



## Measurement of RF Emissions from a JLRHL3 Transceiver

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

P.O. No. : 245321  
Date Tested : September 30, 2008 through October 8, 2008  
Test Personnel : Richard King  
Specification : FCC "Code of Federal Regulations" Title 47  
: Part15, Subpart B for Receivers  
: Industry Canada RSS-310  
: Industry Canada RSS-GEN

Test Report By : *RICHARD E. KING*  
Richard King

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Registered Professional  
Engineer of Illinois - 44894



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



**REVISION HISTORY**

Revision	Date	Description
—	10/30/2008	Initial release

## Measurement of RF Emissions from a Transceiver, Part No. JLRHL3

### 1 INTRODUCTION

#### 1.1 Scope of Tests

This report presents the results of the RF emissions measurements performed on a Transceiver, model JLRHL3, Serial No. 100, (hereinafter referred to as the test item). The test item was manufactured and submitted for testing by Gentex Corporation located in Zeeland, MI.

The test item is a super-heterodyne scanning type receiver designed to scan through the following frequencies: 288MHz, 310MHz, 340MHz, 365MHz, 390MHz, 418MHz. It has an internal antenna.

#### 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 B, Sections 15.107 and 15.109 for receivers and Industry Canada RSS-GEN Table 2 and RSS-310 Table 2. 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 22°C and the relative humidity was 33%.

### 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-310, Issue 2, June 2007, "Spectrum Management and Telecommunications Radio Standards Specification, Low-power License-exempt radio communication devices (All Frequency Bands): Category II 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. JLRHL3. 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 third wire of its input power cord.

3.1.5 Frequency of Test Item

The test item was equipped with a super-heterodyne scanning type receiver that tuned to either 288MHz, 310MHz, 340MHz, 365MHz, 390MHz, or 418MHz. The test item utilized one local oscillator 10.7MHz below the tuned frequency. In accordance with 47 CFR 15.33, since the highest frequency generated or used by the test item is below 500MHz, radiated emissions measurements were made up to 2GHz.

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.

Two samples were submitted for testing. One sample was programmed to scan through all of the receiver frequencies (normal operation). A second unit was programmed so that it could receive separately at a low, mid, and high channel (288MHz, 310MHz, and 418MHz).

3.3 Test Item Modifications

No modifications were required for compliance to the FCC 15B requirements for receivers.

No modifications were required for compliance to the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart B, Sections 15.107 and 15.109 for receivers and Industry Canada RSS-GEN Table 2 and RSS-310 Table 2 requirements for receivers.

4 TEST FACILITY AND TEST INSTRUMENTATION

4.1 Shielded Enclosure

All radiated emissions 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 and radiated emission measurements were performed with a spectrum analyzer. This receiver allows measurements with the bandwidths and detector functions specified by the FCC. The receiver bandwidth was



120kHz for the 30MHz to 1000MHz radiated emissions data and 1MHz for the 1000MHz to 2000MHz 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 are required.

5.2 Radiated Measurements

5.2.1 Requirements

All emanations from a receiver shall be below the levels shown on the following table:

RADIATION LIMITS FOR A RECEIVER

Frequency MHz	Distance between Test Item 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

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 test item 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 test item. 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 test item with respect to the antenna. The frequency range from 1GHz to 2GHz 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 test item 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 test item 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 test item 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, with the receiver scanning through the frequencies, are presented on pages 13 through 16. The plots are presented for a reference only, and are not used to determine compliance. The final radiated levels are presented on pages 29 and 30. As can be seen from the data, all emissions measured from the test item were within the specification limits.

The preliminary plots, with the test item set to receive at 288MHz, 310MHz and 418MHz are presented on pages 17 and 28. The plots are presented for a reference only, and are not used to determine compliance. The final radiated levels are presented on pages 31 through 39. As can be seen from the data, all emissions measured from the test item were within the specification limits.

## 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. JLRHL3, Serial No. 100, did fully meet the conducted radio interference requirements of Section 15.107 and the radiated interference requirements of Section 15.109 of the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart B for Receivers and the Industry Canada conducted radio interference requirements of RSS-GEN Table 2 and the radiated interference requirements of RSS-310 Table 2.

## **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
CDS2	COMPUTER	GATEWAY	MFATXPNT NMZ 500L	0028483108	1.8GHZ	N/A	
CMA1	Controllers	EMCO	2090	9701-1213	---	N/A	
GRE0	SIGNAL GENERATOR	AGILENT TECHNOLOGIES	E4438C	MY42083127	250KHZ-6GHZ	1/7/2008	1/7/2009
HRE1	LASER JET 5P	HEWLETT PACKARD	C3150A	USHB061052	---	N/A	
NTA0	BILOG ANTENNA	CHASE EMC LTD.	BILOG CBL6112	2057	0.03-2GHZ	6/11/2008	6/11/2009
NWH0	RIDGED WAVE GUIDE	TENSOR	4105	2081	1-12.4GHZ	10/25/2008	10/25/2009
RAKG	RF SECTION	HEWLETT PACKARD	85462A	3549A00284	0.009-6500MHZ	11/21/2007	11/21/2008
RAKH	RF FILTER SECTION	HEWLETT PACKARD	85460A	3448A00324	---	11/21/2007	11/21/2008
RBB0	EMI TEST RECEIVER 20HZ TO 40 GHZ.	ROHDE & SCHWARZ	ESIB40	100250	20 HZ TO 40GHZ	11/5/2007	11/5/2008
SSKE	DC POWER SUPPLY	KIKUSUI ELECT CORP	PAD 35-10L	26027117	0-35 VOLT/ 10 AMP	NOTE 1	

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.

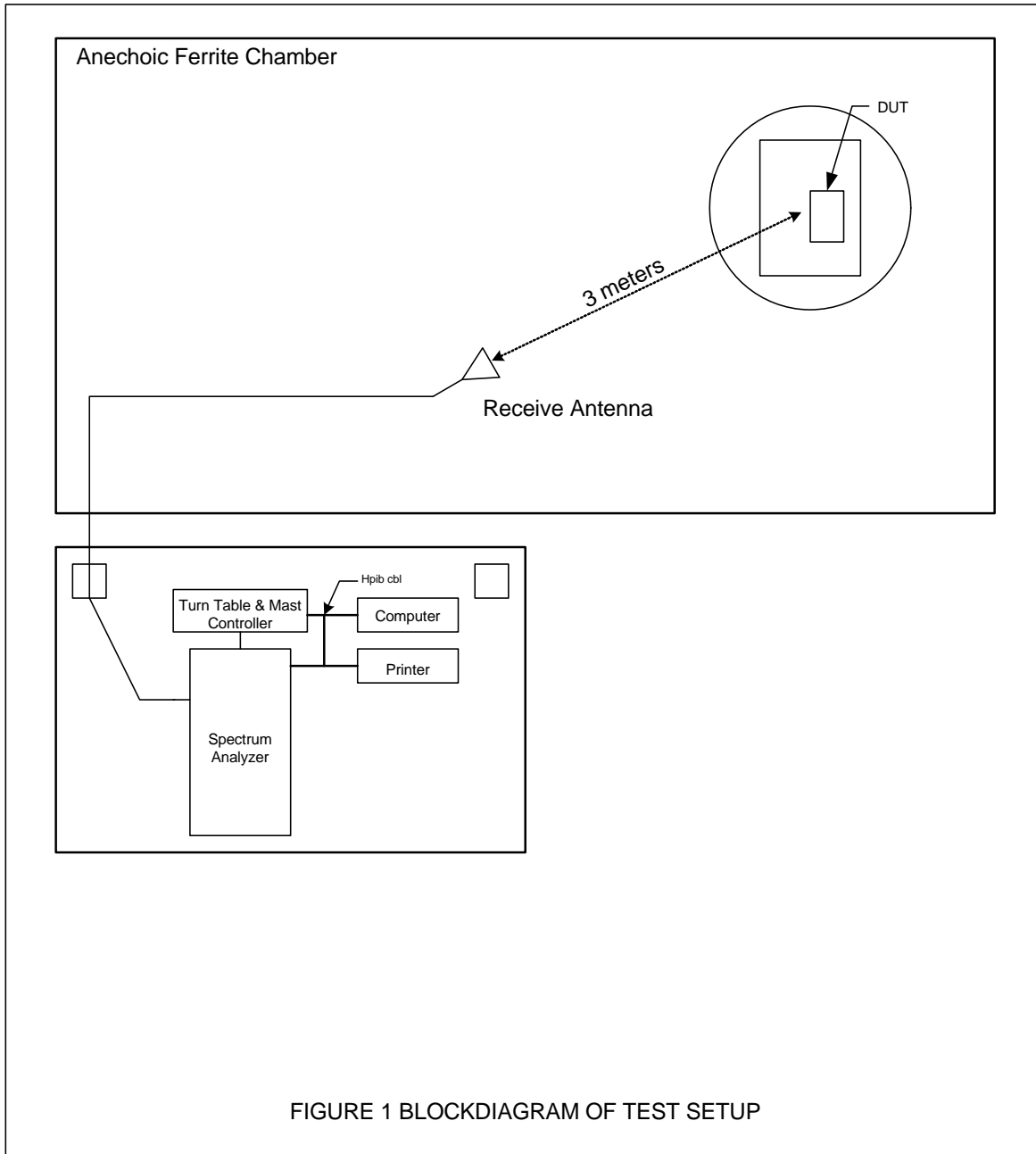
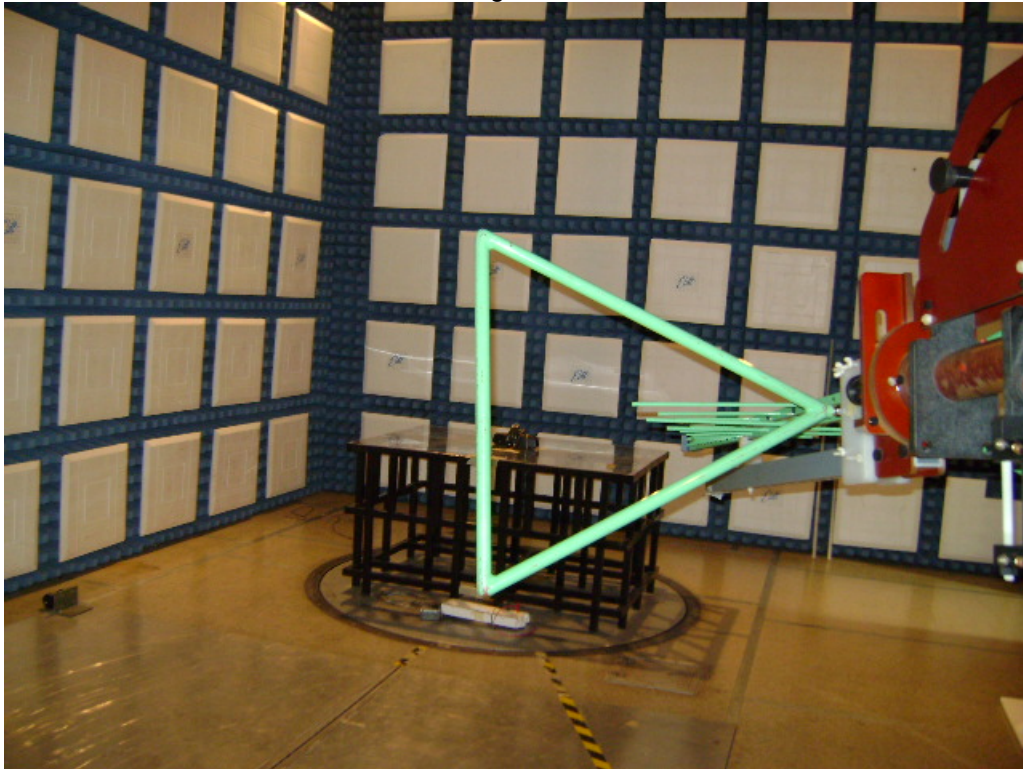
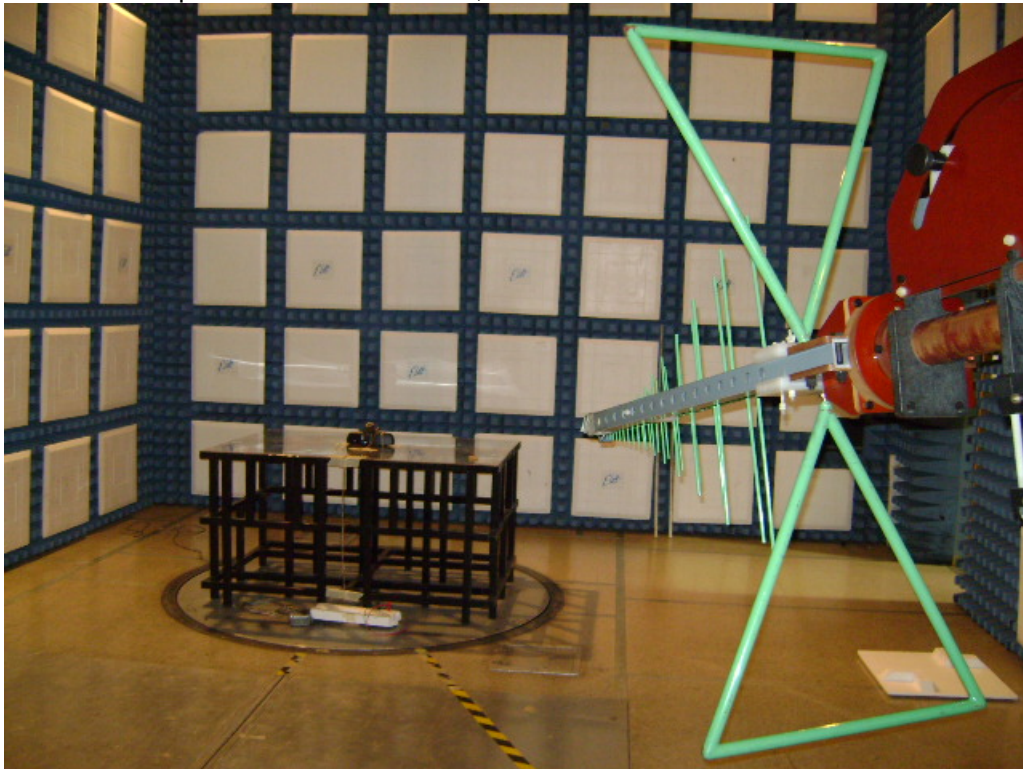


Figure 3



Test Set-up for Radiated Emissions, 30MHz to 1GHz – Horizontal Polarization



Test Set-up for Radiated Emissions, 30MHz to 1GHz – Vertical Polarization

Figure 4



Test Set-up for Radiated Emissions, 1GHz to 2GHz – Horizontal Polarization



Test Set-up for Radiated Emissions, 1GHz to 2GHz – Vertical Polarization

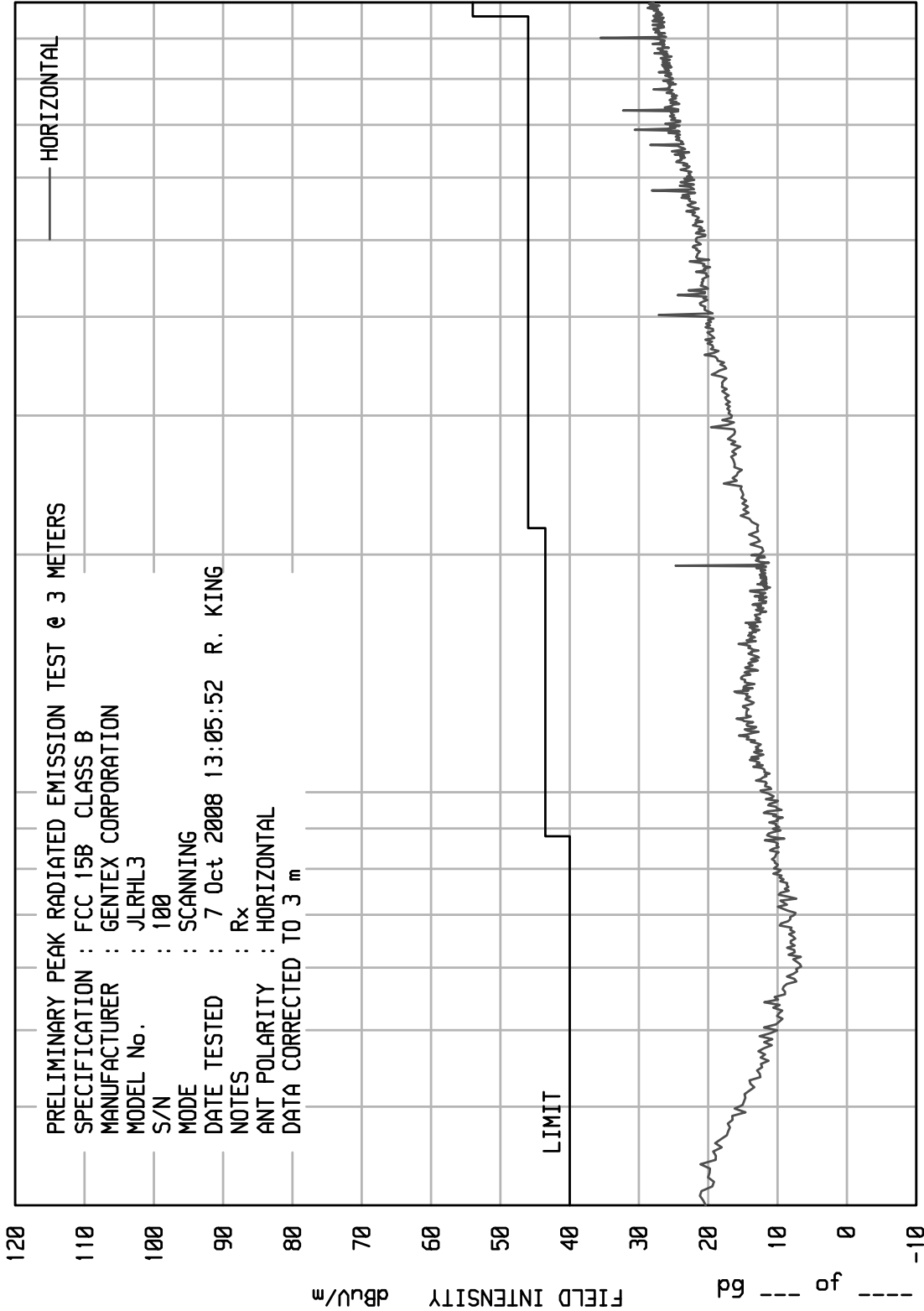
ELITE ELECTRONIC ENGINEERING Inc.

Downers Grove, Ill. 60515

8546A RE RUN 7

W088 11/26/07

PRELIMINARY PEAK RADIATED EMISSION TEST @ 3 METERS  
 SPECIFICATION : FCC 15B CLASS B  
 MANUFACTURER : GENTEX CORPORATION  
 MODEL No. : JLRHL3  
 S/N : 100  
 MODE : SCANNING  
 DATE TESTED : 7 Oct 2008 13:05:52 R. KING  
 NOTES : Rx  
 ANT POLARITY : HORIZONTAL  
 DATA CORRECTED TO 3 m



STOP = 1000

FREQUENCY - MHz

100

START = 30

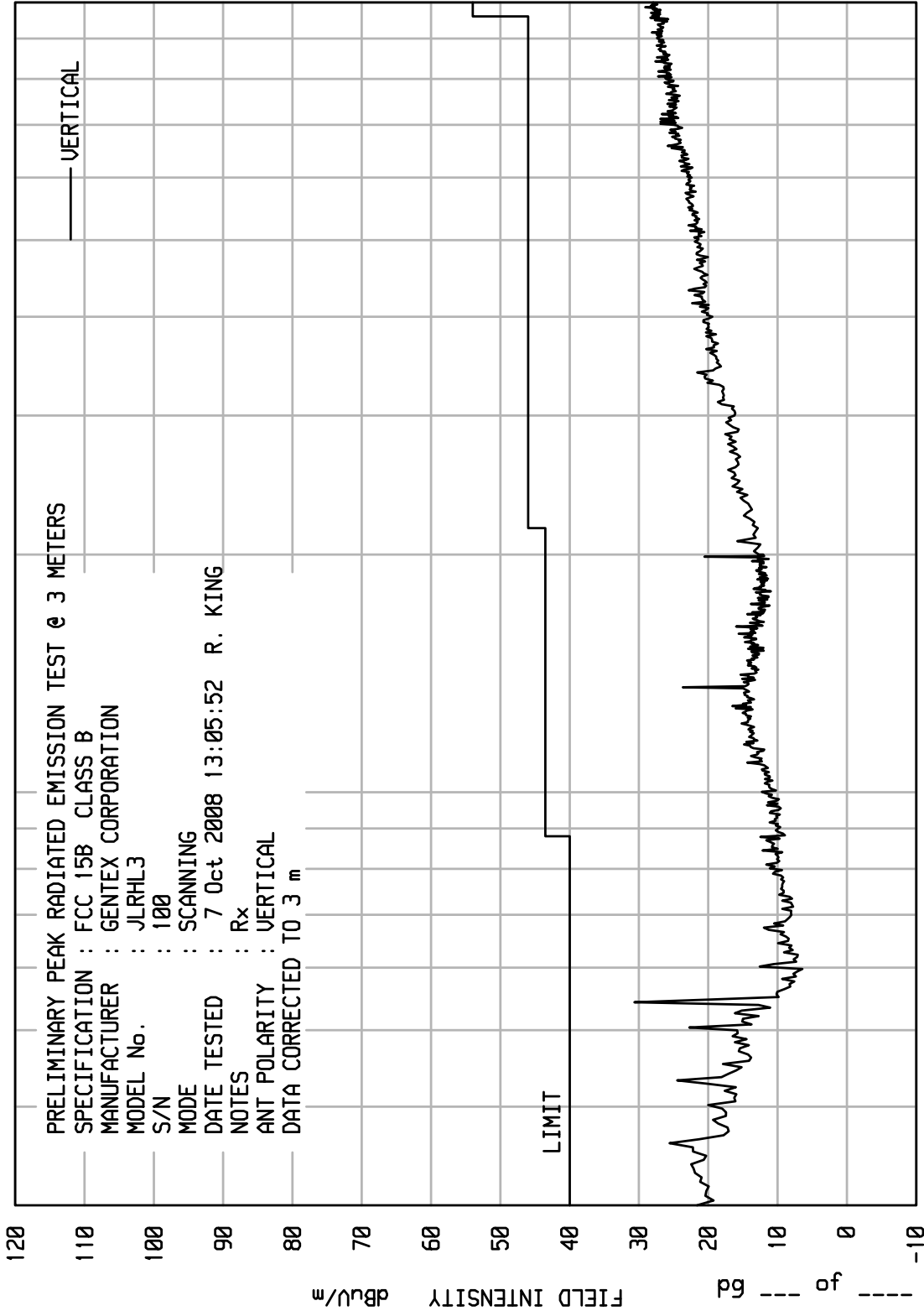
ELITE ELECTRONIC ENGINEERING Inc.

Downers Grove, Ill. 60515

8546A RE RUN 7

u088 11/26/07

PRELIMINARY PEAK RADIATED EMISSION TEST @ 3 METERS  
 SPECIFICATION : FCC 15B CLASS B  
 MANUFACTURER : GENTEX CORPORATION  
 MODEL No. : JLRHL3  
 S/N : 100  
 MODE : SCANNING  
 DATE TESTED : 7 Oct 2008 13:05:52 R. KING  
 NOTES : Rx  
 ANT POLARITY : VERTICAL  
 DATA CORRECTED TO 3 m



STOP = 1000

FREQUENCY - MHz

100

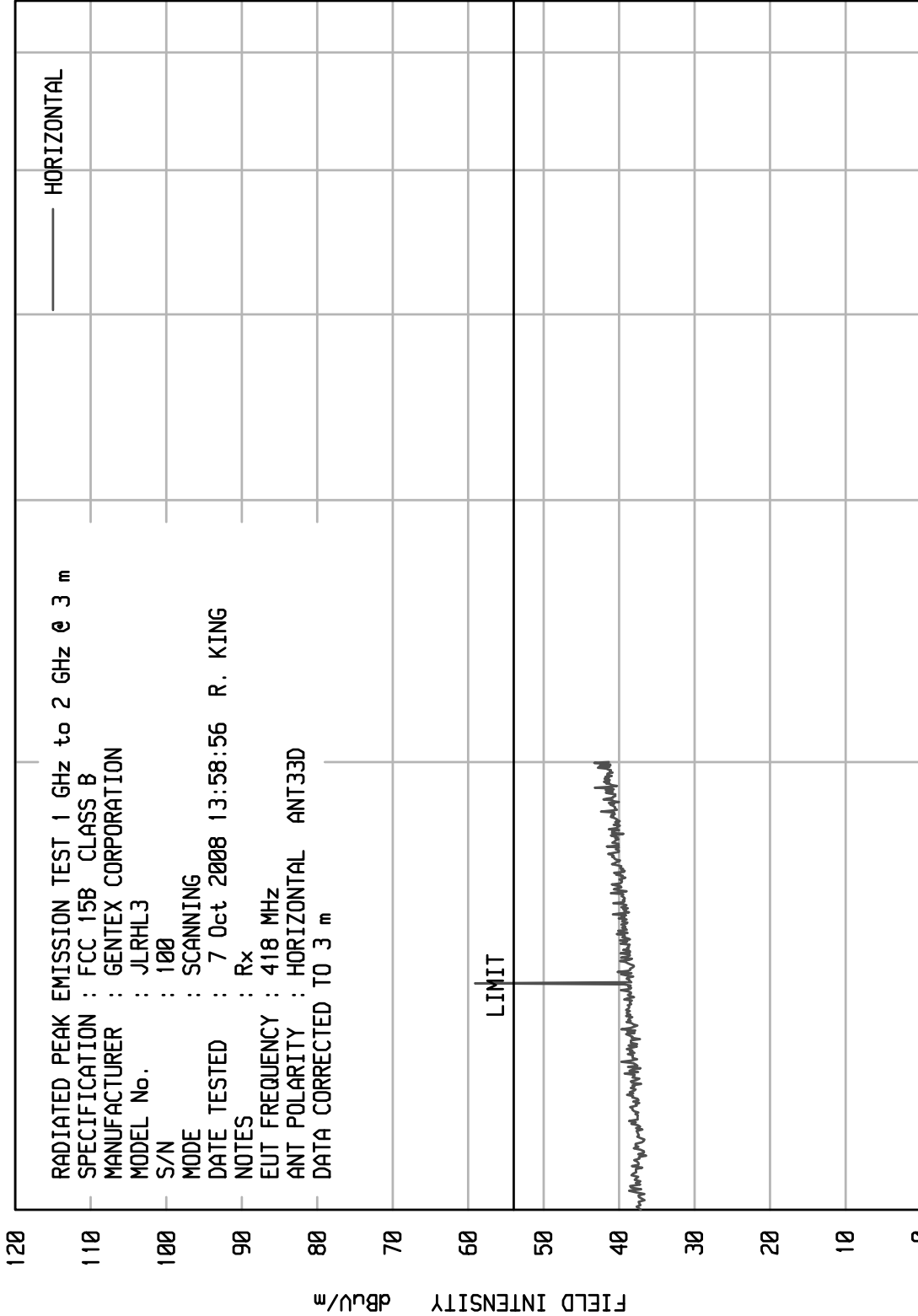
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ELITE ELECTRONIC ENGINEERING Inc.

Downers Grove, Ill. 60515

8546A HF RUN 1

WCCB 10/30/03

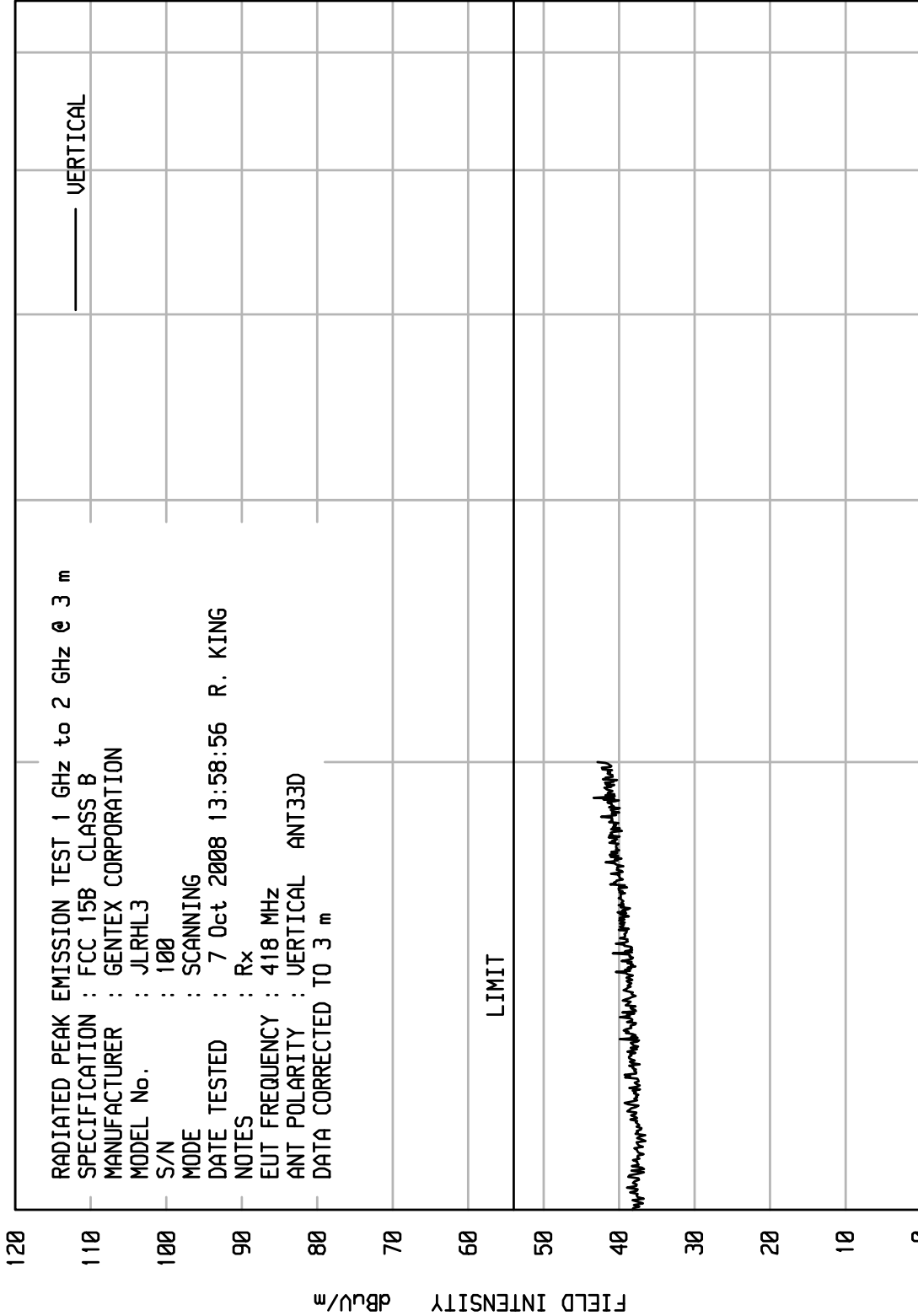


ELITE ELECTRONIC ENGINEERING Inc.

Downers Grove, Ill. 60515

8546A HF RUN 1

W008 10/30/03





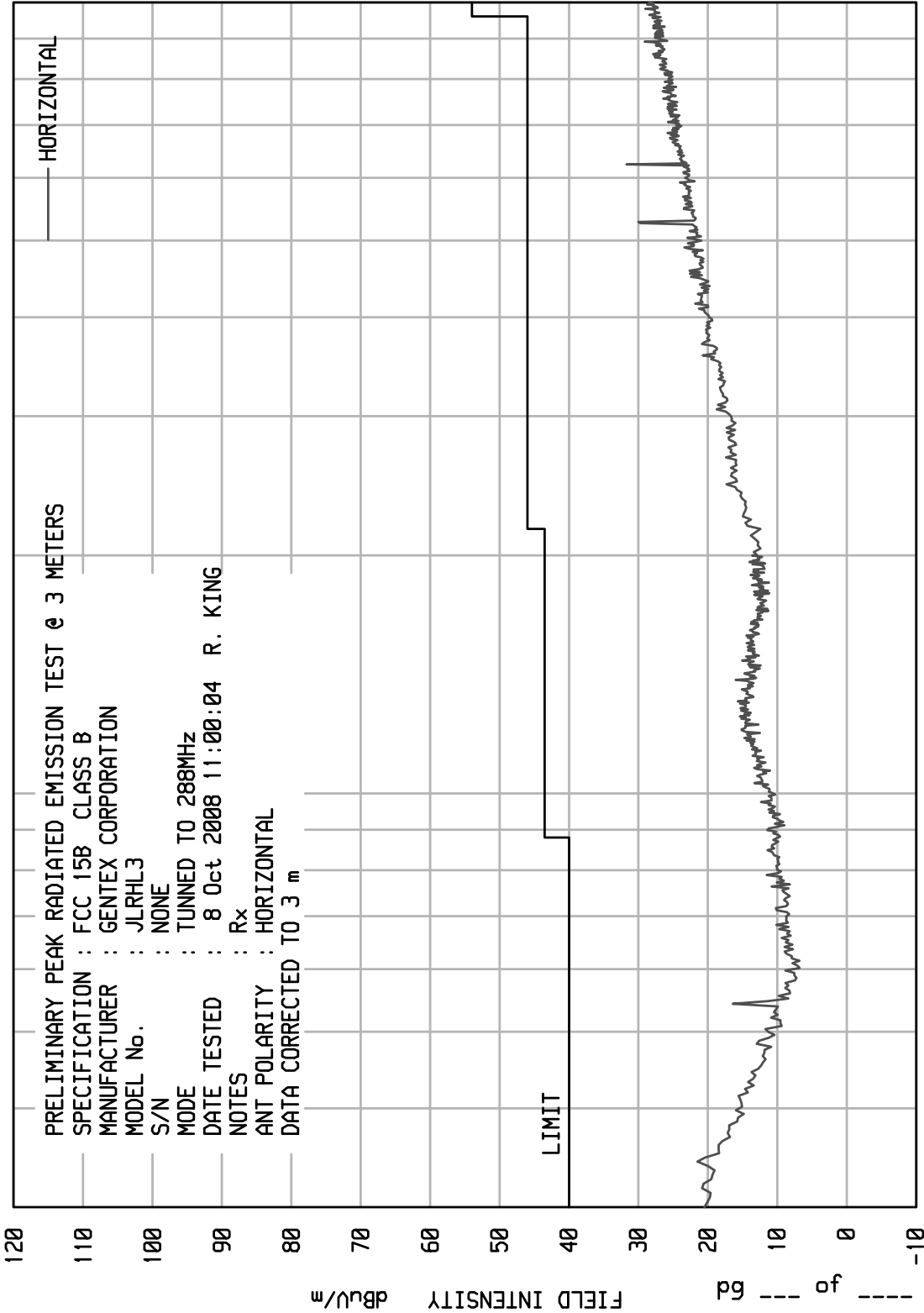
ELITE ELECTRONIC ENGINEERING Inc.

Downers Grove, Ill. 60515

8546A RE RUN 11

W088 11/26/07

PRELIMINARY PEAK RADIATED EMISSION TEST @ 3 METERS  
 SPECIFICATION : FCC 15B CLASS B  
 MANUFACTURER : GENTEX CORPORATION  
 MODEL No. : JLRHL3  
 S/N : NONE  
 MODE : TUNNED TO 288MHz  
 DATE TESTED : 8 Oct 2008 11:00:04 R. KING  
 NOTES : Rx  
 ANT POLARITY : HORIZONTAL  
 DATA CORRECTED TO 3 m



STOP = 1000

FREQUENCY - MHz

100

START = 30

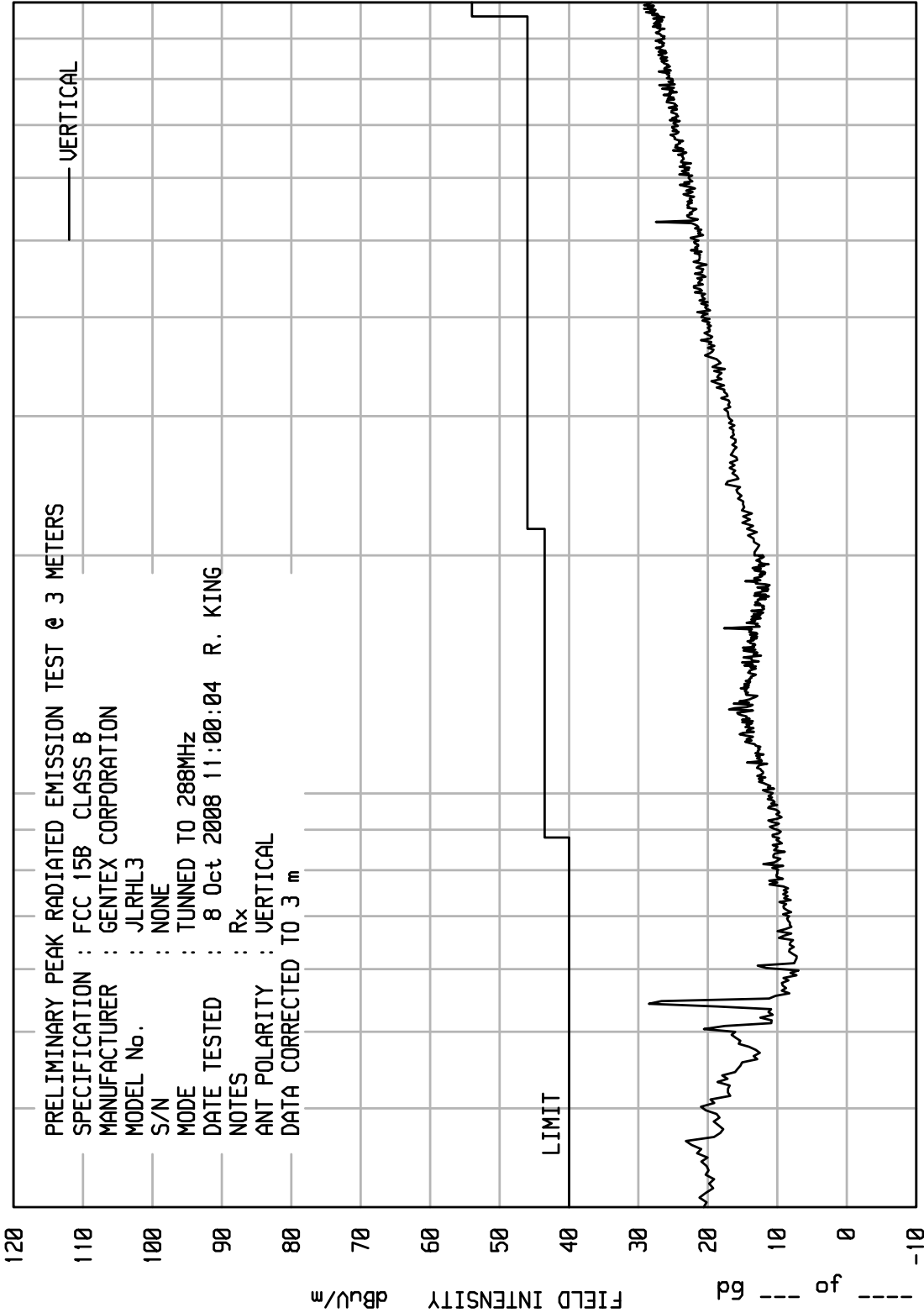
ELITE ELECTRONIC ENGINEERING Inc.

Downers Grove, Ill. 60515

8546A RE RUN 11

W088 11/26/07

PRELIMINARY PEAK RADIATED EMISSION TEST @ 3 METERS  
 SPECIFICATION : FCC 15B CLASS B  
 MANUFACTURER : GENTEX CORPORATION  
 MODEL No. : JLRHL3  
 S/N : NONE  
 MODE : TUNNED TO 288MHz  
 DATE TESTED : 8 Oct 2008 11:00:04 R. KING  
 NOTES : Rx  
 ANT POLARITY : VERTICAL  
 DATA CORRECTED TO 3 m



STOP = 1000

FREQUENCY - MHz

100

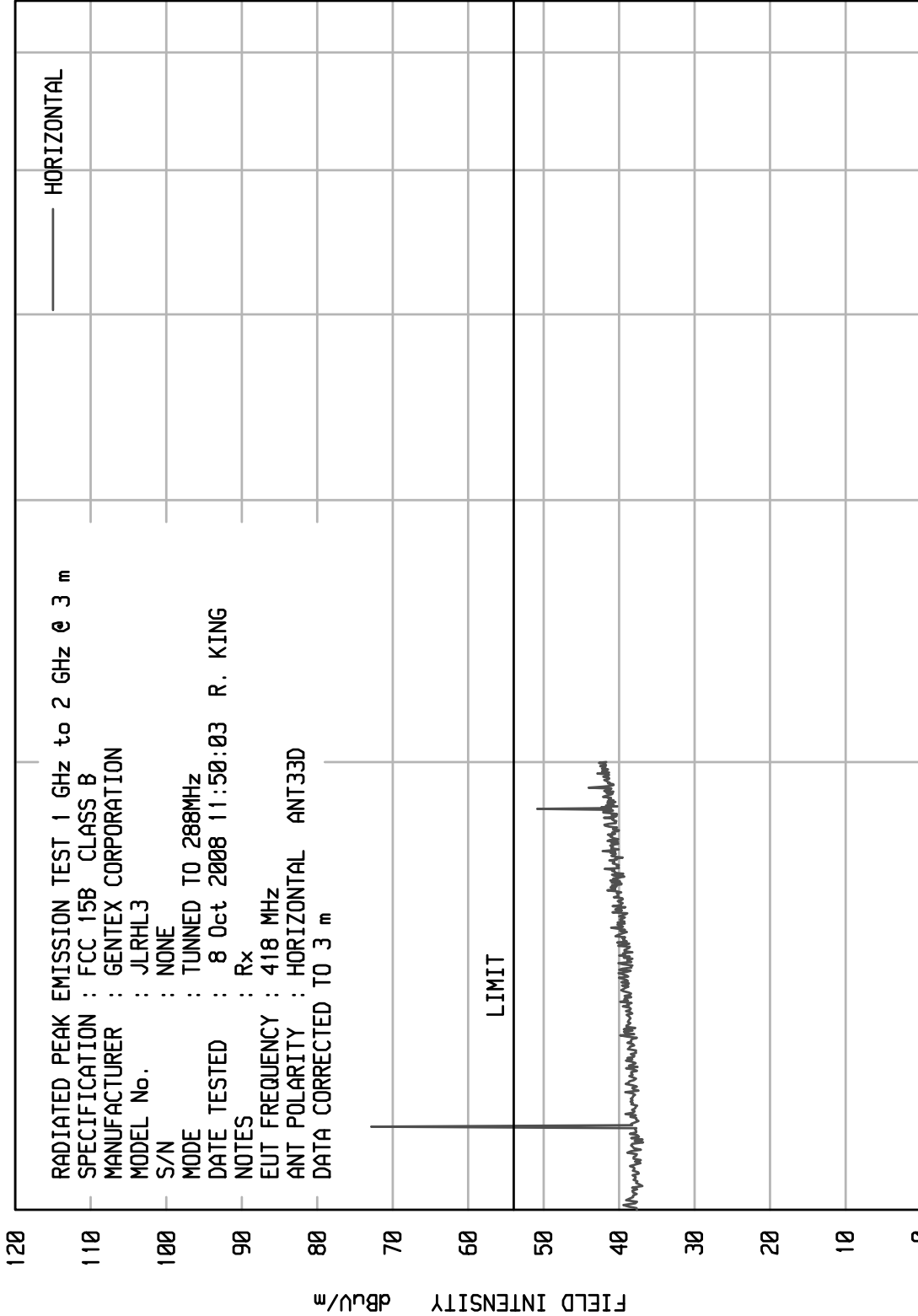
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ELITE ELECTRONIC ENGINEERING Inc.

Downers Grove, Ill. 60515

8546A HF RUN 2

WCCB 10/30/03



STOP = 6500

FREQUENCY - MHz

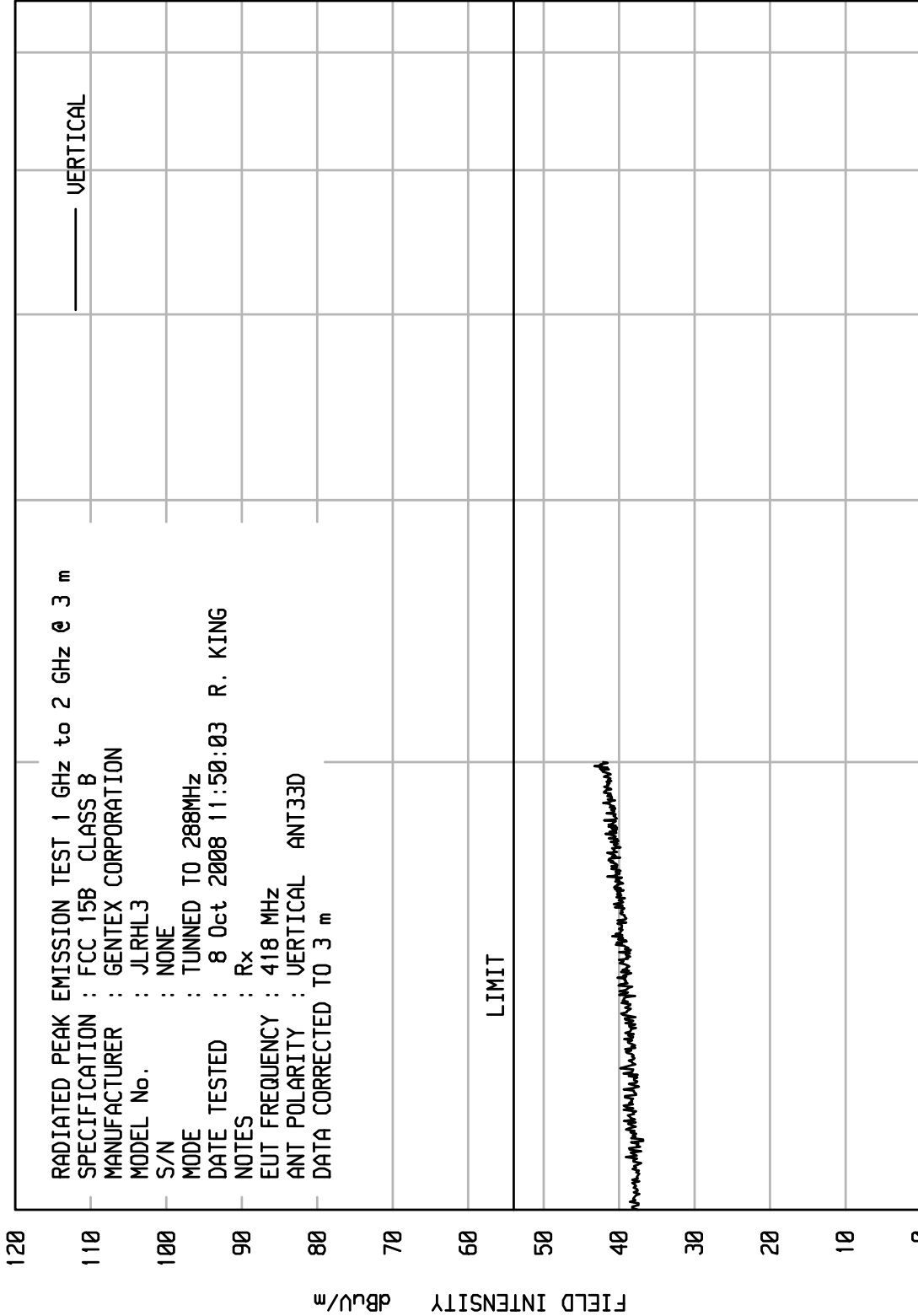
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ELITE ELECTRONIC ENGINEERING Inc.

Downers Grove, Ill. 60515

8546A HF RUN 2

WCCB 10/30/03



STOP = 6500

FREQUENCY - MHz

START = 1000

ELITE ELECTRONIC ENGINEERING Inc.

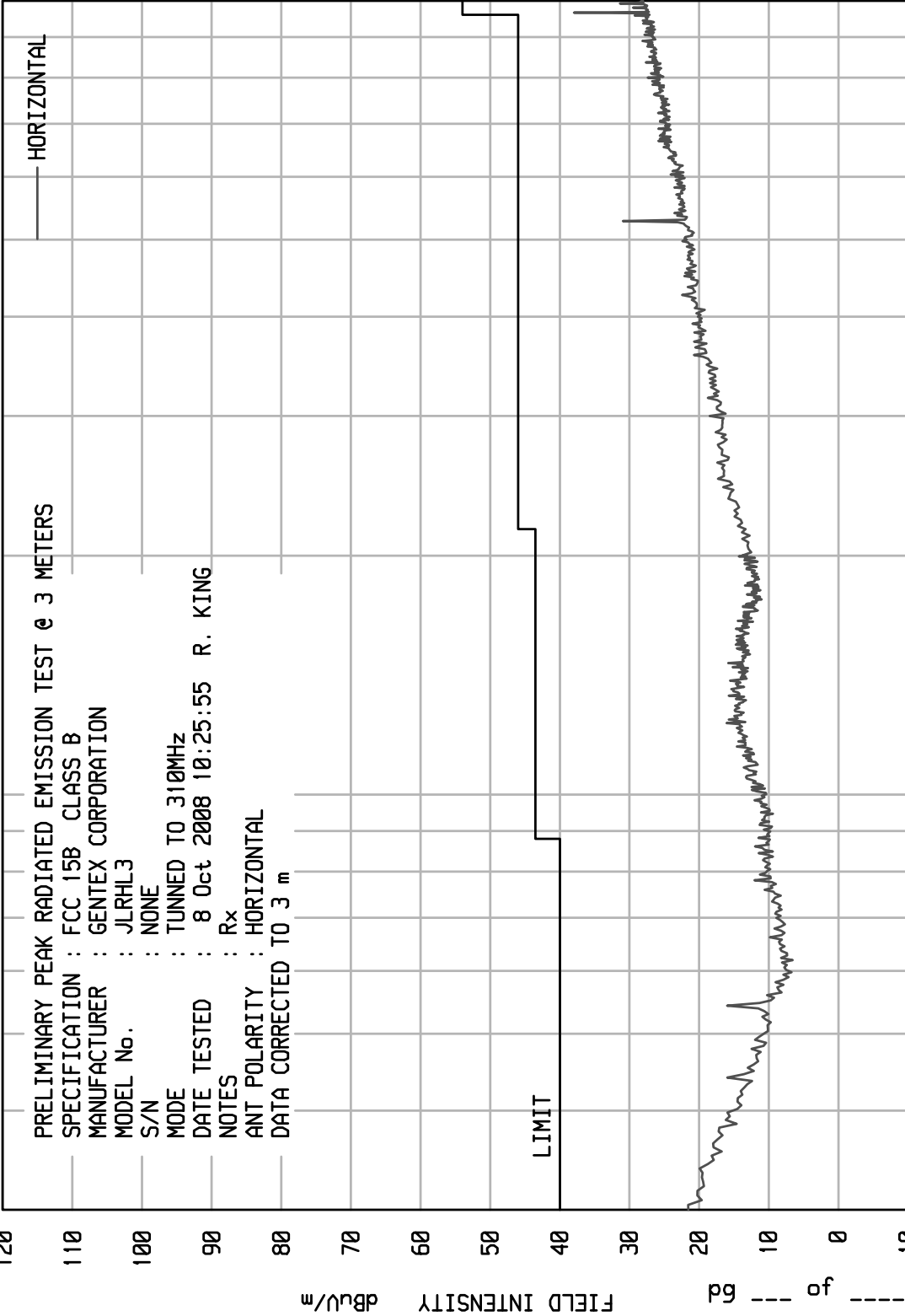
Downers Grove, Ill. 60515

8546A RE RUN 10

W088 11/26/07

PRELIMINARY PEAK RADIATED EMISSION TEST @ 3 METERS

SPECIFICATION : FCC 15B CLASS B  
 MANUFACTURER : GENTEX CORPORATION  
 MODEL No. : JLRHL3  
 S/N : NONE  
 MODE : TUNED TO 310MHz  
 DATE TESTED : 8 Oct 2008 10:25:55 R. KING  
 NOTES : Rx  
 ANT POLARITY : HORIZONTAL  
 DATA CORRECTED TO 3 m



STOP = 1000

FREQUENCY - MHz

100

START = 30

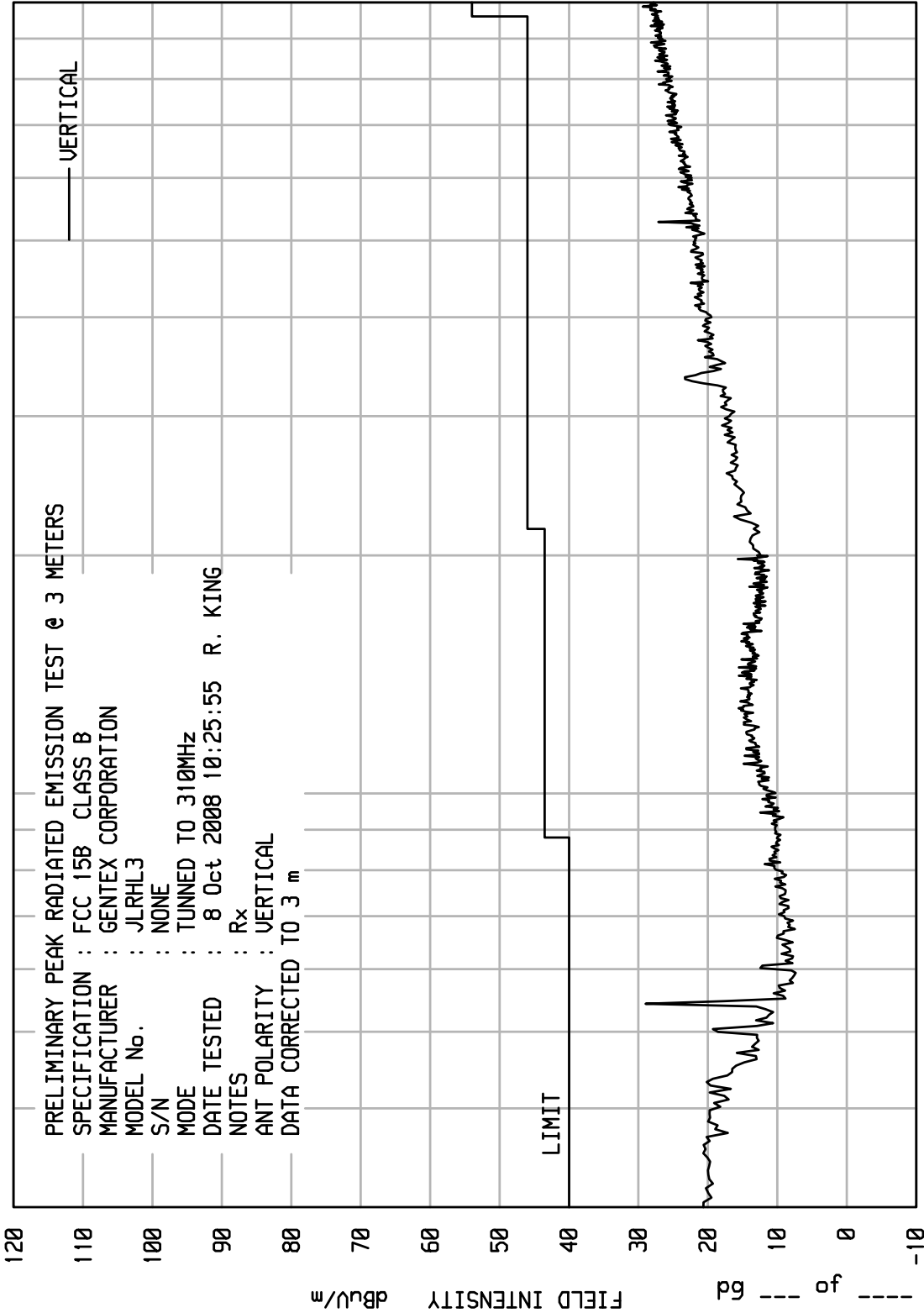
ELITE ELECTRONIC ENGINEERING Inc.

Downers Grove, Ill. 60515

8546A RE RUN 10

W088 11/26/07

PRELIMINARY PEAK RADIATED EMISSION TEST @ 3 METERS  
 SPECIFICATION : FCC 15B CLASS B  
 MANUFACTURER : GENTEX CORPORATION  
 MODEL No. : JLRHL3  
 S/N : NONE  
 MODE : TUNED TO 310MHz  
 DATE TESTED : 8 Oct 2008 10:25:55 R. KING  
 NOTES : Rx  
 ANT POLARITY : VERTICAL  
 DATA CORRECTED TO 3 m



STOP = 1000

FREQUENCY - MHz

100

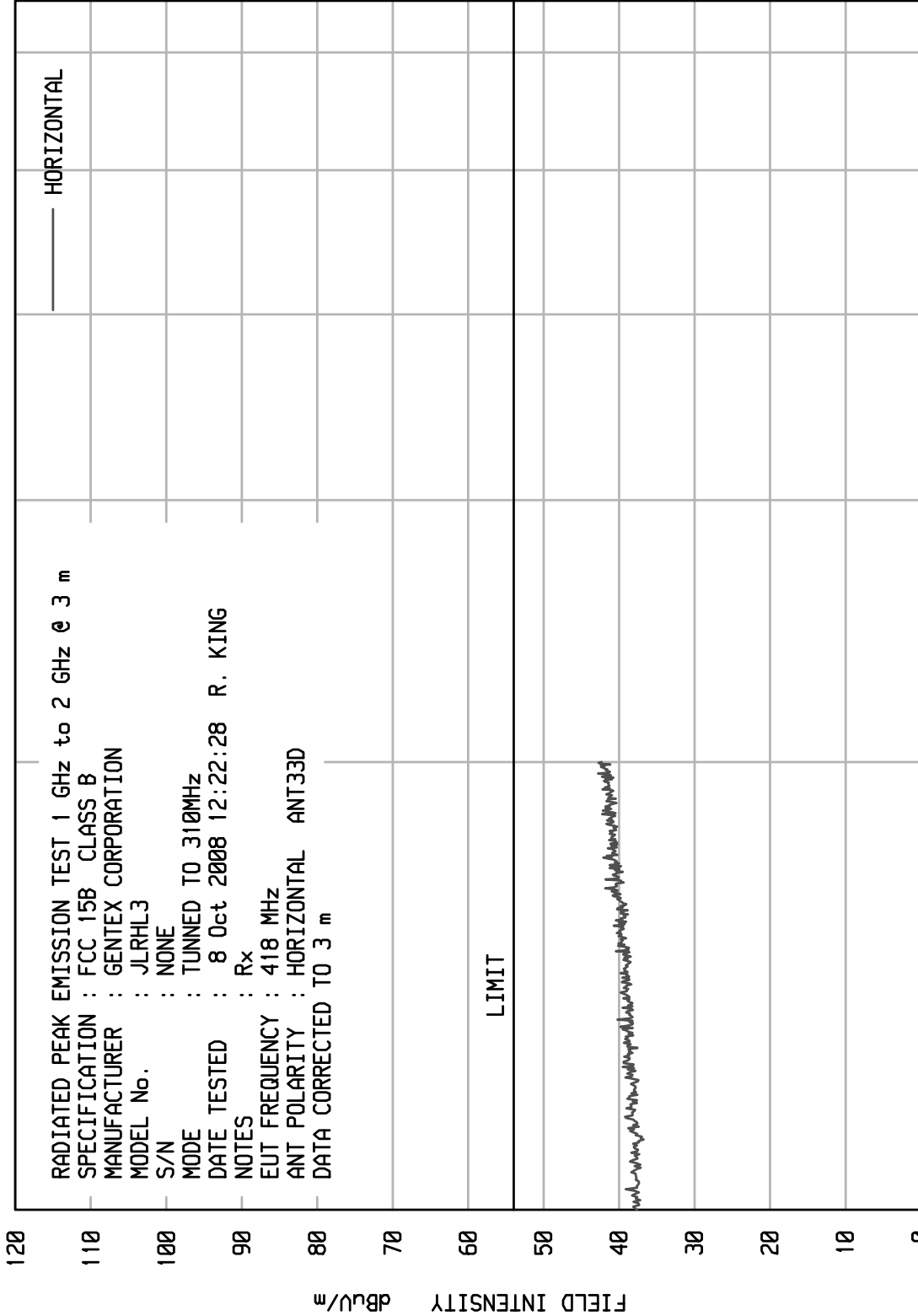
START = 30

ELITE ELECTRONIC ENGINEERING Inc.

Downers Grove, Ill. 60515

8546A HF RUN 3

WCCB 10/30/03



STOP = 6500

FREQUENCY - MHz

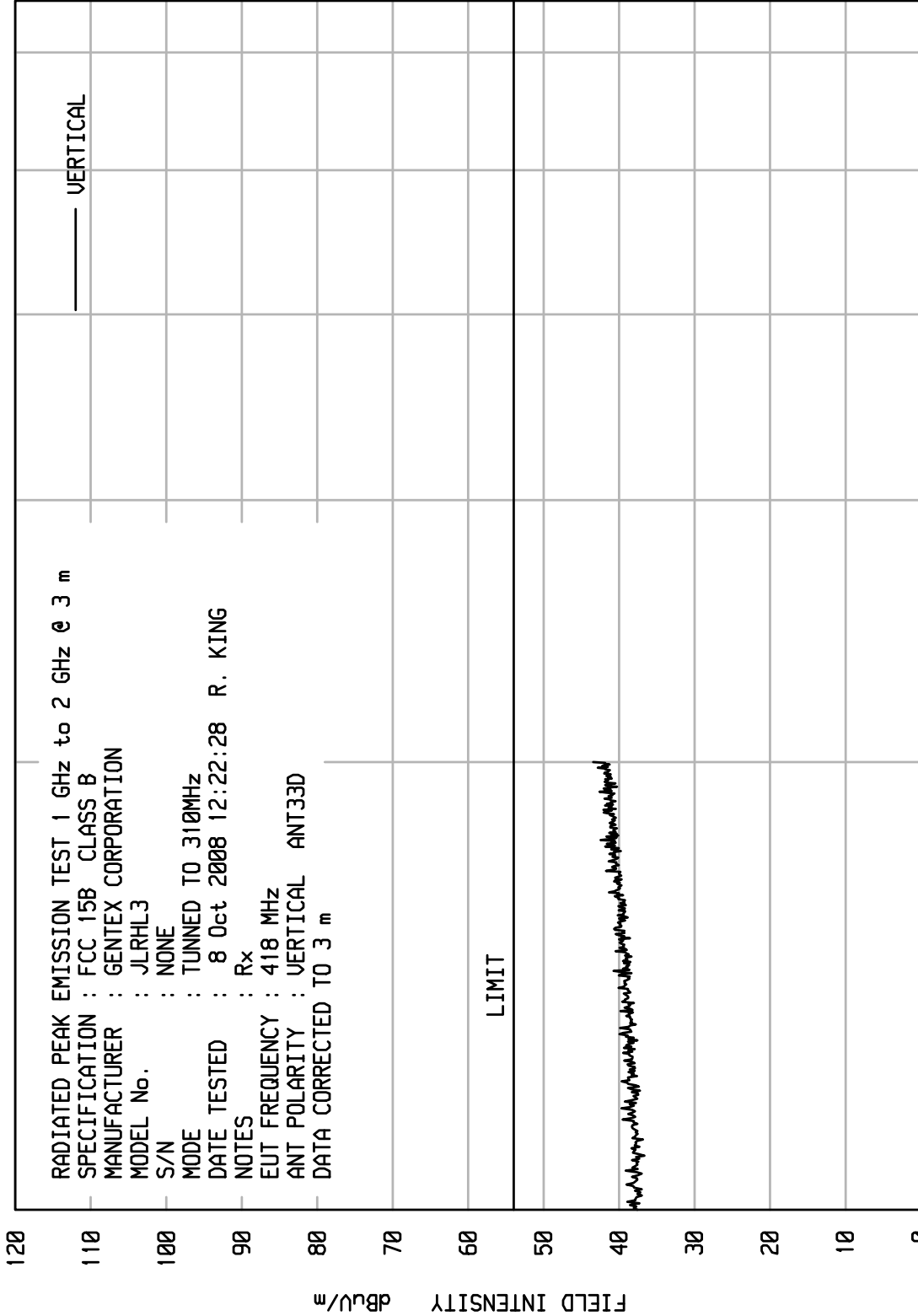
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ELITE ELECTRONIC ENGINEERING Inc.

Downers Grove, Ill. 60515

8546A HF RUN 3

WCCB 10/30/03





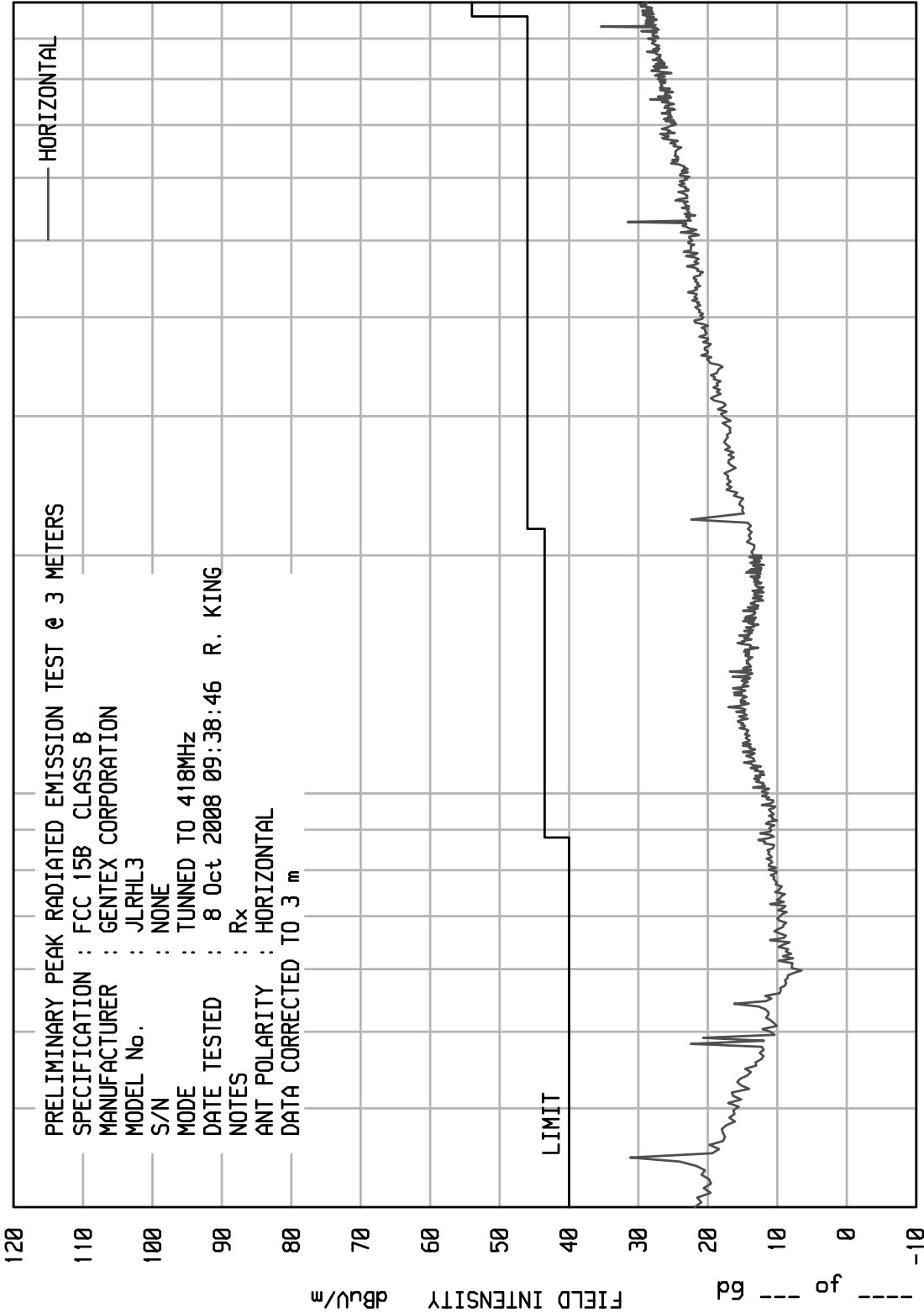
ELITE ELECTRONIC ENGINEERING Inc.

Downers Grove, Ill. 60515

8546A RE RUN 9

W088 11/26/07

PRELIMINARY PEAK RADIATED EMISSION TEST @ 3 METERS  
 SPECIFICATION : FCC 15B CLASS B  
 MANUFACTURER : GENTEX CORPORATION  
 MODEL No. : JLRHL3  
 S/N : NONE  
 MODE : TUNED TO 418MHz  
 DATE TESTED : 8 Oct 2008 09:38:46 R. KING  
 NOTES : Rx  
 ANT POLARITY : HORIZONTAL  
 DATA CORRECTED TO 3 m



STOP = 1000

FREQUENCY - MHz

100

START = 30

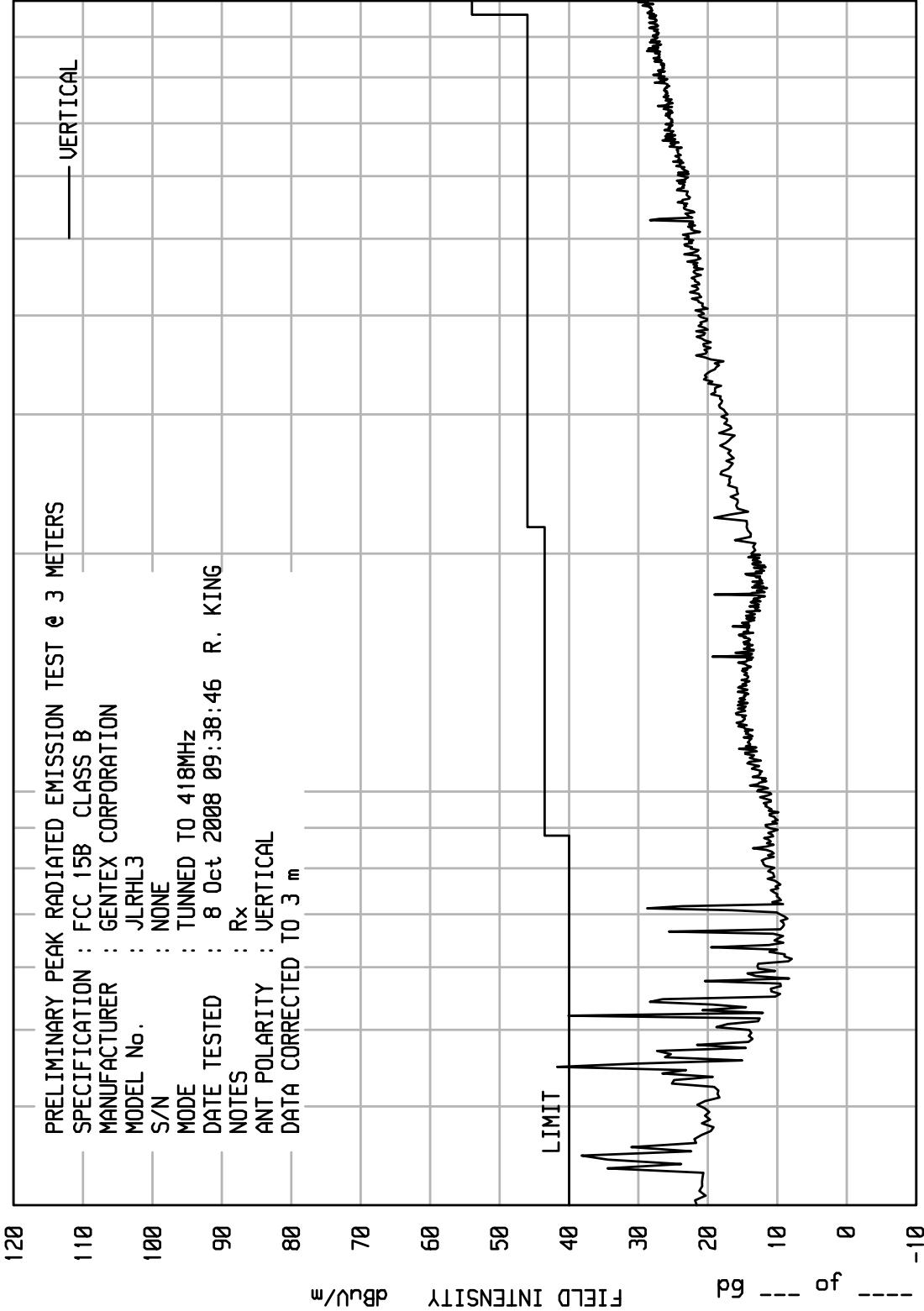
ELITE ELECTRONIC ENGINEERING Inc.

Downers Grove, Ill. 60515

8546A RE RUN 9

W088 11/26/07

PRELIMINARY PEAK RADIATED EMISSION TEST @ 3 METERS  
 SPECIFICATION : FCC 15B CLASS B  
 MANUFACTURER : GENTEX CORPORATION  
 MODEL No. : JLRHL3  
 S/N : NONE  
 MODE : TUNED TO 418MHz  
 DATE TESTED : 8 Oct 2008 09:38:46 R. KING  
 NOTES : Rx  
 ANT POLARITY : VERTICAL  
 DATA CORRECTED TO 3 m



STOP = 1000

FREQUENCY - MHz

100

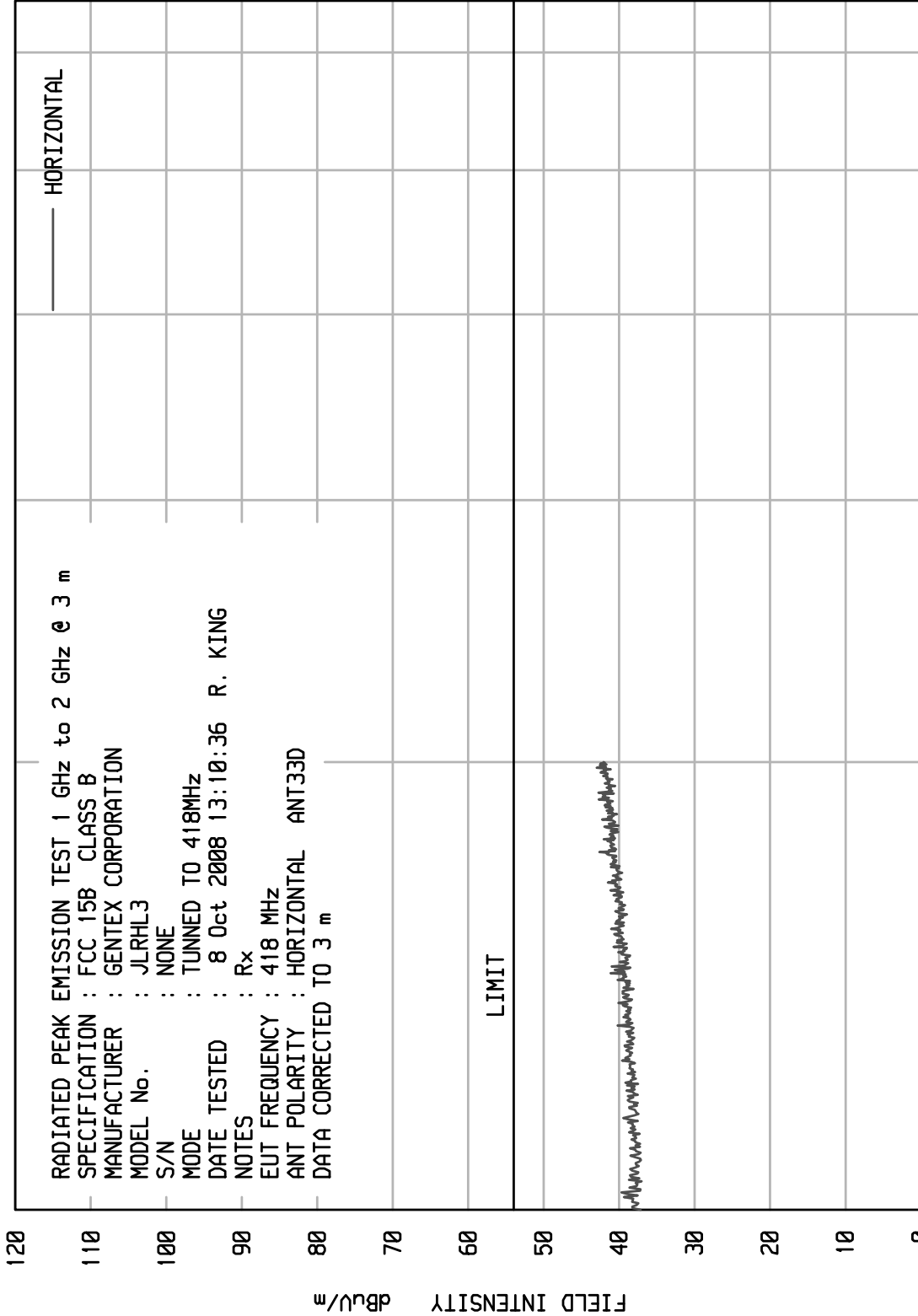
START = 30

ELITE ELECTRONIC ENGINEERING Inc.

Downers Grove, Ill. 60515

8546A HF RUN 4

WOCB 10/30/03



STOP = 6500

FREQUENCY - MHz

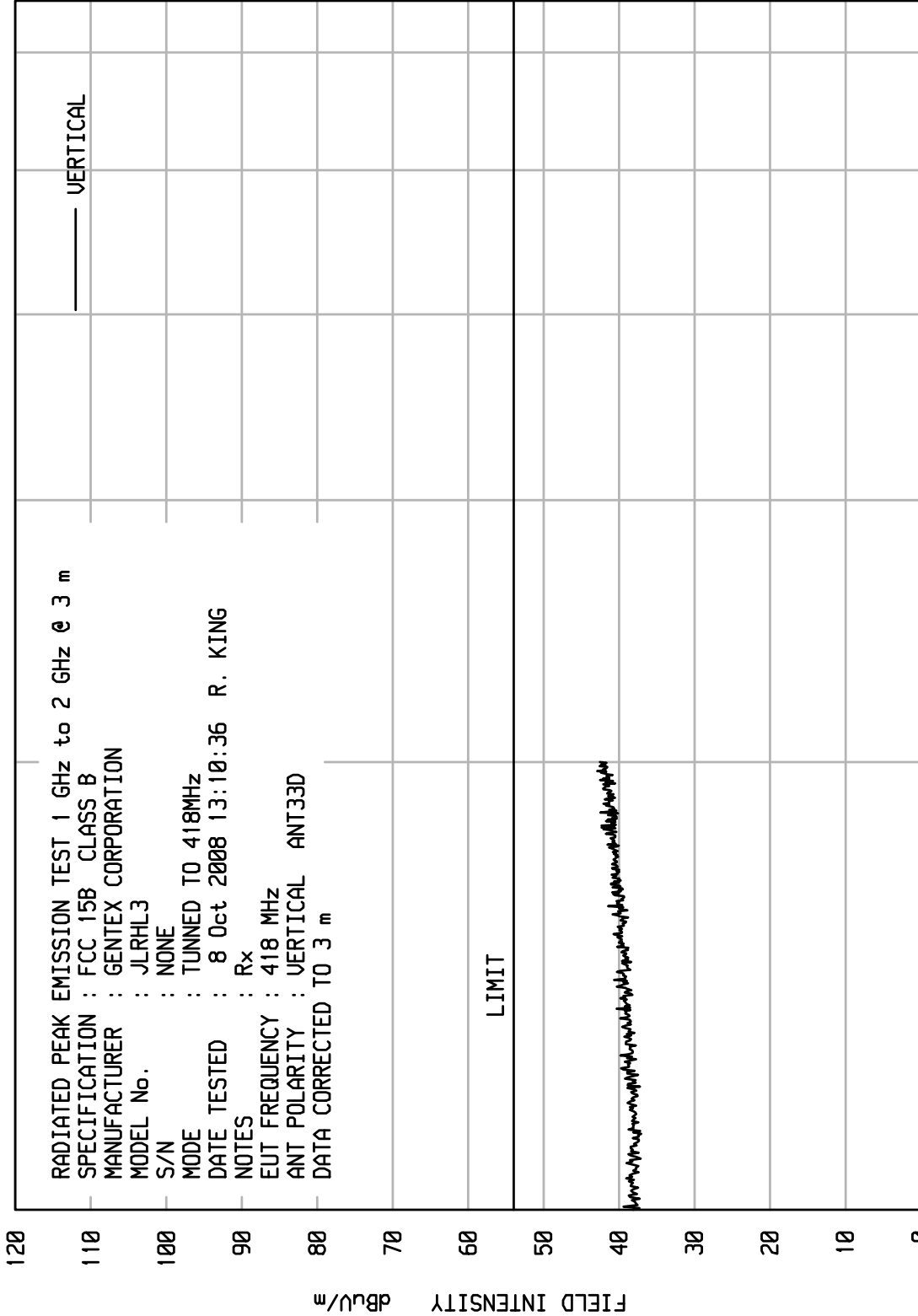
START = 1000

ELITE ELECTRONIC ENGINEERING Inc.

Downers Grove, Ill. 60515

8546A HF RUN 4

WQCB 10/30/03





ETR No.  
DATA SHEET

8546A  
TEST NO. 7

RADIATED QP EMISSION MEASUREMENTS in a 3 m SEMI-ANECHOIC ROOM  
SPECIFICATION : FCC 15B CLASS B  
MANUFACTURER : GENTEX CORPORATION  
MODEL NO. : JLRHL3  
SERIAL NO. : 100  
TEST MODE : SCANNING  
NOTES : Rx  
TEST DATE : 7 Oct 2008 13:05:52  
TEST DISTANCE : 3 m (DATA EXTRAPOLATED TO 3 m)

FREQUENCY MHz	QP READING dBuV	ANT FAC dB	CBL FAC dB	EXT ATTN dB	DIST FAC dB	TOTAL dBuV/m	QP LIMIT dBuV/m	AZ deg	ANT HT cm	POLAR
36.04	22.4	16.1	.5	0.0	0.0	39.0	40.0	180	120	V
54.00	14.4	7.7	.7	0.0	0.0	22.8	40.0	45	120	V
89.09	-7.3	8.6	.9	0.0	0.0	2.3	43.5	0	200	V
116.50	-7.9	12.1	1.0	0.0	0.0	5.2	43.5	135	120	H
135.00	-5.9	12.6	1.0	0.0	0.0	7.7	43.5	315	120	V
163.94	-6.7	10.7	1.0	0.0	0.0	5.1	43.5	45	340	V
169.00	-4.4	10.3	1.0	0.0	0.0	6.9	43.5	270	120	V
193.49	-7.5	10.6	1.0	0.0	0.0	4.1	43.5	180	200	H
333.01	2.1	15.0	1.5	0.0	0.0	18.6	46.0	90	120	V
404.18	-6.3	16.7	1.5	0.0	0.0	11.9	46.0	180	200	H
580.13	-7.5	19.4	2.0	0.0	0.0	13.9	46.0	225	200	H
689.57	-5.3	20.4	2.2	0.0	0.0	17.4	46.0	180	120	H
722.28	-6.8	20.9	2.3	0.0	0.0	16.4	46.0	135	120	H
905.37	-6.8	22.6	2.5	0.0	0.0	18.4	46.0	270	200	H
963.28	-6.5	22.9	2.5	0.0	0.0	19.0	54.0	180	200	V

Checked BY RICHARD E. KING :

Richard E. King



ETR No.

DATA SHEET

HF TEST NO. 1

RADIATED AVG EMISSION MEASUREMENTS  $\geq 1000$  MHz in a 3 m ANECHOIC ROOM  
 SPECIFICATION : FCC 15B CLASS B  
 MANUFACTURER : GENTEX CORPORATION  
 MODEL NO. : JLRHL3  
 SERIAL NO. : 100  
 TEST MODE : SCANNING  
 NOTES : Rx  
 TEST DATE : 7 Oct 2008 13:58:56  
 EUT FREQUENCY : 418 MHz  
 TEST DISTANCE : 3 m (DATA EXTRAPOLATED TO 3 m)  
 ANTENNA : ANT33D

FREQUENCY	AVG	ANT	CBL	DIST	TOTAL	AVG	PASS/	AZ	ANT	POLAR
MHz	READING	FAC	FAC	FAC	dBuV/m	LIMIT	FAIL	deg	HT	
	dBuV	dB	dB	dB		dBuV/m			cm	
1027.18	7.2	25.1	2.5	0.0	34.8	54.0		45	200	V
1249.53	-3.7	25.6	2.8	0.0	24.7	54.0		270	200	H
1309.33	-3.5	25.7	2.9	0.0	25.0	54.0		270	340	V
1440.76	-2.9	25.9	3.0	0.0	26.1	54.0		90	200	H
1683.21	-3.0	26.9	3.3	0.0	27.1	54.0		315	120	V
1700.17	7.3	27.0	3.3	0.0	37.6	54.0		135	200	V
1910.23	-3.1	27.9	3.4	0.0	28.2	54.0		270	200	V
1980.17	-3.3	28.1	3.5	0.0	28.3	54.0		135	200	H

Checked BY *RICHARD E. KING* :

Richard E. King



ETR No. 8546A

DATA SHEET TEST NO. 11

RADIATED QP EMISSION MEASUREMENTS in a 3 m SEMI-ANECHOIC ROOM  
 SPECIFICATION : FCC 15B CLASS B  
 MANUFACTURER : GENTEX CORPORATION  
 MODEL NO. : JLRHL3  
 SERIAL NO. : NONE  
 TEST MODE : TUNNED TO 288MHz  
 NOTES : Rx  
 TEST DATE : 8 Oct 2008 11:00:04  
 TEST DISTANCE : 3 m (DATA EXTRAPOLATED TO 3 m)

FREQUENCY MHz	QP READING dBuV	ANT FAC dB	CBL FAC dB	EXT ATTN dB	DIST FAC dB	TOTAL dBuV/m	QP LIMIT dBuV/m	AZ deg	ANT HT cm	POLAR
35.14	-1.4	16.6	.5	0.0	0.0	15.6	40.0	270	120	V
54.00	19.7	7.7	.7	0.0	0.0	28.1	40.0	315	120	V
80.99	-1.3	8.7	.9	0.0	0.0	8.2	40.0	0	200	V
116.27	-7.8	12.0	1.0	0.0	0.0	5.2	43.5	225	120	V
127.07	-7.9	13.0	1.0	0.0	0.0	6.0	43.5	225	200	V
162.03	-6.1	10.9	1.0	0.0	0.0	5.8	43.5	135	200	V
187.76	-6.7	10.4	1.0	0.0	0.0	4.7	43.5	135	120	V
250.05	-6.8	13.3	1.3	0.0	0.0	7.8	46.0	0	200	V
350.31	-6.0	15.4	1.5	0.0	0.0	11.0	46.0	0	340	H
454.56	-6.5	17.4	1.7	0.0	0.0	12.5	46.0	0	340	H
523.48	9.5	18.6	1.8	0.0	0.0	29.9	46.0	180	200	H
618.18	-7.2	19.9	2.1	0.0	0.0	14.8	46.0	270	200	H
783.81	-6.4	21.4	2.5	0.0	0.0	17.4	46.0	0	200	V
887.08	-6.5	22.6	2.5	0.0	0.0	18.6	46.0	315	340	H
960.18	-6.4	22.9	2.5	0.0	0.0	19.0	46.0	180	340	H

Checked BY RICHARD E. KING :

Richard E. King



ETR No.  
DATA SHEET

8546A  
TEST NO. 10

RADIATED QP EMISSION MEASUREMENTS in a 3 m SEMI-ANECHOIC ROOM  
SPECIFICATION : FCC 15B CLASS B  
MANUFACTURER : GENTEX CORPORATION  
MODEL NO. : JLRHL3  
SERIAL NO. : NONE  
TEST MODE : TUNNED TO 310MHz  
NOTES : Rx  
TEST DATE : 8 Oct 2008 10:25:55  
TEST DISTANCE : 3 m (DATA EXTRAPOLATED TO 3 m)

FREQUENCY MHz	QP READING dBuV	ANT FAC dB	CBL FAC dB	EXT ATTN dB	DIST FAC dB	TOTAL dBuV/m	QP LIMIT dBuV/m	AZ deg	ANT HT cm	POLAR
54.00	21.2	7.7	.7	0.0	0.0	29.5	40.0	0	120	V
79.82	-7.3	8.6	.9	0.0	0.0	2.2	40.0	135	200	H
107.29	-7.8	10.8	1.0	0.0	0.0	3.9	43.5	180	200	V
123.54	-7.8	13.0	1.0	0.0	0.0	6.1	43.5	135	120	H
143.74	-8.2	12.2	1.0	0.0	0.0	5.0	43.5	225	340	H
181.60	-7.0	10.2	1.0	0.0	0.0	4.2	43.5	180	120	V
198.53	-7.5	10.8	1.0	0.0	0.0	4.3	43.5	225	120	V
331.01	2.2	15.0	1.5	0.0	0.0	18.6	46.0	225	120	V
441.02	-5.6	17.3	1.6	0.0	0.0	13.3	46.0	180	120	V
523.52	9.7	18.6	1.8	0.0	0.0	30.1	46.0	180	200	H
690.12	-6.4	20.4	2.2	0.0	0.0	16.3	46.0	315	200	H
780.21	-6.6	21.4	2.5	0.0	0.0	17.2	46.0	315	340	V
898.00	-6.6	22.6	2.5	0.0	0.0	18.5	46.0	226	340	V
964.94	-6.2	23.0	2.5	0.0	0.0	19.3	54.0	45	200	H

Checked BY RICHARD E. KING :

Richard E. King





ETR No.

8546A

DATA SHEET

TEST NO. 9

RADIATED QP EMISSION MEASUREMENTS in a 3 m SEMI-ANECHOIC ROOM

SPECIFICATION : FCC 15B CLASS B
MANUFACTURER : GENTEX CORPORATION
MODEL NO. : JLRHL3
SERIAL NO. : NONE
TEST MODE : TUNNED TO 418MHz
NOTES : Rx
TEST DATE : 8 Oct 2008 09:38:46
TEST DISTANCE : 3 m (DATA EXTRAPOLATED TO 3 m)

Table with 12 columns: FREQUENCY MHz, QP READING dBuV, ANT FAC dB, CBL FAC dB, EXT ATTN dB, DIST FAC dB, TOTAL dBuV/m, QP LIMIT dBuV/m, AZ deg, ANT HT cm, POLAR. It contains 18 rows of measurement data.

Checked BY RICHARD E. KING :

Richard E. King



ETR No. DATA SHEET HF TEST NO. 2  
 RADIATED AVG EMISSION MEASUREMENTS >=1000 MHz in a 3 m ANECHOIC ROOM  
 SPECIFICATION : FCC 15B CLASS B  
 MANUFACTURER : GENTEX CORPORATION  
 MODEL NO. : JLRHL3  
 SERIAL NO. : NONE  
 TEST MODE : TUNNED TO 288MHz  
 NOTES : Rx  
 TEST DATE : 8 Oct 2008 11:50:03  
 EUT FREQUENCY : 418 MHz  
 TEST DISTANCE : 3 m (DATA EXTRAPOLATED TO 3 m)  
 ANTENNA : ANT33D

FREQUENCY	AVG	ANT	CBL	DIST	TOTAL	AVG	PASS/	AZ	ANT	POLAR
MHz	READING	FAC	FAC	FAC	dBuV/m	LIMIT	FAIL	deg	HT	
	dBuV	dB	dB	dB		dBuV/m			cm	
1025.47	-2.8	25.1	2.5	0.0	24.8	54.0		315	120	H
1132.03	7.1	25.3	2.7	0.0	35.0	54.0		90	200	H
1375.75	-3.1	25.8	3.0	0.0	25.6	54.0		0	120	V
1526.04	-2.7	26.1	3.1	0.0	26.6	54.0		180	340	V
1644.25	7.8	26.7	3.2	0.0	37.8	54.0		45	200	H
1752.71	-2.6	27.2	3.3	0.0	27.9	54.0		0	120	H
1875.96	7.3	27.7	3.4	0.0	38.4	54.0		180	200	H
1994.24	-2.8	28.2	3.5	0.0	28.9	54.0		270	120	V

Checked BY Richard E. King :

Richard E. King



ETR No.

DATA SHEET

HF TEST NO. 3

RADIATED AVG EMISSION MEASUREMENTS >=1000 MHz in a 3 m ANECHOIC ROOM

SPECIFICATION : FCC 15B CLASS B  
 MANUFACTURER : GENTEX CORPORATION  
 MODEL NO. : JLRHL3  
 SERIAL NO. : NONE  
 TEST MODE : TUNNED TO 310MHz  
 NOTES : Rx  
 TEST DATE : 8 Oct 2008 12:22:28  
 EUT FREQUENCY : 418 MHz  
 TEST DISTANCE : 3 m (DATA EXTRAPOLATED TO 3 m)  
 ANTENNA : ANT33D

FREQUENCY MHz	AVG READING dBuV	ANT FAC dB	CBL FAC dB	DIST FAC dB	TOTAL dBuV/m	AVG LIMIT dBuV/m	PASS/ FAIL	AZ deg	ANT HT cm	POLAR
1036.05	-2.8	25.1	2.6	0.0	24.8	54.0		0	120	V
1171.07	7.3	25.4	2.7	0.0	35.5	54.0		270	200	V
1373.17	-2.8	25.8	3.0	0.0	25.9	54.0		270	200	H
1472.11	-2.8	26.0	3.1	0.0	26.2	54.0		0	120	V
1627.14	-2.9	26.6	3.2	0.0	27.0	54.0		135	120	H
1797.42	7.9	27.4	3.3	0.0	38.7	54.0		270	200	V
1925.65	-2.6	27.9	3.4	0.0	28.7	54.0		315	340	V
1980.12	-2.9	28.1	3.5	0.0	28.8	54.0		315	120	V

Checked BY *RICHARD E. KING* :

Richard E. King



ETR No.

DATA SHEET

HF TEST NO. 4

RADIATED AVG EMISSION MEASUREMENTS >=1000 MHz in a 3 m ANECHOIC ROOM

SPECIFICATION : FCC 15B CLASS B
MANUFACTURER : GENTEX CORPORATION
MODEL NO. : JLRHL3
SERIAL NO. : NONE
TEST MODE : TUNNED TO 418MHz
NOTES : Rx
TEST DATE : 8 Oct 2008 13:10:36
EUT FREQUENCY : 418 MHz
TEST DISTANCE : 3 m (DATA EXTRAPOLATED TO 3 m)
ANTENNA : ANT33D

Table with 11 columns: FREQUENCY, AVG READING, ANT FAC, CBL FAC, DIST FAC, TOTAL, AVG LIMIT, PASS/FAIL, AZ, ANT HT, POLAR. It contains 8 rows of test data.

Checked BY RICHARD E. KING :

Richard E. King



DATA PAGE

MAMANUFACTURER : Gentex Corporation  
 MODEL : JLRHL3  
 S/N : None Assigned  
 SPECIFICATION : FCC-15B Radiated Emissions  
 DATE : October 06, 2008  
 NOTES : Tuned @ 288MHz  
 : TEST DISTANCE IS 3 METERS

Freq (MHz)	Ant Pol	Meter Reading (dBUV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Total dBUV/m at 3 M	Total uV/m at 3M	Limit uV/m at 30M	Margin (dB)
277.3	H	3.6	*	1.3	13.5	18.3	8.3	200	-27.7
277.3	V	3.7	*	1.3	13.5	18.4	8.3	200	-27.6
554.6	H	4.1	*	1.9	19.0	25.0	17.8	200	-21.0
554.6	V	4.3	*	1.9	19.0	25.2	18.2	200	-20.8
831.9	H	5.5	*	2.3	21.6	29.4	29.4	200	-16.7
831.9	V	5.7	*	2.3	21.6	29.6	30.0	200	-16.5
1109.2	H	12.9	*	2.6	24.0	39.5	94.9	500	-14.4
1109.2	V	13.0	*	2.6	24.0	39.6	96.0	500	-14.3
1386.5	H	13.0	*	3.0	25.3	41.3	116.3	500	-12.7
1386.5	V	13.2	*	3.0	25.3	41.5	119.0	500	-12.5
1663.8	H	13.7	*	3.3	27.0	44.0	158.3	500	-10.0
1663.8	V	13.9	*	3.3	27.0	44.2	161.9	500	-9.8
1941.1	H	14.2	*	3.6	28.3	46.1	202.1	500	-7.9
1941.1	V	14.5	*	3.6	28.3	46.4	209.2	500	-7.6

Checked BY *RICHARD E. KING* :

Richard E. King



DATA PAGE

MAMANUFACTURER : Gentex Corporation  
 MODEL : JLRHL3  
 S/N : None Assigned  
 SPECIFICATION : FCC-15B Radiated Emissions  
 DATE : October 06, 2008  
 NOTES : Tuned @ 310MHz  
 : TEST DISTANCE IS 3 METERS

Freq (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Total dBuV/m at 3 M	Total uV/m at 3M	Limit uV/m at 30M	Margin (dB)
299.3	H	4.1	*	1.3	13.9	19.3	9.2	200	-26.7
299.3	V	4.5	*	1.3	13.9	19.7	9.7	200	-26.3
598.6	H	3.3	*	2.0	19.3	24.6	17.0	200	-21.4
598.6	V	4.2	*	2.0	19.3	25.5	18.8	200	-20.5
897.9	H	6.2	*	2.4	22.2	30.7	34.4	200	-15.3
897.9	V	6.3	*	2.4	22.2	30.8	34.8	200	-15.2
1197.2	H	13.1	*	2.8	24.5	40.4	104.8	500	-13.6
1197.2	V	13.6	*	2.8	24.5	40.9	111.1	500	-13.1
1496.5	H	13.2	*	3.1	26.2	42.6	134.4	500	-11.4
1496.5	V	12.7	*	3.1	26.2	42.1	126.9	500	-11.9
1795.8	H	14.3	*	3.4	28.0	45.7	193.6	500	-8.2
1795.8	V	14.4	*	3.4	28.0	45.8	195.8	500	-8.1

Checked BY Richard E. King :

Richard E. King



DATA PAGE

MAMANUFACTURER : Gentex Corporation  
MODEL : JLRHL3  
S/N : None Assigned  
SPECIFICATION : FCC-15B Radiated Emissions  
DATE : October 06, 2008  
NOTES : Tuned @ 418MHz  
: TEST DISTANCE IS 3 METERS

Freq (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Total dBuV/m at 3 M	Total uV/m at 3M	Limit uV/m at 30M	Margin (dB)
407.3	H	3.3	*	1.6	16.7	21.6	12.0	200	-24.4
407.3	V	3.7	*	1.6	16.7	22.0	12.6	200	-24.0
814.6	H	3.2	*	2.3	21.6	27.1	22.6	200	-19.0
814.6	V	3.8	*	2.3	21.6	27.7	24.2	200	-18.4
1221.9	H	12.6	*	2.8	24.8	40.2	102.3	500	-13.8
1221.9	V	12.7	*	2.8	24.8	40.3	103.5	500	-13.7
1629.2	H	13.0	*	3.3	26.7	43.0	140.6	500	-11.0
1629.2	V	13.4	*	3.3	26.7	43.4	147.2	500	-10.6

Checked BY Richard E. King :

Richard E. King