 | 53.97 | -14.22 | 0-360 | 199 | V |

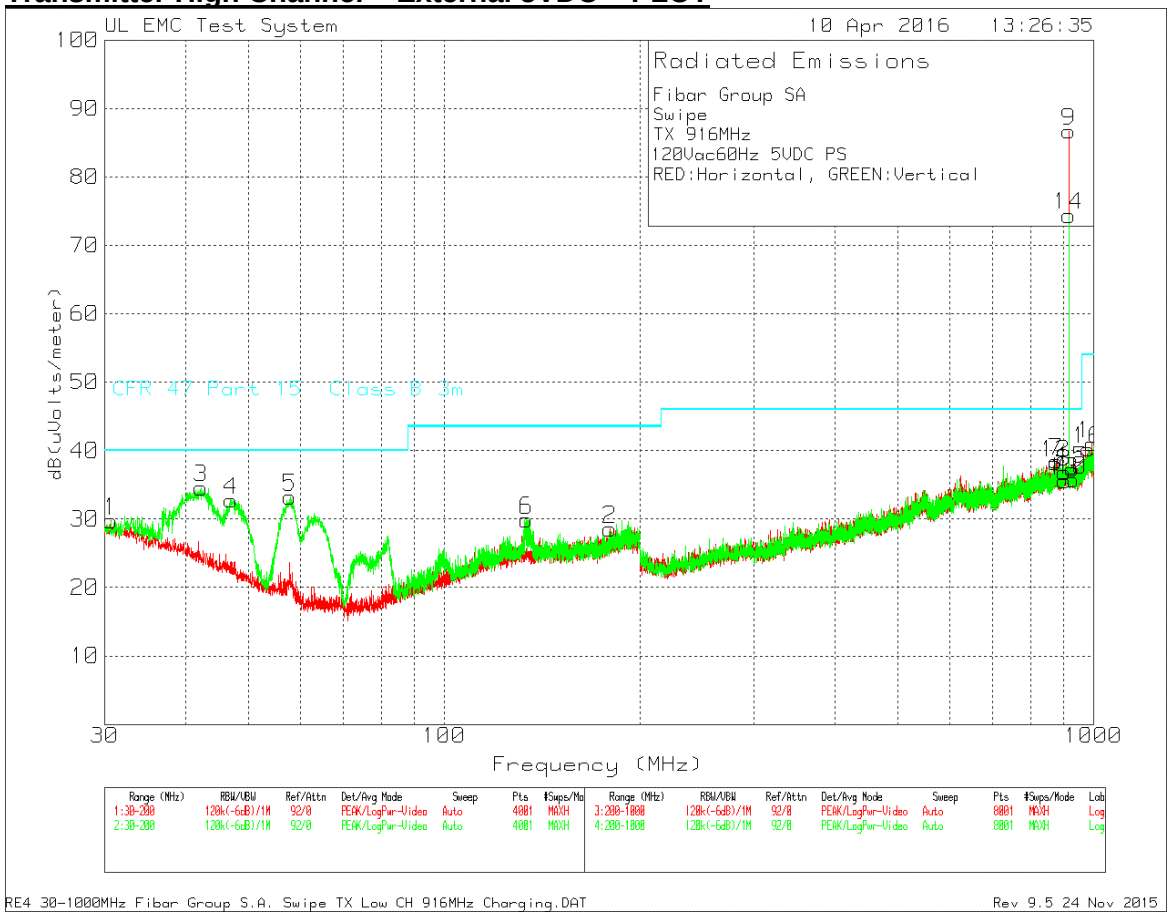
Pk - Peak detector
* - Transmit Singal Bandedge Markers

| Test Frequency (MHz) | Meter Reading (dBuV) | Detector | Antenna Factor dBm | Gain/Loss (dBm) | 10M to 3M Factor dB | Corrected Reading dB(uVolts/ meter) | Qp Limit | Margin (dB) | Azimuth [Degs] | Height [cm] | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 40.4263 | 34.19 | Qp | 14.2 | -30 | 10.5 | 28.89 | 40 | -11.11 | 54 | 105 | V |

Qp - Quasi-Peak detector

The transmit signal remains within the 902-928MHz operational band, outside of the restricted bands 15.205.

**Transmitter High Channel – External 5VDC – PLOT**




The transmit signal remains within the 902-928MHz operational band, outside of the restricted bands 15.205.

## Transmitter High Channel – External 5VDC – DATA

Fibar Group S.A.
Swipe
TX 916MHz
120Vac60Hz 5VDC PS
Trace Markers

| Marker No. | Test Frequency (MHz) | Meter Reading (dBuV) | Detector | Antenna Factor dBm | Gain/Loss (dBm) | 10M to 3M Factor dB | Corrected Reading dB(uVolts/ meter) | Qp Limit | Margin (dB) | Azimuth [Degs] | Height [cm] | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 30.68 | 31.33 | Pk | 17.9 | -30 | 10.5 | 29.73 | 40 | -10.27 | 0-360 | 250 | H |
| 2 | 179.8975 | 31.84 | Pk | 15.4 | -29.2 | 10.5 | 28.54 | 43.52 | -14.98 | 0-360 | 398 | H |
| 3 | 42.1975 | 40.58 | Pk | 13.5 | -30 | 10.5 | 34.58 | 40 | -5.42 | 0-360 | 101 | V |
| 4 | 47 | 40.76 | Pk | 11.5 | -30 | 10.5 | 32.76 | 40 | -7.24 | 0-360 | 101 | V |
| 5 | 57.88 | 45.11 | Pk | 7.6 | -30 | 10.5 | 33.21 | 40 | -6.79 | 0-360 | 398 | V |
| 6 | 133.87 | 34.87 | Pk | 14.2 | -29.7 | 10.5 | 29.87 | 43.52 | -13.65 | 0-360 | 101 | V |
| 7* | 915.7 | 37.32 | Pk | 23 | -26.9 | 10.5 | 43.92 | * | * | 0-360 | 299 | H |
| 8* | 915.8 | 41.74 | Pk | 23 | -26.9 | 10.5 | 48.34 | * | * | 0-360 | 299 | H |
| 9 | 916.1 | 80.2 | Pk | 23 | -27 | 10.5 | 86.7 | 46.02 | 40.68 | 0-360 | 299 | H |
| 10* | 916.3 | 42.24 | Pk | 23 | -27 | 10.5 | 48.74 | * | * | 0-360 | 299 | H |
| 11* | 916.4 | 36.76 | Pk | 23 | -27 | 10.5 | 43.26 | * | * | 0-360 | 103 | H |
| 12 | 952.8 | 31.28 | Pk | 23 | -26.3 | 10.5 | 38.48 | 46.02 | -7.54 | 0-360 | 299 | H |
| 13 | 994.3 | 31.74 | Pk | 24.4 | -25.6 | 10.5 | 41.04 | 53.97 | -12.93 | 0-360 | 299 | H |
| 14 | 873.9 | 31.92 | Pk | 22.8 | -27 | 10.5 | 38.22 | 46.02 | -7.8 | 0-360 | 103 | V |
| 15* | 915.8 | 31.7 | Pk | 23 | -26.9 | 10.5 | 38.3 | * | * | 0-360 | 299 | V |
| 16* | 915.9 | 56.12 | Pk | 23 | -26.9 | 10.5 | 62.72 | * | * | 0-360 | 399 | V |
| 17 | 916.1 | 67.89 | Pk | 23 | -27 | 10.5 | 74.39 | 46.02 | 28.37 | 0-360 | 399 | V |
| 18* | 916.2 | 60.24 | Pk | 23 | -27 | 10.5 | 66.74 | * | * | 0-360 | 399 | V |
| 19* | 916.3 | 33 | Pk | 23 | -27 | 10.5 | 39.5 | * | * | 0-360 | 199 | V |
| 20 | 979.9 | 31.29 | Pk | 24.4 | -26 | 10.5 | 40.19 | 53.97 | -13.78 | 0-360 | 199 | V |

Pk - Peak detector
* - Transmit Signal Bandedge Markers

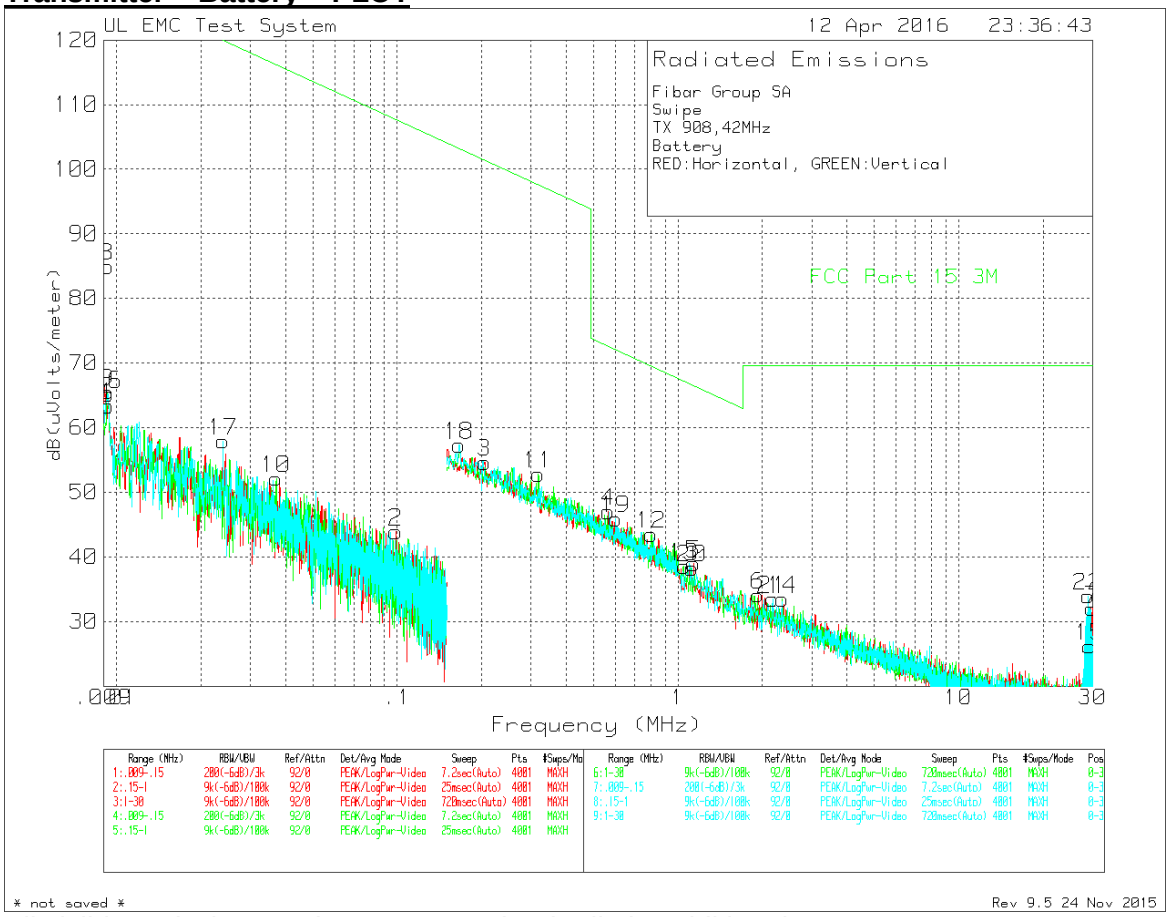
| Test Frequency (MHz) | Meter Reading (dBuV) | Detector | Antenna Factor dBm | Gain/Loss (dBm) | 10M to 3M Factor dB | Corrected Reading dB(uVolts/ meter) | Qp Limit | Margin (dB) | Azimuth [Degs] | Height [cm] | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 42.2525 | 34.86 | Qp | 13.5 | -30 | 10.5 | 28.86 | 40 | -11.14 | 1 | 104 | V |

Qp - Quasi-Peak detector

The transmit signal remains within the 902-928MHz operational band, outside of the restricted bands 15.205.

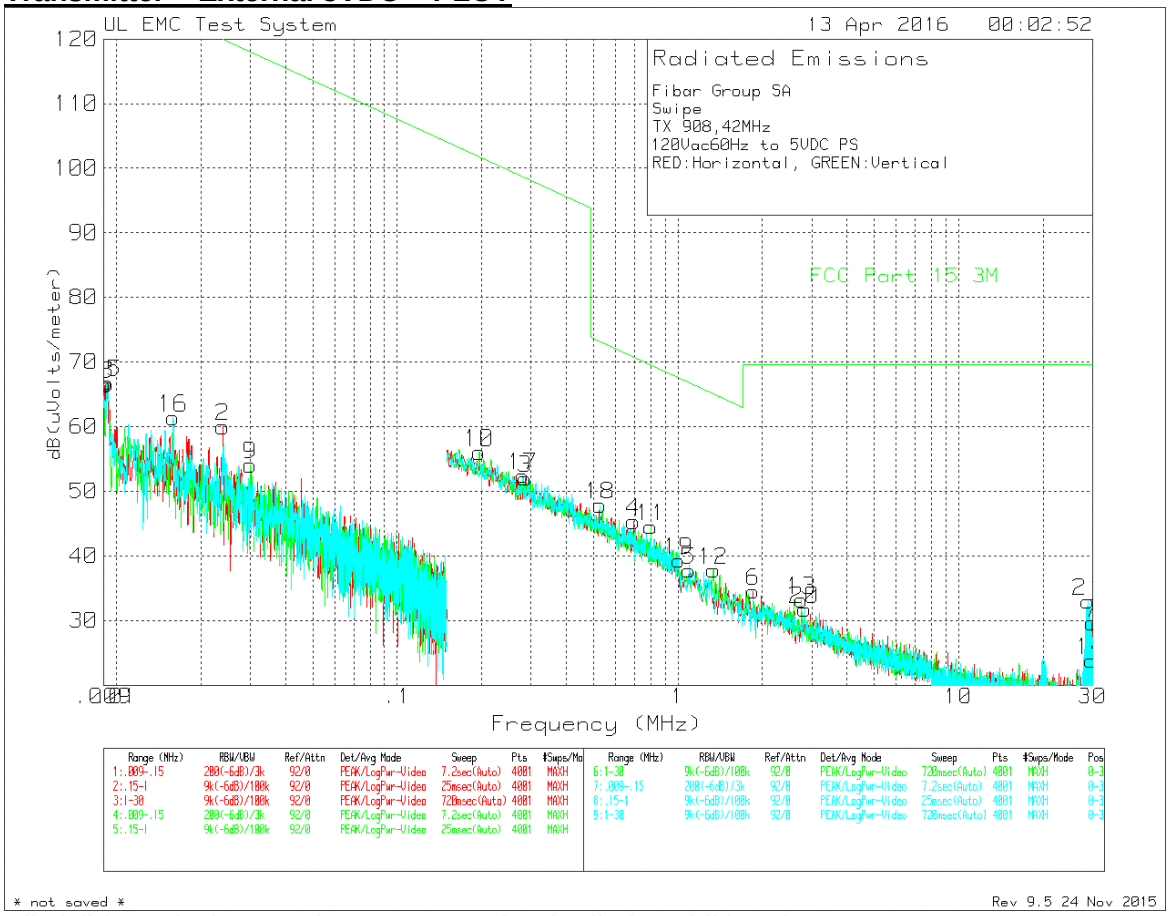
## SPURIOUS EMISSIONS 9k TO 30 MHz (Worst Case)

### Transmitter – Battery – PLOT




All visible emissions 30dB or more under the limit. Additional measurements or correlation measurements were considered not necessary.

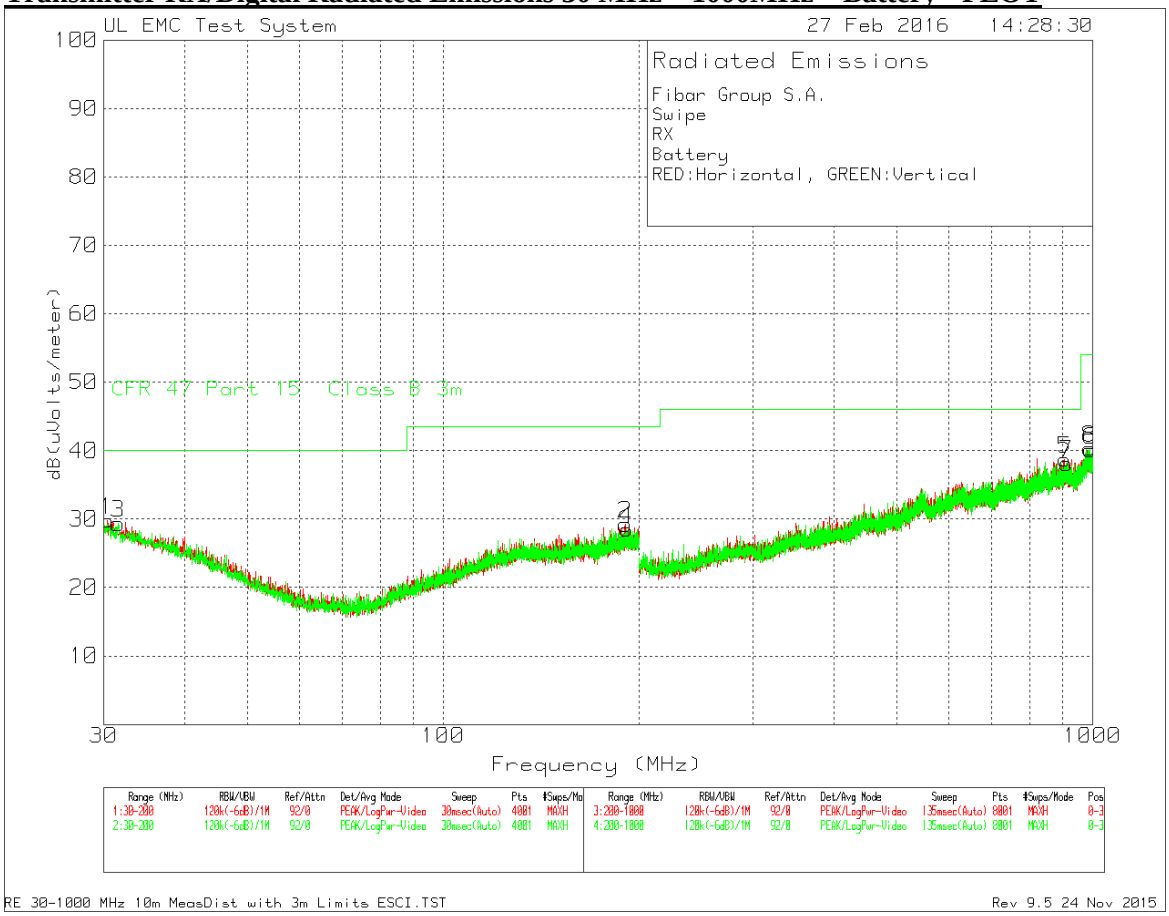
**Transmitter – External 5VDC – PLOT**




All visible emissions 30dB or more under the limit. Additional measurements or correlation measurements were considered not necessary.

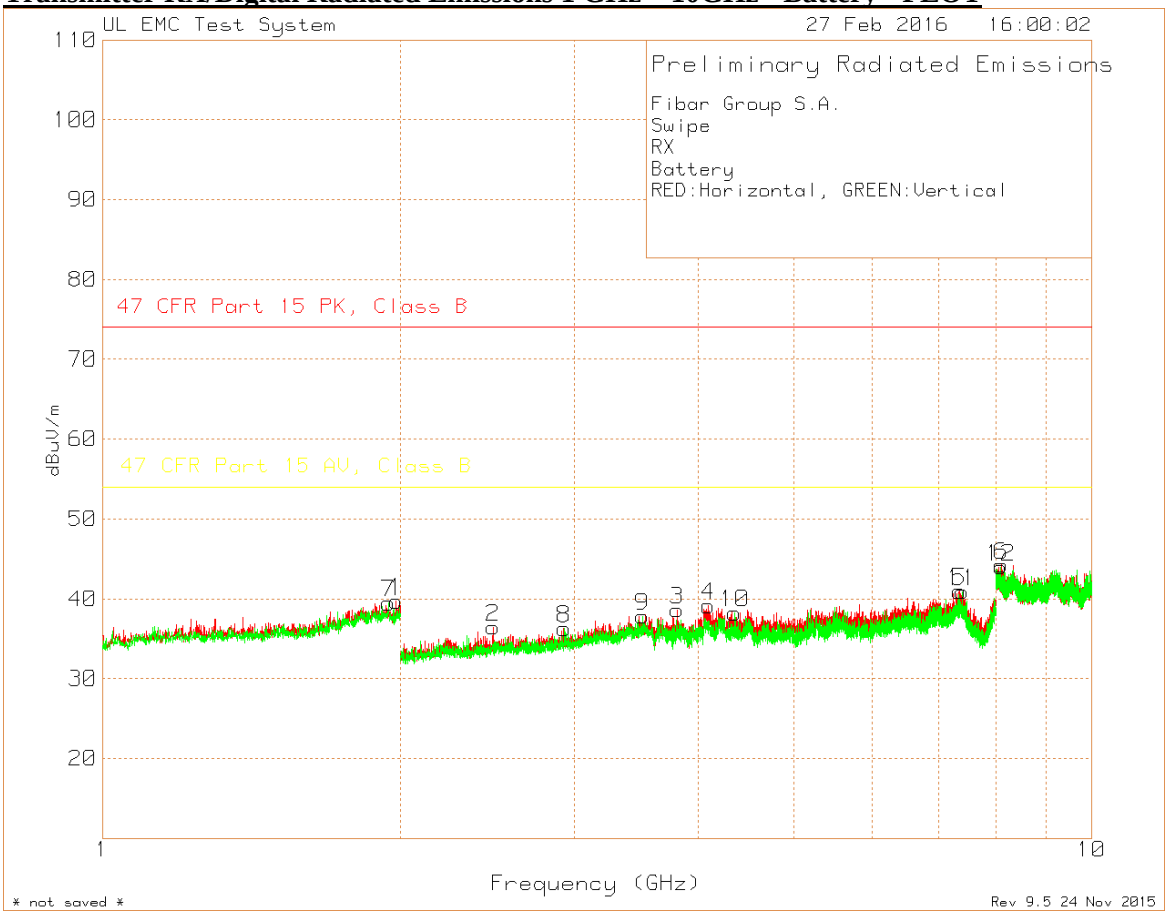
## 7.2.4. TRANSMITTER RX/DIGITAL RADIATED EMISSIONS

**Transmitter RX/Digital Radiated Emissions 30 MHz – 1000MHz – Battery - PLOT**



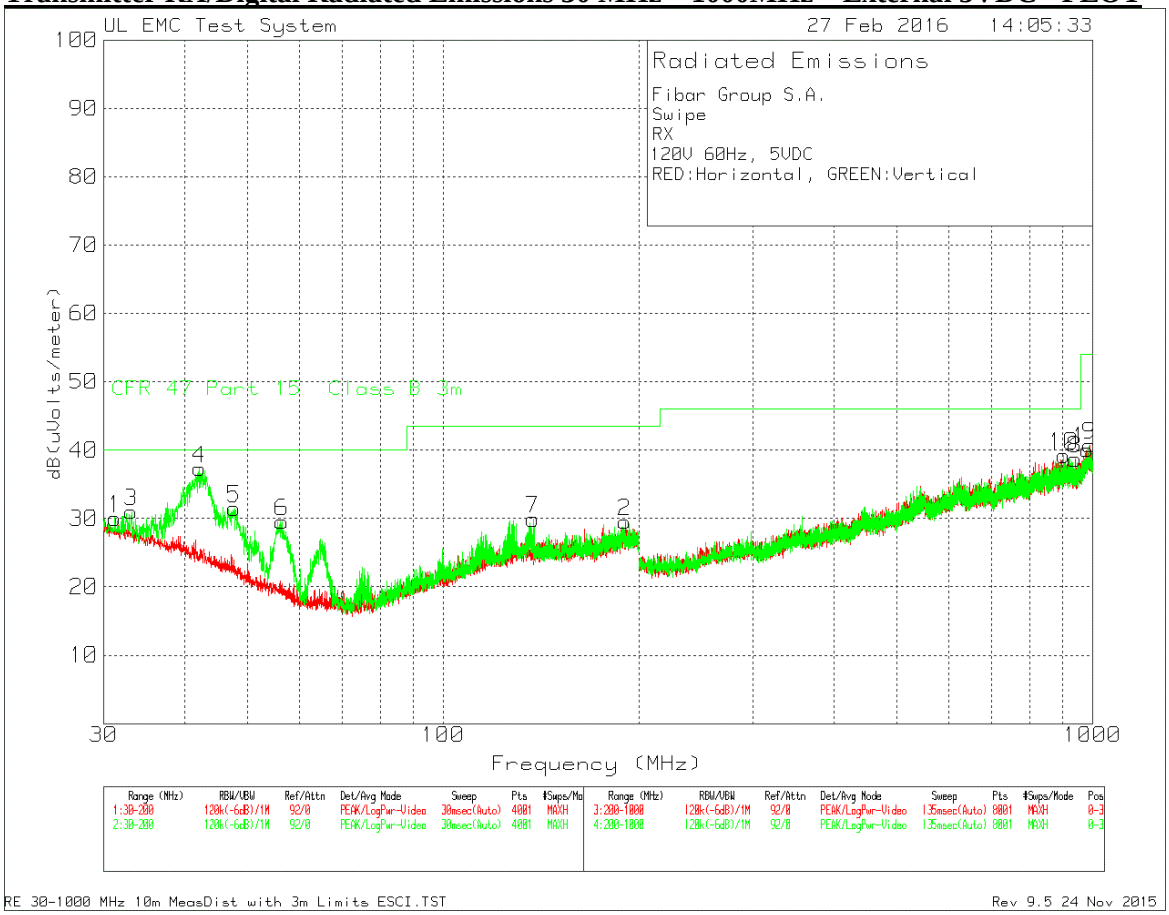

All visible emissions are at least 6dB below the limit or under the noise floor, therefore no further measurement needed.

**Transmitter RX/Digital Radiated Emissions 1 GHz – 10GHz - Battery - PLOT**




All visible emissions are at least 6dB below the limit or under the noise floor, therefore no further measurement needed.

**Transmitter RX/Digital Radiated Emissions 30 MHz – 1000MHz – External 5VDC - PLOT**



## Transmitter RX/Digital Radiated Emissions 30 MHz – 1000MHz - External 5VDC - DATA

Fibar Group S.A.
Swipe
RX
120Vac60Hz 5VDC PS
Trace Markers

| Marker No. | Test Frequency (MHz) | Meter Reading (dBuV) | Detector | Antenna Factor dBm | Gain/Loss (dBm) | 10M to 3M Factor dB | Corrected Reading dB(uVolts/ meter) | Limit | Margin (dB) | Azimuth [Degs] | Height [cm] | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 31.2325 | 31.82 | Pk | 17.7 | -30 | 10.5 | 30.02 | 40 | -9.98 | 0-360 | 240 | H |
| 2 | 190.5225 | 32.04 | Pk | 16 | -29 | 10.5 | 29.54 | 43.52 | -13.98 | 0-360 | 398 | H |
| 3 | 33.1025 | 33.51 | Pk | 17 | -30 | 10.5 | 31.01 | 40 | -8.99 | 0-360 | 102 | V |
| 4 | 42.155 | 43.21 | Pk | 13.6 | -30 | 10.5 | 37.31 | 40 | -2.69 | 0-360 | 102 | V |
| 5 | 47.68 | 39.67 | Pk | 11.3 | -30 | 10.5 | 31.47 | 40 | -8.53 | 0-360 | 102 | V |
| 6 | 56.435 | 41.04 | Pk | 8 | -30 | 10.5 | 29.54 | 40 | -10.46 | 0-360 | 245 | V |
| 7 | 137.5675 | 34.91 | Pk | 14.2 | -29.7 | 10.5 | 29.91 | 43.52 | -13.61 | 0-360 | 102 | V |
| 8 | 940.5 | 32.19 | Pk | 22.5 | -26.5 | 10.5 | 38.69 | 46.02 | -7.33 | 0-360 | 103 | H |
| 9 | 990.3 | 31.26 | Pk | 24.6 | -25.6 | 10.5 | 40.76 | 53.97 | -13.21 | 0-360 | 103 | H |
| 10 | 902.9 | 32.71 | Pk | 23.1 | -27.1 | 10.5 | 39.21 | 46.02 | -6.81 | 0-360 | 199 | V |
| 11 | 981.6 | 30.98 | Pk | 24.5 | -25.9 | 10.5 | 40.08 | 53.97 | -13.89 | 0-360 | 299 | V |

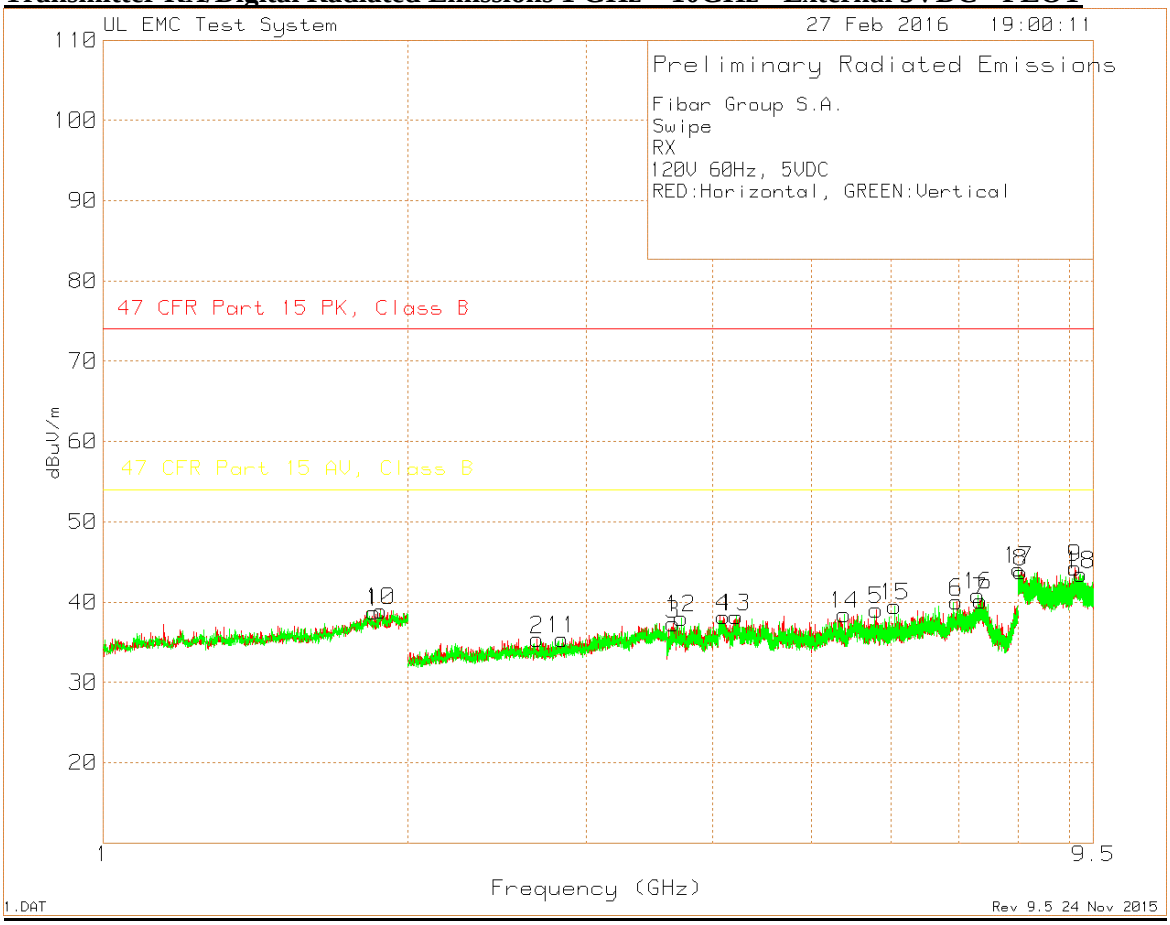
Pk - Peak detector

Measurements

| Test Frequency (MHz) | Meter Reading (dBuV) | Detector | Antenna Factor dBm | Gain/Loss (dBm) | 10M to 3M Factor dB | Corrected Reading dB(uVolts/ meter) | Limit | Margin (dB) | Azimuth [Degs] | Height [cm] | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 42.2785 | 36.34 | Qp | 13.5 | -30 | 10.5 | 30.34 | 40 | -9.66 | 52 | 107 | V |

Qp - Quasi-Peak detector

**Transmitter RX/Digital Radiated Emissions 1 GHz – 10GHz - External 5VDC - PLOT**




All visible emissions are at least 6dB below the limit or under the noise floor, therefore no further measurement needed.

# 8. AC POWER LINE CONDUCTED EMISSIONS

**LIMITS**

FCC §15.207 (a)

RSS-Gen 8.8

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

* Decreases with the logarithm of the frequency.

**TEST PROCEDURE**

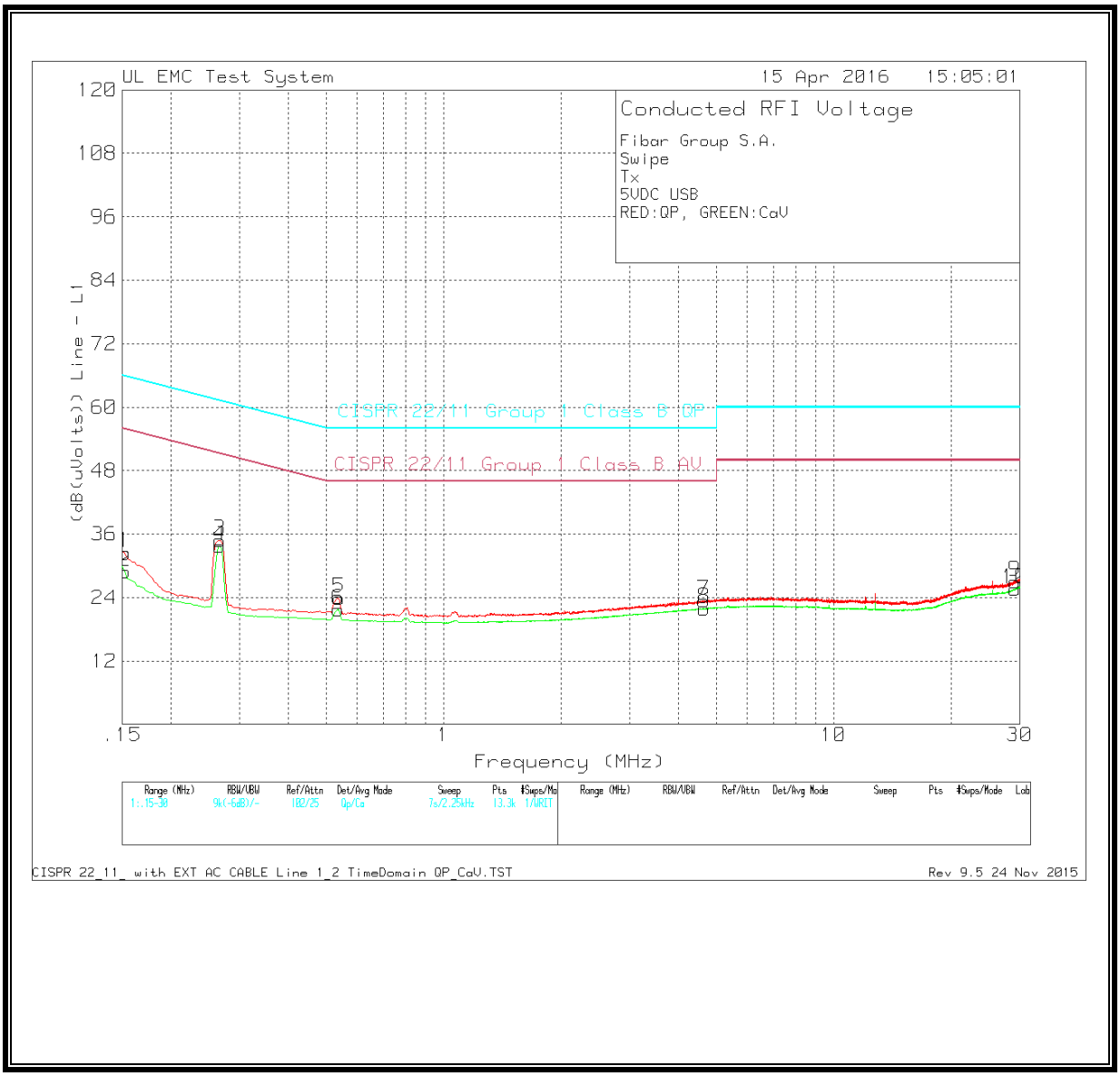
The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.10.

The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

Line conducted data is recorded for both NEUTRAL and HOT lines.

**RESULTS**

**LINE 1 PLOT – TX Mode – 5VDC USB**



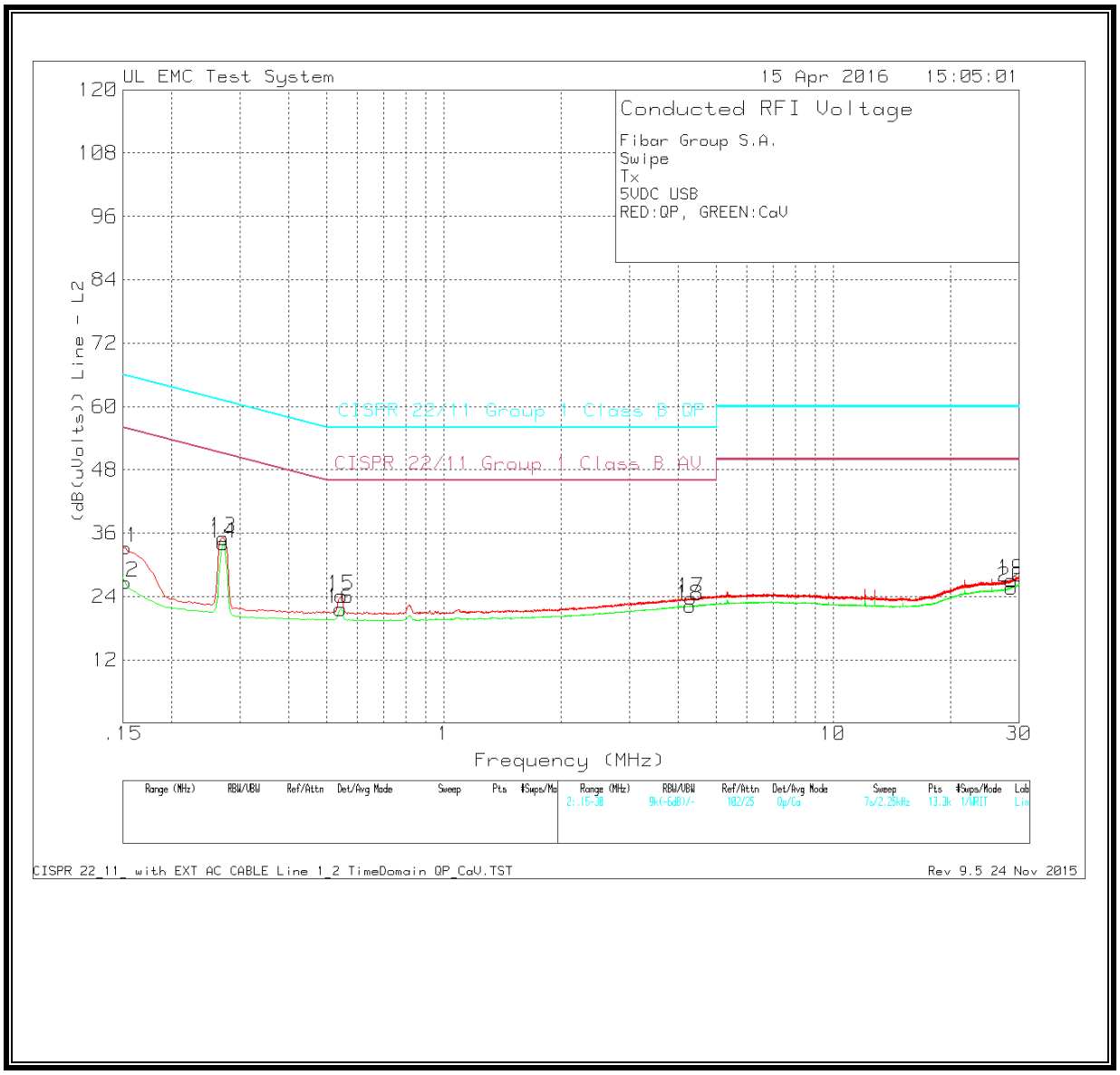
**LINE 1 DATA – TX Mode – 5VDC USB**

Manufacturer:Fibar
Model#Swipe
Mode:TX Low CH -16dB
Voltage:5VDC USB
QP=Red CaV=Grn

| Marker No. | Test Frequency (MHz) | Meter Reading (dBuV) | Detector | Line 1 LISN Factors dBm | Cable Gain/Loss dBm | Line 1 EXT Cable Gain/Loss dBm | Line 1 Dongle Gain/Loss dBm | Corrected Reading dB(uVolts) | CISPR 22/11 Group 1 Class B QP | QP Margin (dB) | CISPR 22/11 Group 1 Class B AV | AV Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.15225 | 18.71 | Qp | 0.1 | 13.6 | 0 | 0 | 32.41 | 65.88 | -33.47 | - | - |
| 2 | 0.15225 | 15.22 | Ca | 0.1 | 13.6 | 0 | 0 | 28.92 | - | - | 55.88 | -26.96 |
| 3 | 0.267 | 23.71 | Qp | 0 | 11.1 | 0 | 0 | 34.81 | 61.21 | -26.4 | - | - |
| 4 | 0.267 | 22.62 | Ca | 0 | 11.1 | 0 | 0 | 33.72 | - | - | 51.21 | -17.49 |
| 5 | 0.53925 | 13.27 | Qp | 0 | 10.6 | 0 | 0 | 23.87 | 56 | -32.13 | - | - |
| 6 | 0.537 | 11.13 | Ca | 0 | 10.6 | 0 | 0 | 21.73 | - | - | 46 | -24.27 |
| 7 | 4.64775 | 12.61 | Qp | 0 | 10.7 | 0 | 0.1 | 23.41 | 56 | -32.59 | - | - |
| 8 | 4.659 | 11.11 | Ca | 0 | 10.7 | 0 | 0.1 | 21.91 | - | - | 46 | -24.09 |
| 9 | 29.17275 | 13.69 | Qp | 0 | 11.9 | 0.1 | 1.3 | 26.99 | 60 | -33.01 | - | - |
| 10 | 29.16825 | 12.28 | Ca | 0 | 11.9 | 0.1 | 1.3 | 25.58 | - | - | 50 | -24.42 |

Qp - Quasi-Peak detector
Ca - CISPR Average detection

**LINE 2 PLOT – TX Mode – 5VDC USB**



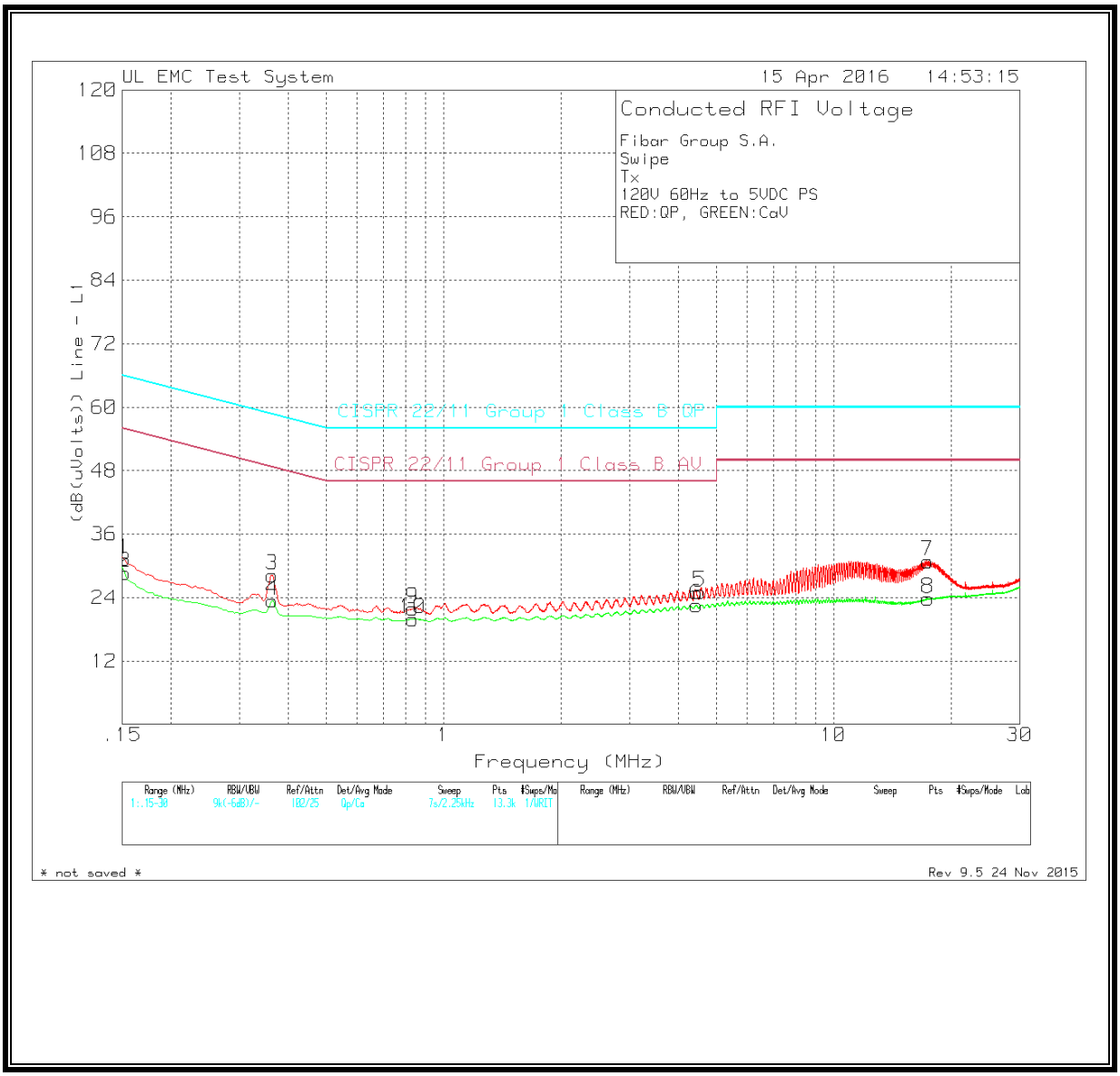
**LINE 2 DATA – TX Mode – 5VDC USB**

Manufacturer:Fibar
Model#Swipe
Mode:TX Low CH -16dB
Voltage:5VDC USB
QP=Red CaV=Grn

| Marker No. | Test Frequency (MHz) | Meter Reading (dBuV) | Detector | Line 2 LISN Factors dBm | Cable Gain/Loss dBm | Line 2 EXT Cable Gain/Loss dBm | Line 2 Dongle Gain/Loss dBm | Corrected Reading dB(uVolts) | CISPR 22/11 Group 1 Class B QP | QP Margin (dB) | CISPR 22/11 Group 1 Class B AV | AV Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | 0.15225 | 18.96 | Qp | 0.1 | 14.2 | 0 | 0 | 33.26 | 65.88 | -32.62 | - | - |
| 12 | 0.15225 | 12.39 | Ca | 0.1 | 14.2 | 0 | 0 | 26.69 | - | - | 55.88 | -29.19 |
| 13 | 0.2715 | 23.4 | Qp | 0.1 | 11.6 | 0 | 0 | 35.1 | 61.07 | -25.97 | - | - |
| 14 | 0.2715 | 22.39 | Ca | 0.1 | 11.6 | 0 | 0 | 34.09 | - | - | 51.07 | -16.98 |
| 15 | 0.546 | 12.89 | Qp | 0 | 11.2 | 0 | 0 | 24.09 | 56 | -31.91 | - | - |
| 16 | 0.54375 | 10.47 | Ca | 0 | 11.2 | 0 | 0 | 21.67 | - | - | 46 | -24.33 |
| 17 | 4.31025 | 12.43 | Qp | 0 | 11.2 | 0 | 0.1 | 23.73 | 56 | -32.27 | - | - |
| 18 | 4.29225 | 10.93 | Ca | 0 | 11.2 | 0 | 0.1 | 22.23 | - | - | 46 | -23.77 |
| 19 | 28.68675 | 13.6 | Qp | -0.1 | 12.4 | 0.1 | 1.1 | 27.1 | 60 | -32.9 | - | - |
| 20 | 28.6935 | 12.23 | Ca | -0.1 | 12.4 | 0.1 | 1.1 | 25.73 | - | - | 50 | -24.27 |

Qp - Quasi-Peak detector
Ca - CISPR Average detection

**LINE 1 PLOT – TX Mode – 120Vac60Hz to Power Supply**



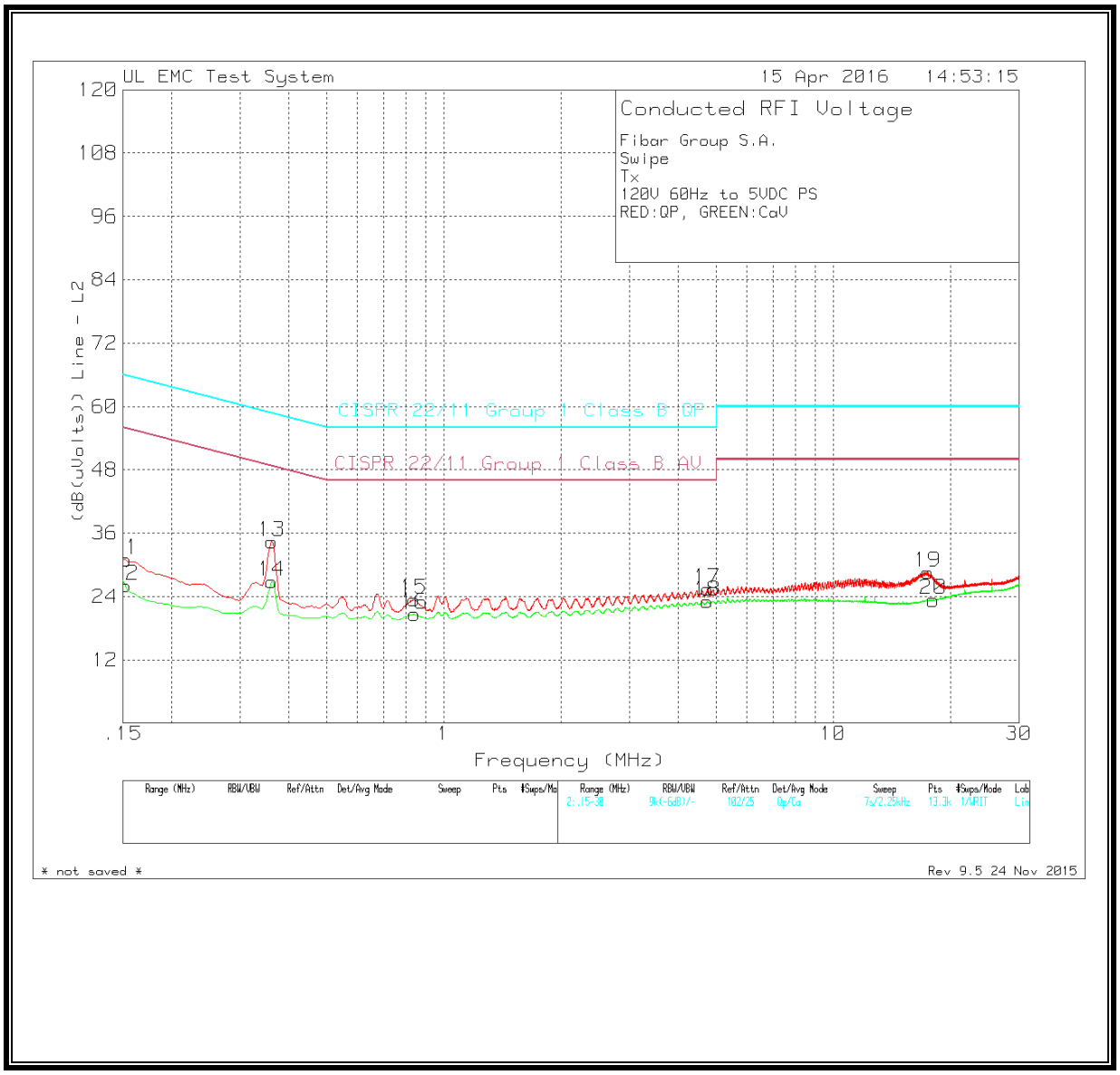
**LINE 1 DATA – TX Mode – 120Vac60Hz to Power Supply**

Manufacturer:Fibar
Model#Swipe
Mode:TX
Voltage:120V 60Hz to 5VDC PS
QP=Red CaV=Grn

| Marker No. | Test Frequency (MHz) | Meter Reading (dBuV) | Detector | Line 1 LISN Factors dBm | Cable Gain/Loss dBm | Line 1 EXT Cable Gain/Loss dBm | Line 1 Dongle Gain/Loss dBm | Corrected Reading dB(uVolts) | CISPR 22/11 Group 1 Class B QP | QP Margin (dB) | CISPR 22/11 Group 1 Class B AV | AV Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.15225 | 17.53 | Qp | 0.1 | 13.6 | 0 | 0 | 31.23 | 65.88 | -34.65 | - | - |
| 2 | 0.15225 | 14.97 | Ca | 0.1 | 13.6 | 0 | 0 | 28.67 | - | - | 55.88 | -27.21 |
| 3 | 0.36375 | 17.4 | Qp | 0 | 10.8 | 0 | 0 | 28.2 | 58.64 | -30.44 | - | - |
| 4 | 0.36375 | 12.64 | Ca | 0 | 10.8 | 0 | 0 | 23.44 | - | - | 48.64 | -25.2 |
| 5 | 4.542 | 14.24 | Qp | 0 | 10.7 | 0 | 0.1 | 25.04 | 56 | -30.96 | - | - |
| 6 | 4.452 | 11.76 | Ca | 0 | 10.7 | 0 | 0.1 | 22.56 | - | - | 46 | -23.44 |
| 7 | 17.4255 | 18.85 | Qp | 0 | 11.3 | 0.1 | 0.6 | 30.85 | 60 | -29.15 | - | - |
| 8 | 17.44125 | 11.8 | Ca | 0 | 11.3 | 0.1 | 0.6 | 23.8 | - | - | 50 | -26.2 |
| 9 | 0.834 | 11.32 | Qp | 0 | 10.6 | 0 | 0 | 21.92 | 56 | -34.08 | - | - |
| 10 | 0.834 | 9.32 | Ca | 0 | 10.6 | 0 | 0 | 19.92 | - | - | 46 | -26.08 |

Qp - Quasi-Peak detector
Ca - CISPR Average detection

**LINE 2 PLOT – TX Mode – 120Vac60Hz to Power Supply**



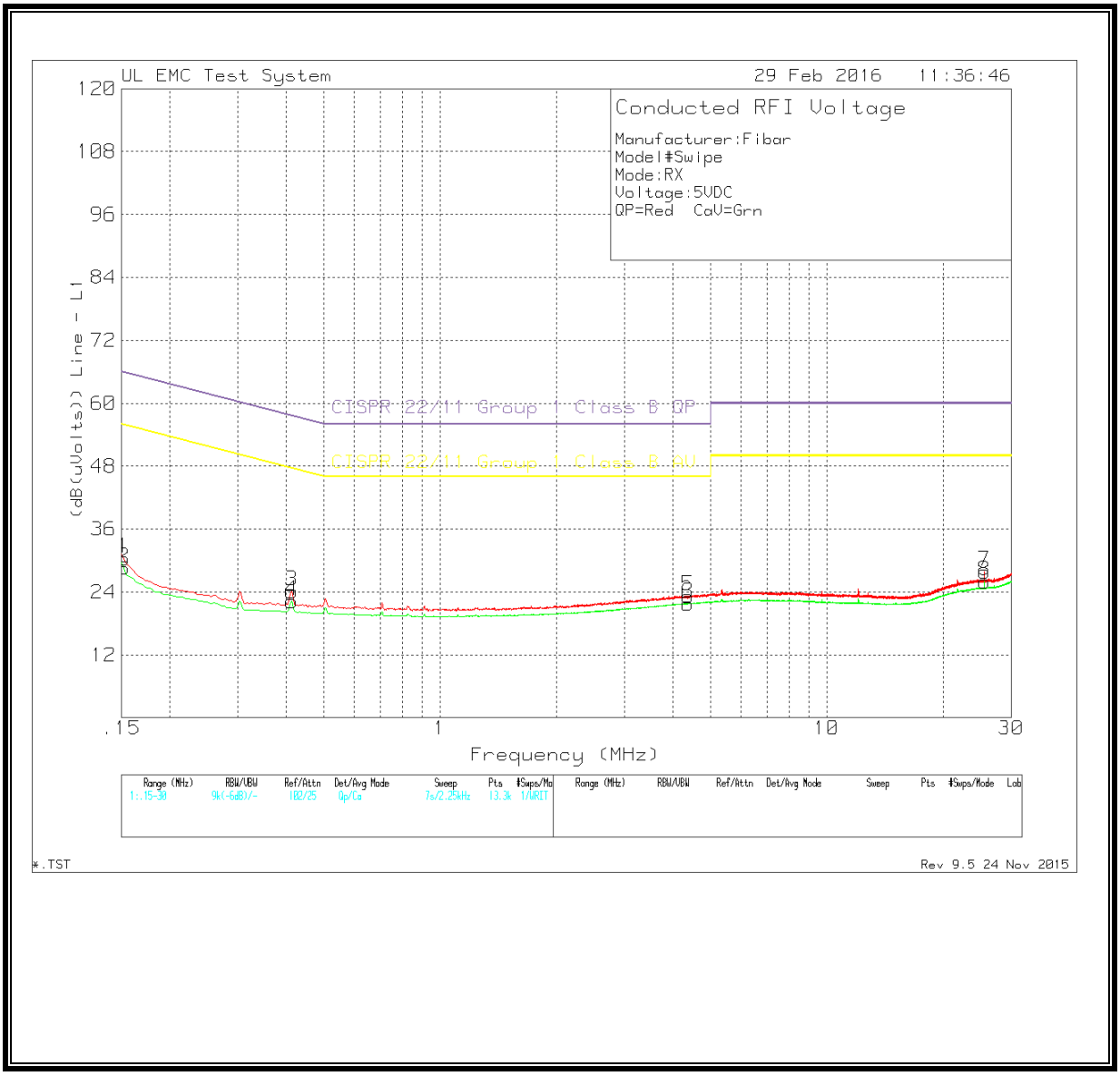
**LINE 2 DATA – TX Mode – 120Vac60Hz to Power Supply**

Manufacturer:Fibar
Model#Swipe
Mode:TX
Voltage:120V 60Hz to 5VDC PS
QP=Red CaV=Grn

| Marker No. | Test Frequency (MHz) | Meter Reading (dBuV) | Detector | Line 2 LISN Factors dBm | Cable Gain/Loss dBm | Line 2 EXT Cable Gain/Loss dBm | Line 2 Dongle Gain/Loss dBm | Corrected Reading dB(uVolts) | CISPR 22/11 Group 1 Class B QP | QP Margin (dB) | CISPR 22/11 Group 1 Class B AV | AV Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | 0.15225 | 16.69 | Qp | 0.1 | 14.2 | 0 | 0 | 30.99 | 65.88 | -34.89 | - | - |
| 12 | 0.15225 | 11.78 | Ca | 0.1 | 14.2 | 0 | 0 | 26.08 | - | - | 55.88 | -29.8 |
| 13 | 0.3615 | 23.09 | Qp | 0 | 11.3 | 0 | 0 | 34.39 | 58.69 | -24.3 | - | - |
| 14 | 0.3615 | 15.54 | Ca | 0 | 11.3 | 0 | 0 | 26.84 | - | - | 48.69 | -21.85 |
| 15 | 0.8385 | 12.34 | Qp | 0 | 11.1 | 0 | 0 | 23.44 | 56 | -32.56 | - | - |
| 16 | 0.84075 | 9.58 | Ca | 0 | 11.1 | 0 | 0 | 20.68 | - | - | 46 | -25.32 |
| 17 | 4.7535 | 14.03 | Qp | 0 | 11.3 | 0 | 0.1 | 25.43 | 56 | -30.57 | - | - |
| 18 | 4.749 | 11.69 | Ca | 0 | 11.3 | 0 | 0.1 | 23.09 | - | - | 46 | -22.91 |
| 19 | 17.49975 | 16.2 | Qp | 0 | 11.8 | 0.1 | 0.5 | 28.6 | 60 | -31.4 | - | - |
| 20 | 18.08025 | 10.88 | Ca | 0 | 11.9 | 0.1 | 0.5 | 23.38 | - | - | 50 | -26.62 |

Qp - Quasi-Peak detector
Ca - CISPR Average detection

**LINE 1 DATA – RX Mode – 5VDC USB**



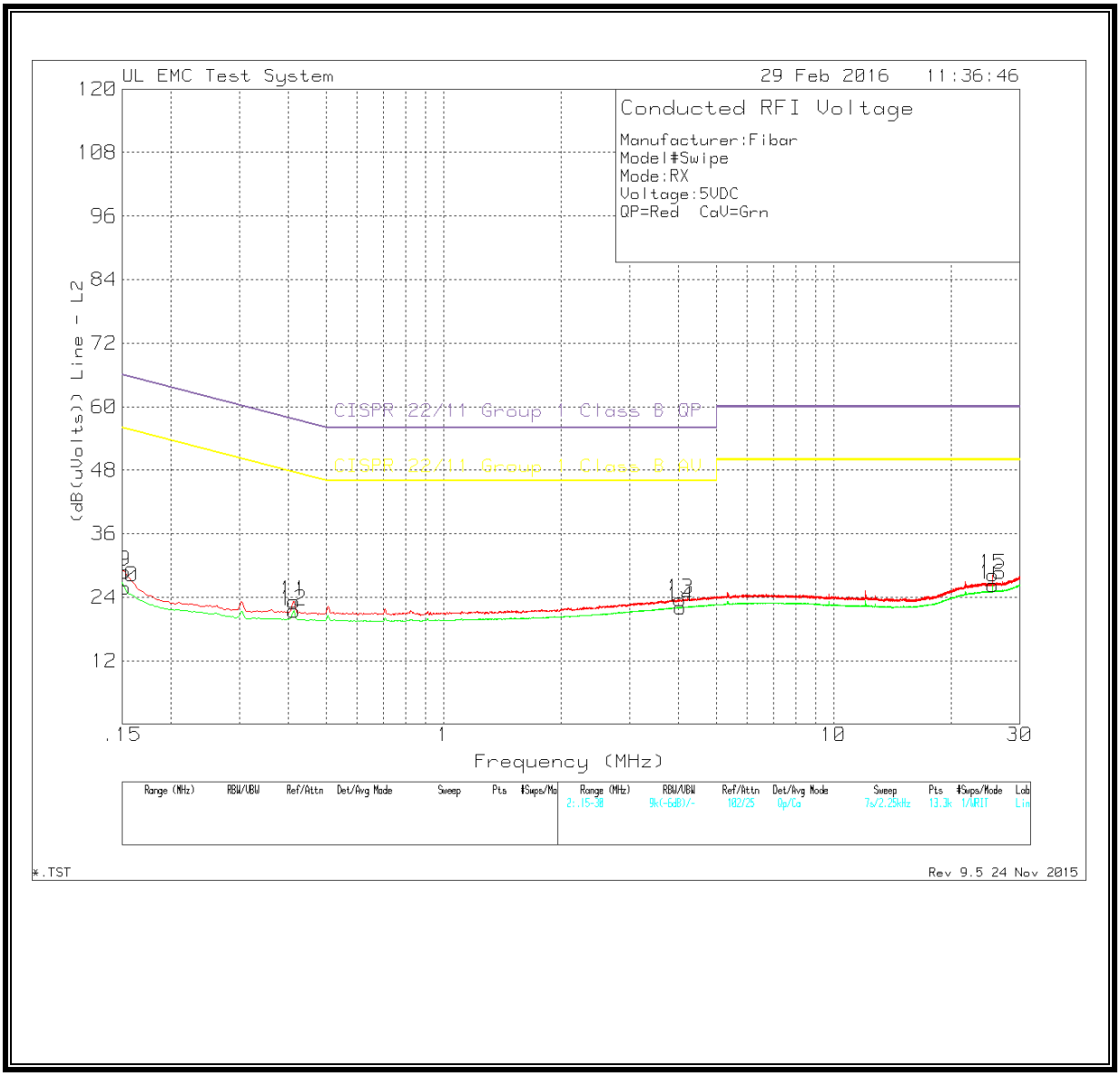
**LINE 1 DATA – RX Mode – 5VDC USB**

Manufacturer:Fibar
Model#Swipe
Mode:RX
Voltage:5VDC USB
QP=Red CaV=Grn

| Marker No. | Test Frequency (MHz) | Meter Reading (dBuV) | Detector | Line 1 LISN Factors dBm | Cable Gain/Loss dBm | Line 1 EXT Cable Gain/Loss dBm | Line 1 Dongle Gain/Loss dBm | Corrected Reading dB(uVolts) | CISPR 22/11 Group 1 Class B QP | QP Margin (dB) | CISPR 22/11 Group 1 Class B AV | AV Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.15225 | 16.72 | Qp | 0.1 | 13.6 | 0 | 0 | 30.42 | 65.88 | -35.46 | - | - |
| 2 | 0.15225 | 14.87 | Ca | 0.1 | 13.6 | 0 | 0 | 28.57 | - | - | 55.88 | -27.31 |
| 3 | 0.41325 | 13.44 | Qp | 0 | 10.7 | 0 | 0 | 24.14 | 57.58 | -33.44 | - | - |
| 4 | 0.41325 | 11.58 | Ca | 0 | 10.7 | 0 | 0 | 22.28 | - | - | 47.58 | -25.3 |
| 5 | 4.37325 | 12.4 | Qp | 0 | 10.7 | 0 | 0.1 | 23.2 | 56 | -32.8 | - | - |
| 6 | 4.371 | 11.01 | Ca | 0 | 10.7 | 0 | 0.1 | 21.81 | - | - | 46 | -24.19 |
| 7 | 25.59975 | 14.99 | Qp | 0 | 11.7 | 0.1 | 1.1 | 27.89 | 60 | -32.11 | - | - |
| 8 | 25.59975 | 13.11 | Ca | 0 | 11.7 | 0.1 | 1.1 | 26.01 | - | - | 50 | -23.99 |

Qp - Quasi-Peak detector
Ca - CISPR Average detection

**LINE 2 DATA – RX/Digital Mode – 5VDC USB**



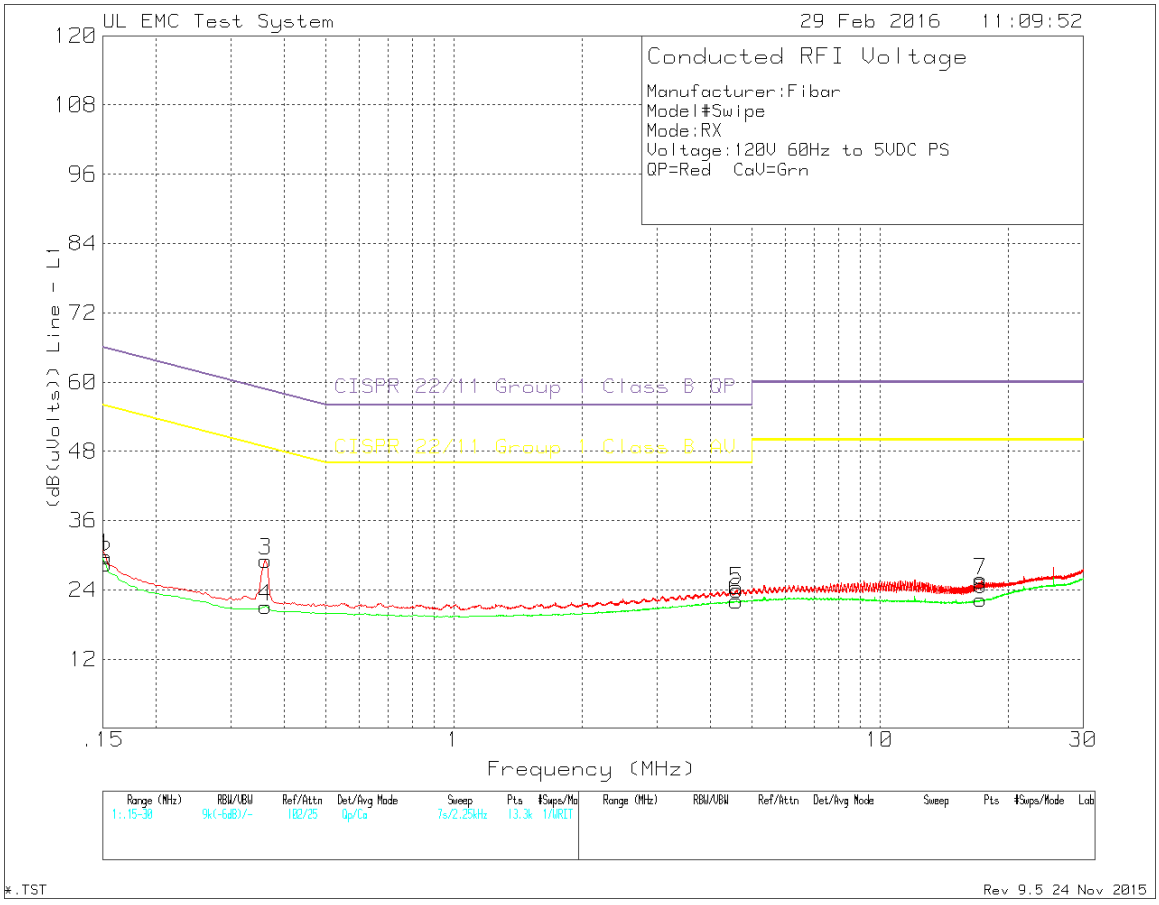
**LINE 2 DATA – RX/Digital Mode – 5VDC USB**

Manufacturer:Fibar
Model#Swipe
Mode:RX
Voltage:5VDC USB
QP=Red CaV=Grn

| Marker No. | Test Frequency (MHz) | Meter Reading (dBuV) | Detector | Line 2 LISN Factors dBm | Cable Gain/Loss dBm | Line 2 EXT Cable Gain/Loss dBm | Line 2 Dongle Gain/Loss dBm | Corrected Reading dB(uVolts) | CISPR 22/11 Group 1 Class B QP | QP Margin (dB) | CISPR 22/11 Group 1 Class B AV | AV Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9 | 0.15225 | 14.51 | Qp | 0.1 | 14.2 | 0 | 0 | 28.81 | 65.88 | -37.07 | - | - |
| 10 | 0.15225 | 11.59 | Ca | 0.1 | 14.2 | 0 | 0 | 25.89 | - | - | 55.88 | -29.99 |
| 11 | 0.41325 | 11.94 | Qp | 0 | 11.3 | 0 | 0 | 23.24 | 57.58 | -34.34 | - | - |
| 12 | 0.41325 | 10.14 | Ca | 0 | 11.3 | 0 | 0 | 21.44 | - | - | 47.58 | -26.14 |
| 13 | 4.0425 | 12.27 | Qp | 0 | 11.2 | 0 | 0.1 | 23.57 | 56 | -32.43 | - | - |
| 14 | 4.0515 | 10.79 | Ca | 0 | 11.2 | 0 | 0.1 | 22.09 | - | - | 46 | -23.91 |
| 15 | 25.59975 | 14.98 | Qp | 0 | 12.2 | 0.1 | 1 | 28.28 | 60 | -31.72 | - | - |
| 16 | 25.59975 | 13.05 | Ca | 0 | 12.2 | 0.1 | 1 | 26.35 | - | - | 50 | -23.65 |

Qp - Quasi-Peak detector
Ca - CISPR Average detection

**LINE 1 DATA – RX/Digital Mode – 120Vac60Hz to Power Supply**



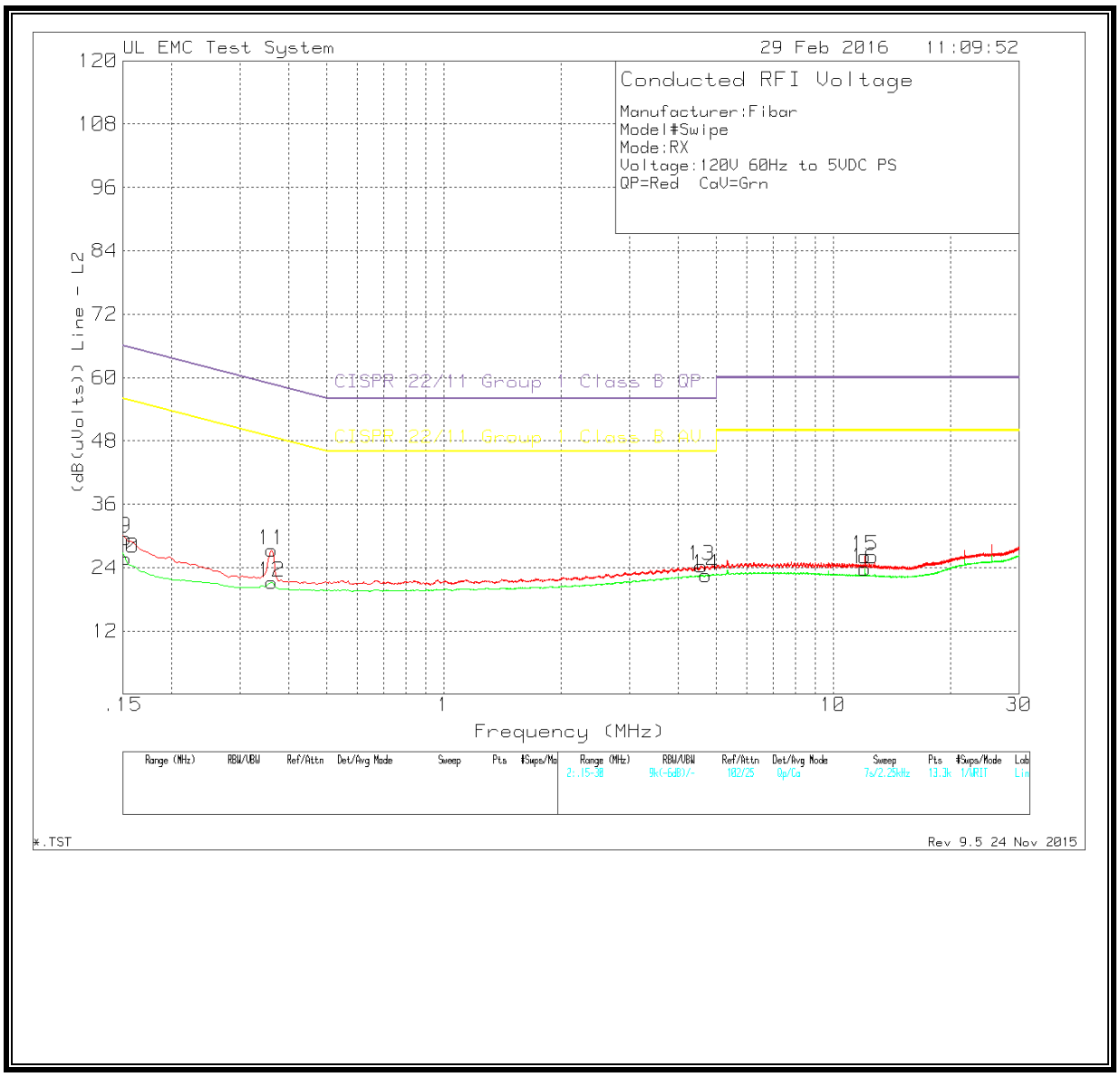
**LINE 1 DATA – RX/Digital Mode – 120Vac60Hz to Power Supply**

Manufacturer:Fibar
Model#Swipe
Mode:RX
Voltage:120V 60Hz to 5VDC PS
QP=Red CaV=Grn

| Marker No. | Test Frequency (MHz) | Meter Reading (dBuV) | Detector | Line 1 LISN Factors dBm | Cable Gain/Loss dBm | Line 1 EXT Cable Gain/Loss dBm | Line 1 Dongle Gain/Loss dBm | Corrected Reading dB(uVolts) | CISPR 22/11 Group 1 Class B QP | QP Margin (dB) | CISPR 22/11 Group 1 Class B AV | AV Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.15225 | 16.04 | Qp | 0.1 | 13.6 | 0 | 0 | 29.74 | 65.88 | -36.14 | - | - |
| 2 | 0.15225 | 14.77 | Ca | 0.1 | 13.6 | 0 | 0 | 28.47 | - | - | 55.88 | -27.41 |
| 3 | 0.3615 | 18.28 | Qp | 0 | 10.8 | 0 | 0 | 29.08 | 58.69 | -29.61 | - | - |
| 4 | 0.3615 | 10.3 | Ca | 0 | 10.8 | 0 | 0 | 21.1 | - | - | 48.69 | -27.59 |
| 5 | 4.62075 | 13.14 | Qp | 0 | 10.7 | 0 | 0.1 | 23.94 | 56 | -32.06 | - | - |
| 6 | 4.60275 | 11.3 | Ca | 0 | 10.7 | 0 | 0.1 | 22.1 | - | - | 46 | -23.9 |
| 7 | 17.25225 | 13.57 | Qp | 0 | 11.3 | 0.1 | 0.6 | 25.57 | 60 | -34.43 | - | - |
| 8 | 17.24775 | 10.43 | Ca | 0 | 11.3 | 0.1 | 0.5 | 22.33 | - | - | 50 | -27.67 |

Qp - Quasi-Peak detector
Ca - CISPR Average detection

**LINE 2 DATA – RX/Digital Mode – 120Vac60Hz to Power Supply**



**LINE 2 DATA – RX/Digital Mode – 120Vac60Hz to Power Supply**

Manufacturer:Fibar
Model#Swipe
Mode:RX
Voltage:120V 60Hz to 5VDC PS
QP=Red CaV=Grn

| Marker No. | Test Frequency (MHz) | Meter Reading (dBuV) | Detector | Line 2 LISN Factors dBm | Cable Gain/Loss dBm | Line 2 EXT Cable Gain/Loss dBm | Line 2 Dongle Gain/Loss dBm | Corrected Reading dB(uVolts) | CISPR 22/11 Group 1 Class B QP | QP Margin (dB) | CISPR 22/11 Group 1 Class B AV | AV Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9 | 0.15225 | 15.28 | Qp | 0.1 | 14.2 | 0 | 0 | 29.58 | 65.88 | -36.3 | - | - |
| 10 | 0.15225 | 11.48 | Ca | 0.1 | 14.2 | 0 | 0 | 25.78 | - | - | 55.88 | -30.1 |
| 11 | 0.3615 | 16.01 | Qp | 0 | 11.3 | 0 | 0 | 27.31 | 58.69 | -31.38 | - | - |
| 12 | 0.3615 | 9.92 | Ca | 0 | 11.3 | 0 | 0 | 21.22 | - | - | 48.69 | -27.47 |
| 13 | 4.58925 | 13.03 | Qp | 0 | 11.2 | 0 | 0.1 | 24.33 | 56 | -31.67 | - | - |
| 14 | 4.7085 | 11.25 | Ca | 0 | 11.2 | 0 | 0.1 | 22.55 | - | - | 46 | -23.45 |
| 15 | 12.05925 | 14.07 | Qp | 0.1 | 11.6 | 0.1 | 0.3 | 26.17 | 60 | -33.83 | - | - |
| 16 | 12.05925 | 11.67 | Ca | 0.1 | 11.6 | 0.1 | 0.3 | 23.77 | - | - | 50 | -26.23 |

Qp - Quasi-Peak detector
Ca - CISPR Average detection