Measurement of RF Emissions from an 821LMB-SENSOR and MYQ-G0302 Door Sensor Transmitter

For	Chamberlain Group, Inc. 1818 Swift Drive Oak Brook, IL 60523
P.O. Number	4900044708
Date Tested	April 27, 2017 and April 28, 2017
Test Personnel	Mark E. Longinotti
Test Specification	FCC "Code of Federal Regulations" Title 47 Part15, Subpart C Innovation, Science, and Economic Development Canada RSS-Gen Innovation, Science, and Economic Development Canada RSS-210

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Approved By: Raymond J Klouda
Raymond J. Klouda
Registered Professional Engineer of Illinois - 44894

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FAX: 630 - 495 - 9785
www.elitetest.com

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REVISION HISTORY

Revision	Date	Description
—	8 May 2017	Initial release
A	12 May 2017	- Added Rev A to the report number in the header of each page. - Per Chamberlain Group, Inc. personnel, model number of the EUT was changed from: OOK, To: 821LMB-SENSOR and MYQ-G0302 throughout the test report.

Measurement of RF Emissions from an 821LMB-SENSOR and MYQ-G0302 Door Sensor Transmitter

1. INTRODUCTION

1.1. Scope of Tests

This report presents the results of the RF emissions measurements performed on a Door Sensor, Model Numbers: 821LMB-SENSOR and MYQ-G0302 (hereinafter referred to as the Equipment Under Test (EUT)). The EUT was designed to transmit at approximately 311.88MHz, 312.5MHz, and 313.12MHz using an internal antenna. The EUT was manufactured and submitted for testing by Chamberlain Group, Inc. located in Oak Brook, IL.

1.2. Purpose

The test series was performed to determine if the EUT meets the radiated RF emission requirements of the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart C, Section 15.231 for Intentional Radiators.

The test series was also performed to determine if the EUT meets the radiated RF emission requirements of the Innovation, Science, and Economic Development Canada, RSS-210, Annex A for transmitters.

Testing was performed in accordance with ANSI C63.4-2014.

1.3. Deviations, Additions and Exclusions

There were no deviations, additions to, or exclusions from the test specification during this test series.

1.4. EMC Laboratory Identification

This series of tests was performed by Elite Electronic Engineering Incorporated of Downers Grove, Illinois. The laboratory is accredited by The American Association for Laboratory Accreditation (A2LA). A2LA Certificate Number: 1786.01.

1.5. Laboratory Conditions

The temperature at the time of the test was 22°C and the relative humidity was 23%.

2. APPLICABLE DOCUMENTS

The following documents of the exact issue designated form part of this document to the extent specified herein:

- Federal Communications Commission "Code of Federal Regulations", Title 47, Part 15, Subpart C, dated 1 October 2016
- ANSI C63.4-2014, "American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz"
- Innovation, Science, and Economic Development Canada Radio Standards Specification, RSS-Gen, “General Requirements for Compliance of Radio Apparatus”, Issue 4, November 2014
- Innovation, Science, and Economic Development Canada Radio Standards Specification, RSS-210, “License-Exempt Radio Apparatus: Category I Equipment”, Issue 9, August 2016

3. EUT SETUP AND OPERATION

3.1. General Description

The EUT is a Chamberlain Group, Inc. Door Sensor, Model Numbers: 821LMB-SENSOR and MYQ-G0302. A block diagram of the EUT setup is shown as Figure 1. A photograph of the EUT is shown as Figure 2.

3.1.1. Power Input

The EUT received 3VDC from an internal CR2450 battery.

3.1.2. Peripheral Equipment

There was no peripheral equipment submitted with the EUT.

3.1.3. Signal Input/Output Leads

There were no interconnecting cables submitted with the EUT.

3.1.4. Grounding

The EUT was ungrounded during the tests.

3.2. Software

For all tests, the EUT had RF Test Code loaded onto the device to provide correct load characteristics.

3.3. Operational Mode

The EUT can act as both an automatically operated transmitter and a periodic transmitter. When the EUT detects garage door movement, it acts as an automatically operated transmitter. If the EUT does not detect motion, it acts as a periodic transmitter.

Three separate samples were submitted for testing. Sample 1 was programmed to transmit continuously at the power levels for automatically operated transmitters. Sample 2 was programmed to transmit continuously at the power levels for periodic transmitters. Sample 3 operated in normal operation mode to determine deactivation time for automatically operated transmitters and periodic rate for periodic transmitters.

For all tests, the EUT was placed on a non-conductive stand. The EUT was energized. The EUT was programmed to continuously transmit separately in each of the following modes:

- 311.88MHz, mode 73
- 312.5MHz, mode 73
- 313.12MHz, mode 73
- 311.88MHz, mode 41
- 312.5MHz, mode 41
- 313.12MHz, mode 41

3.4. EUT Modifications

No modifications were required for compliance to FCC Title 47, Part 15, Subpart C, Section 15.231 or Innovation, Science, and Economic Development Canada Radio Standards Specification, RSS-210, Annex A.

4. TEST FACILITY AND TEST INSTRUMENTATION

4.1. Shielded Enclosure

All tests were performed in a 32ft. x 20ft. x 18ft. hybrid ferrite-tile/anechoic absorber lined test chamber. With the exception of the floor, the reflective surfaces of the shielded chamber are lined with ferrite tiles on the walls and ceiling. Anechoic absorber material is installed over the ferrite tile. The floor of the chamber is used as the ground plane. The chamber complies with ANSI C63.4-2014 for site attenuation.

4.2. Test Instrumentation

The test instrumentation and auxiliary equipment used during the tests are listed in Table 9-1.

4.3. Calibration Traceability

Test equipment is maintained and calibrated on a regular basis with a calibration interval not greater than two years. All calibrations are traceable to the National Institute of Standards and Technology (NIST).

4.4. Measurement Uncertainty

All measurements are an estimate of their true value. The measurement uncertainty characterizes, with a specified confidence level, the spread of values which may be possible for a given measurement system.

The measurement uncertainty for these tests is presented below:

Conducted Emissions Measurements		
Combined Standard Uncertainty	1.06	-1.06
Expanded Uncertainty (95% confidence)	2.12	-2.12

Radiated Emissions Measurements		
Combined Standard Uncertainty	2.09	-2.09
Expanded Uncertainty (95% confidence)	4.19	-4.19

5. TEST PROCEDURES

5.1. Automatic Operation Measurements

5.1.1. Requirements

A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released. Also, a transmitter activated automatically shall cease transmission within 5 seconds after activation.

5.1.2. Procedures

The spectrum analyzer was set up to display the time domain trace. The EUT was set to transmit normally. The spectrum analyzer was used to record the amount of time that the EUT remained active following activation.

5.1.3. Results

The plot of the deactivation time is shown on data page 17. The data shows that the EUT ceases operation within the allotted time.

5.2. Periodic Operation Measurements

5.2.1. Requirements

Periodic transmitters shall be provided with a means for automatically limiting operation so that the duration of each transmission shall not be greater than one second and the silent period between transmissions shall be at least 30 times the duration of the transmission but in no case less than 10 seconds.

5.2.2. Procedures

The spectrum analyzer was setup to display the time domain trace. The EUT was set to transmit normally. The spectrum analyzer was used to record the amount of time that the EUT transmits and the time between transmissions.

5.2.3. Results

The plot of the periodic operation time is shown on data page 18. The data shows that the EUT meets the periodic operation requirements.

5.3. Duty Cycle Factor Measurements

5.3.1. Procedures

The duty cycle factor is used to convert peak detected readings to average readings. This factor is computed from the time domain trace of the pulse modulation signal.

The duty cycle factor was calculated from information supplied by the manufacturer. Since this EUT utilizes a rolling code modulation, the duty is calculated based on the worst case. The following procedure was used to measure a representative sample:

a) With the transmitter set up to transmit for maximum pulse density, the time domain trace is displayed on the spectrum analyzer.

b) The pulse width is measured and a plot of this measurement is recorded.

c) Next the number of pulses in the word period is measured and a plot is recorded.

d) Finally the length of the word period is measured and a third plot is recorded. If the word period exceeds 100msec, the word period is limited to 100msec.

e) The pulse width and number of pulses for the word period are used to compute the on-time. The duty cycle is then computed as the (on-time/ word period).

f) The duty cycle factor is computed from the duty cycle.

5.3.2. Results

The plot of the duty cycles are shown on data pages 19 through 21. The manufacturer provided following information to calculate the duty cycle for the Rolling Code:

The rolling code consists of the following: 50 short pulses (0.246msec) and 18 long pulses (0.494msec).

A worst case situation is used when computing the rolling code modulation factor.

Worst Case = 21.2msec on-time over 100msec word period

Duty Cycle Factor = 20log (21.2/100) = -13.5dB.

Since the plots were made for the rolling code, the duty cycle factor shown on the plots may not show the worst case but was found to be no greater than the worst case duty cycle factor.

5.4. Radiated Measurements

5.4.1. Requirements

The EUT, when acting as an automatically operated transmitter, must comply with the requirements of FCC "Code of Federal Regulations Title 47", Part 15, Subpart C, Section 15.231(b) and Innovation, Science, and Economic Development Canada Radio Standards Specification, RSS-210, Table A1.

Fundamental Frequency MHz	Field Intensity uV/m @ 3 meters	Field Strength Harmonics and Spurious @ 3 meters
260 to 470	3,750 to 12,500*	375 to 1,250*

* - Linear Interpolation

In addition, emissions appearing in the Restricted Bands of Operation listed in paragraph 15.231(b) shall not exceed the general requirements shown in paragraph 15.231.

The EUT, when acting as a periodic transmitter, must comply with the requirements of FCC "Code of Federal Regulations Title 47", Part 15, Subpart C, Section 15.231(e) and Innovation, Science, and Economic Development Canada Radio Standards Specification, RSS-210, Table A2.

Fundamental Frequency MHz	Field Intensity uV/m @ 3 meters	Field Strength Harmonics and Spurious @ 3 meters
260 to 470	1,500 to 5,000*	150 to 500*

* - Linear Interpolation

In addition, emissions appearing in the Restricted Bands of Operation listed in paragraph 15.231(b) shall not exceed the general requirements shown in paragraph 15.231.

5.4.2.Procedures

All tests were performed in a 32ft. x 20ft. x 18ft. hybrid ferrite-tile/anechoic absorber lined test chamber. The walls and ceiling of the shielded chamber are lined with ferrite tiles. Anechoic absorber material is installed over the ferrite tile. The floor of the chamber is used as the ground plane. The chamber complies with ANSI C63.4-2014 for site attenuation.

The shielded enclosure prevents emissions from other sources, such as radio and TV stations from interfering with the measurements. All powerlines and signal lines entering the enclosure pass through filters on the enclosure wall. The powerline filters prevent extraneous signals from entering the enclosure on these leads.

Radiated measurements were performed in a 32ft. x 20ft. x 14ft. high shielded enclosure. The shielded enclosure prevents emissions from other sources, such as radio and TV stations from interfering with the measurements. All powerlines and signal lines entering the enclosure pass through filters on the enclosure wall. The powerline filters prevent extraneous signals from entering the enclosure on these leads.

Preliminary radiated emissions tests were performed to determine the emission characteristics of the EUT. For the preliminary test, a broadband measuring antenna was positioned at a 3 meter distance from the EUT. The entire frequency range from 30MHz to 3.5GHz was investigated using a peak detector function.

The final radiated emission tests were then manually performed over the frequency range of 30MHz to 3.5GHz. Between 30MHz and 1000MHz, a bi-log antenna was used as the pick-up device. The bi-log antenna was positioned at a 3 meter distance from the EUT. The EUT was placed on an 80cm high non-conductive stand. A resolution bandwidth of 100 kHz was used on the spectrum analyzer. A broadband double ridged waveguide antenna was used as the pick-up device for all frequencies above 1GHz. The waveguide antenna was positioned at a 3 meter distance from the EUT. The EUT was placed on a 1.5 meter high non-conductive stand. A peak detector with a resolution bandwidth of 1 MHz was used on the spectrum analyzer. All significant broadband and narrowband signals were measured and recorded. The peak detected levels were converted to average levels using a duty cycle factor which was computed from the pulse train.

To ensure that maximum or worst case, emission levels were measured, the following steps were taken:

1) The EUT was set to transmit at 311.88MHz, mode 73.
2) The EUT was rotated so that all of its sides were exposed to the receiving antenna.
3) Since the measuring antenna is linearly polarized, both horizontal and vertical field components were measured.
4) The measuring antenna was raised and lowered from 1 to 4 meters for each antenna polarization to

maximize the readings.
5) Steps (1) through (4) were repeated with the EUT set to transmit at 312.5MHz, mode 73.
6) Steps (1) through (4) were repeated with the EUT set to transmit at 313.12MHz, mode 73.
7) Steps (1) through (4) were repeated with the EUT set to transmit at 311.88MHz, mode 41.
8) Steps (1) through (4) were repeated with the EUT set to transmit at 312.5MHz, mode 41.
9) Steps (1) through (4) were repeated with the EUT set to transmit at 313.12MHz, mode 41.

5.4.3. Results

FCC 15.231(b) and RSS-210, Annex A, Table A1:

The preliminary plots, with the EUT transmitting at 311.88MHz, 312.5MHz, and 313.12MHz, are presented on data pages 22 through 33. The plots are presented for a reference only, and are not used to determine compliance.

The final radiated levels, with the EUT transmitting at 311.88MHz, 312.5MHz, and 313.12MHz, are presented on data pages 34 through 36. As can be seen from the data, all emissions measured from the EUT were within the specification limits. The emissions level closet to the limit (worst case) occurred at 311.88MHz. The emissions level at this frequency was -0.8dB within the limit. Photographs of the test configuration which yielded the highest (or worst case) radiated emission levels are shown as Figures 3 and 4.

FCC 15.231(e) and RSS-210, Annex A, Table A2:

The preliminary plots, with the EUT transmitting at 311.88MHz, 312.5MHz, and 313.12MHz, are presented on data pages 37 through 48. The plots are presented for a reference only, and are not used to determine compliance.

The final radiated levels, with the EUT transmitting at 311.88MHz, 312.5MHz, and 313.12MHz, are presented on data pages 49 through 51. As can be seen from the data, all emissions measured from the EUT were within the specification limits. The emissions level closet to the limit (worst case) occurred at 311.88MHz. The emissions level at this frequency was -0.8dB within the limit. Photographs of the test configuration which yielded the highest (or worst case) radiated emission levels are shown as Figures 3 and 4.

5.5. Occupied Bandwidth Measurements

5.5.1. Requirement

In accordance with paragraph 15.231(c), all emissions within 20dB of the peak amplitude level of the center frequency are required to be within a band less than 0.25% of the center frequency wide.

5.5.2. Procedures

The EUT was placed on an 80cm high non-conductive stand. The unit was set to transmit continuously. With an antenna positioned nearby, occupied bandwidth emissions were displayed on the spectrum analyzer. The resolution bandwidth was set to 30kHz and span was set to 2MHz. The frequency spectrum near the fundamental was plotted for all frequencies.

5.5.3. Results

The plot of the emissions near the fundamental frequency is presented on data pages 52 through 57. As can be seen from this data page, the transmitter met the occupied bandwidth requirements. The 99% bandwidth was measured to be 392.8kHz.

6. OTHER TEST CONDITIONS

6.1. Test Personnel and Witnesses

All tests were performed by qualified personnel from Elite Electronic Engineering Incorporated.

6.2. Disposition of the EUT

The EUT and all associated equipment were returned to Chamberlain Group, Inc. upon completion of the tests.

7. CONCLUSIONS

The Chamberlain Group, Inc. Door Sensor, Model Numbers: 821LMB-SENSOR and MYQ-G0302 did fully meet the radiated emission requirements of the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart C, Section 15.231 for both automatically operated intentional radiators and periodic intentional radiators, when tested per ANSI C63.4-2014.

The Chamberlain Group, Inc. Door Sensor, Model Numbers: 821LMB-SENSOR and MYQ-G0302 did also fully meet the technical requirements of the Innovation, Science, and Economic Development Canada Radio Standards Specification, Radio Standards Specification RSS-210 for both automatically operated transmitters and periodic transmitters, when tested per ANSI C63.4-2014.

8. CERTIFICATION

Elite Electronic Engineering Incorporated certifies that the information contained in this report was obtained under conditions which meet or exceed those specified in the test specifications.

The data presented in this test report pertains to the EUT at the test date. Any electrical or mechanical modification made to the EUT subsequent to the specified test date will serve to invalidate the data and void this certification.

This report must not be used to claim product certification, approval, or endorsement by A2LA, NIST or any agency of the Federal Government.

9. EQUIPMENT LIST

Table 9-1 Equipment List

Eq ID	Equipment Description	Manufacturer	Model No.	Serial No.	Frequency Range	Cal Date	Due Date
CDX8	COMPUTER	ELITE	WORKSTATION			N/A	
NTA2	BILOG ANTENNA	TESEQ	6112D	28040	25-1000MHz	11/27/2016	11/27/2017
NWQ1	DOUBLE RIDGED WAVEGUIDE ANTENNA	ETS-LINDGREN	3117	66655	1GHZ-18GHZ	4/4/2016	4/4/2018
PHA0	MAGNETIC FIELD PROBE	ELECTRO-METRICS	EM-6882	134	22-230MHZ	NOTE 1	
RBA0	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB26	100145	20HZ-26.5GHZ	03/10/2017	03/10/2018
WKA1	SOFTWARE, UNIVERSAL RCV EMI	ELITE	UNIV_RCV_EMI	1	---	I/O	

I/O: Initial Only
N/A: Not Applicable
Note 1: For the purpose of this test, the equipment was calibrated over the specified frequency range, pulse rate, or modulation prior to the test or monitored by a calibrated instrument.

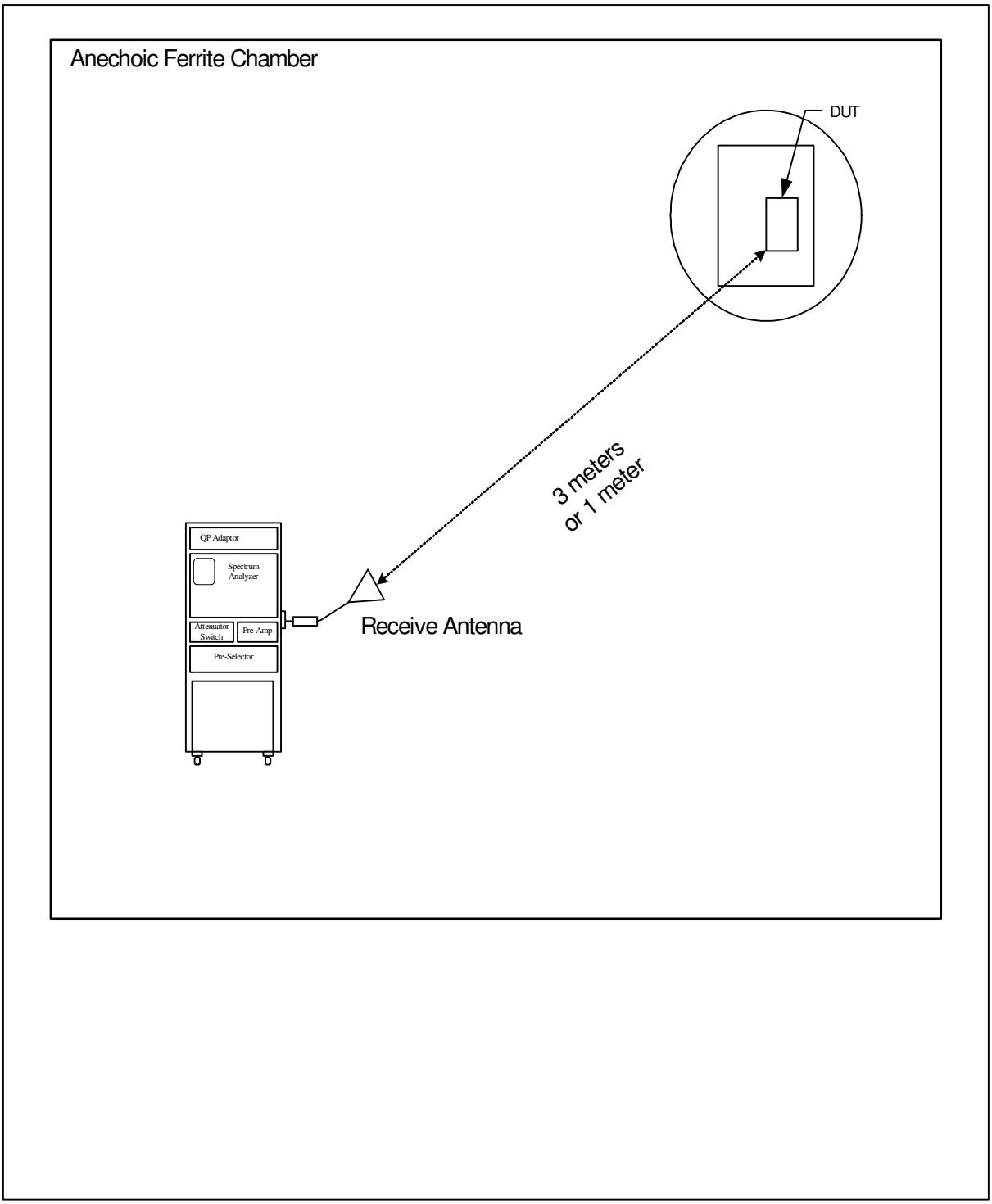
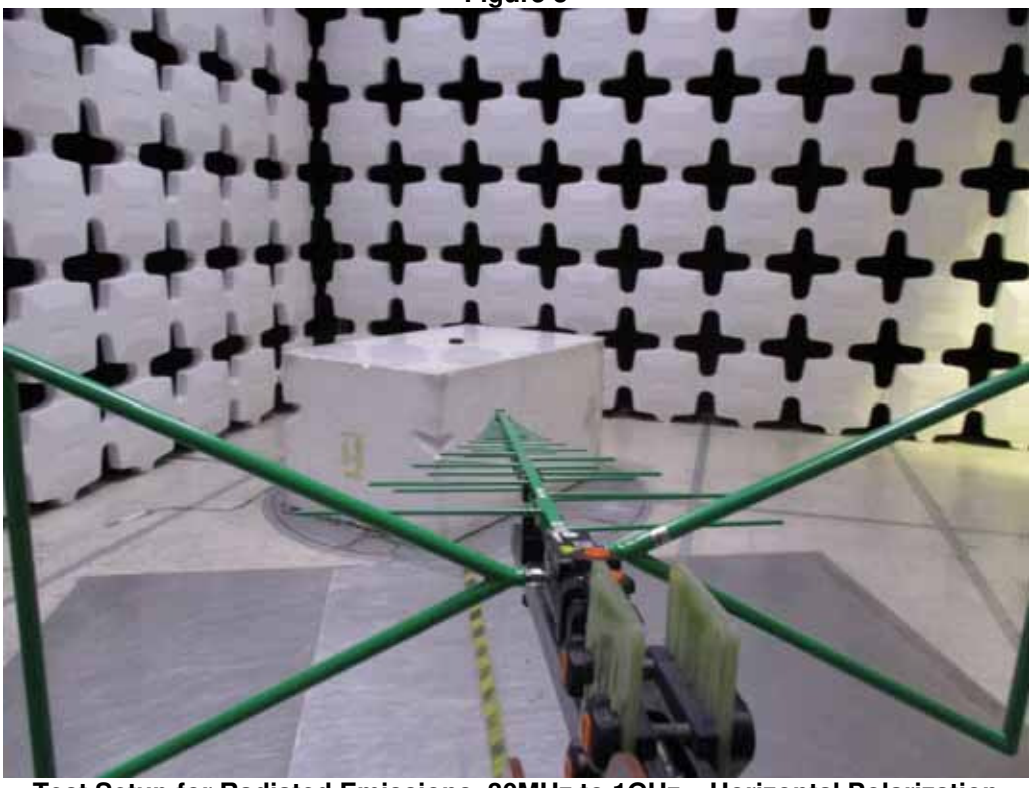

Anechoic Ferrite Chamber
DUT
3 meters
or 1 meter
QP Adaptor
Spectrum
Analyzer
Attenuator
Switch
Pre-Amp
Pre-Selector
Receive Antenna

Figure 2

Photograph of EUT

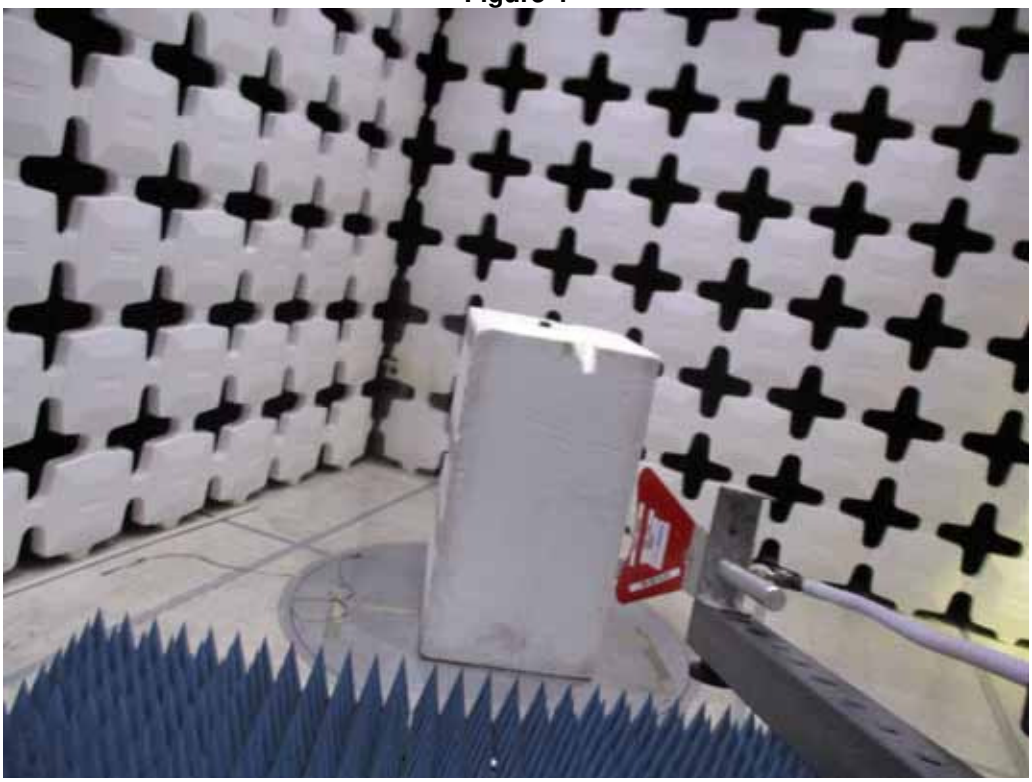
Figure 3



Test Setup for Radiated Emissions, 30MHz to 1GHz – Horizontal Polarization

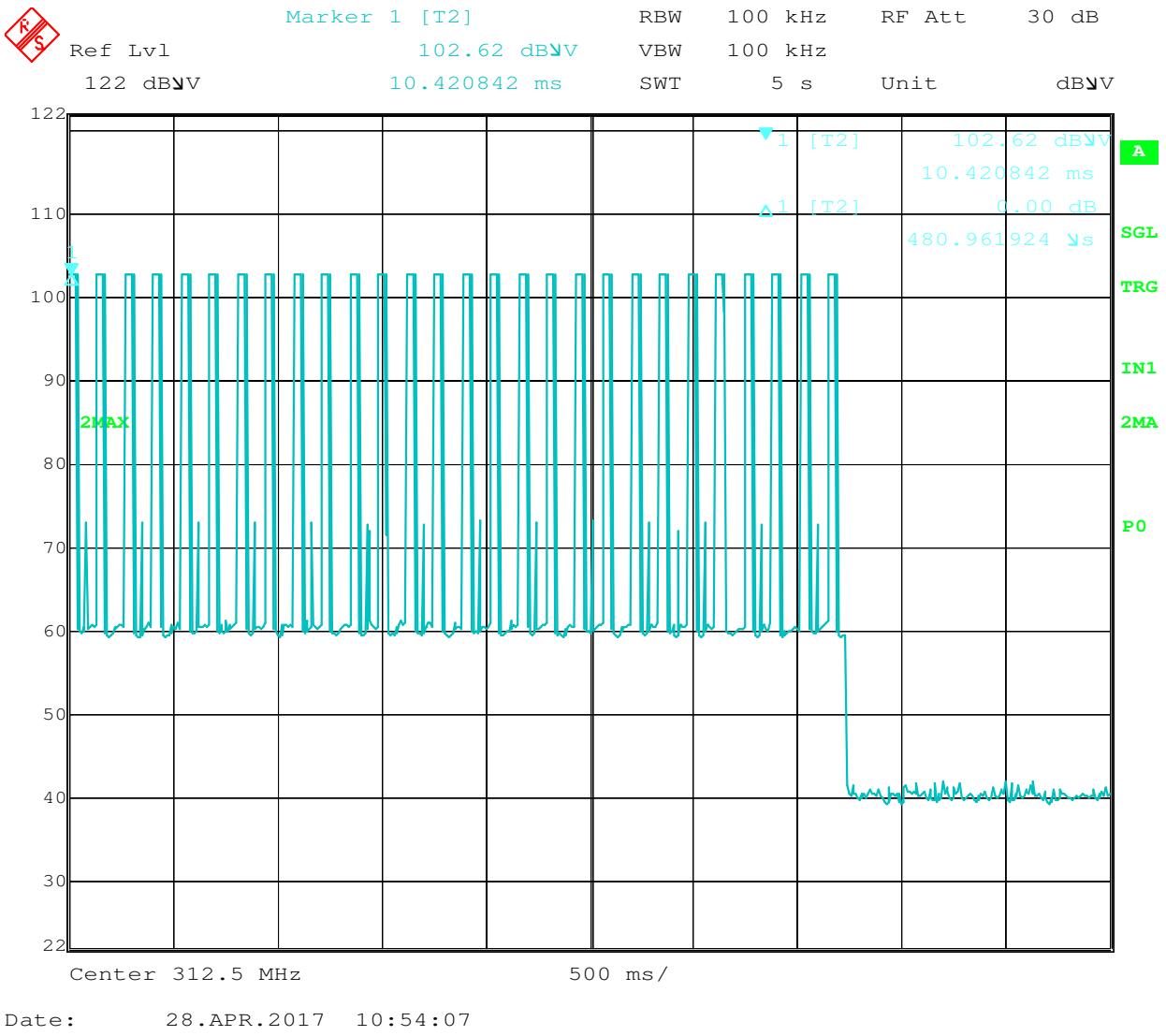
Test Setup for Radiated Emissions, 30MHz to 1GHz – Vertical Polarization

Figure 4



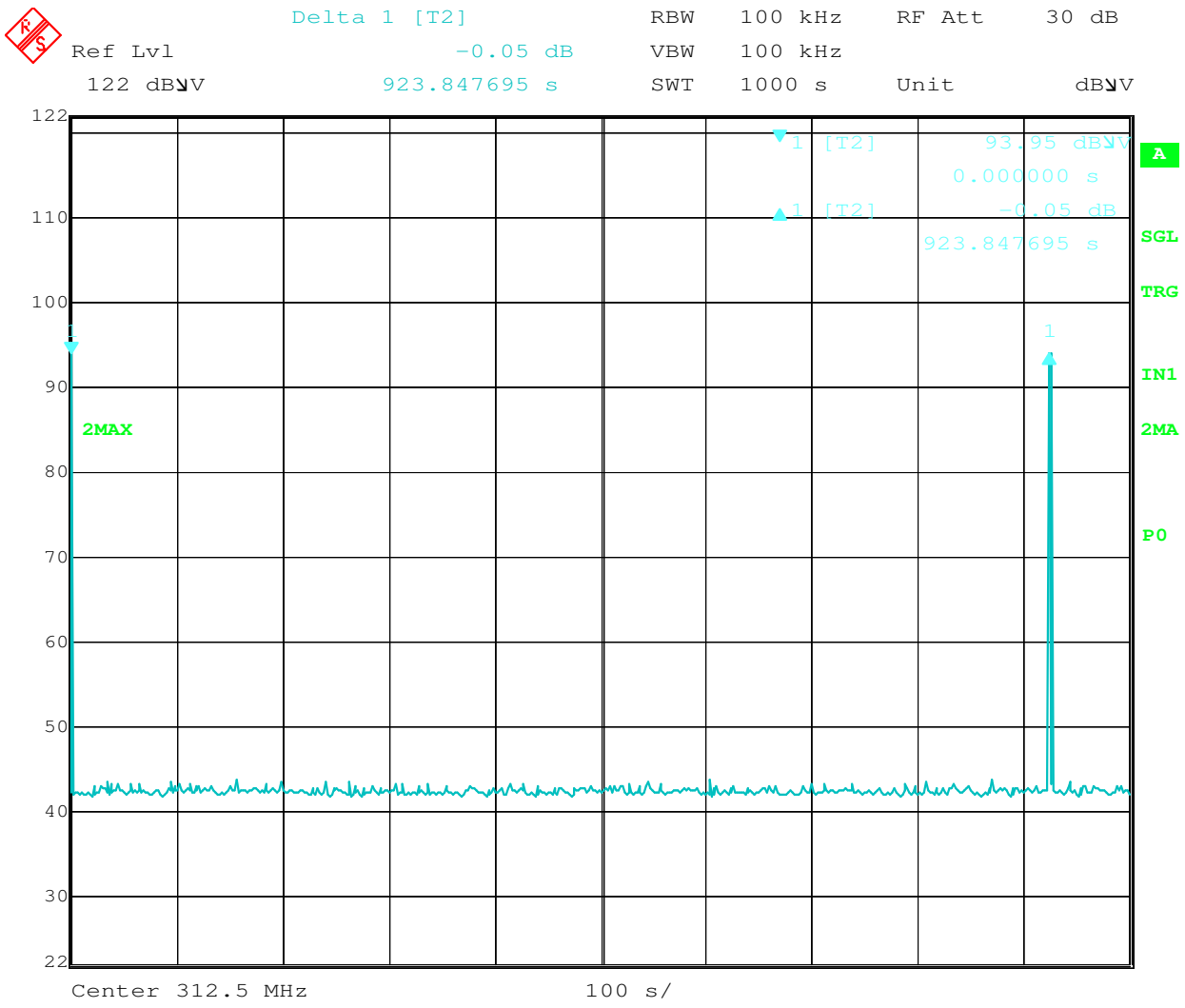
Test Setup for Radiated Emissions, 1-3.5GHz – Horizontal Polarization

Test Setup for Radiated Emissions, 1-3.5GHz – Vertical Polarization



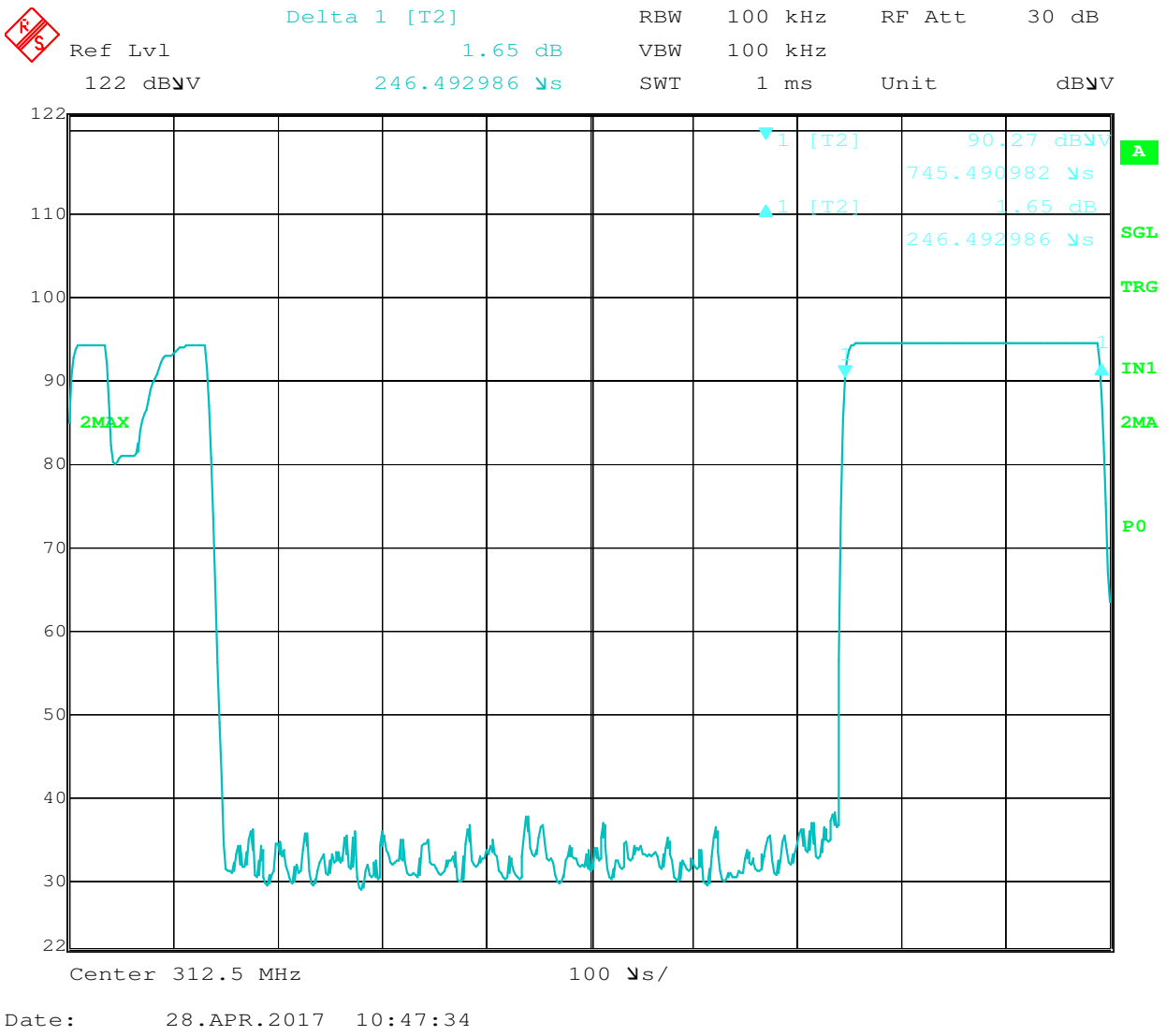
Deactivation Time

Manufacturer : Chamberlain
Model Number : 821LMB-SENSOR and MYQ-G0302 Door Sensor
Serial Number :
Mode : Tx @ 312.5MHz
Date : 4/28/2017 10:36:52 AM
Notes : Less than 5 seconds



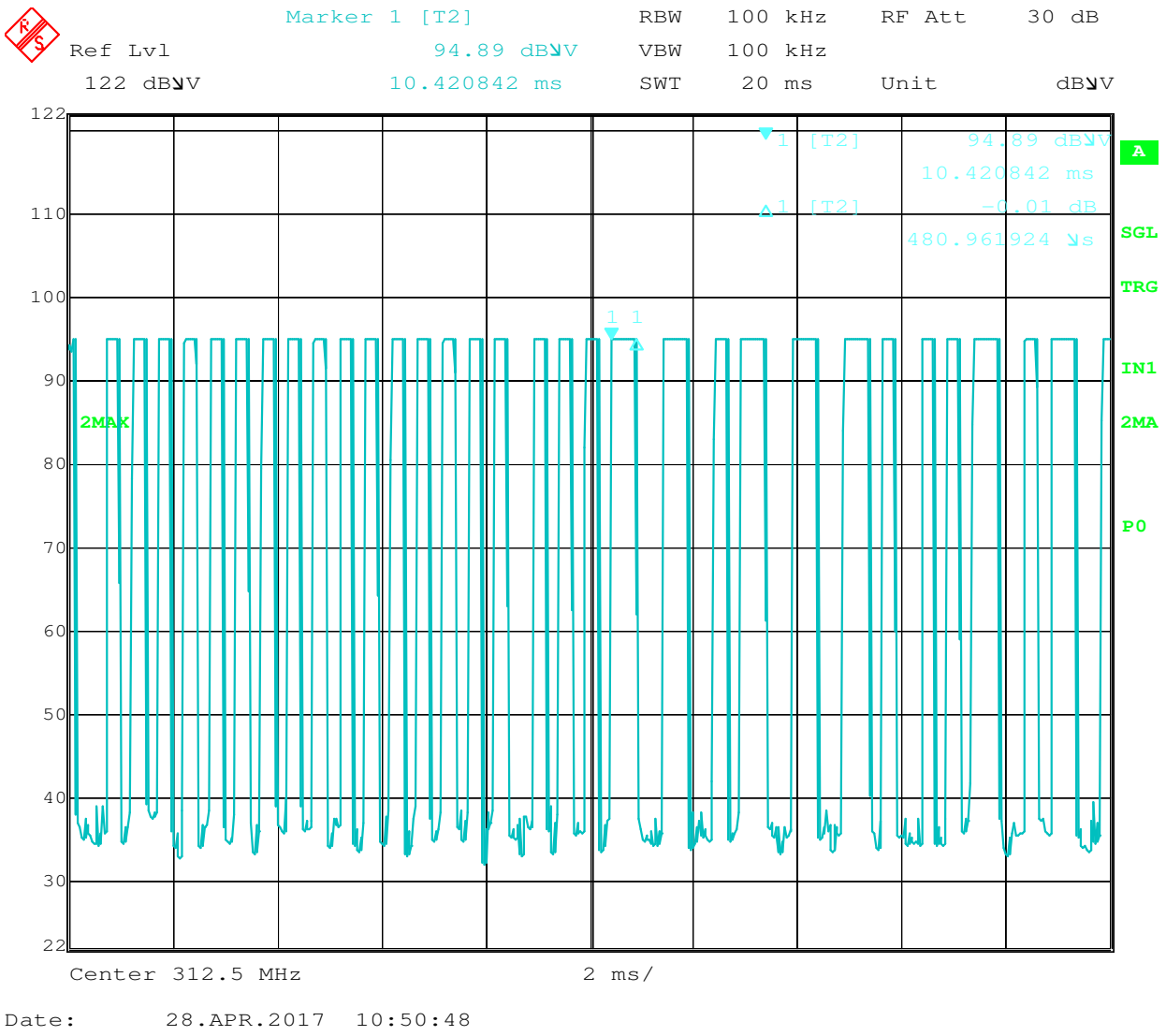
Periodic Transmission

Manufacturer : Chamberlain
Model Number : 821LMB-SENSOR and MYQ-G0302 Door Sensor
Serial Number :
Mode : Tx @ 312.5MHz
Date : 4/28/2017 11:05:06 AM
Notes : At least 10 seconds between transmissions



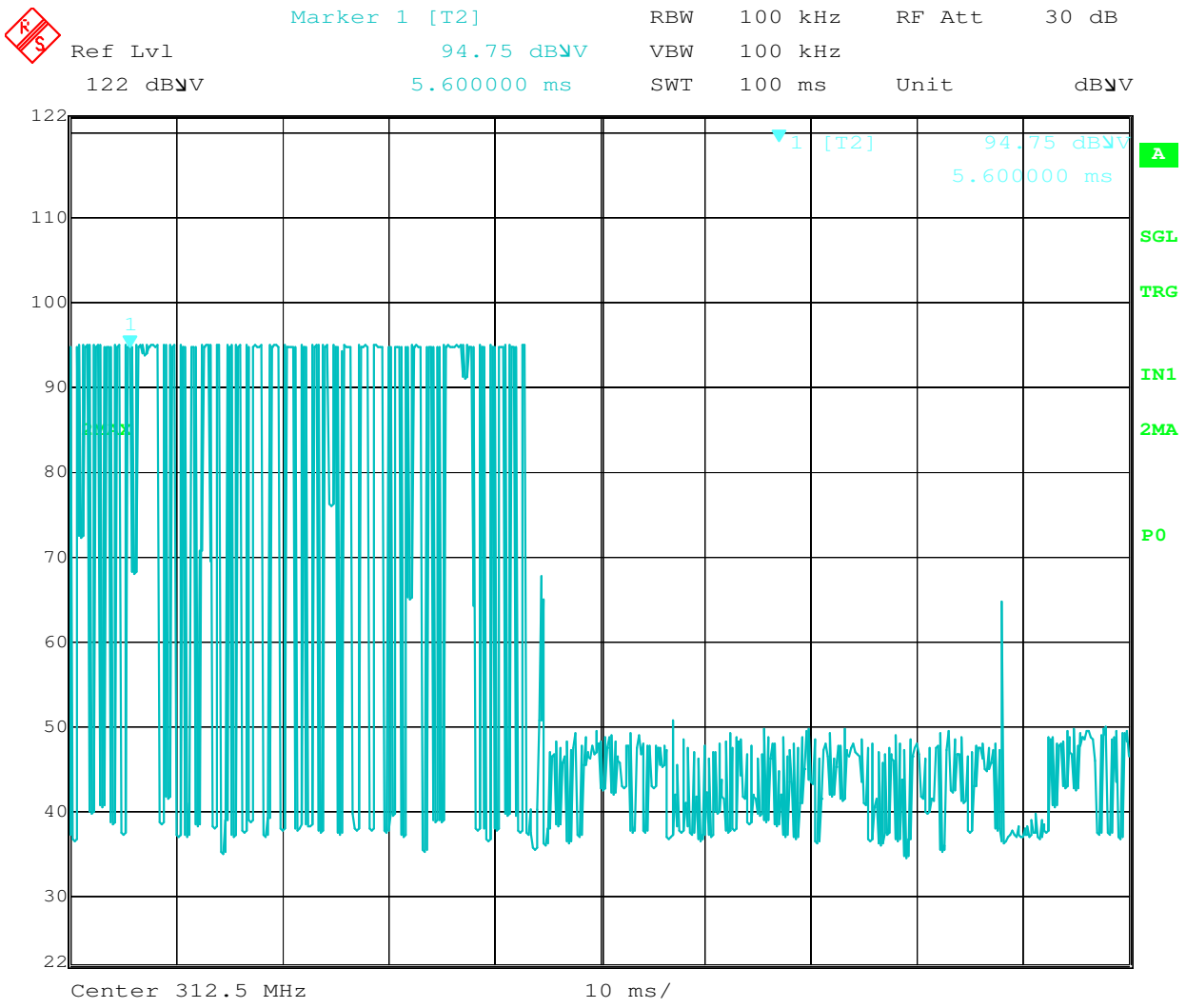
Duty Cycle

Manufacturer : Chamberlain
Model Number : 821LMB-SENSOR and MYQ-G0302 Door Sensor
Serial Number :
Mode : Tx @ 312.5MHz
Date : 4/28/2017 10:30:19 AM
Notes : narrow pulse is 246.5usec



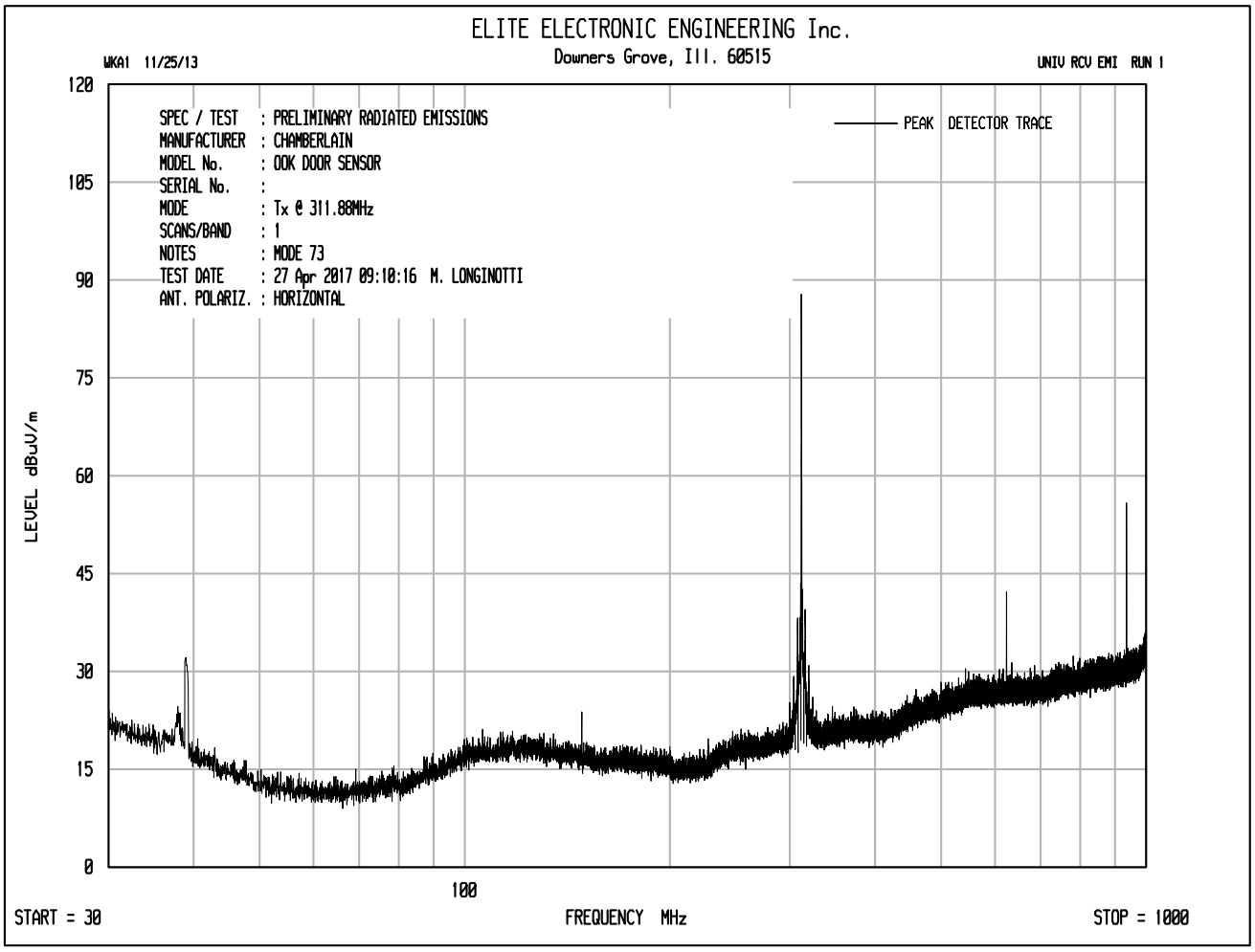
Duty Cycle

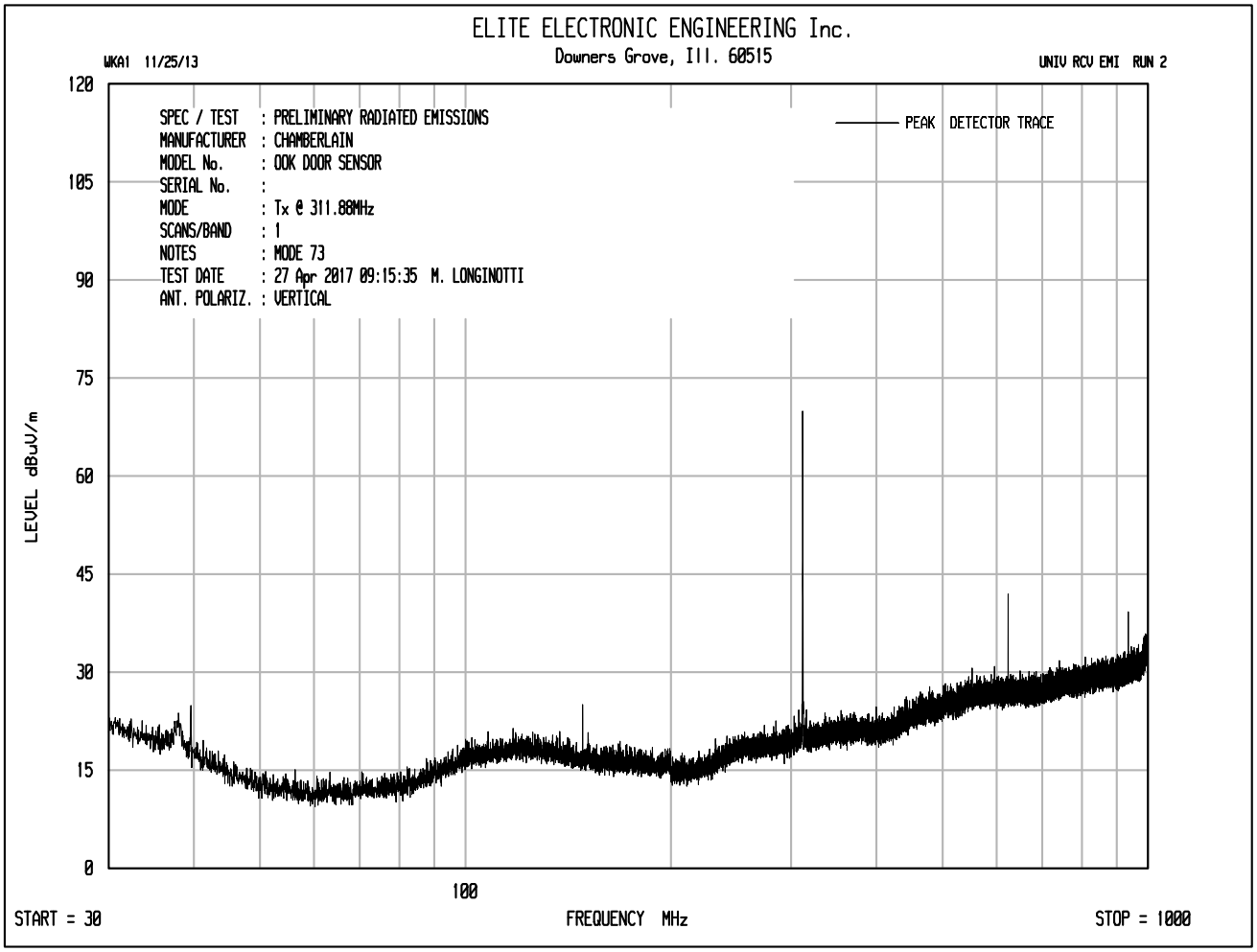
Manufacturer : Chamberlain
Model Number : 821LMB-SENSOR and MYQ-G0302 Door Sensor
Serial Number :
Mode : Tx @ 312.5MHz
Date : 4/28/2017 10:33:33 AM
Notes : wide pulse is 480usec

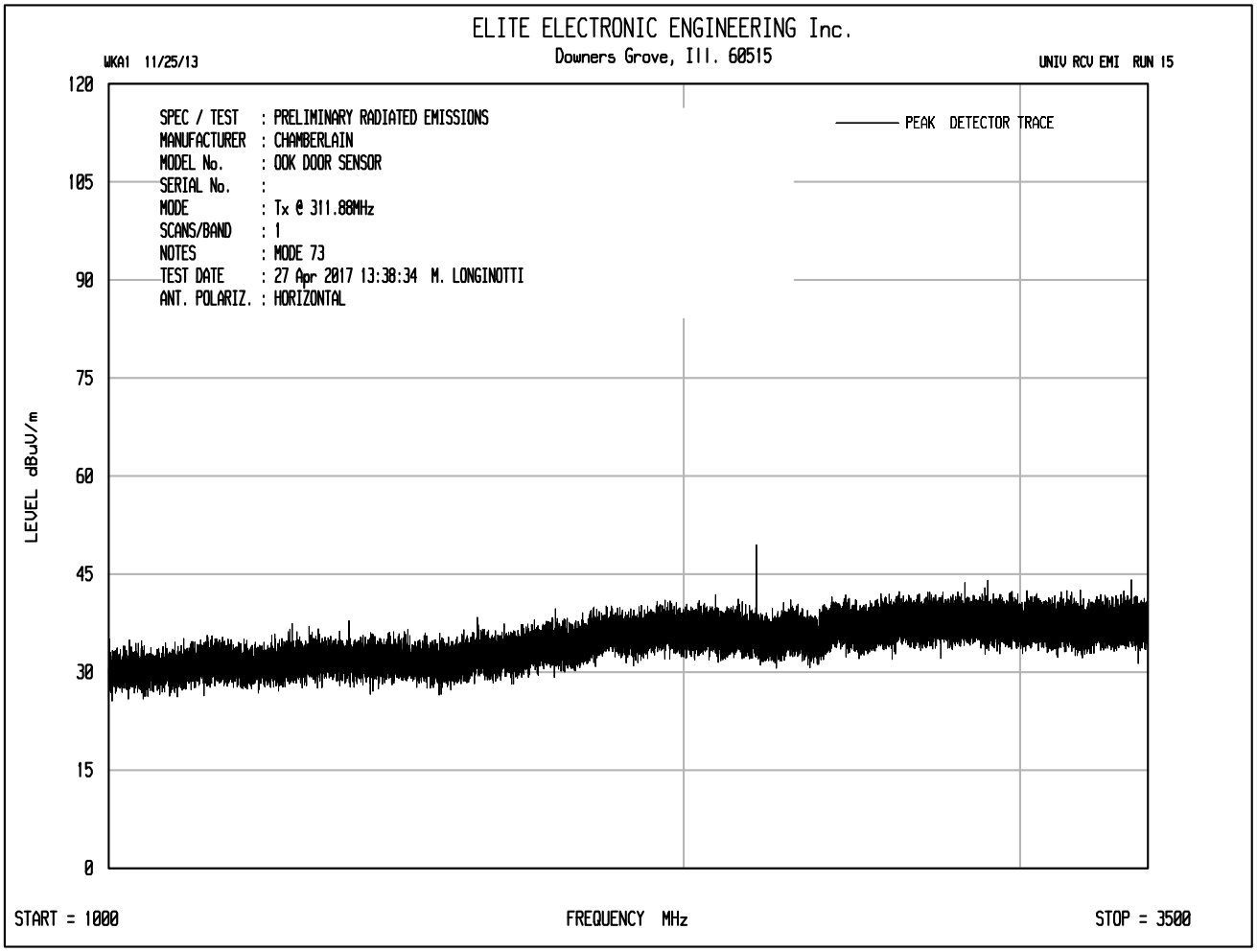


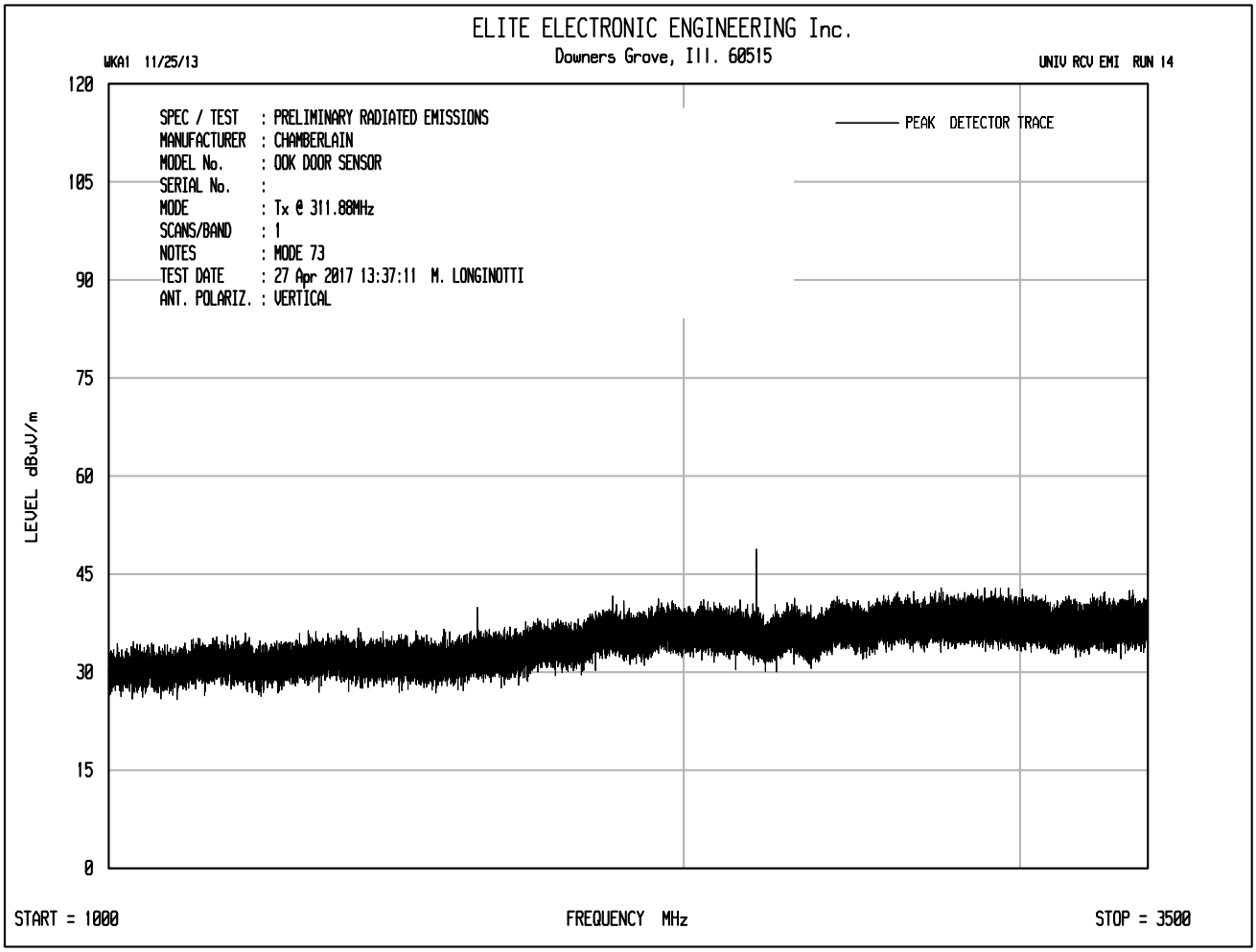
Duty Cycle

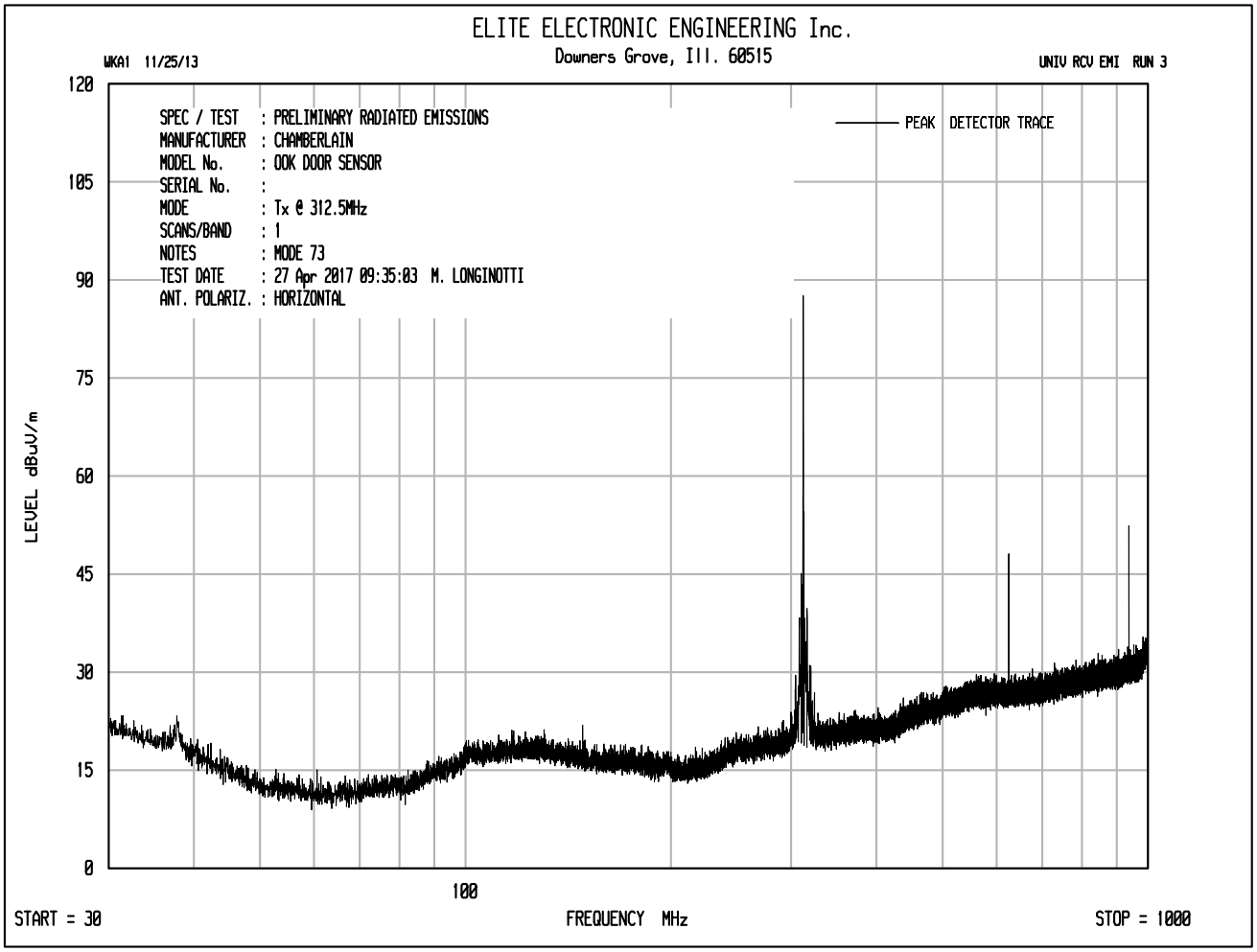
Manufacturer : Chamberlain
Model Number : 821LMB-SENSOR and MYQ-G0302 Door Sensor
Serial Number :
Mode : Tx @ 312.5MHz
Date : 4/28/2017 10:27:30 AM
Notes :

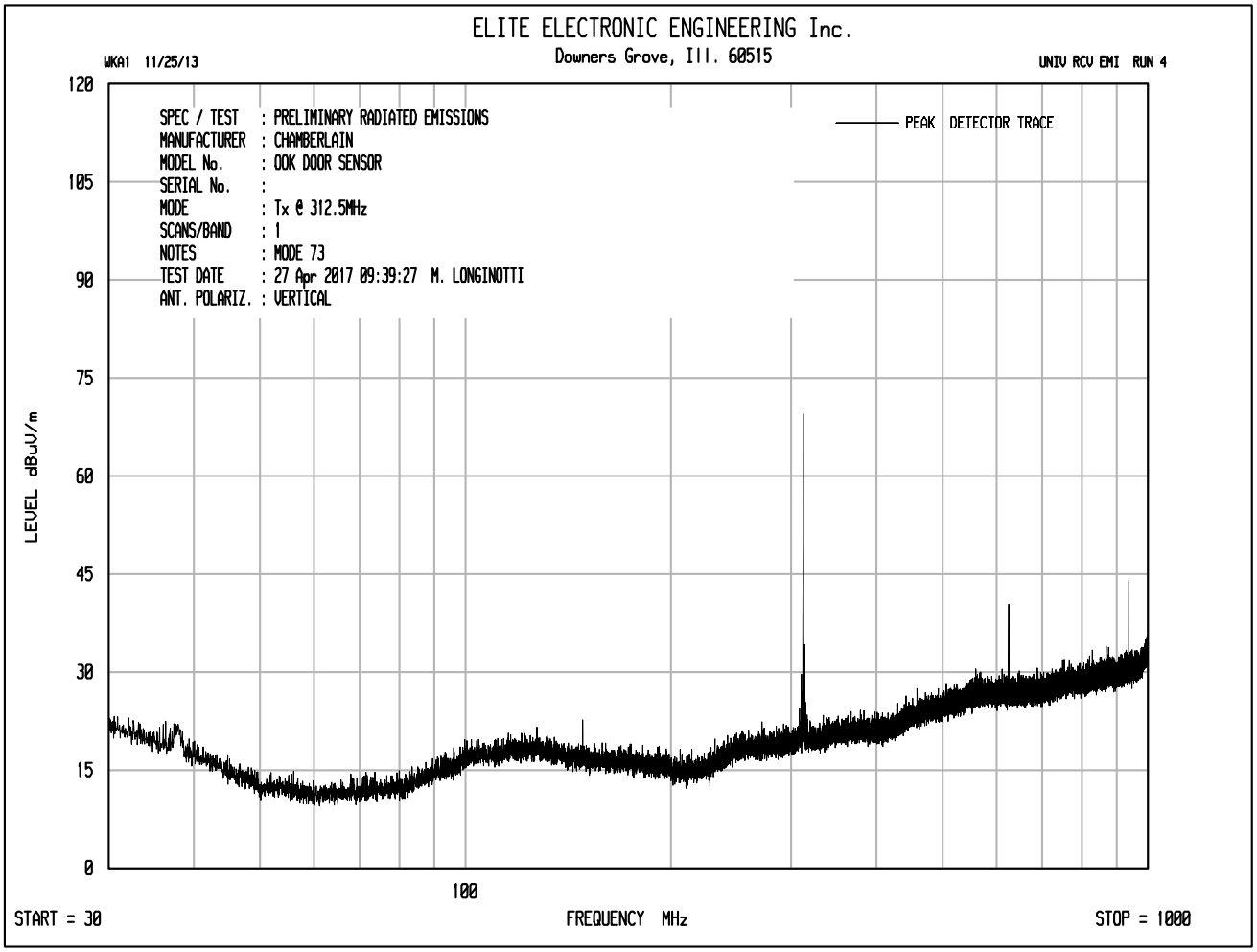

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 1
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : OOK DOOR SENSOR
SERIAL No. :
MODE : Tx @ 311.88MHz
SCANS/BAND : 1
NOTES : MODE 73
TEST DATE : 27 Apr 2017 09:10:16 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000

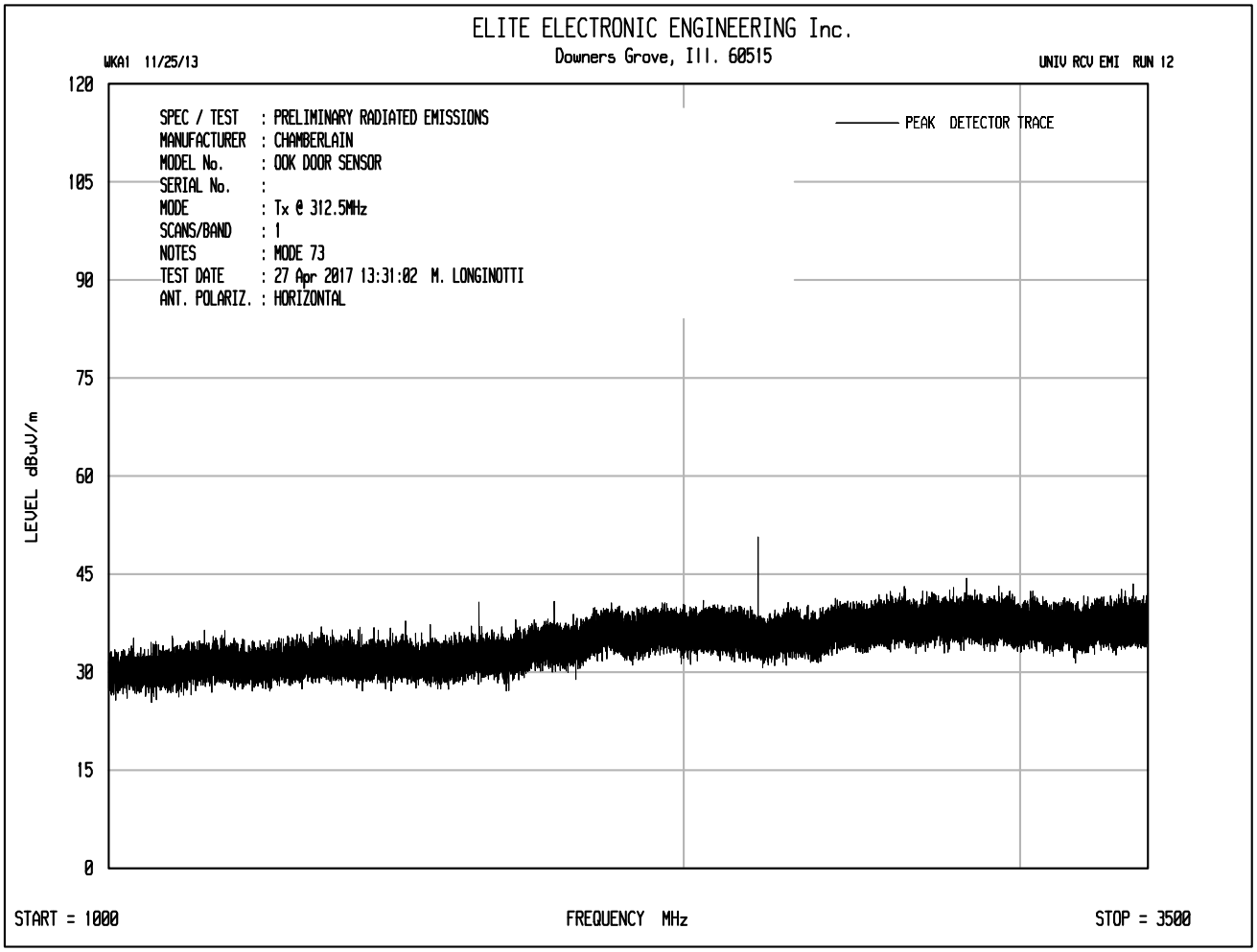

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 2
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : OOK DOOR SENSOR
SERIAL No. :
MODE : Tx @ 311.88MHz
SCANS/BAND : 1
NOTES : MODE 73
TEST DATE : 27 Apr 2017 09:15:35 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000

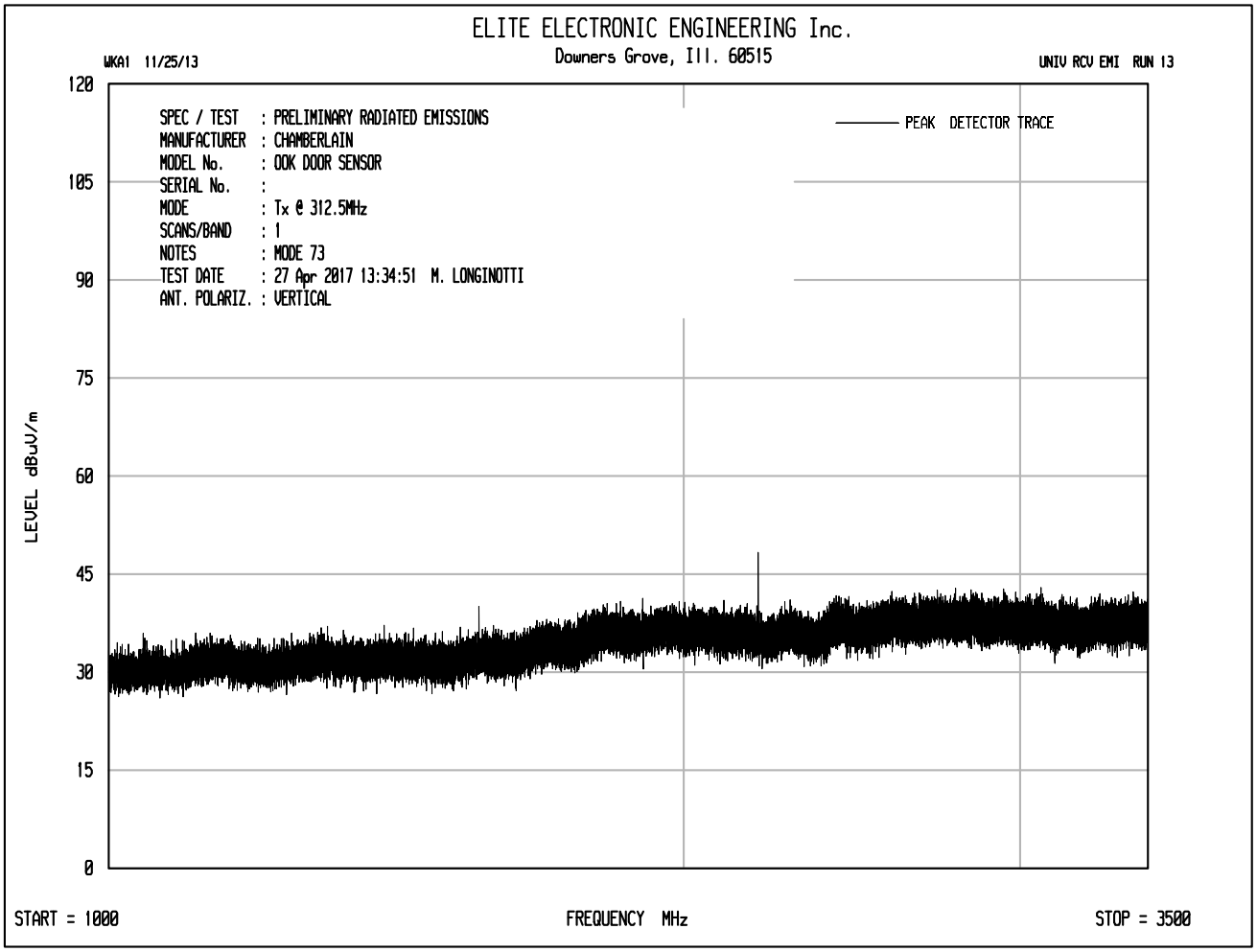

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 15
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : OOK DOOR SENSOR
SERIAL No. :
MODE : Tx @ 311.88MHz
SCANS/BAND : 1
NOTES : MODE 73
TEST DATE : 27 Apr 2017 13:38:34 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 3500

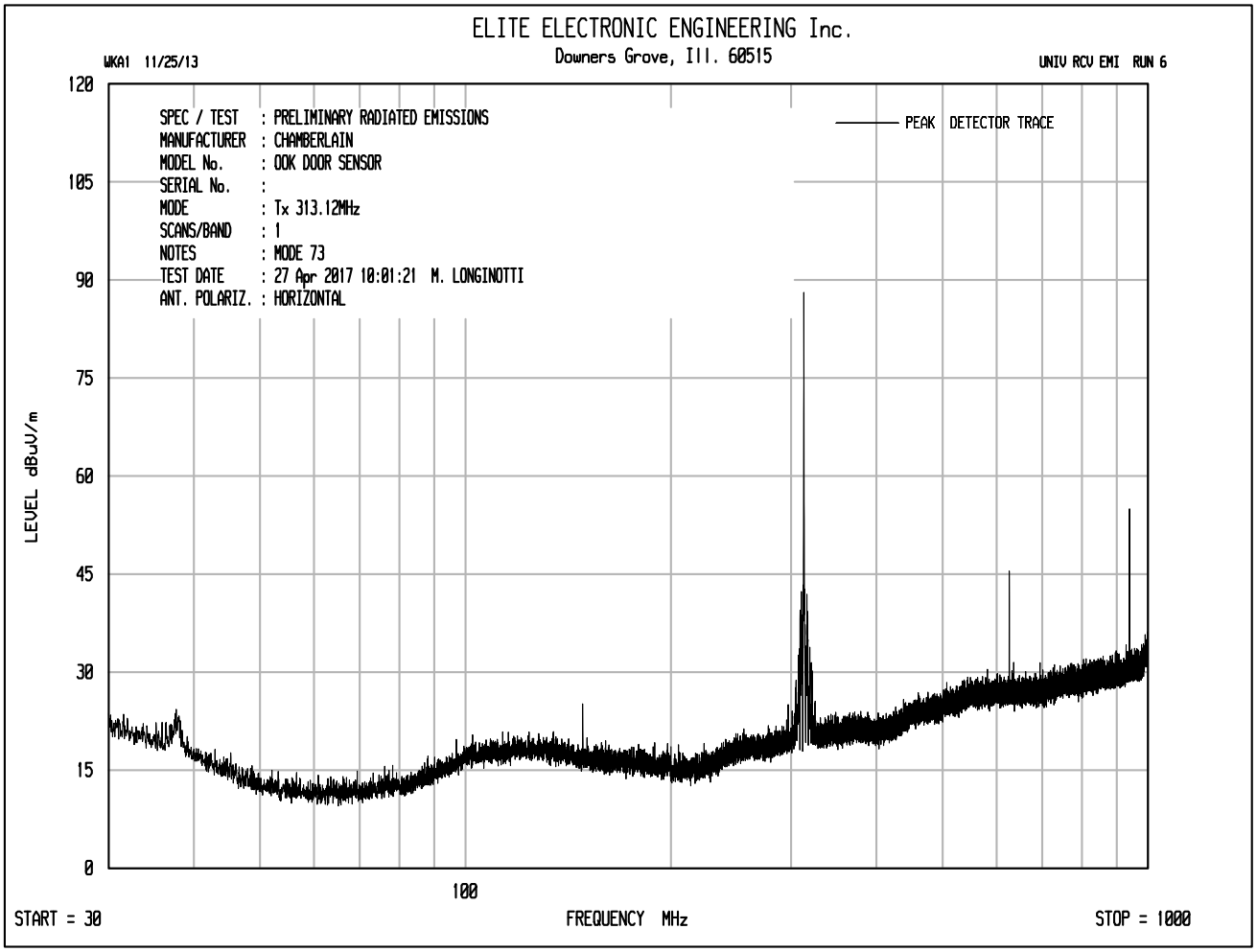

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 14
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : OOK DOOR SENSOR
SERIAL No. :
MODE : Tx @ 311.88MHz
SCANS/BAND : 1
NOTES : MODE 73
TEST DATE : 27 Apr 2017 13:37:11 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 3500

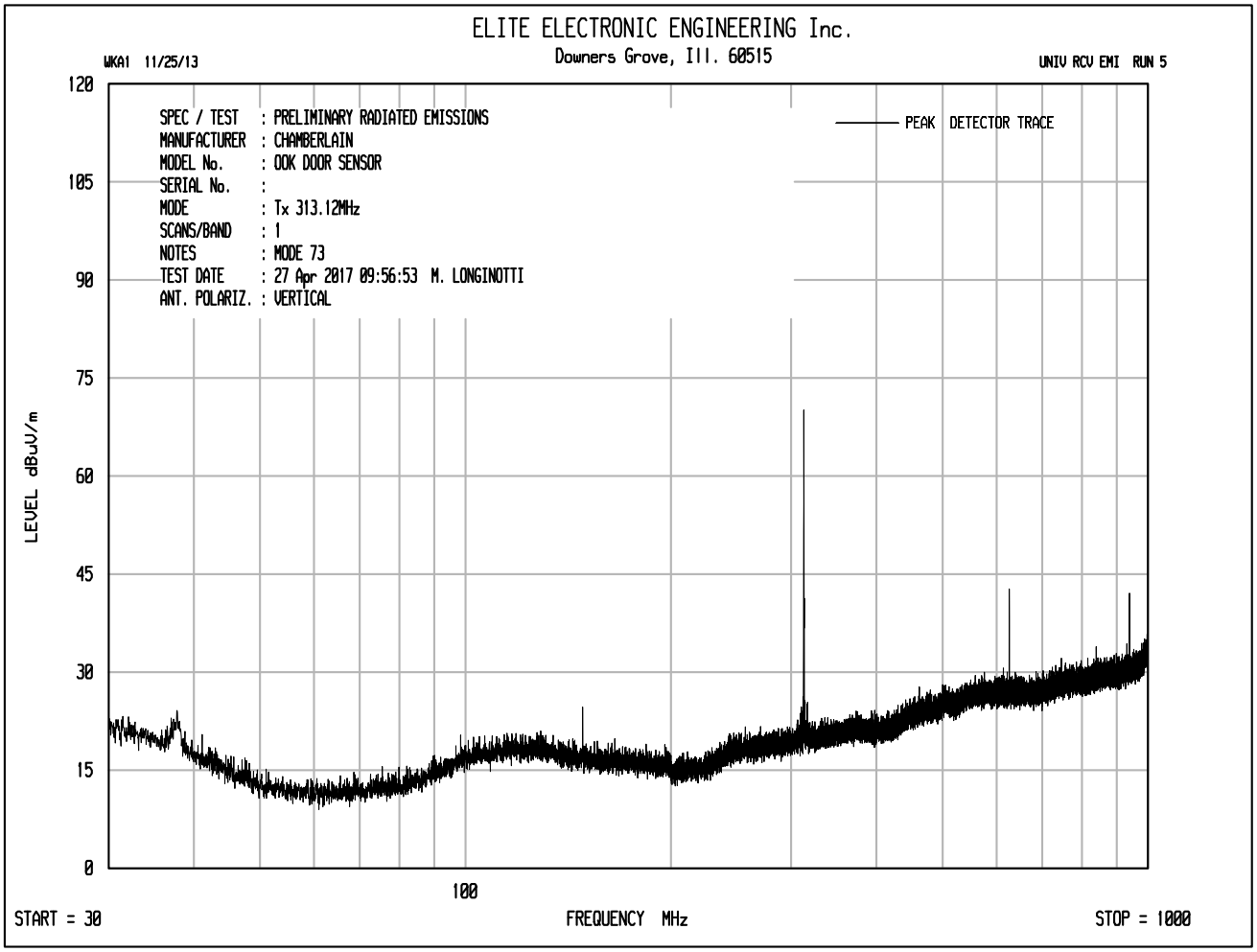

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 3
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : OOK DOOR SENSOR
SERIAL No. :
MODE : Tx @ 312.5MHz
SCANS/BAND : 1
NOTES : MODE 73
TEST DATE : 27 Apr 2017 09:35:03 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000

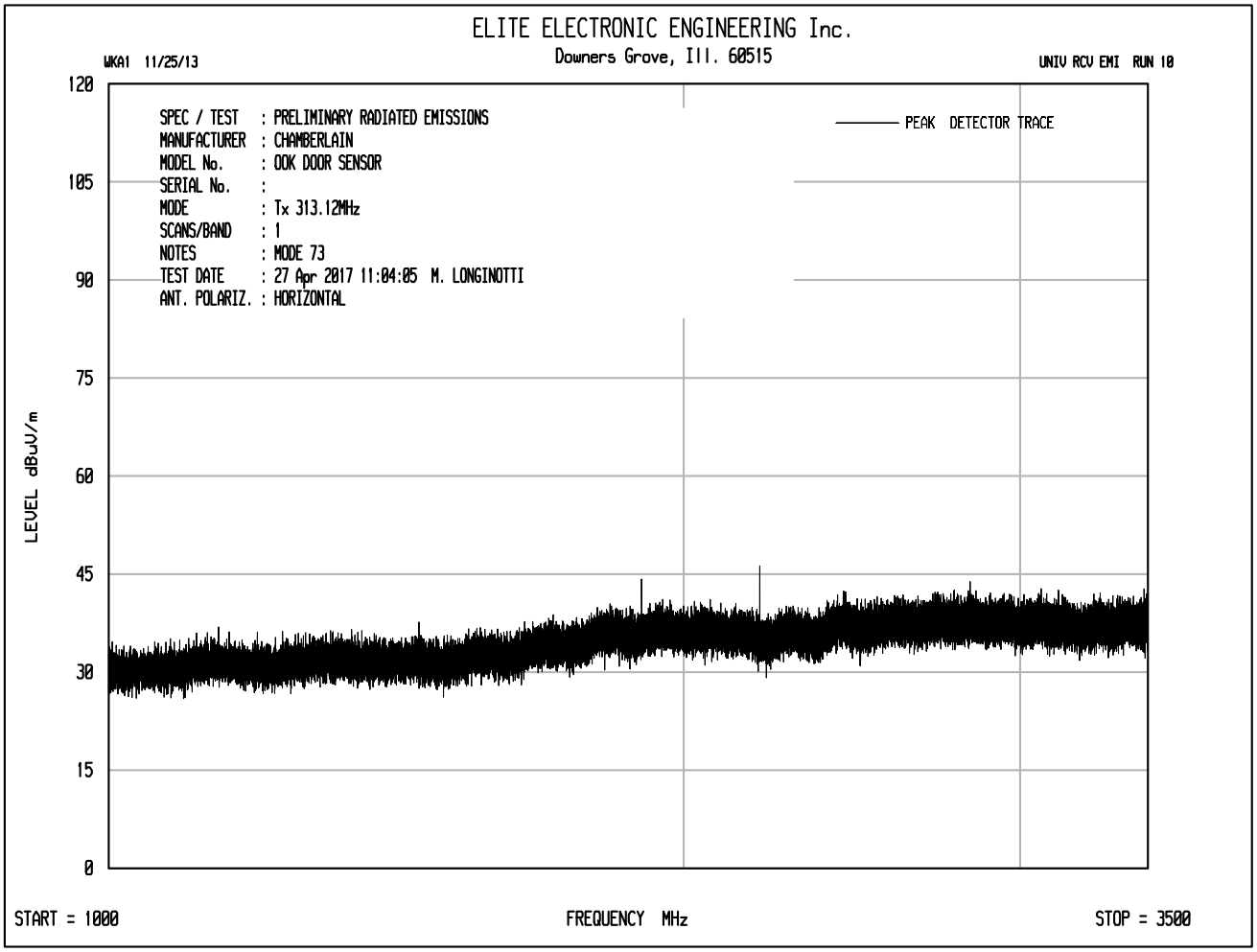

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 4
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : OOK DOOR SENSOR
SERIAL No. :
MODE : Tx @ 312.5MHz
SCANS/BAND : 1
NOTES : MODE 73
TEST DATE : 27 Apr 2017 09:39:27 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000

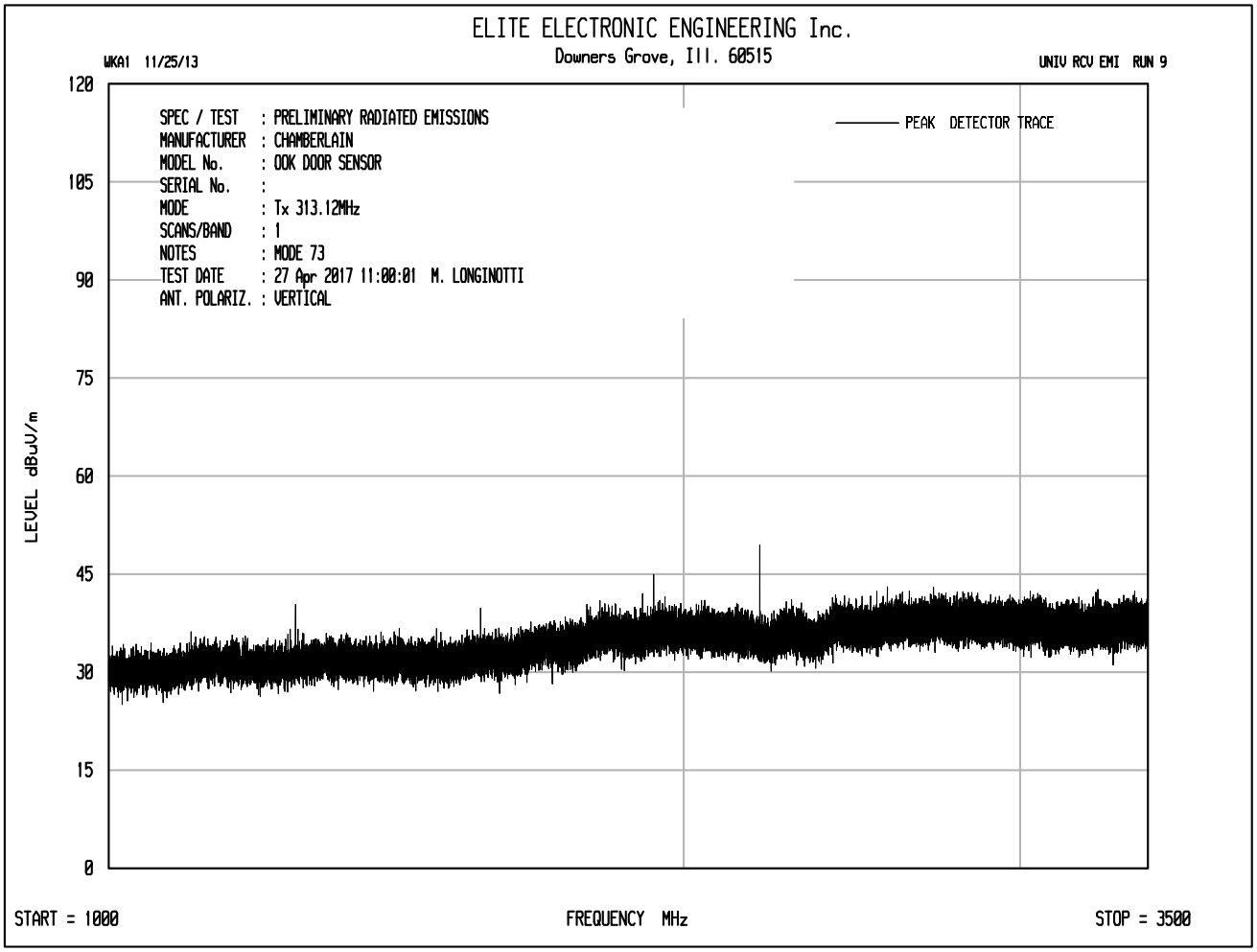

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 12
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : OOK DOOR SENSOR
SERIAL No. :
MODE : Tx @ 312.5MHz
SCANS/BAND : 1
NOTES : MODE 73
TEST DATE : 27 Apr 2017 13:31:02 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 3500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 13
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : OOK DOOR SENSOR
SERIAL No. :
MODE : Tx @ 312.5MHz
SCANS/BAND : 1
NOTES : MODE 73
TEST DATE : 27 Apr 2017 13:34:51 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 3500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 6
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : OOK DOOR SENSOR
SERIAL No. :
MODE : Tx 313.12MHz
SCANS/BAND : 1
NOTES : MODE 73
TEST DATE : 27 Apr 2017 10:01:21 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 5
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : OOK DOOR SENSOR
SERIAL No. :
MODE : Tx 313.12MHz
SCANS/BAND : 1
NOTES : MODE 73
TEST DATE : 27 Apr 2017 09:56:53 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : OOK DOOR SENSOR
SERIAL No. :
MODE : Tx 313.12MHz
SCANS/BAND : 1
NOTES : MODE 73
TEST DATE : 27 Apr 2017 11:04:05 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 3500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 9
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : OOK DOOR SENSOR
SERIAL No. :
MODE : Tx 313.12MHz
SCANS/BAND : 1
NOTES : MODE 73
TEST DATE : 27 Apr 2017 11:00:01 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 3500

MANUFACTURER	Chamberlain Group, Inc.
EUT	821LMB-SENSOR and MYQ-G0302 Door Sensor
SPECIFICATION	FCC 15C, Section 15.231(b) and RSS-210 Annex A, Table A1
TEST	Radiated Emissions
MODE	Transmit at 311.88MHz, mode 73
DATE TESTED	04/27/2017

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Total (dBuV/m)	Total (uV/m)	Limit (uV/m)	Margin (dB)
311.880	H	66.9		1.8	19.4	0.0	-13.5	74.6	5398.8	5911.7	-0.8
311.880	V	49.0		1.8	19.4	0.0	-13.5	56.7	687.5	5911.7	-18.7
623.760	H	25.0		2.5	24.9	0.0	-13.5	38.9	88.0	591.2	-16.5
623.760	V	22.8		2.5	24.9	0.0	-13.5	36.7	68.3	591.2	-18.7
935.640	H	27.8		2.9	27.0	0.0	-13.5	44.2	161.7	591.2	-11.3
935.640	V	22.3		2.9	27.0	0.0	-13.5	38.7	85.9	591.2	-16.8
1247.520	H	18.7		3.1	29.1	0.0	-13.5	37.4	73.8	591.2	-18.1
1247.520	V	17.0		3.1	29.1	0.0	-13.5	35.7	60.7	591.2	-19.8
1559.400	H	18.3		3.2	28.2	0.0	-13.5	36.2	64.4	500.0	-17.8
1559.400	V	18.0		3.2	28.2	0.0	-13.5	35.9	62.2	500.0	-18.1
1871.280	H	16.6	Ambient	3.3	30.8	0.0	-13.5	37.1	71.8	591.2	-18.3
1871.280	V	16.9	Ambient	3.3	30.8	0.0	-13.5	37.4	74.3	591.2	-18.0
2183.160	H	19.8		3.3	31.7	0.0	-13.5	41.3	116.0	591.2	-14.1
2183.160	V	19.1		3.3	31.7	0.0	-13.5	40.6	107.0	591.2	-14.8
2495.040	H	16.5	Ambient	3.4	32.2	0.0	-13.5	38.6	85.0	500.0	-15.4
2495.040	V	16.6	Ambient	3.4	32.2	0.0	-13.5	38.7	86.0	500.0	-15.3
2806.920	H	18.0	Ambient	3.8	32.5	0.0	-13.5	40.9	110.7	500.0	-13.1
2806.920	V	16.8	Ambient	3.8	32.5	0.0	-13.5	39.7	96.4	500.0	-14.3
3118.800	H	15.9	Ambient	4.3	32.9	0.0	-13.5	39.6	95.5	591.2	-15.8
3118.800	V	16.0	Ambient	4.3	32.9	0.0	-13.5	39.7	96.6	591.2	-15.7

Tested By: MARK E. LONGINOTTI

Mark E. Longinotti

MANUFACTURER	Chamberlain Group, Inc.
EUT	821LMB-SENSOR and MYQ-G0302 Door Sensor
SPECIFICATION	FCC 15C, Section 15.231(b) and RSS-210 Annex A, Table A1
TEST	Radiated Emissions
MODE	Transmit at 312.5MHz, mode 73
DATE TESTED	04/27/2017

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Total (dBuV/m)	Total (uV/m)	Limit (uV/m)	Margin (dB)
312.500	H	66.7		1.8	19.5	0.0	-13.5	74.5	5284.2	5937.5	-1.0
312.500	V	49.1		1.8	19.5	0.0	-13.5	56.9	696.6	5937.5	-18.6
625.000	H	25.8		2.5	24.9	0.0	-13.5	39.7	96.6	593.7	-15.8
625.000	V	23.5		2.5	24.9	0.0	-13.5	37.4	74.2	593.7	-18.1
937.500	H	27.4		2.9	27.0	0.0	-13.5	43.8	155.0	593.7	-11.7
937.500	V	22.2		2.9	27.0	0.0	-13.5	38.6	85.2	593.7	-16.9
1250.000	H	18.3		3.1	29.1	0.0	-13.5	37.0	70.5	593.7	-18.5
1250.000	V	17.8		3.1	29.1	0.0	-13.5	36.5	66.6	593.7	-19.0
1562.500	H	17.9	Ambient	3.2	28.2	0.0	-13.5	35.8	61.7	500.0	-18.2
1562.500	V	18.5		3.2	28.2	0.0	-13.5	36.4	66.1	500.0	-17.6
1875.000	H	16.3	Ambient	3.3	30.8	0.0	-13.5	36.9	69.6	593.7	-18.6
1875.000	V	16.5	Ambient	3.3	30.8	0.0	-13.5	37.1	71.2	593.7	-18.4
2187.500	H	20.4		3.3	31.6	0.0	-13.5	41.9	124.3	593.7	-13.6
2187.500	V	19.0		3.3	31.6	0.0	-13.5	40.5	105.8	593.7	-15.0
2500.000	H	16.5	Ambient	3.4	32.2	0.0	-13.5	38.6	85.1	500.0	-15.4
2500.000	V	16.7	Ambient	3.4	32.2	0.0	-13.5	38.8	87.1	500.0	-15.2
2812.500	H	17.9	Ambient	3.8	32.6	0.0	-13.5	40.8	109.6	500.0	-13.2
2812.500	V	17.8	Ambient	3.8	32.6	0.0	-13.5	40.7	108.4	500.0	-13.3
3125.000	H	15.4	Ambient	4.3	32.9	0.0	-13.5	39.1	90.4	593.7	-16.4
3125.000	V	15.5	Ambient	4.3	32.9	0.0	-13.5	39.2	91.4	593.7	-16.3

Tested By: MARK E. LONGINOTTI

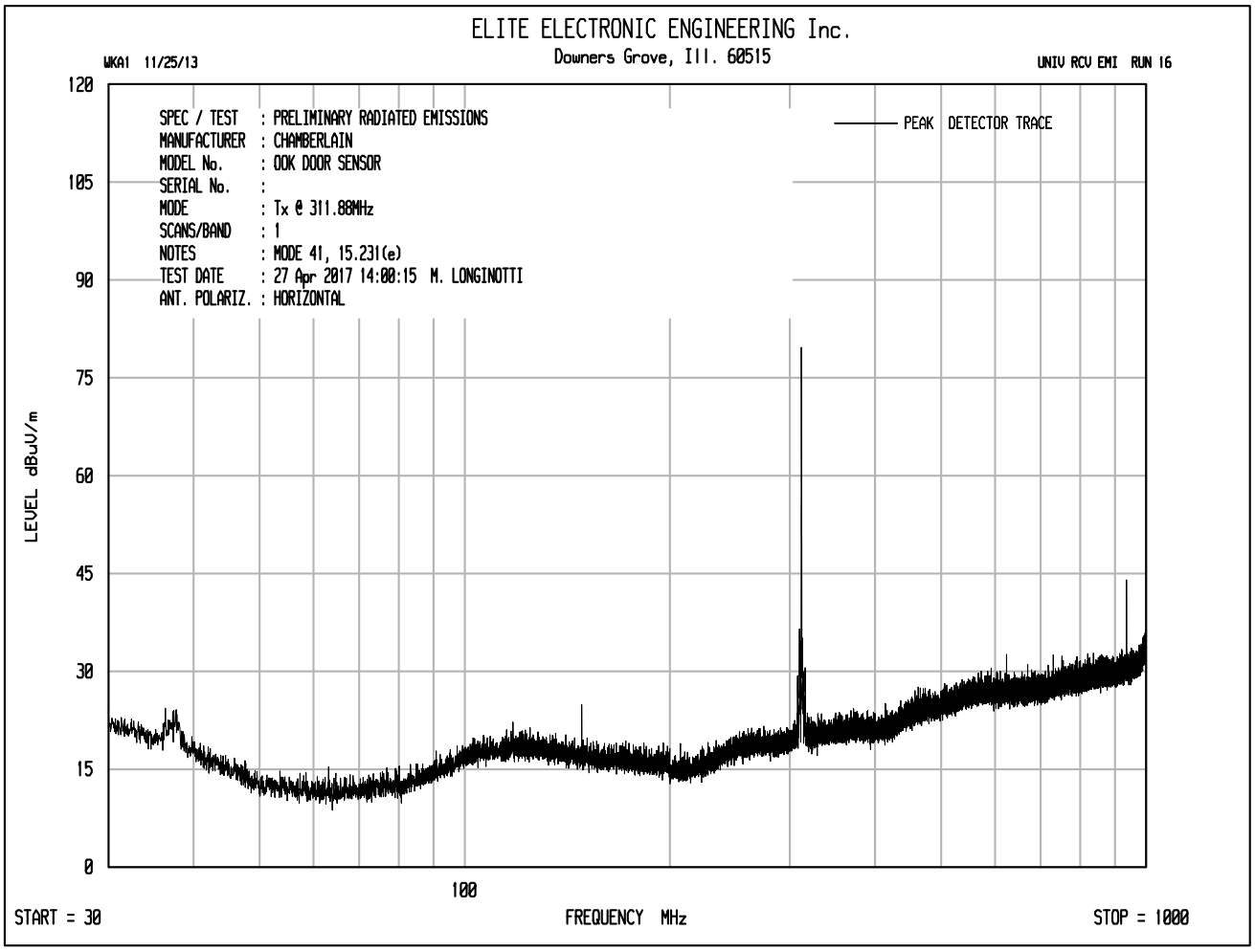
Mark E. Longinotti

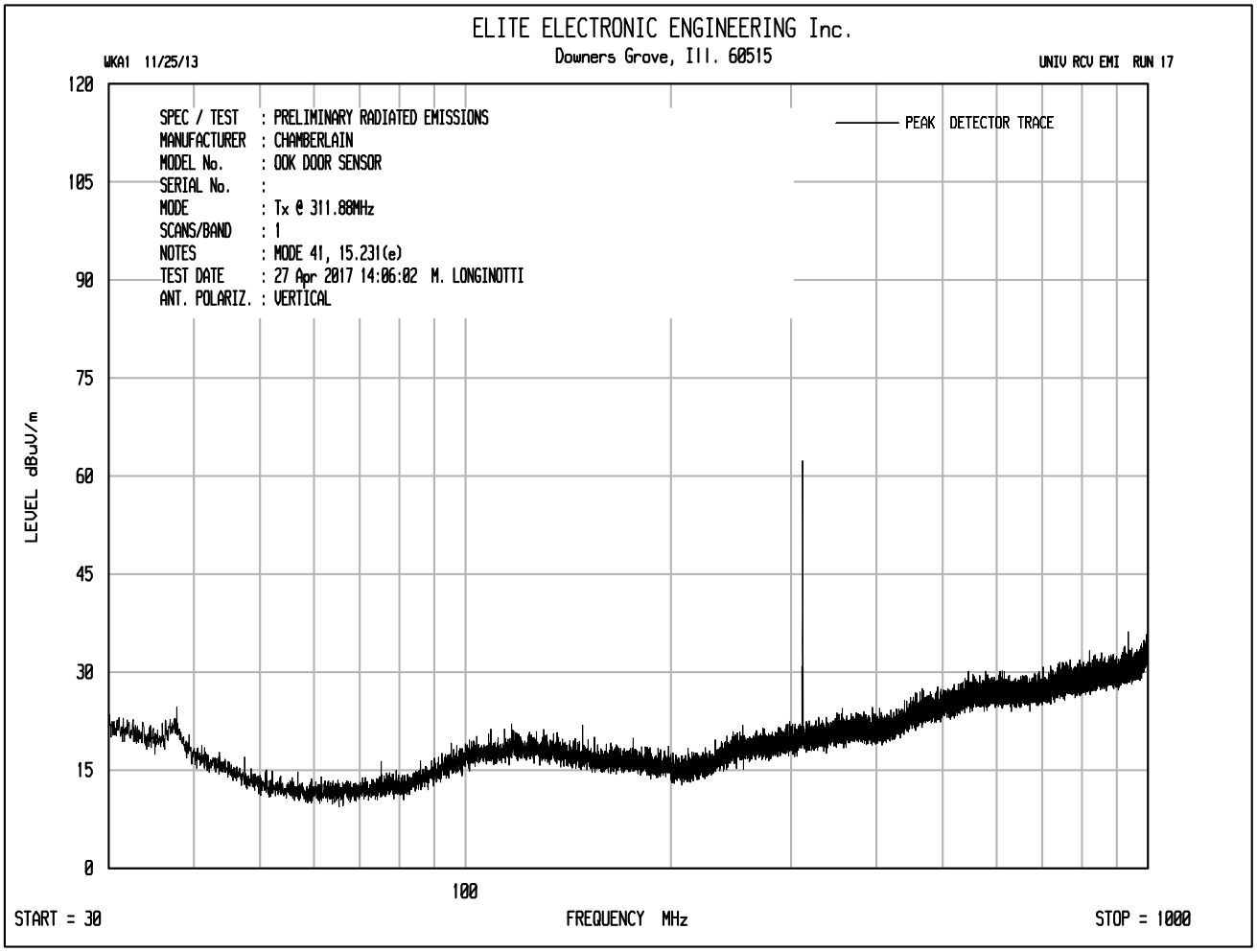
MANUFACTURER	Chamberlain Group, Inc.
EUT	821LMB-SENSOR and MYQ-G0302 Door Sensor
SPECIFICATION	FCC 15C, Section 15.231(b) and RSS-210 Annex A, Table A1
TEST	Radiated Emissions
MODE	Transmit at 313.12MHz, mode 73
DATE TESTED	04/27/2017

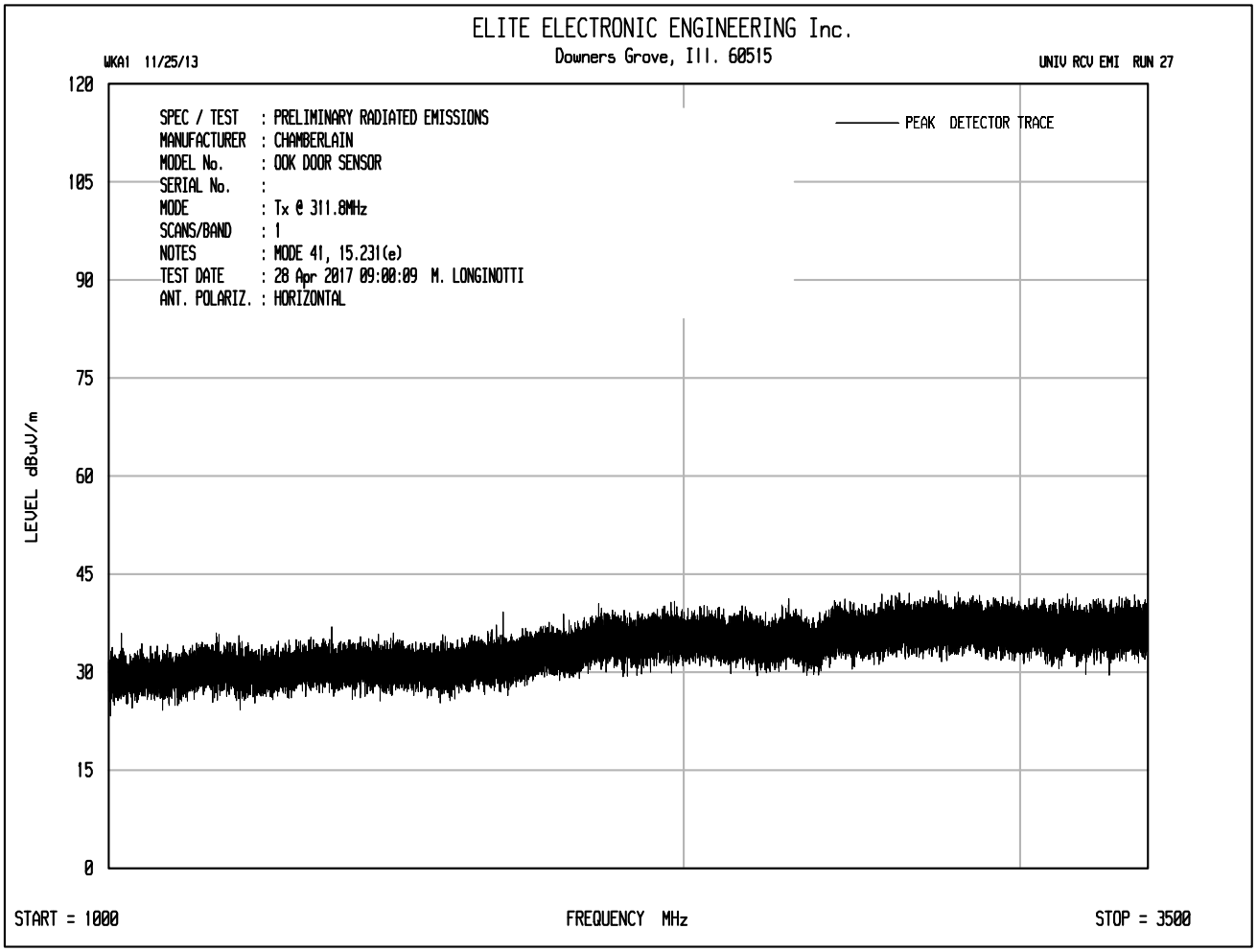
Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Total (dBuV/m)	Total (uV/m)	Limit (uV/m)	Margin (dB)
313.120	H	66.9		1.8	19.5	0.0	-13.5	74.7	5415.7	5963.3	-0.8
313.120	V	48.8		1.8	19.5	0.0	-13.5	56.6	674.0	5963.3	-18.9
626.240	H	26.6		2.5	24.9	0.0	-13.5	40.5	106.1	596.3	-15.0
626.240	V	23.5		2.5	24.9	0.0	-13.5	37.4	74.2	596.3	-18.1
939.360	H	27.4		2.9	27.0	0.0	-13.5	43.8	155.5	596.3	-11.7
939.360	V	22.7		2.9	27.0	0.0	-13.5	39.1	90.5	596.3	-16.4
1252.480	H	19.0		3.1	29.1	0.0	-13.5	37.7	76.3	596.3	-17.9
1252.480	V	17.7		3.1	29.1	0.0	-13.5	36.4	65.7	596.3	-19.2
1565.600	H	17.7		3.2	28.3	0.0	-13.5	35.6	60.5	500.0	-18.3
1565.600	V	17.6		3.2	28.3	0.0	-13.5	35.5	59.8	500.0	-18.4
1878.720	H	17.0	Ambient	3.3	30.8	0.0	-13.5	37.6	75.7	596.3	-17.9
1878.720	V	16.3	Ambient	3.3	30.8	0.0	-13.5	36.9	69.8	596.3	-18.6
2191.840	H	19.4		3.3	31.6	0.0	-13.5	40.9	110.7	596.3	-14.6
2191.840	V	18.7		3.3	31.6	0.0	-13.5	40.2	102.1	596.3	-15.3
2504.960	H	16.7	Ambient	3.4	32.2	0.0	-13.5	38.8	87.2	596.3	-16.7
2504.960	V	16.8	Ambient	3.4	32.2	0.0	-13.5	38.9	88.2	596.3	-16.6
2818.080	H	17.1	Ambient	3.9	32.6	0.0	-13.5	40.0	100.1	500.0	-14.0
2818.080	V	17.1	Ambient	3.9	32.6	0.0	-13.5	40.0	100.1	500.0	-14.0
3131.200	H	15.7	Ambient	4.3	32.9	0.0	-13.5	39.4	93.7	596.3	-16.1
3131.200	V	15.9	Ambient	4.3	32.9	0.0	-13.5	39.6	95.9	596.3	-15.9

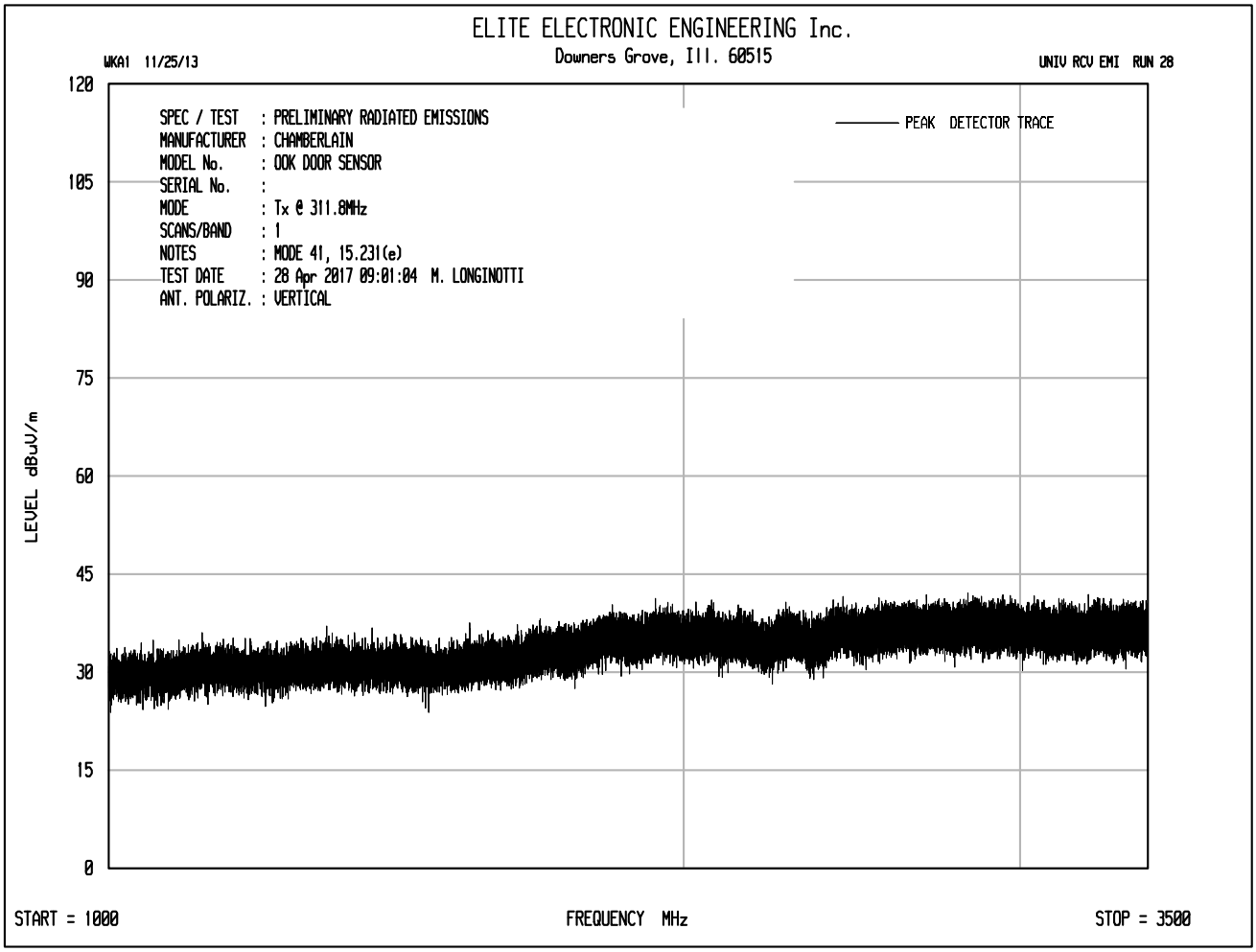
Tested By: MARK E. LONGINOTTI

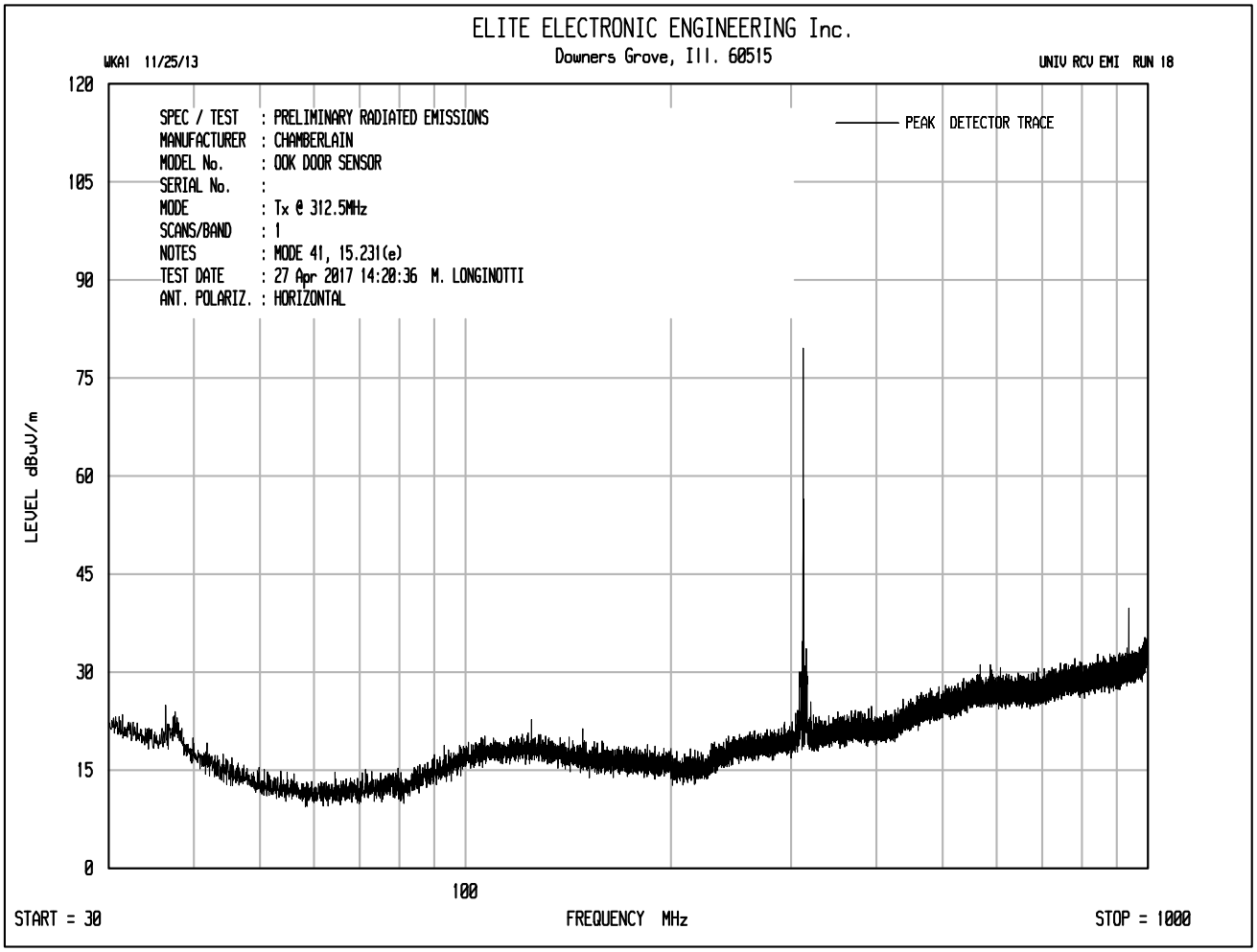
Mark E. Longinotti

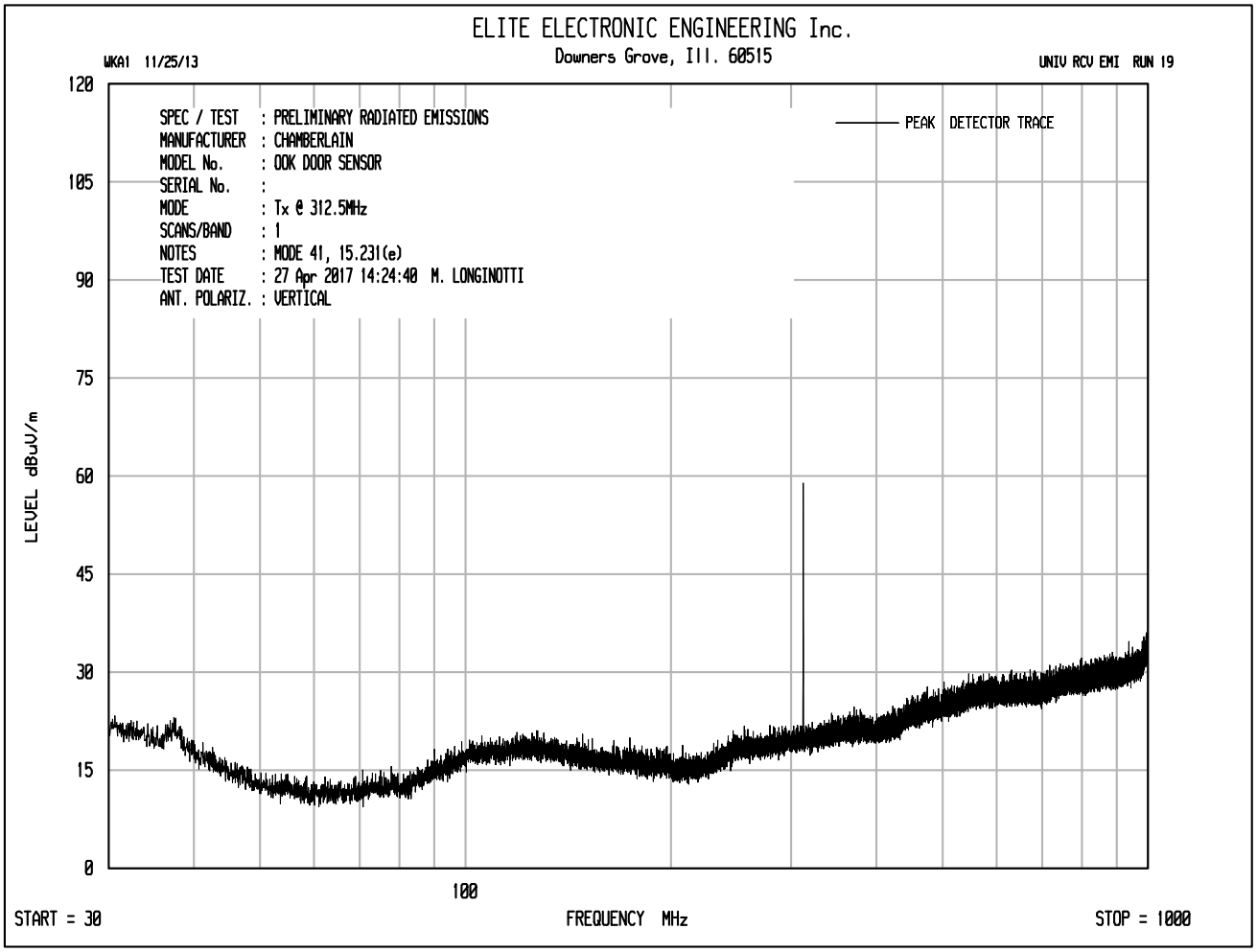

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 16
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : OOK DOOR SENSOR
SERIAL No. :
MODE : Tx @ 311.88MHz
SCANS/BAND : 1
NOTES : MODE 41, 15.231(e)
TEST DATE : 27 Apr 2017 14:00:15 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000

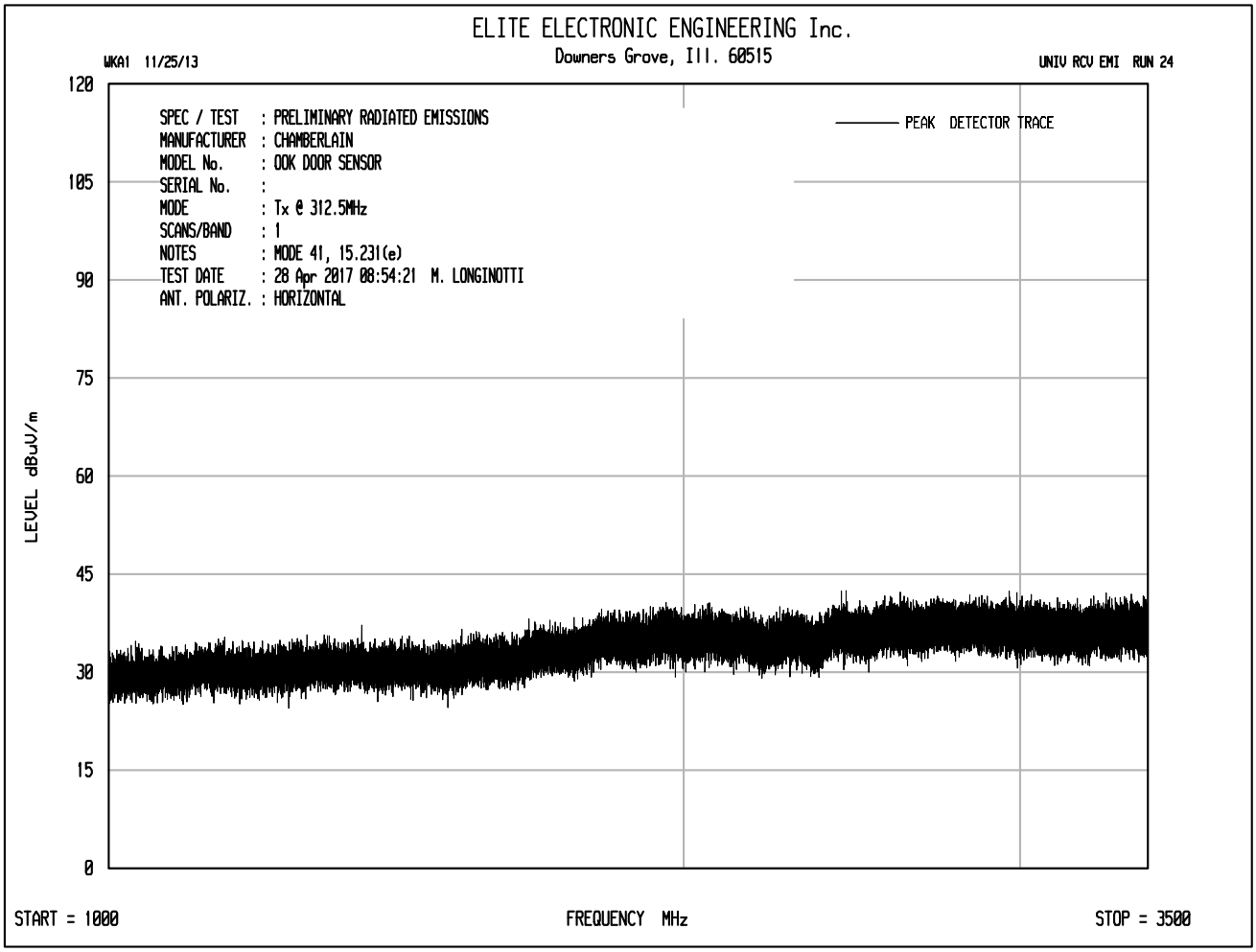

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 17
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : OOK DOOR SENSOR
SERIAL No. :
MODE : Tx @ 311.88MHz
SCANS/BAND : 1
NOTES : MODE 41, 15.231(e)
TEST DATE : 27 Apr 2017 14:06:02 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000

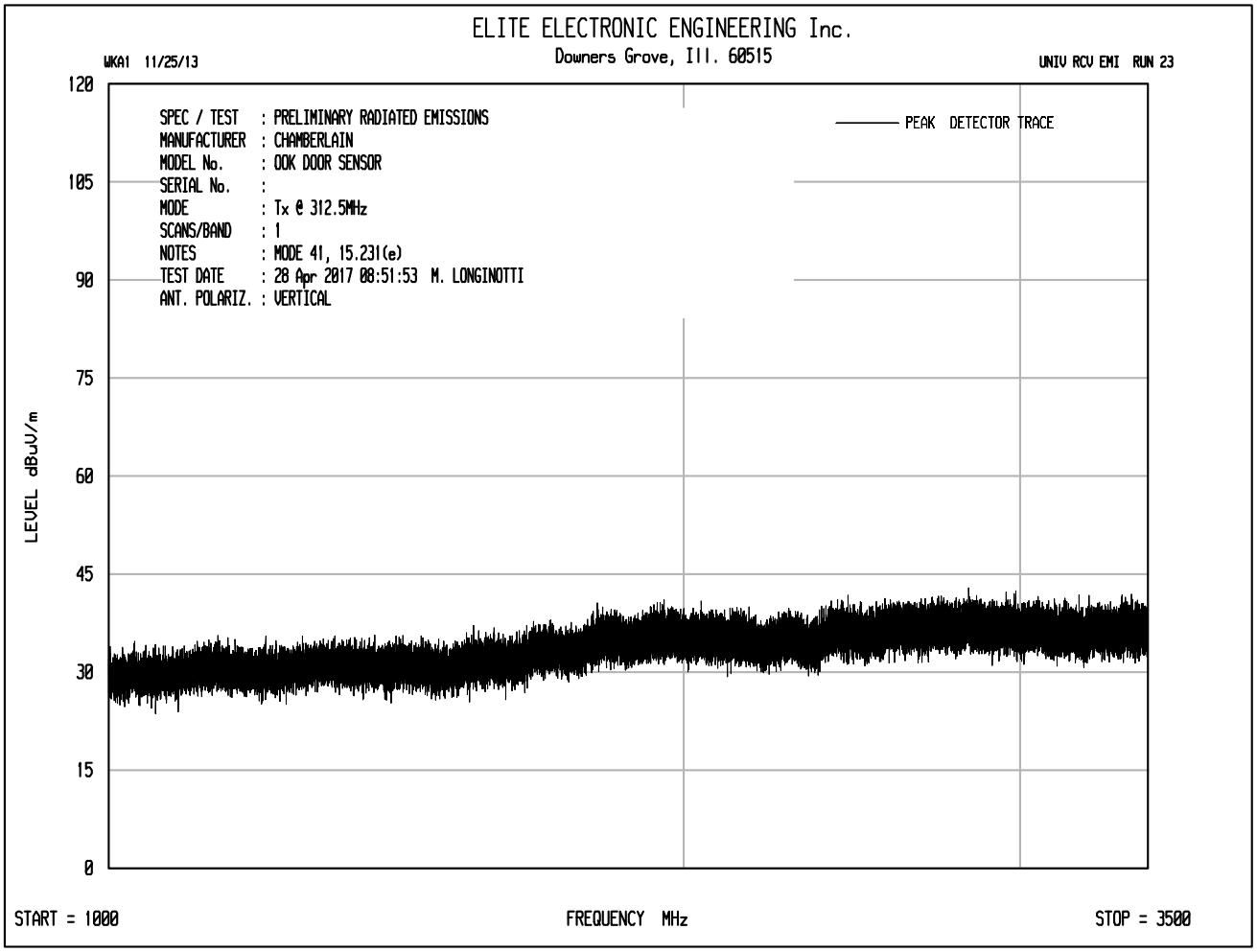

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 27
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : OOK DOOR SENSOR
SERIAL No. :
MODE : Tx @ 311.8MHz
SCANS/BAND : 1
NOTES : MODE 41, 15.231(e)
TEST DATE : 28 Apr 2017 09:00:09 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 3500

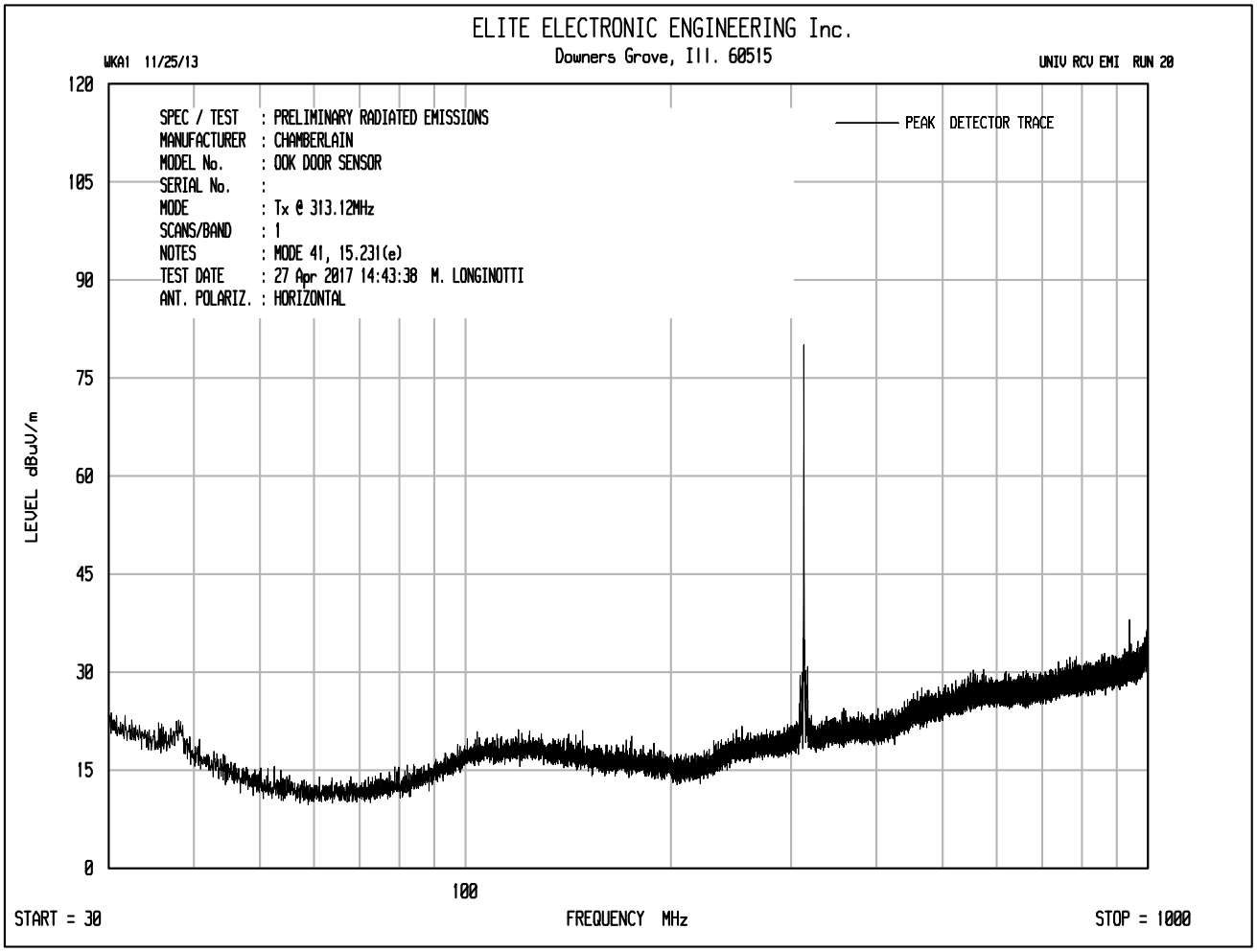

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 28
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : OOK DOOR SENSOR
SERIAL No. :
MODE : Tx @ 311.8MHz
SCANS/BAND : 1
NOTES : MODE 41, 15.231(e)
TEST DATE : 28 Apr 2017 09:01:04 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 3500

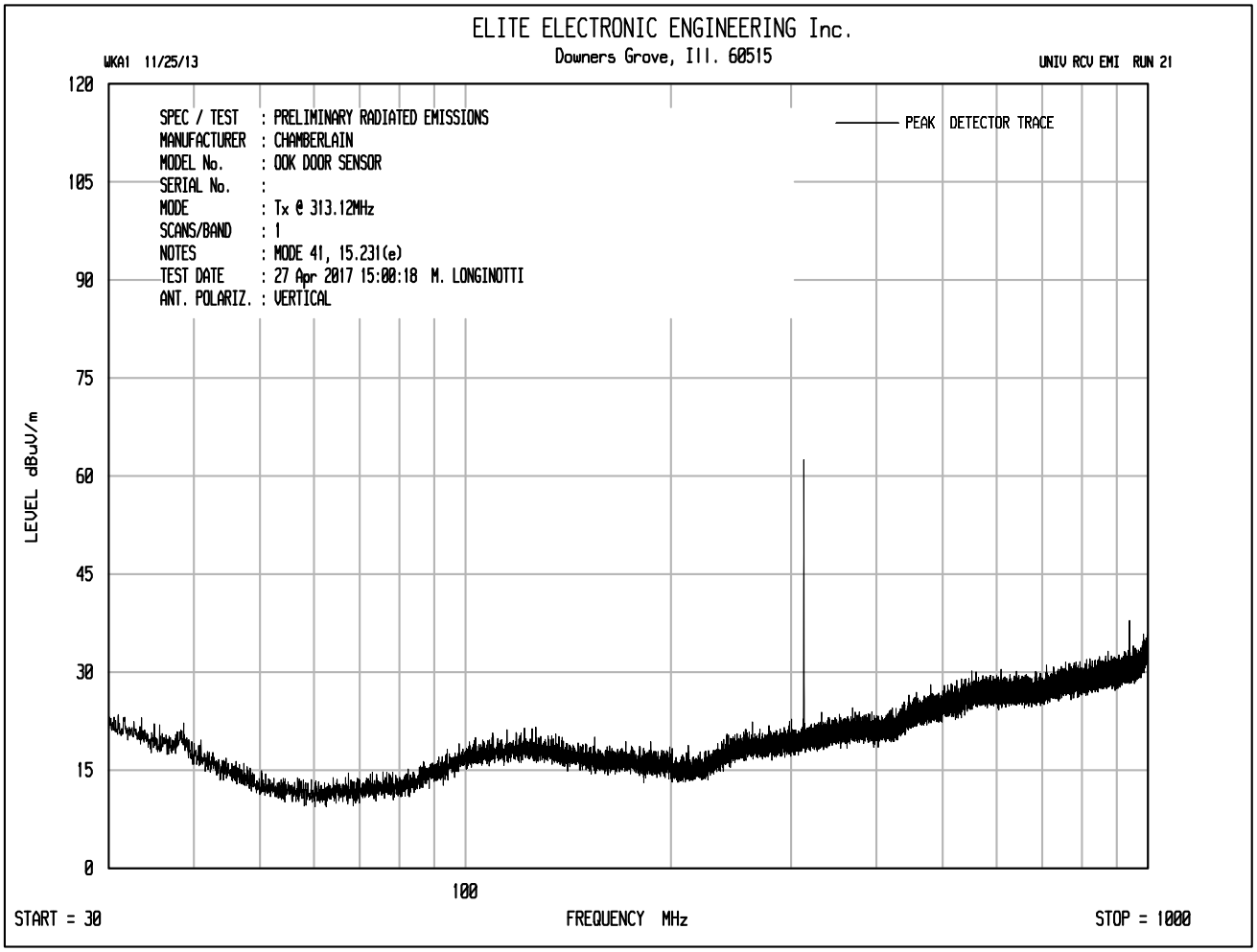

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 18
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : OOK DOOR SENSOR
SERIAL No. :
MODE : Tx @ 312.5MHz
SCANS/BAND : 1
NOTES : MODE 41, 15.231(e)
TEST DATE : 27 Apr 2017 14:20:36 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000

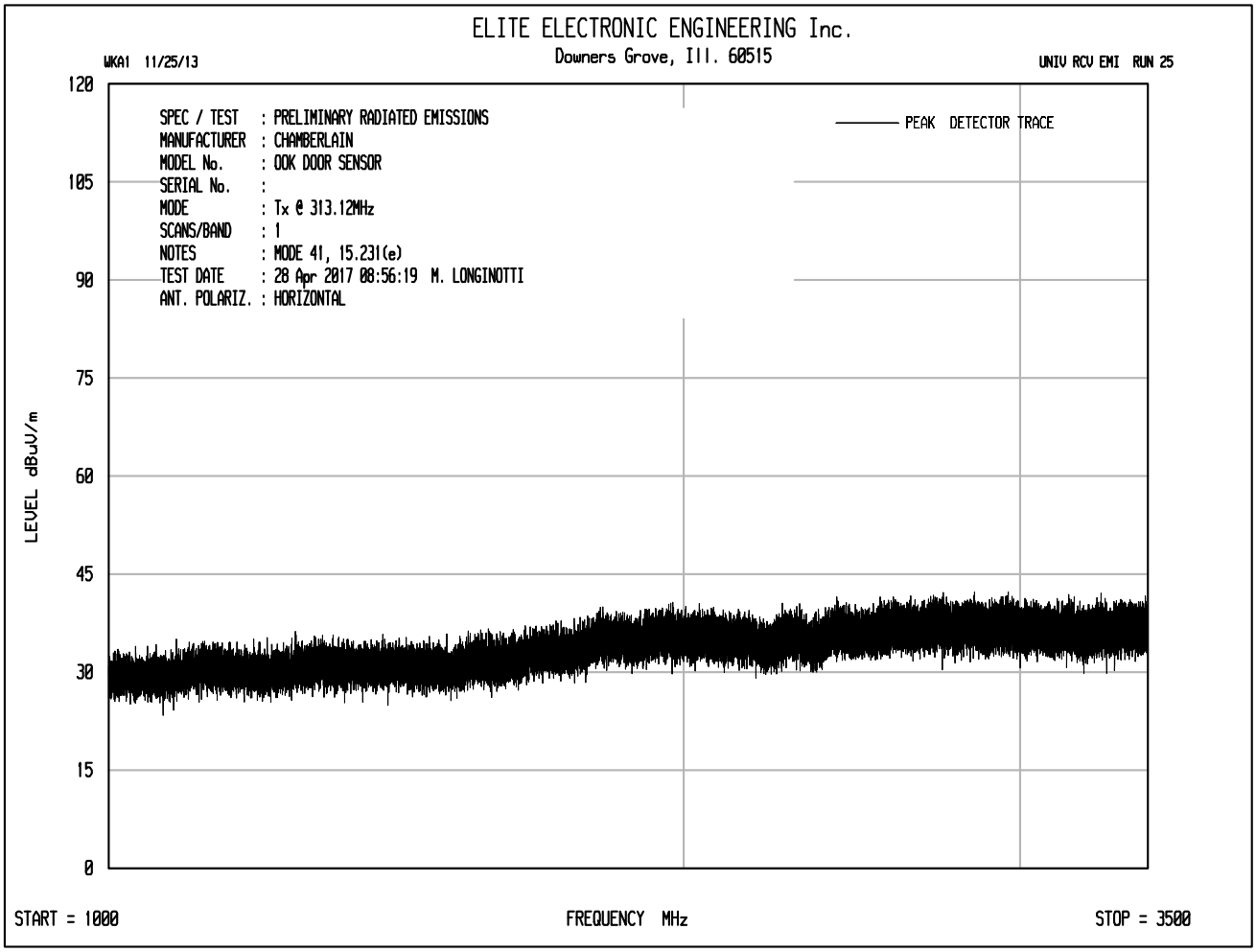

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 19
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : OOK DOOR SENSOR
SERIAL No. :
MODE : Tx @ 312.5MHz
SCANS/BAND : 1
NOTES : MODE 41, 15.231(e)
TEST DATE : 27 Apr 2017 14:24:40 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000

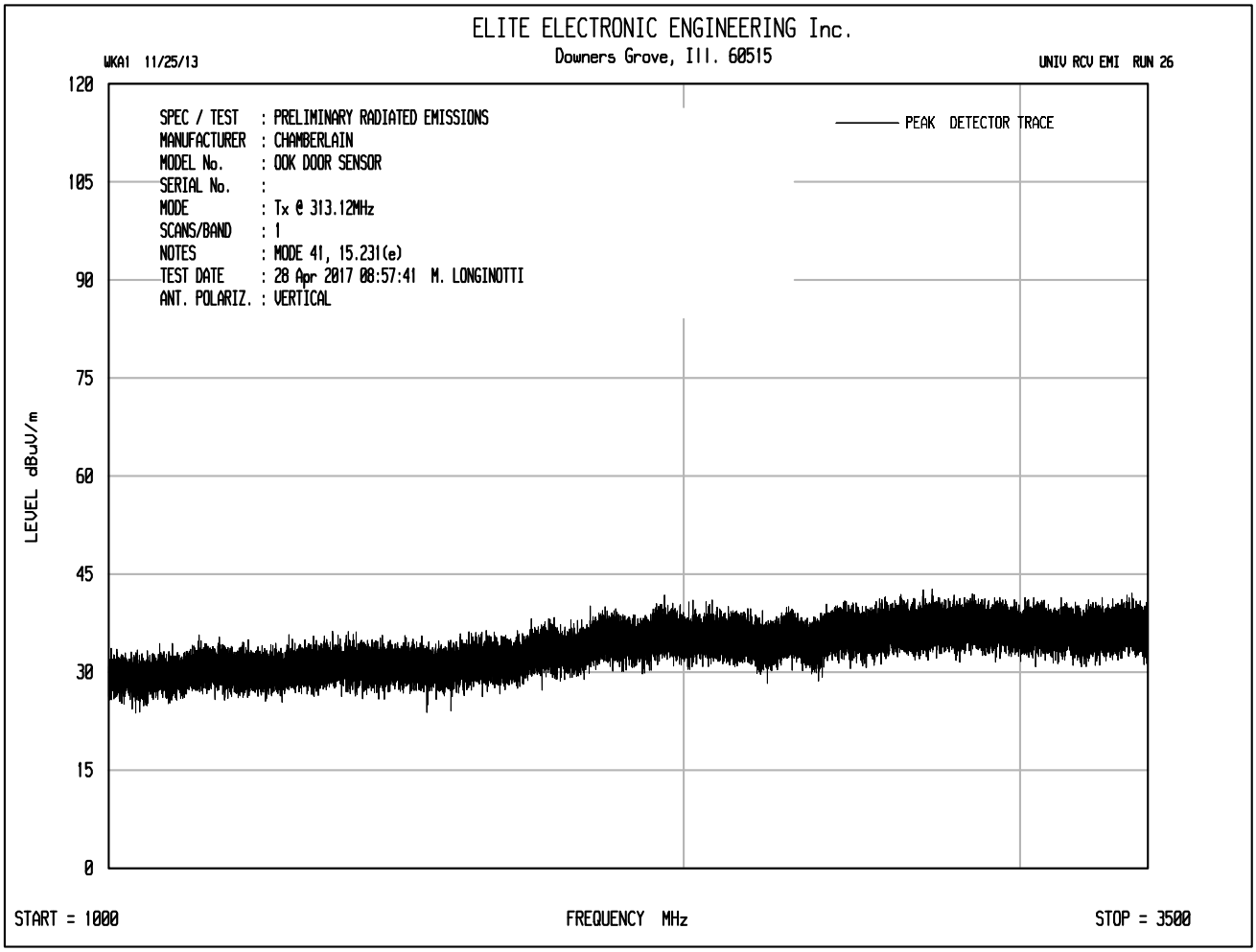

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 24
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : OOK DOOR SENSOR
SERIAL No. :
MODE : Tx @ 312.5MHz
SCANS/BAND : 1
NOTES : MODE 41, 15.231(e)
TEST DATE : 28 Apr 2017 08:54:21 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 3500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 23
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : OOK DOOR SENSOR
SERIAL No. :
MODE : Tx @ 312.5MHz
SCANS/BAND : 1
NOTES : MODE 41, 15.231(e)
TEST DATE : 28 Apr 2017 08:51:53 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 3500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 20
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : OOK DOOR SENSOR
SERIAL No. :
MODE : Tx @ 313.12MHz
SCANS/BAND : 1
NOTES : MODE 41, 15.231(e)
TEST DATE : 27 Apr 2017 14:43:38 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 21
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : OOK DOOR SENSOR
SERIAL No. :
MODE : Tx @ 313.12MHz
SCANS/BAND : 1
NOTES : MODE 41, 15.231(e)
TEST DATE : 27 Apr 2017 15:00:18 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 25
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : OOK DOOR SENSOR
SERIAL No. :
MODE : Tx @ 313.12MHz
SCANS/BAND : 1
NOTES : MODE 41, 15.231(e)
TEST DATE : 28 Apr 2017 08:56:19 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 3500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 26
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : OOK DOOR SENSOR
SERIAL No. :
MODE : Tx @ 313.12MHz
SCANS/BAND : 1
NOTES : MODE 41, 15.231(e)
TEST DATE : 28 Apr 2017 08:57:41 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 3500

MANUFACTURER	Chamberlain Group, Inc.
EUT	821LMB-SENSOR and MYQ-G0302 Door Sensor
SPECIFICATION	FCC 15C, Section 15.231(e) and RSS-210 Annex A, Table A2
TEST	Radiated Emissions
MODE	Transmit at 311.88MHz, mode 41
DATE TESTED	04/27/2017 and April 28, 2017

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Total (dBuV/m)	Total (uV/m)	Limit (uV/m)	Margin (dB)
311.800	H	58.9		1.8	19.4	0.0	-13.5	66.6	2148.9	2363.3	-0.8
311.800	V	42.0		1.8	19.4	0.0	-13.5	49.7	307.0	2363.3	-17.7
623.600	H	7.8		2.5	24.9	0.0	-13.5	21.7	12.1	236.3	-25.8
623.600	V	7.6		2.5	24.9	0.0	-13.5	21.5	11.9	236.3	-26.0
935.400	H	15.7		2.9	27.0	0.0	-13.5	32.1	40.1	236.3	-15.4
935.400	V	12.8		2.9	27.0	0.0	-13.5	29.2	28.7	236.3	-18.3
1247.200	H	15.1	Ambient	3.1	29.1	0.0	-13.5	33.8	48.7	500.0	-20.2
1247.200	V	16.0	Ambient	3.1	29.1	0.0	-13.5	34.7	54.1	500.0	-19.3
1559.000	H	17.1	Ambient	3.2	28.2	0.0	-13.5	35.0	56.1	500.0	-19.0
1559.000	V	16.2	Ambient	3.2	28.2	0.0	-13.5	34.1	50.6	500.0	-19.9
1870.800	H	16.2	Ambient	3.3	30.7	0.0	-13.5	36.7	68.5	500.0	-17.3
1870.800	V	16.7	Ambient	3.3	30.7	0.0	-13.5	37.2	72.6	500.0	-16.8
2182.600	H	16.8	Ambient	3.3	31.7	0.0	-13.5	38.3	82.1	500.0	-15.7
2182.600	V	17.6	Ambient	3.3	31.7	0.0	-13.5	39.1	90.0	500.0	-14.9
2494.400	H	16.8	Ambient	3.4	32.2	0.0	-13.5	38.9	88.0	500.0	-15.1
2494.400	V	16.8	Ambient	3.4	32.2	0.0	-13.5	38.9	88.0	500.0	-15.1
2806.200	H	17.0	Ambient	3.8	32.5	0.0	-13.5	39.9	98.7	500.0	-14.1
2806.200	V	17.3	Ambient	3.8	32.5	0.0	-13.5	40.2	102.1	500.0	-13.8
3118.000	H	15.6	Ambient	4.3	32.9	0.0	-13.5	39.3	92.2	500.0	-14.7
3118.000	V	15.8	Ambient	4.3	32.9	0.0	-13.5	39.5	94.4	500.0	-14.5

Tested By: MARK E. LONGINOTTI

Mark E. Longinotti

MANUFACTURER	Chamberlain Group, Inc.
EUT	821LMB-SENSOR and MYQ-G0302 Door Sensor
SPECIFICATION	FCC 15C, Section 15.231(e) and RSS-210 Annex A, Table A2
TEST	Radiated Emissions
MODE	Transmit at 312.5MHz, mode 41
DATE TESTED	04/27/2017 and April 28, 2017

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Total (dBuV/m)	Total (uV/m)	Limit (uV/m)	Margin (dB)
312.500	H	58.9		1.8	19.5	0.0	-13.5	66.7	2152.7	2375.0	-0.9
312.500	V	42.3		1.8	19.5	0.0	-13.5	50.1	318.4	2375.0	-17.5
625.000	H	7.8		2.5	24.9	0.0	-13.5	21.7	12.2	237.5	-25.8
625.000	V	7.8		2.5	24.9	0.0	-13.5	21.7	12.2	237.5	-25.8
937.500	H	16.2		2.9	27.0	0.0	-13.5	32.6	42.7	237.5	-14.9
937.500	V	11.5		2.9	27.0	0.0	-13.5	27.9	24.8	237.5	-19.6
1250.000	H	15.8	Ambient	3.1	29.1	0.0	-13.5	34.5	52.9	500.0	-19.5
1250.000	V	15.4	Ambient	3.1	29.1	0.0	-13.5	34.1	50.5	500.0	-19.9
1562.500	H	16.8	Ambient	3.2	28.2	0.0	-13.5	34.7	54.4	500.0	-19.3
1562.500	V	17.3	Ambient	3.2	28.2	0.0	-13.5	35.2	57.6	500.0	-18.8
1875.000	H	15.9	Ambient	3.3	30.8	0.0	-13.5	36.5	66.5	500.0	-17.5
1875.000	V	16.4	Ambient	3.3	30.8	0.0	-13.5	37.0	70.4	500.0	-17.0
2187.500	H	16.4	Ambient	3.3	31.6	0.0	-13.5	37.9	78.4	500.0	-16.1
2187.500	V	15.9	Ambient	3.3	31.6	0.0	-13.5	37.4	74.0	500.0	-16.6
2500.000	H	17.0	Ambient	3.4	32.2	0.0	-13.5	39.1	90.2	500.0	-14.9
2500.000	V	16.4	Ambient	3.4	32.2	0.0	-13.5	38.5	84.2	500.0	-15.5
2812.500	H	17.2	Ambient	3.8	32.6	0.0	-13.5	40.1	101.1	500.0	-13.9
2812.500	V	16.9	Ambient	3.8	32.6	0.0	-13.5	39.8	97.7	500.0	-14.2
3125.000	H	15.5	Ambient	4.3	32.9	0.0	-13.5	39.2	91.4	500.0	-14.8
3125.000	V	15.3	Ambient	4.3	32.9	0.0	-13.5	39.0	89.3	500.0	-15.0

Tested By: MARK E. LONGINOTTI

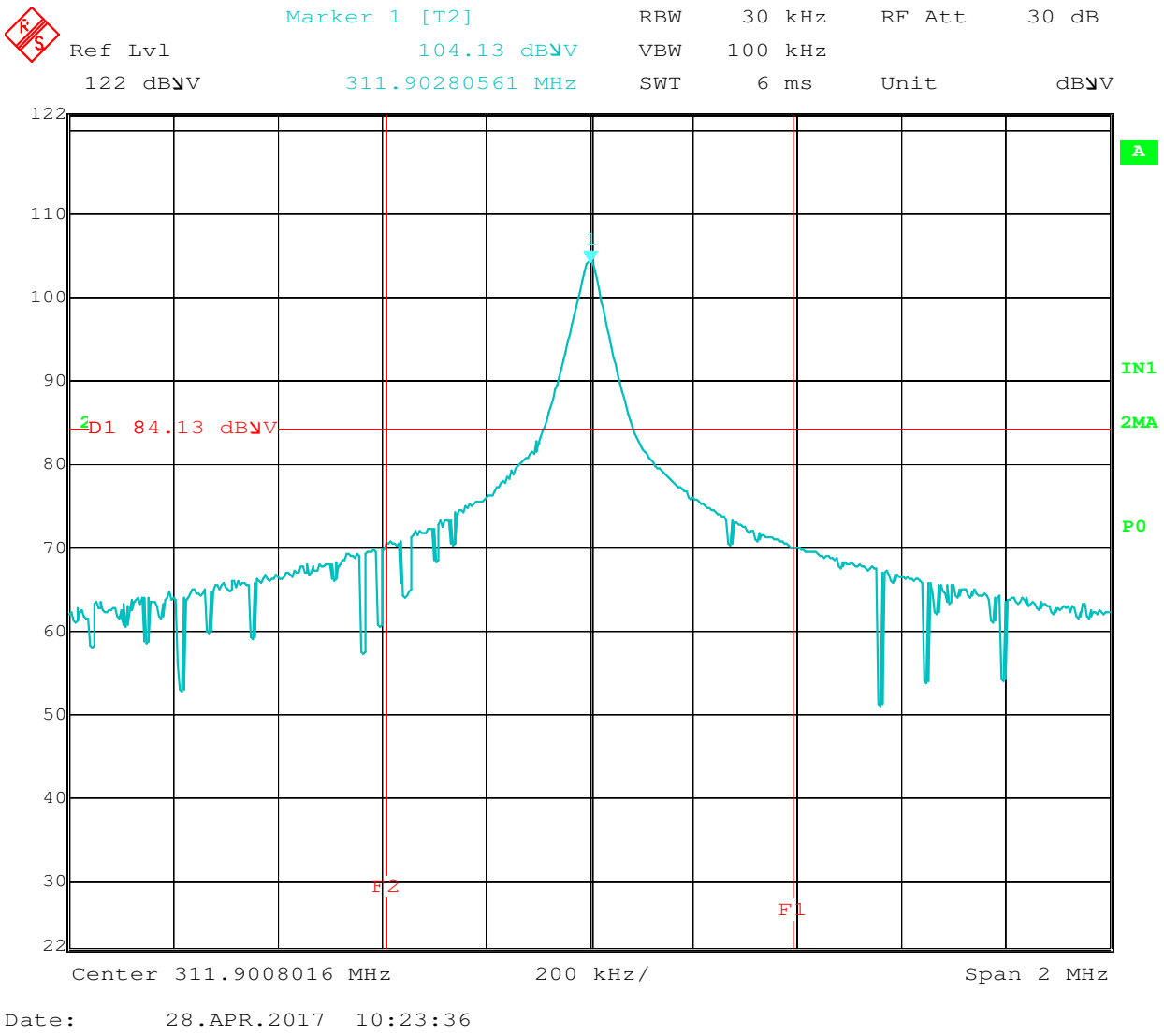
Mark E. Longinotti

MANUFACTURER	Chamberlain Group, Inc.
EUT	821LMB-SENSOR and MYQ-G0302 Door Sensor
SPECIFICATION	FCC 15C, Section 15.231(e) and RSS-210 Annex A, Table A2
TEST	Radiated Emissions
MODE	Transmit at 313.12MHz, mode 41
DATE TESTED	04/27/2017 and April 28, 2017

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Duty Cycle (dB)	Total (dBuV/m)	Total (uV/m)	Limit (uV/m)	Margin (dB)
313.120	H	59.0		1.8	19.5	0.0	-13.5	66.8	2181.0	2385.3	-0.8
313.120	V	42.4		1.8	19.5	0.0	-13.5	50.2	322.6	2385.3	-17.4
626.240	H	8.0		2.5	24.9	0.0	-13.5	21.9	12.5	238.5	-25.6
626.240	V	7.6		2.5	24.9	0.0	-13.5	21.5	11.9	238.5	-26.0
939.360	H	15.8		2.9	27.0	0.0	-13.5	32.2	40.9	238.5	-15.3
939.360	V	12.0		2.9	27.0	0.0	-13.5	28.4	26.4	238.5	-19.1
1252.480	H	15.3	Ambient	3.1	29.1	0.0	-13.5	34.0	49.8	500.0	-20.0
1252.480	V	15.6	Ambient	3.1	29.1	0.0	-13.5	34.3	51.6	500.0	-19.7
1565.600	H	15.7	Ambient	3.2	28.3	0.0	-13.5	33.6	48.1	500.0	-20.3
1565.600	V	16.3	Ambient	3.2	28.3	0.0	-13.5	34.2	51.5	500.0	-19.7
1878.720	H	16.2	Ambient	3.3	30.8	0.0	-13.5	36.8	69.0	500.0	-17.2
1878.720	V	16.5	Ambient	3.3	30.8	0.0	-13.5	37.1	71.5	500.0	-16.9
2191.840	H	16.5	Ambient	3.3	31.6	0.0	-13.5	38.0	79.3	500.0	-16.0
2191.840	V	16.0	Ambient	3.3	31.6	0.0	-13.5	37.5	74.9	500.0	-16.5
2504.960	H	16.0	Ambient	3.4	32.2	0.0	-13.5	38.1	80.4	500.0	-15.9
2504.960	V	16.1	Ambient	3.4	32.2	0.0	-13.5	38.2	81.4	500.0	-15.8
2818.080	H	18.0	Ambient	3.9	32.6	0.0	-13.5	40.9	111.1	500.0	-13.1
2818.080	V	16.6	Ambient	3.9	32.6	0.0	-13.5	39.5	94.5	500.0	-14.5
3131.200	H	17.0	Ambient	4.3	32.9	0.0	-13.5	40.7	108.9	500.0	-13.2
3131.200	V	15.7	Ambient	4.3	32.9	0.0	-13.5	39.4	93.7	500.0	-14.5

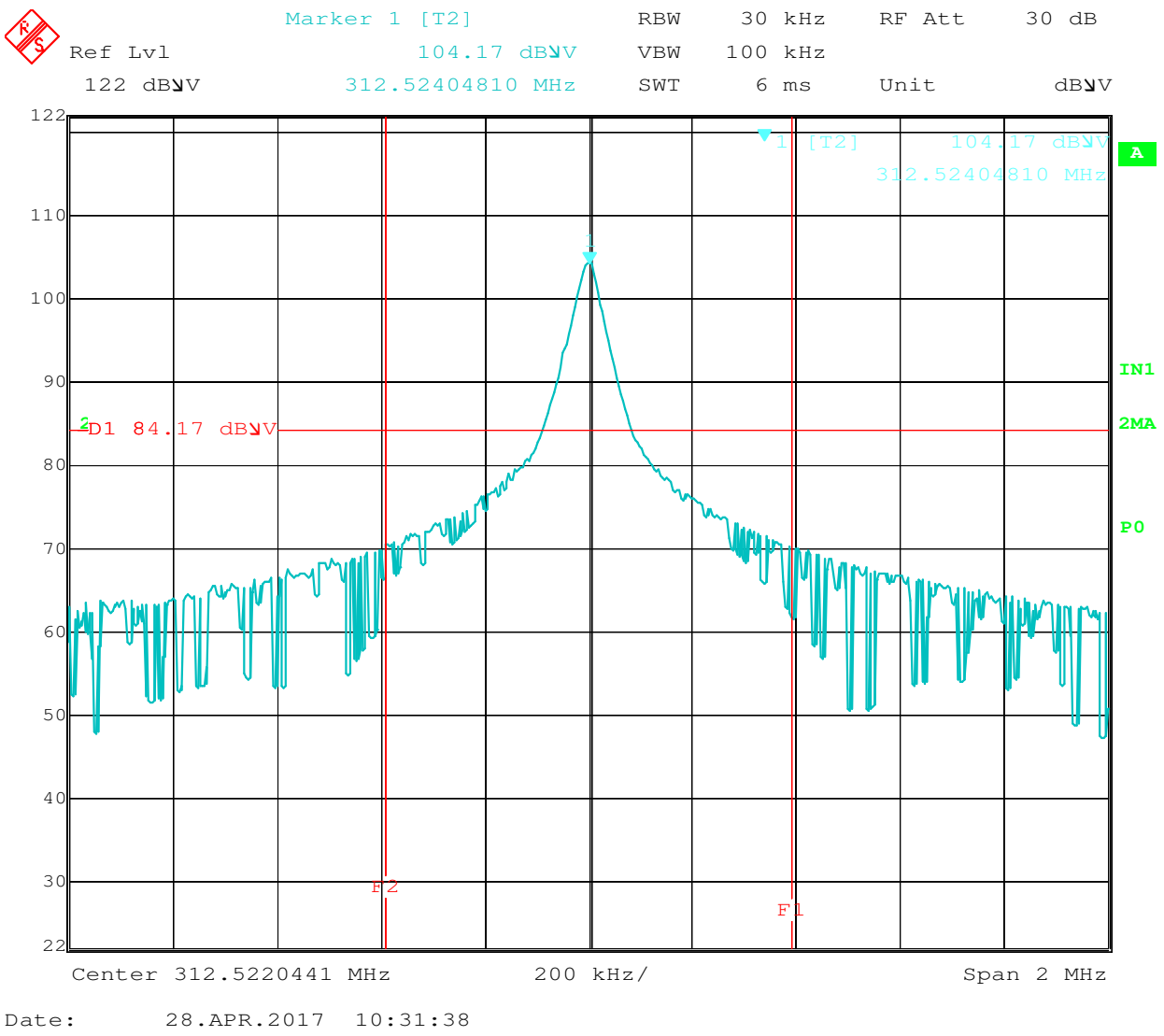
Tested By: MARK E. LONGINOTTI

Mark E. Longinotti



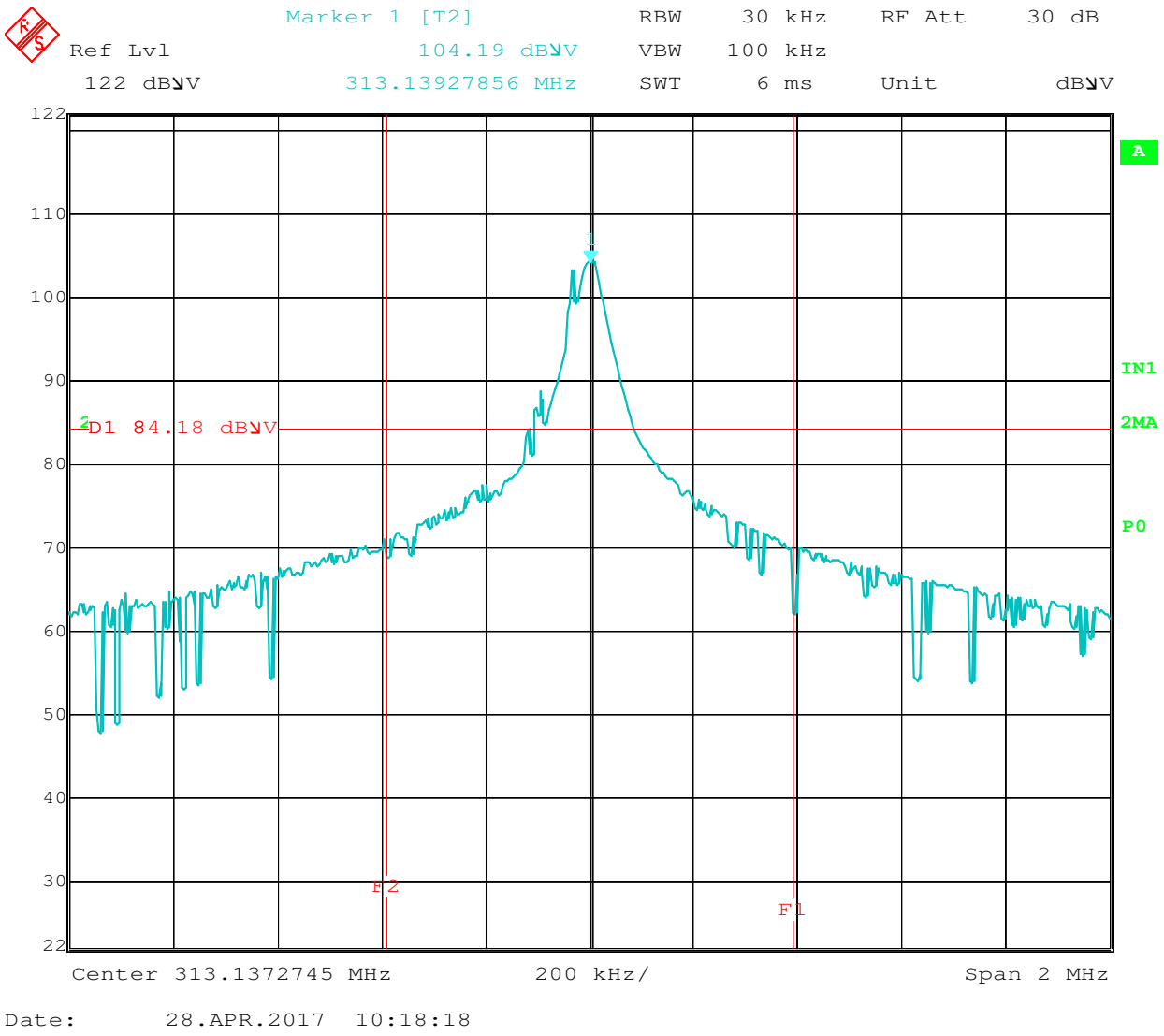
Occupied Bandwidth

Manufacturer	:	Chamberlain
Model Number	:	821LMB-SENSOR and MYQ-G0302 Door Sensor
Serial Number	:	
Mode	:	Tx @ 311.88MHz, Mode 73
Date	:	4/28/2017 10:06:20 AM
Notes	:	15.231(b)



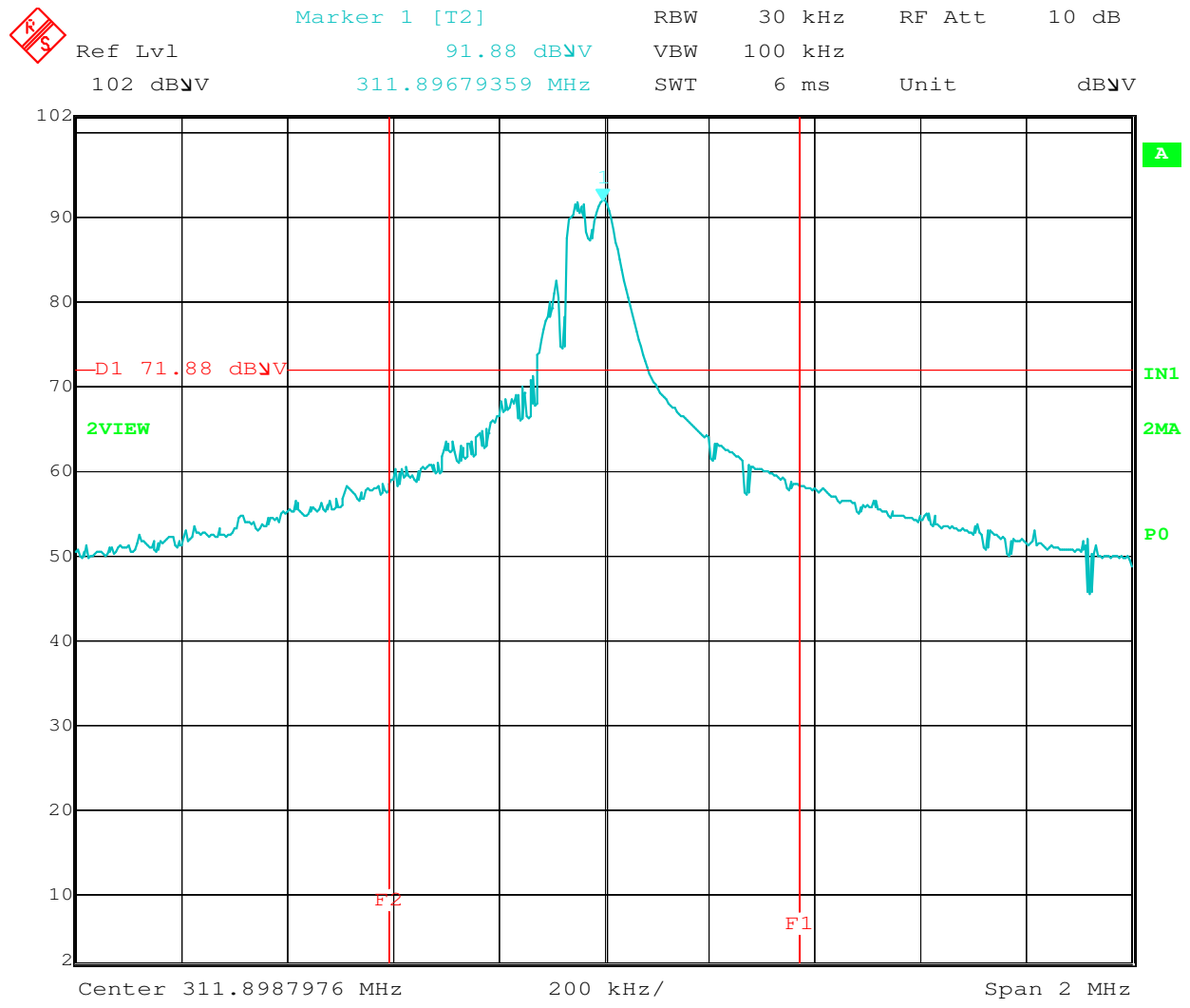
Occupied Bandwidth

Manufacturer : Chamberlain
Model Number : 821LMB-SENSOR and MYQ-G0302 Door Sensor
Serial Number :
Mode : Tx @ 312.5MHz, Mode 73
Date : 4/28/2017 10:14:23 AM
Notes : 15.231(b)



Occupied Bandwidth

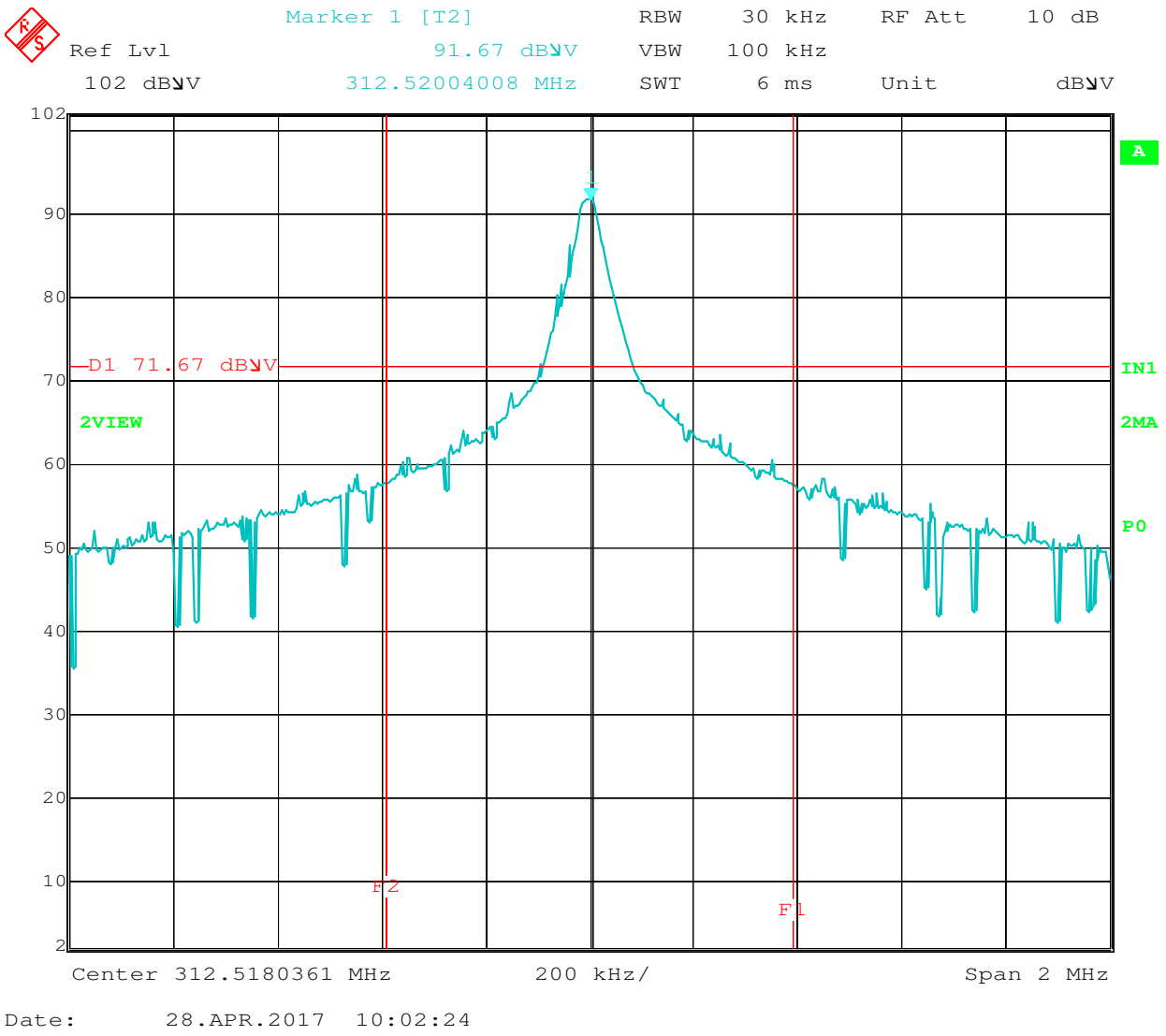
Manufacturer	:	Chamberlain
Model Number	:	821LMB-SENSOR and MYQ-G0302 Door Sensor
Serial Number	:	
Mode	:	Tx @ 313.1MHz, Mode 73
Date	:	4/28/2017 10:01:02 AM
Notes	:	15.231(b)



321

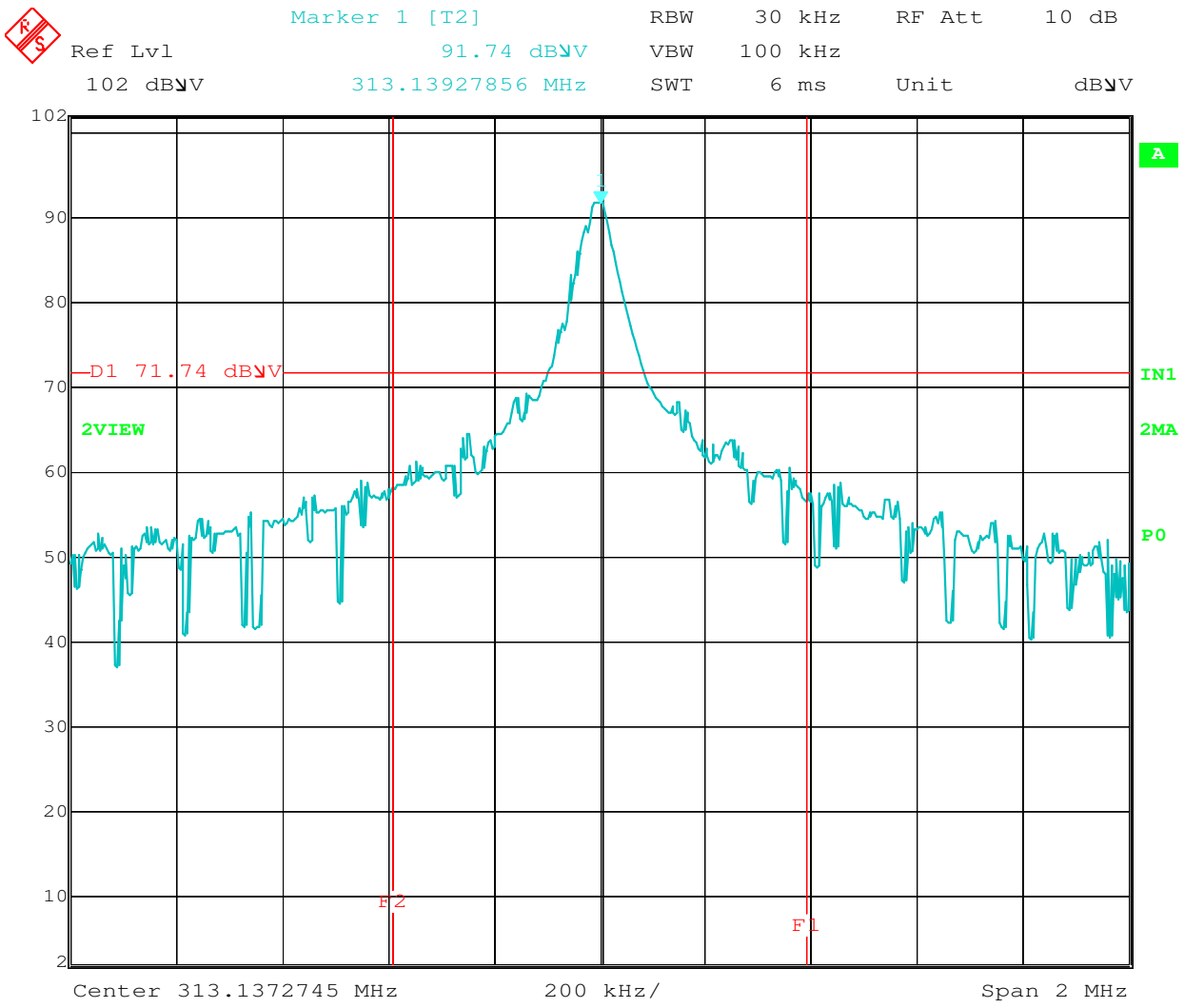
Occupied Bandwidth

Manufacturer : Chamberlain
Model Number : 821LMB-SENSOR and MYQ-G0302 Door Sensor
Serial Number :
Mode : Tx @ 311.88MHz, Mode 41
Date : 4/28/2017 9:39:46 AM
Notes : 15.231(e)



Occupied Bandwidth

Manufacturer : Chamberlain
Model Number : 821LMB-SENSOR and MYQ-G0302 Door Sensor
Serial Number :
Mode : Tx @ 312.5MHz, Mode 41
Date : 4/28/2017 9:45:36 AM
Notes : 15.231(e)



Occupied Bandwidth

Manufacturer : Chamberlain
Model Number : 821LMB-SENSOR and MYQ-G0302 Door Sensor
Serial Number :
Mode : Tx @ 313.1MHz, Mode 41
Date : 4/28/2017 9:55:59 AM
Notes : 15.231(e)