# Measurement of RF Emissions from an MSD9 Rev. A Transceiver

| | |
|---|---|
| For | XetaWave, LLC<br>1668 Valtec Lane, Suite G<br>Boulder, CO 80301 |
| P.O. Number | 120890 |
| Date Tested | August 27th through September 7th, 2012 |
| Test Personnel | Richard King, Ian Carnegie |
| Test Specification | FCC "Code of Federal Regulations" Title 47<br>Part 101, Subpart C |

Test Report By:

Richard King, Ian Carnegie
EMC Engineer

Requested By:

David Greene
XetaWave, LLC

Approved By:

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.elitetest.com**

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## REVISION HISTORY

| Revision | Date | Description |
|---|---|---|
| — | 26 September 2012 | Initial release |
| | | |

# Measurement of RF Emissions from a Model No. MSD9 Rev. A Transceiver

## 1. Introduction

### 1.1. Scope of Tests

This report presents the results of the RF emissions measurements performed on a Transceiver, Model No. MSD9 Rev. A, serial number 4, (hereinafter referred to as the Equipment Under Test (EUT)). The EUT is designed to transmit in the frequency range 928MHz to 960MHz frequency range. The EUT uses an external antenna. The EUT was manufactured and submitted for testing by XetaWave, LLC located in Boulder, CO.

### 1.2. Purpose

The test series was performed to determine if the EUT meets FCC technical requirements for transmitters. The EUT shall comply with the technical requirements of FCC Part 101. The testing includes the RF power output, occupied bandwidth, spurious emissions at antenna terminal, field strength of spurious emissions, and frequency stability requirements for the transmitters. Testing was performed in accordance with TIA-603-C-2004.

### 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 22.4$^{o}$C and the relative humidity was 38%.

## 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 101, Subpart C, dated 1 October 2011
- TIA-603-C-2004, “Land Mobile FM or PM – Communications Equipment – Measurement and Performance Standards”

## 3. EUT Setup and Operation

### 3.1. General Description

The EUT is a XetaWave, LLC, Transceiver, Model No. MSD9 Rev. A. A block diagram of the EUT setup is shown as Figure 1.

#### 3.1.1. Power Input

The EUT is typically powered via batteries. For test purposes, a DC power supply provided 5VDC to the EUT.

#### 3.1.2. Peripheral Equipment

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

- Sony Viao Laptop Computer M/N: PCG-8N2L, P/N: 28398098, S/N: 3000596

#### 3.1.3. Signal Input/Output Leads

The EUT was submitted for testing with a 10 wire, 50 cm long cable. Eight (8) of those wires went to the serial port of the Sony laptop computer. The other two (2) wires went to the output of the DC power supply and were used to provide 5VDC power to the EUT.

#### 3.1.4. Grounding

The EUT was ungrounded during testing.

### 3.2. Operational Mode

For all transmitter tests, the EUT was set to transmit separately at 928.025MHz, 942.1MHz, and 959.975MHz. The EUT was operated with 2FSK and 4FSK modulations.

### 3.3. 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 C63.4-2009 for site attenuation.

### 4.2. Test Instrumentation

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

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

### 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. Transmitter

### 5.1.1. RF Power Output

#### 5.1.1.1. Requirements

In accordance with paragraph 101.113(a), on any authorized frequency, the average power delivered to an antenna in this service must be the minimum amount of power necessary to carry out the communications desired. Application of this principle includes, but is not to be limited to, requiring a licensee who replaces one or more of its antennas with larger antennas to reduce its antenna input power by an amount appropriate to compensate for the increased primary lobe gain of the replacement antenna(s). In no event shall the average equivalent isotropically radiated power (EIRP), as referenced to an isotropic radiator, exceed the values specified below. In cases of harmful interference, the Commission may, after notice and opportunity for hearing, order a change in the effective radiated power of this station. Further, the output power of a transmitter on any authorized frequency in this service may not exceed the following:

| Frequency band (MHz) | Maximum allowable EIRP (dBW) |
|---|---|
| 928.0–929.0 | +17 |
| 932.0–932.5 | +17 |
| 932.5–935.0 | +40 |
| 941.0–941.5 | +30 |
| 941.5–944.0 | +40 |
| 952.0–960.0 | +40 |

#### 5.1.1.2. Procedures

With the EUT transmitting, the antenna port of the EUT was connected to a spectrum analyzer through a 39.2dB attenuator. The resolution bandwidth of the spectrum analyzer was set wider than the bandwidth of the EUT. The output power of the item was then measured. This procedure was repeated separately with the EUT transmitting at the frequencies listed in paragraph 3.2.

#### 5.1.1.3. Results

The output power plots are shown on pages 17 through 24.

### 5.1.2. Emission Mask

#### 5.1.2.1. Requirements

Per 101.111(a)(6), when using transmissions employing digital modulation techniques on the 900 MHz multiple address frequencies with a bandwidth greater than 12.5 KHz, the power of any emission must be attenuated below the unmodulated carrier power of the transmitter (P) in accordance with the following schedule:

- On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in KHz) of more than 5 KHz up to and including 10 KHz: At least 83 log10(fd/5) decibels;
- On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in KHz) of more than 10 KHz up to and including 250 percent of the authorized bandwidth: At least 116 log10(fd/6.1) decibels or 50 plus 10 log10(P) or 70 decibels, whichever is the lesser attenuation; and
- On any frequency removed from the center of the authorized bandwidth by more that 250 percent of the authorized bandwidth: At least 43 plus 10 log10(output power in watts) decibels or 80 decibels, whichever is the lesser attenuation.

5.1.2.2. Procedures

The EUT was set to transmit.

(a) The antenna port of the EUT was connected to a spectrum analyzer through a 50 dB attenuator.
(b) The following spectrum analyzer settings were employed:
- trace 1 = on
- center frequency = transmit frequency of the EUT
- resolution bandwidth = 300 MHz
- video bandwidth > resolution bandwidth
- frequency span = 125 kHz
- sweep = Auto
- detector function = peak
- trace = max hold
(c) Several sweeps were made with the settings listed above.
(d) Trace 1 was changed from max hold to view
(e) The following spectrum analyzer settings were employed:
- trace 2 = on
- resolution bandwidth = 300 Hz
- video bandwidth > resolution bandwidth
- sweep = Auto
- detector function = peak
- trace = max hold
(f) Several sweeps were made with the settings listed above.
(g) Steps (a) through (f) were repeated with the EUT set to transmit all the frequencies in paragraph 3.2.

5.1.2.3. Results

The spectrum analyzer plots of the emissions of the EUT are shown on pages 23 through 28. The limits, shown on the plots, are referenced to the power measured with a modulation turned off. As can be seen from the data, the EUT did not produce spurious emissions in excess of the limit.

5.1.3. Spurious Emissions at the Antenna Terminals

5.1.3.1. Requirements

Per 101.111, On any frequency removed from the center of the authorized bandwidth by more that 250 percent of the authorized bandwidth: At least 43 plus 10 log10(output power in watts) decibels or 80 decibels, whichever is the lesser attenuation.

5.1.3.2. Procedures

The EUT was set to transmit.

(a) The antenna port of the EUT was connected to a spectrum analyzer through a 50dB attenuator.
(b) The resolution bandwidth of the spectrum analyzer was set to 100 kHz.
(c) A sweep was made from 30 MHz to 1 GHz.
(d) The resolution bandwidth of the spectrum analyzer was set to 1 MHz.
(e) A sweep was made from 1 GHz to 10 GHz.
(f) Steps (a) through (e) were repeated with the EUT set to transmit all the frequencies in paragraph 3.2.

5.1.3.3. Results

The plots of the antenna conducted output measurements are presented on pages 29 through 34. The limits, shown on the plots, are referenced to the RF power output measurements made on the EUT.As can be seen

from the data, the EUT did not produce spurious emissions in excess of the limit. Field Strength of Spurious

5.1.2. Spurious Radiated Emissions

5.1.2.1. Requirements

Per 101.111, On any frequency removed from the center of the authorized bandwidth by more that 250 percent of the authorized bandwidth: At least 43 plus 10 log10(output power in watts) decibels or 80 decibels, whichever is the lesser attenuation.

5.1.2.2. Procedures

All tests were performed in a 32 ft. x 20 ft. x 18 ft. 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 2003 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.

1. Preliminary radiated emissions measurements were first performed using a peak detector and automatically plotted. The broadband measuring antenna was positioned at a 3 meter distance from the EUT. The entire frequency range from 30 MHz to 10 GHz was investigated using a peak detector function. All preliminary tests were performed separately with the EUT transmitting at the frequencies listed in paragraph 3.2.

2. All significant broadband and narrowband signals found in the preliminary sweeps were then measured using a peak detector at a test distance of 3 meters. The measurements were made with a tuned dipole or double ridged waveguide antenna over the frequency range of 30 MHz to 10 GHz.

3. To ensure that maximum emission levels were measured, the following steps were taken:

   a. The EUT was rotated so that all of its sides were exposed to the receiving antenna.
   b. Since the measuring antennas are 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.

4. The equivalent power was determined from the field intensity levels measured at 3 meters using the substitution method. To determine the emission power a tuned dipole or double ridged waveguide antenna was 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 corrected to compensate for cable loss, as required, and when the double ridged waveguide antenna was used, increased by the difference in gain between the dipole and the waveguide antenna.

5.1.2.3. Results

The preliminary radiated emissions plots are presented on pages 35 through 46. This data is only presented for a reference, and is not used as official data. The final radiated levels are presented on pages 47 through 49. The radiated emissions were measured through the 10th harmonic. As can be seen from the data, all emissions measured from the EUT were within the specification limits. Photographs of the test configuration are shown on Figures 2 and 3.

5.1.3. Frequency Stability

5.1.3.1. Requirements

In accordance with paragraph 101.107(a), The carrier frequency of each transmitter authorized in these services must be maintained within the following percentage of the reference frequency except as otherwise provided in paragraph (b) of this section or in the applicable subpart of this part (unless otherwise specified in the instrument of station authorization the reference frequency will be deemed to be the assigned frequency):

| Frequency (MHz) | Frequency tolerance (percent) |
|---|---|
| 928 to 929 | 0.0005 |
| 932 to 932.5 | 0.00015 |
| 932.5 to 935 | 0.00025 |
| 941 to 941.5 | 0.00015 |
| 941.5 to 944 | 0.00025 |
| 952 to 960 | 0.0005 |

5.1.3.2. Procedures

The antenna port of the EUT was connected to a frequency counter through a 20 dB attenuator. The EUT was then placed in a humidity temperature chamber.

(a) The EUT was set to transmit at 941.25MHz. The transmit frequency was measured and recorded at ambient temperature.
(b) The temperature chamber was then set to -30ºC.
(c) Once the temperature chamber had reached -30ºC, the EUT was allowed to soak for 30 minutes.
(d) After soaking at -30ºC for thirty minutes, the EUT was turned on and set to transmit and the transmit frequency was measured and recorded.
(e) Steps (b) through (d) were repeated at -20ºC.
(f) Steps (b) through (d) were repeated at -10ºC.
(g) Steps (b) through (d) were repeated at 0ºC.
(h) Steps (b) through (d) were repeated at +10ºC.
(i) Steps (b) through (d) were repeated at +20ºC.
(j) Steps (b) through (d) were repeated at +30ºC.
(k) Steps (b) through (d) were repeated at +40ºC.
(l) Steps (b) through (d) were repeated at +50ºC.
(m) Steps (b) through (l) were repeated with the EUT set to transmit at 941.25MHz.
(n) The EUT was then removed from the temperature chamber and allowed to adjust to nominal room temperature.
(o) The supply voltage was checked and adjusted to the nominal level (6.4 VDC). The EUT was turned on and set to transmit. The transmit frequency was measured and recorded at ambient temperature.
(p) The supply voltage was then varied to 85% of its nominal level (5.9 VDC). The EUT was turned on and set to transmit. The transmit frequency was measured and recorded at ambient temperature.
(q) The supply voltage was then varied to 115% of its nominal level (6.9 VDC). The EUT was turned on and set to transmit. The transmit frequency was measured and recorded at ambient temperature.

5.1.3.3. Results

The frequency stability measurements are presented on pages 50 and 51. As can be seen from the data, all frequency deviations were within the 0.00015% limit. A photograph of the test setup is shown on Figure 4.

# 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 XetaWave, LLC upon completion of the tests.

# 7. Conclusions

It was determined that the XetaWave, LLC, Model No. MSD9 Rev. A, Transceiver did fully meet the RF power output, emissions mask, spurious emissions at antenna terminal, field strength of spurious emissions, and frequency stability requirements of the FCC "Code of Federal Regulations" Title 47, Part 101, Subpart C, when tested per TIA-603-C-2004.

# 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 endorsement by NVLAP or any agency of the US Government.

# 9. EQUIPMENT LIST

**Table 9-1 Equipment List**

| Eq ID | Equipment Description | Manufacturer | Model No. | Serial No. | Frequency Range | Cal Date | Due Date |
|---|---|---|---|---|---|---|---|
| CDX2 | COMPUTER | ELITE | WORKSTATION | --- | --- | N/A | |
| CDX8 | COMPUTER | ELITE | WORKSTATION | | | N/A | |
| CLT3 | LAPTOP COMPUTER | SONY | PCG-GRT390ZP | 3001143 | --- | NOTE 1 | |
| GBR6 | SIGNAL GENERATOR | HEWLETT PACKARD | 8648C | 3642U02047 | 9KHZ-3000MHZ | 2/22/2012 | 2/22/2013 |
| MFB0 | FREQUENCY COUNTER | HEWLETT PACKARD | 5334A | 2426A02162 | 0-100MHZ | 6/27/2012 | 6/27/2013 |
| NTA3 | BILOG ANTENNA | TESEQ | 6112D | 28040 | 25-1000MHz | 2/16/2012 | 2/16/2013 |
| NWP1 | DOUBLE RIDGED WAVEGUIDE ANTENNA | EATON | 3115 | 2100 | 1GHZ-12.4GHZ | 3/6/2012 | 3/6/2013 |
| RAKI | RF SECTION | HEWLETT PACKARD | 85462A | 3411A00181 | 0.009-6500MHZ | 3/15/2012 | 3/15/2013 |
| RAKJ | RF FILTER SECTION | HEWLETT PACKARD | 85460A | 3330A00154 | --- | 3/15/2012 | 3/15/2013 |
| RBA0 | EMI TEST RECEIVER | ROHDE & SCHWARZ | ESIB26 | 100145 | 20HZ-26.5GHZ | 3/8/2012 | 3/8/2013 |
| RBA1 | EMI TEST RECEIVER | ROHDE & SCHWARZ | ESIB26 | 100146 | 20HZ-26.5GHZ | 11/15/2011 | 11/15/2012 |
| SHB0 | DC POWER SUPPLY | HEWLETT PACKARD | 6644A | MY40000115 | 0-60V/0-3.5A | NOTE 1 | |
| T2D7 | 20DB, 25W ATTENUATOR | WEINSCHEL | 46-20-43 | AY9246 | DC-18GHZ | 8/6/2012 | 8/6/2013 |
| T2S3 | 20DB 25W ATTENUATOR | WEINSCHEL | 46-20-34 | BV3544 | DC-18GHZ | 1/3/2012 | 1/3/2013 |
| XLJ1 | 5W, 50 OHM TERMINATION | JFW INDUSTRIES | 50T-052 | 2 | DC-2GHZ | 8/6/2012 | 8/6/2013 |

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.

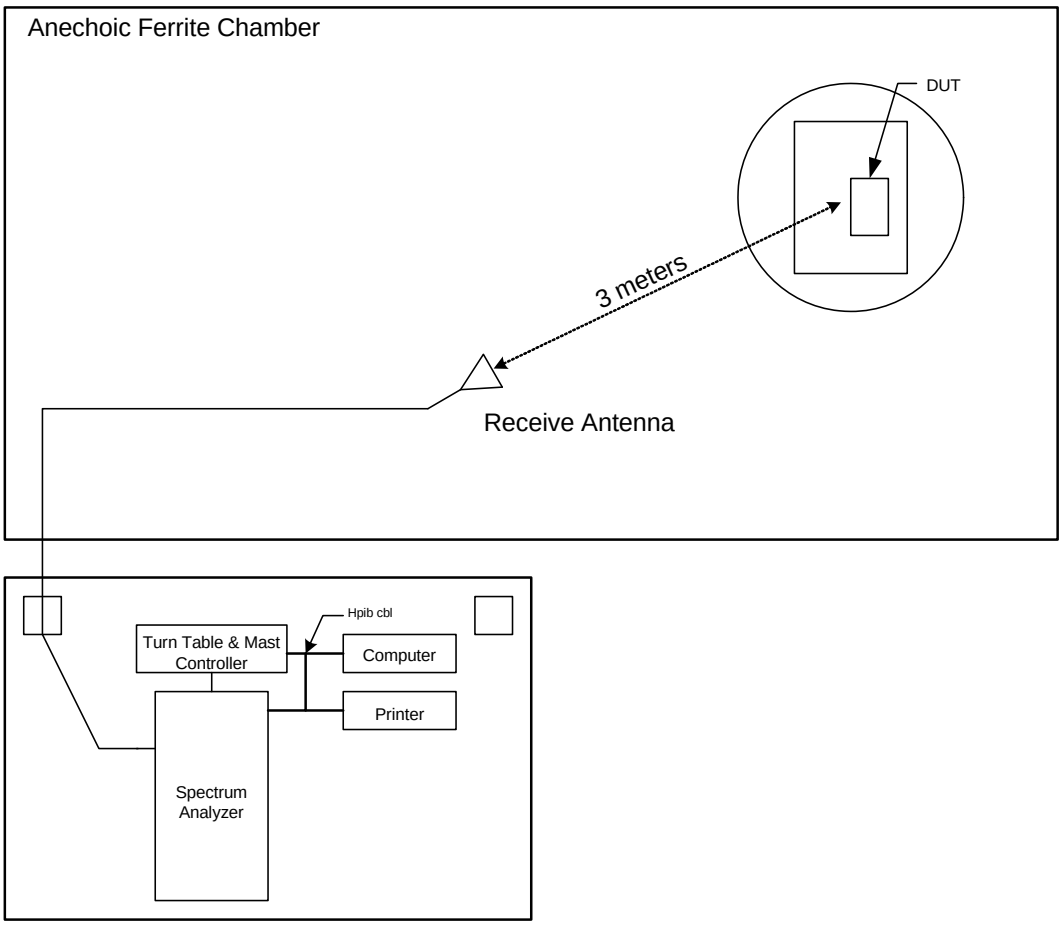
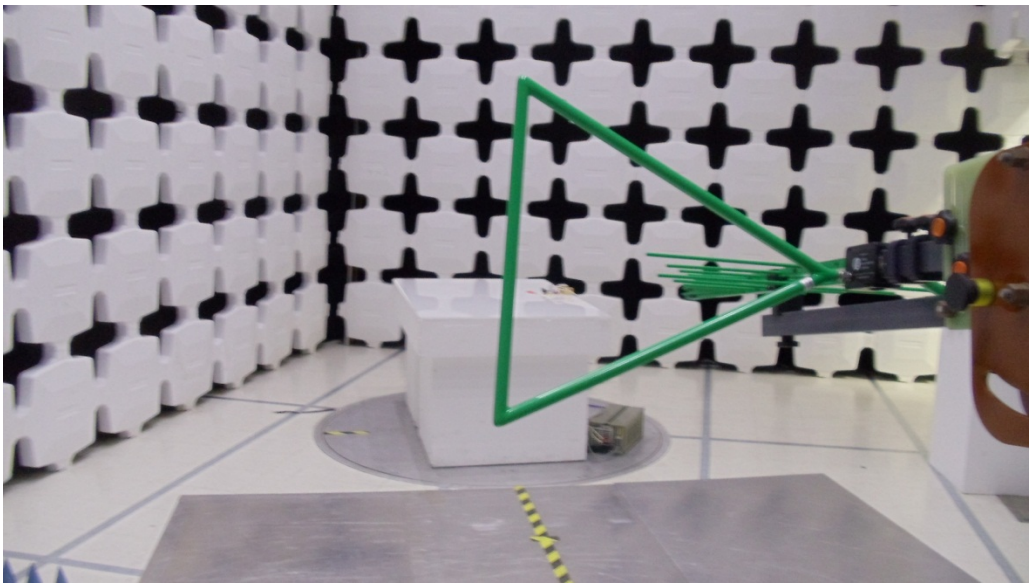
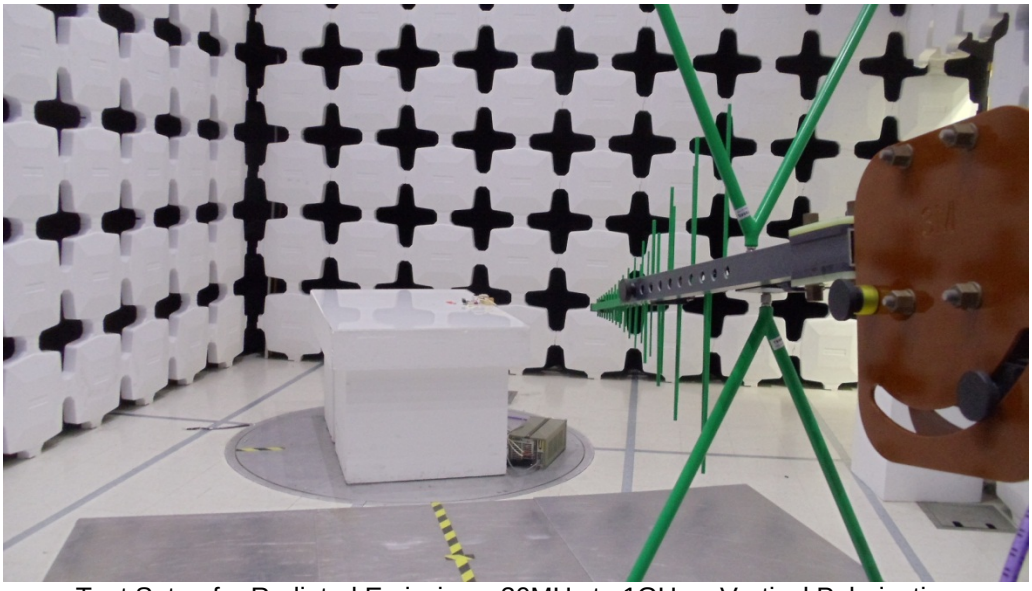



FIGURE 1 BLOCKDIAGRAM OF TEST SETUP

Figure 2

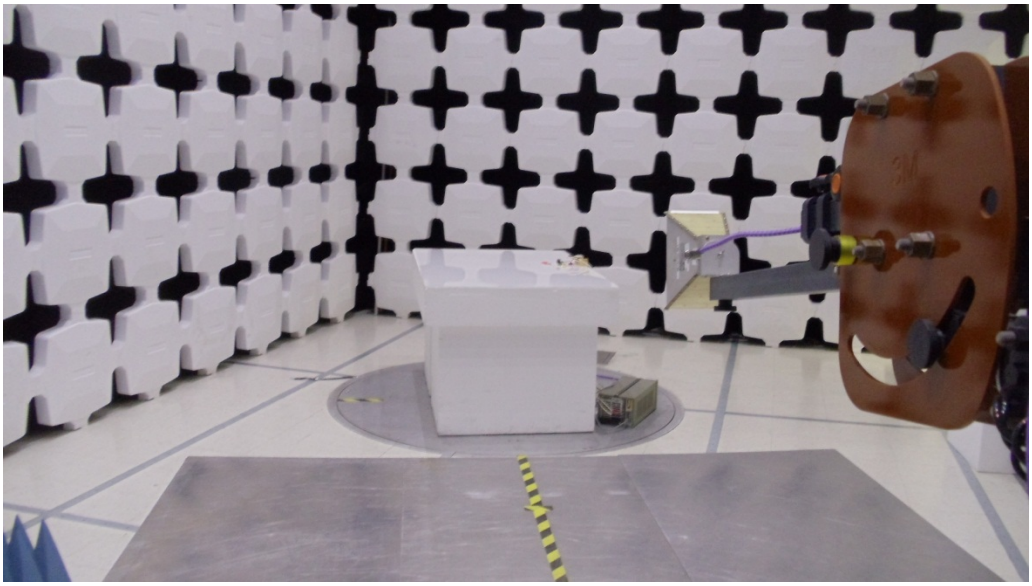


Test Setup for Radiated Emissions, 30MHz to 1GHz – Horizontal Polarization

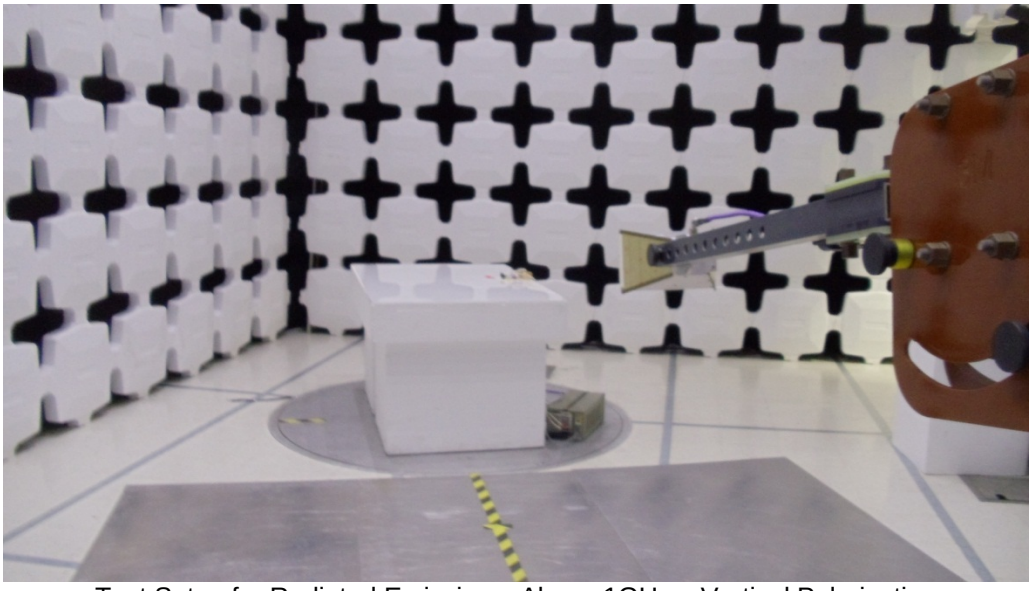


Test Setup for Radiated Emissions, 30MHz to 1GHz – Vertical Polarization

Figure 3



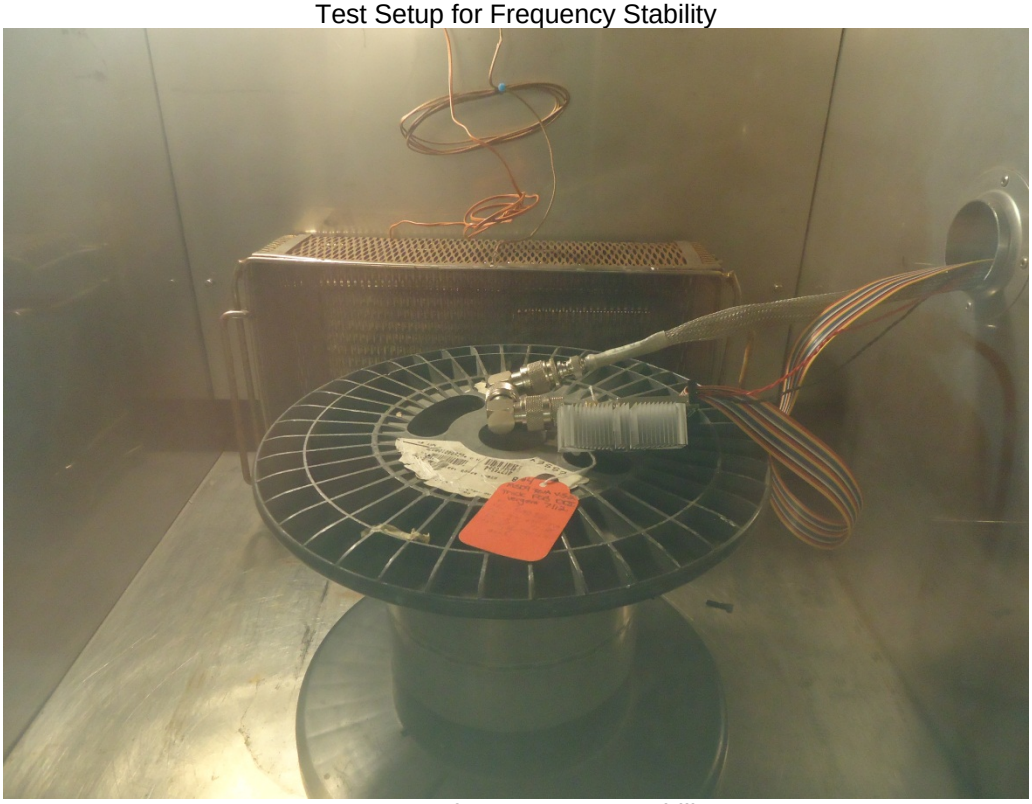
Test Setup for Radiated Emissions, Above 1GHz – Horizontal Polarization



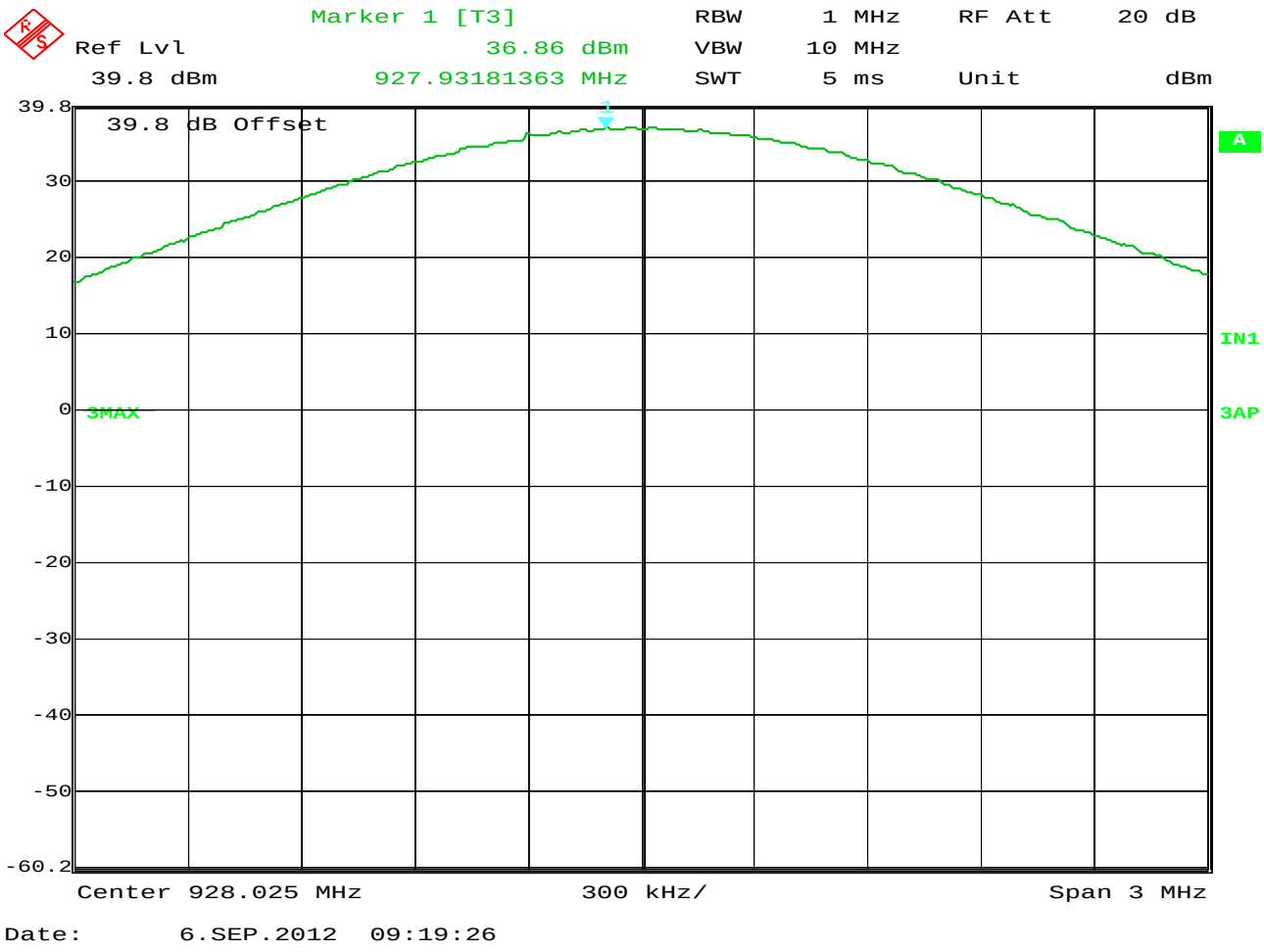
Test Setup for Radiated Emissions, Above 1GHz – Vertical Polarization

Figure 4

Test Setup for Frequency Stability



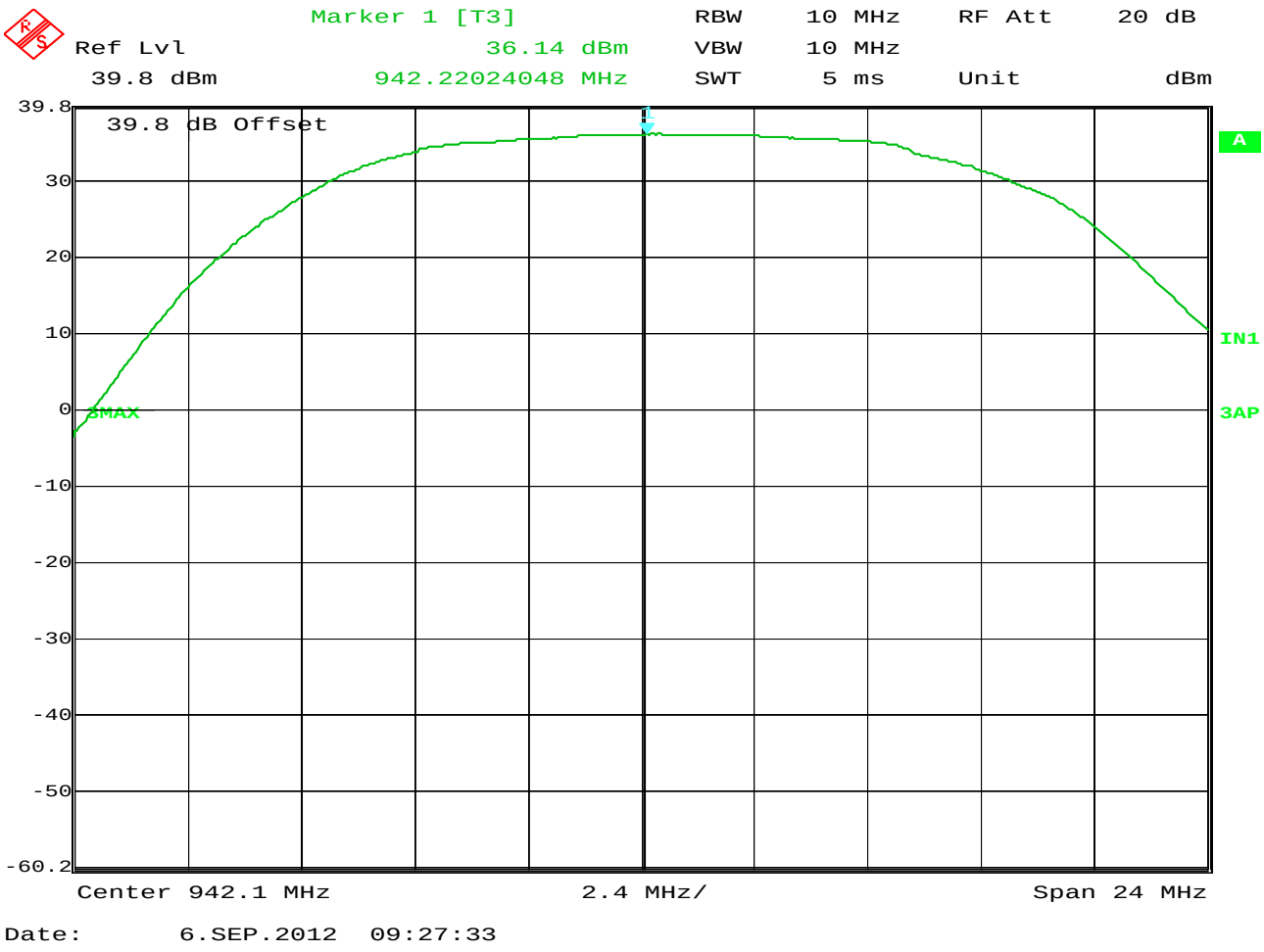
Test Setup for Frequency Stability




**FCC 101: Power Output**

MANUFACTURER : XetaWave
MODEL NUMBER : MSD9 Rev. A
SERIAL NUMBER : 4
TEST MODE : 2FSK/19.3kbps (928.025MHz @ 9000 power level)
TEST PARAMETERS :
EQUIPMENT USED : RBA1, T2S3, T2D7, GBR6, CLT3, SHB0

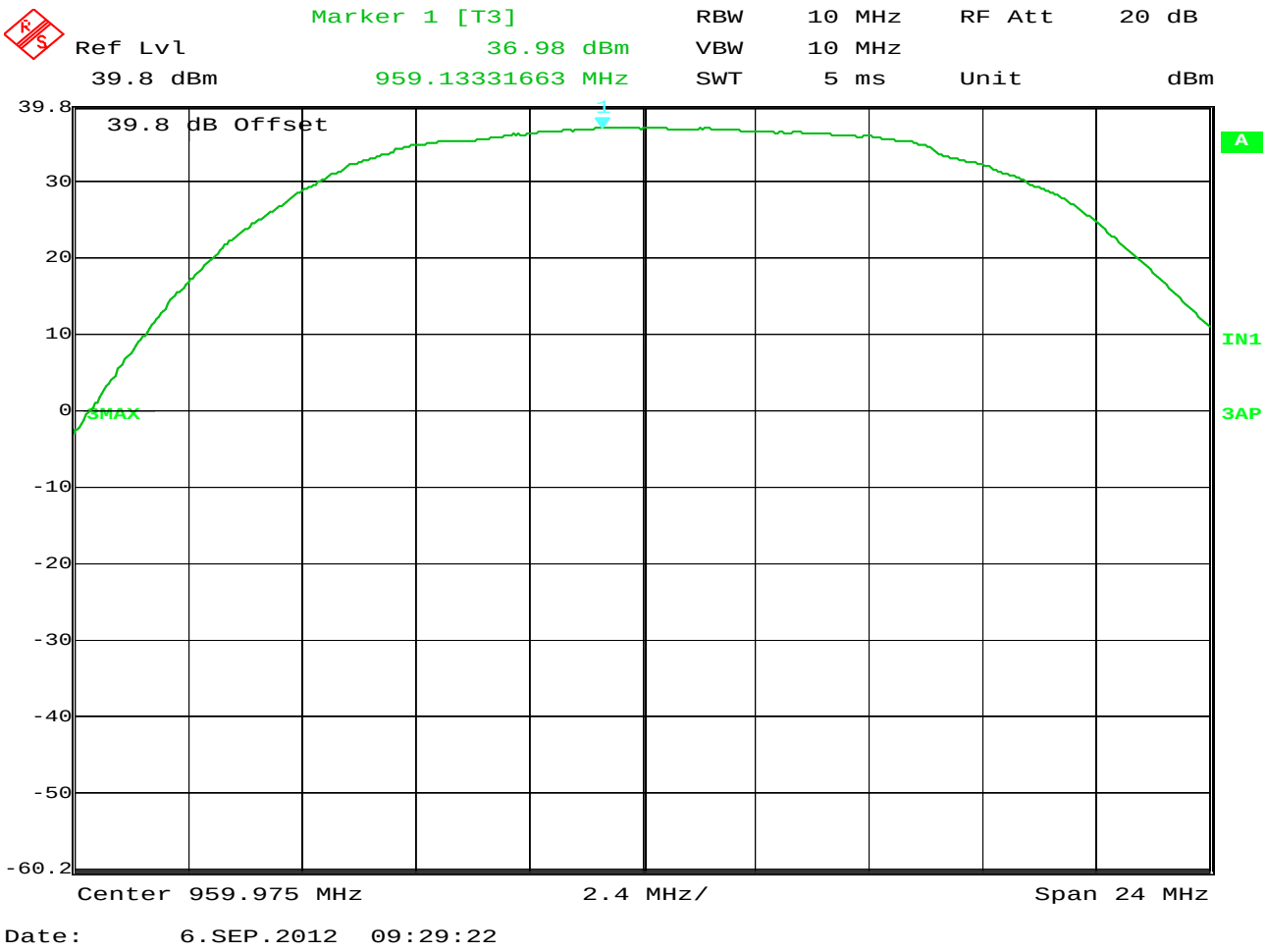
NOTES




**FCC 101: Power Output**

MANUFACTURER : XetaWave
MODEL NUMBER : MSD9 Rev. A
SERIAL NUMBER : 4
TEST MODE : 2FSK/19.3kbps (942.1MHz @ 9100 power level)
TEST PARAMETERS :
EQUIPMENT USED : RBA1, T2S3, T2D7, GBR6, CLT3, SHB0

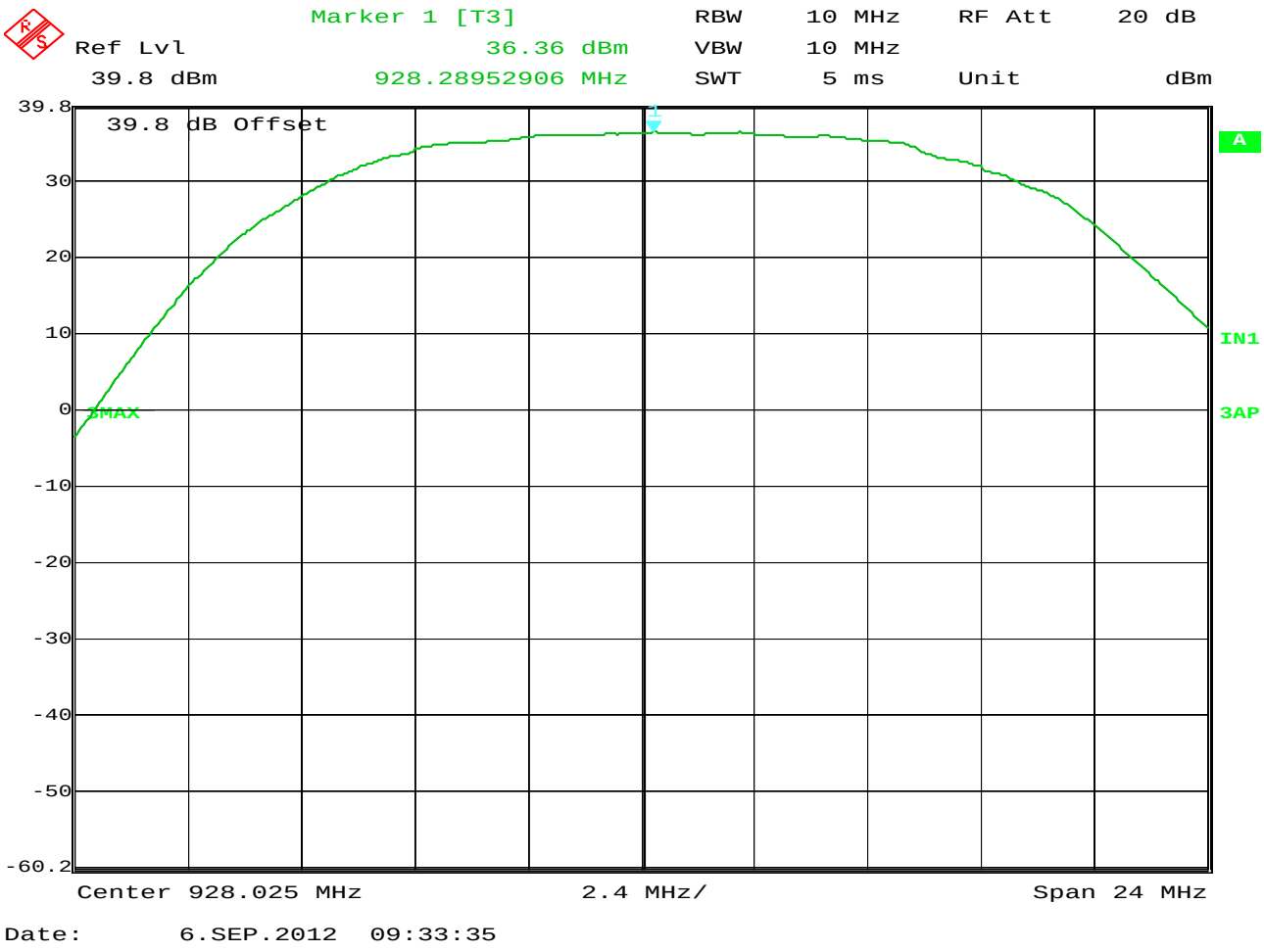
NOTES




**FCC 101: Power Output**

MANUFACTURER : XetaWave
MODEL NUMBER : MSD9 Rev. A
SERIAL NUMBER : 4
TEST MODE : 2FSK/19.3kbps (958.975MHz @ 11750 power level)
TEST PARAMETERS :
EQUIPMENT USED : RBA1, T2S3, T2D7, GBR6, CLT3, SHB0

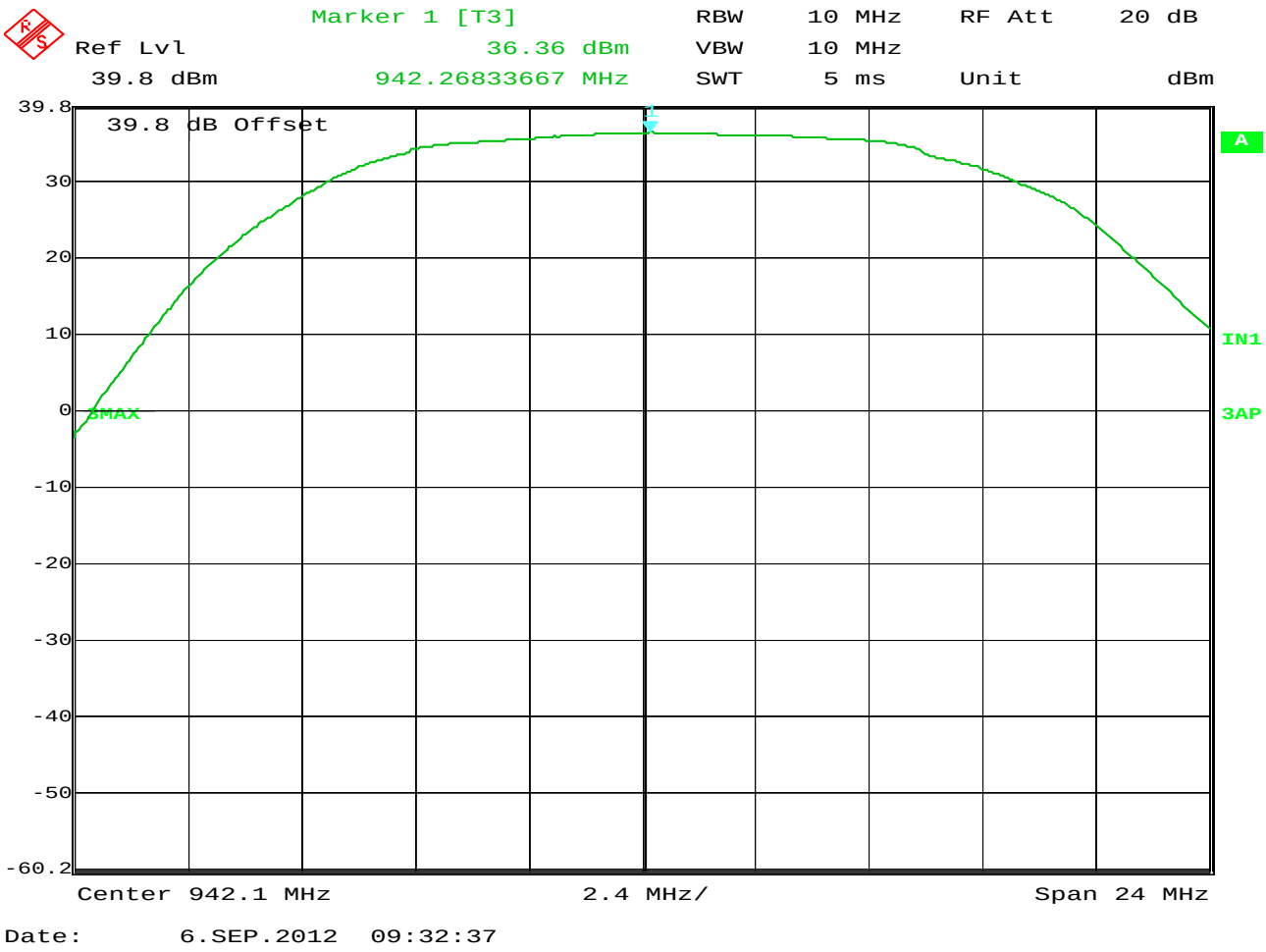
NOTES




**FCC 101: Power Output**

MANUFACTURER : XetaWave
MODEL NUMBER : MSD9 Rev. A
SERIAL NUMBER : 4
TEST MODE : 4FSK/19.3kbps (928.025MHz @ 9000 power level)
TEST PARAMETERS :
EQUIPMENT USED : RBA1, T2S3, T2D7, GBR6, CLT3, SHB0

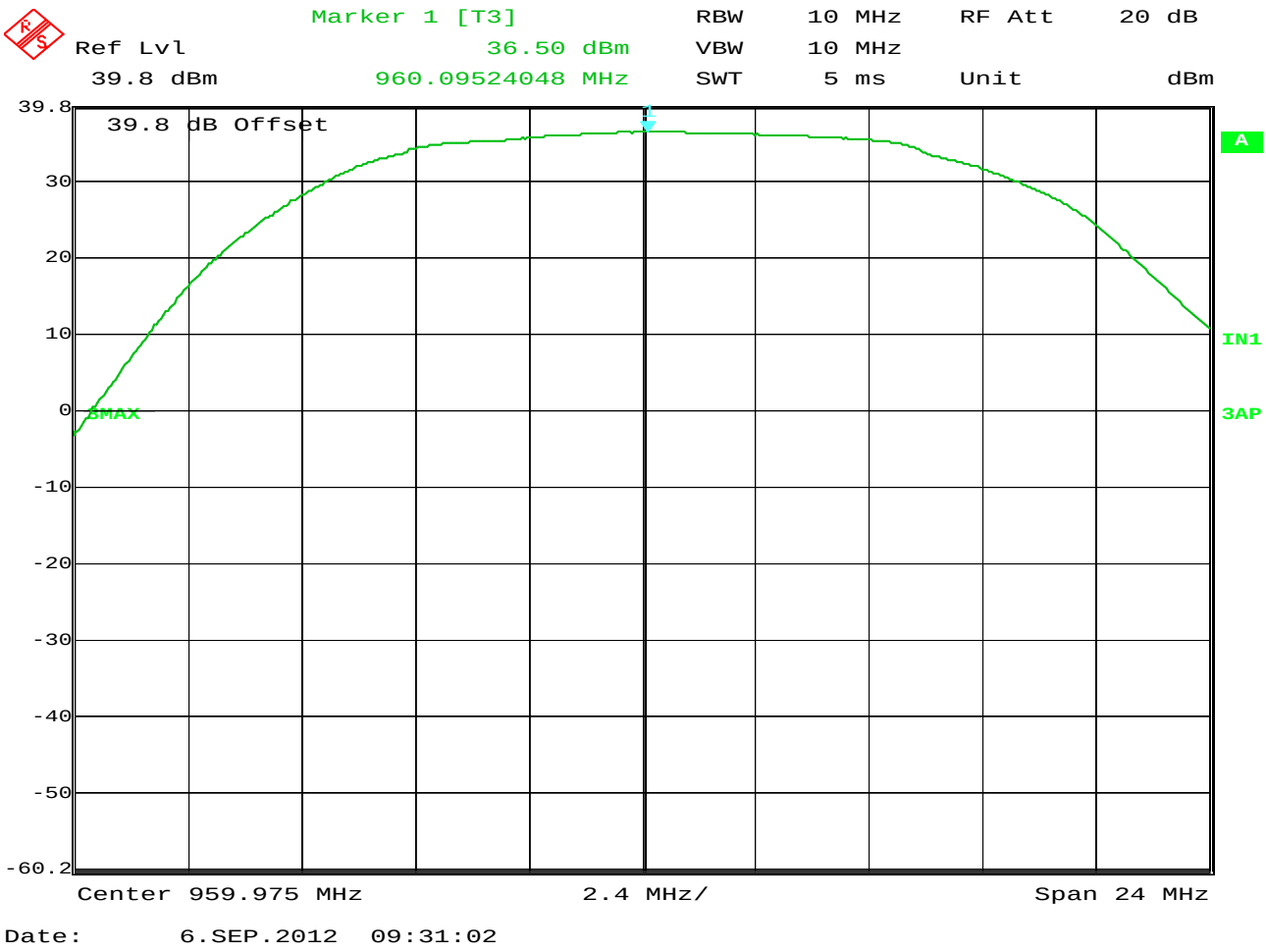
NOTES




**FCC 101: Power Output**

MANUFACTURER : XetaWave
MODEL NUMBER : MSD9 Rev. A
SERIAL NUMBER : 4
TEST MODE : 4FSK/19.3kbps (942.1MHz @ 9100 power level)
TEST PARAMETERS :
EQUIPMENT USED : RBA1, T2S3, T2D7, GBR6, CLT3, SHB0

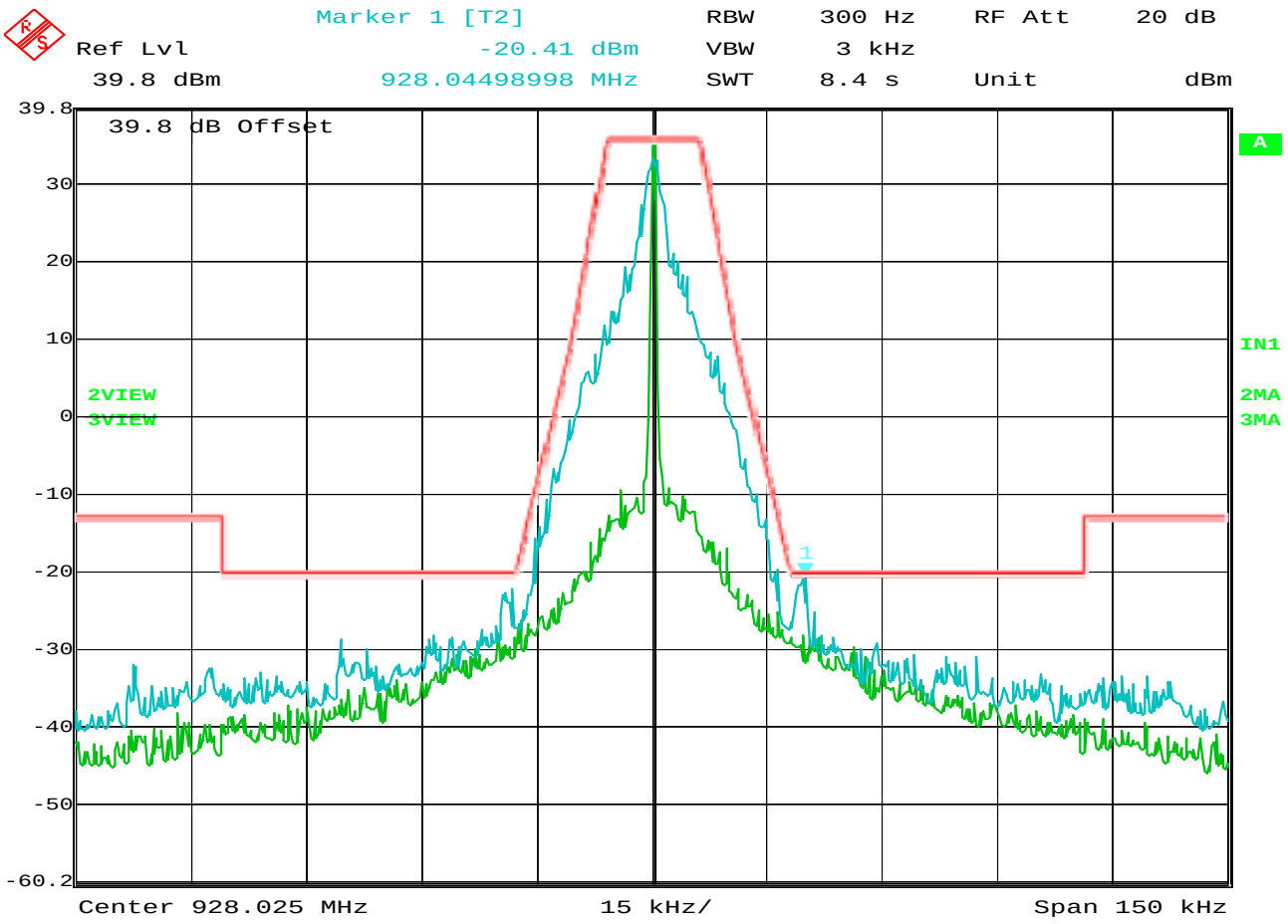
NOTES




**FCC 101: Power Output**

MANUFACTURER : XetaWave
MODEL NUMBER : MSD9 Rev. A
SERIAL NUMBER : 4
TEST MODE : 4FSK/19.3kbps (958.975MHz @ 11750 power level)
TEST PARAMETERS :
EQUIPMENT USED : RBA1, T2S3, T2D7, GBR6, CLT3, SHB0

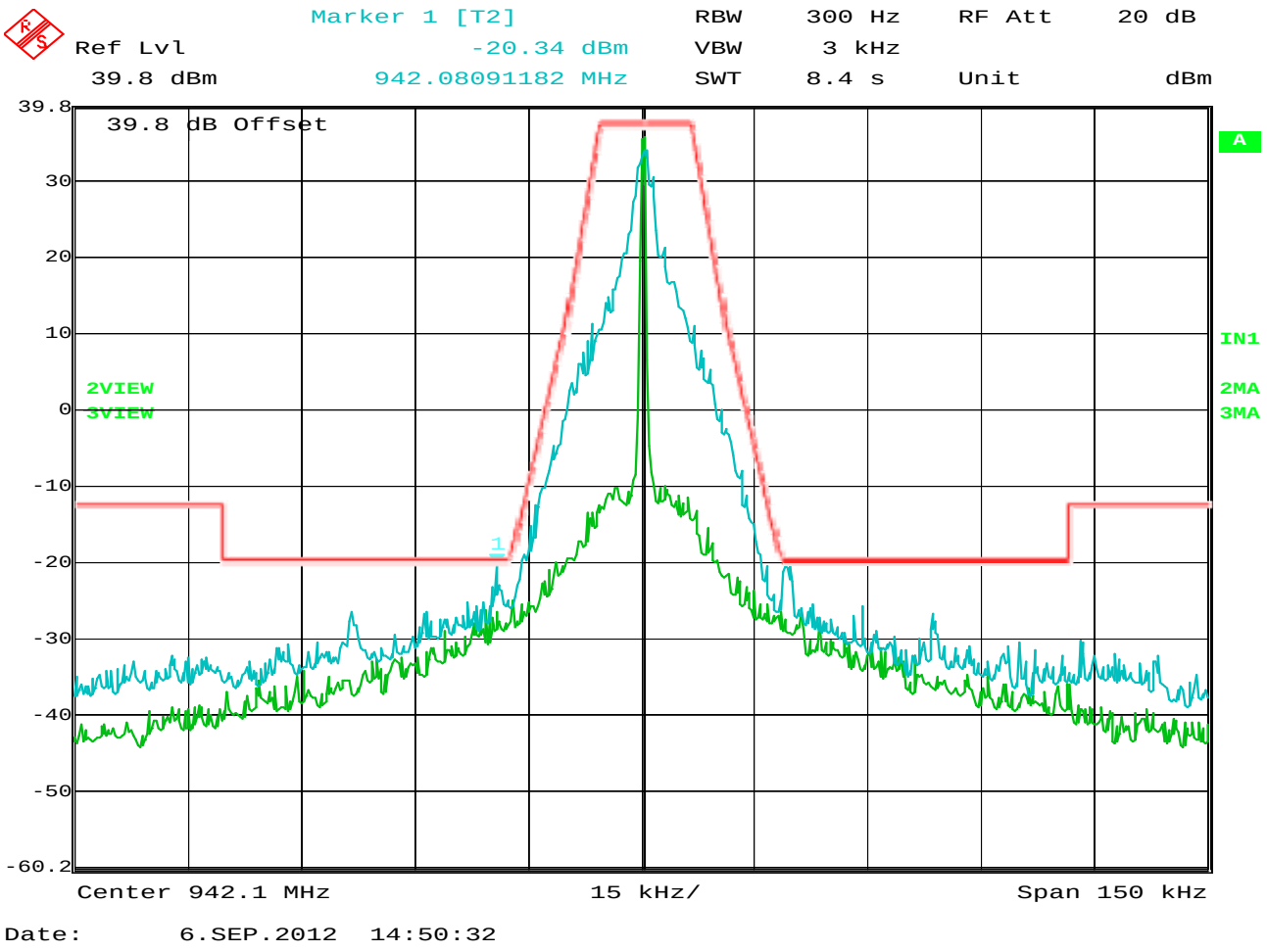
NOTES




**FCC 101: Occupied Bandwidth**

MANUFACTURER : XetaWave
MODEL NUMBER : MSD9 Rev. A
SERIAL NUMBER : 4
TEST MODE : 2FSK/19.3kbps (928.025MHz @ 9000 power level)
TEST PARAMETERS : 4 Watts, deviation 6000
EQUIPMENT USED : RBA1, T2S3, T2D7, GBR6, CLT3, SHB0

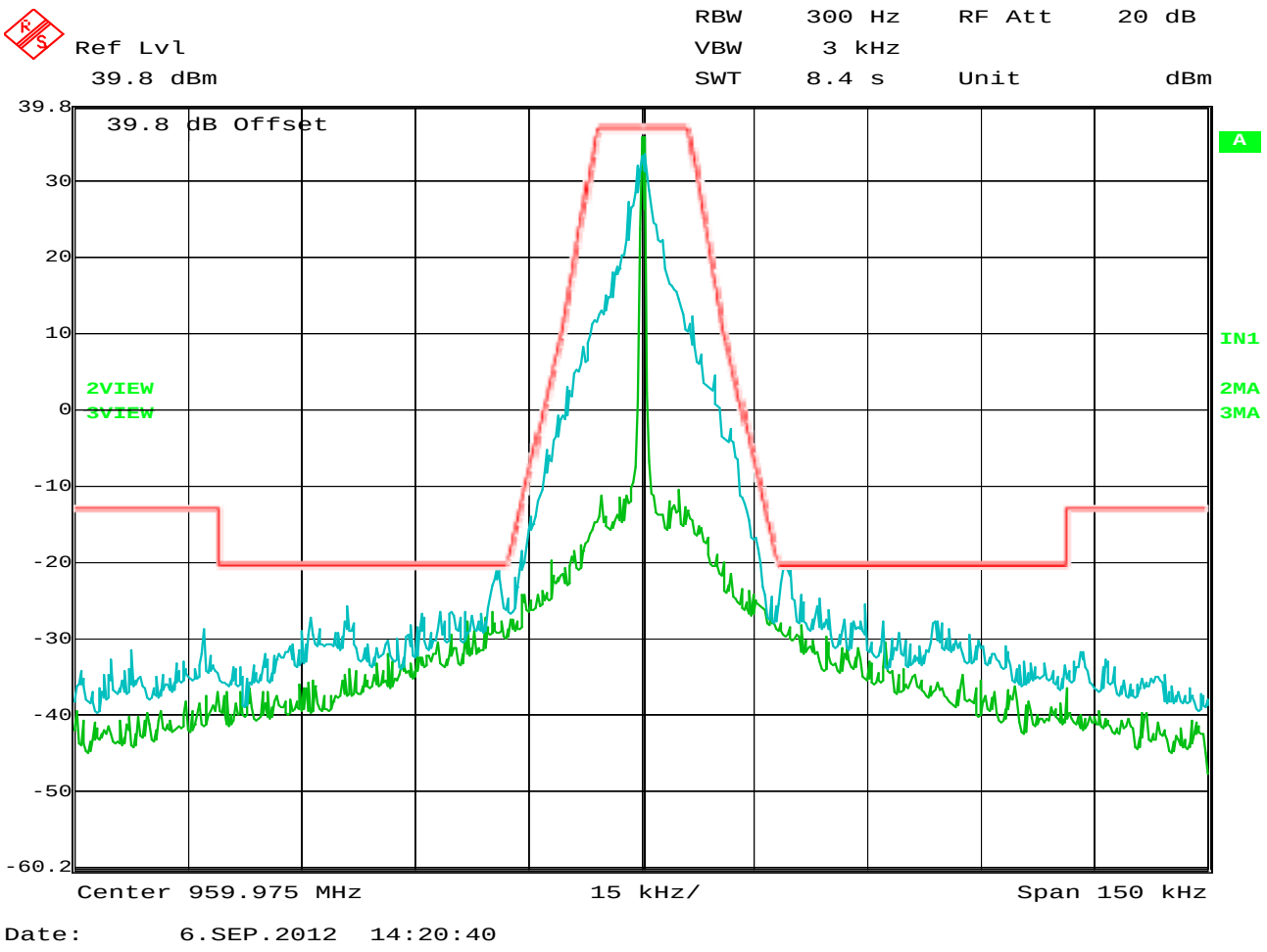
NOTES




**FCC 101: Occupied Bandwidth**

| | | |
|---|---|---|
| MANUFACTURER | : | XetaWave |
| MODEL NUMBER | : | MSD9 Rev. A |
| SERIAL NUMBER | : | 4 |
| TEST MODE | : | 2FSK/19.3kbps (942.1MHz @ 9100 power level) |
| TEST PARAMETERS | : | 5 Watts, deviation 5500 |
| EQUIPMENT USED | : | RBA1, T2S3, T2D7, GBR6, CLT3, SHB0 |

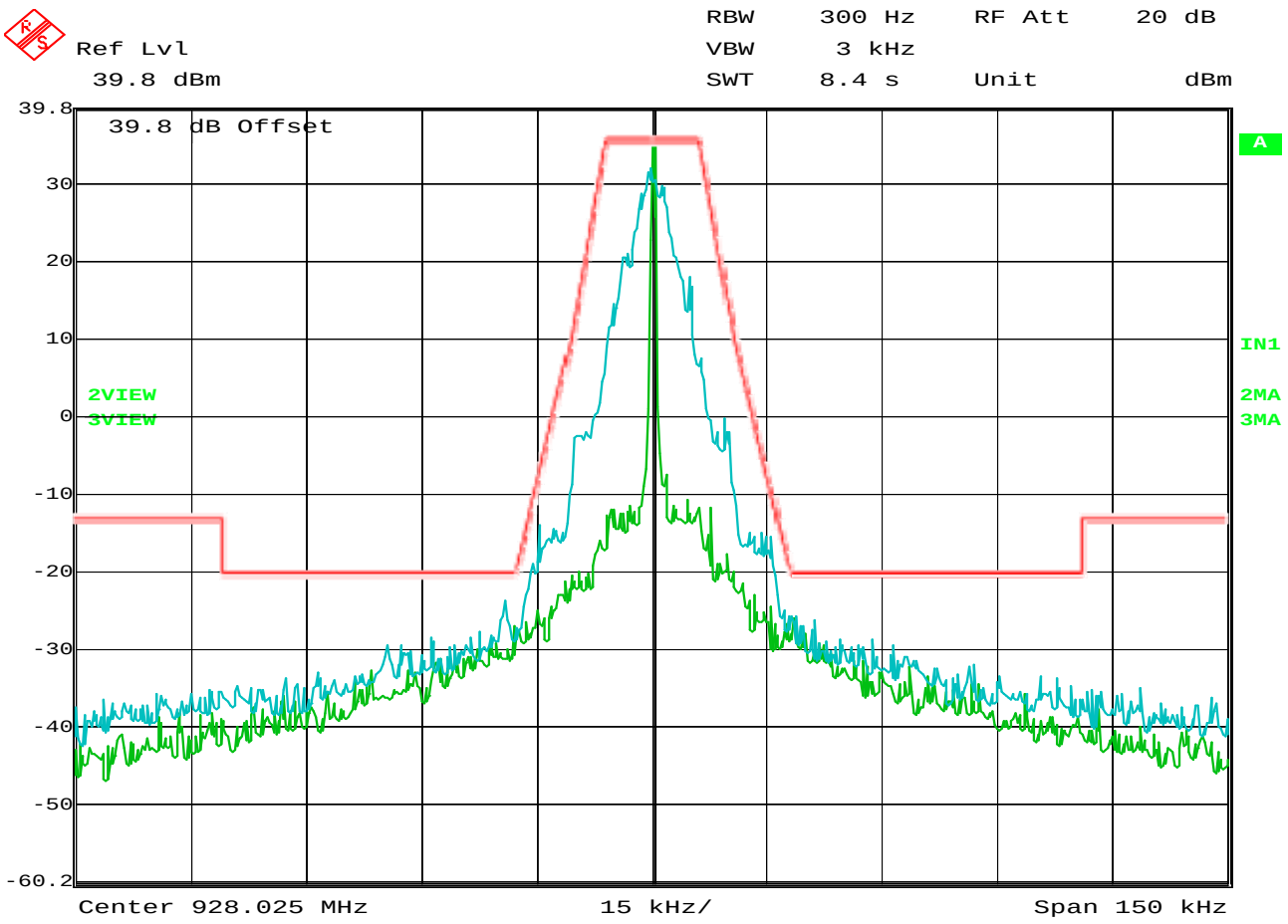
NOTES




**FCC 101: Occupied Bandwidth**

| | | |
|---|---|---|
| MANUFACTURER | : | XetaWave |
| MODEL NUMBER | : | MSD9 Rev. A |
| SERIAL NUMBER | : | 4 |
| TEST MODE | : | 2FSK/19.3kbps (959.975MHz @ 11750 power level) |
| TEST PARAMETERS | : | 5 Watts, deviation 6000 |
| EQUIPMENT USED | : | RBA1, T2S3, T2D7, GBR6, CLT3, SHB0 |

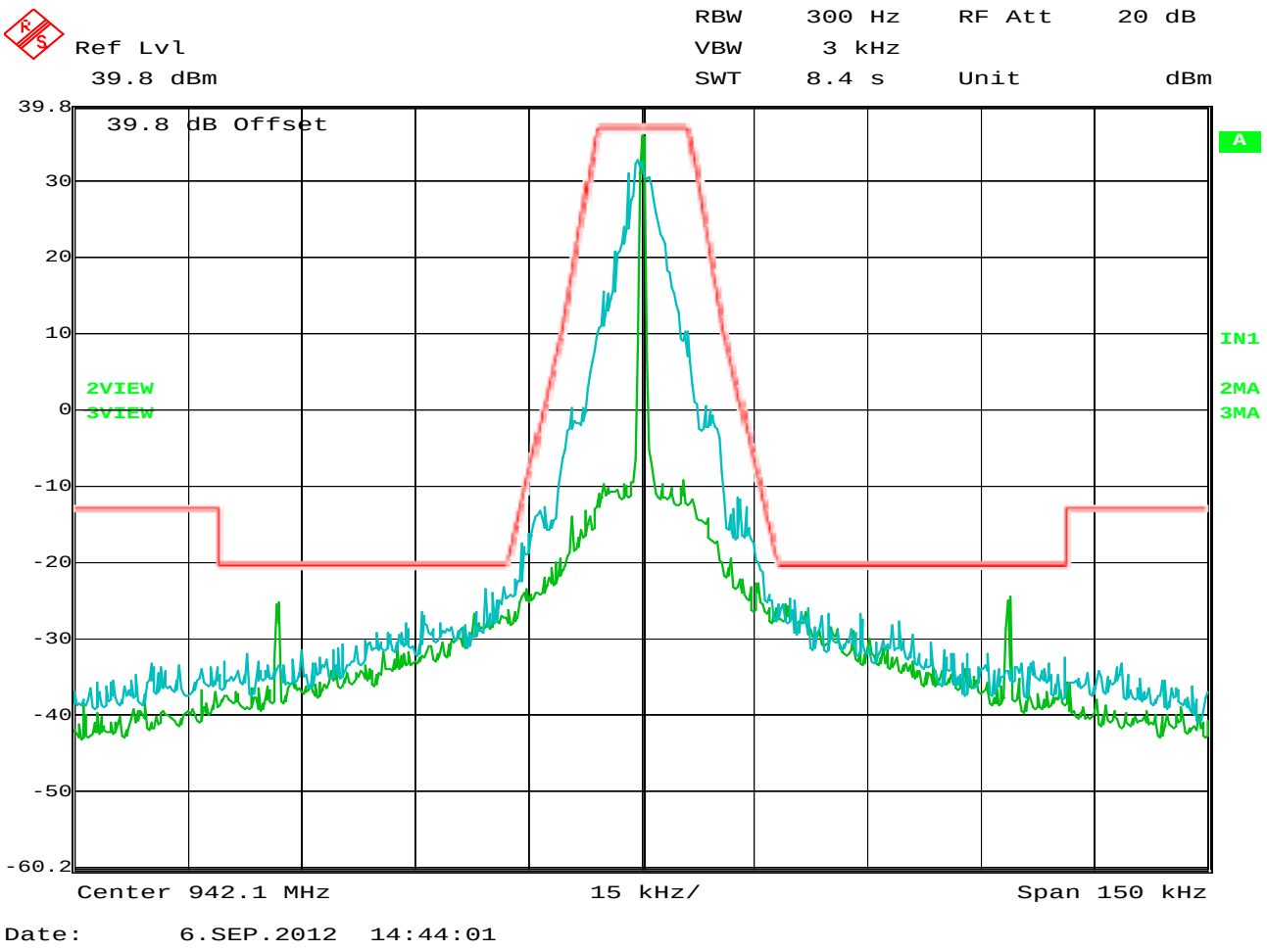
NOTES




**FCC 101: Occupied Bandwidth**

MANUFACTURER : XetaWave
MODEL NUMBER : MSD9 Rev. A
SERIAL NUMBER : 4
TEST MODE : 4FSK/19.3kbps (928.025MHz @ 9000 power level)
TEST PARAMETERS : 4 Watts, deviation 15000
EQUIPMENT USED : RBA1, T2S3, T2D7, GBR6, CLT3, SHB0

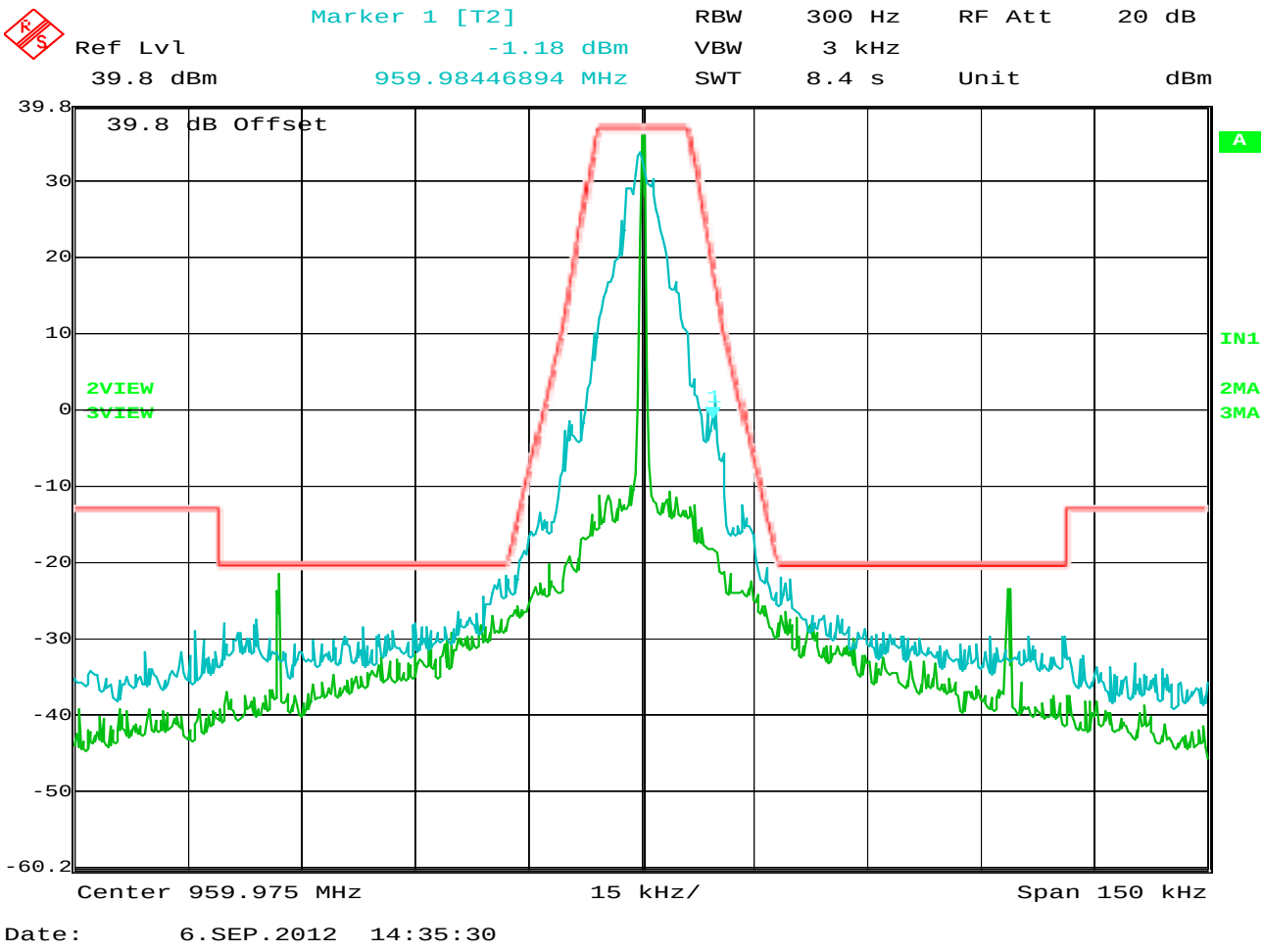
NOTES




**FCC 101: Occupied Bandwidth**

MANUFACTURER : XetaWave
MODEL NUMBER : MSD9 Rev. A
SERIAL NUMBER : 4
TEST MODE : 4FSK/19.3kbps (942.1MHz @ 9100 power level)
TEST PARAMETERS : 5 Watts, deviation 15000
EQUIPMENT USED : RBA1, T2S3, T2D7, GBR6, CLT3, SHB0

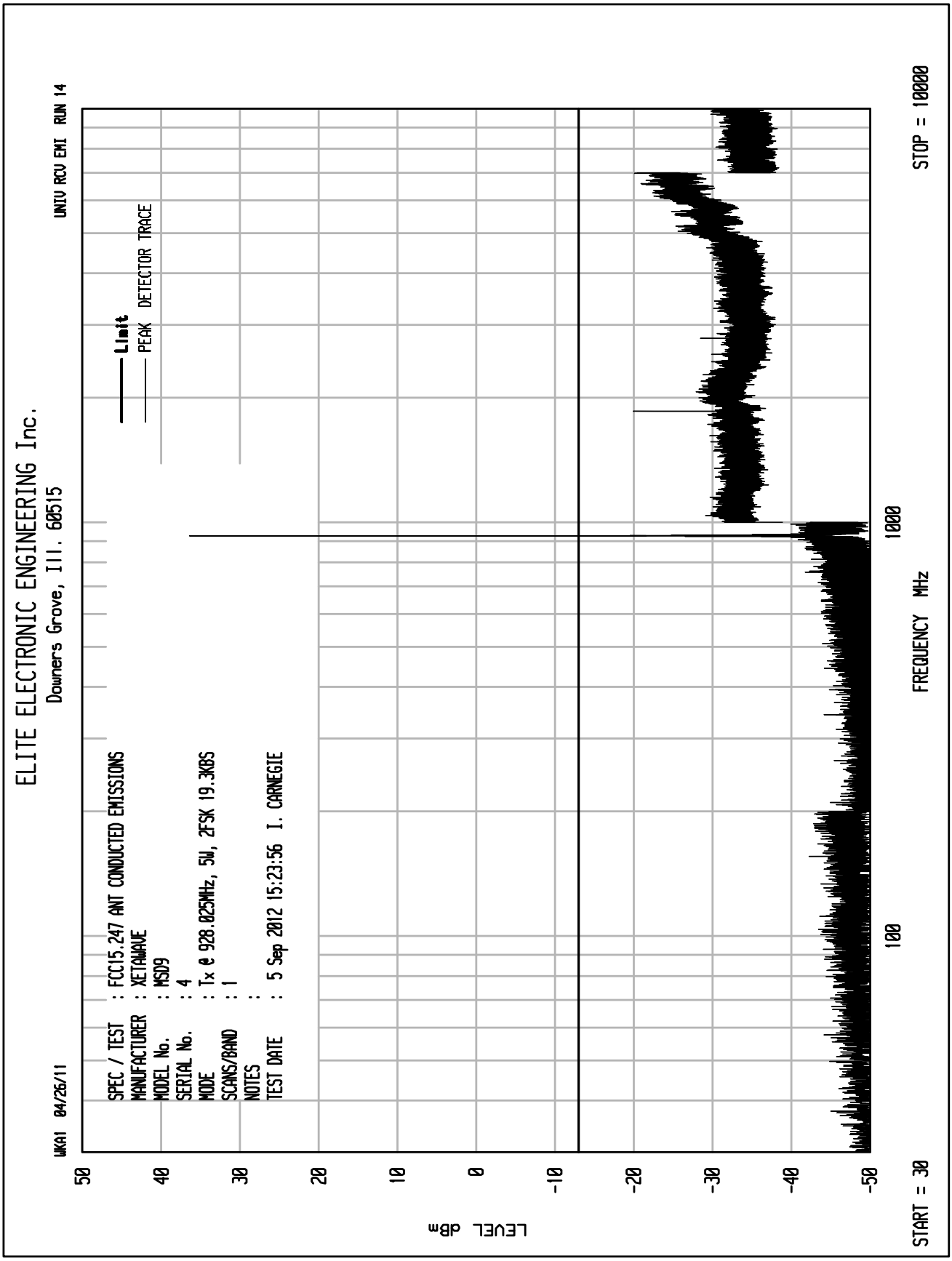
NOTES

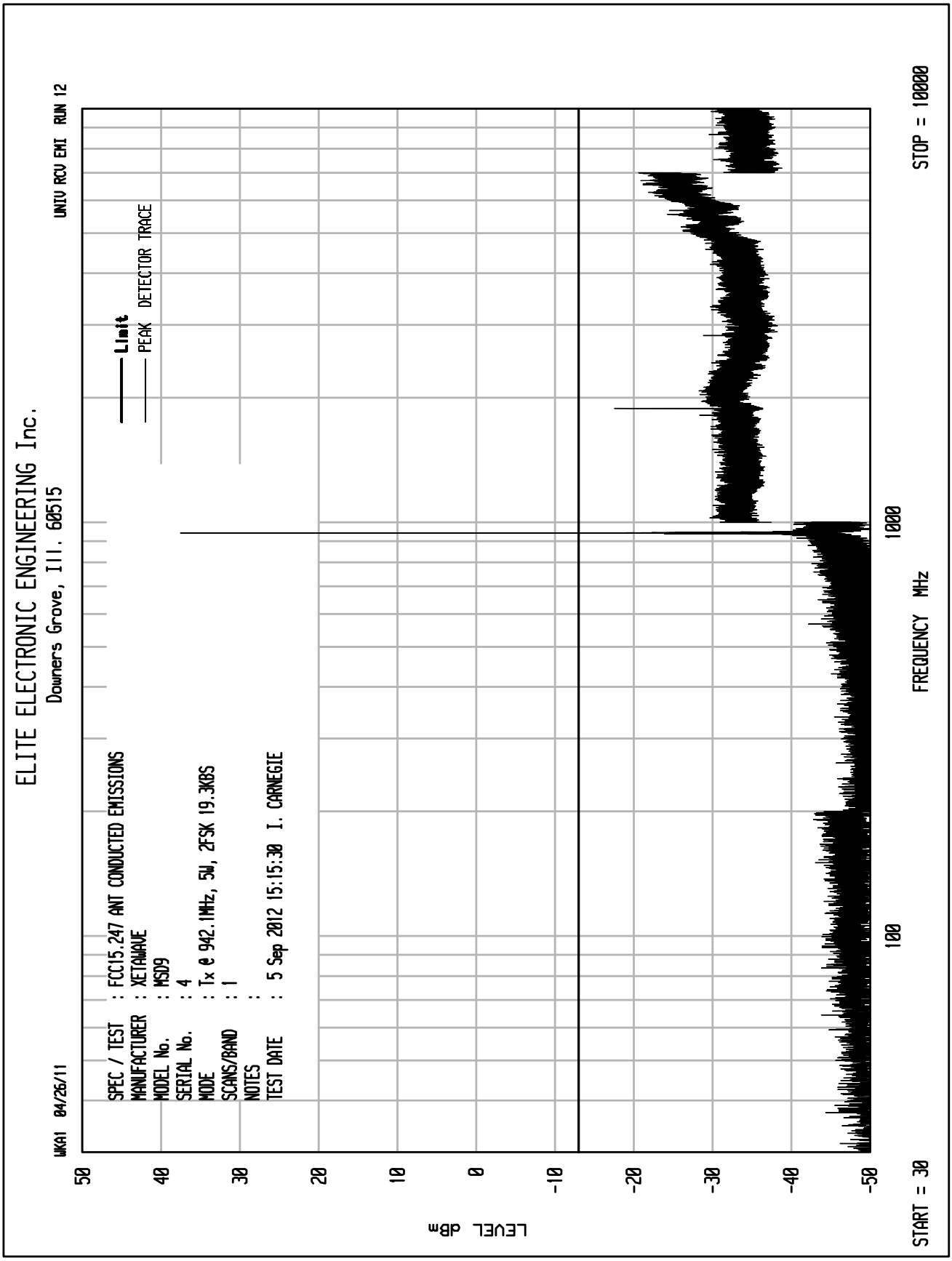


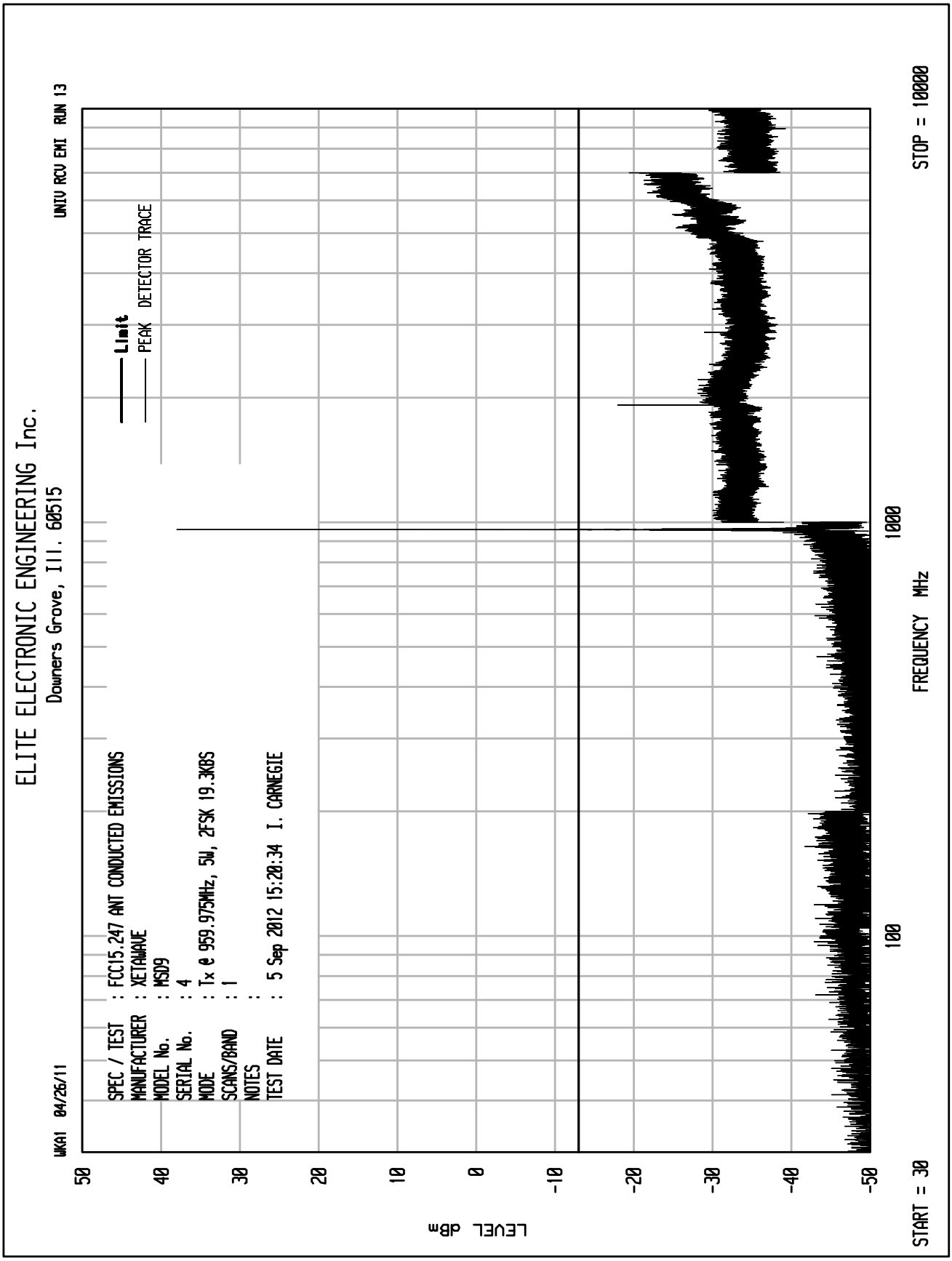

**FCC 101: Occupied Bandwidth**

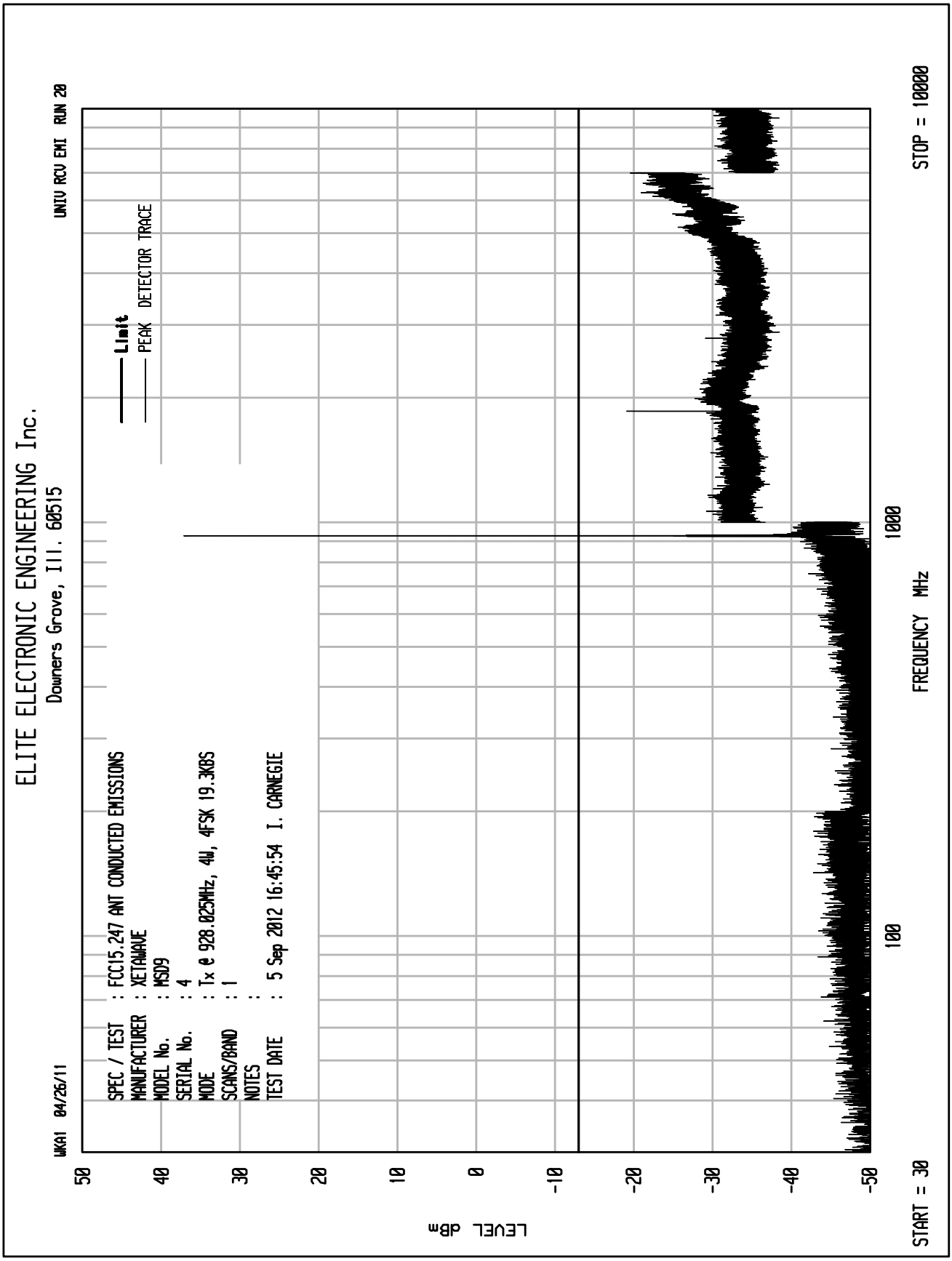
| | | |
|---|---|---|
| MANUFACTURER | : | XetaWave |
| MODEL NUMBER | : | MSD9 Rev. A |
| SERIAL NUMBER | : | 4 |
| TEST MODE | : | 4FSK/19.3kbps (959.975MHz @ 11750 power level) |
| TEST PARAMETERS | : | 5 Watts, deviation 15000 |
| EQUIPMENT USED | : | RBA1, T2S3, T2D7, GBR6, CLT3, SHB0 |

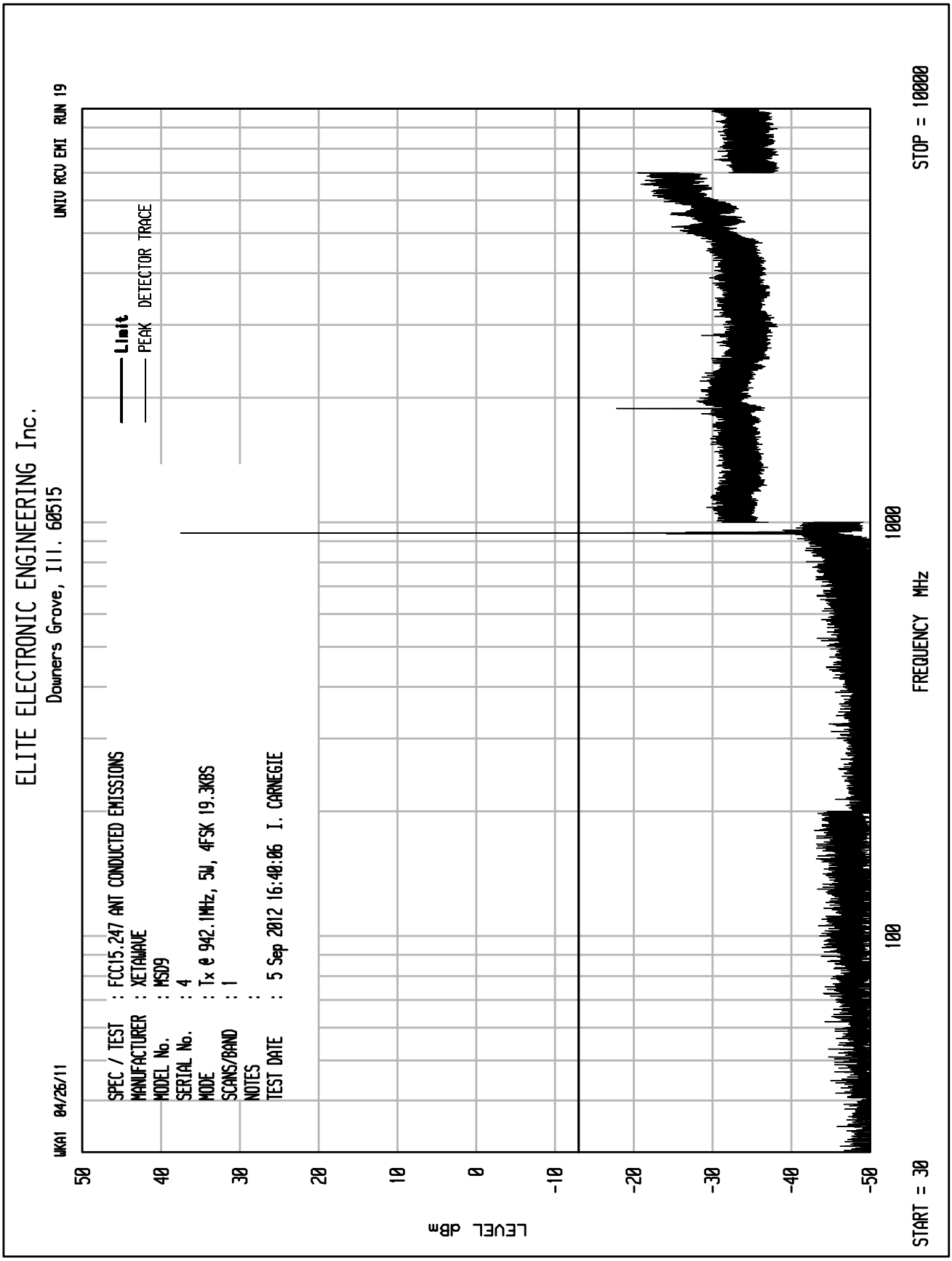
NOTES

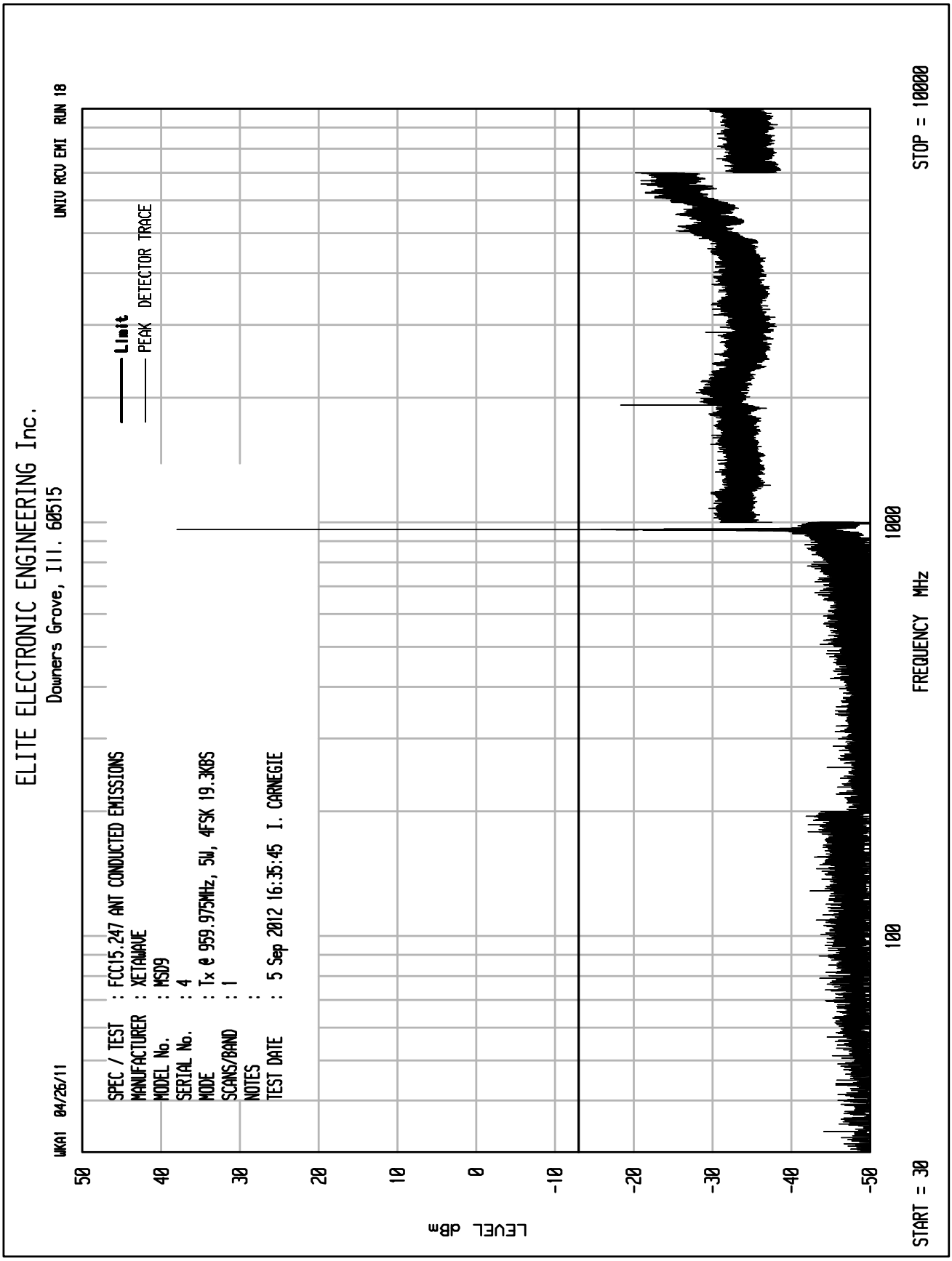

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 14
WKA1 04/26/11
SPEC / TEST : FCC15.247 ANT CONDUCTED EMISSIONS
MANUFACTURER : XETAWAVE
MODEL No. : MSD9
SERIAL No. : 4
MODE : Tx @ 928.025MHz, 5W, 2FSK 19.3KBS
SCANS/BAND : 1
NOTES :
TEST DATE : 5 Sep 2012 15:23:56 I. CARNEGIE
Limit
PEAK DETECTOR TRACE
LEVEL dBm
50
40
30
20
10
0
-10
-20
-30
-40
-50
START = 30
100
1000
STOP = 10000
FREQUENCY MHz

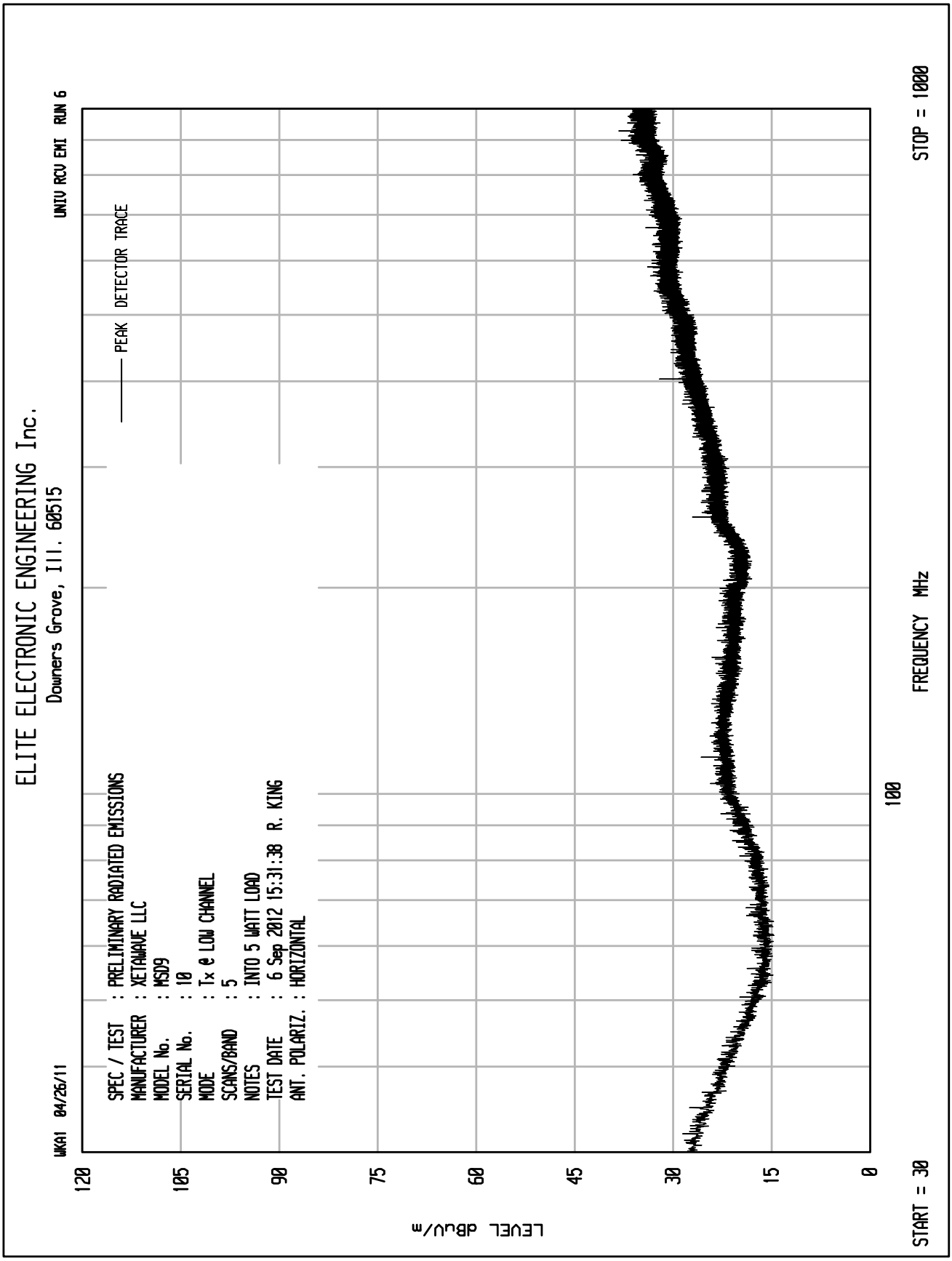

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 12
WKA1 04/26/11
SPEC / TEST : FCC15.247 ANT CONDUCTED EMISSIONS
MANUFACTURER : XETAWAVE
MODEL No. : MSD9
SERIAL No. : 4
MODE : Tx @ 942.1MHz, 5W, 2FSK 19.3KBS
SCANS/BAND : 1
NOTES :
TEST DATE : 5 Sep 2012 15:15:30 I. CARNEGIE
Limit
PEAK DETECTOR TRACE
LEVEL dBm
50
40
30
20
10
0
-10
-20
-30
-40
-50
START = 30
100
1000
STOP = 10000
FREQUENCY MHz

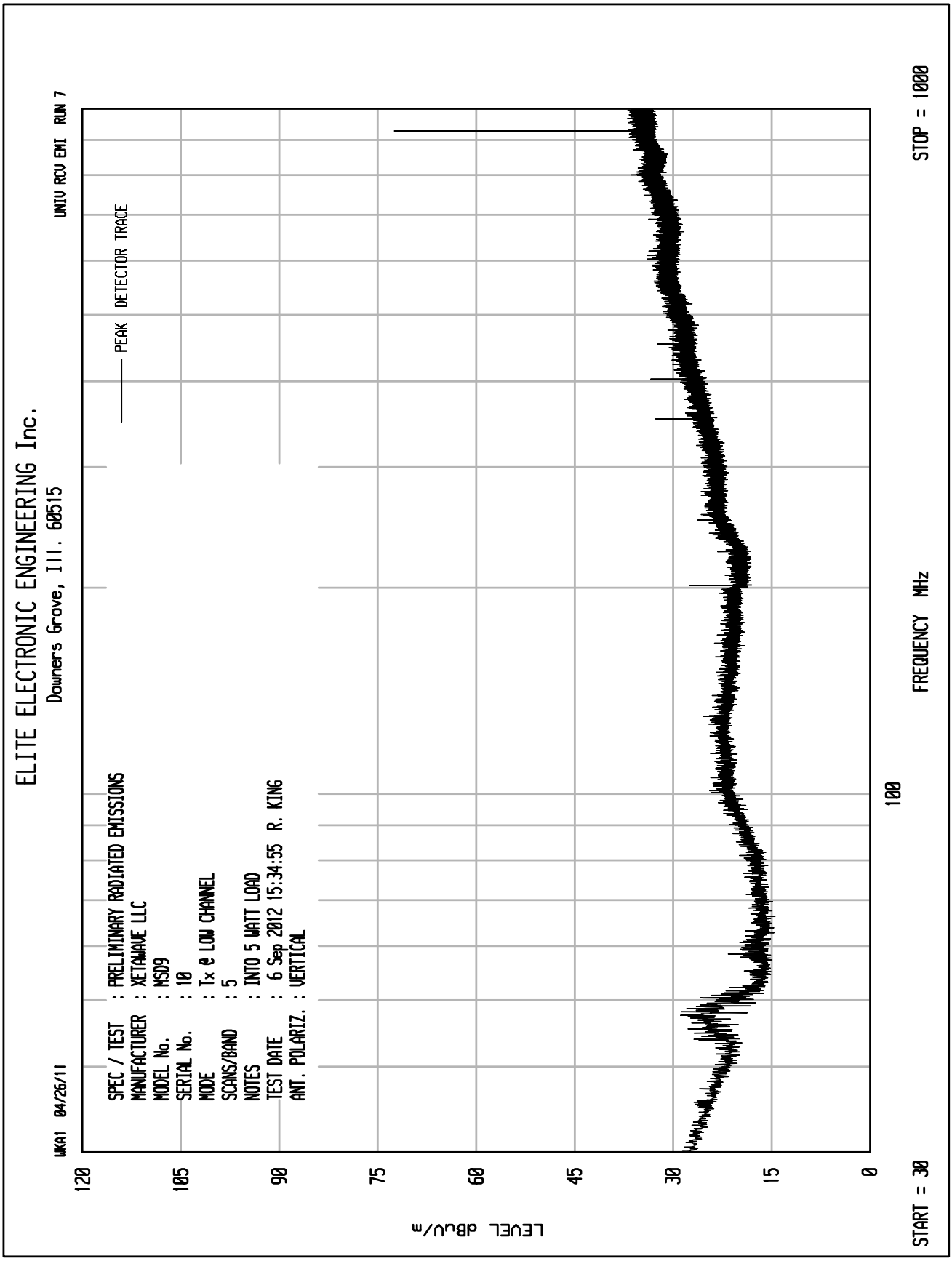

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 13
WKA1 04/26/11
SPEC / TEST : FCC15.247 ANT CONDUCTED EMISSIONS
MANUFACTURER : XETAWAVE
MODEL No. : MSD9
SERIAL No. : 4
MODE : Tx @ 959.975MHz, 5W, 2FSK 19.3KBS
SCANS/BAND : 1
NOTES :
TEST DATE : 5 Sep 2012 15:20:34 I. CARNEGIE
Limit
PEAK DETECTOR TRACE
LEVEL dBm
50
40
30
20
10
0
-10
-20
-30
-40
-50
START = 30
100
1000
STOP = 10000
FREQUENCY MHz

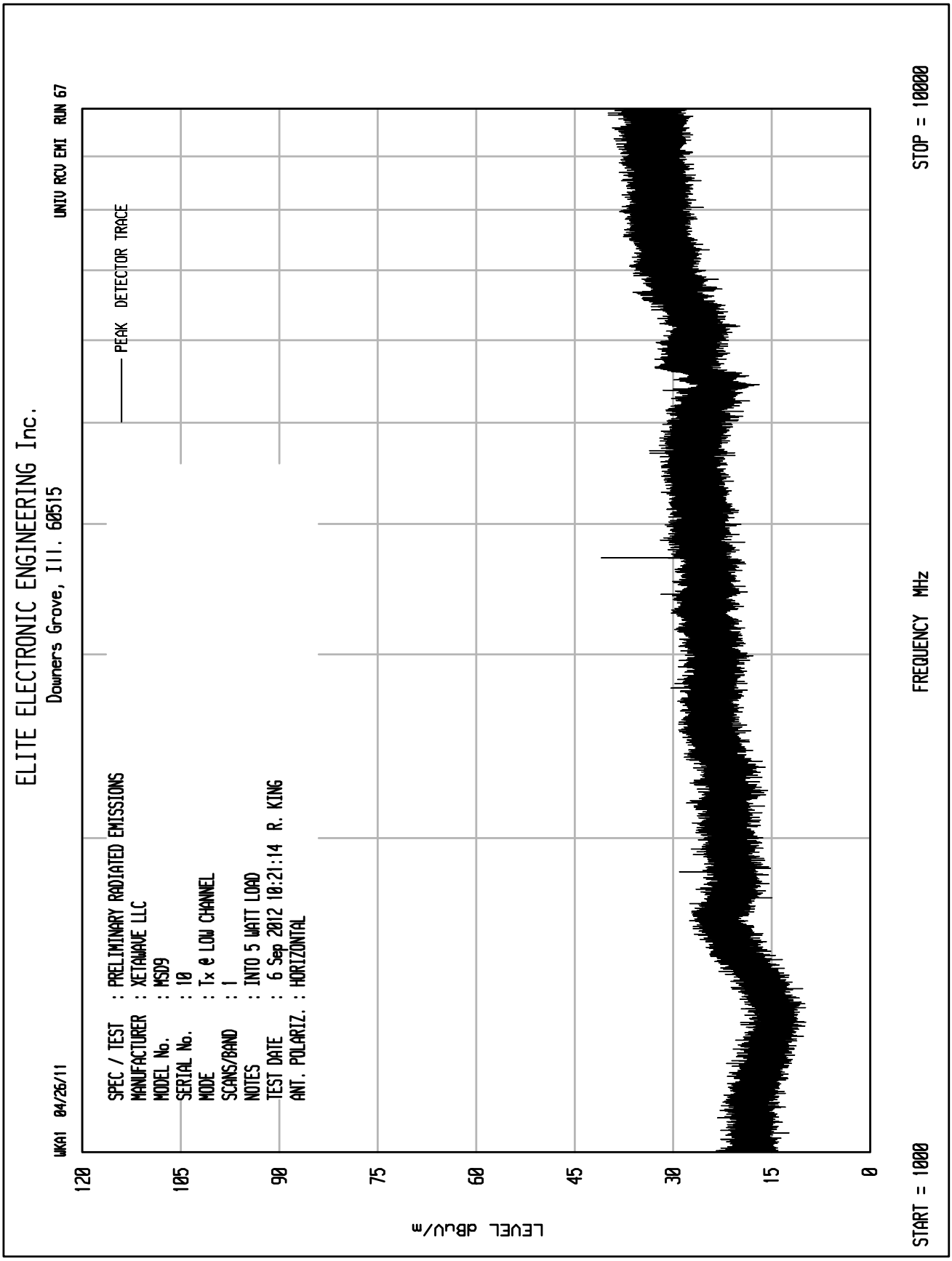

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 20
WKA1 04/26/11
SPEC / TEST : FCC15.247 ANT CONDUCTED EMISSIONS
MANUFACTURER : XETAWAVE
MODEL No. : MSD9
SERIAL No. : 4
MODE : Tx @ 928.025MHz, 4W, 4FSK 19.2KBS
SCANS/BAND : 1
NOTES :
TEST DATE : 5 Sep 2012 16:45:54 I. CARNEGIE
Limit
PEAK DETECTOR TRACE
LEVEL dBm
50
40
30
20
10
0
-10
-20
-30
-40
-50
START = 30
100
1000
STOP = 10000
FREQUENCY MHz

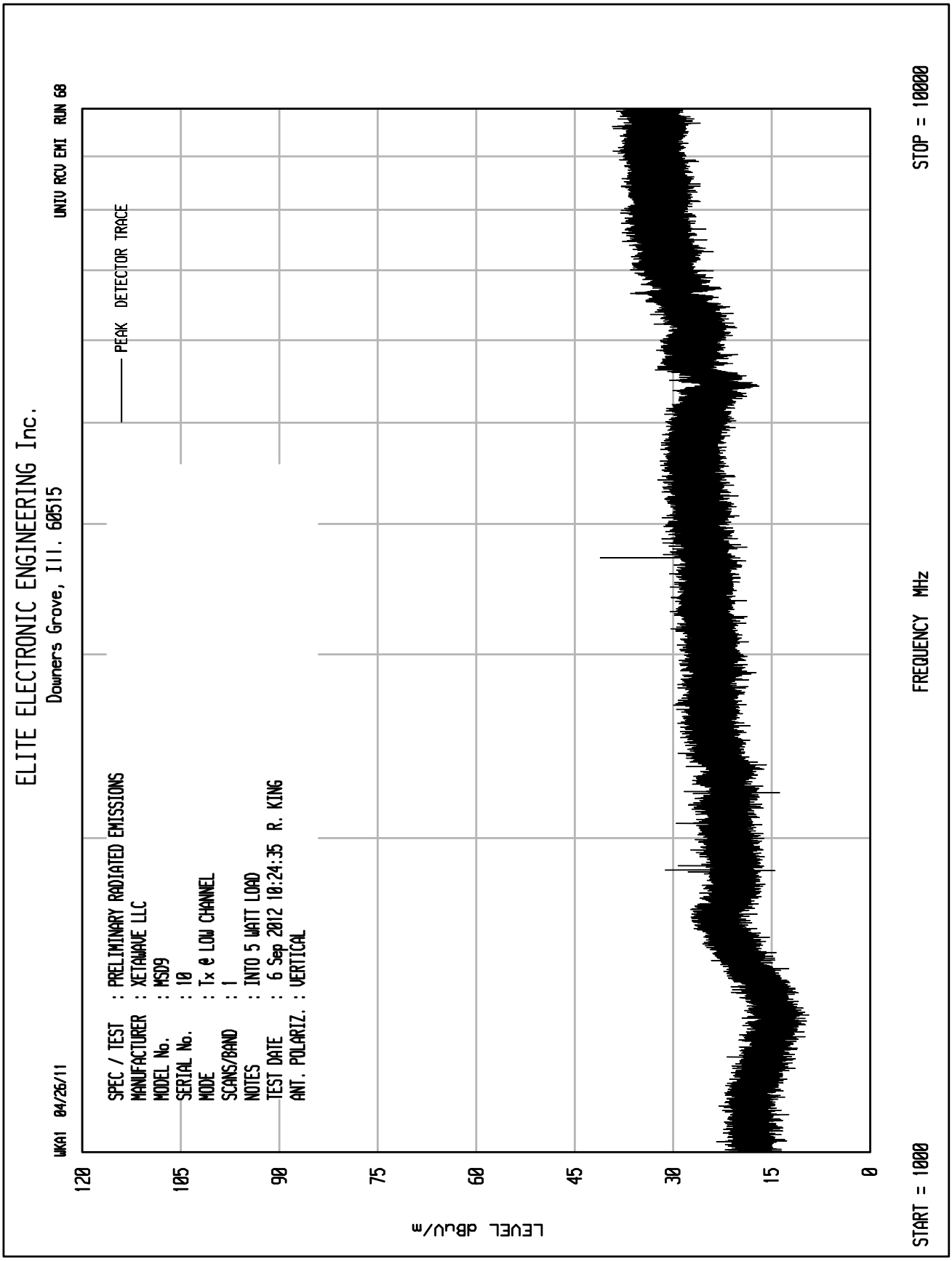

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 19
WKA1 04/26/11
SPEC / TEST : FCC15.247 ANT CONDUCTED EMISSIONS
MANUFACTURER : XETAWAVE
MODEL No. : MSD9
SERIAL No. : 4
MODE : Tx @ 942.1MHz, 5W, 4FSK 19.3KBS
SCANS/BAND : 1
NOTES :
TEST DATE : 5 Sep 2012 16:40:06 I. CARNEGIE
Limit
PEAK DETECTOR TRACE
LEVEL dBm
50
40
30
20
10
0
-10
-20
-30
-40
-50
START = 30
100
1000
STOP = 10000
FREQUENCY MHz

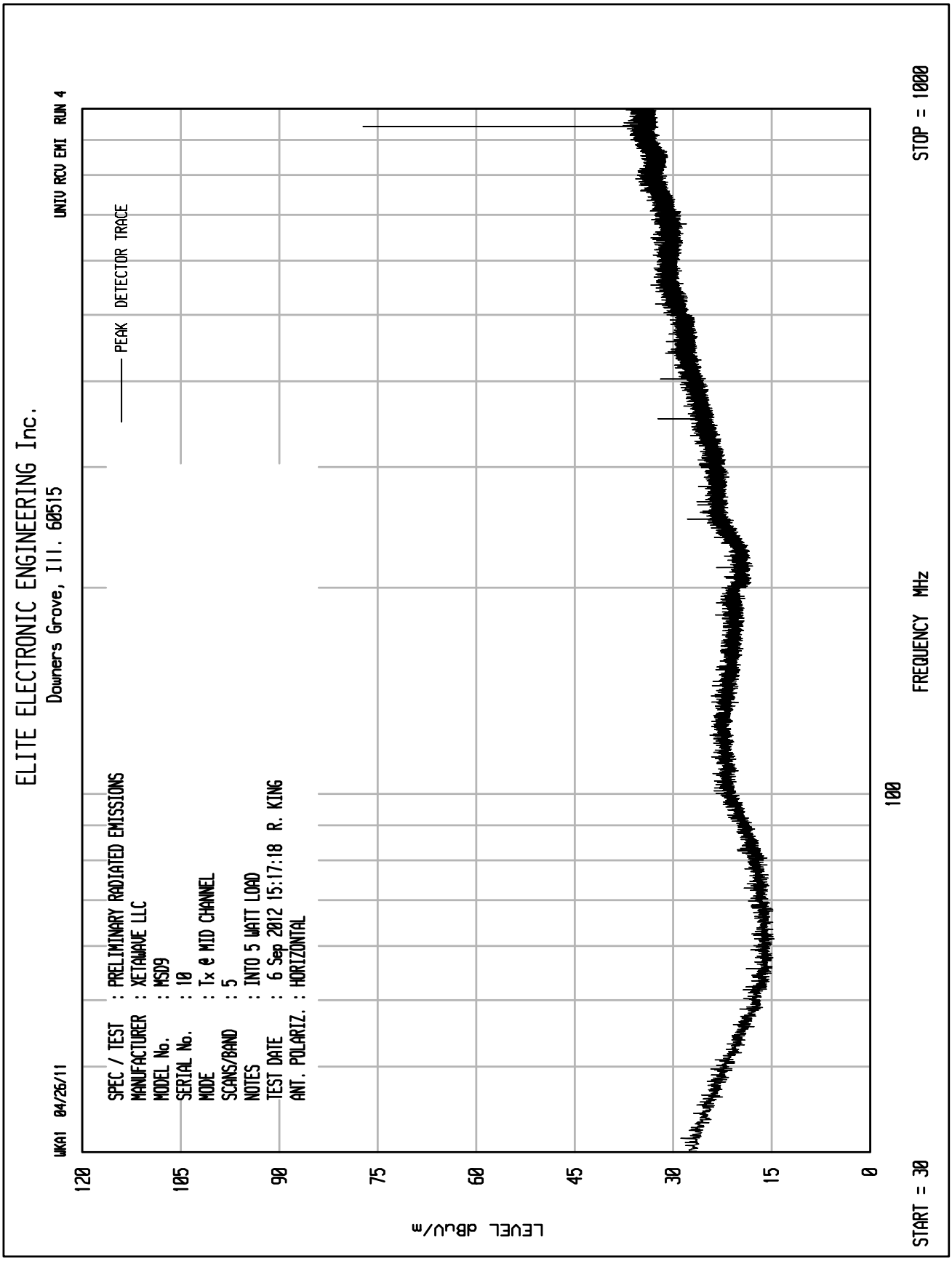

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 18
WKA1 04/26/11
SPEC / TEST : FCC15.247 ANT CONDUCTED EMISSIONS
MANUFACTURER : XETAWAVE
MODEL No. : MSD9
SERIAL No. : 4
MODE : Tx @ 959.975MHz, 5W, 4FSK 19.2KBS
SCANS/BAND : 1
NOTES :
TEST DATE : 5 Sep 2012 16:35:45 I. CARNEGIE
Limit
PEAK DETECTOR TRACE
LEVEL dBm
50
40
30
20
10
0
-10
-20
-30
-40
-50
START = 30
100
1000
STOP = 10000
FREQUENCY MHz

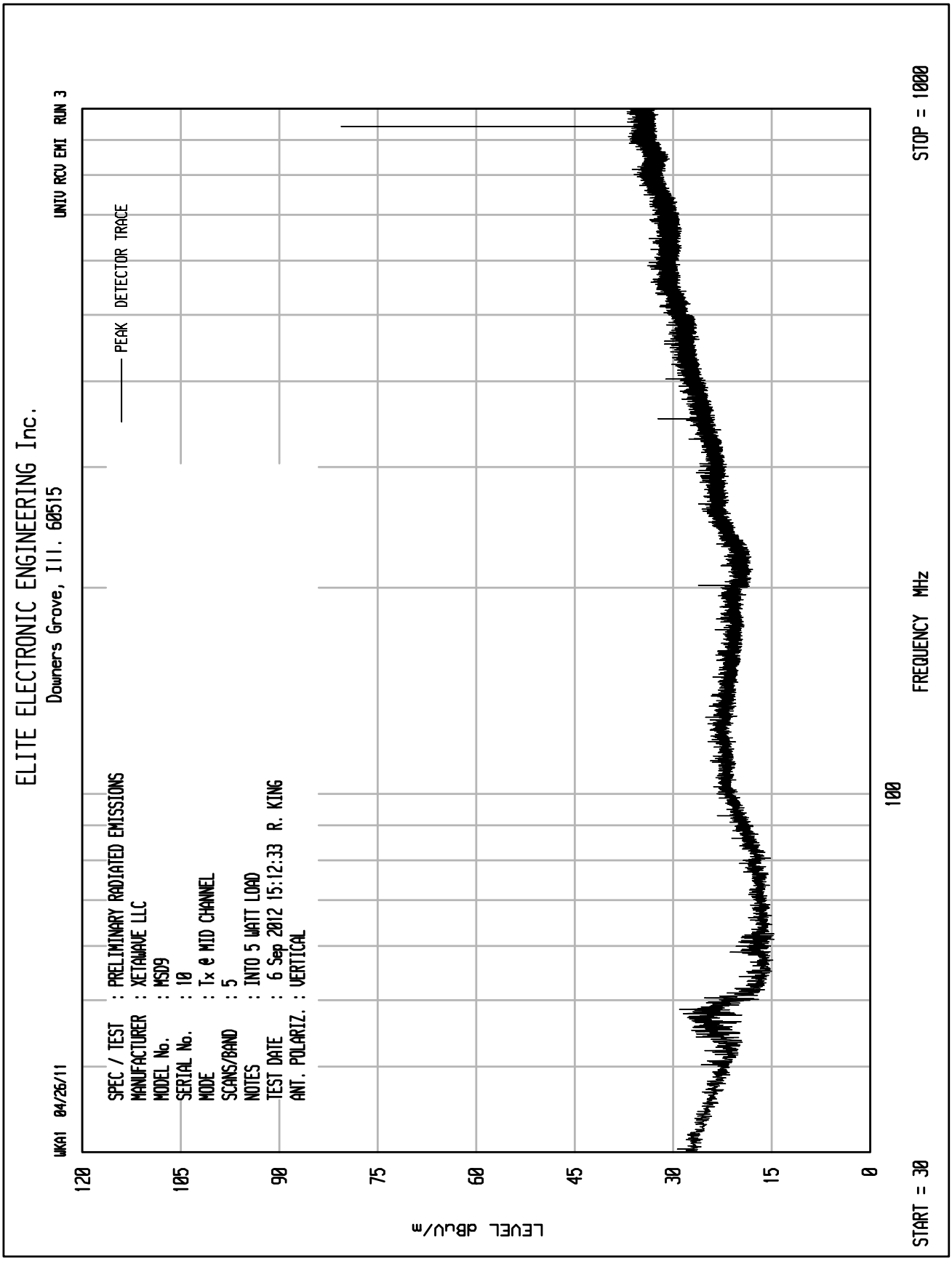

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 6
WKA1 04/26/11
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : XETAWAVE LLC
MODEL No. : MSD9
SERIAL No. : 10
MODE : Tx @ LOW CHANNEL
SCANS/BAND : 5
NOTES : INTO 5 WATT LOAD
TEST DATE : 6 Sep 2012 15:31:38 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 30
100
FREQUENCY MHz
STOP = 1000

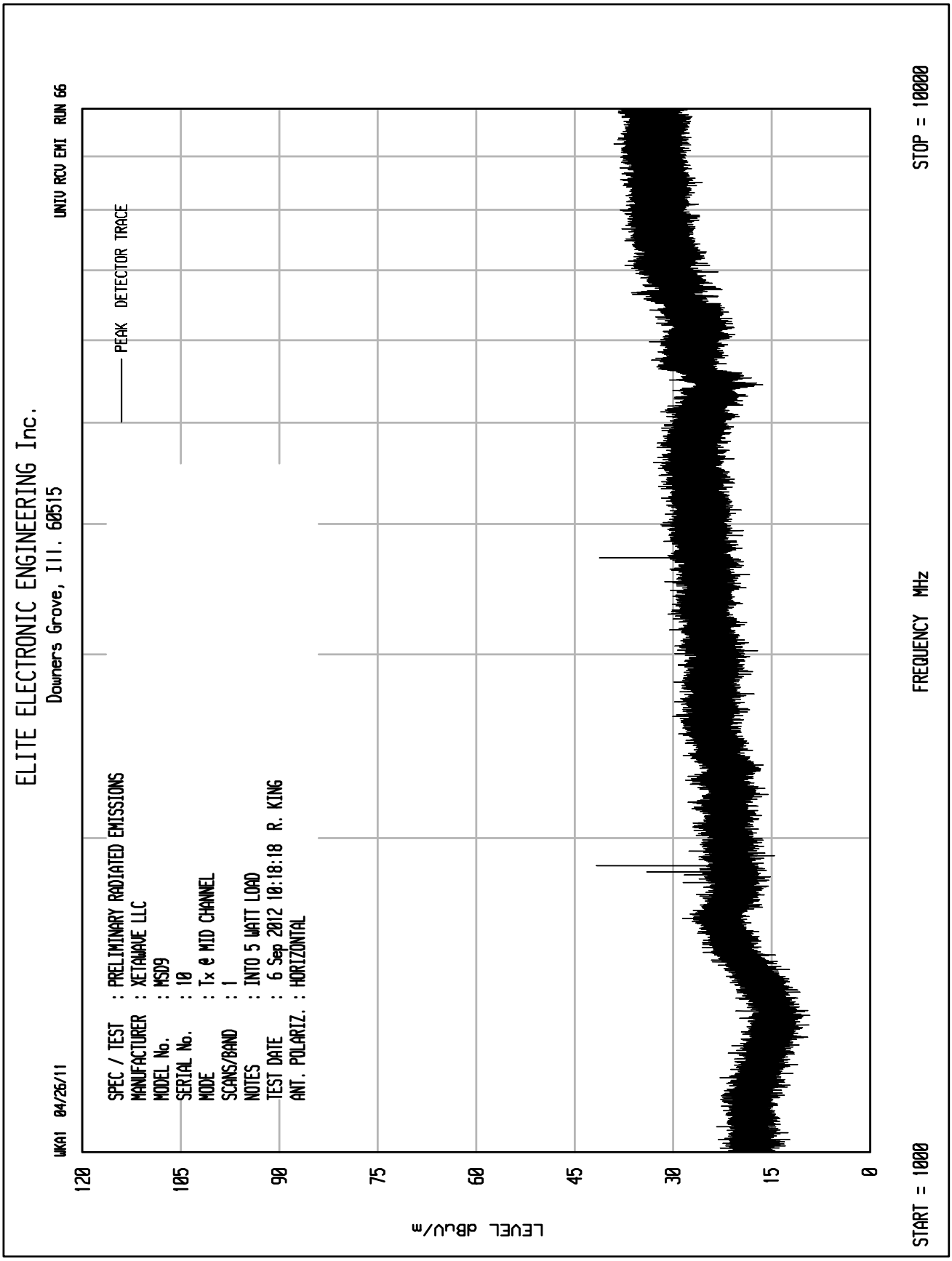

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 7
WKA1 04/26/11
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : XETAWAVE LLC
MODEL No. : MSD9
SERIAL No. : 10
MODE : Tx @ LOW CHANNEL
SCANS/BAND : 5
NOTES : INTO 5 WATT LOAD
TEST DATE : 6 Sep 2012 15:34:55 R. KING
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 30
100
FREQUENCY MHz
STOP = 1000

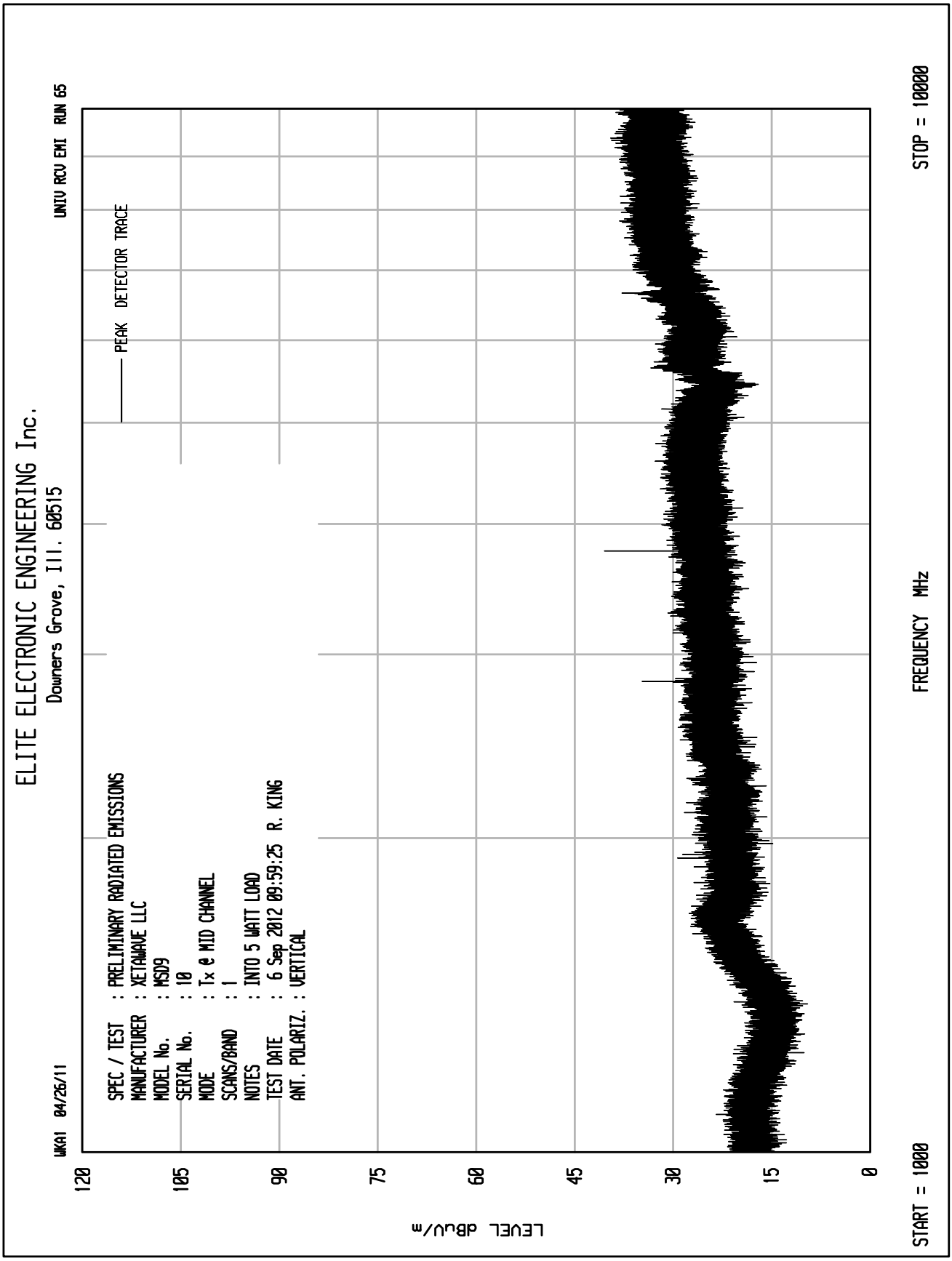

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 67
WKA1 04/26/11
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : XETAWAVE LLC
MODEL No. : MSD9
SERIAL No. : 10
MODE : Tx @ LOW CHANNEL
SCANS/BAND : 1
NOTES : INTO 5 WATT LOAD
TEST DATE : 6 Sep 2012 10:21:14 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 10000

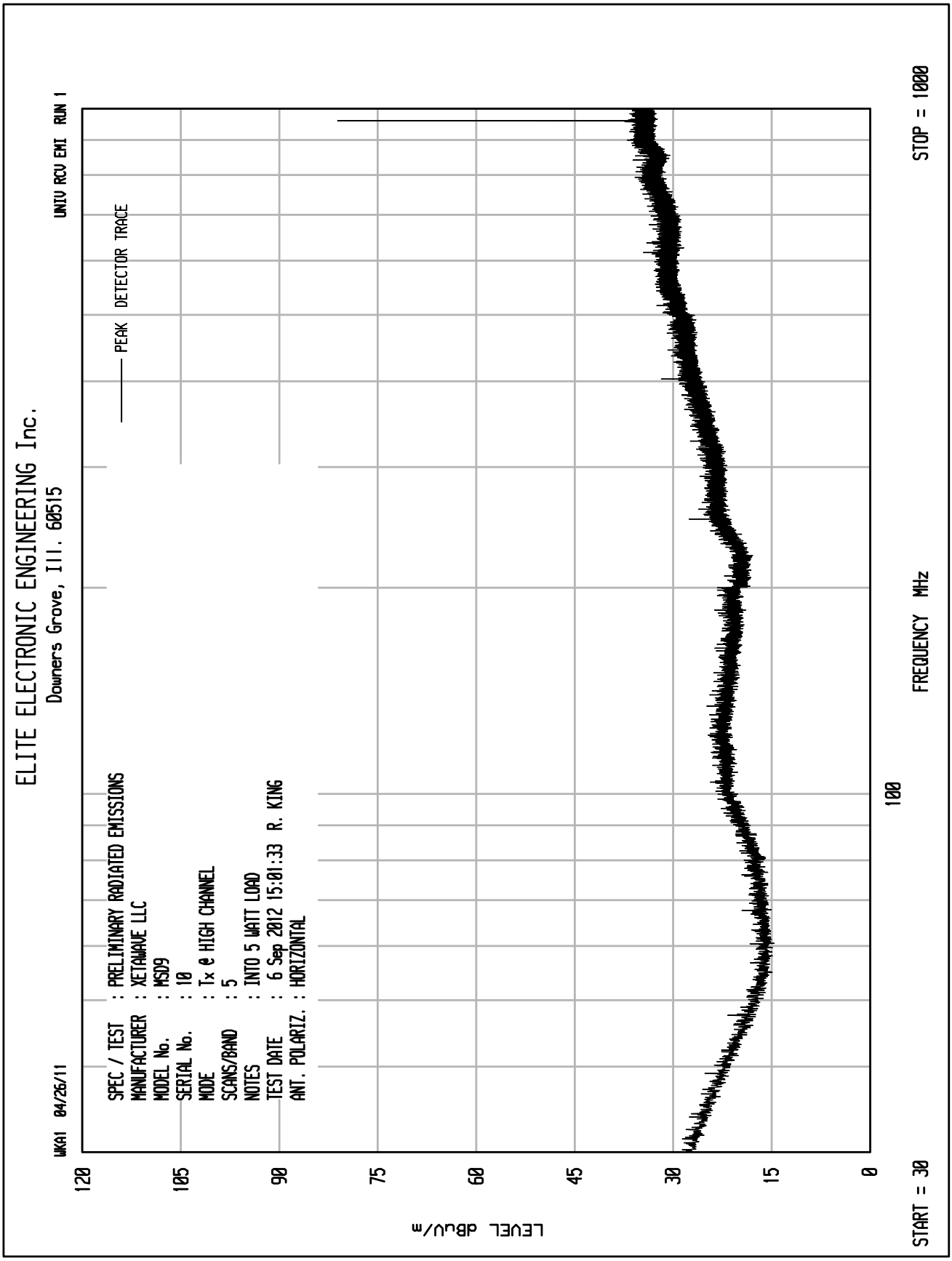

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 68
WKA1 04/26/11
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : XETAWAVE LLC
MODEL No. : MSD9
SERIAL No. : 10
MODE : Tx @ LOW CHANNEL
SCANS/BAND : 1
NOTES : INTO 5 WATT LOAD
TEST DATE : 6 Sep 2012 10:24:35 R. KING
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 10000

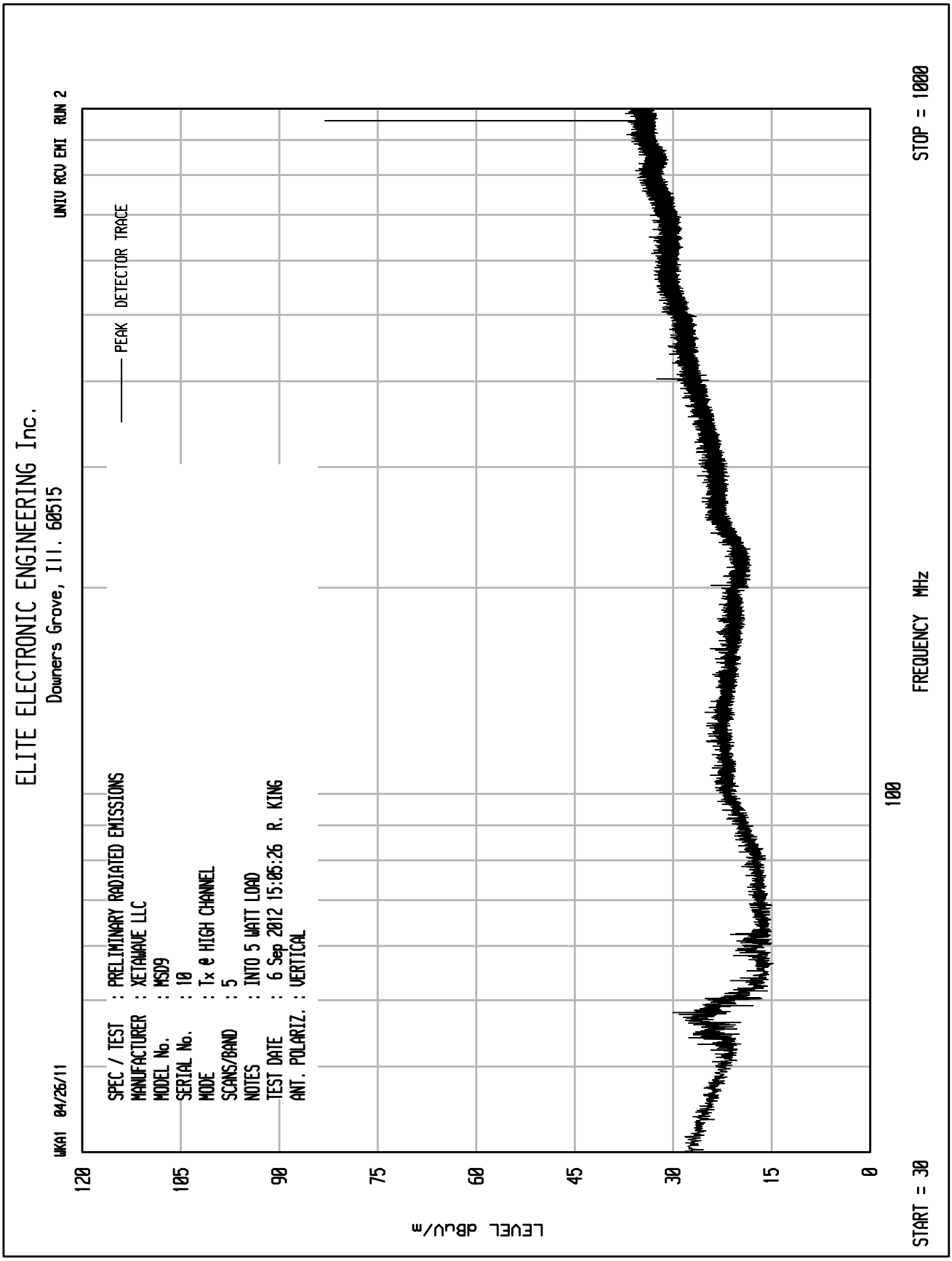

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 4
WKA1 04/26/11
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : XETAWAVE LLC
MODEL No. : MSD9
SERIAL No. : 10
MODE : Tx @ MID CHANNEL
SCANS/BAND : 5
NOTES : INTO 5 WATT LOAD
TEST DATE : 6 Sep 2012 15:17:18 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 30
100
FREQUENCY MHz
STOP = 1000

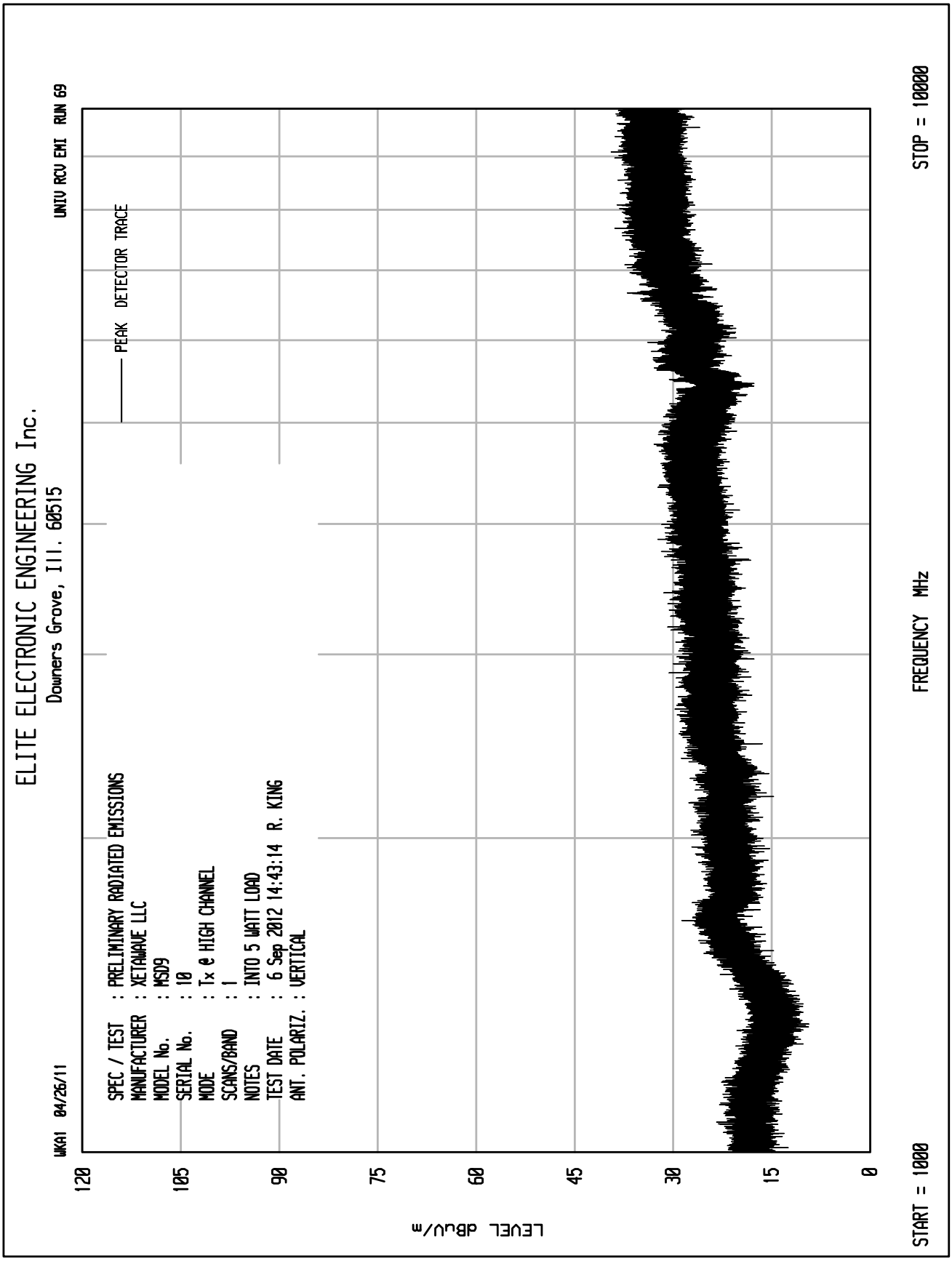

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 3
WKA1 04/26/11
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : XETAWAVE LLC
MODEL No. : MSD9
SERIAL No. : 10
MODE : Tx @ MID CHANNEL
SCANS/BAND : 5
NOTES : INTO 5 WATT LOAD
TEST DATE : 6 Sep 2012 15:12:33 R. KING
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 30
100
FREQUENCY MHz
STOP = 1000

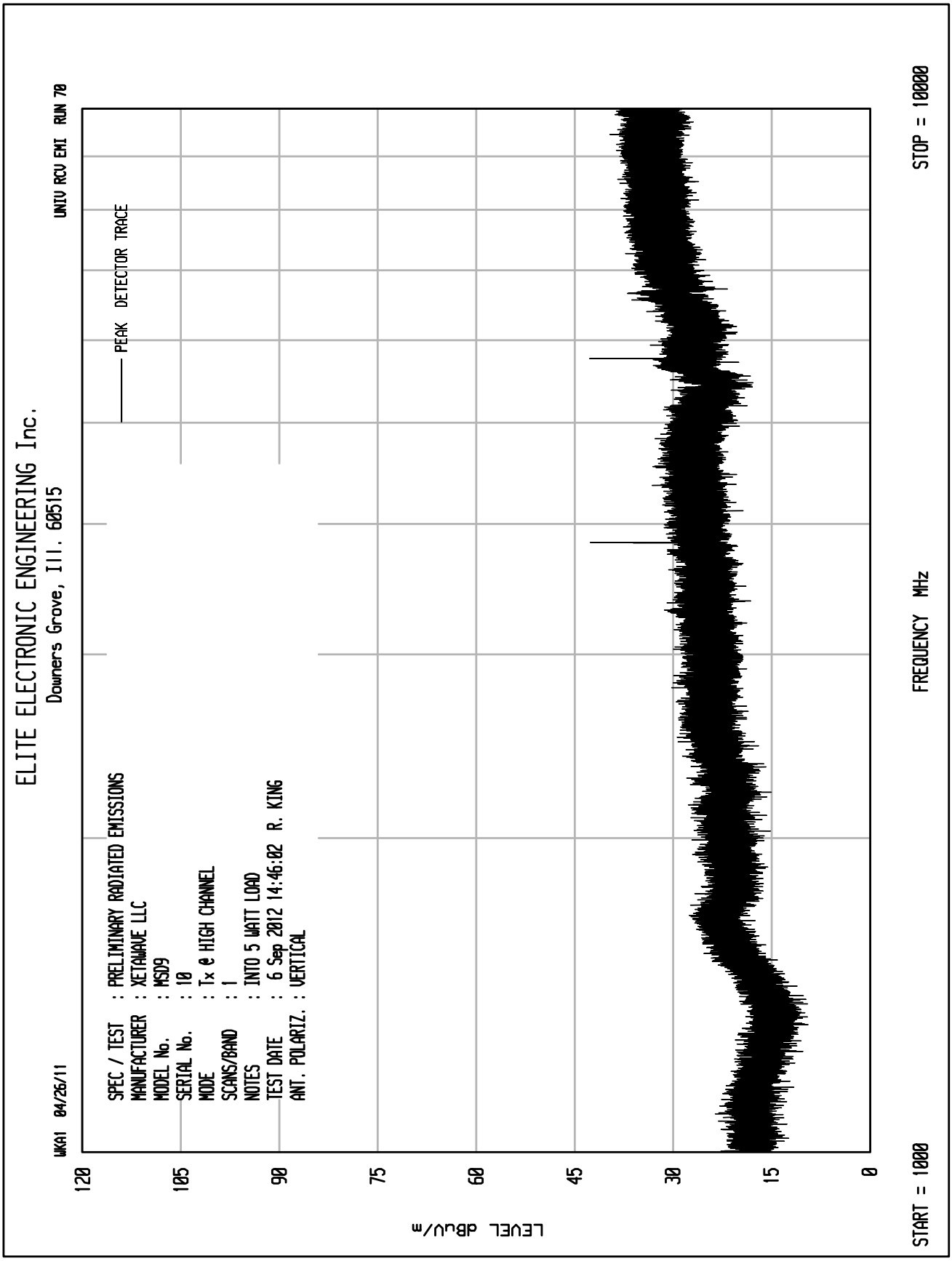

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 66
WKA1 04/26/11
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : XETAWAVE LLC
MODEL No. : MSD9
SERIAL No. : 10
MODE : Tx @ MID CHANNEL
SCANS/BAND : 1
NOTES : INTO 5 WATT LOAD
TEST DATE : 6 Sep 2012 10:18:18 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 10000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 65
WKA1 04/26/11
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : XETAWAVE LLC
MODEL No. : MSD9
SERIAL No. : 10
MODE : Tx @ MID CHANNEL
SCANS/BAND : 1
NOTES : INTO 5 WATT LOAD
TEST DATE : 6 Sep 2012 09:59:25 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 = 10000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 1
WKA1 04/26/11
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : XETAWAVE LLC
MODEL No. : MSD9
SERIAL No. : 10
MODE : Tx @ HIGH CHANNEL
SCANS/BAND : 5
NOTES : INTO 5 WATT LOAD
TEST DATE : 6 Sep 2012 15:01:33 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 30
100
FREQUENCY MHz
STOP = 1000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 2
WKA1 04/26/11
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : XETAWAVE LLC
MODEL No. : MSD9
SERIAL No. : 10
MODE : Tx @ HIGH CHANNEL
SCANS/BAND : 5
NOTES : INTO 5 WATT LOAD
TEST DATE : 6 Sep 2012 15:05:26 R. KING
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 30
100
FREQUENCY MHz
STOP = 1000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 69
WKA1 04/26/11
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : XETAWAVE LLC
MODEL No. : MSD9
SERIAL No. : 10
MODE : Tx @ HIGH CHANNEL
SCANS/BAND : 1
NOTES : INTO 5 WATT LOAD
TEST DATE : 6 Sep 2012 14:43:14 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 = 10000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 70
WKA1 04/26/11
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : XETAWAVE LLC
MODEL No. : MSD9
SERIAL No. : 10
MODE : Tx @ HIGH CHANNEL
SCANS/BAND : 1
NOTES : INTO 5 WATT LOAD
TEST DATE : 6 Sep 2012 14:46:02 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 = 10000

MANUFACTURER : XetaWave, LLC
MODEL : MSD9 Rev. A
SPECIFICATION : FCC Part 101
DATE : September 6, 2010
NOTES : Transmit at 928.025MHz
: Test Distance is 3 meters

MIN ATTEN = (matched signal + antenna gain - cable loss) – power in dBm
FCC minimum attenuation = 43+ 10*log(Power in watts) = 43 + 10*log(4W) = 49

| Freq. MHz | Ant Pol | Meter Reading (dBuV) | Ambient | Matched Sig. Gen. Reading (dB) | Equivalent Antenna Gain (dB) | Cable Loss (dB) | ERP (dBm) | Attenuation Below Output Power (dB) | Minimum Attenuation (dB) |
|---|---|---|---|---|---|---|---|---|---|
| 1856.05 | H | 50.0 | | -63.4 | 6.1 | 2.7 | -60.0 | 96.0 | 49.0 |
| 1856.05 | V | 49.0 | | -63.3 | 6.1 | 2.7 | -59.9 | 96.0 | 49.0 |
| 2784.08 | H | 47.4 | | -66.5 | 7.1 | 3.4 | -62.9 | 98.9 | 49.0 |
| 2784.08 | V | 46.1 | | -68.0 | 7.1 | 3.4 | -64.4 | 100.4 | 49.0 |
| 3712.10 | H | 57.3 | | -49.0 | 6.7 | 4.0 | -46.2 | 82.2 | 49.0 |
| 3712.10 | V | 53.2 | | -48.0 | 6.7 | 4.0 | -45.3 | 81.3 | 49.0 |
| 4640.13 | H | 46.3 | * | -59.0 | 7.9 | 4.4 | -55.5 | 91.5 | 49.0 |
| 4640.13 | V | 46.6 | * | -55.5 | 7.9 | 4.4 | -52.0 | 88.1 | 49.0 |
| 5568.15 | H | 41.6 | * | -58.3 | 7.8 | 4.8 | -55.3 | 91.3 | 49.0 |
| 5568.15 | V | 41.0 | * | -61.9 | 7.8 | 4.8 | -59.0 | 95.0 | 49.0 |
| 6496.18 | H | 43.9 | * | -51.1 | 9.3 | 5.3 | -47.1 | 83.1 | 49.0 |
| 6496.18 | V | 43.3 | * | -51.7 | 9.3 | 5.3 | -47.7 | 83.7 | 49.0 |
| 7424.20 | H | 43.5 | * | -51.3 | 7.6 | 5.7 | -49.4 | 85.5 | 49.0 |
| 7424.20 | V | 43.3 | * | -51.5 | 7.6 | 5.7 | -49.7 | 85.7 | 49.0 |
| 8352.23 | H | 44.4 | * | -50.5 | 9.0 | 6.0 | -47.5 | 83.5 | 49.0 |
| 8352.23 | V | 43.6 | * | -51.3 | 9.0 | 6.0 | -48.3 | 84.3 | 49.0 |
| 9280.25 | H | 45.2 | * | -48.7 | 9.4 | 6.1 | -45.3 | 81.4 | 49.0 |
| 9280.25 | V | 44.9 | * | -48.9 | 9.4 | 6.1 | -45.6 | 81.6 | 49.0 |

Checked BY Richard E. King :

Richard E. King

MANUFACTURER : XetaWave, LLC
MODEL : MSD9 Rev. A
SPECIFICATION : FCC Part 101
DATE : September 6, 2010
NOTES : Transmit at 942.1MHz
: Test Distance is 3 meters

MIN ATTEN = (matched signal + antenna gain - cable loss) – power in dBm
FCC minimum attenuation = 43+ 10*log(Power in watts) = 43 + 10*log(5W) = 50

| Freq. MHz | Ant Pol | Meter Reading (dBuV) | Ambient | Matched Sig. Gen. Reading (dB) | Equivalent Antenna Gain (dB) | Cable Loss (dB) | ERP (dBm) | Attenuation Below Output Power (dB) | Minimum Attenuation (dB) |
|---|---|---|---|---|---|---|---|---|---|
| 1884.20 | H | 50.6 | | -63.4 | 6.1 | 2.7 | -60.0 | 97.0 | 50.0 |
| 1884.20 | V | 49.0 | | -63.3 | 6.1 | 2.7 | -60.0 | 97.0 | 50.0 |
| 2826.30 | H | 47.6 | | -66.5 | 7.1 | 3.5 | -62.8 | 99.8 | 50.0 |
| 2826.30 | V | 47.9 | | -68.0 | 7.1 | 3.5 | -64.4 | 101.4 | 50.0 |
| 3768.40 | H | 54.6 | | -51.7 | 6.6 | 4.0 | -49.0 | 86.0 | 50.0 |
| 3768.40 | V | 52.2 | | -51.3 | 6.6 | 4.0 | -48.7 | 85.7 | 50.0 |
| 4710.50 | H | 46.3 | * | -58.8 | 7.7 | 4.4 | -55.5 | 92.5 | 50.0 |
| 4710.50 | V | 46.6 | * | -55.5 | 7.7 | 4.4 | -52.2 | 89.2 | 50.0 |
| 5652.60 | H | 41.6 | * | -63.8 | 8.1 | 4.8 | -60.5 | 97.5 | 50.0 |
| 5652.60 | V | 41.0 | * | -61.9 | 8.1 | 4.8 | -58.6 | 95.6 | 50.0 |
| 6594.70 | H | 43.9 | * | -50.6 | 9.3 | 5.3 | -46.6 | 83.6 | 50.0 |
| 6594.70 | V | 43.3 | * | -51.2 | 9.3 | 5.3 | -47.2 | 84.2 | 50.0 |
| 7536.80 | H | 43.5 | * | -51.4 | 7.8 | 5.8 | -49.4 | 86.4 | 50.0 |
| 7536.80 | V | 43.3 | * | -51.7 | 7.8 | 5.8 | -49.6 | 86.6 | 50.0 |
| 8478.90 | H | 44.4 | * | -51.0 | 9.2 | 6.0 | -47.8 | 84.8 | 50.0 |
| 8478.90 | V | 43.6 | * | -51.7 | 9.2 | 6.0 | -48.5 | 85.5 | 50.0 |
| 9421.00 | H | 45.2 | * | -48.2 | 9.1 | 6.2 | -45.3 | 82.3 | 50.0 |
| 9421.00 | V | 44.9 | * | -48.5 | 9.1 | 6.2 | -45.6 | 82.6 | 50.0 |

Checked BY Richard E. King :

Richard E. King

MANUFACTURER : XetaWave, LLC
MODEL : MSD9 Rev. A
SPECIFICATION : FCC Part 101
DATE : September 6, 2010
NOTES : Transmit at 959.975MHz
: Test Distance is 3 meters

MIN ATTEN = (matched signal + antenna gain - cable loss) – power in dBm
FCC minimum attenuation = 43+ 10*log(Power in watts) = 43 + 10*log(5W) = 50

| Freq. MHz | Ant Pol | Meter Reading (dBuV) | Ambient | Matched Sig. Gen. Reading (dB) | Equivalent Antenna Gain (dB) | Cable Loss (dB) | ERP (dBm) | Attenuation Below Output Power (dB) | Minimum Attenuation (dB) |
|---|---|---|---|---|---|---|---|---|---|
| 1919.95 | H | 64.8 | | -46.6 | 6.1 | 2.8 | -43.2 | 80.2 | 50.0 |
| 1919.95 | V | 60.2 | | -49.5 | 6.1 | 2.8 | -46.2 | 83.1 | 50.0 |
| 2879.93 | H | 54.5 | | -55.7 | 7.2 | 3.5 | -52.0 | 89.0 | 50.0 |
| 2879.93 | V | 50.8 | | -57.5 | 7.2 | 3.5 | -53.9 | 90.9 | 50.0 |
| 3839.90 | H | 51.5 | | -53.0 | 6.6 | 4.0 | -50.4 | 87.4 | 50.0 |
| 3839.90 | V | 50.7 | | -53.2 | 6.6 | 4.0 | -50.7 | 87.7 | 50.0 |
| 4799.88 | H | 47.3 | | -59.9 | 7.5 | 4.5 | -56.9 | 93.9 | 50.0 |
| 4799.88 | V | 48.3 | | -52.4 | 7.5 | 4.5 | -49.4 | 86.4 | 50.0 |
| 5759.85 | H | 47.3 | | -52.6 | 8.5 | 4.9 | -49.0 | 86.0 | 50.0 |
| 5759.85 | V | 47.1 | | -52.4 | 8.5 | 4.9 | -48.8 | 85.8 | 50.0 |
| 6719.83 | H | 44.6 | * | -49.1 | 8.8 | 5.4 | -45.7 | 82.7 | 50.0 |
| 6719.83 | V | 44.5 | * | -49.2 | 8.8 | 5.4 | -45.8 | 82.8 | 50.0 |
| 7679.80 | H | 45.2 | * | -49.3 | 8.0 | 5.8 | -47.1 | 84.1 | 50.0 |
| 7679.80 | V | 45.2 | * | -49.3 | 8.0 | 5.8 | -47.1 | 84.1 | 50.0 |
| 8639.78 | H | 45.4 | * | -49.8 | 9.3 | 6.0 | -46.5 | 83.5 | 50.0 |
| 8639.78 | V | 45.3 | * | -49.8 | 9.3 | 6.0 | -46.5 | 83.5 | 50.0 |
| 9599.75 | H | 45.1 | * | -47.9 | 8.8 | 6.3 | -45.4 | 82.4 | 50.0 |
| 9599.75 | V | 45.1 | * | -47.9 | 8.8 | 6.3 | -45.4 | 82.4 | 50.0 |

Checked BY Richard E. King :

Richard E. King

MANUFACTURER : XetaWave, LLC
MODEL : MSD9 Rev. A
SPECIFICATION : FCC Part 101 Frequency Stability vs. Temperature
DATE : September 6, 2012
EQUIPMENT USED :
NOTES : Transmit at 941.25MHz

| Temperature °C | Input Voltage | Nominal Frequency Hz | Measured Frequency Hz | Frequency Variation in % | | | Pass/Fail |
|---|---|---|---|---|---|---|---|
| | | | | Lower Limit % | Measured Variation % | Upper Limit % | |
| -30 | 6.0 | 941,250,000 | 941,249,910 | -0.000150000 | -0.000009562 | 0.000150000 | Pass |
| -20 | 6.0 | 941,250,000 | 941,249,920 | -0.000150000 | -0.000008499 | 0.000150000 | Pass |
| -10 | 6.0 | 941,250,000 | 941,249,810 | -0.000150000 | -0.000020186 | 0.000150000 | Pass |
| 0 | 6.0 | 941,250,000 | 941,249,990 | -0.000150000 | -0.000001062 | 0.000150000 | Pass |
| +10 | 6.0 | 941,250,000 | 941,250,007 | -0.000150000 | 0.000000744 | 0.000150000 | Pass |
| +20 | 6.0 | 941,250,000 | 941,250,240 | -0.000150000 | 0.000025498 | 0.000150000 | Pass |
| +30 | 6.0 | 941,250,000 | 941,250,320 | -0.000150000 | 0.000033997 | 0.000150000 | Pass |
| +40 | 6.0 | 941,250,000 | 941,250,420 | -0.000150000 | 0.000044622 | 0.000150000 | Pass |
| +50 | 6.0 | 941,250,000 | 941,250,470 | -0.000150000 | 0.000049934 | 0.000150000 | Pass |

Limit = 0.00015%

MANUFACTURER : XetaWave, LLC
MODEL : MSD9 Rev. A
SPECIFICATION : FCC Part 90/RSS-119 Frequency Stability vs. Temperature
DATE : September 6, 2012
EQUIPMENT USED :
NOTES : Transmit at 941.25MHz

| Input Voltage | Nominal Frequency Hz | Measured Frequency Hz | Frequency Variation in % | | | Pass/Fail |
|---|---|---|---|---|---|---|
| | | | Lower Limit % | Measured Variation % | Upper Limit % | |
| 6.0 | 941,250,000 | 941,250,400 | -0.000150000 | 0.000042497 | 0.000150000 | Pass |
| 5.1 | 941,250,000 | 941,250,390 | -0.000150000 | 0.000041434 | 0.000150000 | Pass |
| 6.9 | 941,250,000 | 941,250,390 | -0.000150000 | 0.000041434 | 0.000150000 | Pass |

Limit = 0.00015%