Measurement of RF Emissions from a Model OBSVER1000 Portable Vibration Data Recorder

For	Vibration Research Corporation 1294 Chicago Drive Jenison, MI 49248
P.O. Number	20170627BB
Date Tested	March 1-2 and June 29, 2017
Test Personnel	Richard E King
Test Specification	FCC "Code of Federal Regulations" Title 47 Part15, Subpart B, Class A ICES-003

Test Report By: Richard E. King

Richard E King
EMC Engineer

Requested By: Gerald Van Baren
Vibration Research Corporation

Approved By: Raymond J Klouda

Raymond J. Klouda
Registered Professional
Engineer of Illinois - 44894

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REVISION HISTORY

Revision	Date	Description
—	30 June 2017	Initial release

Measurement of RF Emissions from a Portable Vibration Data Recorder, Model No. OBSVER1000

1. INTRODUCTION

1.1. Scope of Tests

This report presents the results of the RF emissions measurements performed on a Portable Vibration Data Recorder, Model No. OBSVER1000, Serial No. Prototype, (hereinafter referred to as the Equipment Under Test (EUT)). The EUT was manufactured and submitted for testing by Vibration Research Corporation located in Jenison, MI.

1.2. Purpose

The test series was performed to determine if the EUT meets the conducted and radiated RF emission requirements of the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart B, Sections 15.107 and 15.109 for Class A digital devices. Testing was performed in accordance with ANSI C63.4-2014.

The test series was performed to determine if the EUT meets the conducted and radiated RF emission requirements of the Industry Canada, ICES-003 Sections 6.1 and 6.2 for Class A Information Technology Equipment (ITE). Testing was performed in accordance with ANSI C63.4-2014.

1.3. Deviations, Additions and Exclusions

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

1.4. EMC Laboratory Identification

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

1.5. Laboratory Conditions

The temperature at the time of the test was 22.2^{o}C and the relative humidity was 47%.

2. APPLICABLE DOCUMENTS

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

- Federal Communications Commission "Code of Federal Regulations", Title 47, Part 15, Subpart B for Class A digital devices, dated 1 Oct 2016
- ANSI C63.4-2014, "American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz"
- ICES-003, Issue 6, January 2016, “Spectrum Management and Telecommunications, Interference-Causing Equipment Standard, Information Technology Equipment (Including Digital Apparatus) – Limits and methods of measurement”

3. EUT SETUP AND OPERATION

3.1. General Description

The EUT is a Vibration Research Corporation, Portable Vibration Data Recorder, Model No. OBSVER1000. A block diagram of the EUT setup is shown as Figure 1. A photograph of the EUT is shown as Figure 2.

3.1.1. Power Input

The EUT was powered with 230VAC 50Hz through 1.5-meter, unshielded leads from an ICCNexergy Elpac Power Systems AC/DC transformer model FWE030018A serial 0000058 for conducted and radiated emissions only.

All other testing the EUT was powered by its internal Lithium Ion 12V rechargeable battery.

3.1.2. Peripheral Equipment

The EUT was submitted for testing with the following peripheral equipment:

Item	Description
Function Generator	Berkeley Nucleonics Corp SmartARB Model: 625-A Serial: 23117
Ethernet Switch	Allied Telesyn Model: AT-GS900/8 Serial: A03706G100500008A
Laptop computer	DELL Model: Latitude E5570
Triax Accelerometer	Ditran Model: 3263M1

3.1.3. Signal Input/Output Leads

The EUT was submitted for testing with the following signal leads:

Item	Description
1 output	BNC output loops back to the 13 Inputs < ½ meter long extended to 1 ½ meters long
1 RS-232 Serial	1 meter long serial cable to GPS test load.
3 Triax ACC inputs	2 meter long input cable with three connectors to an accelerometer.
13 inputs	CAN Loopback
1 Ethernet CAT 6	6 meter long shielded twisted Ethernet cable run outside the chamber connected to the switch. A second Ethernet cable which was connected between the switch and the computer to control the EUT and the monitor the EUT's performance.

3.1.4. Grounding

The EUT was connected to ground through the third wire of its input power cord.

3.1.5. Frequency of EUT

The EUT was equipped with a WIFI module that operated at a frequency range of 2400 to 2483.5MHz. In accordance with 47 CFR 15.33 radiated emissions measurements were made up to 12.5GHz.

3.2. Software

For all tests the EUT had Firmware Version OB1K12.017 loaded onto the device to provide correct load characteristics.

3.3. Operational Mode

For all tests the EUT and all peripheral equipment were placed on an 80cm high non-conductive stand. The EUT and all peripheral equipment were energized. All tests were performed with the EUT operating in the Random Vibration Loopback mode and in the Random Vibration Loopback battery power mode.

The cables were manually maximized during the preliminary emissions sweeps. The cable arrangement which resulted in the worst case emissions was utilized.

Random vibration loopback – The EUT is controlled through the Ethernet cable via the laptop to a test script that runs the vibration loopback.

Random vibration loopback battery pack – Same as random vibration loopback except the EUT is disconnected from the AC/DC Supply power brick.

3.4. EUT Modifications

No modifications were required for compliance to the FCC 15B Class A requirements or the Industry Canada ICES-003 Class A requirements for Information Technology Equipment.

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.

4.3. Calibration Traceability

Test equipment is maintained and calibrated on a regular basis with a calibration interval not greater than two years. All calibrations are traceable to the National Institute of Standards and Technology (NIST).

4.4. Measurement Uncertainty

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

The measurement uncertainty for these tests is presented below:

Conducted Emissions Measurements		
Combined Standard Uncertainty	1.06	-1.06
Expanded Uncertainty (95% confidence)	2.12	-2.12

Radiated Emissions Measurements		
Combined Standard Uncertainty	2.09	-2.09
Expanded Uncertainty (95% confidence)	4.19	-4.19

5. TEST PROCEDURES

5.1. Powerline Conducted Emissions

5.1.1. Requirements

All radio frequency voltages on the power lines of a Class A device shall be below the values shown below when using a quasi-peak detector:

CONDUCTED LIMITS FOR CLASS A DEVICE

Frequency MHz	RFI Voltage dBuV(QP)	RFI Voltage dBuV(Average)
0.15-0.5	79	66
0.5-30	73	60

Note 1: The lower limit shall apply at the transition frequencies.
Note 2: Measurements taken with a 9kHz bandwidth
Note 3: 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.

5.1.2. 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.

a) The EUT was operated in the Random Vibration Loopback mode.

b) Measurements were first made on the 120VAC 60Hz high line.

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

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

e) The data thus obtained was then searched by the computer for the highest levels. Any emissions levels that were within 10dB of the average limit were then measured again using both a quasi-peak detector and an average detector. (If no peak readings were within 10dB of the average limit, quasi-peak and average readings were taken on the highest emissions levels measured during the peak detector scan.)

f) Steps (d) and (e) were repeated for the remainder of the frequency sub-bands until the entire frequency range from 150kHz to 30MHz was investigated. The peak trace was automatically plotted. The plot also shows quasi-peak and average readings that were taken on discrete frequencies. A table showing the quasi-peak and average readings was also generated. This tabular data compares the quasi-peak and average conducted emissions to the applicable conducted emissions limits. The resultant voltage level (VL) is a summation in decibels (dB) of the receiver meter reading (MTR) and the cable loss factor (CF).

Formula 1: VL (dBuV) = MTR (dBuV) + CF (dB).

g) Steps (c) through (f) were repeated on the 120VAC 60Hz return line.

5.1.3. 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 Random Vibration Loopback and Random Vibration Loopback battery power mode are shown on pages 17 through 20. All power line conducted emissions measured from the EUT were within the specification limits.

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

5.2. Radiated Measurements

5.2.1. Requirements

All emanations from a Class A device shall be below the levels shown on the following tables:

RADIATION LIMITS BELOW 1GHz FOR CLASS A DEVICE

Frequency MHz	Distance between EUT And Antenna in Meters	Field Strength Limit Quasi-Peak uV/m	Field Strength Limit Quasi-Peak dBuV/m
30-88	10	90	39
88-216	10	150	43.5
216-960	10	210	46.4
960-1000	10	300	49.5

Note 1: The tighter limit shall apply at the edge between the two frequency bands.
Note 2: Measurements taken with a 120kHz Bandwidth.

RADIATION LIMITS ABOVE 1GHz FOR CLASS A DEVICE

Frequency MHz	Distance between EUT And Antenna in Meters	Field Strength Limit Peak uV/m	Field Strength Limit Peak dBuV/m	Field Strength Limit Average uV/m	Field Strength Limit Average dBuV/m
>1000	10	3000	69.5	300	49.5

Note 1: Measurements taken with a 1MHz Bandwidth.

5.2.2.Procedures

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

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

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

The broadband measuring antenna was positioned at a 3 meter distance from the EUT. The frequency range from 30MHz to 1GHz was investigated using a peak detector function with the bilog antenna at several heights, horizontal and vertical polarization, and with several different orientations of the EUT with respect to the antenna. The frequency range from 1GHz to Max Frequency Tested 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 data was then processed by the computer to equivalent field intensity at 10 meters using linear extrapolation. A -10.5dB (-10.5dB = 20 * Log (3m/10m)) distance correction factor has automatically been applied to the plotted emissions data. The maximum levels for each antenna polarization were plotted. The resultant field strength (FS) is a summation in decibels (dB) of the receiver meter reading (MTR), the antenna correction factor (AF), and the cable loss factor (CF). If an external pre-amplifier is used, the total is reduced by its gain (-PA). If a distance correction (DC) is required, it is added to the total.

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

To convert the Field Strength dBuV/m term to uV/m, the dBuV/m is first divided by 20. The

Base 10 AntiLog is taken of this quotient. The result is the Field Strength value in uV/m terms.

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

Final radiated emissions were performed on all significant broadband and narrowband emissions found in the 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 a peak detector and an average detector and a broadband double ridged waveguide antenna.
2) To ensure that maximum or worst case, emission levels were measured, the following steps were taken:
    a) The EUT was rotated so that all of its sides were exposed to the receiving antenna.
    b) Since the measuring antenna is linearly polarized, both horizontal and vertical field components were measured.
    c) The measuring antenna was raised and lowered from 1 to 4 meters for each antenna polarization to maximize the readings.
    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.

5.2.3.Results

The exploratory peak radiated emission plots from 30MHz to 12.5GHz with the EUT operating in the Random Vibration Loopback are presented on pages 21 through 32. The final radiated emissions tabular data are presented on pages 33 through 34.

The exploratory peak radiated emission plots from 30MHz to 12.5GHz with the EUT operating in the power are presented on pages 35 through 46. The final radiated emissions tabular data are presented on pages 47 through 48.

Radiated emissions data from 30MHz to 1000MHz was tested to FCC 15B Class B limits. Since the FCC 15B Class B limit is a more stringent than the Class limit, the radiated emission levels will also meet Class A.

As can be seen from the data, all emissions measured from the EUT met the quasi-peak limit below 1GHz and met both the peak limit and average limit above 1GHz.

Photographs of the test configuration which yielded the highest or worst case, radiated emission levels are shown on Figure 4 and Figure 5.

6. OTHER TEST CONDITIONS

6.1. Test Personnel and Witnesses

All tests were performed by qualified personnel from Elite Electronic Engineering Incorporated. The test series was witnessed by Vibration Research Corporation personnel.

6.2. Disposition of the EUT

The EUT and all associated equipment were returned to Vibration Research Corporation upon completion of the tests.

7. CONCLUSIONS

The Vibration Research Corporation Portable Vibration Data Recorder, Model No. OBSVER1000, Serial No. Prototype, did fully meet the conducted radio interference requirements of Section 15.107 and the radiated interference requirements of Section 15.109 of the FCC "Code of Federal Regulations" Title 47, Part 15,

Subpart B for Class A equipment.

The Vibration Research Corporation Portable Vibration Data Recorder, Model No. OBSVER1000, Serial No. Prototype, did also fully meet the conducted radio interference requirements of Section 6.1 and the radiated interference requirements of Section 6.2 of the Industry Canada ICES-003 for Class A Information Technology Equipment (ITE).

8. CERTIFICATION

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

The data presented in this test report pertains to the EUT at the test date as operated by Vibration Research Corporation personnel. Any electrical or mechanical modification made to the EUT subsequent to the specified test date will serve to invalidate the data and void this certification.

This report must not be used to claim product certification, approval, or endorsement by A2LA, NIST or any agency of the Federal Government.

9. EQUIPMENT LIST

Table 9-1 Equipment List

Eq ID	Equipment Description	Manufacturer	Model No.	Serial No.	Frequency Range	Cal Date	Due Date
APW11	PREAMPLIFIER	PMI	PE2-35-120-5R0-10-12-SFF	PL11685/1241	1GHZ-20GHZ	3/22/2017	3/22/2018
NTA2	BILOG ANTENNA	TESEQ	6112D	28040	25-1000MHz	11/27/2016	11/27/2017
NWQ1	DOUBLE RIDGED WAVEGUIDE ANTENNA	ETS-LINDGREN	3117	66655	1GHZ-18GHZ	4/4/2016	4/4/2018
PLF2	CISPR16 50UH LISN	ELITE	CISPR16/70A	002	.15-30MHz	5/4/2017	5/4/2018
PLF4	CISPR16 50UH LISN	ELITE	CISPR16/70A	003	.15-30MHz	5/4/2017	5/4/2018
RAKI	RF SECTION	HEWLETT PACKARD	85462A	3411A00181	0.009-6500MHZ	2/23/2017	2/23/2018
RAKJ	RF FILTER SECTION	HEWLETT PACKARD	85460A	3330A00154	---	2/23/2017	2/23/2018
RBA1	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB26	100146	20HZ-26.5GHZ	2/12/2016	3/12/2017
RBG3	EMI ANALYZER	ROHDE & SCHWARZ	ESW44	101592	2HZ-44GHZ	1/11/2017	1/11/2018
SES0	24VDC POWER SUPPLY	P-TRANS	FS-32024-1M	001	18-27VDC	NOTE 1	
T1N5	10DB 20W ATTENUATOR	NARDA	766-10	---	DC-4GHZ	5/2/2016	5/2/2018
XLJN	5W, 50 OHM TERMINATION	JFW INDUSTRIES	50T-052	---	DC-2GHZ	7/7/2016	7/7/2018

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

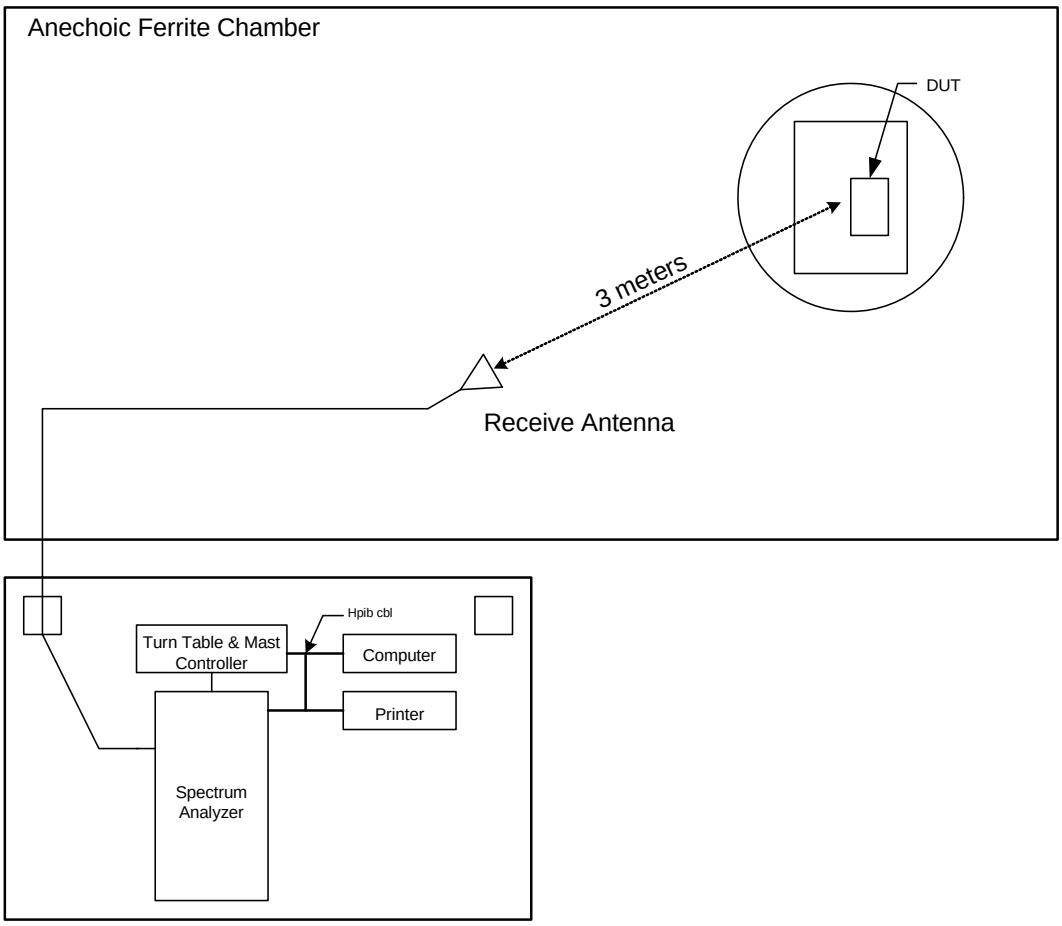
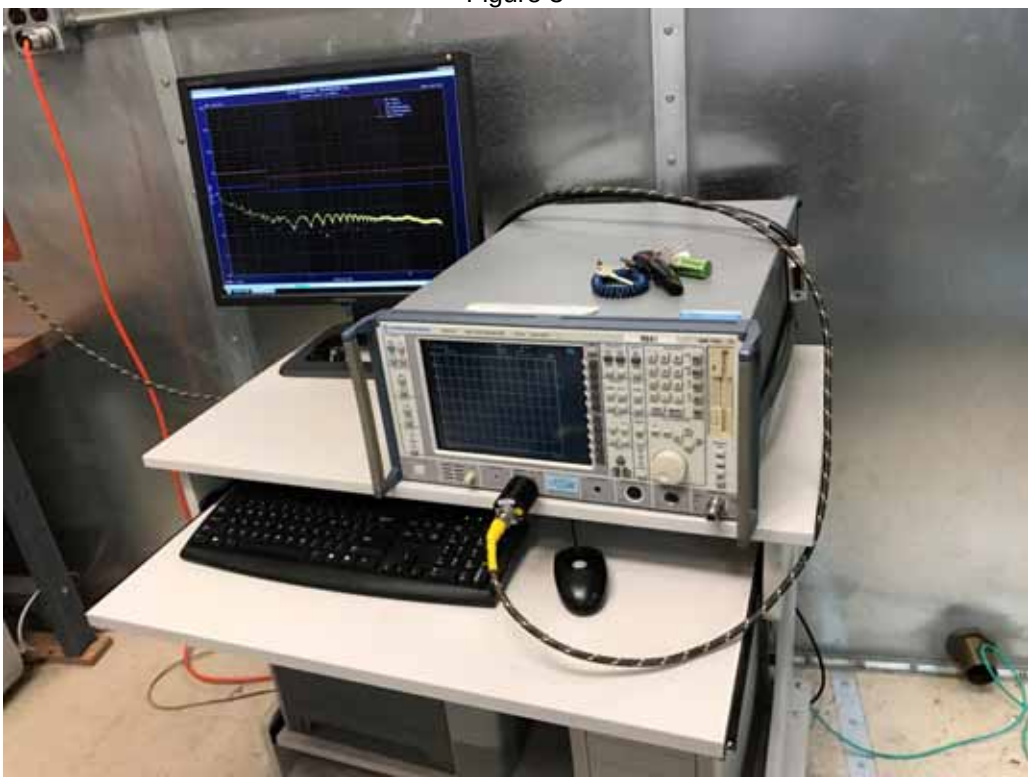


FIGURE 1 BLOCKDIAGRAM OF TEST SETUP

Figure 2

Photograph of the EUT

Figure 3



Test Setup for Conducted Emissions

Test Setup for Conducted Emissions

Figure 4

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

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

Figure 5

Test Setup for Radiated Emissions above 1GHz – Horizontal Polarization

Test Setup for Radiated Emissions above 1GHz – Vertical Polarization

FCC 15B Conducted Emissions Test

Significant Emissions Data

VBR8 04/23/2015

Manufacturer	:	VIBRATION RESEARCH
Model	:	OBSERVR1000
DUT Revision	:	
Serial Number	:	PROTOTYPE
DUT Mode	:	RANDOM VIBRATION LOOPBACK
Line Tested	:	L1
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-10
Notes	:	
Test Engineer	:	R. King
Limit	:	Class A
Test Date	:	Mar 01, 2017 01:22:14 PM
Data Filter	:	Up to 80 maximum levels detected with 6 dB level excursion threshold over 10 dB margin below limit

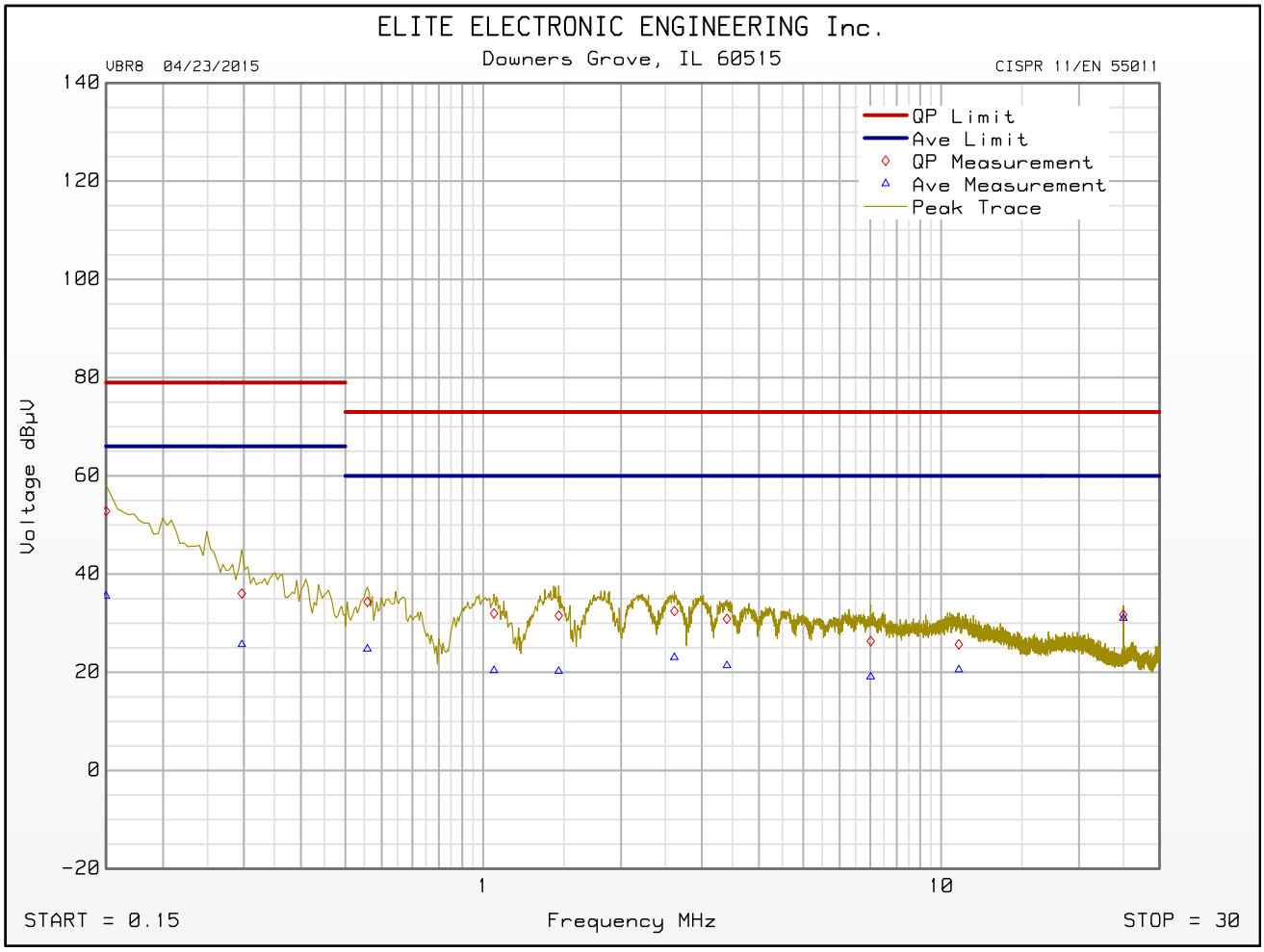
Freq MHz	Quasi-peak Level dBµV	Quasi-peak Limit dBµV	Excessive Quasi-peak Emissions	Average Level dBµV	Average Limit dBµV	Excessive Average Emissions
0.150	52.8	79.0		35.5	66.0	
0.297	36.1	79.0		25.7	66.0	
0.559	34.4	73.0		24.8	60.0	
1.056	32.0	73.0		20.4	60.0	
1.462	31.6	73.0		20.2	60.0	
2.615	32.5	73.0		23.0	60.0	
3.406	30.9	73.0		21.4	60.0	
7.016	26.4	73.0		19.1	60.0	
10.931	25.7	73.0		20.5	60.0	
24.998	31.7	73.0		31.0	60.0	

FCC 15B Conducted Emissions Test

Cumulative Data

VBR8 04/23/2015

Manufacturer	:	VIBRATION RESEARCH
Model	:	OBSERVR1000
DUT Revision	:	
Serial Number	:	PROTOTYPE
DUT Mode	:	RANDOM VIBRATION LOOPBACK
Line Tested	:	L1
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-10
Notes	:	
Test Engineer	:	R. King
Limit	:	Class A
Test Date	:	Mar 01, 2017 01:22:14 PM



Emissions Meet QP Limit
Emissions Meet Ave Limit

FCC 15B Conducted Emissions Test

Significant Emissions Data

VBR8 04/23/2015

Manufacturer	:	VIBRATION RESEARCH
Model	:	OBSERVR1000
DUT Revision	:	
Serial Number	:	PROTOTYPE
DUT Mode	:	RANDOM VIBRATION LOOPBACK
Line Tested	:	L2
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-10
Notes	:	
Test Engineer	:	R. King
Limit	:	Class A
Test Date	:	Mar 01, 2017 01:16:30 PM
Data Filter	:	Up to 80 maximum levels detected with 6 dB level excursion threshold over 10 dB margin below limit

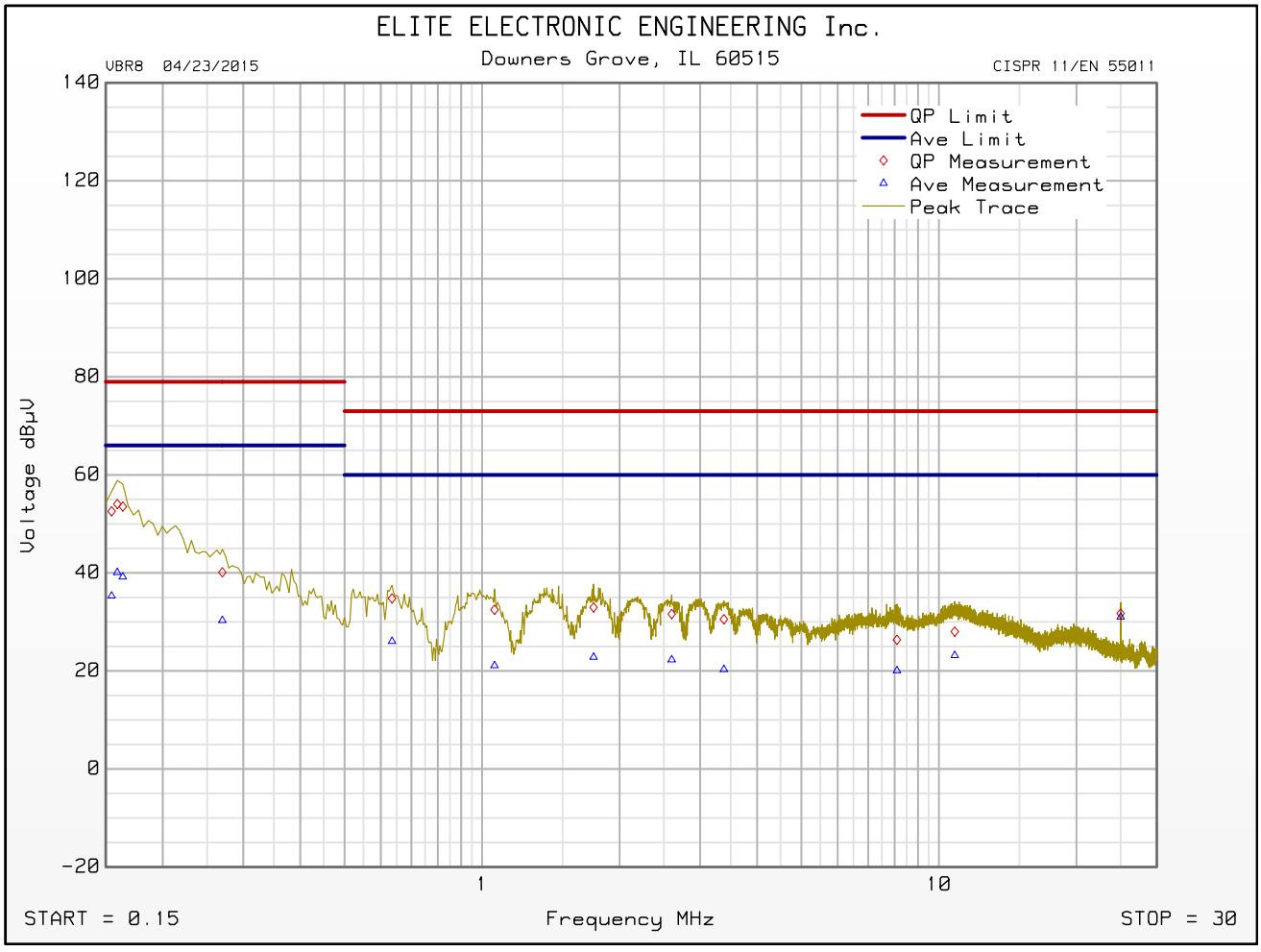
Freq MHz	Quasi-peak Level dBµV	Quasi-peak Limit dBµV	Excessive Quasi-peak Emissions	Average Level dBµV	Average Limit dBµV	Excessive Average Emissions
0.159	54.1	79.0		40.1	66.0	
0.270	40.1	79.0		30.3	66.0	
0.635	34.8	73.0		26.1	60.0	
1.065	32.5	73.0		21.1	60.0	
1.754	33.0	73.0		22.8	60.0	
2.601	31.6	73.0		22.3	60.0	
3.383	30.5	73.0		20.3	60.0	
8.092	26.4	73.0		20.1	60.0	
10.832	28.0	73.0		23.2	60.0	
24.998	31.7	73.0		31.0	60.0	

FCC 15B Conducted Emissions Test

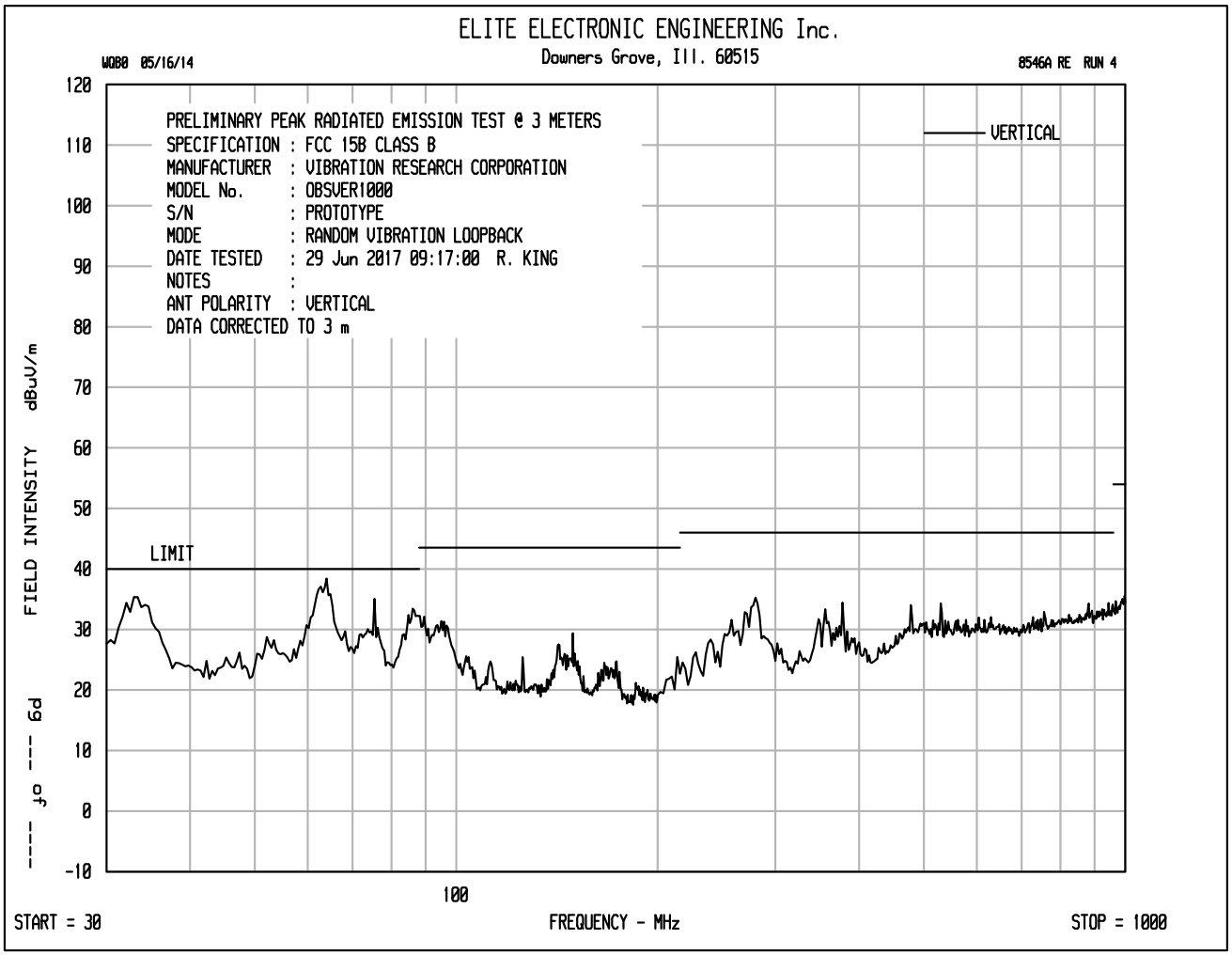
Cumulative Data

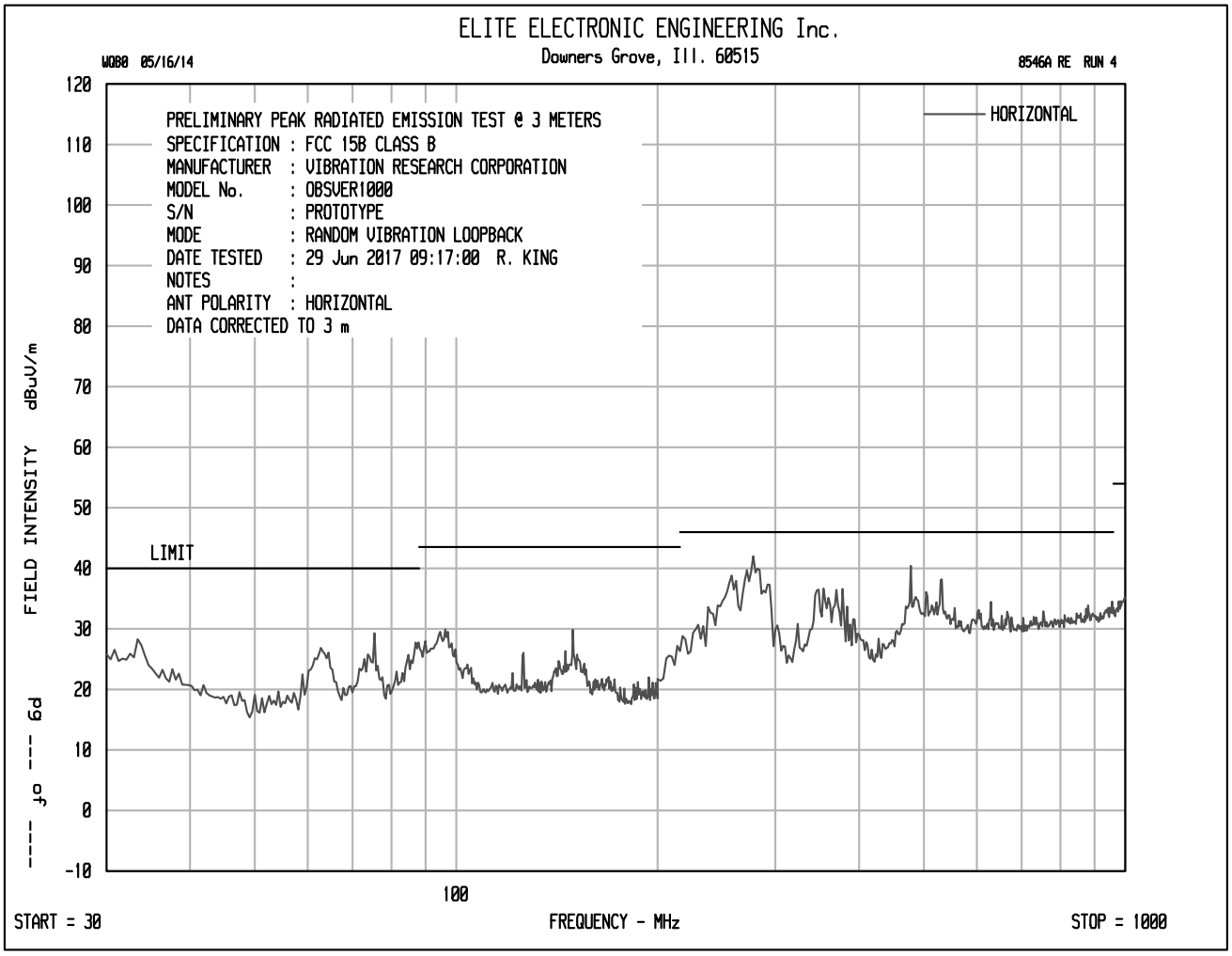
VBR8 04/23/2015

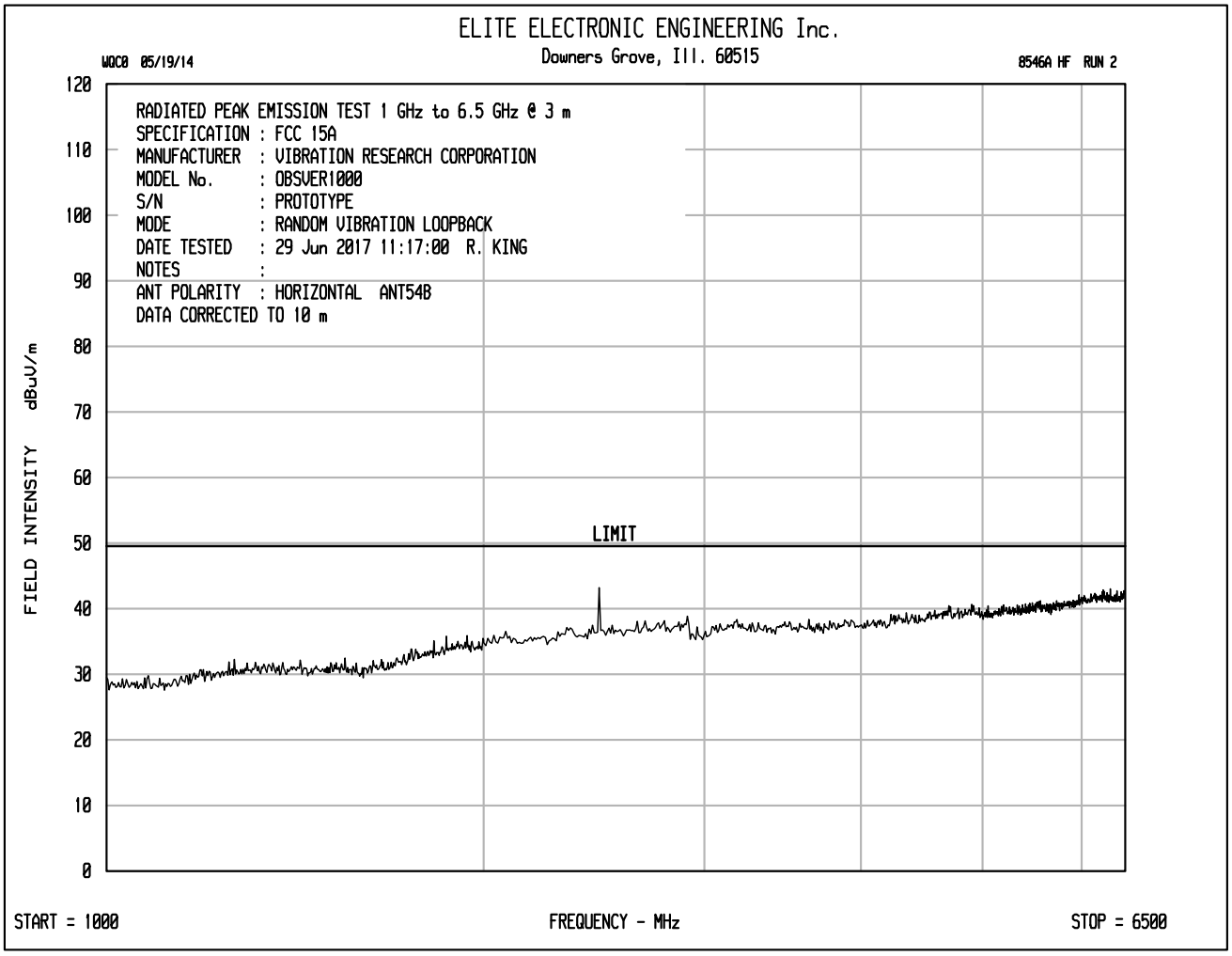
Manufacturer	:	VIBRATION RESEARCH
Model	:	OBSERVR1000
DUT Revision	:	
Serial Number	:	PROTOTYPE
DUT Mode	:	RANDOM VIBRATION LOOPBACK
Line Tested	:	L2
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-10
Notes	:	
Test Engineer	:	R. King
Limit	:	Class A
Test Date	:	Mar 01, 2017 01:16:30 PM

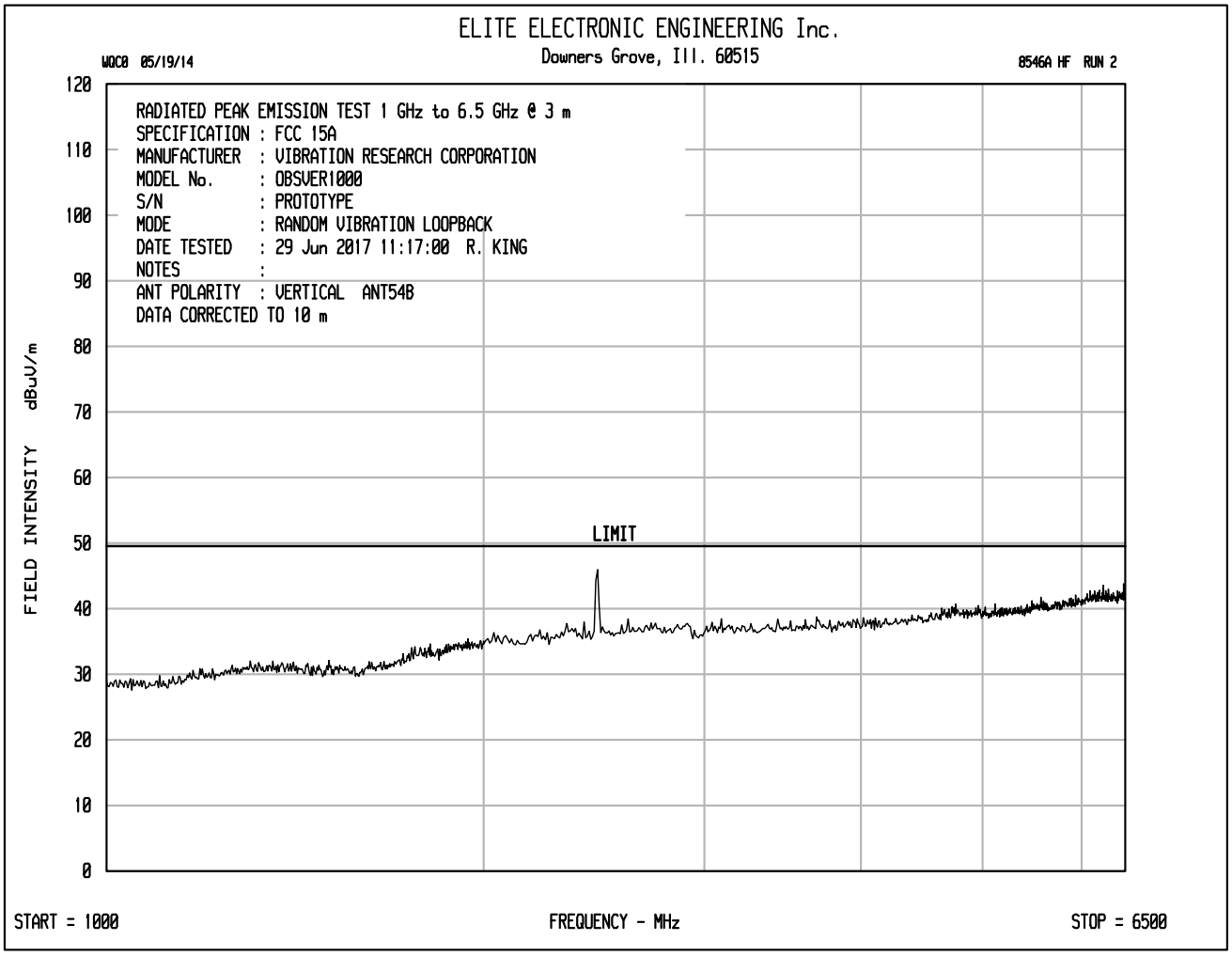


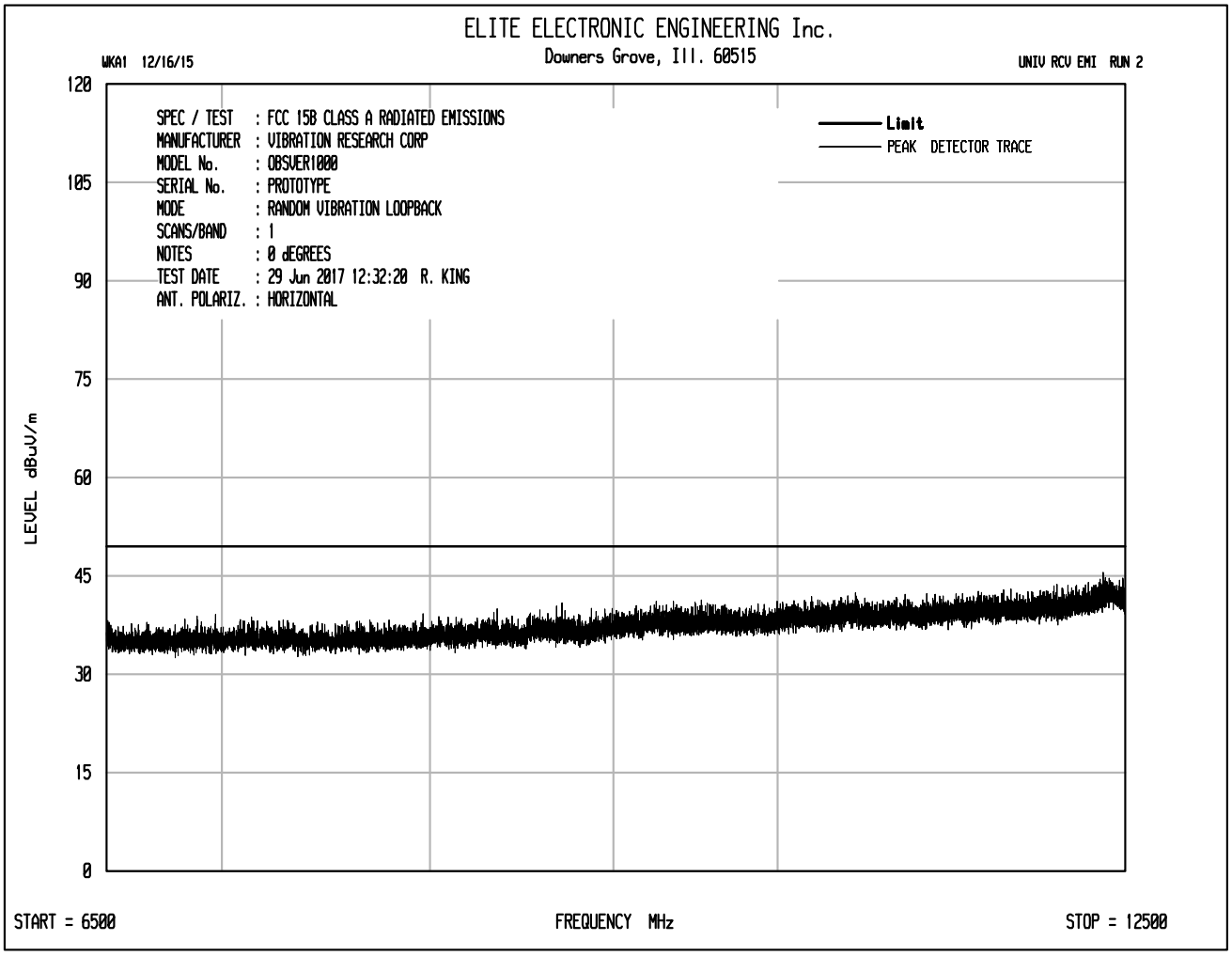
Emissions Meet QP Limit
Emissions Meet Ave Limit

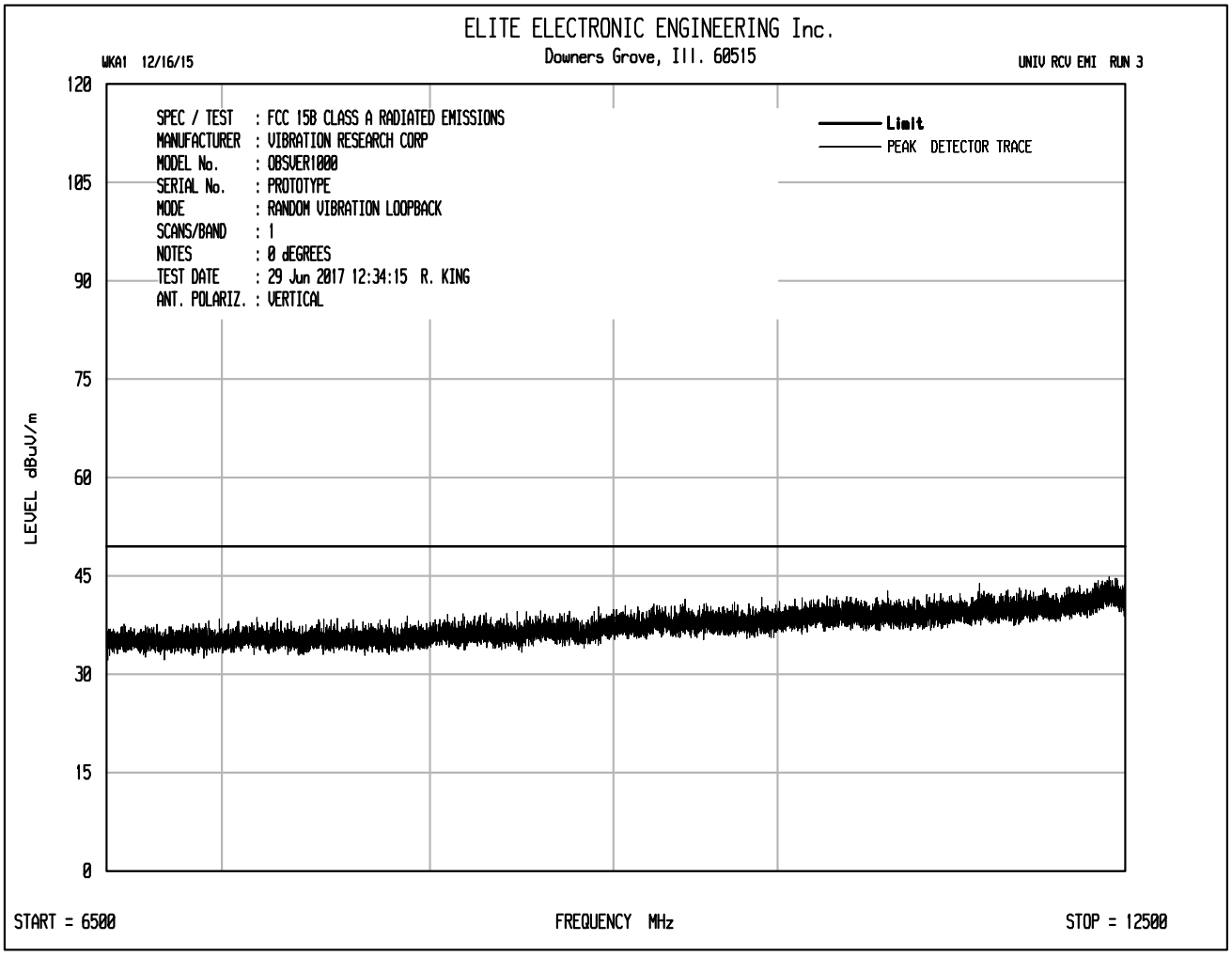

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
W080 05/16/14
8546A RE RUN 4
PRELIMINARY PEAK RADIATED EMISSION TEST @ 3 METERS
SPECIFICATION : FCC 15B CLASS B
MANUFACTURER : VIBRATION RESEARCH CORPORATION
MODEL No. : OBSVER1000
S/N : PROTOTYPE
MODE : RANDOM VIBRATION LOOPBACK
DATE TESTED : 29 Jun 2017 09:17:00 R. KING
NOTES :
ANT POLARITY : VERTICAL
DATA CORRECTED TO 3 m
VERTICAL
LIMIT
FIELD INTENSITY dBuV/m
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
100
START = 30
FREQUENCY - MHz
STOP = 1000

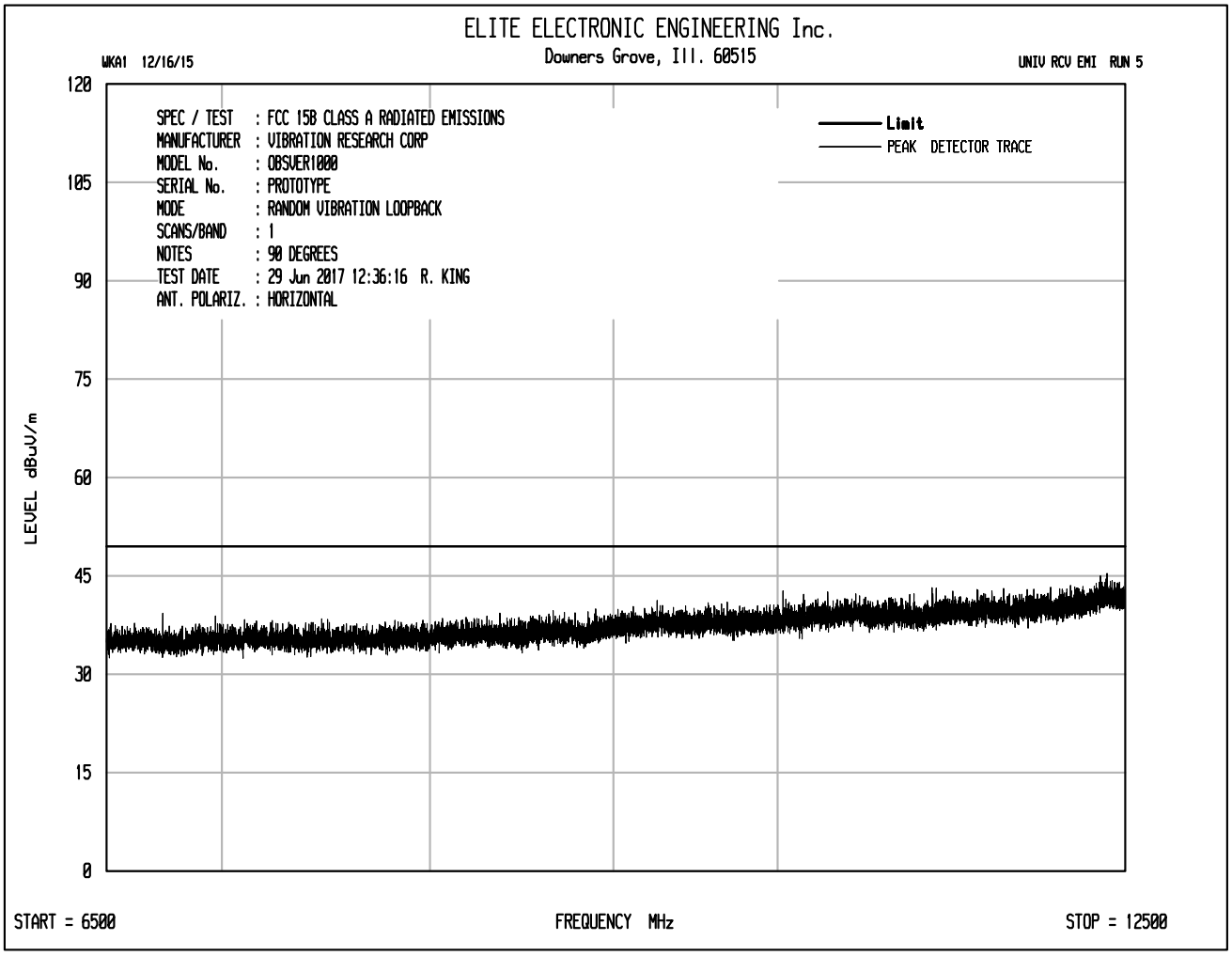

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
W080 05/16/14
8546A RE RUN 4
PRELIMINARY PEAK RADIATED EMISSION TEST @ 3 METERS
SPECIFICATION : FCC 15B CLASS B
MANUFACTURER : VIBRATION RESEARCH CORPORATION
MODEL No. : OBSVER1000
S/N : PROTOTYPE
MODE : RANDOM VIBRATION LOOPBACK
DATE TESTED : 29 Jun 2017 09:17:00 R. KING
NOTES :
ANT POLARITY : HORIZONTAL
DATA CORRECTED TO 3 m
HORIZONTAL
LIMIT
FIELD INTENSITY dBuV/m
---- of --- 69
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
100
START = 30
FREQUENCY - MHz
STOP = 1000

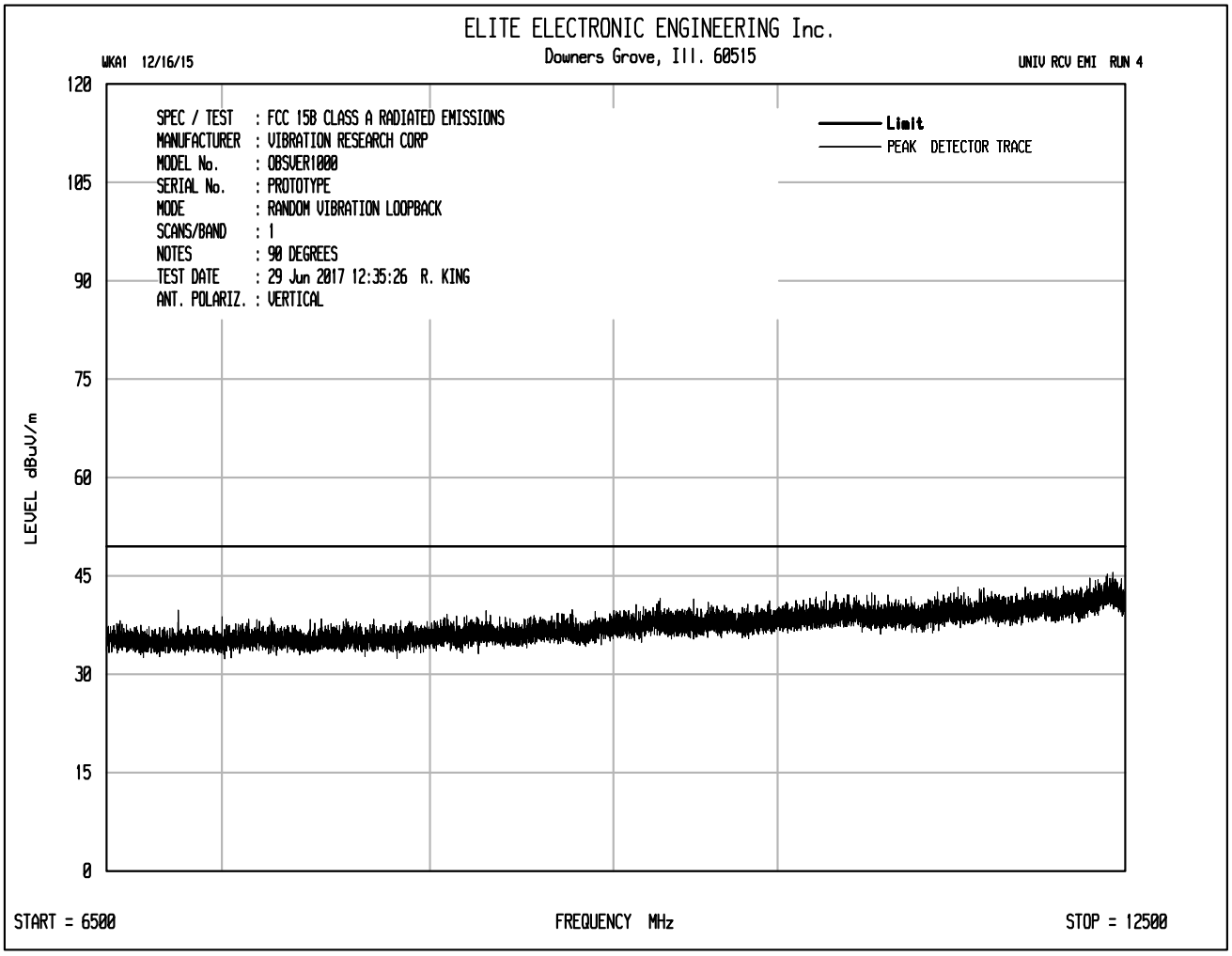

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
W0C8 05/19/14
8546A HF RUN 2
RADIATED PEAK EMISSION TEST 1 GHz to 6.5 GHz @ 3 m
SPECIFICATION : FCC 15A
MANUFACTURER : VIBRATION RESEARCH CORPORATION
MODEL No. : OBSVER1000
S/N : PROTOTYPE
MODE : RANDOM VIBRATION LOOPBACK
DATE TESTED : 29 Jun 2017 11:17:00 R. KING
NOTES :
ANT POLARITY : HORIZONTAL ANT54B
DATA CORRECTED TO 10 m
LIMIT
FIELD INTENSITY dBuV/m
120
110
100
90
80
70
60
50
40
30
20
10
0
START = 1000
FREQUENCY - MHz
STOP = 6500

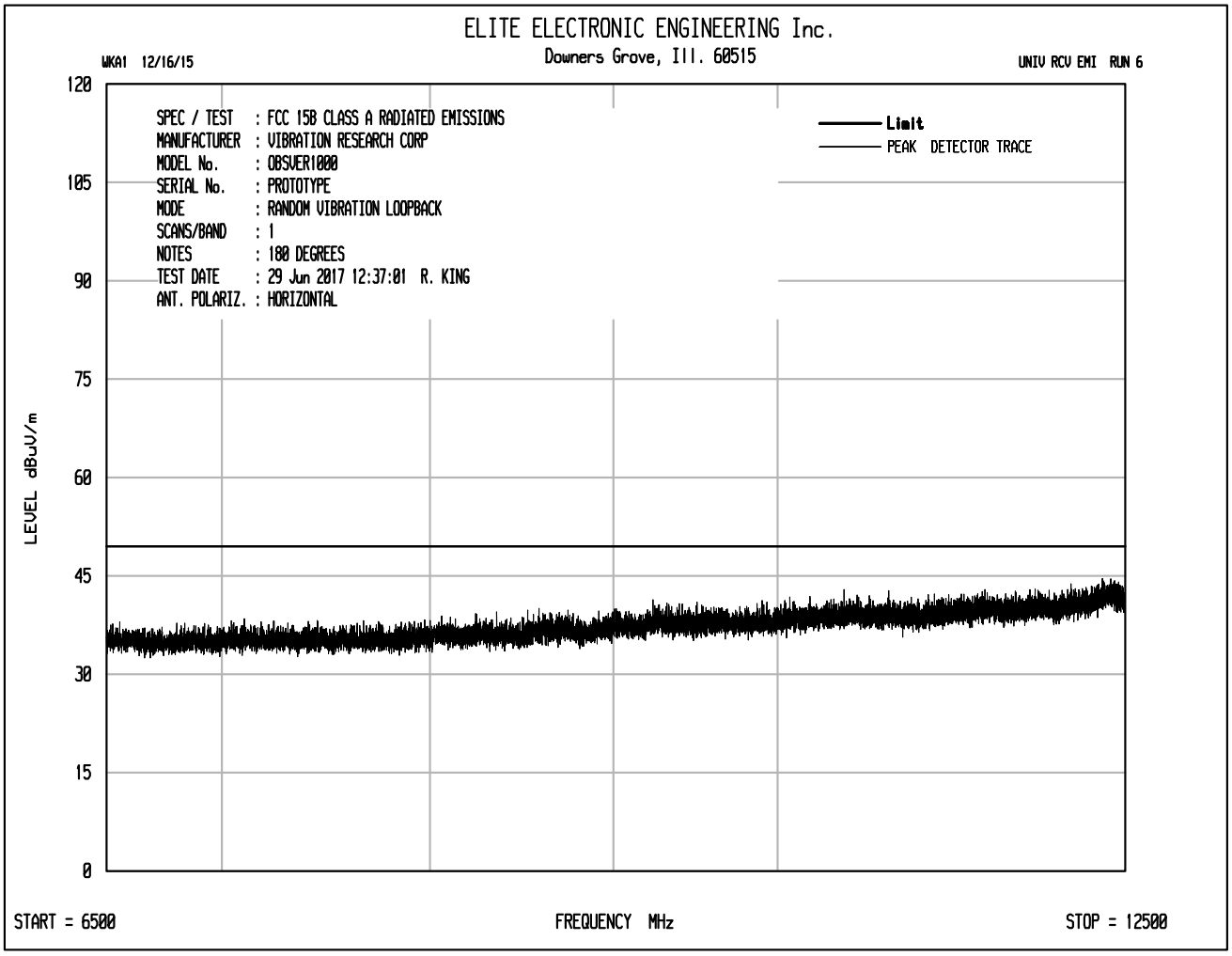

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WQC8 05/19/14
8546A HF RUN 2
RADIATED PEAK EMISSION TEST 1 GHz to 6.5 GHz @ 3 m
SPECIFICATION : FCC 15A
MANUFACTURER : VIBRATION RESEARCH CORPORATION
MODEL No. : OBSVER1000
S/N : PROTOTYPE
MODE : RANDOM VIBRATION LOOPBACK
DATE TESTED : 29 Jun 2017 11:17:00 R. KING
NOTES :
ANT POLARITY : VERTICAL ANT54B
DATA CORRECTED TO 10 m
FIELD INTENSITY dBuV/m
120
110
100
90
80
70
60
50
40
30
20
10
0
LIMIT
START = 1000
FREQUENCY - MHz
STOP = 6500

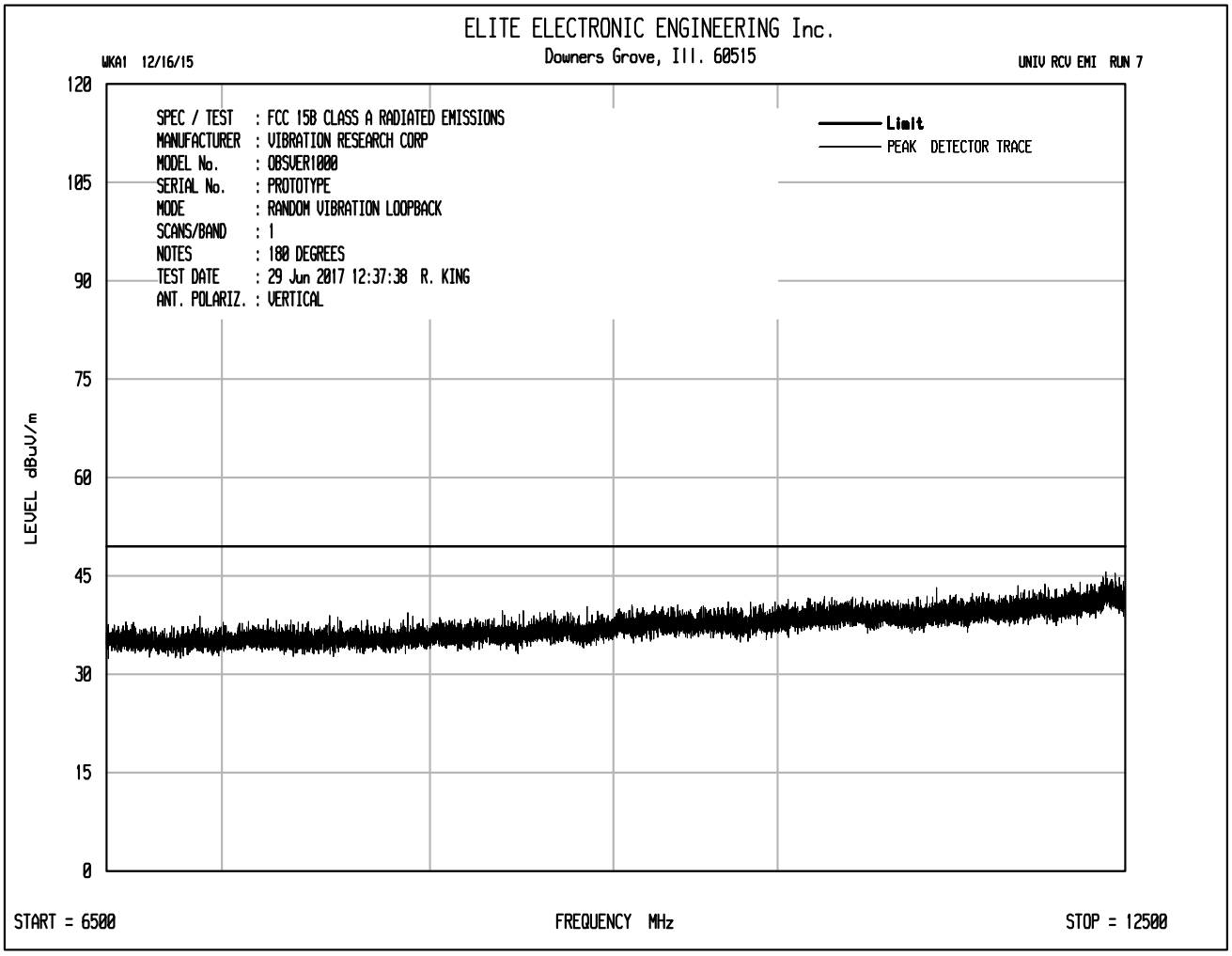

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 12/16/15
UNIV RCV EMI RUN 2
SPEC / TEST : FCC 15B CLASS A RADIATED EMISSIONS
MANUFACTURER : VIBRATION RESEARCH CORP
MODEL No. : OBSVER1000
SERIAL No. : PROTOTYPE
MODE : RANDOM VIBRATION LOOPBACK
SCANS/BAND : 1
NOTES : 0 dEGREES
TEST DATE : 29 Jun 2017 12:32:20 R. KING
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 6500
FREQUENCY MHz
STOP = 12500

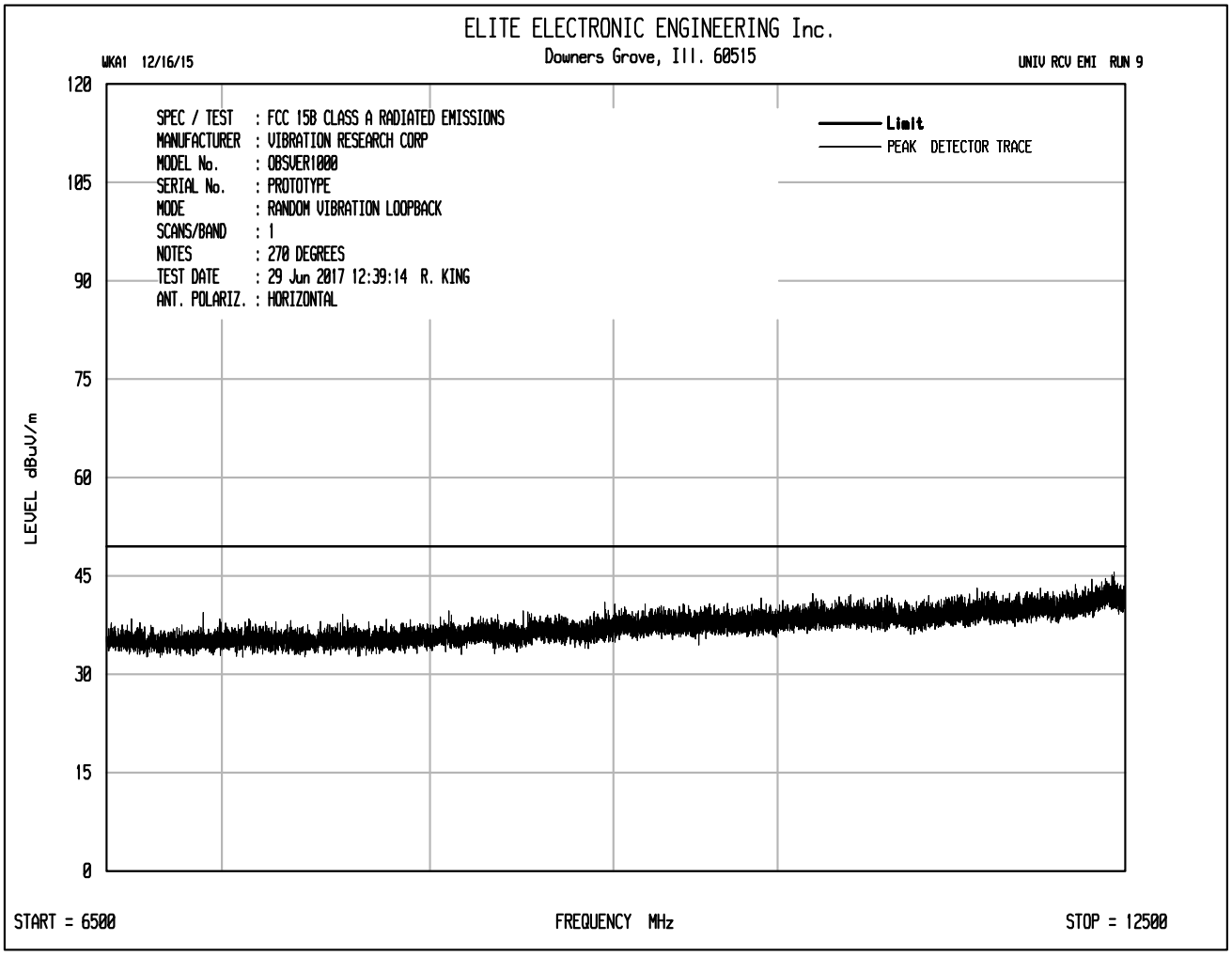

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 12/16/15
UNIV RCV EMI RUN 3
SPEC / TEST : FCC 15B CLASS A RADIATED EMISSIONS
MANUFACTURER : VIBRATION RESEARCH CORP
MODEL No. : OBSVER1000
SERIAL No. : PROTOTYPE
MODE : RANDOM VIBRATION LOOPBACK
SCANS/BAND : 1
NOTES : 0 dEGREES
TEST DATE : 29 Jun 2017 12:34:15 R. KING
ANT. POLARIZ. : VERTICAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 6500
FREQUENCY MHz
STOP = 12500

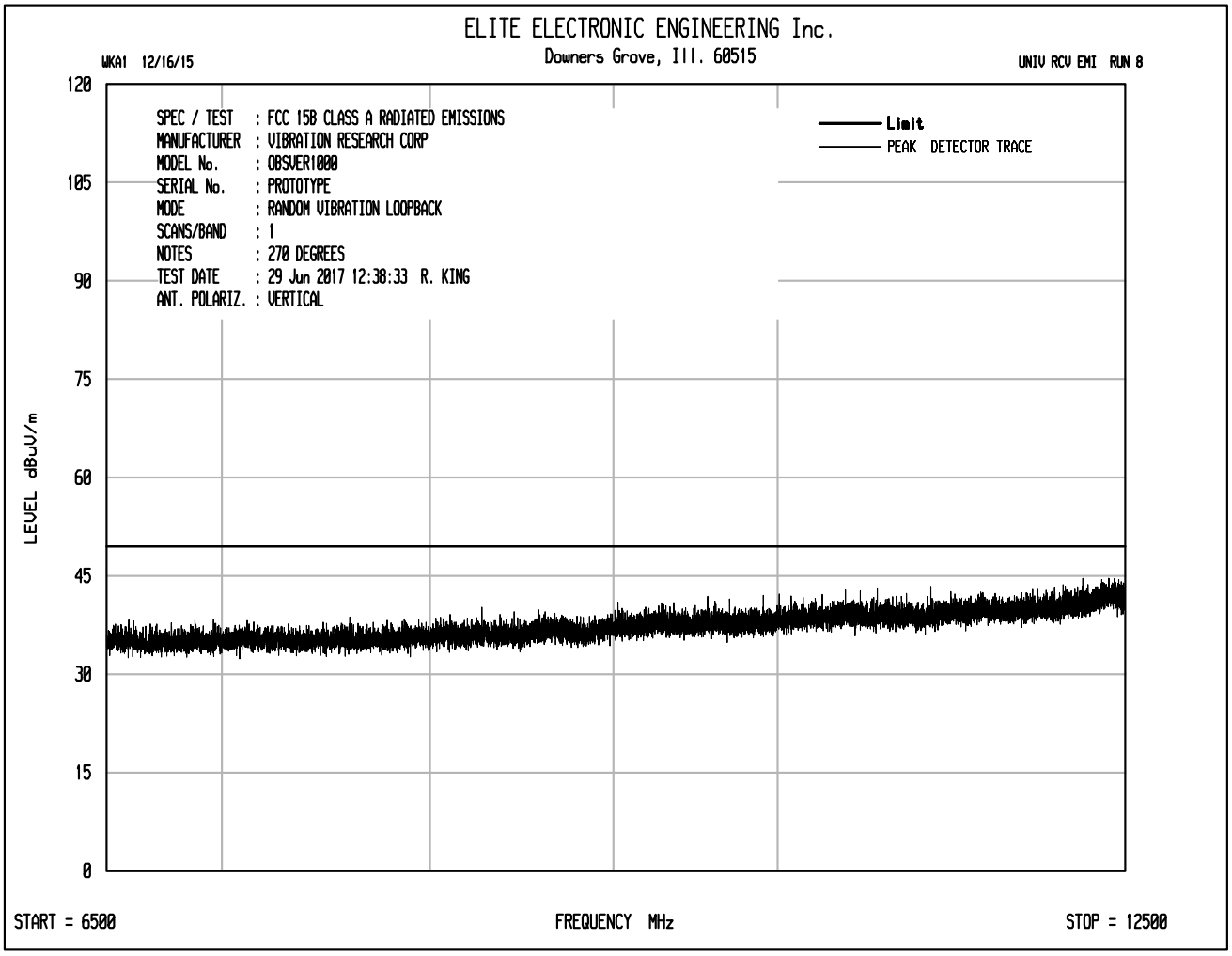

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 12/16/15
UNIV RCV EMI RUN 5
SPEC / TEST : FCC 15B CLASS A RADIATED EMISSIONS
MANUFACTURER : VIBRATION RESEARCH CORP
MODEL No. : OBSVER1000
SERIAL No. : PROTOTYPE
MODE : RANDOM VIBRATION LOOPBACK
SCANS/BAND : 1
NOTES : 90 DEGREES
TEST DATE : 29 Jun 2017 12:36:16 R. KING
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 6500
FREQUENCY MHz
STOP = 12500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 12/16/15
UNIV RCV EMI RUN 4
SPEC / TEST : FCC 15B CLASS A RADIATED EMISSIONS
MANUFACTURER : VIBRATION RESEARCH CORP
MODEL No. : OBSVER1000
SERIAL No. : PROTOTYPE
MODE : RANDOM VIBRATION LOOPBACK
SCANS/BAND : 1
NOTES : 90 DEGREES
TEST DATE : 29 Jun 2017 12:35:26 R. KING
ANT. POLARIZ. : VERTICAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 6500
FREQUENCY MHz
STOP = 12500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 12/16/15
UNIV RCV EMI RUN 6
SPEC / TEST : FCC 15B CLASS A RADIATED EMISSIONS
MANUFACTURER : VIBRATION RESEARCH CORP
MODEL No. : OBSVER1000
SERIAL No. : PROTOTYPE
MODE : RANDOM VIBRATION LOOPBACK
SCANS/BAND : 1
NOTES : 180 DEGREES
TEST DATE : 29 Jun 2017 12:37:01 R. KING
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 6500
FREQUENCY MHz
STOP = 12500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 12/16/15
UNIV RCV EMI RUN 7
SPEC / TEST : FCC 15B CLASS A RADIATED EMISSIONS
MANUFACTURER : VIBRATION RESEARCH CORP
MODEL No. : OBSVER1000
SERIAL No. : PROTOTYPE
MODE : RANDOM VIBRATION LOOPBACK
SCANS/BAND : 1
NOTES : 180 DEGREES
TEST DATE : 29 Jun 2017 12:37:38 R. KING
ANT. POLARIZ. : VERTICAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 6500
FREQUENCY MHz
STOP = 12500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 12/16/15
UNIV RCV EMI RUN 9
SPEC / TEST : FCC 15B CLASS A RADIATED EMISSIONS
MANUFACTURER : VIBRATION RESEARCH CORP
MODEL No. : OBSVER1000
SERIAL No. : PROTOTYPE
MODE : RANDOM VIBRATION LOOPBACK
SCANS/BAND : 1
NOTES : 270 DEGREES
TEST DATE : 29 Jun 2017 12:39:14 R. KING
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 6500
FREQUENCY MHz
STOP = 12500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 12/16/15
UNIV RCV EMI RUN 8
SPEC / TEST : FCC 15B CLASS A RADIATED EMISSIONS
MANUFACTURER : VIBRATION RESEARCH CORP
MODEL No. : OBSVER1000
SERIAL No. : PROTOTYPE
MODE : RANDOM VIBRATION LOOPBACK
SCANS/BAND : 1
NOTES : 270 DEGREES
TEST DATE : 29 Jun 2017 12:38:33 R. KING
ANT. POLARIZ. : VERTICAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 6500
FREQUENCY MHz
STOP = 12500

ETR No. 8546A
DATA SHEET TEST NO. 4

RADIATED QP EMISSION MEASUREMENTS in a 3 m SEMI-ANECHOIC ROOM
SPECIFICATION : FCC 15B CLASS B
MANUFACTURER : VIBRATION RESEARCH CORPORATION
MODEL NO. : OBSVER1000
SERIAL NO. : PROTOTYPE
TEST MODE : RANDOM VIBRATION LOOPBACK
NOTES :
TEST DATE : 29 Jun 2017 09:17:00
TEST DISTANCE : 3 m

FREQUENCY	QP READING	ANT FAC	CBL FAC	EXT ATTN	DIST FAC	TOTAL	QP LIMIT	AZ	ANT HT	ANT POL
MHz	dBuV	dB	dB	dB	dB	dBuV/m	dBuV/m	deg	cm	
33.96	7.8	21.8	.5	0.0	0.0	30.1	40.0	45	120	V
63.56	20.7	12.3	.5	0.0	0.0	33.5	40.0	270	200	V
75.00	20.6	12.7	.5	0.0	0.0	33.8	40.0	270	120	V
97.23	6.1	16.5	.5	0.0	0.0	23.1	43.5	0	200	H
142.28	6.6	17.0	.8	0.0	0.0	24.3	43.5	135	120	V
148.50	10.5	16.5	.8	0.0	0.0	27.8	43.5	315	200	H
171.21	.8	15.8	.9	0.0	0.0	17.5	43.5	0	120	V
254.28	20.0	18.4	1.0	0.0	0.0	39.4	46.0	225	120	H
277.88	21.6	18.7	1.0	0.0	0.0	41.3	46.0	315	120	H
375.00	12.9	20.9	1.4	0.0	0.0	35.2	46.0	90	120	H
475.00	15.4	23.4	1.5	0.0	0.0	40.3	46.0	315	200	H
625.02	2.9	24.9	1.6	0.0	0.0	29.4	46.0	0	340	H
750.00	1.6	25.7	1.9	0.0	0.0	29.2	46.0	225	200	V
887.53	-5.5	26.5	2.0	0.0	0.0	23.1	46.0	90	340	V
950.00	1.2	27.2	2.0	0.0	0.0	30.4	46.0	90	200	H

Richard E. King

tested by: _____
R. KING

pg ___ of ____

DATA SHEET HF TEST NO. 2

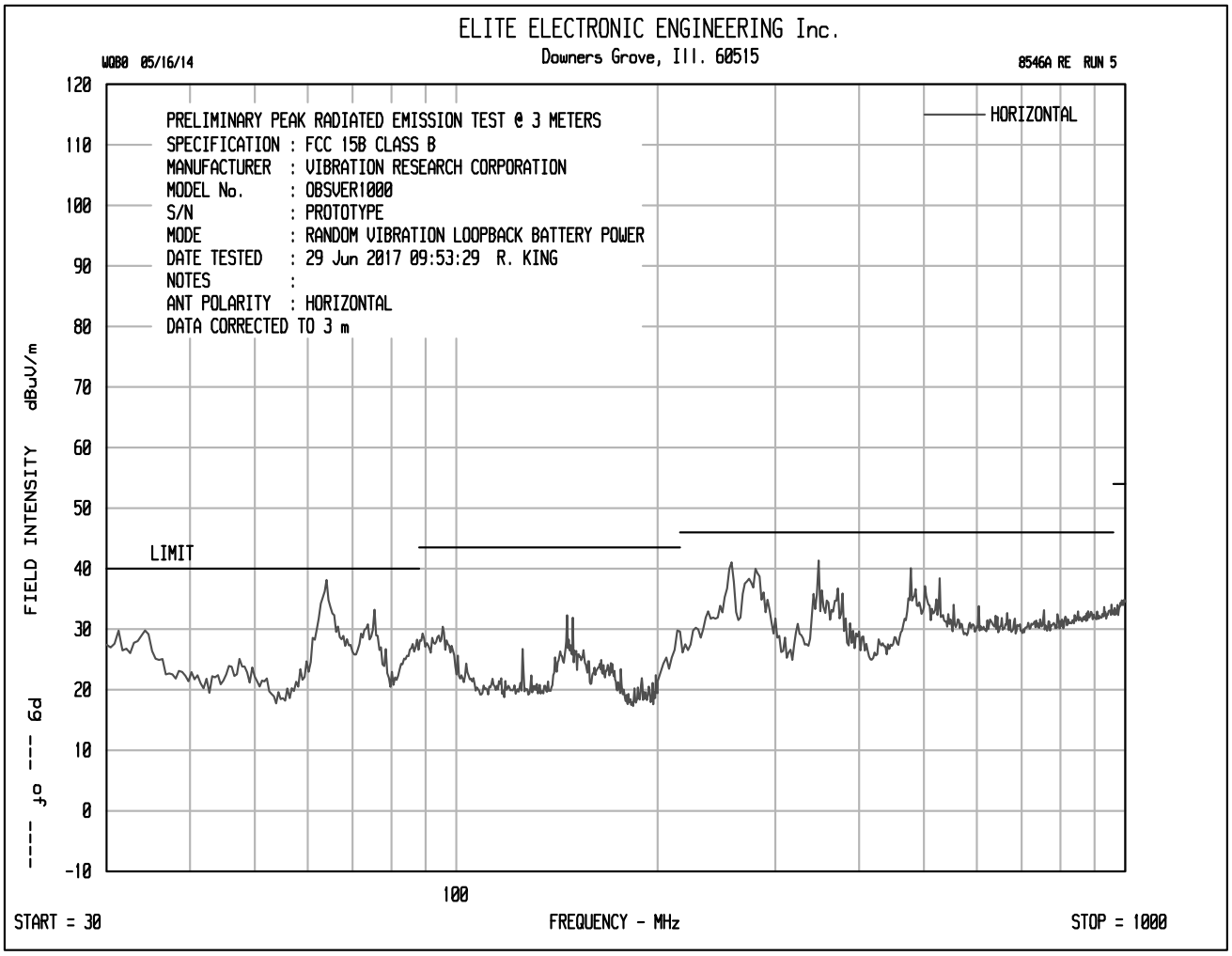
RADIATED AVG EMISSION MEASUREMENTS >=1000 MHz in a 3 m ANECHOIC ROOM

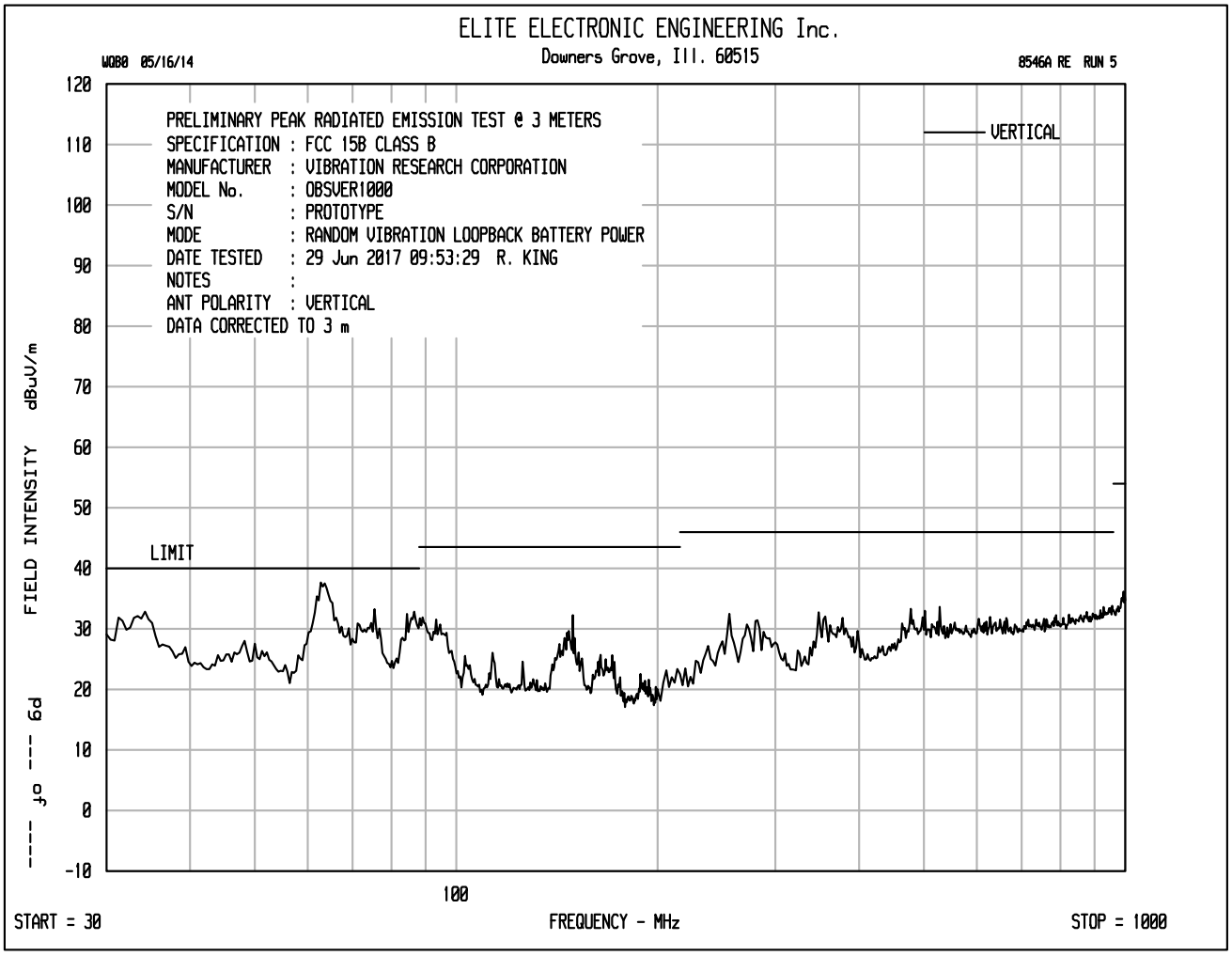
SPECIFICATION : FCC 15A
MANUFACTURER : VIBRATION RESEARCH CORPORATION
MODEL NO. : OBSVER1000
SERIAL NO. : PROTOTYPE
TEST MODE : RANDOM VIBRATION LOOPBACK
NOTES :
TEST DATE : 29 Jun 2017 11:17:00
TEST DISTANCE : 3 m (DATA EXTRAPOLATED TO 10 m)
ANTENNA : ANT54B

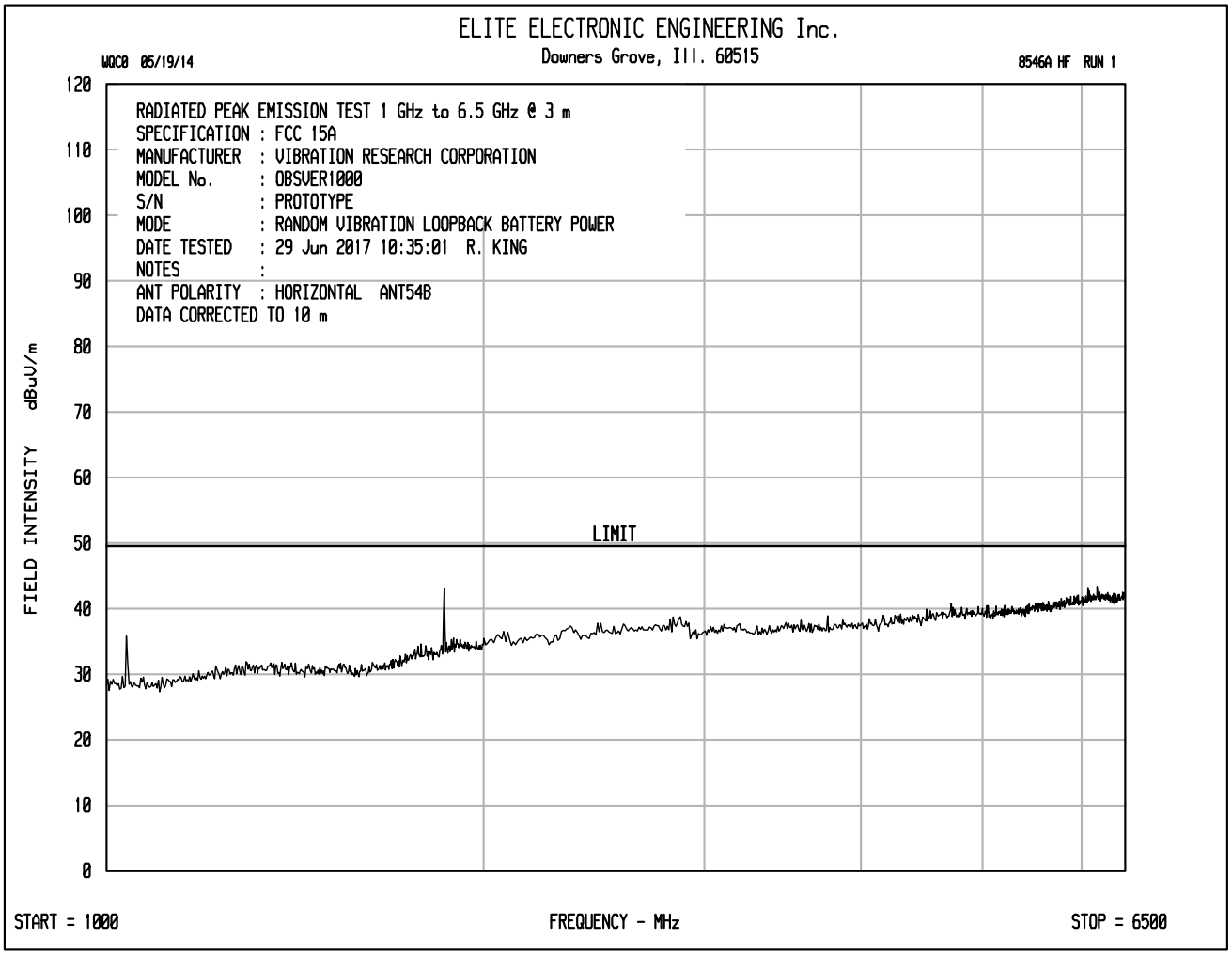
FREQUENCY	AVG READING	ANT FAC	CBL FAC	DIST FAC	TOTAL	AVG LIMIT	PASS/ FAIL	AZ	ANT HT	POLAR
MHz	dBuV	dB	dB	dB	dBuV/m	dBuV/m		deg	cm	
1277.12	-3.5	29.0	2.4	-10.5	17.4	49.5		225	120	H
1305.61	-3.7	29.2	2.4	-10.5	17.4	49.5		315	340	V
1411.27	-3.5	28.9	2.5	-10.5	17.4	49.5		315	340	H
2200.82	-2.9	31.6	3.2	-10.5	21.4	49.5		315	120	V
2461.88	7.0	32.4	3.5	-10.5	32.4	49.5		225	340	V
6219.21	-3.6	34.7	5.0	-10.5	25.7	49.5		270	120	V
6098.33	-3.7	34.7	5.0	-10.5	25.6	49.5		270	340	H
6132.89	-3.6	34.7	5.0	-10.5	25.7	49.5		270	120	V
6195.78	-3.5	34.7	5.0	-10.5	25.7	49.5		270	120	V
6239.49	-3.6	34.7	5.0	-10.5	25.7	49.5		315	200	V
6431.54	-3.8	34.7	5.0	-10.5	25.4	49.5		270	340	H

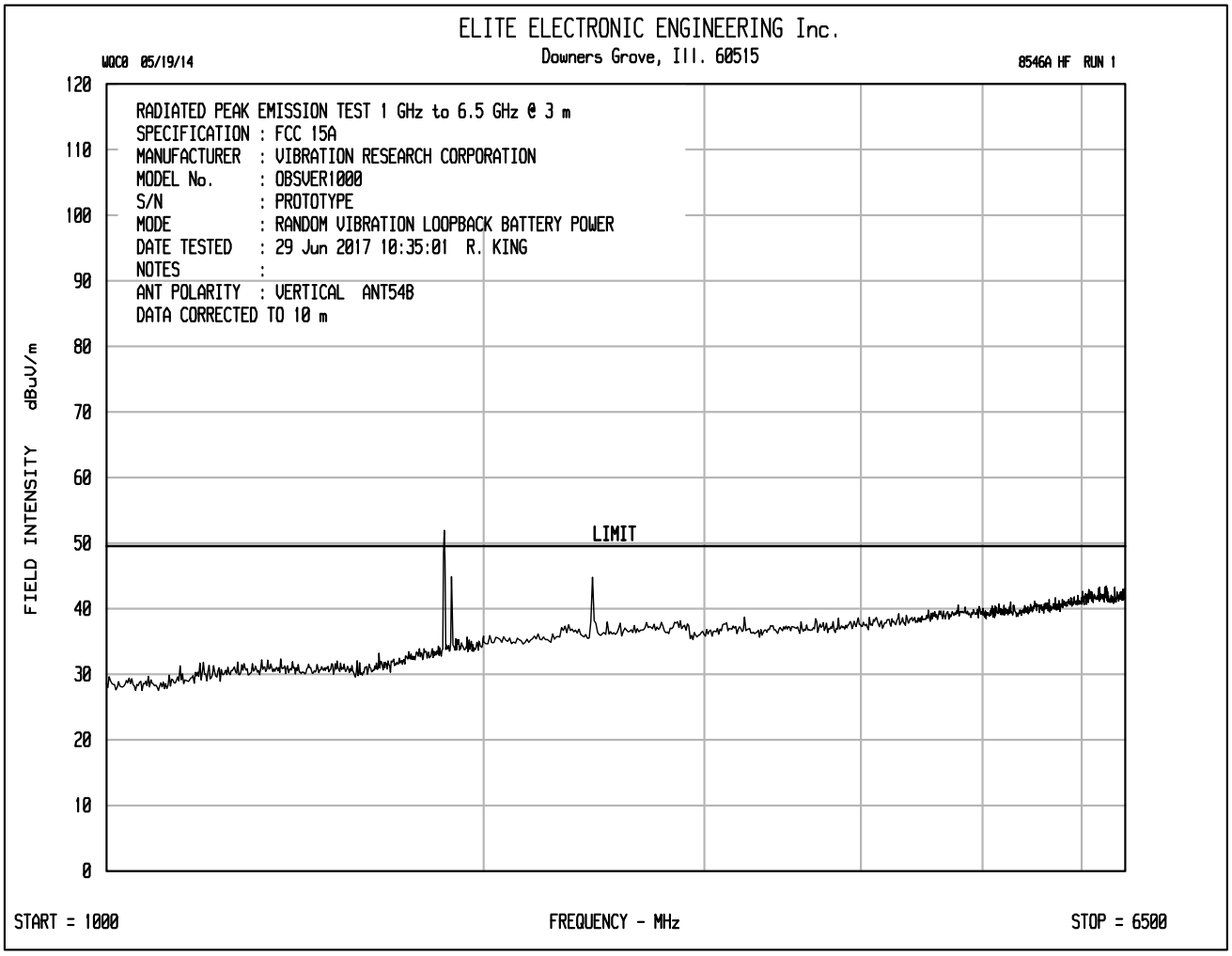
Richard E. King

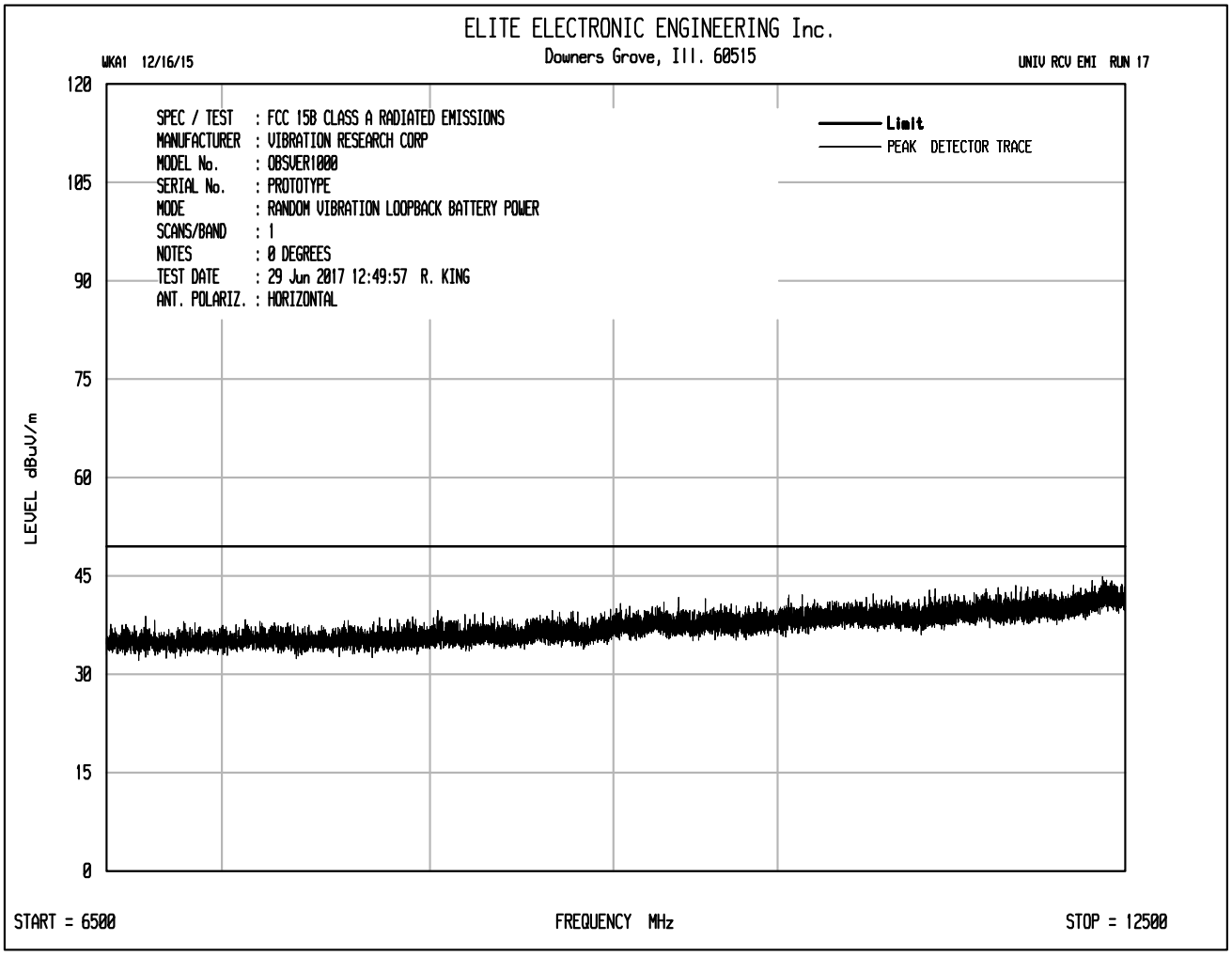
tested by: --- -
R. KING

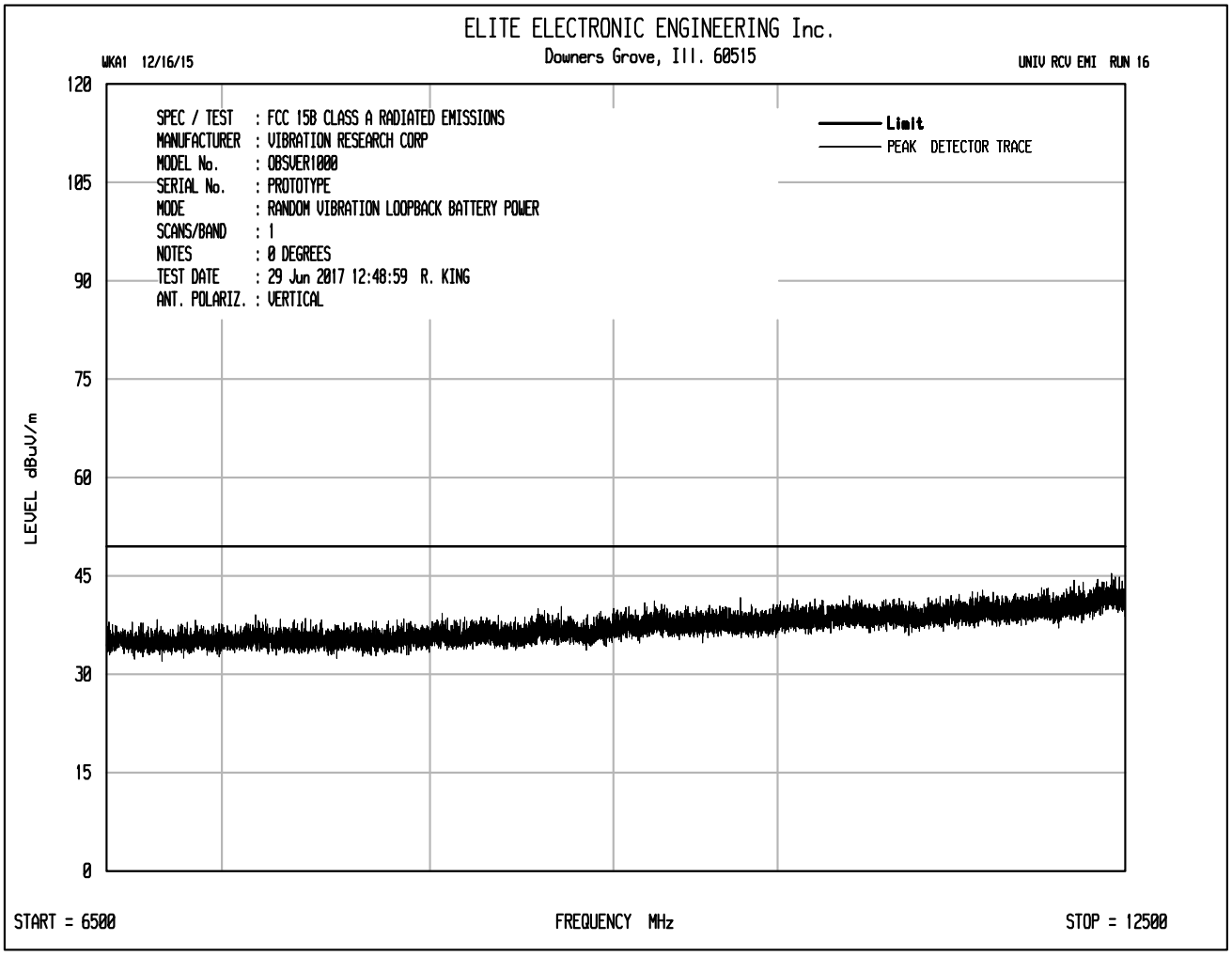

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
W080 05/16/14
8546A RE RUN 5
PRELIMINARY PEAK RADIATED EMISSION TEST @ 3 METERS
SPECIFICATION : FCC 15B CLASS B
MANUFACTURER : VIBRATION RESEARCH CORPORATION
MODEL No. : OBSVER1000
S/N : PROTOTYPE
MODE : RANDOM VIBRATION LOOPBACK BATTERY POWER
DATE TESTED : 29 Jun 2017 09:53:29 R. KING
NOTES :
ANT POLARITY : HORIZONTAL
DATA CORRECTED TO 3 m
HORIZONTAL
LIMIT
FIELD INTENSITY dBuV/m
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
100
START = 30
FREQUENCY - MHz
STOP = 1000

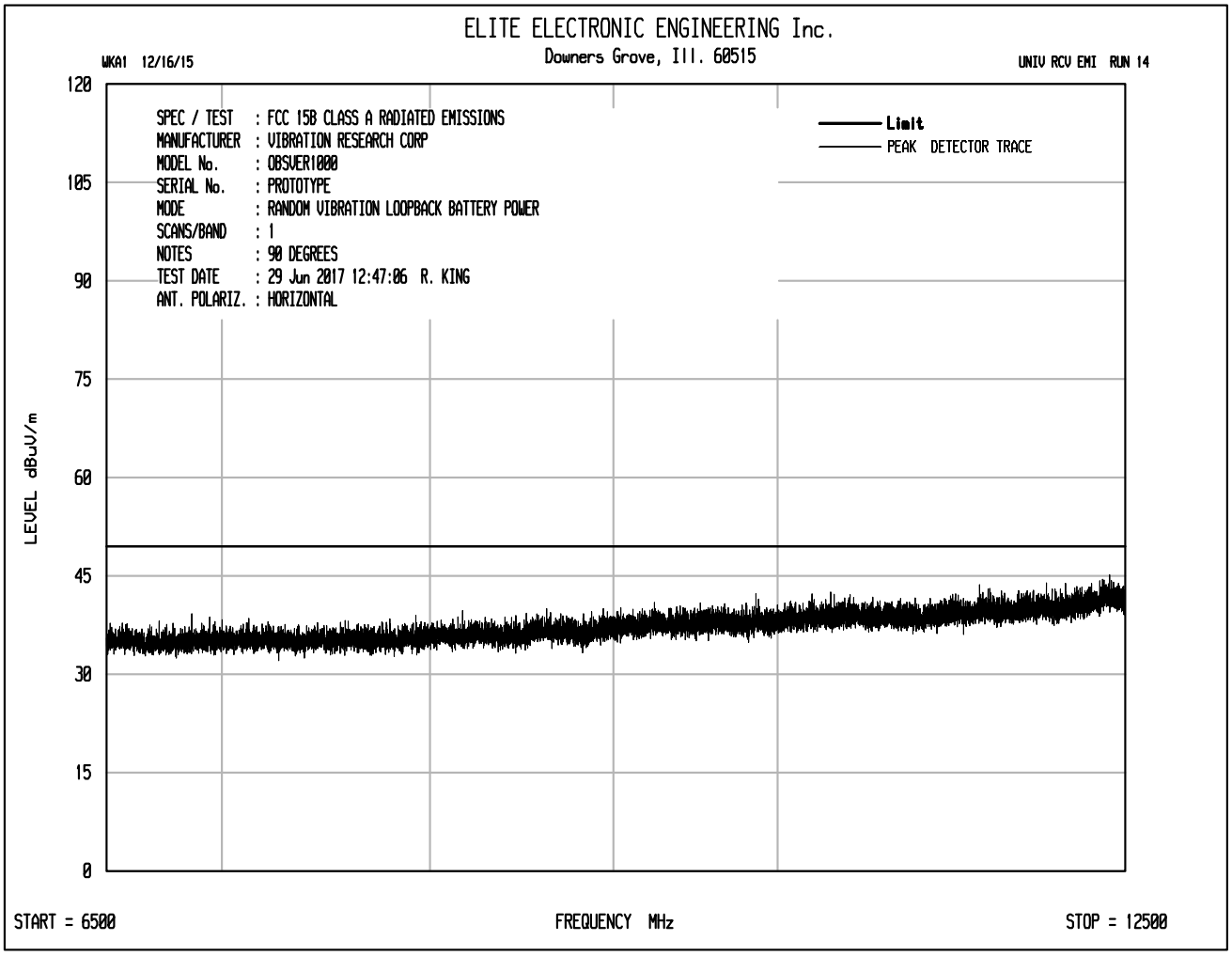

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
W080 05/16/14
8546A RE RUN 5
PRELIMINARY PEAK RADIATED EMISSION TEST @ 3 METERS
SPECIFICATION : FCC 15B CLASS B
MANUFACTURER : VIBRATION RESEARCH CORPORATION
MODEL No. : OBSVER1000
S/N : PROTOTYPE
MODE : RANDOM VIBRATION LOOPBACK BATTERY POWER
DATE TESTED : 29 Jun 2017 09:53:29 R. KING
NOTES :
ANT POLARITY : VERTICAL
DATA CORRECTED TO 3 m
VERTICAL
LIMIT
FIELD INTENSITY dBuV/m
---- of --- 6d
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
100
START = 30
FREQUENCY - MHz
STOP = 1000

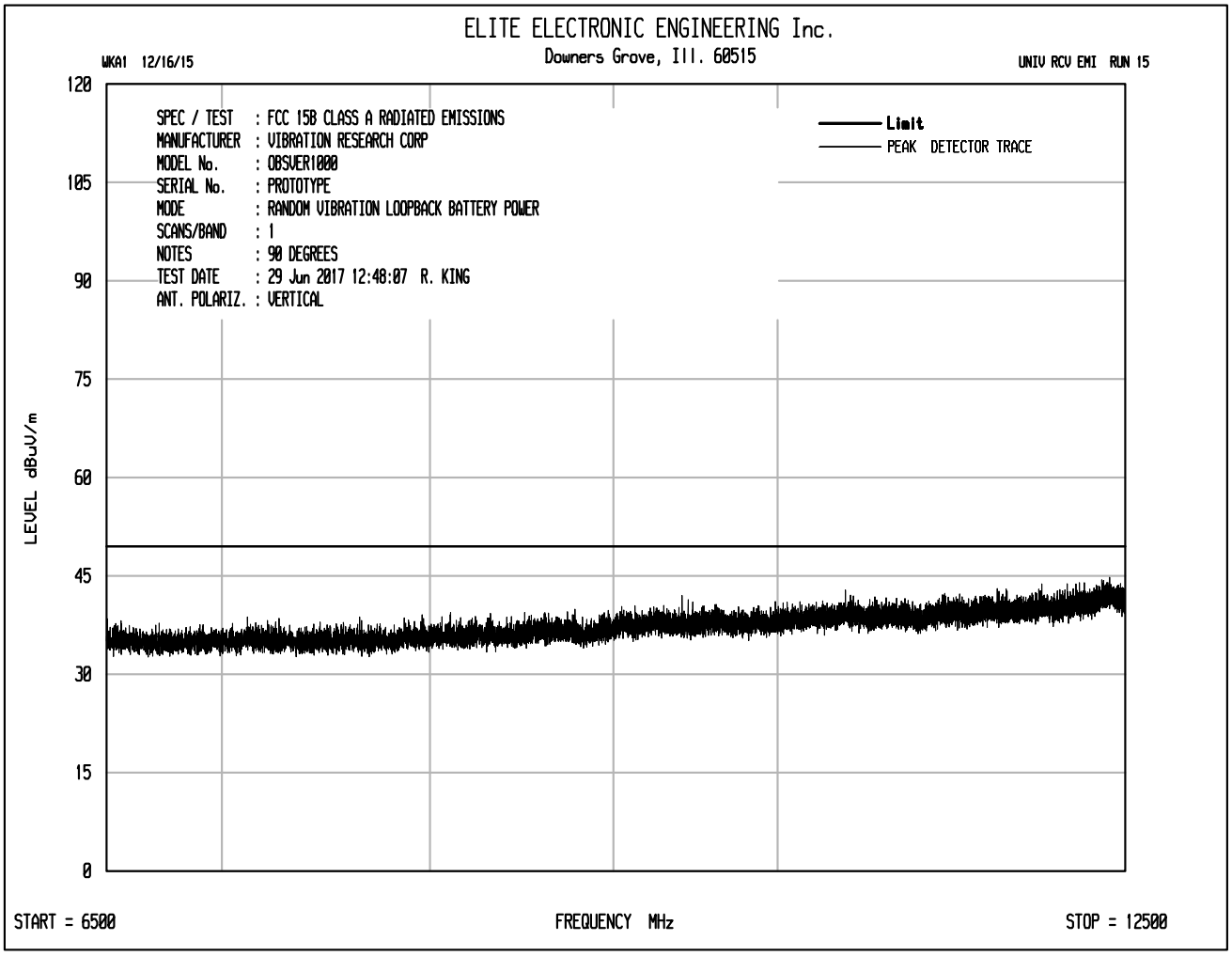

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
W0C8 05/19/14
8546A HF RUN 1
RADIATED PEAK EMISSION TEST 1 GHz to 6.5 GHz @ 3 m
SPECIFICATION : FCC 15A
MANUFACTURER : VIBRATION RESEARCH CORPORATION
MODEL No. : OBSVER1000
S/N : PROTOTYPE
MODE : RANDOM VIBRATION LOOPBACK BATTERY POWER
DATE TESTED : 29 Jun 2017 10:35:01 R. KING
NOTES :
ANT POLARITY : HORIZONTAL ANT54B
DATA CORRECTED TO 10 m
LIMIT
FIELD INTENSITY dBuV/m
120
110
100
90
80
70
60
50
40
30
20
10
0
START = 1000
FREQUENCY - MHz
STOP = 6500

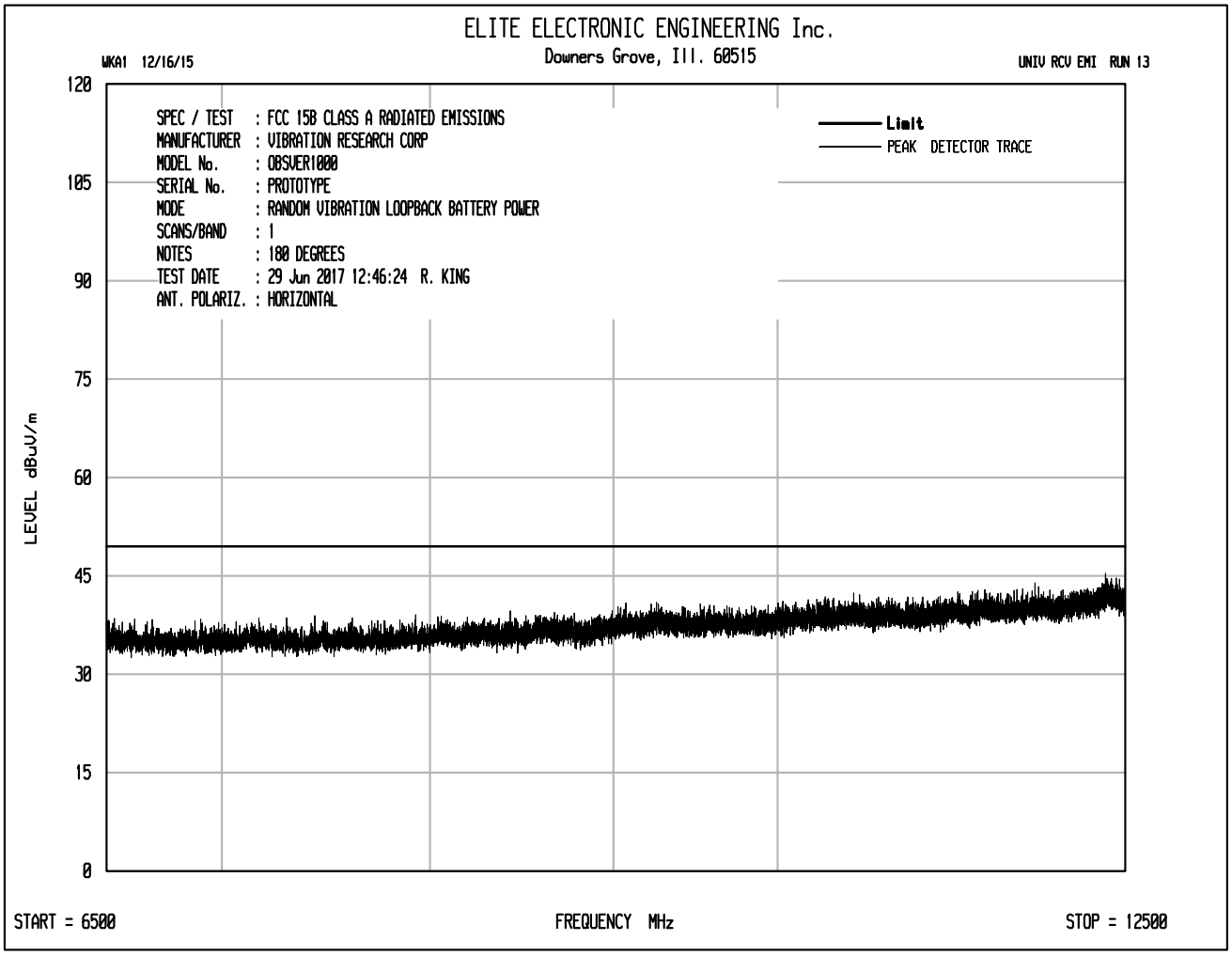

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
W0C8 05/19/14
8546A HF RUN 1
RADIATED PEAK EMISSION TEST 1 GHz to 6.5 GHz @ 3 m
SPECIFICATION : FCC 15A
MANUFACTURER : VIBRATION RESEARCH CORPORATION
MODEL No. : OBSVER1000
S/N : PROTOTYPE
MODE : RANDOM VIBRATION LOOPBACK BATTERY POWER
DATE TESTED : 29 Jun 2017 10:35:01 R. KING
NOTES :
ANT POLARITY : VERTICAL ANT54B
DATA CORRECTED TO 10 m
LIMIT
FIELD INTENSITY dBuV/m
120
110
100
90
80
70
60
50
40
30
20
10
0
START = 1000
FREQUENCY - MHz
STOP = 6500

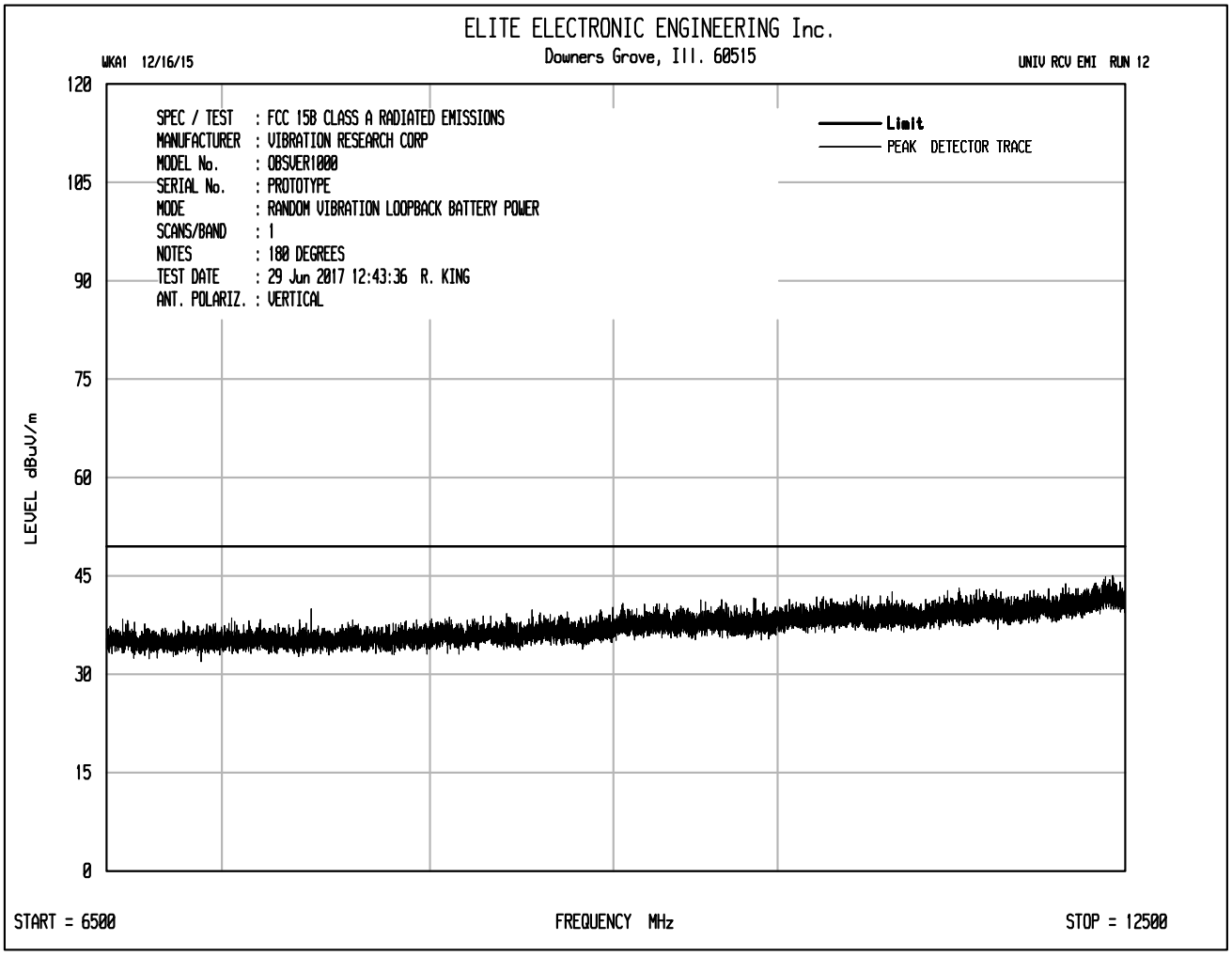

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 12/16/15
UNIV RCV EMI RUN 17
SPEC / TEST : FCC 15B CLASS A RADIATED EMISSIONS
MANUFACTURER : VIBRATION RESEARCH CORP
MODEL No. : OBSVER1000
SERIAL No. : PROTOTYPE
MODE : RANDOM VIBRATION LOOPBACK BATTERY POWER
SCANS/BAND : 1
NOTES : 0 DEGREES
TEST DATE : 29 Jun 2017 12:49:57 R. KING
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 6500
FREQUENCY MHz
STOP = 12500

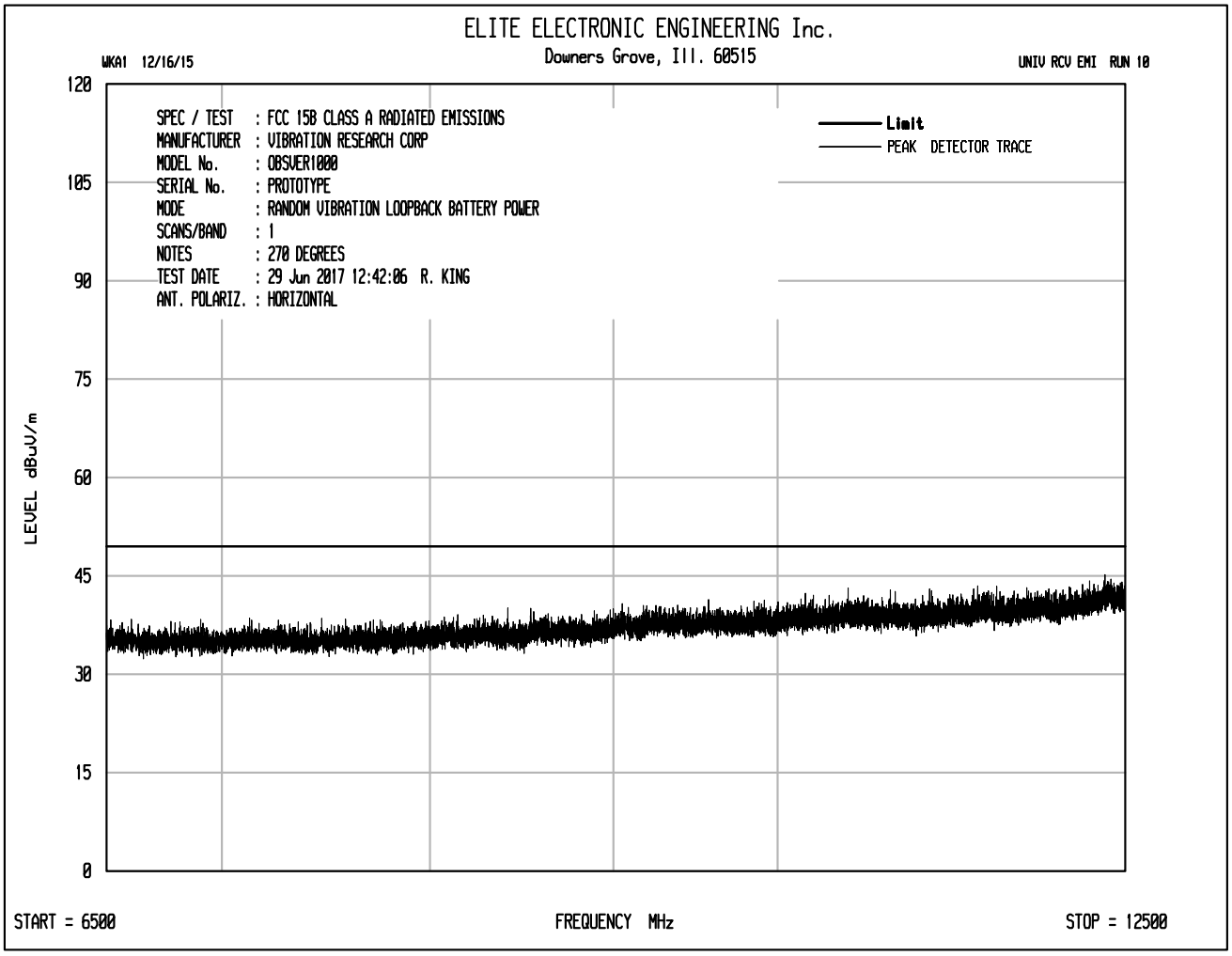

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 12/16/15
UNIV RCV EMI RUN 16
SPEC / TEST : FCC 15B CLASS A RADIATED EMISSIONS
MANUFACTURER : VIBRATION RESEARCH CORP
MODEL No. : OBSVER1000
SERIAL No. : PROTOTYPE
MODE : RANDOM VIBRATION LOOPBACK BATTERY POWER
SCANS/BAND : 1
NOTES : 0 DEGREES
TEST DATE : 29 Jun 2017 12:48:59 R. KING
ANT. POLARIZ. : VERTICAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 6500
FREQUENCY MHz
STOP = 12500

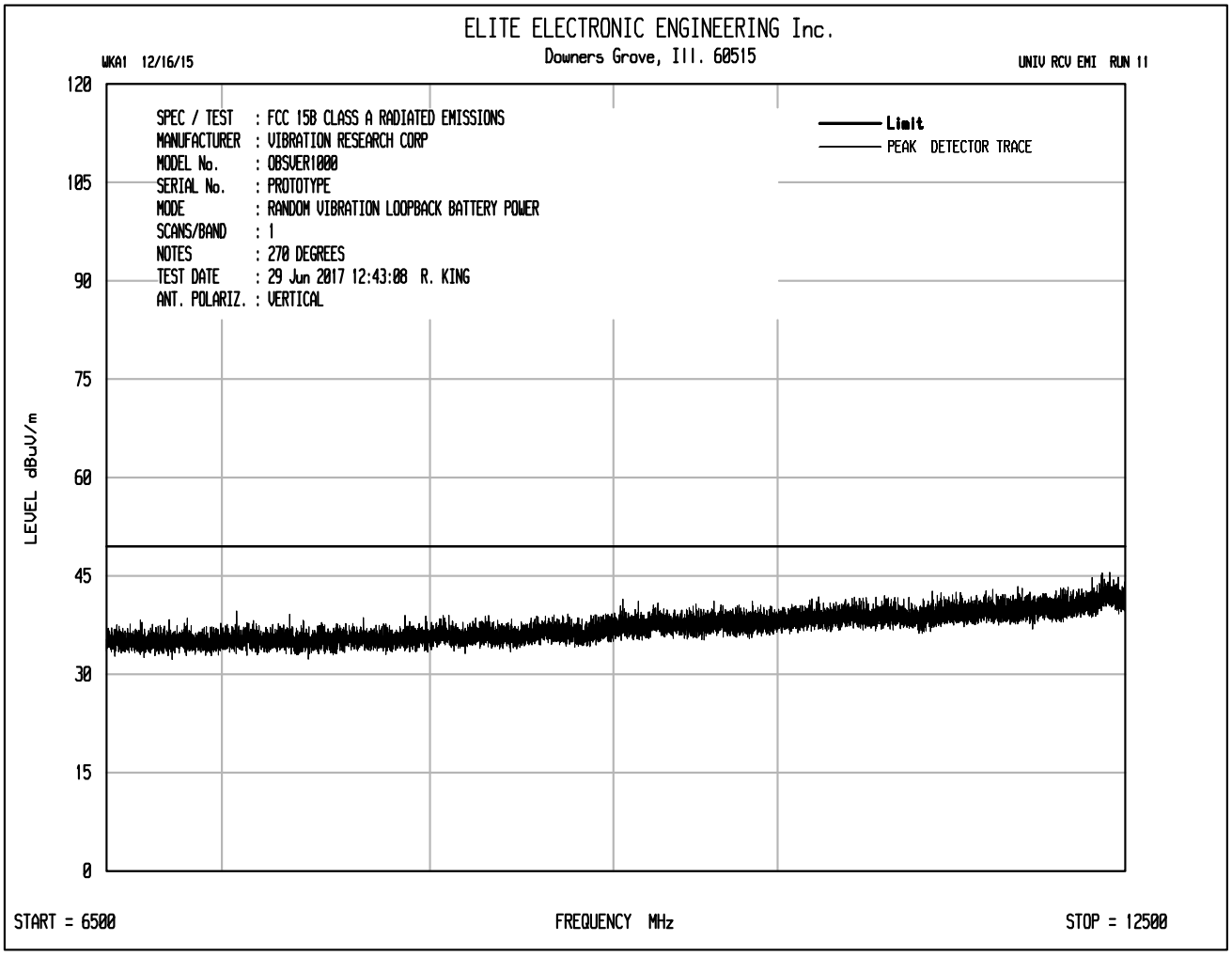

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 12/16/15
UNIV RCV EMI RUN 14
SPEC / TEST : FCC 15B CLASS A RADIATED EMISSIONS
MANUFACTURER : VIBRATION RESEARCH CORP
MODEL No. : OBSVER1000
SERIAL No. : PROTOTYPE
MODE : RANDOM VIBRATION LOOPBACK BATTERY POWER
SCANS/BAND : 1
NOTES : 90 DEGREES
TEST DATE : 29 Jun 2017 12:47:06 R. KING
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 6500
FREQUENCY MHz
STOP = 12500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 12/16/15
UNIV RCV EMI RUN 15
SPEC / TEST : FCC 15B CLASS A RADIATED EMISSIONS
MANUFACTURER : VIBRATION RESEARCH CORP
MODEL No. : OBSVER1000
SERIAL No. : PROTOTYPE
MODE : RANDOM VIBRATION LOOPBACK BATTERY POWER
SCANS/BAND : 1
NOTES : 90 DEGREES
TEST DATE : 29 Jun 2017 12:48:07 R. KING
ANT. POLARIZ. : VERTICAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 6500
FREQUENCY MHz
STOP = 12500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 12/16/15
UNIV RCV EMI RUN 13
SPEC / TEST : FCC 15B CLASS A RADIATED EMISSIONS
MANUFACTURER : VIBRATION RESEARCH CORP
MODEL No. : OBSVER1000
SERIAL No. : PROTOTYPE
MODE : RANDOM VIBRATION LOOPBACK BATTERY POWER
SCANS/BAND : 1
NOTES : 180 DEGREES
TEST DATE : 29 Jun 2017 12:46:24 R. KING
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 6500
FREQUENCY MHz
STOP = 12500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 12/16/15
UNIV RCV EMI RUN 12
SPEC / TEST : FCC 15B CLASS A RADIATED EMISSIONS
MANUFACTURER : VIBRATION RESEARCH CORP
MODEL No. : OBSVER1000
SERIAL No. : PROTOTYPE
MODE : RANDOM VIBRATION LOOPBACK BATTERY POWER
SCANS/BAND : 1
NOTES : 180 DEGREES
TEST DATE : 29 Jun 2017 12:43:36 R. KING
ANT. POLARIZ. : VERTICAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 6500
FREQUENCY MHz
STOP = 12500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 12/16/15
UNIV RCV EMI RUN 10
SPEC / TEST : FCC 15B CLASS A RADIATED EMISSIONS
MANUFACTURER : VIBRATION RESEARCH CORP
MODEL No. : OBSVER1000
SERIAL No. : PROTOTYPE
MODE : RANDOM VIBRATION LOOPBACK BATTERY POWER
SCANS/BAND : 1
NOTES : 270 DEGREES
TEST DATE : 29 Jun 2017 12:42:06 R. KING
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 6500
FREQUENCY MHz
STOP = 12500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 12/16/15
UNIV RCV EMI RUN 11
SPEC / TEST : FCC 15B CLASS A RADIATED EMISSIONS
MANUFACTURER : VIBRATION RESEARCH CORP
MODEL No. : OBSVER1000
SERIAL No. : PROTOTYPE
MODE : RANDOM VIBRATION LOOPBACK BATTERY POWER
SCANS/BAND : 1
NOTES : 270 DEGREES
TEST DATE : 29 Jun 2017 12:43:08 R. KING
ANT. POLARIZ. : VERTICAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 6500
FREQUENCY MHz
STOP = 12500

ETR No. 8546A
DATA SHEET TEST NO. 5

RADIATED QP EMISSION MEASUREMENTS in a 3 m SEMI-ANECHOIC ROOM
SPECIFICATION : FCC 15B CLASS B
MANUFACTURER : VIBRATION RESEARCH CORPORATION
MODEL NO. : OBSVER1000
SERIAL NO. : PROTOTYPE
TEST MODE : RANDOM VIBRATION LOOPBACK BATTERY POWER
NOTES :
TEST DATE : 29 Jun 2017 09:53:29
TEST DISTANCE : 3 m

FREQUENCY	QP READING	ANT FAC	CBL FAC	EXT ATTN	DIST FAC	TOTAL	QP LIMIT	AZ	ANT HT	ANT POL
MHz	dBuV	dB	dB	dB	dB	dBuV/m	dBuV/m	deg	cm	
34.08	5.7	21.8	.5	0.0	0.0	28.0	40.0	270	120	V
63.47	.9	12.3	.5	0.0	0.0	13.7	40.0	270	200	H
75.00	20.2	12.7	.5	0.0	0.0	33.4	40.0	270	120	V
97.16	5.7	16.5	.5	0.0	0.0	22.7	43.5	-0	200	H
142.16	5.8	17.0	.8	0.0	0.0	23.5	43.5	135	120	V
148.50	12.2	16.5	.8	0.0	0.0	29.5	43.5	180	340	H
169.79	3.3	15.9	.9	0.0	0.0	20.1	43.5	-0	120	V
256.63	20.5	18.4	1.0	0.0	0.0	39.9	46.0	225	120	H
346.03	19.2	20.4	1.3	0.0	0.0	40.9	46.0	180	120	H
362.50	11.5	20.7	1.3	0.0	0.0	33.6	46.0	-0	120	H
475.00	15.3	23.4	1.5	0.0	0.0	40.2	46.0	315	200	H
600.00	5.3	24.7	1.5	0.0	0.0	31.5	46.0	-0	200	H
750.01	4.2	25.7	1.9	0.0	0.0	31.8	46.0	-0	120	H
882.52	-5.3	26.6	2.0	0.0	0.0	23.3	46.0	90	120	H
950.00	1.6	27.2	2.0	0.0	0.0	30.8	46.0	90	120	H

Richard E. King

tested by: R. KING

pg ___ of ____

DATA SHEET HF TEST NO. 1

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

SPECIFICATION : FCC 15A
MANUFACTURER : VIBRATION RESEARCH CORPORATION
MODEL NO. : OBSVER1000
SERIAL NO. : PROTOTYPE
TEST MODE : RANDOM VIBRATION LOOPBACK BATTERY POWER
NOTES :
TEST DATE : 29 Jun 2017 10:35:01
TEST DISTANCE : 3 m (DATA EXTRAPOLATED TO 10 m)
ANTENNA : ANT54B

FREQUENCY	AVG READING	ANT FAC	CBL FAC	DIST FAC	TOTAL	AVG LIMIT	PASS/ FAIL	AZ	ANT HT	POLAR
MHz	dBuV	dB	dB	dB	dBuV/m	dBuV/m		deg	cm	
1179.97	-3.4	28.1	2.2	-10.5	16.4	49.5		270	120	V
1372.93	-2.2	29.0	2.5	-10.5	18.8	49.5		225	120	V
1541.08	-3.4	28.4	2.6	-10.5	17.2	49.5		270	340	V
1667.06	-3.4	29.0	2.7	-10.5	17.9	49.5		90	120	V
1816.41	-3.3	30.8	2.9	-10.5	19.9	49.5		180	120	H
1862.56	-3.6	31.3	2.9	-10.5	20.1	49.5		225	200	V
2084.36	-2.8	31.8	3.1	-10.5	21.6	49.5		135	200	H
2425.95	-2.7	32.2	3.4	-10.5	22.5	49.5		135	120	V
2886.54	-2.9	32.7	3.8	-10.5	23.1	49.5		45	120	H
3207.38	-4.2	32.9	4.0	-10.5	22.2	49.5		180	120	V
3746.53	-5.0	33.3	4.4	-10.5	22.2	49.5		225	340	H
4172.27	-5.2	33.6	4.6	-10.5	22.5	49.5		45	200	H
4498.24	-5.0	34.2	4.8	-10.5	23.5	49.5		90	200	H
5129.79	-4.6	34.7	5.0	-10.5	24.7	49.5		270	340	V
5252.23	-4.6	34.7	5.0	-10.5	24.7	49.5		135	200	V
5511.68	-4.2	34.7	5.0	-10.5	25.1	49.5		135	200	V
5850.18	-3.8	34.7	5.0	-10.5	25.5	49.5		135	340	H
5983.12	-4.0	34.7	5.0	-10.5	25.3	49.5		270	340	V
6185.91	-3.6	34.7	5.0	-10.5	25.7	49.5		45	340	H
6473.58	-3.8	34.7	5.0	-10.5	25.5	49.5		180	340	V

Richard E. King

tested by: --
R. KING