Measurement of RF Interference a ZICM900P2 Transceiver Module

For	California Eastern Laboratories 1253 N. Old Rand Road Wauconda, IL 60084
P.O. Number	179522
Date Tested	May 23 through June 3, 2011
Test Personnel	Dan Crowder
Test Specification	FCC "Code of Federal Regulations" Title 47 Part 15, Subpart C, Section 15.247 for Frequency Hopping and Digitally Modulated Intentional Radiators Operating within the 902-928MHz/2400-2483.5MHz/5725-5850MHz band. Industry Canada RSS-210, Annex 8, for Frequency Hopping and Digital : Modulation Systems Operating in the Bands 902–928MHz, 2400–2483.5MHz, and 5725–5850MHz Industry Canada RSS-GEN

Test Report By:

Dan Crowder
EMC Engineer

Requested By:

David Wilde
California Eastern Laboratories

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

TABLE OF CONTENTS

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	6
4.3.	Calibration Traceability	7
5.	Test Procedures	7
5.1.	Powerline Conducted Emissions	7
5.1.1.	Requirements	7
5.1.2.	Procedures	7
5.1.3.	Results	7
5.2.	Radiated Measurements Receiver:	8
5.2.1.	Requirements	8
5.2.2.	Procedures	8
5.2.3.	Results	9
5.3.	Carrier Frequency Separation:	9
5.3.1.	Requirements	9
5.3.2.	Procedures	9
5.3.3.	Results	9
5.4.	Number of Hopping Frequencies	9
5.4.1.	Requirements	9
5.4.2.	Procedures	10
5.4.3.	Results	10
5.5.	Time of Occupancy	10
5.5.1.	Requirement	10
5.5.2.	Procedures	10
5.5.3.	Results	10
5.6.	20dB Bandwidth	10

TABLE OF CONTENTS

PARAGRAPH	DESCRIPTION OF CONTENTS	PAGE NO.
5.6.1.	Requirement	10
5.6.2.	Procedures	10
5.6.3.	Results	11
5.7.	Peak Output Power	11
5.7.1.	Requirement	11
5.7.2.	Procedures	11
5.7.3.	Results	11
5.8.	Bandedge Compliance	11
5.8.1.	Requirement	11
5.8.2.	Procedures	11
5.8.3.	Results	11
5.9.	Antenna Conducted Spurious Emissions	11
5.9.1.	Requirement	11
5.9.2.	Procedures	11
5.9.3.	Results	12
5.10.	Radiated Spurious Emissions	12
5.10.1.	Requirement	12
5.10.2.	Procedures	12
5.10.3.	Results	12
6.	Other Test Conditions	12
6.1.	Test Personnel and Witnesses	12
6.2.	Disposition of the EUT	12
7.	Conclusions	13
8.	Certification	13
9.	Equipment List	14

REVISION HISTORY

Revision	Date	Description
—	16 June 2011	Initial release

Measurement of RF Emissions from a Transceiver Module, Model No. ZICM900P2

1. INTRODUCTION

1.1. Scope of Tests

This report presents the results of the radio interference measurements performed on a Transceiver Module, Model No. ZICM900P2, (hereinafter referred to as the Equipment Under Test (EUT)). No serial number was assigned to the EUT. The EUT was manufactured and submitted for testing by California Eastern Laboratories located in Wauconda, IL.

The EUT is a frequency hopping spread spectrum transceiver module. It transmits and receives over the frequency range of 903MHz to 927MHz and uses an external antenna. The EUT was provided and tested with two antennas, a whip antenna and a wire antenna. The EUT can utilize two different FHSS protocols, CEL hopping and SNAP Hopping. Protocol tests were performed separately on each hopping format.

1.2. Purpose

The test series was performed to determine if the EUT meets the conducted and radiated RF emission requirements of the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart C, Sections 15.207 and 15.247 for Intentional Radiators. The test series was also performed to determine if the EUT meets the conducted RF emission requirements of the Industry Canada Radio Standards Specification, RSS-Gen, Section 7.2.2 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 C63.4-2003.

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 23^{o}C and the relative humidity was 28%.

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 2010
- FCC Public Notice, DA 00-705, "Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems", Released March 30, 2000
- ANSI C63.4-2003, "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"
- Industry Canada Radio Standards Specification, RSS-Gen, “General Requirements and Information for the Certification of Radiocommunication Equipment”, Issue 3, Dec. 2010

- Industry Canada Radio Standards Specification, RSS-210, “Low-power License-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment”, Issue 8, Dec. 2010

3. EUT SETUP AND OPERATION

3.1. General Description

The EUT is a California Eastern Laboratories, Transceiver Module, Model No. ZICM900P2. A block diagram of the EUT setup is shown as Figure 1.

3.1.1. Power Input

The EUT obtained 3.5VDC power through 2 leads. Each primary lead was connected through a line impedance stabilization network (LISN) which was located on the ground plane. The network complies with the requirements of Paragraph 4.1.2 of ANSI C63.4-2003.

3.1.2. Peripheral Equipment

The EUT does not have connections for peripheral equipment.

3.1.3. Signal Input/Output Leads

The EUT does not have connections for Input/Output leads.

3.1.4. Grounding

Since only two wires were used to provide the input power, the EUT was ungrounded during the tests.

3.2. Operational Mode

The EUT was energized and placed on an 80cm high non-conductive stand. For tests, the EUT was programmed to operate in one of the following modes:

- transmit at 903MHz
- transmit at 915MHz
- transmit at 927MHz
- hopping
- receive at 903MHz
- receive at 915MHz
- receive at 927MHz

3.3. EUT Modifications

No modifications were required for compliance to FCC 15.247 requirements.

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 C63.4-2003 for site attenuation.

4.2. Test Instrumentation

The test instrumentation and auxiliary equipment used during the tests are listed in Table 9-1. All equipment was calibrated per the instruction manuals supplied by the manufacturer.

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).

5. TEST PROCEDURES

5.1. Powerline Conducted Emissions

5.1.1. Requirements

All radio frequency voltages on the power lines for any frequency or frequencies of an intentional radiator shall not exceed the limits in the following table:

Frequency MHz	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 – 0.5	66 decreasing with logarithm of frequency to 56	56 decreasing with logarithm of frequency to 46
0.5 - 5	56	46
5 - 30	60	50

Note 1: The lower limit shall apply at the transition frequencies.

5.1.2. Procedures

The interference on each power lead of the EUT was measured by connecting the measuring equipment to the appropriate meter terminal of the Line Impedance Stabilization Network (LISN). The meter terminal of the LISN not under test was terminated with 50 ohms.

a) The EUT was operated in the receive mode.

b) Measurements were first made on the 3.5VDC positive line.

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

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

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

f) Steps (d) and (e) were repeated for the remainder of the frequency sub-bands until the entire frequency range from 150kHz to 30MHz was investigated. The peak trace was automatically plotted. The plot also shows quasi-peak and average readings that were taken on discrete frequencies. A table showing the quasi-peak and average readings was also generated. This tabular data compares the quasi-peak and average conducted emissions to the applicable conducted emissions limits.

g) Steps (c) through (f) were repeated on the 3.5VDC return line.

h) Steps (b) through (g) were repeated with the EUT operated in the transmit mode.

5.1.3. Results

The plots of the peak, quasi-peak, and average conducted voltage levels acquired from each input power line with the EUT operated in the receive mode are shown on pages 20 and 22. The tabular quasi-peak and average results from each input power line with the EUT operated in the receive mode are shown on pages 19

and 21. All power line conducted emissions measured from the EUT were within the specification limits for an intentional radiator.

The plots of the peak, quasi-peak, and average conducted voltage levels acquired from each input power line with the EUT operated in the transmit mode are shown on pages 24 and 26. The tabular quasi-peak and average results from each input power line with the EUT operated in the transmit mode are shown on pages 23 and 25. All power line conducted emissions measured from the EUT were within the specification limits for an intentional radiator.

A photograph of the test configuration which yielded the highest or worst case, conducted emission levels are shown on Figure 2.

5.2. Radiated Measurements Receiver:

5.2.1.Requirements

Per the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart B, Section 15.109(a) and Industry Canada RSS-Gen, Section 7.2.3, all radio frequency emissions from a receiver shall be below the limits shown on the following table:

RADIATION LIMITS FOR A RECEIVER

Frequency MHz	Distance between EUT And Antenna in Meters	Field Strength uV/m	Field Strength dBuV/m
30-88	3	100	40
88-216	3	150	43.5
216-960	3	200	46
Above 960	3	500	54

Note: The tighter limit shall apply at the edge between the two frequency bands.

5.2.2.Procedures

Testing was performed separately on a low, middle, and high channel. The emissions in the frequency range of 30MHz to 5GHz were measured. Testing was performed with the antenna of the EUT in place.

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 C63.4-2003 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.

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

The broadband measuring antenna was positioned at a 3 meter distance from the EUT. The frequency range from 30MHz to 1GHz was investigated using a peak detector function with the bilog antenna at several heights, horizontal and vertical polarization, and with several different orientations of the EUT with respect to the antenna. The frequency range from 1GHz to 5GHz was investigated using a peak detector function with the double ridged waveguide antenna at several heights, horizontal and vertical polarization, and with several different orientations of the EUT with respect to the antenna. The maximum levels for each antenna

polarization were plotted.

Final radiated emissions were performed on all significant broadband and narrowband emissions found in the preliminary sweeps using the following methods:

1) Measurements from 30MHz to 1GHz were made using a quasi-peak detector and a broadband bilog antenna. Measurements above 1GHz were made using an average detector and a broadband double ridged waveguide antenna.

2) To ensure that maximum or worst case, emission levels were measured, the following steps were taken:

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

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

    c) The measuring antenna was raised and lowered from 1 to 4 meters for each antenna polarization to maximize the readings.

    d) For hand-held or body-worn devices, the EUT was rotated through three orthogonal axes to determine which orientation produces the highest emission relative to the limit.

5.2.3.Results

The preliminary plots are presented on pages 27 through 38. The plots are presented for a reference only, and are not used to determine compliance. The final radiated levels are presented on page 39 through 44. As can be seen from the data, all emissions measured from the EUT were within the specification limits. Photographs of the test configuration which yielded the highest or worst case, radiated emission levels are shown on Figure 3 and Figure 4.

5.3. Carrier Frequency Separation:

5.3.1.Requirements

Per section 15.247 (a)(1), frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25kHz or the 20dB bandwidth of the hopping channel, whichever is greater.

5.3.2.Procedures

The EUT was setup inside the chamber. The output of the EUT was connected to the spectrum analyzer through a 40dB pad. With the hopping function enabled, the EUT was allowed to transmit continuously.

The resolution bandwidth (RBW) was set to $\geq$ to 1% of the span. The peak detector and 'Max-Hold' function was engaged. The span was set wide enough to capture the peaks of at least two adjacent channels. When, the trace had stabilized after multiple scans. The marker-delta function was used to determine the separation between the peaks of the adjacent channels. The analyzer's display was plotted using a 'screen dump' utility.

5.3.3.Results

Pages 45 and 46 show the results carrier frequency separation measurements. As can be seen from these plots, the separation with CEL modulation is 1.002MHz which is greater than the 20dB bandwidth (350.7kHz) and the separation with SNAP modulation is 402.18MHz which is greater than the 20dB bandwidth (204.4kHz).

5.4. Number of Hopping Frequencies

5.4.1.Requirements

Per section 15.247(a)(1)(i), for frequency hopping systems operating in the 902-928MHz band. The frequency

hopping system shall use at least 50 hopping frequencies if the 20dB bandwidth is less than 250kHz. If the 20dB bandwidth is greater than 250kHz the frequency hopping system shall use at least 25 hopping frequencies.

5.4.2.Procedures

The EUT was setup inside the chamber. The output of the EUT was connected to the spectrum analyzer through a 40dB pad. With the hopping function enabled, the EUT was allowed to transmit continuously.

The resolution bandwidth (RBW) was set to $\geq$ to 1% of the span. The peak detector and 'Max-Hold' function was engaged. The span was set wide enough to capture the entire frequency band of operation.

The EUT's signal was allowed to stabilize after multiple scans. The number of hopping frequencies was counted. The analyzer's display was plotted using a 'screen dump' utility.

5.4.3.Results

Pages 47 through 50 show the results of the number of hopping frequencies measurements. As can be seen from these plots, the number of frequencies for the CEL modulation is 25 and the number of frequencies for the SNAP modulation is 25, both of which are greater than or equal to the minimum required.

5.5. Time of Occupancy

5.5.1.Requirement

Per section 15.247(a)(1)(i), For frequency hopping systems operating in the 902-928MHz band. The average time of occupancy shall not be greater than 0.4 seconds within a 20 second period if the 20dB bandwidth is less than 250kHz. If the 20dB bandwidth is greater than 250kHz, the average time of occupancy shall not be greater than 0.4 seconds within a 10 second period

5.5.2.Procedures

The EUT was setup inside the chamber. The output of the EUT was connected to the spectrum analyzer. With the hopping function enabled, the EUT was allowed to transmit continuously.

The resolution bandwidth (RBW) was set to 10 kHz. The peak detector and 'Max-Hold' function was engaged. With the span set to 0Hz, the sweep time was adjusted to capture a single event in order to measure the dwell time per hop. Then, the sweep time was expanded to capture the average time between hops. When the trace had stabilized after multiple scans, the time between hops was measured. The analyzer's display was plotted using a 'screen dump' utility.

5.5.3.Results

Pages 51 through 54 show the plots for the time of occupancy (dwell time) measurements. As can be seen from the plots, the time of occupancy for the CEL modulation can be determined by a 4.8mSec burst that hits 9 times in a 10 second period. This calculated value is equal to 86.4mSec seconds which is less than the 400mSec allowed. The time of occupancy for the SNAP modulation can be determined by a 15.8mSec burst that hits 4 times in a 10 second period. This calculated value is equal to 63.2mSec seconds which is less than the 400mSec allowed.

5.6. 20dB Bandwidth

5.6.1.Requirement

Per section 15.247(a)(1)(i), for frequency hopping systems operating in the 902-928MHz band. The 20dB bandwidth shall not be greater than 500kHz.

5.6.2.Procedures

The EUT was setup inside the chamber. The output of the EUT was connected to the spectrum analyzer through a 40dB pad. With the hopping function disabled, the EUT was allowed to transmit continuously. The

frequency hopping channel was set separately to low, middle, and high hopping channels. The resolution bandwidth (RBW) was set to ≥ to 1% of the 20 dB BW.

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.

5.6.3.Results

The plots on pages 55 through 57 show that the maximum 20 dB bandwidth for the CEL Modulation was 350.7kHz. The maximum 99% bandwidth for the CEL modulation was measured to be 342.7kHz. The plots on pages 58 through 60 show that the maximum 20 dB bandwidth for the SNAP Modulation was 204.4kHz. The maximum 99% bandwidth for the SNAP modulation was measured to be 186.3kHz. The 20 dB bandwidth for both modulations was less than the 500kHz maximum requirement.

5.7. Peak Output Power

5.7.1.Requirement

Per section 15.247(b)(2), for frequency hopping systems operating in the 902-928MHz band. The peak output power shall not be greater than 1 watt for systems employing at least 50 hopping channels. For systems employing less than 50 hopping channels the peak output power shall not be greater than 0.25 watts

5.7.2.Procedures

The output of the EUT was connected to the spectrum analyzer. The maximum meter reading was recorded. The peak power output was calculated for the low, middle and high hopping frequencies.

5.7.3.Results

The results are presented on pages 61 through 63. The maximum antenna conducted output power measured from the transmitter was 19dBm which meets the 24 dBm limit (<50 channels).

5.8. Bandedge Compliance

5.8.1.Requirement

Per section 15.247(c), the emissions at the band-edges must be at least 20dB below the highest level measured within the band.

5.8.2.Procedures

The same data recorded for the low and high hopping frequencies from the 20 dB bandwidth measurements was used to demonstrate compliance with the 20 dB band-edge requirements.

Next, the band-edge emissions were plotted using peak detector and 100 kHz bandwidth. The "delta" limit was applied to this plot to determine compliance at the band-edge.

5.8.3.Results

Pages 64 through 67 show the band-edge compliance results. As can be seen from these plots, the emissions at the band-edge are below the 20dBc limits.

5.9. Antenna Conducted Spurious Emissions

5.9.1.Requirement

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.

5.9.2.Procedures

The measuring equipment was connected to the EUT's antenna port. The emissions in the frequency range

from 30MHz to 10GHz were observed and plotted separately with the EUT transmitting at 903MHz, 915MHz, and 927MHz.

5.9.3. Results

The results of the antenna conducted emissions levels were plotted. These plots are presented on pages 68 through 73. These plots show that the spurious emissions were at least 20 dB below the level of the fundamental.

5.10. Radiated Spurious Emissions

5.10.1. Requirement

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. In addition, the radiated emissions which fall in the restricted bands must meet the general limits of 15.209.

5.10.2. Procedures

The radiated tests were performed in a 32ft. x 20ft. x 18ft. hybrid absorber lined semi-anechoic 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. The floor of the chamber is used as the ground plane. The chamber complies with ANSI 63.4 and CISPR 16 requirements for site attenuation.

Preliminary radiated measurements are performed to determine the frequencies where the significant emissions might be found. With the EUT at one set position and the measurement antenna at a set height (i.e. without maximizing), the radiated emissions were measured using peak detection with 100 kHz BW. This data was then automatically plotted up through 10 GHz.

Next, the harmonic or spurious emissions falling in the restricted bands were measured up through the 10th harmonic. For these measurements, the measurement bandwidths were set to 1 MHz RBW. A pre-amplifier was used to increase the receiver sensitivity.

In instances where it was necessary to use a shortened cable between the measuring antenna and the spectrum analyzer and the antenna cannot be raised to 4 meters. The measuring antenna is raised or lowered as much as the cable will allow and the EUT is rotated through all axis to ensure the maximum readings are recorded. See attached Figure.

5.10.3. Results

The preliminary emissions levels were plotted. These plots are presented on pages 74 through 85. These plots show that the radiated spurious emissions were at least 20 dB below the level of the fundamental.

The harmonics and any other emissions that fall in the restricted frequency bands were then re-measured manually. This data is shown in the tables on pages 86 through 91. The field intensities levels for the harmonics in the restricted band were within the limit.

A block diagram of the EUT orientation position is shown in Figure 1.

6. OTHER TEST CONDITIONS

6.1. Test Personnel and Witnesses

All tests were performed by qualified personnel from Elite Electronic Engineering Incorporated. The test series was witnessed by California Eastern Laboratories personnel.

6.2. Disposition of the EUT

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

7. CONCLUSIONS

It was determined that the California Eastern Laboratories Transceiver Module, Model No. ZICM900P2, did fully meet the conducted and radiated emission requirements of the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart C, Section 15.207 and 15.247 for Intentional Radiators, when tested per ANSI C63.4-2003.

It was determined that the California Eastern Laboratories Transceiver Module, Model No. ZICM900P2, did fully meet the conducted emissions requirements of the Industry Canada Radio Standards Specification, RSS-Gen. Section 7.2.2 and the radiated emissions requirements of the Industry Canada Radio Standards Specification RSS-210, Annex 8 for transmitters, when tested per ANSI C63.4-2003.

8. CERTIFICATION

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

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

This report must not be used to claim product 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
APW3	PREAMPLIFIER	PLANAR ELECTRONICS	PE2-35-120-5R0-10-12	PL2924	1GHZ-20GHZ	8/27/2010	8/27/2011
CDW3	COMPUTER			004		N/A	
CMA1	Controllers	EMCO	2090	9701-1213	---	N/A	
NTA2	BILOG ANTENNA	TESEQ	6112D	28040	25-1000MHz	6/7/2010	6/7/2011
NWH0	RIDGED WAVE GUIDE	TENSOR	4105	2081	1-12.4GHZ	8/31/2010	8/31/2011
PLL9	50UH LISN 462D	ELITE ELECTRONIC ENG	462D/70A	010	0.01-400MHZ	3/15/2011	3/15/2012
PLLA	50UH LISN 462D	ELITE ELECTRONIC ENG	462D/70A	011	0.01-400MHZ	3/15/2011	3/15/2012
RBB0	EMI TEST RECEIVER 20HZ TO 40 GHZ.	ROHDE & SCHWARZ	ESIB40	100250	20 HZ TO 40GHZ	3/24/2011	3/24/2012
RBE1	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESU26	100096	20Hz-26GHz	3/23/2011	3/23/2012
SBA4	DC POWER SUPPLY	APLAB	ZS3205	99071028	0-32V;0-5A	NOTE 1	
T1E7	10DB 25W ATTENUATOR	WEINSCHEL	46-10-34	BG3489	DC-18GHZ	8/9/2010	8/9/2011
XPQ3	HIGH PASS FILTER	K&L MICROWAVE	4IH30-1804/T10000-0	4	1.8GHZ-10GHZ	10/28/2010	10/28/2011

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.

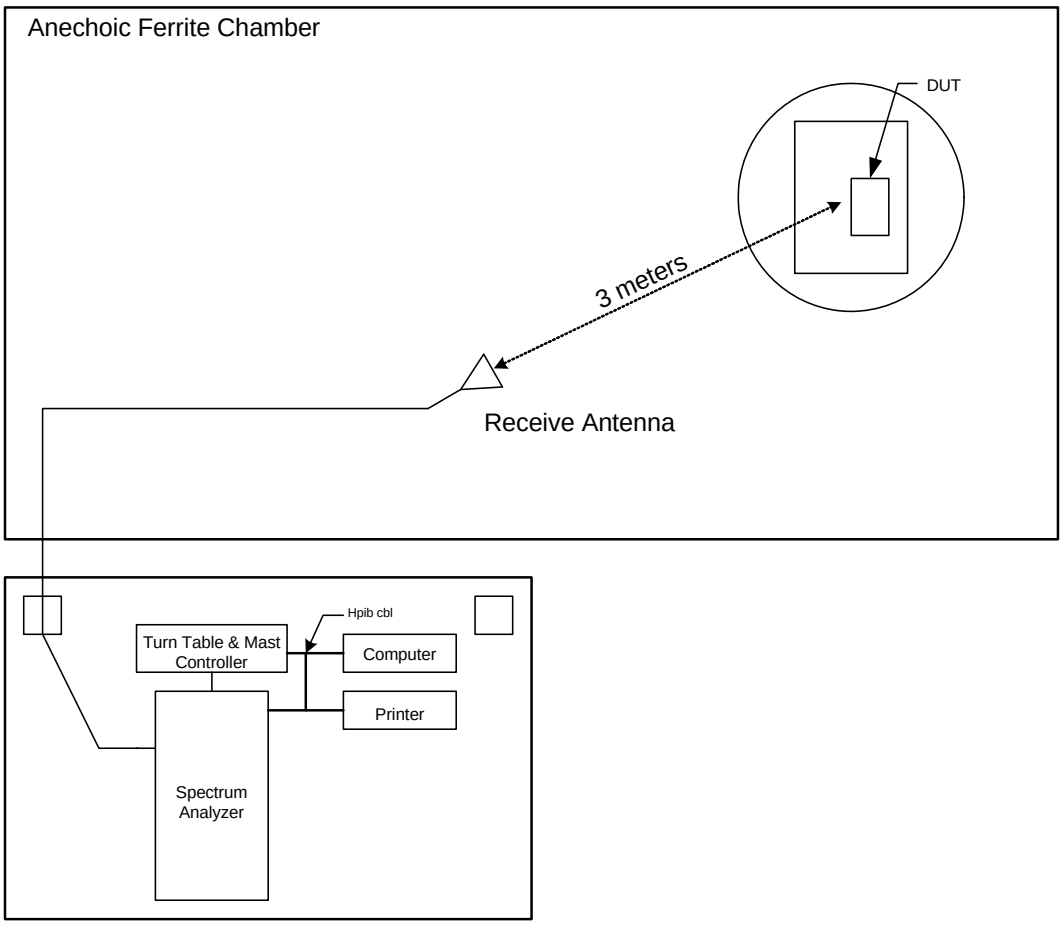
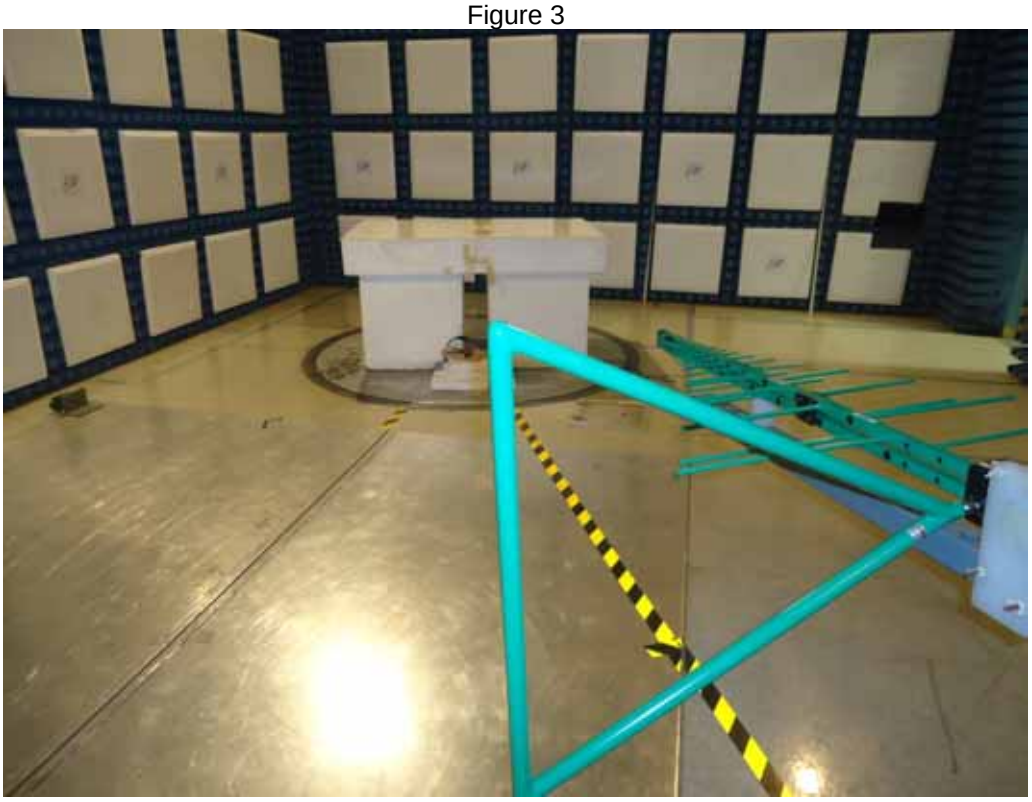


FIGURE 1 BLOCKDIAGRAM OF TEST SETUP

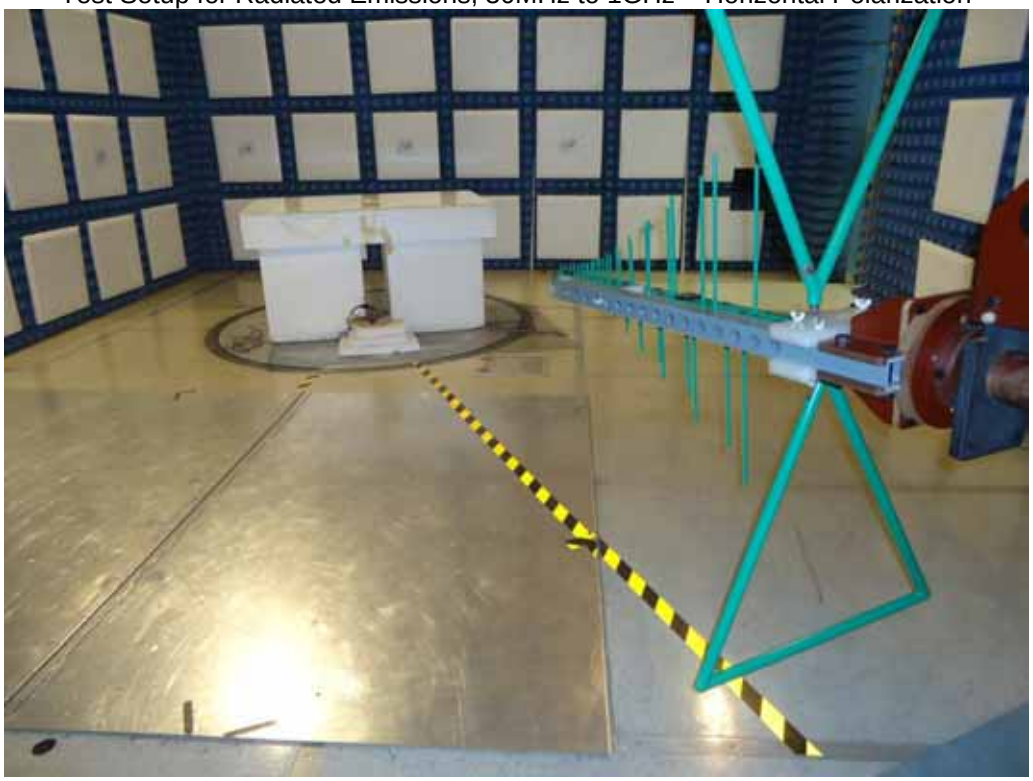
Figure 2

Test Setup for Conducted Emissions

Figure 3

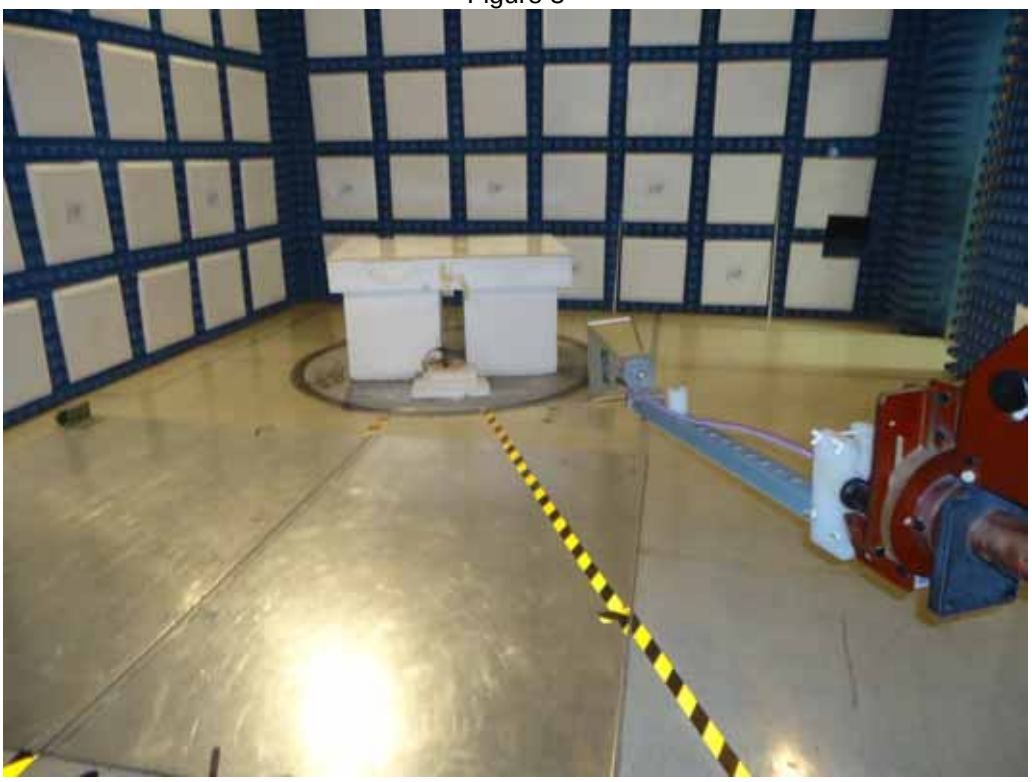


Test Setup for Radiated Emissions, 30MHz to 1GHz – Horizontal Polarization

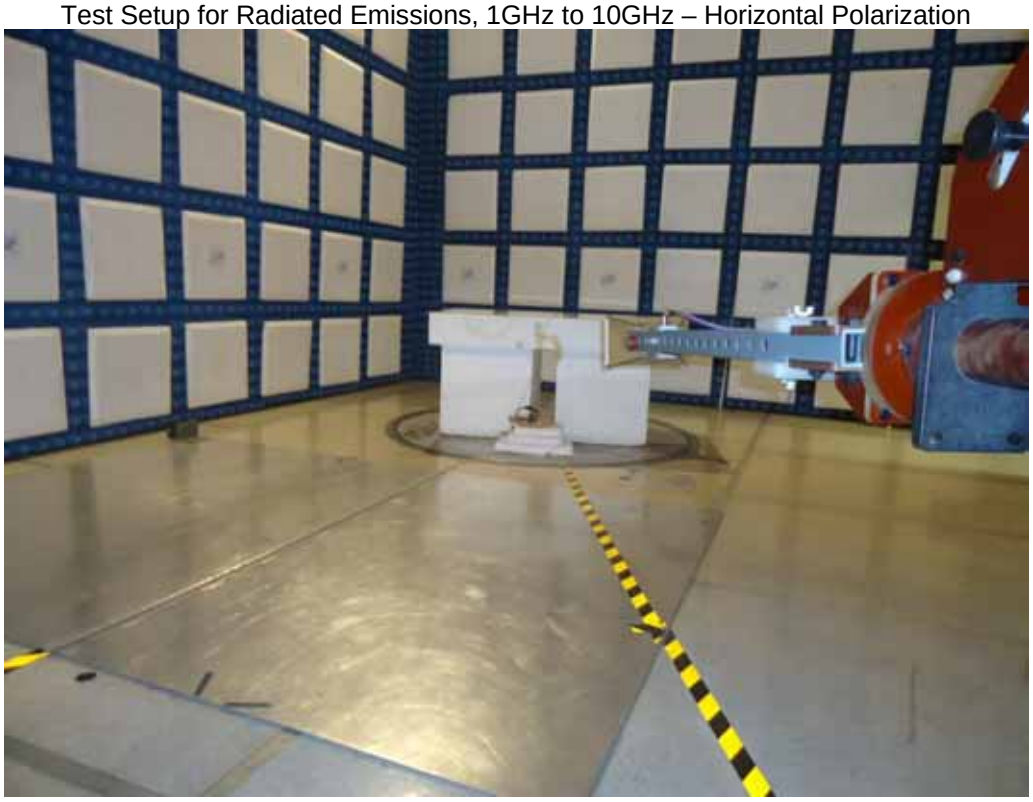


Test Setup for Radiated Emissions, 30MHz to 1GHz – Vertical Polarization

Figure 3



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



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

CISPR 22/EN 55022 Conducted Emissions Test

Significant Emissions Data

VB** 08/30/2010

Manufacturer	:	California Eastern Labs
Model	:	ZICM900P2
DUT Mode	:	Receive
Line Tested	:	+3.5VDC
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-10
Notes	:	
Test Engineer	:	D. Crowder
Limit	:	Mains Ports, Class B
Test Date	:	Jun 03, 2011 09:19:30 AM
Data Filter	:	Up to 80 maximum levels detected with 6 dB level excursion threshold over 10 dB margin below limit

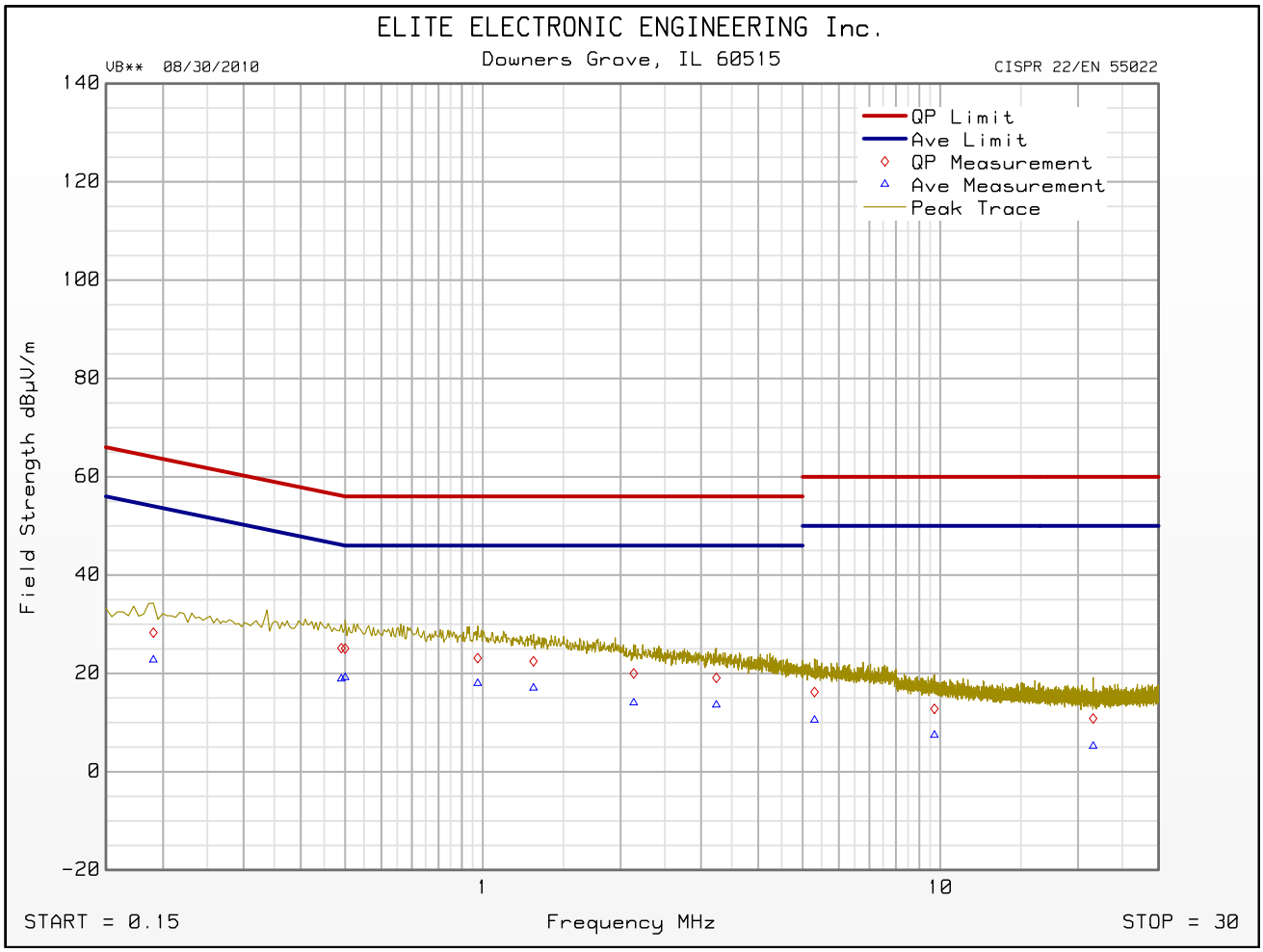
Freq MHz	Quasi-peak Level dBµV/m	Quasi-peak Limit dBµV/m	Excessive Quasi-peak Emissions	Average Level dBµV/m	Average Limit dBµV/m	Excessive Average Emissions
0.191	28.3	64.0		22.8	54.0	
0.500	25.1	56.0		19.2	46.0	
0.975	23.1	56.0		18.0	46.0	
1.291	22.5	56.0		17.0	46.0	
2.138	20.0	56.0		14.0	46.0	
3.239	19.1	56.0		13.6	46.0	
5.311	16.2	60.0		10.5	50.0	
9.711	12.8	60.0		7.4	50.0	
21.583	10.8	60.0		5.2	50.0	

CISPR 22/EN 55022 Conducted Emissions Test

Cumulative Data

VB** 08/30/2010

Manufacturer	:	California Eastern Labs
Model	:	ZICM900P2
DUT Mode	:	Receive
Line Tested	:	+3.5VDC
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-10
Notes	:	
Test Engineer	:	D. Crowder
Limit	:	Mains Ports, Class B
Test Date	:	Jun 03, 2011 09:19:30 AM



Emissions Meet QP Limit
Emissions Meet Ave Limit

CISPR 22/EN 55022 Conducted Emissions Test

Significant Emissions Data

VB** 08/30/2010

Manufacturer	:	California Eastern Labs
Model	:	ZICM900P2
DUT Mode	:	Receive
Line Tested	:	3.5VDC Return
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-10
Notes	:	
Test Engineer	:	D. Crowder
Limit	:	Mains Ports, Class B
Test Date	:	Jun 03, 2011 09:07:49 AM
Data Filter	:	Up to 80 maximum levels detected with 6 dB level excursion threshold over 10 dB margin below limit

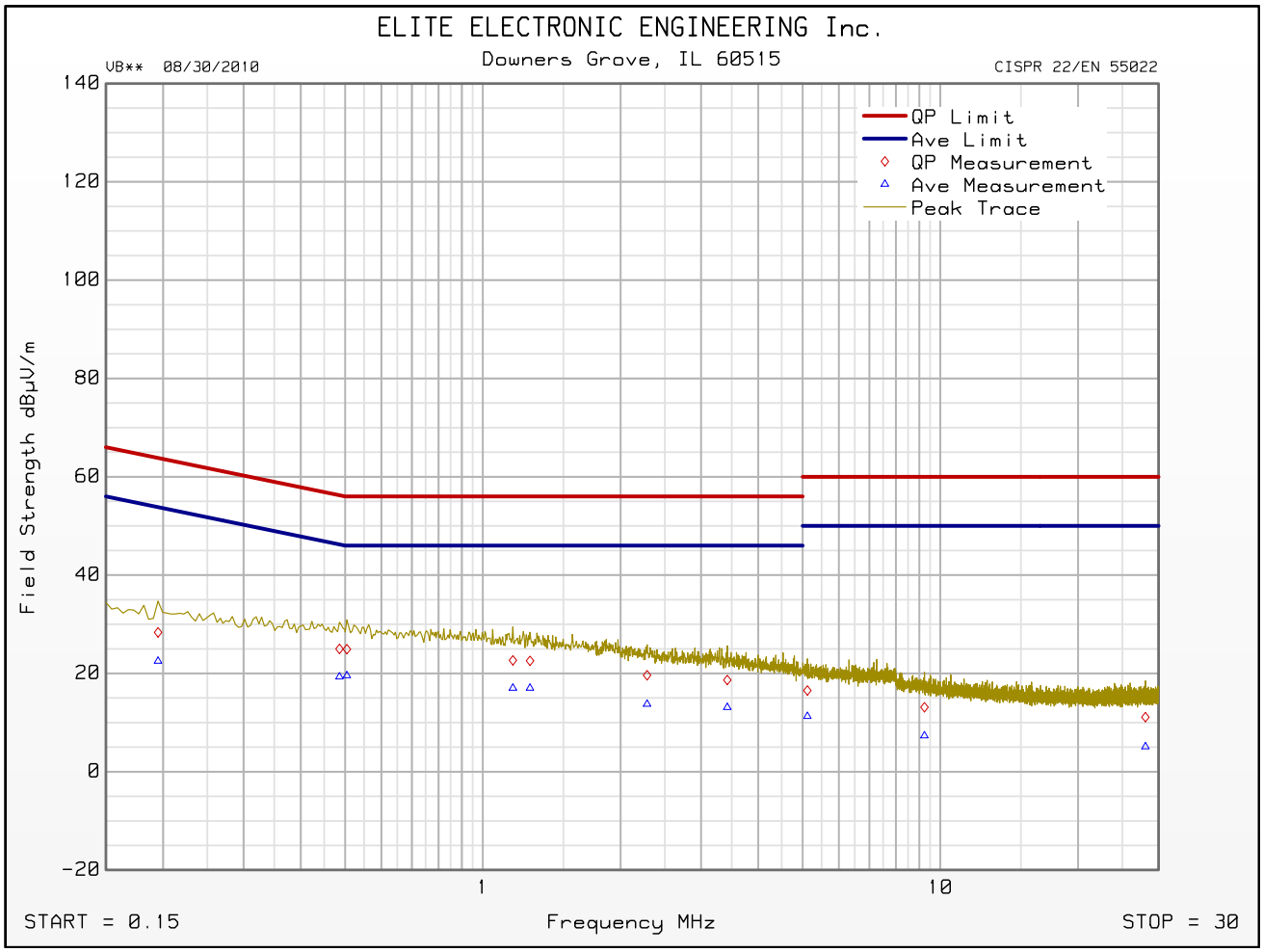
Freq MHz	Quasi-peak Level dBµV/m	Quasi-peak Limit dBµV/m	Excessive Quasi-peak Emissions	Average Level dBµV/m	Average Limit dBµV/m	Excessive Average Emissions
0.195	28.3	63.8		22.5	53.8	
0.486	25.0	56.2		19.3	46.2	
0.505	24.9	56.0		19.6	46.0	
1.164	22.7	56.0		17.0	46.0	
1.268	22.6	56.0		17.0	46.0	
2.286	19.6	56.0		13.8	46.0	
3.424	18.7	56.0		13.1	46.0	
5.122	16.5	60.0		11.3	50.0	
9.234	13.1	60.0		7.3	50.0	
28.076	11.1	60.0		5.1	50.0	

CISPR 22/EN 55022 Conducted Emissions Test

Cumulative Data

VB** 08/30/2010

Manufacturer	:	California Eastern Labs
Model	:	ZICM900P2
DUT Mode	:	Receive
Line Tested	:	3.5VDC Return
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-10
Notes	:	
Test Engineer	:	D. Crowder
Limit	:	Mains Ports, Class B
Test Date	:	Jun 03, 2011 09:07:49 AM



Emissions Meet QP Limit
Emissions Meet Ave Limit

CISPR 22/EN 55022 Conducted Emissions Test

Significant Emissions Data

VB** 08/30/2010

Manufacturer	:	California Eastern Labs
Model	:	ZICM900P2
DUT Mode	:	Transmit
Line Tested	:	+3.5VDC
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-10
Notes	:	
Test Engineer	:	D. Crowder
Limit	:	Mains Ports, Class B
Test Date	:	Jun 03, 2011 08:48:56 AM
Data Filter	:	Up to 80 maximum levels detected with 6 dB level excursion threshold over 10 dB margin below limit

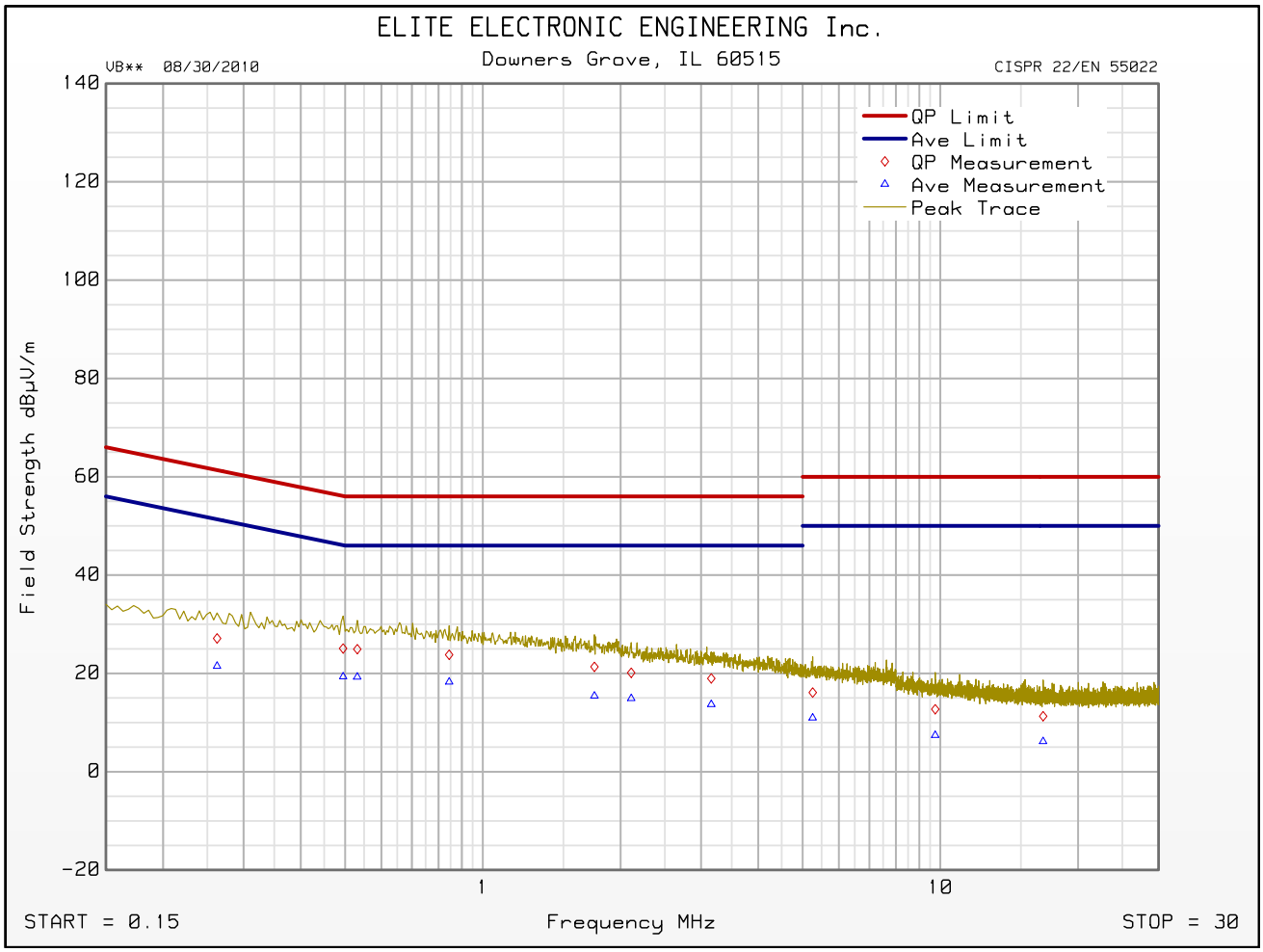
Freq MHz	Quasi-peak Level dBµV/m	Quasi-peak Limit dBµV/m	Excessive Quasi-peak Emissions	Average Level dBµV/m	Average Limit dBµV/m	Excessive Average Emissions
0.263	27.1	61.4		21.5	51.4	
0.495	25.1	56.1		19.3	46.1	
0.532	24.9	56.0		19.3	46.0	
0.844	23.8	56.0		18.3	46.0	
1.754	21.3	56.0		15.4	46.0	
2.111	20.1	56.0		14.9	46.0	
3.158	19.0	56.0		13.7	46.0	
5.261	16.1	60.0		11.0	50.0	
9.747	12.7	60.0		7.4	50.0	
16.781	11.3	60.0		6.2	50.0	

CISPR 22/EN 55022 Conducted Emissions Test

Cumulative Data

VB** 08/30/2010

Manufacturer	:	California Eastern Labs
Model	:	ZICM900P2
DUT Mode	:	Transmit
Line Tested	:	+3.5VDC
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-10
Notes	:	
Test Engineer	:	D. Crowder
Limit	:	Mains Ports, Class B
Test Date	:	Jun 03, 2011 08:48:56 AM



Emissions Meet QP Limit
Emissions Meet Ave Limit

CISPR 22/EN 55022 Conducted Emissions Test

Significant Emissions Data

VB** 08/30/2010

Manufacturer	:	California Eastern Labs
Model	:	ZICM900P2
DUT Mode	:	Transmit
Line Tested	:	3.5VDC Return
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-10
Notes	:	
Test Engineer	:	D. Crowder
Limit	:	Mains Ports, Class B
Test Date	:	Jun 03, 2011 08:54:39 AM
Data Filter	:	Up to 80 maximum levels detected with 6 dB level excursion threshold over 10 dB margin below limit

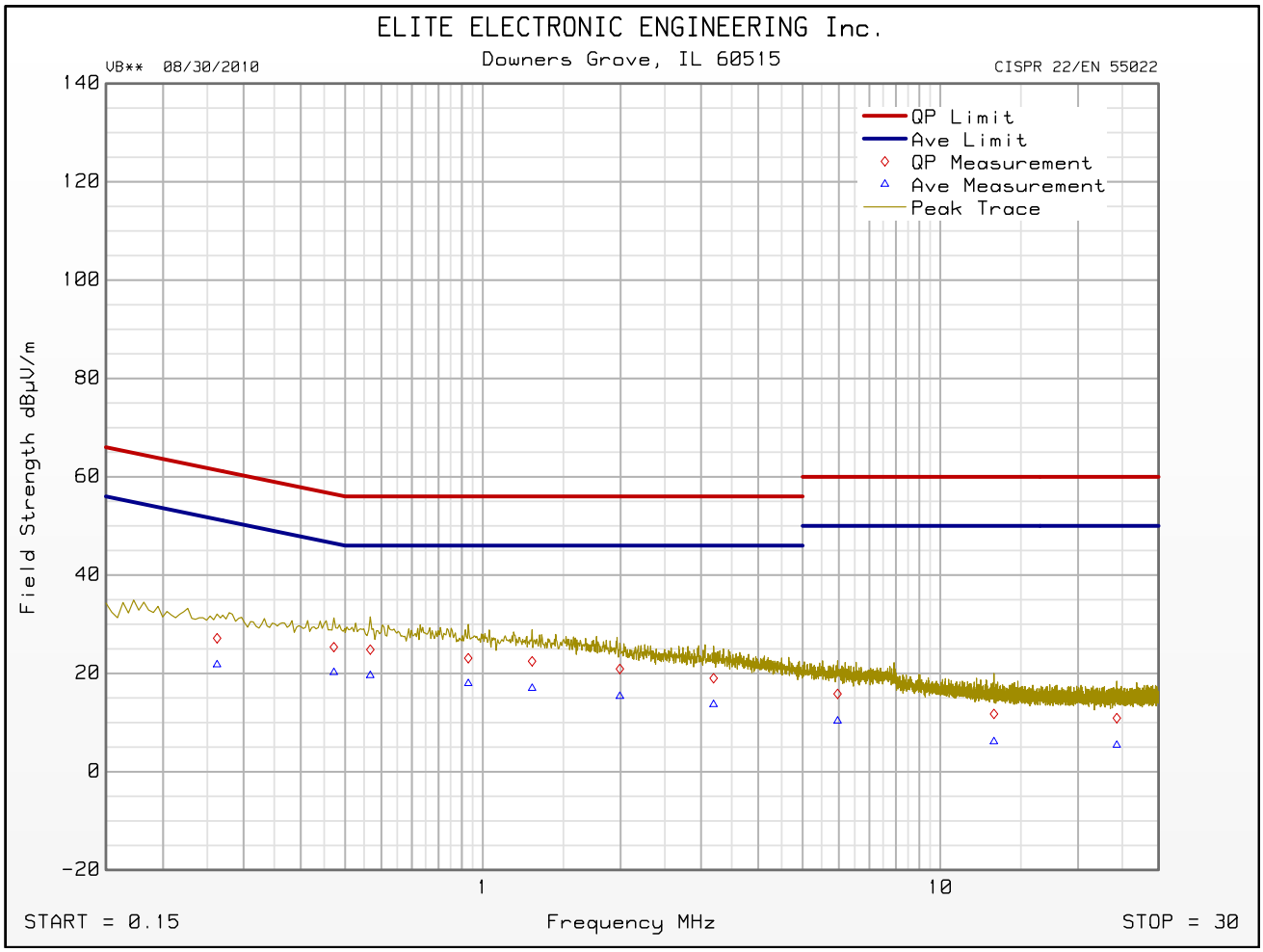
Freq MHz	Quasi-peak Level dBµV/m	Quasi-peak Limit dBµV/m	Excessive Quasi-peak Emissions	Average Level dBµV/m	Average Limit dBµV/m	Excessive Average Emissions
0.263	27.1	61.4		21.8	51.4	
0.473	25.4	56.5		20.2	46.5	
0.568	24.8	56.0		19.6	46.0	
0.930	23.1	56.0		18.0	46.0	
1.282	22.5	56.0		17.0	46.0	
1.994	20.9	56.0		15.4	46.0	
3.194	19.0	56.0		13.7	46.0	
5.963	15.8	60.0		10.3	50.0	
13.100	11.8	60.0		6.1	50.0	
24.314	10.9	60.0		5.4	50.0	

CISPR 22/EN 55022 Conducted Emissions Test

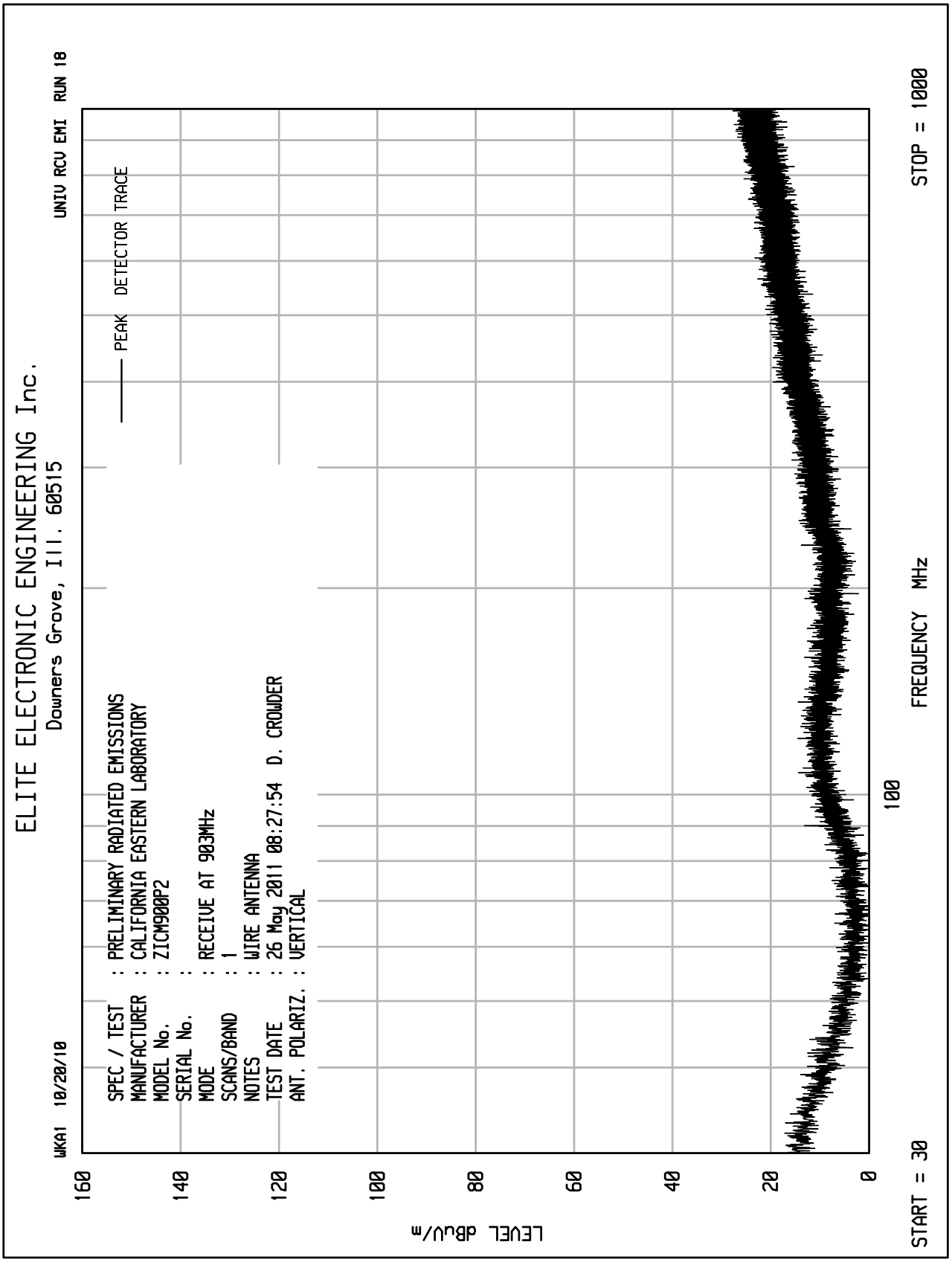
Cumulative Data

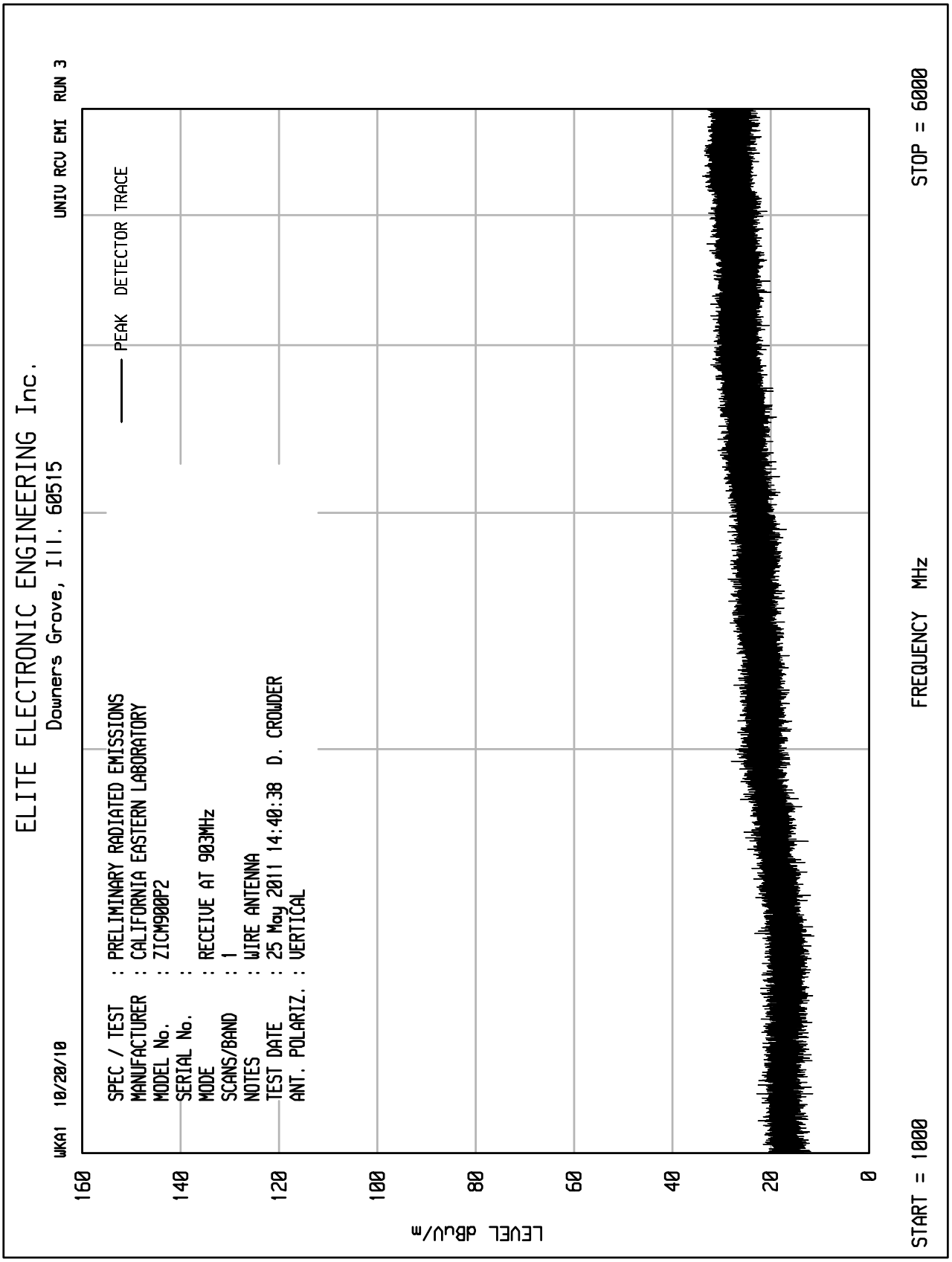
VB** 08/30/2010

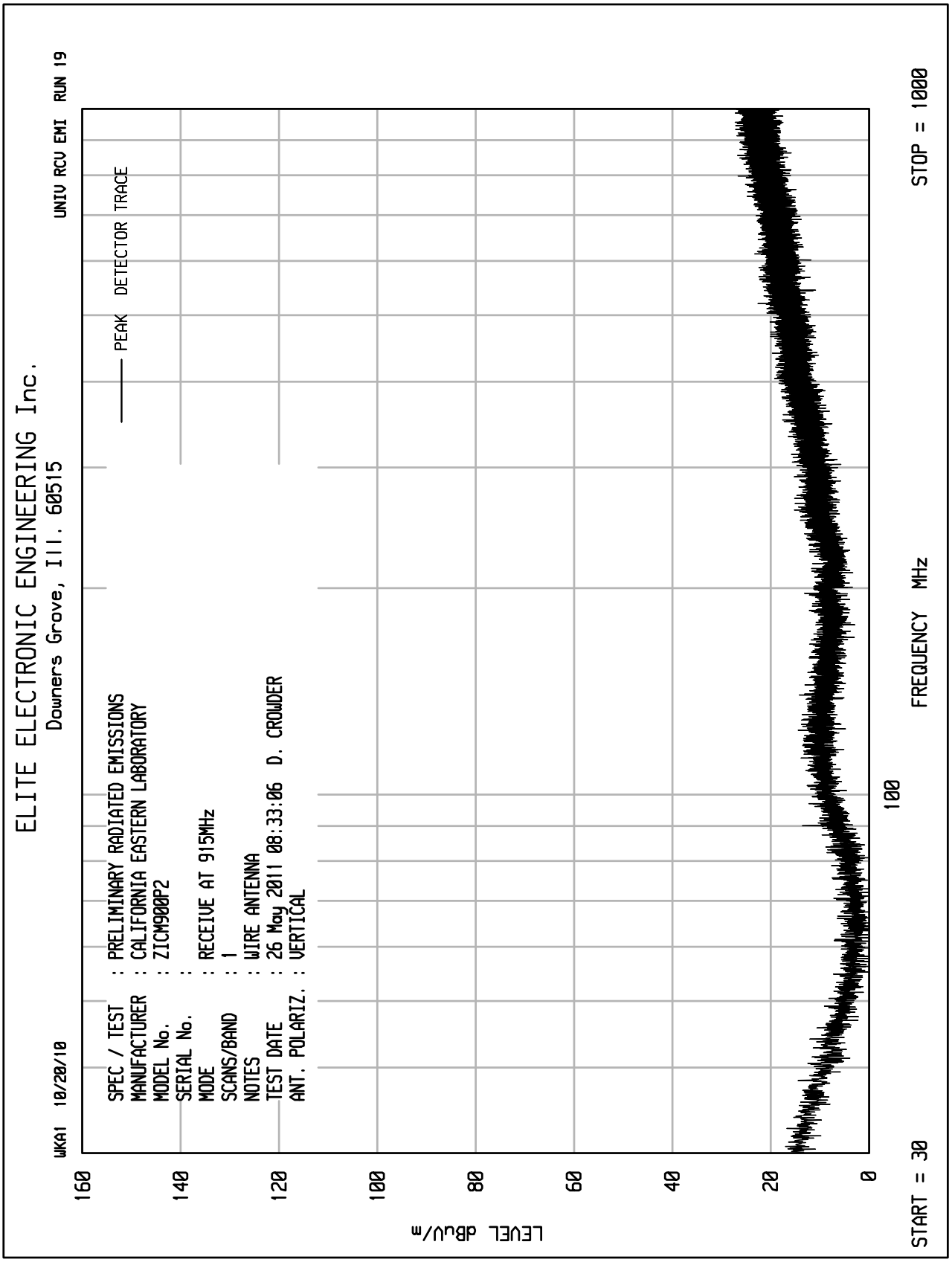
Manufacturer	:	California Eastern Labs
Model	:	ZICM900P2
DUT Mode	:	Transmit
Line Tested	:	3.5VDC Return
Scan Step Time [ms]	:	30
Meas. Threshold [dB]	:	-10
Notes	:	
Test Engineer	:	D. Crowder
Limit	:	Mains Ports, Class B
Test Date	:	Jun 03, 2011 08:54:39 AM

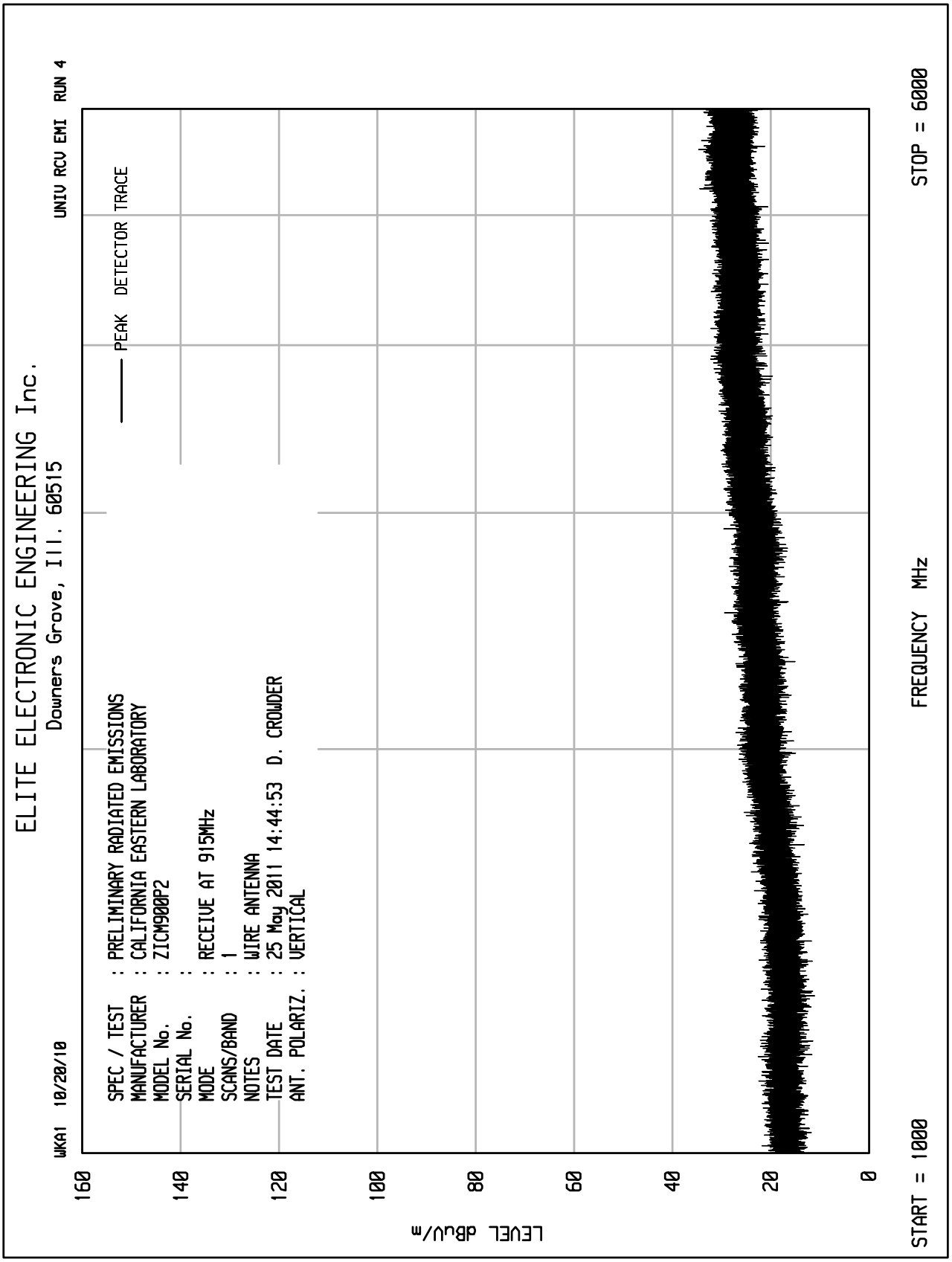


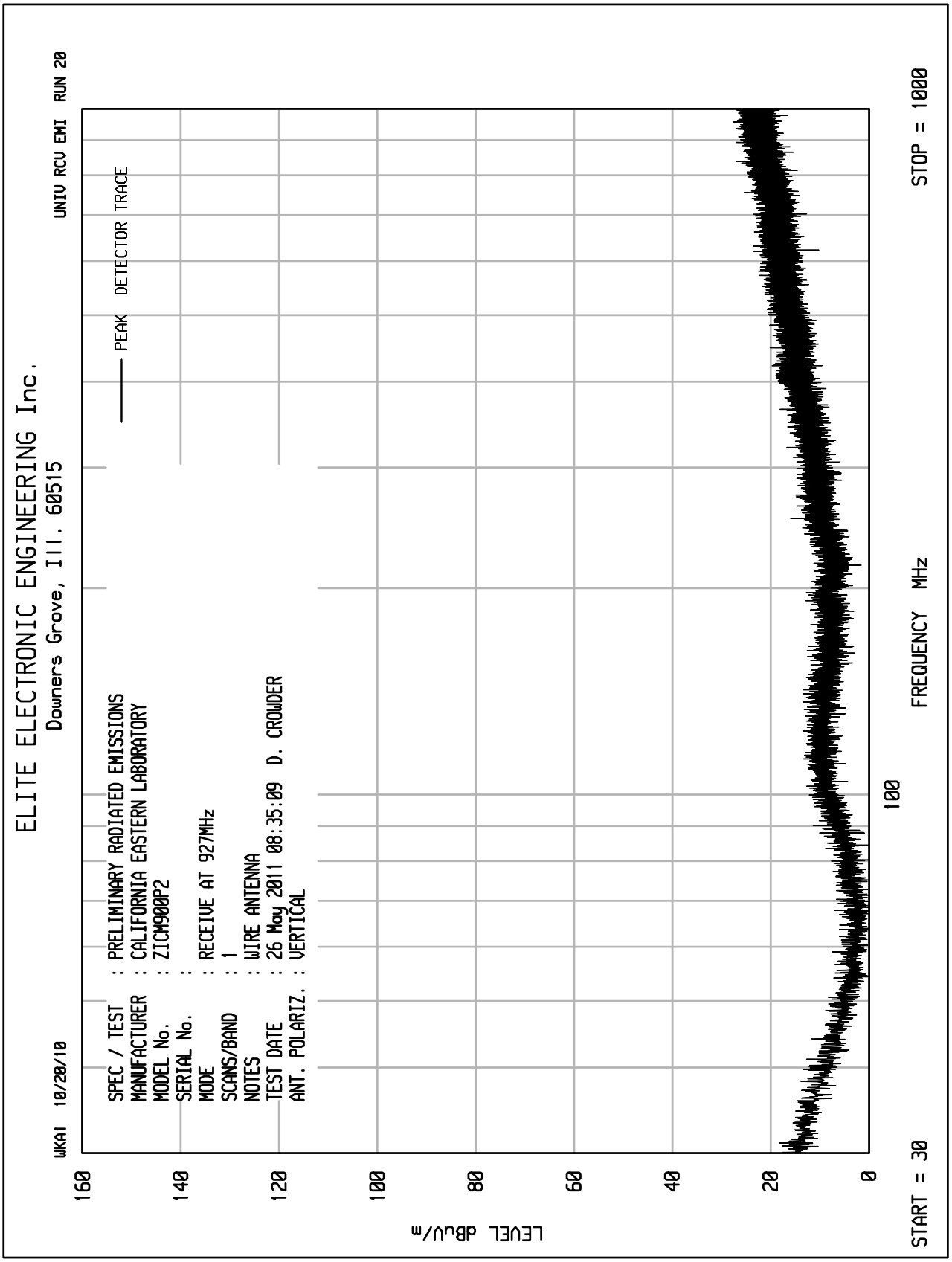
Emissions Meet QP Limit
Emissions Meet Ave Limit

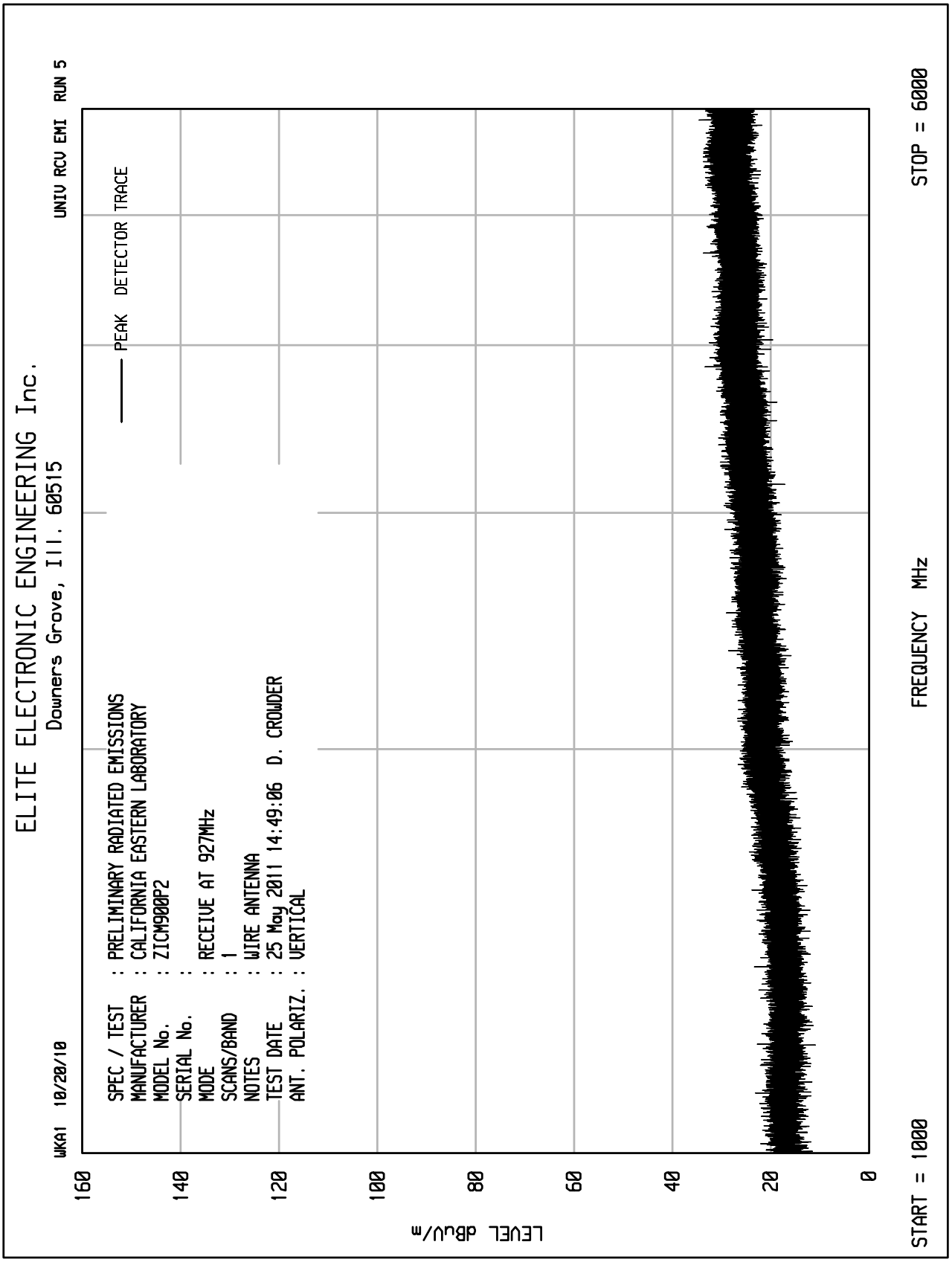

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 18
WKA1 10/20/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORY
MODEL No. : ZICM900P2
SERIAL No. :
MODE : RECEIVE AT 903MHz
SCANS/BAND : 1
NOTES : WIRE ANTENNA
TEST DATE : 26 May 2011 08:27:54 D. CROWDER
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
160
140
120
100
80
60
40
20
0
START = 30
100
FREQUENCY MHz
STOP = 1000

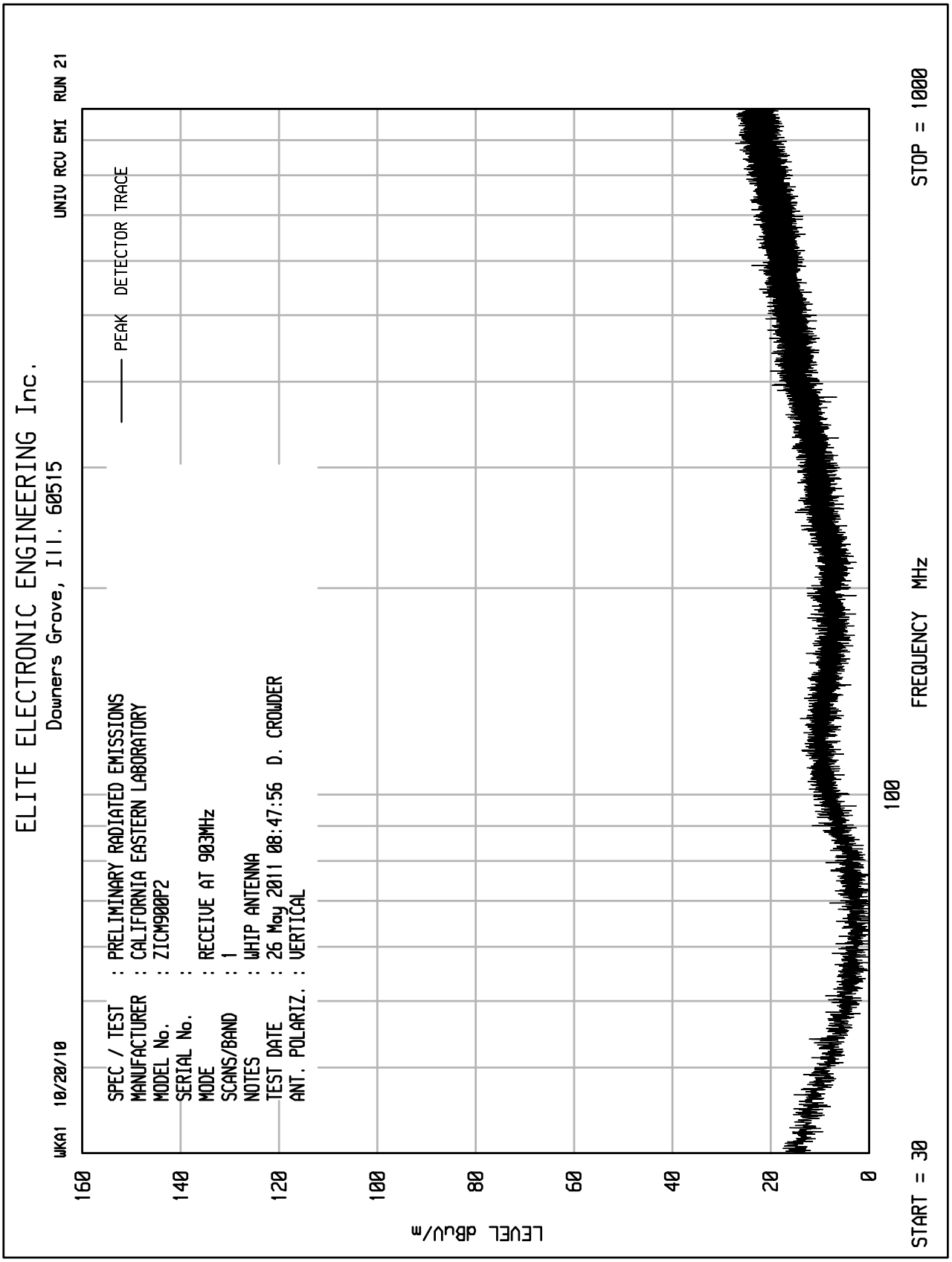

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 3
WKA1 10/20/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORY
MODEL No. : ZICM900P2
SERIAL No. :
MODE : RECEIVE AT 903MHz
SCANS/BAND : 1
NOTES : WIRE ANTENNA
TEST DATE : 25 May 2011 14:40:38 D. CROWDER
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
160
140
120
100
80
60
40
20
0
START = 1000
FREQUENCY MHz
STOP = 6000

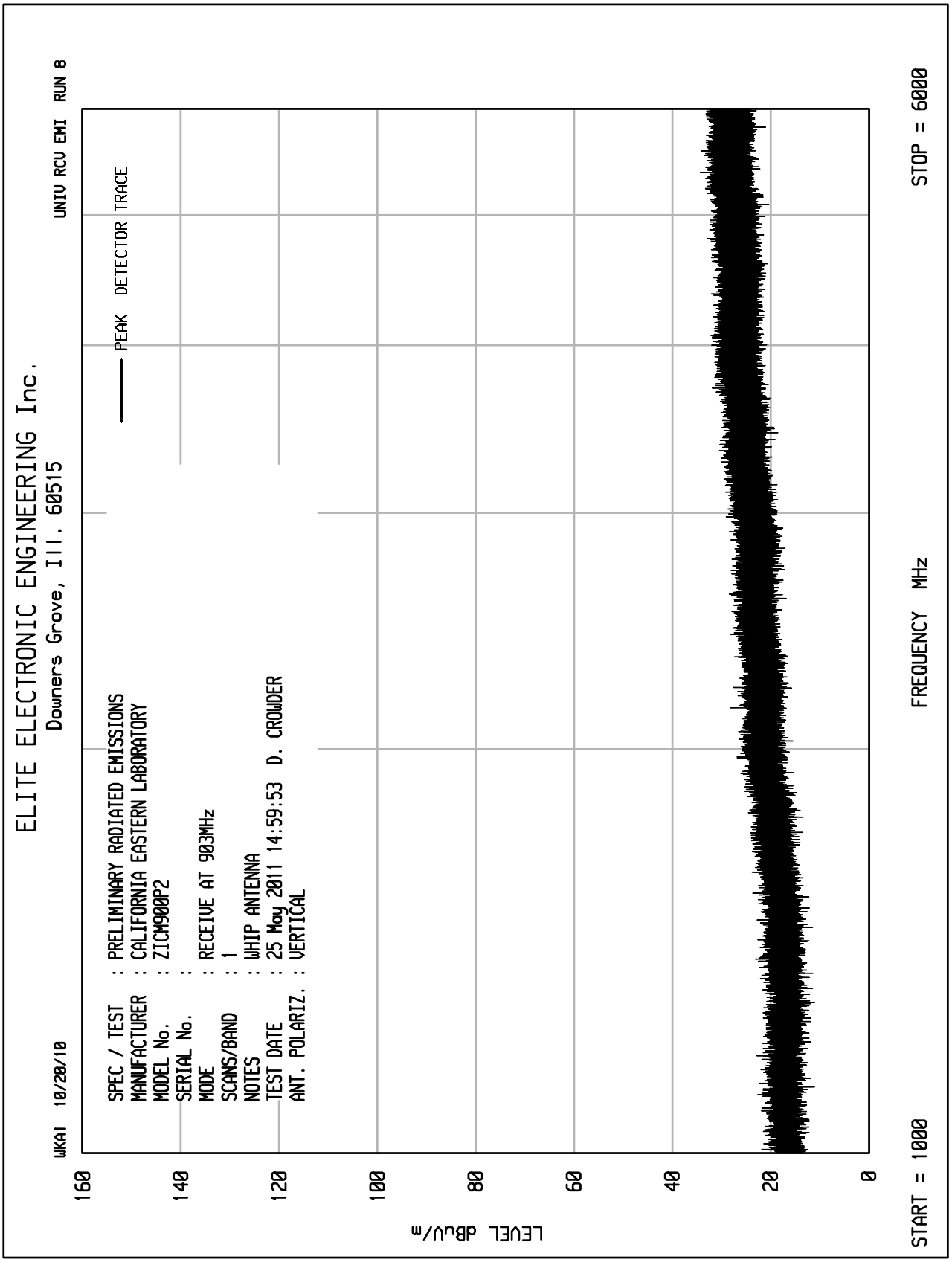

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 19
WKA1 10/20/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORY
MODEL No. : ZICM900P2
SERIAL No. :
MODE : RECEIVE AT 915MHz
SCANS/BAND : 1
NOTES : WIRE ANTENNA
TEST DATE : 26 May 2011 08:33:06 D. CROWDER
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
160
140
120
100
80
60
40
20
0
START = 30
100
FREQUENCY MHz
STOP = 1000

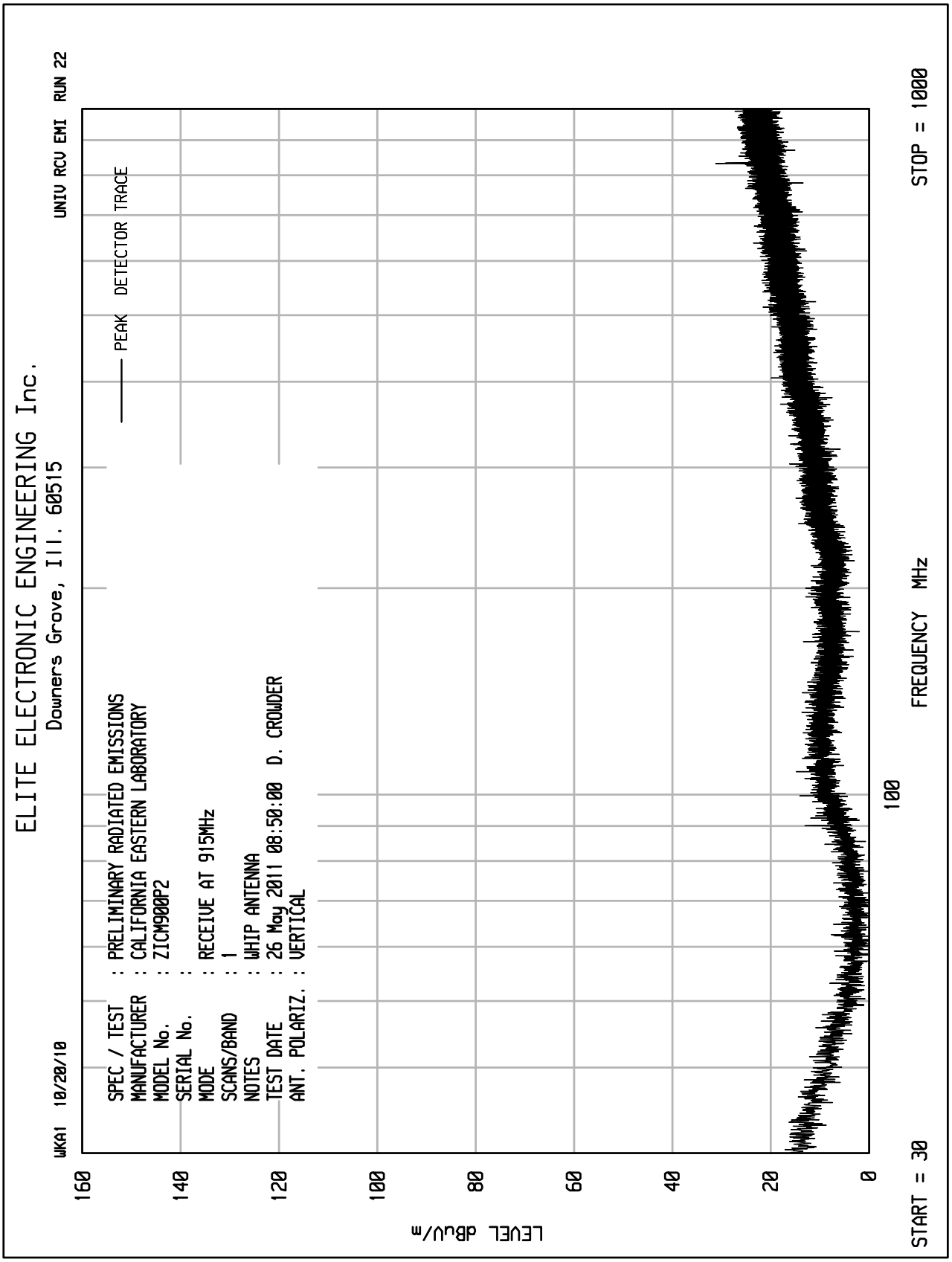

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 4
WKA1 10/20/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORY
MODEL No. : ZICM900P2
SERIAL No. :
MODE : RECEIVE AT 915MHz
SCANS/BAND : 1
NOTES : WIRE ANTENNA
TEST DATE : 25 May 2011 14:44:53 D. CROWDER
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
160
140
120
100
80
60
40
20
0
START = 1000
FREQUENCY MHz
STOP = 6000

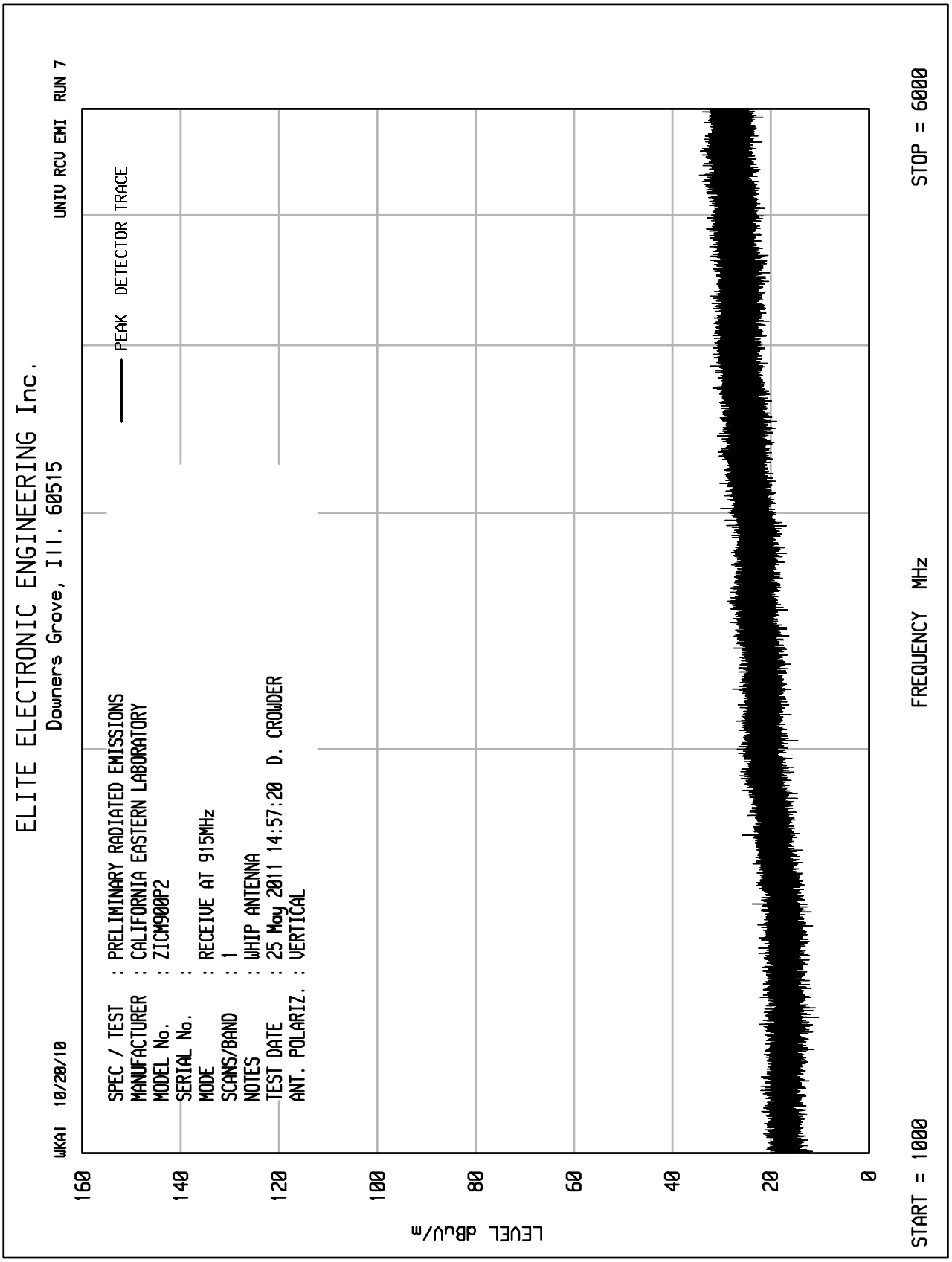

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 20
WKA1 10/20/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORY
MODEL No. : ZICM900P2
SERIAL No. :
MODE : RECEIVE AT 927MHz
SCANS/BAND : 1
NOTES : WIRE ANTENNA
TEST DATE : 26 May 2011 08:35:09 D. CROWDER
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
160
140
120
100
80
60
40
20
0
START = 30
100
FREQUENCY MHz
STOP = 1000

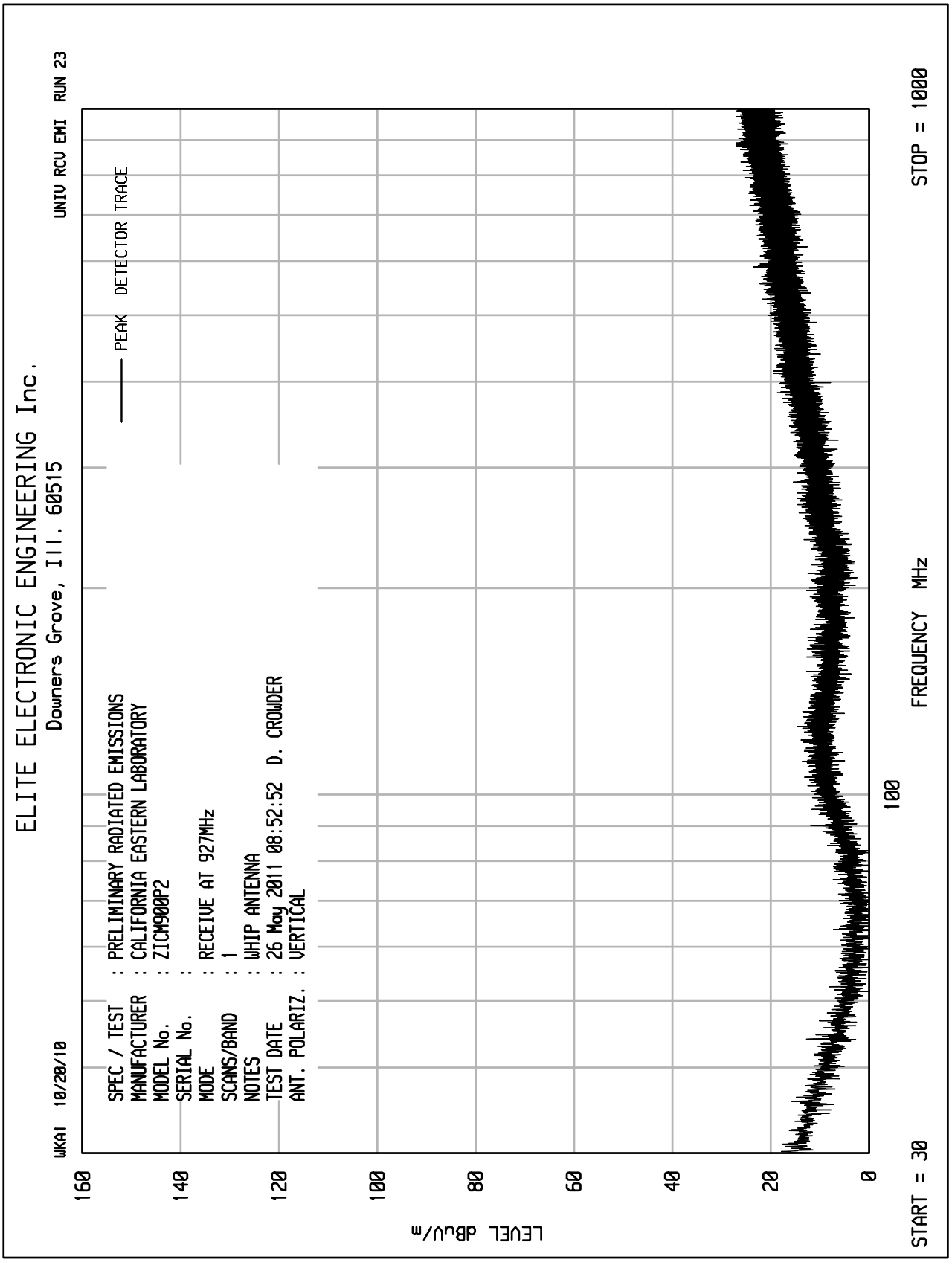

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 5
WKA1 10/20/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORY
MODEL No. : ZICM900P2
SERIAL No. :
MODE : RECEIVE AT 927MHz
SCANS/BAND : 1
NOTES : WIRE ANTENNA
TEST DATE : 25 May 2011 14:49:06 D. CROWDER
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
160
140
120
100
80
60
40
20
0
START = 1000
FREQUENCY MHz
STOP = 6000

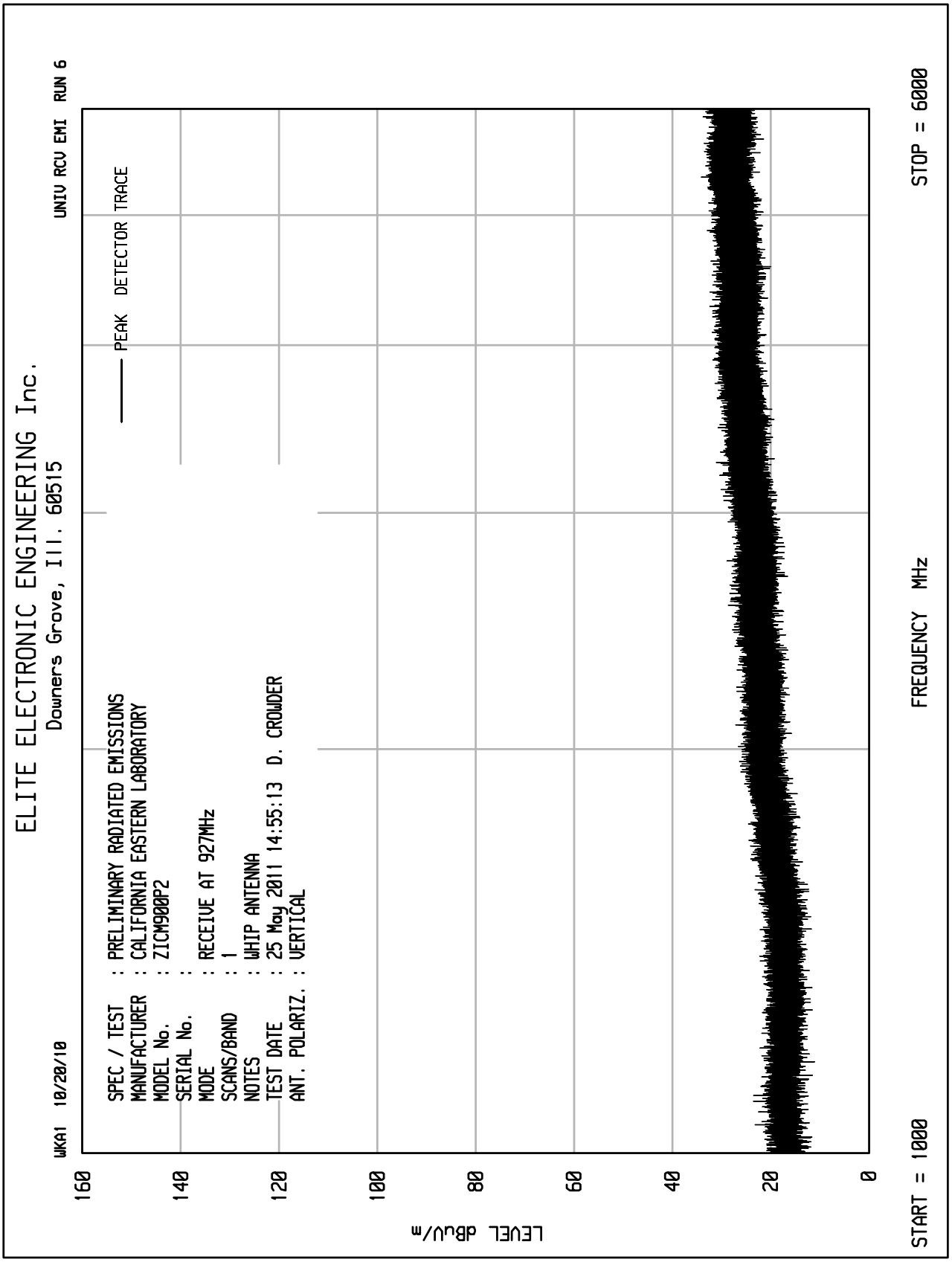

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 21
WKA1 10/20/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORY
MODEL No. : ZICM900P2
SERIAL No. :
MODE : RECEIVE AT 903MHz
SCANS/BAND : 1
NOTES : WHIP ANTENNA
TEST DATE : 26 May 2011 08:47:56 D. CROWDER
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
160
140
120
100
80
60
40
20
0
START = 30
100
FREQUENCY MHz
STOP = 1000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 8
WKA1 10/20/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORY
MODEL No. : ZICM900P2
SERIAL No. :
MODE : RECEIVE AT 903MHz
SCANS/BAND : 1
NOTES : WHIP ANTENNA
TEST DATE : 25 May 2011 14:59:53 D. CROWDER
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
160
140
120
100
80
60
40
20
0
START = 1000
FREQUENCY MHz
STOP = 6000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 22
WKA1 10/20/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORY
MODEL No. : ZICM900P2
SERIAL No. :
MODE : RECEIVE AT 915MHz
SCANS/BAND : 1
NOTES : WHIP ANTENNA
TEST DATE : 26 May 2011 08:50:00 D. CROWDER
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
160
140
120
100
80
60
40
20
0
START = 30
100
FREQUENCY MHz
STOP = 1000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 7
WKA1 10/20/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORY
MODEL No. : ZICM900P2
SERIAL No. :
MODE : RECEIVE AT 915MHz
SCANS/BAND : 1
NOTES : WHIP ANTENNA
TEST DATE : 25 May 2011 14:57:20 D. CROWDER
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
160
140
120
100
80
60
40
20
0
START = 1000
FREQUENCY MHz
STOP = 6000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 23
WKA1 10/20/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORY
MODEL No. : ZICM900P2
SERIAL No. :
MODE : RECEIVE AT 927MHz
SCANS/BAND : 1
NOTES : WHIP ANTENNA
TEST DATE : 26 May 2011 08:52:52 D. CROWDER
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
160
140
120
100
80
60
40
20
0
START = 30
100
FREQUENCY MHz
STOP = 1000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 6
WKA1 10/20/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORY
MODEL No. : ZICM900P2
SERIAL No. :
MODE : RECEIVE AT 927MHz
SCANS/BAND : 1
NOTES : WHIP ANTENNA
TEST DATE : 25 May 2011 14:55:13 D. CROWDER
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
160
140
120
100
80
60
40
20
0
START = 1000
FREQUENCY MHz
STOP = 6000

Manufacturer : California Eastern Laboratories
Model No. : ZICM900P2
Serial No. : None Assigned
Specification : FCC-15B Spurious Radiated Emissions
Date : May 30, 2011
Mode : Receive at 903MHz
Notes : Whip Antenna
Notes : Test Distance is 3 meters

Freq (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Total dBuV/m at 3 M	Total uV/m at 3M	Limit uV/m at 3M	Margin (dB)
903.000	H	4.7	Ambient	2.0	21.8	0.0	28.5	26.6	200.0	-17.5
903.000	V	4.8	Ambient	2.0	21.8	0.0	28.6	26.9	200.0	-17.4
1806.000	H	48.4	Ambient	2.9	26.5	-40.6	37.1	71.8	500.0	-16.9
1806.000	V	47.9	Ambient	2.9	26.5	-40.6	36.6	67.8	500.0	-17.4
2709.000	H	46.3	Ambient	3.7	29.6	-40.3	39.2	91.2	500.0	-14.8
2709.000	V	46.8	Ambient	3.7	29.6	-40.3	39.7	96.6	500.0	-14.3
3612.000	H	45.7	Ambient	4.3	32.0	-39.9	42.1	127.9	500.0	-11.8
3612.000	V	45.9	Ambient	4.3	32.0	-39.9	42.3	130.9	500.0	-11.6
4515.000	H	45.9	Ambient	4.8	32.9	-40.0	43.6	152.0	500.0	-10.3
4515.000	V	45.1	Ambient	4.8	32.9	-40.0	42.8	138.7	500.0	-11.1

H – Horizontal V – Vertical

Total (dBuV/m) = Meter Reading (dBuV) + Cable Factor (dB) + Antenna Factor (dB) + Pre Amp (dB)

Manufacturer : California Eastern Laboratories
Model No. : ZICM900P2
Serial No. : None Assigned
Specification : FCC-15B Spurious Radiated Emissions
Date : May 30, 2011
Mode : Receive at 915MHz
Notes : Whip Antenna
Notes : Test Distance is 3 meters

Freq (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Total dBuV/m at 3 M	Total uV/m at 3M	Limit uV/m at 3M	Margin (dB)
915.000	H	4.7	Ambient	2.0	21.8	0.0	28.5	26.6	200.0	-17.5
915.000	V	3.9	Ambient	2.0	21.8	0.0	27.7	24.3	200.0	-18.3
1830.000	H	48.7	Ambient	2.9	26.8	-40.6	37.8	77.3	500.0	-16.2
1830.000	V	48.9	Ambient	2.9	26.8	-40.6	38.0	79.1	500.0	-16.0
2745.000	H	46.8	Ambient	3.7	29.6	-40.3	39.7	96.8	500.0	-14.3
2745.000	V	46.5	Ambient	3.7	29.6	-40.3	39.4	93.5	500.0	-14.6
3660.000	H	46.3	Ambient	4.3	32.2	-39.8	43.1	142.9	500.0	-10.9
3660.000	V	46.2	Ambient	4.3	32.2	-39.8	43.0	141.3	500.0	-11.0
4575.000	H	44.9	Ambient	4.8	33.1	-40.0	42.8	138.6	500.0	-11.1
4575.000	V	45.2	Ambient	4.8	33.1	-40.0	43.1	143.5	500.0	-10.8

H – Horizontal V – Vertical

Total (dBuV/m) = Meter Reading (dBuV) + Cable Factor (dB) + Antenna Factor (dB) + Pre Amp (dB)

Manufacturer : California Eastern Laboratories
Model No. : ZICM900P2
Serial No. : None Assigned
Specification : FCC-15B Spurious Radiated Emissions
Date : May 30, 2011
Mode : Receive at 927MHz
Notes : Whip Antenna
Notes : Test Distance is 3 meters

Freq (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Total dBuV/m at 3 M	Total uV/m at 3M	Limit uV/m at 3M	Margin (dB)
927.000	H	4.2		2.0	21.9	0.0	28.1	25.3	200.0	-18.0
927.000	V	4.5		2.0	21.9	0.0	28.4	26.2	200.0	-17.7
1854.000	H	47.9		2.9	27.0	-40.5	37.3	73.3	500.0	-16.7
1854.000	V	48.6		2.9	27.0	-40.5	38.0	79.4	500.0	-16.0
2781.000	H	46.8		3.7	29.6	-40.4	39.7	97.1	500.0	-14.2
2781.000	V	47.0		3.7	29.6	-40.4	39.9	99.3	500.0	-14.0
3708.000	H	45.7		4.3	32.4	-39.6	42.9	138.8	500.0	-11.1
3708.000	V	46.0		4.3	32.4	-39.6	43.2	143.7	500.0	-10.8
4635.000	H	46.1		4.8	33.3	-40.0	44.2	162.7	500.0	-9.7
4635.000	V	45.2		4.8	33.3	-40.0	43.3	146.7	500.0	-10.6

H – Horizontal V – Vertical

Total (dBuV/m) = Meter Reading (dBuV) + Cable Factor (dB) + Antenna Factor (dB) + Pre Amp (dB)

Manufacturer : California Eastern Laboratories
Model No. : ZICM900P2
Serial No. : None Assigned
Specification : FCC-15B Spurious Radiated Emissions
Date : May 30, 2011
Mode : Receive at 903MHz
Notes : Wire Antenna
Notes : Test Distance is 3 meters

Freq (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Total dBuV/m at 3 M	Total uV/m at 3M	Limit uV/m at 3M	Margin (dB)
903.000	H	4.9	Ambient	2.0	21.8	0.0	28.7	27.2	200.0	-17.3
903.000	V	5.2	Ambient	2.0	21.8	0.0	29.0	28.2	200.0	-17.0
1806.000	H	48.4	Ambient	2.9	26.5	-40.6	37.1	71.8	500.0	-16.9
1806.000	V	47.9	Ambient	2.9	26.5	-40.6	36.6	67.8	500.0	-17.4
2709.000	H	46.3	Ambient	3.7	29.6	-40.3	39.2	91.2	500.0	-14.8
2709.000	V	46.8	Ambient	3.7	29.6	-40.3	39.7	96.6	500.0	-14.3
3612.000	H	45.7	Ambient	4.3	32.0	-39.9	42.1	127.9	500.0	-11.8
3612.000	V	45.9	Ambient	4.3	32.0	-39.9	42.3	130.9	500.0	-11.6
4515.000	H	45.9	Ambient	4.8	32.9	-40.0	43.6	152.0	500.0	-10.3
4515.000	V	45.1	Ambient	4.8	32.9	-40.0	42.8	138.7	500.0	-11.1

H – Horizontal V – Vertical

Total (dBuV/m) = Meter Reading (dBuV) + Cable Factor (dB) + Antenna Factor (dB) + Pre Amp (dB)

Manufacturer : California Eastern Laboratories
Model No. : ZICM900P2
Serial No. : None Assigned
Specification : FCC-15B Spurious Radiated Emissions
Date : May 30, 2011
Mode : Receive at 915MHz
Notes : Wire Antenna
Notes : Test Distance is 3 meters

Freq (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Total dBuV/m at 3 M	Total uV/m at 3M	Limit uV/m at 3M	Margin (dB)
915.000	H	4.7	Ambient	2.0	21.8	0.0	28.5	26.6	200.0	-17.5
915.000	V	4.8	Ambient	2.0	21.8	0.0	28.6	26.9	200.0	-17.4
1830.000	H	48.7	Ambient	2.9	26.8	-40.6	37.8	77.3	500.0	-16.2
1830.000	V	48.9	Ambient	2.9	26.8	-40.6	38.0	79.1	500.0	-16.0
2745.000	H	46.8	Ambient	3.7	29.6	-40.3	39.7	96.8	500.0	-14.3
2745.000	V	46.5	Ambient	3.7	29.6	-40.3	39.4	93.5	500.0	-14.6
3660.000	H	46.3	Ambient	4.3	32.2	-39.8	43.1	142.9	500.0	-10.9
3660.000	V	46.2	Ambient	4.3	32.2	-39.8	43.0	141.3	500.0	-11.0
4575.000	H	44.9	Ambient	4.8	33.1	-40.0	42.8	138.6	500.0	-11.1
4575.000	V	45.2	Ambient	4.8	33.1	-40.0	43.1	143.5	500.0	-10.8

H – Horizontal V – Vertical

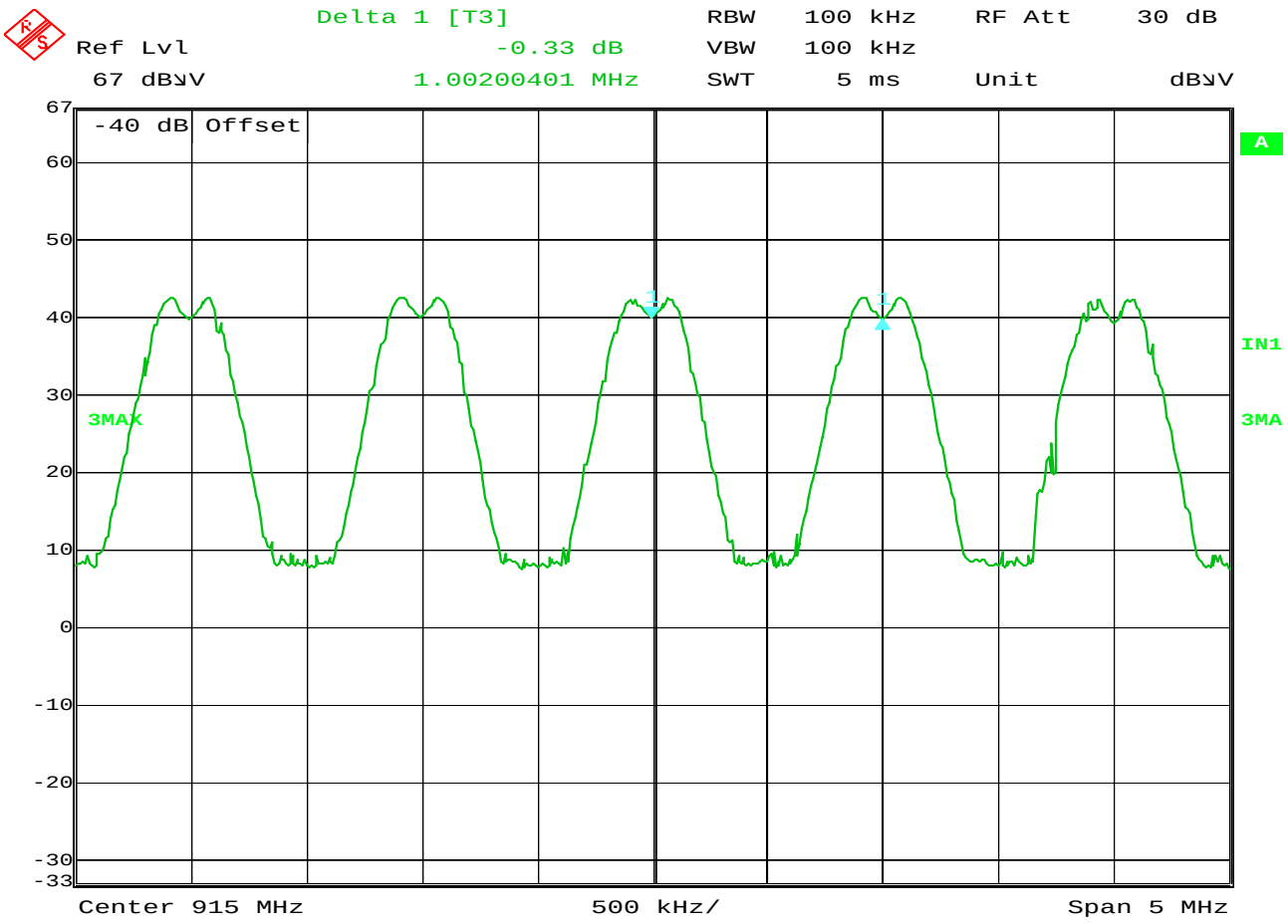
Total (dBuV/m) = Meter Reading (dBuV) + Cable Factor (dB) + Antenna Factor (dB) + Pre Amp (dB)

Manufacturer : California Eastern Laboratories
Model No. : ZICM900P2
Serial No. : None Assigned
Specification : FCC-15B Spurious Radiated Emissions
Date : May 30, 2011
Mode : Receive at 927MHz
Notes : Wire Antenna
Notes : Test Distance is 3 meters

Freq (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Total dBuV/m at 3 M	Total uV/m at 3M	Limit uV/m at 3M	Margin (dB)
927.000	H	5.1	Ambient	2.0	21.9	0.0	29.0	28.1	200.0	-17.1
927.000	V	5.1	Ambient	2.0	21.9	0.0	29.0	28.1	200.0	-17.1
1854.000	H	47.9	Ambient	2.9	27.0	-40.5	37.3	73.3	500.0	-16.7
1854.000	V	48.6	Ambient	2.9	27.0	-40.5	38.0	79.4	500.0	-16.0
2781.000	H	46.8	Ambient	3.7	29.6	-40.4	39.7	97.1	500.0	-14.2
2781.000	V	47.0	Ambient	3.7	29.6	-40.4	39.9	99.3	500.0	-14.0
3708.000	H	45.7	Ambient	4.3	32.4	-39.6	42.9	138.8	500.0	-11.1
3708.000	V	46.0	Ambient	4.3	32.4	-39.6	43.2	143.7	500.0	-10.8
4635.000	H	46.1	Ambient	4.8	33.3	-40.0	44.2	162.7	500.0	-9.7
4635.000	V	45.2	Ambient	4.8	33.3	-40.0	43.3	146.7	500.0	-10.6

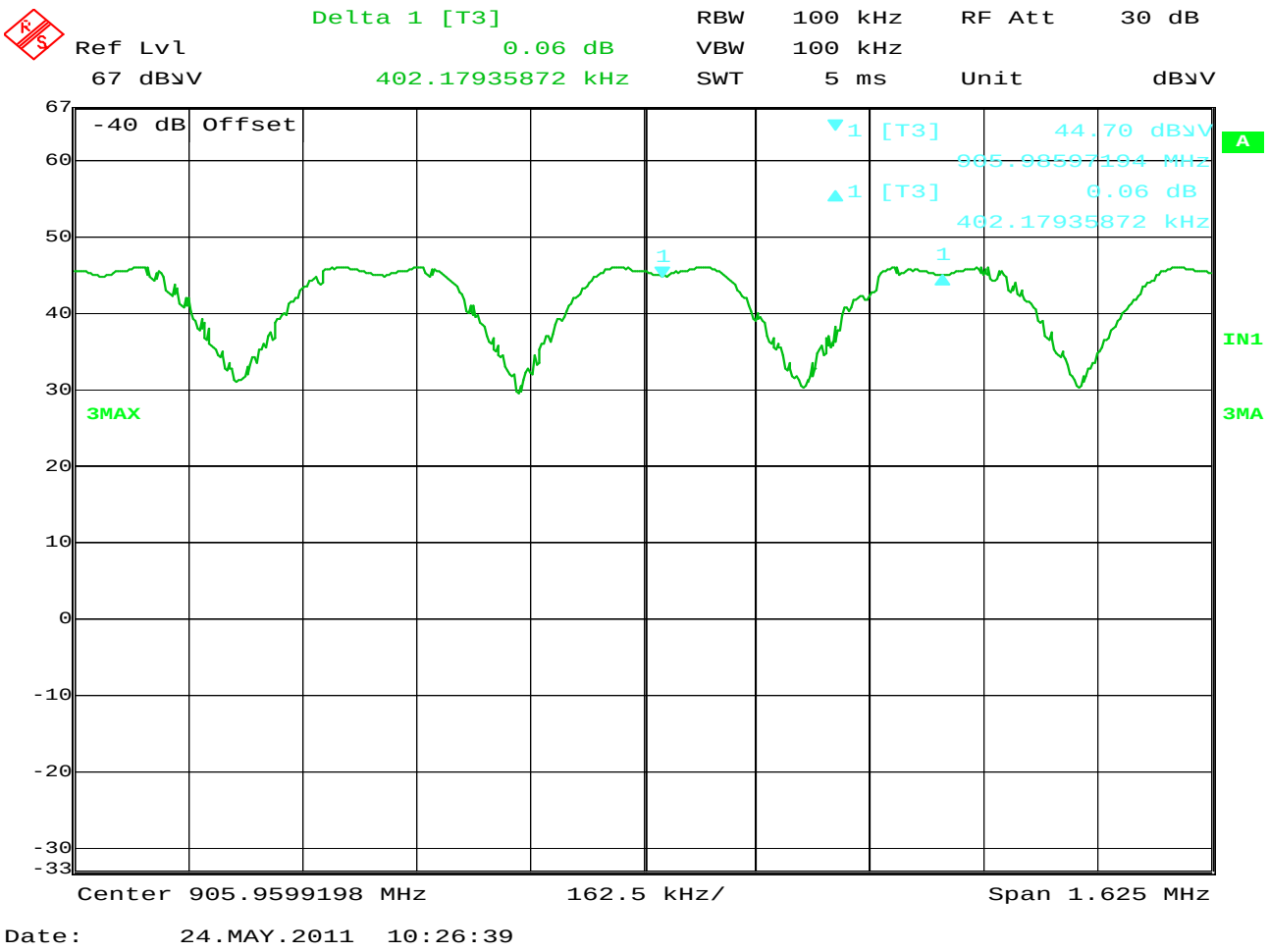
H – Horizontal V – Vertical

Total (dBuV/m) = Meter Reading (dBuV) + Cable Factor (dB) + Antenna Factor (dB) + Pre Amp (dB)



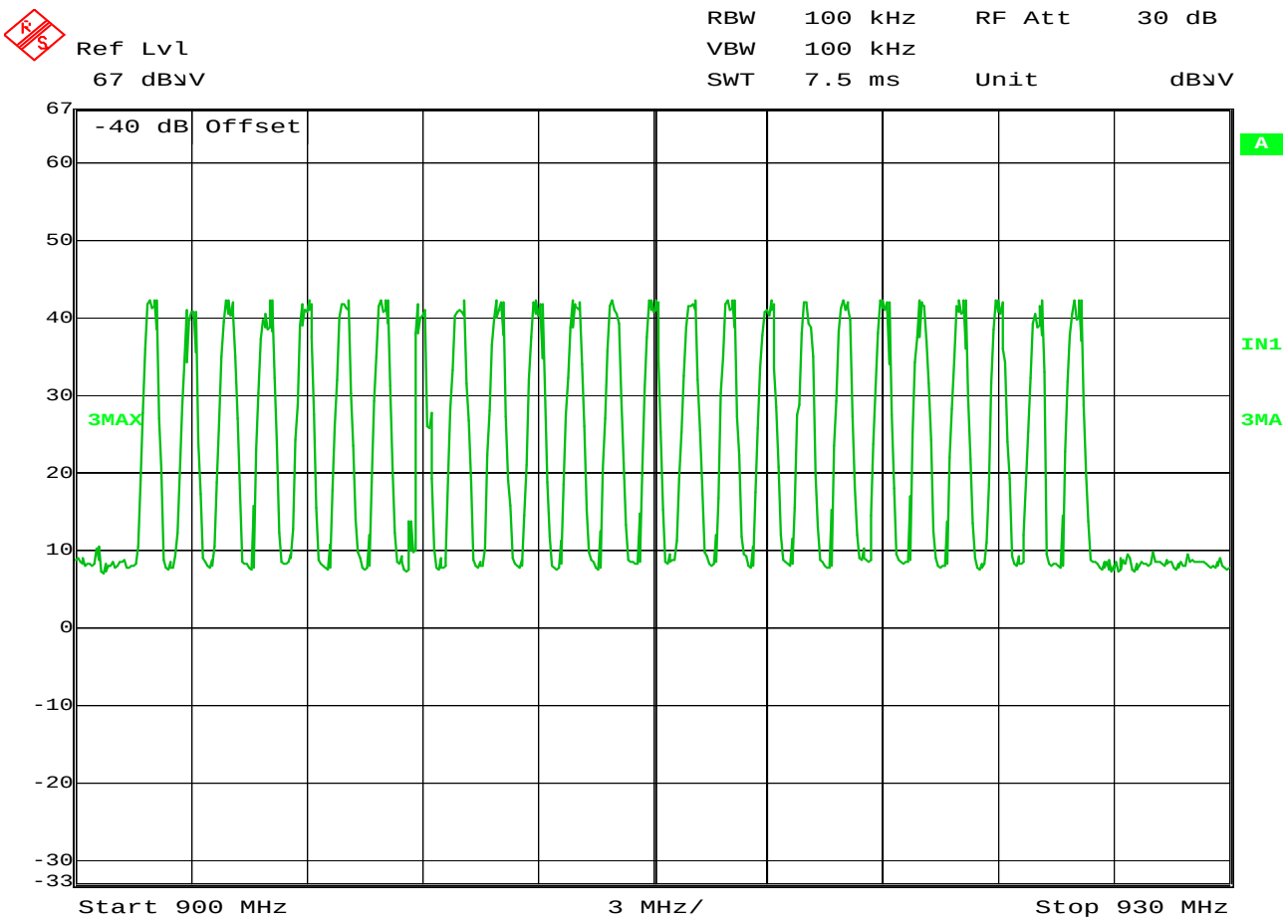
Carrier Frequency Separation

MANUFACTURER : California Eastern Labs
MODEL NUMBER : ZICM900P2
TEST MODE : CEL Hopping
TEST PARAMETERS : Carrier Frequency Separation = 1.00MHz
NOTES :



Carrier Frequency Separation

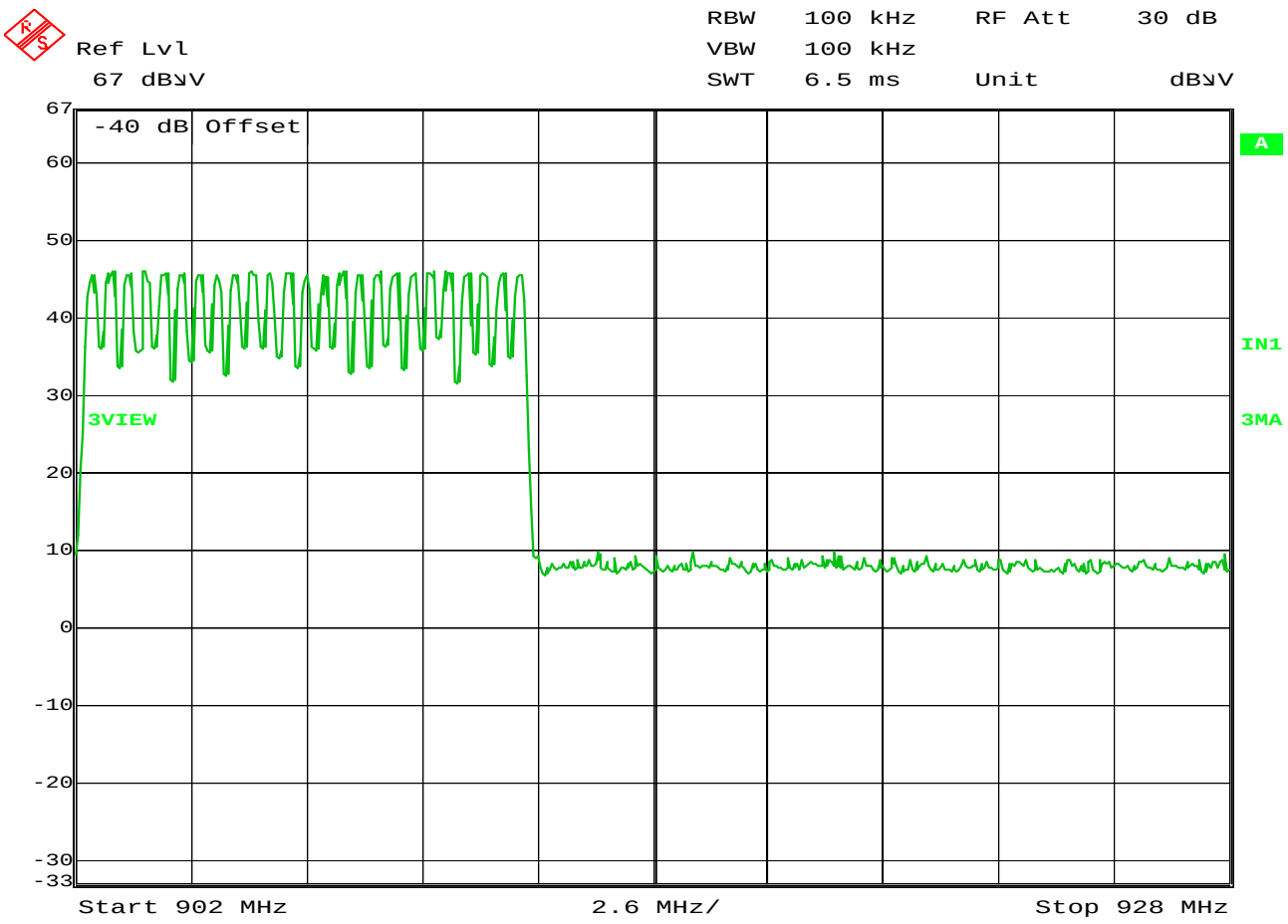
MANUFACTURER : California Eastern Labs
MODEL NUMBER : ZICM900P2
TEST MODE : Snap Hopping
TEST PARAMETERS : Carrier Frequency Separation = 402.2kHz
NOTES :



Date: 24.MAY.2011 09:46:43

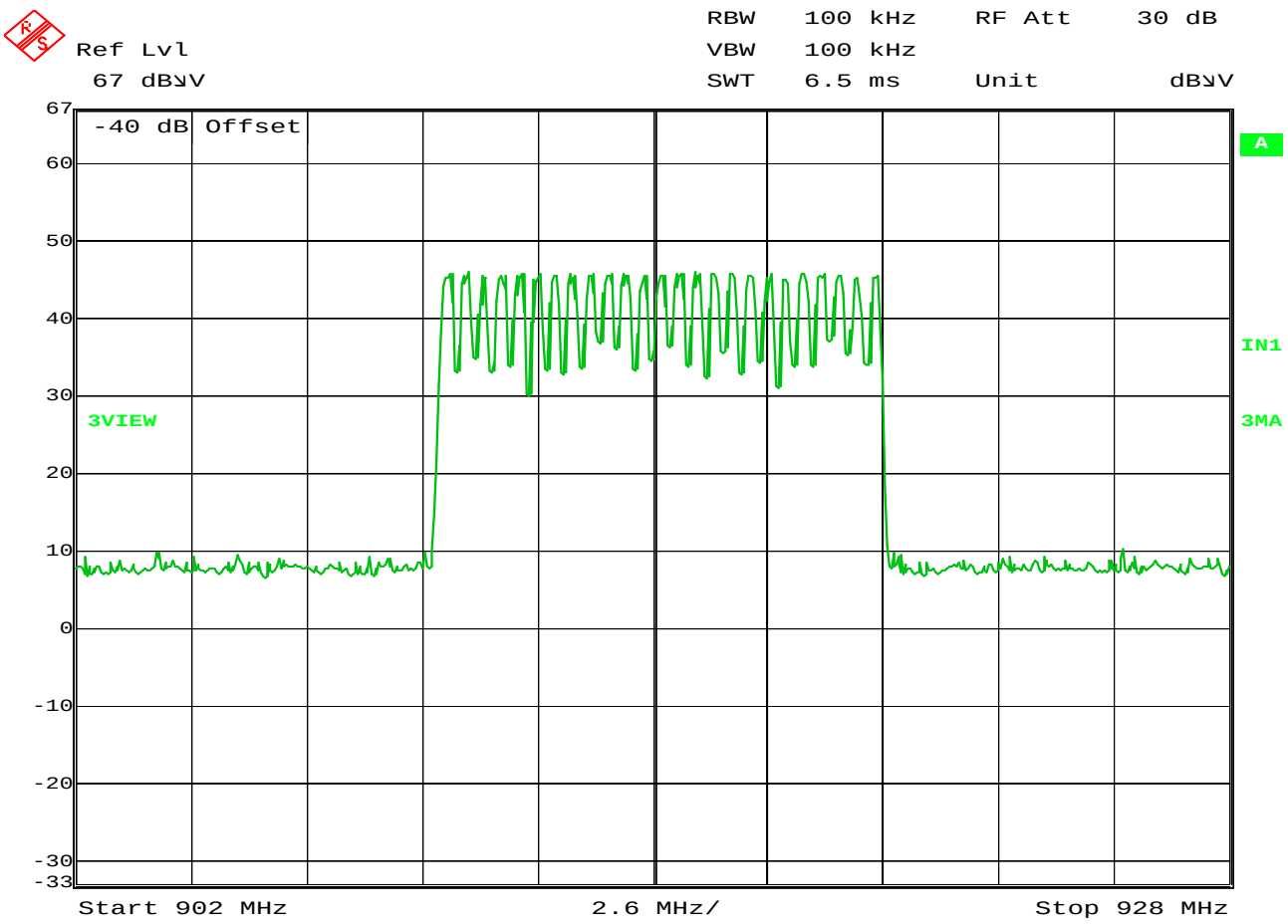
Number of Hopping Frequencies

MANUFACTURER : California Eastern Labs
MODEL NUMBER : ZICM900P2
TEST MODE : CEL Hopping
TEST PARAMETERS : 25 Channels
NOTES :



Number of Hopping Frequencies

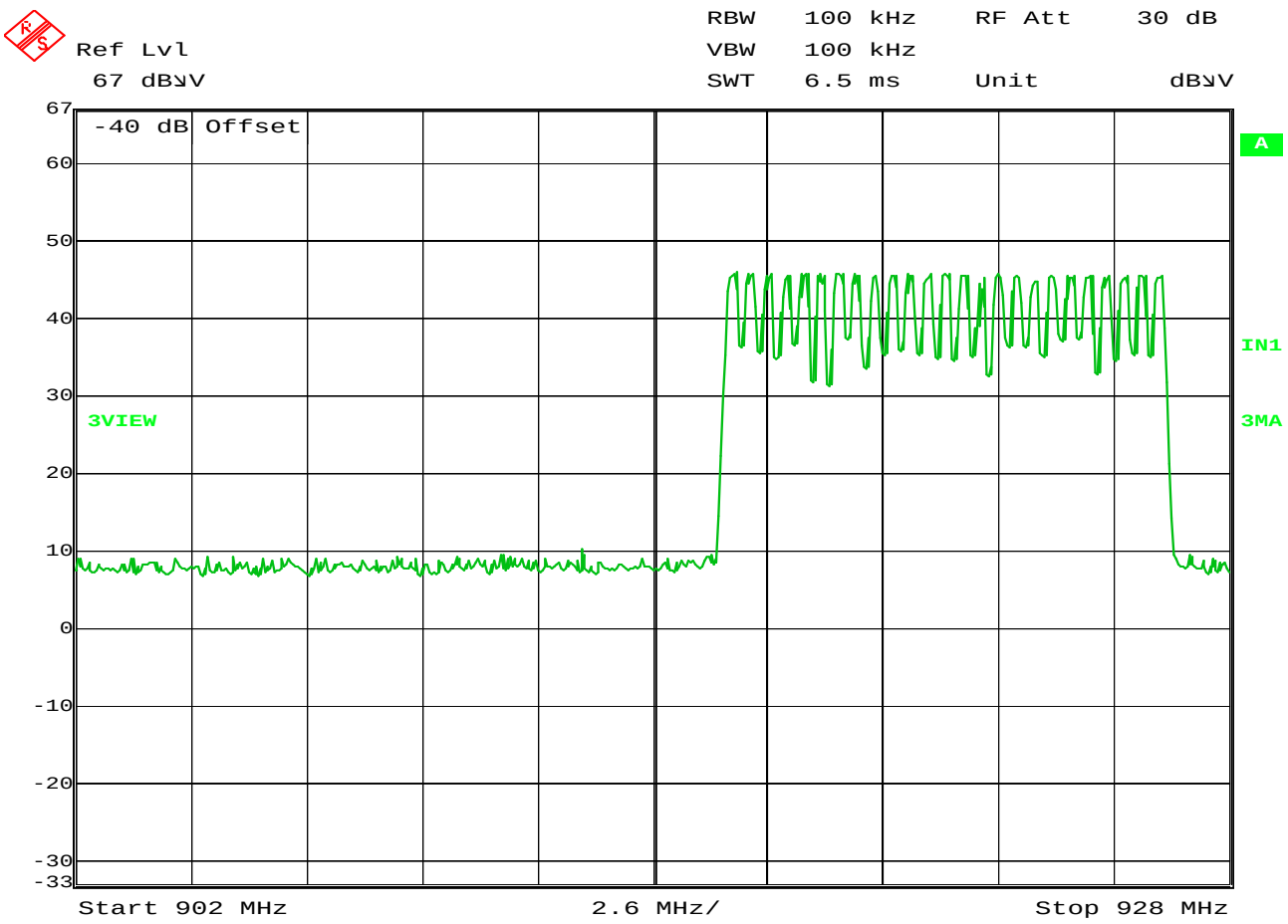
MANUFACTURER : California Eastern Labs
MODEL NUMBER : ZICM900P2
TEST MODE : Snap Hopping
TEST PARAMETERS : 25 Channels
NOTES :



Date: 24.MAY.2011 14:04:06

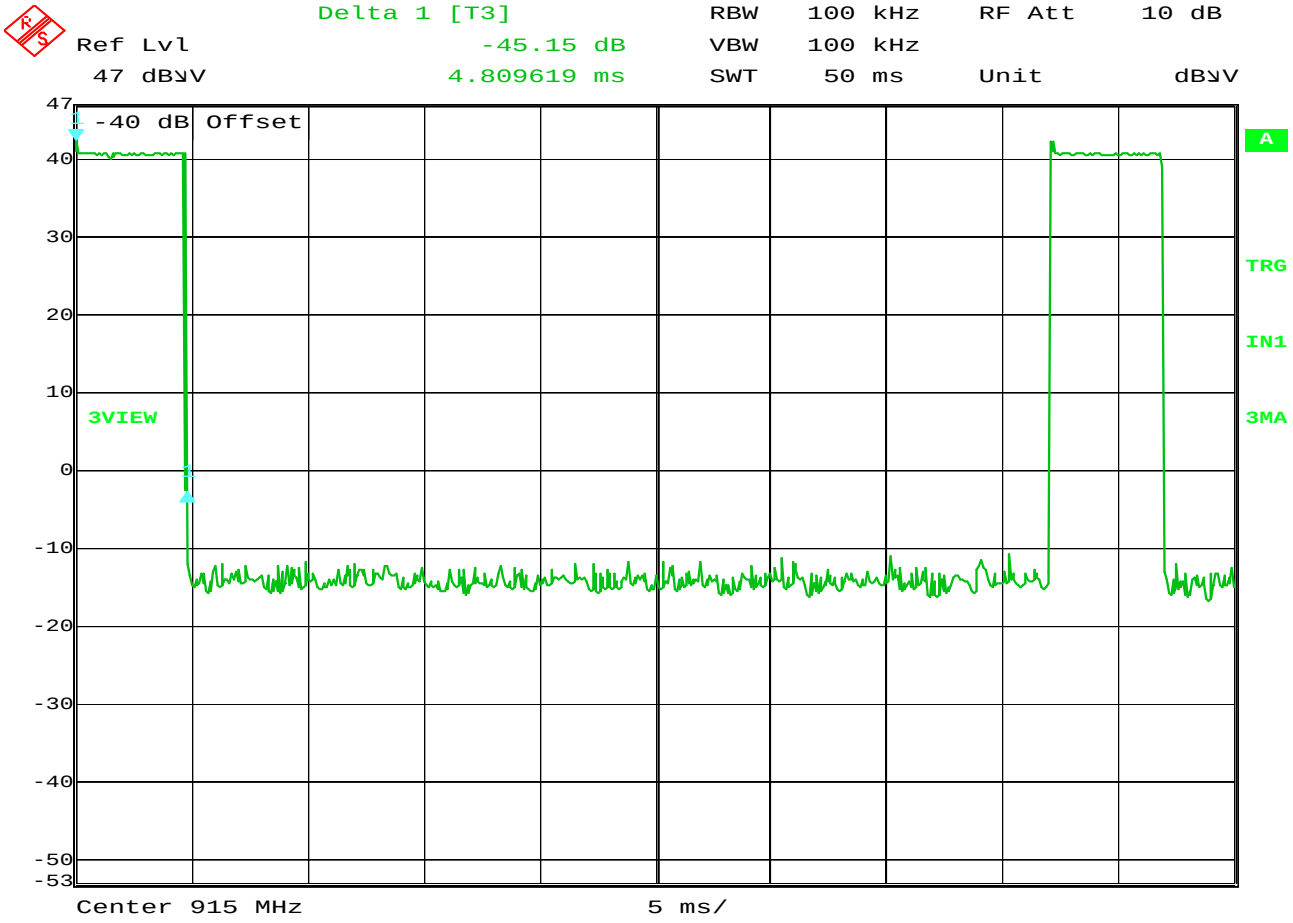
Number of Hopping Frequencies

MANUFACTURER : California Eastern Labs
MODEL NUMBER : ZICM900P2
TEST MODE : Snap Hopping
TEST PARAMETERS : 25 Channels
NOTES :



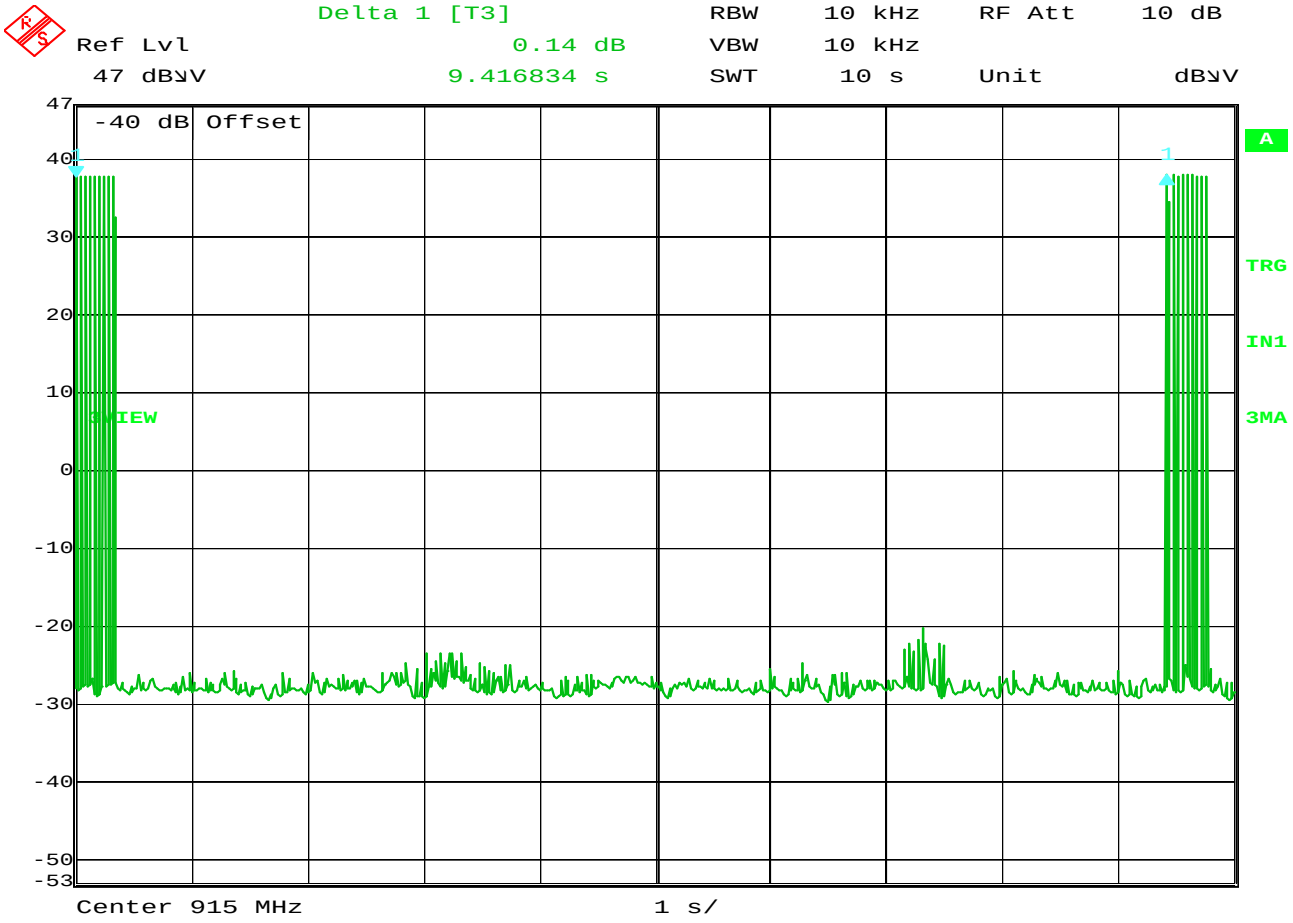
Number of Hopping Frequencies

MANUFACTURER : California Eastern Labs
MODEL NUMBER : ZICM900P2
TEST MODE : Snap Hopping
TEST PARAMETERS : 25 Channels
NOTES :



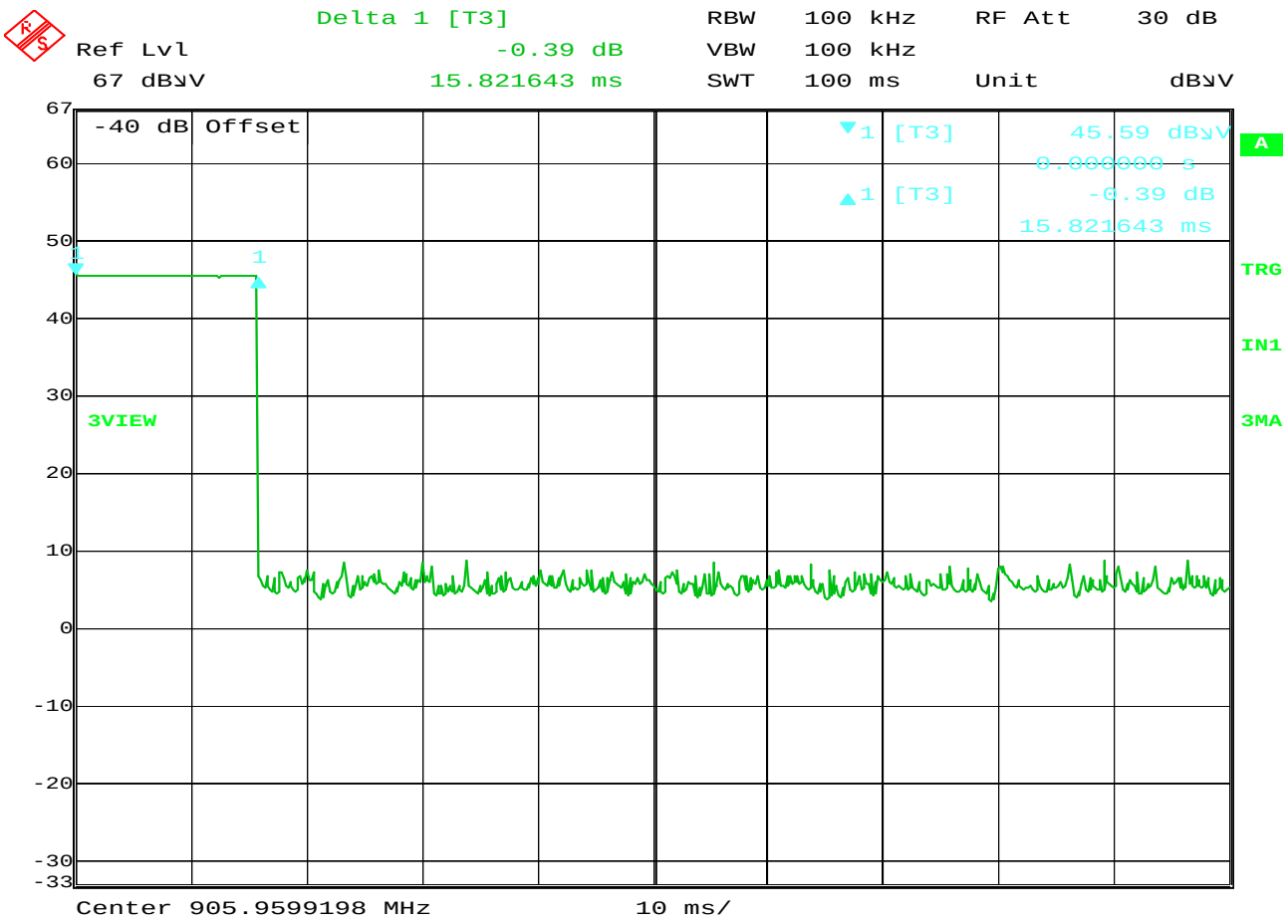
Dwell Time

MANUFACTURER : California Eastern Labs
MODEL NUMBER : ZICM900P2
TEST MODE : CEL Hopping
TEST PARAMETERS : Single Pulse = 4.8mSec
NOTES :



Duty Cycle

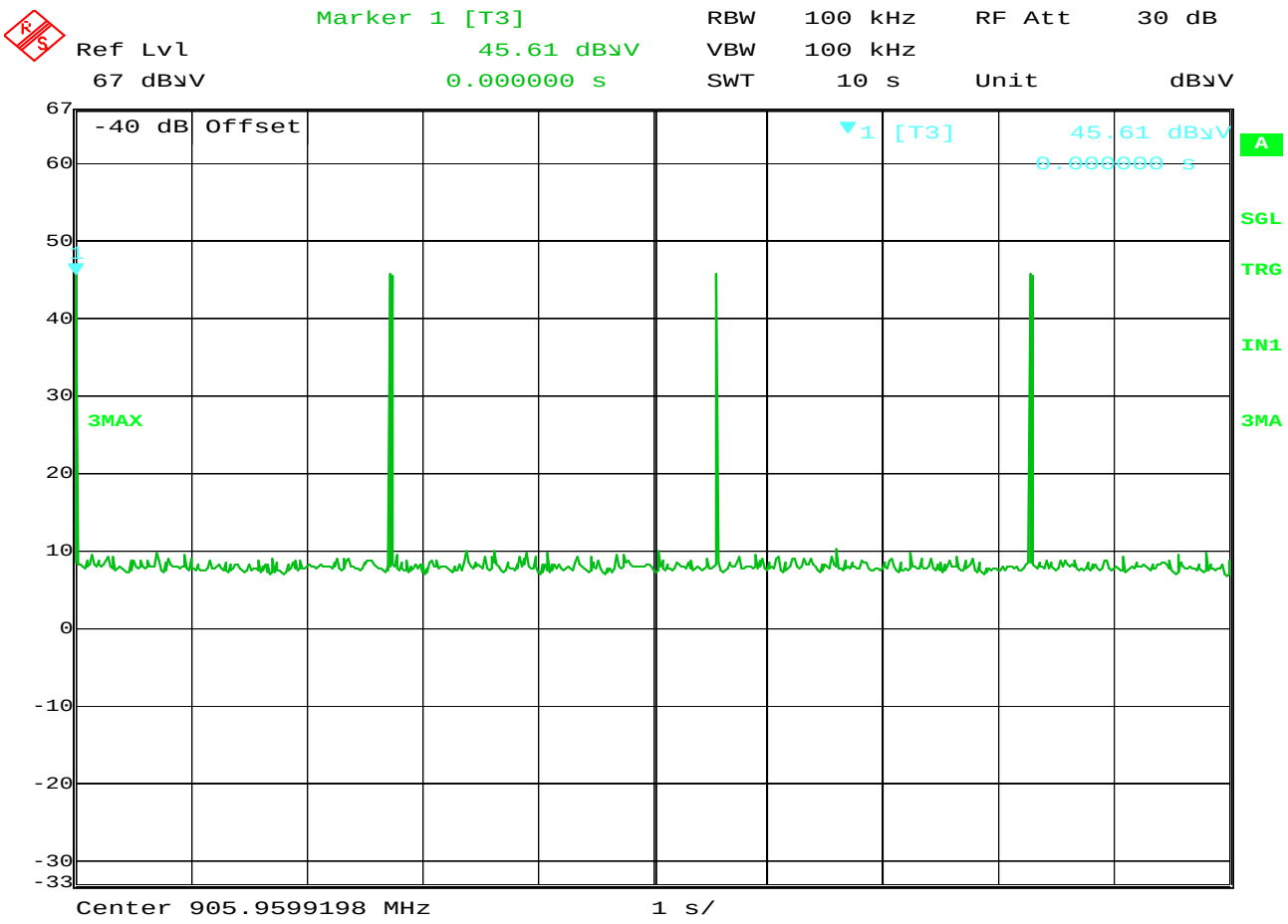
MANUFACTURER : California Eastern Labs
MODEL NUMBER : ZICM900P2
TEST MODE : CEL Hopping
TEST PARAMETERS : (9 * 4.8mS) * 2 = 86.4mS
NOTES :



Date: 24.MAY.2011 10:29:05

Duty Cycle

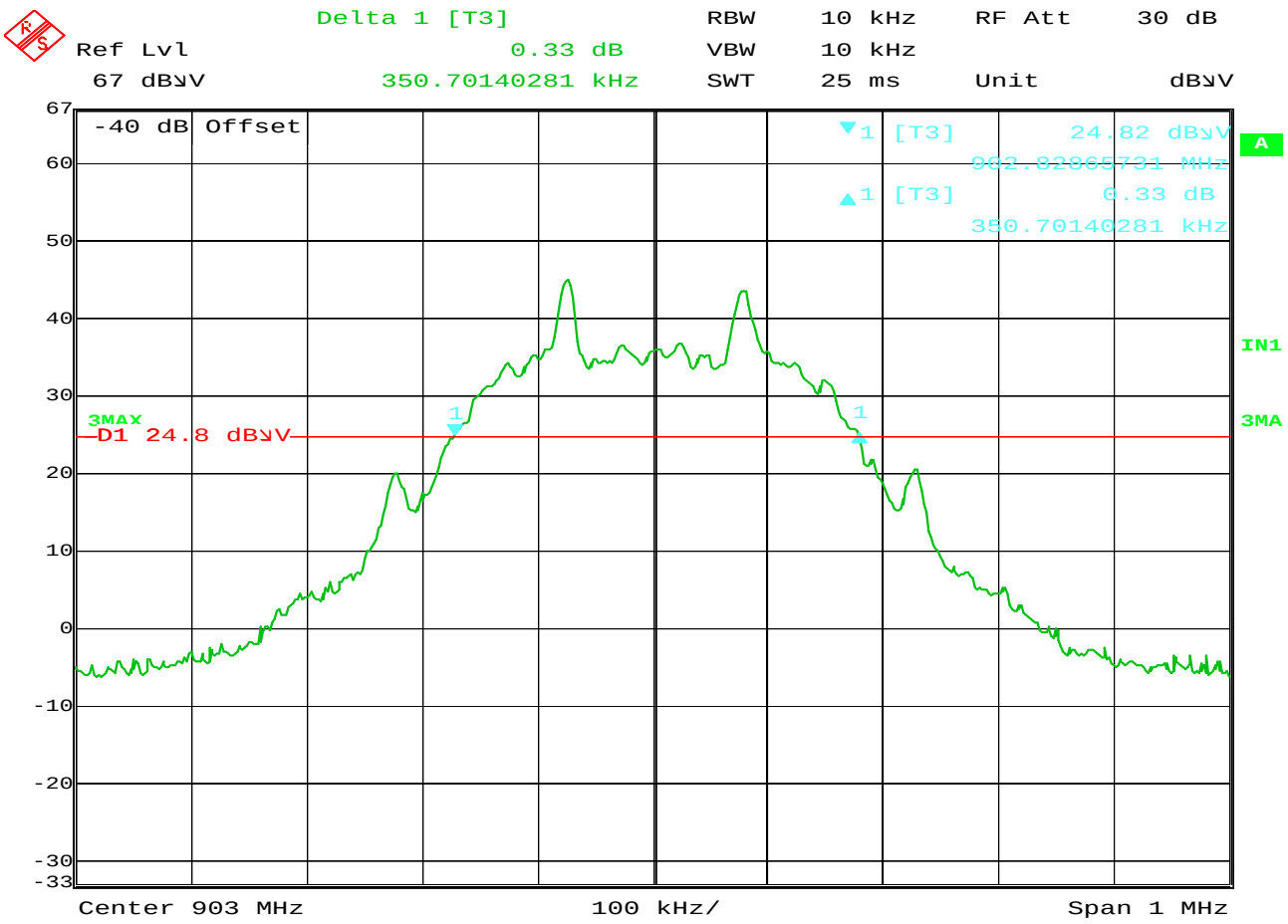
MANUFACTURER : California Eastern Labs
MODEL NUMBER : ZICM900P2
TEST MODE : Snap Hopping
TEST PARAMETERS : Single Pulse = 15.8mS
NOTES :



Date: 24.MAY.2011 10:31:22

Duty Cycle

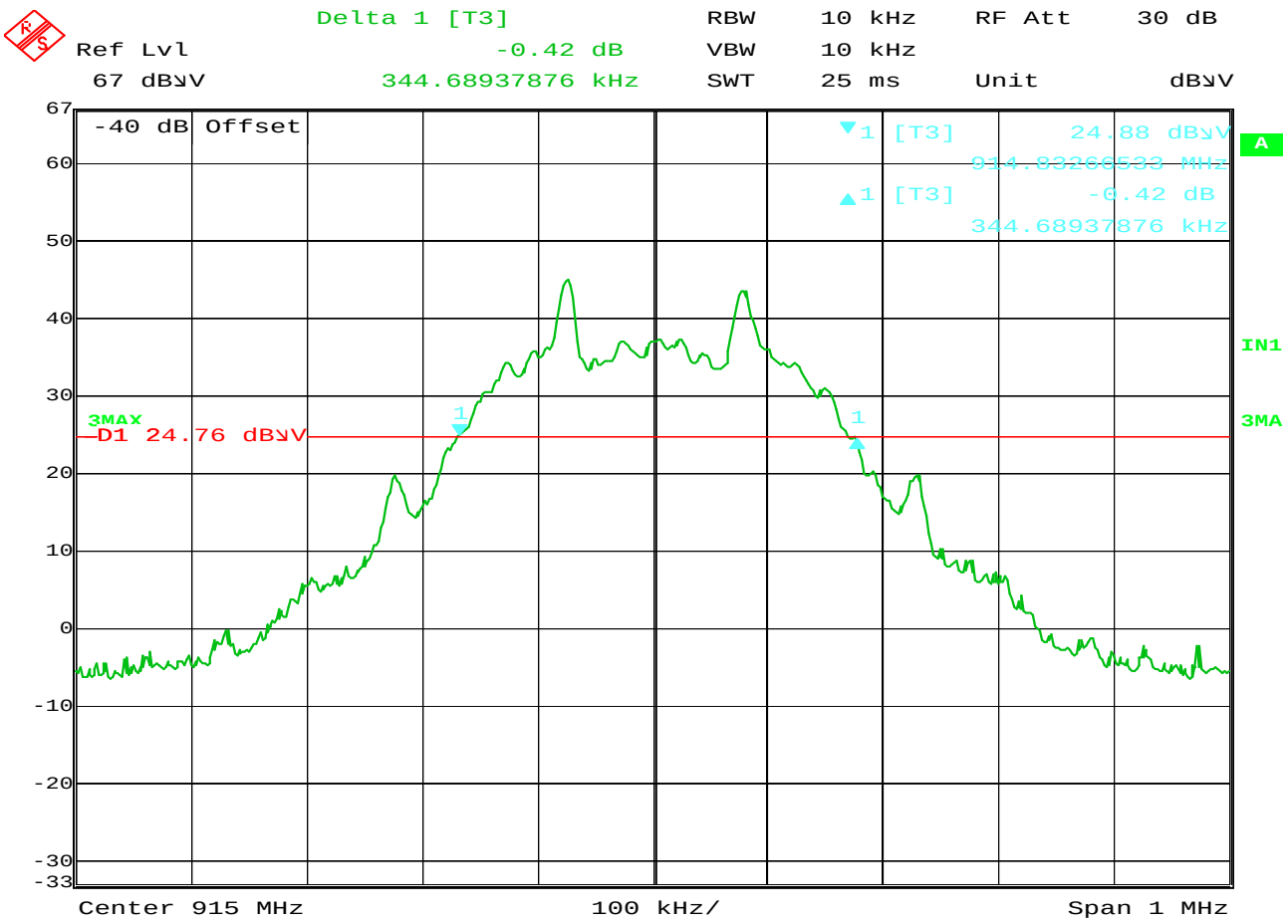
MANUFACTURER : California Eastern Labs
MODEL NUMBER : ZICM900P2
TEST MODE : Snap Hopping
TEST PARAMETERS : 15.8mS * 4 = 63.2mSec
NOTES :



Date: 24.MAY.2011 10:00:38

20dB Bandwidth

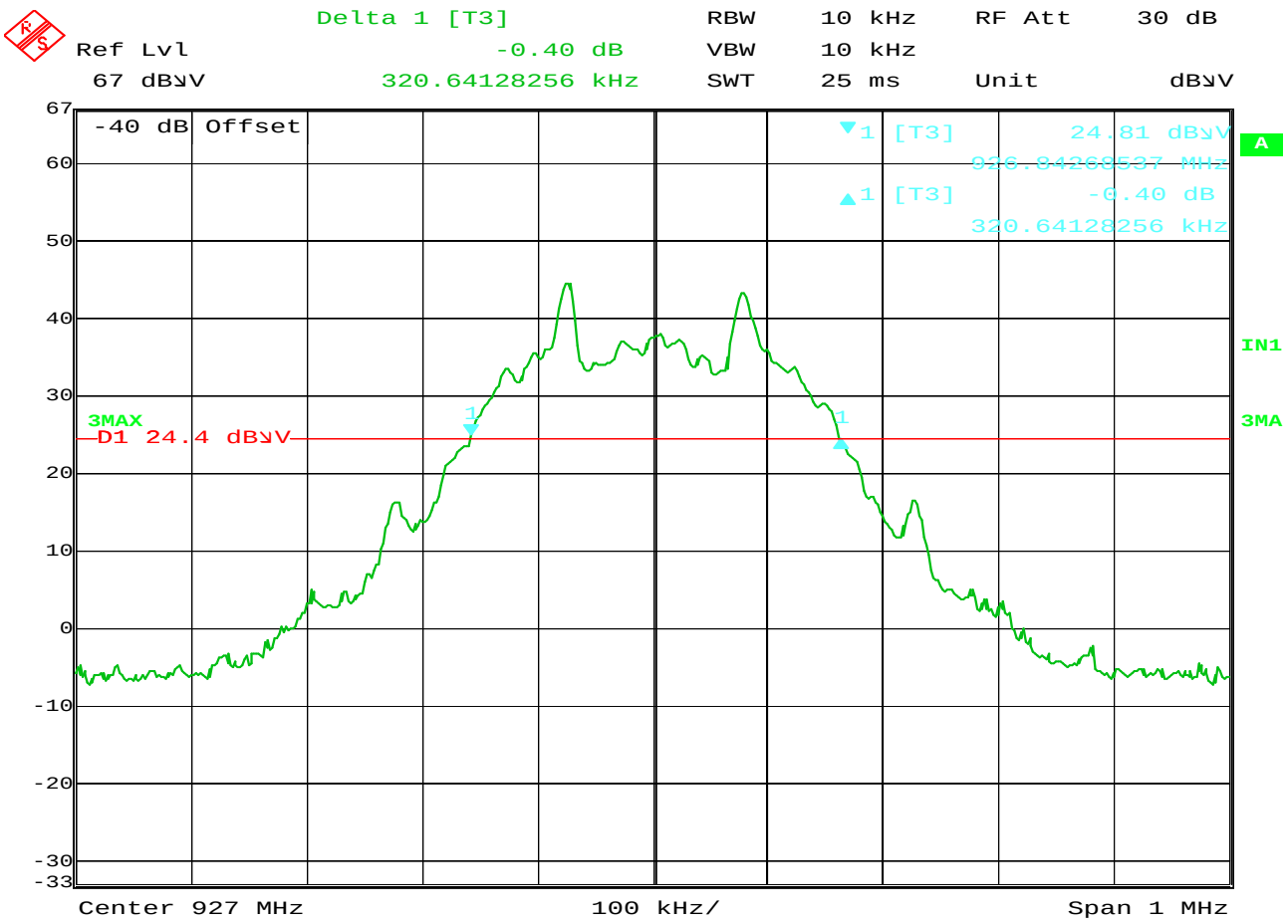
MANUFACTURER : California Eastern Labs
MODEL NUMBER : ZICM900P2
TEST MODE : CEL Hopping
TEST PARAMETERS : 350.7kHz
NOTES :



Date: 24.MAY.2011 09:58:23

20dB Bandwidth

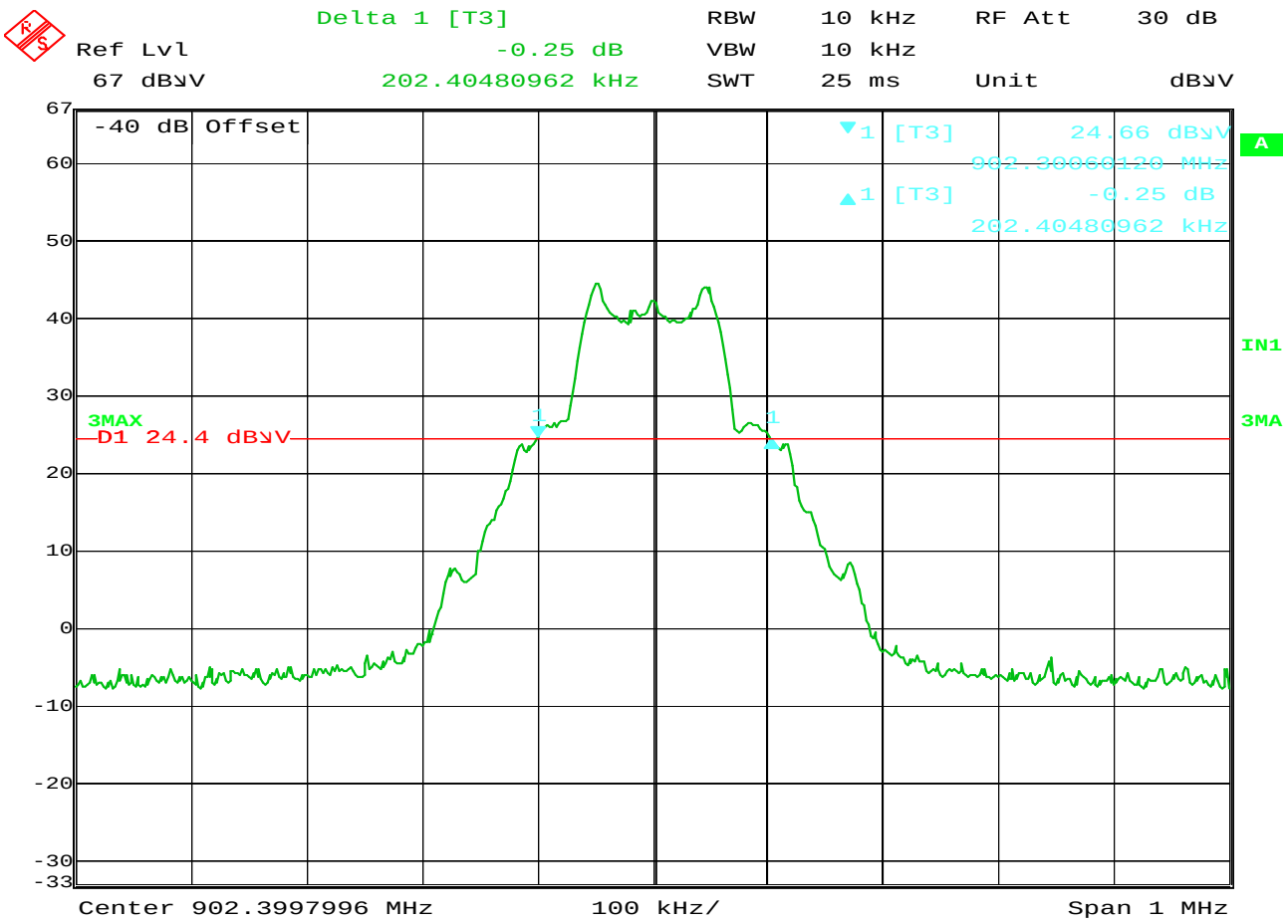
MANUFACTURER : California Eastern Labs
MODEL NUMBER : ZICM900P2
TEST MODE : CEL Hopping
TEST PARAMETERS : 344.68kHz
NOTES :



Date: 24.MAY.2011 10:02:03

20dB Bandwidth

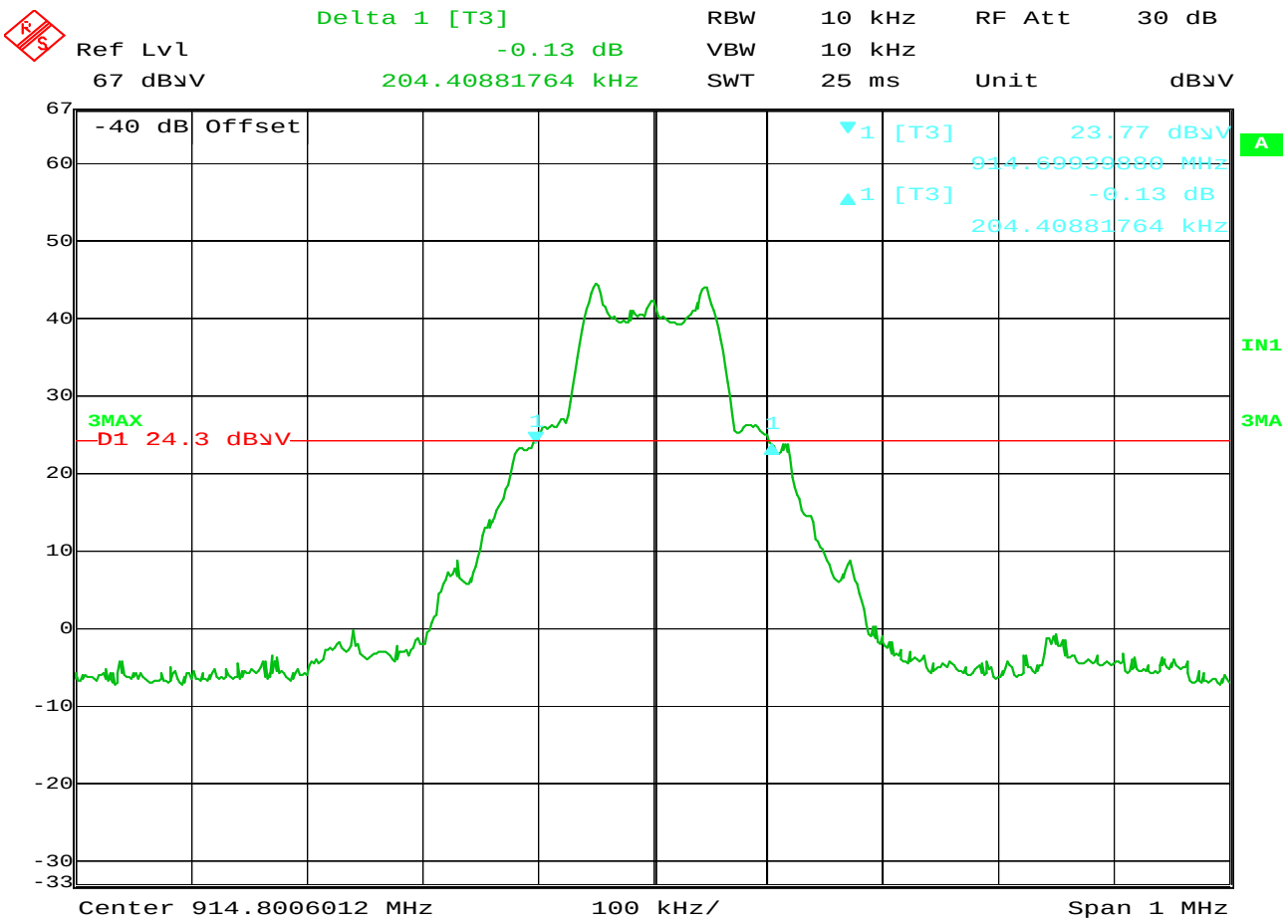
MANUFACTURER : California Eastern Labs
MODEL NUMBER : ZICM900P2
TEST MODE : CEL Hopping
TEST PARAMETERS : 320.64kHz
NOTES :



Date: 24.MAY.2011 10:18:17

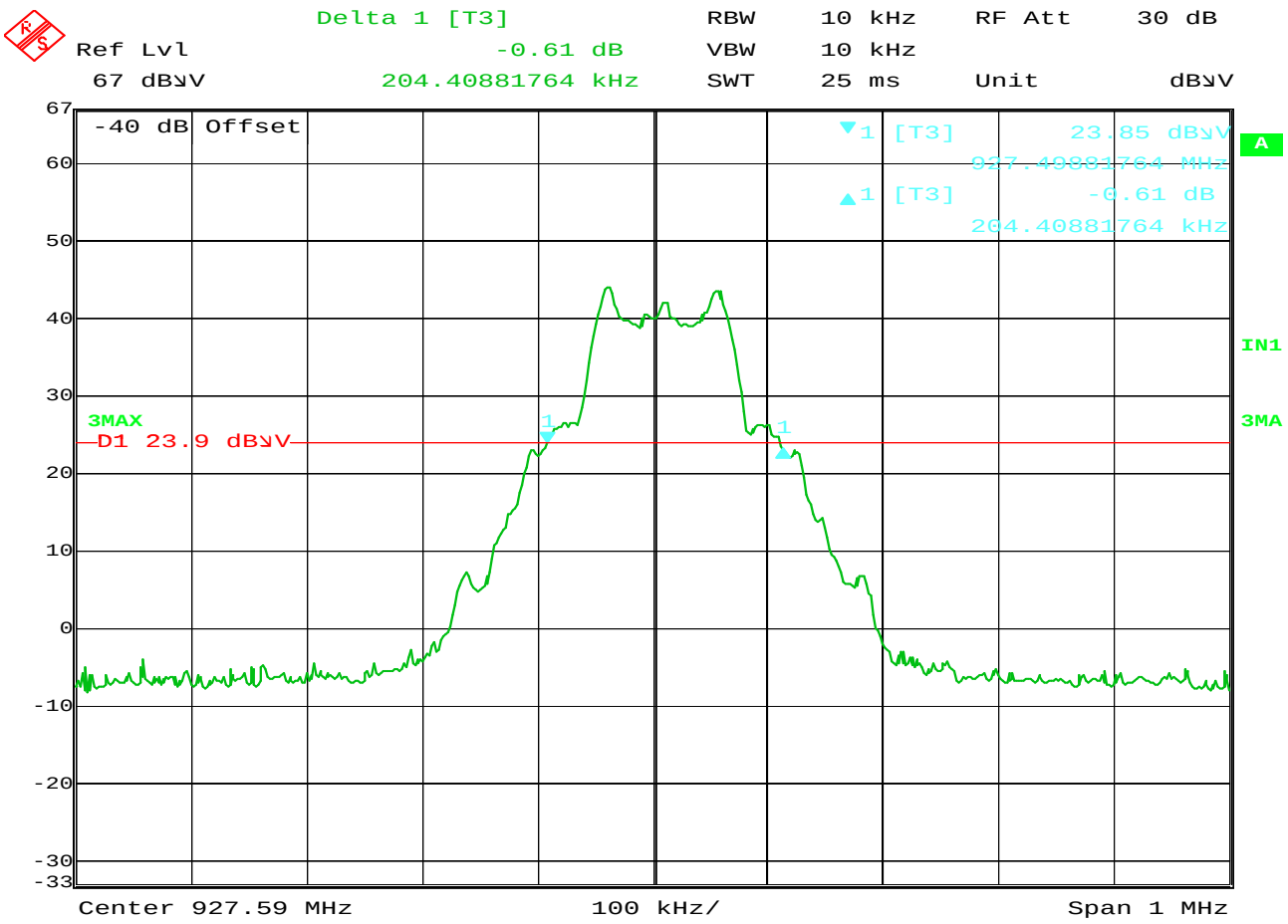
20dB Bandwidth

MANUFACTURER : California Eastern Labs
MODEL NUMBER : ZICM900P2
TEST MODE : Snap Hopping
TEST PARAMETERS : 202.4kHz
NOTES :



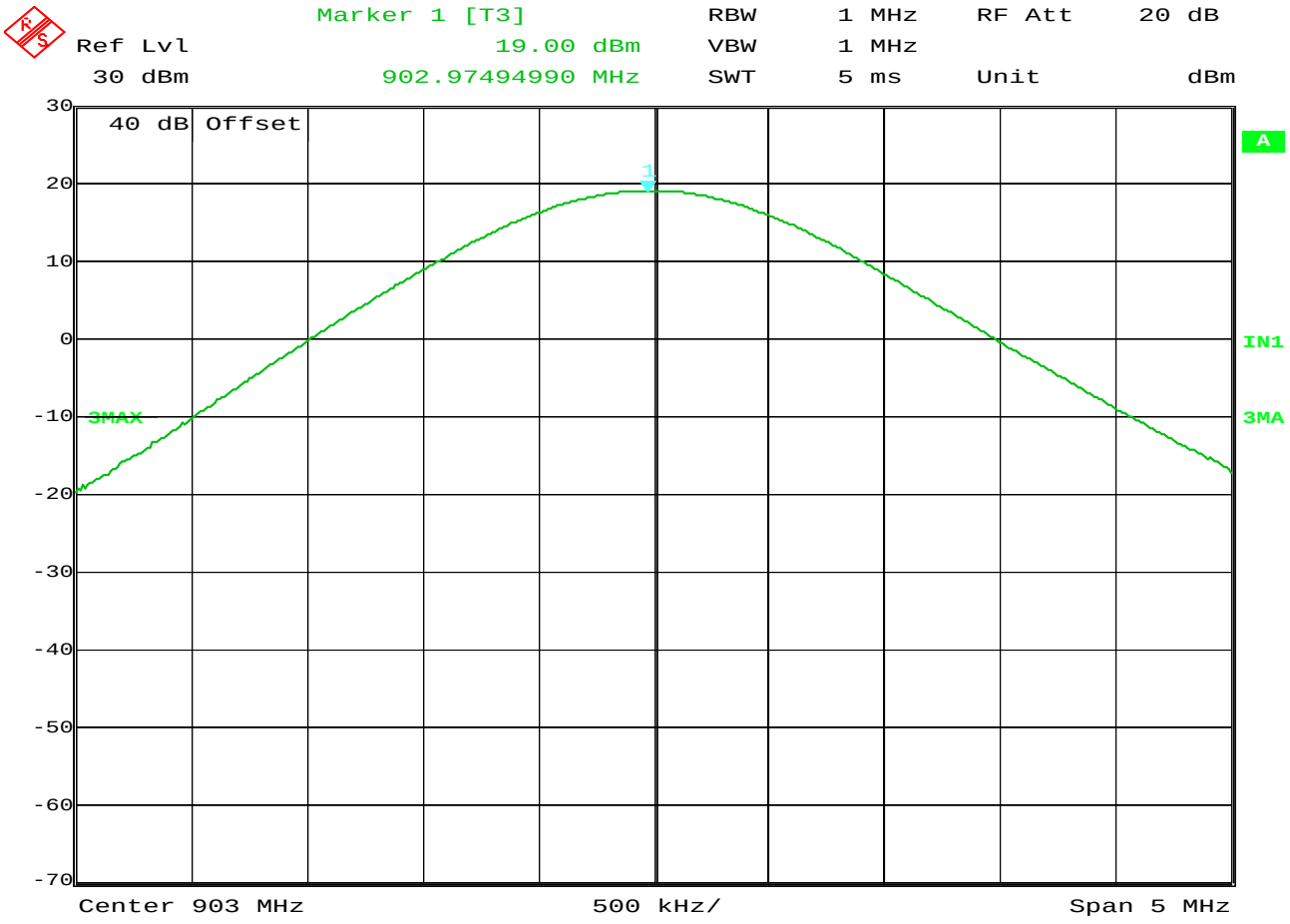
20dB Bandwidth

MANUFACTURER : California Eastern Labs
MODEL NUMBER : ZICM900P2
TEST MODE : Snap Hopping
TEST PARAMETERS : 204.4kHz
NOTES :



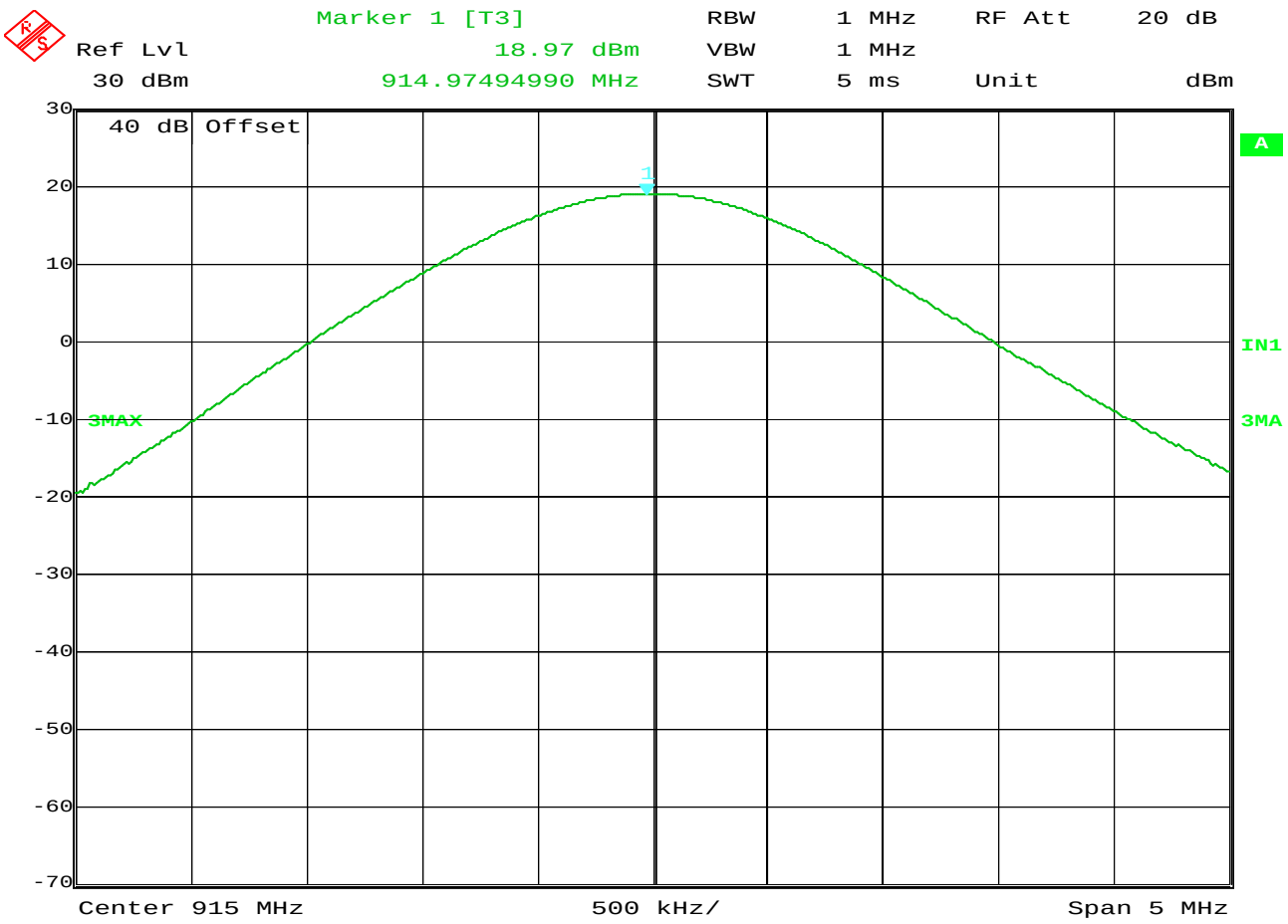
20dB Bandwidth

MANUFACTURER : California Eastern Labs
MODEL NUMBER : ZICM900P2
TEST MODE : Snap Hopping
TEST PARAMETERS : 204.4kHz
NOTES :



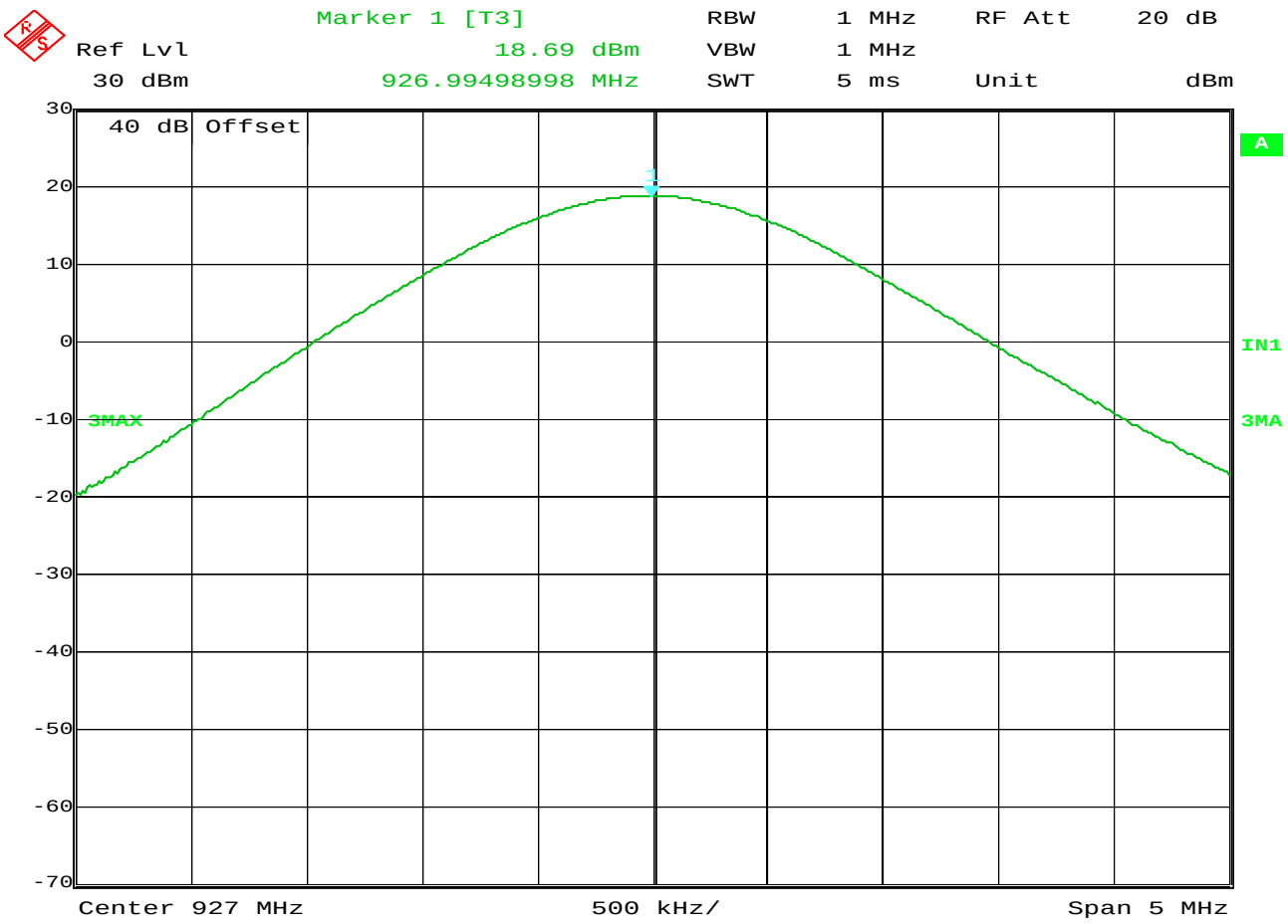
Peak Power Output

MANUFACTURER : California Eastern Labs
MODEL NUMBER : ZICM900P2
TEST MODE : Transmit at 903MHz
TEST PARAMETERS : 19dBm
NOTES :



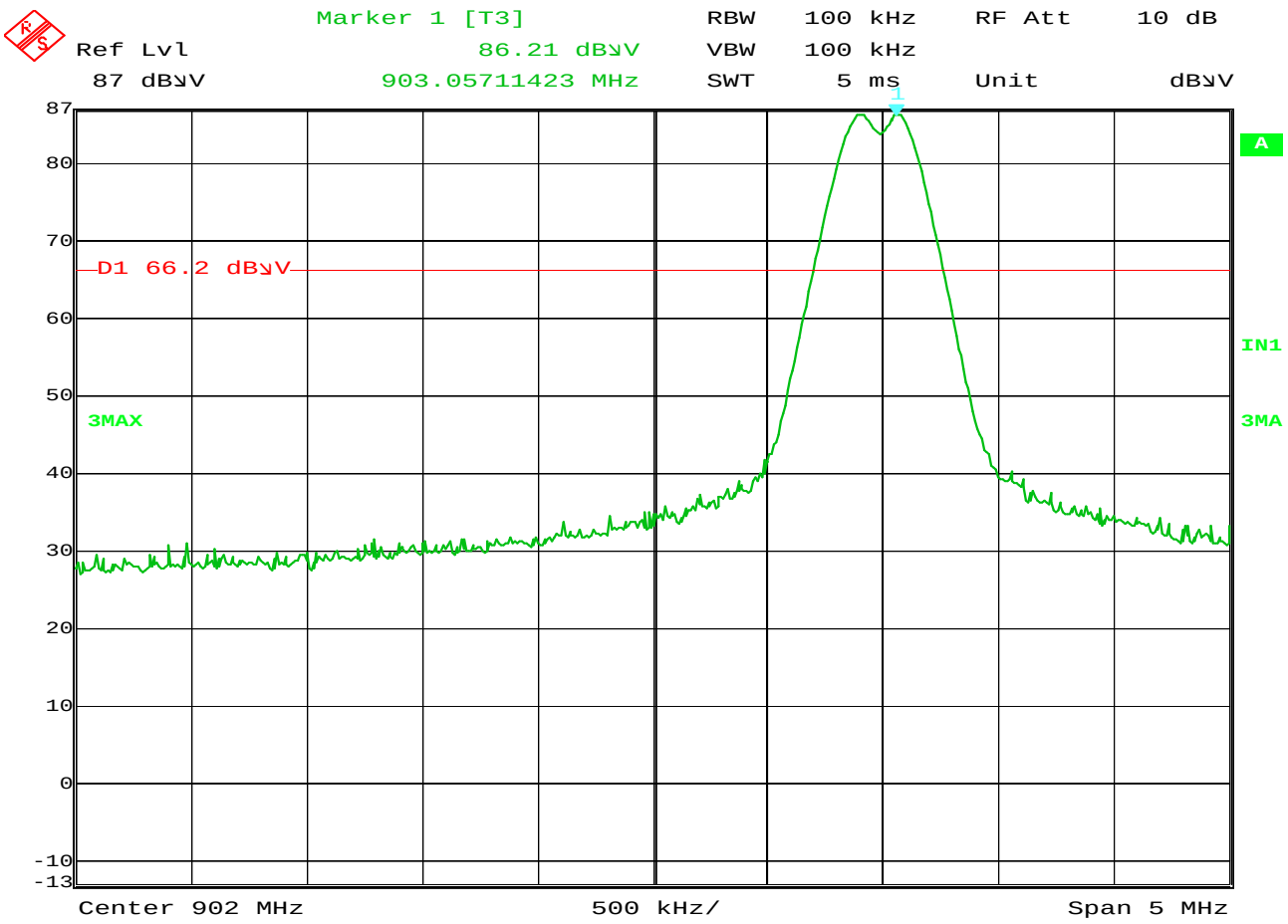
Peak Power Output

MANUFACTURER : California Eastern Labs
MODEL NUMBER : ZICM900P2
TEST MODE : Transmit at 915MHz
TEST PARAMETERS : 19dBm
NOTES :



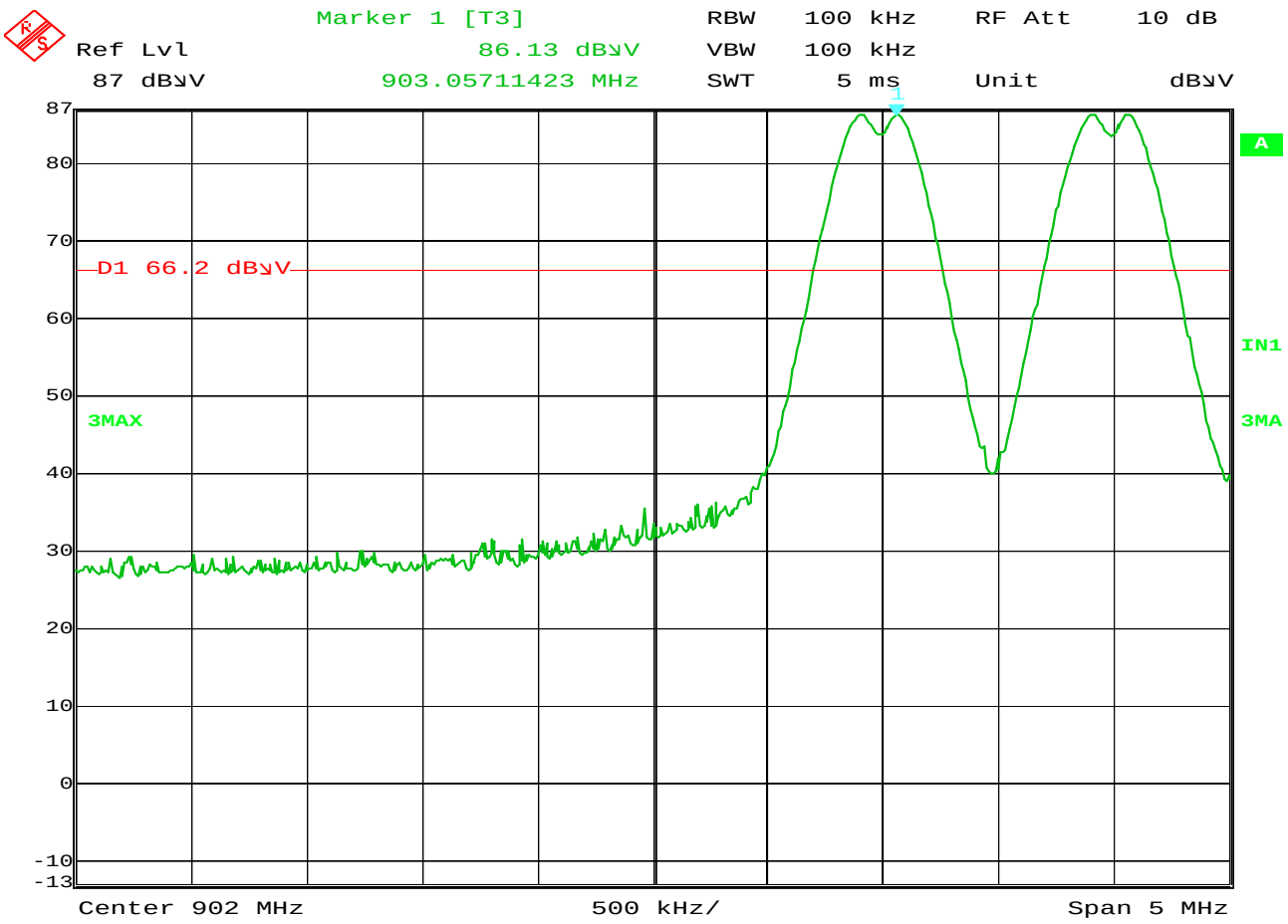
Peak Power Output

MANUFACTURER : California Eastern Labs
MODEL NUMBER : ZICM900P2
TEST MODE : Transmit at 927MHz
TEST PARAMETERS : 18.7dBm
NOTES :



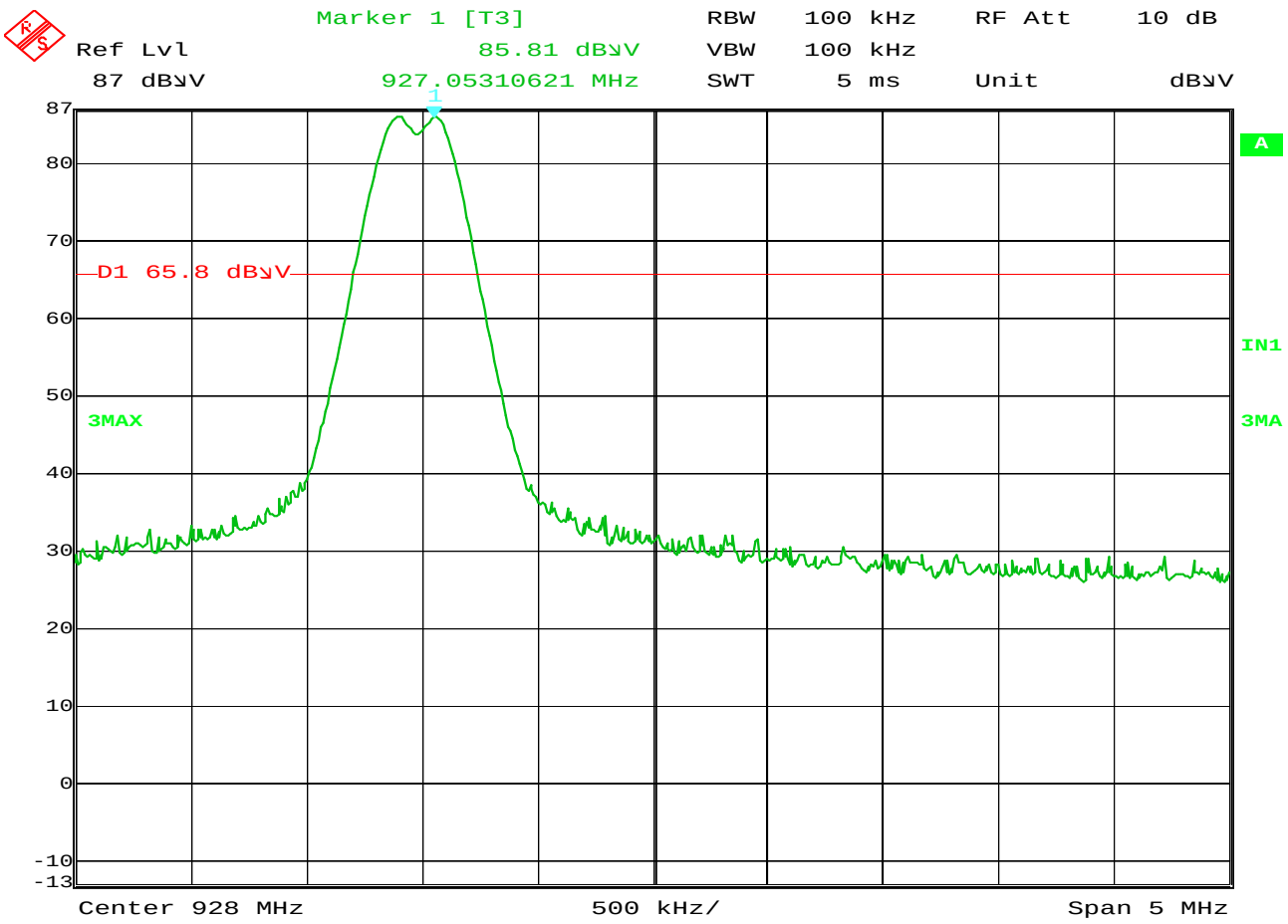
Band Edge Emissions

MANUFACTURER	: California Eastern Labs
MODEL NUMBER	: ZICM900P2
TEST MODE	: Transmit at 903MHz
TEST PARAMETERS	: 20dBc limit
NOTES	: Center line is Bandedge



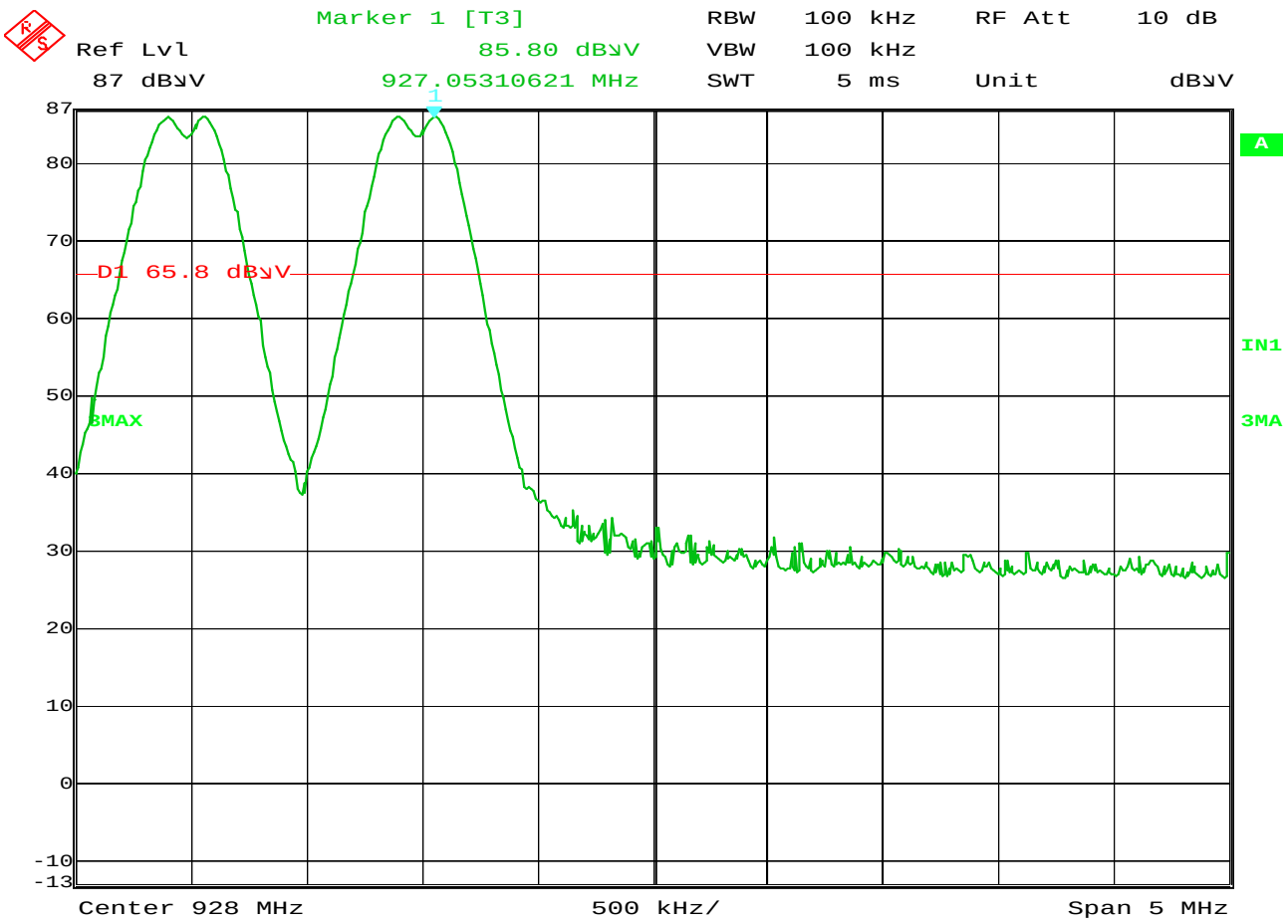
Band Edge Emissions

MANUFACTURER : California Eastern Labs
MODEL NUMBER : ZICM900P2
TEST MODE : Hopping
TEST PARAMETERS : 20dBc limit
NOTES : Center line is Bandedge



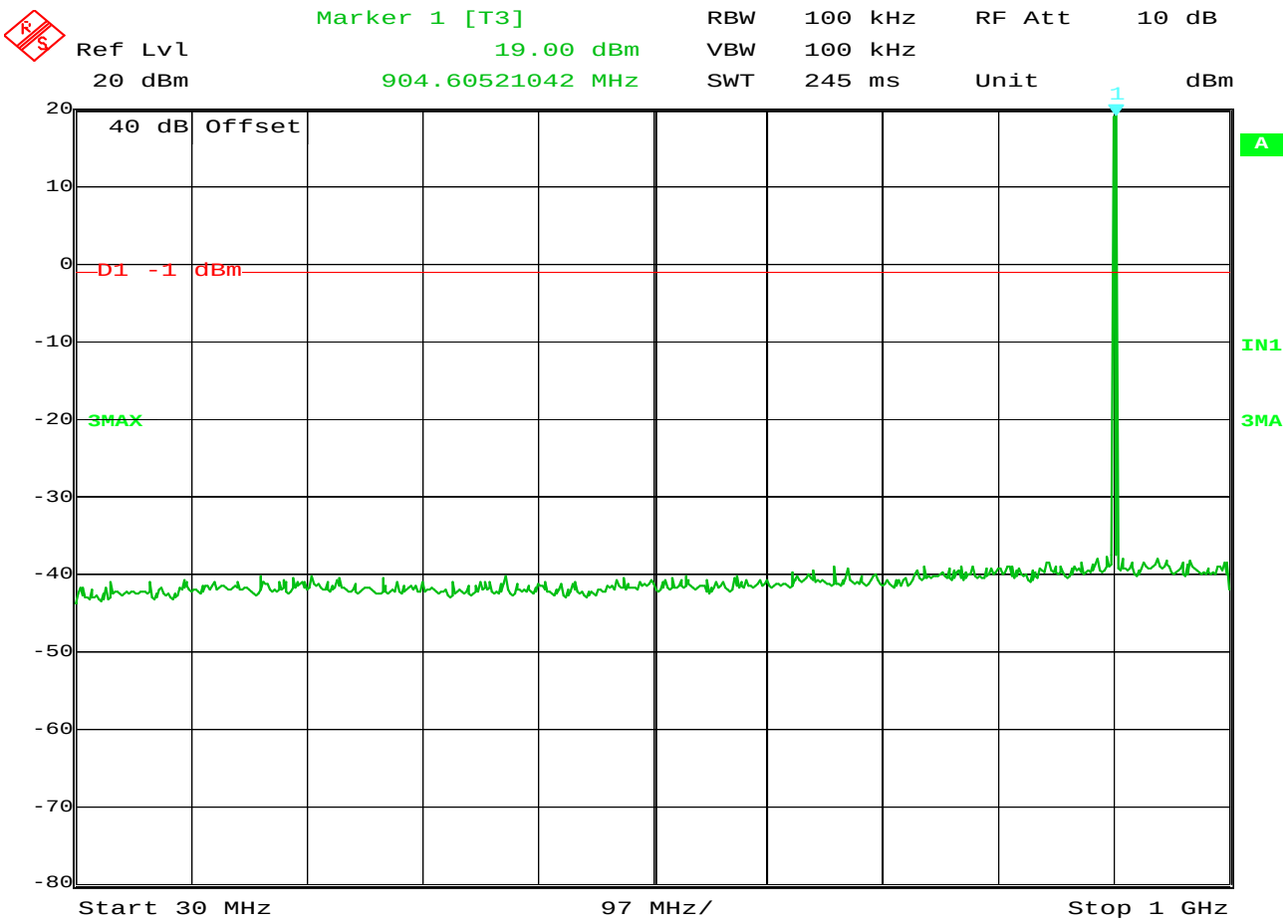
Band Edge Emissions

MANUFACTURER : California Eastern Labs
MODEL NUMBER : ZICM900P2
TEST MODE : Hopping
TEST PARAMETERS : 20dBc limit
NOTES : Center line is Bandedge



Band Edge Emissions

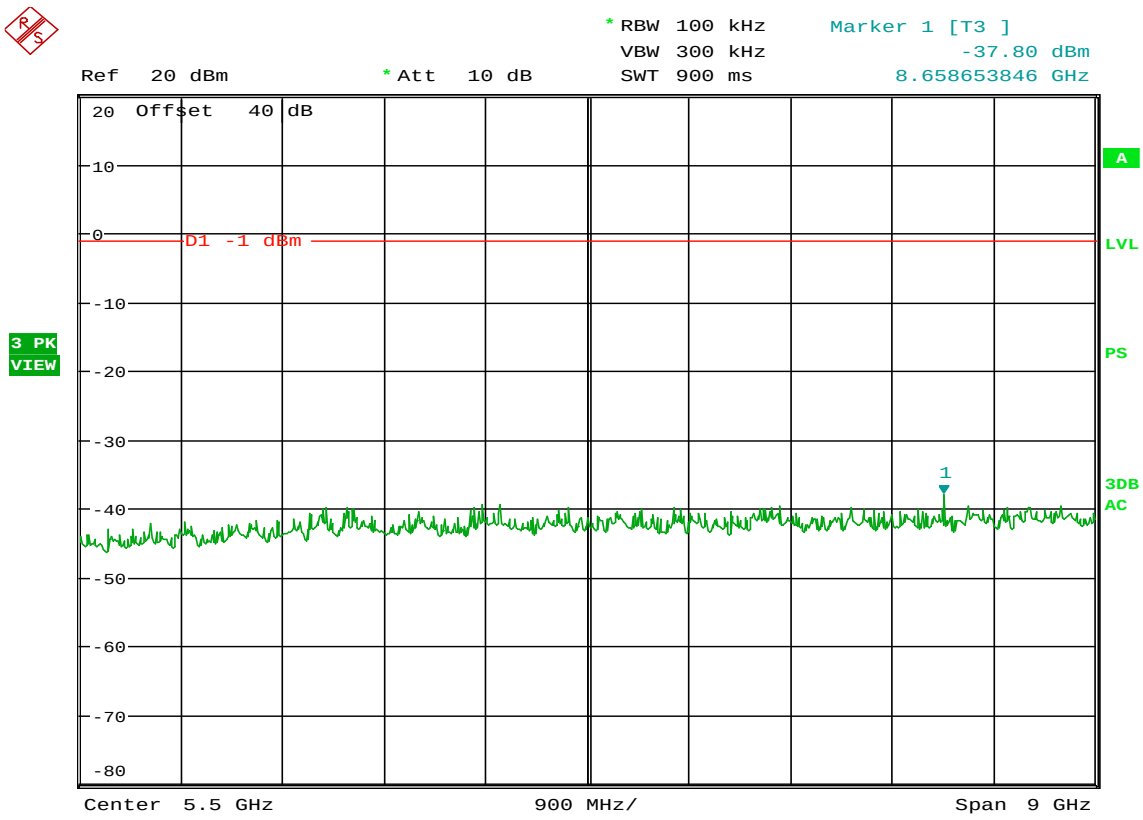
MANUFACTURER : California Eastern Labs
MODEL NUMBER : ZICM900P2
TEST MODE : Hopping
TEST PARAMETERS : 20dBc limit
NOTES : Center line is Bandedge



Date: 26.MAY.2011 10:32:09

Antenna Conducted Emissions

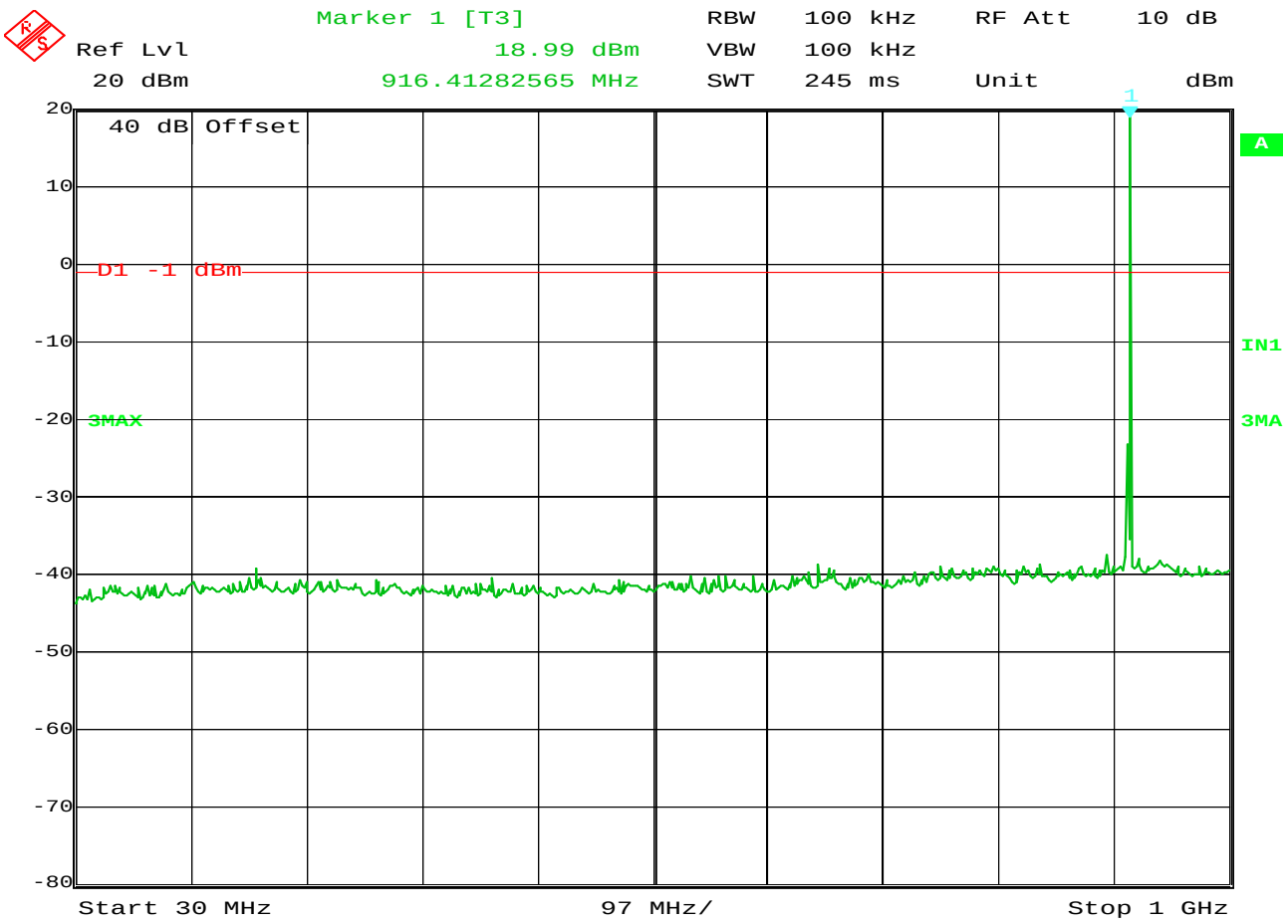
MANUFACTURER : California Eastern Labs
MODEL NUMBER : ZICM900P2
TEST MODE : Transmit at 903MHz
TEST PARAMETERS : 20dBc limit
NOTES :



Date: 1.JUN.2011 13:12:40

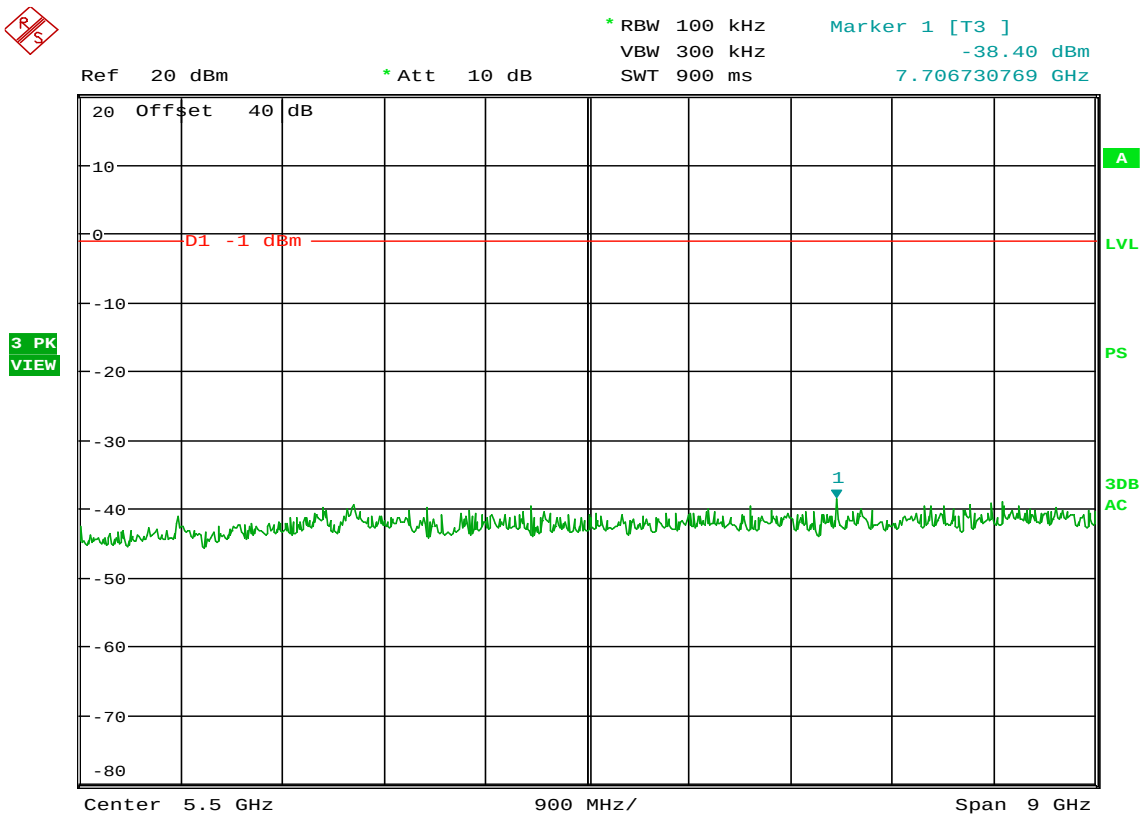
Antenna Conducted Emissions

MANUFACTURER	: California Eastern Labs
MODEL NUMBER	: ZICM900P2
TEST MODE	: Transmit at 903MHz
TEST PARAMETERS	: 20dBc limit
NOTES	:



Antenna Conducted Emissions

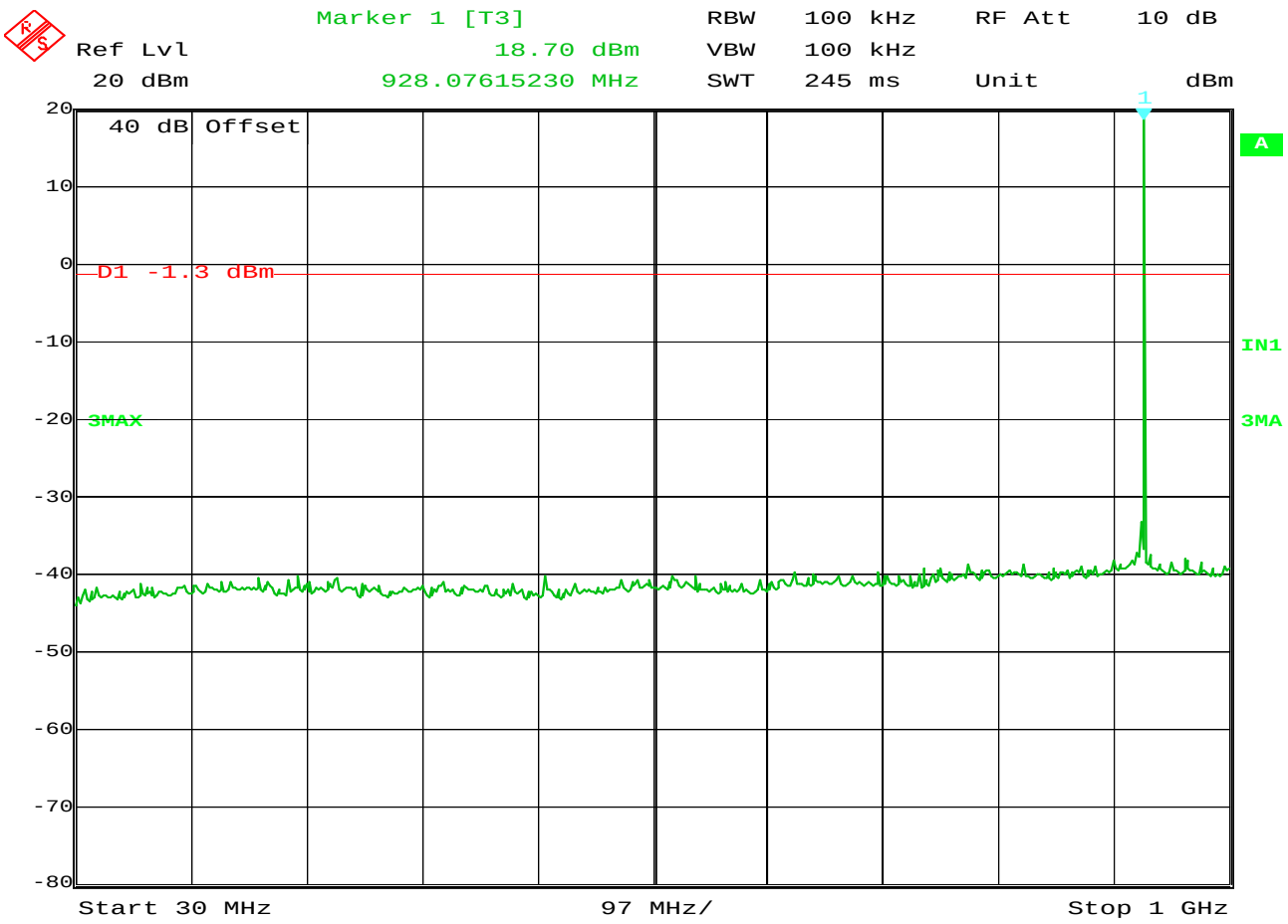
MANUFACTURER : California Eastern Labs
MODEL NUMBER : ZICM900P2
TEST MODE : Transmit at 915MHz
TEST PARAMETERS : 20dBc limit
NOTES :



Date: 1.JUN.2011 13:15:48

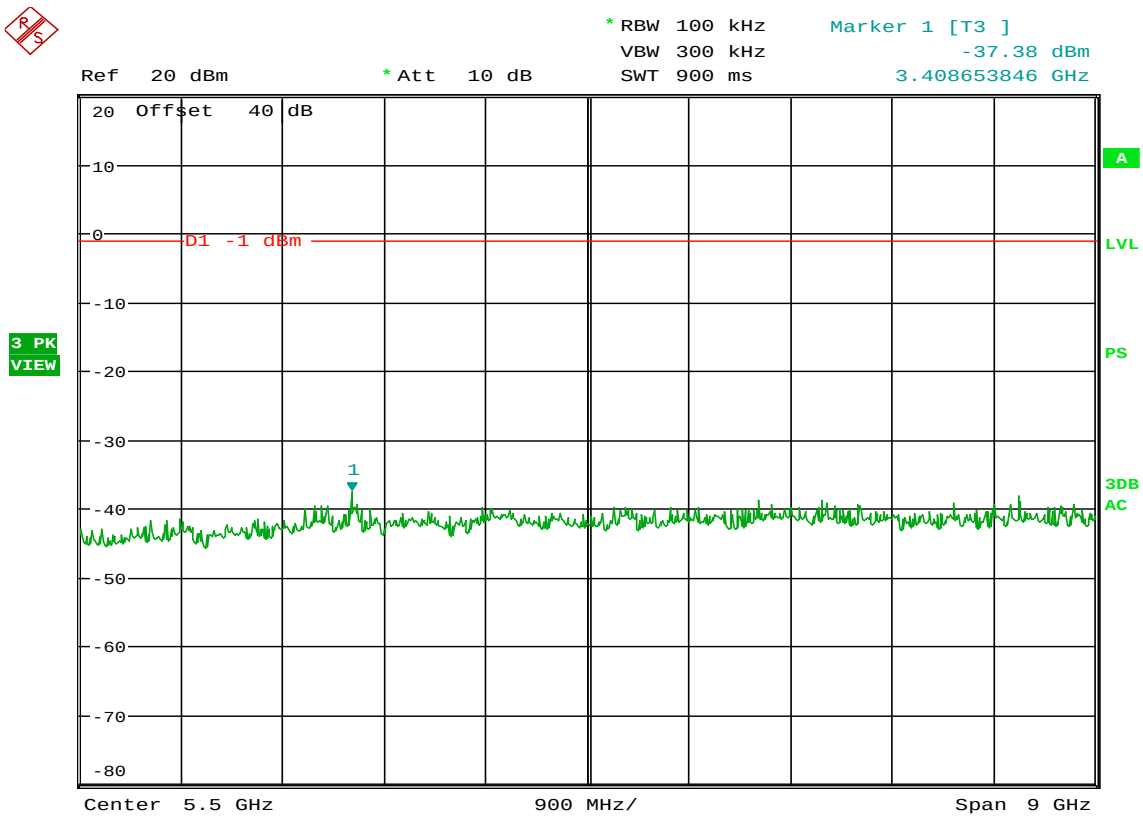
Antenna Conducted Emissions

MANUFACTURER	: California Eastern Labs
MODEL NUMBER	: ZICM900P2
TEST MODE	: Transmit at 915MHz
TEST PARAMETERS	: 20dBc limit
NOTES	:



Antenna Conducted Emissions

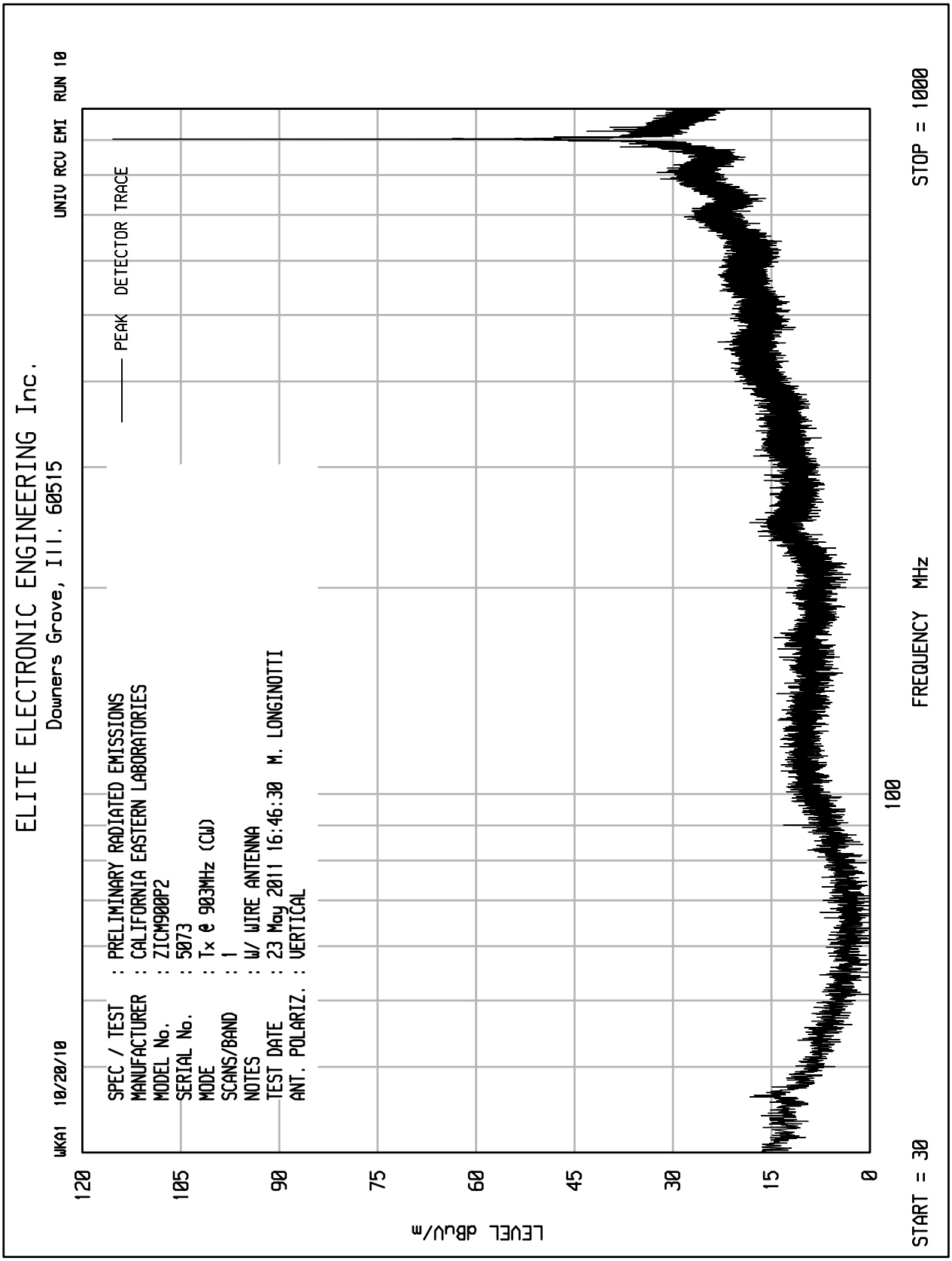
MANUFACTURER : California Eastern Labs
MODEL NUMBER : ZICM900P2
TEST MODE : Transmit at 927MHz
TEST PARAMETERS : 20dBc limit
NOTES :

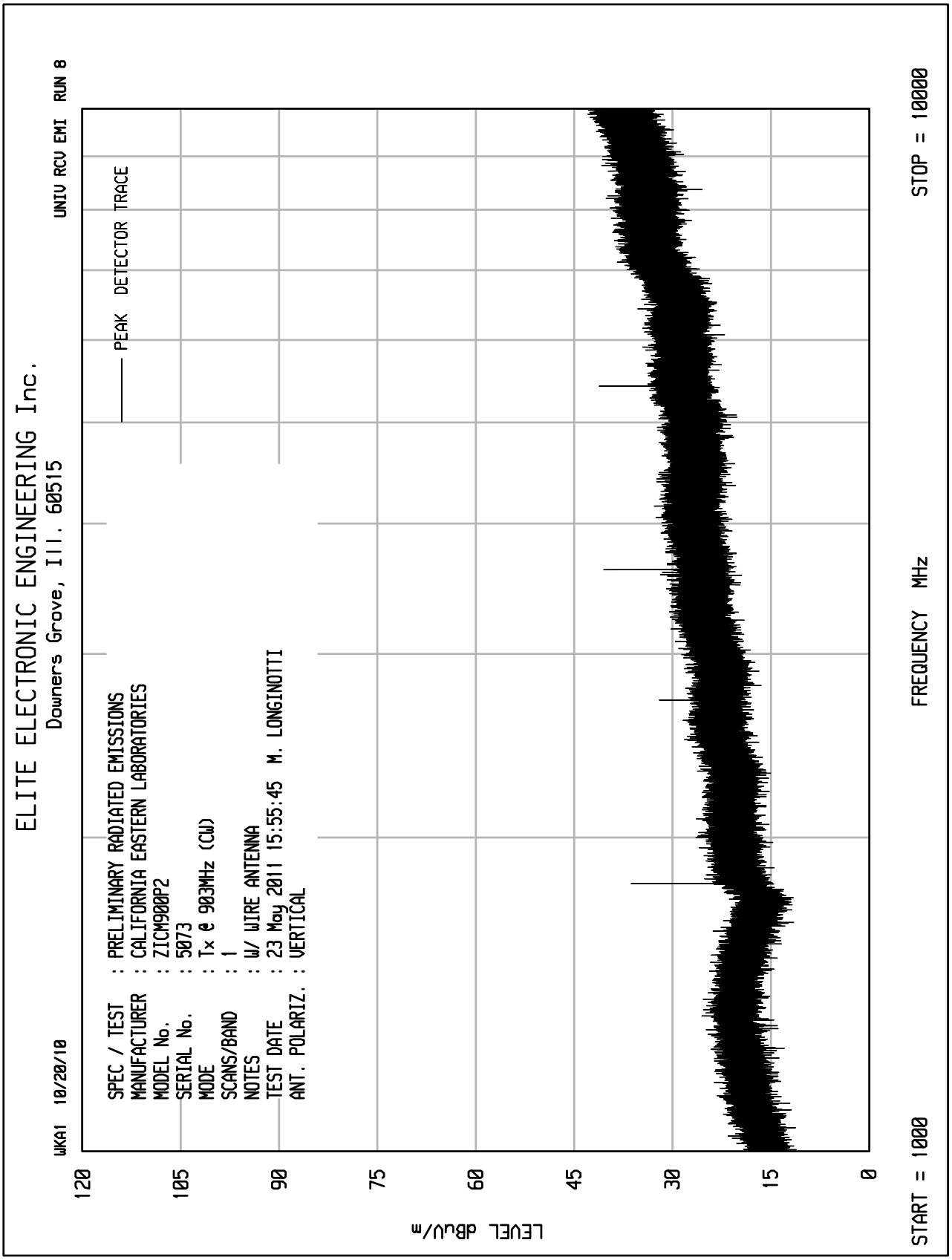


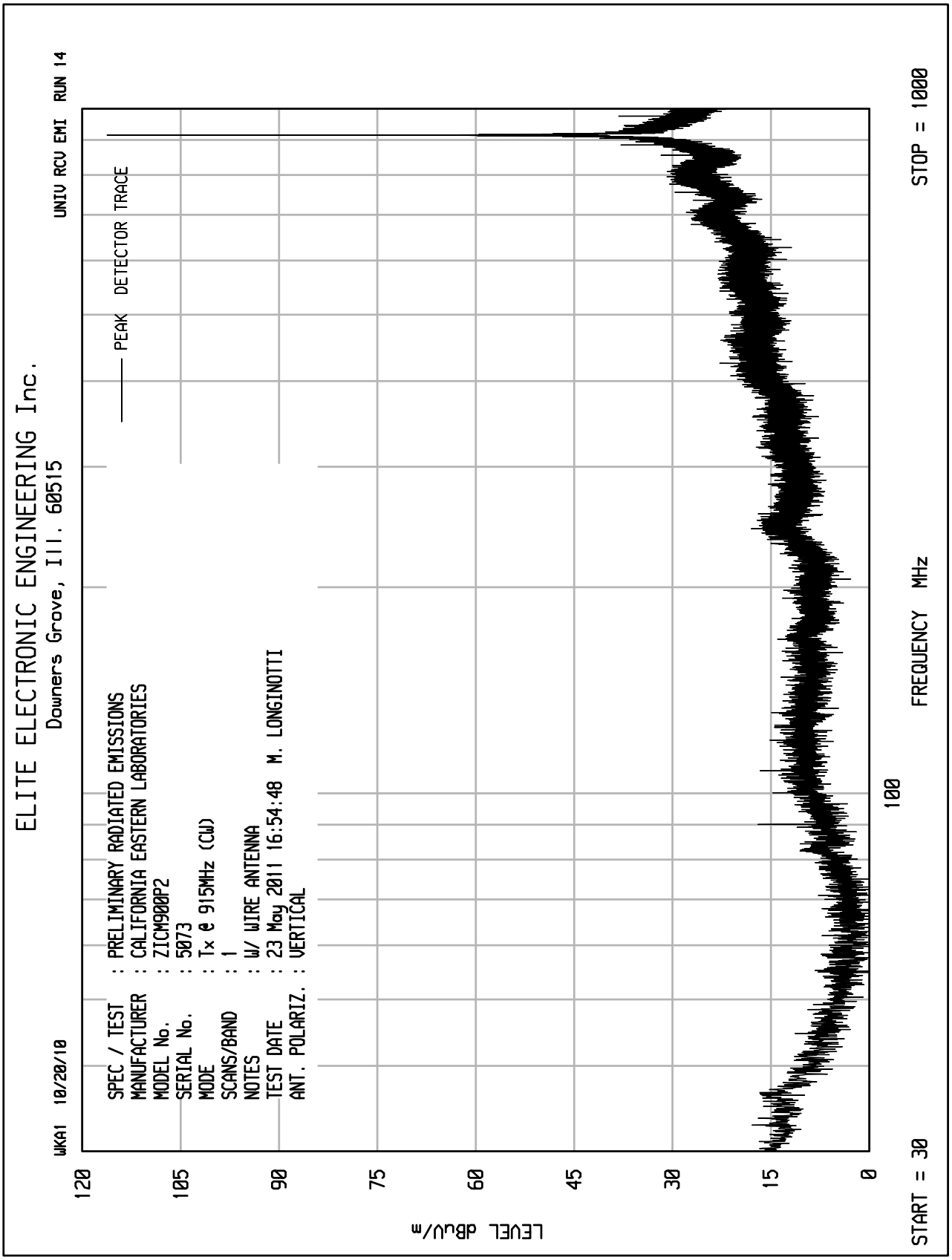
Date: 1.JUN.2011 13:16:58

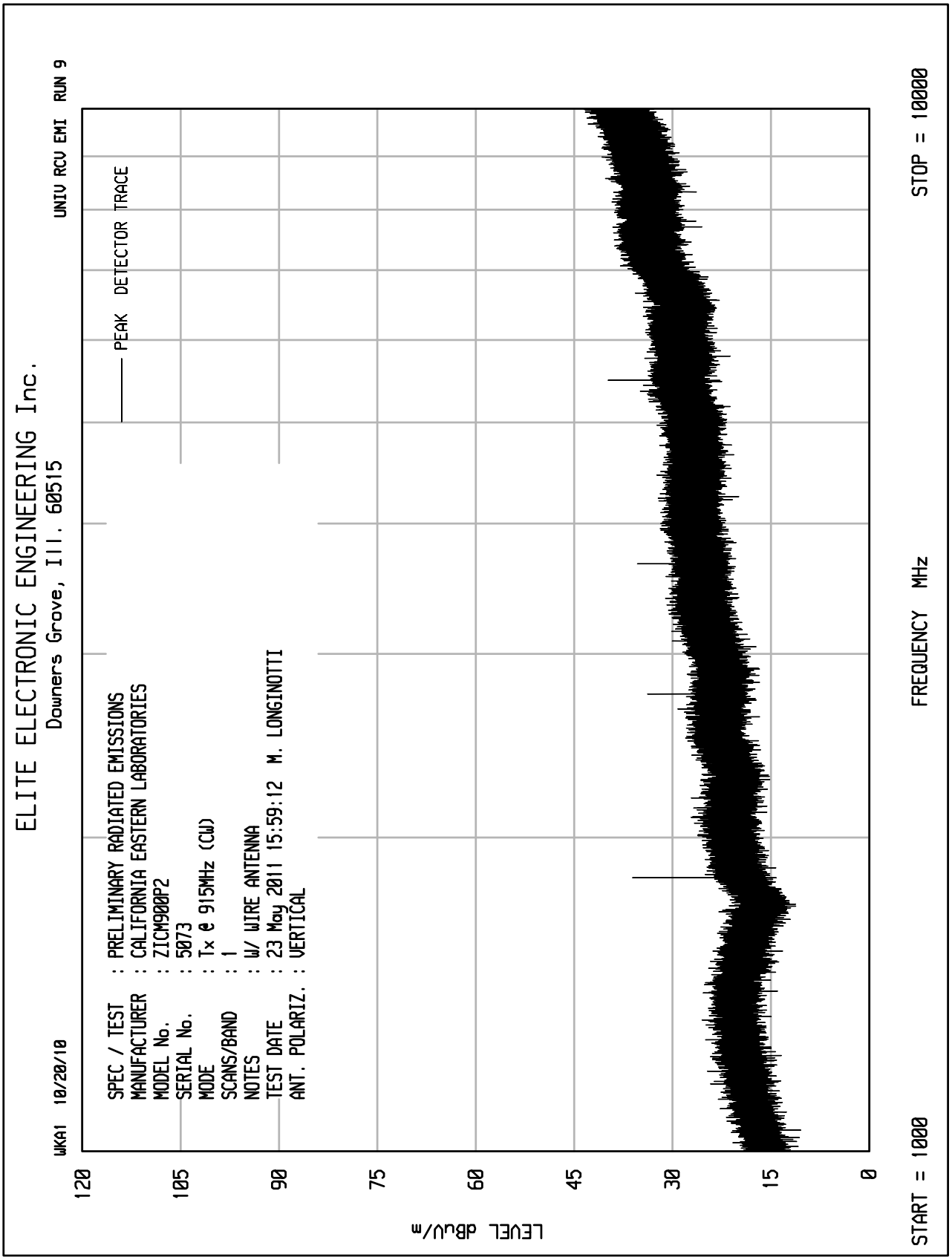
Antenna Conducted Emissions

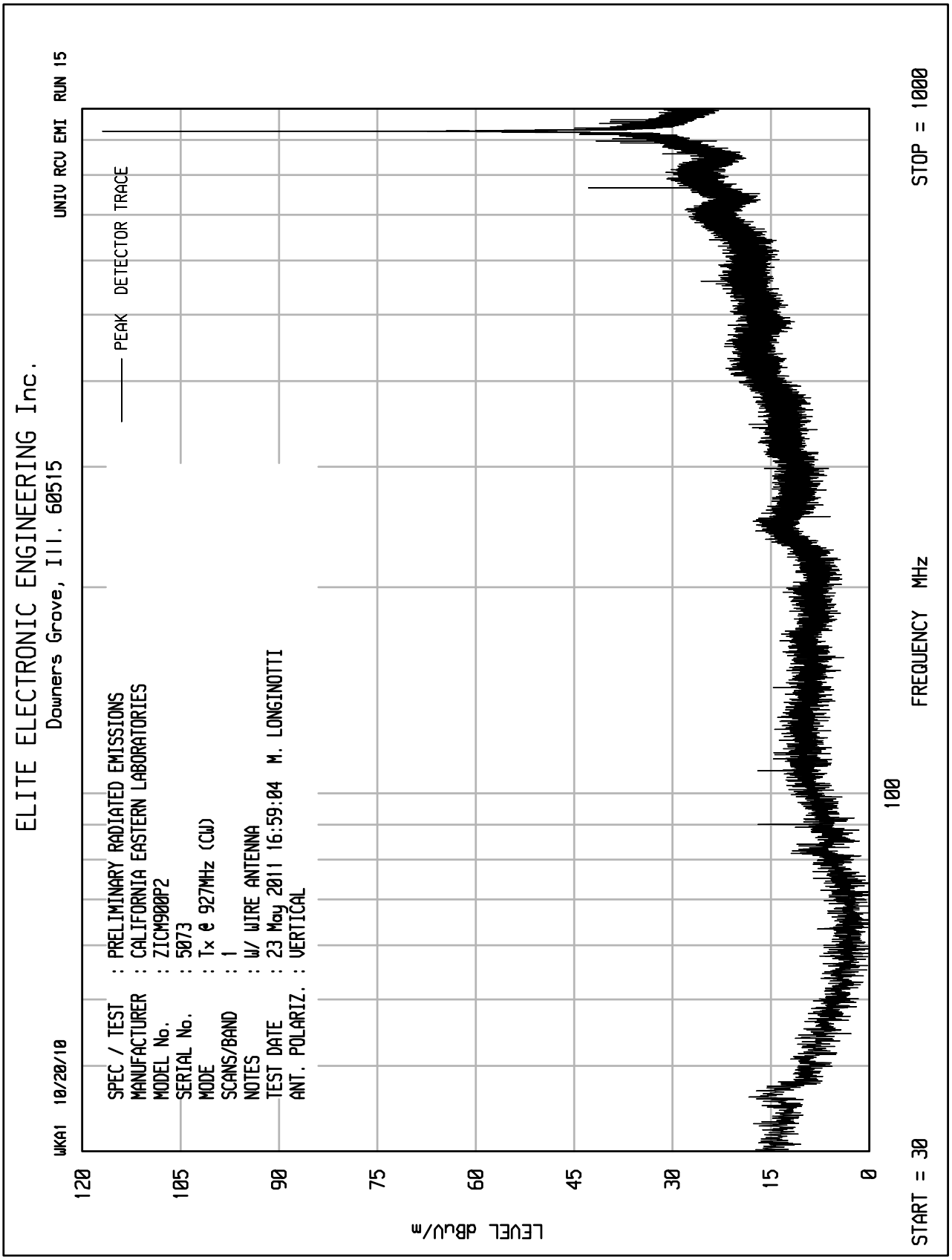
MANUFACTURER	: California Eastern Labs
MODEL NUMBER	: ZICM900P2
TEST MODE	: Transmit at 927MHz
TEST PARAMETERS	: 20dBc limit
NOTES	:

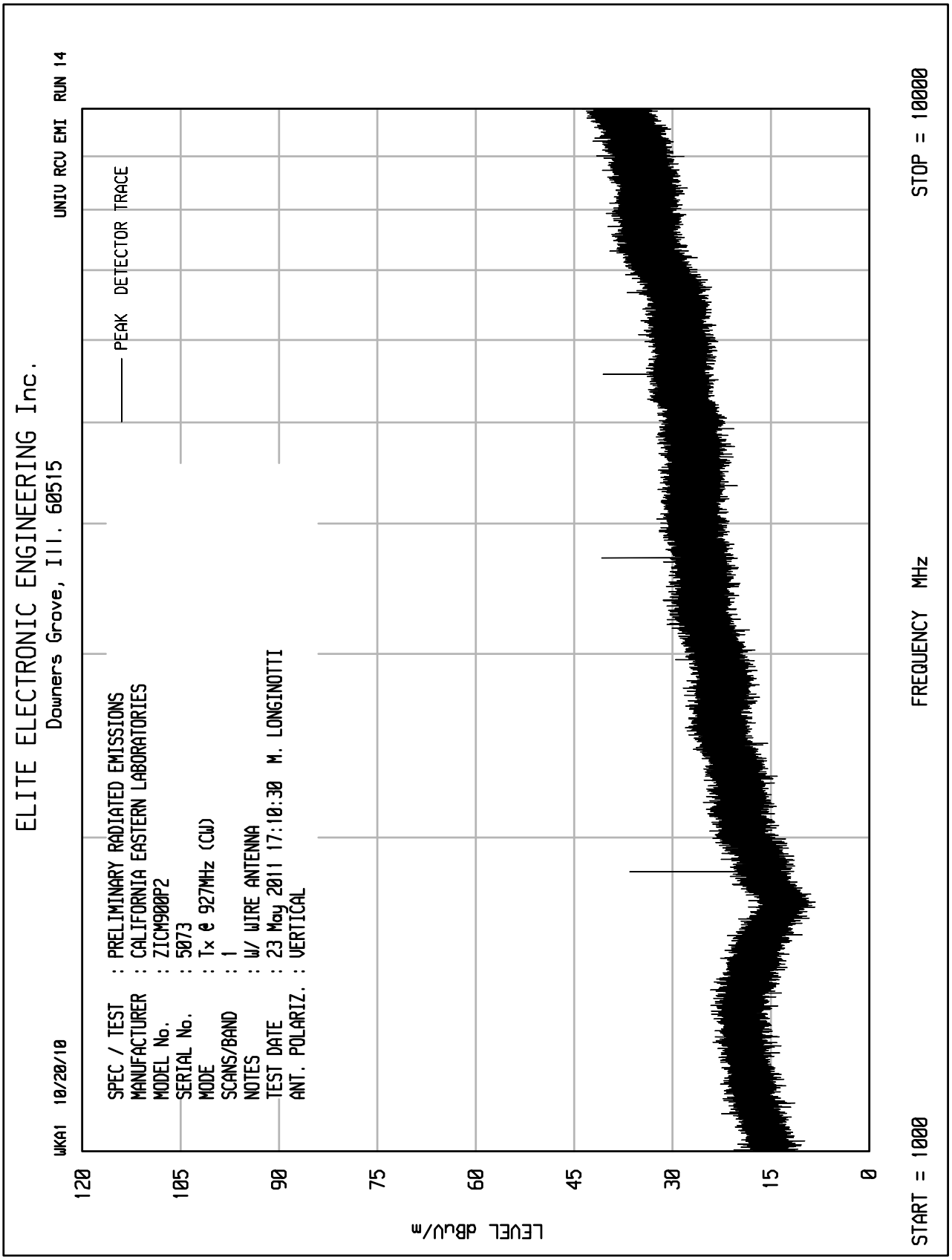

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 10
WKA1 10/20/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : ZICM900P2
SERIAL No. : 5073
MODE : Tx @ 903MHz (CW)
SCANS/BAND : 1
NOTES : W/ WIRE ANTENNA
TEST DATE : 23 May 2011 16:46:30 M. LONGINOTTI
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

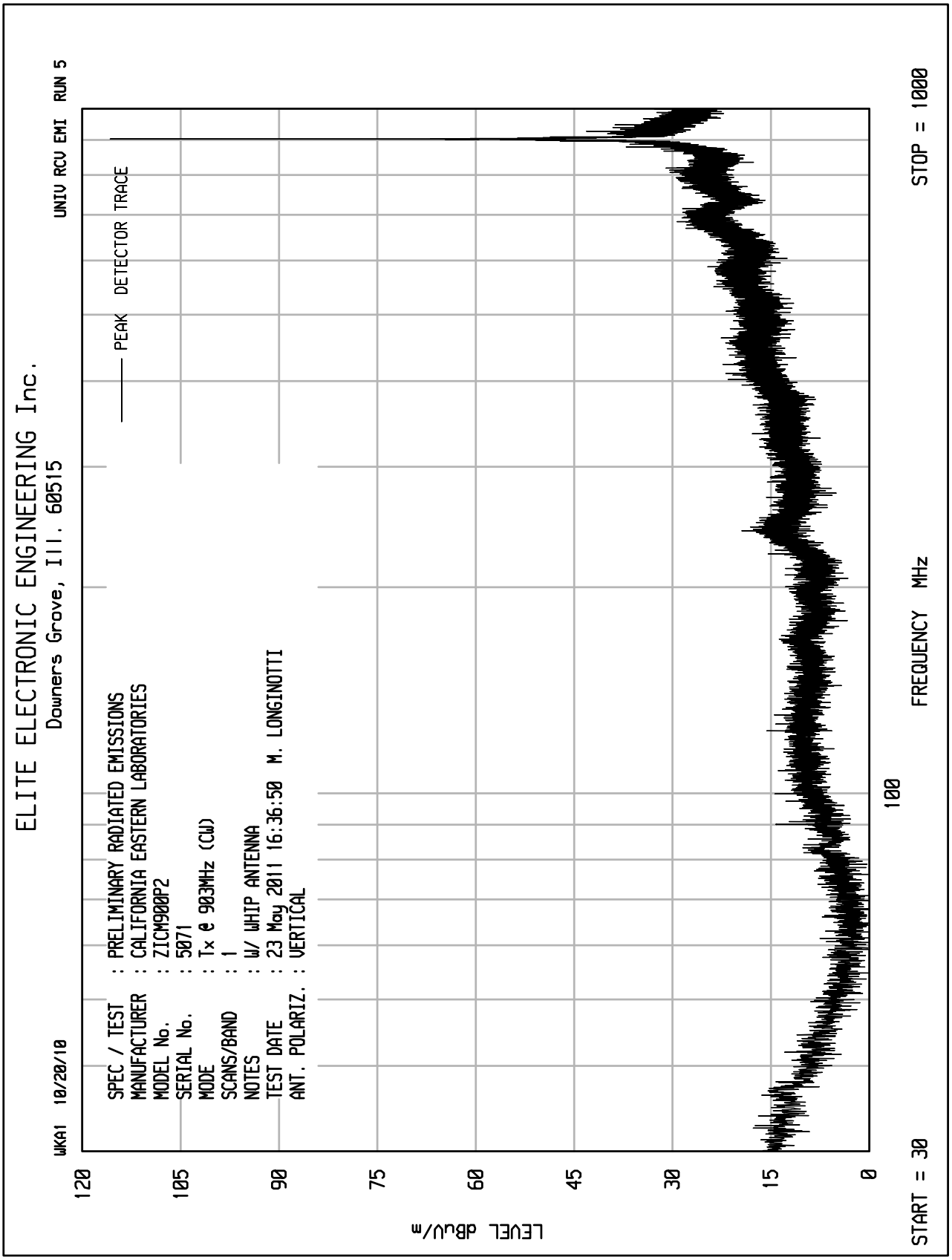

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 8
WKA1 10/20/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : ZICM900P2
SERIAL No. : 5073
MODE : Tx @ 903MHz (CW)
SCANS/BAND : 1
NOTES : W/ WIRE ANTENNA
TEST DATE : 23 May 2011 15:55:45 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 10000

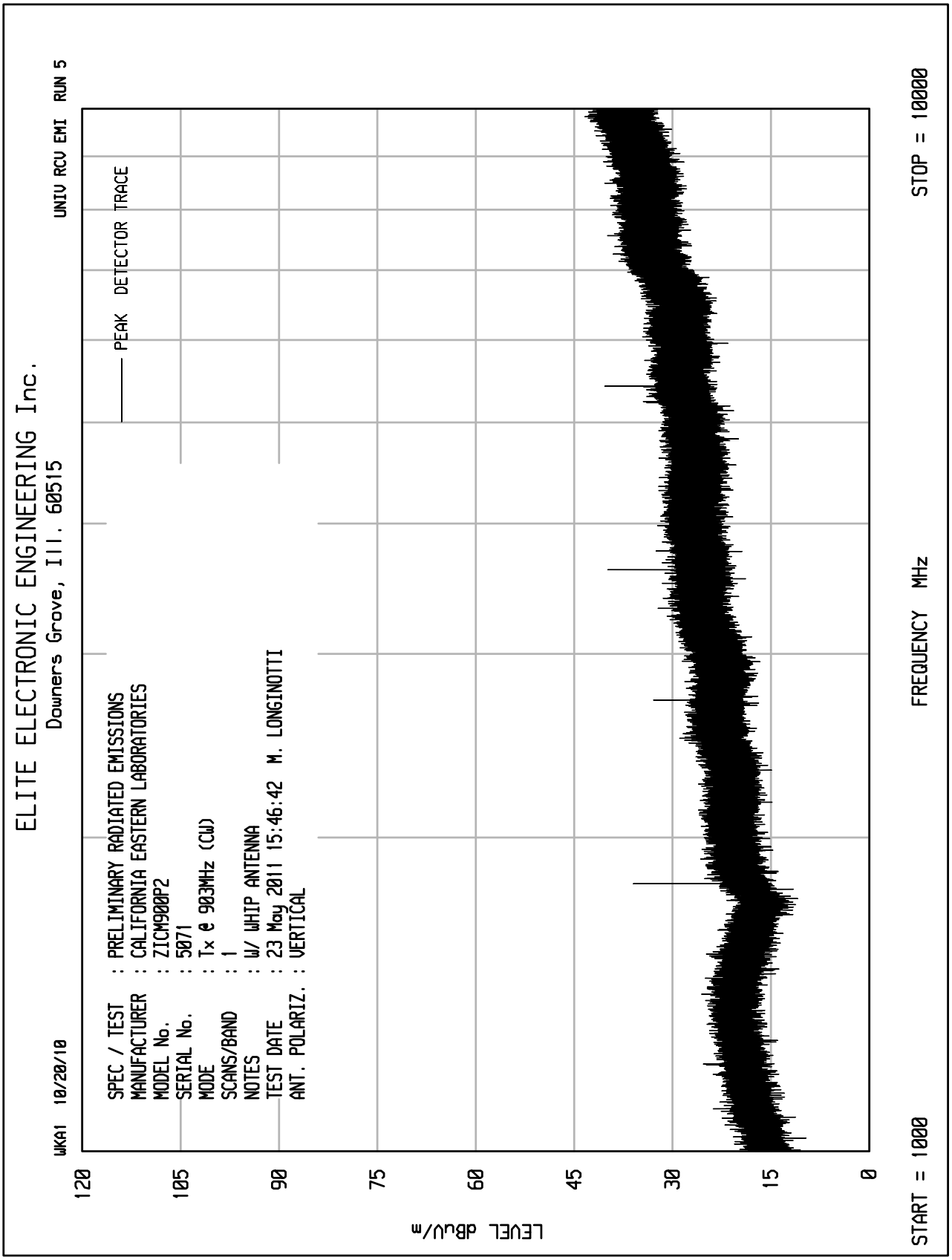

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 14
WKA1 10/20/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : ZICM900P2
SERIAL No. : 5073
MODE : Tx @ 915MHz (CW)
SCANS/BAND : 1
NOTES : W/ WIRE ANTENNA
TEST DATE : 23 May 2011 16:54:48 M. LONGINOTTI
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

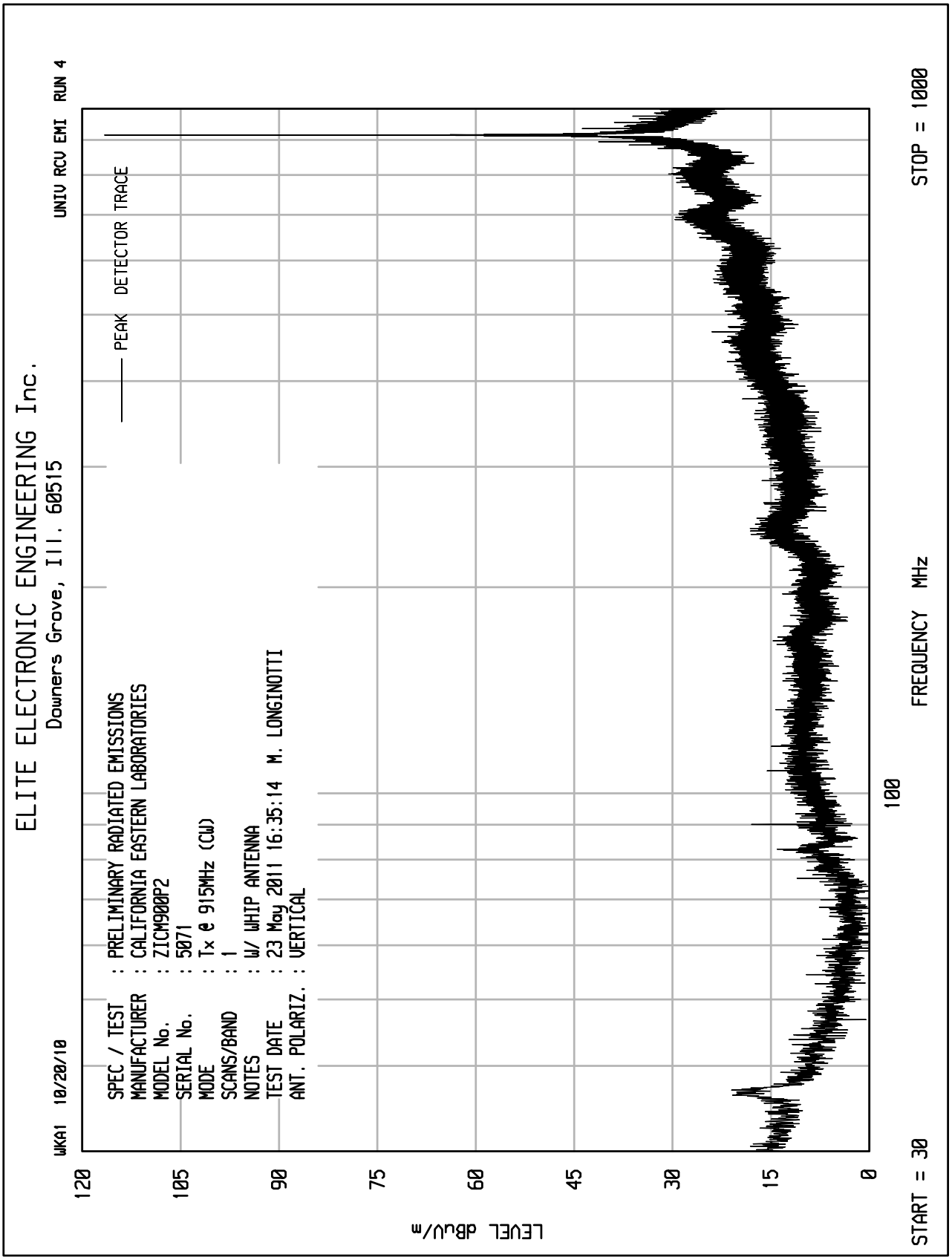

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 9
WKA1 10/20/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : ZICM900P2
SERIAL No. : 5073
MODE : Tx @ 915MHz (CW)
SCANS/BAND : 1
NOTES : W/ WIRE ANTENNA
TEST DATE : 23 May 2011 15:59:12 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 10000

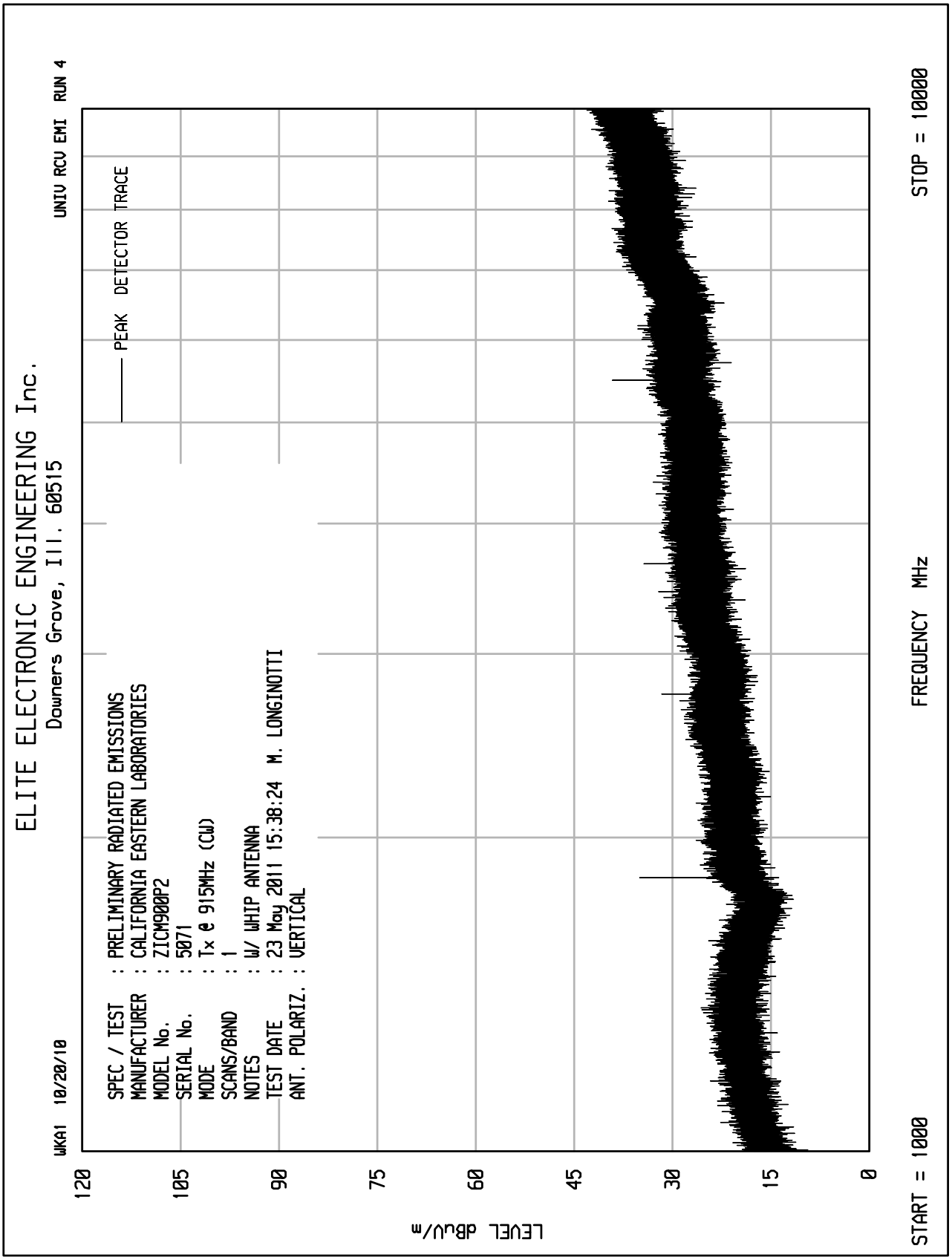

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 15
WKA1 10/20/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : ZICM900P2
SERIAL No. : 5073
MODE : Tx @ 927MHz (CW)
SCANS/BAND : 1
NOTES : W/ WIRE ANTENNA
TEST DATE : 23 May 2011 16:59:04 M. LONGINOTTI
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

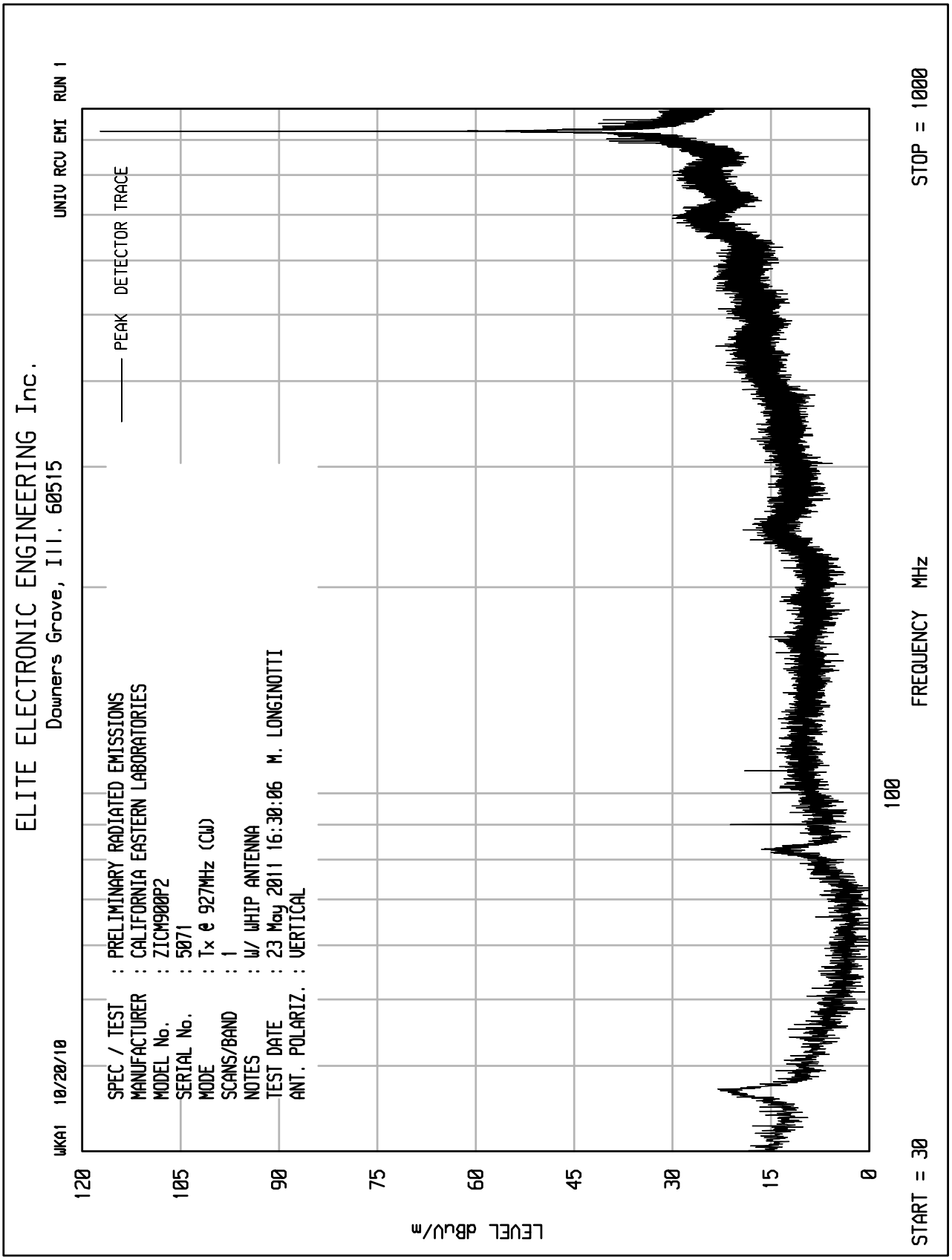

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 14
WKA1 10/20/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : ZICM900P2
SERIAL No. : 5073
MODE : Tx @ 927MHz (CW)
SCANS/BAND : 1
NOTES : W/ WIRE ANTENNA
TEST DATE : 23 May 2011 17:10:30 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 10000

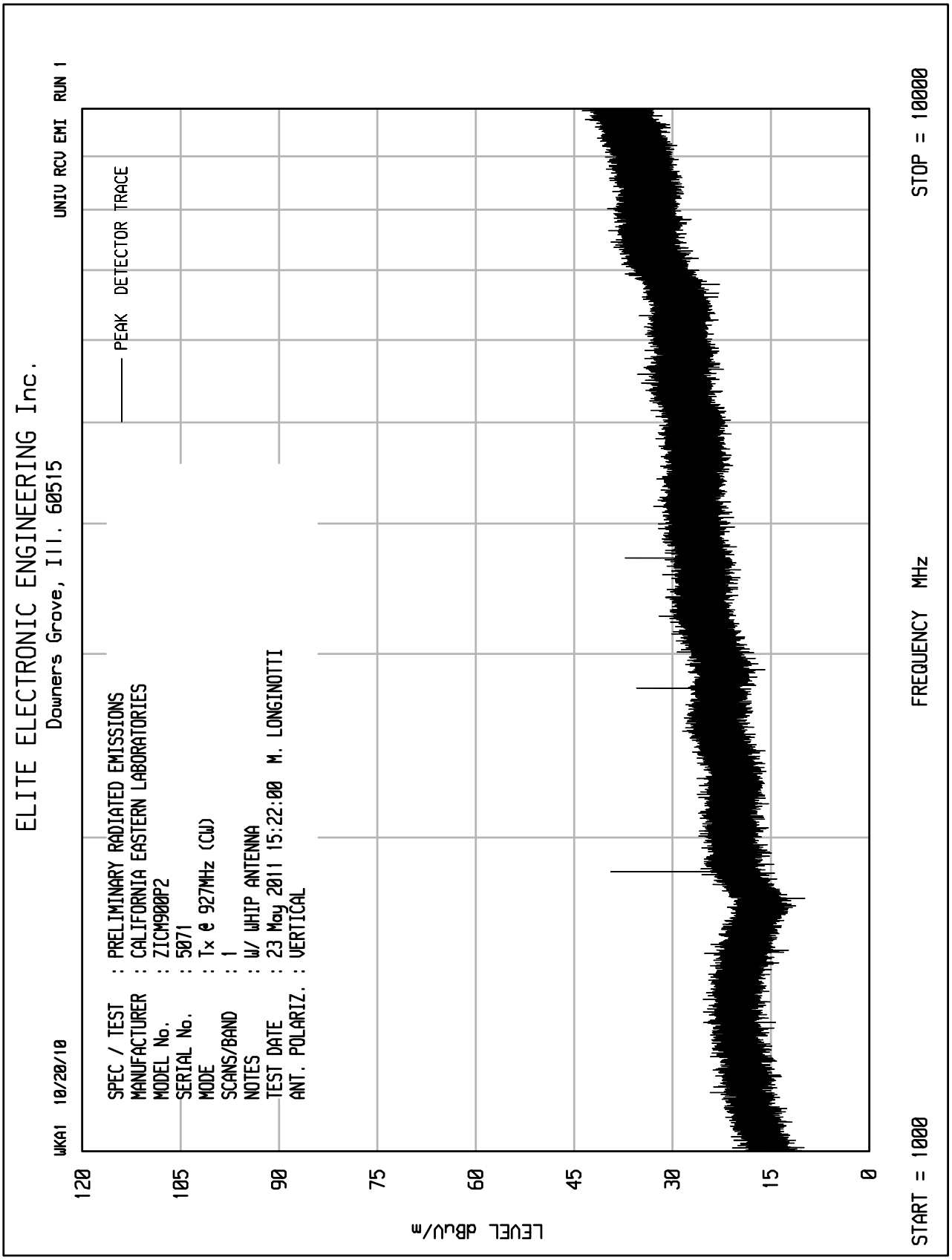

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 5
WKA1 10/20/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : ZICM900P2
SERIAL No. : 5071
MODE : Tx @ 903MHz (CW)
SCANS/BAND : 1
NOTES : W/ WHIP ANTENNA
TEST DATE : 23 May 2011 16:36:50 M. LONGINOTTI
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 5
WKA1 10/20/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : ZICM900P2
SERIAL No. : 5071
MODE : Tx @ 903MHz (CW)
SCANS/BAND : 1
NOTES : W/ WHIP ANTENNA
TEST DATE : 23 May 2011 15:46:42 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 10000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 4
WKA1 10/20/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : ZICM900P2
SERIAL No. : 5071
MODE : Tx @ 915MHz (CW)
SCANS/BAND : 1
NOTES : W/ WHIP ANTENNA
TEST DATE : 23 May 2011 16:35:14 M. LONGINOTTI
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 4
WKA1 10/20/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : ZICM900P2
SERIAL No. : 5071
MODE : Tx @ 915MHz (CW)
SCANS/BAND : 1
NOTES : W/ WHIP ANTENNA
TEST DATE : 23 May 2011 15:38:24 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 10000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 1
WKA1 10/20/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : ZICM900P2
SERIAL No. : 5071
MODE : Tx @ 927MHz (CW)
SCANS/BAND : 1
NOTES : W/ WHIP ANTENNA
TEST DATE : 23 May 2011 16:30:06 M. LONGINOTTI
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 1
WKA1 10/20/10
SPEC / TEST : PRELIMINARY RADIATED EMISSIONS
MANUFACTURER : CALIFORNIA EASTERN LABORATORIES
MODEL No. : ZICM900P2
SERIAL No. : 5071
MODE : Tx @ 927MHz (CW)
SCANS/BAND : 1
NOTES : W/ WHIP ANTENNA
TEST DATE : 23 May 2011 15:22:00 M. LONGINOTTI
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 10000

DATA PAGE

Manufacturer : California Eastern Laboratories
Model No. : ZICM900P2
Test Specification : FCC Part 15, Subpart C, Section 15.247, Radiated Emissions
Date : May 27, 2011
Mode : Transmit at 903MHz
Test Distance : 3 meters
Notes : Whip antenna
Notes : Peak Detector
: Total = Meter Reading + Cable Loss + Antenna Factor + Preamp Gain

Freq (MHz)	Ant Pol	Meter Reading (dBuV)	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Total dBuV/m at 3 M	Total uV/m at 3M	Limit uV/m at 3M	Margin (dB)
903.0	H	92.8	2.0	21.8	0.0	116.6	676083.0		
903.0	V	96.3	2.0	21.8	0.0	120.1	1011579.5		
2709.0	H	52.8	3.7	29.6	-40.3	45.7	192.8	500.0	-8.3
2709.0	V	51.4	3.7	29.6	-40.3	44.3	164.1	500.0	-9.7
3612.0	H	48.4	4.3	32.0	-39.9	44.8	174.5	500.0	-9.1
3612.0	V	51.0	4.3	32.0	-39.9	47.4	235.4	500.0	-6.5
4515.0	H	46.8	4.8	32.9	-40.0	44.5	168.6	500.0	-9.4
4515.0	V	46.7	4.8	32.9	-40.0	44.4	166.7	500.0	-9.5
5418.0	H	48.6	5.2	35.2	-40.1	48.9	278.7	500.0	-5.1
5418.0	V	49.5	5.2	35.2	-40.1	49.8	309.1	500.0	-4.2
8127.0	H	46.9	6.5	38.5	-39.6	52.3	410.9	500.0	-1.7
8127.0	V	47.0	6.5	38.5	-39.6	52.4	415.7	500.0	-1.6
9030.0	H	46.1	6.5	39.6	-39.1	53.2	456.2	500.0	-0.8
9030.0	V	46.3	6.5	39.6	-39.1	53.4	466.8	500.0	-0.6

DATA PAGE

Manufacturer : California Eastern Laboratories
Model No. : ZICM900P2
Test Specification : FCC Part 15, Subpart C, Section 15.247, Radiated Emissions
Date : May 27, 2011
Mode : Transmit at 915MHz
Test Distance : 3 meters
Notes : Whip antenna
Notes : Average Readings in Restricted Bands
: Total = Meter Reading + Cable Loss + Antenna Factor + Preamp Gain + Duty Cycle Factor

Freq (MHz)	Ant Pol	Meter Reading (dBuV)	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Total dBuV/m at 3 M	Total uV/m at 3M	Limit uV/m at 3M	Margin (dB)
915.0	H	93.2	2.0	21.8	0.0	117.0	707945.8		
915.0	V	96.4	2.0	21.8	0.0	120.2	1023293.0		
2745.0	H	52.5	3.7	29.6	-40.3	45.4	186.7	500.0	-8.6
2745.0	V	55.4	3.7	29.6	-40.3	48.3	260.6	500.0	-5.7
3660.0	H	48.9	4.3	32.2	-39.8	45.7	192.8	500.0	-8.3
3660.0	V	50.4	4.3	32.2	-39.8	47.2	229.1	500.0	-6.8
4575.0	H	46.6	4.8	33.1	-40.0	44.5	168.6	500.0	-9.4
4575.0	V	46.3	4.8	33.1	-40.0	44.2	162.9	500.0	-9.7
7320.0	H	47.3	6.2	37.3	-39.8	51.0	354.2	500.0	-3.0
7320.0	V	47.1	6.2	37.3	-39.8	50.8	346.1	500.0	-3.2
8235.0	H	47.2	6.5	38.6	-39.5	52.8	435.9	500.0	-1.2
8235.0	V	47.4	6.5	38.6	-39.5	53.0	446.0	500.0	-1.0
9150.0	H	46.0	6.6	39.8	-39.0	53.4	465.4	500.0	-0.6
9150.0	V	46.0	6.6	39.8	-39.0	53.4	465.4	500.0	-0.6

DATA PAGE

Manufacturer : California Eastern Laboratories
Model No. : ZICM900P2
Test Specification : FCC Part 15, Subpart C, Section 15.247, Radiated Emissions
Date : May 27, 2011
Mode : Transmit at 927MHz
Test Distance : 3 meters
Notes : Whip antenna
Notes : Peak Detector
: Total = Meter Reading + Cable Loss + Antenna Factor + Preamp Gain

Freq (MHz)	Ant Pol	Meter Reading (dBuV)	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Total dBuV/m at 3 M	Total uV/m at 3M	Limit uV/m at 3M	Margin (dB)
927.0	H	92.3	2.0	21.9	0.0	116.2	643464.4		
927.0	V	96.2	2.0	21.9	0.0	120.1	1008148.5		
2781.0	H	52.9	3.7	29.6	-40.4	45.8	195.9	500.0	-8.1
2781.0	V	53.1	3.7	29.6	-40.4	46.0	200.5	500.0	-7.9
3708.0	H	50.0	4.3	32.4	-39.6	47.2	227.8	500.0	-6.8
3708.0	V	50.4	4.3	32.4	-39.6	47.6	238.5	500.0	-6.4
4635.0	H	46.3	4.8	33.3	-40.0	44.4	166.5	500.0	-9.5
4635.0	V	46.3	4.8	33.3	-40.0	44.4	166.5	500.0	-9.5
7416.0	H	46.8	6.2	37.4	-39.7	50.7	342.6	500.0	-3.3
7416.0	V	46.5	6.2	37.4	-39.7	50.4	331.0	500.0	-3.6
8343.0	H	47.1	6.5	38.7	-39.5	52.9	441.4	500.0	-1.1
8343.0	V	46.9	6.5	38.7	-39.5	52.7	431.3	500.0	-1.3

DATA PAGE

Manufacturer : California Eastern Laboratories
Model No. : ZICM900P2
Test Specification : FCC Part 15, Subpart C, Section 15.247, Radiated Emissions
Date : May 27, 2011
Mode : Transmit at 903MHz
Test Distance : 3 meters
Notes : Wire antenna
Notes : Average Readings in Restricted Bands
: Total = Meter Reading + Cable Loss + Antenna Factor + Preamp Gain + Duty Cycle Factor

Freq (MHz)	Ant Pol	Meter Reading (dBuV)	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Total dBuV/m at 3 M	Total uV/m at 3M	Limit uV/m at 3M	Margin (dB)
903.0	H	93.3	2.0	21.8	0.0	117.1	716143.4		
903.0	V	96.4	2.0	21.8	0.0	120.2	1023293.0		
2709.0	H	56.2	3.7	29.6	-40.3	49.1	285.1	500.0	-4.9
2709.0	V	53.2	3.7	29.6	-40.3	46.1	201.8	500.0	-7.9
3612.0	H	48.1	4.3	32.0	-39.9	44.5	168.6	500.0	-9.4
3612.0	V	51.0	4.3	32.0	-39.9	47.4	235.4	500.0	-6.5
4515.0	H	46.4	4.8	32.9	-40.0	44.1	161.1	500.0	-9.8
4515.0	V	47.1	4.8	32.9	-40.0	44.8	174.6	500.0	-9.1
5418.0	H	47.7	5.2	35.2	-40.1	48.0	251.2	500.0	-6.0
5418.0	V	50.1	5.2	35.2	-40.1	50.4	331.2	500.0	-3.6
8127.0	H	46.6	6.5	38.5	-39.6	52.0	397.0	500.0	-2.0
8127.0	V	47.0	6.5	38.5	-39.6	52.4	415.7	500.0	-1.6
9030.0	H	45.3	6.5	39.6	-39.1	52.4	416.0	500.0	-1.6
9030.0	V	45.9	6.5	39.6	-39.1	53.0	445.8	500.0	-1.0

DATA PAGE

Manufacturer : California Eastern Laboratories
Model No. : ZICM900P2
Test Specification : FCC Part 15, Subpart C, Section 15.247, Radiated Emissions
Date : May 27, 2011
Mode : Transmit at 915MHz
Test Distance : 3 meters
Notes : Wire antenna
Notes : Peak Detector
: Total = Meter Reading + Cable Loss + Antenna Factor + Preamp Gain

Freq (MHz)	Ant Pol	Meter Reading (dBuV)	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Total dBuV/m at 3 M	Total uV/m at 3M	Limit uV/m at 3M	Margin (dB)
915.0	H	93.9	2.0	21.8	0.0	117.7	767361.5		
915.0	V	97.1	2.0	21.8	0.0	120.9	1109174.8		
2745.0	H	55.1	3.7	29.6	-40.3	48.0	251.8	500.0	-6.0
2745.0	V	52.0	3.7	29.6	-40.3	44.9	176.2	500.0	-9.1
3660.0	H	48.7	4.3	32.2	-39.8	45.5	188.4	500.0	-8.5
3660.0	V	50.0	4.3	32.2	-39.8	46.8	218.8	500.0	-7.2
4575.0	H	46.4	4.8	33.1	-40.0	44.3	164.7	500.0	-9.6
4575.0	V	46.4	4.8	33.1	-40.0	44.3	164.7	500.0	-9.6
7320.0	H	46.9	6.2	37.3	-39.8	50.6	338.3	500.0	-3.4
7320.0	V	47.1	6.2	37.3	-39.8	50.8	346.1	500.0	-3.2
8235.0	H	47.2	6.5	38.6	-39.5	52.8	435.9	500.0	-1.2
8235.0	V	46.7	6.5	38.6	-39.5	52.3	411.5	500.0	-1.7
9150.0	H	46.0	6.6	39.8	-39.0	53.4	465.4	500.0	-0.6
9150.0	V	45.9	6.6	39.8	-39.0	53.3	460.1	500.0	-0.7

DATA PAGE

Manufacturer : California Eastern Laboratories
Model No. : ZICM900P2
Test Specification : FCC Part 15, Subpart C, Section 15.247, Radiated Emissions
Date : May 27, 2011
Mode : Transmit at 927MHz
Test Distance : 3 meters
Notes : Wire antenna
Notes : Average Readings in Restricted Bands
: Total = Meter Reading + Cable Loss + Antenna Factor + Preamp Gain + Duty Cycle Factor

Freq (MHz)	Ant Pol	Meter Reading (dBuV)	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Total dBuV/m at 3 M	Total uV/m at 3M	Limit uV/m at 3M	Margin (dB)
927.0	H	93.8	2.0	21.9	0.0	117.7	764758.9		
927.0	V	97.1	2.0	21.9	0.0	121.0	1118212.9		
2781.0	H	54.2	3.7	29.6	-40.4	47.1	227.5	500.0	-6.8
2781.0	V	52.6	3.7	29.6	-40.4	45.5	189.2	500.0	-8.4
3708.0	H	49.5	4.3	32.4	-39.6	46.7	215.0	500.0	-7.3
3708.0	V	51.0	4.3	32.4	-39.6	48.2	255.6	500.0	-5.8
4635.0	H	46.1	4.8	33.3	-40.0	44.2	162.7	500.0	-9.7
4635.0	V	46.2	4.8	33.3	-40.0	44.3	164.6	500.0	-9.6
7416.0	H	46.5	6.2	37.4	-39.7	50.4	331.0	500.0	-3.6
7416.0	V	46.1	6.2	37.4	-39.7	50.0	316.1	500.0	-4.0
8343.0	H	46.9	6.5	38.7	-39.5	52.7	431.3	500.0	-1.3
8343.0	V	47.0	6.5	38.7	-39.5	52.8	436.3	500.0	-1.2