Measurement of RF Emissions from a DTS module Model No. WB4343WF3SP-1 Transmitter

For	California Eastern Laboratories 1253 N. Old Rand Road Wauconda, IL 60084
P.O. Number	204338
Date Tested	May 18th, 2016 through June 27, 2016
Test Personnel	Richard King
Test Specification	FCC "Code of Federal Regulations" Title 47, Part 15, Subpart C, Section 15.247 for Digital Modulation Intentional Radiators Operating within The bands 2400-2483.5MHz Industry Canada RSS-GEN Industry Canada RSS-210

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REVISION HISTORY

Revision	Date	Description
—	07/12/2016	Initial release

Measurement of RF Emissions from a DTS module, Model No. WB4343WF3SP-1 Transmitter

1. INTRODUCTION

1.1. Scope of Tests

This report represents the results of the series of radio interference measurements performed on a California Eastern Laboratories DTS module, Model No. WB4343WF3SP-1, no serial number was assigned, transmitter (hereinafter referred to as the EUT). The EUT is a digital modulation transmitter. The transmitter was designed to transmit in the 2400-2483.5 MHz, band using an integral antenna as both a Bluetooth Low Energy device and a Bluetooth Enhanced Device. The EUT was manufactured and submitted for testing by California Eastern Laboratories located in Wauconda, IL.

1.2. Purpose

The test series was performed to determine if the EUT meets the conducted and radiated RF emission requirements of the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart C, Sections 15.207 and 15.247 for Intentional Radiators. The test series was also performed to determine if the EUT meets the conducted RF emission requirements of the Industry Canada Radio Standards Specification, RSS-Gen, Section 7.2.4 and the radiated RF emission requirements of the Industry Canada Radio Standards Specification, RSS-247, Annex 8 for transmitters. Testing was performed in accordance with ANSI C63.4-2014.

1.3. Deviations, Additions and Exclusions

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

1.4. EMC Laboratory Identification

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

1.5. Laboratory Conditions

The temperature at the time of the test was 24.2^{o}C and the relative humidity was 35%.

2. APPLICABLE DOCUMENTS

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

- Federal Communications Commission "Code of Federal Regulations", Title 47, Part 15, Subpart C, dated 1 October 2015
- 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"
- FCC Public Notice, DA 00-705, "Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems", Released March 30, 2000
- Federal Communications Commission Office of Engineering and Technology Laboratory Division Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under Section 15.247, April 8, 2016

- Industry Canada Radio Standards Specification, RSS-Gen, “General Requirements and Information for the Certification of Radiocommunication Equipment”, Issue 4, June 2014

- Industry Canada RSS-247, Issue 1, May 2015, “Spectrum Management and Telecommunications Radio Standards Specification, Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs), and License-Exempt Local Area Network (LE-LAN) Devices”

3. EUT SETUP AND OPERATION

3.1. General Description

The EUT is a California Eastern Laboratories, DTS module, Model No. WB4343WF3SP-1. A block diagram of the EUT setup is shown as Figure 1.

3.1.1. Power Input

The EUT obtained 3.6VDC power to the SMA power connector on the board. The EUT had no external power cable. The 3.6VDC was supplied to the board through two 6 foot long leads.

3.1.2. Peripheral Equipment

No peripheral equipment was submitted with the EUT.

3.1.3. Signal Input/Output Leads

No interconnect cables were submitted with the EUT.

3.1.4. Grounding

The EUT was ungrounded during the tests.

3.2. Software

For all tests the EUT had Firmware Version BCM4343A1_001_002_009_0018_0028_Generic_UART_37_4MHz_wlbga_ref_hcd loaded onto the device to provide correct load characteristics.

3.3. Operational Mode

For all tests the EUT was placed on an 80cm high non-conductive stand when investigating frequencies between 30MHz and 1GHz. For all tests the EUT was placed on a 150cm high non-conductive stand when investigating frequencies above 1GHz.The EUT as energized.

The unit was programmed to operate in both of the following modes:

BLE (Bluetooth Low Energy)

- Transmit at 2402MHz
- Transmit at 2440MHHz
- Transmit at 2480MHHz

Bluetooth Enhanced Data Rate

- Transmit at 2402MHz
- Transmit at 2440MHHz
- Transmit at 2480MHHz

3.4. EUT Modifications

No modifications were required for compliance.

4. Test Facility and Test Instrumentation

4.1. Shielded Enclosure

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

4.2. Test Instrumentation

The test instrumentation and auxiliary equipment used during the tests are listed in Table 9-1.

Conducted and radiated emission measurements were performed with a spectrum analyzer. This receiver allows measurements with the bandwidths and detector functions specified by the FCC and IC.

4.3. Calibration Traceability

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

4.4. Measurement Uncertainty

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

The measurement uncertainty for these tests is presented below:

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

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

5. Test Procedures

5.1. 6 dB Bandwidth

5.1.1.Requirement

Per 15.247(a)(2),the minimum 6dB bandwidth shall be at least 500kHz for all systems using digital modulation techniques.

5.1.2.Procedures

The output of the EUT was connected to the spectrum analyzer through 40dB of attenuation.

The EUT was allowed to transmit continuously. The transmit channel was set separately to low, middle, and

high channels. The resolution bandwidth (RBW) was set to 100kHz and the span was set to greater than the RBW.

The 'Max-Hold' function was engaged. The analyzer was allowed to scan until the envelope of the transmitter bandwidth was defined. The analyzer's display was plotted using a 'screen dump' utility.

5.1.3. Results

The plots on pages 19 through 24 show that the minimum 6 dB bandwidth was 716.34kHz for the BLE and 1.067MHz for the Bluetooth Enhanced which is greater than minimum allowable 6dB bandwidth requirement of 500kHz for systems using digital modulation techniques. The 99% bandwidth for the BLE was measured to be 1.09MHz and 1.25MHz for the Bluetooth Enhanced.

5.2. Peak Output Power

5.2.1. Requirements

Per section 15.247(b)(3), for systems using digital modulation the maximum peak output conducted power shall not be greater than 1.0W (30dBm). Per section 15.247(b)(4), this limit is based on the use of antennas with directional gains that do not exceed 6dBi. Since the limit allows for a 6dBi antenna gain, the maximum EIRP can be increased by 6dB to 4 Watt (36dBm).

5.2.2. Procedures

The output of the EUT was connected to the spectrum analyzer through 40dB of attenuation. The maximum meter reading was recorded. The peak power output was calculated for the low, middle and high channels.

The output of the EUT was connected to the spectrum analyzer through 40dB of attenuation. The EUT was set to transmit separately at the low, middle, and high channels. The resolution bandwidth (RBW) was set to greater than the 6dB bandwidth. The 'Max-Hold' function was engaged. The maximum meter reading was recorded. The peak power output was calculated for the low, middle and high channels.

5.2.3. Results

The results are presented on pages 25 through 32.

The maximum peak conducted output power from the BLE transmitter was 0.006W (7.73 dBm) which is below the 1 Watt limit. The maximum EIRP measured from the BLE transmitter was 10.9 dBm or 0.012 W which is below the 4 Watt limit.

The maximum peak conducted output power from the Bluetooth Enhanced transmitter was 0.004W (6.41 dBm) which is below the 1 Watt limit. The maximum EIRP measured from the BLE transmitter was 5.9 dBm or 0.003 W which is below the 4 Watt limit.

5.3. Antenna Conducted Spurious Emissions

5.3.1. Requirements

Per section 15.247(c), the spurious emissions in any 100 kHz BW outside the frequency band must be at least 20dB below the highest 100 kHz BW level measured within the band.

5.3.2. Procedures

The output of the EUT was connected to the spectrum analyzer through 40dB of attenuation. The resolution bandwidth (RBW) was set to 100kHz. The peak detector and 'Max-Hold' function were engaged. The emissions in the frequency range from 30MHz to 25GHz were observed and plotted separately with the EUT transmitting at low, middle and high channels.

5.3.3. Results

The results of the antenna conducted emissions levels were plotted. These plots are presented on pages 33

through 56. These plots show that the spurious emissions were at least 20 dB below the level of the fundamental.

5.4. Radiated Spurious Emissions Measurements

5.4.1. Requirements

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

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

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

5.4.2. Procedures

All tests were performed in a 32ft. x 20ft. x 18ft. hybrid ferrite-tile/anechoic absorber lined test chamber. The walls and ceiling of the shielded chamber are lined with ferrite tiles. Anechoic absorber material is installed over the ferrite tile. The floor of the chamber is used as the ground plane. The chamber complies with ANSI C63.4-2014 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 25GHz used for 2400-2483.5MHz range was investigated using a peak detector function.

The final open field emission tests were then manually performed over the frequency range of 30MHz to 25GHz used for 2400-2483.5MHz range.

1) For all emissions in the restricted bands, the following procedure was used:
   a) The field strengths of all emissions below 1 GHz were measured using a bi-log antenna. The bi-log antenna was positioned at a 3 meter distance from the EUT. A peak detector with a resolution bandwidth of 100 kHz was used on the spectrum analyzer.
   b) The field strengths of all emissions above 1 GHz were measured using a double-ridged waveguide antenna. The waveguide antenna was positioned at a 3 meter distance from the EUT. A peak detector with a resolution bandwidth of 1 MHz was used on the spectrum analyzer.
   c) To ensure that maximum or worst case emission levels were measured, the following steps were taken when taking all measurements:
      i) The EUT was rotated so that all of its sides were exposed to the receiving antenna.
      ii) Since the measuring antenna is linearly polarized, both horizontal and vertical field components were measured.
      iii) The measuring antenna was raised and lowered for each antenna polarization to maximize the readings.
      iv) In instances where it was necessary to use a shortened cable between the measuring antenna

and the spectrum analyzer, the measuring antenna was not raised or lowered to ensure maximized readings. Instead the EUT was rotated through all axes to ensure the maximum readings were recorded for the EUT.

d) For all radiated emissions measurements below 1 GHz, if the peak reading is below the limits listed in 15.209(a), no further measurements are required. If however, the peak readings exceed the limits listed in 15.209(a), then the emissions are remeasured using a quasi-peak detector.
e) For all radiated emissions measurements above 1 GHz, the peak readings must comply with the 15.35(b) limits. 15.35(b) states that when average radiated emissions measurements are specified, there also is a limit on the peak level of the radiated emissions. The limit on the peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test. Therefore, all peak readings above 1 GHz must be no greater than 20 dB above the limits specified in 15.209(a).

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

5.4.3. Results

Preliminary radiated emissions plots with the EUT transmitting at Low Frequency, Middle Frequency, and High Frequency are shown on pages 57 through 104. Final radiated emissions data are presented on data pages 105 through 117. As can be seen from the data, all emissions measured from the EUT were within the specification limits.

Photographs of the test configuration which yielded the highest, or worst case, radiated emission levels are shown on Figures 3 through 6.

5.5. Band Edge Compliance

5.5.1. Requirement

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

In addition, the radiated emissions which fall in the restricted band beginning at 2483.5 MHz must meet the general limits of 15.209(a).

5.5.2. Procedures

5.4.2.1 Low Band Edge

1) The output of the EUT was connected to the spectrum analyzer through 40dB of attenuation.
2) The EUT was set to transmit continuously at the channel closest to the low band-edge.
3) To determine the band edge compliance, the following spectrum analyzer settings were used:

   a. Center frequency = low band-edge frequency.
   b. Span = Wide enough to capture the peak level of the emission operating on the channel closest to the band-edge, as well as any modulation products which fall outside of the authorized band of operation.
   c. Resolution bandwidth (RBW) ≥ 1% of the span.
   d. The 'Max-Hold' function was engaged. The analyzer was allowed to scan until the envelope of the transmitter bandwidth was defined.
   e. The marker was set on the peak of the in-band emissions. A display line was placed 20dB down from the peak of the in-band emissions. All emissions which fall outside of the authorized band of operation must be below the 20dB down display line. (All emissions to the left of the center frequency (band-edge) must be below the display line.)
   f. The analyzer's display was plotted using a 'screen dump' utility.

5.4.2.2 High Band Edge

1) The EUT was set to transmit continuously at the channel closest to the high band-edge.
2) A double ridged waveguide was placed 3 meters away from the EUT. The antenna was connected to the input of a spectrum analyzer.
3) The center frequency of the analyzer was set to the high band edge (2483.5MHz)
4) The resolution bandwidth was set to 1MHz.
5) To ensure that the maximum or worst case emission level was 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.

6) The highest measured peak reading was recorded.
7) The highest measured average reading was recorded.

5.5.3. Results

Pages 118 through 123 show the band-edge compliance results. As can be seen from these plots, the conducted emissions at the low end band edge are within the 20 dB down limits. The radiated emissions at the high band edge are within the general limits.

5.6. Power Spectral Density

5.6.1. Requirements

Per section 15.247(d), the peak power spectral density from the intentional radiator shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

5.6.2. Procedures

1) The output of the EUT was connected to the spectrum analyzer through 40dB of attenuation.
2) To determine the power spectral density, the following spectrum analyzer settings were used:

    a. Center frequency = transmit frequency
    b. Resolution bandwidth (RBW) greater than the 20dB bandwidth.
    c. Sweep time = auto
    d. The peak detector and 'Max-Hold' function was engaged. The analyzer was allowed to scan until the envelope of the transmitter bandwidth was defined.
    e. The analyzer's display was plotted using a 'screen dump' utility.

3) This reading corresponds to the peak EIRP measured for the mid channel.
4) Turn on Display Line 1 and place it at the peak of the measured level. Turn on Display Line 2 and place it at the corresponding +8dBm level (e.g. if the peak output power is +18dBm then the +8dBm level will be 10dB down from the radiated level and if the peak output power is +6dBm then the +8dBm level will be 2dB above the radiated level.)
5) The EUT was then placed in the normal operation mode (for DTS devices)
6) To determine the power spectral density, the following spectrum analyzer settings were used:
    a. Center frequency = transmit frequency
    b. Span =1.5times the channel bandwidth
    c. Resolution bandwidth (RBW) ≥3kHz
    d. Video bandwidth (VBW) ≥ 3 x RBW
    e. Sweep time = auto couple

f. The analyzer was allowed to scan until the envelope of the transmitter bandwidth was defined. The peak detector and 'Max-Hold' function was engaged.
g. The analyzer's display was plotted using a 'screen dump' utility.
h. If the measured value exceeds the +8dBm limit, reduce the RBW (no less than 3kHz) and repeat step 7.

5.6.3. Results

Pages 124 through 129 show the power spectral density results. As can be seen from the plots, the peak power density is less than 8dBm in a 3kHz band during any time interval of continuous transmission for both the BLE and Bluetooth Enhanced modes.

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 California Eastern Laboratories personnel.

6.2. Disposition of the EUT

The EUT and all associated equipment were returned to California Eastern Laboratories upon completion of the tests.

7. Conclusions

It was determined that the California Eastern Laboratories DTS module, Model No. WB4343WF3SP-1, digital modulation transmitter, no serial number assigned, did fully meet the conducted and radiated emission requirements of the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart C, Sections 15.207 and 15.247 for Intentional Radiators Operating within the 2400-2483.5 MHz, band, when tested per ANSI C63.4-2014.

It was also determined that the California Eastern Laboratories DTS module, Model No. WB4343WF3SP-1, digital modulation transmitter, no serial number assigned, did fully meet the conducted and radiated RF emission requirements of the Industry Canada Radio Standards Specification, RSS-Gen Section 7.2.4 and RSS-210 Annex 8, for transmitters, when tested per ANSI C63.4-2014.

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 California Eastern Laboratories 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 NVLAP, 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
APW0	PREAMPLIFIER	PLANAR ELECTRONICS	PE2-30-20G20R6G	PL2926/0646	20GHZ-26.5GHZ	3/2/2016	3/2/2017
APW11	PREAMPLIFIER	PMI	PE2-35-120-5R0-10-12-SFF	PL11685/1241	1GHZ-20GHZ	4/18/2016	4/18/2017
CDX8	COMPUTER	ELITE	WORKSTATION			N/A	
CDY0	WORKSTATION	ELITE	WORKSTATION		WINDOWS 7	N/A	
CDY3	LAB COMPUTER	ELITE	WORKSTATION		WINDOWS 7	N/A	
GRD0	SIGNAL GENERATOR	HEWLETT PACKARD	E4432B	US38080222	250KHZ-3.0GHZ	9/1/2015	9/1/2016
MDA9	MULTIMETER	FLUKE CORPORATION	26 III	77311274	I;VDC;VAC;R	9/10/2015	9/10/2016
MPW0	POWER METER	KEYSIGHT	8990B	MY51000388		2/5/2016	2/5/2017
MWPA	WIDEBAND POWER SENSOR	KEYSIGHT	N1923A	MY56080002	50MHZ-18GHZ	2/17/2016	2/17/2017
NHG0	STANDARD GAIN HORN ANTENNA	NARDA	638	---	18-26.5GHZ	NOTE 1	
NTA2	BILOG ANTENNA	TESEQ	6112D	28040	25-1000MHz	10/27/2015	10/27/2016
NTA3	BILOG ANTENNA	TESEQ	6112D	32853	25-1000MHz	3/23/2016	3/23/2017
NWQ1	DOUBLE RIDGED WAVEGUIDE ANTENNA	ETS-LINDGREN	3117	66655	1GHZ-18GHZ	4/4/2016	4/4/2018
NWQ2	DOUBLE RIDGED WAVEGUIDE ANTENNA	ETS LINDGREN	3117	66659	1GHZ-18GHZ	3/2/2016	3/2/2018
PHA0	MAGNETIC FIELD PROBE	ELECTRO-METRICS	EM-6882	134	22-230MHZ	NOTE 1	
RAKG	RF SECTION	HEWLETT PACKARD	85462A	3549A00284	0.009-6500MHZ	2/22/2016	2/22/2017
RAKI	RF SECTION	HEWLETT PACKARD	85462A	3411A00181	0.009-6500MHZ	3/4/2016	3/4/2017
RAKJ	RF FILTER SECTION	HEWLETT PACKARD	85460A	3330A00154	---	3/4/2016	3/4/2017
RBA1	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB26	100146	20HZ-26.5GHZ	2/12/2016	2/12/2017
RBB0	EMI TEST RECEIVER 20HZ TO 40 GHZ.	ROHDE & SCHWARZ	ESIB40	100250	20 HZ TO 40GHZ	2/16/2016	2/16/2017
RBD1	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESU40	100009	20Hz-40GHz	2/10/2016	2/10/2017
RBE1	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESU26	100096	20Hz-26GHz	2/25/2016	2/25/2017
SDL3	POWER SUPPLY	HEWLETT PACKARD	3425A	254	0-20VDC; 0-10A	NOTE 1	
SES0	24VDC POWER SUPPLY	P-TRANS	FS-32024-1M	001	18-27VDC	NOTE 1	
SES1	24VDC POWER SUPPLY	P TRANS	FS-32024-1M	002	18-27VDC	NOTE 1	
SHA0	DC POWER SUPPLY	HEWLETT PACKARD	6642A	MY40000116	0-20V/0-10A	NOTE 1	
SHB0	DC POWER SUPPLY	HEWLETT PACKARD	6644A	MY40000115	0-60V/0-3.5A	NOTE 1	
T2S3	20DB 25W ATTENUATOR	WEINSCHEL	46-20-34	BV3544	DC-18GHZ	8/7/2015	8/7/2016
T2SG	20DB 25W ATTENUATOR	WEINSCHEL	46-20-34	CD5016	DC-18GHZ	1/5/2016	1/5/2018
WQB0	RE_8546A						
WQC0	HF_8546A						
XLQU	5W, 50 OHM TERMINATION	JFW INDUSTRIES	50T-052	---	DC-2GHZ	7/8/2015	7/8/2016
XOB2	ADAPTER	HEWLETT PACKARD	K281C,012	09407	18-26.5GHZ	NOTE 1	
XPR0	HIGH PASS FILTER	K&L MICROWAVE	11SH10-4800/X20000	001	4.8-20GHZ	9/22/2015	9/22/2016

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.

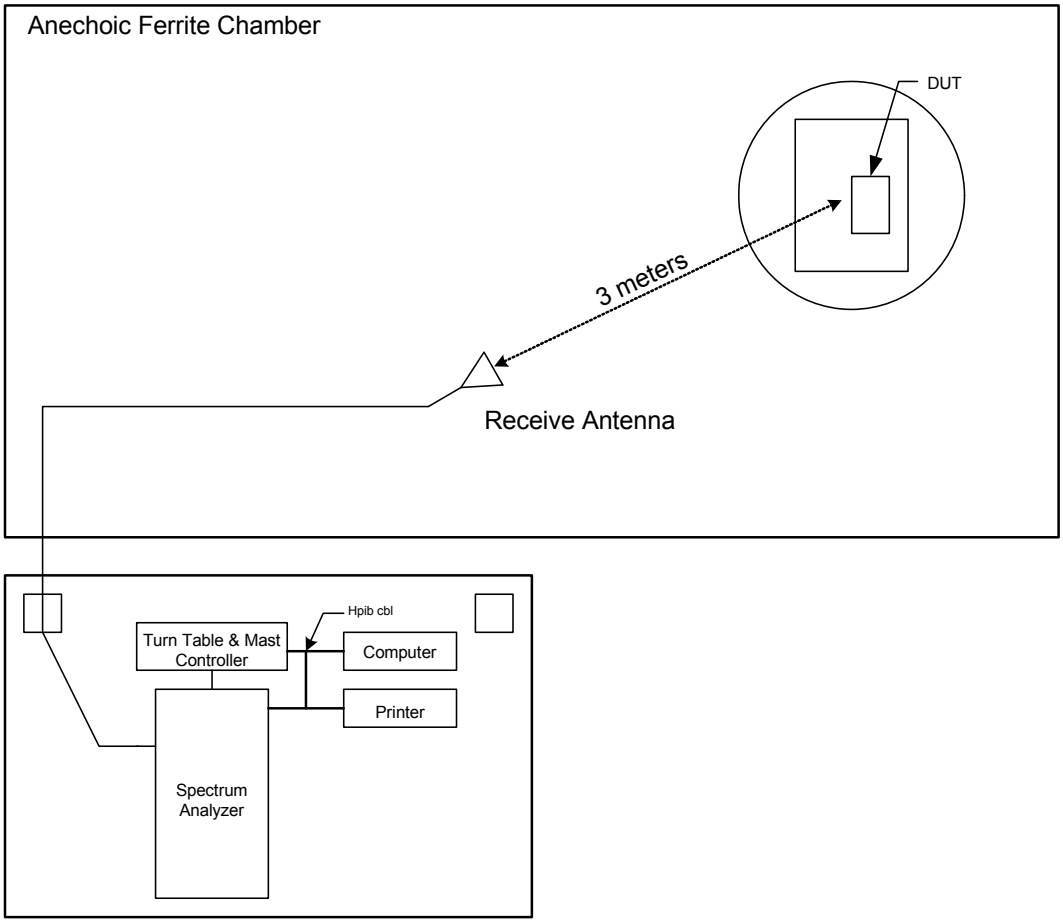


FIGURE 1 BLOCKDIAGRAM OF TEST SETUP

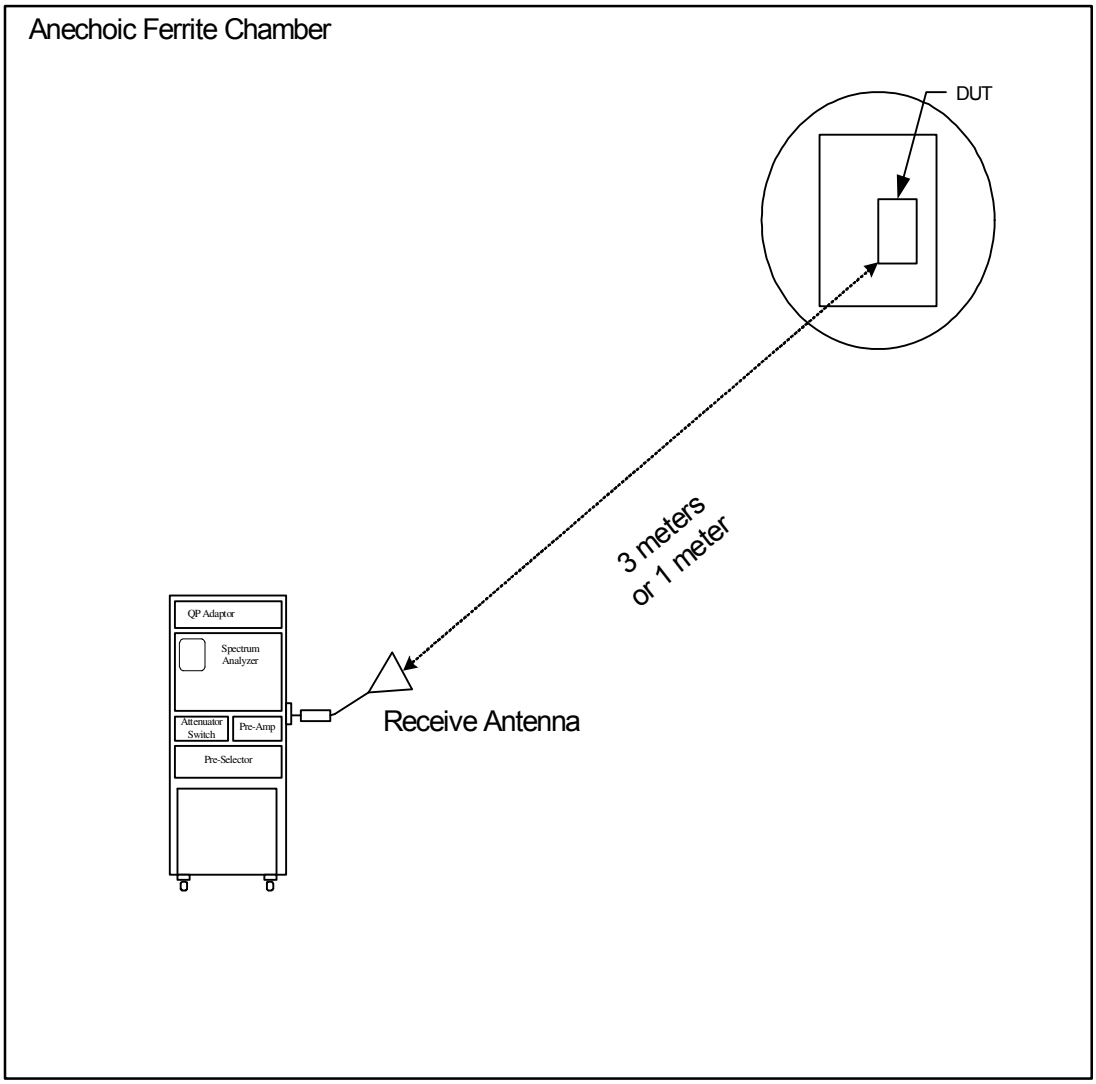
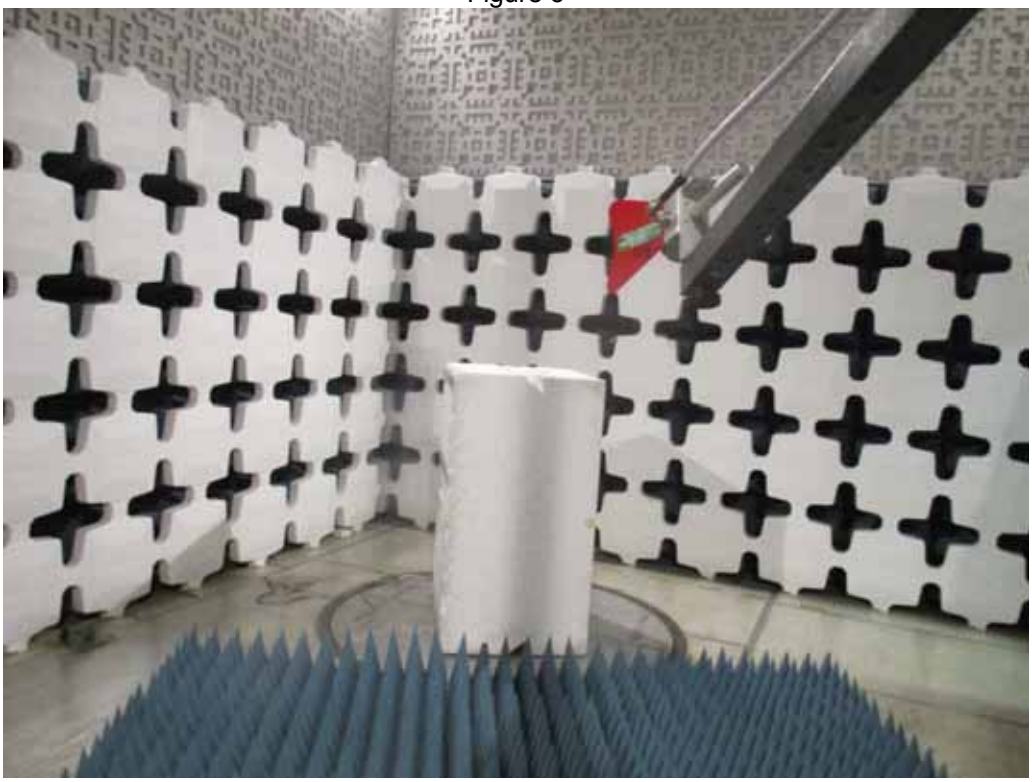

Anechoic Ferrite Chamber
DUT
3 meters
or 1 meter
QP Adaptor
Spectrum
Analyzer
Attenuator
Switch
Pre-Amp
Pre-Selector
Receive Antenna

Figure 3

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

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

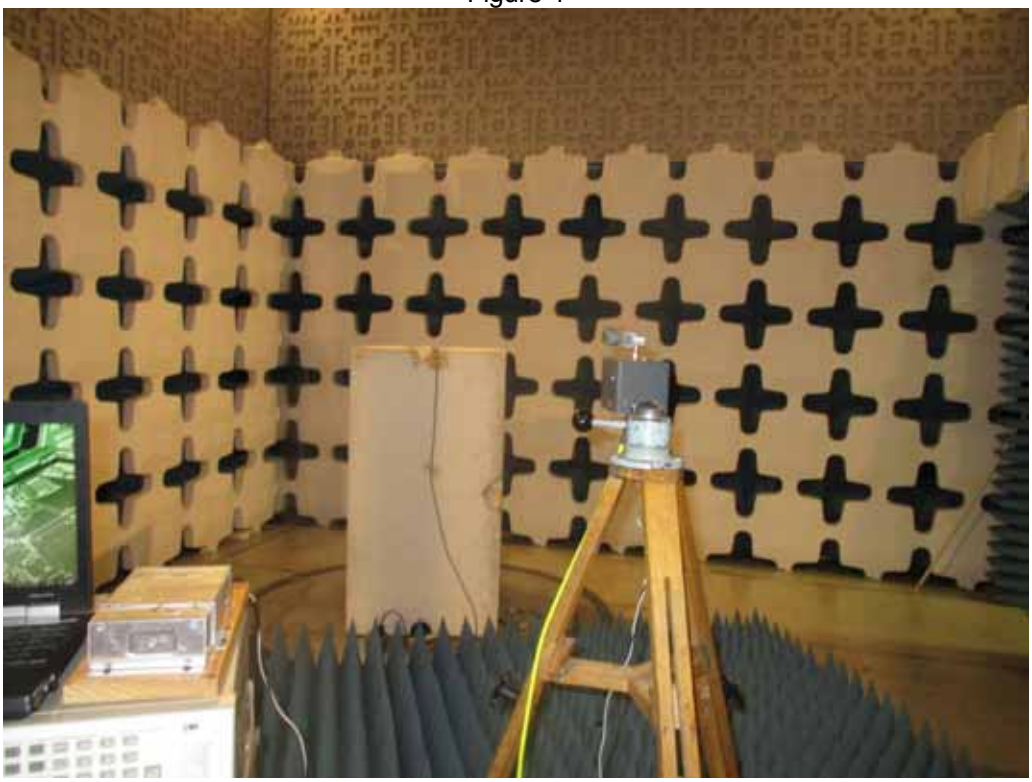
Figure 3



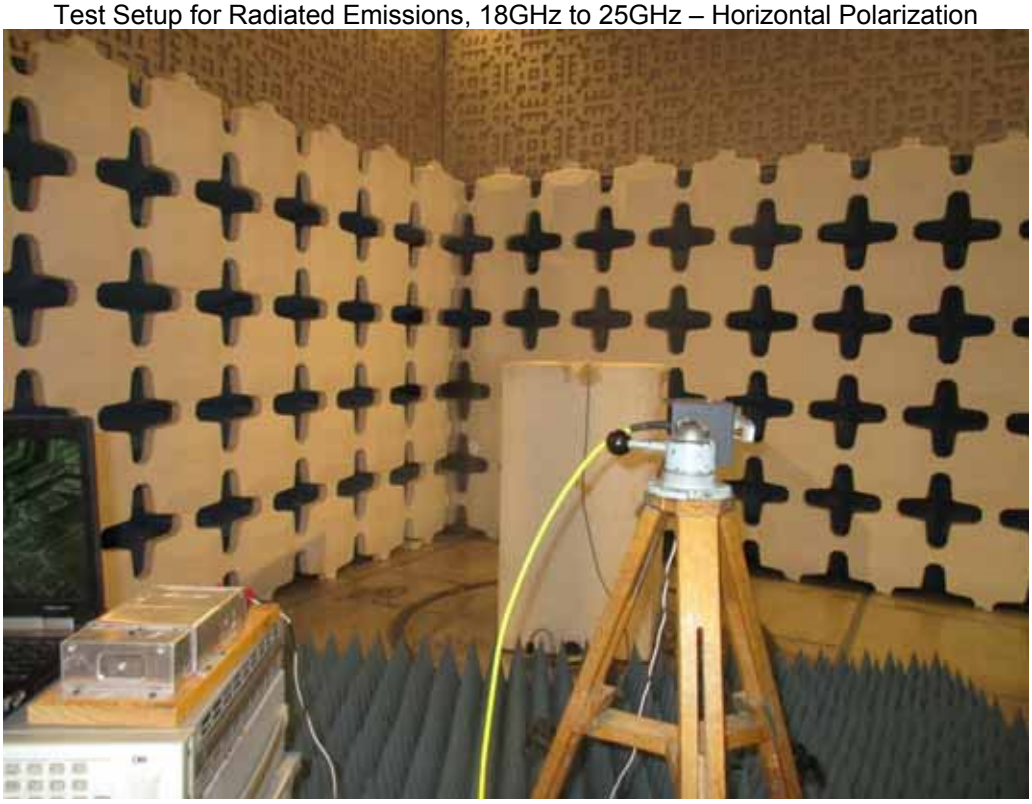
Test Setup for Radiated Emissions, 1GHz to 18GHz – Horizontal Polarization

Test Setup for Radiated Emissions, 1GHz to 18GHz – Vertical Polarization

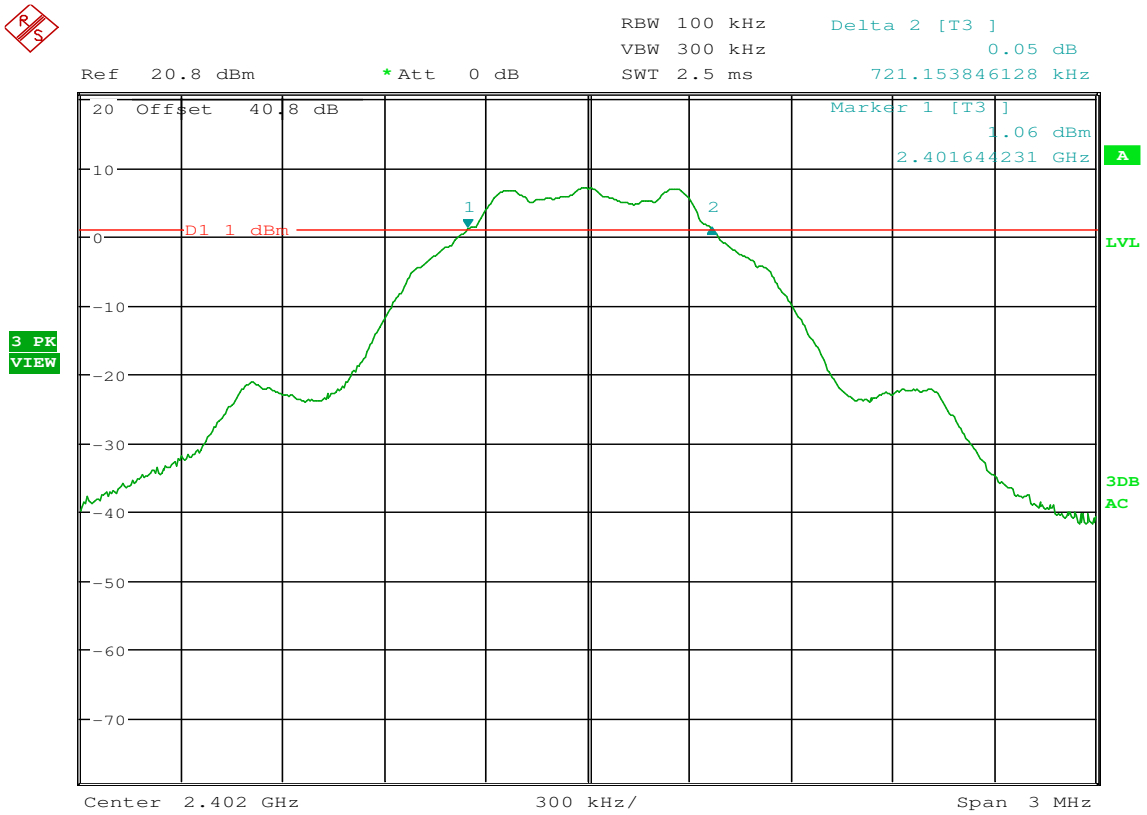
Figure 4



Test Setup for Radiated Emissions, 18GHz to 25GHz – Horizontal Polarization



Test Setup for Radiated Emissions, 18GHz to 25GHz – Vertical Polarization

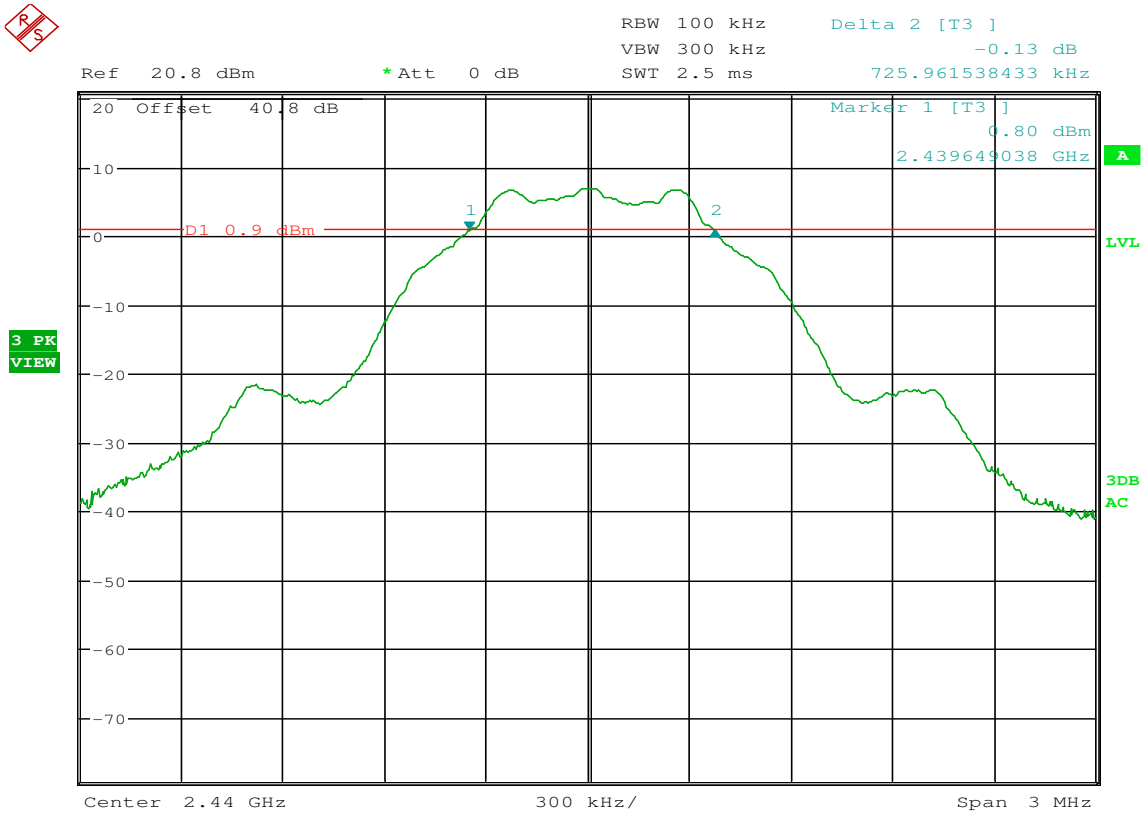


Date: 1.JUN.2016 11:23:34

FCC 15.247 6dB Bandwidth Measurement

MANUFACTURER	: California Eastern Laboratories
MODEL NUMBER	: WB4343WF3SP-1
TEST MODE	: Tx @ 2402MHz
	: PEAK detector
NOTES	: 6dB Bandwidth measurement
NOTES	: BLE
NOTES	:

NOTES

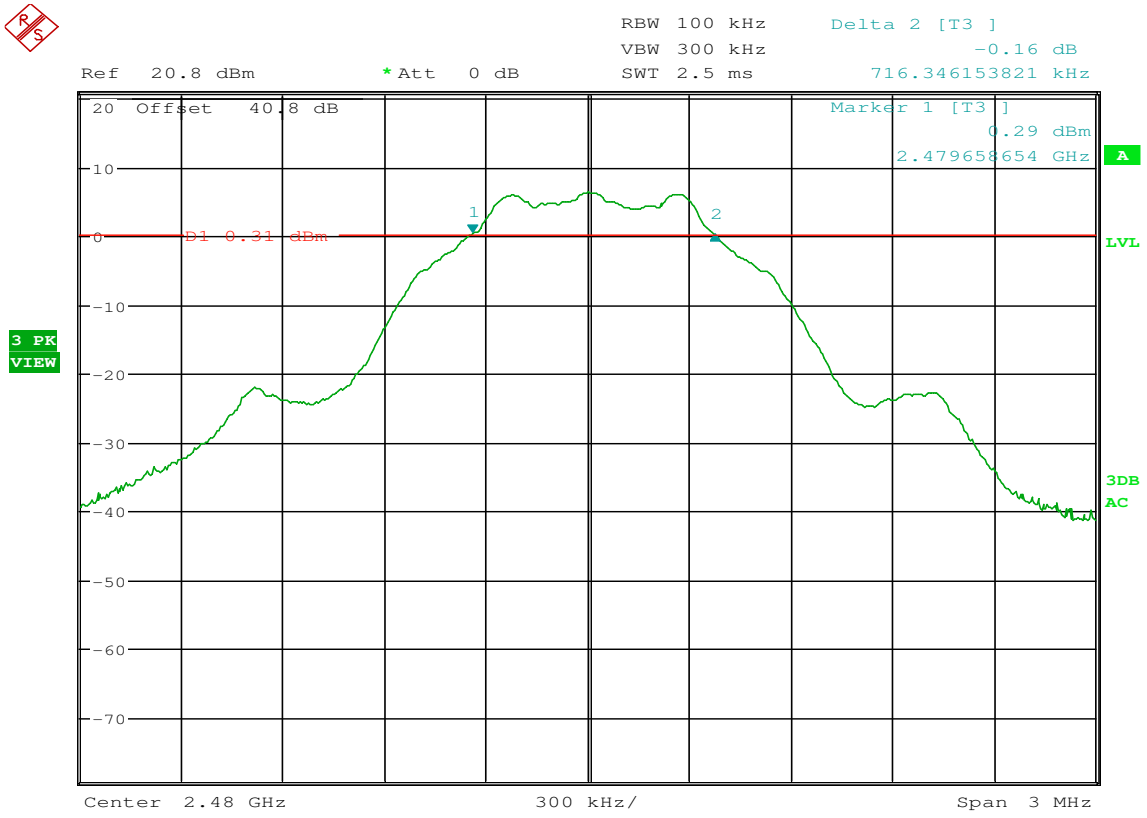


Date: 1.JUN.2016 11:15:23

FCC 15.247 6dB Bandwidth Measurement

MANUFACTURER	: California Eastern Laboratories
MODEL NUMBER	: WB4343WF3SP-1
TEST MODE	: Tx @ 2440MHz
	: PEAK detector
NOTES	: 6dB Bandwidth measurement
NOTES	: BLE
NOTES	:

NOTES

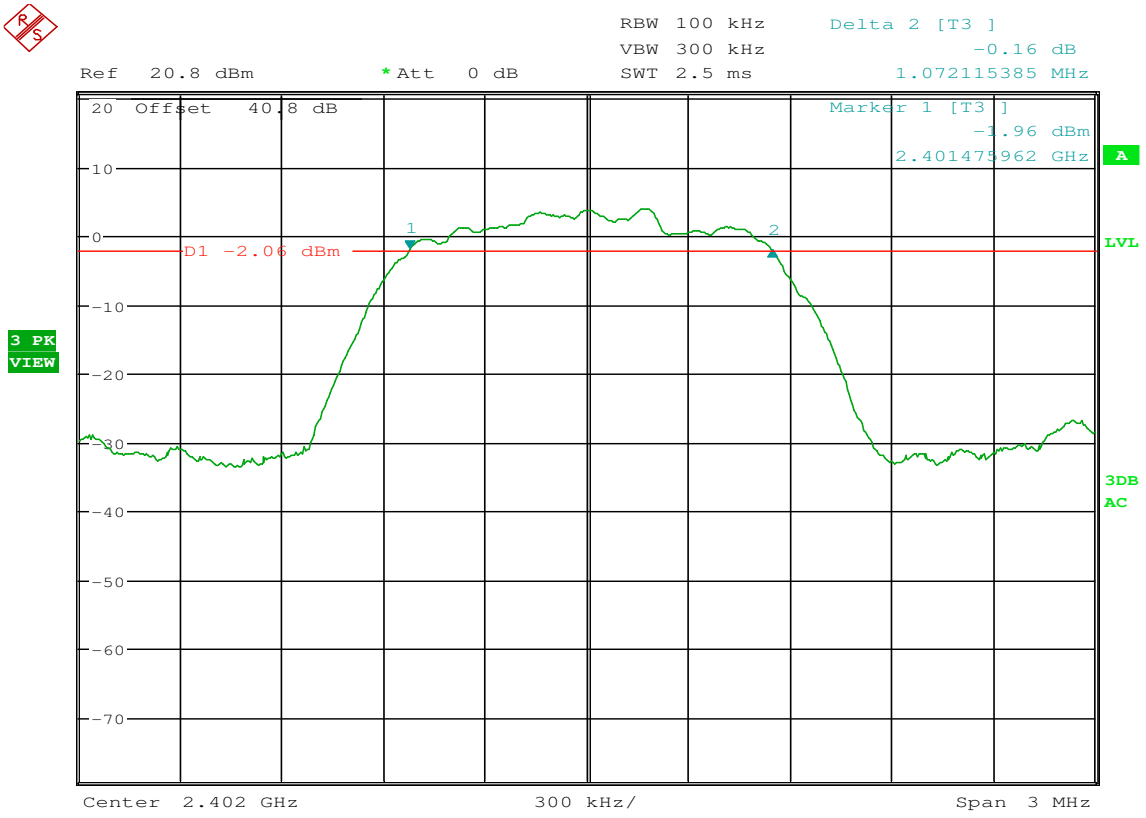


Date: 1.JUN.2016 11:20:43

FCC 15.247 6dB Bandwidth Measurement

MANUFACTURER : California Eastern Laboratories
MODEL NUMBER : WB4343WF3SP-1
TEST MODE : Tx @ 2480MHz
: PEAK detector
NOTES : 6dB Bandwidth measurement
NOTES : BLE
NOTES :

NOTES

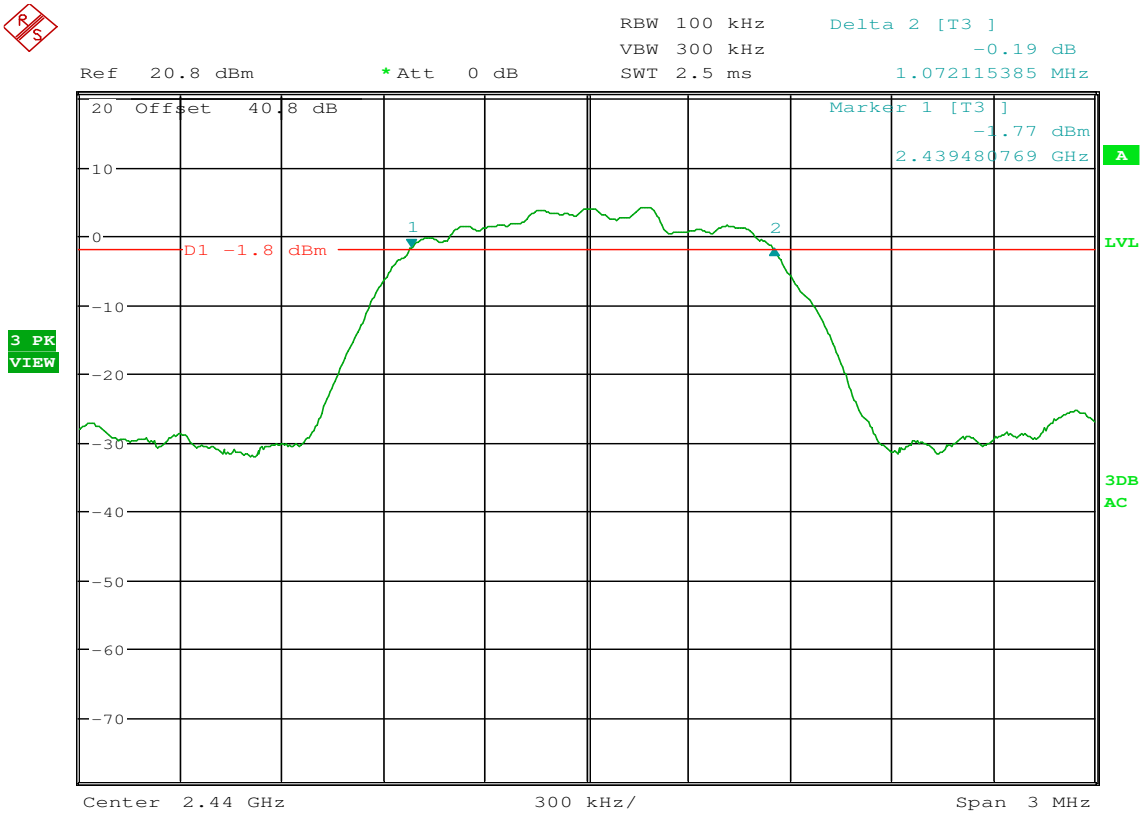


Date: 1.JUN.2016 11:29:52

FCC 15.247 6dB Bandwidth Measurement

MANUFACTURER	: California Eastern Laboratories
MODEL NUMBER	: WB4343WF3SP-1
TEST MODE	: Tx @ 2402MHz
	: PEAK detector
NOTES	: 6dB Bandwidth measurement
NOTES	: Bluetooth Enhanced
NOTES	:

NOTES

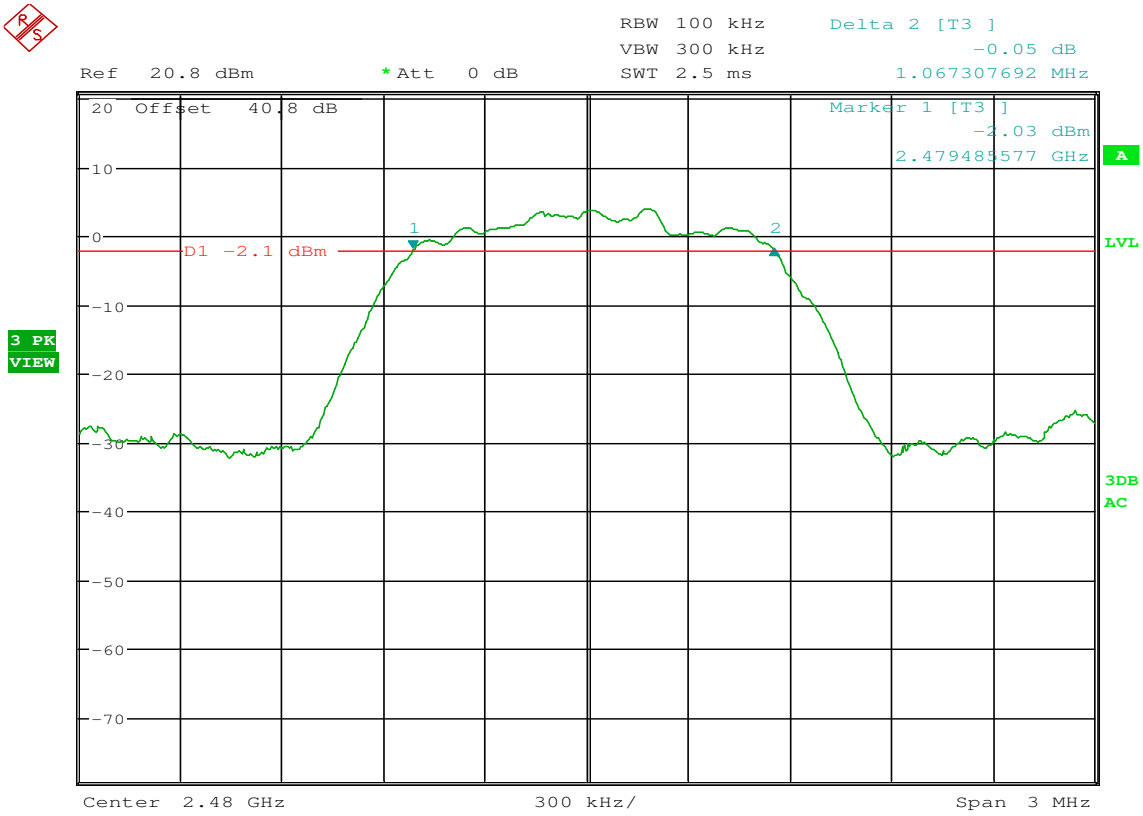


Date: 1.JUN.2016 11:34:48

FCC 15.247 6dB Bandwidth Measurement

MANUFACTURER	: California Eastern Laboratories
MODEL NUMBER	: WB4343WF3SP-1
TEST MODE	: Tx @ 2440MHz
	: PEAK detector
NOTES	: 6dB Bandwidth measurement
NOTES	: Bluetooth Enhanced
NOTES	:

NOTES

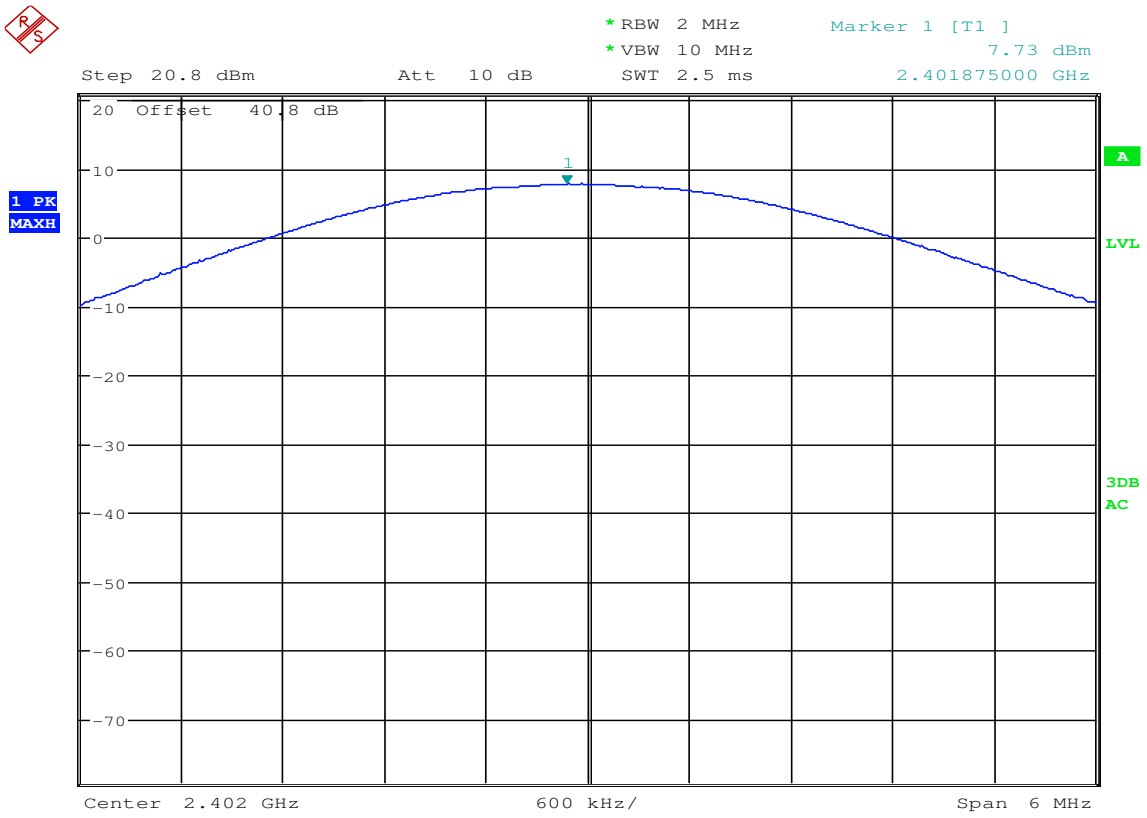


Date: 1.JUN.2016 11:37:46

FCC 15.247 6dB Bandwidth Measurement

MANUFACTURER	: California Eastern Laboratories
MODEL NUMBER	: WB4343WF3SP-1
TEST MODE	: Tx @ 2480MHz
	: PEAK detector
NOTES	: 6dB Bandwidth measurement
NOTES	: Bluetooth Enhanced
NOTES	:

NOTES

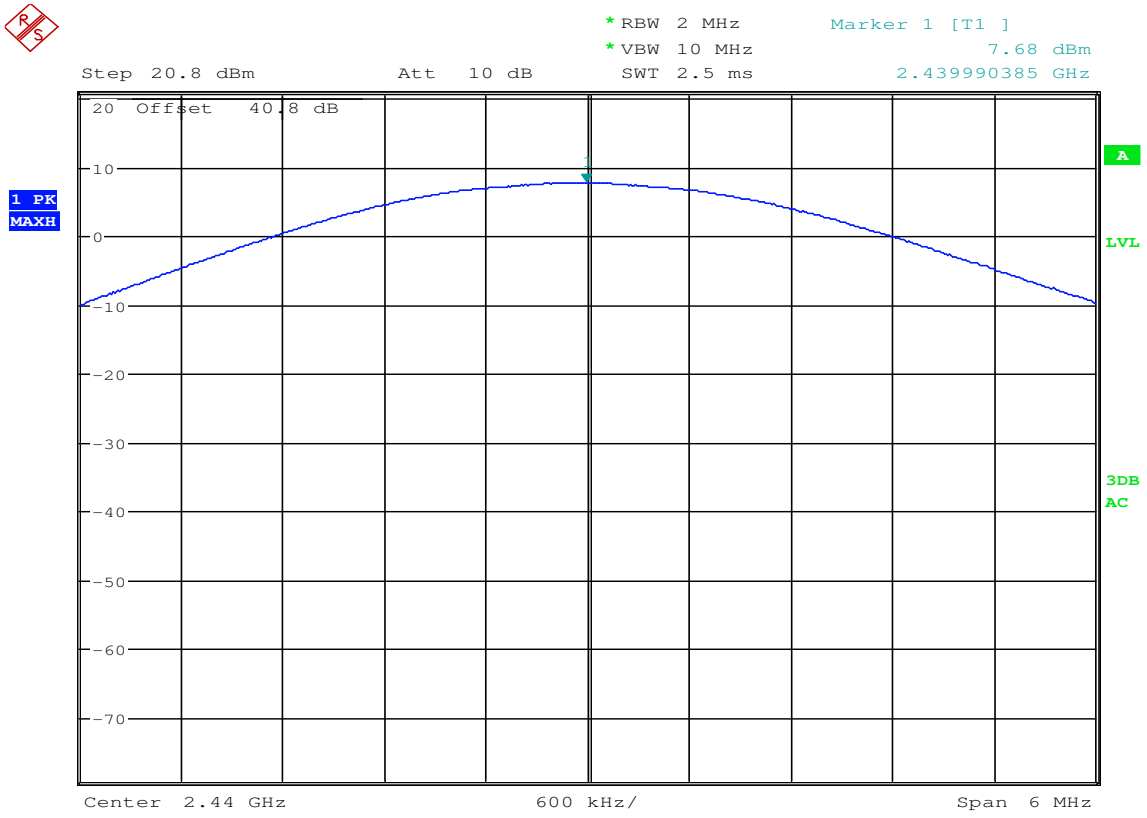


Date: 2.JUN.2016 08:58:33

FCC 15.247 Output Power

MANUFACTURER	: California Eastern Laboratories
MODEL NUMBER	: WB4343WF3SP-1
TEST MODE	: Tx @ 2402MHz
	: PEAK detector
NOTES	: Output Power
NOTES	: BLE
NOTES	:

NOTES

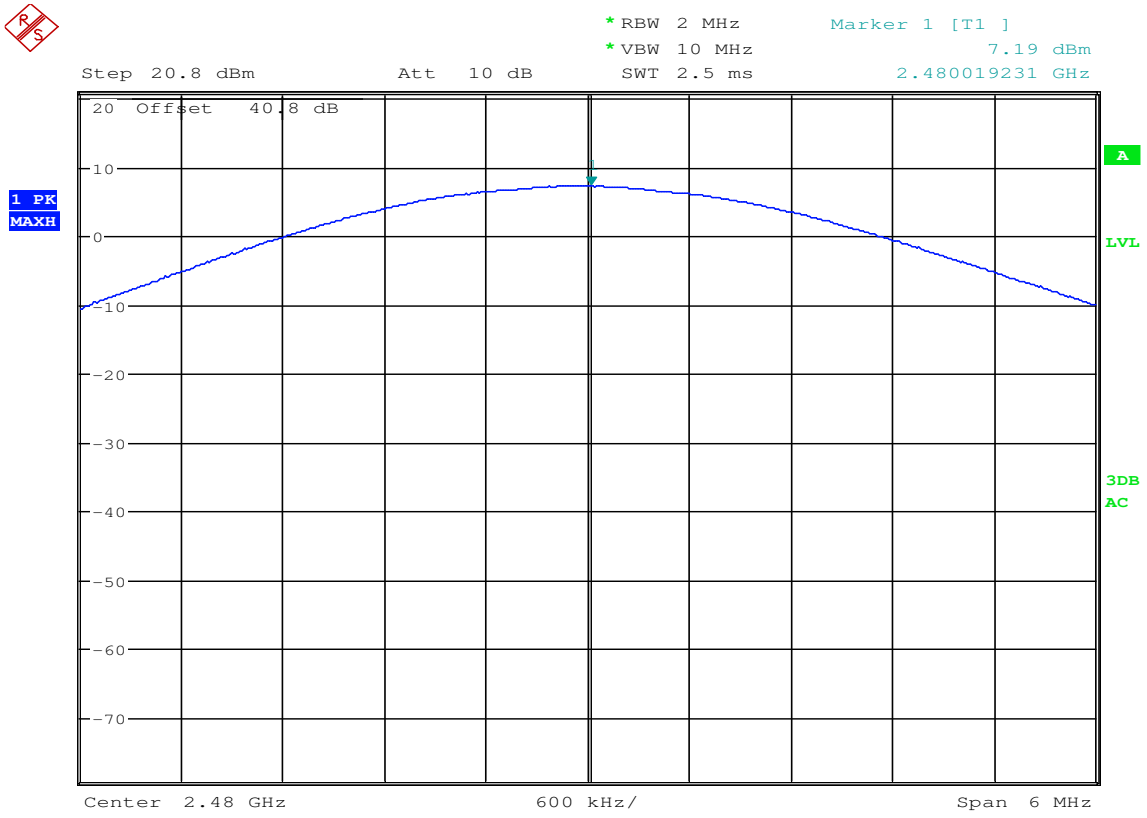


Date: 2.JUN.2016 09:07:15

FCC 15.247 Output Power

MANUFACTURER	: California Eastern Laboratories
MODEL NUMBER	: WB4343WF3SP-1
TEST MODE	: Tx @ 2440MHz
	: PEAK detector
NOTES	: Output Power
NOTES	: BLE
NOTES	:

NOTES

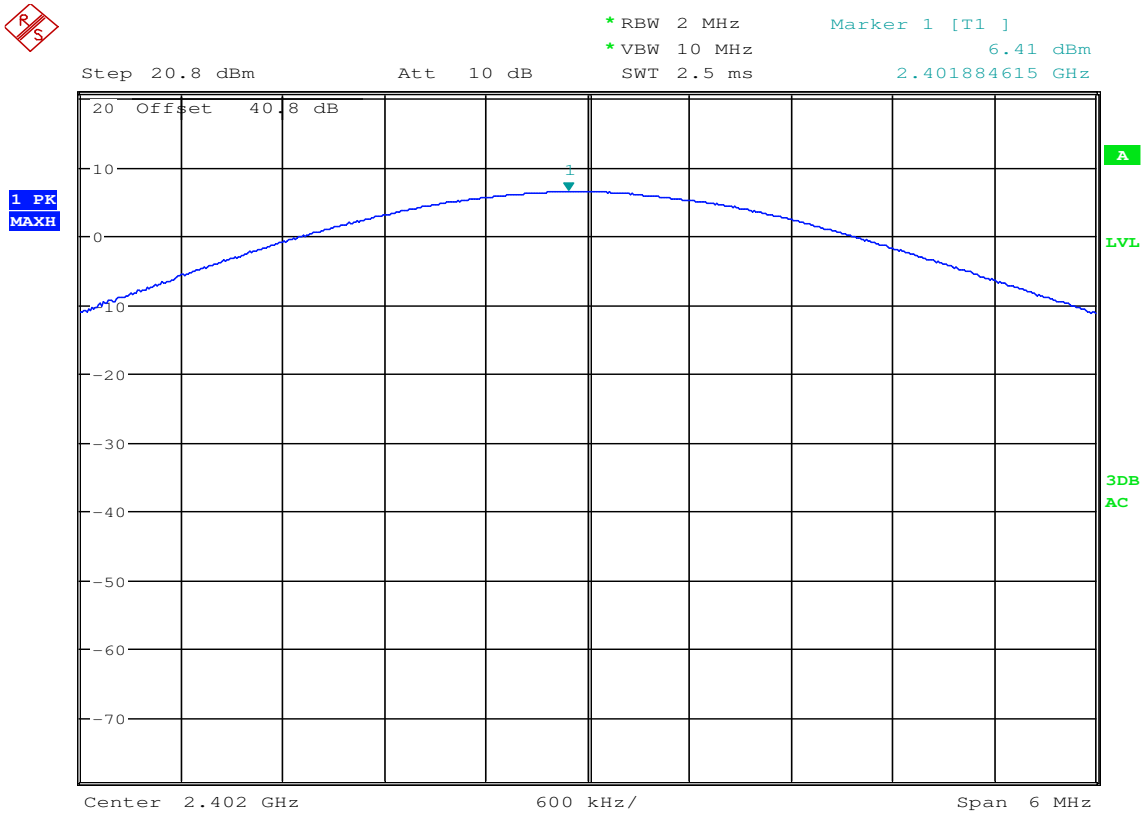


Date: 2.JUN.2016 09:09:47

FCC 15.247 Output Power

MANUFACTURER	: California Eastern Laboratories
MODEL NUMBER	: WB4343WF3SP-1
TEST MODE	: Tx @ 2480MHz
	: PEAK detector
NOTES	: Output Power
NOTES	: BLE
NOTES	:

NOTES

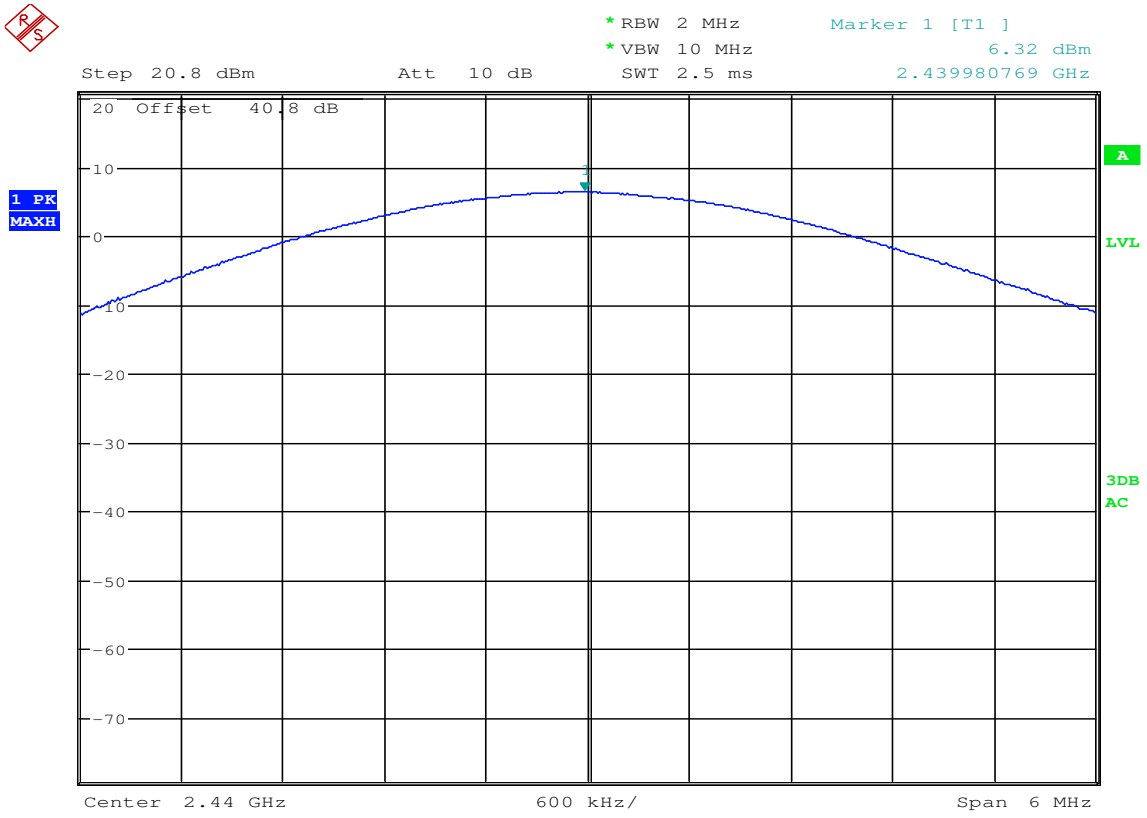


Date: 2.JUN.2016 08:49:56

FCC 15.247 Output Power

MANUFACTURER	: California Eastern Laboratories
MODEL NUMBER	: WB4343WF3SP-1
TEST MODE	: Tx @ 2402MHz
	: PEAK detector
NOTES	: Output Power
NOTES	: Bluetooth Enhanced
NOTES	:

NOTES

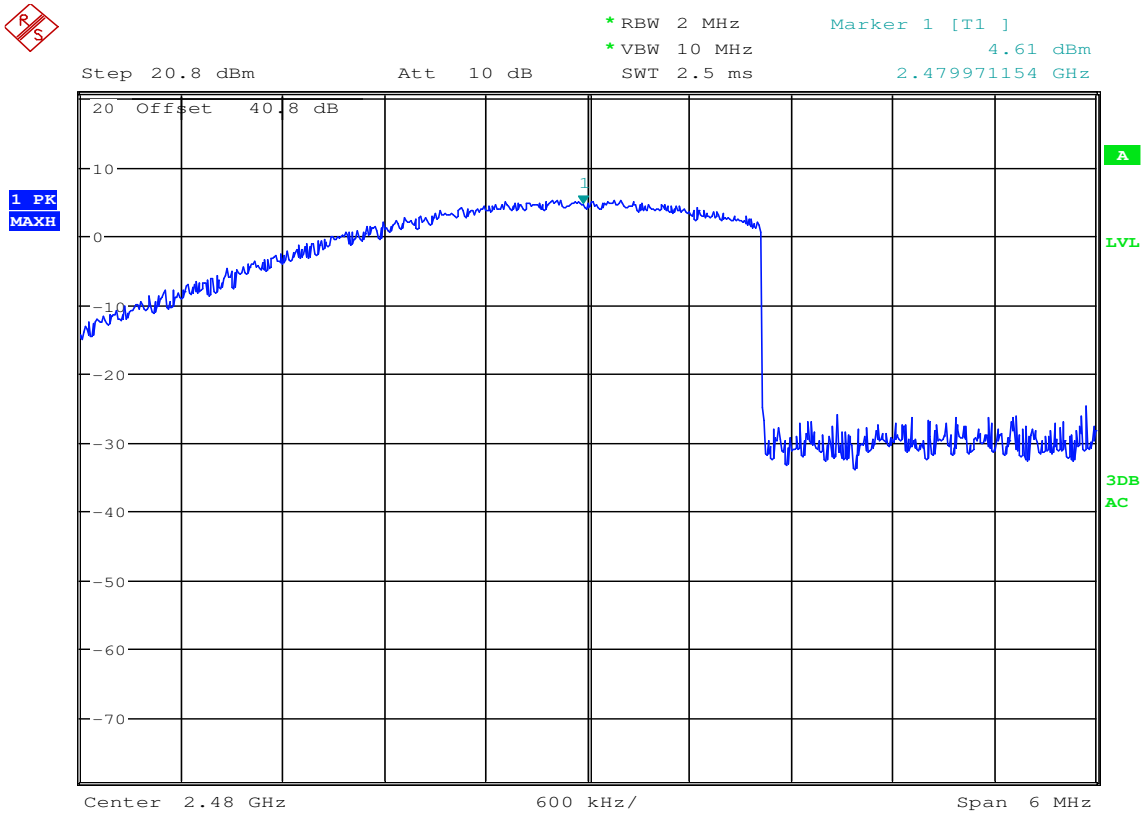


Date: 2.JUN.2016 08:54:23

FCC 15.247 Output Power

MANUFACTURER	: California Eastern Laboratories
MODEL NUMBER	: WB4343WF3SP-1
TEST MODE	: Tx @ 2440MHz
	: PEAK detector
NOTES	: Output Power
NOTES	: Bluetooth Enhanced
NOTES	:

NOTES



Date: 2.JUN.2016 08:55:22

FCC 15.247 Output Power

MANUFACTURER	: California Eastern Laboratories
MODEL NUMBER	: WB4343WF3SP-1
TEST MODE	: Tx @ 2480MHz
	: PEAK detector
NOTES	: Output Power
NOTES	: Bluetooth Enhanced
NOTES	:

NOTES

Manufacturer : California Eastern Laboratories
Model Number : DTS module - BLE
Specification : FCC-15.247 Effective Isotropic Radiated Power (EIRP)
Date : June 6, 2016
Notes : Test Distance is 3 meters

Freq (MHz)	Ant Pol	Meter Reading (dBuV)	Matched SIG. GEN. (dBm)	Equivalent Ant Gain (dB)	Cable Loss (dB)	EIRP Total (dBm)	Limit dBm
2402.00	H	70.0	8.0	5.7	2.7	10.9	36.0
2402.00	V	63.2	1.5	5.7	2.7	4.4	36.0
2440.00	H	69.3	7.4	5.8	2.8	10.4	36.0
2440.00	V	61.2	-0.5	5.8	2.8	2.6	36.0
2480.00	H	68.2	6.4	5.7	2.8	9.3	36.0
2480.00	V	57.6	-4.1	5.7	2.8	-1.1	36.0

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

Checked BY Richard E. King :

Richard E. King

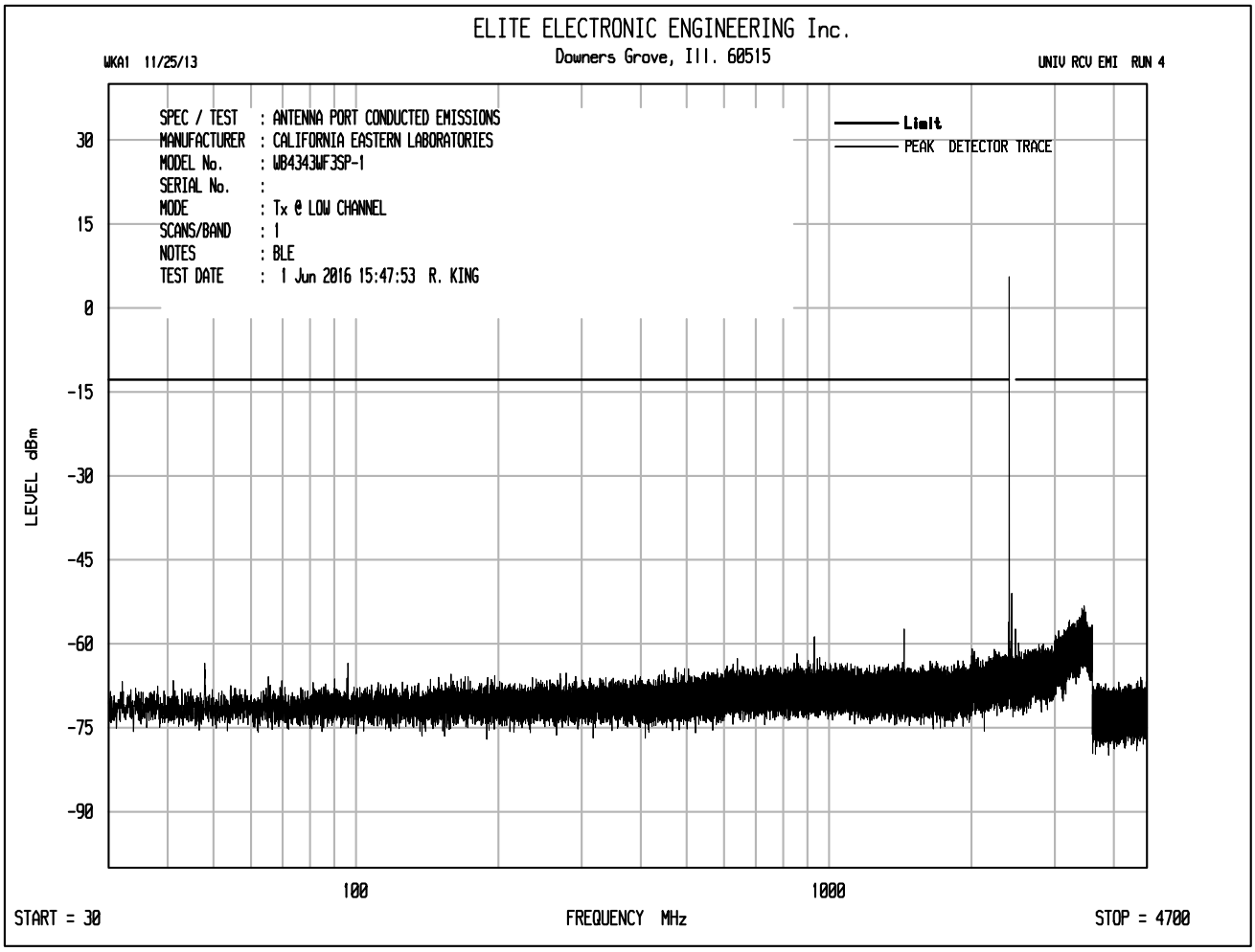
Manufacturer : California Eastern Laboratories
Model Number : DTS module – Bluetooth Enhanced
Specification : FCC-15.247 Effective Isotropic Radiated Power (EIRP)
Date : June 6, 2016
Notes : Test Distance is 3 meters

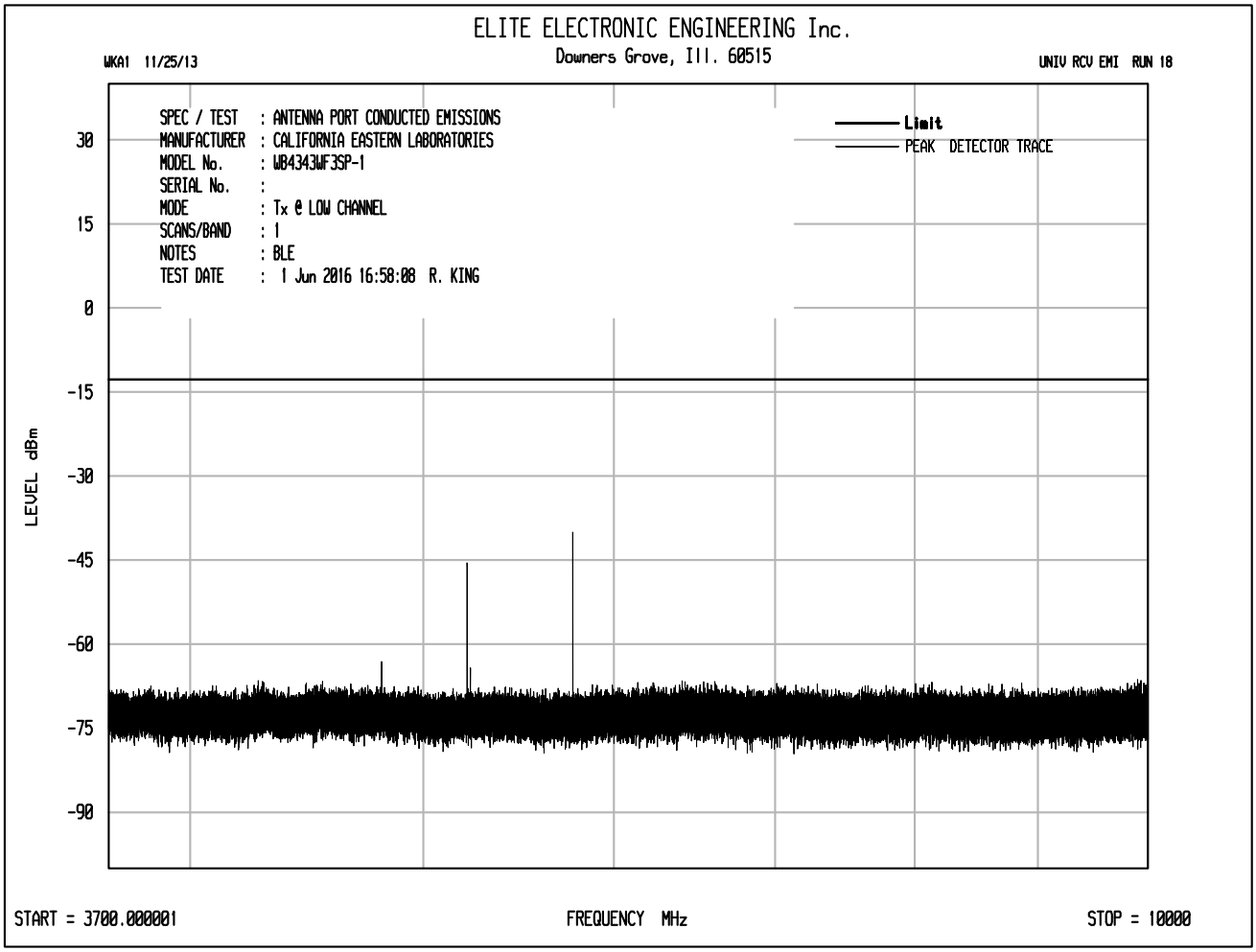
Freq (MHz)	Ant Pol	Meter Reading (dBuV)	Matched SIG. GEN. (dBm)	Equivalent Ant Gain (dB)	Cable Loss (dB)	EIRP Total (dBm)	Limit dBm
2402.00	H	65.0	3.0	5.7	2.7	5.9	36.0
2402.00	V	54.3	-7.4	5.7	2.7	-4.5	36.0
2440.00	H	64.3	2.4	5.8	2.8	5.4	36.0
2440.00	V	55.2	-6.5	5.8	2.8	-3.4	36.0
2480.00	H	63.2	1.4	5.7	2.8	4.3	36.0
2480.00	V	55.0	-6.6	5.7	2.8	-3.7	36.0

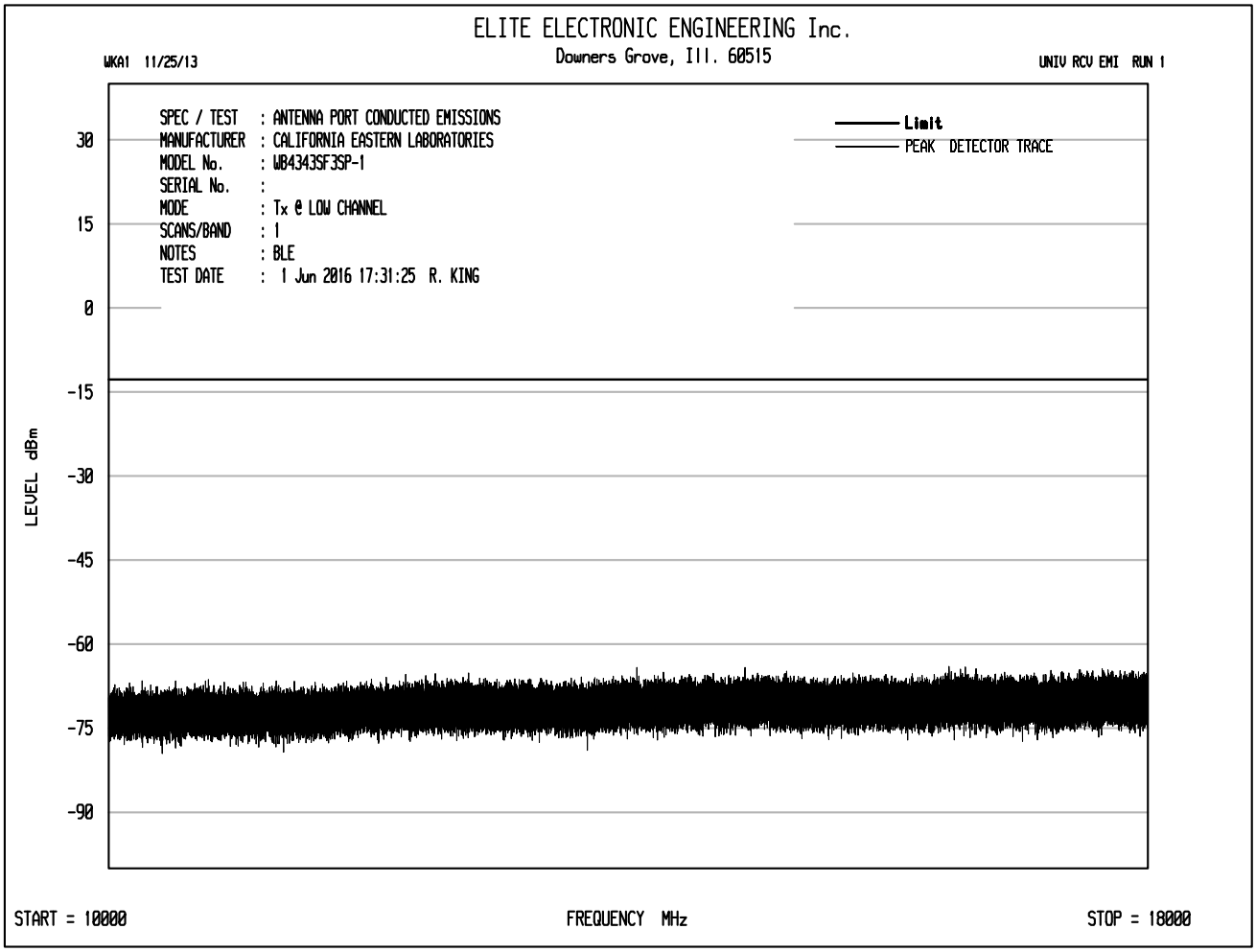
EIRP (dBm) = Matched Signal Generator (dBm) + Antenna Gain (dB) – Cable Loss (dB)

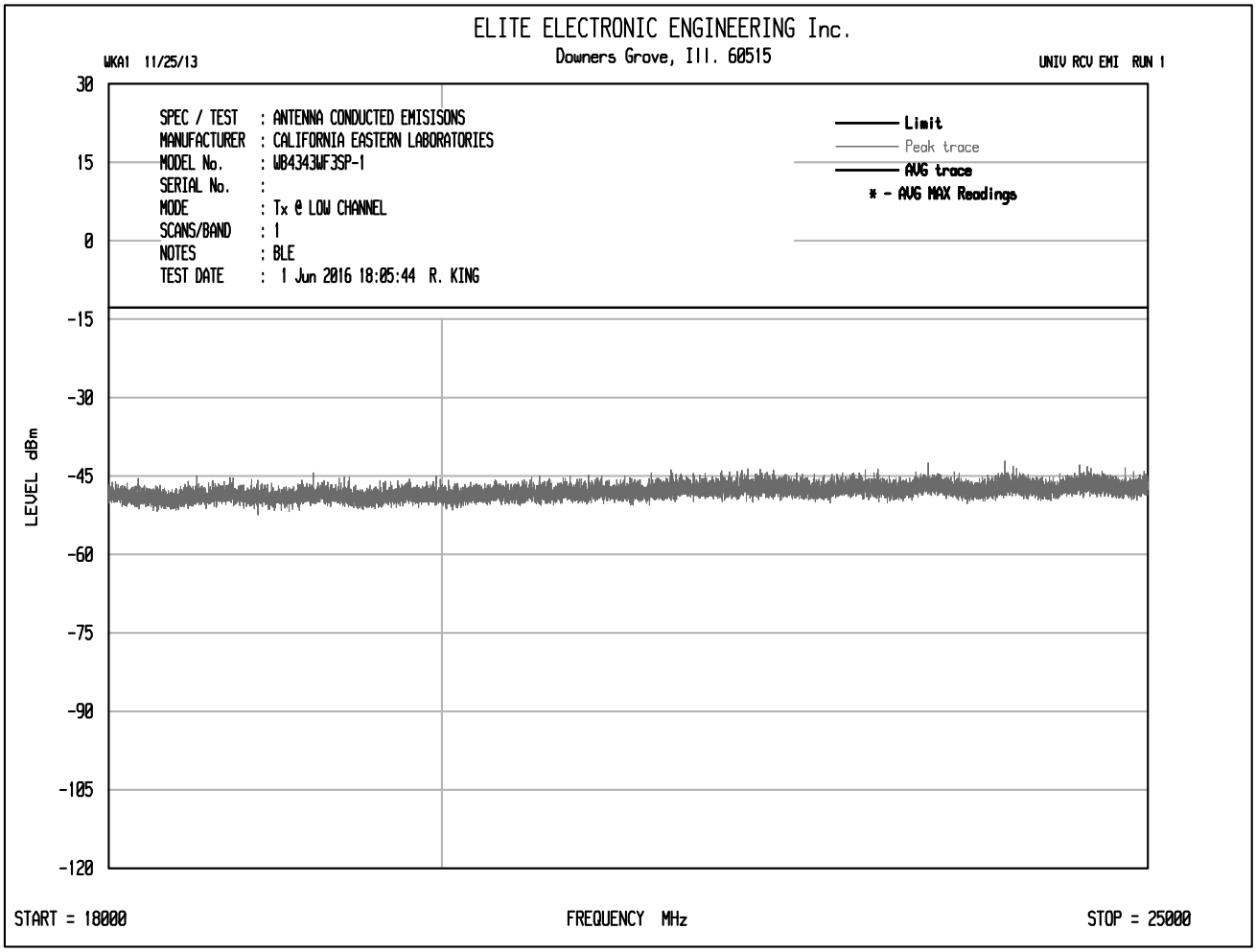
Checked BY Richard E. King :

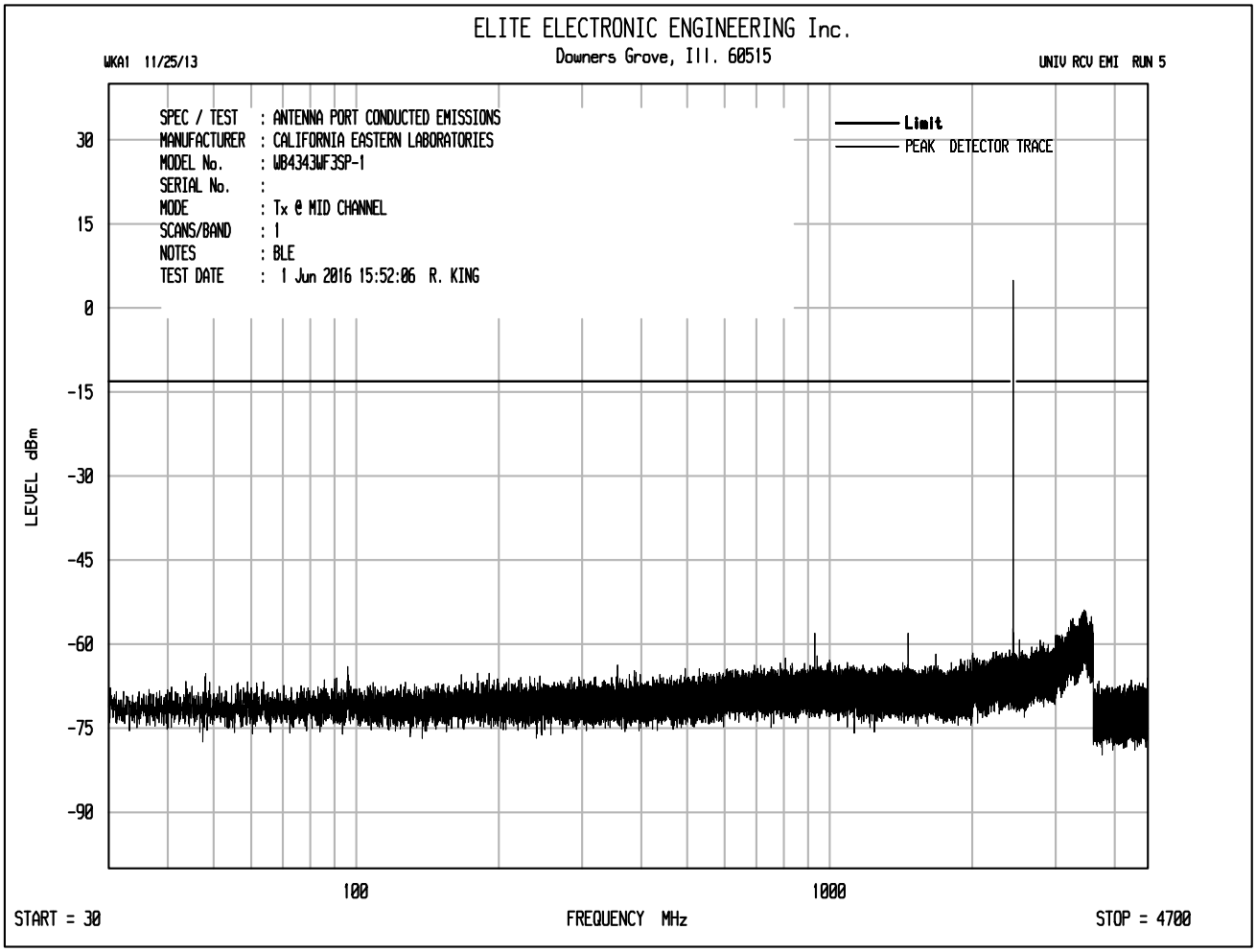
Richard E. King

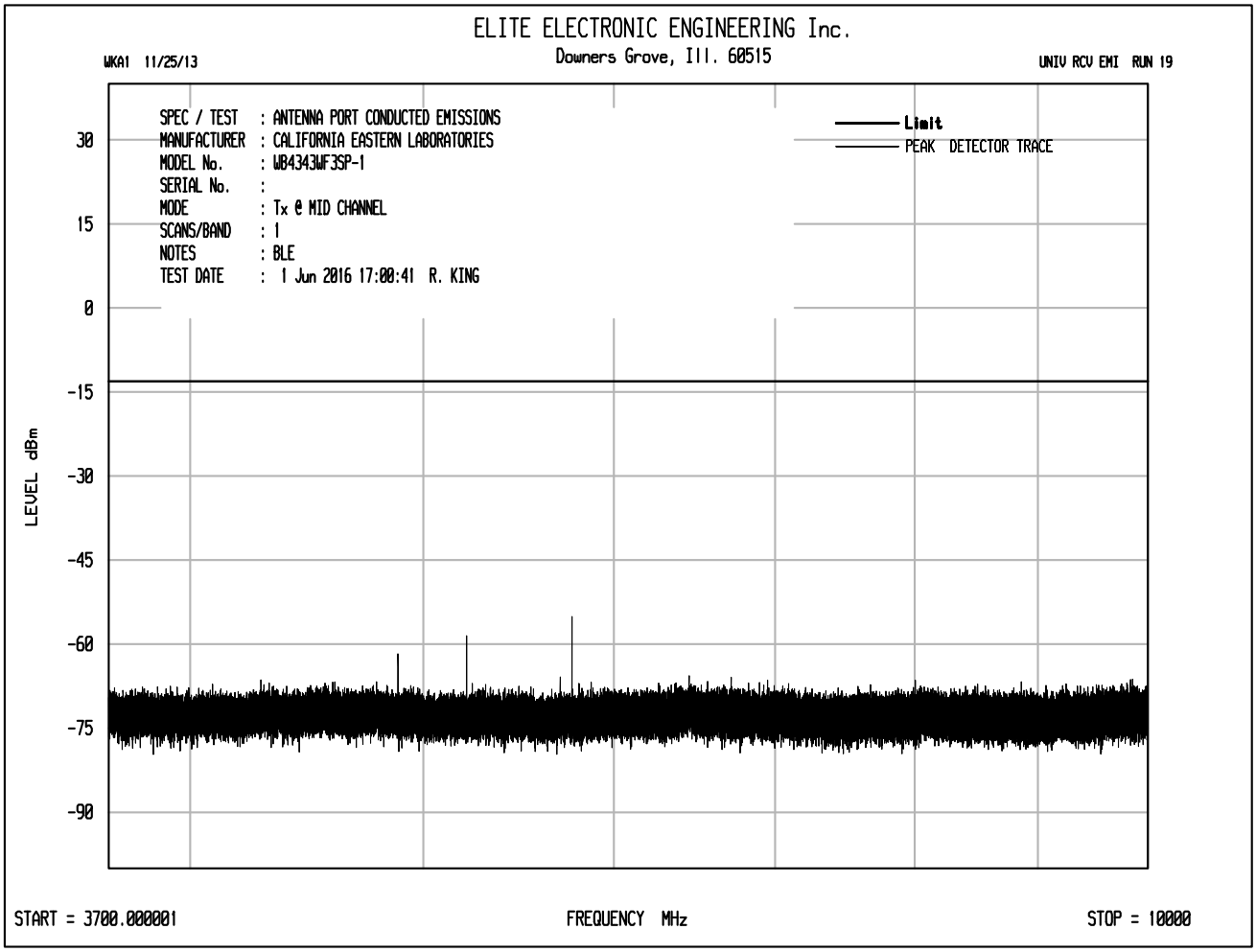

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 4
SPEC / TEST : ANTENNA PORT CONDUCTED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ LOW CHANNEL
SCANS/BAND : 1
NOTES : BLE
TEST DATE : 1 Jun 2016 15:47:53 R. KING
Limit
PEAK DETECTOR TRACE
30
15
0
-15
-30
-45
-60
-75
-90
LEVEL dBm
100
1000
START = 30
FREQUENCY MHz
STOP = 4700

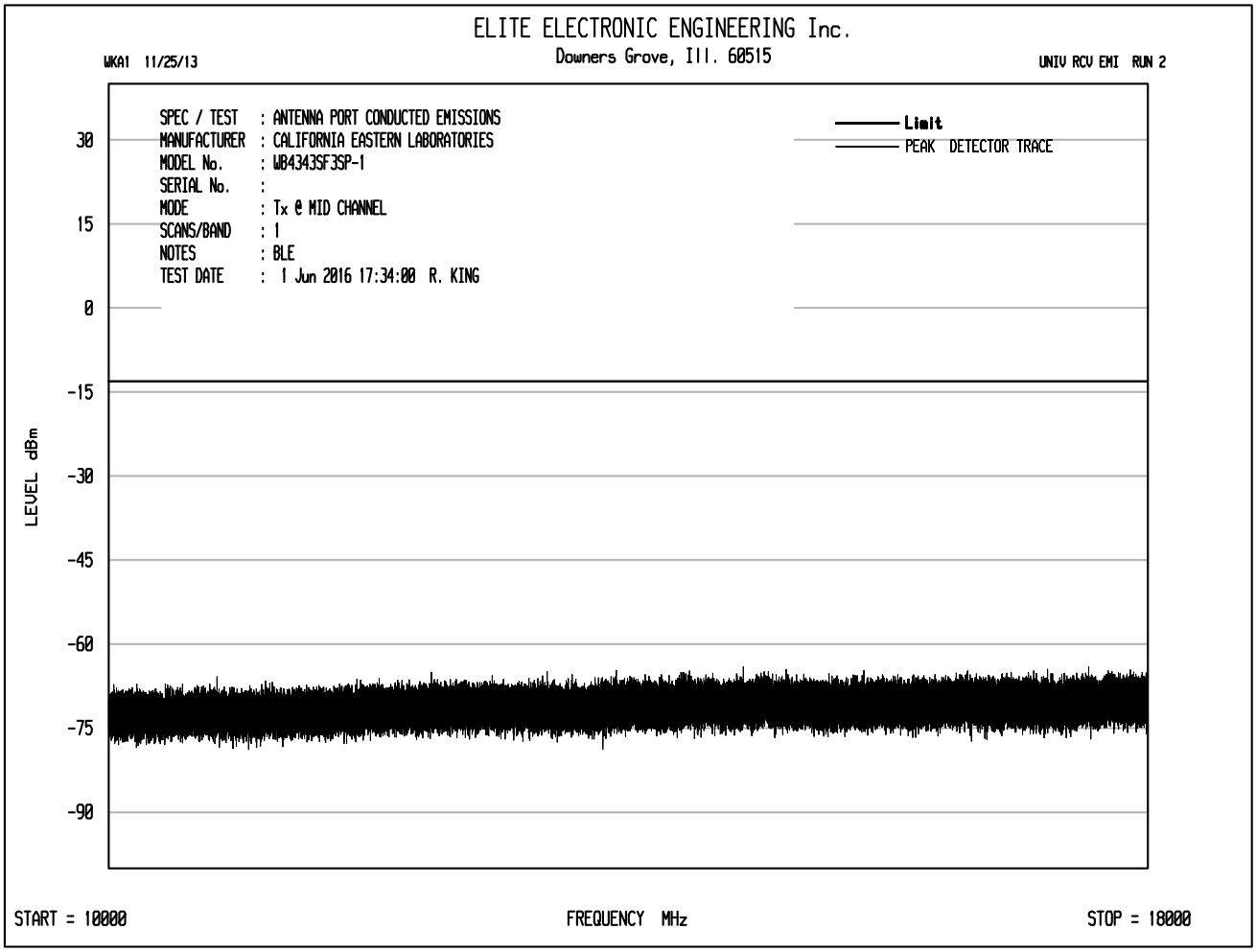

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 18
SPEC / TEST : ANTENNA PORT CONDUCTED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ LOW CHANNEL
SCANS/BAND : 1
NOTES : BLE
TEST DATE : 1 Jun 2016 16:58:08 R. KING
Limit
PEAK DETECTOR TRACE
LEVEL dBm
30
15
0
-15
-30
-45
-60
-75
-90
START = 3700.000001
FREQUENCY MHz
STOP = 10000

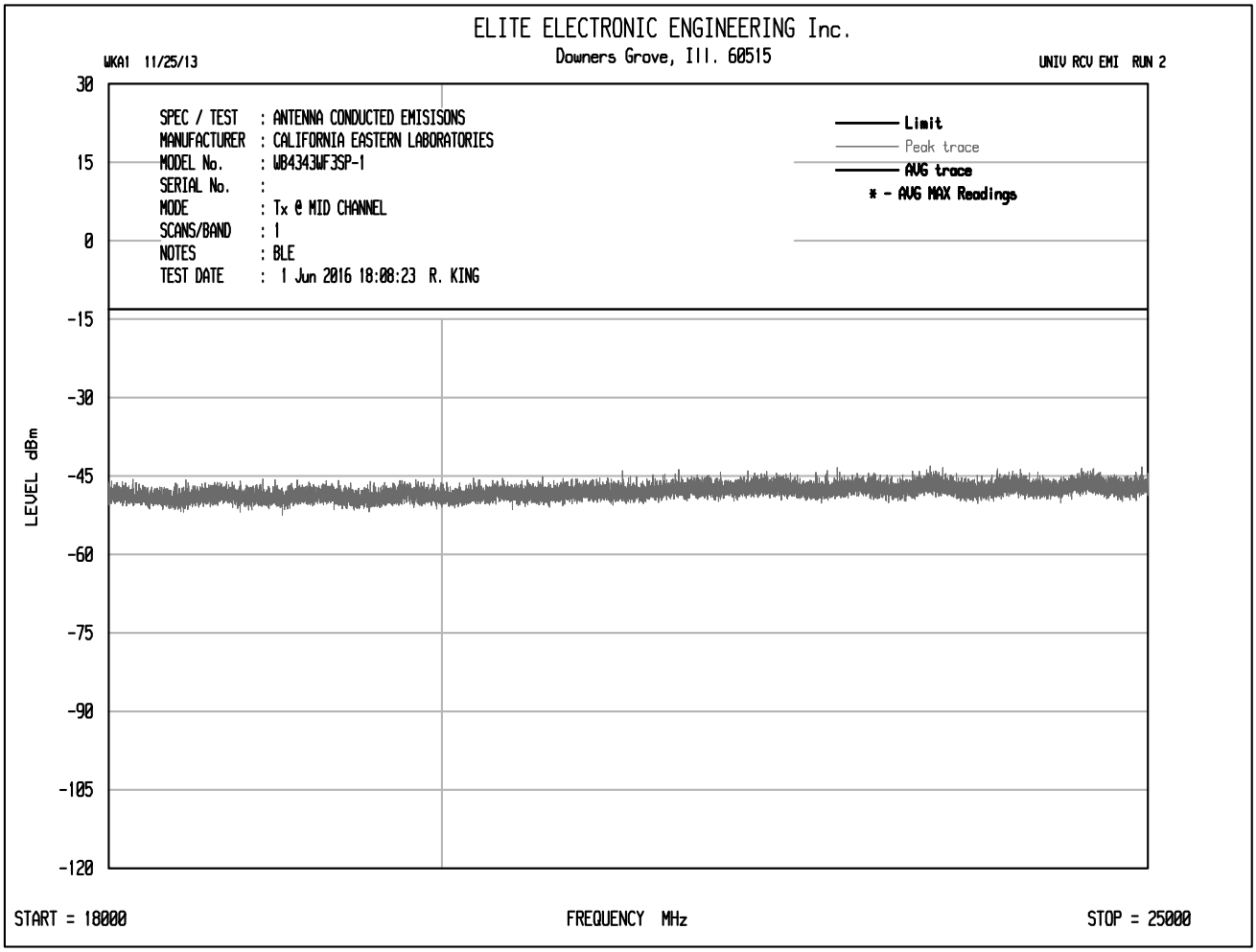

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 1
SPEC / TEST : ANTENNA PORT CONDUCTED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343SF3SP-1
SERIAL No. :
MODE : Tx @ LOW CHANNEL
SCANS/BAND : 1
NOTES : BLE
TEST DATE : 1 Jun 2016 17:31:25 R. KING
Limit
PEAK DETECTOR TRACE
LEVEL dBm
30
15
0
-15
-30
-45
-60
-75
-90
START = 10000
FREQUENCY MHz
STOP = 18000

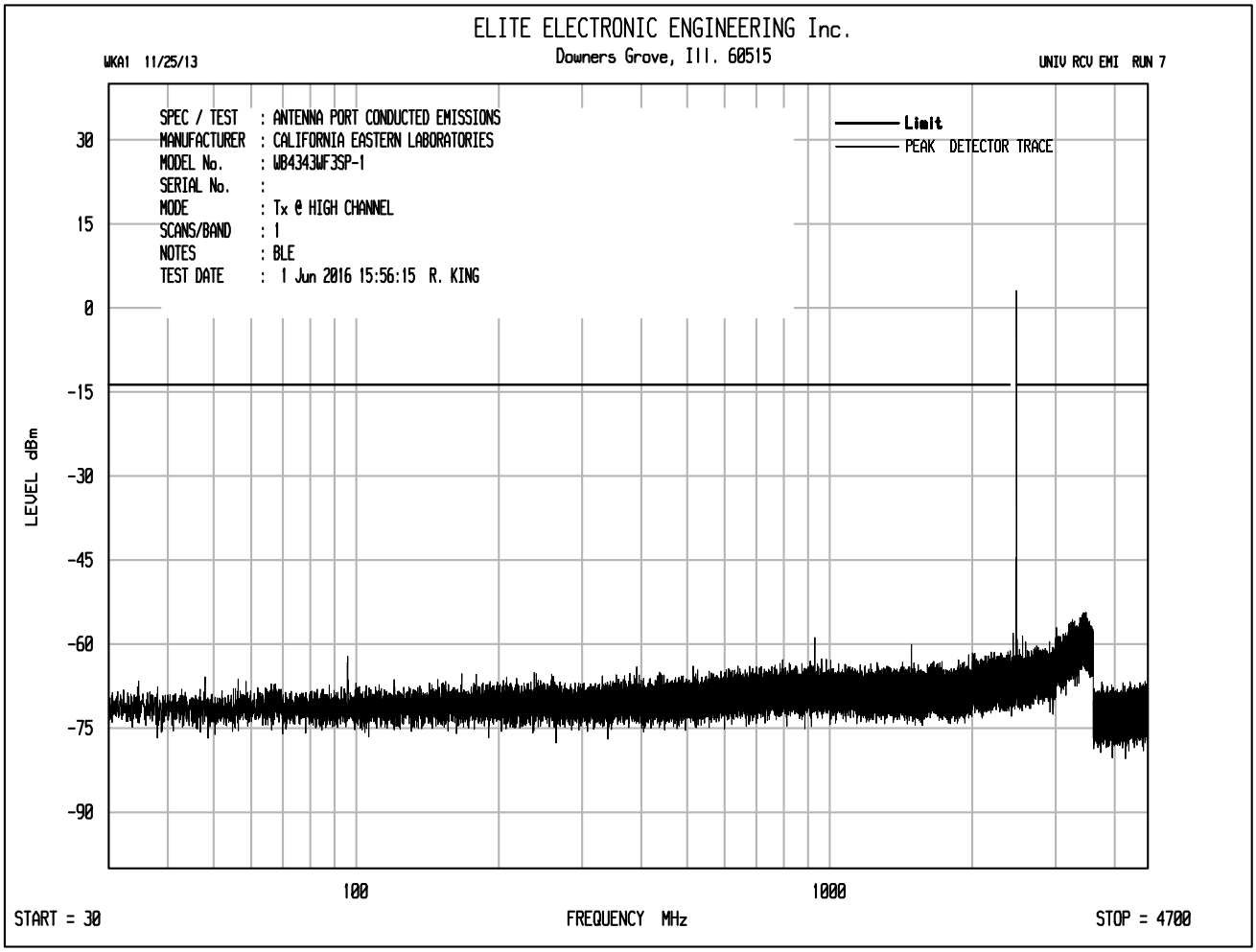

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 1
SPEC / TEST : ANTENNA CONDUCTED EMISISONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ LOW CHANNEL
SCANS/BAND : 1
NOTES : BLE
TEST DATE : 1 Jun 2016 18:05:44 R. KING
Limit
Peak trace
AVG trace
* - AVG MAX Readings
LEVEL dBm
30
15
0
-15
-30
-45
-60
-75
-90
-105
-120
START = 18000
FREQUENCY MHz
STOP = 25000

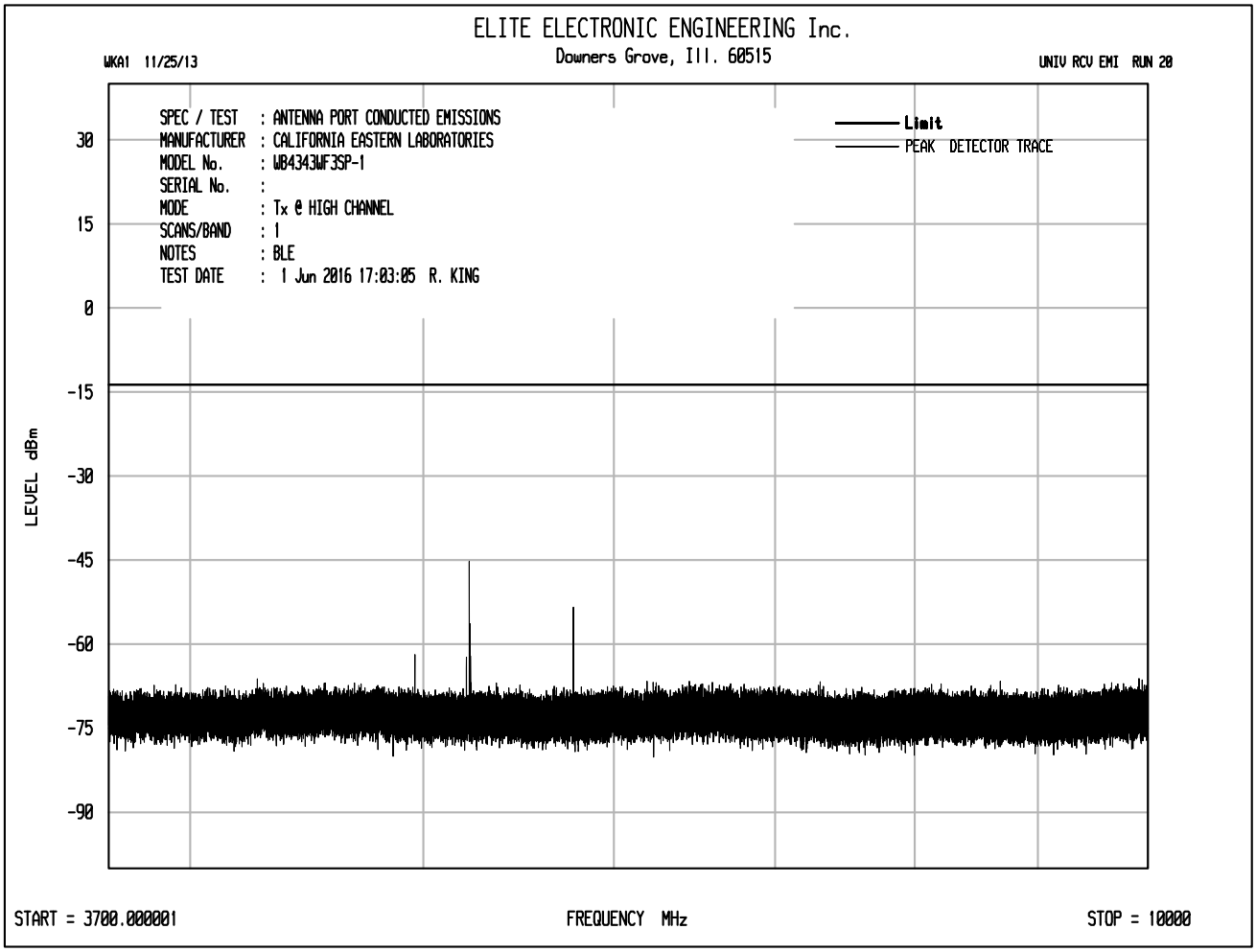

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 5
SPEC / TEST : ANTENNA PORT CONDUCTED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ MID CHANNEL
SCANS/BAND : 1
NOTES : BLE
TEST DATE : 1 Jun 2016 15:52:06 R. KING
Limit
PEAK DETECTOR TRACE
LEVEL dBm
30
15
0
-15
-30
-45
-60
-75
-90
100
1000
START = 30
FREQUENCY MHz
STOP = 4700

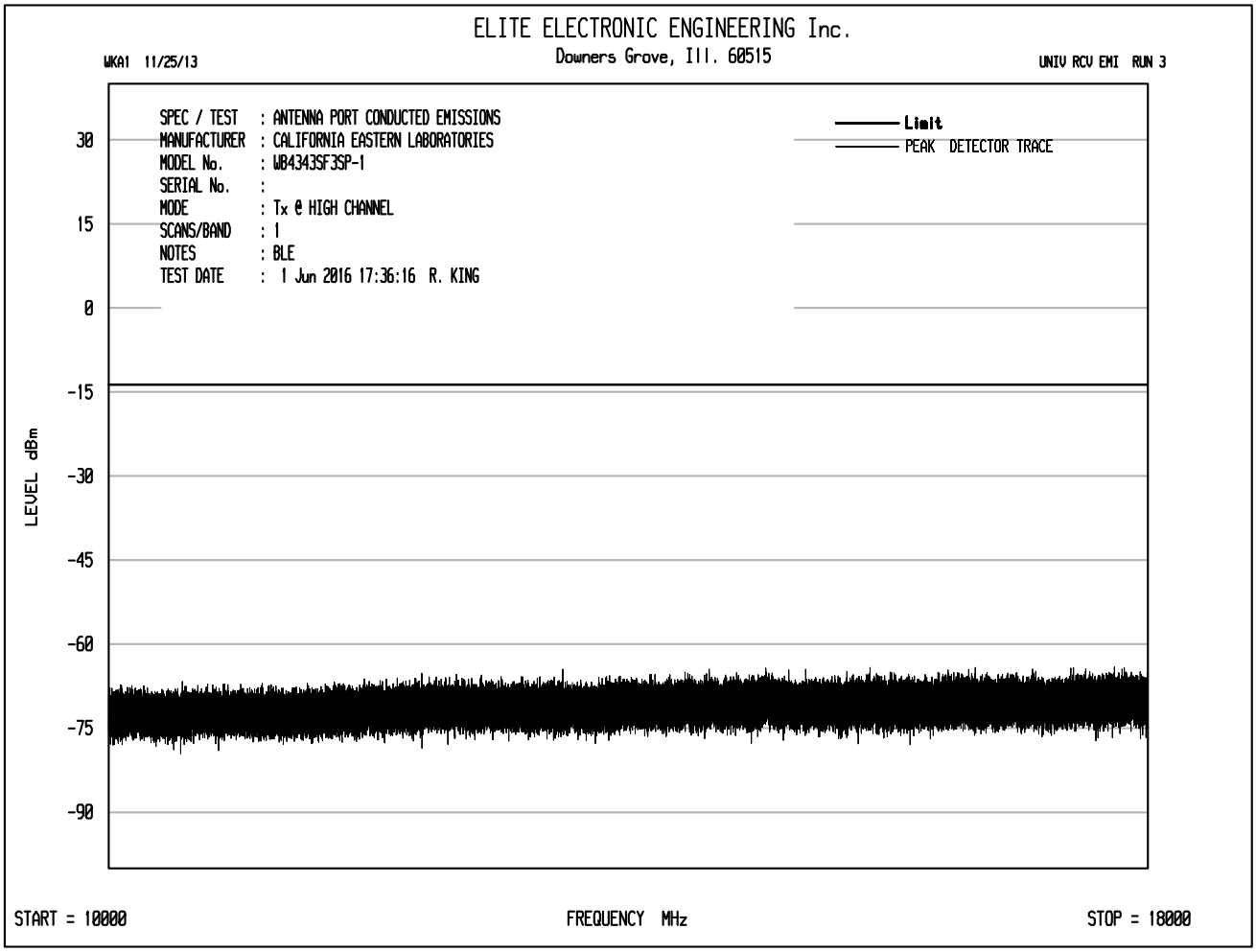

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 19
SPEC / TEST : ANTENNA PORT CONDUCTED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ MID CHANNEL
SCANS/BAND : 1
NOTES : BLE
TEST DATE : 1 Jun 2016 17:00:41 R. KING
Limit
PEAK DETECTOR TRACE
LEVEL dBm
30
15
0
-15
-30
-45
-60
-75
-90
START = 3700.000001
FREQUENCY MHz
STOP = 10000

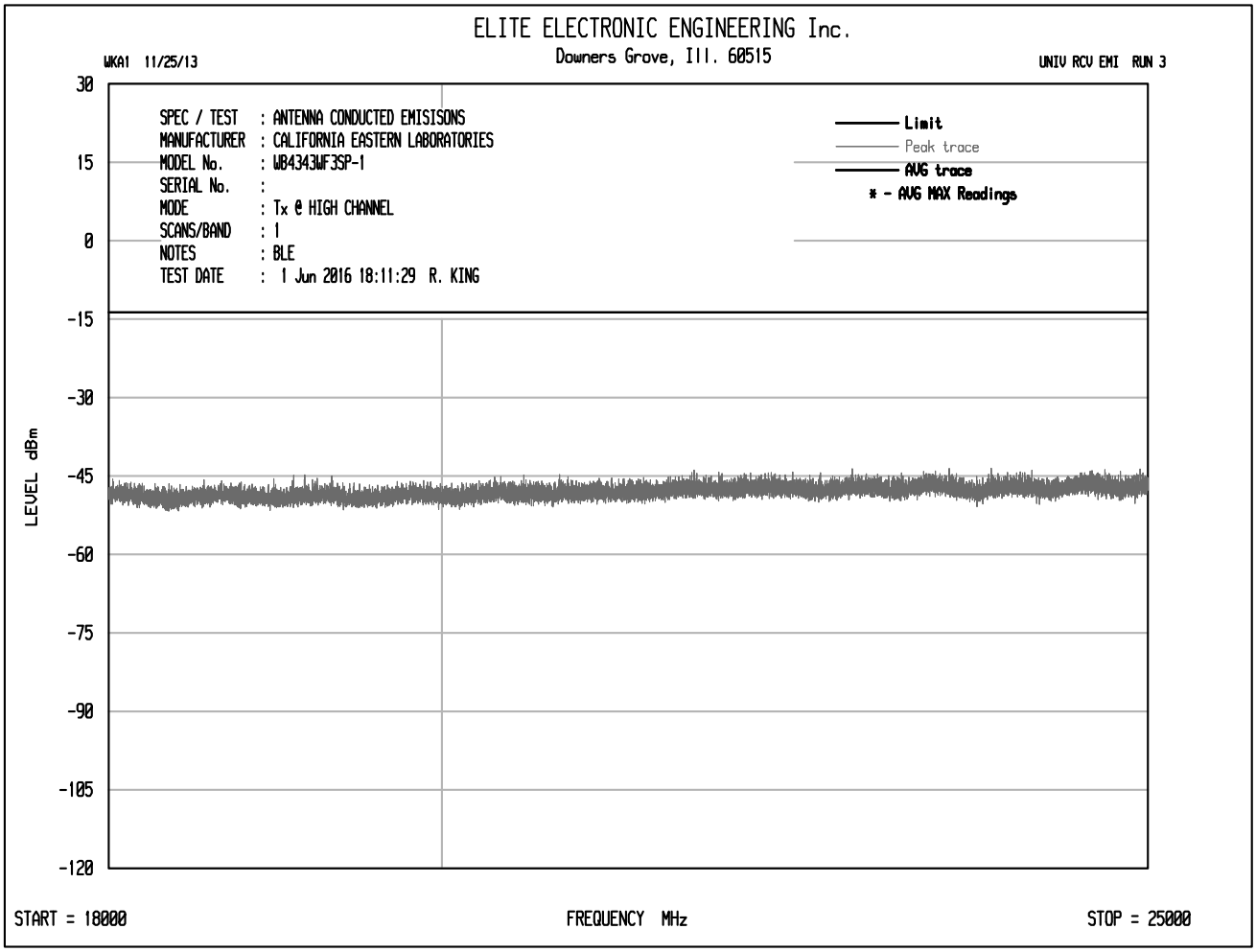

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 2
SPEC / TEST : ANTENNA PORT CONDUCTED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343SF3SP-1
SERIAL No. :
MODE : Tx @ MID CHANNEL
SCANS/BAND : 1
NOTES : BLE
TEST DATE : 1 Jun 2016 17:34:00 R. KING
Limit
PEAK DETECTOR TRACE
LEVEL dBm
30
15
0
-15
-30
-45
-60
-75
-90
START = 10000
FREQUENCY MHz
STOP = 18000

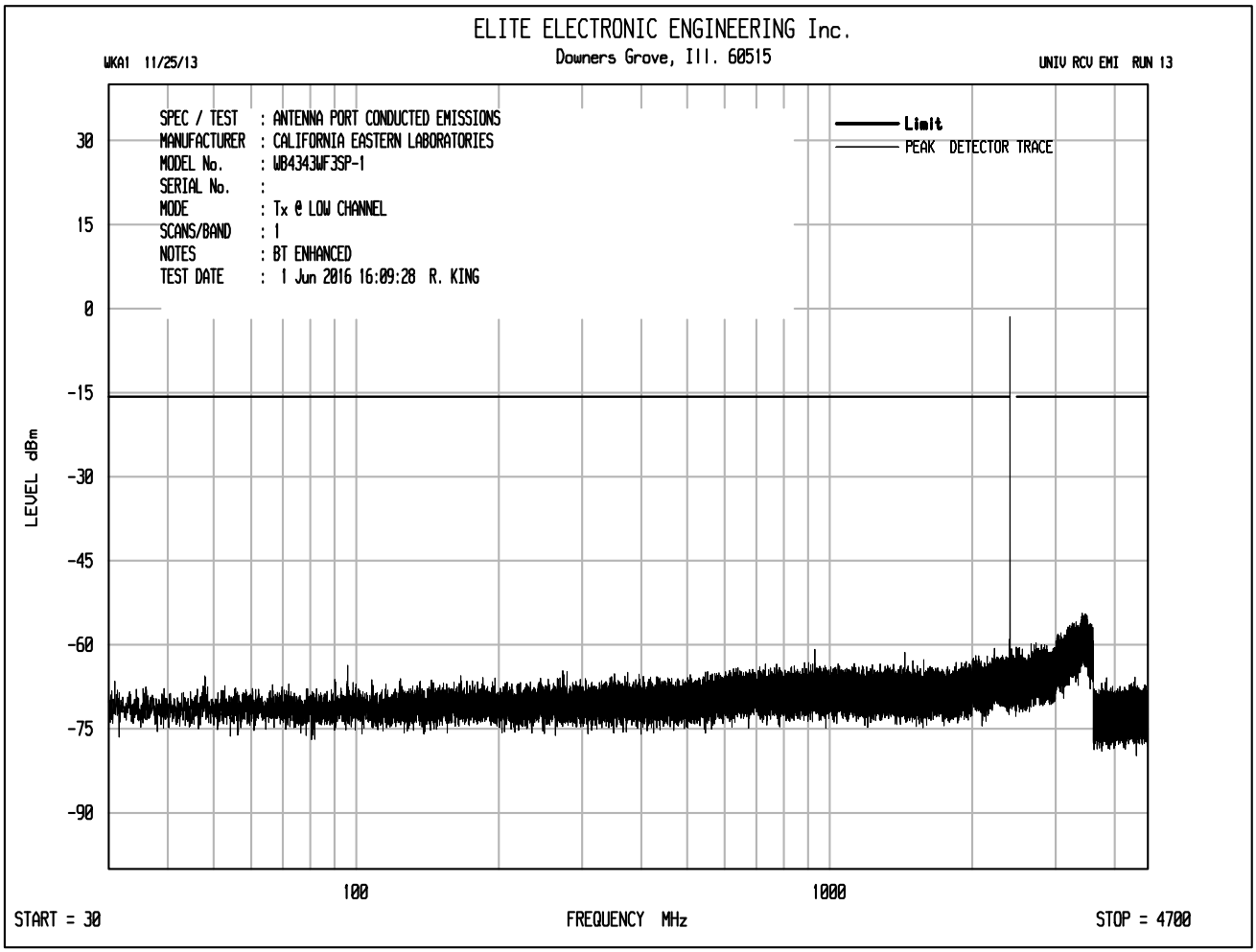

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 2
SPEC / TEST : ANTENNA CONDUCTED EMISISONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ MID CHANNEL
SCANS/BAND : 1
NOTES : BLE
TEST DATE : 1 Jun 2016 18:08:23 R. KING
Limit
Peak trace
AVG trace
* - AVG MAX Readings
30
15
0
-15
-30
-45
-60
-75
-90
-105
-120
LEVEL dBm
START = 18000
FREQUENCY MHz
STOP = 25000

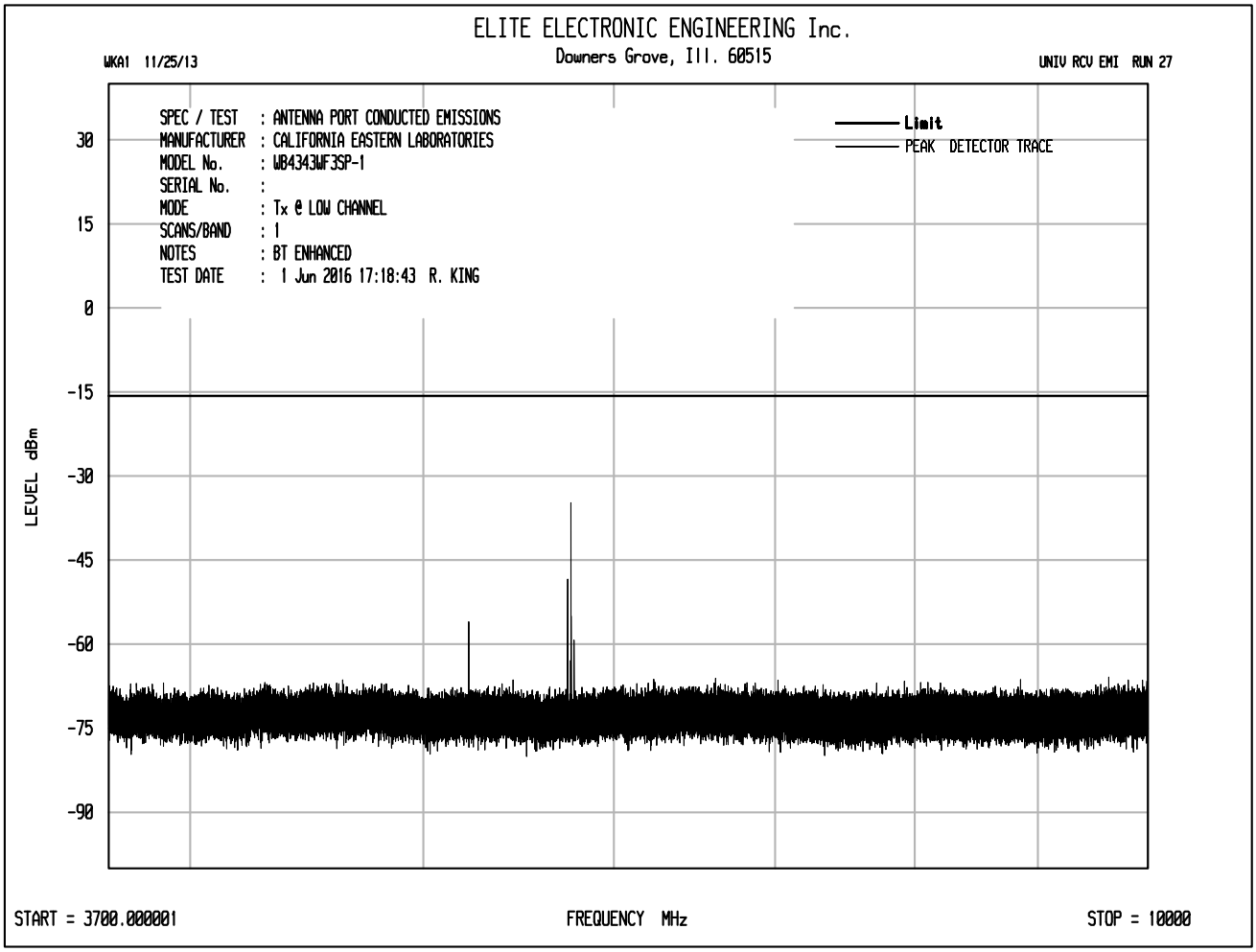

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 7
SPEC / TEST : ANTENNA PORT CONDUCTED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ HIGH CHANNEL
SCANS/BAND : 1
NOTES : BLE
TEST DATE : 1 Jun 2016 15:56:15 R. KING
Limit
PEAK DETECTOR TRACE
30
15
0
-15
-30
-45
-60
-75
-90
LEVEL dBm
100
1000
START = 30
FREQUENCY MHz
STOP = 4700

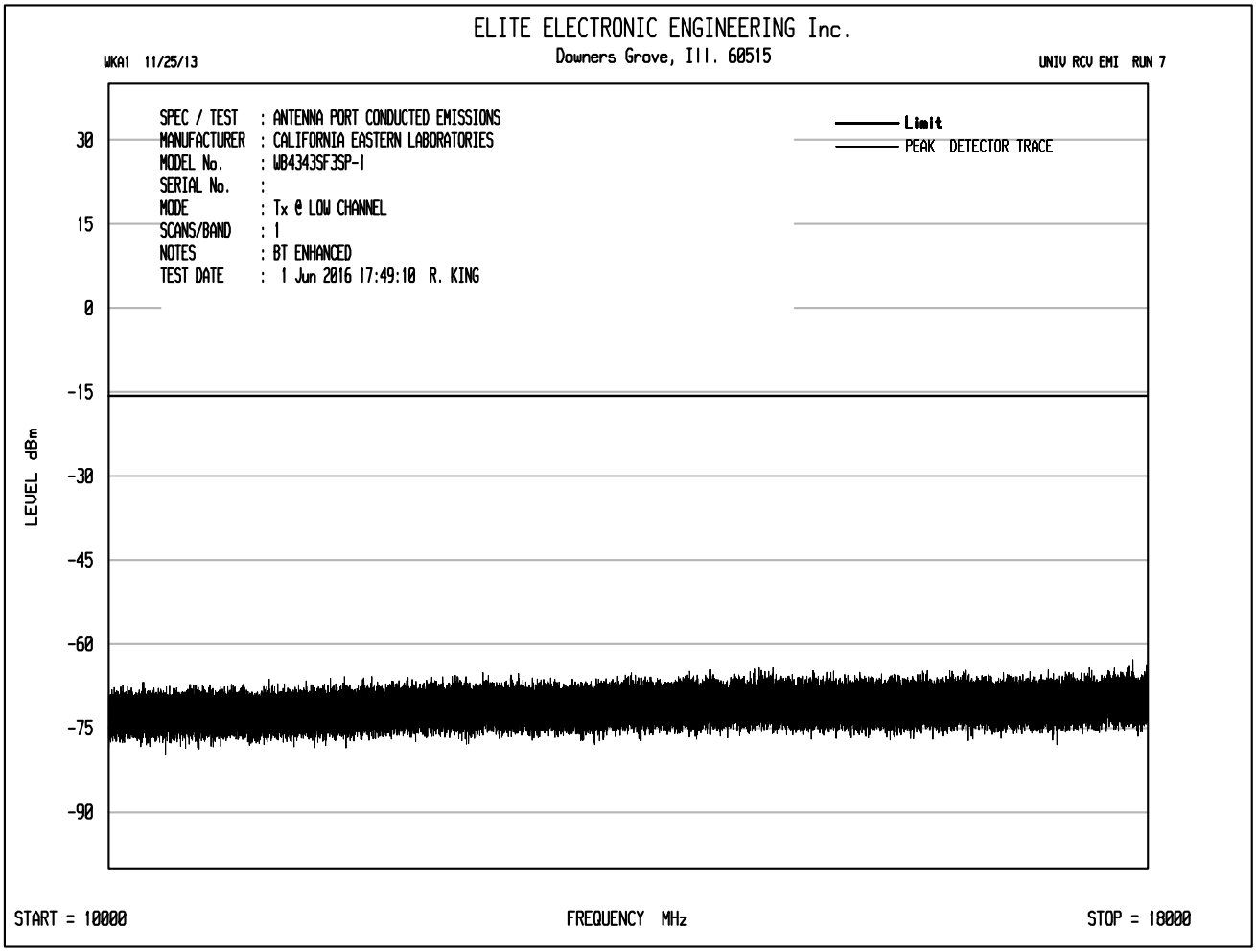

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 20
SPEC / TEST : ANTENNA PORT CONDUCTED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ HIGH CHANNEL
SCANS/BAND : 1
NOTES : BLE
TEST DATE : 1 Jun 2016 17:03:05 R. KING
Limit
PEAK DETECTOR TRACE
LEVEL dBm
30
15
0
-15
-30
-45
-60
-75
-90
START = 3700.000001
FREQUENCY MHz
STOP = 10000

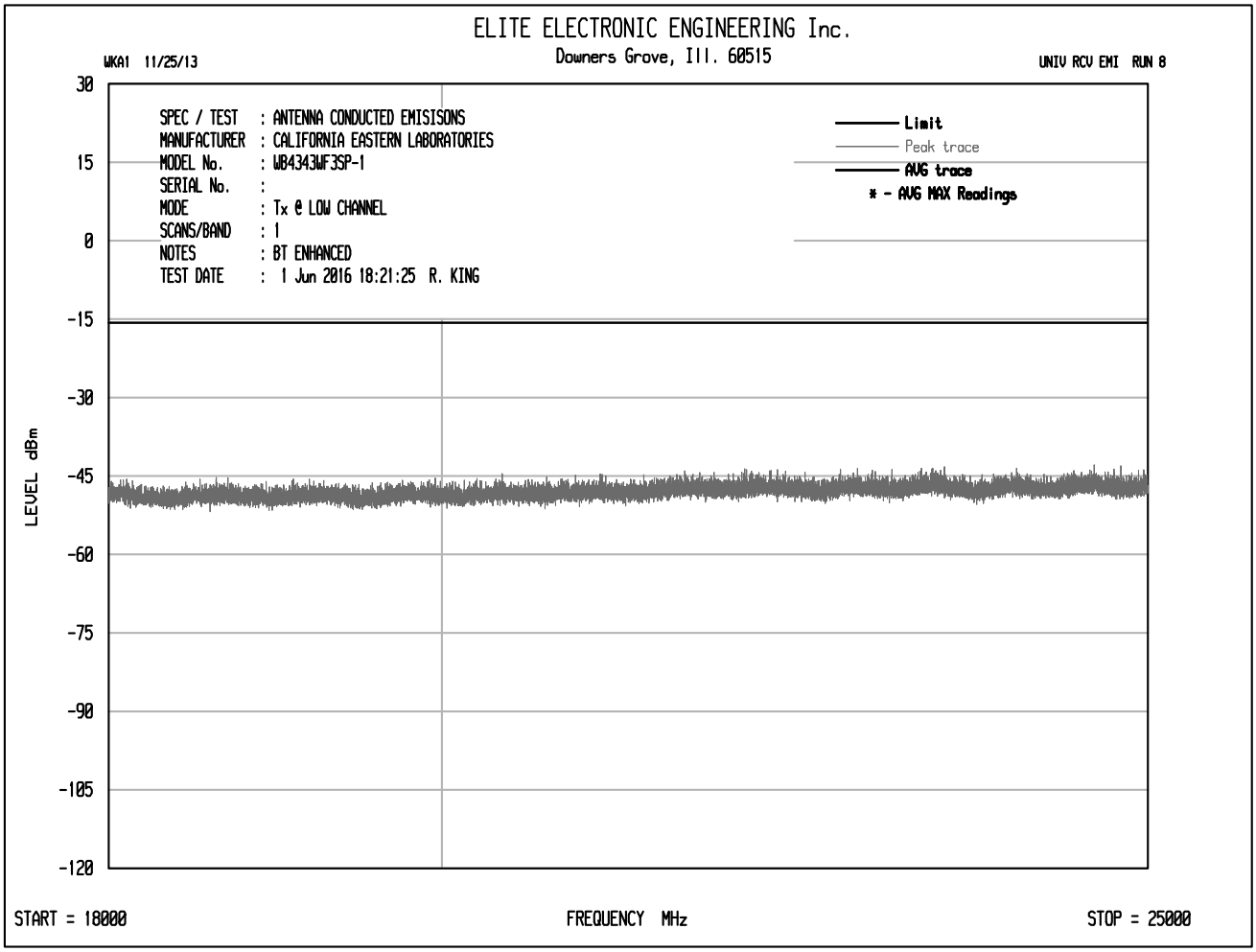

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 3
SPEC / TEST : ANTENNA PORT CONDUCTED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343SF3SP-1
SERIAL No. :
MODE : Tx @ HIGH CHANNEL
SCANS/BAND : 1
NOTES : BLE
TEST DATE : 1 Jun 2016 17:36:16 R. KING
Limit
PEAK DETECTOR TRACE
LEVEL dBm
30
15
0
-15
-30
-45
-60
-75
-90
START = 10000
FREQUENCY MHz
STOP = 18000

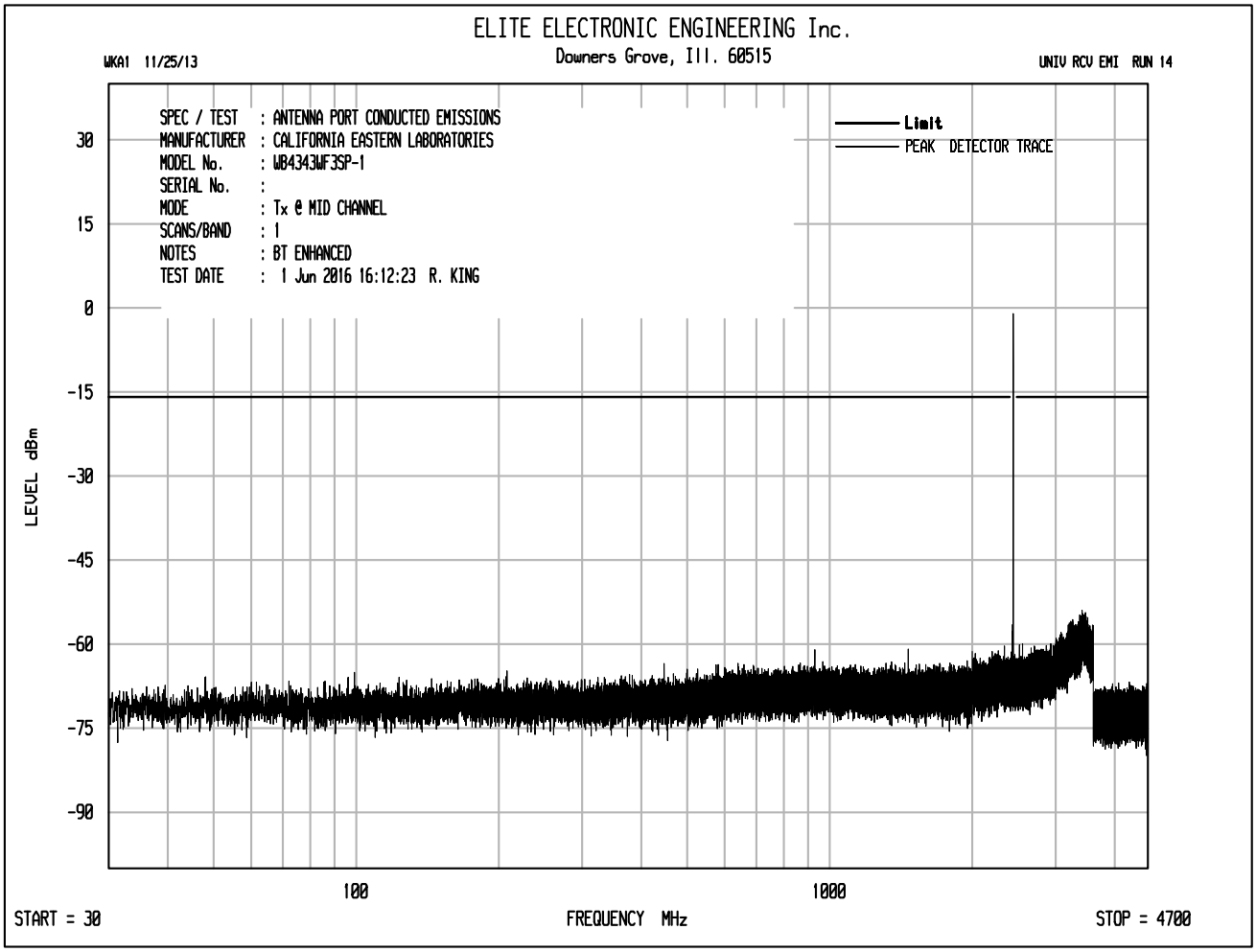

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 3
SPEC / TEST : ANTENNA CONDUCTED EMISISONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ HIGH CHANNEL
SCANS/BAND : 1
NOTES : BLE
TEST DATE : 1 Jun 2016 18:11:29 R. KING
Limit
Peak trace
AVG trace
* - AVG MAX Readings
30
15
0
-15
-30
-45
-60
-75
-90
-105
-120
LEVEL dBm
START = 18000
FREQUENCY MHz
STOP = 25000

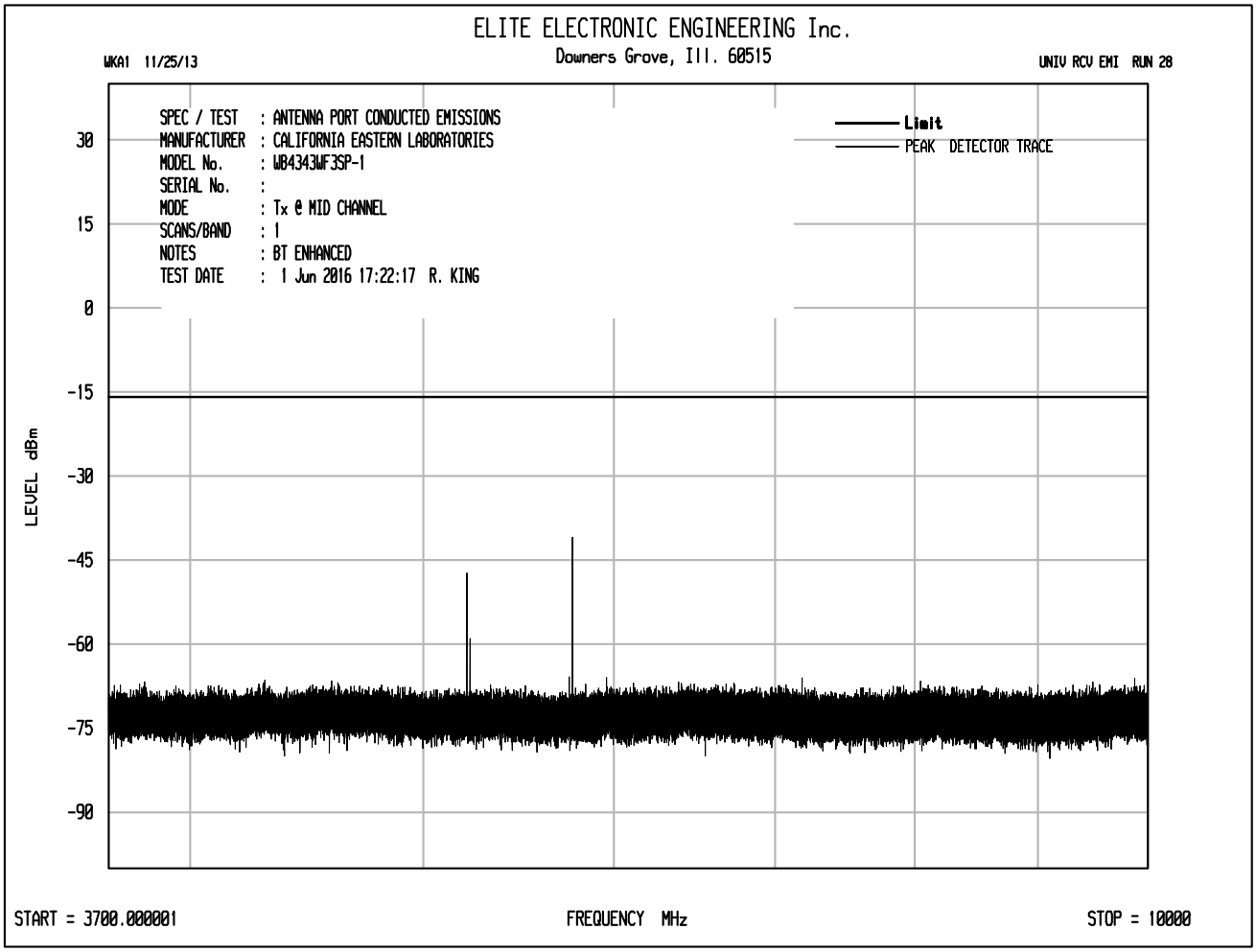

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 13
SPEC / TEST : ANTENNA PORT CONDUCTED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ LOW CHANNEL
SCANS/BAND : 1
NOTES : BT ENHANCED
TEST DATE : 1 Jun 2016 16:09:28 R. KING
Limit
PEAK DETECTOR TRACE
LEVEL dBm
30
15
0
-15
-30
-45
-60
-75
-90
100
1000
START = 30
FREQUENCY MHz
STOP = 4700

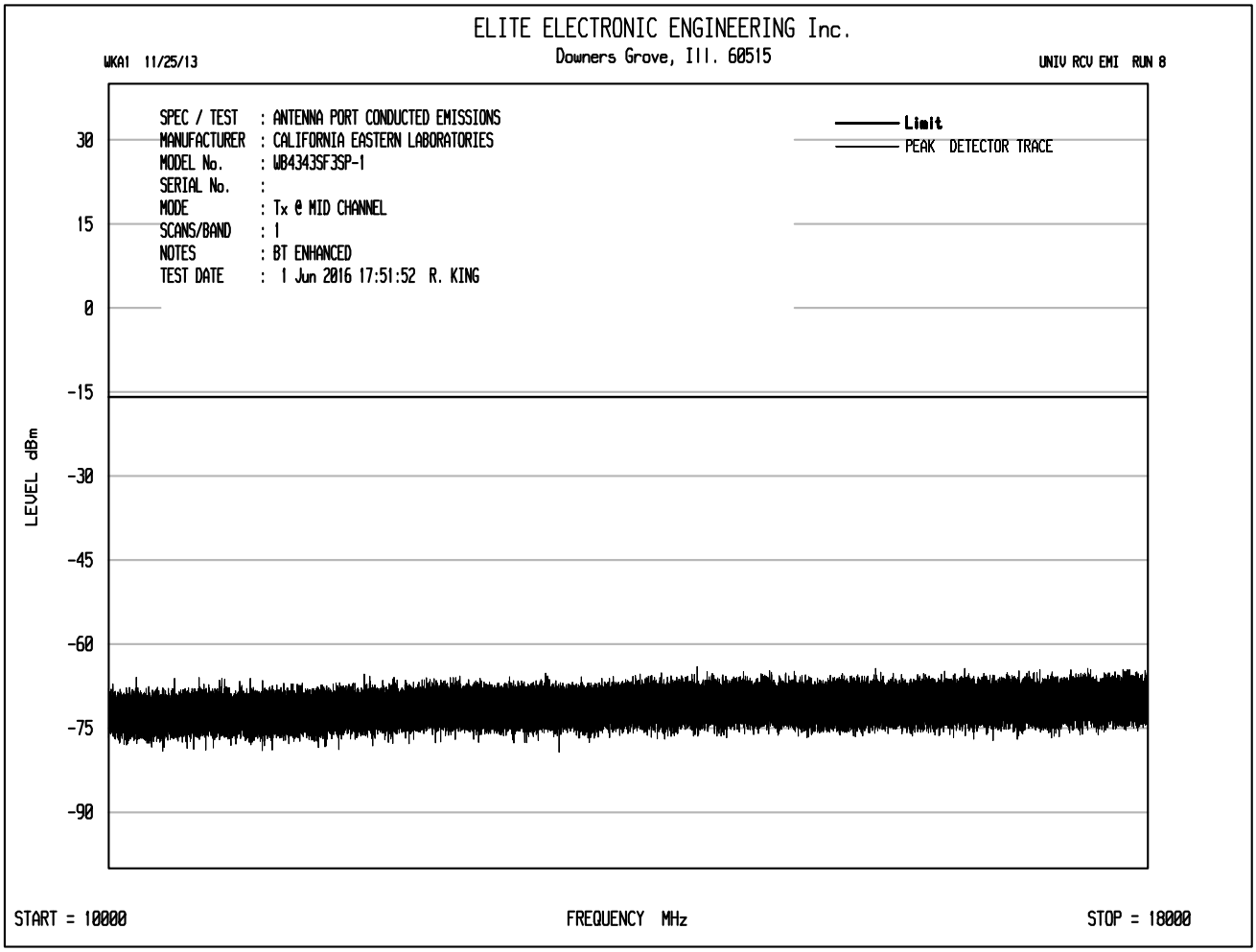

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 27
SPEC / TEST : ANTENNA PORT CONDUCTED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ LOW CHANNEL
SCANS/BAND : 1
NOTES : BT ENHANCED
TEST DATE : 1 Jun 2016 17:18:43 R. KING
Limit
PEAK DETECTOR TRACE
LEVEL dBm
30
15
0
-15
-30
-45
-60
-75
-90
START = 3700.000001
FREQUENCY MHz
STOP = 10000

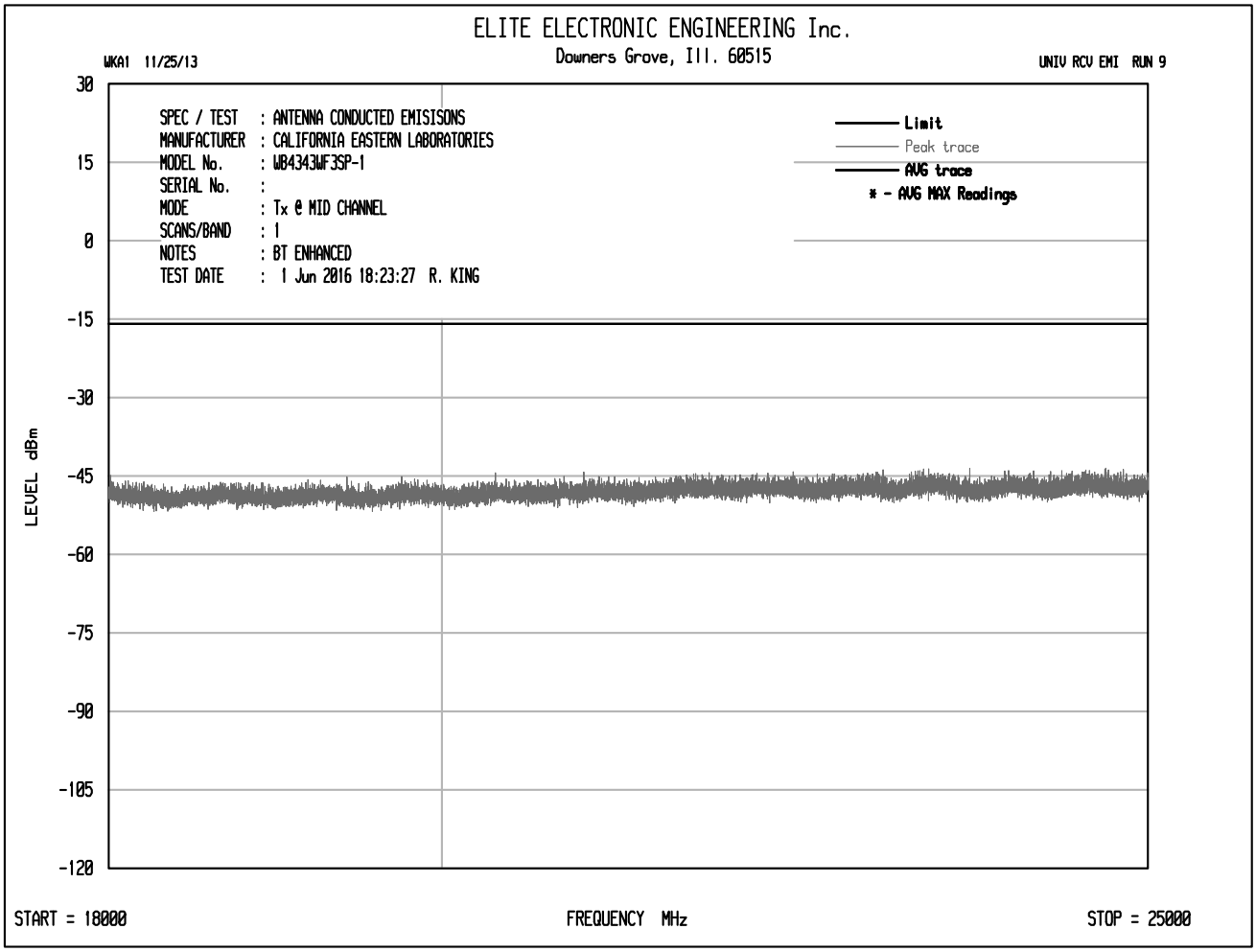

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 7
SPEC / TEST : ANTENNA PORT CONDUCTED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343SF3SP-1
SERIAL No. :
MODE : Tx @ LOW CHANNEL
SCANS/BAND : 1
NOTES : BT ENHANCED
TEST DATE : 1 Jun 2016 17:49:10 R. KING
Limit
PEAK DETECTOR TRACE
LEVEL dBm
30
15
0
-15
-30
-45
-60
-75
-90
START = 10000
FREQUENCY MHz
STOP = 18000

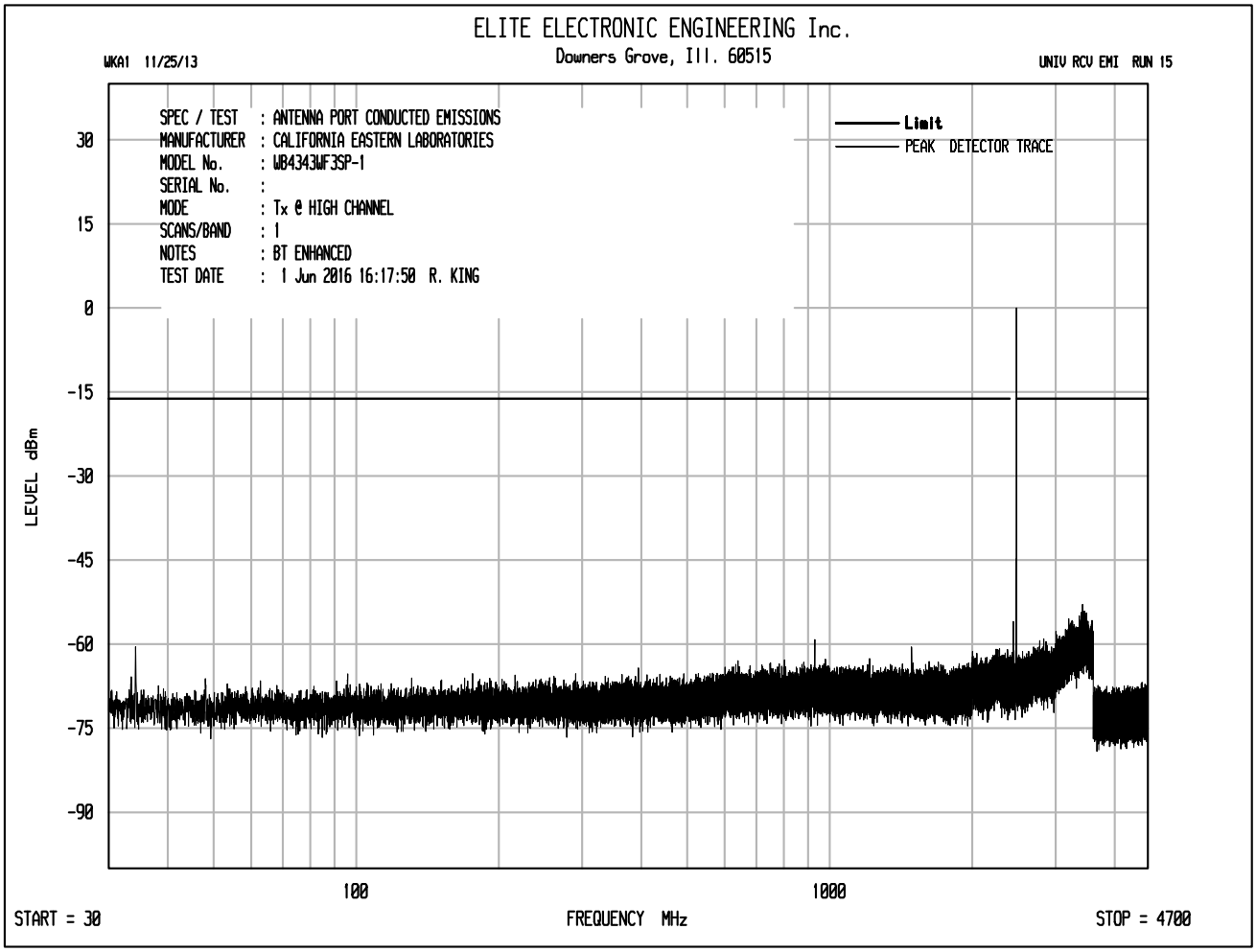

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 8
SPEC / TEST : ANTENNA CONDUCTED EMISISONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ LOW CHANNEL
SCANS/BAND : 1
NOTES : BT ENHANCED
TEST DATE : 1 Jun 2016 18:21:25 R. KING
Limit
Peak trace
AVG trace
* - AVG MAX Readings
LEVEL dBm
30
15
0
-15
-30
-45
-60
-75
-90
-105
-120
START = 18000
FREQUENCY MHz
STOP = 25000

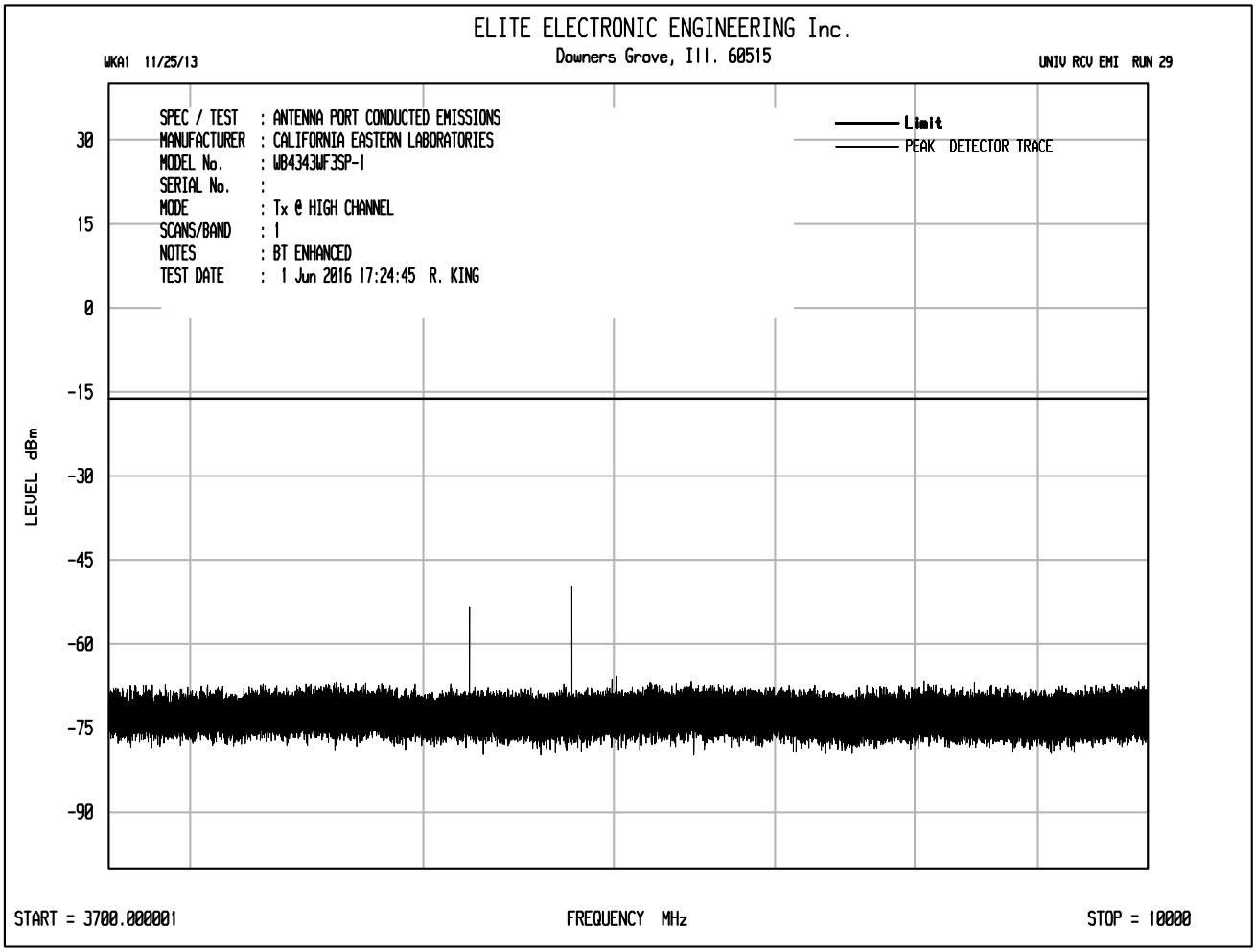

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 14
SPEC / TEST : ANTENNA PORT CONDUCTED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ MID CHANNEL
SCANS/BAND : 1
NOTES : BT ENHANCED
TEST DATE : 1 Jun 2016 16:12:23 R. KING
Limit
PEAK DETECTOR TRACE
LEVEL dBm
30
15
0
-15
-30
-45
-60
-75
-90
100
1000
START = 30
FREQUENCY MHz
STOP = 4700

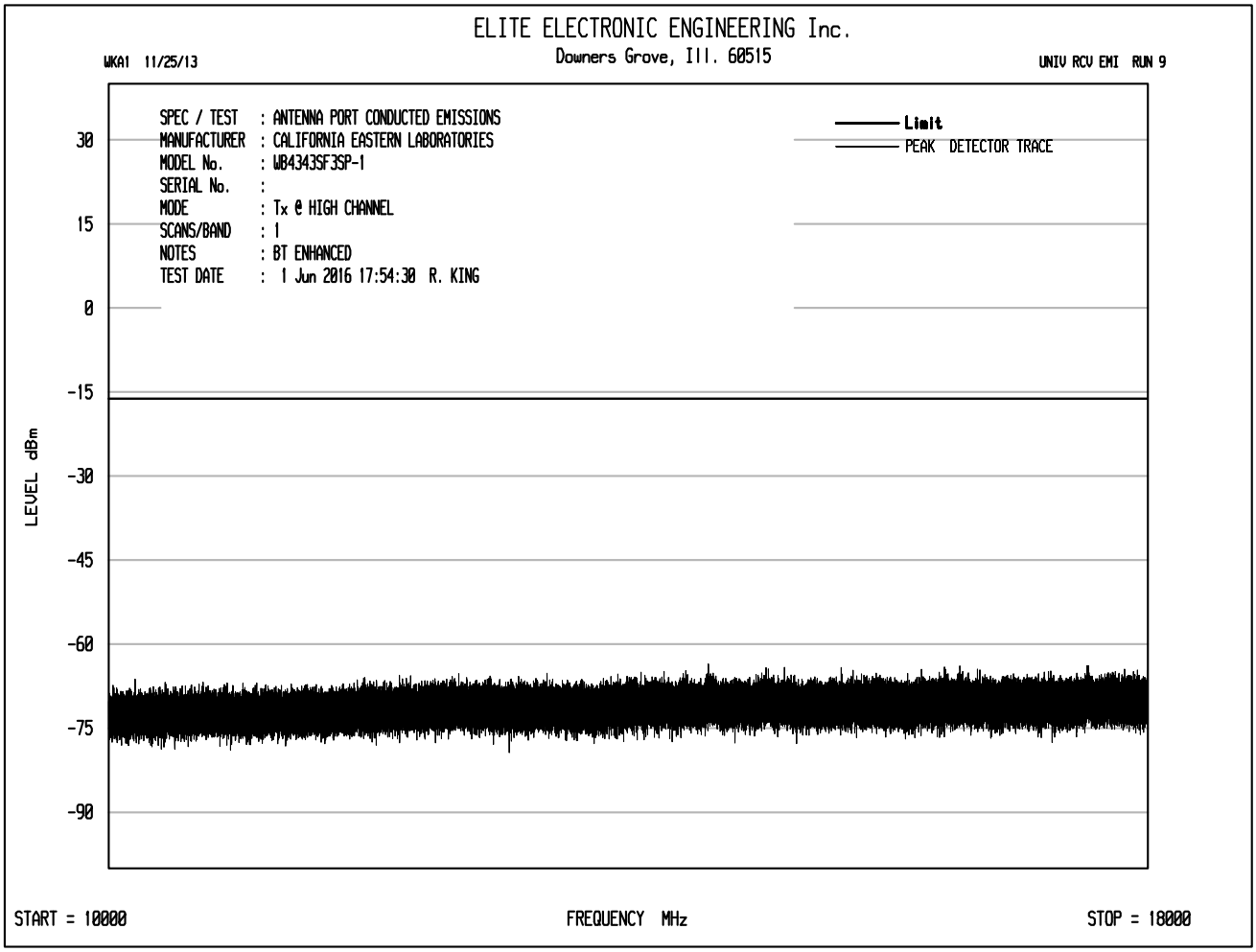

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 28
SPEC / TEST : ANTENNA PORT CONDUCTED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ MID CHANNEL
SCANS/BAND : 1
NOTES : BT ENHANCED
TEST DATE : 1 Jun 2016 17:22:17 R. KING
Limit
PEAK DETECTOR TRACE
LEVEL dBm
30
15
0
-15
-30
-45
-60
-75
-90
START = 3700.000001
FREQUENCY MHz
STOP = 10000

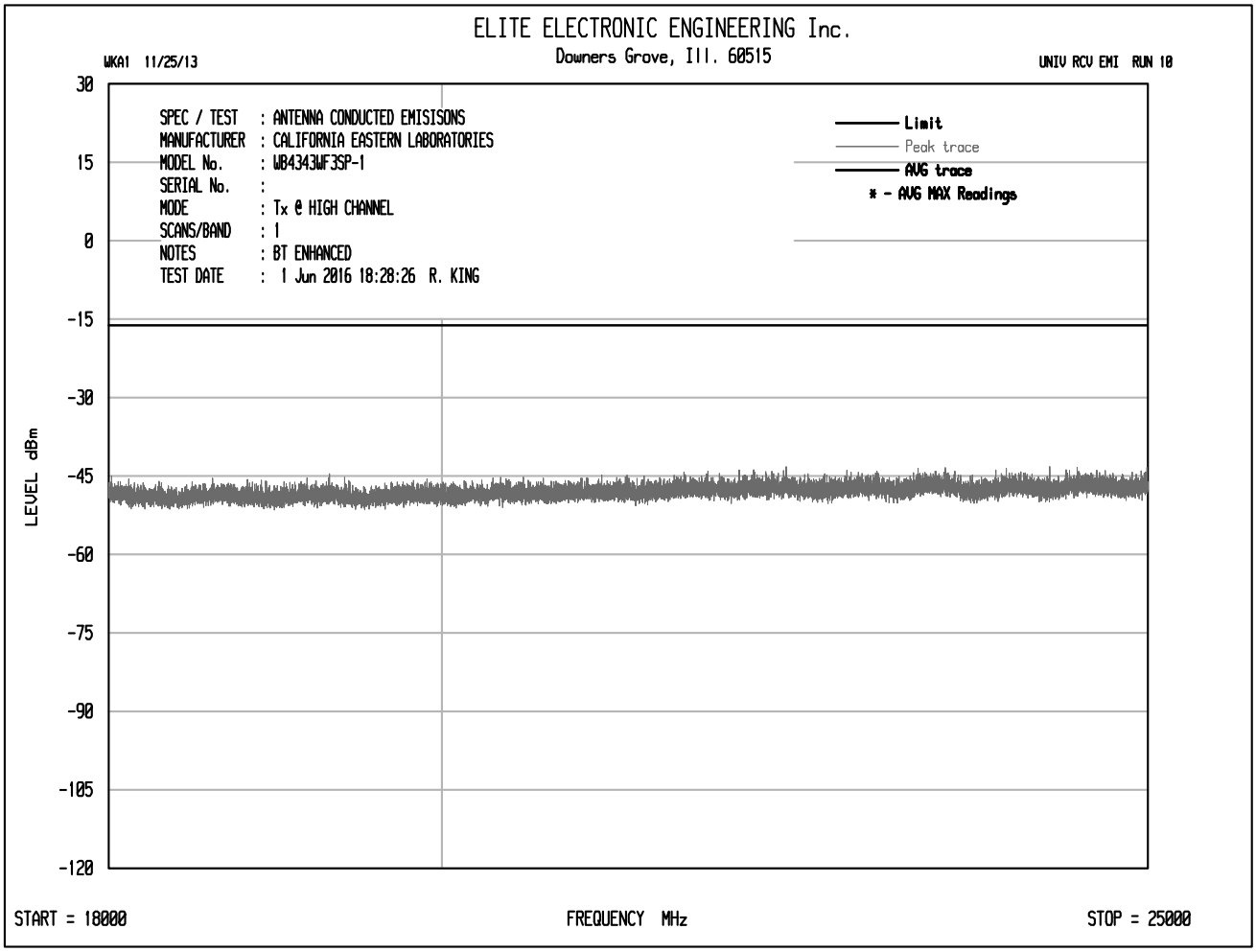

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 8
SPEC / TEST : ANTENNA PORT CONDUCTED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343SF3SP-1
SERIAL No. :
MODE : Tx @ MID CHANNEL
SCANS/BAND : 1
NOTES : BT ENHANCED
TEST DATE : 1 Jun 2016 17:51:52 R. KING
Limit
PEAK DETECTOR TRACE
LEVEL dBm
30
15
0
-15
-30
-45
-60
-75
-90
START = 10000
FREQUENCY MHz
STOP = 18000

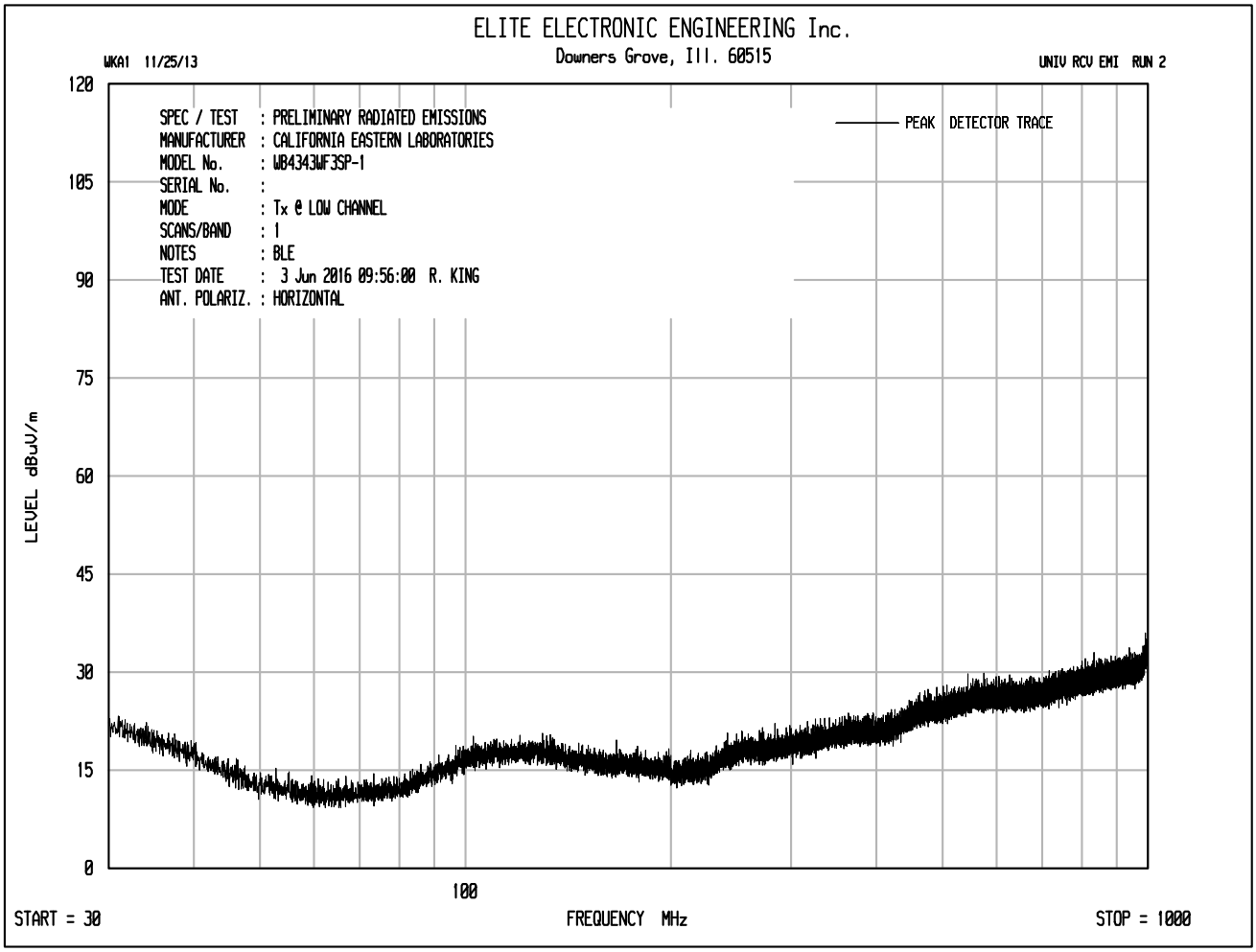

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 9
SPEC / TEST : ANTENNA CONDUCTED EMISISONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ MID CHANNEL
SCANS/BAND : 1
NOTES : BT ENHANCED
TEST DATE : 1 Jun 2016 18:23:27 R. KING
Limit
Peak trace
AVG trace
* - AVG MAX Readings
LEVEL dBm
30
15
0
-15
-30
-45
-60
-75
-90
-105
-120
START = 18000
FREQUENCY MHz
STOP = 25000

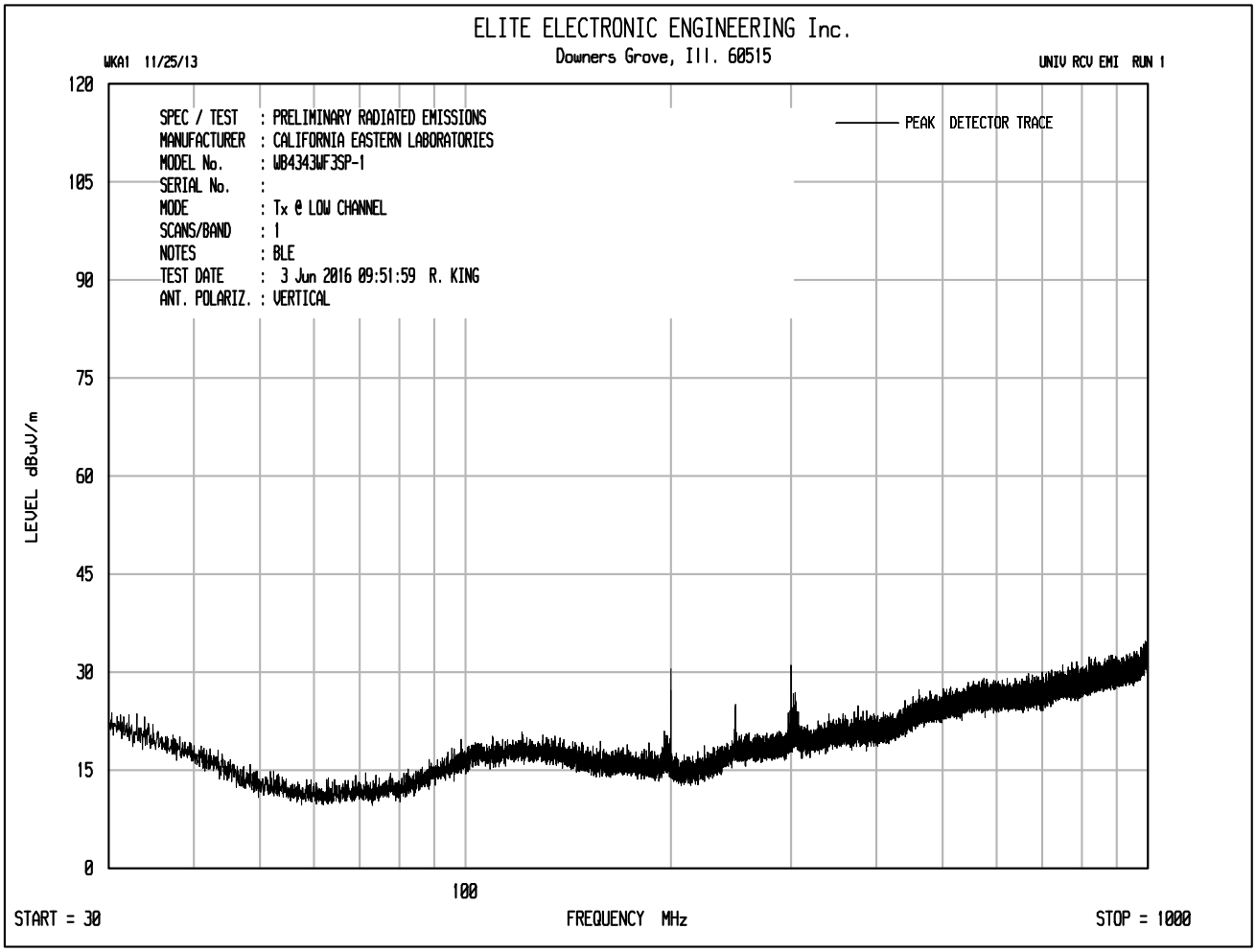

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 15
SPEC / TEST : ANTENNA PORT CONDUCTED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ HIGH CHANNEL
SCANS/BAND : 1
NOTES : BT ENHANCED
TEST DATE : 1 Jun 2016 16:17:50 R. KING
Limit
PEAK DETECTOR TRACE
LEVEL dBm
30
15
0
-15
-30
-45
-60
-75
-90
100
1000
START = 30
FREQUENCY MHz
STOP = 4700

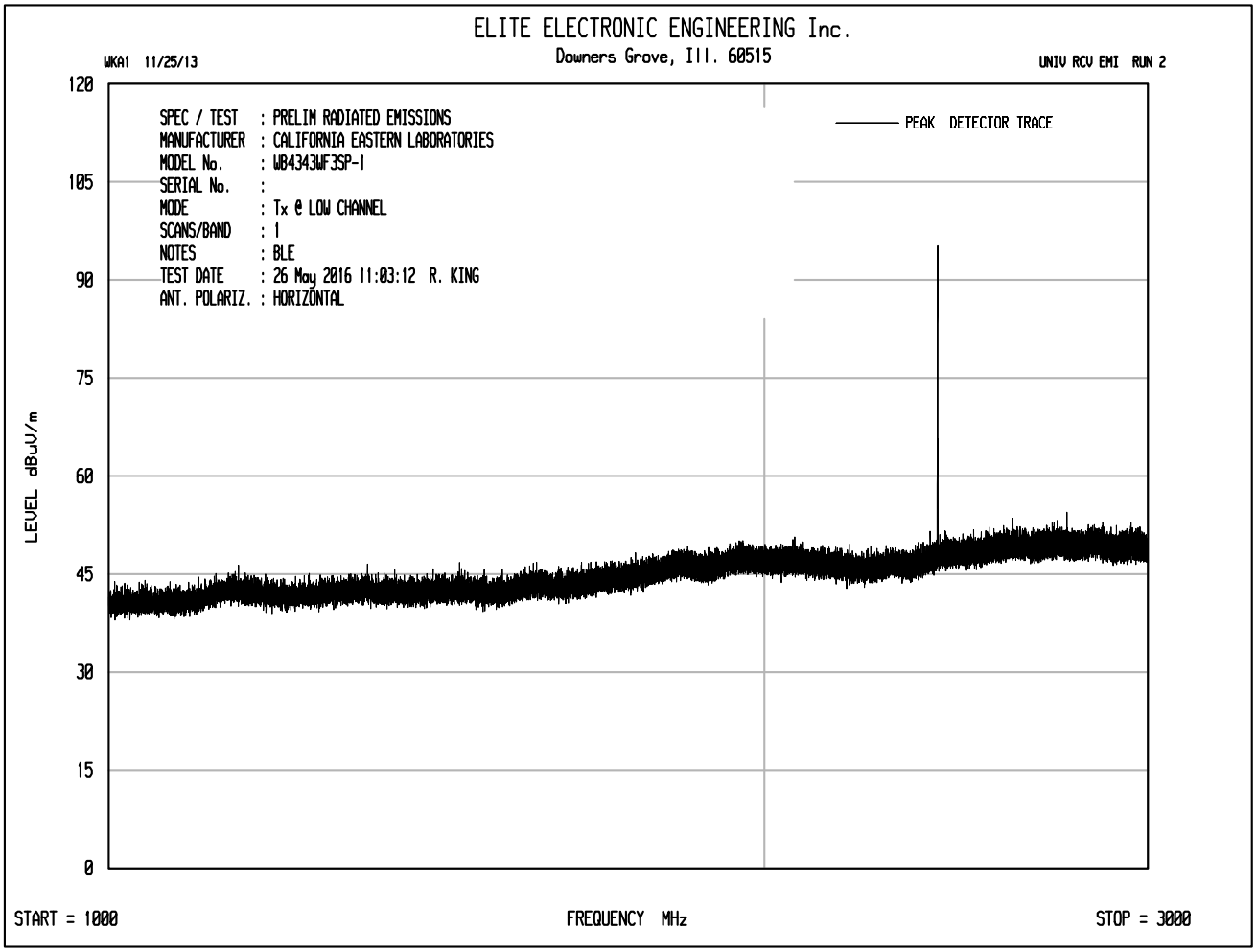

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 29
SPEC / TEST : ANTENNA PORT CONDUCTED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ HIGH CHANNEL
SCANS/BAND : 1
NOTES : BT ENHANCED
TEST DATE : 1 Jun 2016 17:24:45 R. KING
Limit
PEAK DETECTOR TRACE
LEVEL dBm
30
15
0
-15
-30
-45
-60
-75
-90
START = 3700.000001
FREQUENCY MHz
STOP = 10000

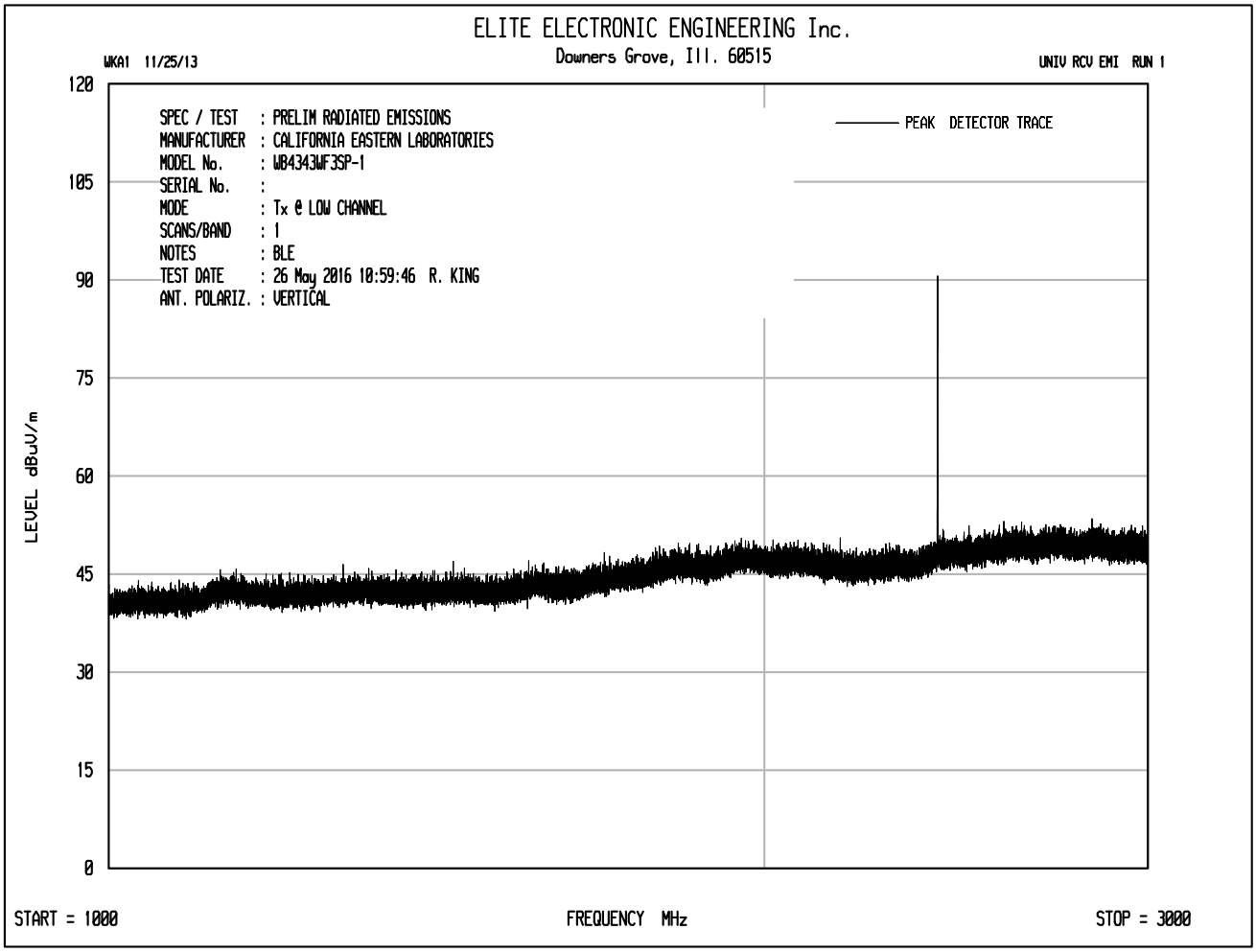

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 9
SPEC / TEST : ANTENNA PORT CONDUCTED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343SF3SP-1
SERIAL No. :
MODE : Tx @ HIGH CHANNEL
SCANS/BAND : 1
NOTES : BT ENHANCED
TEST DATE : 1 Jun 2016 17:54:30 R. KING
Limit
PEAK DETECTOR TRACE
LEVEL dBm
30
15
0
-15
-30
-45
-60
-75
-90
START = 10000
FREQUENCY MHz
STOP = 18000

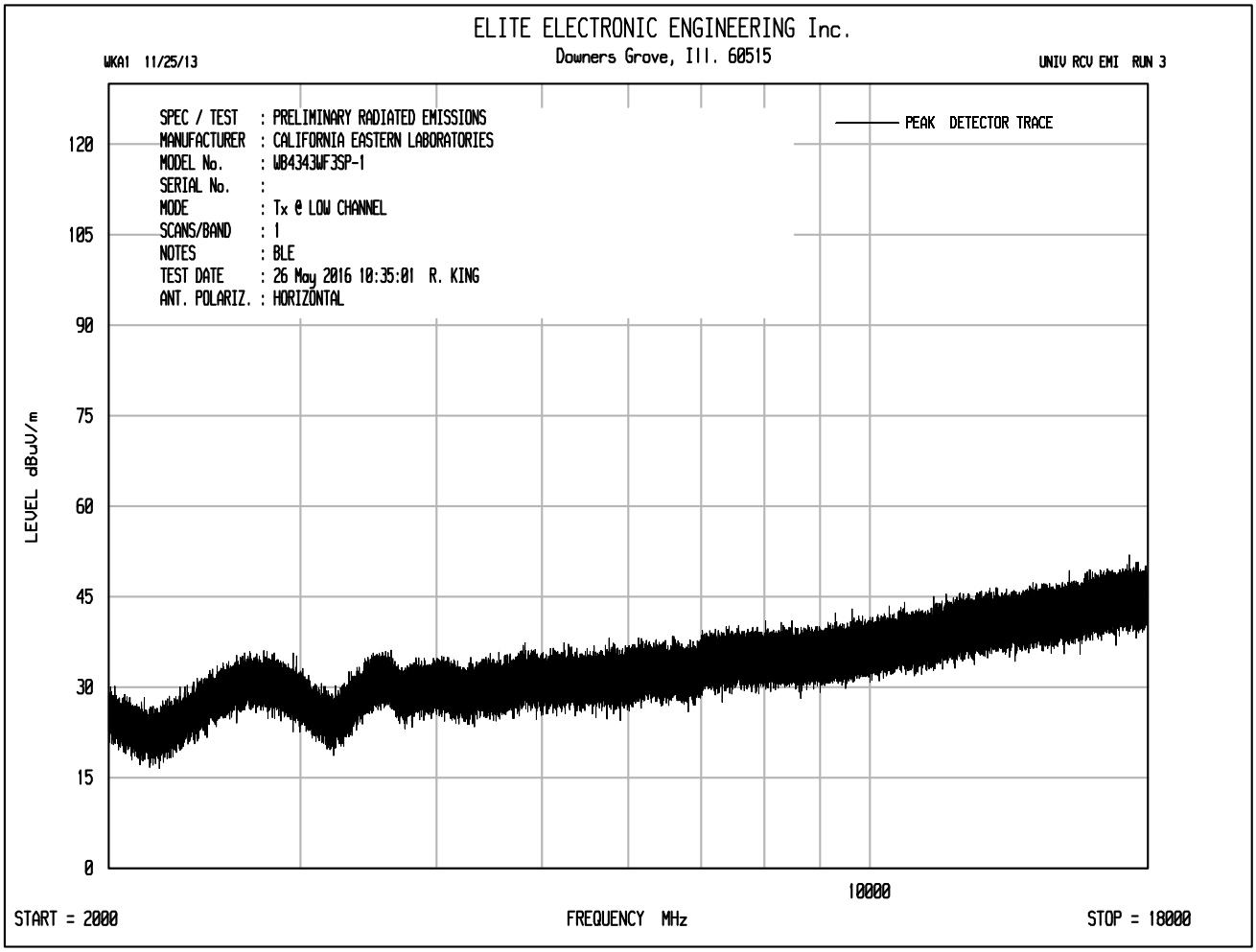

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 10
SPEC / TEST : ANTENNA CONDUCTED EMISISONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ HIGH CHANNEL
SCANS/BAND : 1
NOTES : BT ENHANCED
TEST DATE : 1 Jun 2016 18:28:26 R. KING
Limit
Peak trace
AVG trace
* - AVG MAX Readings
30
15
0
-15
-30
-45
-60
-75
-90
-105
-120
LEVEL dBm
START = 18000
FREQUENCY MHz
STOP = 25000

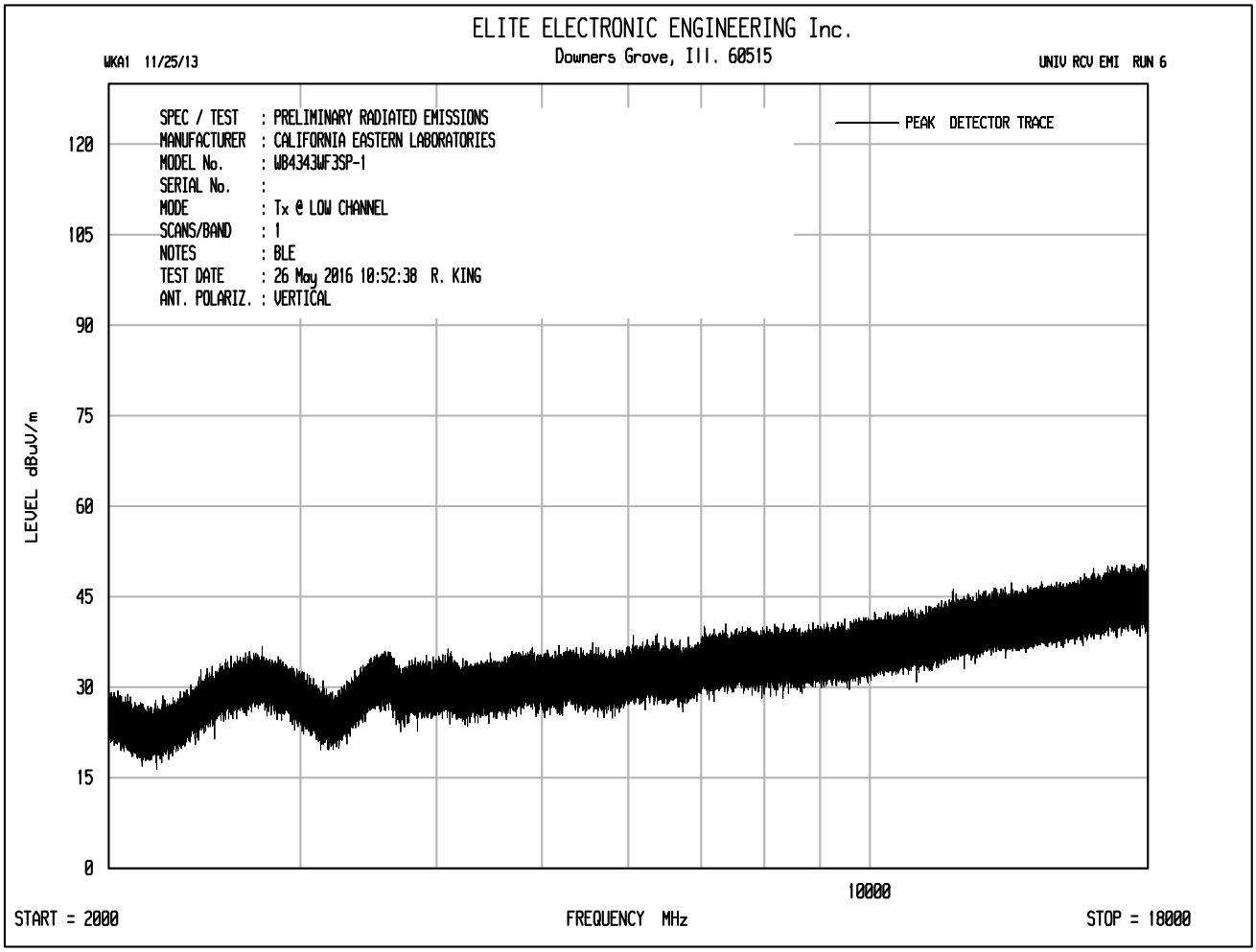

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 2
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ LOW CHANNEL
SCANS/BAND : 1
NOTES : BLE
TEST DATE : 3 Jun 2016 09:56:00 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000

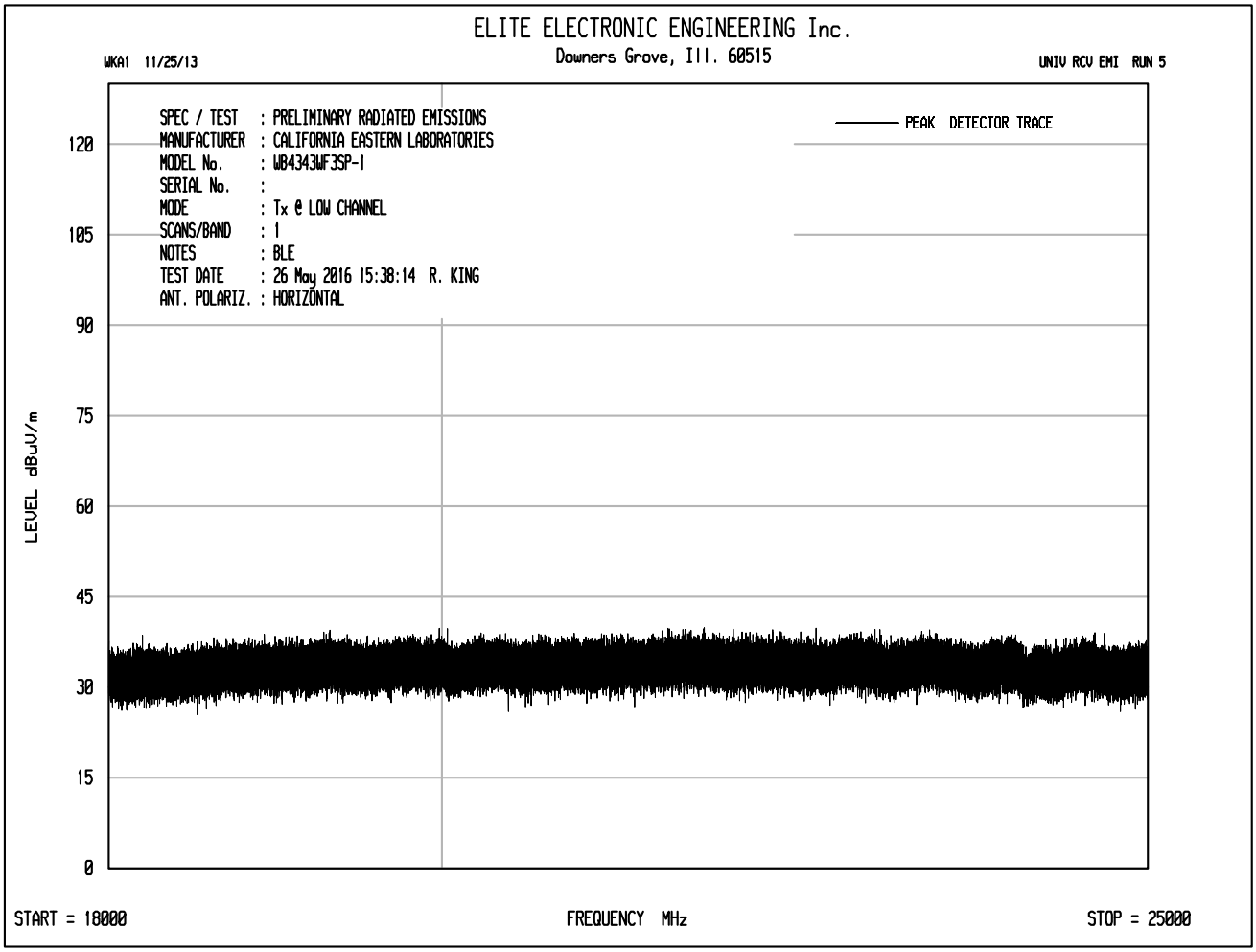

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 1
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ LOW CHANNEL
SCANS/BAND : 1
NOTES : BLE
TEST DATE : 3 Jun 2016 09:51:59 R. KING
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000

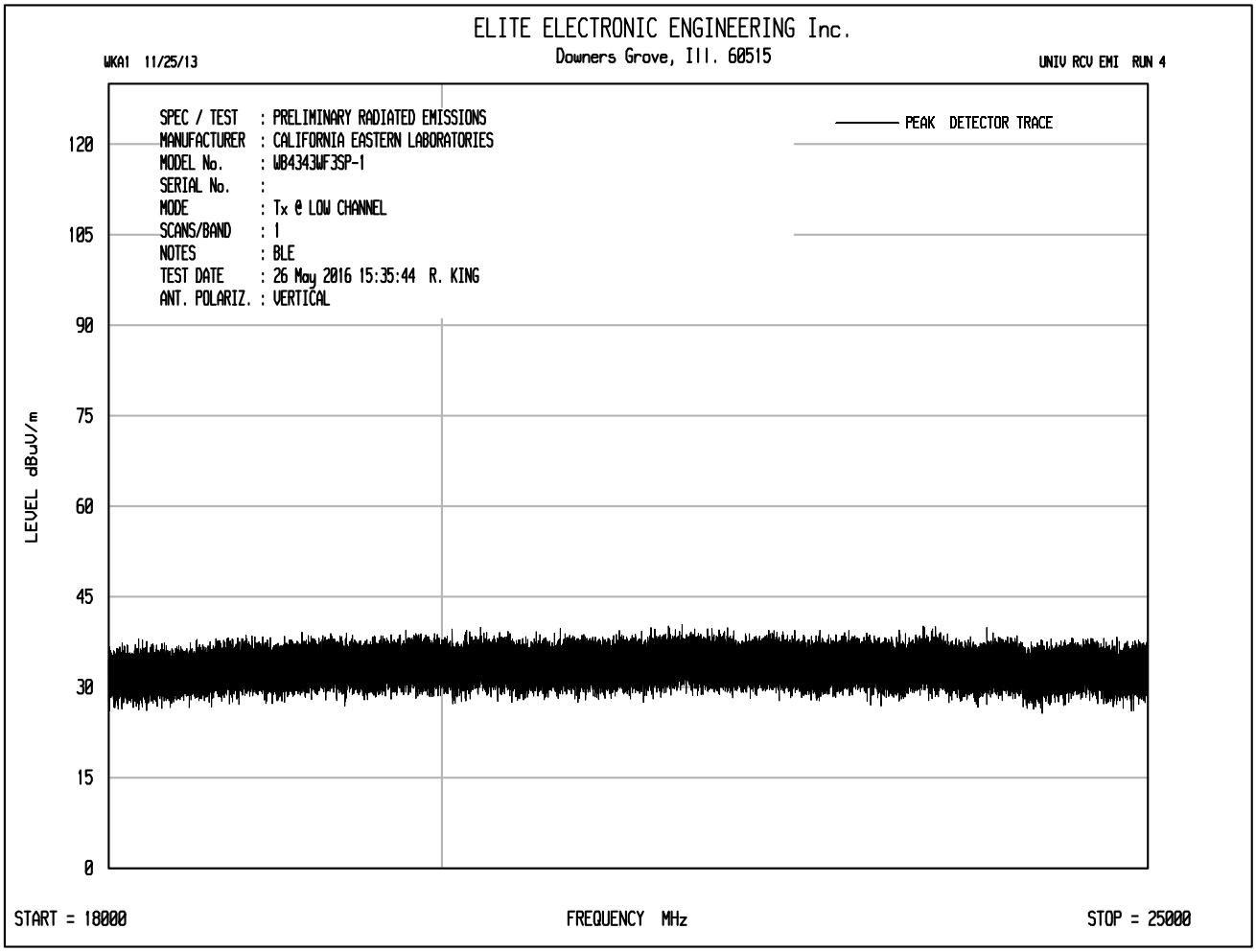

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 2
SPEC / TEST : PRELIM RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ LOW CHANNEL
SCANS/BAND : 1
NOTES : BLE
TEST DATE : 26 May 2016 11:03:12 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 3000

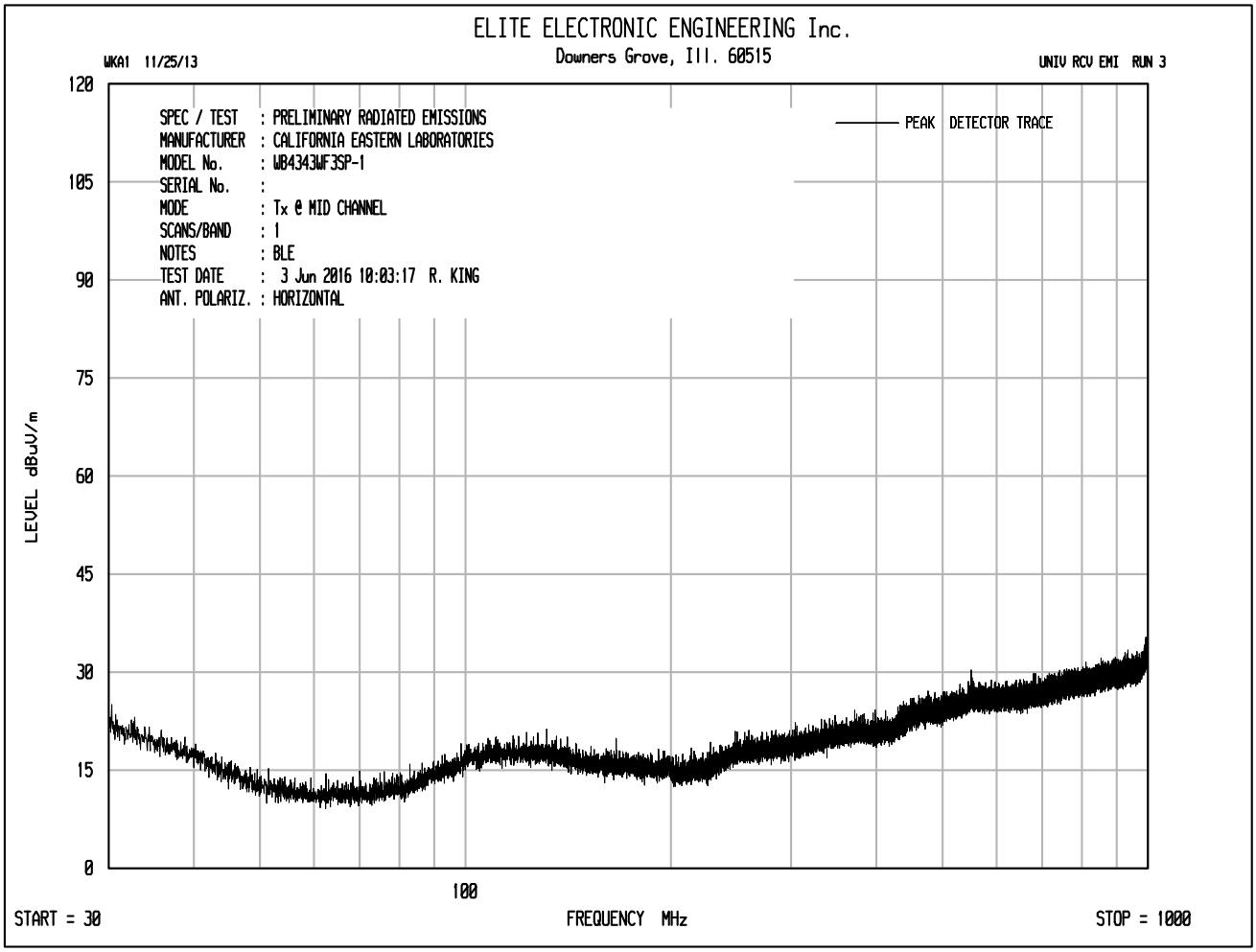

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 1
SPEC / TEST : PRELIM RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ LOW CHANNEL
SCANS/BAND : 1
NOTES : BLE
TEST DATE : 26 May 2016 10:59:46 R. KING
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 3000

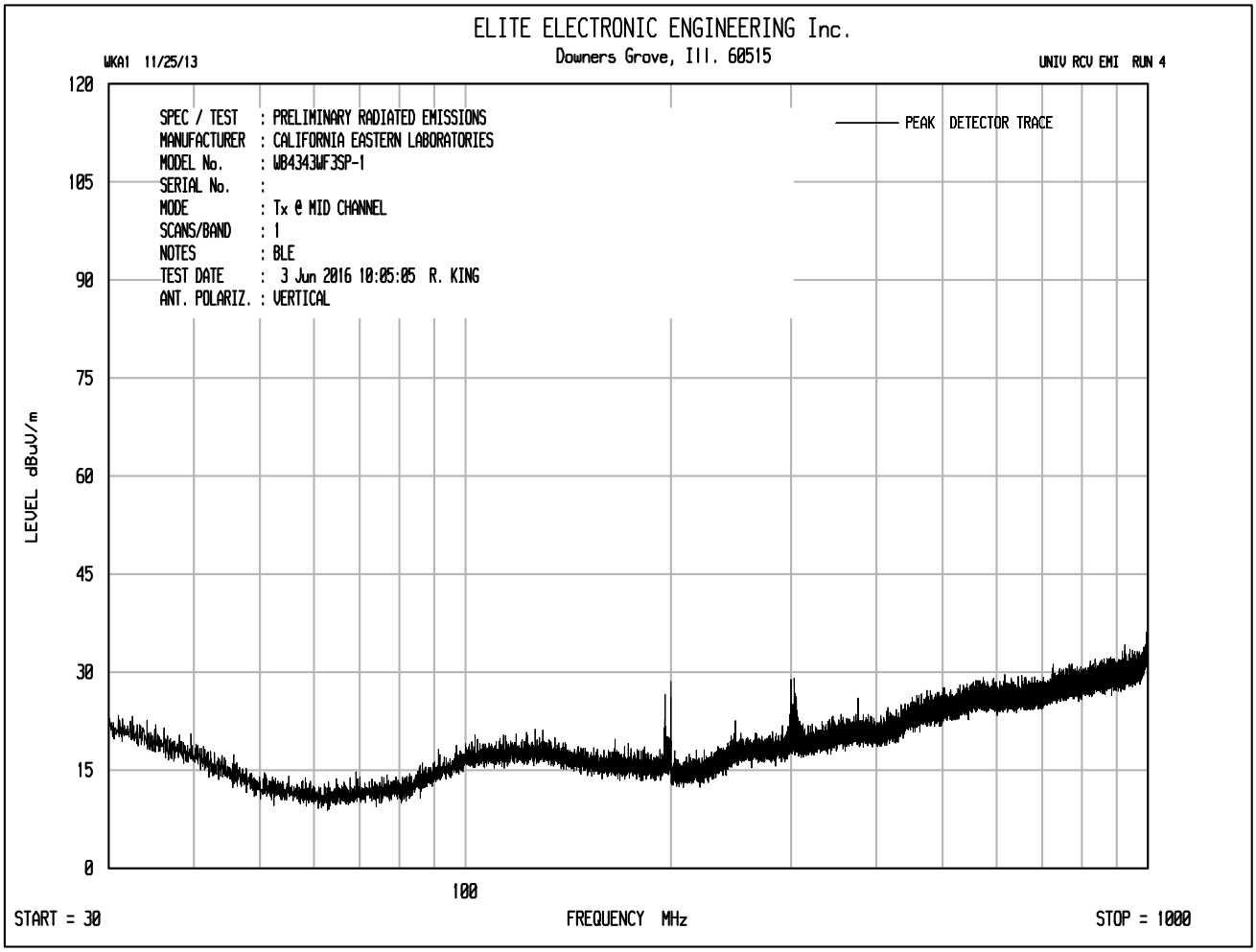

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 3
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ LOW CHANNEL
SCANS/BAND : 1
NOTES : BLE
TEST DATE : 26 May 2016 10:35:01 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 2000
FREQUENCY MHz
STOP = 18000

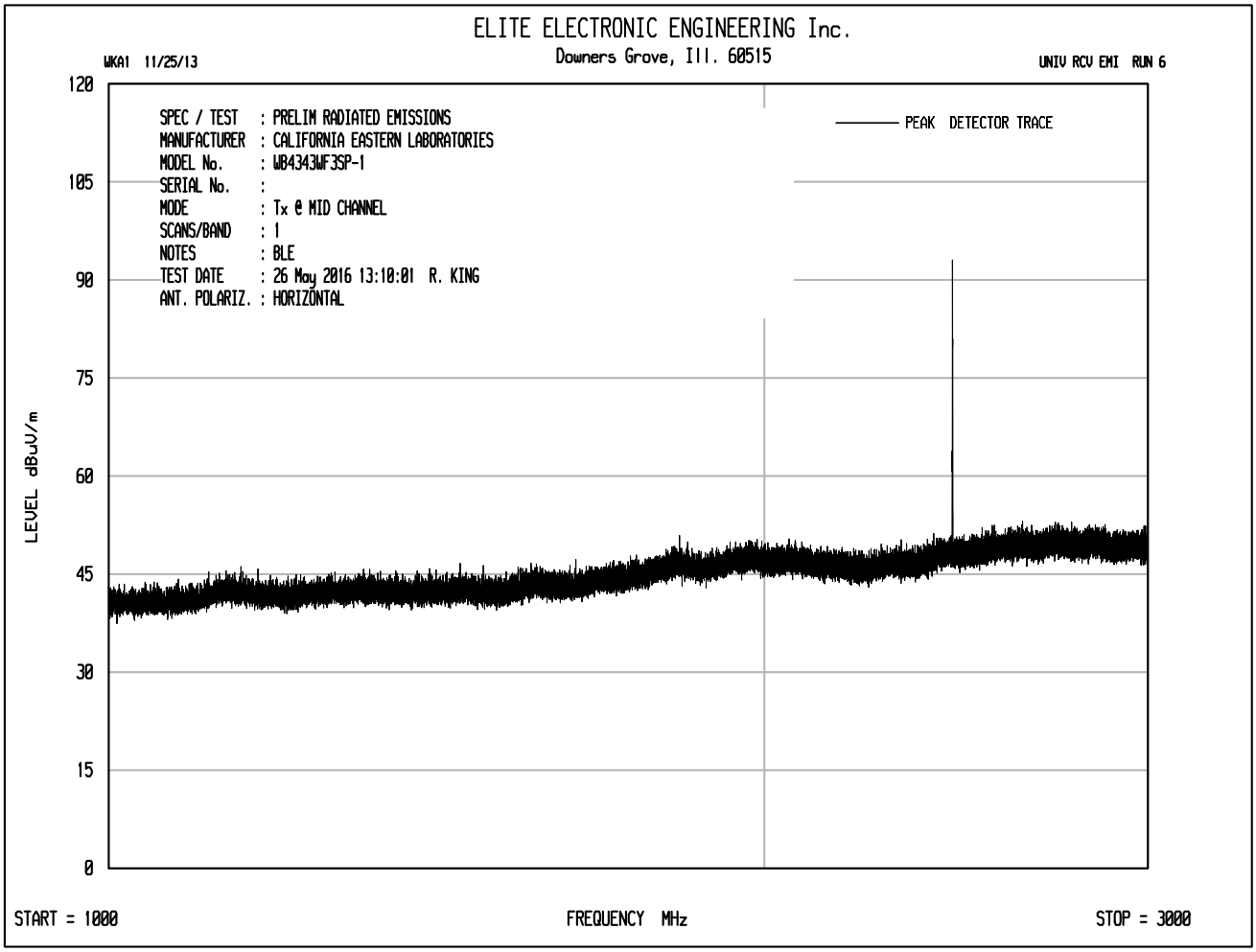

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 6
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ LOW CHANNEL
SCANS/BAND : 1
NOTES : BLE
TEST DATE : 26 May 2016 10:52:38 R. KING
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 2000
FREQUENCY MHz
STOP = 18000

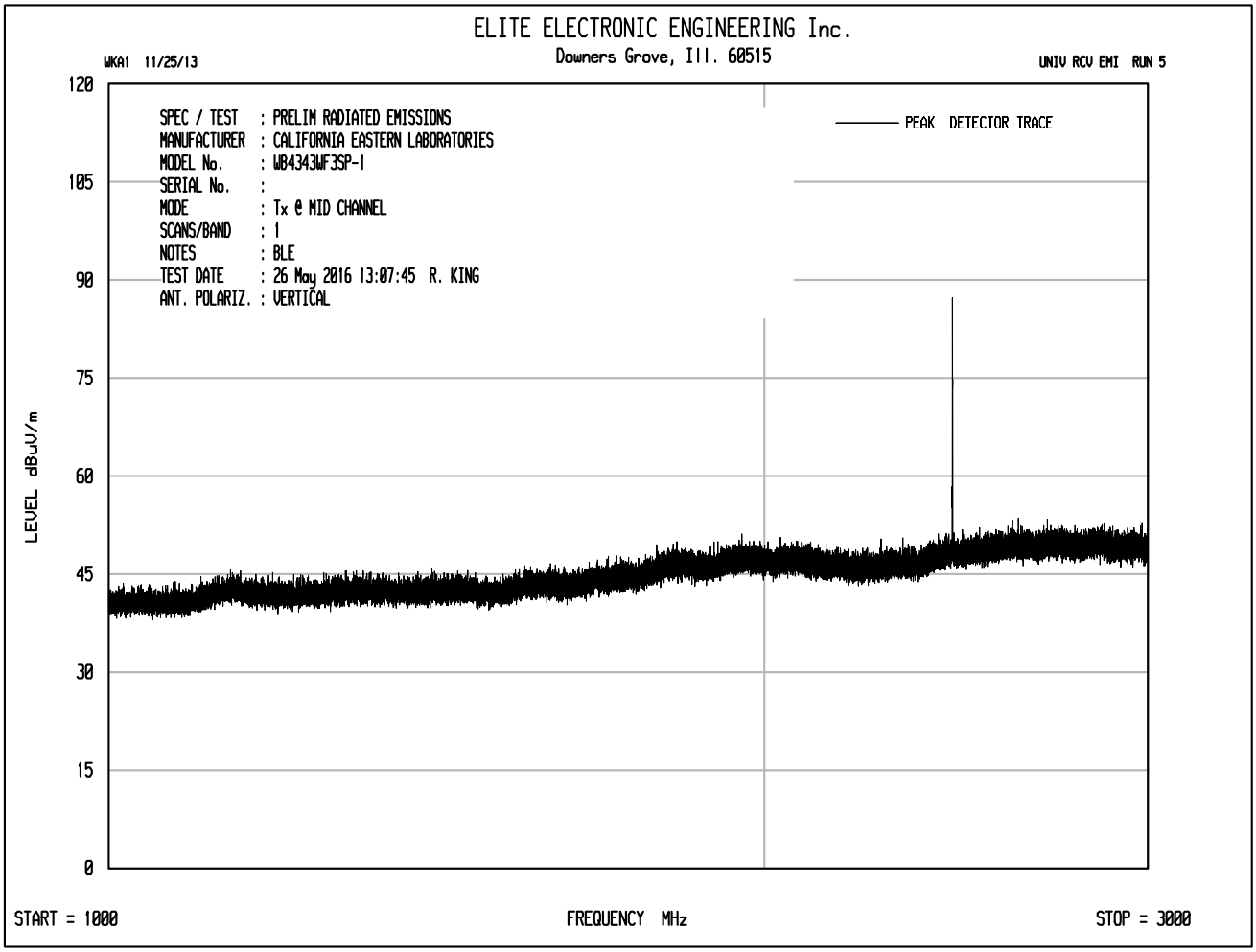

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 5
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ LOW CHANNEL
SCANS/BAND : 1
NOTES : BLE
TEST DATE : 26 May 2016 15:38:14 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000

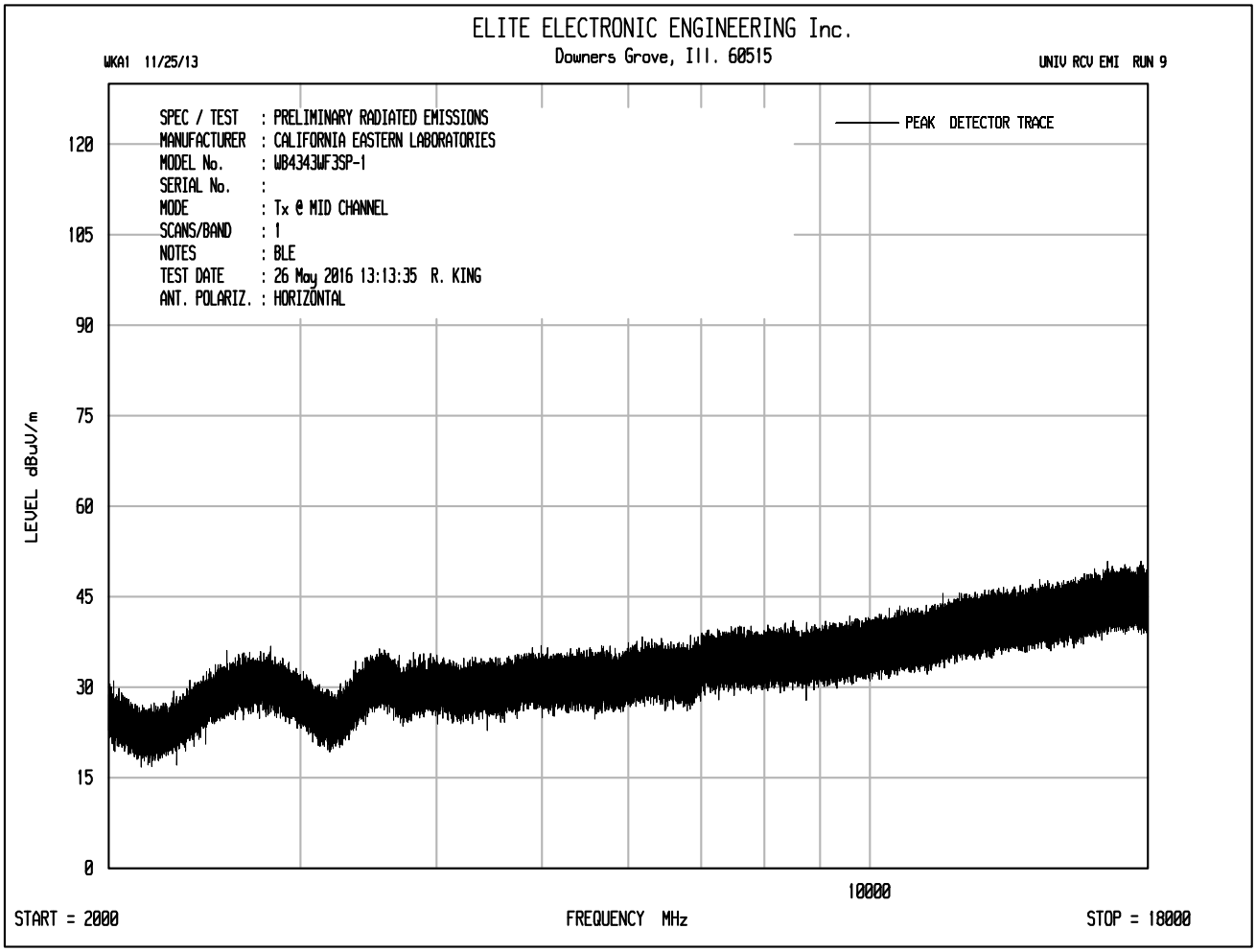

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 4
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ LOW CHANNEL
SCANS/BAND : 1
NOTES : BLE
TEST DATE : 26 May 2016 15:35:44 R. KING
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000

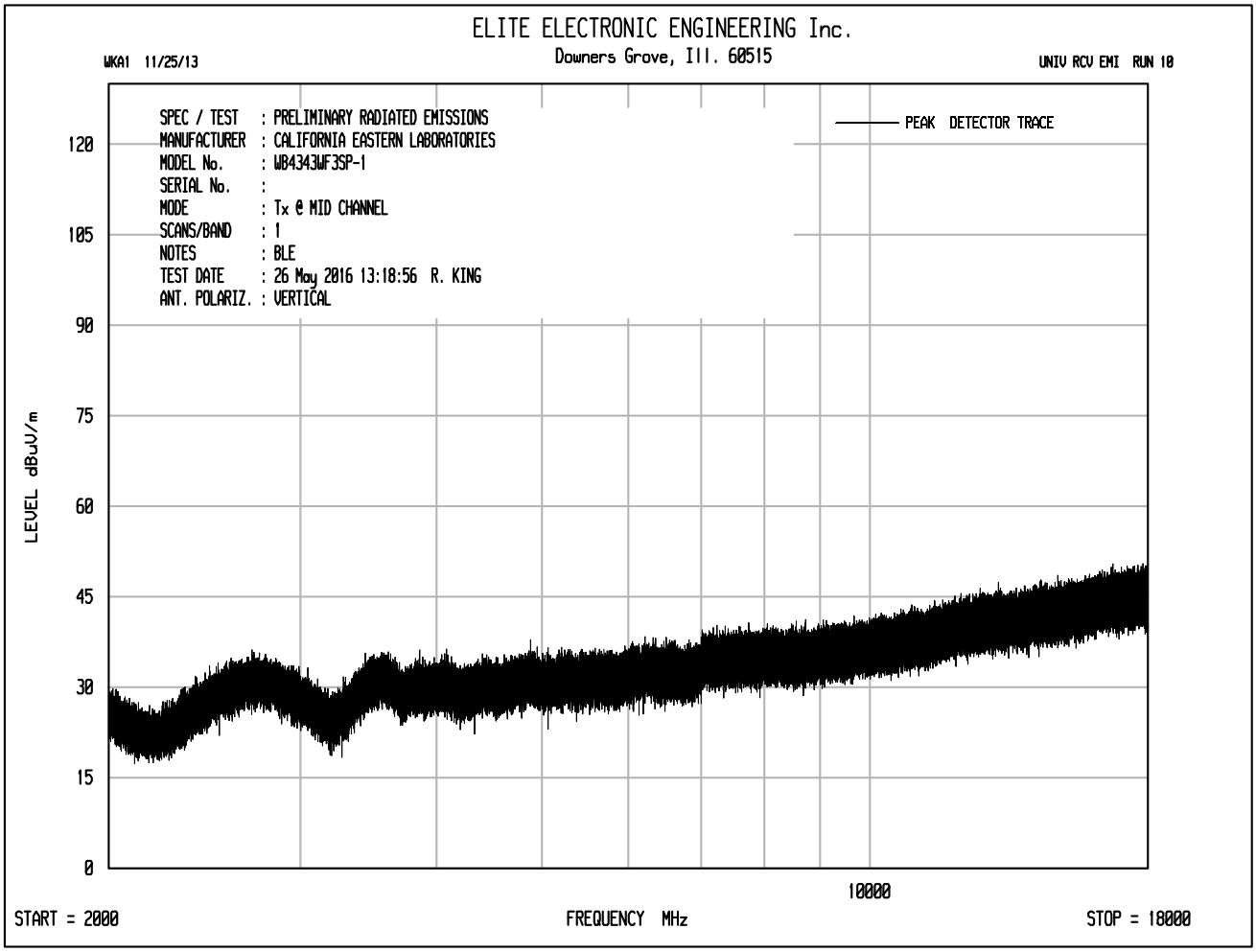

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 3
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ MID CHANNEL
SCANS/BAND : 1
NOTES : BLE
TEST DATE : 3 Jun 2016 10:03:17 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000

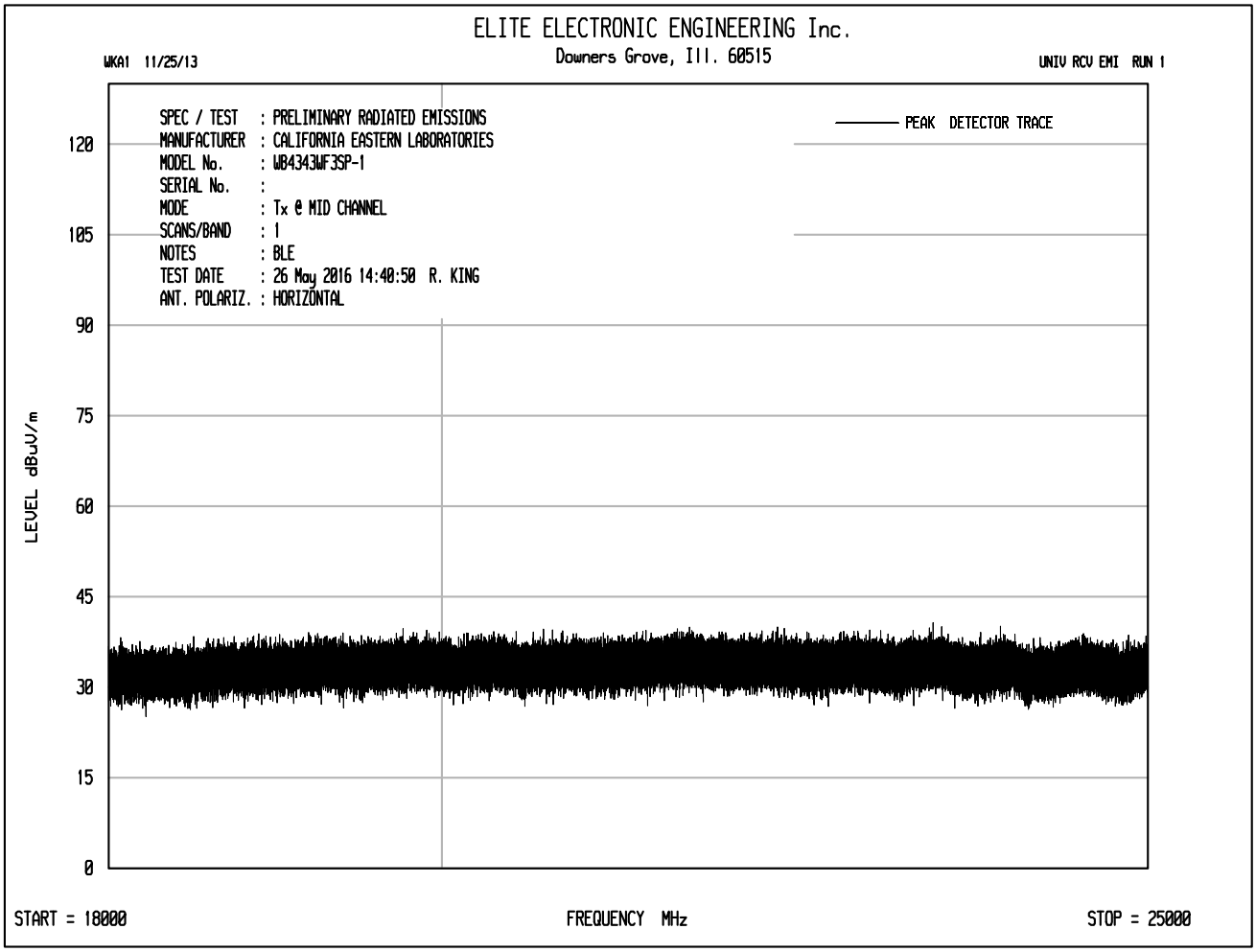

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 4
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ MID CHANNEL
SCANS/BAND : 1
NOTES : BLE
TEST DATE : 3 Jun 2016 10:05:05 R. KING
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000

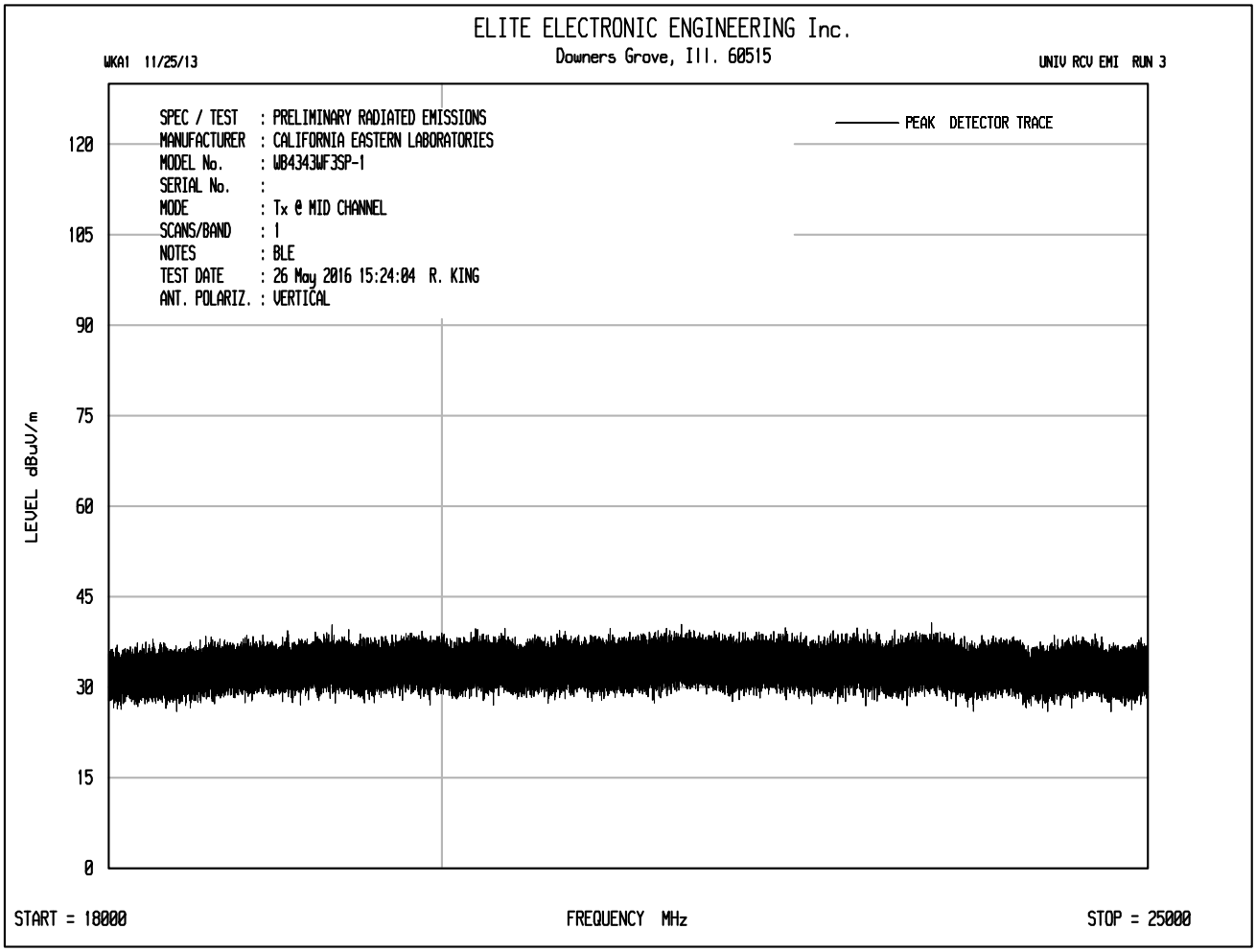

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 6
SPEC / TEST : PRELIM RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ MID CHANNEL
SCANS/BAND : 1
NOTES : BLE
TEST DATE : 26 May 2016 13:10:01 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 3000

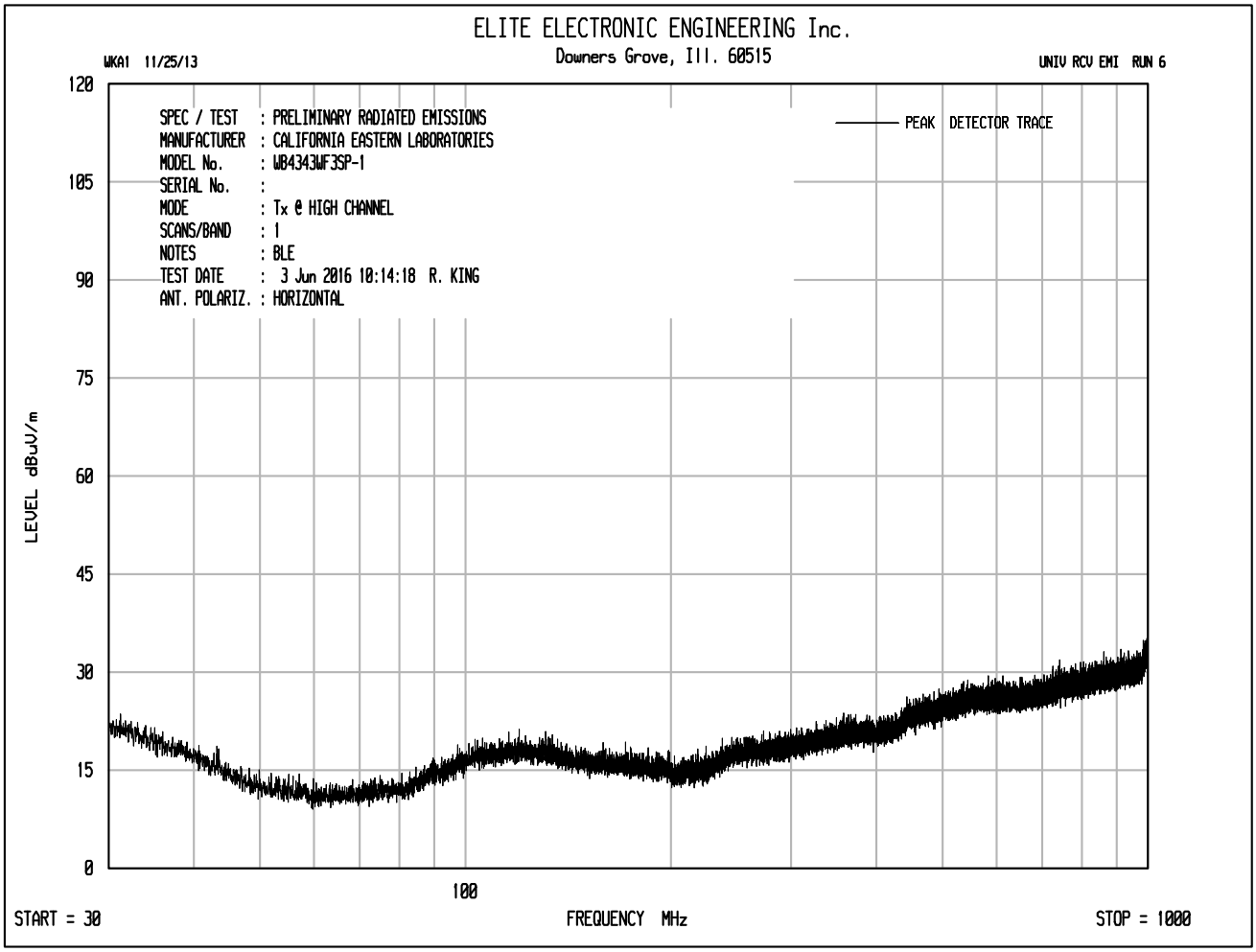

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 5
SPEC / TEST : PRELIM RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ MID CHANNEL
SCANS/BAND : 1
NOTES : BLE
TEST DATE : 26 May 2016 13:07:45 R. KING
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 3000

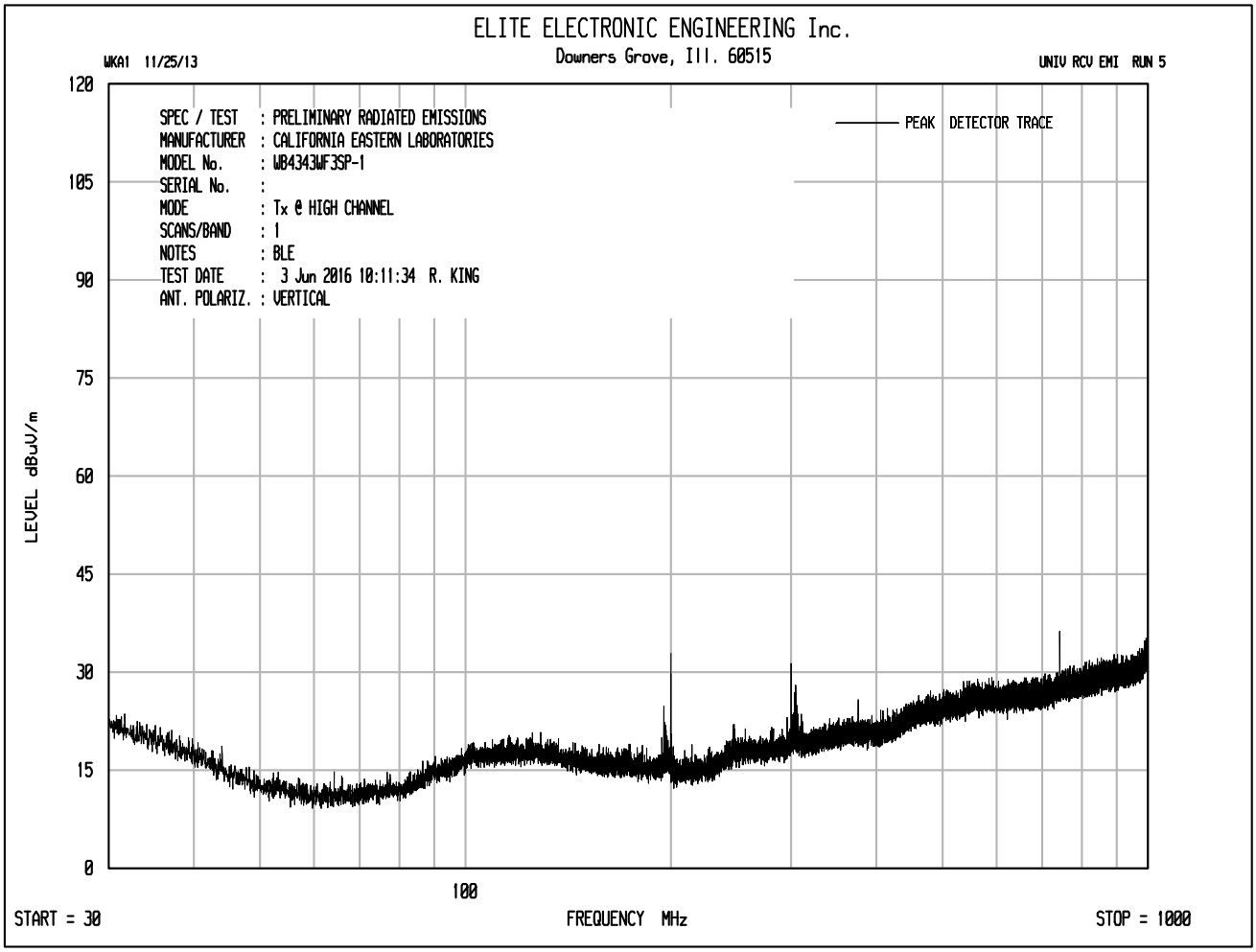

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 9
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ MID CHANNEL
SCANS/BAND : 1
NOTES : BLE
TEST DATE : 26 May 2016 13:13:35 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 2000
FREQUENCY MHz
STOP = 18000

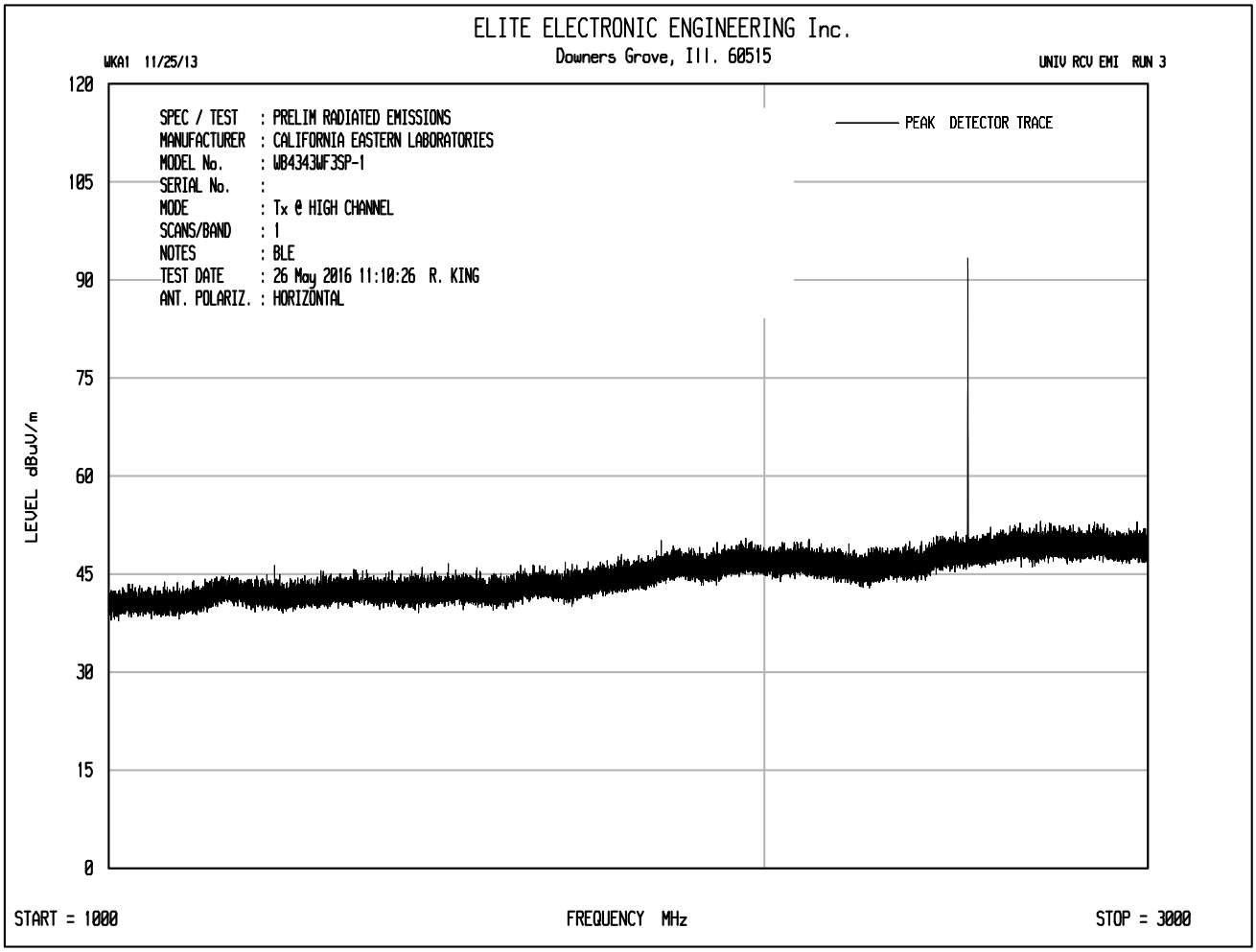

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ MID CHANNEL
SCANS/BAND : 1
NOTES : BLE
TEST DATE : 26 May 2016 13:18:56 R. KING
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 2000
FREQUENCY MHz
STOP = 18000

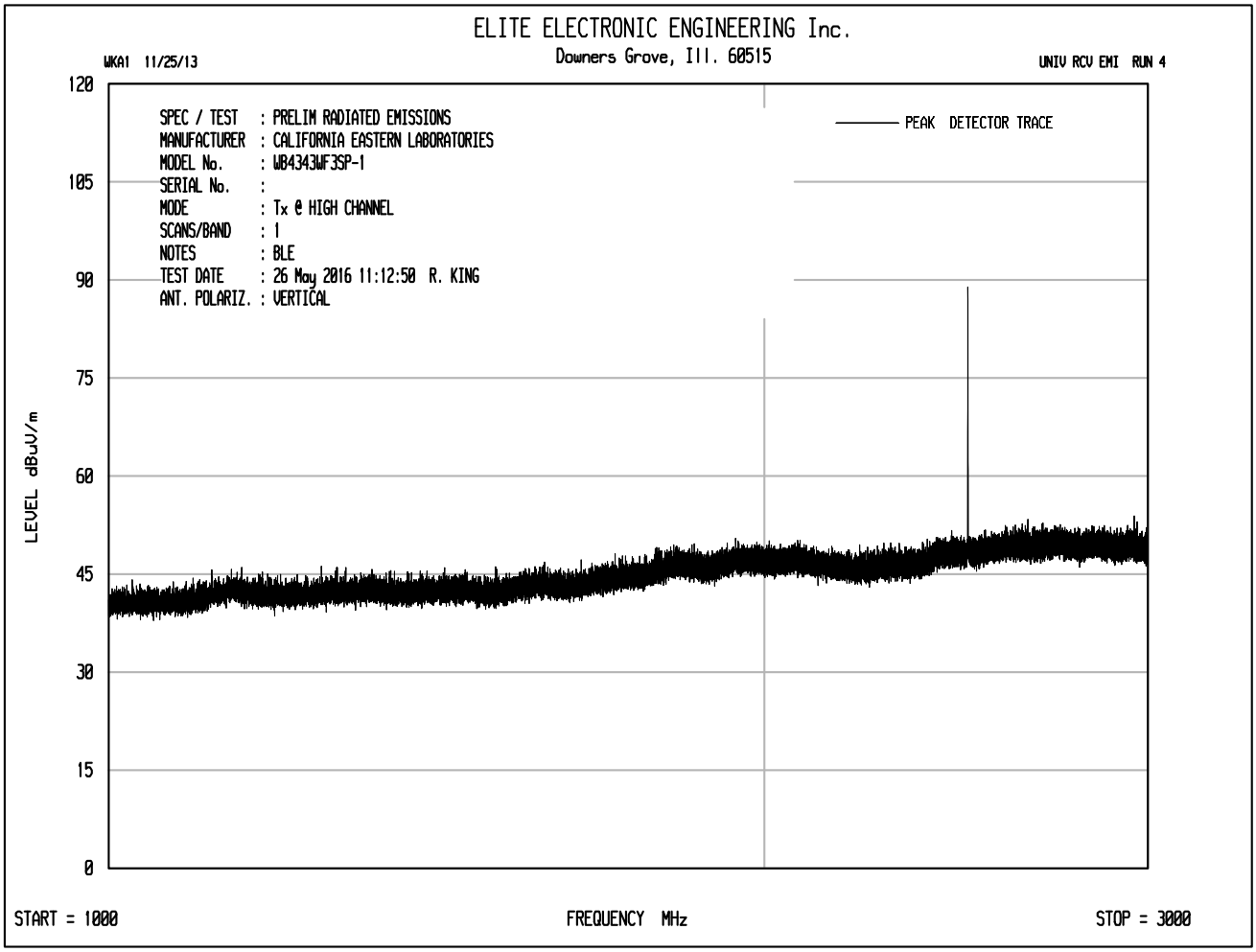

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 1
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ MID CHANNEL
SCANS/BAND : 1
NOTES : BLE
TEST DATE : 26 May 2016 14:40:50 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000

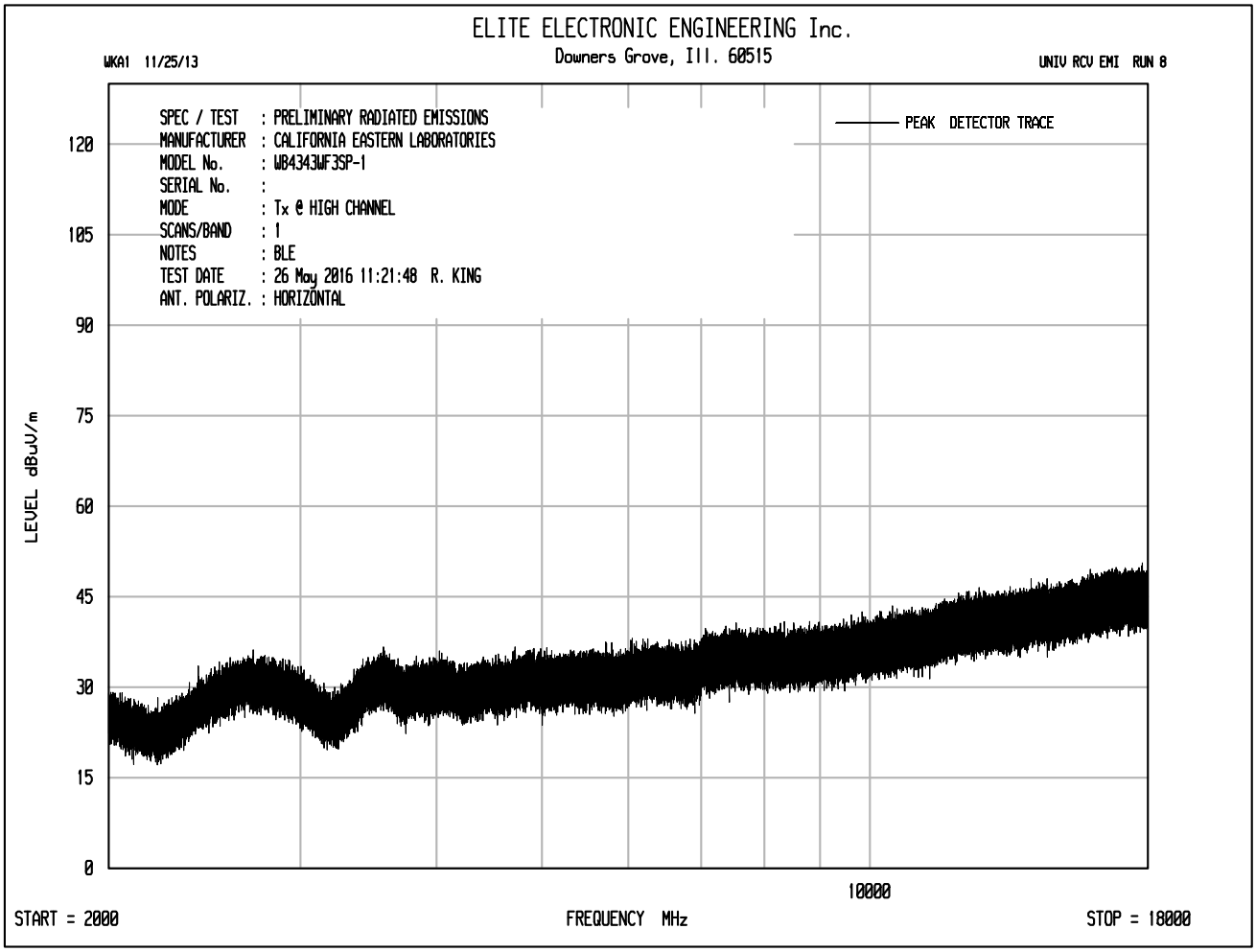

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 3
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ MID CHANNEL
SCANS/BAND : 1
NOTES : BLE
TEST DATE : 26 May 2016 15:24:04 R. KING
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000

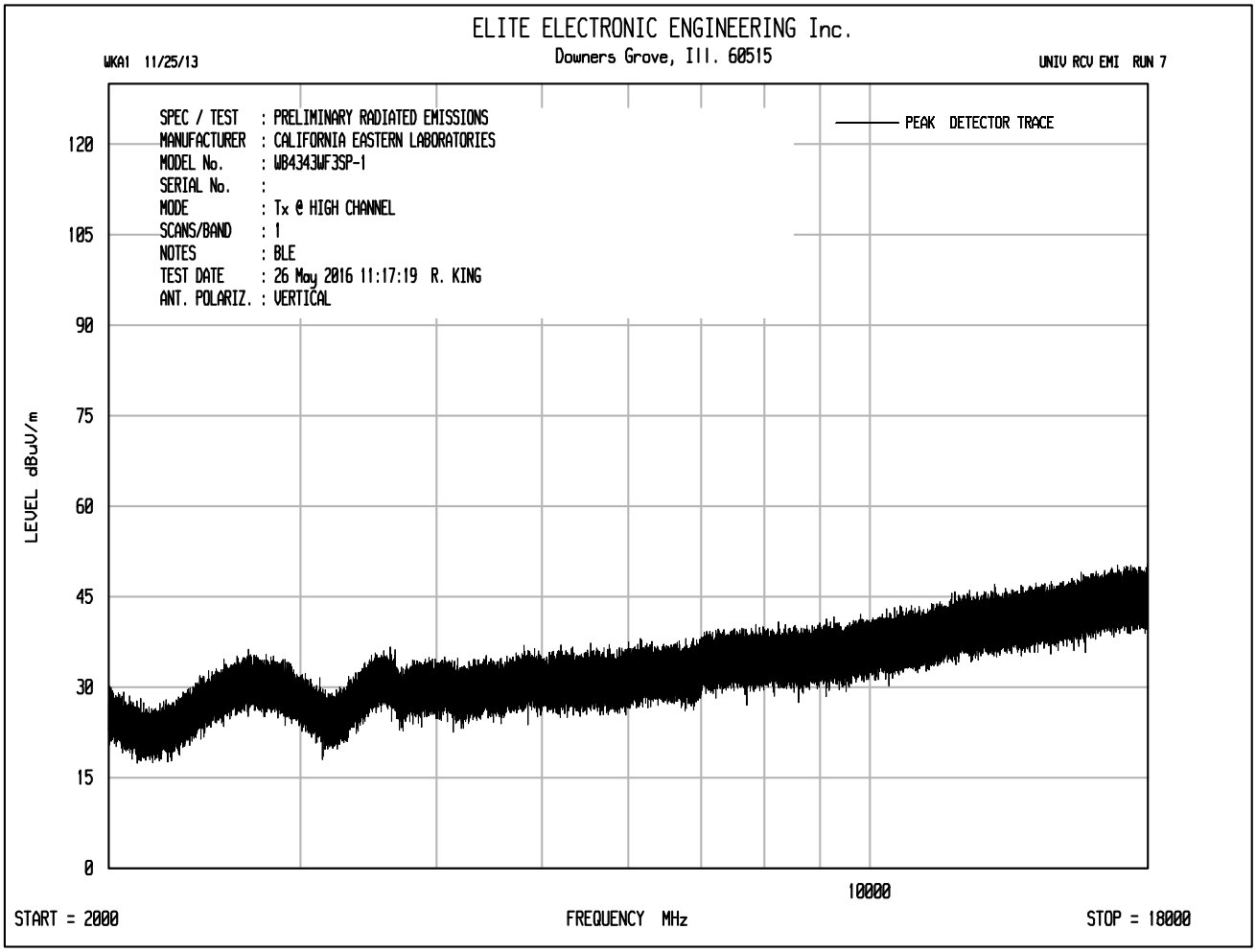

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 6
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ HIGH CHANNEL
SCANS/BAND : 1
NOTES : BLE
TEST DATE : 3 Jun 2016 10:14:18 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000

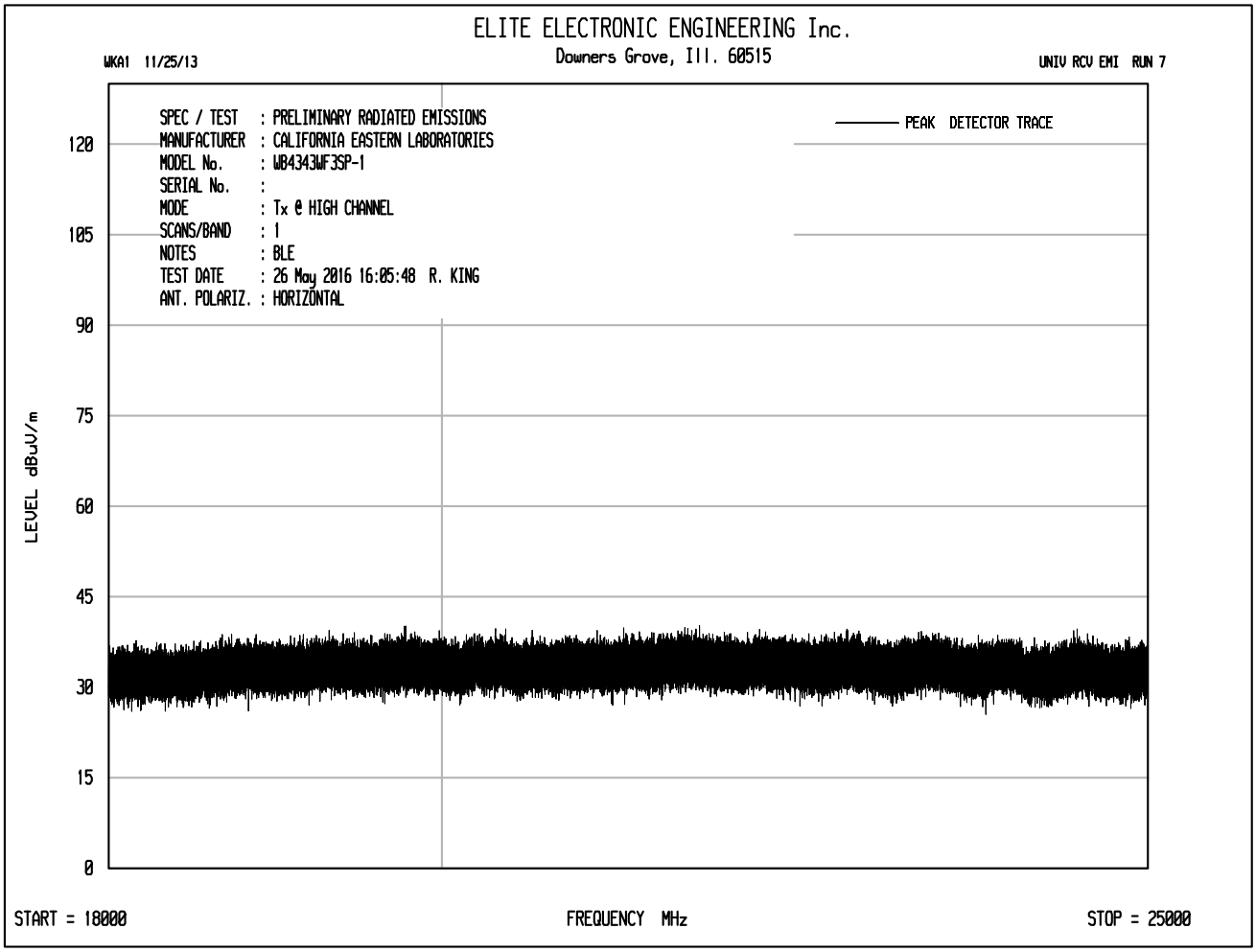

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 5
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ HIGH CHANNEL
SCANS/BAND : 1
NOTES : BLE
TEST DATE : 3 Jun 2016 10:11:34 R. KING
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000

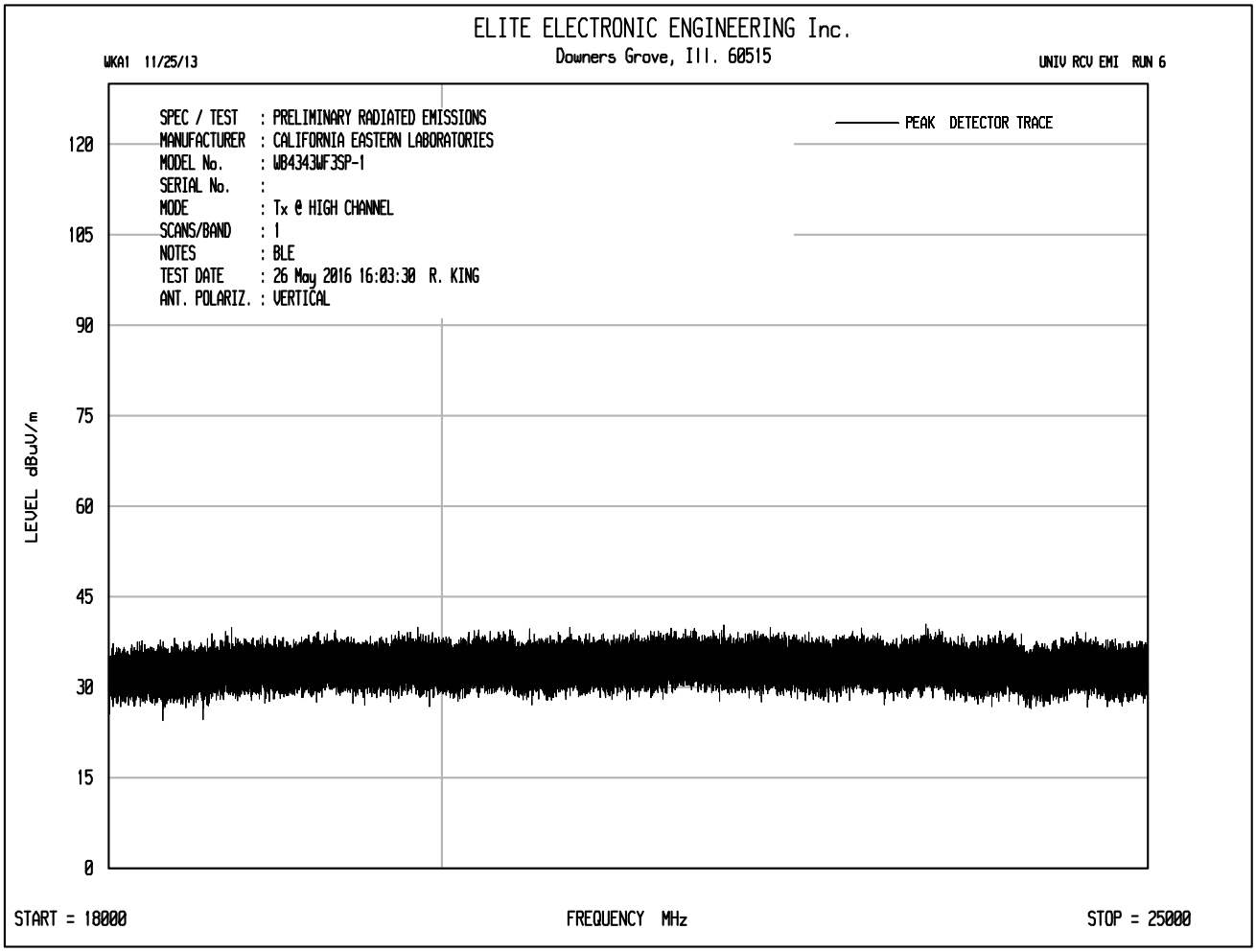

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 3
SPEC / TEST : PRELIM RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ HIGH CHANNEL
SCANS/BAND : 1
NOTES : BLE
TEST DATE : 26 May 2016 11:10:26 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 3000

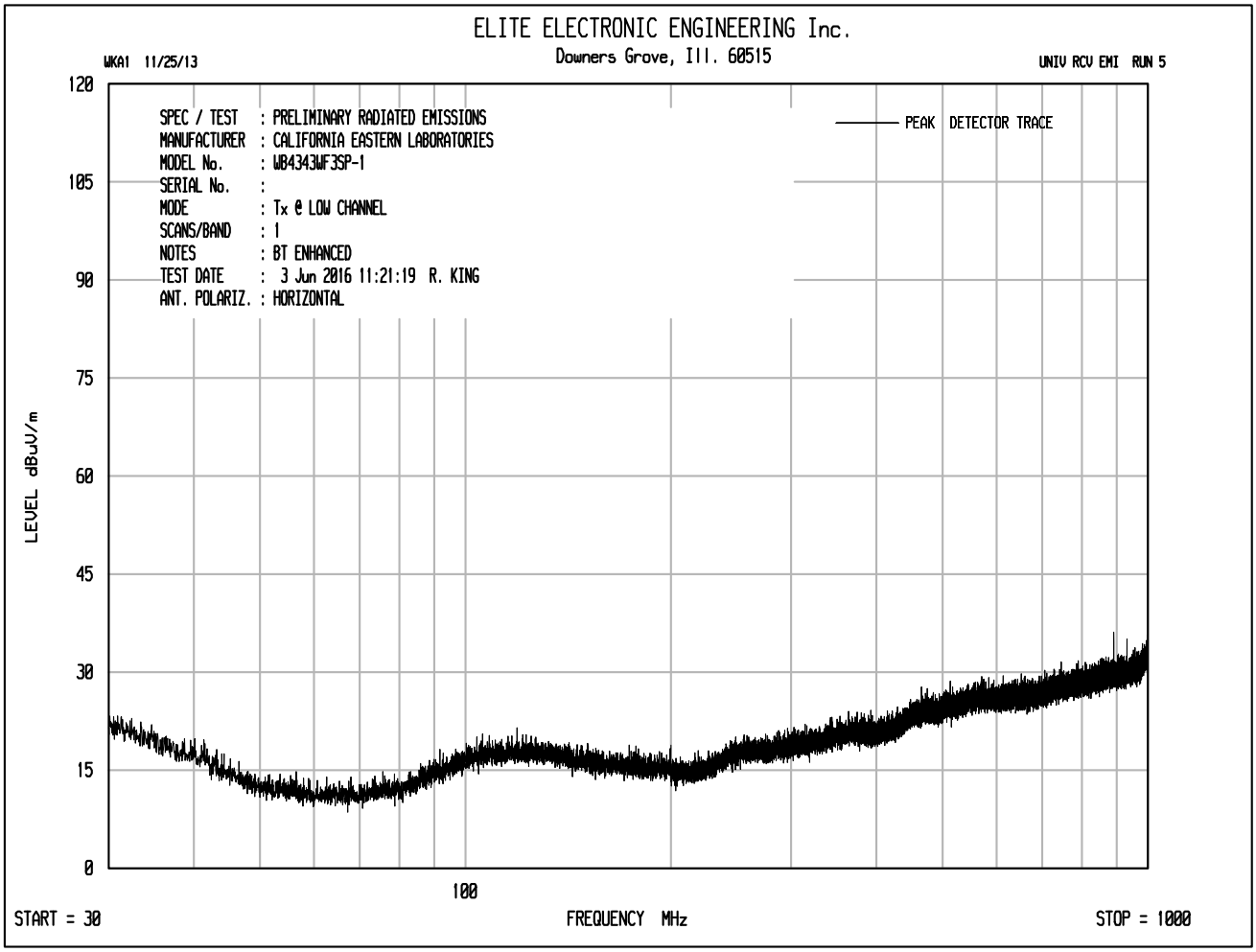

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 4
SPEC / TEST : PRELIM RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ HIGH CHANNEL
SCANS/BAND : 1
NOTES : BLE
TEST DATE : 26 May 2016 11:12:50 R. KING
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 3000

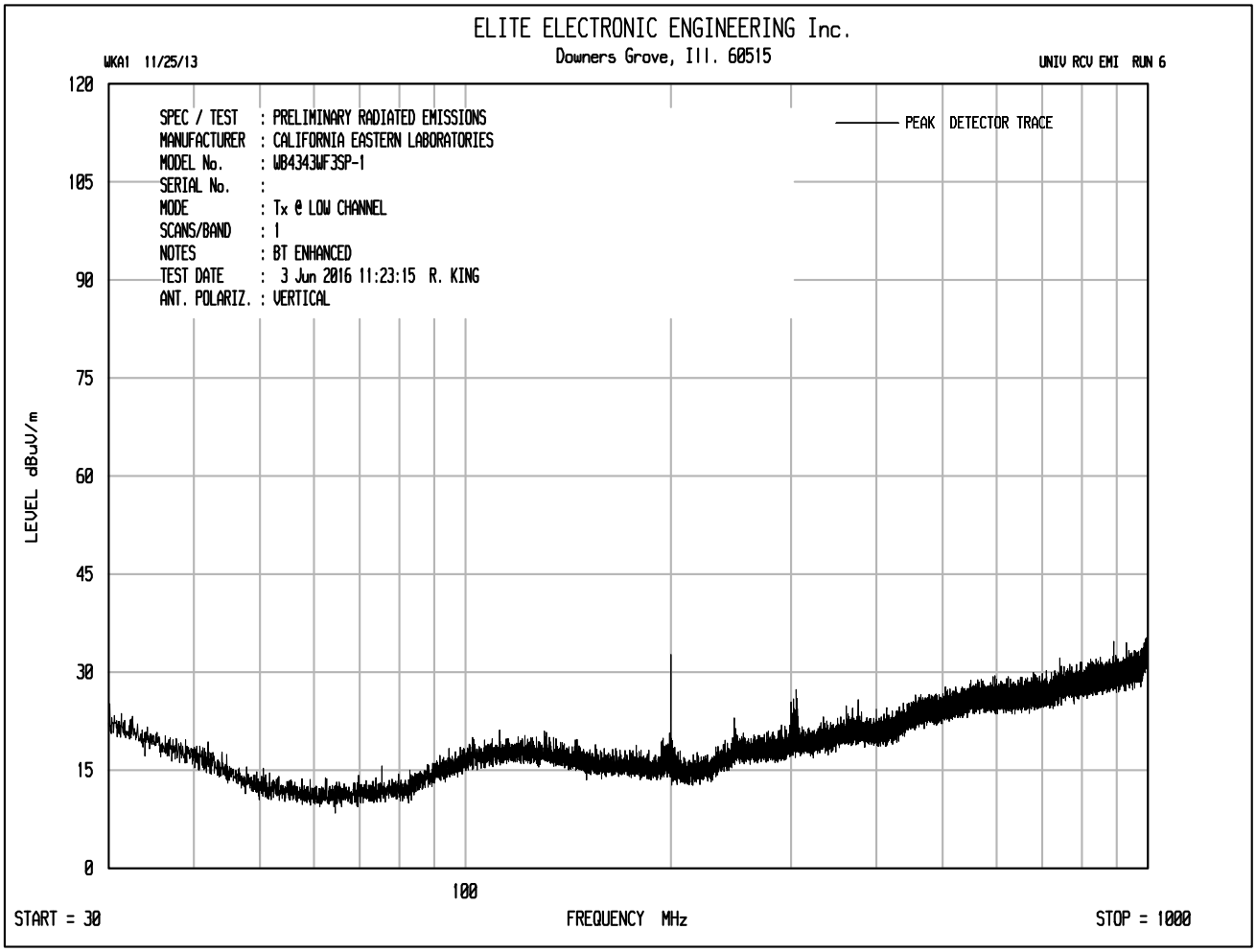

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 8
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ HIGH CHANNEL
SCANS/BAND : 1
NOTES : BLE
TEST DATE : 26 May 2016 11:21:48 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 2000
FREQUENCY MHz
STOP = 18000

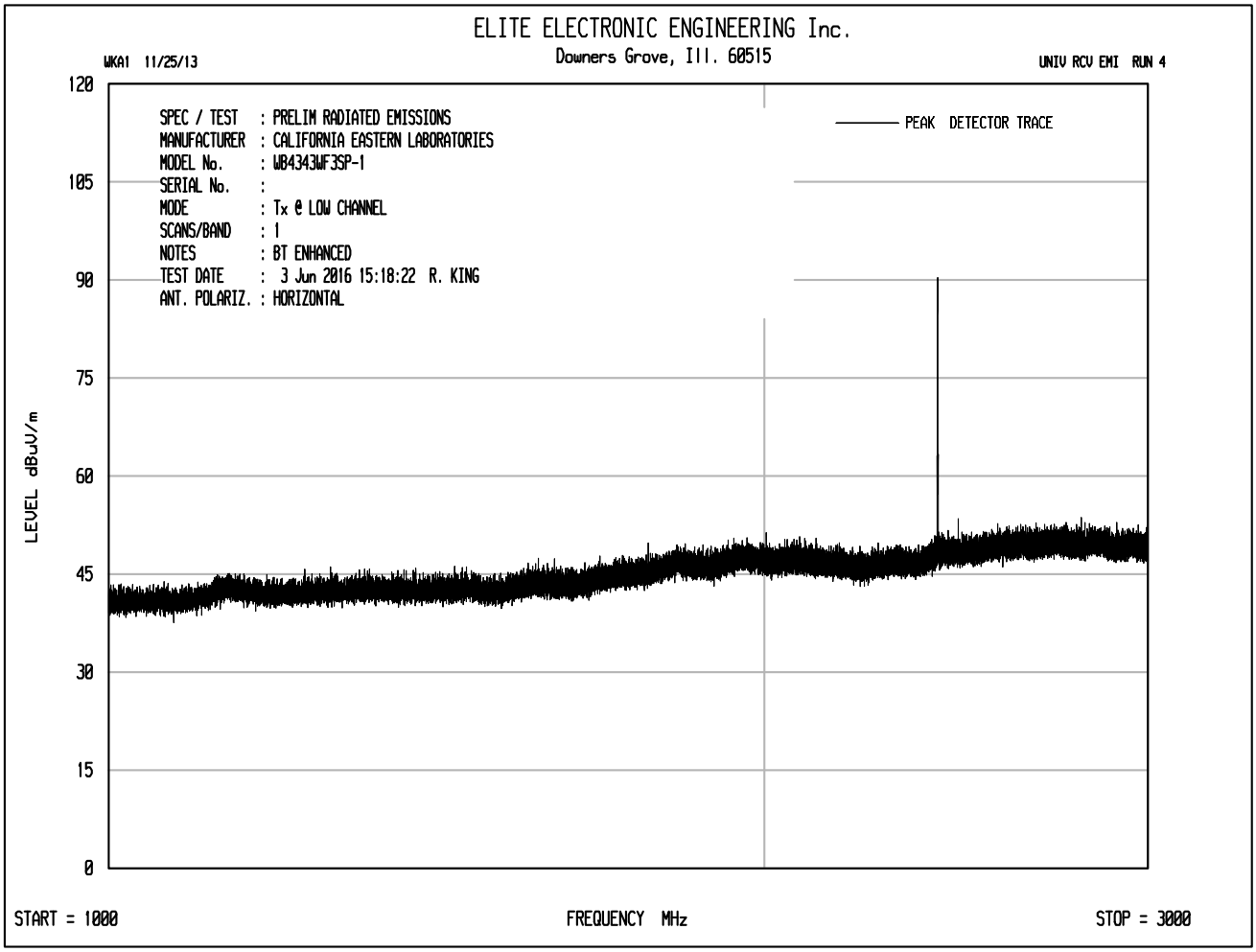

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 7
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ HIGH CHANNEL
SCANS/BAND : 1
NOTES : BLE
TEST DATE : 26 May 2016 11:17:19 R. KING
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 2000
FREQUENCY MHz
STOP = 18000

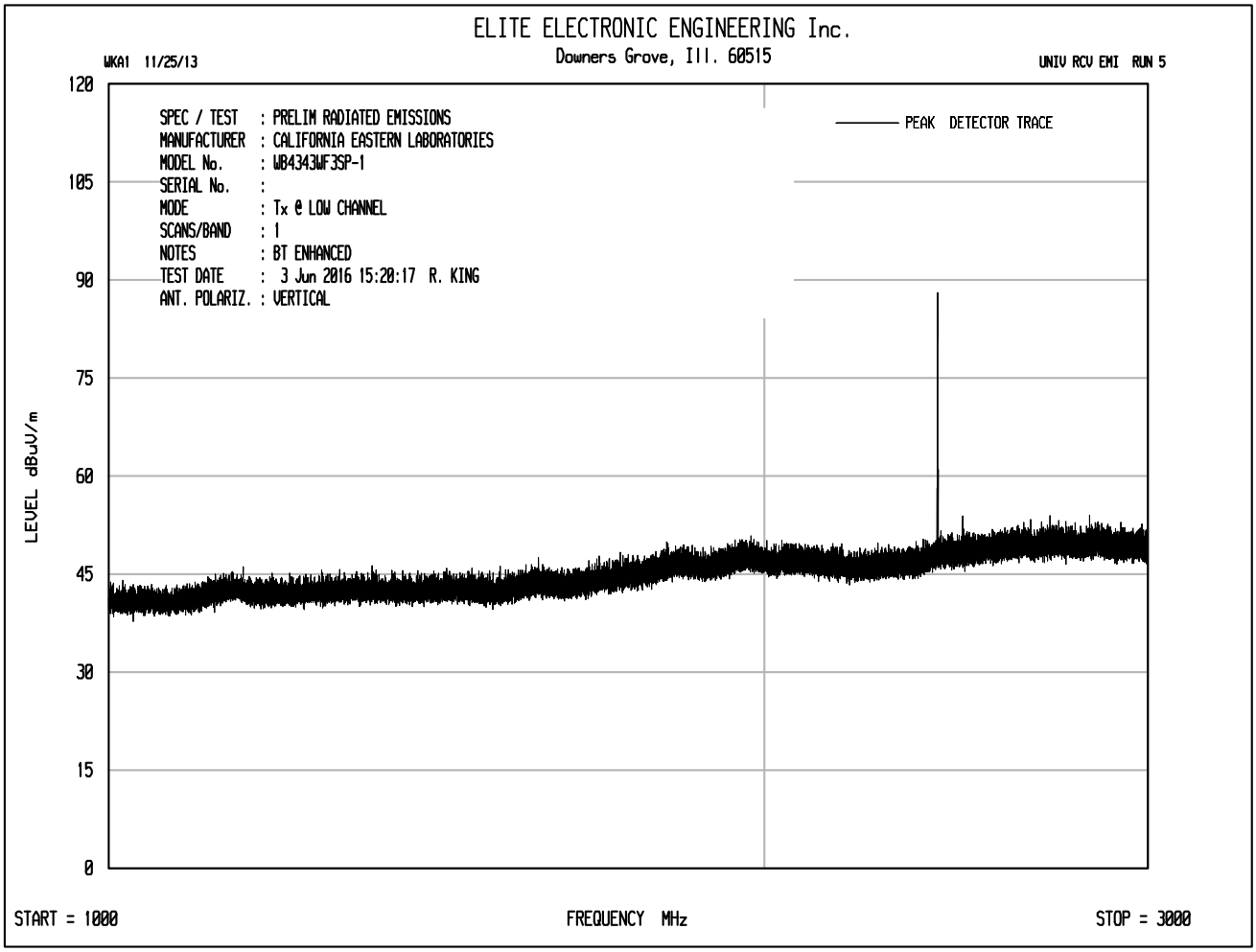

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 7
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ HIGH CHANNEL
SCANS/BAND : 1
NOTES : BLE
TEST DATE : 26 May 2016 16:05:48 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000

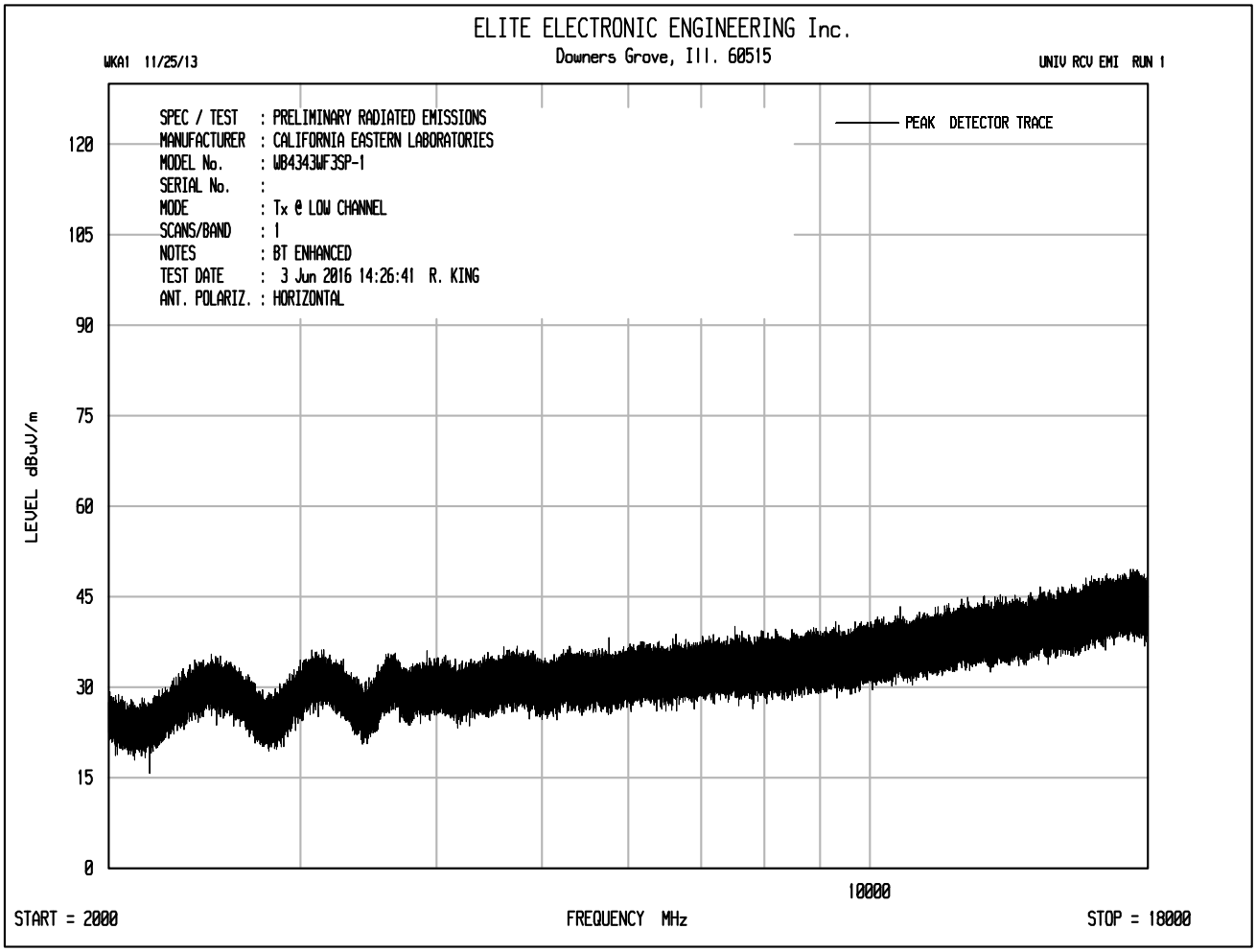

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 6
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ HIGH CHANNEL
SCANS/BAND : 1
NOTES : BLE
TEST DATE : 26 May 2016 16:03:30 R. KING
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000

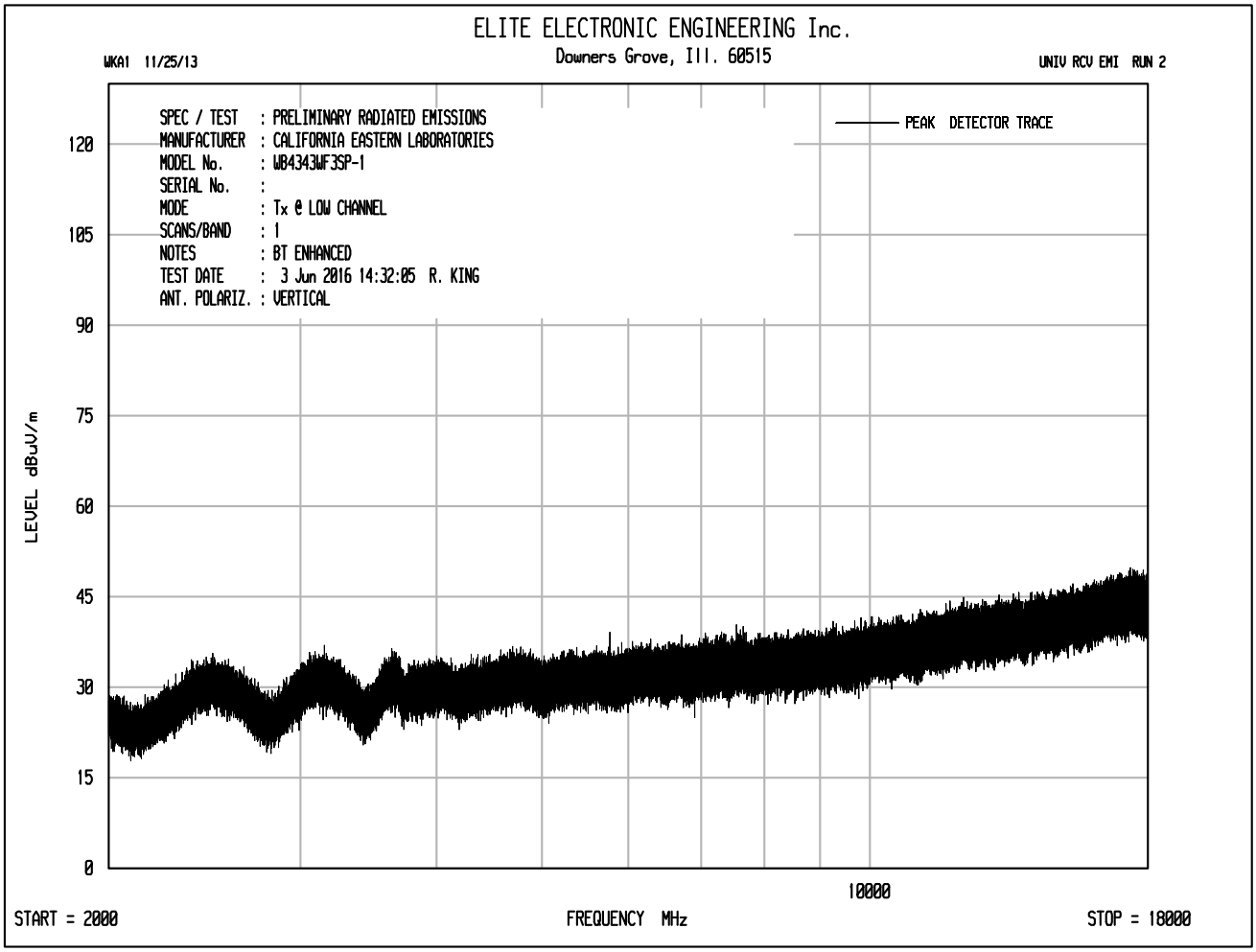

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 5
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ LOW CHANNEL
SCANS/BAND : 1
NOTES : BT ENHANCED
TEST DATE : 3 Jun 2016 11:21:19 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000

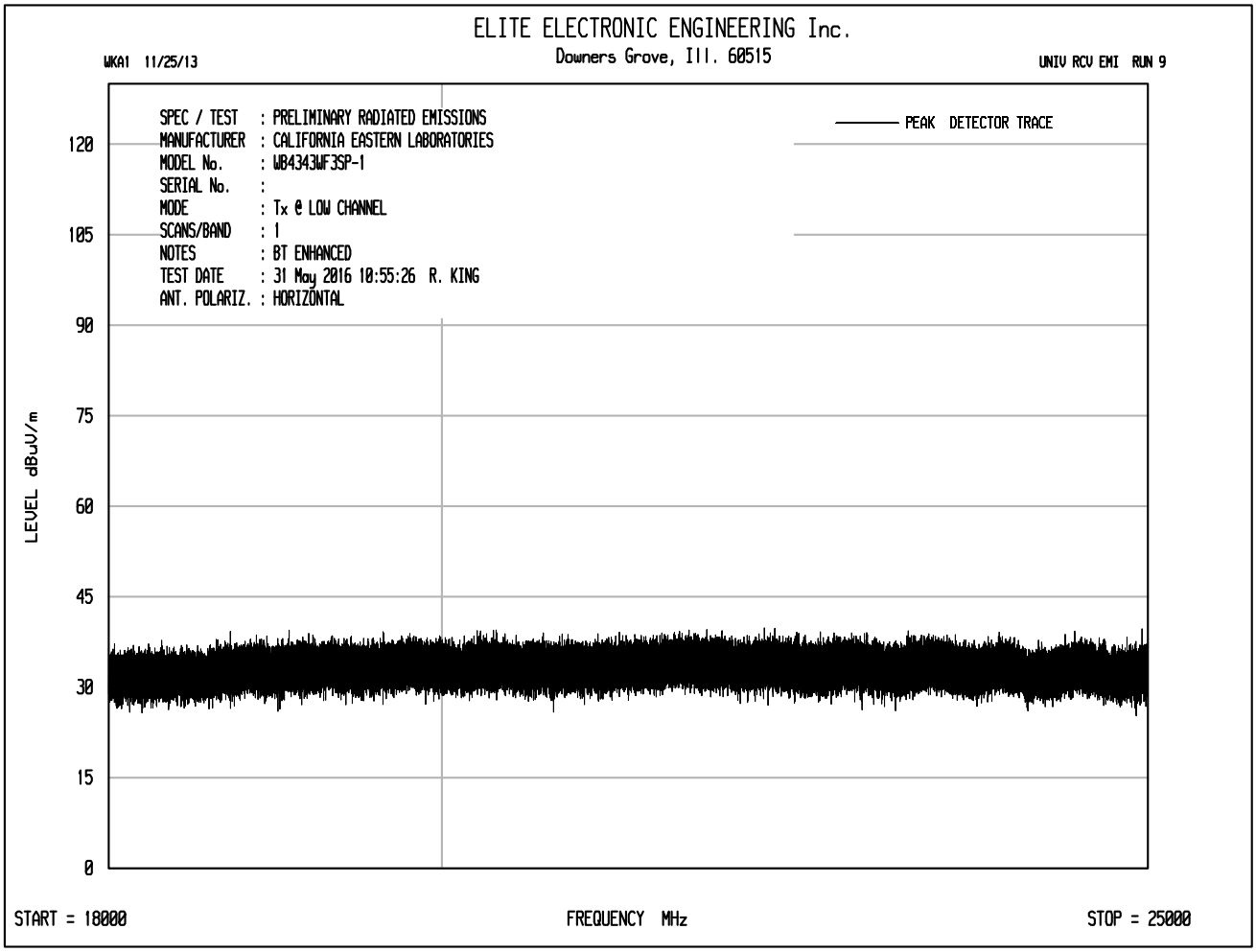

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 6
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ LOW CHANNEL
SCANS/BAND : 1
NOTES : BT ENHANCED
TEST DATE : 3 Jun 2016 11:23:15 R. KING
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000

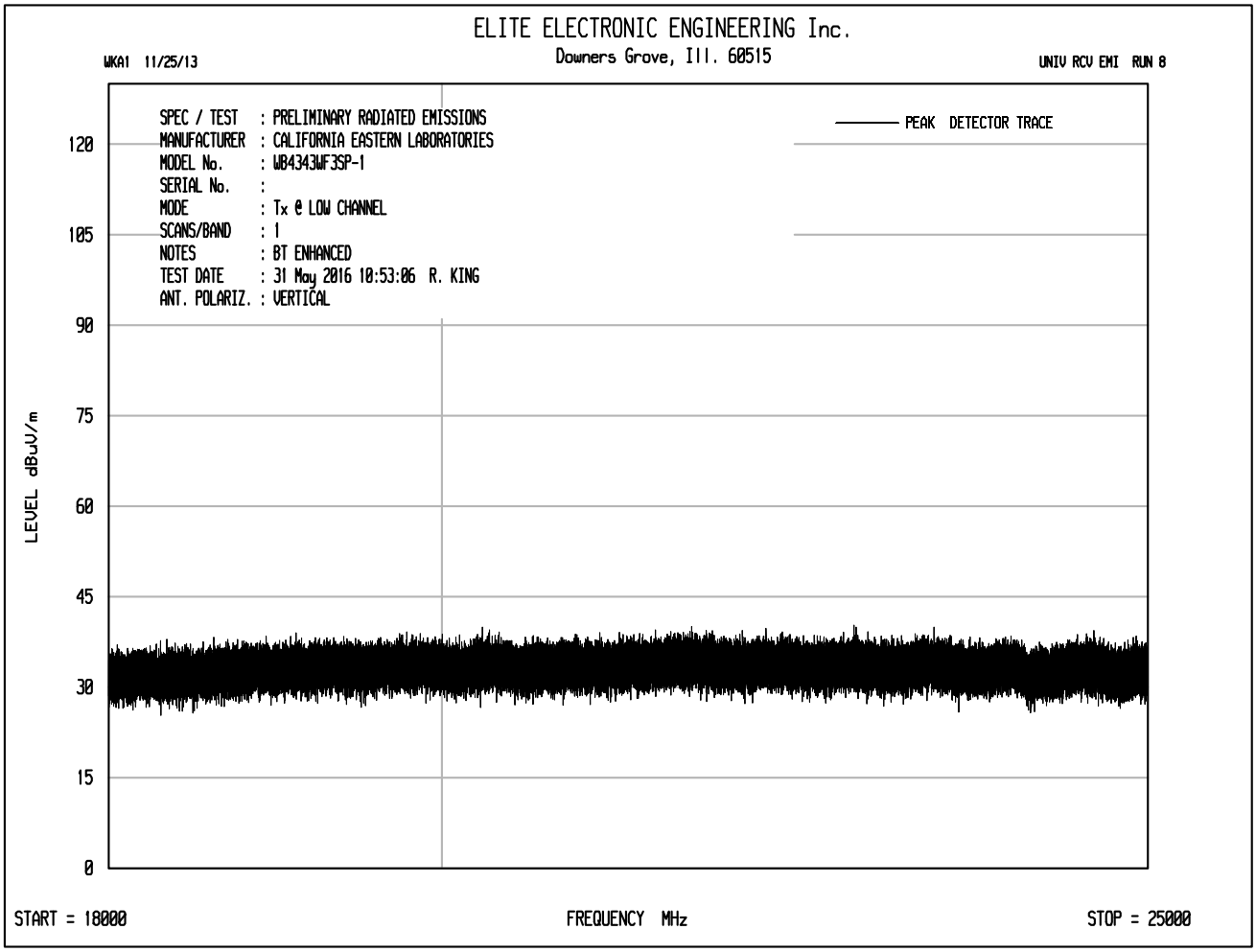

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 4
SPEC / TEST : PRELIM RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ LOW CHANNEL
SCANS/BAND : 1
NOTES : BT ENHANCED
TEST DATE : 3 Jun 2016 15:18:22 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 3000

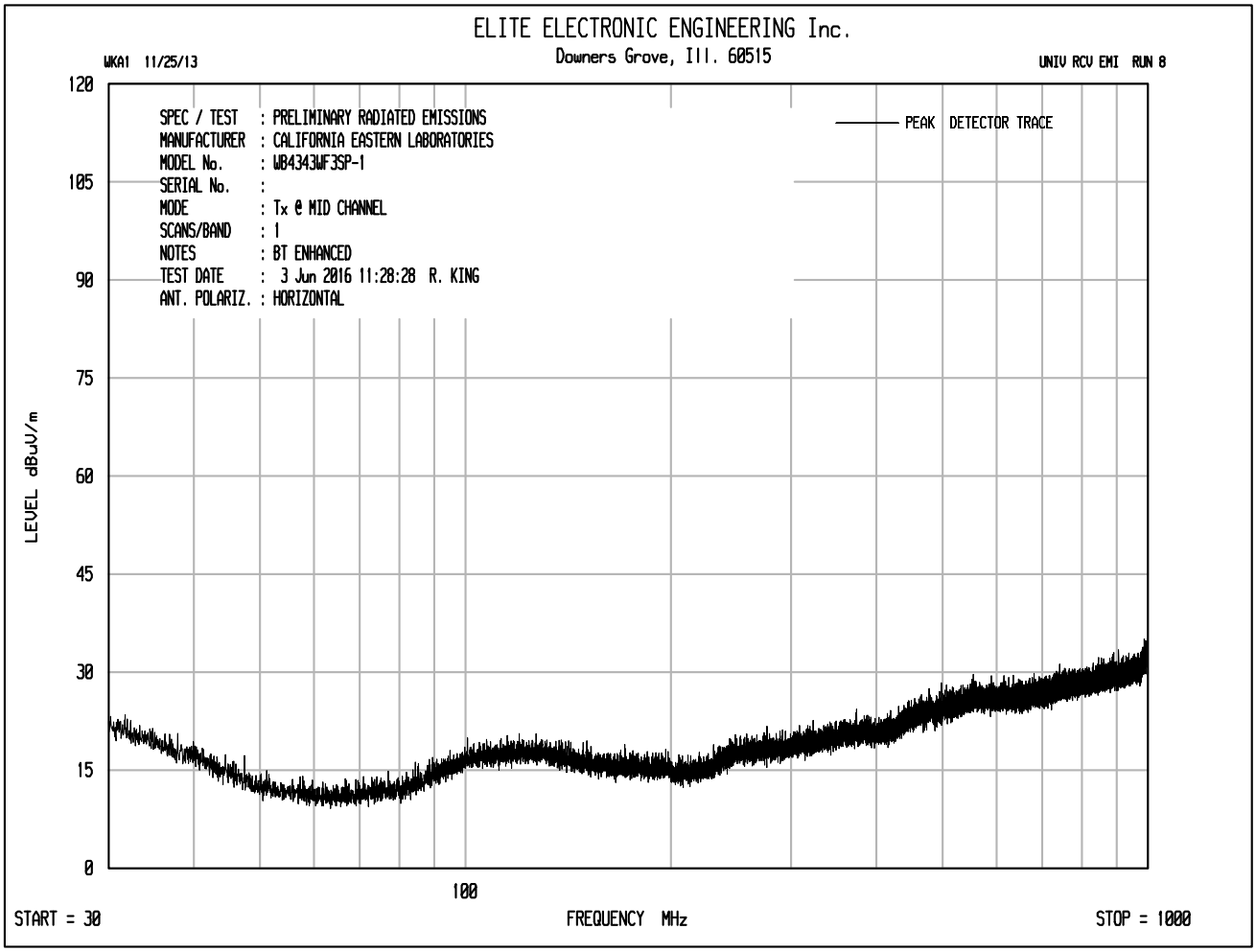

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 5
SPEC / TEST : PRELIM RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ LOW CHANNEL
SCANS/BAND : 1
NOTES : BT ENHANCED
TEST DATE : 3 Jun 2016 15:20:17 R. KING
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 3000

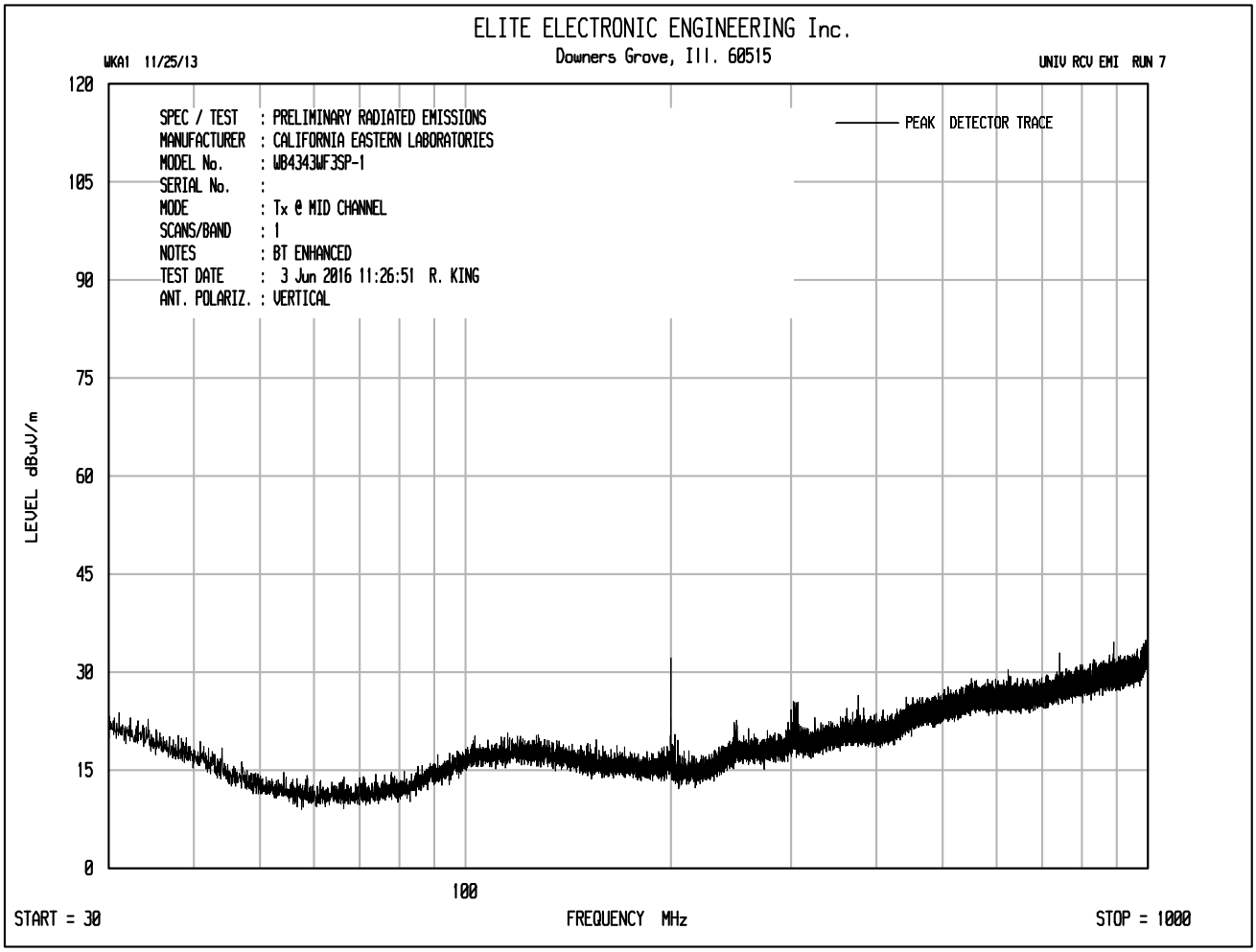

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 1
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ LOW CHANNEL
SCANS/BAND : 1
NOTES : BT ENHANCED
TEST DATE : 3 Jun 2016 14:26:41 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 2000
FREQUENCY MHz
STOP = 18000

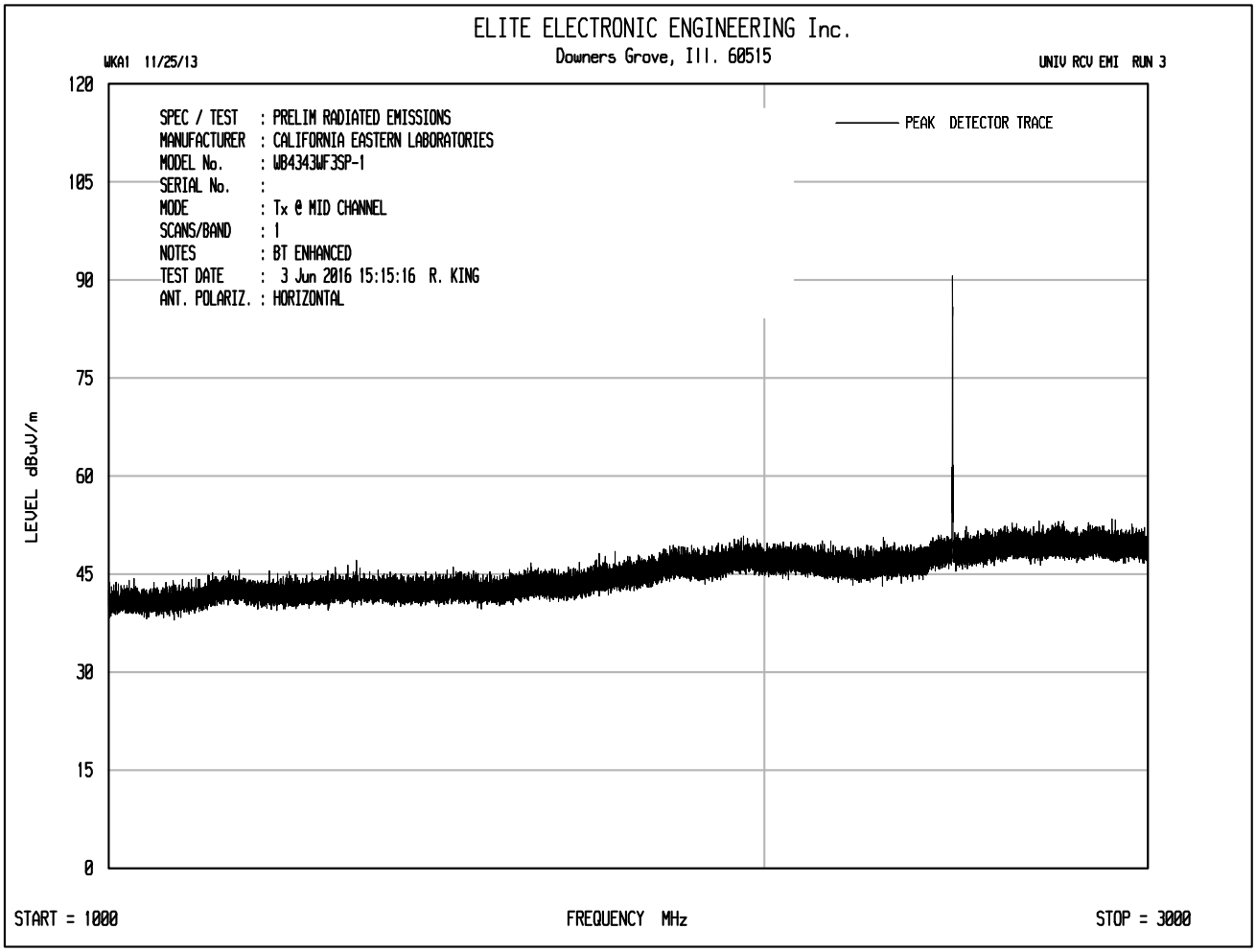

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 2
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ LOW CHANNEL
SCANS/BAND : 1
NOTES : BT ENHANCED
TEST DATE : 3 Jun 2016 14:32:05 R. KING
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 2000
FREQUENCY MHz
STOP = 18000

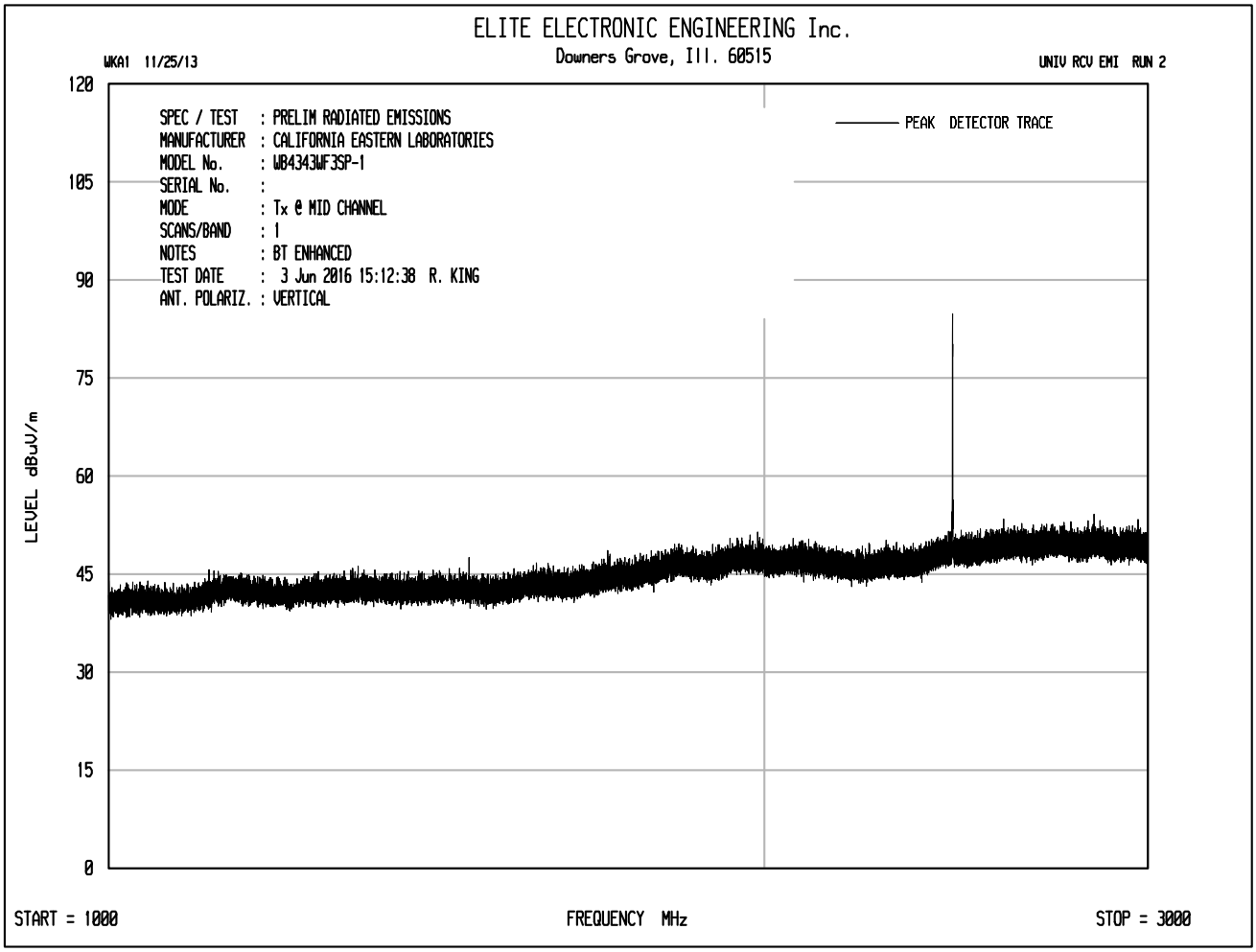

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 9
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ LOW CHANNEL
SCANS/BAND : 1
NOTES : BT ENHANCED
TEST DATE : 31 May 2016 10:55:26 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000

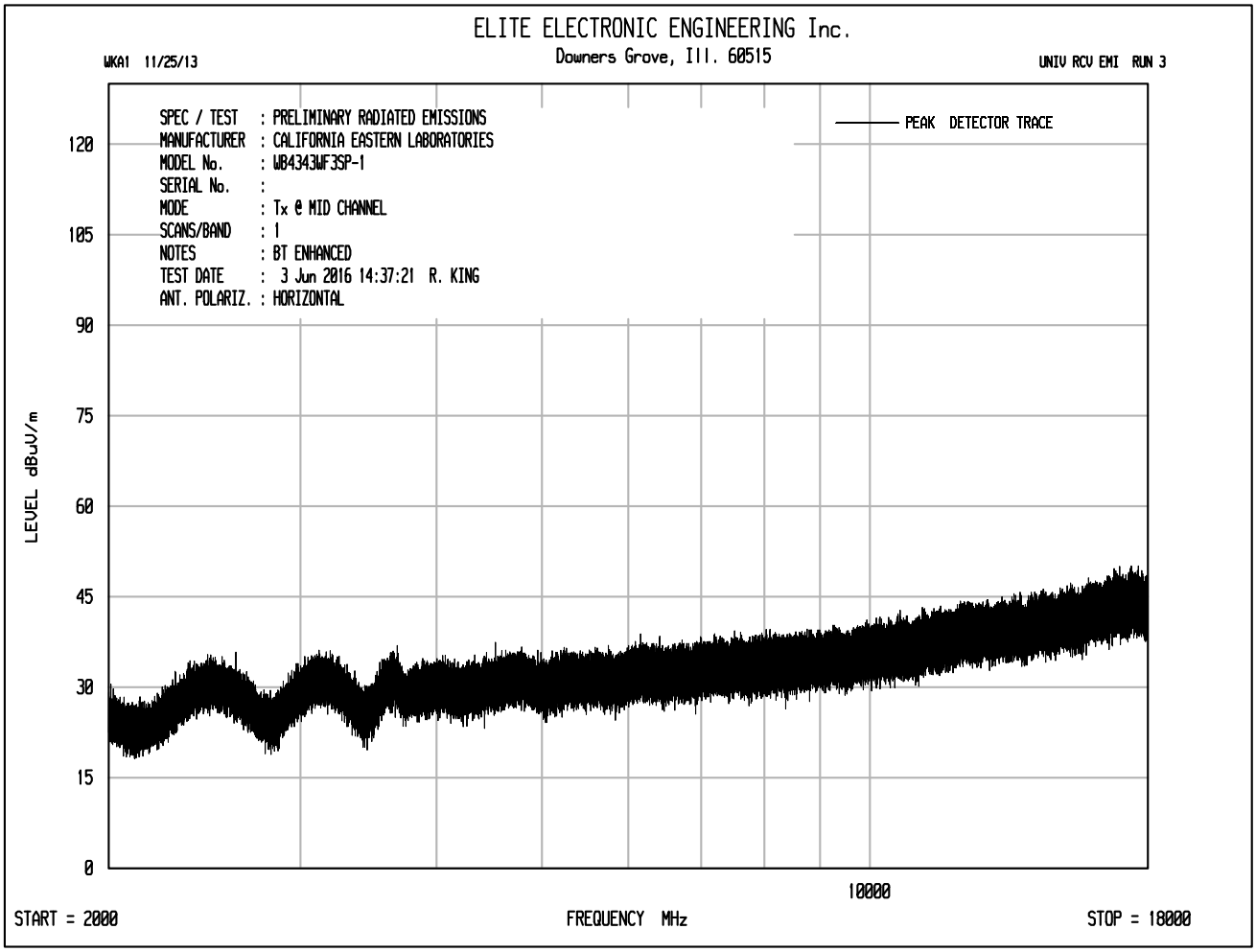

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 8
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ LOW CHANNEL
SCANS/BAND : 1
NOTES : BT ENHANCED
TEST DATE : 31 May 2016 10:53:06 R. KING
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000

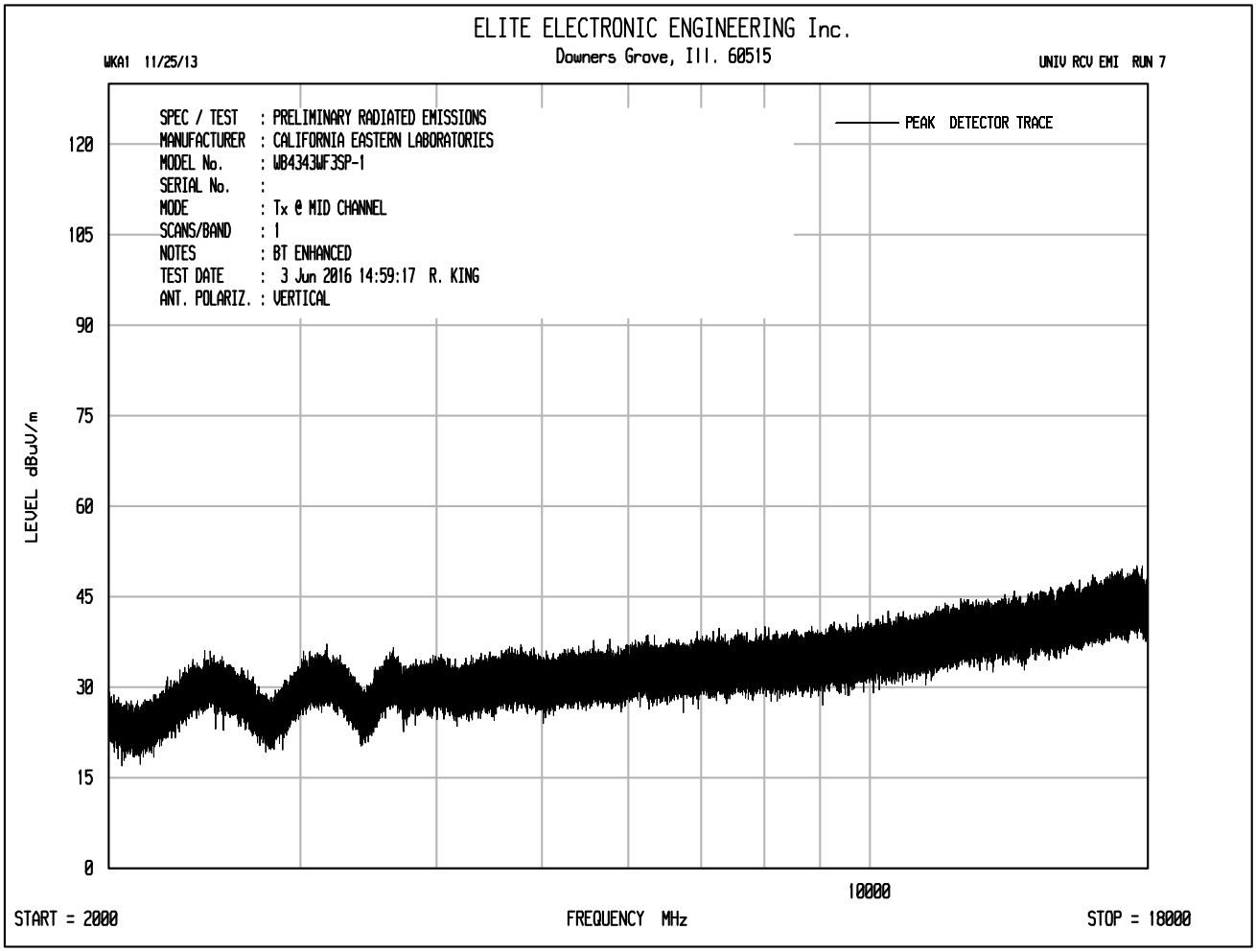

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 8
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ MID CHANNEL
SCANS/BAND : 1
NOTES : BT ENHANCED
TEST DATE : 3 Jun 2016 11:28:28 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000

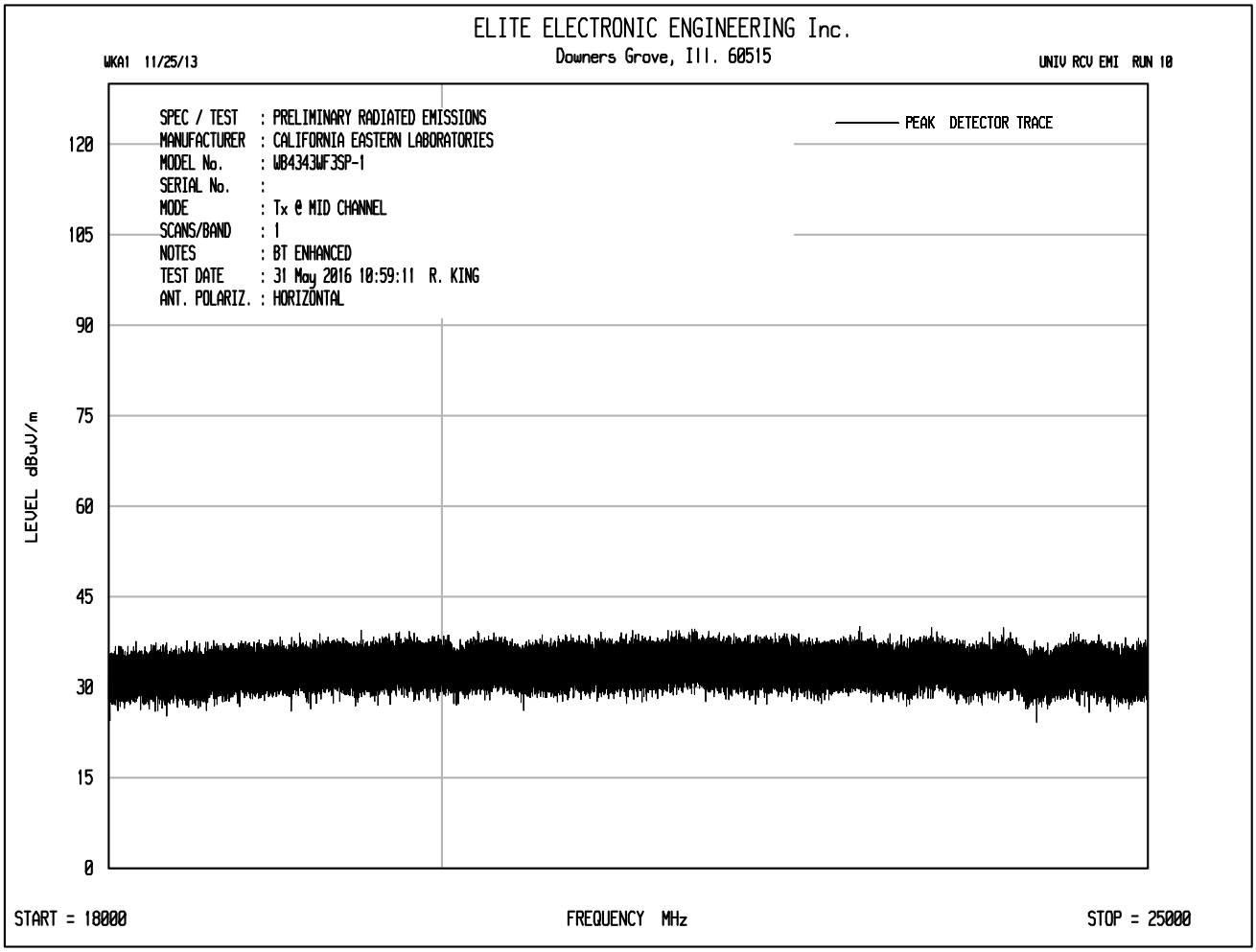

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 7
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ MID CHANNEL
SCANS/BAND : 1
NOTES : BT ENHANCED
TEST DATE : 3 Jun 2016 11:26:51 R. KING
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000

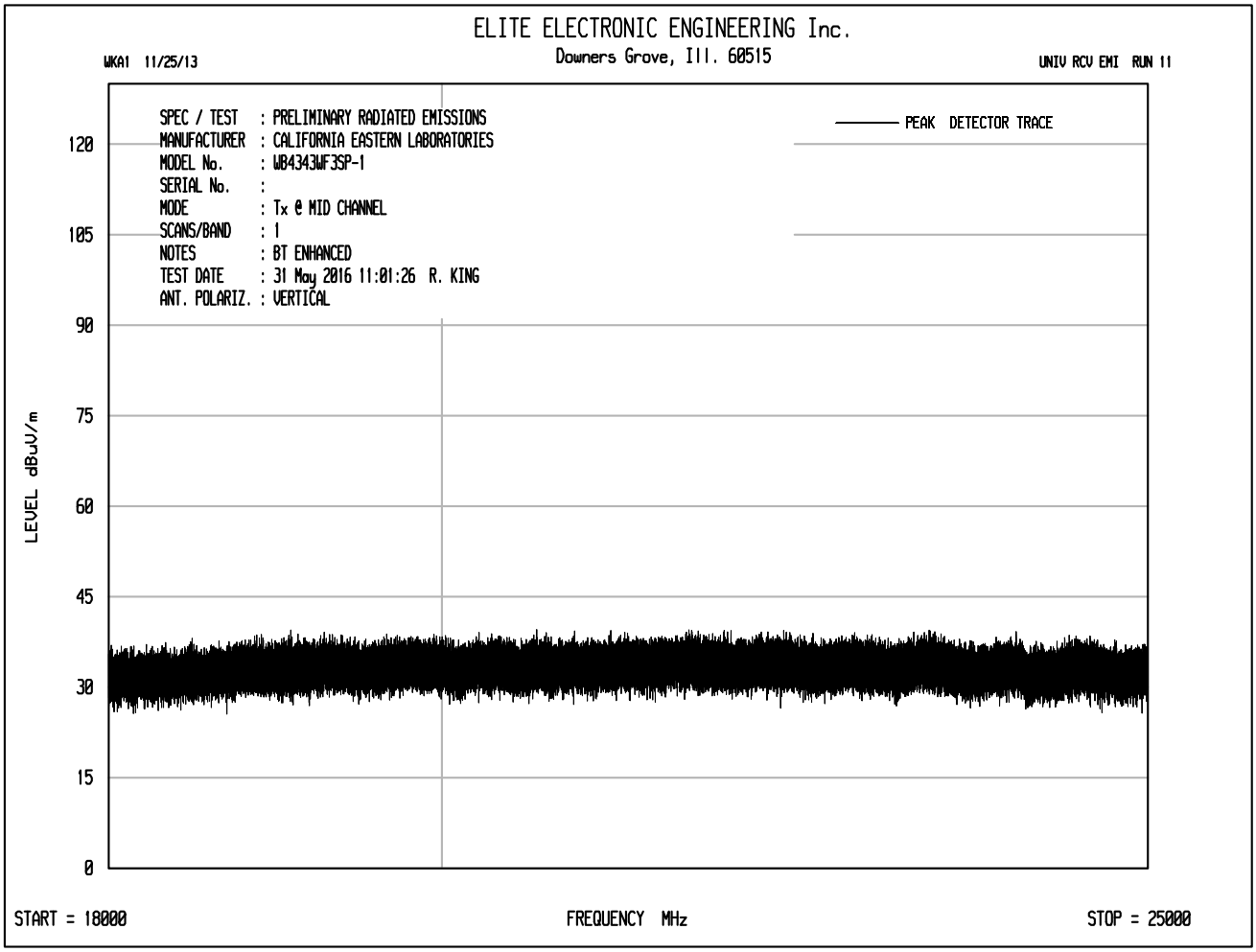

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 3
SPEC / TEST : PRELIM RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ MID CHANNEL
SCANS/BAND : 1
NOTES : BT ENHANCED
TEST DATE : 3 Jun 2016 15:15:16 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 3000

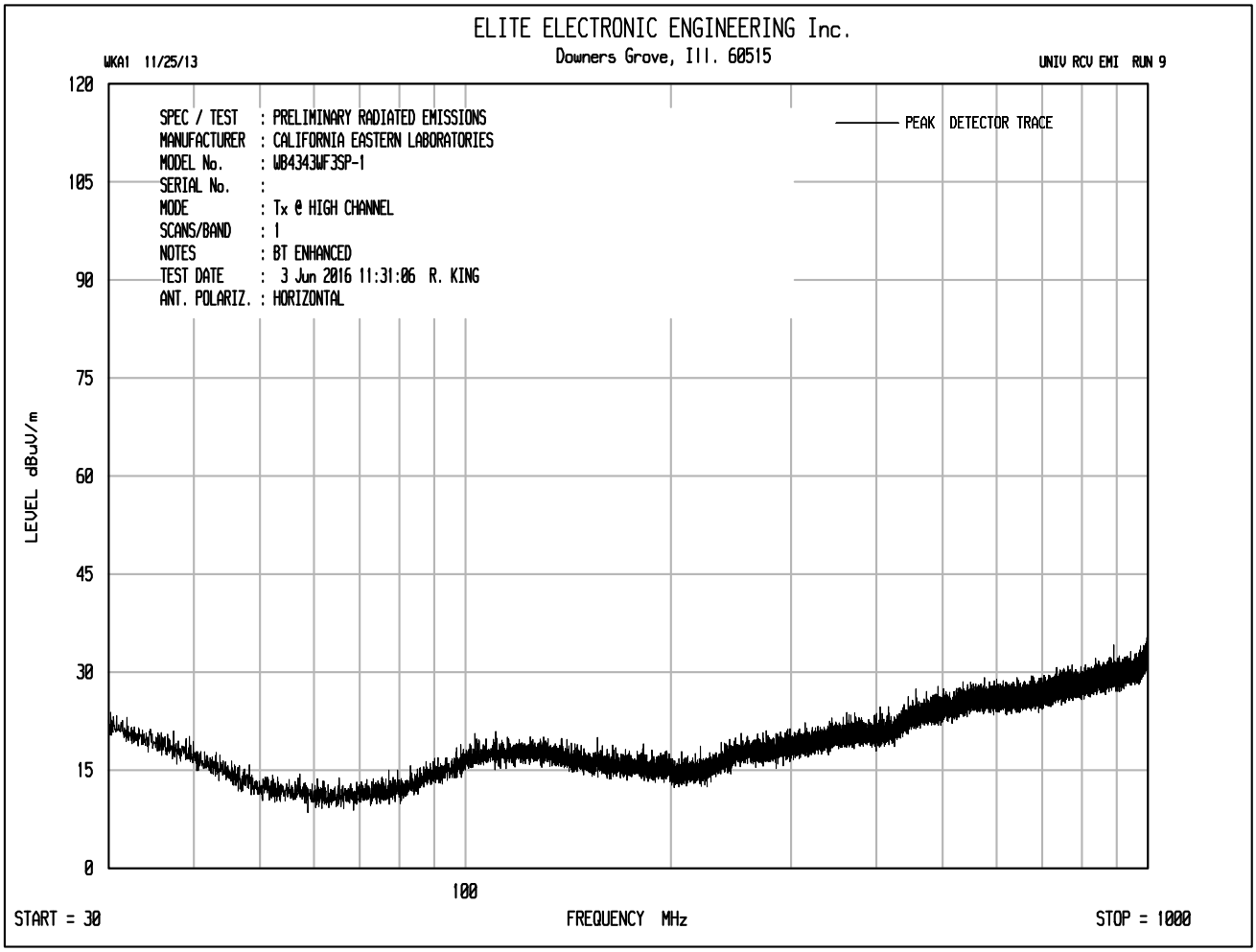

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 2
SPEC / TEST : PRELIM RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ MID CHANNEL
SCANS/BAND : 1
NOTES : BT ENHANCED
TEST DATE : 3 Jun 2016 15:12:38 R. KING
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 3000

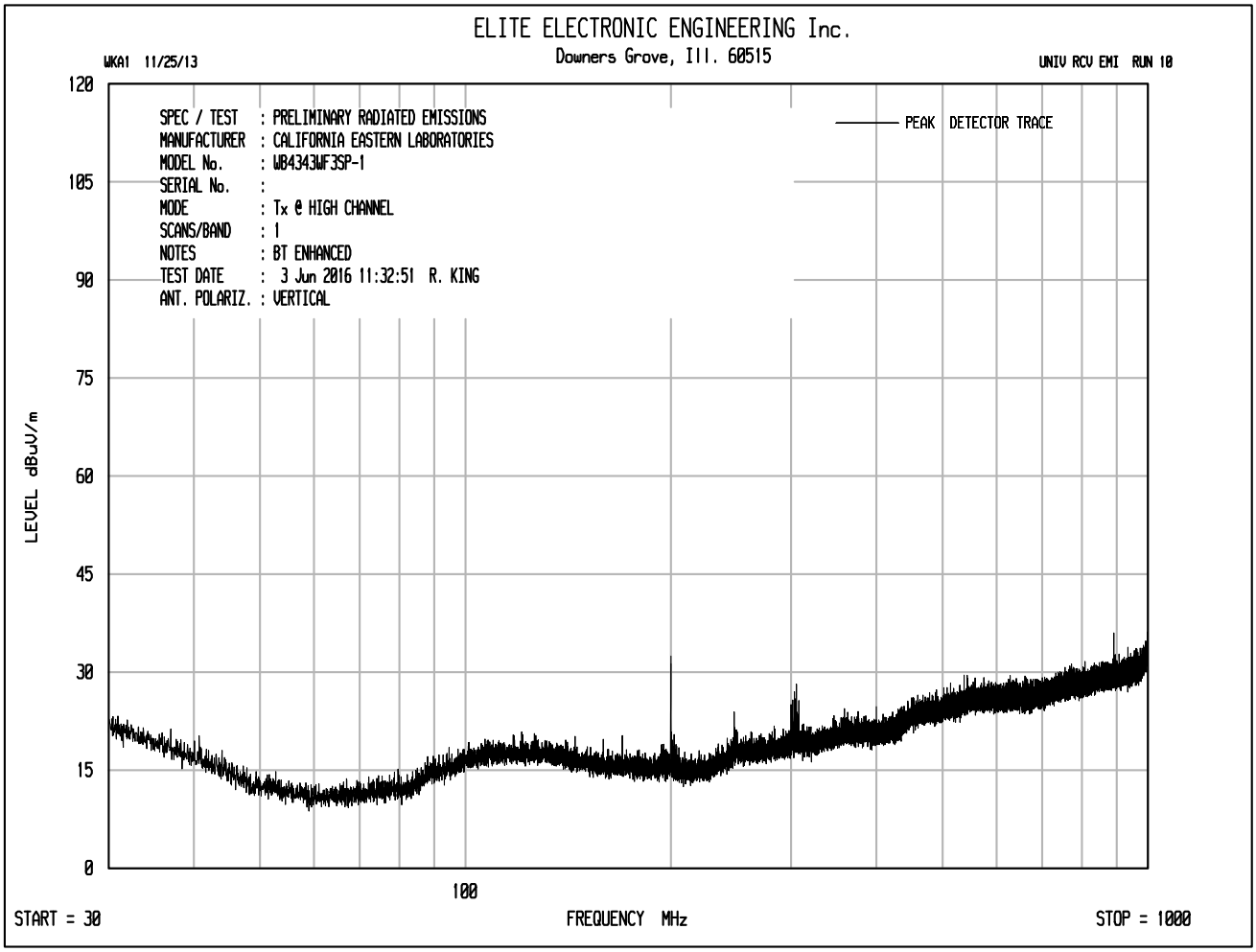

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 3
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ MID CHANNEL
SCANS/BAND : 1
NOTES : BT ENHANCED
TEST DATE : 3 Jun 2016 14:37:21 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 2000
FREQUENCY MHz
STOP = 18000

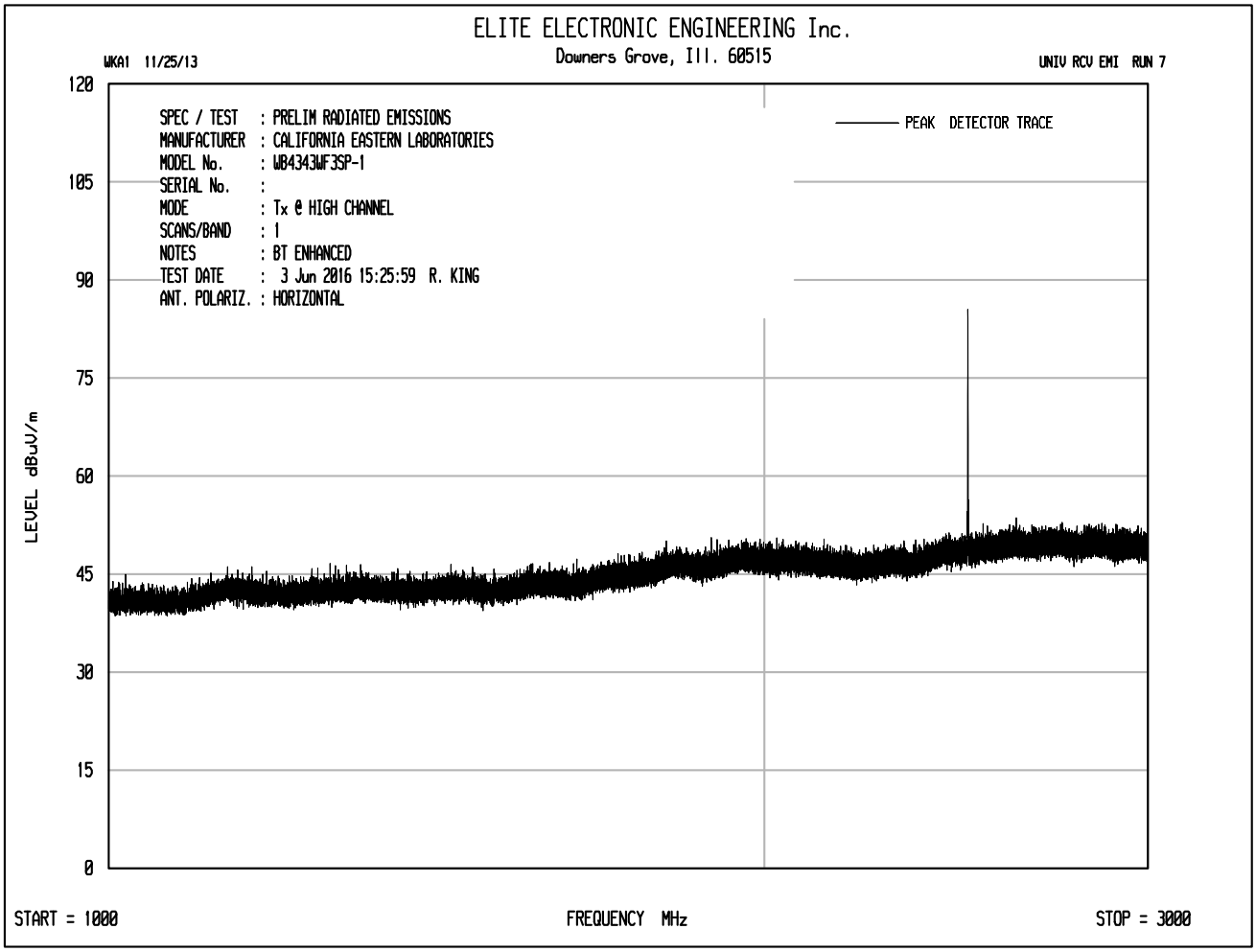

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 7
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ MID CHANNEL
SCANS/BAND : 1
NOTES : BT ENHANCED
TEST DATE : 3 Jun 2016 14:59:17 R. KING
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 2000
FREQUENCY MHz
STOP = 18000

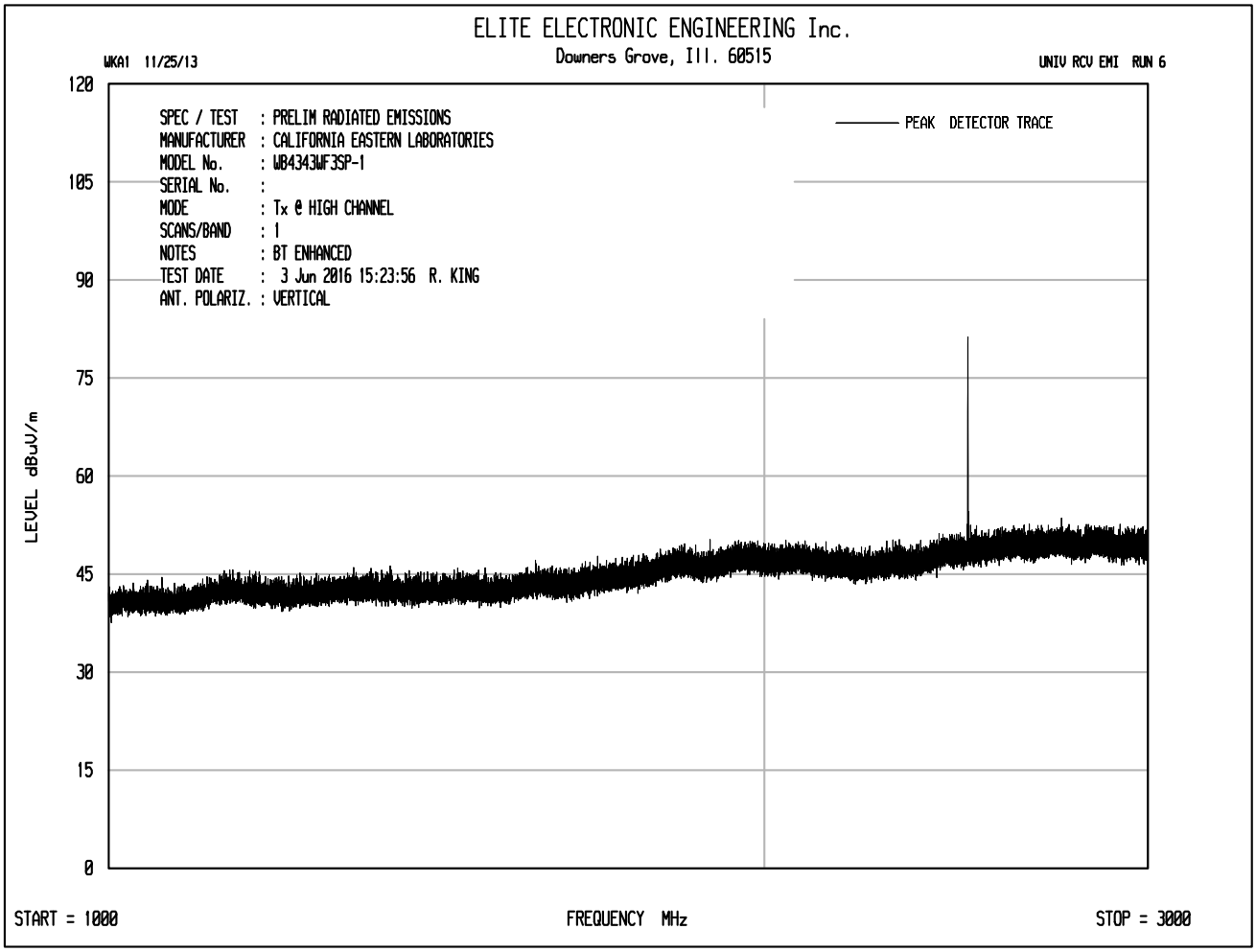

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ MID CHANNEL
SCANS/BAND : 1
NOTES : BT ENHANCED
TEST DATE : 31 May 2016 10:59:11 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000

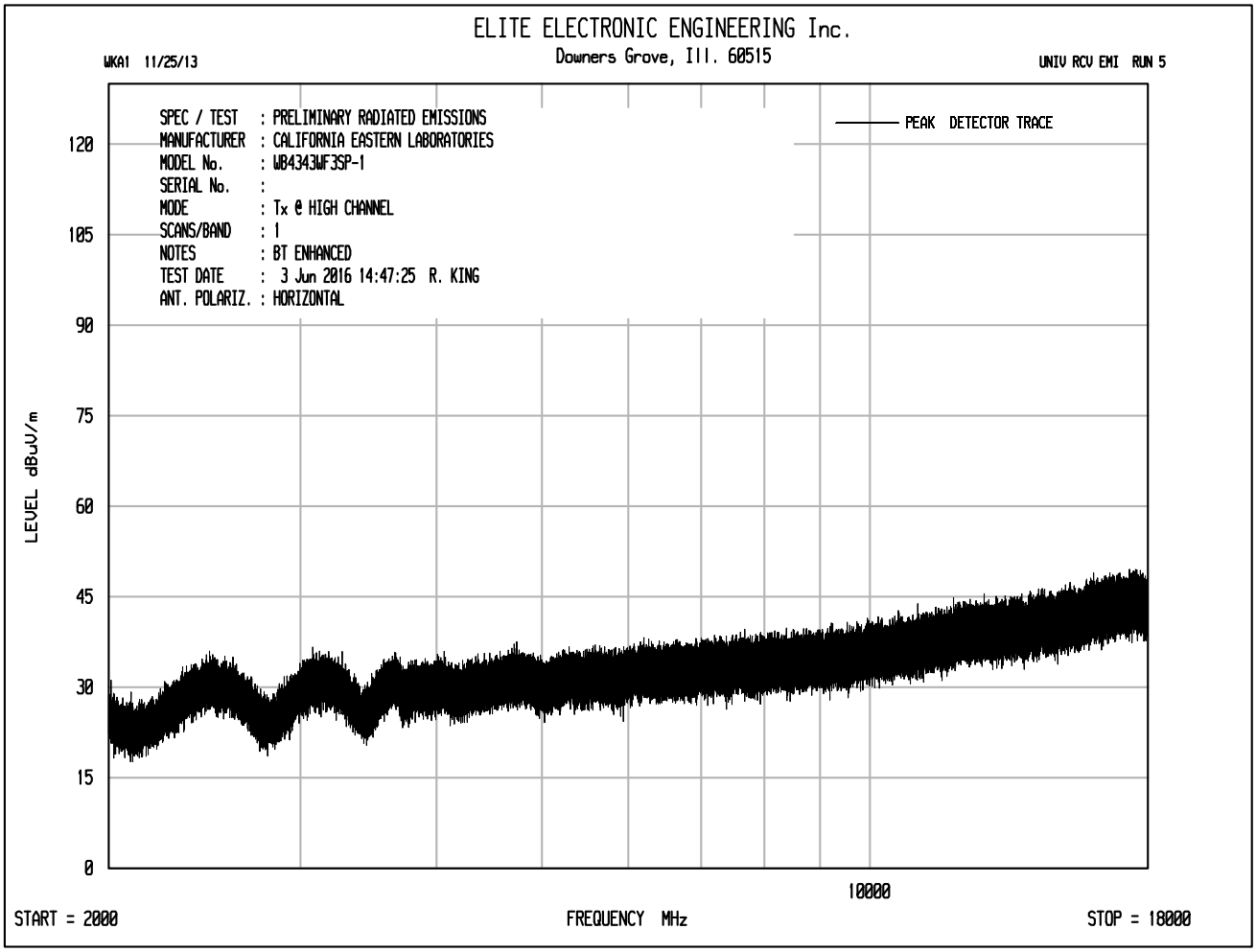

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 11
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ MID CHANNEL
SCANS/BAND : 1
NOTES : BT ENHANCED
TEST DATE : 31 May 2016 11:01:26 R. KING
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000

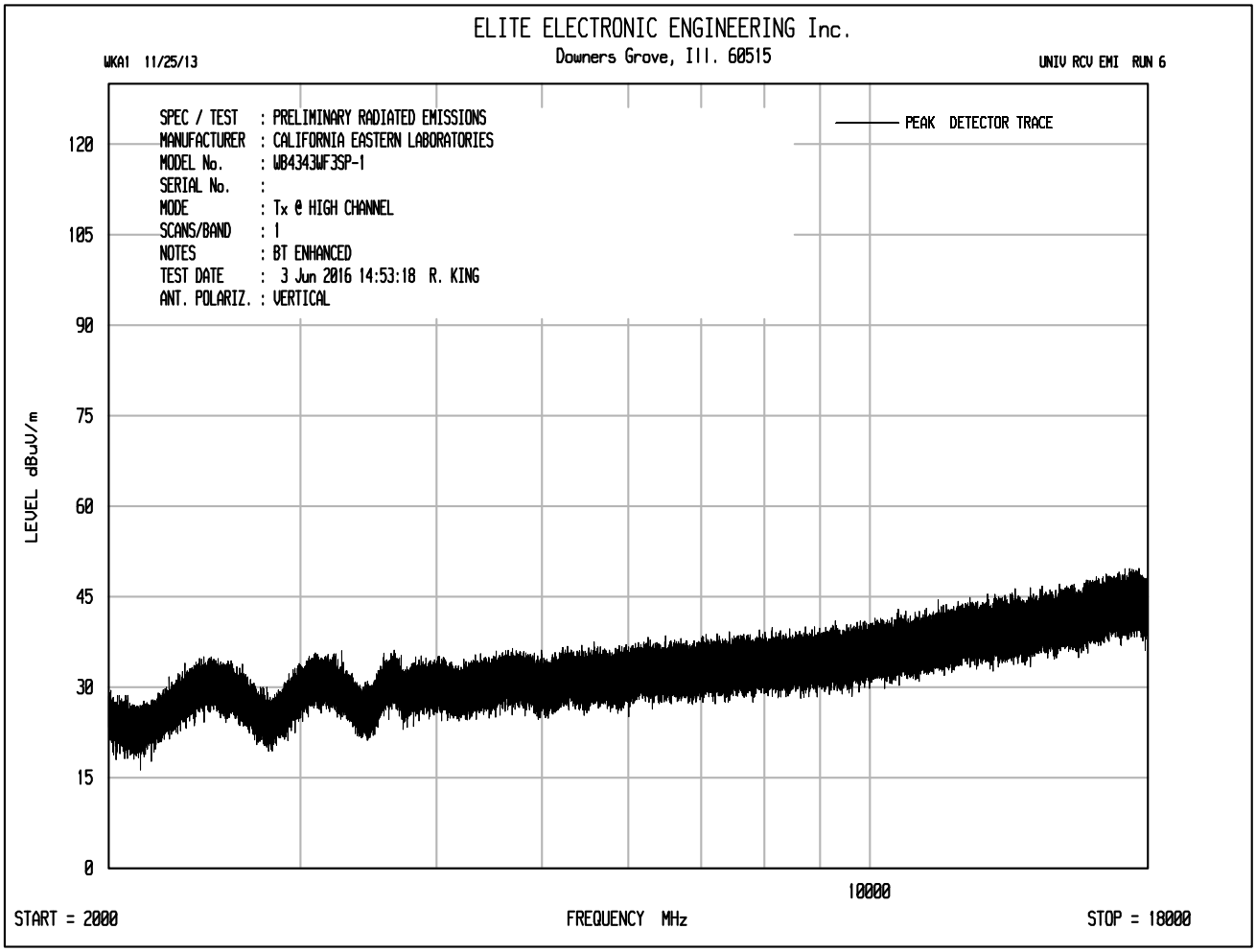

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 9
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ HIGH CHANNEL
SCANS/BAND : 1
NOTES : BT ENHANCED
TEST DATE : 3 Jun 2016 11:31:06 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000

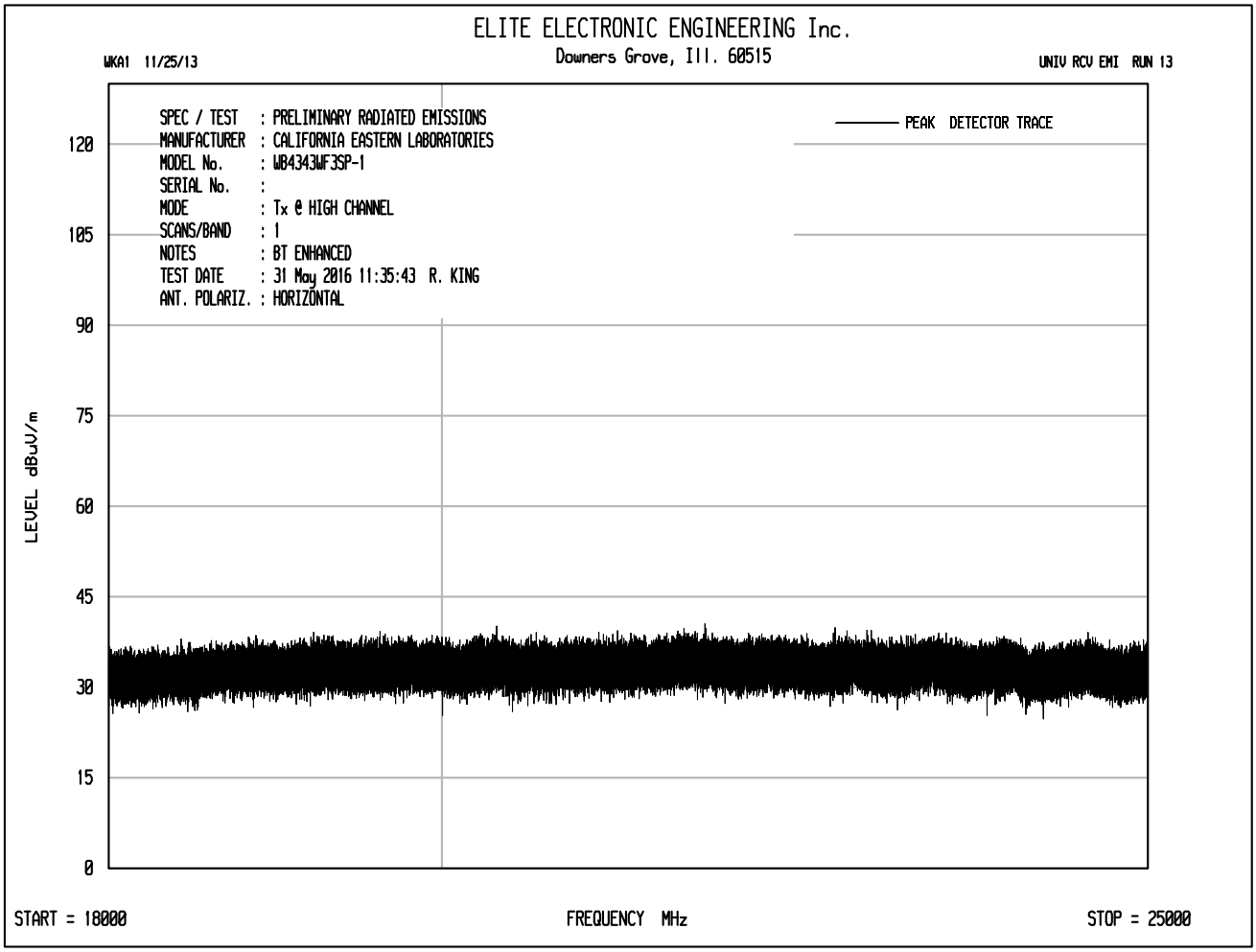

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ HIGH CHANNEL
SCANS/BAND : 1
NOTES : BT ENHANCED
TEST DATE : 3 Jun 2016 11:32:51 R. KING
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000

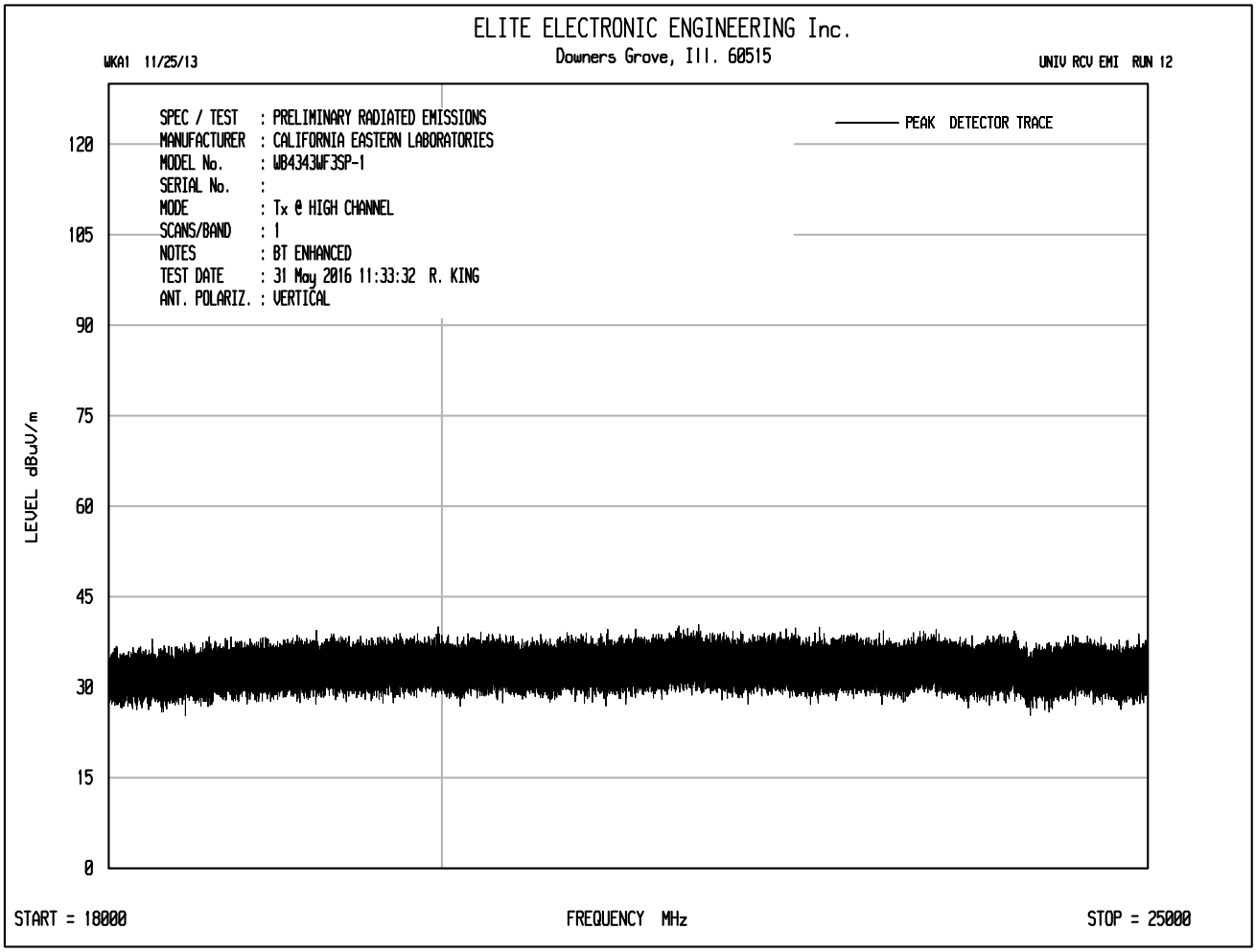

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 7
SPEC / TEST : PRELIM RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ HIGH CHANNEL
SCANS/BAND : 1
NOTES : BT ENHANCED
TEST DATE : 3 Jun 2016 15:25:59 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 3000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 6
SPEC / TEST : PRELIM RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ HIGH CHANNEL
SCANS/BAND : 1
NOTES : BT ENHANCED
TEST DATE : 3 Jun 2016 15:23:56 R. KING
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 3000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 5
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ HIGH CHANNEL
SCANS/BAND : 1
NOTES : BT ENHANCED
TEST DATE : 3 Jun 2016 14:47:25 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 2000
FREQUENCY MHz
STOP = 18000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 6
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ HIGH CHANNEL
SCANS/BAND : 1
NOTES : BT ENHANCED
TEST DATE : 3 Jun 2016 14:53:18 R. KING
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 2000
FREQUENCY MHz
STOP = 18000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 13
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ HIGH CHANNEL
SCANS/BAND : 1
NOTES : BT ENHANCED
TEST DATE : 31 May 2016 11:35:43 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 12
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : WB4343WF3SP-1
SERIAL No. :
MODE : Tx @ HIGH CHANNEL
SCANS/BAND : 1
NOTES : BT ENHANCED
TEST DATE : 31 May 2016 11:33:32 R. KING
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000

ETR No. EEE1601463 854
6A

DATA SHEET TEST NO. 1

RADIATED QP EMISSION MEASUREMENTS in a 3 m SEMI-ANECHOIC ROOM
SPECIFICATION : FCC 15B CLASS B
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL NO. : WB4343WF3SP-1
SERIAL NO. :
TEST MODE : Tx @ LOW CHANNEL
NOTES :
TEST DATE : 3 Jun 2016 10:49:01
TEST DISTANCE : 3 m

FREQUENCY MHz	QP READING dBuV	ANT FAC dB	CBL FAC dB	EXT ATTN dB	DIST FAC dB	TOTAL dBuV/m	QP LIMIT dBuV/m	AZ deg	ANT HT cm	ANT POL
32.41	-8.3	22.7	.5	0.0	0.0	15.0	40.0	90	340	H
52.74	-6.3	13.5	.5	0.0	0.0	7.6	40.0	45	120	V
88.06	-7.5	14.7	.5	0.0	0.0	7.7	43.5	90	200	H
120.64	-8.0	18.3	.6	0.0	0.0	11.0	43.5	-0	200	H
133.98	-8.0	17.7	.7	0.0	0.0	10.4	43.5	135	120	H
142.02	-8.0	17.0	.8	0.0	0.0	9.8	43.5	225	200	H
167.77	-8.1	15.9	.9	0.0	0.0	8.7	43.5	90	200	H
193.74	-6.0	15.0	1.0	0.0	0.0	9.9	43.5	90	200	V
298.77	-5.9	19.2	1.0	0.0	0.0	14.3	46.0	315	120	V
443.00	-7.0	22.2	1.5	0.0	0.0	16.7	46.0	-0	200	H
476.09	.3	23.4	1.5	0.0	0.0	25.2	46.0	180	120	V
677.78	-7.0	25.0	1.7	0.0	0.0	19.7	46.0	-0	340	V
774.33	-6.7	25.8	1.9	0.0	0.0	21.0	46.0	225	120	H
869.94	-5.9	26.6	2.0	0.0	0.0	22.7	46.0	-0	200	H
951.00	-5.7	27.2	2.0	0.0	0.0	23.5	46.0	270	120	H

Manufacturer : California Eastern Laboratories
Test Item : DTS module
Model No. : **Error! Unknown document property name.**
Mode : Tx @ 2402MHz Low Channel - BLE
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions in Restricted Bands
Date : May 31st through June 6th, 2016
Notes : Peak Detector with 1MHz Resolution Bandwidth

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp.

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
4804.00	H	49.3		4.8	34.2	-39.3	49.0	282.3	5000.0	-25.0
4804.00	V	50.1		4.8	34.2	-39.3	49.8	310.6	5000.0	-24.1
12010.00	H	46.6	*	8.0	39.1	-39.2	54.5	532.2	5000.0	-19.5
12010.00	V	47.4	*	8.0	39.1	-39.2	55.4	586.3	5000.0	-18.6
19216.00	H	38.2	*	2.2	40.4	-28.6	52.2	407.1	5000.0	-21.8
19216.00	V	42.8	*	2.2	40.4	-28.6	56.8	694.6	5000.0	-17.1

Checked BY Richard E. King :

Richard E. King

Manufacturer : California Eastern Laboratories
Test Item : WIFI/BLT Module
Model No. : WB4343WF3SP-1
Mode : Tx @ 2402MHz Low Channel - BLE
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions in Restricted Bands
Date : May 31st through June 6th, 2016
Notes : Average Detector with 1MHz Resolution Bandwidth

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Average Total dBuV/m at 3m	Average Total uV/m at 3 m	Average Limit uV/m at 3 m	Margin (dB)
4804.00	H	35.6		4.8	34.2	-39.3	35.4	58.6	500.0	-18.6
4804.00	V	37.1		4.8	34.2	-39.3	36.8	69.5	500.0	-17.1
12010.00	H	33.4	*	8.0	39.1	-39.2	41.4	117.2	500.0	-12.6
12010.00	V	33.4	*	8.0	39.1	-39.2	41.4	117.0	500.0	-12.6
19216.00	H	24.2	*	2.2	40.4	-28.6	38.2	81.5	500.0	-15.8
19216.00	V	28.7	*	2.2	40.4	-28.6	42.7	136.2	500.0	-11.3

Checked BY Richard E. King :

Richard E. King

Manufacturer : California Eastern Laboratories
Test Item : DTS module
Model No. : **Error! Unknown document property name.**
Mode : Tx @ 2440MHz Mid Channel - BLE
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions in Restricted Bands
Date : May 31st through June 6th, 2016
Notes : Peak Detector with 1MHz Resolution Bandwidth

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp.

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
4880.00	H	48.5	*	4.9	34.2	-39.3	48.3	258.9	5000.0	-25.7
4880.00	V	47.7	*	4.9	34.2	-39.3	47.5	236.4	5000.0	-26.5
7320.00	H	48.1	*	6.2	36.2	-39.4	51.0	354.0	5000.0	-23.0
7320.00	V	47.8	*	6.2	36.2	-39.4	50.7	341.9	5000.0	-23.3
12200.00	H	47.4	*	8.0	39.3	-39.1	55.6	600.1	5000.0	-18.4
12200.00	V	47.1	*	8.0	39.3	-39.1	55.3	579.8	5000.0	-18.7
19520.00	H	43.1	*	2.2	40.4	-28.5	57.2	721.3	5000.0	-16.8
19520.00	V	43.4	*	2.2	40.4	-28.5	57.5	745.8	5000.0	-16.5

Checked BY Richard E. King :

Richard E. King

Manufacturer : California Eastern Laboratories
Test Item : WIFI/BLT Module
Model No. : WB4343WF3SP-1
Mode : Tx @ 2440MHz Mid Channel - BLE
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions in Restricted Bands
Date : May 31st through June 6th, 2016
Notes : Average Detector with 1MHz Resolution Bandwidth

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Average Total dBuV/m at 3m	Average Total uV/m at 3 m	Average Limit uV/m at 3 m	Margin (dB)
4880.00	H	34.3	*	4.9	34.2	-39.3	34.1	50.5	500.0	-19.9
4880.00	V	34.3	*	4.9	34.2	-39.3	34.1	50.4	500.0	-19.9
7320.00	H	34.67	*	6.2	36.2	-39.4	37.6	75.6	500.0	-16.4
7320.00	V	34.1	*	6.2	36.2	-39.4	37.0	70.7	500.0	-17.0
12200.00	H	34.0	*	8.0	39.3	-39.1	42.2	128.5	500.0	-11.8
12200.00	V	34.0	*	8.0	39.3	-39.1	42.2	128.5	500.0	-11.8
19520.00	H	29.8	*	2.2	40.4	-28.5	43.9	157.4	500.0	-10.0
19520.00	V	29.8	*	2.2	40.4	-28.5	43.9	157.4	500.0	-10.0

Checked BY Richard E. King :

Richard E. King

Manufacturer : California Eastern Laboratories
Test Item : DTS module
Model No. : **Error! Unknown document property name.**
Mode : Tx @ 2480MHz High Channel - BLE
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions in Restricted Bands
Date : May 31st through June 6th, 2016
Notes : Peak Detector with 1MHz Resolution Bandwidth

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp.

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
4960.00	H	47.6	*	4.9	34.2	-39.3	47.3	232.4	5000.0	-26.7
4960.00	V	48.1	*	4.9	34.2	-39.3	47.8	246.5	5000.0	-26.1
7440.00	H	46.7	*	6.2	36.3	-39.4	49.7	306.3	5000.0	-24.3
7440.00	V	46.8	*	6.2	36.3	-39.4	49.9	310.9	5000.0	-24.1
12400.00	H	47.1	*	8.0	39.4	-39.0	55.5	592.8	5000.0	-18.5
12400.00	V	46.9	*	8.0	39.4	-39.0	55.2	578.7	5000.0	-18.7
19840.00	H	42.9	*	2.2	40.4	-28.2	57.4	742.4	5000.0	-16.6
19840.00	V	42.6	*	2.2	40.4	-28.2	57.1	716.4	5000.0	-16.9
22320.00	H	42.5	*	2.2	40.6	-29.1	56.2	645.5	5000.0	-17.8
22320.00	V	43.6	*	2.2	40.6	-29.1	57.3	736.1	5000.0	-16.6

Checked BY Richard E. King :

Richard E. King

Manufacturer : California Eastern Laboratories
Test Item : WIFI/BLT Module
Model No. : WB4343WF3SP-1
Mode : Tx @ 2480MHz High Channel - BLE
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions in Restricted Bands
Date : May 31st through June 6th, 2016
Notes : Average Detector with 1MHz Resolution Bandwidth

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Average Total dBuV/m at 3m	Average Total uV/m at 3 m	Average Limit uV/m at 3 m	Margin (dB)
4960.00	H	34.4		4.9	34.2	-39.3	34.2	51.3	500.0	-19.8
4960.00	V	34.1		4.9	34.2	-39.3	33.8	49.1	500.0	-20.2
7440.00	H	33.66	*	6.2	36.3	-39.4	36.7	68.5	500.0	-17.3
7440.00	V	33.6	*	6.2	36.3	-39.4	36.7	68.0	500.0	-17.3
12400.00	H	33.7	*	8.0	39.4	-39.0	42.0	126.6	500.0	-11.9
12400.00	V	33.7	*	8.0	39.4	-39.0	42.0	126.5	500.0	-11.9
19840.00	H	28.3	*	2.2	40.4	-28.2	42.8	137.6	500.0	-11.2
19840.00	V	28.4	*	2.2	40.4	-28.2	42.9	139.4	500.0	-11.1
22320.00	H	29.1	*	2.2	40.6	-29.1	42.9	139.3	500.0	-11.1
22320.00	V	29.2	*	2.2	40.6	-29.1	42.9	140.1	500.0	-11.1

Checked BY Richard E. King :

Richard E. King

Manufacturer : California Eastern Laboratories
Test Item : DTS module
Model No. : **Error! Unknown document property name.**
Mode : Tx @ 2402MHz Low Channel – Bluetooth Enhanced
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions in Restricted Bands
Date : May 31st through June 6th, 2016
Notes : Peak Detector with 1MHz Resolution Bandwidth

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp.

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
4804.00	H	47.4	*	4.8	34.2	-39.3	47.1	227.3	5000.0	-26.8
4804.00	V	47.5	*	4.8	34.2	-39.3	47.2	230.0	5000.0	-26.7
12010.00	H	47.0	*	8.0	39.1	-39.2	54.9	557.9	5000.0	-19.0
12010.00	V	46.5	*	8.0	39.1	-39.2	54.5	527.9	5000.0	-19.5
19216.00	H	33.4	*	2.2	40.4	-28.6	47.5	235.9	5000.0	-26.5
19216.00	V	33.4	*	2.2	40.4	-28.6	47.4	234.8	5000.0	-26.6

Checked BY Richard E. King :

Richard E. King

Manufacturer : California Eastern Laboratories
Test Item : WIFI/BLT Module
Model No. : WB4343WF3SP-1
Mode : Tx @ 2402MHz Low Channel – Bluetooth Enhanced
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions in Restricted Bands
Date : May 31st through June 6th, 2016
Notes : Average Detector with 1MHz Resolution Bandwidth

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Average Total dBuV/m at 3m	Average Total uV/m at 3 m	Average Limit uV/m at 3 m	Margin (dB)
4804.00	H	33.9	*	4.8	34.2	-39.3	33.7	48.2	500.0	-20.3
4804.00	V	33.7	*	4.8	34.2	-39.3	33.5	47.1	500.0	-20.5
12010.00	H	33.5	*	8.0	39.1	-39.2	41.4	117.7	500.0	-12.6
12010.00	V	33.5	*	8.0	39.1	-39.2	41.4	117.8	500.0	-12.6
19216.00	H	22.2	*	2.2	40.4	-28.6	36.2	64.7	500.0	-17.8
19216.00	V	22.2	*	2.2	40.4	-28.6	36.3	65.1	500.0	-17.7

Checked BY Richard E. King :

Richard E. King

Manufacturer : California Eastern Laboratories
Test Item : DTS module
Model No. : **Error! Unknown document property name.**
Mode : Tx @ 2440MHz Mid Channel – Bluetooth Enhanced
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions in Restricted Bands
Date : May 31st through June 6th, 2016
Notes : Peak Detector with 1MHz Resolution Bandwidth

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp.

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
4880.00	H	46.8	*	4.9	34.2	-39.3	46.5	212.2	5000.0	-27.4
4880.00	V	47.0	*	4.9	34.2	-39.3	46.7	216.9	5000.0	-27.3
7320.00	H	47.0	*	6.2	36.2	-39.4	49.9	311.9	5000.0	-24.1
7320.00	V	46.5	*	6.2	36.2	-39.4	49.4	294.8	5000.0	-24.6
12200.00	H	46.6	*	8.0	39.3	-39.1	54.8	550.5	5000.0	-19.2
12200.00	V	46.5	*	8.0	39.3	-39.1	54.7	541.1	5000.0	-19.3
19520.00	H	35.5	*	2.2	40.4	-28.5	49.6	301.0	5000.0	-24.4
19520.00	V	35.8	*	2.2	40.4	-28.5	49.9	314.1	5000.0	-24.0

Checked BY Richard E. King :

Richard E. King

Manufacturer : California Eastern Laboratories
Test Item : WIFI/BLT Module
Model No. : WB4343WF3SP-1
Mode : Tx @ 2440MHz Mid Channel – Bluetooth Enhanced
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions in Restricted Bands
Date : May 31st through June 6th, 2016
Notes : Average Detector with 1MHz Resolution Bandwidth

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Average Total dBuV/m at 3m	Average Total uV/m at 3 m	Average Limit uV/m at 3 m	Margin (dB)
4880.00	H	33.3	*	4.9	34.2	-39.3	33.1	45.1	500.0	-20.9
4880.00	V	33.3	*	4.9	34.2	-39.3	33.0	44.9	500.0	-20.9
7320.00	H	33.87	*	6.2	36.2	-39.4	36.8	68.9	500.0	-17.2
7320.00	V	33.9	*	6.2	36.2	-39.4	36.8	68.9	500.0	-17.2
12200.00	H	33.8	*	8.0	39.3	-39.1	42.0	125.7	500.0	-12.0
12200.00	V	33.8	*	8.0	39.3	-39.1	42.0	126.1	500.0	-12.0
19520.00	H	21.8	*	2.2	40.4	-28.5	35.9	62.2	500.0	-18.1
19520.00	V	21.8	*	2.2	40.4	-28.5	35.9	62.4	500.0	-18.1

Checked BY Richard E. King :

Richard E. King

Manufacturer : California Eastern Laboratories
Test Item : DTS module
Model No. : **Error! Unknown document property name.**
Mode : Tx @ 2480MHz High Channel – Bluetooth Enhanced
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions in Restricted Bands
Date : May 31st through June 6th, 2016
Notes : Peak Detector with 1MHz Resolution Bandwidth

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp.

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
4960.00	H	46.0	*	4.9	34.2	-39.3	45.7	193.5	5000.0	-28.2
4960.00	V	46.0	*	4.9	34.2	-39.3	45.7	193.5	5000.0	-28.2
7440.00	H	45.9	*	6.2	36.3	-39.4	48.9	278.7	5000.0	-25.1
7440.00	V	46.5	*	6.2	36.3	-39.4	49.5	300.0	5000.0	-24.4
12400.00	H	46.5	*	8.0	39.4	-39.0	54.8	552.0	5000.0	-19.1
12400.00	V	47.0	*	8.0	39.4	-39.0	55.3	584.0	5000.0	-18.7
19840.00	H	35.8	*	2.2	40.4	-28.2	50.2	324.8	5000.0	-23.7
19840.00	V	35.7	*	2.2	40.4	-28.2	50.1	321.5	5000.0	-23.8
22320.00	H	36.5	*	2.2	40.6	-29.1	50.3	325.8	5000.0	-23.7
22320.00	V	35.5	*	2.2	40.6	-29.1	49.2	290.0	5000.0	-24.7

Checked BY Richard E. King :

Richard E. King

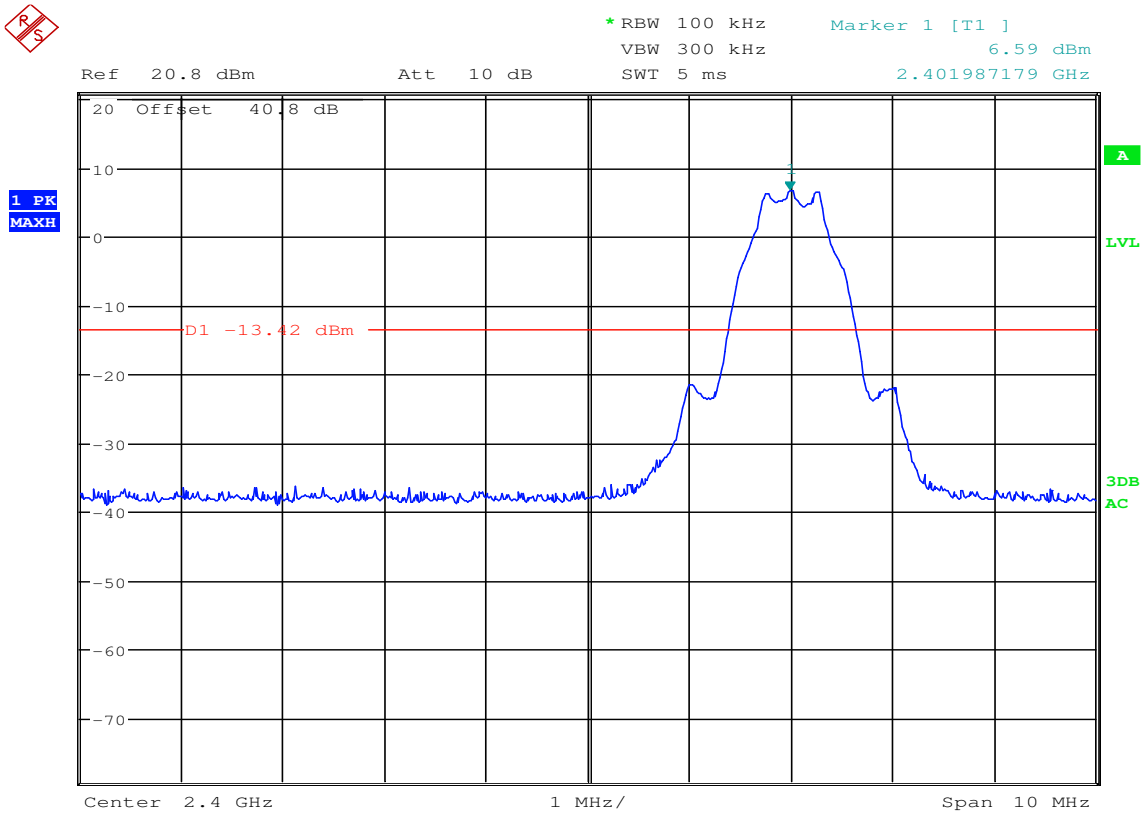
Manufacturer : California Eastern Laboratories
Test Item : WIFI/BLT Module
Model No. : WB4343WF3SP-1
Mode : Tx @ 2480MHz High Channel – Bluetooth Enhanced
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions in Restricted Bands
Date : May 31st through June 6th, 2016
Notes : Average Detector with 1MHz Resolution Bandwidth

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Average Total dBuV/m at 3m	Average Total uV/m at 3 m	Average Limit uV/m at 3 m	Margin (dB)
4960.00	H	32.7	*	4.9	34.2	-39.3	32.4	41.7	500.0	-21.6
4960.00	V	32.6	*	4.9	34.2	-39.3	32.3	41.3	500.0	-21.7
7440.00	H	32.77	*	6.2	36.3	-39.4	35.8	61.8	500.0	-18.2
7440.00	V	33.0	*	6.2	36.3	-39.4	36.0	63.1	500.0	-18.0
12400.00	H	33.8	*	8.0	39.4	-39.0	42.1	127.6	500.0	-11.9
12400.00	V	33.8	*	8.0	39.4	-39.0	42.1	127.8	500.0	-11.9
19840.00	H	28.9	*	2.2	40.4	-28.2	43.4	147.8	500.0	-10.6
19840.00	V	28.7	*	2.2	40.4	-28.2	43.2	144.4	500.0	-10.8
22320.00	H	28.7	*	2.2	40.6	-29.1	42.5	132.7	500.0	-11.5
22320.00	V	28.8	*	2.2	40.6	-29.1	42.5	133.8	500.0	-11.5

Checked BY Richard E. King :

Richard E. King



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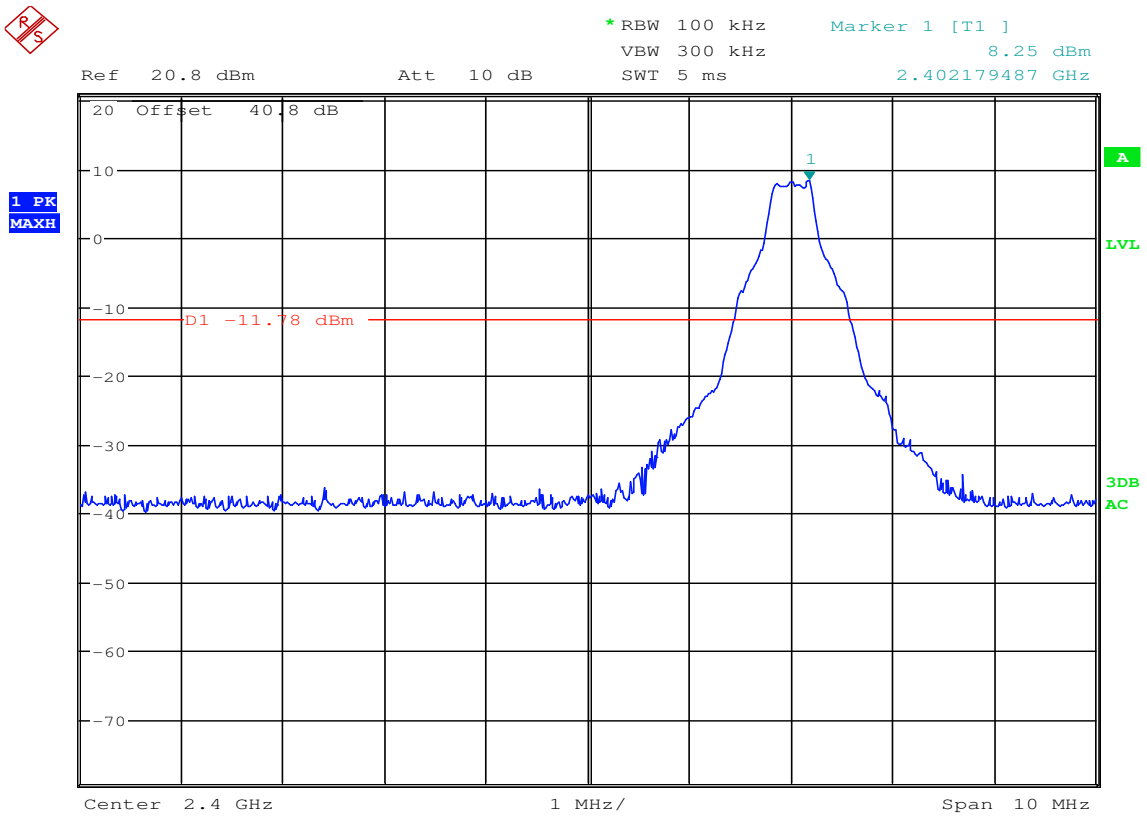
FCC 15.247 Band-edge Compliance

MANUFACTURER	: California Eastern Laboratories
MODEL NUMBER	: WB4343WF3SP-1
TEST MODE	: Tx @ 2402MHz
	: PEAK detector
NOTES	: BLE
NOTES	:

NOTES



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FCC 15.247 Band-edge Compliance

MANUFACTURER : California Eastern Laboratories
MODEL NUMBER : WB4343WF3SP-1
TEST MODE : Tx @ 2402MHz
: PEAK detector
NOTES : Bluetooth Enhanced
NOTES :

NOTES

Manufacturer : California Eastern Laboratories
Test Item : DTS module
Model No. : **Error! Unknown document property name.**
Mode : Tx @ 2480MHz High Channel - BLE
Test Specification : FCC-15.247, RSS-247 Band-edge Compliance
Date : May 31st through June 6th, 2016
Notes : Peak Detector with 1MHz Resolution Bandwidth

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp.

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
2483.50	H	26.0		3.5	32.6	0.0	62.0	1262.1	5000.0	-12.0
2483.50	V	14.4		3.5	32.6	0.0	50.5	333.5	5000.0	-23.5

Checked BY Richard E. King :

Richard E. King

Manufacturer : California Eastern Laboratories
Test Item : WIFI/BLT Module
Model No. : WB4343WF3SP-1
Mode : Tx @ 2480MHz High Channel – BLE
Test Specification : FCC-15.247, RSS-247 Band-edge Compliance
Date : May 31st through June 6th, 2016
Notes : Average Measurement with 1MHz Resolution Bandwidth

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Average Total dBuV/m at 3m	Average Total uV/m at 3 m	Average Limit uV/m at 3 m	Margin (dB)
2483.50	H	17.0		3.5	32.6	0.0	53.1	449.9	500.0	-0.9
2483.50	V	7.8		3.5	32.6	0.0	43.9	156.7	500.0	-10.1

Checked BY Richard E. King :

Richard E. King

Manufacturer : California Eastern Laboratories
Test Item : DTS module
Model No. : **Error! Unknown document property name.**
Mode : Tx @ 2480MHz High Channel – Bluetooth Enhanced
Test Specification : FCC-15.247, RSS-247 Band-edge Compliance
Date : May 31st through June 6th, 2016
Notes : Peak Detector with 1MHz Resolution Bandwidth

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp.

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
2483.50	H	11.5		3.5	32.6	0.0	47.6	238.8	5000.0	-26.4
2483.50	V	13.4		3.5	32.6	0.0	49.5	298.9	5000.0	-24.5

Checked BY Richard E. King :

Richard E. King

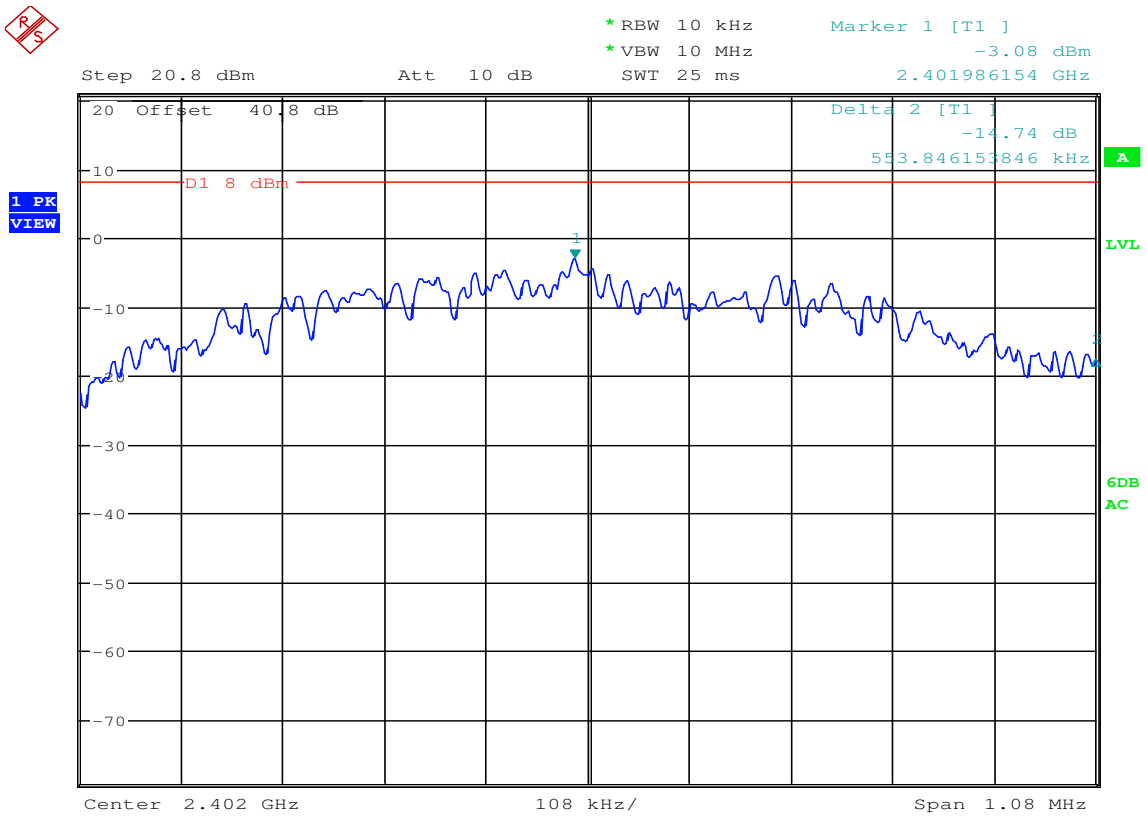
Manufacturer : California Eastern Laboratories
Test Item : WIFI/BLT Module
Model No. : WB4343WF3SP-1
Mode : Tx @ 2480MHz High Channel – Bluetooth Enhanced
Test Specification : FCC-15.247, RSS-247 Band-edge Compliance
Date : May 31st through June 6th, 2016
Notes : Average Measurement with 1MHz Resolution Bandwidth

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Average Total dBuV/m at 3m	Average Total uV/m at 3 m	Average Limit uV/m at 3 m	Margin (dB)
2483.50	H	8.2		3.5	32.6	0.0	44.3	163.5	500.0	-9.7
2483.50	V	8.1		3.5	32.6	0.0	44.2	161.7	500.0	-9.8

Checked BY Richard E. King :

Richard E. King



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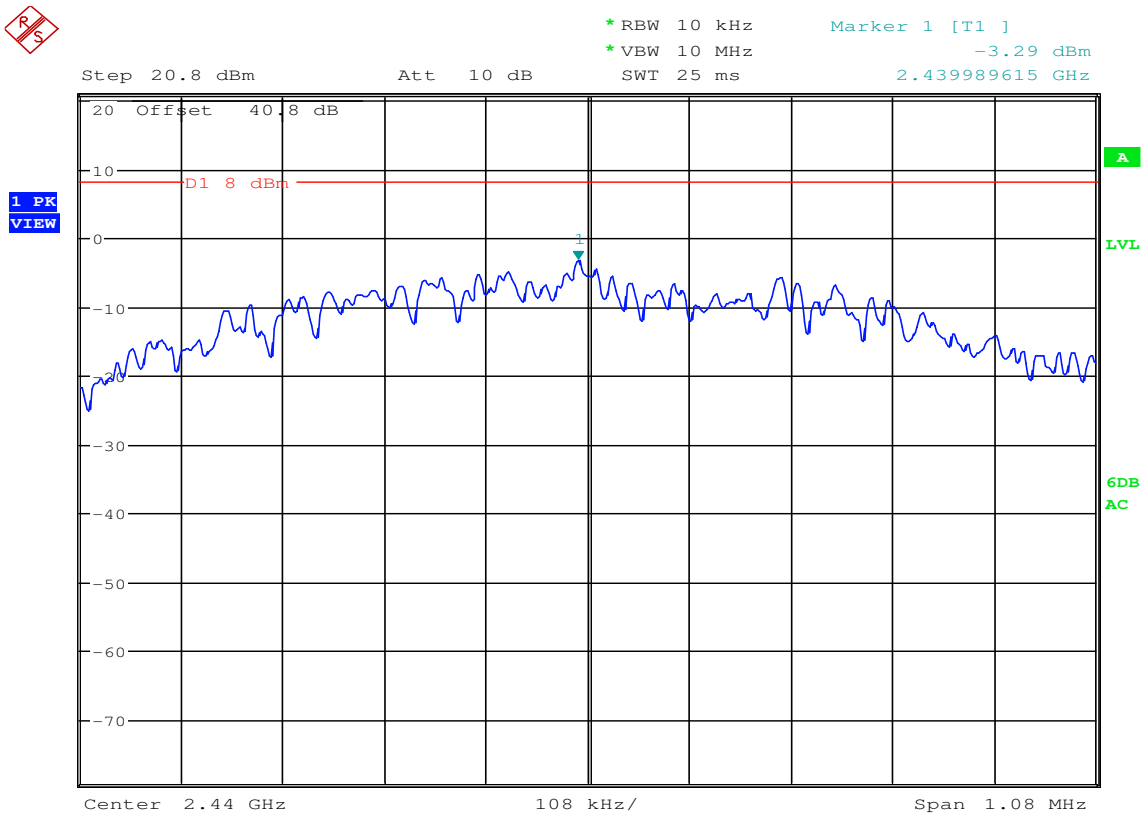
FCC 15.247 Power Spectral Density

MANUFACTURER	: California Eastern Laboratories
MODEL NUMBER	: WB4343WF3SP-1
TEST MODE	: Tx @ 2402MHz
	: PEAK detector
NOTES	: Power Spectral Density
NOTES	: BLE
NOTES	:

NOTES

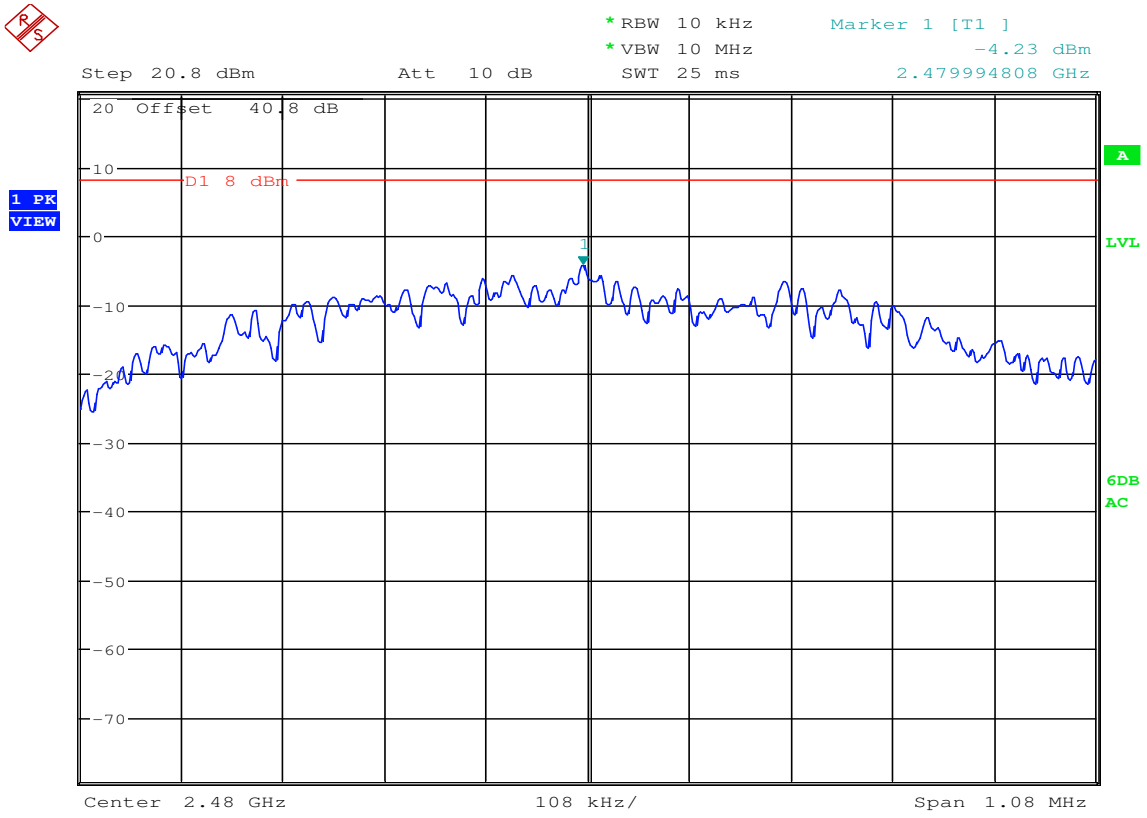


Date: 2.JUN.2016 12:13:04

FCC 15.247 Power Spectral Density

MANUFACTURER	: California Eastern Laboratories
MODEL NUMBER	: WB4343WF3SP-1
TEST MODE	: Tx @ 2440MHz
	: PEAK detector
NOTES	: Power Spectral Density
NOTES	: BLE
NOTES	:

NOTES



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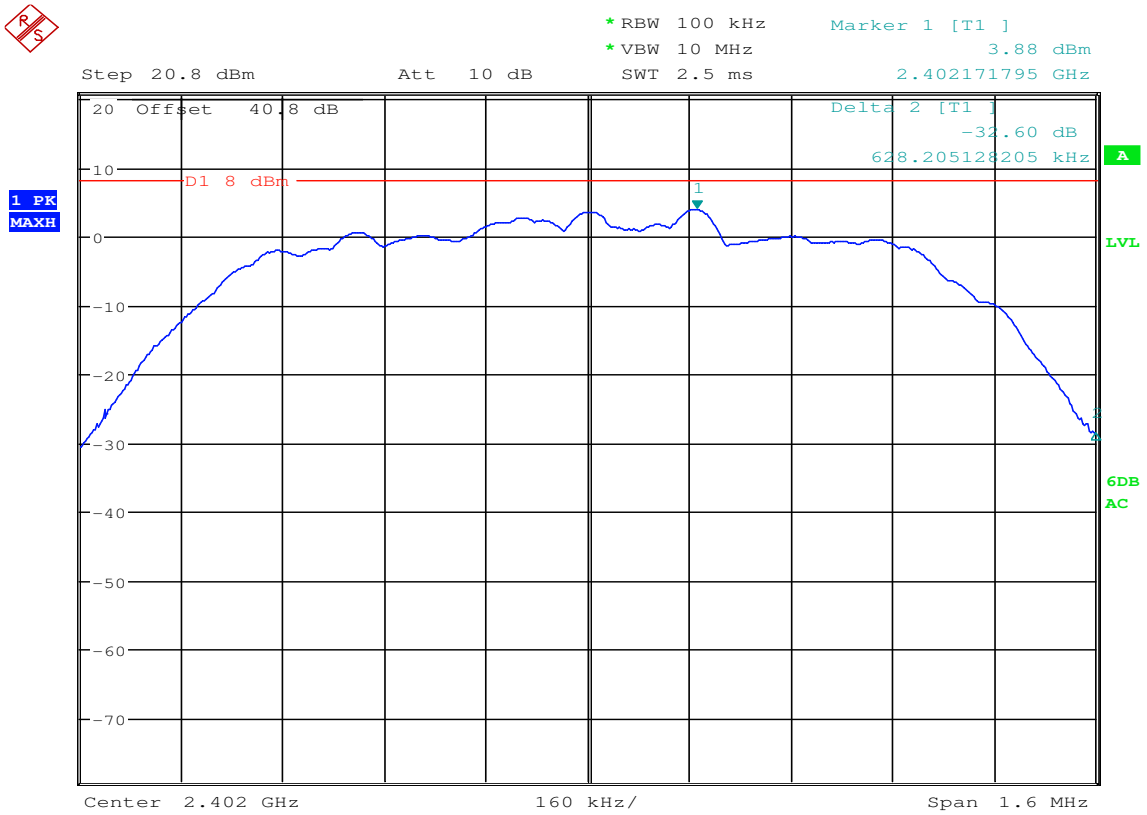
FCC 15.247 Power Spectral Density

MANUFACTURER : California Eastern Laboratories
MODEL NUMBER : WB4343WF3SP-1
TEST MODE : Tx @ 2480MHz
: PEAK detector
NOTES : Power Spectral Density
NOTES : BLE
NOTES :

NOTES

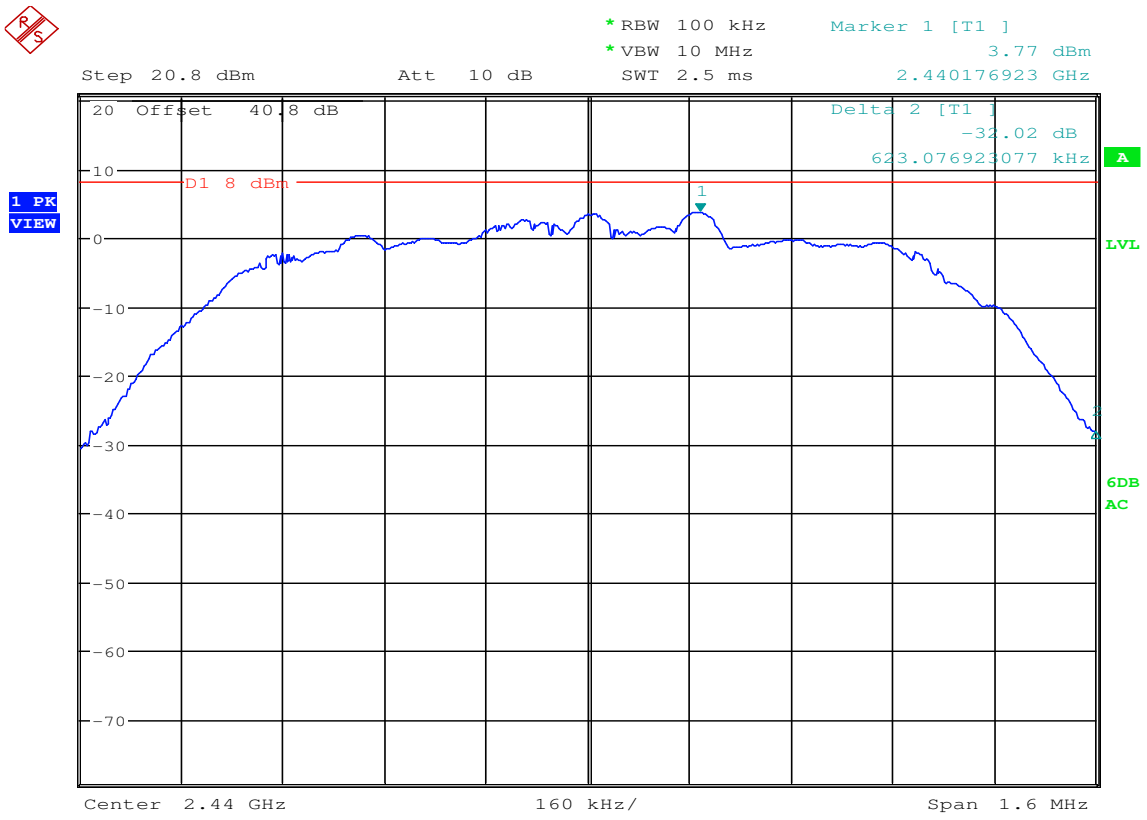


Date: 2.JUN.2016 12:06:30

FCC 15.247 Power Spectral Density

MANUFACTURER	: California Eastern Laboratories
MODEL NUMBER	: WB4343WF3SP-1
TEST MODE	: Tx @ 2402MHz
	: PEAK detector
NOTES	: Power Spectral Density
NOTES	: Bluetooth Enhanced
NOTES	:

NOTES

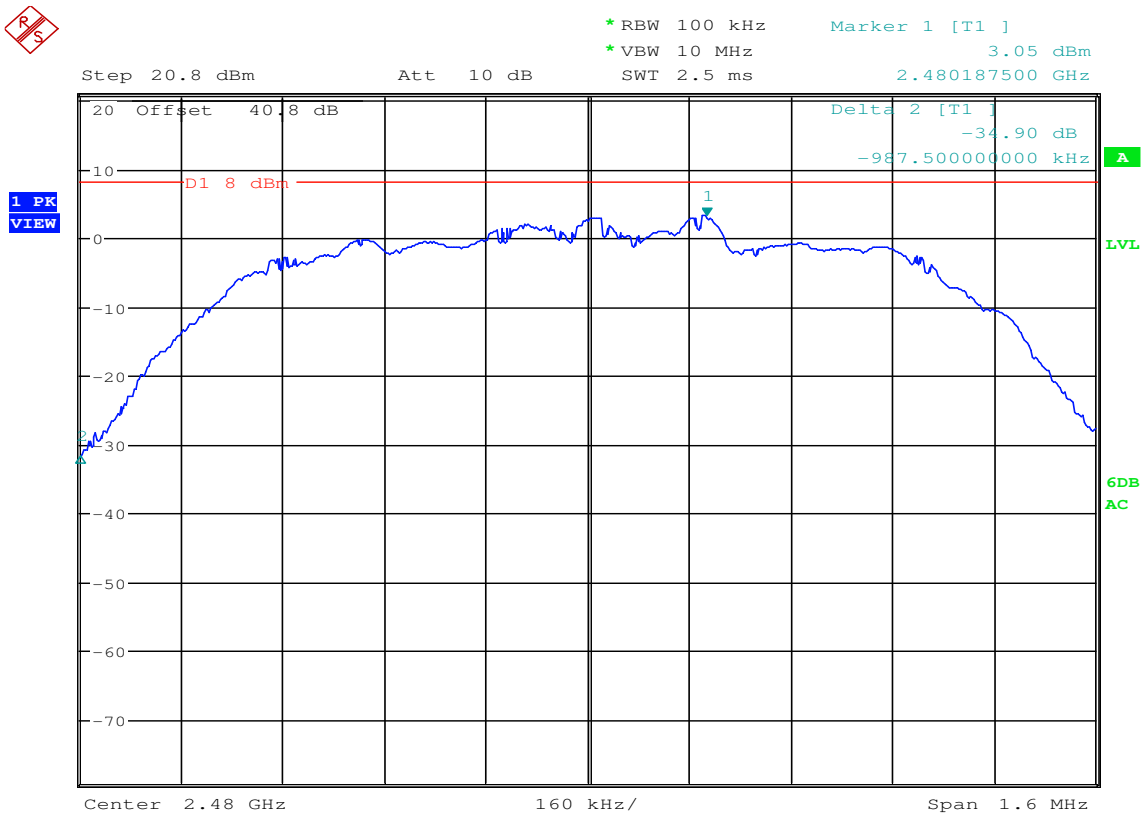


Date: 2.JUN.2016 12:03:17

FCC 15.247 Power Spectral Density

MANUFACTURER	: California Eastern Laboratories
MODEL NUMBER	: WB4343WF3SP-1
TEST MODE	: Tx @ 2440MHz
	: PEAK detector
NOTES	: Power Spectral Density
NOTES	: Bluetooth Enhanced
NOTES	:

NOTES



Date: 2.JUN.2016 11:58:23

FCC 15.247 Power Spectral Density

MANUFACTURER	: California Eastern Laboratories
MODEL NUMBER	: WB4343WF3SP-1
TEST MODE	: Tx @ 2480MHz
	: PEAK detector
NOTES	: Power Spectral Density
NOTES	: Bluetooth Enhanced
NOTES	:

NOTES