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

CERTIFICATION TEST REPORT

FOR

Door Window Sensor

MODEL NUMBER: FGK-10X

FCC ID: 2AA9MFGK10XZ5
IC: 20430-FGK10XZ5

REPORT NUMBER: 11204799A

ISSUE DATE: June 28, 2016

Prepared for
Fibar Group sp. z.o.o
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Revision History

Rev.	Issue Date	Revisions	Revised By
--	06/28/16	Initial Issue	MF

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1. ATTESTATION OF TEST RESULTS

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

EUT DESCRIPTION: Door Window Sensor

MODEL: FGK-10X

SERIAL NUMBER: Prototype

DATE TESTED: May 1, 2016 – June 27, 2016

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C (15.249)	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:

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UL LLC

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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.
C63.10 sect 4.1.4.2.3

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 12 Laboratory Dr., Research Triangle Park, NC 27709, USA.

12 Laboratory Dr., RTP, NC 27709
☐ Chamber A
☒ Chamber C

The onsite chambers (A & C) are covered under Industry Canada company address code 2180C with site numbers 2180C -1 through 2180C-2, respectively.

UL LLC (RTP) is accredited by NVLAP, Laboratory Code 200246-0.

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

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Radiated Disturbance, 9k to 30 MHz	+/-3.12
Radiated Disturbance, 30 to 1000 MHz	+/-5.36
Radiated Emissions, 1-18 GHz	+/-4.32
Radiated Emissions,18-26 GHz	+/-4.45

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a door window sensor that contains a 908.4-916MHz transceiver. It is battery powered. The EUT contains 4 aux inputs.

5.2. MAXIMUM OUTPUT E-FIELD STRENGTH

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

Frequency Range (MHz)	Mode	Output QP E-field Strength (dBuV/m)
908.4-916MHz	TX	90.70

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an isolated copper wire type whip antenna.

5.4. WORST-CASE CONFIGURATION AND MODE

The EUT was set in worst X axis as found in preliminary testing.

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Use	Product Type	Manufacturer	Model	Comments
EUT	Door Window Sensor	Fibar	FGK-10X	None

Note: **EUT** - Equipment Under Test, **AE** - Auxiliary/Associated Equipment, or **SIM** - Simulator (Not Subjected to Test)

I/O CABLES

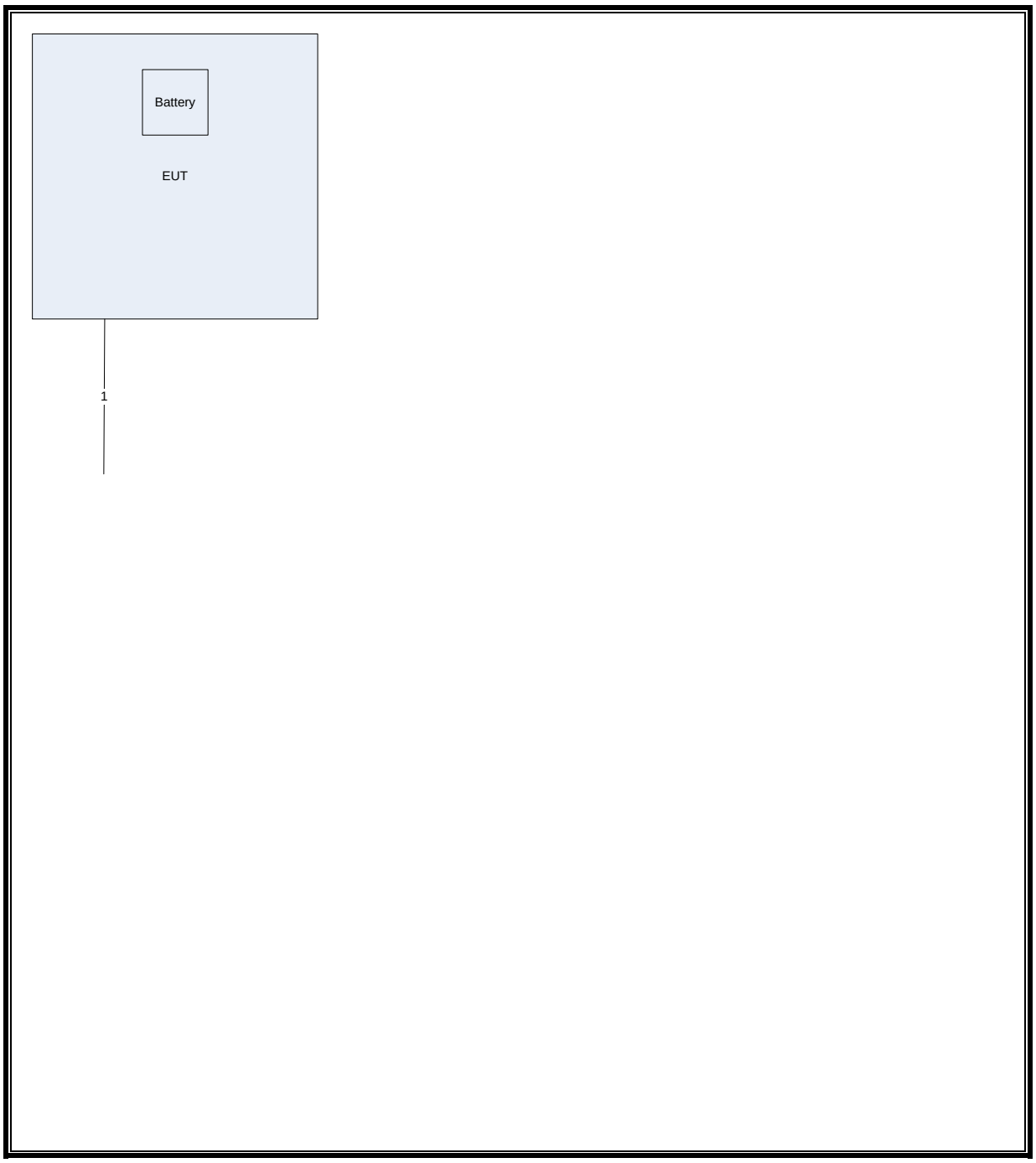
Port #	Name	Type*	Cable Max. >3m (Y/N)	Cable Shielded (Y/N)	Comments
0	Enclosure	N/E	—	—	None
1	Aux input	IO	N	N	1m length

Note:
AC = AC Power Port DC = DC Power Port N/E = Non-Electrical
I/O = Signal Input or Output Port (Not Involved in Process Control)
TP = Telecommunication Ports

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:

Equip. ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
	30-1000 MHz Range				
AT0075	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2015-06-10	2016-06-30
	1-18 GHz				
AT0062	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2015-08-25	2016-08-31
	9k-30MHz				
00204701	Loop Antenna	ETS-Lindgren	6502	2015-12-08	2016-12-31
	Gain-Loss Chains				
C-SAC01	Gain-loss string: 0.009-1000MHz	Various	Various	2016-01-26	2017-01-31
C-SAC02	Gain-loss string: 1-18GHz	Various	Various	2016-01-28	2017-01-31
	Receiver & Software				
SA0016	Spectrum Analyzer	Agilent	PXA N9030A	2015-08-26	2016-08-31
SOFTEMI	EMI Software	UL	Version 9.5	NA	NA
	Additional Equipment used				
HI0069	Temp/Humid/Pressure Meter	Cole-Parmer	99760-00	2015-07-15	2016-07-31

7. TEST RESULTS

7.1.1. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

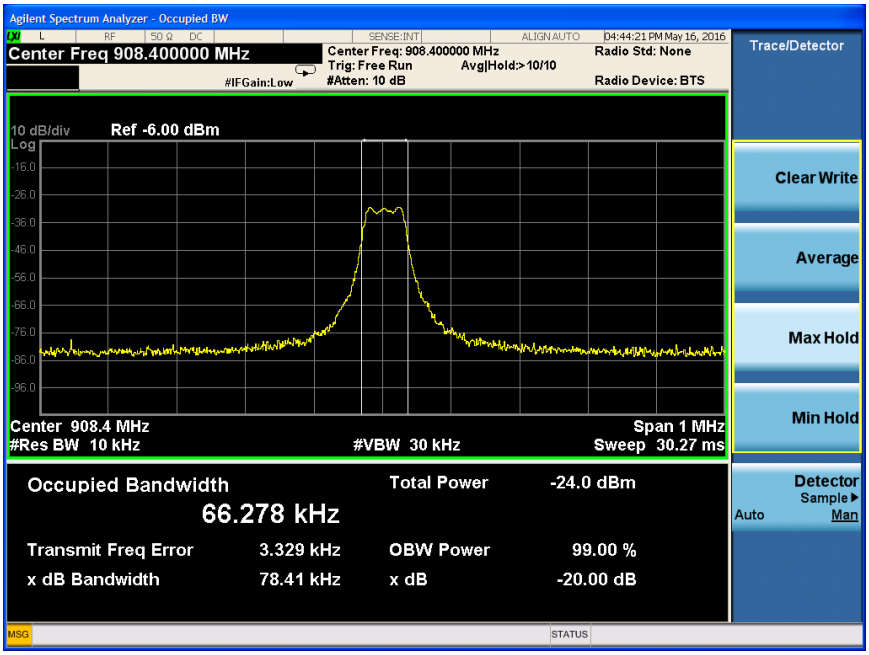
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

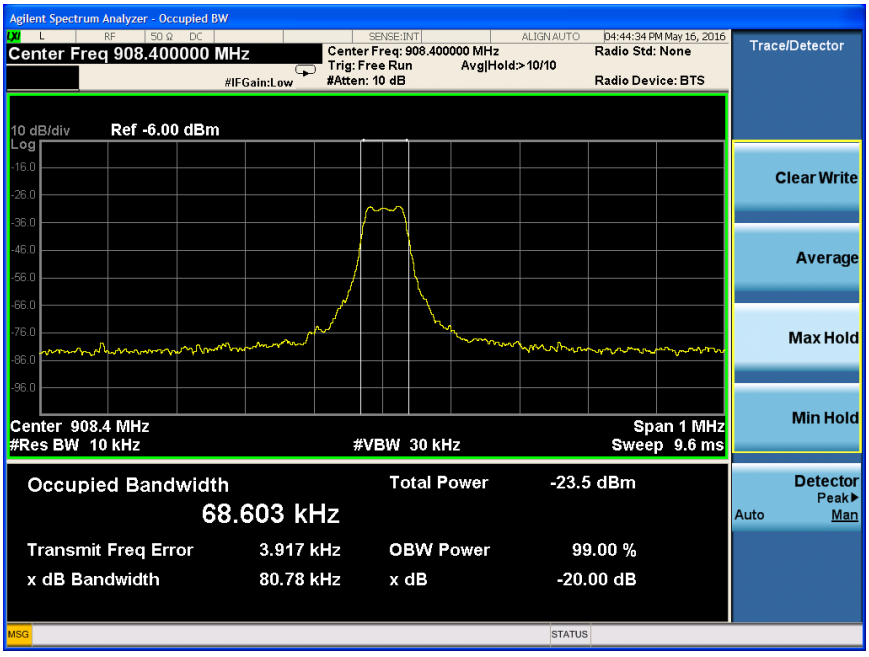
RESULTS

Channel	Frequency (MHz)	99% Bandwidth (kHz)	20dB Bandwidth (kHz)
Low	908.4	66.28	80.78
High	916	82.23	97.49

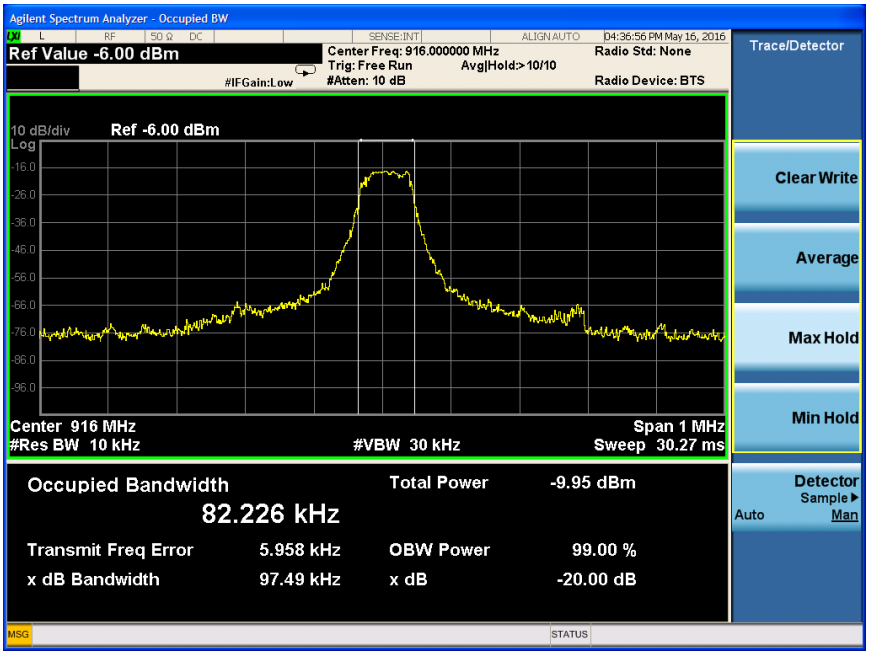
BANDWIDTH

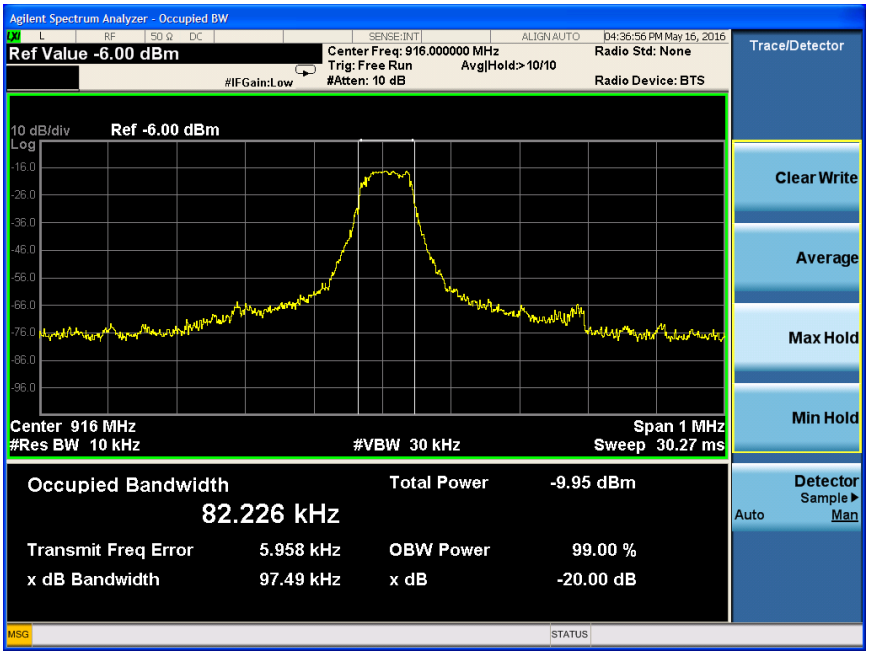
BANDWIDTH LOW CH





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

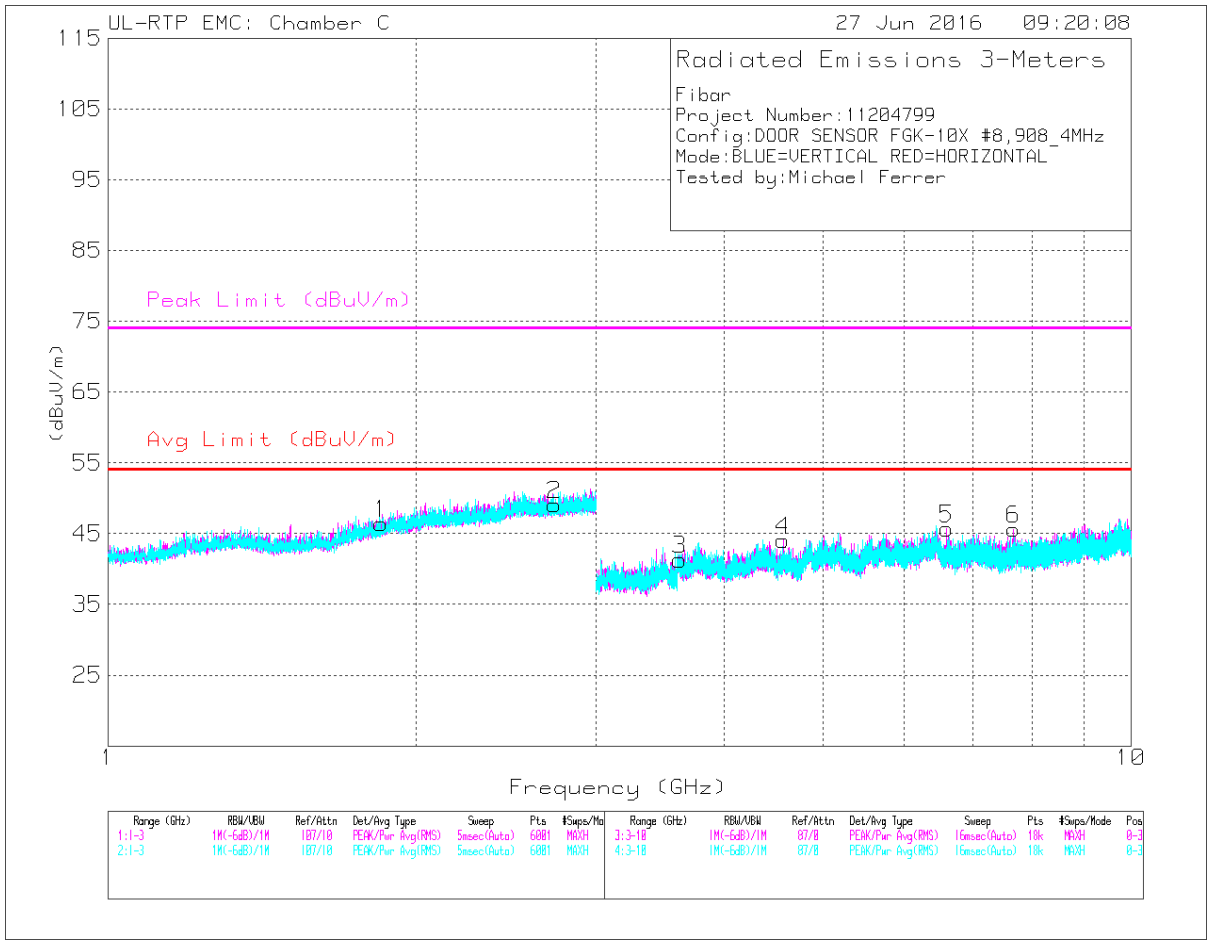
** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54–72 MHz, 76–88 MHz, 174–216 MHz or 470–806 MHz. However, operation within these frequency bands is permitted under other sections of this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

RESULTS

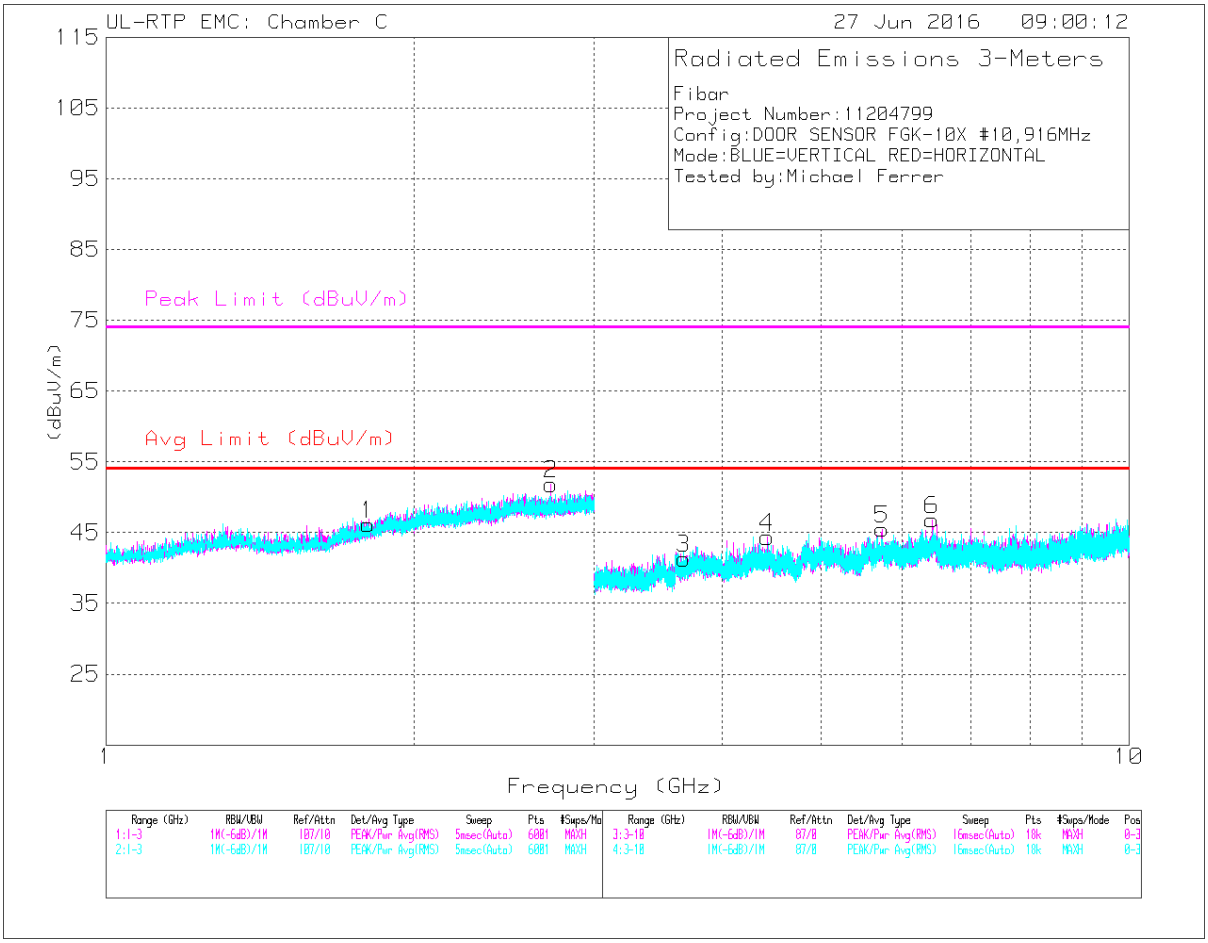
7.2.1. FUNDAMENTAL FREQUENCY RADIATED EMISSION

Test Frequency (MHz)	Meter Reading (dBuV)	Detector	AF (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
908.4	91.02	Qp	26.8	-27.2	90.62	94	-3.38	243	161	H
908.4	87.32	Qp	26.8	-27.2	86.92	94	-7.08	299	296	V
916	88.08	Qp	26.7	-27.1	87.68	94	-6.32	296	294	V
916	91.1	Qp	26.7	-27.1	90.7	94	-3.3	242	159	H

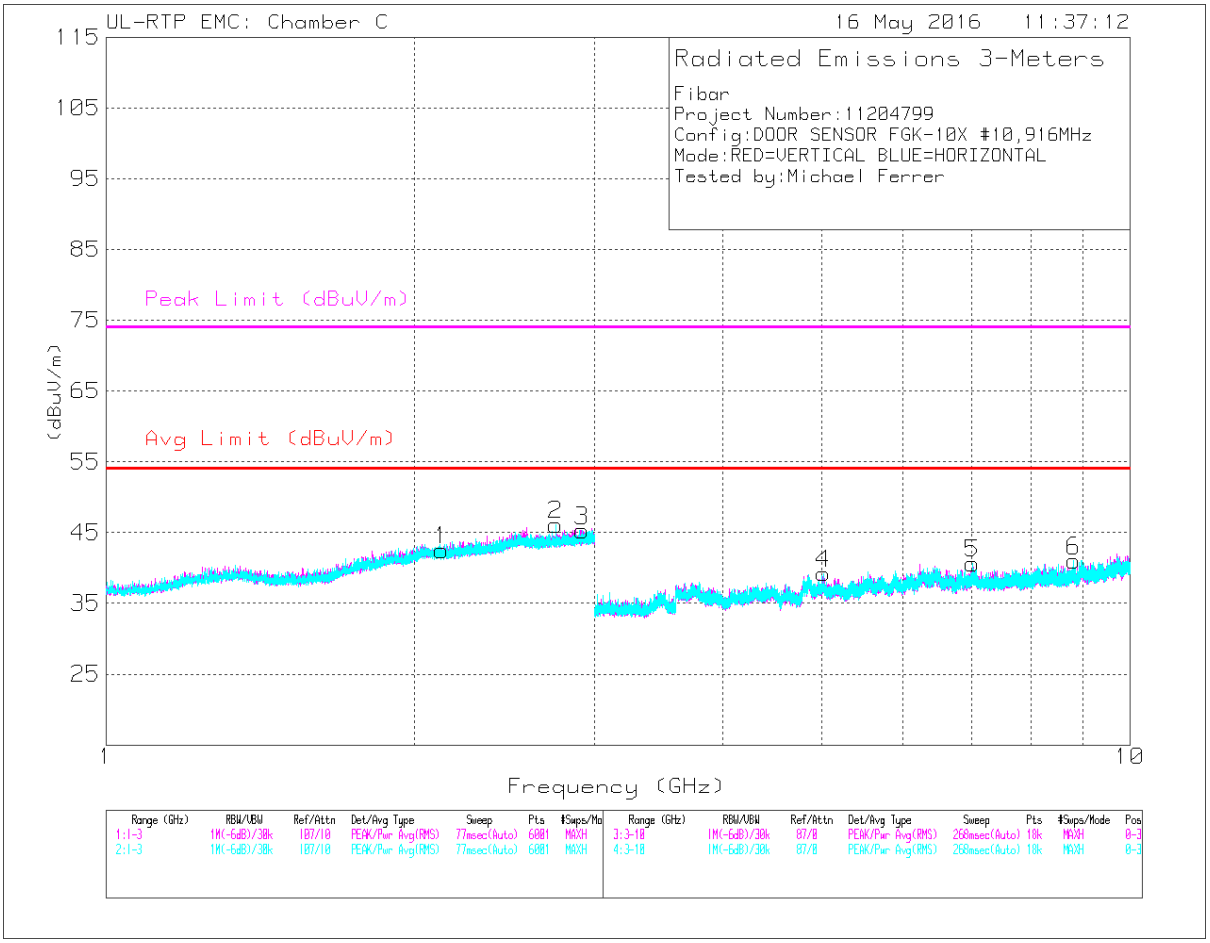
7.2.2. HARMONICS AND SPURIOUS EMISSIONS ABOVE 1GHz



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF (dB/m)	Amp/Cbl/Fltr/ Pad	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	2.73	42.88	Pk	32.3	-26.1	49.08	54	-4.92	74	-24.92	0-360	200	H
3	3.621	42.4	Pk	33.3	-34.4	41.3	54	-12.7	74	-32.7	0-360	101	H
4	4.57	43.75	Pk	34.2	-33.9	44.05	54	-9.95	74	-29.95	0-360	200	H
6	7.678	38.64	Pk	35.8	-28.8	45.64	54	-8.36	74	-28.36	0-360	101	H
1	1.849	44.24	Pk	30.2	-28	46.44	54	-7.56	74	-27.56	0-360	200	H
5	6.606	39.57	Pk	35.6	-29.5	45.67	54	-8.33	74	-28.33	0-360	101	H



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF (dB/m)	Amp/Cbl/Fltr/ Pad	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	2.722	45.66	Pk	32.3	-26.1	51.86	54	-2.14	74	-22.14	0-360	200	H
3	3.67	42.71	Pk	33.3	-34.7	41.31	54	-2.69	74	-32.69	0-360	200	H
1	1.804	44.24	Pk	30.1	-28.2	46.14	54	-7.86	74	-27.86	0-360	101	H
4	4.427	44.33	Pk	33.9	-33.9	44.33	54	-9.67	74	-29.67	0-360	101	H
5	5.737	40.98	Pk	34.6	-30.1	45.48	54	-8.52	74	-28.52	0-360	200	H
6	6.422	40.71	Pk	35.5	-29.4	46.81	54	-7.19	74	-27.19	0-360	200	H

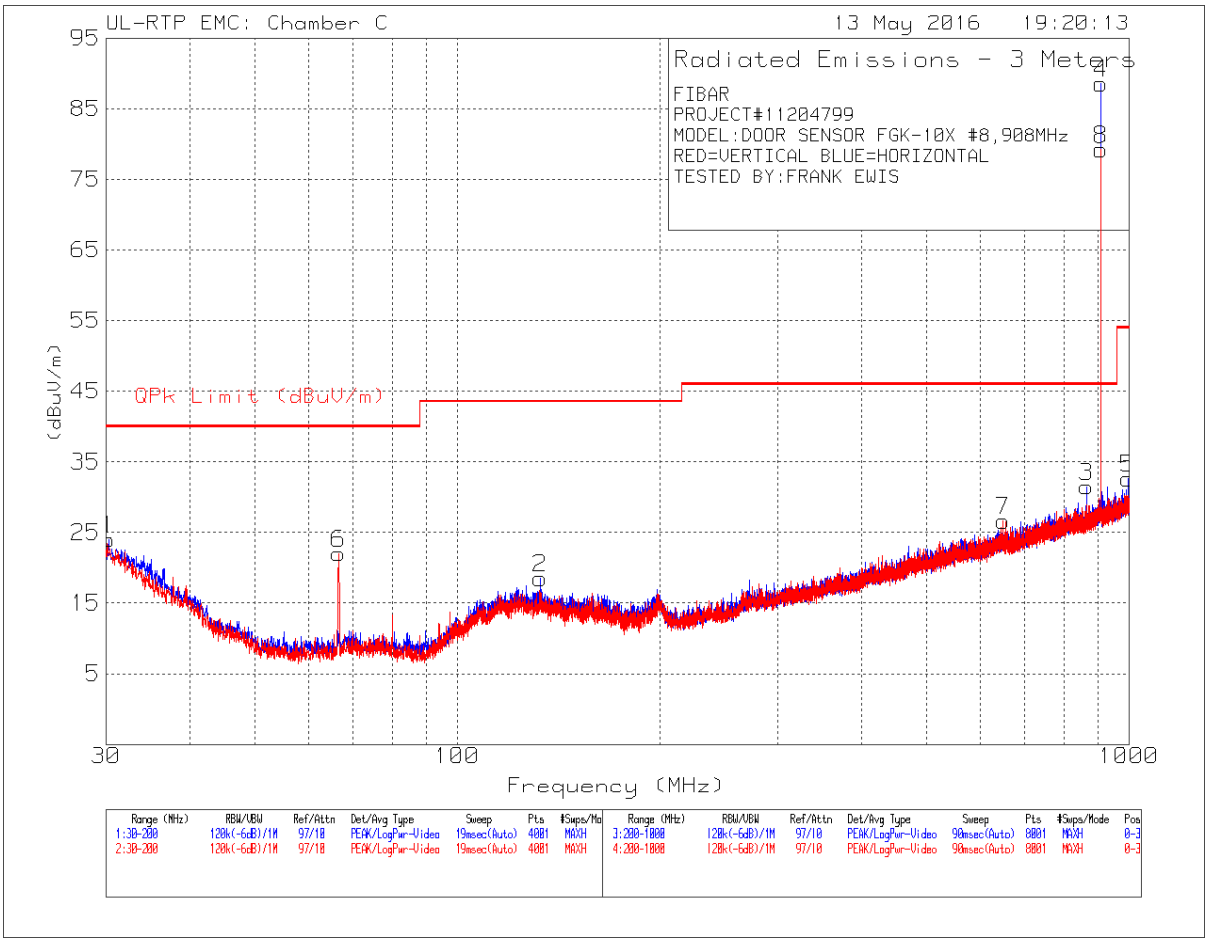


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF (dB/m)	Amp/Cbl/Fltr/Pad	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	2.748	39.8	Pk	32.4	-26.1	46.1	54	-7.9	74	-27.9	0-360	200	V
4	5.019	37.03	Pk	34.2	-32	39.23	54	-14.77	74	-34.77	0-360	101	V
1	2.127	38.43	Pk	31.6	-27.5	42.53	54	-11.47	74	-31.47	0-360	101	V
3	2.918	38.37	Pk	32.7	-25.8	45.27	54	-8.73	74	-28.73	0-360	101	V
5	7.016	33.57	Pk	35.7	-28.6	40.67	54	-13.33	74	-33.33	0-360	101	V
6	8.814	32.61	Pk	36.1	-27.7	41.01	54	-12.99	74	-32.99	0-360	101	V

Reduced VBW scan was performed to show emissions below AV limit. 30kHz was considered to be worst case. C63.10 (4.1.4.2.3) AV measurements using reduced VBW.

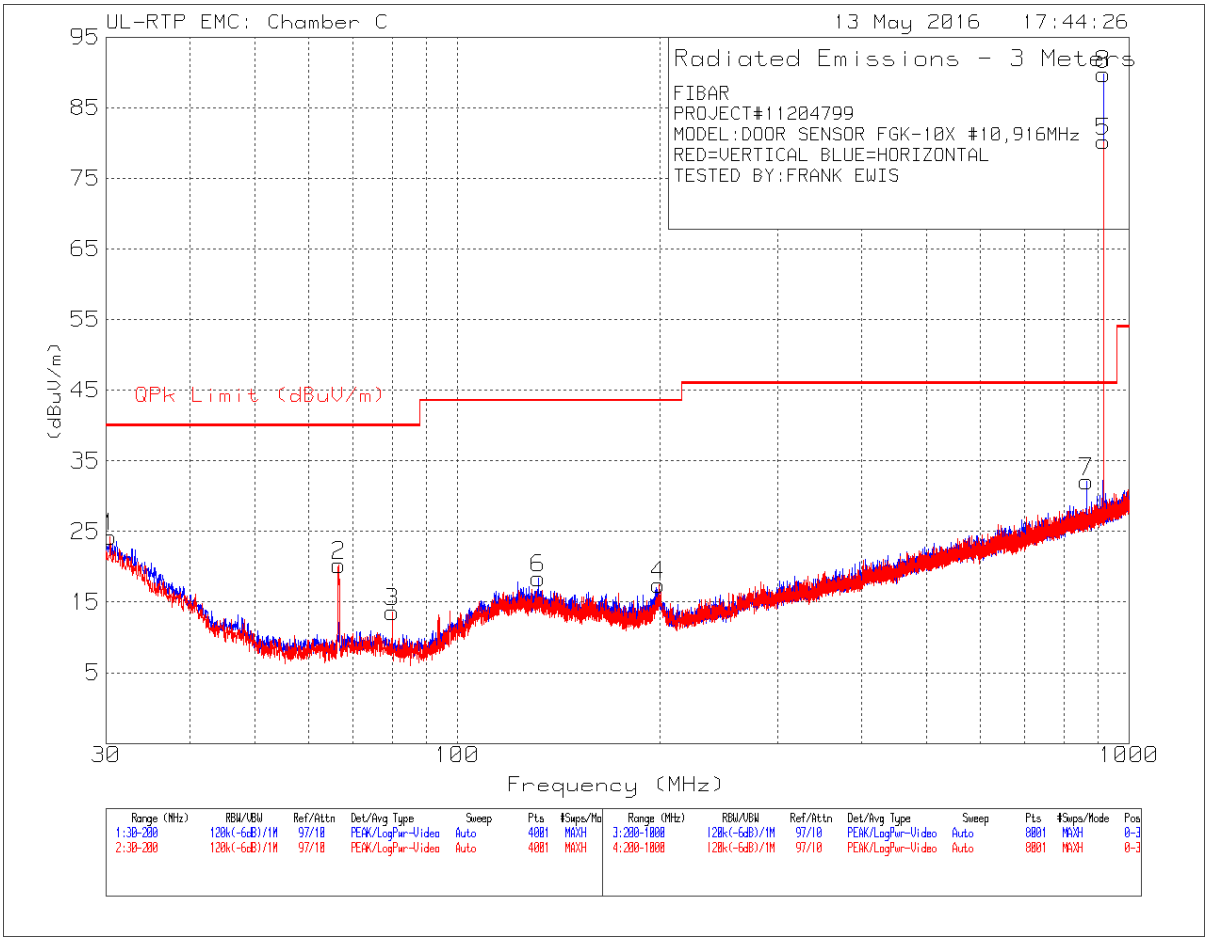
7.2.3. WORST-CASE BELOW 1 GHz

SPURIOUS EMISSIONS 30 TO 1000 MHz



Frequency (MHz)	Meter Reading (dBuV)	Det	AF (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
133.0325	25.45	Qp	18.1	-30.7	12.85	43.52	-30.67	55	101	H
133.2701	31.74	Pk	18.1	-30.7	19.14	43.52	-24.38	55	101	H
992.0034	27.69	Pk	27.9	-26.2	29.39	53.97	-24.58	243	139	H
992.0057	25.54	Qp	27.9	-26.2	27.24	53.97	-26.73	243	139	H

Pk - Peak detector
Qp - Quasi-Peak detector

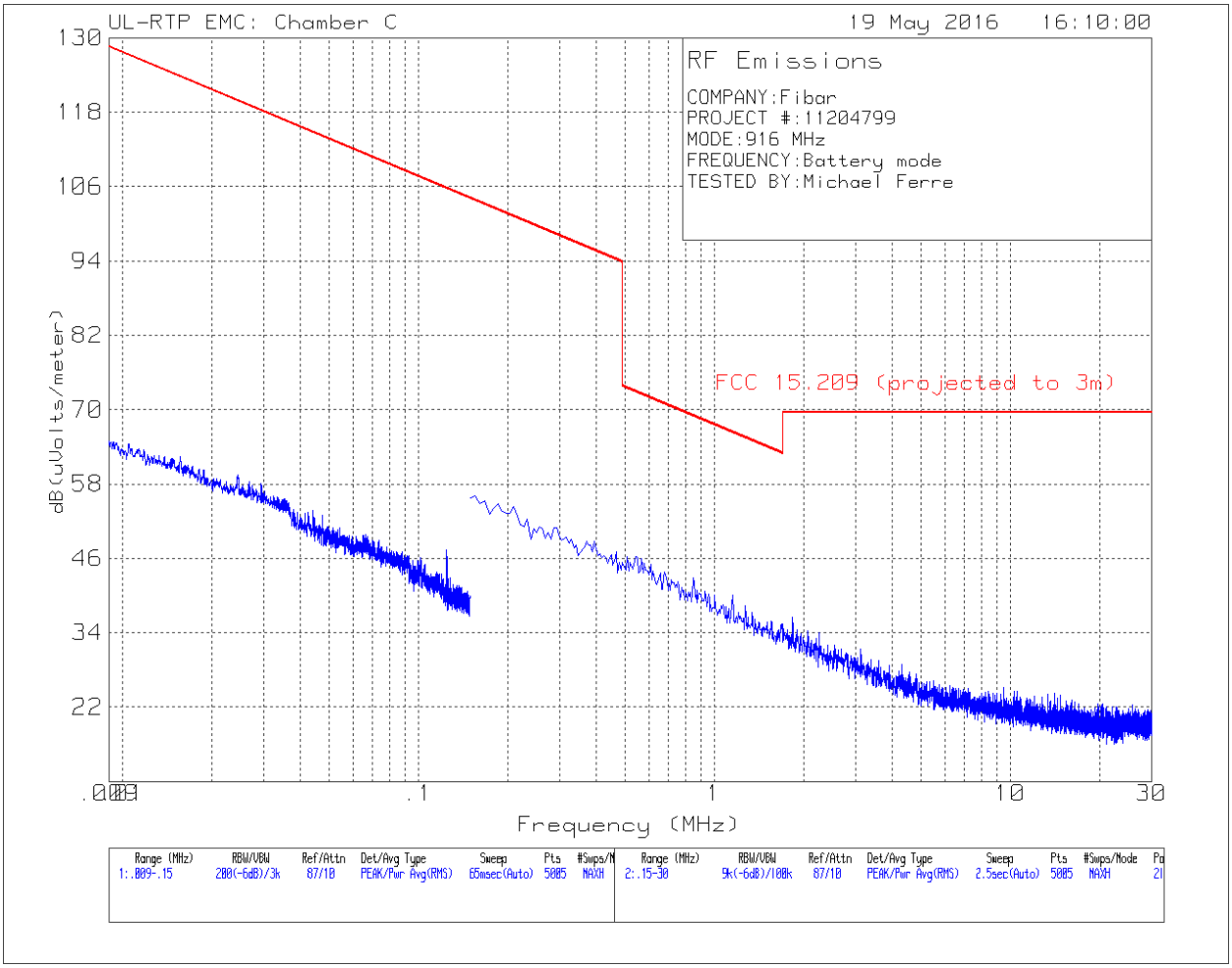


Frequency (MHz)	Meter Reading (dBuV)	Det	AF (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
132.8285	26.47	Qp	18.1	-30.7	13.87	43.52	-29.65	349	118	H
132.8285	31.03	Pk	18.1	-30.7	18.43	43.52	-25.09	349	118	H

Pk - Peak detector
Qp - Quasi-Peak detector

SPURIOUS EMISSIONS 9k TO 30 MHz

Worst case channel



No visable emissions above noise floor