Measurement of RF Interference from a Model Toyota 975L Transceiver

For : Gentex Corporation
600 N.Centennial Street
Zeeland, MI 49464

P.O. No. : 1009472
Date Tested : September 2 through September 17, 2009
Test Personnel : Richard E. King
Specification : FCC "Code of Federal Regulations" Title 47 Part 15, Subpart C
Industry Canada RSS-210
Industry Canada RSS-GEN

Test Report By :
Richard E. King

Witnessed By :
Chris Kemperman
Gentex Corporation

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

REVISION HISTORY

Revision	Date	Description
—	September 24, 2009	Initial release

Measurement of RF Emissions from a Toyota 975L Transceiver

1 INTRODUCTION

1.1 Scope of Tests

This document represents the results of the series of radio interference measurements performed on a model Toyota 975L Transceiver, Serial No. none assigned, (hereinafter referred to as the test item). The test item is designed to transmit in the 288MHz to 420MHz band using an internal antenna. The test item was manufactured and submitted for testing by Gentex Corporation located in Zeeland, MI.

1.2 Purpose

The test series was performed to determine if the test item 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 15.231 for Intentional Radiators and Industry Canada RSS-GEN Table 2 and RSS-210 Table 5. 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 National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP). NVLAP Lab Code: 100278-0.

1.5 Laboratory Conditions

The temperature at the time of the test was 23.1°C and the relative humidity was 41%.

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 B for Receivers, dated 1 October 2008
- 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 RSS-210, Issue 7, June 2007, “Spectrum Management and Telecommunications Radio Standards Specification, Low-power License-exempt radio communication devices (All Frequency Bands): Category I Equipment”
- Industry Canada RSS-GEN, Issue 2, June 2007, “Spectrum Management and Telecommunications Radio Standards Specification, General Requirements and Information for the Certification of radio communication equipment”

3 TEST ITEM SET-UP AND OPERATION

3.1 General Description

The test item is a Transceiver, Model No. Toyota 975L. A block diagram of the test item set-up is shown as Figure 1.

3.1.1 Power Input

The test item obtained 12VDC from an external DC power supply. The test item is typically power with 12VDC from an automotive battery.

3.1.2 Peripheral Equipment

The test item does not require peripheral equipment.

3.1.3 Interconnect Cables

The following interconnect cables were submitted with the test item:

Item	Description
Power harness	1 meter long, two lead input power harness.

3.1.4 Grounding

The test item was grounded only through the return lead of its input power lead.

3.2 Operational Mode

For all tests, the test item and all peripheral equipment were placed on an 80cm high non-conductive stand. The test item and all peripheral equipment were energized.

The test item was trained to transmit at each of the following frequencies 288MHz, 310MHz, 340MHz, 365MHz, 390MHz or 418MHz. Training was perform using a signal generator to set the transmit frequency and a pulse generator to set the modulation to 30%, 50% or 80%.

3.3 Test Item Modifications

No modifications were required for compliance to the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart C, Sections 15.207 and 15.231 for Intentional Radiators and Industry Canada RSS-GEN Table 2 and RSS-210 Table 5 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.

Conducted emission tests were performed with a spectrum analyzer in conjunction with a quasi-peak adapter.

Radiated emissions were performed with a spectrum analyzer. This receiver allows measurements with the bandwidths specified by the FCC and with the quasi-peak detector function. The receiver bandwidth was 120kHz for the 30MHz to 1000MHz radiated emissions data.

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

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

5 TEST PROCEDURES

5.1 Powerline Conducted Emissions

5.1.1 Requirements

Since the test item is powered with 12VDC from an automotive battery. No conducted emissions measurements were required.

5.2 Duty Cycle Factor Measurements

5.2.1 Procedures

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

With the transmitter set up to transmit for maximum pulse density, the time domain trace is displayed on the spectrum analyzer. This trace is obtained by tuning center frequency to the transmitter frequency and then setting a zero span width with 10msec/div. The amplitude settings are adjusted so that the on/off transitions clear the 4th division from the bottom of the display. The markers are set at the beginning and end of a word period. If the word period exceeds 100 msec the word period is set to 100 msec. The on-time and off-time are then measured. The on-time is total time signal level exceeds the 4th division. Off-time is time under for the word period. The duty cycle is then computed as the (On-time/ word period) where the word period = (On-time + Off-time). The test item is a learned transmitter and was trained using 500Hz pulse modulation at 30%, 50% and 80% duty cycles.
The duty cycle factor to apply was determined for the duty cycles of 30%, 50% and 80% as Follows:

For 30% (0.30): duty cycle factor = 20*Log(0.3) = -10.46 dB
For 50% (0.50): duty cycle factor = 20*Log(0.5) = -6.02 dB
For 80% (0.80): duty cycle factor = 20*Log(0.8) = -1.94 dB

5.2.2 Results

Representative plots of the duty cycle are shown on pages 14 through 16.

5.3 Radiated Measurements

5.3.1 Requirements

The test item must comply with the requirements of FCC "Code of Federal Regulations Title 47", Part 15, Subpart C, Section 15.205 et seq.

Paragraph 15.231(b) has the following radiated emission limits:

Fundamental Frequency MHz	Field Intensity uV/m @ 3 meters	Field Strength Harmonics and Spurious @ 3 meters
260 to 470	3750 to 12500*	375 to 1,250*

* - Linear Interpolation

For 288MHz, the limit at the fundamental is 4916.7uV/m @ 3m. The limit for the harmonics is 491.6uV/m @ 3m or the general limit shown in 15.209 whichever limit permits a higher field strength.

For 310MHz, the limit at the fundamental is 5833.3uV/m @ 3m. The limit for the harmonics is 583.3uV/m @ 3m or the general limit shown in 15.209 whichever limit permits a higher field strength.

For 340MHz, the limit at the fundamental is 7083.3uV/m @ 3m. The limit for the harmonics is 708.3uV/m @ 3m or the general limit shown in 15.209 whichever limit permits a higher field strength.

For 365MHz, the limit at the fundamental is 8125.0uV/m @ 3m. The limit for the harmonics is 812.5uV/m @ 3m or the general limit shown in 15.209 whichever limit permits a higher field strength.

For 390MHz, the limit at the fundamental is 9166.7uV/m @ 3m. The limit for the harmonics is 916.7uV/m @ 3m or the general limit shown in 15.209 whichever limit permits a higher field strength.

For 418MHz, the limit at the fundamental is 10333.3uV/m @ 3m. The limit for the harmonics is 1033.3uV/m @ 3m or the general limit shown in 15.209 whichever limit permits a higher field strength.

In addition, emissions appearing in the Restricted Bands of Operation listed in paragraph 15.205(a) shall not exceed the general requirements shown in paragraph 15.209.

5.3.2 Procedures

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

A preliminary radiated emissions test was performed to determine the emission characteristics of the test item. For the preliminary test, a broadband measuring antenna was positioned at a 3 meter distance from the test item. The entire frequency range from 30MHz to 5.0GHz was investigated using a peak detector function. The data was then processed by the computer to calculate equivalent field intensity.

The final open field emission tests were then manually performed over the frequency range of 30MHz to 5000MHz. Between 30MHz and 1000MHz, a tuned dipole antenna was used as the pick-up device. A broadband double ridged waveguide antenna was used as the pick-up device for all frequencies above 1GHz. All significant broadband and narrowband signals were measured and recorded. The peak detected levels were converted to average levels using a duty cycle factor which was computed from the pulse train.

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

1) The test item was rotated so that all of its sides were exposed to the receiving antenna.
2) Since the measuring antenna is linearly polarized, both horizontal and vertical field components were measured.
3) The measuring antenna was raised and lowered from 1 to 4 meters for each antenna polarization to maximize the readings.
4) For hand-held or body-worn devices, the test item was rotated through three orthogonal axes to determine which orientation produces the highest emission relative to the limit.

5.3.3 Results

The preliminary plots, with the test item transmitting at 288MHz, 310MHz and 418MHz, are presented on data pages 17 through 52. The plots are presented for a reference only, and are not used to determine compliance.

The radiated emission levels with the test item transmitting at 288MHz, 310MHz and 418MHz, are presented on data pages 53 through 61. As can be seen from the data, all emissions measured from the test item were within the specification limits. In addition, the radiated field strength levels with the test item transmitting 340MHz, 365MHz and 390MHz and the third harmonic of 321MHz are shown on data pages 62 through 63.

Photographs of the test item set-up radiated emission levels are shown on Figure 2 and Figure 3.

5.4 Occupied Bandwidth Measurements

5.4.1 Requirement

In accordance with paragraph 15.231(c), all emissions within 20dB of the peak amplitude level of the center frequency are required to be within a band less than 0.25% of the center frequency wide.

5.4.2 Procedures

The test item was placed on an 80cm high non-conductive stand. The unit was set to transmit continuously. With an antenna positioned nearby, occupied bandwidth emissions were displayed on the spectrum analyzer. The resolution bandwidth was set to 30 kHz and span was set to 2 MHz. The frequency spectrum near the fundamental was plotted.

5.4.3 Results

The plots of the emissions near the fundamental frequencies are presented on data pages 64 through 72. As can be seen from the data, the transmitter met the occupied bandwidth requirements. The maximum 99% bandwidth was measured to be 404.8kHz.

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 Test Item

The test item and all associated equipment were returned to Gentex Corporation upon completion of the tests.

7 CONCLUSIONS

It was determined that Gentex Corporation Transceiver, Part No. Toyota 975L, Serial No. none assigned, did fully meet the conducted and radiated emission requirements of the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart C, Section 15.207 and 15.231for Intentional Radiators and Industry Canada RSS-GEN Table 2 and RSS-210 Table 5 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 test item at the test date. Any electrical or mechanical modification made to the test item 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
APK2	PREAMPLIFIER	AGILENT TECHNOLOGIES	8449B	3008A01595	1-26.5GHZ	4/6/2009	4/6/2010
CMA1	Controllers	EMCO	2090	9701-1213	---	N/A	
GRE0	SIGNAL GENERATOR	AGILENT TECHNOLOGIES	E4438C	MY42083127	250KHZ-6GHZ	1/12/2009	1/12/2010
NTA0	BILOG ANTENNA	CHASE EMC LTD.	BILOG CBL6112	2057	0.03-2GHZ	11/14/2008	11/14/2009
NWH0	RIDGED WAVE GUIDE	TENSOR	4105	2081	1-12.4GHZ	10/25/2008	10/25/2009
PHA0	MAGNETIC FIELD PROBE	ELECTRO-METRICS	EM-6882	134	22-230MHZ	NOTE 1	
RAC0	SPECTRUM ANALYZER	HEWLETT PACKARD	85660B	2449A01117	100HZ-22GHZ	7/21/2009	7/21/2010
RACE	RF PRESELECTOR	HEWLETT PACKARD	85685A	3010A01194	20HZ-2GHZ	12	
RAF1	QUASIPEAK ADAPTER	HEWLETT PACKARD	85650A	2043A00271	0.01-1000MHZ	7/22/2009	7/22/2010
RAKG	RF SECTION	HEWLETT PACKARD	85462A	3549A00284	0.009-6500MHZ	1/23/2009	1/23/2010
RAKH	RF FILTER SECTION	HEWLETT PACKARD	85460A	3448A00324	---	1/23/2009	1/23/2010
RBA1	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB26	100146	20HZ-26.5GHZ	9/18/2009	9/18/2010
SBA1	DC POWER SUPPLY	APLAB	ZS3205	99071032	0-32VDC;0-5A	NOTE 1	
XZG2	ATTENUATOR/SWITCH DRIVER	HEWLETT PACKARD	11713A	2223A01751	---	N/A	

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.

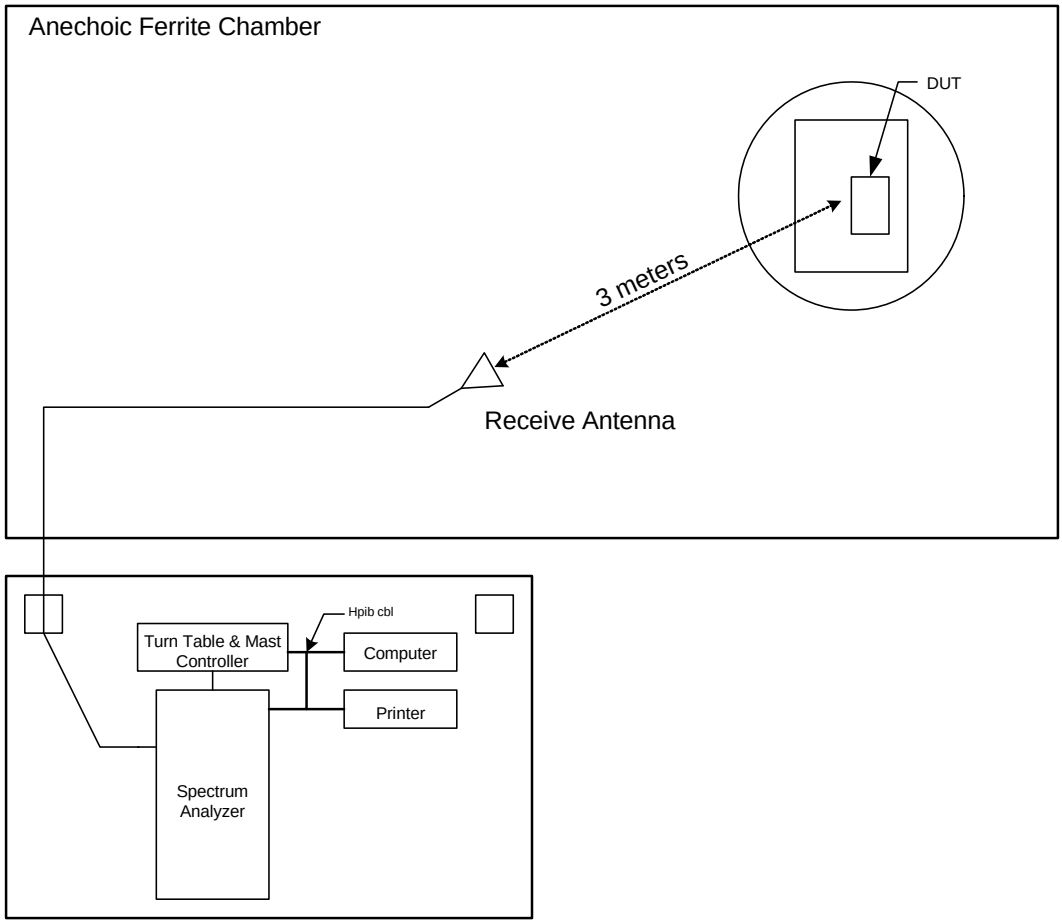
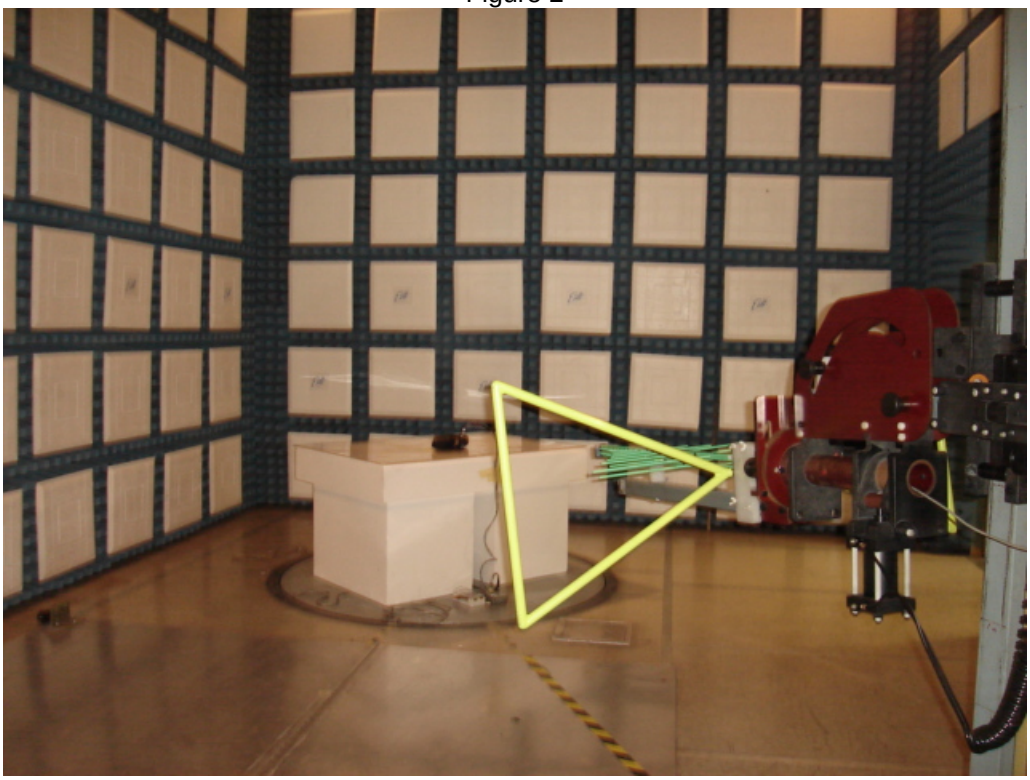
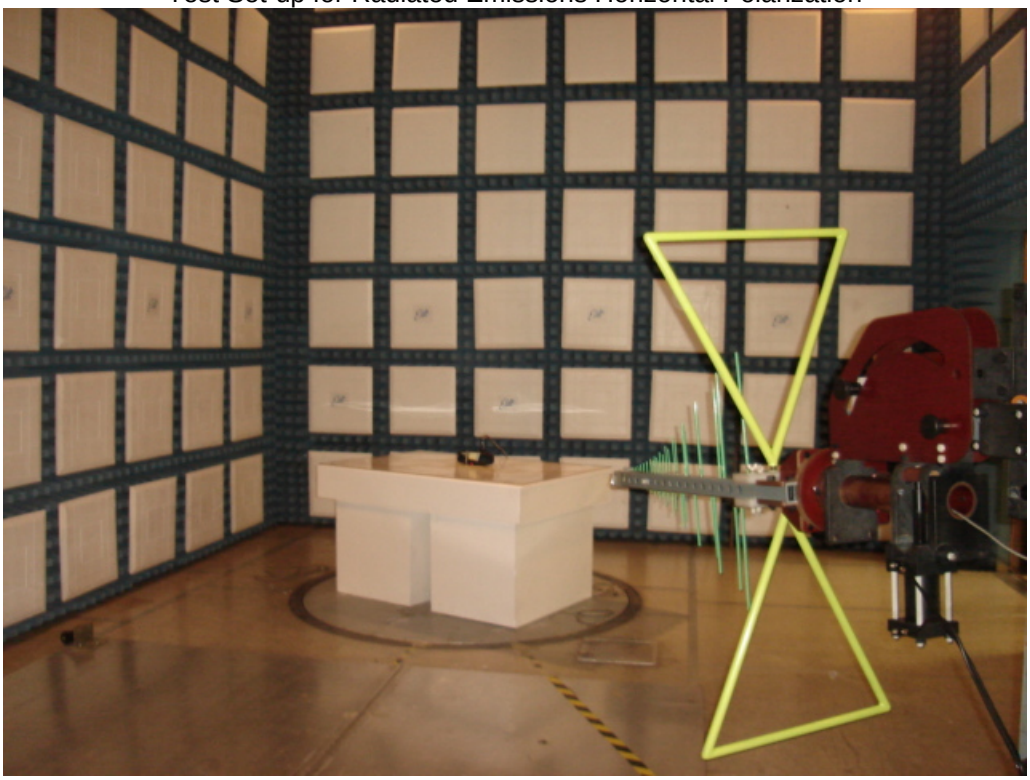


FIGURE 1 BLOCKDIAGRAM OF TEST SETUP

Figure 2

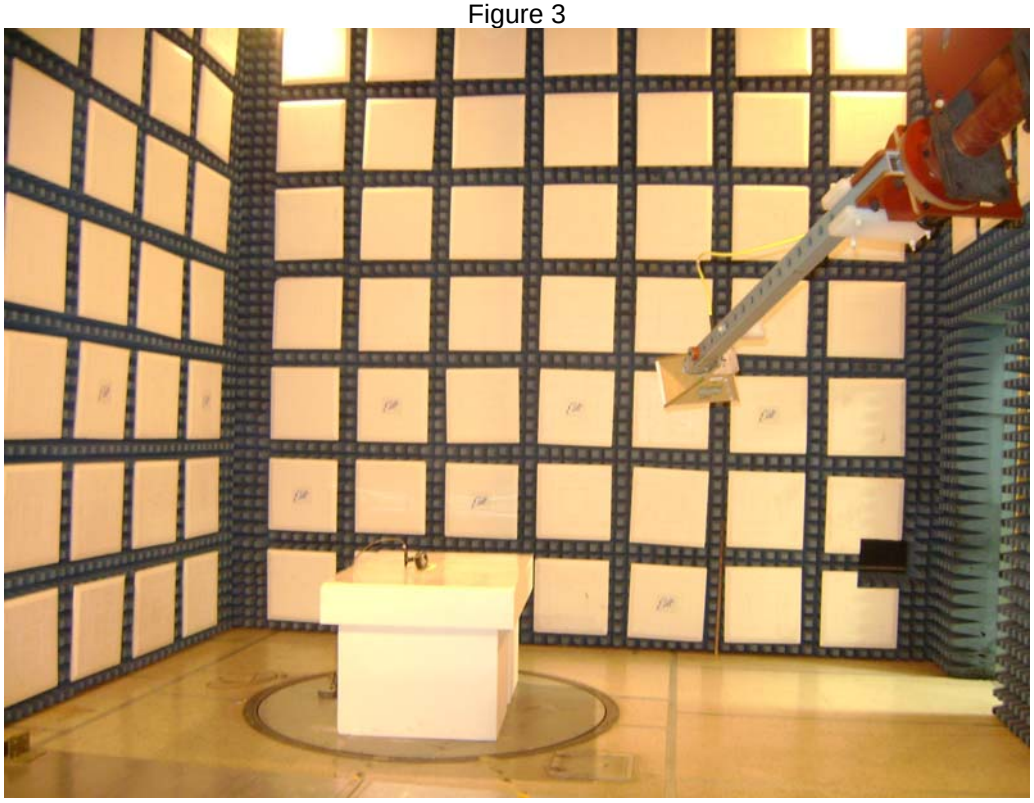


Test Set-up for Radiated Emissions Horizontal Polarization



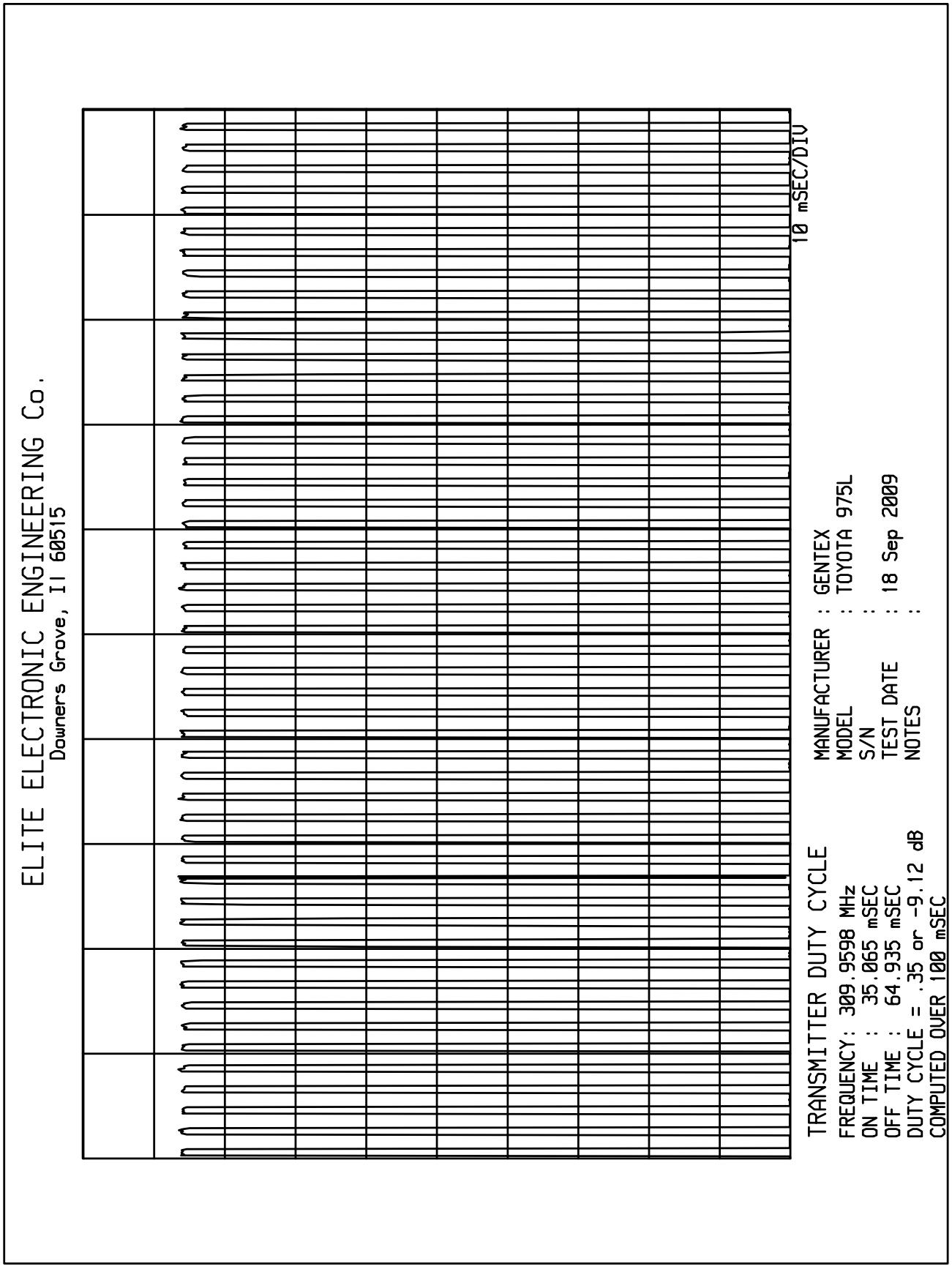
Test Set-up for Radiated Emissions Vertical Polarization

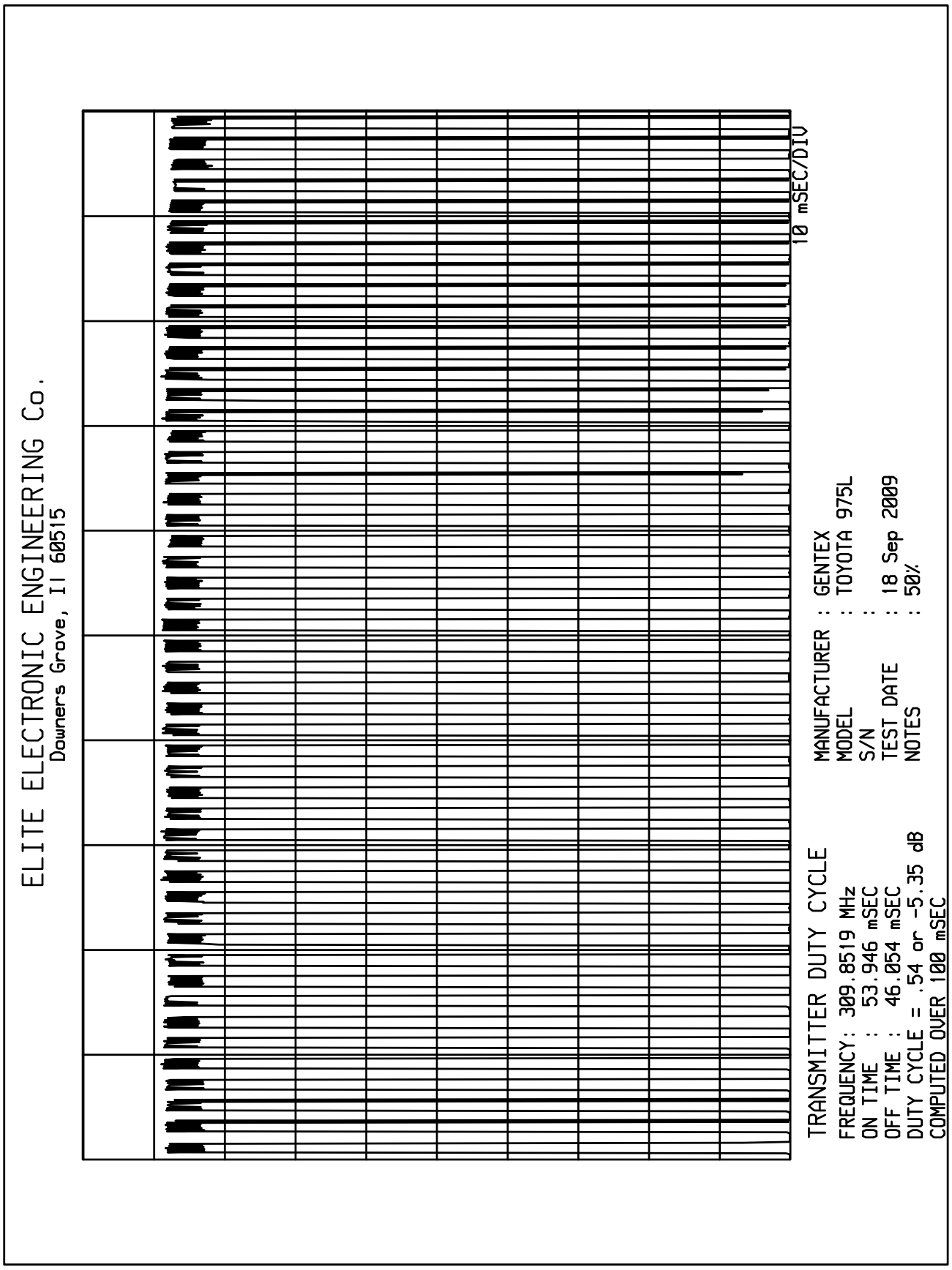
Figure 3

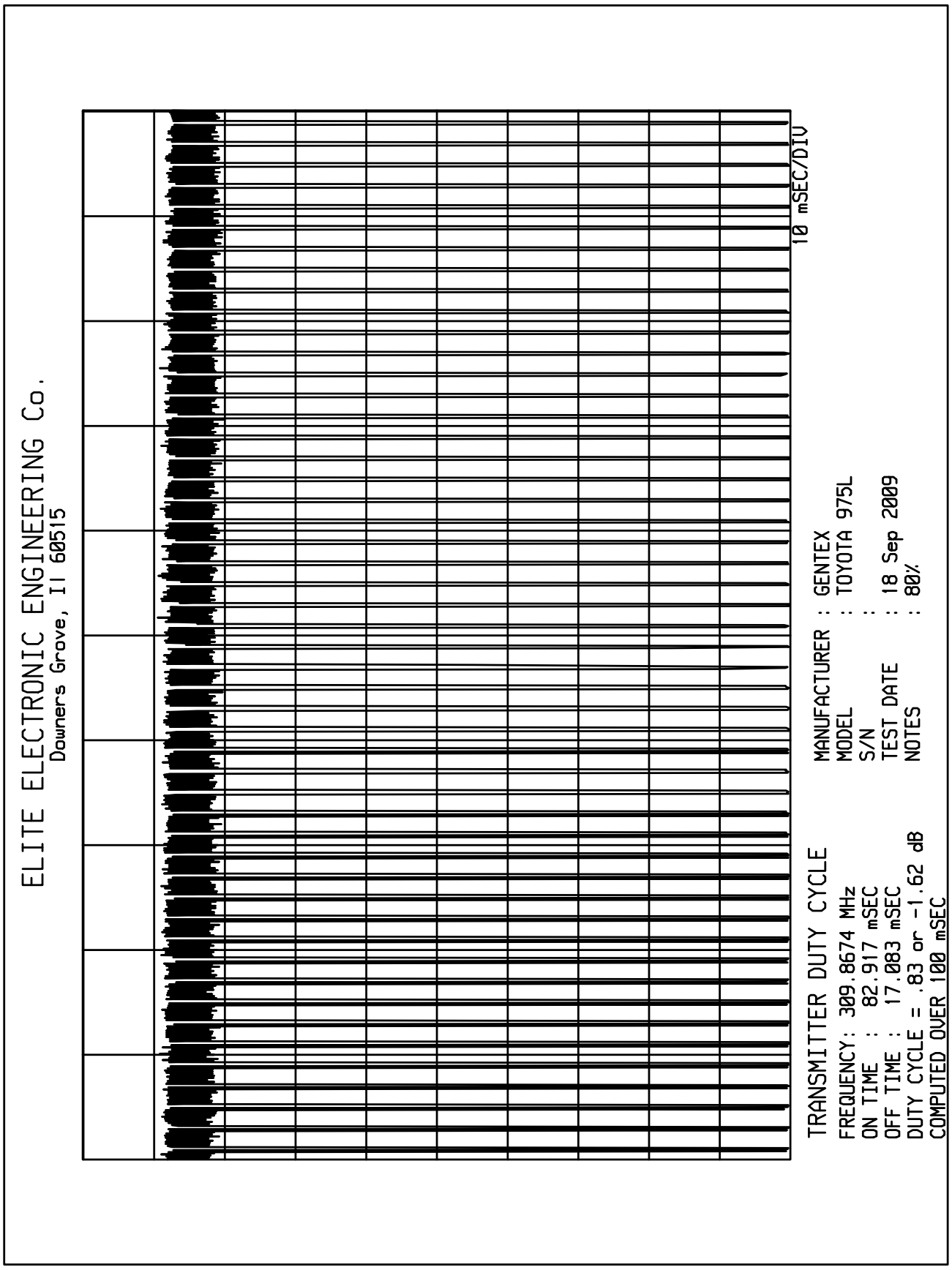


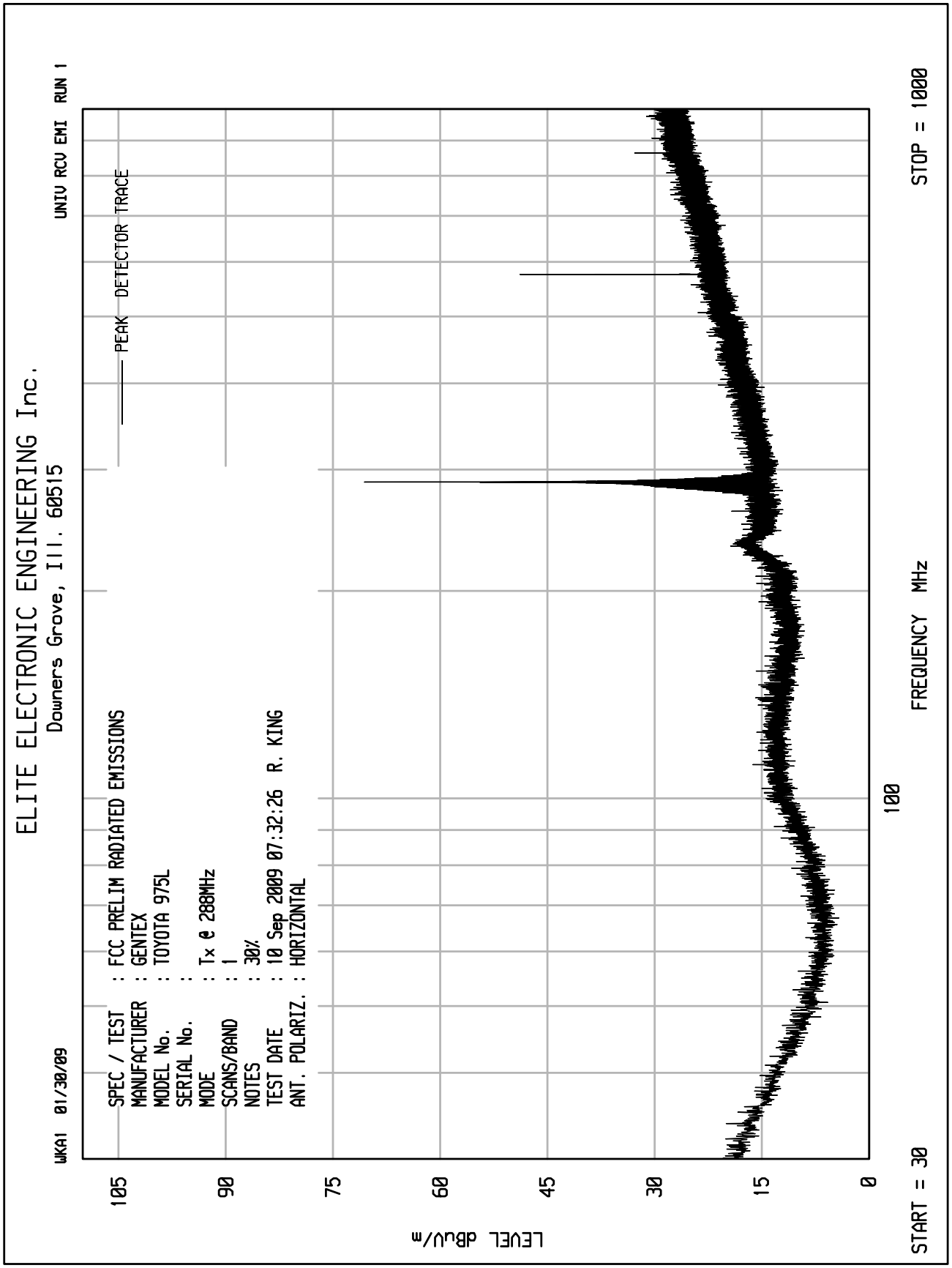
Test Set-up for Radiated Emissions, 1GHz to 5GHz – Vertical Polarization

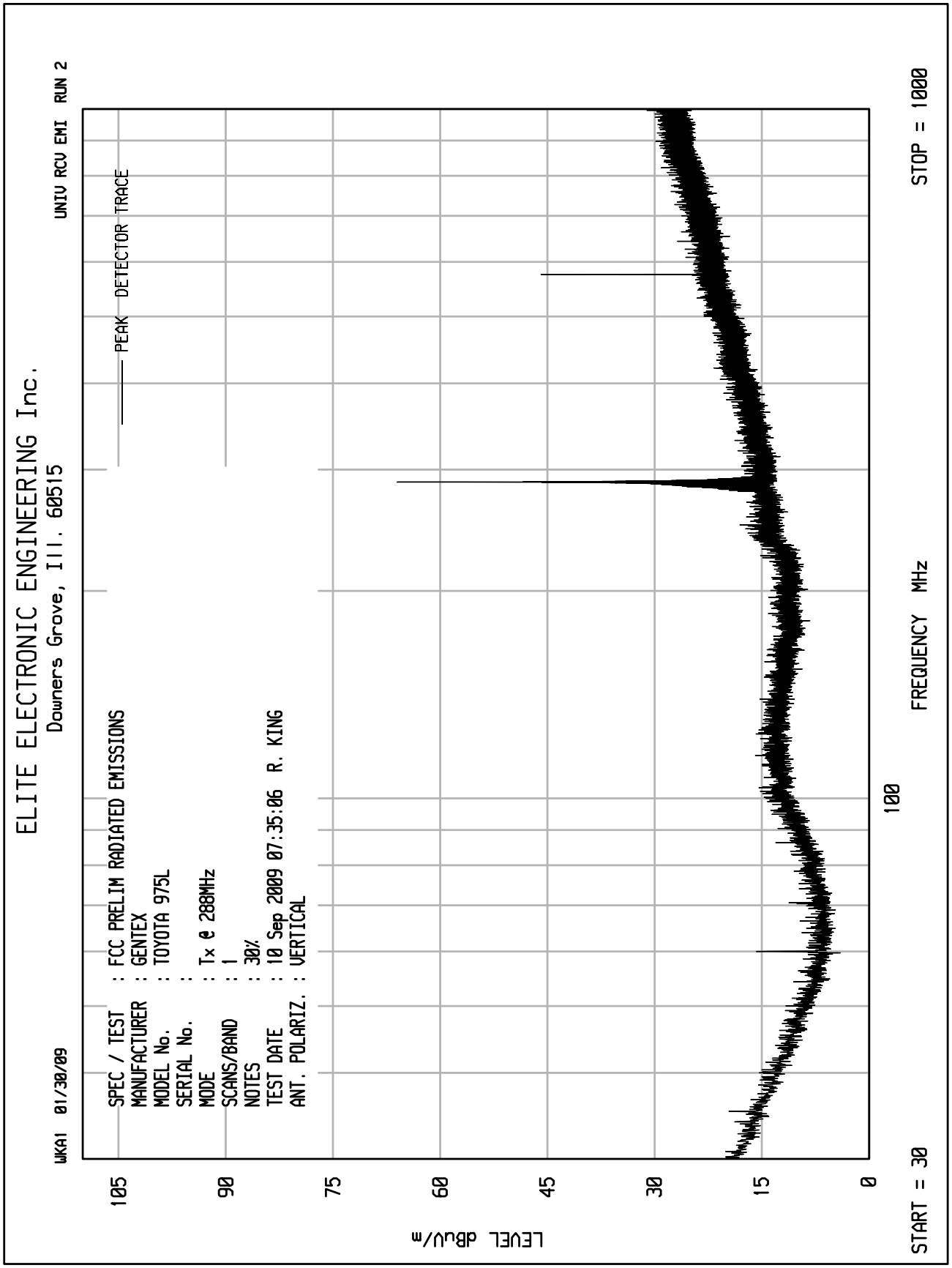
Test Set-up for Radiated Emissions, 1GHz to 5GHz – Horizontal Polarization

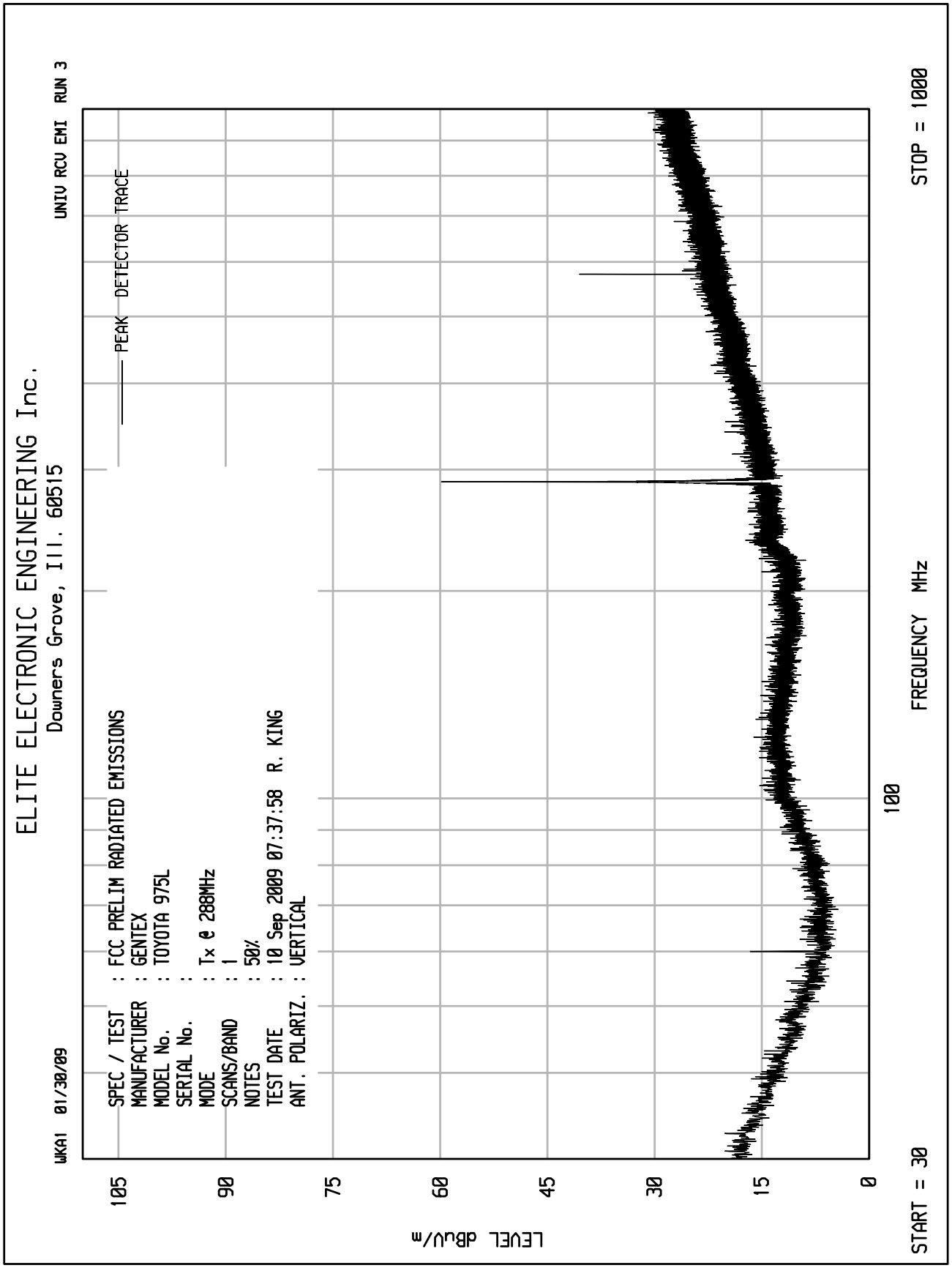

ELITE ELECTRONIC ENGINEERING Co.
Downers Grove, Il 60515
10 mSEC/DIV
TRANSMITTER DUTY CYCLE
FREQUENCY: 309.9598 MHz
ON TIME : 35.065 mSEC
OFF TIME : 64.935 mSEC
DUTY CYCLE = .35 or -9.12 dB
COMPUTED OVER 100 mSEC
MANUFACTURER : GENTEX
MODEL : TOYOTA 975L
S/N : :
TEST DATE : 18 Sep 2009
NOTES : :

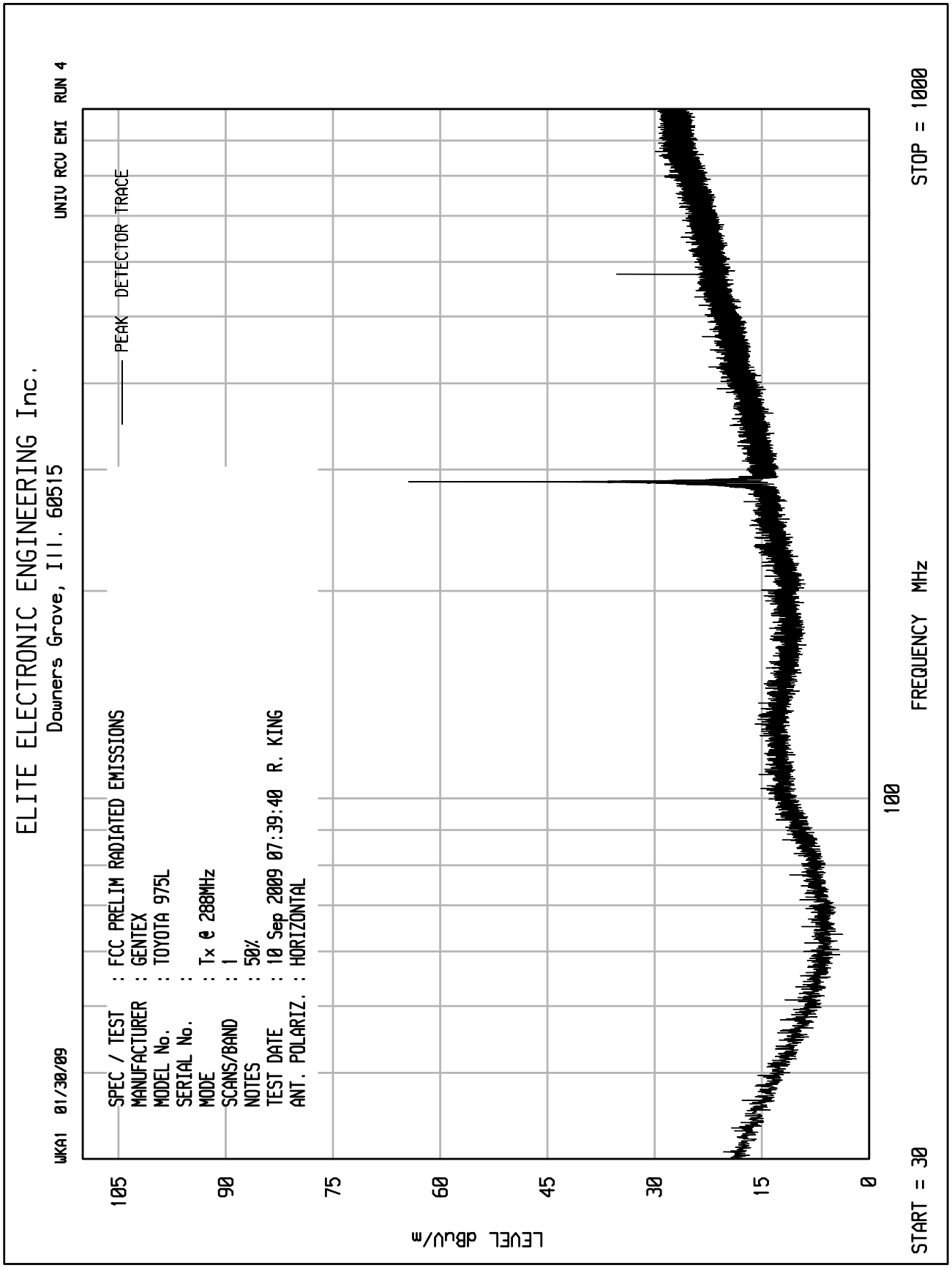

ELITE ELECTRONIC ENGINEERING Co.
Downers Grove, Il 60515
10 mSEC/DIV
TRANSMITTER DUTY CYCLE
FREQUENCY: 309.8519 MHz
ON TIME : 53.946 mSEC
OFF TIME : 46.054 mSEC
DUTY CYCLE = .54 or -5.35 dB
COMPUTED OVER 100 mSEC
MANUFACTURER : GENTEX
MODEL : TOYOTA 975L
S/N : :
TEST DATE : 18 Sep 2009
NOTES : 50%

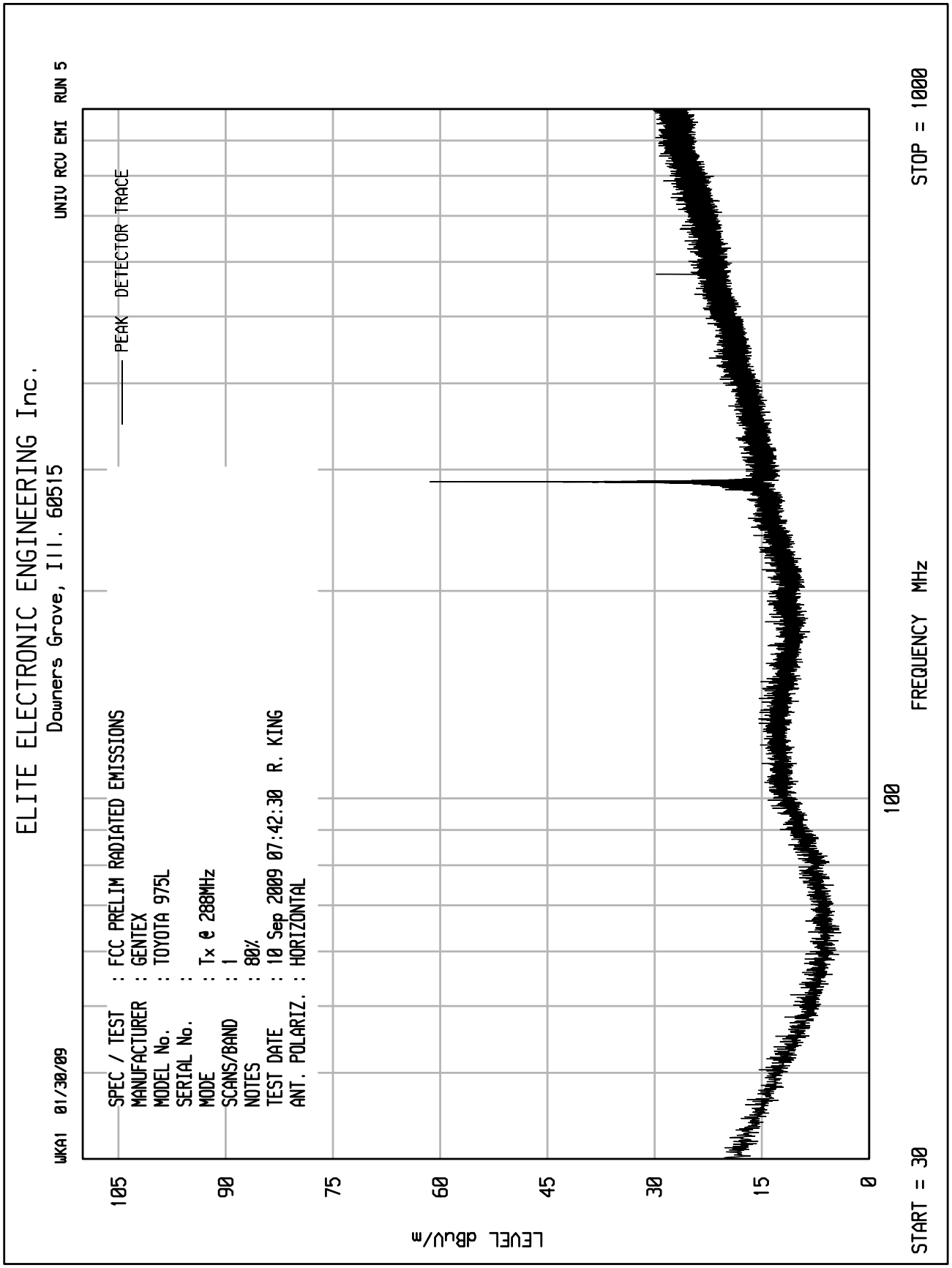

ELITE ELECTRONIC ENGINEERING Co.
Downers Grove, Il 60515
10 mSEC/DIV
TRANSMITTER DUTY CYCLE
FREQUENCY: 309.8674 MHz
ON TIME : 82.917 mSEC
OFF TIME : 17.083 mSEC
DUTY CYCLE = .83 or -1.62 dB
COMPUTED OVER 100 mSEC
MANUFACTURER : GENTEX
MODEL : TOYOTA 975L
S/N : :
TEST DATE : 18 Sep 2009
NOTES : 80%

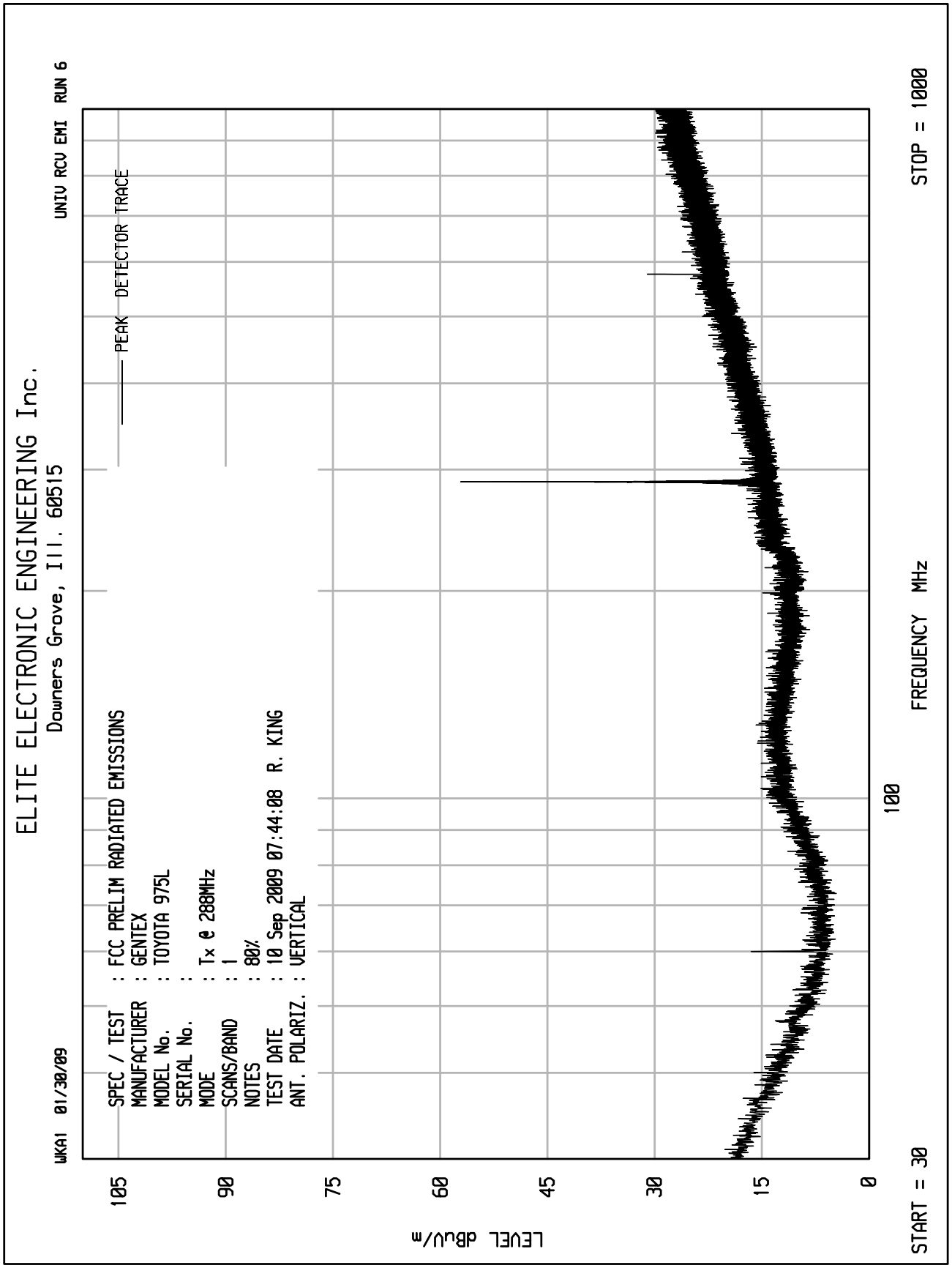

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 1
WKAI 01/30/09
SPEC / TEST : FCC PRELIM RADIATED EMISSIONS
MANUFACTURER : GENTEX
MODEL No. : TOYOTA 975L
SERIAL No. : :
MODE : Tx @ 280MHz
SCANS/BAND : 1
NOTES : 30%
TEST DATE : 10 Sep 2009 07:32:26 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
105
90
75
60
45
30
15
0
START = 30
100
FREQUENCY MHz
STOP = 1000

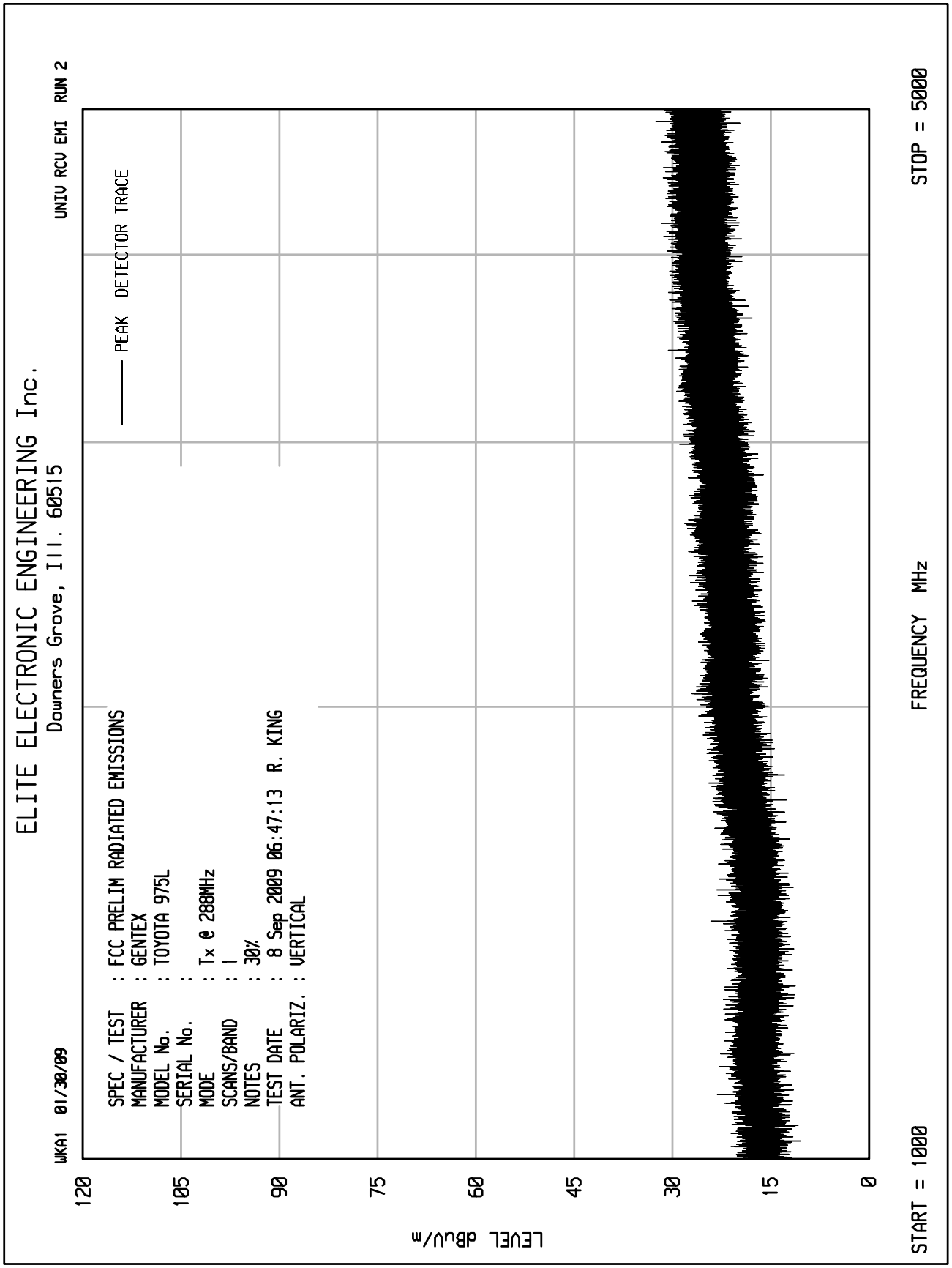

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 2
WKAI 01/30/09
SPEC / TEST : FCC PRELIM RADIATED EMISSIONS
MANUFACTURER : GENTEX
MODEL No. : TOYOTA 975L
SERIAL No. : :
MODE : Tx @ 280MHz
SCANS/BAND : 1
NOTES : 30%
TEST DATE : 10 Sep 2009 07:35:06 R. KING
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
105
90
75
60
45
30
15
0
START = 30
100
FREQUENCY MHz
STOP = 1000

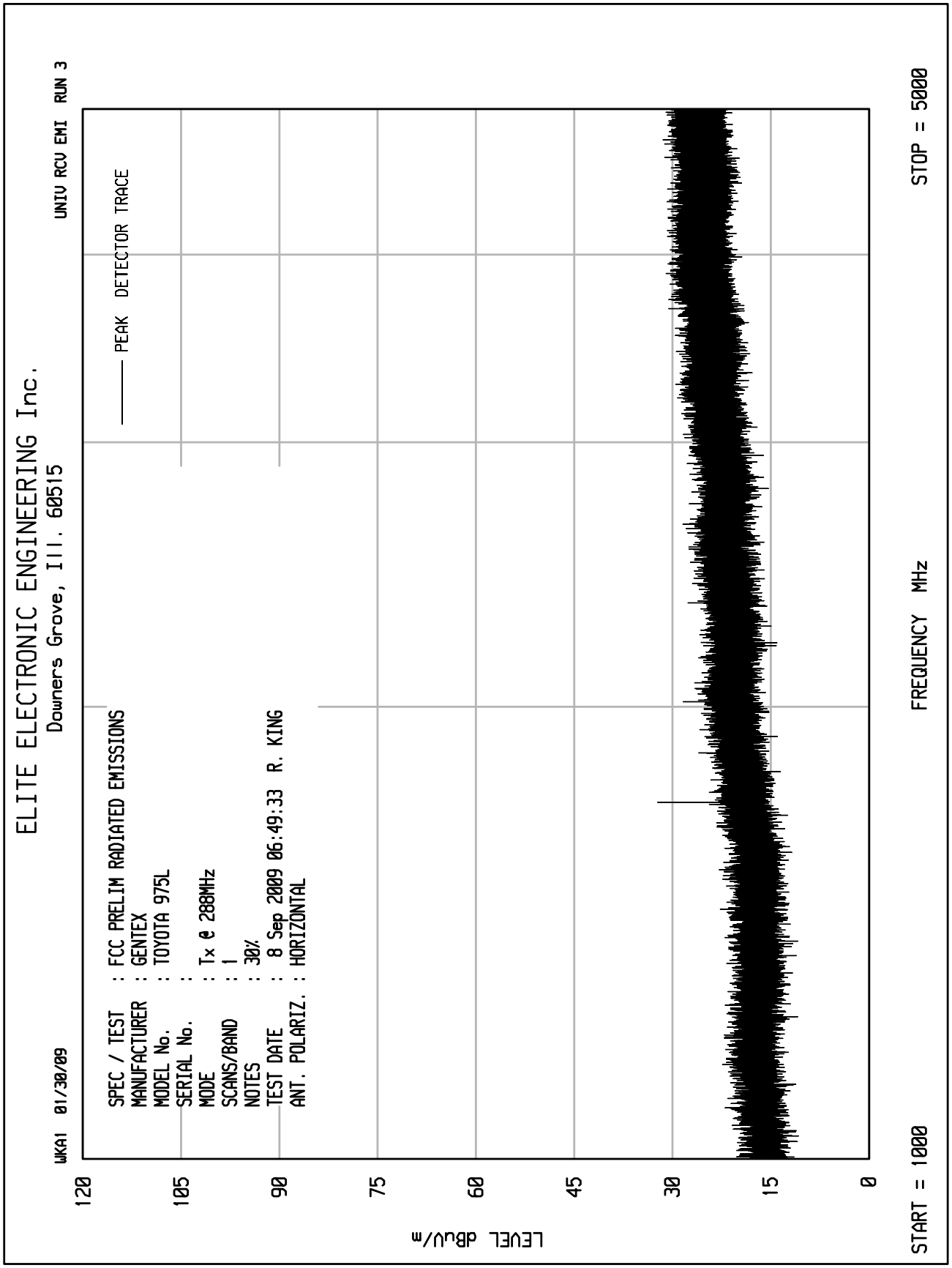

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 3
WKAI 01/30/09
SPEC / TEST : FCC PRELIM RADIATED EMISSIONS
MANUFACTURER : GENTEX
MODEL No. : TOYOTA 975L
SERIAL No. : :
MODE : Tx @ 280MHz
SCANS/BAND : 1
NOTES : 50%
TEST DATE : 10 Sep 2009 07:37:58 R. KING
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
105
90
75
60
45
30
15
0
START = 30
100
FREQUENCY MHz
STOP = 1000

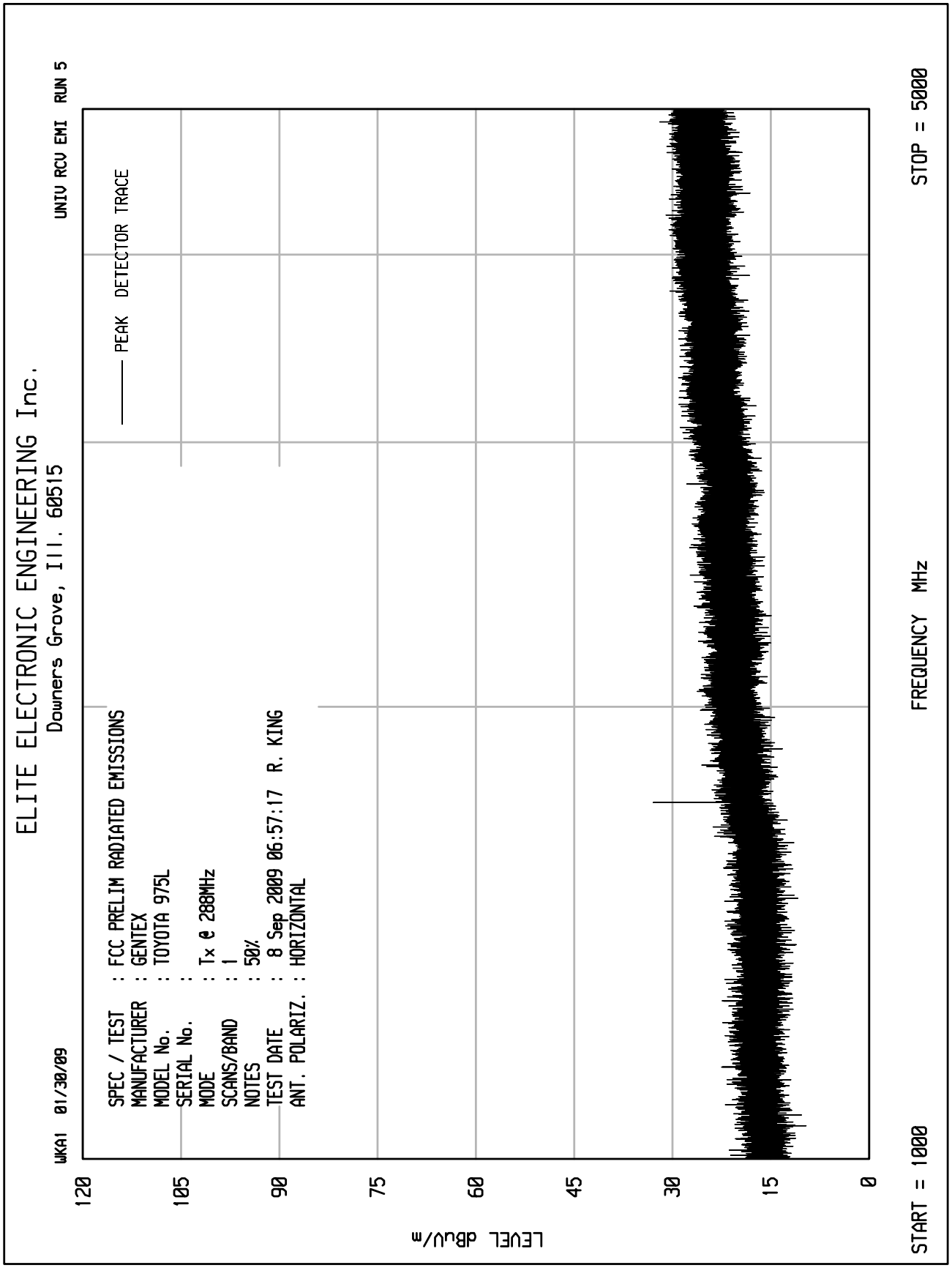

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 4
WKAI 01/30/09
SPEC / TEST : FCC PRELIM RADIATED EMISSIONS
MANUFACTURER : GENTEX
MODEL No. : TOYOTA 975L
SERIAL No. : :
MODE : Tx @ 280MHz
SCANS/BAND : 1
NOTES : 50%
TEST DATE : 10 Sep 2009 07:39:40 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
105
90
75
60
45
30
15
0
START = 30
100
FREQUENCY MHz
STOP = 1000

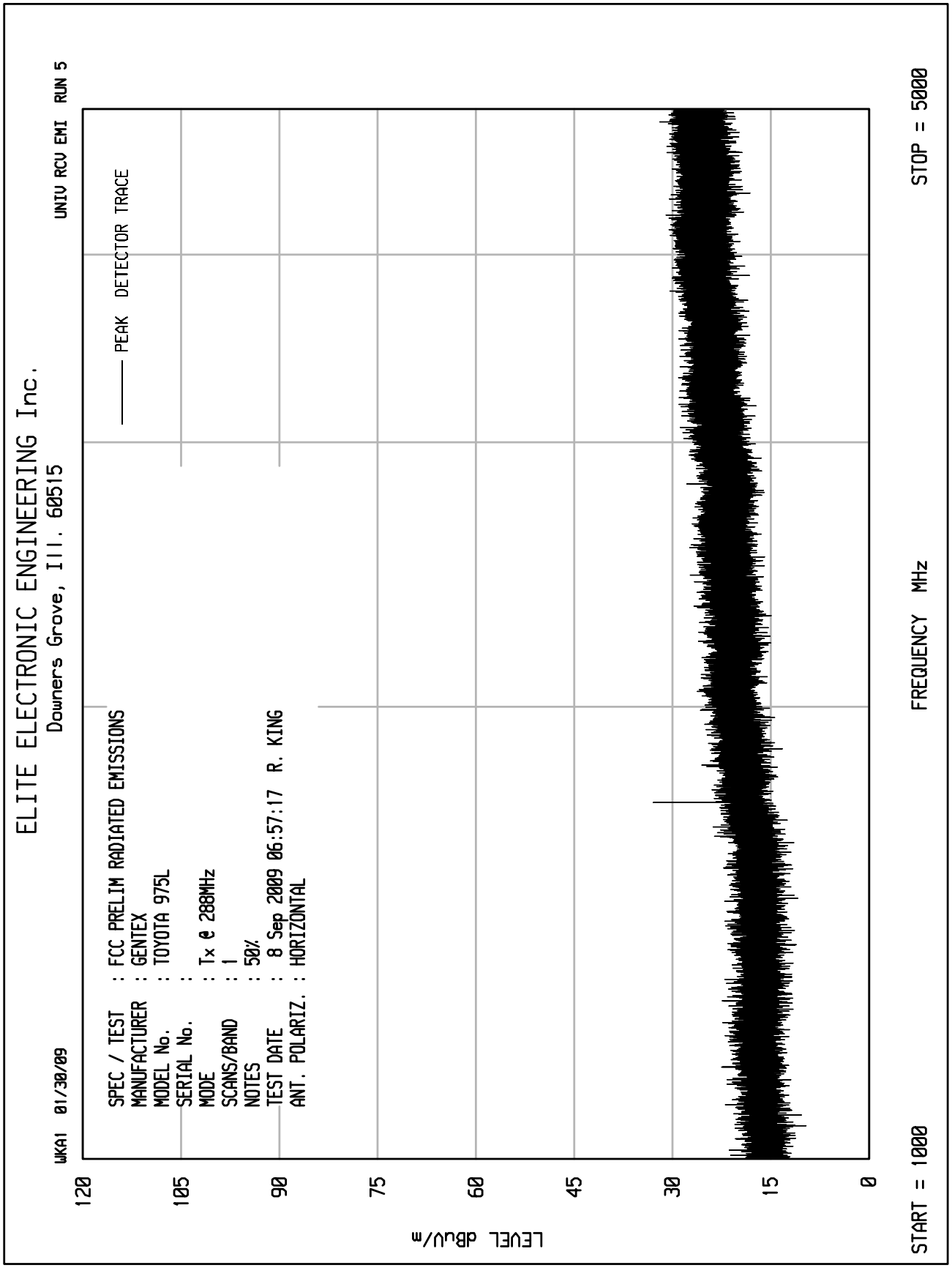

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 5
WKAI 01/30/09
SPEC / TEST : FCC PRELIM RADIATED EMISSIONS
MANUFACTURER : GENTEX
MODEL No. : TOYOTA 975L
SERIAL No. :
MODE : Tx @ 280MHz
SCANS/BAND : 1
NOTES : 80%
TEST DATE : 10 Sep 2009 07:42:30 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
105
90
75
60
45
30
15
0
START = 30
100
FREQUENCY MHz
STOP = 1000

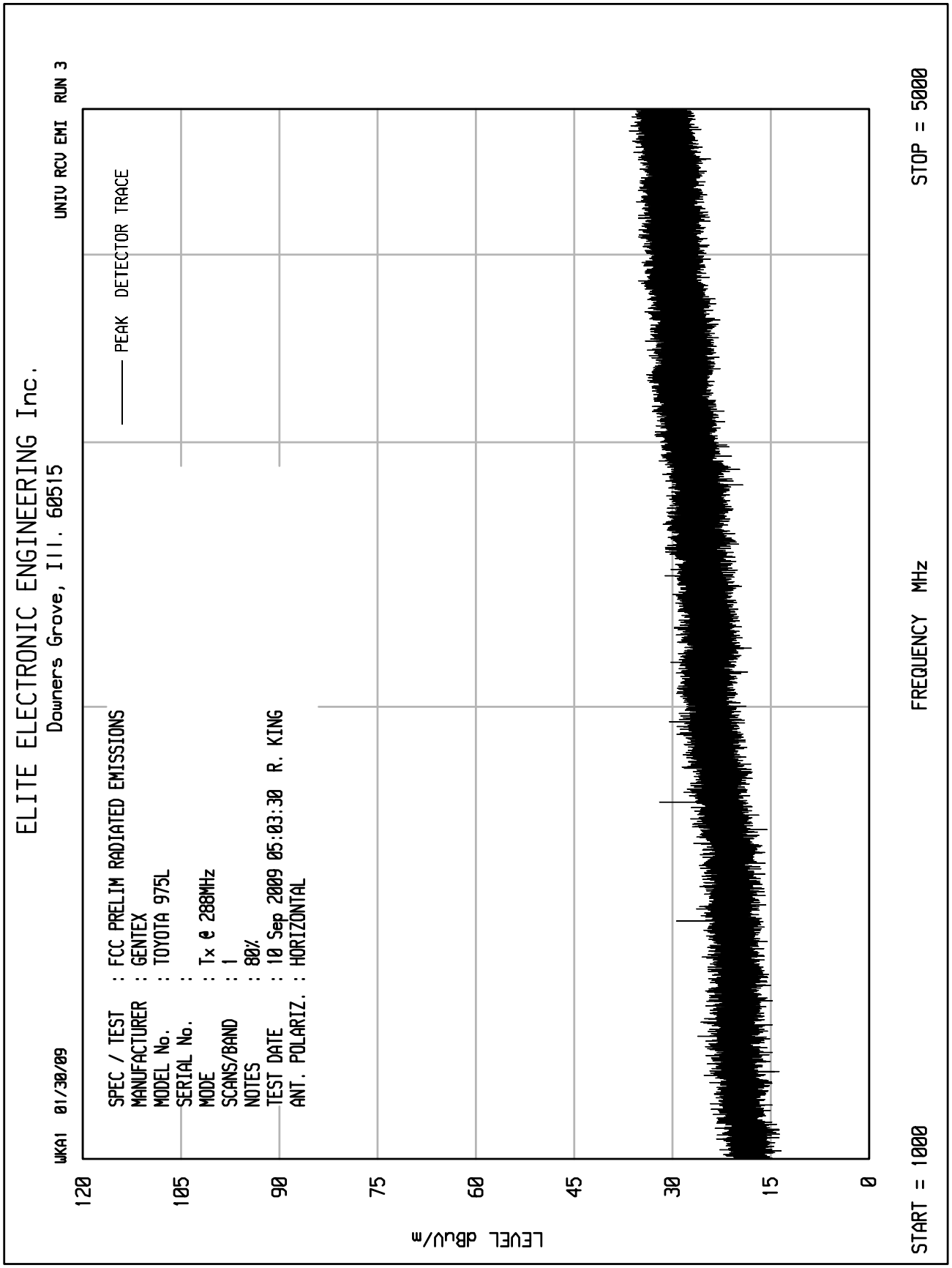

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 6
WKAI 01/30/09
SPEC / TEST : FCC PRELIM RADIATED EMISSIONS
MANUFACTURER : GENTEX
MODEL No. : TOYOTA 975L
SERIAL No. : :
MODE : Tx @ 280MHz
SCANS/BAND : 1
NOTES : 80%
TEST DATE : 10 Sep 2009 07:44:08 R. KING
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
105
90
75
60
45
30
15
0
START = 30
100
FREQUENCY MHz
STOP = 1000

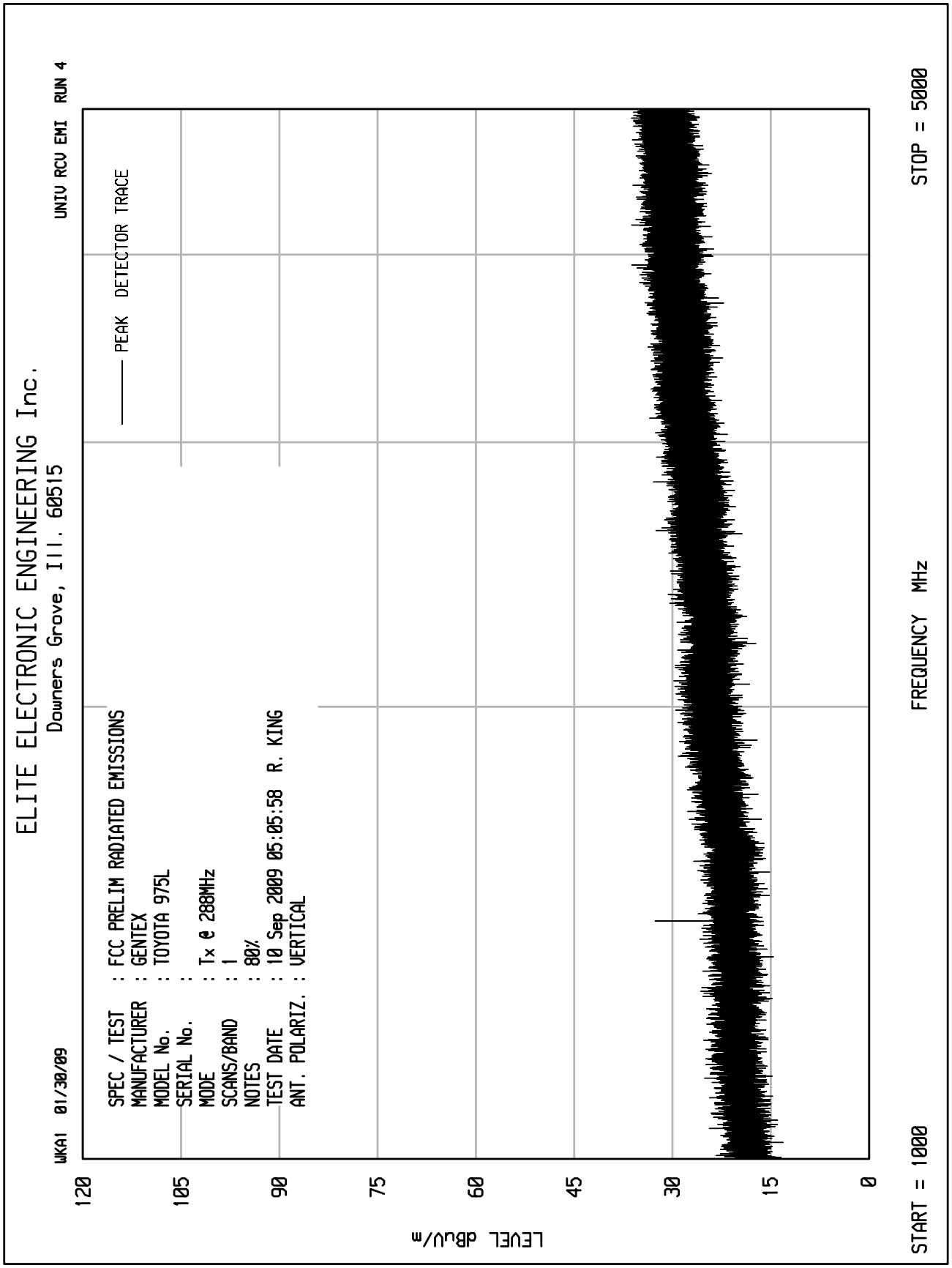

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 2
WKAI 01/30/09
SPEC / TEST : FCC PRELIM RADIATED EMISSIONS
MANUFACTURER : GENTEX
MODEL No. : TOYOTA 975L
SERIAL No. :
MODE : Tx @ 280MHz
SCANS/BAND : 1
NOTES : 30'
TEST DATE : 8 Sep 2009 06:47:13 R. KING
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 5000

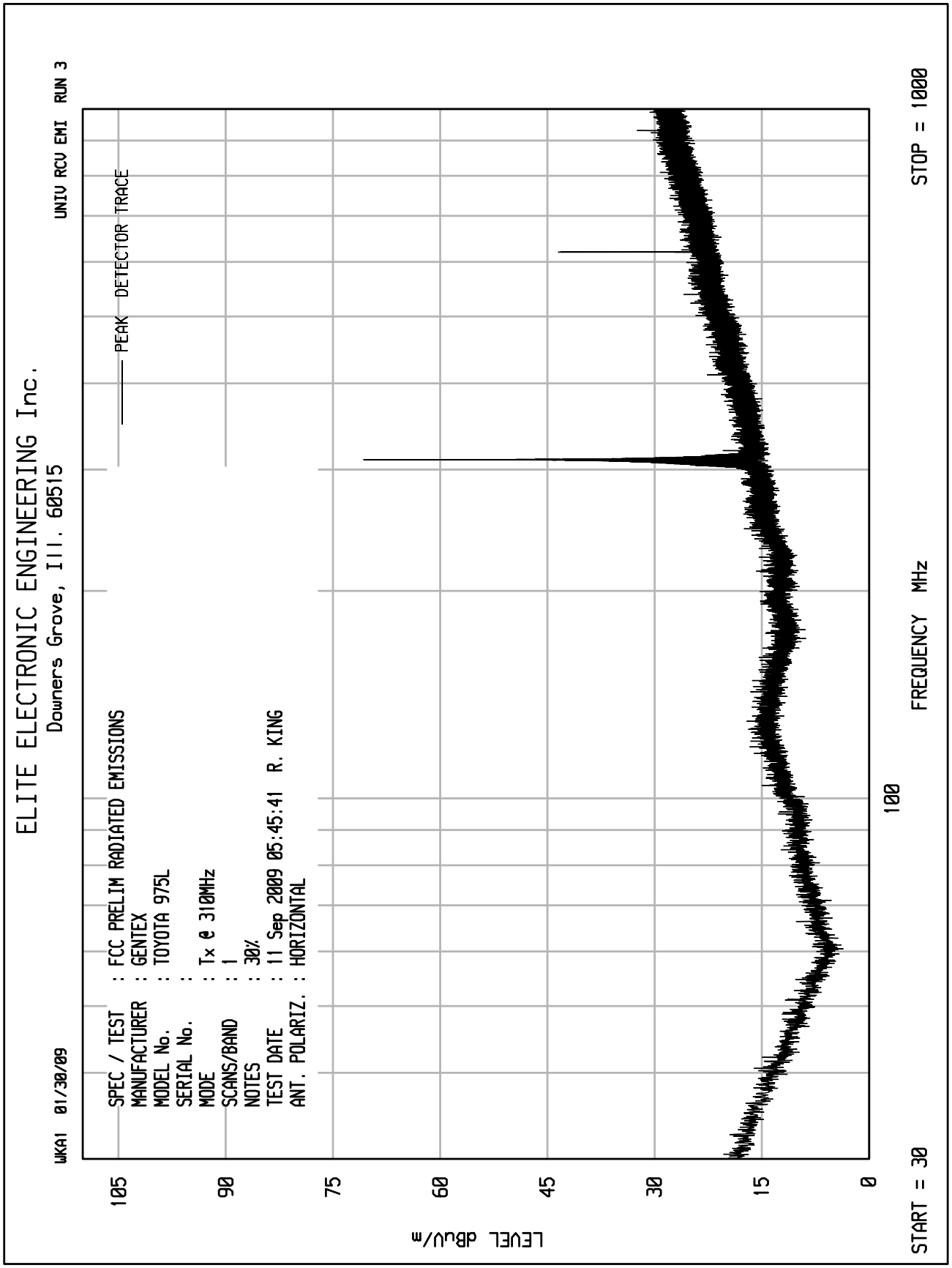

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 3
WKAI 01/30/09
SPEC / TEST : FCC PRELIM RADIATED EMISSIONS
MANUFACTURER : GENTEX
MODEL No. : TOYOTA 975L
SERIAL No. :
MODE : Tx @ 280MHz
SCANS/BAND : 1
NOTES : 30'
TEST DATE : 8 Sep 2009 06:49:33 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 5000

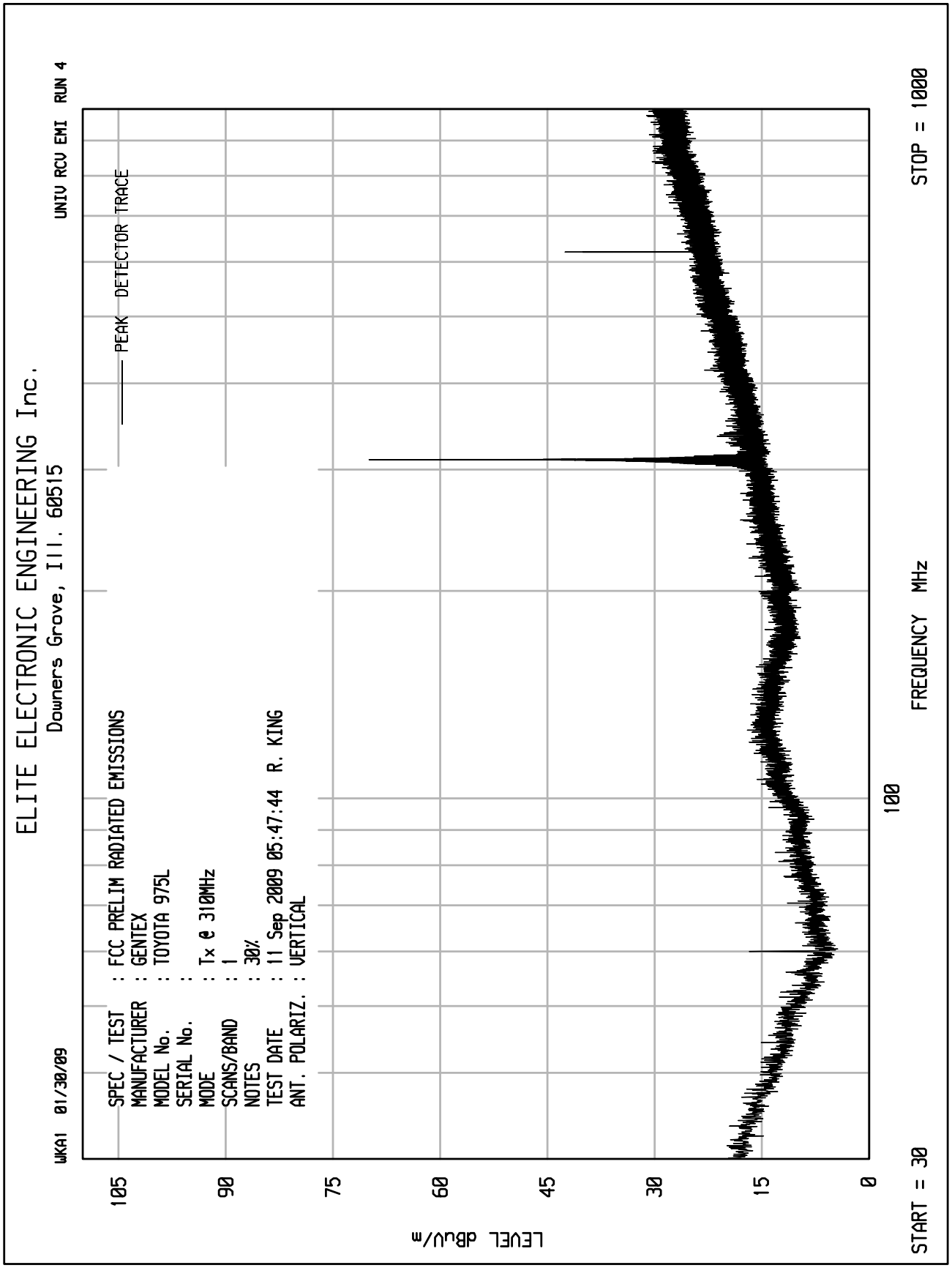

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 5
WKAI 01/30/09
SPEC / TEST : FCC PRELIM RADIATED EMISSIONS
MANUFACTURER : GENTEX
MODEL No. : TOYOTA 975L
SERIAL No. :
MODE : Tx @ 280MHz
SCANS/BAND : 1
NOTES : 50%
TEST DATE : 8 Sep 2009 06:57:17 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 5000

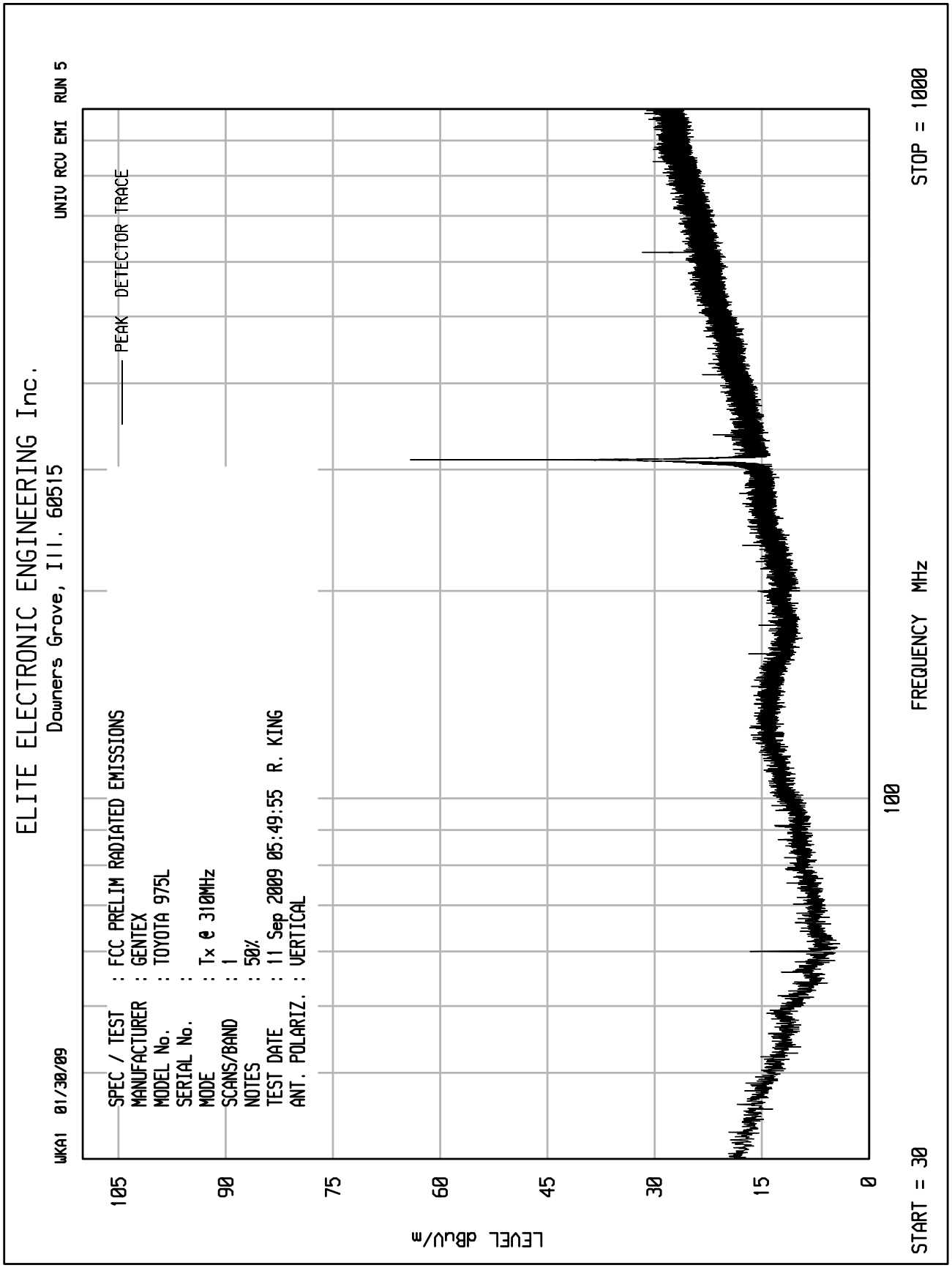

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 5
WKAI 01/30/09
SPEC / TEST : FCC PRELIM RADIATED EMISSIONS
MANUFACTURER : GENTEX
MODEL No. : TOYOTA 975L
SERIAL No. :
MODE : Tx @ 280MHz
SCANS/BAND : 1
NOTES : 50%
TEST DATE : 8 Sep 2009 06:57:17 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 5000

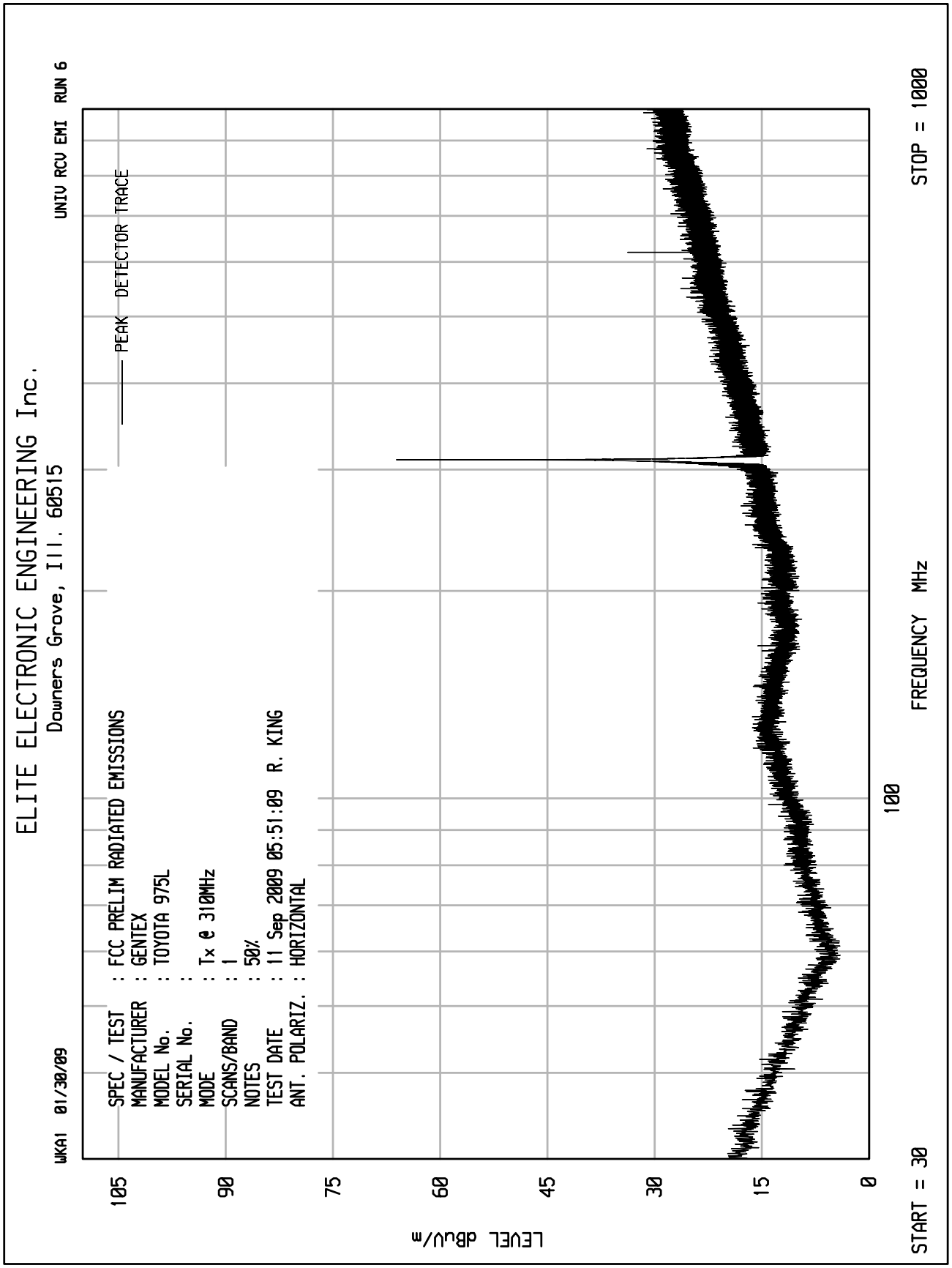

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 3
WKAI 01/30/09
SPEC / TEST : FCC PRELIM RADIATED EMISSIONS
MANUFACTURER : GENTEX
MODEL No. : TOYOTA 975L
SERIAL No. : :
MODE : Tx @ 280MHz
SCANS/BAND : 1
NOTES : 80%
TEST DATE : 10 Sep 2009 05:03:30 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 5000

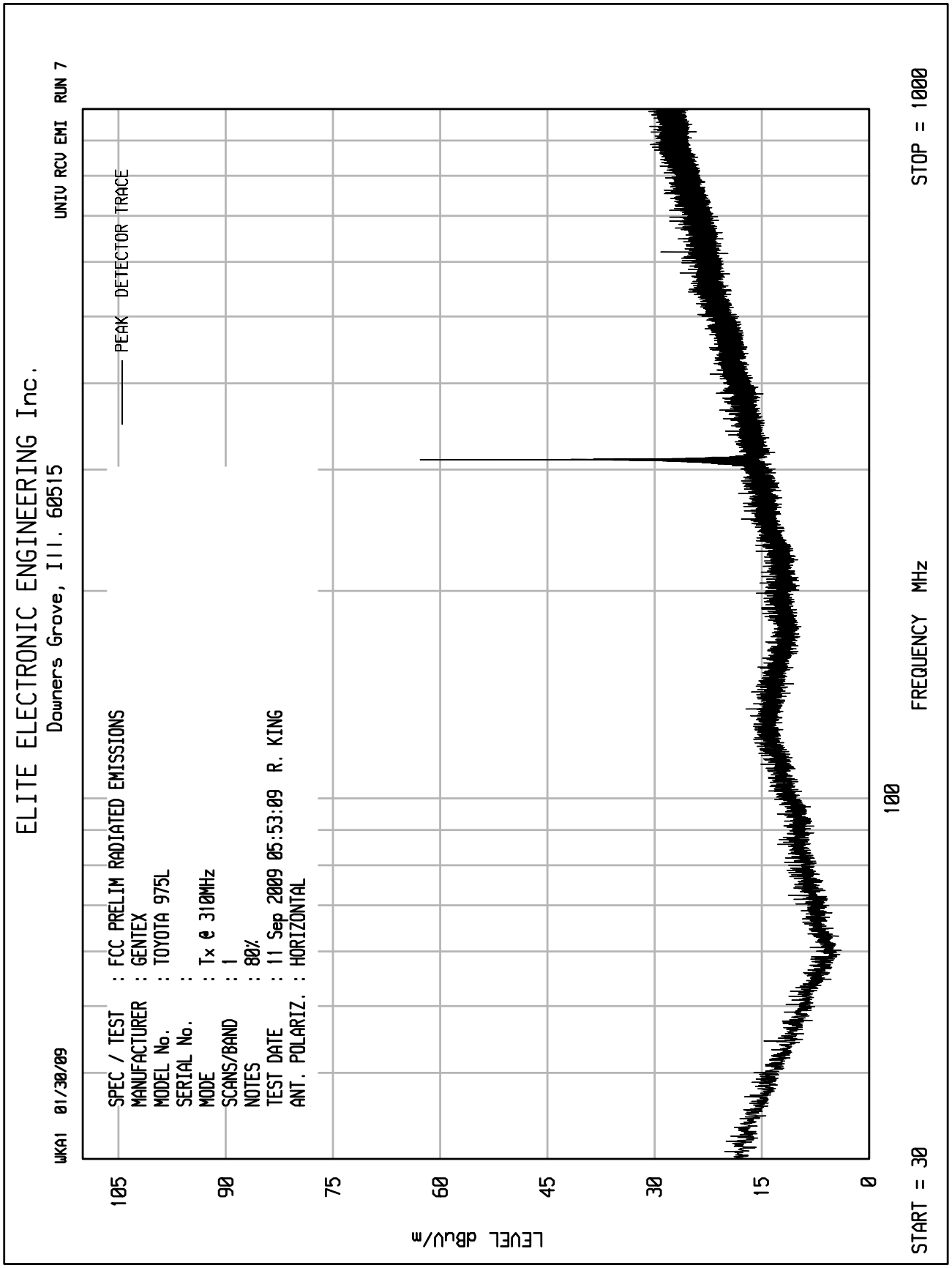

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 4
WKAI 01/30/09
SPEC / TEST : FCC PRELIM RADIATED EMISSIONS
MANUFACTURER : GENTEX
MODEL No. : TOYOTA 975L
SERIAL No. : :
MODE : Tx @ 280MHz
SCANS/BAND : 1
NOTES : 80%
TEST DATE : 10 Sep 2009 05:05:58 R. KING
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 1000
FREQUENCY MHz
STOP = 5000

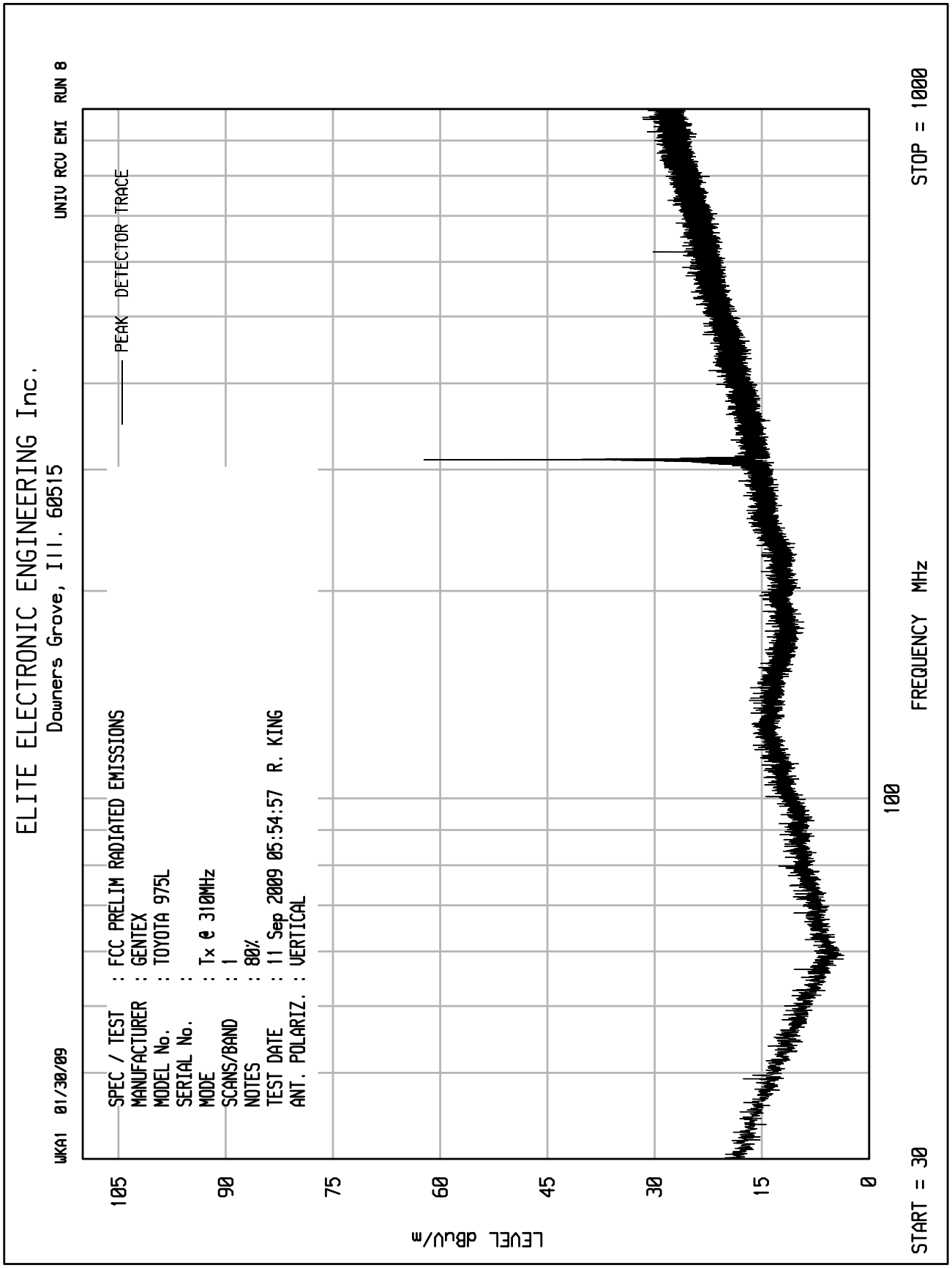

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 3
WKAI 01/30/09
SPEC / TEST : FCC PRELIM RADIATED EMISSIONS
MANUFACTURER : GENTEX
MODEL No. : TOYOTA 975L
SERIAL No. :
MODE : Tx @ 310MHz
SCANS/BAND : 1
NOTES : 30%
TEST DATE : 11 Sep 2009 05:45:41 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
105
90
75
60
45
30
15
0
START = 30
100
FREQUENCY MHz
STOP = 1000

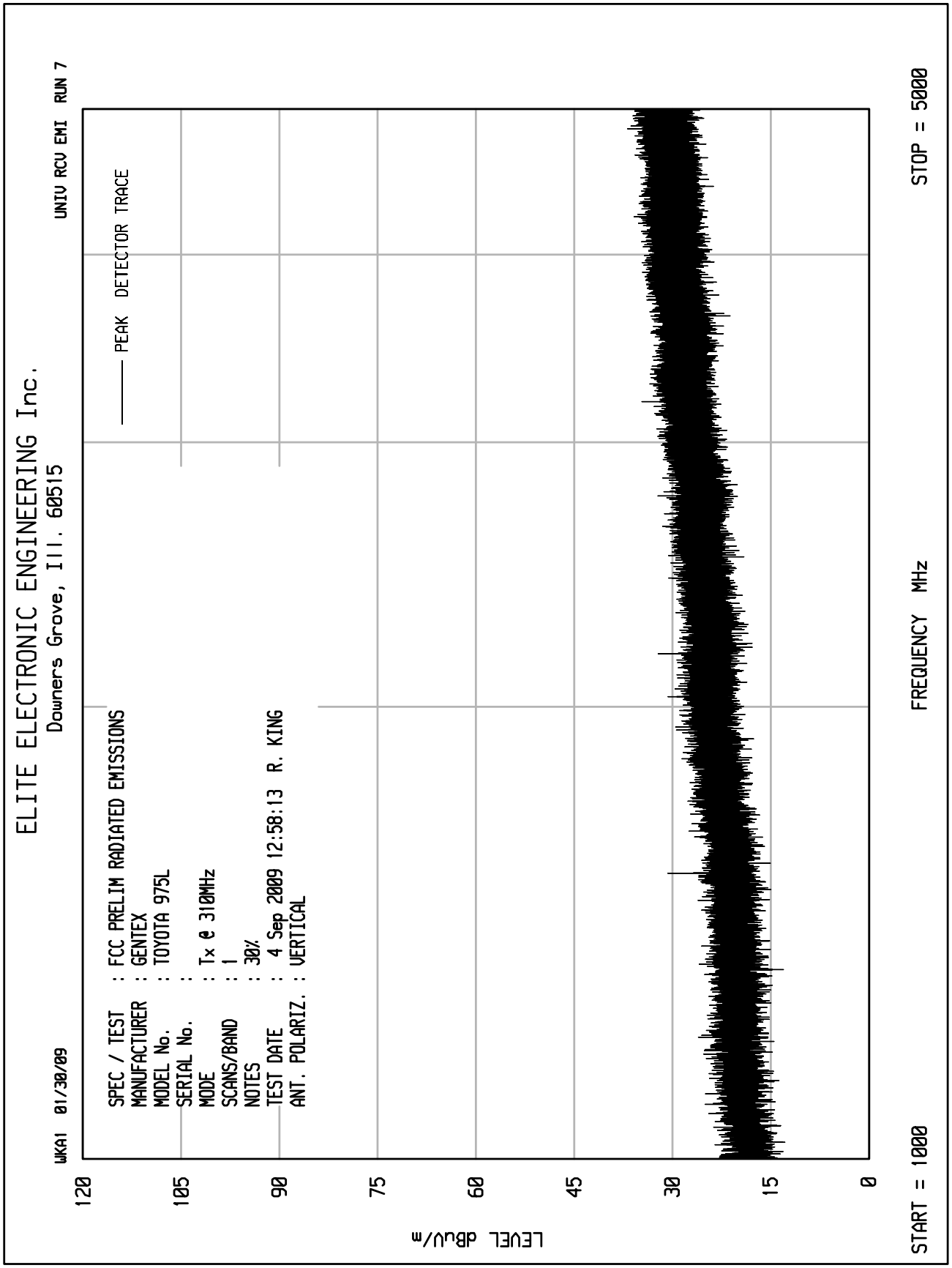

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 4
WKAI 01/30/09
SPEC / TEST : FCC PRELIM RADIATED EMISSIONS
MANUFACTURER : GENTEX
MODEL No. : TOYOTA 975L
SERIAL No. : :
MODE : Tx @ 310MHz
SCANS/BAND : 1
NOTES : 30%
TEST DATE : 11 Sep 2009 05:47:44 R. KING
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
105
90
75
60
45
30
15
0
START = 30
100
FREQUENCY MHz
STOP = 1000

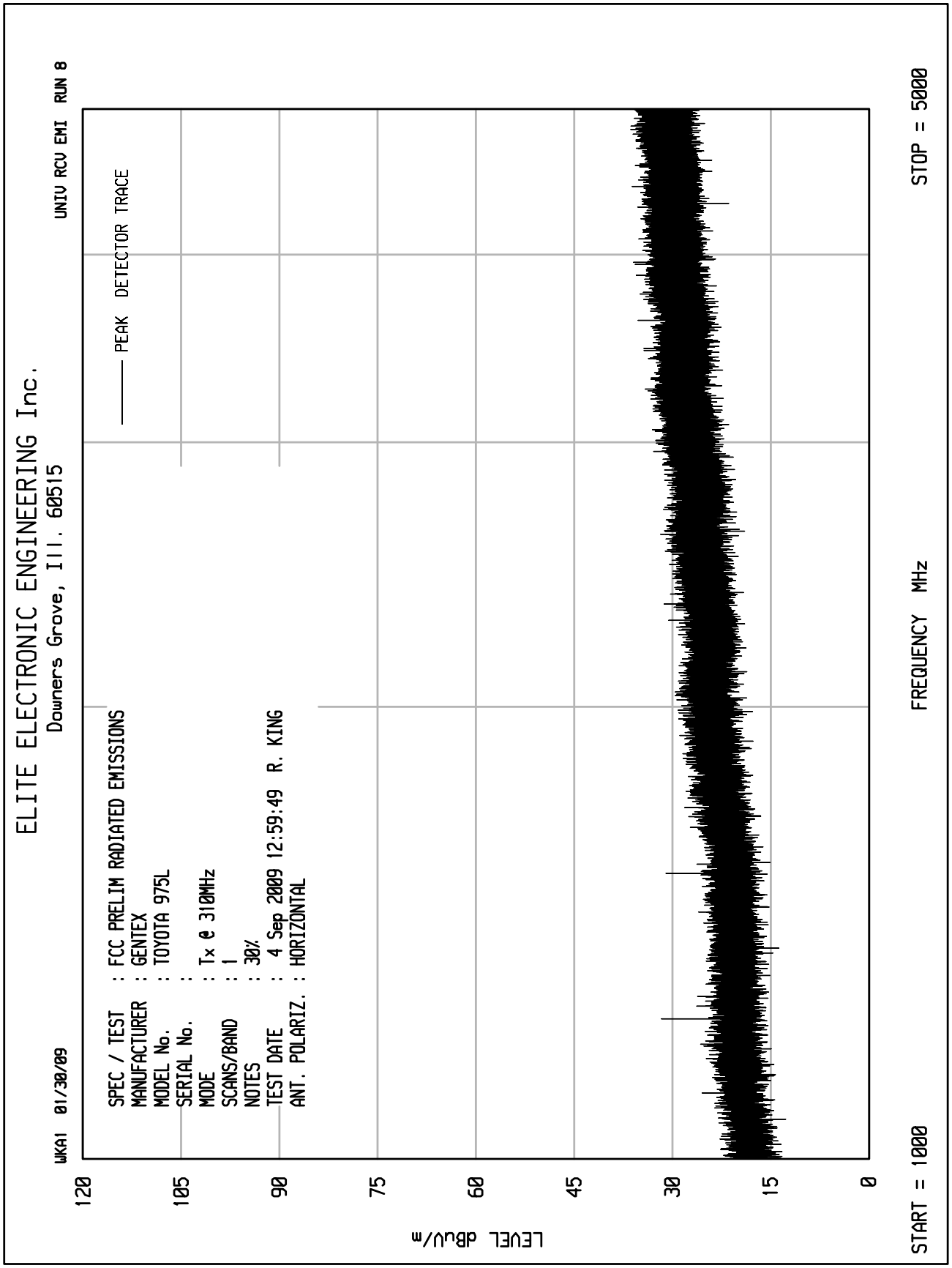

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 5
WKAI 01/30/09
SPEC / TEST : FCC PRELIM RADIATED EMISSIONS
MANUFACTURER : GENTEX
MODEL No. : TOYOTA 975L
SERIAL No. : :
MODE : Tx @ 310MHz
SCANS/BAND : 1
NOTES : 50%
TEST DATE : 11 Sep 2009 05:49:55 R. KING
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
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 6
WKAI 01/30/09
SPEC / TEST : FCC PRELIM RADIATED EMISSIONS
MANUFACTURER : GENTEX
MODEL No. : TOYOTA 975L
SERIAL No. : :
MODE : Tx @ 310MHz
SCANS/BAND : 1
NOTES : 50%
TEST DATE : 11 Sep 2009 05:51:09 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
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
WKAI 01/30/09
SPEC / TEST : FCC PRELIM RADIATED EMISSIONS
MANUFACTURER : GENTEX
MODEL No. : TOYOTA 975L
SERIAL No. : :
MODE : Tx @ 310MHz
SCANS/BAND : 1
NOTES : 80%
TEST DATE : 11 Sep 2009 05:53:09 R. KING
ANT. POLARIZ. : HORIZONTAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
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
WKAI 01/30/09
SPEC / TEST : FCC PRELIM RADIATED EMISSIONS
MANUFACTURER : GENTEX
MODEL No. : TOYOTA 975L
SERIAL No. : :
MODE : Tx @ 310MHz
SCANS/BAND : 1
NOTES : 80%
TEST DATE : 11 Sep 2009 05:54:57 R. KING
ANT. POLARIZ. : VERTICAL
PEAK DETECTOR TRACE
LEVEL dBuV/m
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
WKAI 01/30/09
SPEC / TEST : FCC PRELIM RADIATED EMISSIONS
MANUFACTURER : GENTEX
MODEL No. : TOYOTA 975L
SERIAL No. :
MODE : Tx @ 310MHz
SCANS/BAND : 1
NOTES : 30%
TEST DATE : 4 Sep 2009 12:58:13 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 = 5000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 8
WKAI 01/30/09
SPEC / TEST : FCC PRELIM RADIATED EMISSIONS
MANUFACTURER : GENTEX
MODEL No. : TOYOTA 975L
SERIAL No. :
MODE : Tx @ 310MHz
SCANS/BAND : 1
NOTES : 30%
TEST DATE : 4 Sep 2009 12:59:49 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 = 5000