Measurement of RF Interference from an ADX1M Micro Bodypack Transmitter

For	Shure Incorporated 5800 West Touhy Avenue Niles, IL 60714
P.O. Number	4500381025
Date Tested	October 20, 2017 through March 29, 2018
Test Personnel	Richard King and Mark E. Longinotti
Specification	FCC "Code of Federal Regulations" Title 47, Part 15, Subpart C, Sections 15.207 and 15.247 for Digital Modulation Intentional Radiators Operating within the band 2400-2483.5MHz FCC “Code of Federal Regulations” Title 47, Part15, Subpart 15B, Section 15.107 and 15.109 for Receivers Innovation, Science, and Economic Development Canada RSS-247 Innovation, Science, and Economic Development Canada RSS-GEN

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REVISION HISTORY

Revision	Date	Description
—	05 April 2018	Initial release

Measurement of RF Emissions from a Micro Bodypack Transmitter, Model No. ADX1M

1. INTRODUCTION

1.1 Scope of Tests

This document represents the results of the series of radio interference measurements performed on a Shure Incorporated Micro Bodypack Transmitter, Part No. ADX1M (hereinafter referred to as the EUT). The EUT is a digital modulation transceiver. The transceiver was designed to transmit and receive in the 2400-2483.5 MHz band using two (2) separate internal, non-removable antennas. Both antennas (Antenna A and Antenna B) have a 2.0dBi gain. The EUT can only transmit or receive on one antenna at a time – simultaneous transmission on both antennas at the same time is not supported.

Serial No. 185 was assigned to the EUT used for all radiated emissions tests. Serial No. 186 was assigned to the EUT used for antenna port conducted emissions tests. The EUT was manufactured and submitted for testing by Shure Incorporated located in Niles, IL.

The EUT also contained a transmitter that was designed to transmit in the following UHF frequency bands using an external, removable whip antenna:

Band	Frequency (MHz)	Serial No. Used for All Tests	FCC Rule Part	Output Power (mW)
G57	470.125 – 607.875	65	15.236	2,10, 20
G57	470.125 – 607.875	65	74.861	2,10, 20
G57	614.125 – 615.875	65	15.236	2,10, 20
K54	606.000 – 607.875	296	15.236	2,10, 20
K54	606.000 – 607.875	296	74.861	2,10, 20
K54	614.125 – 615.875	296	15.236	2,10, 20
K54	653.000 – 657.000	296	74.861	2,10, 20
K54	657.000 – 662.875	296	15.236	2,10, 20
X55*	941.000 - 960.000	183	74.861	2,10, 20

*- For FCC only

See Elite Electronic Engineering, Inc. Engineering Test Report No. 1703408-01 for compliance testing on the UHF transmitter and the intermodulation testing on the UHF transmitter and Zigbee transmitter.

1.2 Purpose

The test series was performed to determine if the EUT meets the conducted RF emission requirements, radiated RF emissions requirements, and additional provisions of the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart B, Sections 15.107 and 15.109, for receivers and Subpart C, Sections 15.207 and 15.247 for Intentional Radiators Operating within the 2400-2483.5 MHz band.

The test series was also performed to determine if the EUT meets the conducted RF emission requirements, radiated RF emissions requirements, and additional provisions of the Innovation, Science, and Economic Development Canada Radio Standards Specification RSS-Gen Section 8.8 and Section 7.1.2 for receivers and Innovation, Science, and Economic Development Canada Radio Standards Specification RSS-Gen Section 8.8 and Innovation, Science, and Economic Development Canada Radio Standards Specification RSS-247 for Transmitters.

Testing was performed in accordance with ANSI C63.4-2014 and ANSI C63.10-2013.

1.3 Deviations, Additions and Exclusions

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

1.4 EMC Laboratory Identification

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

1.5 Laboratory Conditions

The temperature at the time of the test was 23C° and the relative humidity was 48%.

2. APPLICABLE DOCUMENTS

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

- ANSI C63.4-2014, "American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz"
- ANSI C63.10-2013, "American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices"
- Federal Communications Commission Office of Engineering and Technology Laboratory Division, Guidance For Performing Compliance Measurements On Digital Transmissions Systems (DTS) Operating Under §15.247
  April 5, 2017
- Innovation, Science, and Economic Development Canada RSS-247, Issue 2, February 2017, "Spectrum Management and Telecommunications Radio Standards Specification, Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs), and License-Exempt Local Area Network (LE-LAN) Devices"
- Innovation, Science, and Economic Development Canada RSS-Gen, Issue 4, November 2014, "Spectrum Management and Telecommunications Radio Standards Specification, General Requirements for Compliance of Radio Apparatus"

3. EUT SETUP AND OPERATION

3.1 General Description

The EUT is a Micro Bodypack Transmitter, Part No. ADX1M. A block diagram of the EUT setup is shown as Figure 1 and Figure 2. A photograph of the EUT is shown as Figure 3.

3.1.1 Power Input

The EUT was powered by 3.7VDC from a removable, rechargeable Li-ion Battery Pack, Shure Model No.: SB910M.

3.1.2 Peripheral Equipment

The following peripheral equipment was submitted with the EUT:

Item	Description
Shure TL 48 Lavaliere Microphone	Connected to the microphone port of the EUT for all radiated emissions tests.

3.1.3 Interconnect Cables

No interconnect cables were submitted with the EUT.

3.1.4 Grounding

The EUT was not grounded during testing.

3.1.5 Frequency of EUT

The EUT was equipped with a Zigbee transmitter that operated in the 2400MHz to 2483.5MHz band. Per CFR Title 47, Part 15, Section 15.33 (a)(1) and RSS-Gen Section 6.13, for an intentional radiator, the spectrum shall be investigated up to the tenth harmonic of the highest fundamental frequency.

3.2 Software

For all tests the EUT had Firmware Version 1.1.12 loaded onto the device to provide correct load.

3.3 Operational Mode

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

Transmit at 2405MHz, Antenna A, mid-power, txmod mode (modulated signal with 100% duty cycle)
Transmit at 2445MHz, Antenna A, mid-power, txmod mode (modulated signal with 100% duty cycle)
Transmit at 2480MHz, Antenna A, mid-power, txmod mode (modulated signal with 100% duty cycle)

Transmit at 2405MHz, Antenna B, mid-power, txmod mode (modulated signal with 100% duty cycle)
Transmit at 2445MHz, Antenna B, mid-power, txmod mode (modulated signal with 100% duty cycle)
Transmit at 2480MHz, Antenna B, mid-power, txmod mode (modulated signal with 100% duty cycle)

Note – mid-power is the highest power setting for the Zigbee transmitter.

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 tests were performed with an EMI receiver utilizing the bandwidths and detectors specified by the FCC.

4.3 Calibration Traceability

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

4.4 Measurement Uncertainty

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

Values of Expanded Measurement Uncertainty (95% Confidence) are presented below:

Measurement Type	Expanded Measurement Uncertainty
Conducted disturbance (mains port) (150 kHz – 30 MHz)	2.7
Radiated disturbance (electric field strength on an open area test site or alternative test site) (30 MHz – 1000 MHz)	4.3
Radiated disturbance (electric field strength on an open area test site or alternative test site) (1 GHz – 6 GHz)	3.1
Radiated disturbance (electric field strength on an open area test site or alternative test site) (6 GHz – 18 GHz)	3.2

5. TEST PROCEDURES

5.1 Receiver

Per the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart B, Section 15.101(b), receivers operating above 960MHz are exempt from complying with the technical provisions of part 15.

Per the Innovation, Science, and Economic Development Canada RSS-Gen, Section 5.3, only radiocommunication receivers operating in stand-alone mode within the band 30-960 MHz are subject to Industry Canada requirements, as described above. All other receivers are exempted from any Industry Canada certification, testing, labeling and reporting requirements.

5.2 Transmitter

5.2.1 Powerline Conducted Emissions

5.2.1.1 Requirements

Since the EUT is powered by internal batteries and has no connections for AC power, no conducted emissions tests are required.

5.2.2 6dB Bandwidth

5.2.2.1 Requirements

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

5.2.2.2 Procedures

The antenna port of the EUT was connected to the spectrum analyzer through 30dB 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, the video bandwidth (VBW) was set to the same as or 3 times greater than the RBW, and the span was set to 3 times 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.

5.2.2.3 Results

The plots on pages 23 through 25 show that the minimum 6 dB bandwidth was 1.504MHz which is greater than the minimum allowable 6dB bandwidth requirement of 500kHz for systems using digital modulation techniques. The 99% bandwidth was measured to be 2.4MHz.

5.2.3 Peak Conducted Output Power

5.2.3.1 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).

5.2.3.2 Procedures

The antenna port of the EUT was connected to the spectrum analyzer through 30dB 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.

5.2.3.3 Results

The results are presented on pages 26 and 28. The maximum peak conducted output power from the transmitter was 0.008W (9.12dBm) which is below the 1 Watt limit.

5.2.4 Peak EIRP

5.2.4.1 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).

5.2.4.2 Procedures

The EUT was placed on a 1.5 meter high, non-conductive stand and set to transmit. A double ridged waveguide antenna was placed at a test distance of 3 meters from the EUT. The resolution bandwidth (RBW) of the spectrum analyzer was set to greater than the 6dB bandwidth. The EUT was maximized for worst case emissions (or maximum output power) at the measuring antenna. The maximum meter reading was recorded. The peak power output was measured for the low, middle and high channels.

EIRP was calculated using equation (22) from ANSI C63.10-2013 and the field intensity levels measured at 3 meters.

Equation (22) from ANSI C63.10-2013 states:

$EIRP = E_{meas} + 20 \times \log (d_{meas}) - 104.7$

Where:

EIRP	is the equivalent isotropically radiated power in dBm
E_{meas}	is the field strength of the emission at the measurement distance in dBuV/m
d_{meas}	is the measurement distance in m

For a test distance of 3 meters, equation (22) becomes:

$EIRP = E_{meas} - 95$

The peak EIRP was calculated for the low, middle, and high channels.

5.2.4.3 Results

The results are presented on pages 29 and 34. The maximum peak EIRP measured from the transmitter was 13.2 dBm or 0.021 W which is below the 4 Watt limit.

5.2.5 Duty Cycle Factor Measurements

5.2.5.1 Requirements

Per CFR Title 47, Part 15, Section 15.35(c), when the radiated emission limits are expressed in terms of the average value of the emission, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.

Per Federal Communications Commission Office of Engineering and Technology Laboratory Division, Guidance For Performing Compliance Measurements On Digital Transmissions Systems (DTS) Operating Under §15.247, dated April 5, 2017, section 12.2.5.2, the duty cycle reduction factor expressed in Section 15.35(c) can be utilized for determining the unwanted emissions (including spurious emissions) in the 2483.5-2500 MHz restricted band for a DTS device (e.g., Zigbee devices) approved under Section 15.247, if the following conditions are met:

i) The unwanted emission is temporally related to the fundamental emission (i.e., the skirt of the fundamental falls into the 2483.5-2500 MHz restricted frequency band);
ii) The unwanted emission falls into a restricted frequency band (e.g., 2483.5-2500 MHz); and
iii) The maximum duty cycle used in determining the reduction factor is “hardwired” such that under no condition can it be changed or modified by either the device or the end user; and
iv) A documented justification for use of Section 15.35(c), including the measurements used to determine the worst-case duty cycle, must be included in the test report.

5.2.5.2 Procedures

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

The duty cycle calculation was provided in Shure document “Duty Cycle Measurement of Shure AXT610 Wireless Access Point for FCC Regulatory Approval”, dated December 6, 2010.

This test was performed with the AXT610 communicating with 16 portables. Ten (10) consecutive measurements were taken in 2 second intervals and the amount of captured packets in each 2 second interval was counted. The mean number of packets for the ten 2 second intervals was calculated. The standard deviation was then calculated. For “worst case” duty cycle, 3 standard deviations were added to the mean number of packets for the ten 2 second intervals (# packets = Mean + (3 x STDEV)).

5.2.5.3 Results

From the Shure document, “Duty Cycle Measurement of Shure AXT610 Wireless Access Point for FCC Regulatory Approval”, December 6, 2010, the pulse width is 0.46 msec and 2.636 pulses will be transmitted in a 100msec period. The duty cycle factor was calculated to be 20*log (0.46 pulse width x 2.636 pulses/ 100msec) = -38.3dB.

5.2.6 Radiated Spurious Emissions Measurements

5.2.6.1 Requirements

Per section 15.247(d), in any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional

radiator shall be at least 20 dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated emissions measurement. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must comply with the radiated emission limits specified in §15.209(a).

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

5.2.6.2 Procedures

Radiated measurements were performed in a 32ft. x 20ft. x 14ft. high shielded enclosure. The shielded enclosure prevents emissions from other sources, such as radio and TV stations from interfering with the measurements. All powerlines and signal lines entering the enclosure pass through filters on the enclosure wall. The powerline filters prevent extraneous signals from entering the enclosure on these leads.

Preliminary radiated emissions tests were performed to determine the emission characteristics of the EUT. For the preliminary test, a broadband measuring antenna was positioned at a 3 meter distance from the EUT. The entire frequency range from 30MHz to 25GHz was investigated using a peak detector function.

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

1) For all harmonics not in the restricted bands, the following procedure was used:
   a) The field strength of the fundamental was measured using a double ridged waveguide antenna. The waveguide antenna was positioned at a 3 meter distance from the EUT. The EUT was placed on a 1.5 meter high non-conductive stand. A peak detector with a resolution bandwidth of 100 kHz was used on the spectrum analyzer.
   b) The field strengths of all of the harmonics not in the restricted band were then measured using a double-ridged waveguide antenna. The waveguide antenna was positioned at a 3 meter distance from the EUT. The EUT was placed on a 1.5 meter high non-conductive stand. A peak detector with a resolution bandwidth of 100 kHz was used on the spectrum analyzer.
   c) To ensure that maximum or worst case emission levels at the fundamental and harmonics were measured, the following steps were taken when measuring the fundamental emissions and the spurious emissions:
      i) The EUT was rotated so that all of its sides were exposed to the receiving antenna.
      ii) Since the measuring antenna is linearly polarized, both horizontal and vertical field components were measured.
      iii) The measuring antenna was raised and lowered for each antenna polarization to maximize the readings.
      iv) In instances where it was necessary to use a shortened cable between the measuring antenna and the spectrum analyzer. The measuring antenna was not raised or lowered to ensure maximized

readings, instead the EUT was rotated through all axis to ensure the maximum readings were recorded for the EUT.

d) All harmonics not in the restricted bands must be at least 20 dB below levels measured at the fundamental. However, attenuation below the general limits specified in §15.209(a) is not required.

2) For all emissions in the restricted bands, the following procedure was used:

a) The field strengths of all emissions below 1 GHz were measured using a bilog antenna. The bilog antenna was positioned at a 3 meter distance from the EUT. The EUT was placed on an 80cm high non-conductive stand. A peak detector with a resolution bandwidth of 100 kHz was used on the spectrum analyzer.

b) The field strengths of all emissions above 1 GHz were measured using a double-ridged waveguide antenna. The waveguide antenna was positioned at a 3 meter distance from the EUT. The EUT was placed on a 1.5 meter high non-conductive stand. A peak detector with a resolution bandwidth of 1 MHz was used on the spectrum analyzer.

c) To ensure that maximum or worst case emission levels were measured, the following steps were taken when taking all measurements:

i) The EUT was rotated so that all of its sides were exposed to the receiving antenna.

ii) Since the measuring antenna is linearly polarized, both horizontal and vertical field components were measured.

iii) The measuring antenna was raised and lowered for each antenna polarization to maximize the readings.

iv) In instances where it was necessary to use a shortened cable between the measuring antenna and the spectrum analyzer. The measuring antenna was not raised or lowered to ensure maximized readings, instead the EUT was rotated through all axis to ensure the maximum readings were recorded for the EUT.

d) For all radiated emissions measurements below 1 GHz, if the peak reading is below the limits listed in 15.209(a), no further measurements are required. If however, the peak readings exceed the limits listed in 15.209(a), then the emissions are remeasured using a quasi-peak detector.

e) For all radiated emissions measurements above 1 GHz, the peak readings must comply with the 15.35(b) limits. 15.35(b) states that when average radiated emissions measurements are specified, there also is a limit on the peak level of the radiated emissions. The limit on the peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test. Therefore, all peak readings above 1 GHz must be no greater than 20 dB above the limits specified in 15.209(a).

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

5.2.6.3 Results

5.2.6.3.1 Transmit at 2405MHz:

Preliminary radiated emissions plots with the EUT transmitting at 2405MHz are shown on pages 35 through 42. Final radiated emissions data are presented on data pages 43 through 45. 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 as Figures 4 through 6.

5.2.6.3.2 Transmit at 2445MHz:

Preliminary radiated emissions plots with the EUT transmitting at 2445MHz are shown on pages 46 through 53. Final radiated emissions data are presented on data pages 54 through 56. 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 as Figures 4 through 6.

5.2.6.3.3 Transmit at 2480MHz:

Preliminary radiated emissions plots with the EUT transmitting at 2480MHz are shown on pages 57 through 64. Final radiated emissions data are presented on data pages 65 through 67. 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 as Figures 4 through 6.

5.2.7 Band Edge Compliance

5.2.7.1 Requirements

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

5.2.7.2 Procedures

5.2.7.2.1 Low Band Edge

1) The antenna port of the EUT was connected to the spectrum analyzer through 30dB 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) = 100kHz, Video bandwidth (VBW) = 300kHz.
    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.

5.2.7.2.2 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.

5.2.7.3 Results

Page 68 shows the low band-edge antenna port conducted emissions compliance results. Pages 69 and 72 show the radiated high band-edge compliance results. As can be seen from these plots, the emissions at the low end band-edge are within the 20 dB down limits. The radiated emissions at the high end band-edge are within the general limits.

5.2.8 Power Spectral Density

5.2.8.1 Requirement

Per section 15.247(e), 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.

5.2.8.2 Procedures

1) The antenna port of the EUT was connected to the spectrum analyzer through a 30dB pad.
2) The EUT was set to transmit continuously at the lowest channel.
3) To determine the power spectral density, the following spectrum analyzer settings were used:
    a. Center frequency = transmit frequency
    b. Span = 1.5 times the DTS (6 dB) bandwidth
    c. Resolution bandwidth (RBW): 3kHz
    d. Sweep time = auto
    e. The peak detector and 'Max-Hold' function was engaged.
    f. The display line represents the 8 dBm limit
    g. The analyzer's display was plotted using a 'screen dump' utility.
4) If measured value exceeds limit, reduce RBW (no less than 3kHz) and repeat.
5) Steps 1) through 4) were repeated separately for the mid channel and the high channel.

5.2.8.3 Results

Pages 73 through 75 show the power spectral density results. As can be seen from these plots, the peak power spectral density is less than 8dBm in a 3kHz band during any time interval of continuous transmission.

6. CONCLUSIONS

It was determined that the Shure Incorporated Micro Bodypack Transmitter, Part No. ADX1M, did fully meet the conducted and radiated emission requirements of the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart B, Sections 15.107 and 15.109 for receivers and 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 and ANSI C63.10-2013.

It was also determined that the Shure Incorporated Micro Bodypack Transmitter, Part No. ADX1M, did fully meet the conducted and radiated RF emission requirements of the Innovation, Science, and Economic Development Canada Radio Standards Specification, RSS-Gen, Section 8.8 and Section 7.1.2 for receivers and the Innovation, Science, and Economic Development Canada Radio Standards Specification RSS-Gen Section 8.8 and Radio Standards Specification RSS-247 for transmitters, when tested per ANSI C63.4-2014 and ANSI C63.10-2013.

7. CERTIFICATION

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

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

8. ENDORSEMENT DISCLAIMER

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

9. EQUIPMENT LIST

Table 9-1 Equipment List

Eq ID	Equipment Description	Manufacturer	Model No.	Serial No.	Frequency Range	Cal Date	Due Date
APW0	PREAMPLIFIER	PLANAR ELECTRONICS	PE2-30-20G20R6G	PL2926/0646	20GHZ-26.5GHZ	3/22/2017	422/2018
APW10	PREAMPLIFIER	PMI	PE2-35-120-5R0-10-12-SFF	PL9609/1139	1GHZ-20GHZ	3/22/2017	4/22/2018
APW11	PREAMPLIFIER	PMI	PE2-35-120-5R0-10-12-SFF	PL11685/1241	1GHZ-20GHZ	3/22/2017	4/22/2018
CDX8	COMPUTER	ELITE	WORKSTATION			N/A	
NHG1	STANDARD GAIN HORN ANTENNA	NARDA	638	---	18-26.5GHZ	NOTE 1	
NTA3	BILOG ANTENNA	TESEQ	6112D	32853	25-1000MHz	9/11/2017	9/11/2018
NWQ0	DOUBLE RIDGED WAVEGUIDE ANTENNA	ETS LINDGREN	3117	66657	1GHZ-18GHZ	5/18/2016	5/18/2018
NWQ1	DOUBLE RIDGED WAVEGUIDE ANTENNA	ETS-LINDGREN	3117	66655	1GHZ-18GHZ	4/4/2016	4/4/2018
RBG0	EMI ANALYZER	ROHDE & SCHWARZ	ESW44	101533	10HZ-44GHZ	12/7/2017	12/7/2018
RBG2	EMI ANALYZER	ROHDE & SCHWARZ	ESW44	101591	2HZ-44GHZ	2/23/2018	2/23/2019
T1E5	10DB 25W ATTENUATOR	WEINSCHEL	46-10-34	BG3492	DC-18GHZ	6/9/2016	6/9/2018
T2DG	20DB, 25W ATTENUATOR	WEINSCHEL	46-20-34	BN1038	DC-18GHZ	1/8/2018	1/8/2020
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	9/12/2017	9/12/2019

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

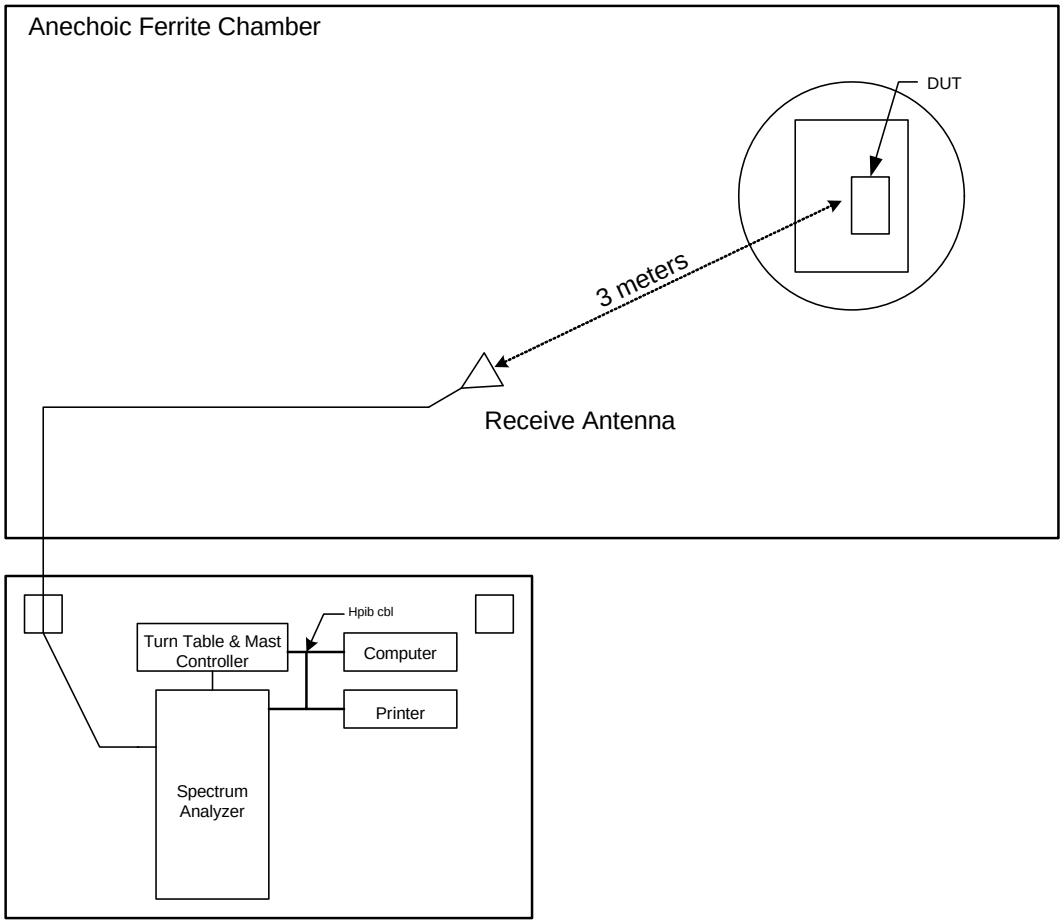


FIGURE 1 BLOCKDIAGRAM OF TEST SETUP

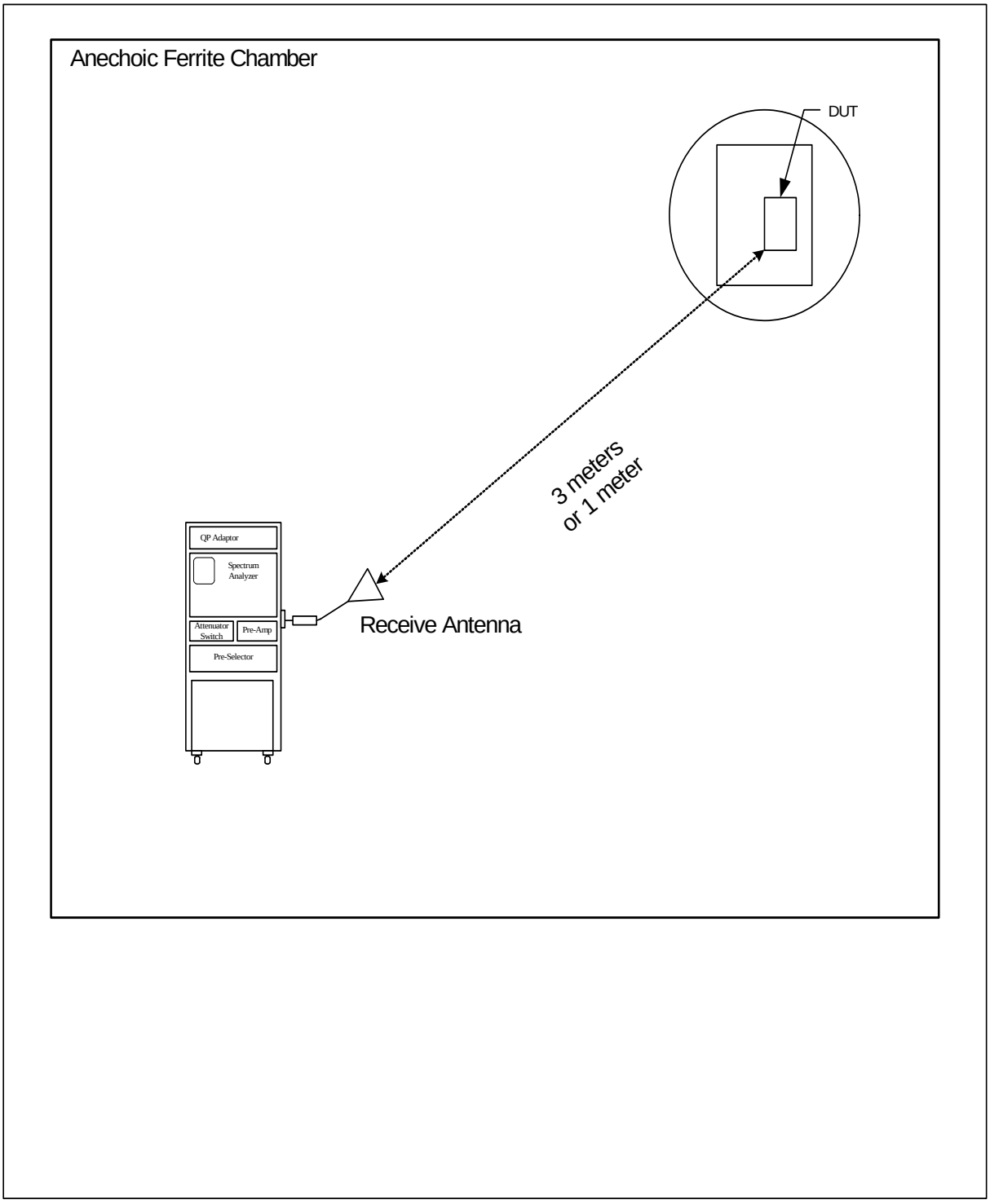


Figure 2: BLOCK DIAGRAM OF TEST SETUP FOR RADIATED EMISSIONS ABOVE 18GHZ

Figure 3

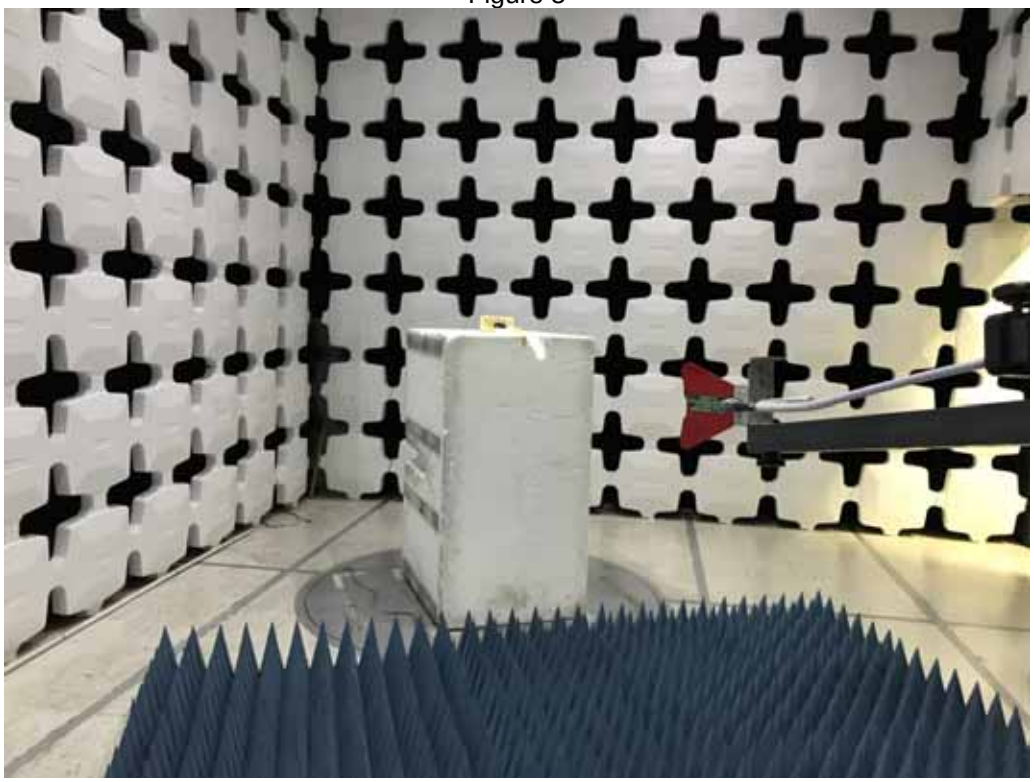
Photograph of EUT

Figure 4

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

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

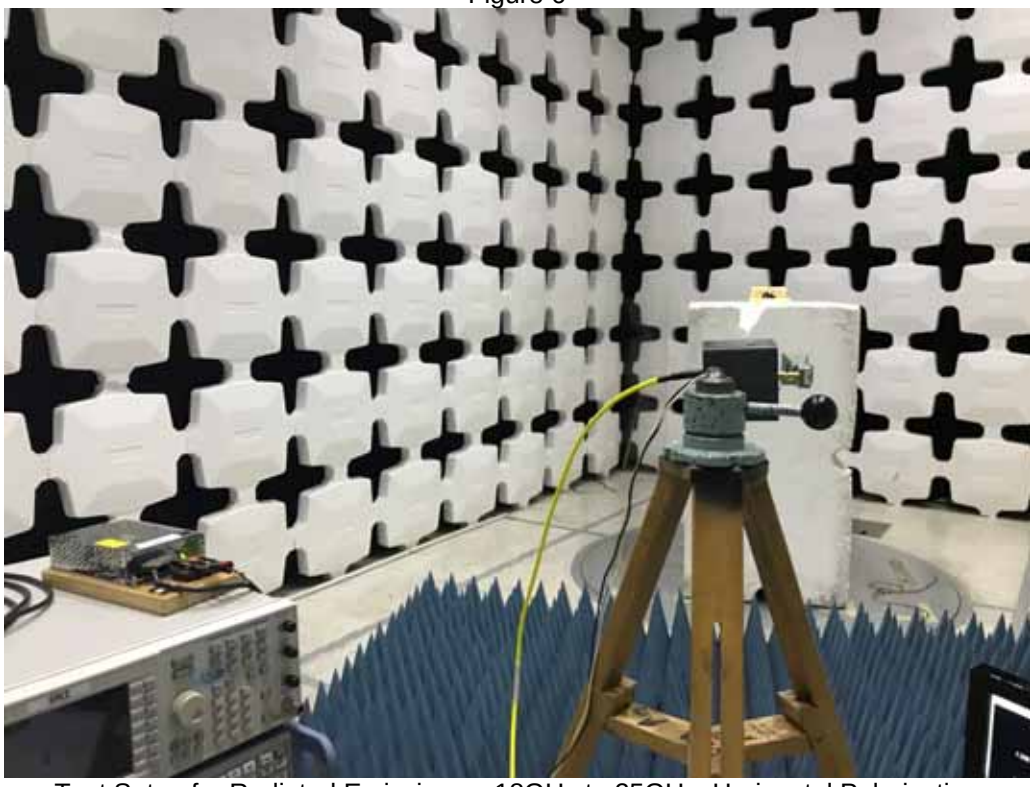
Figure 5



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

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

Figure 6



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

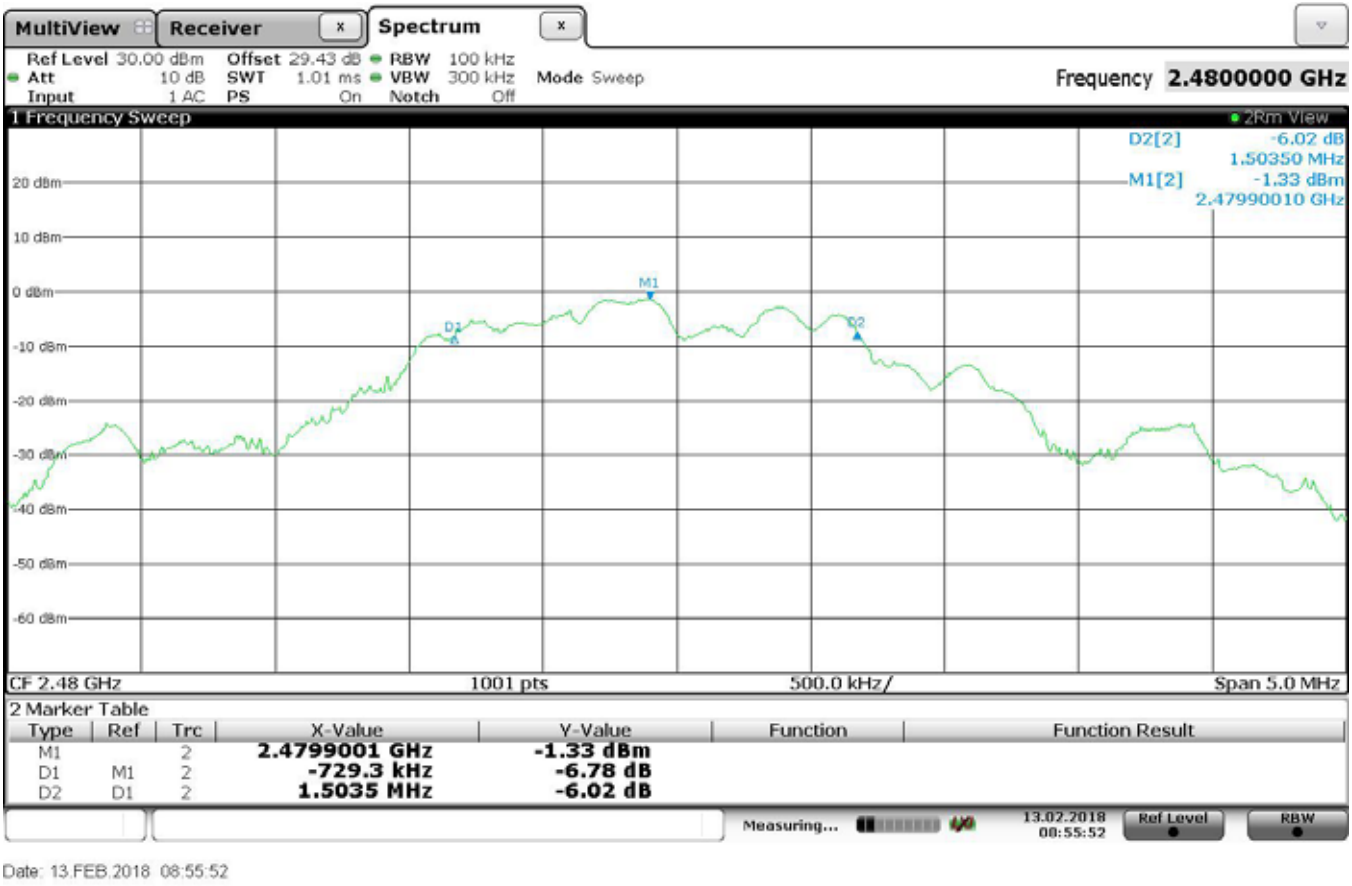
Test Setup for Radiated Emissions – 18GHz to 25GHz, Vertical Polarization

Date: 3.NOV.2017 16:24:47

MANUFACTURER	: Shure Incorporated
MODEL NO.	: ADX1M
SERIAL NO.	: 186
SPECIFICATION	: FCC 15.247(a)(2) 6dB Bandwidth
DATE	: November 3, 2017
MODE	: Transmit at 2405MHz (Ch. 11)
UNIT	: Mid Power
EQUIPMENT USED	: RBG0, T2DG, T1E5
NOTES	: 6dB bandwidth = 1.5MHz

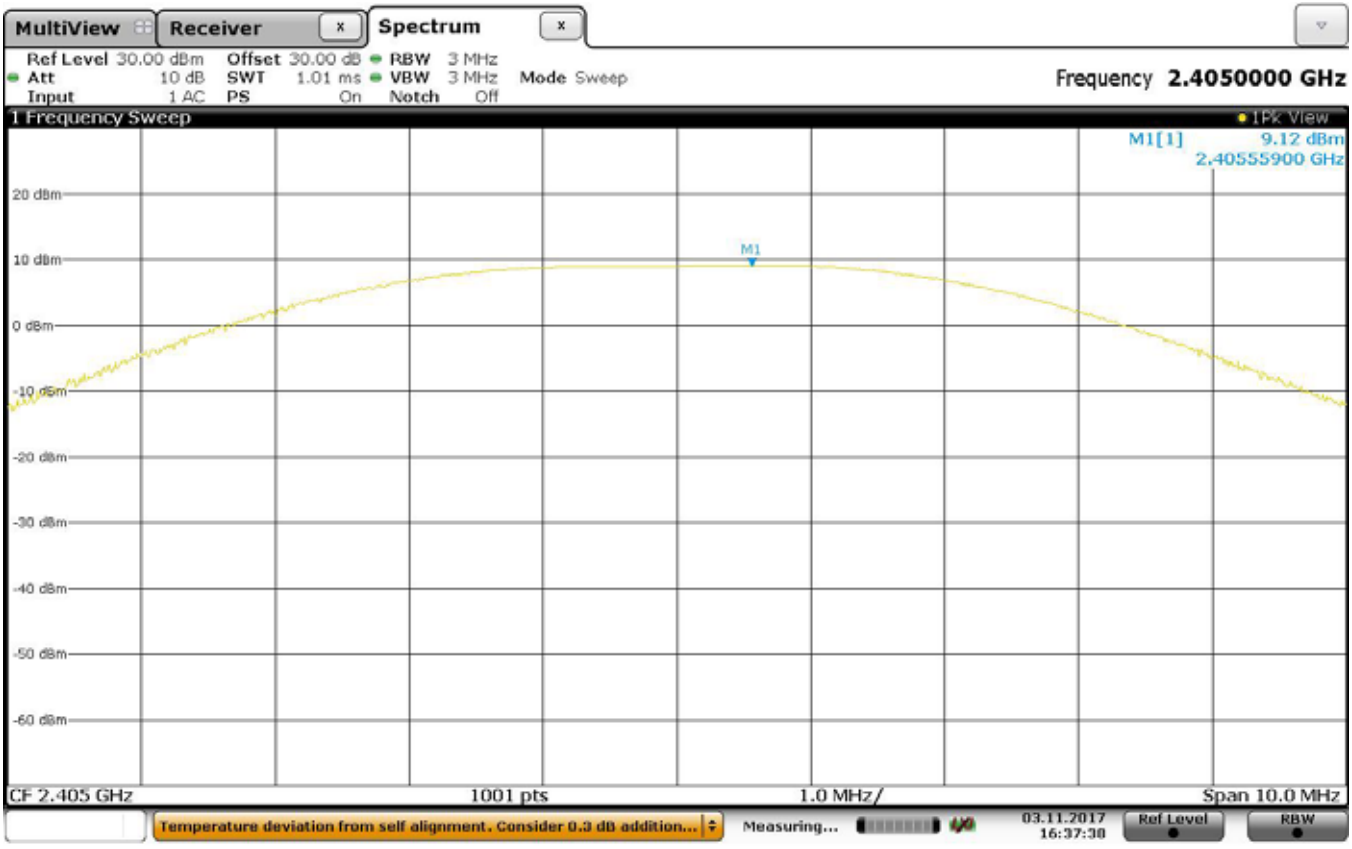
Date: 3.NOV.2017 16:19:18

MANUFACTURER	: Shure Incorporated
MODEL NO.	: ADX1M
SERIAL NO.	: 186
SPECIFICATION	: FCC 15.247(a)(2) 6dB Bandwidth
DATE	: November 3, 2017
MODE	: Transmit at 2445MHz (Ch. 19)
UNIT	: Mid Power
EQUIPMENT USED	: RBG0, T2DG, T1E5
NOTES	: 6dB bandwidth = 1.5MHz



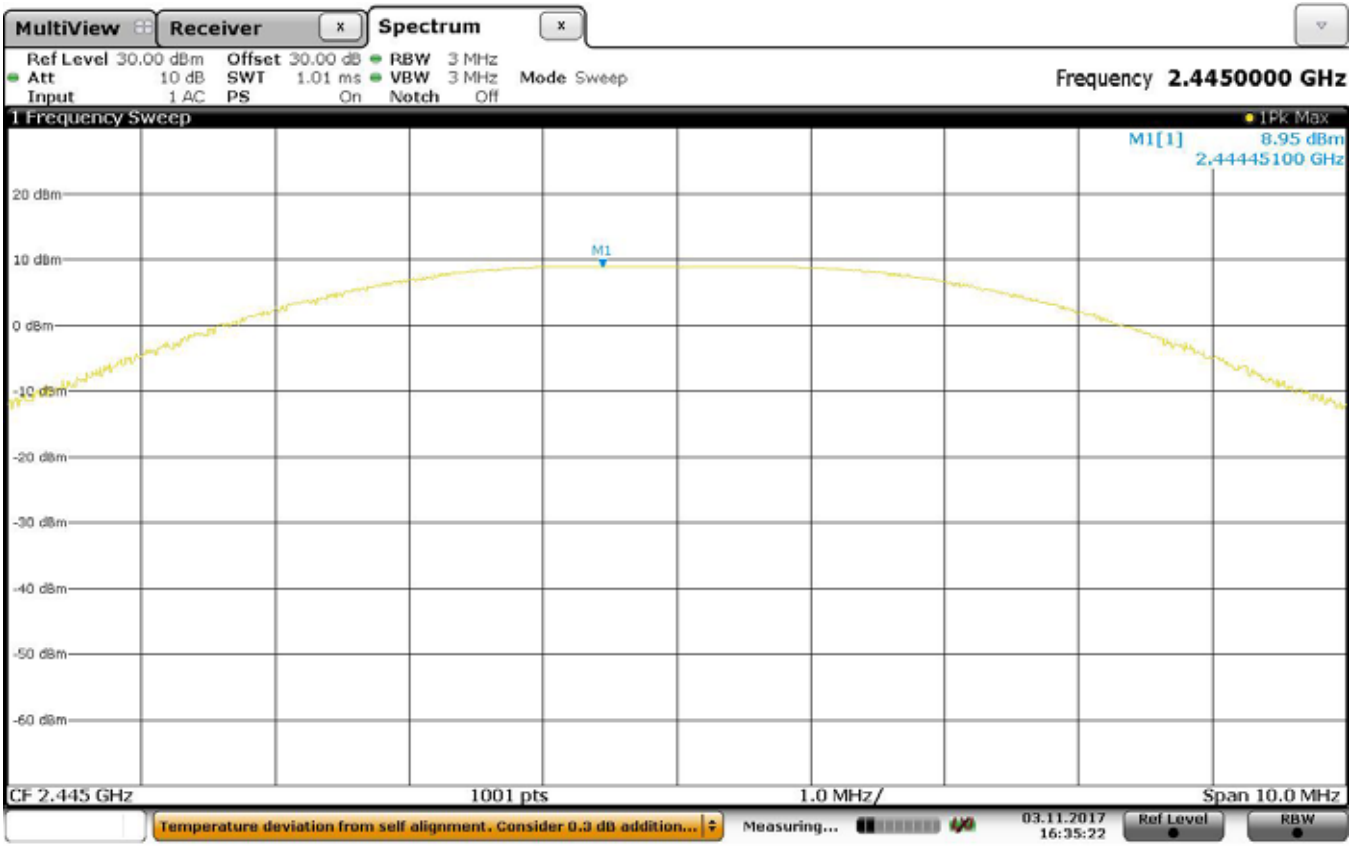
Date: 13.FEB.2018 08:55:52

MANUFACTURER : Shure Incorporated
MODEL NO. : ADX1
SERIAL NO. : 186
SPECIFICATION : FCC 15.247(a)(2) 6dB Bandwidth
DATE : February 13, 2018
MODE : Transmit at 2480MHz (Ch. 26)
UNIT : Mid Power
EQUIPMENT USED : RBG0, T2DG, T1E5
NOTES : 6dB bandwidth = 1.5MHz



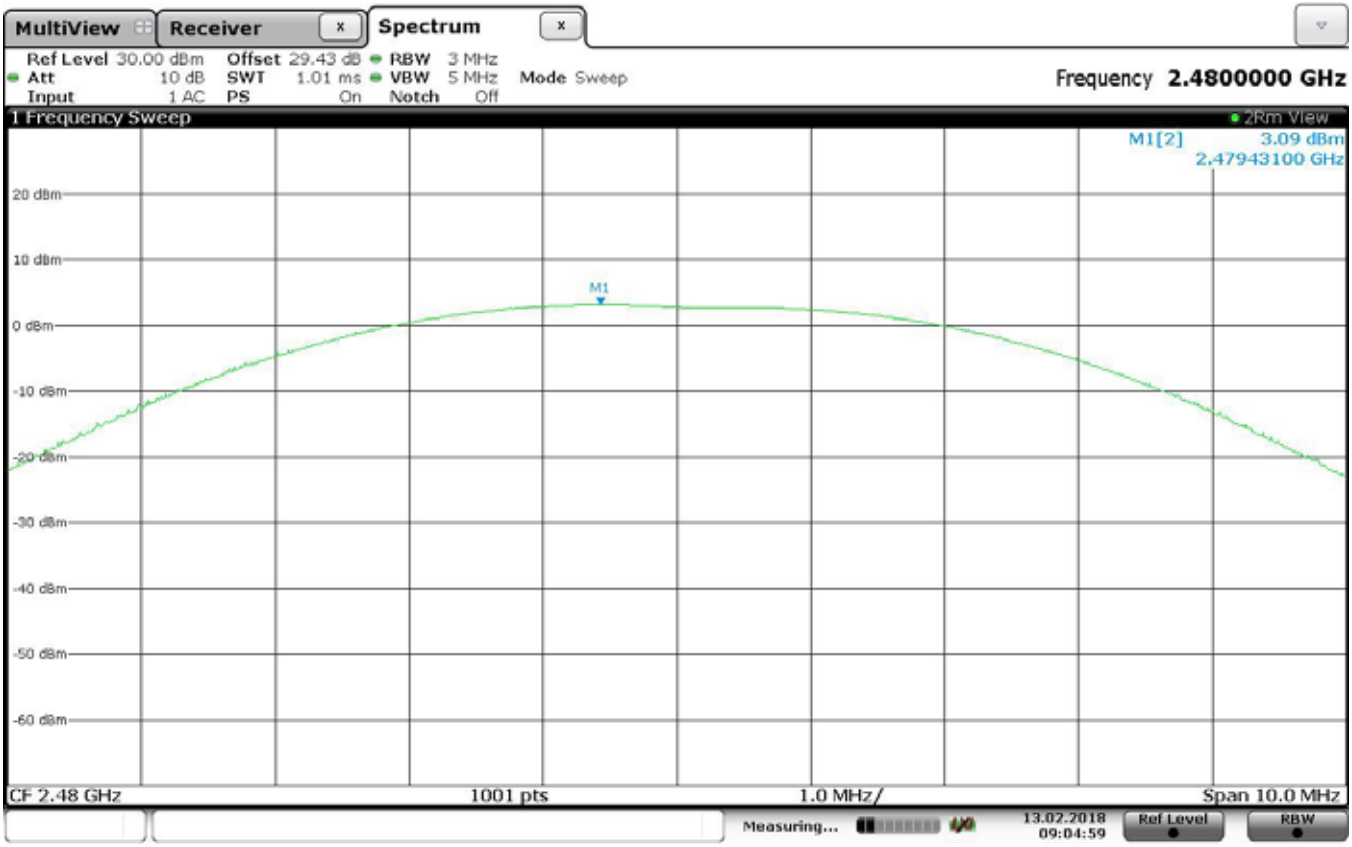
Date: 3.NOV.2017 16:37:37

MANUFACTURER	: Shure Incorporated
MODEL NO.	: ADX1M
SERIAL NO.	: 186
SPECIFICATION	: FCC 15.247(a)(3) Conducted Peak Power
DATE	: November 3, 2017
MODE	: Transmit at 2405MHz (Ch. 11)
UNIT	: Mid Power
EQUIPMENT USED	: RBG0, T2DG, T1E5
NOTES	: Conducted Peak Power = 9.12dBm



Date: 3.NOV.2017 16:35:22

MANUFACTURER	: Shure Incorporated
MODEL NO.	: ADX1M
SERIAL NO.	: 186
SPECIFICATION	: FCC 15.247(a)(3) Conducted Peak Power
DATE	: November 3, 2017
MODE	: Transmit at 2445MHz (Ch. 19)
UNIT	: Mid Power
EQUIPMENT USED	: RBG0, T2DG, T1E5
NOTES	: Conducted Peak Power = 8.95dBm



Date: 13.FEB.2018 09:04:59

MANUFACTURER	: Shure Incorporated
MODEL NO.	: ADX1M
SERIAL NO.	: 186
SPECIFICATION	: FCC 15.247(a)(3) Conducted Peak Power
DATE	: February 13, 2018
MODE	: Transmit at 2480MHz (Ch. 26)
UNIT	: Mid Power
EQUIPMENT USED	: RBG0, T2DG, T1E5
NOTES	: Conducted Peak Power = 3.09dBm

Manufacturer : Shure Incorporated
Test Item : Micro Bodypack Transmitter
Model No. : ADX1M
Serial No. : 185
Mode : Transmit at 2405MHz (Ch. 11), Mid Power, Antenna A
Test Specification : FCC-15.247, RSS-247 Peak EIRP
Date : October 21, 2017
Test Distance : 3 meters
Notes :

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	EIRP (dBm)	Limit (dBm)	Margin (dBm)
2405.00	H	69.4	2.6	33.0	0.0	105.1	10.1	36.0	-25.9
2405.00	V	64.7	2.6	33.0	0.0	100.4	5.4	36.0	-30.6

Peak Field Strength (dBuV/m) = Meter Reading (dBuV) + CBL Fac (dB) + Ant Fac (dB) + Pre Amp Gain (dB)

$EIRP_{peak}$ (dBm) = Peak Field Strength (dBuV/m) + 20 log (distance) - 104.7 OR:

$EIRP_{peak}$ (dBm) = Peak Field Strength (dBuV/m) - 95 for 3 meter test distance.

Checked BY Richard E. King :

Richard E. King

Manufacturer : Shure Incorporated
Test Item : Micro Bodypack Transmitter
Model No. : ADX1M
Serial No. : 185
Mode : Transmit at 2405MHz (Ch. 11), Mid Power, Antenna B
Test Specification : FCC-15.247, RSS-247 Peak EIRP
Date : October 21, 2017
Test Distance : 3 meters
Notes :

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	EIRP (dBm)	Limit (dBm)	Margin (dBm)
2405.00	H	73.0	2.6	32.0	0.0	107.6	12.6	36.0	-23.4
2405.00	V	67.4	2.6	32.0	0.0	102.0	7.0	36.0	-29.0

Peak Field Strength (dBuV/m) = Meter Reading (dBuV) + CBL Fac (dB) + Ant Fac (dB) + Pre Amp Gain (dB)

$EIRP_{peak}$ (dBm) = Peak Field Strength (dBuV/m) + 20 log (distance) - 104.7 OR:

$EIRP_{peak}$ (dBm) = Peak Field Strength (dBuV/m) - 95 for 3 meter test distance.

Checked BY Richard E. King :

Richard E. King

Manufacturer : Shure Incorporated
Test Item : Micro Bodypack Transmitter
Model No. : ADX1M
Serial No. : 185
Mode : Transmit at 2445MHz (Ch. 19), Mid Power, Antenna A
Test Specification : FCC-15.247, RSS-247 Peak EIRP
Date : October 21, 2018
Test Distance : 3 meters
Notes :

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	EIRP (dBm)	Limit (dBm)	Margin (dBm)
2445.00	H	66.5	2.6	32.1	0.0	101.2	6.2	36.0	-29.8
2445.00	V	65.6	2.6	32.1	0.0	100.3	5.3	36.0	-30.7

Peak Field Strength (dBuV/m) = Meter Reading (dBuV) + CBL Fac (dB) + Ant Fac (dB) + Pre Amp Gain (dB)

$EIRP_{peak}$ (dBm) = Peak Field Strength (dBuV/m) + 20 log (distance) - 104.7 OR:

$EIRP_{peak}$ (dBm) = Peak Field Strength (dBuV/m) - 95 for 3 meter test distance.

Checked BY Richard E. King :

Richard E. King

Manufacturer : Shure Incorporated
Test Item : Micro Bodypack Transmitter
Model No. : ADX1M
Serial No. : 185
Mode : Transmit at 2445MHz (Ch. 19), Mid Power, Antenna B
Test Specification : FCC-15.247, RSS-247 Peak EIRP
Date : October 21, 2018
Test Distance : 3 meters
Notes :

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	EIRP (dBm)	Limit (dBm)	Margin (dBm)
2445.00	H	73.5	2.6	32.1	0.0	108.2	13.2	36.0	-22.8
2445.00	V	68.3	2.6	32.1	0.0	103.1	8.1	36.0	-27.9

Peak Field Strength (dBuV/m) = Meter Reading (dBuV) + CBL Fac (dB) + Ant Fac (dB) + Pre Amp Gain (dB)

$EIRP_{peak}$ (dBm) = Peak Field Strength (dBuV/m) + 20 log (distance) - 104.7 OR:

$EIRP_{peak}$ (dBm) = Peak Field Strength (dBuV/m) - 95 for 3 meter test distance.

Checked BY Richard E. King :

Richard E. King

Manufacturer : Shure Incorporated
Test Item : Micro Bodypack Transmitter
Model No. : ADX1M
Serial No. : 185
Mode : Transmit at 2480MHz (Ch. 26), Mid Power, Antenna A
Test Specification : FCC-15.247, RSS-247 Peak Output Power
Date : February 8, 2018
Test Distance : 3 meters
Notes :

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	EIRP (dBm)	Limit (dBm)	Margin (dBm)
2480.00	H	58.8	3.5	32.2	0.0	94.5	-0.5	36.0	-36.5
2480.00	V	61.8	3.5	32.2	0.0	97.5	2.5	36.0	-33.5

Peak Field Strength (dBuV/m) = Meter Reading (dBuV) + CBL Fac (dB) + Ant Fac (dB) + Pre Amp Gain (dB)

$EIRP_{peak}$ (dBm) = Peak Field Strength (dBuV/m) + 20 log (distance) - 104.7 OR:

$EIRP_{peak}$ (dBm) = Peak Field Strength (dBuV/m) - 95 for 3 meter test distance.

Checked By: MARK E. LONGINOTTI
Mark E. Longinotti

Manufacturer : Shure Incorporated
Test Item : Micro Bodypack Transmitter
Model No. : ADX1M
Serial No. : 185
Mode : Transmit at 2480MHz (Ch. 26), Mid Power, Antenna B
Test Specification : FCC-15.247, RSS-247 Peak Output Power
Date : February 8, 2018
Test Distance : 3 meters
Notes :

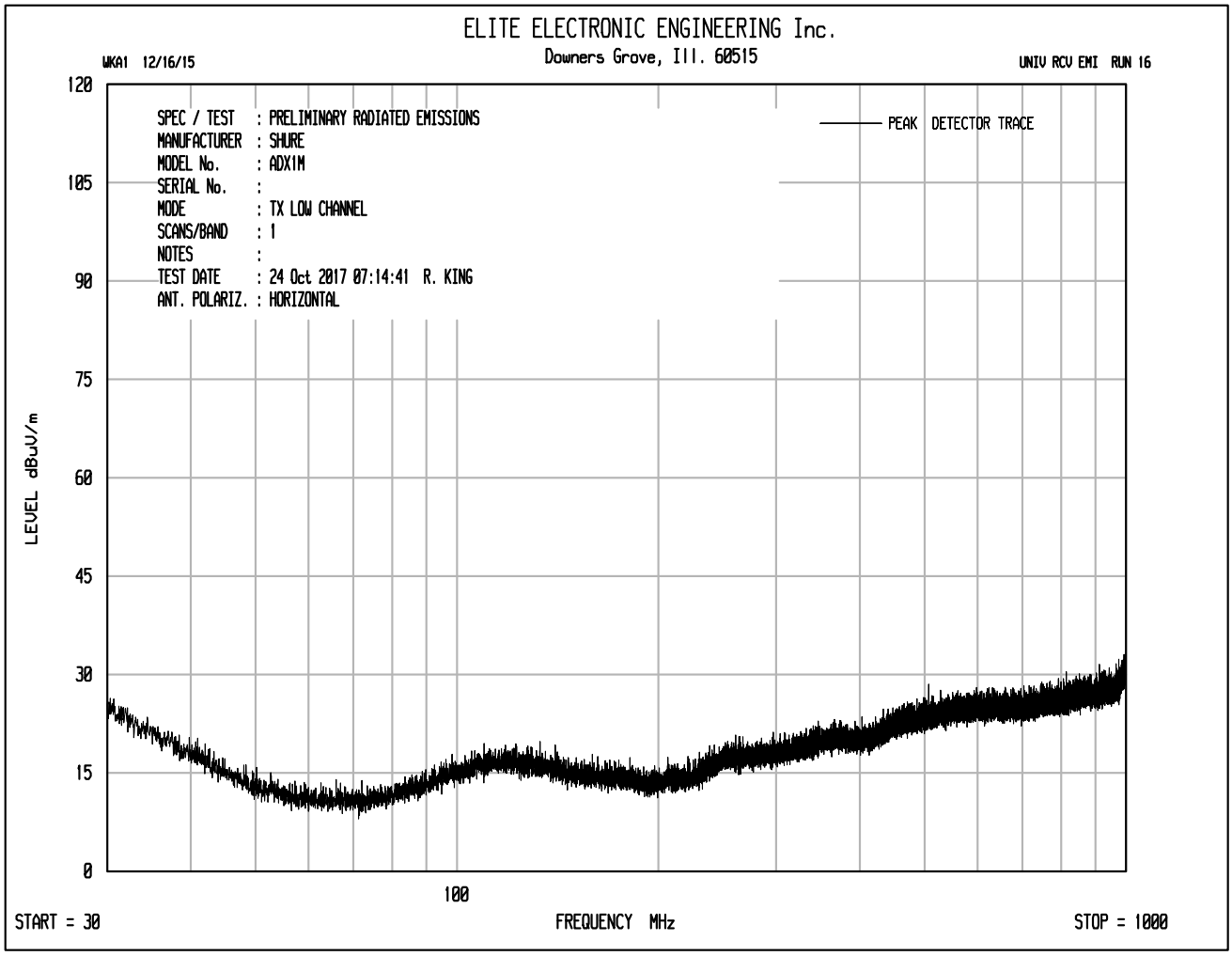
Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	EIRP (dBm)	Limit (dBm)	Margin (dBm)
2480.00	H	66.0	2.7	32.2	0.0	100.9	5.9	36.0	-30.1
2480.00	V	62.9	2.7	32.2	0.0	97.8	2.8	36.0	-33.2

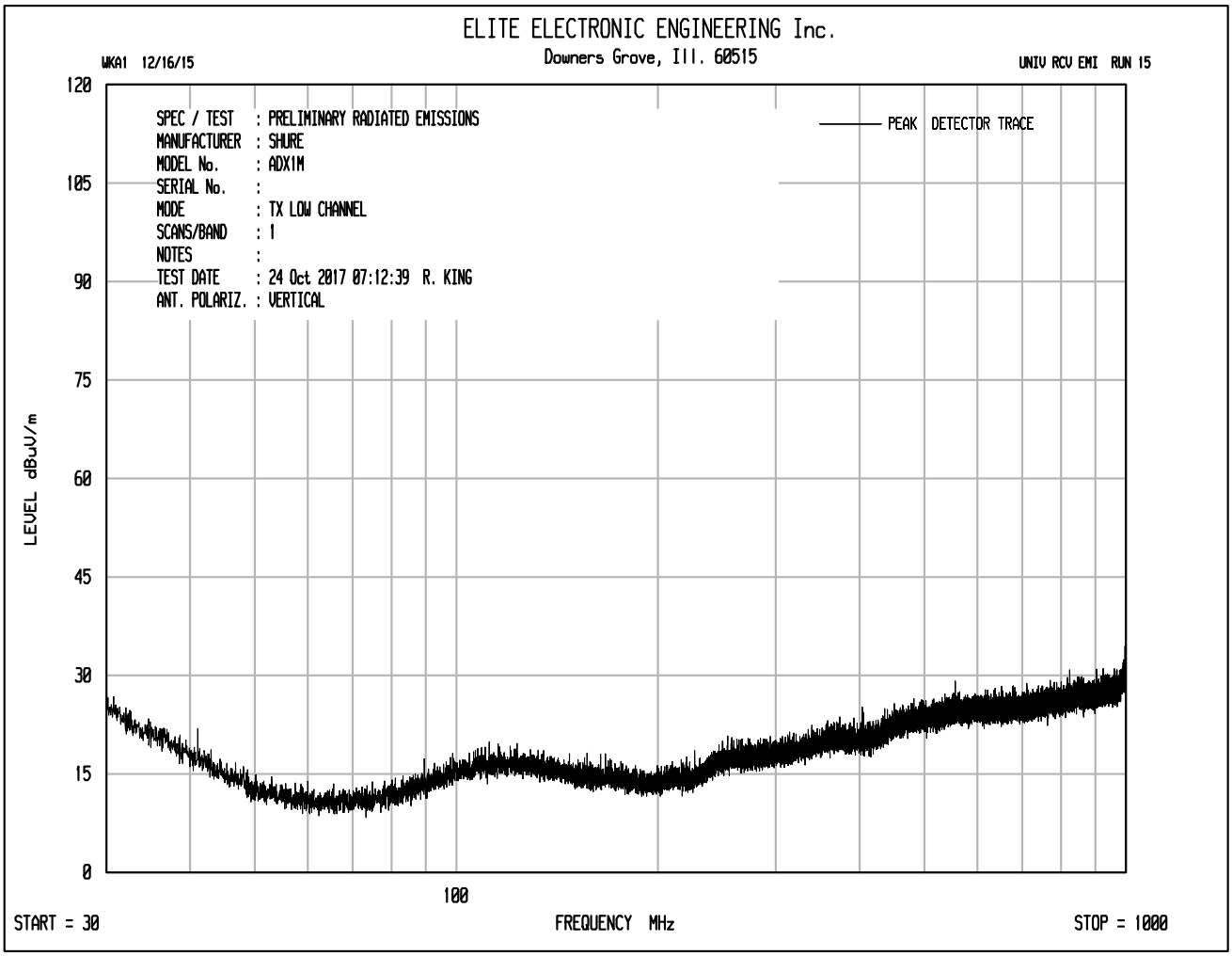
Peak Field Strength (dBuV/m) = Meter Reading (dBuV) + CBL Fac (dB) + Ant Fac (dB) + Pre Amp Gain (dB)

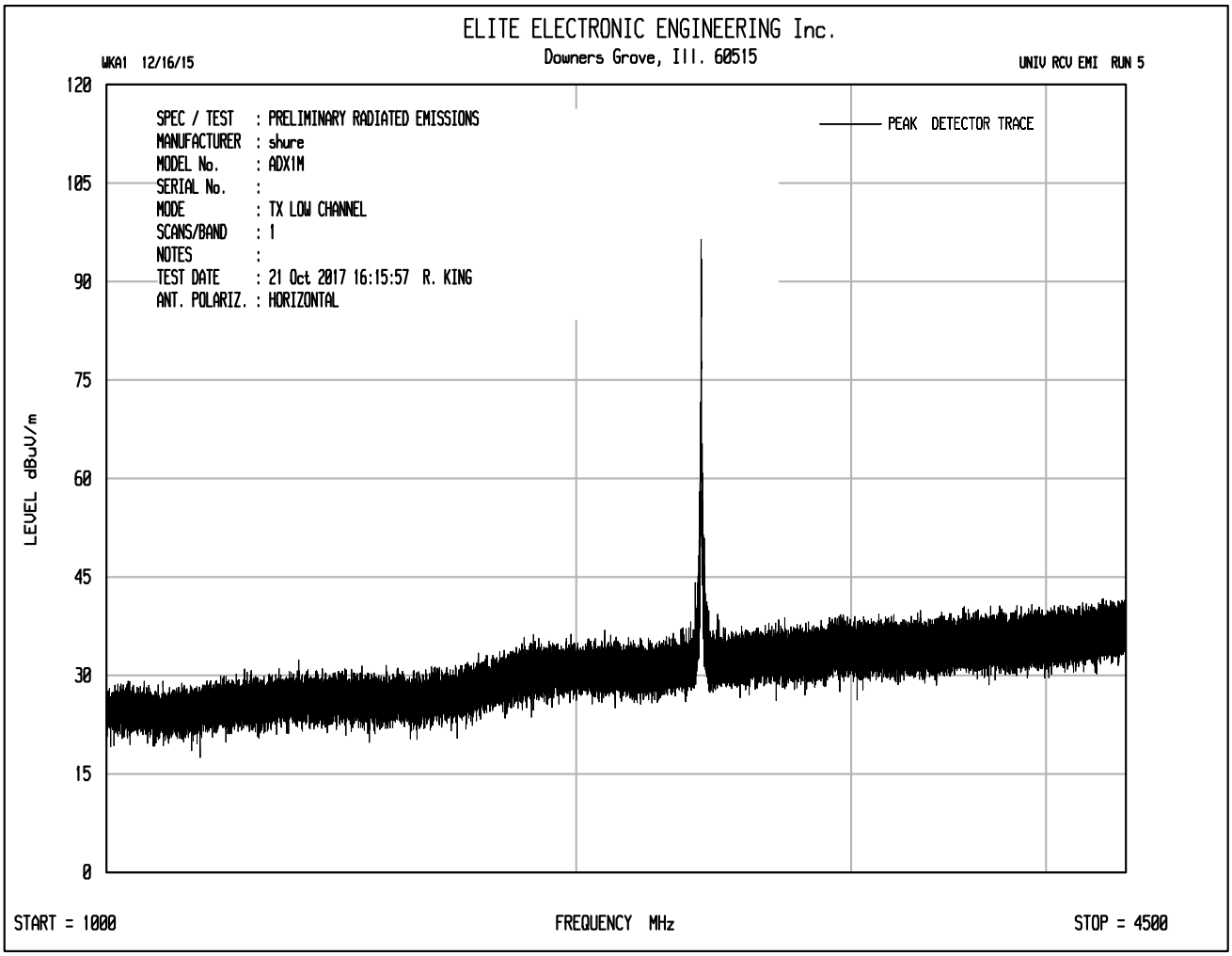
$EIRP_{peak}$ (dBm) = Peak Field Strength (dBuV/m) + 20 log (distance) - 104.7 OR:

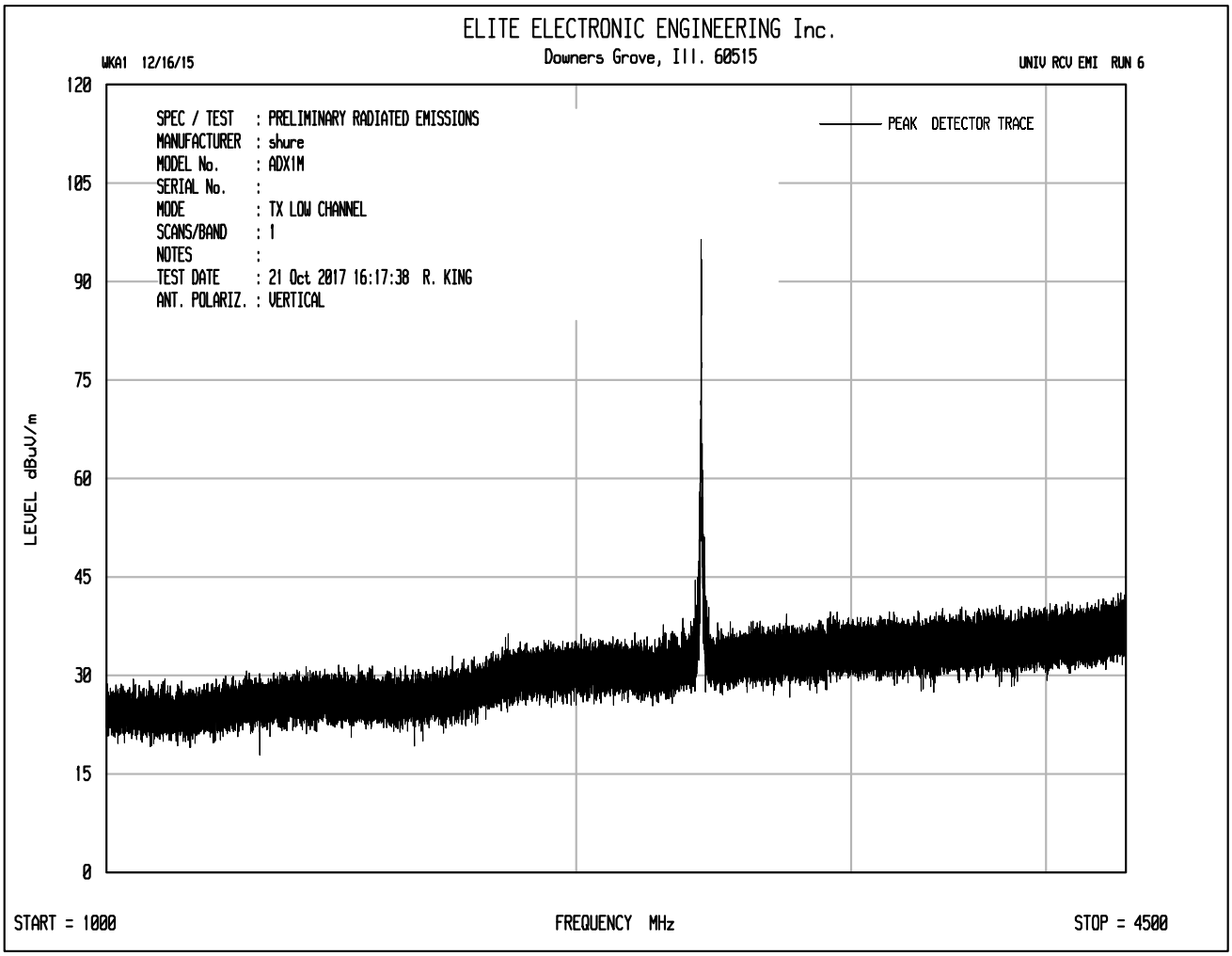
$EIRP_{peak}$ (dBm) = Peak Field Strength (dBuV/m) - 95 for 3 meter test distance.

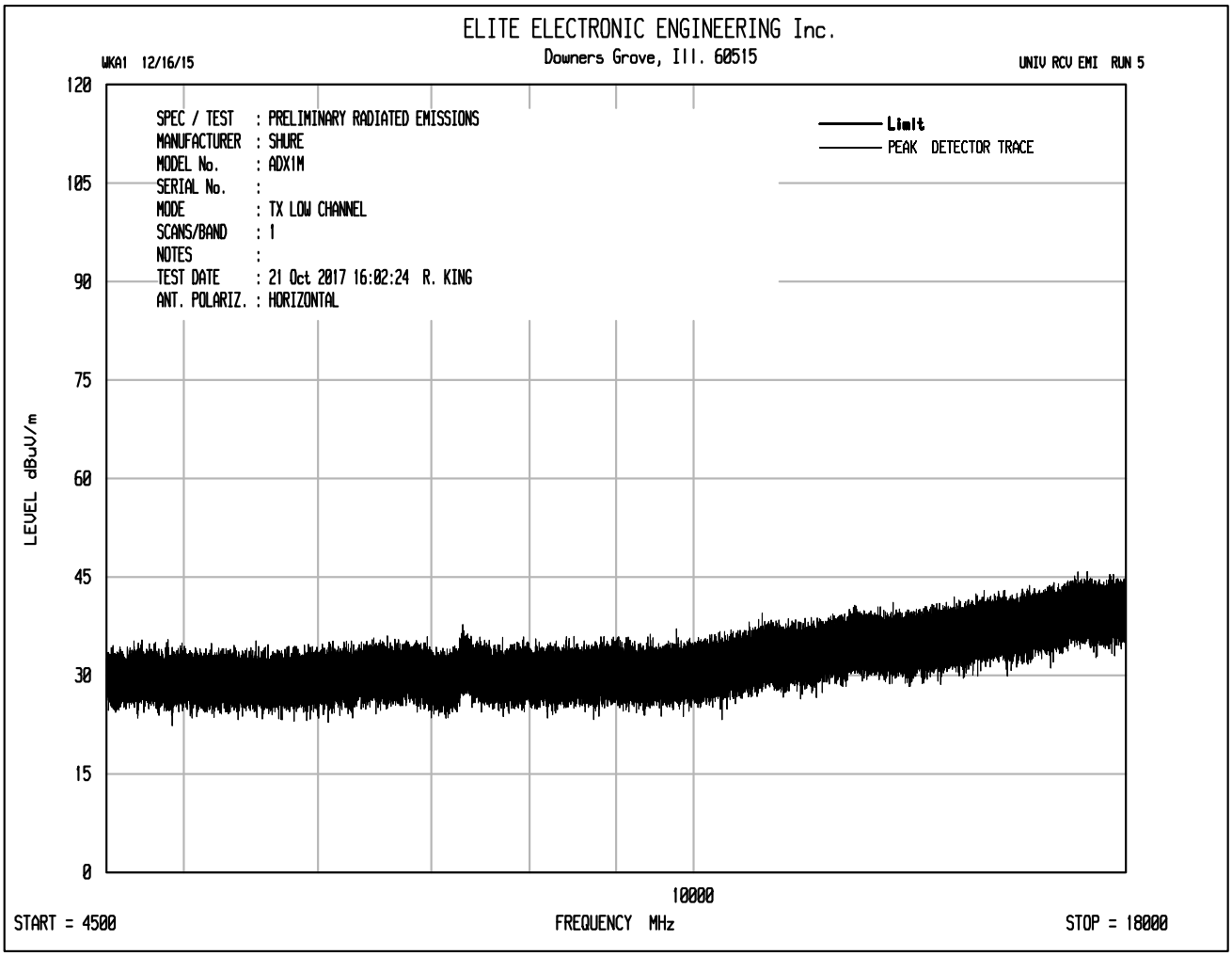
Checked By: MARK E. LONGINOTTI
Mark E. Longinotti

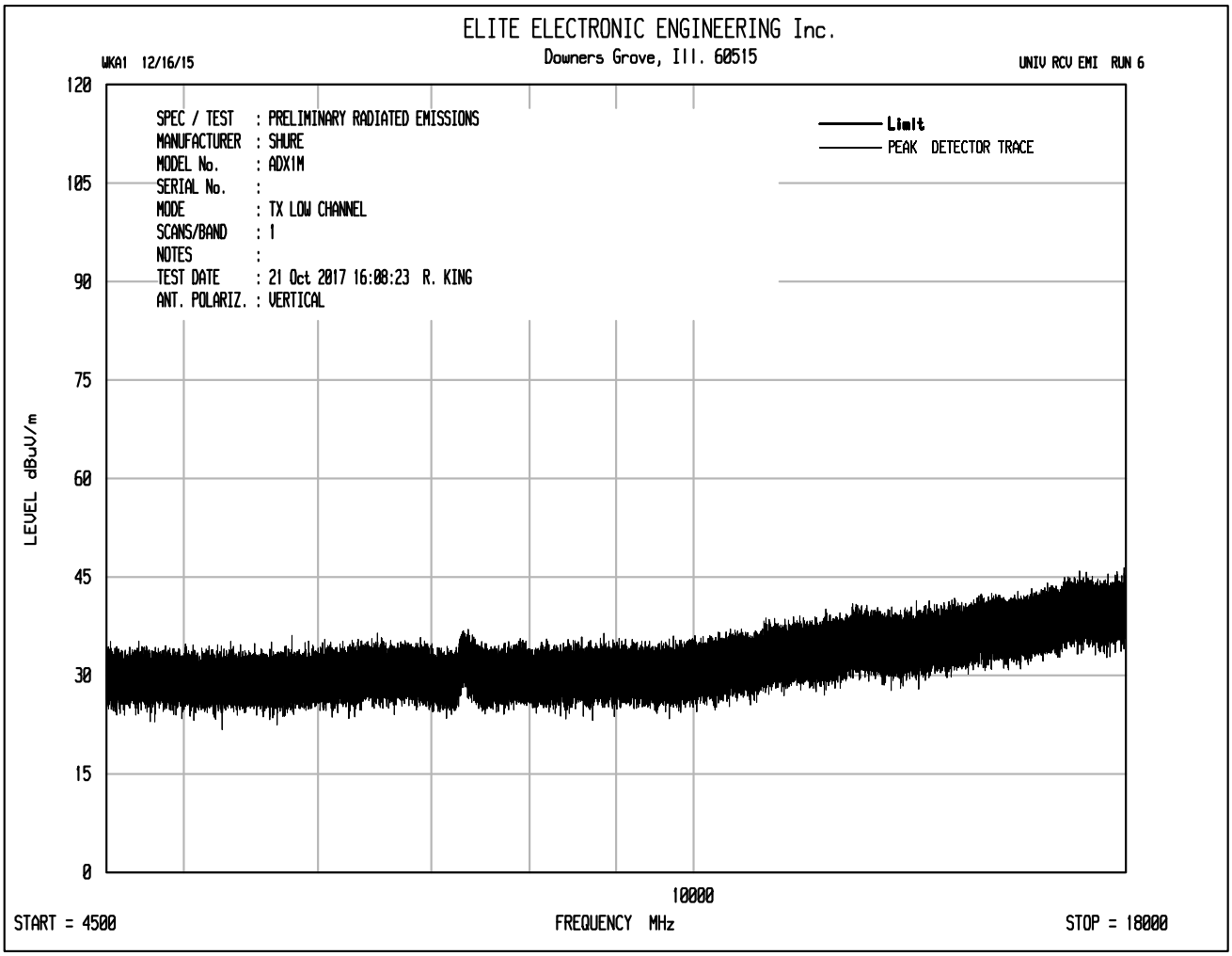

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 12/16/15
UNIV RCV EMI RUN 16
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : SHURE
MODEL No. : ADX1M
SERIAL No. :
MODE : TX LOW CHANNEL
SCANS/BAND : 1
NOTES :
TEST DATE : 24 Oct 2017 07:14:41 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000

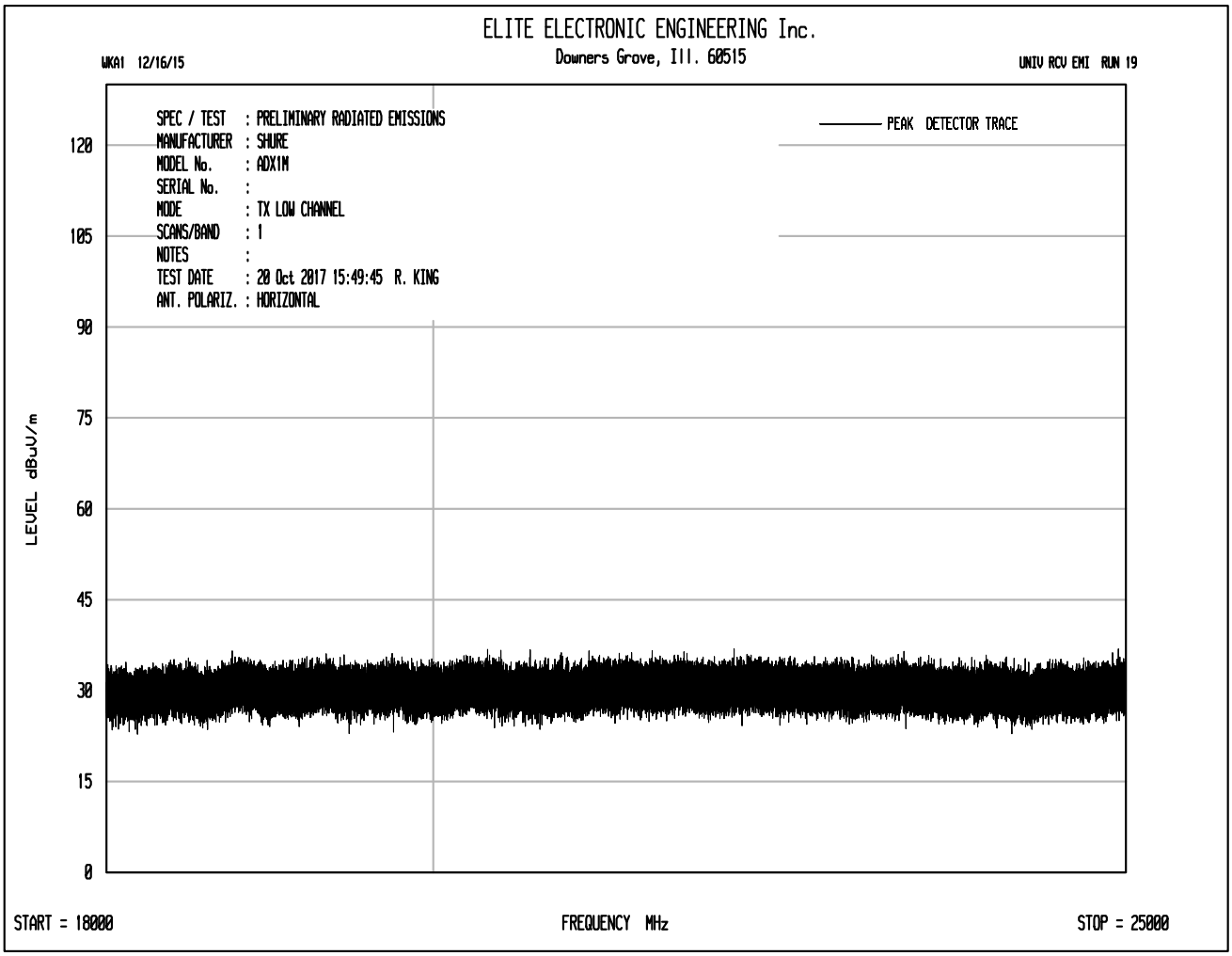

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 12/16/15
UNIV RCV EMI RUN 15
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : SHURE
MODEL No. : ADX1M
SERIAL No. :
MODE : TX LOW CHANNEL
SCANS/BAND : 1
NOTES :
TEST DATE : 24 Oct 2017 07:12:39 R. KING
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000

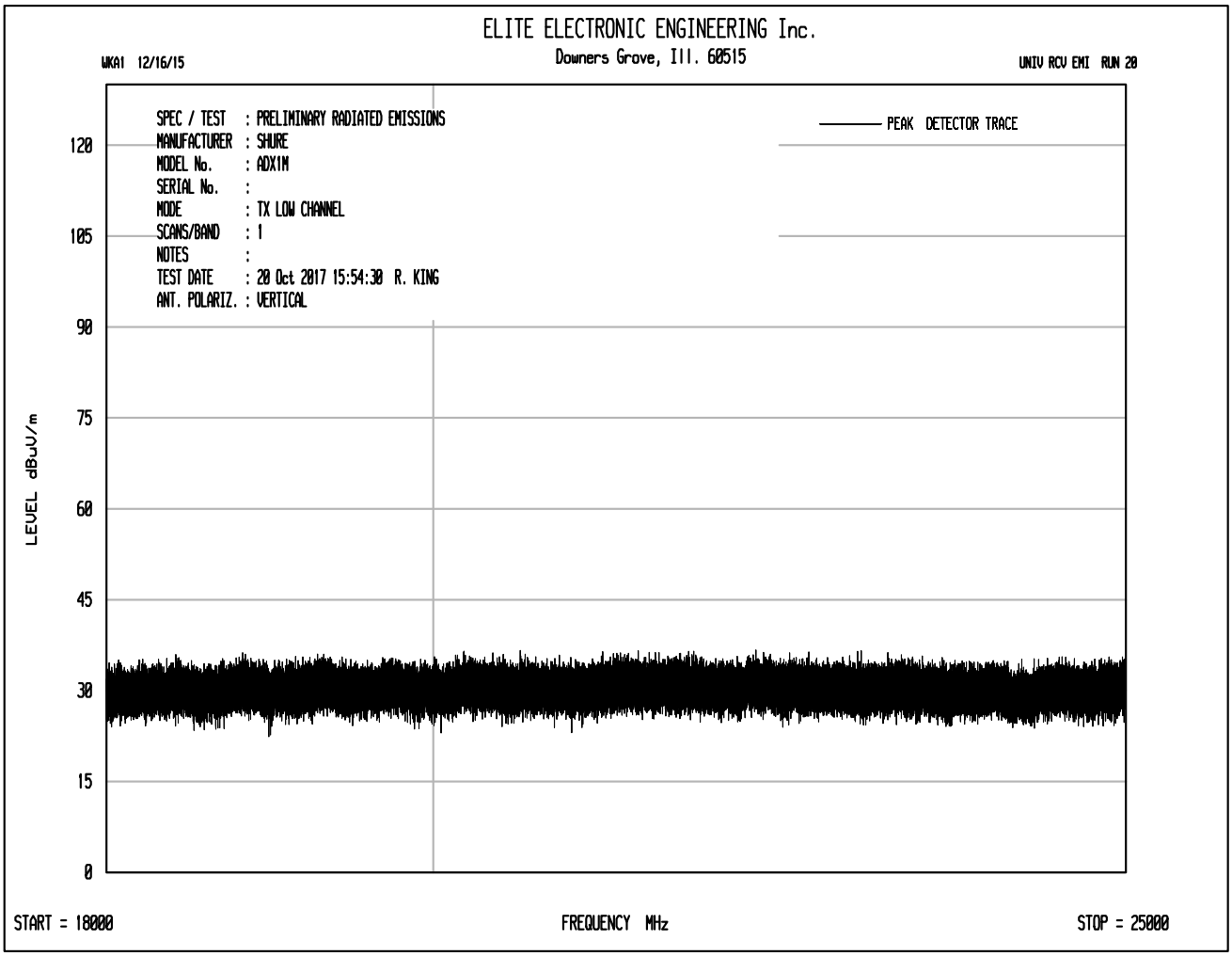

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 12/16/15
UNIV RCV EMI RUN 5
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : shure
MODEL No. : ADX1M
SERIAL No. :
MODE : TX LOW CHANNEL
SCANS/BAND : 1
NOTES :
TEST DATE : 21 Oct 2017 16:15:57 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 12/16/15
UNIV RCV EMI RUN 6
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : shure
MODEL No. : ADX1M
SERIAL No. :
MODE : TX LOW CHANNEL
SCANS/BAND : 1
NOTES :
TEST DATE : 21 Oct 2017 16:17:38 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 = 4500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 12/16/15
UNIV RCV EMI RUN 5
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : SHURE
MODEL No. : ADX1M
SERIAL No. :
MODE : TX LOW CHANNEL
SCANS/BAND : 1
NOTES :
TEST DATE : 21 Oct 2017 16:02:24 R. KING
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 4500
FREQUENCY MHz
STOP = 18000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 12/16/15
UNIV RCV EMI RUN 6
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : SHURE
MODEL No. : ADX1M
SERIAL No. :
MODE : TX LOW CHANNEL
SCANS/BAND : 1
NOTES :
TEST DATE : 21 Oct 2017 16:08:23 R. KING
ANT. POLARIZ. : VERTICAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 4500
FREQUENCY MHz
STOP = 18000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 12/16/15
UNIV RCV EMI RUN 19
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : SHURE
MODEL No. : ADX1M
SERIAL No. :
MODE : TX LOW CHANNEL
SCANS/BAND : 1
NOTES :
TEST DATE : 20 Oct 2017 15:49:45 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 12/16/15
UNIV RCV EMI RUN 20
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : SHURE
MODEL No. : ADX1M
SERIAL No. :
MODE : TX LOW CHANNEL
SCANS/BAND : 1
NOTES :
TEST DATE : 20 Oct 2017 15:54:30 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

Manufacturer : Shure Incorporated
Test Item : Micro Bodypack Transmitter
Model No. : ADX1M
Serial No. : 185
Mode : Transmit at 2405MHz, Mid Power, Antenna B
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions in Restricted Bands
Date : October 20, 2017 through October, 24, 2017
Test Distance : 3 meters
Notes : Peak Detector with 1MHz Resolution Bandwidth

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)
4810.00	H	52.2	*	3.7	34.6	-39.3	51.1	359.7	5000.0	-22.9
4810.00	V	51.8	*	3.7	34.6	-39.3	50.7	342.7	5000.0	-23.3
12025.00	H	49.7	*	6.1	38.7	-39.2	55.3	584.1	5000.0	-18.6
12025.00	V	49.8	*	6.1	38.7	-39.2	55.4	588.8	5000.0	-18.6
19240.00	H	35.7	*	2.2	40.4	-28.7	49.6	302.0	5000.0	-24.4
19240.00	V	35.7	*	2.2	40.4	-28.7	49.6	300.6	5000.0	-24.4

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

Checked BY Richard E. King :

Richard E. King

Manufacturer : Shure Incorporated
Test Item : Micro Bodypack Transmitter
Model No. : ADX1M
Serial No. : 185
Mode : Transmit at 2405MHz, Mid Power, Antenna B
Test Specification : FCC-15.247, RSS-247 Average Radiated Emissions in Restricted Bands
Date : October 20, 2017 through October, 24, 2017
Test Distance : 3 meters
Notes : Average Detector with 1MHz Resolution Bandwidth

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)
4810.00	H	37.1	*	3.7	34.6	-39.3	36.1	63.5	500.0	-17.9
4810.00	V	37.2	*	3.7	34.6	-39.3	36.2	64.3	500.0	-17.8
12025.00	H	34.2	*	6.1	38.7	-39.2	39.8	97.9	500.0	-14.2
12025.00	V	34.2	*	6.1	38.7	-39.2	39.9	98.6	500.0	-14.1
19240.00	H	21.2	*	2.2	40.4	-28.7	35.1	57.0	500.0	-18.9
19240.00	V	21.2	*	2.2	40.4	-28.7	35.1	56.8	500.0	-18.9

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

Checked BY Richard E. King :

Richard E. King

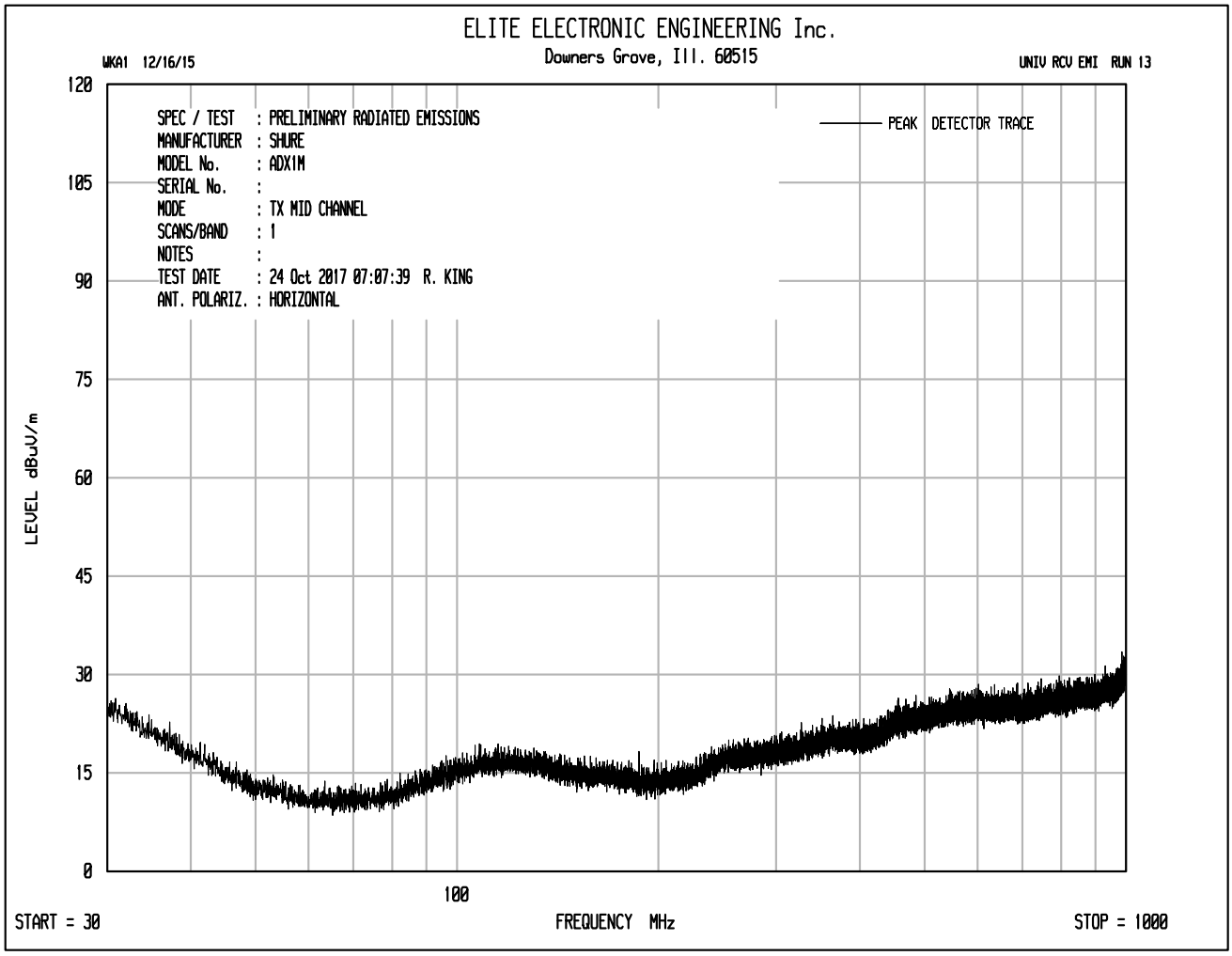
Manufacturer : Shure Incorporated
Test Item : Micro Bodypack Transmitter
Model No. : ADX1M
Serial No. : 185
Mode : Transmit at 2405MHz, Mid Power, Antenna B
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions not in Restricted Bands
Date : October 20, 2017 through October, 24, 2017
Test Distance : 3 meters
Notes : Peak Detector with 100kHz Resolution Bandwidth

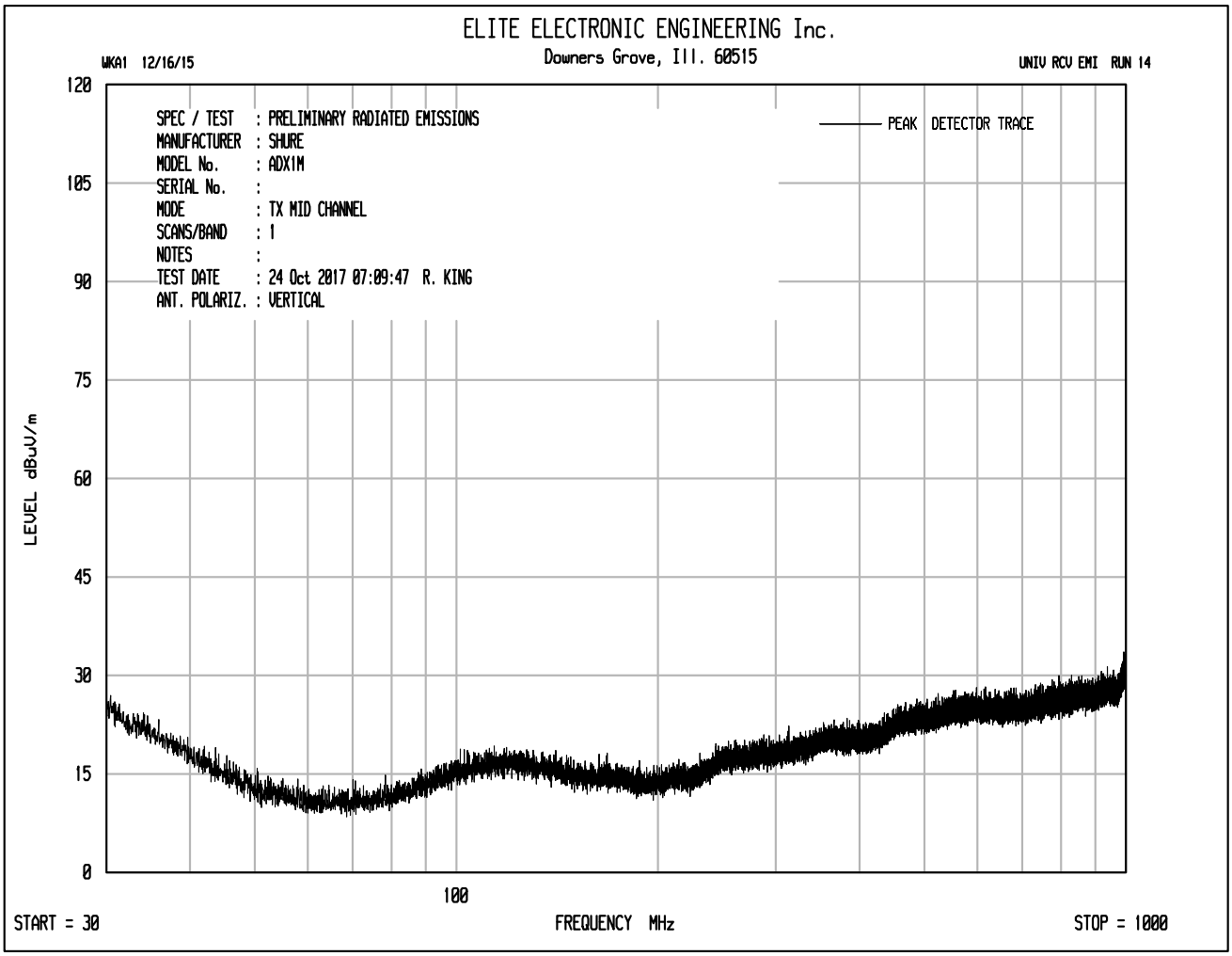
Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
2405.00	H	67.4		2.6	32.0	0.0	102.0	126219.1		
2405.00	V	63.2		2.6	32.0	0.0	97.8	77826.1		
7215.00	H	39.3	*	4.6	35.7	-39.4	40.2	102.2	12621.9	-41.8
7215.00	V	40.6		4.6	35.7	-39.4	41.5	118.6	12621.9	-40.5
9620.00	H	39.3	*	5.2	36.6	-39.3	41.8	123.7	12621.9	-40.2
9620.00	V	38.8	*	5.2	36.6	-39.3	41.4	117.0	12621.9	-40.7
14430.00	H	38.2	*	6.6	39.6	-38.3	46.2	203.3	12621.9	-35.9
14430.00	V	39.1	*	6.6	39.6	-38.3	47.0	224.2	12621.9	-35.0
16835.00	H	39.3	*	7.2	41.7	-37.5	50.7	343.8	12621.9	-31.3
16835.00	V	39.1	*	7.2	41.7	-37.5	50.5	336.3	12621.9	-31.5
21645.00	H	24.5	*	2.2	40.6	-28.9	38.4	83.4	12621.9	-43.6
21645.00	V	24.5	*	2.2	40.6	-28.9	38.4	83.4	12621.9	-43.6
24050.00	H	25.7	*	2.2	40.6	-30.3	38.3	82.0	12621.9	-43.7
24050.00	V	25.7	*	2.2	40.6	-30.3	38.3	82.0	12621.9	-43.7

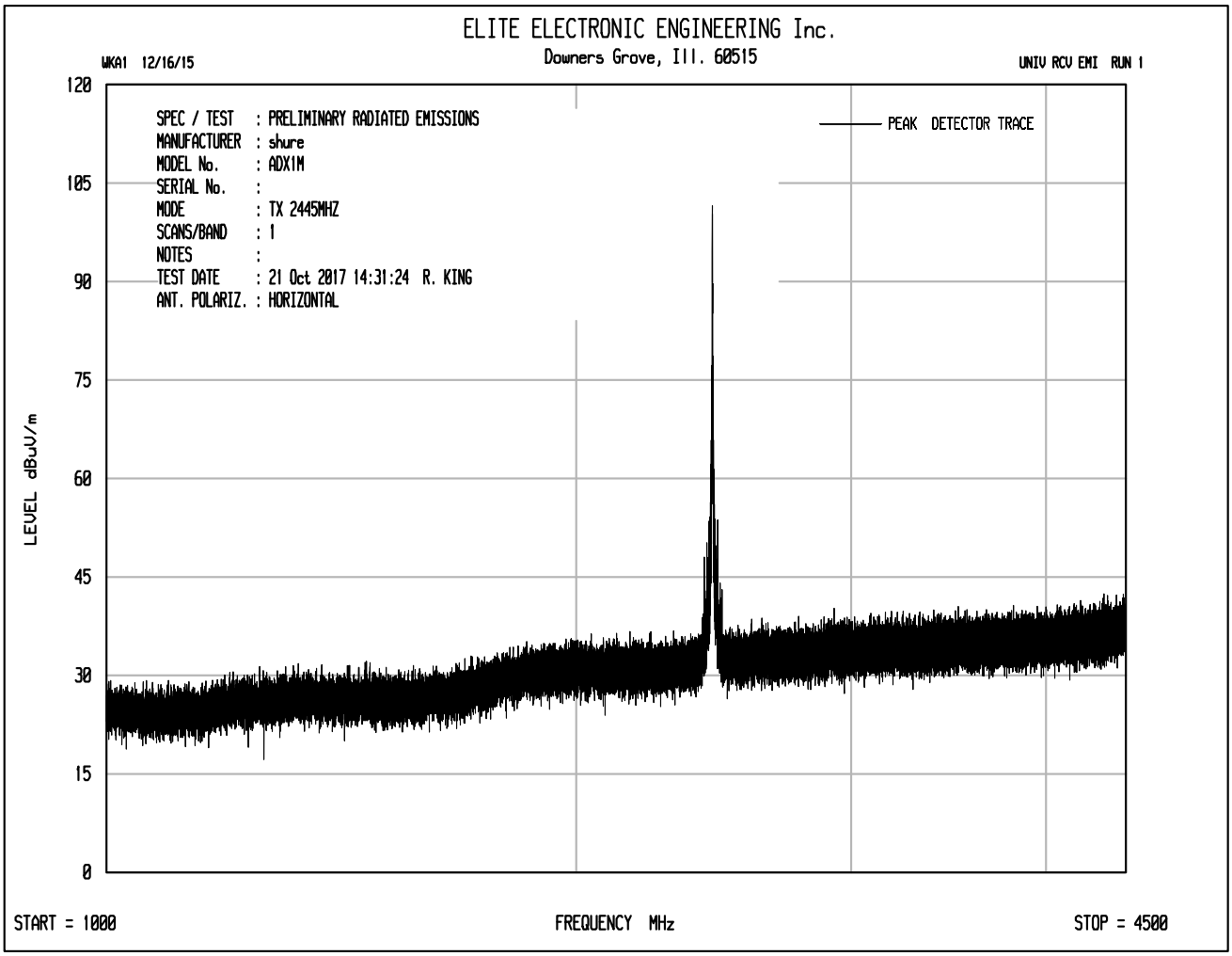
Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

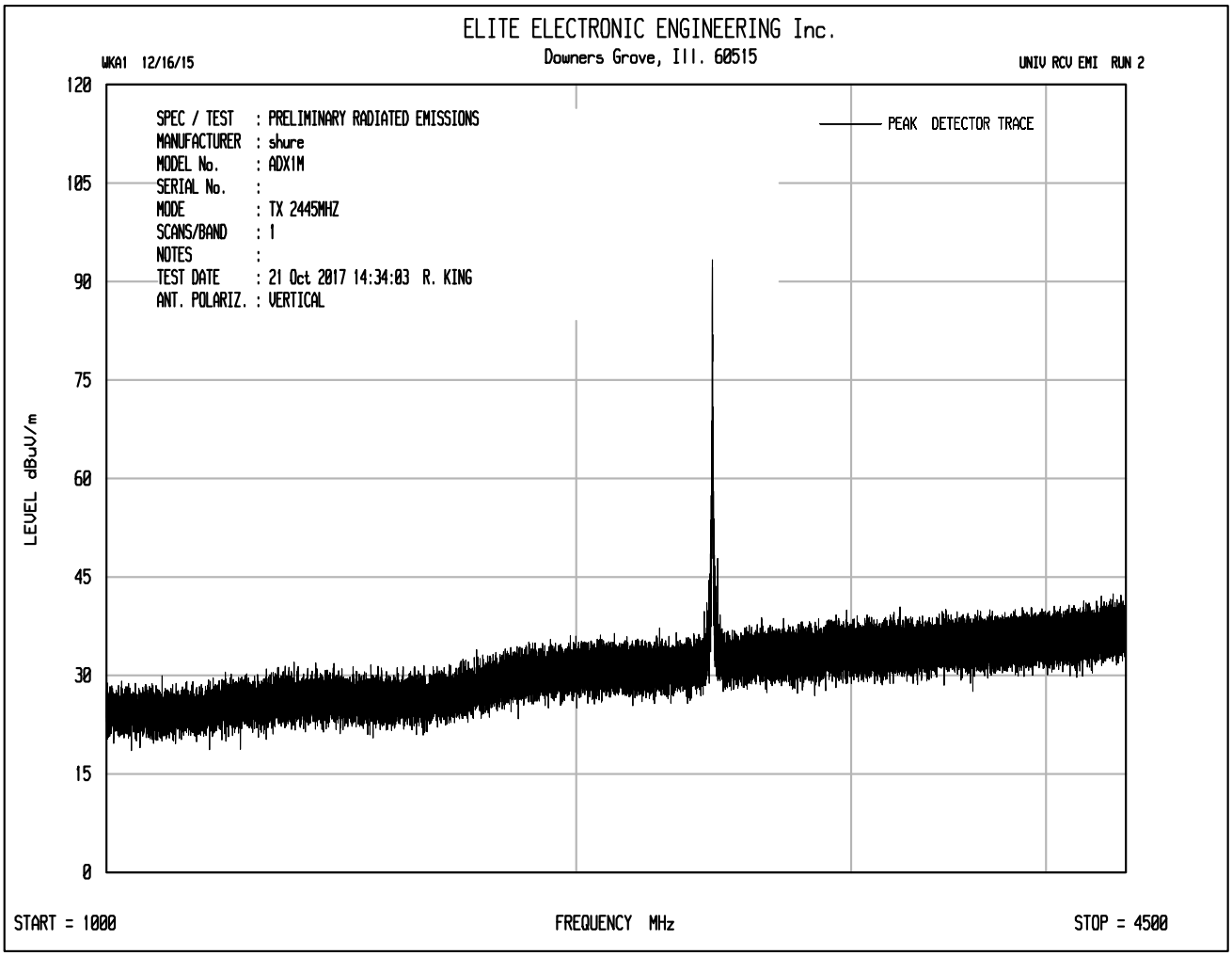
Checked BY Richard E. King :

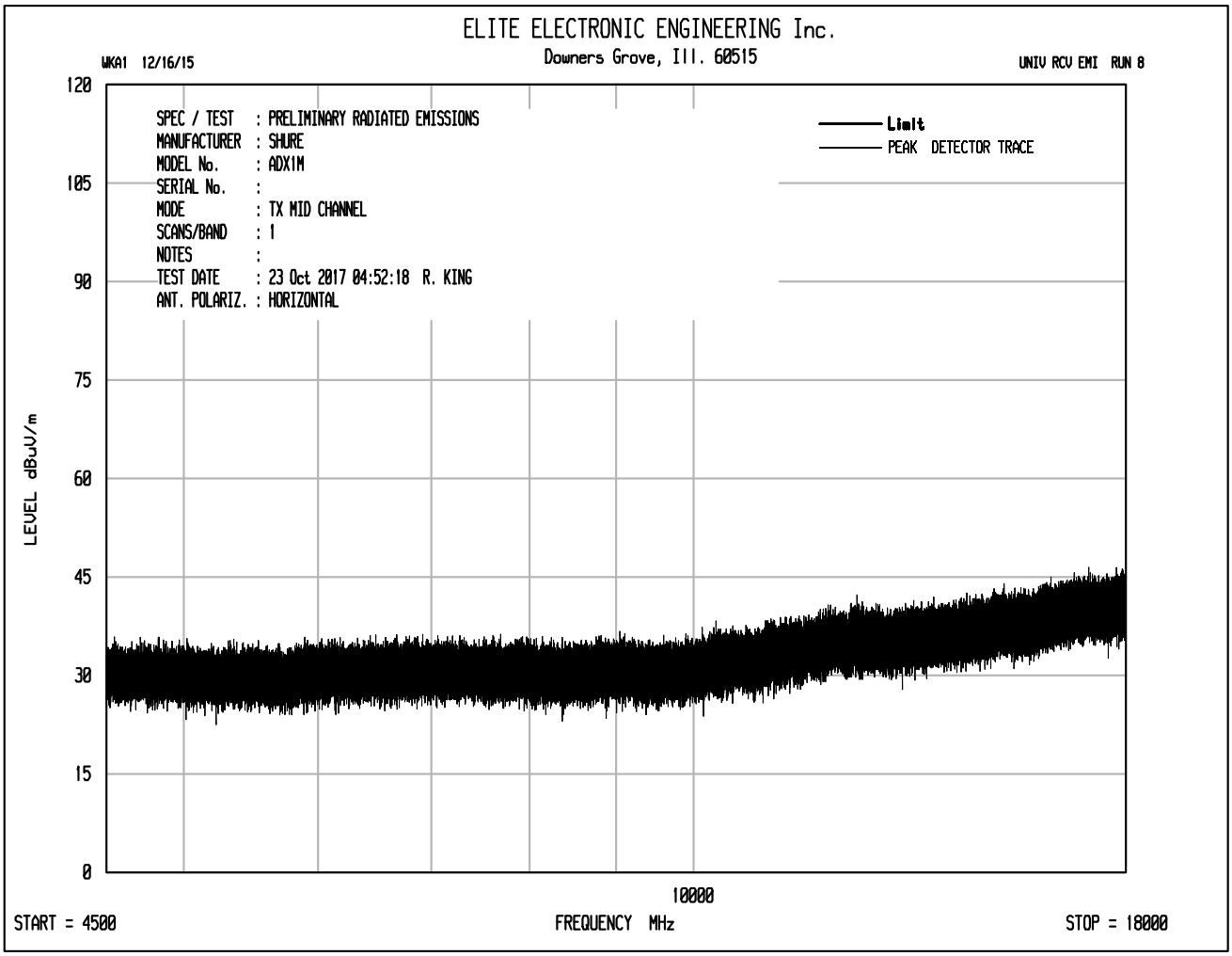
Richard E. King

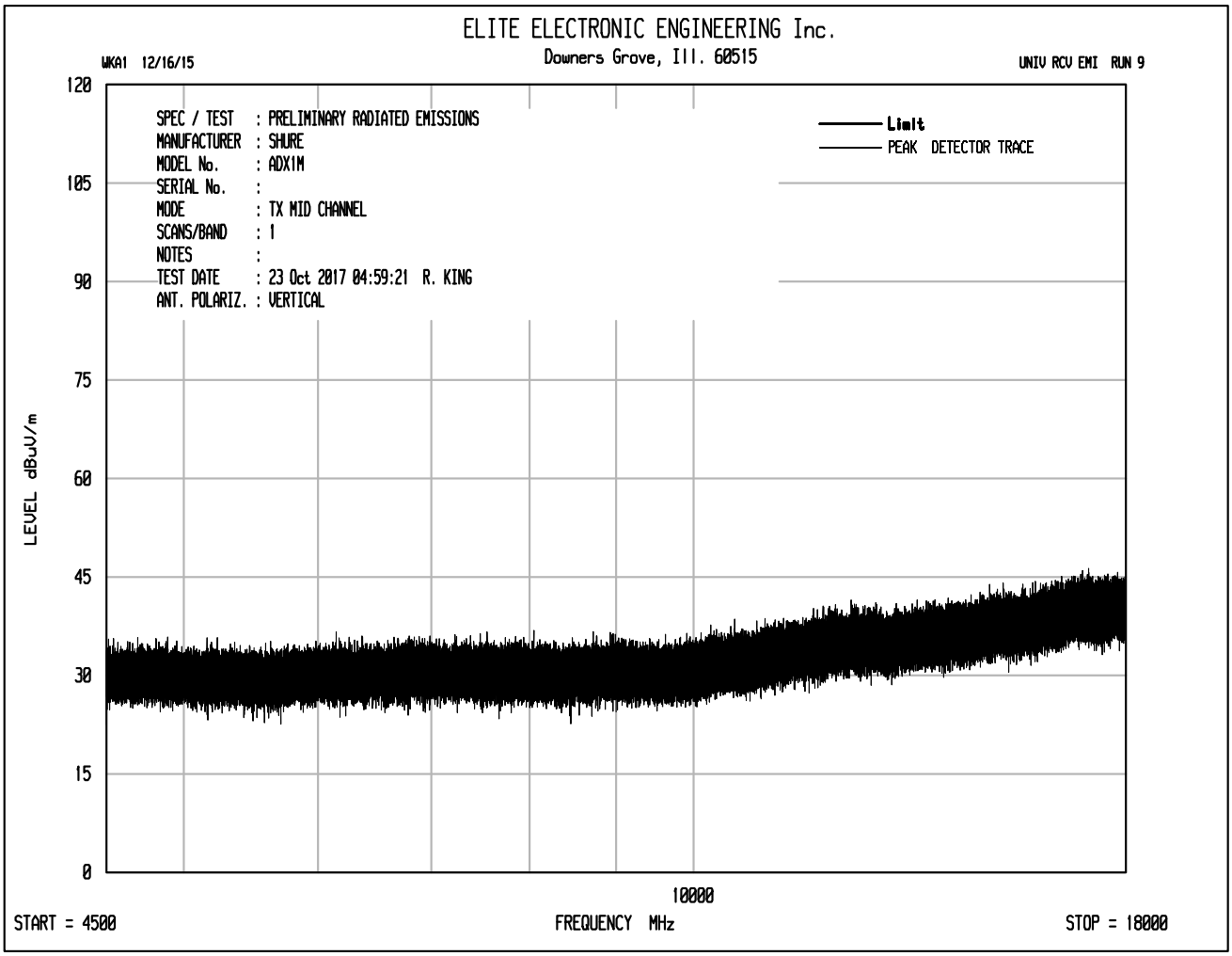

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 12/16/15
UNIV RCV EMI RUN 13
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : SHURE
MODEL No. : ADX1M
SERIAL No. :
MODE : TX MID CHANNEL
SCANS/BAND : 1
NOTES :
TEST DATE : 24 Oct 2017 07:07:39 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000

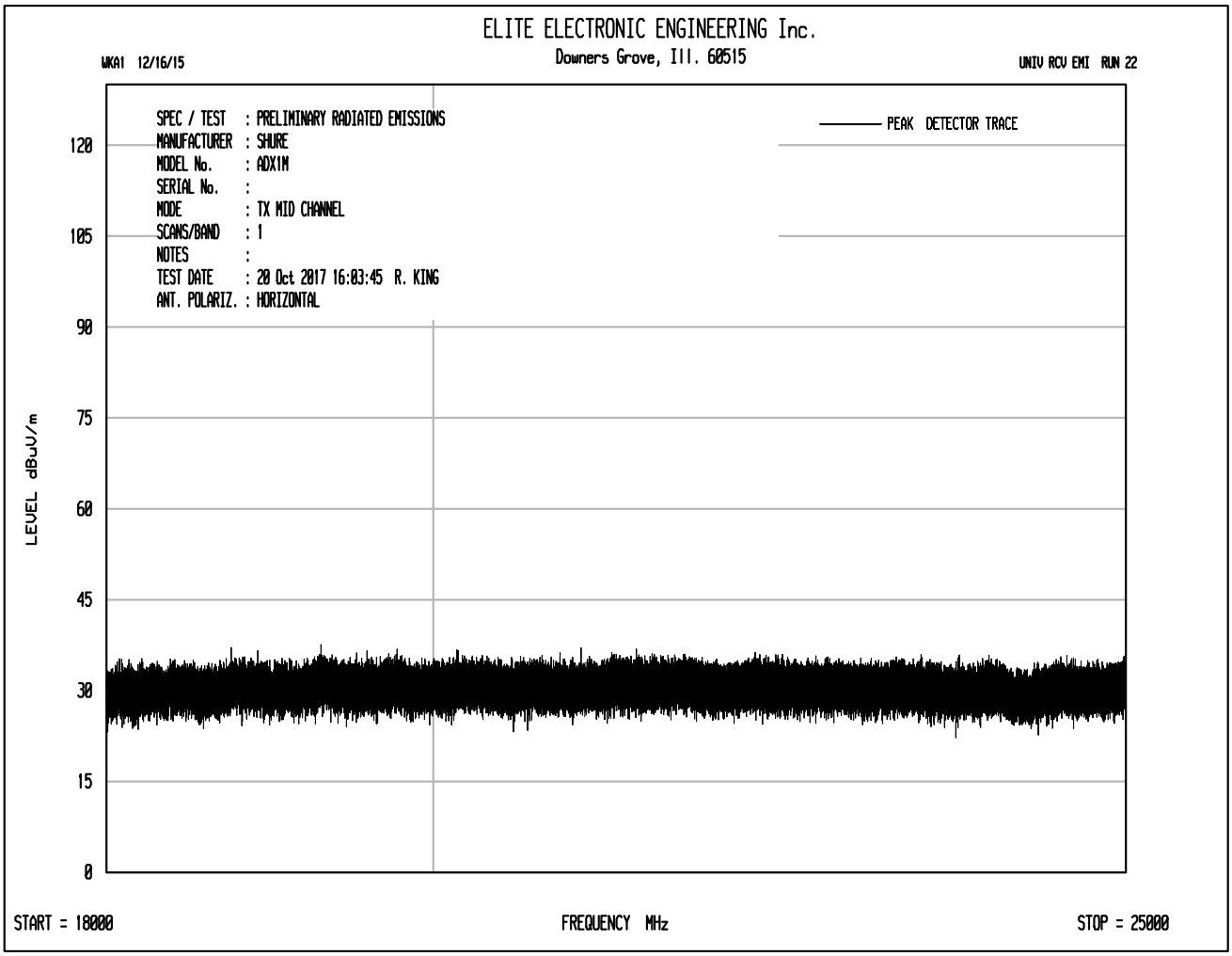

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 12/16/15
UNIV RCV EMI RUN 14
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : SHURE
MODEL No. : ADX1M
SERIAL No. :
MODE : TX MID CHANNEL
SCANS/BAND : 1
NOTES :
TEST DATE : 24 Oct 2017 07:09:47 R. KING
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
100
START = 30
FREQUENCY MHz
STOP = 1000

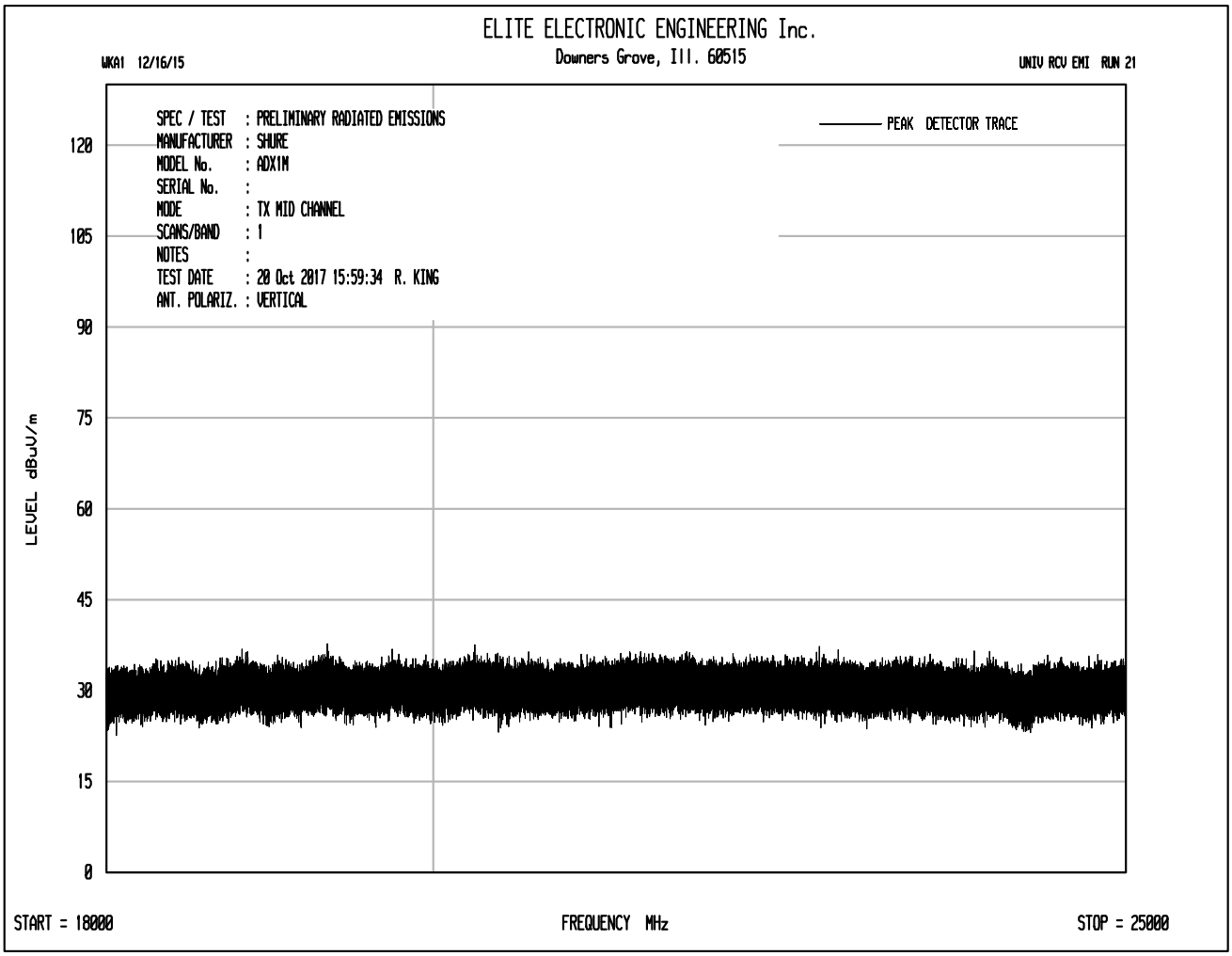

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 12/16/15
UNIV RCV EMI RUN 1
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : shure
MODEL No. : ADX1M
SERIAL No. :
MODE : TX 2445MHZ
SCANS/BAND : 1
NOTES :
TEST DATE : 21 Oct 2017 14:31:24 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 12/16/15
UNIV RCV EMI RUN 2
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : shure
MODEL No. : ADX1M
SERIAL No. :
MODE : TX 2445MHZ
SCANS/BAND : 1
NOTES :
TEST DATE : 21 Oct 2017 14:34:03 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 = 4500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 12/16/15
UNIV RCV EMI RUN 8
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : SHURE
MODEL No. : ADX1M
SERIAL No. :
MODE : TX MID CHANNEL
SCANS/BAND : 1
NOTES :
TEST DATE : 23 Oct 2017 04:52:18 R. KING
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 4500
FREQUENCY MHz
STOP = 18000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 12/16/15
UNIV RCV EMI RUN 9
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : SHURE
MODEL No. : ADX1M
SERIAL No. :
MODE : TX MID CHANNEL
SCANS/BAND : 1
NOTES :
TEST DATE : 23 Oct 2017 04:59:21 R. KING
ANT. POLARIZ. : VERTICAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 4500
FREQUENCY MHz
STOP = 18000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 12/16/15
UNIV RCV EMI RUN 22
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : SHURE
MODEL No. : ADX1M
SERIAL No. :
MODE : TX MID CHANNEL
SCANS/BAND : 1
NOTES :
TEST DATE : 20 Oct 2017 16:03:45 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 12/16/15
UNIV RCV EMI RUN 21
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : SHURE
MODEL No. : ADX1M
SERIAL No. :
MODE : TX MID CHANNEL
SCANS/BAND : 1
NOTES :
TEST DATE : 20 Oct 2017 15:59:34 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

Manufacturer : Shure Incorporated
Test Item : Micro Bodypack Transmitter
Model No. : ADX1M
Serial No. : 185
Mode : Transmit at 2445MHz (Ch. 19), Mid Power, Antenna B
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions in Restricted Bands
Date : October 20, 2017 through October, 24, 2017
Test Distance : 3 meters
Notes : Peak Detector with 1MHz Resolution Bandwidth

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)
4890.00	H	52.1	*	3.7	34.5	-39.3	51.0	354.8	5000.0	-23.0
4890.00	V	50.8	*	3.7	34.5	-39.3	49.7	305.8	5000.0	-24.3
7335.00	H	50.8	*	4.7	35.7	-39.4	51.7	383.9	5000.0	-22.3
7335.00	V	51.1	*	4.7	35.7	-39.4	52.0	398.3	5000.0	-22.0
12225.00	H	49.1	*	6.1	38.8	-39.1	54.9	558.1	5000.0	-19.0
12225.00	V	49.5	*	6.1	38.8	-39.1	55.3	579.0	5000.0	-18.7
19560.00	H	35.9	*	2.2	40.4	-28.6	50.0	314.4	5000.0	-24.0
19560.00	V	35.9	*	2.2	40.4	-28.6	49.9	313.3	5000.0	-24.1

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

Checked BY Richard E. King :

Richard E. King

Manufacturer : Shure Incorporated
Test Item : Micro Bodypack Transmitter
Model No. : ADX1M
Serial No. : 185
Mode : Transmit at 2445MHz (Ch. 19), Mid Power, Antenna B
Test Specification : FCC-15.247, RSS-247 Average Radiated Emissions in Restricted Bands
Date : October 20, 2017 through October, 24, 2017
Test Distance : 3 meters
Notes : Average Detector with 1MHz Resolution Bandwidth

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)
4890.00	H	36.1	*	3.7	34.5	-39.3	35.0	56.1	500.0	-19.0
4890.00	V	36.1	*	3.7	34.5	-39.3	35.0	56.1	500.0	-19.0
7335.00	H	34.84	*	4.7	35.7	-39.4	35.8	61.5	500.0	-18.2
7335.00	V	35.0	*	4.7	35.7	-39.4	36.0	62.8	500.0	-18.0
12225.00	H	33.9	*	6.1	38.8	-39.1	39.7	96.3	500.0	-14.3
12225.00	V	33.9	*	6.1	38.8	-39.1	39.7	96.3	500.0	-14.3
19560.00	H	21.7	*	2.2	40.4	-28.6	35.7	61.1	500.0	-18.3
19560.00	V	21.7	*	2.2	40.4	-28.6	35.7	61.2	500.0	-18.2

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

Checked BY Richard E. King :

Richard E. King

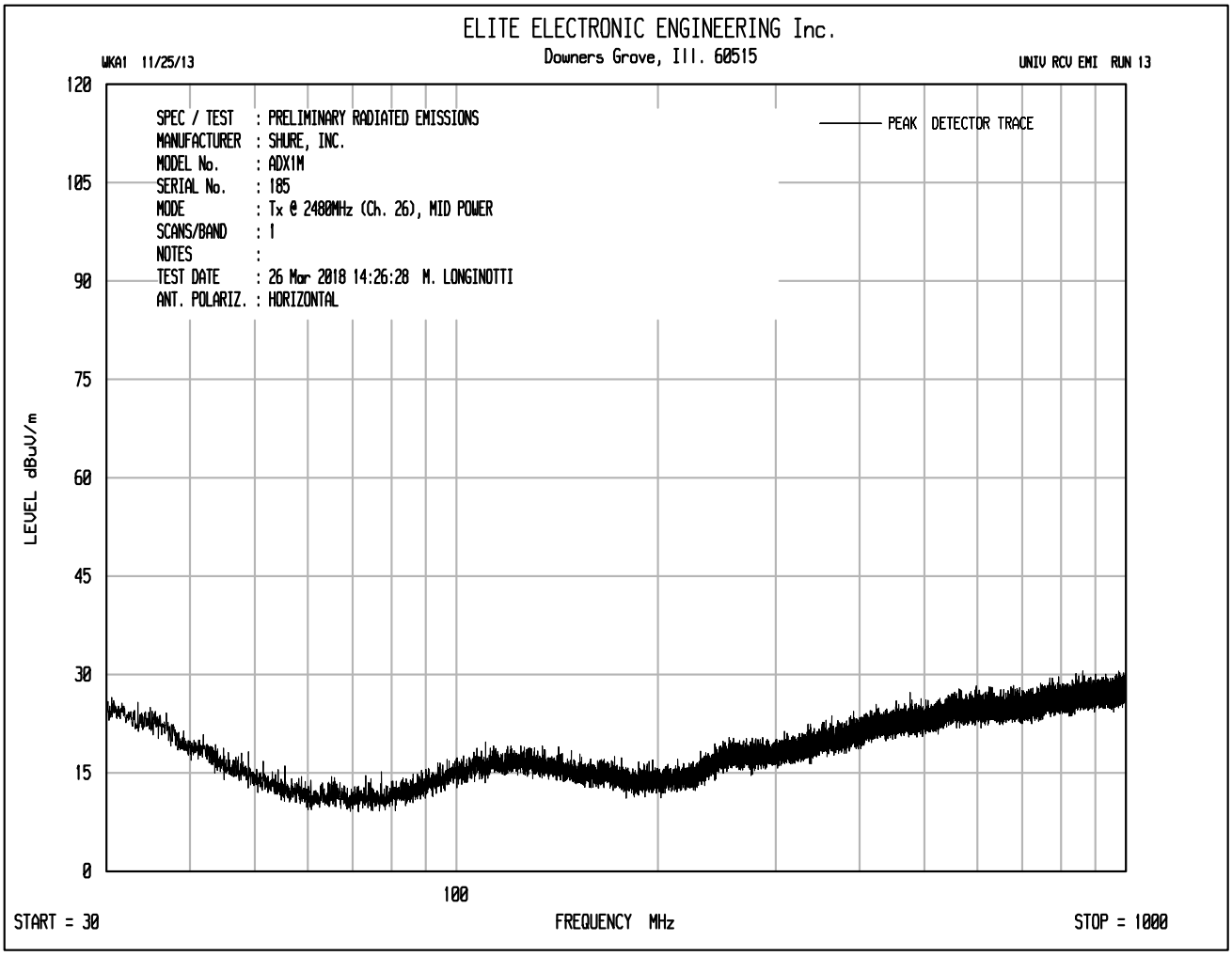
Manufacturer : Shure Incorporated
Test Item : Micro Bodypack Transmitter
Model No. : ADX1M
Serial No. : 185
Mode : Transmit at 2445MHz (Ch. 19), Mid Power, Antenna B
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions not in Restricted Bands
Date : October 20, 2017 through October, 24, 2017
Test Distance : 3 meters
Notes : Peak Detector with 100kHz Resolution Bandwidth

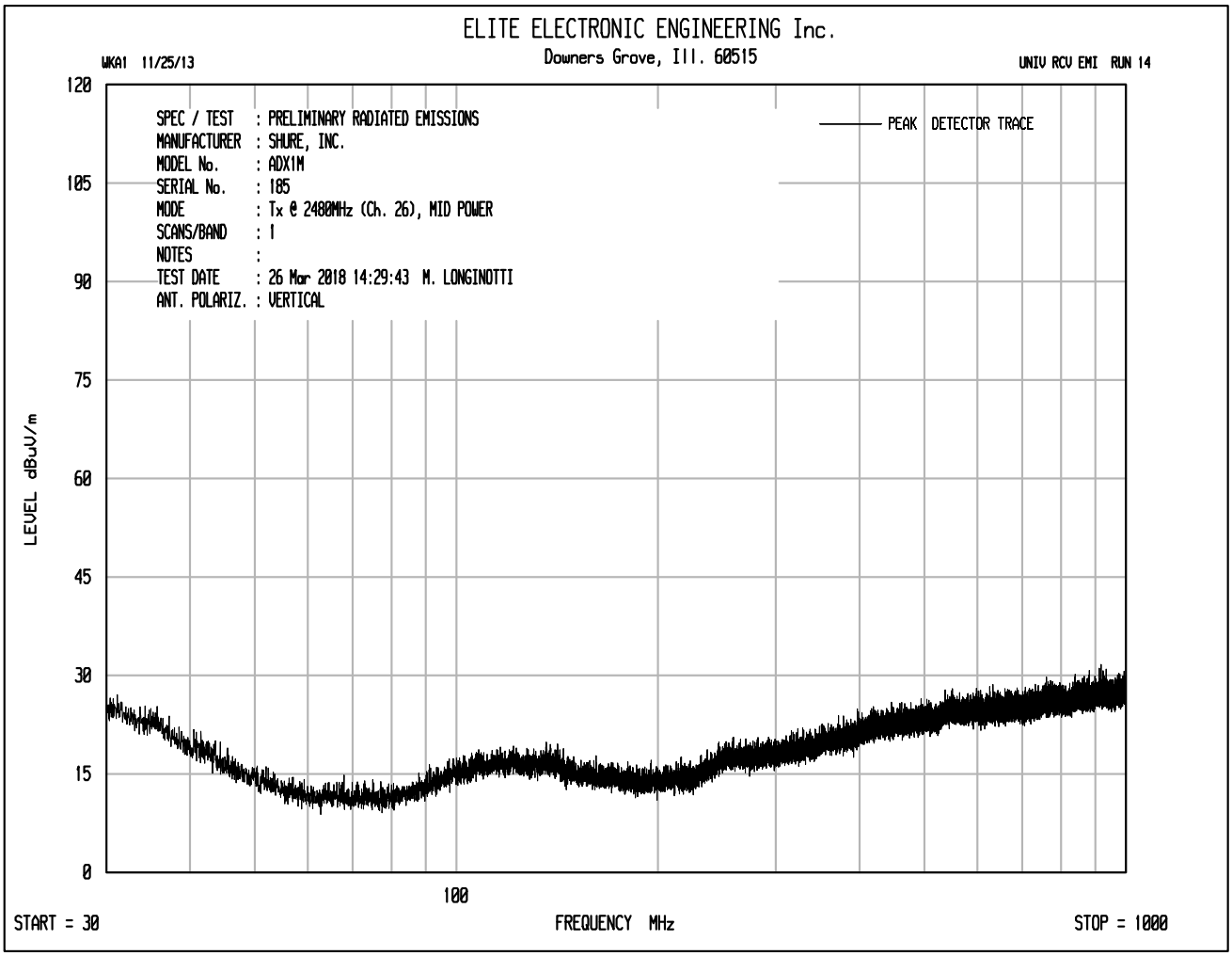
Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Peak Total dBuV/m at 3m	Peak Total uV/m at 3 m	Peak Limit uV/m at 3 m	Margin (dB)
2445.00	H	68.4		2.6	32.1	0.0	103.1	143413.8		
2445.00	V	63.5		2.6	32.1	0.0	98.2	81300.1		
9780.00	H	38.3	*	5.2	36.9	-39.3	41.2	114.9	14341.4	-41.9
9780.00	V	39.3	*	5.2	36.9	-39.3	42.2	129.0	14341.4	-40.9
14670.00	H	39.9	*	6.7	39.6	-38.2	48.0	251.1	14341.4	-35.1
14670.00	V	38.2	*	6.7	39.6	-38.2	46.3	206.0	14341.4	-36.9
17115.00	H	39.6	*	7.3	41.6	-37.6	50.8	348.3	14341.4	-32.3
17115.00	V	38.0	*	7.3	41.6	-37.6	49.2	288.7	14341.4	-33.9
22005.00	H	25.0	*	2.2	40.6	-29.4	38.3	82.2	14341.4	-44.8
22005.00	V	25.0	*	2.2	40.6	-29.4	38.4	82.7	14341.4	-44.8
24450.00	H	27.1	*	2.2	40.6	-30.4	39.6	95.1	14341.4	-43.6
24450.00	V	27.1	*	2.2	40.6	-30.4	39.6	95.0	14341.4	-43.6

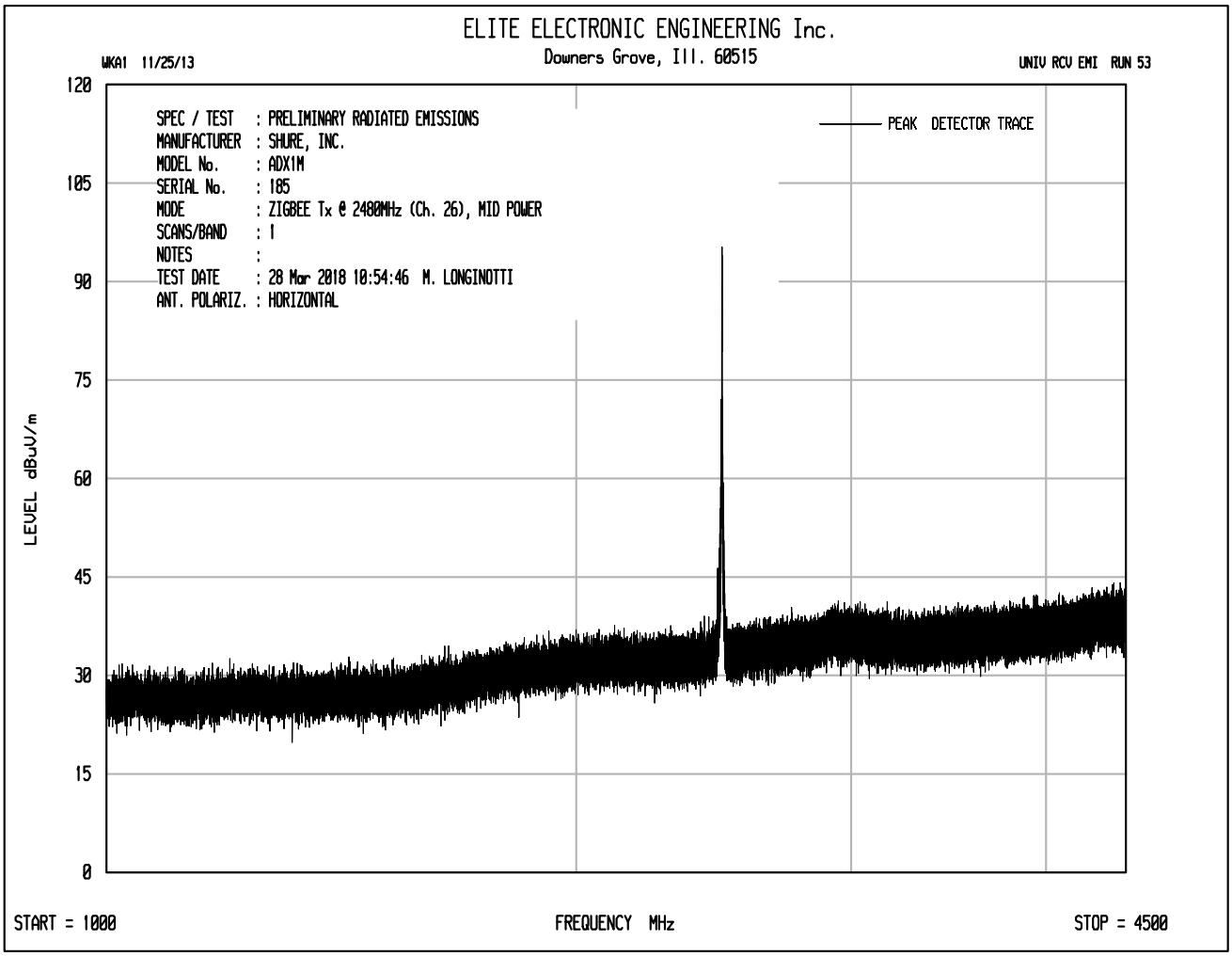
Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Pre Amp

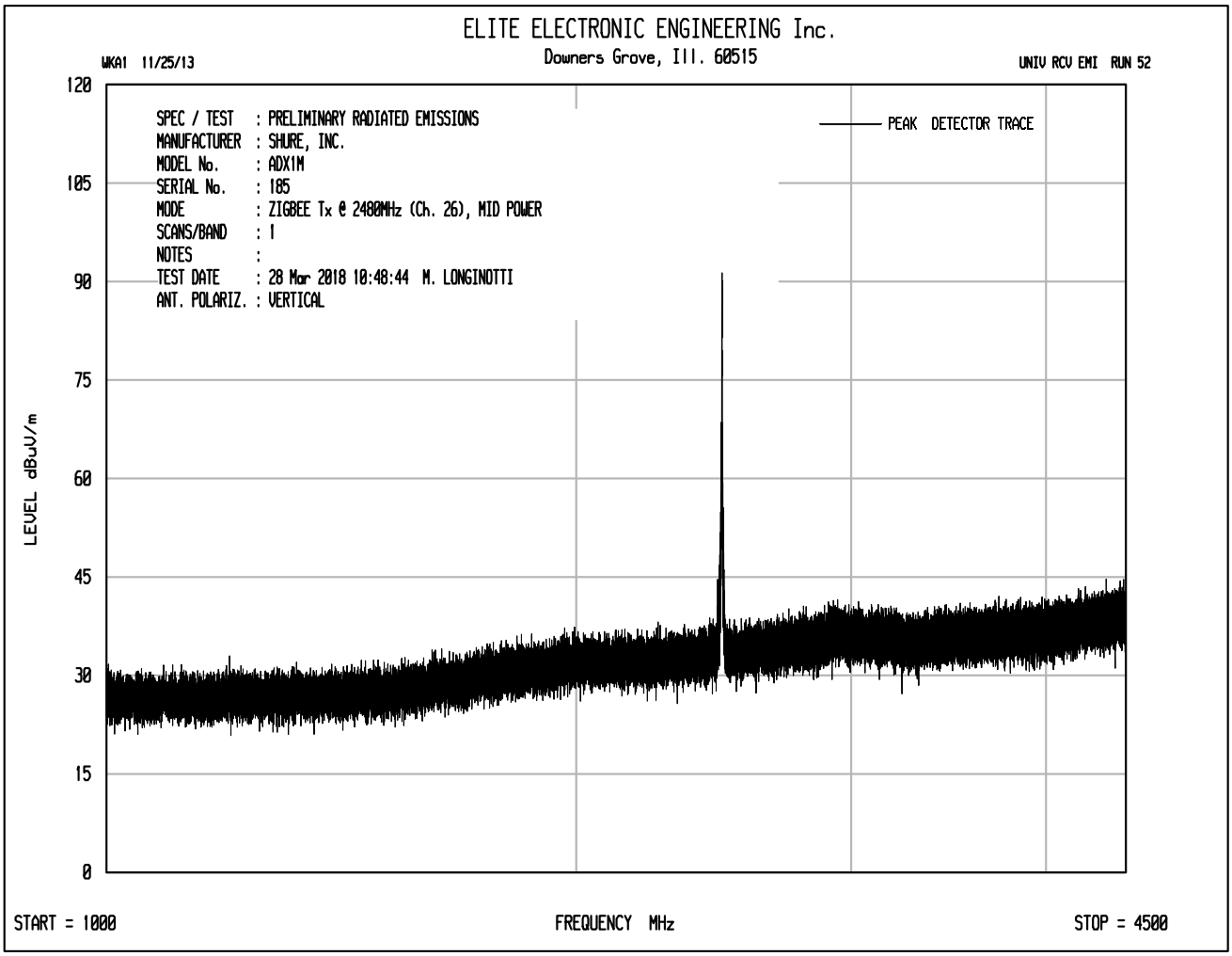
Checked BY Richard E. King :

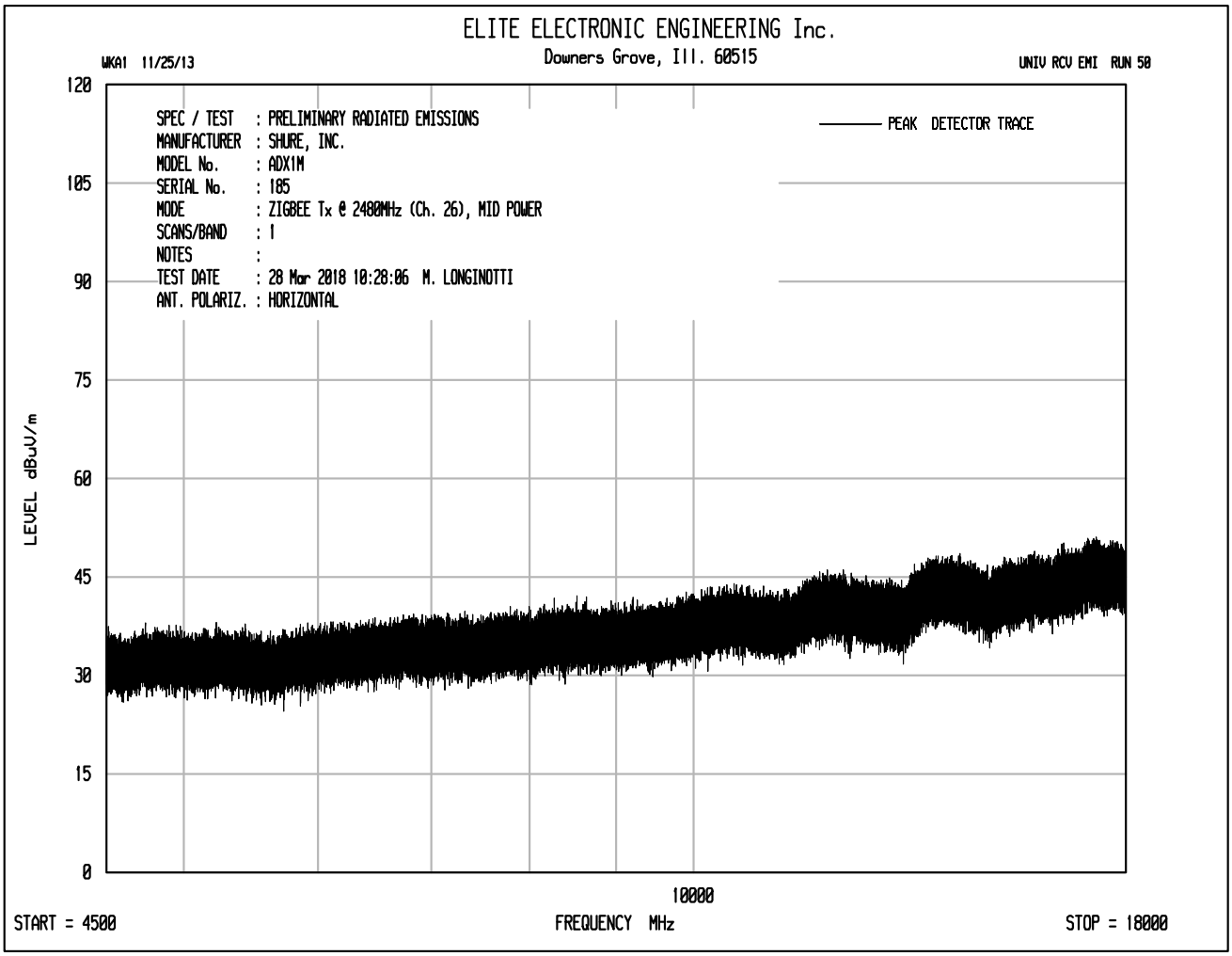
Richard E. King

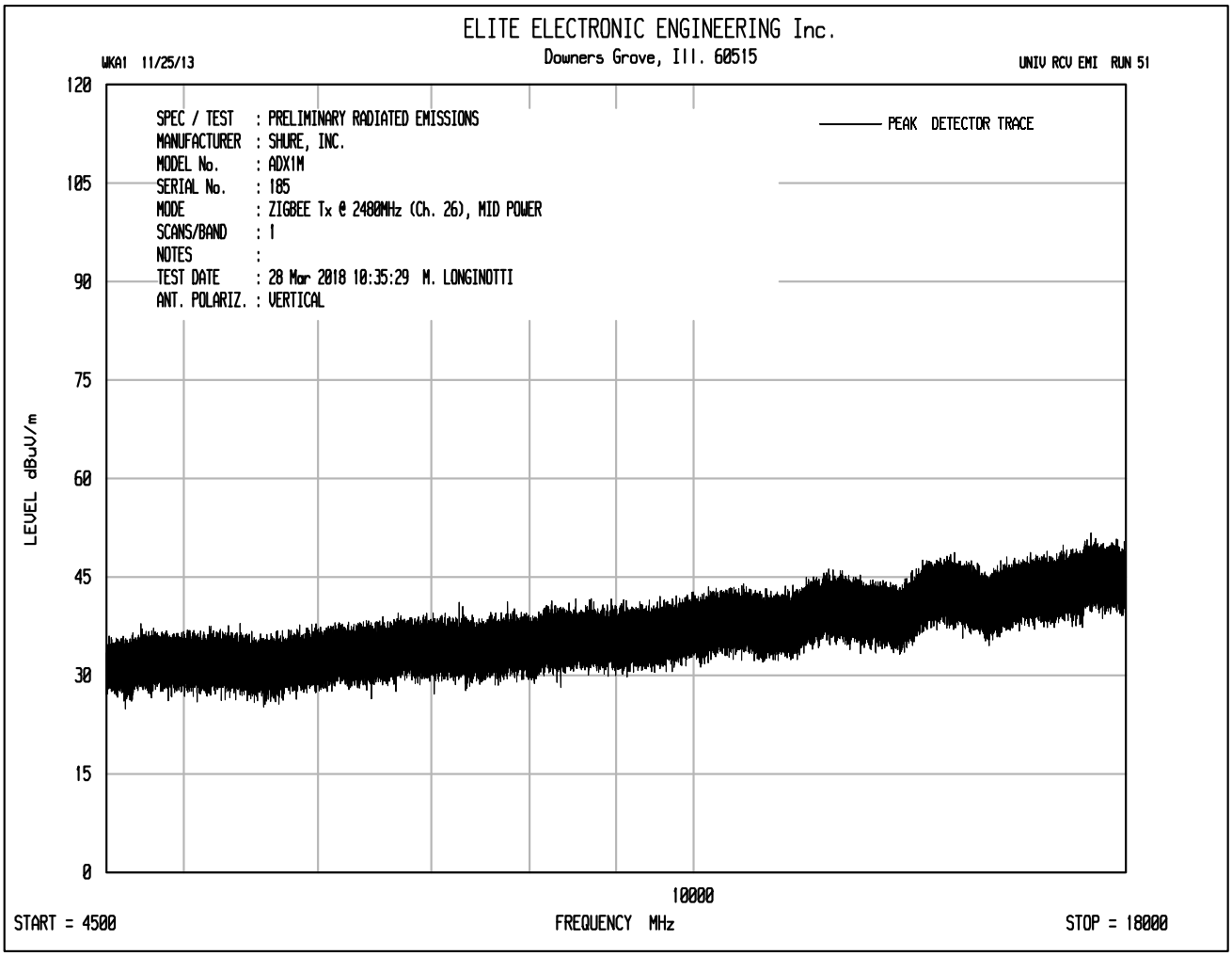

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 13
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : SHURE, INC.
MODEL No. : ADX1M
SERIAL No. : 185
MODE : Tx @ 2480MHz (Ch. 26), MID POWER
SCANS/BAND : 1
NOTES :
TEST DATE : 26 Mar 2018 14:26:28 M. LONGINOTTI
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

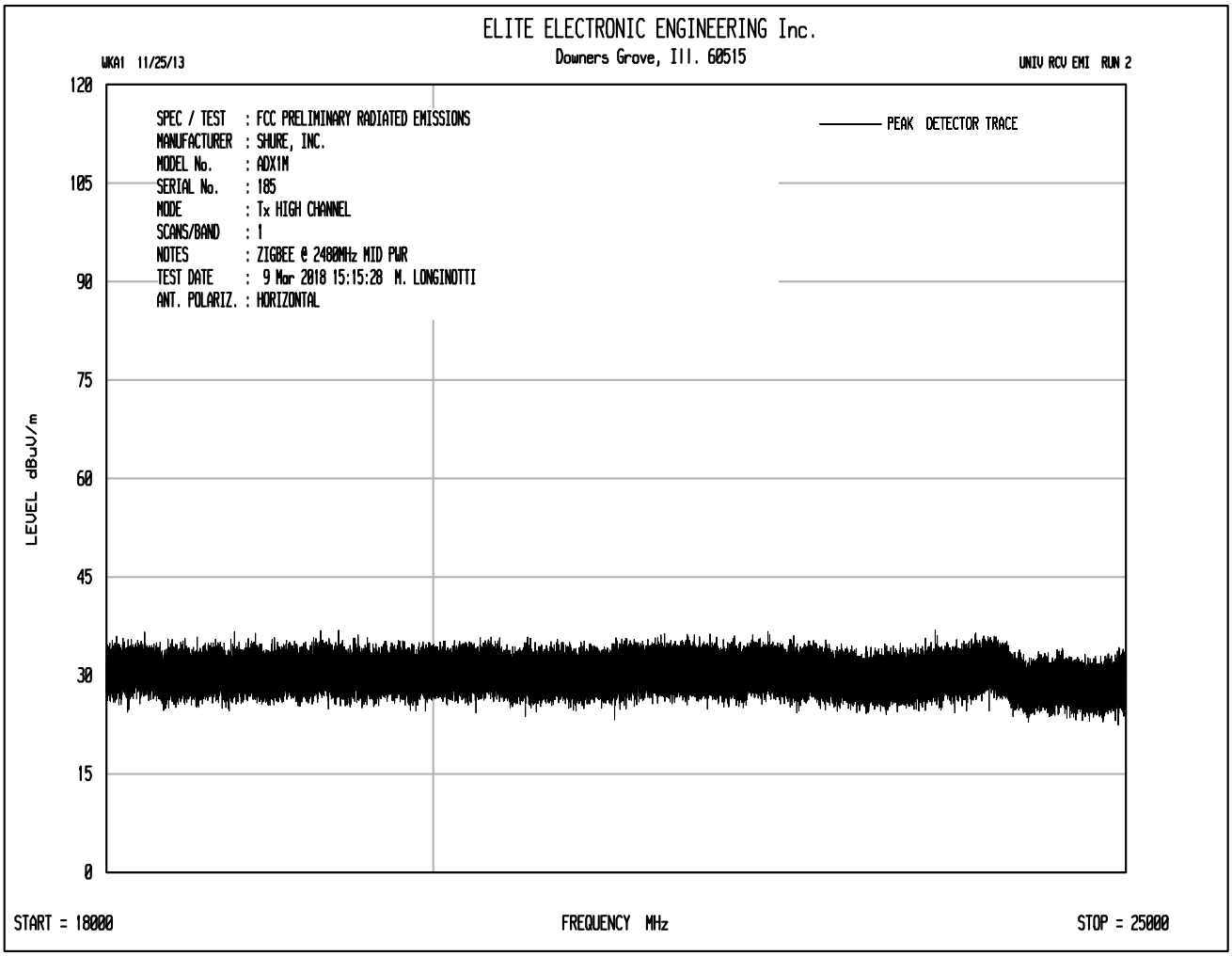

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 14
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : SHURE, INC.
MODEL No. : ADX1M
SERIAL No. : 185
MODE : Tx @ 2480MHz (Ch. 26), MID POWER
SCANS/BAND : 1
NOTES :
TEST DATE : 26 Mar 2018 14:29:43 M. LONGINOTTI
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

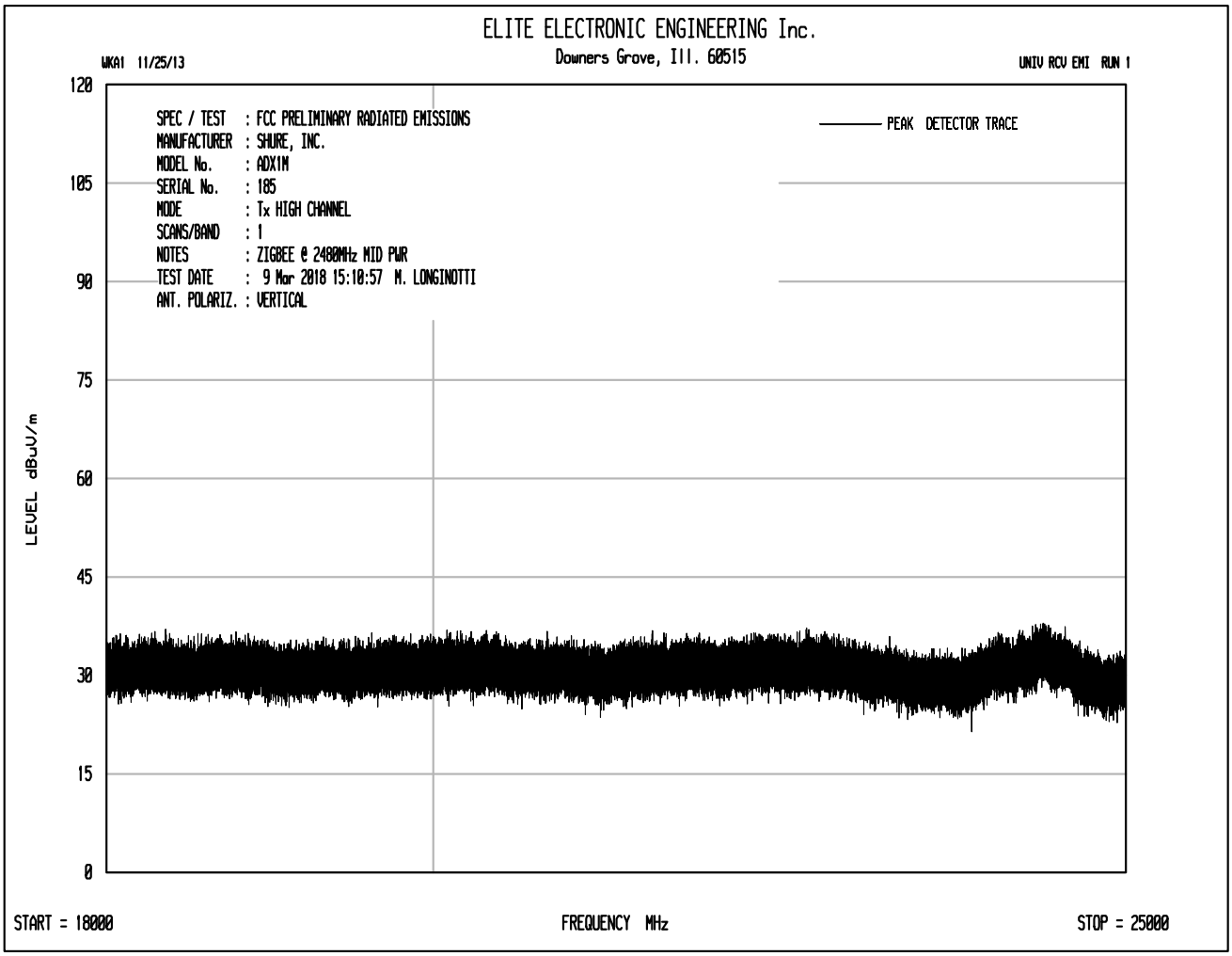

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 53
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : SHURE, INC.
MODEL No. : ADX1M
SERIAL No. : 185
MODE : ZIGBEE Tx @ 2480MHz (Ch. 26), MID POWER
SCANS/BAND : 1
NOTES :
TEST DATE : 28 Mar 2018 10:54:46 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 52
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : SHURE, INC.
MODEL No. : ADX1M
SERIAL No. : 185
MODE : ZIGBEE Tx @ 2480MHz (Ch. 26), MID POWER
SCANS/BAND : 1
NOTES :
TEST DATE : 28 Mar 2018 10:48:44 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 4500


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 50
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : SHURE, INC.
MODEL No. : ADX1M
SERIAL No. : 185
MODE : ZIGBEE Tx @ 2480MHz (Ch. 26), MID POWER
SCANS/BAND : 1
NOTES :
TEST DATE : 28 Mar 2018 10:28:06 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 4500
FREQUENCY MHz
STOP = 18000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 51
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : SHURE, INC.
MODEL No. : ADX1M
SERIAL No. : 185
MODE : ZIGBEE Tx @ 2480MHz (Ch. 26), MID POWER
SCANS/BAND : 1
NOTES :
TEST DATE : 28 Mar 2018 10:35:29 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
10000
START = 4500
FREQUENCY MHz
STOP = 18000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 2
SPEC / TEST : FCC PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : SHURE, INC.
MODEL No. : ADX1M
SERIAL No. : 185
MODE : Tx HIGH CHANNEL
SCANS/BAND : 1
NOTES : ZIGBEE @ 2480MHz MID PWR
TEST DATE : 9 Mar 2018 15:15:28 M. LONGINOTTI
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
WKA1 11/25/13
UNIV RCV EMI RUN 1
SPEC / TEST : FCC PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : SHURE, INC.
MODEL No. : ADX1M
SERIAL No. : 185
MODE : Tx HIGH CHANNEL
SCANS/BAND : 1
NOTES : ZIGBEE @ 2480MHz MID PWR
TEST DATE : 9 Mar 2018 15:10:57 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000

Manufacturer : Shure Incorporated
Test Item : Micro Bodypack Transmitter
Model No. : ADX1M
Serial No. : 185
Mode : Transmit at 2480MHz (Ch. 26), Mid Power, Antenna B
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions in Restricted Bands
Date : February 8, 2018 through March 29, 2018
Test Distance : 3 meters
Notes : Peak Detector with 1MHz Resolution Bandwidth

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	51.0	Ambient	3.7	36.5	-39.5	51.8	388.3	5000.0	-22.2
4960.00	V	50.2	Ambient	3.7	36.5	-39.5	51.0	354.2	5000.0	-23.0
7440.00	H	50.3	Ambient	4.7	38.1	-39.8	53.3	464.6	5000.0	-20.6
7440.00	V	50.4	Ambient	4.7	38.1	-39.8	53.4	470.0	5000.0	-20.5
12400.00	H	49.6	Ambient	6.1	41.5	-39.4	57.8	774.4	5000.0	-16.2
12400.00	V	50.0	Ambient	6.1	41.5	-39.4	58.2	810.9	5000.0	-15.8
19840.00	H	33.9	Ambient	2.2	40.4	-28.4	48.1	255.4	5000.0	-25.8
19840.00	V	34.2	Ambient	2.2	40.4	-28.4	48.4	264.3	5000.0	-25.5
22320.00	H	35.2	Ambient	2.2	40.6	-29.3	48.7	272.8	5000.0	-25.3
22320.00	V	34.7	Ambient	2.2	40.6	-29.3	48.2	257.6	5000.0	-25.8

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

Checked By: Mark E. Longinotti

Mark E. Longinotti

Manufacturer : Shure Incorporated
Test Item : Micro Bodypack Transmitter
Model No. : ADX1M
Serial No. : 185
Mode : Transmit at 2480MHz (Ch. 26), Mid Power, Antenna B
Test Specification : FCC-15.247, RSS-247 Average Radiated Emissions in Restricted Bands
Date : February 8, 2018 through March 29, 2018
Test Distance : 3 meters
Notes : Average Detector with 1MHz Resolution Bandwidth

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	34.7	Ambient	3.7	36.5	0.0	35.5	59.5	500.0	-18.5
4960.00	V	34.8	Ambient	3.7	36.5	0.0	35.6	60.1	500.0	-18.4
7440.00	H	33.70	Ambient	4.7	38.1	0.0	36.7	68.7	500.0	-17.2
7440.00	V	33.8	Ambient	4.7	38.1	0.0	36.8	69.5	500.0	-17.1
12400.00	H	34.5	Ambient	6.1	41.5	0.0	42.7	136.1	500.0	-11.3
12400.00	V	34.5	Ambient	6.1	41.5	0.0	42.7	136.1	500.0	-11.3
19840.00	H	20.0	Ambient	2.2	40.4	0.0	34.2	51.5	500.0	-19.7
19840.00	V	19.8	Ambient	2.2	40.4	0.0	34.0	50.4	500.0	-19.9
22320.00	H	20.8	Ambient	2.2	40.6	0.0	34.3	52.0	500.0	-19.7
22320.00	V	20.7	Ambient	2.2	40.6	0.0	34.2	51.4	500.0	-19.8

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

Checked By: MARK E. LONGINOTTI
Mark E. Longinotti

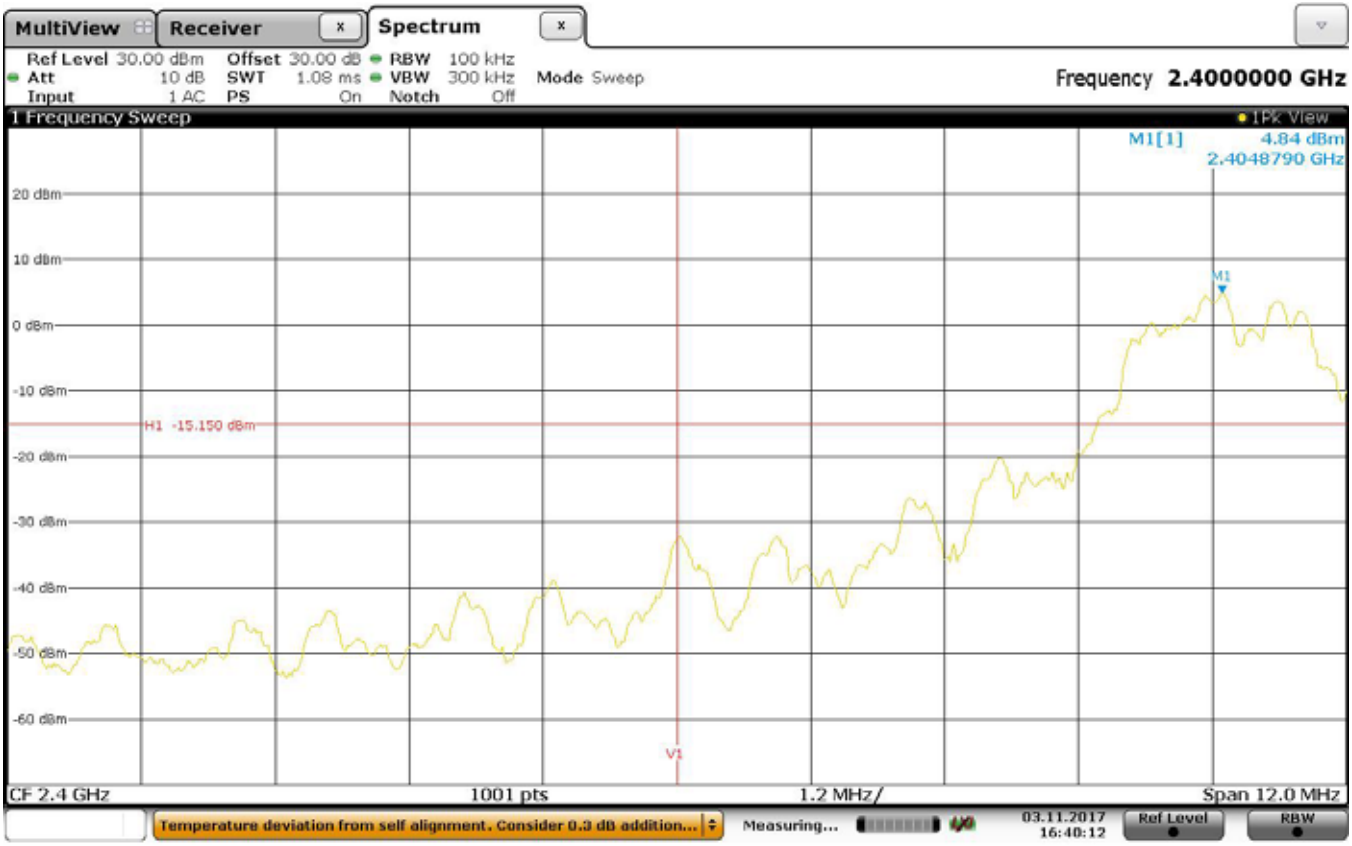
Manufacturer : Shure Incorporated
Test Item : Micro Bodypack Transmitter
Model No. : ADX1M
Serial No. : 185
Mode : Transmit at 2480MHz (Ch. 26), Mid Power, Antenna B
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions not in Restricted Bands
Date : February 8, 2018 through March 29, 2018
Test Distance : 3 meters
Notes : Peak Detector with 100kHz Resolution Bandwidth

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)
2480.00	H	61.1		2.7	32.2	0.0	96.0	62739.6		
2480.00	V	58.0		2.7	32.2	0.0	92.9	43907.8		
9920.00	H	36.9	Ambient	5.3	39.8	-39.6	42.4	131.5	6274.0	-33.6
9920.00	V	36.6	Ambient	5.3	39.8	-39.6	42.1	127.1	6274.0	-33.9
14880.00	H	38.3	Ambient	6.8	42.2	-38.9	48.4	263.1	6274.0	-27.5
14880.00	V	38.6	Ambient	6.8	42.2	-38.9	48.7	272.4	6274.0	-27.2
17360.00	H	40.0	Ambient	7.4	44.8	-38.7	53.4	468.6	6274.0	-22.5
17360.00	V	39.6	Ambient	7.4	44.8	-38.7	53.0	447.5	6274.0	-22.9
24800.00	H	23.6	Ambient	2.2	40.6	-31.2	35.3	58.0	6274.0	-40.7
24800.00	V	23.6	Ambient	2.2	40.6	-31.2	35.3	58.0	6274.0	-40.7

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

Checked By: Mark E. Longinotti

Mark E. Longinotti



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FCC 15.247 Low Frequency Band Edge Compliance

MANUFACTURER	:	Shure Incorporated
MODEL NUMBER	:	ADX1M
SERIAL NUMBER	:	186
TEST MODE	:	Transmit at 2405MHz (Ch. 11), Mid Power
NOTES	:	The trace represents the highest power measured inside the band with a 100kHz
	:	bandwidth. The red lines represents the 20dB down level from the peak in a
	:	100kHz bandwidth and the low frequency band edge.
TEST DATE	:	November 3, 2017
EQUIPMENT USED	:	RBG0, T2DG, T1E5

Manufacturer : Shure Incorporated
Test Item : Micro Bodypack Transmitter
Model No. : ADX1M
Serial No. : 185
Mode : Transmit at 2480MHz (Ch. 26), Mid Power, Antenna A
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions at High Band Edge
Date : February 8, 2018
Test Distance : 3 meters
Notes : Peak Detector with 1MHz Resolution Bandwidth

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	28.1		3.5	32.2	0.0	63.8	1549.1	5000.0	-10.2
2483.50	V	30.6		3.5	32.2	0.0	66.3	2065.8	5000.0	-7.7

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

Checked By: MARK E. LONGINOTTI
Mark E. Longinotti

Manufacturer : Shure Incorporated
Test Item : Micro Bodypack Transmitter
Model No. : ADX1M
Serial No. : 185
Mode : Transmit at 2480MHz (Ch. 26), Mid Power Antenna A
Test Specification : FCC-15.247, RSS-247 Average Radiated Emissions at High Band Edge
Date : February 8, 2018
Test Distance : 3 meters
Notes : Average Detector with 1MHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Duty Cycle (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	15.3		3.5	32.2	-38.3	12.7	4.3	500.0	-41.3
2483.50	V	18.4		3.5	32.2	-38.3	15.8	6.2	500.0	-38.2

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Duty Cycle

Checked By: MARK E. LONGINOTTI

Mark E. Longinotti

Manufacturer : Shure Incorporated
Test Item : Micro Bodypack Transmitter
Model No. : ADX1M
Serial No. : 185
Mode : Transmit at 2480MHz (Ch. 26), Mid Power, Antenna B
Test Specification : FCC-15.247, RSS-247 Peak Radiated Emissions at High Band Edge
Date : February 8, 2018
Test Distance : 3 meters
Notes : Peak Detector with 1MHz Resolution Bandwidth

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	34.8		2.7	32.2	0.0	69.7	3041.2	5000.0	-4.3
2483.50	V	31.8		2.7	32.2	0.0	66.7	2153.0	5000.0	-7.3

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

Checked By: MARK E. LONGINOTTI
Mark E. Longinotti

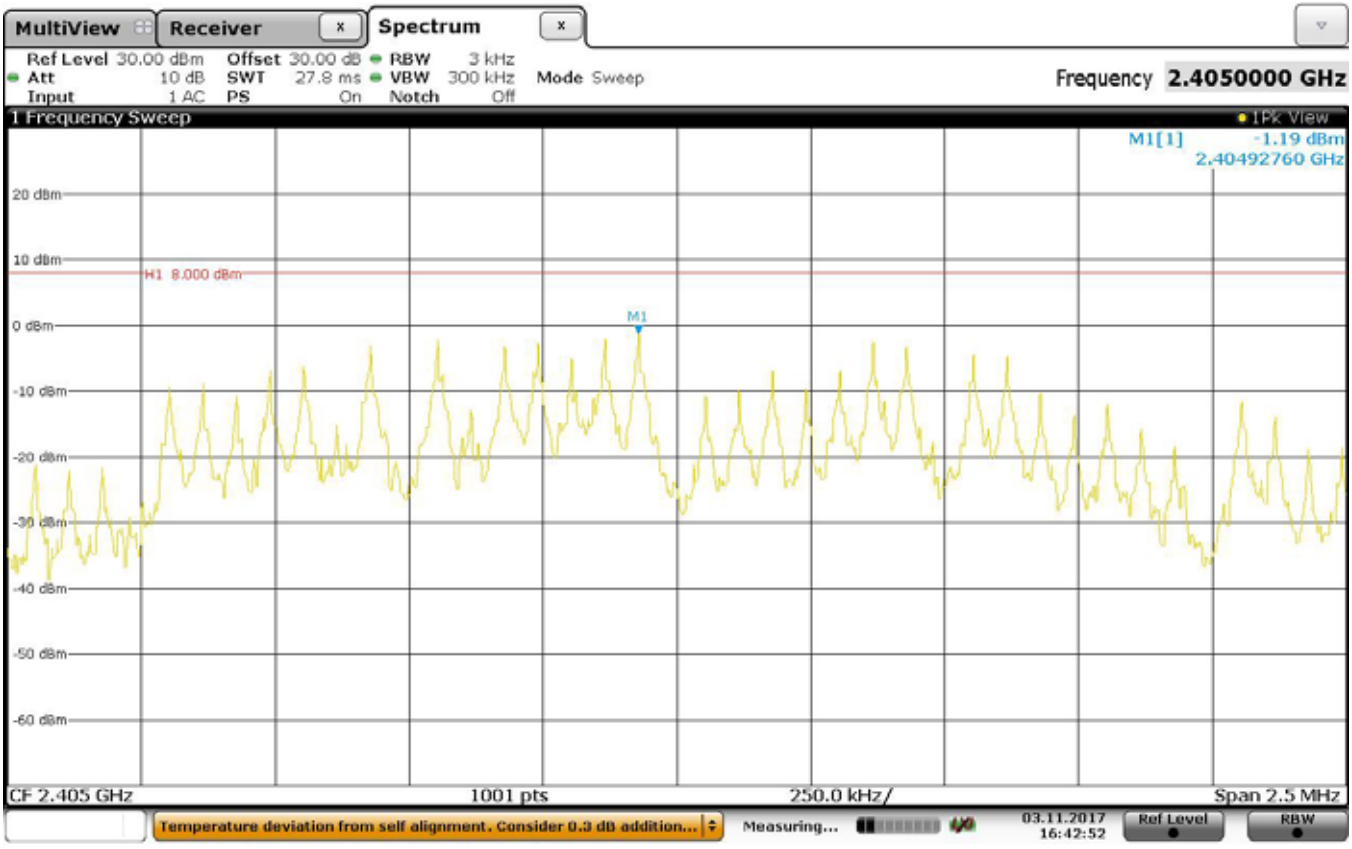
Manufacturer : Shure Incorporated
Test Item : Micro Bodypack Transmitter
Model No. : ADX1M
Serial No. : 185
Mode : Transmit at 2480MHz (Ch. 26), Mid Power Antenna B
Test Specification : FCC-15.247, RSS-247 Average Radiated Emissions at High Band Edge
Date : February 8, 2018
Test Distance : 3 meters
Notes : Average Detector with 1MHz Resolution Bandwidth

Freq. MHz	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Duty Cycle (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	21.7		2.7	32.2	-38.3	18.3	8.2	500.0	-35.7
2483.50	V	19.6		2.7	32.2	-38.3	16.2	6.4	500.0	-37.8

Total (dBuV/m) = Meter Reading + CBL FAC + Ant Fac + Duty Cycle

Checked By: MARK E. LONGINOTTI

Mark E. Longinotti



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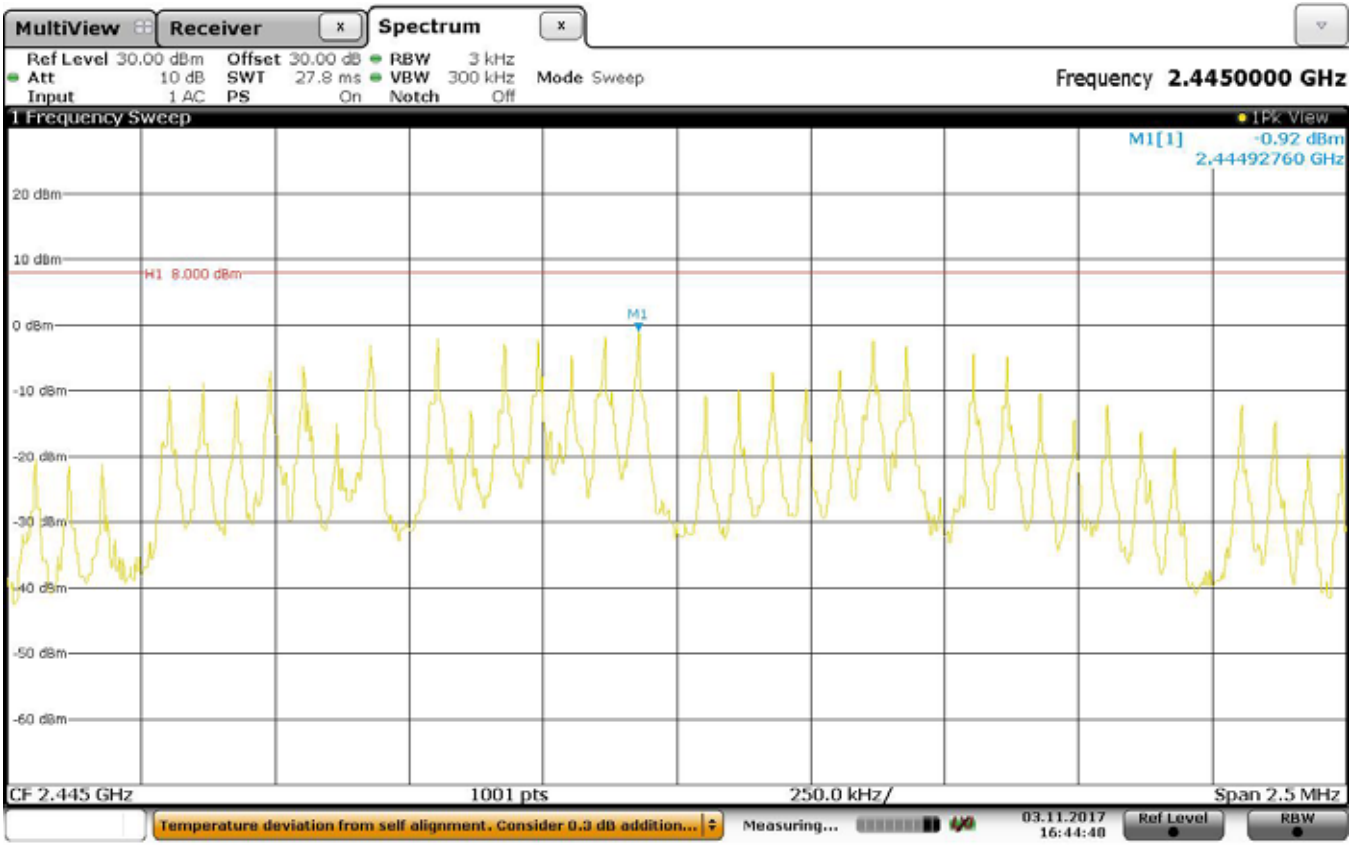
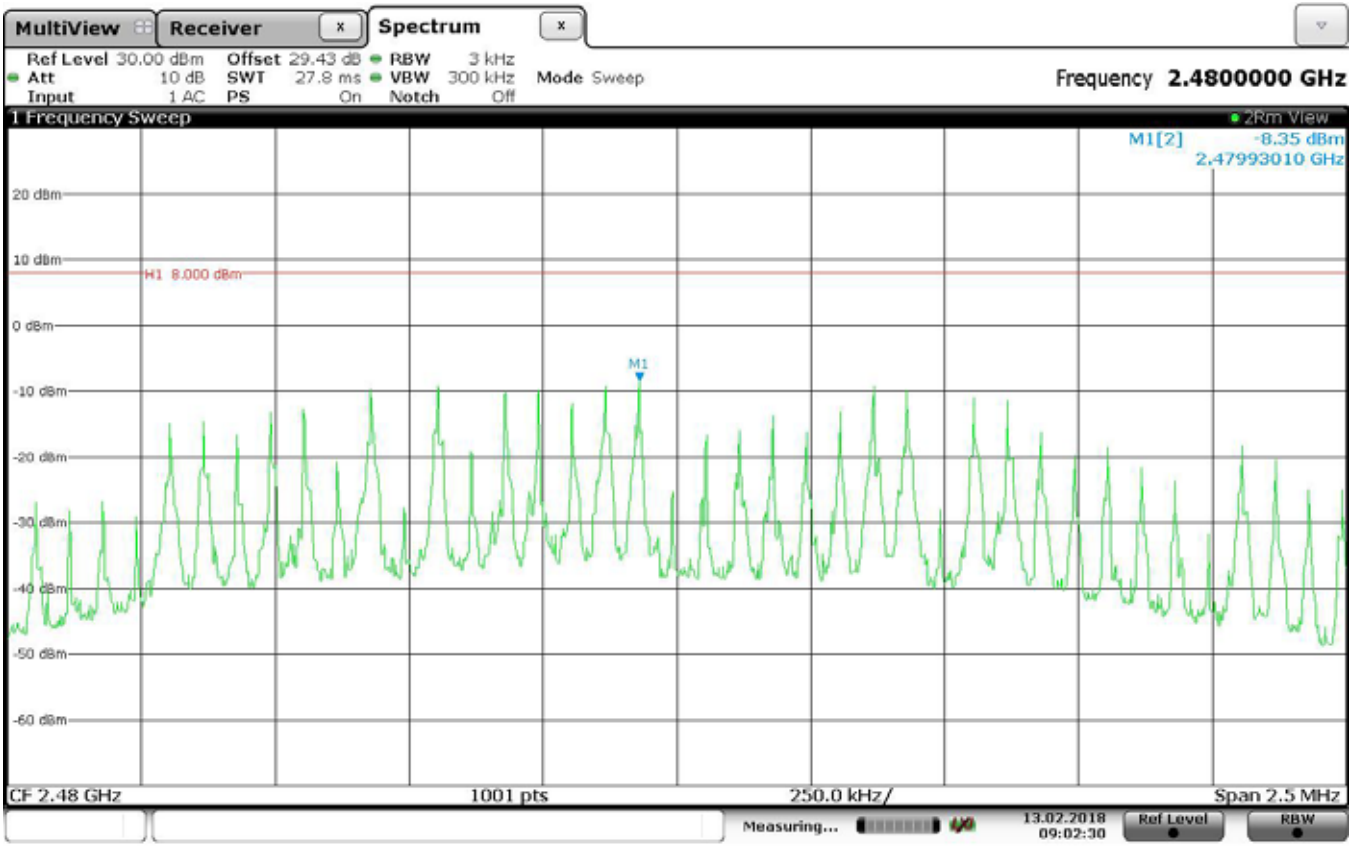
FCC 15.247 Power Spectral Density

MANUFACTURER	:	Shure Incorporated
MODEL NUMBER	:	ADX1M
SERIAL NUMBER	:	186
TEST MODE	:	Transmit at 2405MHz (Ch. 11), Mid Power, Antenna A
NOTES	:	Peak Power Spectral Density = -1.19 dBm in a 3kHz RBW
TEST DATE	:	November 3, 2017
EQUIPMENT USED	:	RBG0, T2DG, T1E5



FCC 15.247 Power Spectral Density

MANUFACTURER	:	Shure Incorporated
MODEL NUMBER	:	ADX1M
SERIAL NUMBER	:	186
TEST MODE	:	Transmit at 2445MHz (Ch. 19), Mid Power, Antenna A
NOTES	:	Peak Power Spectral Density = -0.92 dBm in a 3kHz RBW
TEST DATE	:	November 3, 2017
EQUIPMENT USED	:	RBG0, T2DG, T1E5



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FCC 15.247 Power Spectral Density

MANUFACTURER	:	Shure Incorporated
MODEL NUMBER	:	ADX1M
SERIAL NUMBER	:	186
TEST MODE	:	Transmit at 2480MHz (Ch. 26), Mid Power, Antenna A
NOTES	:	Peak Power Spectral Density = -8.35 dBm in a 3kHz RBW
TEST DATE	:	November 1, 2017
EQUIPMENT USED	:	RBG0, T2DG, T1E5