Measurement of RF Interference from an 001D9525-01 Main/Control PCB Transceiver

For	The Chamberlain Group, Inc. 300 Windsor Dr Oak Brook, IL 60523
P.O. Number	4900061714
Date Tested	November 4 - 8 & 18 – 22 and December , 2019
Test Personnel	Tylar Jozefczyk
Specification	FCC "Code of Federal Regulations" Title 47, Part 15, Subpart C, Sections 15.207 and 15.247 for Frequency Hopping Spread Spectrum Intentional Radiators within the band 902-928MHz, 2400-2483.5MHz, 5725-5850MHz FCC “Code of Federal Regulations” Title 47, Part15, Subpart 15B, Section 15.107 and 15.109 for Receivers Industry Canada RSS-247 Industry Canada RSS-GEN
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REVISION HISTORY

Revision	Date	Description
—	01/08/2020	Initial release
A	24 JAN 2020 by TMJ	- Changed test report number 1902057-01 to 1902057-01 Rev. A throughout report. - Changed company name from Chamberlain Group, Inc. to The Chamberlain Group, Inc. throughout report. - Corrected spelling on Requestors name. - Changed EUT descriptor from HD Swinger 24VDC to Main/Control PCB Transceiver throughout report. - Changed Model No. from HDSW24UL to 001D9525-01 throughout report. - Minor wording edits throughout report. - Sections 1.1, 3.1, and 6: Added note that the EUT was installed in a HD Operator (Model No. HDSW24UL) during testing.

Measurement of RF Emissions from a Main/Control PCB Transceiver, Model No. 001D9525-01

1. INTRODUCTION

1.1 Scope of Tests

This document represents the results of the series of radio interference measurements performed on a The Chamberlain Group, Inc. Main/Control PCB Transceiver, Model No. 001D9525-01 (hereinafter referred to as the EUT). The EUT is a frequency hopping spread spectrum transceiver. The transceiver was designed to transmit and receive in the 902-928MHz band using an external antenna and was used in a HD Operator (Model No. HDSW24UL). The EUT was manufactured and submitted for testing by The Chamberlain Group, Inc. 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 902-928MHz band.

The test series was also performed to determine if the EUT meets the conducted RF and radiated RF emissions requirements of the Industry Canada Radio Standards Specification RSS Gen Section 7.2.4 and 6 for receivers and Industry Canada Radio Standards Specification RSS Gen Section 8 and Industry Canada Radio Standards Specification RSS-247 for Transmitters.

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

1.3 Deviations, Additions and Exclusions

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

1.4 EMC Laboratory Identification

This series of tests was performed by Elite Electronic Engineering Incorporated of Downers Grove, Illinois. The laboratory is accredited by the American Association for Laboratory Accreditation (A2LA), A2LA Lab Code: 1786-01.

1.5 Laboratory Conditions

The temperature at the time of the test was 24C and the relative humidity was 22%.

2. APPLICABLE DOCUMENTS

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

- Federal Communications Commission "Code of Federal Regulations", Title 47, Part 15, Subpart C, dated 1 October 2016
- ANSI C63.4-2014, "American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz”
- ANSI C63.10-2013, "American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices”
- FCC Public Notice, DA 00-705, "Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems", Released March 30, 2000
- Industry Canada Radio Standards Specification, RSS-Gen, “General Requirements for Compliance of Radio Apparatus”, Issue 5, April 2018

- Industry Canada Radio Standards Specification, RSS-247, “Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and License-Exempt Local Area Network (LE-LAN) Devices”, Issue 2, February 2017

3. EUT SETUP AND OPERATION

3.1 General Description

The EUT is a Main/Control PCB Transceiver, Model No. 001D9525-01. For testing, the EUT was installed in a HD Operator (Model No. HDSW24UL). A block diagram of the EUT setup is shown as Figure 1 and Figure 2.

3.1.1 Power Input

The EUT obtained 120VAC 60Hz power via a 3-wire 1m unshielded power cord.

3.1.2 Peripheral Equipment

The following peripheral equipment was submitted with the EUT:

Item	Description
Yagi High Performance Antenna	Model: HG912YE; 12dBi
Antenna Adaptor	F-type Male to N Male

3.1.3 Interconnect Cables

The following interconnect cables were submitted with the EUT:

Item	Description
G86LMT Antenna Extension Cable	7.5m

3.1.4 Grounding

The EUT was grounded only through the third wire of its input power cord.

3.2 Operational Mode

The EUT was energized. The cables were manually maximized during the preliminary emissions sweeps. The cable arrangement which resulted in the worst case emissions was utilized. The unit was programmed to operate in one of the following modes:

Mode	Description
Tx	The EUT was powered on and set to transmit at one of the following frequencies: - 902.25MHz - 914.75MHz - 926.75MHz
Rx	The EUT was powered on and set to receive at one of the following frequencies: - 310MHz - 315MHz - 390MHz - 433.92MHz - 902.25MHz - 914.75MHz - 926.75MHz
Motor Running	The EUT was turned on and set to have the motor running.

Note: For all Radiated tests, two (2) different antennas were used: the Antenna Adaptor and the Yagi antenna.

3.3 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 utilizes the bandwidths and detectors specified by the FCC.

4.3 Calibration Traceability

Test equipment is maintained and calibrated on a regular basis. All calibrations are traceable to the National Institute of Standards and Technology (NIST).

4.4 Measurement Uncertainty

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

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

Per the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart B, 15.107(a), all radio frequency voltages on the power lines of a receiver shall be below the values shown below when using a quasi-peak or average detector:

CONDUCTED LIMITS FOR A RECEIVER

Frequency MHz	RFI Voltage dBµV(QP)	RFI Voltage dBµV(Average)
0.15-0.5	66 decreasing with logarithm of frequency to 56	56 decreasing with logarithm of frequency to 46
0.5-5	56	46
5-30	60	50

Note 1: The lower limit shall apply at the transition frequencies.
Note 2: If the levels measured using the QP detector meet both the QP and the Average limits, the EUT is considered to have met both requirements and measurements do not need to be performed using the Average detector.

5.1.1.2 Procedures

The interference on each power lead of the EUT was measured by connecting the measuring equipment to the appropriate meter terminal of the Line Impedance Stabilization Network (LISN). The meter terminal of the LISN not under test was terminated with 50 ohms.

1) The EUT was operated in the Tx mode.
2) Measurements were first made on the 120VAC high line.
3) The frequency range from 150 kHz to 30 MHz was broken up into smaller frequency sub-bands.
4) Conducted emissions measurements were taken on the first frequency sub-band using a peak detector.
5) The data thus obtained was then searched by the computer for the highest levels. Any emissions levels that were within 10dB of the average limit were then measured again using both a quasi-peak detector and an average detector. (If no peak readings were within 10dB of the average limit, quasi-peak and average readings were taken on the highest emissions levels measured during the peak detector scan.)
6) Steps (4) and (5) were repeated for the remainder of the frequency sub-bands until the entire frequency range from 150kHz to 30MHz was investigated. The peak trace was automatically plotted. The plot also shows quasi-peak and average readings that were taken on discrete frequencies. A table showing the quasi-peak and average readings was also generated. This tabular data compares the quasi-peak and average conducted emissions to the applicable conducted emissions limits. The resultant voltage level (VL) is a summation in decibels (dB) of the receiver meter reading (MTR) and the cable loss factor (CF).

   Formula 1: VL (dBµV) = MTR (dBµV) + CF (dB)

7) Steps (3) through (6) were repeated on the 120VAC neutral line.
8) Steps (2) through (7) were repeated with the EUT operated in the Motor Running mode.

5.1.1.3 Results

The plots of the peak, quasi-peak, and average conducted voltage levels and the tabular quasi-peak and average results acquired from each input power line with the EUT operated in the Rx mode are shown on pages 28 and 35. All power line conducted emissions measured from the EUT were within the specification limits. The emissions level closest to the limit (worst case) occurred at 0.159MHz. The emissions level at this frequency was 27.3dB within the limit.

The plots of the peak, quasi-peak, and average conducted voltage levels and the tabular quasi-peak and average results acquired from each input power line with the EUT operated in the Motor Running mode are shown on pages 36 and 39. All power line conducted emissions measured from the EUT were within the specification limits. The emissions level closest to the limit (worst case) occurred at 0.150MHz. The emissions level at this frequency was 6.3dB within the limit.

Photographs of the test configuration which yielded the highest or worst case, conducted emission levels are shown in Figure 3.

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 2.0nW.

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 a low, middle, and high channel. The emissions in the frequency range of 30MHz to 5GHz (for the 300MHz and 400MHz band) and 30MHz to 10GHz (for the 902-928MHz band) 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 40 through 53. 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 2.0nW requirements.

Since the emissions were below the 2.0nW limit, the antenna port can be terminated with a shielded load for the radiated emissions measurements.

5.1.3 Radiated Measurements

5.1.3.1 Requirements

Per the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart B, Section 15.109(a) and Industry Canada 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 (meters)	Field Strength (µV/m)	Field Strength (dBµV/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.

5.1.3.2 Procedures

Testing was performed separately on a low, middle, and high channel. The emissions in the frequency range of 30MHz to 5GHz (for the 300MHz and 400MHz band) and 30MHz to 10GHz (for the 902-928MHz band) were measured. 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 10GHz 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.

For hand-held or body-worn devices, the EUT was rotated through three orthogonal axes to determine which orientation produces the highest emission relative to the limit.

5.1.3.3 Results

Radiated emissions plots and final data are shown on pages 54 through 154. As can be seen from the data, all emissions measured from the EUT were within the specification limits. The emissions level closest to the limit (worst case) occurred at 38.58MHz. The emissions level at this frequency was 1.0dB within the limit. Photographs of the test configuration which yielded the highest (or worst case) radiated emission levels are shown in Figures 5 and 6.

5.2 Transmitter

5.2.1 Powerline Conducted Emissions

5.2.1.1 Requirements

Per the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart C, Per 15.207(a), all radio frequency voltages on the power lines of a transmitter shall be below the values shown below when using a quasi-peak or average detector:

Frequency (MHz)	Conducted Limit (dBµV)	
	Quasi-peak	Average
0.15 – 0.5	66 decreasing with logarithm of frequency to 56	56 decreasing with logarithm of frequency to 46
0.5 - 5	56	46
5 - 30	60	50

Note 1: The lower limit shall apply at the transition frequencies.
Note 2: If the levels measured using the QP detector meet both the QP and the Average limits, the EUT is considered

to have met both requirements and measurements do not need to be performed using the Average detector.

5.2.1.2 Procedures

The interference on each power lead of the EUT was measured by connecting the measuring equipment to the appropriate meter terminal of the Line Impedance Stabilization Network (LISN). The meter terminal of the LISN not under test was terminated with 50 ohms.

1) The EUT was operated in the Tx mode.
2) Measurements were first made on the 120VAC high line.
3) The frequency range from 150 kHz to 30 MHz was broken up into smaller frequency sub-bands.
4) Conducted emissions measurements were taken on the first frequency sub-band using a peak detector.
5) The data thus obtained was then searched by the computer for the highest levels. Any emissions levels that were within 10dB of the average limit were then measured again using both a quasi-peak detector and an average detector. (If no peak readings were within 10dB of the average limit, quasi-peak and average readings were taken on the highest emissions levels measured during the peak detector scan.)
6) Steps (4) and (5) were repeated for the remainder of the frequency sub-bands until the entire frequency range from 150kHz to 30MHz was investigated. The peak trace was automatically plotted. The plot also shows quasi-peak and average readings that were taken on discrete frequencies. A table showing the quasi-peak and average readings was also generated. This tabular data compares the quasi-peak and average conducted emissions to the applicable conducted emissions limits.
7) Steps (3) through (6) were repeated on the 120VAC neutral line.

5.2.1.3 Results

The plots of the peak, quasi-peak, and average conducted voltage levels and the tabular quasi-peak and average results acquired from each input power line with the EUT operated in the Tx mode are shown on pages 155 and 158. All power line conducted emissions measured from the EUT were within the specification limits. The emissions level closest to the limit (worst case) occurred at 0.150MHz. The emissions level at this frequency was 26.5MHz within the limit.

Photographs of the test configuration which yielded the highest or worst case, conducted emission levels are shown in Figure 3.

5.2.2 20dB Bandwidth

5.2.2.1 Requirements

Per FCC 15.247(a)(1) and RSS 247 5.1(b), 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. Per section 15.247(a)(1)(i) and RSS 247 5.1(c), 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.

5.2.2.2 Procedures

The antenna port of the EUT was connected to the spectrum analyzer through 40dB 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 ≥ 1% of the 20dB BW. The span was set to approximately 2 to 3 times the 20 dB bandwidth.

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 159 through 164 show that the maximum 20 dB bandwidth was 228.8kHz. The 99% bandwidth was measured to be 191.98kHz.

Therefore, since the 20dB bandwidth of the hopping channel is less than 250kHz, the system shall use at least 50 hopping channels.

5.2.3 Carrier Frequency Separation

5.2.3.1 Requirements

Per FCC 15.247 (a)(1) and RSS 247 5.1(b), 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 40dB of attenuation. With the hopping function enabled, the EUT was allowed to transmit continuously.

The resolution bandwidth (RBW) was set to > 1% of the span. The peak detector and 'Max-Hold' function were engaged. The span was set wide enough to capture the peaks of at least two adjacent channels.
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 165 shows the carrier frequency separation. As can be seen from this plot, the carrier frequency separation is 499.5kHz, which is greater than the 20dB bandwidth (228.8kHz).

5.2.4 Number of Hopping Frequencies

5.2.4.1 Requirements

Per FCC 15.247(a)(1)(i) and RSS 247 5.1(c), 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 40dB of attenuation. With the hopping function enabled, the EUT was allowed to transmit continuously.

The resolution bandwidth (RBW) was set to ≥ 1% of the span. 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 166 shows the number of hopping frequencies. As can be seen from this plot, the number of hopping frequencies is 50, which is equal to 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 FCC 15.247(a)(1)(i) and RSS 247 5.1(c), 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 40dB of attenuation. With the hopping function enabled, the EUT was allowed to transmit continuously.

The resolution bandwidth (RBW) was set to 1 MHz. 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 to capture the number of hops in the appropriate sweep time. A single sweep was made. The analyzer's display was plotted using a 'screen dump' utility.

The dwell time in the specified time period was then calculated from dwell time per hop multiplied by the number of hops in the specified time period.

5.2.5.3 Results

Pages 167 and 168 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 1.288ms multiplied by 88. This calculated value is equal to 0.11 seconds, which is less than the 0.4 seconds maximum allowed.

5.2.6 Peak Output Power

5.2.6.1 Requirements

Per FCC 15.247(b)(2), 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 15.247(b)(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 6dBi 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 6dBi.

Per RSS 247 5.4(a), for frequency hopping systems operating in the band 902-928MHz, the maximum peak conducted output power shall not exceed 1.0W, and the e.i.r.p. shall not exceed 4W if the hop set uses 50 or more hopping channels; the maximum peak conducted output power shall not exceed 0.25W and the e.i.r.p. shall not exceed 1W if the hop set uses less than 50 hopping channels.

5.2.6.2 Procedures

For the radiated emissions method, the EUT was placed on the 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.

For the antenna conducted emissions method, the antenna port of the EUT was connected to the spectrum analyzer through 40dB 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 '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 radiated emissions results are presented on pages 169 and 170.

The maximum EIRP measured from the transmitter with the Antenna Adaptor was 0.00425W (6.28dBm), which is below the 4 Watt de facto limit.

The maximum EIRP measured from the transmitter with the Yagi antenna was 0.0027W (4.32dBm), which is below the 4 Watt de facto limit.

The antenna conducted emissions results are presented on pages 171 through 173. The maximum peak conducted output power from the transmitter was 0.00746W (8.73dBm), which is below the 1 Watt limit.

5.2.7 Duty Cycle Factor Measurements

5.2.7.1 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 2msec/div. The amplitude settings are adjusted so that the on/off transitions clear the 4th 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).

5.2.7.2 Results

The plots of the duty cycle are shown on data pages 174 through 176.

The EUT transmits a 1.288ms pulse every 3.378ms. Since a word is greater than 100msec long, the duty cycle factor was computed over a 100msec interval. The duty cycle correction factor was calculated to be -8.259dB ($20\log\left(\frac{(30)\times(1.288ms)}{100ms}\right)$).

5.2.8 Radiated Spurious Emissions Measurements

5.2.8.1 Requirements

Radiated emissions which fall in the restricted bands, as defined in FCC §15.205(a) and RSS GEN, must comply with the radiated emission limits specified in FCC §15.209(a) and RSS GEN Section 8.9.

Paragraph FCC 15.209(a) and RSS GEN Section 8.9 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

5.2.8.2 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 harmonics not in the restricted bands, the following procedure was used:
   a) The field strength of the fundamental was measured using a bilog antenna. The bilog antenna was positioned at a 3 meter distance from the EUT. The EUT was placed on an 80 centimeter 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 of the harmonics not in the restricted band were then 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 100 kHz was used on the spectrum analyzer.
   c) To ensure that maximum or worst case emission levels at the fundamental and harmonics were measured, the following steps were taken when measuring the fundamental emissions and the spurious emissions:
      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.
      iv) In instances where it was necessary to use a shortened cable between the measuring antenna and the spectrum analyzer. The measuring antenna was not raised or lowered to ensure maximized readings, instead the EUT was rotated through all axis to ensure the maximum readings were recorded for the EUT.
   d) All harmonics not in the restricted bands must be at least 20 dB below levels measured at the fundamental. However, attenuation below the general limits specified in §15.209(a) is not required.
2) 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 bilog antenna. The bilog 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.

   iv) In instances where it was necessary to use a shortened cable between the measuring antenna and the spectrum analyzer. The measuring antenna was not raised or lowered to ensure maximized readings, instead the EUT was rotated through all axis to ensure the maximum readings were recorded for the EUT.

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) Next, for all radiated emissions measurements above 1GHz, the resolution bandwidth was set to 1MHz. The analyzer was set to linear mode with a 10Hz video bandwidth in order to simulate an average detector. An average reading was taken.

If the dwell time per channel of the hopping signal is less than 100msec, then the reading obtained with the 10 Hz video bandwidth may be further adjusted by a “duty cycle correction factor”, derived from 20*log(dwell time/100msec). These readings must be no greater than the limits specified in 15.209(a).

5.2.8.3 Results

Preliminary radiated emissions plots are shown on pages 177 through 200. Final radiated emissions data are presented on data pages 201 through 218. 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 Figures 5 and 7.

The emissions level closest to the limit (worst case) with the Antenna Adaptor occurred at 7318MHz. The emissions level at this frequency was 18.68dB within the limit.

The emissions level closest to the limit (worst case) with the Yagi antenna occurred at 8232.75MHz. The emissions level at this frequency was 19.79dB within the limit.

5.2.9 Band Edge Compliance

5.2.9.1 Requirements

Per FCC 15.247(d) and RSS 247 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 FCC 15.209(a) and RSS GEN is not required.

5.2.9.2 Procedures

5.2.9.2.1 Low Band Edge

1) The antenna port of the EUT was connected to the spectrum analyzer through 40dB of attenuation.
2) The EUT was set to transmit continuously at the channel closest to the low band edge with the 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) ≥ 1% of the span.
    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.

5.2.9.2.2 High Band Edge

1) The antenna port of the EUT was connected to the spectrum analyzer through 40dB of attenuation.
2) The EUT was set to transmit continuously at the channel closest to the high band edge with the 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) ≥ 1% of the span.
    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.

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

5.2.9.3 Results

Pages 219 through 222 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 20dB down limits.

6. CONCLUSIONS

It was determined that The Chamberlain Group, Inc. Main/Control PCB Transceiver, Model No. 001D9525-01 frequency hopping spread spectrum transceiver (when used in HD Operator HDSW24UL) 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 902-928MHz band, when tested per ANSI C63.4-2014.

It was also determined that The Chamberlain Group, Inc. Main/Control PCB Transceiver, Model No. 001D9525-01 frequency hopping spread spectrum transceiver (when used in HD Operator HDSW24UL) did fully meet the conducted and radiated RF emission requirements of the Industry Canada Radio Standards Specification RSS Gen Sections 5 and 7 for receivers and the Industry Canada Radio Standards Specification RSS Gen Section 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.

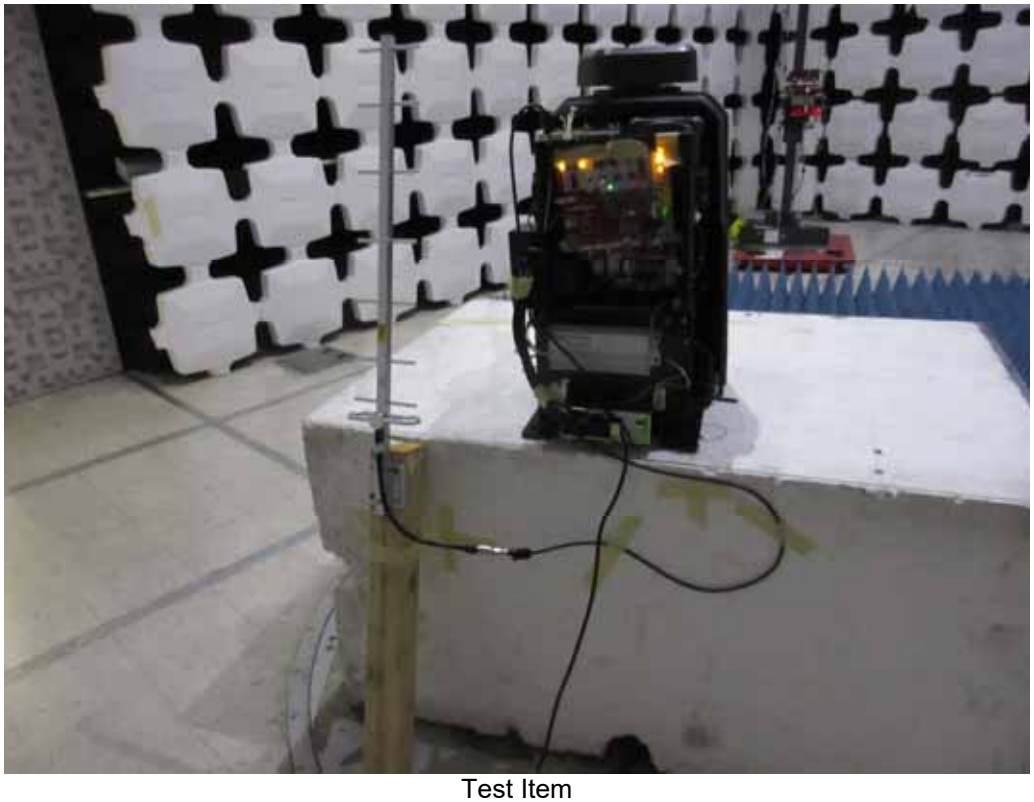
9. EQUIPMENT LIST

Table 9-1 Equipment List

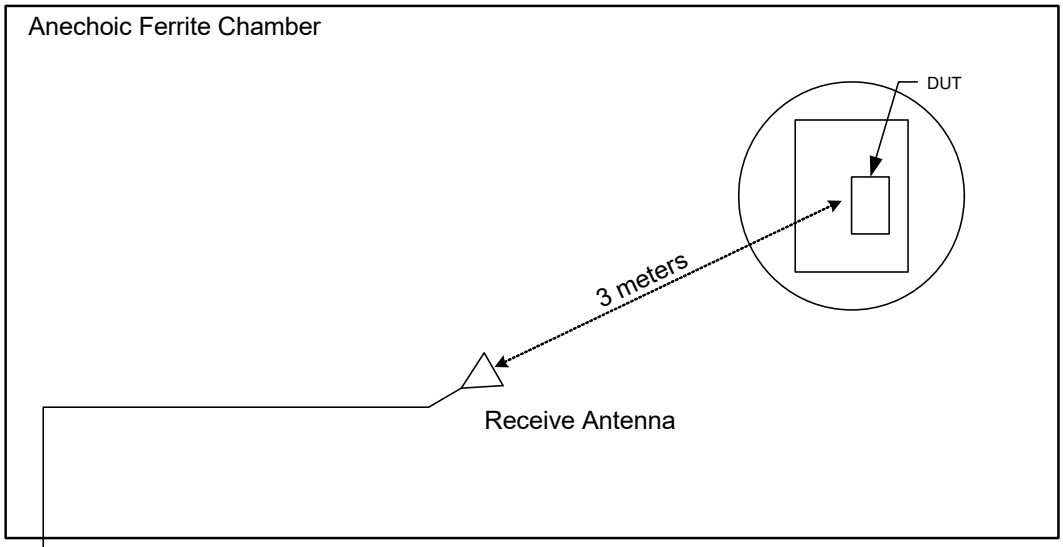
Eq ID	Equipment Description	Manufacturer	Model No.	Serial No.	Frequency Range	Cal Date	Due Date
APW11	PREAMPLIFIER	PMI	PE2-35-120-5R0-22-SFF	PL11685/1241	1GHZ-20GHZ	4/8/2019	4/8/2020
APW3	PREAMPLIFIER	PLANAR ELECTRONICS	PE2-35-120-5R0-22	PL2924	1GHZ-20GHZ	4/8/2019	4/8/2020
CDX8	COMPUTER	ELITE	WORKSTATION			N/A	
CDY0	WORKSTATION	ELITE	WORKSTATION		WINDOWS 7	N/A	
MEA0	MICRO-OHM METER	KEITHLEY	580	674866	10UOHM-200KOHM	7/13/2019	7/13/2020
NTA2	BILOG ANTENNA	TESEQ	6112D	28040	25-1000MHz	12/20/2018	12/20/2019
NTA4	BILOG ANTENNA	TESEQ	6112D	46660	20-2000GHZ	9/23/2019	9/23/2020
NWQ0	DOUBLE RIDGED WAVEGUIDE ANTENNA	ETS LINDGREN	3117	66657	1GHZ-18GHZ	5/31/2018	5/31/2020
NWQ1	DOUBLE RIDGED WAVEGUIDE ANTENNA	ETS-LINDGREN	3117	66655	1GHZ-18GHZ	4/10/2018	4/10/2020
PLF1	CISPR16 50UH LISN	ELITE	CISPR16/70A	001	.15-30MHz	4/24/2019	4/24/2020
PLF3	CISPR16 50UH LISN	ELITE	CISPER16/70A	003	.15-30MHz	4/24/2019	4/24/2020
RBG2	EMI ANALYZER	ROHDE & SCHWARZ	ESW44	101591	2HZ-44GHZ	2/21/2019	2/21/2020
RBG3	EMI ANALYZER	ROHDE & SCHWARZ	ESW44	101592	2HZ-44GHZ	2/20/2019	2/20/2020
SES0	24VDC POWER SUPPLY	P-TRANS	FS-32024-1M	001	18-27VDC	NOTE 1	
SHC2	Power Supplies	HENGFU	HF60W-SL-24	A11372702	24V	NOTE 1	
T1EQ	10DB 25W ATTENUATOR	WEINSCHEL	46-10-34	CD6791	DC-18GHZ	4/23/2018	4/23/2020
T2DQ	20DB, 25W ATTENUATOR	WEINSCHEL	46-20-34	BS2139	DC-18GHZ	4/23/2018	4/23/2020
T2SG	20DB 25W ATTENUATOR	WEINSCHEL	46-20-34	CD5016	DC-18GHZ	1/8/2018	1/8/2020
VBR8	CISPR EN FCC CE VOLTAGE.exe						
VBV2	CISPR EN FCC ICES RE.EXE	ELITE	CISPR EN FCC ICES RE.EXE	---	---	N/A	
XLJW	5W, 50 OHM TERMINATION	JFW INDUSTRIES	50T-052	---	DC-2GHZ	6/11/2018	6/11/2020
XPQ2	HIGH PASS FILTER	K&L MICROWAVE	4IH30-1804/T10000-0	3	1.8-10GHZ	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.

Test Item



Test Item



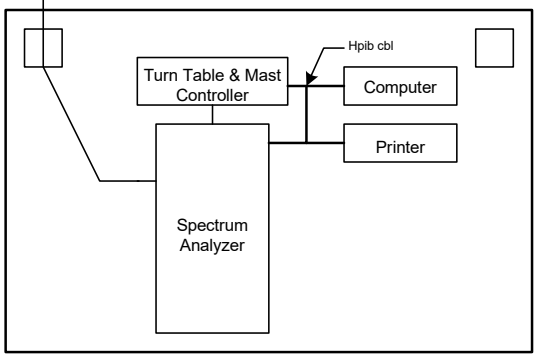


FIGURE 1 BLOCKDIAGRAM OF TEST SETUP

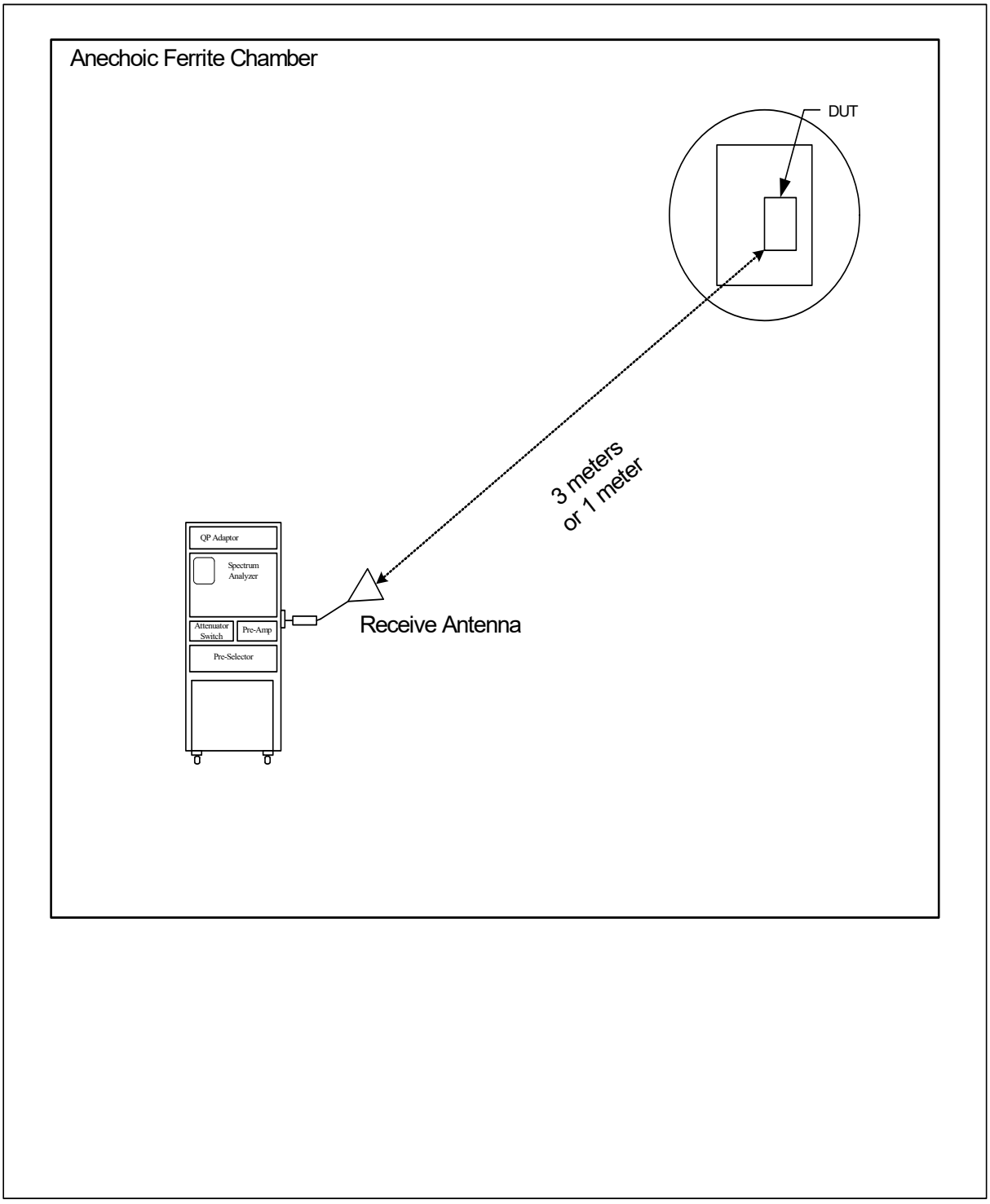


Figure 2: BLOCK DIAGRAM OF TEST SETUP FOR RADIATED EMISSIONS ABOVE 1GHZ

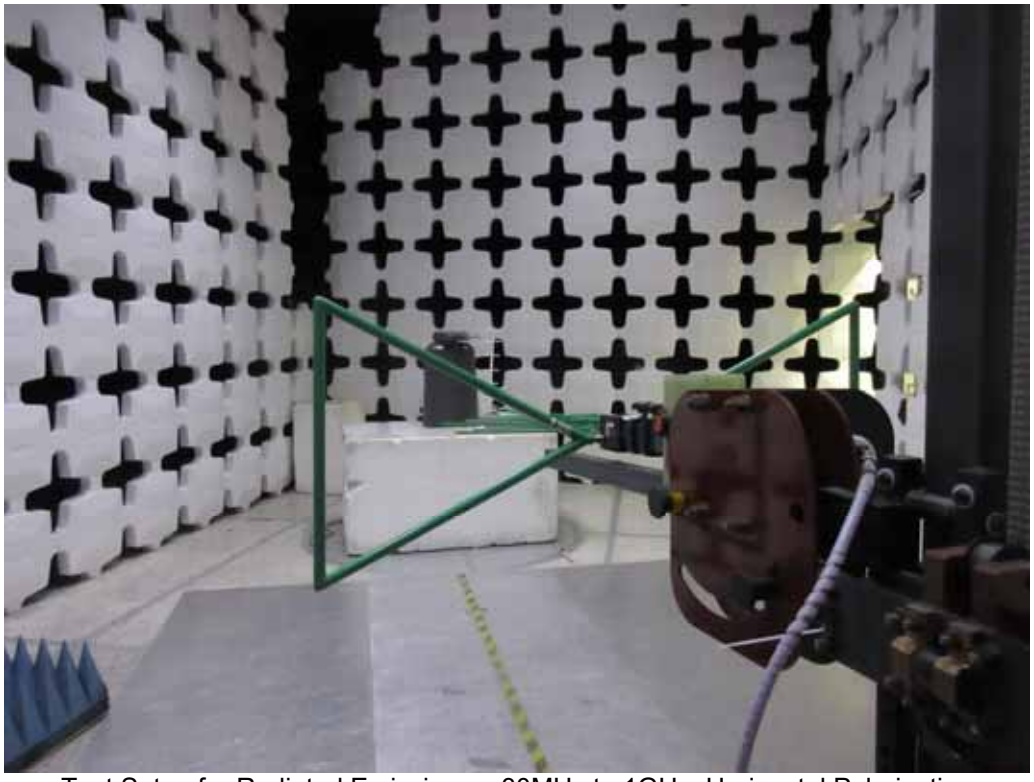
Figure 3

Test Setup for Conducted Emissions

Figure 4

Test Setup for Antenna Conducted

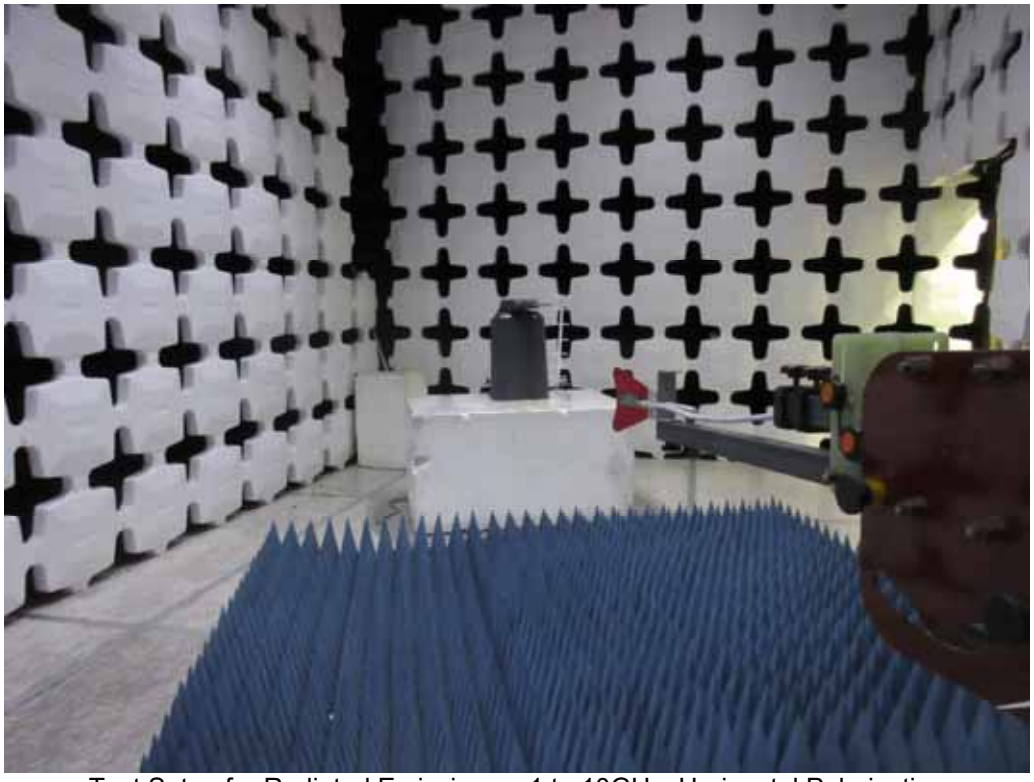
Figure 5



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

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

Figure 6



Test Setup for Radiated Emissions – 1 to 10GHz, Horizontal Polarization

Test Setup for Radiated Emissions – 1 to 10GHz, Vertical Polarization

Figure 7

Test Setup for Spurious Emissions – 1 to 10GHz, Horizontal Polarization

Test Setup for Spurious Emissions – 1 to 10GHz, Vertical Polarization

FCC Part 15 Subpart B Conducted Emissions Test

Significant Emissions Data

VBR8 04/23/2015

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
DUT Revision	:	1.0
Serial Number	:	ESL3
DUT Mode	:	STANDBY
Line Tested	:	120VAC 60HZ HIGH LINE
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-10
Notes	:	
Test Engineer	:	T. Jozefczyk
Limit	:	Class B
Test Date	:	Nov 04, 2019 03:28:04 PM
Data Filter	:	Up to 80 maximum levels detected with 6 dB level excursion threshold over 10 dB margin below limit

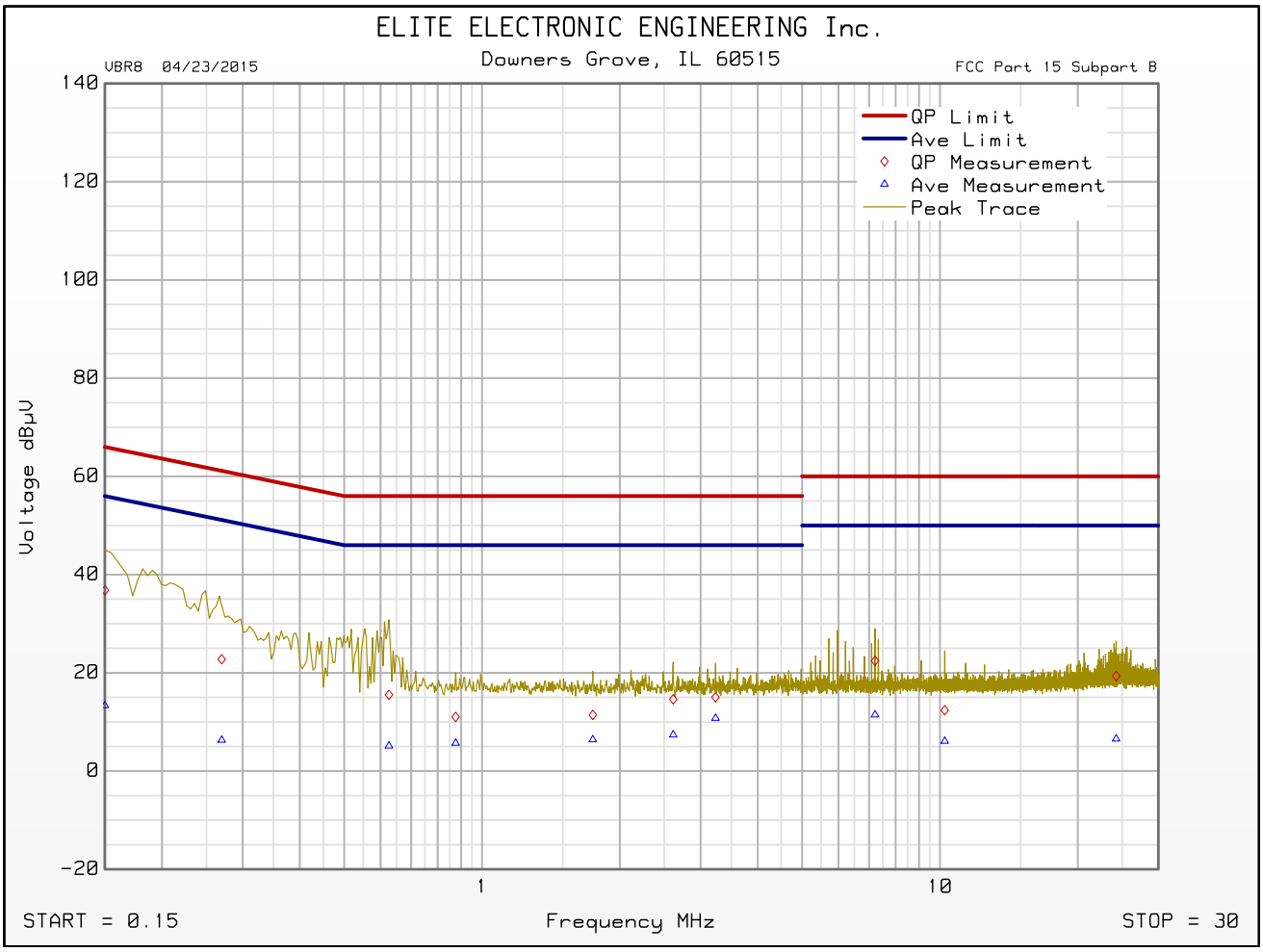
Freq MHz	Quasi-peak Level dBµV	Quasi-peak Limit dBµV	Excessive Quasi-peak Emissions	Average Level dBµV	Average Limit dBµV	Excessive Average Emissions
0.150	36.8	66.0		13.3	56.0	
0.270	22.8	61.1		6.3	51.1	
0.626	15.5	56.0		5.1	46.0	
0.876	11.0	56.0		5.7	46.0	
1.745	11.4	56.0		6.4	46.0	
2.615	14.6	56.0		7.4	46.0	
3.235	15.0	56.0		10.8	46.0	
7.214	22.4	60.0		11.4	50.0	
10.242	12.4	60.0		6.1	50.0	
24.251	19.4	60.0		6.6	50.0	

FCC Part 15 Subpart B Conducted Emissions Test

Cumulative Data

VBR8 04/23/2015

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
DUT Revision	:	1.0
Serial Number	:	ESL3
DUT Mode	:	STANDBY
Line Tested	:	120VAC 60HZ HIGH LINE
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-10
Notes	:	
Test Engineer	:	T. Jozefczyk
Limit	:	Class B
Test Date	:	Nov 04, 2019 03:28:04 PM



Emissions Meet QP Limit
Emissions Meet Ave Limit

FCC Part 15 Subpart B Conducted Emissions Test

Significant Emissions Data

VBR8 04/23/2015

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
DUT Revision	:	1.0
Serial Number	:	ESL3
DUT Mode	:	STANDBY
Line Tested	:	120VAC 60HZ NEUTRAL LINE
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-10
Notes	:	
Test Engineer	:	T. Jozefczyk
Limit	:	Class B
Test Date	:	Nov 04, 2019 03:33:35 PM
Data Filter	:	Up to 80 maximum levels detected with 6 dB level excursion threshold over 10 dB margin below limit

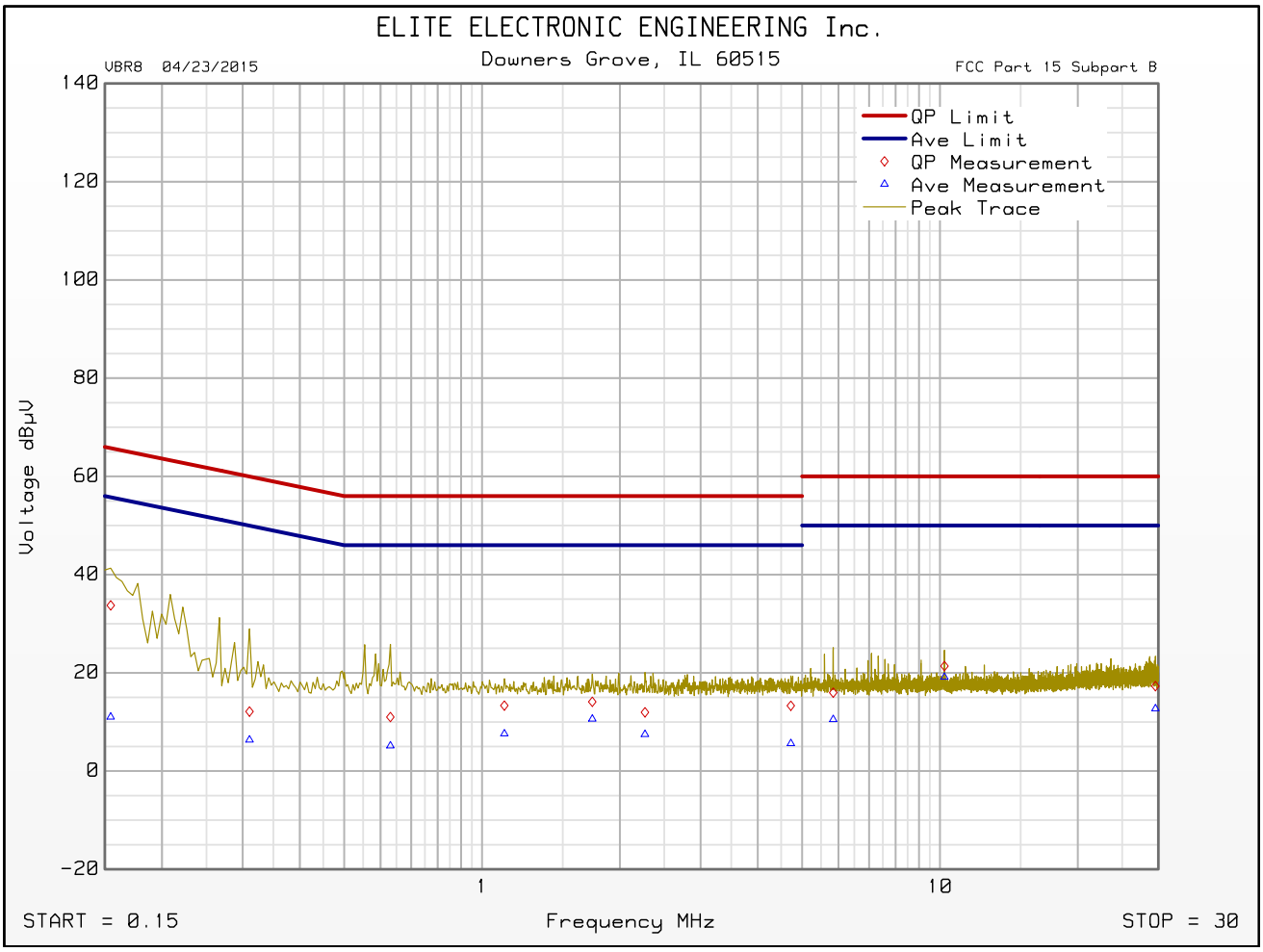
Freq MHz	Quasi-peak Level dBµV	Quasi-peak Limit dBµV	Excessive Quasi-peak Emissions	Average Level dBµV	Average Limit dBµV	Excessive Average Emissions
0.155	33.7	65.8		11.0	55.8	
0.311	12.1	60.0		6.3	50.0	
0.631	11.0	56.0		5.2	46.0	
1.119	13.3	56.0		7.6	46.0	
1.741	14.1	56.0		10.6	46.0	
2.268	12.0	56.0		7.5	46.0	
4.724	13.3	56.0		5.6	46.0	
5.846	16.0	60.0		10.5	50.0	
10.229	21.4	60.0		19.1	50.0	
29.548	17.3	60.0		12.7	50.0	

FCC Part 15 Subpart B Conducted Emissions Test

Cumulative Data

VBR8 04/23/2015

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
DUT Revision	:	1.0
Serial Number	:	ESL3
DUT Mode	:	STANDBY
Line Tested	:	120VAC 60HZ NEUTRAL LINE
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-10
Notes	:	
Test Engineer	:	T. Jozefczyk
Limit	:	Class B
Test Date	:	Nov 04, 2019 03:33:35 PM



Emissions Meet QP Limit
Emissions Meet Ave Limit

FCC Part 15 Subpart B Conducted Emissions Test

Significant Emissions Data

VBR8 04/23/2015

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
DUT Revision	:	1.0
Serial Number	:	ESL3
DUT Mode	:	RX
Line Tested	:	120VAC 60HZ HIGH LINE
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	0
Notes	:	
Test Engineer	:	T. Jozefczyk
Limit	:	Class B
Test Date	:	Nov 04, 2019 04:00:49 PM
Data Filter	:	Up to 80 maximum levels detected with 6 dB level excursion threshold

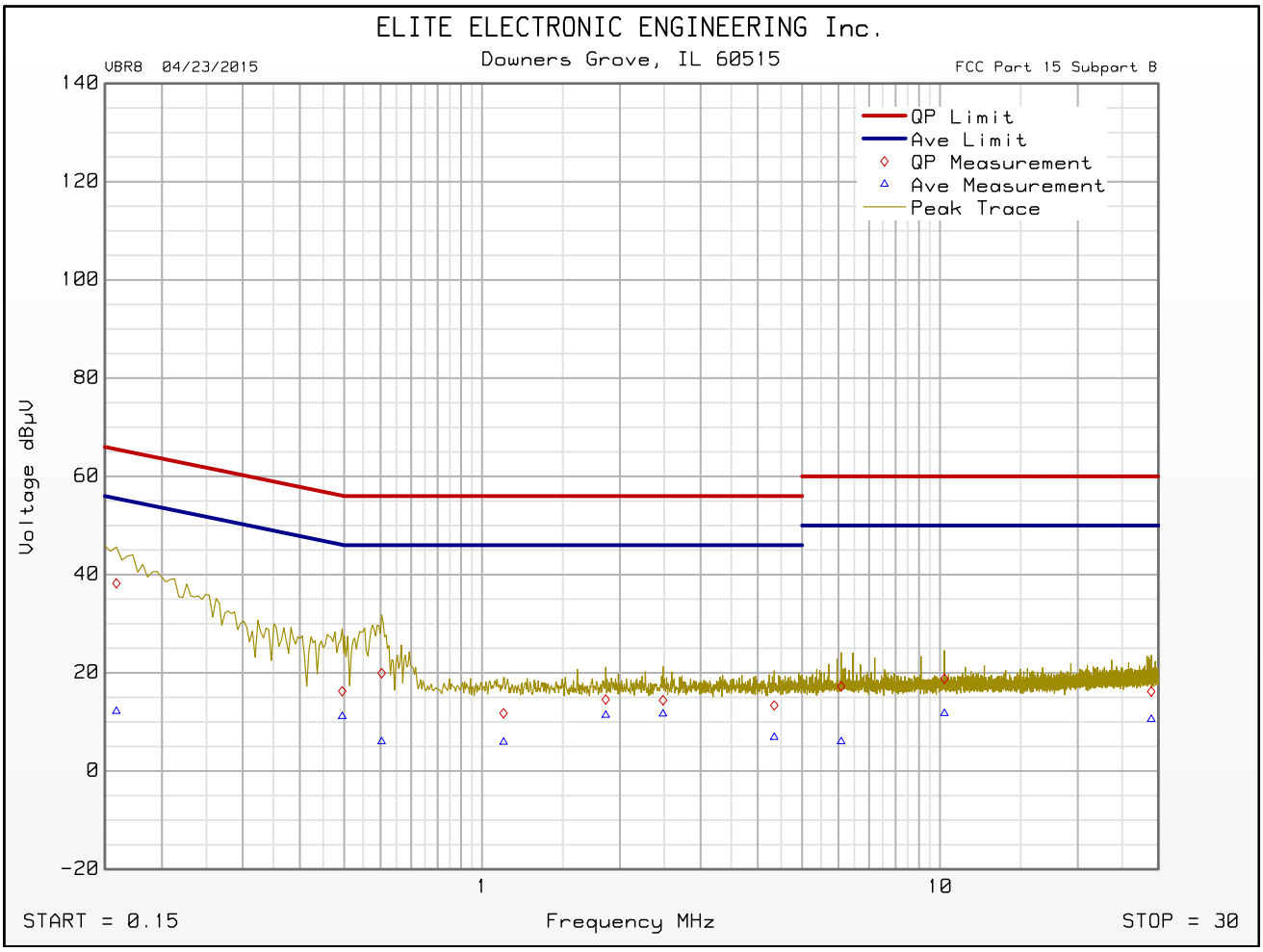
Freq MHz	Quasi-peak Level dBµV	Quasi-peak Limit dBµV	Excessive Quasi-peak Emissions	Average Level dBµV	Average Limit dBµV	Excessive Average Emissions
0.159	38.2	65.5		12.2	55.5	
0.495	16.2	56.1		11.1	46.1	
0.604	19.9	56.0		6.0	46.0	
1.114	11.8	56.0		5.9	46.0	
1.862	14.6	56.0		11.4	46.0	
2.484	14.4	56.0		11.6	46.0	
4.346	13.4	56.0		6.9	46.0	
6.085	17.2	60.0		6.0	50.0	
10.229	18.8	60.0		11.7	50.0	
28.931	16.2	60.0		10.5	50.0	

FCC Part 15 Subpart B Conducted Emissions Test

Cumulative Data

VBR8 04/23/2015

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
DUT Revision	:	1.0
Serial Number	:	ESL3
DUT Mode	:	RX
Line Tested	:	120VAC 60HZ HIGH LINE
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	0
Notes	:	
Test Engineer	:	T. Jozefczyk
Limit	:	Class B
Test Date	:	Nov 04, 2019 04:00:49 PM



Emissions Meet QP Limit
Emissions Meet Ave Limit

FCC Part 15 Subpart B Conducted Emissions Test

Significant Emissions Data

VBR8 04/23/2015

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
DUT Revision	:	1.0
Serial Number	:	ESL3
DUT Mode	:	RX
Line Tested	:	120VAC 60HZ NEUTRAL LINE
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	0
Notes	:	
Test Engineer	:	T. Jozefczyk
Limit	:	Class B
Test Date	:	Nov 04, 2019 03:55:48 PM
Data Filter	:	Up to 80 maximum levels detected with 6 dB level excursion threshold

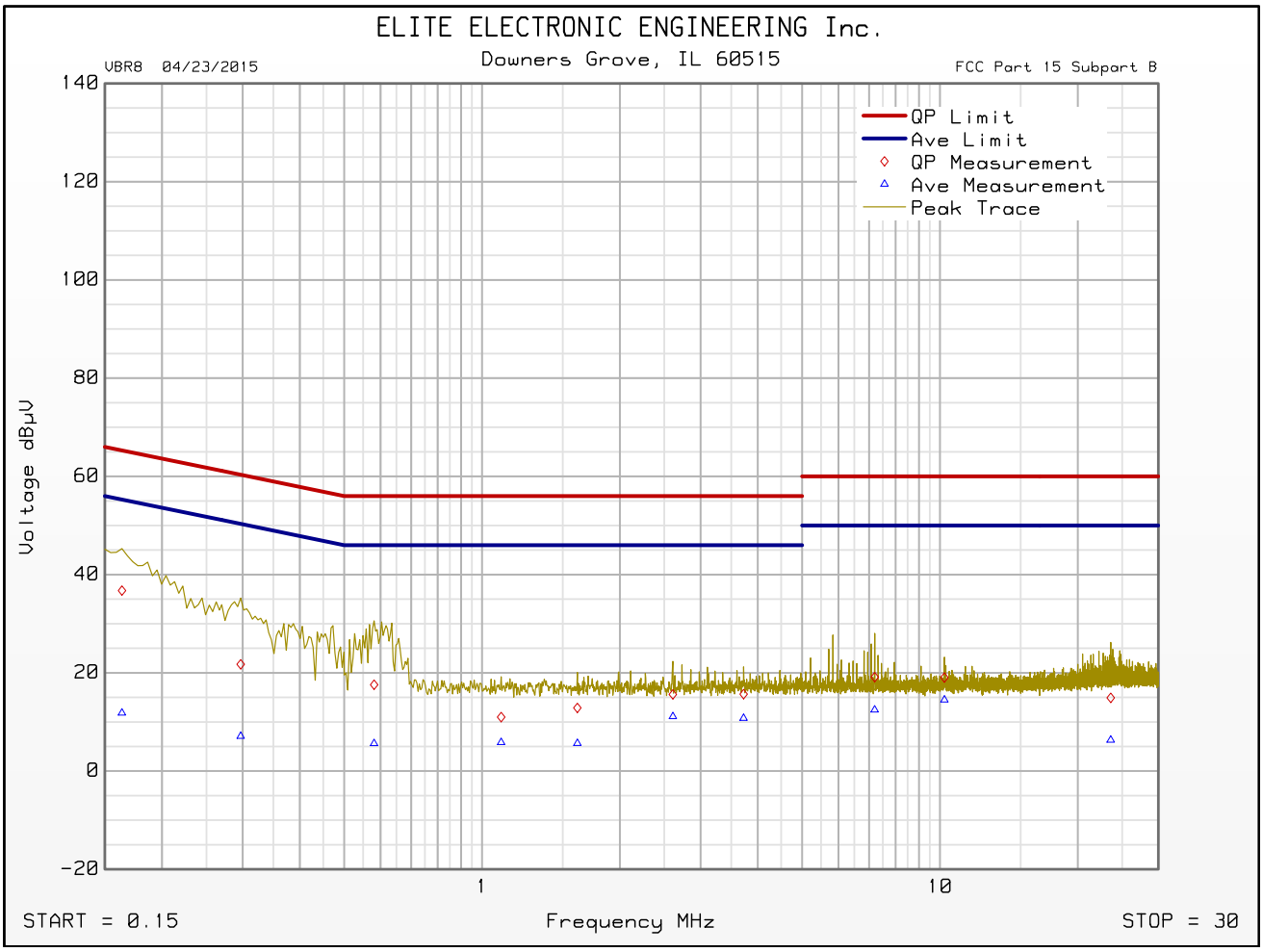
Freq MHz	Quasi-peak Level dBµV	Quasi-peak Limit dBµV	Excessive Quasi-peak Emissions	Average Level dBµV	Average Limit dBµV	Excessive Average Emissions
0.164	36.7	65.3		11.8	55.3	
0.297	21.7	60.3		7.1	50.3	
0.581	17.6	56.0		5.6	46.0	
1.101	11.0	56.0		5.8	46.0	
1.615	12.9	56.0		5.7	46.0	
2.610	15.6	56.0		11.1	46.0	
3.725	15.7	56.0		10.8	46.0	
7.201	19.1	60.0		12.5	50.0	
10.224	19.0	60.0		14.5	50.0	
23.599	14.9	60.0		6.3	50.0	

FCC Part 15 Subpart B Conducted Emissions Test

Cumulative Data

VBR8 04/23/2015

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
DUT Revision	:	1.0
Serial Number	:	ESL3
DUT Mode	:	RX
Line Tested	:	120VAC 60HZ NEUTRAL LINE
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	0
Notes	:	
Test Engineer	:	T. Jozefczyk
Limit	:	Class B
Test Date	:	Nov 04, 2019 03:55:48 PM



Emissions Meet QP Limit
Emissions Meet Ave Limit

FCC Part 15 Subpart B Conducted Emissions Test

Significant Emissions Data

VBR8 04/23/2015

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
DUT Revision	:	1.0
Serial Number	:	ESL3
DUT Mode	:	70-90% SPEED
Line Tested	:	120VAC 60HZ HIGH LINE
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	0
Notes	:	
Test Engineer	:	T. Jozefczyk
Limit	:	Class B
Test Date	:	Nov 04, 2019 03:41:14 PM
Data Filter	:	Up to 80 maximum levels detected with 6 dB level excursion threshold

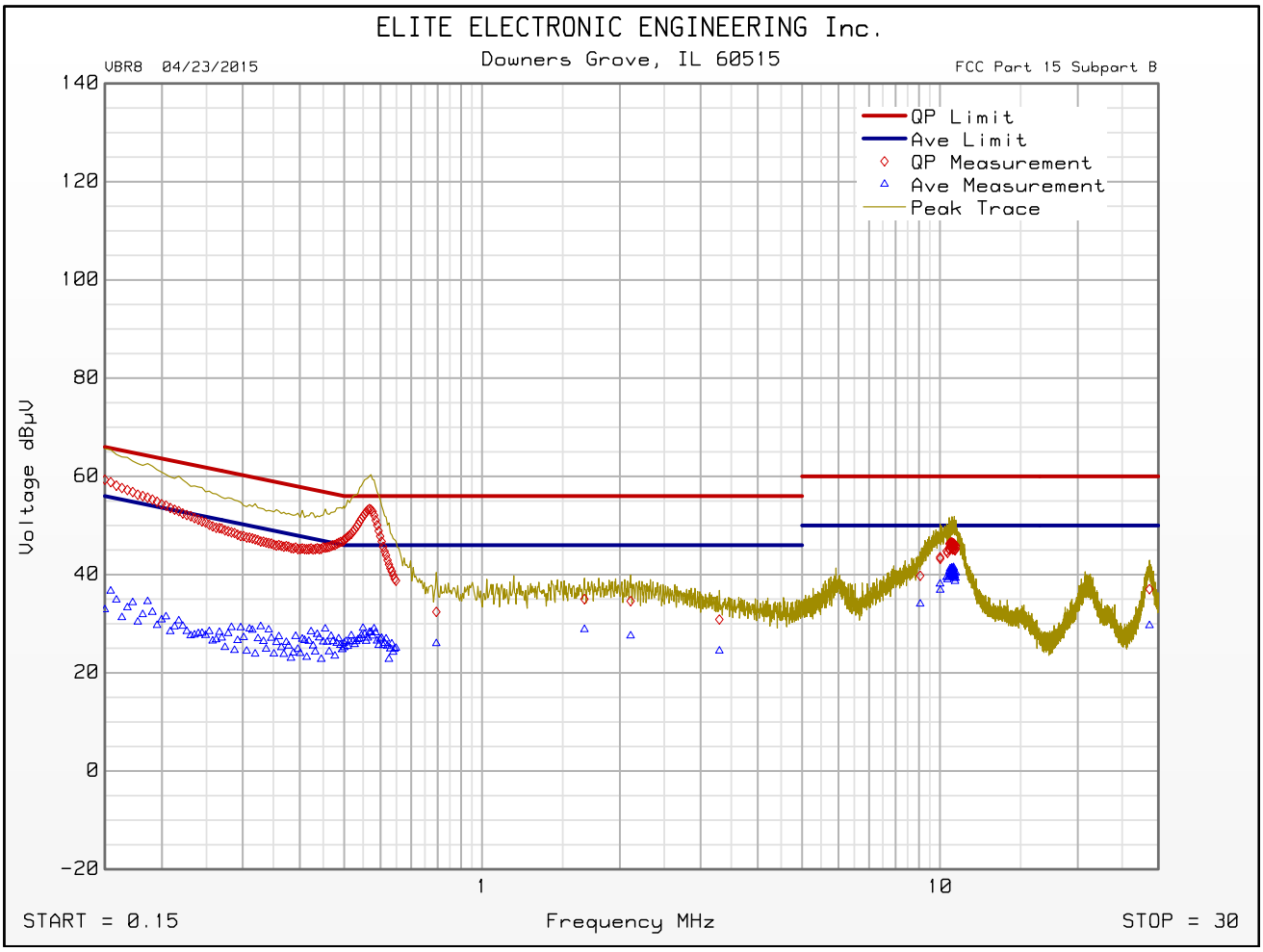
Freq MHz	Quasi-peak Level dBµV	Quasi-peak Limit dBµV	Excessive Quasi-peak Emissions	Average Level dBµV	Average Limit dBµV	Excessive Average Emissions
0.150	59.3	66.0		32.9	56.0	
0.500	47.1	56.0		25.2	46.0	
0.795	32.4	56.0		26.0	46.0	
1.673	35.0	56.0		28.8	46.0	
2.111	34.6	56.0		27.5	46.0	
3.298	30.9	56.0		24.5	46.0	
9.055	39.8	60.0		34.0	50.0	
10.616	46.5	60.0		41.2	50.0	
28.684	37.0	60.0		29.7	50.0	

FCC Part 15 Subpart B Conducted Emissions Test

Cumulative Data

VBR8 04/23/2015

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
DUT Revision	:	1.0
Serial Number	:	ESL3
DUT Mode	:	70-90% SPEED
Line Tested	:	120VAC 60HZ HIGH LINE
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	0
Notes	:	
Test Engineer	:	T. Jozefczyk
Limit	:	Class B
Test Date	:	Nov 04, 2019 03:41:14 PM



Emissions Meet QP Limit
Emissions Meet Ave Limit

FCC Part 15 Subpart B Conducted Emissions Test

Significant Emissions Data

VBR8 04/23/2015

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
DUT Revision	:	1.0
Serial Number	:	ESL3
DUT Mode	:	70-90% SPEED
Line Tested	:	120VAC 60HZ NEUTRAL LINE
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	0
Notes	:	
Test Engineer	:	T. Jozefczyk
Limit	:	Class B
Test Date	:	Nov 04, 2019 03:48:11 PM
Data Filter	:	Up to 80 maximum levels detected with 6 dB level excursion threshold

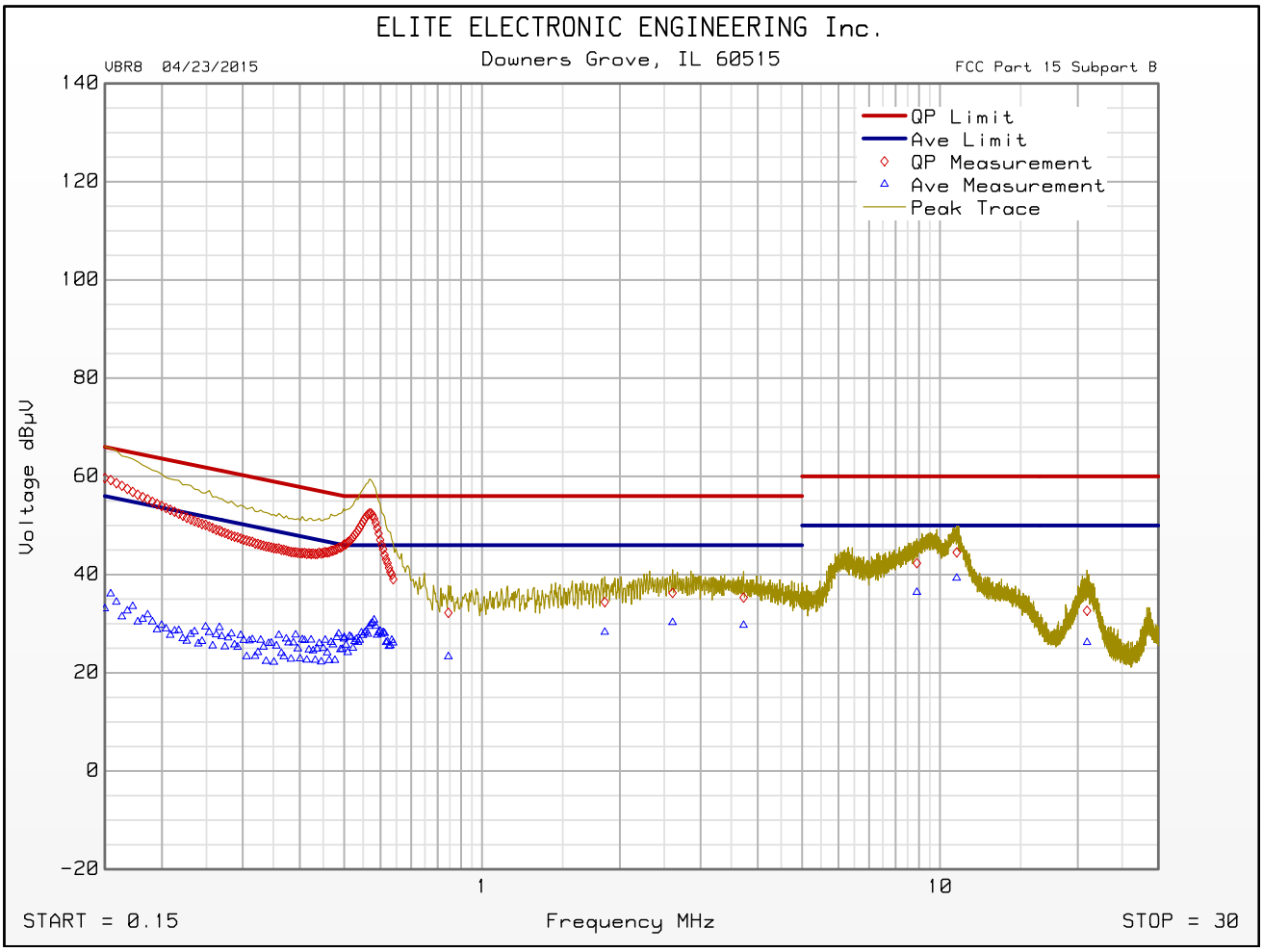
Freq MHz	Quasi-peak Level dBµV	Quasi-peak Limit dBµV	Excessive Quasi-peak Emissions	Average Level dBµV	Average Limit dBµV	Excessive Average Emissions
0.150	59.7	66.0		33.1	56.0	
0.500	46.1	56.0		27.2	46.0	
0.844	32.2	56.0		23.3	46.0	
1.853	34.4	56.0		28.3	46.0	
2.606	36.3	56.0		30.3	46.0	
3.725	35.3	56.0		29.7	46.0	
8.906	42.3	60.0		36.4	50.0	
10.877	44.5	60.0		39.3	50.0	
20.953	32.6	60.0		26.2	50.0	

FCC Part 15 Subpart B Conducted Emissions Test

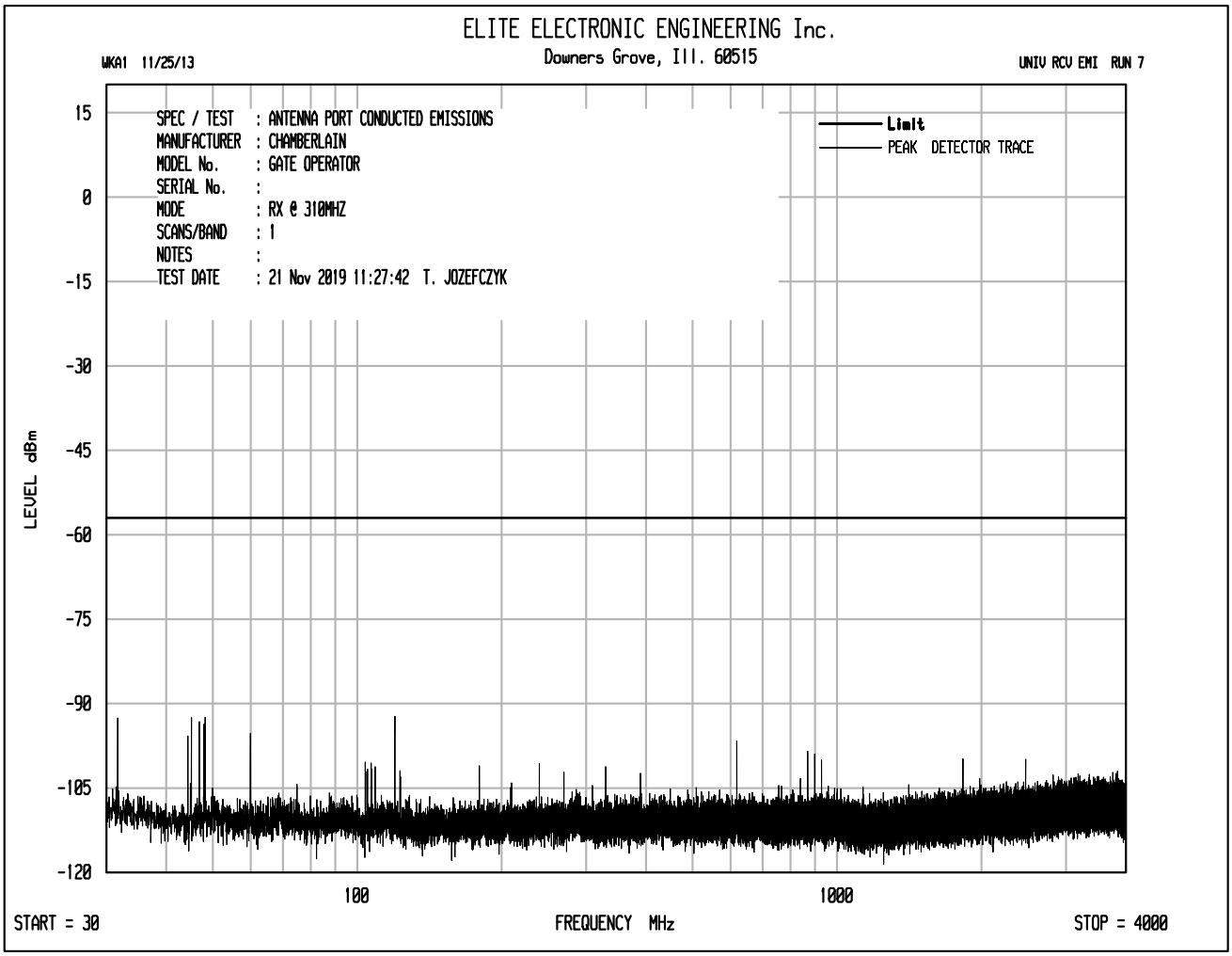
Cumulative Data

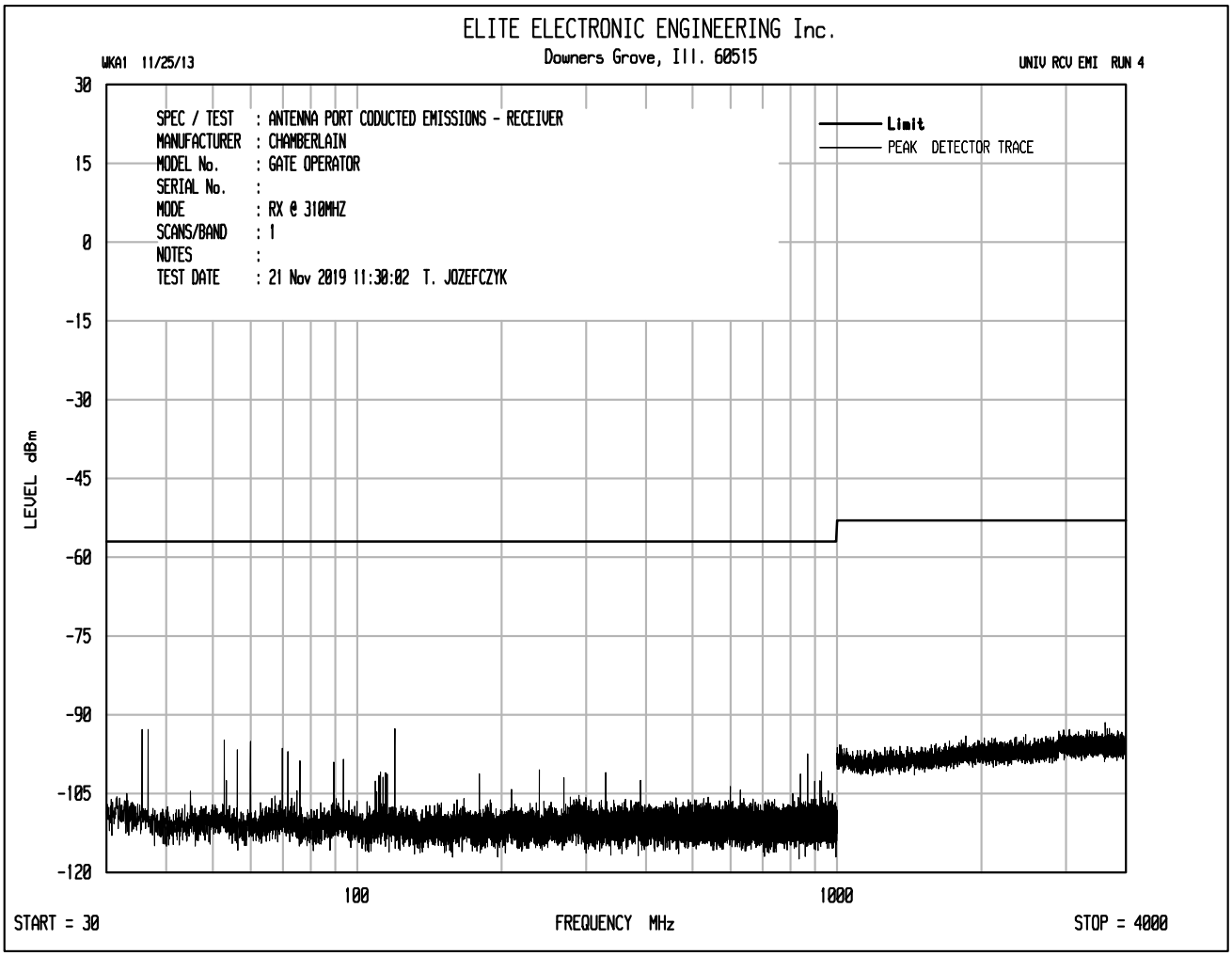
VBR8 04/23/2015

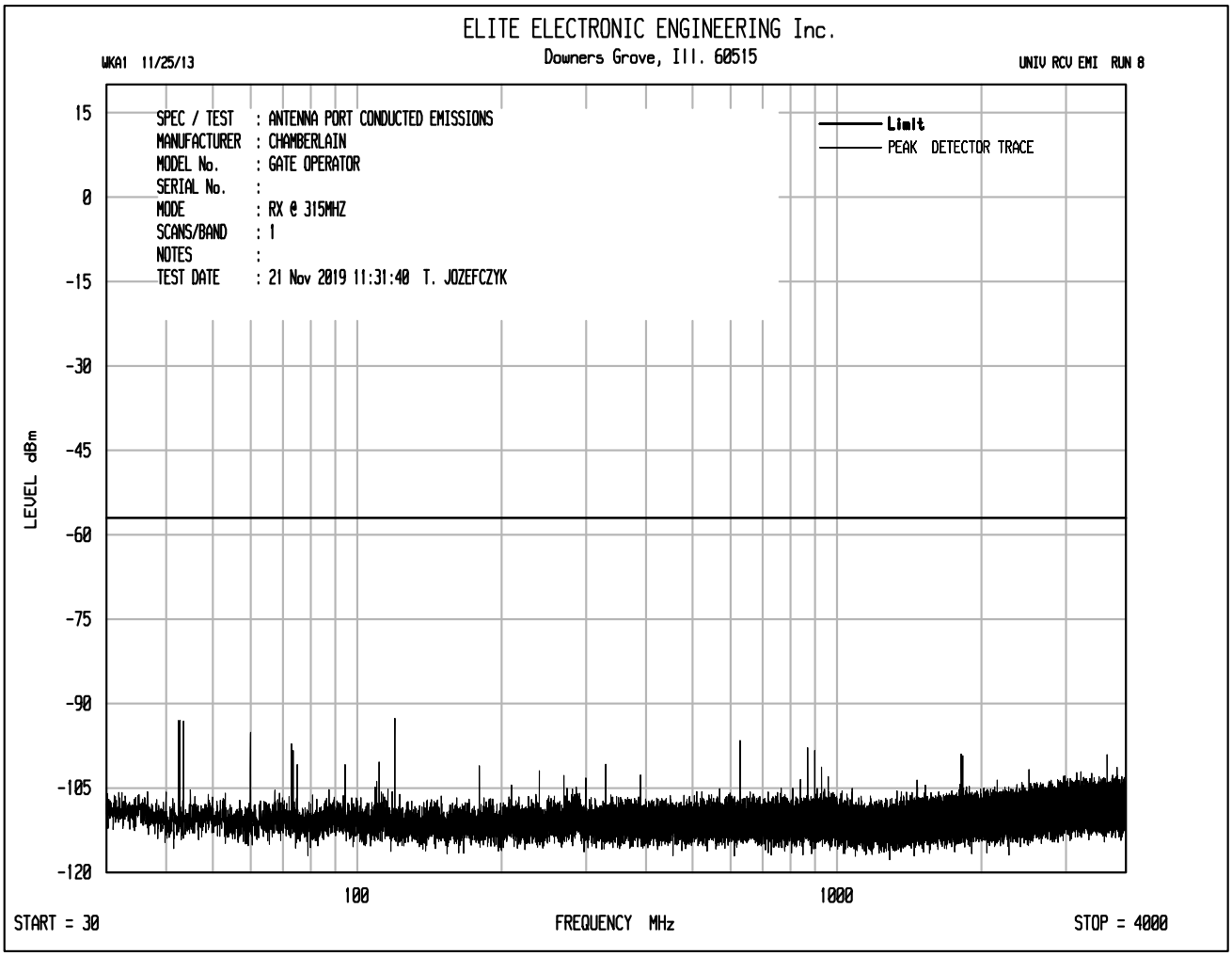
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
DUT Revision	:	1.0
Serial Number	:	ESL3
DUT Mode	:	70-90% SPEED
Line Tested	:	120VAC 60HZ NEUTRAL LINE
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	0
Notes	:	
Test Engineer	:	T. Jozefczyk
Limit	:	Class B
Test Date	:	Nov 04, 2019 03:48:11 PM

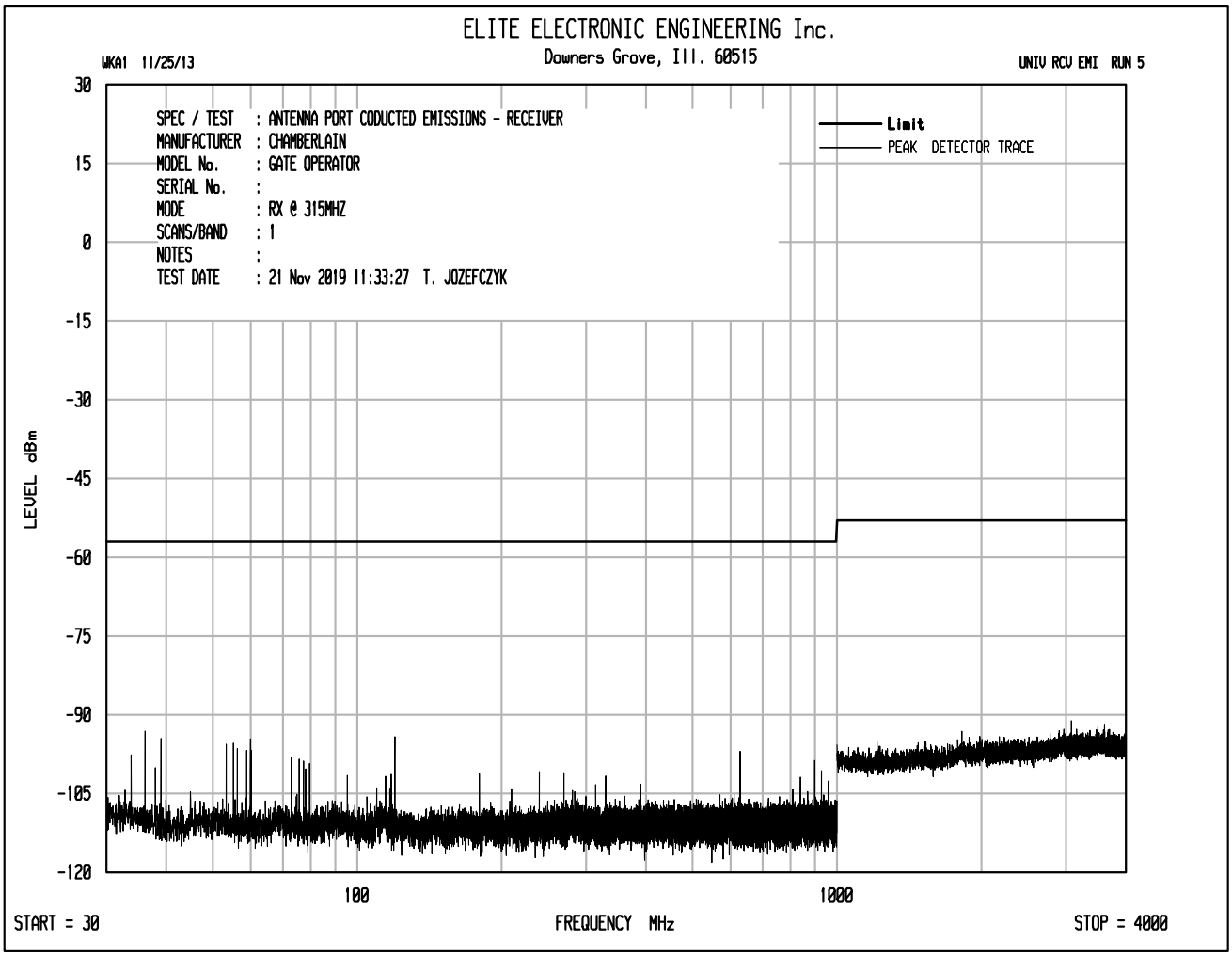


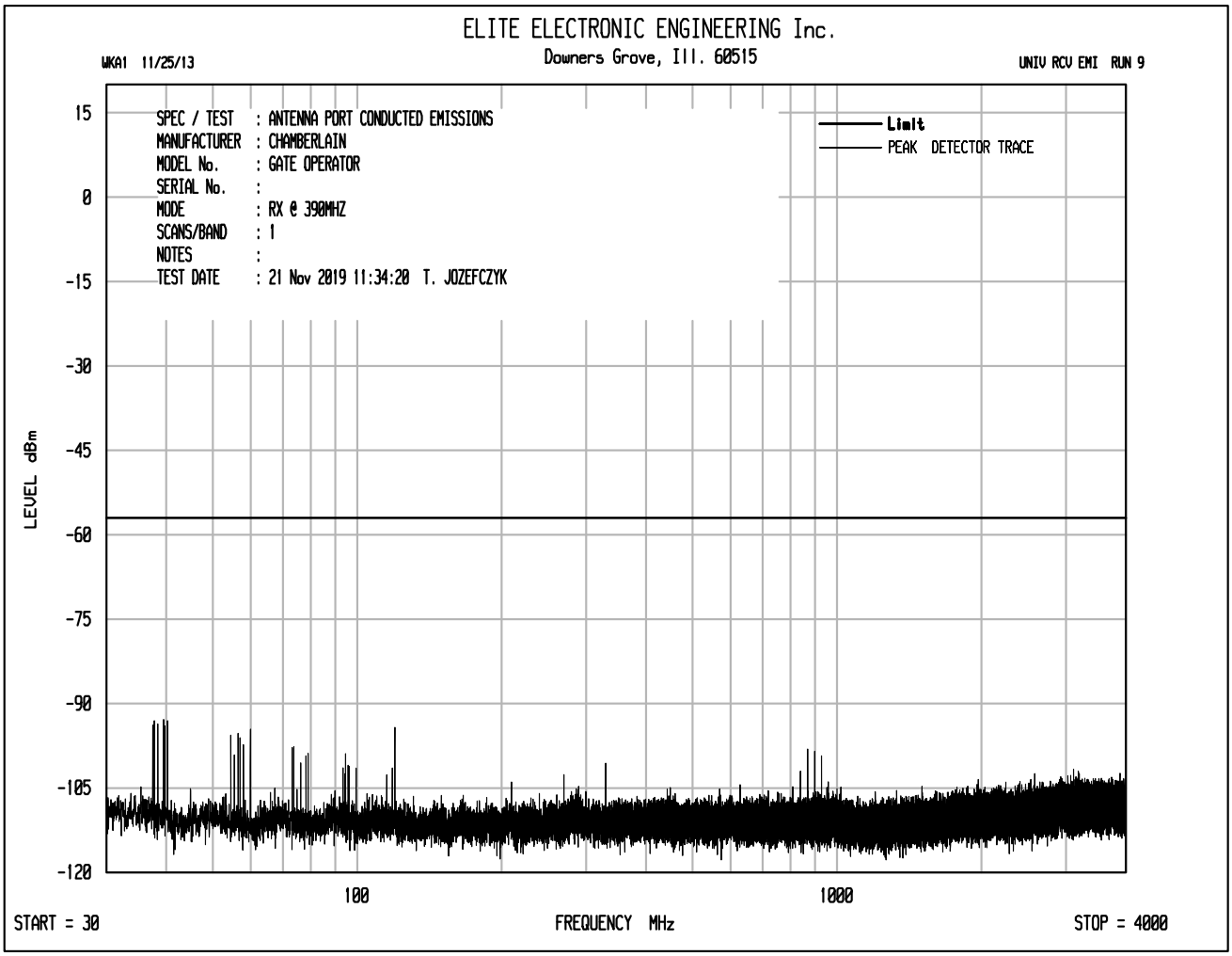
Emissions Meet QP Limit
Emissions Meet Ave Limit

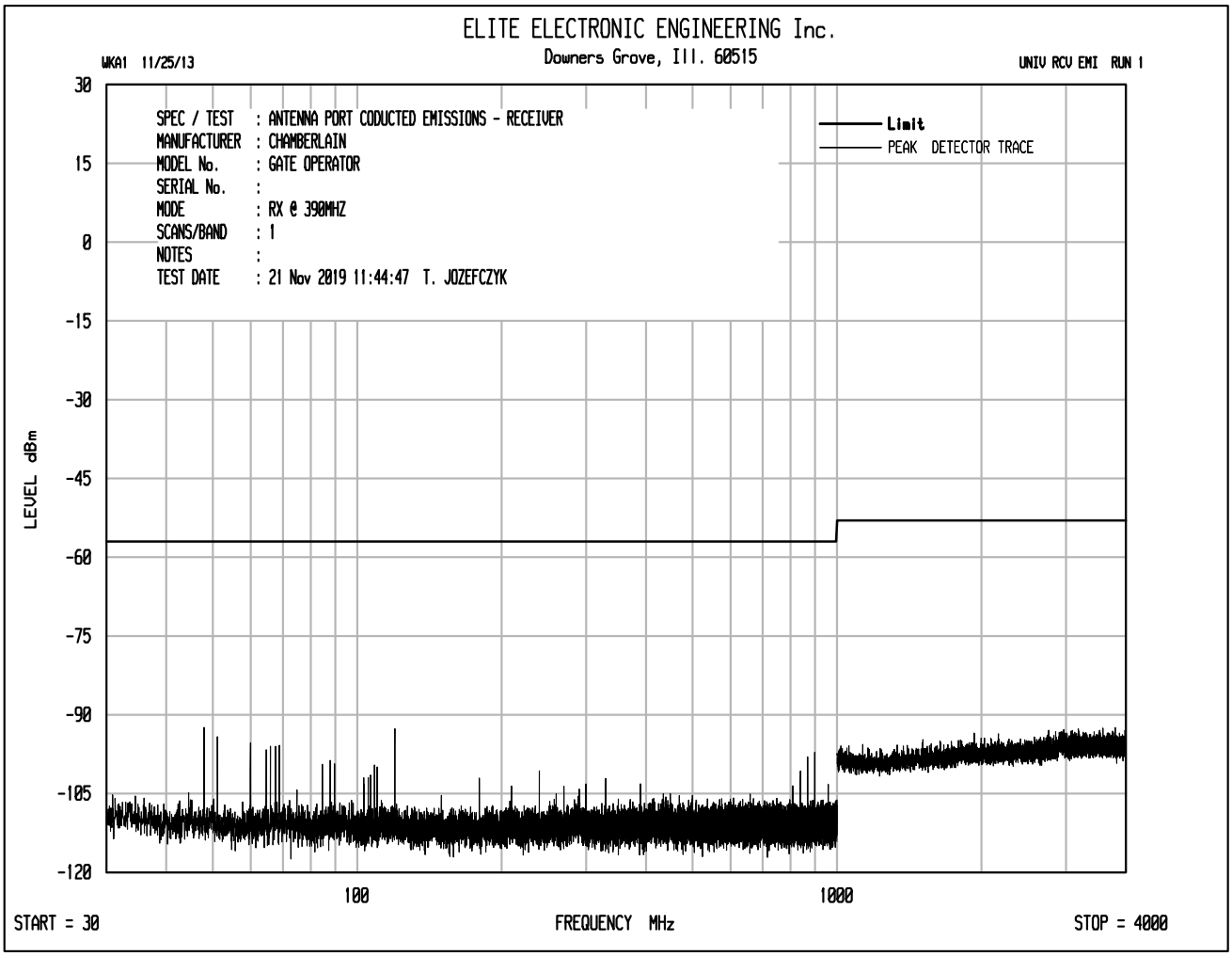

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 7
SPEC / TEST : ANTENNA PORT CONDUCTED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : GATE OPERATOR
SERIAL No. :
MODE : RX @ 310MHZ
SCANS/BAND : 1
NOTES :
TEST DATE : 21 Nov 2019 11:27:42 T. JOZEFCZYK
Limit
PEAK DETECTOR TRACE
LEVEL dBm
15
0
-15
-30
-45
-60
-75
-90
-105
-120
100
1000
START = 30
FREQUENCY MHz
STOP = 4000

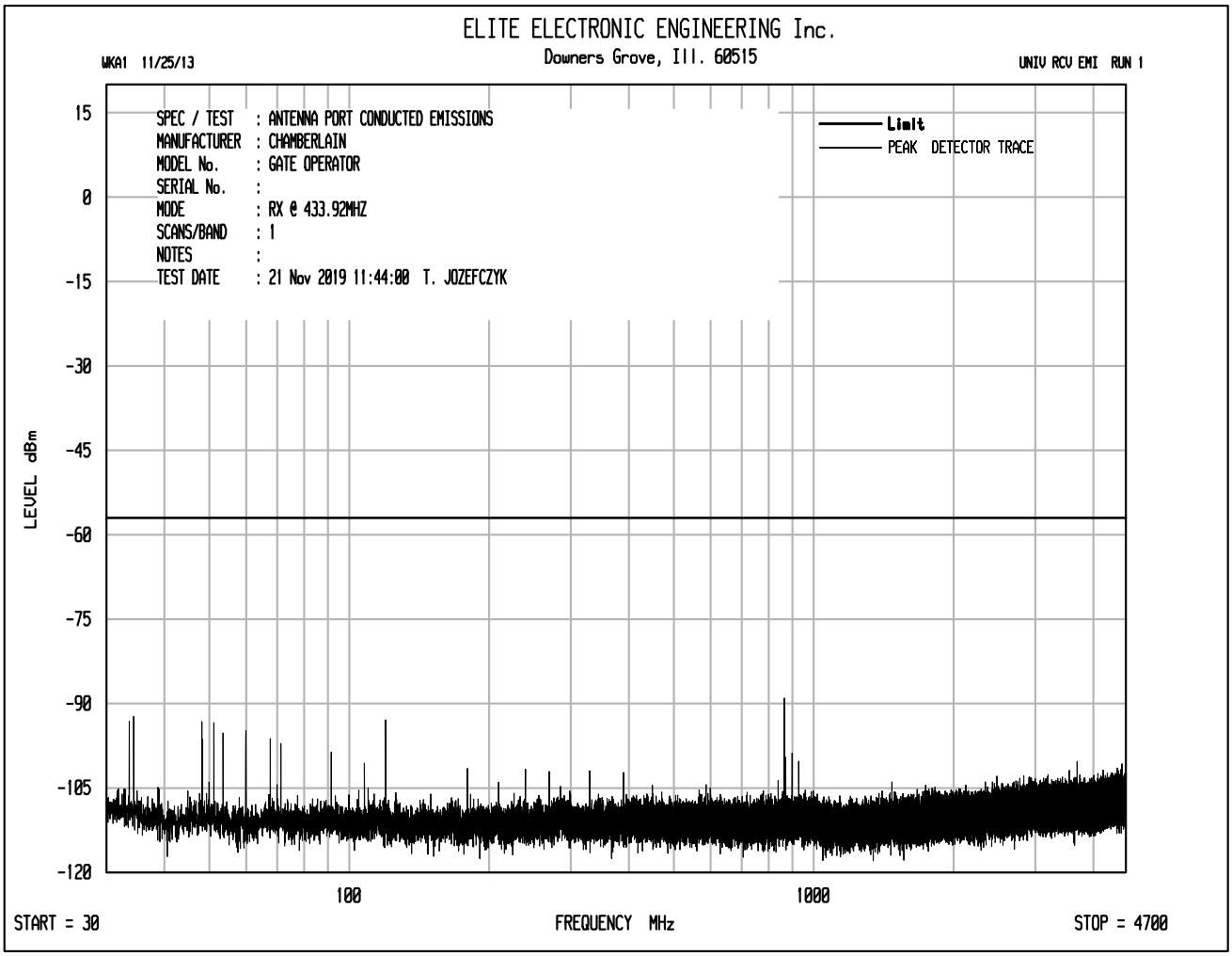

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 4
SPEC / TEST : ANTENNA PORT CODUCTED EMISSIONS - RECEIVER
MANUFACTURER : CHAMBERLAIN
MODEL No. : GATE OPERATOR
SERIAL No. :
MODE : RX @ 310MHZ
SCANS/BAND : 1
NOTES :
TEST DATE : 21 Nov 2019 11:30:02 T. JOZEFCZYK
Limit
PEAK DETECTOR TRACE
LEVEL dBm
30
15
0
-15
-30
-45
-60
-75
-90
-105
-120
100
1000
START = 30
FREQUENCY MHz
STOP = 4000

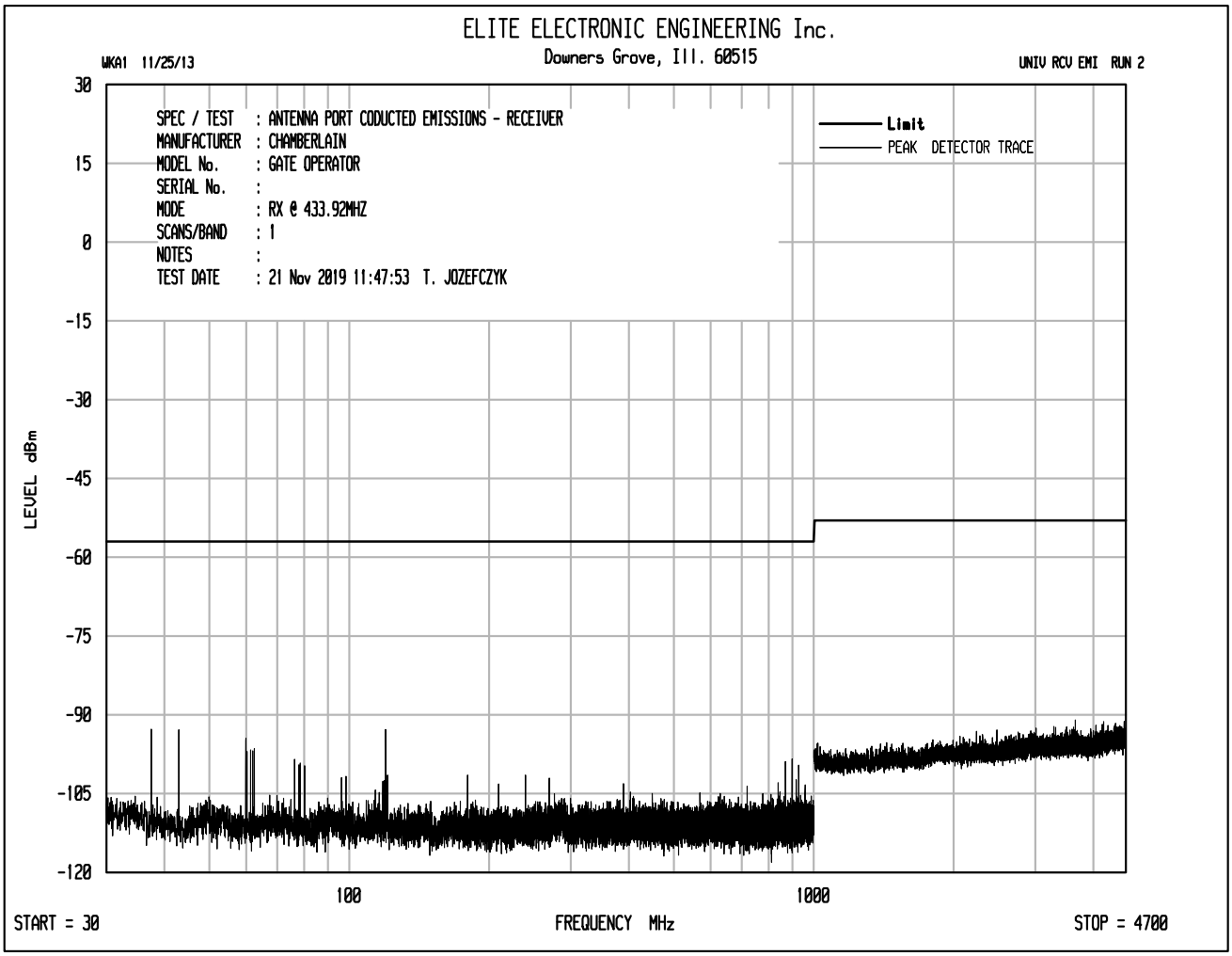

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 8
SPEC / TEST : ANTENNA PORT CONDUCTED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : GATE OPERATOR
SERIAL No. :
MODE : RX @ 315MHZ
SCANS/BAND : 1
NOTES :
TEST DATE : 21 Nov 2019 11:31:40 T. JOZEFCZYK
Limit
PEAK DETECTOR TRACE
LEVEL dBm
15
0
-15
-30
-45
-60
-75
-90
-105
-120
100
1000
START = 30
FREQUENCY MHz
STOP = 4000

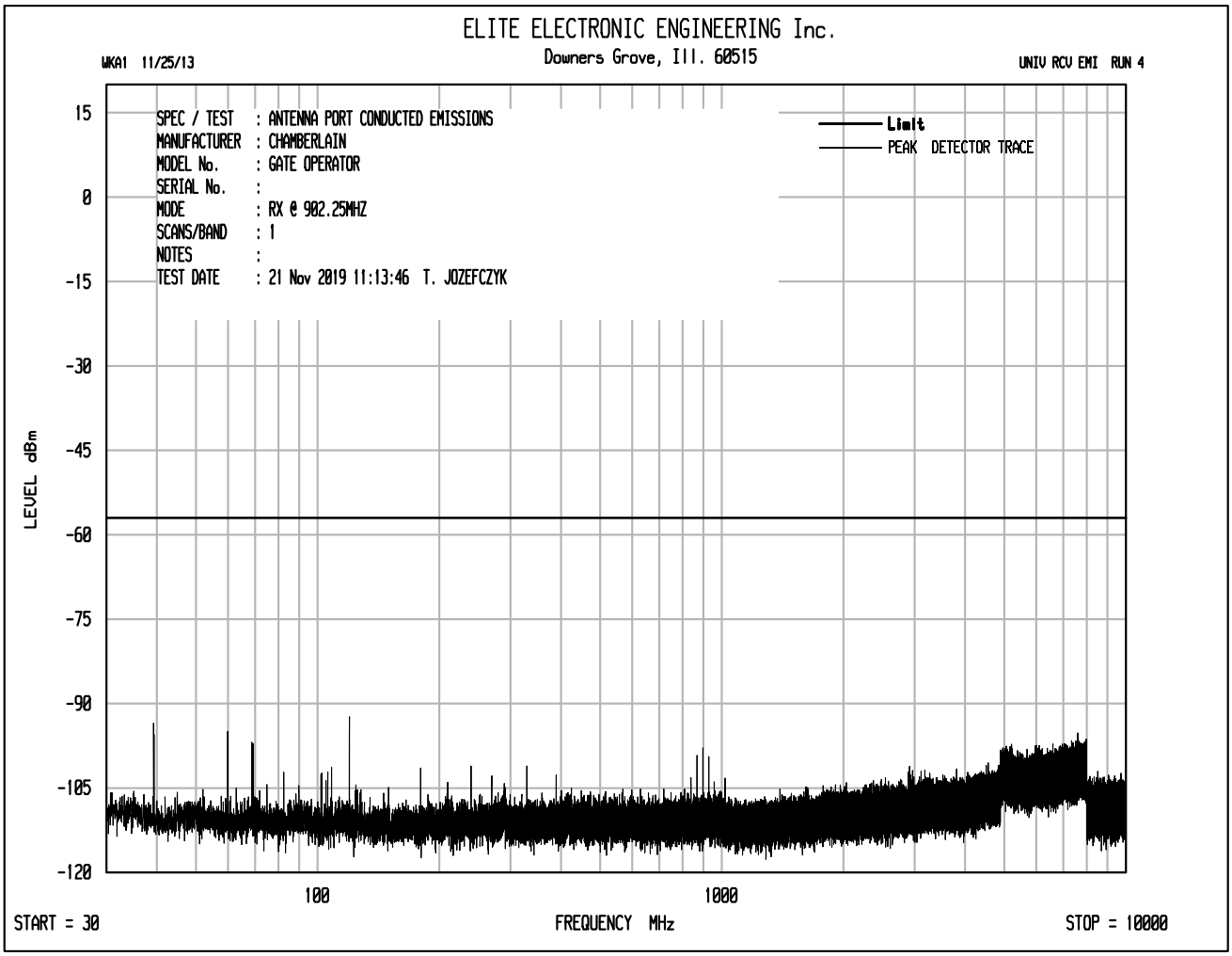

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 5
SPEC / TEST : ANTENNA PORT CODUCTED EMISSIONS - RECEIVER
MANUFACTURER : CHAMBERLAIN
MODEL No. : GATE OPERATOR
SERIAL No. :
MODE : RX @ 315MHZ
SCANS/BAND : 1
NOTES :
TEST DATE : 21 Nov 2019 11:33:27 T. JOZEFCZYK
Limit
PEAK DETECTOR TRACE
LEVEL dBm
30
15
0
-15
-30
-45
-60
-75
-90
-105
-120
100
1000
START = 30
FREQUENCY MHz
STOP = 4000

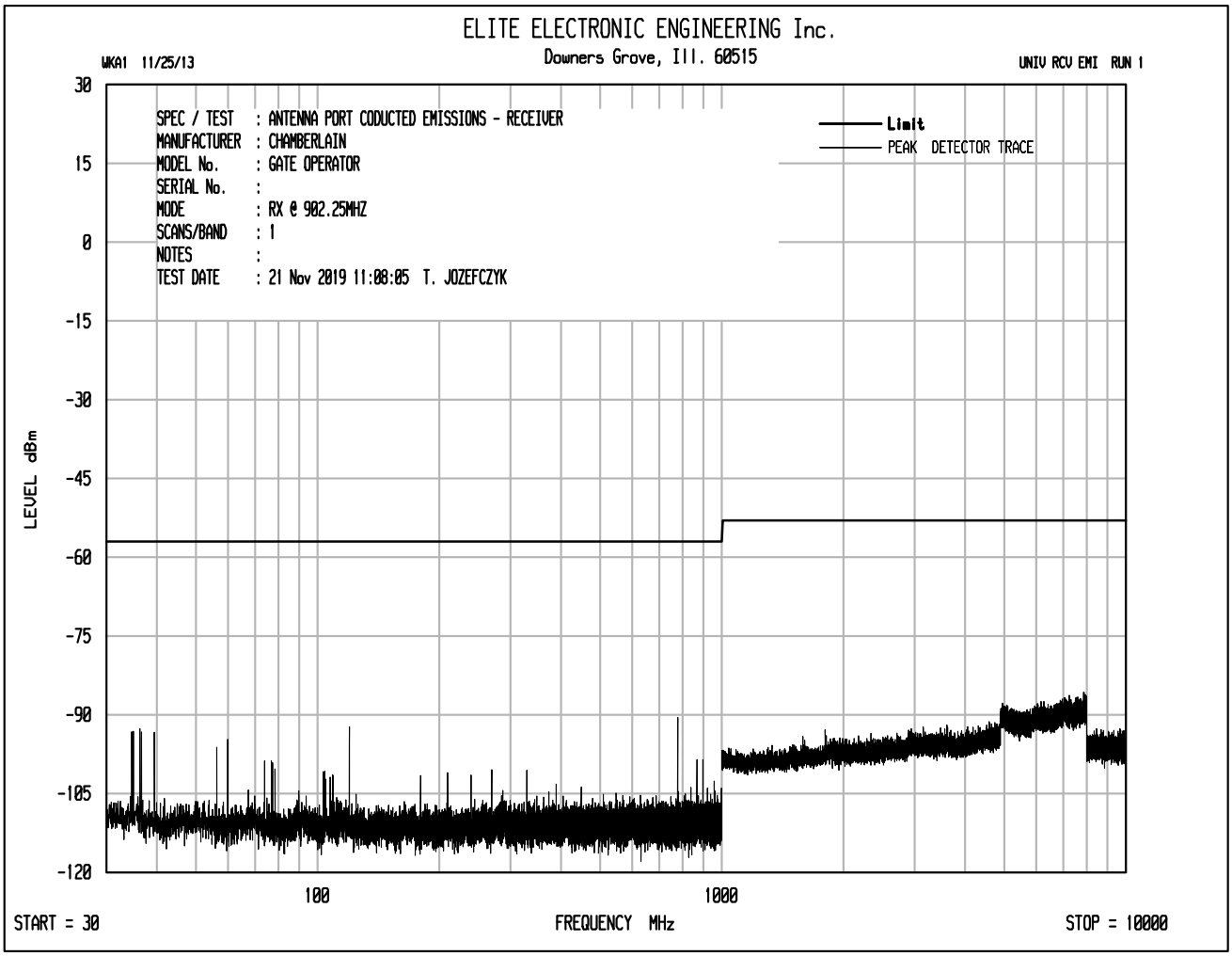

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 9
SPEC / TEST : ANTENNA PORT CONDUCTED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : GATE OPERATOR
SERIAL No. :
MODE : RX @ 390MHZ
SCANS/BAND : 1
NOTES :
TEST DATE : 21 Nov 2019 11:34:20 T. JOZEFCZYK
Limit
PEAK DETECTOR TRACE
LEVEL dBm
15
0
-15
-30
-45
-60
-75
-90
-105
-120
100
1000
START = 30
FREQUENCY MHz
STOP = 4000

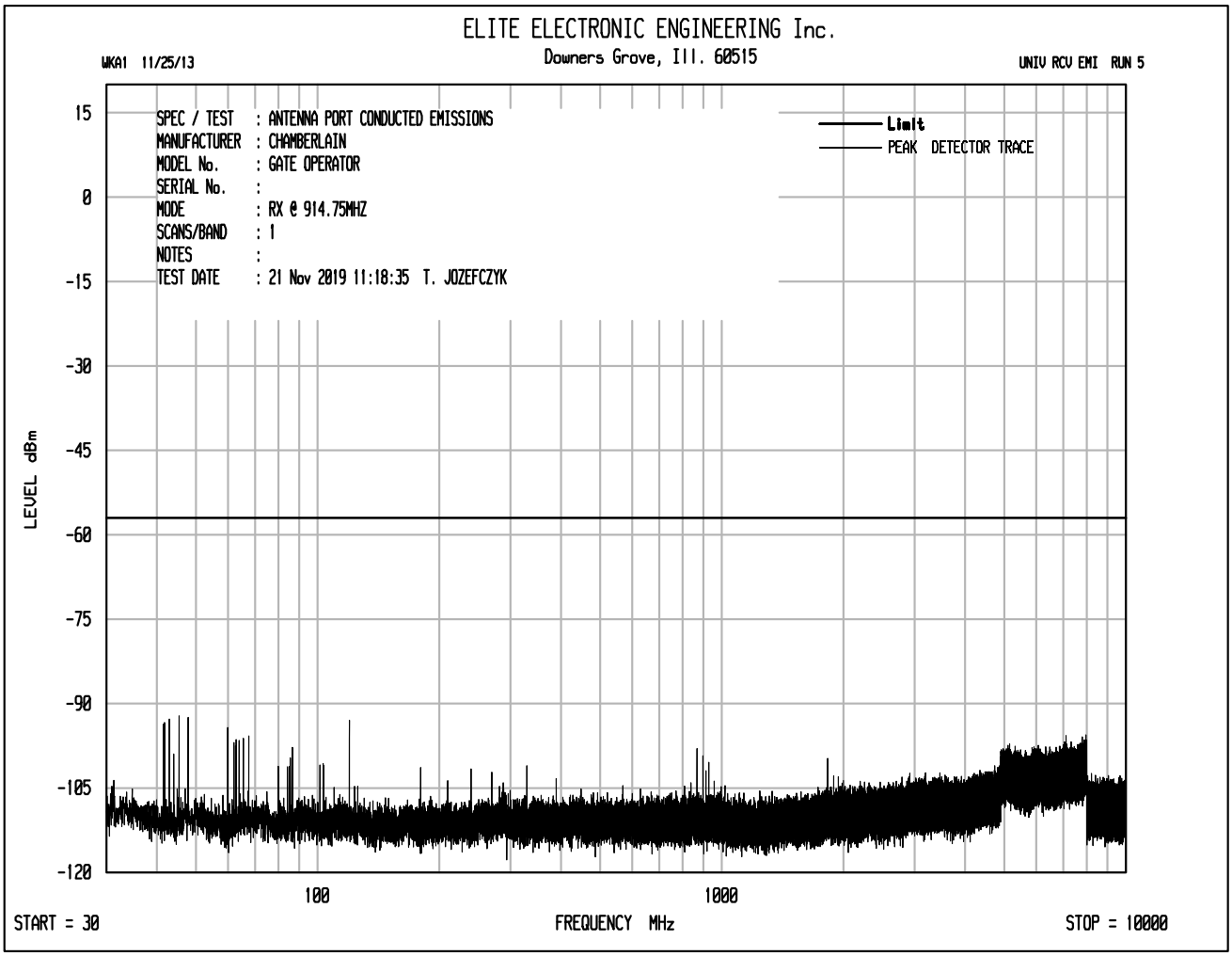

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 1
SPEC / TEST : ANTENNA PORT CODUCTED EMISSIONS - RECEIVER
MANUFACTURER : CHAMBERLAIN
MODEL No. : GATE OPERATOR
SERIAL No. :
MODE : RX @ 390MHZ
SCANS/BAND : 1
NOTES :
TEST DATE : 21 Nov 2019 11:44:47 T. JOZEFCZYK
Limit
PEAK DETECTOR TRACE
LEVEL dBm
30
15
0
-15
-30
-45
-60
-75
-90
-105
-120
100
1000
START = 30
FREQUENCY MHz
STOP = 4000

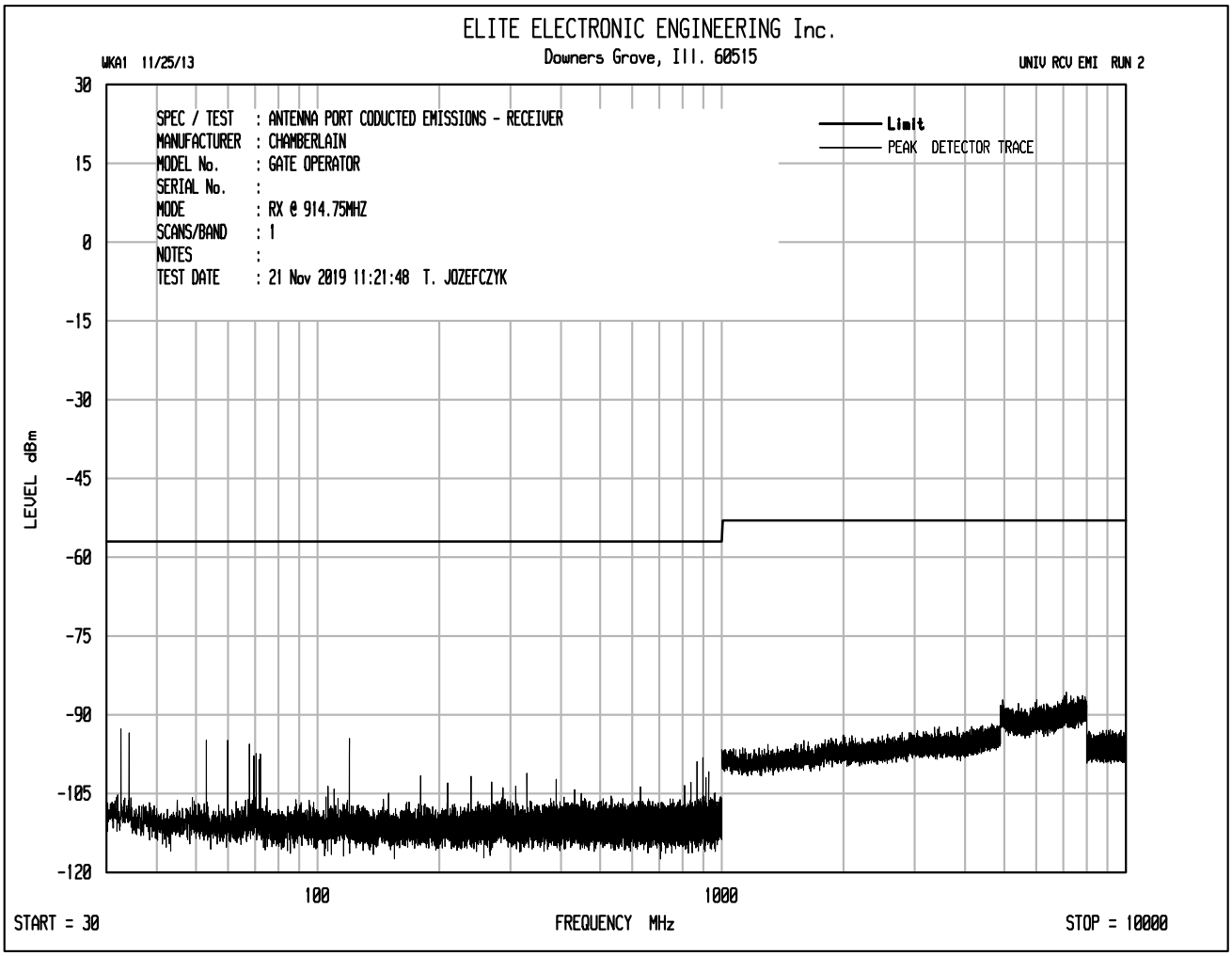

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 1
SPEC / TEST : ANTENNA PORT CONDUCTED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : GATE OPERATOR
SERIAL No. :
MODE : RX @ 433.92MHZ
SCANS/BAND : 1
NOTES :
TEST DATE : 21 Nov 2019 11:44:00 T. JOZEFCZYK
Limit
PEAK DETECTOR TRACE
LEVEL dBm
15
0
-15
-30
-45
-60
-75
-90
-105
-120
100
1000
START = 30
FREQUENCY MHz
STOP = 4700

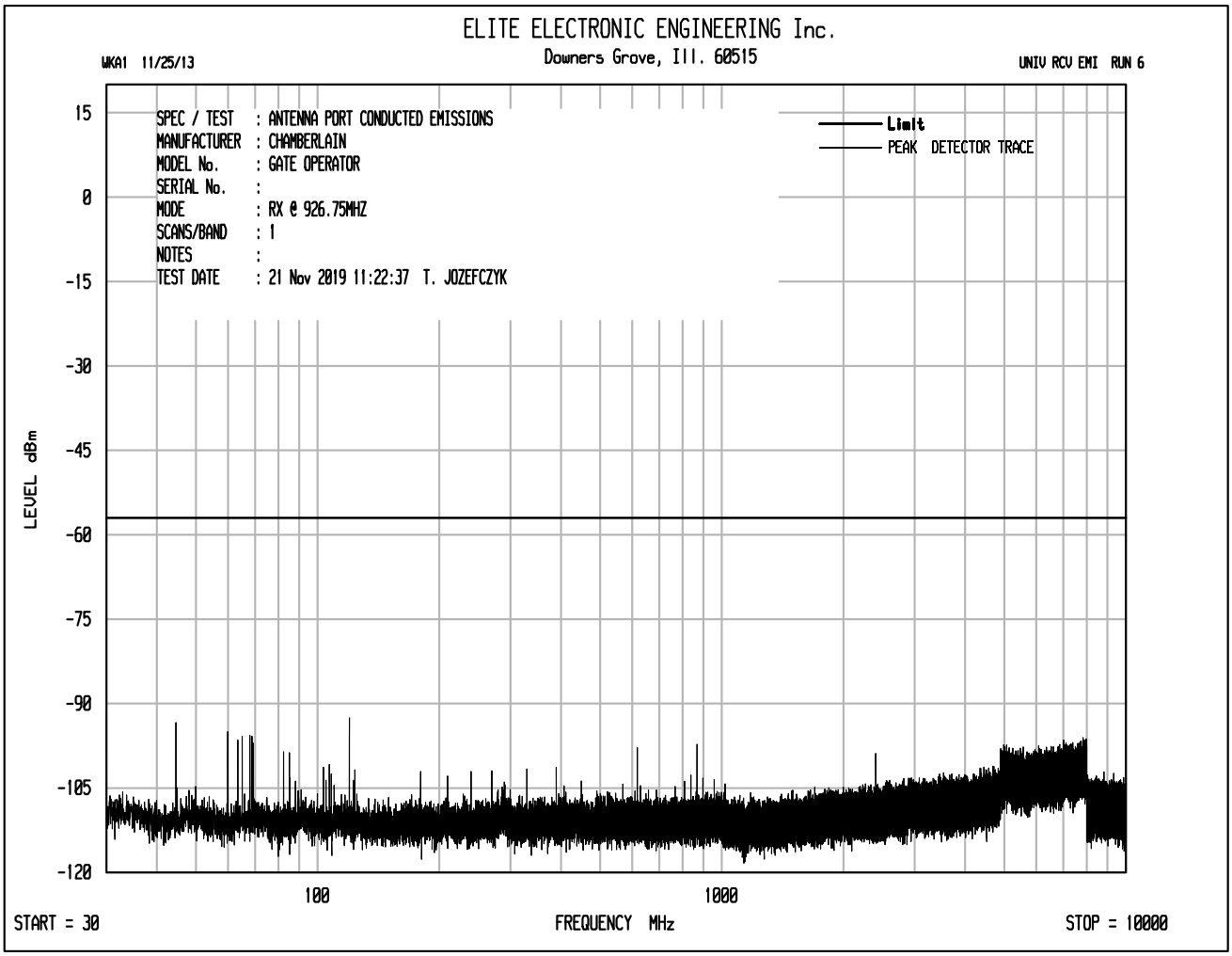

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 2
SPEC / TEST : ANTENNA PORT CODUCTED EMISSIONS - RECEIVER
MANUFACTURER : CHAMBERLAIN
MODEL No. : GATE OPERATOR
SERIAL No. :
MODE : RX @ 433.92MHZ
SCANS/BAND : 1
NOTES :
TEST DATE : 21 Nov 2019 11:47:53 T. JOZEFCZYK
Limit
PEAK DETECTOR TRACE
LEVEL dBm
30
15
0
-15
-30
-45
-60
-75
-90
-105
-120
100
1000
START = 30
FREQUENCY MHz
STOP = 4700

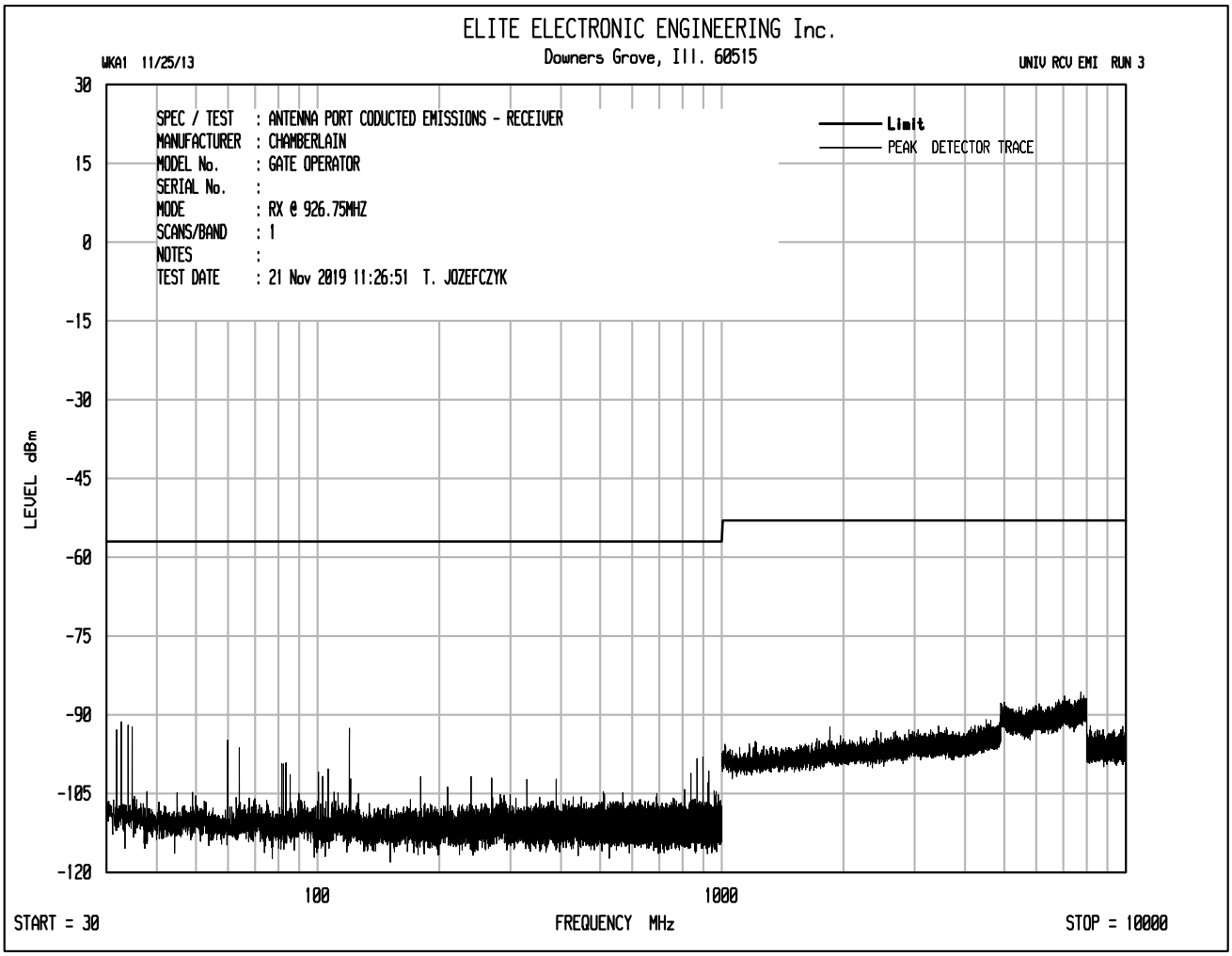

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 4
SPEC / TEST : ANTENNA PORT CONDUCTED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : GATE OPERATOR
SERIAL No. :
MODE : RX @ 902.25MHZ
SCANS/BAND : 1
NOTES :
TEST DATE : 21 Nov 2019 11:13:46 T. JOZEFCZYK
Limit
PEAK DETECTOR TRACE
LEVEL dBm
15
0
-15
-30
-45
-60
-75
-90
-105
-120
100
1000
START = 30
FREQUENCY MHz
STOP = 10000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 1
SPEC / TEST : ANTENNA PORT CODUCTED EMISSIONS - RECEIVER
MANUFACTURER : CHAMBERLAIN
MODEL No. : GATE OPERATOR
SERIAL No. :
MODE : RX @ 902.25MHZ
SCANS/BAND : 1
NOTES :
TEST DATE : 21 Nov 2019 11:08:05 T. JOZEFCZYK
Limit
PEAK DETECTOR TRACE
LEVEL dBm
30
15
0
-15
-30
-45
-60
-75
-90
-105
-120
100
1000
START = 30
FREQUENCY MHz
STOP = 10000


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. : GATE OPERATOR
SERIAL No. :
MODE : RX @ 914.75MHZ
SCANS/BAND : 1
NOTES :
TEST DATE : 21 Nov 2019 11:18:35 T. JOZEFCZYK
Limit
PEAK DETECTOR TRACE
LEVEL dBm
15
0
-15
-30
-45
-60
-75
-90
-105
-120
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 : ANTENNA PORT CODUCTED EMISSIONS - RECEIVER
MANUFACTURER : CHAMBERLAIN
MODEL No. : GATE OPERATOR
SERIAL No. :
MODE : RX @ 914.75MHZ
SCANS/BAND : 1
NOTES :
TEST DATE : 21 Nov 2019 11:21:48 T. JOZEFCZYK
Limit
PEAK DETECTOR TRACE
LEVEL dBm
30
15
0
-15
-30
-45
-60
-75
-90
-105
-120
100
1000
START = 30
FREQUENCY MHz
STOP = 10000

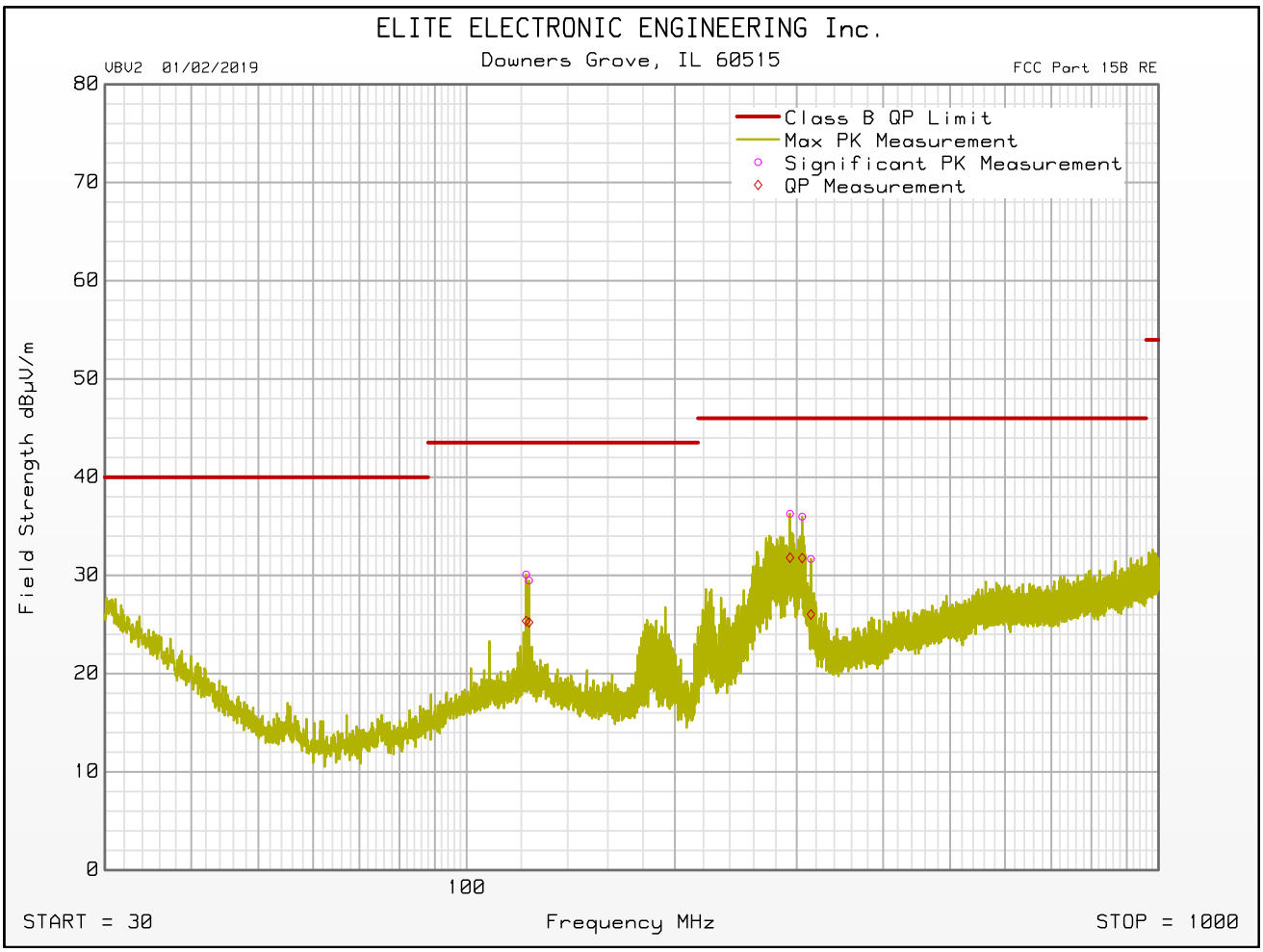

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 6
SPEC / TEST : ANTENNA PORT CONDUCTED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : GATE OPERATOR
SERIAL No. :
MODE : RX @ 926.75MHZ
SCANS/BAND : 1
NOTES :
TEST DATE : 21 Nov 2019 11:22:37 T. JOZEFCZYK
Limit
PEAK DETECTOR TRACE
LEVEL dBm
15
0
-15
-30
-45
-60
-75
-90
-105
-120
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 CODUCTED EMISSIONS - RECEIVER
MANUFACTURER : CHAMBERLAIN
MODEL No. : GATE OPERATOR
SERIAL No. :
MODE : RX @ 926.75MHZ
SCANS/BAND : 1
NOTES :
TEST DATE : 21 Nov 2019 11:26:51 T. JOZEFCZYK
Limit
PEAK DETECTOR TRACE
LEVEL dBm
30
15
0
-15
-30
-45
-60
-75
-90
-105
-120
100
1000
START = 30
FREQUENCY MHz
STOP = 10000

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

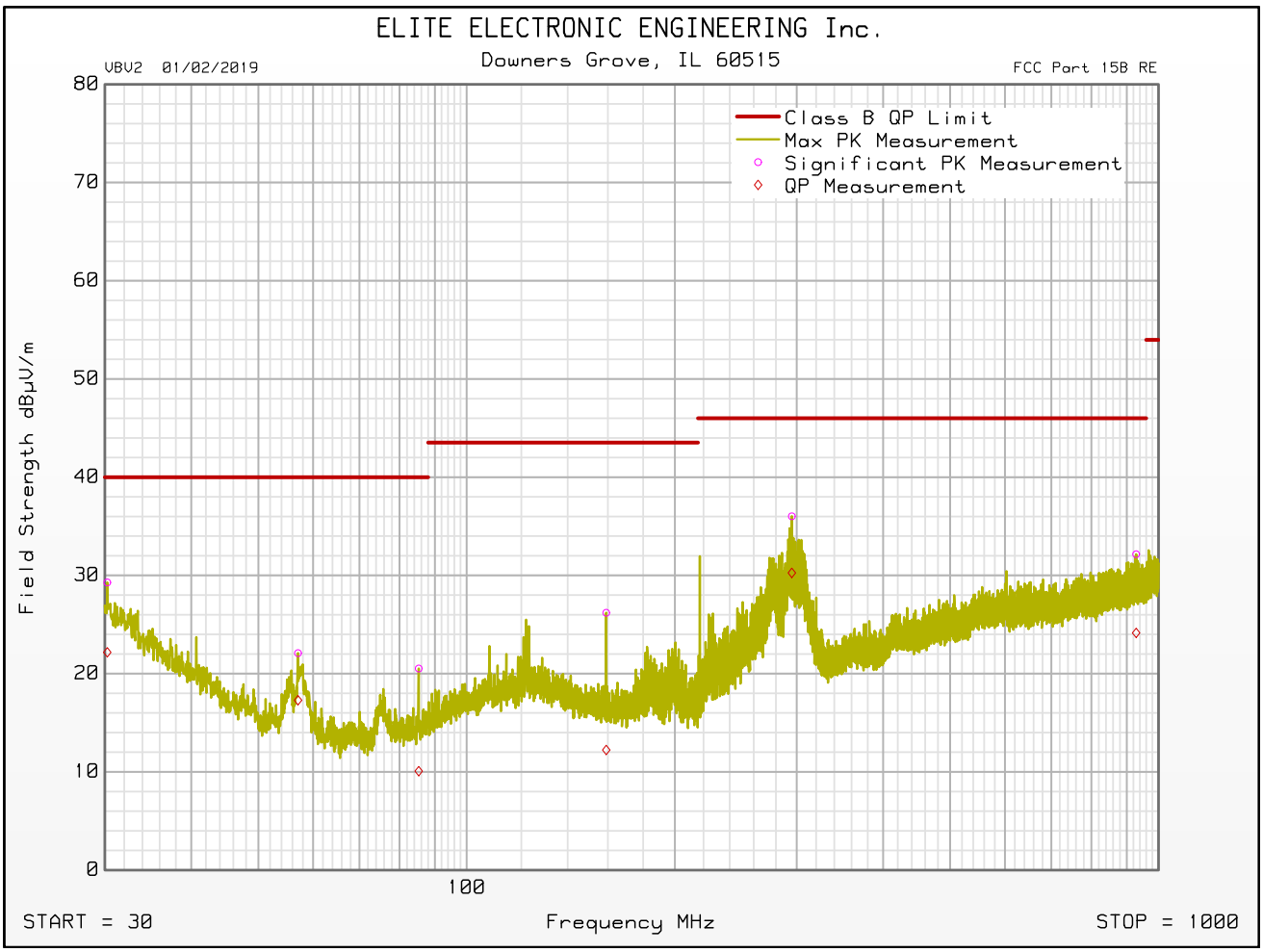
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 310MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	H
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 04:02:48 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 310MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	V
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 04:02:48 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

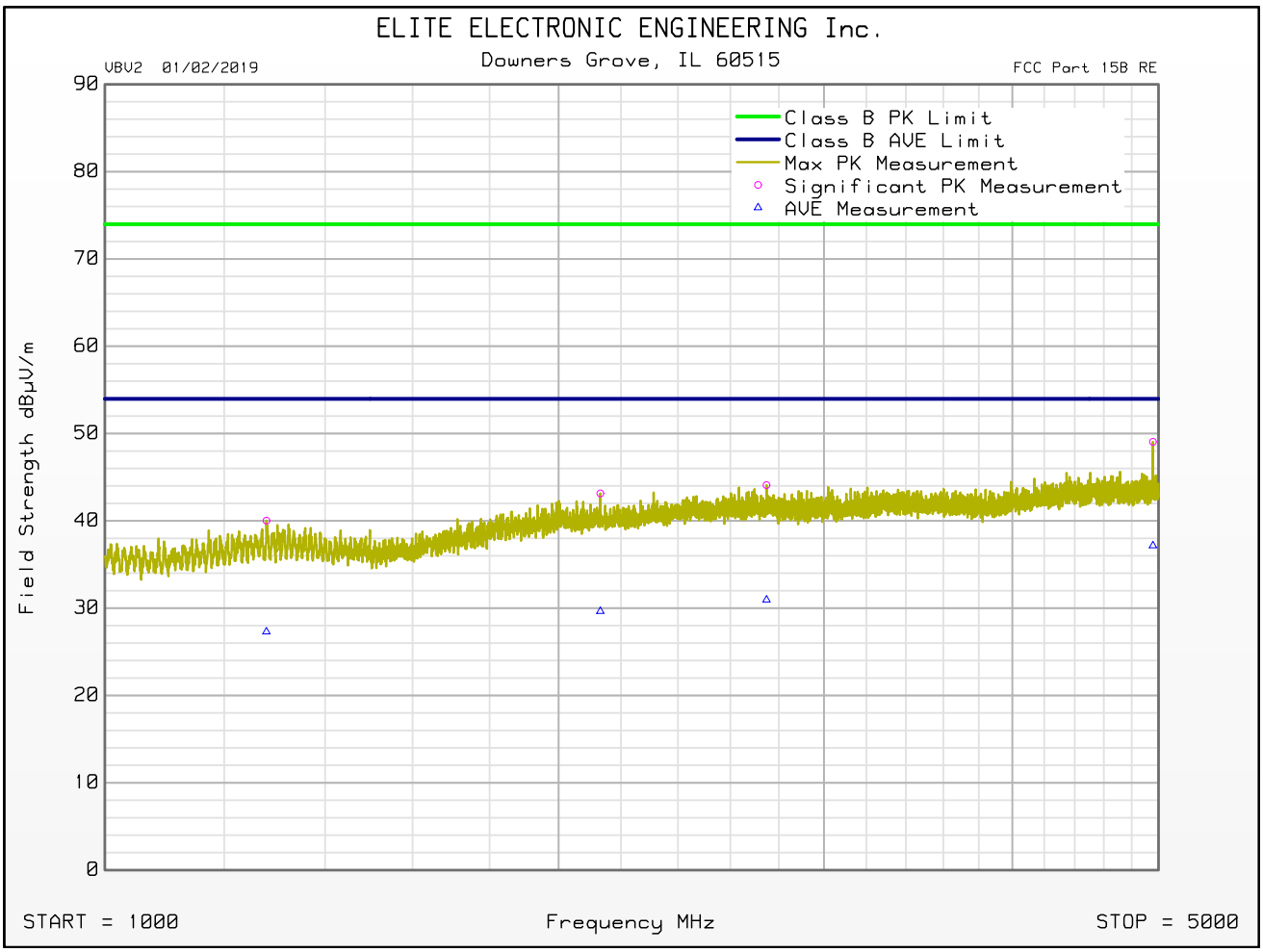
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 310MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 04:02:48 PM

Freq (MHz)	Peak Mtr Rdg (dBµV)	QP Mtr Rdg (dBµV)	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 (°)
30.240	4.5	-2.6	24.5	0.0	0.3	0.0	29.3	22.2	40.0	-17.8	V	120	90
57.060	9.2	4.4	12.5	0.0	0.4	0.0	22.1	17.3	40.0	-22.7	V	120	0
85.260	5.8	-4.7	14.2	0.0	0.5	0.0	20.5	10.1	40.0	-29.9	V	120	90
121.900	11.2	6.5	18.3	0.0	0.6	0.0	30.1	25.4	43.5	-18.2	H	200	315
123.100	10.5	6.3	18.3	0.0	0.7	0.0	29.5	25.2	43.5	-18.3	H	200	315
159.160	9.3	-4.7	16.2	0.0	0.7	0.0	26.2	12.2	43.5	-31.3	V	120	315
293.400	16.0	11.5	19.3	0.0	1.0	0.0	36.3	31.8	46.0	-14.2	H	120	0
295.200	15.7	9.9	19.3	0.0	1.0	0.0	36.0	30.3	46.0	-15.7	V	340	180
305.520	15.3	11.1	19.6	0.0	1.1	0.0	36.0	31.8	46.0	-14.2	H	120	90
314.520	10.9	5.3	19.7	0.0	1.1	0.0	31.7	26.0	46.0	-20.0	H	120	90
928.380	3.7	-4.4	26.7	0.0	1.8	0.0	32.2	24.1	46.0	-21.9	V	340	270

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

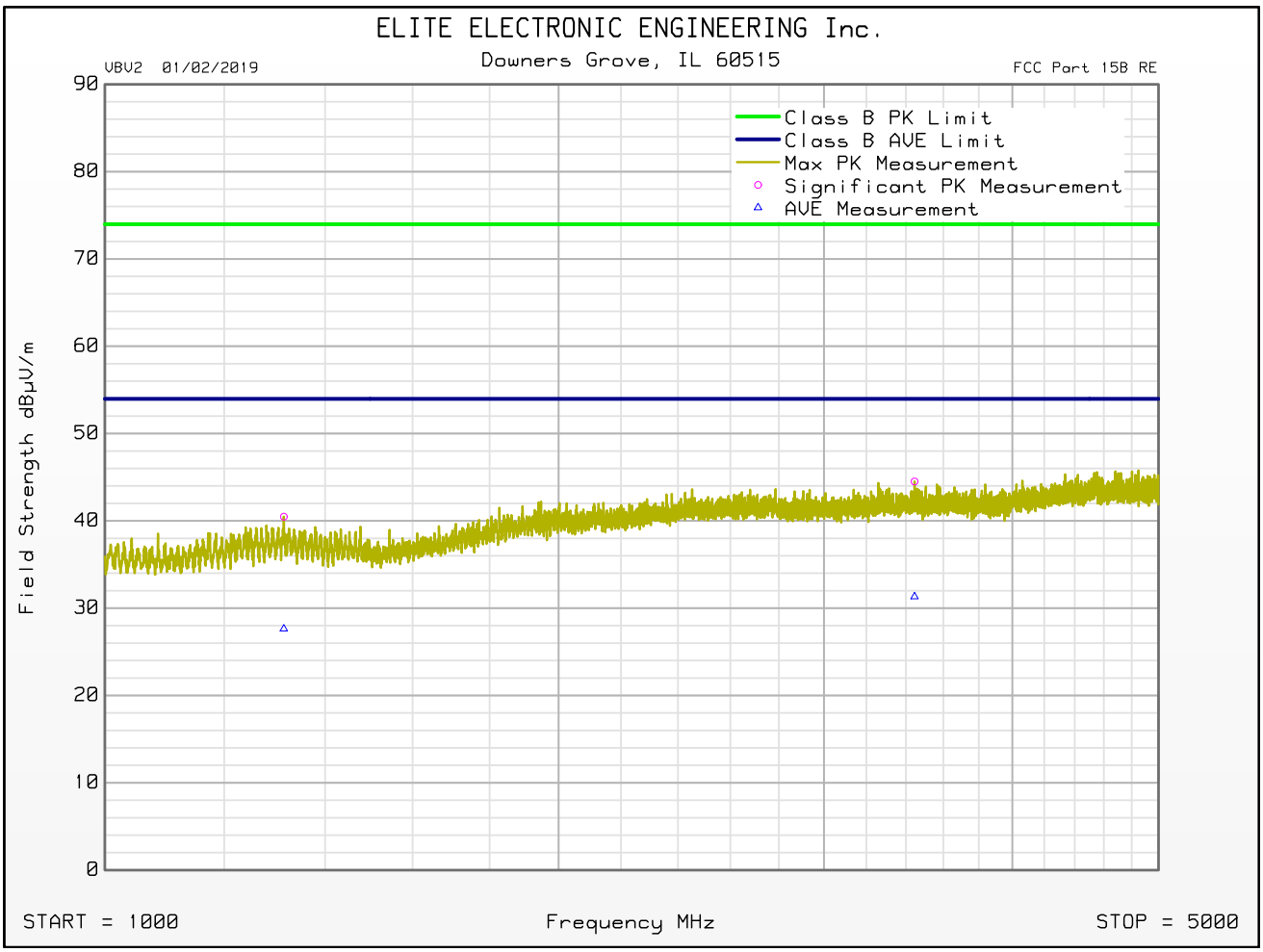
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 310MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	H
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 01:20:28 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 310MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	V
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 01:20:28 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

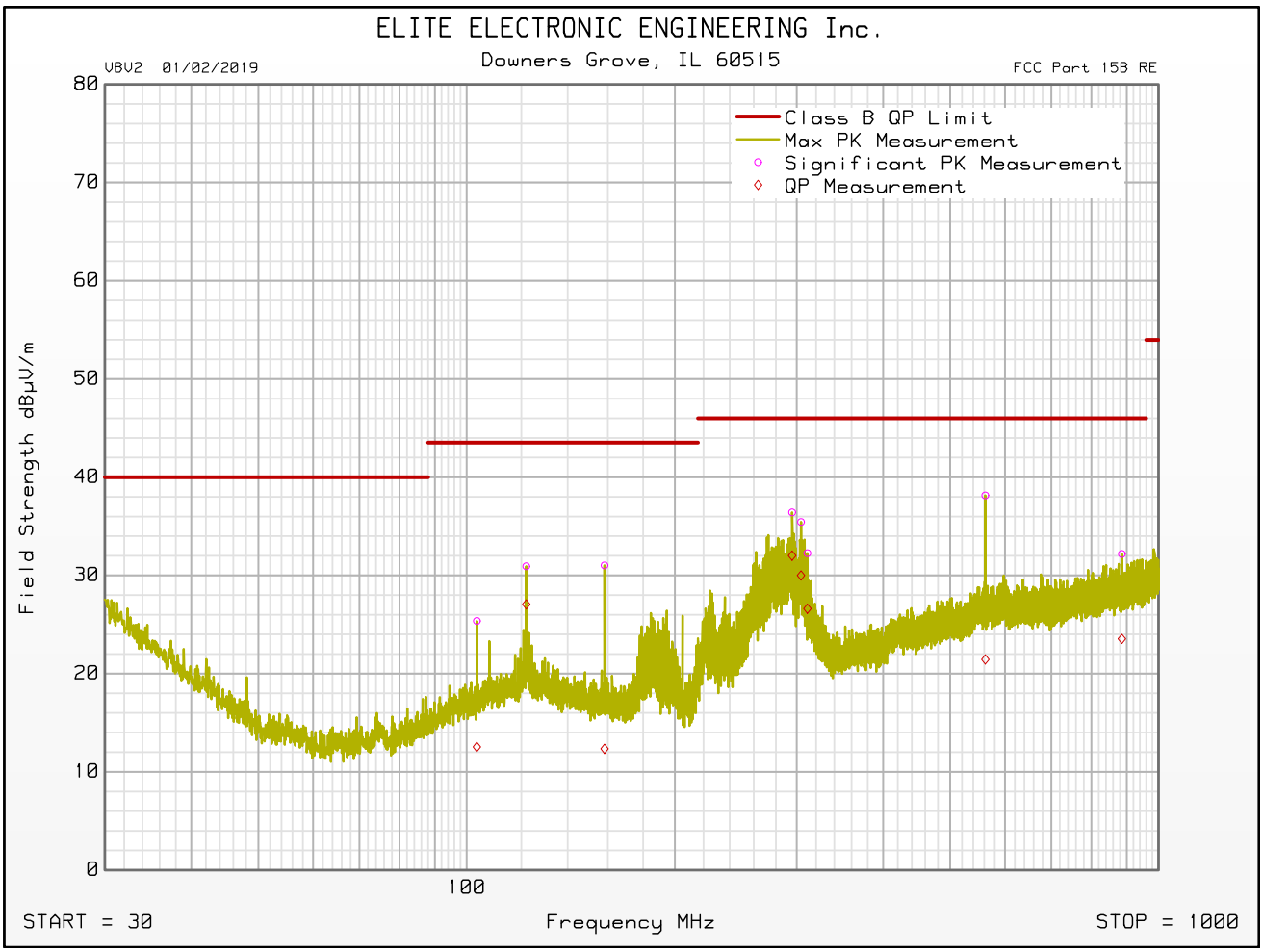
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 310MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 01:20:28 PM

Freq (GHz)	Peak Mtr Rdg (dBµV)	Ave. Mtr Rdg (dBµV)	Ant Fac (dB)	Amp Fac (dB)	Cbl Fac (dB)	Dist Corr (dB)	Peak Total (dBµV/m)	Peak Limit (dBµV/m)	Peak Lim Mrg (dB)	Ave. Total (dBµV/m)	Ave. Limit (dBµV/m)	Ave. Lim Mrg (dB)	Ant Pol	Mast Ht (cm)	Azim (°)
1.28	49.7	36.9	29.1	-40.8	2.1	0.0	40.0	74.0	-34.0	27.3	54.0	-26.7	H	200	0
1.3145	50.2	37.3	29.0	-40.9	2.1	0.0	40.5	74.0	-33.5	27.6	54.0	-26.3	V	340	315
2.1315	49.7	36.2	31.4	-40.7	2.7	0.0	43.1	74.0	-30.8	29.6	54.0	-24.3	H	340	315
2.7475	49.0	35.9	32.6	-40.6	3.1	0.0	44.1	74.0	-29.9	31.0	54.0	-23.0	H	200	45
3.445	48.6	35.4	32.9	-40.4	3.4	0.0	44.5	74.0	-29.5	31.3	54.0	-22.7	V	340	135
4.958	50.9	39.0	34.4	-40.3	4.1	0.0	49.1	74.0	-24.9	37.2	54.0	-16.8	H	200	135

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

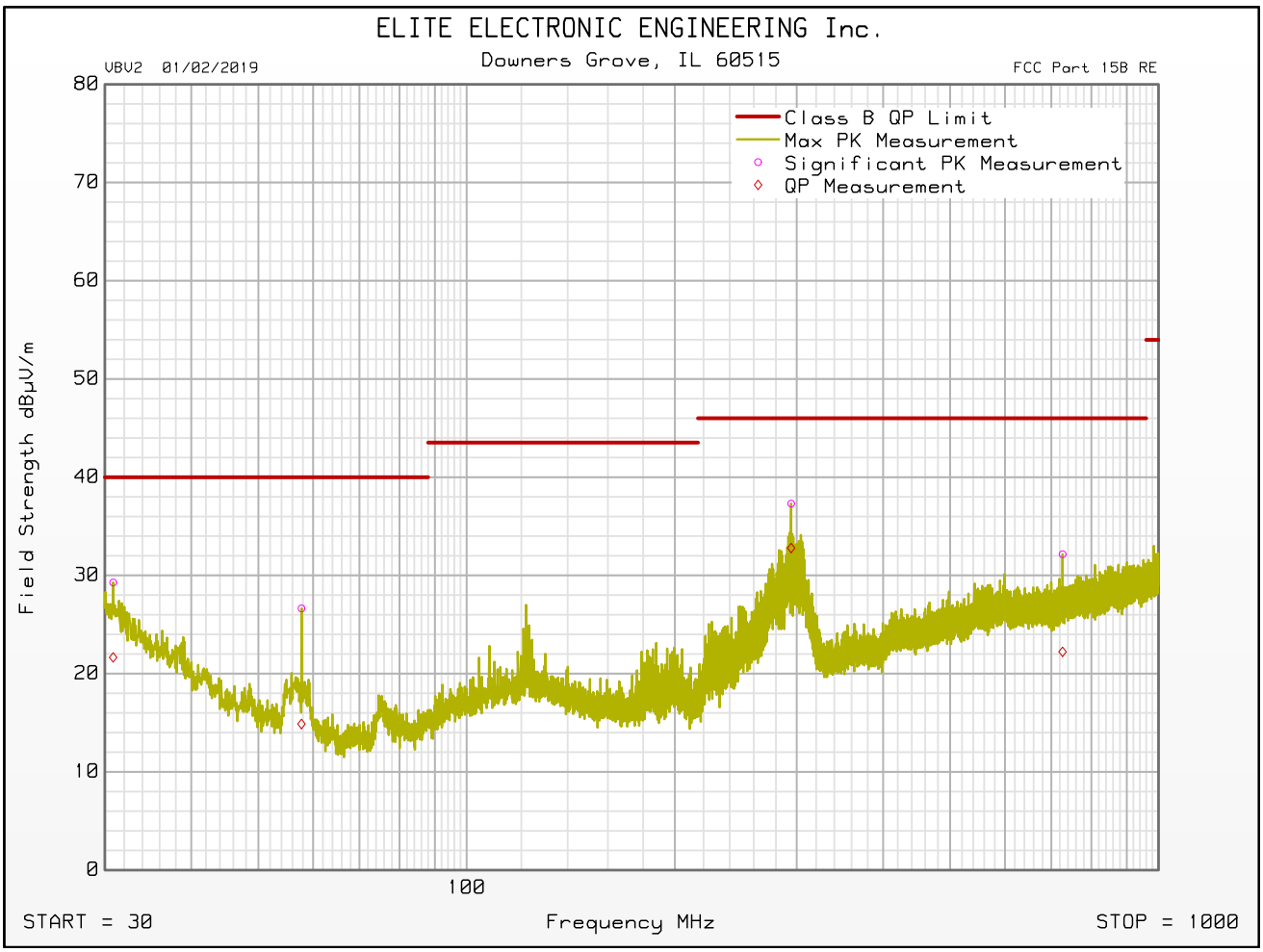
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 315MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	H
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 04:19:27 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 315MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	V
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 04:19:27 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

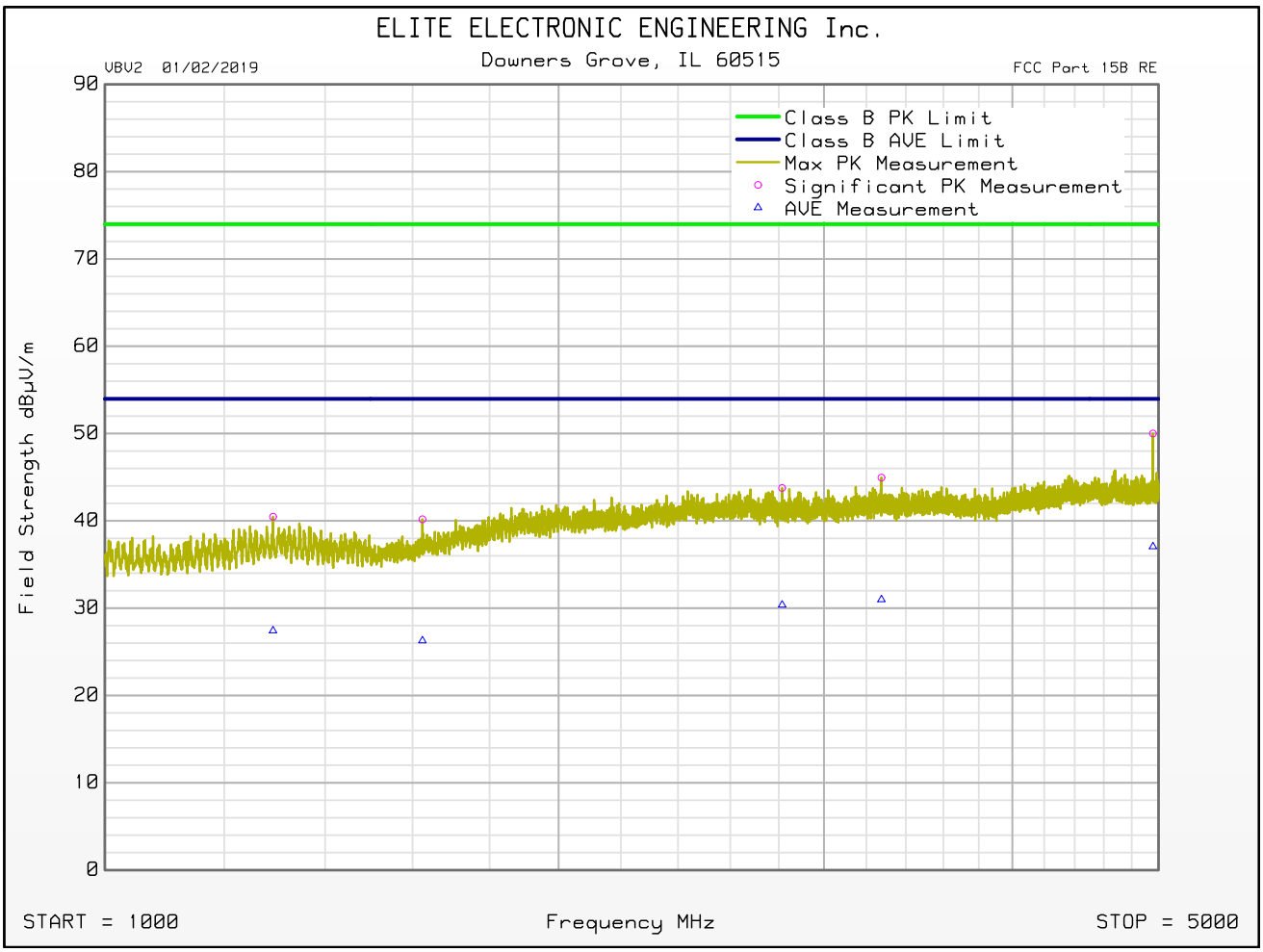
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 315MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 04:19:27 PM

Freq (MHz)	Peak Mtr Rdg (dBµV)	QP Mtr Rdg (dBµV)	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 (°)
30.840	4.8	-2.8	24.1	0.0	0.3	0.0	29.3	21.7	40.0	-18.3	V	340	180
57.720	13.8	2.0	12.4	0.0	0.4	0.0	26.6	14.9	40.0	-25.1	V	120	270
103.480	7.5	-5.3	17.2	0.0	0.6	0.0	25.4	12.5	43.5	-31.0	H	120	315
121.960	12.0	8.1	18.3	0.0	0.6	0.0	30.9	27.1	43.5	-16.5	H	200	315
158.260	14.1	-4.6	16.2	0.0	0.7	0.0	31.0	12.3	43.5	-31.2	H	120	180
294.480	17.0	12.4	19.3	0.0	1.0	0.0	37.3	32.8	46.0	-13.2	V	340	180
295.440	16.1	11.6	19.3	0.0	1.0	0.0	36.4	32.0	46.0	-14.0	H	200	180
304.320	14.8	9.4	19.5	0.0	1.1	0.0	35.4	30.0	46.0	-16.0	H	120	0
310.860	11.5	5.9	19.7	0.0	1.1	0.0	32.3	26.6	46.0	-19.4	H	120	90
561.960	11.9	-4.8	24.9	0.0	1.4	0.0	38.2	21.5	46.0	-24.5	H	200	45
726.780	5.1	-4.9	25.5	0.0	1.6	0.0	32.2	22.2	46.0	-23.8	V	200	180
885.360	3.9	-4.7	26.5	0.0	1.8	0.0	32.2	23.5	46.0	-22.5	H	120	0

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

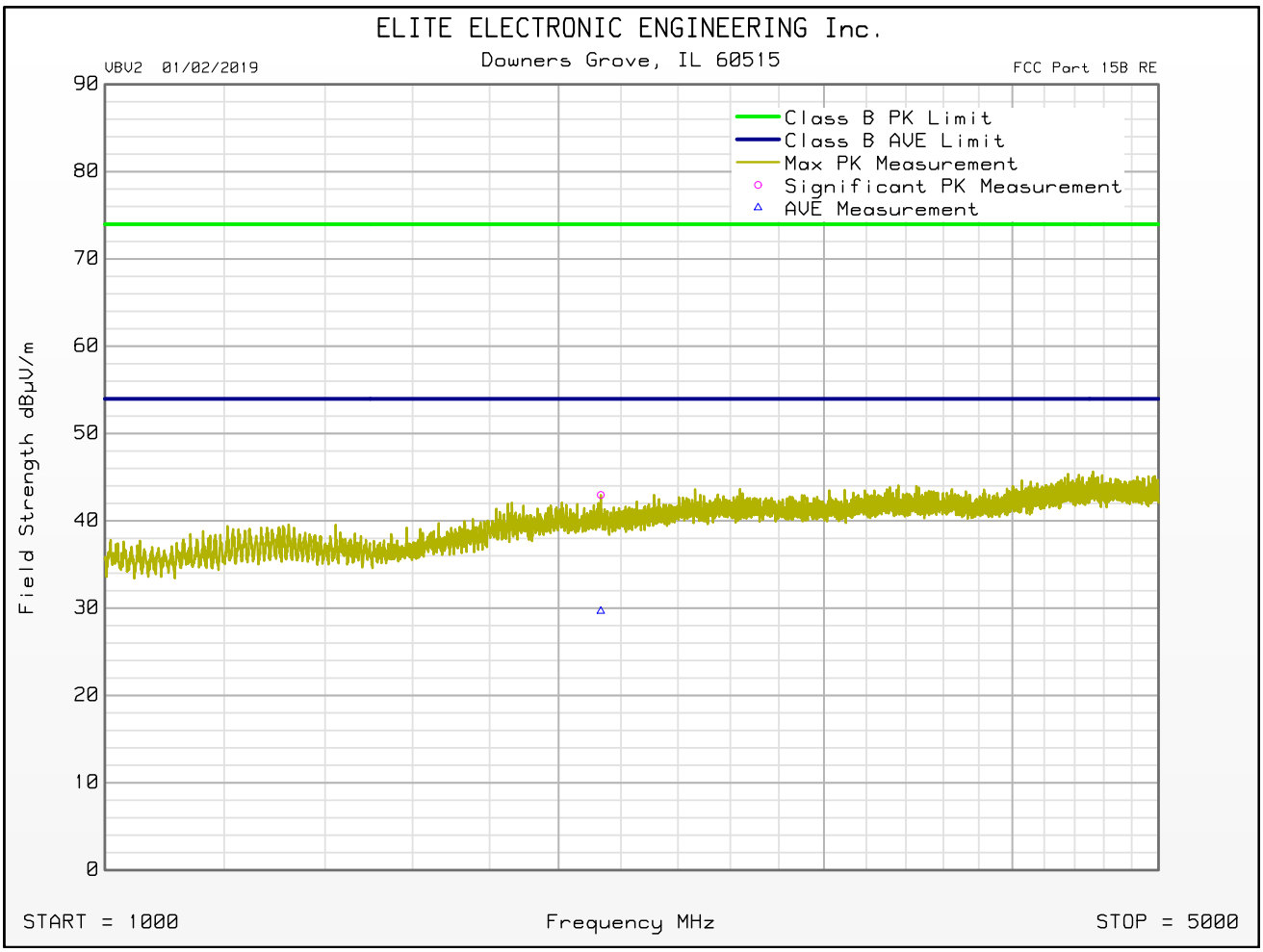
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 315MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	H
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 01:42:03 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 315MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	V
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 01:42:03 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

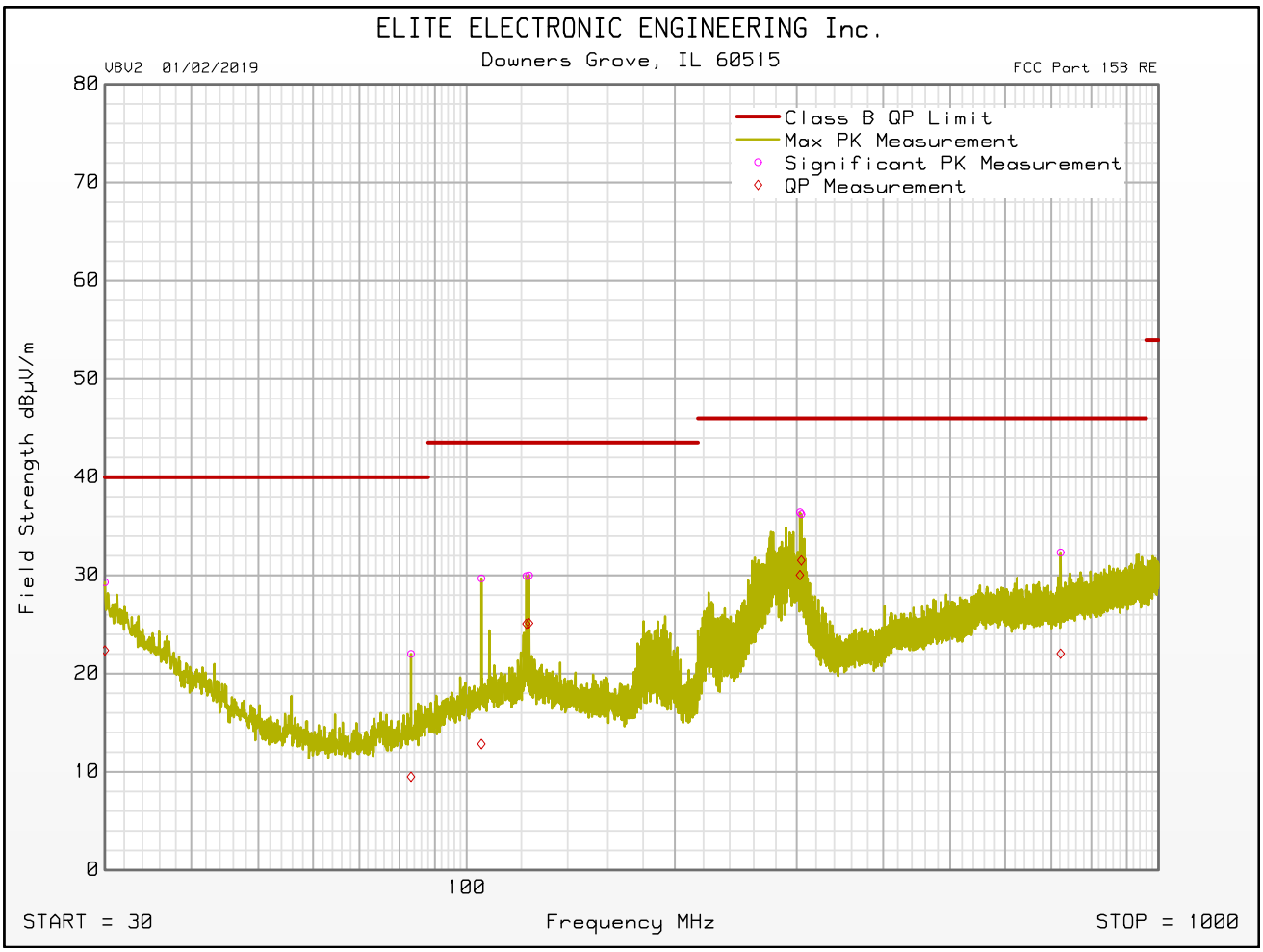
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 315MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 01:42:03 PM

Freq (GHz)	Peak Mtr Rdg (dBµV)	Ave. Mtr Rdg (dBµV)	Ant Fac (dB)	Amp Fac (dB)	Cbl Fac (dB)	Dist Corr (dB)	Peak Total (dBµV/m)	Peak Limit (dBµV/m)	Peak Lim Mrg (dB)	Ave. Total (dBµV/m)	Ave. Limit (dBµV/m)	Ave. Lim Mrg (dB)	Ant Pol	Mast Ht (cm)	Azim (°)
1.293	50.1	37.1	29.1	-40.9	2.1	0.0	40.5	74.0	-33.5	27.4	54.0	-26.5	H	120	270
1.6245	50.5	36.5	28.4	-41.1	2.4	0.0	40.2	74.0	-33.8	26.3	54.0	-27.7	H	340	135
2.133	49.5	36.2	31.4	-40.7	2.7	0.0	43.0	74.0	-31.0	29.7	54.0	-24.3	V	200	315
2.814	48.8	35.4	32.4	-40.6	3.1	0.0	43.8	74.0	-30.2	30.4	54.0	-23.6	H	200	315
3.275	49.2	35.2	32.8	-40.5	3.4	0.0	45.0	74.0	-29.0	31.0	54.0	-23.0	H	120	0
4.958	51.9	38.9	34.4	-40.3	4.1	0.0	50.0	74.0	-24.0	37.1	54.0	-16.9	H	200	135

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

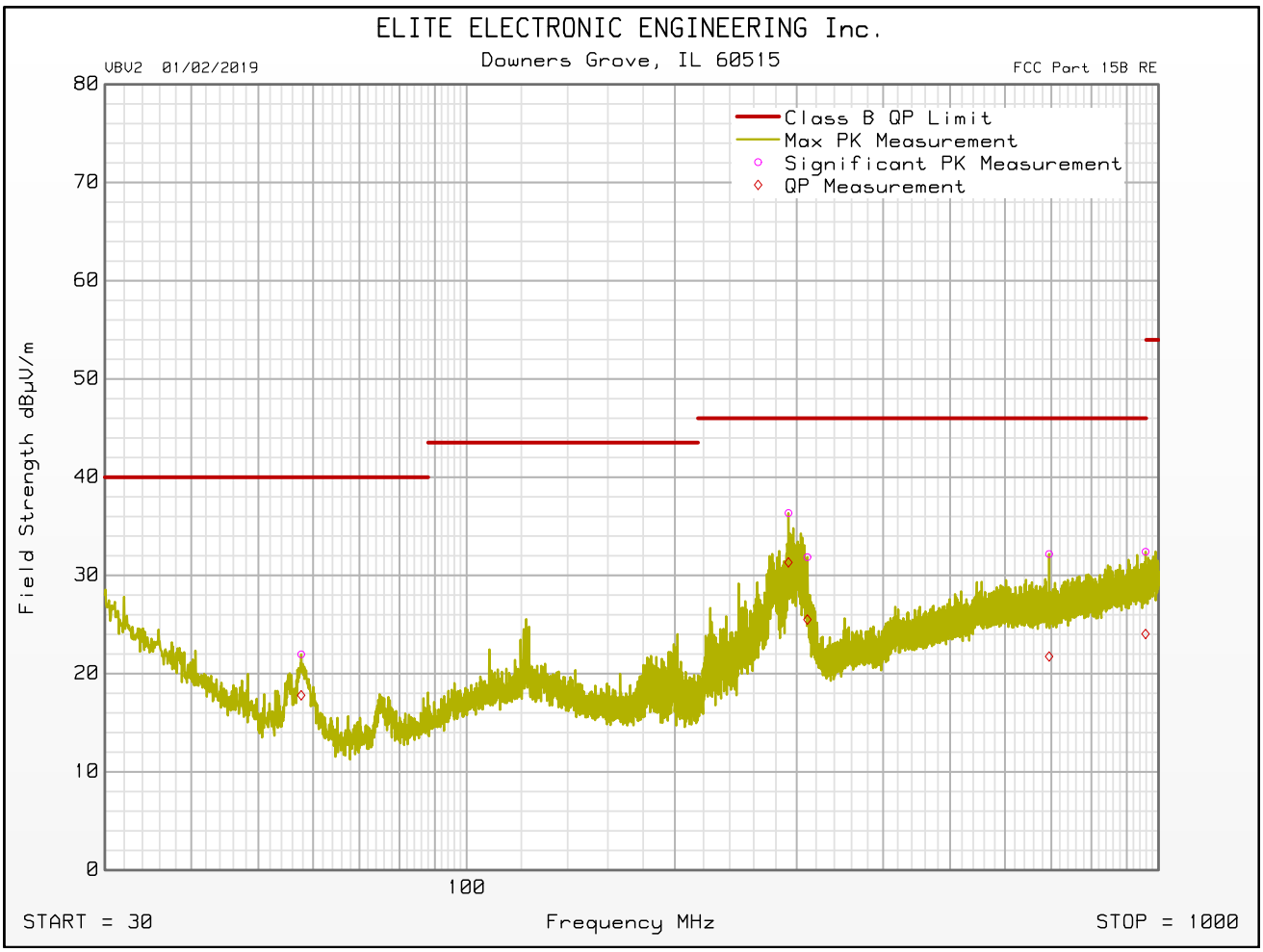
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 390MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	H
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 04:37:22 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 390MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	V
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 04:37:22 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

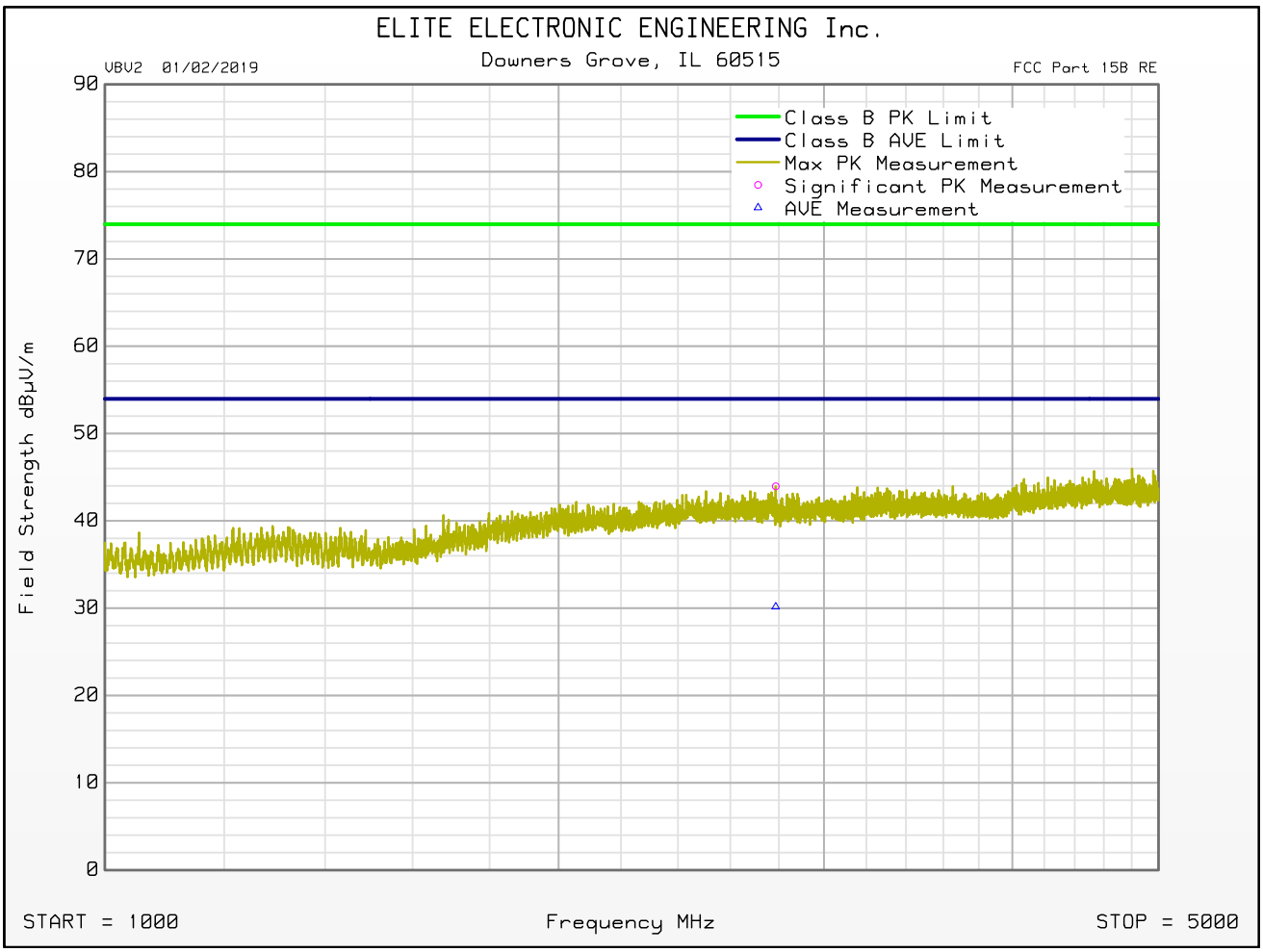
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 390MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 04:37:22 PM

Freq (MHz)	Peak Mtr Rdg (dBµV)	QP Mtr Rdg (dBµV)	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 (°)
30.000	4.3	-2.6	24.6	0.0	0.3	0.0	29.3	22.4	40.0	-17.6	H	340	90
57.660	9.1	4.9	12.4	0.0	0.4	0.0	22.0	17.8	40.0	-22.2	V	200	0
83.100	7.7	-4.8	13.8	0.0	0.5	0.0	22.0	9.5	40.0	-30.5	H	200	270
105.040	11.7	-5.1	17.4	0.0	0.6	0.0	29.7	12.8	43.5	-30.7	H	120	90
122.020	11.0	6.2	18.3	0.0	0.6	0.0	29.9	25.1	43.5	-18.4	H	200	315
123.100	11.0	6.2	18.3	0.0	0.7	0.0	30.0	25.1	43.5	-18.4	H	200	315
291.900	16.1	11.1	19.2	0.0	1.0	0.0	36.3	31.3	46.0	-14.7	V	200	180
303.240	15.9	9.5	19.5	0.0	1.1	0.0	36.4	30.0	46.0	-16.0	H	120	90
304.620	15.6	10.9	19.5	0.0	1.1	0.0	36.2	31.5	46.0	-14.5	H	120	90
310.860	11.1	4.8	19.7	0.0	1.1	0.0	31.9	25.5	46.0	-20.5	V	120	180
694.920	5.5	-4.9	25.1	0.0	1.6	0.0	32.2	21.8	46.0	-24.2	V	200	90
722.040	5.4	-4.9	25.4	0.0	1.6	0.0	32.3	22.0	46.0	-24.0	H	120	180
957.900	3.6	-4.7	27.0	0.0	1.8	0.0	32.4	24.0	46.0	-22.0	V	200	180

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

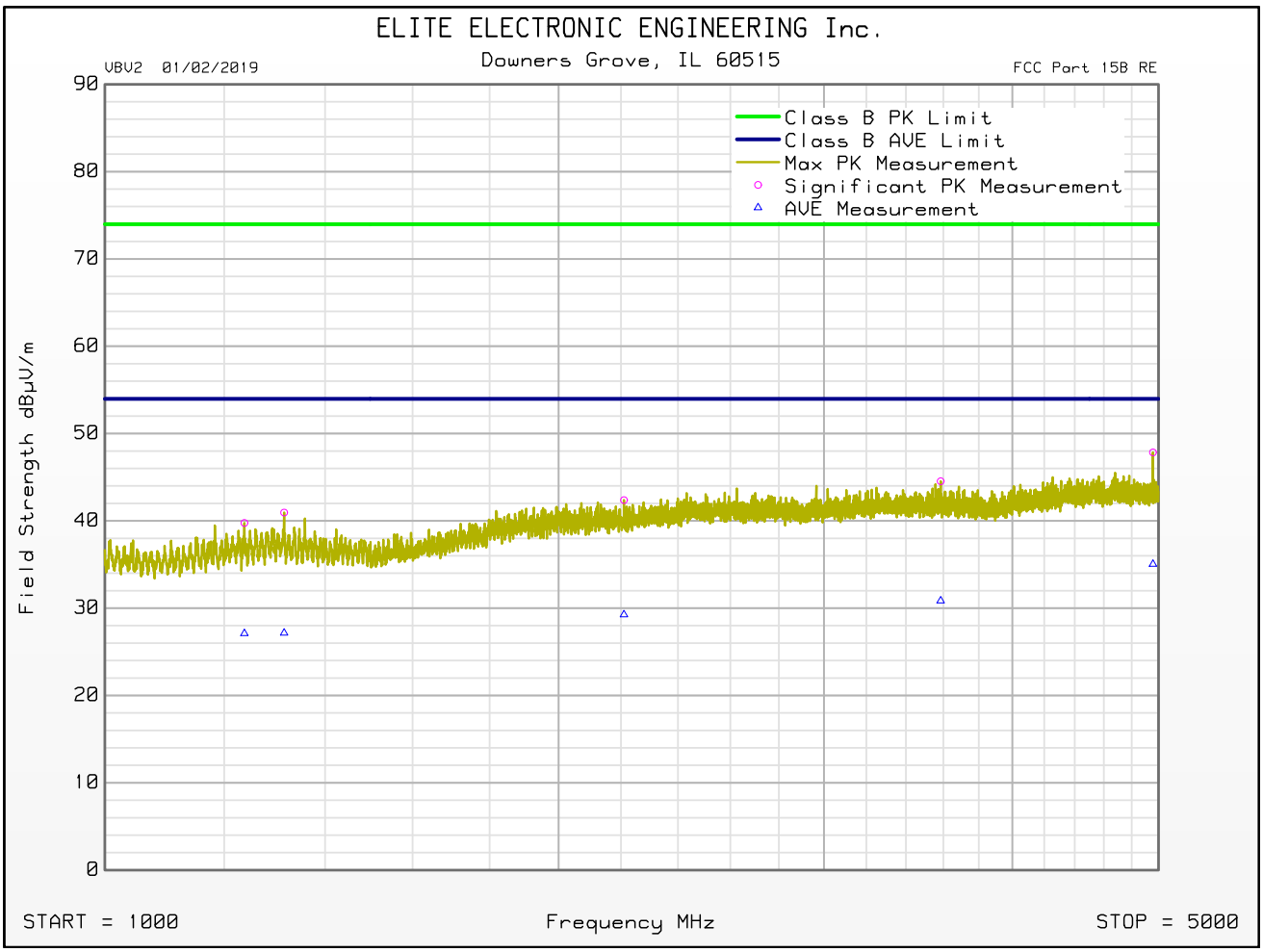
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 390MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	H
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 02:02:37 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 390MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	V
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 02:02:37 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

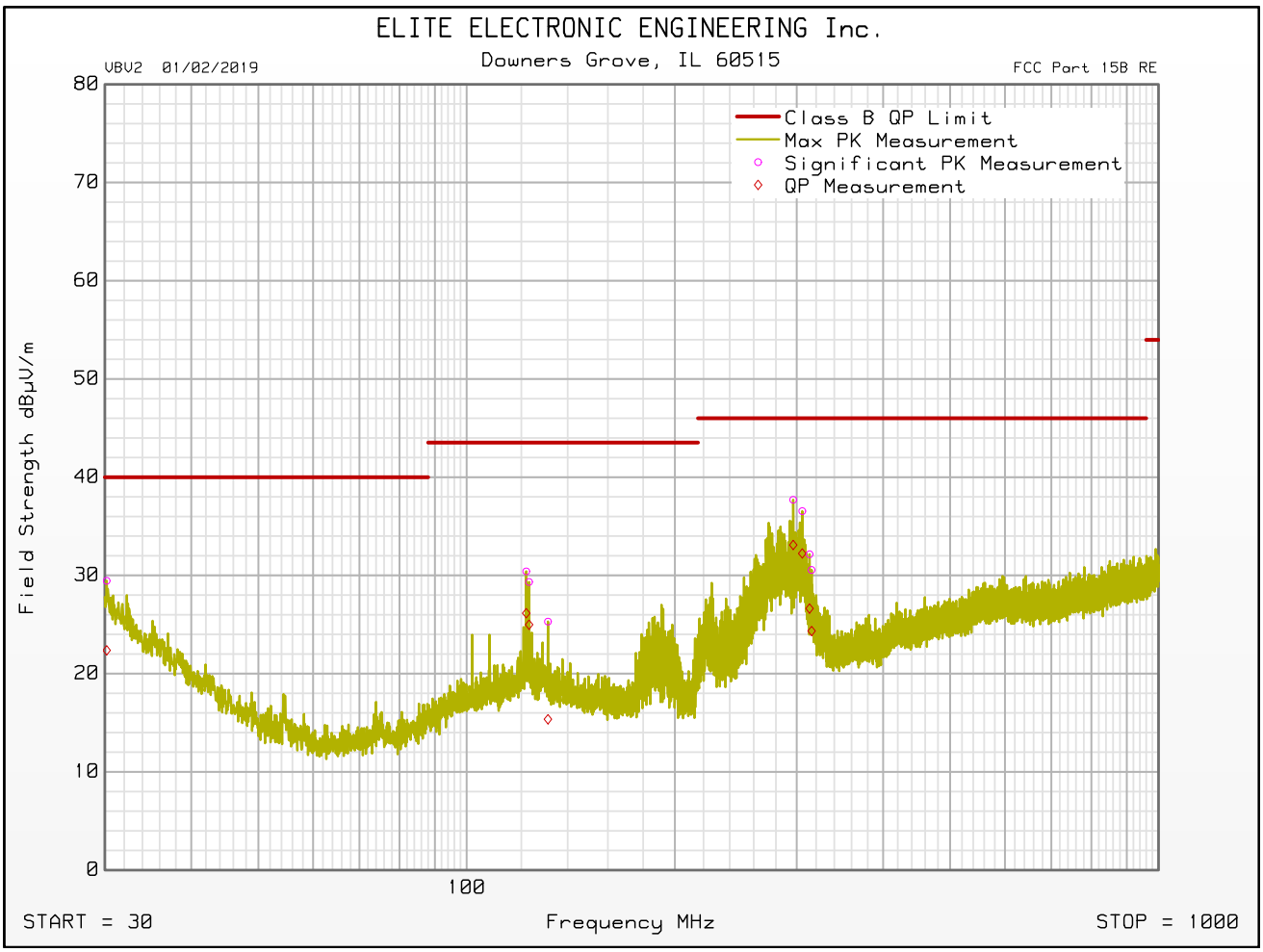
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 390MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 02:02:37 PM

Freq (GHz)	Peak Mtr Rdg (dBµV)	Ave. Mtr Rdg (dBµV)	Ant Fac (dB)	Amp Fac (dB)	Cbl Fac (dB)	Dist Corr (dB)	Peak Total (dBµV/m)	Peak Limit (dBµV/m)	Peak Lim Mrg (dB)	Ave. Total (dBµV/m)	Ave. Limit (dBµV/m)	Ave. Lim Mrg (dB)	Ant Pol	Mast Ht (cm)	Azim (°)
1.2375	49.5	36.8	29.0	-40.8	2.1	0.0	39.8	74.0	-34.2	27.1	54.0	-26.9	V	200	90
1.315	50.6	36.9	29.0	-40.9	2.1	0.0	41.0	74.0	-33.0	27.2	54.0	-26.8	V	200	225
2.21	48.8	35.7	31.4	-40.6	2.7	0.0	42.4	74.0	-31.6	29.3	54.0	-24.7	V	340	0
2.7865	49.0	35.2	32.4	-40.6	3.1	0.0	44.0	74.0	-30.0	30.2	54.0	-23.8	H	200	180
3.585	48.4	34.8	32.9	-40.3	3.5	0.0	44.5	74.0	-29.4	30.8	54.0	-23.1	V	340	45
4.958	49.7	36.9	34.4	-40.3	4.1	0.0	47.8	74.0	-26.1	35.0	54.0	-18.9	V	340	135

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

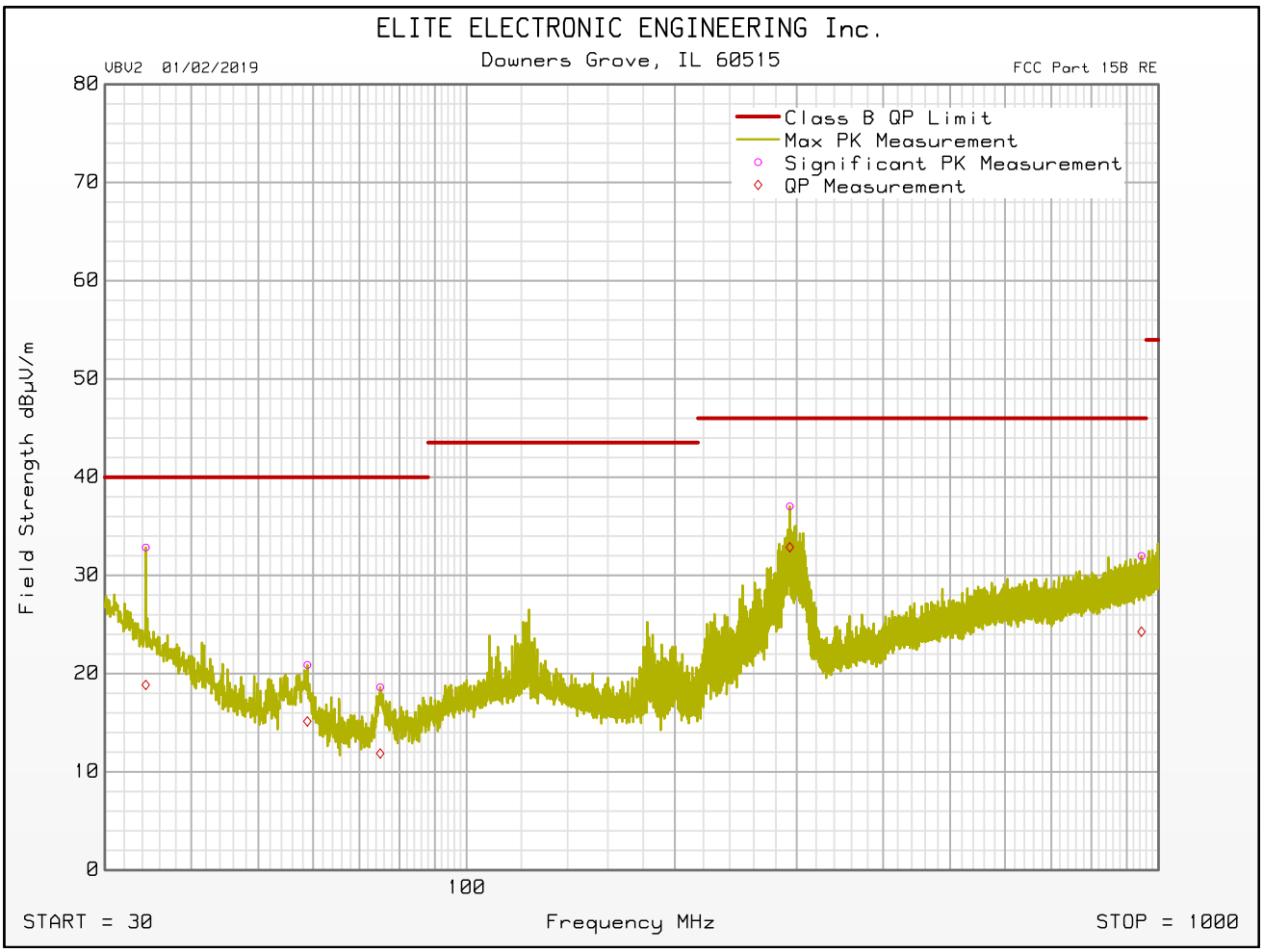
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 433.92MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	H
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 18, 2019 08:51:32 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 433.92MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	V
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 18, 2019 08:51:32 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

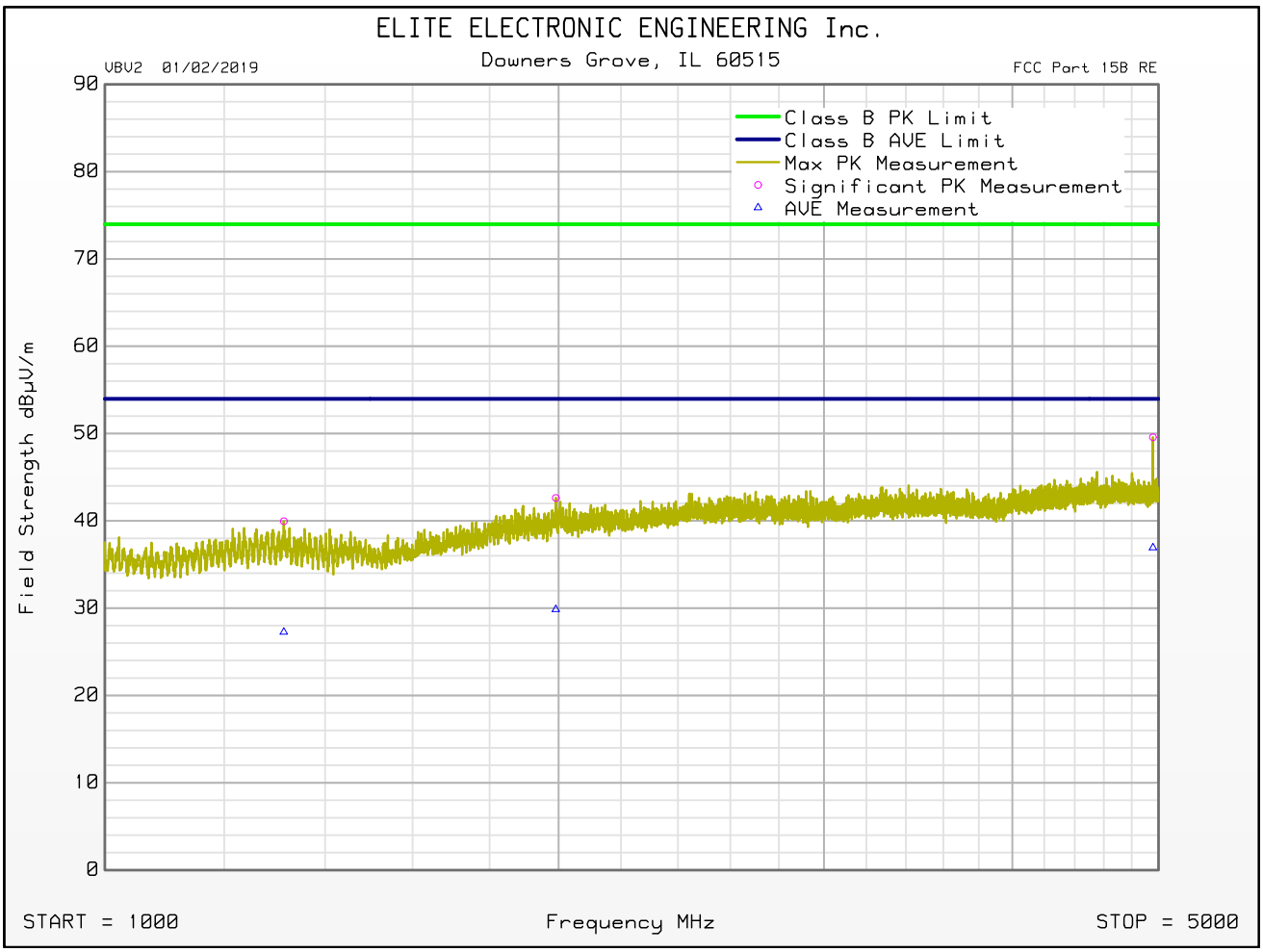
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 433.92MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 18, 2019 08:51:32 AM

Freq (MHz)	Peak Mtr Rdg (dBµV)	QP Mtr Rdg (dBµV)	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 (°)
30.180	4.6	-2.5	24.5	0.0	0.3	0.0	29.5	22.4	40.0	-17.6	H	200	0
34.380	10.5	-3.5	22.0	0.0	0.4	0.0	32.8	18.9	40.0	-21.1	V	120	225
58.860	8.1	2.4	12.3	0.0	0.4	0.0	20.9	15.1	40.0	-24.9	V	120	315
75.000	5.3	-1.4	12.8	0.0	0.5	0.0	18.6	11.9	40.0	-28.1	V	200	270
121.960	11.5	7.2	18.3	0.0	0.6	0.0	30.4	26.2	43.5	-17.4	H	200	315
123.100	10.4	6.0	18.3	0.0	0.7	0.0	29.3	25.0	43.5	-18.5	H	120	315
131.080	6.4	-3.5	18.2	0.0	0.7	0.0	25.3	15.4	43.5	-28.2	H	340	315
293.220	16.7	12.6	19.3	0.0	1.0	0.0	37.0	32.9	46.0	-13.1	V	200	180
296.520	17.3	12.7	19.4	0.0	1.0	0.0	37.7	33.1	46.0	-12.9	H	200	180
305.580	15.9	11.6	19.6	0.0	1.1	0.0	36.5	32.2	46.0	-13.8	H	120	90
313.140	11.4	5.9	19.7	0.0	1.1	0.0	32.2	26.6	46.0	-19.4	H	120	90
315.240	9.8	3.6	19.7	0.0	1.1	0.0	30.6	24.3	46.0	-21.7	H	120	90
945.120	3.5	-4.2	26.7	0.0	1.8	0.0	32.0	24.3	46.0	-21.7	V	340	0

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

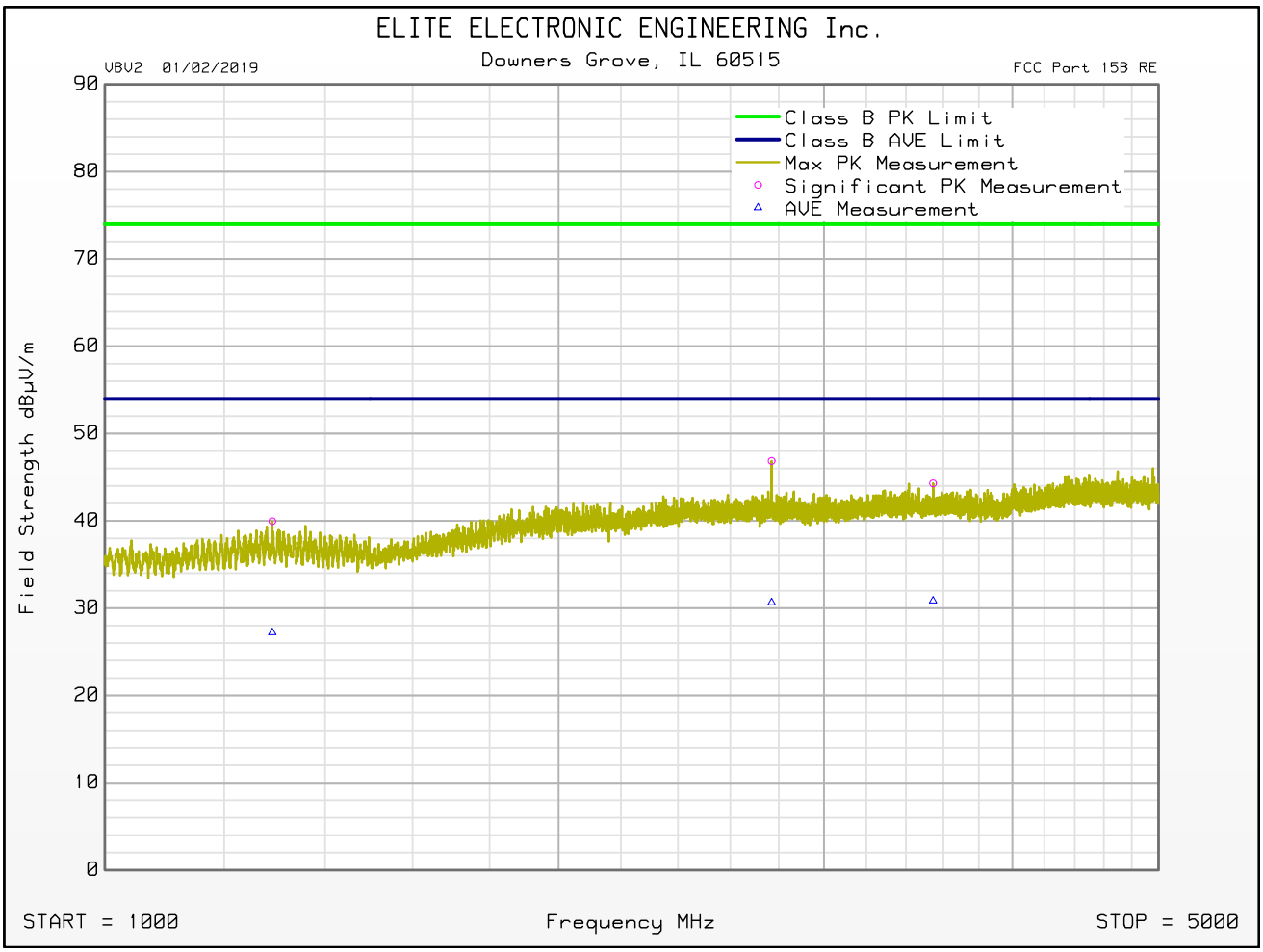
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 433.92MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	H
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 02:21:08 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 433.92MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	V
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 02:21:08 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

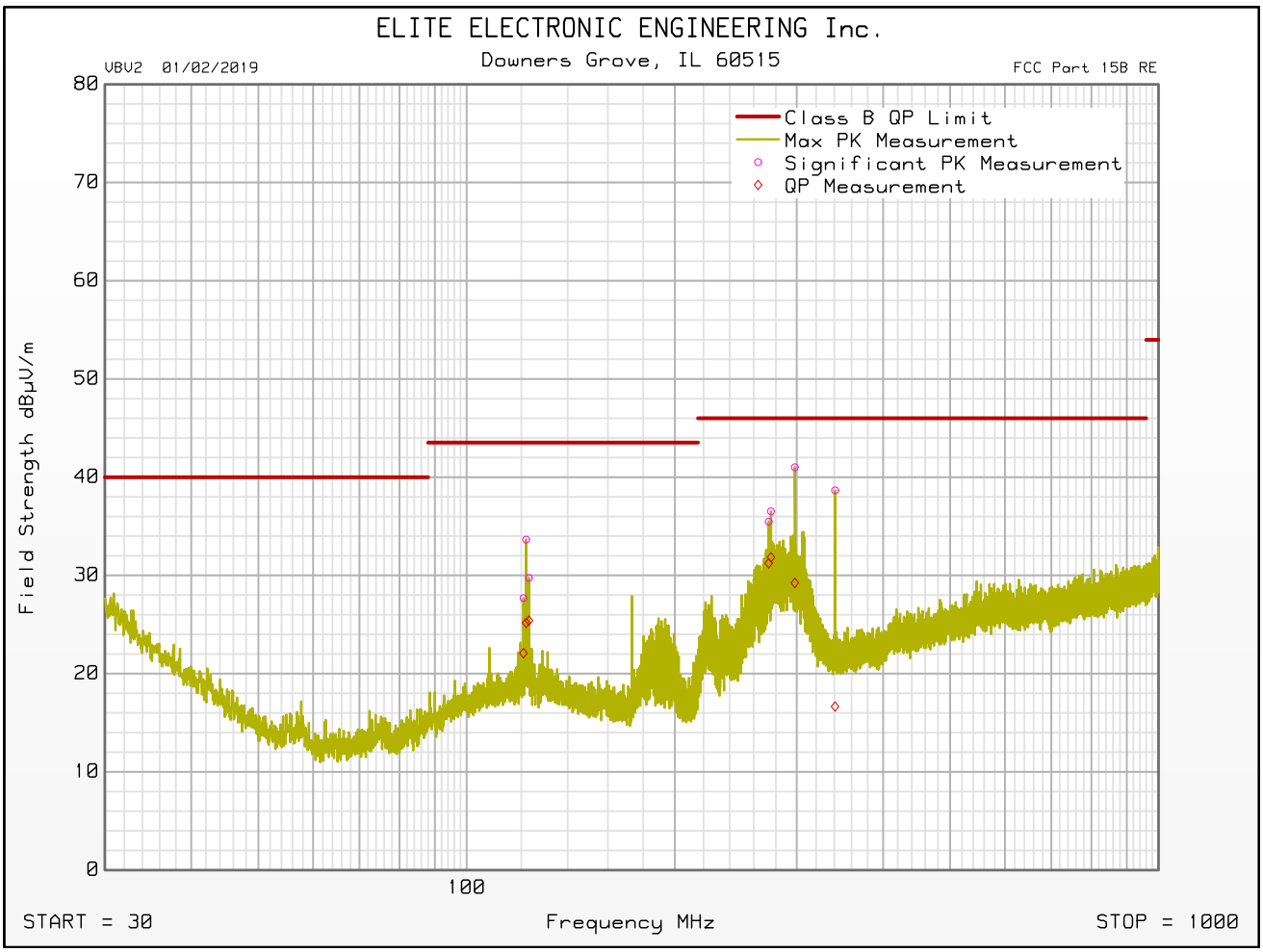
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 433.92MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 02:21:08 PM

Freq (GHz)	Peak Mtr Rdg (dBµV)	Ave. Mtr Rdg (dBµV)	Ant Fac (dB)	Amp Fac (dB)	Cbl Fac (dB)	Dist Corr (dB)	Peak Total (dBµV/m)	Peak Limit (dBµV/m)	Peak Lim Mrg (dB)	Ave. Total (dBµV/m)	Ave. Limit (dBµV/m)	Ave. Lim Mrg (dB)	Ant Pol	Mast Ht (cm)	Azim (°)
1.2915	49.6	36.9	29.1	-40.9	2.1	0.0	40.0	74.0	-34.0	27.2	54.0	-26.8	V	340	225
1.3145	49.7	37.0	29.0	-40.9	2.1	0.0	40.0	74.0	-34.0	27.3	54.0	-26.7	H	200	90
1.9915	49.4	36.6	31.5	-40.9	2.6	0.0	42.6	74.0	-31.4	29.9	54.0	-24.1	H	120	315
2.769	51.9	35.7	32.5	-40.6	3.1	0.0	46.9	74.0	-27.1	30.6	54.0	-23.3	V	120	270
3.5435	48.3	34.8	32.9	-40.4	3.5	0.0	44.3	74.0	-29.7	30.9	54.0	-23.1	V	340	45
4.958	51.5	38.8	34.4	-40.3	4.1	0.0	49.6	74.0	-24.4	36.9	54.0	-17.0	H	200	135

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

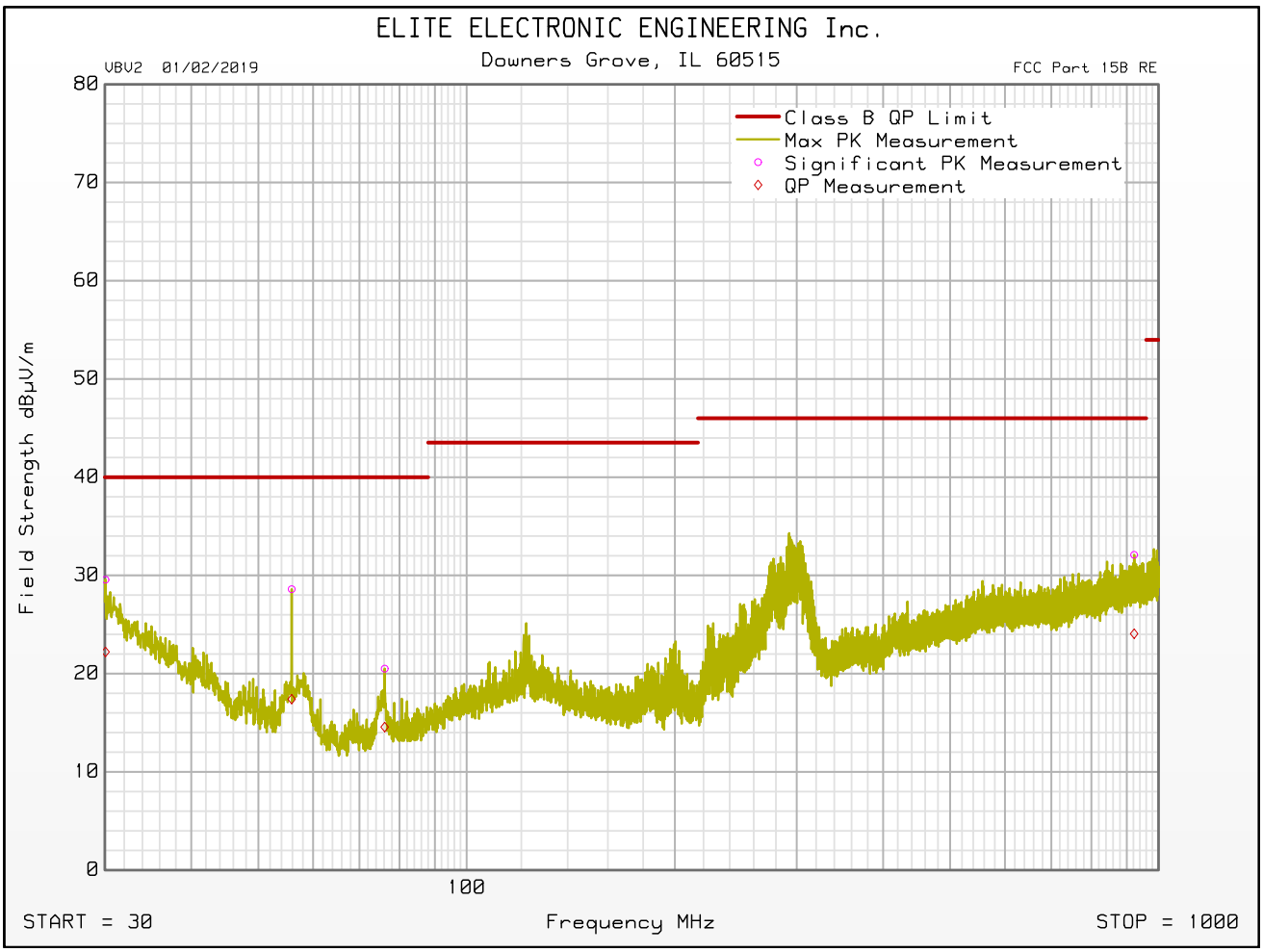
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 902.25MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	H
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 03:05:49 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 902.25MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	V
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 03:05:49 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

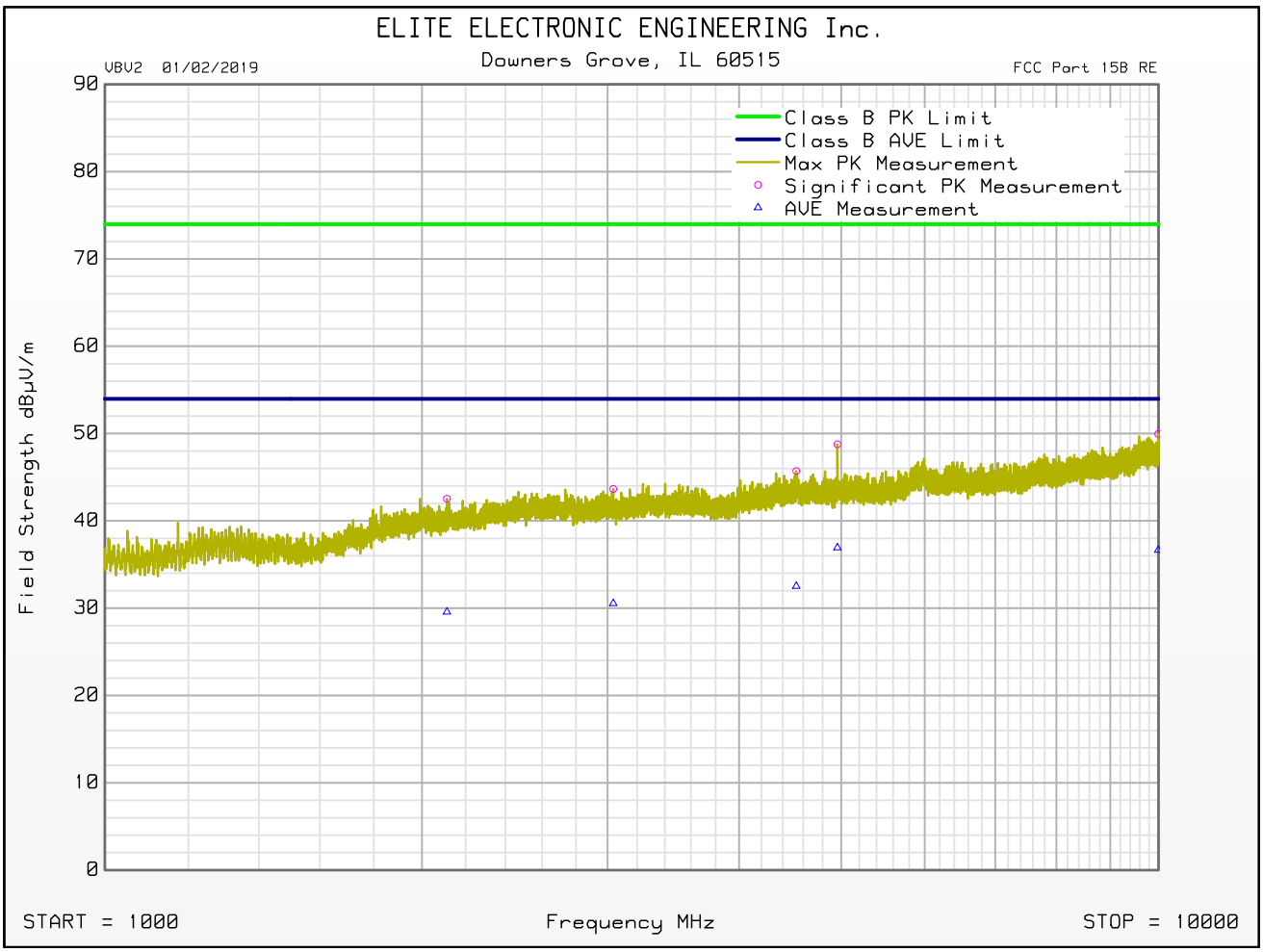
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 902.25MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 03:05:49 PM

Freq (MHz)	Peak Mtr Rdg (dBµV)	QP Mtr Rdg (dBµV)	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 (°)
30.060	4.6	-2.7	24.6	0.0	0.3	0.0	29.6	22.2	40.0	-17.8	V	340	45
55.860	15.6	4.4	12.6	0.0	0.4	0.0	28.6	17.4	40.0	-22.6	V	120	315
76.140	7.1	1.2	12.9	0.0	0.5	0.0	20.5	14.6	40.0	-25.4	V	200	0
120.820	8.8	3.2	18.2	0.0	0.6	0.0	27.7	22.1	43.5	-21.4	H	200	315
121.900	14.7	6.3	18.3	0.0	0.6	0.0	33.6	25.2	43.5	-18.3	H	200	315
123.040	10.8	6.4	18.3	0.0	0.7	0.0	29.8	25.4	43.5	-18.1	H	200	315
273.300	15.6	11.4	18.9	0.0	1.0	0.0	35.5	31.2	46.0	-14.8	H	120	90
275.340	16.7	12.0	18.8	0.0	1.0	0.0	36.5	31.8	46.0	-14.2	H	120	90
298.140	20.6	8.8	19.4	0.0	1.0	0.0	41.0	29.2	46.0	-16.8	H	200	180
340.860	17.4	-4.6	20.2	0.0	1.1	0.0	38.7	16.7	46.0	-29.3	H	340	225
922.200	3.6	-4.4	26.7	0.0	1.8	0.0	32.1	24.1	46.0	-21.9	V	200	135

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

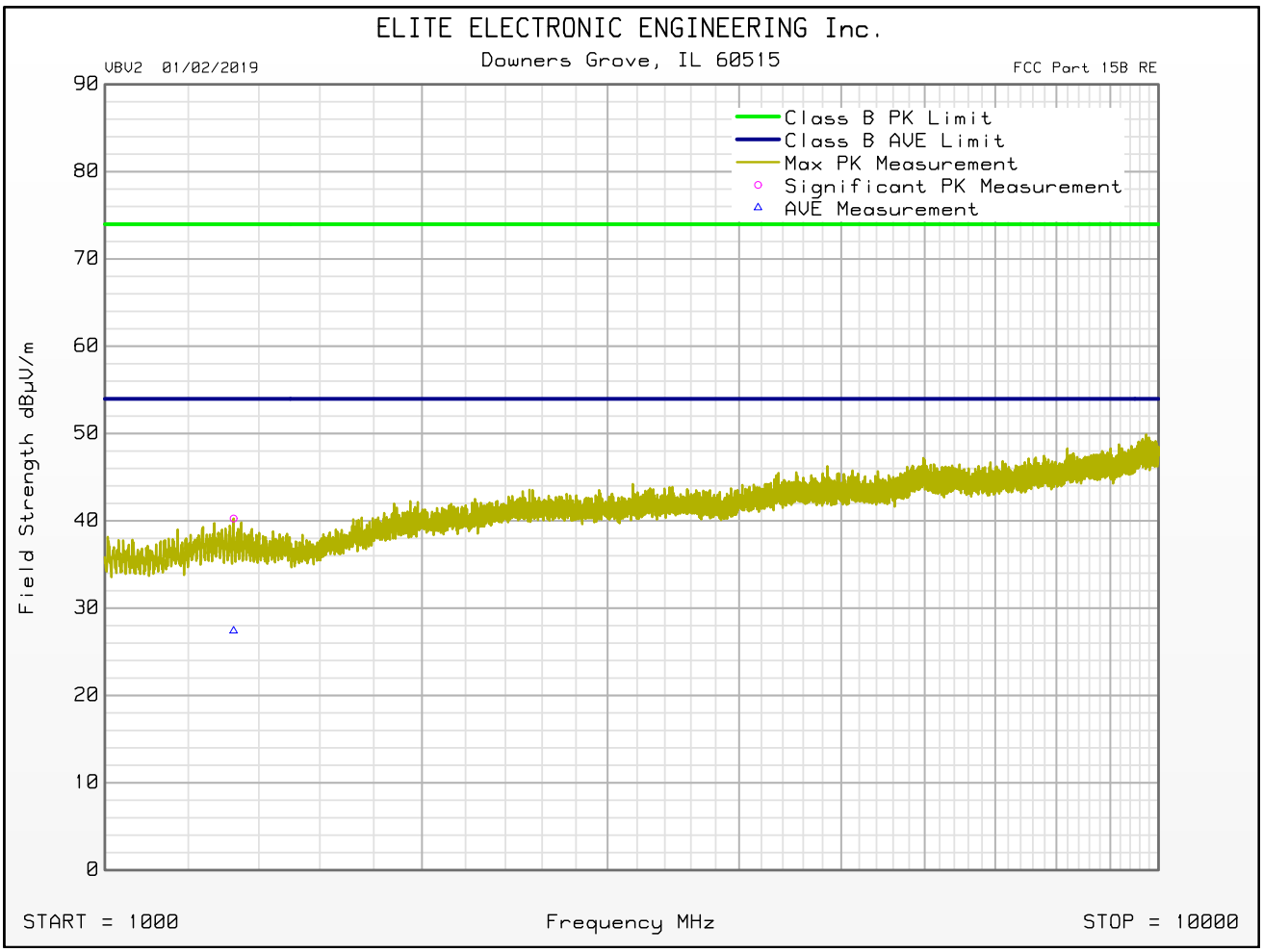
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 902.25MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	H
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 20, 2019 04:12:12 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 902.25MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	V
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 20, 2019 04:12:12 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

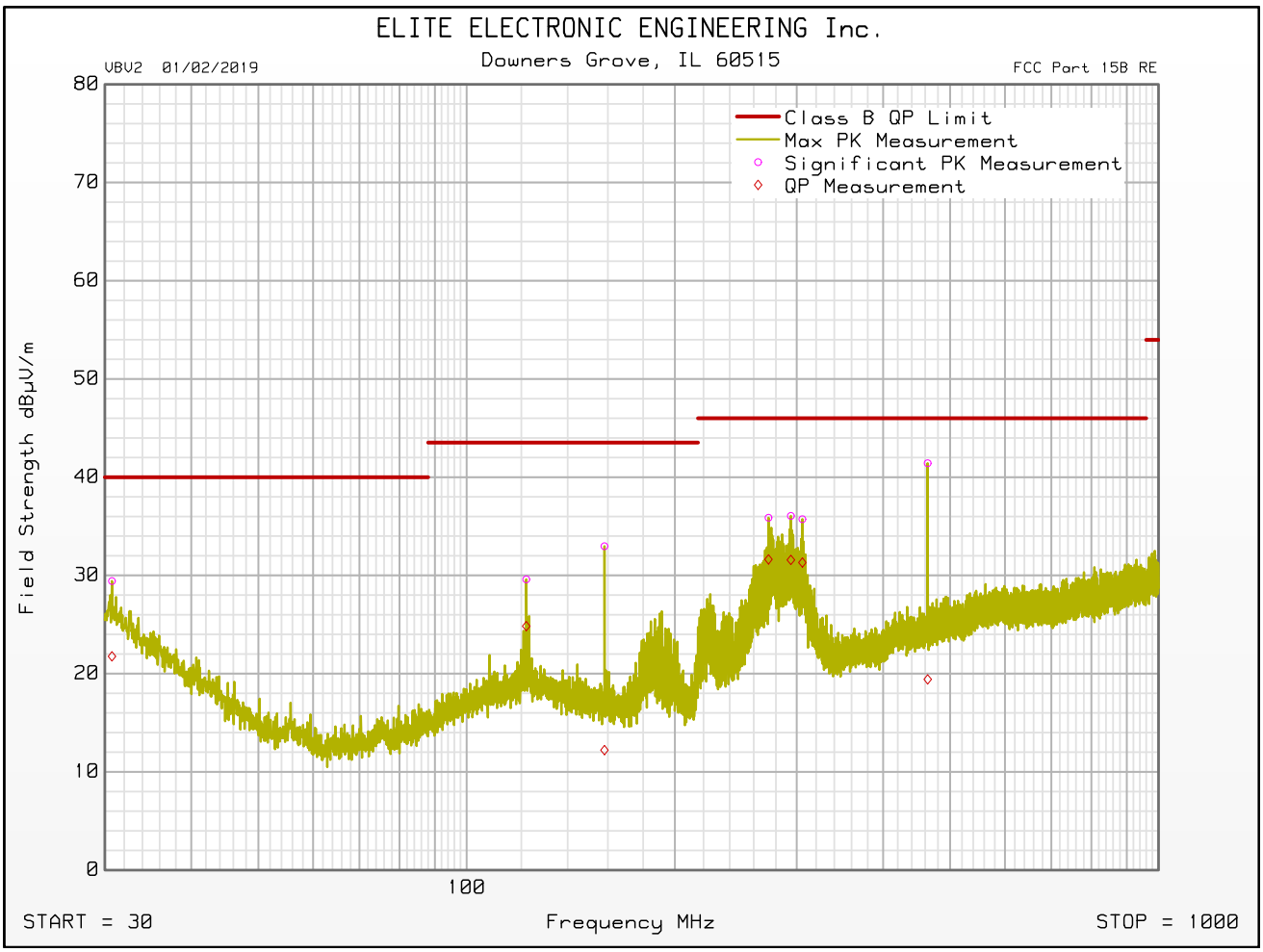
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 902.25MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 20, 2019 04:12:12 PM

Freq (GHz)	Peak Mtr Rdg (dBµV)	Ave. Mtr Rdg (dBµV)	Ant Fac (dB)	Amp Fac (dB)	Cbl Fac (dB)	Dist Corr (dB)	Peak Total (dBµV/m)	Peak Limit (dBµV/m)	Peak Lim Mrg (dB)	Ave. Total (dBµV/m)	Ave. Limit (dBµV/m)	Ave. Lim Mrg (dB)	Ant Pol	Mast Ht (cm)	Azim (°)
1.325	50.0	37.1	29.0	-40.9	2.2	0.0	40.3	74.0	-33.7	27.4	54.0	-26.6	V	340	0
2.112	49.1	36.1	31.5	-40.7	2.7	0.0	42.5	74.0	-31.4	29.6	54.0	-24.4	H	200	225
3.0375	48.3	35.2	32.7	-40.5	3.2	0.0	43.7	74.0	-30.3	30.6	54.0	-23.4	H	200	315
4.531	48.1	34.9	34.1	-40.4	3.9	0.0	45.7	74.0	-28.3	32.5	54.0	-21.5	H	340	0
4.958	50.7	38.8	34.4	-40.3	4.1	0.0	48.8	74.0	-25.2	36.9	54.0	-17.1	H	340	135
9.995	47.3	34.0	36.8	-40.1	6.0	0.0	50.0	74.0	-24.0	36.7	54.0	-17.3	H	120	90

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

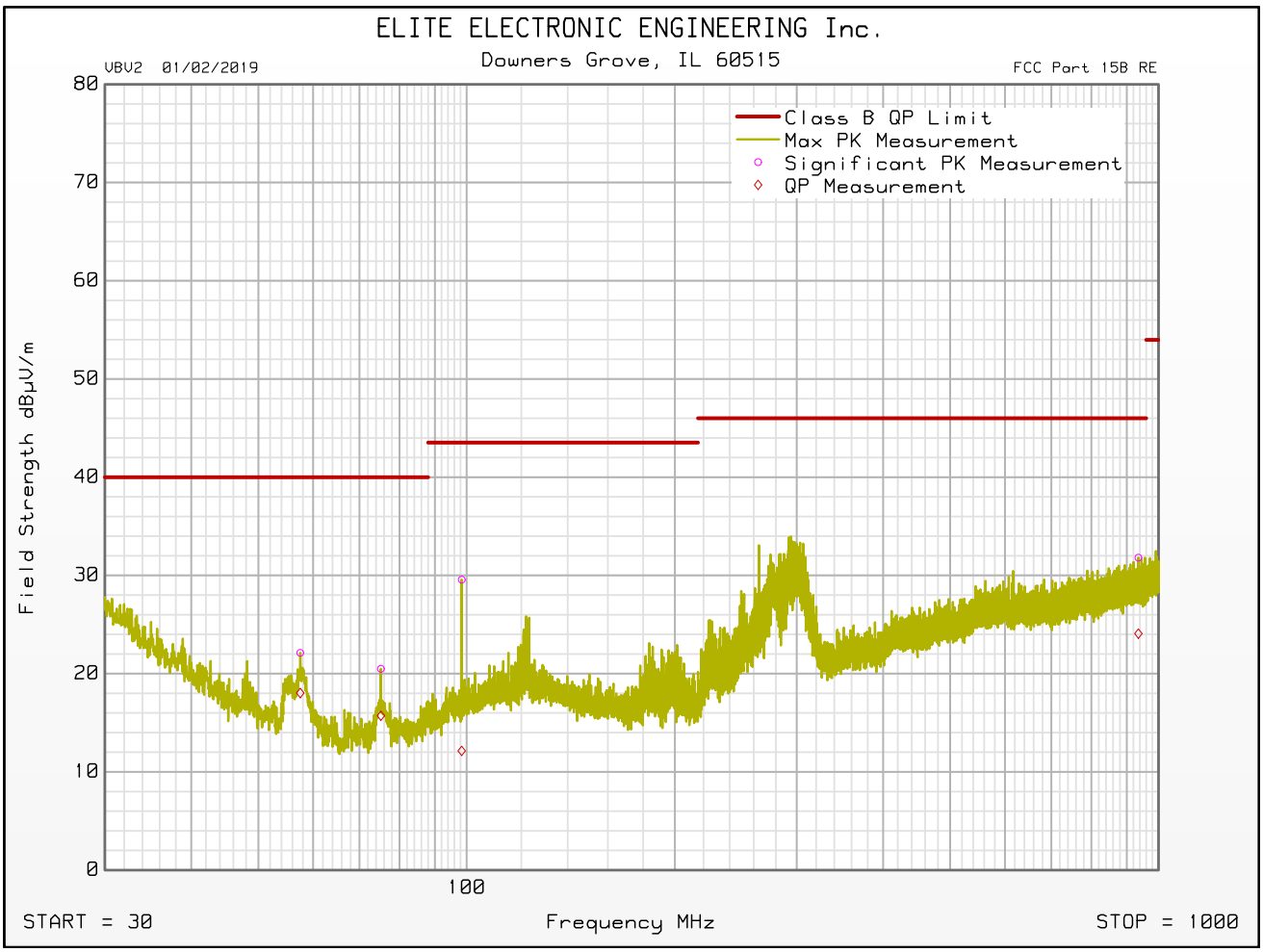
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 914.75MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	H
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 03:24:07 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 914.75MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	V
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 03:24:07 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

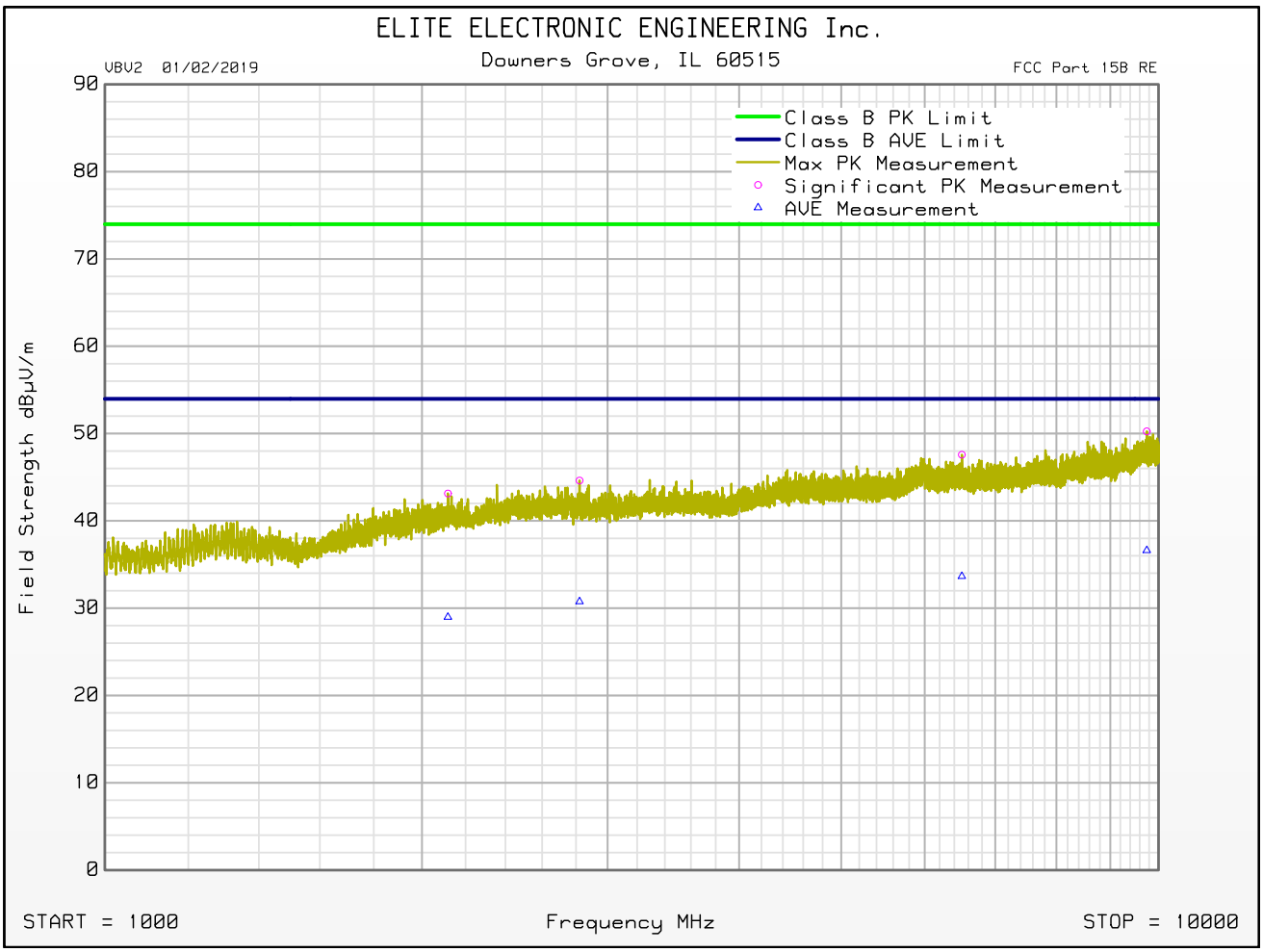
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 914.75MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 03:24:07 PM

Freq (MHz)	Peak Mtr Rdg (dBµV)	QP Mtr Rdg (dBµV)	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 (°)
30.720	4.9	-2.7	24.2	0.0	0.3	0.0	29.4	21.8	40.0	-18.2	H	200	0
57.480	9.2	5.1	12.4	0.0	0.4	0.0	22.1	18.0	40.0	-22.0	V	120	0
75.180	7.2	2.4	12.8	0.0	0.5	0.0	20.5	15.7	40.0	-24.3	V	120	180
98.380	12.4	-5.0	16.6	0.0	0.6	0.0	29.6	12.1	43.5	-31.4	V	120	90
121.960	10.7	5.9	18.3	0.0	0.6	0.0	29.6	24.8	43.5	-18.7	H	200	270
158.200	16.0	-4.7	16.2	0.0	0.7	0.0	33.0	12.2	43.5	-31.3	H	120	90
273.120	16.0	11.7	18.9	0.0	1.0	0.0	35.9	31.6	46.0	-14.4	H	120	90
294.240	15.7	11.2	19.3	0.0	1.0	0.0	36.1	31.6	46.0	-14.4	H	120	0
305.700	15.1	10.7	19.6	0.0	1.1	0.0	35.7	31.3	46.0	-14.7	H	120	90
463.920	17.1	-4.9	23.1	0.0	1.3	0.0	41.4	19.4	46.0	-26.6	H	200	225
935.460	3.3	-4.4	26.7	0.0	1.8	0.0	31.8	24.1	46.0	-21.9	V	120	225

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

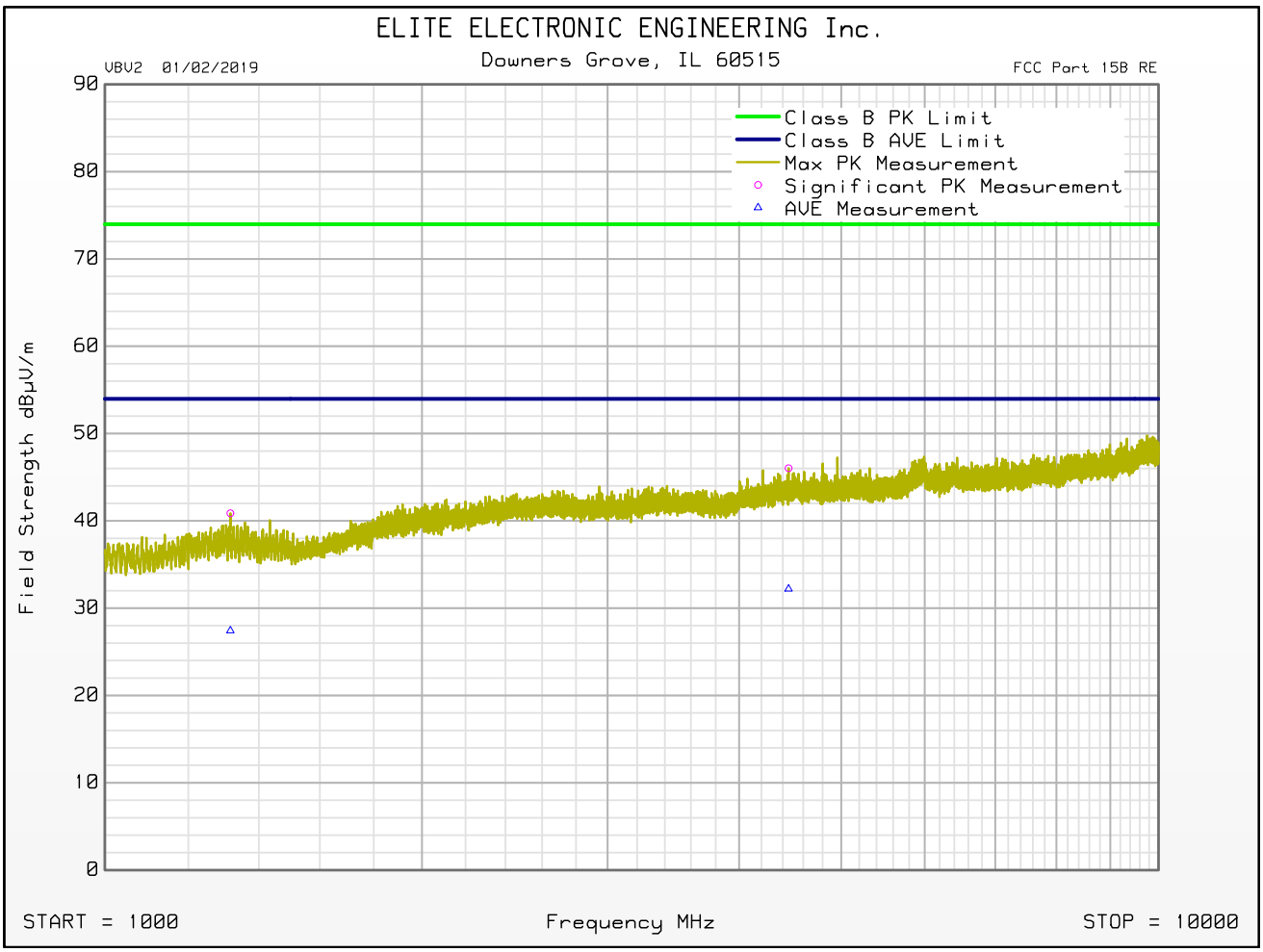
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 914.75MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	H
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	ANTENNA ADAPTER
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 21, 2019 08:46:22 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 914.75MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	V
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	ANTENNA ADAPTER
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 21, 2019 08:46:22 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

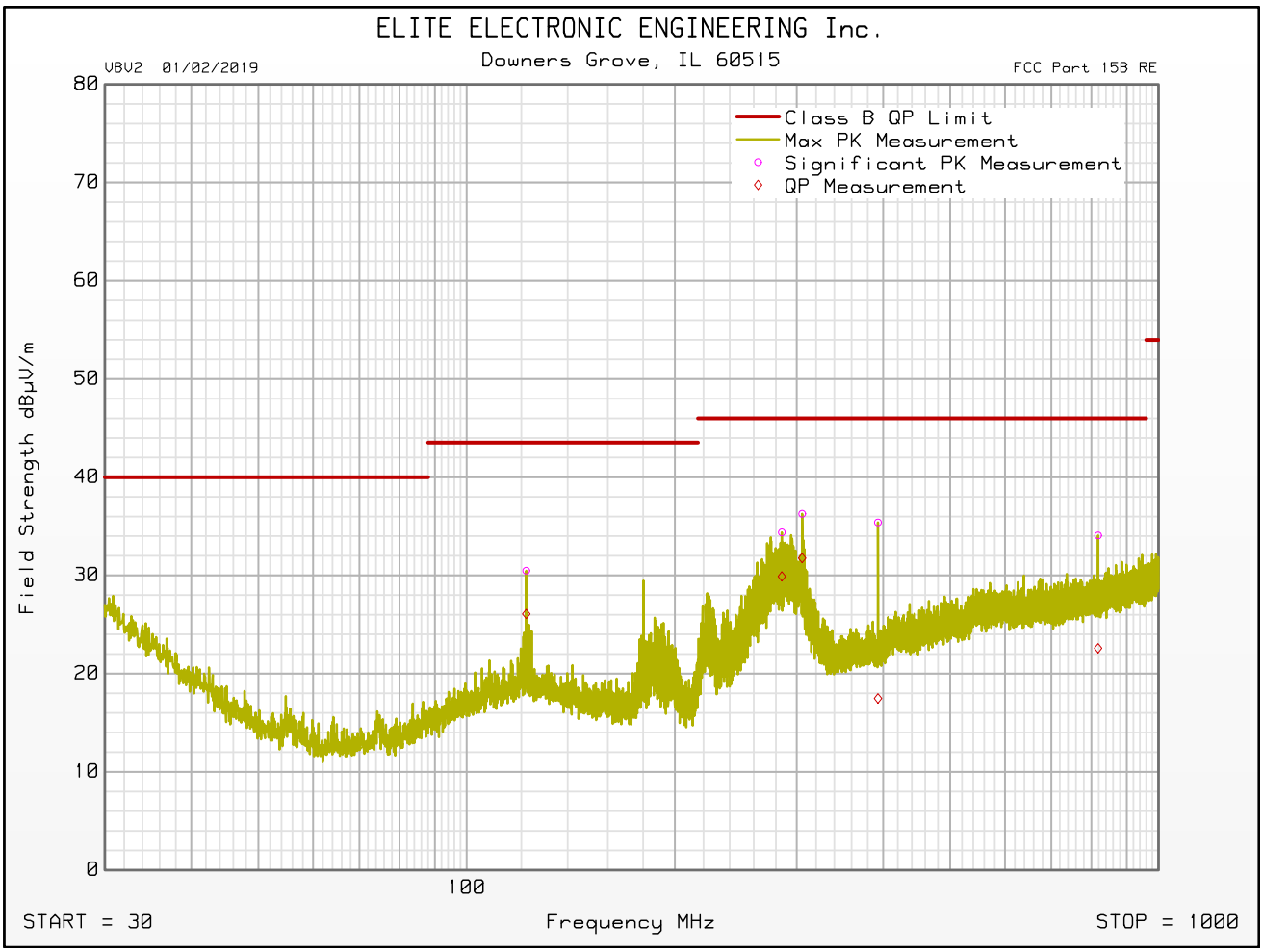
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 914.75MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	ANTENNA ADAPTER
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 21, 2019 08:46:22 AM

Freq (GHz)	Peak Mtr Rdg (dBµV)	Ave. Mtr Rdg (dBµV)	Ant Fac (dB)	Amp Fac (dB)	Cbl Fac (dB)	Dist Corr (dB)	Peak Total (dBµV/m)	Peak Limit (dBµV/m)	Peak Lim Mrg (dB)	Ave. Total (dBµV/m)	Ave. Limit (dBµV/m)	Ave. Lim Mrg (dB)	Ant Pol	Mast Ht (cm)	Azim (°)
1.3155	50.6	37.1	29.0	-40.9	2.1	0.0	40.9	74.0	-33.1	27.4	54.0	-26.6	V	200	45
2.1165	49.7	35.5	31.5	-40.7	2.7	0.0	43.1	74.0	-30.8	29.0	54.0	-25.0	H	200	270
2.822	49.7	35.8	32.4	-40.6	3.1	0.0	44.6	74.0	-29.4	30.8	54.0	-23.2	H	120	225
4.456	48.5	34.7	33.9	-40.3	3.9	0.0	46.0	74.0	-27.9	32.2	54.0	-21.8	V	120	270
6.5075	47.8	33.9	35.6	-40.4	4.6	0.0	47.6	74.0	-26.4	33.6	54.0	-20.3	H	340	0
9.7475	47.8	34.2	36.7	-40.2	6.0	0.0	50.3	74.0	-23.7	36.6	54.0	-17.4	H	200	90

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

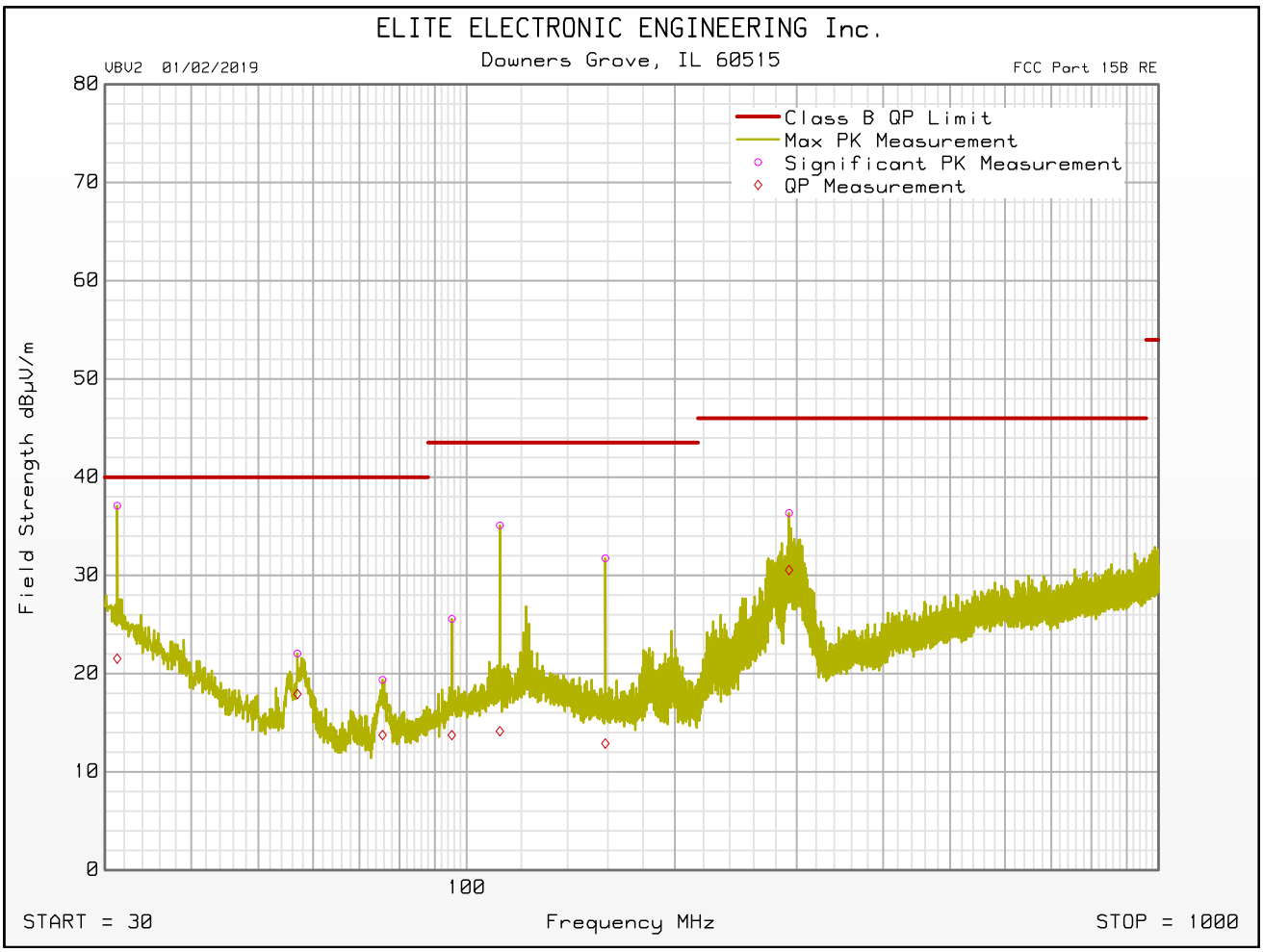
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 927.25MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	H
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 03:45:00 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 927.25MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	V
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 03:45:00 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

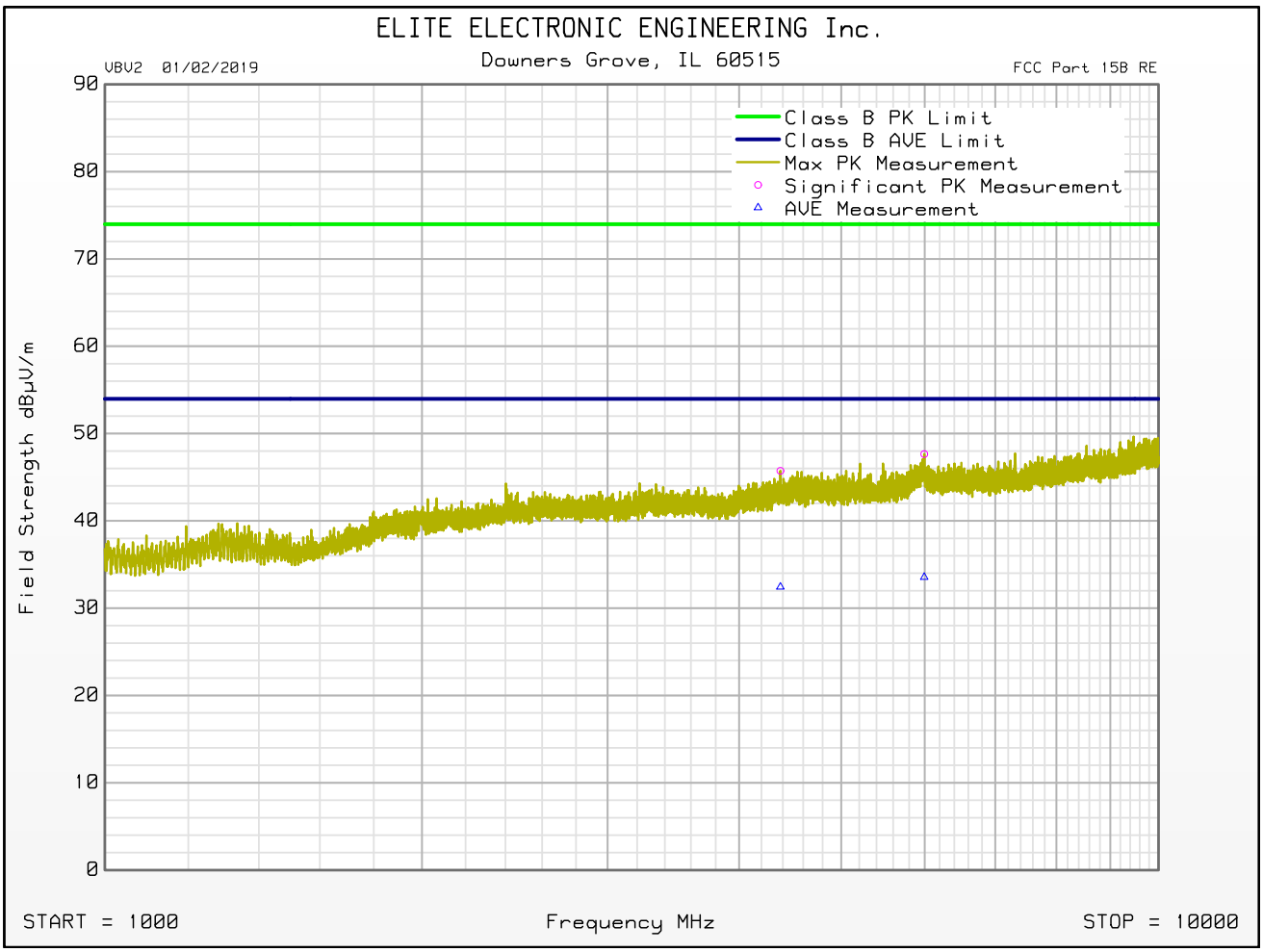
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 927.25MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 03:45:00 PM

Freq (MHz)	Peak Mtr Rdg (dBµV)	QP Mtr Rdg (dBµV)	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 (°)
31.260	12.9	-2.6	23.8	0.0	0.4	0.0	37.1	21.5	40.0	-18.5	V	340	0
56.940	9.1	5.0	12.5	0.0	0.4	0.0	22.0	17.9	40.0	-22.1	V	120	45
75.600	6.0	0.4	12.8	0.0	0.5	0.0	19.4	13.8	40.0	-26.2	V	120	0
95.200	8.9	-2.9	16.1	0.0	0.6	0.0	25.6	13.7	43.5	-29.8	V	120	0
111.700	16.7	-4.2	17.7	0.0	0.6	0.0	35.1	14.1	43.5	-29.4	V	120	180
121.960	11.6	7.2	18.3	0.0	0.6	0.0	30.5	26.1	43.5	-17.4	H	200	315
158.680	14.8	-4.0	16.2	0.0	0.7	0.0	31.7	12.9	43.5	-30.6	V	120	270
285.540	14.3	9.8	19.1	0.0	1.0	0.0	34.4	29.9	46.0	-16.1	H	120	90
292.440	16.1	10.3	19.3	0.0	1.0	0.0	36.4	30.5	46.0	-15.5	V	200	180
305.520	15.6	11.1	19.6	0.0	1.1	0.0	36.3	31.8	46.0	-14.2	H	120	90
393.120	13.3	-4.6	20.9	0.0	1.2	0.0	35.4	17.5	46.0	-28.5	H	120	0
818.040	6.4	-5.1	26.0	0.0	1.7	0.0	34.1	22.6	46.0	-23.4	H	120	180

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

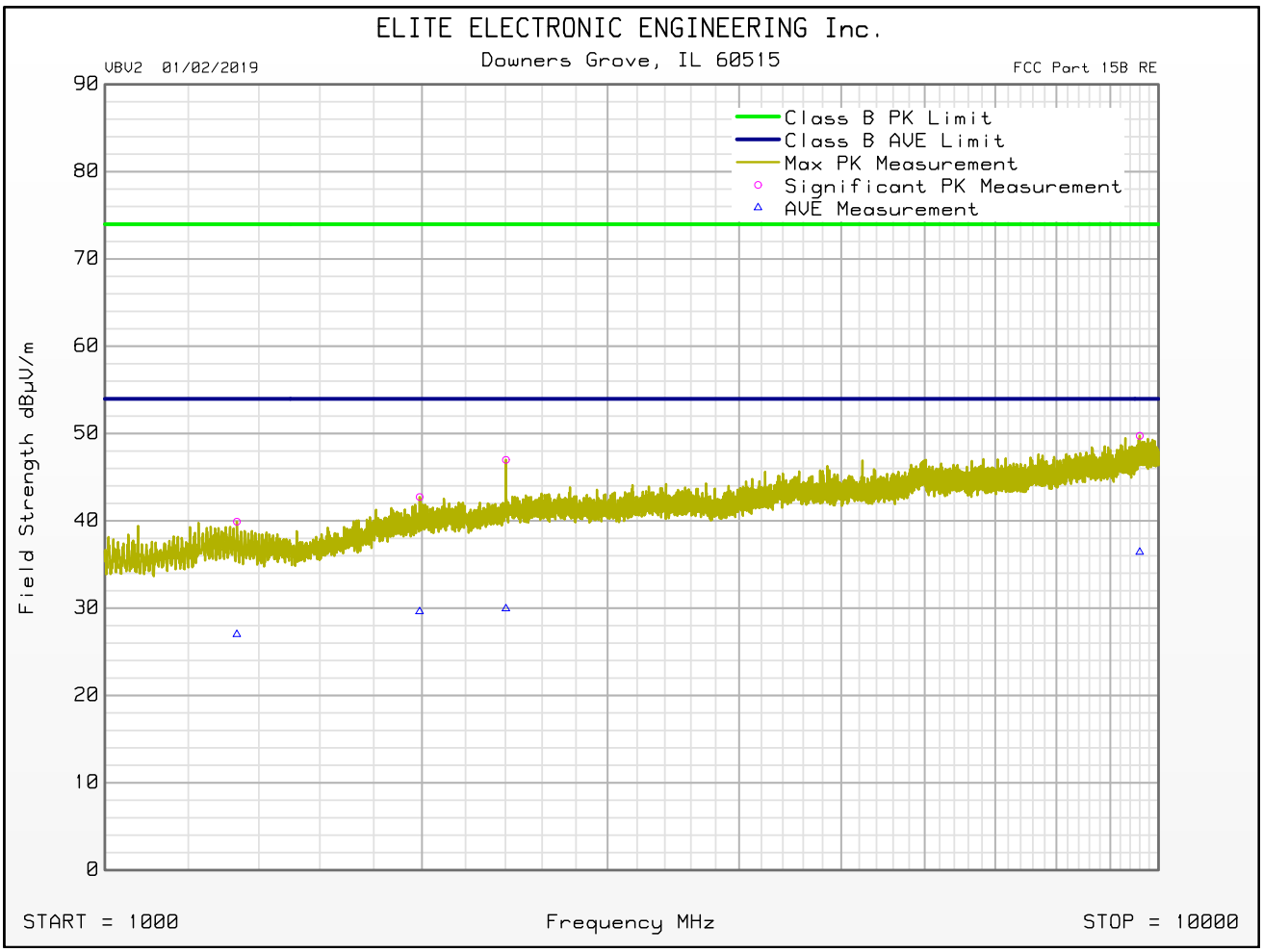
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 926.75MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	H
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	ANTENNA ADAPTER
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 21, 2019 09:07:35 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 926.75MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	V
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	ANTENNA ADAPTER
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 21, 2019 09:07:35 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

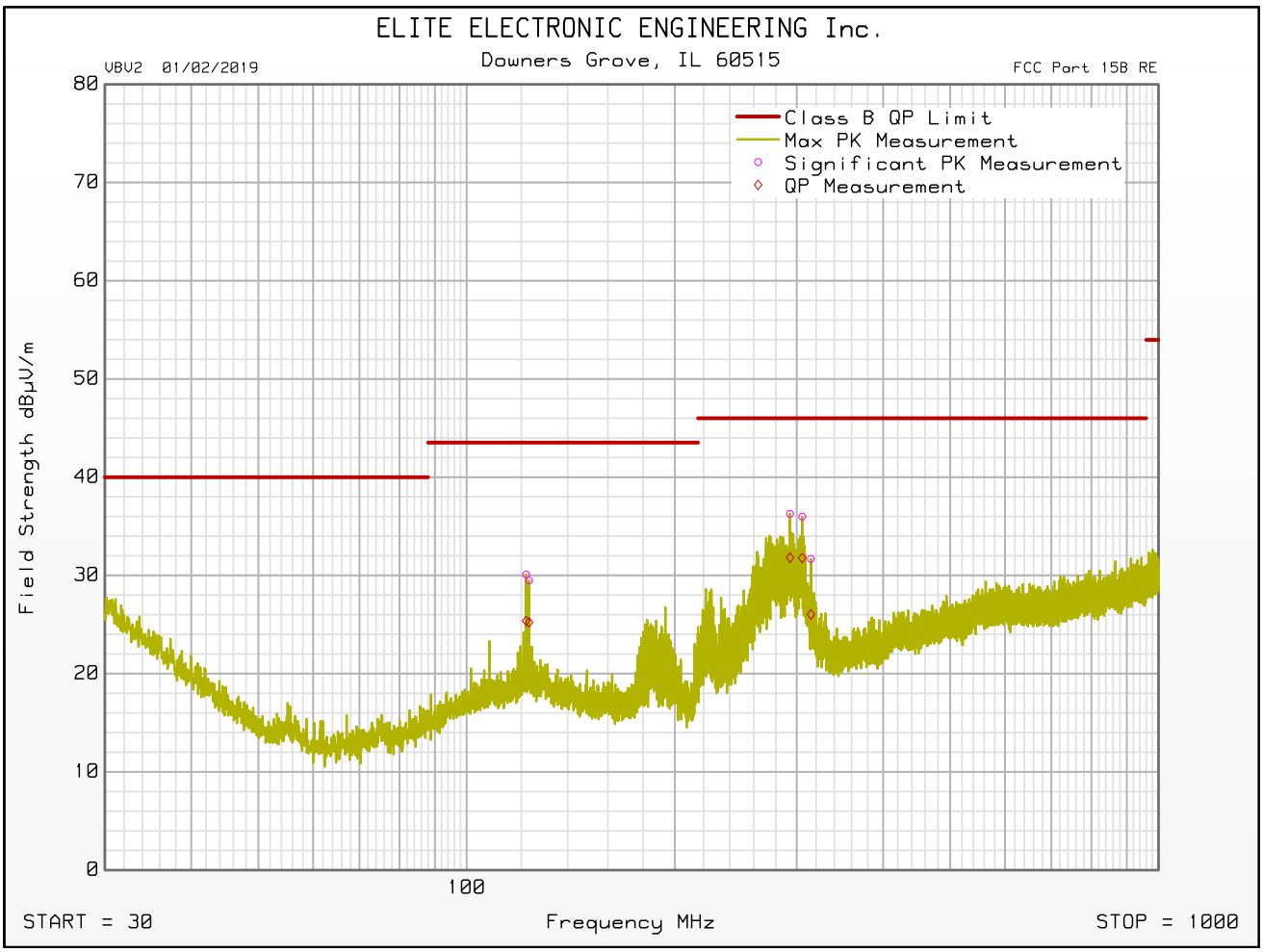
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 926.75MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	ANTENNA ADAPTER
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 21, 2019 09:07:35 AM

Freq (GHz)	Peak Mtr Rdg (dBµV)	Ave. Mtr Rdg (dBµV)	Ant Fac (dB)	Amp Fac (dB)	Cbl Fac (dB)	Dist Corr (dB)	Peak Total (dBµV/m)	Peak Limit (dBµV/m)	Peak Lim Mrg (dB)	Ave. Total (dBµV/m)	Ave. Limit (dBµV/m)	Ave. Lim Mrg (dB)	Ant Pol	Mast Ht (cm)	Azim (°)
1.3345	49.6	36.7	29.0	-40.9	2.2	0.0	39.9	74.0	-34.1	27.0	54.0	-27.0	V	120	270
1.9895	49.5	36.4	31.5	-40.9	2.6	0.0	42.7	74.0	-31.2	29.6	54.0	-24.4	V	120	90
2.4025	52.4	35.4	32.2	-40.5	2.9	0.0	47.0	74.0	-27.0	29.9	54.0	-24.0	V	340	180
4.377	48.4	35.1	33.8	-40.3	3.9	0.0	45.7	74.0	-28.3	32.4	54.0	-21.5	H	200	45
5.994	48.5	34.4	35.1	-40.4	4.5	0.0	47.6	74.0	-26.3	33.6	54.0	-20.4	H	340	45
9.5995	47.5	34.2	36.5	-40.2	5.9	0.0	49.7	74.0	-24.2	36.4	54.0	-17.6	V	340	225

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

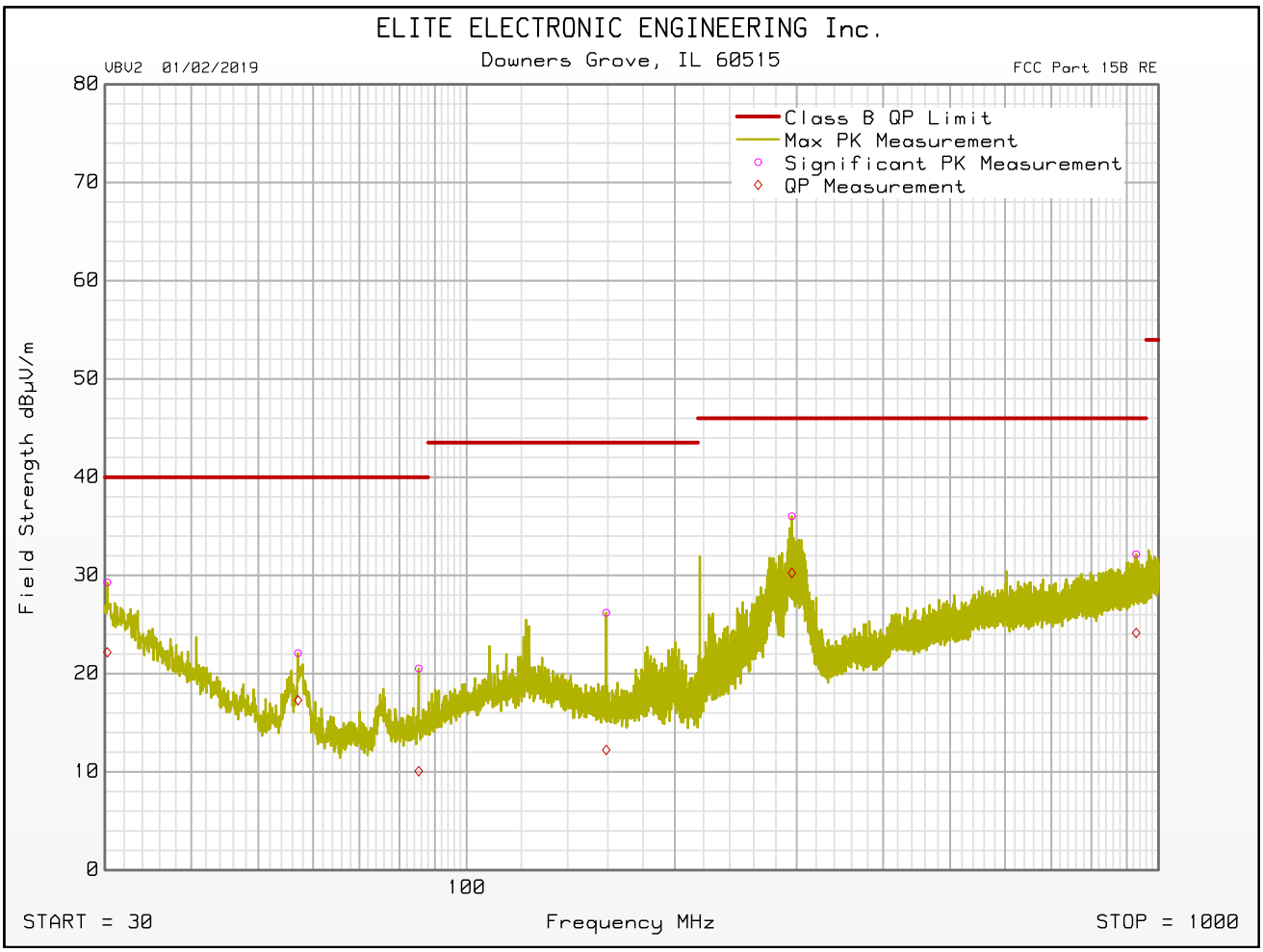
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 310MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	H
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 04:02:48 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 310MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	V
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 04:02:48 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

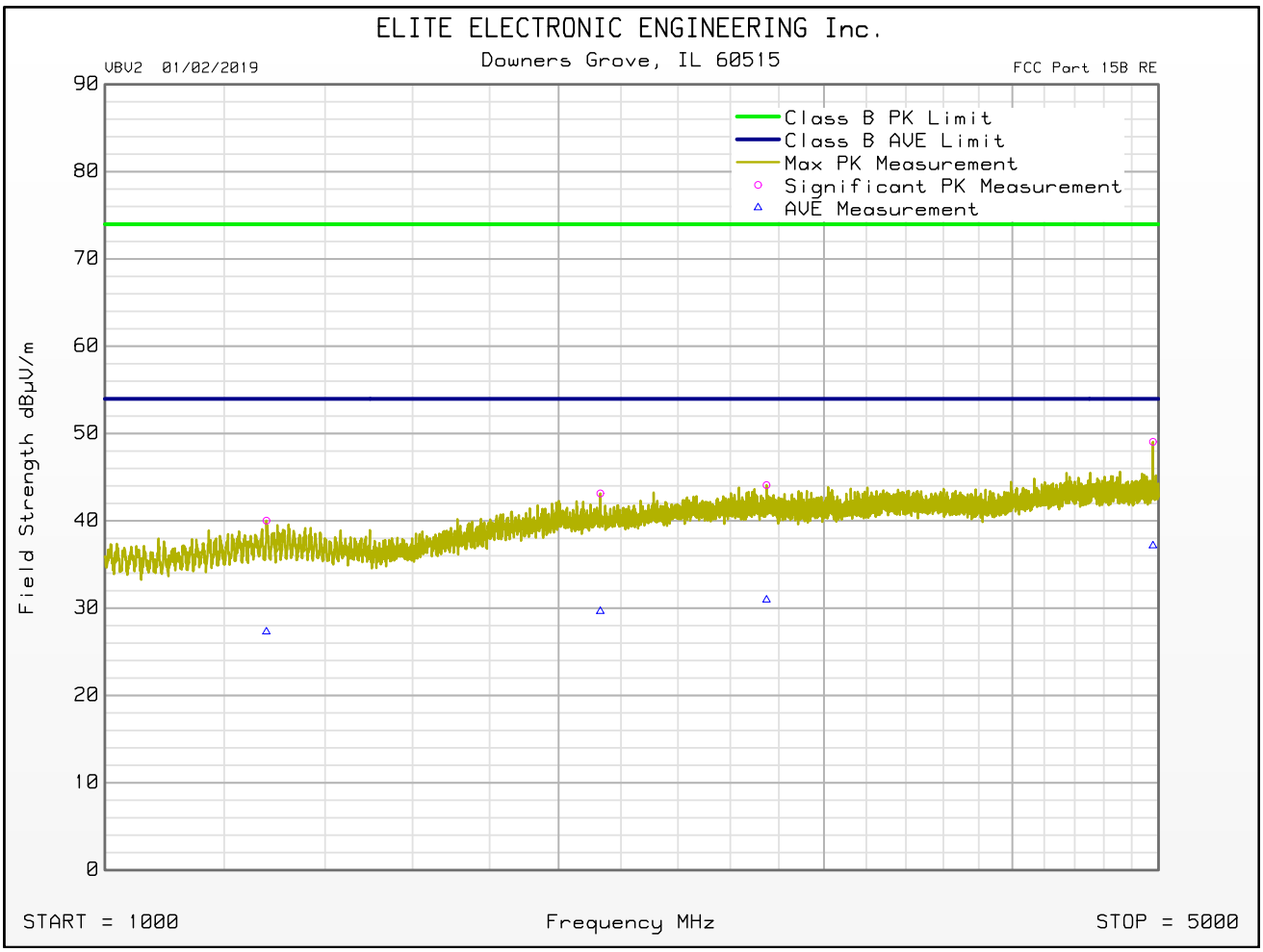
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 310MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 04:02:48 PM

Freq (MHz)	Peak Mtr Rdg (dBµV)	QP Mtr Rdg (dBµV)	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 (°)
30.240	4.5	-2.6	24.5	0.0	0.3	0.0	29.3	22.2	40.0	-17.8	V	120	90
57.060	9.2	4.4	12.5	0.0	0.4	0.0	22.1	17.3	40.0	-22.7	V	120	0
85.260	5.8	-4.7	14.2	0.0	0.5	0.0	20.5	10.1	40.0	-29.9	V	120	90
121.900	11.2	6.5	18.3	0.0	0.6	0.0	30.1	25.4	43.5	-18.2	H	200	315
123.100	10.5	6.3	18.3	0.0	0.7	0.0	29.5	25.2	43.5	-18.3	H	200	315
159.160	9.3	-4.7	16.2	0.0	0.7	0.0	26.2	12.2	43.5	-31.3	V	120	315
293.400	16.0	11.5	19.3	0.0	1.0	0.0	36.3	31.8	46.0	-14.2	H	120	0
295.200	15.7	9.9	19.3	0.0	1.0	0.0	36.0	30.3	46.0	-15.7	V	340	180
305.520	15.3	11.1	19.6	0.0	1.1	0.0	36.0	31.8	46.0	-14.2	H	120	90
314.520	10.9	5.3	19.7	0.0	1.1	0.0	31.7	26.0	46.0	-20.0	H	120	90
928.380	3.7	-4.4	26.7	0.0	1.8	0.0	32.2	24.1	46.0	-21.9	V	340	270

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

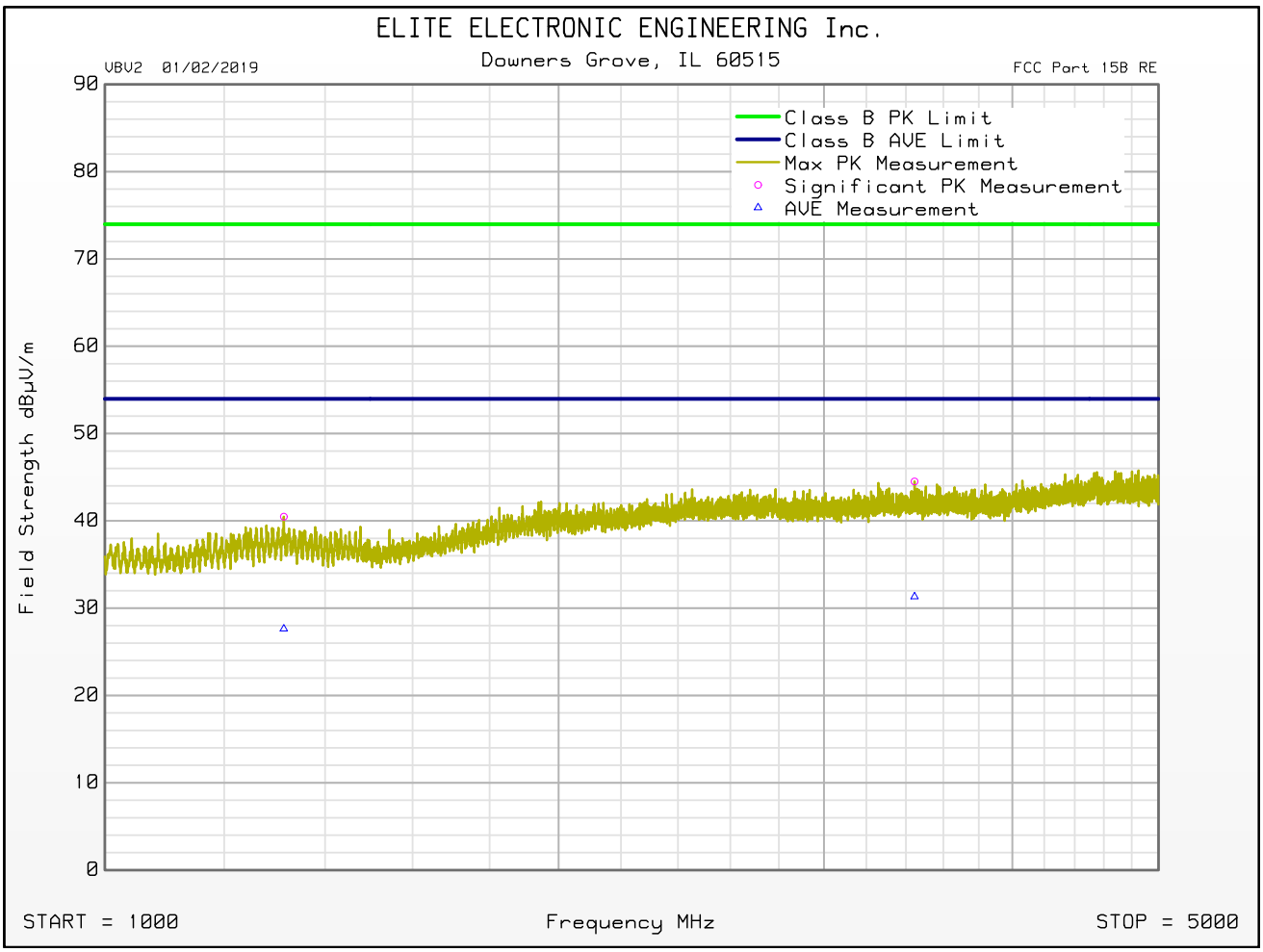
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 310MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	H
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 01:20:28 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 310MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	V
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 01:20:28 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

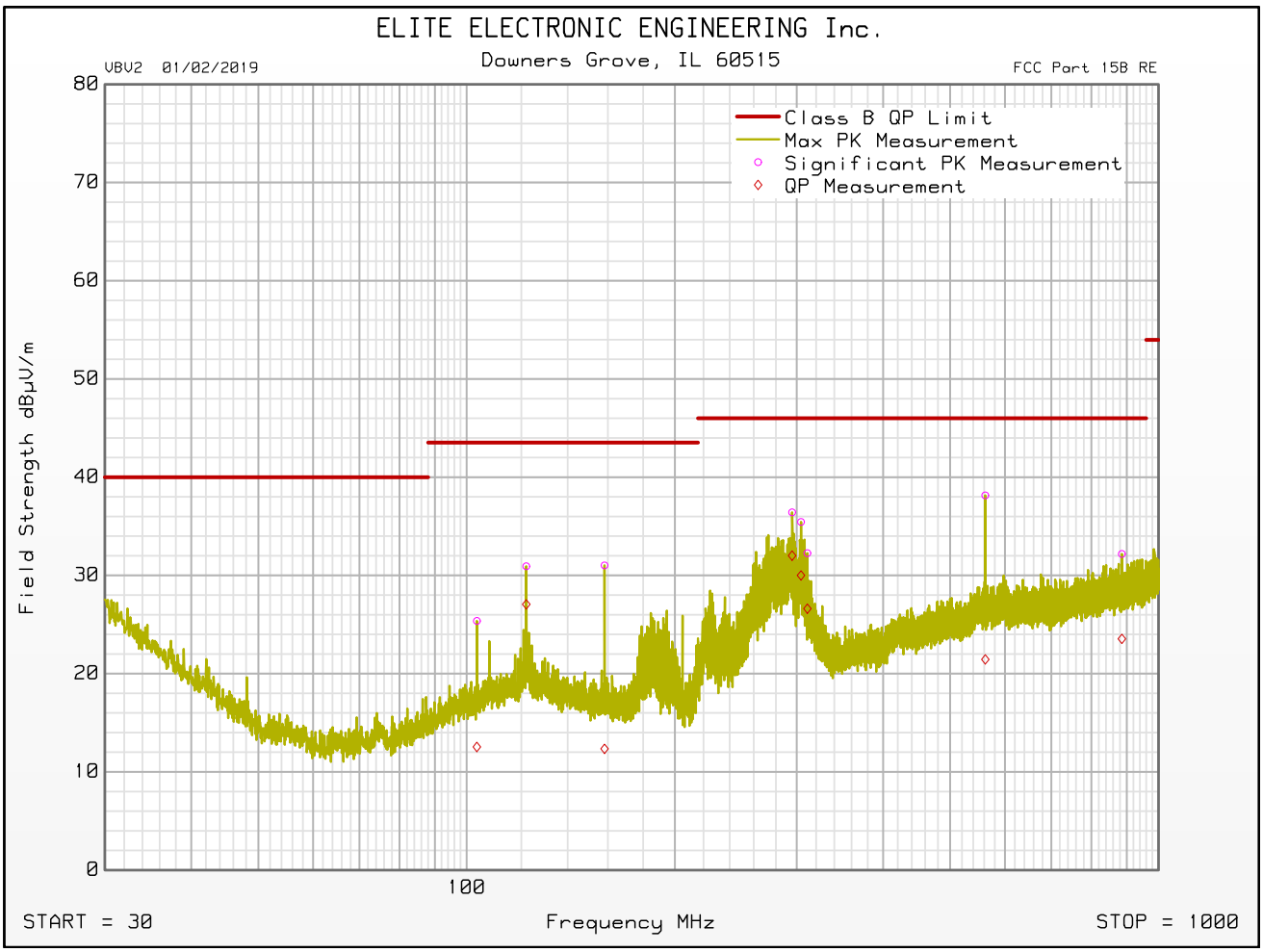
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 310MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 01:20:28 PM

Freq (GHz)	Peak Mtr Rdg (dBµV)	Ave. Mtr Rdg (dBµV)	Ant Fac (dB)	Amp Fac (dB)	Cbl Fac (dB)	Dist Corr (dB)	Peak Total (dBµV/m)	Peak Limit (dBµV/m)	Peak Lim Mrg (dB)	Ave. Total (dBµV/m)	Ave. Limit (dBµV/m)	Ave. Lim Mrg (dB)	Ant Pol	Mast Ht (cm)	Azim (°)
1.28	49.7	36.9	29.1	-40.8	2.1	0.0	40.0	74.0	-34.0	27.3	54.0	-26.7	H	200	0
1.3145	50.2	37.3	29.0	-40.9	2.1	0.0	40.5	74.0	-33.5	27.6	54.0	-26.3	V	340	315
2.1315	49.7	36.2	31.4	-40.7	2.7	0.0	43.1	74.0	-30.8	29.6	54.0	-24.3	H	340	315
2.7475	49.0	35.9	32.6	-40.6	3.1	0.0	44.1	74.0	-29.9	31.0	54.0	-23.0	H	200	45
3.445	48.6	35.4	32.9	-40.4	3.4	0.0	44.5	74.0	-29.5	31.3	54.0	-22.7	V	340	135
4.958	50.9	39.0	34.4	-40.3	4.1	0.0	49.1	74.0	-24.9	37.2	54.0	-16.8	H	200	135

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

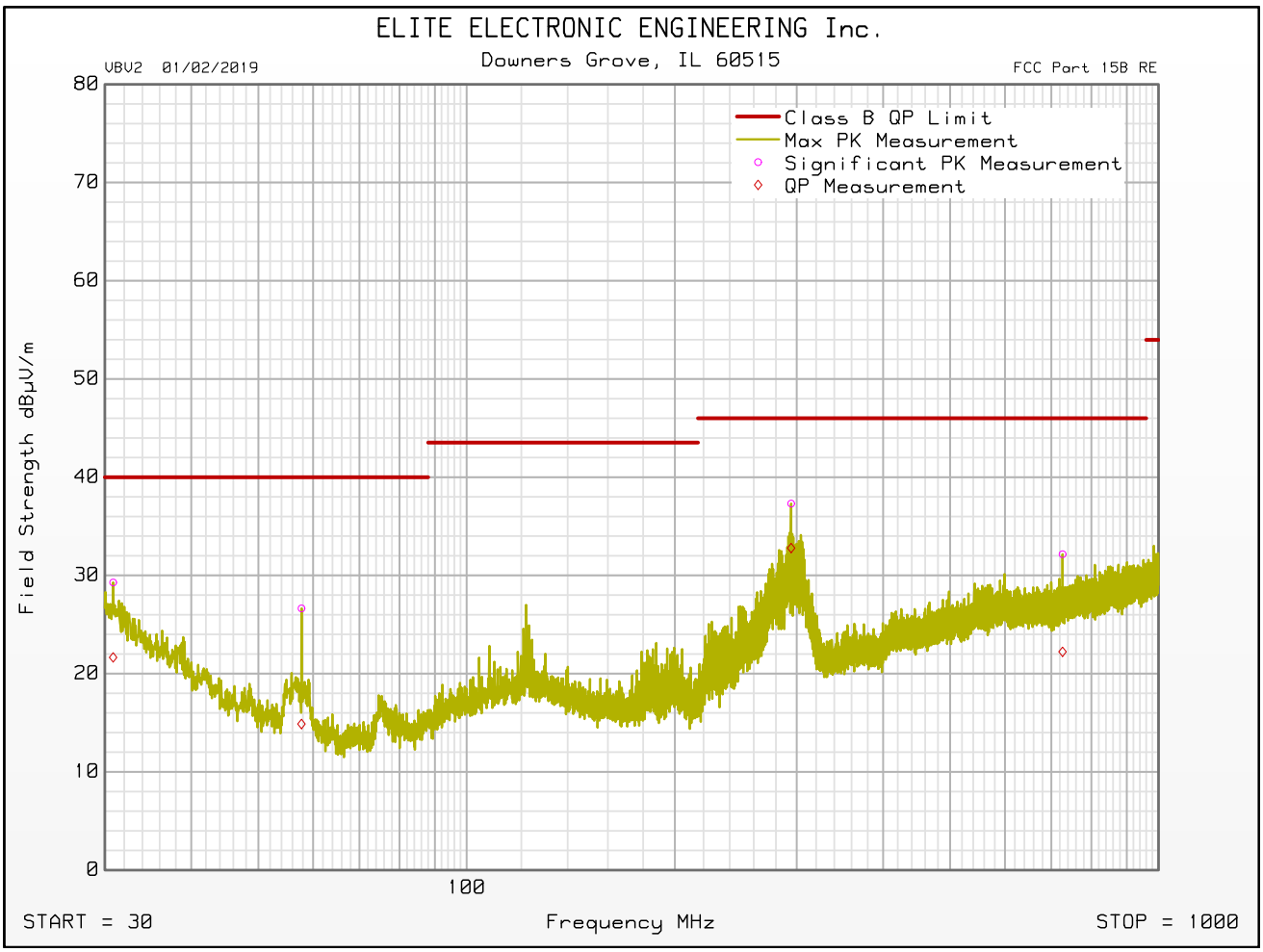
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 315MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	H
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 04:19:27 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 315MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	V
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 04:19:27 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

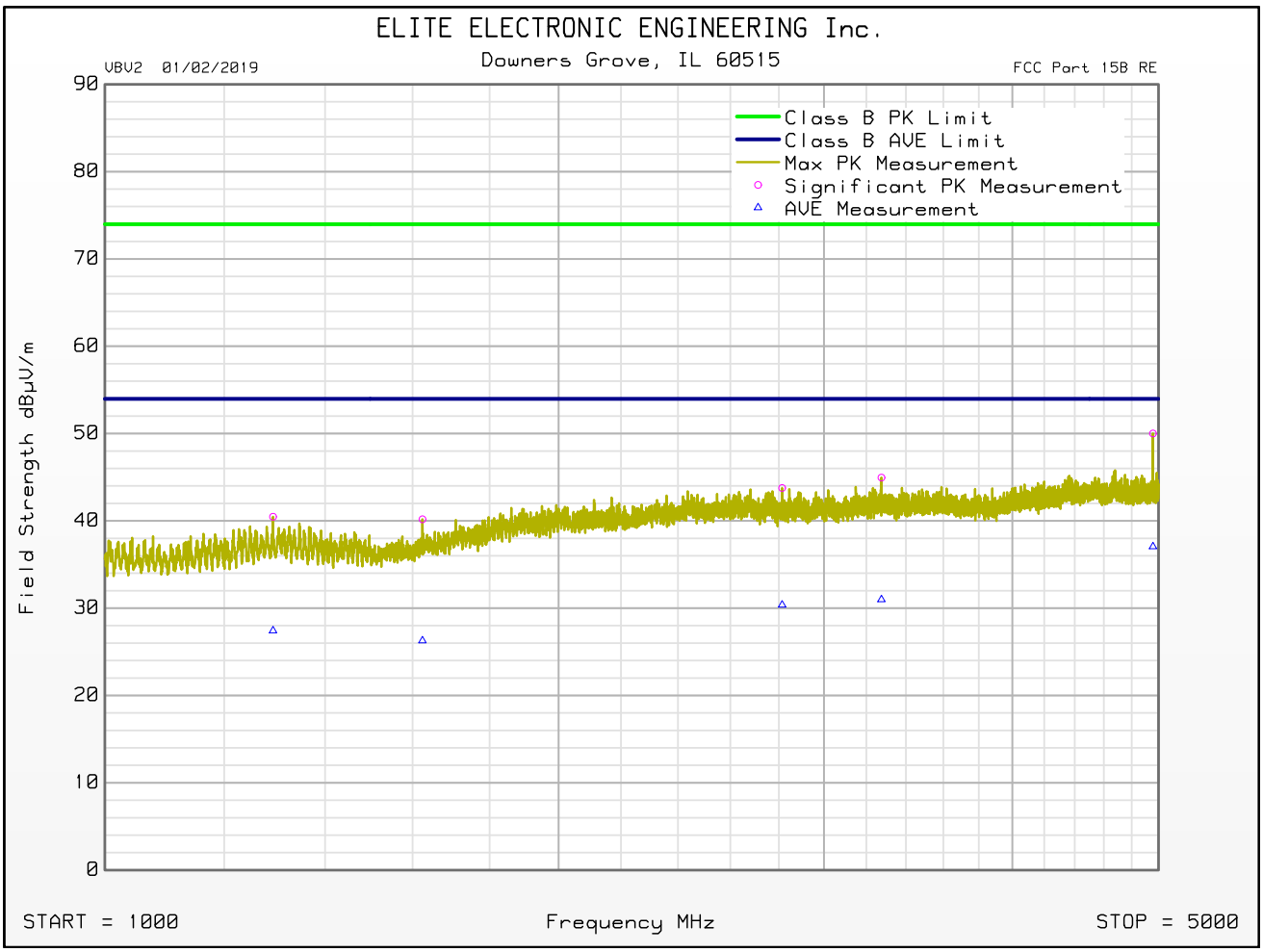
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 315MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 04:19:27 PM

Freq (MHz)	Peak Mtr Rdg (dBµV)	QP Mtr Rdg (dBµV)	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 (°)
30.840	4.8	-2.8	24.1	0.0	0.3	0.0	29.3	21.7	40.0	-18.3	V	340	180
57.720	13.8	2.0	12.4	0.0	0.4	0.0	26.6	14.9	40.0	-25.1	V	120	270
103.480	7.5	-5.3	17.2	0.0	0.6	0.0	25.4	12.5	43.5	-31.0	H	120	315
121.960	12.0	8.1	18.3	0.0	0.6	0.0	30.9	27.1	43.5	-16.5	H	200	315
158.260	14.1	-4.6	16.2	0.0	0.7	0.0	31.0	12.3	43.5	-31.2	H	120	180
294.480	17.0	12.4	19.3	0.0	1.0	0.0	37.3	32.8	46.0	-13.2	V	340	180
295.440	16.1	11.6	19.3	0.0	1.0	0.0	36.4	32.0	46.0	-14.0	H	200	180
304.320	14.8	9.4	19.5	0.0	1.1	0.0	35.4	30.0	46.0	-16.0	H	120	0
310.860	11.5	5.9	19.7	0.0	1.1	0.0	32.3	26.6	46.0	-19.4	H	120	90
561.960	11.9	-4.8	24.9	0.0	1.4	0.0	38.2	21.5	46.0	-24.5	H	200	45
726.780	5.1	-4.9	25.5	0.0	1.6	0.0	32.2	22.2	46.0	-23.8	V	200	180
885.360	3.9	-4.7	26.5	0.0	1.8	0.0	32.2	23.5	46.0	-22.5	H	120	0

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

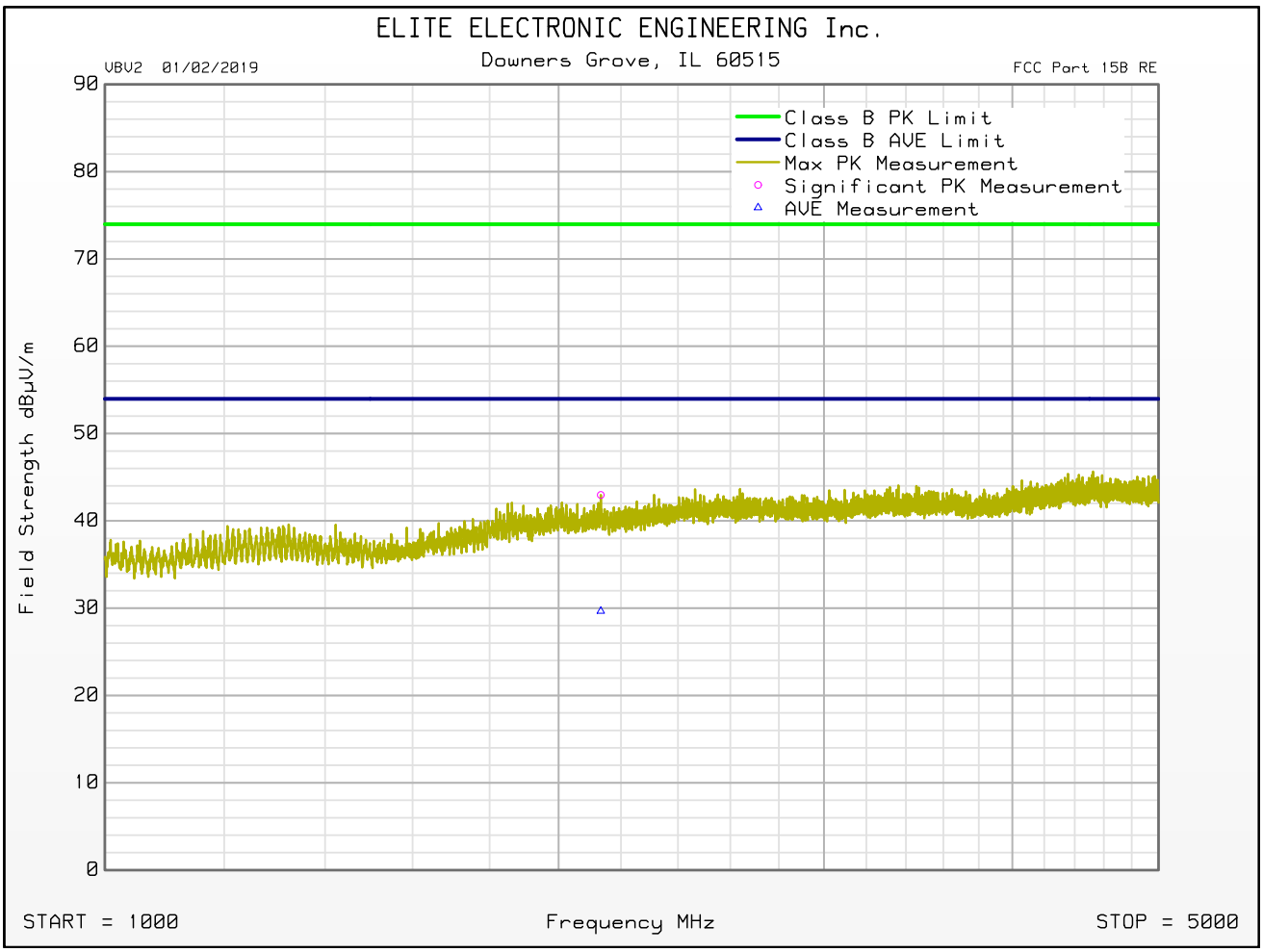
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 315MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	H
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 01:42:03 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 315MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	V
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 01:42:03 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

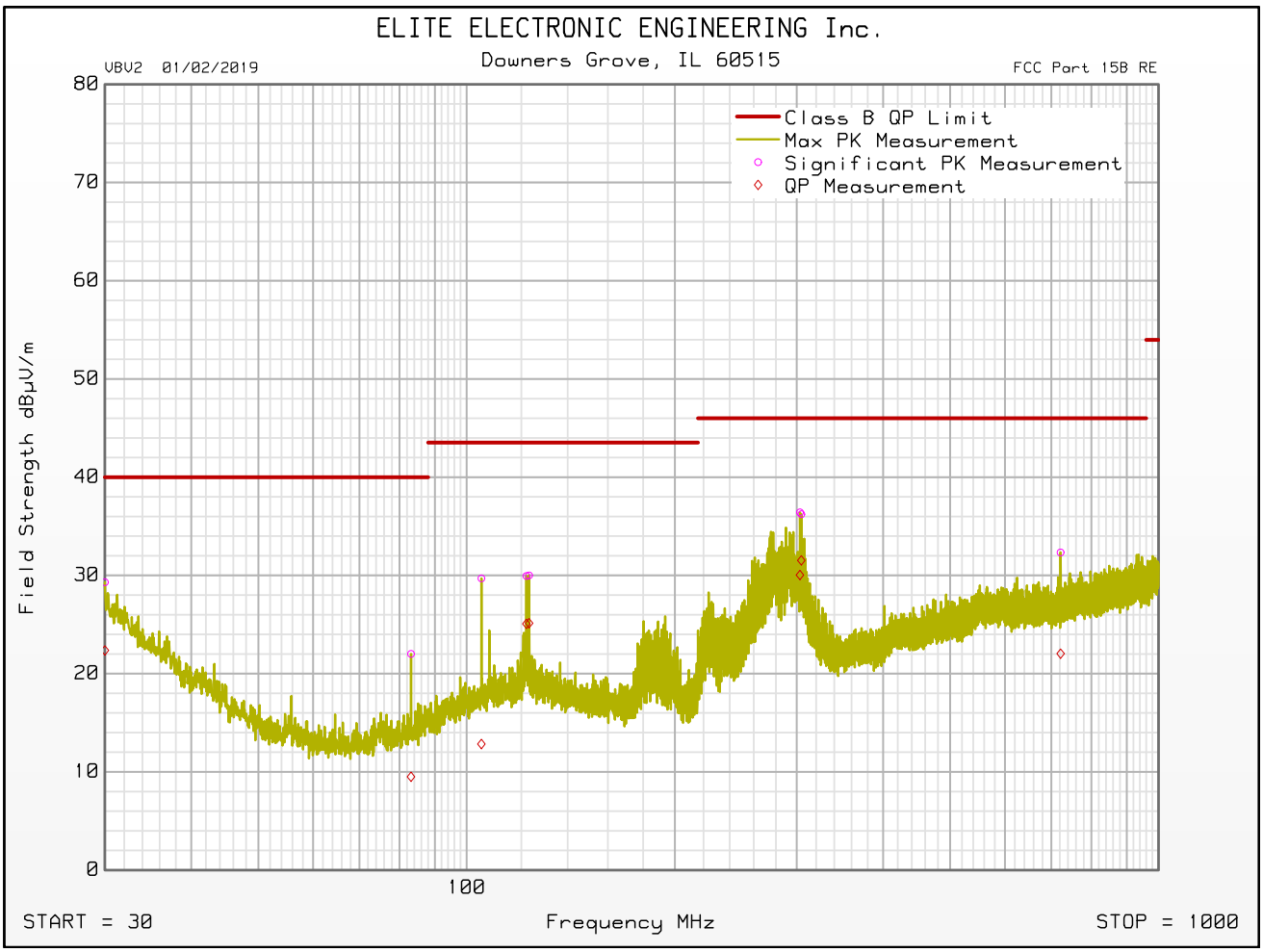
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 315MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 01:42:03 PM

Freq (GHz)	Peak Mtr Rdg (dBµV)	Ave. Mtr Rdg (dBµV)	Ant Fac (dB)	Amp Fac (dB)	Cbl Fac (dB)	Dist Corr (dB)	Peak Total (dBµV/m)	Peak Limit (dBµV/m)	Peak Lim Mrg (dB)	Ave. Total (dBµV/m)	Ave. Limit (dBµV/m)	Ave. Lim Mrg (dB)	Ant Pol	Mast Ht (cm)	Azim (°)
1.293	50.1	37.1	29.1	-40.9	2.1	0.0	40.5	74.0	-33.5	27.4	54.0	-26.5	H	120	270
1.6245	50.5	36.5	28.4	-41.1	2.4	0.0	40.2	74.0	-33.8	26.3	54.0	-27.7	H	340	135
2.133	49.5	36.2	31.4	-40.7	2.7	0.0	43.0	74.0	-31.0	29.7	54.0	-24.3	V	200	315
2.814	48.8	35.4	32.4	-40.6	3.1	0.0	43.8	74.0	-30.2	30.4	54.0	-23.6	H	200	315
3.275	49.2	35.2	32.8	-40.5	3.4	0.0	45.0	74.0	-29.0	31.0	54.0	-23.0	H	120	0
4.958	51.9	38.9	34.4	-40.3	4.1	0.0	50.0	74.0	-24.0	37.1	54.0	-16.9	H	200	135

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

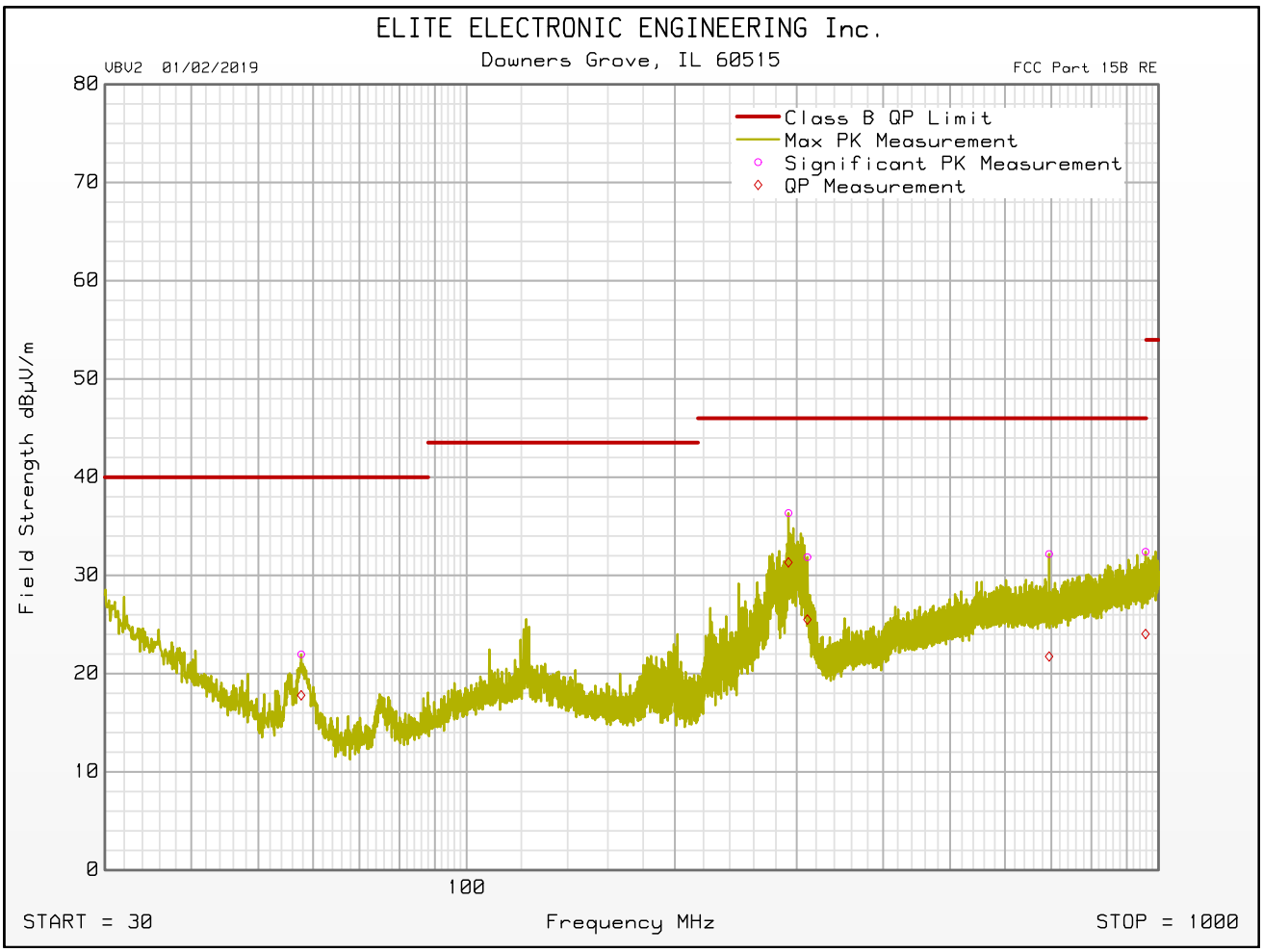
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 390MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	H
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 04:37:22 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 390MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	V
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 04:37:22 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

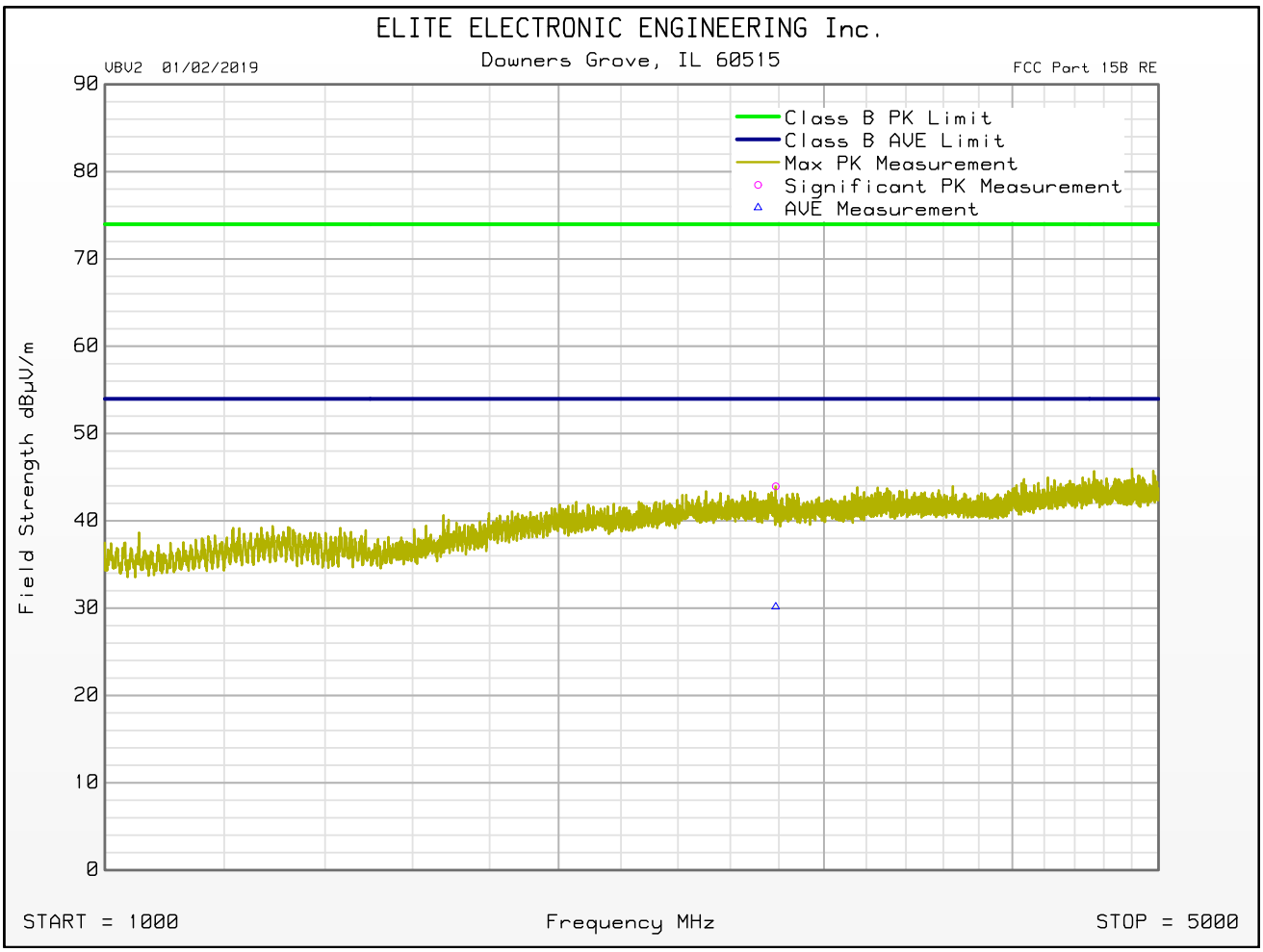
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 390MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 04:37:22 PM

Freq (MHz)	Peak Mtr Rdg (dBµV)	QP Mtr Rdg (dBµV)	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 (°)
30.000	4.3	-2.6	24.6	0.0	0.3	0.0	29.3	22.4	40.0	-17.6	H	340	90
57.660	9.1	4.9	12.4	0.0	0.4	0.0	22.0	17.8	40.0	-22.2	V	200	0
83.100	7.7	-4.8	13.8	0.0	0.5	0.0	22.0	9.5	40.0	-30.5	H	200	270
105.040	11.7	-5.1	17.4	0.0	0.6	0.0	29.7	12.8	43.5	-30.7	H	120	90
122.020	11.0	6.2	18.3	0.0	0.6	0.0	29.9	25.1	43.5	-18.4	H	200	315
123.100	11.0	6.2	18.3	0.0	0.7	0.0	30.0	25.1	43.5	-18.4	H	200	315
291.900	16.1	11.1	19.2	0.0	1.0	0.0	36.3	31.3	46.0	-14.7	V	200	180
303.240	15.9	9.5	19.5	0.0	1.1	0.0	36.4	30.0	46.0	-16.0	H	120	90
304.620	15.6	10.9	19.5	0.0	1.1	0.0	36.2	31.5	46.0	-14.5	H	120	90
310.860	11.1	4.8	19.7	0.0	1.1	0.0	31.9	25.5	46.0	-20.5	V	120	180
694.920	5.5	-4.9	25.1	0.0	1.6	0.0	32.2	21.8	46.0	-24.2	V	200	90
722.040	5.4	-4.9	25.4	0.0	1.6	0.0	32.3	22.0	46.0	-24.0	H	120	180
957.900	3.6	-4.7	27.0	0.0	1.8	0.0	32.4	24.0	46.0	-22.0	V	200	180

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

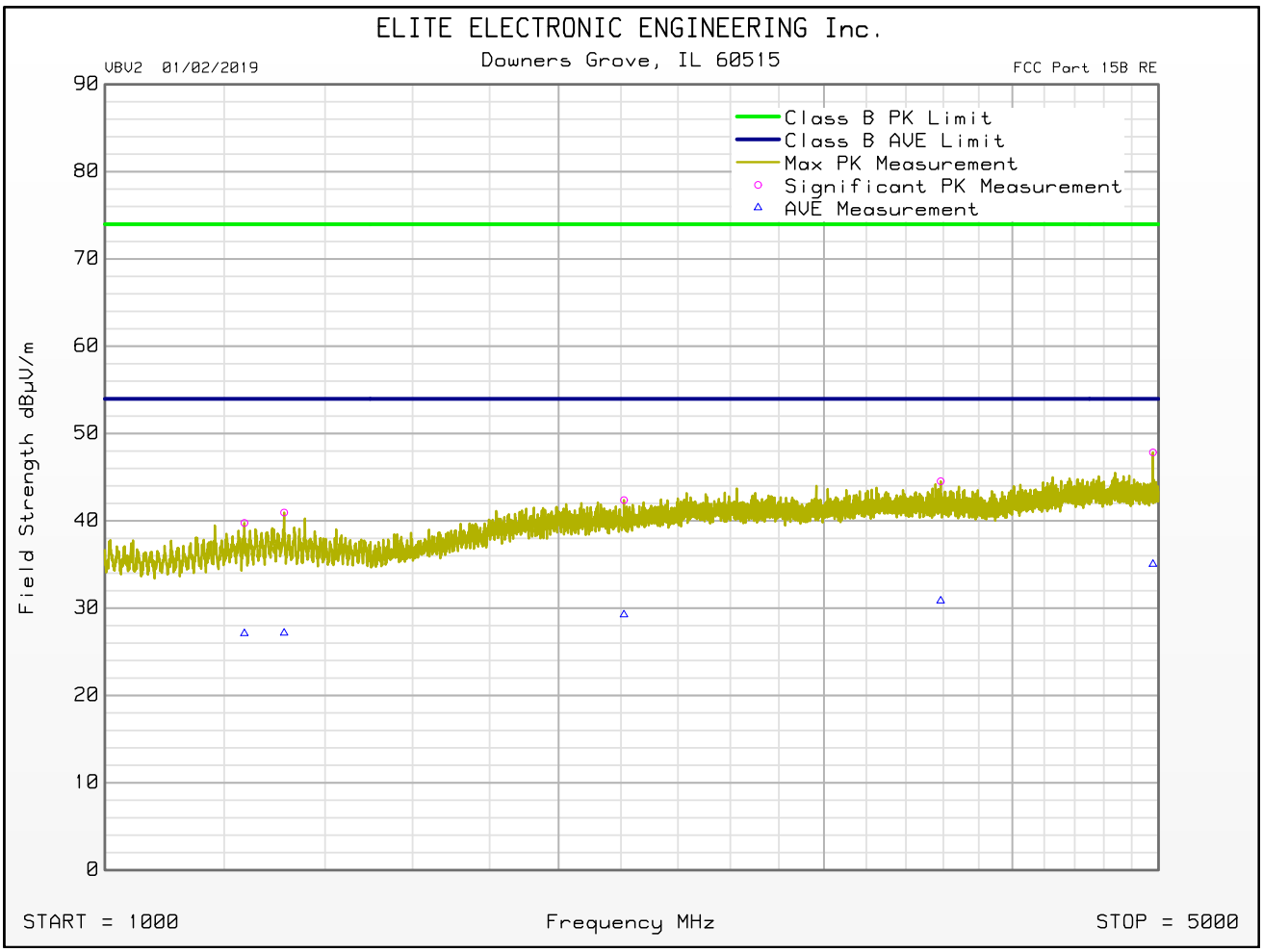
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 390MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	H
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 02:02:37 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 390MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	V
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 02:02:37 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

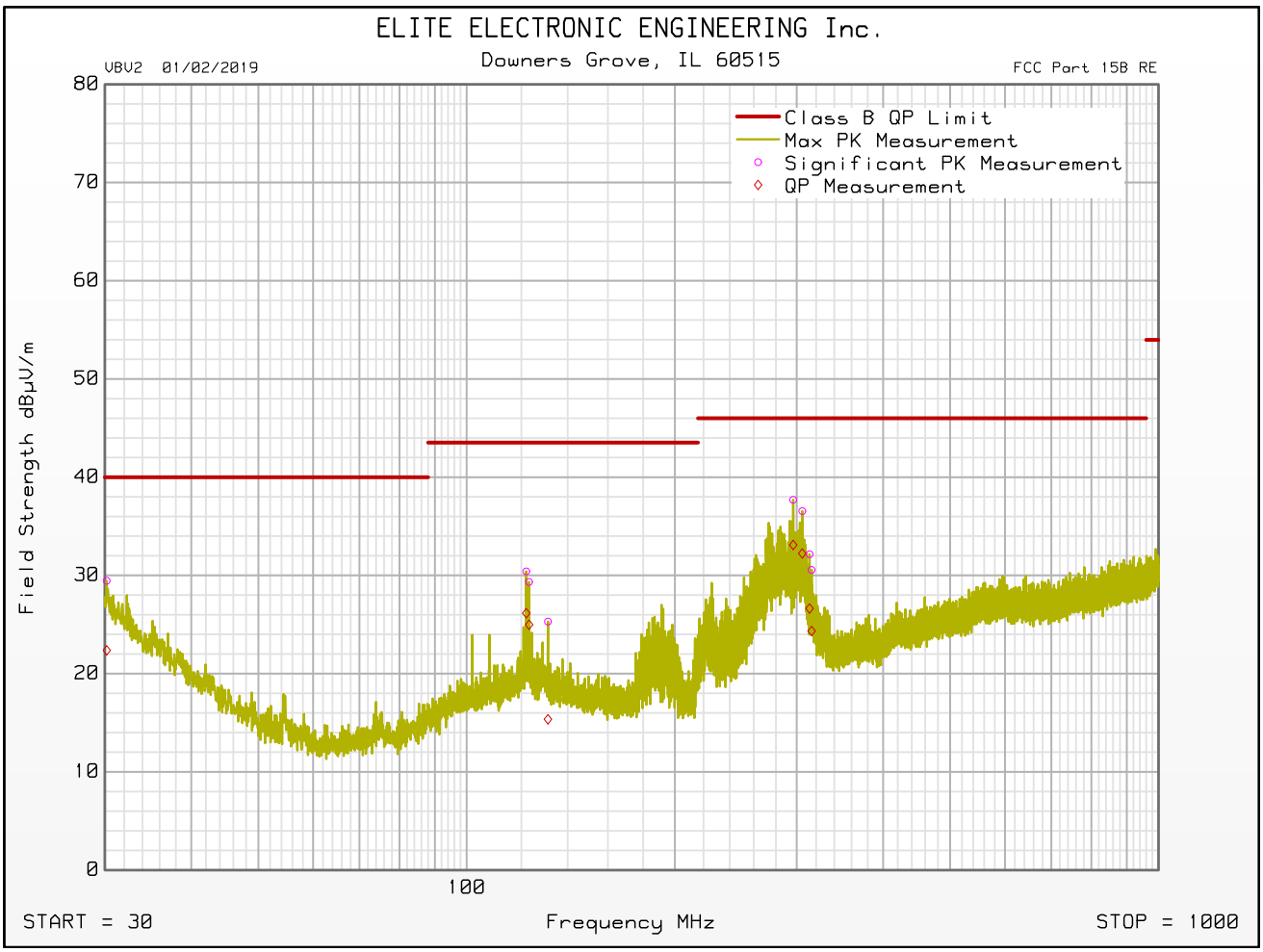
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 390MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 02:02:37 PM

Freq (GHz)	Peak Mtr Rdg (dBµV)	Ave. Mtr Rdg (dBµV)	Ant Fac (dB)	Amp Fac (dB)	Cbl Fac (dB)	Dist Corr (dB)	Peak Total (dBµV/m)	Peak Limit (dBµV/m)	Peak Lim Mrg (dB)	Ave. Total (dBµV/m)	Ave. Limit (dBµV/m)	Ave. Lim Mrg (dB)	Ant Pol	Mast Ht (cm)	Azim (°)
1.2375	49.5	36.8	29.0	-40.8	2.1	0.0	39.8	74.0	-34.2	27.1	54.0	-26.9	V	200	90
1.315	50.6	36.9	29.0	-40.9	2.1	0.0	41.0	74.0	-33.0	27.2	54.0	-26.8	V	200	225
2.21	48.8	35.7	31.4	-40.6	2.7	0.0	42.4	74.0	-31.6	29.3	54.0	-24.7	V	340	0
2.7865	49.0	35.2	32.4	-40.6	3.1	0.0	44.0	74.0	-30.0	30.2	54.0	-23.8	H	200	180
3.585	48.4	34.8	32.9	-40.3	3.5	0.0	44.5	74.0	-29.4	30.8	54.0	-23.1	V	340	45
4.958	49.7	36.9	34.4	-40.3	4.1	0.0	47.8	74.0	-26.1	35.0	54.0	-18.9	V	340	135

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

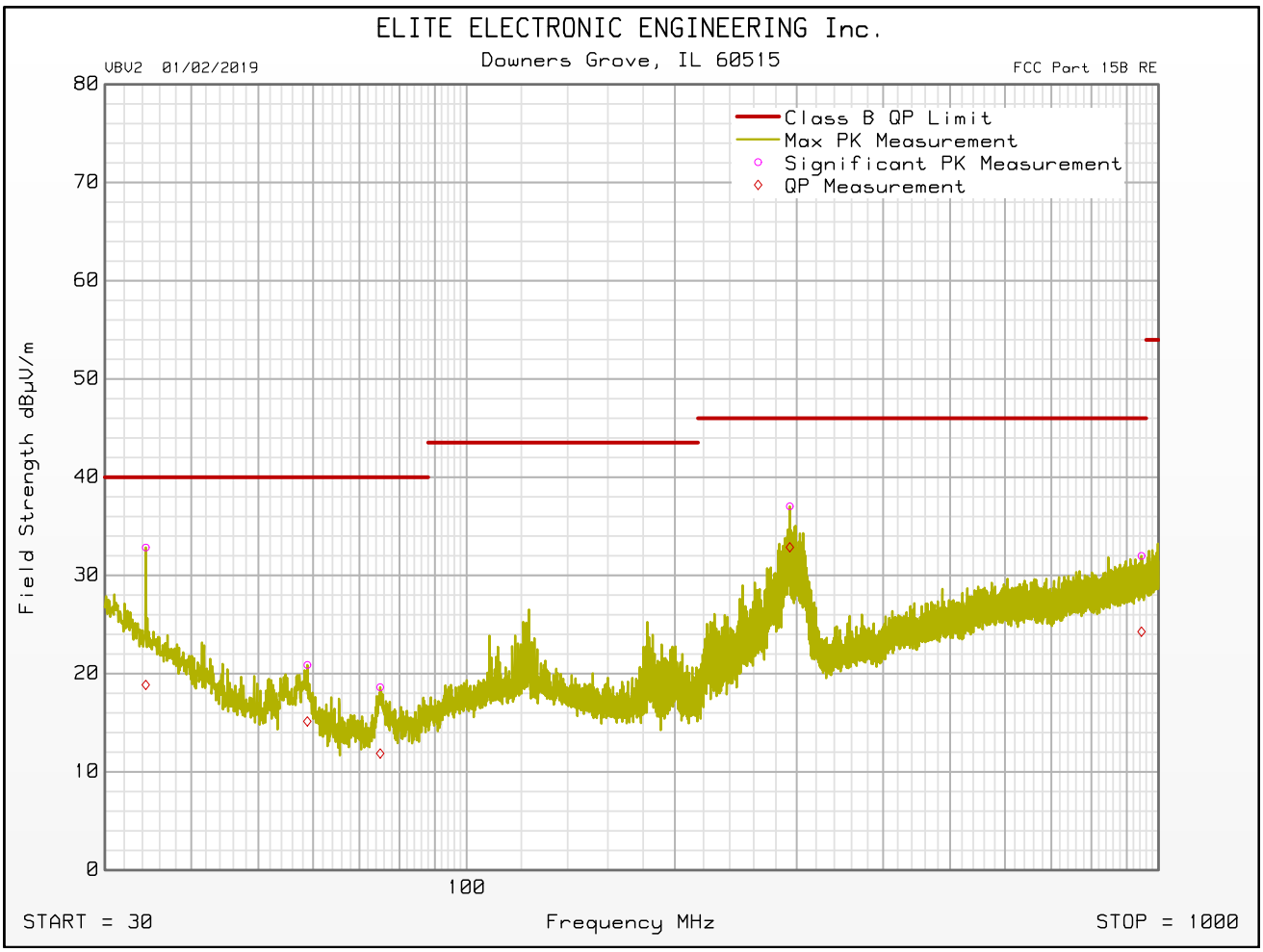
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 433.92MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	H
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 18, 2019 08:51:32 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 433.92MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	V
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 18, 2019 08:51:32 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

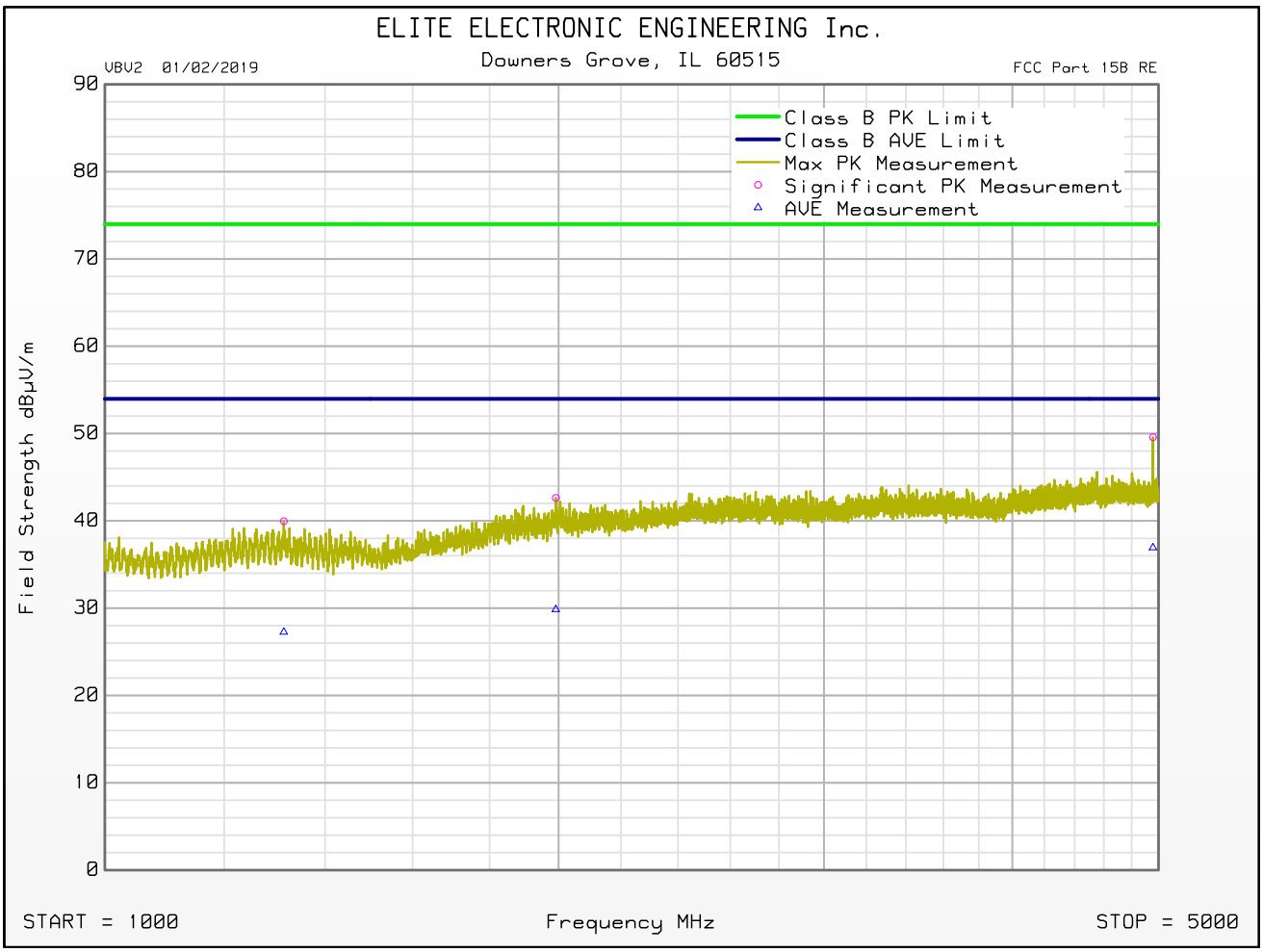
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 433.92MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 18, 2019 08:51:32 AM

Freq (MHz)	Peak Mtr Rdg (dBµV)	QP Mtr Rdg (dBµV)	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 (°)
30.180	4.6	-2.5	24.5	0.0	0.3	0.0	29.5	22.4	40.0	-17.6	H	200	0
34.380	10.5	-3.5	22.0	0.0	0.4	0.0	32.8	18.9	40.0	-21.1	V	120	225
58.860	8.1	2.4	12.3	0.0	0.4	0.0	20.9	15.1	40.0	-24.9	V	120	315
75.000	5.3	-1.4	12.8	0.0	0.5	0.0	18.6	11.9	40.0	-28.1	V	200	270
121.960	11.5	7.2	18.3	0.0	0.6	0.0	30.4	26.2	43.5	-17.4	H	200	315
123.100	10.4	6.0	18.3	0.0	0.7	0.0	29.3	25.0	43.5	-18.5	H	120	315
131.080	6.4	-3.5	18.2	0.0	0.7	0.0	25.3	15.4	43.5	-28.2	H	340	315
293.220	16.7	12.6	19.3	0.0	1.0	0.0	37.0	32.9	46.0	-13.1	V	200	180
296.520	17.3	12.7	19.4	0.0	1.0	0.0	37.7	33.1	46.0	-12.9	H	200	180
305.580	15.9	11.6	19.6	0.0	1.1	0.0	36.5	32.2	46.0	-13.8	H	120	90
313.140	11.4	5.9	19.7	0.0	1.1	0.0	32.2	26.6	46.0	-19.4	H	120	90
315.240	9.8	3.6	19.7	0.0	1.1	0.0	30.6	24.3	46.0	-21.7	H	120	90
945.120	3.5	-4.2	26.7	0.0	1.8	0.0	32.0	24.3	46.0	-21.7	V	340	0

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

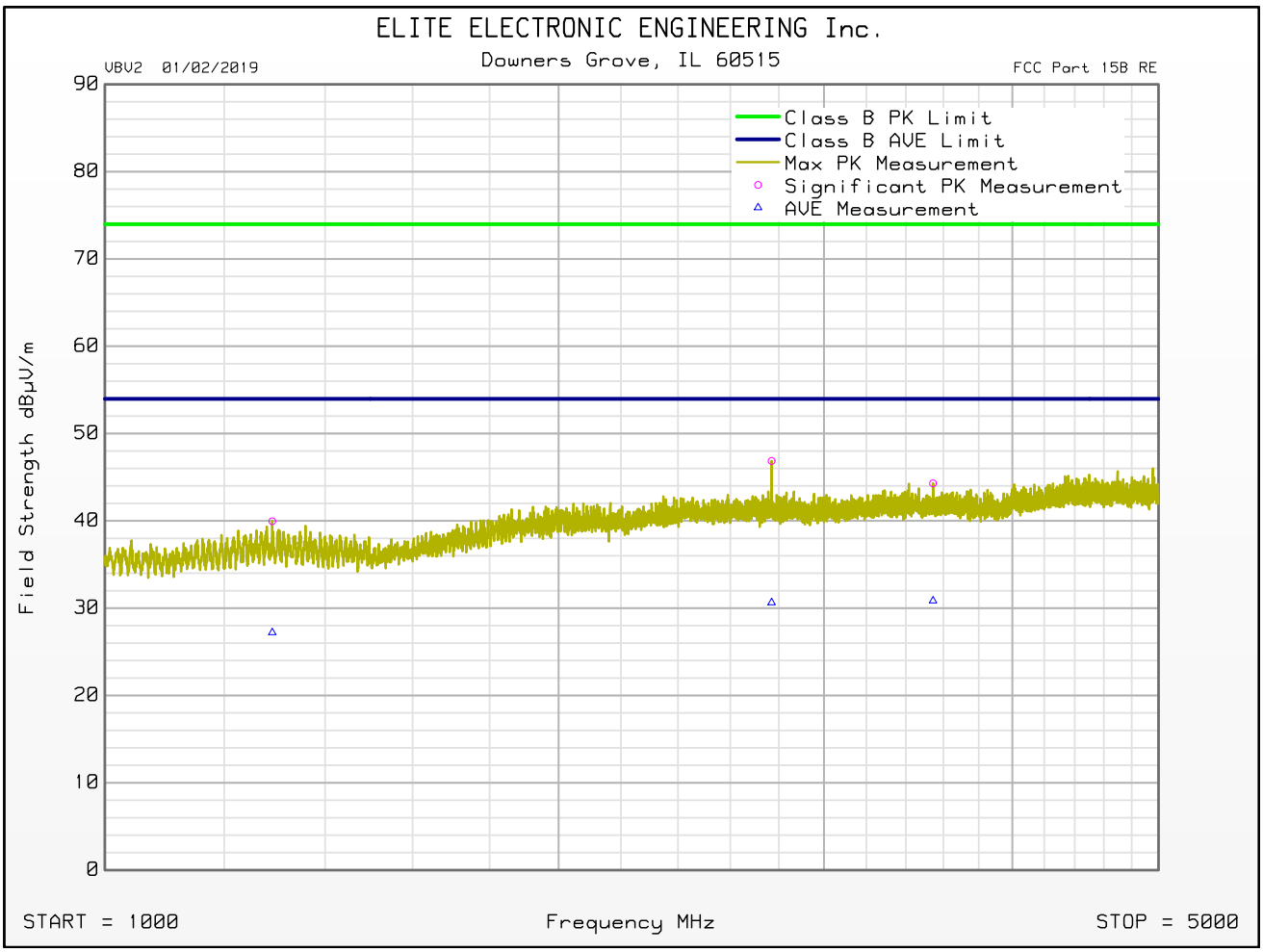
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 433.92MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	H
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 02:21:08 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 433.92MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	V
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 02:21:08 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

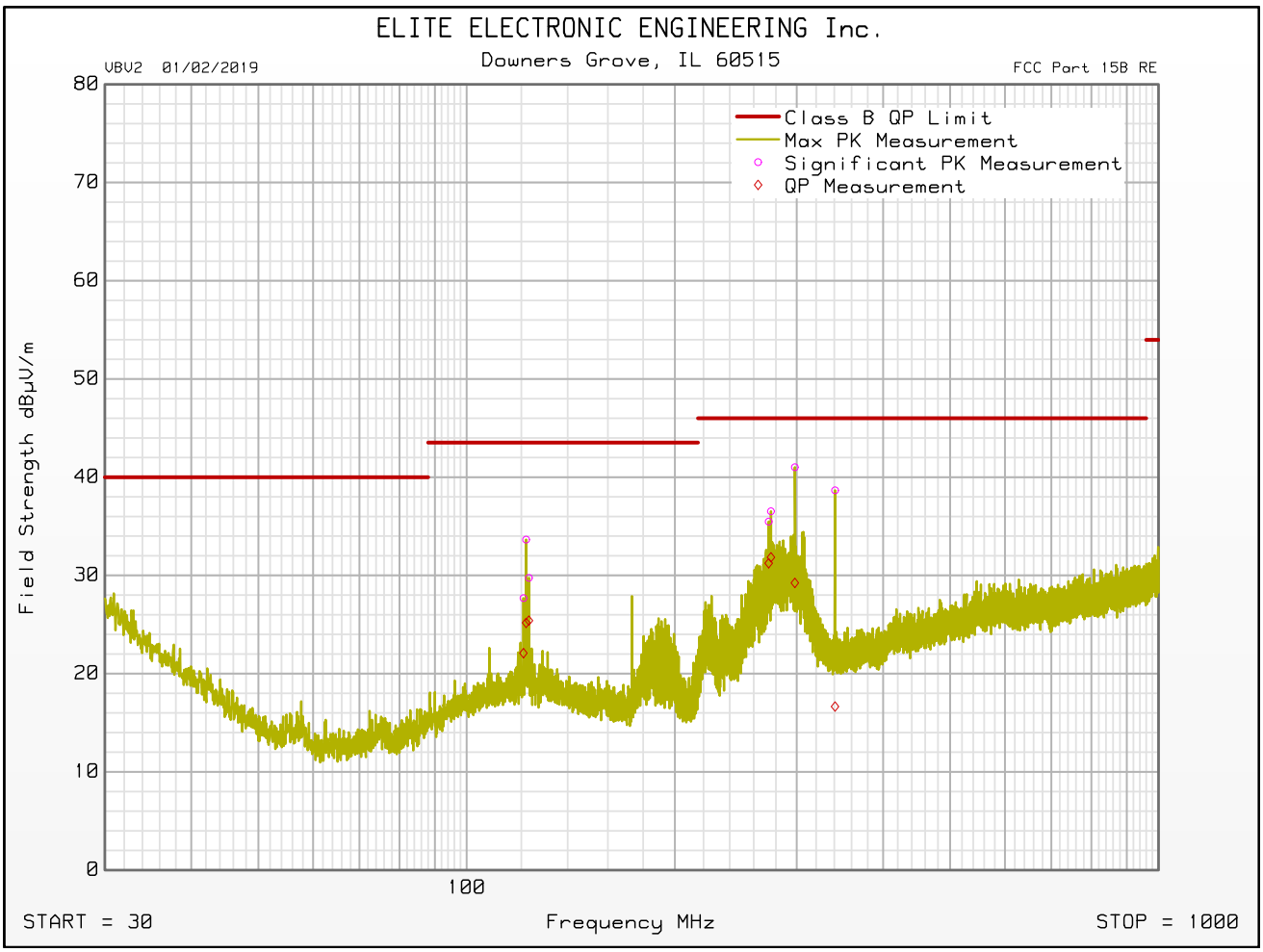
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 433.92MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 02:21:08 PM

Freq (GHz)	Peak Mtr Rdg (dBµV)	Ave. Mtr Rdg (dBµV)	Ant Fac (dB)	Amp Fac (dB)	Cbl Fac (dB)	Dist Corr (dB)	Peak Total (dBµV/m)	Peak Limit (dBµV/m)	Peak Lim Mrg (dB)	Ave. Total (dBµV/m)	Ave. Limit (dBµV/m)	Ave. Lim Mrg (dB)	Ant Pol	Mast Ht (cm)	Azim (°)
1.2915	49.6	36.9	29.1	-40.9	2.1	0.0	40.0	74.0	-34.0	27.2	54.0	-26.8	V	340	225
1.3145	49.7	37.0	29.0	-40.9	2.1	0.0	40.0	74.0	-34.0	27.3	54.0	-26.7	H	200	90
1.9915	49.4	36.6	31.5	-40.9	2.6	0.0	42.6	74.0	-31.4	29.9	54.0	-24.1	H	120	315
2.769	51.9	35.7	32.5	-40.6	3.1	0.0	46.9	74.0	-27.1	30.6	54.0	-23.3	V	120	270
3.5435	48.3	34.8	32.9	-40.4	3.5	0.0	44.3	74.0	-29.7	30.9	54.0	-23.1	V	340	45
4.958	51.5	38.8	34.4	-40.3	4.1	0.0	49.6	74.0	-24.4	36.9	54.0	-17.0	H	200	135

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

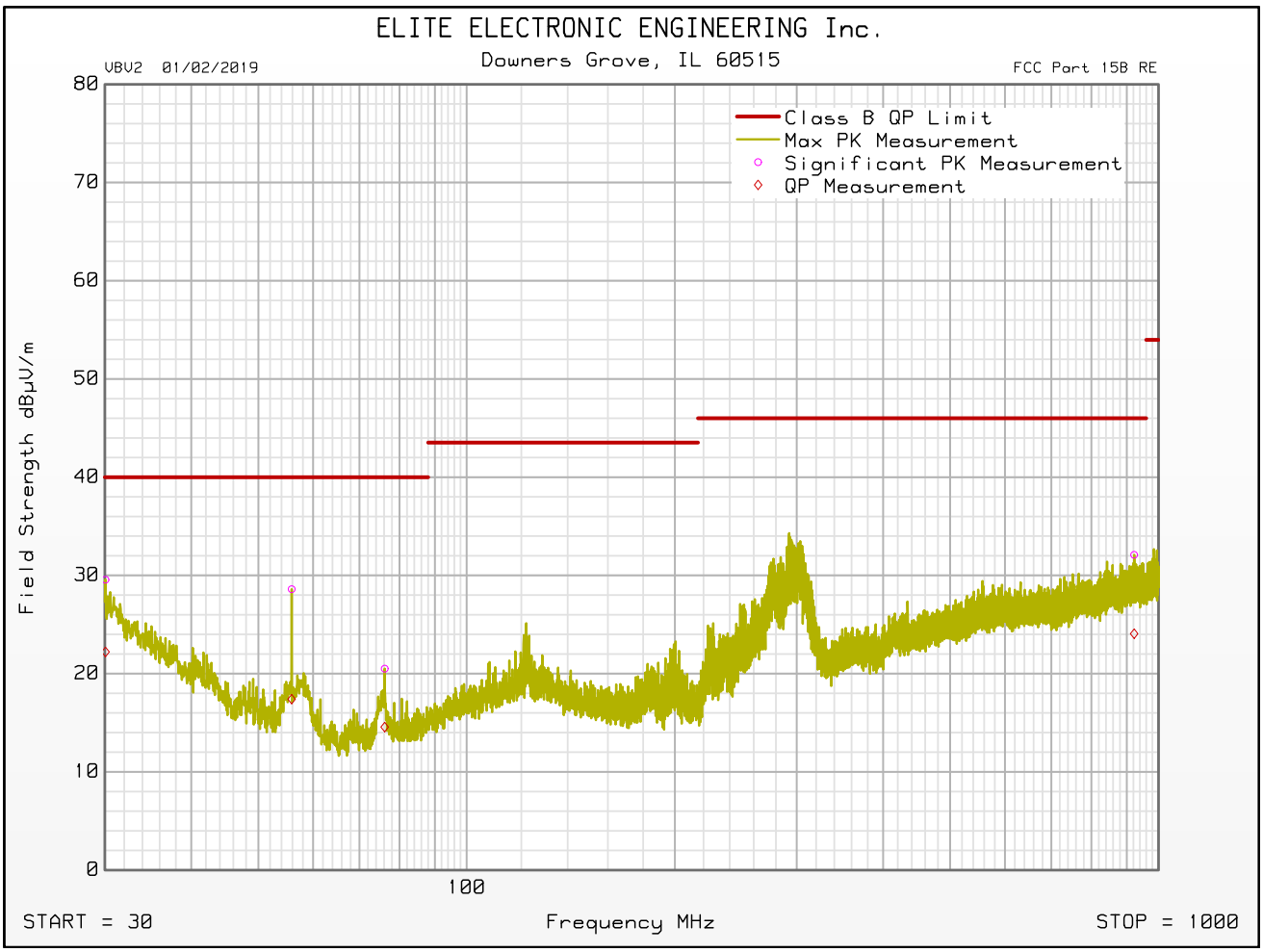
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 902.25MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	H
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 03:05:49 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 902.25MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	V
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 03:05:49 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

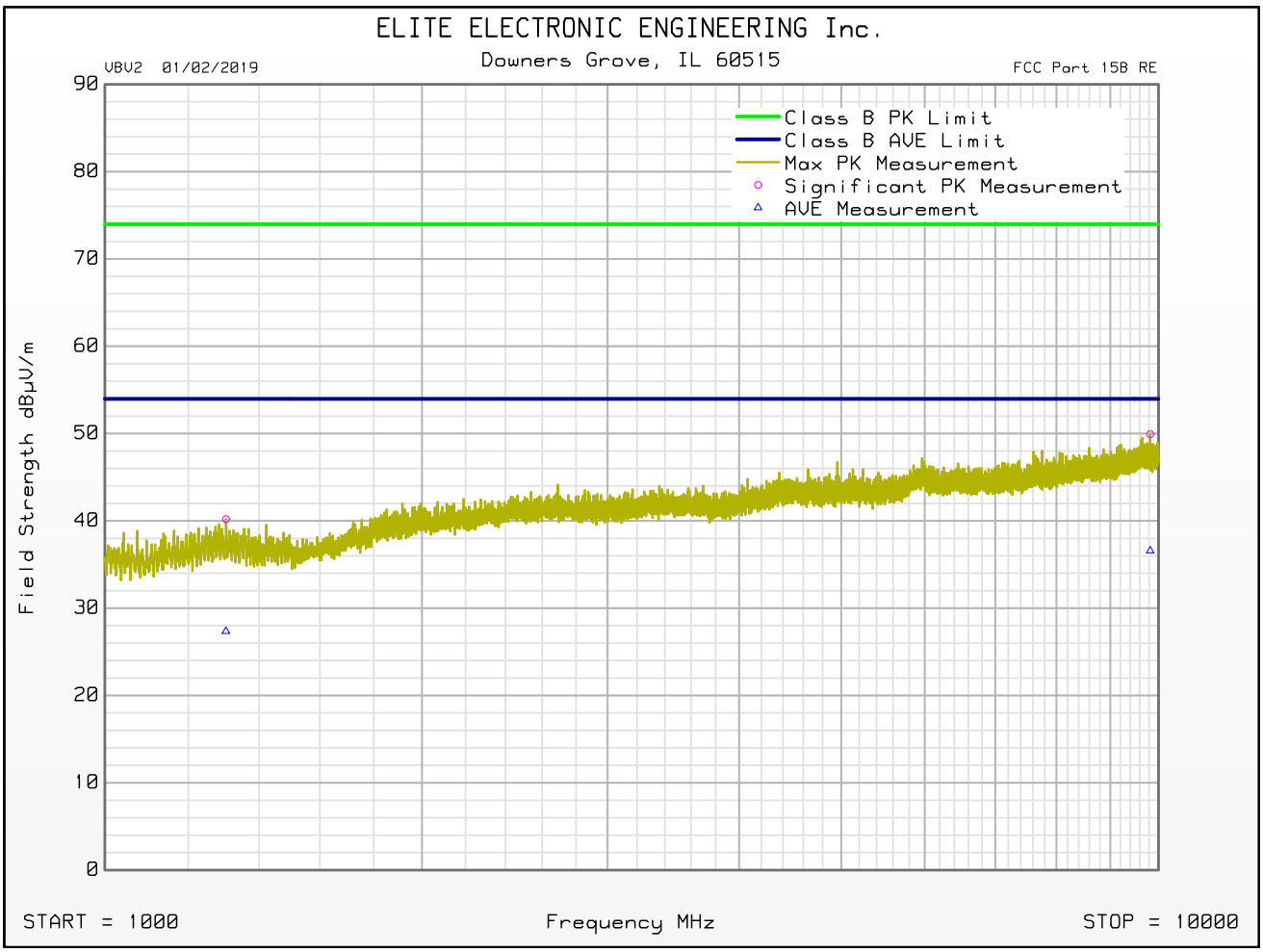
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 902.25MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 03:05:49 PM

Freq (MHz)	Peak Mtr Rdg (dBµV)	QP Mtr Rdg (dBµV)	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 (°)
30.060	4.6	-2.7	24.6	0.0	0.3	0.0	29.6	22.2	40.0	-17.8	V	340	45
55.860	15.6	4.4	12.6	0.0	0.4	0.0	28.6	17.4	40.0	-22.6	V	120	315
76.140	7.1	1.2	12.9	0.0	0.5	0.0	20.5	14.6	40.0	-25.4	V	200	0
120.820	8.8	3.2	18.2	0.0	0.6	0.0	27.7	22.1	43.5	-21.4	H	200	315
121.900	14.7	6.3	18.3	0.0	0.6	0.0	33.6	25.2	43.5	-18.3	H	200	315
123.040	10.8	6.4	18.3	0.0	0.7	0.0	29.8	25.4	43.5	-18.1	H	200	315
273.300	15.6	11.4	18.9	0.0	1.0	0.0	35.5	31.2	46.0	-14.8	H	120	90
275.340	16.7	12.0	18.8	0.0	1.0	0.0	36.5	31.8	46.0	-14.2	H	120	90
298.140	20.6	8.8	19.4	0.0	1.0	0.0	41.0	29.2	46.0	-16.8	H	200	180
340.860	17.4	-4.6	20.2	0.0	1.1	0.0	38.7	16.7	46.0	-29.3	H	340	225
922.200	3.6	-4.4	26.7	0.0	1.8	0.0	32.1	24.1	46.0	-21.9	V	200	135

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

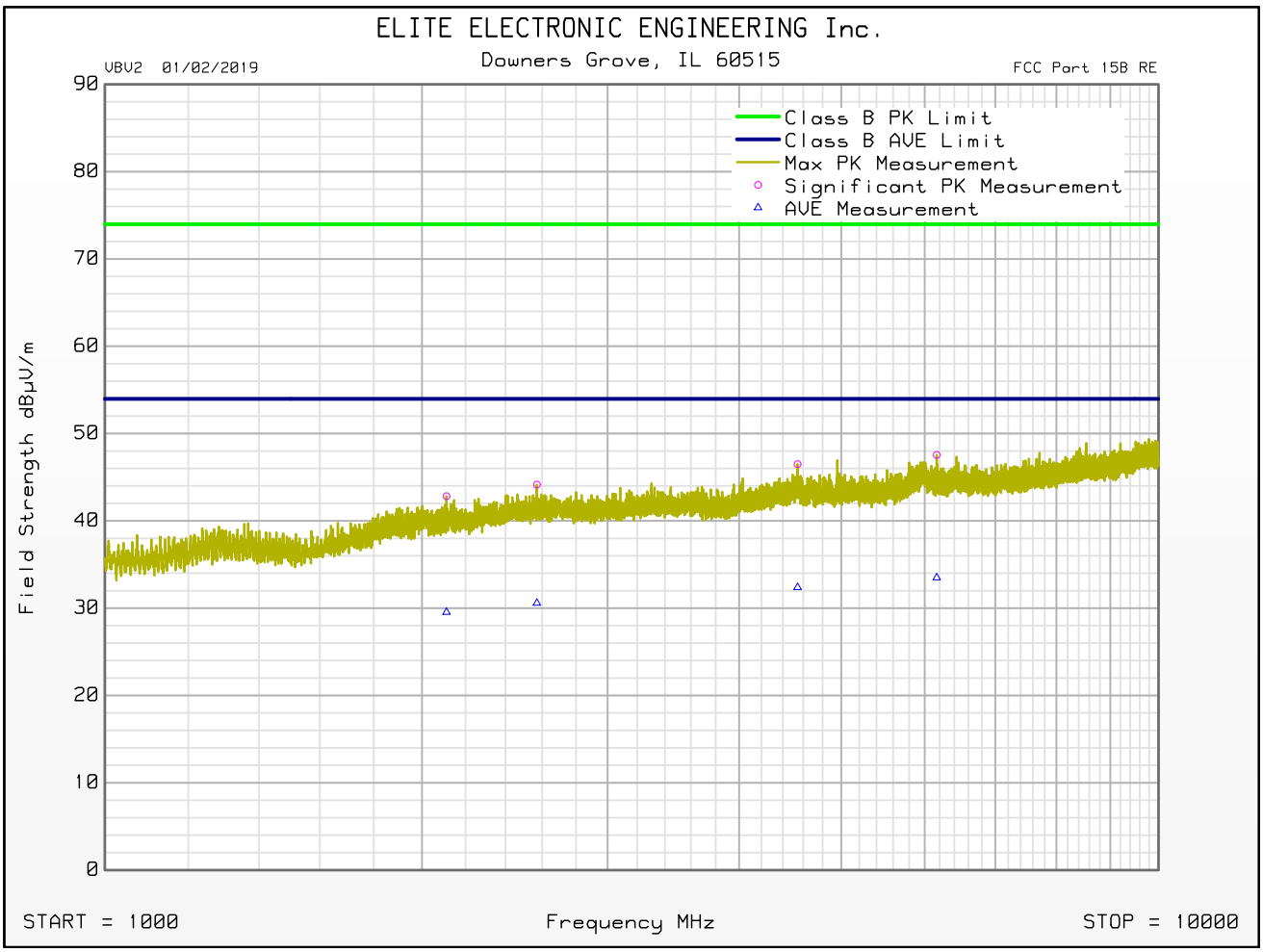
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 902.25MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	H
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 21, 2019 09:31:43 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 902.25MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	V
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 21, 2019 09:31:43 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

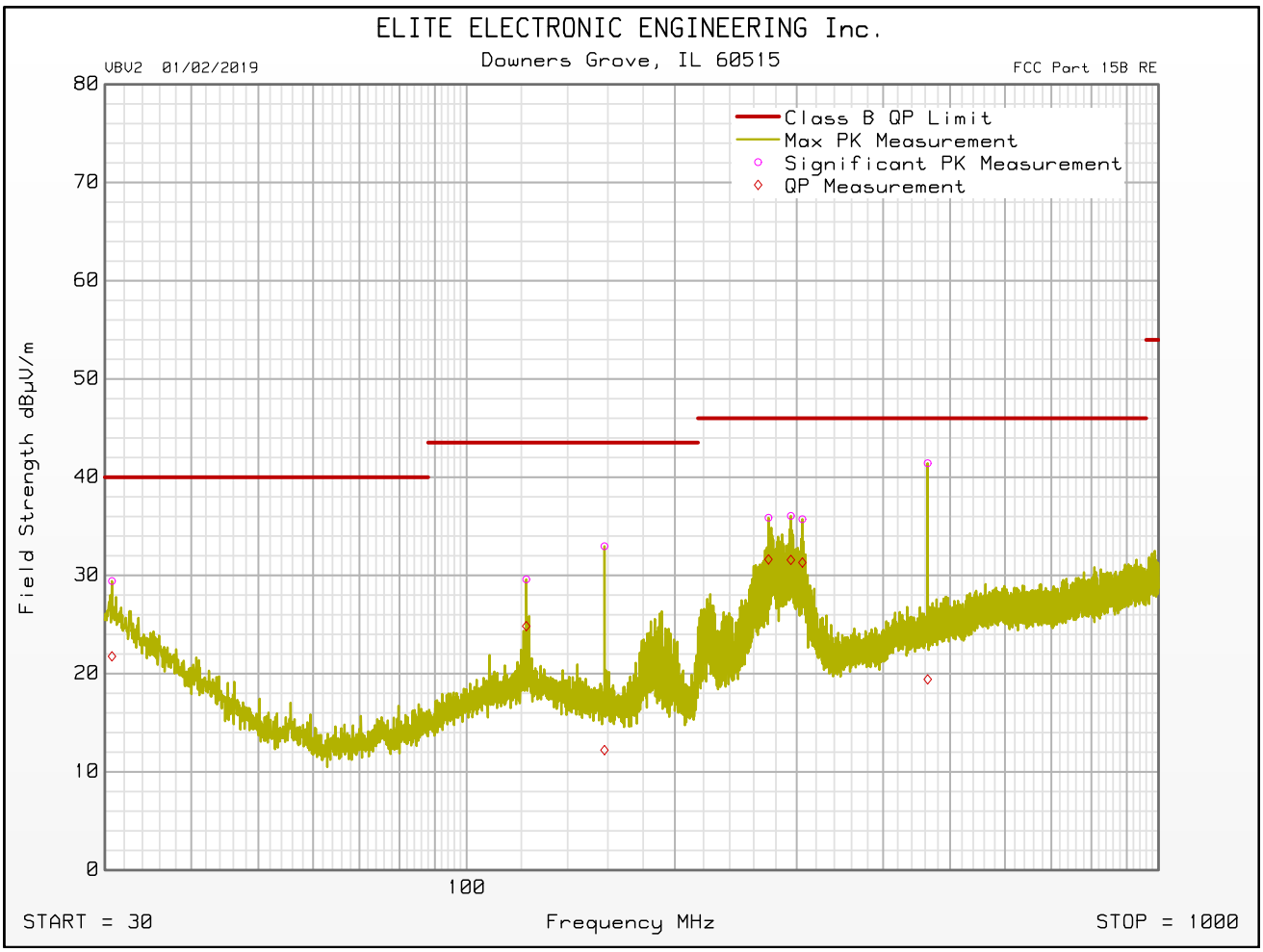
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 902.25MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 21, 2019 09:31:43 AM

Freq (GHz)	Peak Mtr Rdg (dBµV)	Ave. Mtr Rdg (dBµV)	Ant Fac (dB)	Amp Fac (dB)	Cbl Fac (dB)	Dist Corr (dB)	Peak Total (dBµV/m)	Peak Limit (dBµV/m)	Peak Lim Mrg (dB)	Ave. Total (dBµV/m)	Ave. Limit (dBµV/m)	Ave. Lim Mrg (dB)	Ant Pol	Mast Ht (cm)	Azim (°)
1.303	49.9	37.0	29.1	-40.9	2.1	0.0	40.2	74.0	-33.8	27.4	54.0	-26.6	H	340	270
2.11	49.3	36.1	31.5	-40.7	2.7	0.0	42.8	74.0	-31.2	29.5	54.0	-24.4	V	340	45
2.571	49.1	35.5	32.7	-40.5	3.0	0.0	44.2	74.0	-29.8	30.6	54.0	-23.4	V	340	180
4.5445	48.8	34.7	34.1	-40.3	3.9	0.0	46.5	74.0	-27.5	32.4	54.0	-21.6	V	340	315
6.159	48.1	34.1	35.3	-40.4	4.6	0.0	47.6	74.0	-26.4	33.5	54.0	-20.5	V	200	90
9.822	47.4	34.1	36.7	-40.2	6.0	0.0	49.9	74.0	-24.1	36.6	54.0	-17.4	H	340	0

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

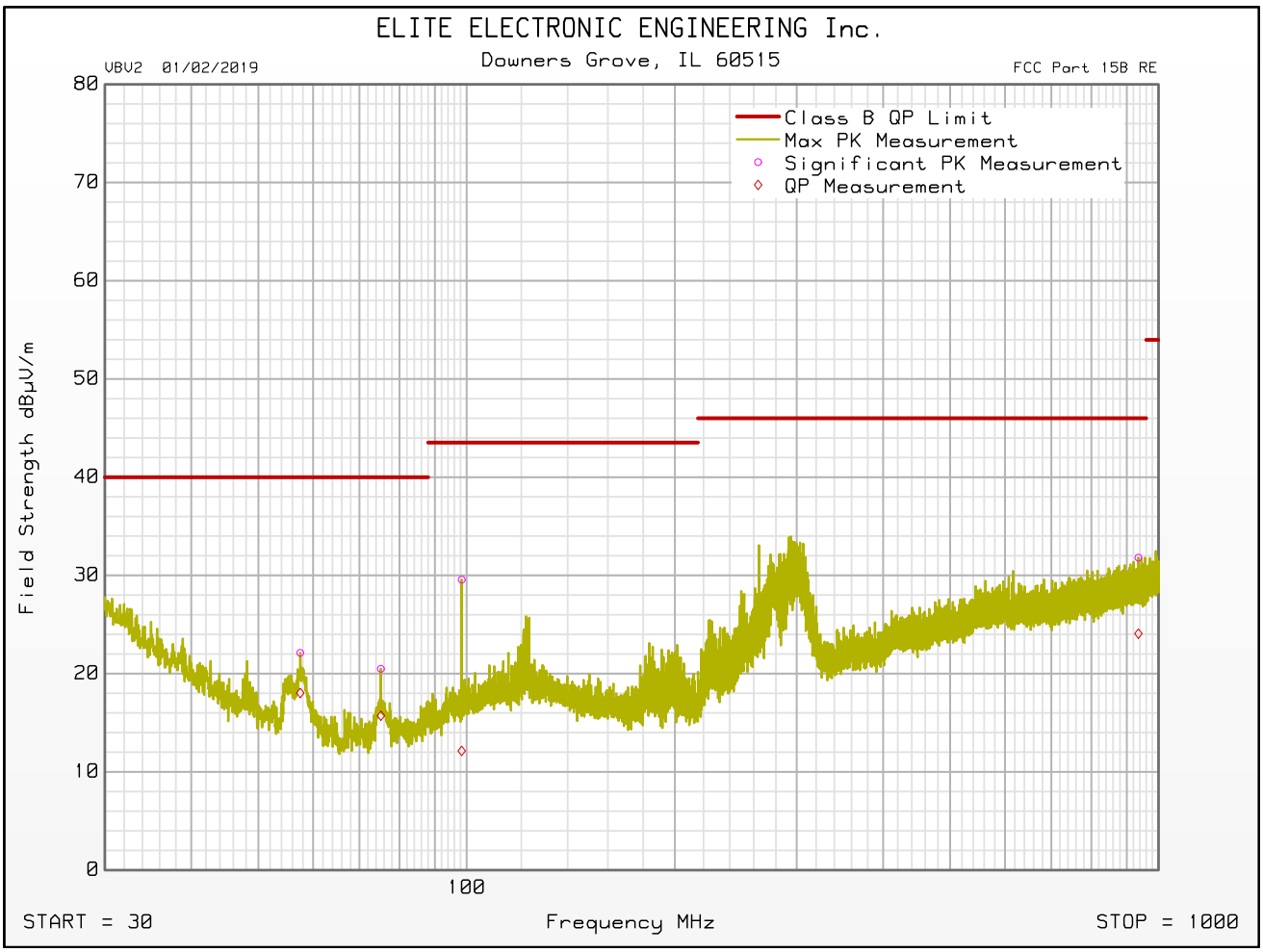
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 914.75MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	H
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 03:24:07 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 914.75MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	V
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 03:24:07 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

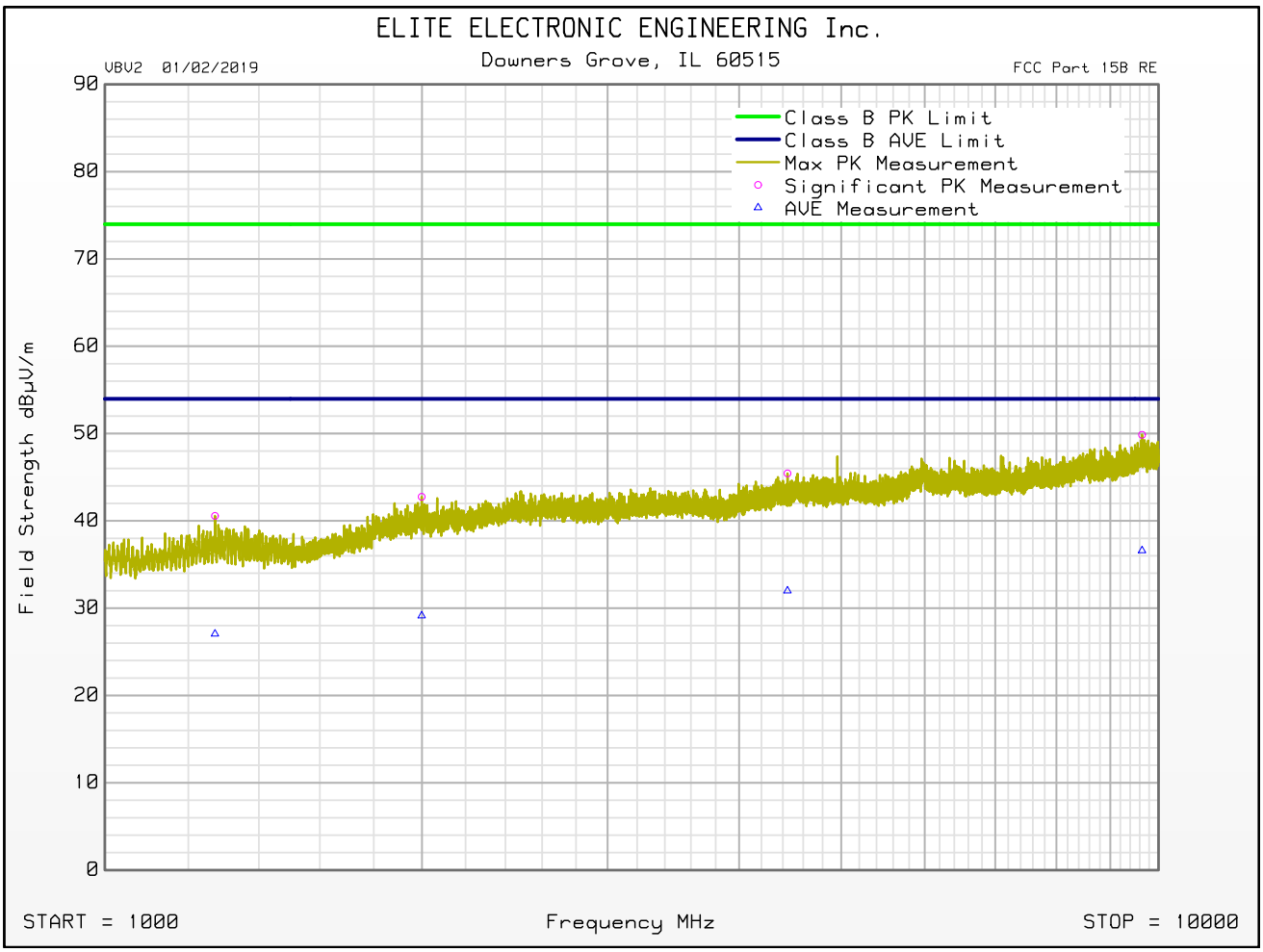
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 914.75MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 03:24:07 PM

Freq (MHz)	Peak Mtr Rdg (dBµV)	QP Mtr Rdg (dBµV)	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 (°)
30.720	4.9	-2.7	24.2	0.0	0.3	0.0	29.4	21.8	40.0	-18.2	H	200	0
57.480	9.2	5.1	12.4	0.0	0.4	0.0	22.1	18.0	40.0	-22.0	V	120	0
75.180	7.2	2.4	12.8	0.0	0.5	0.0	20.5	15.7	40.0	-24.3	V	120	180
98.380	12.4	-5.0	16.6	0.0	0.6	0.0	29.6	12.1	43.5	-31.4	V	120	90
121.960	10.7	5.9	18.3	0.0	0.6	0.0	29.6	24.8	43.5	-18.7	H	200	270
158.200	16.0	-4.7	16.2	0.0	0.7	0.0	33.0	12.2	43.5	-31.3	H	120	90
273.120	16.0	11.7	18.9	0.0	1.0	0.0	35.9	31.6	46.0	-14.4	H	120	90
294.240	15.7	11.2	19.3	0.0	1.0	0.0	36.1	31.6	46.0	-14.4	H	120	0
305.700	15.1	10.7	19.6	0.0	1.1	0.0	35.7	31.3	46.0	-14.7	H	120	90
463.920	17.1	-4.9	23.1	0.0	1.3	0.0	41.4	19.4	46.0	-26.6	H	200	225
935.460	3.3	-4.4	26.7	0.0	1.8	0.0	31.8	24.1	46.0	-21.9	V	120	225

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

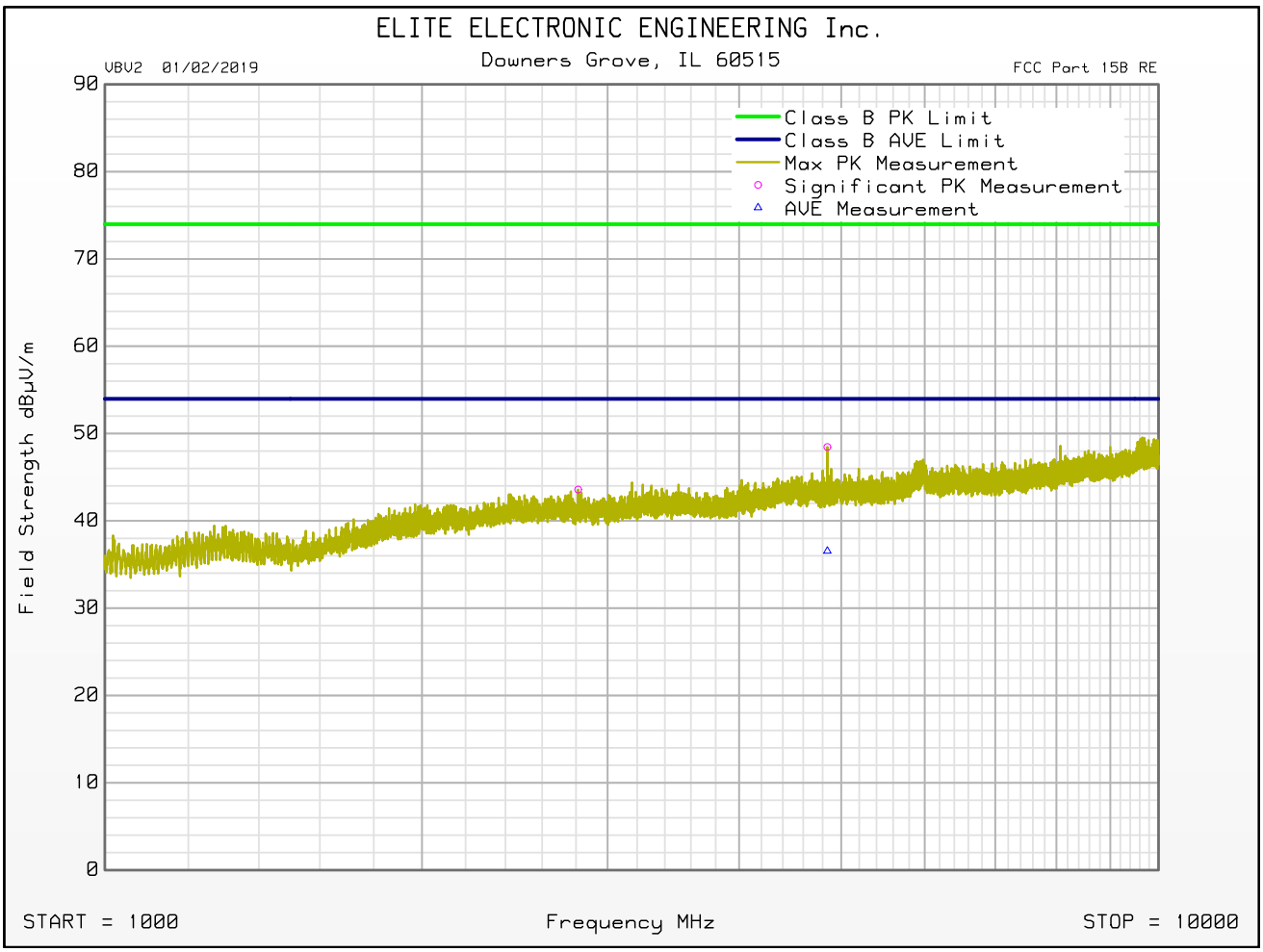
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 914.75MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	H
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 21, 2019 09:52:36 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 914.75MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	V
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 21, 2019 09:52:36 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

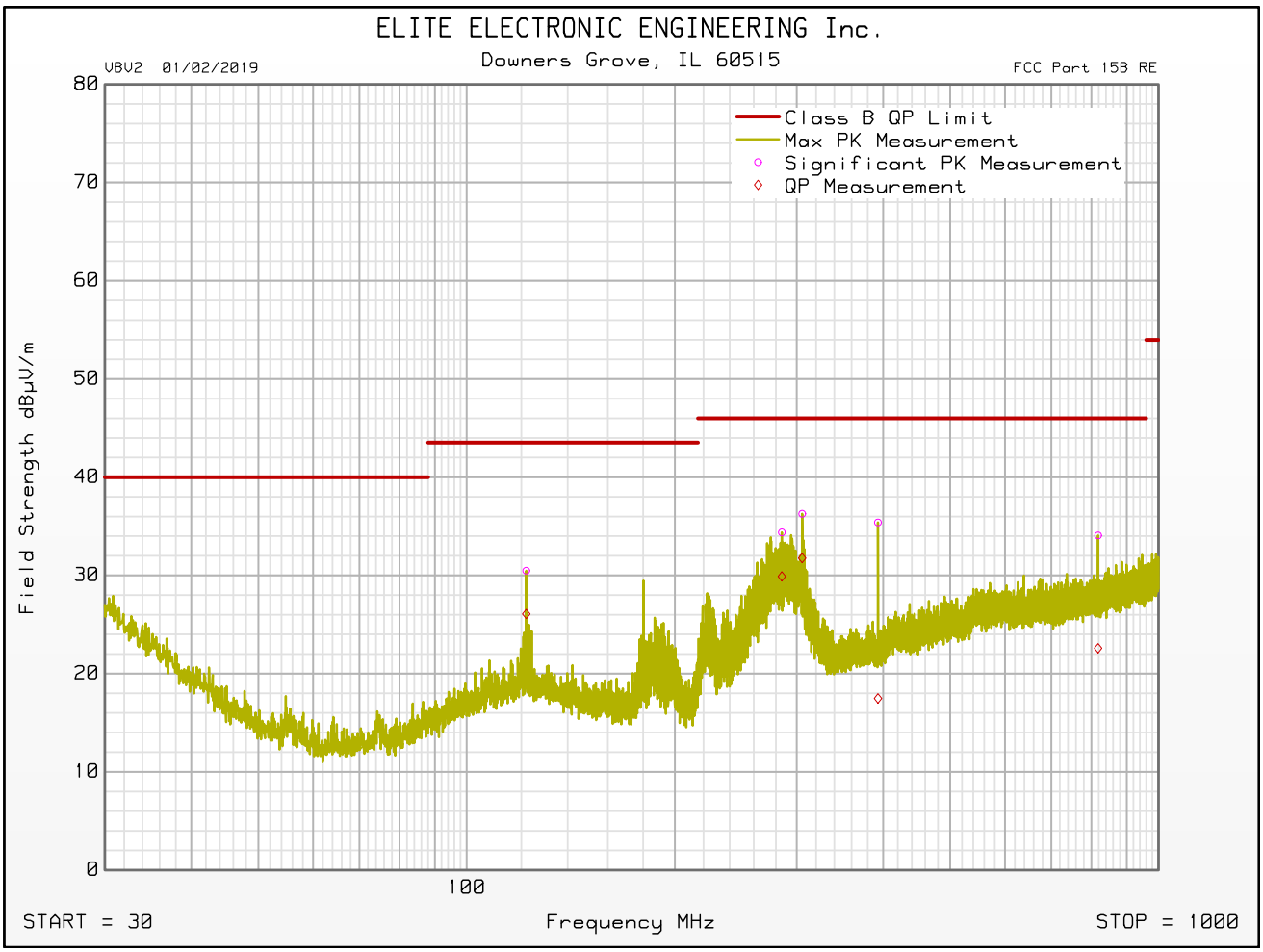
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 914.75MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 21, 2019 09:52:36 AM

Freq (GHz)	Peak Mtr Rdg (dBµV)	Ave. Mtr Rdg (dBµV)	Ant Fac (dB)	Amp Fac (dB)	Cbl Fac (dB)	Dist Corr (dB)	Peak Total (dBµV/m)	Peak Limit (dBµV/m)	Peak Lim Mrg (dB)	Ave. Total (dBµV/m)	Ave. Limit (dBµV/m)	Ave. Lim Mrg (dB)	Ant Pol	Mast Ht (cm)	Azim (°)
1.272	50.2	36.7	29.1	-40.8	2.1	0.0	40.6	74.0	-33.4	27.1	54.0	-26.9	H	120	90
1.9985	49.4	35.8	31.6	-40.9	2.6	0.0	42.8	74.0	-31.2	29.1	54.0	-24.9	H	120	135
4.445	47.9	34.5	33.9	-40.3	3.9	0.0	45.4	74.0	-28.5	32.0	54.0	-22.0	H	340	90
4.85	50.4	38.5	34.4	-40.4	4.1	0.0	48.5	74.0	-25.5	36.5	54.0	-17.4	V	200	225
9.648	47.5	34.3	36.6	-40.2	5.9	0.0	49.9	74.0	-24.1	36.6	54.0	-17.4	H	340	270

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

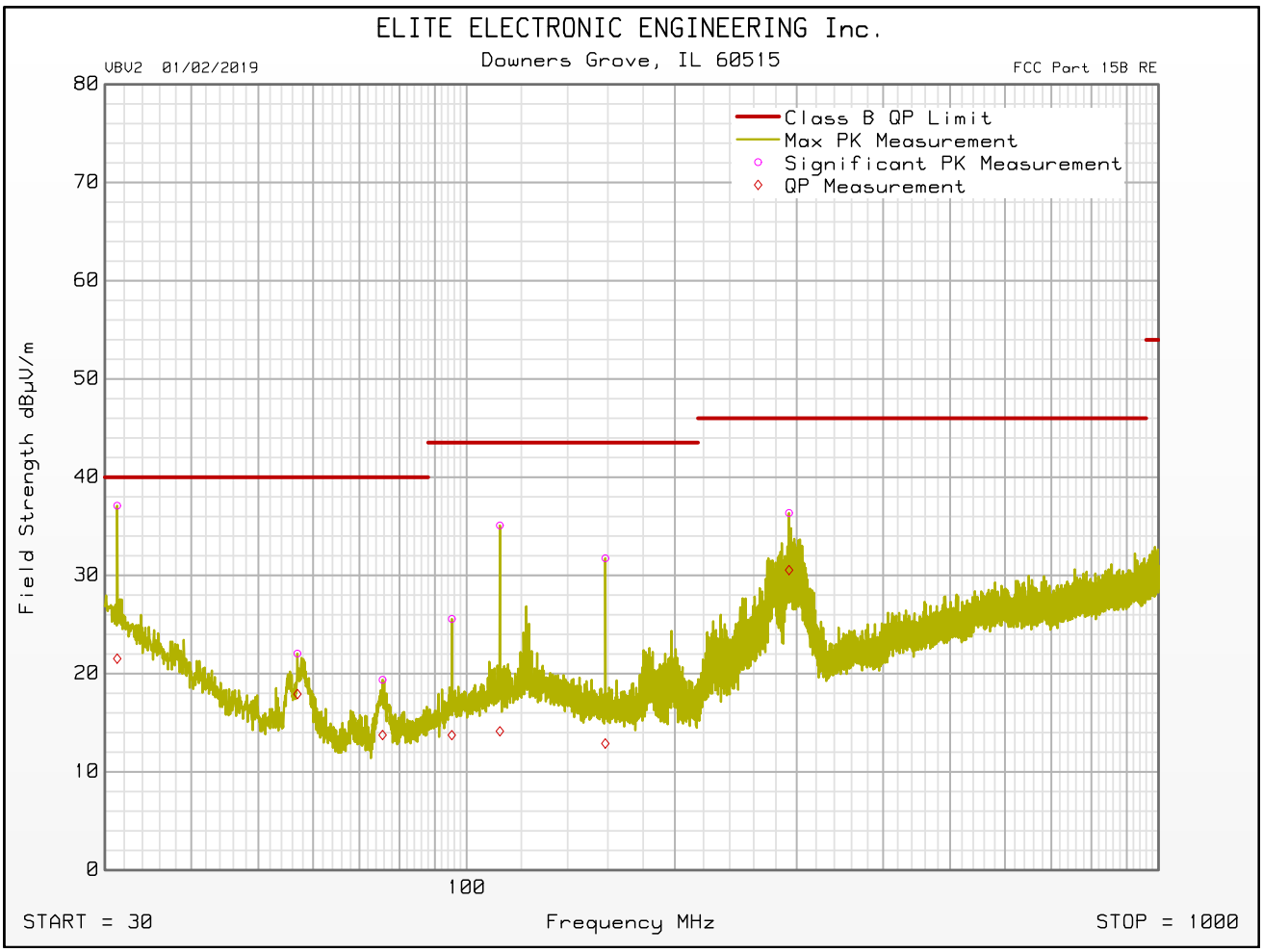
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 927.25MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	H
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 03:45:00 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 927.25MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	V
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 03:45:00 PM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

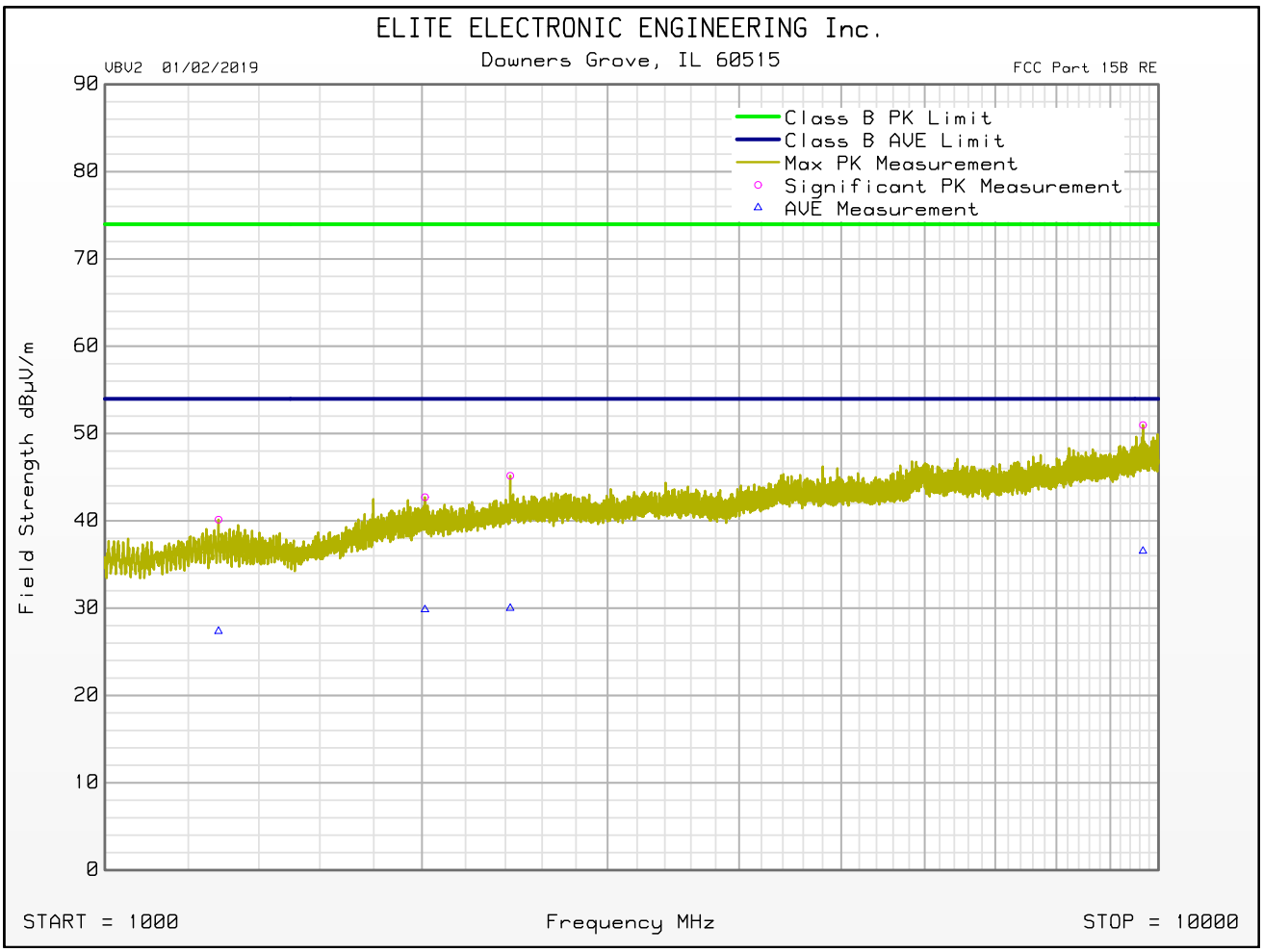
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 927.25MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 15, 2019 03:45:00 PM

Freq (MHz)	Peak Mtr Rdg (dBµV)	QP Mtr Rdg (dBµV)	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 (°)
31.260	12.9	-2.6	23.8	0.0	0.4	0.0	37.1	21.5	40.0	-18.5	V	340	0
56.940	9.1	5.0	12.5	0.0	0.4	0.0	22.0	17.9	40.0	-22.1	V	120	45
75.600	6.0	0.4	12.8	0.0	0.5	0.0	19.4	13.8	40.0	-26.2	V	120	0
95.200	8.9	-2.9	16.1	0.0	0.6	0.0	25.6	13.7	43.5	-29.8	V	120	0
111.700	16.7	-4.2	17.7	0.0	0.6	0.0	35.1	14.1	43.5	-29.4	V	120	180
121.960	11.6	7.2	18.3	0.0	0.6	0.0	30.5	26.1	43.5	-17.4	H	200	315
158.680	14.8	-4.0	16.2	0.0	0.7	0.0	31.7	12.9	43.5	-30.6	V	120	270
285.540	14.3	9.8	19.1	0.0	1.0	0.0	34.4	29.9	46.0	-16.1	H	120	90
292.440	16.1	10.3	19.3	0.0	1.0	0.0	36.4	30.5	46.0	-15.5	V	200	180
305.520	15.6	11.1	19.6	0.0	1.1	0.0	36.3	31.8	46.0	-14.2	H	120	90
393.120	13.3	-4.6	20.9	0.0	1.2	0.0	35.4	17.5	46.0	-28.5	H	120	0
818.040	6.4	-5.1	26.0	0.0	1.7	0.0	34.1	22.6	46.0	-23.4	H	120	180

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

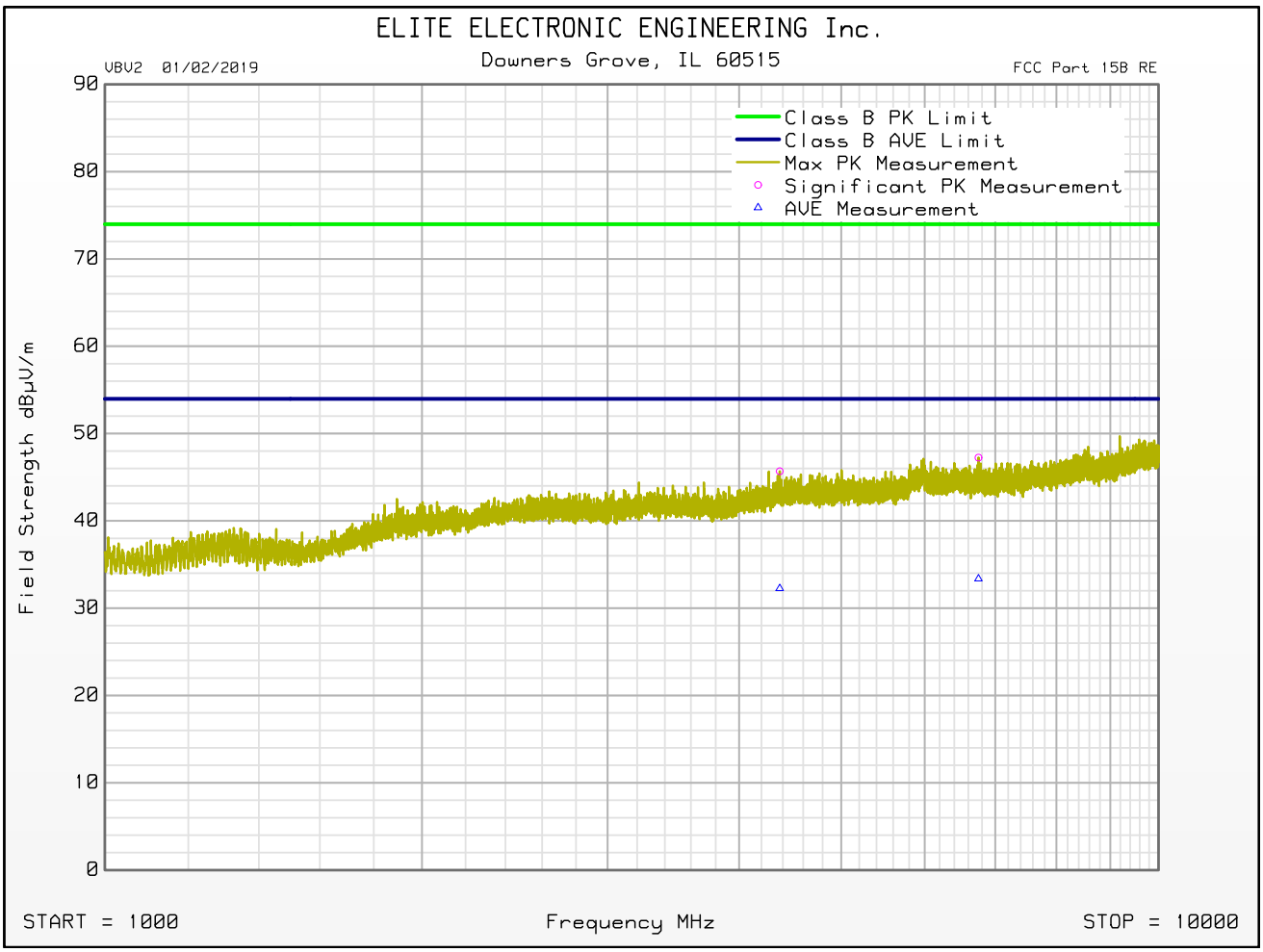
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 926.75MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	H
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 21, 2019 10:26:46 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 926.75MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	V
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 21, 2019 10:26:46 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

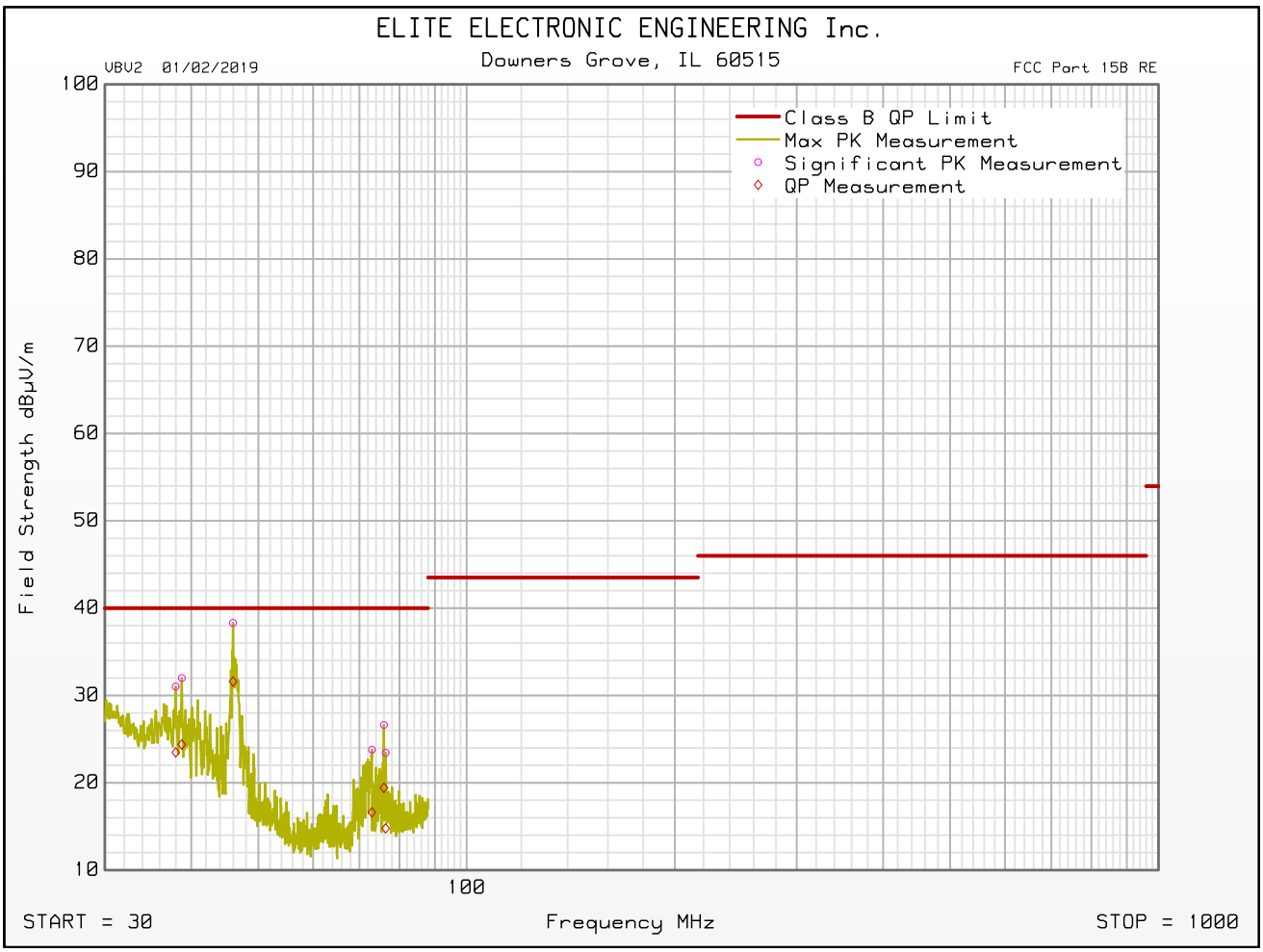
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	RX @ 926.75MHZ
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	YAGI ANTENNA
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 21, 2019 10:26:46 AM

Freq (GHz)	Peak Mtr Rdg (dBµV)	Ave. Mtr Rdg (dBµV)	Ant Fac (dB)	Amp Fac (dB)	Cbl Fac (dB)	Dist Corr (dB)	Peak Total (dBµV/m)	Peak Limit (dBµV/m)	Peak Lim Mrg (dB)	Ave. Total (dBµV/m)	Ave. Limit (dBµV/m)	Ave. Lim Mrg (dB)	Ant Pol	Mast Ht (cm)	Azim (°)
1.282	49.8	37.0	29.1	-40.8	2.1	0.0	40.1	74.0	-33.8	27.4	54.0	-26.6	H	340	90
2.013	49.4	36.5	31.5	-40.8	2.6	0.0	42.7	74.0	-31.3	29.8	54.0	-24.1	H	200	225
2.4255	50.5	35.3	32.3	-40.5	2.9	0.0	45.2	74.0	-28.8	30.0	54.0	-24.0	H	200	90
4.3705	48.4	34.9	33.8	-40.3	3.9	0.0	45.7	74.0	-28.3	32.3	54.0	-21.7	V	340	0
6.7475	47.5	33.6	35.5	-40.5	4.8	0.0	47.2	74.0	-26.7	33.4	54.0	-20.6	V	120	45
9.6675	48.6	34.2	36.6	-40.2	5.9	0.0	51.0	74.0	-23.0	36.5	54.0	-17.4	H	340	180

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	HDSW24VDC
Serial Number	:	ESL3
DUT Mode	:	CONTINUOUS MOTOR RUN, 70% DUTY CYCLE
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	H
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	WITH EXTERNAL ANTENNA
Test Engineer	:	J. Cardenas
Test Date	:	Dec 13, 2019 09:35:09 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

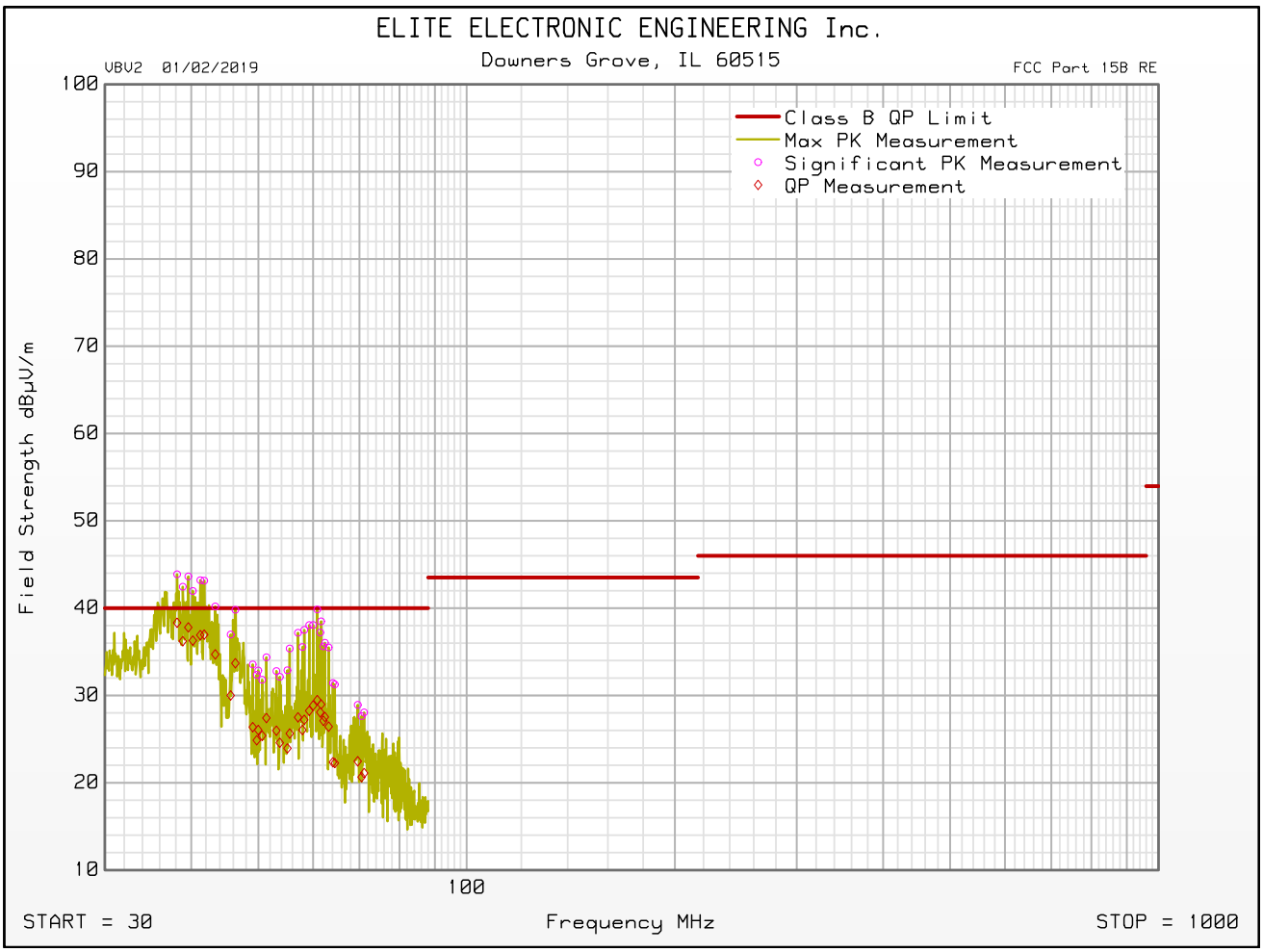
Manufacturer	:	CHAMBERLAIN
Model	:	HDSW24VDC
Serial Number	:	ESL3
DUT Mode	:	CONTINUOUS MOTOR RUN, 70% DUTY CYCLE
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	H
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	WITH EXTERNAL ANTENNA
Test Engineer	:	J. Cardenas
Test Date	:	Dec 13, 2019 09:35:09 AM

Freq (MHz)	Peak Mtr Rdg (dBµV)	QP Mtr Rdg (dBµV)	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 (°)
37.980	10.0	2.5	20.6	0.0	0.4	0.0	31.0	23.5	40.0	-16.5	H	340	0
38.760	11.4	3.8	20.2	0.0	0.4	0.0	32.0	24.4	40.0	-15.6	H	340	315
45.960	21.4	14.6	16.6	0.0	0.4	0.0	38.3	31.6	40.0	-8.4	H	200	225
72.960	9.8	2.6	13.6	0.0	0.4	0.0	23.8	16.6	40.0	-23.4	H	200	180
75.960	12.0	4.8	14.2	0.0	0.4	0.0	26.6	19.4	40.0	-20.6	H	200	225
76.380	8.8	0.1	14.3	0.0	0.4	0.0	23.4	14.8	40.0	-25.2	H	200	270

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	HDSW24VDC
Serial Number	:	ESL3
DUT Mode	:	CONTINUOUS MOTOR RUN, 70% DUTY CYCLE
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	V
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	WITH EXTERNAL ANTENNA
Test Engineer	:	J. Cardenas
Test Date	:	Dec 13, 2019 09:21:04 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

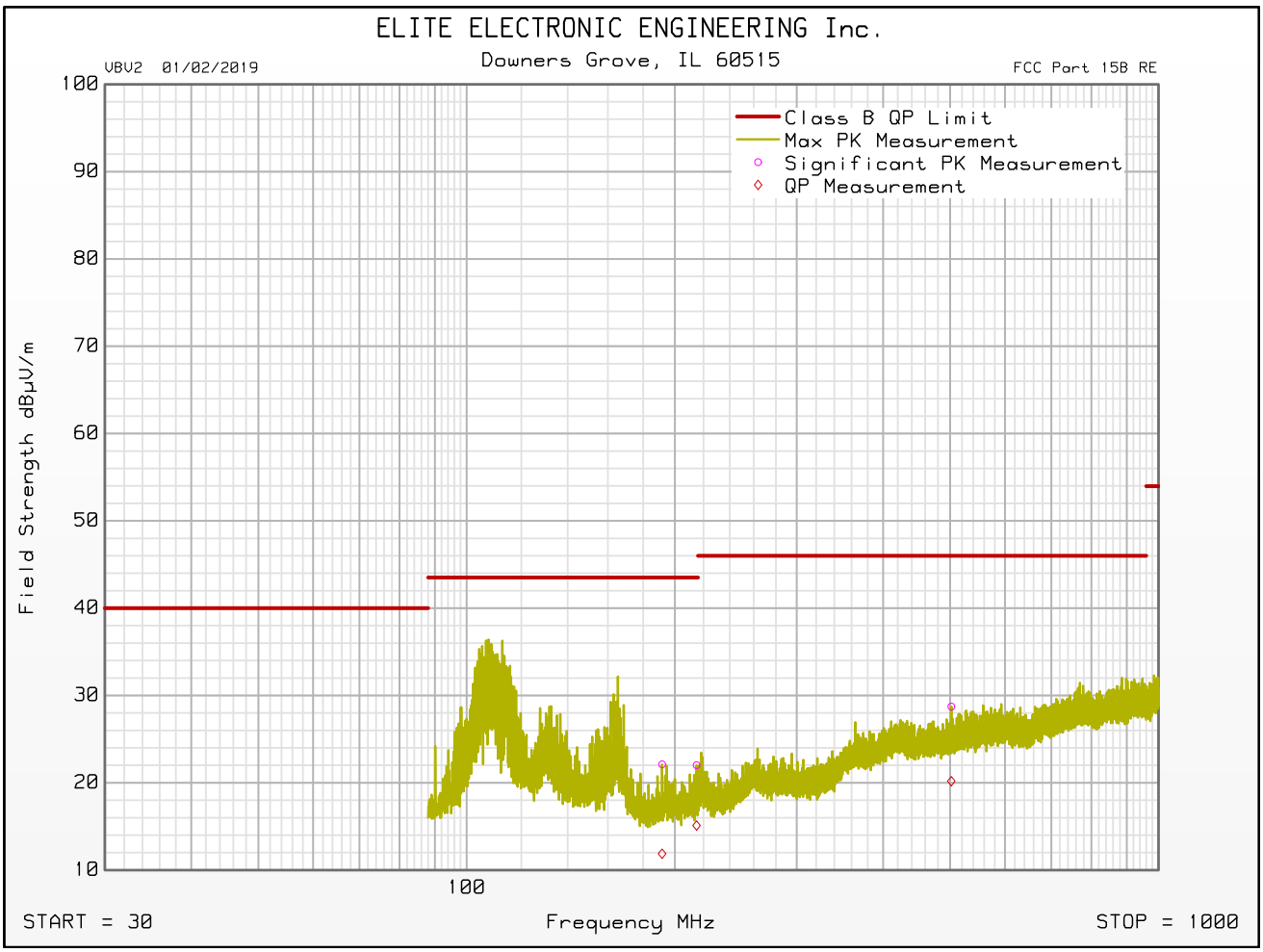
Manufacturer	:	CHAMBERLAIN
Model	:	HDSW24VDC
Serial Number	:	ESL3
DUT Mode	:	CONTINUOUS MOTOR RUN, 70% DUTY CYCLE
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	V
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	WITH EXTERNAL ANTENNA
Test Engineer	:	J. Cardenas
Test Date	:	Dec 13, 2019 09:21:04 AM

Freq (MHz)	Peak Mtr Rdg (dBµV)	QP Mtr Rdg (dBµV)	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 (°)
38.160	23.0	17.4	20.5	0.0	0.4	0.0	43.9	38.3	40.0	-1.7	V	120	270
38.880	21.9	15.7	20.1	0.0	0.4	0.0	42.5	36.2	40.0	-3.8	V	200	225
39.600	23.5	17.7	19.8	0.0	0.4	0.0	43.6	37.8	40.0	-2.2	V	120	270
40.200	22.1	16.5	19.4	0.0	0.4	0.0	42.0	36.3	40.0	-3.7	V	120	225
41.220	23.9	17.6	18.9	0.0	0.4	0.0	43.2	36.9	40.0	-3.1	V	120	270
41.760	24.1	17.9	18.6	0.0	0.4	0.0	43.2	37.0	40.0	-3.0	V	120	225
43.320	21.9	16.5	17.9	0.0	0.4	0.0	40.2	34.7	40.0	-5.3	V	120	225
45.600	19.8	12.9	16.8	0.0	0.4	0.0	37.0	30.0	40.0	-10.0	V	120	225
46.320	23.0	16.9	16.4	0.0	0.4	0.0	39.8	33.7	40.0	-6.3	V	340	135
49.080	18.1	11.0	15.0	0.0	0.4	0.0	33.6	26.4	40.0	-13.6	V	120	90
49.740	17.2	9.7	14.8	0.0	0.4	0.0	32.4	24.9	40.0	-15.1	V	120	135
49.980	17.8	11.0	14.7	0.0	0.4	0.0	32.9	26.0	40.0	-14.0	V	120	90
50.640	17.0	10.6	14.4	0.0	0.4	0.0	31.8	25.4	40.0	-14.6	V	120	135
51.360	19.8	12.9	14.1	0.0	0.4	0.0	34.4	27.4	40.0	-12.6	V	120	90
53.100	18.8	12.0	13.6	0.0	0.4	0.0	32.8	26.0	40.0	-14.0	V	120	135
53.700	18.3	10.8	13.4	0.0	0.4	0.0	32.1	24.6	40.0	-15.4	V	200	90
55.080	19.4	10.5	13.1	0.0	0.4	0.0	32.9	23.9	40.0	-16.1	V	200	270
55.500	22.0	12.3	13.0	0.0	0.4	0.0	35.4	25.6	40.0	-14.4	V	120	90
57.060	24.1	14.4	12.7	0.0	0.4	0.0	37.2	27.5	40.0	-12.5	V	120	315
57.900	22.6	13.1	12.6	0.0	0.4	0.0	35.6	26.1	40.0	-13.9	V	200	315
58.260	24.6	14.3	12.6	0.0	0.4	0.0	37.5	27.2	40.0	-12.8	V	200	270
59.220	25.2	15.4	12.5	0.0	0.4	0.0	38.1	28.2	40.0	-11.8	V	120	270
60.000	25.3	16.1	12.4	0.0	0.4	0.0	38.1	28.9	40.0	-11.1	V	120	270
60.840	27.1	16.7	12.4	0.0	0.4	0.0	39.9	29.5	40.0	-10.5	V	120	270
61.440	24.5	15.3	12.3	0.0	0.4	0.0	37.2	28.1	40.0	-11.9	V	200	270
61.620	25.8	16.3	12.3	0.0	0.4	0.0	38.5	29.0	40.0	-11.0	V	120	270
62.100	22.9	14.4	12.3	0.0	0.4	0.0	35.6	27.1	40.0	-12.9	V	200	270
62.400	23.3	14.8	12.3	0.0	0.4	0.0	36.0	27.5	40.0	-12.5	V	120	270
63.180	22.8	13.7	12.4	0.0	0.4	0.0	35.5	26.4	40.0	-13.6	V	120	270
64.080	18.6	9.5	12.5	0.0	0.4	0.0	31.4	22.4	40.0	-17.6	V	120	315
64.500	18.4	9.4	12.5	0.0	0.4	0.0	31.3	22.3	40.0	-17.7	V	200	270
69.600	15.5	9.0	13.0	0.0	0.4	0.0	28.9	22.5	40.0	-17.5	V	120	270
70.500	14.1	7.1	13.1	0.0	0.4	0.0	27.6	20.7	40.0	-19.3	V	120	315
71.100	14.5	7.5	13.2	0.0	0.4	0.0	28.1	21.1	40.0	-18.9	V	120	270

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

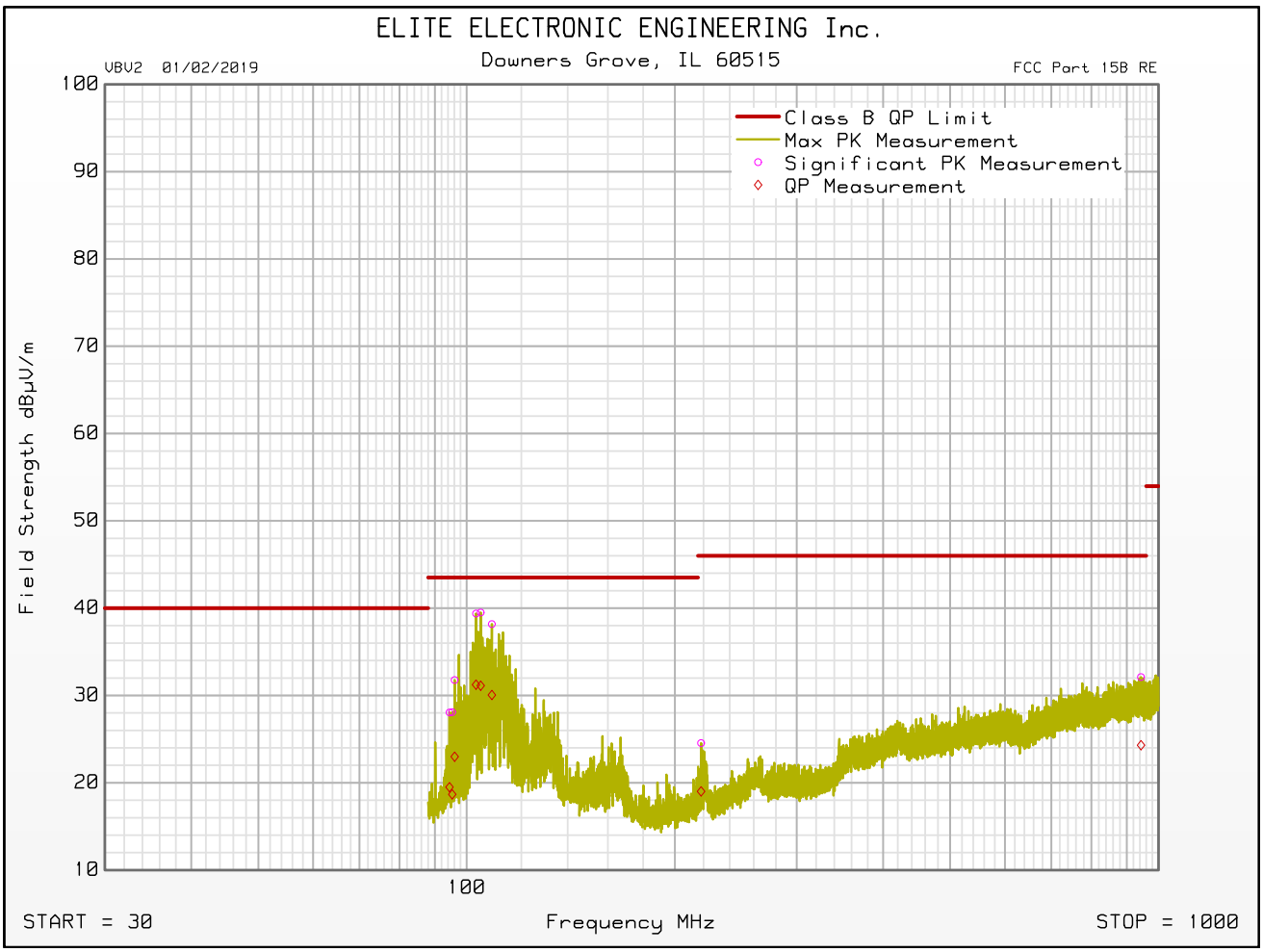
Manufacturer	:	CHAMBERLAIN
Model	:	HDSW24VDC
Serial Number	:	ESL3
DUT Mode	:	CONTINUOUS MOTOR RUN, 70% DUTY CYCLE
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	H
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	WITH EXTERNAL ANTENNA
Test Engineer	:	J. Cardenas
Test Date	:	Dec 13, 2019 09:56:02 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	HDSW24VDC
Serial Number	:	ESL3
DUT Mode	:	CONTINUOUS MOTOR RUN, 70% DUTY CYCLE
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	V
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	WITH EXTERNAL ANTENNA
Test Engineer	:	J. Cardenas
Test Date	:	Dec 13, 2019 09:56:02 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

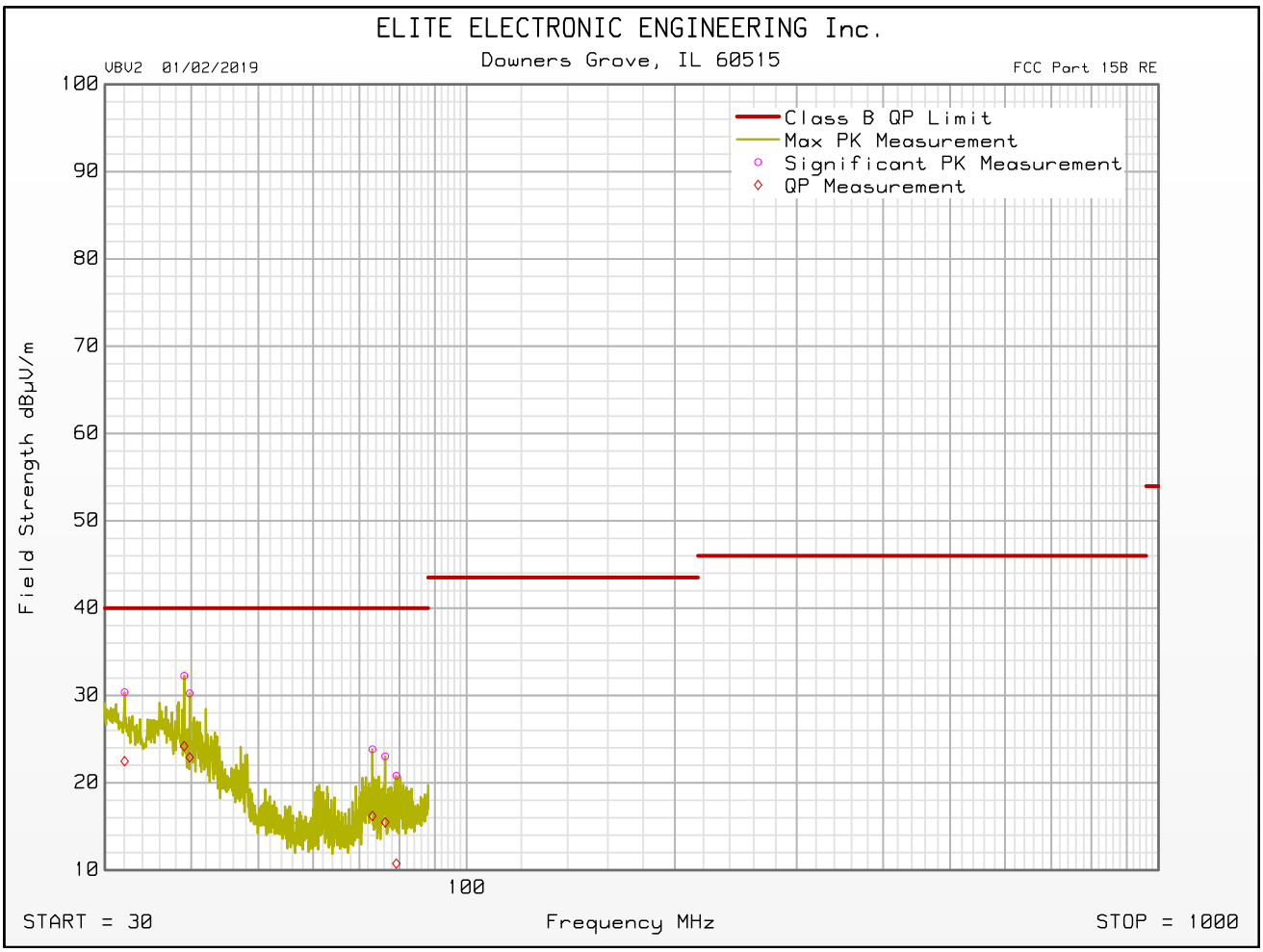
Manufacturer	:	CHAMBERLAIN
Model	:	HDSW24VDC
Serial Number	:	ESL3
DUT Mode	:	CONTINUOUS MOTOR RUN, 70% DUTY CYCLE
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	WITH EXTERNAL ANTENNA
Test Engineer	:	J. Cardenas
Test Date	:	Dec 13, 2019 09:56:02 AM

Freq (MHz)	Peak Mtr Rdg (dBµV)	QP Mtr Rdg (dBµV)	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 (°)
94.480	10.3	1.7	17.4	0.0	0.4	0.0	28.1	19.5	43.5	-24.0	V	120	90
95.320	10.2	0.8	17.5	0.0	0.4	0.0	28.1	18.7	43.5	-24.8	V	120	0
96.100	13.8	5.1	17.6	0.0	0.4	0.0	31.8	23.0	43.5	-20.5	V	120	45
103.180	20.8	12.6	18.2	0.0	0.4	0.0	39.4	31.2	43.5	-12.3	V	120	90
104.800	20.7	12.4	18.3	0.0	0.4	0.0	39.5	31.1	43.5	-12.4	V	120	45
108.760	19.1	10.9	18.7	0.0	0.4	0.0	38.2	30.1	43.5	-13.5	V	120	90
191.680	5.5	-4.8	15.9	0.0	0.7	0.0	22.1	11.9	43.5	-31.6	H	340	270
214.960	5.1	-1.8	16.2	0.0	0.8	0.0	22.0	15.1	43.5	-28.4	H	120	180
218.220	7.4	1.9	16.3	0.0	0.8	0.0	24.5	19.0	46.0	-27.0	V	200	135
501.900	3.8	-4.7	23.8	0.0	1.1	0.0	28.7	20.2	46.0	-25.8	H	200	0
943.560	3.3	-4.5	27.3	0.0	1.5	0.0	32.1	24.3	46.0	-21.7	V	120	225

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	HDSW24VDC
Serial Number	:	ESL3
DUT Mode	:	CONTINUOUS MOTOR RUN, 70% DUTY CYCLE
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	H
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	
Test Engineer	:	J. Cardenas
Test Date	:	Dec 13, 2019 10:16:39 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

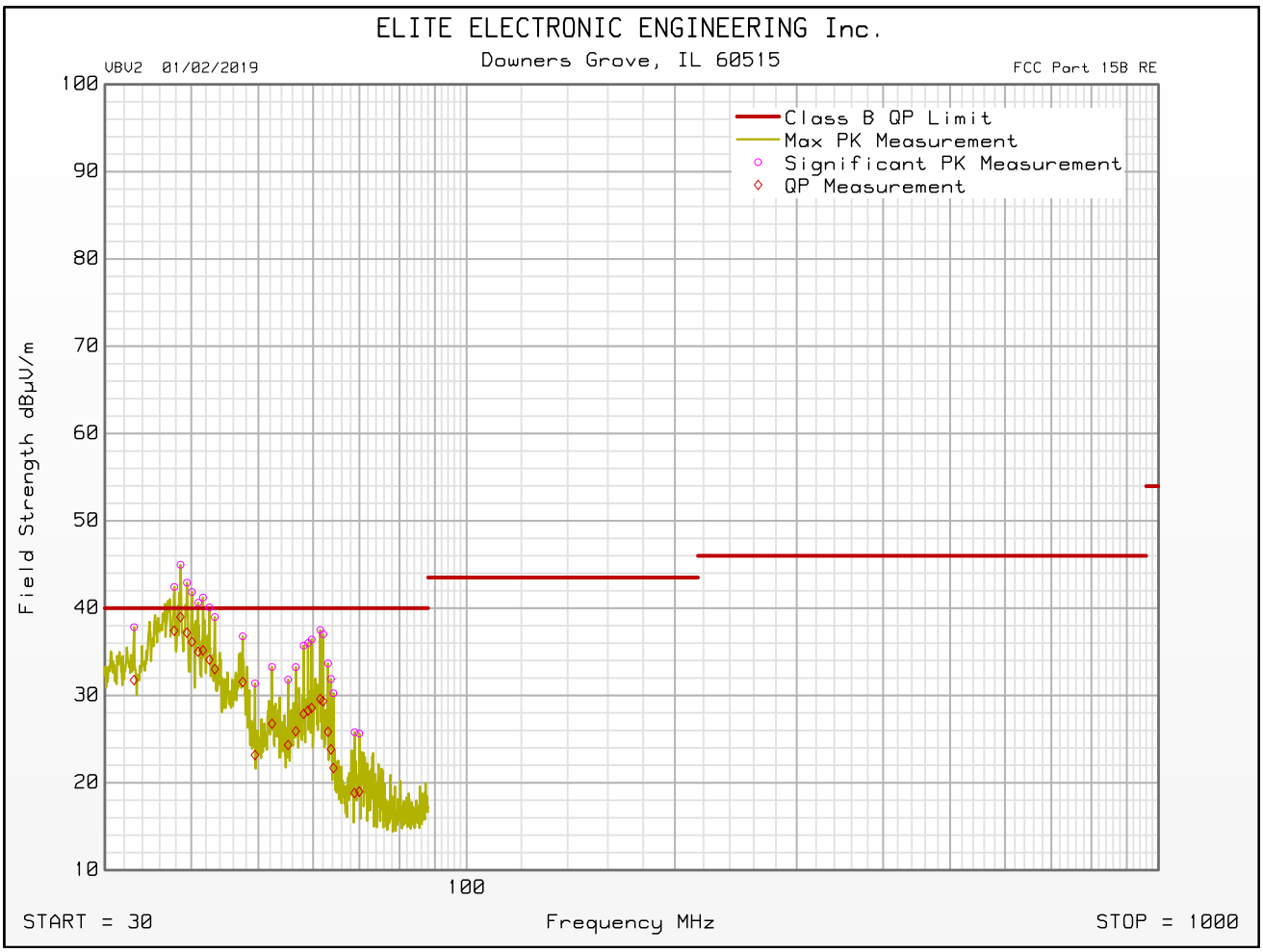
Manufacturer	:	CHAMBERLAIN
Model	:	HDSW24VDC
Serial Number	:	ESL3
DUT Mode	:	CONTINUOUS MOTOR RUN, 70% DUTY CYCLE
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	H
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	
Test Engineer	:	J. Cardenas
Test Date	:	Dec 13, 2019 10:16:39 AM

Freq (MHz)	Peak Mtr Rdg (dBµV)	QP Mtr Rdg (dBµV)	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 (°)
32.040	5.8	-2.1	24.2	0.0	0.4	0.0	30.4	22.5	40.0	-17.5	H	200	315
39.060	11.8	3.8	20.0	0.0	0.4	0.0	32.3	24.2	40.0	-15.8	H	340	315
39.780	10.2	2.9	19.7	0.0	0.4	0.0	30.2	22.9	40.0	-17.1	H	340	315
73.080	9.8	2.2	13.6	0.0	0.4	0.0	23.8	16.2	40.0	-23.8	H	340	180
76.260	8.4	0.8	14.3	0.0	0.4	0.0	23.0	15.5	40.0	-24.5	H	340	180
79.140	5.6	-4.5	14.8	0.0	0.4	0.0	20.8	10.7	40.0	-29.3	H	340	315

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	HDSW24VDC
Serial Number	:	ESL3
DUT Mode	:	CONTINUOUS MOTOR RUN, 70% DUTY CYCLE
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	V
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	
Test Engineer	:	J. Cardenas
Test Date	:	Dec 13, 2019 09:01:14 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

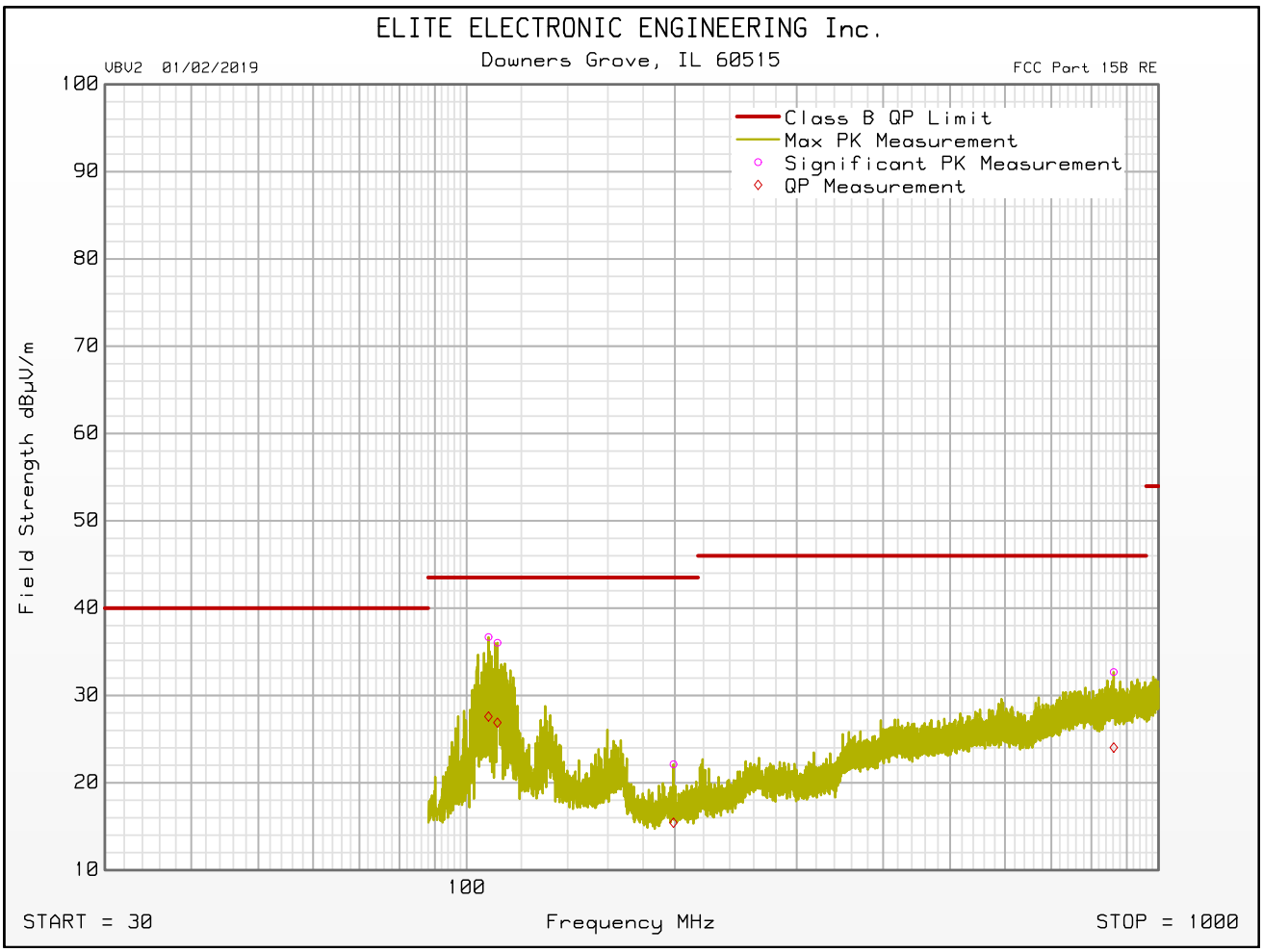
Manufacturer : CHAMBERLAIN
Model : HDSW24VDC
Serial Number : ESL3
DUT Mode : CONTINUOUS MOTOR RUN, 70% DUTY CYCLE
Turntable Step Angle (°): 45
Mast Positions (cm) : 120, 200, 340
Ant. Polarization(s) : V
Scan Type : Stepped Scan
Test RBW : 120 kHz
Prelim Dwell Time (s) : 0.0001
Notes :
Test Engineer : J. Cardenas
Test Date : Dec 13, 2019 09:01:14 AM

Freq (MHz)	Peak Mtr Rdg (dBµV)	QP Mtr Rdg (dBµV)	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 (°)
33.060	13.9	7.8	23.6	0.0	0.4	0.0	37.8	31.8	40.0	-8.2	V	120	270
37.800	21.3	16.3	20.7	0.0	0.4	0.0	42.4	37.4	40.0	-2.6	V	120	270
38.580	24.3	18.3	20.3	0.0	0.4	0.0	45.0	39.0	40.0	-1.0	V	120	270
39.420	22.7	17.0	19.9	0.0	0.4	0.0	42.9	37.2	40.0	-2.8	V	120	315
40.080	22.0	16.3	19.5	0.0	0.4	0.0	41.8	36.1	40.0	-3.9	V	120	225
40.920	21.2	15.6	19.1	0.0	0.4	0.0	40.6	35.0	40.0	-5.0	V	120	270
41.580	22.1	16.1	18.7	0.0	0.4	0.0	41.2	35.2	40.0	-4.8	V	120	225
42.480	21.4	15.4	18.3	0.0	0.4	0.0	40.1	34.1	40.0	-5.9	V	120	270
43.260	20.7	14.7	17.9	0.0	0.4	0.0	39.0	33.0	40.0	-7.0	V	120	270
47.460	20.6	15.3	15.8	0.0	0.4	0.0	36.8	31.5	40.0	-8.5	V	120	90
49.440	16.1	7.9	14.9	0.0	0.4	0.0	31.4	23.2	40.0	-16.8	V	120	135
52.320	19.1	12.6	13.8	0.0	0.4	0.0	33.3	26.8	40.0	-13.2	V	120	90
55.200	18.4	10.9	13.0	0.0	0.4	0.0	31.8	24.3	40.0	-15.7	V	120	90
56.640	20.1	12.8	12.8	0.0	0.4	0.0	33.2	25.9	40.0	-14.1	V	120	270
58.140	22.8	14.9	12.6	0.0	0.4	0.0	35.7	27.9	40.0	-12.1	V	120	270
58.980	23.1	15.4	12.5	0.0	0.4	0.0	36.0	28.3	40.0	-11.7	V	120	270
59.700	23.6	15.8	12.4	0.0	0.4	0.0	36.4	28.6	40.0	-11.4	V	120	270
61.440	24.8	16.9	12.3	0.0	0.4	0.0	37.5	29.6	40.0	-10.4	V	120	270
62.040	24.3	16.6	12.3	0.0	0.4	0.0	37.0	29.3	40.0	-10.7	V	120	270
63.060	20.9	13.1	12.3	0.0	0.4	0.0	33.7	25.8	40.0	-14.2	V	120	225
63.660	19.1	11.1	12.4	0.0	0.4	0.0	31.9	23.8	40.0	-16.2	V	120	225
64.200	17.4	8.8	12.5	0.0	0.4	0.0	30.3	21.7	40.0	-18.3	V	200	315
68.880	12.5	5.5	13.0	0.0	0.4	0.0	25.8	18.8	40.0	-21.2	V	200	315
69.960	12.2	5.5	13.1	0.0	0.4	0.0	25.6	19.0	40.0	-21.0	V	120	315

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

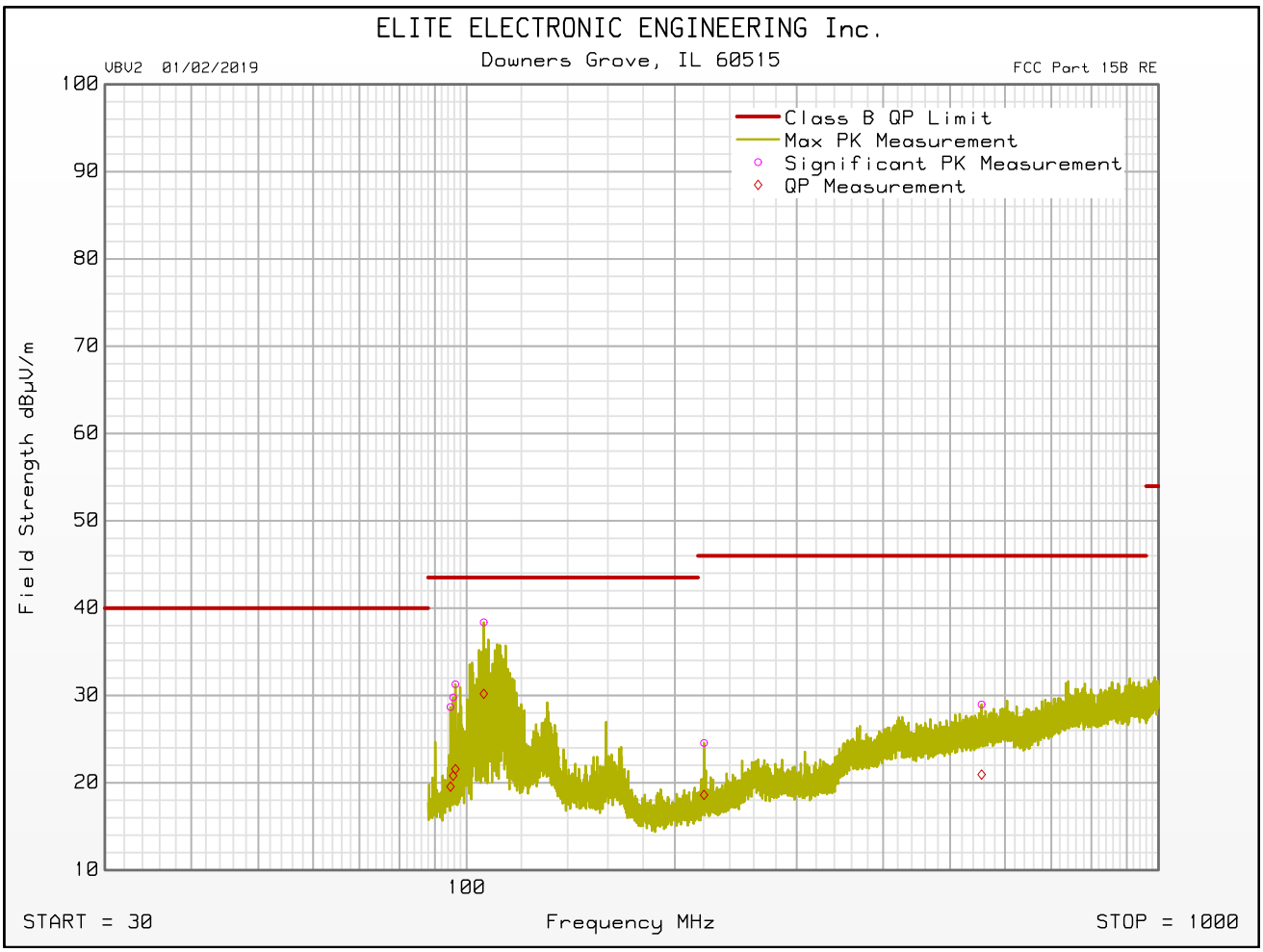
Manufacturer	:	CHAMBERLAIN
Model	:	HDSW24VDC
Serial Number	:	ESL3
DUT Mode	:	CONTINUOUS MOTOR RUN, 70% DUTY CYCLE
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	H
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	
Test Engineer	:	J. Cardenas
Test Date	:	Dec 13, 2019 10:34:05 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	HDSW24VDC
Serial Number	:	ESL3
DUT Mode	:	CONTINUOUS MOTOR RUN, 70% DUTY CYCLE
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	V
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	
Test Engineer	:	J. Cardenas
Test Date	:	Dec 13, 2019 10:34:05 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

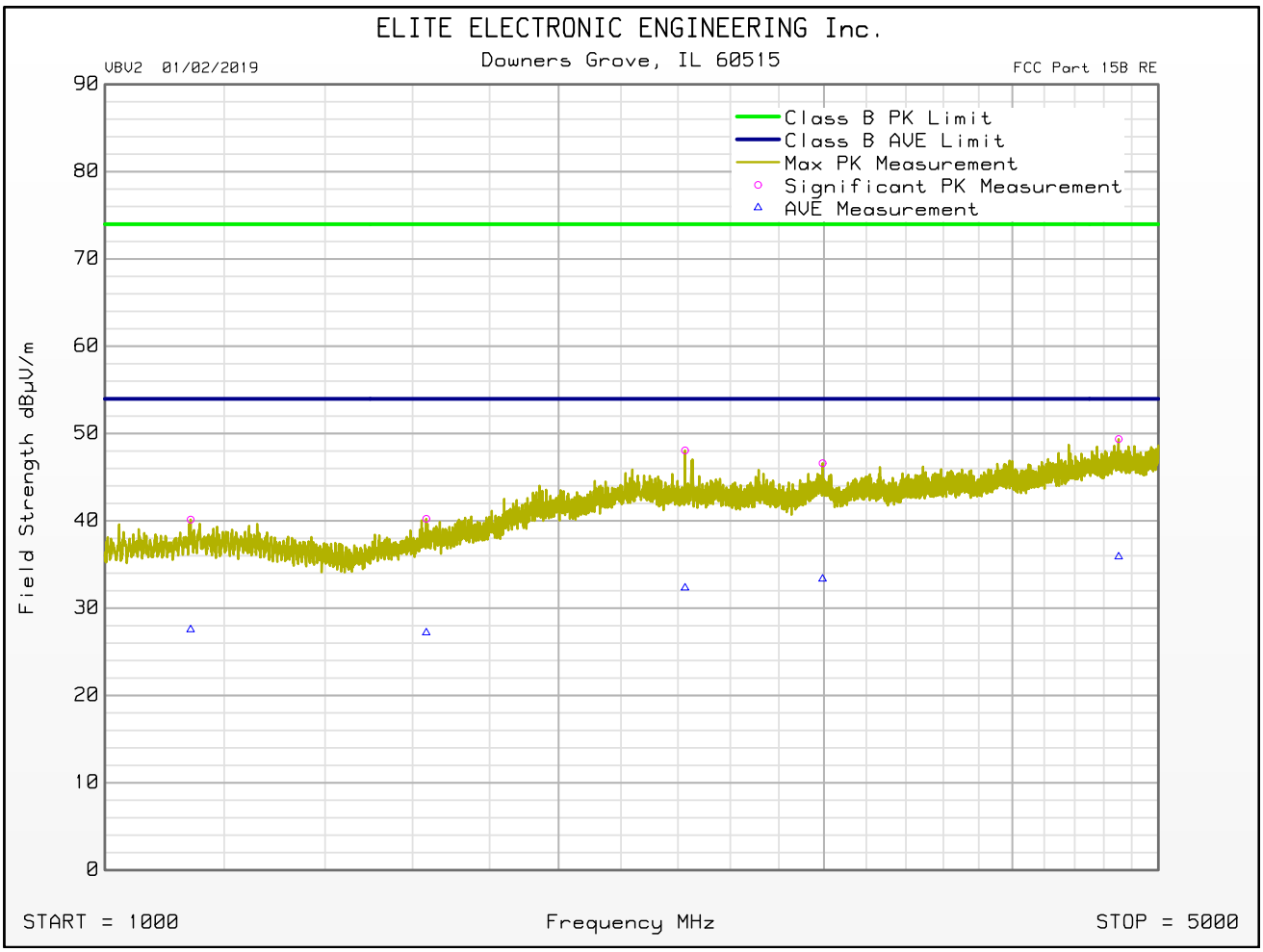
Manufacturer	:	CHAMBERLAIN
Model	:	HDSW24VDC
Serial Number	:	ESL3
DUT Mode	:	CONTINUOUS MOTOR RUN, 70% DUTY CYCLE
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	With Internal Antenna
Test Engineer	:	J. Cardenas
Test Date	:	Dec 13, 2019 10:34:05 AM

Freq (MHz)	Peak Mtr Rdg (dBµV)	QP Mtr Rdg (dBµV)	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 (°)
94.780	10.9	1.8	17.4	0.0	0.4	0.0	28.7	19.6	43.5	-24.0	V	120	90
95.620	11.9	2.9	17.5	0.0	0.4	0.0	29.8	20.8	43.5	-22.7	V	120	90
96.340	13.3	3.6	17.6	0.0	0.4	0.0	31.3	21.6	43.5	-22.0	V	120	90
105.880	19.5	11.3	18.4	0.0	0.4	0.0	38.4	30.2	43.5	-13.3	V	120	90
107.560	17.7	8.6	18.6	0.0	0.4	0.0	36.7	27.6	43.5	-15.9	H	340	180
110.800	16.7	7.6	18.9	0.0	0.4	0.0	36.0	26.9	43.5	-16.6	H	340	0
199.060	5.2	-1.5	16.2	0.0	0.8	0.0	22.1	15.4	43.5	-28.1	H	120	135
220.380	7.4	1.4	16.4	0.0	0.8	0.0	24.6	18.6	46.0	-27.4	V	200	135
555.060	3.1	-4.9	24.7	0.0	1.1	0.0	29.0	20.9	46.0	-25.1	V	200	315
861.660	4.0	-4.6	27.1	0.0	1.5	0.0	32.7	24.0	46.0	-22.0	H	340	315

FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

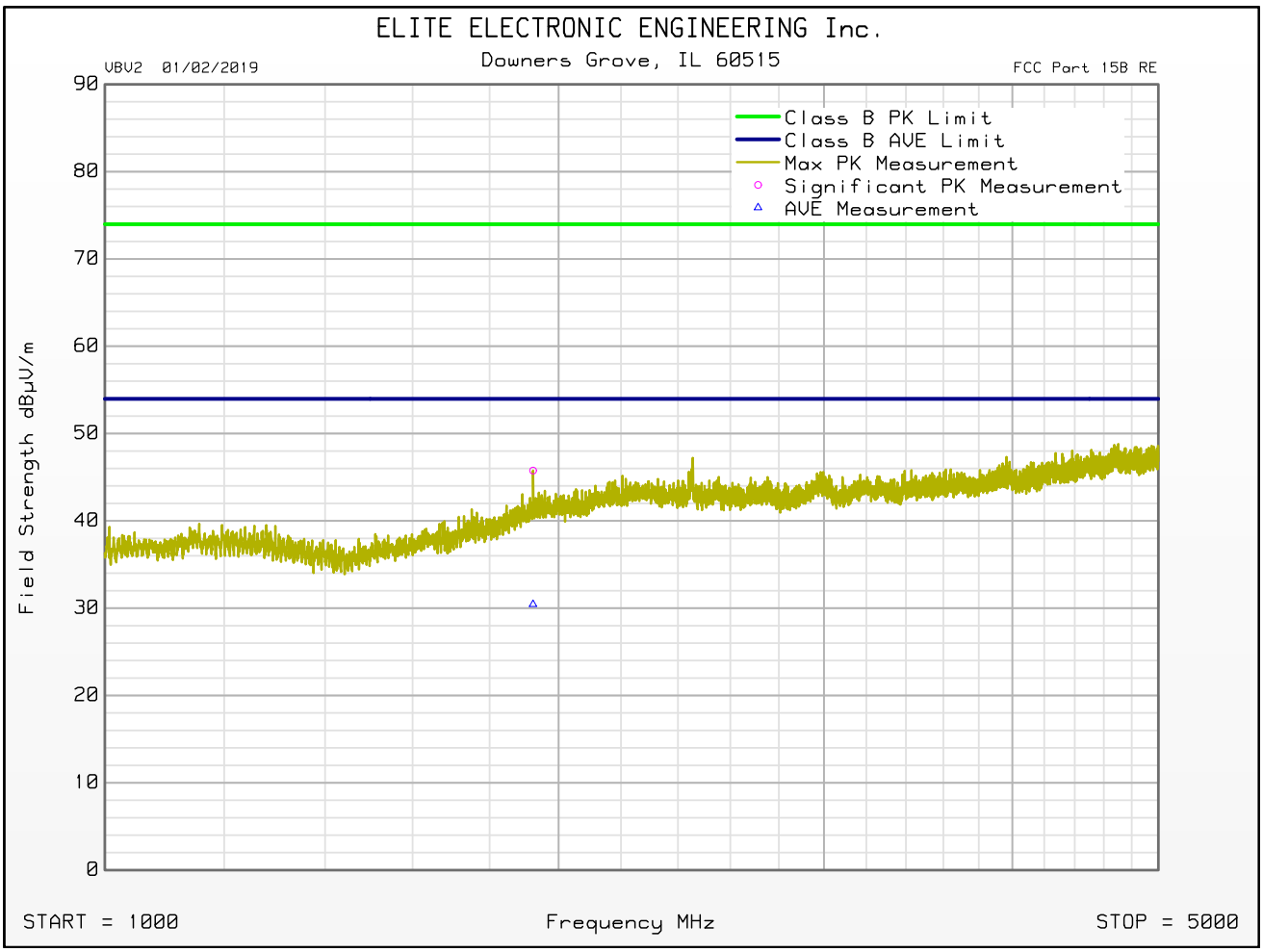
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	MOTOR RATE @ 80%
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	H
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	120VAC 60HZ
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 04, 2019 11:11:33 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	MOTOR RATE @ 80%
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Ant. Polarization(s)	:	V
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	120VAC 60HZ
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 04, 2019 11:11:33 AM



FCC Part 15B Class B Radiated RF Emissions Test

SW ID/Rev: VBV2 01/02/2019

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
Serial Number	:	ESL3
DUT Mode	:	MOTOR RATE @ 80%
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	120VAC 60HZ
Test Engineer	:	T. Jozefczyk
Test Date	:	Nov 04, 2019 11:11:33 AM

Freq (GHz)	Peak Mtr Rdg (dBµV)	Ave. Mtr Rdg (dBµV)	Ant Fac (dB)	Amp Fac (dB)	Cbl Fac (dB)	Dist Corr (dB)	Peak Total (dBµV/m)	Peak Limit (dBµV/m)	Peak Lim Mrg (dB)	Ave. Total (dBµV/m)	Ave. Limit (dBµV/m)	Ave. Lim Mrg (dB)	Ant Pol	Mast Ht (cm)	Azim (°)
1.14	48.5	35.9	29.7	-40.9	2.9	0.0	40.1	74.0	-33.8	27.6	54.0	-26.4	H	340	225
1.634	47.6	34.6	29.5	-40.2	3.3	0.0	40.2	74.0	-33.7	27.2	54.0	-26.8	H	200	315
1.9235	49.8	34.5	32.3	-40.0	3.6	0.0	45.8	74.0	-28.2	30.4	54.0	-23.5	V	120	315
2.426	50.5	34.8	33.6	-40.2	4.2	0.0	48.1	74.0	-25.9	32.3	54.0	-21.7	H	120	180
2.9935	47.4	34.2	34.5	-39.9	4.6	0.0	46.6	74.0	-27.4	33.3	54.0	-20.6	H	340	135
4.7055	46.5	33.0	36.8	-39.7	5.8	0.0	49.4	74.0	-24.6	35.9	54.0	-18.1	H	340	45

FCC Part 15 Subpart B Conducted Emissions Test

Significant Emissions Data

VBR8 04/23/2015

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
DUT Revision	:	1.0
Serial Number	:	ESL3
DUT Mode	:	FHSS
Line Tested	:	120VAC 60HZ HIGH LINE
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	0
Notes	:	
Test Engineer	:	T. Jozefczyk
Limit	:	Class B
Test Date	:	Nov 04, 2019 04:05:42 PM
Data Filter	:	Up to 80 maximum levels detected with 6 dB level excursion threshold

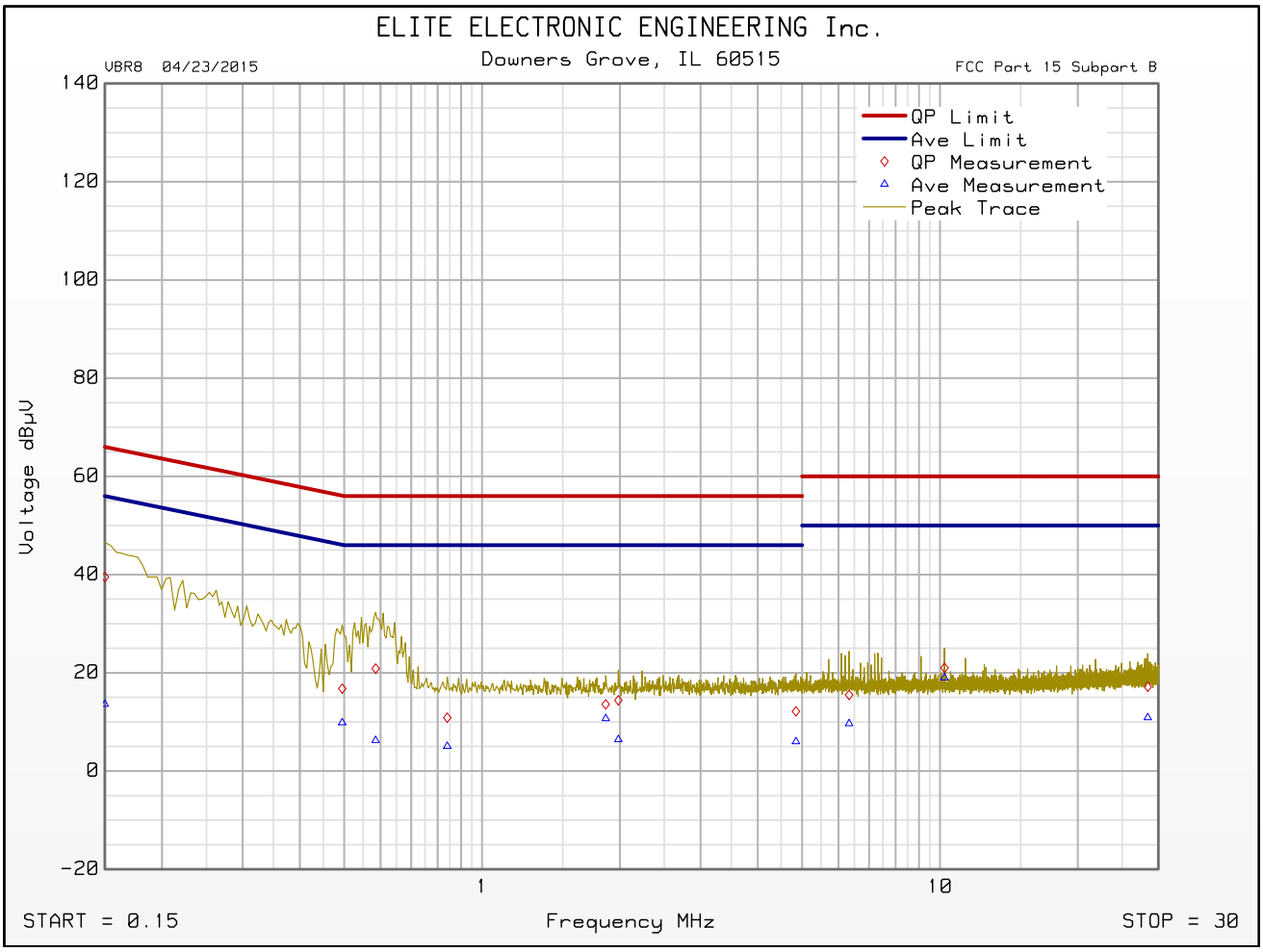
Freq MHz	Quasi-peak Level dBµV	Quasi-peak Limit dBµV	Excessive Quasi-peak Emissions	Average Level dBµV	Average Limit dBµV	Excessive Average Emissions
0.150	39.5	66.0		13.6	56.0	
0.495	16.8	56.1		9.9	46.1	
0.586	20.9	56.0		6.2	46.0	
0.840	10.9	56.0		5.0	46.0	
1.862	13.6	56.0		10.7	46.0	
1.985	14.4	56.0		6.5	46.0	
4.846	12.2	56.0		6.0	46.0	
6.332	15.5	60.0		9.7	50.0	
10.229	21.0	60.0		19.0	50.0	
28.436	17.2	60.0		10.9	50.0	

FCC Part 15 Subpart B Conducted Emissions Test

Cumulative Data

VBR8 04/23/2015

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
DUT Revision	:	1.0
Serial Number	:	ESL3
DUT Mode	:	FHSS
Line Tested	:	120VAC 60HZ HIGH LINE
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	0
Notes	:	
Test Engineer	:	T. Jozefczyk
Limit	:	Class B
Test Date	:	Nov 04, 2019 04:05:42 PM



Emissions Meet QP Limit
Emissions Meet Ave Limit

FCC Part 15 Subpart B Conducted Emissions Test

Significant Emissions Data

VBR8 04/23/2015

Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
DUT Revision	:	1.0
Serial Number	:	ESL3
DUT Mode	:	FHSS
Line Tested	:	120VAC 60HZ NEUTRAL LINE
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	0
Notes	:	
Test Engineer	:	T. Jozefczyk
Limit	:	Class B
Test Date	:	Nov 04, 2019 04:10:52 PM
Data Filter	:	Up to 80 maximum levels detected with 6 dB level excursion threshold

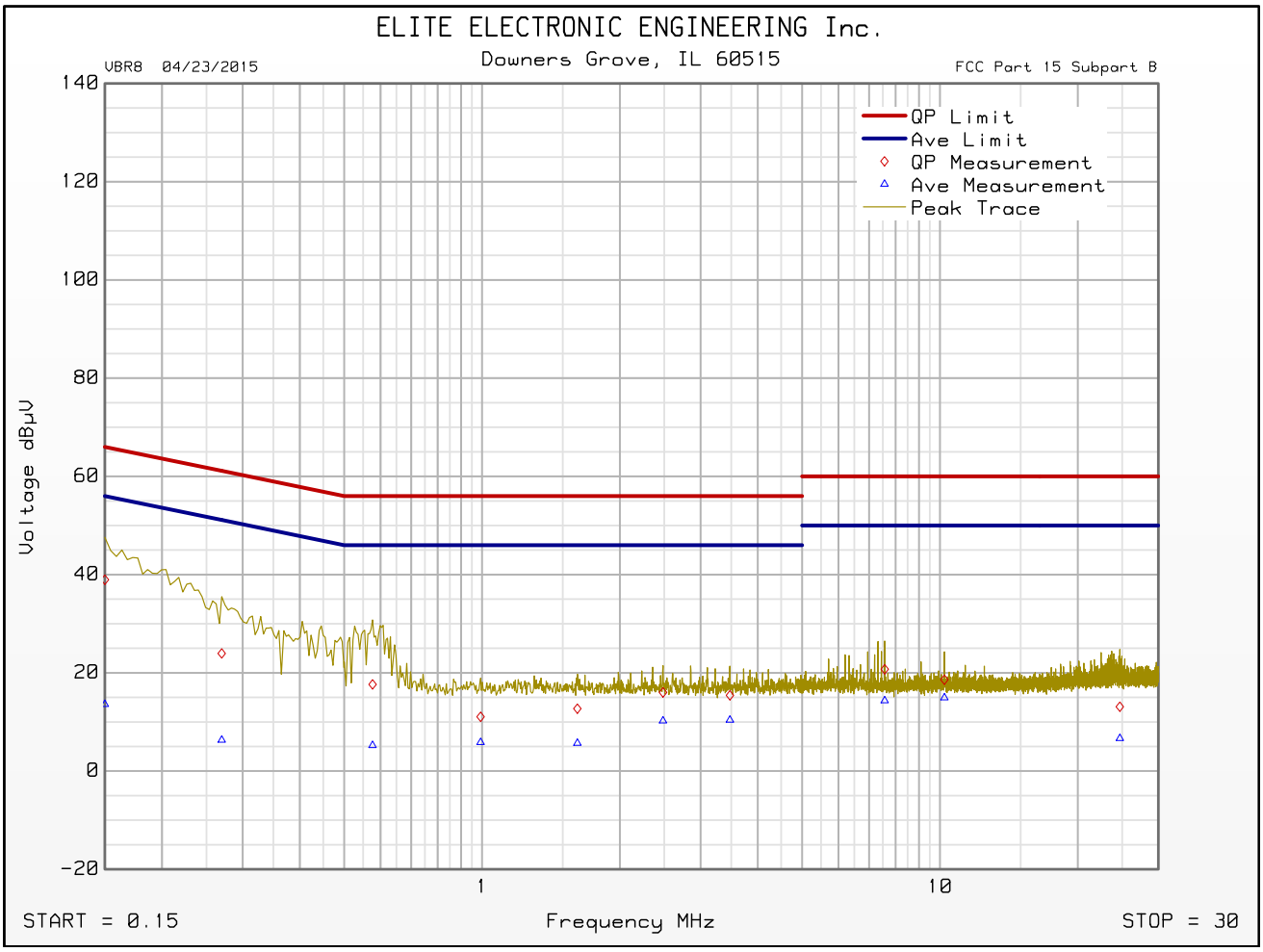
Freq MHz	Quasi-peak Level dBµV	Quasi-peak Limit dBµV	Excessive Quasi-peak Emissions	Average Level dBµV	Average Limit dBµV	Excessive Average Emissions
0.150	39.0	66.0		13.6	56.0	
0.270	23.9	61.1		6.3	51.1	
0.577	17.6	56.0		5.2	46.0	
0.993	11.0	56.0		5.8	46.0	
1.615	12.7	56.0		5.7	46.0	
2.484	16.0	56.0		10.2	46.0	
3.478	15.4	56.0		10.4	46.0	
7.574	20.7	60.0		14.3	50.0	
10.224	18.6	60.0		14.9	50.0	
24.706	13.1	60.0		6.7	50.0	

FCC Part 15 Subpart B Conducted Emissions Test

Cumulative Data

VBR8 04/23/2015

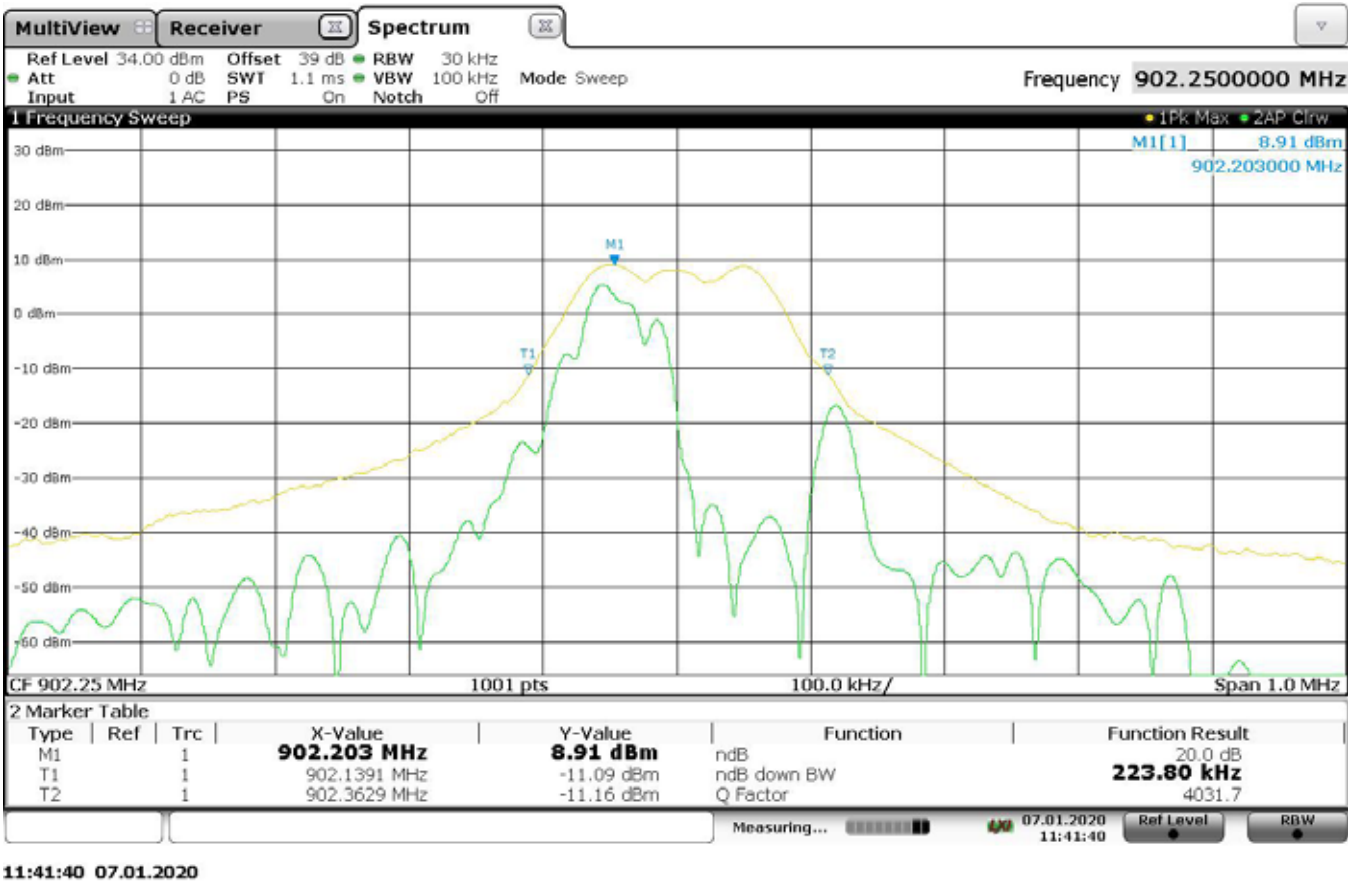
Manufacturer	:	CHAMBERLAIN
Model	:	GATE OPERATOR
DUT Revision	:	1.0
Serial Number	:	ESL3
DUT Mode	:	FHSS
Line Tested	:	120VAC 60HZ NEUTRAL LINE
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	0
Notes	:	
Test Engineer	:	T. Jozefczyk
Limit	:	Class B
Test Date	:	Nov 04, 2019 04:10:52 PM



Emissions Meet QP Limit
Emissions Meet Ave Limit

DATA PAGE	
MANUFACTURER	The Chamberlain Group, Inc.
EUT	Main/Control PCB Transceiver
MODEL NO.	001D9525-01
SERIAL NO.	ESL3
TEST	FCC §15.247, RSS-247 – Occupied Bandwidth - Conducted
MODE	Tx – 902.25MHz
DATE TESTED	November 20, 2019
TEST PERFORMED BY	Tylar Jozefczyk
NOTES	20dB BW = 223.8kHz

OCCUPIED BANDWIDTH – 20DB BW

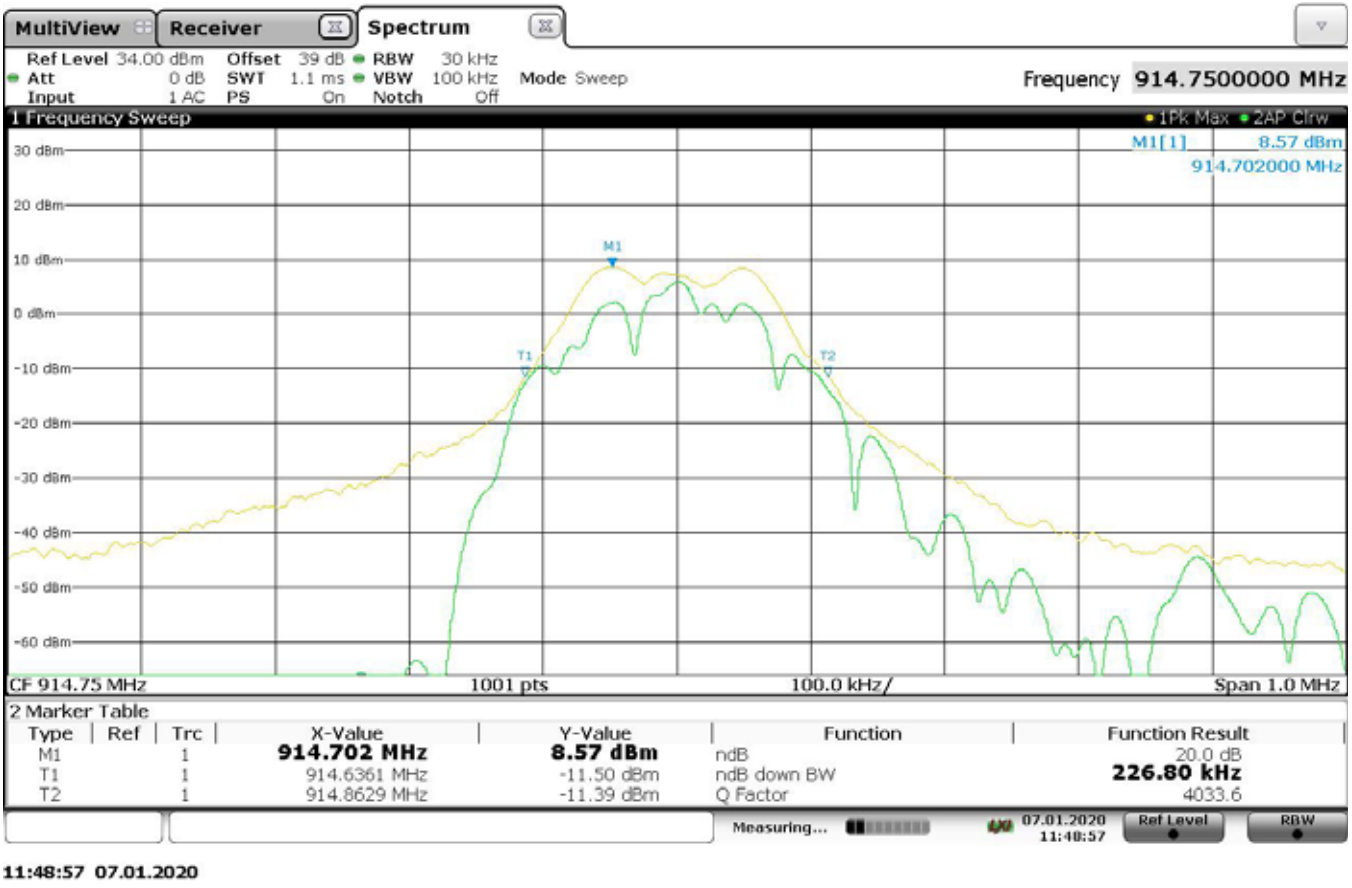


DATA PAGE	
MANUFACTURER	The Chamberlain Group, Inc.
EUT	Main/Control PCB Transceiver
MODEL NO.	001D9525-01
SERIAL NO.	ESL3
TEST	FCC §15.247, RSS-247 – Occupied Bandwidth - Conducted
MODE	Tx – 902.25MHz
DATE TESTED	November 20, 2019
TEST PERFORMED BY	Tylar Jozefczyk
NOTES	99% BW = 186.298kHz

OCCUPIED BANDWIDTH – 99%

DATA PAGE	
MANUFACTURER	The Chamberlain Group, Inc.
EUT	Main/Control PCB Transceiver
MODEL NO.	001D9525-01
SERIAL NO.	ESL3
TEST	FCC §15.247, RSS-247 – Occupied Bandwidth - Conducted
MODE	Tx – 914.75MHz
DATE TESTED	November 20, 2019
TEST PERFORMED BY	Tylar Jozefczyk
NOTES	20dB BW = 226.8kHz

OCCUPIED BANDWIDTH – 20DB BW



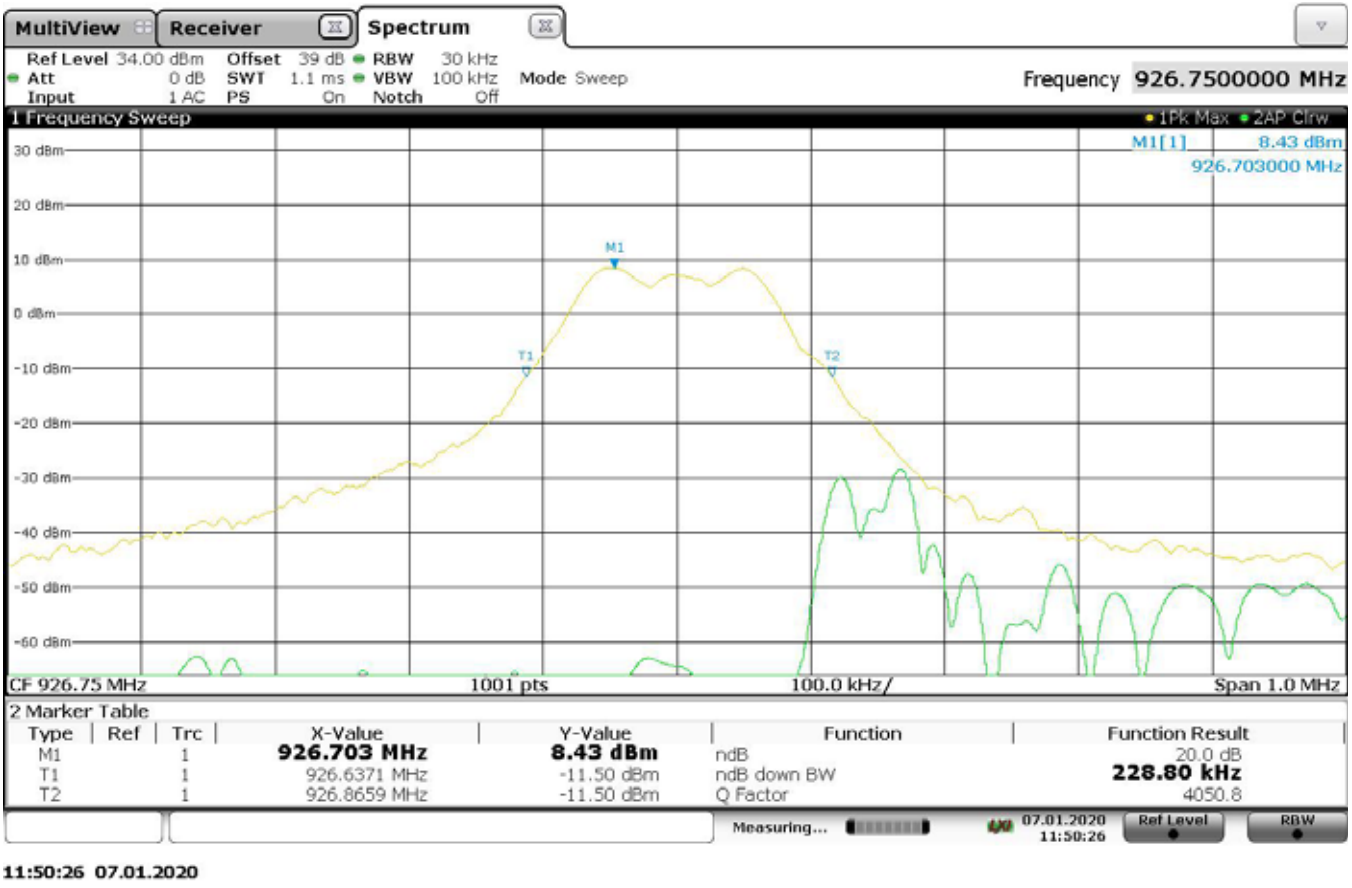
DATA PAGE	
MANUFACTURER	The Chamberlain Group, Inc.
EUT	Main/Control PCB Transceiver
MODEL NO.	001D9525-01
SERIAL NO.	ESL3
TEST	FCC §15.247, RSS-247 – Occupied Bandwidth - Conducted
MODE	Tx – 914.75MHz
DATE TESTED	November 20, 2019
TEST PERFORMED BY	Tylar Jozefczyk
NOTES	99% BW = 190.687kHz

OCCUPIED BANDWIDTH – 99%

11:48:28 07.01.2020

DATA PAGE	
MANUFACTURER	The Chamberlain Group, Inc.
EUT	Main/Control PCB Transceiver
MODEL NO.	001D9525-01
SERIAL NO.	ESL3
TEST	FCC §15.247, RSS-247 – Occupied Bandwidth - Conducted
MODE	Tx – 926.75MHz
DATE TESTED	November 20, 2019
TEST PERFORMED BY	Tylar Jozefczyk
NOTES	20dB BW = 228.8kHz

OCCUPIED BANDWIDTH – 20DB BW



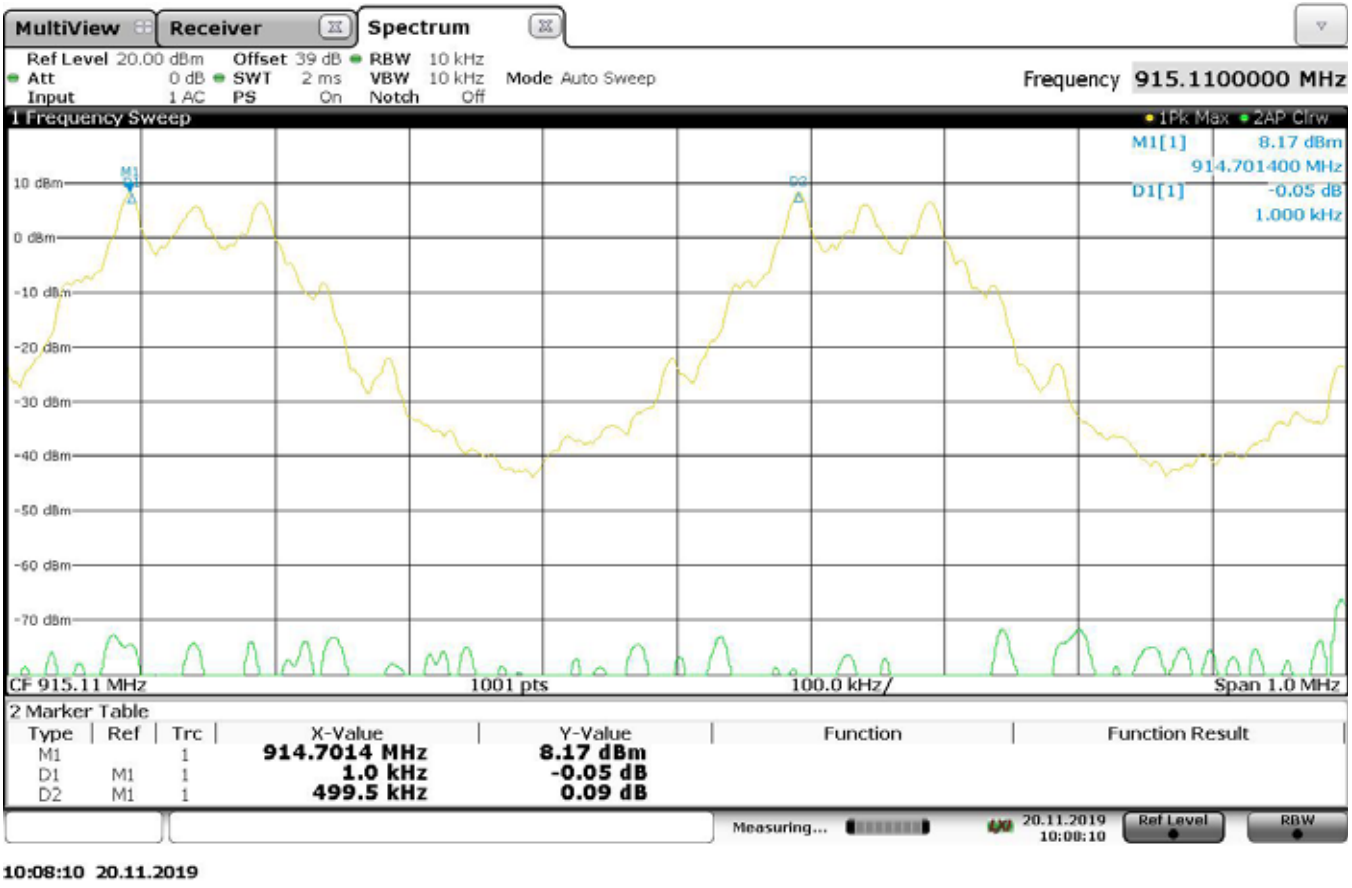
DATA PAGE	
MANUFACTURER	The Chamberlain Group, Inc.
EUT	Main/Control PCB Transceiver
MODEL NO.	001D9525-01
SERIAL NO.	ESL3
TEST	FCC §15.247, RSS-247 – Occupied Bandwidth - Conducted
MODE	Tx – 926.75MHz
DATE TESTED	November 20, 2019
TEST PERFORMED BY	Tylar Jozefczyk
NOTES	99% BW = 191.98kHz

OCCUPIED BANDWIDTH – 99%

11:51:39 07.01.2020

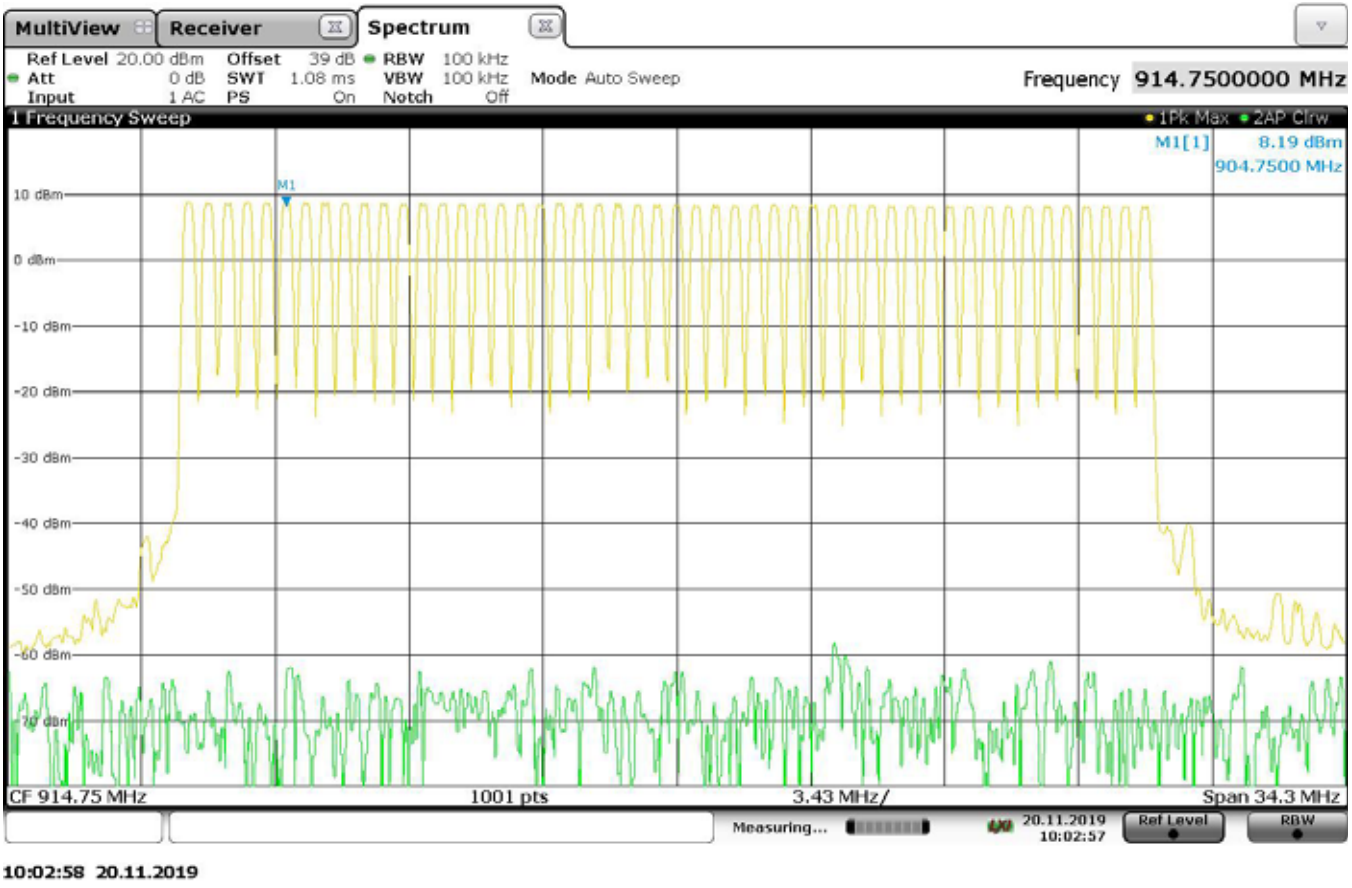
DATA PAGE	
MANUFACTURER	The Chamberlain Group, Inc.
EUT	Main/Control PCB Transceiver
MODEL NO.	001D9525-01
SERIAL NO.	ESL3
TEST	FCC §15.247, RSS-247 – Carrier Frequency Separation
MODE	Tx - FHSS
DATE TESTED	November 20, 2019
TEST PERFORMED BY	Tylar Jozefczyk
NOTES	Separation = 499.5kHz

CARRIER FREQUENCY SEPARATION



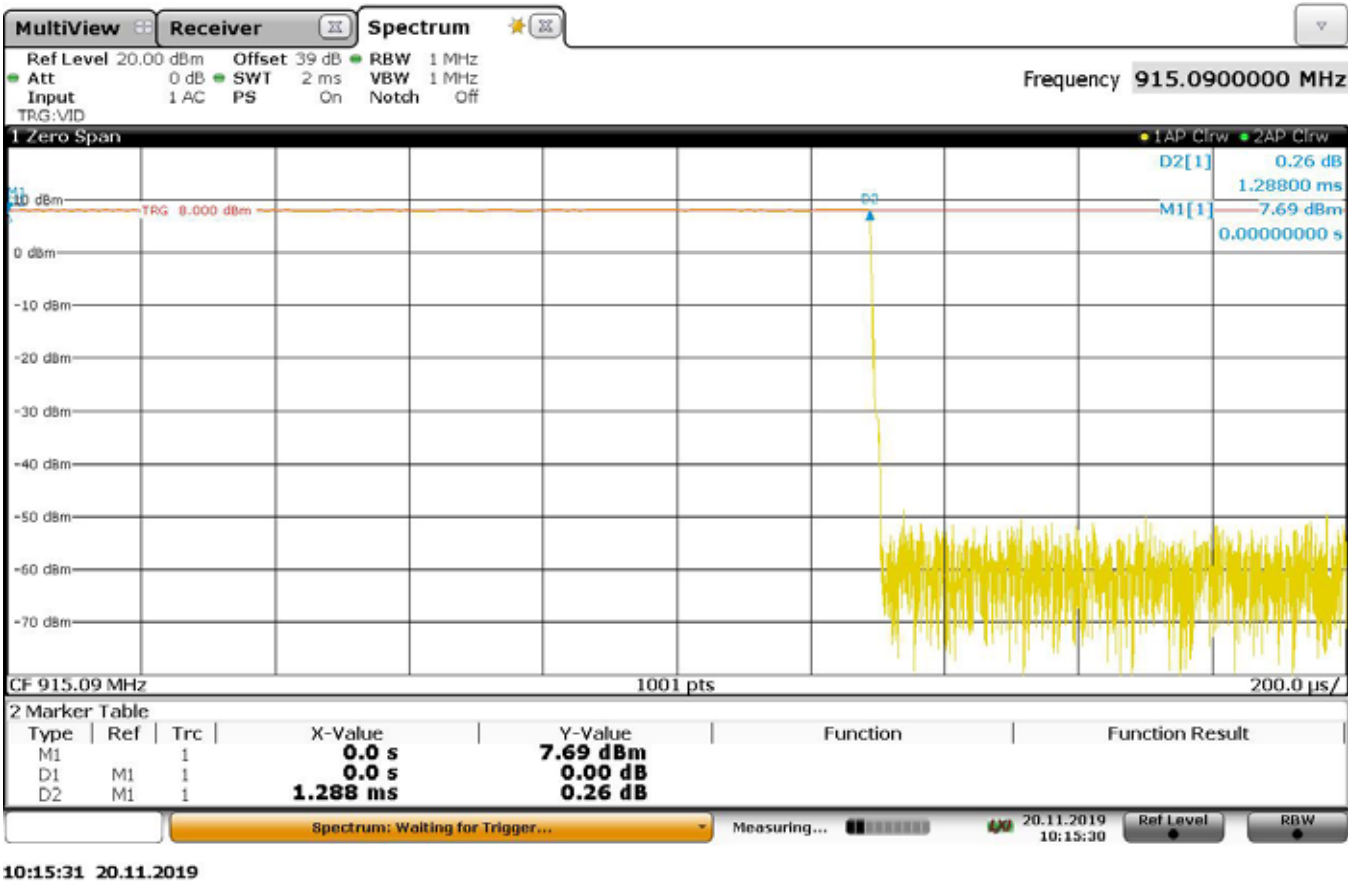
DATA PAGE	
MANUFACTURER	The Chamberlain Group, Inc.
EUT	Main/Control PCB Transceiver
MODEL NO.	001D9525-01
SERIAL NO.	ESL3
TEST	FCC §15.247, RSS-247 – Number of Hopping Channels
MODE	Tx - FHSS
DATE TESTED	November 20, 2019
TEST PERFORMED BY	Tylar Jozefczyk
NOTES	# of Hopping Channels = 50

NUMBER OF HOPPING CHANNELS



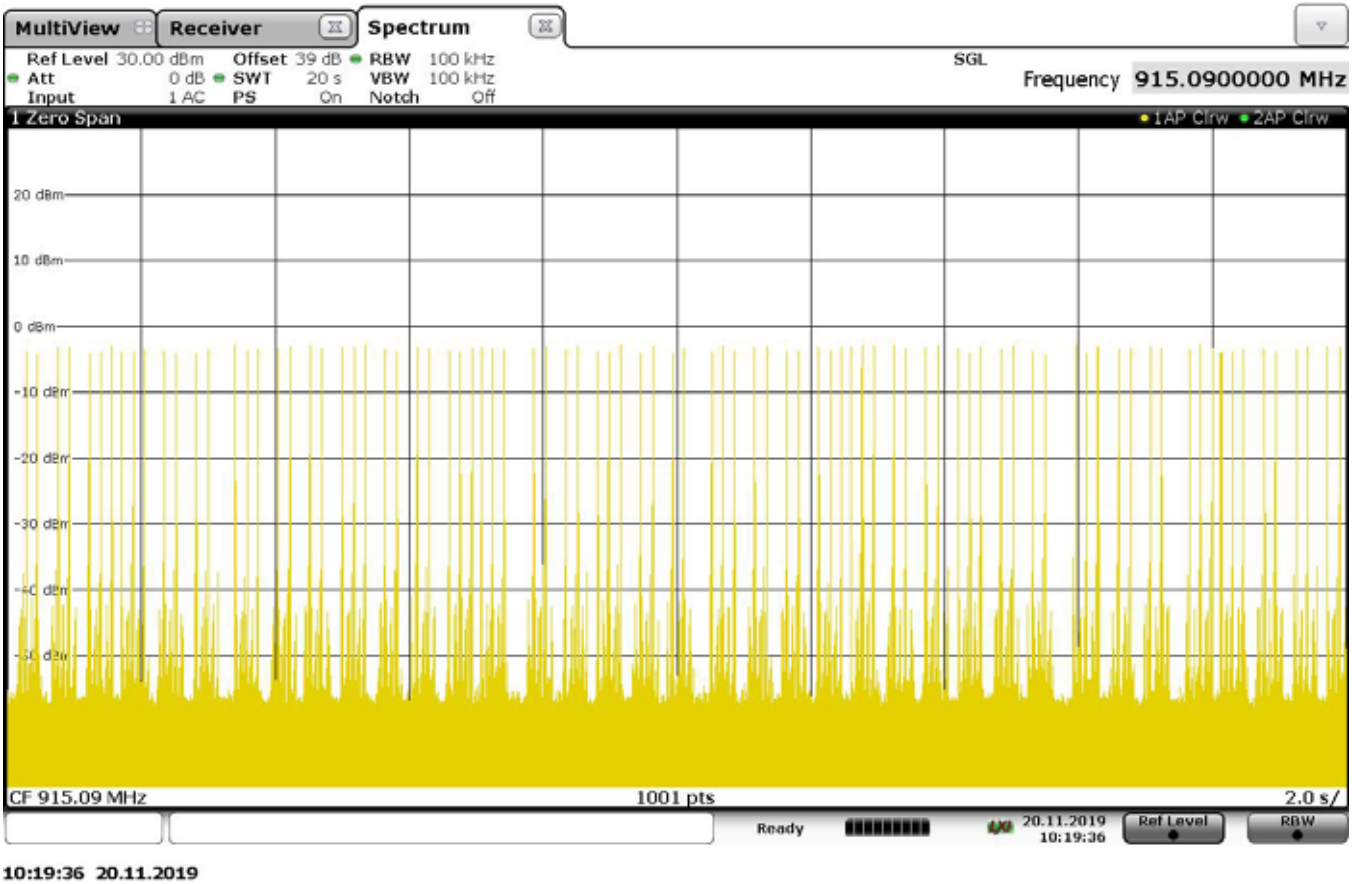
DATA PAGE	
MANUFACTURER	The Chamberlain Group, Inc.
EUT	Main/Control PCB Transceiver
MODEL NO.	001D9525-01
SERIAL NO.	ESL3
TEST	FCC §15.247, RSS-247 – Time of Occupancy
MODE	Tx - FHSS
DATE TESTED	November 20, 2019
TEST PERFORMED BY	Tylar Jozefczyk
NOTES	Burst = 1.288ms

TIME OF OCCUPANCY



DATA PAGE	
MANUFACTURER	The Chamberlain Group, Inc.
EUT	Main/Control PCB Transceiver
MODEL NO.	001D9525-01
SERIAL NO.	ESL3
TEST	FCC §15.247, RSS-247 – Time of Occupancy
MODE	Tx - FHSS
DATE TESTED	November 20, 2019
TEST PERFORMED BY	Tylar Jozefczyk
NOTES	Time of Occupancy = # of bursts × burst duration = (88)×(1.288) = 0.113344s

TIME OF OCCUPANCY



DATA PAGE	
MANUFACTURER	The Chamberlain Group, Inc.
EUT	Main/Control PCB Transceiver
MODEL NO.	001D9525-01
SERIAL NO.	ESL3
TEST	FCC §15.247, RSS-247 – RF Output Power - Radiated
MODE	Tx
DATE TESTED	November 18 & 19, 2019
TEST PERFORMED BY	Tylar Jozefczyk
NOTES	Antenna Adaptor

RF OUTPUT POWER

Freq. (MHz)	Ant Pol	Wide BW Meter Reading (dBµV)	Matched Sig. Gen. Reading (dBm)	Equivalent Antenna Gain (dB)	Cable Loss (dB)	EIRP Total (dBm)	Limit (dBm)	Margin (dB)
902.25	H	68.51	-1.90	2.15	2.04	-1.79	30.00	-31.79
902.25	V	71.38	2.18	2.15	2.04	2.29	30.00	-27.71
914.75	H	71.58	1.12	2.15	2.05	1.22	30.00	-28.78
914.75	V	75.38	6.18	2.15	2.05	6.28	30.00	-23.72
926.75	H	70.76	0.30	2.15	2.07	0.38	30.00	-29.62
926.75	V	71.14	1.94	2.15	2.07	2.02	30.00	-27.98

EIRP = Calculated Signal (dBm) + Antenna Gain (dB) – Cable Loss (dB)

DATA PAGE	
MANUFACTURER	The Chamberlain Group, Inc.
EUT	Main/Control PCB Transceiver
MODEL NO.	001D9525-01
SERIAL NO.	ESL3
TEST	FCC §15.247, RSS-247 – RF Output Power - Radiated
MODE	Tx
DATE TESTED	November 18 & 19, 2019
TEST PERFORMED BY	Tylar Jozefczyk
NOTES	Yagi Antenna

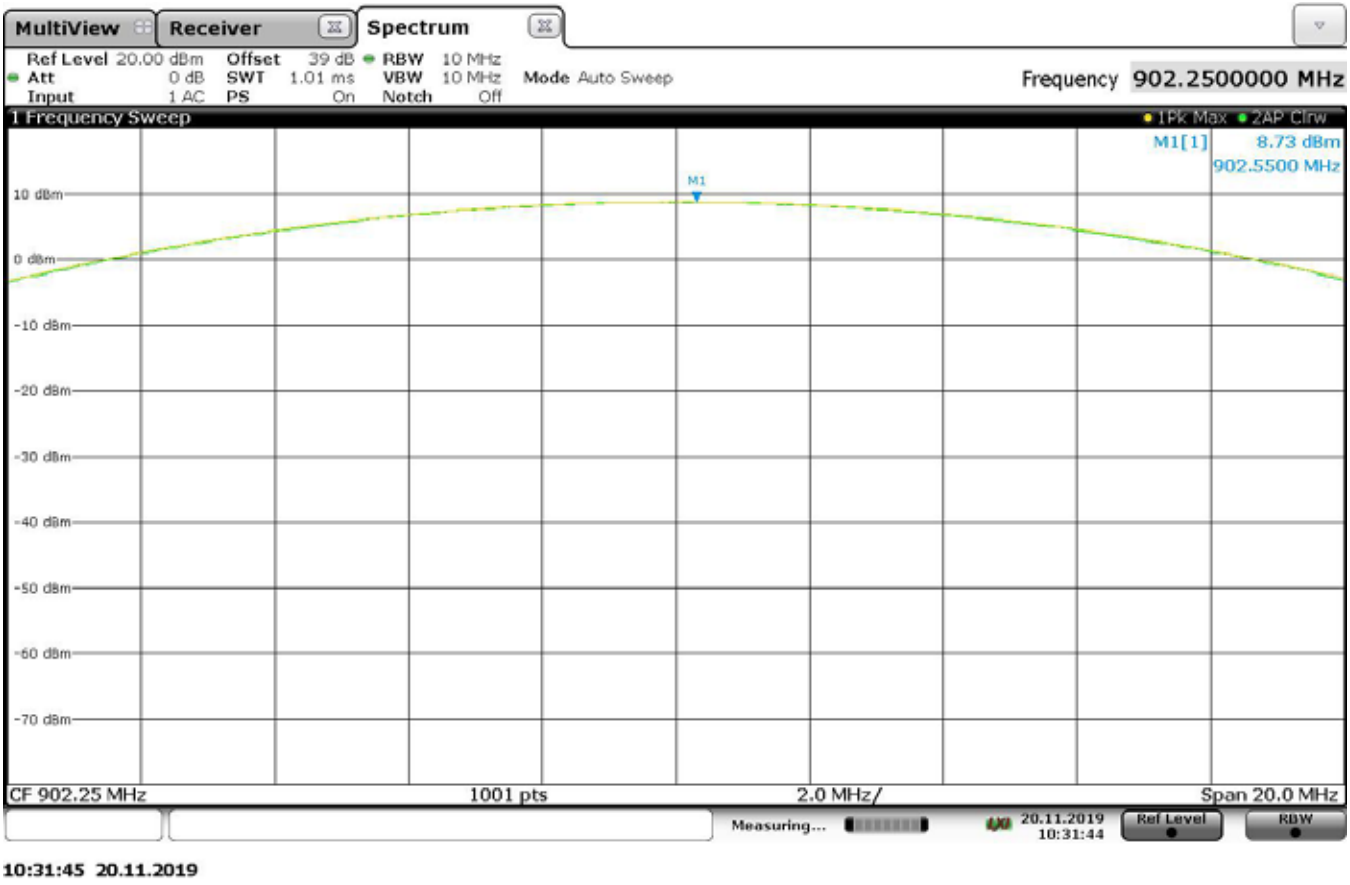
RF OUTPUT POWER

Freq. (MHz)	Ant Pol	Wide BW Meter Reading (dBµV)	Matched Sig. Gen. Reading (dBm)	Equivalent Antenna Gain (dB)	Cable Loss (dB)	EIRP Total (dBm)	Limit (dBm)	Margin (dB)
902.25	H	74.62	4.21	2.15	2.04	4.32	30.00	-25.68
902.25	V	70.78	1.58	2.15	2.04	1.69	30.00	-28.31
914.75	H	74.50	4.04	2.15	2.05	4.14	30.00	-25.86
914.75	V	71.78	2.58	2.15	2.05	2.68	30.00	-27.32
926.75	H	74.34	3.88	2.15	2.07	3.96	30.00	-26.04
926.75	V	66.36	-2.84	2.15	2.07	-2.76	30.00	-32.76

EIRP = Calculated Signal (dBm) + Antenna Gain (dB) – Cable Loss (dB)

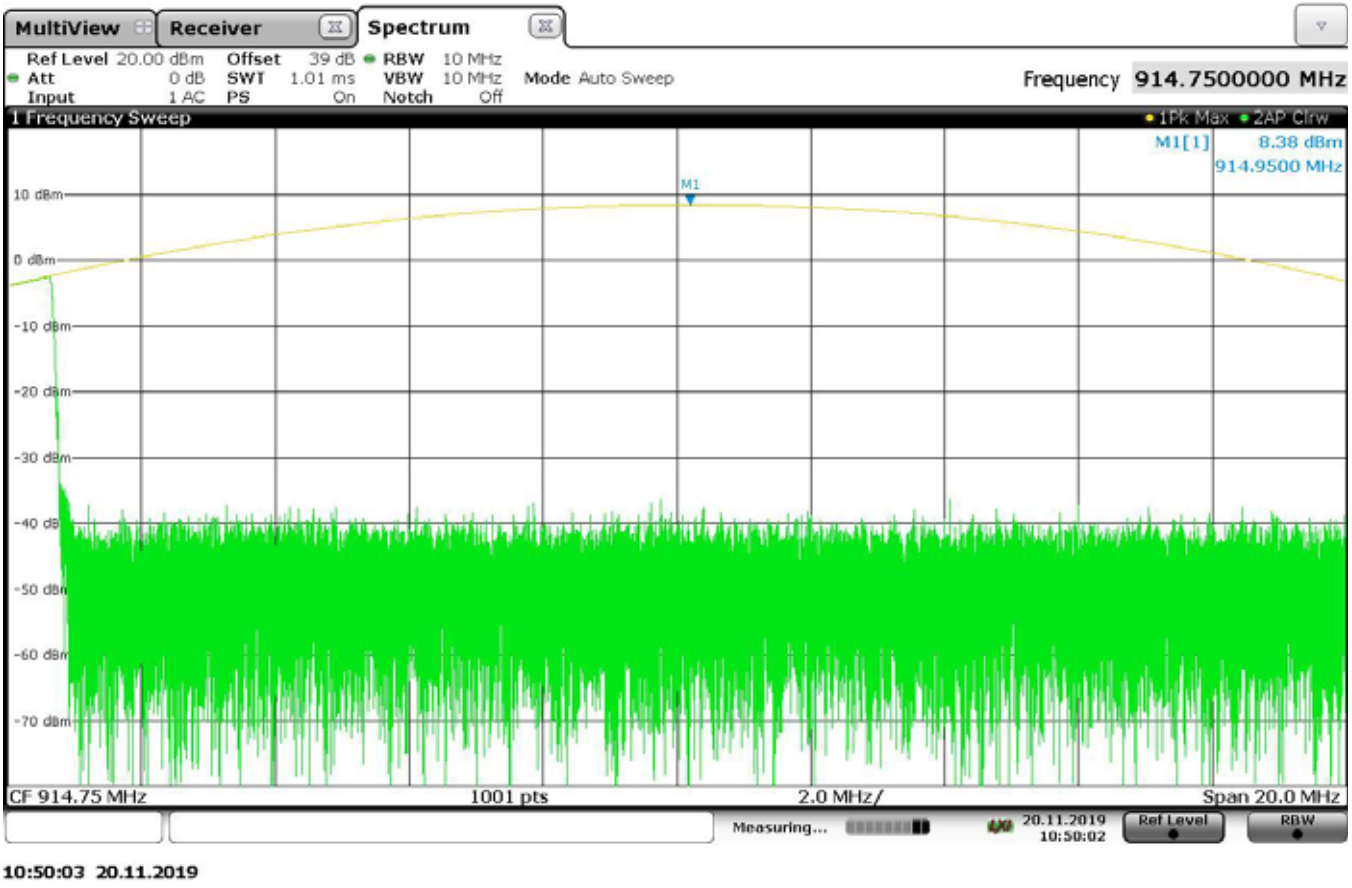
DATA PAGE	
MANUFACTURER	The Chamberlain Group, Inc.
EUT	Main/Control PCB Transceiver
MODEL NO.	001D9525-01
SERIAL NO.	ESL3
TEST	FCC §15.247, RSS-247 – RF Output Power - Conducted
MODE	Tx – 902.25MHz
DATE TESTED	November 20, 2019
TEST PERFORMED BY	Tylar Jozefczyk
NOTES	RF Output Power = 8.73dBm

RF OUTPUT POWER - CONDUCTED



DATA PAGE	
MANUFACTURER	The Chamberlain Group, Inc.
EUT	Main/Control PCB Transceiver
MODEL NO.	001D9525-01
SERIAL NO.	ESL3
TEST	FCC §15.247, RSS-247 – RF Output Power - Conducted
MODE	Tx – 914.75MHz
DATE TESTED	November 20, 2019
TEST PERFORMED BY	Tylar Jozefczyk
NOTES	RF Output Power = 8.38dBm

RF OUTPUT POWER - CONDUCTED



DATA PAGE	
MANUFACTURER	The Chamberlain Group, Inc.
EUT	Main/Control PCB Transceiver
MODEL NO.	001D9525-01
SERIAL NO.	ESL3
TEST	FCC §15.247, RSS-247 – RF Output Power - Conducted
MODE	Tx – 926.75MHz
DATE TESTED	November 20, 2019
TEST PERFORMED BY	Tylar Jozefczyk
NOTES	RF Output Power = 8.27dBm

RF OUTPUT POWER - CONDUCTED