Engineering Test Report No. 2301036-01		
Report Date	December 27, 2023	
Manufacturer Name	The Climate Corporation	
Manufacturer Address	1330 W Fulton, Suite 400 Chicago, IL 60607	
Product Name Brand/Model No.	FieldView Drive 2 730A105M	
Date Received	December 18, 2023	
Test Dates	December 18 and 19, 2023	
Specifications	Federal Communications Commission "Code of Federal Regulations", Title 47, Part 15, Subpart B, C, and E Federal Communications Commission "Code of Federal Regulations", Title 47, Part 22, 24, and 27 ICES-003, Issue 7, October 15, 2020 RSS-Gen, Issue 5, February 2021, Amendment 2 RSS-132 Issue 4, January 2023 RSS-133 Issue 6, Amendment 1, January 2018 RSS-247 Issue 2, February 2017	
Test Facility	Elite Electronic Engineering, Inc. 1516 Centre Circle, Downers Grove, IL 60515	FCC Reg. Number: 269750 IC Reg. Number: 2987A CAB Identifier: US0107
Signature		
Tested by	Tylar Jozefczyk	
Signature		
Approved by	Raymond J. Klouda, Registered Professional Engineer of Illinois – 44894	
PO Number	6500570095	

Table of Contents

1. Report Revision History

Revision	Date	Description
–	3 JAN 2024	Initial Release of Engineering Test Report No. 2301036-01

2. Introduction

This document presents the results of a series of electromagnetic compatibility (EMC) tests that were performed on two (2) FieldView Drive 2 (hereinafter referred to as the Equipment Under Test (EUT)).

Additionally, this document presents the results of limited spurious emissions measurements performed on the EUT. The product is equipped with the following pre-certified radio modules:

- Sierra Wireless HL7810 (FCC ID: N7NHL78A, IC: 2417C-HL78C) CATM1 module.
- Laird 450-0152C (FCC ID: TFB-1003, IC: 5969A-1003) 2.4GHz Wi-Fi/Bluetooth module.

The nature of these measurements is to ensure that the radio module and host remain in compliance with the emissions requirements of the FCC and Innovation, Science, and Economic Development Canada after the integration process.

The EUTs were identified as follows and used throughout the test series:

EUT Identification	
EUT #1	
Description	FieldView Drive 2 – Verizon
Model/Part No.	730A101M
Serial No.	N/A
Software/Firmware Version	1.0
Size of EUT	5.5cm x 5.5cm x 5.5cm
Number of Interconnection Wires	N/A
Highest Internal Frequency of the EUT	2.4GHz
EUT #2	
Description	FieldView Drive 2 – AT&T
Model/Part No.	730A105M
Serial No.	N/A
Software/Firmware Version	1.0
Size of EUT	5.5cm x 5.5cm x 5.5cm
Number of Interconnection Wires	N/A
Highest Internal Frequency of the EUT	2.4GHz

3. Power Input

The EUTs are powered by 12VDC. For this test series, the EUTs received 12VDC through an AC/DC converter powered by 120VAC 60Hz power through lowpass powerline filters on the wall of the shielded enclosure.

4. Grounding

The EUTs were not connected to ground.

5. Support Equipment

The EUTs were submitted for testing along with the following support equipment:

Description	Model #	S/N
Laptop	Dell	N/A

6. Interconnect Leads

No interconnect leads were used during the tests.

7. Modifications Made to the EUT

No modifications were made to the EUTs during the testing.

8. Modes of Operation

The EMC tests were performed with the EUTs operating in one of the test modes described below. See the specific test section for the applicable test modes.

8.1. Tx Standby

This mode was achieved by applying power to the device. All radios were powered, but in a standby mode.

8.2. Tx

The EUT and all peripheral equipment was energized. The EUT was then programmed to transmit in one of the following modes:

Mode	Description
Wi-Fi	- 802.11b: 2452MHz
Bluetooth	- 2440MHz
LTE	- Band 4: 1710MHz (both units) - Band 12: 699MHz (AT&T only) - Band 13: 776.97MHz (Verizon only)

8.3. Multi-Tx

The EUTs and all peripheral equipment were energized. The DUTs were set to transmit in one of the following combinations:

Combination	Description
1	- 802.11b: 2412MHz - LTE: Band 4 (1710MHz)
2	- Bluetooth: 2440MHz - LTE: Band 4 (1710MHz)

9. Test Specifications

The tests were performed to selected portions of, and in accordance with the following test specifications:

- Federal Communications Commission "Code of Federal Regulations", Title 47, Chapter I, Subchapter A, Part 15, Subpart B – “Unintentional Radiators”
- Federal Communications Commission "Code of Federal Regulations", Title 47, Chapter I, Subchapter A, Part 15, Subpart C – “Intentional Radiators”
- Federal Communications Commission "Code of Federal Regulations", Title 47, Chapter I, Subchapter A, Part 15, Subpart E – “Unlicensed National Information Infrastructure Devices”
- Federal Communications Commission "Code of Federal Regulations", Title 47, Chapter I, Subchapter B, Part 22, Subpart E – “Public Mobile Services”
- Federal Communications Commission "Code of Federal Regulations", Title 47, Chapter I, Subchapter B, Part 24 – “Personal Communications Services”
- Federal Communications Commission "Code of Federal Regulations", Title 47, Chapter I, Subchapter B, Part 27 – “Miscellaneous Wireless Communications Services”

- Radio Standard Specification RSS-Gen Issue 5, Amendment 2 (February 2021) – “General Requirements for Compliance of Radio Apparatus”

- RSS-132 Issue 3, January 2013, “Cellular Telephone Systems Operating in the Bands 824-849 MHz and 869-894 MHz”

- RSS-133 Issue 6, Amendment 1 (January 2018) – “2 GHz Personal Communications Services”

- Radio Standard Specification RSS-247 Issue 3 (August 2023) – "Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and License-Exempt Local Area Network (LE-LAN) Devices”

- 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”

- ANSI C63.26-2015, “American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services”

- KDB 996369 D04 Module Integration Guide v02 (October 13, 2020) – “Modular Transmitter Integration Guide Guidance for Host Product Manufacturers”

- KDB 789033 D02 General UNII Test Procedures New Rules v02r01 (December 14, 2017) – “Guidelines For Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E”

10. Test Plan

No test plan was provided. Instructions were provided by personnel from The Climate Corporation and used in conjunction with the test specifications.

11. Deviation, Additions to, or Exclusions from Test Specifications

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

12. Laboratory Conditions

The following were the laboratory conditions while the EMC tests were performed:

Ambient Parameters	Value
Temperature	22°C
Relative Humidity	24%
Atmospheric Pressure	1009.48mb

13. Summary

The following EMC tests were performed, and the results are shown below:

Test Description	Test Requirements	Test Method	Equipment Class	M/N	Result
RF Radiated Emissions	FCC 15.209 ICES-003, Section 3.2.2	ANSI C63.4:2014	B	730A101M	Conforms
Module Integration – Emissions	FCC 15.247 FCC 22/24/27 ISED RSS-247	ANSI C63.10:2013 ANSI C63.26:2015	---	730A101M, 730A105M	Conforms

14. Sample Calculations

For Radiated Emissions:

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 preamplifier 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 (dBµV/m) = MTR (dBµV) + AF (dB/m) + CF (dB) + (- PA (dB)) + DC (dB)

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

Formula 2: FS (µV/m) = AntiLog [(FS (dBµV/m))/20]

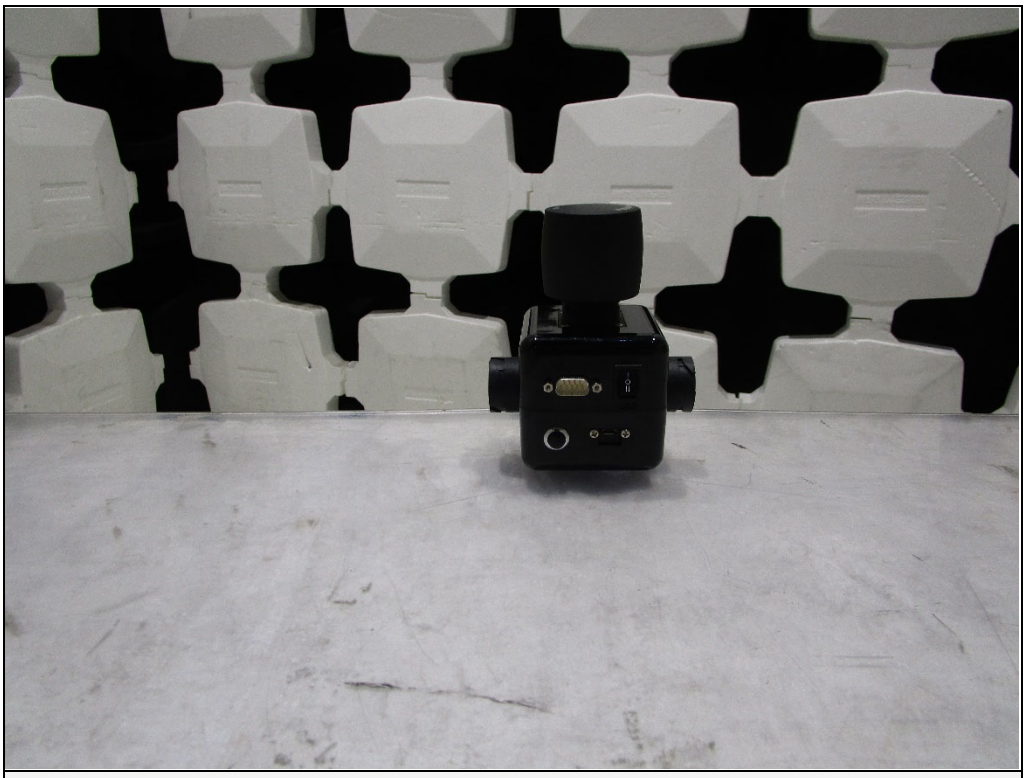
15. Statement of Conformity

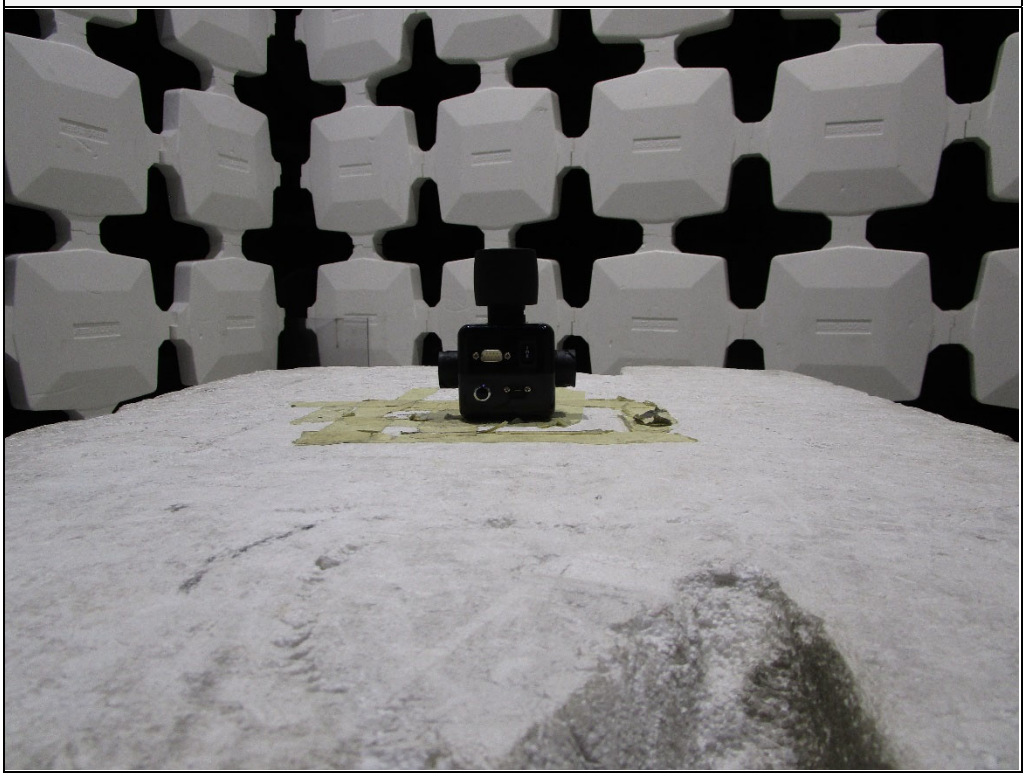
The Climate Corporation FieldView Drive 2 (Model No. 730A101M and Model No. 730A105M) did fully conform to the selected requirements of the specified test specifications.

16. 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 EUTs on the test date specified. Any electrical or mechanical modifications made to the EUTs subsequent to the specified test date will serve to invalidate the data and void this certification.

17. Photographs of EUT



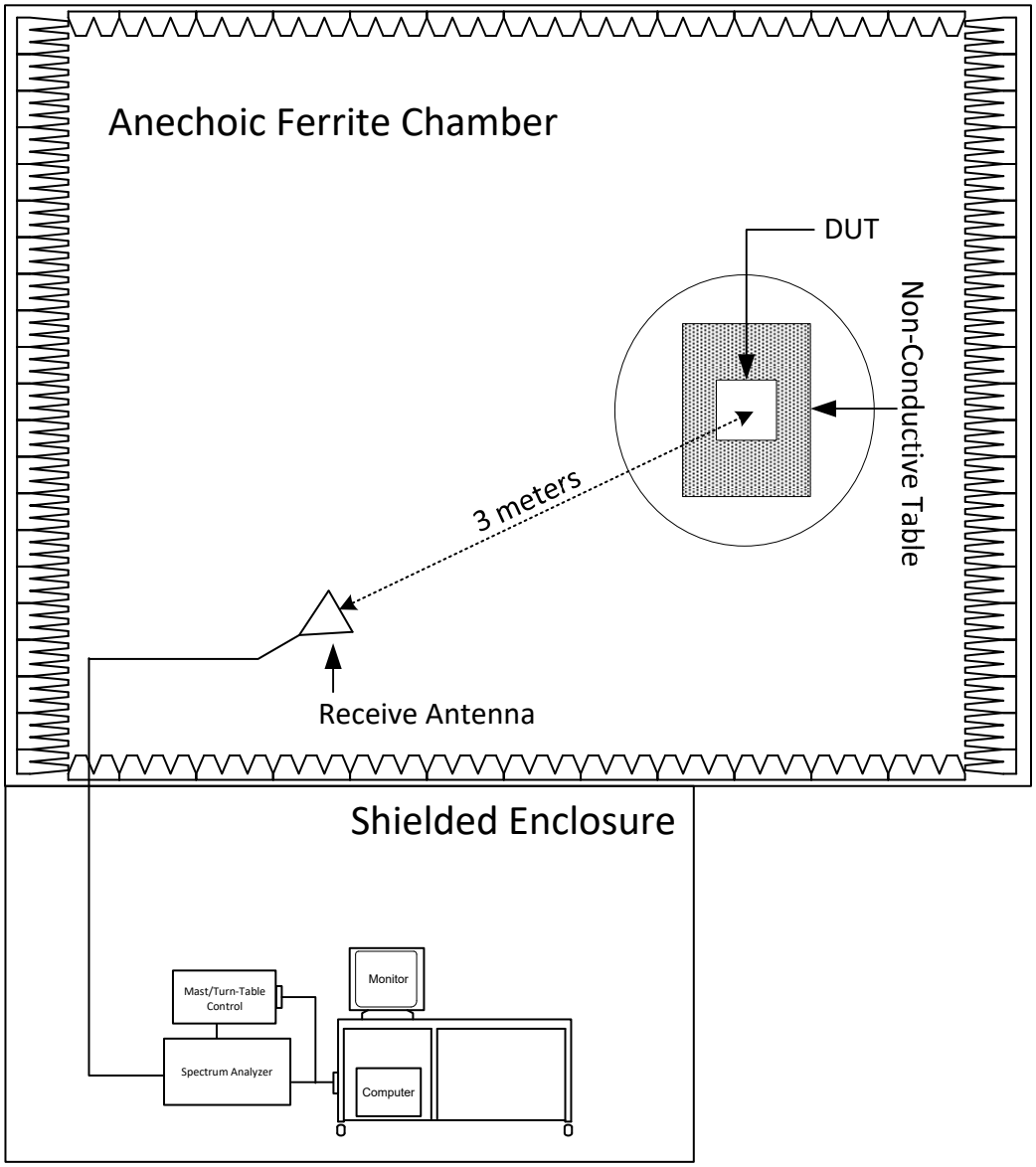


18. Equipment List

Eq ID	Equipment Description	Manufacturer	Model No.	Serial No.	Frequency Range	Cal Date	Due Date
APW10	PREAMPLIFIER	PMI	PE2-35-120-5R0-10-12-SFF	PL11685/1241	1GHZ-20GHZ	3/10/2023	3/10/2024
CDZ3	LAB WORKSTATION	ELITE	LWS-10		WINDOWS 10	CNR	
NSDS1	UNIVERSAL SPHERICAL DIPOLE SOURCE	AET	USDS-H	AET-1116		NOTE 1	
NTA3	BILOG ANTENNA	TESEQ	6112D	32853	25-1000MHz	11/17/2022	11/17/2024
NWQ0	DOUBLE RIDGED WAVEGUIDE ANTENNA	ETS LINDGREN	3117	66657	1GHZ-18GHZ	6/13/2022	6/13/2024
R29F	3M ANECHOIC CHAMBER NSA	EMC TEST SYSTEMS	3M ANECHOIC		30MHZ-18GHZ	6/12/2023	6/12/2024
RBG2	EMI ANALYZER	ROHDE & SCHWARZ	ESW44	101591	2HZ-44GHZ	4/10/2023	4/10/2024
SES0	24VDC POWER SUPPLY	P-TRANS	FS-32024-1M	001	18-27VDC	NOTE 1	
VBV2	CISPR EN FCC ICES RE.EXE	ELITE	CISPR EN FCC ICES RE.EXE	---	---	N/A	
XPQ4	HIGH PASS FILTER	K&L MICROWAVE	11SH10-4800/X20000-O/O	1	4.8-20GHZ	9/14/2023	9/14/2025

N/A: Not Applicable I/O: Initial Only CNR: Calibration Not Required
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.

19. Block Diagram of Test Setup



Radiated Measurements Test Setup

20. RF Radiated Emissions

EUT Information	
Manufacturer	The Climate Corporation
Product	FieldView Drive 2
Model No.	730A101M
Serial No.	N/A
Mode	Tx Standby

Test Site Information	
Setup Format	Tabletop
Height of Support	N/A
Type of Test Site	Semi-Anechoic Chamber
Test Site Used	R29F
Type of Antennas Used	Below 1GHz: Bilog (or equivalent) Above 1GHz: Double-ridged waveguide (or equivalent)
Highest Internal Frequency	2.4GHz
Highest Measurement Frequency	13GHz
Notes	The cables were manually maximized during the preliminary emissions sweeps. The cable arrangement which resulted in the worst-case emissions was utilized. Note: Only the 730101M unit was tested, as both units are electrically the same.

Measurement Uncertainty	
Measurement Type	Expanded Measurement Uncertainty
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

Requirements
The field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the values in the following tables.

FCC Part 15 Class B Radiated Emissions Limits (30MHz to 1GHz)		
Frequency of Emission (MHz)	Field Strength (µV/m)	Field Strength (dBµV/m)
30 – 88	100	40
88 – 216	150	43.5
216 – 960	200	46
Above 960	500	54
FCC Part 15 Class B Radiated Emissions Limits (Above 1GHz)		
Frequency of Emission (MHz)	Peak Limit (dBµV/m)	Average Limit (dBµV/m)
Above 1000	74	54

ICES-003 Class B Radiated Emissions Limits (30MHz to 1GHz)		
Frequency Range (MHz)	Field Strength at 3 meters (dBµV/m)	Field Strength at 10 meters (dBµV/m)
30 – 88	40	30
88 – 216	43.5	33.1
216 – 230	46	35.6
230 – 960	47	37
960 – 1000	54	43.5
ICES-003 Class B Radiated Emissions Limits (At and Above 1GHz)		
Frequency Range (GHz)	Average (dBµV/m)	Peak (dBµV/m)
1 – F_M	54	74
F_M = highest measurement frequency		

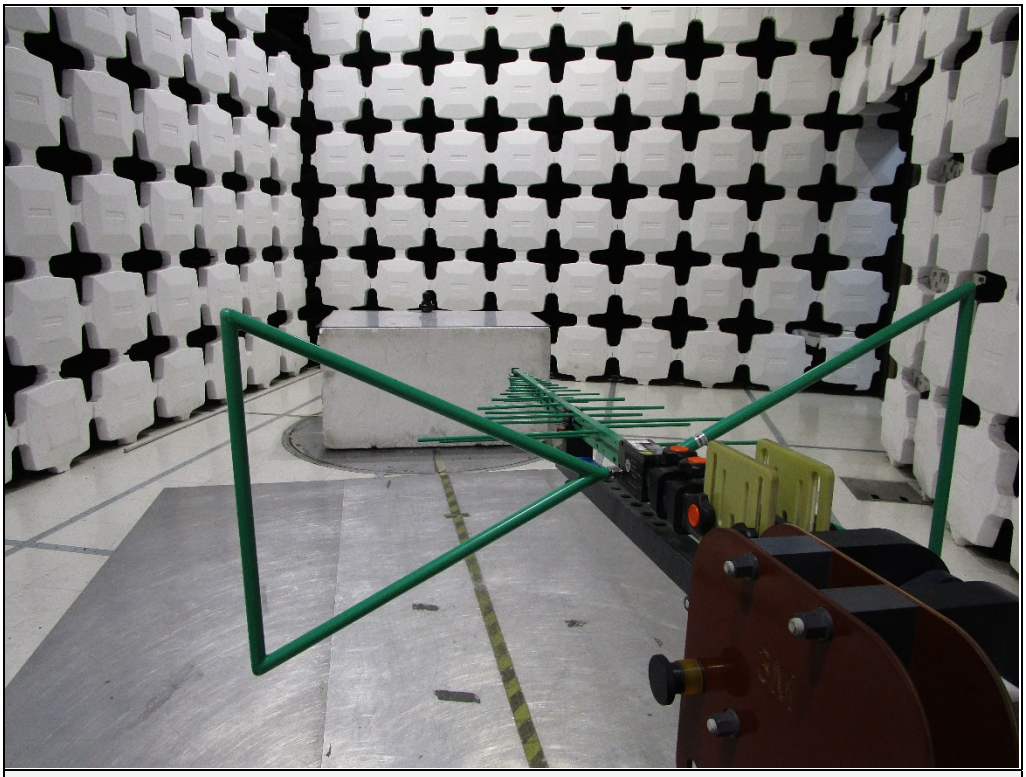
Procedure

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

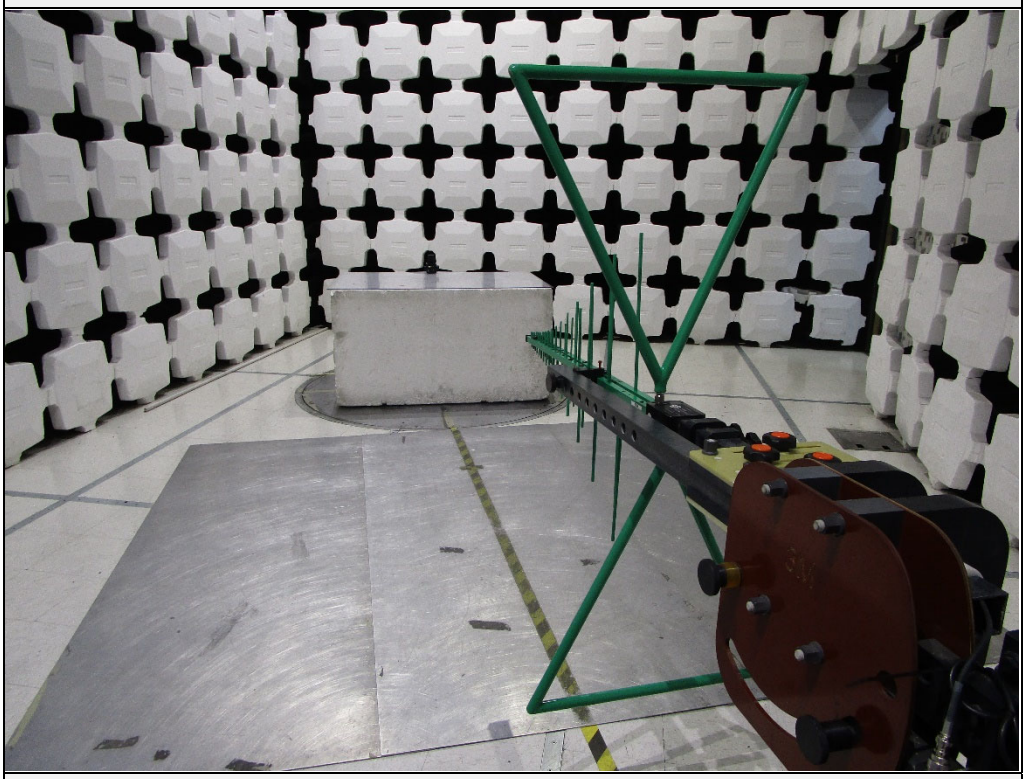
The EUT and all peripheral equipment were placed on an 80cm high non-conductive stand. The broadband measuring antenna was positioned at a 3-meter distance from the EUT. The frequency range from 30MHz to 1GHz was investigated using a peak detector function with the bilog antenna at several heights, horizontal and vertical polarization, and with several different orientations of the EUT with respect to the antenna. The frequency range from 1 – 13GHz was investigated using a peak detector function with the double ridged waveguide antenna at several heights, horizontal and vertical polarization, and with several different orientations of the EUT with respect to the antenna. The maximum levels for each antenna polarization were plotted.

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

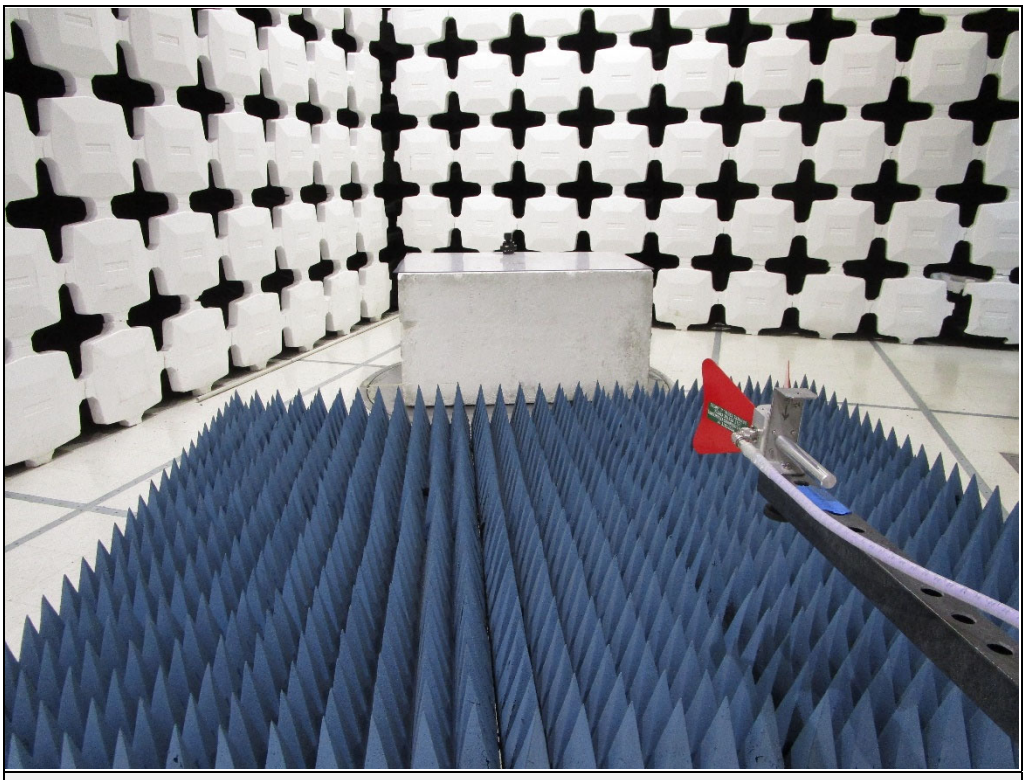
1) Measurements from 30MHz to 1GHz were made using a quasi-peak detector and a broadband bilog antenna. Measurements above 1GHz were made using an average detector and a broadband double ridged waveguide antenna.
2) To ensure that maximum or worst case, emission levels were measured, the following steps were taken:
    a) The EUT was rotated so that all 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.
    d) 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.



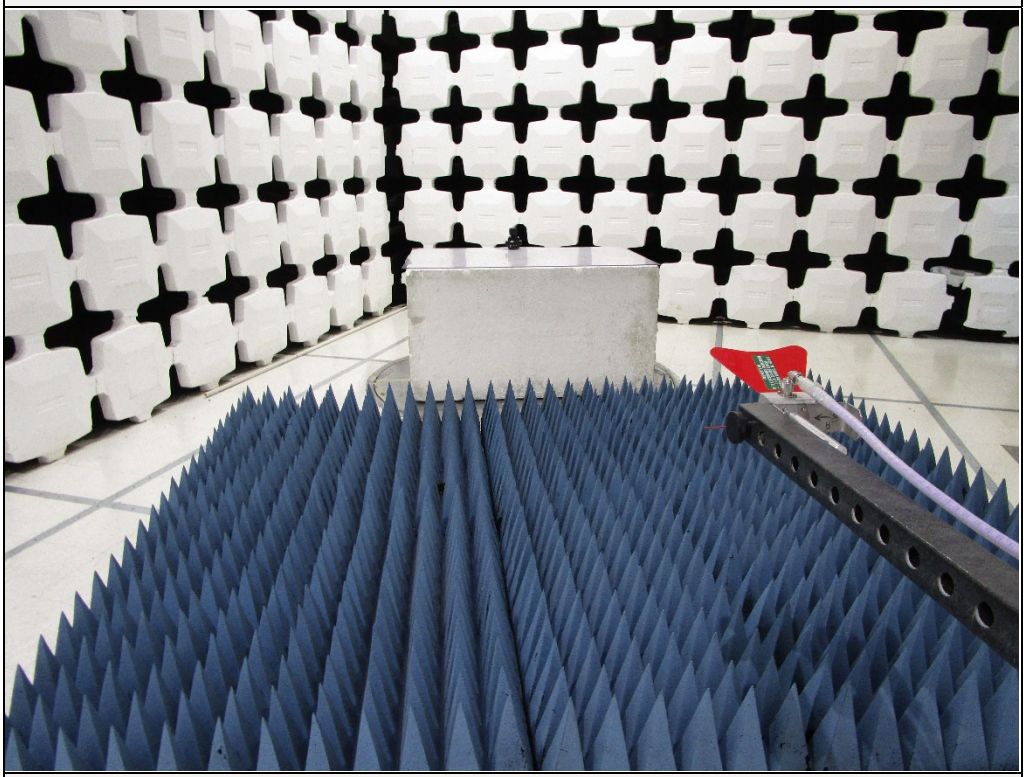
Test Setup for Radiated Emissions: 30MHz to 1GHz, Horizontal Polarization



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



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

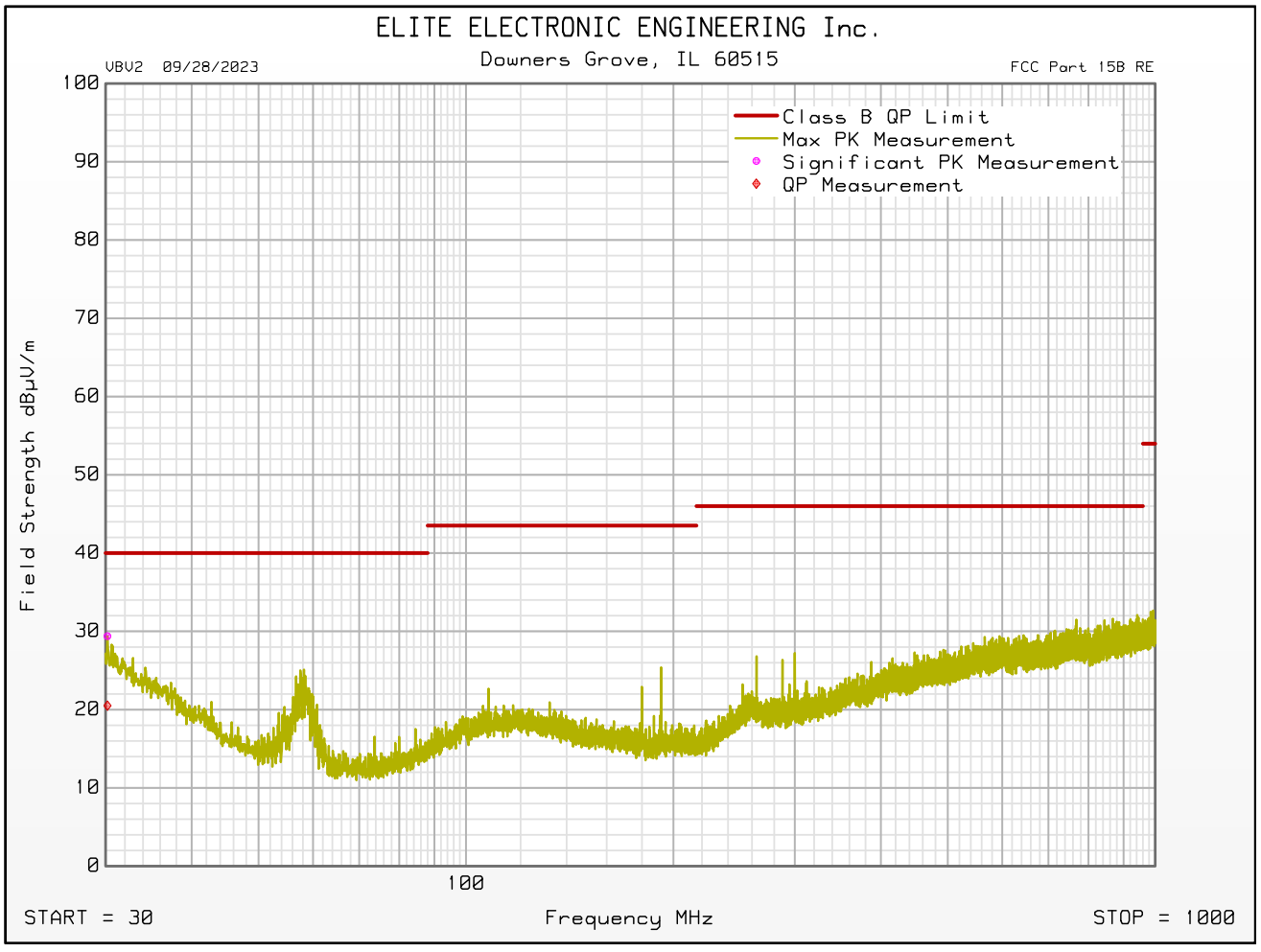


Test Setup for Radiated Emissions: Above 1GHz, Vertical Polarization

FCC Part 15B Class B
Radiated RF Emissions Test

SW ID/Rev: VBV2 09/28/2023

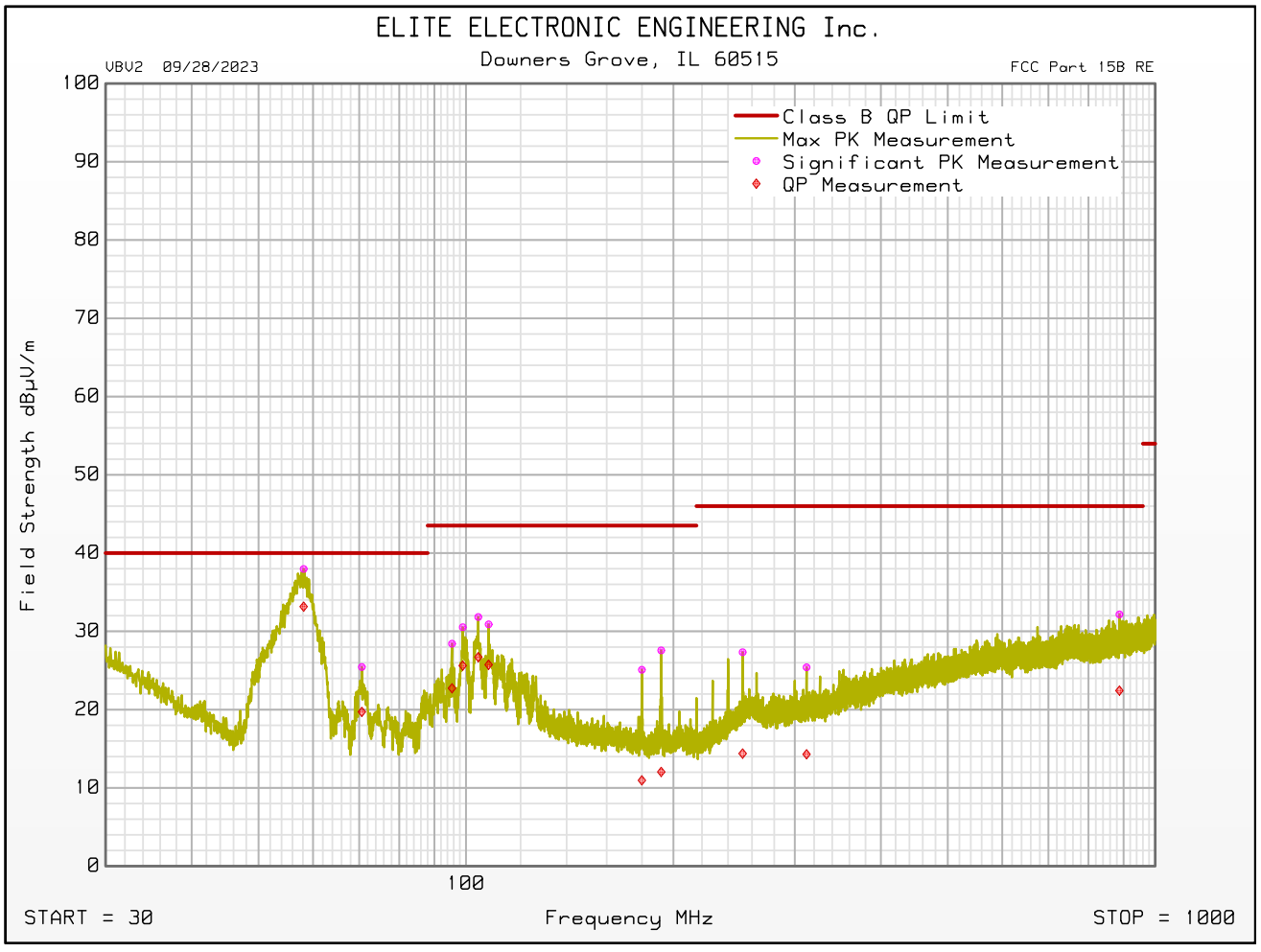
Manufacturer	:	CLIMATE CORP.
Model	:	FIELDVIEW DRIVE 2 - 730A101M
Serial Number	:	
DUT Mode	:	TX STANDBY
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Antenna Polarization	:	Horizontal
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	
Test Engineer	:	T. Jozefczyk
Test Date	:	Dec 18, 2023 09:11:49 AM



FCC Part 15B Class B
Radiated RF Emissions Test

SW ID/Rev: VBV2 09/28/2023

Manufacturer	:	CLIMATE CORP.
Model	:	FIELDVIEW DRIVE 2 - 730A101M
Serial Number	:	
DUT Mode	:	TX STANDBY
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Antenna Polarization	:	Vertical
Scan Type	:	Stepped Scan
Test RBW	:	120 kHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	
Test Engineer	:	T. Jozefczyk
Test Date	:	Dec 18, 2023 09:11:49 AM



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Radiated RF Emissions Test

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DUT Mode	:	TX STANDBY
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Mast Positions (cm)	:	120, 200, 340
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Prelim Dwell Time (s)	:	0.0001
Notes	:	
Test Engineer	:	T. Jozefczyk
Test Date	:	Dec 18, 2023 09:11:49 AM

Freq MHz	Peak Mtr Rdg dBuV	QP Mtr Rdg dBuV	Ant Fac dB/m	Amp Fac dB	Cbl Fac dB	Dist Corr dB	Peak Total dBµV/m	QP Total dBµV/m	QP Limit dBµV/m	QP Lim Mrg dB	Ant Pol	Mast Ht cm	Azim °	Excessive QP Level
30.180	4.6	-4.2	24.4	0.0	0.3	0.0	29.4	20.5	40.0	-19.5	Horizontal	340	135	
58.140	25.0	20.2	12.5	0.0	0.5	0.0	38.0	33.2	40.0	-6.8	Vertical	120	225	
70.620	12.7	7.0	12.2	0.0	0.5	0.0	25.4	19.7	40.0	-20.3	Vertical	200	0	
95.440	11.8	6.1	16.1	0.0	0.6	0.0	28.4	22.7	43.5	-20.8	Vertical	120	135	
98.920	13.2	8.3	16.7	0.0	0.6	0.0	30.5	25.6	43.5	-17.9	Vertical	120	135	
104.200	13.8	8.7	17.4	0.0	0.6	0.0	31.8	26.7	43.5	-16.8	Vertical	120	90	
107.860	12.5	7.3	17.8	0.0	0.6	0.0	30.9	25.7	43.5	-17.8	Vertical	120	90	
179.980	9.1	-5.0	15.1	0.0	0.8	0.0	25.1	11.0	43.5	-32.6	Vertical	340	225	
191.980	11.7	-3.8	15.0	0.0	0.8	0.0	27.6	12.0	43.5	-31.5	Vertical	340	225	
252.000	7.7	-5.3	18.7	0.0	1.0	0.0	27.3	14.4	46.0	-31.6	Vertical	340	225	
312.000	5.1	-6.0	19.2	0.0	1.1	0.0	25.4	14.3	46.0	-31.7	Vertical	340	225	
887.340	3.7	-6.0	26.7	0.0	1.8	0.0	32.2	22.4	46.0	-23.6	Vertical	200	270	

FCC Part 15B Class B
Radiated RF Emissions Test

SW ID/Rev: VBV2 09/28/2023

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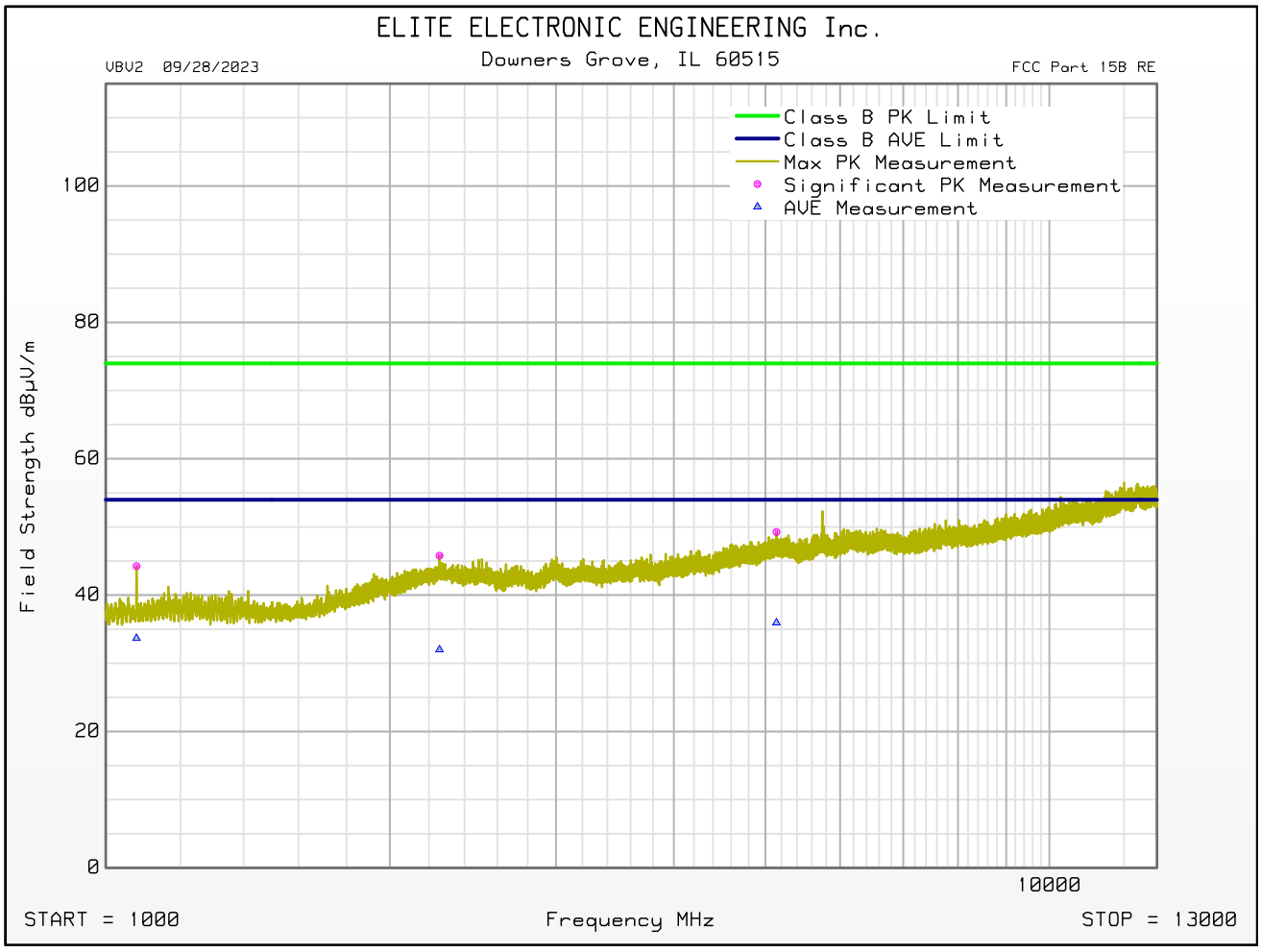
Model	:	FIELDVIEW DRIVE 2 - 730A101M
Serial Number	:	
DUT Mode	:	TX STANDBY
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Antenna Polarization	:	Horizontal
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
Notes	:	
Test Engineer	:	T. Jozefczyk
Test Date	:	Dec 18, 2023 10:16:52 AM



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Radiated RF Emissions Test

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Model	:	FIELDVIEW DRIVE 2 - 730A101M
Serial Number	:	
DUT Mode	:	TX STANDBY
Turntable Step Angle (°)	:	45
Mast Positions (cm)	:	120, 200, 340
Antenna Polarization	:	Vertical
Scan Type	:	Stepped Scan
Test RBW	:	1 MHz
Prelim Dwell Time (s)	:	0.0001
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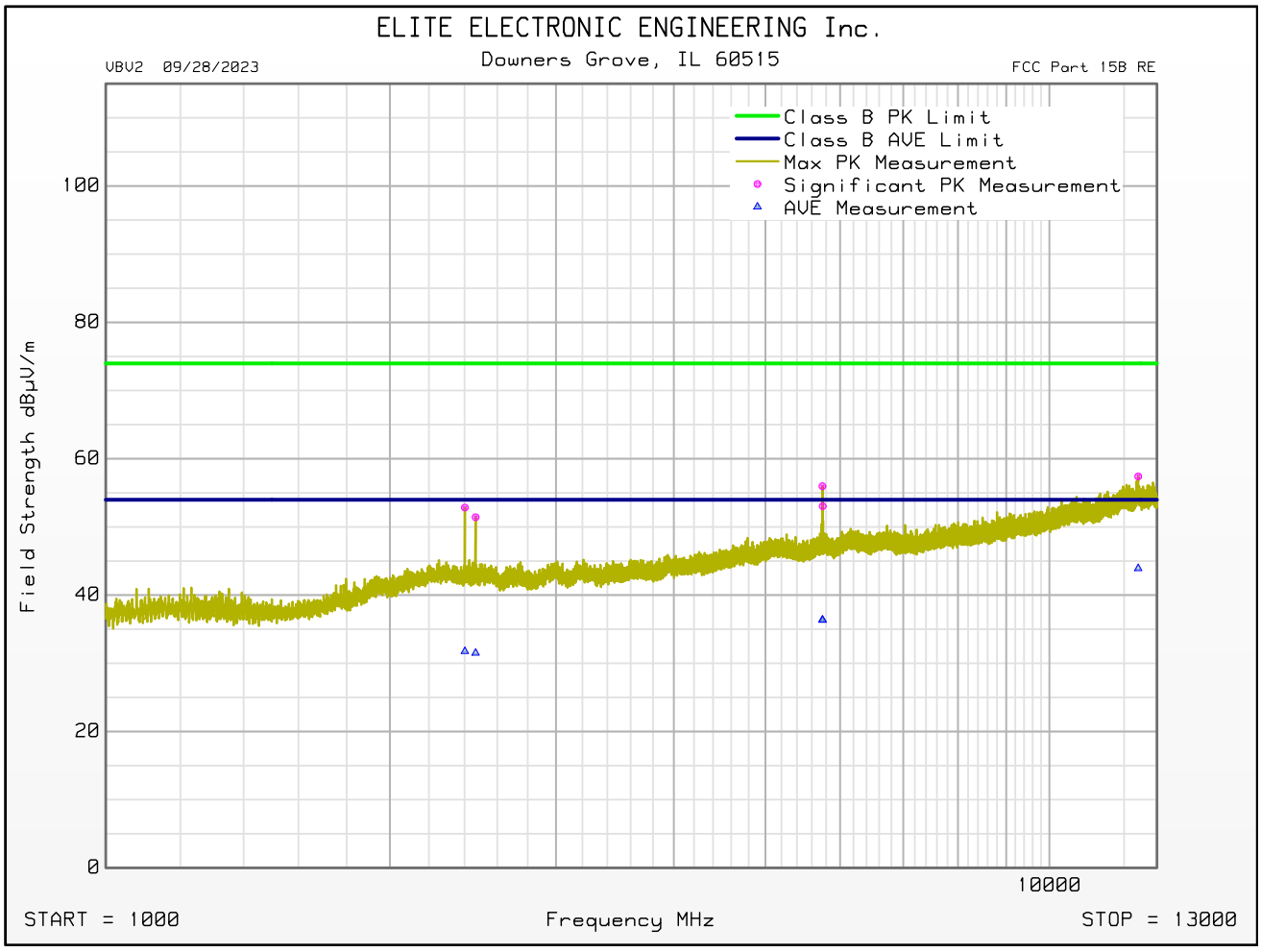

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Test Engineer	:	T. Jozefczyk
Test Date	:	Dec 18, 2023 10:16:52 AM

Freq MHz	Peak Mtr Rdg dBuV	Ant Fac dB/m	Amp Fac dB	Cbl Fac dB	Dist Corr dB	Peak Total dBµV/m	Peak Limit dBµV/m	Peak Lim Mrg dB	Ant Pol	Mast Ht cm	Azim °	Excessive Peak Level
1078.000	54.1	29.2	-41.0	1.9	0.0	44.3	74.0	-29.7	Horizontal	120	180	
2257.500	49.5	33.9	-40.5	2.9	0.0	45.8	74.0	-28.2	Horizontal	200	135	
2402.000	56.7	33.6	-40.5	3.0	0.0	52.8	74.0	-21.1	Vertical	200	315	
2465.500	55.3	33.6	-40.5	3.0	0.0	51.4	74.0	-22.6	Vertical	200	180	
5137.000	47.6	37.7	-40.3	4.3	0.0	49.3	74.0	-24.7	Horizontal	340	225	
5747.000	53.9	37.9	-40.4	4.5	0.0	56.0	74.0	-18.0	Vertical	120	45	
5750.500	51.0	37.9	-40.4	4.5	0.0	53.0	74.0	-20.9	Vertical	120	45	
12418.500	48.3	41.9	-39.6	6.9	0.0	57.4	74.0	-16.6	Vertical	120	225	

Freq MHz	Average Mtr Rdg dBuV	Ant Fac dB/m	Amp Fac dB	Cbl Fac dB	Dist Corr dB	Average Total dBµV/m	Average Limit dBµV/m	Average Lim Mrg dB	Ant Pol	Mast Ht cm	Azim °	Excessive Average Level
1078.000	43.5	29.2	-41.0	1.9	0.0	33.7	54.0	-20.3	Horizontal	120	180	
2257.500	35.8	33.9	-40.5	2.9	0.0	32.0	54.0	-22.0	Horizontal	200	135	
2402.000	35.6	33.6	-40.5	3.0	0.0	31.7	54.0	-22.2	Vertical	200	315	
2465.500	35.4	33.6	-40.5	3.0	0.0	31.5	54.0	-22.5	Vertical	200	180	
5137.000	34.3	37.7	-40.3	4.3	0.0	35.9	54.0	-18.0	Horizontal	340	225	
5747.000	34.3	37.9	-40.4	4.5	0.0	36.4	54.0	-17.6	Vertical	120	45	
5750.500	34.3	37.9	-40.4	4.5	0.0	36.3	54.0	-17.6	Vertical	120	45	
12418.500	34.8	41.9	-39.6	6.9	0.0	43.9	54.0	-10.1	Vertical	120	225	

21. Module Integration – Emissions

EUT Information	
Manufacturer	The Climate Corporation
Product	FieldView Drive 2
Model No.	730A101M, 730A105M
Serial No.	N/A
Mode	Tx, Multi-Tx

Test Site Information	
Setup Format	Tabletop
Height of Support	N/A
Type of Test Site	Semi-Anechoic Chamber
Test Site Used	R29F
Type of Antennas Used	Below 1GHz: Bilog (or equivalent) Above 1GHz: Double-ridged waveguide (or equivalent)
Notes	The cables were manually maximized during the preliminary emissions sweeps. The cable arrangement which resulted in the worst-case emissions was utilized. Any peaks that are not annotated have been found to be from the base unit, not the radios. (See Section 20.) Note: The Wi-Fi and Bluetooth radios were only tested on the 730101M unit, as both units are electrically the same.

Measurement Uncertainty	
Measurement Type	Expanded Measurement Uncertainty
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

Requirements
Per 996369 D04 Module Integration Guide v01: Testing of the host product with all the transmitters installed is recommended, to verify that the host product meets all the applicable FCC rules. The radio spectrum is to be investigated with all the transmitters in the final host product functioning to determine that no emissions exceed the highest limit permitted for any one individual transmitter as required by Section 2.947(f). The testing shall also check for emissions that may occur due to the intermixing of emissions with the other transmitters, digital circuitry, or due to physical properties of the host product (enclosure). This investigation is especially important when integrating multiple modular transmitters where the certification is based on testing each of them in a stand-alone configuration. No emissions exceed the highest limit permitted for any one individual transmitter as required by Section 2.947(f).
FCC 15.247: 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 20dB 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 measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30dB instead of 20dB. 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 also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).
Per RSS-247: In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20dB 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 measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(d), the attenuation required shall be 30dB instead of 20dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.
Per FCC 22.917(a): The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.
Per FCC 24.238(a): The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

Procedures

Radiated measurements 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 and anechoic absorber material is installed over the ferrite tiles. The floor of the chamber is used as the ground plane. The chamber complies with ANSI C63.4-2014 for site attenuation.

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

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 18GHz was investigated using a peak detector function.

The final open field emission tests were then manually performed over the frequency range of 30MHz to 18GHz.

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 (bilog antenna for > 1GHz range). The waveguide antenna (bilog antenna for > 1GHz range) was positioned at a 3-meter distance from the EUT. The EUT was placed on a 1.5 meter high (80cm high for > 1GHz) 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 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 1GHz were measured using a bi-log antenna. The bilog antenna was positioned at a 3-meter distance from the EUT. The EUT was placed on an 80cm high non-conductive stand. A peak detector with a resolution bandwidth of 100kHz was used on the spectrum analyzer.

   b) The field strengths of all emissions above 1GHz 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 1MHz 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.

d) For all radiated emissions measurements below 1GHz, 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 1GHz, 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 20dB above the maximum permitted average emission limit applicable to the equipment under test. Therefore, all peak readings above 1GHz must be no greater than 20dB 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 and an average reading was taken.

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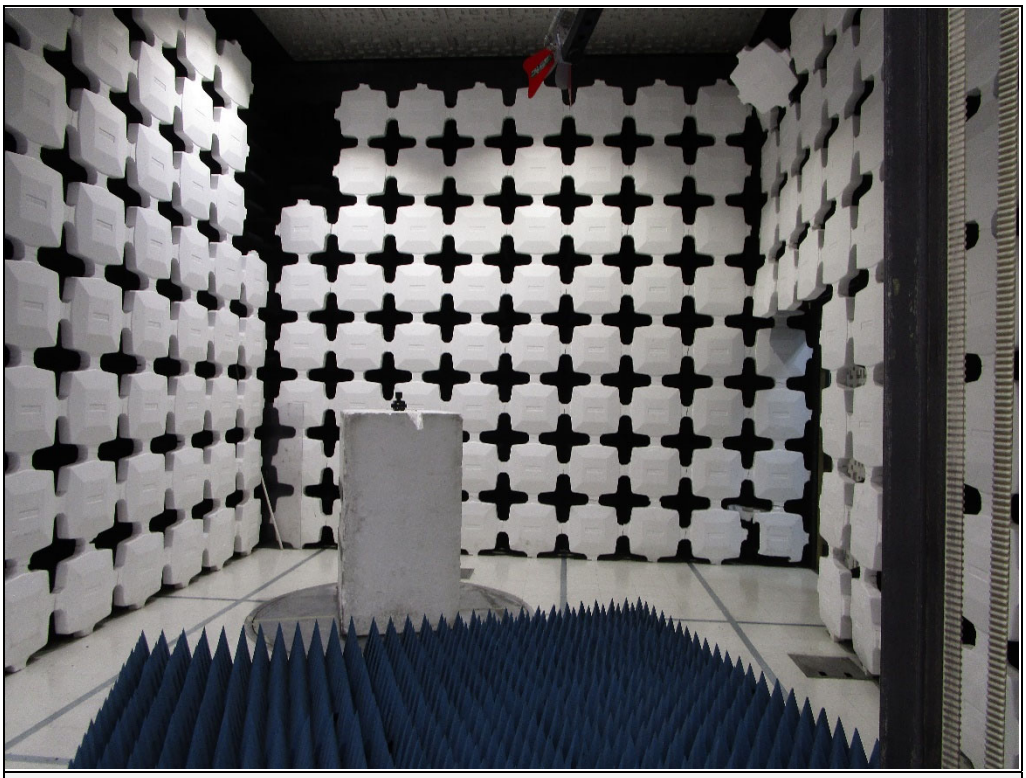
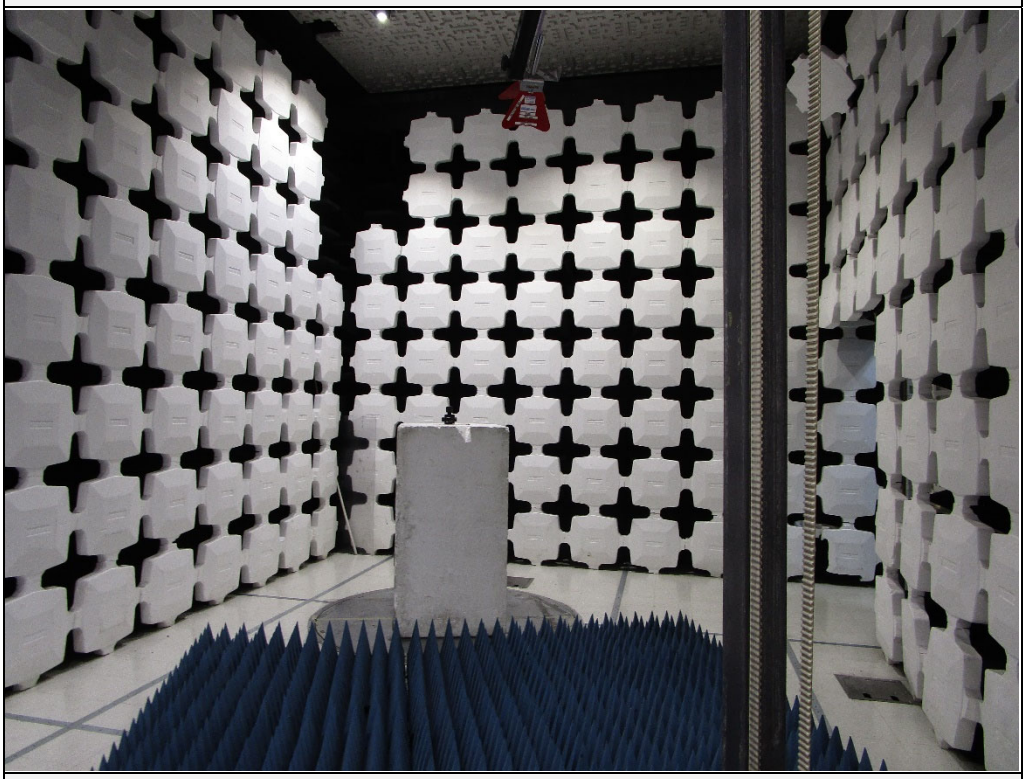
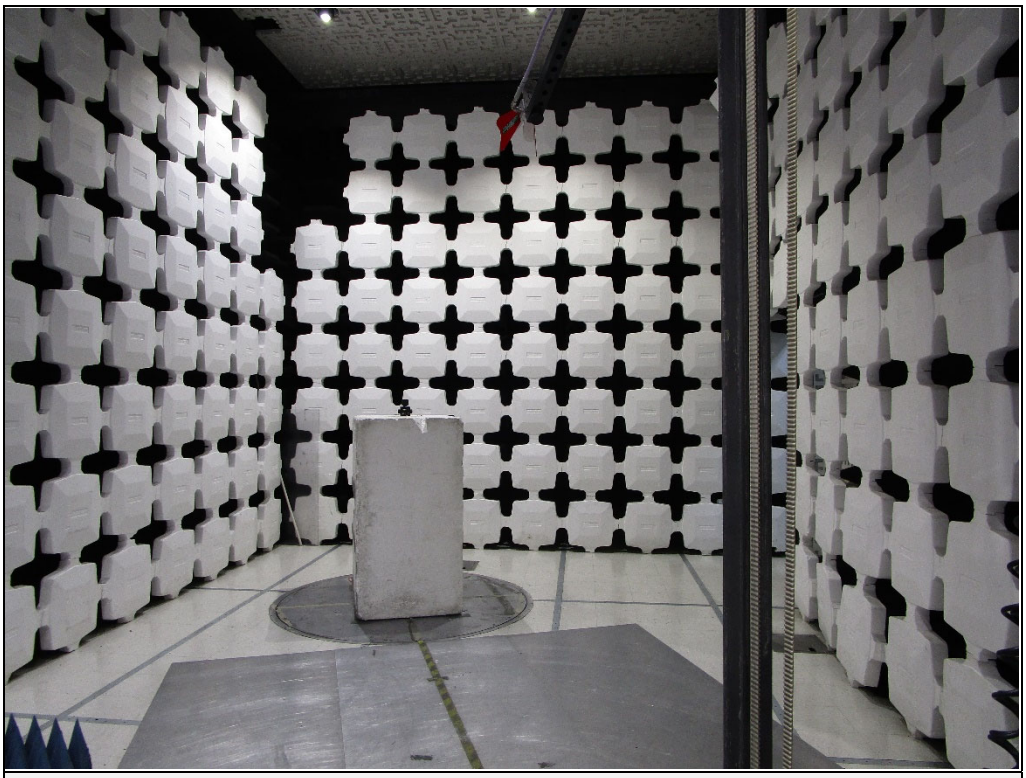


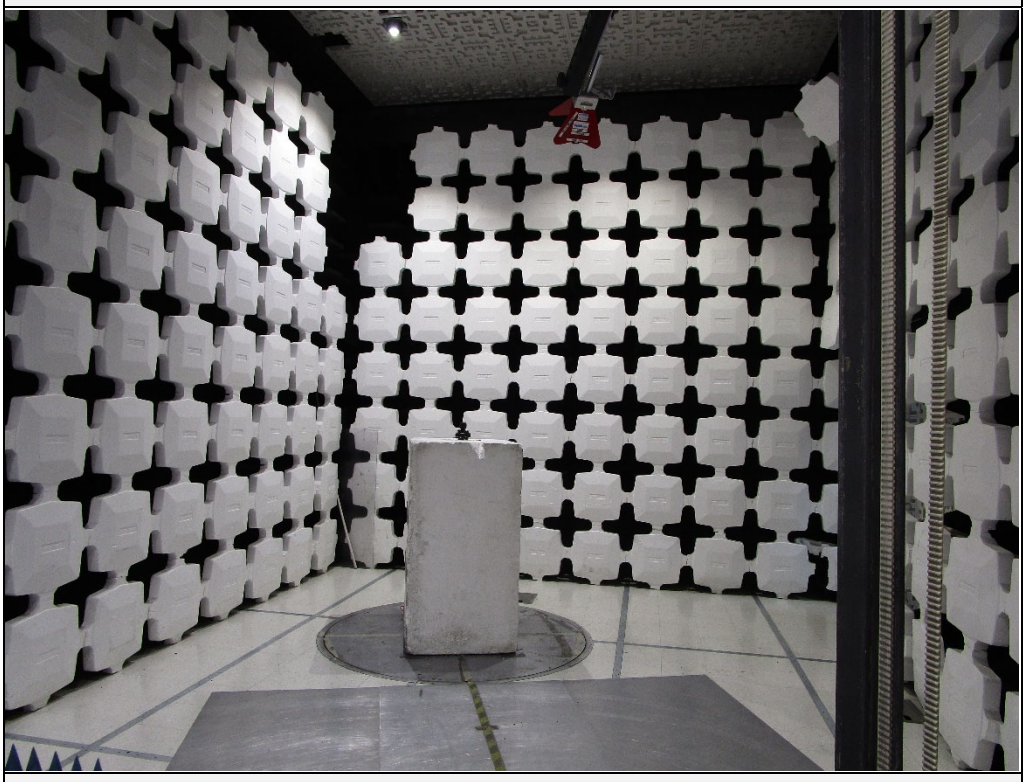
Test Setup for Spurious Emissions: Above 1GHz, Horizontal Polarization



Test Setup for Spurious Emissions: Above 1GHz, Vertical Polarization



Test Setup for Spurious Emissions: Above 1GHz, Horizontal Polarization



Test Setup for Spurious Emissions: Above 1GHz, Vertical Polarization

Test Details	
Manufacturer	The Climate Corporation
Model No.	730A101M
Serial No.	N/A
Test	Host Product Testing – Case Spurious Emissions
Mode	Tx – 802.11b
Frequency Tested	2452MHz
Notes	

Spurious Emissions in the Restricted Bands – Peak

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dB)
4904.00	H	49.72	Ambient	5.07	35.86	-39.33	51.31	367.78	5000.00	-22.67
	V	50.99		5.07	35.86	-39.33	52.58	425.69	5000.00	-21.40
7356.00	H	49.20	Ambient	5.86	37.66	-39.43	53.29	461.87	5000.00	-20.69
	V	50.17		5.86	37.66	-39.43	54.26	516.44	5000.00	-19.72
12260.00	H	48.89	Ambient	7.33	41.16	-39.06	58.31	823.32	5000.00	-15.67
	V	48.94	Ambient	7.33	41.16	-39.06	58.36	828.08	5000.00	-15.62

Spurious Emissions in the Restricted Bands – Average

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Duty Cycle Factor (dB)	Average Total at 3m (dBµV/m)	Average Total at 3m (µV/m)	Average Limit at 3m (µV/m)	Margin (dB)
4904.00	H	34.58	Ambient	5.07	35.86	-39.33	0.00	36.17	64.36	500.00	-17.81
	V	35.05		5.07	35.86	-39.33	0.00	36.64	67.93	500.00	-17.34
7356.00	H	34.17	Ambient	5.86	37.66	-39.43	0.00	38.26	81.85	500.00	-15.72
	V	36.62		5.86	37.66	-39.43	0.00	40.71	108.52	500.00	-13.27
12260.00	H	33.91	Ambient	7.33	41.16	-39.06	0.00	43.33	146.75	500.00	-10.65
	V	33.91	Ambient	7.33	41.16	-39.06	0.00	43.33	146.75	500.00	-10.65

Spurious Emissions Not in the Restricted Bands – Peak

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dB)
2452.00	H	75.34		3.39	32.82	0.00	111.55	377961.13		
	V	72.47		3.39	32.82	0.00	108.68	271610.87		
9808.00	H	38.03	Ambient	6.39	39.31	-39.25	44.49	167.64	37796.11	-47.06
	V	39.05		6.39	39.31	-39.25	45.51	188.53	37796.11	-46.04
14712.00	H	38.55	Ambient	7.41	42.02	-38.21	49.78	308.36	37796.11	-41.77
	V	38.48	Ambient	7.41	42.02	-38.21	49.71	305.88	37796.11	-41.84
17164.00	H	38.92	Ambient	7.57	44.55	-37.61	53.43	469.34	37796.11	-38.12
	V	38.12	Ambient	7.57	44.55	-37.61	52.63	428.04	37796.11	-38.92

Test Details	
Manufacturer	The Climate Corporation
Model No.	730A101M
Serial No.	N/A
Test	Host Product Testing – Case Spurious Emissions
Mode	Tx - Bluetooth
Frequency Tested	2440MHz
Notes	

Spurious Emissions in the Restricted Bands – Peak

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dB)
4880.00	H	50.32		5.01	35.79	-39.33	51.80	388.83	5000.00	-22.18
	V	50.15		5.01	35.79	-39.33	51.63	381.29	5000.00	-22.35
7320.00	H	50.00	Ambient	5.84	37.70	-39.42	54.12	507.89	5000.00	-19.86
	V	49.58	Ambient	5.84	37.70	-39.42	53.70	483.92	5000.00	-20.28
12200.00	H	49.00	Ambient	7.25	41.10	-39.09	58.26	818.74	5000.00	-15.72
	V	48.42	Ambient	7.25	41.10	-39.09	57.68	765.86	5000.00	-16.30

Spurious Emissions in the Restricted Bands – Average

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	CBL Fac (dB)	Ant Fac (dB/m)	Pre Amp (dB)	Duty Cycle Factor (dB)	Average Total at 3m (dBµV/m)	Average Total at 3m (µV/m)	Average Limit at 3m (µV/m)	Margin (dB)
4880.00	H	34.66		5.01	35.79	-39.33	0.00	36.14	64.09	500.00	-17.84
	V	35.13		5.01	35.79	-39.33	0.00	36.61	67.65	500.00	-17.37
7320.00	H	33.90	Ambient	5.84	37.70	-39.42	0.00	38.02	79.57	500.00	-15.96
	V	33.91	Ambient	5.84	37.70	-39.42	0.00	38.03	79.67	500.00	-15.95
12200.00	H	33.41	Ambient	7.25	41.10	-39.09	0.00	42.67	136.03	500.00	-11.31
	V	33.65	Ambient	7.25	41.10	-39.09	0.00	42.91	139.85	500.00	-11.07

Spurious Emissions Not in the Restricted Bands – Peak

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Cable Factor (dB)	Antenna Factor (dB/m)	Pre Amp (dB)	Peak Total at 3m (dBµV/m)	Peak Total at 3m (µV/m)	Peak Limit at 3m (µV/m)	Margin (dB)
2440.00	H	61.18	0.00	3.39	32.74	0.00	97.31	73385.16		
	V	58.72	0.00	3.39	32.74	0.00	94.85	55285.12		
9760.00	H	39.56	Ambient	6.37	39.27	-39.25	45.94	198.21	7338.52	-31.37
	V	38.53	Ambient	6.37	39.27	-39.25	44.91	176.04	7338.52	-32.40

Test Details	
Manufacturer	The Climate Corporation
Model No.	730A101M
Serial No.	N/A
Test	Host Product Testing – Case Spurious Emissions
Mode	Tx – Verizon Band 4
Frequency Tested	1710MHz
Notes	

Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Calculated Sig Gen Reading (dBm)	Equivalent Antenna Gain (dB)	Cable Loss (dB)	ERP (dBm)	Attenuation Below Output Power (dB)	Minimum Attenuation (dB)
3420.00	H	23.26	Ambient	-41.95	5.04	4.15	-41.06	71.06	43.00
	V	23.01	Ambient	-40.29	5.04	4.15	-39.40	69.40	43.00
5130.00	H	50.39	Ambient	-48.65	5.09	4.99	-48.55	78.55	43.00
	V	49.98	Ambient	-48.61	5.09	4.99	-48.52	78.52	43.00
6840.00	H	49.60	Ambient	-46.35	6.33	5.92	-45.93	75.93	43.00
	V	49.87	Ambient	-47.17	6.33	5.92	-46.75	76.75	43.00
8550.00	H	48.92	Ambient	-47.82	7.97	6.50	-46.34	76.34	43.00
	V	49.31	Ambient	-47.94	7.97	6.50	-46.47	76.47	43.00

Test Details	
Manufacturer	The Climate Corporation
Model No.	730A101M
Serial No.	N/A
Test	Host Product Testing – Case Spurious Emissions
Mode	Tx – Verizon Band 13
Frequency Tested	776.97MHz
Notes	

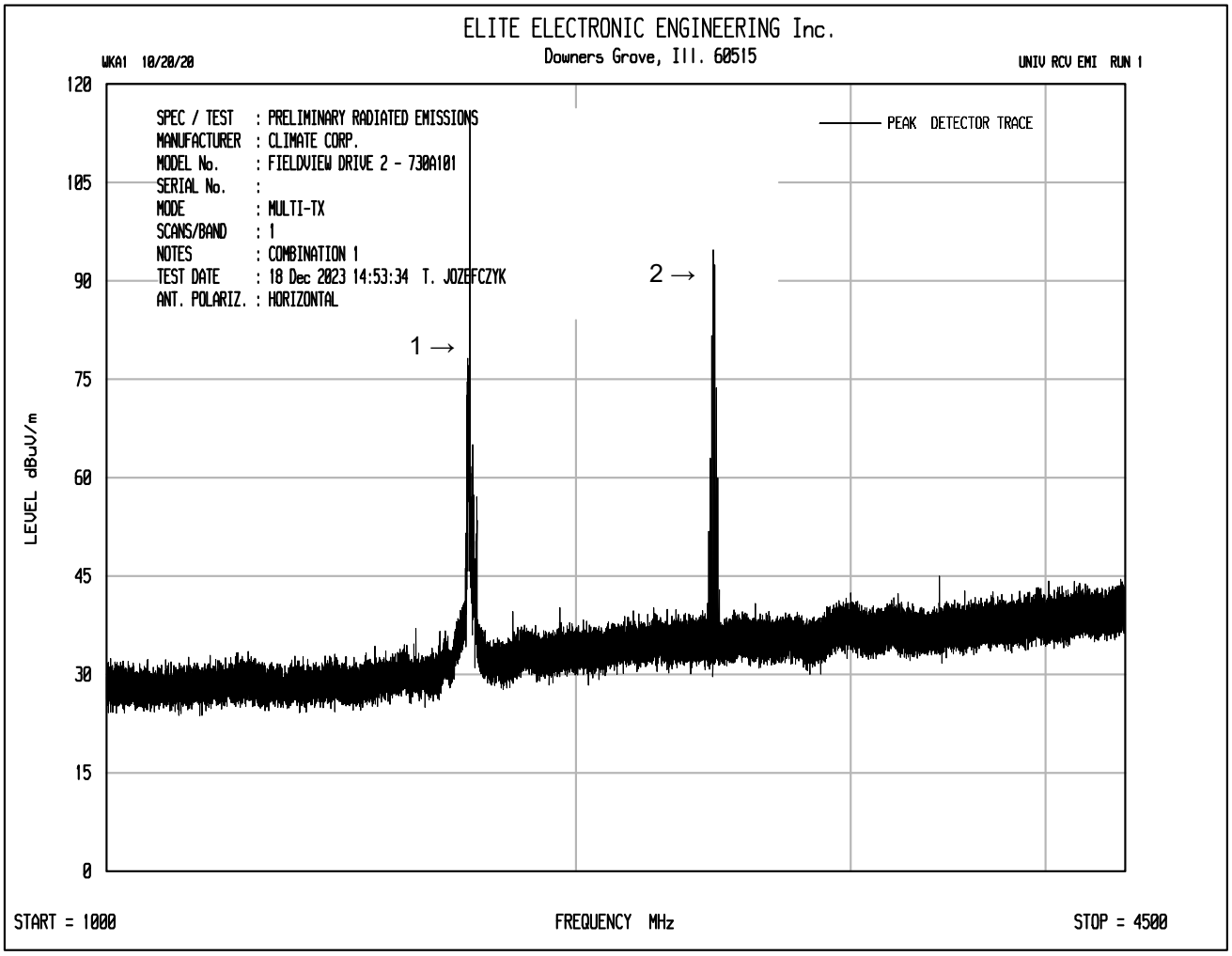
Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Calculated Sig Gen Reading (dBm)	Equivalent Antenna Gain (dB)	Cable Loss (dB)	ERP (dBm)	Attenuation Below Output Power (dB)	Minimum Attenuation (dB)
1553.94	H	21.81	Ambient	-47.68	2.73	2.73	-47.69	77.69	43.00
	V	21.58	Ambient	-45.29	2.73	2.73	-45.29	75.29	43.00
2330.91	H	60.21		-45.89	2.86	3.37	-46.40	76.40	43.00
	V	60.10		-44.86	2.86	3.37	-45.37	75.37	43.00
3107.88	H	53.77		-51.15	4.49	3.96	-50.62	80.62	43.00
	V	52.73		-50.21	4.49	3.96	-49.67	79.67	43.00
3884.85	H	50.20	Ambient	-53.30	5.51	4.41	-52.21	82.21	43.00
	V	50.49	Ambient	-51.98	5.51	4.41	-50.89	80.89	43.00
4661.82	H	50.29	Ambient	-50.66	5.06	4.78	-50.39	80.39	43.00
	V	50.54	Ambient	-50.14	5.06	4.78	-49.87	79.87	43.00

Test Details	
Manufacturer	The Climate Corporation
Model No.	730A101M
Serial No.	N/A
Test	Host Product Testing – Case Spurious Emissions
Mode	Tx – AT&T Band 4
Frequency Tested	1710MHz
Notes	

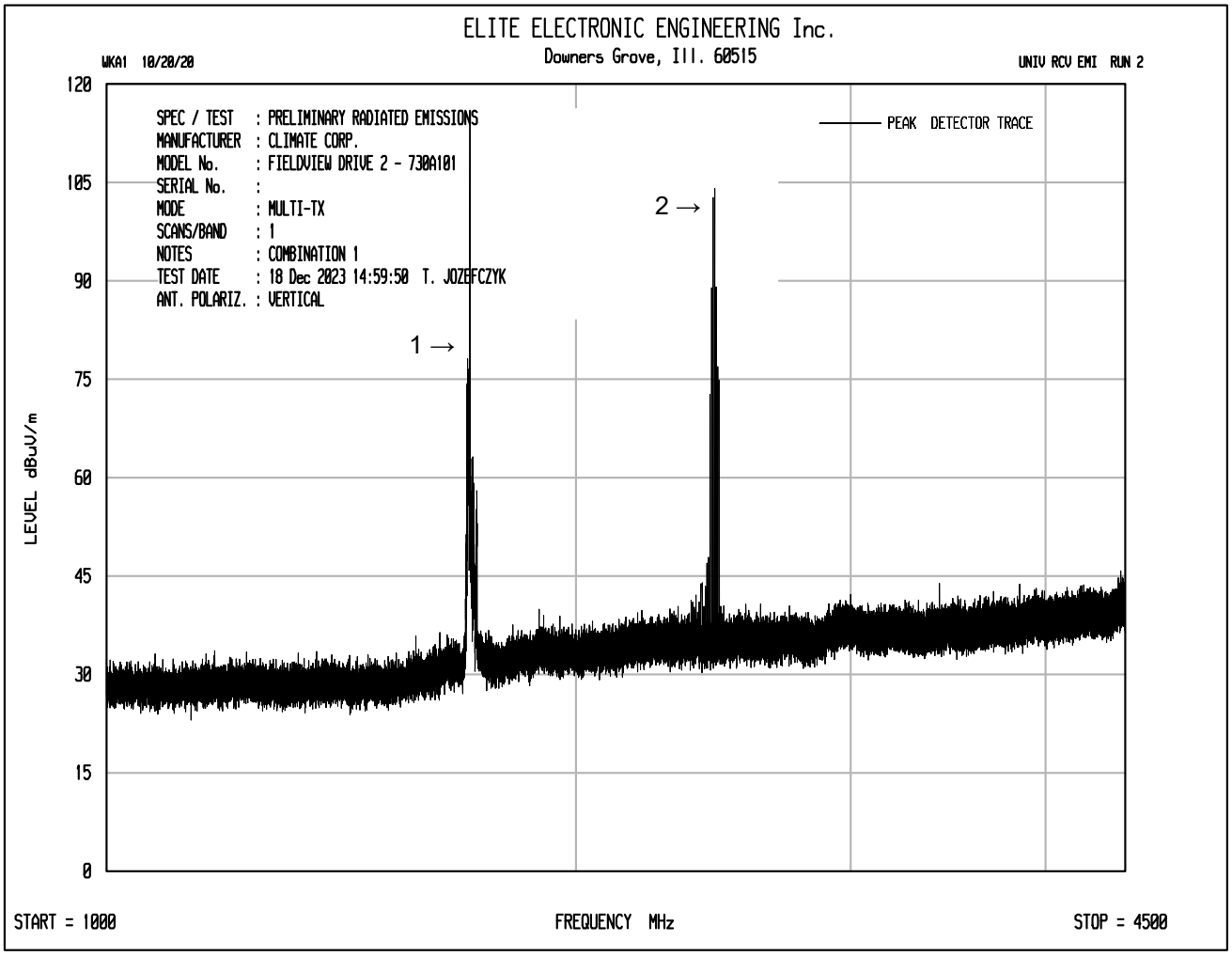
Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Calculated Sig Gen Reading (dBm)	Equivalent Antenna Gain (dB)	Cable Loss (dB)	ERP (dBm)	Attenuation Below Output Power (dB)	Minimum Attenuation (dB)
3420.00	H	23.80		-41.41	5.04	4.15	-40.52	70.52	43.00
	V	23.58	Ambient	-39.72	5.04	4.15	-38.83	68.83	43.00
5130.00	H	49.48	Ambient	-49.56	5.09	4.99	-49.46	79.46	43.00
	V	49.93	Ambient	-48.66	5.09	4.99	-48.57	78.57	43.00
6840.00	H	49.36	Ambient	-46.59	6.33	5.92	-46.17	76.17	43.00
	V	49.66	Ambient	-47.38	6.33	5.92	-46.96	76.96	43.00
8550.00	H	49.59	Ambient	-47.15	7.97	6.50	-45.67	75.67	43.00
	V	49.24	Ambient	-48.01	7.97	6.50	-46.54	76.54	43.00

Test Details	
Manufacturer	The Climate Corporation
Model No.	730A101M
Serial No.	N/A
Test	Host Product Testing – Case Spurious Emissions
Mode	Tx – AT&T Band 13
Frequency Tested	699MHz
Notes	

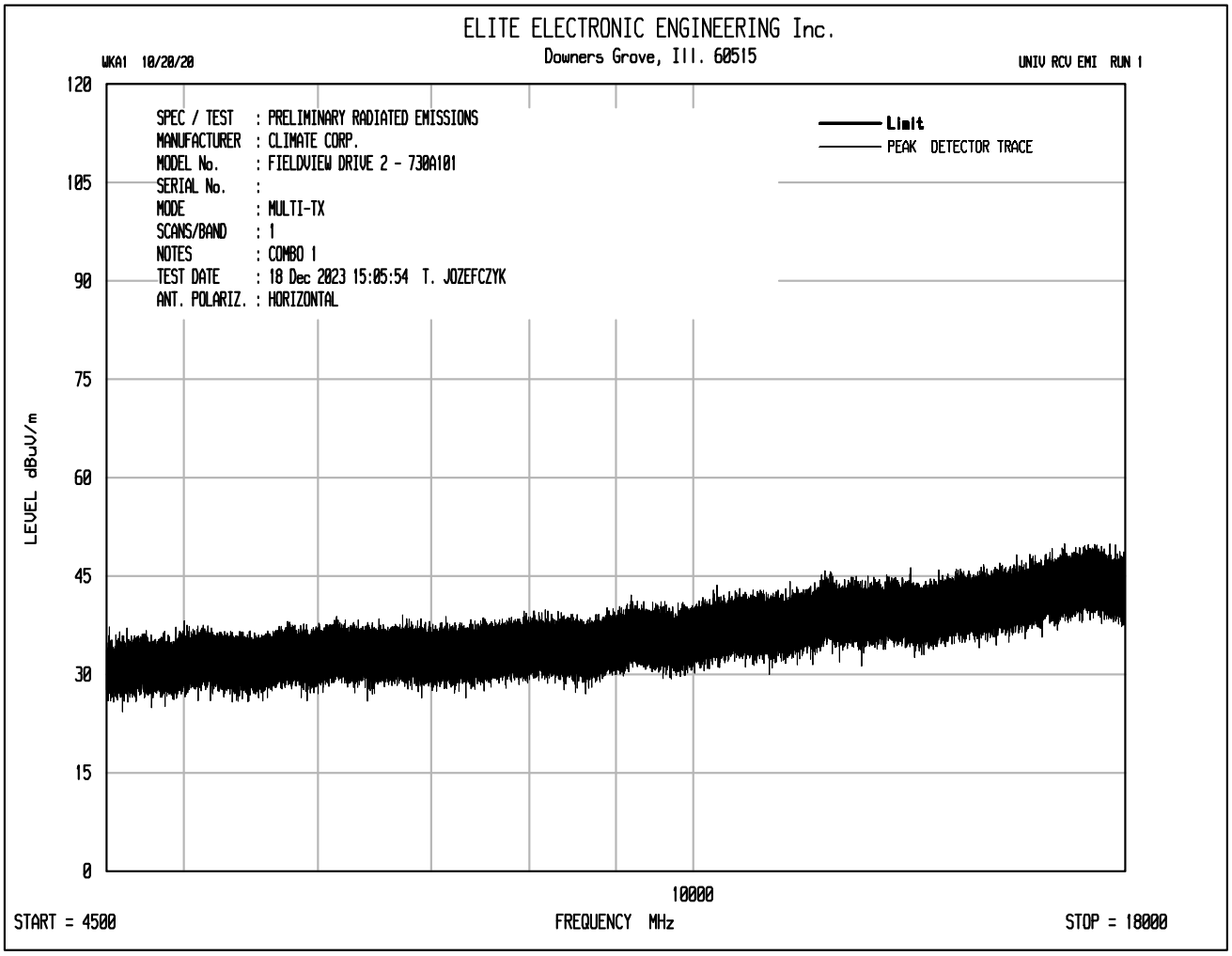
Freq (MHz)	Ant Pol	Meter Reading (dBµV)	Ambient	Calculated Sig Gen Reading (dBm)	Equivalent Antenna Gain (dB)	Cable Loss (dB)	ERP (dBm)	Attenuation Below Output Power (dB)	Minimum Attenuation (dB)
1398.00	H	22.08		-46.32	1.38	2.59	-47.53	77.53	43.00
	V	22.30		-44.10	1.38	2.59	-45.31	75.31	43.00
2097.00	H	58.84		-45.41	1.29	3.16	-47.28	77.28	43.00
	V	58.38		-45.13	1.29	3.16	-47.00	77.00	43.00
2796.00	H	55.65		-51.07	3.42	3.74	-51.40	81.40	43.00
	V	53.50		-51.44	3.42	3.74	-51.77	81.77	43.00
3495.00	H	50.66	Ambient	-53.96	4.81	4.20	-53.35	83.35	43.00
	V	50.96	Ambient	-52.09	4.81	4.20	-51.48	81.48	43.00
4194.00	H	50.10	Ambient	-52.37	5.51	4.56	-51.42	81.42	43.00
	V	49.42	Ambient	-52.21	5.51	4.56	-51.26	81.26	43.00



Note	Description
1	Plot shows emissions at LTE Band 4.
2	Plot shows emissions at 802.11b frequency 2452MHz.



Note	Description
1	Plot shows emissions at LTE Band 4.
2	Plot shows emissions at 802.11b frequency 2452MHz.


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 10/20/20
UNIV RCV EMI RUN 1
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CLIMATE CORP.
MODEL No. : FIELDVIEW DRIVE 2 - 730A101
SERIAL No. :
MODE : MULTI-TX
SCANS/BAND : 1
NOTES : COMBO 1
TEST DATE : 18 Dec 2023 15:05:54 T. JOZEFCZYK
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
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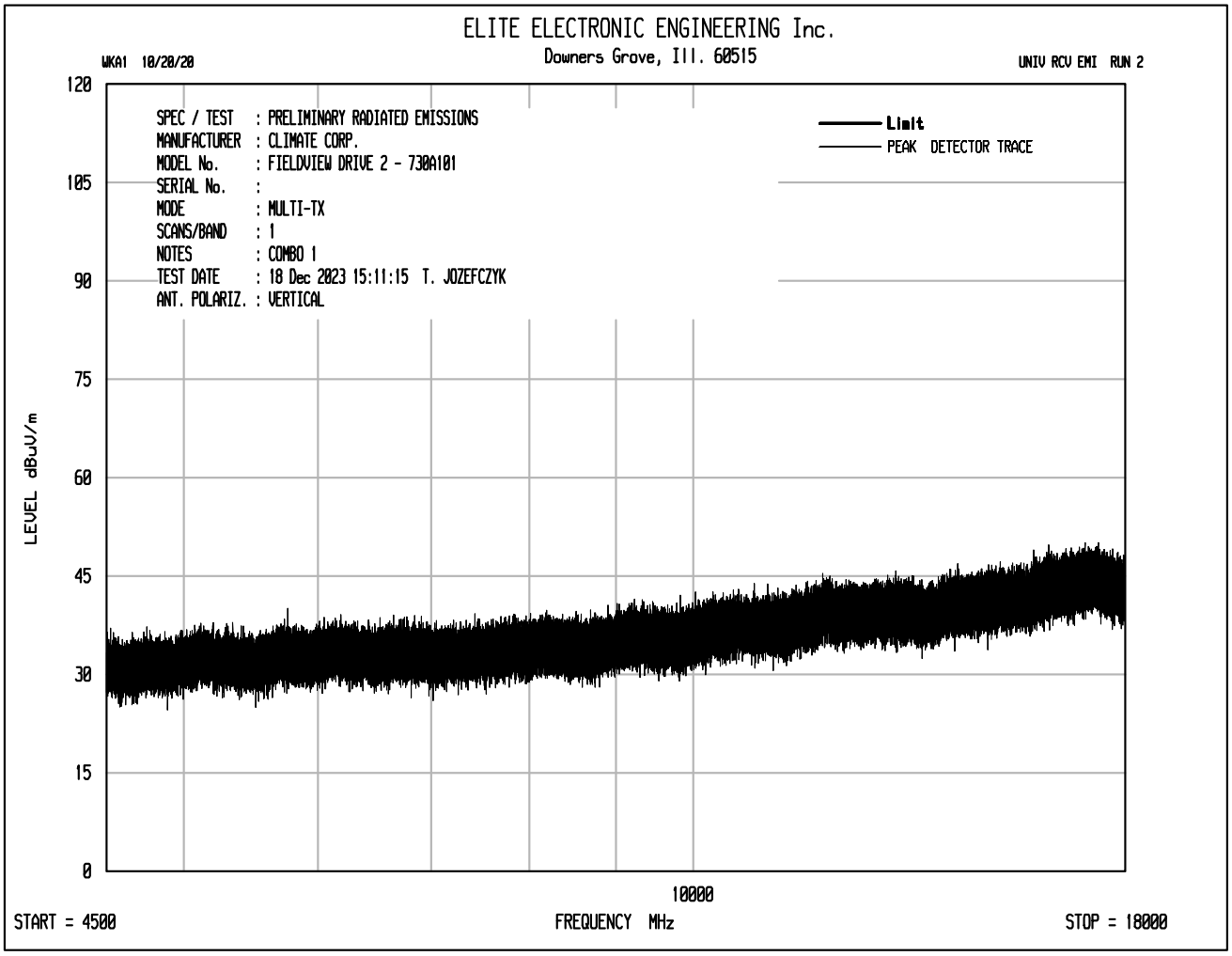
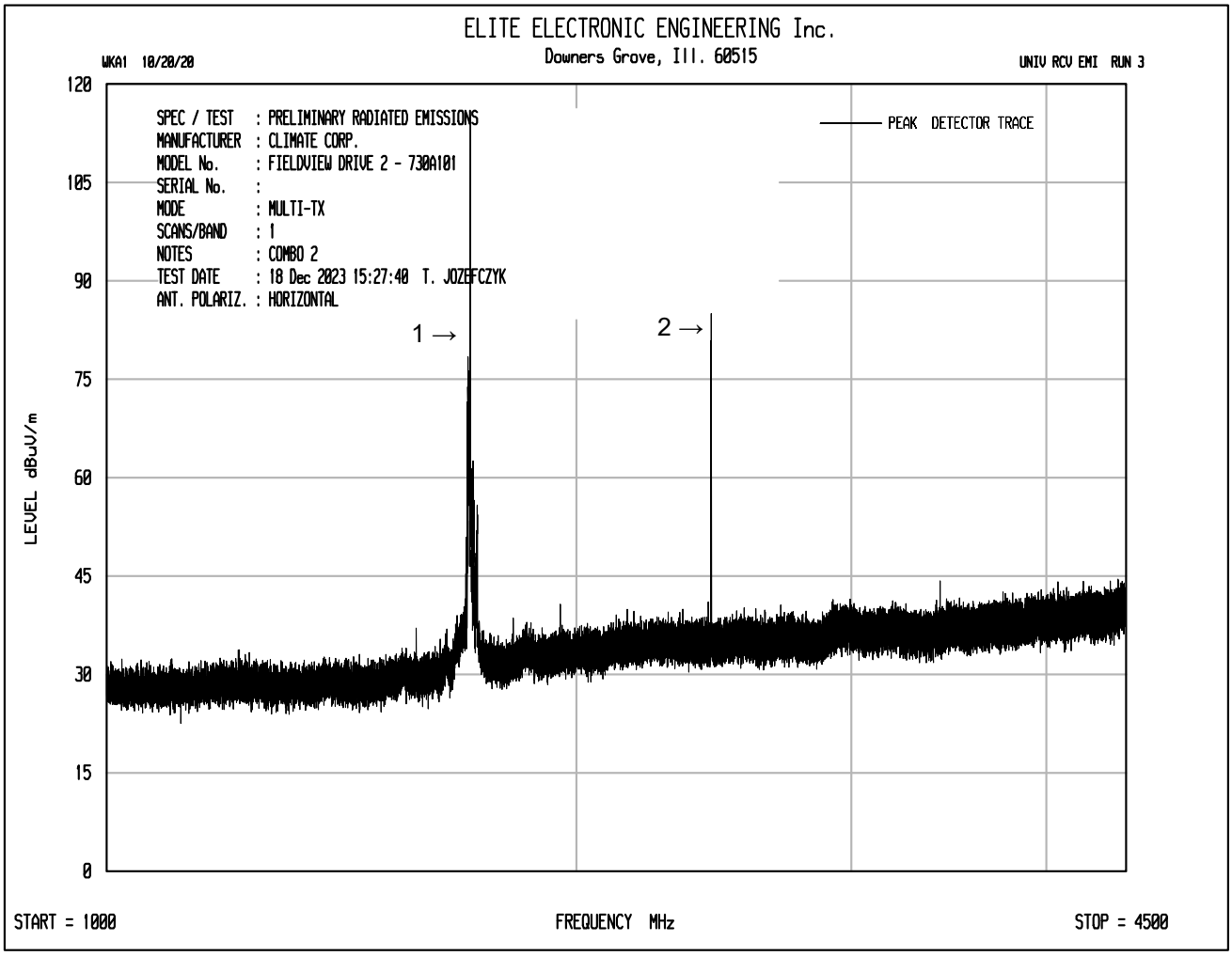
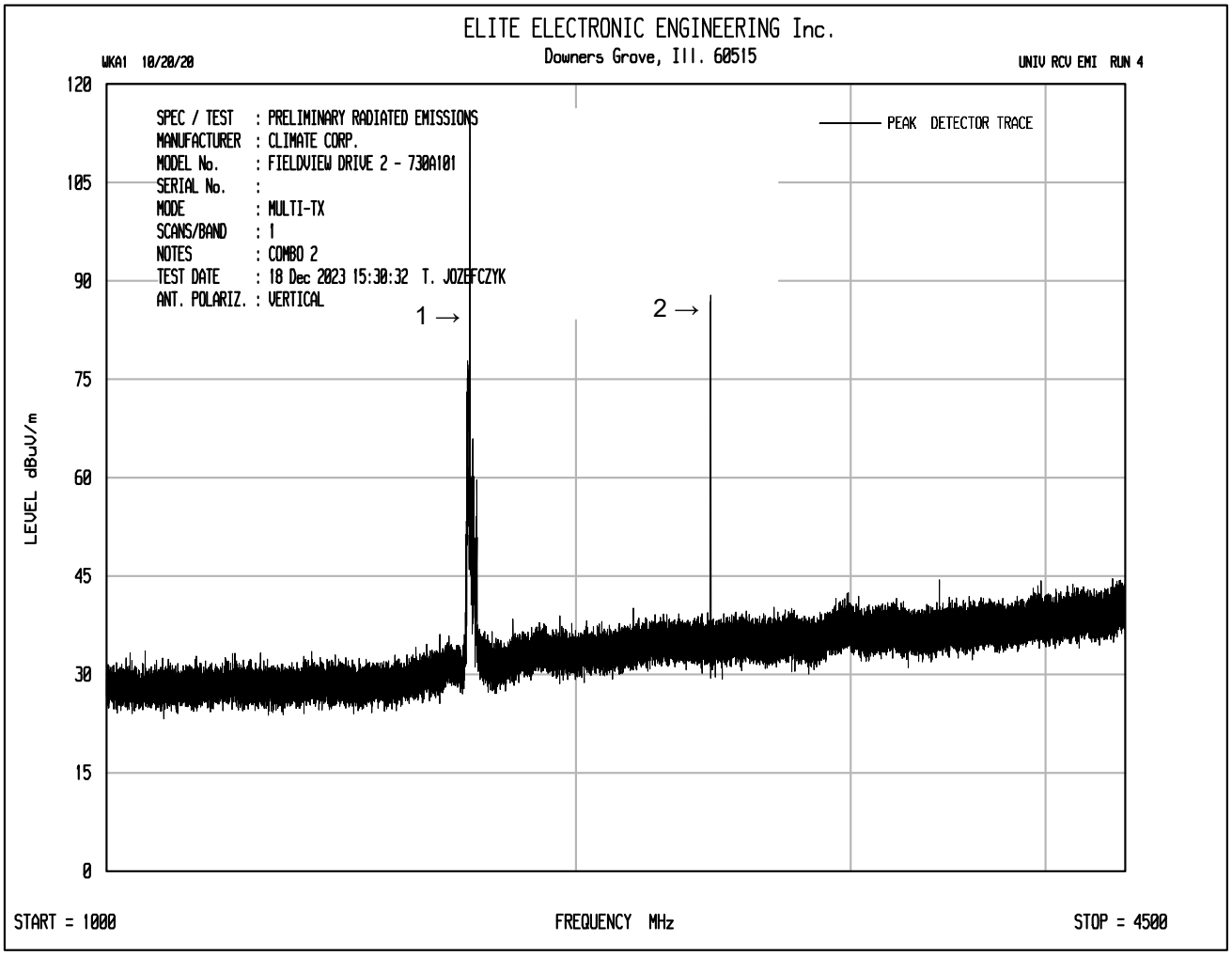
105
90
75
60
45
30
15
0
10000
START = 4500
FREQUENCY MHz
STOP = 18000

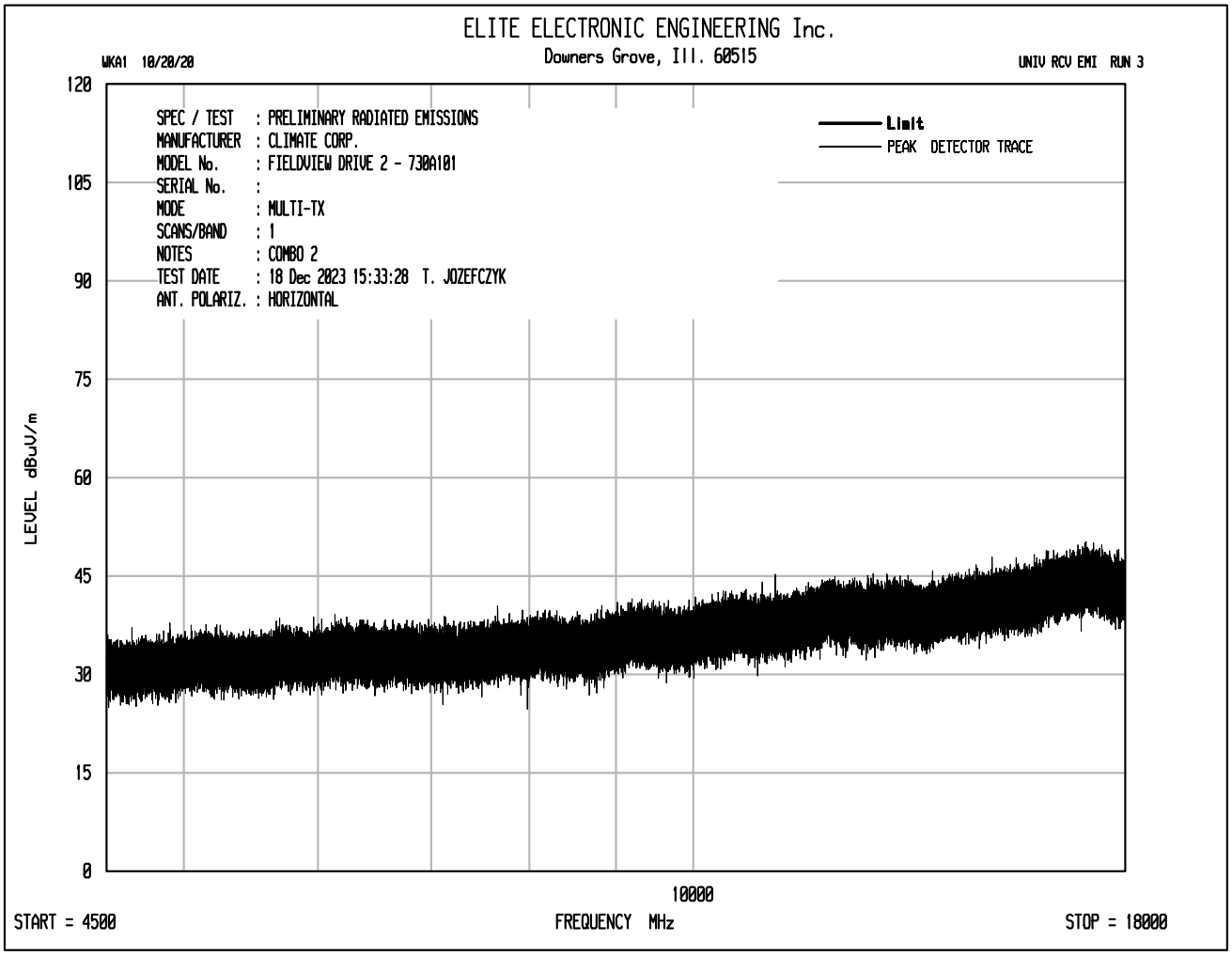

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 10/20/20
UNIV RCV EMI RUN 2
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CLIMATE CORP.
MODEL No. : FIELDVIEW DRIVE 2 - 730A101
SERIAL No. :
MODE : MULTI-TX
SCANS/BAND : 1
NOTES : COMBO 1
TEST DATE : 18 Dec 2023 15:11:15 T. 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

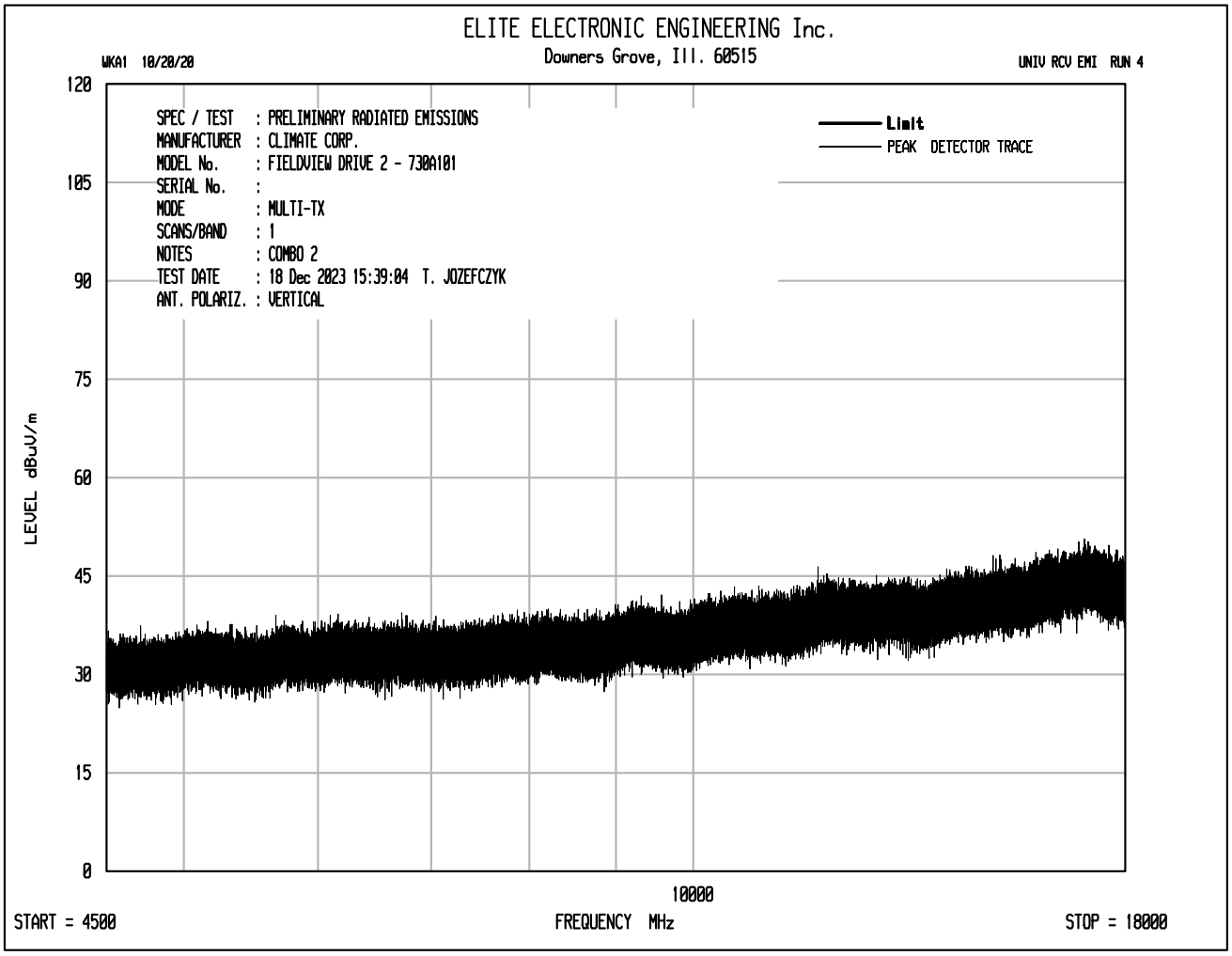


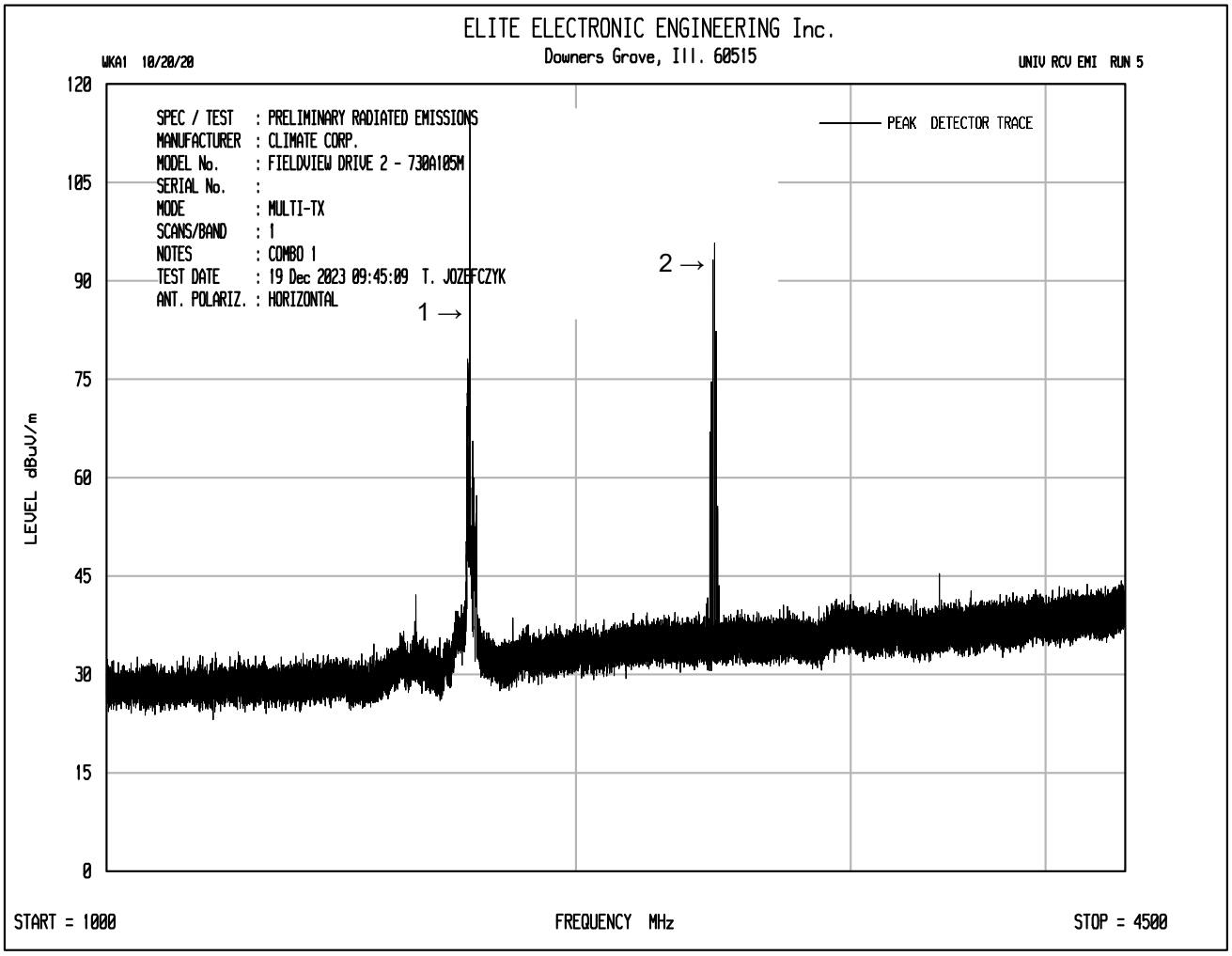
Note	Description
1	Plot shows emissions at LTE Band 4.
2	Plot shows emissions at Bluetooth frequency 2440MHz.



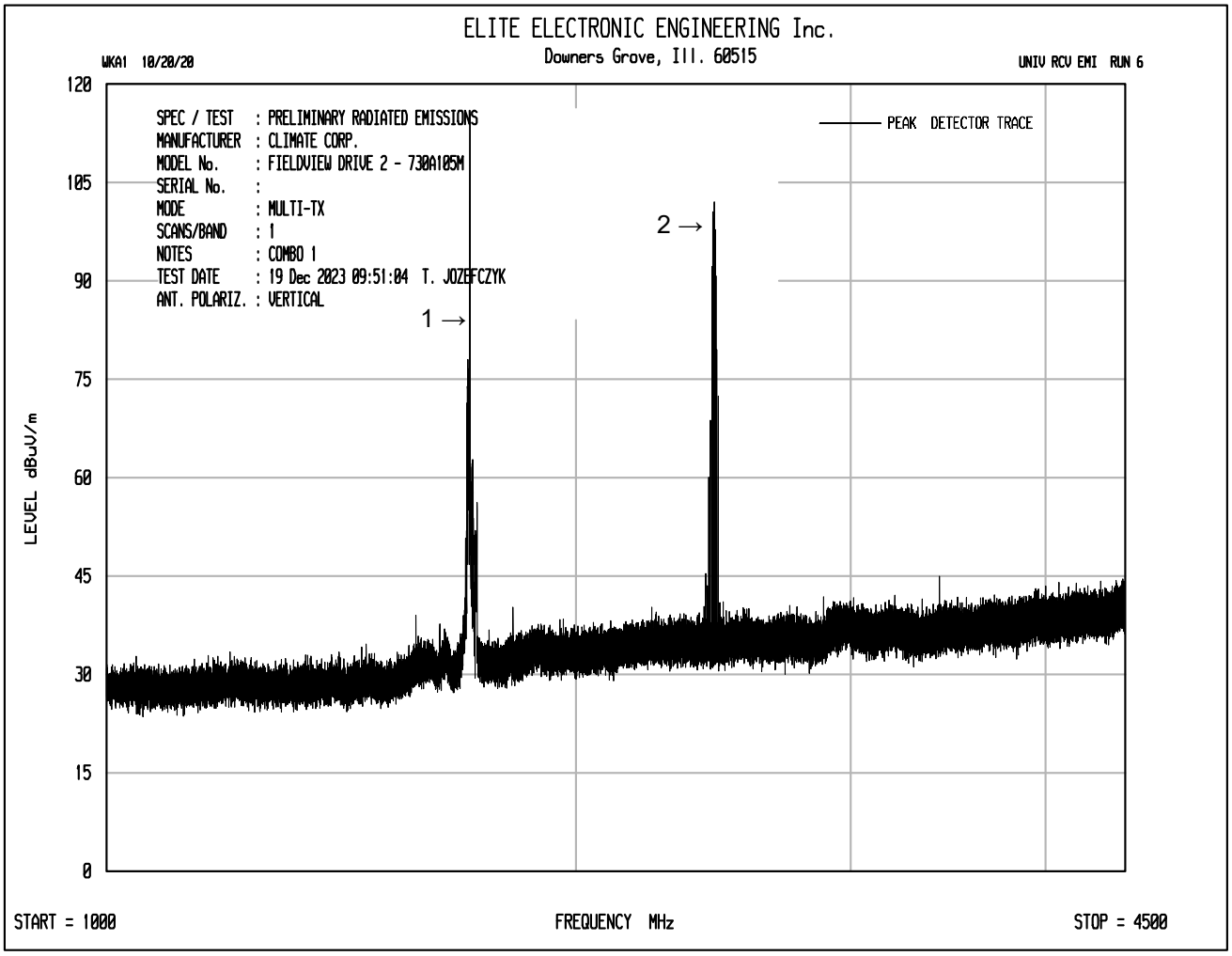
Note	Description
1	Plot shows emissions at LTE Band 4.
2	Plot shows emissions at Bluetooth frequency 2440MHz.


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 10/20/20
UNIV RCV EMI RUN 3
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CLIMATE CORP.
MODEL No. : FIELDVIEW DRIVE 2 - 730A101
SERIAL No. :
MODE : MULTI-TX
SCANS/BAND : 1
NOTES : COMBO 2
TEST DATE : 18 Dec 2023 15:33:28 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

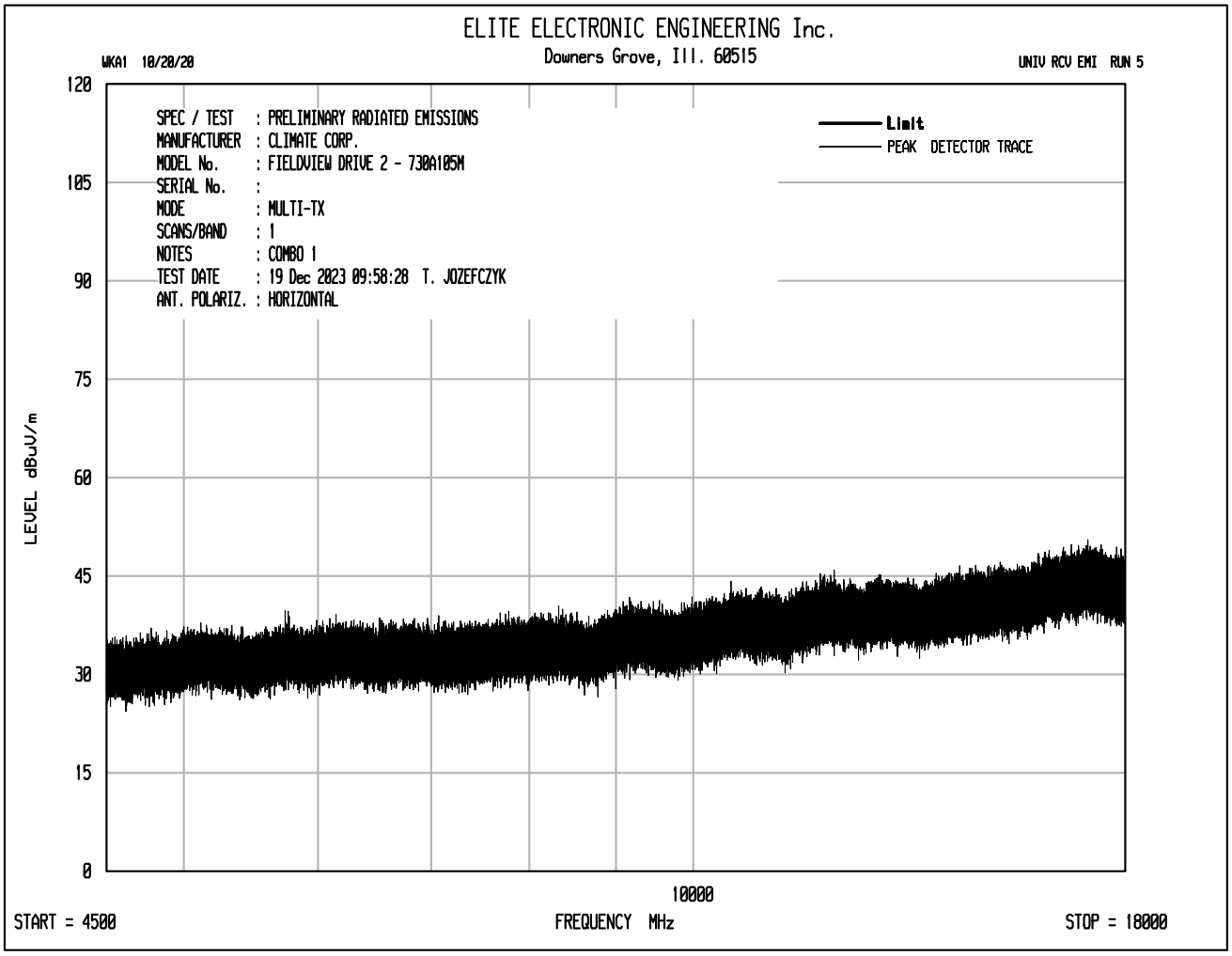

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 10/20/20
UNIV RCV EMI RUN 4
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CLIMATE CORP.
MODEL No. : FIELDVIEW DRIVE 2 - 730A101
SERIAL No. :
MODE : MULTI-TX
SCANS/BAND : 1
NOTES : COMBO 2
TEST DATE : 18 Dec 2023 15:39:04 T. 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

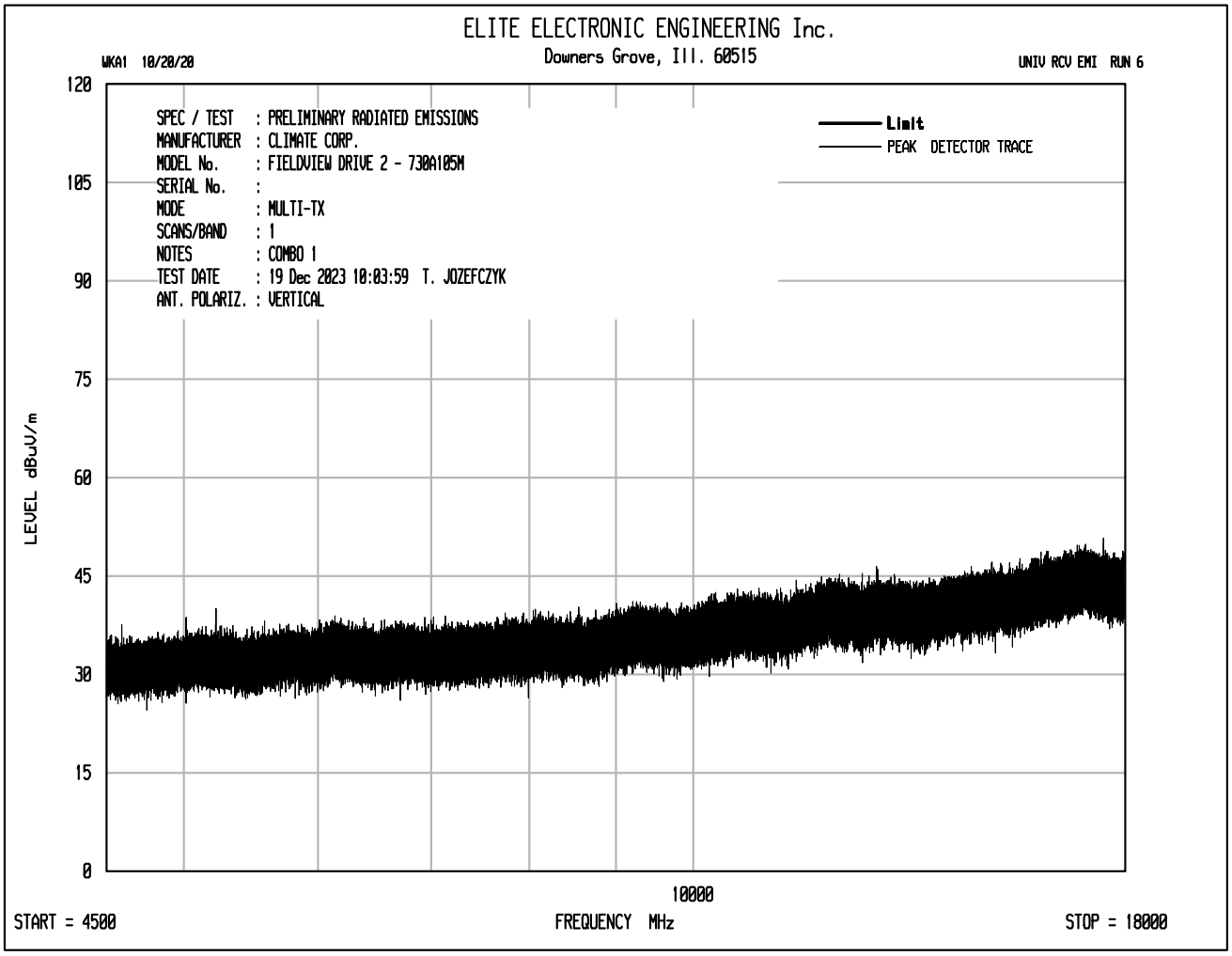


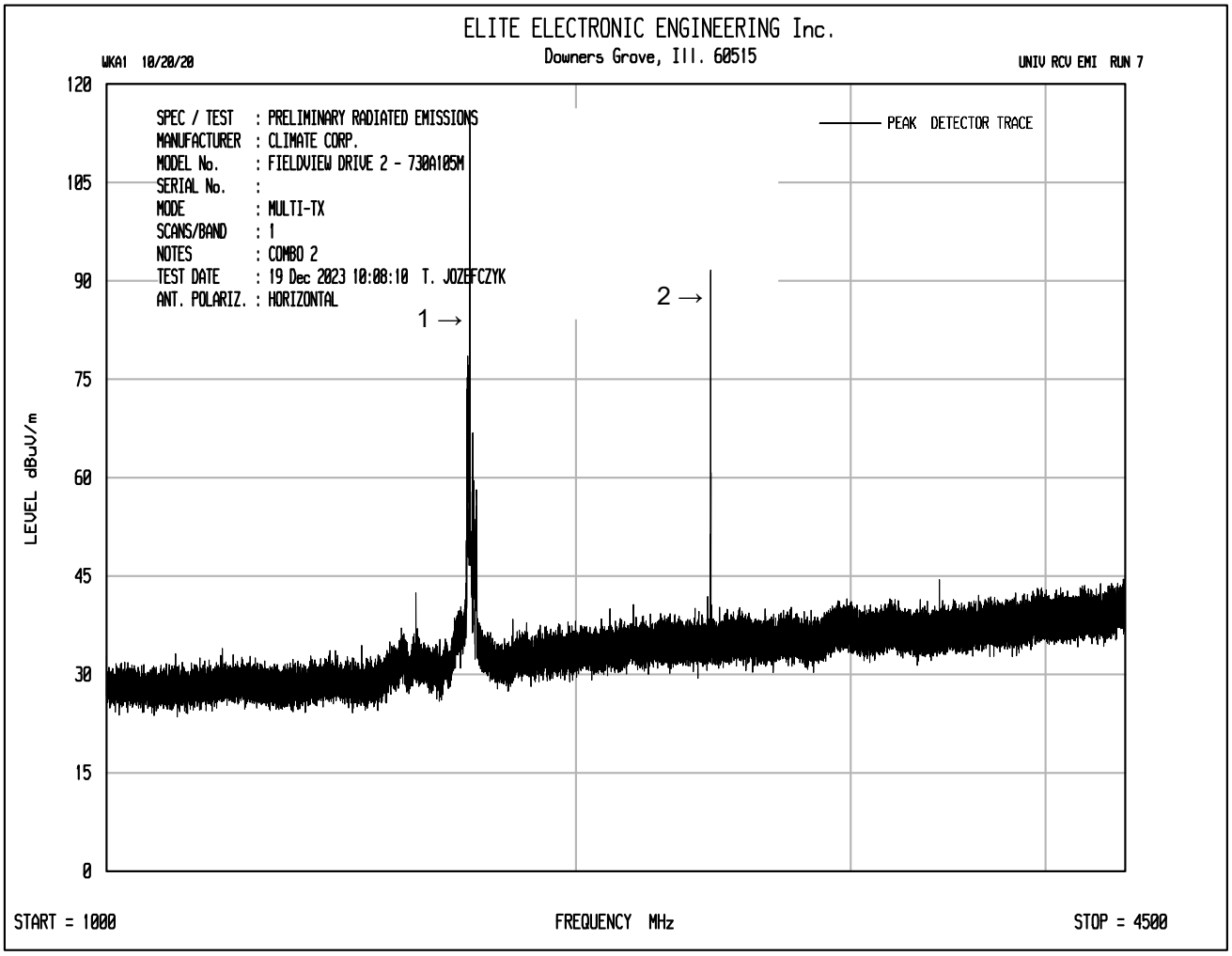
Note	Description
1	Plot shows emissions at LTE Band 4.
2	Plot shows emissions at 802.11b frequency 2452MHz.



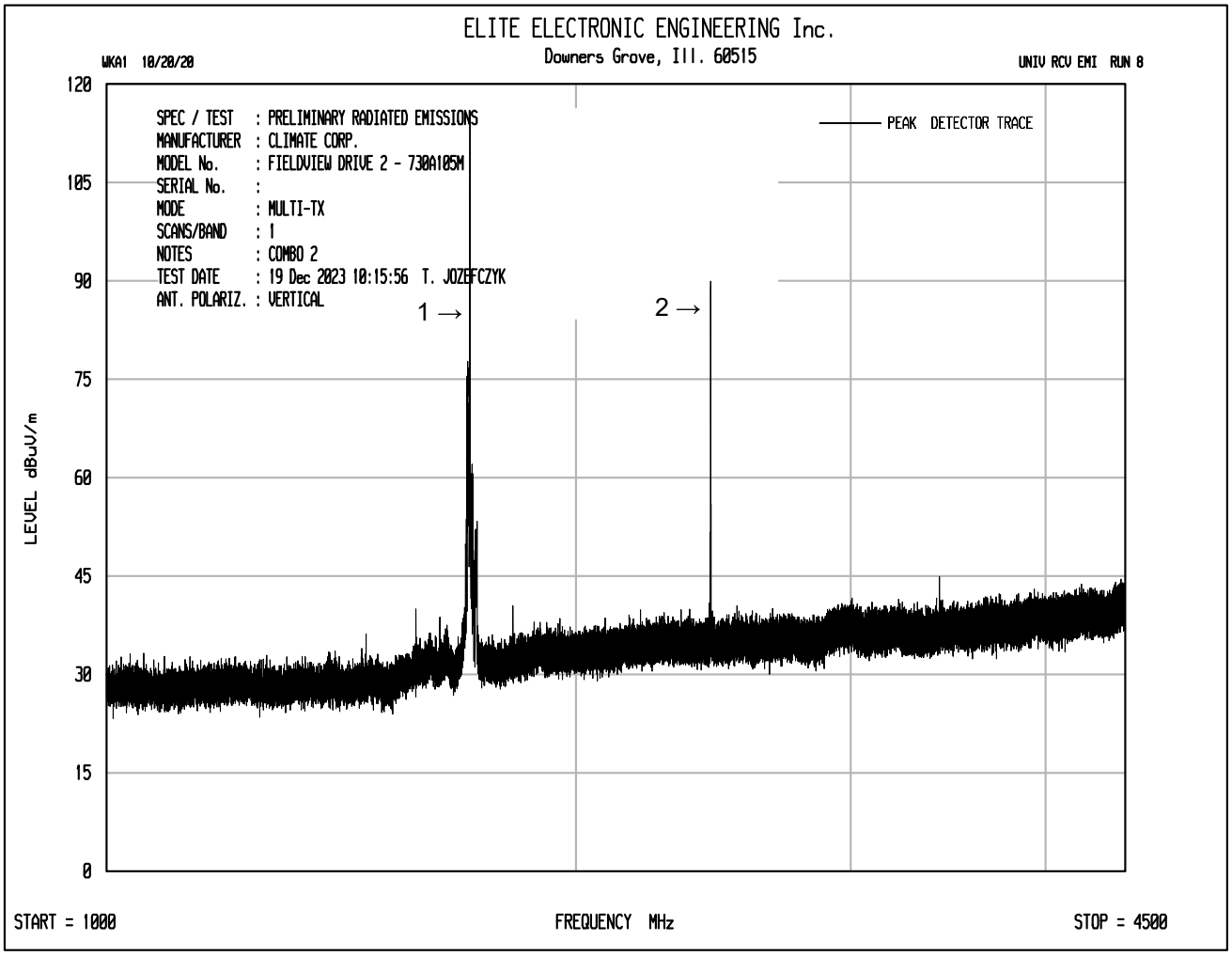
Note	Description
1	Plot shows emissions at LTE Band 4.
2	Plot shows emissions at 802.11b frequency 2452MHz.


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 10/20/20
UNIV RCV EMI RUN 5
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CLIMATE CORP.
MODEL No. : FIELDVIEW DRIVE 2 - 730A105M
SERIAL No. :
MODE : MULTI-TX
SCANS/BAND : 1
NOTES : COMBO 1
TEST DATE : 19 Dec 2023 09:58:28 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

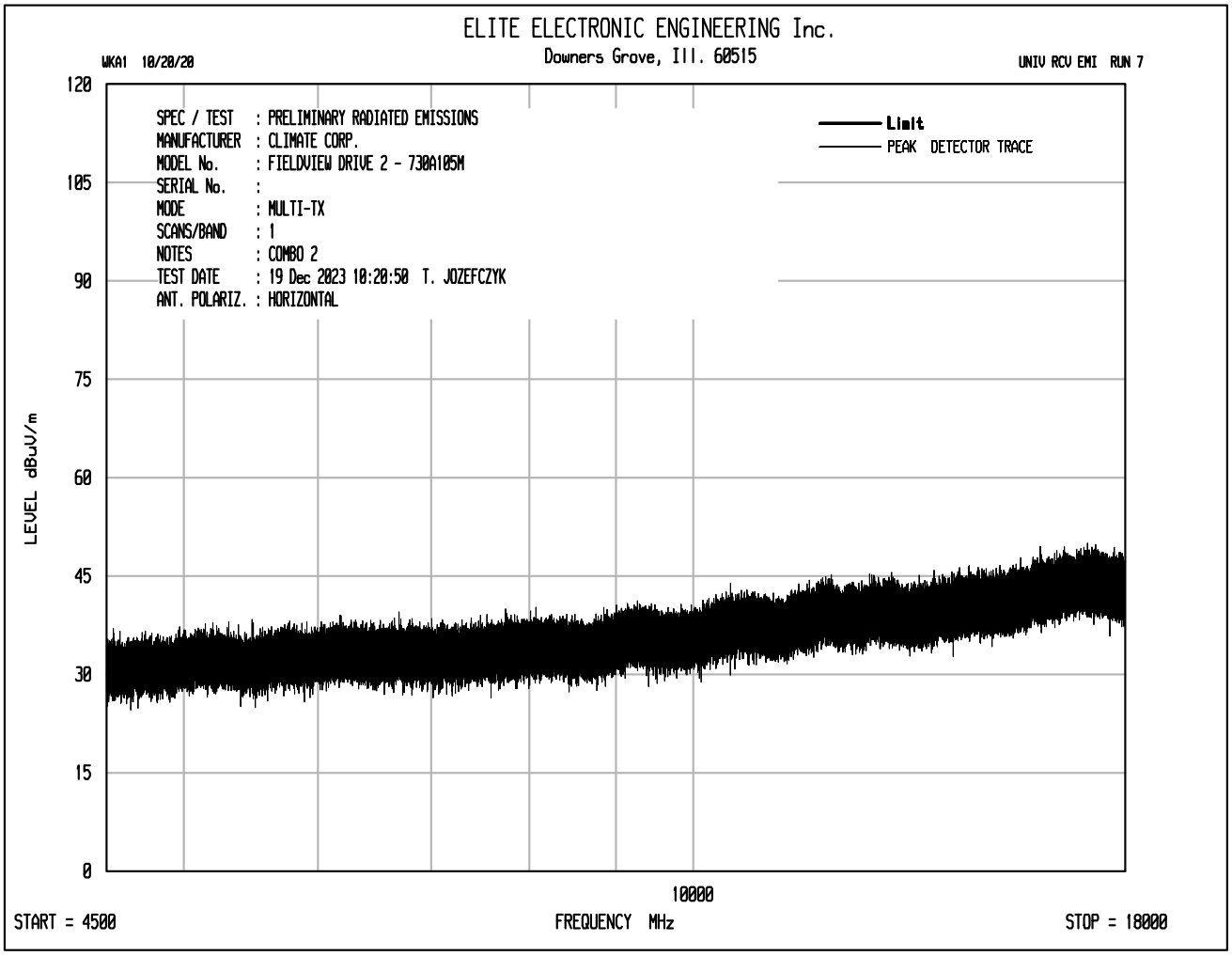

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 10/20/20
UNIV RCV EMI RUN 6
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CLIMATE CORP.
MODEL No. : FIELDVIEW DRIVE 2 - 730A105M
SERIAL No. :
MODE : MULTI-TX
SCANS/BAND : 1
NOTES : COMBO 1
TEST DATE : 19 Dec 2023 10:03:59 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

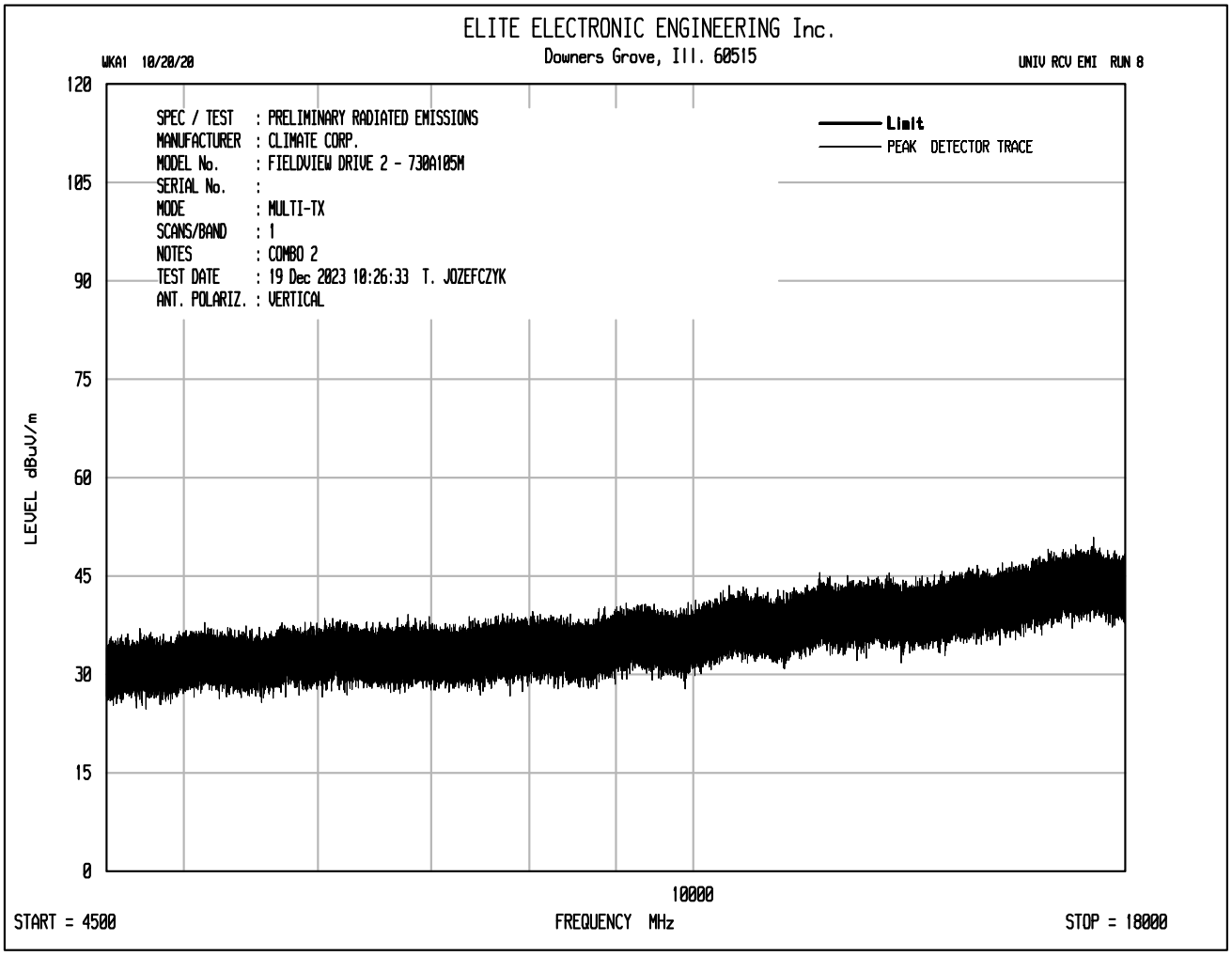


Note	Description
1	Plot shows emissions at LTE Band 4.
2	Plot shows emissions at Bluetooth frequency 2440MHz.



Note	Description
1	Plot shows emissions at LTE Band 4.
2	Plot shows emissions at Bluetooth frequency 2440MHz.


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 10/20/20
UNIV RCV EMI RUN 7
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CLIMATE CORP.
MODEL No. : FIELDVIEW DRIVE 2 - 730A105M
SERIAL No. :
MODE : MULTI-TX
SCANS/BAND : 1
NOTES : COMBO 2
TEST DATE : 19 Dec 2023 10:20:50 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 10/20/20
UNIV RCV EMI RUN 8
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CLIMATE CORP.
MODEL No. : FIELDVIEW DRIVE 2 - 730A105M
SERIAL No. :
MODE : MULTI-TX
SCANS/BAND : 1
NOTES : COMBO 2
TEST DATE : 19 Dec 2023 10:26:33 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

22. Scope of Accreditation

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

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Richard King (FCC/Commercial Team Leader) Phone: 630 495 9770 ext. 123
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Website: www.elitetest.com

ELECTRICAL

Valid To: June 30, 2025 Certificate Number: 1786.01

In recognition of the successful completion of the A2LA Accreditation Program evaluation process, accreditation is granted to this laboratory to perform the following automotive electromagnetic compatibility and other electrical tests:

Test Technology:	Test Method(s)[1]:
Transient Immunity *(Max Voltage 60V/Max current 100A)*	ISO 7637-2 (including emissions); ISO 7637-3; ISO 16750-2:2012, Sections 4.6.3 and 4.6.4; CS-11979, Section 6.4; CS.00054, Section 5.9; EMC-CS-2009.1 (CI220); FMC1278 (CI220, CI221, CI222); GMW 3097, Section 3.5; SAE J1113-11; SAE J1113-12; ECE Regulation 10.06 Annex 10
Electrostatic Discharge (ESD) *(Up to +/-25kV)*	ISO 10605 (2001, 2008); CS-11979 Section 7.0; CS.00054, Section 5.10; EMC-CS-2009.1 (CI 280); FMC1278 (CI280); SAE J1113-13; GMW 3097 Section 3.6
Conducted Emissions	CISPR 25 (2002, 2008), Sections 6.2 and 6.3; CISPR 25 (2016), Sections 6.3 and 6.4; CS-11979, Section 5.1; CS.00054, Sections 5.6.1 and 5.6.2; GMW 3097, Section 3.3.2; EMC-CS-2009.1 (CE 420); FMC1278 (CE420, CE421, CE 430, CE440)

Test Technology:	Test Method(s)[1]:
Radiated Emissions Anechoic *(Up to 6GHz)*	CISPR 25 (2002, 2008), Section 6.4; CISPR 25 (2016), Section 6.5; CS-11979, Section 5.3; CS.00054, Section 5.6.3; GMW 3097, Section 3.3.1; EMC-CS-2009.1 (RE 310); FMC1278 (RE310, RE320);
Vehicle Radiated Emissions	CISPR 12; CISPR 36; ICES-002; ECE Regulation 10.06 Annex 5
Bulk Current Injection (BCI) *(1 to 400MHz 500mA)*	ISO 11452-4; CS-11979, Section 6.1; CS.00054, Section 5.8.1; GMW 3097, Section 3.4.1; SAE J1113-4; EMC-CS-2009.1 (RI112); FMC1278 (RI112); ECE Regulation 10.06 Annex 9
Radiated Immunity Anechoic *(Up to 6GHz and 200V/m)* *(Including Radar Pulse 600V/m)*	ISO 11452-2; CS-11979, Section 6.2; CS.00054, Section 5.8.2; GMW 3097, Section 3.4.2; EMC-CS-2009.1 (RI114); FMC1278 (RI114); SAE J1113-21; ECE Regulation 10.06 Annex 9
Radiated Immunity Magnetic Field	ISO 11452-8; FMC 1278 (RI140)
Radiated Immunity Reverb *(360MHz to 6GHz and 100V/m)*	ISO/IEC 61000-4-21; GMW 3097, Section 3.4.3; EMC-CS-2009.1 (RI114); FMC1278 (RI114); ISO 11452-11
Radiated Immunity *(Portable Transmitters)* *(Up to 6GHz and 20W)*	ISO 11452-9; EMC-CS-2009.1 (RI115); FMC1278 (RI115); GMW 3097, Sec 3.4.4
Vehicle Radiated Immunity (ALSE)	ISO 11451-2; ECE Regulation 10.06 Annex 6
Vehicle Product Specific EMC Standards	EN 14982; EN ISO 13309; ISO 13766; EN 50498; EC Regulation No. 2015/208; EN 55012
Electrical Loads	ISO 16750-2
Stripline	ISO 11452-5
Transverse Electromagnetic (TEM) Cell	ISO 11452-3

Test Technology:	Test Method(s)[1]:
Emissions	
Radiated and Conducted (3m Semi-anechoic chamber, up to 40 GHz)	47 CFR, FCC Part 15 B (using ANSI C63.4:2014); 47 CFR, FCC Part 18 (using FCC MP-5:1986); ICES-001; ICES-003; ICES-005; IEC/CISPR 11, Ed. 4.1 (2004-06); AS/NZS CISPR 11 (2004); IEC/CISPR 11 Ed 5 (2009-05) + A1 (2010); KN 11 (2008-5) with RRL Notice No. 2008-3 (May 20, 2008); CISPR 11; EN 55011; KS C 9811; CNS 13803 (1997, 2003); CISPR 14-1; EN 55014-1; AS/NZS CISPR 14.1; CISPR 16-2-1 (2008); CISPR 16-2-1; KS C 9814-1; KN 14-1; IEC/CISPR 22 (1997); EN 55022 (1998) + A1(2000); EN 55022 (1998) + A1(2000) + A2(2003); EN 55022 (2006); IEC/CISPR 22 (2008-09); AS/NZS CISPR 22 (2004); AS/NZS CISPR 22, 3rd Edition (2006); KN 22 (up to 6 GHz); CNS 13438 (up to 6 GHz); VCCI V-3 (up to 6 GHz); CISPR 32; EN 55032; KS C 9832; KN 32; ECE Regulation 10.06 Annex 7 (Broadband); ECE Regulation 10.06 Annex 8 (Narrowband); ECE Regulation 10.06 Annex 14 (Conducted)
Cellular Radiated Spurious Emissions	ETSI TS 151 010-1 GSM; 3GPP TS 51.010-1, Sec 12; ETSI TS 134 124 UMTS; 3GPP TS 34.124; ETSI TS 136 124 LTE; E-UTRA; 3GPP TS 36.124
Current Harmonics	IEC 61000-3-2; IEC 61000-3-12; EN 61000-3-2; KN 61000-3-2; KS C 9610-3-2; ECE Regulation 10.06 Annex 11
Flicker and Fluctuations	IEC 61000-3-3; IEC 61000-3-11; EN 61000-3-3; KN 61000-3-3; KS C 9610-3-3; ECE Regulation 10.06 Annex 12
Immunity	
Electrostatic Discharge	IEC 61000-4-2, Ed. 1.2 (2001); IEC 61000-4-2 (1995) + A1(1998) + A2(2000); EN 61000-4-2 (1995); EN 61000-4-2 (2009-05); KN 61000-4-2 (2008-5); RRL Notice No. 2008-4 (May 20, 2008); IEC 61000-4-2; EN 61000-4-2; KN 61000-4-2; KS C 9610-4-2; IEEE C37.90.3 2001
Radiated Immunity	IEC 61000-4-3 (1995) + A1(1998) + A2(2000); IEC 61000-4-3, Ed. 3.0 (2006-02); IEC 61000-4-3, Ed. 3.2 (2010); KN 61000-4-3 (2008-5); RRL Notice No. 2008-4 (May 20, 2008); IEC 61000-4-3; EN 61000-4-3; KN 61000-4-3; KS C 9610-4-3; IEEE C37.90.2 2004

Test Technology:	Test Method(s)[1]:
Immunity (cont'd)	
Electrical Fast Transient/Burst	IEC 61000-4-4, Ed. 2.0 (2004-07); IEC 61000-4-4, Ed. 2.1 (2011); IEC 61000-4-4 (1995) + A1(2000) + A2(2001); KN 61000-4-4 (2008-5); RRL Notice No. 2008-5 (May 20, 2008); IEC 61000-4-4; EN 61000-4-4; KN 61000-4-4; KS C 9610-4-4; ECE Regulation 10.06 Annex 15
Surge	IEC 61000-4-5 (1995) + A1(2000); IEC 61000-4-5, Ed 1.1 (2005-11); EN 61000-4-5 (1995) + A1(2001); KN 61000-4-5 (2008-5); RRL Notice No. 2008-4 (May 20, 2008); IEC 61000-4-5; EN 61000-4-5; KN 61000-4-5; KS C 9610-4-5; IEEE C37.90.1 2012; IEEE STD C62.41.2 2002; ECE Regulation 10.06 Annex 16
Conducted Immunity	IEC 61000-4-6 (1996) + A1(2000); IEC 61000-4-6, Ed 2.0 (2006-05); IEC 61000-4-6 Ed. 3.0 (2008); KN 61000-4-6 (2008-5); RRL Notice No. 2008-4 (May 20, 2008); EN 61000-4-6 (1996) + A1(2001); IEC 61000-4-6; EN 61000-4-6; KN 61000-4-6; KS C 9610-4-6
Power Frequency Magnetic Field Immunity (*Down to 3 A/m*)	IEC 61000-4-8 (1993) + A1(2000); IEC 61000-4-8 (2009); EN 61000-4-8 (1994) + A1(2000); KN 61000-4-8 (2008-5); RRL Notice No. 2008-4 (May 20, 2008); IEC 61000-4-8; EN 61000-4-8; KN 61000-4-8; KS C 9610-4-8
Voltage Dips, Short Interrupts, and Line Voltage Variations	IEC 61000-4-11, Ed. 2 (2004-03); KN 61000-4-11 (2008-5); RRL Notice No. 2008-4 (May 20, 2008); IEC 61000-4-11; EN 61000-4-11; KN 61000-4-11; KS C 9610-4-11
Ring Wave	IEC 61000-4-12, Ed. 2 (2006-09); EN 61000-4-12:2006; IEC 61000-4-12; EN 61000-4-12; KN 61000-4-12; IEEE STD C62.41.2 2002

Test Technology:	Test Method(s)[1]:
Generic and Product Specific EMC Standards	IEC/EN 61000-6-1; AS/NZS 61000-6-1; KN 61000-6-1; KS C 9610-6-1; IEC/EN 61000-6-2; AS/NZS 61000-6-2; KN 61000-6-2; KS C 9610-6-2; IEC/EN 61000-6-3; AS/NZS 61000-6-3; KN 61000-6-3; KS C 9610-6-3; IEC/EN 61000-6-4; AS/NZS 61000-6-4; KN 61000-6-4; KS C 9610-6-4; EN 50130-4; EN 61326-1; EN 50121-3-2; EN 12895; EN 50270; EN 50491-1; EN 50491-2; EN 50491-3; EN 55015; EN 60730-1; EN 60945; IEC 60533; EN 61326-2-6; EN 61800-3; IEC/CISPR 14-2; EN 55014-2; AS/NZS CISPR 14.2; KN 14-2; KS C 9814-2; IEC/CISPR 24; AS/NZS CISPR 24; EN 55024; KN 24; IEC/CISPR 35; AS/NZS CISPR 35; EN 55035; KN 35; KS C 9835; IEC 60601-1-2; JIS T0601-1-2
TxRx EMC Requirements	EN 301 489-1; EN 301 489-3; EN 301 489-9; EN 301 489-17; EN 301 489-19; EN 301 489-20
European Radio Test Standards	ETSI EN 300 086-1; ETSI EN 300 086-2; ETSI EN 300 113-1; ETSI EN 300 113-2; ETSI EN 300 220-1; ETSI EN 300 220-2; ETSI EN 300 220-3-1; ETSI EN 300 220-3-2; ETSI EN 300 330-1; ETSI EN 300 330-2; ETSI EN 300 440-1; ETSI EN 300 440-2; ETSI EN 300 422-1; ETSI EN 300 422-2; ETSI EN 300 328; ETSI EN 301 893; ETSI EN 301 511; ETSI EN 301 908-1; ETSI EN 908-2; ETSI EN 908-13; ETSI EN 303 413; ETSI EN 302 502; EN 303 340; EN 303 345-2; EN 303 345-3; EN 303 345-4
Canadian Radio Tests	RSS-102 measurement (RF Exposure Evaluation); RSS-102 measurement (Nerve Stimulation); SPR-002; RSS-111; RSS-112; RSS-117; RSS-119; RSS-123; RSS-125; RSS-127; RSS-130; RSS-131; RSS-132; RSS-133; RSS-134; RSS-135; RSS-137; RSS-139; RSS-140; RSS-141; RSS-142; RSS-170; RSS-181; RSS-182; RSS-191; RSS-192; RSS-194; RSS-195; RSS-196; RSS-197; RSS-199; RSS-210; RSS-211; RSS-213; RSS-215; RSS-216; RSS-220; RSS-222; RSS-236; RSS-238; RSS-243; RSS-244; RSS-247; RSS-248; RSS-251; RSS-252; RSS-287; RSS-288; RSS-310; RSS-GEN
Mexico Radio Tests	IFT-008-2015; NOM-208-SCFI-2016
Japan Radio Tests	Radio Law No. 131, Ordinance of MPT No. 37, 1981, MIC Notification No. 88:2004, Table No. 22-11; ARIB STD-T66, Regulation 18
Taiwan Radio Tests	LP-0002 (July 15, 2020)

Test Technology:	Test Method(s)[1]:
Australia/New Zealand Radio Tests	AS/NZS 4268; Radiocommunications (Short Range Devices) Standard (2014)
Hong Kong Radio Tests	HKCA 1039 Issue 6; HKCA 1042; HKCA 1033 Issue 7; HKCA 1061; HKCA 1008; HKCA 1043; HKCA 1057; HKCA 1073
Korean Radio Test Standards	KN 301 489-1; KN 301 489-3; KN 301 489-9; KN 301 489-17; KN 301 489-52; KS X 3124; KS X 3125; KS X 3130; KS X 3126; KS X 3129
Vietnam Radio Test Standards	QCVN 47:2015/BTTTT; QCVN 54:2020/BTTTT; QCVN 55:2011/BTTTT; QCVN 65:2013/BTTTT; QCVN 73:2013/BTTTT; QCVN 74:2020/BTTTT; QCVN 112:2017/BTTTT; QCVN 117:2020//BTTTT
Vietnam EMC Test Standards	QCVN 18:2014/BTTTT; QCVN 86:2019/BTTTT; QCVN 96:2015/BTTTT; QCVN 118:2018/BTTTT
Unlicensed Radio Frequency Devices *(3 Meter Semi-Anechoic Room)*	47 CFR FCC Part 15C, 15D, 15E, 15F, 15G, 15H (using ANSI C63.10:2013, ANSI C63.17:2013 and FCC KDB 905462 D02 (v02))
Licensed Radio Service Equipment	47 CFR FCC Parts 20, 22, 24, 25, 27, 30, 73, 74, 80, 87, 90, 95, 96, 97, 101 (using ANSI/TIA-603-E, TIA-102.CAAA-E, ANSI C63.26:2015)
OTA (Over the Air) Performance GSM, GPRS, EGPRS UMTS (W-CDMA) LTE including CAT M1 A-GPS for UMTS/GSM LTS A-GPS, A-GLONASS, SIB8/SIB16 Large Device/Laptop/Tablet Testing Integrated Device Testing WiFi 802.11 a/b/g/n/a	CTIA Test Plan for Wireless Device Over-the-Air Performance (Method for Measurement for Radiated Power and Receiver Performance) V3.8.2; CTIA Test Plan for RF Performance Evaluation of WiFi Mobile Converged Devices V2.1.0

Test Technology:	Test Method(s)[1]:
Electrical Measurements and Simulation	
AC Voltage / Current (1mV to 5kV) 60 Hz (0.1V to 250V) up to 500 MHz (1μA to 150A) 60 Hz	FAA AC 150/5345-10H; FAA AC 150/5345-43J; FAA AC 150/5345-44K; FAA AC 150/5345-46E; FAA AC 150/5345-47C;
DC Voltage / Current (1mV to 15 kV) / (1μA to 10A)	FAA EB 67D
Power Factor / Efficiency / Crest Factor (Power to 30kW)	
Resistance (1mΩ to 4000MΩ)	
Surge (Up to 10 kV / 5 kA) (Combination Wave and Ring Wave)	

On the following products and materials:
Telecommunications Terminal Equipment (TTE), Radio Equipment, Network Equipment, Information Technology Equipment (ITE), Automotive Electronic Equipment, Automotive Hybrid Electronic Devices, Maritime Navigation and Radio Communication Equipment and Systems, Vehicles, Boats and Internal Combustion Engine Driven Devices, Automotive, Aviation, and General Lighting Products, Medical Electrical Equipment, Motors, Industrial, Scientific and Medical (ISM) Radio-Frequency Equipment, Household Appliances, Electric Tools, Low-voltage Switchgear and Control gear, Programmable Controllers, Electrical Equipment for Measurement, Control and Laboratory Use, Base Materials, Power and Data Transmission Cables and Connectors

[1] When the date, edition, version, etc. is not identified in the scope of accreditation, laboratories may use the version that immediately precedes the current version for a period of one year from the date of publication of the standard measurement method, per part C., Section 1 of A2LA *R101 - General Requirements - Accreditation of ISO-IEC 17025 Laboratories*.

Testing Activities Performed in Support of FCC Certification in Accordance with 47 Code of Federal Regulations and FCC KDB 974614, Appendix A, Table A.1[2]

Rule Subpart/Technology	Test Method	Maximum Frequency (MHz)
Unintentional Radiators Part 15B	ANSI C63.4:2014	40000
Industrial, Scientific, and Medical Equipment Part 18	FCC MP-5 (February 1986)	40000
Intentional Radiators Part 15C	ANSI C63.10:2013	40000

Testing Activities Performed in Support of FCC Certification in Accordance with 47 Code of Federal Regulations and FCC KDB 974614, Appendix A, Table A.1[2]

Rule Subpart/Technology	Test Method	Maximum Frequency (MHz)
Unlicensed Personal Communication Systems Devices Part 15D	ANSI C63.17:2013	40000
U-NII without DFS Intentional Radiators Part 15E	ANSI C63.10:2013	40000
U-NII with DFS Intentional Radiators Part 15E	FCC KDB 905462 D02 (v02)	40000
UWB Intentional Radiators Part 15F	ANSI C63.10:2013	40000
BPL Intentional Radiators Part 15G	ANSI C63.10:2013	40000
White Space Device Intentional Radiators Part 15H	ANSI C63.10:2013	40000
Commercial Mobile Services (FCC Licensed Radio Service Equipment) Parts 22 (cellular), 24, 25 (below 3 GHz), and 27	ANSI/TIA-603-E; TIA-102.CAAA-E; ANSI C63.26:2015	40000
General Mobile Radio Services (FCC Licensed Radio Service Equipment) Parts 22 (non-cellular), 90 (below 3 GHz), 95, 97, and 101 (below 3 GHz)	ANSI/TIA-603-E; TIA-102.CAAA-E; ANSI C63.26:2015	40000
Citizens Broadband Radio Services (FCC Licensed Radio Service Equipment) Part 96	ANSI/TIA-603-E; TIA-102.CAAA-E; ANSI C63.26:2015	40000
Maritime and Aviation Radio Services Parts 80 and 87	ANSI/TIA-603-E; ANSI C63.26:2015	40000
Microwave and Millimeter Bands Radio Services Parts 25, 30, 74, 90 (above 3 GHz), 97 (above 3 GHz), and 101	ANSI/TIA-603-E; TIA-102.CAAA-E; ANSI C63.26:2015	40000

Testing Activities Performed in Support of FCC Certification in Accordance with 47 Code of Federal Regulations and FCC KDB 974614, Appendix A, Table A.1[2]

Rule Subpart/Technology	Test Method	Maximum Frequency (MHz)
Broadcast Radio Services		
Parts 73 and 74 (below 3 GHz)	ANSI/TIA-603-E; TIA-102.CAAA-E; ANSI C63.26:2015	40000
Signal Boosters		
Part 20 (Wideband Consumer Signal Boosters, Provider-specific signal boosters, and Industrial Signal Boosters) Section 90.219	ANSI C63.26:2015	40000

[2] Accreditation does not imply acceptance to the FCC equipment authorization program. Please see the FCC website (https://apps.fcc.gov/oetcf/eas/) for a listing of FCC approved laboratories.

Accredited Laboratory

A2LA has accredited

ELITE ELECTRONIC ENGINEERING INC.

Downers Grove, IL

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated April 2017*).

Presented this 15th day of August 2023.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 1786.01
Valid to June 30, 2025

For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.