



Measurement of RF Emissions from a Bodypack Transmitter Model No. QLXD1

For Shure, Inc.
5800 West Touhy Avenue
Niles, IL 60714

P.O. Number 4500292783
Date Tested April 6, 2015 through April 10, 2015
Test Personnel Mark Longinotti
Test Specification FCC "Code of Federal Regulations" Title 47, Part 15,
Subpart C, Section 15.247 for Digital
Modulation Intentional Radiators Operating within
the band 902-928MHz
Industry Canada RSS-GEN
Industry Canada RSS-210

Test Report By: *MARK E. LONGINOTTI*
Mark Longinotti
EMC Engineer

Requested By: Alex Stelmaszczyk
Shure, Inc.

Approved By: *Raymond J. Klouda*
Raymond J. Klouda
Registered Professional
Engineer of Illinois - 44894

Elite Electronic Engineering Inc.

1516 CENTRE CIRCLE
DOWNERS GROVE, IL 60515

TEL: 630 - 495 - 9770
FAX: 630 - 495 - 9785

www.elitelest.com

PARAGRAPH	DESCRIPTION OF CONTENTS	PAGE NO.
1.	Introduction.....	5
1.1.	Scope of Tests.....	5
1.2.	Purpose	5
1.3.	Deviations, Additions and Exclusions.....	5
1.4.	EMC Laboratory Identification	5
1.5.	Laboratory Conditions.....	5
2.	Applicable Documents.....	5
3.	EUT Setup and Operation	6
3.1.	General Description	6
3.1.1.	Power Input.....	6
3.1.2.	Peripheral Equipment	6
3.1.3.	Signal Input/Output Leads	6
3.1.4.	Grounding	6
3.2.	Operational Mode	6
3.3.	EUT Modifications.....	6
4.	Test Facility and Test Instrumentation	6
4.1.	Shielded Enclosure.....	6
4.2.	Test Instrumentation.....	7
4.3.	Calibration Traceability	7
4.4.	Measurement Uncertainty	7
5.	Test Procedures	7
5.1.	Powerline Conducted Emissions	7
5.1.1.	Requirements.....	7
5.2.	DTS (6dB) Bandwidth.....	7
5.2.1.	Procedures.....	7
5.2.2.	Results	8
5.3.	Peak Conducted Output Power	8
5.3.1.	Requirements.....	8
5.3.2.	Procedures.....	8
5.3.3.	Results	8
5.4.	Antenna Conducted Spurious Emissions	8
5.4.1.	Requirements.....	8
5.4.2.	Procedures.....	9
5.4.3.	Results	9
5.5.	Radiated Spurious Emissions Measurements.....	9
5.5.1.	Requirements.....	9
5.5.2.	Procedures.....	9
5.5.3.	Results	10
5.6.	Band Edge Compliance	10
5.6.1.	Requirement.....	10

THIS REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT THE WRITTEN APPROVAL OF ELITE ELECTRONIC ENGINEERING INCORPORATED.



PARAGRAPH	DESCRIPTION OF CONTENTS	PAGE NO.
5.6.2.	Procedures.....	10
5.10.2.1	Low Band Edge	10
5.10.2.2	High Band Edge.....	10
5.6.3.	Results	11
5.7.	Power Spectral Density	11
5.7.1.	Requirements.....	11
5.7.2.	Procedures.....	11
5.7.3.	Results	11
6.	Other Test Conditions	12
6.1.	Test Personnel and Witnesses	12
6.2.	Disposition of the EUT	12
7.	Conclusions	12
8.	Certification.....	12
9.	Equipment List.....	13

THIS REPORT SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT THE
WRITTEN APPROVAL OF ELITE ELECTRONIC ENGINEERING INCORPORATED.

REVISION HISTORY

Revision	Date	Description
—	08 June 2015	Initial release

Measurement of RF Emissions from a Bodypack Transmitter, Model No. QLXD1

1. INTRODUCTION

1.1. Scope of Tests

This report represents the results of the series of radio interference measurements performed on a Shure, Inc. Bodypack Transmitter, Model No. QLXD1, Serial No. None Assigned, (hereinafter referred to as the EUT). The EUT is a digital modulation transmitter. The transmitter was designed to transmit in the 902-928 MHz band using an external, removable whip antenna. The EUT was manufactured and submitted for testing by Shure, Inc. located in Niles, 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. Testing was performed in accordance with ANSI C63.4-2009.

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 8.8 and the radiated RF emission requirements of the Industry Canada Radio Standards Specification, RSS-210, 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 21°C and the relative humidity was 21%.

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 2014
- ANSI C63.4-2009, "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 C63.4-2014, "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"
- 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, June 5, 2014

- Industry Canada Radio Standards Specification, RSS-Gen, "General Requirements and Information for the Certification of Radiocommunication Equipment", Issue 4, November 2014
- Industry Canada Radio Standards Specification, RSS-210, "Low-power License-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment", Issue 8, December 2010, with Amendment 1, February 2015

3. EUT SETUP AND OPERATION

3.1. General Description

The EUT is a Shure, Inc., Bodypack Transmitter, Model No. QLXD1. A block diagram of the EUT setup is shown as Figure 1. A photograph of the EUT is shown as Figure 2.

3.1.1. Power Input

The EUT was powered with 3VDC from 2 each internal "AA" batteries.

3.1.2. Peripheral Equipment

The microphone port of the EUT was terminated with a Shure WL93 Lavalier Microphone.

3.1.3. Signal Input/Output Leads

The Shure WL93 Lavalier Microphone was connected to the microphone port of the EUT via a 1.2 meter long, 4 conductor cable.

3.1.4. Grounding

The EUT was not grounded during testing.

3.2. Software

For all tests the EUT had Software Package 1.1.9 loaded onto the device to provide correct load characteristics.

3.3. Operational Mode

All emissions tests were performed separately in the following modes:

Transmit at 902.4MHz, low power
Transmit at 915MHz, low power
Transmit at 927.6MHz, low power
Transmit at 902.4MHz, high power
Transmit at 915MHz, high power
Transmit at 927.6MHz, hi power

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 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 in the requirements.

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. Powerline Conducted Emissions

5.1.1. Requirements

Since the EUT was powered by internal batteries and has no connection for AC power, conducted emission measurements are not required.

5.2. DTS (6dB) Bandwidth

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

5.2.1. Procedures

The output 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 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.

5.2.2.Results

The plots on pages 18 through 23 show that the minimum 6 dB bandwidth was 565kHz which is greater than minimum allowable 6dB bandwidth requirement of 500kHz for systems using digital modulation techniques. The 99% bandwidth was measured to be 521kHz.

5.3. Peak Conducted Output Power

5.3.1.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).

5.3.2.Procedures

The output 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.

5.3.3.Results

The results are presented on page 24. The maximum peak conducted output power from the transmitter was 25.17mW (14.01 dBm) which is below the 1 Watt limit.

5.4. Effective Isotropic Radiated Power (EIRP)

5.4.1.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).

5.4.2.Procedures

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

The equivalent power was determined from the field intensity levels measured at 3 meters using the substitution method. To determine the emission power, a dipole antenna was then set in place of the EUT and connected to a calibrated signal generator. The output of the signal generator was adjusted to match the received level at the spectrum analyzer. The signal level was recorded. The reading was then corrected to compensate for cable loss as required. The peak power output was calculated for low, middle, and high hopping frequencies.

5.4.3.Results

The results are presented on pages 25 through 30. The maximum EIRP measured from the transmitter was 14.1dBm or 25.7mW which is below the 4 Watt limit.

5.5. Antenna Conducted Spurious Emissions

5.5.1.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.

5.5.2.Procedures

The output of the EUT was connected to the spectrum analyzer through 30dB 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 10GHz were observed and plotted separately with the EUT transmitting at low, middle and high channels.

5.5.3.Results

The results of the antenna conducted emissions levels were plotted. These plots are presented on pages 31 through 36. These plots show that the spurious emissions were at least 20 dB below the level of the fundamental.

5.6. Radiated Spurious Emissions Measurements

5.6.1.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

5.6.2.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 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 10.0GHz was investigated using a peak detector function.

The final open field emission tests were then manually performed over the frequency range of 30MHz to 10.0GHz.

- 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.

5.6.3.Results

Preliminary radiated emissions plots with the EUT transmitting at 902.4MHz, 915MHz, and 927.6MHz are shown on pages 37 through 60. Final radiated emissions data are presented on data pages 61 through 72. As can be seen from the data, all emissions measured from the EUT were within the specification limits. The emissions level closest to the limit (worst case) occurred at 3710.4MHz. The emissions level at this frequency was 14.9dB within the limit. Photographs of the test configuration which yielded the highest or worst case, radiated emission levels are shown on Figure 3 and Figure 4.

5.7. Band Edge Compliance

5.7.1.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.

5.7.2.Procedures

5.10.2.1 Low Band Edge

- 1) The output 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) $\geq$ 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.

5.10.2.2 High Band Edge

- 1) The output 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 high band-edge.
- 3) To determine the band edge compliance, the following spectrum analyzer settings were used:
 - a. Center frequency = high band-edge frequency.
 - b. Span = Wide enough to capture 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) $\geq 1\%$ 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 right of the center frequency (band-edge) must be below the display line.)
 - f. The analyzer's display was plotted using a 'screen dump' utility.

5.7.3.Results

Pages 73 through 76 show the conducted band-edge compliance results. As can be seen from these plots, the emissions at the low end band edge and the high end band edge are within the 20 dB down limits.

5.8. Power Spectral Density

5.8.1.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.

5.8.2.Procedures

- 1) The output of the EUT was connected to the spectrum analyzer through 30dB of attenuation.
- 2) The EUT was set to transmit separately at the low, middle, and high channels.
- 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 channel bandwidth
 - c. Resolution bandwidth $3\text{kHz} \leq (\text{RBW}) \leq 100\text{kHz}$
 - d. Video bandwidth (VBW) $\geq 3 \times \text{RBW}$
 - 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 3.

5.8.3.Results

Pages 77 through 82 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.

6. OTHER TEST CONDITIONS

6.1. Test Personnel and Witnesses

All tests were performed by qualified personnel from Elite Electronic Engineering Incorporated.

6.2. Disposition of the EUT

The EUT and all associated equipment were returned to Shure, Inc. upon completion of the tests.

7. CONCLUSIONS

It was determined that the Shure, Inc. Bodypack Transmitter, Model No. QLXD1, digital modulation transmitter, Serial No. None 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 902-928 MHz band when tested per ANSI C63.4-2009.

It was also determined that the Shure, Inc. Bodypack Transmitter, Model No. QLXD1, digital modulation transmitter, Serial No. None Assigned, did fully meet the conducted and radiated RF emission requirements of the Industry Canada Radio Standards Specification, RSS-Gen Section 8.8 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. 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
APW3	PREAMPLIFIER	PLANAR ELECTRONICS	PE2-35-120-5R0-10-12	PL2924	1GHZ-20GHZ	11/3/2014	11/3/2015
CDX8	COMPUTER	ELITE	WORKSTATION			N/A	
GSD3	SIGNAL GENERATOR	ROHDE & SCHWARZ	SMB100A	104454	9KHZ-6GHZ	9/10/2014	9/10/2015
NDQ1	TUNED DIPOLE ANTENNA	EMCO	3121C-DB4	313	400-1000MHZ	4/17/2014	4/17/2016
NTA3	BILOG ANTENNA	TESEQ	6112D	32853	25-1000MHz	3/27/2015	3/27/2016
NWQ1	DOUBLE RIDGED WAVEGUIDE ANTENNA	ETS-LINDGREN	3117	66655	1GHZ-18GHZ	3/11/2014	3/11/2016
RBA0	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB26	100145	20HZ-26.5GHZ	3/3/2015	3/3/2016
RBB0	EMI TEST RECEIVER 20HZ TO 40 GHZ.	ROHDE & SCHWARZ	ESIB40	100250	20 HZ TO 40GHZ	2/13/2015	2/13/2016
SES0	24VDC POWER SUPPLY	P-TRANS	FS-32024-1M	001	18-27VDC	NOTE 1	
T1E4	10DB 25W ATTENUATOR	WEINSCHEL	46-10-43	AV5805	DC-18GHZ	11/17/2014	11/17/2015
T1E5	10DB 25W ATTENUATOR	WEINSCHEL	46-10-34	BG3492	DC-18GHZ	7/21/2014	7/21/2015
T2D8	20DB, 25W ATTENUATOR	WEINSCHEL	46-20-43	AY9247	DC-18GHZ	10/13/2014	10/13/2015
T2SA	20DB 25W ATTENUATOR	WEINSCHEL	46-20-34	CD5015	DC-18GHZ	10/13/2014	10/13/2015
XPQ3	HIGH PASS FILTER	K&L MICROWAVE	4IH30-1804/T10000-0	4	1.8GHZ-10GHZ	10/24/2014	10/24/2015

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.

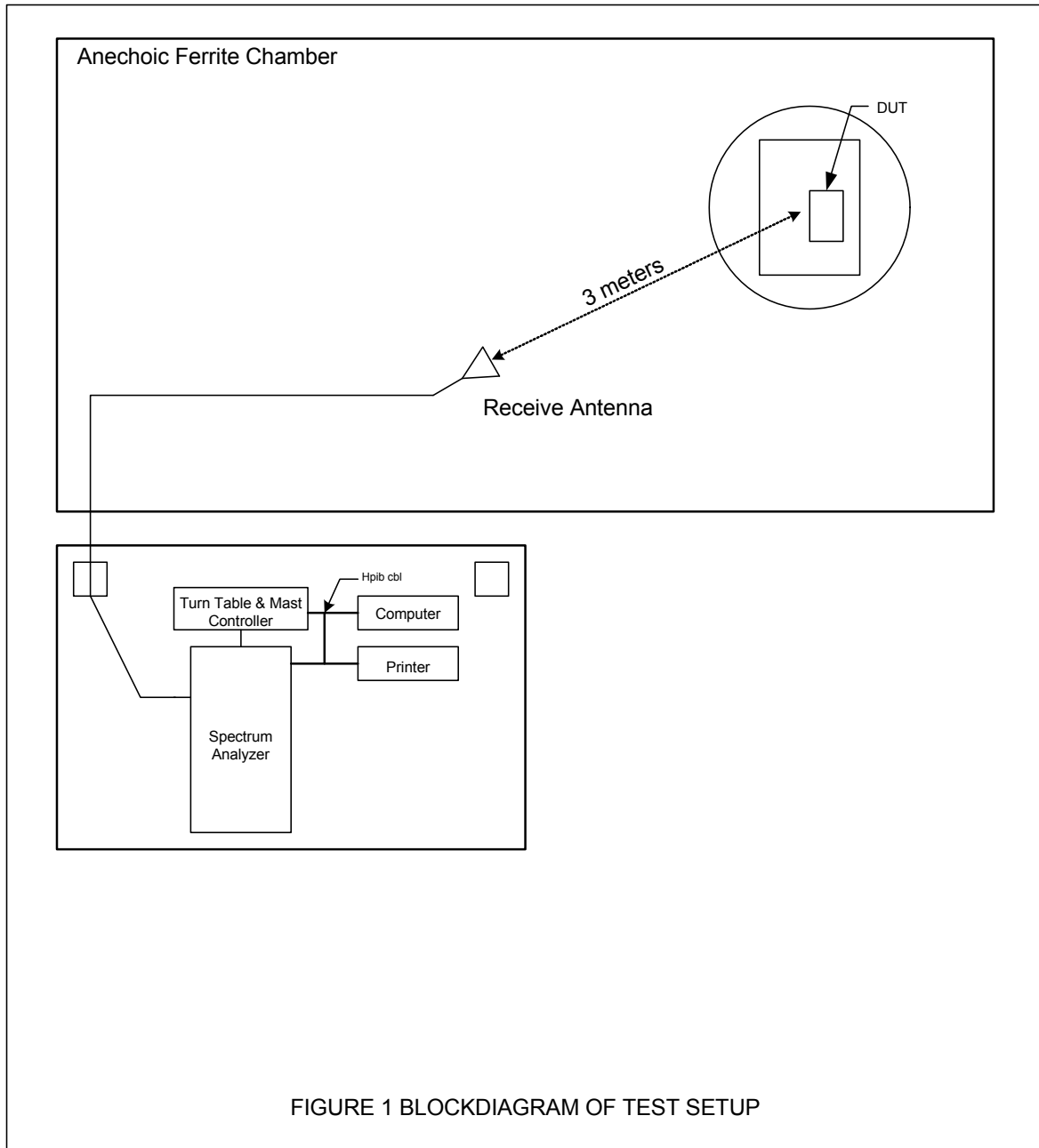


Figure 2



Photograph of EUT

Figure 3



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

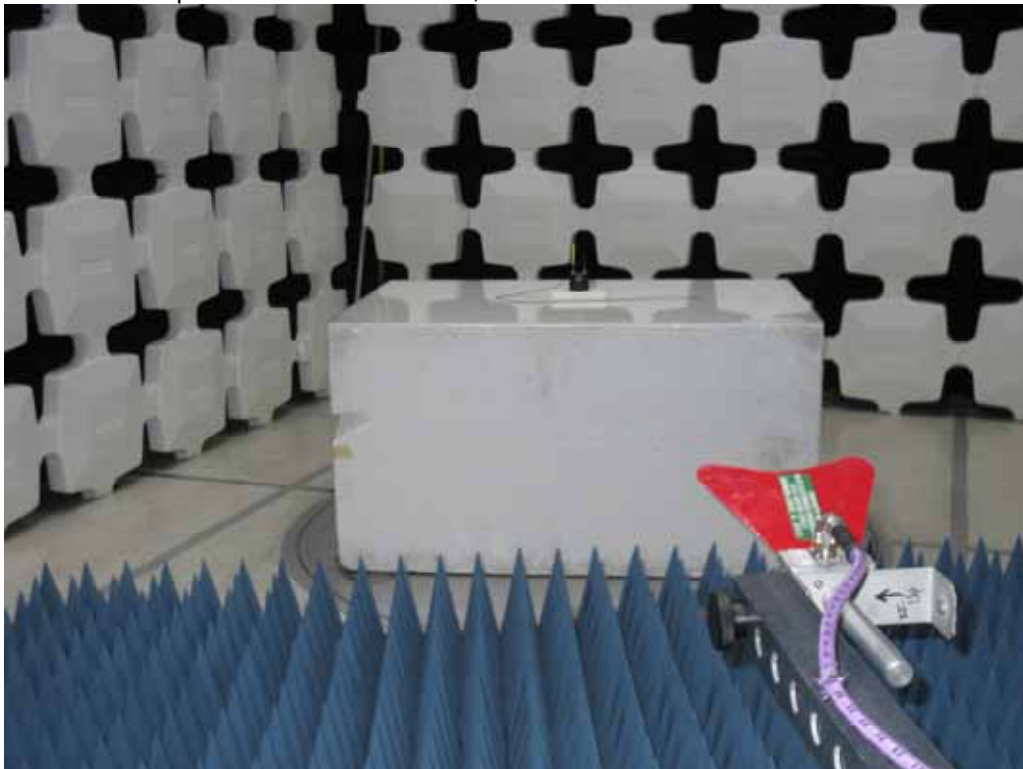


Test Setup for Radiated Emissions, 30MHz to 1GHz – Vertical Polarization

Figure 4



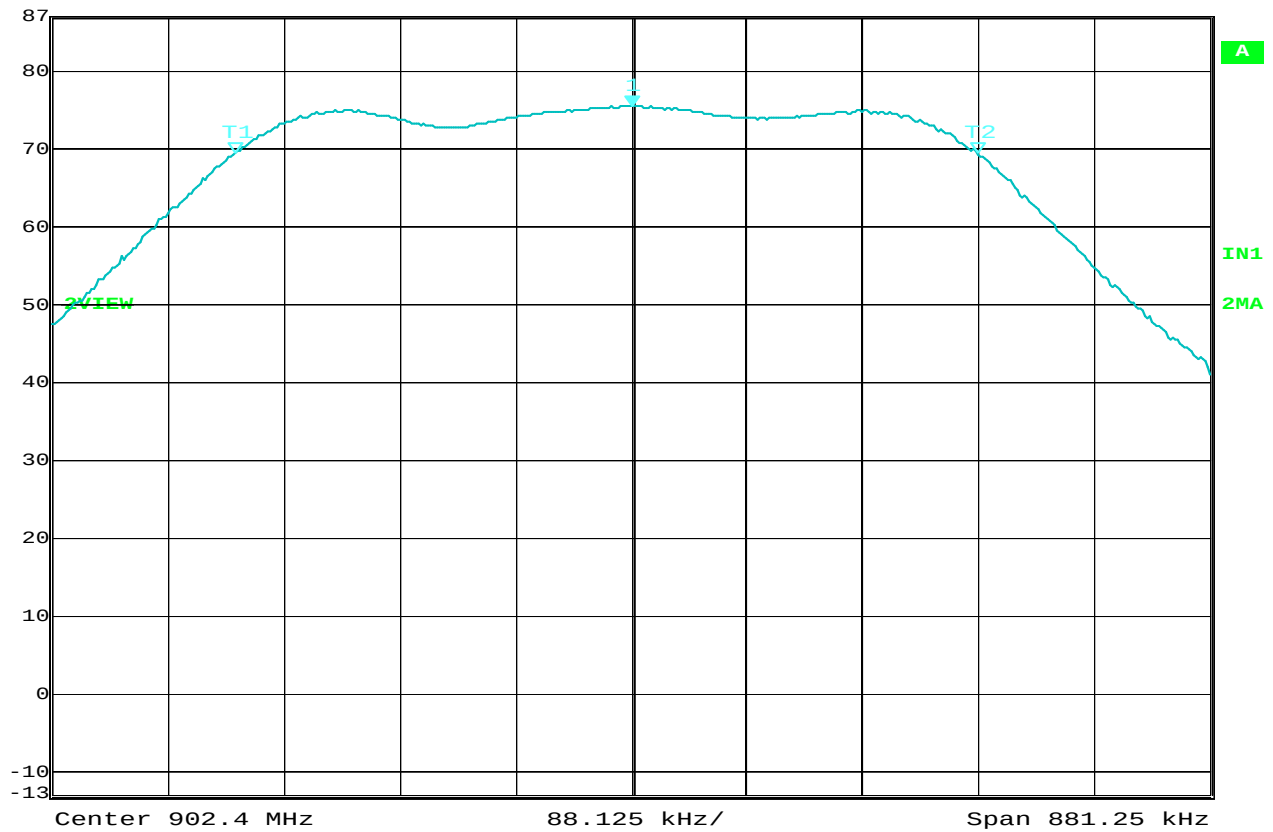
Test Setup for Radiated Emissions, 1GHz to 10GHz – Horizontal Polarization



Test Setup for Radiated Emissions, 1GHz to 10GHz – Vertical Polarization



Ref Lvl 87 dBμV
Marker 1 [T2 ndB] 6.00 dB
BW 565.13026052 kHz
RBW 100 kHz
VBW 300 kHz
SWT 5 ms
RF Att 10 dB
Unit dBμV



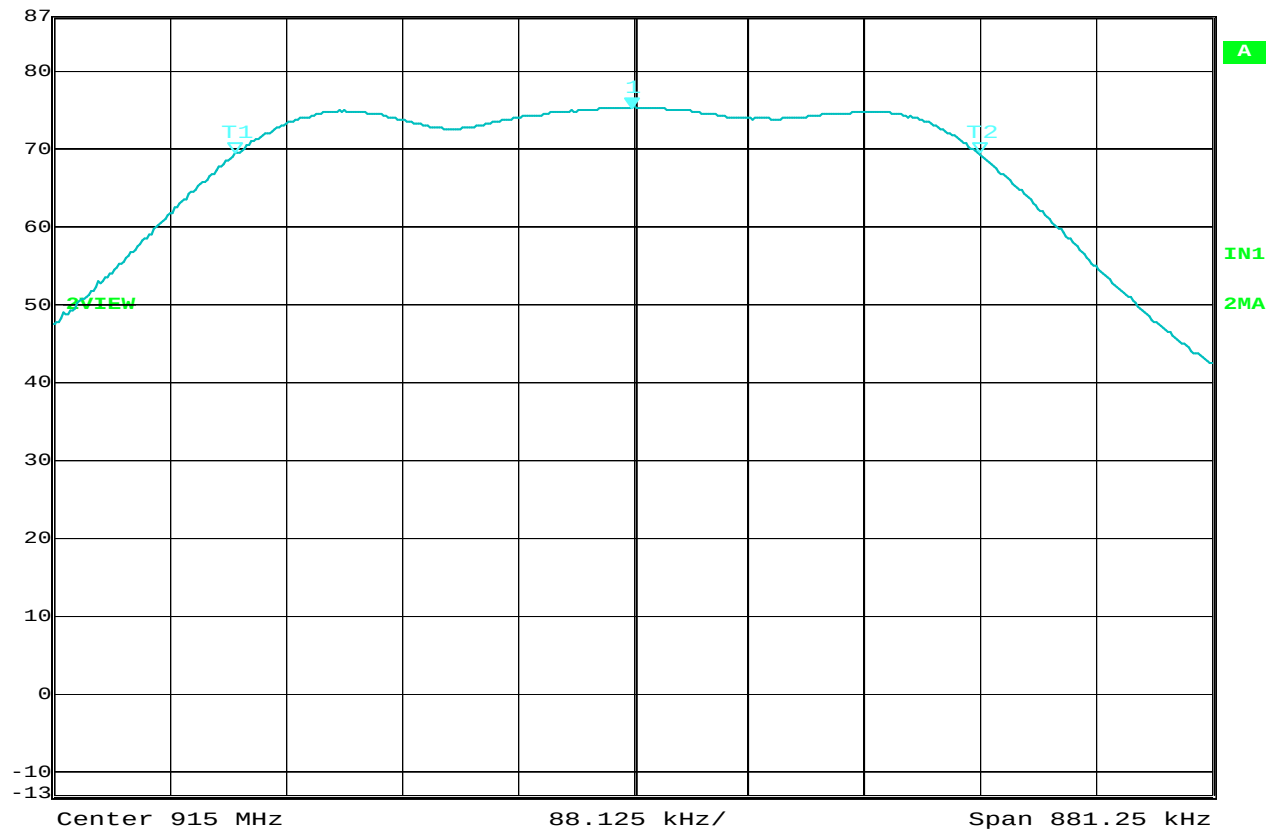
Date: 9.APR.2015 17:00:35

DTS Bandwidth

Manufacturer : Shure
Model No. : QLXD1
Serial No. :
Date : April 9, 2015
Test Performed : DTS Bandwidth
Mode : Tx @ 902.4MHz Low Power
Test Equipment : RBA0, T2D8,T1E5
Notes : 6dB bandwidth = 565.13kHz



Ref Lvl 87 dBμV
Marker 1 [T2 ndB] 6.00 dB
BW 566.89629259 kHz
RBW 100 kHz
VBW 300 kHz
SWT 5 ms
RF Att 10 dB
Unit dBμV



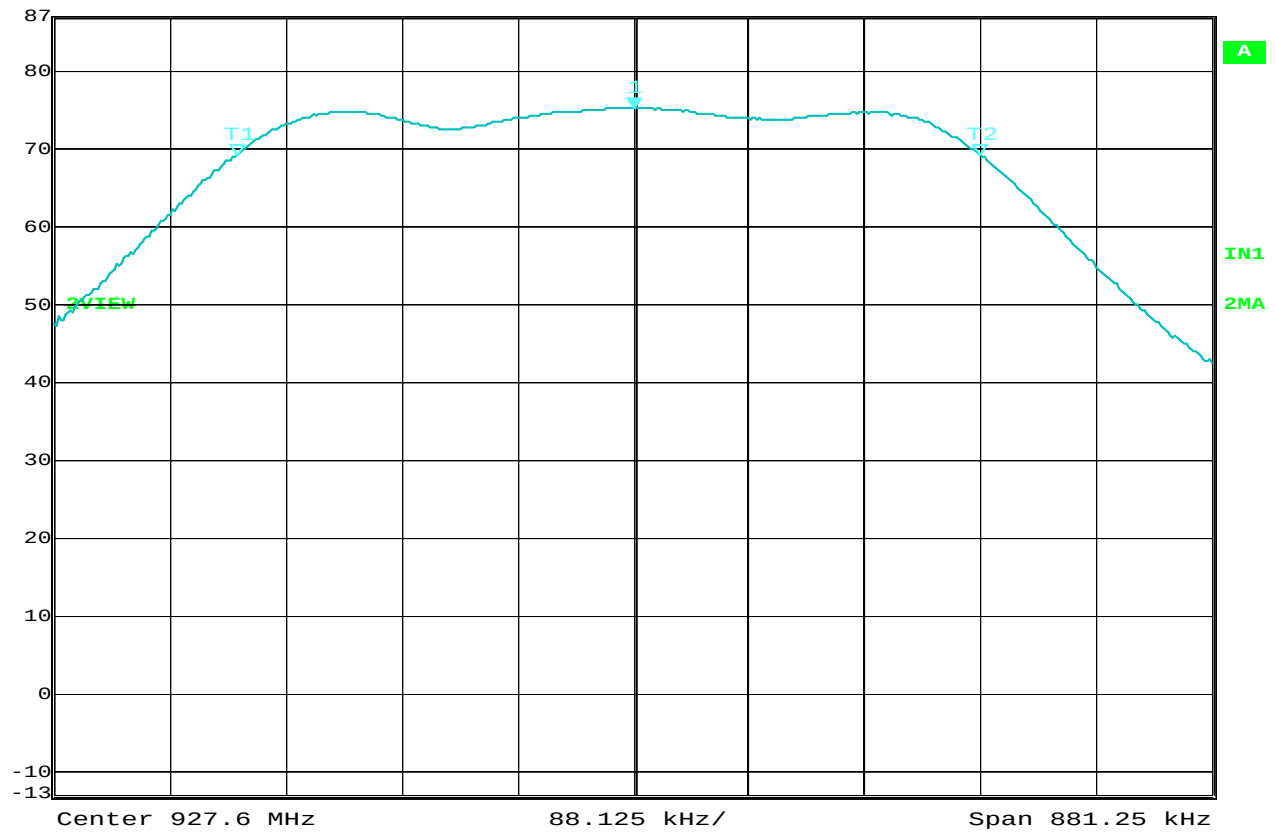
Date: 9.APR.2015 17:06:55

DTS Bandwidth

Manufacturer : Shure
Model No. : QLXD1
Serial No. :
Date : April 9, 2015
Test Performed : DTS Bandwidth
Mode : Tx @ 915MHz Low Power
Test Equipment : RBA0, T2D8, T1E5
Notes : 6dB bandwidth = 566.9kHz



Ref Lvl 87 dBμV
Marker 1 [T2 ndB] 6.00 dB
BW 565.13026052 kHz
RBW 100 kHz
VBW 300 kHz
SWT 5 ms
RF Att 10 dB
Unit dBμV



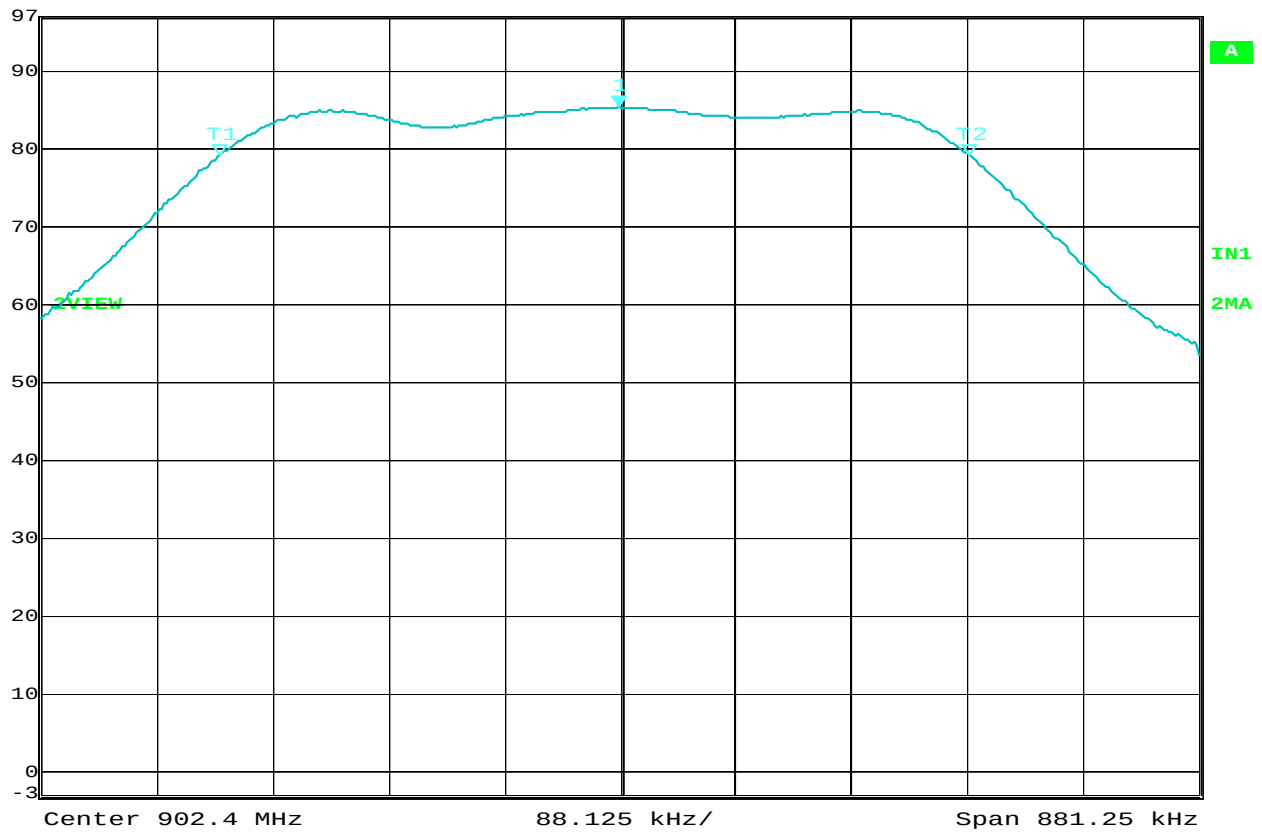
Date: 9.APR.2015 17:09:04

DTS Bandwidth

Manufacturer : Shure
Model No. : QLXD1
Serial No. :
Date : April 9, 2015
Test Performed : DTS Bandwidth
Mode : Tx @ 927.6MHz Low Power
Test Equipment : RBA0, T2D8, T1E5
Notes : 6dB bandwidth = 565.1kHz



Ref Lvl 97 dBμV
Marker 1 [T2 ndB] 6.00 dB
BW 570.42835671 kHz
RBW 100 kHz
VBW 300 kHz
SWT 5 ms
RF Att 10 dB
Unit dBμV



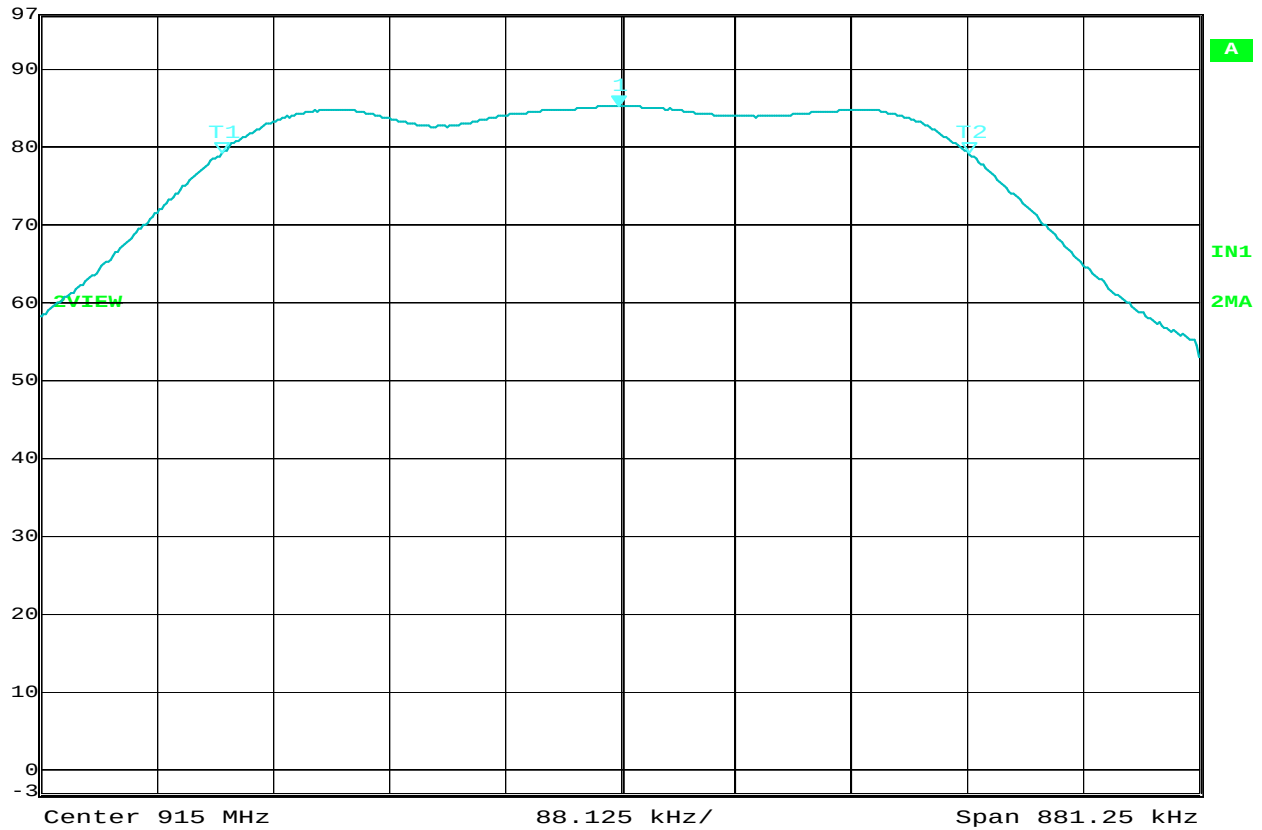
Date: 9.APR.2015 17:10:56

DTS Bandwidth

Manufacturer : Shure
Model No. : QLXD1
Serial No. :
Date : April 9, 2015
Test Performed : DTS Bandwidth
Mode : Tx @ 902.4MHz High Power
Test Equipment : RBA0, T2D8, T1E5
Notes : 6dB bandwidth = 570.4kHz



Ref Lvl 97 dBμV
Marker 1 [T2 ndB] 6.00 dB
BW 568.66232465 kHz
RBW 100 kHz
VBW 300 kHz
SWT 5 ms
RF Att 10 dB
Unit dBμV



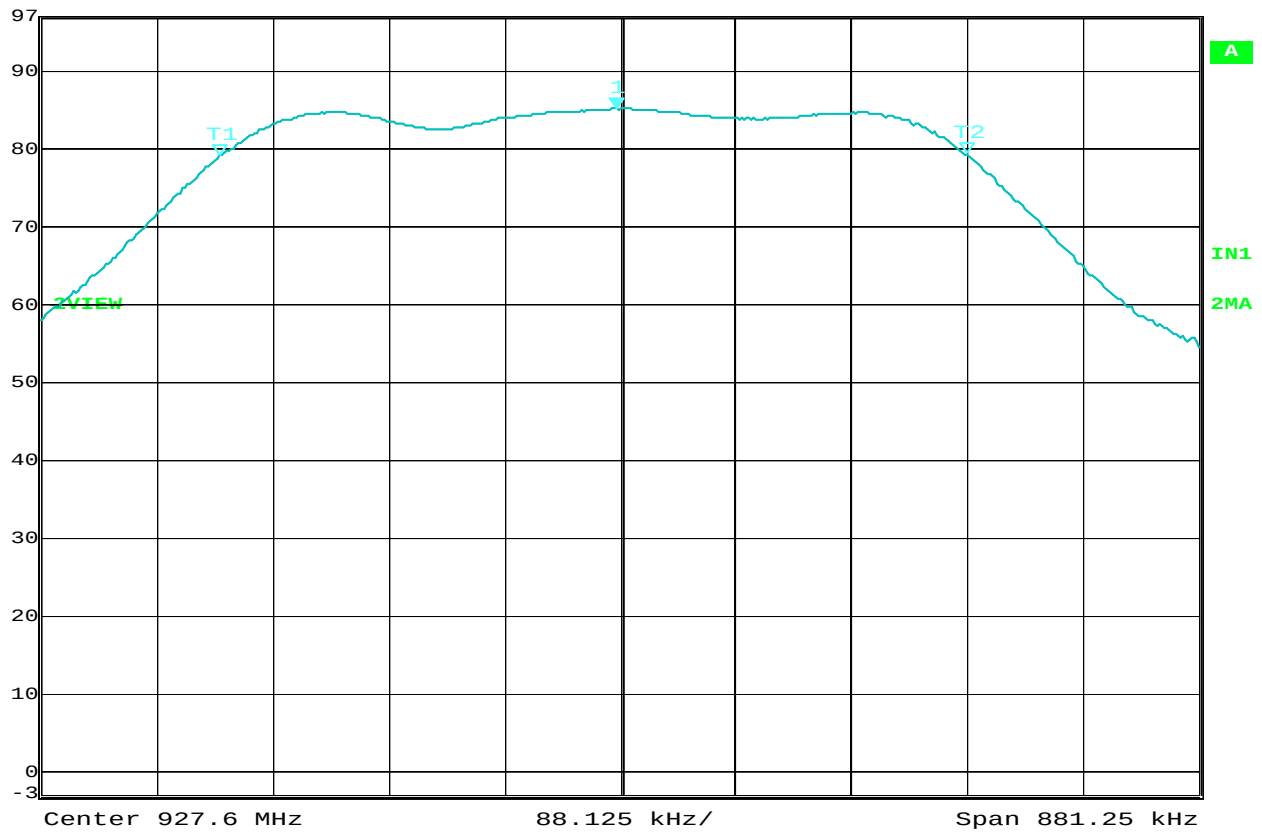
Date: 9.APR.2015 17:12:55

DTS Bandwidth

Manufacturer : Shure
Model No. : QLXD1
Serial No. :
Date : April 9, 2015
Test Performed : DTS Bandwidth
Mode : Tx @ 915MHz High Power
Test Equipment : RBA0, T2D8,T1E5
Notes : 6dB bandwidth = 568.66kHz



Ref Lvl 97 dBμV
Marker 1 [T2 ndB] 6.00 dB
BW 568.66232465 kHz
RBW 100 kHz
VBW 300 kHz
SWT 5 ms
RF Att 10 dB
Unit dBμV



Date: 9.APR.2015 17:15:42

DTS Bandwidth

Manufacturer : Shure
Model No. : QLXD1
Serial No. :
Date : April 9, 2015
Test Performed : DTS Bandwidth
Mode : Tx @ 927.6MHz High Power
Test Equipment : RBA0, T2D8, T1E5
Notes : 6dB bandwidth = 568.66kHz



Manufacturer : Shure, Inc.
Model No. : QLXD1
Serial No. : None Assigned
Date Tested : April 8, 2015
Test Performed : Peak Output Power (Conducted)
Mode : See Below
Test Equipment : RBA0, T2D8, T1E5
Notes :

Frequency MHz	Meter Reading (dBm)	External Attenuation (dB)	Peak Output Power (dBm)	Output Power Limit (dBm)
Lo Power				
902.4	-25.45	29.9	4.17	30.0
915	-25.45	29.9	4.19	30.0
927.6	-25.45	29.9	4.04	30.0
Hi Power				
902.4	-15.89	29.9	14.01	30.0
915	-15.90	29.9	14.00	30.0
927.6	-16.03	29.9	13.87	30.0

Peak Output Power (dBm) = Meter Reading (dBm) + External Attenuation (dB)



Manufacturer : Shure, Inc.
Model No. : QLXD1
Serial No. : None Assigned
Date Tested : April 6 and 7, 2015
Test Performed : Effective Isotropic Radiated Power (EIRP)
Mode : Transmit at 902.4MHz, Lo Power
Test Distance : 3 meters

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	Matched Sig. Gen. Reading (dBm)	Equivalent Antenna Gain (dB)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
902.40	H	79.8	4.1	2.2	2.0	4.2	36.0	-31.8
902.40	V	76.4	4.1	2.2	2.0	4.2	36.0	-31.8

EIRP (dBm) = Meter Reading (dBuV) + Matched Sig. Gen. Reading (dBm) + Antenna Gain (dB) – Cable Loss (dB)



Manufacturer : Shure, Inc.
Model No. : QLXD1
Serial No. : None Assigned
Date Tested : April 6 and 7, 2015
Test Performed : Effective Isotropic Radiated Power (EIRP)
Mode : Transmit at 915MHz, Lo Power
Test Distance : 3 meters

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	Matched Sig. Gen. Reading (dBm)	Equivalent Antenna Gain (dB)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
915.00	H	73.1	-3.3	2.2	2.1	-3.2	36.0	-39.2
915.00	V	77.0	4.7	2.2	2.1	4.8	36.0	-31.2

EIRP (dBm) = Meter Reading (dBuV) + Matched Sig. Gen. Reading (dBm) + Antenna Gain (dB) – Cable Loss (dB)



Manufacturer : Shure, Inc.
Model No. : QLXD1
Serial No. : None Assigned
Date Tested : April 6 and 7, 2015
Test Performed : Effective Isotropic Radiated Power (EIRP)
Mode : Transmit at 927.6MHz, Lo Power
Test Distance : 3 meters

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	Matched Sig. Gen. Reading (dBm)	Equivalent Antenna Gain (dB)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
927.60	H	71.6	-4.9	2.2	2.1	-4.8	36.0	-40.8
927.60	V	76.5	2.6	2.2	2.1	2.7	36.0	-33.3

EIRP (dBm) = Meter Reading (dBuV) + Matched Sig. Gen. Reading (dBm) + Antenna Gain (dB) – Cable Loss (dB)



Manufacturer : Shure, Inc.
Model No. : QLXD1
Serial No. : None Assigned
Date Tested : April 6 and 7, 2015
Test Performed : Effective Isotropic Radiated Power (EIRP)
Mode : Transmit at 902.4MHz, Hi Power
Test Distance : 3 meters

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	Matched Sig. Gen. Reading (dBm)	Equivalent Antenna Gain (dB)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
902.40	H	87.8	12.0	2.2	2.0	12.1	36.0	-23.9
902.40	V	84.2	11.8	2.2	2.0	11.9	36.0	-24.1

EIRP (dBm) = Meter Reading (dBuV) + Matched Sig. Gen. Reading (dBm) + Antenna Gain (dB) – Cable Loss (dB)



Manufacturer : Shure, Inc.
Model No. : QLXD1
Serial No. : None Assigned
Date Tested : April 6 and 7, 2015
Test Performed : Effective Isotropic Radiated Power (EIRP)
Mode : Transmit at 915MHz, Hi Power
Test Distance : 3 meters

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	Matched Sig. Gen. Reading (dBm)	Equivalent Antenna Gain (dB)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
915.00	H	81.7	5.9	2.2	2.1	6.0	36.0	-30.0
915.00	V	86.5	14.0	2.2	2.1	14.1	36.0	-21.9

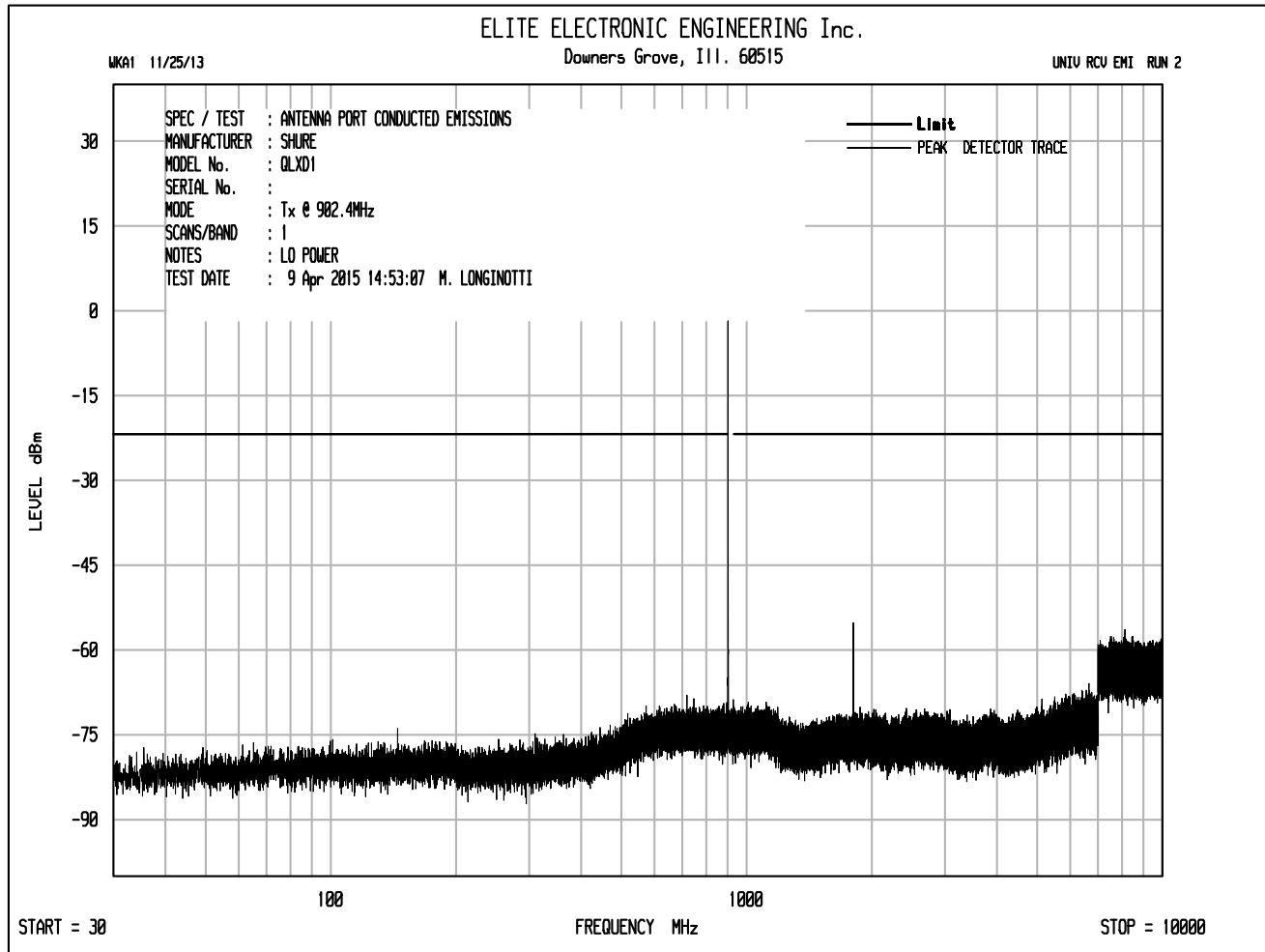
EIRP (dBm) = Meter Reading (dBuV) + Matched Sig. Gen. Reading (dBm) + Antenna Gain (dB) – Cable Loss (dB)

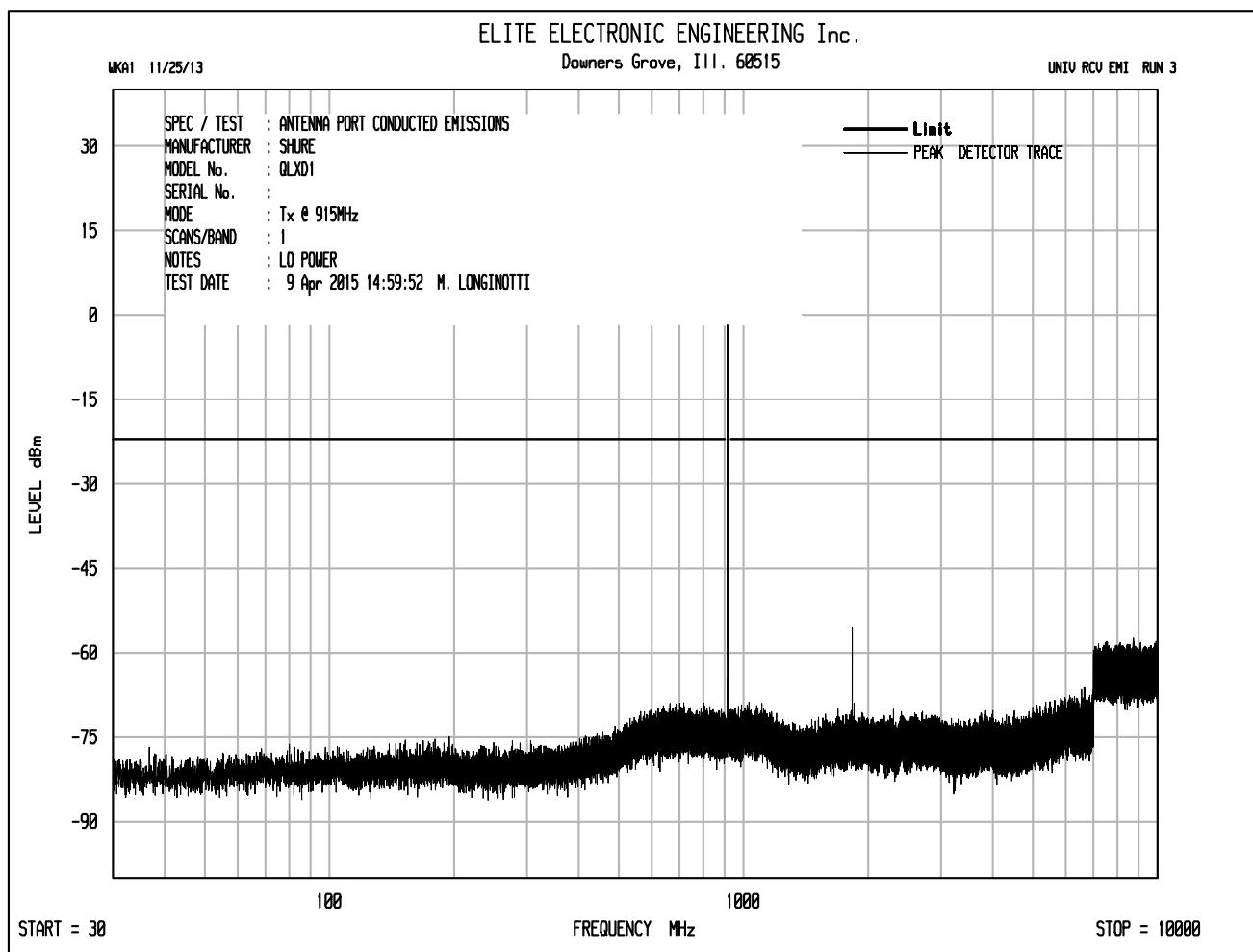


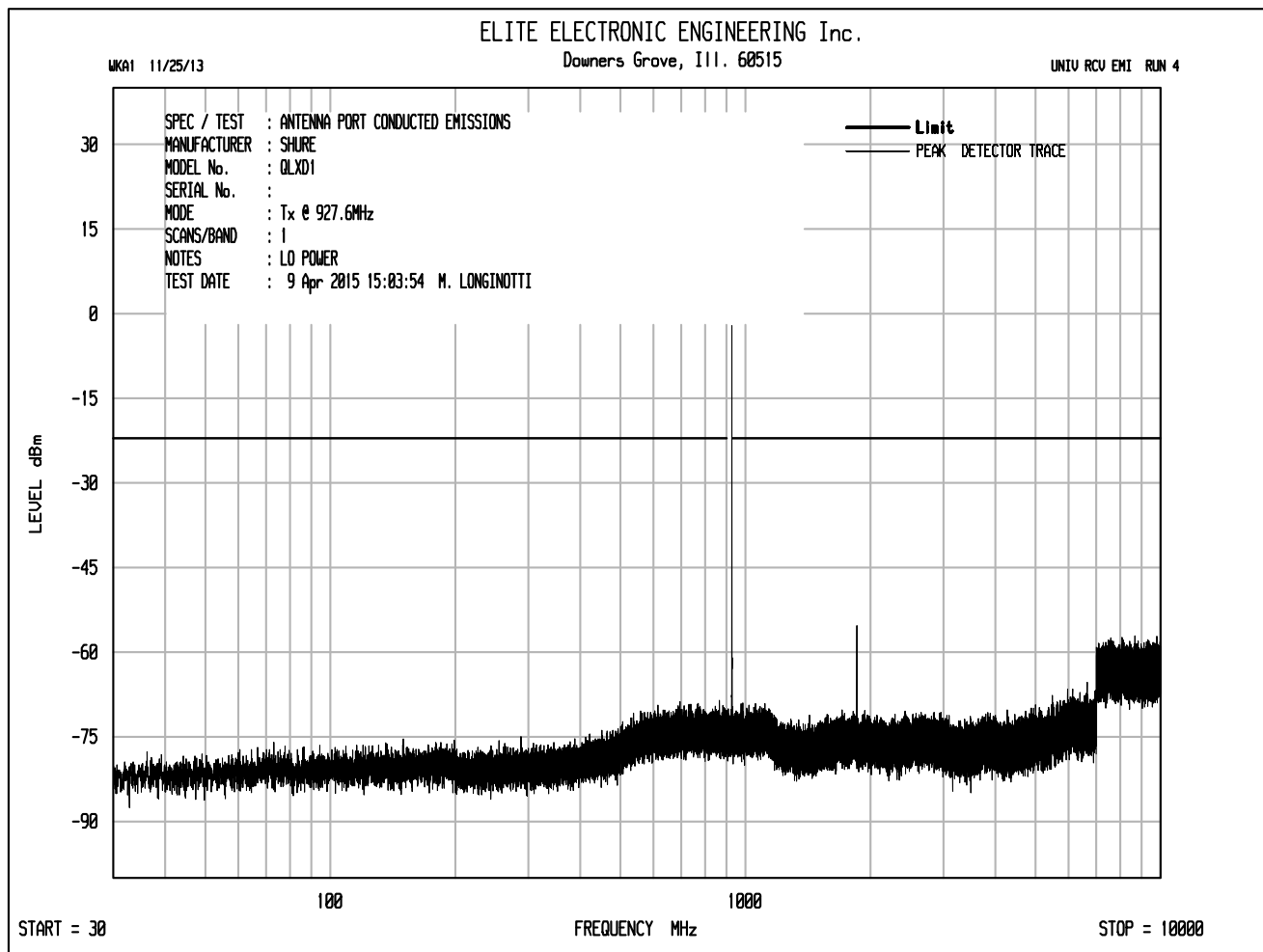
Manufacturer : Shure, Inc.
Model No. : QLXD1
Serial No. : None Assigned
Date Tested : April 6 and 7, 2015
Test Performed : Effective Isotropic Radiated Power (EIRP)
Mode : Transmit at 927.6MHz, Hi Power
Test Distance : 3 meters

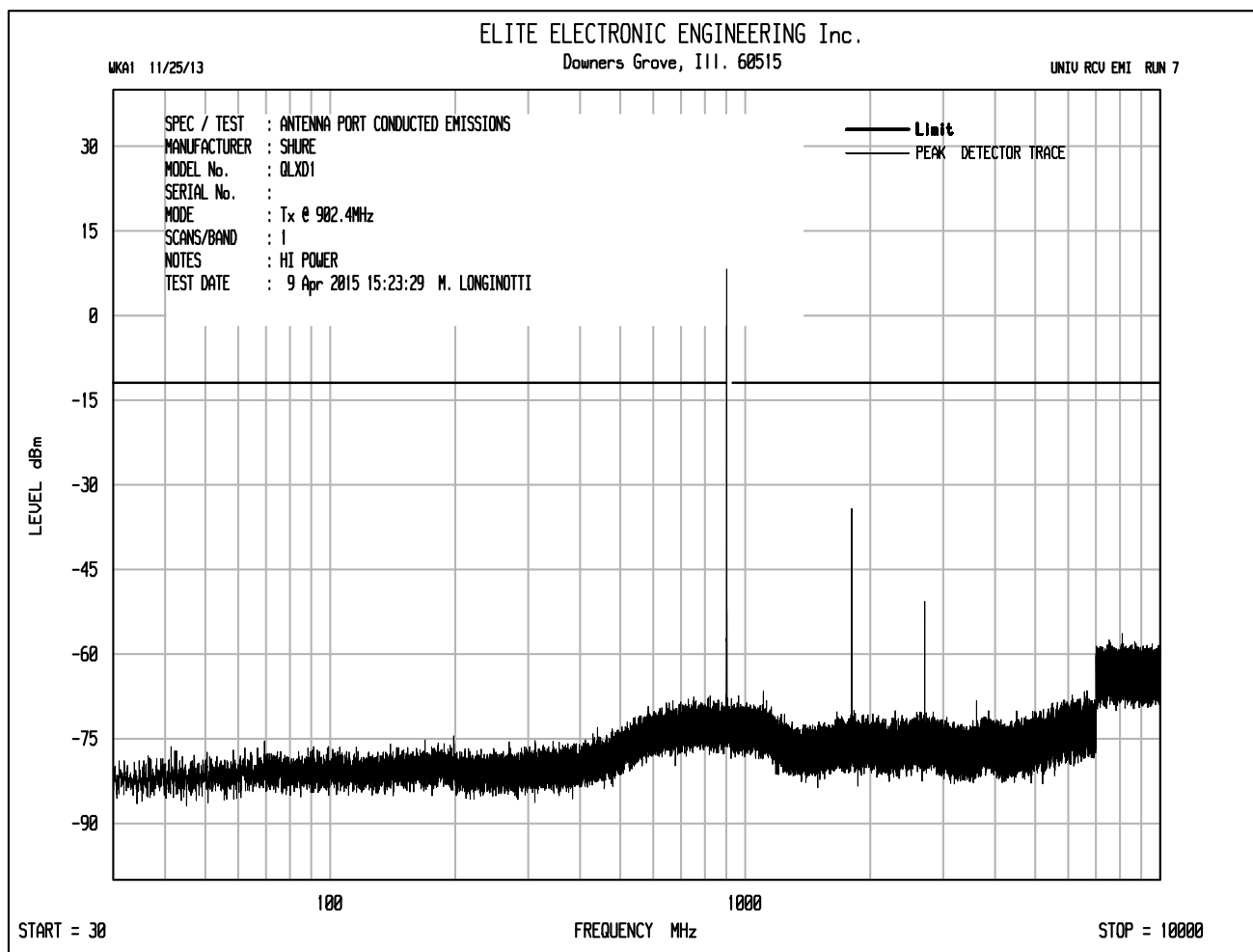
Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	Matched Sig. Gen. Reading (dBm)	Equivalent Antenna Gain (dB)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
927.60	H	86.7	10.1	2.2	2.1	10.2	36.0	-25.8
927.60	V	86.4	12.4	2.2	2.1	12.5	36.0	-23.5

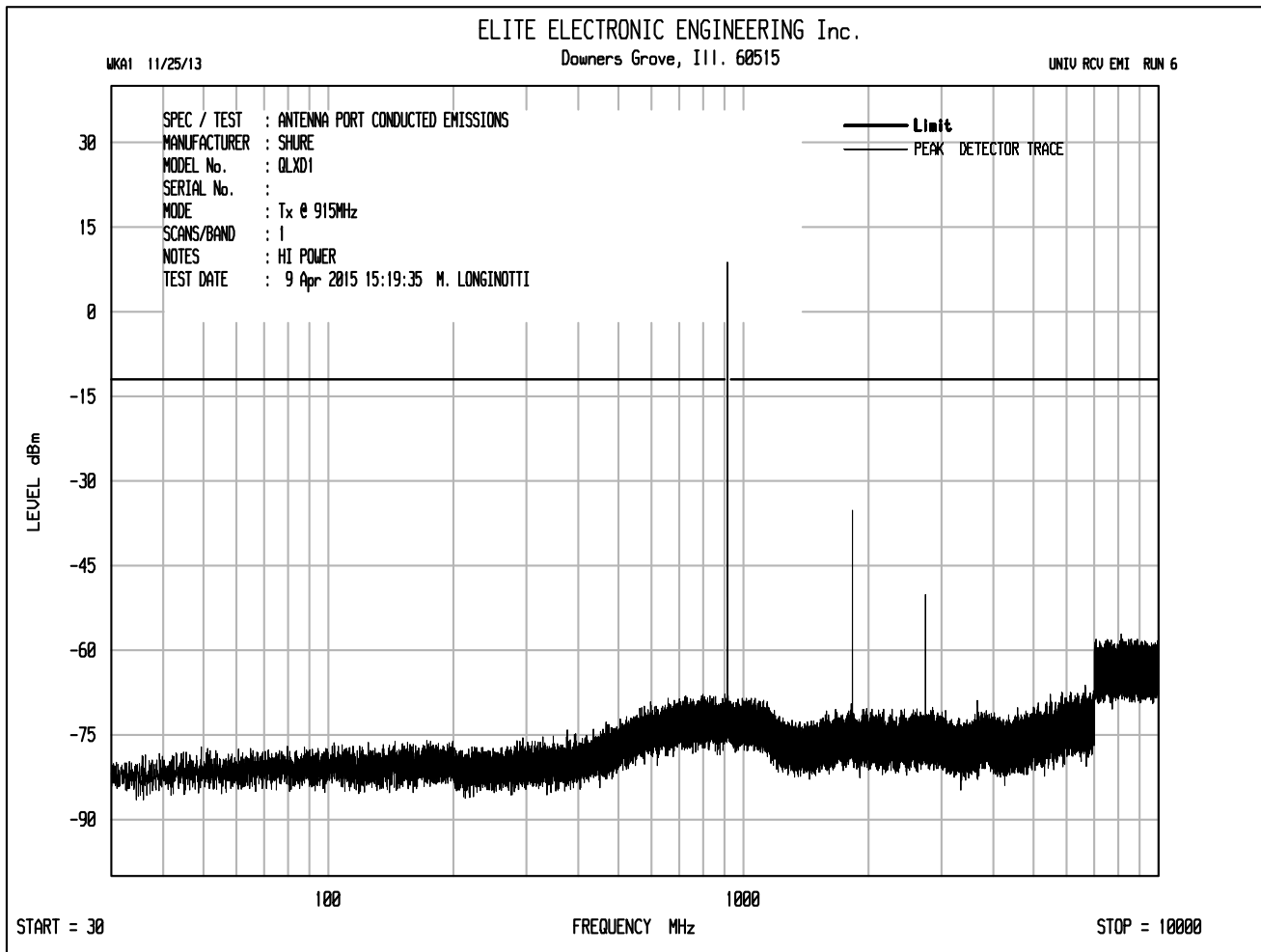
EIRP (dBm) = Meter Reading (dBuV) + Matched Sig. Gen. Reading (dBm) + Antenna Gain (dB) – Cable Loss (dB)

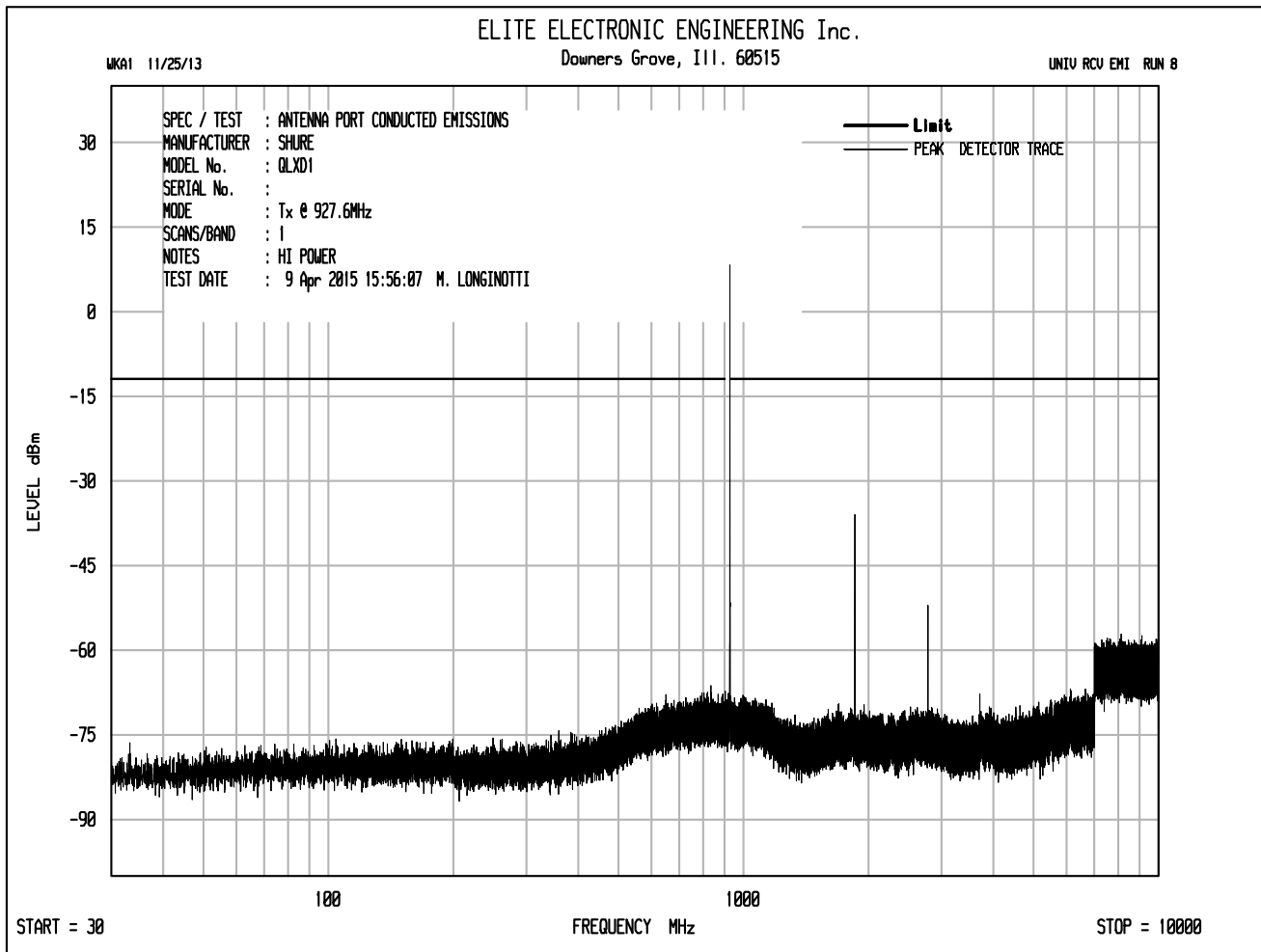


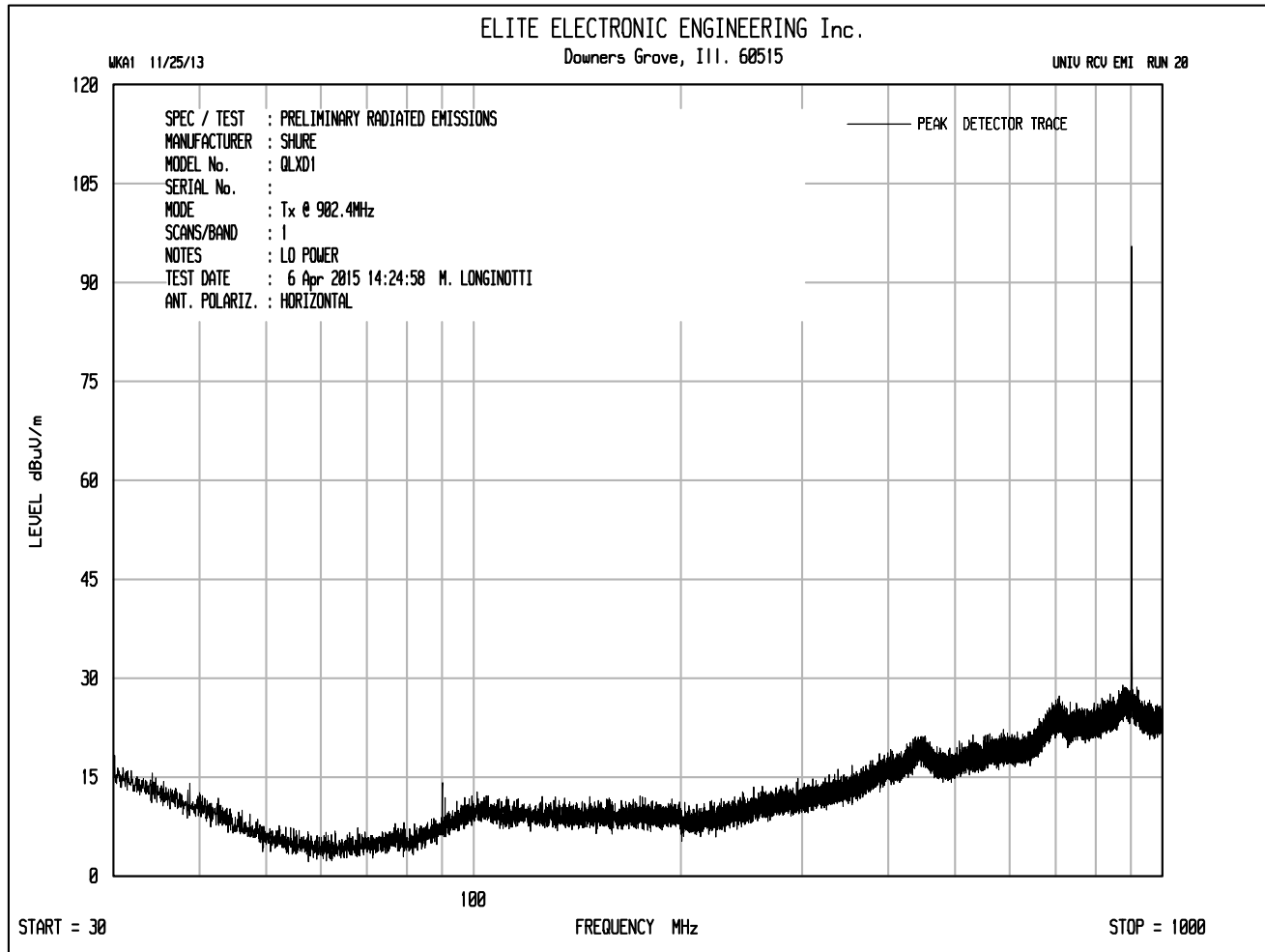


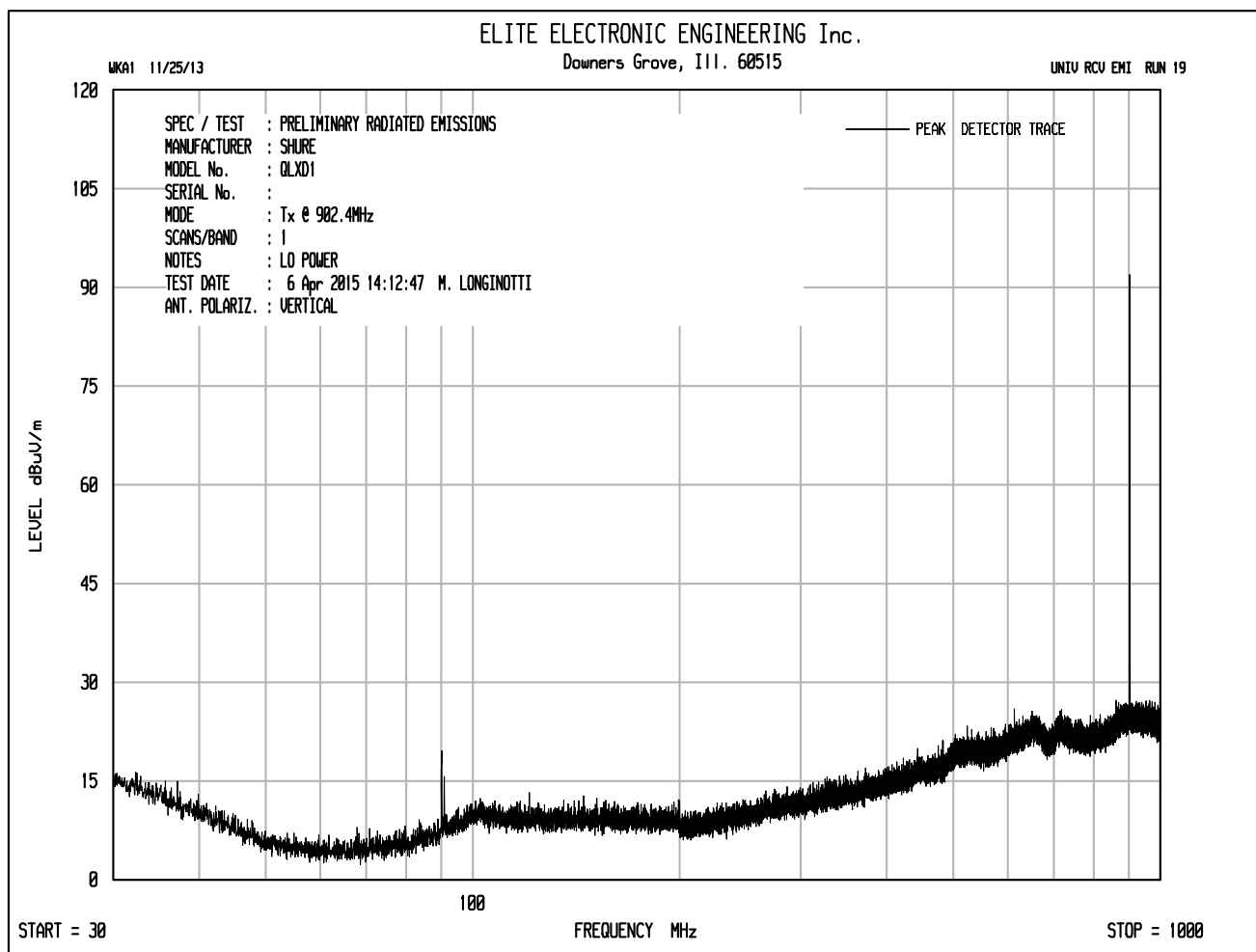


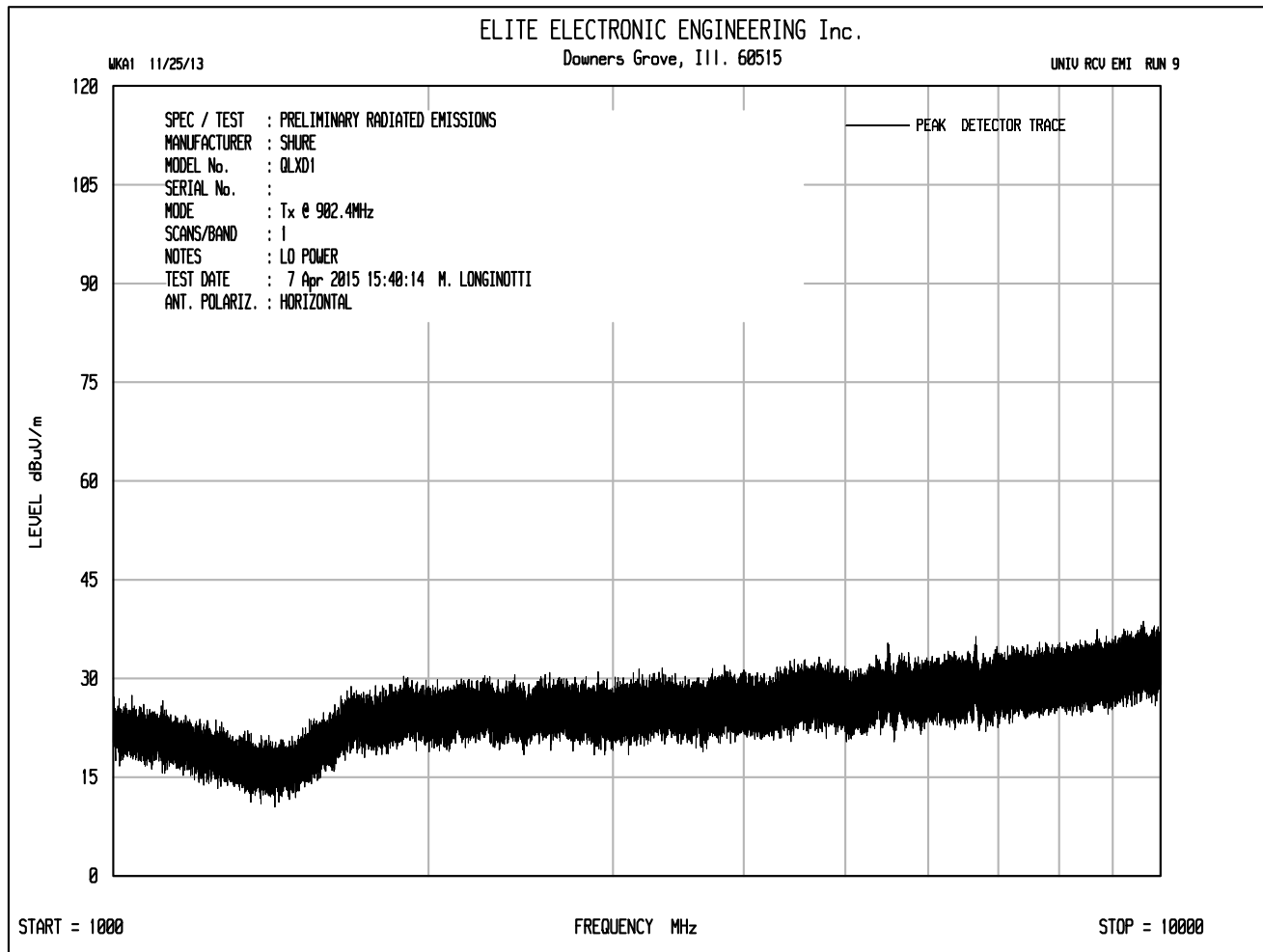


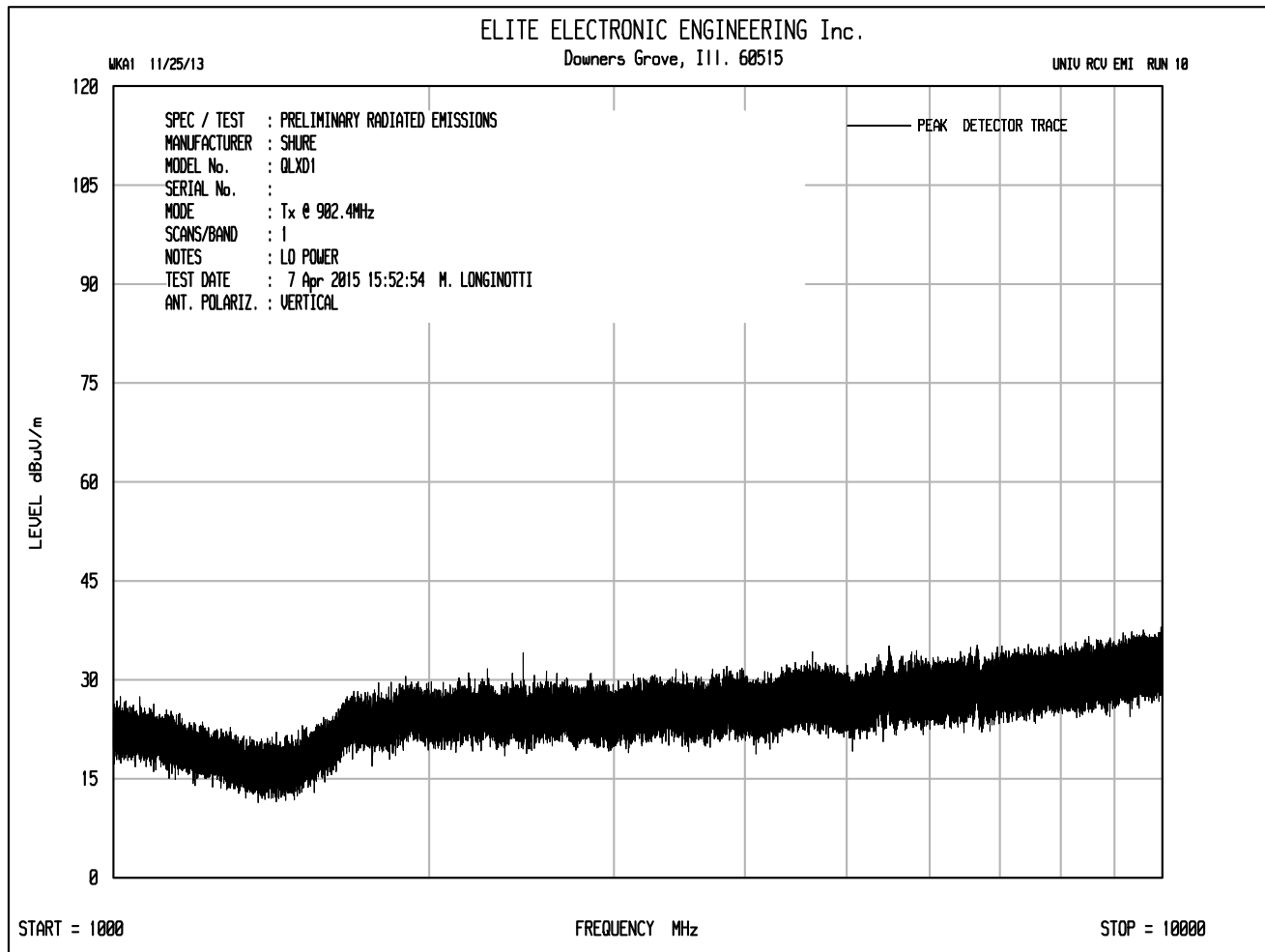


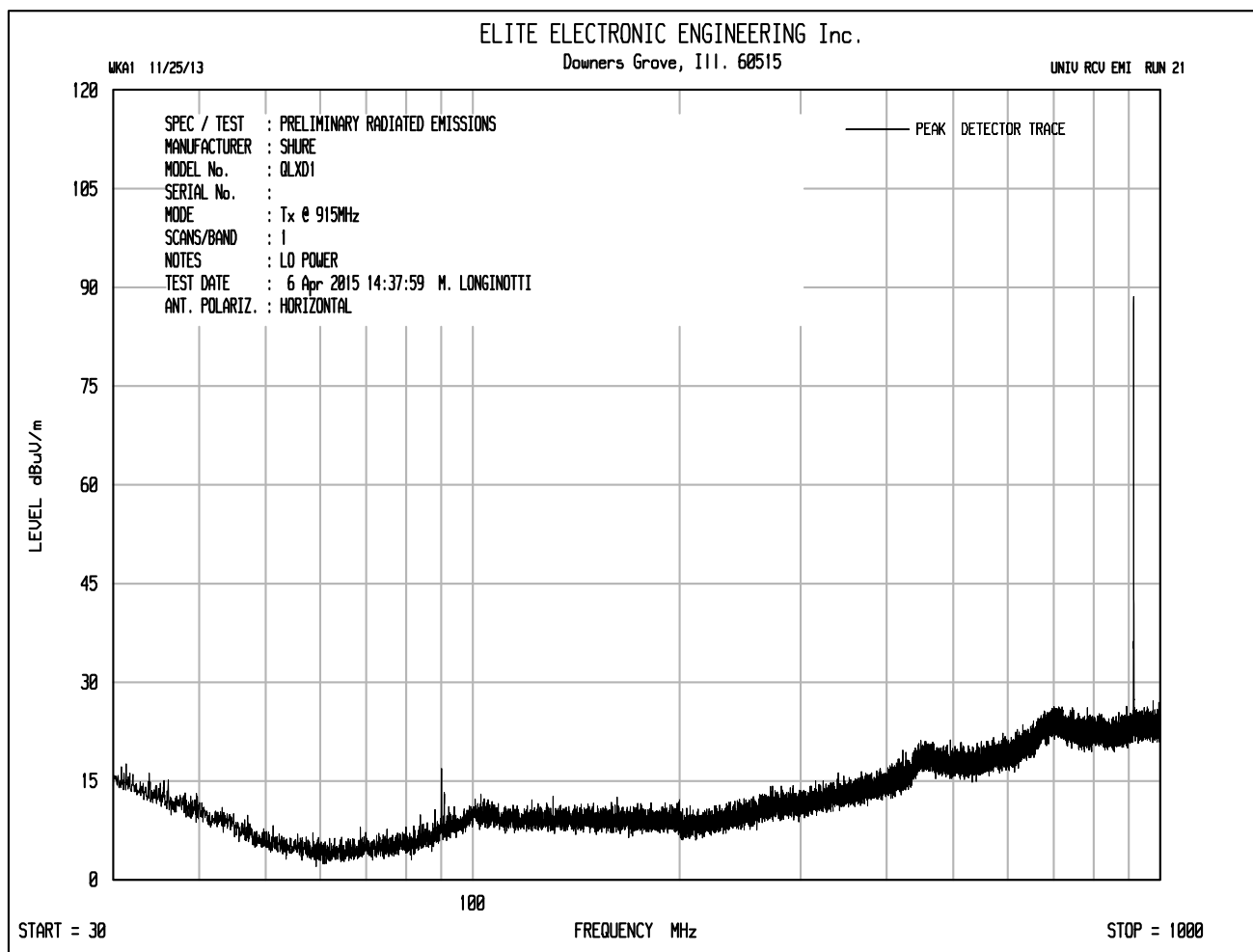


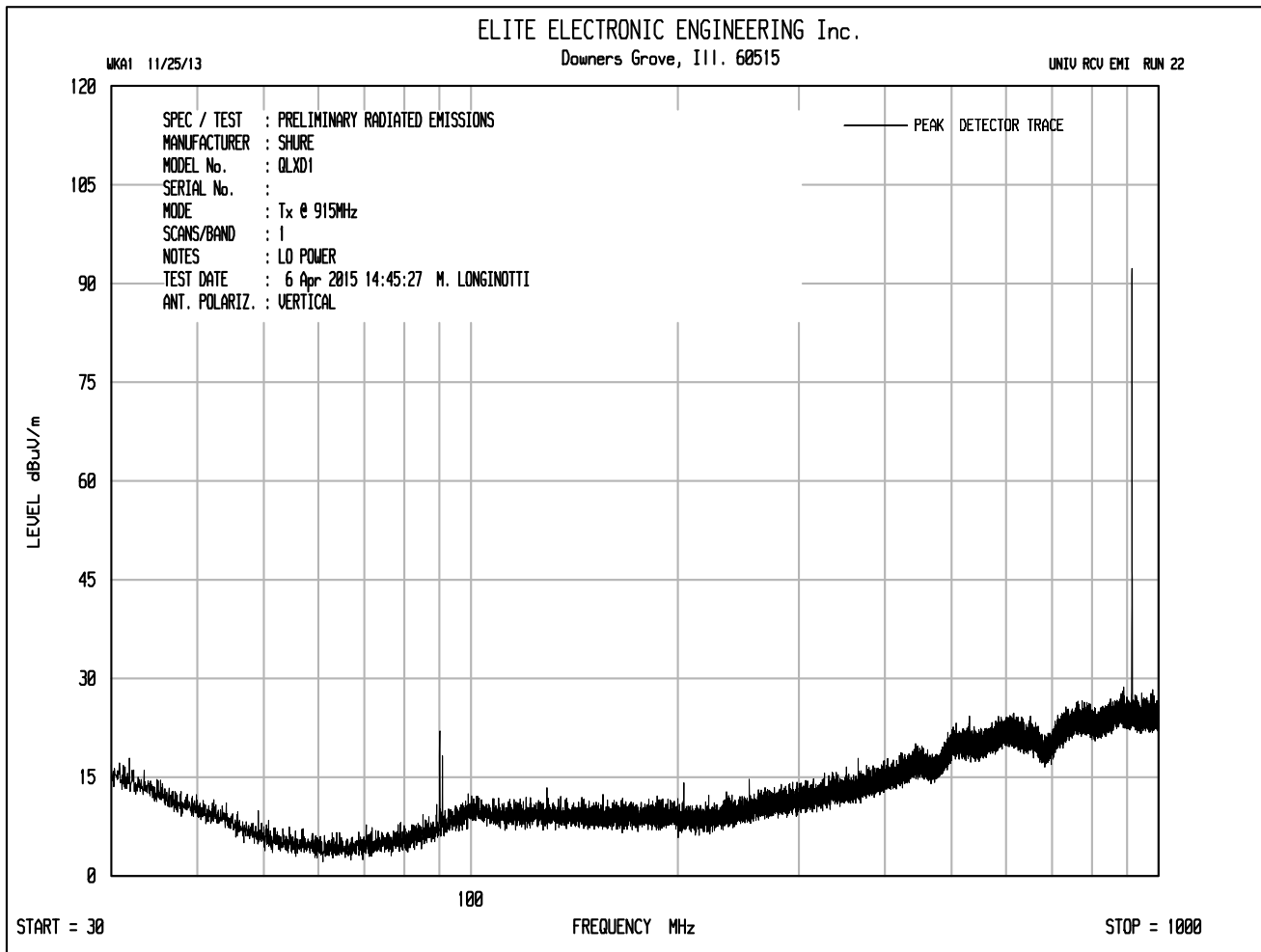


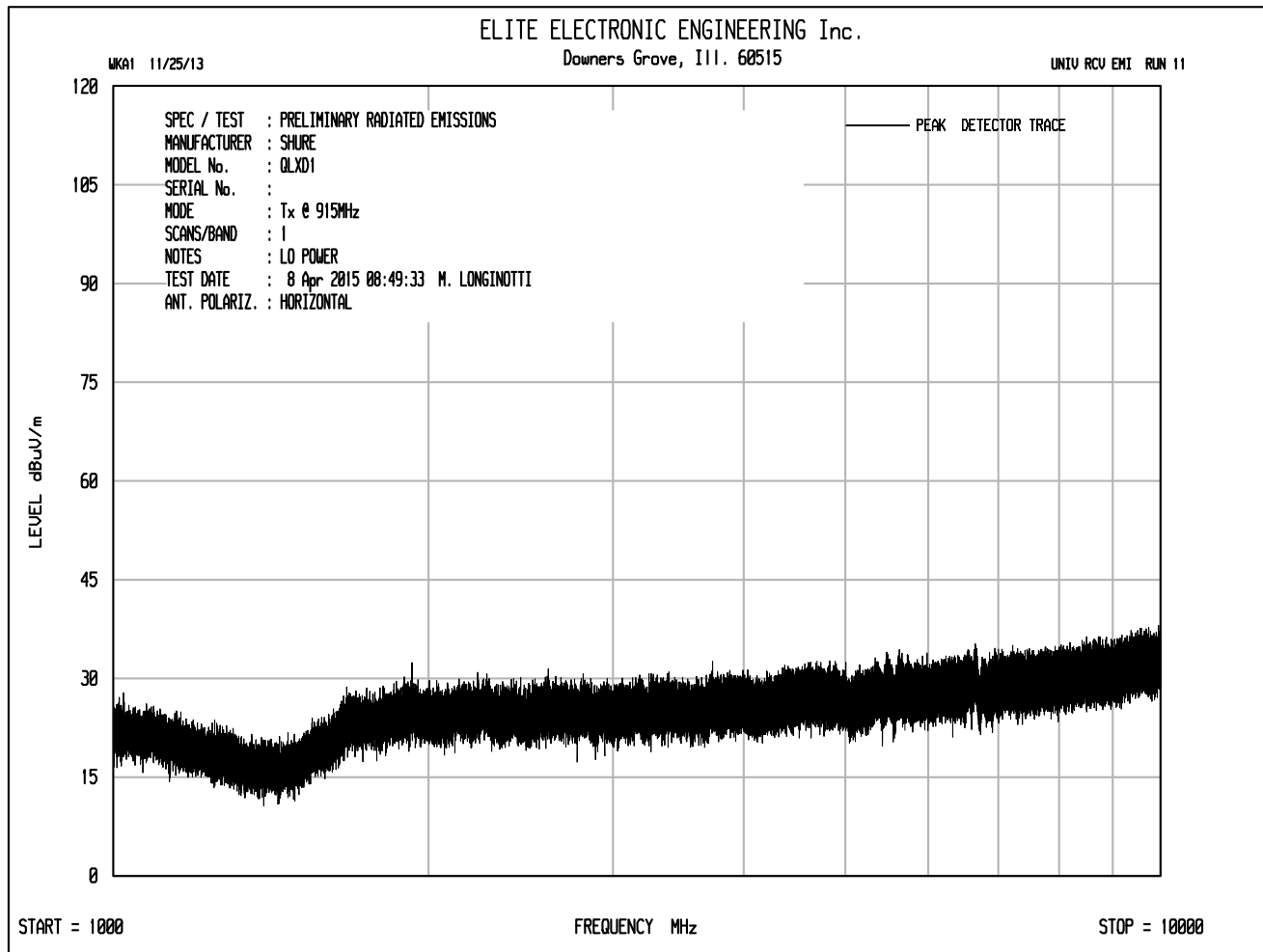


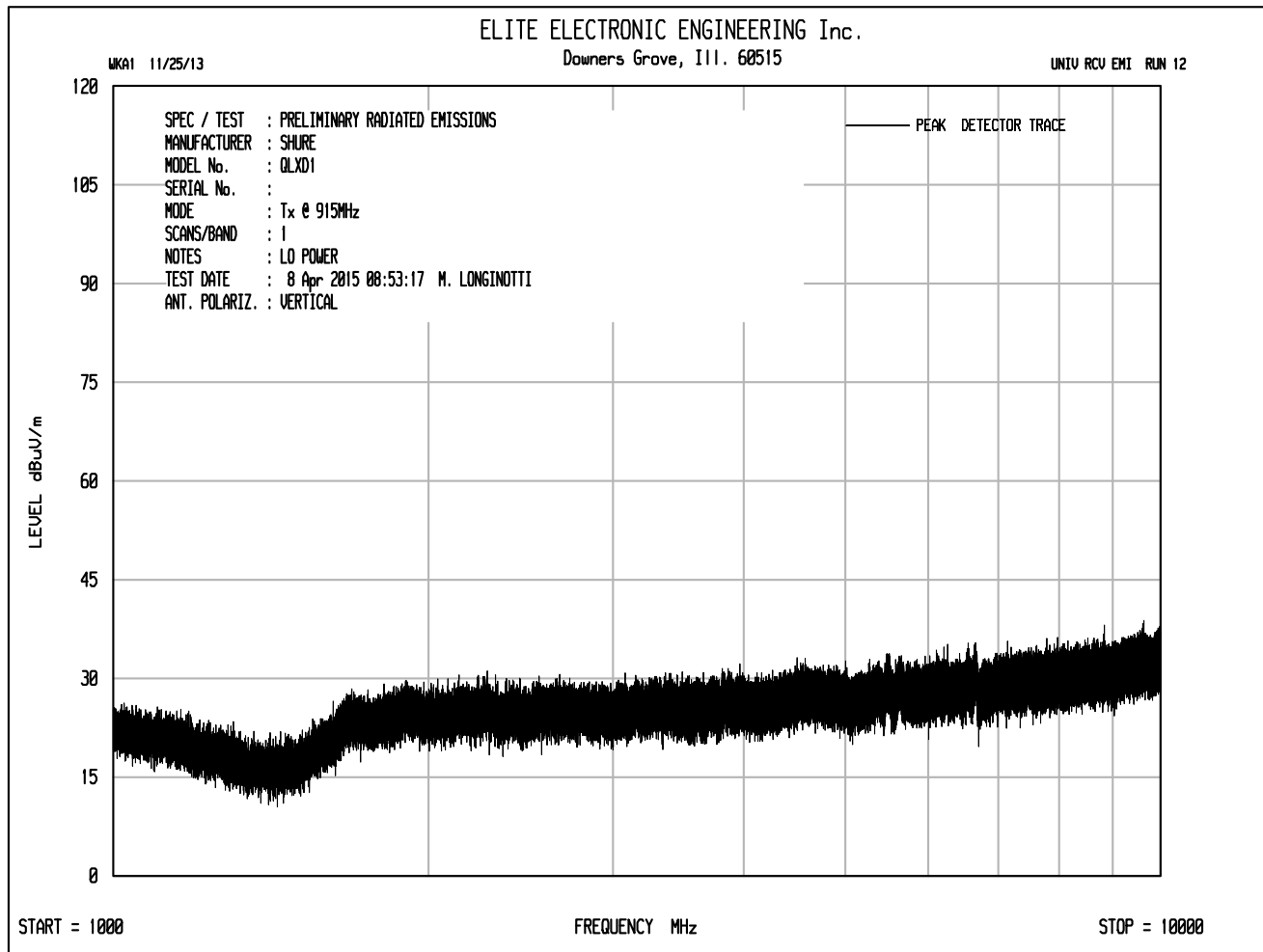


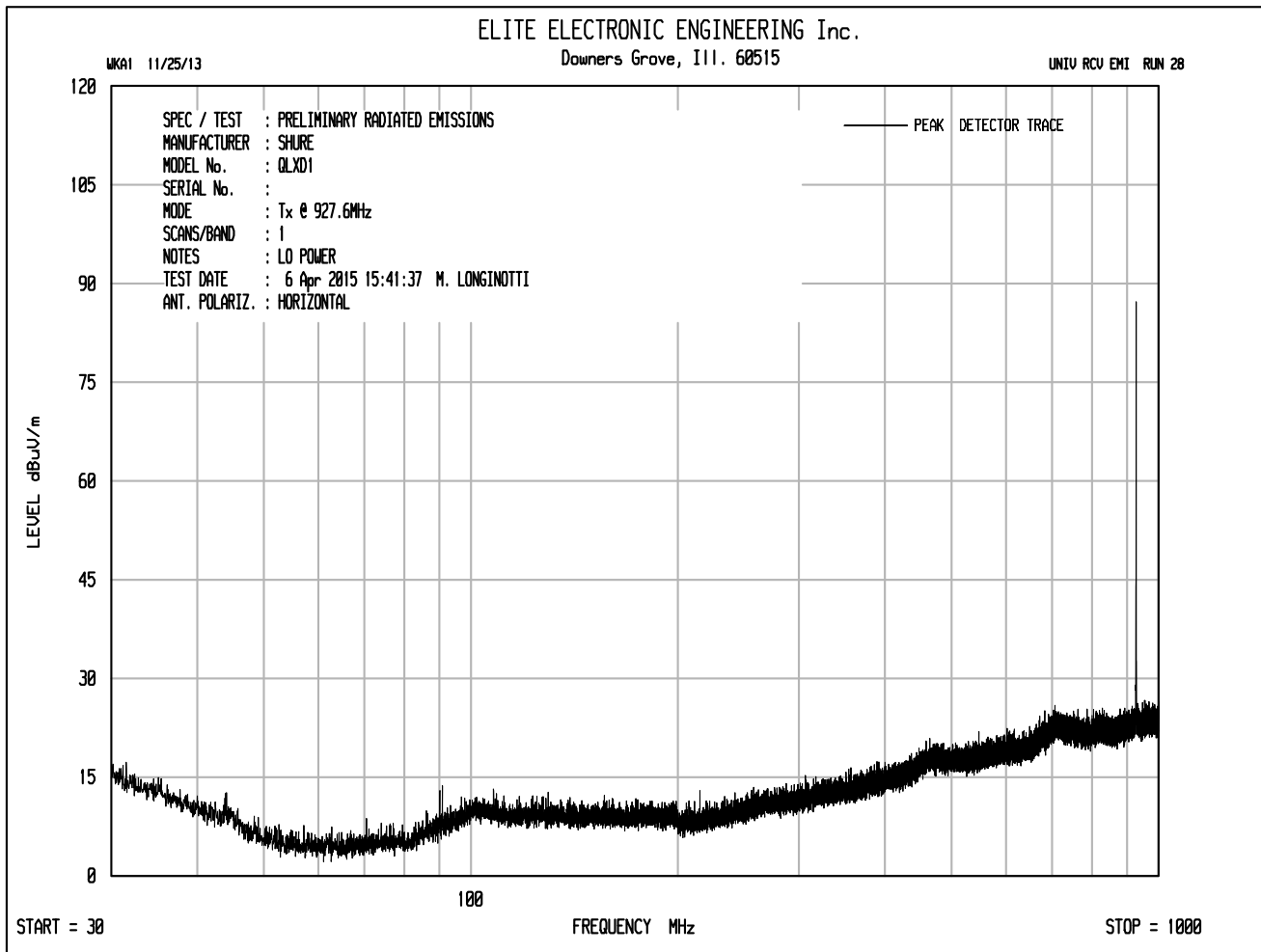


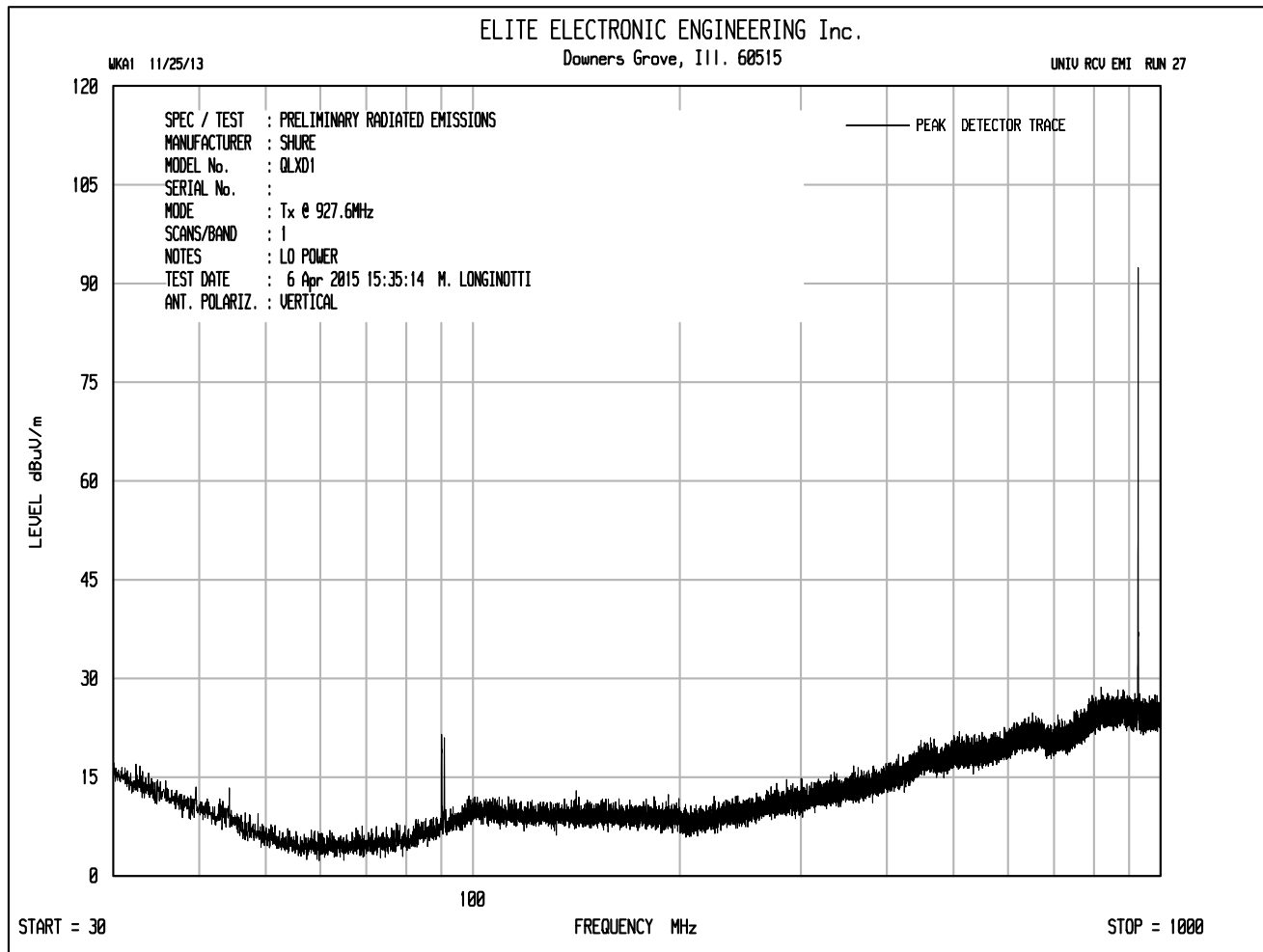


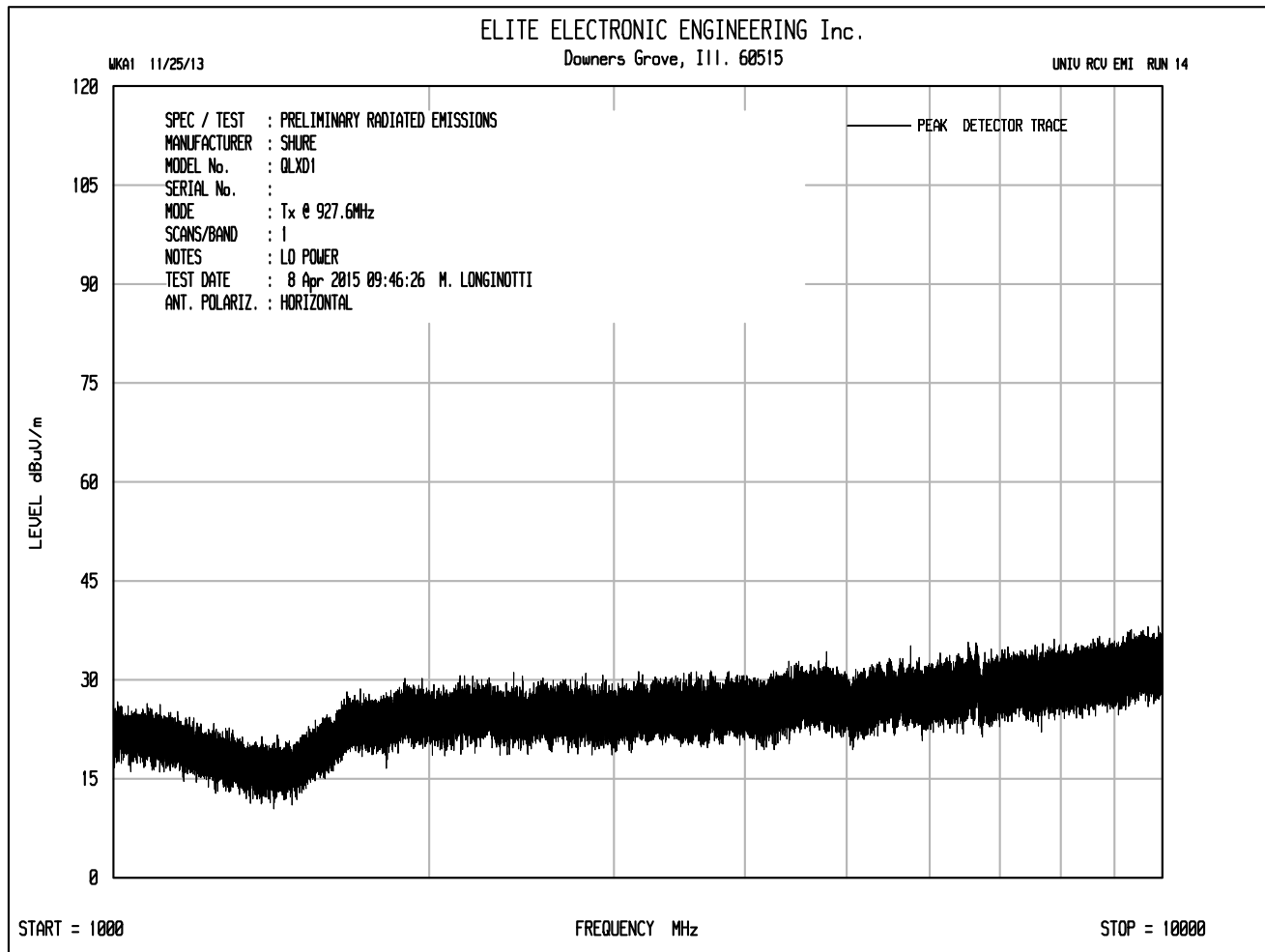


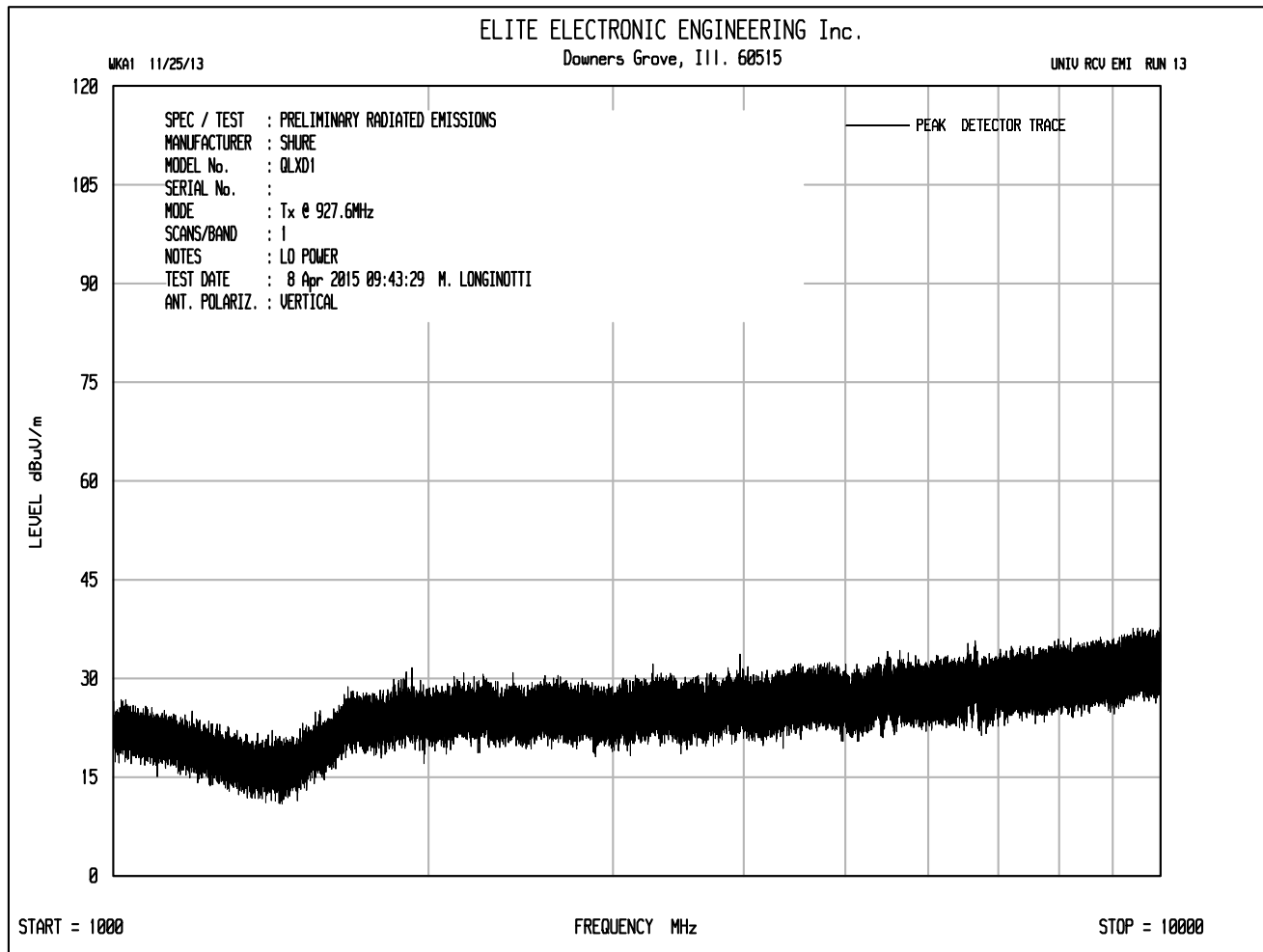


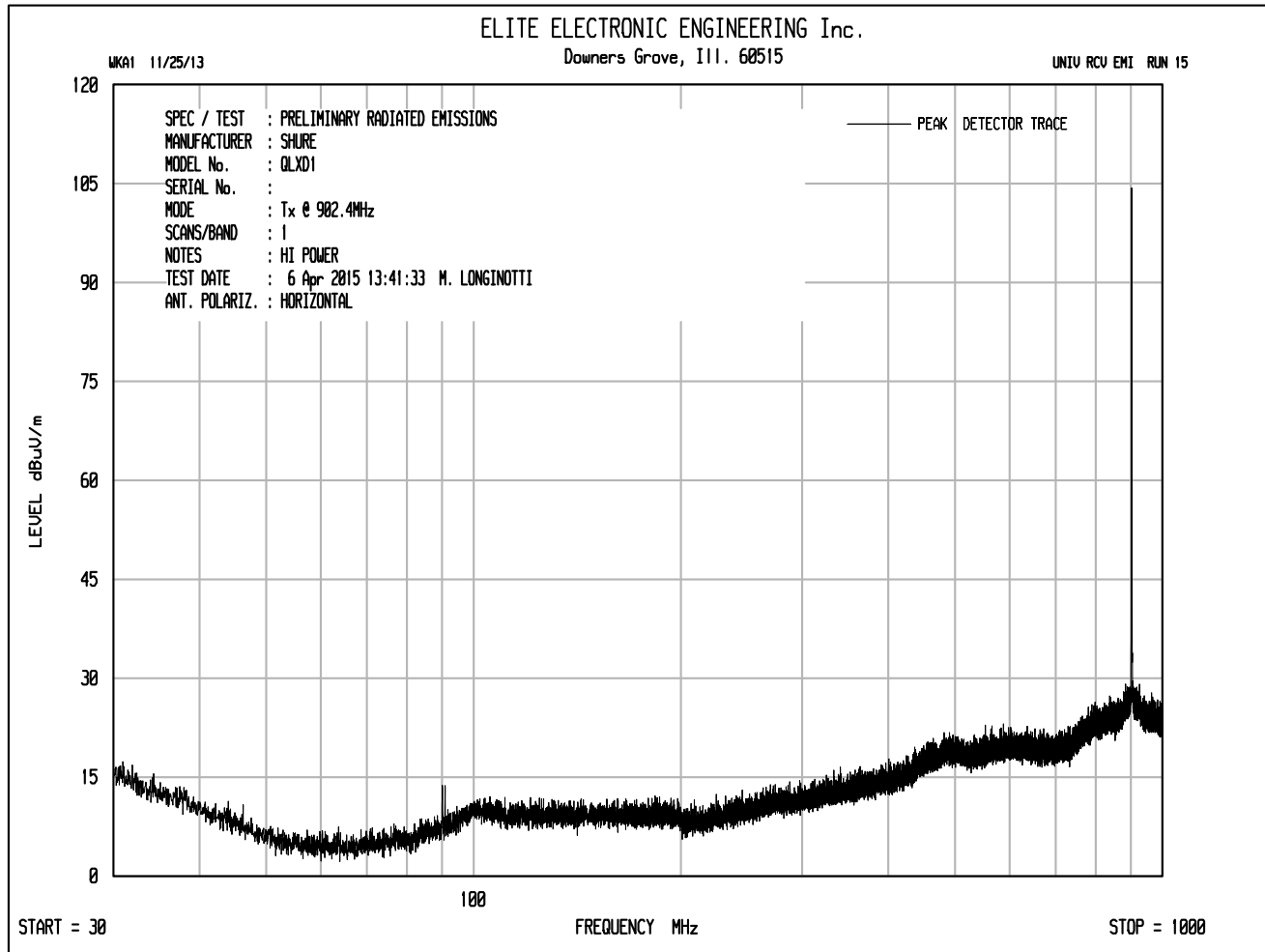


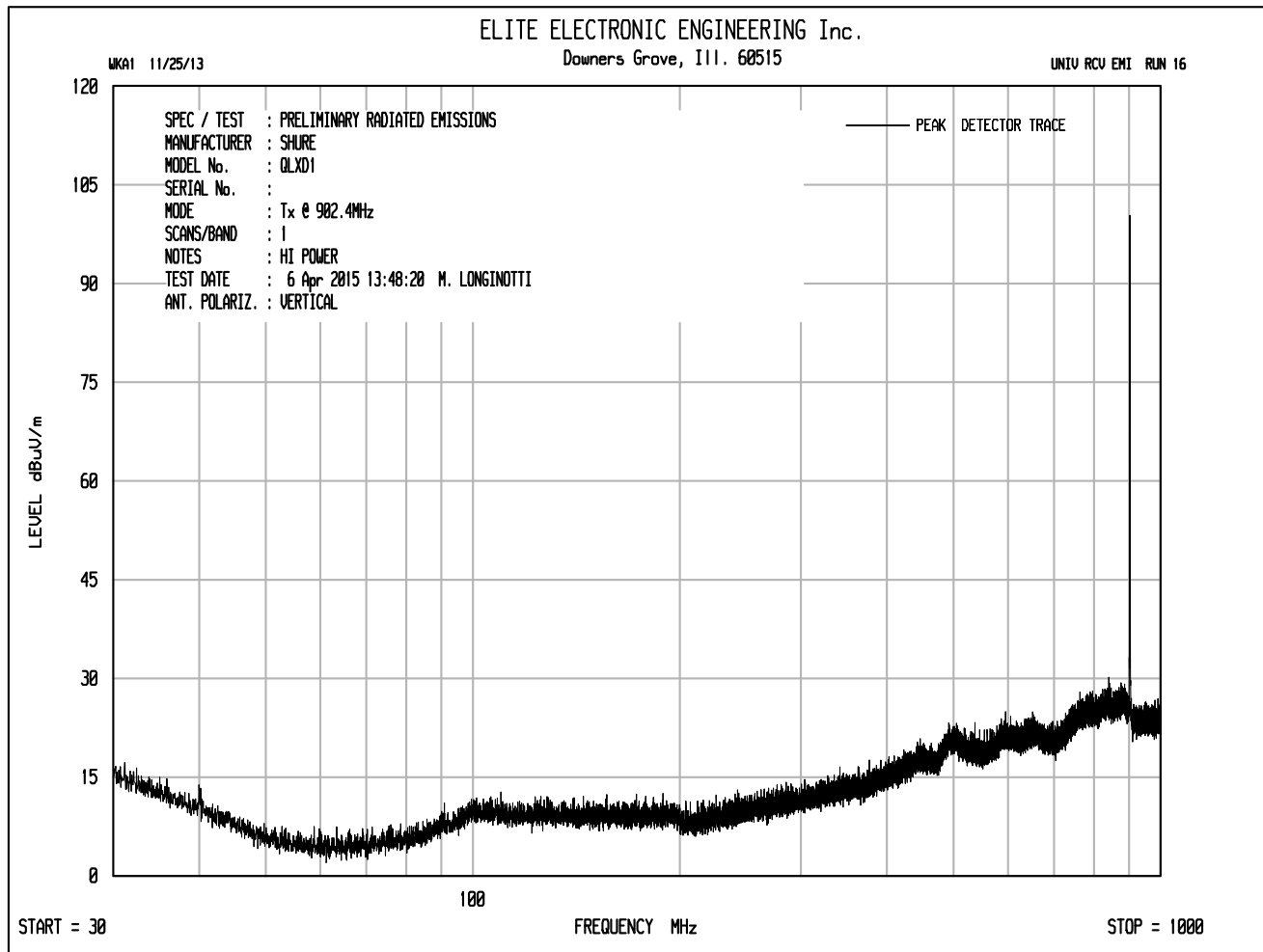


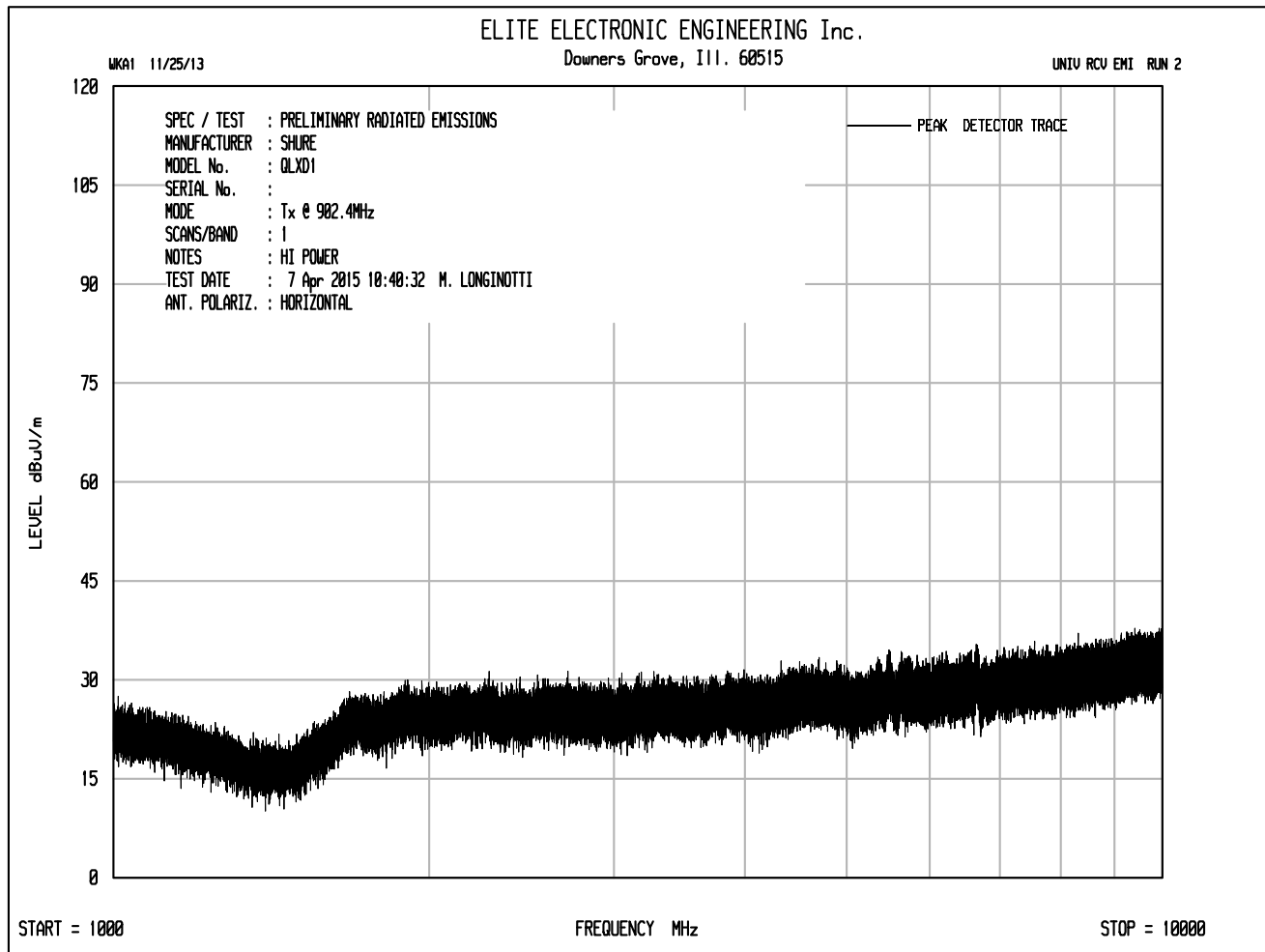


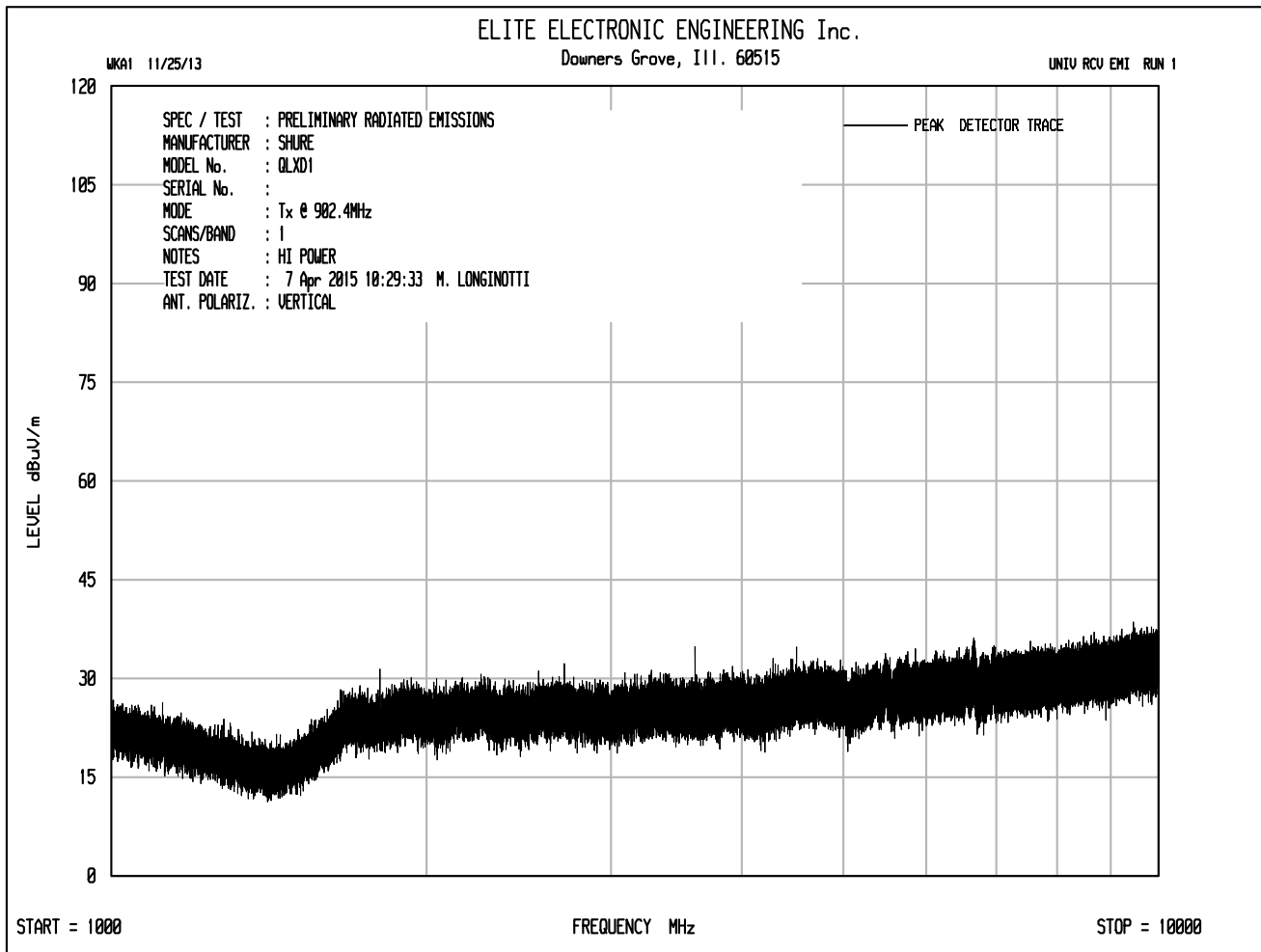


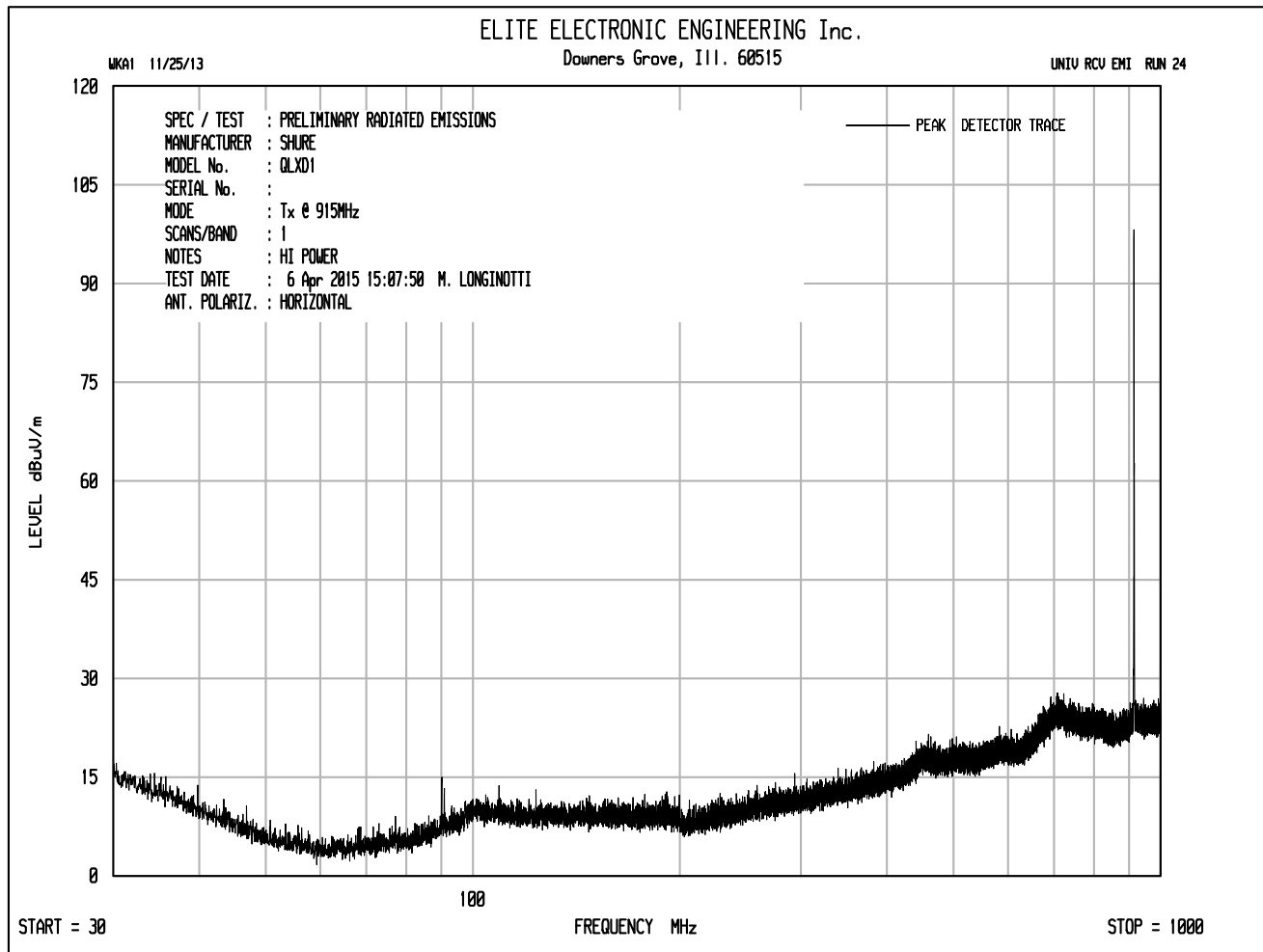


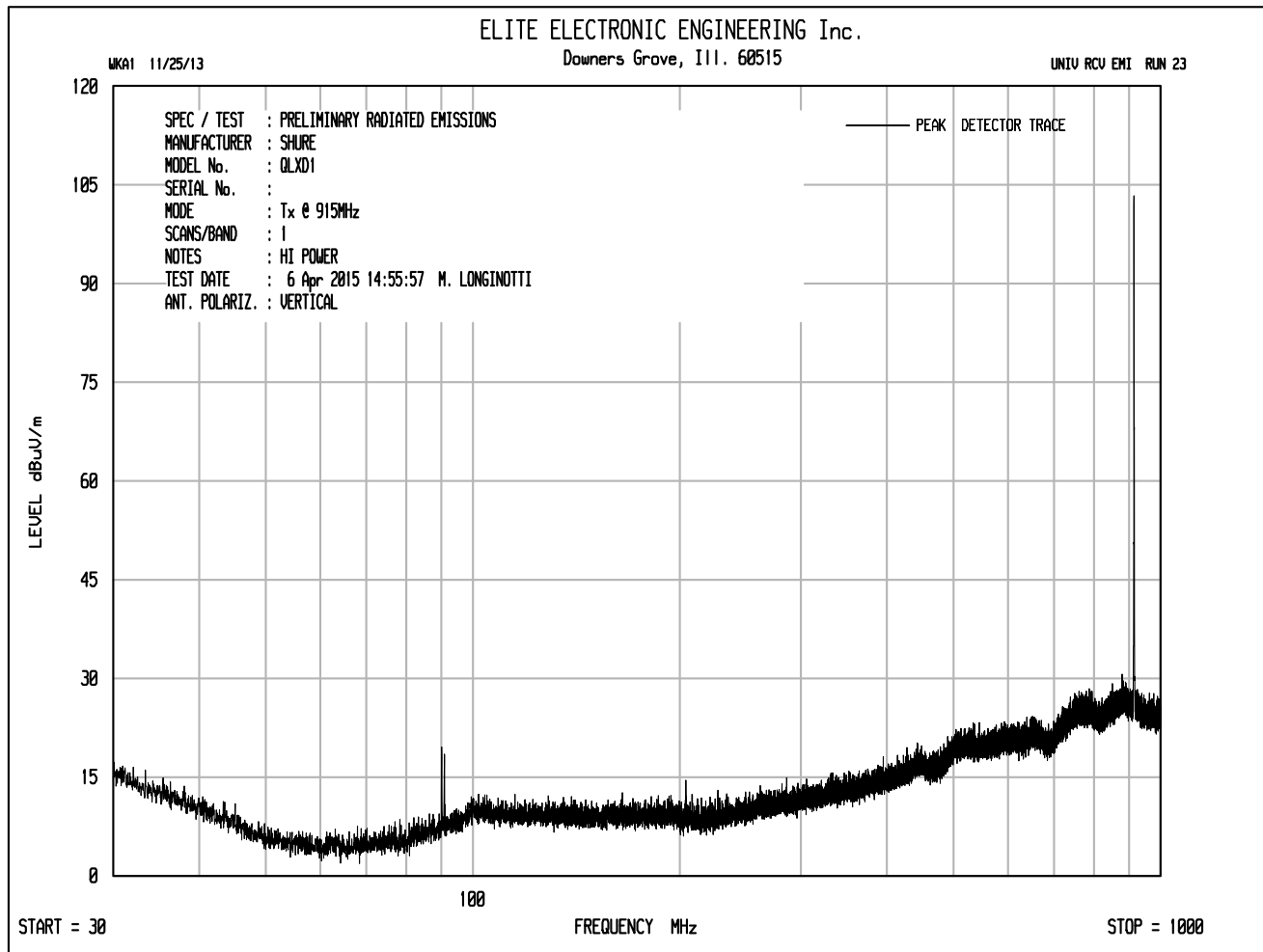


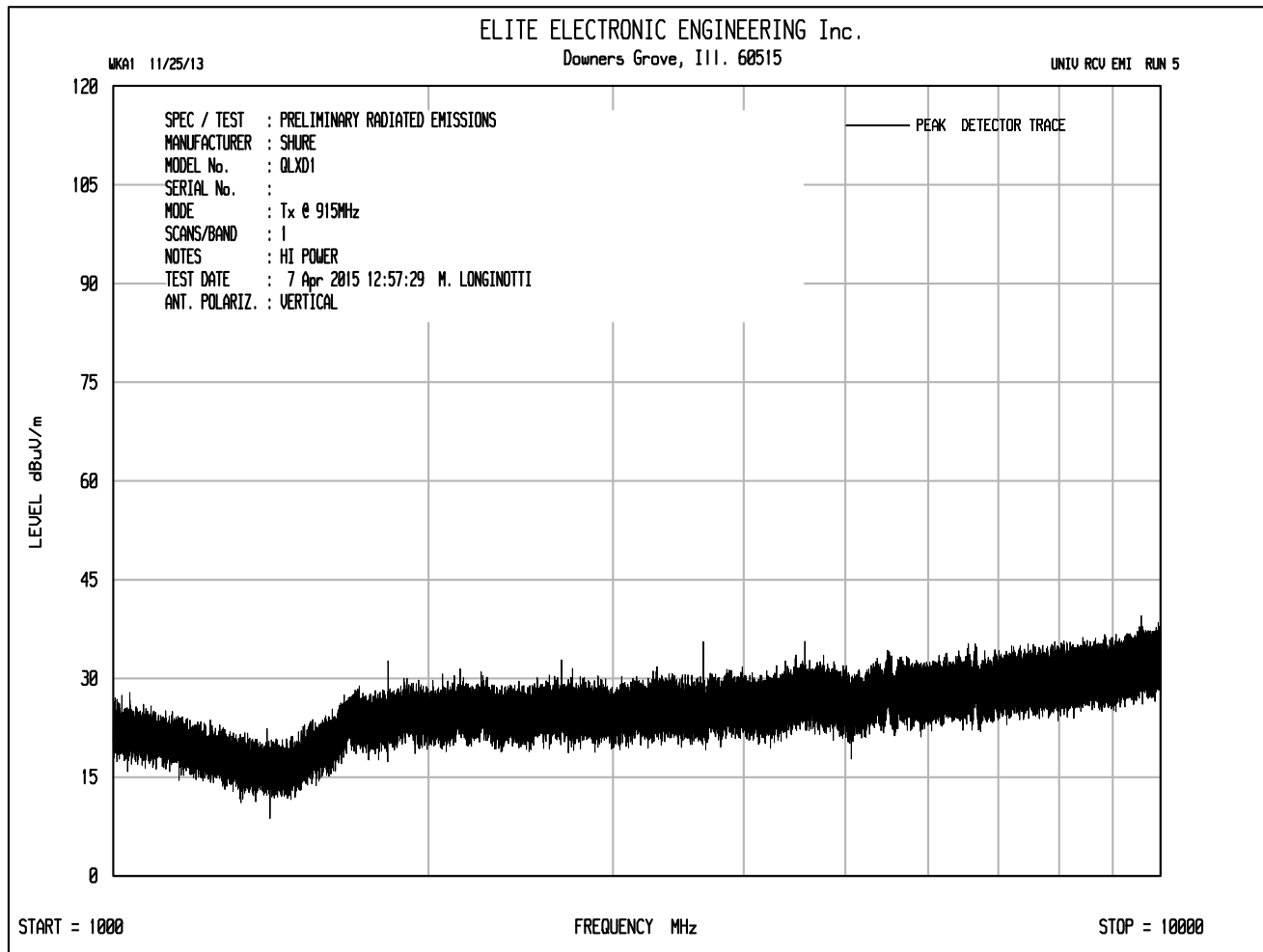


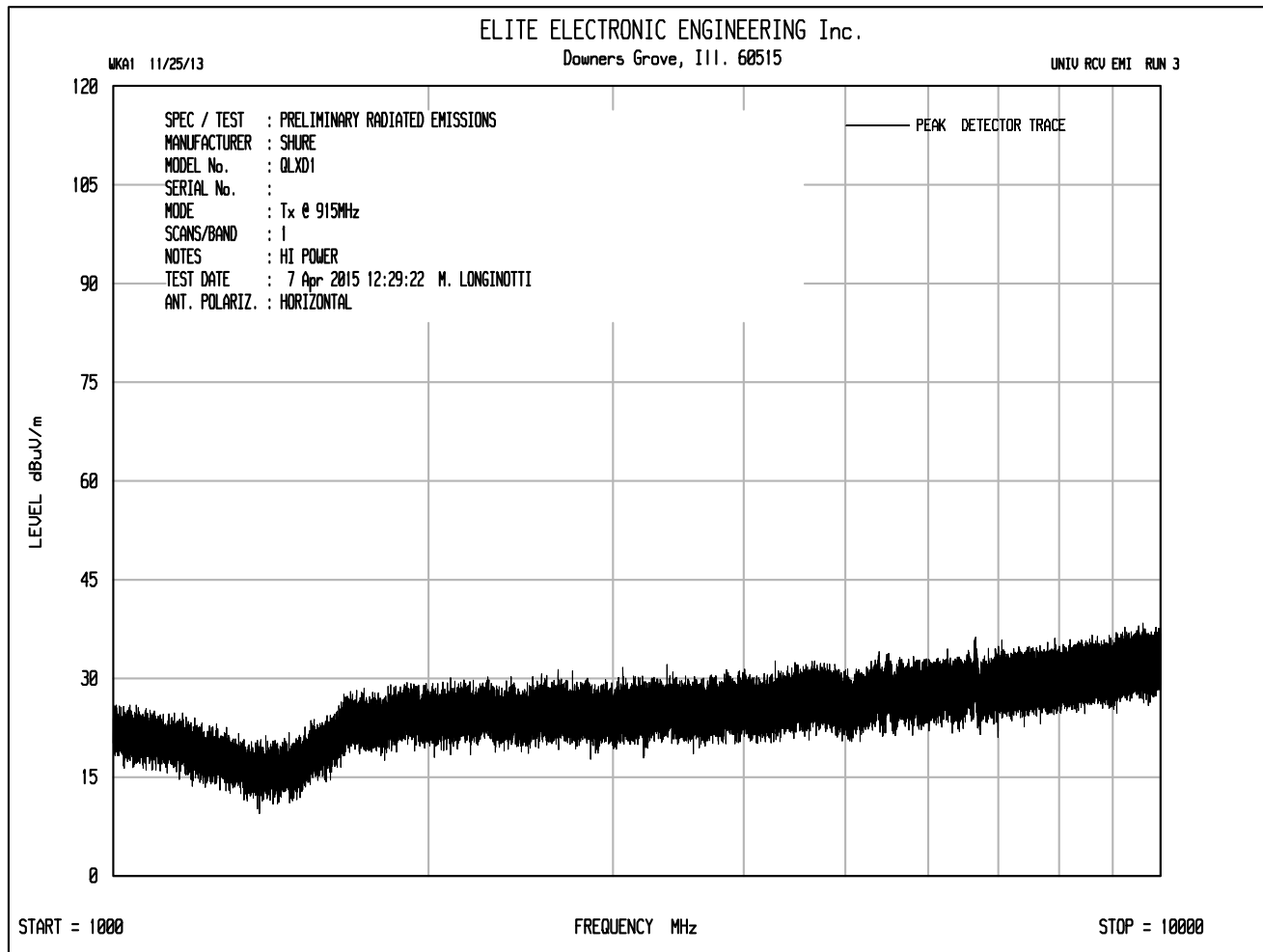


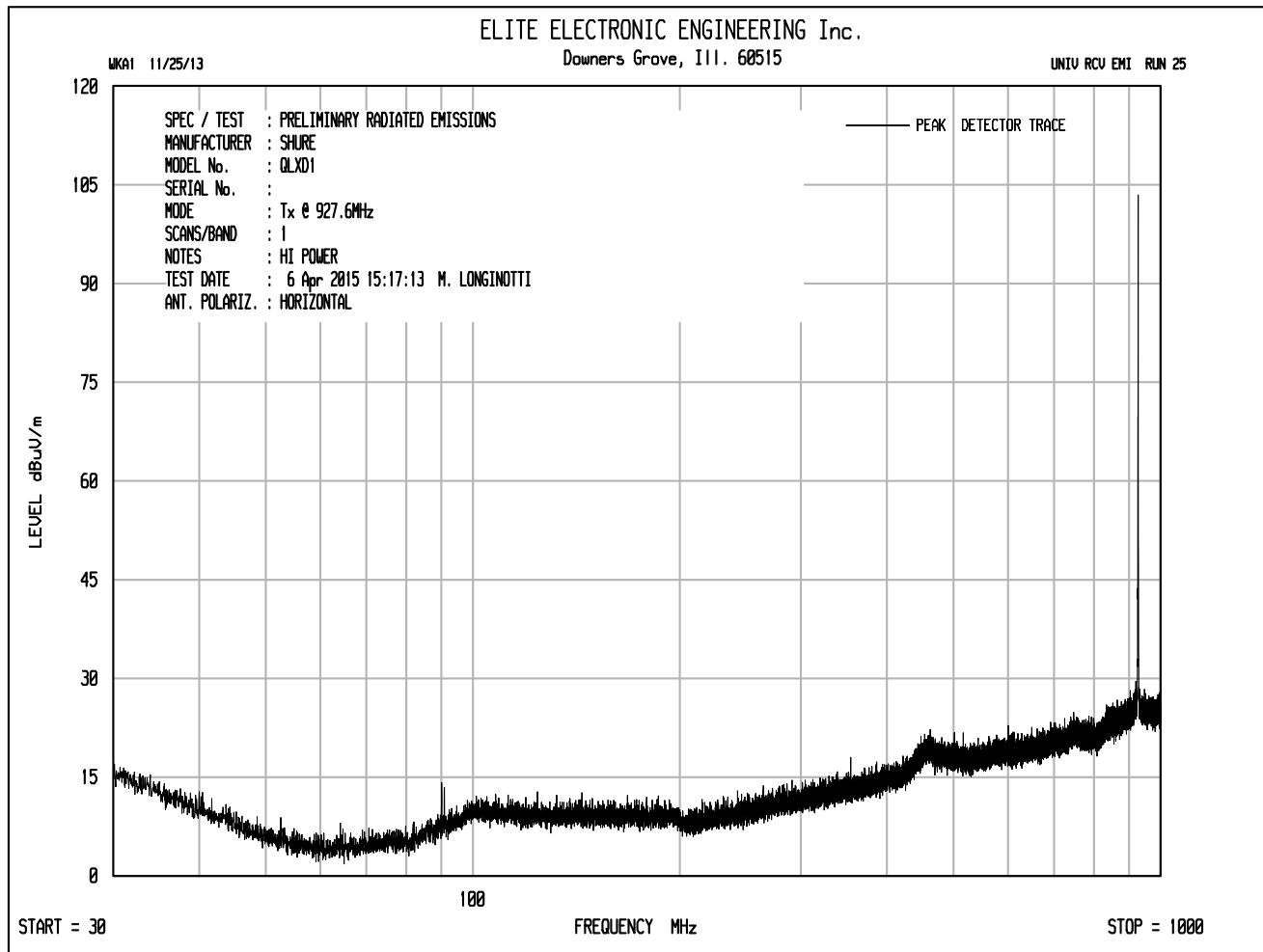


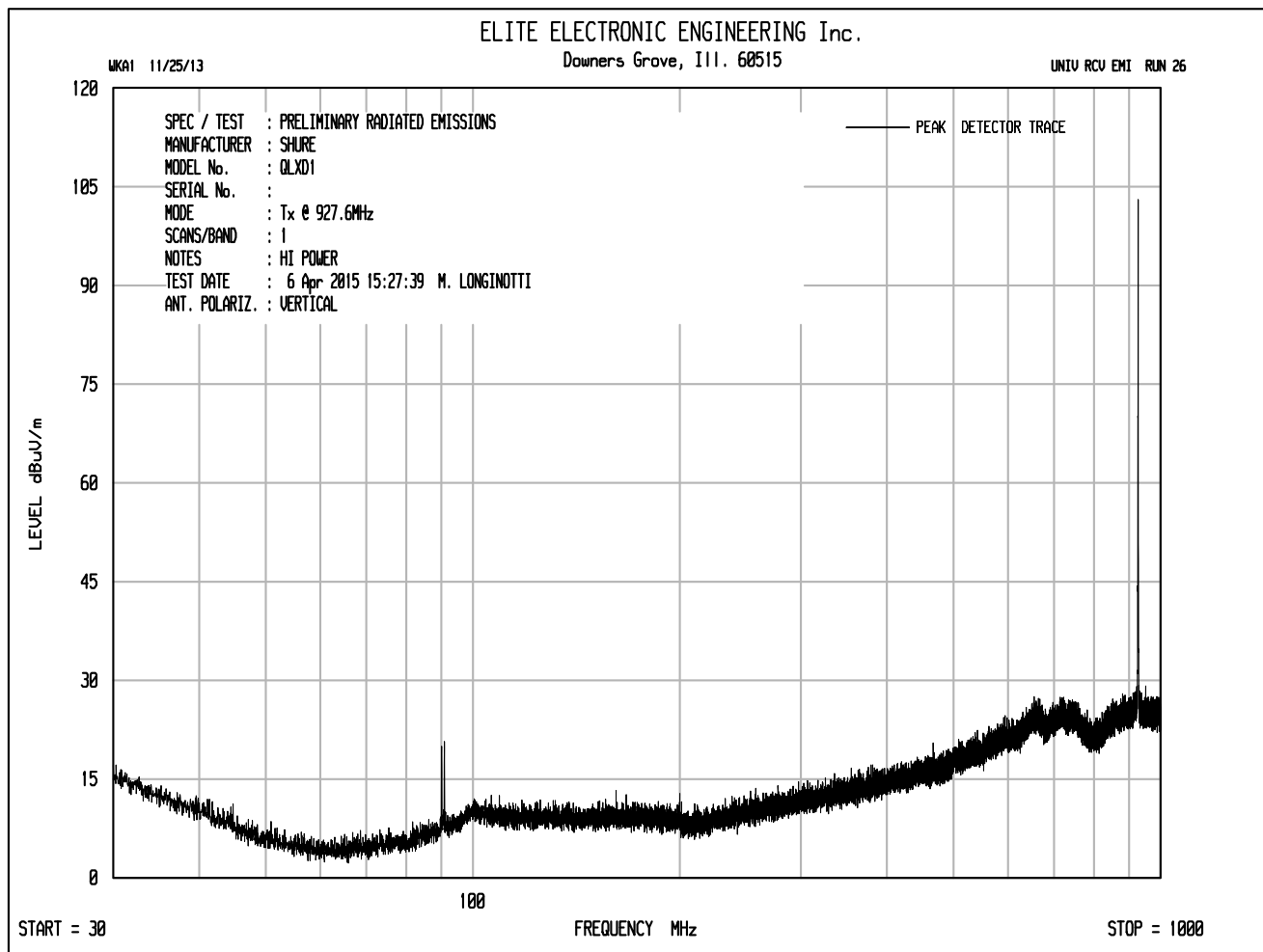


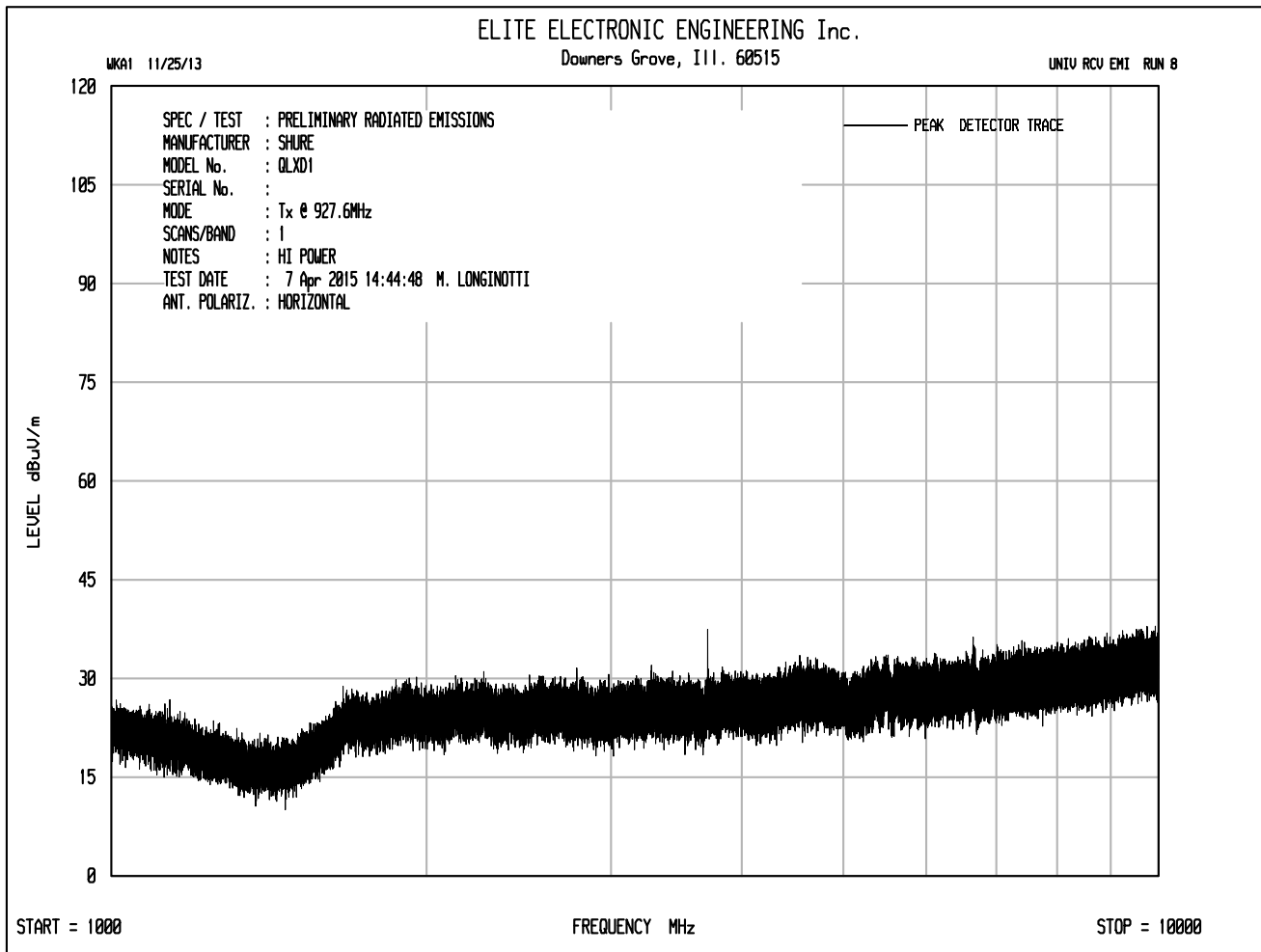


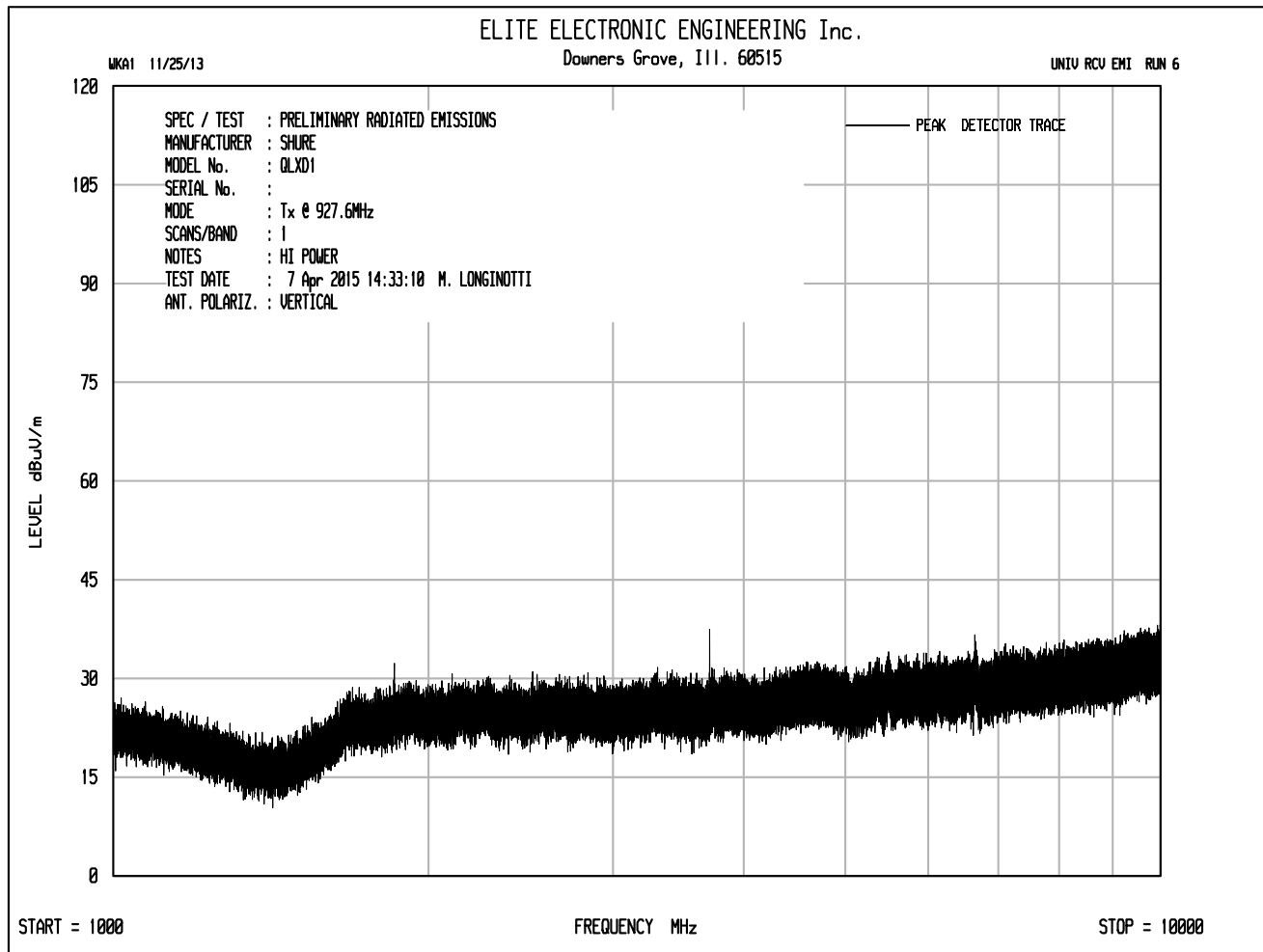














Manufacturer : Shure, Inc.
Model No. : QLXD1
Serial No. : None Assigned
Date Tested : April 7, 2015 through April 10, 2015
Test Performed : Radiated Spurious Emissions in Restricted Bands
Mode : Transmit at 902.4MHz, lo power
Test Distance : 3 meters
Notes : Peak Readings with a 1MHz RBW

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)
2707.20	H	46.8	Ambient	2.8	32.8	-40.4	42.0	125.8	5000.0	-32.0
2707.20	V	47.2	Ambient	2.8	32.8	-40.4	42.4	131.7	5000.0	-31.6
3609.60	H	45.7	Ambient	3.2	33.2	-40.3	41.9	123.8	5000.0	-32.1
3609.60	V	47.3	Ambient	3.2	33.2	-40.3	43.5	148.9	5000.0	-30.5
4512.00	H	46.9	Ambient	3.6	34.2	-40.1	44.6	169.8	5000.0	-29.4
4512.00	V	46.9	Ambient	3.6	34.2	-40.1	44.6	169.8	5000.0	-29.4
5414.40	H	45.2	Ambient	3.9	35.0	-40.2	43.9	156.3	5000.0	-30.1
5414.40	V	46.0	Ambient	3.9	35.0	-40.2	44.7	171.4	5000.0	-29.3
8121.60	H	47.2	Ambient	4.9	35.7	-40.0	47.9	248.9	5000.0	-26.1
8121.60	V	47.5	Ambient	4.9	35.7	-40.0	48.2	257.7	5000.0	-25.8
9024.00	H	46.8	Ambient	4.9	36.1	-39.7	48.2	255.7	5000.0	-25.8
9024.00	V	46.2	Ambient	4.9	36.1	-39.7	47.6	238.7	5000.0	-26.4

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

Peak Total (uV/m) = $10^{(\text{Peak Total (dBuV/m)}/20)}$



Manufacturer : Shure, Inc.
Model No. : QLXD1
Serial No. : None Assigned
Date Tested : April 7, 2015 through April 10, 2015
Test Performed : Radiated Spurious Emissions in Restricted Bands
Mode : Transmit at 902.4MHz, lo power
Test Distance : 3 meters
Notes : Average Readings with a 1MHz RBW, 10Hz VBW

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)
2707.20	H	34.9	Ambient	2.8	32.8	-40.4	30.1	32.0	500.0	-23.9
2707.20	V	34.9	Ambient	2.8	32.8	-40.4	30.1	32.0	500.0	-23.9
3609.60	H	34.3	Ambient	3.2	33.2	-40.3	30.5	33.3	500.0	-23.5
3609.60	V	34.3	Ambient	3.2	33.2	-40.3	30.5	33.3	500.0	-23.5
4512.00	H	34.2	Ambient	3.6	34.2	-40.1	31.9	39.3	500.0	-22.1
4512.00	V	34.2	Ambient	3.6	34.2	-40.1	31.9	39.3	500.0	-22.1
5414.40	H	32.9	Ambient	3.9	35.0	-40.2	31.6	37.9	500.0	-22.4
5414.40	V	33.0	Ambient	3.9	35.0	-40.2	31.7	38.4	500.0	-22.3
8121.60	H	33.8	Ambient	4.9	35.7	-40.0	34.5	53.2	500.0	-19.5
8121.60	V	33.8	Ambient	4.9	35.7	-40.0	34.5	53.2	500.0	-19.5
9024.00	H	33.6	Ambient	4.9	36.1	-39.7	35.0	56.0	500.0	-19.0
9024.00	V	33.6	Ambient	4.9	36.1	-39.7	35.0	56.0	500.0	-19.0

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

Average Total (uV/m) = $10^{(\text{Peak Total (dBuV/m)}/20)}$



Manufacturer : Shure, Inc.
Model No. : QLXD1
Serial No. : None Assigned
Date Tested : April 7, 2015 through April 10, 2015
Test Performed : Radiated Spurious Emissions in Restricted Bands
Mode : Transmit at 902.4MHz, hi power
Test Distance : 3 meters
Notes : Peak Readings with a 1MHz RBW

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)
2707.20	H	48.8		2.8	32.8	-40.4	44.0	158.3	5000.0	-30.0
2707.20	V	51.7		2.8	32.8	-40.4	46.9	221.1	5000.0	-27.1
3609.60	H	52.7		3.2	33.2	-40.3	48.9	277.2	5000.0	-25.1
3609.60	V	53.5		3.2	33.2	-40.3	49.7	303.9	5000.0	-24.3
4512.00	H	46.3	Ambient	3.6	34.2	-40.1	44.0	158.4	5000.0	-30.0
4512.00	V	52.6		3.6	34.2	-40.1	50.3	327.2	5000.0	-23.7
5414.40	H	46.4	Ambient	3.9	35.0	-40.2	45.1	179.4	5000.0	-28.9
5414.40	V	45.2	Ambient	3.9	35.0	-40.2	43.9	156.3	5000.0	-30.1
8121.60	H	45.8	Ambient	4.9	35.7	-40.0	46.5	211.9	5000.0	-27.5
8121.60	V	46.7	Ambient	4.9	35.7	-40.0	47.4	235.0	5000.0	-26.6
9024.00	H	46.9	Ambient	4.9	36.1	-39.7	48.3	258.7	5000.0	-25.7
9024.00	V	46.4	Ambient	4.9	36.1	-39.7	47.8	244.2	5000.0	-26.2

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

Peak Total (uV/m) = $10^{(\text{Peak Total (dBuV/m)}/20)}$



Manufacturer : Shure, Inc.
Model No. : QLXD1
Serial No. : None Assigned
Date Tested : April 7, 2015 through April 10, 2015
Test Performed : Radiated Spurious Emissions in Restricted Bands
Mode : Transmit at 902.4MHz, hi power
Test Distance : 3 meters
Notes : Average Readings with a 1MHz RBW, 10Hz VBW

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)
2707.20	H	36.60		2.8	32.8	-40.4	31.8	38.9	500.0	-22.2
2707.20	V	38.2		2.8	32.8	-40.4	33.4	46.7	500.0	-20.6
3609.60	H	38.8		3.2	33.2	-40.3	35.0	55.9	500.0	-19.0
3609.60	V	39.9		3.2	33.2	-40.3	36.1	63.5	500.0	-17.9
4512.00	H	34.3	Ambient	3.6	34.2	-40.1	32.0	39.8	500.0	-22.0
4512.00	V	38.3		3.6	34.2	-40.1	36.0	63.1	500.0	-18.0
5414.40	H	32.9	Ambient	3.9	35.0	-40.2	31.6	37.9	500.0	-22.4
5414.40	V	33.1	Ambient	3.9	35.0	-40.2	31.8	38.8	500.0	-22.2
8121.60	H	34.0	Ambient	4.9	35.7	-40.0	34.7	54.5	500.0	-19.3
8121.60	V	33.9	Ambient	4.9	35.7	-40.0	34.6	53.8	500.0	-19.4
9024.00	H	33.7	Ambient	4.9	36.1	-39.7	35.1	56.6	500.0	-18.9
9024.00	V	33.7	Ambient	4.9	36.1	-39.7	35.1	56.6	500.0	-18.9

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

Average Total (uV/m) = $10^{(\text{Peak Total (dBuV/m)}/20)}$



Manufacturer : Shure, Inc.
Model No. : QLXD1
Serial No. : None Assigned
Date Tested : April 7, 2015 through April 10, 2015
Test Performed : Radiated Spurious Emissions in Restricted Bands
Mode : Transmit at 915MHz, lo power
Test Distance : 3 meters
Notes : Peak Readings with a 1MHz RBW

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)
2745.00	H	47.4	Ambient	2.8	32.8	-40.4	42.6	134.6	5000.0	-31.4
2745.00	V	47.1	Ambient	2.8	32.8	-40.4	42.3	130.0	5000.0	-31.7
3660.00	H	46.5	Ambient	3.3	33.3	-40.3	42.8	138.1	5000.0	-31.2
3660.00	V	47.0	Ambient	3.3	33.3	-40.3	43.3	146.2	5000.0	-30.7
4575.00	H	48.3	Ambient	3.6	34.3	-40.1	46.1	201.9	5000.0	-27.9
4575.00	V	47.7	Ambient	3.6	34.3	-40.1	45.5	188.4	5000.0	-28.5
7320.00	H	47.0	Ambient	4.7	35.6	-40.1	47.2	229.3	5000.0	-26.8
7320.00	V	46.3	Ambient	4.7	35.6	-40.1	46.5	211.6	5000.0	-27.5
8235.00	H	46.7	Ambient	4.9	35.9	-39.9	47.6	238.9	5000.0	-26.4
8235.00	V	46.5	Ambient	4.9	35.9	-39.9	47.4	233.5	5000.0	-26.6
9150.00	H	46.4	Ambient	5.0	36.2	-39.7	47.9	248.0	5000.0	-26.1
9150.00	V	46.9	Ambient	5.0	36.2	-39.7	48.4	262.7	5000.0	-25.6

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

Peak Total (uV/m) = $10^{(\text{Peak Total (dBuV/m)}/20)}$



Manufacturer : Shure, Inc.
Model No. : QLXD1
Serial No. : None Assigned
Date Tested : April 7, 2015 through April 10, 2015
Test Performed : Radiated Spurious Emissions in Restricted Bands
Mode : Transmit at 915MHz, lo power
Test Distance : 3 meters
Notes : Average Readings with a 1MHz RBW, 10Hz VBW

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)
2745.00	H	34.20	Ambient	2.8	32.8	-40.4	29.4	29.5	500.0	-24.6
2745.00	V	34.2	Ambient	2.8	32.8	-40.4	29.4	29.5	500.0	-24.6
3660.00	H	33.4	Ambient	3.3	33.3	-40.3	29.7	30.6	500.0	-24.3
3660.00	V	33.4	Ambient	3.3	33.3	-40.3	29.7	30.6	500.0	-24.3
4575.00	H	34.5	Ambient	3.6	34.3	-40.1	32.3	41.2	500.0	-21.7
4575.00	V	34.5	Ambient	3.6	34.3	-40.1	32.3	41.2	500.0	-21.7
7320.00	H	34.0	Ambient	4.7	35.6	-40.1	34.2	51.3	500.0	-19.8
7320.00	V	33.9	Ambient	4.7	35.6	-40.1	34.1	50.8	500.0	-19.9
8235.00	H	33.8	Ambient	4.9	35.9	-39.9	34.7	54.1	500.0	-19.3
8235.00	V	33.7	Ambient	4.9	35.9	-39.9	34.6	53.5	500.0	-19.4
9150.00	H	33.4	Ambient	5.0	36.2	-39.7	34.9	55.5	500.0	-19.1
9150.00	V	33.3	Ambient	5.0	36.2	-39.7	34.8	54.9	500.0	-19.2

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

Average Total (uV/m) = $10^{(\text{Peak Total (dBuV/m)}/20)}$



Manufacturer : Shure, Inc.
Model No. : QLXD1
Serial No. : None Assigned
Date Tested : April 7, 2015 through April 10, 2015
Test Performed : Radiated Spurious Emissions in Restricted Bands
Mode : Transmit at 915MHz, hi power
Test Distance : 3 meters
Notes : Peak Readings with a 1MHz RBW

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)
2745.00	H	48.7		2.8	32.8	-40.4	43.9	156.4	5000.0	-30.1
2745.00	V	52.0		2.8	32.8	-40.4	47.2	228.6	5000.0	-26.8
3660.00	H	52.0		3.3	33.3	-40.3	48.3	260.1	5000.0	-25.7
3660.00	V	52.5		3.3	33.3	-40.3	48.8	275.5	5000.0	-25.2
4575.00	H	50.8		3.6	34.3	-40.1	48.6	269.2	5000.0	-25.4
4575.00	V	46.2	Ambient	3.6	34.3	-40.1	44.0	158.5	5000.0	-30.0
7320.00	H	46.2	Ambient	4.7	35.6	-40.1	46.4	209.2	5000.0	-27.6
7320.00	V	47.0	Ambient	4.7	35.6	-40.1	47.2	229.3	5000.0	-26.8
8235.00	H	46.8	Ambient	4.9	35.9	-39.9	47.7	241.7	5000.0	-26.3
8235.00	V	46.9	Ambient	4.9	35.9	-39.9	47.8	244.5	5000.0	-26.2
9150.00	H	47.2	Ambient	5.0	36.2	-39.7	48.7	271.9	5000.0	-25.3
9150.00	V	46.9	Ambient	5.0	36.2	-39.7	48.4	262.7	5000.0	-25.6

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

Peak Total (uV/m) = $10^{(\text{Peak Total (dBuV/m)}/20)}$



Manufacturer : Shure, Inc.
Model No. : QLXD1
Serial No. : None Assigned
Date Tested : April 7, 2015 through April 10, 2015
Test Performed : Radiated Spurious Emissions in Restricted Bands
Mode : Transmit at 915MHz, hi power
Test Distance : 3 meters
Notes : Average Readings with a 1MHz RBW, 10Hz VBW

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)
2745.00	H	36.90		2.8	32.8	-40.4	32.1	40.2	500.0	-21.9
2745.00	V	39.6		2.8	32.8	-40.4	34.8	54.8	500.0	-19.2
3660.00	H	38.7		3.3	33.3	-40.3	35.0	56.2	500.0	-19.0
3660.00	V	39.3		3.3	33.3	-40.3	35.6	60.3	500.0	-18.4
4575.00	H	37.3		3.6	34.3	-40.1	35.1	56.9	500.0	-18.9
4575.00	V	34.5	Ambient	3.6	34.3	-40.1	32.3	41.2	500.0	-21.7
7320.00	H	34.0	Ambient	4.7	35.6	-40.1	34.2	51.3	500.0	-19.8
7320.00	V	34.1	Ambient	4.7	35.6	-40.1	34.3	51.9	500.0	-19.7
8235.00	H	33.8	Ambient	4.9	35.9	-39.9	34.7	54.1	500.0	-19.3
8235.00	V	33.8	Ambient	4.9	35.9	-39.9	34.7	54.1	500.0	-19.3
9150.00	H	33.8	Ambient	5.0	36.2	-39.7	35.3	58.1	500.0	-18.7
9150.00	V	33.8	Ambient	5.0	36.2	-39.7	35.3	58.1	500.0	-18.7

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

Average Total (uV/m) = $10^{(\text{Peak Total (dBuV/m)}/20)}$



Manufacturer : Shure, Inc.
Model No. : QLXD1
Serial No. : None Assigned
Date Tested : April 7, 2015 through April 10, 2015
Test Performed : Radiated Spurious Emissions in Restricted Bands
Mode : Transmit at 927.6MHz, lo power
Test Distance : 3 meters
Notes : Peak Readings with a 1MHz RBW

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)
2782.80	H	46.7	Ambient	2.8	32.7	-40.4	41.9	124.1	5000.0	-32.1
2782.80	V	47.6	Ambient	2.8	32.7	-40.4	42.8	137.7	5000.0	-31.2
3710.40	H	47.6	Ambient	3.3	33.3	-40.2	44.0	158.3	5000.0	-30.0
3710.40	V	47.7	Ambient	3.3	33.3	-40.2	44.1	160.2	5000.0	-29.9
4638.00	H	46.7	Ambient	3.6	34.6	-40.2	44.7	172.1	5000.0	-29.3
4638.00	V	47.1	Ambient	3.6	34.6	-40.2	45.1	180.2	5000.0	-28.9
7420.80	H	46.7	Ambient	4.7	35.6	-40.0	47.0	222.9	5000.0	-27.0
7420.80	V	46.2	Ambient	4.7	35.6	-40.0	46.5	210.5	5000.0	-27.5
8348.40	H	46.9	Ambient	4.9	35.8	-39.9	47.8	244.9	5000.0	-26.2
8348.40	V	47.3	Ambient	4.9	35.8	-39.9	48.2	256.5	5000.0	-25.8

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

Peak Total (uV/m) = $10^{(\text{Peak Total (dBuV/m)}/20)}$



Manufacturer : Shure, Inc.
Model No. : QLXD1
Serial No. : None Assigned
Date Tested : April 7, 2015 through April 10, 2015
Test Performed : Radiated Spurious Emissions in Restricted Bands
Mode : Transmit at 927.6MHz, lo power
Test Distance : 3 meters
Notes : Average Readings with a 1MHz RBW, 10Hz VBW

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)
2782.80	H	34.80	Ambient	2.8	32.7	-40.4	30.0	31.5	500.0	-24.0
2782.80	V	34.8	Ambient	2.8	32.7	-40.4	30.0	31.5	500.0	-24.0
3710.40	H	34.4	Ambient	3.3	33.3	-40.2	30.8	34.6	500.0	-23.2
3710.40	V	34.4	Ambient	3.3	33.3	-40.2	30.8	34.6	500.0	-23.2
4638.00	H	33.9	Ambient	3.6	34.6	-40.2	31.9	39.4	500.0	-22.1
4638.00	V	33.9	Ambient	3.6	34.6	-40.2	31.9	39.4	500.0	-22.1
7420.80	H	33.4	Ambient	4.7	35.6	-40.0	33.7	48.2	500.0	-20.3
7420.80	V	33.3	Ambient	4.7	35.6	-40.0	33.6	47.7	500.0	-20.4
8348.40	H	34.0	Ambient	4.9	35.8	-39.9	34.9	55.5	500.0	-19.1
8348.40	V	34.0	Ambient	4.9	35.8	-39.9	34.9	55.5	500.0	-19.1

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

Average Total (uV/m) = $10^{(\text{Peak Total (dBuV/m)}/20)}$



Manufacturer : Shure, Inc.
Model No. : QLXD1
Serial No. : None Assigned
Date Tested : April 7, 2015 through April 10, 2015
Test Performed : Radiated Spurious Emissions in Restricted Bands
Mode : Transmit at 927.6MHz, hi power
Test Distance : 3 meters
Notes : Peak Readings with a 1MHz RBW

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)
2782.80	H	48.0		2.8	32.7	-40.4	43.2	144.2	5000.0	-30.8
2782.80	V	52.8		2.8	32.7	-40.4	48.0	250.6	5000.0	-26.0
3710.40	H	55.0		3.3	33.3	-40.2	51.4	371.2	5000.0	-22.6
3710.40	V	53.7		3.3	33.3	-40.2	50.1	319.6	5000.0	-23.9
4638.00	H	46.2	Ambient	3.6	34.6	-40.2	44.2	162.5	5000.0	-29.8
4638.00	V	49.6	Ambient	3.6	34.6	-40.2	47.6	240.3	5000.0	-26.4
7420.80	H	46.7	Ambient	4.7	35.6	-40.0	47.0	222.9	5000.0	-27.0
7420.80	V	45.0	Ambient	4.7	35.6	-40.0	45.3	183.3	5000.0	-28.7
8348.40	H	47.1	Ambient	4.9	35.8	-39.9	48.0	250.6	5000.0	-26.0
8348.40	V	47.0	Ambient	4.9	35.8	-39.9	47.9	247.7	5000.0	-26.1

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

Peak Total (uV/m) = $10^{(\text{Peak Total (dBuV/m)}/20)}$



Manufacturer : Shure, Inc.
Model No. : QLXD1
Serial No. : None Assigned
Date Tested : April 7, 2015 through April 10, 2015
Test Performed : Radiated Spurious Emissions in Restricted Bands
Mode : Transmit at 927.6MHz, hi power
Test Distance : 3 meters
Notes : Average Readings with a 1MHz RBW, 10Hz VBW

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)
2782.80	H	36.00		2.8	32.7	-40.4	31.2	36.2	500.0	-22.8
2782.80	V	40.8		2.8	32.7	-40.4	36.0	62.9	500.0	-18.0
3710.40	H	42.7		3.3	33.3	-40.2	39.1	90.1	500.0	-14.9
3710.40	V	41.1		3.3	33.3	-40.2	37.5	74.9	500.0	-16.5
4638.00	H	34.0	Ambient	3.6	34.6	-40.2	32.0	39.9	500.0	-22.0
4638.00	V	36.0	Ambient	3.6	34.6	-40.2	34.0	50.2	500.0	-20.0
7420.80	H	33.4	Ambient	4.7	35.6	-40.0	33.7	48.2	500.0	-20.3
7420.80	V	33.4	Ambient	4.7	35.6	-40.0	33.7	48.2	500.0	-20.3
8348.40	H	34.0	Ambient	4.9	35.8	-39.9	34.9	55.5	500.0	-19.1
8348.40	V	34.1	Ambient	4.9	35.8	-39.9	35.0	56.1	500.0	-19.0
2782.80	H	36.00		2.8	32.7	-40.4	31.2	36.2	500.0	-22.8
2782.80	V	40.8		2.8	32.7	-40.4	36.0	62.9	500.0	-18.0

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

Average Total (uV/m) = $10^{(\text{Peak Total (dBuV/m)}/20)}$



Marker 1 [T2]

RBW 100 kHz RF Att 10 dB

Ref Lvl

-1.83 dBm

VBW 300 kHz

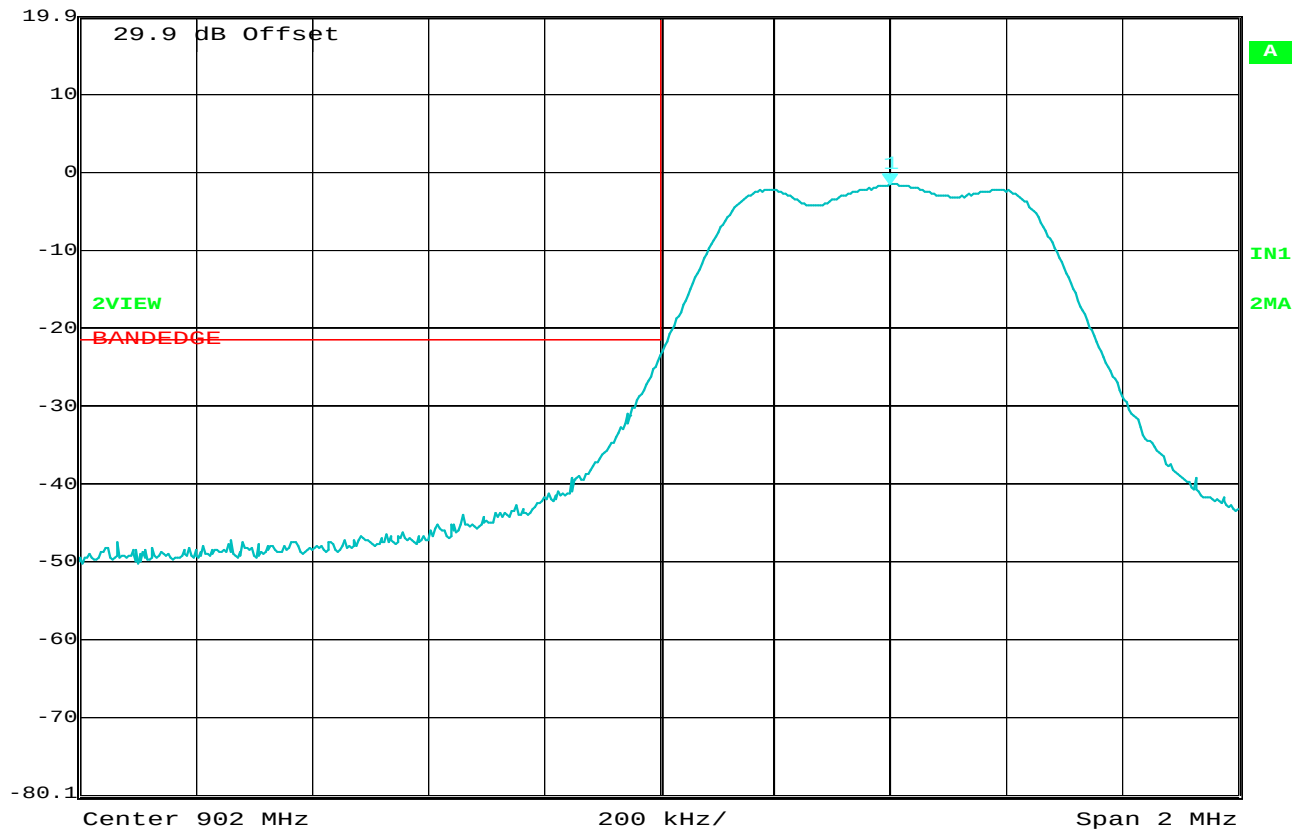
19.9 dBm

902.39879760 MHz

SWT 5 ms

Unit

dBm



Date: 10.APR.2015 10:07:00

Band Edge

Manufacturer : Shure
Model No. : QLXD1
Serial No. :
Date : April 10, 2015
Test Performed : Low Band Edge Requirements
Mode : Tx @ 902.4MHz Low Power
Notes : In any 100kHz bandwidth outside of the authorized frequency band, the power shall be attenuated by at least 20dB relative to the maximum in-band peak power in 100kHz.



Marker 1 [T2]

RBW 100 kHz RF Att 10 dB

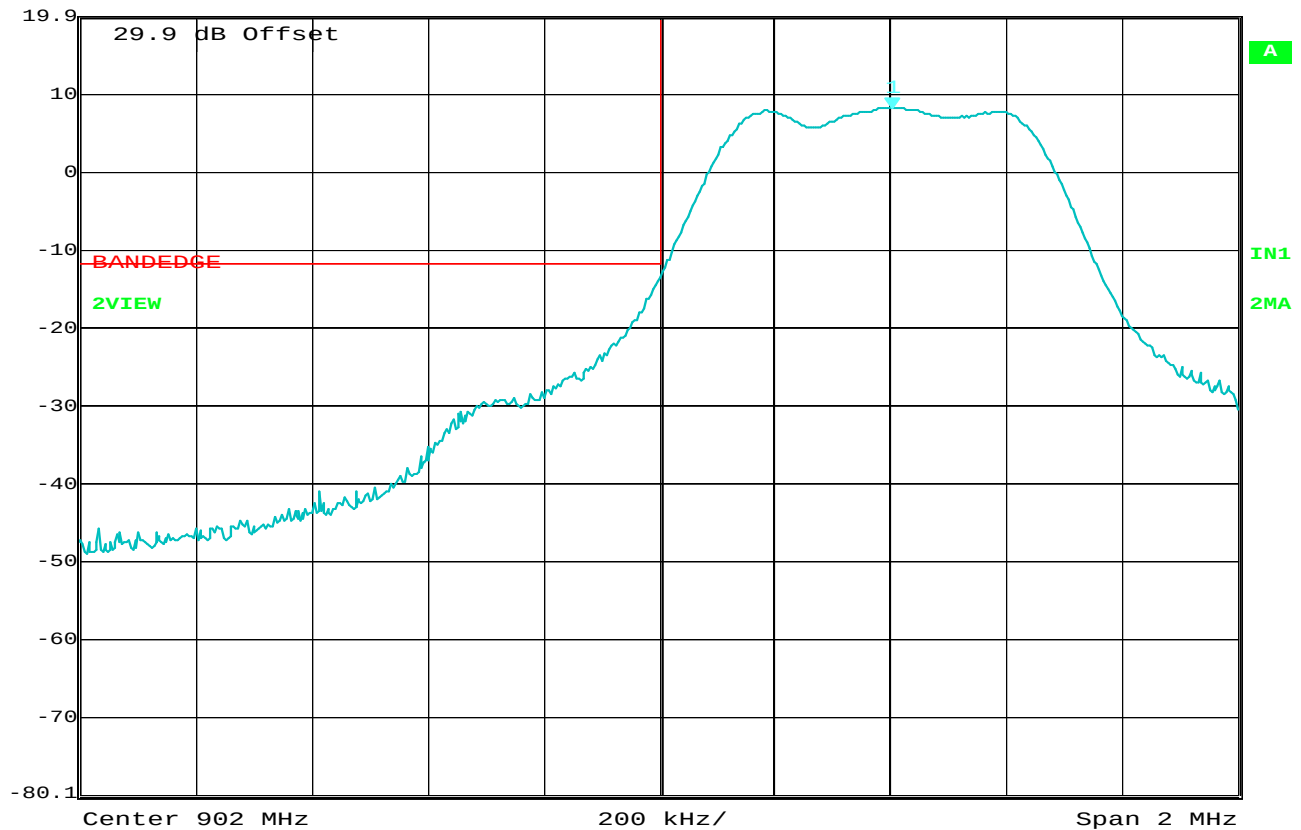
Ref Lvl 8.13 dBm

VBW 300 kHz

19.9 dBm 902.40280561 MHz

SWT 5 ms

Unit dBm



Date: 10.APR.2015 10:12:40

Band Edge

Manufacturer : Shure
Model No. : QLXD1
Serial No. :
Date : April 10, 2015
Test Performed : Low Band Edge Requirements
Mode : Tx @ 902.4MHz High Power
Notes : In any 100kHz bandwidth outside of the authorized frequency band, the power shall be attenuated by at least 20dB relative to the maximum in-band peak power in 100kHz.



Marker 1 [T2]

RBW 100 kHz RF Att 10 dB

Ref Lvl -1.88 dBm

VBW 300 kHz

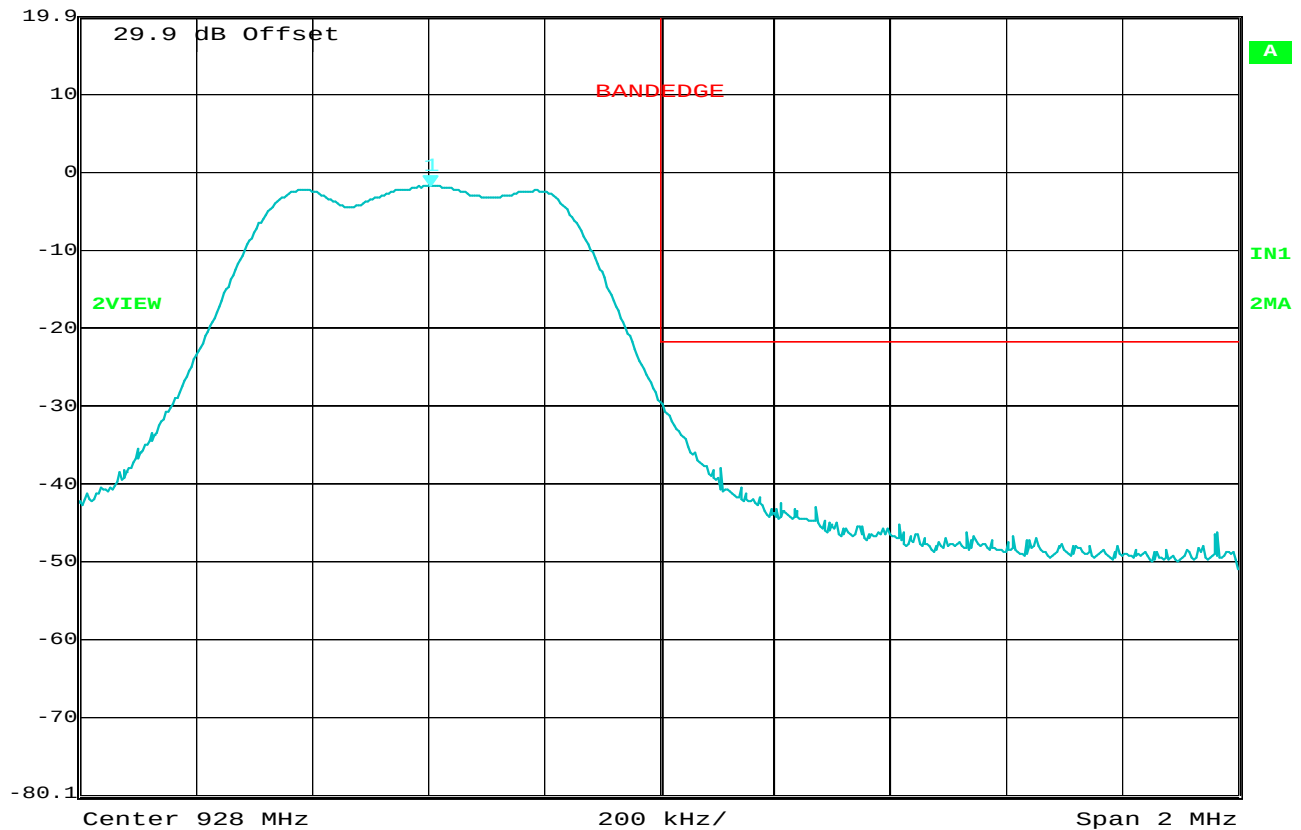
19.9 dBm

927.60521042 MHz

SWT 5 ms

Unit

dBm



Date: 10.APR.2015 10:22:19

Band Edge

Manufacturer : Shure
Model No. : QLXD1
Serial No. :
Date : April 10, 2015
Test Performed : High Band Edge Requirements
Mode : Tx @ 927.6MHz Low Power
Notes : In any 100kHz bandwidth outside of the authorized frequency band, the power shall be attenuated by at least 20dB relative to the maximum in-band peak power in 100kHz.



Marker 1 [T2]

RBW 100 kHz RF Att 10 dB

Ref Lvl 7.98 dBm

VBW 300 kHz

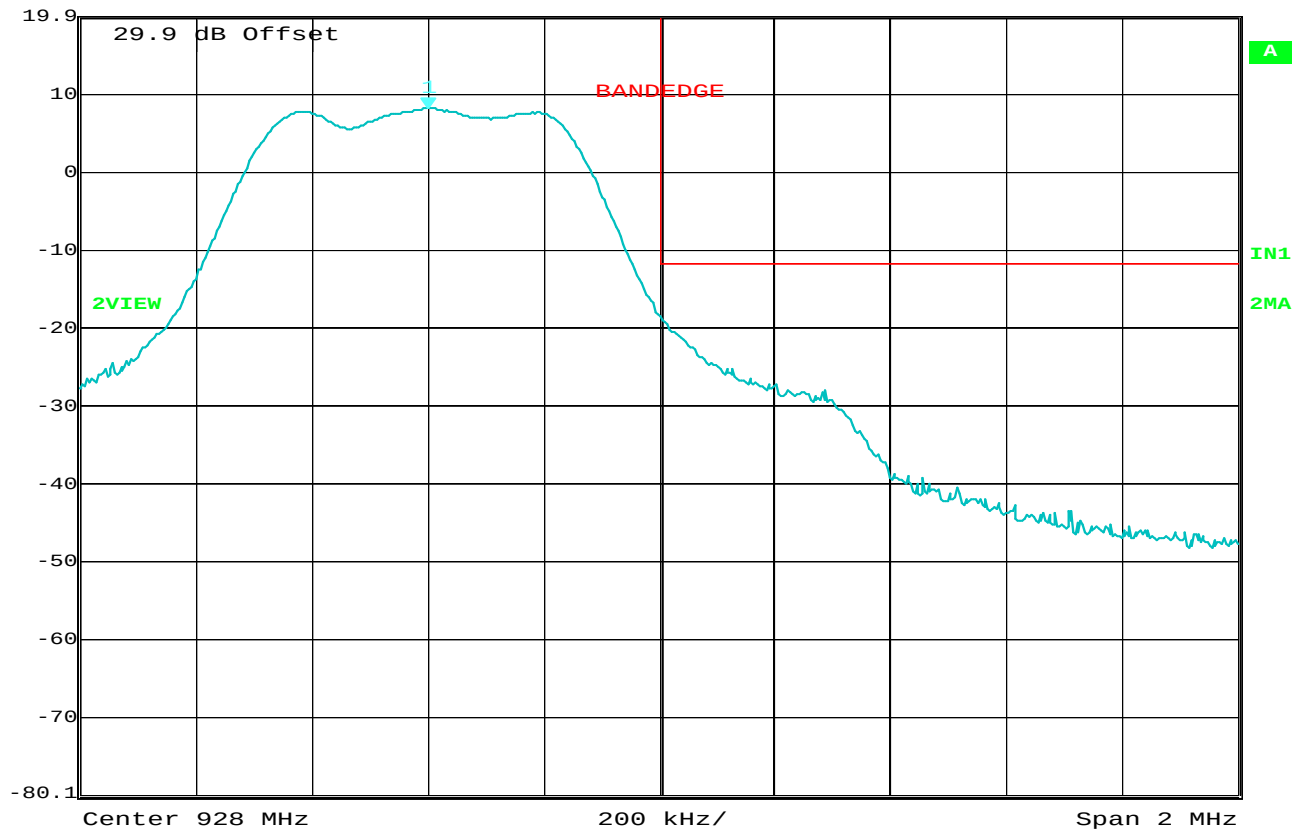
19.9 dBm

927.60120240 MHz

SWT 5 ms

Unit

dBm



Date: 10.APR.2015 10:20:16

Band Edge

Manufacturer : Shure
Model No. : QLXD1
Serial No. :
Date : April 10, 2015
Test Performed : High Band Edge Requirements
Mode : Tx @ 927.6MHz High Power
Notes : In any 100kHz bandwidth outside of the authorized frequency band, the power shall be attenuated by at least 20dB relative to the maximum in-band peak power in 100kHz.



Marker 1 [T2]

RBW 30 kHz RF Att 10 dB

Ref Lvl

-2.56 dBm

VBW 300 kHz

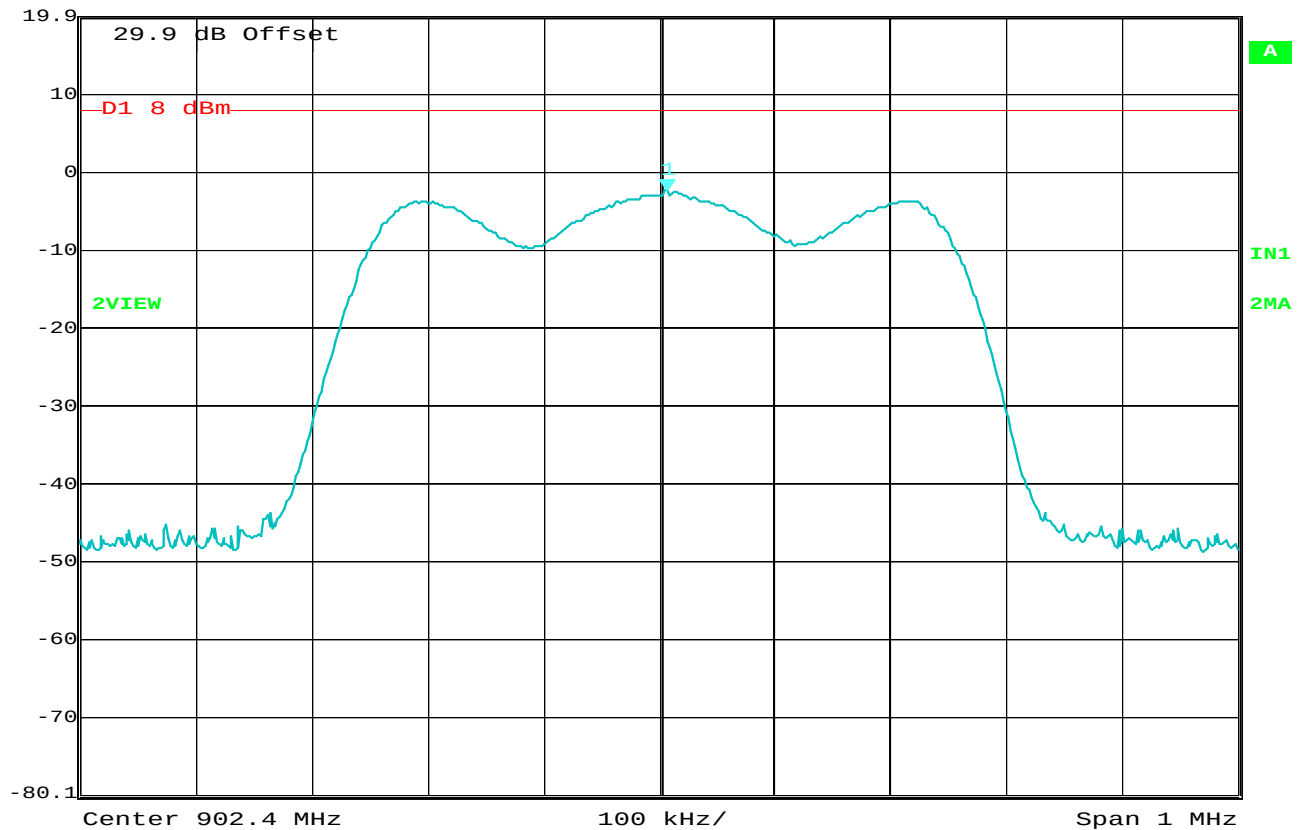
19.9 dBm

902.40701403 MHz

SWT 5 ms

Unit

dBm



Date: 10.APR.2015 09:45:23

Power Spectral Density

Manufacturer : Shure
Model No. : QLXD1
Serial No. :
Date : April 10, 2015
Test Performed : Power Spectral Density (PSD) in a 30kHz bandwidth
Mode : Tx @ 902.4MHz Low Power
Notes : PSD in a 30kHz bandwidth = -2.56dBm



Marker 1 [T2]

RBW 30 kHz RF Att 10 dB

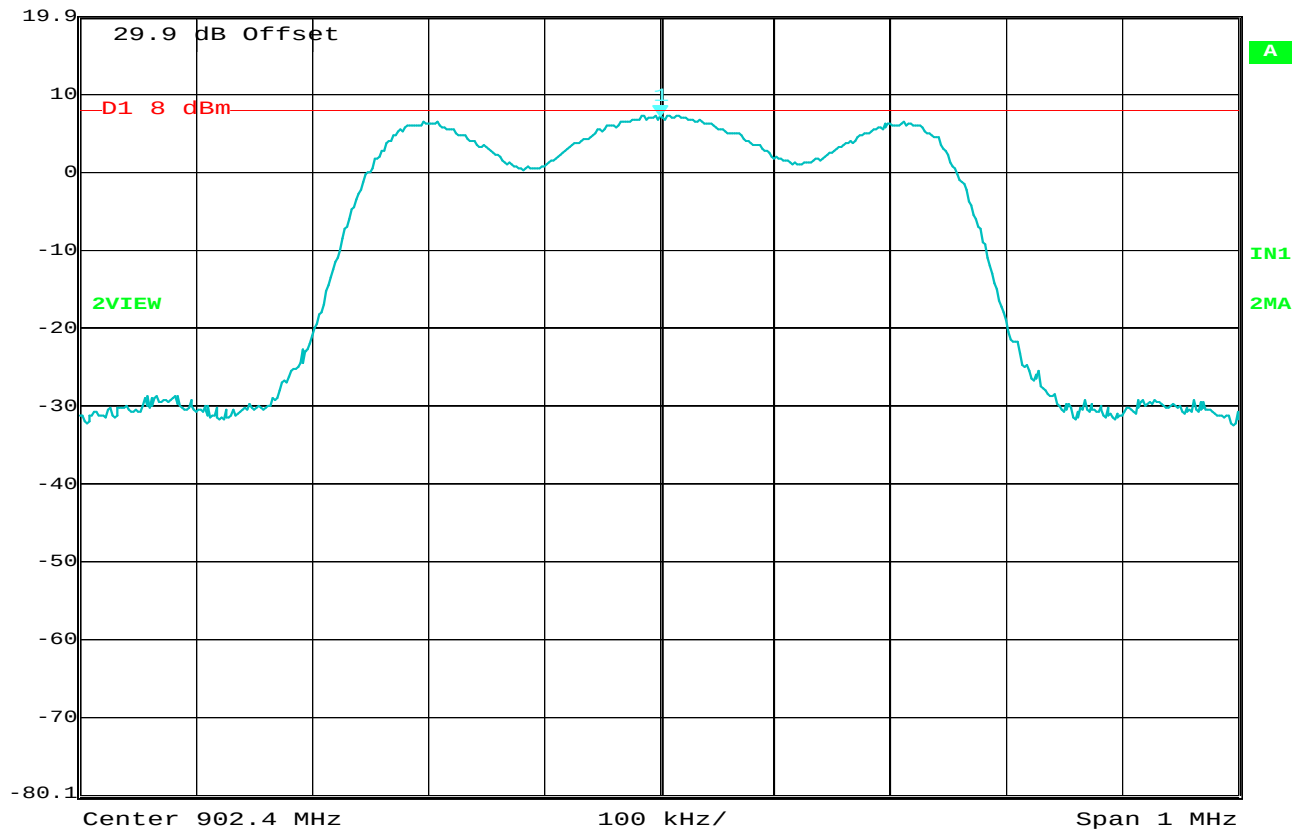
Ref Lvl 7.07 dBm

VBW 300 kHz

19.9 dBm 902.40100200 MHz

SWT 5 ms

Unit dBm



Date: 10.APR.2015 09:50:37

Power Spectral Density

Manufacturer : Shure
Model No. : QLXD1
Serial No. :
Date : April 10, 2015
Test Performed : Power Spectral Density (PSD) in a 30kHz bandwidth
Mode : Tx @ 902.4MHz High Power
Notes : PSD in a 30kHz bandwidth = 7.07dBm



Marker 1 [T2]

RBW 30 kHz RF Att 10 dB

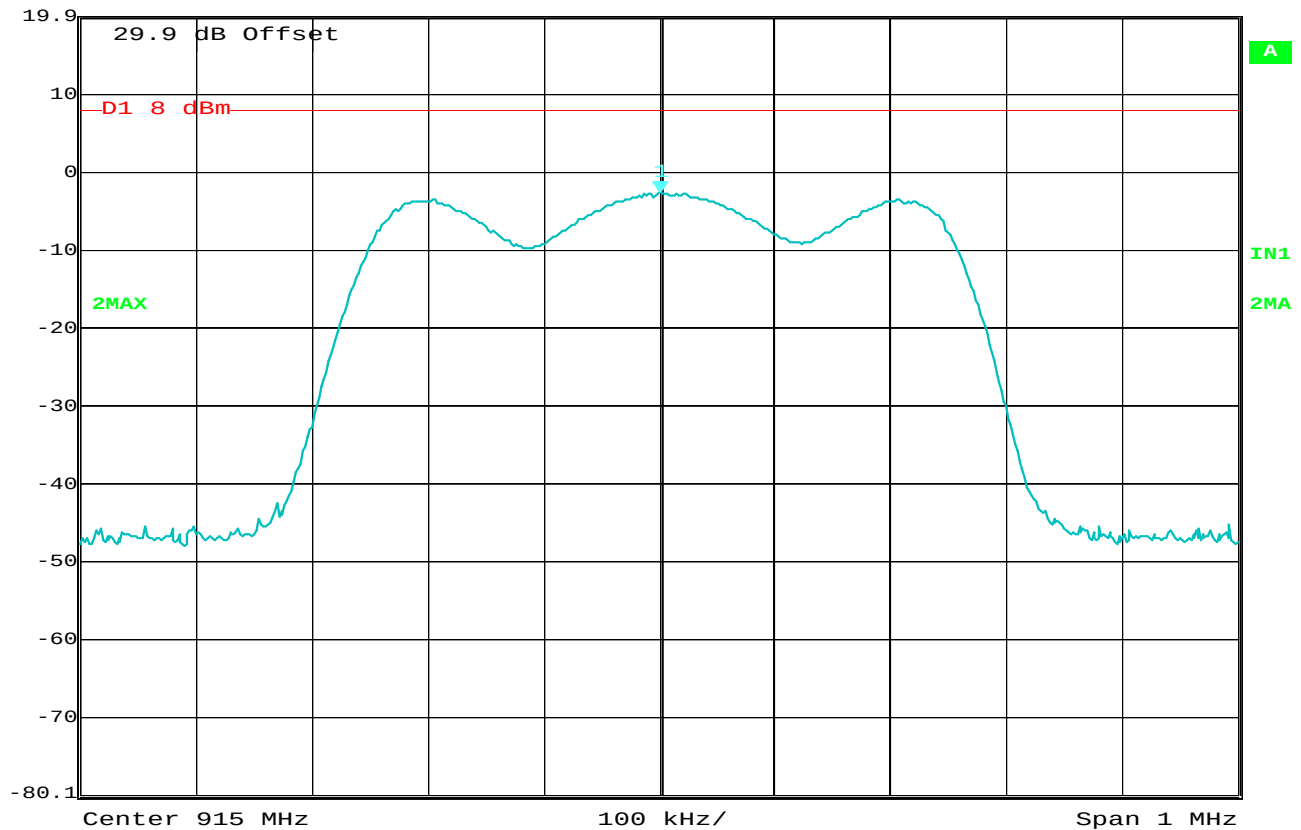
Ref Lvl -2.83 dBm

VBW 300 kHz

19.9 dBm 915.00100200 MHz

SWT 5 ms

Unit dBm



Date: 10.APR.2015 09:57:08

Power Spectral Density

Manufacturer : Shure
Model No. : QLXD1
Serial No. :
Date : April 10, 2015
Test Performed : Power Spectral Density (PSD) in a 30kHz bandwidth
Mode : Tx @ 915MHz Low Power
Notes : PSD in a 30kHz bandwidth = -2.83dBm



Marker 1 [T2]

RBW 30 kHz RF Att 10 dB

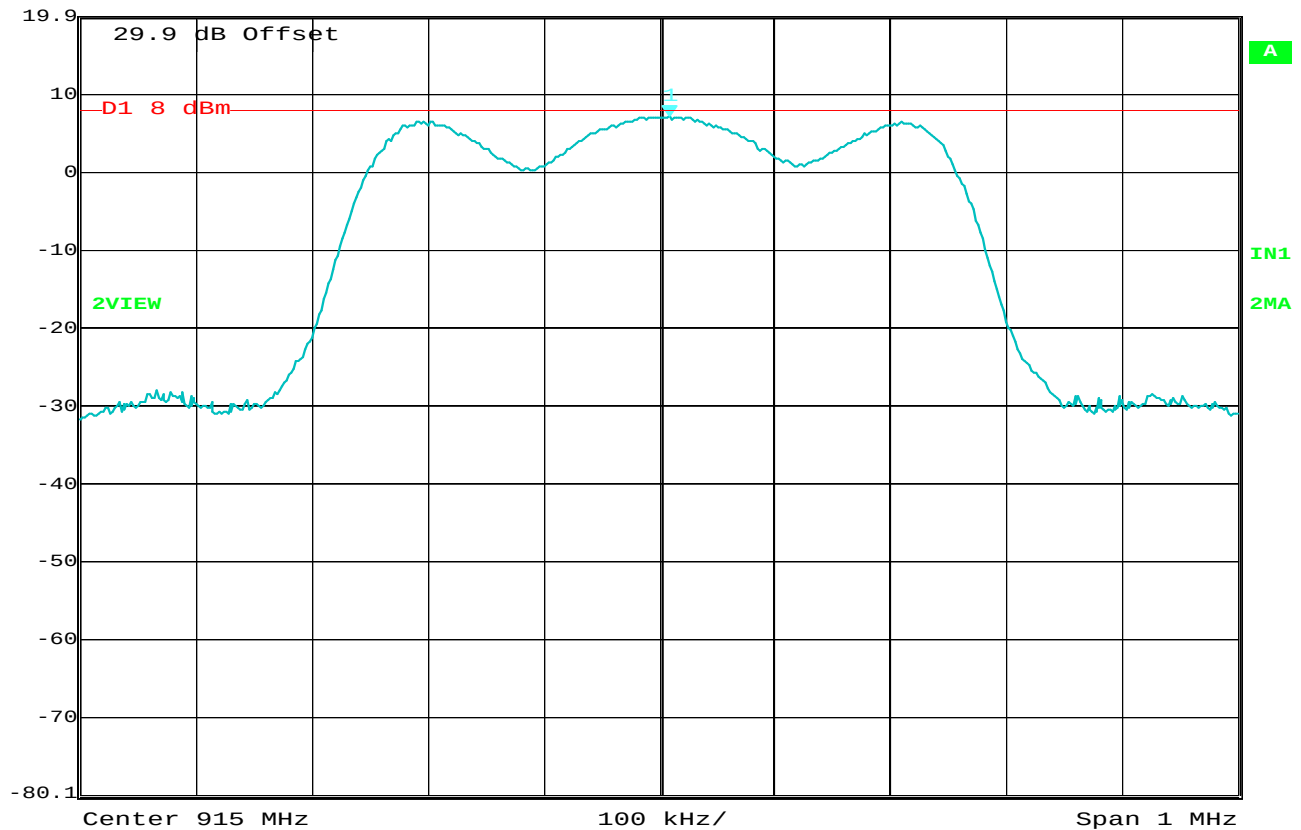
Ref Lvl 6.92 dBm

VBW 300 kHz

19.9 dBm 915.00901804 MHz

SWT 5 ms

Unit dBm



Date: 10.APR.2015 09:53:12

Power Spectral Density

Manufacturer : Shure
Model No. : QLXD1
Serial No. :
Date : April 10, 2015
Test Performed : Power Spectral Density (PSD) in a 30kHz bandwidth
Mode : Tx @ 915MHz High Power
Notes : PSD in a 30kHz bandwidth = 6.92dBm



Marker 1 [T2]

RBW 30 kHz RF Att 10 dB

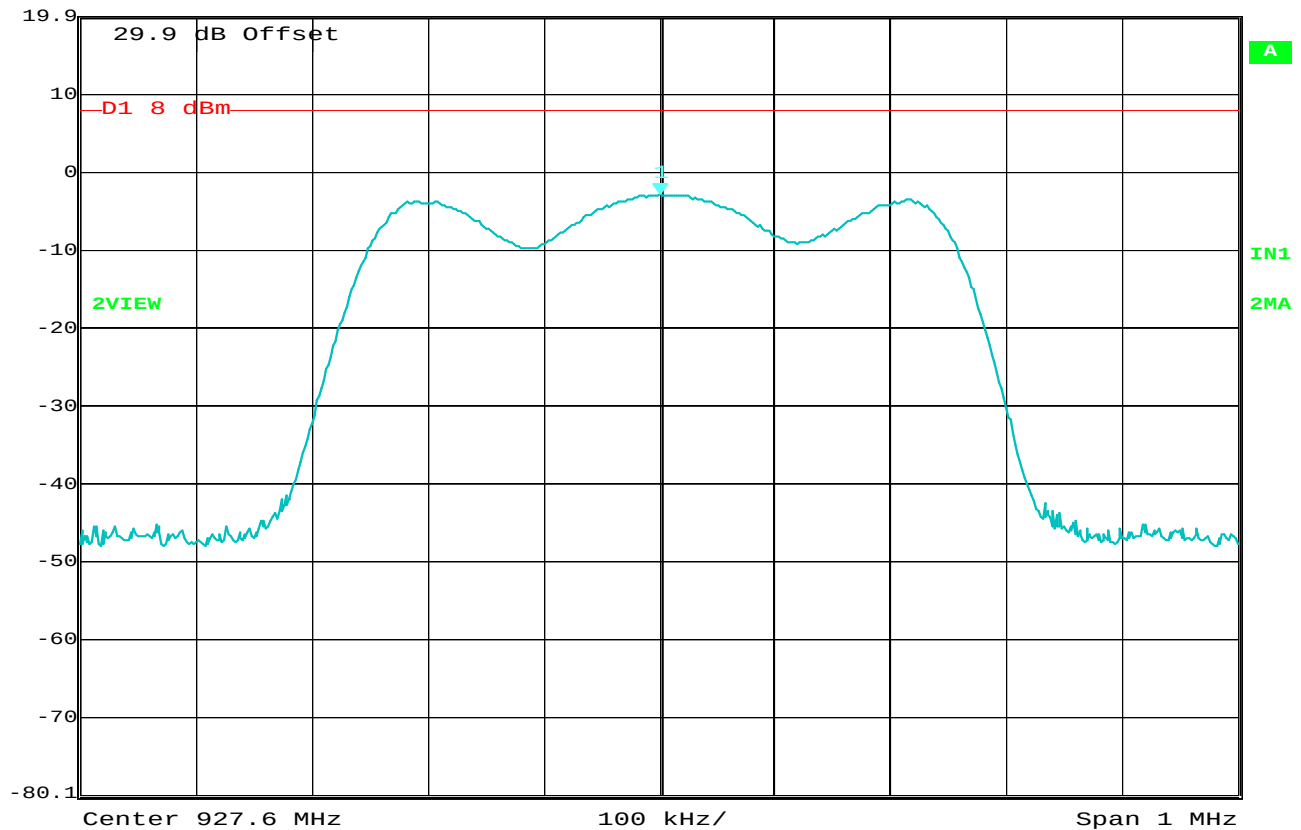
Ref Lvl -3.08 dBm

VBW 300 kHz

19.9 dBm 927.60100200 MHz

SWT 5 ms

Unit dBm



Date: 10.APR.2015 09:43:25

Power Spectral Density

Manufacturer : Shure
Model No. : QLXD1
Serial No. :
Date : April 10, 2015
Test Performed : Power Spectral Density (PSD) in a 30kHz bandwidth
Mode : Tx @ 927.6MHz Low Power
Notes : PSD in a 30kHz bandwidth = -3.08dBm



Marker 1 [T2]

RBW 30 kHz RF Att 10 dB

Ref Lvl 7.03 dBm

VBW 300 kHz

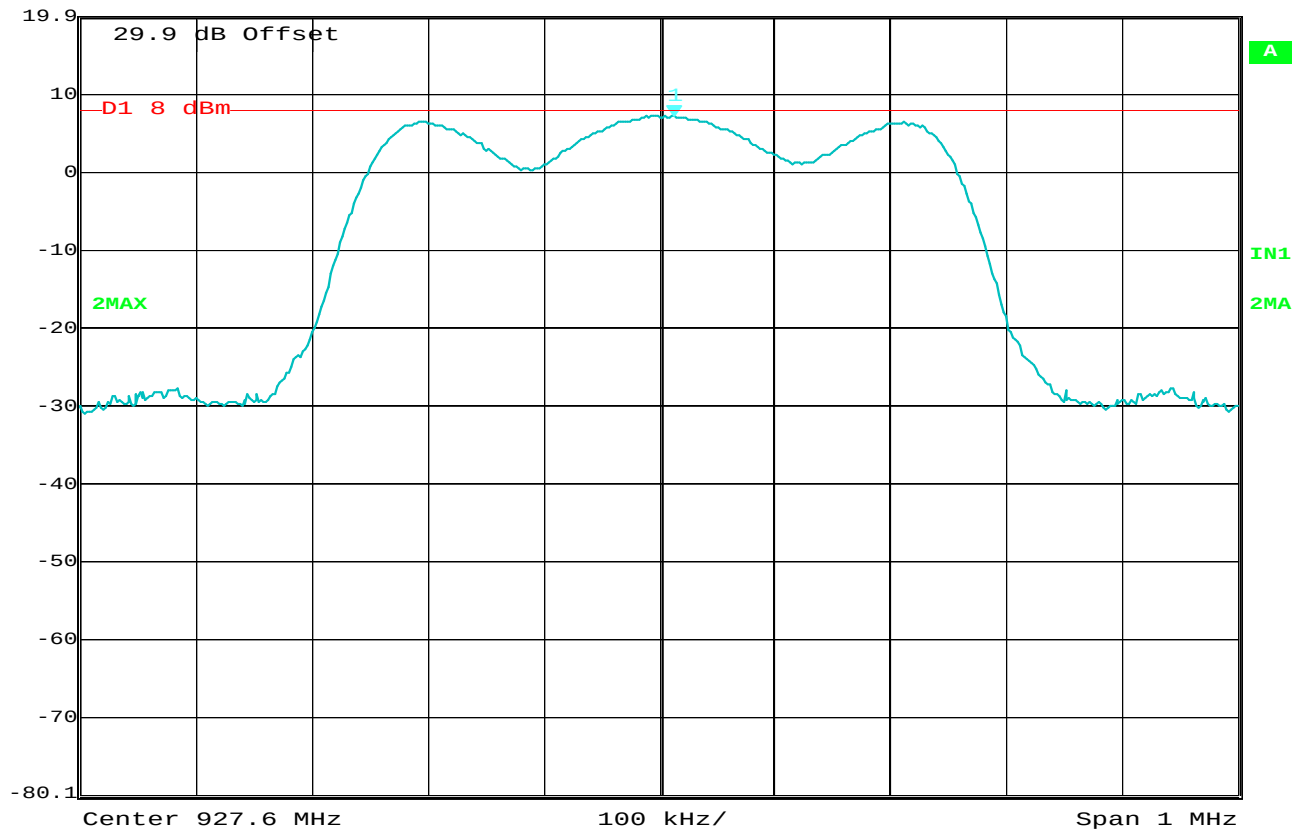
19.9 dBm

927.61302605 MHz

SWT 5 ms

Unit

dBm



Date: 10.APR.2015 09:39:18

Power Spectral Density

Manufacturer : Shure
Model No. : QLXD1
Serial No. :
Date : April 10, 2015
Test Performed : Power Spectral Density (PSD) in a 30kHz bandwidth
Mode : Tx @ 927.6MHz High Power
Notes : PSD in a 30kHz bandwidth = 7.03dBm