



**FCC 47 CFR PART 15 SUBPART C
INDUSTRY CANADA RSS-210 ISSUE 9**

CERTIFICATION TEST REPORT

FOR

Fibaro Door/Window Sensor 2

MODEL NUMBER: FGDW-002

FCC ID: 2AA9MFGDW002

IC: 20430- FGDW002

REPORT NUMBER: 11424859A

ISSUE DATE: March 1, 2017

Prepared for
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Revision History

Rev.	Issue Date	Revisions	Revised By
--	March 1, 2017	Initial Issue	V Sabalvaro

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS	4
2. TEST METHODOLOGY	5
3. FACILITIES AND ACCREDITATION	5
4. CALIBRATION AND UNCERTAINTY	5
4.1. <i>MEASURING INSTRUMENT CALIBRATION</i>	5
4.2. <i>SAMPLE CALCULATION</i>	5
4.3. <i>MEASUREMENT UNCERTAINTY</i>	6
5.5. <i>DESCRIPTION OF TEST SETUP</i>	8
6. TEST AND MEASUREMENT EQUIPMENT	10
7. TEST RESULTS	11
7.1. <i>20 dB AND 99% BANDWIDTH</i>	11
7.2. <i>RADIATED EMISSIONS</i>	15
7.2.1. <i>FUNDAMENTAL FREQUENCY RADIATED EMISSION</i>	16
7.2.2. <i>HARMONICS AND SPURIOUS EMISSIONS ABOVE 1GHz</i>	17
7.2.3. <i>WORST-CASE BELOW 1 GHz</i>	23
7.2.4. <i>Transmitter RX/Digital Radiated Emissions</i>	31
8. SETUP PHOTOS	35

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Fibar Group S.A.
Ul. Lotnicza 1
Poznań, Poland 60-421

EUT DESCRIPTION: Fibaro Door/Window Sensor 2

MODEL: FGDW-002

SERIAL NUMBER: Non-serialized

DATE TESTED: January 30 – February 7, 2017

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Pass
CFR 47 Part 15 Subpart B	Pass
INDUSTRY CANADA RSS-210 Issue 9 Annex B.10	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
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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, ANSI C63.4:2014, FCC CFR 47 Part 2, FCC CFR 47 Part 15, RSS-GEN Issue 4, and RSS-210 Issue 9.

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	9k-30MHz	H-Field Loop	3.15dB
Radiated Emissions	30-200MHz	Bicon 3m Horz	3.64dB
Radiated Emissions	30-200MHz	Bicon 3m Vert	5.10dB
Radiated Emissions	200-1000MHz	LogP 3m Horz	4.00dB
Radiated Emissions	200-1000MHz	LogP 3m Vert	5.36dB
Radiated Emissions	30-200MHz	Bicon 10m Horz	4.48dB
Radiated Emissions	30-200MHz	Bicon 10m Vert	4.49dB
Radiated Emissions	200-1000MHz	LogP 10m Horz	3.79dB
Radiated Emissions	200-1000MHz	LogP 10m Vert	3.84dB
Radiated Emissions	1-18GHz	Horn	4.32dB
Conducted Ant Port	30MHz-26GHz	Spectrum Analyzer	2.94dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT, FGDW-002, is a 908.4MHz, 908.42MHz, and 916MHz transceiver. It is internal battery powered. The transmitter utilizes Z-wave technologies to communicate with other devices for home automation.

The 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	Output QP E-field Strength (dBuV/m)
908.4 - 916	TX	91.74

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio is equipped with an embedded, impedance matched quarter-wave antenna. Antenna was designed as a trace on PCB.

5.4. WORST-CASE CONFIGURATION AND MODE

The EUT was set in worst axis as found in preliminary testing. The Z-axis was determined to be the worst axis.

For radiated emissions, the worst-case configuration is determined to be the transmitting channel with the highest measured output power.

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
None	-	-	-	-

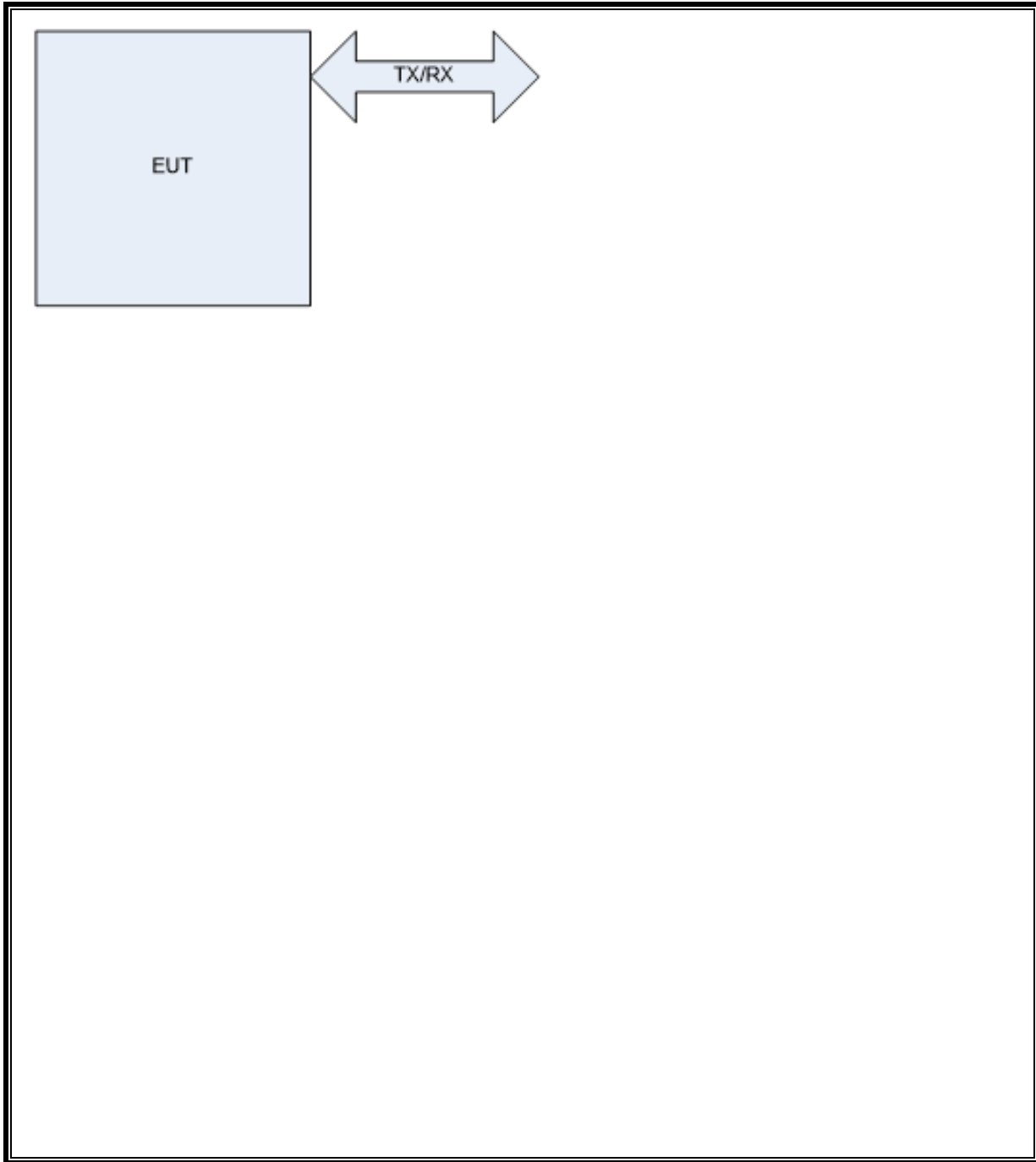
I/O CABLES

Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
0	Enclosure	-	Non-Electrical	-	-	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		
Signal Analyzer	Agilent	N9030A	EMC4360	1/27/2017	1/31/2018
Near Field Probe	EMCO	7405	1270	N/A	N/A
Test Receiver	Rhode & Schwarz	ESCI	EMC4328	12/2/2016	12/31/2017
Log-P Antenna	Chase	UPA6109	EMC4258	5/11/2016	5/31/2017
Bicon Antenna	Chase	EM6912A	EMC4070	12/6/2016	12/31/2017
Antenna Array	UL	BOMS	EMC4276	1/27/2017	1/31/2018
Test Receiver	Rhode & Schwarz	ESU	EMC4323	12/24/2016	12/31/2017
Loop Antenna	EMCO	6502/1	EMC4026	7/22/2016	7/31/2017

7. TEST RESULTS

7.1. 20 dB AND 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

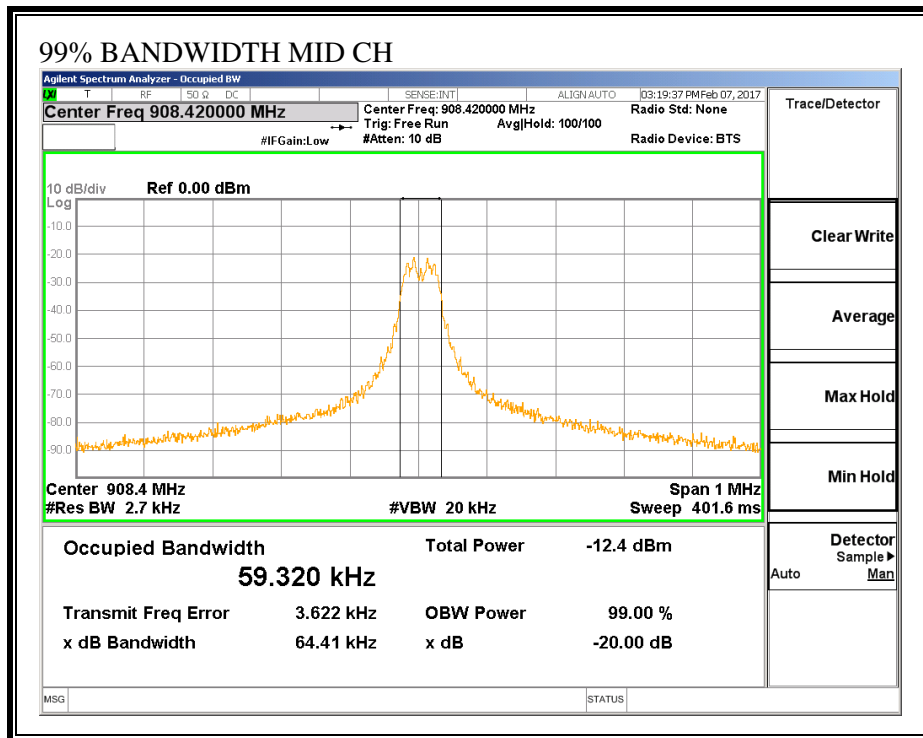
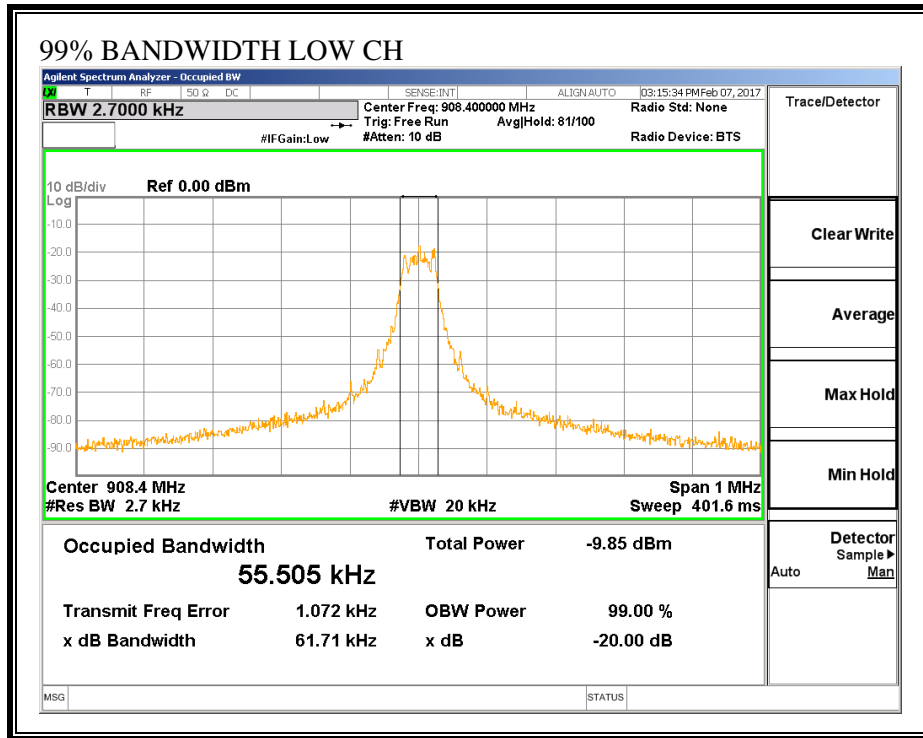
TEST PROCEDURE

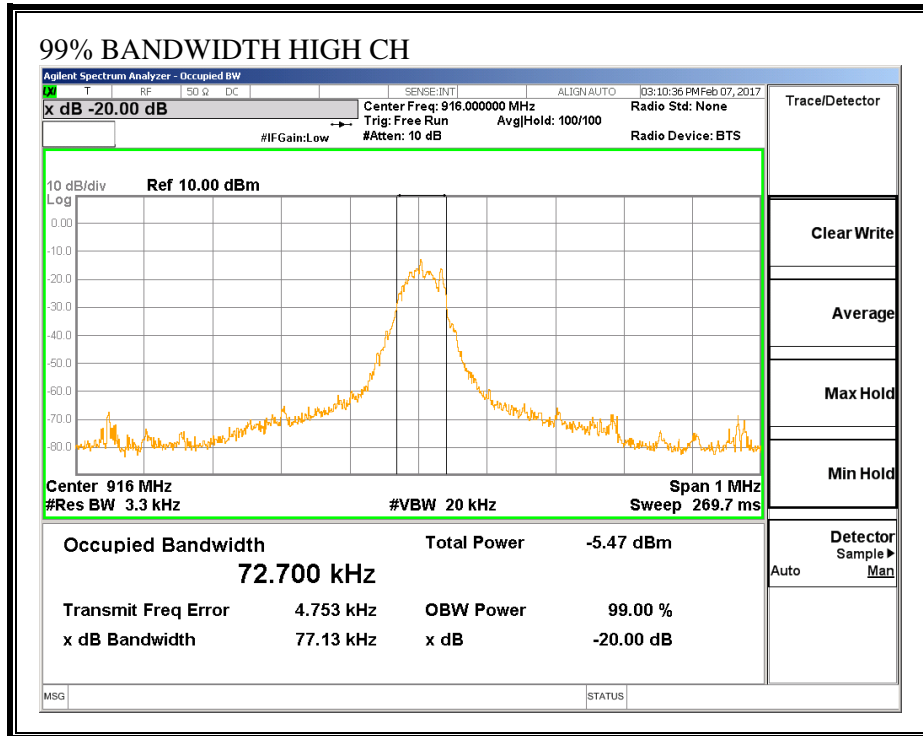
The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 5% of the Occupied Bandwidth. The VBW is set to at least 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

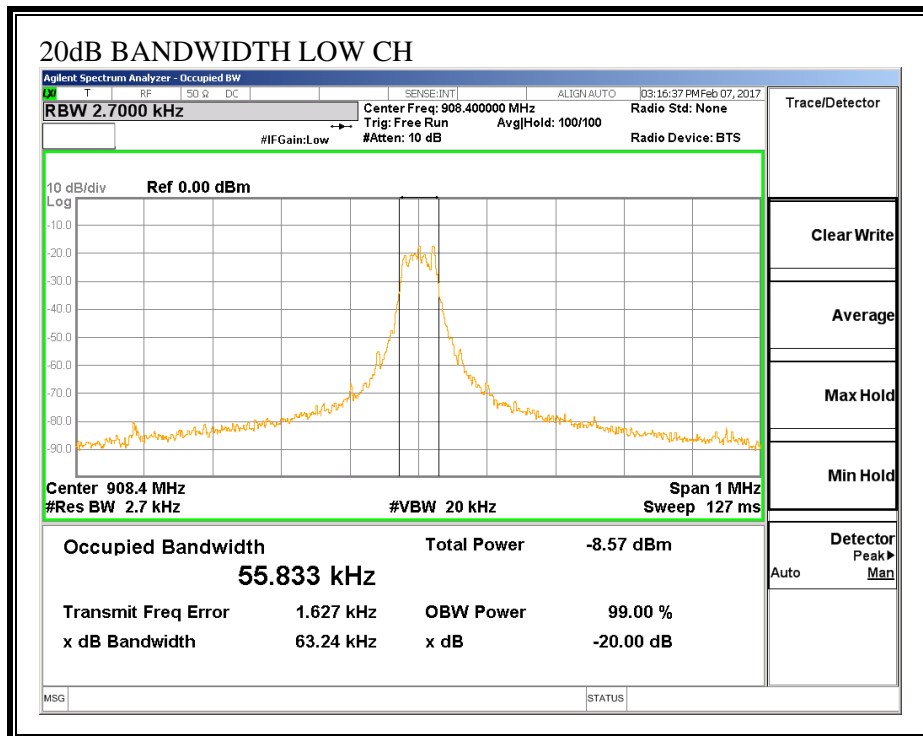
Channel	Frequency (MHz)	20 dB Bandwidth (kHz)	99% Bandwidth (kHz)
Low	908.4	63.24	55.505
Middle	908.42	65.66	59.32
High	916	78.5	72.7

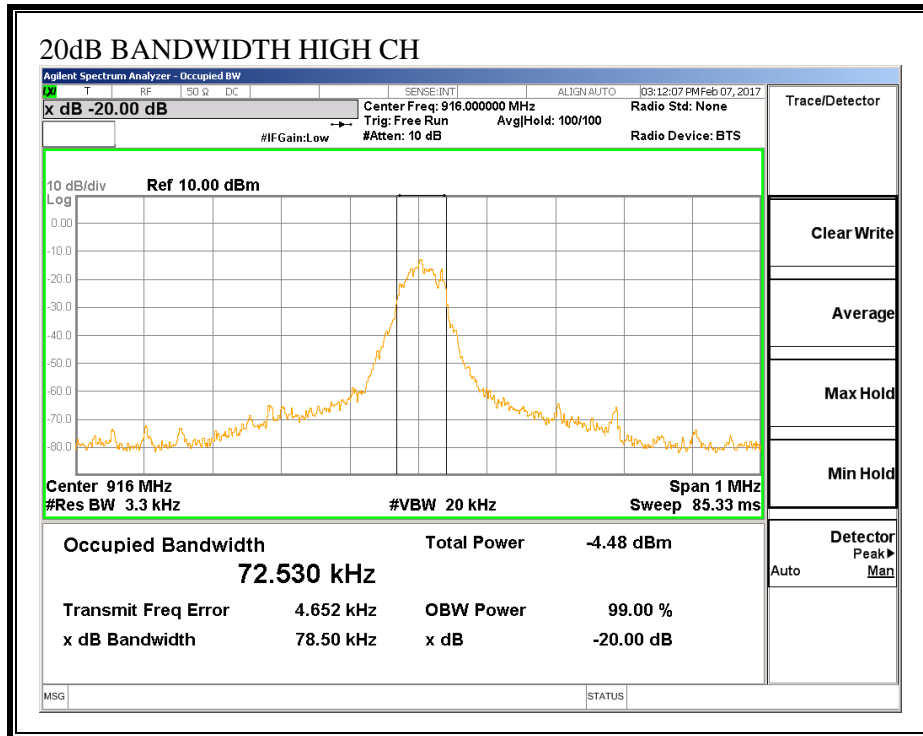
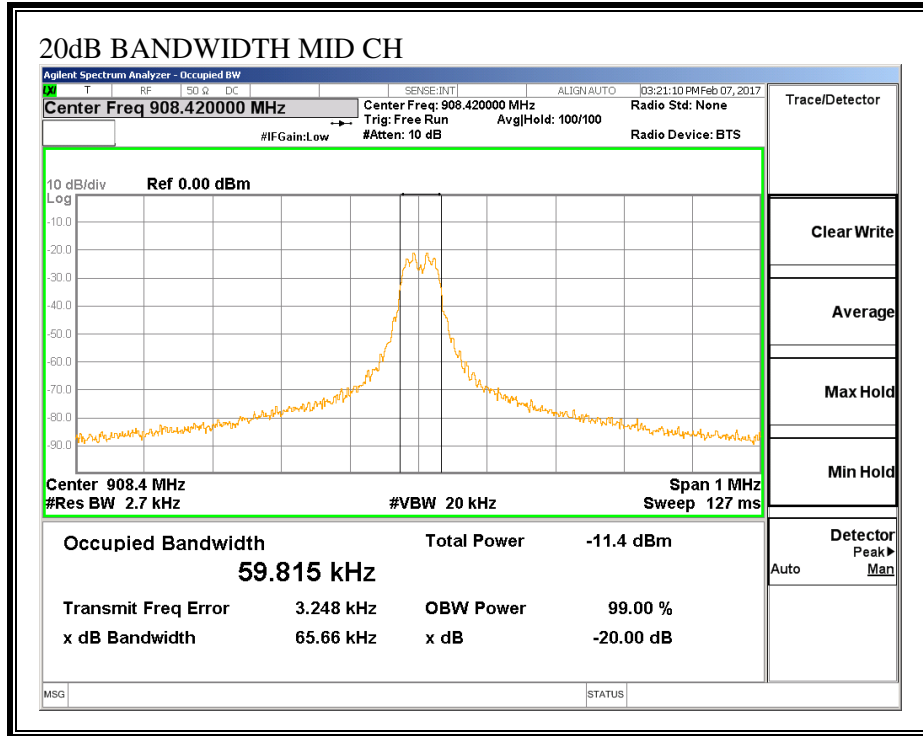
99% BANDWIDTH





20dB BANDWIDTH





7.2. RADIATED EMISSIONS

LIMIT

IC RSS-210, B.10
 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

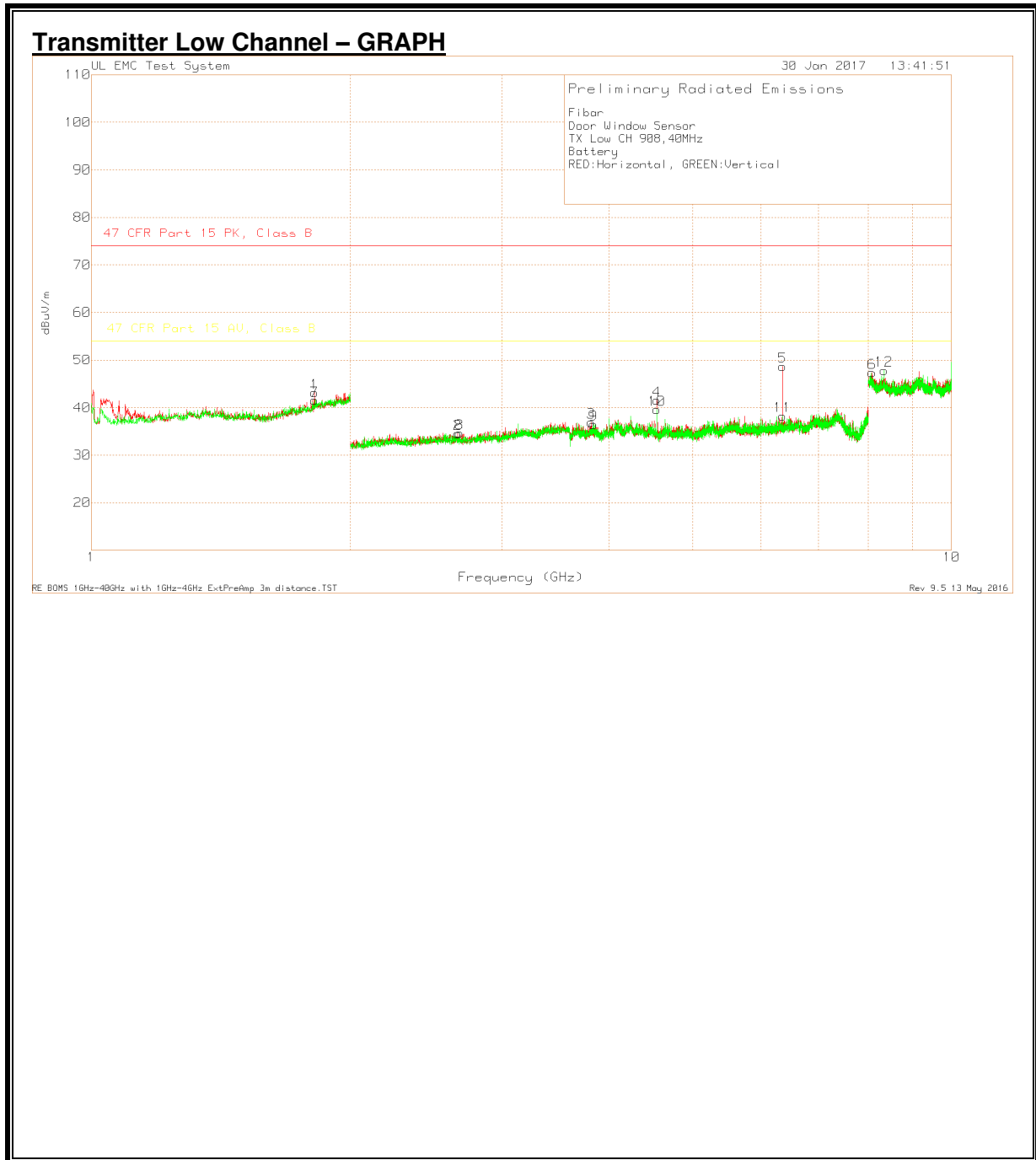
7.2.1. FUNDAMENTAL FREQUENCY RADIATED EMISSION

Manufacturer:Fibar
 Model#Door Window Sensor
 Mode:TX
 Voltage:Battery

Test Frequency (MHz)	Meter Reading (dBuV)	Antenna Factor dBm	Path dB	Corrected Reading		PK Limit dBuV/m	PK Margin (dB)	QP		Azimuth [Degs]	Height [cm]	Polarity
				dB(uVolts/ meter)	PK Limit			QP Limit dBuV/m	Margin (dB)			
Low CH												
908.37756	58.03 Pk	23.1	9.5	90.63	114	-23.37	-	-	-	0	101	H
908.37756	57.81 Qp	23.1	9.5	90.41	-	-	-	94	-3.59	0	101	H
908.37756	49.87 Pk	23.1	9.5	82.47	114	-31.53	-	-	-	108	172	V
908.37756	49.47 Qp	23.1	9.5	82.07	-	-	-	94	-11.93	108	172	V
Mid CH												
908.44031	50.27 Pk	23.1	9.5	82.87	114	-31.13	-	-	-	107	171	V
908.44031	50.12 Qp	23.1	9.5	82.72	-	-	-	94	-11.28	107	171	V
908.44031	50.19 Pk	23.1	9.5	82.79	114	-31.21	-	-	-	106	172	H
908.44031	50.04 Qp	23.1	9.5	82.64	-	-	-	94	-11.36	106	172	H
High CH												
915.97738	59.15 Pk	23.3	9.6	92.05	114	-21.95	-	-	-	105	100	H
915.97738	58.84 Qp	23.3	9.6	91.74	-	-	-	94	-2.26	105	100	H
915.97738	50.18 Pk	23.3	9.6	83.08	114	-30.92	-	-	-	211	177	V
915.97738	49.89 Qp	23.3	9.6	82.79	-	-	-	94	-11.21	211	177	V

Pk - Peak detector
 Qp - Quasi-Peak detector

7.2.2. HARMONICS AND SPURIOUS EMISSIONS ABOVE 1GHz



Transmitter Low Channel – DATA

Fibar
 Door Window Sensor
 TX Low CH 908,40MHz
 Battery

Marker No.	Test Frequency (GHz)	Meter		Antenna		Corrected		PK		AV		Azimuth [Degs]	Height [cm]	Polarity
		Reading (dBuV)	Detector	Factor (dBm)	Path (dB)	Reading dBuV/m	PK Limit dBuV/m	Margin (dB)	AV Limit dBuV/m	Margin (dB)				
1	1.817	67.5	Pk	30.4	-54.78	43.12	74	-30.88	54	-10.88	0-360	150	H	
2	2.667	63.16	Pk	22.2	-50.82	34.54	74	-39.46	54	-19.46	0-360	100	H	
3	3.81	63.07	Pk	24.1	-50.23	36.94	74	-37.06	54	-17.06	0-360	149	H	
4	4.542	65.52	Pk	27.8	-51.81	41.51	74	-32.49	54	-12.49	0-360	102	H	
5	6.359	67.06	Pk	29.2	-47.61	48.65	74	-25.35	54	-5.35	0-360	102	H	
6	8.083	58.19	Pk	36.2	-47.02	47.37	74	-26.63	54	-6.63	0-360	100	H	
7	1.818	65.88	Pk	30.4	-54.77	41.51	74	-32.49	54	-12.49	0-360	100	V	
8	2.679	63.35	Pk	22.1	-50.81	34.64	74	-39.36	54	-19.36	0-360	150	V	
9	3.834	62.36	Pk	24	-49.9	36.46	74	-37.54	54	-17.54	0-360	150	V	
10	4.542	63.59	Pk	27.8	-51.81	39.58	74	-34.42	54	-14.42	0-360	100	V	
11	6.359	56.65	Pk	29.2	-47.61	38.24	74	-35.76	54	-15.76	0-360	100	V	
12	8.344	58.64	Pk	36.5	-47.31	47.83	74	-26.17	54	-6.17	0-360	150	V	

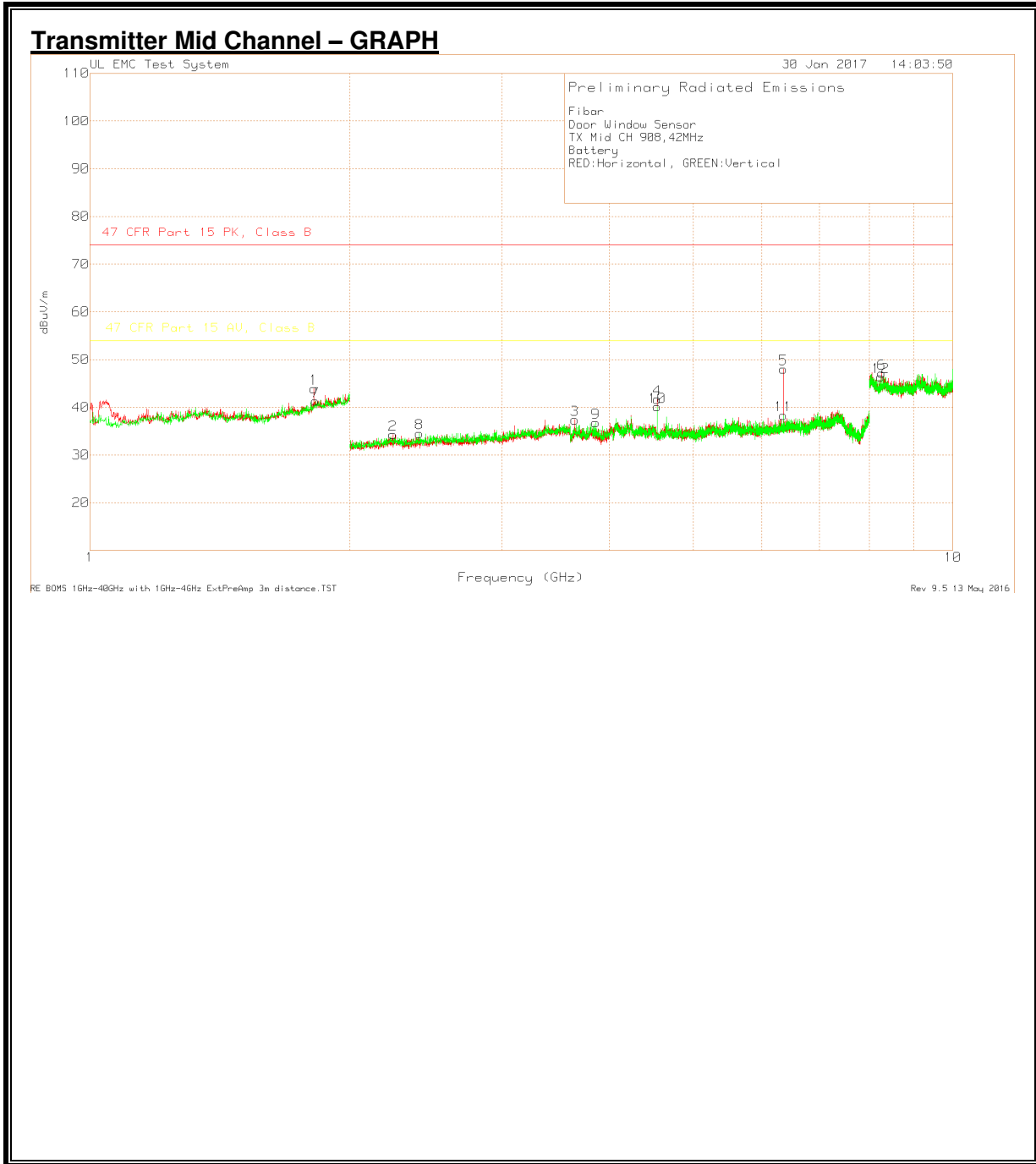
Pk - Peak detector

Radiated Emission Data

Test Frequency (GHz)	Meter		Antenna		Corrected		PK		AV		Azimuth [Degs]	Height [cm]	Polarity
	Reading (dBuV)	Detector	Factor (dBm)	Path (dB)	Reading dBuV/m	PK Limit dBuV/m	Margin (dB)	AV Limit dBuV/m	Margin (dB)				
6.3589	68.65	Pk	29.2	-47.61	50.24	74	-23.76	54	-3.76	270	100	H	
6.3588	65.65	Av	29.2	-47.61	47.24	74	-26.76	54	-6.76	270	100	H	

Pk - Peak detector

Av - Average detection



Transmitter Mid Channel – DATA

Fibar
 Door Window Sensor
 TX Mid CH 908,42MHz
 Battery

Marker No.	Test Frequency (GHz)	Meter		Antenna		Corrected Reading dBuV/m	PK		AV		Azimuth [Degs]	Height [cm]	Polarity
		Reading (dBuV)	Detector	Factor (dBm)	Path (dB)		Limit dBuV/m	Margin (dB)	Limit dBuV/m	Margin (dB)			
1	1.817	68.33	Pk	30.4	-54.78	43.95	74	-30.05	54	-10.05	0-360	100	H
2	2.244	63.7	Pk	21.8	-51.2	34.3	74	-39.7	54	-19.7	0-360	100	H
3	3.647	63.64	Pk	23.3	-49.55	37.39	74	-36.61	54	-16.61	0-360	100	H
4	4.542	65.71	Pk	27.8	-51.81	41.7	74	-32.3	54	-12.3	0-360	102	H
5	6.359	66.46	Pk	29.2	-47.61	48.05	74	-25.95	54	-5.95	0-360	102	H
6	8.271	58.8	Pk	36.4	-48.09	47.11	74	-26.89	54	-6.89	0-360	100	H
7	1.825	65.49	Pk	30.5	-54.68	41.31	74	-32.69	54	-12.69	0-360	150	V
8	2.409	63.89	Pk	21.8	-51.12	34.57	74	-39.43	54	-19.43	0-360	150	V
9	3.855	62.75	Pk	23.9	-49.86	36.79	74	-37.21	54	-17.21	0-360	100	V
10	4.542	64.12	Pk	27.8	-51.81	40.11	74	-33.89	54	-13.89	0-360	100	V
11	6.359	56.76	Pk	29.2	-47.61	38.35	74	-35.65	54	-15.65	0-360	100	V
12	8.247	58.41	Pk	36.4	-48.44	46.37	74	-27.63	54	-7.63	0-360	100	V

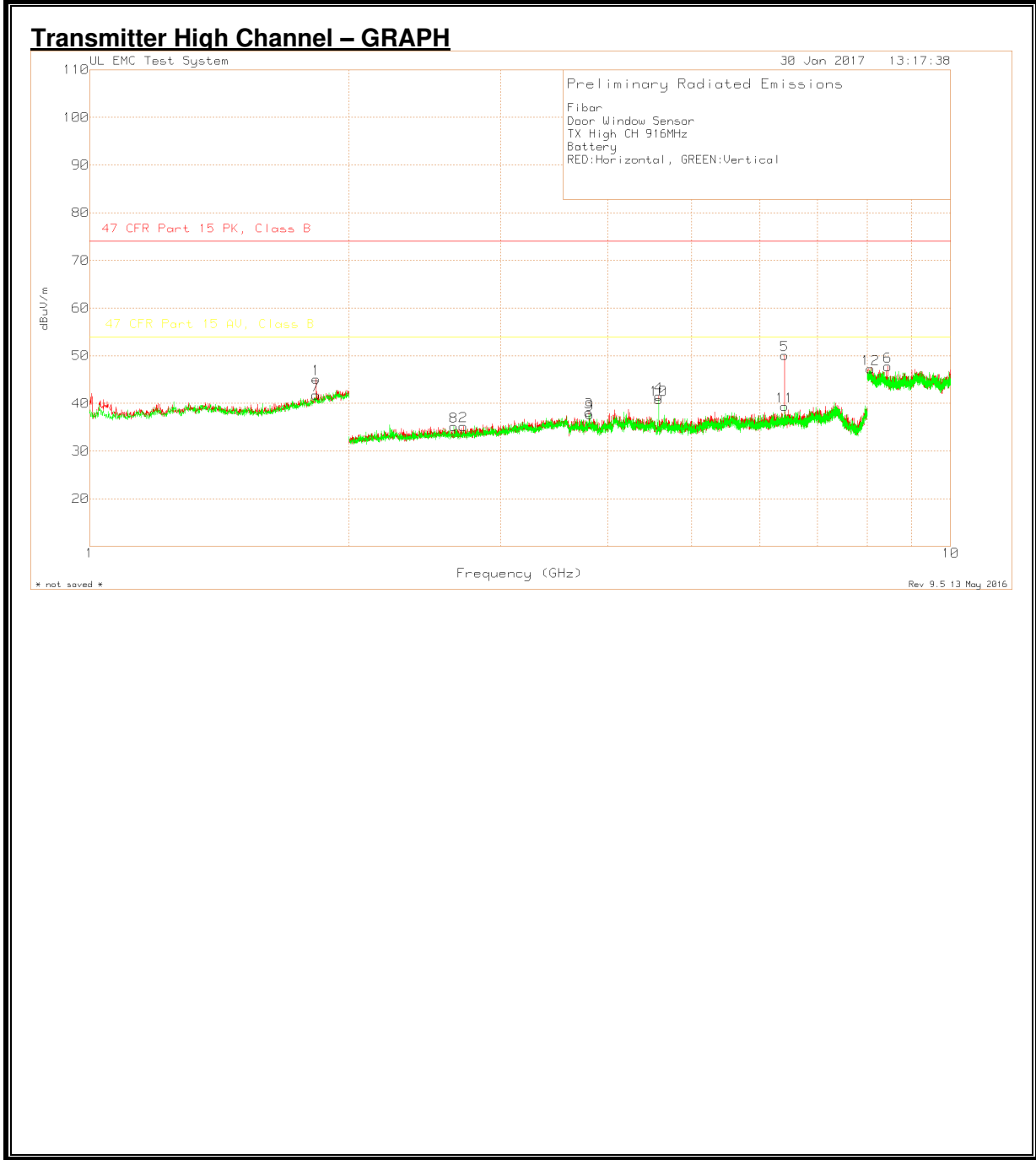
Pk - Peak detector

Radiated Emission Data

Test Frequency (GHz)	Meter		Antenna		Corrected Reading dBuV/m	PK		AV		Azimuth [Degs]	Height [cm]	Polarity
	Reading (dBuV)	Detector	Factor (dBm)	Path (dB)		Limit dBuV/m	Margin (dB)	Limit dBuV/m	Margin (dB)			
6.359	68.95	Pk	29.2	-47.61	50.54	74	-23.46	54	-3.46	270	100	H
6.3589	65.64	Av	29.2	-47.61	47.23	74	-26.77	54	-6.77	270	100	H

Pk - Peak detector

Av - Average detection



Transmitter High Channel – DATA

Fibar
 Door Window Sensor
 TX High CH 916MHz
 Battery

Marker No.	Test	Meter	Antenna		Corrected	PK		AV		Azimuth [Degs]	Height [cm]	Polarity
	Frequency (GHz)	Reading (dBuV)	Factor (dBm)	Path (dB)	Reading dBuV/m	PK Limit dBuV/m	Margin (dB)	AV Limit dBuV/m	Margin (dB)			
1	1.832	69.3 Pk	30.5	-54.66	45.14	74	-28.86	54	-8.86	0-360	150	H
2	2.716	64.06 Pk	22.1	-50.94	35.22	74	-38.78	54	-18.78	0-360	100	H
3	3.799	64.47 Pk	24.1	-50.44	38.13	74	-35.87	54	-15.87	0-360	100	H
4	4.58	65.68 Pk	27.7	-51.85	41.53	74	-32.47	54	-12.47	0-360	102	H
5	6.412	68.49 Pk	29.2	-47.58	50.11	74	-23.89	54	-3.89	0-360	102	H
6	8.451	60.22 Pk	36.6	-49.07	47.75	74	-26.25	54	-6.25	0-360	100	H
7	1.831	65.94 Pk	30.5	-54.66	41.78	74	-32.22	54	-12.22	0-360	150	V
8	2.648	63.86 Pk	22.2	-50.93	35.13	74	-38.87	54	-18.87	0-360	100	V
9	3.809	63.84 Pk	24.1	-50.25	37.69	74	-36.31	54	-16.31	0-360	100	V
10	4.58	64.94 Pk	27.7	-51.85	40.79	74	-33.21	54	-13.21	0-360	100	V
11	6.412	57.73 Pk	29.2	-47.58	39.35	74	-34.65	54	-14.65	0-360	100	V
12	8.073	57.81 Pk	36.2	-46.79	47.22	74	-26.78	54	-6.78	0-360	149	V

Pk - Peak detector

Radiated Emission Data

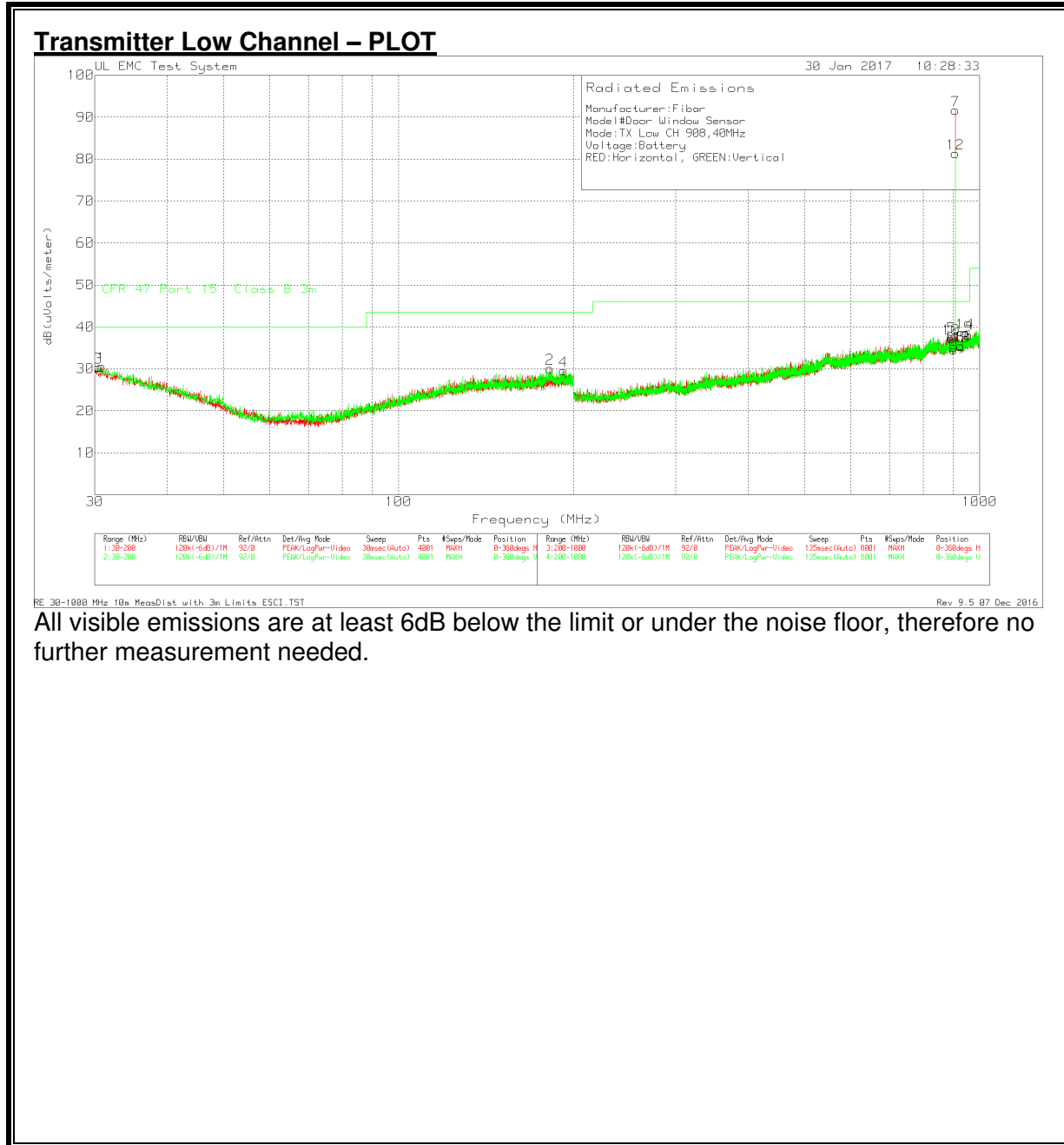
Test	Frequency (GHz)	Meter	Antenna		Corrected	PK		AV		Azimuth [Degs]	Height [cm]	Polarity
		Reading (dBuV)	Factor (dBm)	Path (dB)	Reading dBuV/m	PK Limit dBuV/m	Margin (dB)	AV Limit dBuV/m	Margin (dB)			
	6.4122	69.86 Pk	29.2	-47.58	51.48	74	-22.52	54	-2.52	266	100	H
	6.412	67.29 Av	29.2	-47.58	48.91	74	-25.09	54	-5.09	266	100	H

Pk - Peak detector

Av - Average detection

7.2.3. WORST-CASE BELOW 1 GHz

SPURIOUS EMISSIONS 30 TO 1000 MHz



Transmitter Low Channel – DATA

Manufacturer:Fibar

Model#Door Window Sensor

Mode:TX Low CH 908,40MHz

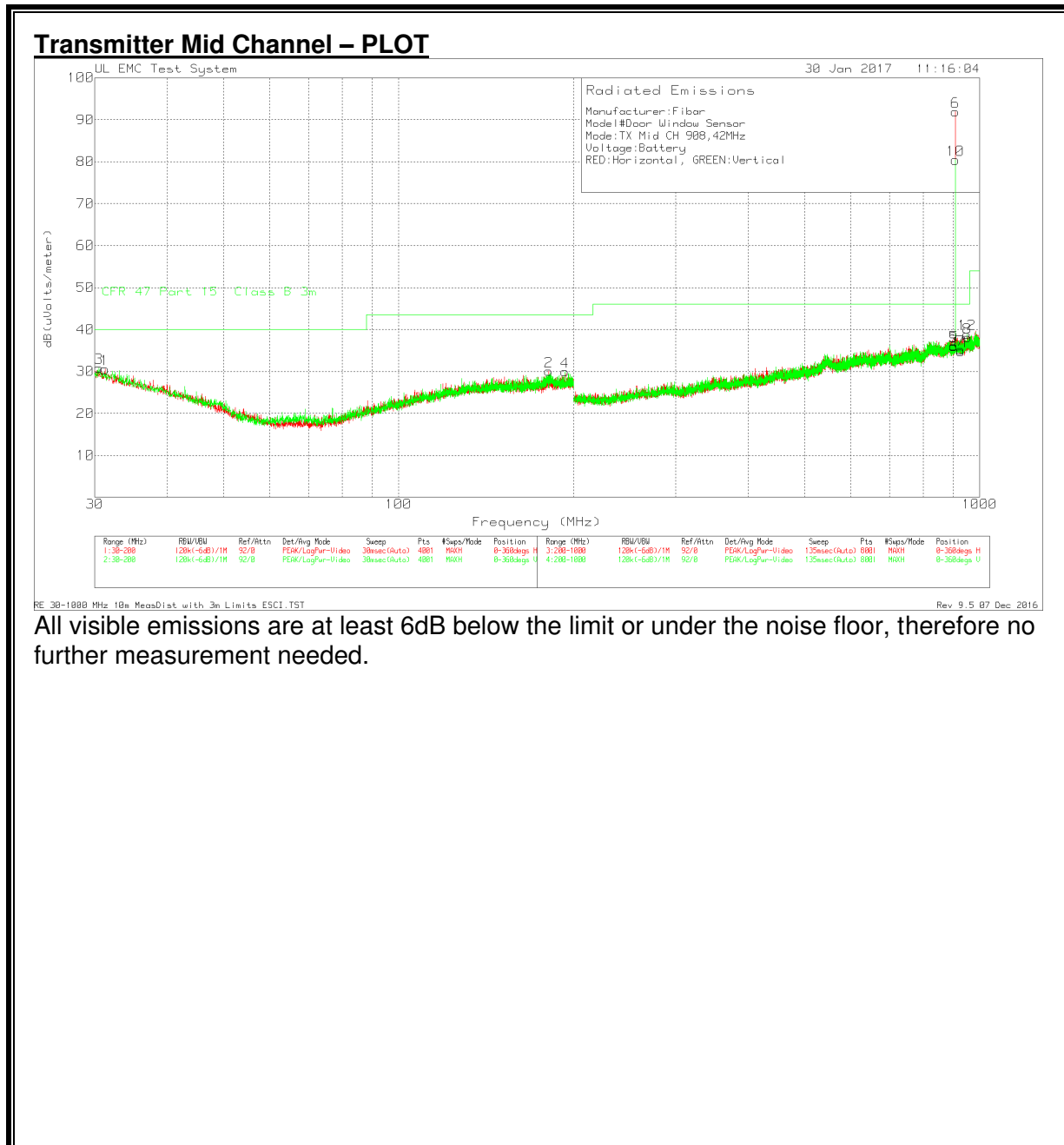
Voltage:Battery

Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Antenna Factor (dBm)	Path (dB)	10M to 3M Factor (dB)	Corrected Reading dB(uVolts/m eter)	QP Limit dBuV/m	QP Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
1	30.8075	31.94 Pk	18.1	-30	10.5	30.54	40	-9.46	0-360	248	H
2	182.15	32.82 Pk	16	-29.2	10.5	30.12	43.52	-13.4	0-360	248	H
3	30.425	31.68 Pk	18.2	-30	10.5	30.38	40	-9.62	0-360	398	V
4	192.35	31.99 Pk	16	-28.9	10.5	29.59	43.52	-13.93	0-360	101	V
5	894.4	32.35 Pk	22.5	-27.6	10.5	37.75	46.02	-8.27	0-360	199	H
6*	902	29.45 Pk	22.7	-28	10.5	34.65	46.02	-11.37	0-360	399	H
7	908.5	85.62 Pk	23.1	-27.6	10.5	91.62	-	-	0-360	98	H
8*	928	29.94 Pk	22.7	-27.6	10.5	35.54	46.02	-10.48	0-360	199	H
9	957.7	31.22 Pk	23.6	-27.3	10.5	38.02	46.02	-8	0-360	98	H
10	892.9	31.77 Pk	22.6	-27.6	10.5	37.27	46.02	-8.75	0-360	199	V
11*	902	30.11 Pk	22.7	-28	10.5	35.31	46.02	-10.71	0-360	399	V
12	908.5	75.32 Pk	23.1	-27.6	10.5	81.32	-	-	0-360	299	V
13*	928	29.83 Pk	22.7	-27.6	10.5	35.43	46.02	-10.59	0-360	199	V
14	944.1	32.44 Pk	23.3	-27.6	10.5	38.64	46.02	-7.38	0-360	399	V

Pk - Peak detector

*-Bandedge

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



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

Transmitter Mid Channel – DATA

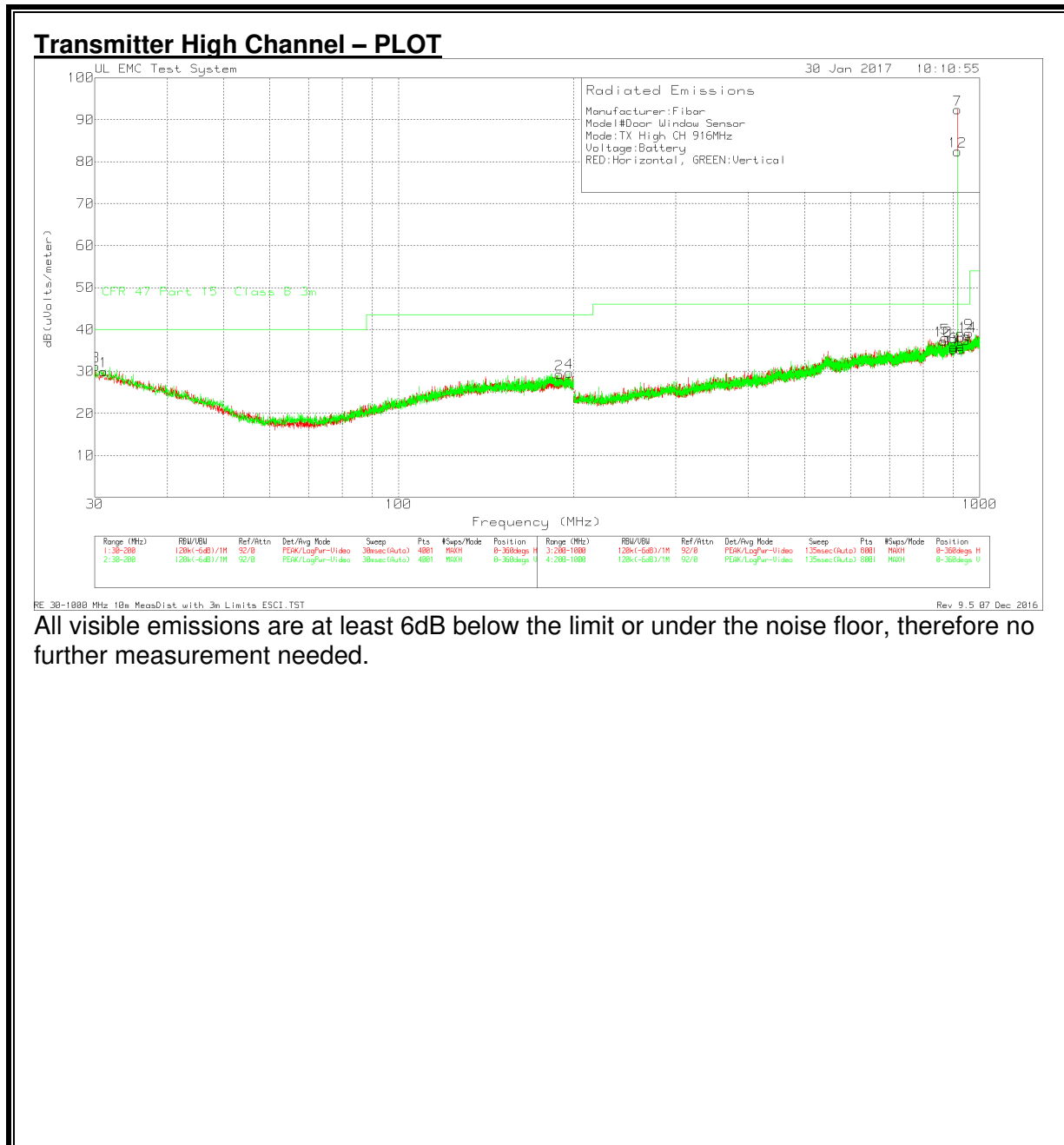
Manufacturer:Fibar
 Model#Door Window Sensor
 Mode:TX Mid CH 908,42MHz
 Voltage:Battery

Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Antenna Factor (dBm)	Path (dB)	10M to 3M Factor (dB)	Corrected Reading dB(uVolts/m eter)	QP Limit dBuV/m	Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
1	31.2325	32.13 Pk	17.9	-30	10.5	30.53	40	-9.47	0-360	100	H
2	181.1725	32.84 Pk	15.9	-29.2	10.5	30.04	43.52	-13.48	0-360	100	H
3	30.51	32.18 Pk	18.2	-30	10.5	30.88	40	-9.12	0-360	102	V
4	193.37	32.25 Pk	16	-28.8	10.5	29.95	43.52	-13.57	0-360	251	V
5*	902	30.96 Pk	22.7	-28	10.5	36.16	46.02	-9.86	0-360	399	H
6	908.5	85.94 Pk	23.1	-27.6	10.5	91.94	-	-	0-360	100	H
7*	928	29.59 Pk	22.7	-27.6	10.5	35.19	46.02	-10.83	0-360	199	H
8	951.9	31.3 Pk	23.5	-27.2	10.5	38.1	46.02	-7.92	0-360	299	H
9*	902	30.78 Pk	22.7	-28	10.5	35.98	46.02	-10.04	0-360	99	V
10	908.5	74.42 Pk	23.1	-27.6	10.5	80.42	-	-	0-360	299	V
11*	928	29.21 Pk	22.7	-27.6	10.5	34.81	46.02	-11.21	0-360	99	V
12	951.5	32.24 Pk	23.5	-27.3	10.5	38.94	46.02	-7.08	0-360	299	V

Pk - Peak detector

*-Bandedge

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



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

Transmitter High Channel – DATA

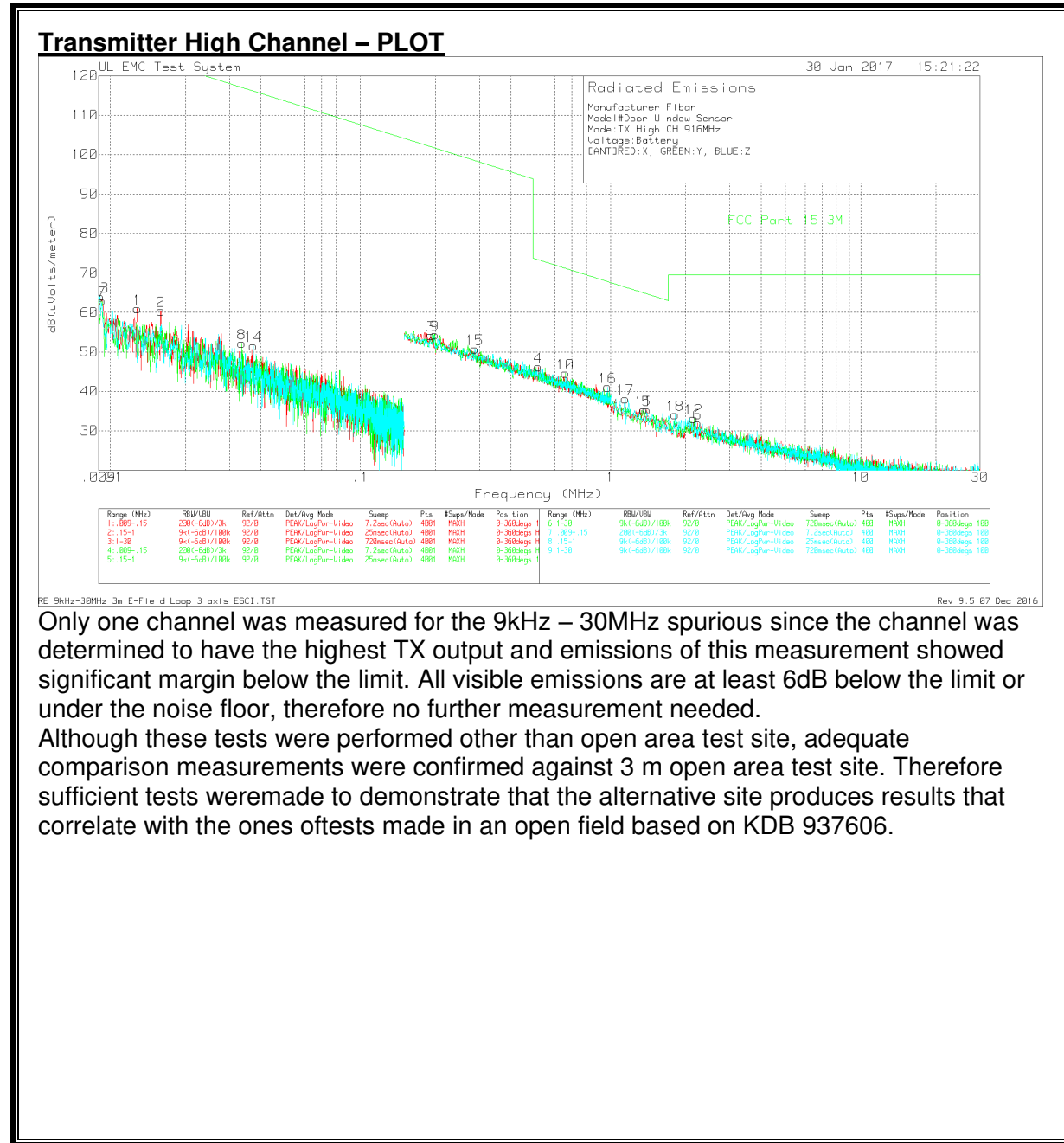
Manufacturer:Fibar
 Model#Door Window Sensor
 Mode:TX High CH 916MHz
 Voltage:Battery

Marker No.	Test Frequency (MHz)	Meter Reading (dBuV)	Antenna Factor (dBm)	Path (dB)	10M to 3M Factor (dB)	Corrected Reading dB(uVolts/m eter)	QP Limit dBuV/m	QP Margin (dB)	Azimuth [Degs]	Height [cm]	Polarity
1	31.0625	31.52 Pk	18	-30	10.5	30.02	40	-9.98	0-360	398	H
2	189.035	31.79 Pk	16	-29	10.5	29.29	43.52	-14.23	0-360	101	H
3	30.085	32.35 Pk	18.4	-30	10.5	31.25	40	-8.75	0-360	251	V
4	196.685	31.95 Pk	16	-28.8	10.5	29.65	43.52	-13.87	0-360	251	V
5	871.9	33.19 Pk	22.2	-27.9	10.5	37.99	46.02	-8.03	0-360	299	H
6*	902	30.66 Pk	22.7	-28	10.5	35.86	46.02	-10.16	0-360	199	H
7	916	86.38 Pk	23.3	-27.8	10.5	92.38	-	-	0-360	102	H
8*	928	30.44 Pk	22.7	-27.6	10.5	36.04	46.02	-9.98	0-360	102	H
9	957.9	32.36 Pk	23.6	-27.3	10.5	39.16	46.02	-6.86	0-360	299	H
10	865.1	32.41 Pk	22	-27.6	10.5	37.31	46.02	-8.71	0-360	98	V
11	902	30.04 Pk	22.7	-28	10.5	35.24	46.02	-10.78	0-360	399	V
12*	916	76.43 Pk	23.3	-27.8	10.5	82.43	-	-	0-360	299	V
13*	928	29.71 Pk	22.7	-27.6	10.5	35.31	46.02	-10.71	0-360	399	V
14	952.2	31.61 Pk	23.5	-27.2	10.5	38.41	46.02	-7.61	0-360	199	V

Pk - Peak detector
 *-Bandedge marker

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

SPURIOUS EMISSIONS 9 kHz TO 30 MHz



Only one channel was measured for the 9kHz – 30MHz spurious since the channel was determined to have the highest TX output and emissions of this measurement showed significant margin below the limit. All visible emissions are at least 6dB below the limit or under the noise floor, therefore no further measurement needed.

Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 3 m open area test site. Therefore sufficient tests weremade to demonstrate that the alternative site produces results that correlate with the ones oftests made in an open field based on KDB 937606.

Transmitter High Channel – DATA

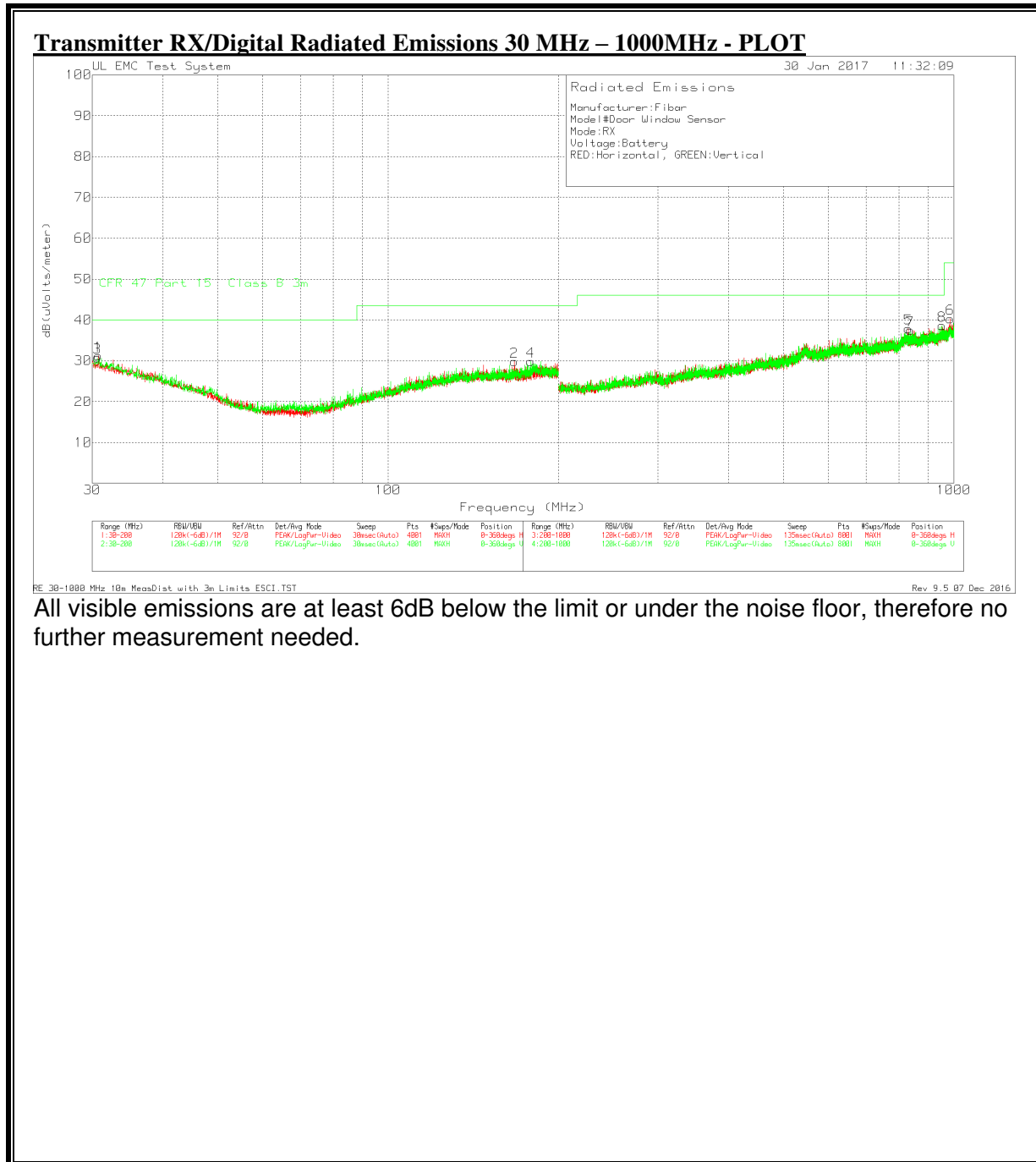
Manufacturer:Fibar
 Model#Door Window Sensor
 Mode:TX High CH 916MHz
 Voltage:Battery
 [ANT]RED:X, GREEN:Y, BLUE:Z

Marker No.	Test Frequency (MHz)	Meter		Antenna		Corrected Reading		AV		Height [cm]	Polarity
		Reading (dBuV)	Detector	Factor (dBm)	Path (dB)	dB(uVolts/ meter)	AV Limit dBuV/m	Margin (dB)	Azimuth [Degs]		
1	0.01285	41.01	Pk	20	0	61.01	125.41	-64.4	0-360	100	X
2	0.015965	41.89	Pk	18.5	0	60.39	123.52	-63.13	0-360	100	X
3	0.19122	42.89	Pk	11.3	0	54.19	101.97	-47.78	0-360	100	X
4	0.51487	34.9	Pk	11.3	0	46.2	73.37	-27.17	0-360	100	X
5	1.39875	23.79	Pk	11.4	0.1	35.29	64.69	-29.4	0-360	100	X
6	2.2325	20.33	Pk	11.5	0.1	31.93	69.54	-37.61	0-360	100	X
7	0.009245	40.76	Pk	22.2	0	62.96	128.27	-65.31	0-360	100	Y
8	0.03364	37.56	Pk	14.6	0	52.16	117.05	-64.89	0-360	100	Y
9	0.19835	43.05	Pk	11.3	0	54.35	101.65	-47.3	0-360	100	Y
10	0.66141	33.19	Pk	11.4	0	44.59	71.19	-26.6	0-360	100	Y
11	1.35525	23.76	Pk	11.4	0.1	35.26	64.96	-29.7	0-360	100	Y
12	2.15275	21.53	Pk	11.5	0.1	33.13	69.54	-36.41	0-360	100	Y
13	0.009105	41.69	Pk	22.3	0	63.99	128.4	-64.41	0-360	100	Z
14	0.037385	37.48	Pk	14.1	0	51.58	116.14	-64.56	0-360	100	Z
15	0.28696	39.47	Pk	11.3	0	50.77	98.44	-47.67	0-360	100	Z
16	0.97154	29.59	Pk	11.4	0.1	41.09	67.86	-26.77	0-360	100	Z
17	1.145	26.63	Pk	11.4	0.1	38.13	66.43	-28.3	0-360	100	Z
18	1.812	22.52	Pk	11.5	0.1	34.12	69.54	-35.42	0-360	100	Z

Pk - Peak detector

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

7.2.4. Transmitter RX/Digital Radiated Emissions



Transmitter RX/Digital Radiated Emissions 30 MHz – 1000MHz - DATA

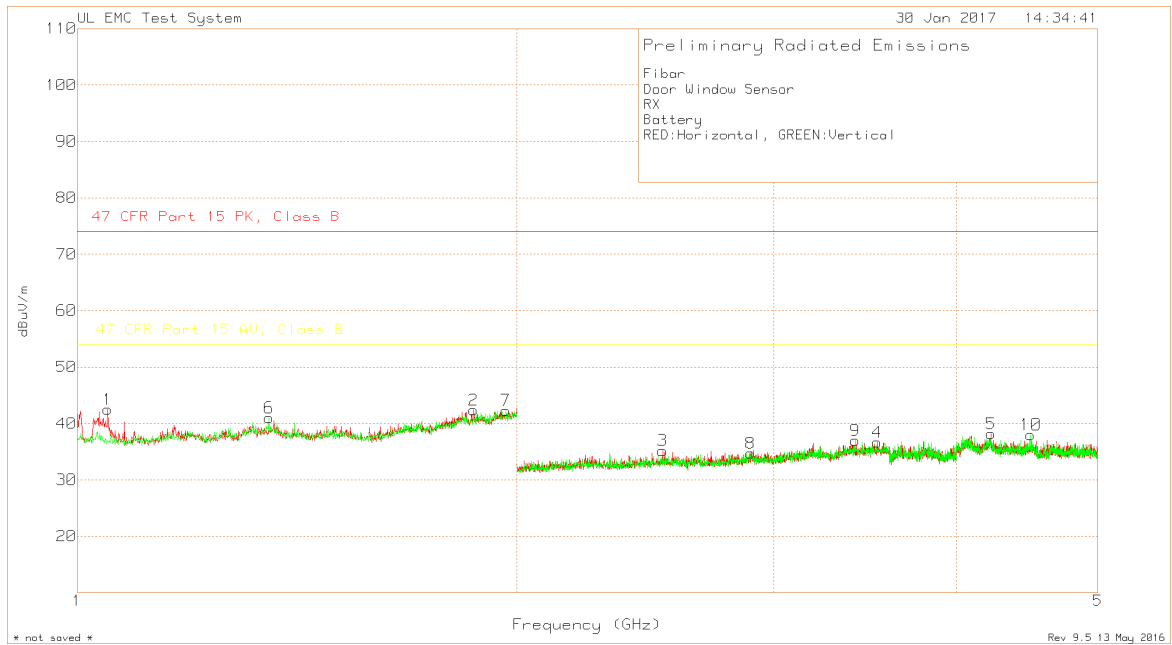
Manufacturer:Fibar
 Model#Door Window Sensor
 Mode:RX
 Voltage:Battery

Marker No.	Test Frequency (MHz)	Meter		Antenna		10M to 3M		Corrected Reading		QP		Height [cm]	Polarity
		Reading (dBuV)	Detector	Factor (dBm)	Path (dB)	Factor (dB)	eter	dB(uVolts/m)	QP Limit dBuV/m	Margin (dB)	Azimuth [Degs]		
1	30.765	32.66	Pk	18.1	-30	10.5	31.26	40	-8.74	0-360	102	H	
2	167.1475	33.15	Pk	15.6	-29.4	10.5	29.85	43.52	-13.67	0-360	102	H	
3	30.6375	32.18	Pk	18.1	-30	10.5	30.78	40	-9.22	0-360	398	V	
4	178.6225	32.78	Pk	15.8	-29.2	10.5	29.88	43.52	-13.64	0-360	398	V	
5	830.3	32.84	Pk	22.5	-27.9	10.5	37.94	46.02	-8.08	0-360	199	H	
6	985.3	32.02	Pk	24.4	-26.6	10.5	40.32	53.97	-13.65	0-360	99	H	
7	836.7	32.27	Pk	22.4	-27.7	10.5	37.47	46.02	-8.55	0-360	299	V	
8	953.5	31.86	Pk	23.5	-27.2	10.5	38.66	46.02	-7.36	0-360	99	V	

Pk - Peak detector

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 – 5GHz - 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 - DATA

Fibar
 Door Window Sensor
 RX
 Battery

Marker No.	Test Frequency (GHz)	Meter Reading		Antenna		Corrected Reading dBuV/m	PK		AV		Azimuth [Degs]	Height [cm]	Polarity
		Reading (dBuV)	Detector	Factor (dBm)	Path (dB)		Limit dBuV/m	Margin (dB)	Limit dBuV/m	Margin (dB)			
1	1.049	72.69	Pk	27.5	-57.66	42.53	74	-31.47	54	-11.47	0-360	150	H
2	1.868	66.14	Pk	30.9	-54.68	42.36	74	-31.64	54	-11.64	0-360	150	H
3	2.517	64.15	Pk	22.1	-51.03	35.22	74	-38.78	54	-18.78	0-360	150	H
4	3.532	63.27	Pk	23.4	-50.01	36.66	74	-37.34	54	-17.34	0-360	100	H
5	4.224	61.54	Pk	28.3	-51.67	38.17	74	-35.83	54	-15.83	0-360	102	H
6	1.353	68.59	Pk	29	-56.56	41.03	74	-32.97	54	-12.97	0-360	100	V
7	1.966	64.87	Pk	31.6	-54.15	42.32	74	-31.68	54	-11.68	0-360	149	V
8	2.891	62.63	Pk	22.6	-50.47	34.76	74	-39.24	54	-19.24	0-360	150	V
9	3.41	63.86	Pk	23.5	-50.36	37	74	-37	54	-17	0-360	150	V
10	4.499	61.99	Pk	27.9	-51.87	38.02	74	-35.98	54	-15.98	0-360	150	V

Pk - Peak detector

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