Measurement of RF Emissions from a 1A6210-1 Garage Door Transceiver

For	The Chamberlain Group, Inc. Elmhurst, IL 60126
P.O. Number	872696
Date Tested	April 18th through May 16, 2011
Test Personnel	Richard E. King
Test Specification	FCC "Code of Federal Regulations" Title 47 Part15, Subpart C Industry Canada RSS-GEN Industry Canada RSS-210

Test Report By:

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REVISION HISTORY

Revision	Date	Description
—	4/29/2011	Initial release
A	5/18/2011	Changed all references of the 315MHz super-heterodyne receiver to 390MHz super regenerative receiver throughout report.

Measurement of RF Emissions from a Model No. 1A6210-1 Garage Door Transceiver

1. INTRODUCTION

1.1. Scope of Tests

This report presents the results of the RF emissions measurements performed on a Garage Door Transceiver, Model No. 1A6210-1, (hereinafter referred to as the Equipment Under Test (EUT)). No serial number was assigned to the EUT. The EUT was designed to transmit at approximately 315MHz using an external antenna. The EUT is also super regenerative type receiver designed to tune at approximately 390MHz. It has a 3.5 inch external antenna. The EUT's LO frequency is at the tuned frequency. The EUT was manufactured and submitted for testing by The Chamberlain Group, Inc. located in Elmhurst, IL.

1.2. Purpose

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

The test series was also performed to determine if the EUT meets the technical requirements of the Industry Canada Radio Standards Specification, RSS-Gen, Section 7.2.2 and Section 7.2.3. Testing was performed in accordance with ANSI C63.4-2003.

1.3. Deviations, Additions and Exclusions

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

1.4. EMC Laboratory Identification

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

1.5. Laboratory Conditions

The temperature at the time of the test was 22.4^{o}C and the relative humidity was 16%.

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 2010
- ANSI C63.4-2003, "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"
- Industry Canada Radio Standards Specification, RSS-Gen, “General Requirements and Information for the Certification of Radiocommunication Equipment”, Issue 3, December 2010
- Industry Canada Radio Standards Specification, RSS-210, “Low-power License-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment”, Issue 8, December 2010

3. EUT Setup and Operation

3.1. General Description

The EUT is a The Chamberlain Group, Inc., Garage Door Transceiver, Model No. 1A6210-1. A block diagram of the EUT setup is shown as Figure 1.

3.1.1. Power Input

The EUT obtained 12VDC power through 2 leads from the secondary of a step-down transformer. The primary of this transformer received 115V 60Hz power through lowpass powerline filters on the wall of the shielded enclosure. Each primary lead was connected through a line impedance stabilization network (LISN) which was located on the ground plane. The network complies with the requirements of Paragraph 4.1.2 of ANSI C63.4-2003.

3.1.2. Peripheral Equipment

No peripheral equipment is required for the EUT to work properly.

3.1.3. Signal Input/Output Leads

No interconnect cables were required by the EUT.

3.1.4. Grounding

The EUT was ungrounded during the tests.

3.2. Operational Mode

For all tests the EUT and all peripheral equipment were placed on an 80cm high non-conductive stand. The EUT and was energized.

The EUT was set to transmit continuously at 315MHz by receiving a signal from a second transmitter set to 390MHz.

The EUT's super regenerative receiver was operated both cohered by an external (unmodulated) signal at 390MHz via a loop probe, and uncohered with no transmitted signal.

3.3. EUT Modifications

No modifications were required for compliance to FCC "Code of Federal Regulations" Title 47, Part 15, Subpart C, Section 15.231 for Intentional Radiators.

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 C63.4-2003 for site attenuation.

4.2. Test Instrumentation

The test instrumentation and auxiliary equipment used during the tests are listed in Table 9-1. All equipment was calibrated per the instruction manuals supplied by the manufacturer.

Conducted and radiated emission measurements were performed with a spectrum analyzer. This receiver allows measurements with the bandwidths and detector functions specified by the FCC. The receiver bandwidth was 120kHz for the 30MHz to 1000MHz radiated emissions data and 1MHz for the radiated emissions data above 1000MHz.

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.

The measurement uncertainty for these tests is presented below:

Conducted Emissions Measurements		
Combined Standard Uncertainty	1.07	-1.07
Expanded Uncertainty (95% confidence)	2.1	-2.1

Radiated Emissions Measurements		
Combined Standard Uncertainty	2.26	-2.18
Expanded Uncertainty (95% confidence)	4.5	-4.4

5. TEST PROCEDURES

5.1. Powerline Conducted Emissions

5.1.1.Requirements

All radio frequency voltages on the power lines for any frequency or frequencies of an intentional radiator shall not exceed the limits in the following table:

Frequency MHz	Conducted Limit (dBuV)	
	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.

5.1.1.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.

a) The EUT was un-cohered and set to receive at 390MHz.

b) Measurements were first made on the high line.

c) The frequency range from 150 kHz to 30 MHz was broken up into smaller frequency sub-bands.

d) Conducted emissions measurements were taken on the first frequency sub-band using a peak detector.

e) 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.)

f) Steps (d) and (e) 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.

g) Steps (c) through (f) were repeated on the return line.

h) Steps (b) through (g) were repeated with the EUT cohered with an external signal.

i) Steps (b) through (g) were repeated with the EUT set to transmit at 315MHz.

5.1.1. Results

The plots of the peak, quasi-peak, and average conducted voltage levels acquired from each input power line with the EUT un-cohered and cohered with an external signal at 390MHz and transmit at 315MHz are shown on pages 18 through 23. The tabular quasi-peak and average results from each input power line with the EUT set to receive at 390MHz and transmit at 315MHz are shown on pages 24 through 29.

Photographs of the test configuration which yielded the highest or worst case, conducted emission levels are shown on Figure 2.

5.2. Periodic Operation Measurements

5.2.1. Requirements

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

5.2.2. Procedures

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

5.2.3. Results

The plot of the periodic timing is shown on data page 30. The data shows that the EUT ceases operation within the allotted time.

5.3. Duty Cycle Factor Measurements

5.3.1. Procedures

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

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

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

b) The first sync pulse width is measured and a plot of this measurement is recorded along with the number of bits.

c) The second sync pulse width is measured and a plot of this measurement is recorded along with the number of bits.

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

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

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

5.3.2.Results

The manufacturer provided following information to calculate the duty cycle for the Rolling Code D:

Rolling Code D consists of the following: First Sync (0.5msec), 20 trinary bits (2msec each, 1.5msec on time), Blank Time (59.5msec), Second Sync (1.5msec), 20 Trinary bits (2msec each) and blank time (58.5msec)

The trinary bits change and roll over time via a proprietary coding scheme. Since the bits will change on a key press, a worst case situation is used when computing the rolling code modulation factor.

Worse Case ON time is calculated as the 20 trinary bits multiplied by the largest bit of 1.5mS plus the worse case sync pulse of 1.5mS. This Worse Case ON time equals 20*1.5mS +1.5mS = 31msec.

Worst Case = 31msec On-time over 100msec word period

Duty Cycle Factor = 20 log (31/100) = -10.2 dB.

Representative plots of the duty cycle factor with the EUT transmitting at 315MHz with rolling D code was measured and is shown on Page 31 through 34. Since the plots were made for the rolling code, the duty cycle factor shown on the plots may not show the worst case but was found to be no greater than the worst case duty cycle factor.

5.4. Radiated Measurements

5.4.1.Radiated Emission for Receiver Portion

All emanations from a receiver shall be below the levels shown on the following table.

RADIATION LIMITS FOR RECEIVER

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

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

5.4.2.Procedures

All tests were performed in a 32ft. x 20ft. x 18ft. hybrid ferrite-tile/anechoic absorber lined test chamber. The walls and ceiling of the shielded chamber are lined with ferrite tiles. Anechoic absorber material is installed over the ferrite tile. The floor of the chamber is used as the ground plane. The chamber complies with ANSI C63.4-2003 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(s) 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 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 2GHz 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. The resultant field strength (FS) is a summation in decibels (dB) of the receiver meter reading (MTR), the antenna correction factor (AF), and the cable loss factor (CF). If an external pre-amplifier is used, the total is reduced by its gain (-PA). If a distance correction (DC) is required, it is added to the total.

Formula 1: FS (dBuV/m) = MTR (dBuV) + AF (dB/m) + CF (dB) + (- PA (dB)) + DC (dB)

To convert the Field Strength dBuV/m term to uV/m, the dBuV/m is first divided by 20. The Base 10 AntiLog is taken of this quotient. The result is the Field Strength value in uV/m terms.

Formula 2: FS (uV/m) = AntiLog [(FS (dBuV/m))/20]

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.

1) 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.

5.4.3.Results

The preliminary plots are presented on pages 35 through 42. The plots are presented for a reference only, and are not used to determine compliance.

As can be seen from the data, all emissions measured from the EUT were within the specification limits. See data pages 43 and 46 for details. Photographs of the test configuration which yielded the highest or worst case, radiated emission levels are shown on Figures 3 and 4.

5.4.4.Radiated Emission Requirements for Transmitter Portion

The EUT must comply with the requirements of FCC "Code of Federal Regulations Title 47", Part 15, Subpart C, Section 15.205 et seq. 15.231.

Paragraph 15.231(b) has the following radiated emission limits:

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

* - Linear Interpolation

For 315MHz, the limit at the fundamental is 6041.7uV/m @ 3m and the limit on the harmonics is 604.2uV/m @ 3m.

In addition, emissions appearing in the Restricted Bands of Operation listed in paragraph 15.205(a) shall not exceed the general requirements shown in paragraph 15.209.

5.4.5.Procedures

All tests were performed in a 32ft. x 20ft. x 18ft. hybrid ferrite-tile/anechoic absorber lined test chamber. The walls and ceiling of the shielded chamber are lined with ferrite tiles. Anechoic absorber material is installed over the ferrite tile. The floor of the chamber is used as the ground plane. The chamber complies with ANSI C63.4-2003 for site attenuation.

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

A preliminary radiated emissions test was 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 4.0GHz was investigated using a peak detector function. The data was then processed by the computer to calculate equivalent field intensity.

The final open field emission tests were then manually performed over the frequency range of 30MHz to 4000MHz. Between 30MHz and 1000MHz, a tuned dipole antenna was used as the pick-up device. A broadband double ridged waveguide antenna was used as the pick-up device for all frequencies above 1GHz. All significant broadband and narrowband signals were measured and recorded. The peak detected levels were converted to average levels using a duty cycle factor which was computed from the pulse train.

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

2) The EUT was rotated so that all of its sides were exposed to the receiving antenna.
3) Since the measuring antenna is linearly polarized, both horizontal and vertical field components were measured.
4) The measuring antenna was raised and lowered from 1 to 4 meters for each antenna polarization to maximize the readings.
5) 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.

5.4.6.Results

The preliminary plots, with the EUT transmitting at 315MHz, are presented on data pages 47 through 50. The plots are presented for a reference only, and are not used to determine compliance.

The final open area radiated levels, with the EUT transmitting at 315MHz, are presented on data page 51. 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 on Figures 3 and 4.

5.5. Occupied Bandwidth Measurements

5.5.1. Requirement

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

5.5.2. Procedures

The EUT was placed on an 80cm high non-conductive stand. The unit was set to transmit continuously. With a probe positioned nearby, occupied bandwidth emissions were displayed on the spectrum analyzer. The resolution bandwidth was set to 50 kHz and span was set to 2 MHz. The frequency spectrum near the fundamental was plotted.

5.5.3. Results

The plot of the emissions near the fundamental frequency is presented on data page 52. As can be seen from this data page, the EUT met the occupied bandwidth requirements. The 99% bandwidth was measured to be 416.6kHz.

6. OTHER TEST CONDITIONS

6.1. Test Personnel and Witnesses

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

6.2. Disposition of the EUT

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

7. CONCLUSIONS

It was determined that The Chamberlain Group, Inc. Garage Door Transceiver, Model No. 1A6210-1, Serial No. none, did fully meet the selected requirements of the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart B for receivers and C for Intentional Radiators.

In addition, The Chamberlain Group, Inc. Garage Door Transceiver, Model No. 1A6210-1, Serial No. none, did also meet the technical requirements of the Industry Canada Radio Standards Specification, RSS-Gen, Section 7.2.2 and Section 7.2.3.

All testing was performed in accordance with ANSI C63.4-2003.

8. CERTIFICATION

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

The data presented in this test report pertains to the EUT at the test date. Any electrical or mechanical modification made to the EUT subsequent to the specified test date will serve to invalidate the data and void this certification. This report must not be used to claim product endorsement by NVLAP or any agency of the US Government.

9. EQUIPMENT LIST

Table 9-1 Equipment List

Eq ID	Equipment Description	Manufacturer	Model No.	Serial No.	Frequency Range	Cal Date	Due Date
NTA2	BILOG ANTENNA	TESEQ	6112D	28040	25-1000MHz	6/7/2010	6/7/2011
NWH0	RIDGED WAVE GUIDE	TENSOR	4105	2081	1-12.4GHZ	8/31/2010	8/31/2011
PLL9	50UH LISN 462D	ELITE ELECTRONIC ENG	462D/70A	010	0.01-400MHZ	3/15/2011	3/15/2012
PLLA	50UH LISN 462D	ELITE ELECTRONIC ENG	462D/70A	011	0.01-400MHZ	3/15/2011	3/15/2012
RAKG	RF SECTION	HEWLETT PACKARD	85462A	3549A00284	0.009-6500MHZ	3/28/2011	3/28/2012
RAKH	RF FILTER SECTION	HEWLETT PACKARD	85460A	3448A00324	---	3/28/2011	3/28/2012
RBB0	EMI TEST RECEIVER 20HZ TO 40 GHZ.	ROHDE & SCHWARZ	ESIB40	100250	20 HZ TO 40GHZ	3/24/2011	3/24/2012
T1N5	10DB 20W ATTENUATOR	NARDA	766-10	---	DC-4GHZ	8/9/2010	8/9/2011
XLTN	5W, 50 OHM TERMINATION	JFW INDUSTRIES	50T-052	---	DC-2GHZ	8/11/2010	8/11/2011

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

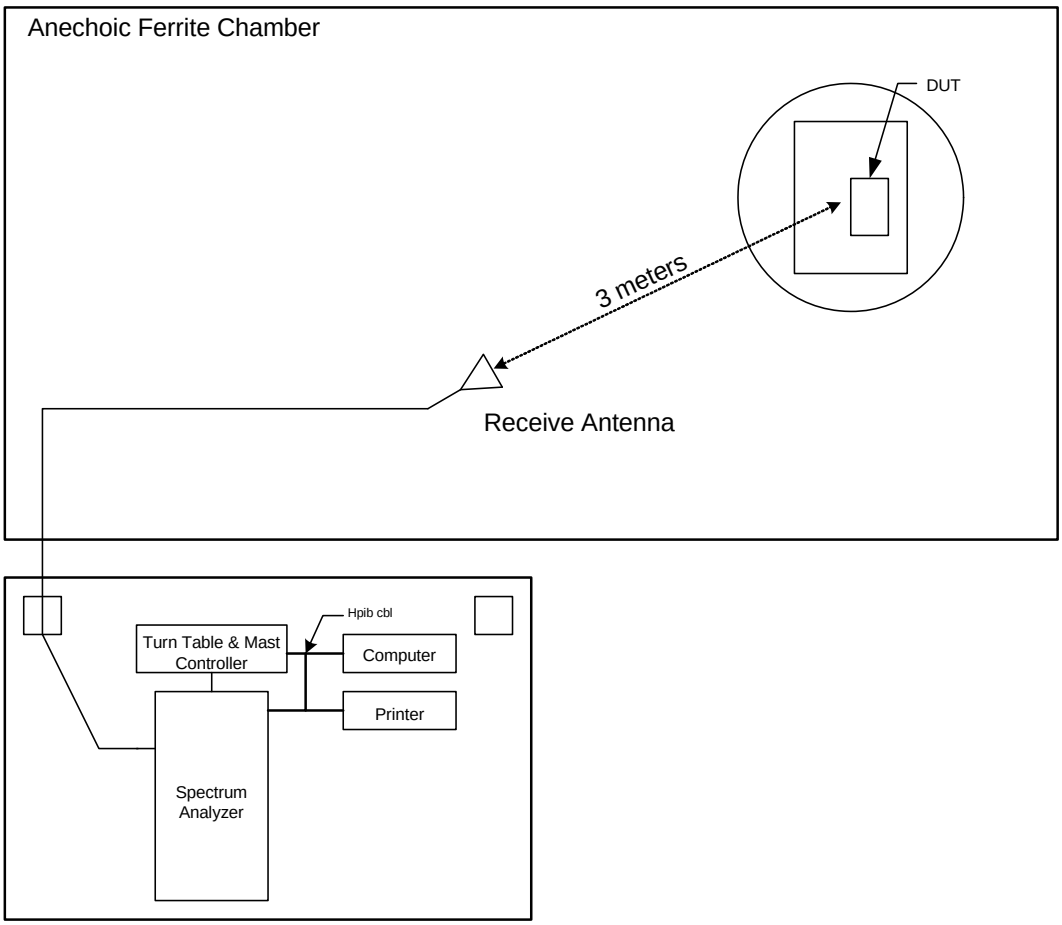


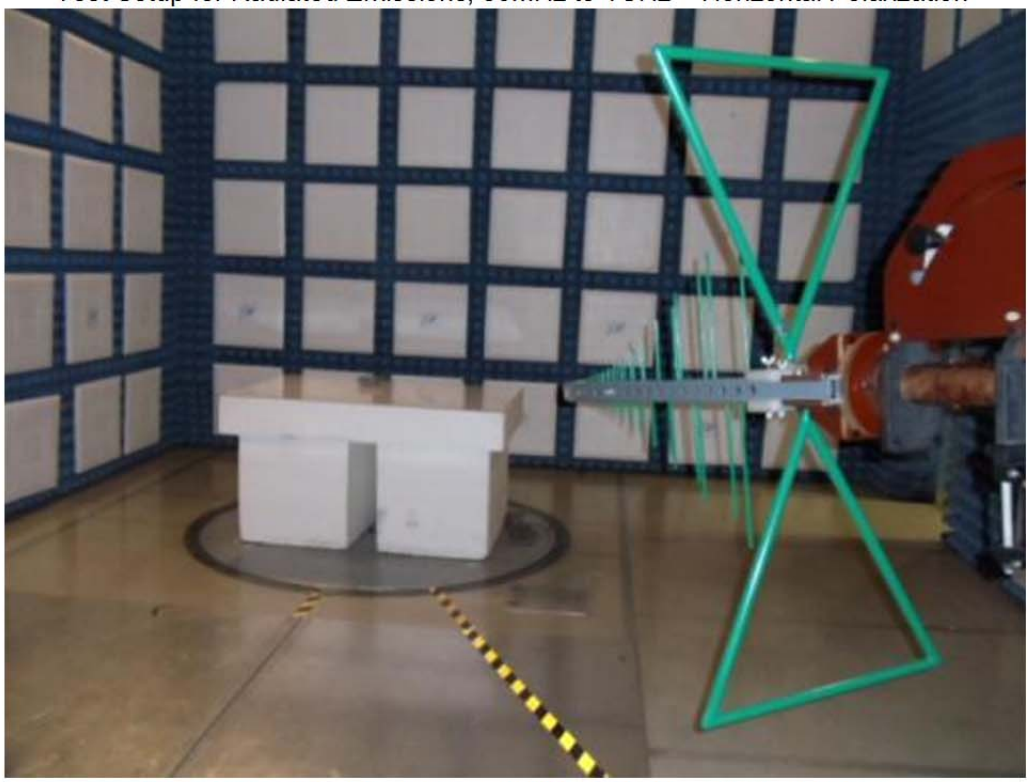
FIGURE 1 BLOCKDIAGRAM OF TEST SETUP

Figure 2

Test Setup for Conducted Emissions, 150kHz to 30MHz

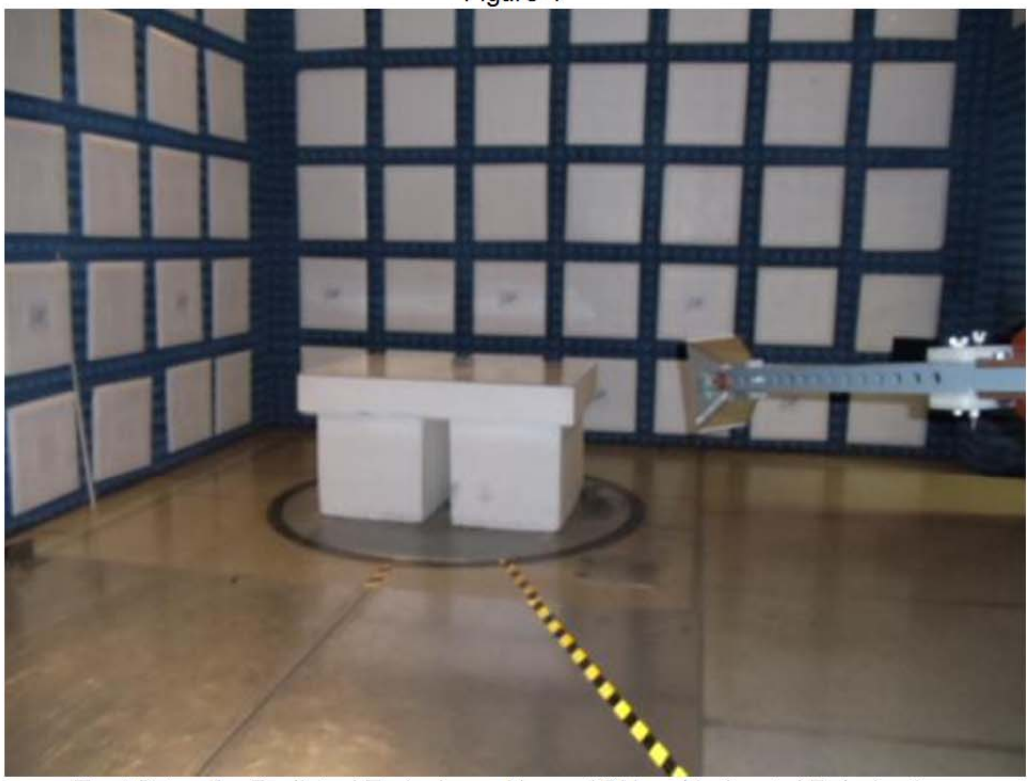
Figure 3

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



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

Figure 4



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

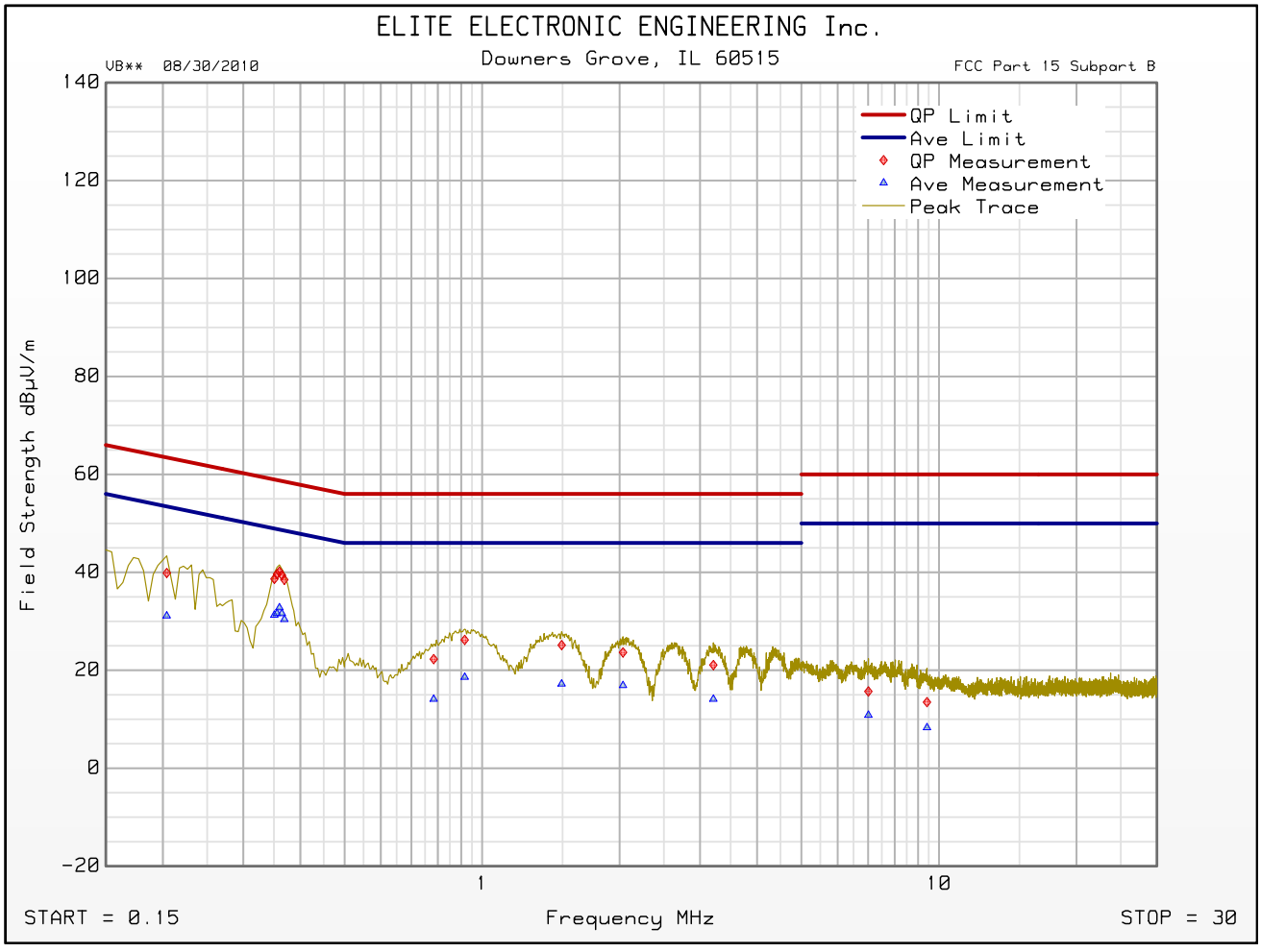
Test Setup for Radiated Emissions, Above 1GHz – Vertical Polarization

FCC Part 15 Subpart B Conducted Emissions Test

Cumulative Data

VB** 08/30/2010

Manufacturer	:	The Chamberlain Group
Model	:	1A6210-1
DUT Revision	:	
Serial Number	:	
DUT Mode	:	un-cohered
Line Tested	:	L1
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-10
Notes	:	
Test Engineer	:	R. King
Limit	:	Class B
Test Date	:	May 16, 2011 08:37:10 AM



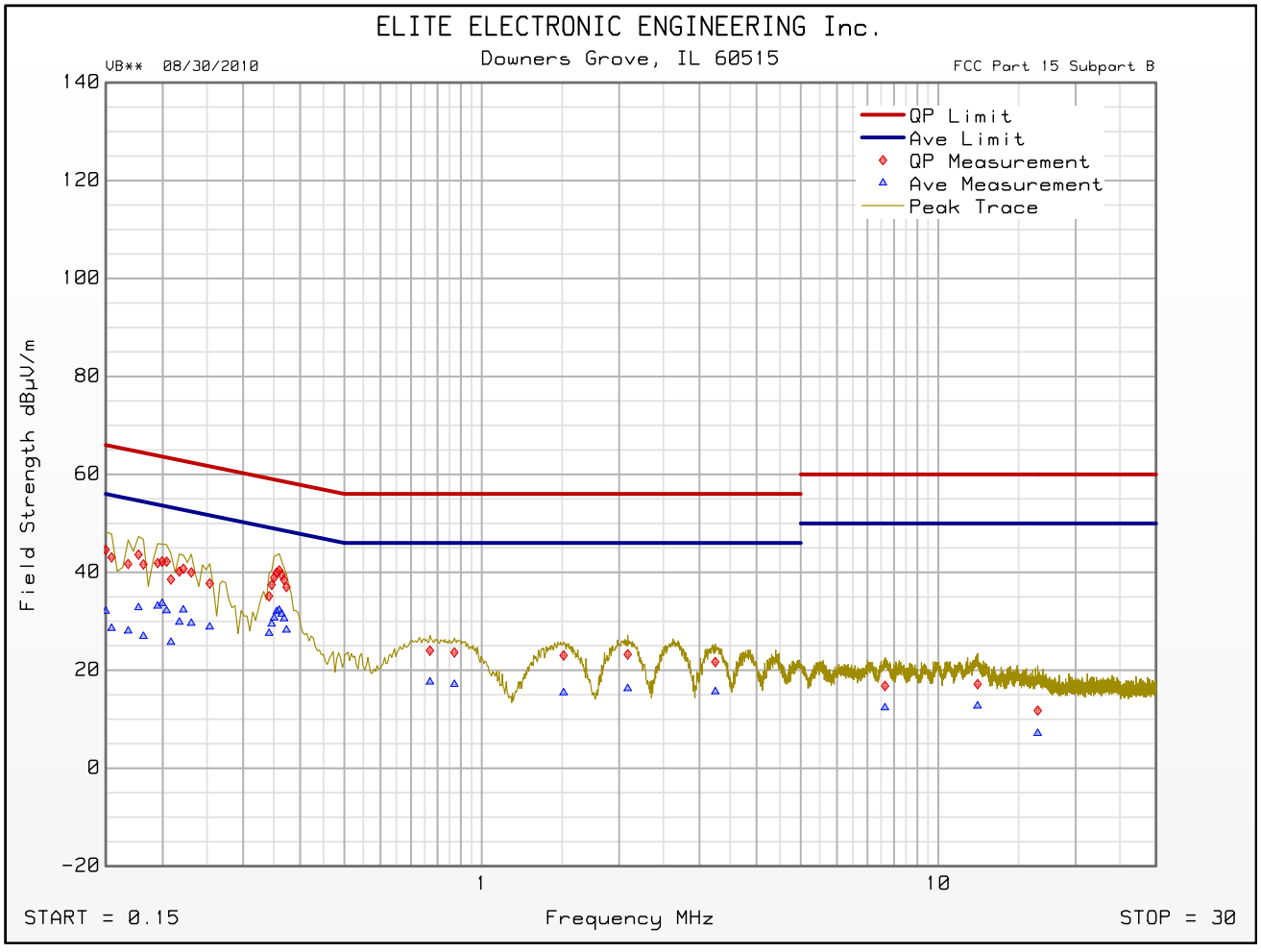
Emissions Meet QP Limit
Emissions Meet Ave Limit

FCC Part 15 Subpart B Conducted Emissions Test

Cumulative Data

VB** 08/30/2010

Manufacturer	:	The Chamberlain Group
Model	:	1A6210-1
DUT Revision	:	
Serial Number	:	
DUT Mode	:	un-cohered
Line Tested	:	L2
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-10
Notes	:	
Test Engineer	:	R. King
Limit	:	Class B
Test Date	:	May 16, 2011 08:43:59 AM



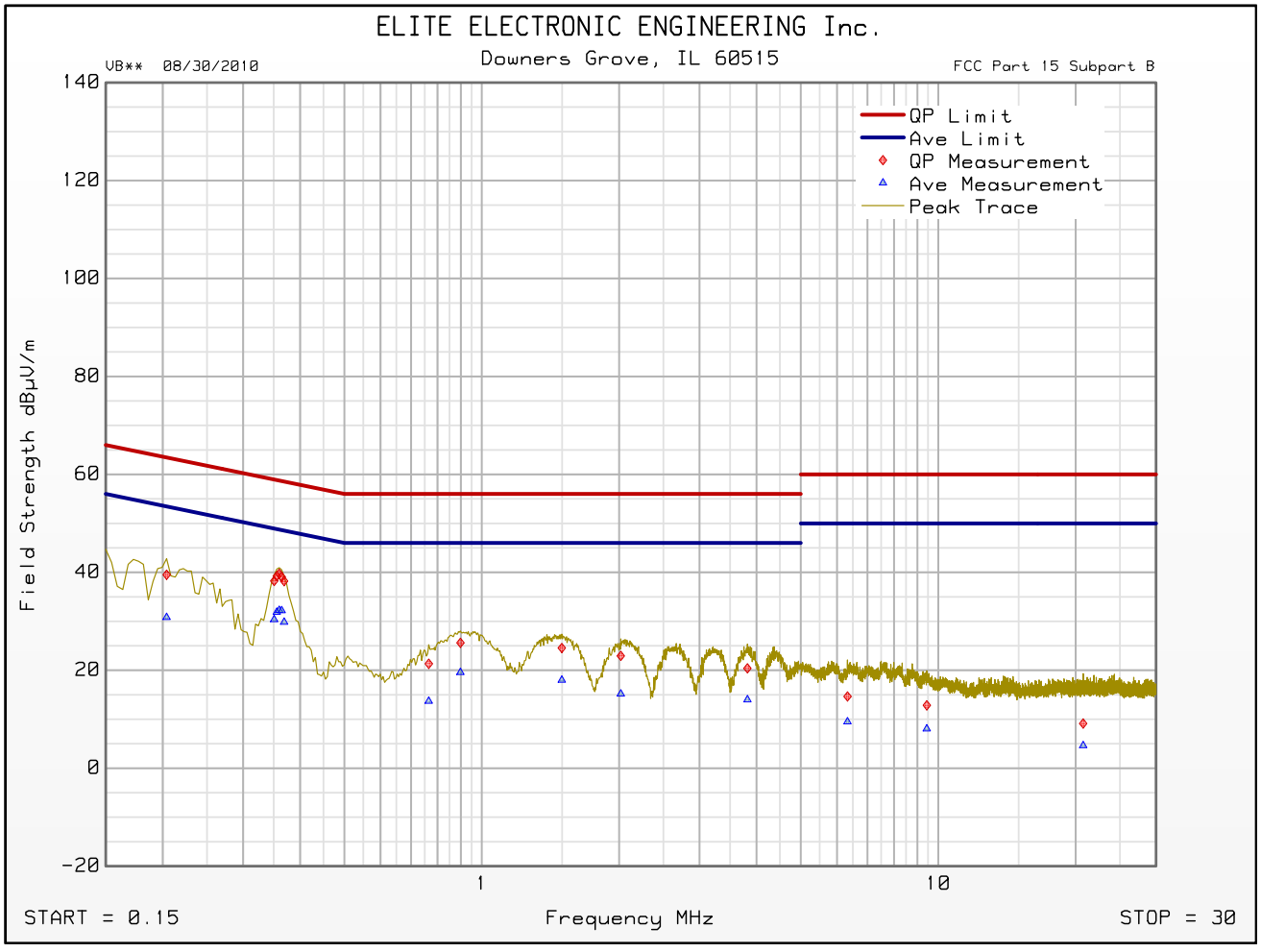
Emissions Meet QP Limit
Emissions Meet Ave Limit

FCC Part 15 Subpart B Conducted Emissions Test

Cumulative Data

VB** 08/30/2010

Manufacturer	:	The Chamberlain Group
Model	:	1A6210-1
DUT Revision	:	
Serial Number	:	
DUT Mode	:	Cohered
Line Tested	:	L1
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-10
Notes	:	
Test Engineer	:	R. King
Limit	:	Class B
Test Date	:	May 16, 2011 08:55:26 AM



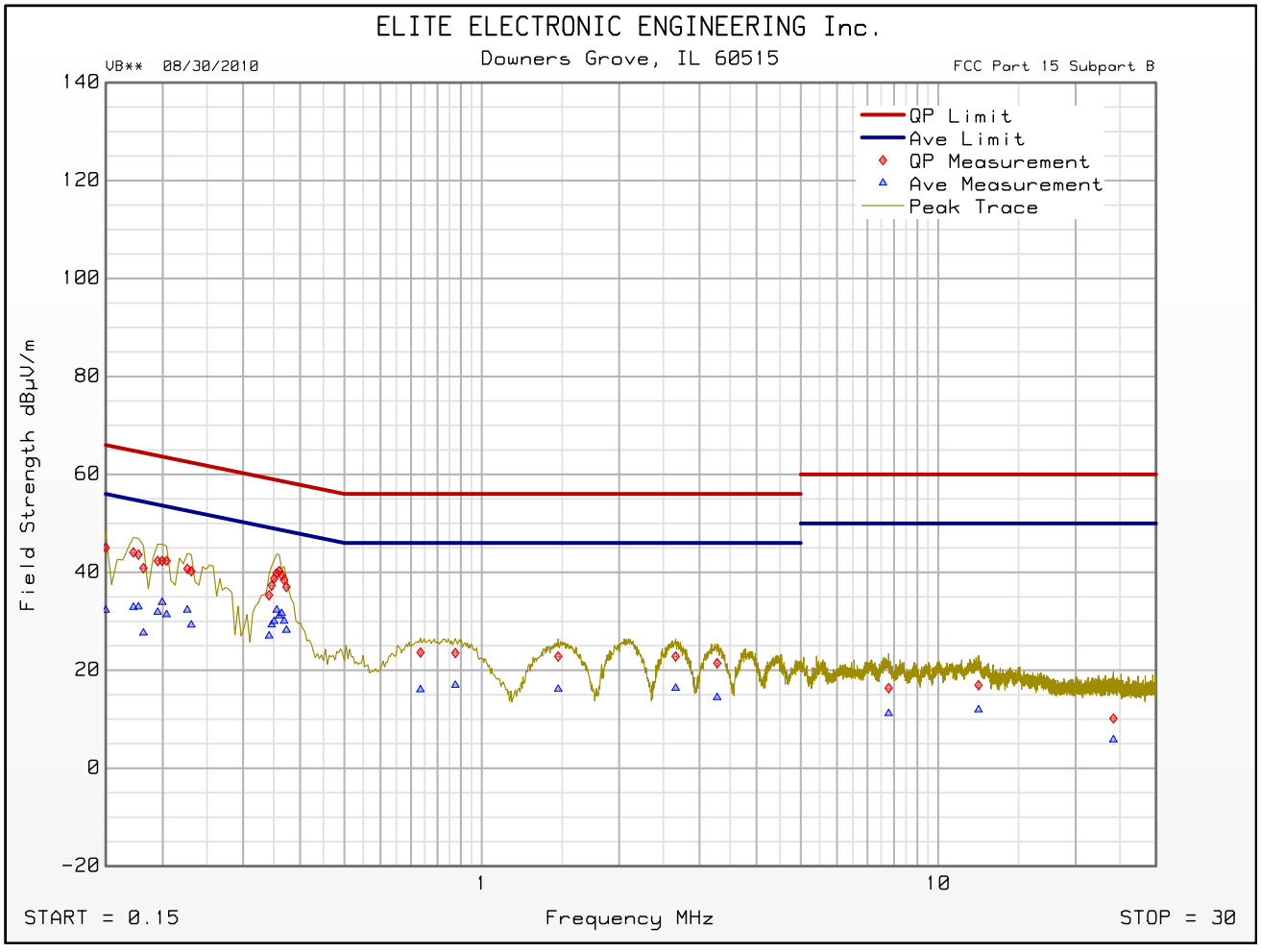
Emissions Meet QP Limit
Emissions Meet Ave Limit

FCC Part 15 Subpart B Conducted Emissions Test

Cumulative Data

VB** 08/30/2010

Manufacturer	:	The Chamberlain Group
Model	:	1A6210-1
DUT Revision	:	
Serial Number	:	
DUT Mode	:	Cohered
Line Tested	:	L2
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-10
Notes	:	
Test Engineer	:	R. King
Limit	:	Class B
Test Date	:	May 16, 2011 08:49:02 AM



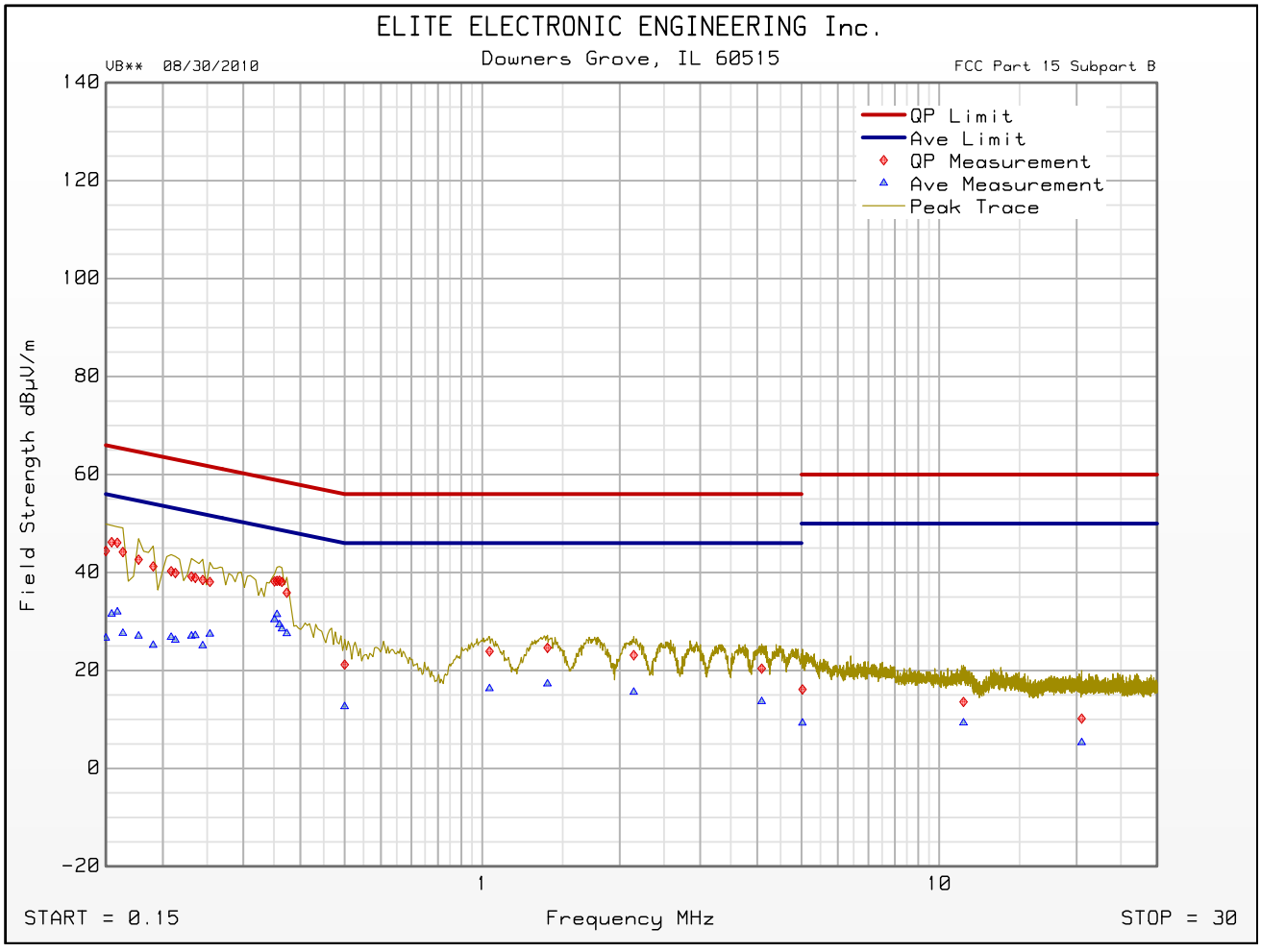
Emissions Meet QP Limit
Emissions Meet Ave Limit

FCC Part 15 Subpart B Conducted Emissions Test

Cumulative Data

VB** 08/30/2010

Manufacturer	:	The Chamberlain Group
Model	:	1A6210-1
DUT Revision	:	
Serial Number	:	
DUT Mode	:	Tx @ 315 MHz
Line Tested	:	L1
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-10
Notes	:	
Test Engineer	:	R. King
Limit	:	Class B
Test Date	:	Apr 22, 2011 04:57:10 AM



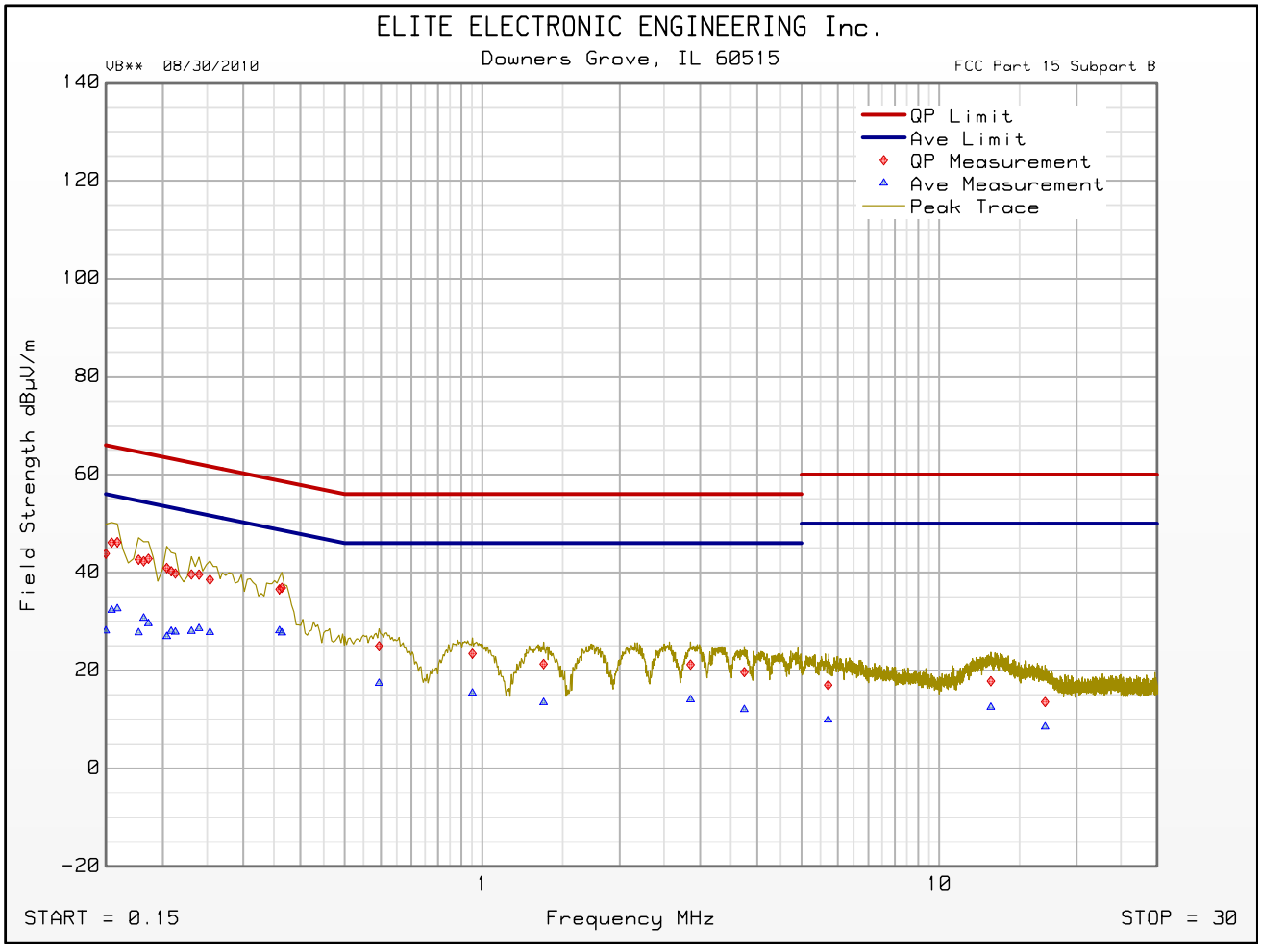
Emissions Meet QP Limit
Emissions Meet Ave Limit

FCC Part 15 Subpart B Conducted Emissions Test

Cumulative Data

VB** 08/30/2010

Manufacturer	:	The Chamberlain Group
Model	:	1A6210-1
DUT Revision	:	
Serial Number	:	
DUT Mode	:	Tx @ 315 MHz
Line Tested	:	L2
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-10
Notes	:	
Test Engineer	:	R. King
Limit	:	Class B
Test Date	:	Apr 22, 2011 05:03:11 AM



Emissions Meet QP Limit
Emissions Meet Ave Limit

FCC Part 15 Subpart B Conducted Emissions Test

Significant Emissions Data

VB** 08/30/2010

Manufacturer	:	The Chamberlain Group
Model	:	1A6210-1
DUT Revision	:	
Serial Number	:	
DUT Mode	:	un-cohered
Line Tested	:	L1
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-10
Notes	:	
Test Engineer	:	R. King
Limit	:	Class B
Test Date	:	May 16, 2011 08:37:10 AM
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/m	Quasi-peak Limit dBµV/m	Excessive Quasi-peak Emissions	Average Level dBµV/m	Average Limit dBµV/m	Excessive Average Emissions
0.204	39.9	63.4		31.1	53.4	
0.360	40.1	58.7		32.8	48.7	
0.784	22.3	56.0		14.1	46.0	
0.916	26.2	56.0		18.6	46.0	
1.493	25.1	56.0		17.2	46.0	
2.034	23.6	56.0		16.9	46.0	
3.208	21.1	56.0		14.1	46.0	
7.007	15.7	60.0		10.8	50.0	
9.414	13.5	60.0		8.3	50.0	

FCC Part 15 Subpart B Conducted Emissions Test

Significant Emissions Data

VB** 08/30/2010

Manufacturer	:	The Chamberlain Group
Model	:	1A6210-1
DUT Revision	:	
Serial Number	:	
DUT Mode	:	un-cohered
Line Tested	:	L2
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-10
Notes	:	
Test Engineer	:	R. King
Limit	:	Class B
Test Date	:	May 16, 2011 08:43:59 AM
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/m	Quasi-peak Limit dBµV/m	Excessive Quasi-peak Emissions	Average Level dBµV/m	Average Limit dBµV/m	Excessive Average Emissions
0.177	43.6	64.6		32.8	54.6	
0.360	40.4	58.7		32.3	48.7	
0.770	24.0	56.0		17.6	46.0	
0.871	23.6	56.0		17.1	46.0	
1.511	23.0	56.0		15.4	46.0	
2.088	23.2	56.0		16.3	46.0	
3.248	21.7	56.0		15.6	46.0	
7.646	16.8	60.0		12.4	50.0	
12.195	17.2	60.0		12.7	50.0	
16.520	11.8	60.0		7.2	50.0	

FCC Part 15 Subpart B Conducted Emissions Test

Significant Emissions Data

VB** 08/30/2010

Manufacturer	:	The Chamberlain Group
Model	:	1A6210-1
DUT Revision	:	
Serial Number	:	
DUT Mode	:	Cohered
Line Tested	:	L1
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-10
Notes	:	
Test Engineer	:	R. King
Limit	:	Class B
Test Date	:	May 16, 2011 08:55:26 AM
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/m	Quasi-peak Limit dBµV/m	Excessive Quasi-peak Emissions	Average Level dBµV/m	Average Limit dBµV/m	Excessive Average Emissions
0.204	39.5	63.4		30.8	53.4	
0.360	39.7	58.7		32.2	48.7	
0.766	21.3	56.0		13.7	46.0	
0.898	25.6	56.0		19.6	46.0	
1.498	24.6	56.0		18.0	46.0	
2.016	22.9	56.0		15.2	46.0	
3.820	20.4	56.0		14.0	46.0	
6.328	14.7	60.0		9.5	50.0	
9.441	12.9	60.0		8.0	50.0	
20.777	9.1	60.0		4.6	50.0	

FCC Part 15 Subpart B Conducted Emissions Test

Significant Emissions Data

VB** 08/30/2010

Manufacturer	:	The Chamberlain Group
Model	:	1A6210-1
DUT Revision	:	
Serial Number	:	
DUT Mode	:	Cohered
Line Tested	:	L2
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-10
Notes	:	
Test Engineer	:	R. King
Limit	:	Class B
Test Date	:	May 16, 2011 08:49:02 AM
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/m	Quasi-peak Limit dBµV/m	Excessive Quasi-peak Emissions	Average Level dBµV/m	Average Limit dBµV/m	Excessive Average Emissions
0.173	44.1	64.8		32.9	54.8	
0.360	40.3	58.7		31.1	48.7	
0.734	23.6	56.0		16.1	46.0	
0.876	23.5	56.0		17.0	46.0	
1.471	22.8	56.0		16.2	46.0	
2.660	22.8	56.0		16.4	46.0	
3.280	21.5	56.0		14.5	46.0	
7.790	16.4	60.0		11.2	50.0	
12.254	17.0	60.0		11.9	50.0	
24.197	10.2	60.0		5.8	50.0	

FCC Part 15 Subpart B Conducted Emissions Test

Significant Emissions Data

VB** 08/30/2010

Manufacturer	:	The Chamberlain Group
Model	:	1A6210-1
DUT Revision	:	
Serial Number	:	
DUT Mode	:	Tx @ 315 MHz
Line Tested	:	L1
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-10
Notes	:	
Test Engineer	:	R. King
Limit	:	Class B
Test Date	:	Apr 22, 2011 04:57:10 AM
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/m	Quasi-peak Limit dBµV/m	Excessive Quasi-peak Emissions	Average Level dBµV/m	Average Limit dBµV/m	Excessive Average Emissions
0.159	46.1	65.5		32.0	55.5	
0.360	38.3	58.7		29.4	48.7	
0.500	21.2	56.0		12.6	46.0	
1.038	23.9	56.0		16.3	46.0	
1.390	24.6	56.0		17.3	46.0	
2.147	23.1	56.0		15.6	46.0	
4.090	20.4	56.0		13.7	46.0	
5.023	16.1	60.0		9.3	50.0	
11.309	13.6	60.0		9.3	50.0	
20.512	10.2	60.0		5.3	50.0	

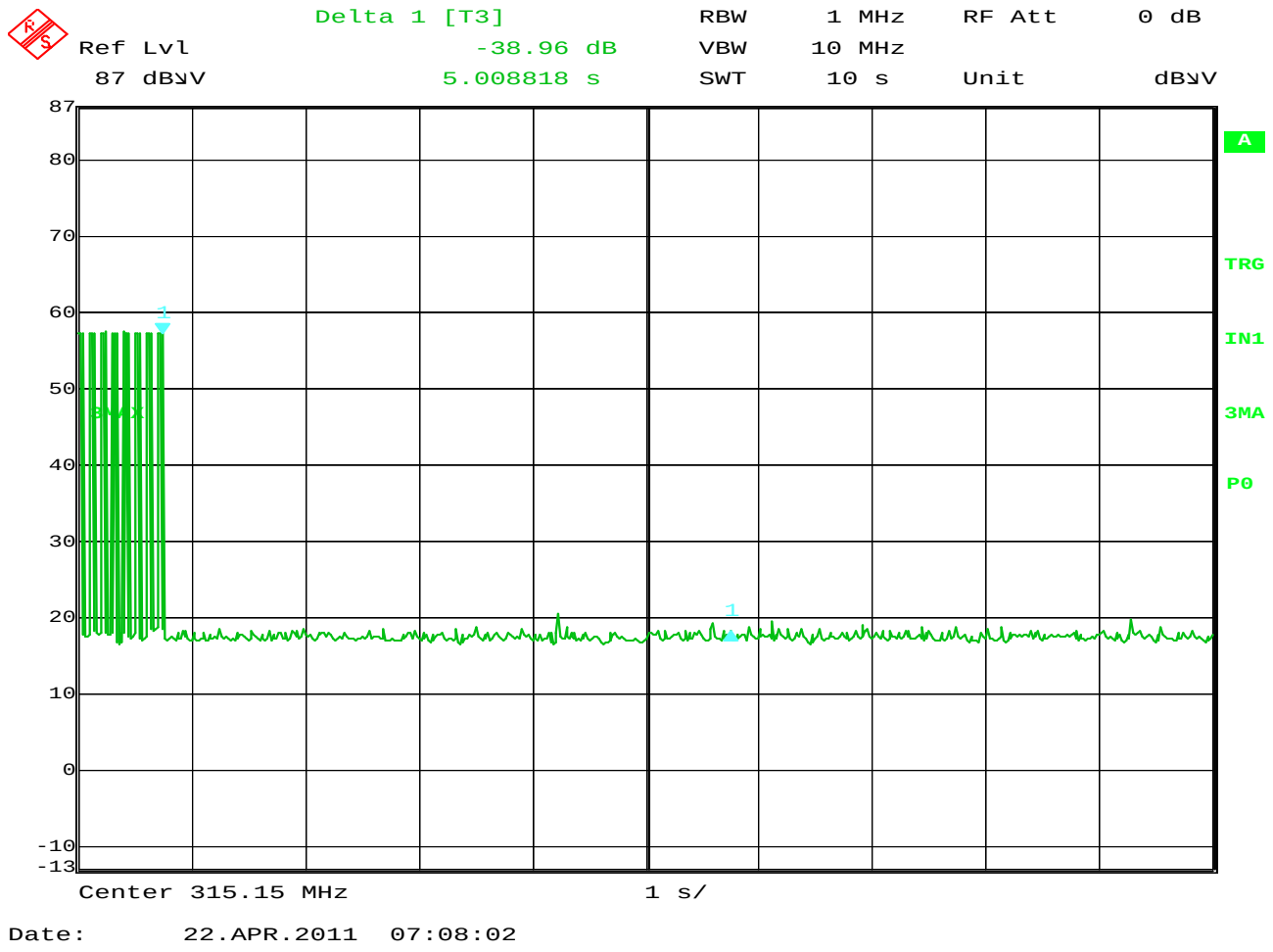
FCC Part 15 Subpart B Conducted Emissions Test

Significant Emissions Data

VB** 08/30/2010

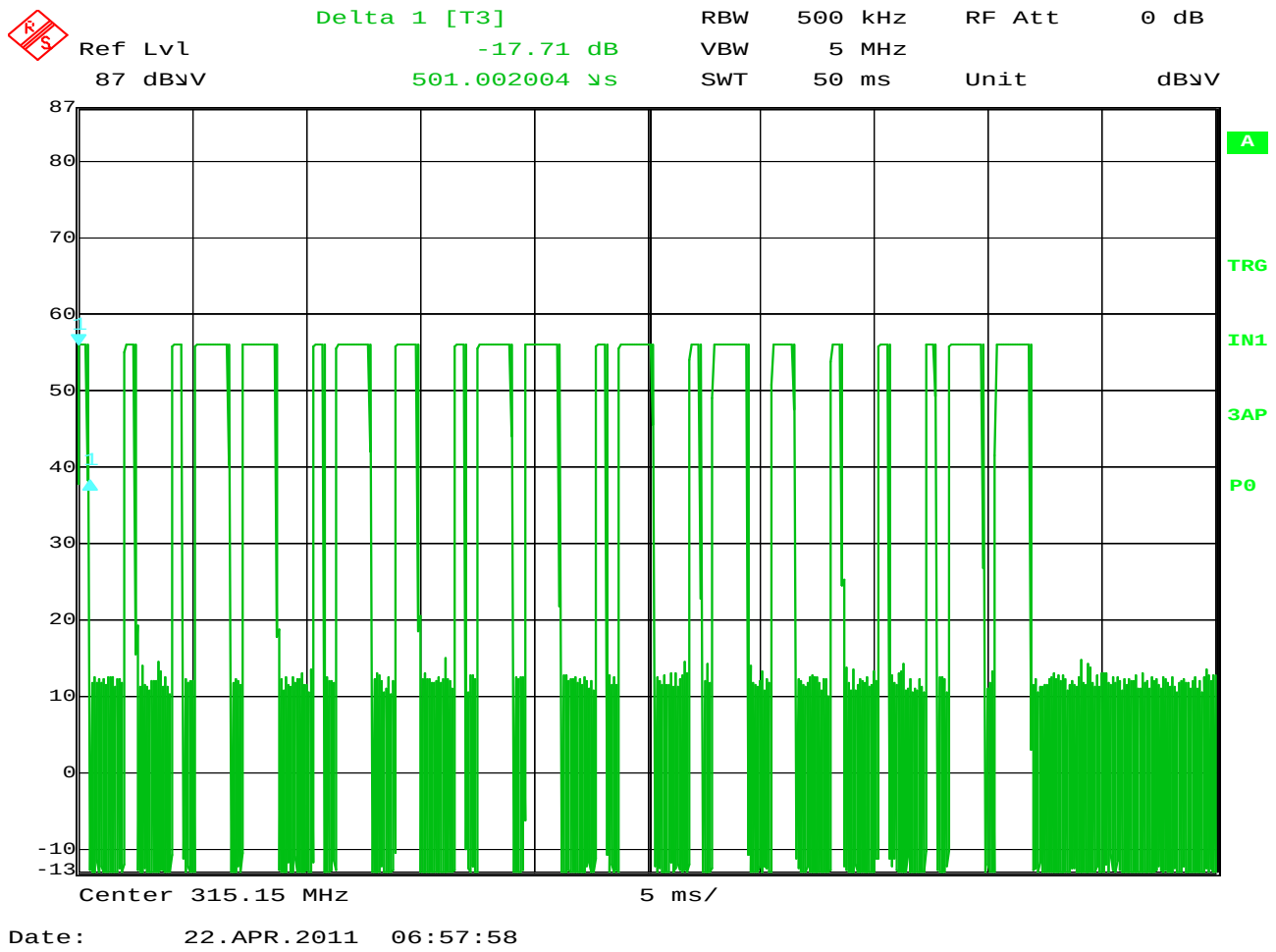
Manufacturer	:	The Chamberlain Group
Model	:	1A6210-1
DUT Revision	:	
Serial Number	:	
DUT Mode	:	Tx @ 315 MHz
Line Tested	:	L2
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-10
Notes	:	
Test Engineer	:	R. King
Limit	:	Class B
Test Date	:	Apr 22, 2011 05:03:11 AM
Data Filter	:	Up to 80 maximum levels detected with 6 dB level excursion threshold over 10 dB margin below limit

Freq MHz	Quasi-peak Level dBµV/m	Quasi-peak Limit dBµV/m	Excessive Quasi-peak Emissions	Average Level dBµV/m	Average Limit dBµV/m	Excessive Average Emissions
0.159	46.2	65.5		32.6	55.5	
0.365	36.9	58.6		27.7	48.6	
0.595	25.0	56.0		17.4	46.0	
0.952	23.4	56.0		15.4	46.0	
1.363	21.3	56.0		13.5	46.0	
2.858	21.2	56.0		14.1	46.0	
3.748	19.7	56.0		12.0	46.0	
5.716	17.0	60.0		9.9	50.0	
12.978	17.8	60.0		12.5	50.0	
17.056	13.6	60.0		8.5	50.0	



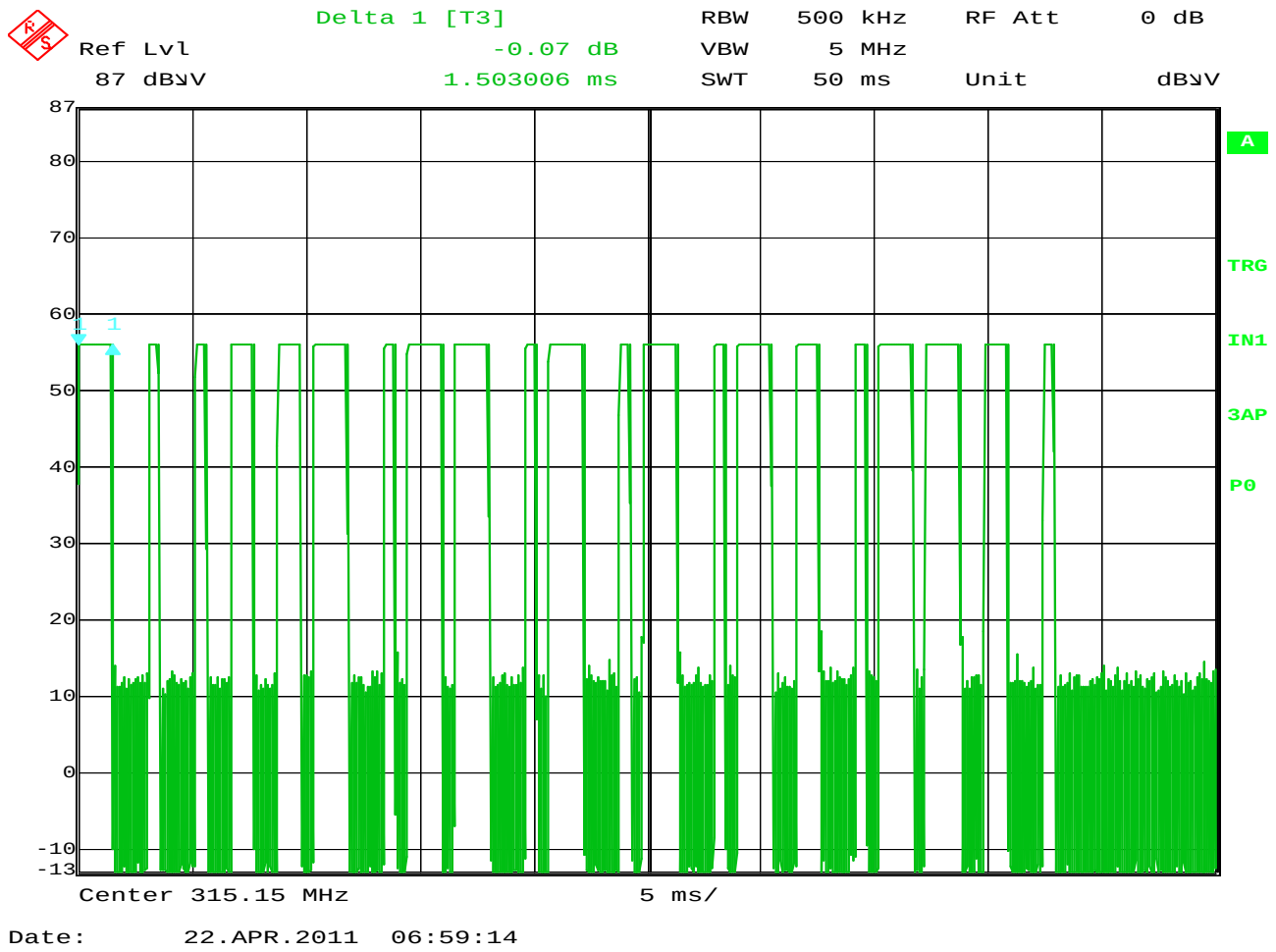
Periodic Operation

MANUFACTURER	:	The Chamberlain Group
MODEL NUMBER	:	1A6210-1
TEST SPEC.	:	15.231 Periodic Operation
TEST PARAMETERS	:	Rolling Code D
EUT FREQUENCY	:	Transmit at 315MHz
NOTES	:	



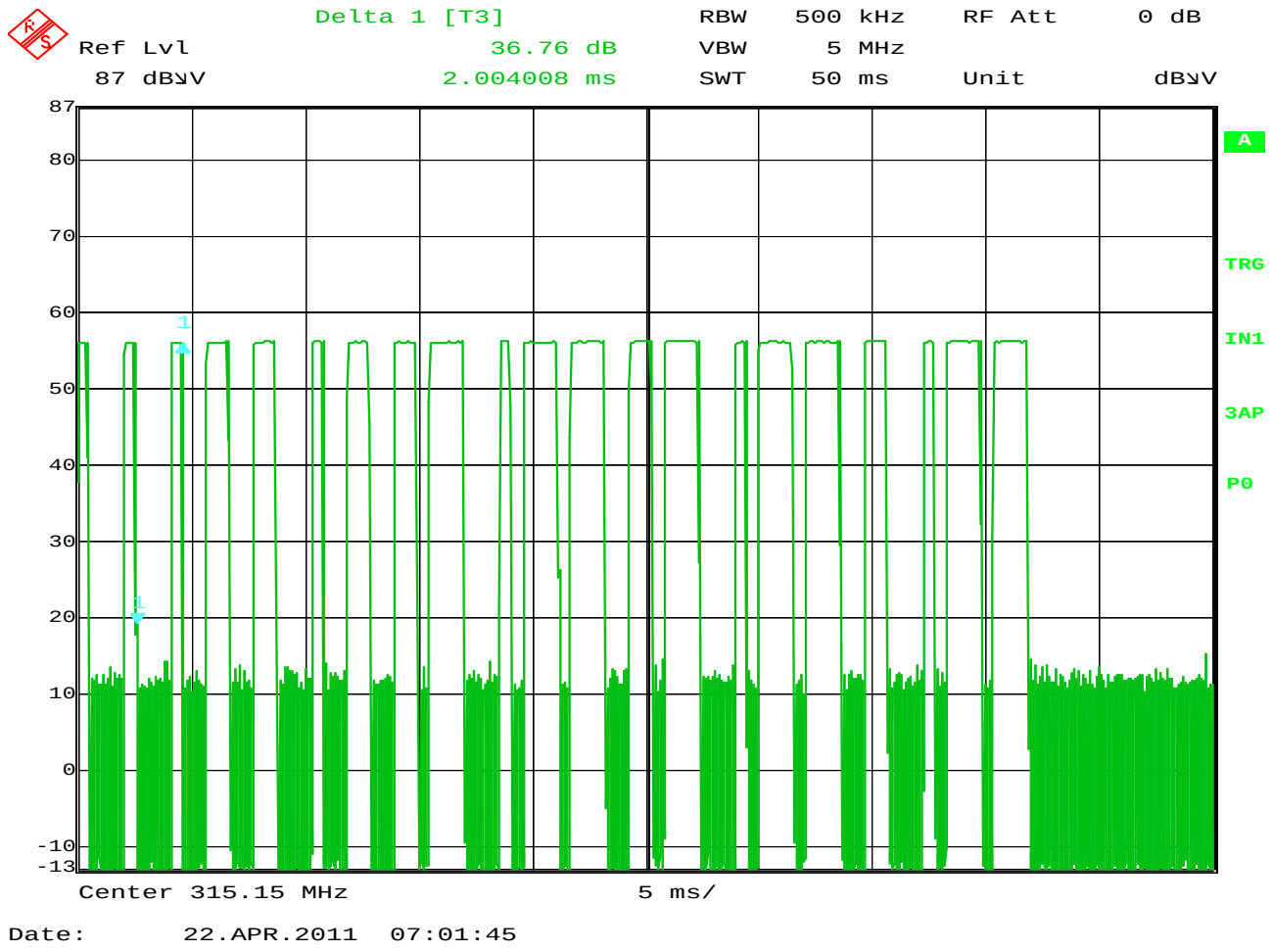
Duty Cycle

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : 1A6210-1
TEST SPEC. : 15.231 Periodic Operation
TEST PARAMETERS : Rolling Code D
EUT FREQUENCY : Transmit at 315MHz
NOTES : .5mS sync pulse



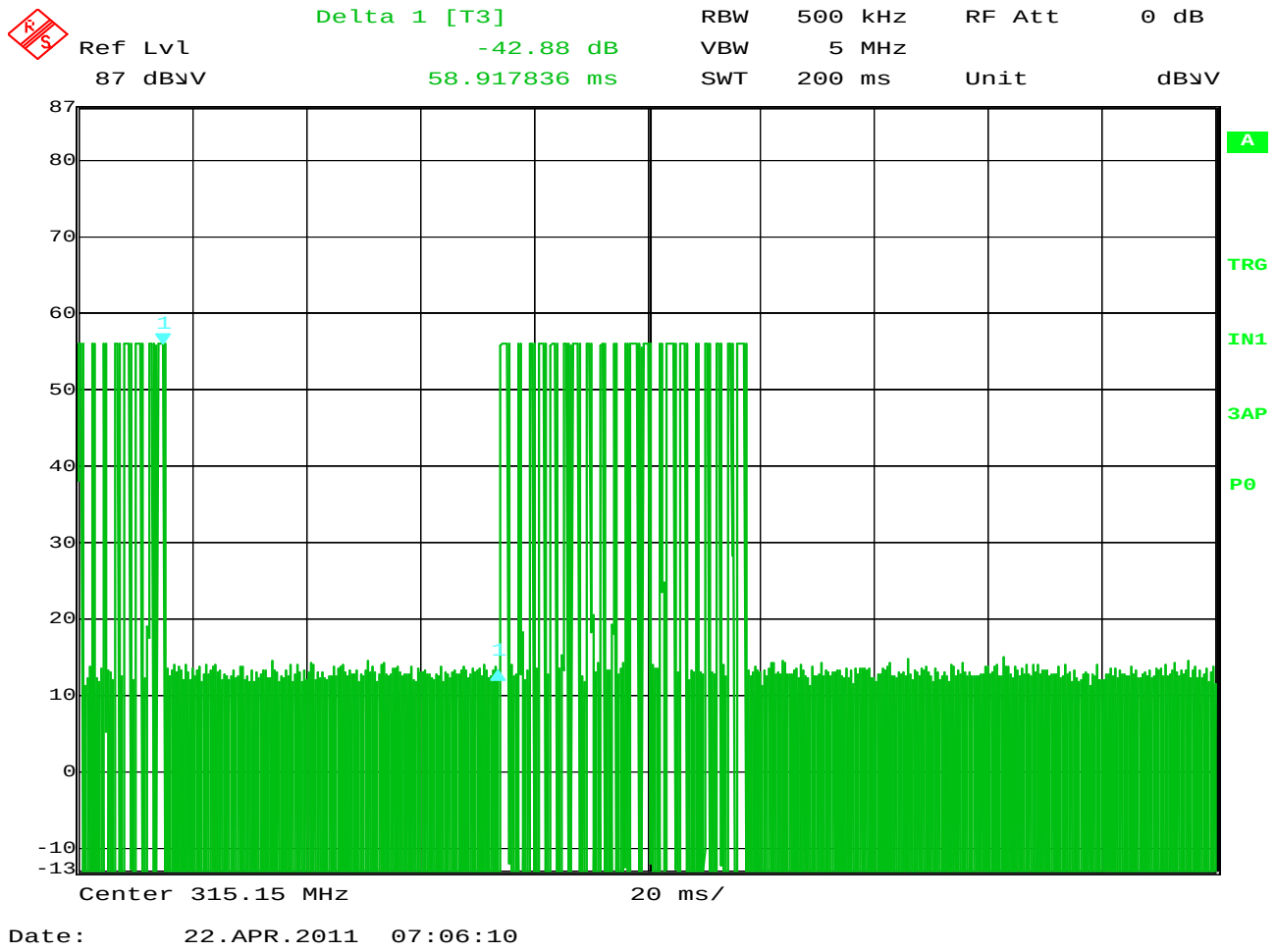
Duty Cycle

MANUFACTURER : The Chamberlain Group
MODEL NUMBER : 1A6210-1
TEST SPEC. : 15.231 Periodic Operation
TEST PARAMETERS : Rolling Code D
EUT FREQUENCY : Transmit at 315MHz
NOTES : 1.5mS Sync Pulse



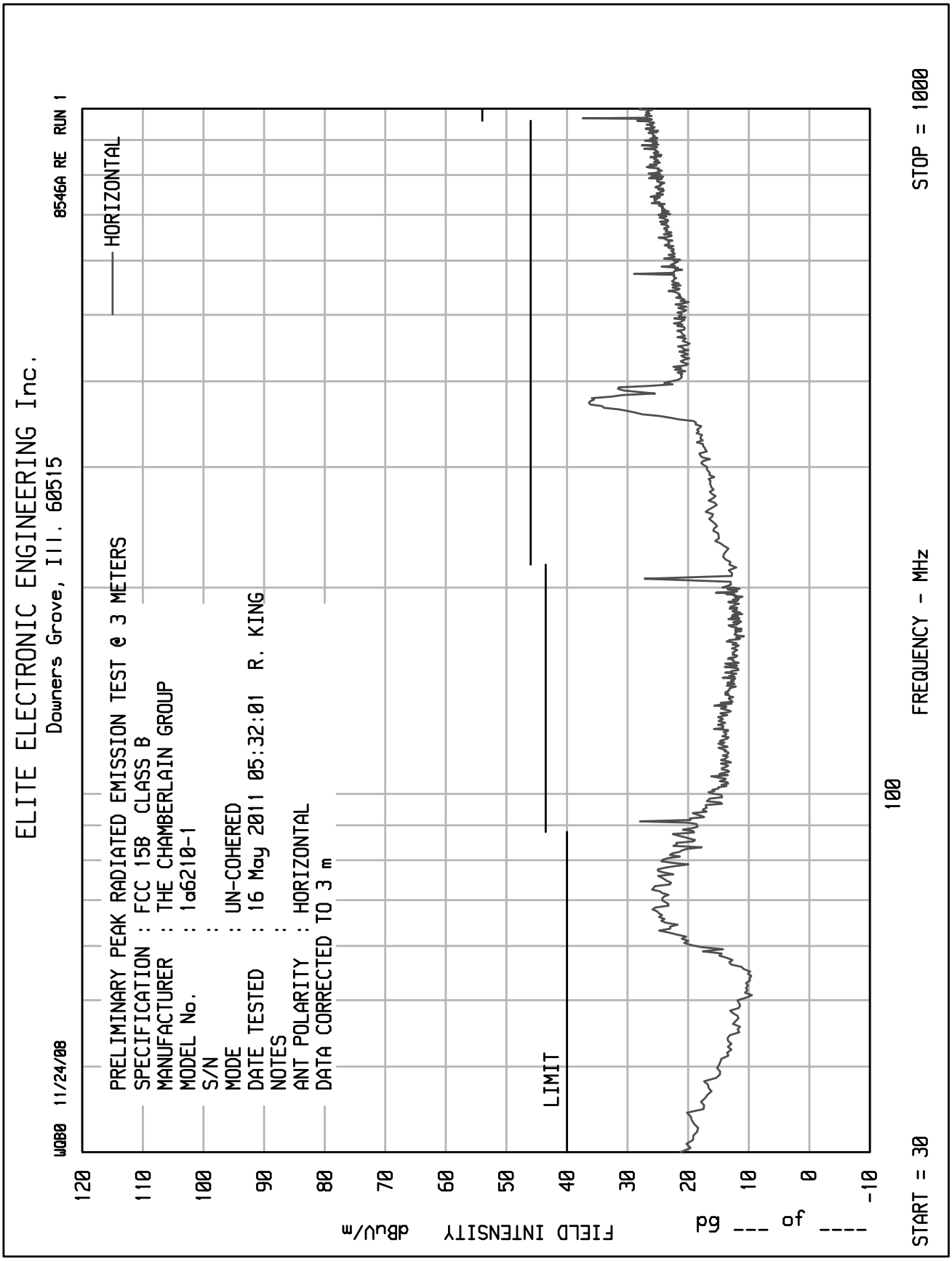
Duty Cycle

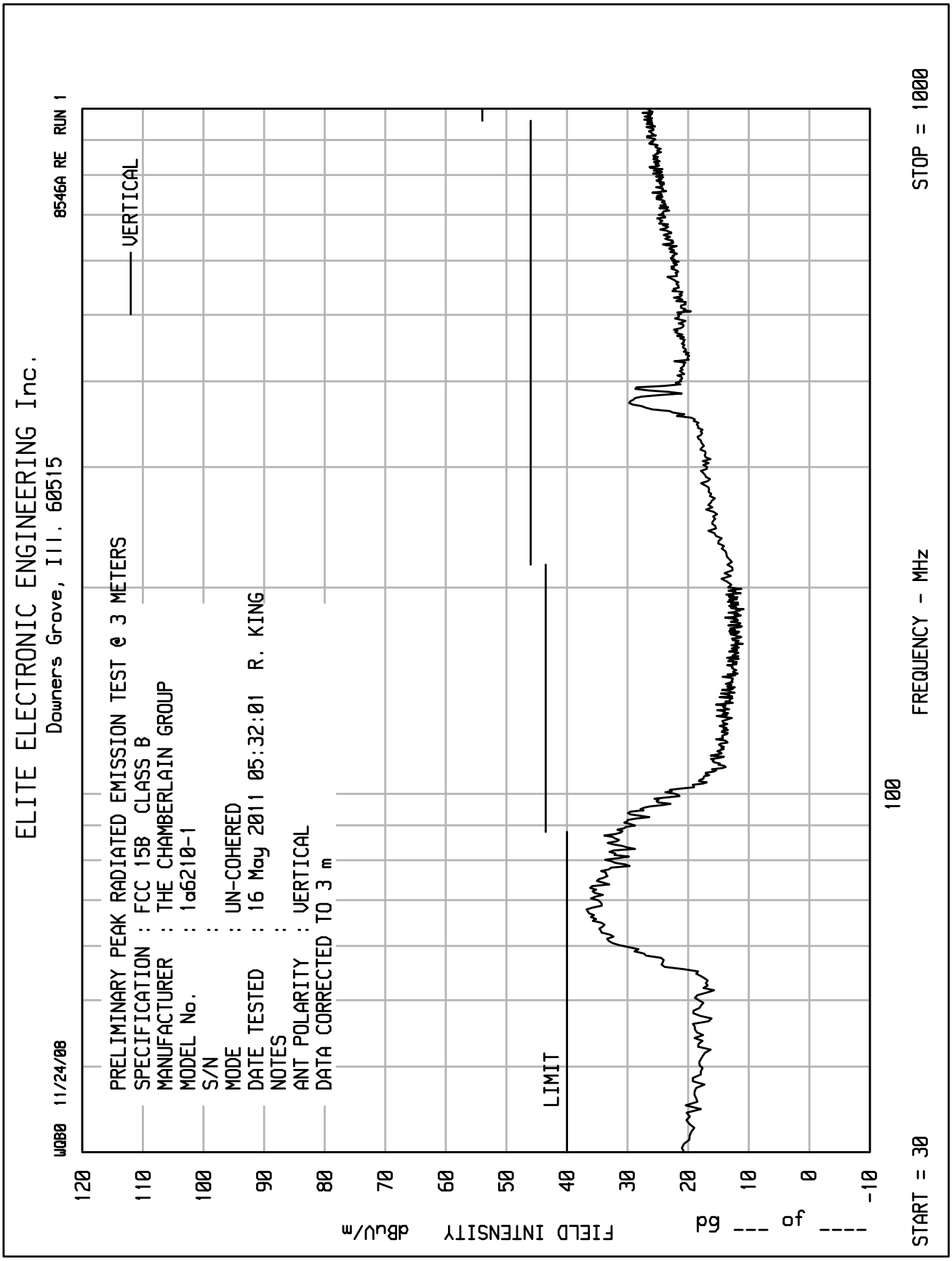
MANUFACTURER	:	The Chamberlain Group
MODEL NUMBER	:	1A6210-1
TEST SPEC.	:	15.231 Periodic Operation
TEST PARAMETERS	:	Rolling Code D
EUT FREQUENCY	:	Transmit at 315MHz
NOTES	:	20 Trinary bits 2 mS wide

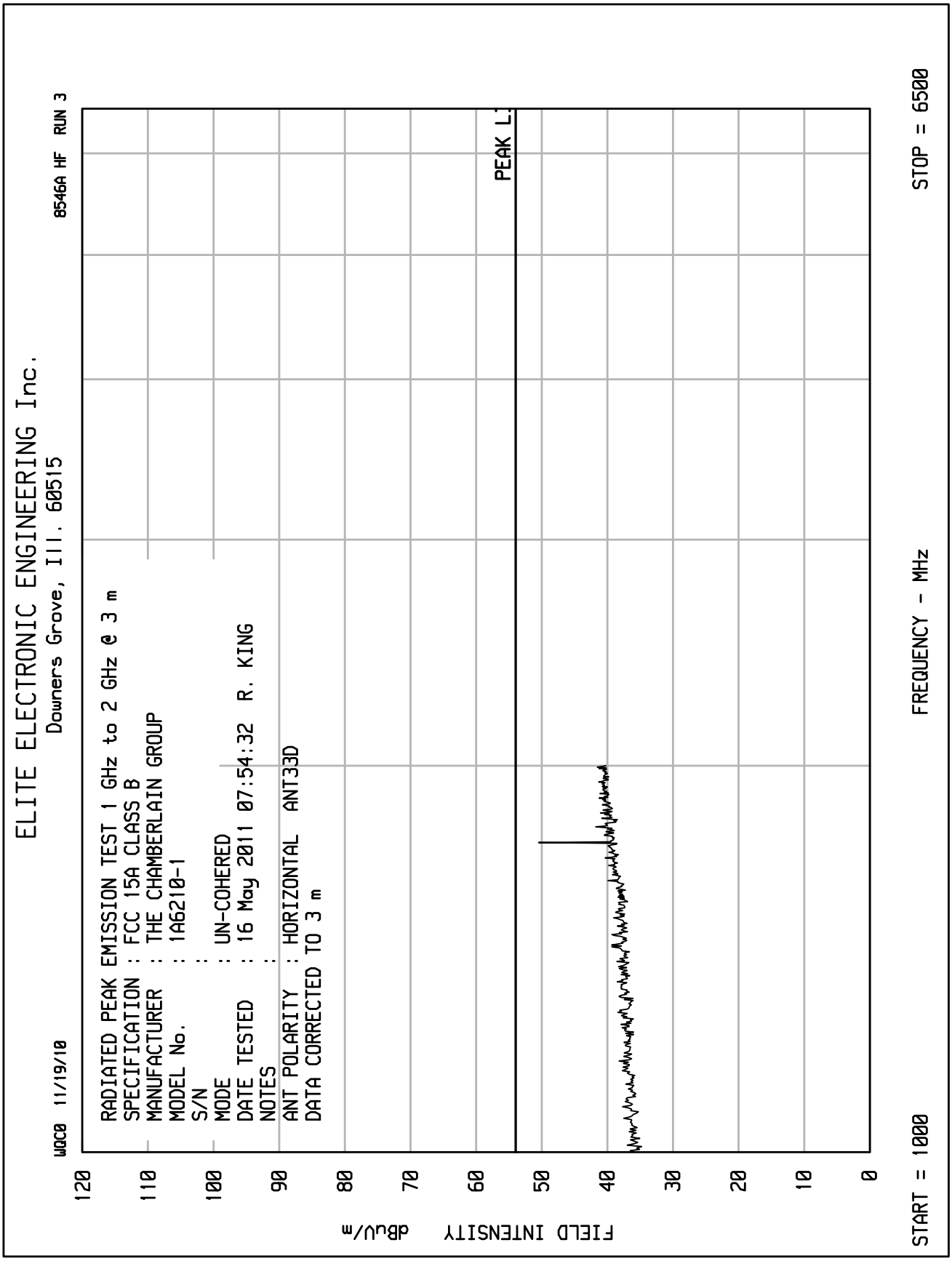


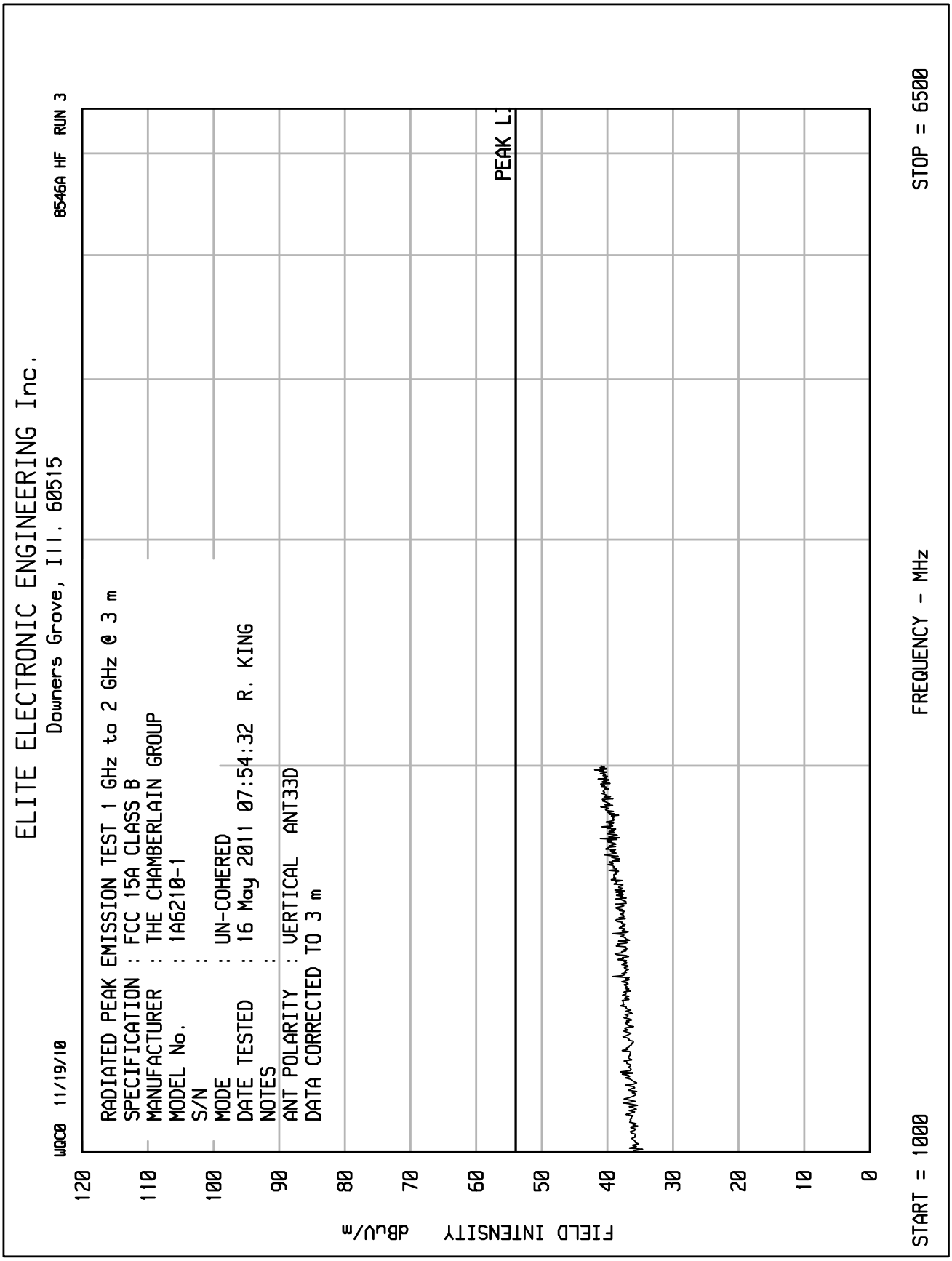
Duty Cycle

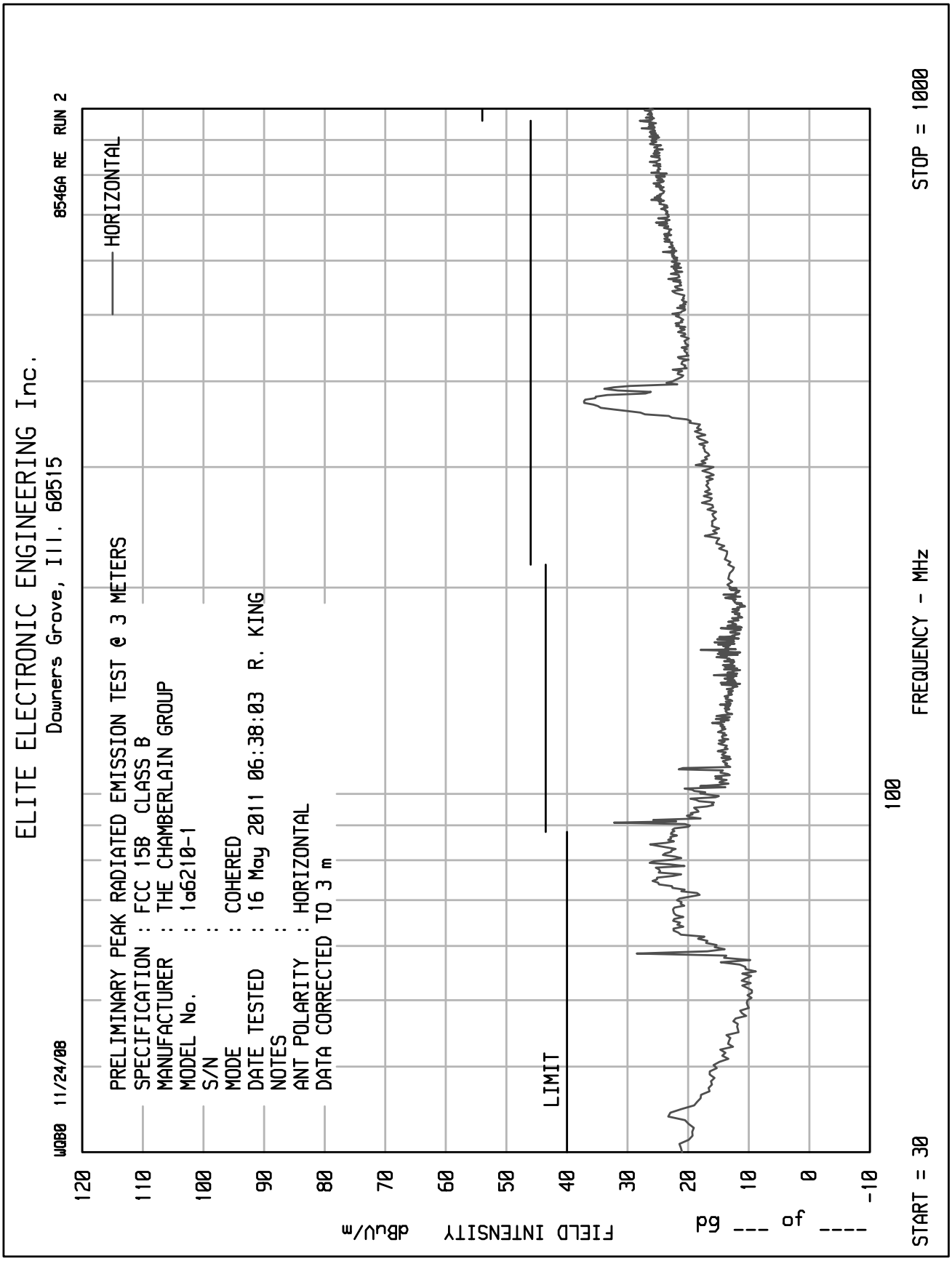
MANUFACTURER	:	The Chamberlain Group
MODEL NUMBER	:	1A6210-1
TEST SPEC.	:	15.231 Periodic Operation
TEST PARAMETERS	:	Rolling Code D
EUT FREQUENCY	:	Transmit at 315MHz
NOTES	:	58.5mS Blank time

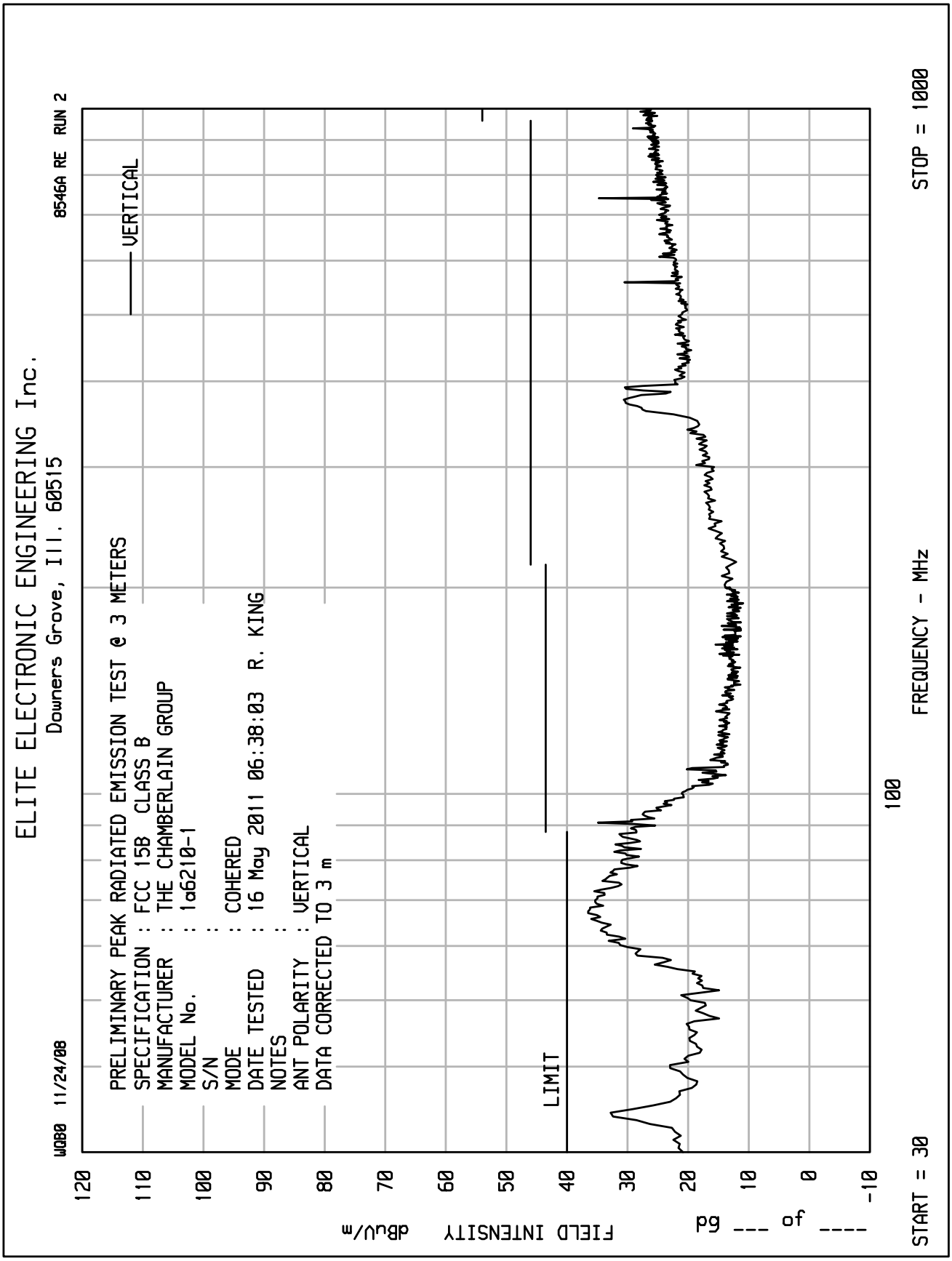

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WQ80 11/24/08
8546A RE RUN 1
PRELIMINARY PEAK RADIATED EMISSION TEST @ 3 METERS
SPECIFICATION : FCC 15B CLASS B
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL No. : 1a6210-1
S/N :
MODE : UN-COHERED
DATE TESTED : 16 May 2011 05:32:01 R. KING
NOTES :
ANT POLARITY : HORIZONTAL
DATA CORRECTED TO 3 m
HORIZONTAL
LIMIT
FIELD INTENSITY dBuV/m
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
START = 30
100
FREQUENCY - MHz
STOP = 1000
pg ___ of ____

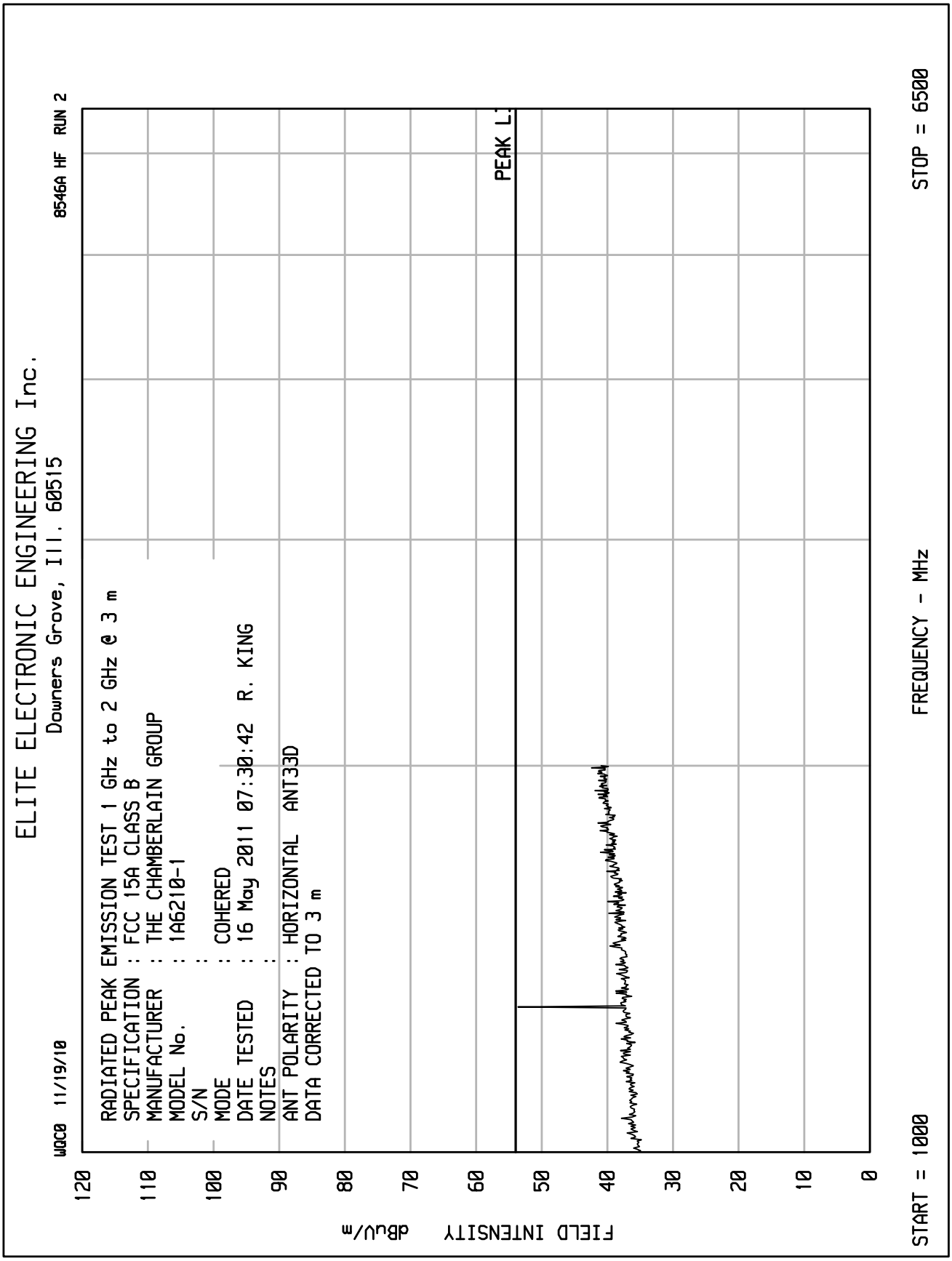

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WQ80 11/24/08
8546A RE RUN 1
PRELIMINARY PEAK RADIATED EMISSION TEST @ 3 METERS
SPECIFICATION : FCC 15B CLASS B
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL No. : 1a6210-1
S/N :
MODE : UN-COHERED
DATE TESTED : 16 May 2011 05:32:01 R. KING
NOTES :
ANT POLARITY : VERTICAL
DATA CORRECTED TO 3 m
VERTICAL
LIMIT
FIELD INTENSITY dBuV/m
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
pg ___ of ____
START = 30
100
FREQUENCY - MHz
STOP = 1000

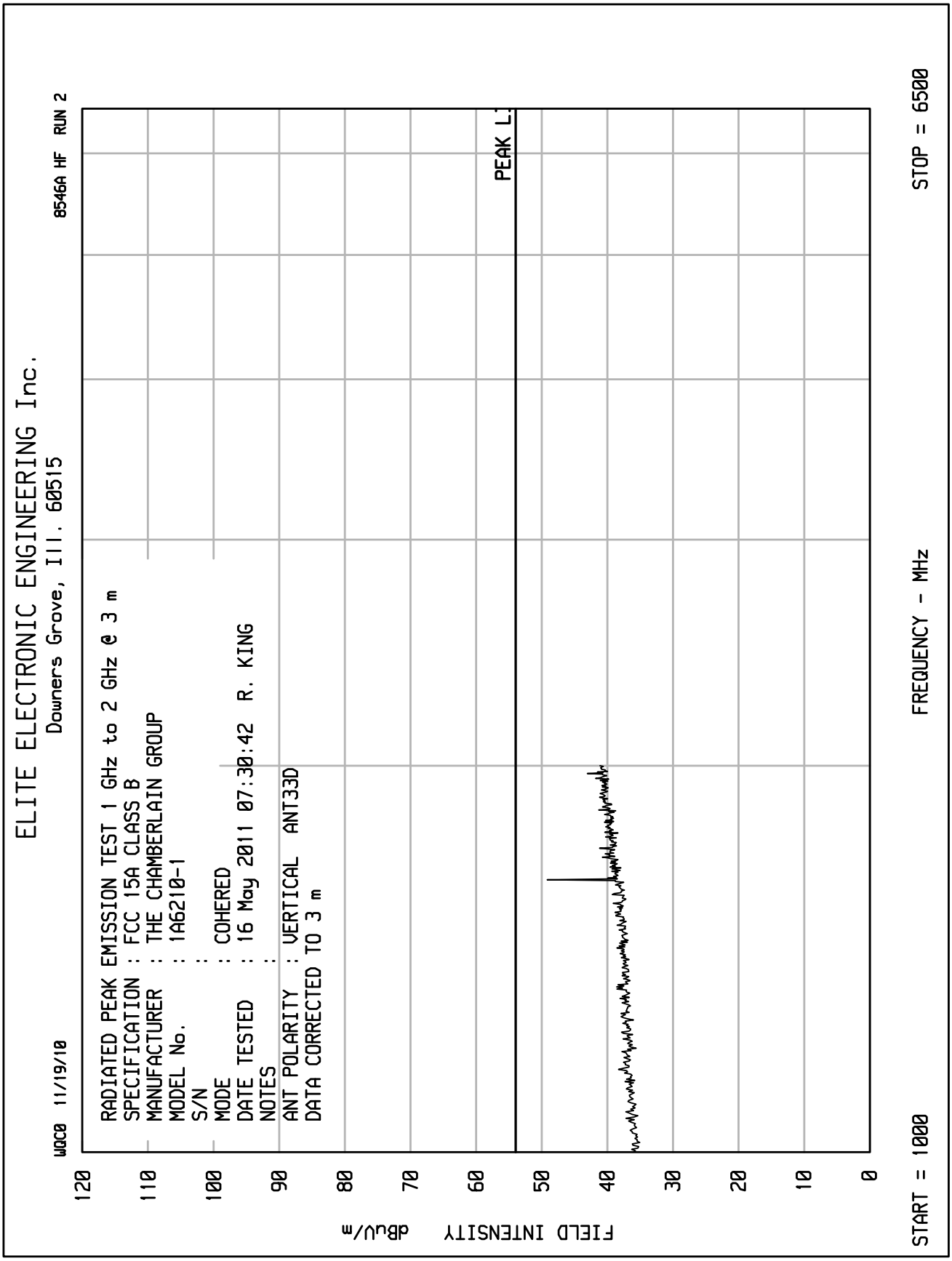

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WQC0 11/19/10
8546A HF RUN 3
RADIATED PEAK EMISSION TEST 1 GHz to 2 GHz @ 3 m
SPECIFICATION : FCC 15A CLASS B
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL No. : 1A6210-1
S/N : :
MODE : UN-COHERED
DATE TESTED : 16 May 2011 07:54:32 R. KING
NOTES :
ANT POLARITY : HORIZONTAL ANT33D
DATA CORRECTED TO 3 m
PEAK L
FIELD INTENSITY dBuV/m
120
110
100
90
80
70
60
50
40
30
20
10
0
START = 1000
FREQUENCY - MHz
STOP = 6500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WQC0 11/19/10
8546A HF RUN 3
RADIATED PEAK EMISSION TEST 1 GHz to 2 GHz @ 3 m
SPECIFICATION : FCC 15A CLASS B
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL No. : 1A6210-1
S/N : :
MODE : UN-COHERED
DATE TESTED : 16 May 2011 07:54:32 R. KING
NOTES :
ANT POLARITY : VERTICAL ANT33D
DATA CORRECTED TO 3 m
PEAK L
FIELD INTENSITY dBuV/m
120
110
100
90
80
70
60
50
40
30
20
10
0
START = 1000
FREQUENCY - MHz
STOP = 6500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WQ80 11/24/08
8546A RE RUN 2
PRELIMINARY PEAK RADIATED EMISSION TEST @ 3 METERS
SPECIFICATION : FCC 15B CLASS B
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL No. : 1a6210-1
S/N :
MODE : COHERED
DATE TESTED : 16 May 2011 06:38:03 R. KING
NOTES :
ANT POLARITY : HORIZONTAL
DATA CORRECTED TO 3 m
HORIZONTAL
LIMIT
FIELD INTENSITY dBuV/m
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
pg ___ of ____
START = 30
100
FREQUENCY - MHz
STOP = 1000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WQ80 11/24/08
8546A RE RUN 2
PRELIMINARY PEAK RADIATED EMISSION TEST @ 3 METERS
SPECIFICATION : FCC 15B CLASS B
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL No. : 1a6210-1
S/N : :
MODE : COHERED
DATE TESTED : 16 May 2011 06:38:03 R. KING
NOTES : :
ANT POLARITY : VERTICAL
DATA CORRECTED TO 3 m
VERTICAL
LIMIT
FIELD INTENSITY dBuV/m
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
START = 30
100
STOP = 1000
FREQUENCY - MHz
pg ___ of ____


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WQC0 11/19/10
8546A HF RUN 2
RADIATED PEAK EMISSION TEST 1 GHz to 2 GHz @ 3 m
SPECIFICATION : FCC 15A CLASS B
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL No. : 1A6210-1
S/N : :
MODE : COHERED
DATE TESTED : 16 May 2011 07:30:42 R. KING
NOTES :
ANT POLARITY : HORIZONTAL ANT33D
DATA CORRECTED TO 3 m
PEAK L
FIELD INTENSITY dBuV/m
120
110
100
90
80
70
60
50
40
30
20
10
0
START = 1000
FREQUENCY - MHz
STOP = 6500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WQC0 11/19/10
8546A HF RUN 2
RADIATED PEAK EMISSION TEST 1 GHz to 2 GHz @ 3 m
SPECIFICATION : FCC 15A CLASS B
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL No. : 1A6210-1
S/N : :
MODE : COHERED
DATE TESTED : 16 May 2011 07:30:42 R. KING
NOTES :
ANT POLARITY : VERTICAL ANT33D
DATA CORRECTED TO 3 m
PEAK L
FIELD INTENSITY dBuV/m
120
110
100
90
80
70
60
50
40
30
20
10
0
START = 1000
FREQUENCY - MHz
STOP = 6500

ETR No. 8546A
DATA SHEET TEST NO. 1

RADIATED QP EMISSION MEASUREMENTS in a 3 m SEMI-ANECHOIC ROOM
SPECIFICATION : FCC 15B CLASS B
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL NO. : 1a6210-1
SERIAL NO. :
TEST MODE : UN-COHERED
NOTES :
TEST DATE : 16 May 2011 05:32:01
TEST DISTANCE : 3 m (DATA EXTRAPOLATED TO 3 m)

FREQUENCY	QP READING	ANT FAC	CBL FAC	EXT ATTN	DIST FAC	TOTAL	QP LIMIT	AZ	ANT HT	POLAR
MHz	dBuV	dB	dB	dB	dB	dBuV/m	dBuV/m	deg	cm	
67.16	26.7	6.3	.5	0.0	0.0	33.5	40.0	0	200	V
76.36	23.5	7.2	.5	0.0	0.0	31.2	40.0	315	200	V
97.23	10.6	11.0	.5	0.0	0.0	22.1	43.5	90	120	V
124.22	-7.8	12.9	.7	0.0	0.0	5.7	43.5	135	340	H
145.34	-7.9	11.5	.8	0.0	0.0	4.3	43.5	45	200	V
178.29	-6.1	10.1	.9	0.0	0.0	4.9	43.5	225	120	V
211.06	-8.2	10.7	1.0	0.0	0.0	3.4	43.5	270	200	H
369.35	16.7	15.6	1.4	0.0	0.0	33.7	46.0	270	120	H
370.03	16.0	15.7	1.4	0.0	0.0	33.1	46.0	91	120	H
574.42	-7.6	19.0	1.5	0.0	0.0	13.0	46.0	45	200	H
642.16	-7.2	19.8	1.6	0.0	0.0	14.2	46.0	270	340	H
787.50	-6.7	20.6	2.0	0.0	0.0	15.9	46.0	315	200	H
881.70	-7.0	21.5	2.0	0.0	0.0	16.6	46.0	180	340	H
974.93	-6.6	22.2	2.0	0.0	0.0	17.6	54.0	180	200	H

Checked BY Richard E. King :

Richard E. King

DATA SHEET HF TEST NO. 3

RADIATED AVG EMISSION MEASUREMENTS >=1000 MHz in a 3 m ANECHOIC ROOM

SPECIFICATION : FCC 15A CLASS B
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL NO. : 1A6210-1
SERIAL NO. :
TEST MODE : UN-COHERED
NOTES :
TEST DATE : 16 May 2011 07:54:32
TEST DISTANCE : 3 m
ANTENNA : ANT33D

FREQUENCY	AVG READING	ANT FAC	CBL FAC	DIST FAC	TOTAL	AVG LIMIT	PASS/ FAIL	AZ	ANT HT	POLAR
MHz	dBuV	dB	dB	dB	dBuV/m	dBuV/m		deg	cm	
1093.55	-2.8	24.4	2.1	0.0	23.7	54.0		45	120	H
1154.82	5.4	24.6	2.2	0.0	32.2	54.0		135	200	H
1393.38	-3.1	25.0	2.5	0.0	24.4	54.0		180	120	V
1462.92	7.3	25.0	2.6	0.0	34.9	54.0		0	200	H
1654.39	-3.1	26.0	2.7	0.0	25.6	54.0		90	120	H
1740.97	7.3	26.4	2.8	0.0	36.5	54.0		135	200	H
1886.16	-3.1	27.4	2.9	0.0	27.2	54.0		270	120	H
1992.38	-3.3	27.6	3.0	0.0	27.3	54.0		45	200	V

Checked BY Richard E. King :

Richard E. King

ETR No. 8546A

DATA SHEET TEST NO. 2

RADIATED QP EMISSION MEASUREMENTS in a 3 m SEMI-ANECHOIC ROOM
SPECIFICATION : FCC 15B CLASS B
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL NO. : 1a6210-1
SERIAL NO. :
TEST MODE : COHERED
NOTES :
TEST DATE : 16 May 2011 06:38:03
TEST DISTANCE : 3 m (DATA EXTRAPOLATED TO 3 m)

FREQUENCY	QP READING	ANT FAC	CBL FAC	EXT ATTN	DIST FAC	TOTAL	QP LIMIT	AZ	ANT HT	POLAR
MHz	dBuV	dB	dB	dB	dB	dBuV/m	dBuV/m	deg	cm	
34.90	11.5	16.5	.5	0.0	0.0	28.6	40.0	180	120	V
67.33	27.2	6.3	.5	0.0	0.0	34.0	40.0	0	200	V
73.74	24.2	6.9	.5	0.0	0.0	31.6	40.0	315	200	V
96.71	6.6	10.9	.5	0.0	0.0	18.0	43.5	180	120	V
124.19	-7.8	12.9	.7	0.0	0.0	5.7	43.5	180	340	H
159.99	-1.4	10.7	.8	0.0	0.0	10.2	43.5	45	200	H
168.00	1.6	10.4	.9	0.0	0.0	12.9	43.5	180	120	H
242.29	-6.8	12.5	1.0	0.0	0.0	6.7	46.0	180	200	H
370.04	19.6	15.7	1.4	0.0	0.0	36.6	46.0	90	120	H
370.36	19.6	15.7	1.4	0.0	0.0	36.6	46.0	90	120	H
551.52	-7.5	18.9	1.5	0.0	0.0	12.9	46.0	135	200	V
675.64	-6.4	19.9	1.7	0.0	0.0	15.2	46.0	315	120	H
743.74	-6.5	20.3	1.9	0.0	0.0	15.7	46.0	90	200	V
853.10	-7.0	21.4	2.0	0.0	0.0	16.4	46.0	90	200	V
941.12	-6.8	22.0	2.0	0.0	0.0	17.2	46.0	90	120	V

Checked BY Richard E. King :

Richard E. King

DATA SHEET HF TEST NO. 2

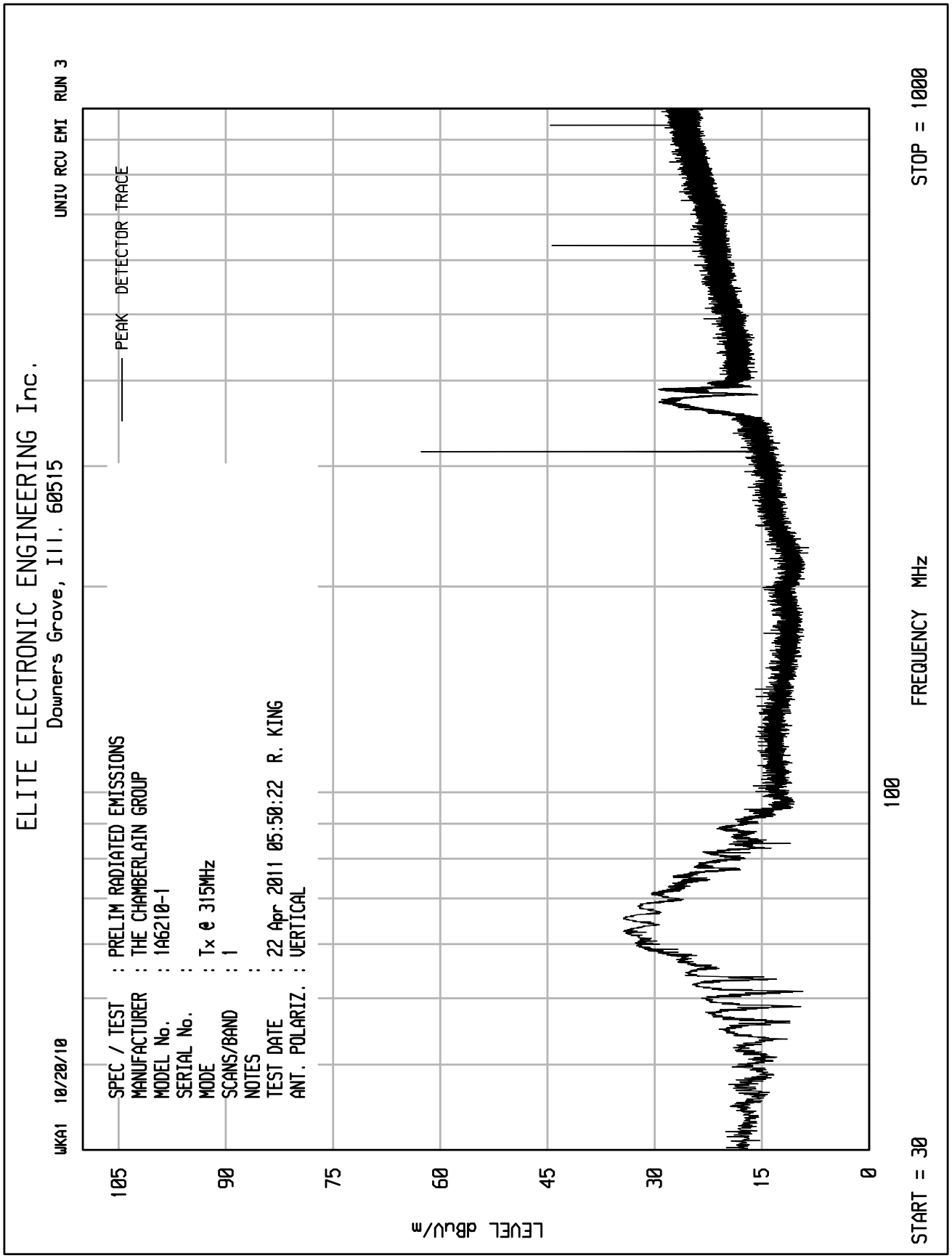
RADIATED AVG EMISSION MEASUREMENTS >=1000 MHz in a 3 m ANECHOIC ROOM

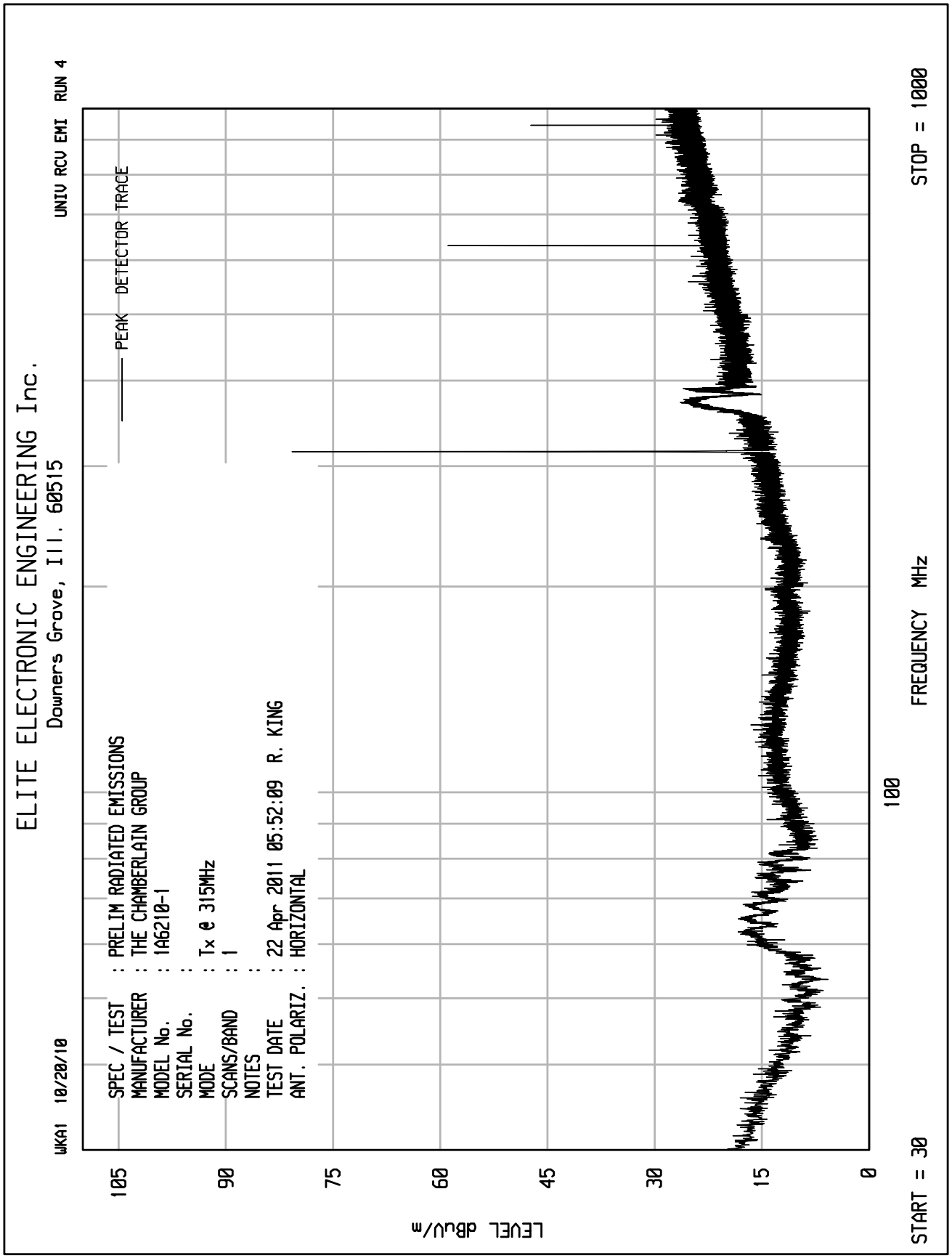
SPECIFICATION : FCC 15A CLASS B
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL NO. : 1A6210-1
SERIAL NO. :
TEST MODE : COHERED
NOTES :
TEST DATE : 16 May 2011 07:30:42
TEST DISTANCE : 3 m
ANTENNA : ANT33D

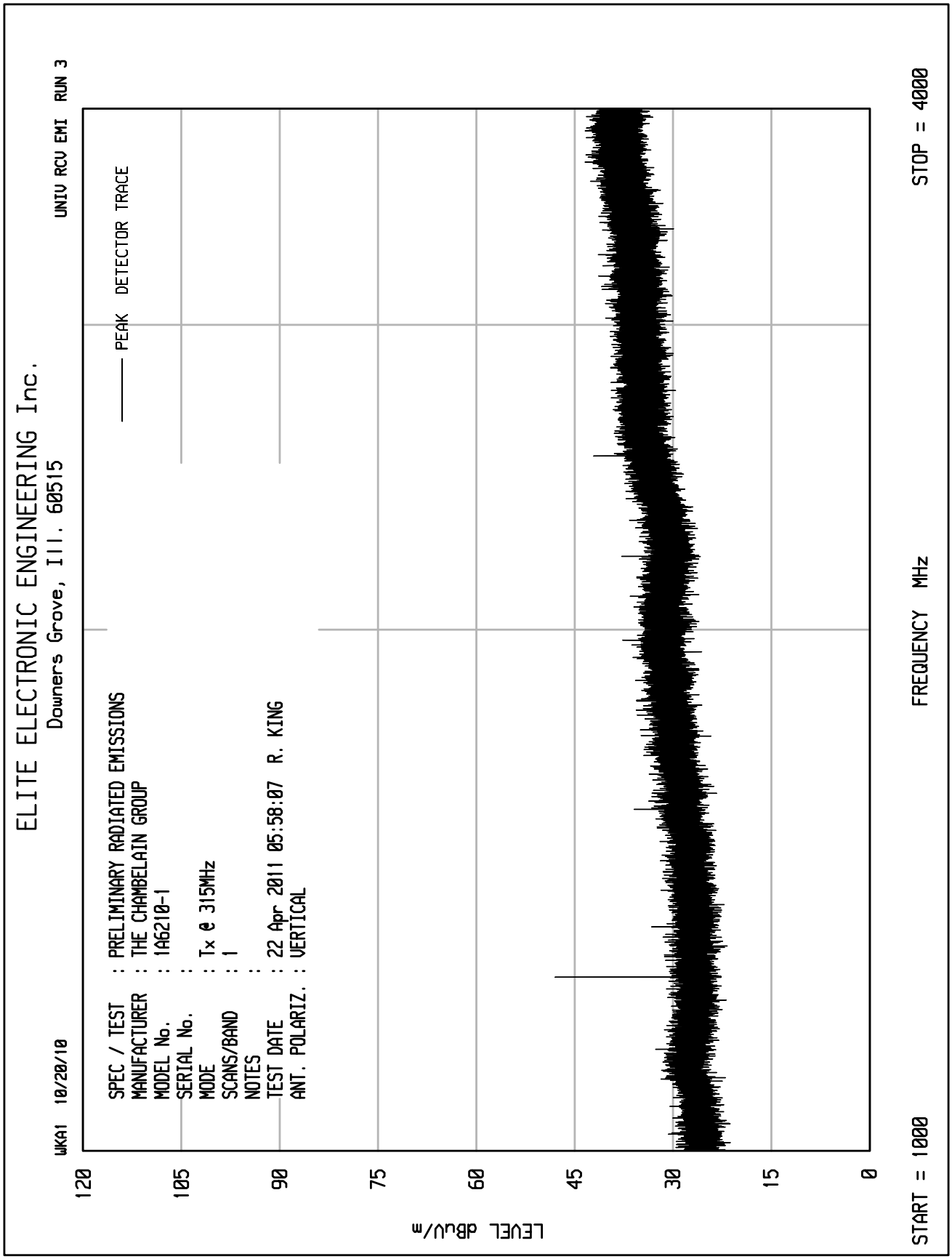
FREQUENCY	AVG READING	ANT FAC	CBL FAC	DIST FAC	TOTAL	AVG LIMIT	PASS/ FAIL	AZ	ANT HT	POLAR
MHz	dBuV	dB	dB	dB	dBuV/m	dBuV/m		deg	cm	
1080.42	-2.9	24.3	2.1	0.0	23.5	54.0		315	200	H
1247.67	-3.4	24.8	2.3	0.0	23.7	54.0		315	200	H
1284.09	-3.1	24.9	2.4	0.0	24.1	54.0		180	200	H
1524.15	-2.8	25.2	2.6	0.0	25.0	54.0		90	120	H
1650.08	-3.0	26.0	2.7	0.0	25.6	54.0		315	340	V
1832.08	.8	26.8	2.9	0.0	30.4	54.0		45	200	H
1913.86	-2.3	27.5	2.9	0.0	28.2	54.0		0	340	H
1962.94	-3.2	27.6	3.0	0.0	27.3	54.0		0	340	V

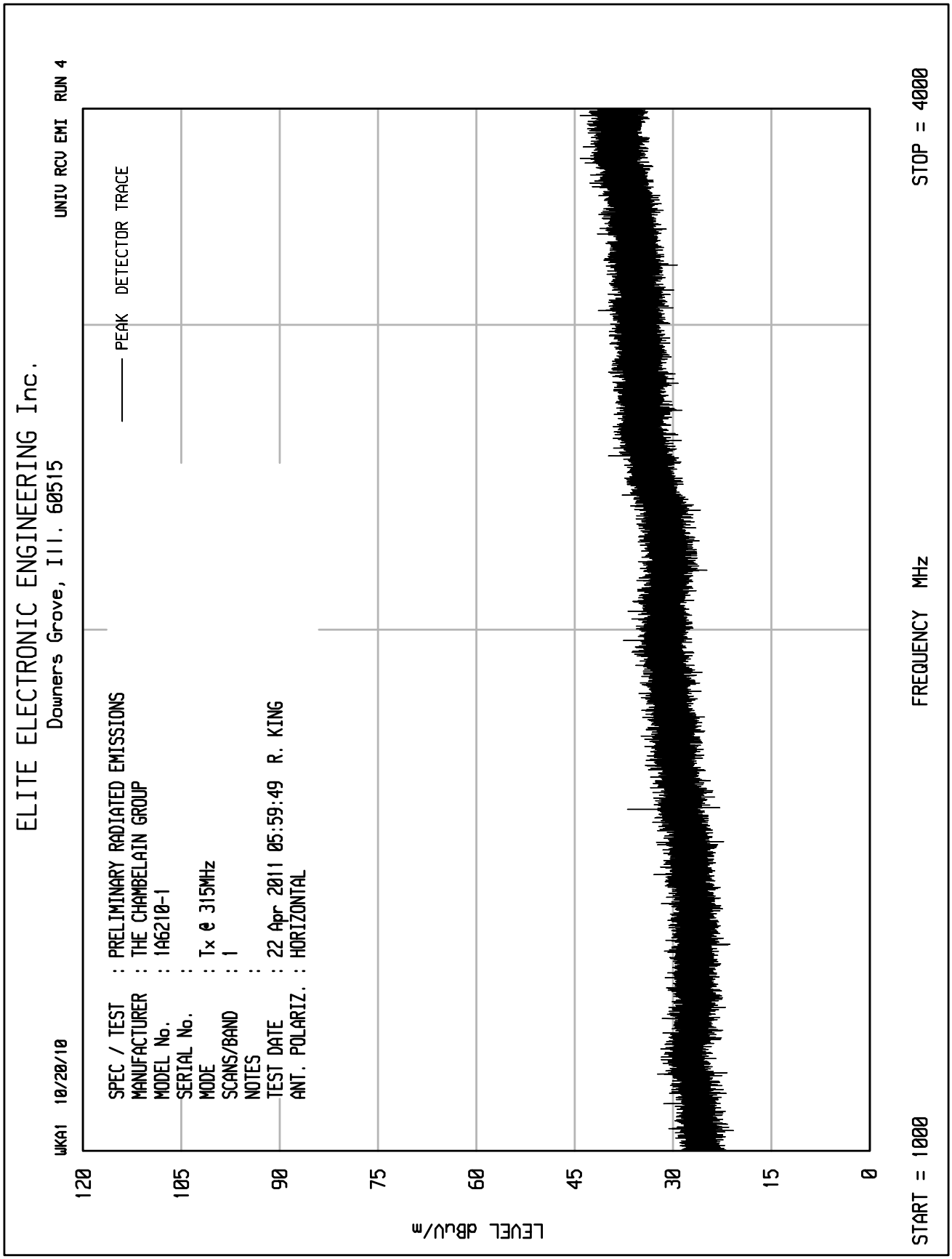
Checked BY Richard E. King :

Richard E. King


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 3
WKA1 10/20/10
SPEC / TEST : PRELIM RADIATED EMISSIONS
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL No. : 1A6210-1
SERIAL No. :
MODE : Tx @ 315MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 22 Apr 2011 05:50:22 R. KING
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
105
90
75
60
45
30
15
0
START = 30
100
FREQUENCY MHz
STOP = 1000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 4
WKA1 10/20/10
SPEC / TEST : PRELIM RADIATED EMISSIONS
MANUFACTURER : THE CHAMBERLAIN GROUP
MODEL No. : 1A6210-1
SERIAL No. :
MODE : Tx @ 315MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 22 Apr 2011 05:52:09 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
105
90
75
60
45
30
15
0
START = 30
100
FREQUENCY MHz
STOP = 1000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 3
WKA1 10/20/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : THE CHAMBELAIN GROUP
MODEL No. : 1A6210-1
SERIAL No. :
MODE : Tx @ 315MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 22 Apr 2011 05:58:07 R. KING
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 4
WKA1 10/20/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : THE CHAMBELAIN GROUP
MODEL No. : 1A6210-1
SERIAL No. :
MODE : Tx @ 315MHz
SCANS/BAND : 1
NOTES :
TEST DATE : 22 Apr 2011 05:59:49 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4000

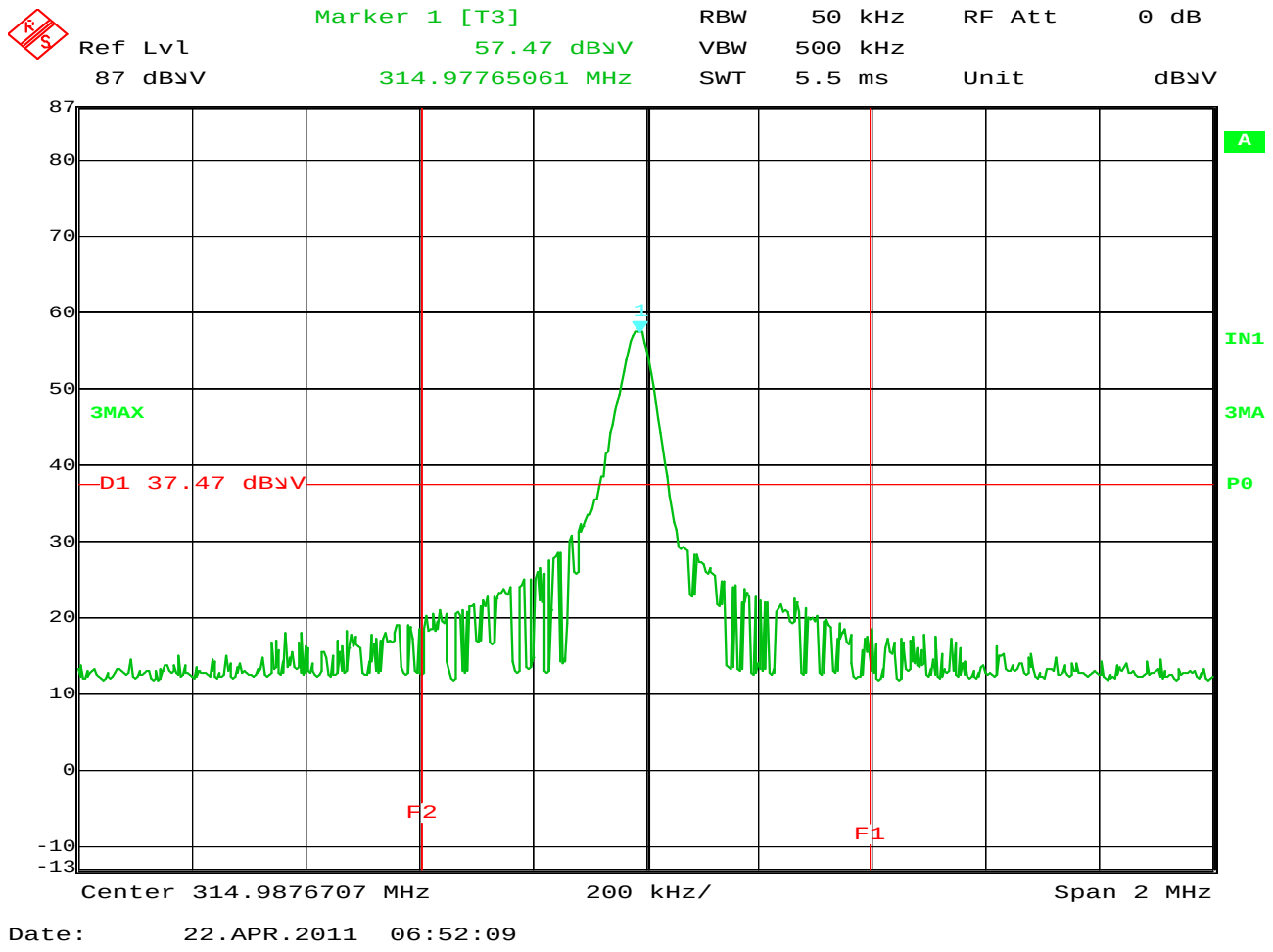
RADIATED EMISSION MEASUREMENTS in a 3 m ANECHOIC ROOM

MANUFACTURER	:	The Chamberlain Group, Inc.
MODEL NO.	:	1A6210-1
SERIAL NO.	:	
TEST MODE	:	Tx @ 315MHz
NOTES	:	Rolling Code D
TEST DATE	:	April 19, 2011

Freq (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Duty Cycle Factor (dB)	Total dBuV/m at 3 M	Total uV/m at 3M	Limit uV/m at 3M	Margin (dB)
315.00	H	63.9		1.4	14.5	-10.2	69.6	3018.9	6041.7	-6.0
315.00	V	52.5		1.4	14.5	-10.2	58.2	815.4	6041.7	-17.4
630.00	H	28.6		2.0	19.5	-10.2	39.9	98.8	604.2	-15.7
630.00	V	31.8		2.0	19.5	-10.2	43.1	143.5	604.2	-12.5
945.00	H	23.3		2.4	22.1	-10.2	37.6	76.2	604.2	-18.0
945.00	V	17.2		2.4	22.1	-10.2	31.5	37.6	604.2	-24.1
1260.00	H	12.6		2.9	25.6	-10.2	30.8	34.8	604.2	-24.8
1260.00	V	14.1		2.9	25.6	-10.2	32.3	41.1	604.2	-23.3
1575.00	H	15.4		3.2	26.4	-10.2	34.8	54.7	500.0	-19.2
1575.00	V	19.0		3.2	26.4	-10.2	38.4	83.4	500.0	-15.6
1890.00	H	16.6		3.5	27.7	-10.2	37.7	76.5	604.2	-18.0
1890.00	V	18.9		3.5	27.7	-10.2	40.0	99.5	604.2	-15.7
2205.00	H	12.8	*	3.7	28.7	-10.2	35.0	56.0	500.0	-19.0
2205.00	V	14.1	*	3.7	28.7	-10.2	36.3	65.1	500.0	-17.7
2520.00	H	17.7		3.9	29.5	-10.2	40.8	109.8	604.2	-14.8
2520.00	V	20.4		3.9	29.5	-10.2	43.5	150.3	604.2	-12.1
2835.00	H	19.0		4.0	30.6	-10.2	43.4	148.0	500.0	-10.6
2835.00	V	18.4		4.0	30.6	-10.2	42.8	137.4	500.0	-11.2
3150.00	H	15.1	*	4.2	31.7	-10.2	40.8	109.1	604.2	-14.9
3150.00	V	15.9		4.2	31.7	-10.2	41.6	120.2	604.2	-14.0

Checked BY Richard E. King :

Richard E. King



Occupied Bandwidth

MANUFACTURER	:	The Chamberlain Group, Inc.
MODEL NUMBER	:	1A6210-1
TEST SPEC.	:	15.231(c) Occupied Bandwidth
TEST PARAMETERS	:	20dBc at .025% of the fundamental frequency
EUT FREQUENCY	:	315MHz
EUT MODULATION	:	Rolling Code D
	:	

NOTES