Measurement of RF Interference from a Part No. ESARM Evolution Stand Alone Radio Module

For	The Chamberlain Group 300 Windsor Drive Oak Brook, IL 60523
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REVISION HISTORY

Revision	Date	Description
—	30 SEP 2019	Initial release
A	2 OCT 2019 By Mark Longinotti	– Report Number was changed from 1902696-01 to 1902696-01 Rev. A throughout the report. – Section 3.1.1: “The EUT obtained 12VDC via 2 wires of a 3-wire, input power cord” was changed to “The EUT obtained 12VDC via 2 wires of a 4-wire, input power cord”.

Measurement of RF Emissions from an Evolution Stand Alone Radio Module, Part No. ESARM

1. INTRODUCTION

1.1 Scope of Tests

This document represents the results of the series of radio interference measurements performed on The Chamberlain Group Evolution Stand Alone Radio Module, Part No. ESARM, Serial No. Sample #1 (hereinafter referred to as the EUT). The EUT is a frequency hopping spread spectrum transceiver. The transceiver was designed to transmit in the 902 to 928 MHz range and receive in the 310MHz to 390MHz range, the 433.3MHz to 434.54MHz range, and the 902 to 928MHz range using a 23cm long, removable monopole antenna with a minimum coaxial cable length of 43cm.

The EUT was manufactured and submitted for testing by The Chamberlain Group located in Oak Brook, IL.

1.2 Purpose

The test series was performed to determine if the EUT meets the conducted RF emission requirements, radiated RF emissions requirements, and additional provisions of the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart B, Sections 15.107 and 15.109, for receivers and Subpart C, Sections 15.207 and 15.247 for Intentional Radiators Operating within the 902-928 MHz band.

The test series was also performed to determine if the EUT meets the conducted RF emission requirements, radiated RF emissions requirements, and additional provisions of the Innovation, Science, and Economic Development Canada Radio Standards Specification RSS-Gen Section 8.8 and Section 7.3 for receivers and Innovation, Science, and Economic Development Canada Radio Standards Specification RSS-Gen Section 8.8 and Innovation, Science, and Economic Development Canada Radio Standards Specification RSS-247 for Transmitters.

Testing was performed in accordance with ANSI C63.4-2014 and ANSI C63.10-2013.

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 Lab Code: 1786-01.

1.5 Laboratory Conditions

The temperature at the time of the test was 24C and the relative humidity was 37%.

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, Subparts B and C

- 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”

- ANSI C63.10-2013, "American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices”

- Federal Communications Commission Office of Engineering and Technology Laboratory Division, Guidance For Performing Compliance Measurements On Digital Transmissions System, Frequency Hopping Spread Spectrum System, and Hybrid System Devices Operating Under Section 15.247 of the FCC Rules,
  April 2, 2019

- Innovation, Science, and Economic Development Canada RSS-247, Issue 2, February 2017, "Spectrum Management and Telecommunications Radio Standards Specification, Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs), and License-Exempt Local Area Network (LE-LAN) Devices"

- Innovation, Science, and Economic Development Canada RSS-GEN, Issue 5, March 2019, "Spectrum Management and Telecommunications Radio Standards Specification, General Requirements for Compliance of Radio Apparatus"

3. EUT SETUP AND OPERATION

3.1 General Description

The EUT is an Evolution Stand Alone Radio Module, Part No. ESARM. A block diagram of the EUT setup is shown as Figure 1.

3.1.1 Power Input

The EUT obtained 12VDC via 2 wires of a 4-wire, input power cord.

3.1.2 Peripheral Equipment

The following peripheral equipment was submitted with the EUT:

Item	Description
Monopole Antenna	23cm long monopole antenna (noted at Antenna #1 on some of the radiated emissions data pages)

3.1.3 Interconnect Cables

The following interconnect cables were submitted with the EUT:

Item	Description
Coaxial Cable	43cm coaxial cable used to connect the 23cm long monopole antenna to the antenna port of the EUT

3.1.4 Grounding

The EUT was not grounded.

3.1.5 Frequency of EUT

Function	FCC 15.33 Required Upper Frequency for Radiated Emissions	Actual Upper Frequency Tested to for FCC Radiated Emissions	RSS-Gen Required Upper frequency for Radiated Emissions (section 7.3 for receivers; section 6.13.2 for transmitters)	Actual Upper Frequency Tested to for FCC Radiated Emissions
Receiver (310MHz to 390MHz)	2000MHz	2500MHz	1950MHz	2500MHz
Receiver (433.3MHz to 434.54MHz)	2000MHz	2500MHz	2172.7MHz	2500MHz
Receiver (902MHz to 928MHz)	5000MHz	5000MHz	4640MHz	5000MHz
Transmitter (902MHz to 928MHz)	9280MHz	10,000MHz	9280MHz	10,000MHz

3.2 Software

For all tests, the EUT had Firmware Version 4.1 loaded onto the device to provide correct load characteristics.

3.3 Operational Mode

The EUT was energized. The unit was programmed to operate in one of the following modes:

- Receive at 310MHz
- Receive at 315MHz
- Receive at 390MHz
- Receive at 433.3MHz
- Receive at 434.54MHz
- Frequency Hopping Enabled (Receive in the frequency range 902MHz to 928MHz)
- Transmit at 902.25MHz
- Transmit at 914.75MHz
- Transmit at 926.75MHz
- Frequency Hopping Enabled (Transmit in the frequency range 902MHz to 928MHz)

3.4 EUT Modifications

No modifications were required for compliance.

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.

Conducted and radiated emission tests were performed with an EMI receiver utilizing the bandwidths and detectors specified in the requirements.

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 International System Units (SI) through 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.

Values of Expanded Measurement Uncertainty (95% Confidence) are presented below:

Measurement Type	Expanded Measurement Uncertainty
Conducted disturbance (mains port) (150 kHz – 30 MHz)	2.7
Radiated disturbance (electric field strength on an open area test site or alternative test site) (30 MHz – 1000 MHz)	4.3
Radiated disturbance (electric field strength on an open area test site or alternative test site) (1 GHz – 6 GHz)	3.1
Radiated disturbance (electric field strength on an open area test site or alternative test site) (6 GHz – 18 GHz)	3.2

5. TEST PROCEDURES

5.1 Receiver

5.1.1 Powerline Conducted Emissions

5.1.1.1 Requirements

Since the EUT was powered by 12VDC and has no connection to AC mains, no conducted emissions tests are required.

5.1.2 FCC Antenna Power Conducted Emissions

5.1.2.1 Requirements

Per the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart B, Section 15.111, receivers that provide terminals for the connection of an external receiving antenna may be tested to demonstrate compliance with the radiated emissions limits with the antenna terminals shielded and terminated with a resistive termination equal to the impedance specified for the antenna, provided these receivers also comply with the following: With the receiver antenna terminal connected to a resistive termination equal to the impedance specified or employed for the antenna, the power at the antenna terminal at any frequency within the range of measurements shall not exceed 2.0 nanowatts.

5.1.2.2 Procedures

The antenna of the EUT was connected to the spectrum analyzer. The EUT was set to receive continuously. Testing was performed separately on each of the receive modes listed in section 3.3. The emissions in the frequency range of 30MHz to 2GHz were measured and plotted using a ‘screen-dump’ utility.

5.1.2.3 Results

The results of the antenna conducted measurements are presented on pages 27 through 32. The antenna power conducted limits are shown on the plots. As can be seen from the data, all emissions from the EUT were below

the 2 nanowatt requirements. Since the emissions were below the 2 nanowatt limit, the antenna port can be terminated with a shielded load for the radiated emissions measurements, however, radiated emissions tests were performed with the antenna connected to the antenna port.

5.1.3 ISED Canada Antenna Port Conducted Emissions

5.1.3.1 Requirements

Per ISED RSS-Gen Section 7.4, if the receiver has a detachable antenna of known impedance, an antenna-conducted spurious emissions measurement is permitted as an alternative to radiated measurement. However, the radiated method of section 7.3 is preferred.

The antenna-conducted test shall be performed with the antenna disconnected and with the receiver antenna port connected to a measuring instrument having equal input impedance to that specified for the antenna. The RF cable connecting the receiver under test to the measuring instrument shall also have the same impedance to that specified for the receiver's antenna.

The spurious emissions from the receiver at any discrete frequency, measured at the antenna port by the antenna-conducted method, shall not exceed 2 nW (-57dBm) in the frequency range 30-1000 MHz and 5 nW (-53dBm) above 1 GHz.

5.1.3.2 Procedures

The antenna of the EUT was connected to the spectrum analyzer. The EUT was set to receive continuously. Testing was performed separately on each of the receive modes listed in section 3.3. The emissions in the frequency range of 30MHz to 2.5GHz were measured and plotted using a 'screen-dump' utility.

5.1.3.3 Results

The results of the antenna conducted measurements are presented on pages 33 through 38. The antenna power conducted limits are shown on the plots. As can be seen from the data, all emissions from the EUT were below the 2 nanowatt requirements from 30MHz to 1GHz and were below the 5 nanowatt requirements from 1GHz to 2.5GHz.

5.1.4 Radiated Measurements

5.1.4.1 Requirements

Per the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart B, Section 15.109(a), and ISED RSS-Gen, Section 7.3, all radio frequency emissions from a receiver shall be below the limits shown on the following table:

RADIATION LIMITS FOR A RECEIVER

Frequency MHz	Distance between EUT And Antenna in Meters	Field Strength uV/m	Field Strength dBuV/m
30-88	3	100	40
88-216	3	150	43.5
216-960	3	200	46
Above 960	3	500	54

Note: The tighter limit shall apply at the edge between the two frequency bands.

5.1.4.2 Procedures

Testing was performed separately on each of the receive modes listed in section 3.3. Testing was performed with the antenna of the EUT in place.

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.

Since a quasi-peak detector and an average detector require long integration times, it is not practical to automatically sweep through the quasi-peak and average levels. Therefore, radiated emissions from the EUT were first scanned using a peak detector and automatically plotted. The frequencies where significant emission levels were noted were then remeasured using the quasi-peak detector or average detector.

The broadband measuring antenna was positioned at a 3 meter distance from the EUT. The EUT was placed on an 80cm high non-conductive stand. The frequency range from 30MHz to 1GHz was investigated using a peak detector function with the bilog antenna at several heights, horizontal and vertical polarization, and with several different orientations of the EUT with respect to the antenna. The frequency range from 1GHz to 2.5GHz was investigated using a peak detector function with the double ridged waveguide antenna at several heights, horizontal and vertical polarization, and with several different orientations of the EUT with respect to the antenna. The maximum levels for each antenna polarization were plotted.

Final radiated emissions were performed on all significant broadband and narrowband emissions found in the preliminary sweeps using the following methods:

1) Measurements from 30MHz to 1GHz were made using a quasi-peak detector and a broadband bilog antenna. Measurements above 1GHz were made using an average detector and a broadband double ridged waveguide antenna.

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

    a) The EUT was rotated so that all of its sides were exposed to the receiving antenna.

    b) Since the measuring antenna is linearly polarized, both horizontal and vertical field components were measured.

    c) The measuring antenna was raised and lowered from 1 to 4 meters for each antenna polarization to maximize the readings.

5.1.4.3 Results

5.1.4.3.1 Receive at 310MHz

The tabular peak and quasi-peak data from 30MHz to 1GHz are presented on page 39. The plots of the peak and quasi-peak radiated emissions levels from 30MHz to 1GHz are presented on pages 40 and 41.

The tabular peak and average data above 1GHz are presented on page 42. The plots of the peak and average radiated emissions levels above 1GHz are presented on pages 43 and 44.

All emissions measured from the EUT met the quasi-peak limit below 1GHz and met both the peak limit and average limit above 1GHz.

5.1.4.3.2 Receive at 315MHz

The tabular peak and quasi-peak data from 30MHz to 1GHz are presented on page 45. The plots of the peak and quasi-peak radiated emissions levels from 30MHz to 1GHz are presented on pages 46 and 47.

The tabular peak and average data above 1GHz are presented on page 48.The plots of the peak and average radiated emissions levels above 1GHz are presented on pages 49 and 50.

All emissions measured from the EUT met the quasi-peak limit below 1GHz and met both the peak limit and average limit above 1GHz.

5.1.4.3.3 Receive at 390MHz

The tabular peak and quasi-peak data from 30MHz to 1GHz are presented on page 51. The plots of the peak and quasi-peak radiated emissions levels from 30MHz to 1GHz are presented on pages 52 and 53.

The tabular peak and average data above 1GHz are presented on page 54.The plots of the peak and average radiated emissions levels above 1GHz are presented on pages 55 and 56.

All emissions measured from the EUT met the quasi-peak limit below 1GHz and met both the peak limit and average limit above 1GHz.

5.1.4.3.4 Receive at 433.3MHz

The tabular peak and quasi-peak data from 30MHz to 1GHz are presented on page 57. The plots of the peak and quasi-peak radiated emissions levels from 30MHz to 1GHz are presented on pages 58 and 59.

The tabular peak and average data above 1GHz are presented on page 60.The plots of the peak and average radiated emissions levels above 1GHz are presented on pages 61 and 62.

All emissions measured from the EUT met the quasi-peak limit below 1GHz and met both the peak limit and average limit above 1GHz.

5.1.4.3.5 Receive at 434.54MHz

The tabular peak and quasi-peak data from 30MHz to 1GHz are presented on page 63. The plots of the peak and quasi-peak radiated emissions levels from 30MHz to 1GHz are presented on pages 64 and 65.

The tabular peak and average data above 1GHz are presented on page 66.The plots of the peak and average radiated emissions levels above 1GHz are presented on pages 67 and 68.

All emissions measured from the EUT met the quasi-peak limit below 1GHz and met both the peak limit and average limit above 1GHz.

5.1.4.3.6 Frequency Hopping Enabled (Receive in the frequency range 902MHz to 928MHz)

The tabular peak and quasi-peak data from 30MHz to 1GHz are presented on page 69. The plots of the peak and quasi-peak radiated emissions levels from 30MHz to 1GHz are presented on pages 70 and 71.

The tabular peak and average data above 1GHz are presented on page 72.The plots of the peak and average radiated emissions levels above 1GHz are presented on pages 73 and 74.

All emissions measured from the EUT met the quasi-peak limit below 1GHz and met both the peak limit and average limit above 1GHz.

Photographs of the test configuration which yielded the highest or worst case, radiated emission levels are shown in Figure 2 through Figure 4.

5.2 Transmitter

5.2.1 Powerline Conducted Emissions

5.2.1.1 Requirements

Since the EUT was powered by 12VDC and has no connection to AC mains, no conducted emissions tests are required.

5.2.2 20dB Bandwidth

5.2.2.1 Requirements

Per FCC 15.247(a)(1) and ISED Canada RSS-247 Section 5.1, frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.) The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz for frequency hopping systems operating in the 902-928 MHz band.

5.2.2.2 Procedures

The antenna port of the EUT was connected to the spectrum analyzer through 20dB of attenuation. With the hopping function disabled, the EUT was allowed to transmit continuously. The frequency hopping channel was set separately to low, middle, and high hopping channels. The center frequency of the spectrum analyzer was set to the transmit frequency of the EUT. The resolution bandwidth (RBW) was set to between 1% and 5% of the occupied bandwidth of the EUT. The span was set to approximately 2 to 5 times the occupied bandwidth of the EUT.

The 'Max-Hold' function was engaged. The analyzer was allowed to scan until the envelope of the transmitter bandwidth was defined. The analyzer's display was plotted using a 'screen dump' utility.

5.2.2.3 Results

The plots on pages 75 through 77 show that the maximum 20 dB bandwidth was 205.8MHz. Therefore, since the 20dB bandwidth of the hopping channel is less than 250kHz, the system shall use at least 50 hopping channels.

The 99% bandwidth was measured to be 191.76kHz.

5.2.3 Carrier Frequency Separation

5.2.3.1 Requirements

Per FCC section 15.247 (a)(1) and ISED Canada RSS-247 section 5.1, frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25kHz or the 20dB bandwidth of the hopping channel, whichever is greater.

5.2.3.2 Procedures

The antenna port of the EUT was connected to the spectrum analyzer through 20dB of attenuation. With the hopping function enabled, the EUT was allowed to transmit continuously.

The resolution bandwidth (RBW) was set to approximately 30% of the channel spacing. The span was set wide enough to capture the peaks of two adjacent channels. The peak detector and 'Max-Hold' function were engaged. When the trace had stabilized after multiple scans, the marker-delta function was used to determine the separation between the peaks of the adjacent channels. The analyzer's display was plotted using a 'screen dump' utility.

5.2.3.3 Results

Page 81 shows the carrier frequency separation. As can be seen from this plot, the carrier frequency separation is 500.5kHz which is greater than the 20dB bandwidth (205.8kHz).

5.2.4 Number of Hopping Frequencies

5.2.4.1 Requirements

Per section FCC 15.247(a)(1)(i) and ISED Canada RSS-247 section 5.1, for frequency hopping systems operating in the 902-928MHz band, the 20dB bandwidth shall be measured for determination of the carrier frequency separation limits and must not exceed 500 kHz. If the 20dB bandwidth of the hopping channel is less than 250kHz, the system shall use at least 50 hopping channels. If the 20dB bandwidth of the hopping channel is 250kHz or greater (but not greater than 500kHz), the system shall use at least 25 hopping channels.

5.2.4.2 Procedures

The antenna port of the EUT was connected to the spectrum analyzer through 20dB of attenuation. With the hopping function enabled, the EUT was allowed to transmit continuously. The resolution bandwidth (RBW) was set to less than 30% of the channel spacing. The peak detector and 'Max-Hold' function were engaged. The span was set wide enough to capture the entire frequency band of operation.

The EUT's signal was allowed to stabilize after multiple scans. The number of hopping frequencies was counted. The analyzer's display was plotted using a 'screen dump' utility.

5.2.4.3 Results

Page 82 shows the number of hopping frequencies. As can be seen from this plot, the number of hopping frequencies is 50 which is the minimum number of required hopping frequencies for systems with a 20dB bandwidth less than 250kHz.

5.2.5 Time of Occupancy

5.2.5.1 Requirements

Per section FCC 15.247(a)(1)(i) and ISED Canada RSS-247 section 5.1, for frequency hopping systems operating in the 902-928MHz band, if the 20dB bandwidth of the hopping channel is less than 250kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period.

5.2.5.2 Procedures

The antenna port of the EUT was connected to the spectrum analyzer through 20dB of attenuation. With the hopping function enabled, the EUT was allowed to transmit continuously. The resolution bandwidth (RBW) was set to less than or equal to the channel spacing. The peak detector and 'Max-Hold' function were engaged. With the span set to 0Hz, the sweep time was adjusted to capture a single event in order to measure the dwell time per hop. The analyzer's display was plotted using a 'screen dump' utility. Then, the sweep time was expanded to 20 seconds.

5.2.5.3 Results

Pages 83 and 84 show the plots for the time of occupancy (dwell time). As can be seen from the plots, the time of occupancy can be determined by (dwell time/hop) multiplied by (# of hops). This calculated value is equal to 108.24msec which is less than the 0.4 seconds maximum allowed.

5.2.6 Peak Conducted Output Power

5.2.6.1 Requirements

Per section FCC 15.247(b)(2) and ISED Canada RSS-247 section 5.4, for frequency hopping systems operating in the 902-928MHz band and employing at least 50 hopping channels, the maximum peak output conducted power shall not be greater than 1W (30dBm).

5.2.6.2 Procedures

The antenna port of the EUT was connected to the spectrum analyzer through 20dB of attenuation. With the

hopping function disabled, the EUT was allowed to transmit continuously. The frequency hopping channel was set separately to low, middle, and high hopping channels. The resolution bandwidth (RBW) was set to greater than the 20dB bandwidth. The span was set to approximately 5 times the 20 dB bandwidth. The peak detector and 'Max-Hold' function was engaged. The maximum meter reading was recorded. The peak power output was calculated for the low, middle and high hopping frequencies.

5.2.6.3 Results

The results are presented on pages 85 through 87. The maximum peak conducted output power from the transmitter was 22.8mW (13.58 dBm) which is below the 1 Watt limit.

5.2.7 EIRP

5.2.7.1 Requirements

Per section FCC 15.247(b)(2) and ISED Canada RSS-247 section 5.4, for frequency hopping systems operating in the 902-928MHz band and employing at least 50 hopping channels, the maximum peak output conducted power shall not be greater than 1W (30dBm). Per section FCC 15.247(b)(4) and ISED Canada RSS-247 section 5.4,, this limit is based on the use of antennas with directional gains that do not exceed 6dBi. Since the limit allows for a 6dBi antenna gain, the maximum EIRP can be increased by 6dB to 4 Watt (36dBm).

If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below 30dBm by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

5.2.7.2 Procedures

The EUT was placed on an 80cm high, non-conductive stand and set to transmit. A bilog antenna was placed at a test distance of 3 meters from the EUT. The resolution bandwidth (RBW) of the spectrum analyzer was set to greater than the 20dB bandwidth. The span was set to approximately 5 times the 20 dB bandwidth. The EUT was maximized for worst case emissions (or maximum output power) at the measuring antenna. The maximum meter reading was recorded. The peak power output was measured for the low, middle and high hopping frequencies.

The equivalent power was determined from the field intensity levels measured at 3 meters using the substitution method. To determine the emission power, a dipole antenna was then set in place of the EUT and connected to a calibrated signal generator. The output of the signal generator was adjusted to match the received level at the spectrum analyzer. The signal level was recorded. The reading was then corrected to compensate for cable loss, as required. The peak power output was calculated for low, middle, and high hopping frequencies.

5.2.7.3 Results

The results are presented on pages 88 through 90. The maximum EIRP measured from the transmitter was 30.9mW (14.9dBm) which is below the 4 Watt limit.

5.2.8 Duty Cycle Factor Measurements

5.2.8.1 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.

With the transmitter set up to transmit for maximum pulse density, the time domain trace is displayed on the spectrum analyzer. This trace is obtained by tuning center frequency to the transmitter frequency and then setting a zero span width with 200usec/div. The amplitude settings are adjusted so that the on/off transitions clear the 5th division from the bottom of the display. The markers are set at the beginning and end of the “on-time”. The trace is recorded.

Next, the spectrum analyzer center frequency is set to the transmitter frequency with a zero span width and 10msec/div. This shows if the word is longer than 100msec or shorter than 100msec. If the word period is less

than 100msec, the display is set to show at least one word. The on-time and off-time are then measured. The on-time is total time signal level exceeds the 4th division. Off-time is time under for the word period. The duty cycle is then computed as the (On-time/ word period) where the word period = (On-time + Off-time).

5.2.8.2 Results

The plots of the duty cycle are shown on data pages 91 and 92. The EUT transmits a 1.32msec pulse one time in any 100msec period. The duty cycle correction factor was calculated to be -37.6dB (-37.6dB = 20 x log (1.32msec/100msec).

5.2.9 Antenna Conducted Spurious Emissions

5.2.9.1 Requirements

Per section FCC 15.247(d) and ISED Canada RSS-247 section 5.5, the spurious emissions in any 100 kHz BW outside the frequency band must be at least 20dB below the highest 100 kHz BW level measured within the band.

5.2.9.2 Procedures

The antenna port of the EUT was connected to the spectrum analyzer through 20dB of attenuation. The frequency hopping function was disabled. The resolution bandwidth (RBW) was set to 100kHz. The peak detector and 'Max-Hold' function were engaged. The emissions in the frequency range from 30MHz to 10GHz were observed and plotted separately with the EUT transmitting at low, middle and high hopping frequencies.

5.2.9.3 Results

The results of the antenna conducted emissions levels were plotted. These plots are presented on pages 93 through 95. These plots show that the spurious emissions were at least 20 dB below the level of the fundamental.

5.2.10 Radiated Spurious Emissions Measurements

5.2.10.1 Requirements

Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must comply with the radiated emission limits specified in §15.209(a).

Paragraph 15.209(a) has the following radiated emission limits:

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	3
30.0-88.0	100	3
88.0-216.0	150	3
216.0-960.0	200	3
Above 960	500	3

5.2.10.2 Procedures

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 10.0GHz was investigated using a peak detector function.

The final open field emission tests were then manually performed over the frequency range of 30MHz to 10.0GHz.

1) For all emissions in the restricted bands, the following procedure was used:
   a) The field strengths of all emissions below 1 GHz were measured using a bi-log antenna. 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 peak detector with a resolution bandwidth of 100 kHz was used on the spectrum analyzer.
   b) The field strengths of all emissions above 1 GHz were measured using a double-ridged waveguide antenna. 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.
   c) To ensure that maximum or worst case emission levels were measured, the following steps were taken when taking all measurements:
      i) The EUT was rotated so that all of its sides were exposed to the receiving antenna.
      ii) Since the measuring antenna is linearly polarized, both horizontal and vertical field components were measured.
      iii) The measuring antenna was raised and lowered for each antenna polarization to maximize the readings.
   d) For all radiated emissions measurements below 1 GHz, if the peak reading is below the limits listed in 15.209(a), no further measurements are required. If however, the peak readings exceed the limits listed in 15.209(a), then the emissions are remeasured using a quasi-peak detector.
   e) For all radiated emissions measurements above 1 GHz, the peak readings must comply with the 15.35(b) limits. 15.35(b) states that when average radiated emissions measurements are specified, there also is a limit on the peak level of the radiated emissions. The limit on the peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test. Therefore, all peak readings above 1 GHz must be no greater than 20 dB above the limits specified in 15.209(a).
   f) To convert the peak reading to an average reading, the duty cycle correction factor was applied to the peak reading. These readings must be no greater than the limits specified in 15.209(a).

5.2.10.3 Results

5.2.10.3.1 Transmit at 902.25MHz

Preliminary radiated emissions plots are shown on pages 96 through 99. Final radiated emissions data are presented on data pages 100 and 101. As can be seen from the data, all emissions measured from the EUT were within the specification limits.

5.2.10.3.2 Transmit at 914.75MHz

Preliminary radiated emissions plots are shown on pages 102 through 105. Final radiated emissions data are presented on data pages 106 and 107. As can be seen from the data, all emissions measured from the EUT were within the specification limits.

5.2.10.3.3 Transmit at 926.75MHz

Preliminary radiated emissions plots are shown on pages 108 through 111. Final radiated emissions data are presented on data pages 112 and 113. As can be seen from the data, all emissions measured from the EUT were within the specification limits.

Photographs of the test configuration which yielded the highest or worst case, radiated emission levels are shown in Figure 5 through Figure 7.

5.2.11 Band Edge Compliance

5.2.11.1 Requirements

Per FCC section 15.247(d) and ISED Canada RSS-247 section 5.5, the emissions at the band edges must be at least 20dB below the highest level measured within the band but attenuation below the general limits listed in 15.209(a) is not required.

5.2.11.2 Procedures

5.2.11.2.1 Low Band Edge

1) The antenna port of the EUT was connected to the spectrum analyzer through 20dB of attenuation.
2) The EUT was set to transmit continuously at the channel closest to the low band-edge (hopping function disabled).
3) To determine the band edge compliance, the following spectrum analyzer settings were used:

    a. Center frequency = low band-edge frequency.
    b. Span = Wide enough to capture the peak level of the emission operating on the channel closest to the band-edge, as well as any modulation products which fall outside of the authorized band of operation.
    c. Resolution bandwidth (RBW) = 100kHz.
    d. The 'Max-Hold' function was engaged. The analyzer was allowed to scan until the envelope of the transmitter bandwidth was defined.
    e. The marker was set on the peak of the in-band emissions. A display line was placed 20dB down from the peak of the in-band emissions. All emissions which fall outside of the authorized band of operation must be below the 20dB down display line. (All emissions to the left of the center frequency (band-edge) must be below the display line.)
    f. The analyzer's display was plotted using a 'screen dump' utility.

4) Step 3) was repeated with the frequency hopping function enabled.

5.2.11.2.2 High Band Edge

1) The antenna port of the EUT was connected to the spectrum analyzer through 20dB of attenuation.
2) The EUT was set to transmit continuously at the channel closest to the high band-edge (hopping function disabled).
3) To determine the band edge compliance, the following spectrum analyzer settings were used:

    a. Center frequency = high band-edge frequency.
    b. Span = Wide enough to capture the peak level of the emission operating on the channel closest to the band-edge, as well as any modulation products which fall outside of the authorized band of operation.
    c. Resolution bandwidth (RBW) = 100kHz.
    d. The 'Max-Hold' function was engaged. The analyzer was allowed to scan until the envelope of the transmitter bandwidth was defined.
    e. The marker was set on the peak of the in-band emissions. A display line was placed 20dB down from the peak of the in-band emissions. All emissions which fall outside of the authorized band of operation must be below the 20dB down display line. (All emissions to the right of the center frequency (band-edge) must be below the display line.)
    f. The analyzer's display was plotted using a 'screen dump' utility.

4) Step 3) was repeated with the frequency hopping function enabled.

5.2.11.3 Results

Pages 114 through 117 show the conducted band edge compliance results. As can be seen from these plots, the

emissions at the low end band edge and the high end band edge are within the 20 dB down limits.

6. CONCLUSIONS

It was determined that The Chamberlain Group Evolution Stand Alone Radio Module, Part No. ESARM frequency hopping spread spectrum transceiver, Serial No. Sample #1, did fully meet the conducted and radiated emission requirements of the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart B, Sections 15.107 and 15.109 for receivers and Subpart C, Sections 15.207 and 15.247 for Intentional Radiators Operating within the 902-928 MHz band, when tested per ANSI C63.4-2014 and ANSI C63.10-2013.

It was also determined that The Chamberlain Group Evolution Stand Alone Radio Module, Part No. ESARM frequency hopping spread spectrum transceiver, Serial No. Sample #1, did fully meet the conducted and radiated RF emission requirements of the Industry Canada Radio Standards Specification, RSS-Gen, Section 8.8 and Section 7.3 for receivers and the Industry Canada Radio Standards Specification RSS-Gen Section 8.8 and Radio Standards Specification RSS-247 for transmitters, when tested per ANSI C63.4-2014.

7. 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.

8. ENDORSEMENT DISCLAIMER

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
APW14	PREAMPLIFIER	PLANAR	PE2-35-120-5R0-10-12-SFF	PL22671	1-20GHz	9/25/2019	9/25/2020
CDY0	WORKSTATION	ELITE	WORKSTATION		WINDOWS 7	N/A	
GRE1	SIGNAL GENERATOR	AGILENT	E4438C	MY42081749	250KHZ-6GHZ	2/22/2019	2/22/2020
NDQ1	TUNED DIPOLE ANTENNA	EMCO	3121C-DB4	313	400-1000MHZ	6/28/2018	6/28/2020
NTA2	BILOG ANTENNA	TESEQ	6112D	28040	25-1000MHz	12/20/2018	12/20/2019
NWQ0	DOUBLE RIDGED WAVEGUIDE ANTENNA	ETS LINDGREN	3117	66657	1GHZ-18GHZ	5/31/2018	5/31/2020
RBG3	EMI ANALYZER	ROHDE & SCHWARZ	ESW44	101592	2HZ-44GHZ	2/20/2019	2/20/2020
SHA0	DC POWER SUPPLY	HEWLETT PACKARD	6642A	MY40000116	0-20V/0-10A	NOTE 1	
SHC2	Power Supplies	HENGFU	HF60W-SL-24	A11372702	24V	NOTE 1	
T2SB	20DB 25W ATTENUATOR	WEINSCHEL	46-20-34	DC5014	DC-18GHZ	4/23/2018	4/23/2020
VBV2	CISPR EN FCC ICES RE.EXE	ELITE	CISPR EN FCC ICES RE.EXE	---	---	N/A	
WKA1	SOFTWARE, UNIVERSAL RCV EMI	ELITE	UNIV_RCV_EMI	1	---	I/O	
XPQ3	HIGH PASS FILTER	K&L MICROWAVE	4IH30-1804/T10000-0	4	1.8GHZ-10GHZ	9/6/2019	9/6/2021

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.

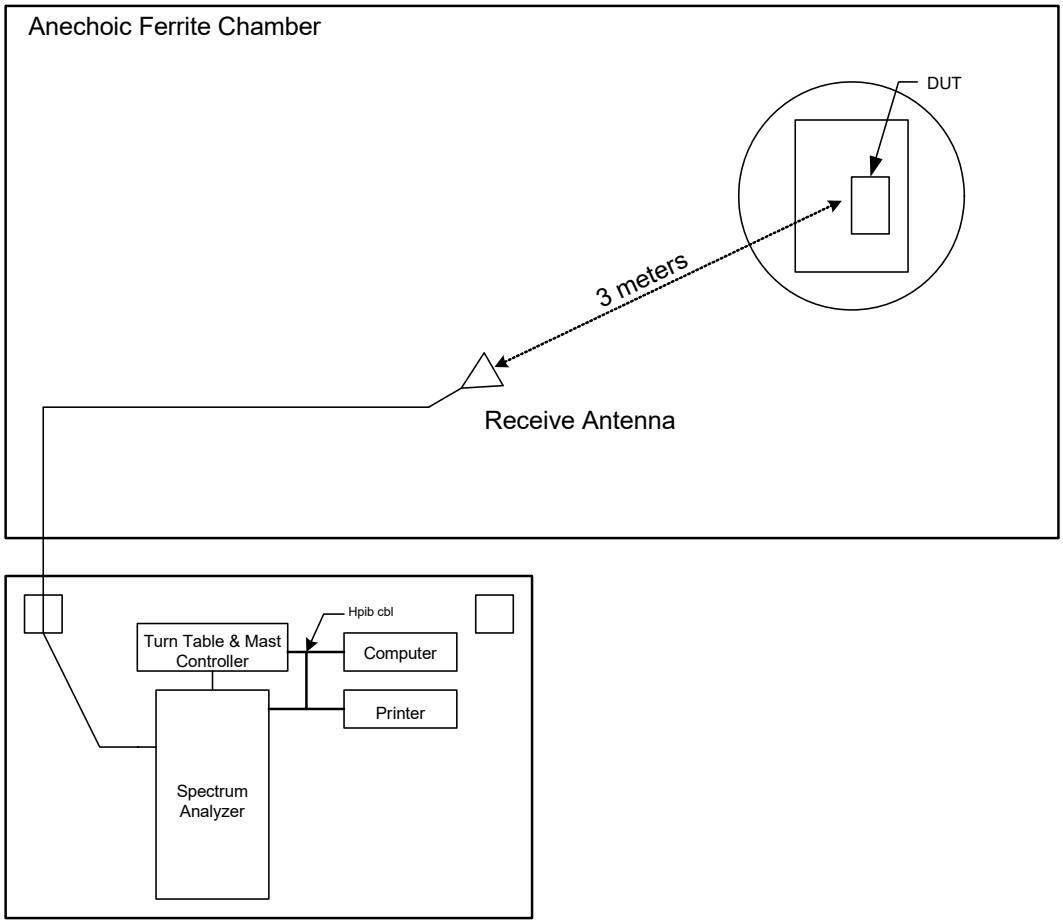
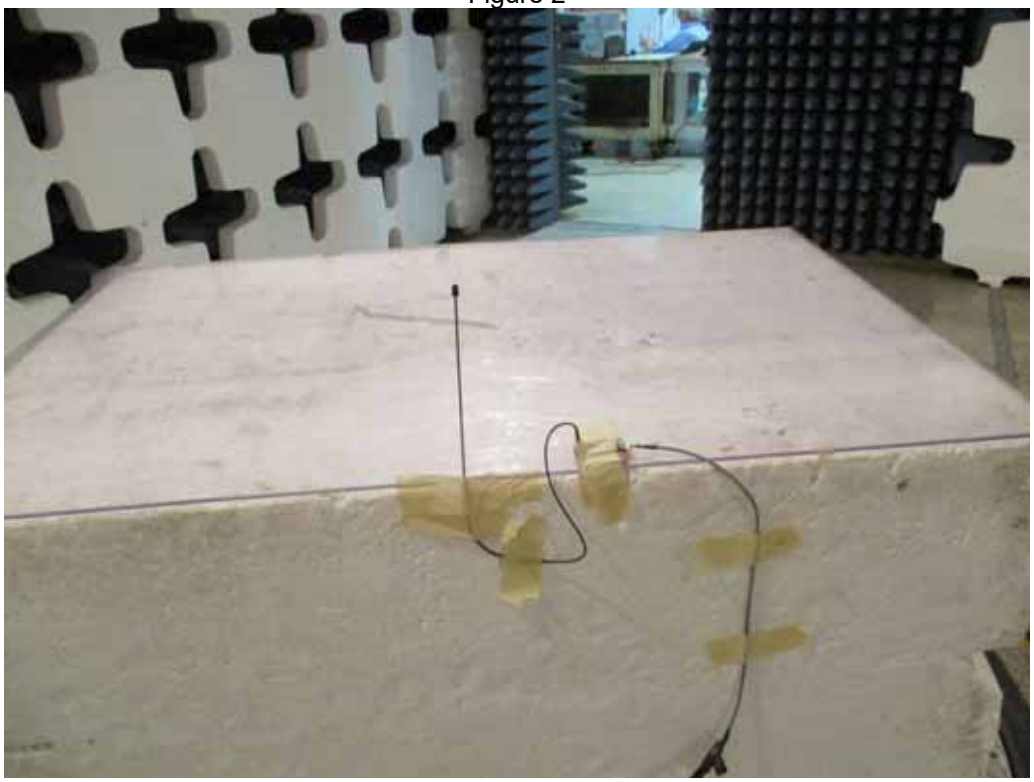


FIGURE 1 BLOCKDIAGRAM OF TEST SETUP

Figure 2



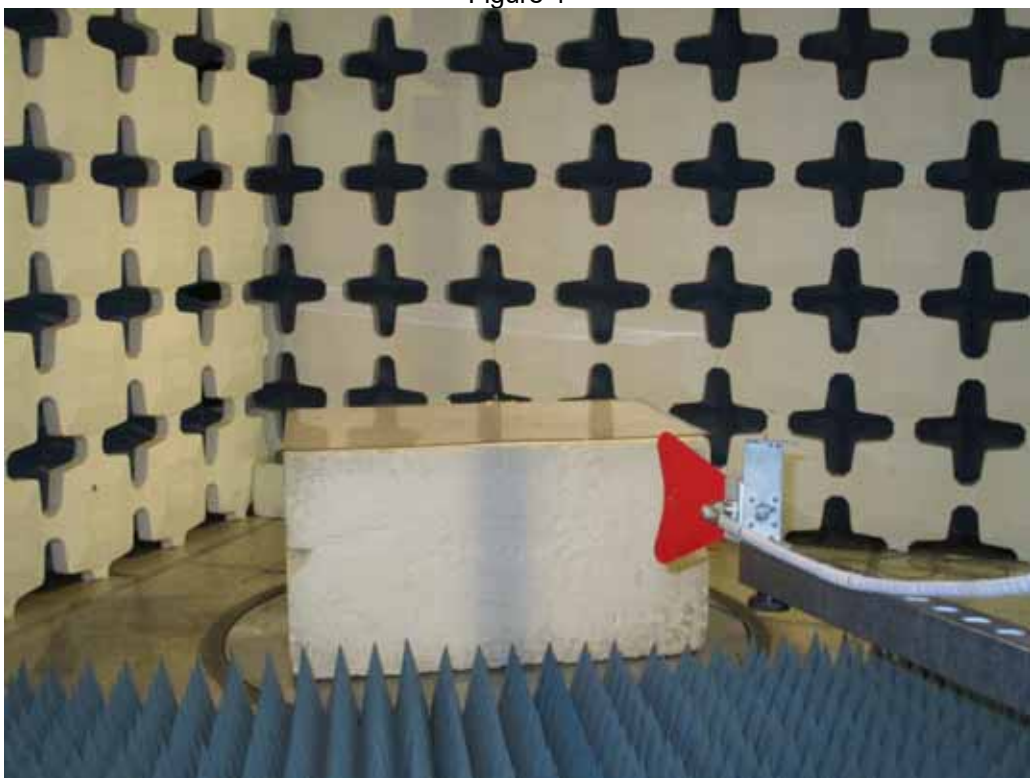
DUT Setup for Receiver Spurious Radiated Emissions Tests

Figure 3

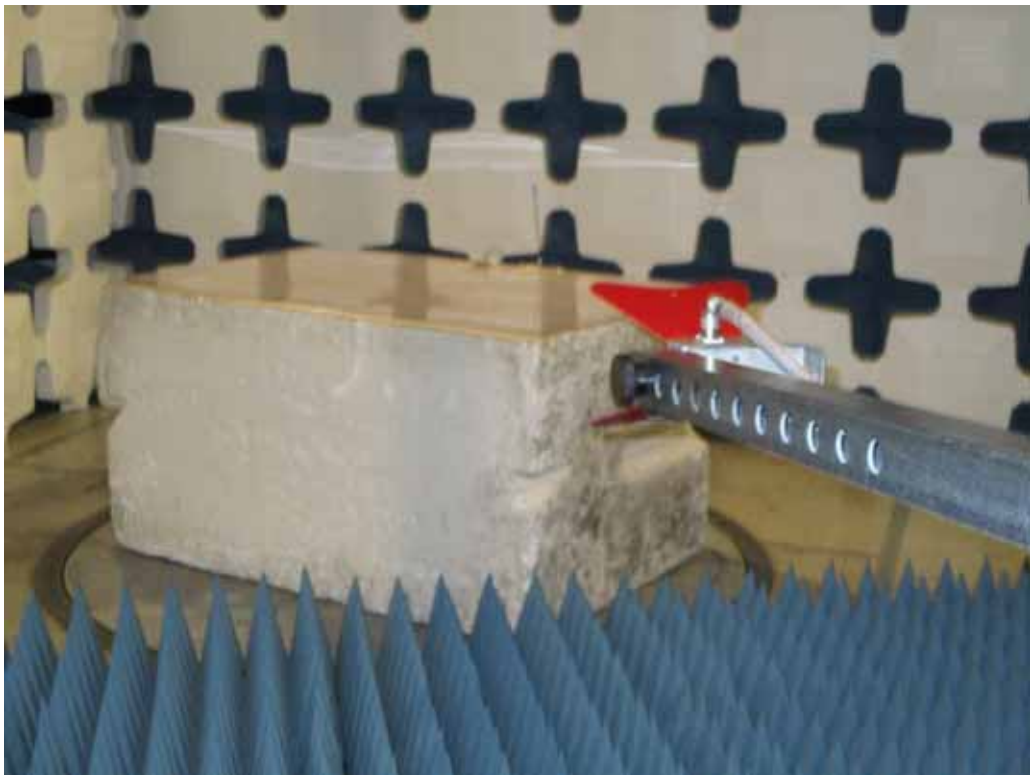
Test Setup for Receiver Spurious Radiated Emissions – 30MHz to 1GHz, Horizontal Polarization

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

Figure 4



Test Setup for Receiver Spurious Radiated Emissions – Above 1GHz, Horizontal Polarization



Test Setup for Receiver Spurious Radiated Emissions – Above 1GHz, Vertical Polarization

Figure 5

DUT Setup for Transmitter Spurious Radiated Emissions Tests

Figure 6

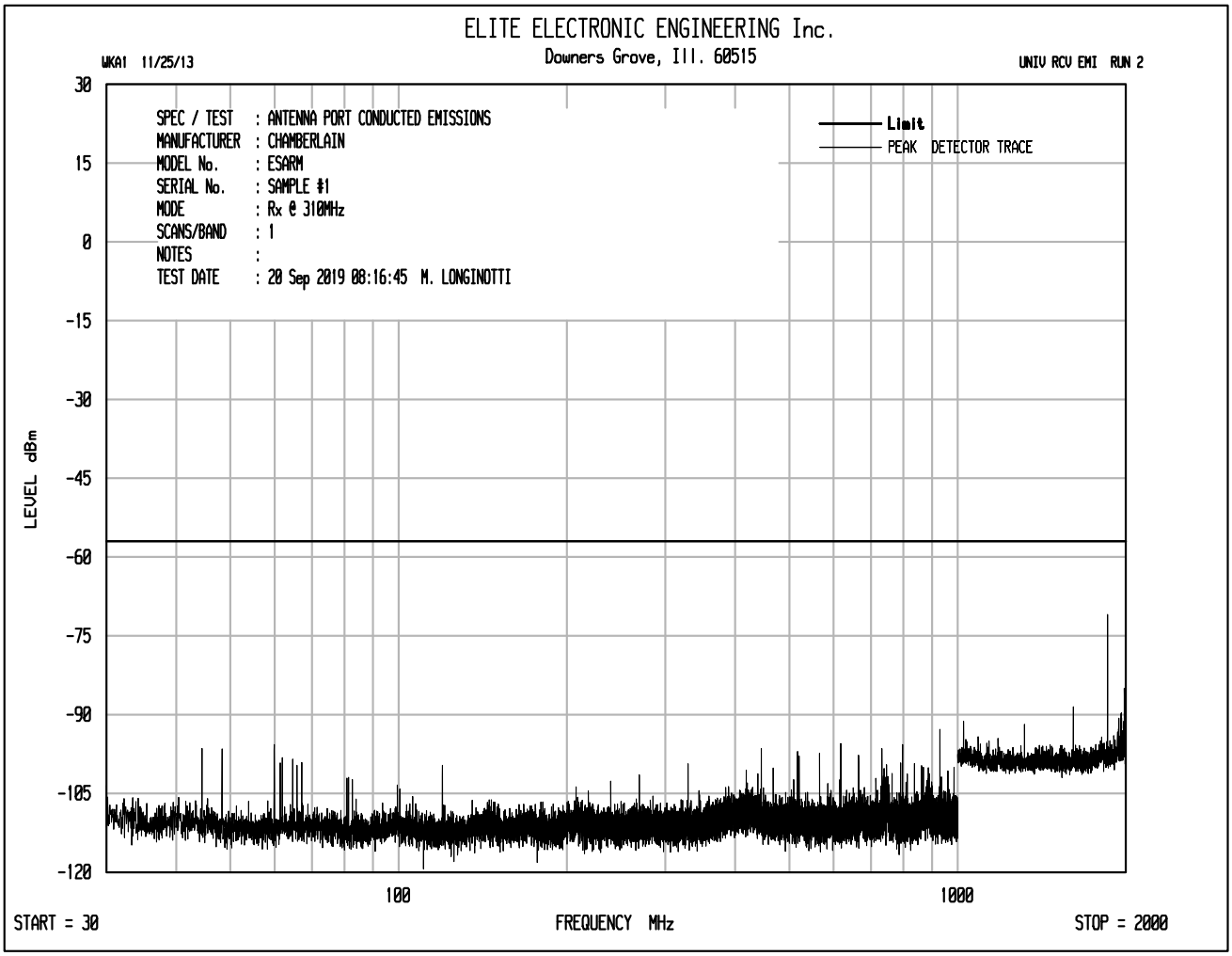
Test Setup for Transmitter Spurious Radiated Emissions – 30MHz to 1GHz, Horizontal Polarization

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

Figure 7

Test Setup for Transmitter Spurious Radiated Emissions – Above 1GHz, Horizontal Polarization

Test Setup for Transmitter Spurious Radiated Emissions – Above 1GHz, Vertical Polarization


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 2
SPEC / TEST : ANTENNA PORT CONDUCTED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : ESARM
SERIAL No. : SAMPLE #1
MODE : Rx @ 310MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 20 Sep 2019 08:16:45 M. LONGINOTTI
Limit
PEAK DETECTOR TRACE
LEVEL dBm
30
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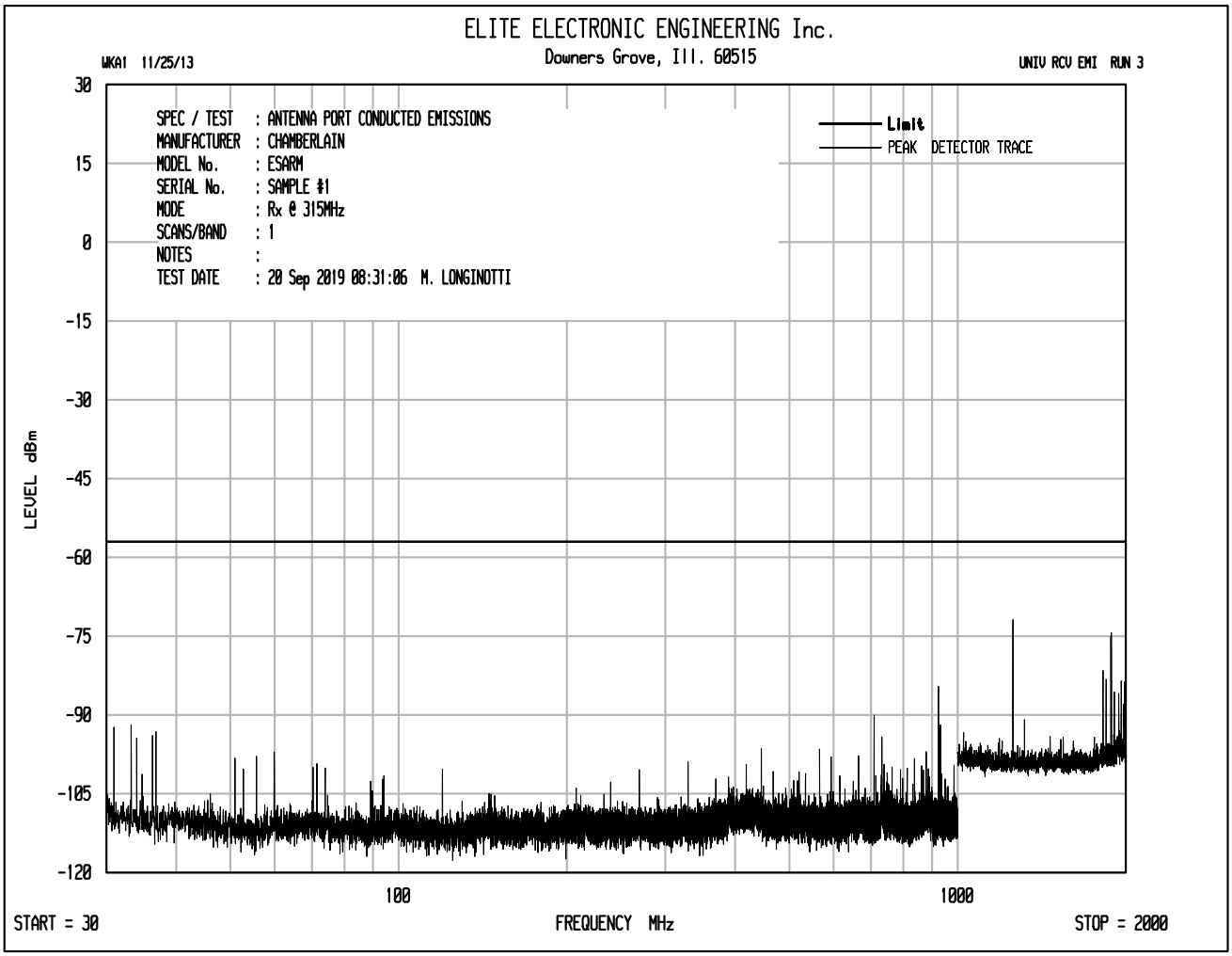
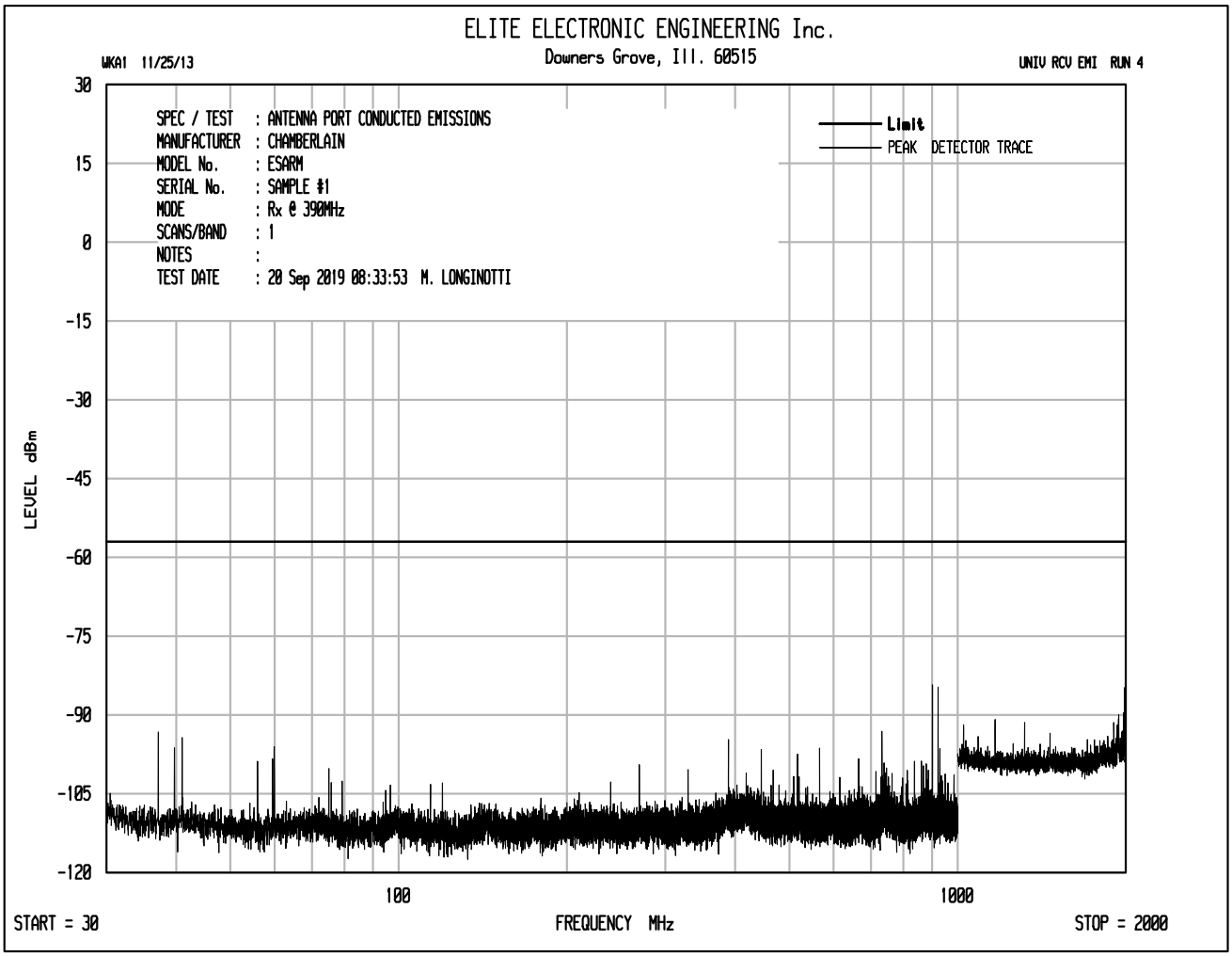
0
-15
-30
-45
-60
-75
-90
-105
-120
100
1000
START = 30
FREQUENCY MHz
STOP = 2000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 3
SPEC / TEST : ANTENNA PORT CONDUCTED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : ESARM
SERIAL No. : SAMPLE #1
MODE : Rx @ 315MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 20 Sep 2019 08:31:06 M. LONGINOTTI
Limit
PEAK DETECTOR TRACE
LEVEL dBm
30
15
0
-15
-30
-45
-60
-75
-90
-105
-120
100
1000
START = 30
FREQUENCY MHz
STOP = 2000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 4
SPEC / TEST : ANTENNA PORT CONDUCTED EMISSIONS
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MODEL No. : ESARM
SERIAL No. : SAMPLE #1
MODE : Rx @ 390MHz
SCANS/BAND : 1
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TEST DATE : 20 Sep 2019 08:33:53 M. LONGINOTTI
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LEVEL dBm
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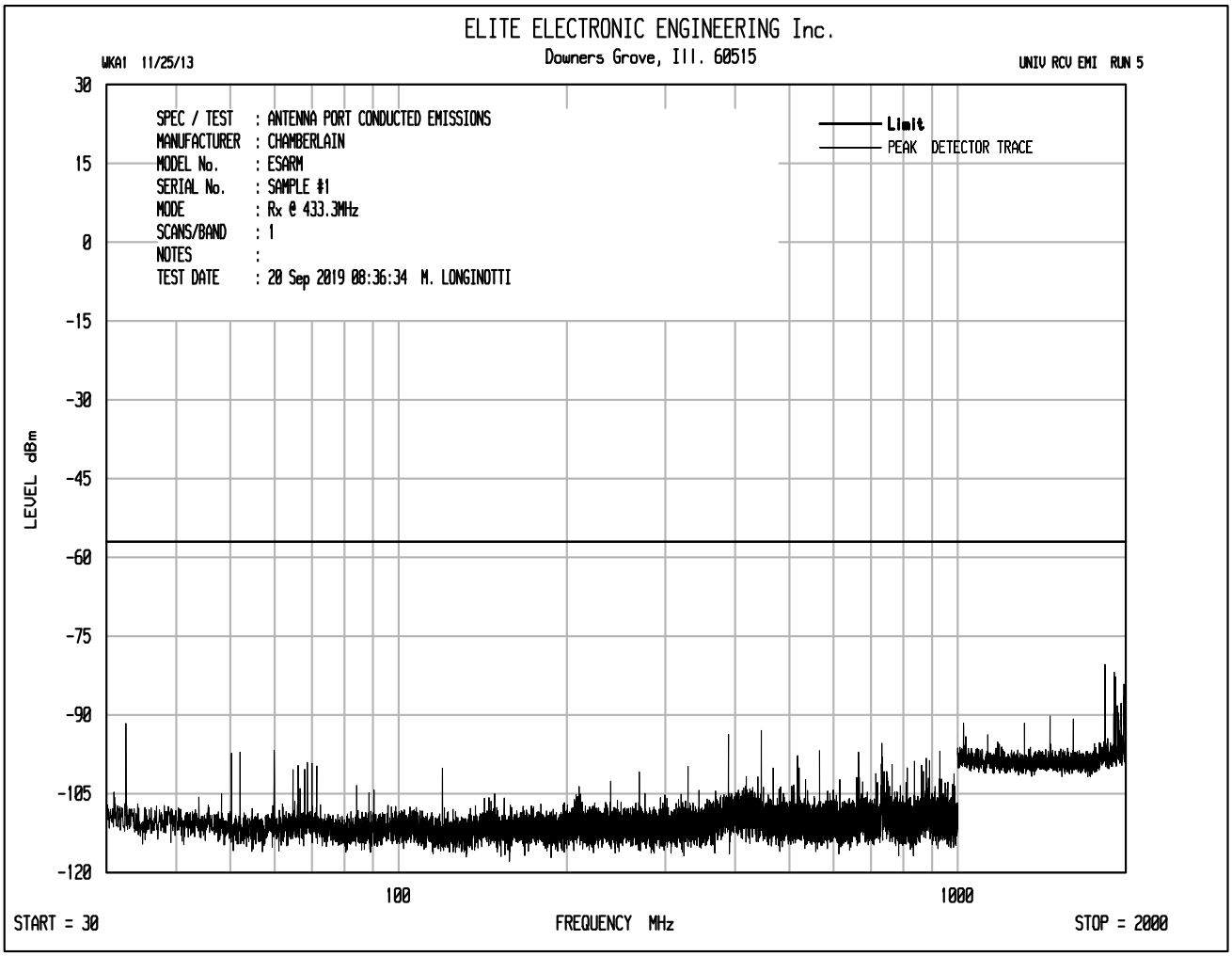
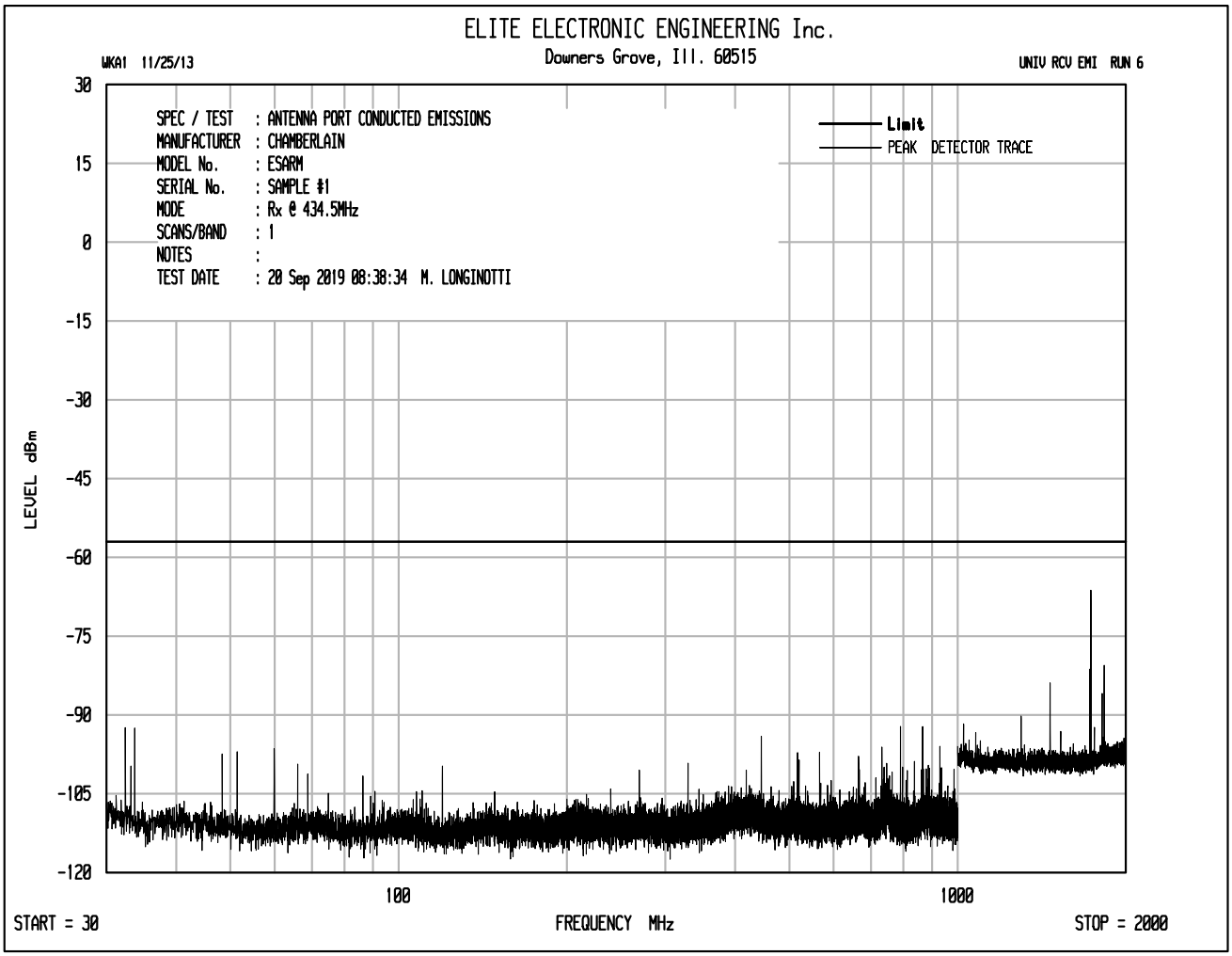
-30
-45
-60
-75
-90
-105
-120
100
1000
START = 30
FREQUENCY MHz
STOP = 2000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 5
SPEC / TEST : ANTENNA PORT CONDUCTED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : ESARM
SERIAL No. : SAMPLE #1
MODE : Rx @ 433.3MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 20 Sep 2019 08:36:34 M. LONGINOTTI
Limit
PEAK DETECTOR TRACE
LEVEL dBm
30
15
0
-15
-30
-45
-60
-75
-90
-105
-120
100
1000
START = 30
FREQUENCY MHz
STOP = 2000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 6
SPEC / TEST : ANTENNA PORT CONDUCTED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : ESARM
SERIAL No. : SAMPLE #1
MODE : Rx @ 434.5MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 20 Sep 2019 08:38:34 M. LONGINOTTI
Limit
PEAK DETECTOR TRACE
LEVEL dBm
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-15
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-45
-60
-75
-90
-105
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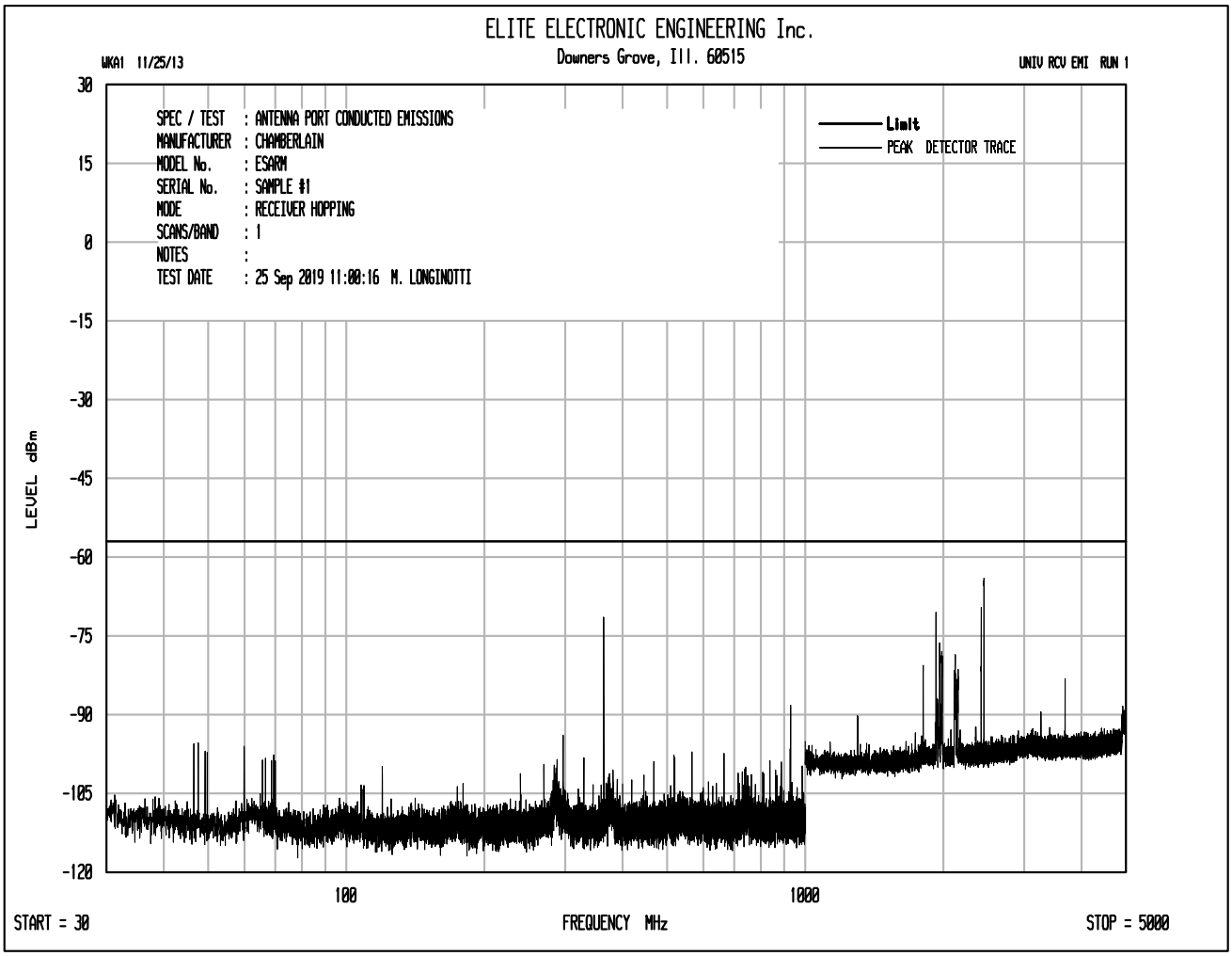
100
1000
START = 30
FREQUENCY MHz
STOP = 2000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 1
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MANUFACTURER : CHAMBERLAIN
MODEL No. : ESARM
SERIAL No. : SAMPLE #1
MODE : RECEIVER HOPPING
SCANS/BAND : 1
NOTES :
TEST DATE : 25 Sep 2019 11:00:16 M. LONGINOTTI
Limit
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LEVEL dBm
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100
1000
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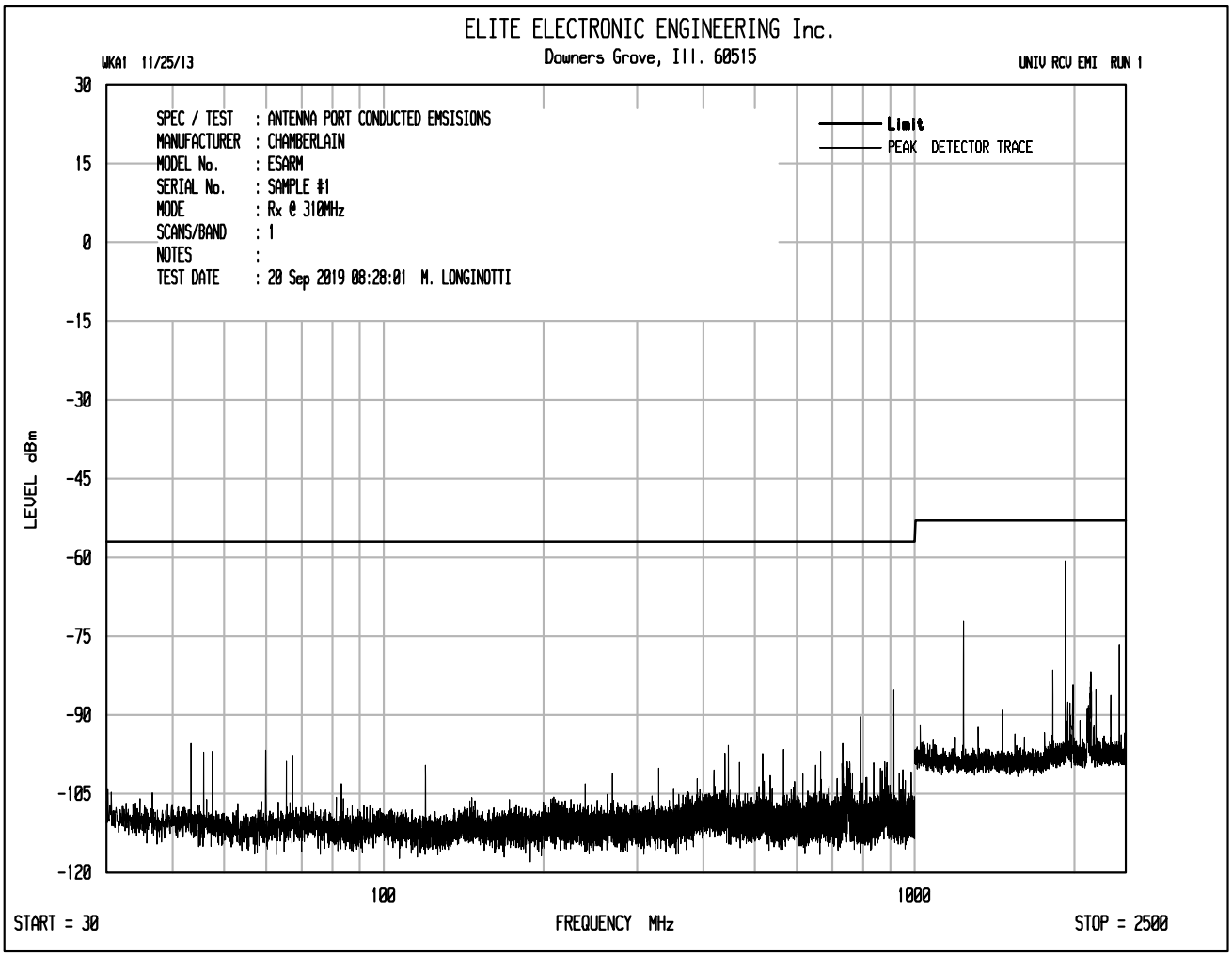
FREQUENCY MHz
STOP = 5000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 1
SPEC / TEST : ANTENNA PORT CONDUCTED EMSISIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : ESARM
SERIAL No. : SAMPLE #1
MODE : Rx @ 310MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 20 Sep 2019 08:28:01 M. LONGINOTTI
Limit
PEAK DETECTOR TRACE
LEVEL dBm
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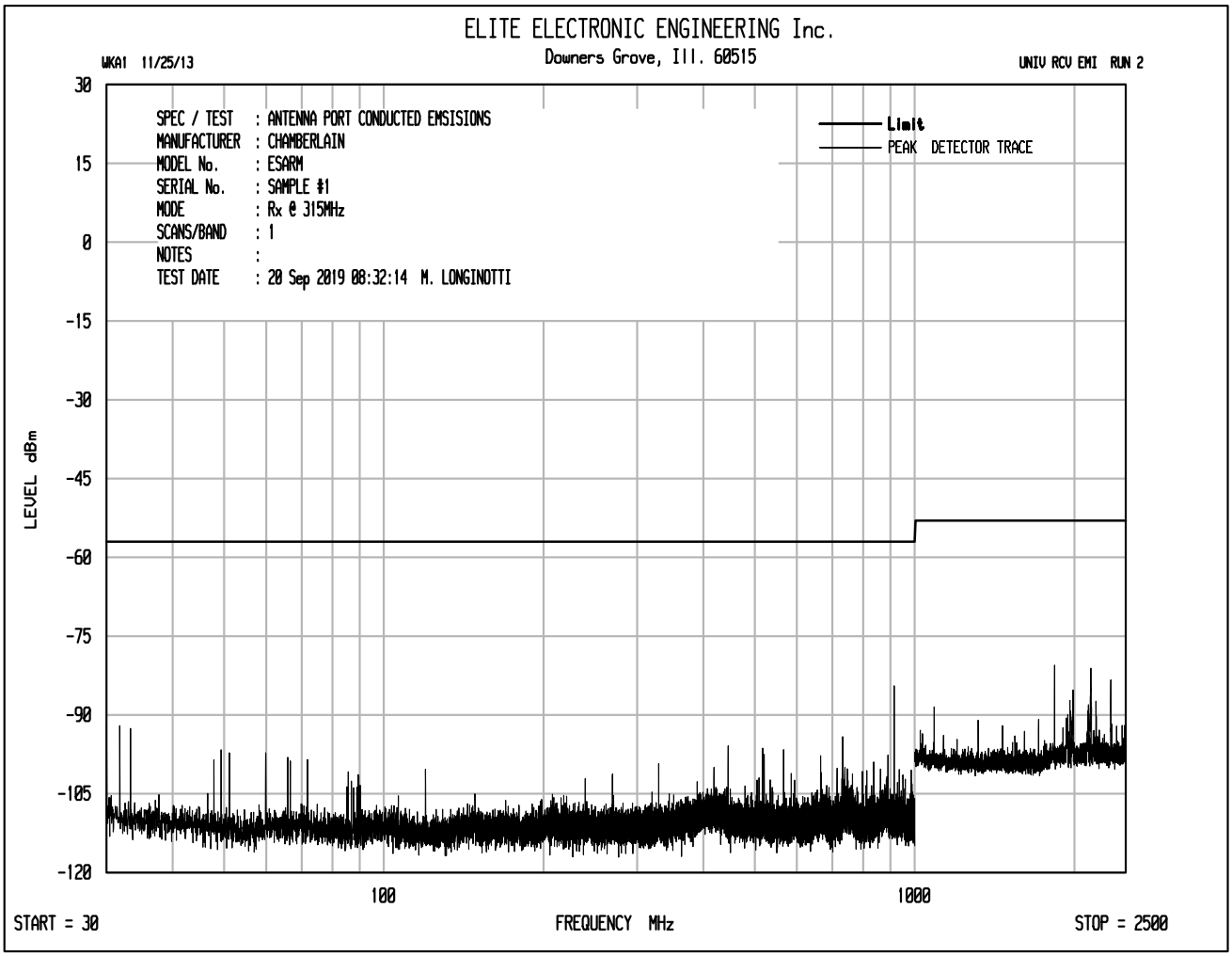
-15
-30
-45
-60
-75
-90
-105
-120
100
1000
START = 30
FREQUENCY MHz
STOP = 2500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 2
SPEC / TEST : ANTENNA PORT CONDUCTED EMSISIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : ESARM
SERIAL No. : SAMPLE #1
MODE : Rx @ 315MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 20 Sep 2019 08:32:14 M. LONGINOTTI
Limit
PEAK DETECTOR TRACE
LEVEL dBm
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-15
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-60
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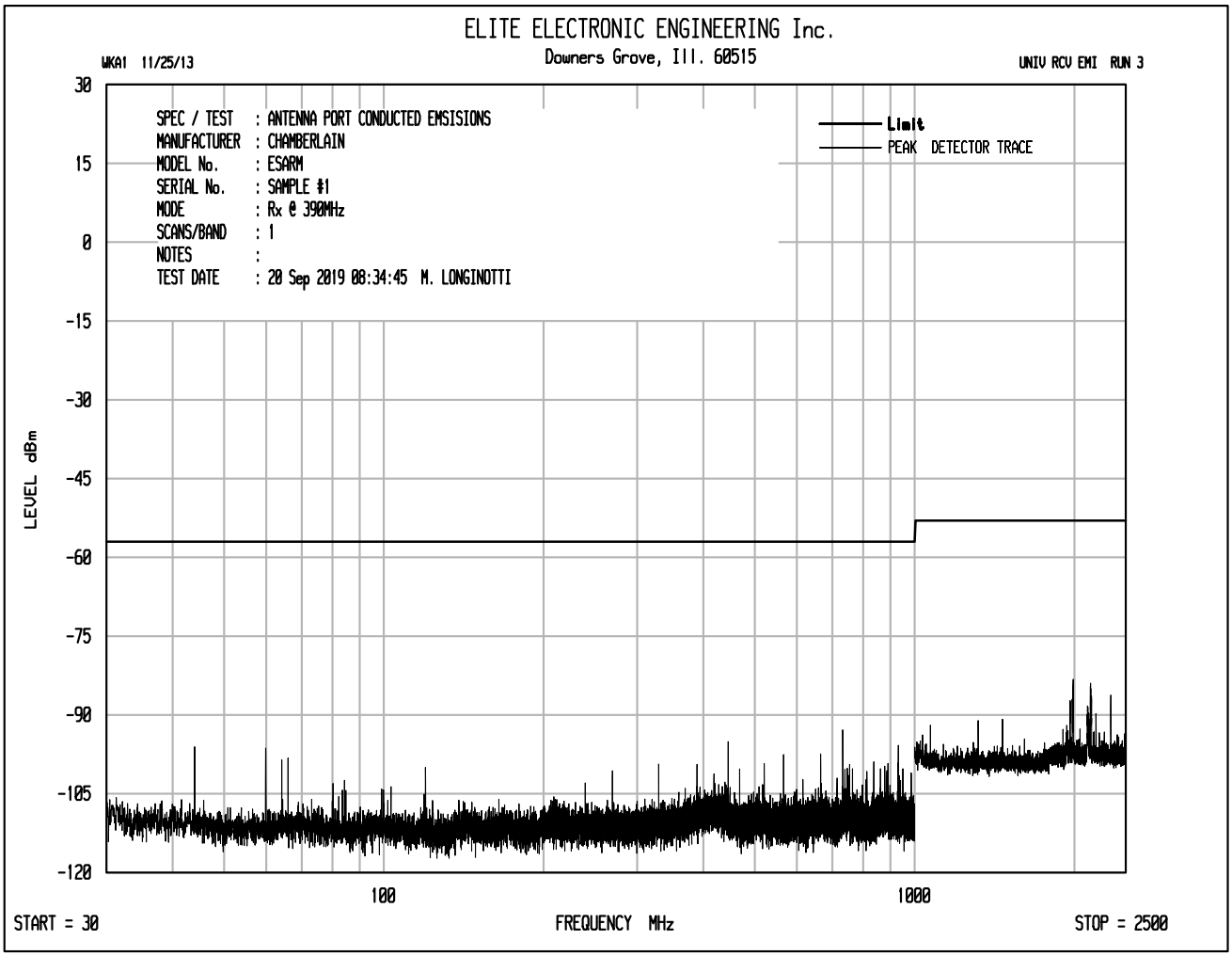
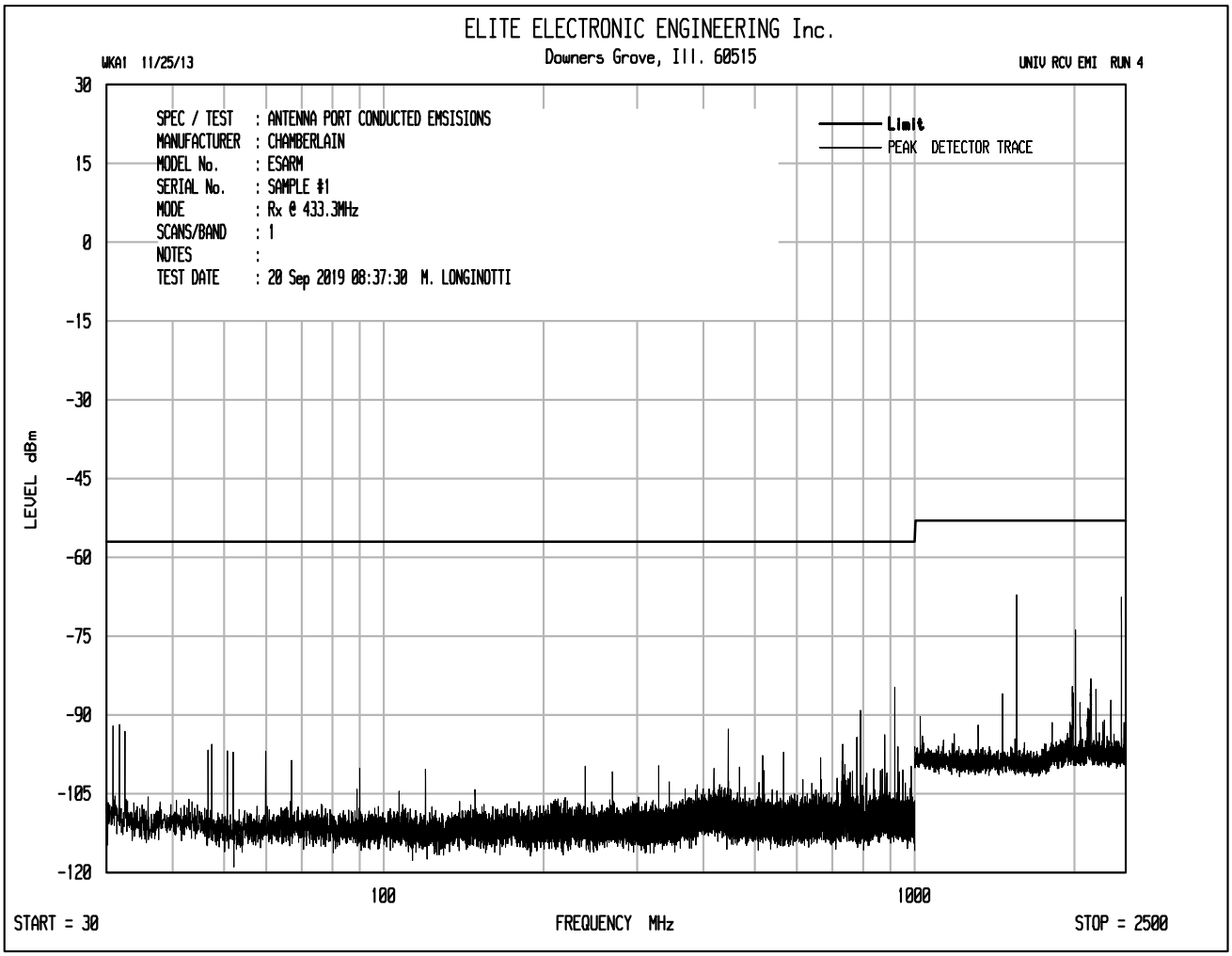
-90
-105
-120
100
1000
START = 30
FREQUENCY MHz
STOP = 2500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 3
SPEC / TEST : ANTENNA PORT CONDUCTED EMSISIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : ESARM
SERIAL No. : SAMPLE #1
MODE : Rx @ 390MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 20 Sep 2019 08:34:45 M. LONGINOTTI
Limit
PEAK DETECTOR TRACE
LEVEL dBm
30
15
0
-15
-30
-45
-60
-75
-90
-105
-120
100
1000
START = 30
FREQUENCY MHz
STOP = 2500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 4
SPEC / TEST : ANTENNA PORT CONDUCTED EMSISIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : ESARM
SERIAL No. : SAMPLE #1
MODE : Rx @ 433.3MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 20 Sep 2019 08:37:30 M. LONGINOTTI
Limit
PEAK DETECTOR TRACE
LEVEL dBm
30
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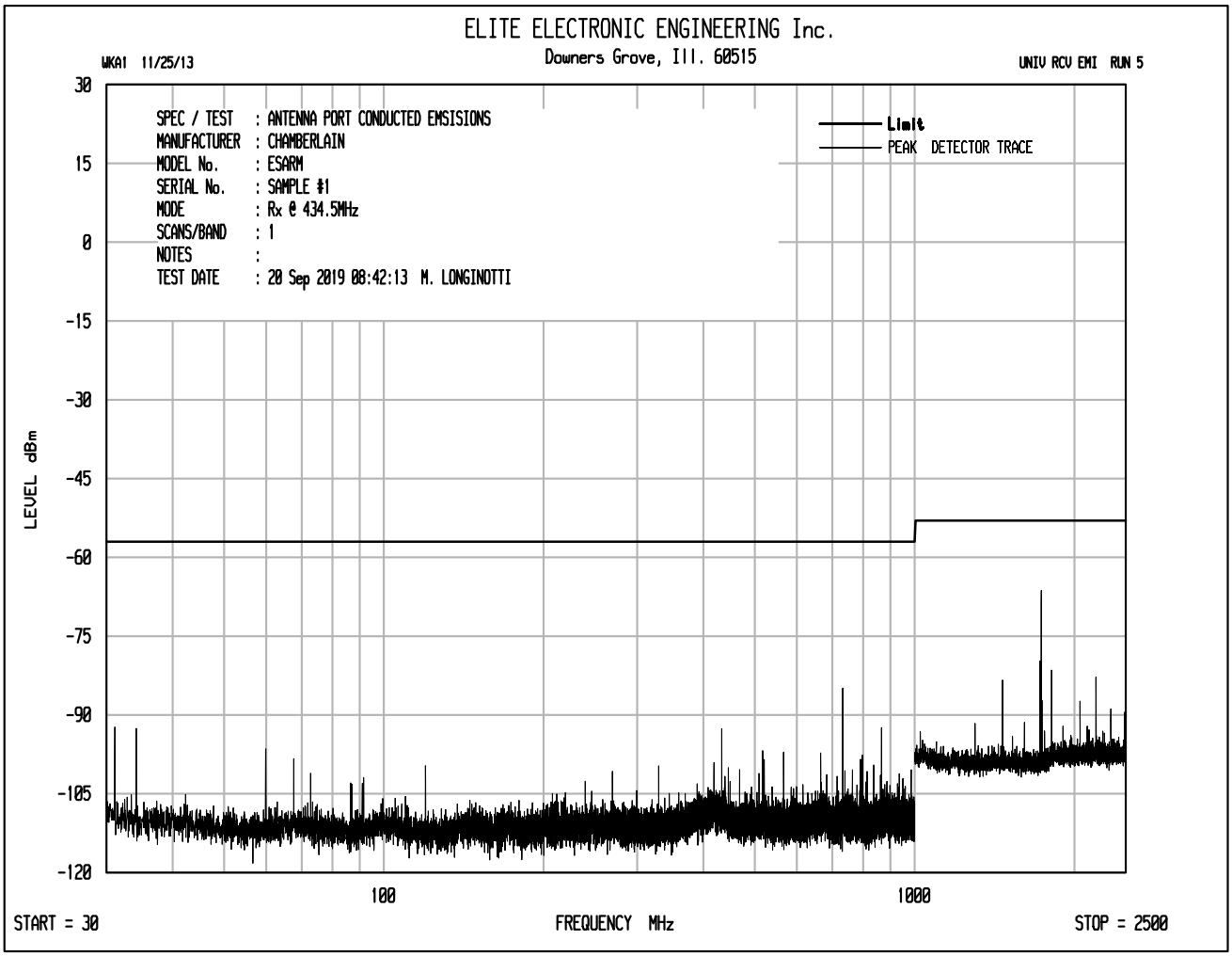
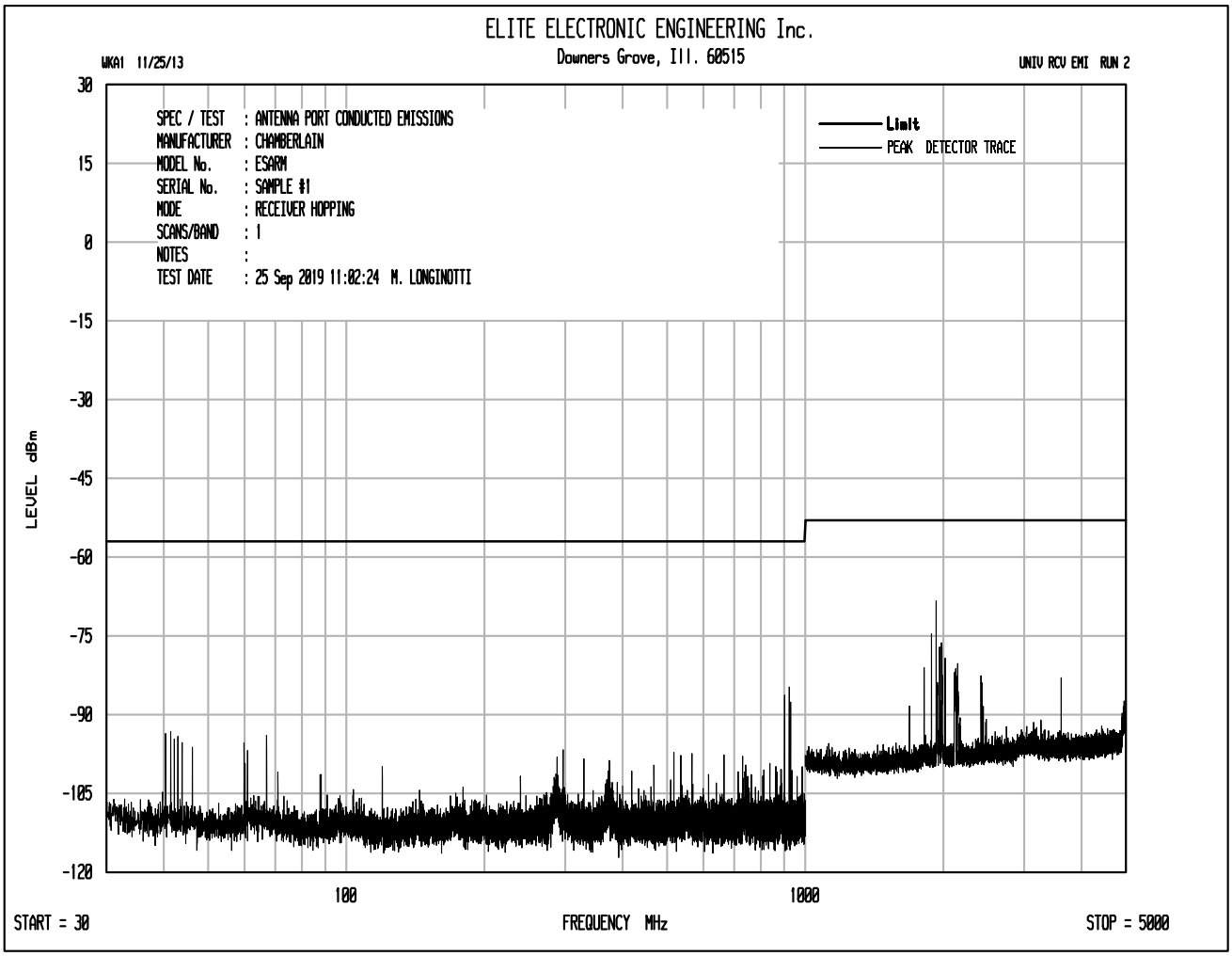
-15
-30
-45
-60
-75
-90
-105
-120
100
1000
START = 30
FREQUENCY MHz
STOP = 2500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 5
SPEC / TEST : ANTENNA PORT CONDUCTED EMSISIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : ESARM
SERIAL No. : SAMPLE #1
MODE : Rx @ 434.5MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 20 Sep 2019 08:42:13 M. LONGINOTTI
Limit
PEAK DETECTOR TRACE
LEVEL dBm
30
15
0
-15
-30
-45
-60
-75
-90
-105
-120
100
1000
START = 30
FREQUENCY MHz
STOP = 2500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 2
SPEC / TEST : ANTENNA PORT CONDUCTED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : ESARM
SERIAL No. : SAMPLE #1
MODE : RECEIVER HOPPING
SCANS/BAND : 1
NOTES :
TEST DATE : 25 Sep 2019 11:02:24 M. LONGINOTTI
Limit
PEAK DETECTOR TRACE
LEVEL dBm
30
15
0
-15
-30
-45
-60
-75
-90
-105
-120
100
1000
START = 30
FREQUENCY MHz
STOP = 5000

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

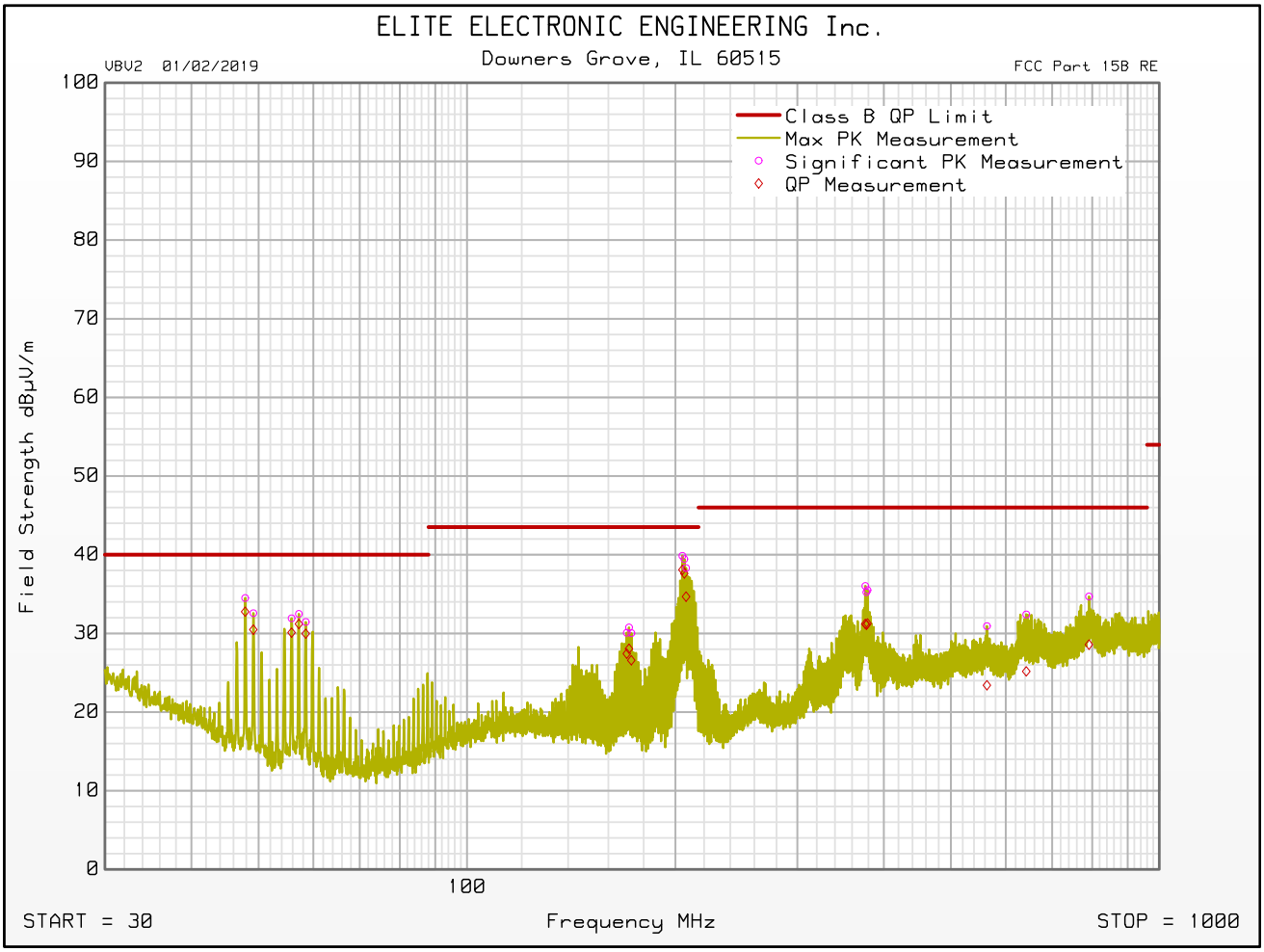
Manufacturer : CHAMBERLAIN
Model : ESARM
Serial Number : SAMPLE #1
DUT Mode : RECEIVE AT 310MHz
Scan Type : Stepped Scan
Test RBW : 120 kHz
Prelim Dwell Time (s) : 0.0001
Notes : TESTED WITH ANTENNA #1 AND 43cm COAX
Test Engineer : M. Longinotti
Test Date : Sep 19, 2019 09:55:19 AM

Freq MHz	Peak Mtr Rdg dBuV	QP Mtr Rdg dBuV	Ant Fac dB	Amp Fac dB	Cbl Fac dB	Dist Corr dB	Peak Total dBµV/m	QP Total dBµV/m	QP Limit dBµV/m	QP Lim Mrg dB	Ant Pol	Mast Ht cm	Azim °
39.720	10.6	-4.6	18.6	0.0	0.5	0.0	29.8	14.5	40.0	-25.5	H	200	225
47.820	19.1	17.3	14.9	0.0	0.5	0.0	34.5	32.8	40.0	-7.2	V	120	90
49.140	17.7	15.6	14.4	0.0	0.5	0.0	32.6	30.5	40.0	-9.5	V	120	135
55.800	18.8	17.0	12.7	0.0	0.5	0.0	31.9	30.1	40.0	-9.9	V	120	180
57.180	19.4	18.2	12.5	0.0	0.5	0.0	32.5	31.2	40.0	-8.8	V	120	45
58.500	18.5	17.0	12.5	0.0	0.5	0.0	31.5	30.0	40.0	-10.0	V	120	90
170.140	13.5	10.8	15.7	0.0	0.9	0.0	30.1	27.4	43.5	-16.1	V	120	225
171.400	14.2	11.4	15.7	0.0	0.9	0.0	30.8	28.1	43.5	-15.5	V	120	180
172.720	13.5	10.0	15.7	0.0	0.9	0.0	30.0	26.6	43.5	-16.9	V	120	180
204.700	23.5	21.7	15.4	0.0	1.0	0.0	39.9	38.1	43.5	-5.4	V	340	270
206.020	23.2	21.3	15.3	0.0	1.0	0.0	39.5	37.6	43.5	-5.9	V	200	270
207.220	22.1	18.5	15.2	0.0	1.0	0.0	38.3	34.7	43.5	-8.8	V	200	270
376.080	13.8	9.0	20.9	0.0	1.4	0.0	36.0	31.2	46.0	-14.8	V	120	180
377.400	13.0	8.8	20.9	0.0	1.4	0.0	35.2	31.1	46.0	-14.9	V	120	45
378.840	13.2	8.9	20.9	0.0	1.4	0.0	35.5	31.3	46.0	-14.7	V	120	180
563.580	4.9	-2.6	24.5	0.0	1.5	0.0	30.9	23.4	46.0	-22.6	V	120	135
642.360	6.0	-1.3	24.8	0.0	1.6	0.0	32.4	25.2	46.0	-20.8	V	340	180
791.340	6.8	0.6	26.0	0.0	2.0	0.0	34.7	28.6	46.0	-17.4	V	120	135

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

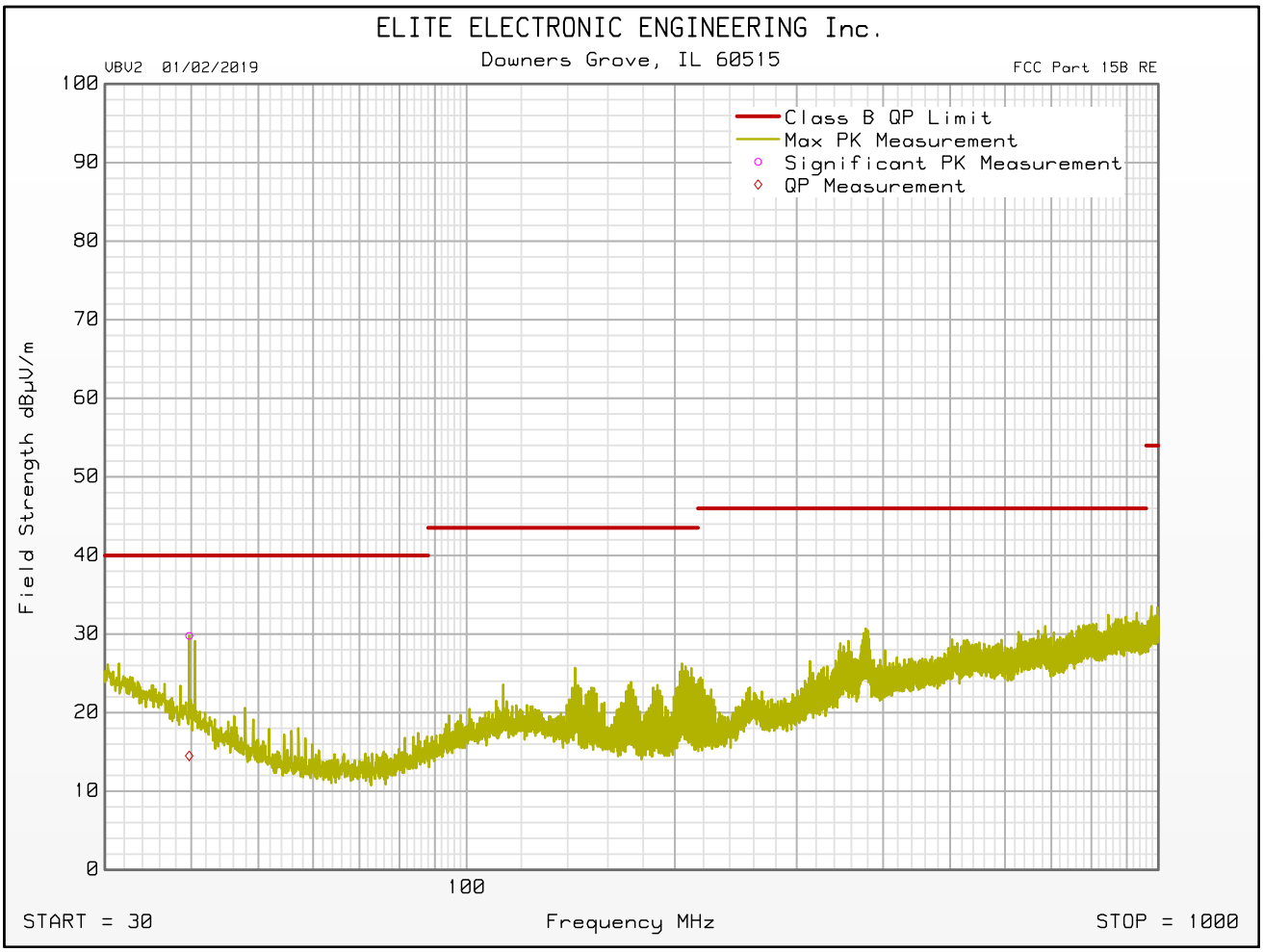
Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	RECEIVE AT 310MHz
Ant. Polarization(s)	:	VERTICAL
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	TESTED WITH ANTENNA #1 AND 43cm COAX
Test Engineer	:	M. Longinotti
Test Date	:	Sep 19, 2019 09:55:19 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	RECEIVE AT 310MHz
Ant. Polarization(s)	:	HORIZONTAL
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	TESTED WITH ANTENNA #1 AND 43cm COAX
Test Engineer	:	M. Longinotti
Test Date	:	Sep 19, 2019 09:55:19 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

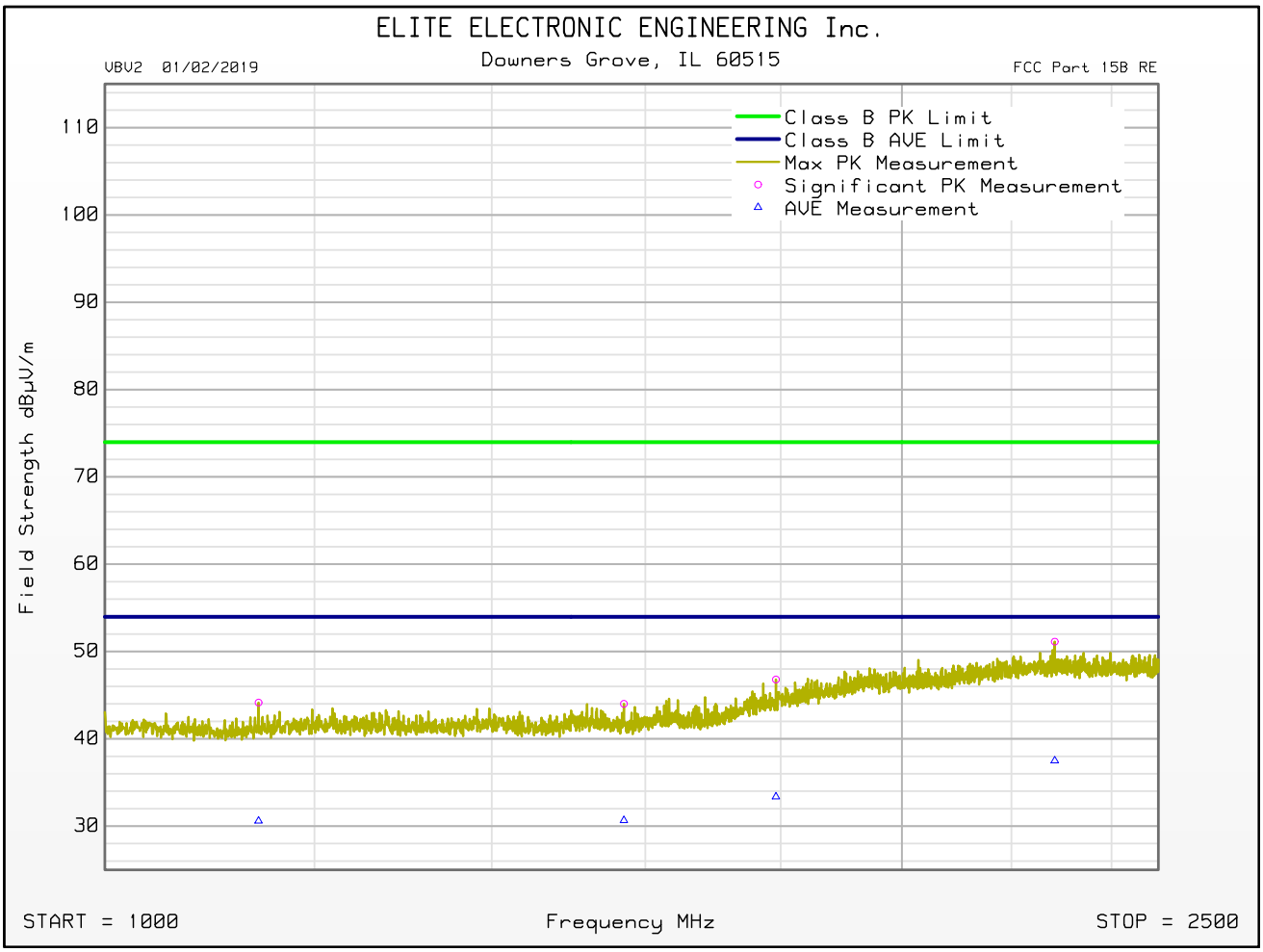
Manufacturer : CHAMBERLAIN
Model : ESARM
Serial Number : SAMPLE #1
DUT Mode : RECEIVE AT 310MHz
Scan Type : Stepped Scan
Test RBW : 1 MHz
Prelim Dwell Time (s) : 0.0001
Notes : TESTED WITH ANTENNA #1 AND 43cm COAX
Test Engineer : M. Longinotti
Test Date : Sep 20, 2019 09:39:49 AM

Freq MHz	Peak Mtr Rdg dBuV	Average Mtr Rdg dBuV	Ant Fac dB	Amp Fac dB	Cbl Fac dB	Dist Corr dB	Peak Total dBµV/m	Peak Limit dBµV/m	Peak Lim Mrg dB	Average Total dBµV/m	Average Limit dBµV/m	Average Lim Mrg dB	Ant Pol	Mast Ht cm	Azim °
1143.000	12.2	-1.3	29.7	0.0	2.2	0.0	44.2	74.0	-29.8	30.6	54.0	-23.4	V	340	270
1213.500	11.9	-1.2	29.8	0.0	2.3	0.0	44.0	74.0	-29.9	31.0	54.0	-23.0	H	340	225
1570.500	12.2	-1.2	29.2	0.0	2.7	0.0	44.0	74.0	-30.0	30.7	54.0	-23.3	V	340	135
1792.500	13.2	-0.3	30.8	0.0	2.8	0.0	46.8	74.0	-27.2	33.4	54.0	-20.6	V	120	270
2120.500	13.2	0.2	33.1	0.0	3.1	0.0	49.4	74.0	-24.6	36.5	54.0	-17.5	H	340	45
2284.500	14.0	0.4	33.9	0.0	3.3	0.0	51.1	74.0	-22.9	37.5	54.0	-16.5	V	200	90

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

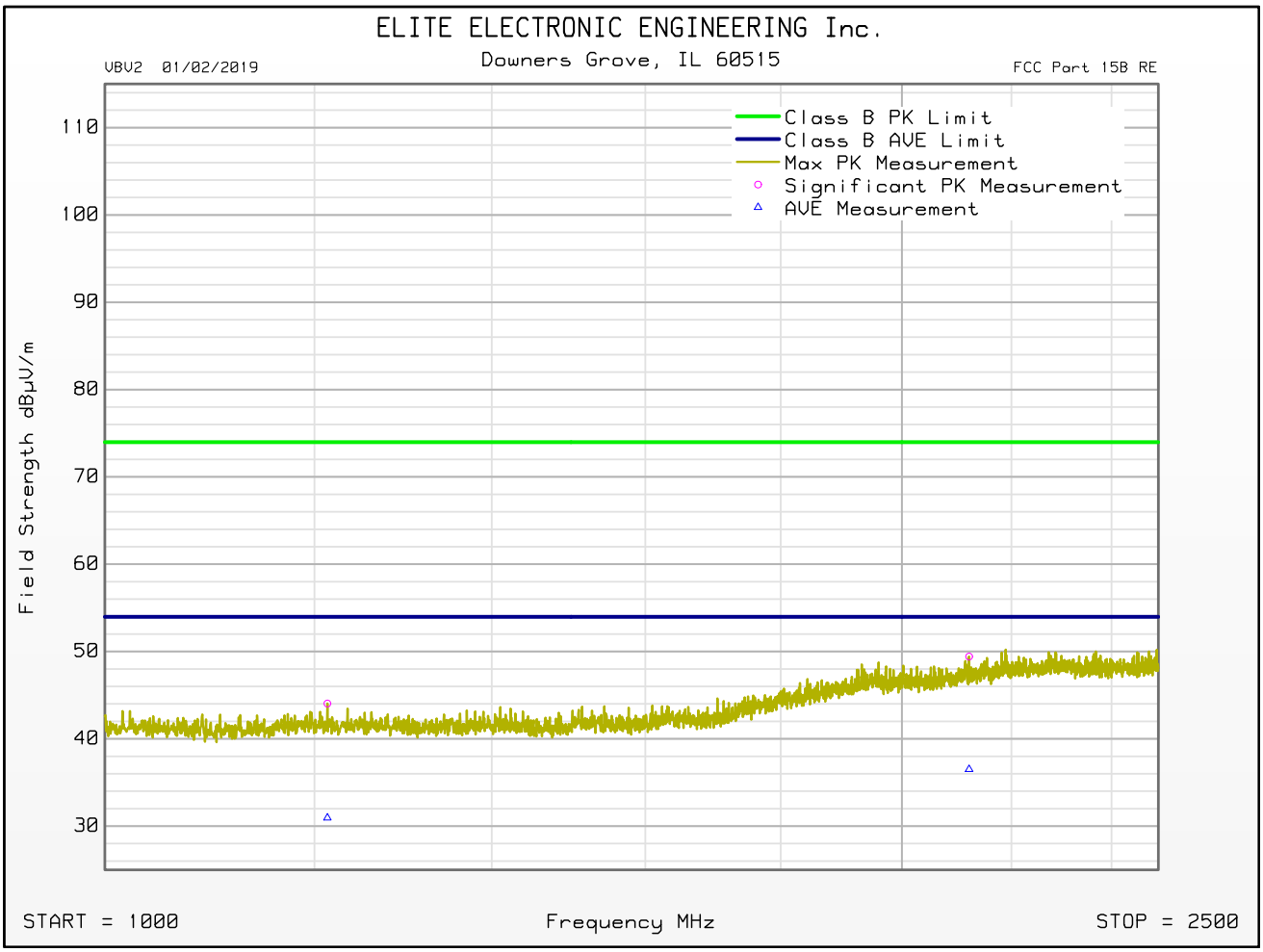
Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	RECEIVE AT 310MHz
Ant. Polarization(s)	:	VERTICAL
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	TESTED WITH ANTENNA #1 AND 43cm COAX
Test Engineer	:	M. Longinotti
Test Date	:	Sep 20, 2019 09:39:49 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	RECEIVE AT 310MHz
Ant. Polarization(s)	:	HORIZONTAL
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	TESTED WITH ANTENNA #1 AND 43cm COAX
Test Engineer	:	M. Longinotti
Test Date	:	Sep 20, 2019 09:39:49 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

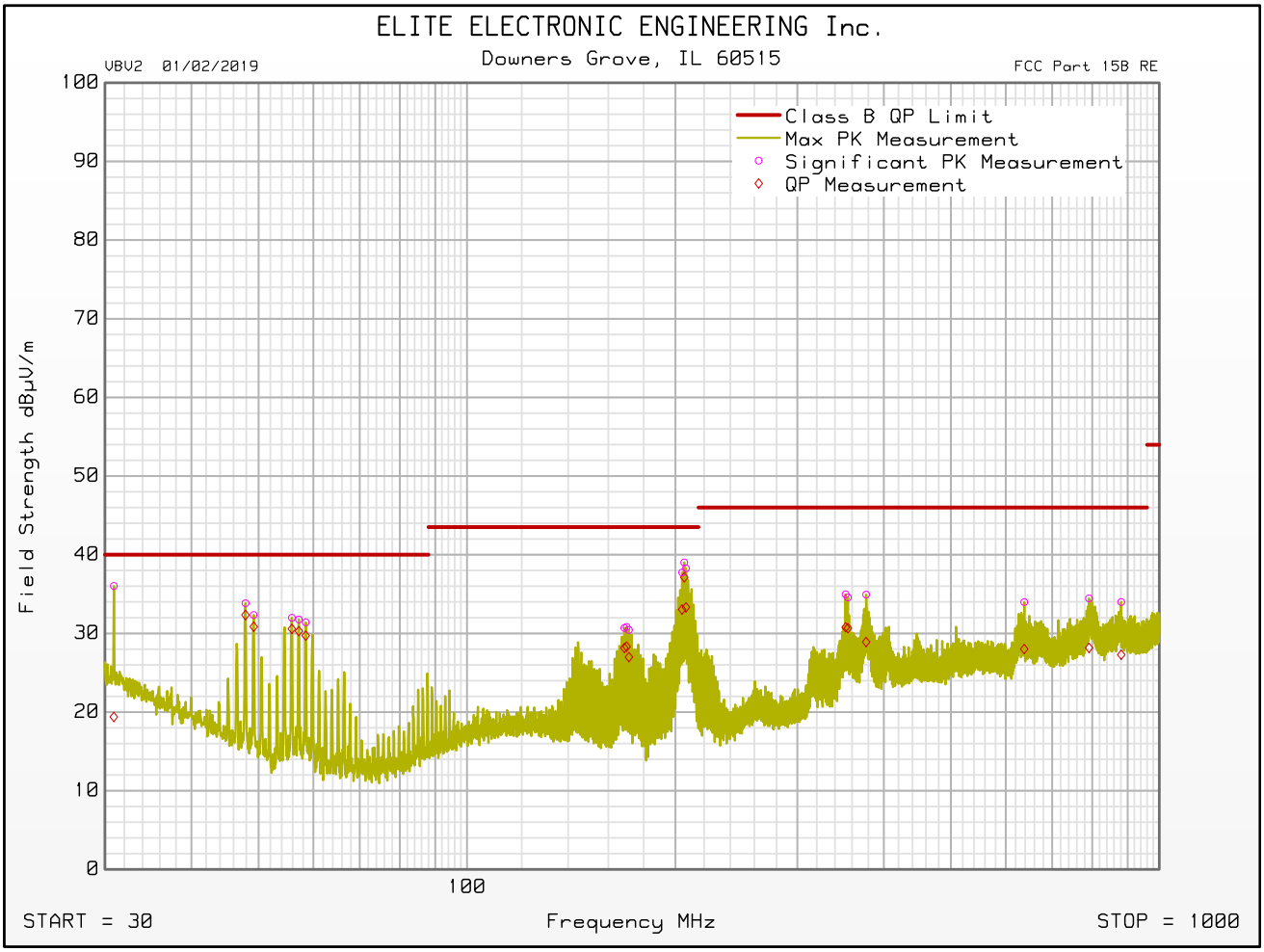
Manufacturer : CHAMBERLAIN
Model : ESARM
Serial Number : SAMPLE #1
DUT Mode : RECEIVE AT 315MHz
Scan Type : Stepped Scan
Test RBW : 120 kHz
Prelim Dwell Time (s) : 0.0001
Notes : TESTED WITH ANTENNA #1 AND 43cm COAX
Test Engineer : M. Longinotti
Test Date : Sep 19, 2019 10:21:24 AM

Freq MHz	Peak Mtr Rdg dBuV	QP Mtr Rdg dBuV	Ant Fac dB	Amp Fac dB	Cbl Fac dB	Dist Corr dB	Peak Total dBµV/m	QP Total dBµV/m	QP Limit dBµV/m	QP Lim Mrg dB	Ant Pol	Mast Ht cm	Azim °
30.900	13.7	-2.9	21.8	0.0	0.5	0.0	36.0	19.4	40.0	-20.6	V	120	180
47.880	18.4	16.9	14.9	0.0	0.5	0.0	33.8	32.3	40.0	-7.7	V	120	90
49.200	17.5	16.0	14.4	0.0	0.5	0.0	32.3	30.9	40.0	-9.1	V	120	135
55.860	18.9	17.4	12.6	0.0	0.5	0.0	32.0	30.6	40.0	-9.4	V	120	0
57.180	18.7	17.3	12.5	0.0	0.5	0.0	31.8	30.3	40.0	-9.7	V	120	45
58.500	18.5	16.8	12.5	0.0	0.5	0.0	31.4	29.7	40.0	-10.3	V	120	90
168.760	14.0	11.5	15.8	0.0	0.9	0.0	30.7	28.2	43.5	-15.4	V	120	180
170.080	14.2	11.7	15.7	0.0	0.9	0.0	30.8	28.3	43.5	-15.2	V	120	180
171.340	13.8	10.4	15.7	0.0	0.9	0.0	30.4	27.0	43.5	-16.5	V	120	180
204.520	21.4	16.7	15.4	0.0	1.0	0.0	37.7	33.0	43.5	-10.5	V	340	270
205.960	22.7	20.8	15.3	0.0	1.0	0.0	39.0	37.1	43.5	-6.4	V	340	270
207.160	22.1	17.1	15.2	0.0	1.0	0.0	38.3	33.3	43.5	-10.2	V	340	270
352.260	13.3	9.1	20.4	0.0	1.3	0.0	35.0	30.8	46.0	-15.2	V	120	180
354.960	12.8	8.9	20.4	0.0	1.3	0.0	34.6	30.7	46.0	-15.3	V	120	180
377.160	12.7	6.6	20.9	0.0	1.4	0.0	34.9	28.9	46.0	-17.1	V	120	180
638.040	7.5	1.5	24.9	0.0	1.6	0.0	34.0	28.0	46.0	-18.0	V	200	180
791.400	6.5	0.2	26.0	0.0	2.0	0.0	34.5	28.2	46.0	-17.8	V	120	45
880.860	5.8	-0.9	26.2	0.0	2.0	0.0	34.0	27.3	46.0	-18.7	V	200	315

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

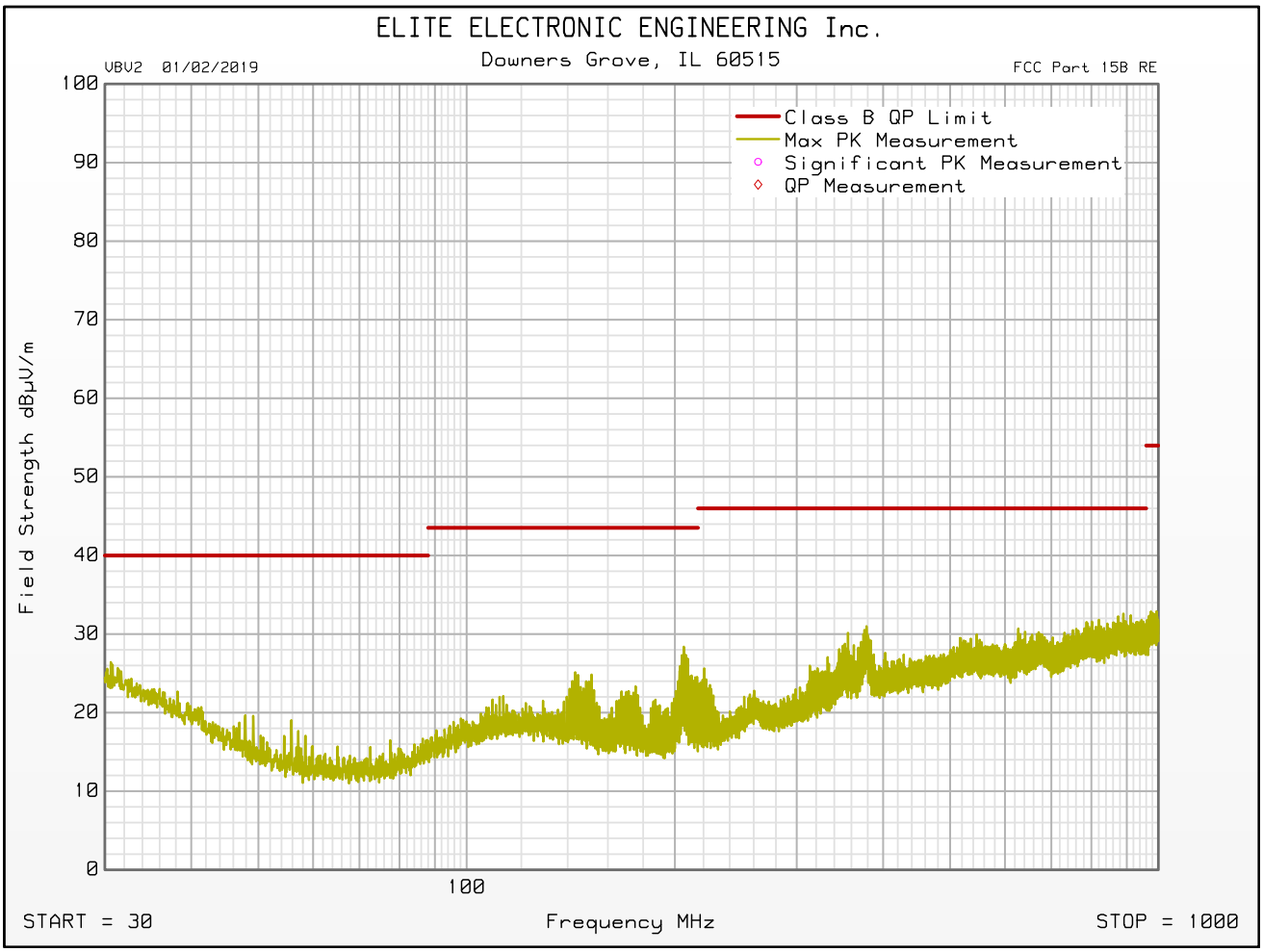
Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	RECEIVE AT 315MHz
Ant. Polarization(s)	:	VERTICAL
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	TESTED WITH ANTENNA #1 AND 43cm COAX
Test Engineer	:	M. Longinotti
Test Date	:	Sep 19, 2019 10:21:24 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	RECEIVE AT 315MHz
Ant. Polarization(s)	:	HORIZONTAL
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	TESTED WITH ANTENNA #1 AND 43cm COAX
Test Engineer	:	M. Longinotti
Test Date	:	Sep 19, 2019 10:21:24 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

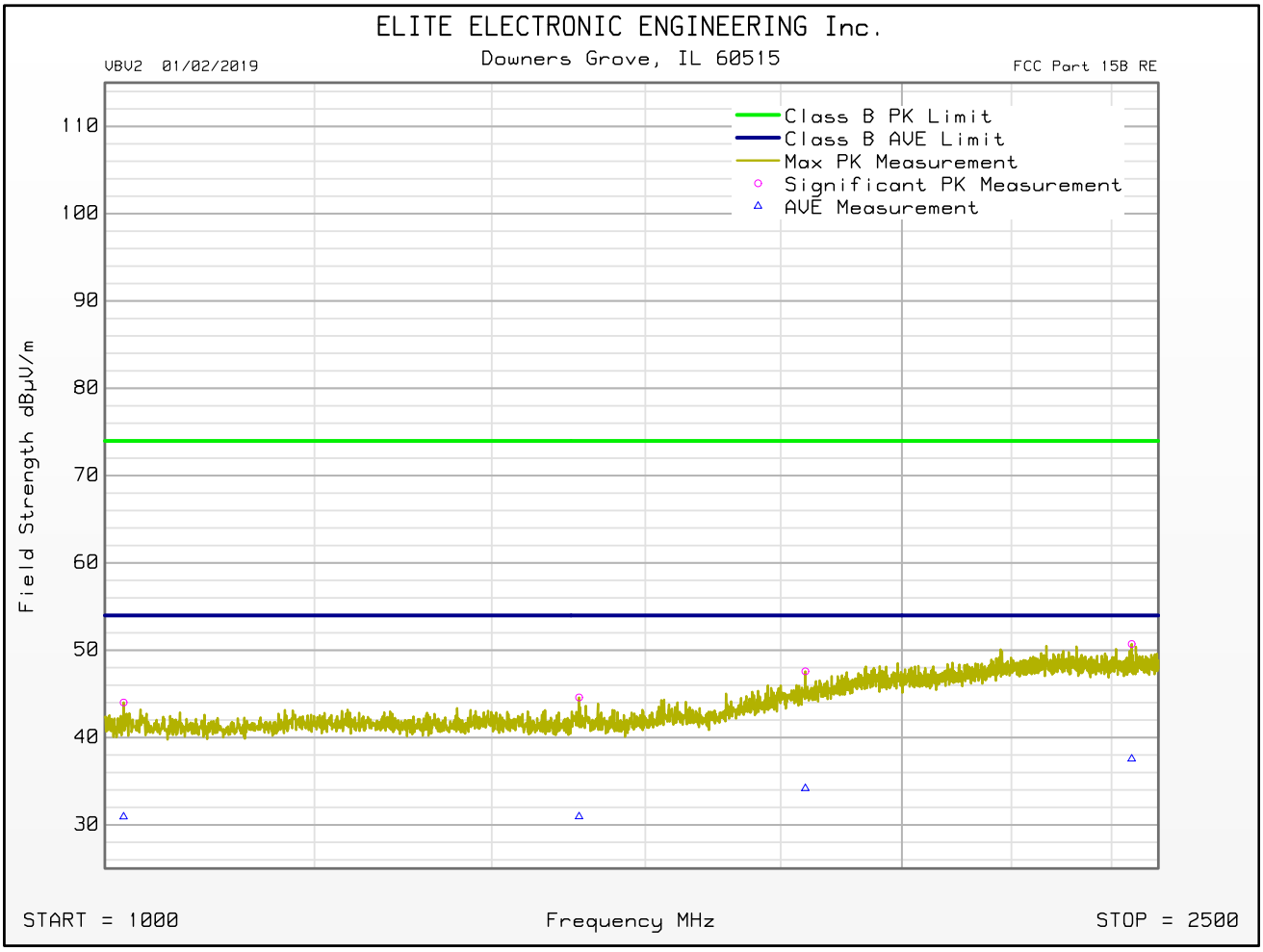
Manufacturer : CHAMBERLAIN
Model : ESARM
Serial Number : SAMPLE #1
DUT Mode : RECEIVE AT 315MHz
Scan Type : Stepped Scan
Test RBW : 1 MHz
Prelim Dwell Time (s) : 0.0001
Notes : TESTED WITH ANTENNA #1 AND 43cm COAX
Test Engineer : M. Longinotti
Test Date : Sep 20, 2019 09:53:31 AM

Freq MHz	Peak Mtr Rdg dBuV	Average Mtr Rdg dBuV	Ant Fac dB	Amp Fac dB	Cbl Fac dB	Dist Corr dB	Peak Total dBµV/m	Peak Limit dBµV/m	Peak Lim Mrg dB	Average Total dBµV/m	Average Limit dBµV/m	Average Lim Mrg dB	Ant Pol	Mast Ht cm	Azim °
1016.500	13.0	-0.1	29.0	0.0	2.0	0.0	44.0	74.0	-30.0	30.9	54.0	-23.0	V	120	225
1231.500	11.3	-1.4	29.9	0.0	2.3	0.0	43.5	74.0	-30.5	30.7	54.0	-23.2	H	200	225
1510.500	12.7	-0.9	29.3	0.0	2.6	0.0	44.6	74.0	-29.4	30.9	54.0	-23.0	V	200	135
1839.000	13.4	0.0	31.3	0.0	2.9	0.0	47.6	74.0	-26.4	34.2	54.0	-19.8	V	200	90
2140.000	13.9	0.3	33.3	0.0	3.1	0.0	50.3	74.0	-23.7	36.7	54.0	-17.2	H	200	45
2442.500	13.7	0.6	33.6	0.0	3.4	0.0	50.7	74.0	-23.3	37.6	54.0	-16.4	V	340	270

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

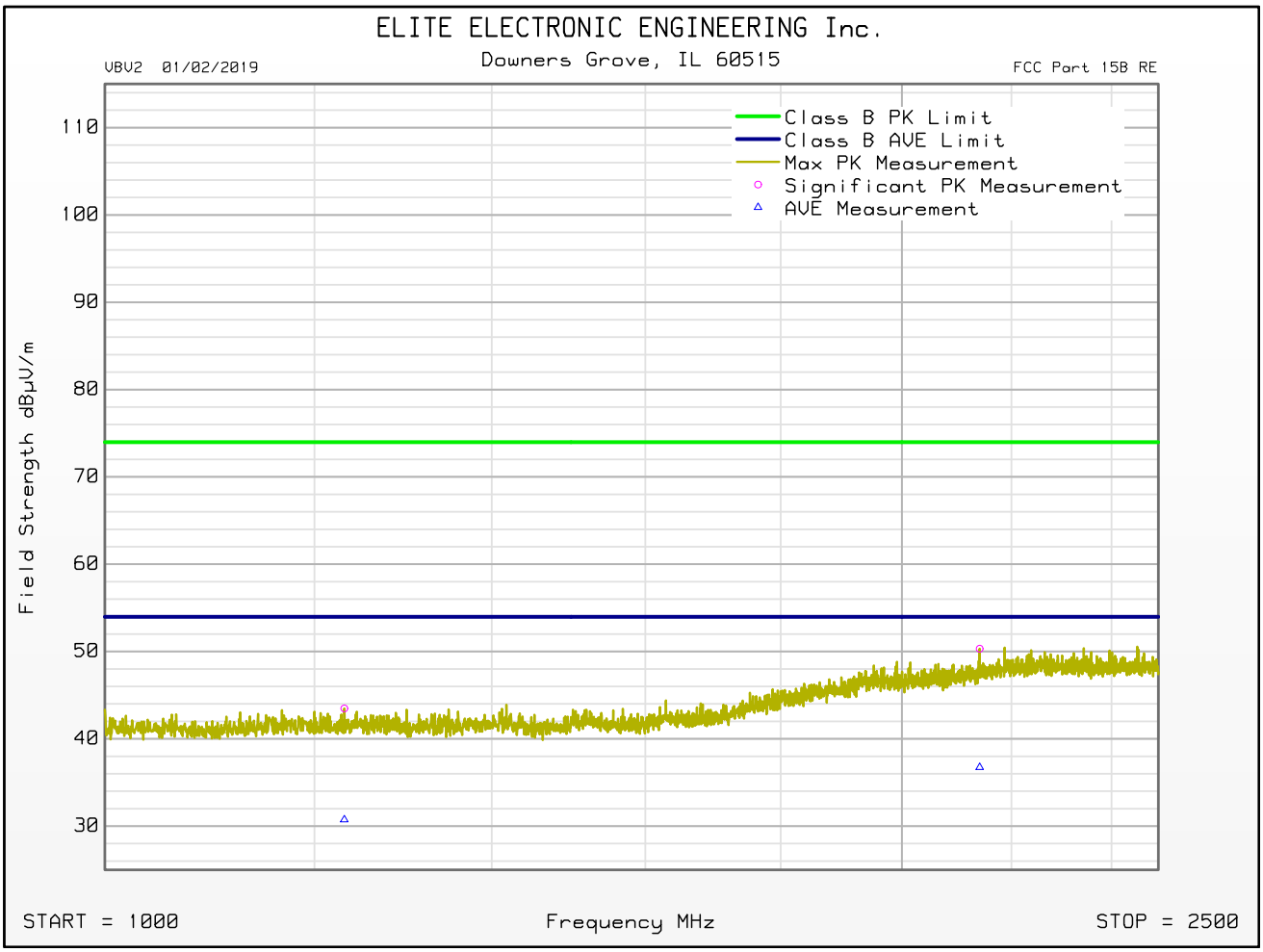
Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	RECEIVE AT 315MHz
Ant. Polarization(s)	:	VERTICAL
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	TESTED WITH ANTENNA #1 AND 43cm COAX
Test Engineer	:	M. Longinotti
Test Date	:	Sep 20, 2019 09:53:31 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	RECEIVE AT 315MHz
Ant. Polarization(s)	:	HORIZONTAL
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	TESTED WITH ANTENNA #1 AND 43cm COAX
Test Engineer	:	M. Longinotti
Test Date	:	Sep 20, 2019 09:53:31 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

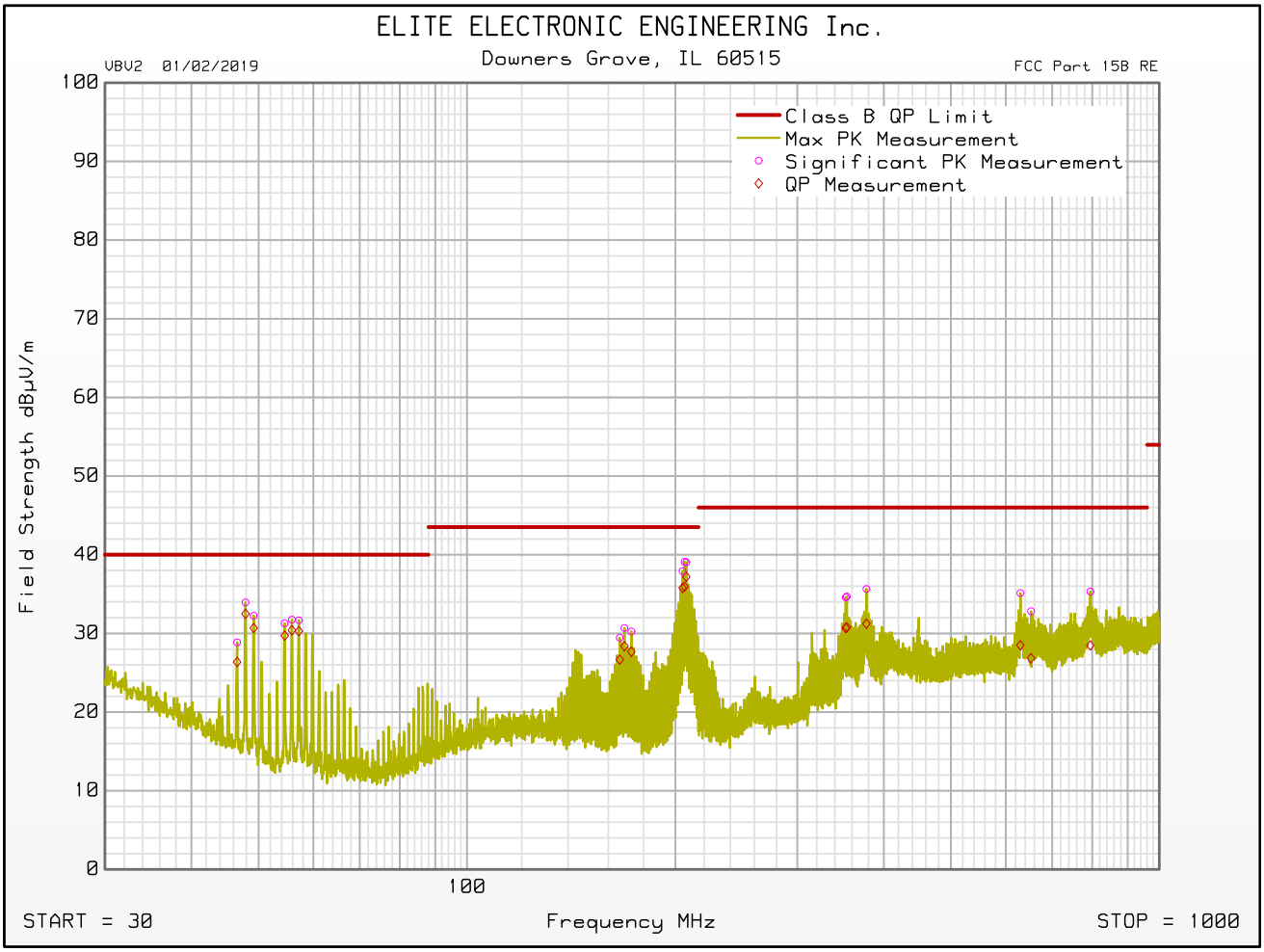
Manufacturer : CHAMBERLAIN
Model : ESARM
Serial Number : SAMPLE #1
DUT Mode : RECEIVE AT 390MHz
Scan Type : Stepped Scan
Test RBW : 120 kHz
Prelim Dwell Time (s) : 0.0001
Notes : TESTED WITH ANTENNA #1 AND 43cm COAX
Test Engineer : M. Longinotti
Test Date : Sep 19, 2019 10:40:44 AM

Freq MHz	Peak Mtr Rdg dBuV	QP Mtr Rdg dBuV	Ant Fac dB	Amp Fac dB	Cbl Fac dB	Dist Corr dB	Peak Total dBµV/m	QP Total dBµV/m	QP Limit dBµV/m	QP Lim Mrg dB	Ant Pol	Mast Ht cm	Azim °
46.560	12.9	10.4	15.5	0.0	0.5	0.0	28.9	26.4	40.0	-13.6	V	120	45
47.880	18.5	17.1	14.9	0.0	0.5	0.0	33.9	32.5	40.0	-7.5	V	120	90
49.200	17.4	15.8	14.4	0.0	0.5	0.0	32.2	30.7	40.0	-9.3	V	120	225
54.540	17.9	16.3	12.9	0.0	0.5	0.0	31.3	29.7	40.0	-10.3	V	120	90
55.860	18.6	17.3	12.6	0.0	0.5	0.0	31.7	30.4	40.0	-9.6	V	120	135
57.180	18.6	17.3	12.5	0.0	0.5	0.0	31.7	30.3	40.0	-9.7	V	120	45
166.240	12.7	10.0	15.8	0.0	0.9	0.0	29.4	26.7	43.5	-16.8	V	120	180
168.820	14.0	11.7	15.8	0.0	0.9	0.0	30.7	28.4	43.5	-15.1	V	120	180
172.780	13.7	11.1	15.7	0.0	0.9	0.0	30.2	27.7	43.5	-15.8	V	120	180
204.820	21.5	19.4	15.4	0.0	1.0	0.0	37.9	35.8	43.5	-7.7	V	200	270
206.200	22.8	19.7	15.3	0.0	1.0	0.0	39.1	35.9	43.5	-7.6	V	340	270
207.400	22.8	21.0	15.2	0.0	1.0	0.0	39.0	37.2	43.5	-6.3	V	340	270
352.380	12.9	9.0	20.4	0.0	1.3	0.0	34.6	30.7	46.0	-15.3	V	120	180
353.700	13.0	9.1	20.4	0.0	1.3	0.0	34.7	30.8	46.0	-15.2	V	120	180
377.460	13.4	8.9	20.9	0.0	1.4	0.0	35.7	31.2	46.0	-14.8	V	120	180
629.940	8.5	1.9	25.0	0.0	1.6	0.0	35.1	28.5	46.0	-17.5	V	200	180
652.560	6.2	0.3	24.9	0.0	1.6	0.0	32.8	26.8	46.0	-19.2	V	200	180
795.000	7.4	0.6	25.9	0.0	2.0	0.0	35.3	28.5	46.0	-17.5	V	120	315

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

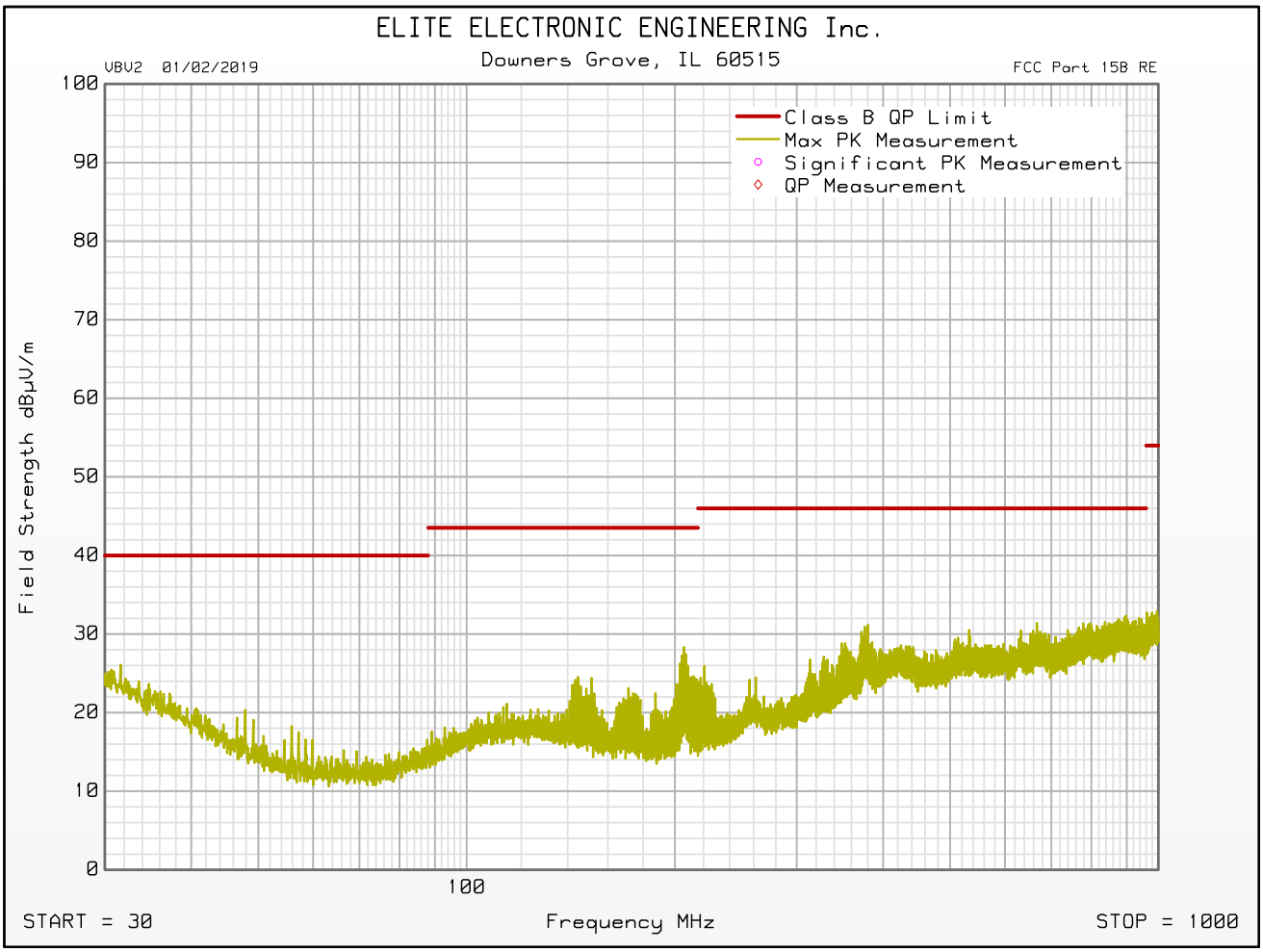
Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	RECEIVE AT 390MHz
Ant. Polarization(s)	:	VERTICAL
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	TESTED WITH ANTENNA #1 AND 43cm COAX
Test Engineer	:	M. Longinotti
Test Date	:	Sep 19, 2019 10:40:44 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	RECEIVE AT 390MHz
Ant. Polarization(s)	:	HORIZONTAL
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	TESTED WITH ANTENNA #1 AND 43cm COAX
Test Engineer	:	M. Longinotti
Test Date	:	Sep 19, 2019 10:40:44 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

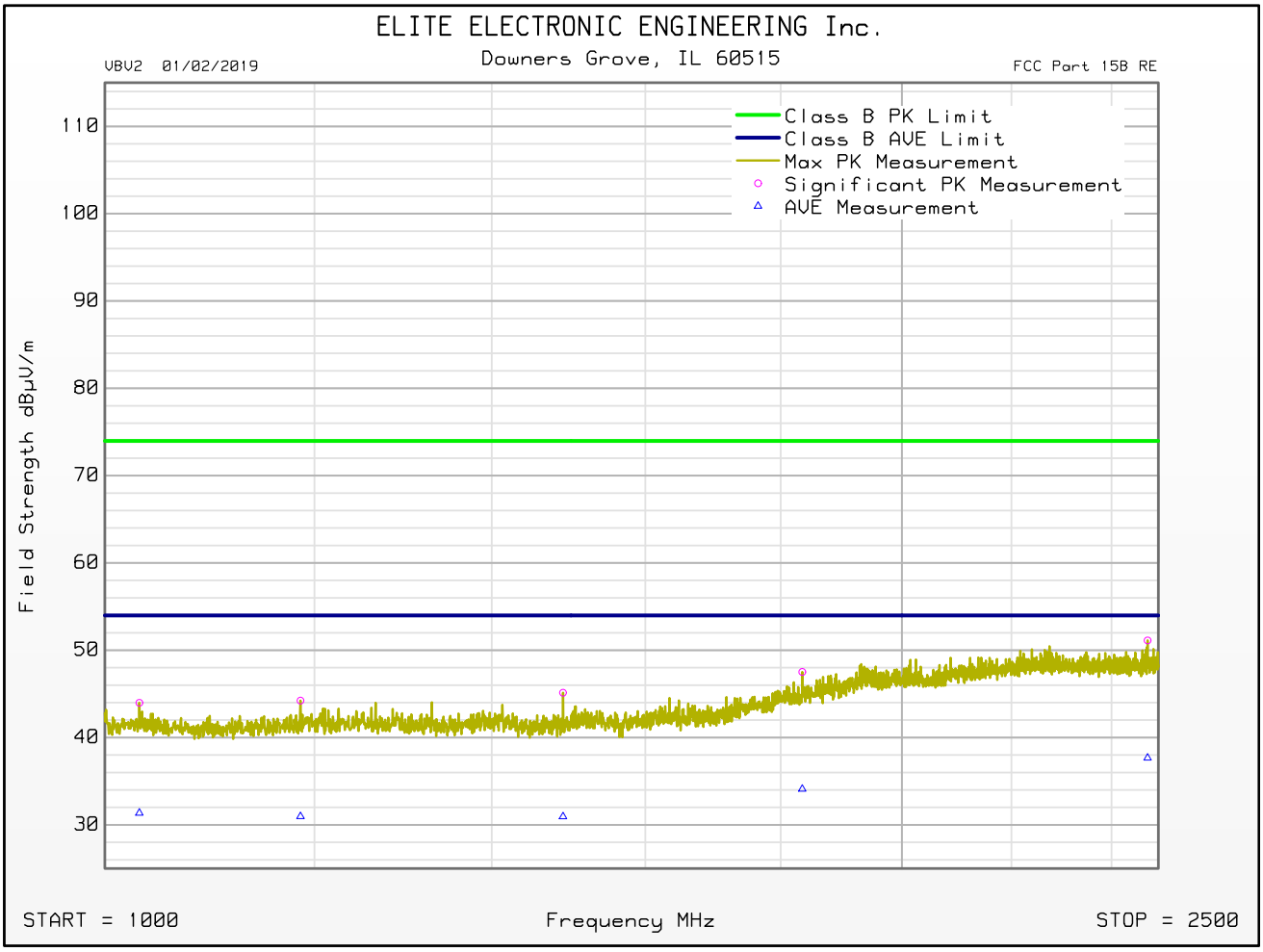
Manufacturer : CHAMBERLAIN
Model : ESARM
Serial Number : SAMPLE #1
DUT Mode : RECEIVE AT 390MHz
Scan Type : Stepped Scan
Test RBW : 1 MHz
Prelim Dwell Time (s) : 0.0001
Notes : TESTED WITH ANTENNA #1 AND 43cm COAX
Test Engineer : M. Longinotti
Test Date : Sep 20, 2019 10:06:34 AM

Freq MHz	Peak Mtr Rdg dBuV	Average Mtr Rdg dBuV	Ant Fac dB	Amp Fac dB	Cbl Fac dB	Dist Corr dB	Peak Total dBµV/m	Peak Limit dBµV/m	Peak Lim Mrg dB	Average Total dBµV/m	Average Limit dBµV/m	Average Lim Mrg dB	Ant Pol	Mast Ht cm	Azim °
1030.500	12.9	0.3	29.1	0.0	2.0	0.0	44.0	74.0	-30.0	31.4	54.0	-22.6	V	120	315
1185.500	12.2	-1.1	29.8	0.0	2.2	0.0	44.2	74.0	-29.8	31.0	54.0	-23.0	V	340	0
1489.500	13.3	-0.9	29.3	0.0	2.6	0.0	45.1	74.0	-28.8	30.9	54.0	-23.0	V	120	270
1834.000	13.4	0.0	31.2	0.0	2.9	0.0	47.5	74.0	-26.5	34.1	54.0	-19.9	V	340	45
2116.000	13.2	0.3	33.1	0.0	3.1	0.0	49.4	74.0	-24.5	36.6	54.0	-17.4	H	340	315
2476.500	14.0	0.5	33.7	0.0	3.5	0.0	51.1	74.0	-22.9	37.7	54.0	-16.3	V	340	0

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

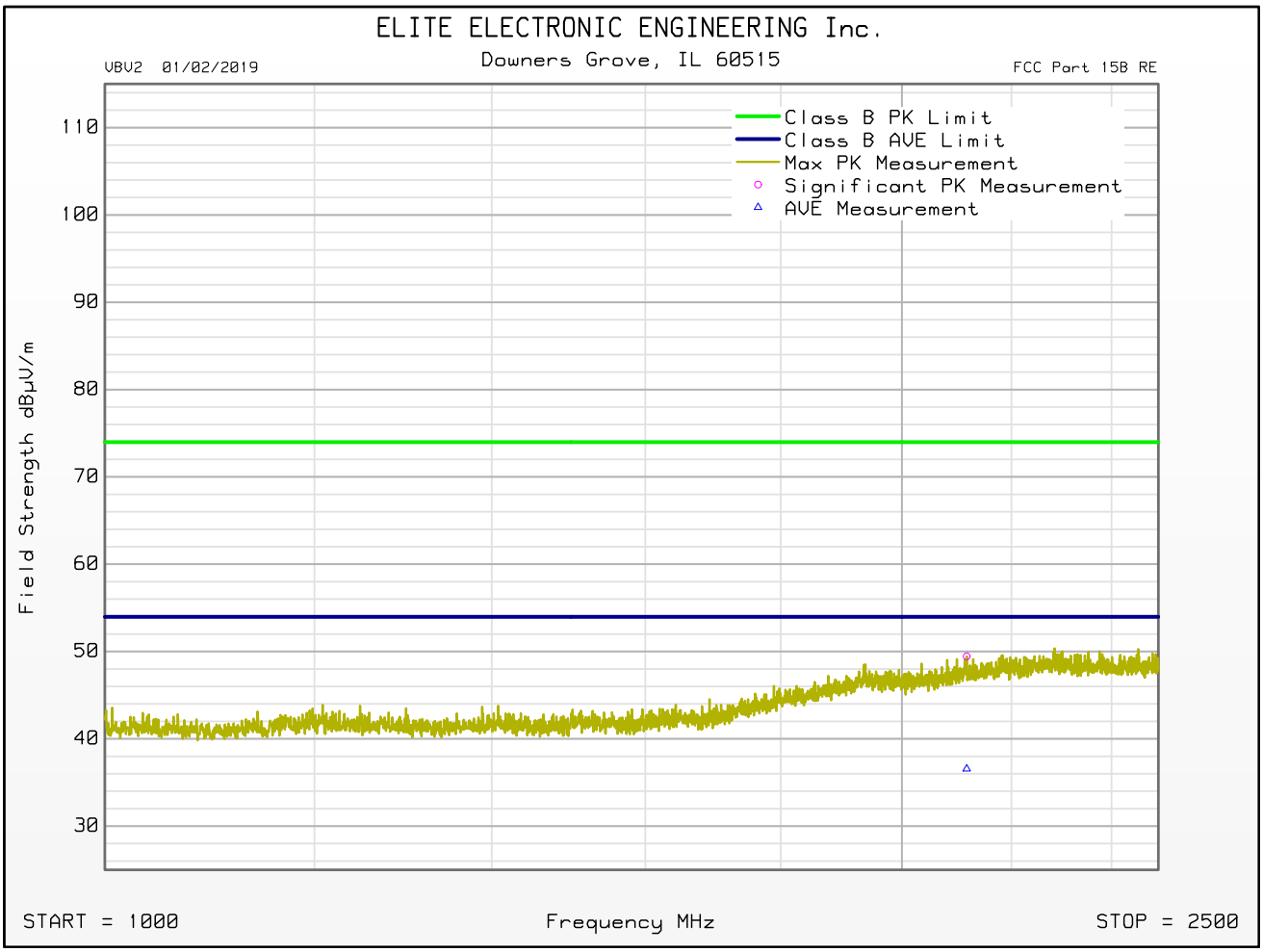
Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	RECEIVE AT 390MHz
Ant. Polarization(s)	:	VERTICAL
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	TESTED WITH ANTENNA #1 AND 43cm COAX
Test Engineer	:	M. Longinotti
Test Date	:	Sep 20, 2019 10:06:34 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	RECEIVE AT 390MHz
Ant. Polarization(s)	:	HORIZONTAL
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	TESTED WITH ANTENNA #1 AND 43cm COAX
Test Engineer	:	M. Longinotti
Test Date	:	Sep 20, 2019 10:06:34 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

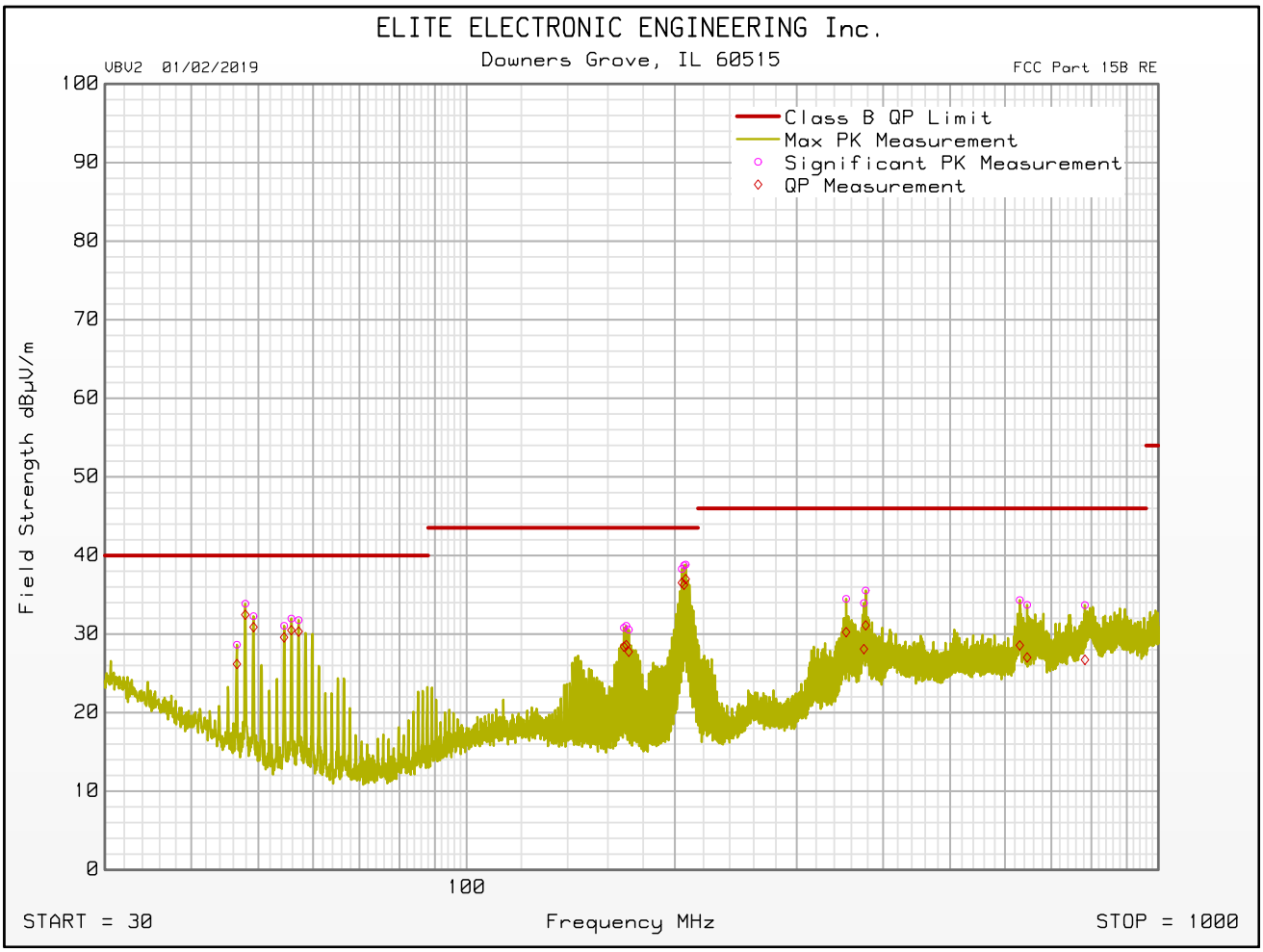
Manufacturer : CHAMBERLAIN
Model : ESARM
Serial Number : SAMPLE #1
DUT Mode : RECEIVE AT 433.3MHz
Scan Type : Stepped Scan
Test RBW : 120 kHz
Prelim Dwell Time (s) : 0.0001
Notes : TESTED WITH ANTENNA #1 AND 43cm COAX
Test Engineer : M. Longinotti
Test Date : Sep 19, 2019 10:58:58 AM

Freq MHz	Peak Mtr Rdg dBuV	QP Mtr Rdg dBuV	Ant Fac dB	Amp Fac dB	Cbl Fac dB	Dist Corr dB	Peak Total dBµV/m	QP Total dBµV/m	QP Limit dBµV/m	QP Lim Mrg dB	Ant Pol	Mast Ht cm	Azim °
46.560	12.6	10.2	15.5	0.0	0.5	0.0	28.6	26.2	40.0	-13.8	V	120	180
47.880	18.4	17.0	14.9	0.0	0.5	0.0	33.9	32.5	40.0	-7.5	V	120	135
49.200	17.4	16.0	14.4	0.0	0.5	0.0	32.3	30.9	40.0	-9.1	V	120	45
54.480	17.6	16.2	12.9	0.0	0.5	0.0	31.0	29.6	40.0	-10.4	V	120	45
55.800	18.8	17.3	12.7	0.0	0.5	0.0	32.0	30.5	40.0	-9.5	V	120	135
57.180	18.7	17.3	12.5	0.0	0.5	0.0	31.8	30.3	40.0	-9.7	V	120	90
168.820	14.1	11.8	15.8	0.0	0.9	0.0	30.8	28.4	43.5	-15.1	V	120	180
170.140	14.4	12.0	15.7	0.0	0.9	0.0	31.1	28.6	43.5	-14.9	V	120	180
171.580	13.9	11.1	15.7	0.0	0.9	0.0	30.6	27.8	43.5	-15.8	V	120	180
204.700	21.9	20.2	15.4	0.0	1.0	0.0	38.3	36.5	43.5	-7.0	V	340	270
206.200	22.5	20.0	15.3	0.0	1.0	0.0	38.7	36.3	43.5	-7.2	V	340	315
207.340	22.6	20.8	15.2	0.0	1.0	0.0	38.8	37.0	43.5	-6.5	V	340	270
353.640	12.8	8.5	20.4	0.0	1.3	0.0	34.5	30.2	46.0	-15.8	V	120	180
375.240	11.7	5.9	20.8	0.0	1.4	0.0	33.9	28.1	46.0	-17.9	V	120	45
377.400	13.3	8.8	20.9	0.0	1.4	0.0	35.5	31.1	46.0	-14.9	V	120	180
630.360	7.7	2.0	25.0	0.0	1.6	0.0	34.3	28.6	46.0	-17.4	V	200	180
646.080	7.3	0.6	24.8	0.0	1.6	0.0	33.7	27.0	46.0	-19.0	V	200	180
782.940	5.9	-1.1	25.9	0.0	2.0	0.0	33.7	26.7	46.0	-19.3	V	120	225

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

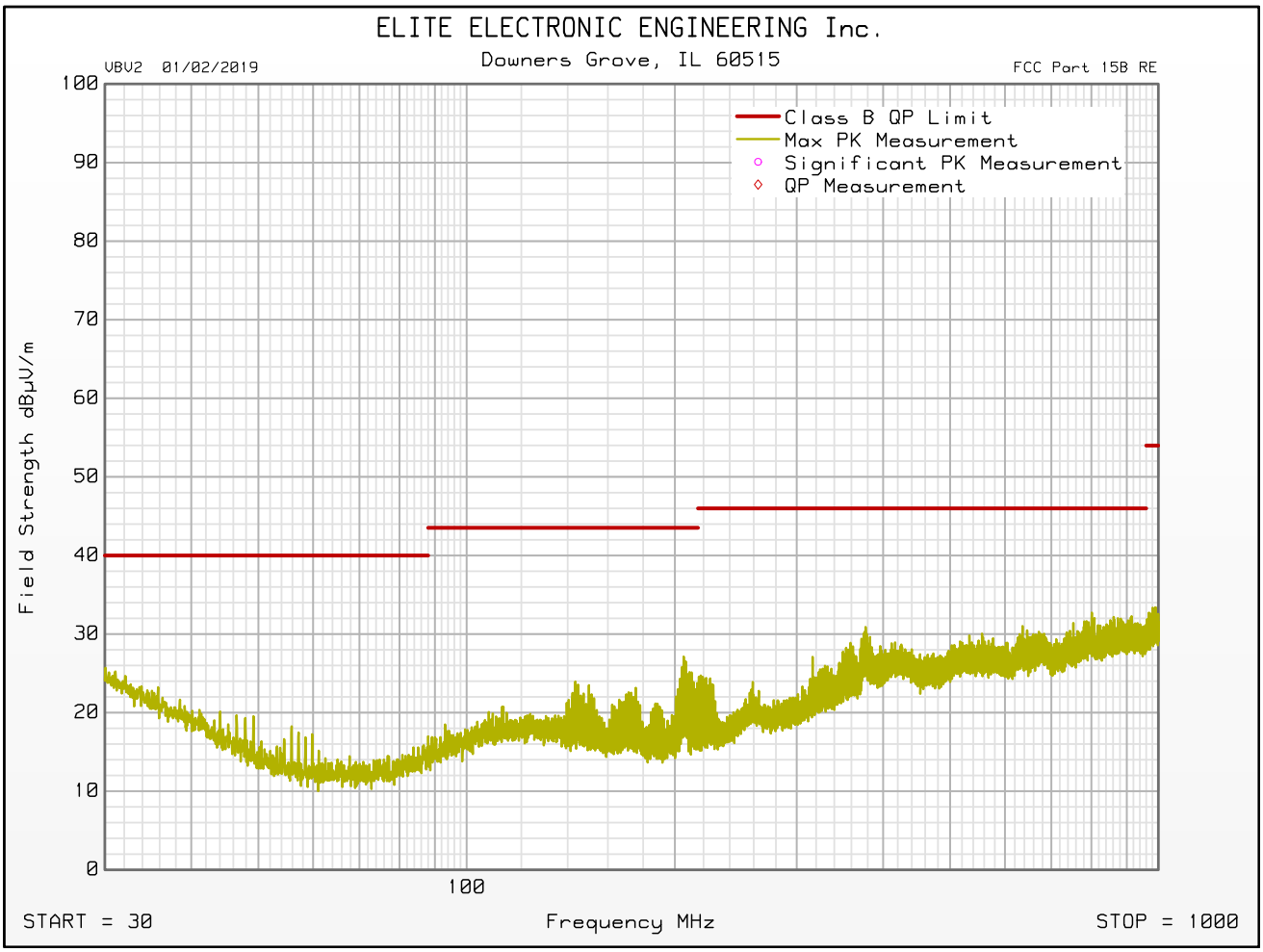
Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	RECEIVE AT 433.3MHz
Ant. Polarization(s)	:	VERTICAL
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	TESTED WITH ANTENNA #1 AND 43cm COAX
Test Engineer	:	M. Longinotti
Test Date	:	Sep 19, 2019 10:58:58 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	RECEIVE AT 433.3MHz
Ant. Polarization(s)	:	HORIZONTAL
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	TESTED WITH ANTENNA #1 AND 43cm COAX
Test Engineer	:	M. Longinotti
Test Date	:	Sep 19, 2019 10:58:58 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

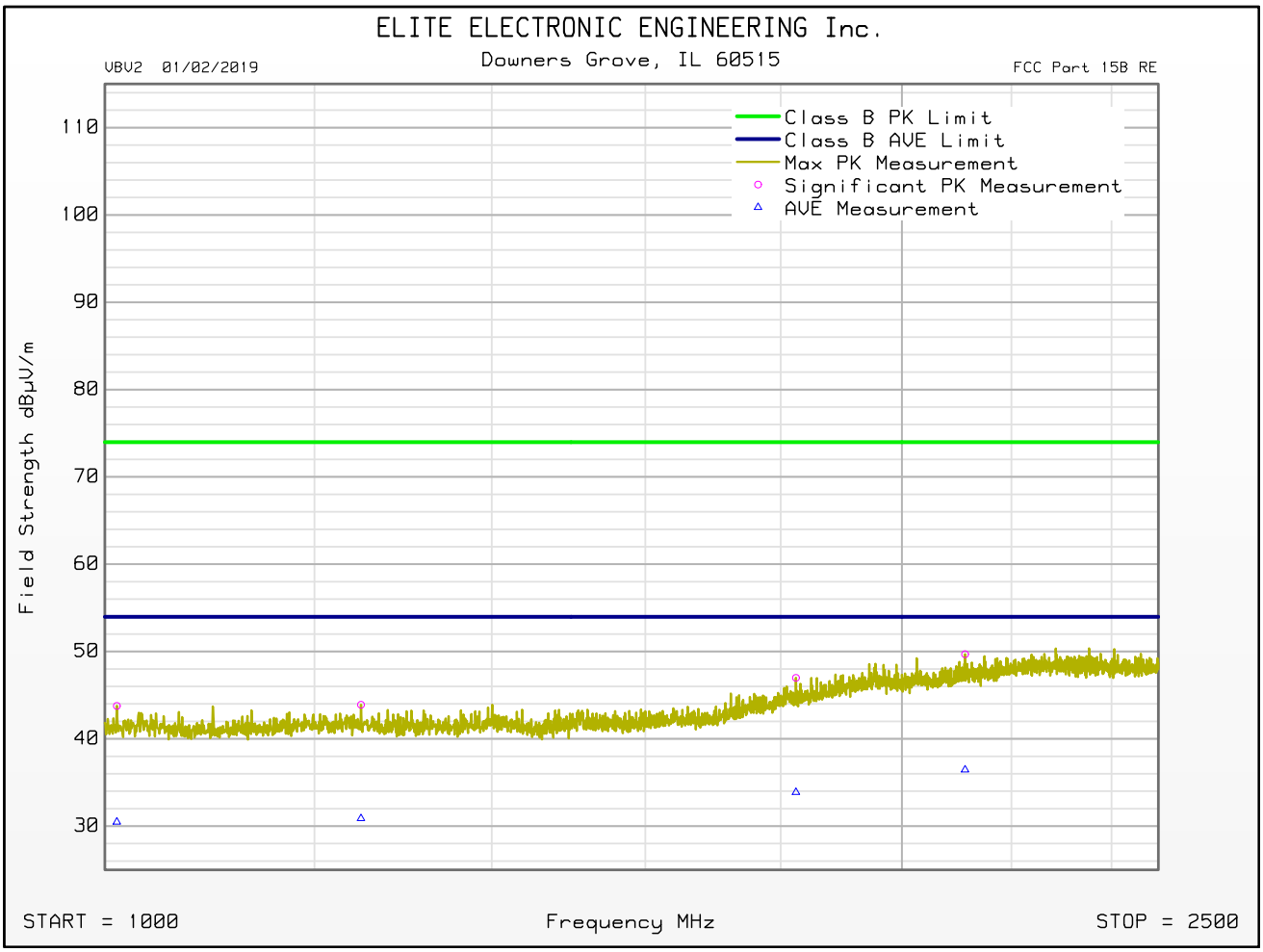
Manufacturer : CHAMBERLAIN
Model : ESARM
Serial Number : SAMPLE #1
DUT Mode : RECEIVE AT 433.3MHz
Scan Type : Stepped Scan
Test RBW : 1 MHz
Prelim Dwell Time (s) : 0.0001
Notes : TESTED WITH ANTENNA #1 AND 43cm COAX
Test Engineer : M. Longinotti
Test Date : Sep 20, 2019 10:22:11 AM

Freq MHz	Peak Mtr Rdg dBuV	Average Mtr Rdg dBuV	Ant Fac dB	Amp Fac dB	Cbl Fac dB	Dist Corr dB	Peak Total dBµV/m	Peak Limit dBµV/m	Peak Lim Mrg dB	Average Total dBµV/m	Average Limit dBµV/m	Average Lim Mrg dB	Ant Pol	Mast Ht cm	Azim °
1010.500	12.8	-0.5	29.0	0.0	2.0	0.0	43.8	74.0	-30.2	30.5	54.0	-23.5	V	200	225
1249.500	11.7	-1.3	29.9	0.0	2.3	0.0	43.9	74.0	-30.1	30.9	54.0	-23.1	V	120	45
1519.000	12.4	-0.9	29.2	0.0	2.6	0.0	44.2	74.0	-29.7	30.9	54.0	-23.0	H	200	225
1824.000	13.0	-0.1	31.1	0.0	2.9	0.0	47.0	74.0	-27.0	33.9	54.0	-20.1	V	200	0
2113.000	13.5	0.2	33.1	0.0	3.1	0.0	49.7	74.0	-24.3	36.5	54.0	-17.5	V	340	315
2226.500	13.5	0.2	33.8	0.0	3.2	0.0	50.5	74.0	-23.5	37.2	54.0	-16.8	H	340	315

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

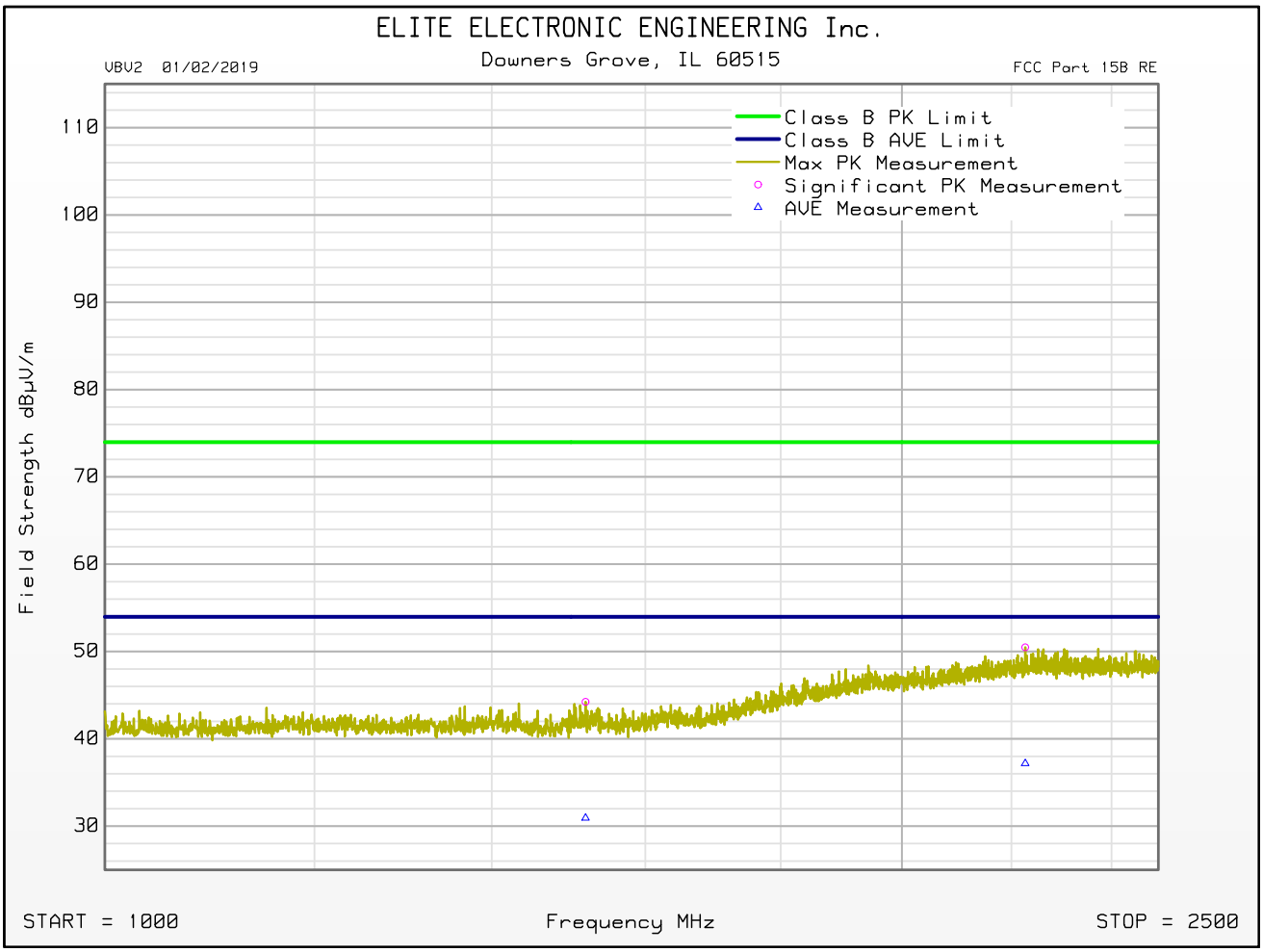
Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	RECEIVE AT 433.3MHz
Ant. Polarization(s)	:	VERTICAL
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	TESTED WITH ANTENNA #1 AND 43cm COAX
Test Engineer	:	M. Longinotti
Test Date	:	Sep 20, 2019 10:22:11 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	RECEIVE AT 433.3MHz
Ant. Polarization(s)	:	HORIZONTAL
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	TESTED WITH ANTENNA #1 AND 43cm COAX
Test Engineer	:	M. Longinotti
Test Date	:	Sep 20, 2019 10:22:11 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

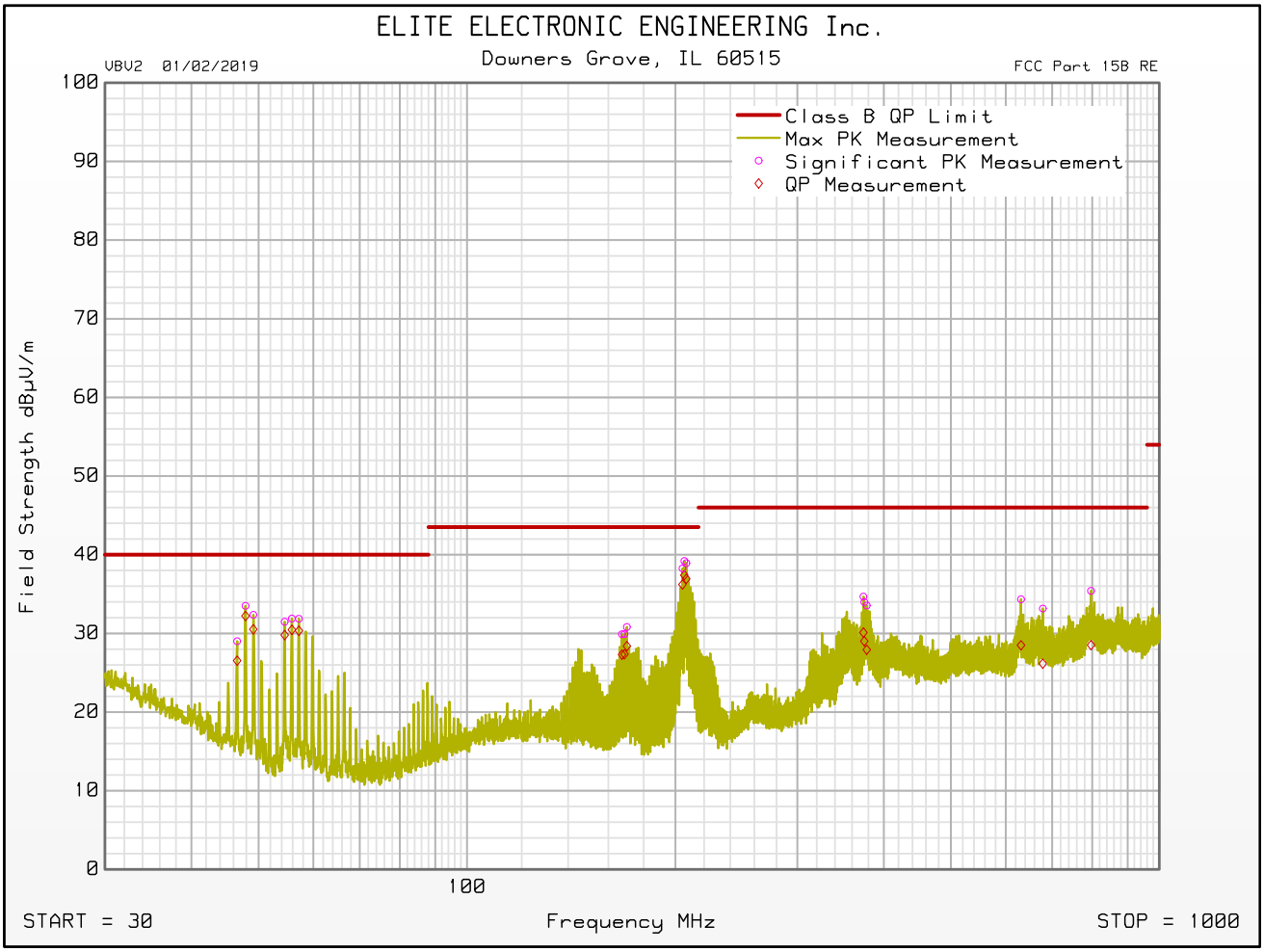
Manufacturer : CHAMBERLAIN
Model : ESARM
Serial Number : SAMPLE #1
DUT Mode : RECEIVE AT 434.54MHz
Scan Type : Stepped Scan
Test RBW : 120 kHz
Prelim Dwell Time (s) : 0.0001
Notes : TESTED WITH ANTENNA #1 AND 43cm COAX
Test Engineer : M. Longinotti
Test Date : Sep 19, 2019 11:17:50 AM

Freq MHz	Peak Mtr Rdg dBuV	QP Mtr Rdg dBuV	Ant Fac dB	Amp Fac dB	Cbl Fac dB	Dist Corr dB	Peak Total dBµV/m	QP Total dBµV/m	QP Limit dBµV/m	QP Lim Mrg dB	Ant Pol	Mast Ht cm	Azim °
46.560	13.0	10.5	15.5	0.0	0.5	0.0	29.0	26.5	40.0	-13.5	V	120	0
47.880	18.1	16.8	14.9	0.0	0.5	0.0	33.5	32.2	40.0	-7.8	V	120	180
49.140	17.5	15.6	14.4	0.0	0.5	0.0	32.4	30.5	40.0	-9.5	V	120	180
54.540	18.1	16.4	12.9	0.0	0.5	0.0	31.5	29.8	40.0	-10.2	V	120	90
55.860	18.8	17.3	12.6	0.0	0.5	0.0	31.9	30.5	40.0	-9.5	V	120	90
57.180	18.8	17.3	12.5	0.0	0.5	0.0	31.9	30.3	40.0	-9.7	V	120	90
167.440	13.2	10.6	15.8	0.0	0.9	0.0	29.9	27.3	43.5	-16.2	V	120	225
168.820	13.3	10.7	15.8	0.0	0.9	0.0	29.9	27.4	43.5	-16.2	V	120	225
170.200	14.2	11.8	15.7	0.0	0.9	0.0	30.8	28.4	43.5	-15.1	V	120	180
204.760	21.9	19.8	15.4	0.0	1.0	0.0	38.3	36.2	43.5	-7.3	V	340	315
206.020	22.9	21.1	15.3	0.0	1.0	0.0	39.2	37.4	43.5	-6.1	V	340	270
207.400	22.7	20.8	15.2	0.0	1.0	0.0	38.9	36.9	43.5	-6.6	V	340	270
373.740	12.5	7.9	20.8	0.0	1.4	0.0	34.7	30.1	46.0	-15.9	V	120	45
374.880	11.8	6.8	20.8	0.0	1.4	0.0	34.0	29.0	46.0	-17.0	V	120	135
377.940	11.2	5.6	20.9	0.0	1.4	0.0	33.5	27.9	46.0	-18.1	V	120	180
631.260	7.7	1.9	25.0	0.0	1.6	0.0	34.3	28.5	46.0	-17.5	V	200	180
678.720	6.4	-0.6	25.1	0.0	1.7	0.0	33.2	26.2	46.0	-19.8	V	200	180
796.740	7.5	0.6	25.9	0.0	2.0	0.0	35.4	28.5	46.0	-17.5	V	120	135

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

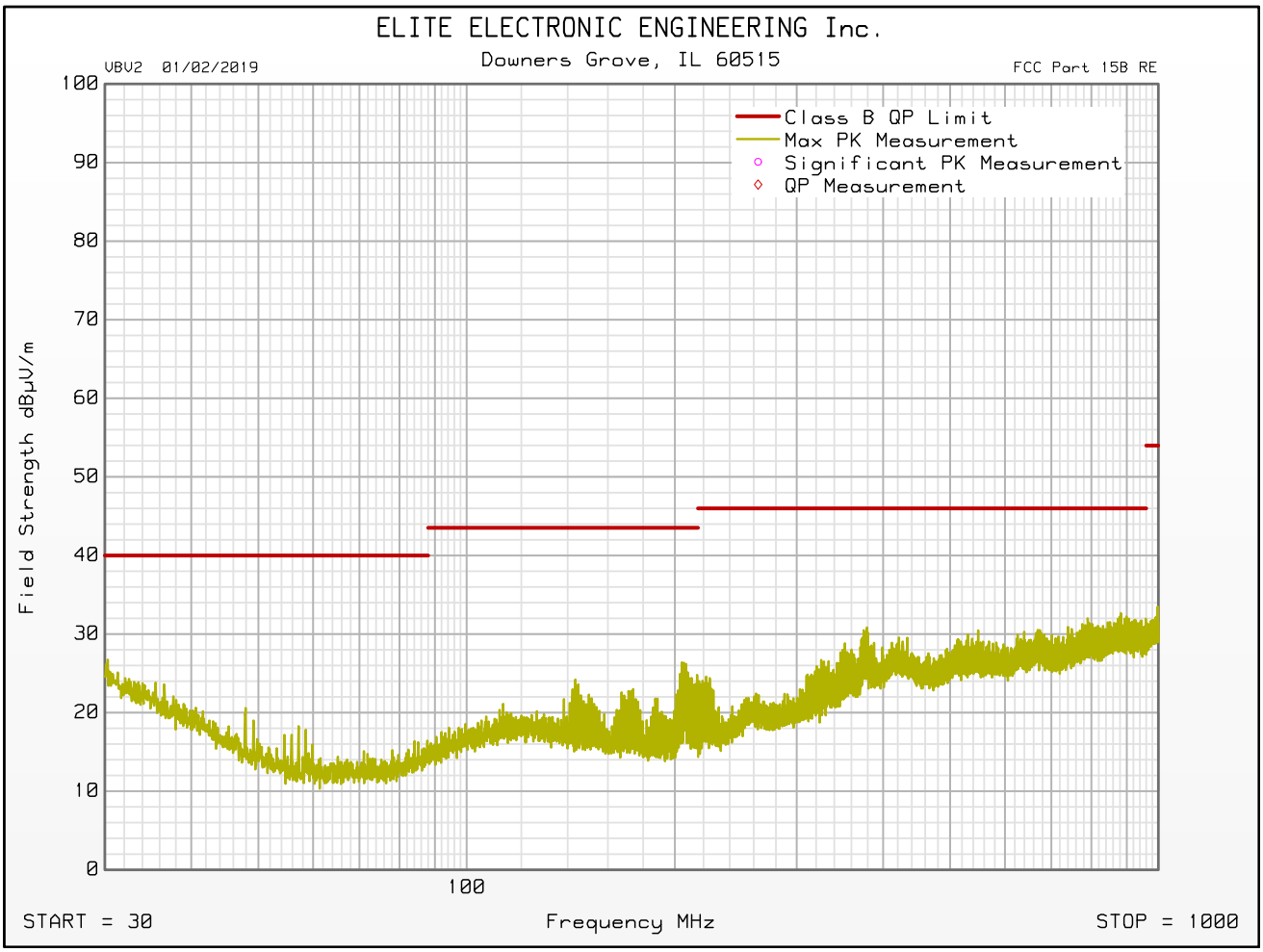
Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	RECEIVE AT 434.54MHz
Ant. Polarization(s)	:	VERTICAL
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	TESTED WITH ANTENNA #1 AND 43cm COAX
Test Engineer	:	M. Longinotti
Test Date	:	Sep 19, 2019 11:17:50 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	RECEIVE AT 434.54MHz
Ant. Polarization(s)	:	HORIZONTAL
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	TESTED WITH ANTENNA #1 AND 43cm COAX
Test Engineer	:	M. Longinotti
Test Date	:	Sep 19, 2019 11:17:50 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

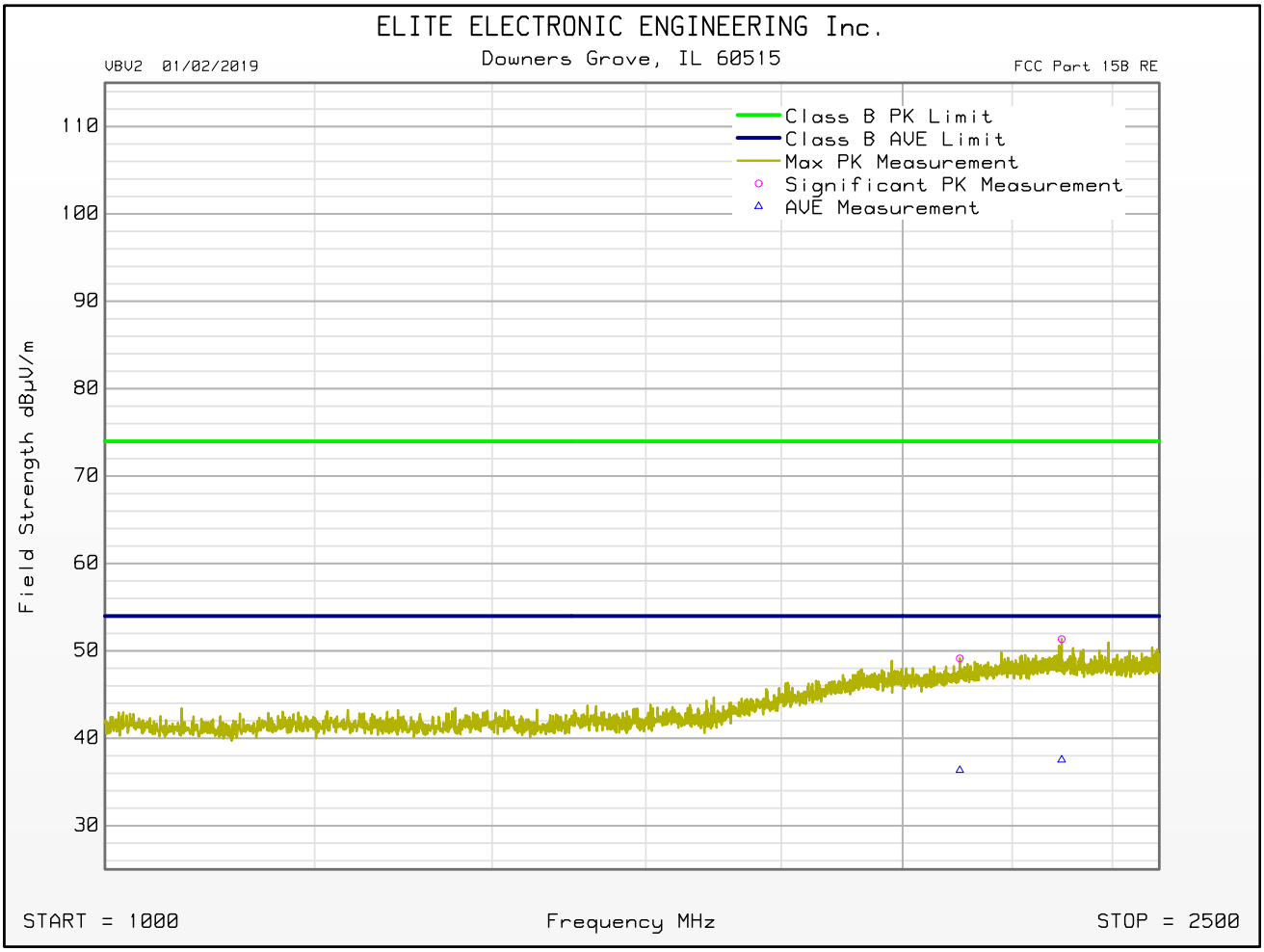
Manufacturer : CHAMBERLAIN
Model : ESARM
Serial Number : SAMPLE #1
DUT Mode : RECEIVE AT 434.54MHz
Scan Type : Stepped Scan
Test RBW : 1 MHz
Prelim Dwell Time (s) : 0.0001
Notes : TESTED WITH ANTENNA #1 AND 43cm COAX
Test Engineer : M. Longinotti
Test Date : Sep 20, 2019 11:28:52 AM

Freq MHz	Peak Mtr Rdg dBuV	Average Mtr Rdg dBuV	Ant Fac dB	Amp Fac dB	Cbl Fac dB	Dist Corr dB	Peak Total dBµV/m	Peak Limit dBµV/m	Peak Lim Mrg dB	Average Total dBµV/m	Average Limit dBµV/m	Average Lim Mrg dB	Ant Pol	Mast Ht cm	Azim °
1000.000	13.8	-1.6	29.0	0.0	2.0	0.0	44.8	74.0	-29.2	29.4	54.0	-24.6	H	200	225
1255.500	11.7	-1.4	29.8	0.0	2.3	0.0	43.8	74.0	-30.1	30.8	54.0	-23.2	H	340	225
1513.000	12.0	-0.9	29.3	0.0	2.6	0.0	43.8	74.0	-30.1	30.9	54.0	-23.1	H	200	90
1831.000	13.4	-0.1	31.2	0.0	2.9	0.0	47.5	74.0	-26.5	34.0	54.0	-20.0	H	200	270
2102.000	13.0	0.2	33.0	0.0	3.1	0.0	49.1	74.0	-24.8	36.3	54.0	-17.6	V	340	0
2296.500	14.2	0.4	33.8	0.0	3.3	0.0	51.3	74.0	-22.6	37.5	54.0	-16.4	V	120	45

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

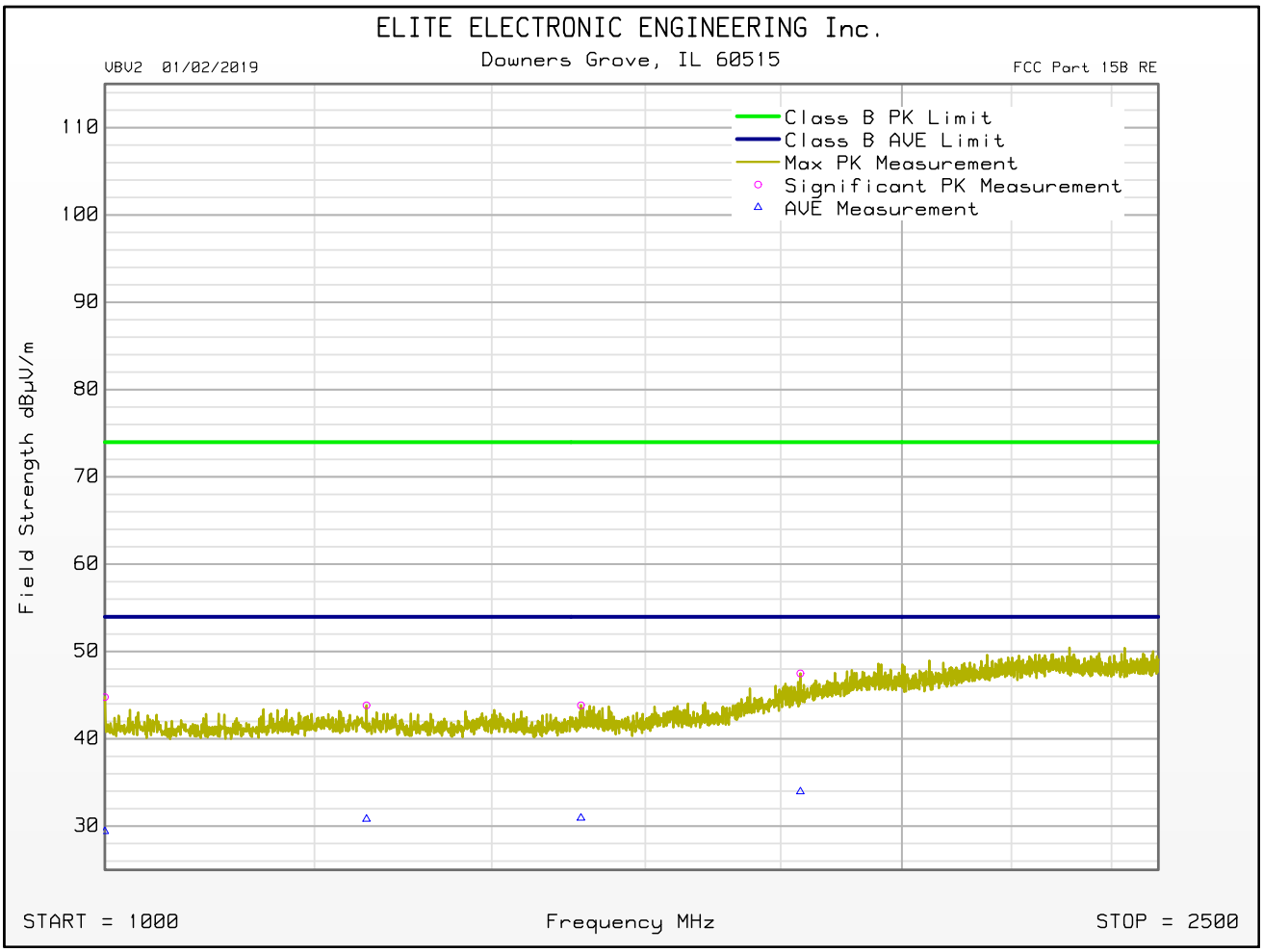
Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	RECEIVE AT 434.54MHz
Ant. Polarization(s)	:	VERTICAL
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	TESTED WITH ANTENNA #1 AND 43cm COAX
Test Engineer	:	M. Longinotti
Test Date	:	Sep 20, 2019 11:28:52 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	RECEIVE AT 434.54MHz
Ant. Polarization(s)	:	HORIZONTAL
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	TESTED WITH ANTENNA #1 AND 43cm COAX
Test Engineer	:	M. Longinotti
Test Date	:	Sep 20, 2019 11:28:52 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

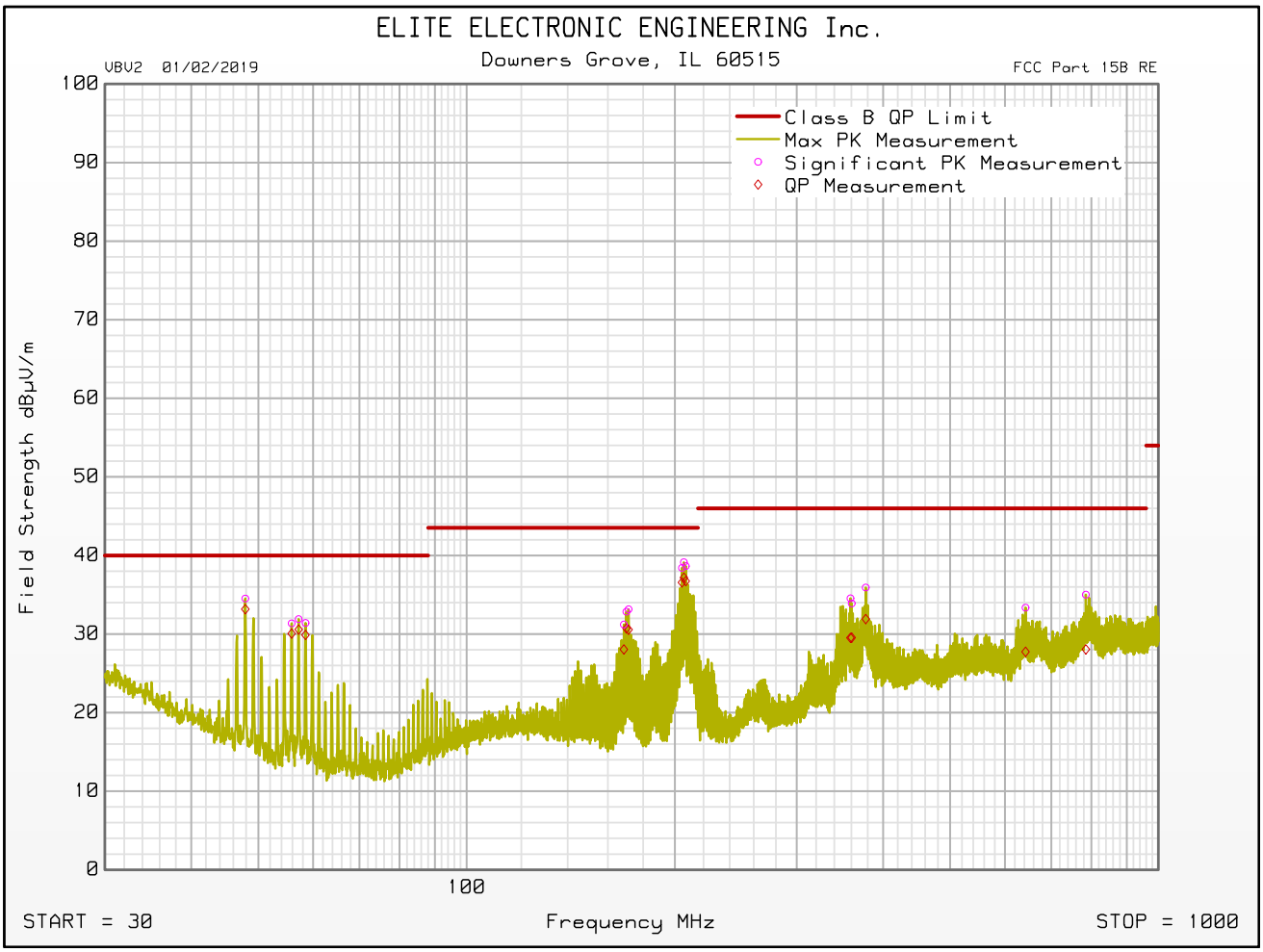
Manufacturer : CHAMBERLAIN
Model : ESARM
Serial Number : SAMPLE #1
DUT Mode : RECEIVER HOPPING
Scan Type : Stepped Scan
Test RBW : 120 kHz
Prelim Dwell Time (s) : 0.0001
Notes : TESTED WITH ANTENNA #1 AND 43cm COAX
Test Engineer : M. Longinotti
Test Date : Sep 19, 2019 09:31:45 AM

Freq MHz	Peak Mtr Rdg dBuV	QP Mtr Rdg dBuV	Ant Fac dB	Amp Fac dB	Cbl Fac dB	Dist Corr dB	Peak Total dBµV/m	QP Total dBµV/m	QP Limit dBµV/m	QP Lim Mrg dB	Ant Pol	Mast Ht cm	Azim °
32.100	10.7	-3.1	21.3	0.0	0.5	0.0	32.5	18.7	40.0	-21.3	H	340	45
33.060	10.7	-3.5	21.0	0.0	0.5	0.0	32.1	18.0	40.0	-22.0	H	340	45
47.880	19.1	17.7	14.9	0.0	0.5	0.0	34.5	33.2	40.0	-6.8	V	120	90
55.860	18.2	16.9	12.6	0.0	0.5	0.0	31.4	30.1	40.0	-9.9	V	120	45
57.180	18.9	17.5	12.5	0.0	0.5	0.0	31.9	30.6	40.0	-9.4	V	120	135
58.500	18.5	16.9	12.5	0.0	0.5	0.0	31.4	29.9	40.0	-10.1	V	120	45
168.760	14.6	11.4	15.8	0.0	0.9	0.0	31.2	28.0	43.5	-15.5	V	120	180
170.200	16.2	14.1	15.7	0.0	0.9	0.0	32.8	30.7	43.5	-12.8	V	120	180
171.460	16.5	14.0	15.7	0.0	0.9	0.0	33.2	30.6	43.5	-13.0	V	120	180
204.760	22.0	20.2	15.4	0.0	1.0	0.0	38.4	36.6	43.5	-6.9	V	340	315
206.080	22.8	20.9	15.3	0.0	1.0	0.0	39.1	37.2	43.5	-6.3	V	340	270
207.400	22.5	20.5	15.2	0.0	1.0	0.0	38.6	36.7	43.5	-6.8	V	340	270
358.800	12.8	7.7	20.5	0.0	1.3	0.0	34.5	29.5	46.0	-16.5	V	120	180
360.240	12.1	7.7	20.5	0.0	1.3	0.0	33.9	29.5	46.0	-16.5	V	120	180
377.520	13.6	9.6	20.9	0.0	1.4	0.0	35.9	31.9	46.0	-14.1	V	120	180
642.540	6.9	1.3	24.8	0.0	1.6	0.0	33.4	27.7	46.0	-18.3	V	200	180
785.400	7.1	0.2	25.9	0.0	2.0	0.0	35.0	28.1	46.0	-17.9	V	120	225

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

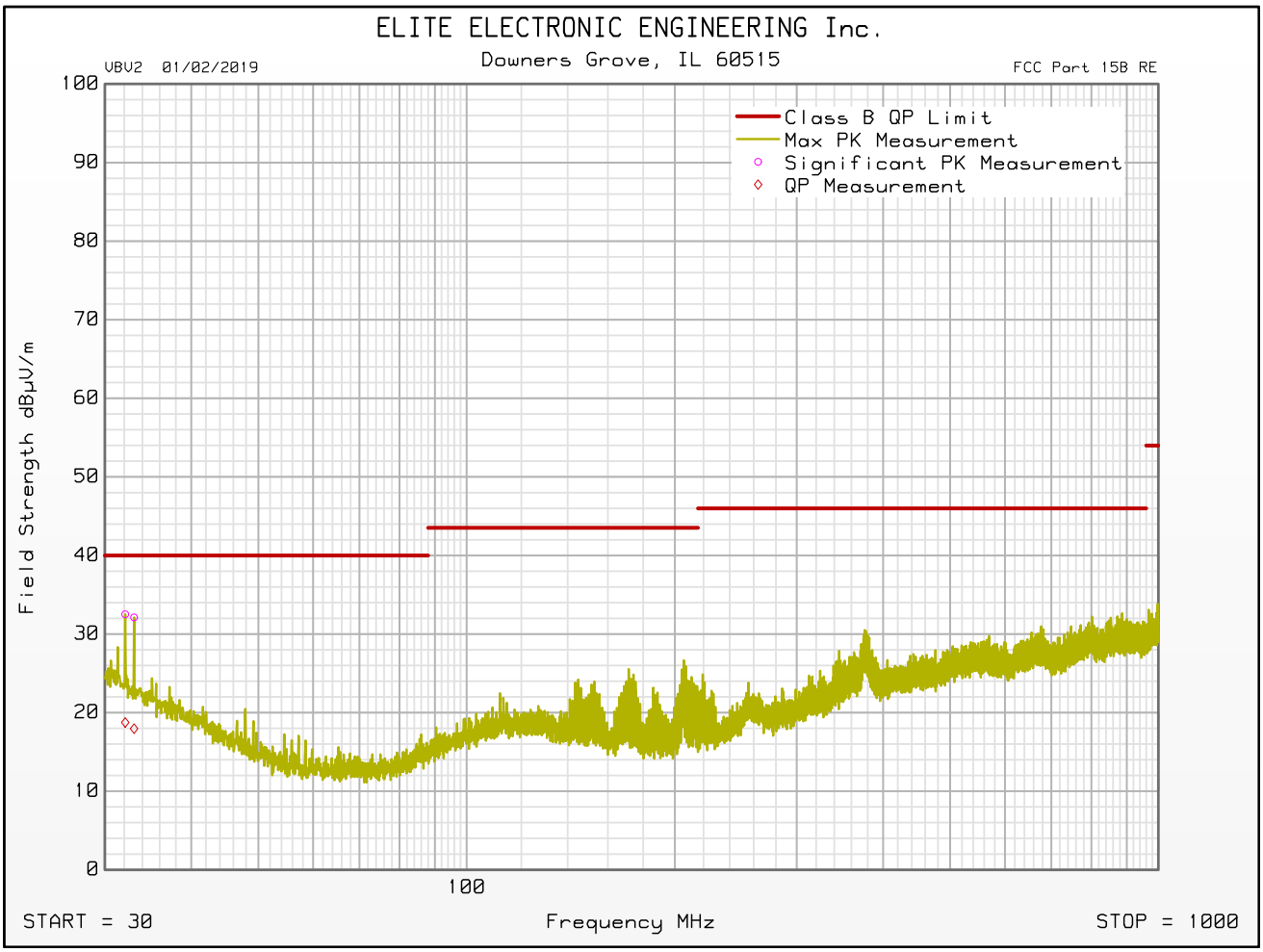
Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	RECEIVER HOPPING
Ant. Polarization(s)	:	VERTICAL
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	TESTED WITH ANTENNA #1 AND 43cm COAX
Test Engineer	:	M. Longinotti
Test Date	:	Sep 19, 2019 09:31:45 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	RECEIVER HOPPING
Ant. Polarization(s)	:	HORIZONTAL
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	TESTED WITH ANTENNA #1 AND 43cm COAX
Test Engineer	:	M. Longinotti
Test Date	:	Sep 19, 2019 09:31:45 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

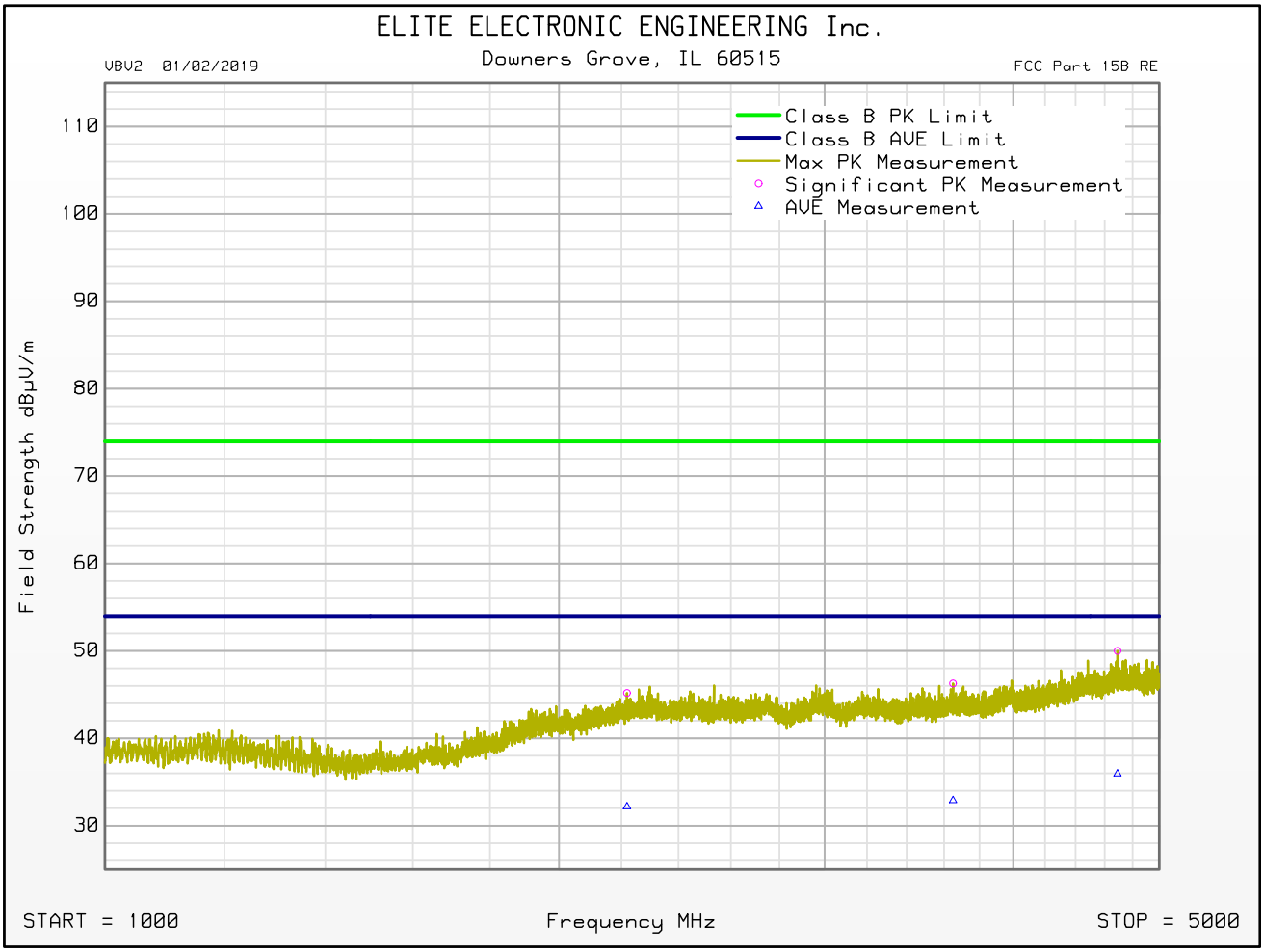
Manufacturer : CHAMBERLAIN
Model : ESARM
Serial Number : SAMPLE #1
DUT Mode : RECEIVER HOPPING
Scan Type : Stepped Scan
Test RBW : 1 MHz
Prelim Dwell Time (s) : 0.0001
Notes : TESTED WITH ANTENNA #1 AND 43cm COAX
Test Engineer : M. Longinotti
Test Date : Sep 26, 2019 01:25:17 PM

Freq MHz	Peak Mtr Rdg dBuV	Average Mtr Rdg dBuV	Ant Fac dB	Amp Fac dB	Cbl Fac dB	Dist Corr dB	Peak Total dBµV/m	Peak Limit dBµV/m	Peak Lim Mrg dB	Average Total dBµV/m	Average Limit dBµV/m	Average Lim Mrg dB	Ant Pol	Mast Ht cm	Azim °
1071.500	51.3	38.8	29.2	-41.0	2.1	0.0	41.6	74.0	-32.3	29.1	54.0	-24.9	H	340	180
1680.000	49.1	35.3	29.7	-41.0	2.7	0.0	40.5	74.0	-33.4	26.8	54.0	-27.2	H	340	45
2218.500	48.5	35.5	33.7	-40.2	3.2	0.0	45.2	74.0	-28.8	32.2	54.0	-21.8	V	200	90
2447.500	50.1	35.9	33.6	-40.3	3.4	0.0	46.9	74.0	-27.1	32.6	54.0	-21.4	H	340	0
3649.000	47.5	34.1	34.6	-40.1	4.3	0.0	46.3	74.0	-27.7	32.9	54.0	-21.1	V	120	315
4691.000	48.5	34.4	36.7	-40.0	4.9	0.0	50.0	74.0	-24.0	35.9	54.0	-18.0	V	340	45

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

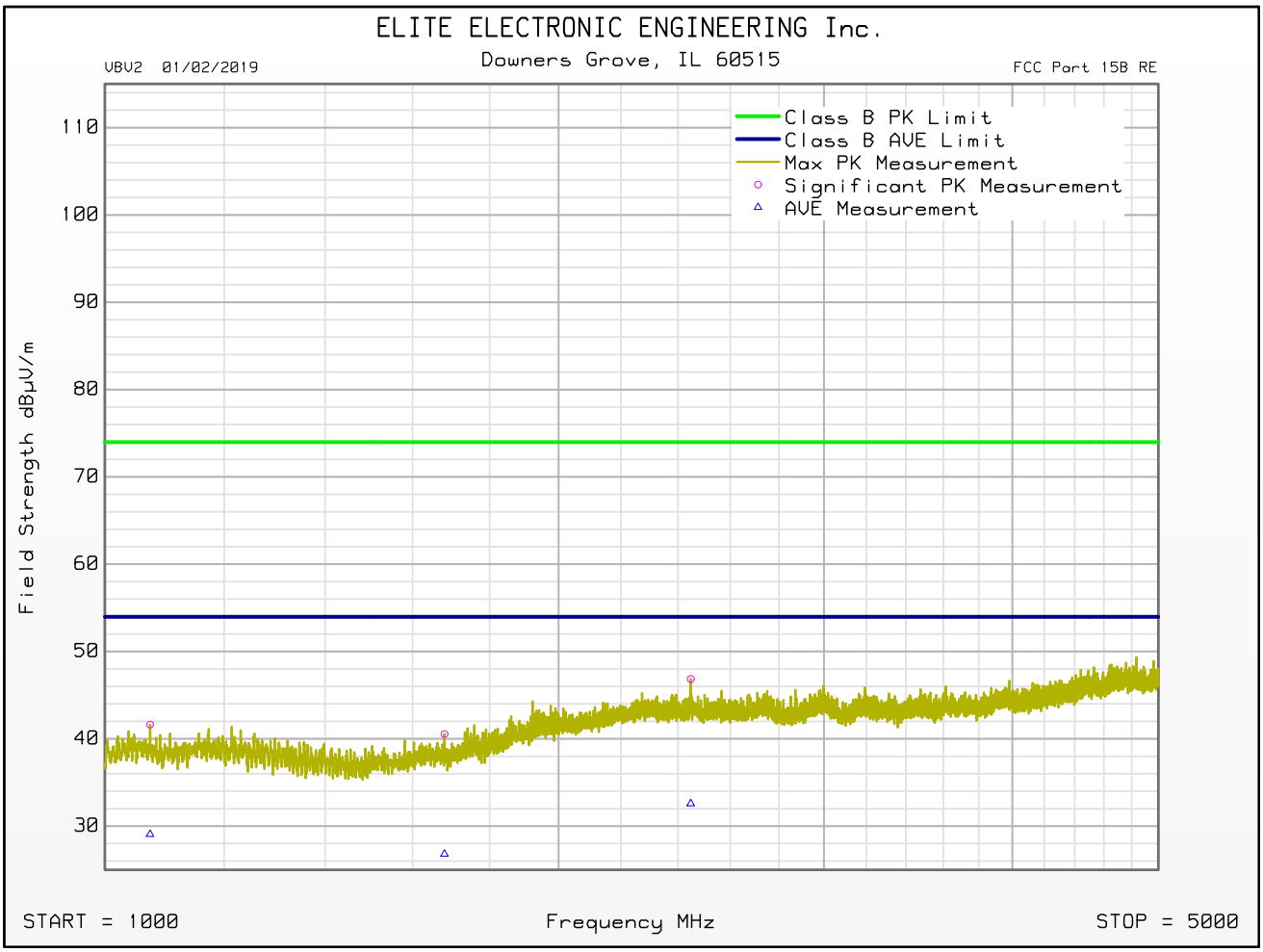
Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	RECEIVER HOPPING
Ant. Polarization(s)	:	VERTICAL
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	TESTED WITH ANTENNA #1 AND 43cm COAX
Test Engineer	:	M. Longinotti
Test Date	:	Sep 26, 2019 01:25:17 PM



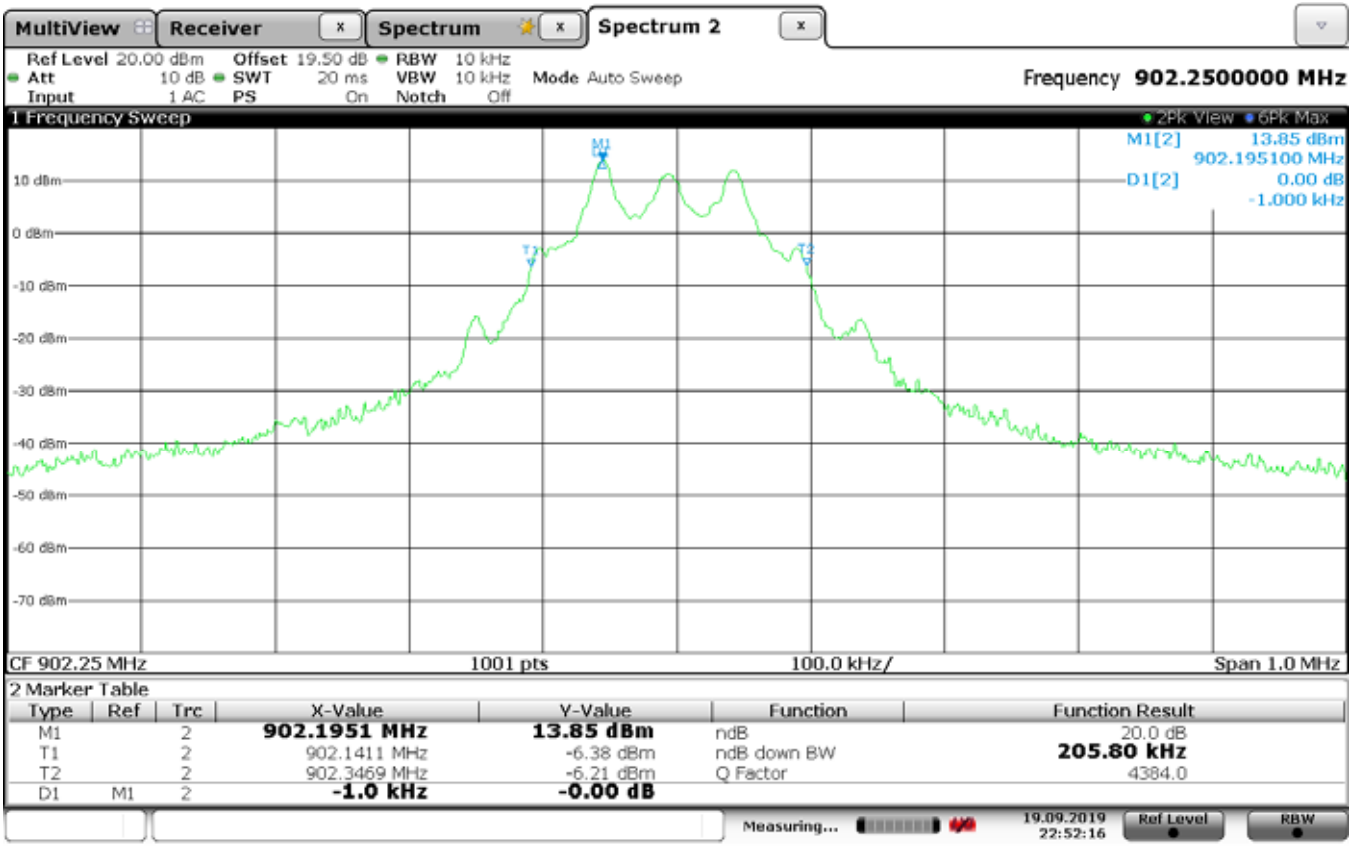
FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	RECEIVER HOPPING
Ant. Polarization(s)	:	HORIZONTAL
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	TESTED WITH ANTENNA #1 AND 43cm COAX
Test Engineer	:	M. Longinotti
Test Date	:	Sep 26, 2019 01:25:17 PM

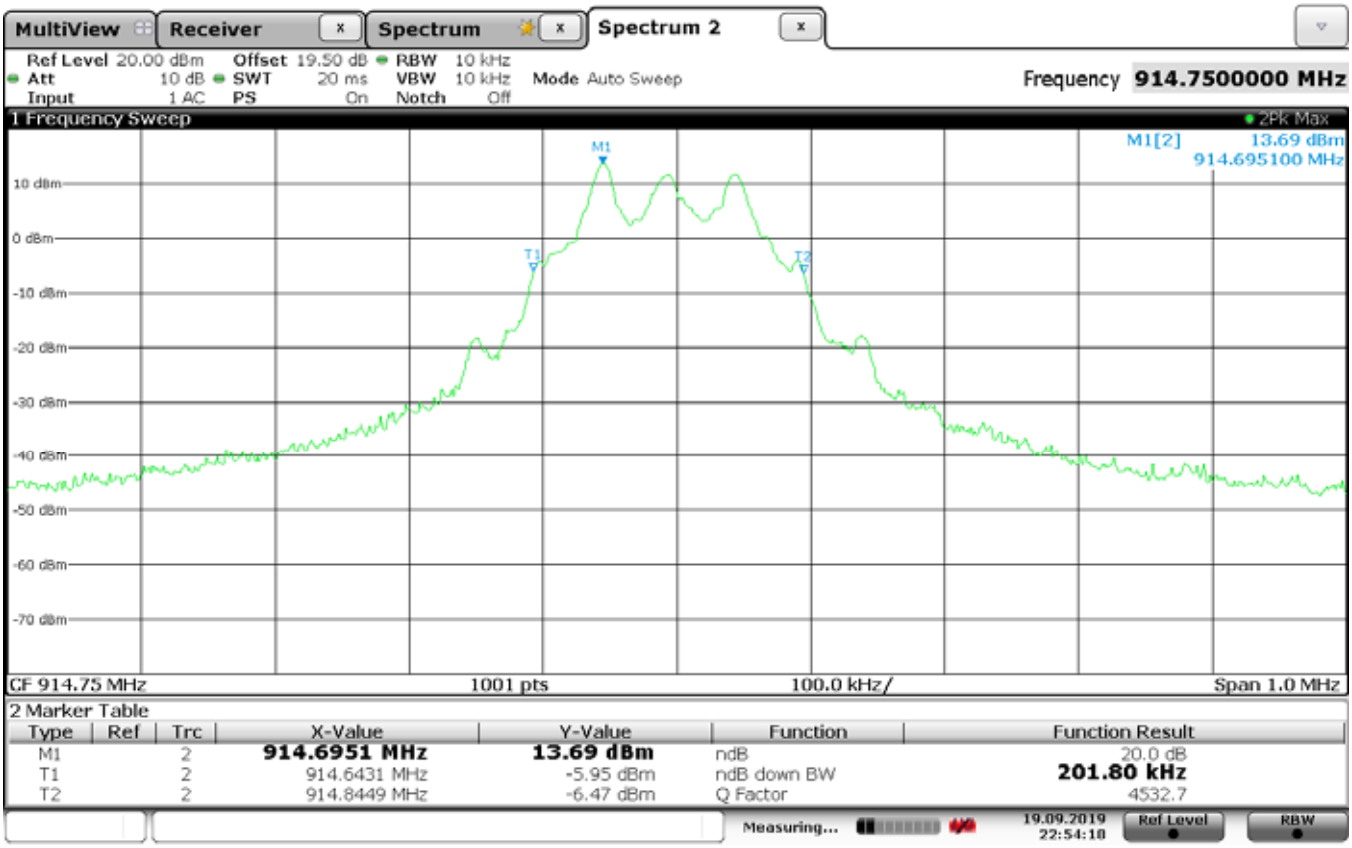


Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	TRANSMIT AT 902.25MHz
Test Performed	:	20dB BANDWIDTH
Notes	:	ANTENNA PORT CONDCUTED
Notes	:	20dB BANDWIDTH = 205.8kHz



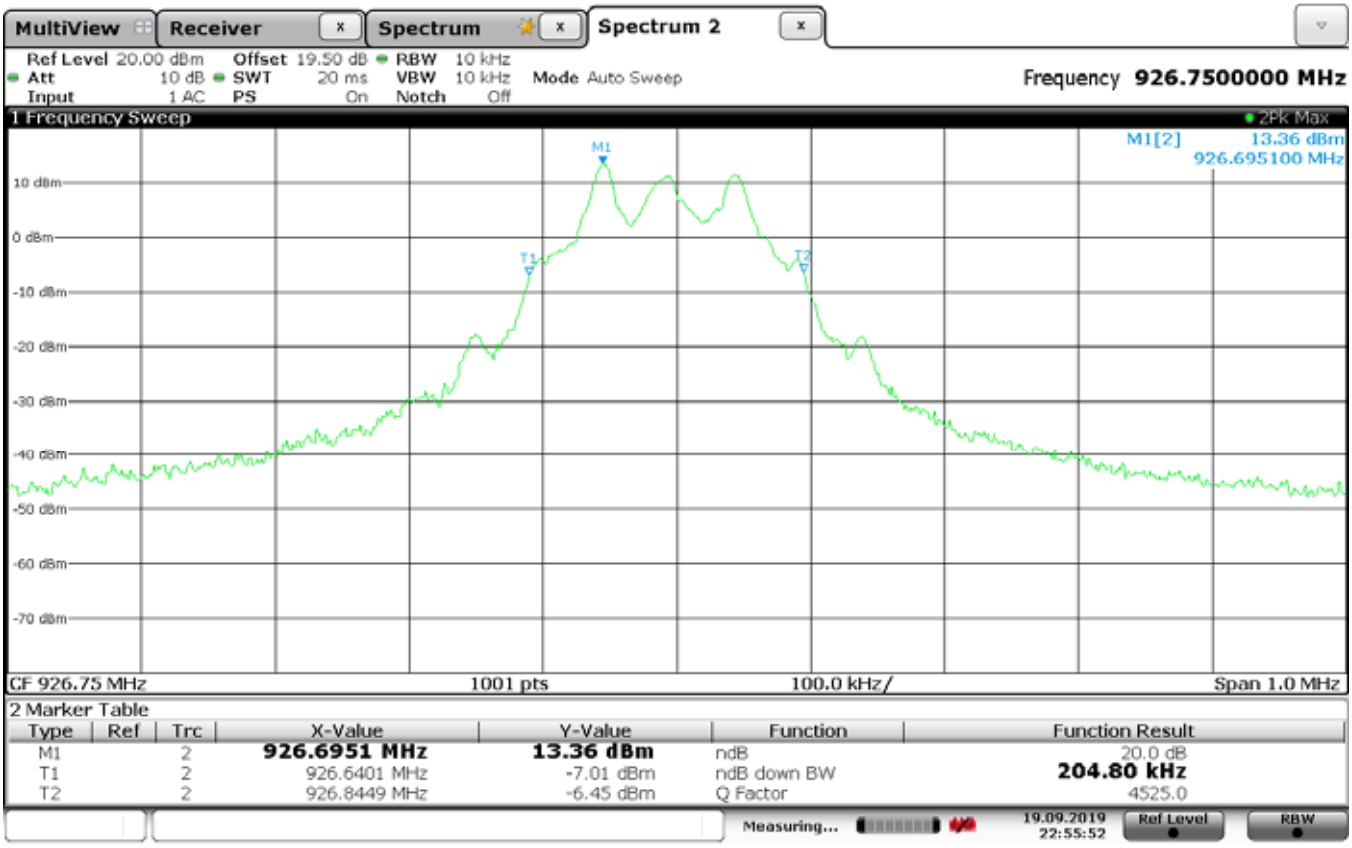
Date: 19.SEP.2019 22:52:16

Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	TRANSMIT AT 914.75MHz
Test Performed	:	20dB BANDWIDTH
Notes	:	ANTENNA PORT CONDCUTED
Notes	:	20dB BANDWIDTH = 201.8kHz



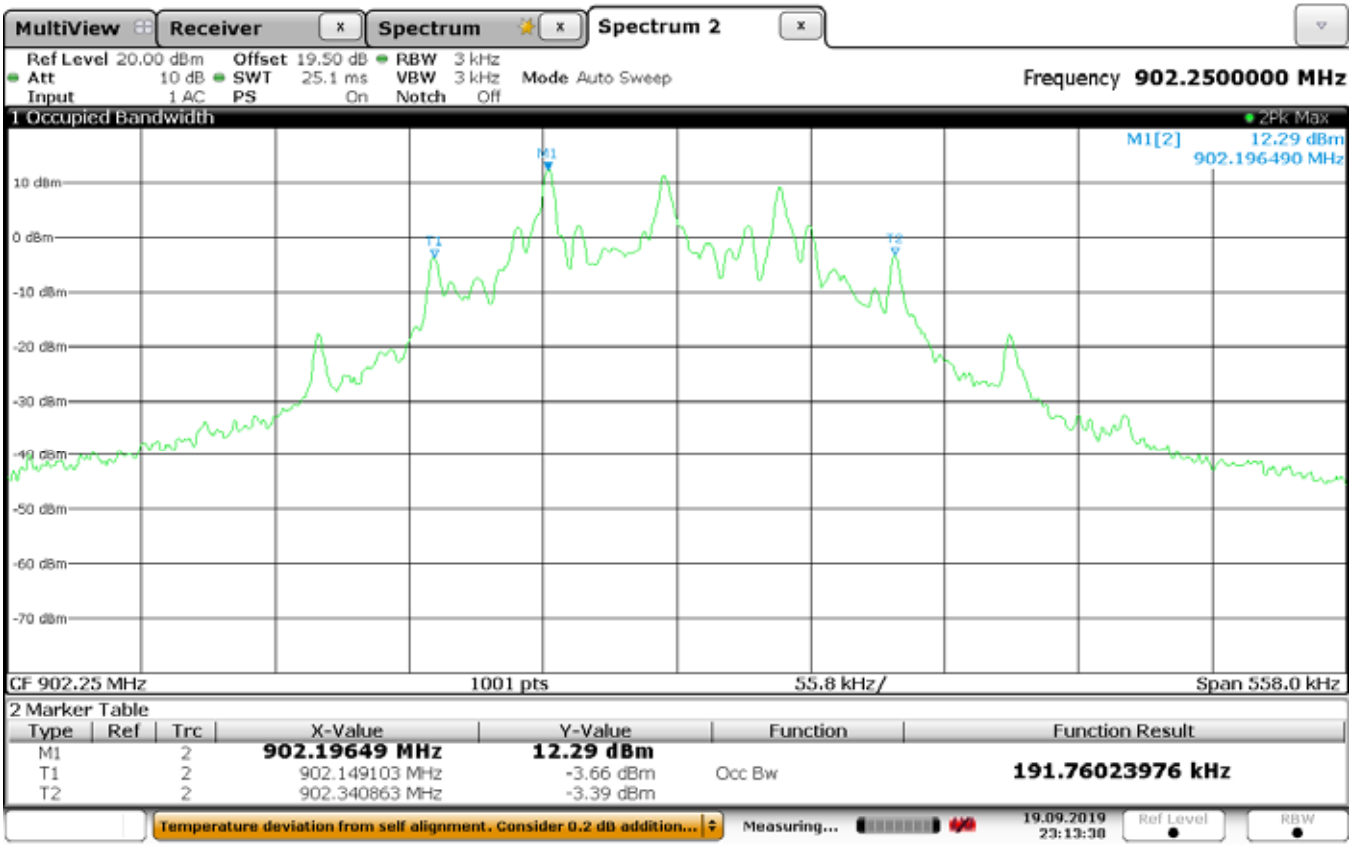
Date: 19.SEP.2019 22:54:18

Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	TRANSMIT AT 926.75MHz
Test Performed	:	20dB BANDWIDTH
Notes	:	ANTENNA PORT CONDCUTED
Notes	:	20dB BANDWIDTH = 204.8kHz



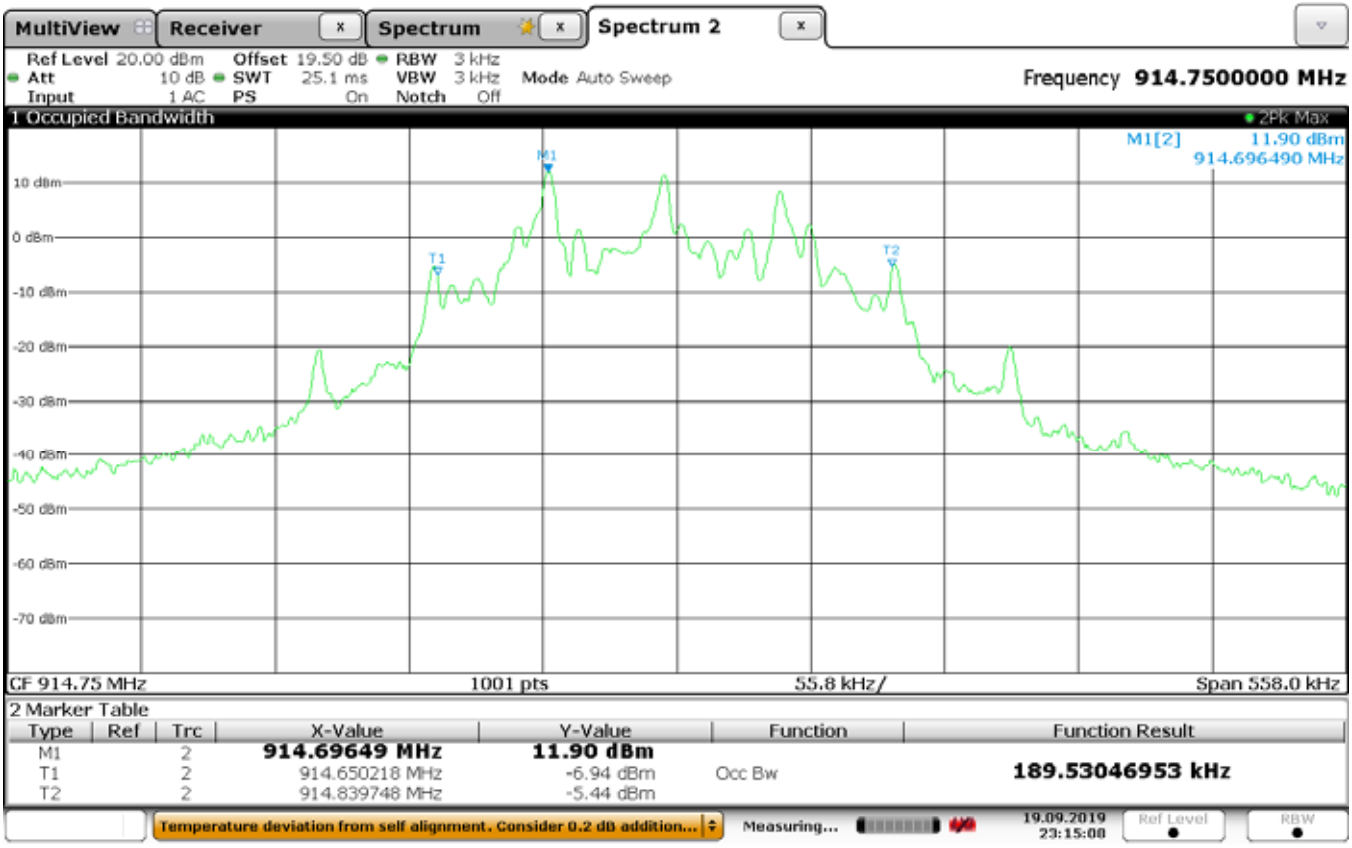
Date: 19.SEP.2019 22:55:51

Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	TRANSMIT AT 902.25MHz
Test Performed	:	99% BANDWIDTH
Notes	:	ANTENNA PORT CONDCUTED
Notes	:	99% BANDWIDTH = 191.76kHz



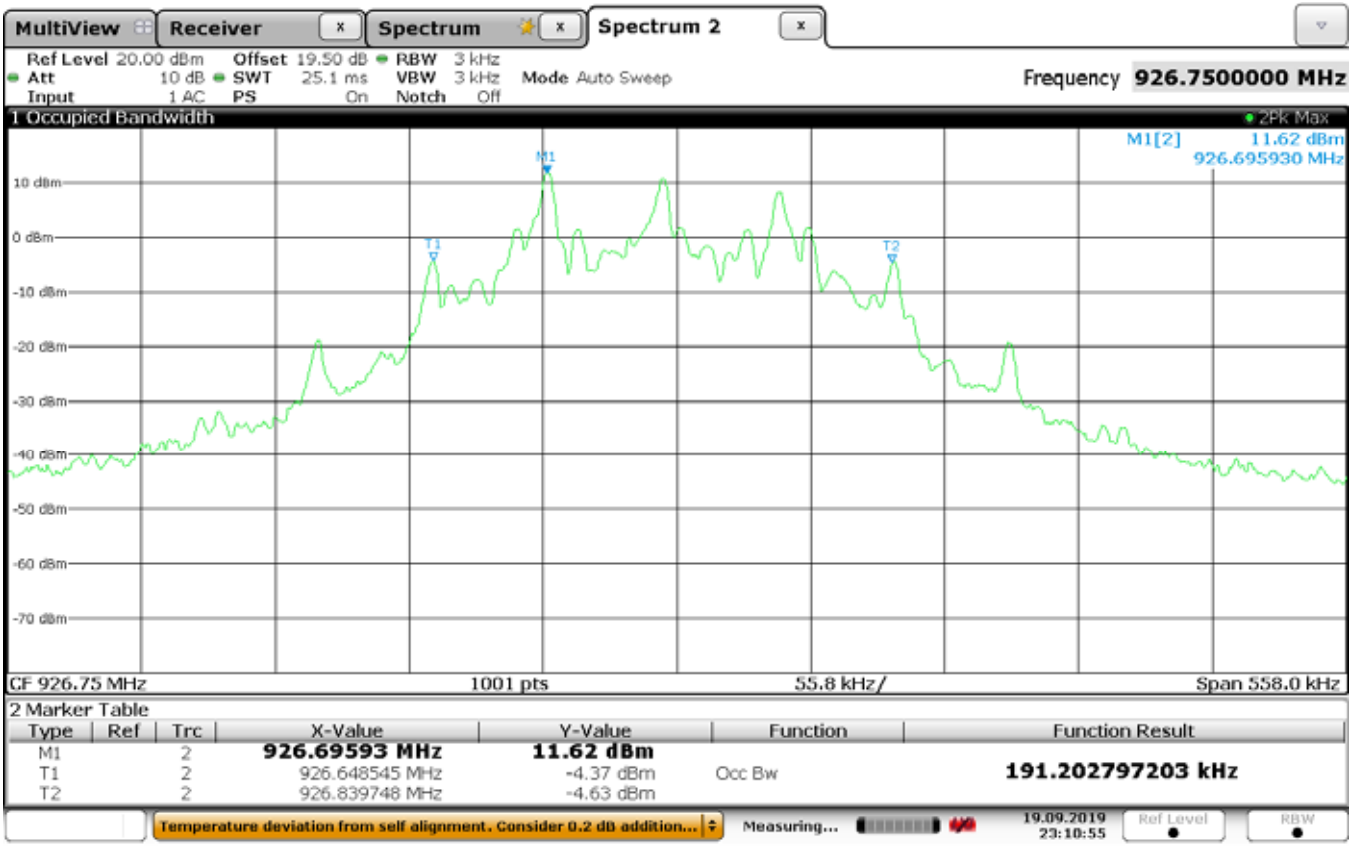
Date: 19.SEP.2019 23:13:37

Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	TRANSMIT AT 914.75MHz
Test Performed	:	99% BANDWIDTH
Notes	:	ANTENNA PORT CONDCUTED
Notes	:	99% BANDWIDTH = 189.53kHz

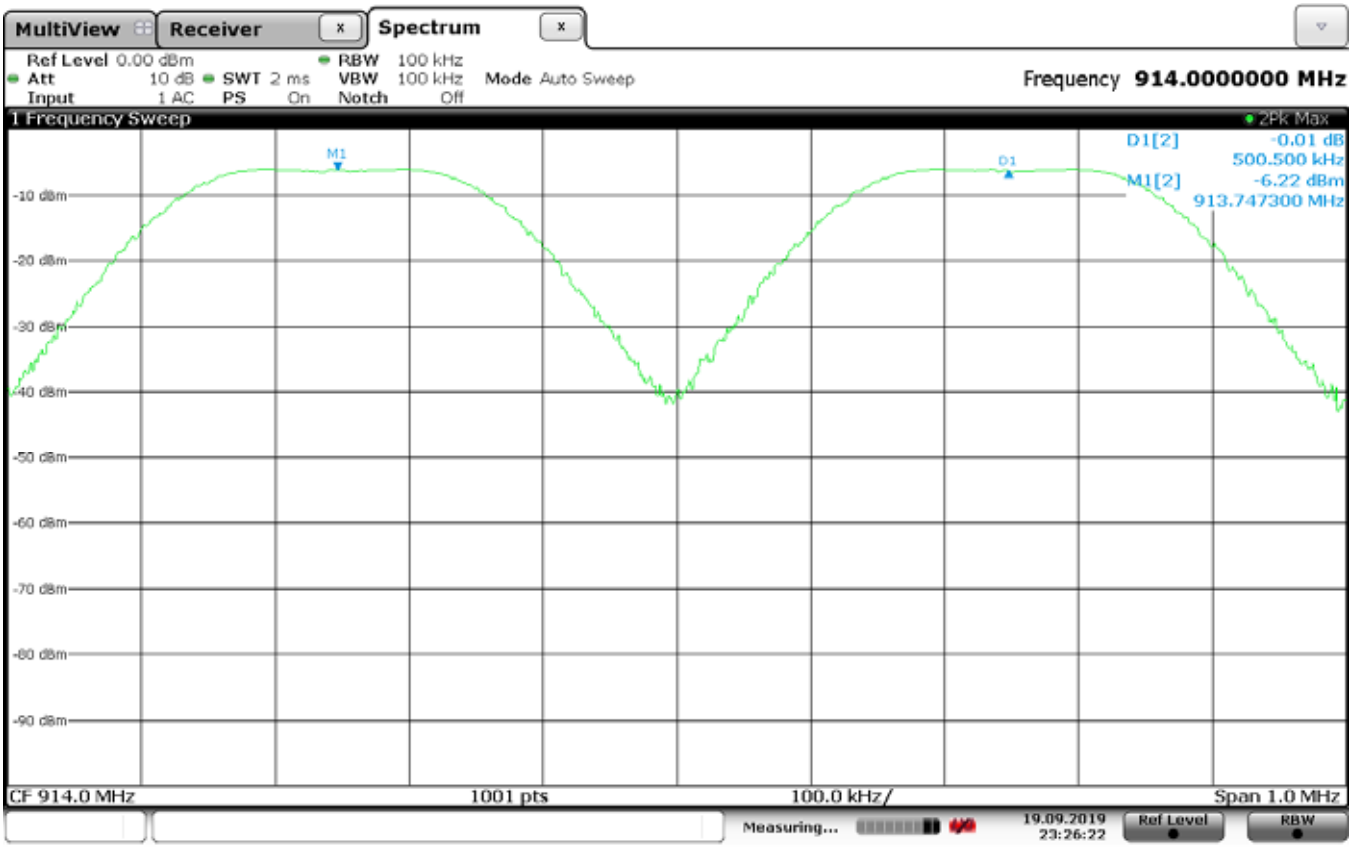


Date: 19.SEP.2019 23:15:08

Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	TRANSMIT AT 926.75MHz
Test Performed	:	99% BANDWIDTH
Notes	:	ANTENNA PORT CONDCUTED
Notes	:	99% BANDWIDTH = 191.2kHz

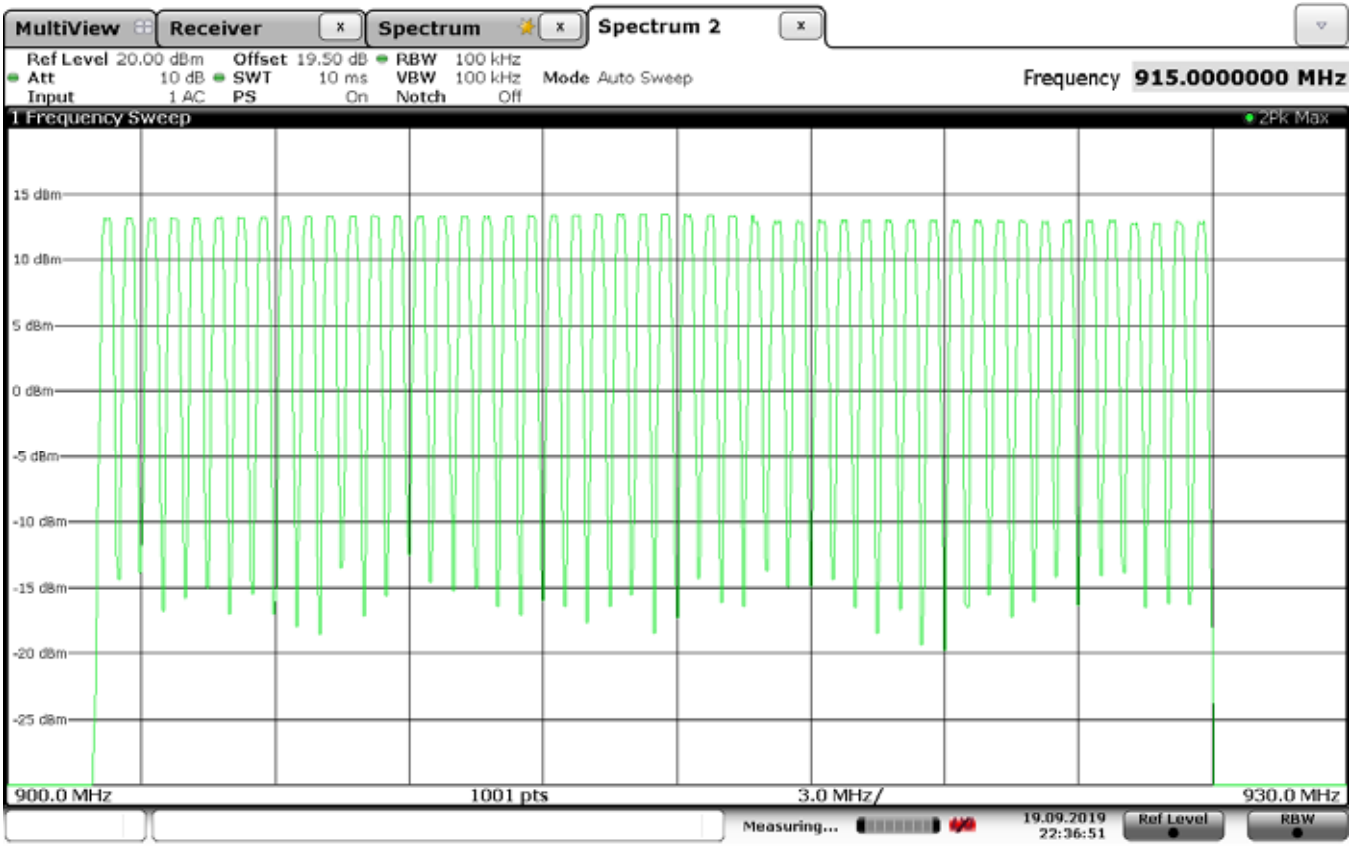


Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	HOPPING ENABLED
Test Performed	:	CARRIER FREQUENCY SEPARATION
Notes	:	ANTENNA PORT CONDCUTED
Notes	:	CARRIER FREQUENCY SEPARATION = 500.5kHz



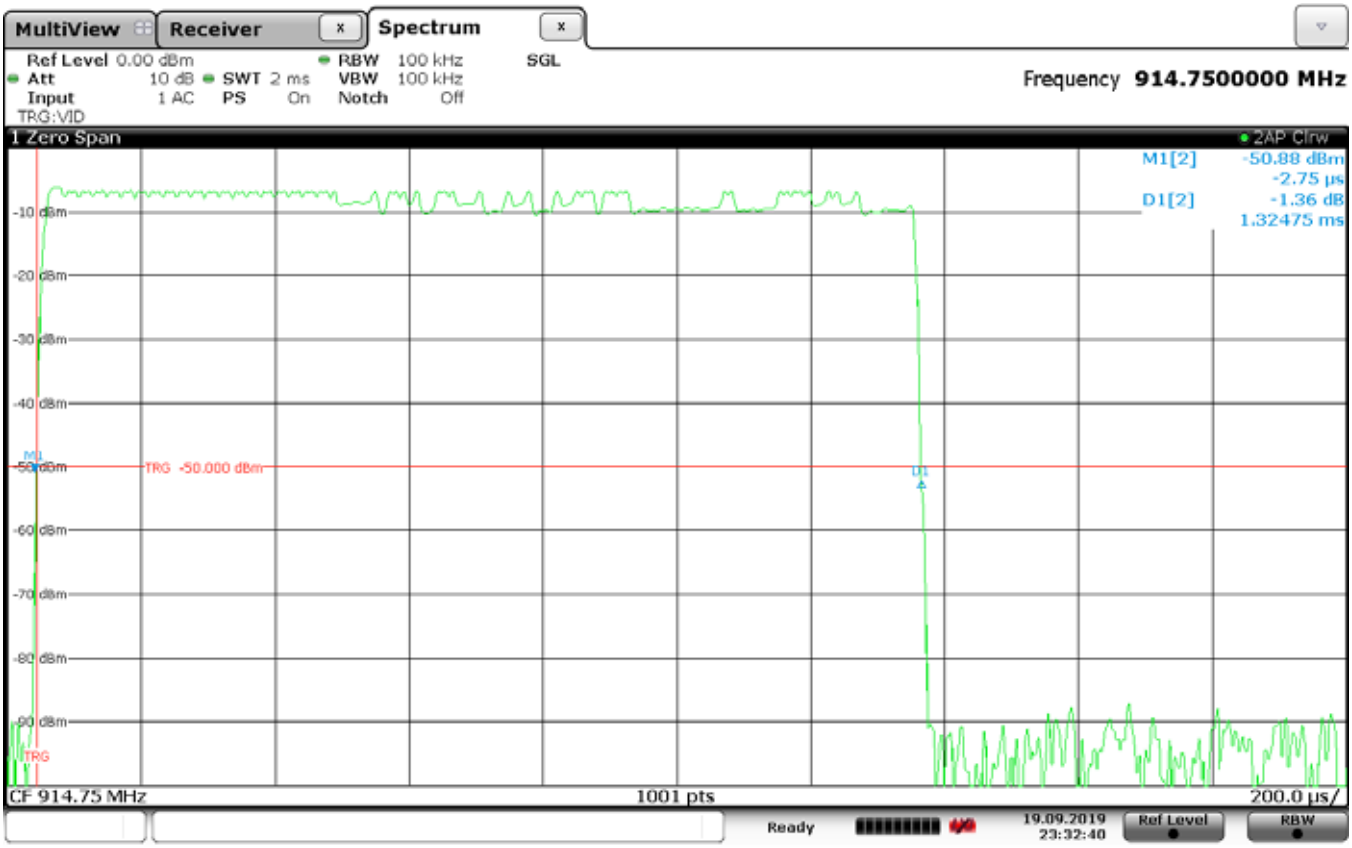
Date: 19.SEP.2019 23:26:22

Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	HOPPING ENABLED
Test Performed	:	NUMBER OF HOPPING FREQUENCIES
Notes	:	ANTENNA PORT CONDCUTED
Notes	:	NUMBER OF HOPPING FREQUENCIES= 50



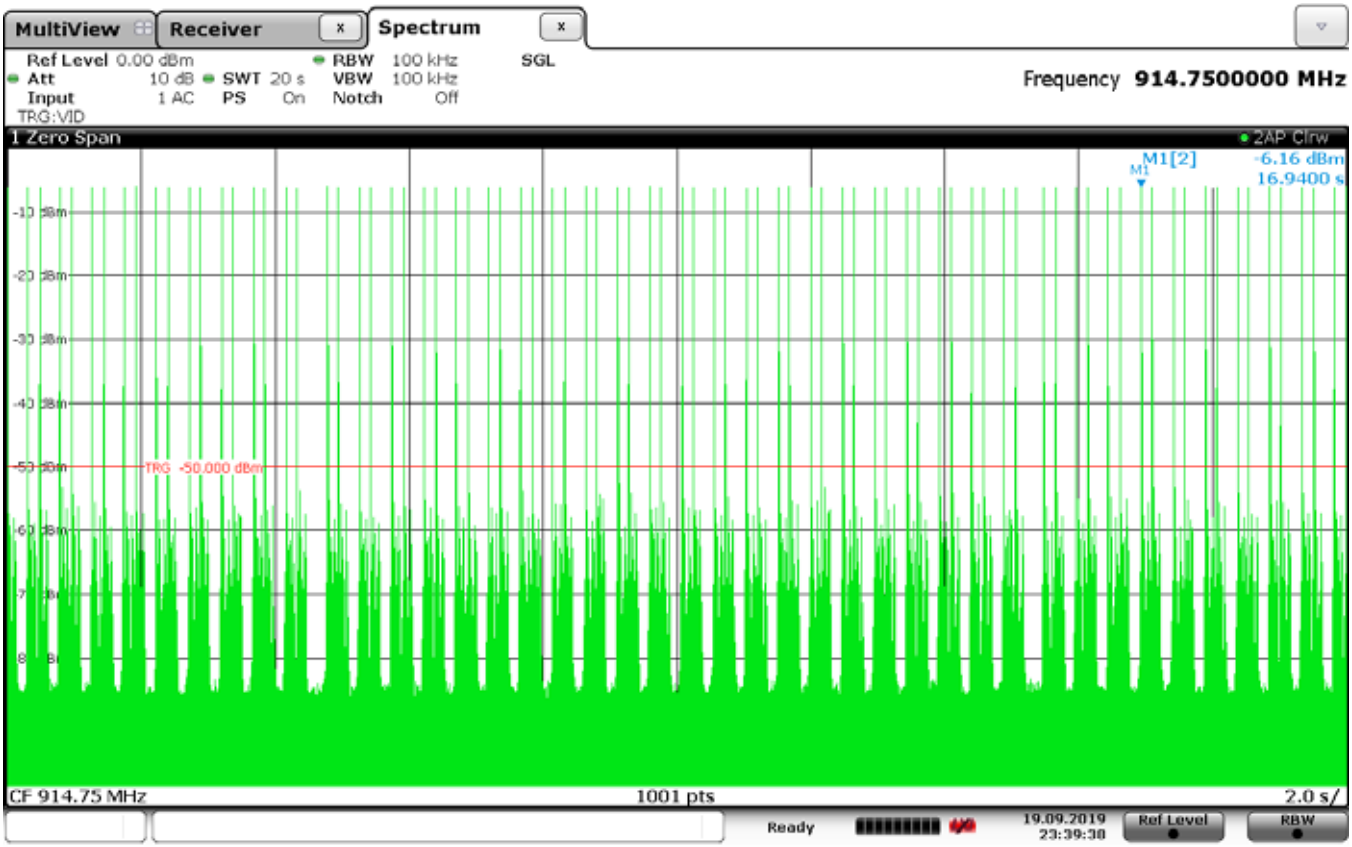
Date: 19.SEP.2019 22:36:51

Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	HOPPING ENABLED
Test Performed	:	TIME OF OCCUPANCY
Notes	:	ANTENNA PORT CONDCUTED
Notes	:	TRANSMIT TIME PER HOP = 1.32msec



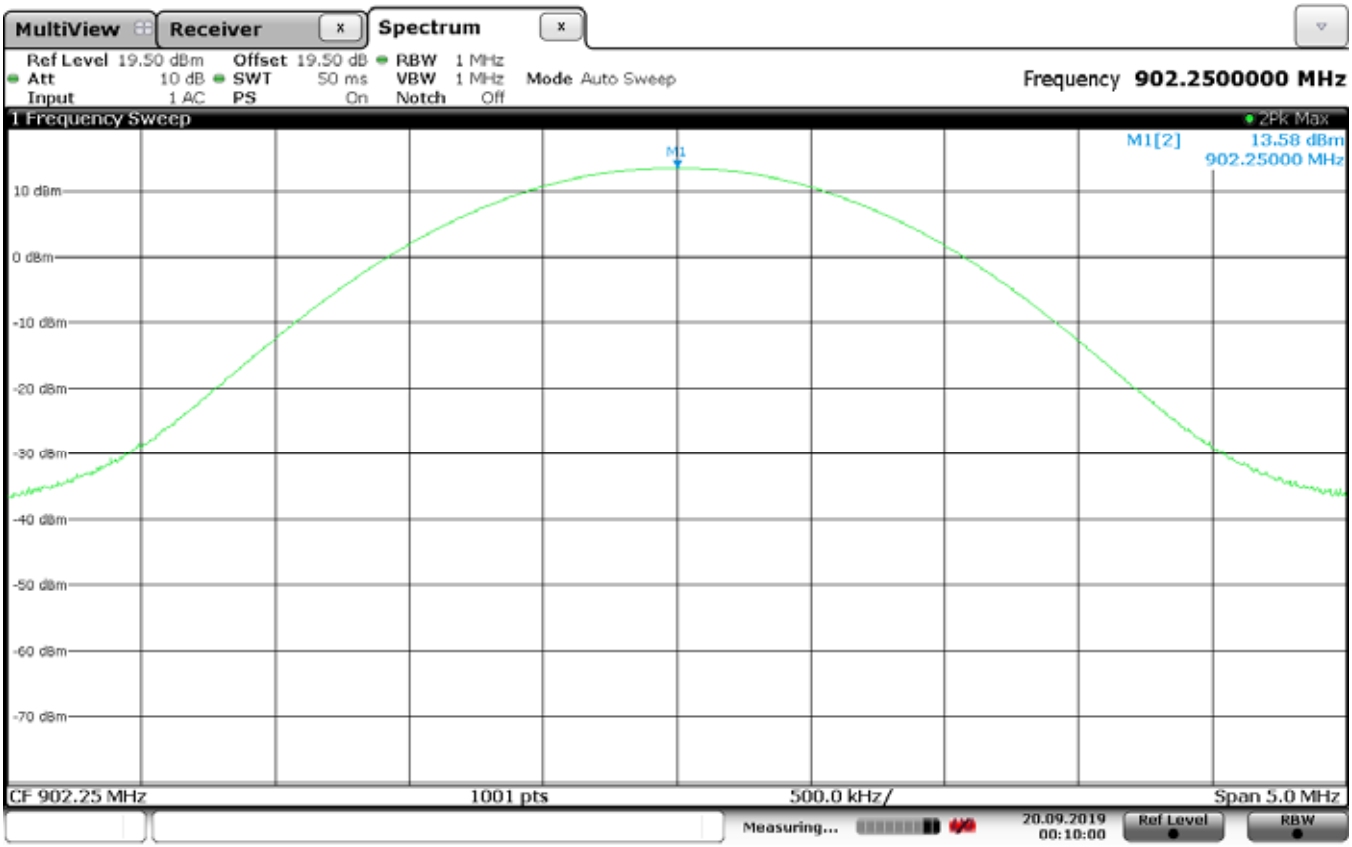
Date: 19.SEP.2019 23:32:40

Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	HOPPING ENABLED
Test Performed	:	TIME OF OCCUPANCY (IN A 20 SECOND TIME PERIOD)
Notes	:	ANTENNA PORT CONDCUTED
Notes	:	TIME OF OCCUPANY (IN A 20 SECOND TIME PERIOD) = (TRANSMIT TIME PER HOP) X (NUMBER OF HOPS IN A 20 SECOND TIME PERIOD)
Notes	:	TIME OF OCCUPANY (IN A 20 SECOND TIME PERIOD) = (1.32msec) X (82)
Notes	:	TIME OF OCCUPANY (IN A 20 SECOND TIME PERIOD) = 108.24msec



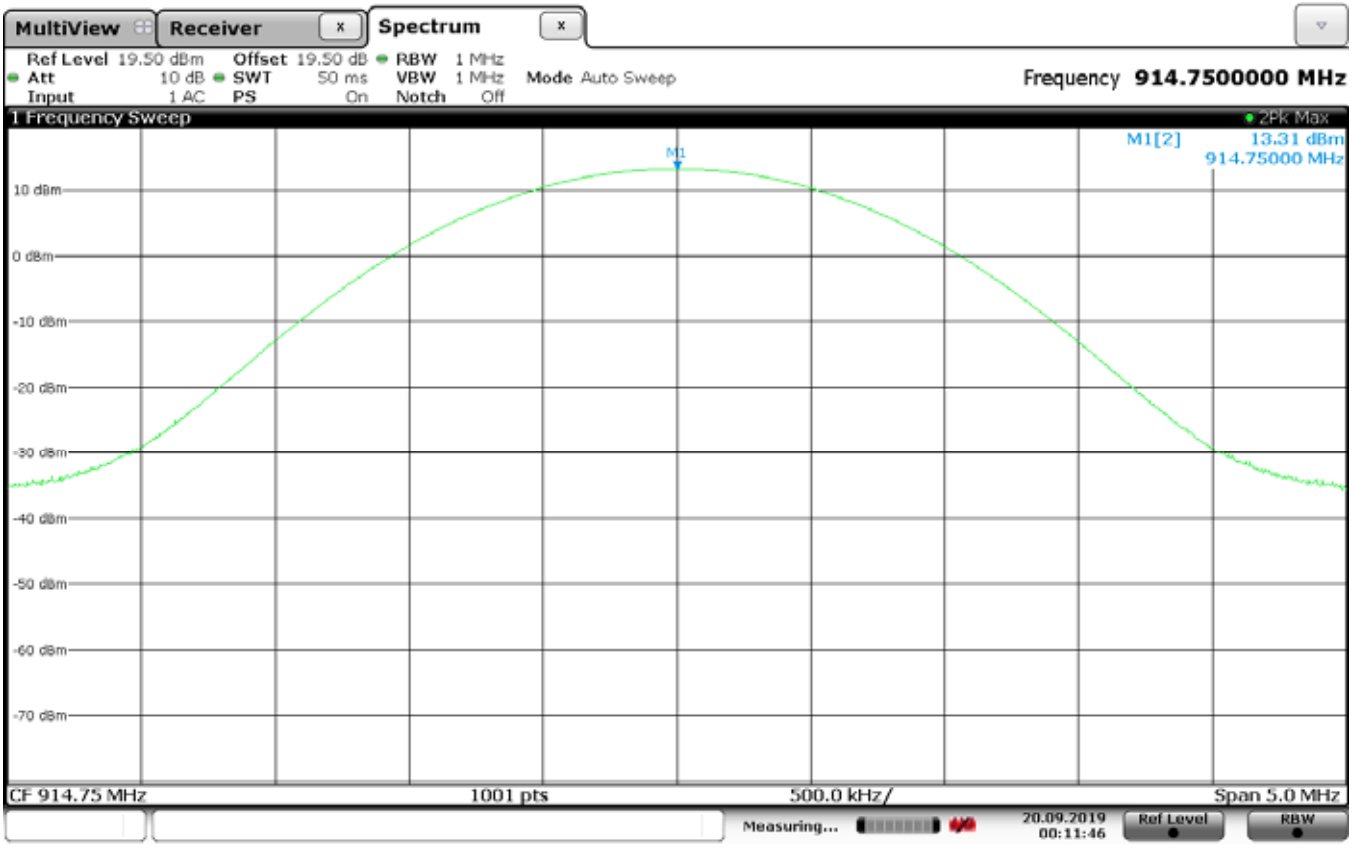
Date: 19.SEP.2019 23:39:38

Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	TRANSMIT AT 902.25MHz
Test Performed	:	PEAK CONDUCTED OUTPUT POWER
Notes	:	ANTENNA PORT CONDCUTED
Notes	:	PEAK OUTPUT POWER = 13.58dBm



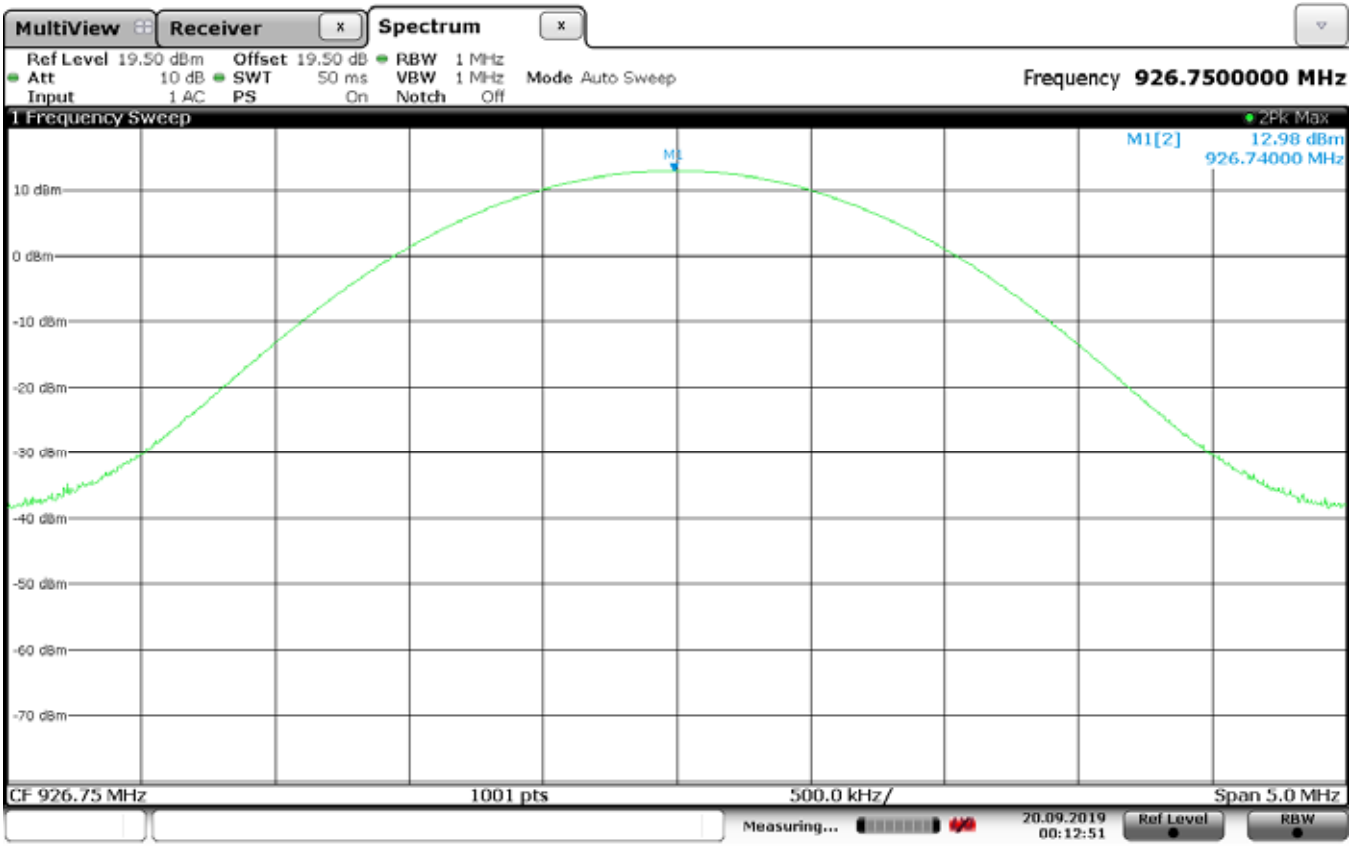
Date: 20.SEP.2019 00:10:00

Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	TRANSMIT AT 914.75MHz
Test Performed	:	PEAK CONDUCTED OUTPUT POWER
Notes	:	ANTENNA PORT CONDCUTED
Notes	:	PEAK OUTPUT POWER = 13.31dBm



Date: 20.SEP.2019 00:11:45

Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	TRANSMIT AT 926.75MHz
Test Performed	:	PEAK CONDUCTED OUTPUT POWER
Notes	:	ANTENNA PORT CONDCUTED
Notes	:	PEAK OUTPUT POWER = 12.98dBm



Date: 20.SEP.2019 00:12:50

Manufacturer : CHAMBERLAIN
Model : ESARM
Serial Number : SAMPLE #1
DUT Mode : TRANSMIT AT 902.25MHz
Test Performed : PEAK EIRP
Notes : 3 meter test distance
Notes : Peak detector with 1MHz RBW

Freq. (MHz)	Ant Pol	Wide BW Meter Reading (dBuV)	Matched Sig. Gen. Reading (dBm)	Equivalent Antenna Gain (dB)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
902.25	H	80.4	9.6	2.2	1.6	10.1	30.0	-19.9
902.25	V	81.4	13.5	2.2	1.6	14.0	30.0	-16.0

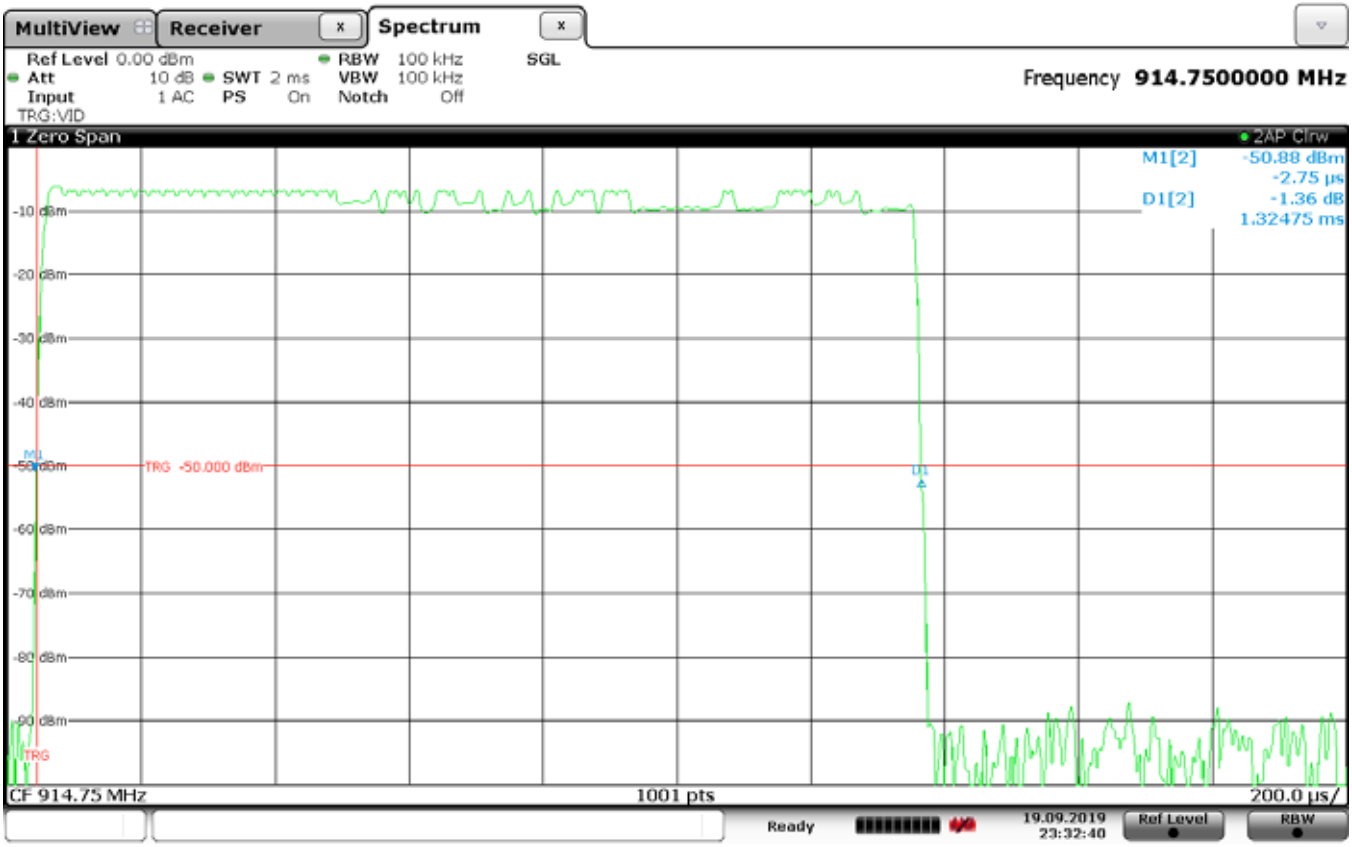
Manufacturer : CHAMBERLAIN
Model : ESARM
Serial Number : SAMPLE #1
DUT Mode : TRANSMIT AT 902.25MHz
Test Performed : PEAK EIRP
Notes : 3 meter test distance
Notes : Peak detector with 1MHz RBW

Freq. (MHz)	Ant Pol	Wide BW Meter Reading (dBuV)	Matched Sig. Gen. Reading (dBm)	Equivalent Antenna Gain (dB)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
914.75	H	80.3	9.3	2.2	1.6	9.8	30.0	-20.2
914.75	V	82.4	14.4	2.2	1.6	14.9	30.0	-15.1

Manufacturer : CHAMBERLAIN
Model : ESARM
Serial Number : SAMPLE #1
DUT Mode : TRANSMIT AT 902.25MHz
Test Performed : PEAK EIRP
Notes : 3 meter test distance
Notes : Peak detector with 1MHz RBW

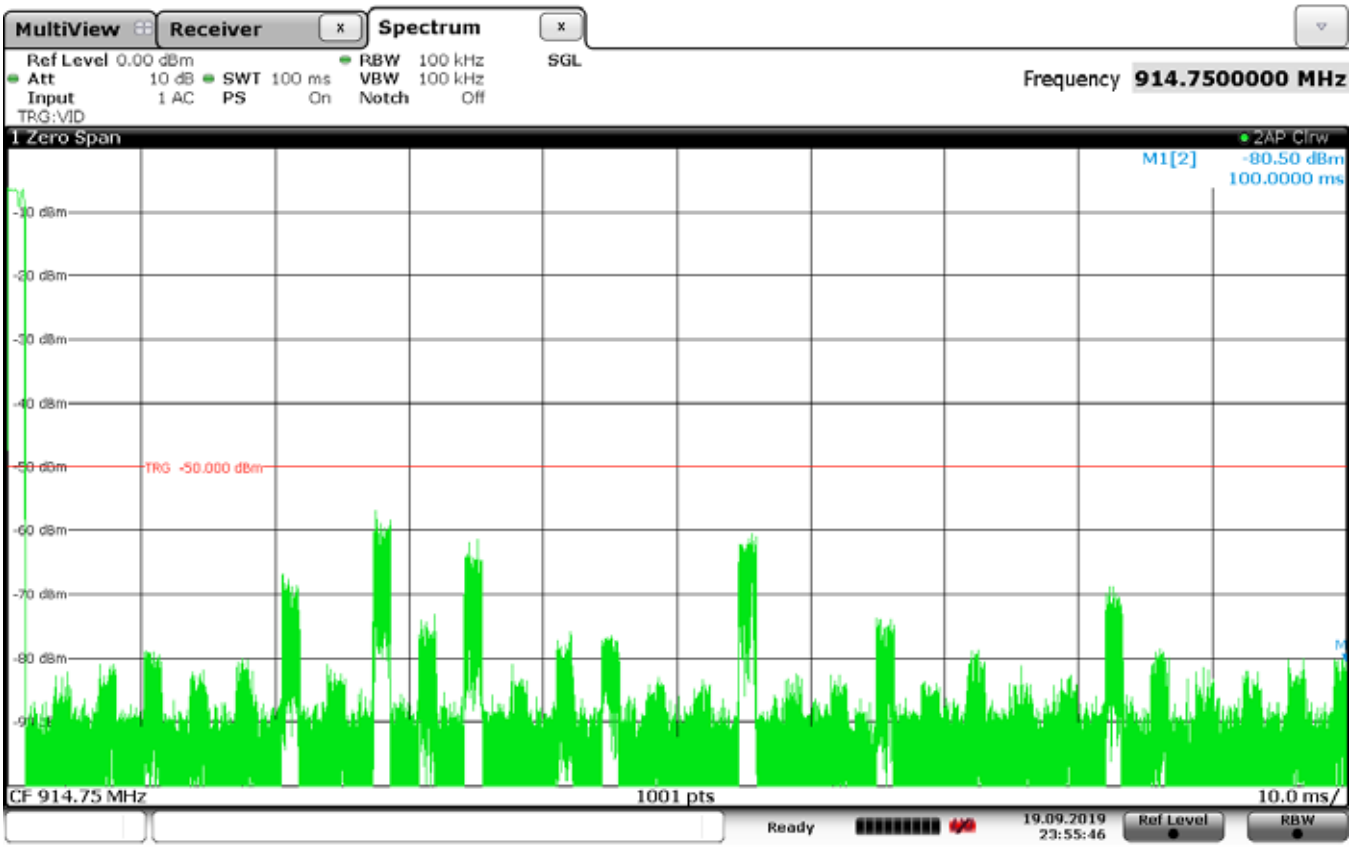
Freq. (MHz)	Ant Pol	Wide BW Meter Reading (dBuV)	Matched Sig. Gen. Reading (dBm)	Equivalent Antenna Gain (dB)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
926.75	H	81.1	12.9	2.2	1.7	13.4	30.0	-16.6
926.75	V	82.8	11.9	2.2	1.7	12.4	30.0	-17.6

Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	TRANSMIT AT 914.75MHz
Test Performed	:	DUTY CYCLE CORRECTION FACTOR
Notes	:	PULSE WIDTH = 1.32msec

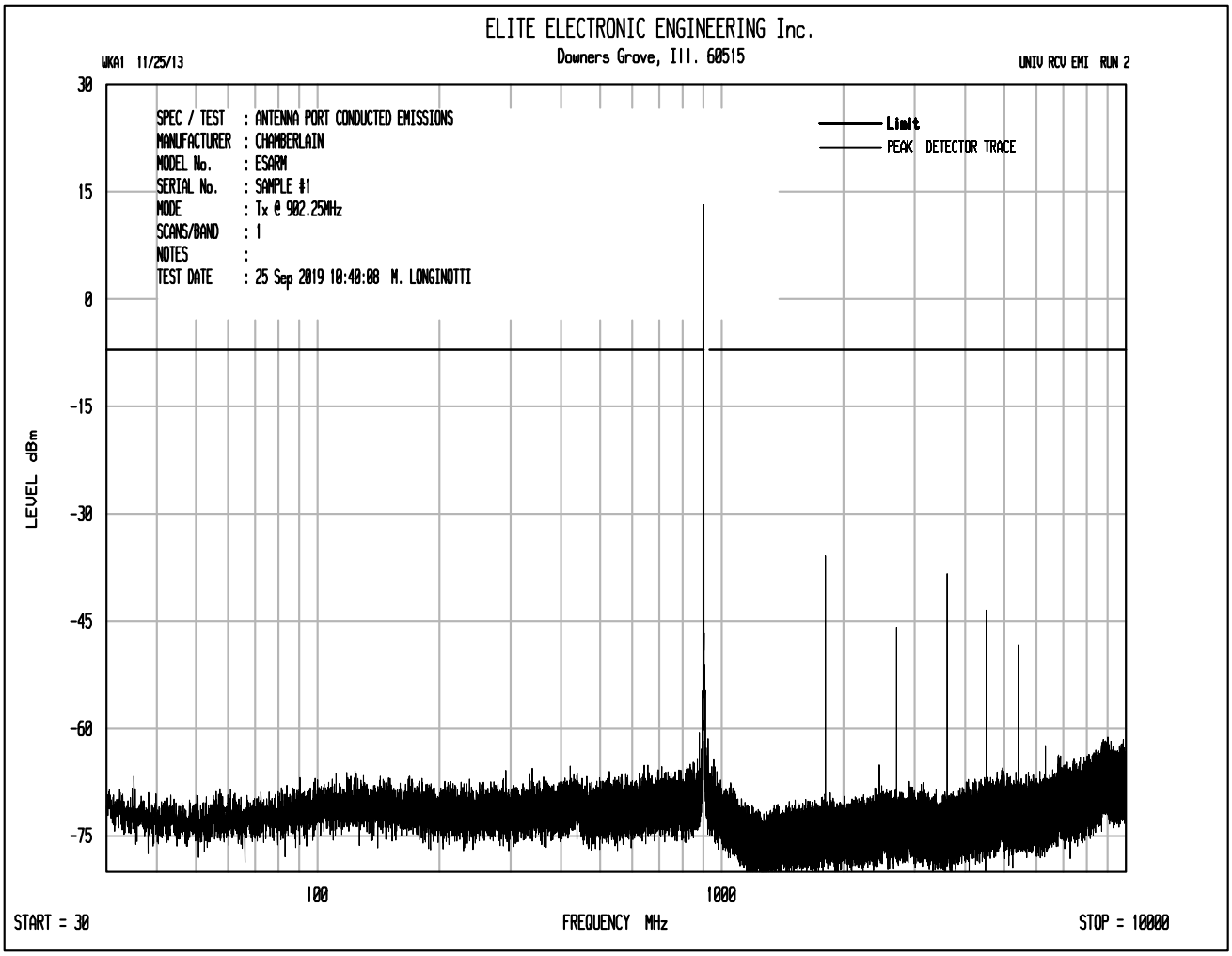


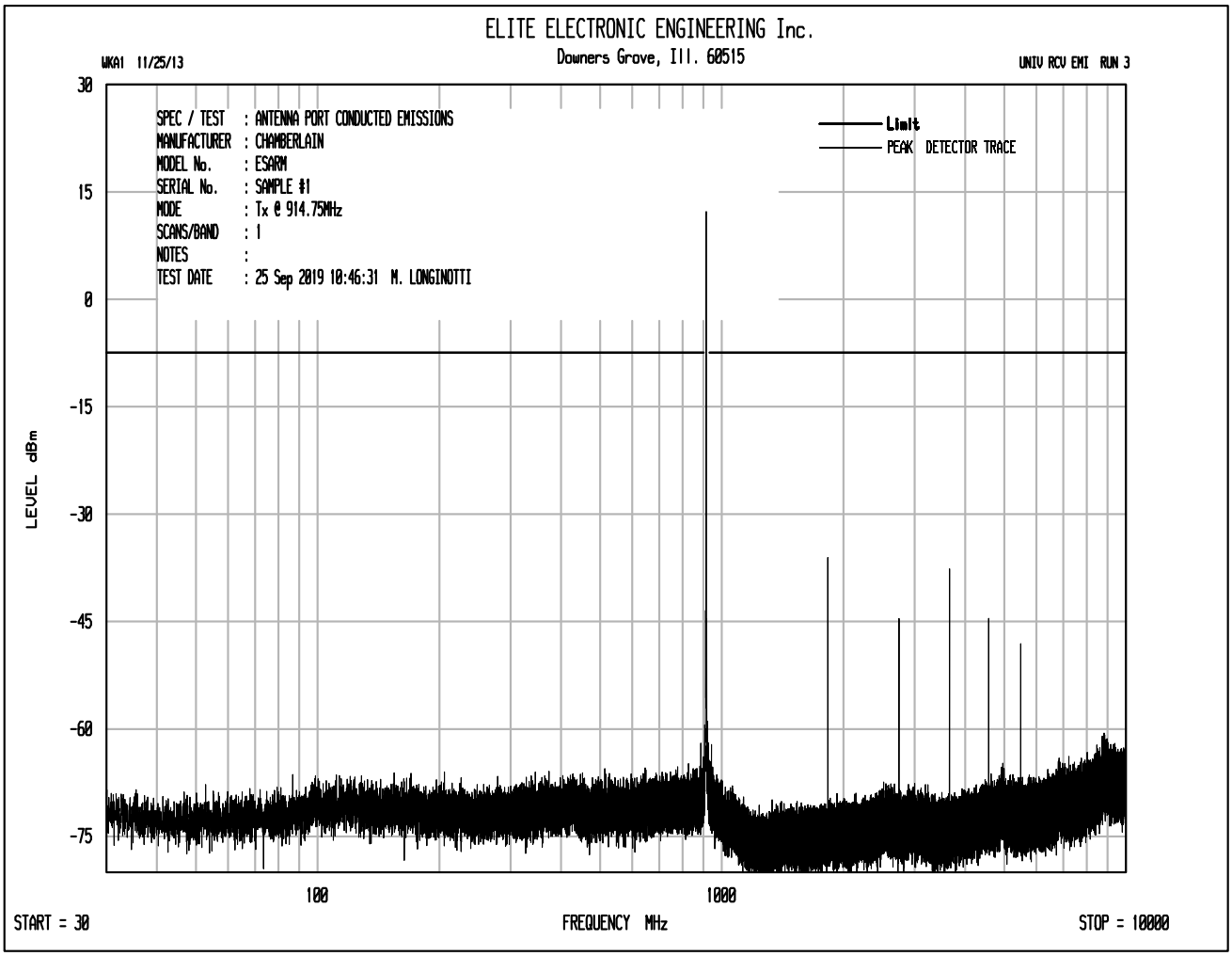
Date: 19.SEP.2019 23:32:40

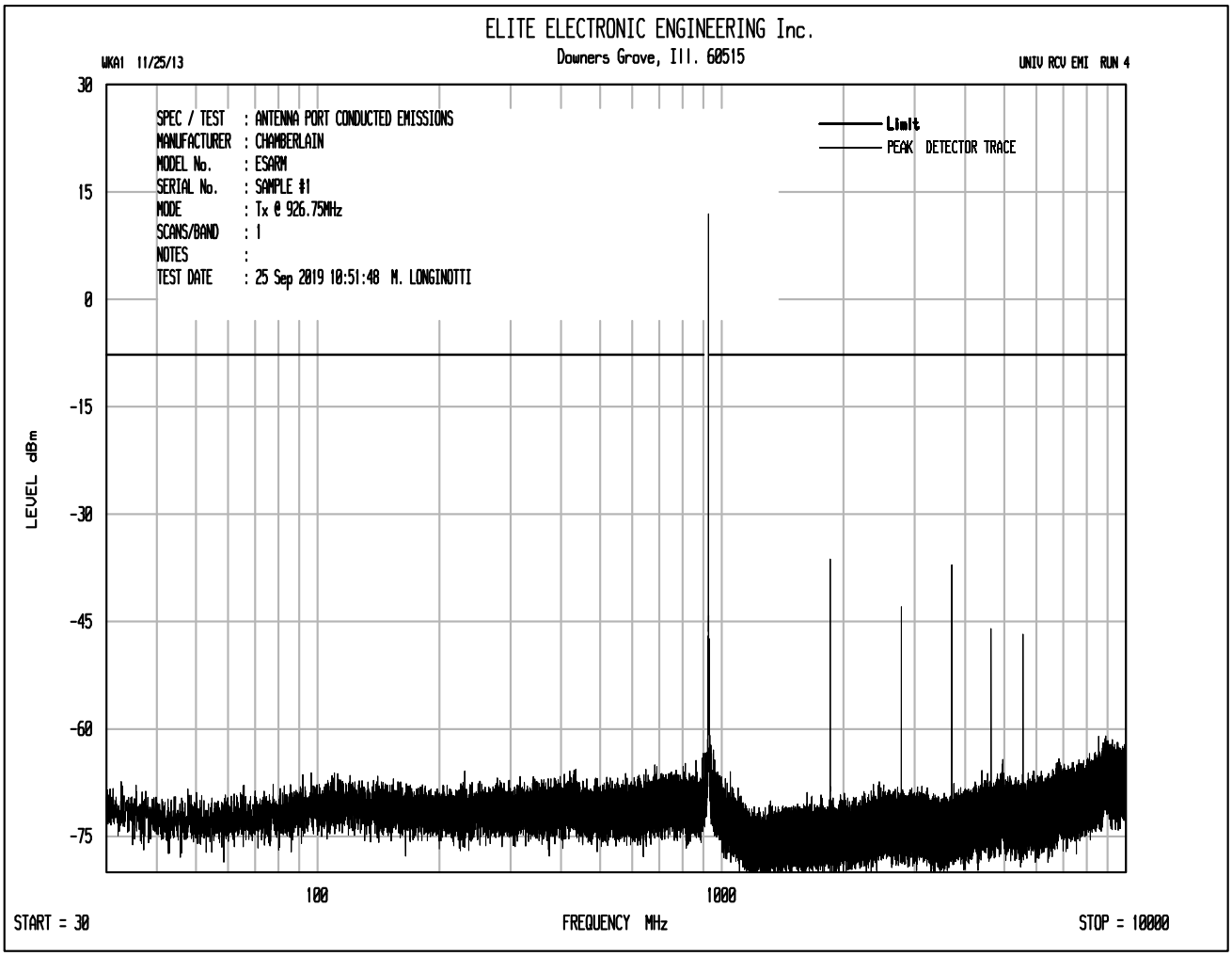
Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	TRANSMIT AT 914.75MHz
Test Performed	:	DUTY CYCLE CORRECTION FACTOR
Notes	:	1 PULSE IN A 100msec PERIOD
Notes	:	Duty Cycle Correction Factor = 20 x log(((pulse width)x(number of pulses in 100msec))/100msec)
Notes	:	Duty Cycle Correction Factor = 20 x log(((1.32msec)x (1 pulse))/100msec)
Notes	:	Duty Cycle Correction Factor = -37.6dB

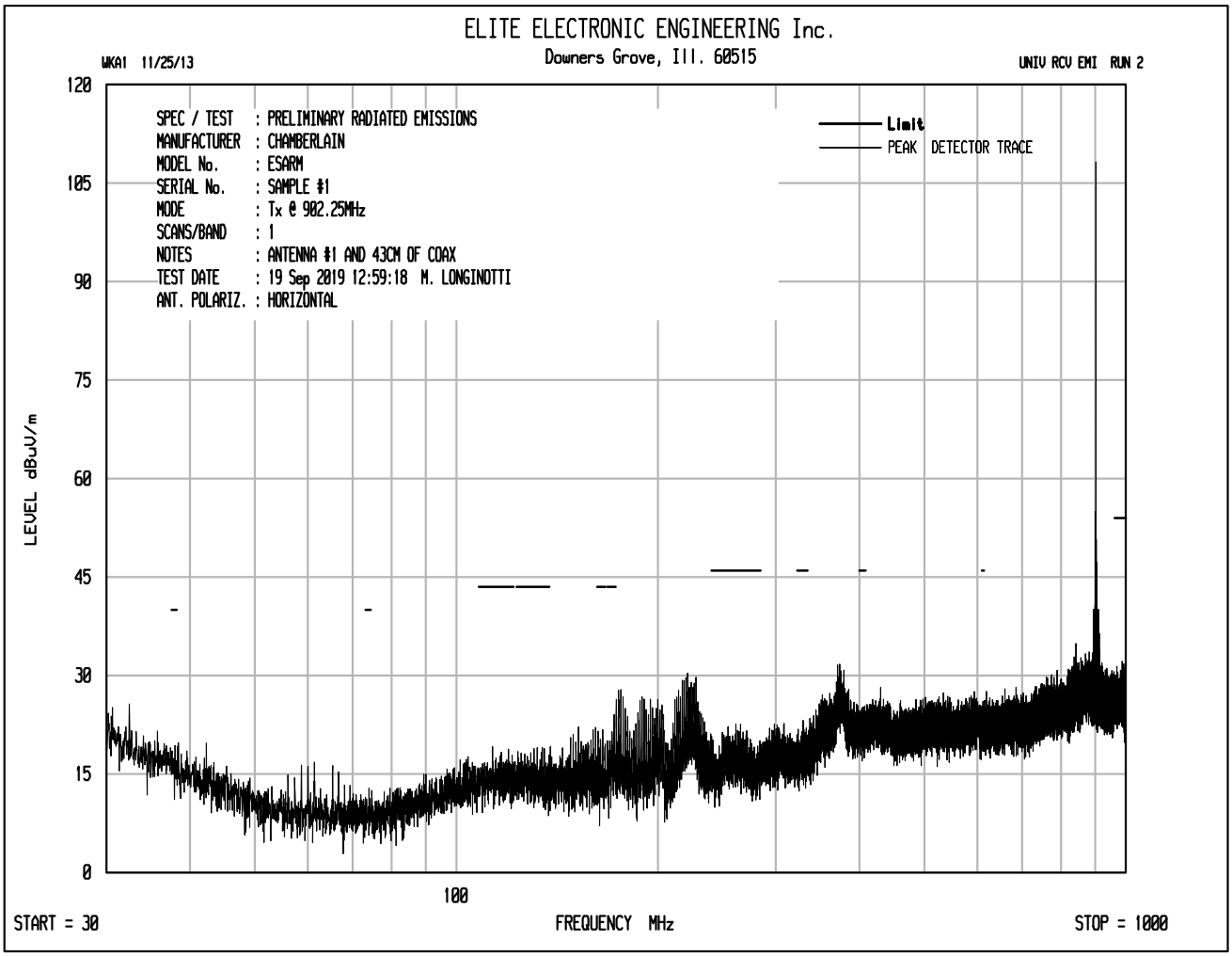


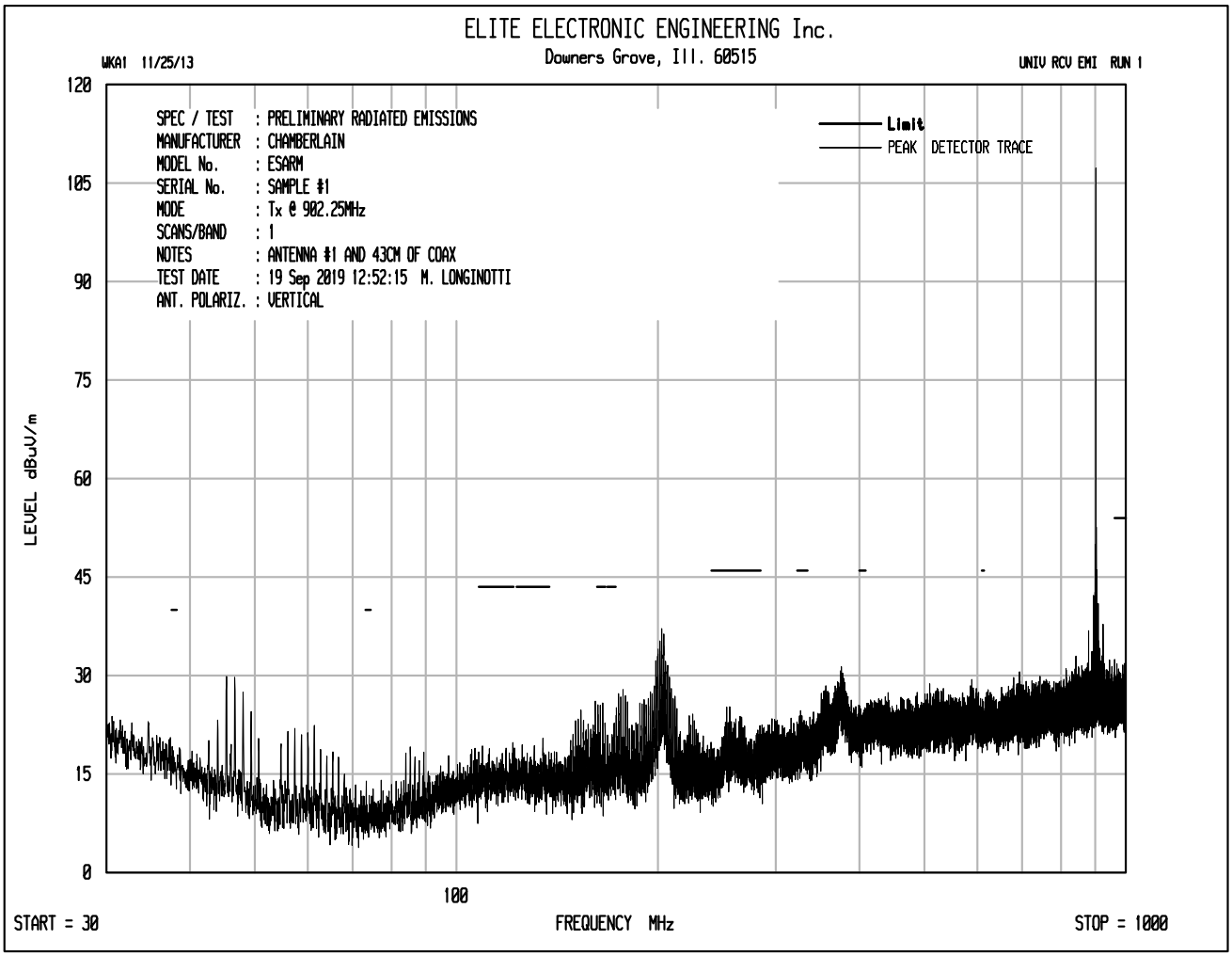
Date: 19.SEP.2019 23:55:47

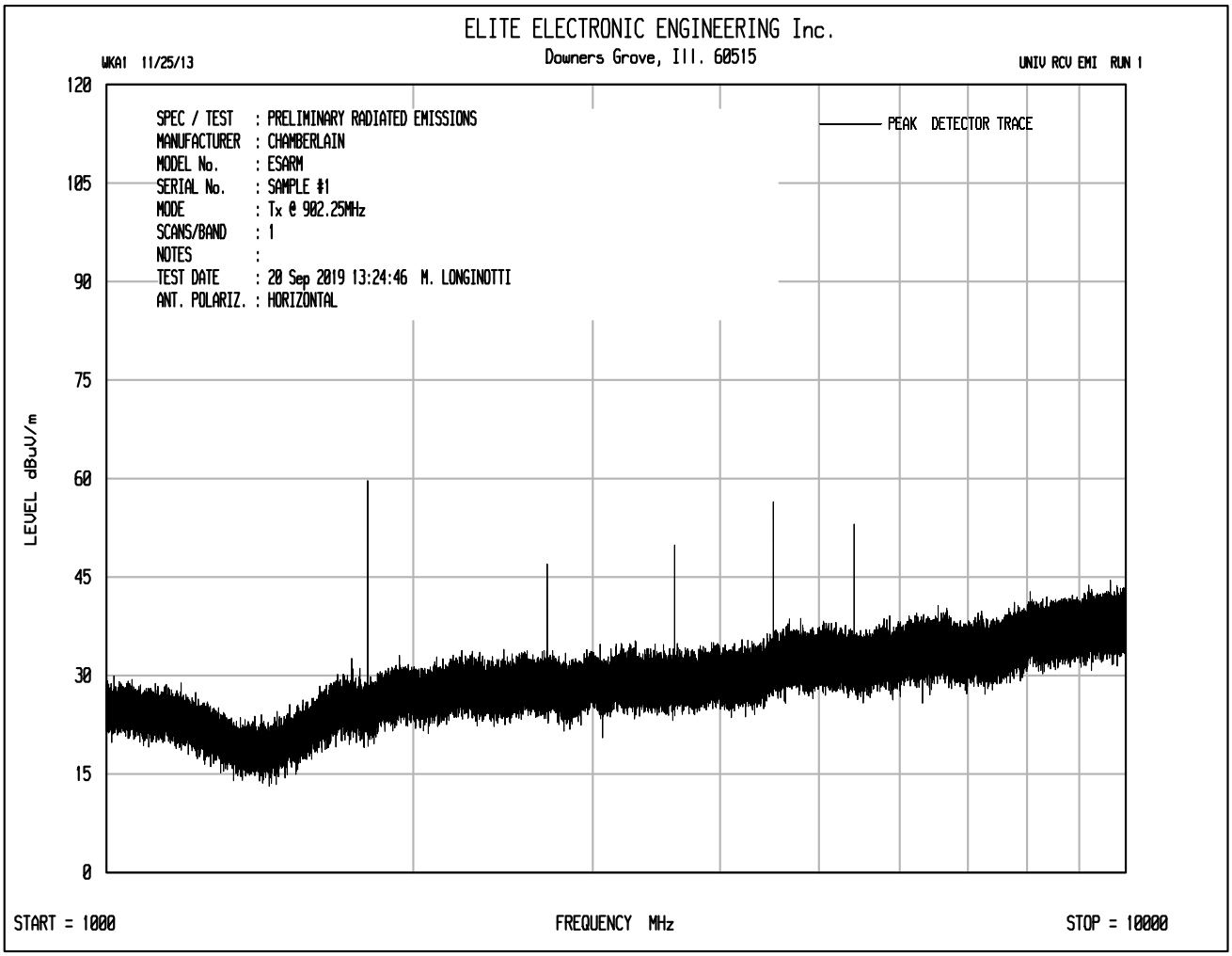

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 2
SPEC / TEST : ANTENNA PORT CONDUCTED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : ESARM
SERIAL No. : SAMPLE #1
MODE : Tx @ 902.25MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 25 Sep 2019 10:40:08 M. LONGINOTTI
Limit
PEAK DETECTOR TRACE
LEVEL dBm
30
15
0
-15
-30
-45
-60
-75
100
1000
START = 30
FREQUENCY MHz
STOP = 10000

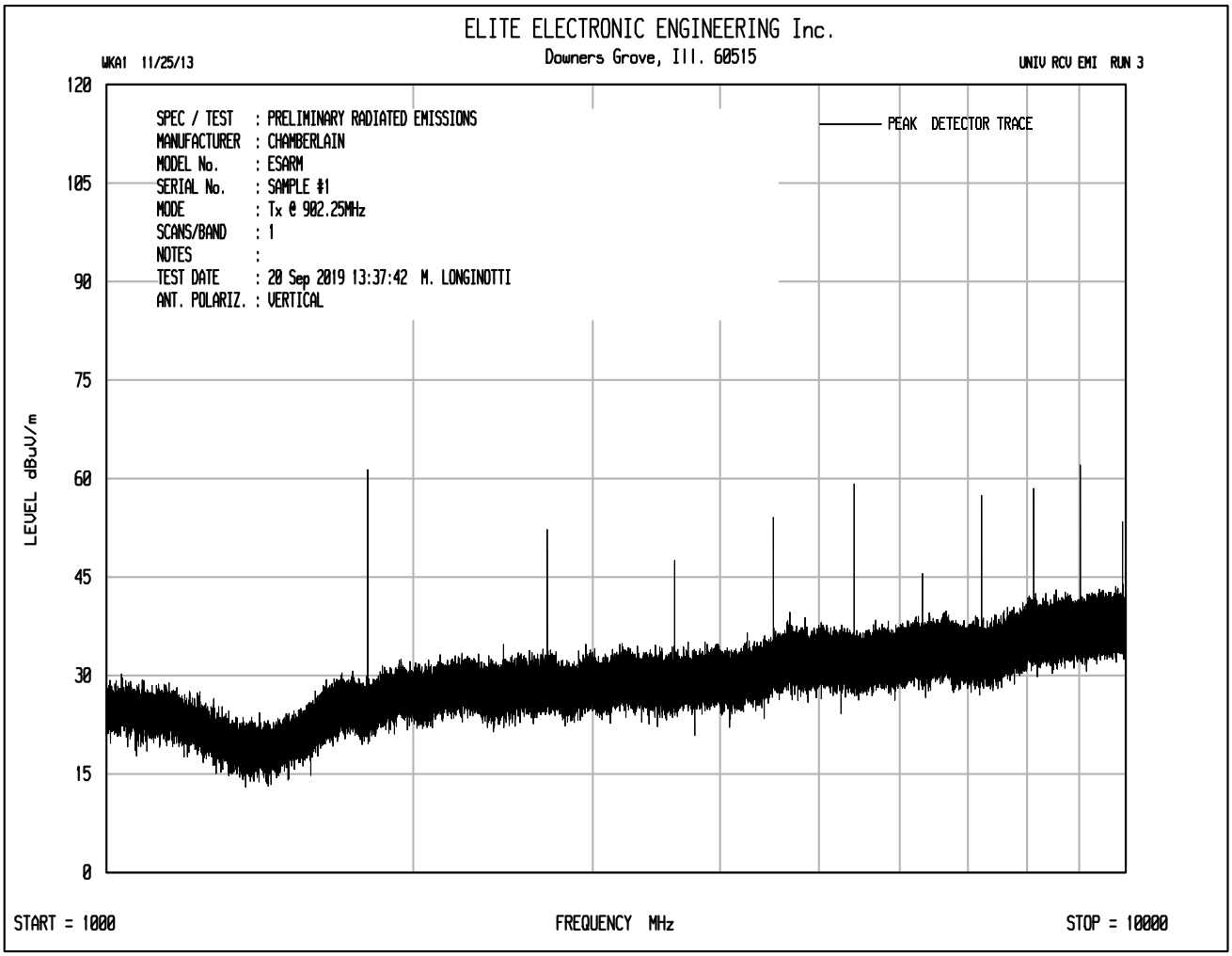

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 3
SPEC / TEST : ANTENNA PORT CONDUCTED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : ESARM
SERIAL No. : SAMPLE #1
MODE : Tx @ 914.75MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 25 Sep 2019 10:46:31 M. LONGINOTTI
Limit
PEAK DETECTOR TRACE
LEVEL dBm
30
15
0
-15
-30
-45
-60
-75
100
1000
START = 30
FREQUENCY MHz
STOP = 10000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 4
SPEC / TEST : ANTENNA PORT CONDUCTED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : ESARM
SERIAL No. : SAMPLE #1
MODE : Tx @ 926.75MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 25 Sep 2019 10:51:48 M. LONGINOTTI
Limit
PEAK DETECTOR TRACE
LEVEL dBm
30
15
0
-15
-30
-45
-60
-75
100
1000
START = 30
FREQUENCY MHz
STOP = 10000


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. : ESARM
SERIAL No. : SAMPLE #1
MODE : Tx @ 902.25MHz
SCANS/BAND : 1
NOTES : ANTENNA #1 AND 43CM OF COAX
TEST DATE : 19 Sep 2019 12:59:18 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
Limit
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 1
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : ESARM
SERIAL No. : SAMPLE #1
MODE : Tx @ 902.25MHz
SCANS/BAND : 1
NOTES : ANTENNA #1 AND 43CM OF COAX
TEST DATE : 19 Sep 2019 12:52:15 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
Limit
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 1
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : ESARM
SERIAL No. : SAMPLE #1
MODE : Tx @ 902.25MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 20 Sep 2019 13:24:46 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 = 10000


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. : ESARM
SERIAL No. : SAMPLE #1
MODE : Tx @ 902.25MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 20 Sep 2019 13:37:42 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 = 10000

Manufacturer : The Chamberlain Group
Test Item : Evolution Stand Alone Radio Module
Model No. : ESARM
Serial No. : Sample #1
Mode : Transmit at 902.25MHz
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions in Restricted Bands
Date : September 19, 2019 through September 23, 2019
Test Distance : 3 meters
Notes : Peak Detector with 1MHz Resolution Bandwidth

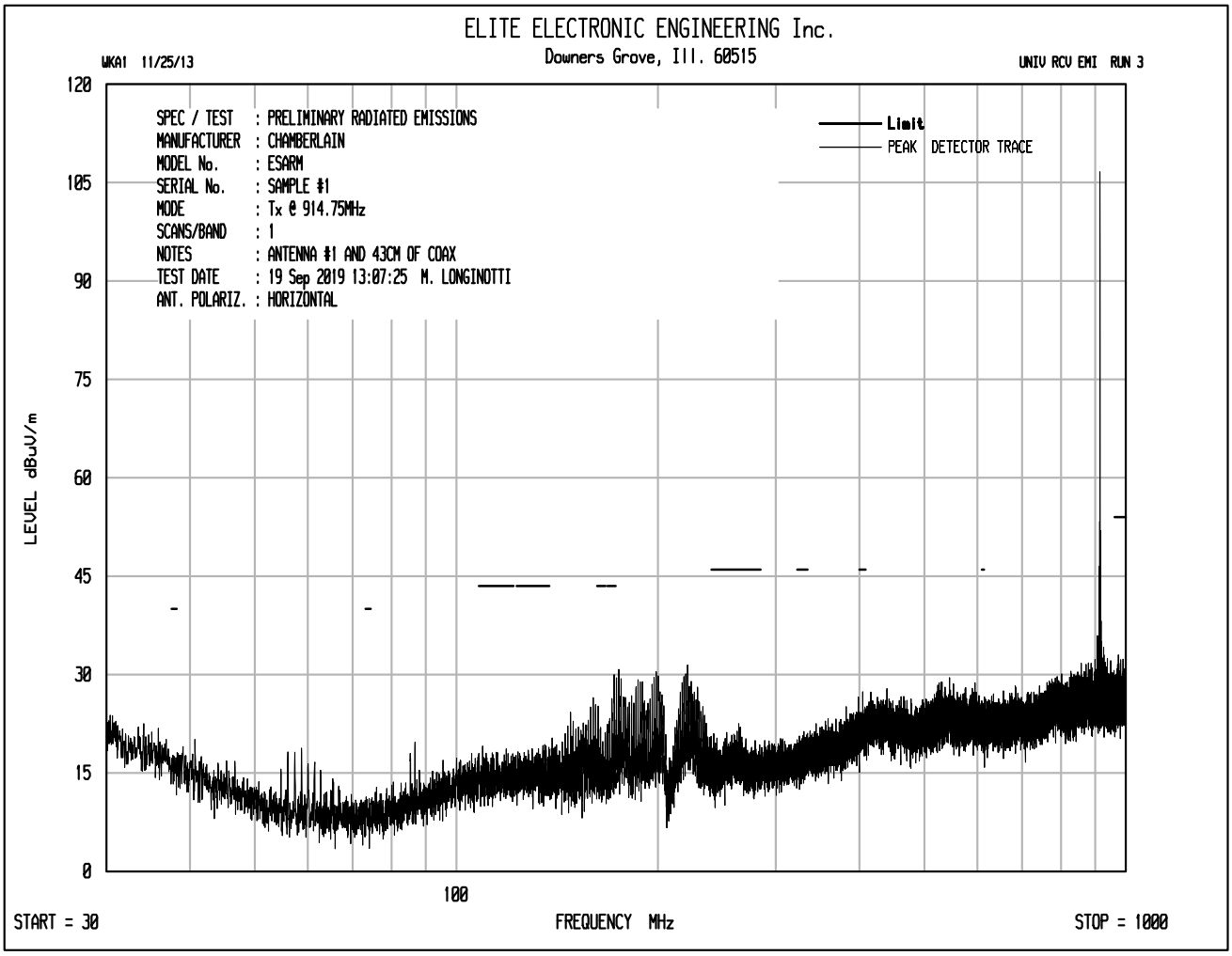
Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
2706.75	H	64.8		3.7	33.5	-40.2	61.8	1225.5	5000.0	-12.2
2706.75	V	67.0		3.7	33.5	-40.2	64.0	1578.8	5000.0	-10.0
3609.00	H	58.9		4.3	34.2	-39.3	58.0	793.5	5000.0	-16.0
3609.00	V	59.4		4.3	34.2	-39.3	58.5	840.5	5000.0	-15.5
4511.25	H	60.4		4.7	36.0	-39.3	61.8	1228.5	5000.0	-12.2
4511.25	V	61.0		4.7	36.0	-39.3	62.4	1316.4	5000.0	-11.6
5413.50	H	63.0		5.1	36.8	-39.2	65.8	1944.2	5000.0	-8.2
5413.50	V	63.2		5.1	36.8	-39.2	66.0	1989.4	5000.0	-8.0
8120.25	H	53.7		6.5	38.4	-39.6	59.0	891.3	5000.0	-15.0
8120.25	V	56.8		6.5	38.4	-39.6	62.1	1273.6	5000.0	-11.9
9022.50	H	56.3		6.5	38.9	-39.4	62.3	1298.9	5000.0	-11.7
9022.50	V	56.7		6.5	38.9	-39.4	62.7	1360.1	5000.0	-11.3

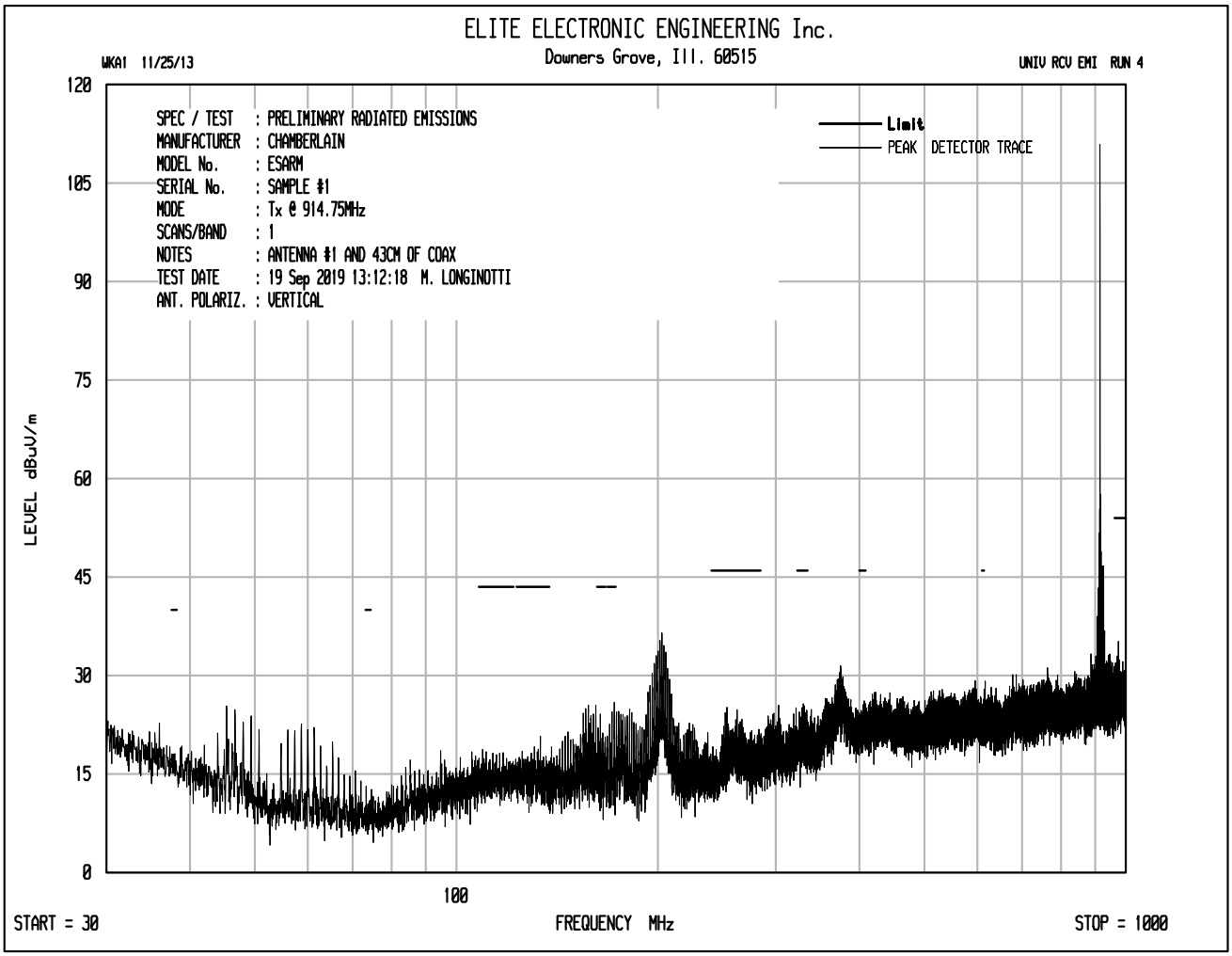
Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

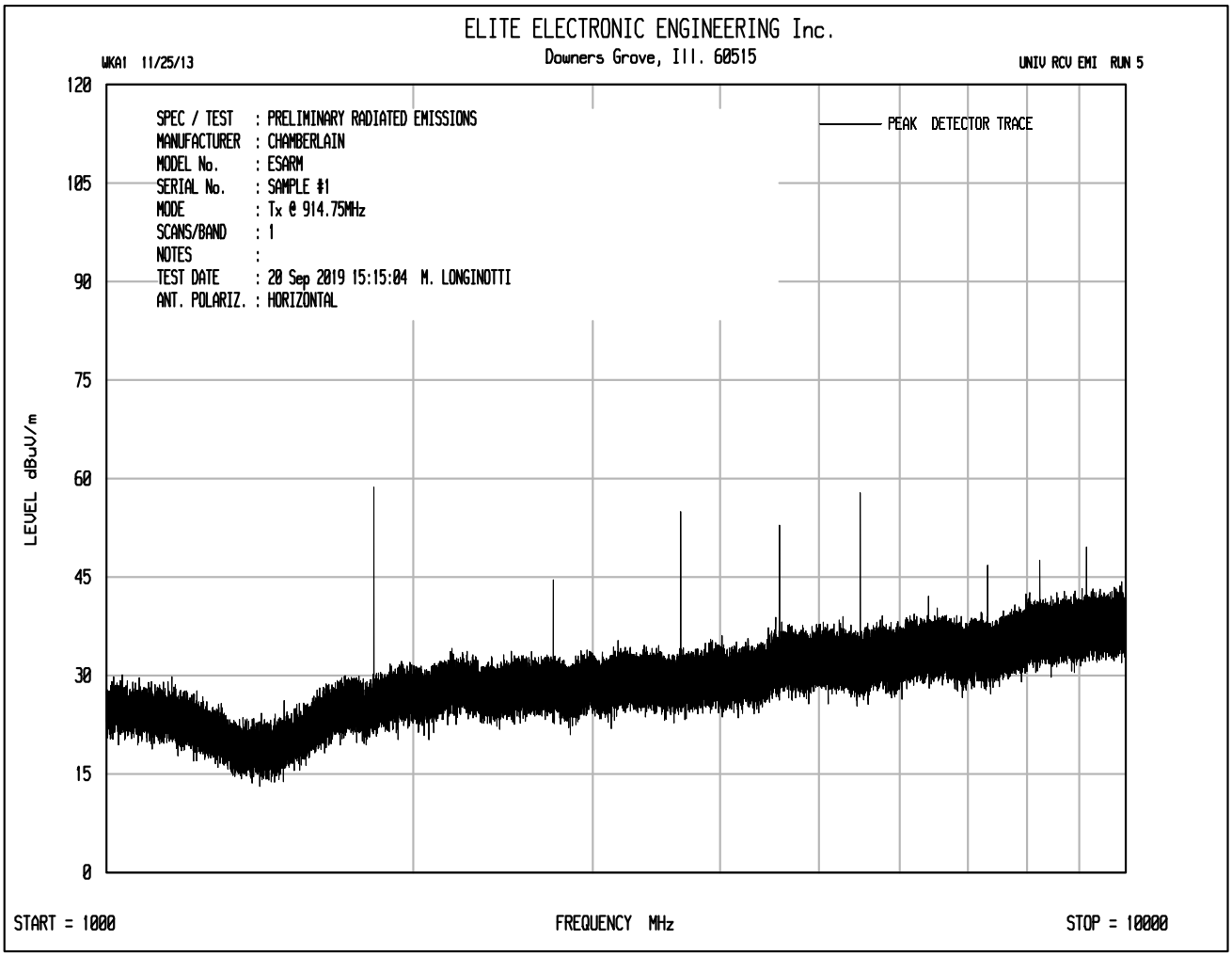
Manufacturer : The Chamberlain Group
Test Item : Evolution Stand Alone Radio Module
Model No. : ESARM
Serial No. : Sample #1
Mode : Transmit at 902.25MHz
Test Specification : FCC-15.247, RSS-247 Average Radiated Emissions in Restricted Bands
Date : September 19, 2019 through September 23, 2019
Test Distance : 3 meters
Notes :

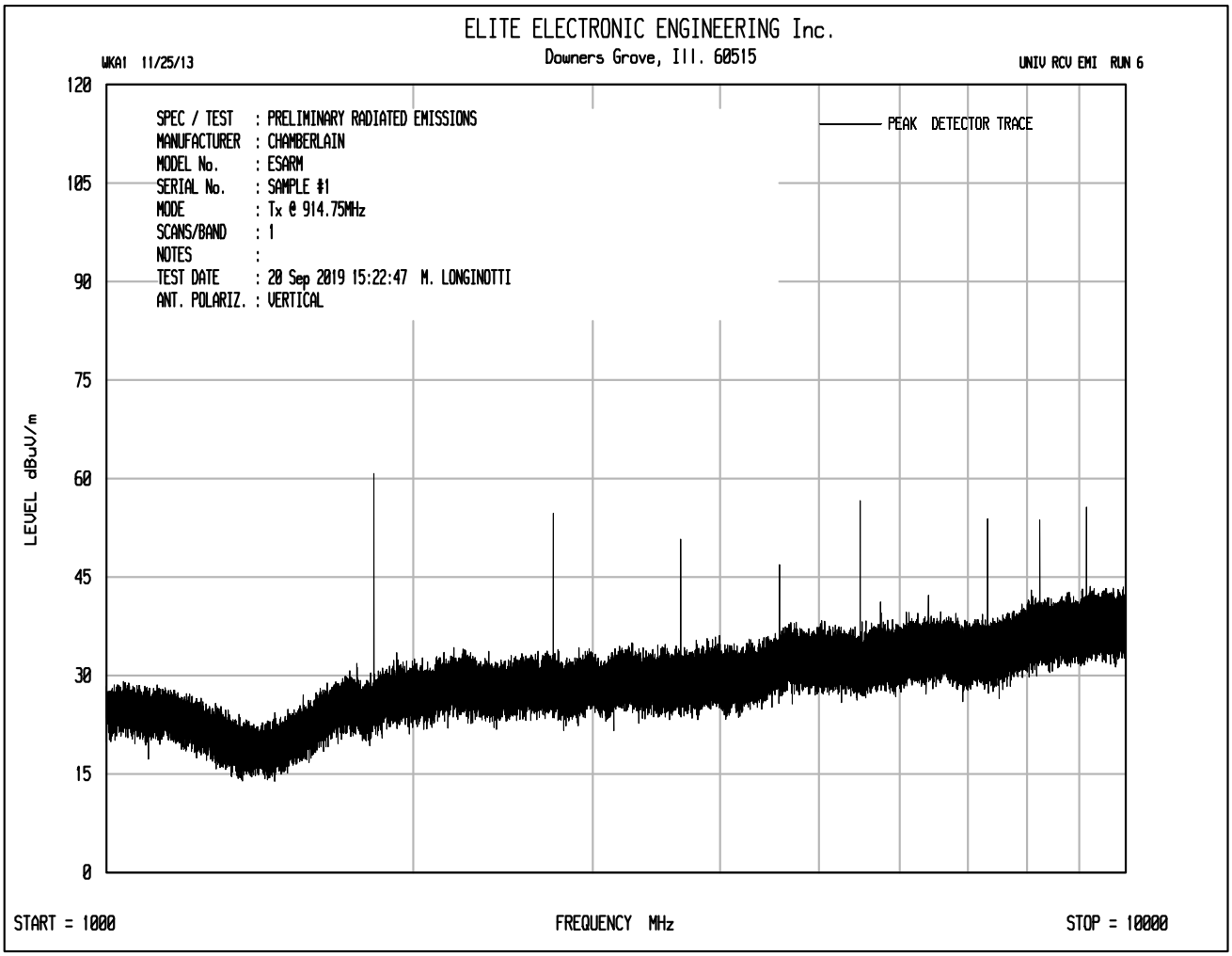
Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Duty Cycle (dB)	Average Total dBuV/m at 3m	Average Total uV/m at 3 m	Average Limit uV/m at 3 m	Margin (dB)
2706.75	H	64.8		3.7	33.5	-40.2	-37.6	24.2	16.2	500.0	-29.8
2706.75	V	67.0		3.7	33.5	-40.2	-37.6	26.4	20.8	500.0	-27.6
3609.00	H	58.9		4.3	34.2	-39.3	-37.6	20.4	10.5	500.0	-33.6
3609.00	V	59.4		4.3	34.2	-39.3	-37.6	20.9	11.1	500.0	-33.1
4511.25	H	60.4		4.7	36.0	-39.3	-37.6	24.2	16.2	500.0	-29.8
4511.25	V	61.0		4.7	36.0	-39.3	-37.6	24.8	17.4	500.0	-29.2
5413.50	H	63.0		5.1	36.8	-39.2	-37.6	28.2	25.6	500.0	-25.8
5413.50	V	63.2		5.1	36.8	-39.2	-37.6	28.4	26.2	500.0	-25.6
8120.25	H	53.7		6.5	38.4	-39.6	-37.6	21.4	11.7	500.0	-32.6
8120.25	V	56.8		6.5	38.4	-39.6	-37.6	24.5	16.8	500.0	-29.5
9022.50	H	56.3		6.5	38.9	-39.4	-37.6	24.7	17.1	500.0	-29.3
9022.50	V	56.7		6.5	38.9	-39.4	-37.6	25.1	17.9	500.0	-28.9

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp + Duty Cycle


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. : ESARM
SERIAL No. : SAMPLE #1
MODE : Tx @ 914.75MHz
SCANS/BAND : 1
NOTES : ANTENNA #1 AND 43CM OF COAX
TEST DATE : 19 Sep 2019 13:07:25 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
Limit
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. : ESARM
SERIAL No. : SAMPLE #1
MODE : Tx @ 914.75MHz
SCANS/BAND : 1
NOTES : ANTENNA #1 AND 43CM OF COAX
TEST DATE : 19 Sep 2019 13:12:18 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
Limit
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. : ESARM
SERIAL No. : SAMPLE #1
MODE : Tx @ 914.75MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 20 Sep 2019 15:15:04 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 = 10000


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. : ESARM
SERIAL No. : SAMPLE #1
MODE : Tx @ 914.75MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 20 Sep 2019 15:22:47 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 = 10000

Manufacturer : The Chamberlain Group
Test Item : Evolution Stand Alone Radio Module
Model No. : ESARM
Serial No. : Sample #1
Mode : Transmit at 914.75MHz
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions in Restricted Bands
Date : September 19, 2019 through September 23, 2019
Test Distance : 3 meters
Notes : Peak Detector with 1MHz Resolution Bandwidth

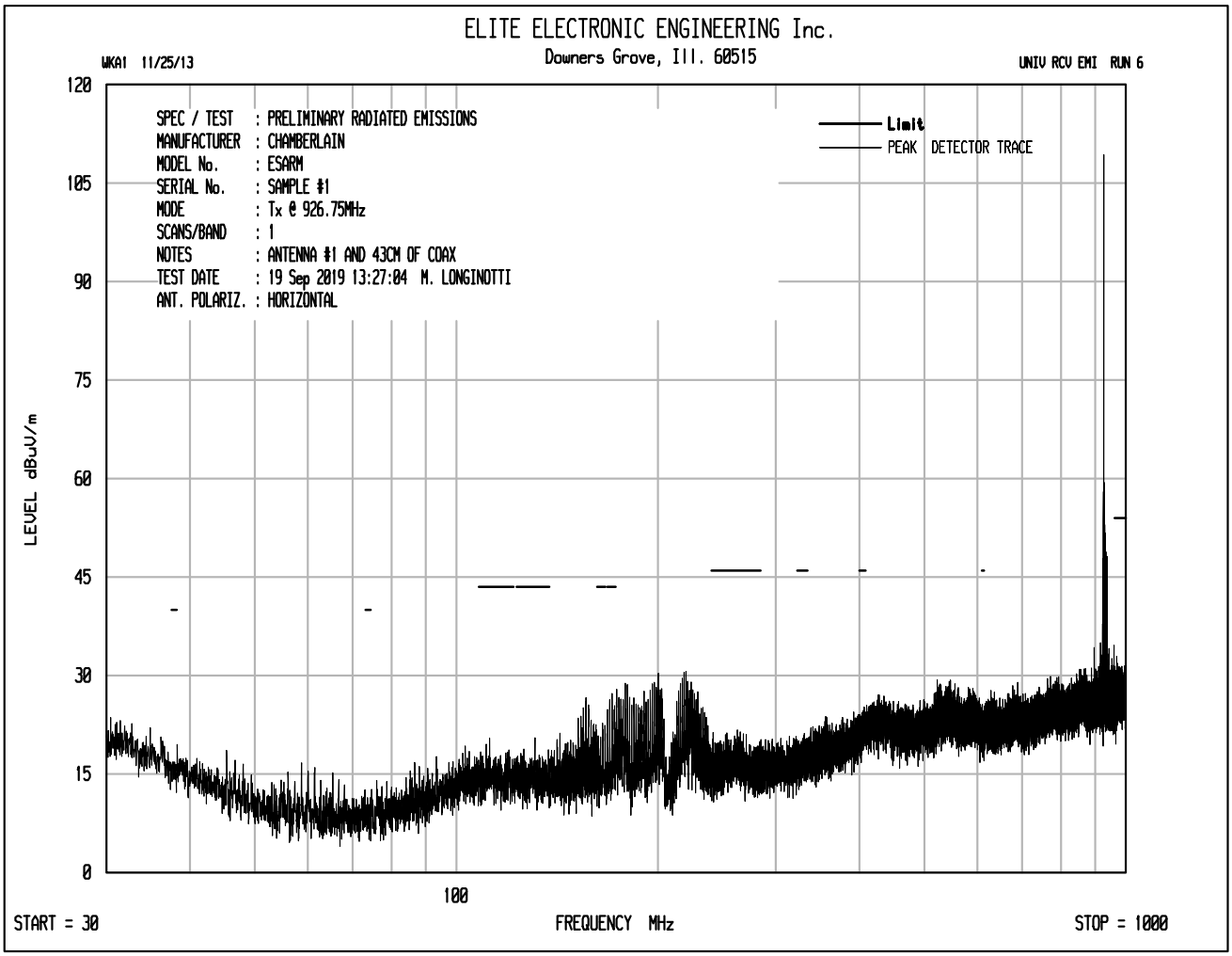
Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
2744.25	H	64.1		3.7	33.7	-40.2	61.3	1166.0	5000.0	-12.6
2744.25	V	64.4		3.7	33.7	-40.2	61.6	1206.9	5000.0	-12.3
3659.00	H	59.4		4.3	34.6	-39.3	59.0	886.9	5000.0	-15.0
3659.00	V	58.6		4.3	34.6	-39.3	58.2	808.9	5000.0	-15.8
4573.75	H	56.3		4.7	36.2	-39.4	57.9	782.2	5000.0	-16.1
4573.75	V	59.0		4.7	36.2	-39.4	60.6	1067.3	5000.0	-13.4
7318.00	H	55.5		6.2	38.1	-39.8	60.0	1003.0	5000.0	-14.0
7318.00	V	55.8		6.2	38.1	-39.8	60.3	1038.2	5000.0	-13.7
8232.75	H	56.6		6.5	38.6	-39.5	62.1	1279.0	5000.0	-11.8
8232.75	V	55.9		6.5	38.6	-39.5	61.4	1180.0	5000.0	-12.5
9147.50	H	55.3		6.6	38.9	-39.5	61.2	1152.3	5000.0	-12.7
9147.50	V	58.5		6.6	38.9	-39.5	64.4	1665.5	5000.0	-9.5

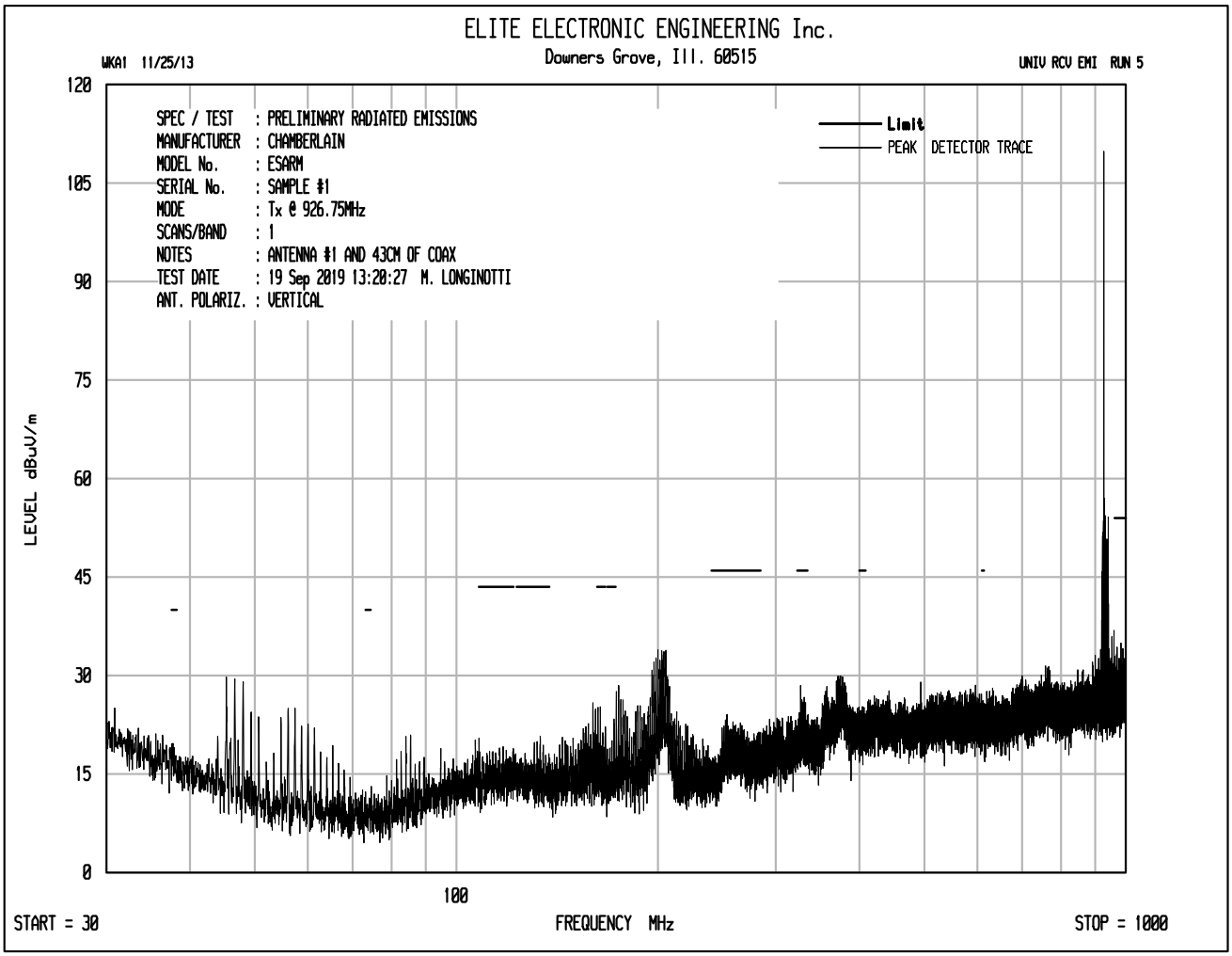
Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

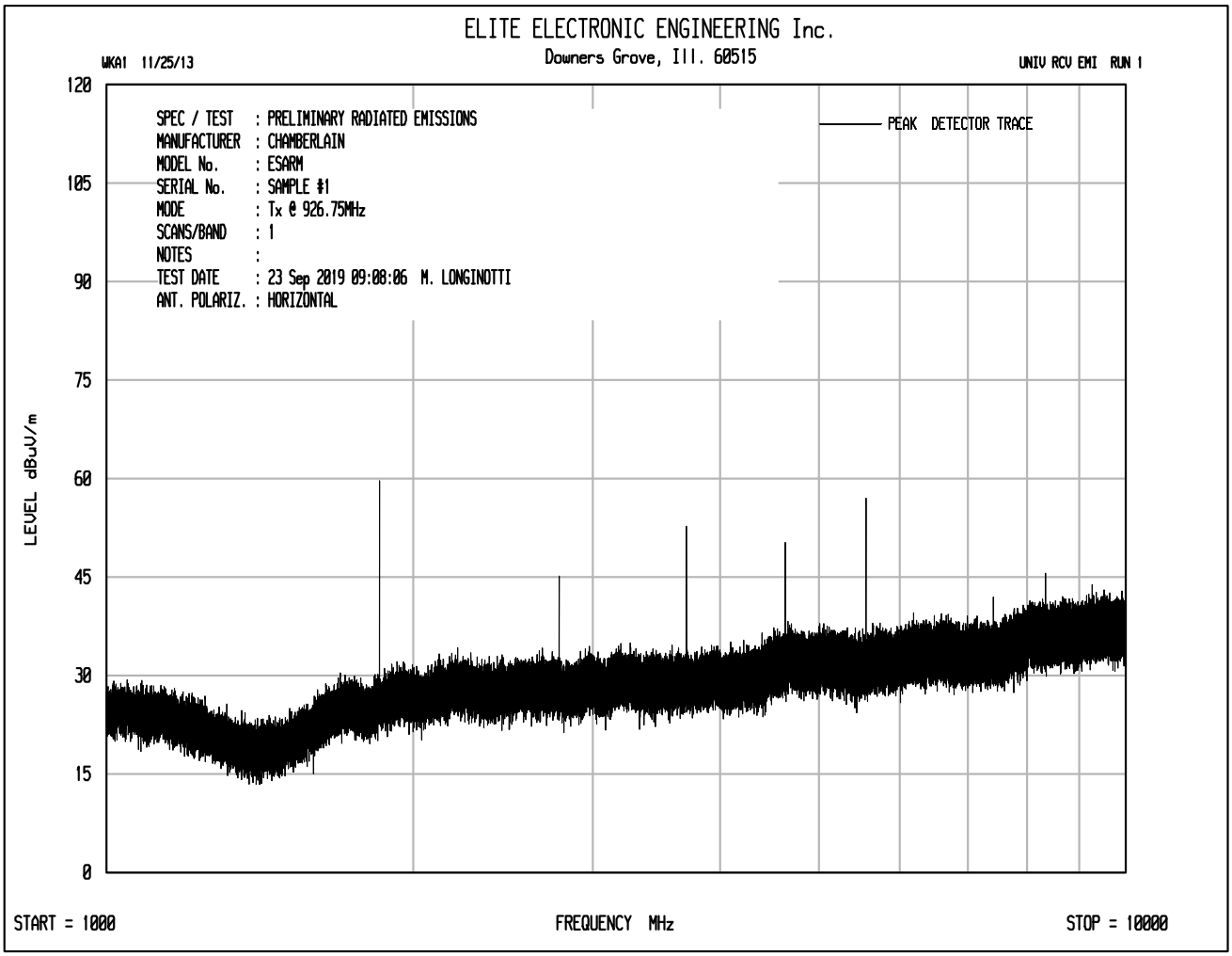
Manufacturer : The Chamberlain Group
Test Item : Evolution Stand Alone Radio Module
Model No. : ESARM
Serial No. : Sample #1
Mode : Transmit at 914.75MHz
Test Specification : FCC-15.247, RSS-247 Average Radiated Emissions in Restricted Bands
Date : September 19, 2019 through September 23, 2019
Test Distance : 3 meters
Notes :

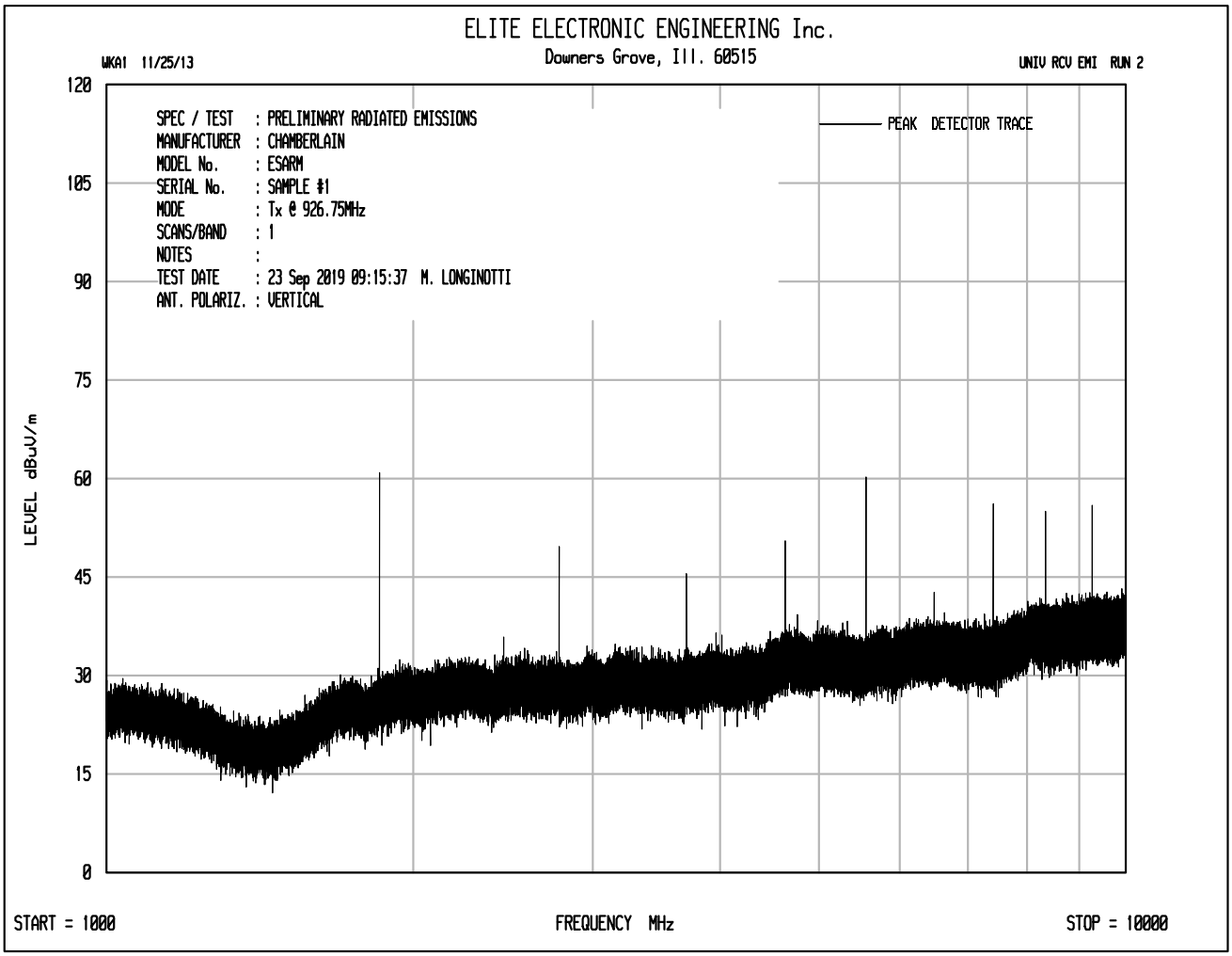
Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Duty Cycle (dB)	Average Total dBuV/m at 3m	Average Total uV/m at 3 m	Average Limit uV/m at 3 m	Margin (dB)
2744.25	H	64.1		3.7	33.7	-40.2	-37.6	23.7	15.4	500.0	-30.2
2744.25	V	64.4		3.7	33.7	-40.2	-37.6	24.0	15.9	500.0	-29.9
3659.00	H	59.4		4.3	34.6	-39.3	-37.6	21.4	11.7	500.0	-32.6
3659.00	V	58.6		4.3	34.6	-39.3	-37.6	20.6	10.7	500.0	-33.4
4573.75	H	56.3		4.7	36.2	-39.4	-37.6	20.3	10.3	500.0	-33.7
4573.75	V	59.0		4.7	36.2	-39.4	-37.6	23.0	14.1	500.0	-31.0
7318.00	H	55.5		6.2	38.1	-39.8	-37.6	22.4	13.2	500.0	-31.6
7318.00	V	55.8		6.2	38.1	-39.8	-37.6	22.7	13.7	500.0	-31.3
8232.75	H	56.6		6.5	38.6	-39.5	-37.6	24.5	16.9	500.0	-29.4
8232.75	V	55.9		6.5	38.6	-39.5	-37.6	23.8	15.6	500.0	-30.1
9147.50	H	55.3		6.6	38.9	-39.5	-37.6	23.6	15.2	500.0	-30.3
9147.50	V	58.5		6.6	38.9	-39.5	-37.6	26.8	22.0	500.0	-27.1

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp + Duty Cycle


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. : ESARM
SERIAL No. : SAMPLE #1
MODE : Tx @ 926.75MHz
SCANS/BAND : 1
NOTES : ANTENNA #1 AND 43CM OF COAX
TEST DATE : 19 Sep 2019 13:27:04 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
Limit
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. : ESARM
SERIAL No. : SAMPLE #1
MODE : Tx @ 926.75MHz
SCANS/BAND : 1
NOTES : ANTENNA #1 AND 43CM OF COAX
TEST DATE : 19 Sep 2019 13:20:27 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
Limit
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 1
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : ESARM
SERIAL No. : SAMPLE #1
MODE : Tx @ 926.75MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 23 Sep 2019 09:08:06 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 = 10000


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. : ESARM
SERIAL No. : SAMPLE #1
MODE : Tx @ 926.75MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 23 Sep 2019 09:15:37 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 = 10000

Manufacturer : The Chamberlain Group
Test Item : Evolution Stand Alone Radio Module
Model No. : ESARM
Serial No. : Sample #1
Mode : Transmit at 926.75MHz
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions in Restricted Bands
Date : September 19, 2019 through September 23, 2019
Test Distance : 3 meters
Notes : Peak Detector with 1MHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
2780.25	H	62.9		3.7	33.4	-40.2	59.8	979.5	5000.0	-14.2
2780.25	V	64.0		3.7	33.4	-40.2	60.9	1111.7	5000.0	-13.1
3707.00	H	58.4		4.3	34.5	-39.3	57.9	785.5	5000.0	-16.1
3707.00	V	59.6		4.3	34.5	-39.3	59.1	901.8	5000.0	-14.9
4633.75	H	53.3		4.8	36.4	-39.4	55.1	567.8	5000.0	-18.9
4633.75	V	54.3		4.8	36.4	-39.4	56.1	637.1	5000.0	-17.9
7414.00	H	52.3		6.2	38.2	-39.7	57.0	708.0	5000.0	-17.0
7414.00	V	53.3		6.2	38.2	-39.7	58.0	794.4	5000.0	-16.0
8340.75	H	53.3		6.5	38.6	-39.5	58.9	884.0	5000.0	-15.1
8340.75	V	54.7		6.5	38.6	-39.5	60.3	1038.6	5000.0	-13.7

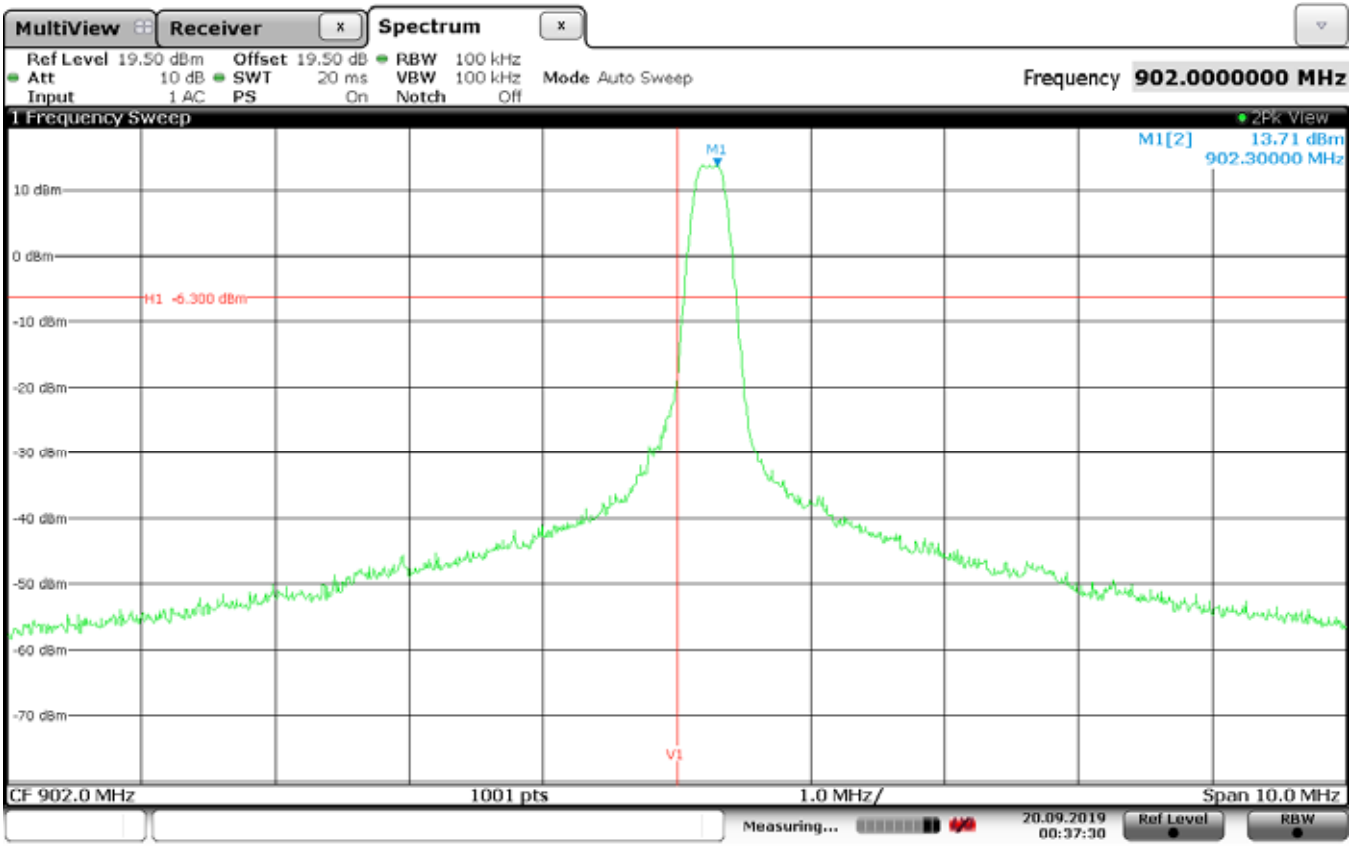
Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Manufacturer : The Chamberlain Group
Test Item : Evolution Stand Alone Radio Module
Model No. : ESARM
Serial No. : Sample #1
Mode : Transmit at 926.75MHz
Test Specification : FCC-15.247, RSS-247 Average Radiated Emissions in Restricted Bands
Date : September 19, 2019 through September 23, 2019
Test Distance : 3 meters
Notes :

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Duty Cycle (dB)	Average Total dBuV/m at 3m	Average Total uV/m at 3 m	Average Limit uV/m at 3 m	Margin (dB)
2780.25	H	62.9		3.7	33.4	-40.2	-37.6	22.2	12.9	500.0	-31.8
2780.25	V	64.0		3.7	33.4	-40.2	-37.6	23.3	14.7	500.0	-30.7
3707.00	H	58.4		4.3	34.5	-39.3	-37.6	20.3	10.4	500.0	-33.7
3707.00	V	59.6		4.3	34.5	-39.3	-37.6	21.5	11.9	500.0	-32.5
4633.75	H	53.3		4.8	36.4	-39.4	-37.6	17.5	7.5	500.0	-36.5
4633.75	V	54.3		4.8	36.4	-39.4	-37.6	18.5	8.4	500.0	-35.5
7414.00	H	52.3		6.2	38.2	-39.7	-37.6	19.4	9.3	500.0	-34.6
7414.00	V	53.3		6.2	38.2	-39.7	-37.6	20.4	10.5	500.0	-33.6
8340.75	H	53.3		6.5	38.6	-39.5	-37.6	21.3	11.7	500.0	-32.7
8340.75	V	54.7		6.5	38.6	-39.5	-37.6	22.7	13.7	500.0	-31.3

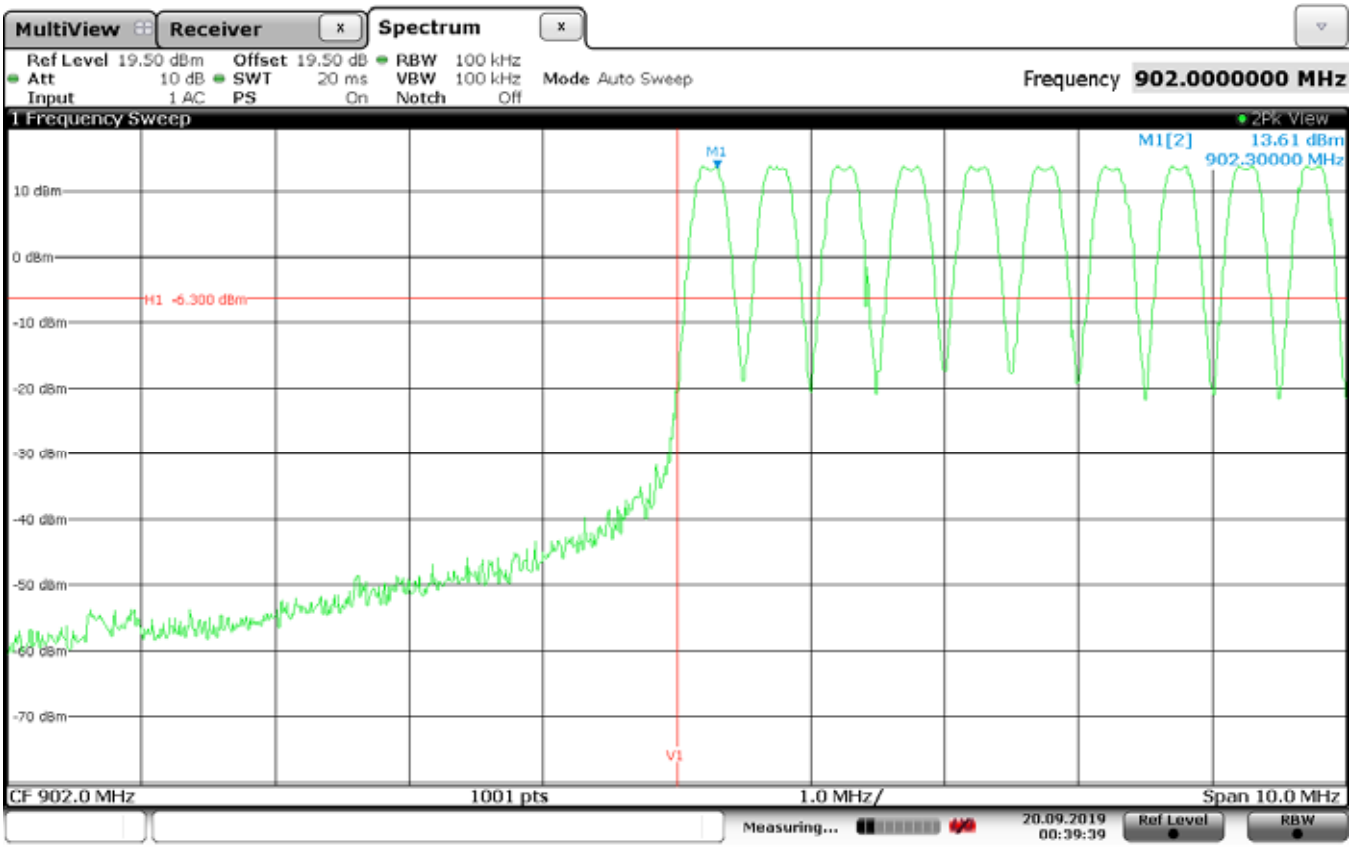
Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp + Duty Cycle

Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	TRANSMIT AT 902.25MHz
Test Performed	:	LOW BAND EDGE EMISSIONS
Notes	:	DISPLAY LINE V1 REPRESENTS THE LOW BAND EDGE (902MHz). DISPLAY LINE H1 REPRESENTS THE LEVEL 20dB DOWN FROM THE PEAK OF THE HIGHEST LEVEL OF THE DESIRED POWER



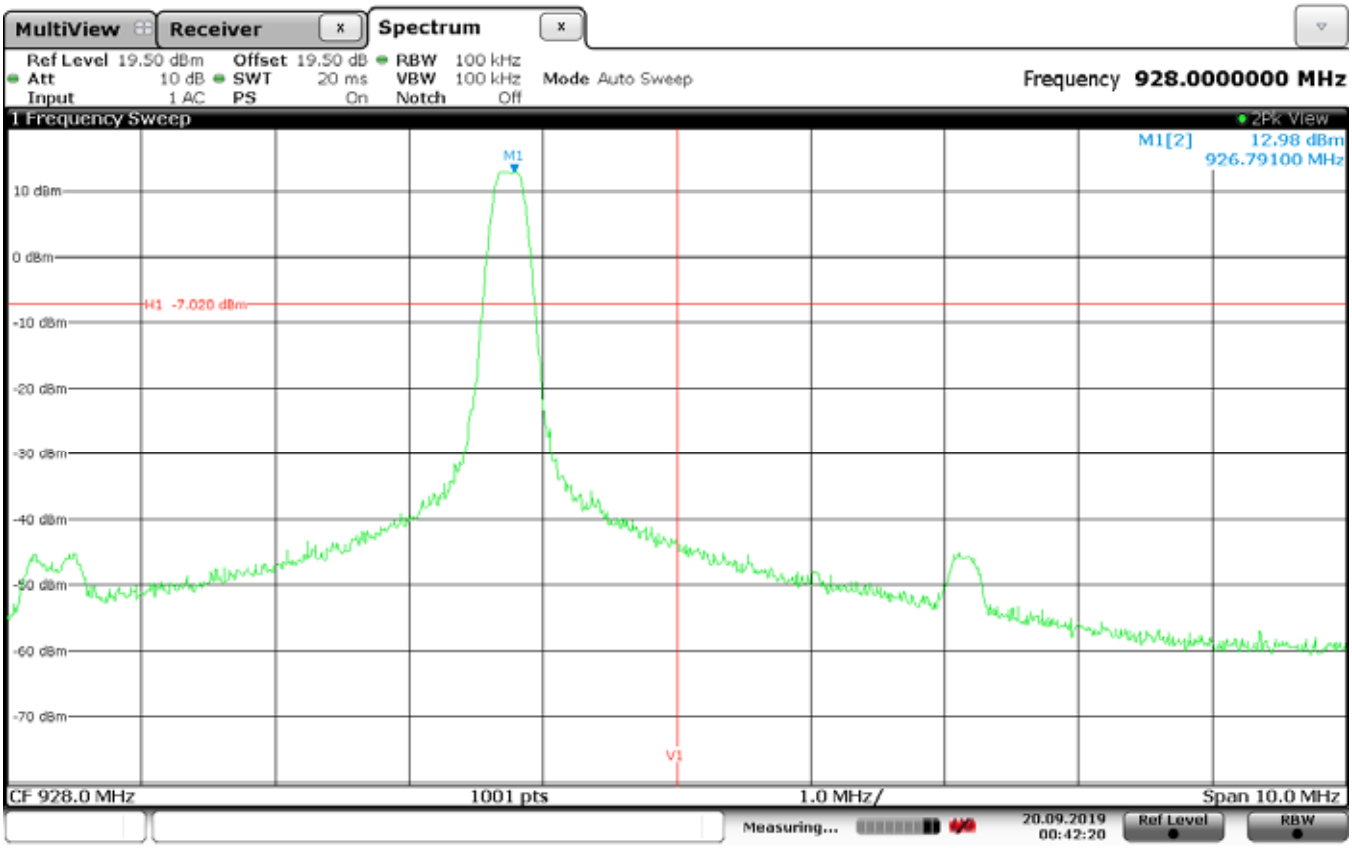
Date: 20.SEP.2019 00:37:30

Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	HOPPING ENABLED
Test Performed	:	LOW BAND EDGE EMISSIONS
Notes	:	DISPLAY LINE V1 REPRESENTS THE LOW BAND EDGE (902MHz). DISPLAY LINE H1 REPRESENTS THE LEVEL 20dB DOWN FROM THE PEAK OF THE HIGHEST LEVEL OF THE DESIRED POWER



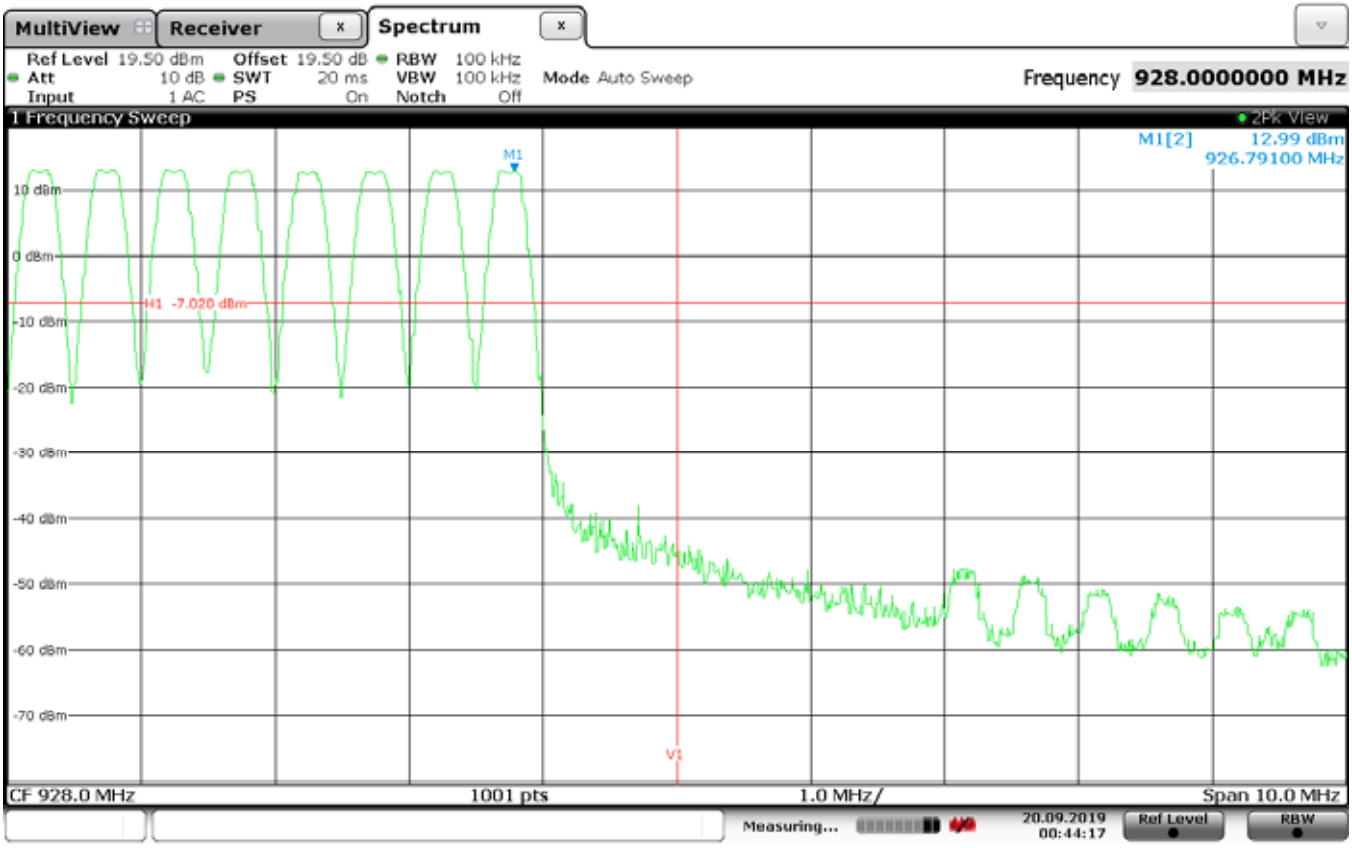
Date: 20.SEP.2019 00:39:39

Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	TRANSMIT AT 926.75MHz
Test Performed	:	HIGH BAND EDGE EMISSIONS
Notes	:	DISPLAY LINE V1 REPRESENTS THE HIGH BAND EDGE (928MHz). DISPLAY LINE H1 REPRESENTS THE LEVEL 20dB DOWN FROM THE PEAK OF THE HIGHEST LEVEL OF THE DESIRED POWER



Date: 20.SEP.2019 00:42:20

Manufacturer	:	CHAMBERLAIN
Model	:	ESARM
Serial Number	:	SAMPLE #1
DUT Mode	:	HOPPING ENABLED
Test Performed	:	HIGH BAND EDGE EMISSIONS
Notes	:	DISPLAY LINE V1 REPRESENTS THE HIGH BAND EDGE (928MHz). DISPLAY LINE H1 REPRESENTS THE LEVEL 20dB DOWN FROM THE PEAK OF THE HIGHEST LEVEL OF THE DESIRED POWER



Date: 20.SEP.2019 00:44:17