Measurement of RF Interference from a Model No. B6765T MyQ Garage Door Opener Transceiver

For	Chamberlain Group, Inc. 300 Windsor Dr Oak Brook, IL 60523
P.O. Number	4900067517
Date Received	February 10, 2020
Date Tested	February 10 – 14 & 18, 2020
Test Personnel	Tylar Jozefczyk
Specification	FCC "Code of Federal Regulations" Title 47, Part 15, Subpart C, Sections 15.207 and 15.247 for Digital Modulation Intentional Radiators Operating 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
Test Report By:	Tylar Jozefczyk EMC Engineer
Requested By:	Adrian Perry Chamberlain Group, Inc.
Approved By:	Raymond J. Klouda Registered Professional Engineer of Illinois - 44894

Elite Electronic Engineering Inc.
1516 CENTRE CIRCLE
DOWNERS GROVE, IL 60515
TEL: 630 - 495 - 9770
FAX: 630 - 495 - 9785
www.elitetest.com

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REVISION HISTORY

Revision	Date	Description
—	03/26/2020	Initial release

Measurement of RF Emissions from a MyQ Garage Door Opener, Model No. B6765T Transceiver

1. INTRODUCTION

1.1 Scope of Tests

This document represents the results of the series of radio interference measurements performed on a Chamberlain Group, Inc. MyQ Garage Door Opener, Model No. B6765T, transceiver (hereinafter referred to as the EUT). The EUT is a digital modulation and Bluetooth hybrid frequency hopping spread spectrum transceiver. The transceiver was designed to transmit in the 902-928MHz and 2400-2483.5MHz band using an integral antenna. The EUT was manufactured and submitted for testing by Chamberlain Group, Inc. located in Oak Brook, IL.

1.2 Purpose

The test series was performed to determine if the EUT meets the conducted RF emission requirements, radiated RF emissions requirements, and additional provisions of the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart C, Sections 15.207 and 15.249 for Intentional Radiators Operating within the 902-928MHz and 2400-2483.5MHz bands for a Class 2 Permissive Change.

The test series was also performed to determine if the EUT meets the conducted RF emission requirements, radiated RF emissions requirements, and additional provisions of the Industry Canada Radio Standards Specification RSS-Gen Section 8.8 and Industry Canada Radio Standards Specification RSS-247 for Transmitters for a Class 2 Permissive Change.

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

1.3 Deviations, Additions and Exclusions

The following additions and exclusions were implemented during this test series:

- The 900MHz transmitter was tested concurrently for a new certification. As such, the following tests in this report can be found in test report number ETR2000515-01 and applied here:
    - o Peak Output Power
    - o Band Edge
    - o Preliminary Radiated Emissions Scans and Harmonics in the Non-Restricted Bands.

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 21.3°C and the relative humidity was 19%.

2. APPLICABLE DOCUMENTS

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

- Federal Communications Commission "Code of Federal Regulations", Title 47, Part 15, Subparts B and C

- ANSI C63.4-2014, "American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz”

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

- FCC Public Notice, DA 00-705, "Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems", Released March 30, 2000

- Federal Communications Commission Office of Engineering and Technology Laboratory Division, Guidance For Performing Compliance Measurements On Digital Transmissions Systems (DTS) Operating Under §15.247, January 7, 2016

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

- Industry Canada RSS-GEN, Issue 5, March 2019, “General Requirements for Compliance of Radio Apparatus”

3. EUT SET-UP AND OPERATION

3.1 General Description

The EUT is a MyQ Garage Door Opener, Model No. B6765T. 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, 1 meter long, unshielded power cord.

3.1.2 Peripheral Equipment

The following peripheral equipment was submitted with the EUT:

Item	Description
Laptop	Used to place the EUT in test mode.
LCD Wall Control	Accessory acting as a load on the board.
Photoeyes	Accessory acting as a load on the board. Also used to provide continuous modes for some testing.

3.1.3 Interconnect Cables

No interconnect cables were submitted with the EUT.

3.1.4 Grounding

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

3.2 Software

For all tests the EUT requires the following firmware versions:

- 900MHz Module: Firmware Revision 3.3
- Wi-Fi Module: Test Code Firmware Revision B.2

3.3 Operational Mode

The EUT and all peripheral equipment were energized. The cables were manually maximized during the preliminary emissions sweeps. The cable arrangement which resulted in the worst case emissions was utilized.

Mode	Description
Wi-Fi	The EUT was powered on and put into one of the following modes: - 802.11b (Data rate CCK 11Mbps; Power at 18dBm) - 802.11g (Data rate OFDM 54Mbps; Power at 17dBm) - 802.11n (Data rate HT20 MCS7; Power at 16dBm) Additionally, the EUT was also set to transmit at of the following frequencies:

	- 2412MHz - 2437MHz - 2462MHz
BLE	The EUT was powered on and was set to transmit at of the following frequencies: - 2402MHz - 2440MHz - 2480MHz
900MHz Tx	The EUT was powered on and set to transmit at one of the following frequencies: - 902.25MHz - 914.75MHz - 926.75MHz

3.4 EUT Modifications

No modifications were required for compliance.

4. TEST FACILITY AND TEST INSTRUMENTATION

4.1 Shielded Enclosure

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

4.2 Test Instrumentation

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

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 Transmitter

5.1.1 Powerline Conducted Emissions

5.1.1.1 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 (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.
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 Wi-Fi 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.

5.1.1.3 Results

The plots and tabular data of the peak, quasi-peak, and average conducted voltage levels acquired from each input power line with the EUT operated in the Wi-Fi mode are shown on pages 19 through 22. 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 4.63MHz. The emissions level at this frequency was 7.2dB within the limit. Photographs of the test configuration which yielded the highest or worst case conducted emission levels are shown on Figure 2.

5.1.2 Peak Output Power

5.1.2.1 Requirements

Per section 15.247(b)(3), for systems using digital modulation the maximum peak output conducted power shall not be greater than 1.0W (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).

5.1.2.2 Procedures

The EUT was placed on the non-conductive stand and set to transmit. A double ridged waveguide 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 6dB 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 channels.

The equivalent power was determined from the field intensity levels measured at 3 meters using the substitution method. To determine the emission power, a double ridged waveguide 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 and antenna gain as required. The peak power output was calculated for low, middle, and high hopping frequencies.

5.1.2.3 Results

The results are presented on pages 23 through 26. The maximum EIRP measured from the transmitter was 0.334W (25.24dBm), which is below the 4 Watt limit.

5.1.3 Radiated Spurious Emissions Measurements

5.1.3.1 Requirements

Per section 15.247(d), in any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated emissions measurement. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must comply with the radiated emission limits specified in §15.209(a).

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

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	3
30.0-88.0	100	3
88.0-216.0	150	3
216.0-960.0	200	3
Above 960	500	3

5.1.3.2 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 25GHz was investigated using a peak detector function.

The final open field emission tests were then manually performed over the frequency range of 30MHz to 25GHz.

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 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.
   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 20dB 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 bi-log antenna. The bi-log antenna was positioned at a 3 meter distance from the EUT. The EUT was placed on an 80cm high non-conductive stand. A peak detector with a resolution bandwidth of 100 kHz was used on the spectrum analyzer.
   b) The field strengths of all emissions above 1 GHz were measured using a double-ridged waveguide antenna. The waveguide antenna was positioned at a 3 meter distance from the EUT. The EUT was placed on a 1.5 meter high non-conductive stand. A peak detector with a resolution bandwidth of 1 MHz was used on the spectrum analyzer.
   c) To ensure that maximum or worst case emission levels were measured, the following steps were taken when taking all measurements:
      i) The EUT was rotated so that all of its sides were exposed to the receiving antenna.
      ii) Since the measuring antenna is linearly polarized, both horizontal and vertical field components were measured.
      iii) The measuring antenna was raised and lowered for each antenna polarization to maximize the readings.
      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.

5.1.3.3 Results

Preliminary radiated emissions plots with the EUT transmitting are shown on pages 27 through 98. Final radiated emissions data are presented on data pages 99 through 104. As can be seen from the data, all emissions measured from the EUT were within the specification limits. The emissions level closet to the limit (worst case) occurred at 14472MHz. The emissions level at this frequency was 13.34dB within the limit. Photographs of the test configuration which yielded the highest or worst case radiated emission levels are shown on Figures 4 and 5.

5.1.4 Band Edge Compliance

5.1.4.1 Requirements

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

5.1.4.2 Procedures

5.1.4.2.1 Low Band Edge

1) The EUT was setup inside the test chamber on a non-conductive stand.
2) A broadband measuring antenna was placed at a test distance of 3 meters from the EUT.
3) The EUT was set to transmit continuously at the channel closest to the low band-edge.
4) The EUT was maximized for worst case emissions at the measuring antenna. The maximum meter reading was recorded.
5) 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.

5.1.4.2.2 High Band Edge

1) The EUT was setup inside the test chamber on a non-conductive stand.
2) A broadband measuring antenna was placed at a test distance of 3 meters from the EUT.
3) The EUT was set to transmit continuously at the channel closest to the high band-edge.
4) The EUT was maximized for worst case emissions at the measuring antenna. A peak reading

was taken with a resolution bandwidth of 1MHz and a video bandwidth of 1MHz or greater. An average reading was then taken with a resolution bandwidth of 1MHz and a video bandwidth of 10Hz. The maximum peak and average meter readings were recorded.

5) 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 both the peak level of the fundamental emission and the band-edge emission under investigation.
    c) Resolution bandwidth (RBW) = 1% of the span (but never less than 30kHz).
    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. This level corresponds to the maximized peak reading previously taken. The "marker-delta" method described in Public Notice DA 00-705 was then used to determine band edge compliance. The delta between the marker and the general limit (74dBuV/m or 54dBuV/m) was calculated by subtracting the general limit (74dBuV/m or 54dBuV/m) from the maximum reading taken with a 1MHz bandwidth. This delta represents how far below the marker the emissions outside of the authorized band of operation must be. A display line was placed at this level. All emissions which fall outside of the authorized band of operation must be below the 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.

5.1.4.3 Results

Pages 141 through 146 show the radiated band-edge compliance results. As can be seen from these plots, the radiated emissions at the low end band edge are within the 20dB down limits. The radiated emissions at the high end band edge are within the general limits.

6. CONCLUSIONS

It was determined that the Chamberlain Group, Inc. MyQ Garage Door Opener, Model No. B6765T, did fully meet the conducted and radiated emission requirements of the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart C, Sections 15.207 and 15.247 for Intentional Radiators Operating within the 902-928MHz and 2400-2483.5MHz bands, when tested per ANSI C63.4-2014 for a Class 2 Permissive Change.

It was also determined that the Chamberlain Group, Inc. MyQ Garage Door Opener, Model No. B6765T, Serial No. S/N 1, did fully meet the conducted and radiated RF emission requirements of the Industry Canada Radio Standards Specification RSS-Gen Section 8.8 and Radio Standards Specification RSS-247 for transmitters, when tested per ANSI C63.4-2014 for a Class 2 Permissive Change.

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
CDW5	DESKTOP COMPUTER	ELITE	PENTIUM 4	006	3.8GHZ	N/A	
CDY0	WORKSTATION	ELITE	WORKSTATION		WINDOWS 7	N/A	
GRB0	1MHZ, LISN SIGNAL CHECKER	ELITE	LISNCHKR1M	1	1MHZ	1/9/2019	1/9/2021
GRE1	SIGNAL GENERATOR	AGILENT	E4438C	MY42081749	250KHZ-6GHZ	2/25/2020	2/25/2021
NDQ0	TUNED DIPOLE ANTENNA	EMCO	3121C-DB4	311	400-1000MHZ	5/8/2018	5/8/2020
NTA3	BILOG ANTENNA	TESEQ	6112D	32853	25-1000MHz	10/10/2019	10/10/2020
NWQ2	DOUBLE RIDGED WAVEGUIDE ANTENNA	ETS LINDGREN	3117	66659	1GHZ-18GHZ	3/22/2018	3/22/2020
PLF2	CISPR16 50UH LISN	ELITE	CISPR16/70A	002	.15-30MHz	4/23/2019	4/23/2020
PLF4	CISPR16 50UH LISN	ELITE	CISPR16/70A	003	.15-30MHz	4/23/2019	4/23/2020
RBG3	EMI ANALYZER	ROHDE & SCHWARZ	ESW44	101592	2HZ-44GHZ	2/20/2019	3/20/2020
RBJ3	EMI RECEIVER	ROHDE & SCHWARZ	ESW8	100984	2HZ-8GHZ	3/2/2020	3/2/2021
SHC2	Power Supplies	HENGFU	HF60W-SL-24	A11372702	24V	NOTE 1	
T1E4	10DB 25W ATTENUATOR (RM 11)	WEINSCHEL	46-10-43	AV5805	DC-18GHZ	4/24/2018	4/24/2020
T2B2	20DB, 2W ATTENUATOR	HEWLETT PACKARD	8491A	11341	DC-12.4GHZ	9/5/2019	9/5/2021
T2F4	20DB, 100W ATTENUATOR	WEINSCHEL	48-20-33	BA0696	DC-18GHZ	6/5/2018	6/5/2020
VBR8	CISPR EN FCC CE VOLTAGE.exe					N/A	
VBV2	CISPR EN FCC ICES RE.EXE	ELITE	CISPR EN FCC ICES RE.EXE	---	---	N/A	
WKA1	SOFTWARE, UNIVERSAL RCV EMI	ELITE	UNIV_RCV_EMI	1	---	I/O	

Create your equipment list using the database on the mainframe. Create a test equipment list. The output of this list will have a "J" prefix, followed by the job and phase number. FTP this output file to your local computer. Open the file using Word; select and copy the text here using Edit, then Paste Special, and finally Unformatted Text. That way, the text will take on the attributes of the Equipment List Text Style contained in this paragraph. Delete this paragraph when finished.

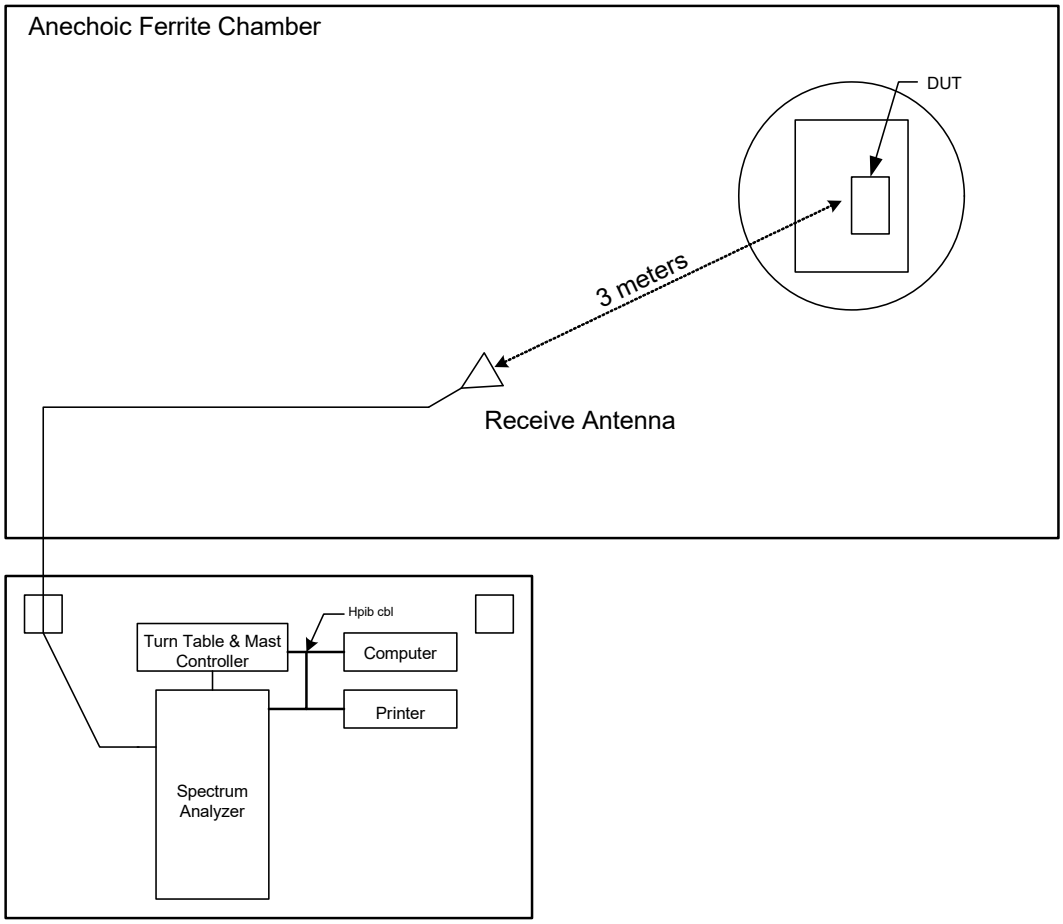


FIGURE 1 BLOCKDIAGRAM OF TEST SETUP

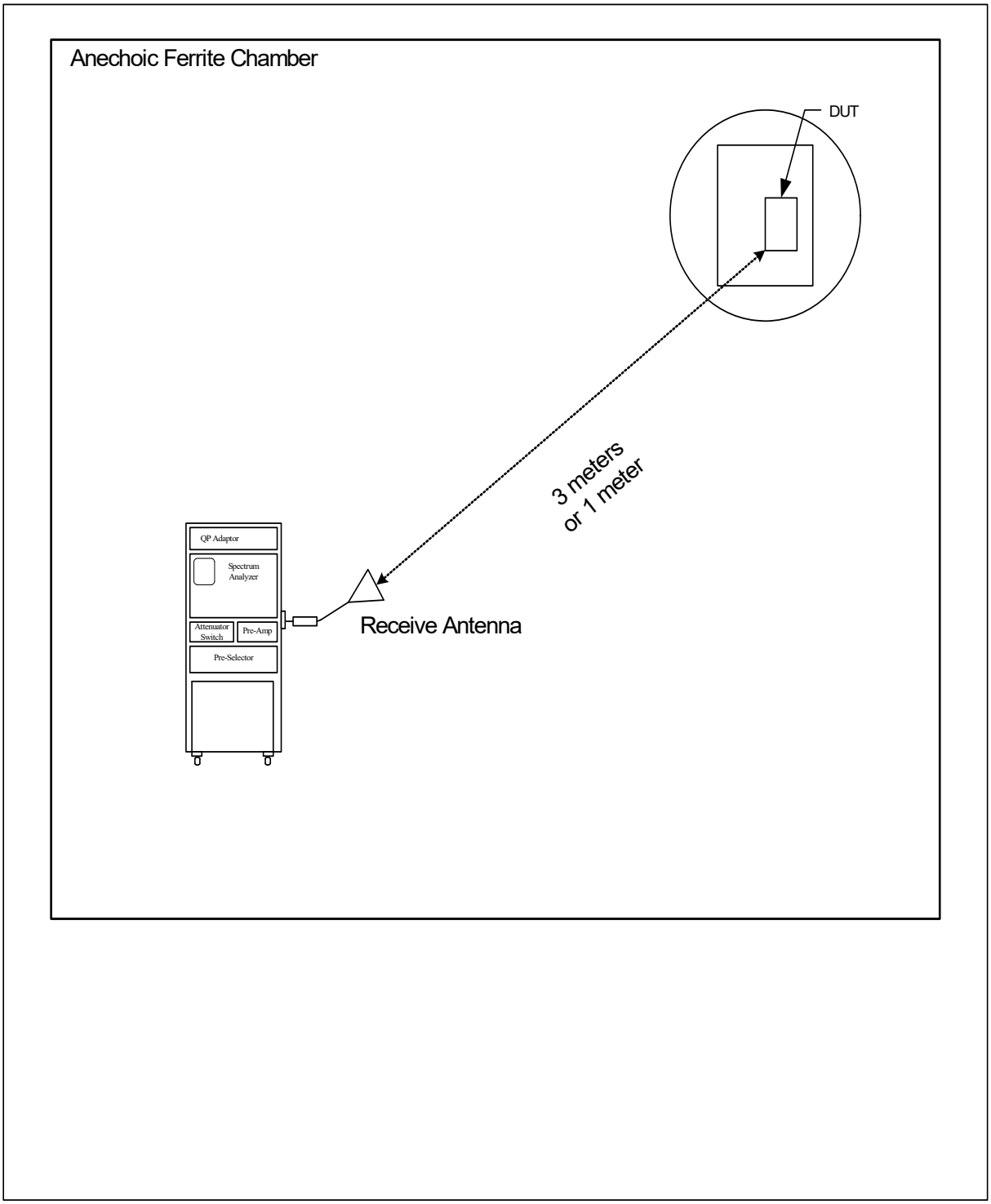


Figure 2: BLOCK DIAGRAM OF TEST SETUP FOR RADIATED EMISSIONS ABOVE 18GHZ

FCC Part 15 Subpart B Conducted Emissions Test

Significant Emissions Data

VBR8 01/08/2020

Manufacturer	:	CHAMBERLAIN
Model	:	HAWKEYE LED OPERATOR
DUT Revision	:	1.0
Serial Number	:	OPERATOR MODEL # B6765T (RED)
DUT Mode	:	TX
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	:	Feb 10, 2020 03:56:15 PM
Data Filter	:	Up to 80 maximum levels detected with 6 dB level excursion threshold

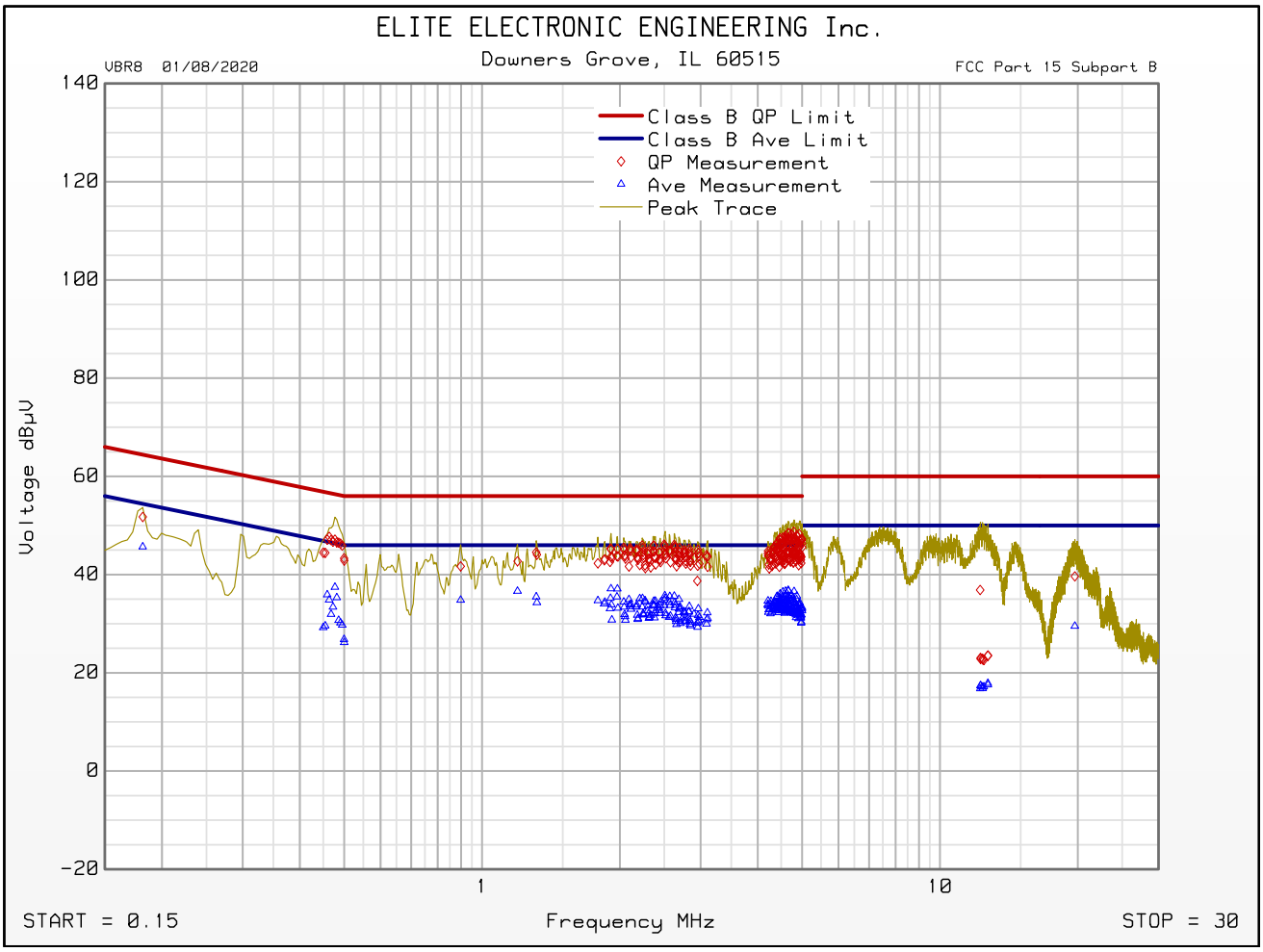
Freq MHz	Quasi-peak Level dBµV	Quasi-peak Limit dBµV	Excessive Quasi-peak Emissions	Average Level dBµV	Average Limit dBµV	Excessive Average Emissions
0.182	51.7	64.4		45.7	54.4	
0.464	47.7	56.6		34.8	46.6	
0.500	42.9	56.0		26.2	46.0	
1.195	42.7	56.0		36.6	46.0	
1.907	45.3	56.0		35.2	46.0	
2.498	46.1	56.0		33.8	46.0	
4.796	48.7	56.0		34.8	46.0	
5.000	45.6	56.0		32.7	46.0	
12.240	36.9	60.0		16.8	50.0	
19.702	39.6	60.0		29.5	50.0	

FCC Part 15 Subpart B Conducted Emissions Test

Cumulative Data

VBR8 01/08/2020

Manufacturer	:	CHAMBERLAIN
Model	:	HAWKEYE LED OPERATOR
DUT Revision	:	1.0
Serial Number	:	OPERATOR MODEL # B6765T (RED)
DUT Mode	:	TX
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	:	Feb 10, 2020 03:56:15 PM



Emissions Meet QP Limit
Emissions Meet Ave Limit

FCC Part 15 Subpart B Conducted Emissions Test

Significant Emissions Data

VBR8 01/08/2020

Manufacturer	:	CHAMBERLAIN
Model	:	HAWKEYE LED OPERATOR
DUT Revision	:	1.0
Serial Number	:	OPERATOR MODEL # B6765T (RED)
DUT Mode	:	TX
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	:	Feb 10, 2020 04:10:01 PM
Data Filter	:	Up to 80 maximum levels detected with 6 dB level excursion threshold

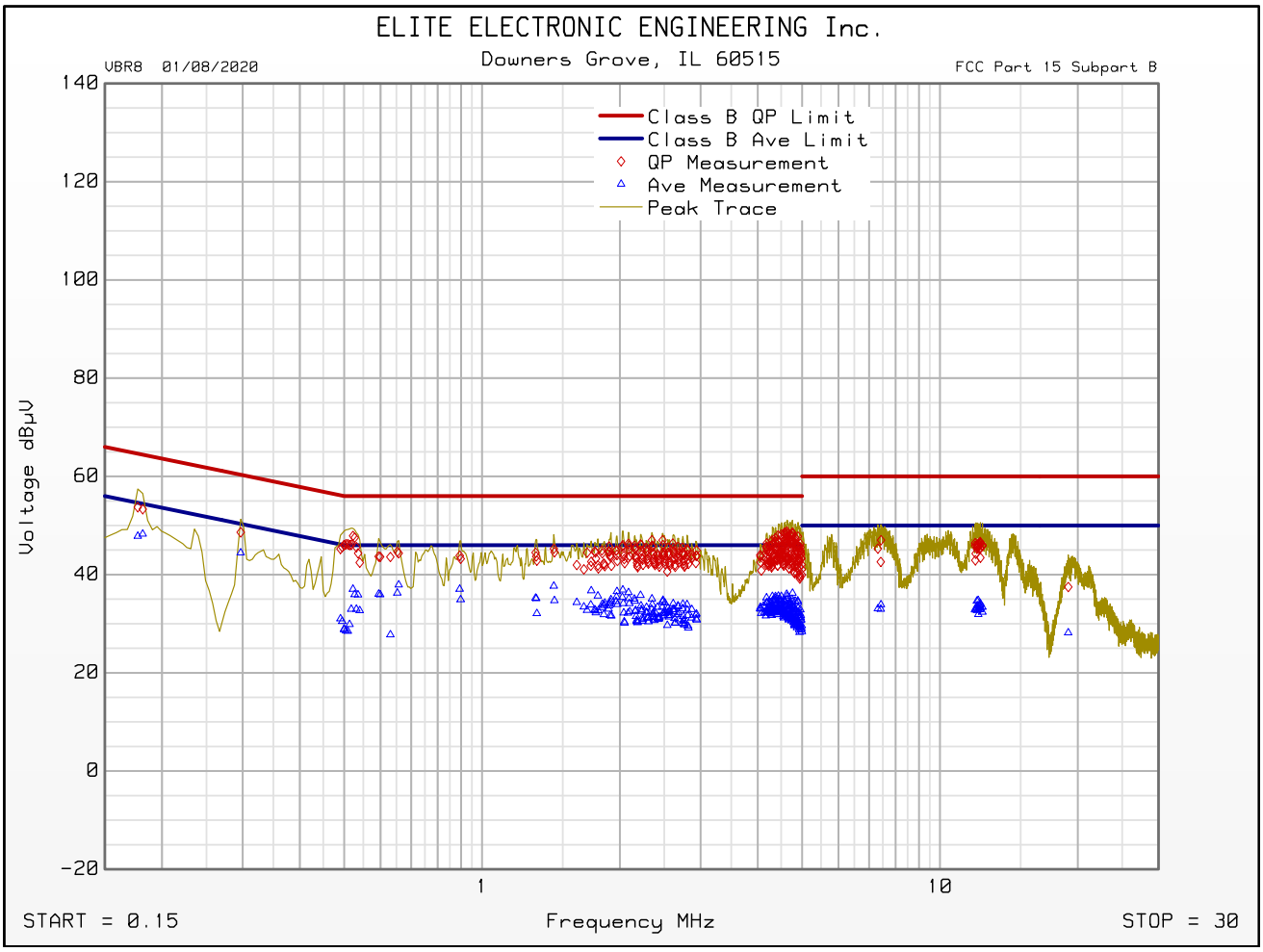
Freq MHz	Quasi-peak Level dBµV	Quasi-peak Limit dBµV	Excessive Quasi-peak Emissions	Average Level dBµV	Average Limit dBµV	Excessive Average Emissions
0.177	53.7	64.6		47.8	54.6	
0.500	46.0	56.0		28.8	46.0	
0.894	43.9	56.0		37.0	46.0	
1.894	45.7	56.0		33.7	46.0	
2.480	47.0	56.0		34.5	46.0	
4.630	48.8	56.0		34.8	46.0	
7.435	47.0	60.0		33.9	50.0	
12.236	46.7	60.0		33.5	50.0	
19.063	37.5	60.0		28.2	50.0	

FCC Part 15 Subpart B Conducted Emissions Test

Cumulative Data

VBR8 01/08/2020

Manufacturer	:	CHAMBERLAIN
Model	:	HAWKEYE LED OPERATOR
DUT Revision	:	1.0
Serial Number	:	OPERATOR MODEL # B6765T (RED)
DUT Mode	:	TX
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	:	Feb 10, 2020 04:10:01 PM



Emissions Meet QP Limit
Emissions Meet Ave Limit

DATA PAGE	
MANUFACTURER	Chamberlain Group, Inc.
EUT	MyQ Garage Door Opener
MODEL NO.	B6765T
TEST	FCC §15.247, RSS-247 – RF Output Power - Radiated
MODE	Wi-Fi – 802.11b
DATE TESTED	February 10 – 14, 2020
TEST PERFORMED BY	Tylar Jozefczyk
NOTES	

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)
2412.00	H	74.69	12.71	5.63	2.76	15.59	36.00	-20.41
2412.00	V	76.85	15.16	5.63	2.76	18.04	36.00	-17.96
2437.00	H	73.93	12.01	5.56	2.77	14.79	36.00	-21.21
2437.00	V	76.72	15.06	5.56	2.77	17.84	36.00	-18.16
2462.00	H	77.47	15.60	5.56	2.79	18.36	36.00	-17.64
2462.00	V	77.78	16.14	5.56	2.79	18.91	36.00	-17.09

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

DATA PAGE	
MANUFACTURER	Chamberlain Group, Inc.
EUT	MyQ Garage Door Opener
MODEL NO.	B6765T
TEST	FCC §15.247, RSS-247 – RF Output Power - Radiated
MODE	Wi-Fi – 802.11g
DATE TESTED	February 10 – 14, 2020
TEST PERFORMED BY	Tylar Jozefczyk
NOTES	

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)
2412.00	H	80.64	18.66	5.63	2.76	21.54	36.00	-14.46
2412.00	V	81.58	19.89	5.63	2.76	22.77	36.00	-13.23
2437.00	H	79.82	17.90	5.56	2.77	20.68	36.00	-15.32
2437.00	V	84.28	22.62	5.56	2.77	25.40	36.00	-10.60
2462.00	H	84.35	22.48	5.56	2.79	25.24	36.00	-10.76
2462.00	V	83.84	22.20	5.56	2.79	24.97	36.00	-11.03

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

DATA PAGE	
MANUFACTURER	Chamberlain Group, Inc.
EUT	MyQ Garage Door Opener
MODEL NO.	B6765T
TEST	FCC §15.247, RSS-247 – RF Output Power - Radiated
MODE	Wi-Fi – 802.11n
DATE TESTED	February 10 – 14, 2020
TEST PERFORMED BY	Tylar Jozefczyk
NOTES	

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)
2412.00	H	77.99	16.01	5.63	2.76	18.89	36.00	-17.11
2412.00	V	81.64	19.95	5.63	2.76	22.83	36.00	-13.17
2437.00	H	79.82	17.90	5.56	2.77	20.68	36.00	-15.32
2437.00	V	78.05	16.39	5.56	2.77	19.17	36.00	-16.83
2462.00	H	76.58	14.71	5.56	2.79	17.47	36.00	-18.53
2462.00	V	74.38	12.74	5.56	2.79	15.51	36.00	-20.49

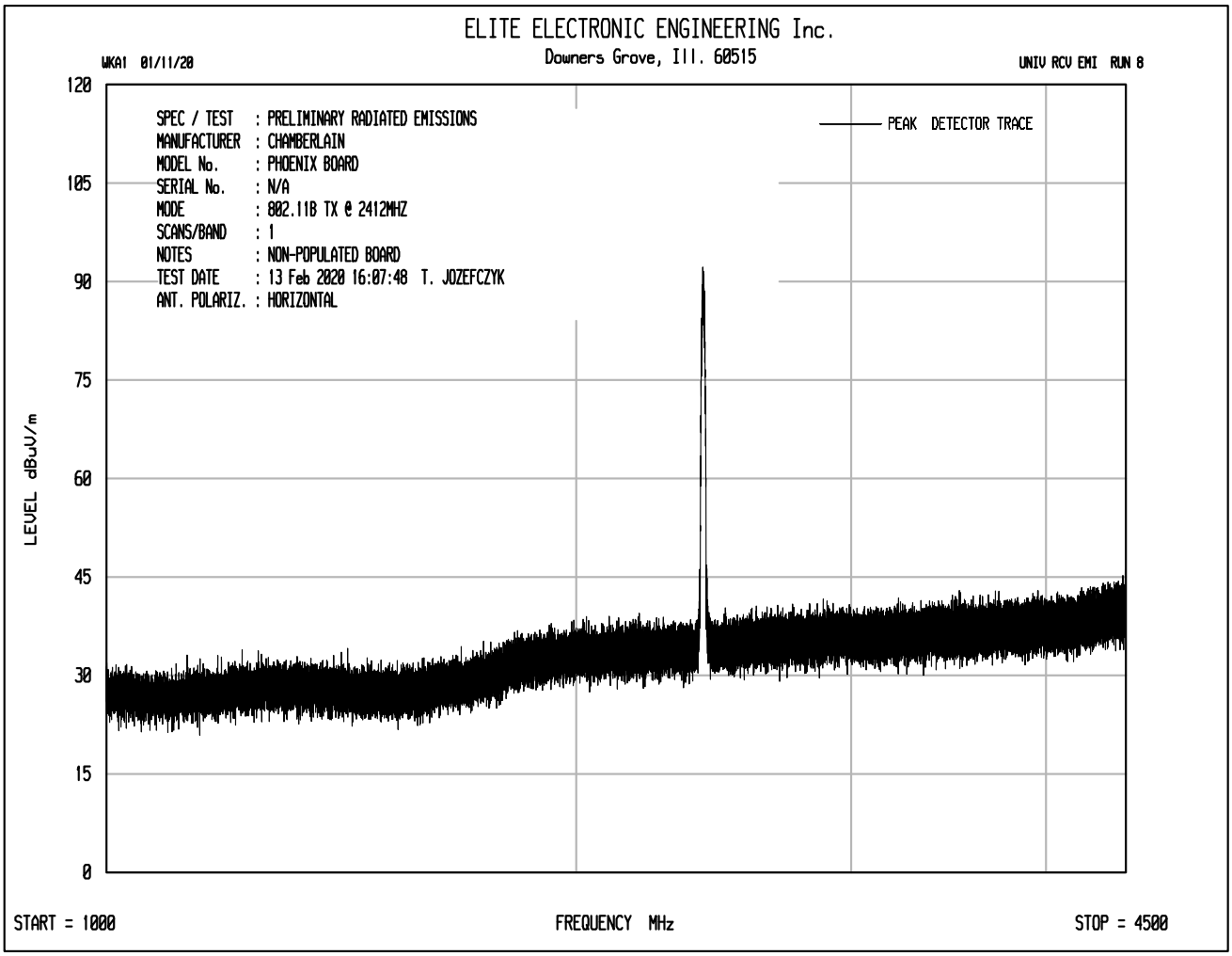
EIRP = Calculated Signal (dBm) + Antenna Gain (dB) – Cable Loss (dB)

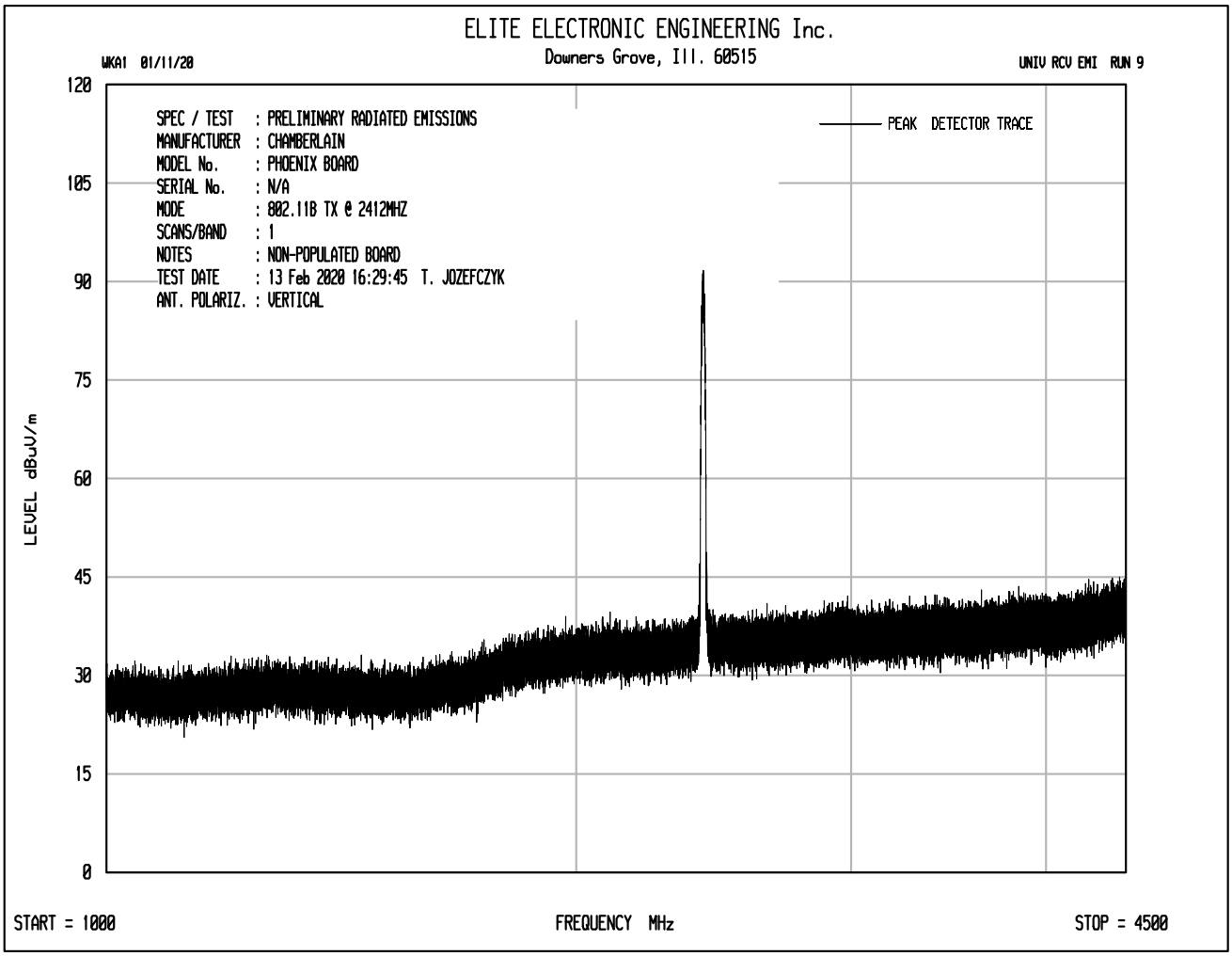
DATA PAGE	
MANUFACTURER	Chamberlain Group, Inc.
EUT	MyQ Garage Door Opener
MODEL NO.	B6765T
TEST	FCC §15.247, RSS-247 – RF Output Power - Radiated
MODE	BLE
DATE TESTED	February 10 – 14, 2020
TEST PERFORMED BY	Tylar Jozefczyk
NOTES	

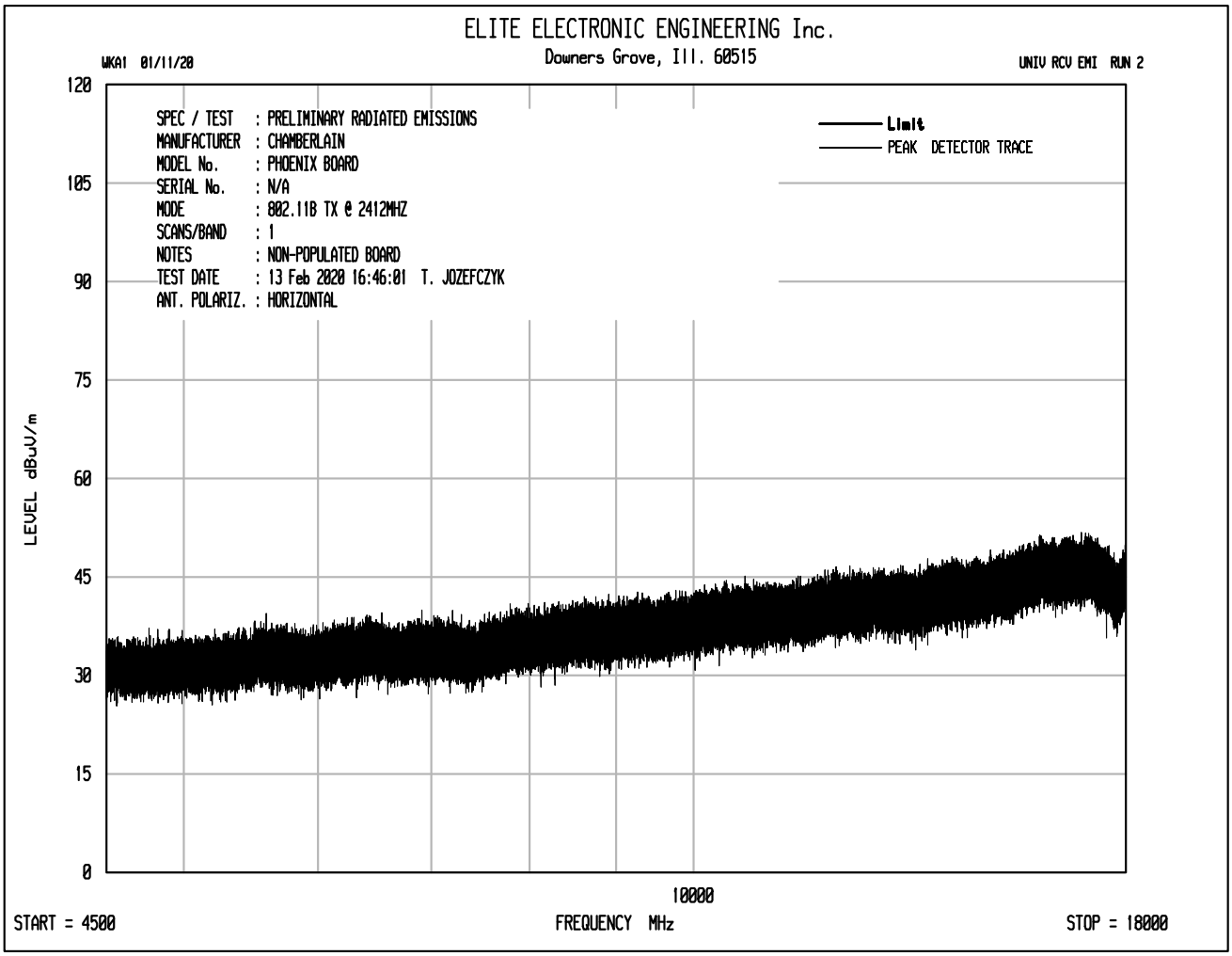
RF OUTPUT POWER

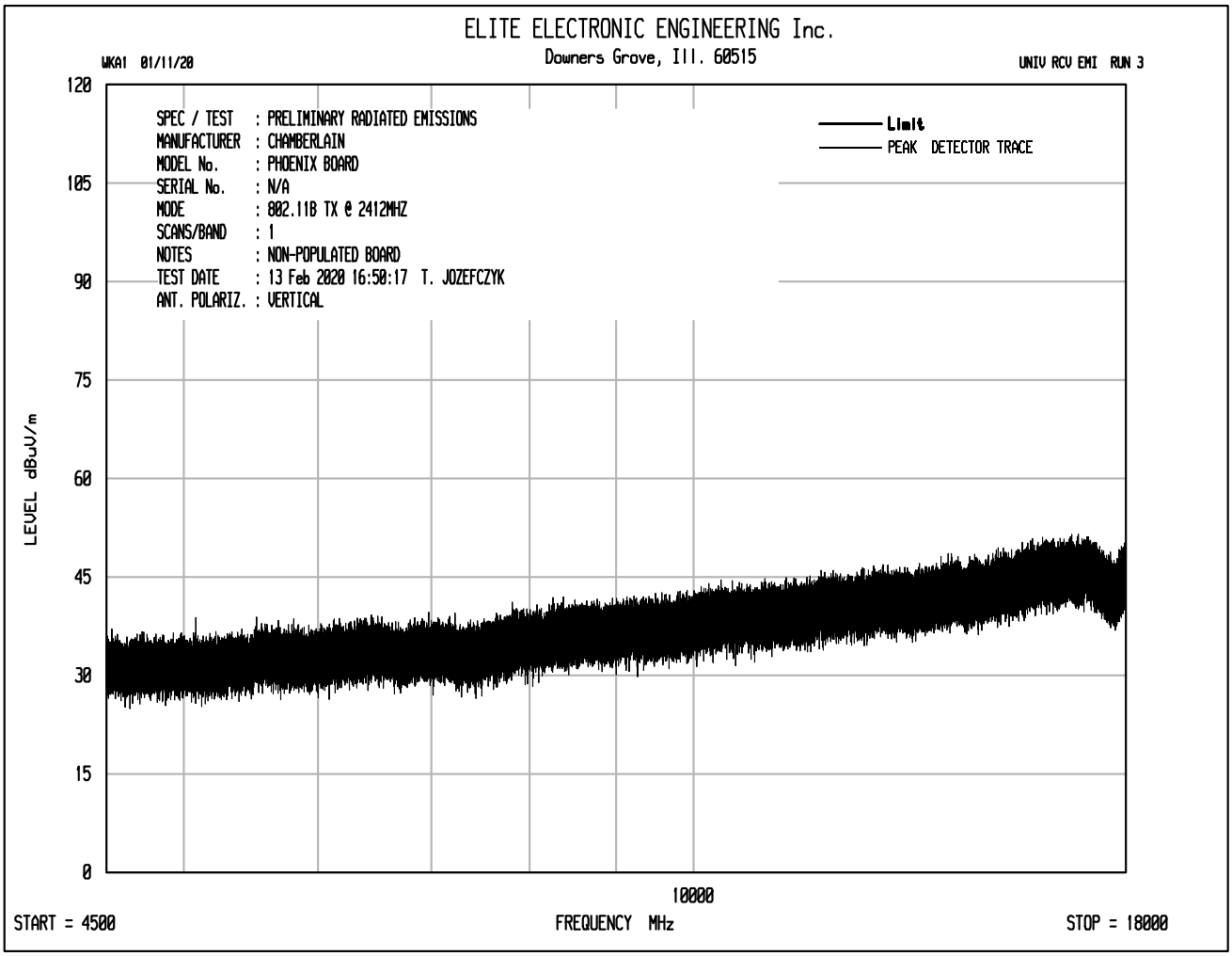
Freq. (MHz)	Ant Pol	Wide BW Meter Reading (dBµV)	Matched Sig. Gen. Reading (dBm)	Equivalent Antenna Gain (dB)	Cable Loss (dB)	EIRP Total (dBm)	Limit (dBm)	Margin (dB)
2402.00	H	57.15	-4.85	5.66	2.75	-1.93	36.00	-37.93
2402.00	V	59.91	-1.79	5.66	2.75	1.13	36.00	-34.87
2440.00	H	54.84	-7.08	5.55	2.77	-4.30	36.00	-40.30
2440.00	V	61.13	-0.53	5.55	2.77	2.25	36.00	-33.75
2480.00	H	56.61	-5.23	5.61	2.80	-2.42	36.00	-38.42
2480.00	V	56.85	-4.77	5.61	2.80	-1.96	36.00	-37.96

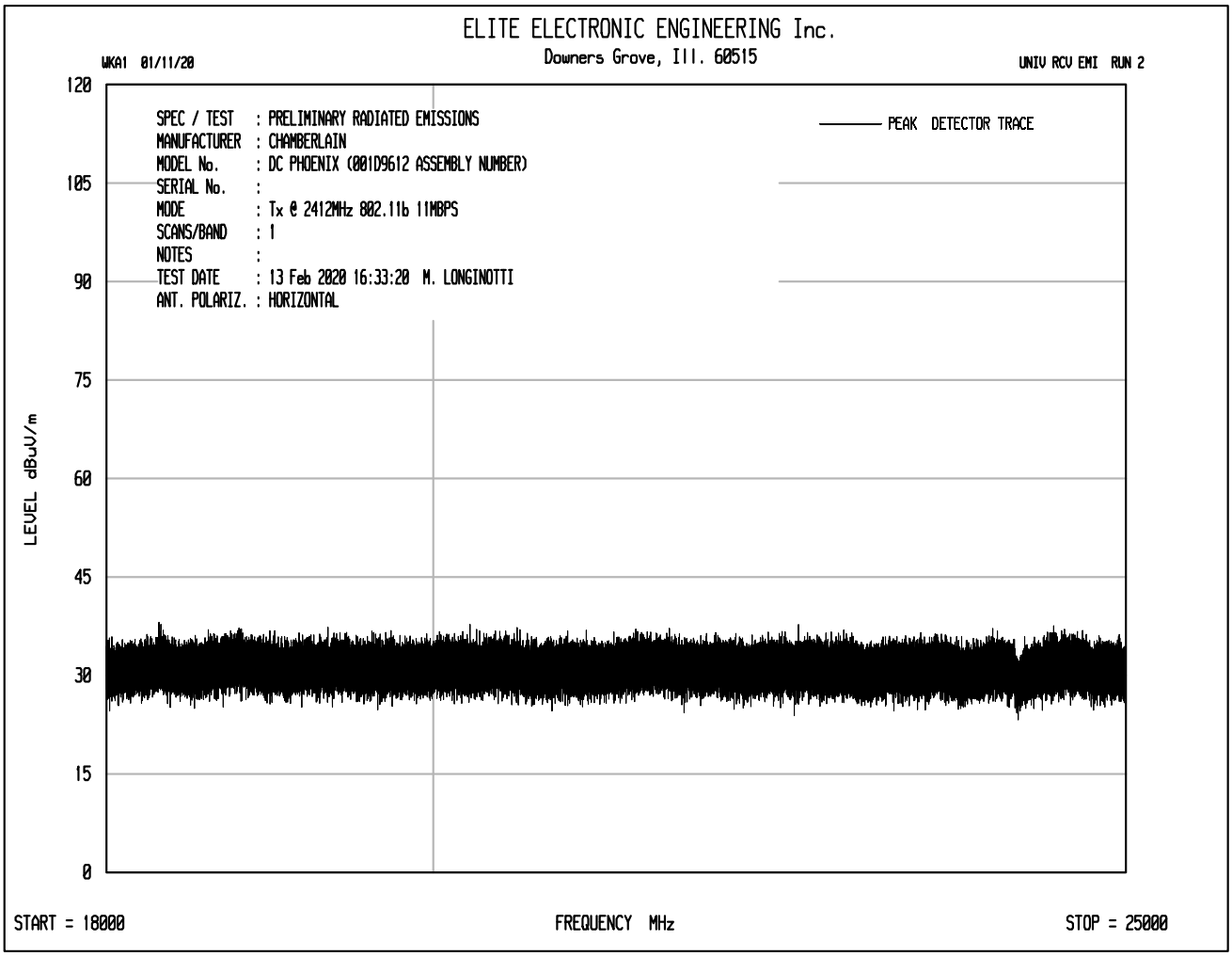
EIRP = Calculated Signal (dBm) + Antenna Gain (dB) – Cable Loss (dB)

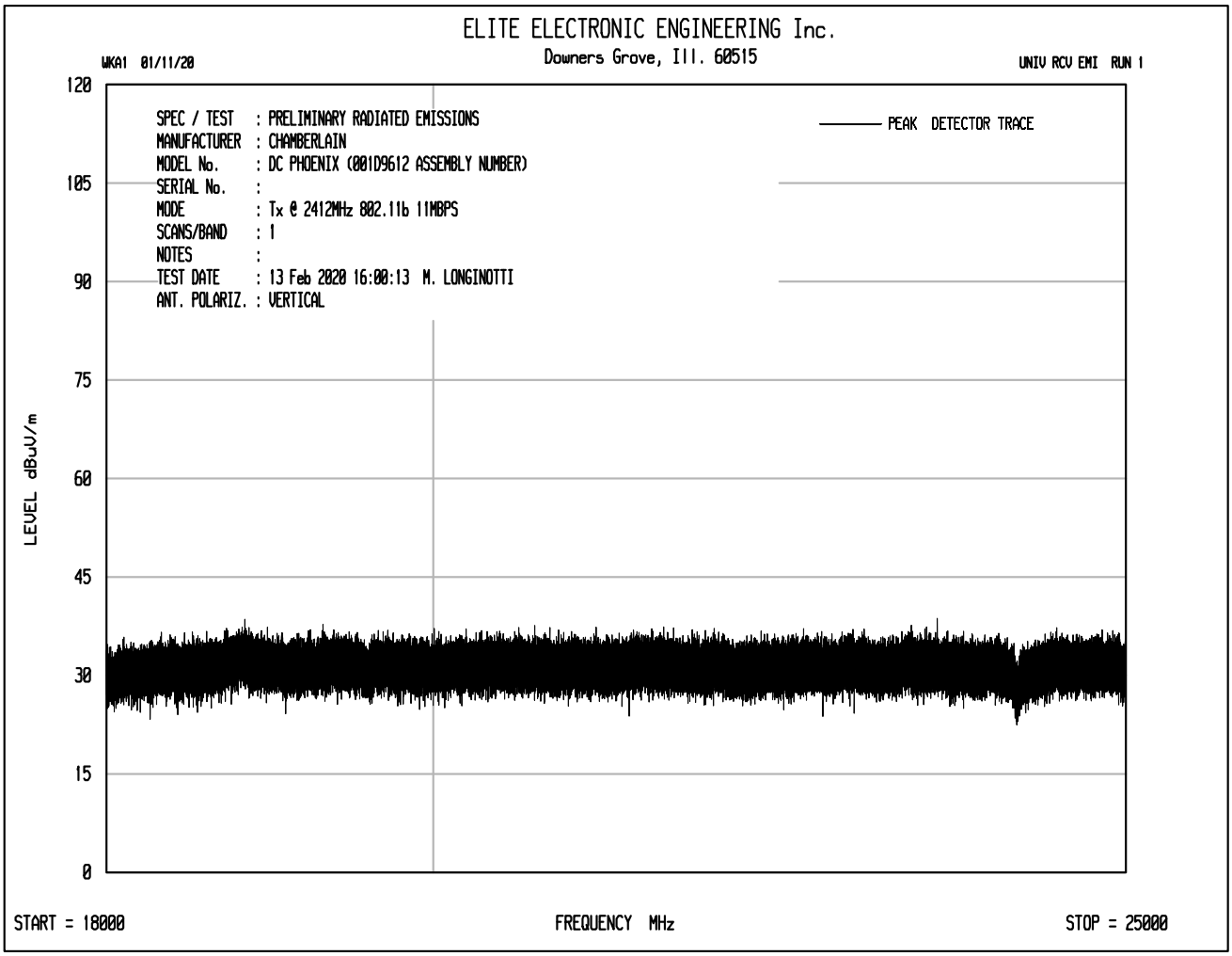

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 01/11/20
UNIV RCV EMI RUN 8
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : PHOENIX BOARD
SERIAL No. : N/A
MODE : 802.11B TX @ 2412MHZ
SCANS/BAND : 1
NOTES : NON-POPULATED BOARD
TEST DATE : 13 Feb 2020 16:07:48 T. JOZEFCZYK
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4500

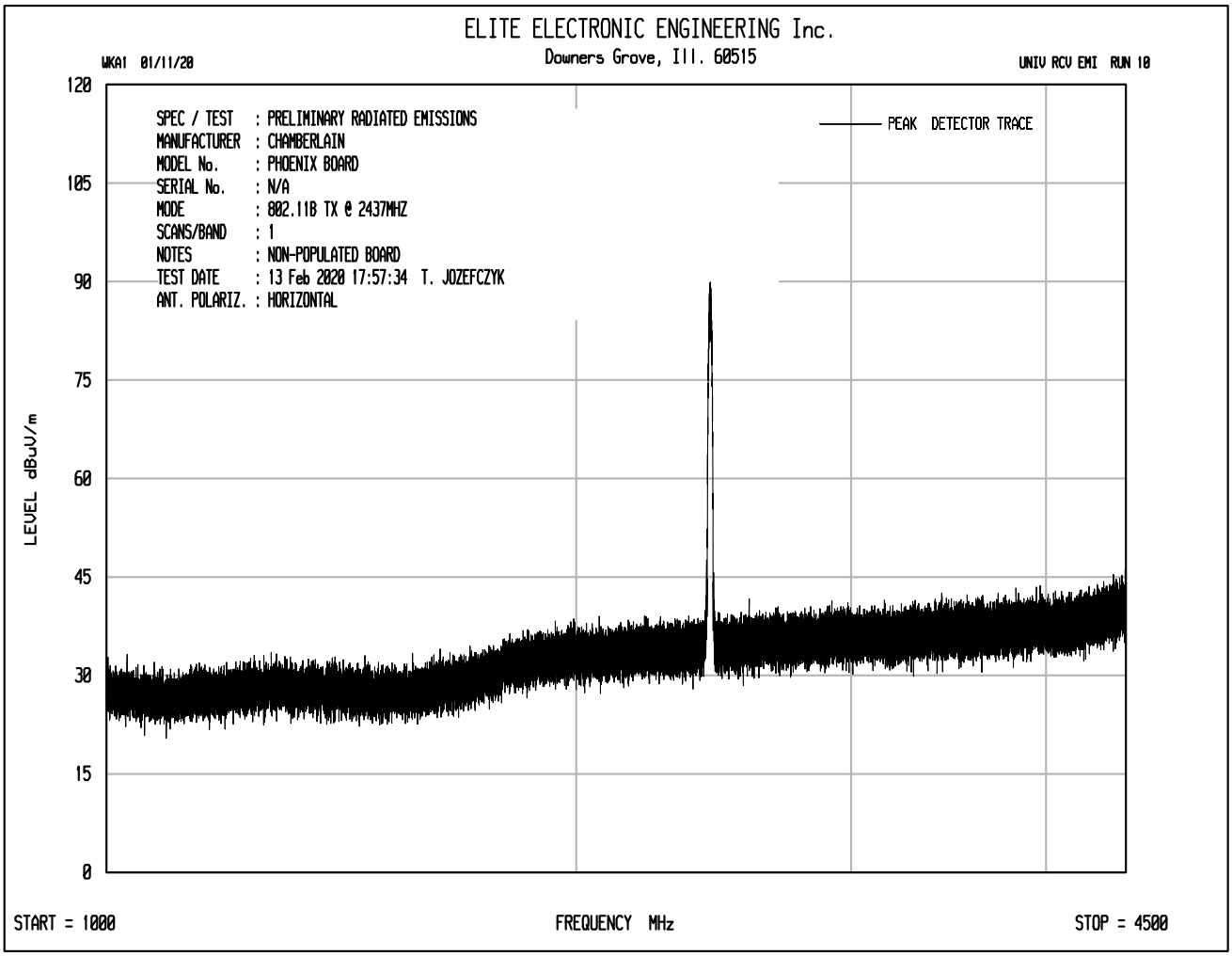

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 01/11/20
UNIV RCV EMI RUN 9
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : PHOENIX BOARD
SERIAL No. : N/A
MODE : 802.11B TX @ 2412MHZ
SCANS/BAND : 1
NOTES : NON-POPULATED BOARD
TEST DATE : 13 Feb 2020 16:29:45 T. JOZEFCZYK
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4500

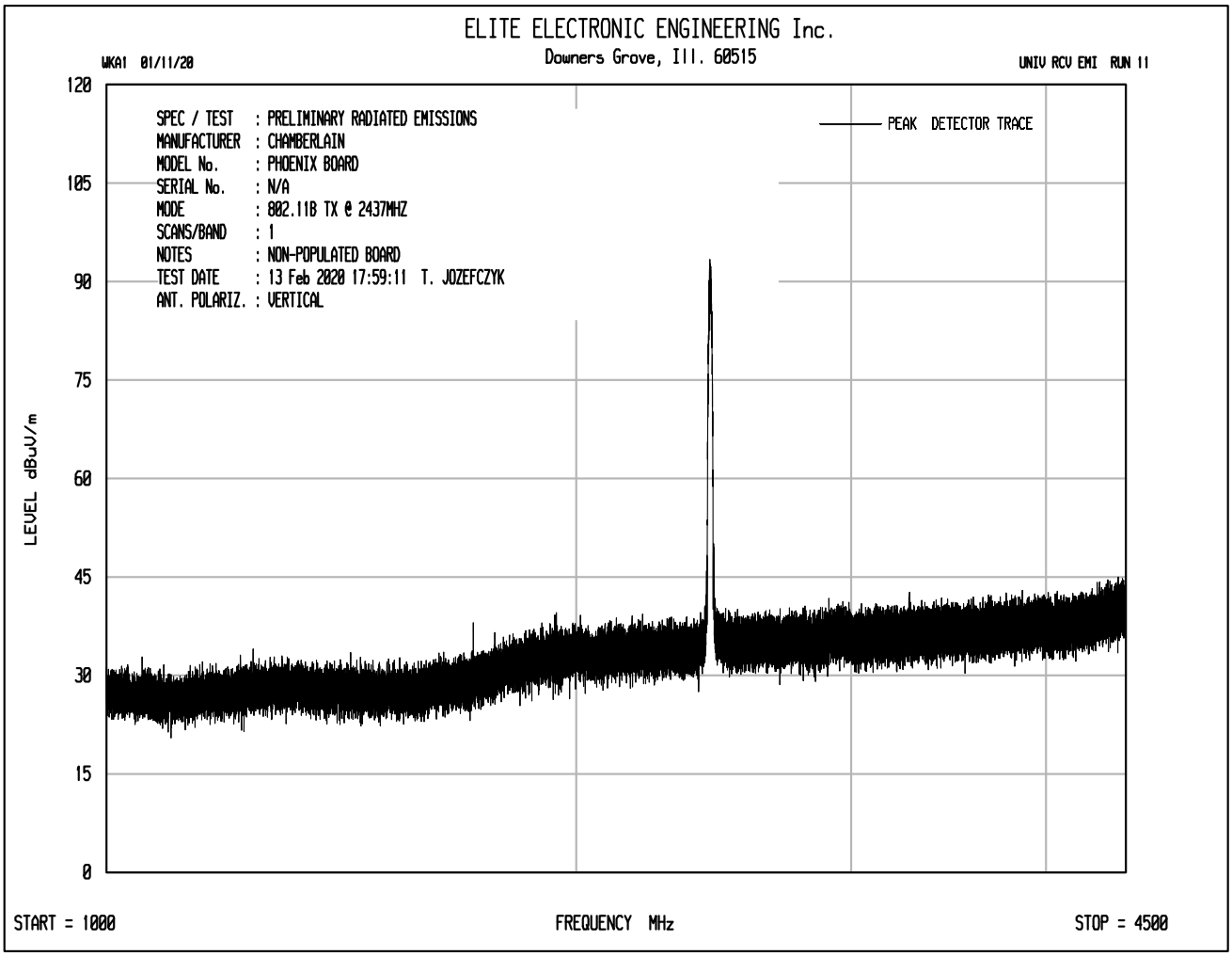

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 01/11/20
UNIV RCV EMI RUN 2
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : PHOENIX BOARD
SERIAL No. : N/A
MODE : 802.11B TX @ 2412MHZ
SCANS/BAND : 1
NOTES : NON-POPULATED BOARD
TEST DATE : 13 Feb 2020 16:46:01 T. JOZEFCZYK
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 4500
FREQUENCY MHz
STOP = 18000

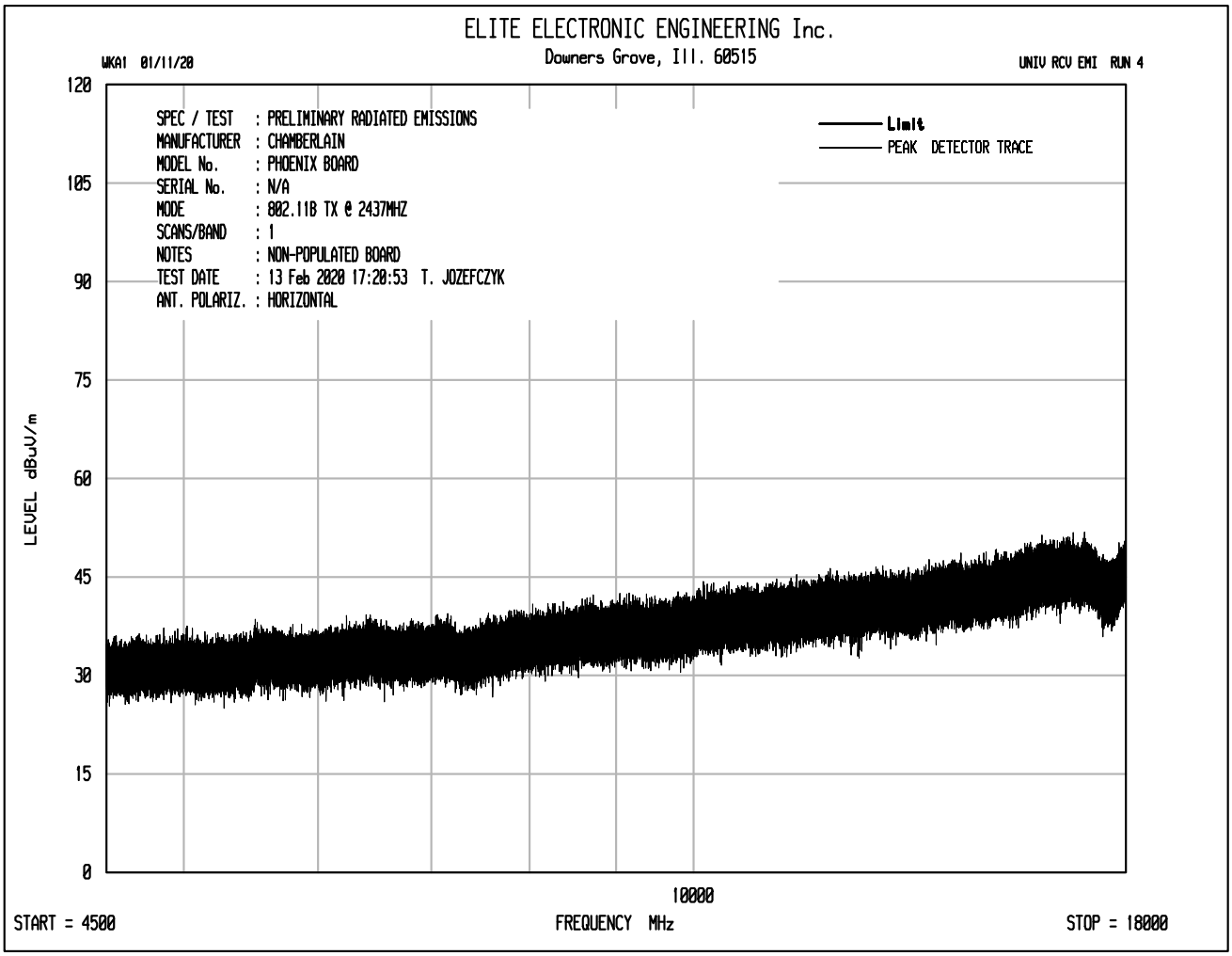

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 01/11/20
UNIV RCV EMI RUN 3
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : PHOENIX BOARD
SERIAL No. : N/A
MODE : 802.11B TX @ 2412MHZ
SCANS/BAND : 1
NOTES : NON-POPULATED BOARD
TEST DATE : 13 Feb 2020 16:50:17 T. JOZEFCZYK
ANT. POLARIZ. : VERTICAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 4500
FREQUENCY MHz
STOP = 18000

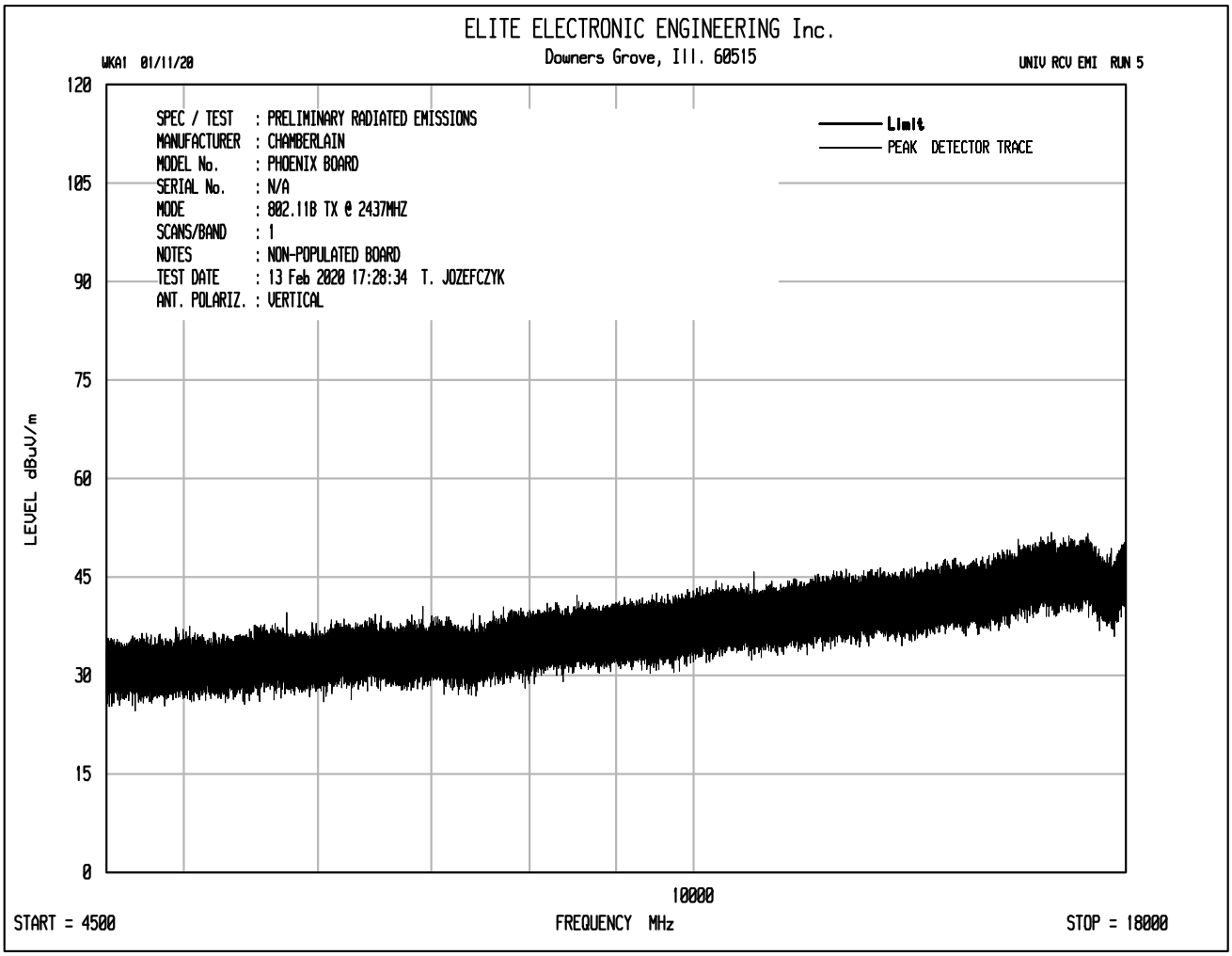

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 01/11/20
UNIV RCV EMI RUN 2
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : DC PHOENIX (001D9612 ASSEMBLY NUMBER)
SERIAL No. :
MODE : Tx @ 2412MHz 802.11b 11MBPS
SCANS/BAND : 1
NOTES :
TEST DATE : 13 Feb 2020 16:33:20 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000

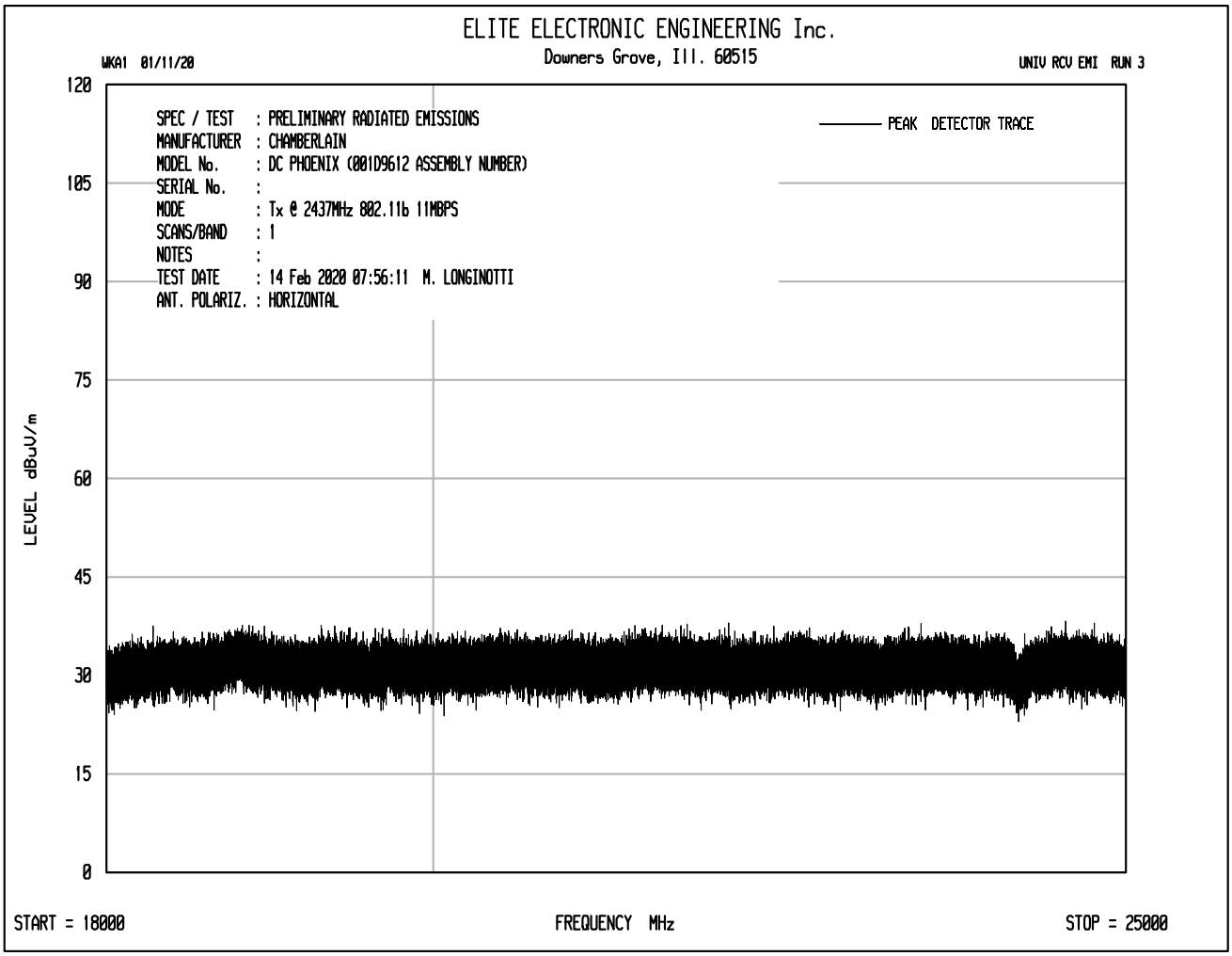

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 01/11/20
UNIV RCV EMI RUN 1
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : DC PHOENIX (001D9612 ASSEMBLY NUMBER)
SERIAL No. :
MODE : Tx @ 2412MHz 802.11b 11MBPS
SCANS/BAND : 1
NOTES :
TEST DATE : 13 Feb 2020 16:00:13 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000

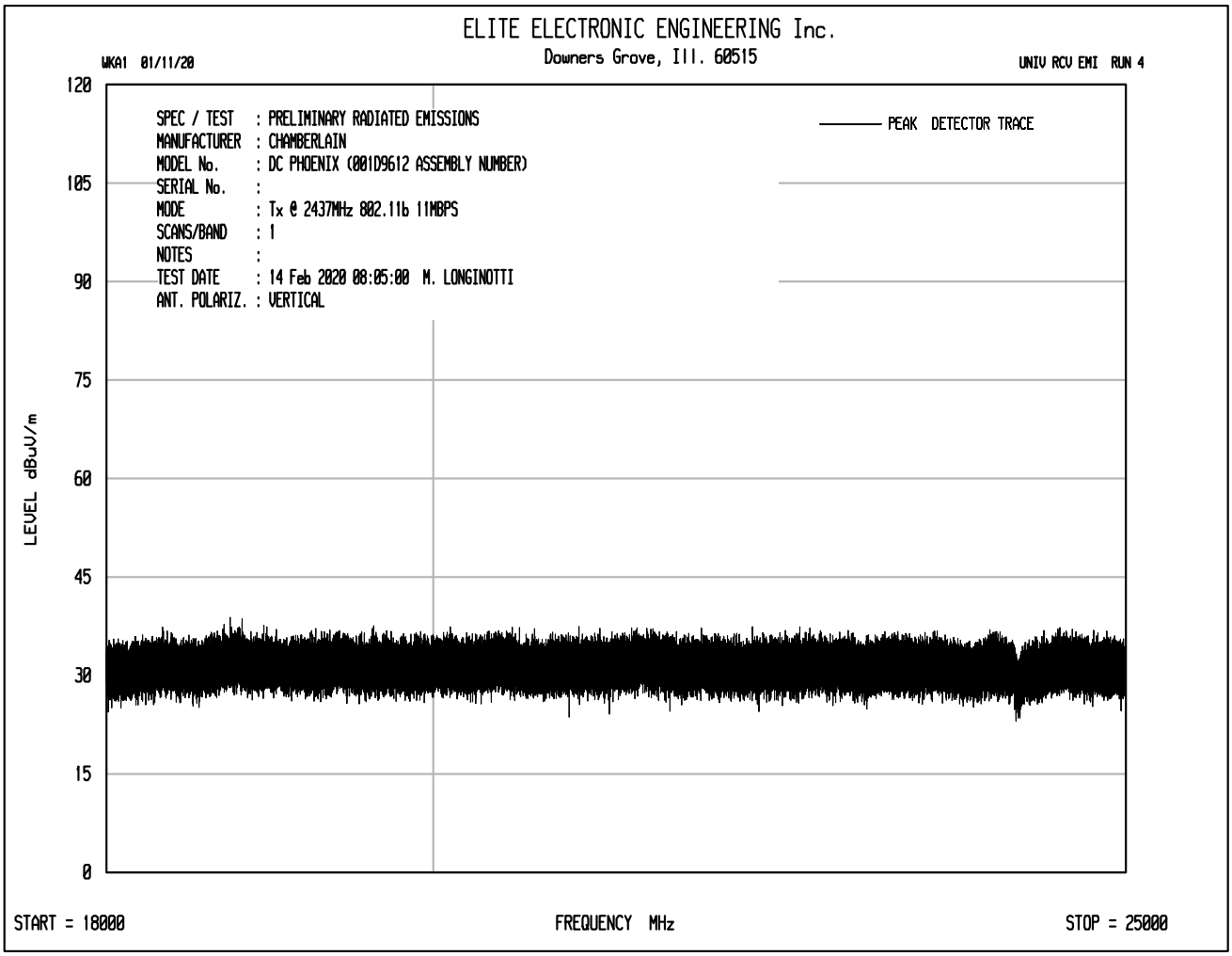

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 01/11/20
UNIV RCV EMI RUN 10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : PHOENIX BOARD
SERIAL No. : N/A
MODE : 802.11B TX @ 2437MHZ
SCANS/BAND : 1
NOTES : NON-POPULATED BOARD
TEST DATE : 13 Feb 2020 17:57:34 T. JOZEFCZYK
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4500

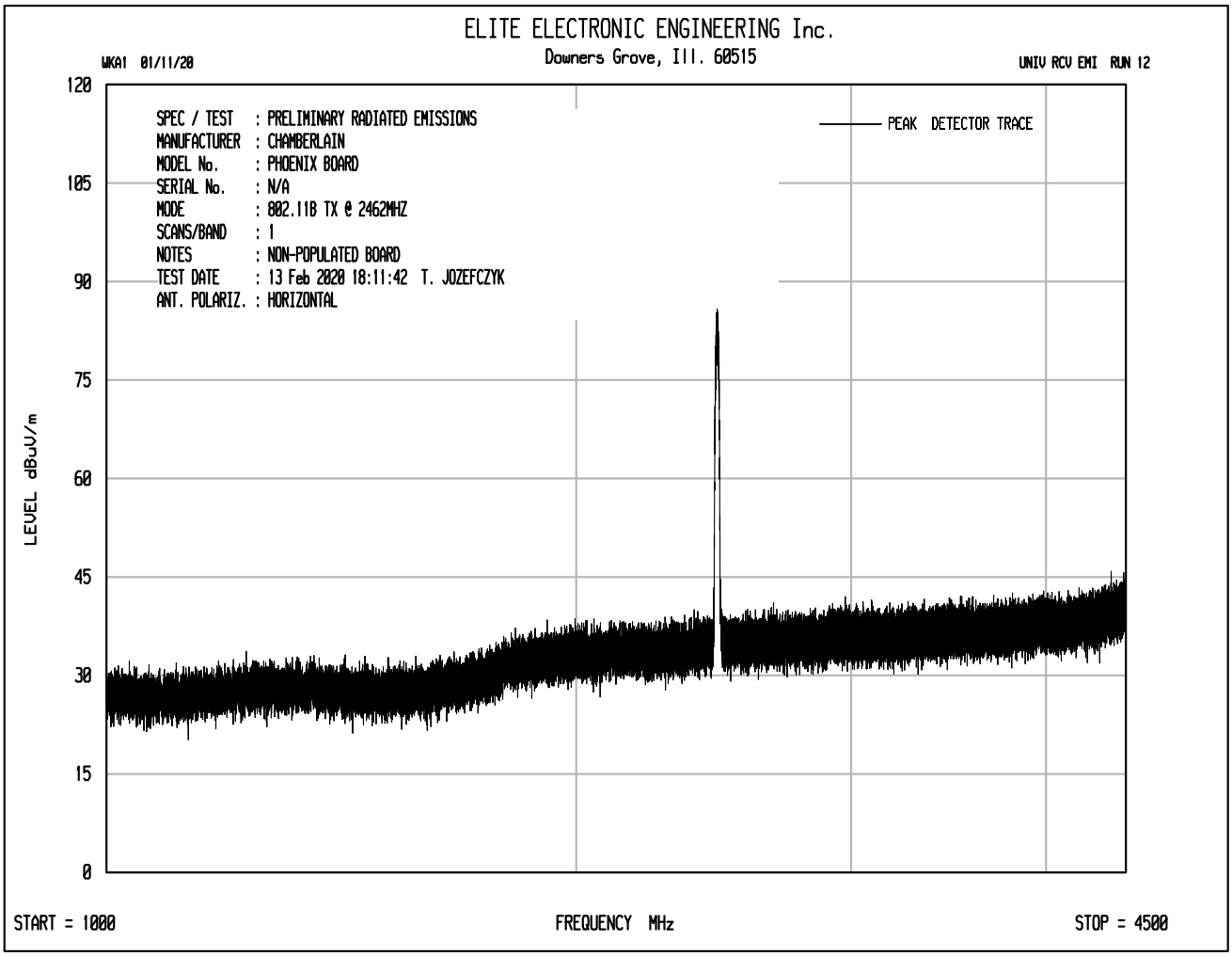

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 01/11/20
UNIV RCV EMI RUN 11
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : PHOENIX BOARD
SERIAL No. : N/A
MODE : 802.11B TX @ 2437MHZ
SCANS/BAND : 1
NOTES : NON-POPULATED BOARD
TEST DATE : 13 Feb 2020 17:59:11 T. JOZEFCZYK
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4500

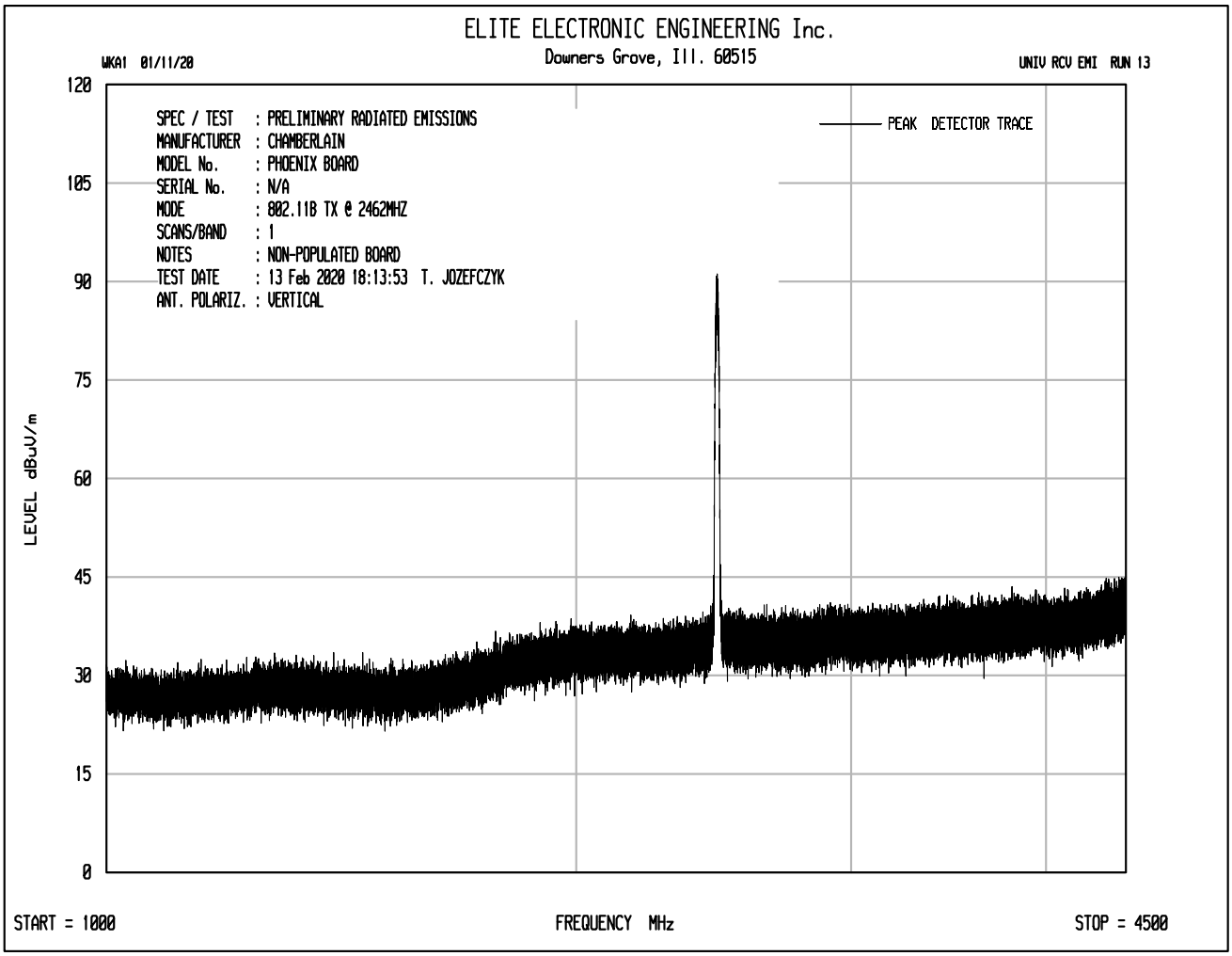

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 01/11/20
UNIV RCV EMI RUN 4
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : PHOENIX BOARD
SERIAL No. : N/A
MODE : 802.11B TX @ 2437MHZ
SCANS/BAND : 1
NOTES : NON-POPULATED BOARD
TEST DATE : 13 Feb 2020 17:20:53 T. JOZEFCZYK
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 4500
FREQUENCY MHz
STOP = 18000

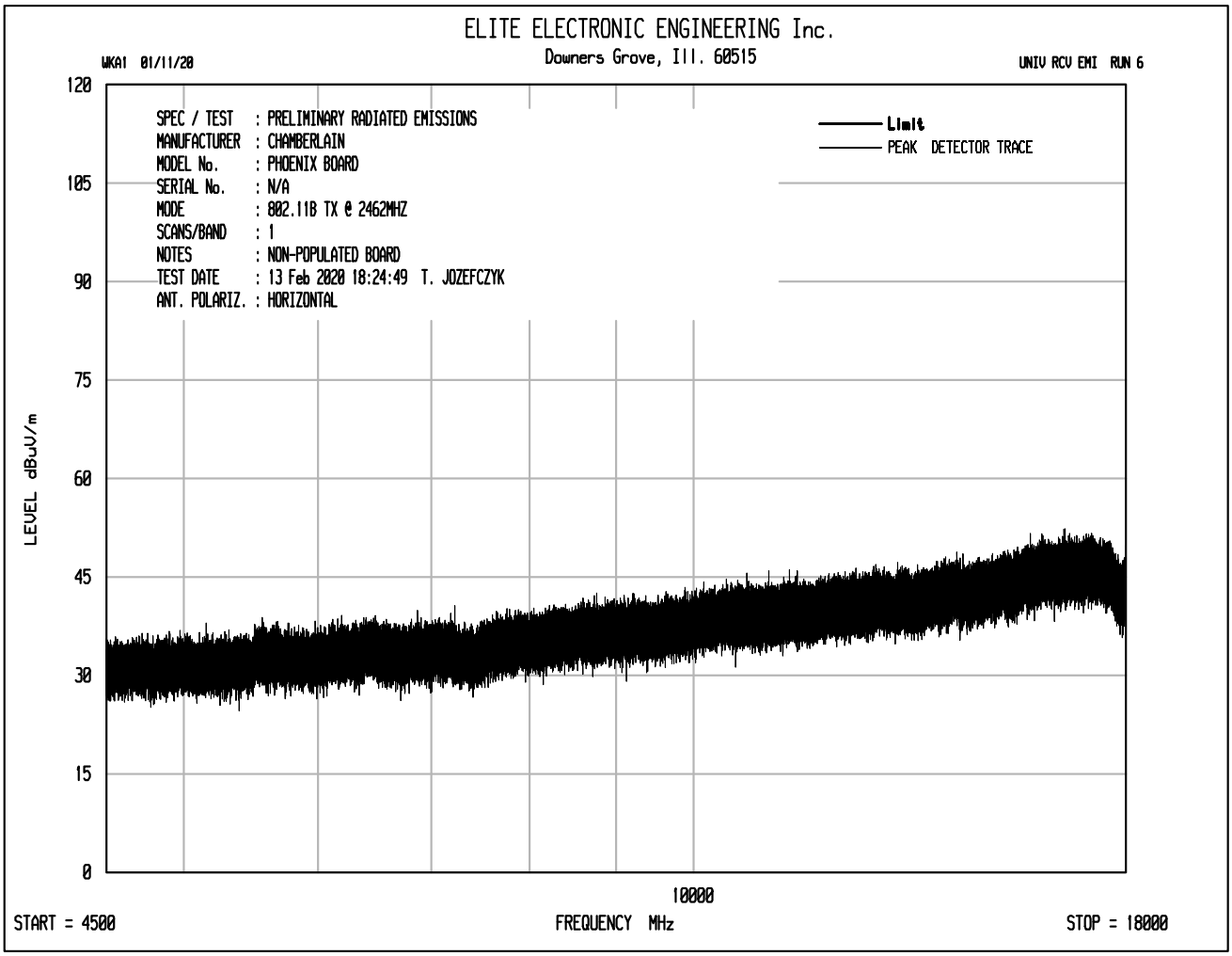

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 01/11/20
UNIV RCV EMI RUN 5
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : PHOENIX BOARD
SERIAL No. : N/A
MODE : 802.11B TX @ 2437MHZ
SCANS/BAND : 1
NOTES : NON-POPULATED BOARD
TEST DATE : 13 Feb 2020 17:28:34 T. JOZEFCZYK
ANT. POLARIZ. : VERTICAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 4500
FREQUENCY MHz
STOP = 18000

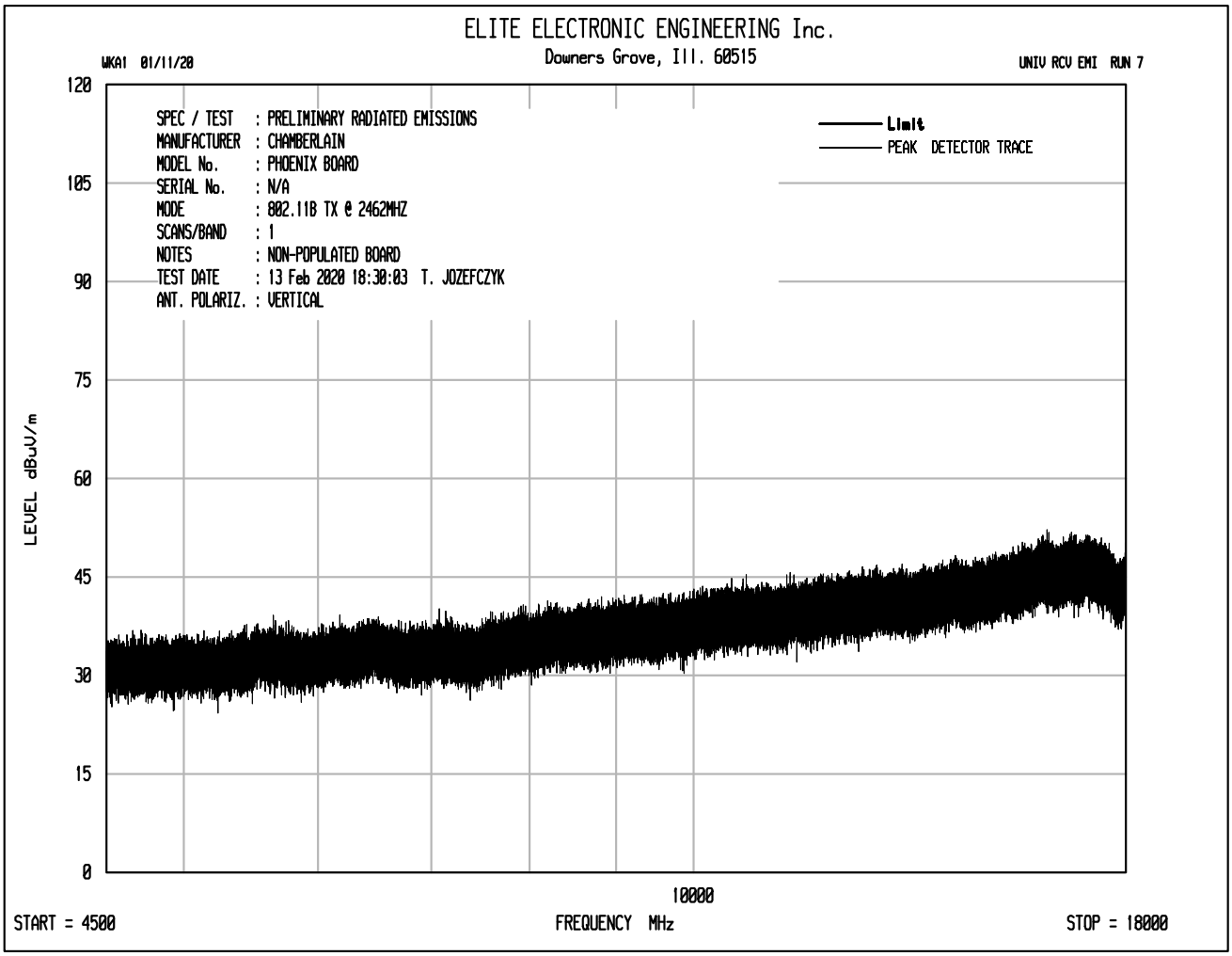

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 01/11/20
UNIV RCV EMI RUN 3
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : DC PHOENIX (001D9612 ASSEMBLY NUMBER)
SERIAL No. :
MODE : Tx @ 2437MHz 802.11b 11MBPS
SCANS/BAND : 1
NOTES :
TEST DATE : 14 Feb 2020 07:56:11 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000

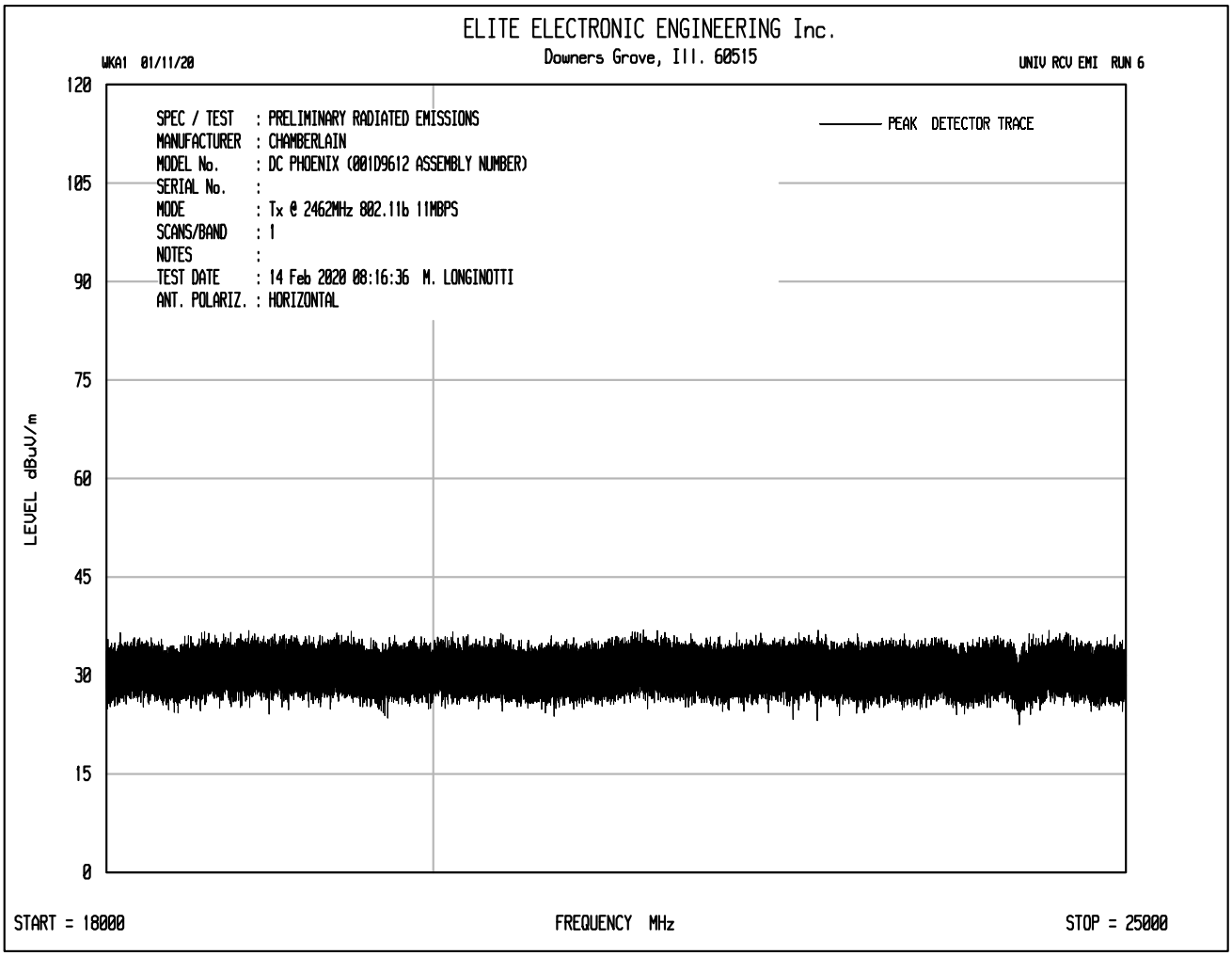

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 01/11/20
UNIV RCV EMI RUN 4
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : DC PHOENIX (001D9612 ASSEMBLY NUMBER)
SERIAL No. :
MODE : Tx @ 2437MHz 802.11b 11MBPS
SCANS/BAND : 1
NOTES :
TEST DATE : 14 Feb 2020 08:05:00 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000

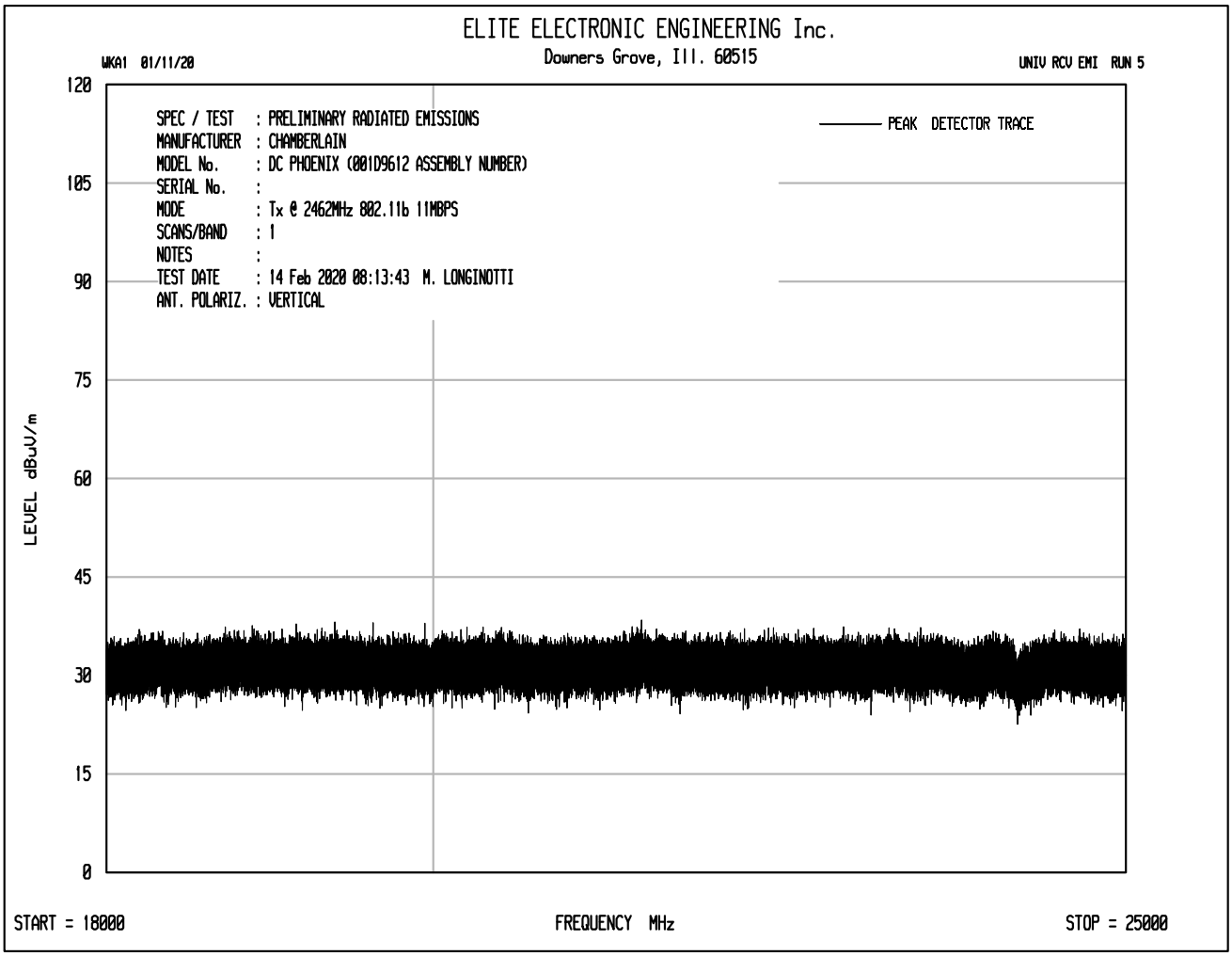

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 01/11/20
UNIV RCV EMI RUN 12
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : PHOENIX BOARD
SERIAL No. : N/A
MODE : 802.11B TX @ 2462MHZ
SCANS/BAND : 1
NOTES : NON-POPULATED BOARD
TEST DATE : 13 Feb 2020 18:11:42 T. JOZEFCZYK
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4500

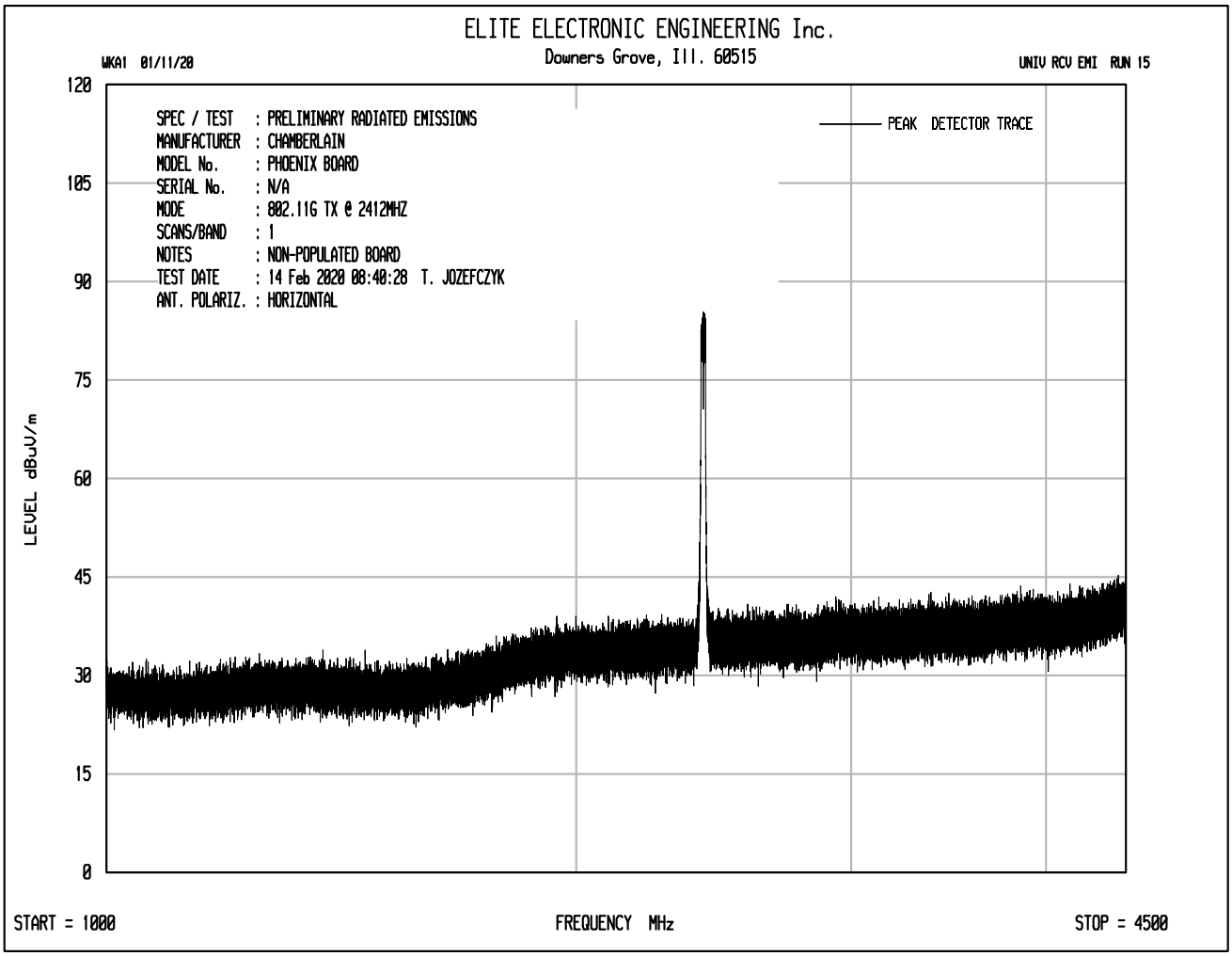

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 01/11/20
UNIV RCV EMI RUN 13
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : PHOENIX BOARD
SERIAL No. : N/A
MODE : 802.11B TX @ 2462MHZ
SCANS/BAND : 1
NOTES : NON-POPULATED BOARD
TEST DATE : 13 Feb 2020 18:13:53 T. JOZEFCZYK
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4500

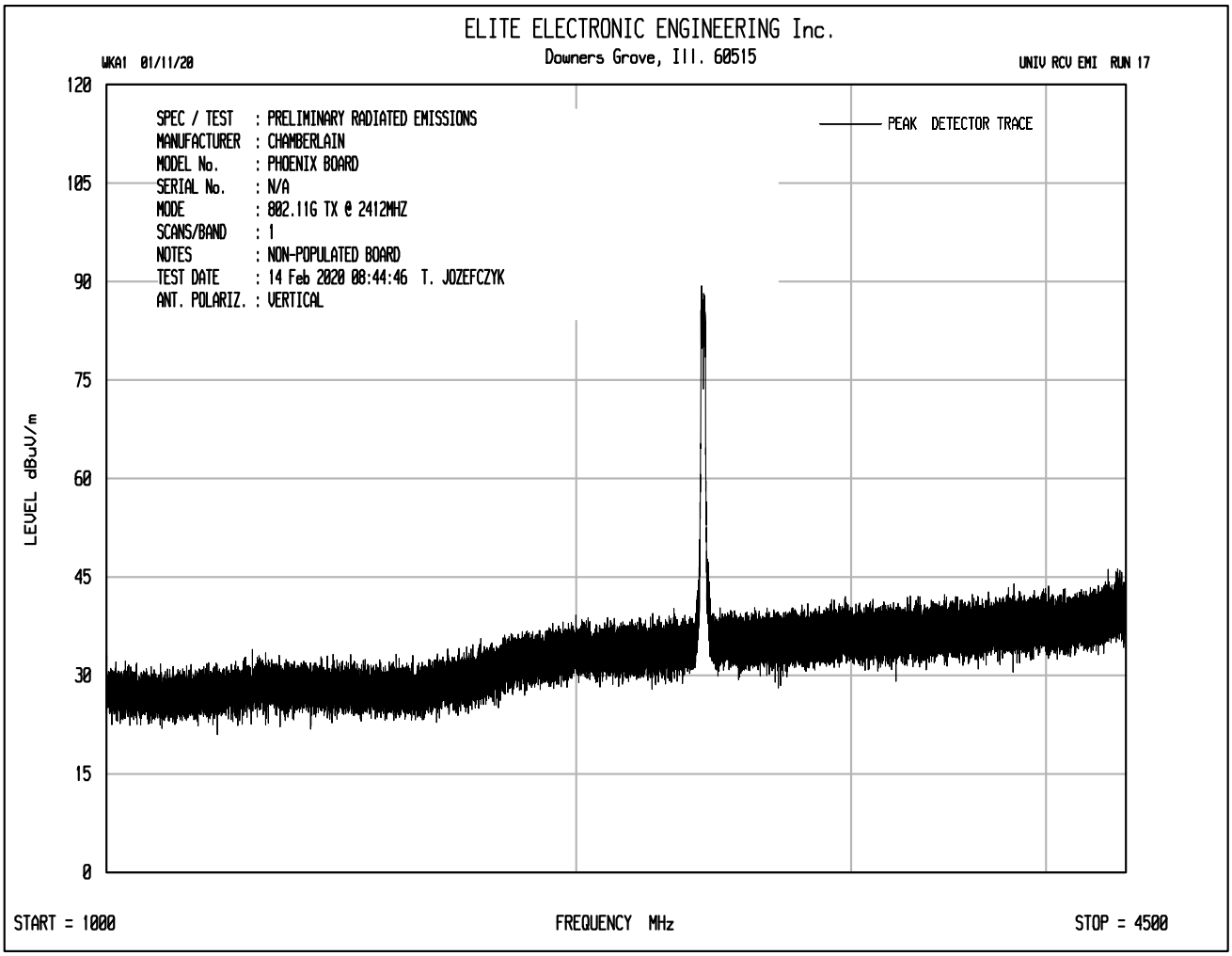

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 01/11/20
UNIV RCV EMI RUN 6
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : PHOENIX BOARD
SERIAL No. : N/A
MODE : 802.11B TX @ 2462MHZ
SCANS/BAND : 1
NOTES : NON-POPULATED BOARD
TEST DATE : 13 Feb 2020 18:24:49 T. JOZEFCZYK
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 4500
FREQUENCY MHz
STOP = 18000

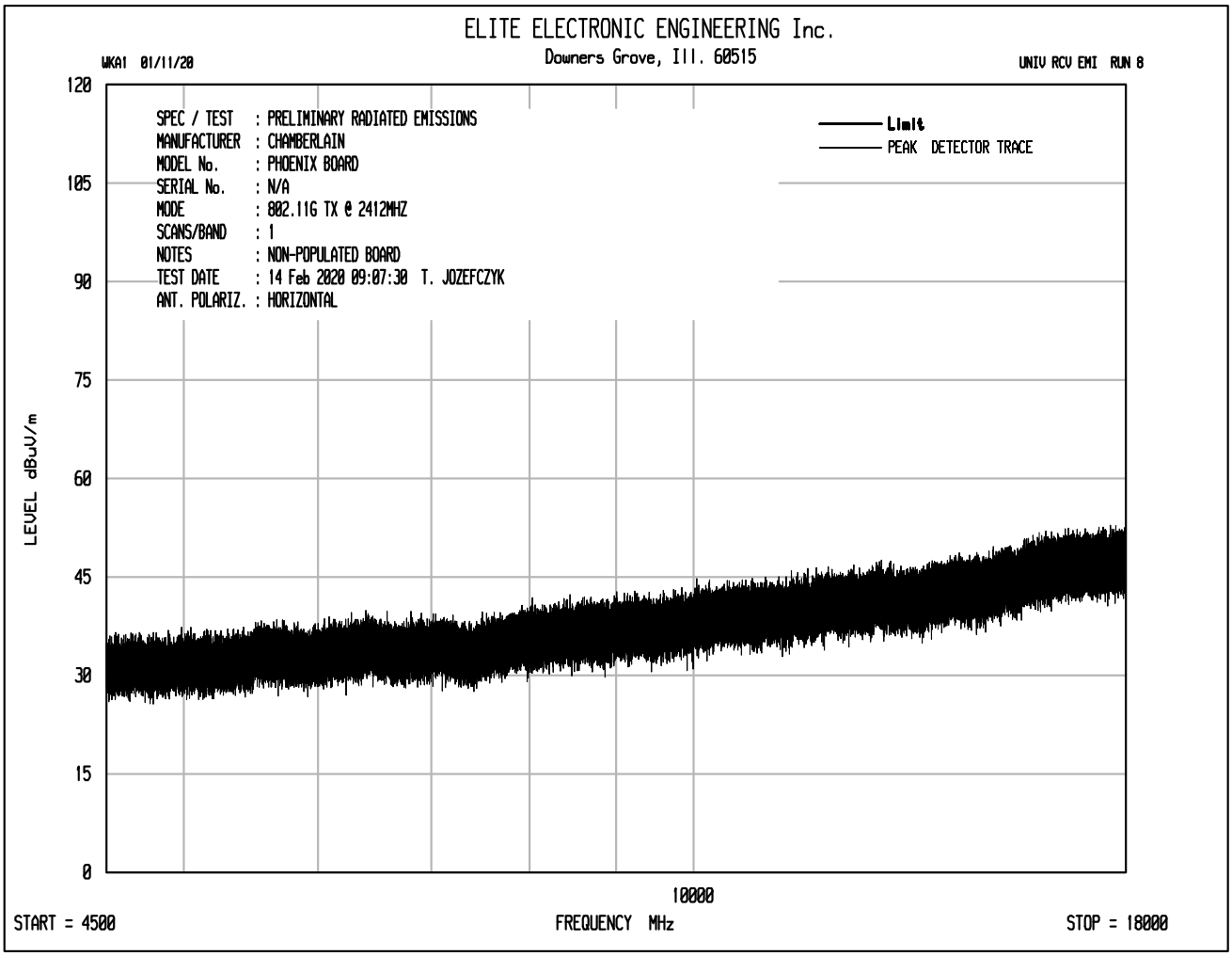

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 01/11/20
UNIV RCV EMI RUN 7
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : PHOENIX BOARD
SERIAL No. : N/A
MODE : 802.11B TX @ 2462MHZ
SCANS/BAND : 1
NOTES : NON-POPULATED BOARD
TEST DATE : 13 Feb 2020 18:30:03 T. JOZEFCZYK
ANT. POLARIZ. : VERTICAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 4500
FREQUENCY MHz
STOP = 18000

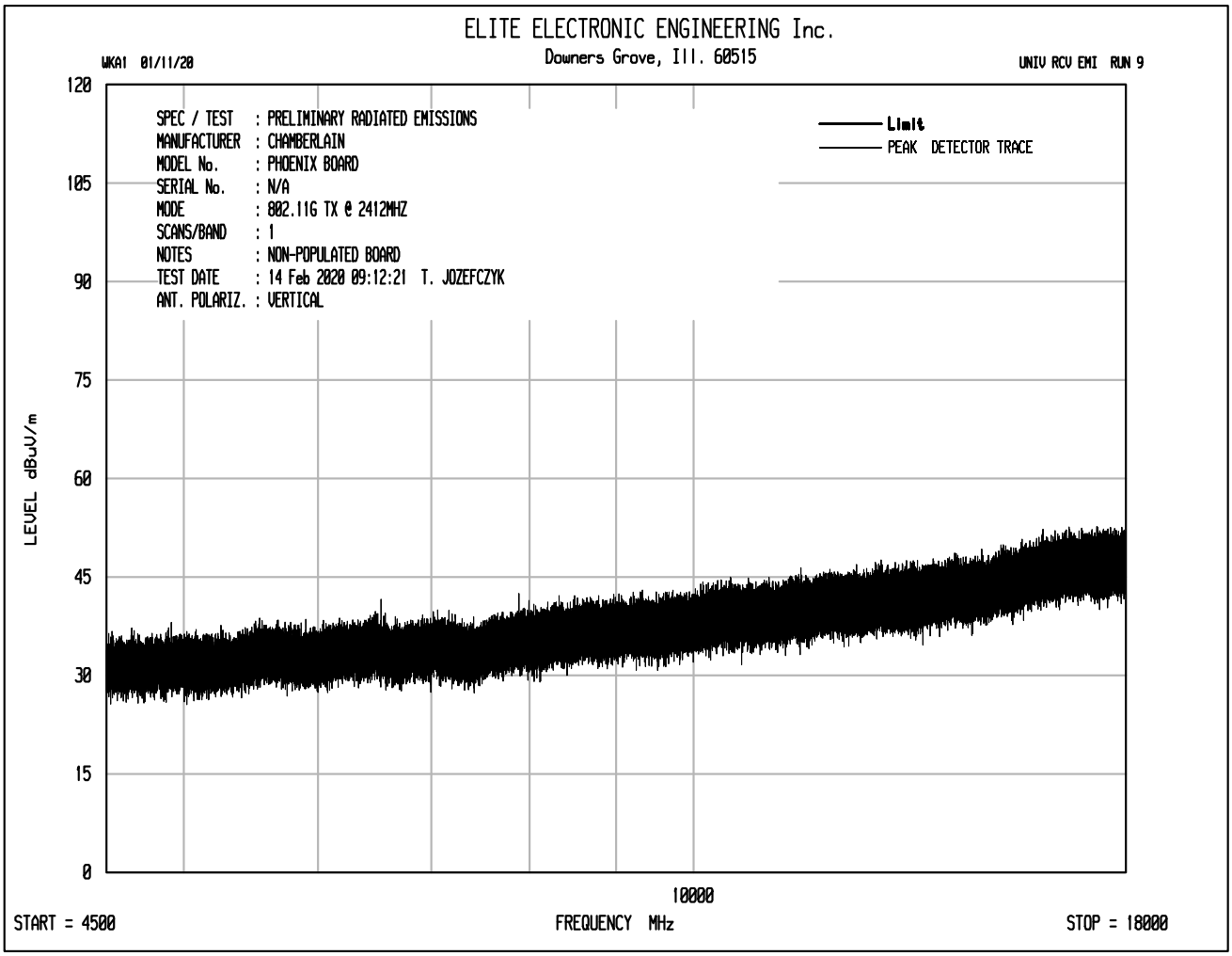

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 01/11/20
UNIV RCV EMI RUN 6
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : DC PHOENIX (001D9612 ASSEMBLY NUMBER)
SERIAL No. :
MODE : Tx @ 2462MHz 802.11b 11MBPS
SCANS/BAND : 1
NOTES :
TEST DATE : 14 Feb 2020 08:16:36 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000

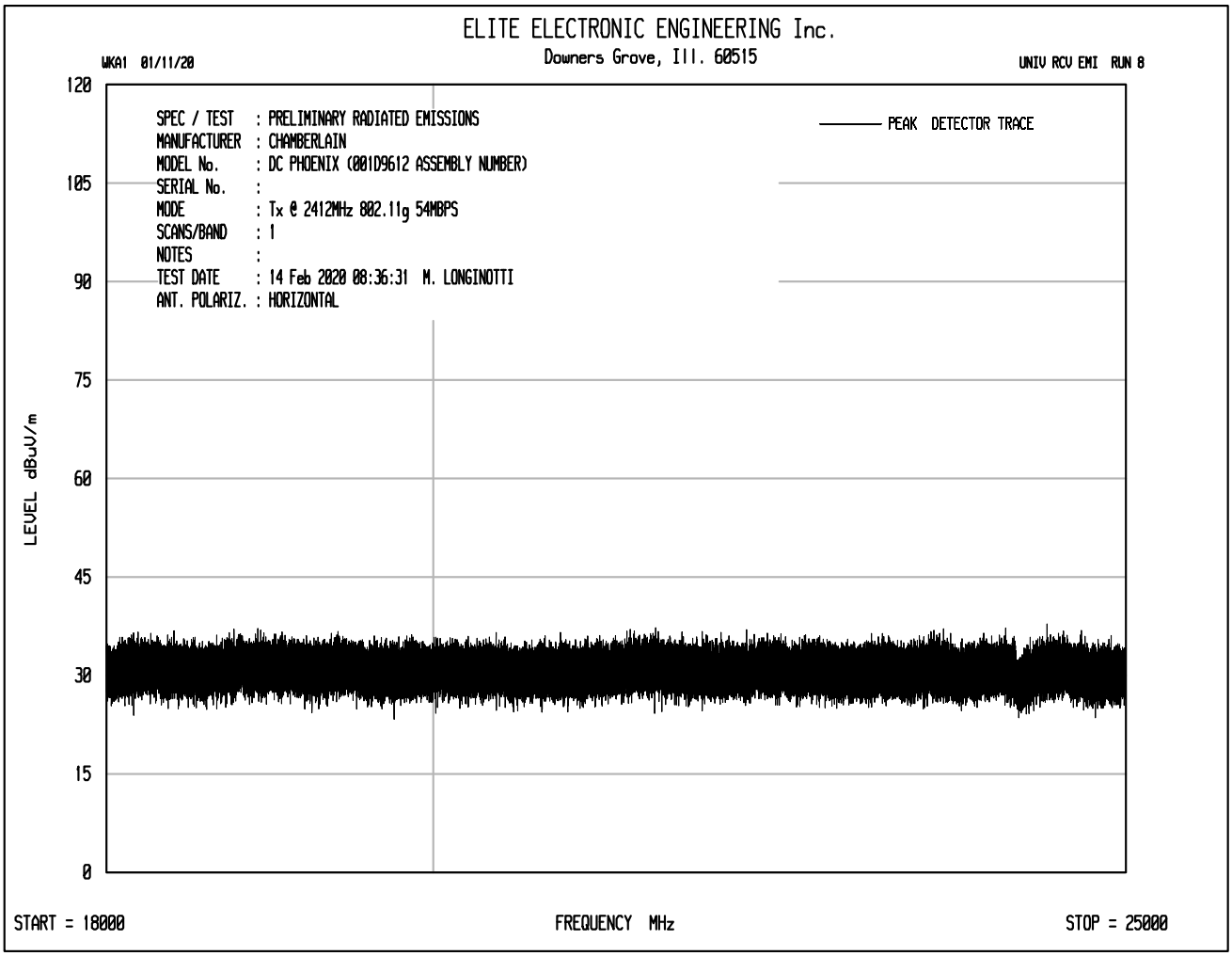

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 01/11/20
UNIV RCV EMI RUN 5
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : DC PHOENIX (001D9612 ASSEMBLY NUMBER)
SERIAL No. :
MODE : Tx @ 2462MHz 802.11b 11MBPS
SCANS/BAND : 1
NOTES :
TEST DATE : 14 Feb 2020 08:13:43 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000

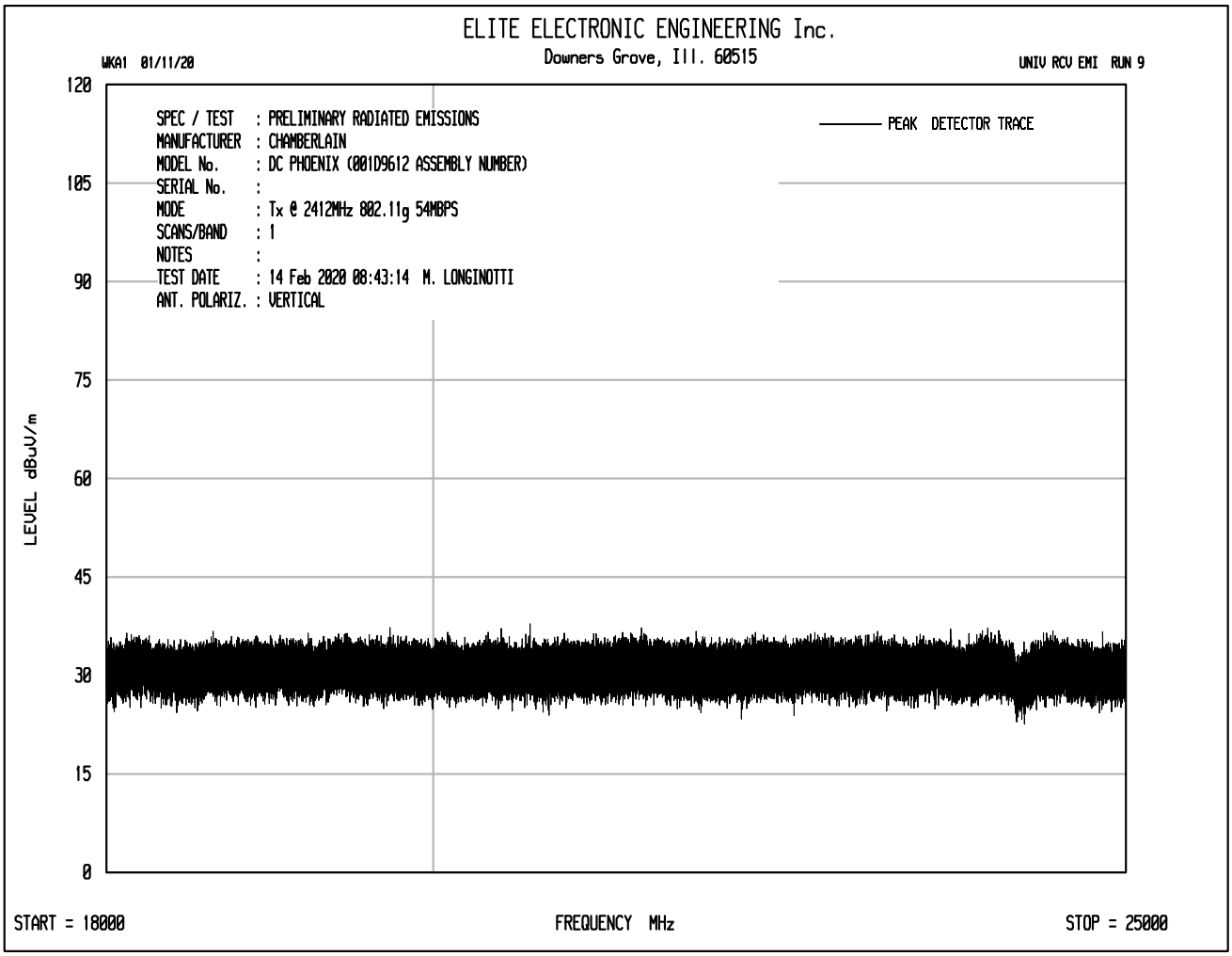

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 01/11/20
UNIV RCV EMI RUN 15
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : PHOENIX BOARD
SERIAL No. : N/A
MODE : 802.11G TX @ 2412MHZ
SCANS/BAND : 1
NOTES : NON-POPULATED BOARD
TEST DATE : 14 Feb 2020 08:40:28 T. JOZEFCZYK
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4500

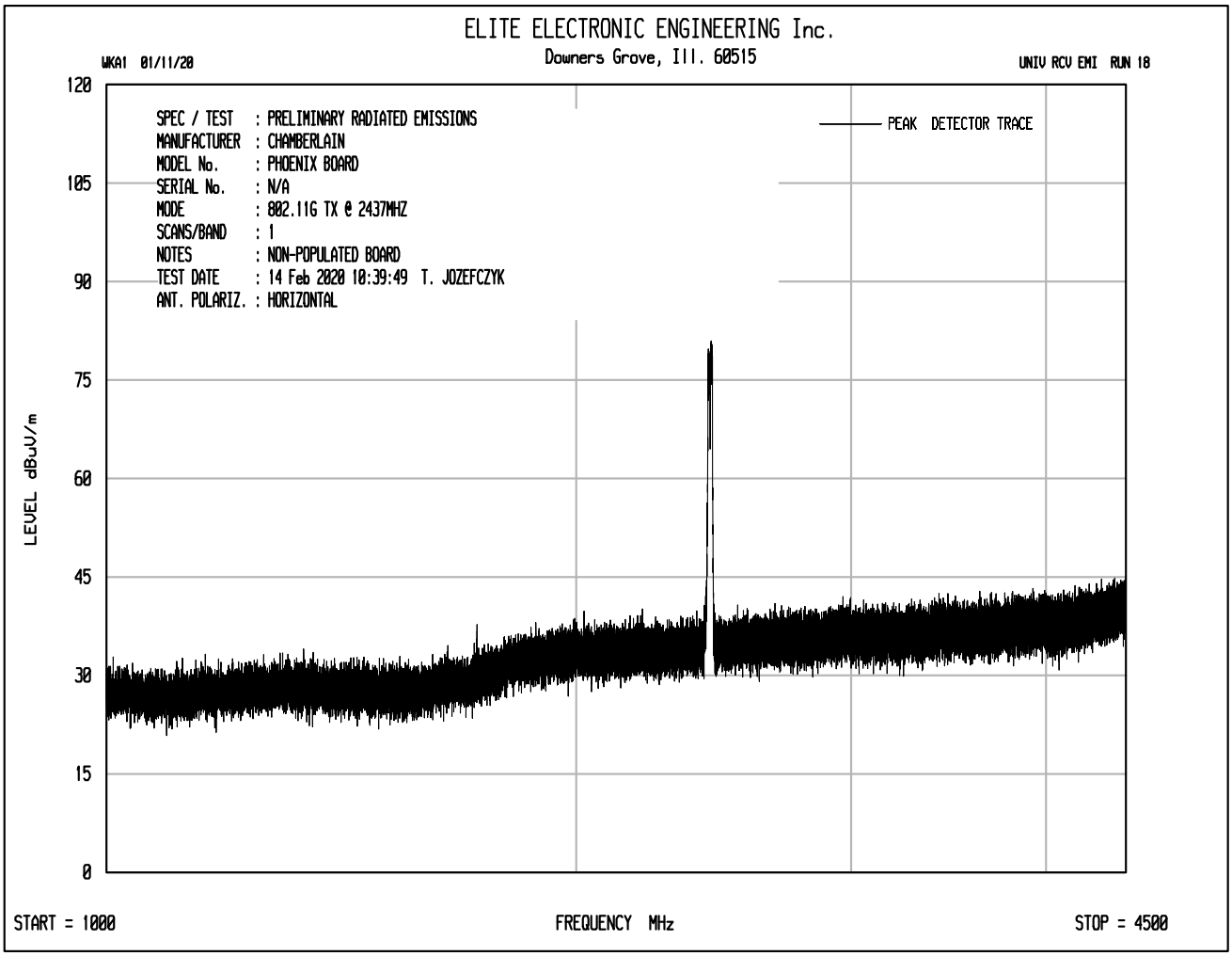

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 01/11/20
UNIV RCV EMI RUN 17
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : PHOENIX BOARD
SERIAL No. : N/A
MODE : 802.11G TX @ 2412MHZ
SCANS/BAND : 1
NOTES : NON-POPULATED BOARD
TEST DATE : 14 Feb 2020 08:44:46 T. JOZEFCZYK
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4500

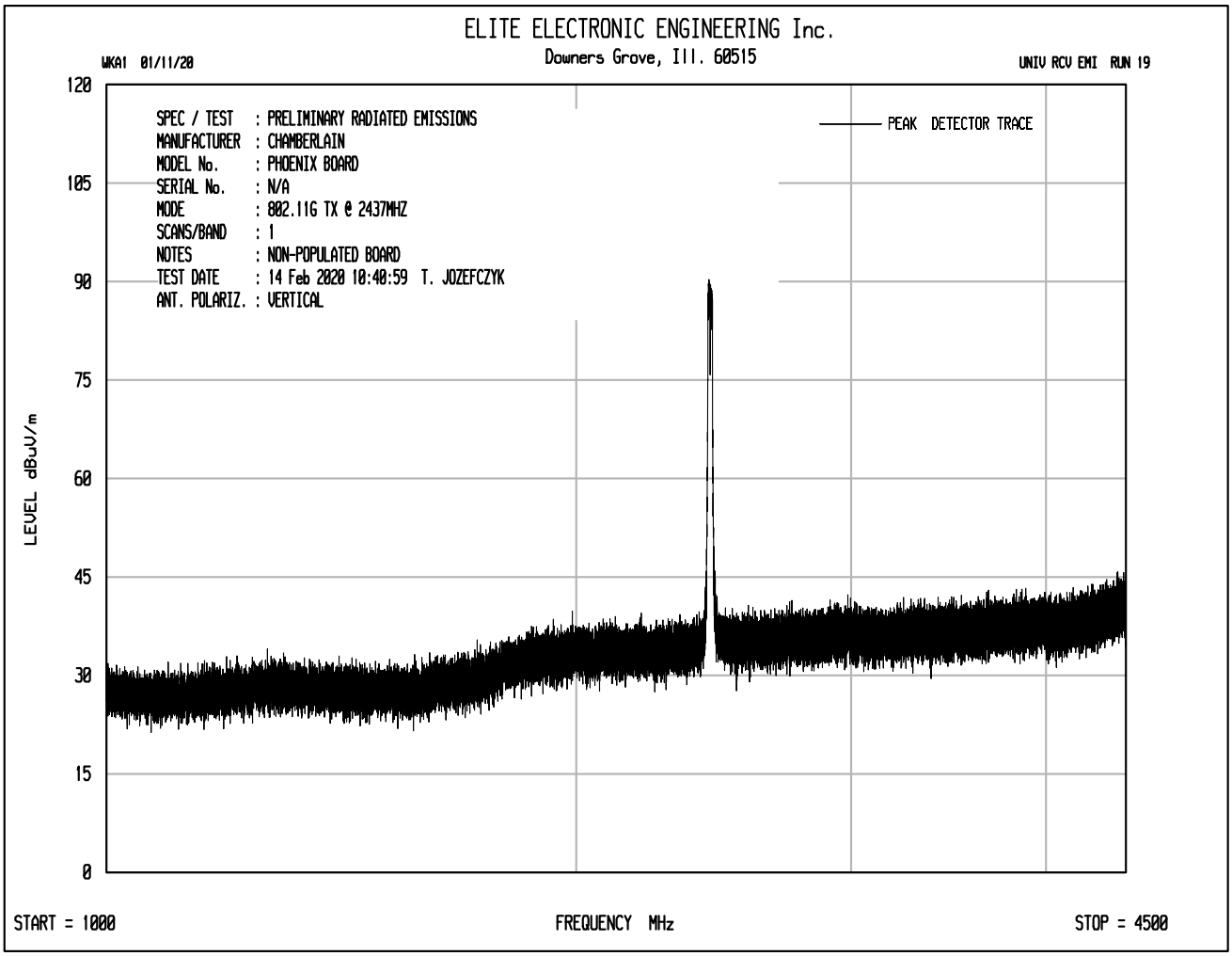

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 01/11/20
UNIV RCV EMI RUN 8
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : PHOENIX BOARD
SERIAL No. : N/A
MODE : 802.11G TX @ 2412MHZ
SCANS/BAND : 1
NOTES : NON-POPULATED BOARD
TEST DATE : 14 Feb 2020 09:07:30 T. JOZEFCZYK
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 4500
FREQUENCY MHz
STOP = 18000

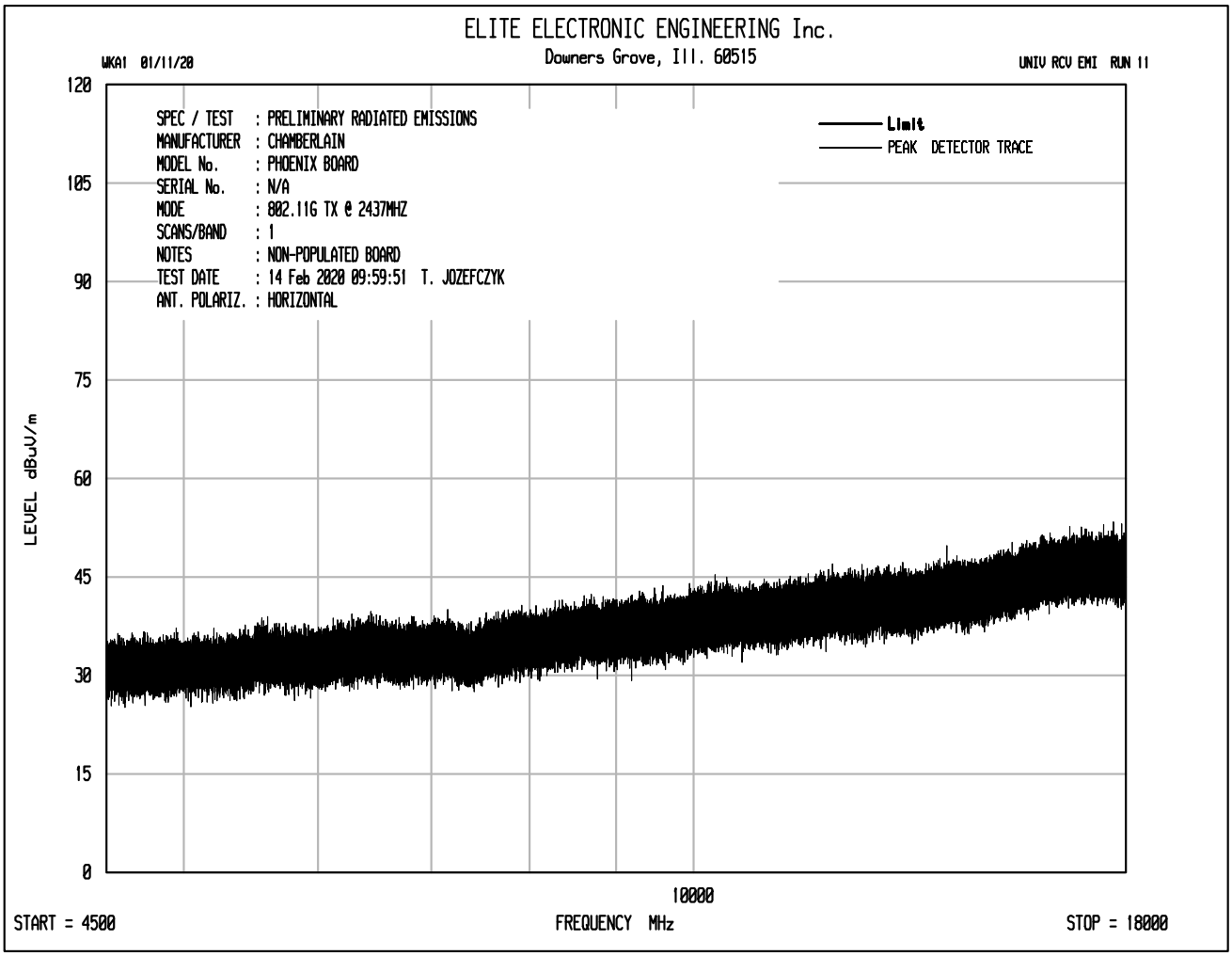

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 01/11/20
UNIV RCV EMI RUN 9
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : PHOENIX BOARD
SERIAL No. : N/A
MODE : 802.11G TX @ 2412MHZ
SCANS/BAND : 1
NOTES : NON-POPULATED BOARD
TEST DATE : 14 Feb 2020 09:12:21 T. JOZEFCZYK
ANT. POLARIZ. : VERTICAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 4500
FREQUENCY MHz
STOP = 18000

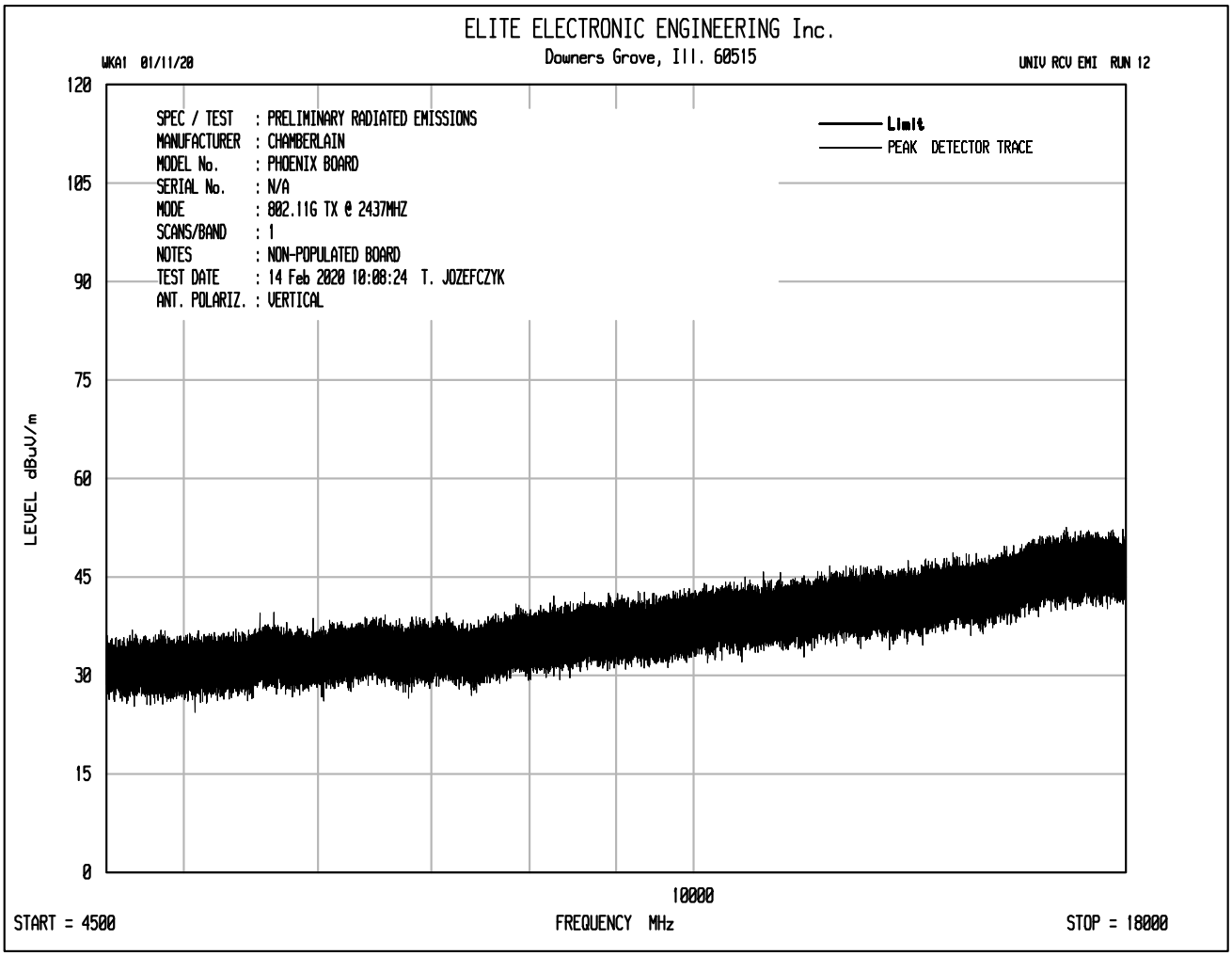

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 01/11/20
UNIV RCV EMI RUN 8
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : DC PHOENIX (001D9612 ASSEMBLY NUMBER)
SERIAL No. :
MODE : Tx @ 2412MHz 802.11g 54MBPS
SCANS/BAND : 1
NOTES :
TEST DATE : 14 Feb 2020 08:36:31 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000

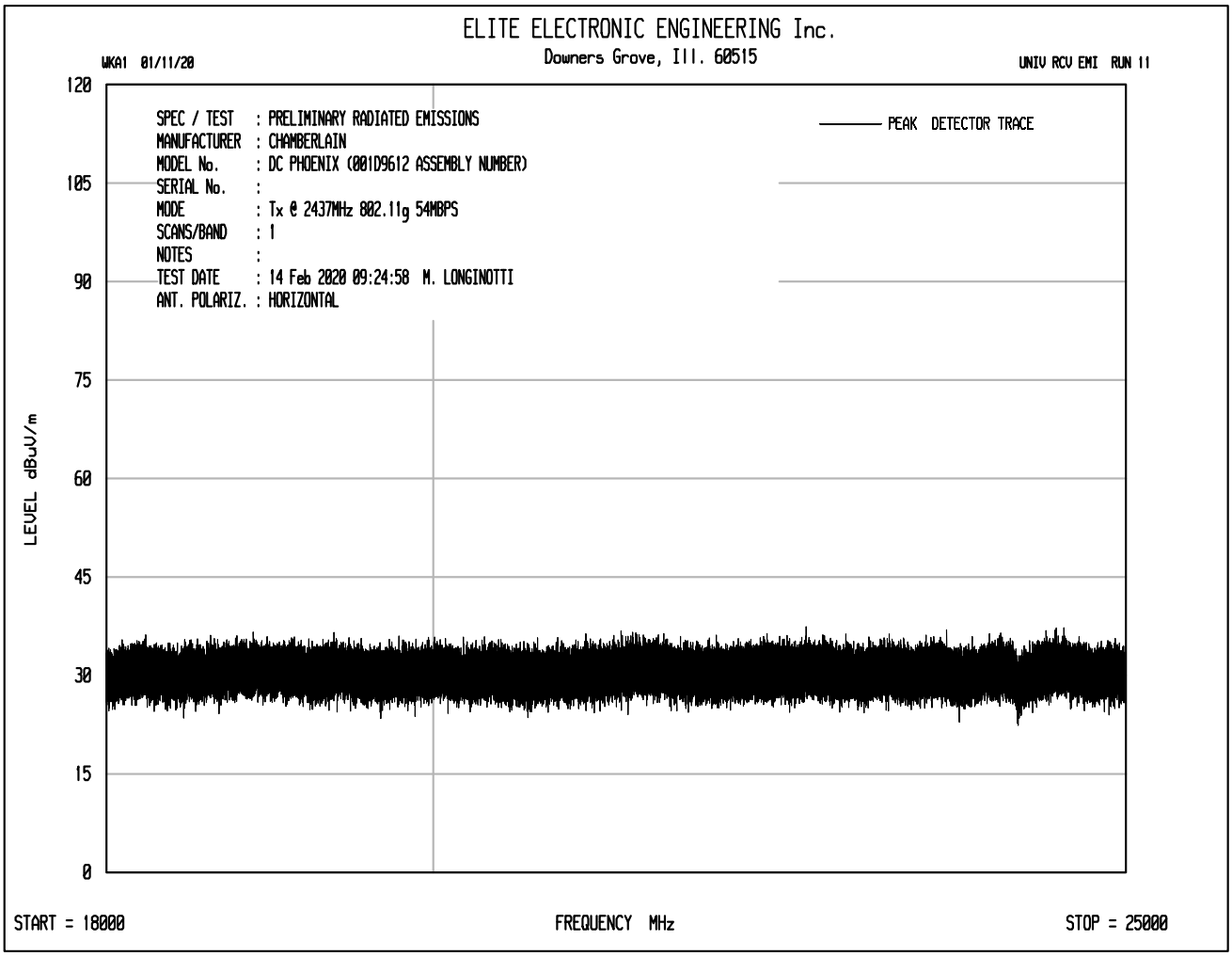

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 01/11/20
UNIV RCV EMI RUN 9
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : DC PHOENIX (001D9612 ASSEMBLY NUMBER)
SERIAL No. :
MODE : Tx @ 2412MHz 802.11g 54MBPS
SCANS/BAND : 1
NOTES :
TEST DATE : 14 Feb 2020 08:43:14 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000

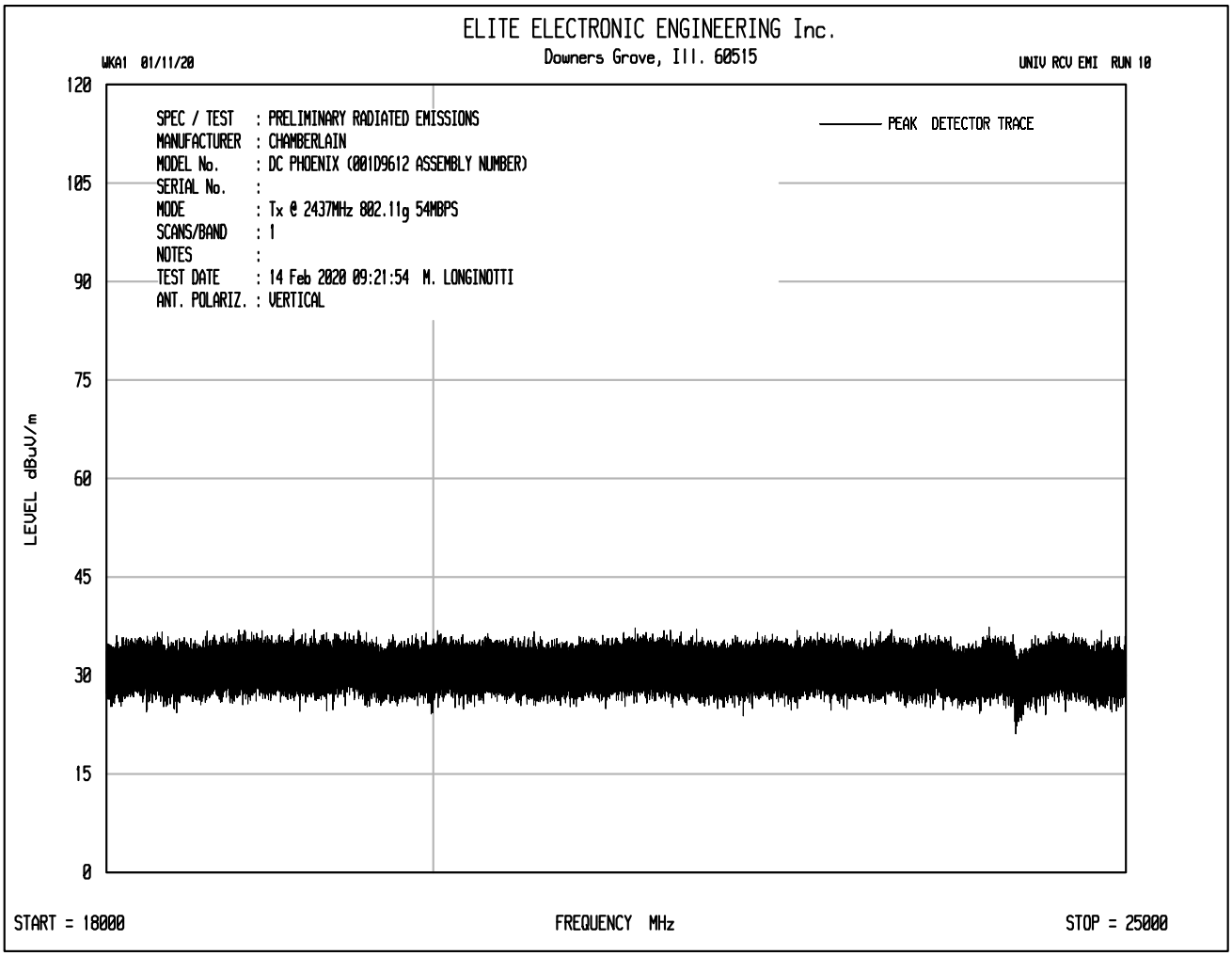

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 01/11/20
UNIV RCV EMI RUN 18
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : PHOENIX BOARD
SERIAL No. : N/A
MODE : 802.11G TX @ 2437MHZ
SCANS/BAND : 1
NOTES : NON-POPULATED BOARD
TEST DATE : 14 Feb 2020 10:39:49 T. JOZEFCZYK
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4500

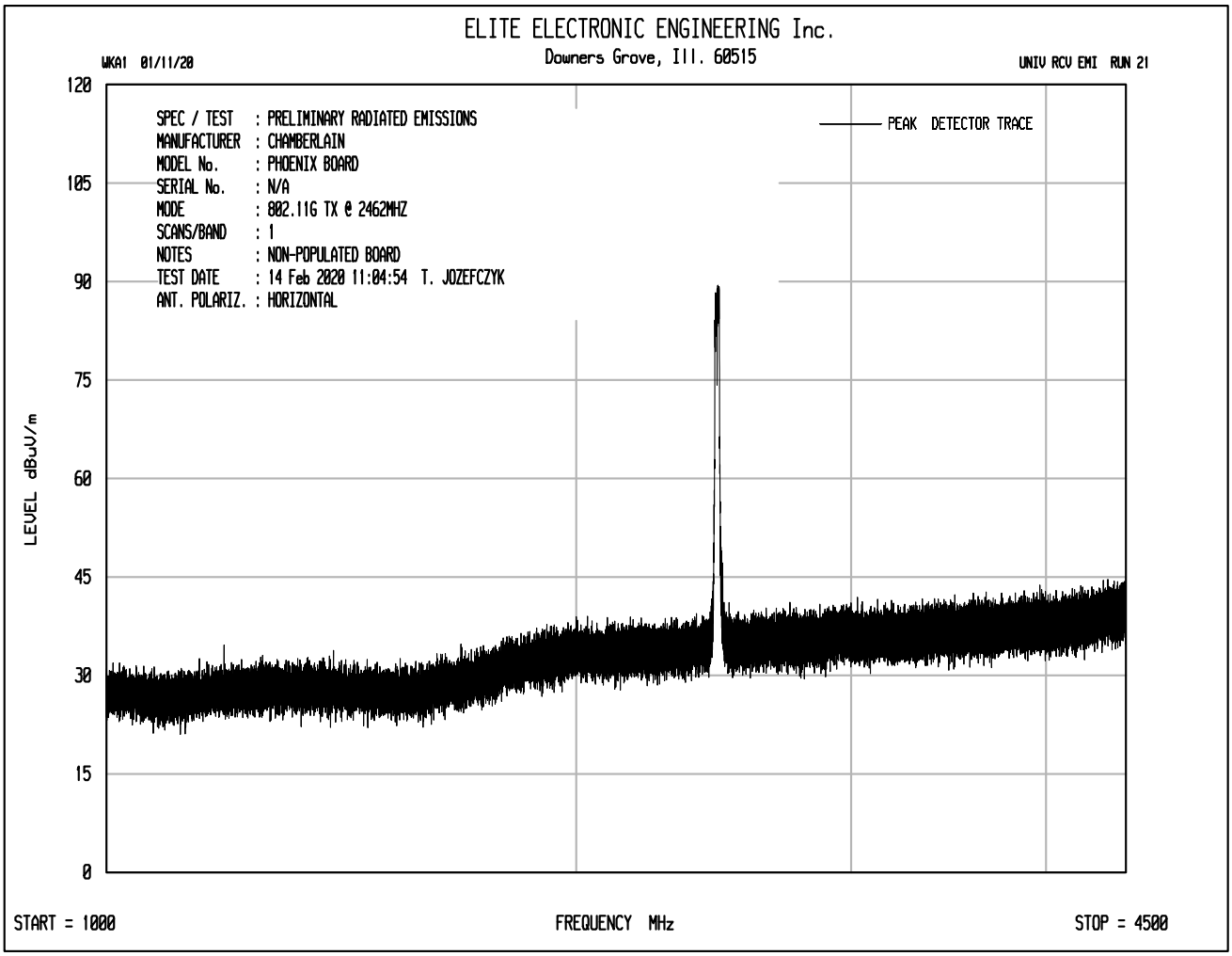

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 01/11/20
UNIV RCV EMI RUN 19
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : PHOENIX BOARD
SERIAL No. : N/A
MODE : 802.11G TX @ 2437MHZ
SCANS/BAND : 1
NOTES : NON-POPULATED BOARD
TEST DATE : 14 Feb 2020 10:40:59 T. JOZEFCZYK
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4500

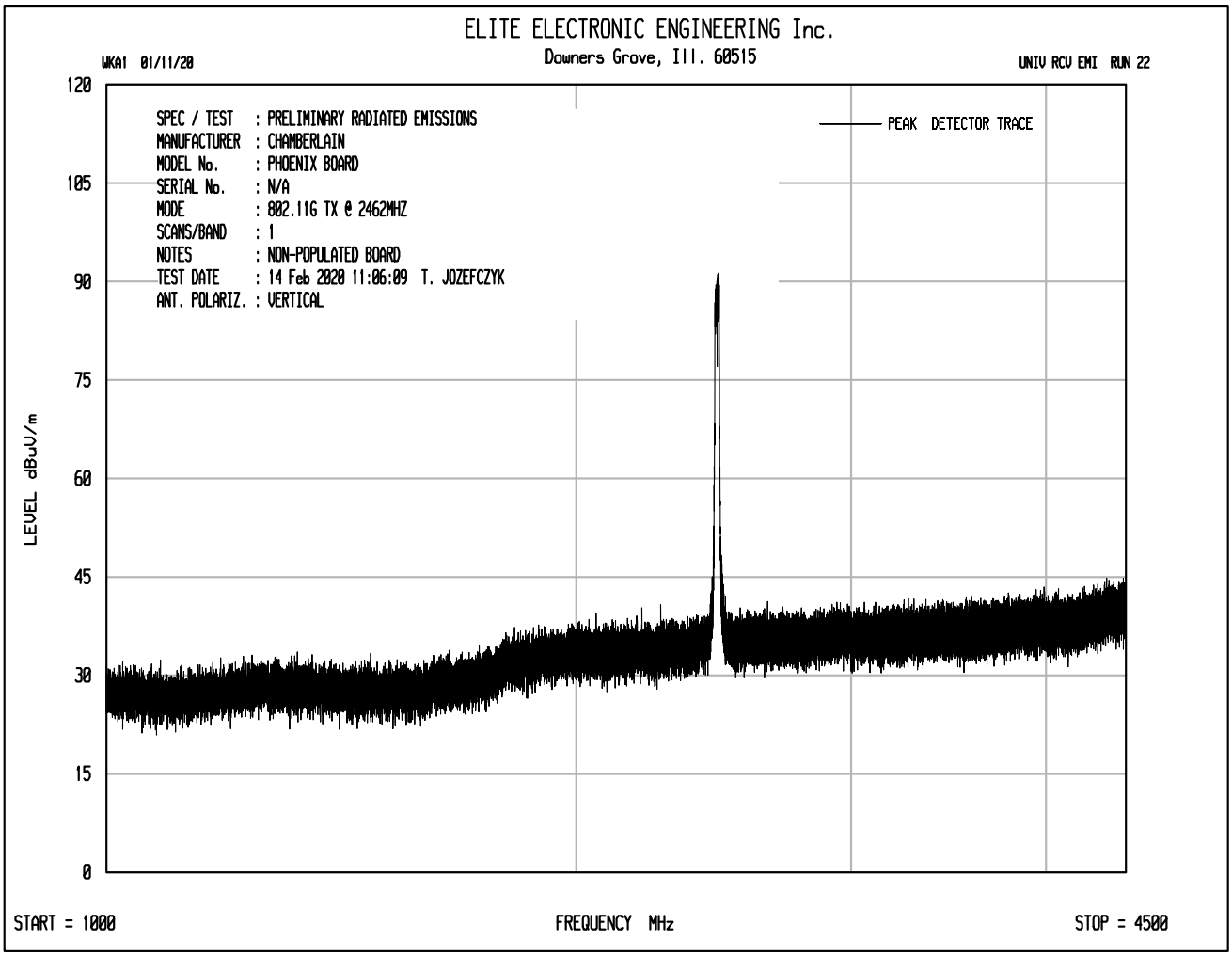

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 01/11/20
UNIV RCV EMI RUN 11
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : PHOENIX BOARD
SERIAL No. : N/A
MODE : 802.11G TX @ 2437MHZ
SCANS/BAND : 1
NOTES : NON-POPULATED BOARD
TEST DATE : 14 Feb 2020 09:59:51 T. JOZEFCZYK
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 4500
FREQUENCY MHz
STOP = 18000

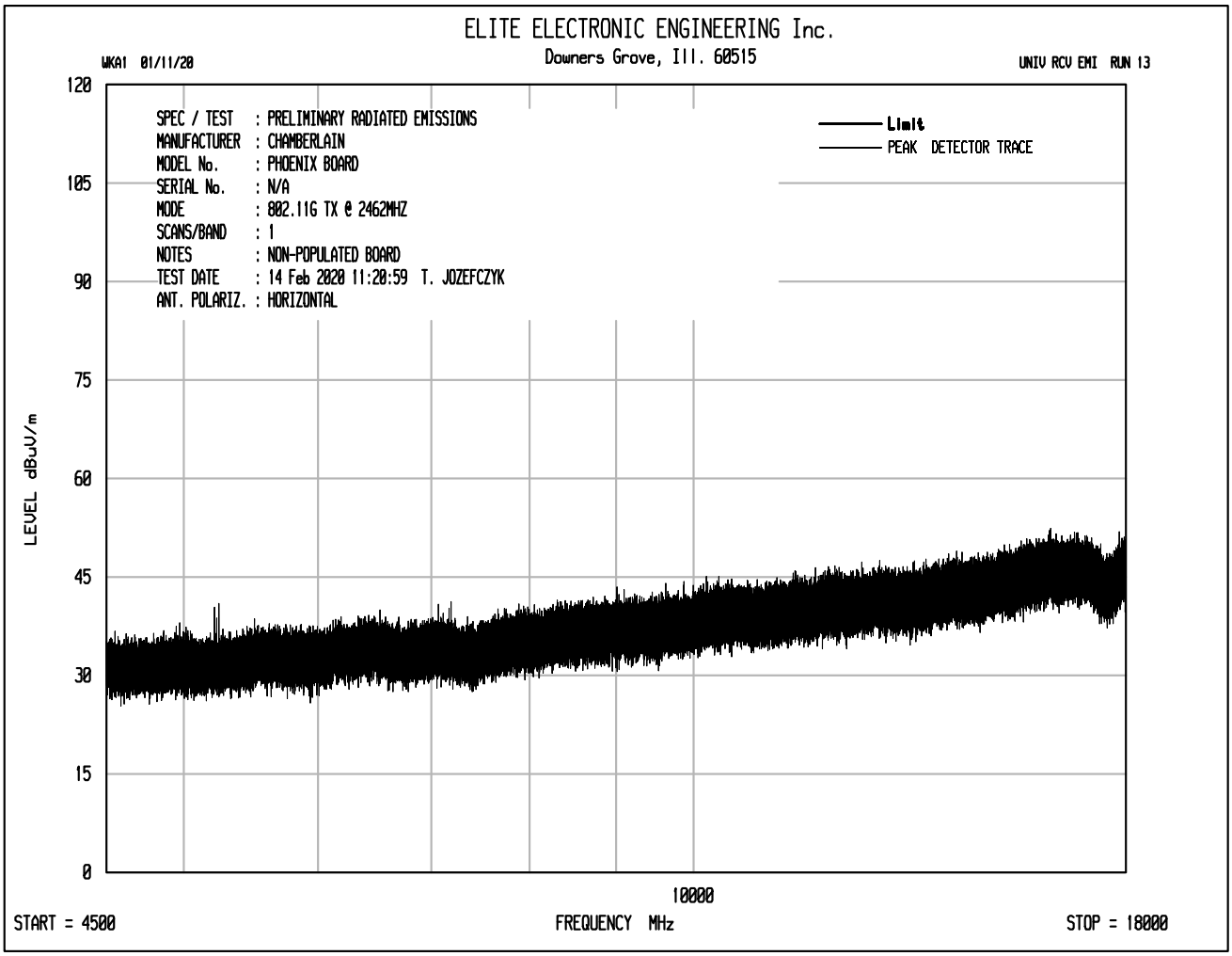

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 01/11/20
UNIV RCV EMI RUN 12
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : PHOENIX BOARD
SERIAL No. : N/A
MODE : 802.11G TX @ 2437MHZ
SCANS/BAND : 1
NOTES : NON-POPULATED BOARD
TEST DATE : 14 Feb 2020 10:08:24 T. JOZEFCZYK
ANT. POLARIZ. : VERTICAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 4500
FREQUENCY MHz
STOP = 18000

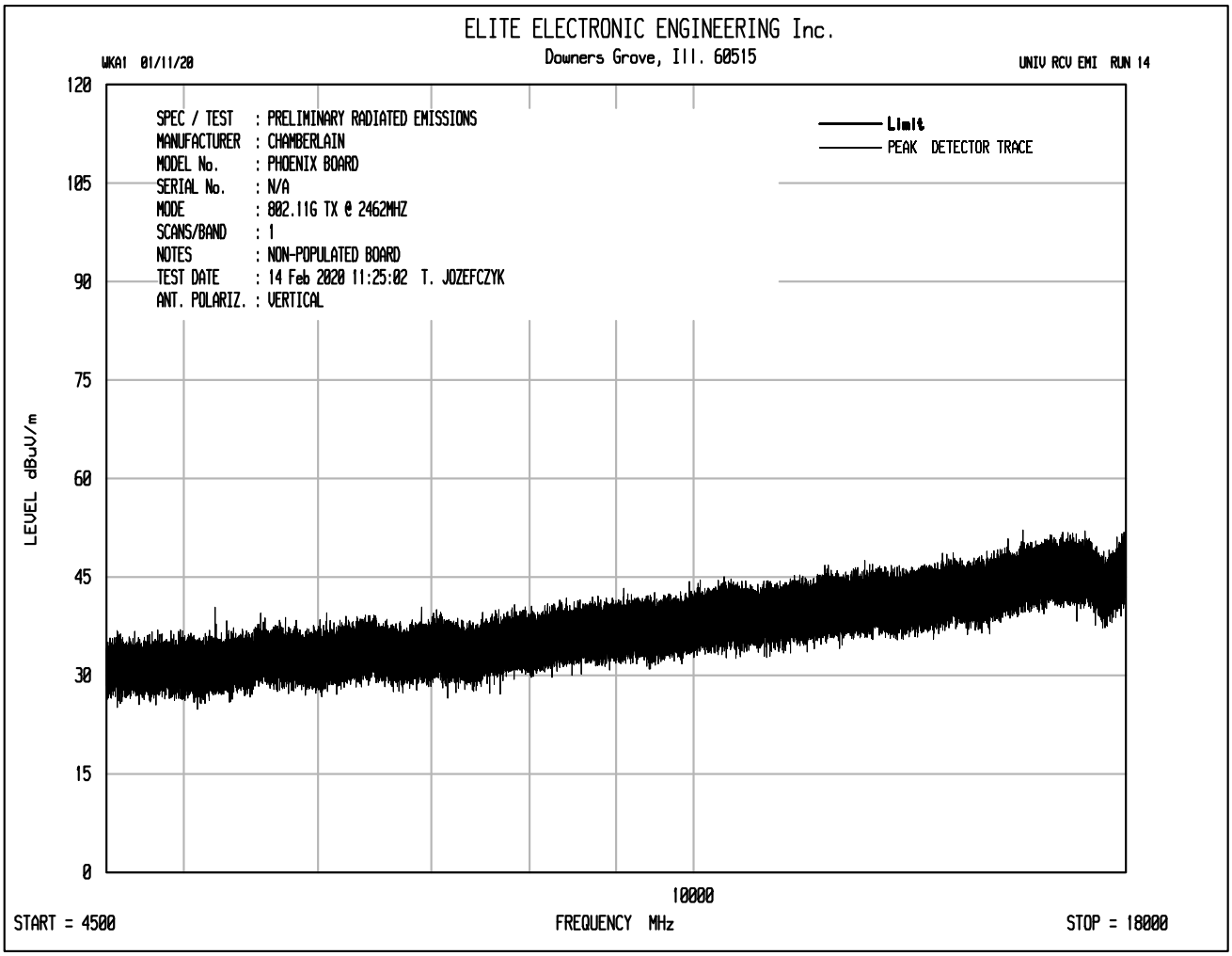

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 01/11/20
UNIV RCV EMI RUN 11
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : DC PHOENIX (001D9612 ASSEMBLY NUMBER)
SERIAL No. :
MODE : Tx @ 2437MHz 802.11g 54MBPS
SCANS/BAND : 1
NOTES :
TEST DATE : 14 Feb 2020 09:24:58 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000

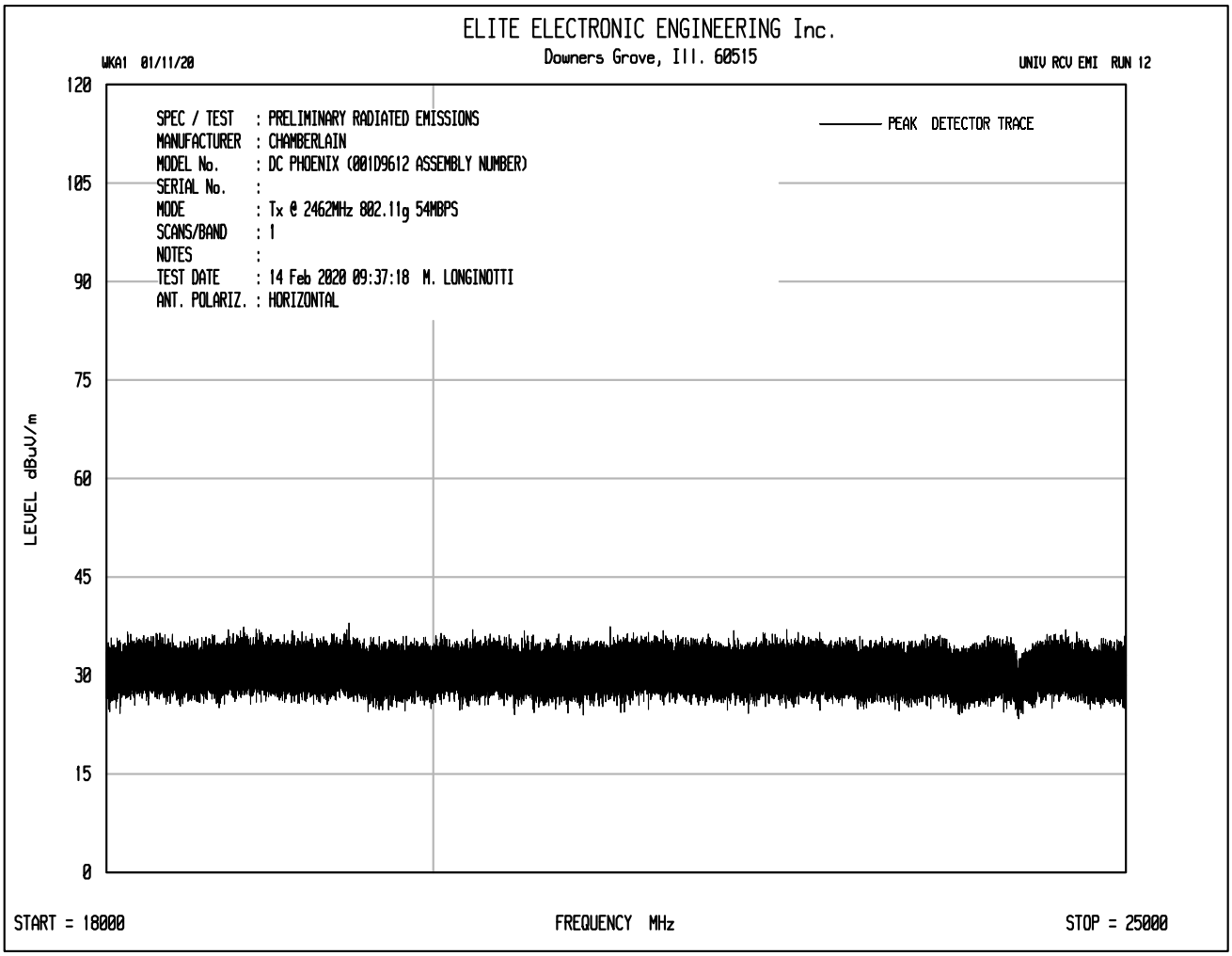

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 01/11/20
UNIV RCV EMI RUN 10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : DC PHOENIX (001D9612 ASSEMBLY NUMBER)
SERIAL No. :
MODE : Tx @ 2437MHz 802.11g 54MBPS
SCANS/BAND : 1
NOTES :
TEST DATE : 14 Feb 2020 09:21:54 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000

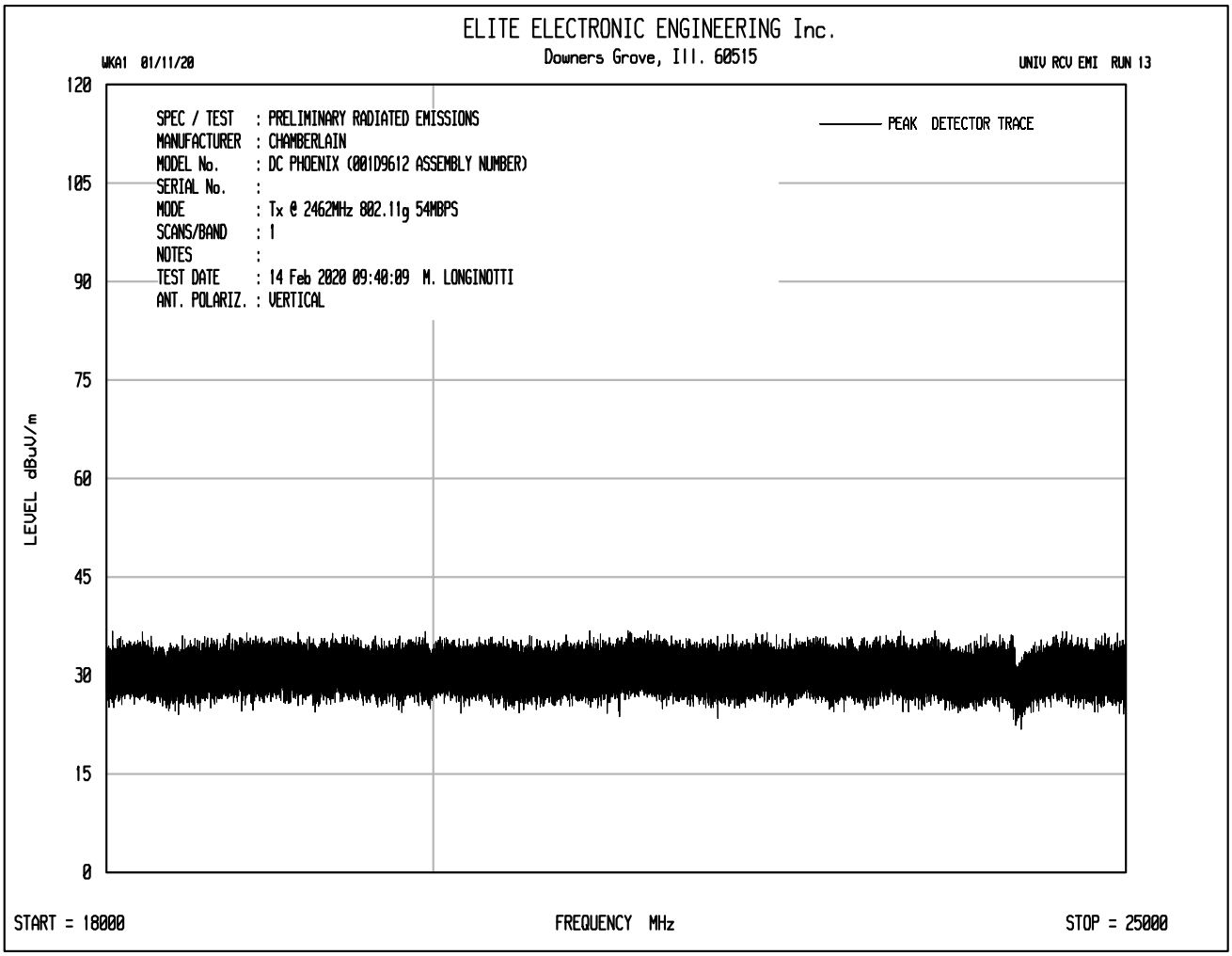

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 01/11/20
UNIV RCV EMI RUN 21
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : PHOENIX BOARD
SERIAL No. : N/A
MODE : 802.11G TX @ 2462MHZ
SCANS/BAND : 1
NOTES : NON-POPULATED BOARD
TEST DATE : 14 Feb 2020 11:04:54 T. JOZEFCZYK
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4500

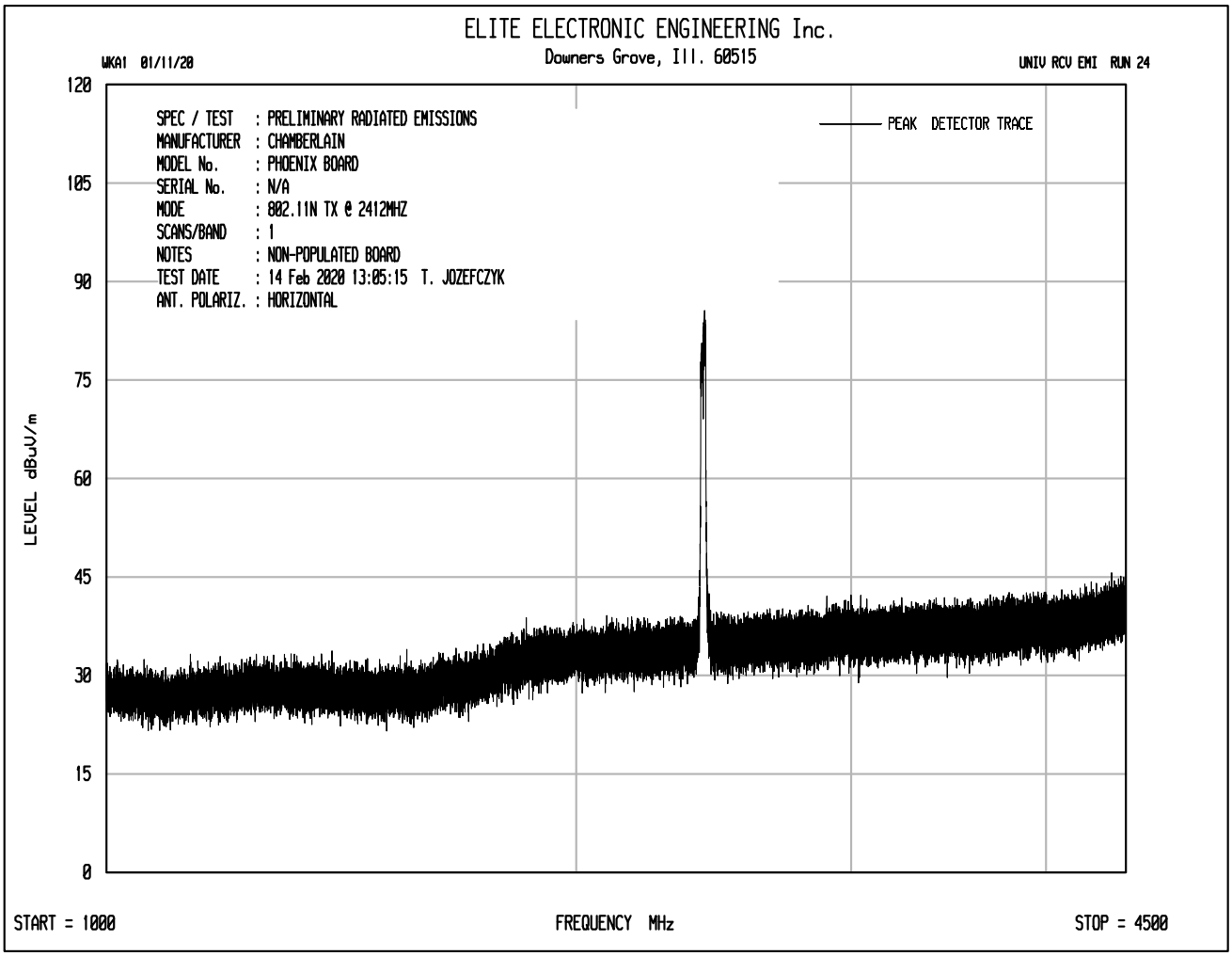

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 01/11/20
UNIV RCV EMI RUN 22
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : PHOENIX BOARD
SERIAL No. : N/A
MODE : 802.11G TX @ 2462MHZ
SCANS/BAND : 1
NOTES : NON-POPULATED BOARD
TEST DATE : 14 Feb 2020 11:06:09 T. JOZEFCZYK
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4500

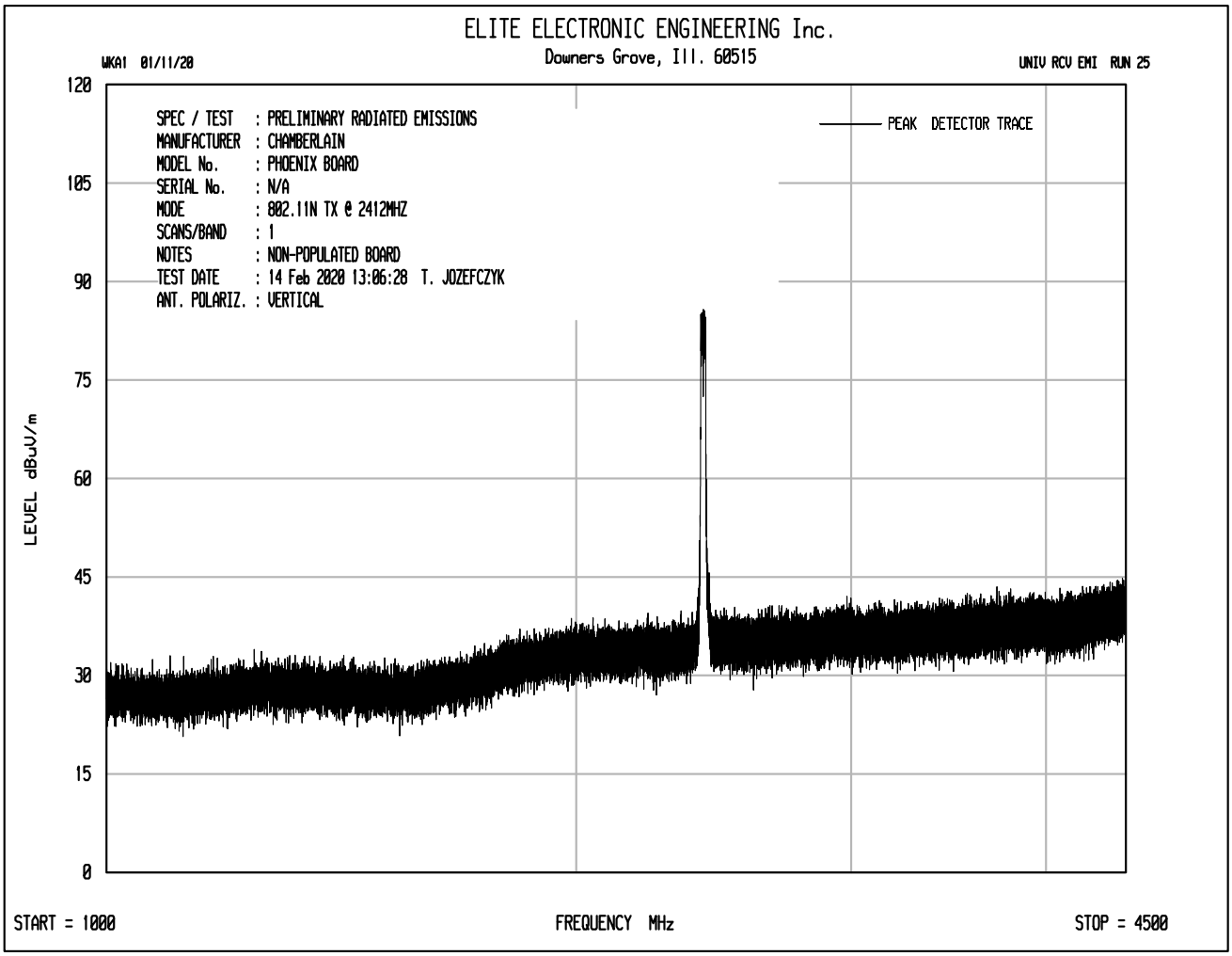

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 01/11/20
UNIV RCV EMI RUN 13
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : PHOENIX BOARD
SERIAL No. : N/A
MODE : 802.11G TX @ 2462MHZ
SCANS/BAND : 1
NOTES : NON-POPULATED BOARD
TEST DATE : 14 Feb 2020 11:20:59 T. JOZEFCZYK
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 4500
FREQUENCY MHz
STOP = 18000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 01/11/20
UNIV RCV EMI RUN 14
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : PHOENIX BOARD
SERIAL No. : N/A
MODE : 802.11G TX @ 2462MHZ
SCANS/BAND : 1
NOTES : NON-POPULATED BOARD
TEST DATE : 14 Feb 2020 11:25:02 T. JOZEFCZYK
ANT. POLARIZ. : VERTICAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 4500
FREQUENCY MHz
STOP = 18000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 01/11/20
UNIV RCV EMI RUN 12
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : DC PHOENIX (001D9612 ASSEMBLY NUMBER)
SERIAL No. :
MODE : Tx @ 2462MHz 802.11g 54MBPS
SCANS/BAND : 1
NOTES :
TEST DATE : 14 Feb 2020 09:37:18 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 01/11/20
UNIV RCV EMI RUN 13
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : DC PHOENIX (001D9612 ASSEMBLY NUMBER)
SERIAL No. :
MODE : Tx @ 2462MHz 802.11g 54MBPS
SCANS/BAND : 1
NOTES :
TEST DATE : 14 Feb 2020 09:40:09 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 01/11/20
UNIV RCV EMI RUN 24
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : PHOENIX BOARD
SERIAL No. : N/A
MODE : 802.11N TX @ 2412MHZ
SCANS/BAND : 1
NOTES : NON-POPULATED BOARD
TEST DATE : 14 Feb 2020 13:05:15 T. JOZEFCZYK
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 01/11/20
UNIV RCV EMI RUN 25
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CHAMBERLAIN
MODEL No. : PHOENIX BOARD
SERIAL No. : N/A
MODE : 802.11N TX @ 2412MHZ
SCANS/BAND : 1
NOTES : NON-POPULATED BOARD
TEST DATE : 14 Feb 2020 13:06:28 T. JOZEFCZYK
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4500