Measurement of RF Interference from a Model No. 0G6020 Base Unit Transceiver

For : Generac Power Systems
: PO Box 8
: Waukesha, WI

P.O. No. : 70010
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Date Tested : May 29, 2007 through June 1, 2007
Test Personnel : Daniel E. Crowder
Specification : FCC "Code of Federal Regulations" Title 47, Part 15, Subpart B and Subpart C, Section 15.247 for Digital Transmission Systems Operating within The band 2400-2483.5MHz
Industry Canada RSS-210
Industry Canada RSS-GEN

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REVISION HISTORY

Revision	Date	Description
—	14 June 2007	Initial release

Measurement of RF Emissions from a Model No. 0G6020 Base Unit Transceiver

1 INTRODUCTION

1.1 Scope of Tests

This document represents the results of the series of radio interference measurements performed on a Model No.0G6020 Base Unit transceiver (hereinafter referred to as the test item). No serial number was assigned to the test item. The test item was designed to transmit and receive in the 2400MHz to 2483.5MHz band using an internal, non-detachable antenna. The test item transmitted using digital transmission system techniques. The test item was manufactured and submitted for testing by Generac Power Systems located in Waukesha, WI.

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, and Subpart C, Sections15.207 and 15.247 for Intentional Radiators operating within the 2400-2483.5MHz band. 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 23C and the relative humidity was 35%.

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 2006
- 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 6, September 2005, “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 1, September 2005, “Spectrum Management and Telecommunications Radio Standards Specification, General Requirements and Information for the Certification of radio communication equipment”
- Public Notice 558074, “New Guidance on Measurements for Digital Transmission Systems in 15.247”
- Public Notice DA 00-705, “Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems”

3 TEST ITEM SET-UP AND OPERATION

3.1 General Description

The test item is a Model No. 0G6020 Base Unit transceiver. The test item is half of a communication system that wirelessly connects an outdoor remote generator to a display located in a house. For test purposes, an antenna port was added for measurement purposes. In production, the antenna connector will not be available. A block diagram of the test item setup is shown as Figure 1.

3.1.1 Power Input

The test item obtained 5VDC power through 2 leads from the secondary of either a DVE, Part No. DSA-31SFUS Class II transformer or a Chi, Part No. 06005US Class II transformer. The primary of this transformer received 120V 60Hz power through lowpass powerline filters on the wall of the shielded enclosure. The 5VDC power from the secondary of the transformer was provided to the test item through a 2 wire, 1.5 meter long unshielded cord. 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-year.

3.1.2 Peripheral Equipment

The test item was submitted for testing with no peripherals.

3.1.3 Interconnect Cables

The test item was submitted for testing with no interconnecting cables.

3.1.4 Grounding

The test item was ungrounded for all tests.

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 was energized.

For radiated emissions tests, the test item was programmed to operate in one of the following modes:

- transmit @ 2405MHz
- transmit @ 2440MHz
- transmit @ 2480MHz

For conducted emissions tests, the test item was programmed to operate in one of the following modes:

- transmit @ 2440MHz, 120V, 60Hz input power, DVE Power Supply
- transmit @ 2440MHz, 120V, 60Hz input power, Chi Power Supply

3.3 Test Item Modifications

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, and Subpart C, Sections 15.207 and 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 Equipment List. 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 detector functions specified by the FCC.

4.3 Calibration Traceability

Test equipment is maintained and calibrated on a regular basis. All calibrations are traceable to the National Institute of Standards and Technology (NIST).

4.4 Measurement Uncertainty

All measurements are an estimate of their true value. The measurement uncertainty characterizes, with a specified confidence level, the spread of values which may be possible for a given measurement system.

5 TEST PROCEDURES

5.1 Powerline Conducted Emissions

5.1.1 Receiver

5.1.1.1 Requirements

Per 15.101(b), receivers operating above 960MHz are exempt from complying with the conducted emissions requirements of 15.107. Therefore, no conducted emissions tests were performed with the test item operating in the receive mode.

5.1.2 Transmitter

5.1.2.1 Requirements

All radio frequency voltages on the power lines of an intentional radiator shall be below the values shown below when using a quasi-peak or average detector:

CONDUCTED LIMITS FOR AN INTENTIONAL RADIATOR

Frequency MHz	RFI Voltage dBuV(QP)	RFI Voltage dBuV(Average)
0.15-0.5	66 decreasing with logarithm of frequency to 56	56 decreasing with logarithm of frequency to 46
0.5 – 5.0	56	46
5.0 – 30.0	60	50

Note 1: The lower limit shall apply at the transition frequencies.
Note 2: If the levels measured using the QP detector meet both the QP and the Average limits, the test item is considered to have met both requirements and measurements do not need to be performed using the Average detector.

5.1.2.2 Procedures

The interference on each power lead was measured by connecting the measuring equipment to the appropriate meter terminal of the LISN. The meter terminal of the LISN not under test was terminated with 50 ohms. Measurements were first made over the entire frequency range from 150kHz through 30MHz with a peak detector and the results were automatically plotted. The data thus obtained was then searched by the computer for the highest levels. Quasi-peak measurements were automatically performed at the frequencies selected from the highest peak measurements, and the results printed.

5.1.2.3 Results

The plots of the peak preliminary conducted voltage levels on each power line, with the test item transmitting at 2445MHz, modulation on, 120V, 60Hz input power with the DVE power supply, are presented on pages 19 and 20. The conducted emissions limits for intentional radiators are shown as a reference. The final quasi-peak and average results are presented on pages 21 and 22. As can be seen from the data, all emissions measured from the test item were within the specification limits. Photographs of the test configuration which yielded the highest or worst case, conducted emission levels are shown on Figure 3.

The plots of the peak preliminary conducted voltage levels on each power line, with the test item transmitting at 2445MHz, modulation on, 120V, 60Hz input power with the CHI power supply, are presented on pages 23 and 24. The conducted emissions limits for intentional radiators are shown as a reference. The final quasi-peak and average results are presented on pages 25 and 26. As can be seen from the data, all emissions measured from the test item were within the specification limits. Photographs of the test configuration which yielded the highest or worst case, conducted emission levels are shown on Figure 3.

5.2 Spurious Measurements

5.2.1 Receiver

5.2.1.1 Requirements

Per 15.101(b), receivers operating above 960MHz are exempt from complying with the radiated emissions requirements of 15.109. Therefore, no radiated emissions tests were performed with the test item operating in the receive mode.

5.2.2 Transmitter Antenna Conducted

5.2.2.1 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.

5.2.2.2 Procedures

The measuring equipment was connected to the test item's antenna port. The emissions in the frequency range from 30MHz to 25GHz were observed and plotted separately with the test item transmitting at 2405MHz, 2440MHz, and 2480.0MHz.

5.2.2.3 Results

The results of the antenna conducted emissions levels were plotted. These plots are presented on pages 27 through 35. These plots show that the spurious emissions were at least 20 dB below the level of the fundamental.

5.2.3 Transmitter Radiated Spurious Emissions

5.2.3.1 Requirements

Per section 15.247(d), in any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated emissions measurement. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must comply with the radiated emission limits specified in §15.209(a).

Paragraph 15.209(a) has the following radiated emission limits:

Frequency MHz	Field Strenght (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	3
30.0-88.0	100	3
88.0-216.0	150	3
216.0-960.0	200	3
Above 960	500	3

5.2.3.2 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.

Preliminary radiated emissions tests were 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 25GHz was investigated using a peak detector function.

The final open field emission tests were then manually performed over the frequency range of 30MHz to 25GHz.

1) For all harmonics not in the restricted bands, the following procedure was used:

   a) The field strength of the fundamental was measured using a double-ridged waveguide antenna. The double-ridged waveguide antenna was positioned at a 3 meter distance from the test item. A peak detector with a resolution bandwidth of 100kHz was used on the spectrum analyzer.

   b) The field strength of all of the harmonics not in the restricted band were then measured using a double-ridged waveguide antenna. The waveguide antenna was positioned at a 3 meter distance from the test item. A peak detector with a resolution bandwidth of 100kHz was used on the spectrum analyzer.

   c) To ensure that maximum or worst case emission levels were measured, the following steps were taken when measuring the fundamental emissions and the spurious emissions:

      i) The test item was rotated so that all of its sides were exposed to the receiving antenna.

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

      iii) The measuring antenna was raised and lowered for each antenna polarization to maximize the readings.

d) All harmonics not in the restricted bands must be at least 20dB below level measured at the fundamental. However, attenuation below the general limits specified in §15.209(a) is not required.

2) For all emissions in the restricted bands, the following procedure was used:

a) The field strength of all emissions below 1GHz were measured using a bi-log antenna. The bi-log antenna was positioned at a 3 meter distance from the test item. A peak detector with a resolution bandwidth of 100kHz was used on the spectrum analyzer.

b) The field strength of all emissions above 1GHz were measured using a double-ridged waveguide antenna. The waveguide antenna was positioned at a 3 meter distance from the test item. A peak detector with a resolution bandwidth of 1MHz was used on the spectrum analyzer.

c) To ensure that maximum or worst case emission levels were measured, the following steps were taken when taking all measurements:

i) The test item was rotated so that all of its sides were exposed to the receiving antenna.

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

iii) The measuring antenna was raised and lowered for each antenna polarization to maximize the readings.

d) For all radiated emissions measurements below 1GHz, if the peak reading is below the limits listed in 15.209(a), no further measurements are required. If however, the peak readings exceed the limits listed in 15.209(a), then the emissions are remeasured using a quasi-peak detector.

e) For all radiated emissions measurements above 1GHz, measurements were taken using a 1MHz resolution bandwidth and a 10Hz video bandwidth. For pulsed emissions, these readings were corrected to average levels using a duty cycle factor which was computed from the pulse train. All average levels must comply with the limits specified in 15.209(a).

f) In instances were 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 test item is rotated through all axis to ensure the maximum readings are recorded.

5.2.3.3 Results

Preliminary radiated emissions plots with the test item transmitting at 2405MHz are shown on pages 36 through 39. Final radiated emissions data are presented on data page 40. As can be seen from the data, all emissions measured from the test item were within the specification limits. Photographs of the test configuration which yielded the highest, or worst case, radiated emission levels are shown on Figure 4.

Preliminary radiated emissions plots with the test item transmitting at 2445MHz are shown on pages 41 through 44. Final radiated emissions data are presented on data page 45. As can be seen from the data, all emissions measured from the test item were within the specification limits.

Preliminary radiated emissions plots with the test item transmitting at 2475MHz are shown on pages 46 through 49. Final radiated emissions data are presented on data page 50. As can be seen from the data, all emissions measured from the test item were within the specification limits.

5.3 6dB Bandwidth and 99% Bandwidth

5.3.1 Requirements

Per 15.247(a) (2), for systems using digital modulation in the 2400-2483.5MHz band, the minimum 6dB bandwidth shall be al least 500kHz.

5.3.2 Procedures

The test item was setup inside the test chamber.

a) With the modulation enabled, the test item was allowed to transmit continuously at 2405MHz.

b) The output of the transmitter was connected to a spectrum analyzer through an attenuator.

c) The center frequency of the spectrum analyzer was set to the transmit frequency of the test item. The resolution bandwidth on the analyzer was set to 100kHz.

d) The 'Max-Hold' function of the spectrum analyzer was engaged. The analyzer was allowed to scan until the envelope of the transmitter bandwidth was defined.

e) The marker-to-peak function of the analyzer was used to set the marker to the peak of the emission. The marker-delta function was used to measure 6dB down point from the peak of the emission. The marker-delta function was reset and the marker was moved to the other side of the emission until it is even with the reference marker level. The marker-delta reading at this point is the 6dB bandwidth.

f) The analyzer's display was plotted using a 'screen dump' utility.

g) The resolution bandwidth was then reduced to 30kHz.

h) The 'Max-Hold' function of the spectrum analyzer was engaged. The analyzer was allowed to scan until the envelope of the transmitter bandwidth was defined. The 99% bandwidth function of the spectrum analyzer was then used to measure the 99% bandwidth. The measurement was recorded.

i) Steps (a) through (h) were repeated with the test item transmitting at 2445MHz.

j) Steps (a) through (h) were repeated with the test item transmitting at 2475MHz.

5.3.3 Results

The plot on the 6dB bandwidth, with the test item transmitting at 2405MHz, is shown on page 51. As can be seen from the plot, the 6dB bandwidth is 1.60MHz which is greater than the minimum required 6dB bandwidth of 500kHz. The 99% bandwidth was measured to be 2.36MHz.

The plot on the 6dB bandwidth, with the test item transmitting at 2440MHz, is shown on page 52. As can be seen from the plot, the 6dB bandwidth is 1.56MHz which is greater than the minimum required 6dB bandwidth of 500kHz. The 99% bandwidth was measured to be 2.33MHz.

The plot on the 6dB bandwidth, with the test item transmitting at 2480MHz, is shown on page 53. As can be seen from the plot, the 6dB bandwidth is 1.56MHz which is greater than the minimum required 6dB bandwidth of 500kHz. The 99% bandwidth was measured to be 2.33MHz.

5.4 Peak Output Power

5.4.1 Requirements

Per section 15.247(b)(3), for systems using digital modulation the maximum peak output conducted power shall not be greater than 1.0W (30dBm). Per section 15.247(b) (4), this limit is based on the use of antennas with directional gains that do not exceed 6dBi. Since the limit allows for a 6dBi antenna gain, the maximum EIRP can be increased by 6dB to 4 Watt (36dBm).

5.4.2 Procedures

The test item was setup inside the test chamber.

a) With the modulation enabled, the test item was allowed to transmit continuously at 2405MHz.

b) The test item was connected to a spectrum analyzer through an attenuator.

c) The center frequency of the spectrum analyzer was set to the transmit frequency of the test item. The resolution bandwidth on the analyzer was set to 3MHz (greater than the 6dB bandwidth of the test item).

d) The test item was maximized for worst case emissions (or maximum output power) at the measuring antenna. The maximum meter reading was recorded.

e) The equivalent isotropic power was determined from the field intensity levels measured at 3 meters using substitution method. To determine the emission power, a second double ridged waveguide antenna was then set in place of the test item and connected to a calibrated signal generator. The output of the signal generator was adjusted to match the received level at the spectrum analyzer. The signal level was recorded. The reading was then corrected to compensate for cable loss and antenna gain, as required.

f) Steps (a) through (e) were repeated with the test item transmitting at 2440MHz.

g) Steps (a) through (e) were repeated with the test item transmitting at 2480MHz.

5.4.3 Results

The plot on the conducted output power, with the test item transmitting at 2405MHz, is shown on page 54. As can be seen from the plot, the output power was measured to be -2.0dBm. The plot on the conducted output power, with the test item transmitting at 2440MHz, is shown on page 55. As can be seen from the plot, the output power was measured to be -3.0dBm. The plot on the conducted output power, with the test item transmitting at 2480MHz, is shown on page 56. As can be seen from the plot, the output power was measured to be -4.3dBm. The maximum EIRP measured from the transmitter was 5.2dBm or 0.003W which is below the 4 Watt or 36 dBm defacto limit. The results are presented on page 57

5.5 Power Spectral Density

5.5.1 Requirements

Per section 15.247(d), for digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.

5.5.2 Procedures

The Power Spectral Density Measurement Option 1 of Public Notice 558074, New Guidance for Digital Transmission Systems in 15.247, was used to measure power spectral density.

The test item was setup inside the test chamber.

a) With the modulation enabled, the test item was allowed to transmit continuously at 2475MHz.

b) The test item was connected to a spectrum analyzer through an attenuator.

c) The center frequency of the spectrum analyzer was set to the transmit frequency of the test item. The resolution bandwidth on the analyzer was set to 3MHz (greater than the 6dB bandwidth of the test item).

d) The test item was maximized for worst case emissions (or maximum output power) at the measuring antenna. The maximum meter reading was recorded.

e) The display line on the spectrum analyzer was set to 8dBm. The resolution bandwidth (RBW) was set to 3kHz, the sweep time was set to a time equal to or greater than the span divided by 3kHz (1.5 MHz/3kHz = 600 seconds). The peak detector and 'Max-Hold' function was engaged.

f) The analyzer's display was plotted using a 'screen dump' utility.

5.5.3 Results

Data pages 58 through 60 show the power spectral density results. As can be seen from this plot, the power spectral density is less than 8dBm in a 3kHz band during any time interval of continuous transmission.

5.6 Band-edge Compliance

5.6.1 Requirements

Per section 15.247(d), the emissions at the band-edges must be at least 20dB below the highest level measured within the band but attenuation below the general limits listed in 15.209(a) is not required. In addition, the radiated emissions which fall in the restricted band beginning at 2483.5 MHz must meet the general limits of 15.209(a).

5.6.2 Procedures

a) The test item was setup inside the test chamber on a non-conductive stand.

b) A broadband measuring antenna was placed at a test distance of 3 meters from the test item.

c) The test item was set to transmit continuously at the channel closest to the low band-edge.

d) The test item was maximized for worst case emissions at the measuring antenna. The maximum meter reading was recorded.

e) To determine the band-edge compliance, the following spectrum analyzer settings were used:

   i. Span = Wide enough to capture the peak level of the emission operating on the channel closest to the band-edge, as well as any modulation products which fall outside of the authorized band of operation.

   ii. Resolution bandwidth (RBW) = 100kHz.

   iii. The 'Max-Hold' function was engaged. The analyzer was allowed to scan until the envelope of the transmitter bandwidth was defined.

   iv. The marker was set on the peak of the in-band emissions. A display line was placed 20dB down from the peak of the in-band emissions. All emissions which fall outside of the authorized band of operation must be below the 20dB down display line. (All emissions to the left of the center frequency (band-edge) must be below the display line.)

   v. The analyzer's display was plotted using a 'screen dump' utility.

f) The test item was set to transmit continuously at the channel closest to the high band-edge.

g) Per Public Notice DA00-705, the Marker-Delta method of measuring band edge compliance can only be used for measuring emissions that are up to two “standard” bandwidths away form the band-edge. (Since C63.4 specifies a 1MHz resolution bandwidth for measurements above 1GHz, two “standard” bandwidths away from the band-edge would be 2MHz away from the band-edge.) Radiated emissions that are removed by more than two “standard” bandwidths must be measured in the conventional manner.

h) The highest transmit frequency used by the test item is 2480MHz. Since this is more than two “standard” bandwidths away from the band-edge, conventional radiated emissions measurements were taken at the band-edge.

i) The test item was setup in the test chamber. With the modulation enabled, the test item was allowed to transmit continuously at 2480MHz.

j) A double-ridged waveguide antenna was positioned at a 3 meter distance from the test item. The output of the double-ridged waveguide antenna was connected to a spectrum analyzer.

k) The center frequency of the spectrum analyzer was set to the band-edge (2483.5MHz). The resolution bandwidth on the analyzer was set to 1MHz.

l) The test item was maximized for worst case emissions at the measuring antenna. The video bandwidth was reduced to 10Hz and an average reading was taken.

5.6.3 Results

Page 61 shows the radiated band-edge compliance results at 2400MHz. As can be seen from the plot, the

emissions at the band-edge are within the 20 dB down limits.

Page 62 shows the radiated band-edge compliance results at 2483.5MHz. As can be seen from the data, the emissions at the band-edge are within the general limits.

6 CONCLUSIONS

It was determined that the Generac Power Systems 0G6020 Base Unit, Model No. 0G6020 Base Unit transceiver, did fully meet the conducted and radiated emission requirements of the FCC "Code of Federal Regulations" Title 47, Part 15, Subpart B, Sections 15.107 and 15.109 for receivers and Subpart C Sections 15.207 and 15.247 for Intentional Radiators Operating within the 2400MHz to 2483.5MHz band, when tested per ANSI C63.4-2003.

7 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.

8 ENDORSEMENT DISCLAIMER

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

ELITE ELECTRONIC ENG. INC. Page: 1

Eq ID	Equipment Description	Manufacturer	Model No.	Serial No.	Frequency Range	Cal Date	Cal Inv	Due Date
Equipment Type: ACCESSORIES, MISCELLANEOUS								
XPR0	HIGH PASS FILTER	K&L MICROWAVE	11SH10-4800/	001	4.8-20GHZ	07/27/06	12	07/27/07
XZG0	ATTENUATOR/SWITCH DRIVER	HEWLETT PACKARD	11713A	3439A02724	---		N/A	
Equipment Type: AMPLIFIERS								
APK0	PRE-AMPLIFIER	HEWLETT PACKARD	8449B	3008A00662	1-26.5GHZ	03/16/07	12	03/16/08
APW0	PREAMPLIFIER	PLANAR ELECTRON	PE2-30-20G20	PL2926/0646	20GHZ-26.5GHZ	11/27/06	12	11/27/07
APW3	PREAMPLIFIER	PLANAR ELECTRON	PE2-35-120-5	PL2924	1GHZ-20GHZ	11/27/06	12	11/27/07
Equipment Type: ANTENNAS								
NHG0	STANDARD GAIN HORN ANTENNA	NARDA	638	---	18-26.5GHZ		NOTE 1	
NTA0	BILOG ANTENNA	CHASE EMC LTD.	BILOG CBL611	2057	0.03-2GHZ	08/21/06	12	08/21/07
NWI0	RIDGED WAVE GUIDE	AEL	H1498	153	2-18GHZ	10/09/06	12	10/09/07
NWI1	RIDGED WAVE GUIDE	AEL	H1498	154	2-18GHZ	10/09/06	12	10/09/07
Equipment Type: ATTENUATORS								
T1EA	10DB, 25W ATTENUATOR	WEINSCHEL	46-10-34	BN2316	DC-18GHZ	03/22/07	12	03/22/08
Equipment Type: CONTROLLERS								
CDS2	COMPUTER	GATEWAY	MFATXPNT NMZ	0028483108	1.8GHZ		N/A	
Equipment Type: PROBES; CLAMP-ON & LISNS								
PLL9	50UH LISN 462D	ELITE	462D/70A	010	0.01-400MHZ	03/08/07	12	03/08/08
PLLA	50UH LISN 462D	ELITE	462D/70A	011	0.01-400MHZ	03/08/07	12	03/08/08
Equipment Type: POWER SUPPLIES								
SRA7	DC POWER SUPPLY	TEKPOWER	HY3005D	0023471			NOTE 1	
Equipment Type: PRINTERS AND PLOTTERS								
HRE1	LASER JET 5P	HEWLETT PACKARD	C3150A	USHB061052	---		N/A	
Equipment Type: RECEIVERS								
RAC1	SPECTRUM ANALYZER	HEWLETT PACKARD	85660B	3407A08369	100HZ-22GHZ	02/21/07	12	02/21/08
RACB	RF PRESELECTOR	HEWLETT PACKARD	85685A	3506A01491	20HZ-2GHZ	02/21/07	12	02/21/08
RAF3	QUASIPEAK ADAPTER	HEWLETT PACKARD	85650A	3303A01775	0.01-1000MHZ	02/21/07	12	02/21/08
RBA1	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESIB26	100146	20HZ-26.5GHZ	08/14/06	12	08/14/07
Equipment Type: SIGNAL GENERATORS								
GBR7	SIGNAL GENERATOR	HEWLETT PACKARD	8648D	3847M00602	9KHZ-4000MHZ	02/20/07	12	02/20/08

Cal. Interval: Listed in Months 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.

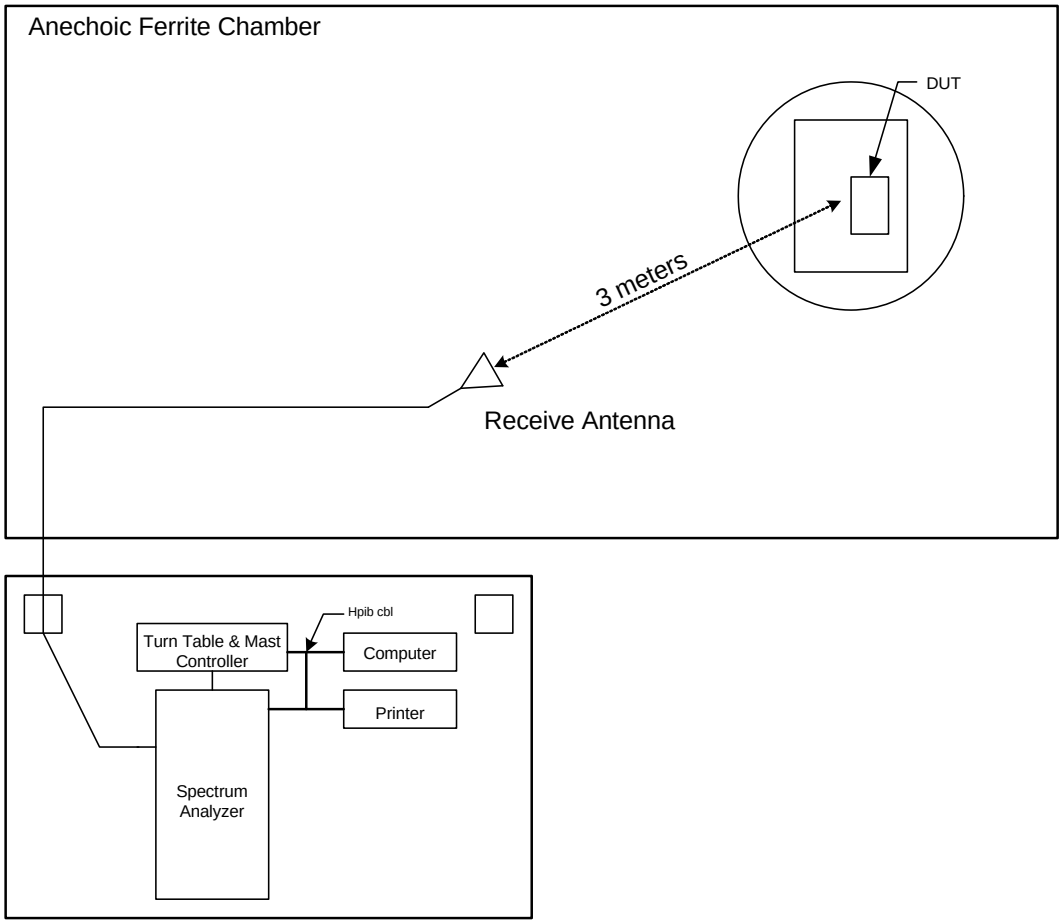
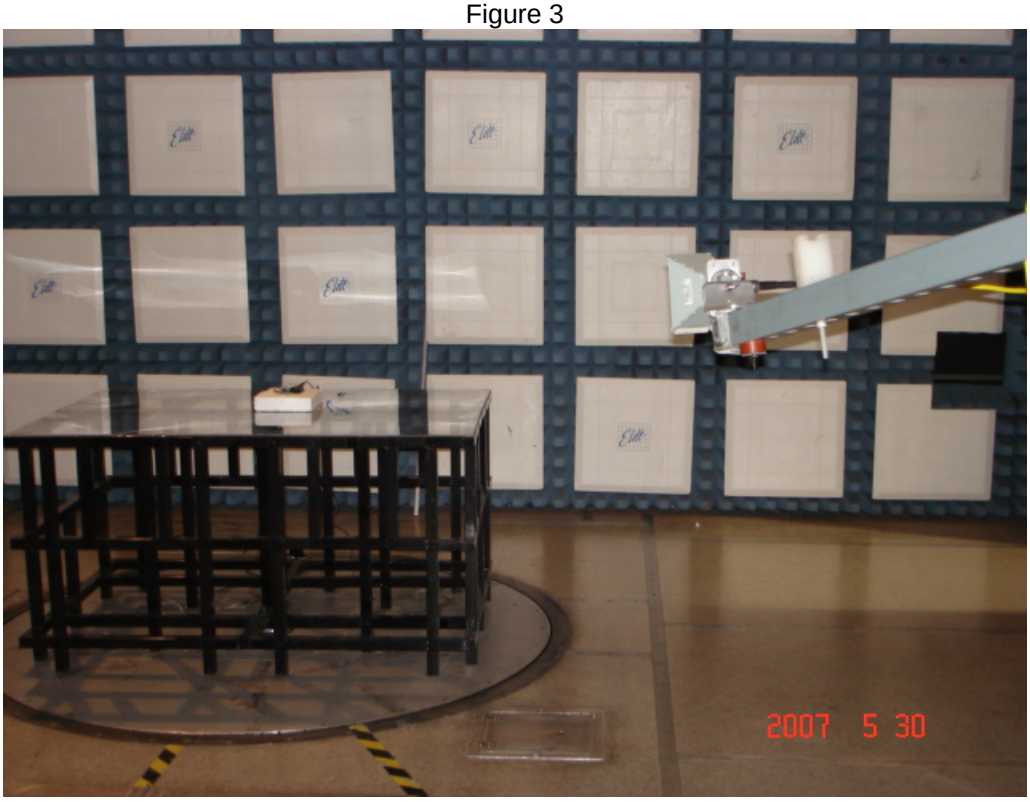


FIGURE 1 BLOCKDIAGRAM OF TEST SETUP

Figure 2

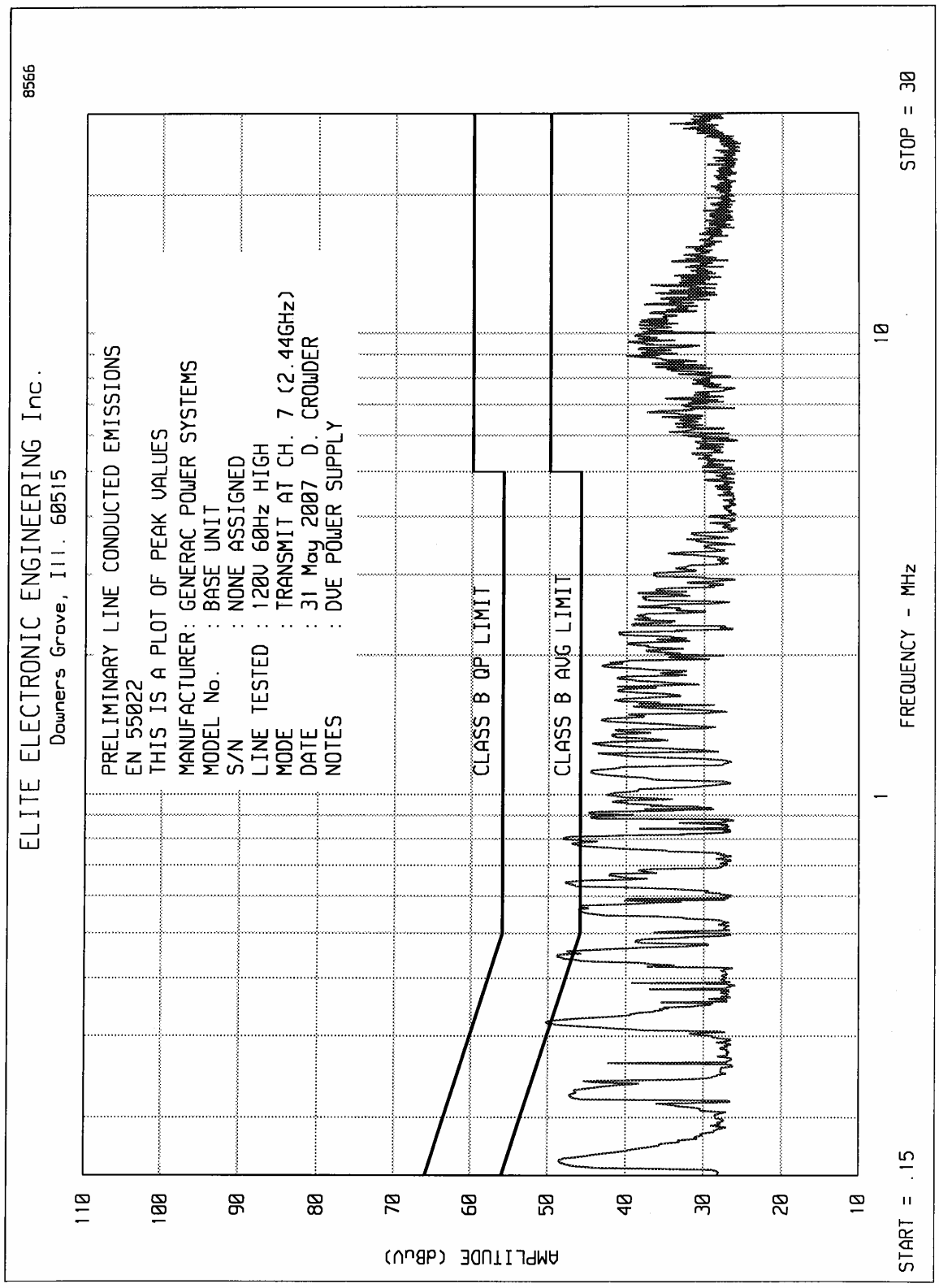
Test Set-up for Conducted Emissions

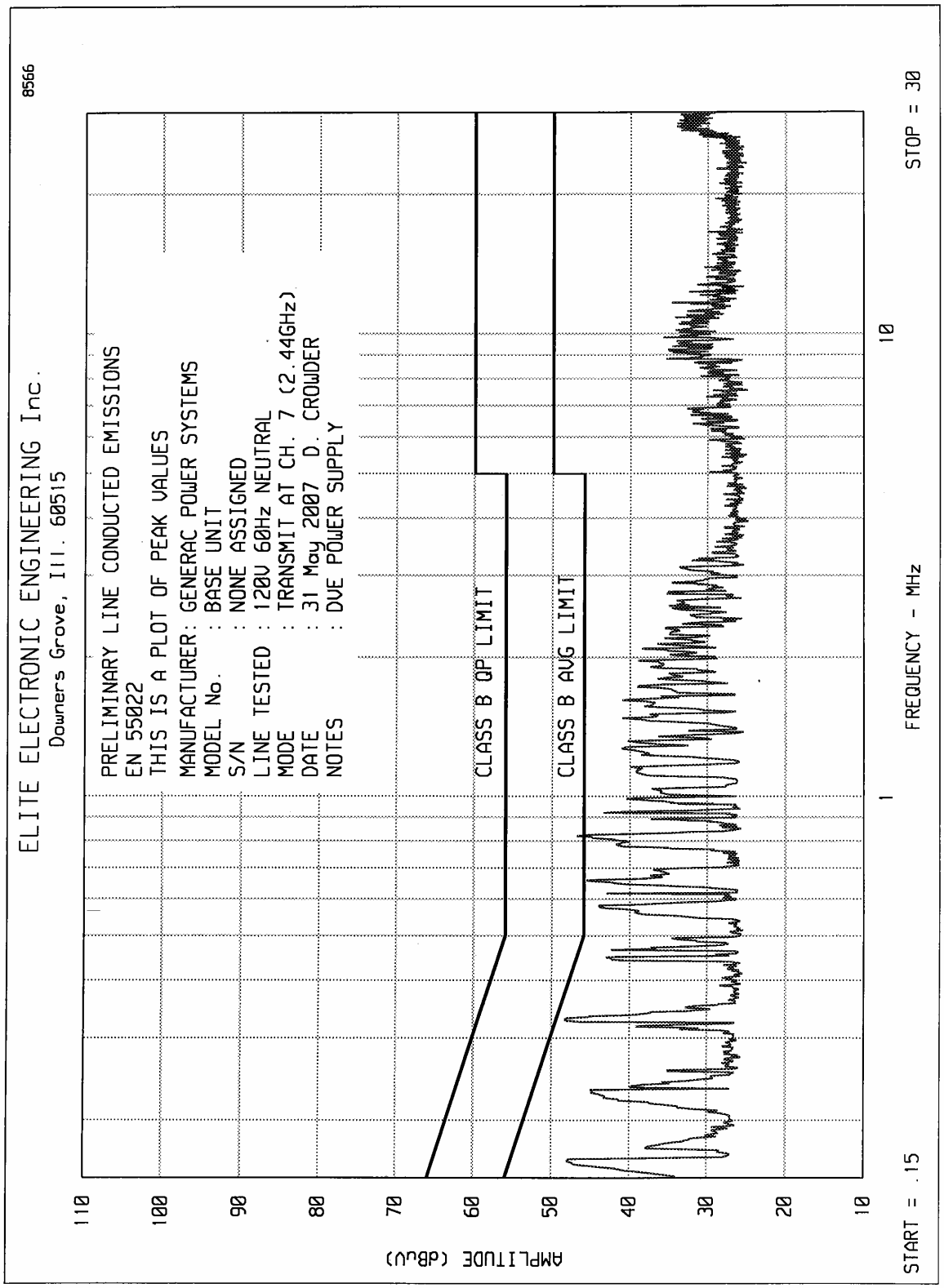
Figure 3



Test Set-up for Radiated Emissions, 2GHz to 18GHz – Horizontal Polarization

Test Set-up for Radiated Emissions, 2GHz to 18GHz – Vertical Polarization


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
8566
PRELIMINARY LINE CONDUCTED EMISSIONS
EN 55022
THIS IS A PLOT OF PEAK VALUES
MANUFACTURER: GENERAC POWER SYSTEMS
MODEL No. : BASE UNIT
S/N : NONE ASSIGNED
LINE TESTED : 120V 60Hz HIGH
MODE : TRANSMIT AT CH. 7 (2.44GHz)
DATE : 31 May 2007 D. CROWDER
NOTES : DVE POWER SUPPLY
CLASS B QP LIMIT
CLASS B AVG LIMIT
AMPLITUDE (dBuV)
110
100
90
80
70
60
50
40
30
20
10
START = .15
1
10
STOP = 30
FREQUENCY - MHz


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
8566
PRELIMINARY LINE CONDUCTED EMISSIONS
EN 55022
THIS IS A PLOT OF PEAK VALUES
MANUFACTURER: GENERAC POWER SYSTEMS
MODEL No. : BASE UNIT
S/N : NONE ASSIGNED
LINE TESTED : 120V 60Hz NEUTRAL
MODE : TRANSMIT AT CH. 7 (2.44GHz)
DATE : 31 May 2007 D. CROWDER
NOTES : DVE POWER SUPPLY
CLASS B QP LIMIT
CLASS B AVG LIMIT
AMPLITUDE (dBuV)
110
100
90
80
70
60
50
40
30
20
10
START = .15
1
10
STOP = 30
FREQUENCY - MHz

ETR No.
ELITE ELECTRONIC ENGINEERING CO.

MANUFACTURER : GENERAC POWER SYSTEMS
MODEL : BASE UNIT
S/N : NONE ASSIGNED
SPECIFICATION : EN 55022, CLASS B
TEST : LINE CONDUCTED EMISSIONS
LINE TESTED : 120V 60Hz HIGH
MODE : TRANSMIT AT CH. 7 (2.44GHz)
DATE : 31 May 2007
NOTES : DVE POWER SUPPLY
RECEIVER : HP 8566 w/ HP85650A QP ADAPTOR
VALUES MEASURED WITH QP DETECTOR USING 9kHz BANDWIDTH

FREQUENCY MHz	METER RDG. dBuV	QP LIMIT dBuV	AVG RDG dBuV	AVG LIMIT dBuV	NOTES
.159	45.9	65.5		55.5	
.318	47.7	59.8		49.8	
.436	46.5	57.1		47.1	
.638	45.8	56.0		46.0	
.800	46.6	56.0	38.5	46.0	*
.914	37.8	56.0		46.0	
1.115	42.8	56.0		46.0	
1.279	42.1	56.0		46.0	
1.897	40.4	56.0		46.0	
2.105	36.9	56.0		46.0	
2.339	36.3	56.0		46.0	
3.010	32.8	56.0		46.0	
5.126	26.0	60.0		50.0	
6.720	33.7	60.0		50.0	
8.919	33.1	60.0		50.0	
9.234	33.6	60.0		50.0	
10.382	32.4	60.0		50.0	
12.647	31.1	60.0		50.0	
15.334	25.7	60.0		50.0	
18.368	23.8	60.0		50.0	
20.881	23.4	60.0		50.0	
24.001	25.9	60.0		50.0	
27.767	25.0	60.0		50.0	

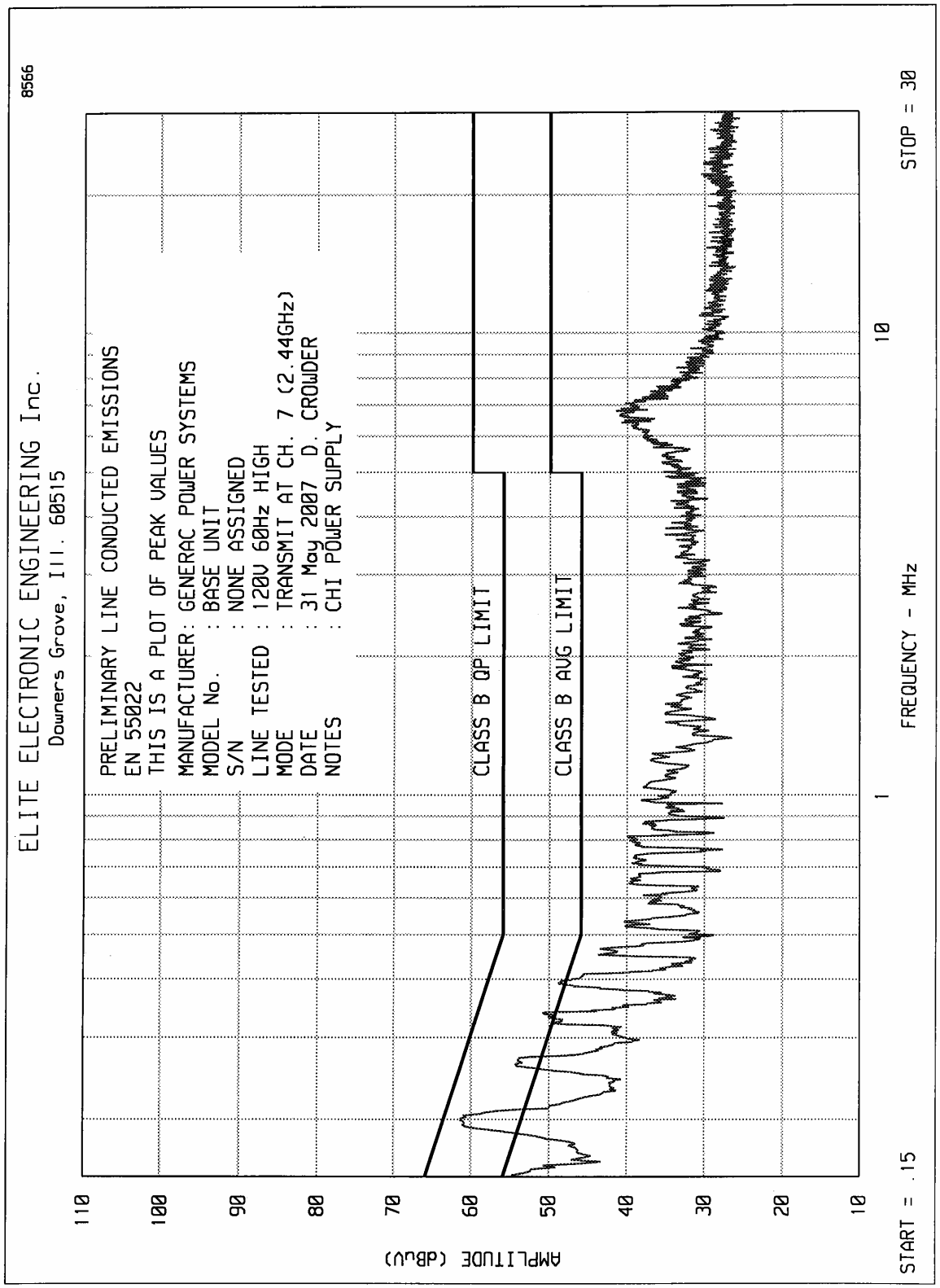
* QP EXCEEDS AVG LIMIT, SEE DATA CHECKED BY: D. CROWDER

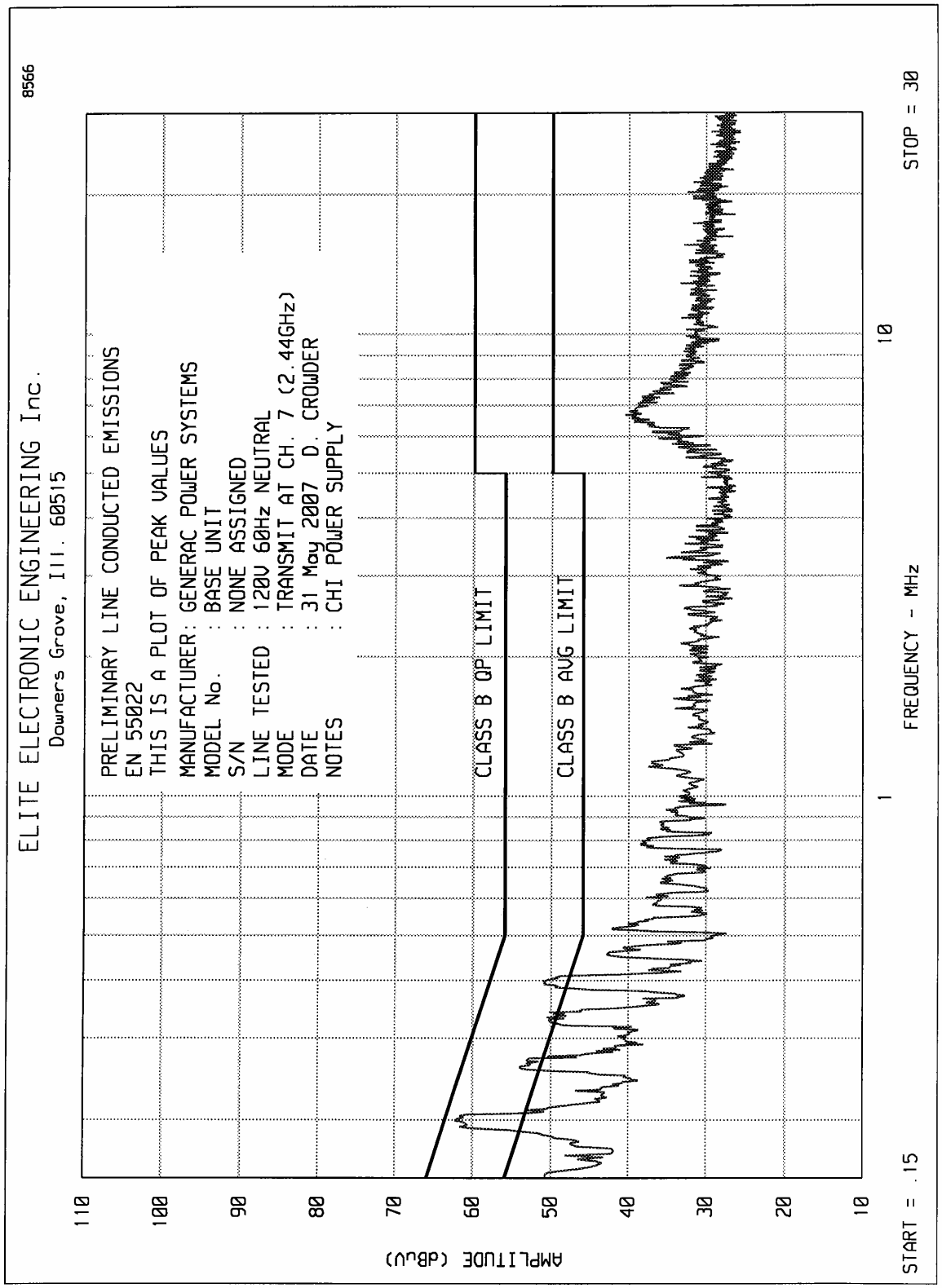
ETR No.
ELITE ELECTRONIC ENGINEERING CO.

MANUFACTURER : GENERAC POWER SYSTEMS
MODEL : BASE UNIT
S/N : NONE ASSIGNED
SPECIFICATION : EN 55022, CLASS B
TEST : LINE CONDUCTED EMISSIONS
LINE TESTED : 120V 60Hz NEUTRAL
MODE : TRANSMIT AT CH. 7 (2.44GHz)
DATE : 31 May 2007
NOTES : DVE POWER SUPPLY
RECEIVER : HP 8566 w/ HP85650A QP ADAPTOR
VALUES MEASURED WITH QP DETECTOR USING 9kHz BANDWIDTH

FREQUENCY MHz	METER RDG. dBuV	QP LIMIT dBuV	AVG RDG dBuV	AVG LIMIT dBuV	NOTES
.164	45.2	65.3		55.3	
.327	42.8	59.5		49.5	
.455	41.2	56.8		46.8	
.573	40.3	56.0		46.0	
.647	35.9	56.0		46.0	
.802	37.6	56.0		46.0	
.812	35.2	56.0		46.0	
1.263	34.6	56.0		46.0	
1.724	28.0	56.0		46.0	
2.744	29.4	56.0		46.0	
3.076	26.3	56.0		46.0	
3.091	27.5	56.0		46.0	
5.030	23.4	60.0		50.0	
6.843	25.4	60.0		50.0	
9.826	27.4	60.0		50.0	
11.637	24.0	60.0		50.0	
15.215	23.8	60.0		50.0	
19.463	23.3	60.0		50.0	
21.205	23.4	60.0		50.0	
24.383	23.1	60.0		50.0	
27.876	26.4	60.0		50.0	

CHECKED BY: _____
D. CROWDER


8566
ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
PRELIMINARY LINE CONDUCTED EMISSIONS
EN 55022
THIS IS A PLOT OF PEAK VALUES
MANUFACTURER: GENERAC POWER SYSTEMS
MODEL No. : BASE UNIT
S/N : NONE ASSIGNED
LINE TESTED : 120V 60Hz HIGH
MODE : TRANSMIT AT CH. 7 (2.44GHz)
DATE : 31 May 2007 D. CROWDER
NOTES : CHI POWER SUPPLY
CLASS B QP LIMIT
CLASS B AVG LIMIT
AMPLITUDE (dBuV)
110
100
90
80
70
60
50
40
30
20
10
START = .15
1
10
STOP = 30
FREQUENCY - MHz


8566
ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
PRELIMINARY LINE CONDUCTED EMISSIONS
EN 55022
THIS IS A PLOT OF PEAK VALUES
MANUFACTURER: GENERAC POWER SYSTEMS
MODEL No. : BASE UNIT
S/N : NONE ASSIGNED
LINE TESTED : 120V 60Hz NEUTRAL
MODE : TRANSMIT AT CH. 7 (2.44GHz)
DATE : 31 May 2007 D. CROWDER
NOTES : CHI POWER SUPPLY
CLASS B QP LIMIT
CLASS B AVG LIMIT
AMPLITUDE (dBuV)
110
100
90
80
70
60
50
40
30
20
10
START = .15
1
10
STOP = 30
FREQUENCY - MHz

ETR No.
ELITE ELECTRONIC ENGINEERING CO.

MANUFACTURER : GENERAC POWER SYSTEMS
MODEL : BASE UNIT
S/N : NONE ASSIGNED
SPECIFICATION : EN 55022, CLASS B
TEST : LINE CONDUCTED EMISSIONS
LINE TESTED : 120V 60Hz HIGH
MODE : TRANSMIT AT CH. 7 (2.44GHz)
DATE : 31 May 2007
NOTES : CHI POWER SUPPLY
RECEIVER : HP 8566 w/ HP85650A QP ADAPTOR
VALUES MEASURED WITH QP DETECTOR USING 9kHz BANDWIDTH

FREQUENCY MHz	METER RDG. dBuV	QP LIMIT dBuV	AVG RDG dBuV	AVG LIMIT dBuV	NOTES
.199	57.5	63.7	45.2	53.7	*
.262	50.0	61.4		51.4	
.394	42.8	58.0		48.0	
.452	39.5	56.8		46.8	
.784	37.0	56.0		46.0	
.811	36.4	56.0		46.0	
.973	32.4	56.0		46.0	
1.026	37.1	56.0		46.0	
1.878	27.9	56.0		46.0	
2.119	28.5	56.0		46.0	
2.538	27.7	56.0		46.0	
3.680	28.8	56.0		46.0	
4.962	29.6	56.0		46.0	
5.994	34.0	60.0		50.0	
6.707	36.9	60.0		50.0	
6.770	36.9	60.0		50.0	
7.328	33.4	60.0		50.0	
7.990	29.4	60.0		50.0	
10.889	24.5	60.0		50.0	
13.922	24.1	60.0		50.0	
17.206	23.4	60.0		50.0	
21.534	24.0	60.0		50.0	
23.721	24.0	60.0		50.0	
27.414	23.3	60.0		50.0	

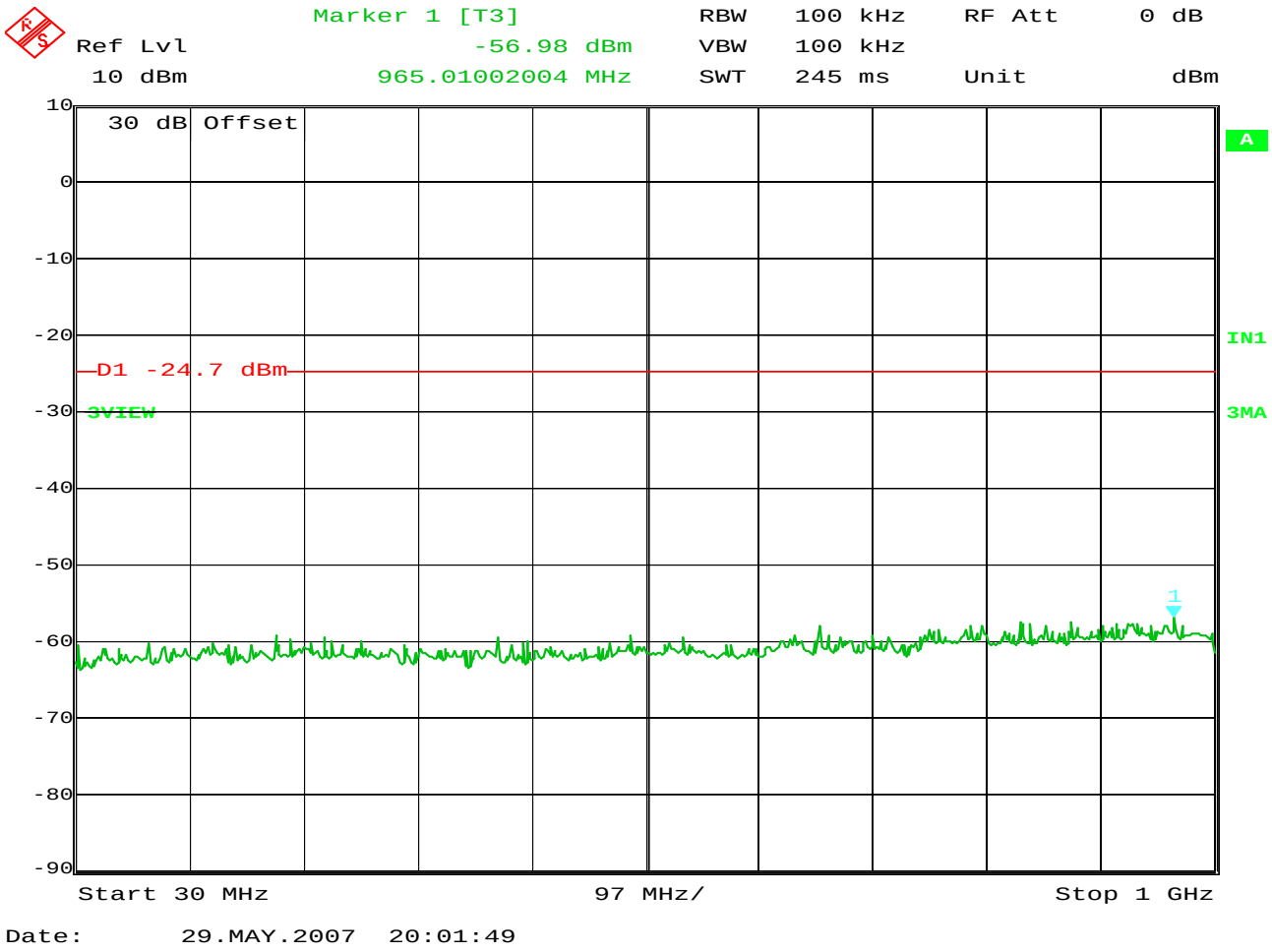
* QP EXCEEDS AVG LIMIT, SEE DATA CHECKED BY: D. CROWDER

ETR No.
ELITE ELECTRONIC ENGINEERING CO.

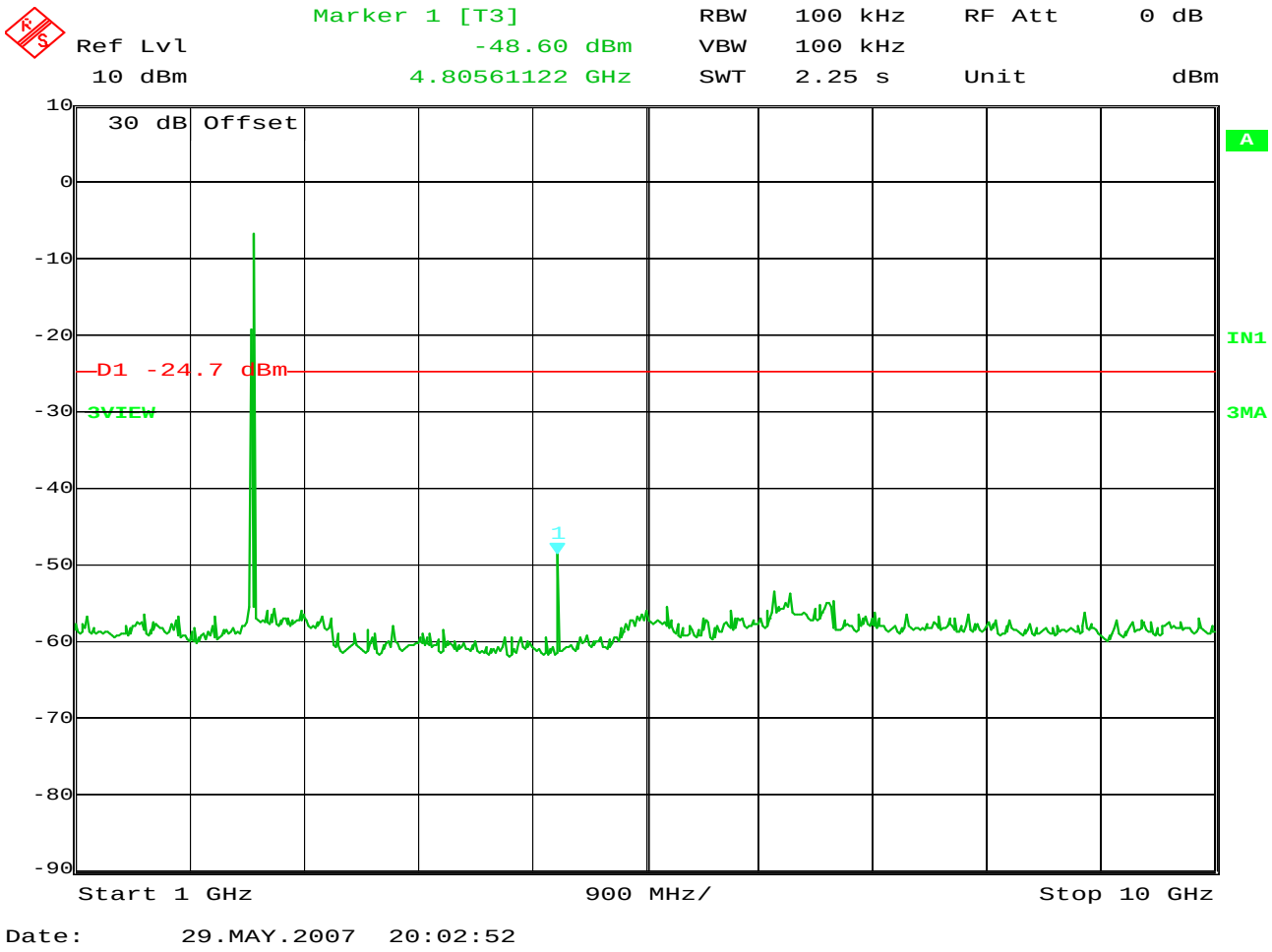
MANUFACTURER : GENERAC POWER SYSTEMS
MODEL : BASE UNIT
S/N : NONE ASSIGNED
SPECIFICATION : EN 55022, CLASS B
TEST : LINE CONDUCTED EMISSIONS
LINE TESTED : 120V 60Hz NEUTRAL
MODE : TRANSMIT AT CH. 7 (2.44GHz)
DATE : 31 May 2007
NOTES : CHI POWER SUPPLY
RECEIVER : HP 8566 w/ HP85650A QP ADAPTOR
VALUES MEASURED WITH QP DETECTOR USING 9kHz BANDWIDTH

FREQUENCY MHz	METER RDG. dBuV	QP LIMIT dBuV	AVG RDG dBuV	AVG LIMIT dBuV	NOTES
.196	59.7	63.8	49.3	53.8	*
.268	50.8	61.2		51.2	
.392	48.4	58.0	42.8	48.0	*
.451	39.6	56.8		46.8	
.784	34.8	56.0		46.0	
.874	31.5	56.0		46.0	
1.168	33.0	56.0		46.0	
1.194	31.0	56.0		46.0	
1.696	26.6	56.0		46.0	
2.848	26.3	56.0		46.0	
3.305	27.4	56.0		46.0	
5.870	29.9	60.0		50.0	
6.702	36.0	60.0		50.0	
7.213	34.6	60.0		50.0	
7.307	33.9	60.0		50.0	
8.722	28.4	60.0		50.0	
12.831	26.4	60.0		50.0	
15.534	25.6	60.0		50.0	
17.667	25.0	60.0		50.0	
21.632	25.0	60.0		50.0	
24.027	23.6	60.0		50.0	
27.252	23.4	60.0		50.0	

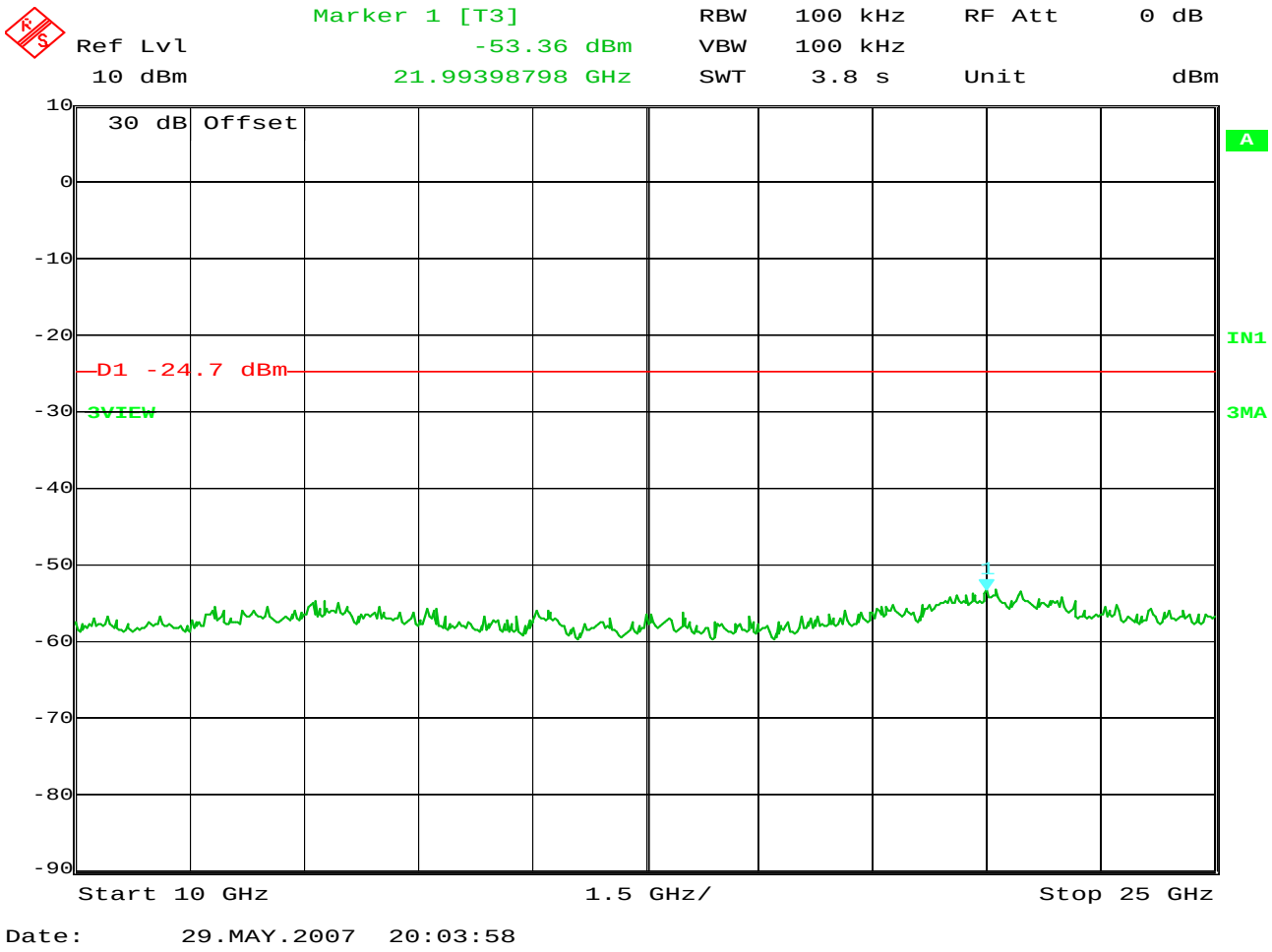
* QP EXCEEDS AVG LIMIT, SEE DATA CHECKED BY: D. CROWDER



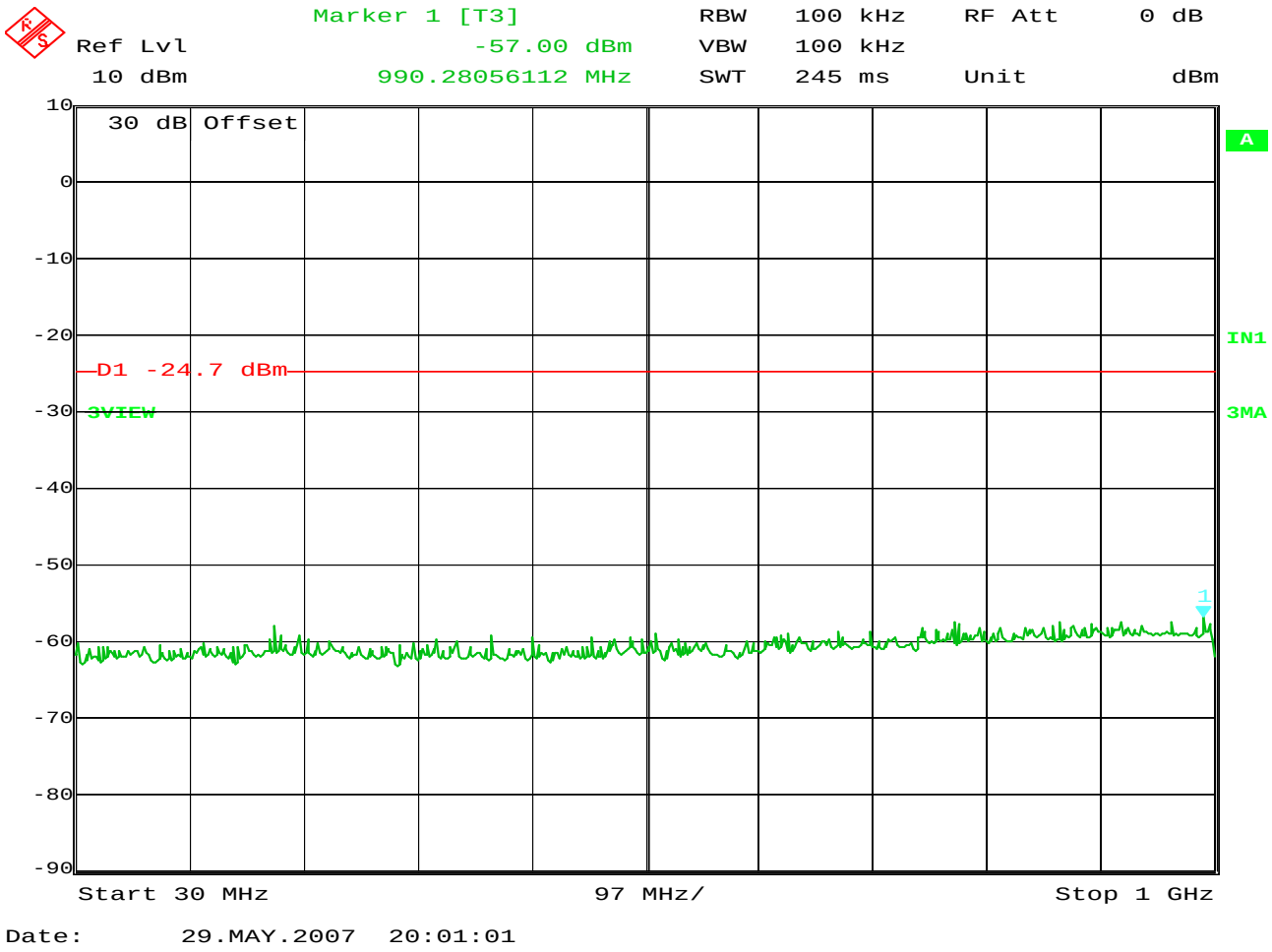
MANUFACTURER :Generac Power Systems
MODEL NUMBER :Base Station
SERIAL NUMBER :None Assigned
TEST MODE :Tuned to Ch 0(2.405GHz)
TEST PARAMETERS :Antenna Conducted
NOTES :
EQUIPMENT USED :RBB0



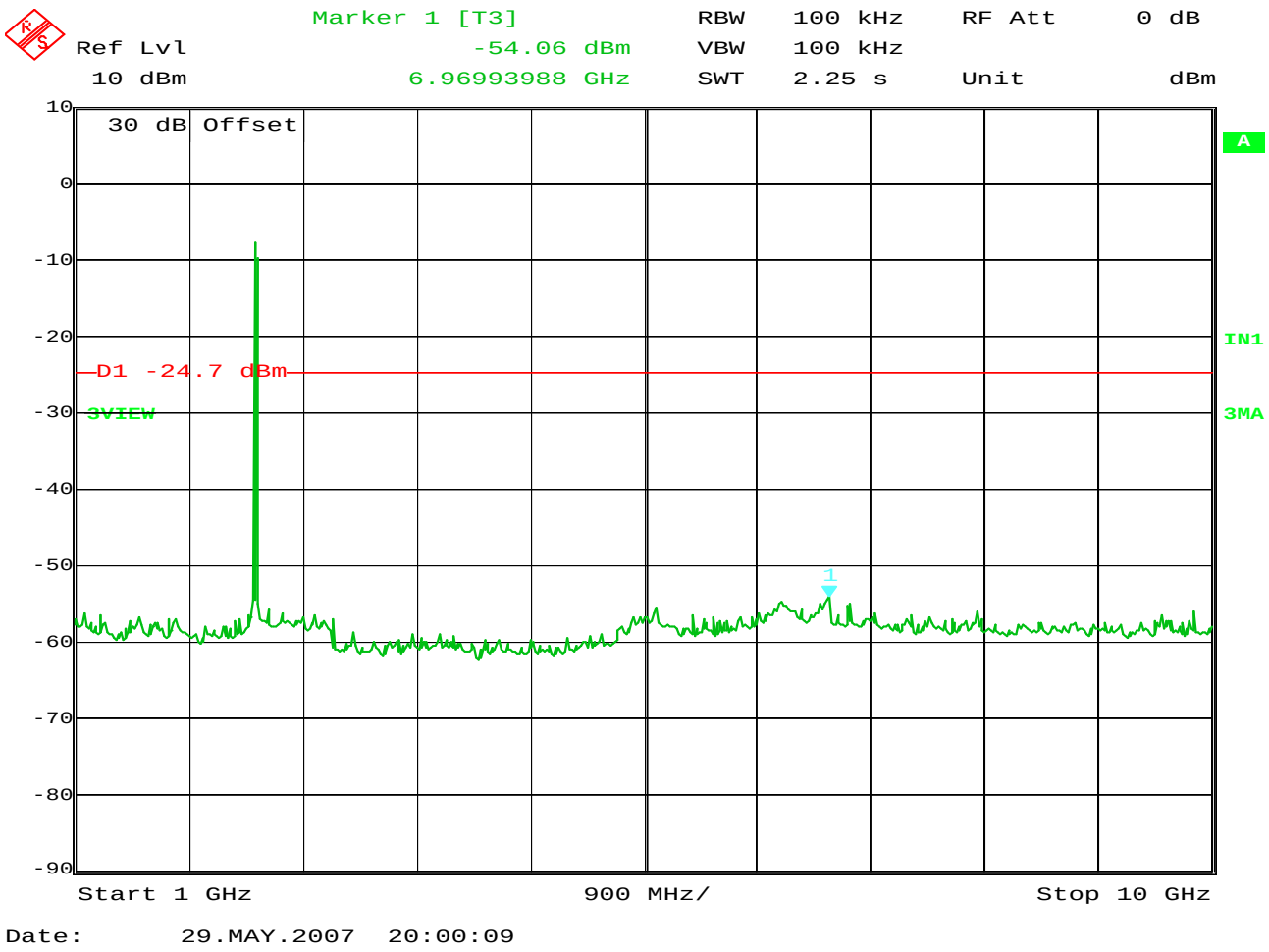
MANUFACTURER :Generac Power Systems
MODEL NUMBER :Base Station
SERIAL NUMBER :None Assigned
TEST MODE :Tuned to Ch 0(2.405GHz)
TEST PARAMETERS :Antenna Conducted
NOTES :
EQUIPMENT USED :RBB0



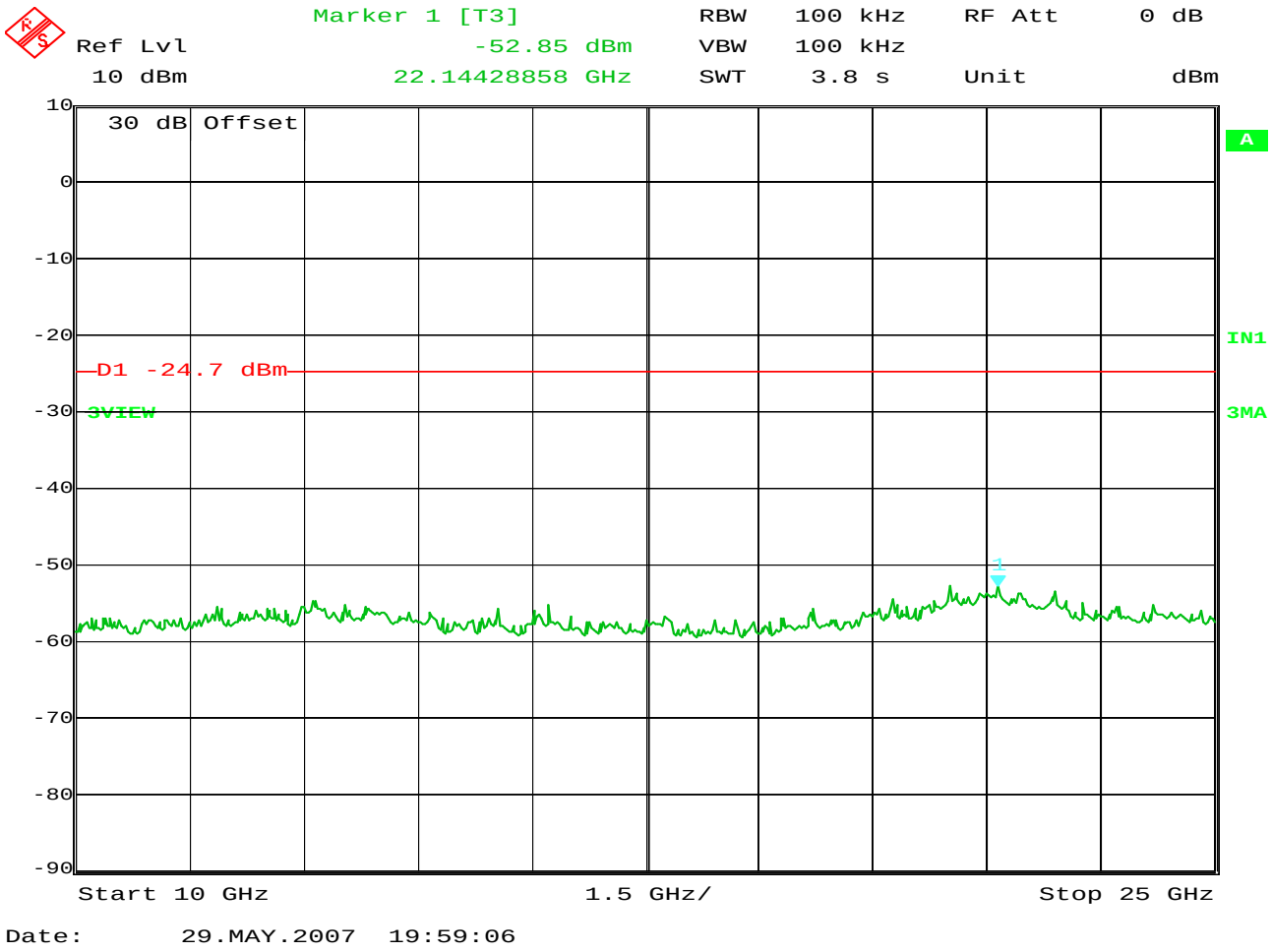
MANUFACTURER :Generac Power Systems
MODEL NUMBER :Base Station
SERIAL NUMBER :None Assigned
TEST MODE :Tuned to Ch 0(2.405GHz)
TEST PARAMETERS :Antenna Conducted
NOTES :
EQUIPMENT USED :RBB0



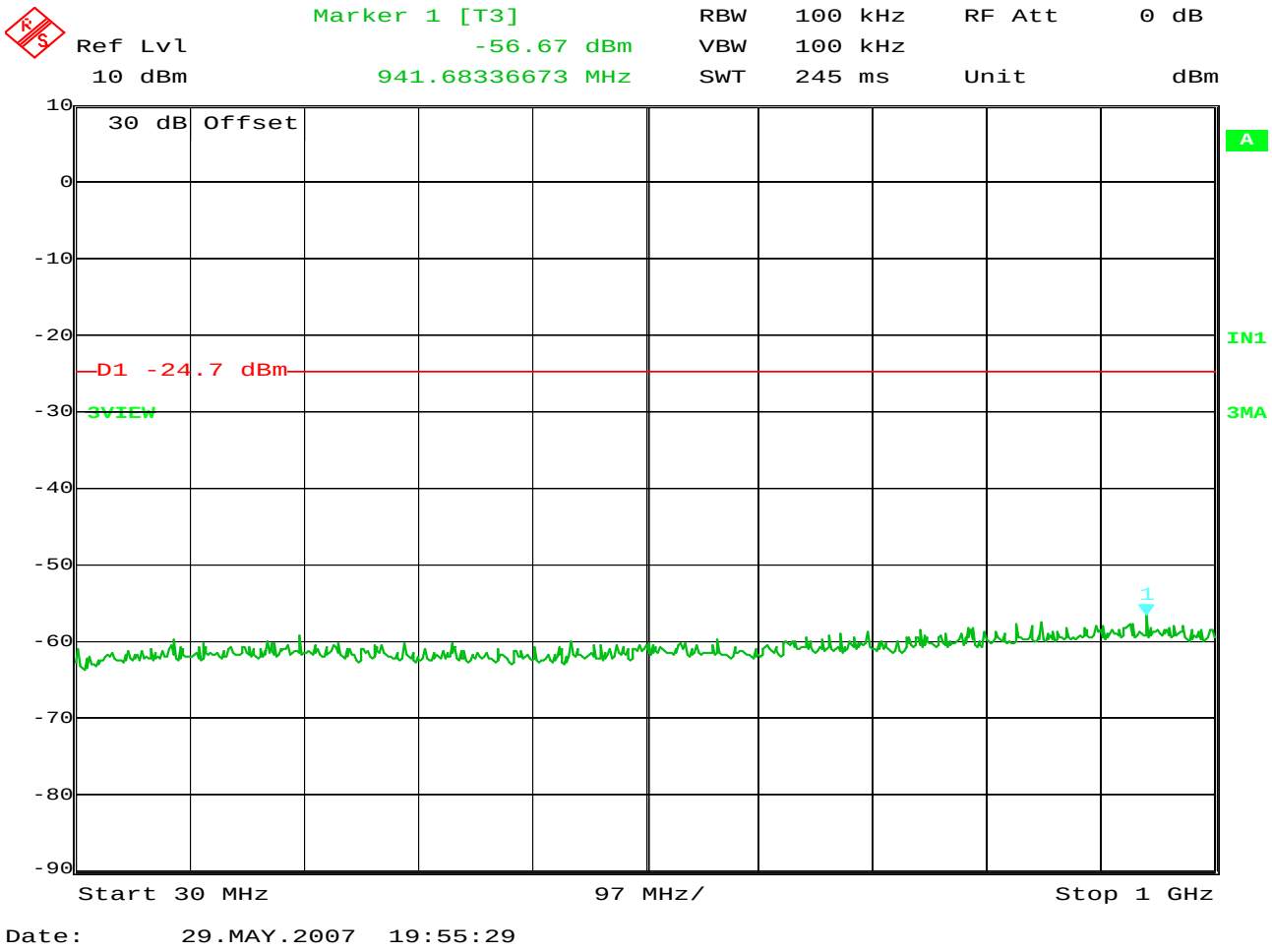
MANUFACTURER :Generac Power Systems
MODEL NUMBER :Base Station
SERIAL NUMBER :None Assigned
TEST MODE :Tuned to Ch 7(2.44GHz)
TEST PARAMETERS :Antenna Conducted
NOTES :
EQUIPMENT USED :RBB0



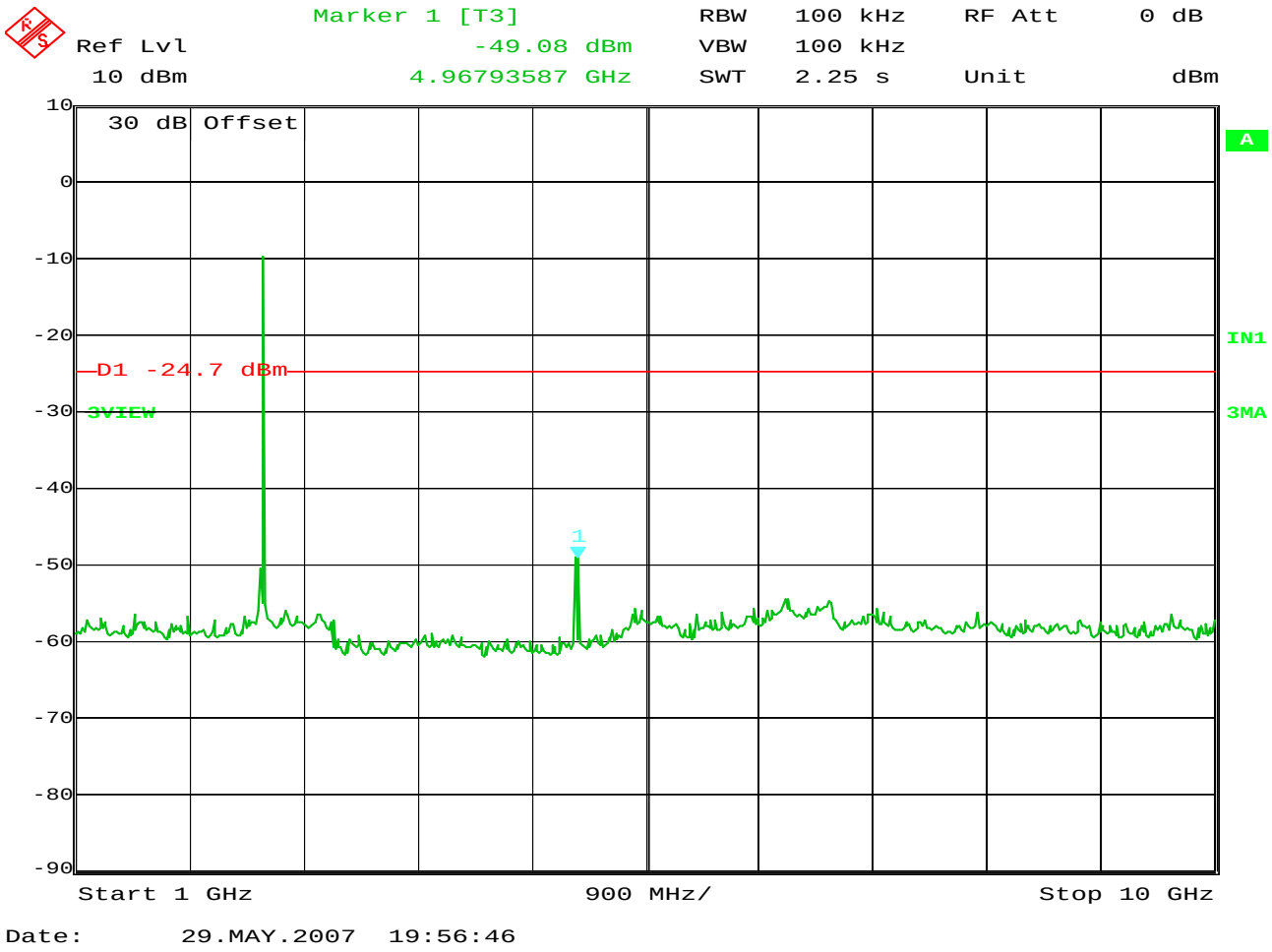
MANUFACTURER :Generac Power Systems
MODEL NUMBER :Base Station
SERIAL NUMBER :None Assigned
TEST MODE :Tuned to Ch 7(2.44GHz)
TEST PARAMETERS :Antenna Conducted
NOTES :
EQUIPMENT USED :RBB0



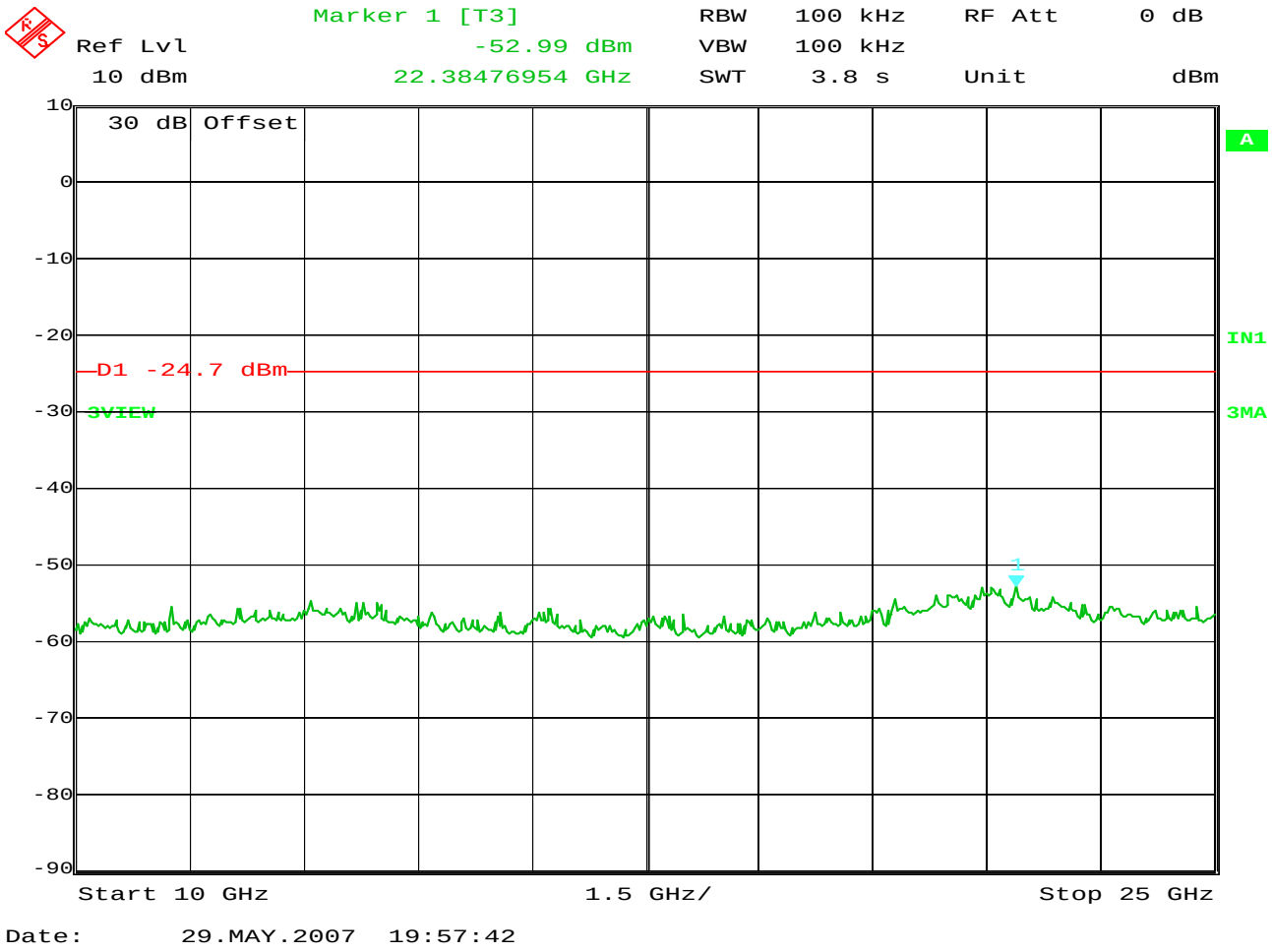
MANUFACTURER :Generac Power Systems
MODEL NUMBER :Base Station
SERIAL NUMBER :None Assigned
TEST MODE :Tuned to Ch 7(2.44GHz)
TEST PARAMETERS :Antenna Conducted
NOTES :
EQUIPMENT USED :RBB0



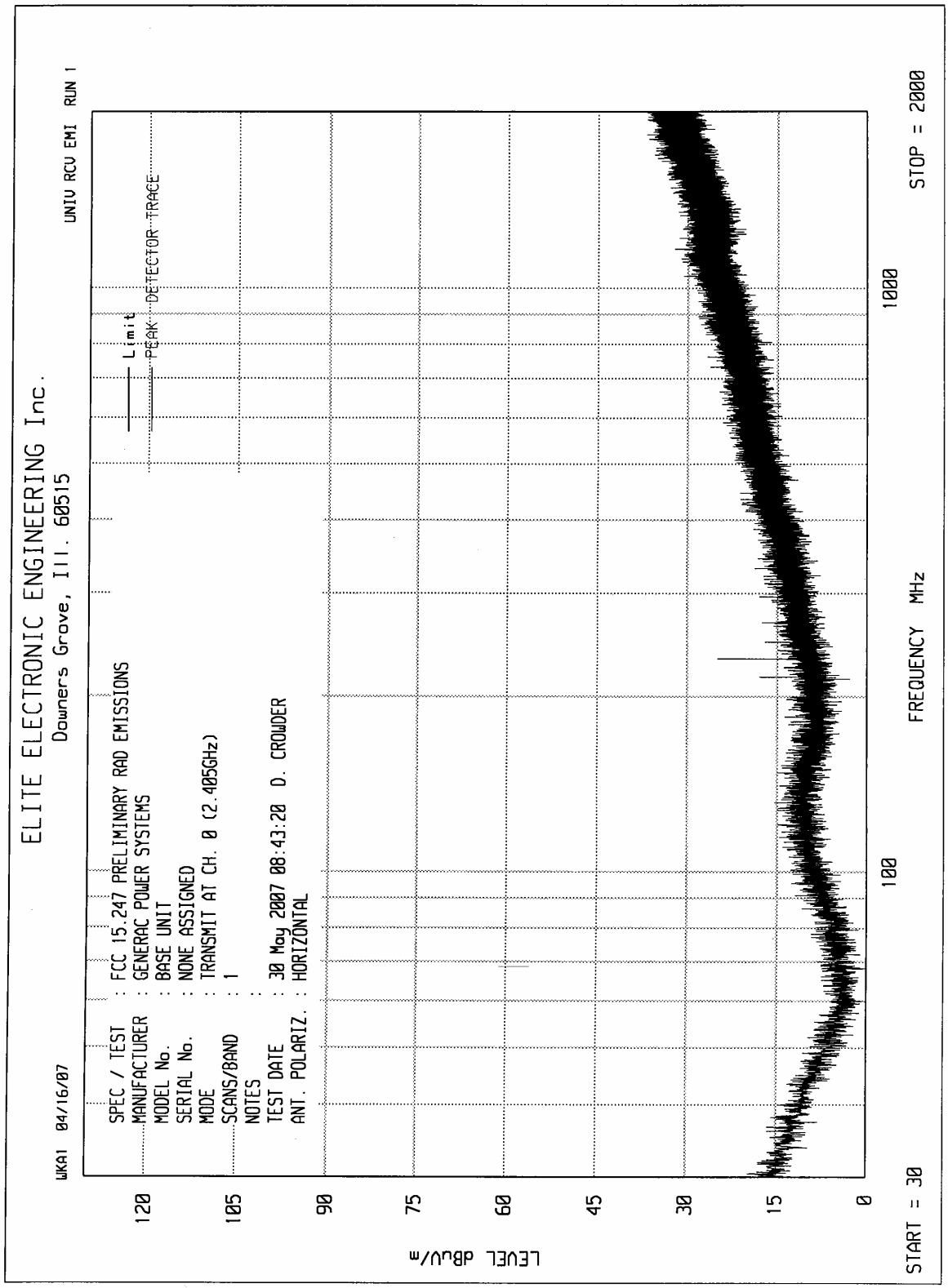
MANUFACTURER :Generac Power Systems
MODEL NUMBER :Base Station
SERIAL NUMBER :None Assigned
TEST MODE :Tuned to Ch 15(2.48GHz)
TEST PARAMETERS :Antenna Conducted
NOTES :
EQUIPMENT USED :RBB0

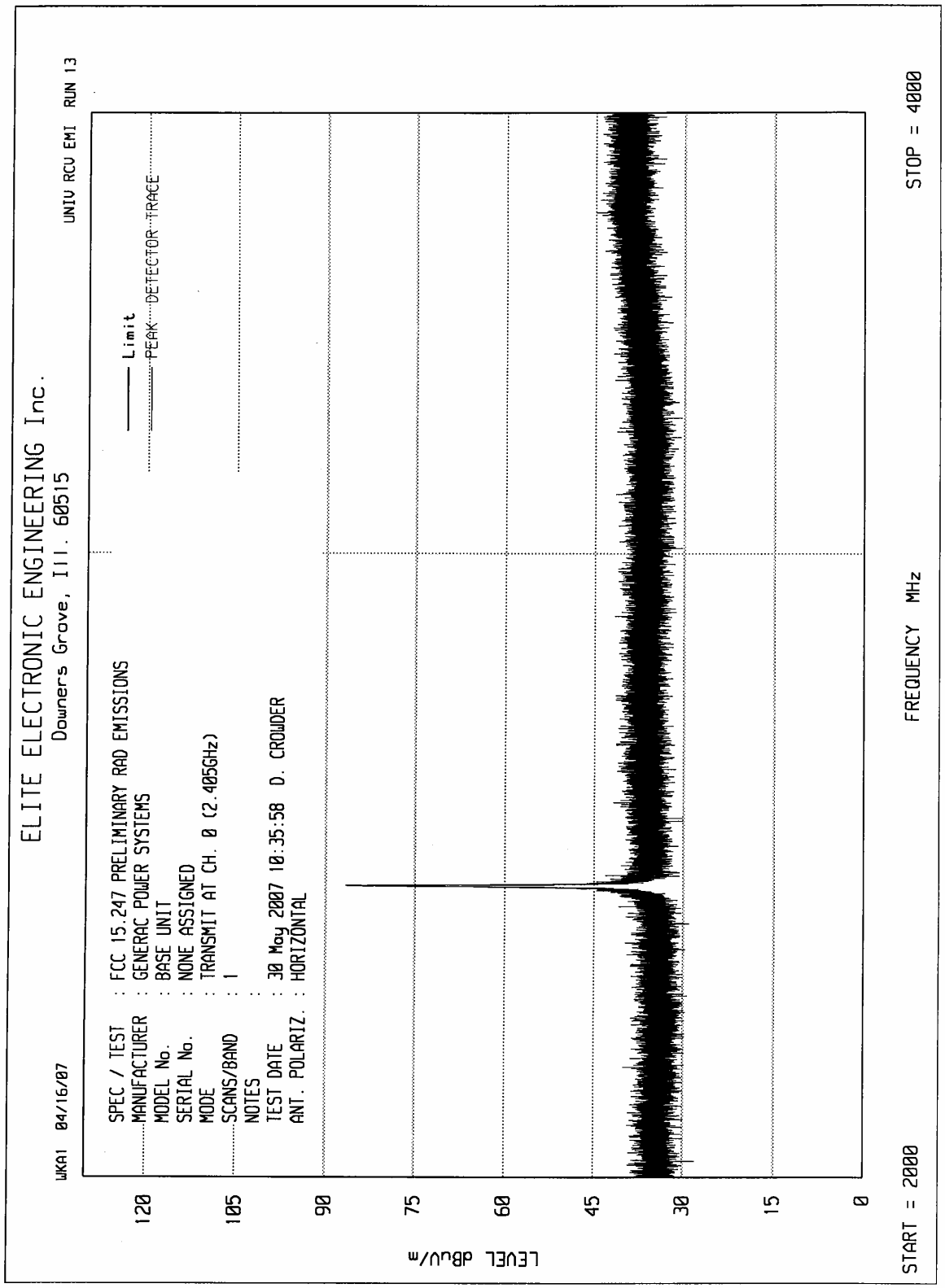


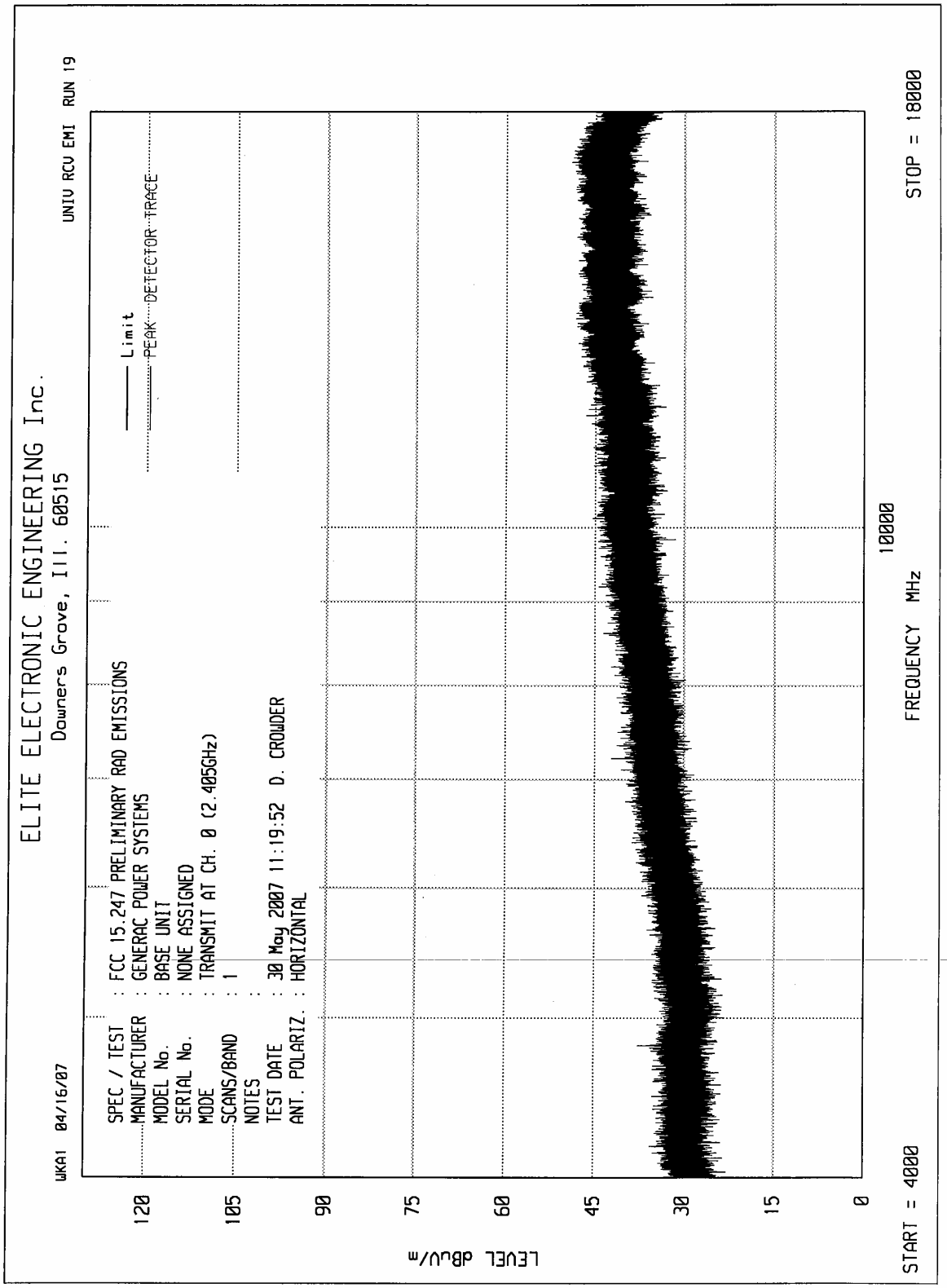
MANUFACTURER :Generac Power Systems
MODEL NUMBER :Base Station
SERIAL NUMBER :None Assigned
TEST MODE :Tuned to Ch 15(2.48GHz)
TEST PARAMETERS :Antenna Conducted
NOTES :
EQUIPMENT USED :RBB0

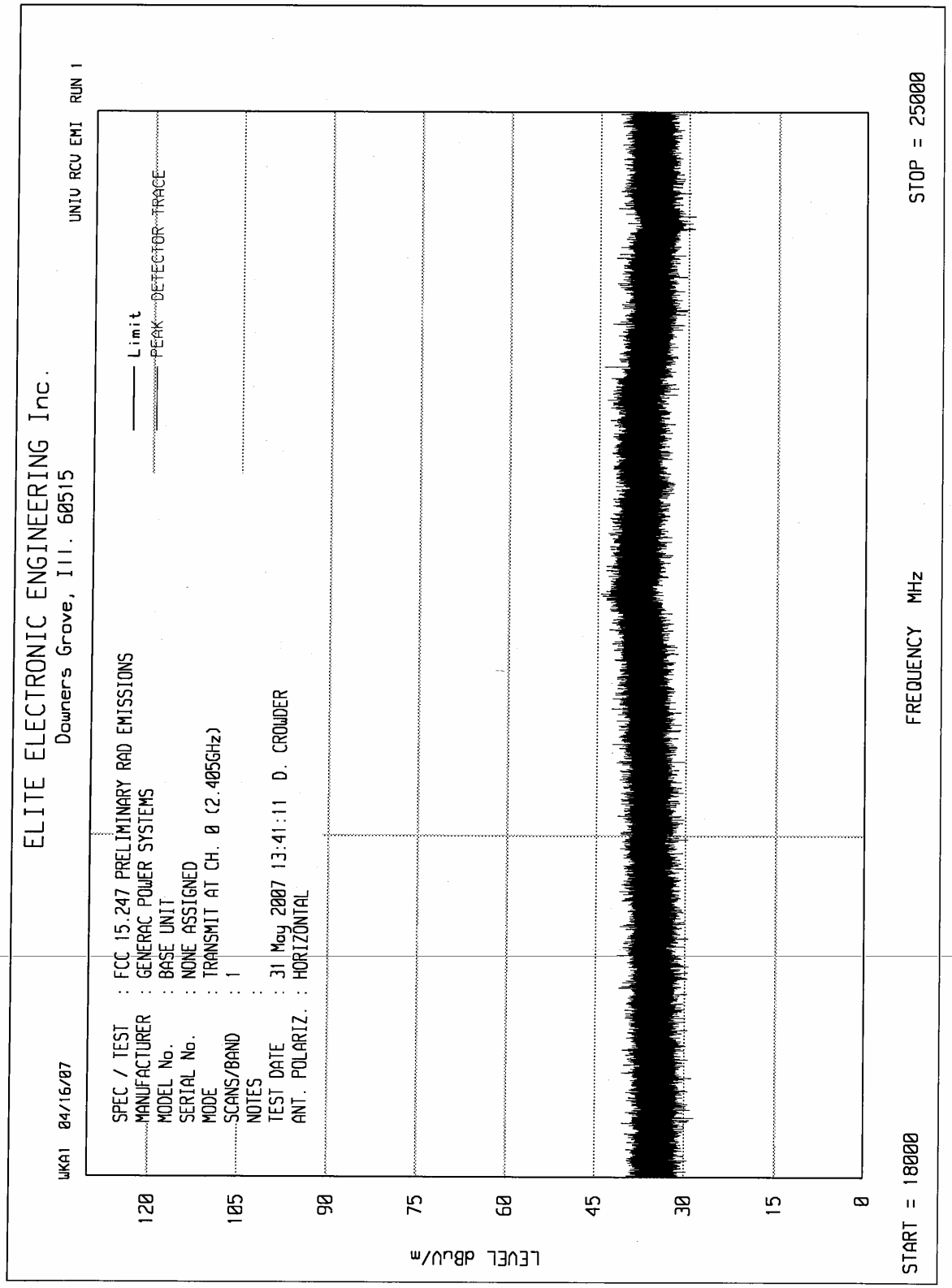


MANUFACTURER :Generac Power Systems
MODEL NUMBER :Base Station
SERIAL NUMBER :None Assigned
TEST MODE :Tuned to Ch 15(2.48GHz)
TEST PARAMETERS :Antenna Conducted
NOTES :
EQUIPMENT USED :RBB0


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 1
WKA1 04/16/07
SPEC / TEST : FCC 15.247 PRELIMINARY RAD EMISSIONS
MANUFACTURER : GENERAC POWER SYSTEMS
MODEL No. : BASE UNIT
SERIAL No. : NONE ASSIGNED
MODE : TRANSMIT AT CH. 0 (2.405GHz)
SCANS/BAND : 1
NOTES :
TEST DATE : 30 May 2007 08:43:20 D. CROWDER
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 30
100
1000
STOP = 2000
FREQUENCY MHz


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 13
WKA1 04/16/07
SPEC / TEST : FCC 15.247 PRELIMINARY RAD EMISSIONS
MANUFACTURER : GENERAC POWER SYSTEMS
MODEL No. : BASE UNIT
SERIAL No. : NONE ASSIGNED
MODE : TRANSMIT AT CH. 0 (2.405GHz)
SCANS/BAND : 1
NOTES :
TEST DATE : 30 May 2007 10:35:58 D. CROWDER
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 2000
FREQUENCY MHz
STOP = 4000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 19
WKA1 04/16/07
SPEC / TEST : FCC 15.247 PRELIMINARY RAD EMISSIONS
MANUFACTURER : GENERAC POWER SYSTEMS
MODEL No. : BASE UNIT
SERIAL No. : NONE ASSIGNED
MODE : TRANSMIT AT CH. 0 (2.405GHz)
SCANS/BAND : 1
NOTES :
TEST DATE : 30 May 2007 11:19:52 D. CROWDER
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 4000
10000
FREQUENCY MHz
STOP = 18000

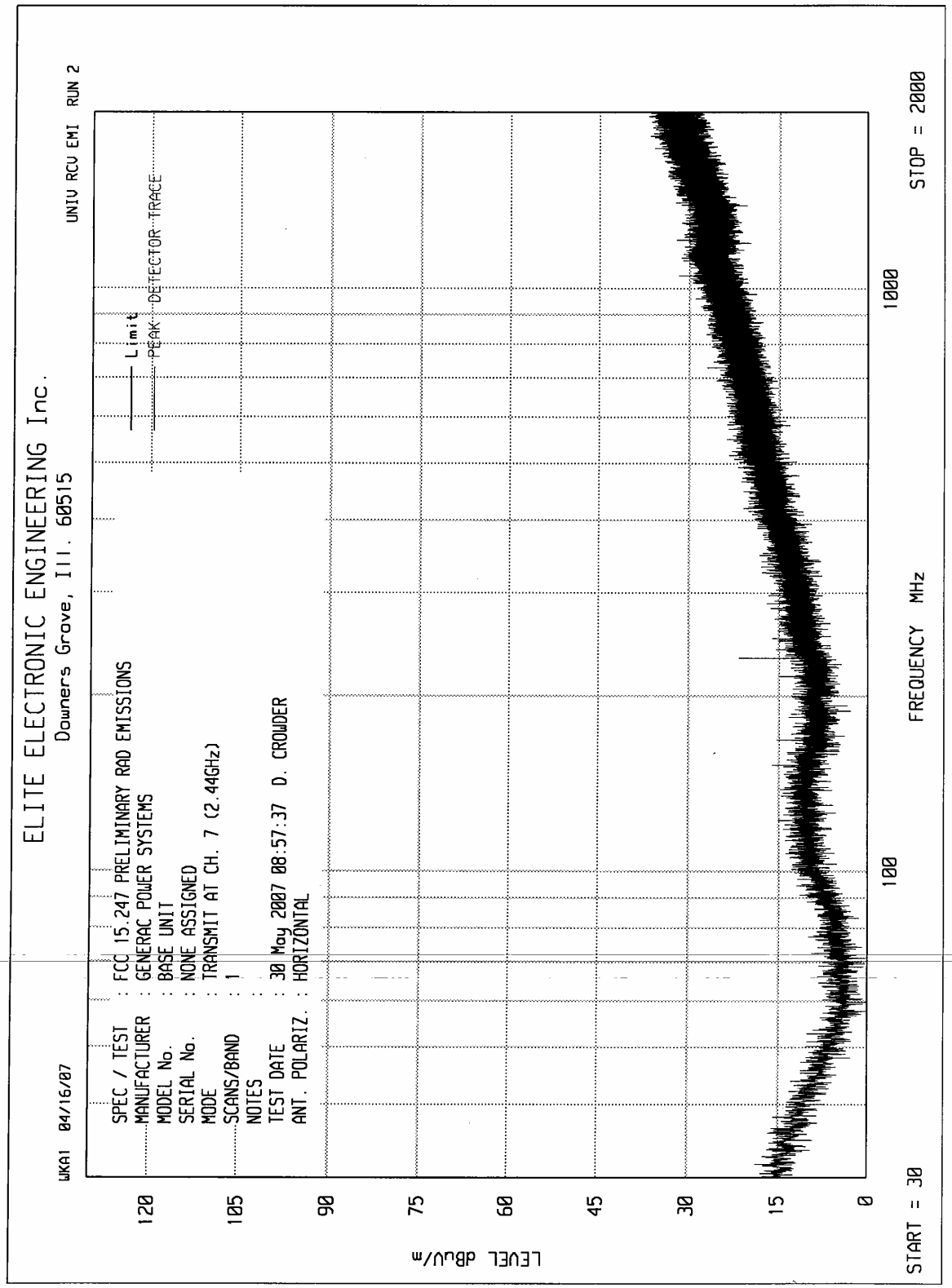

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 1
WKA1 04/16/07
SPEC / TEST : FCC 15.247 PRELIMINARY RAD EMISSIONS
MANUFACTURER : GENERAC POWER SYSTEMS
MODEL No. : BASE UNIT
SERIAL No. : NONE ASSIGNED
MODE : TRANSMIT AT CH. 0 (2.405GHz)
SCANS/BAND : 1
NOTES : :
TEST DATE : 31 May 2007 13:41:11 D. CROWDER
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000

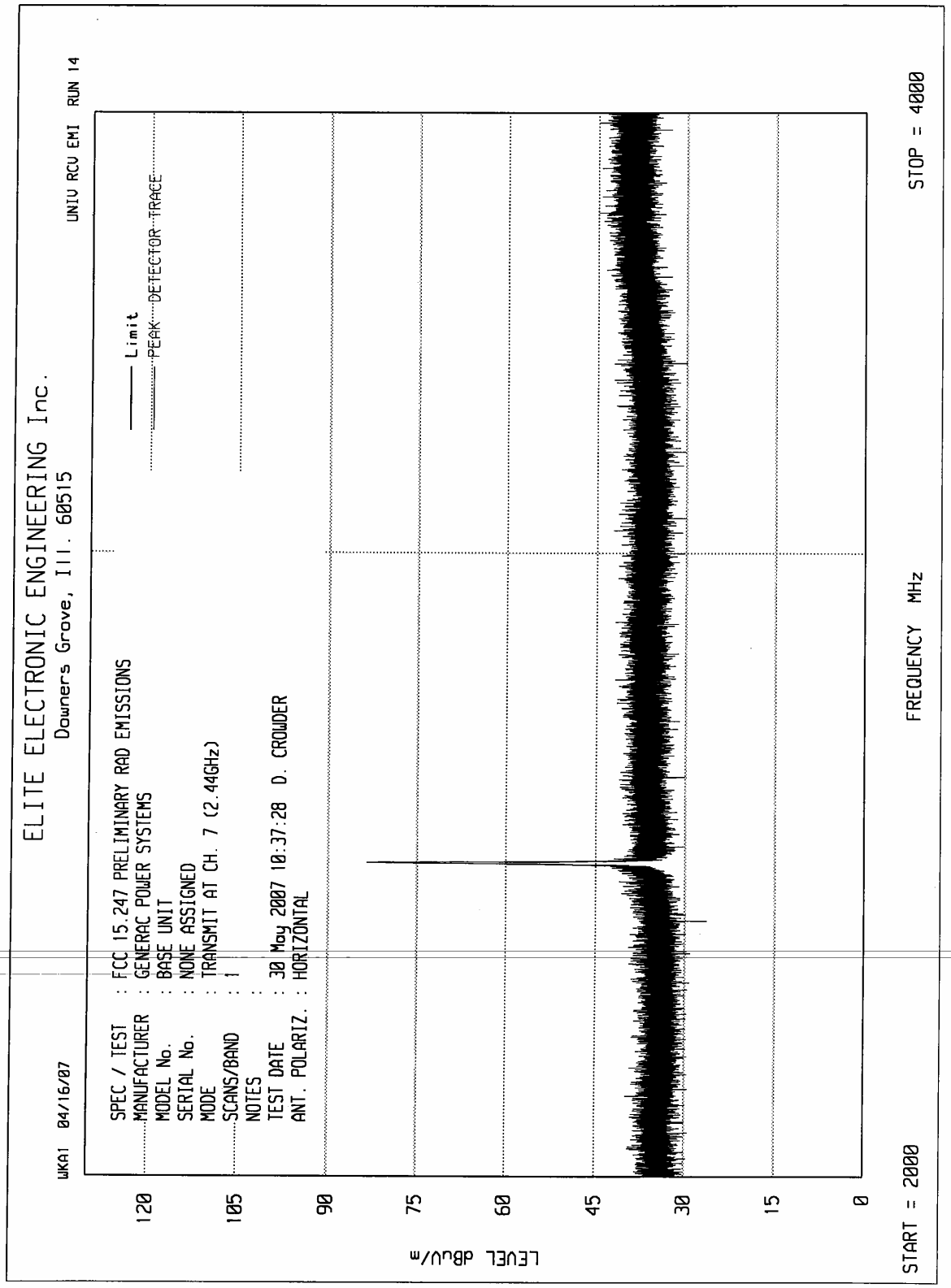
Manufacturer : Generac Power Systems
Test Item : 0G6020 Base Unit
Model No. : 0G6020 Base Unit
Serial No. : None Assigned
Test Specification : FCC Part 15, Subpart C, Section 15.247, Radiated Emissions
Date : May 29, 2007 through June 1, 2007
Mode : Transmit @ 2405MHz
Test Distance : 3 meters
Notes :

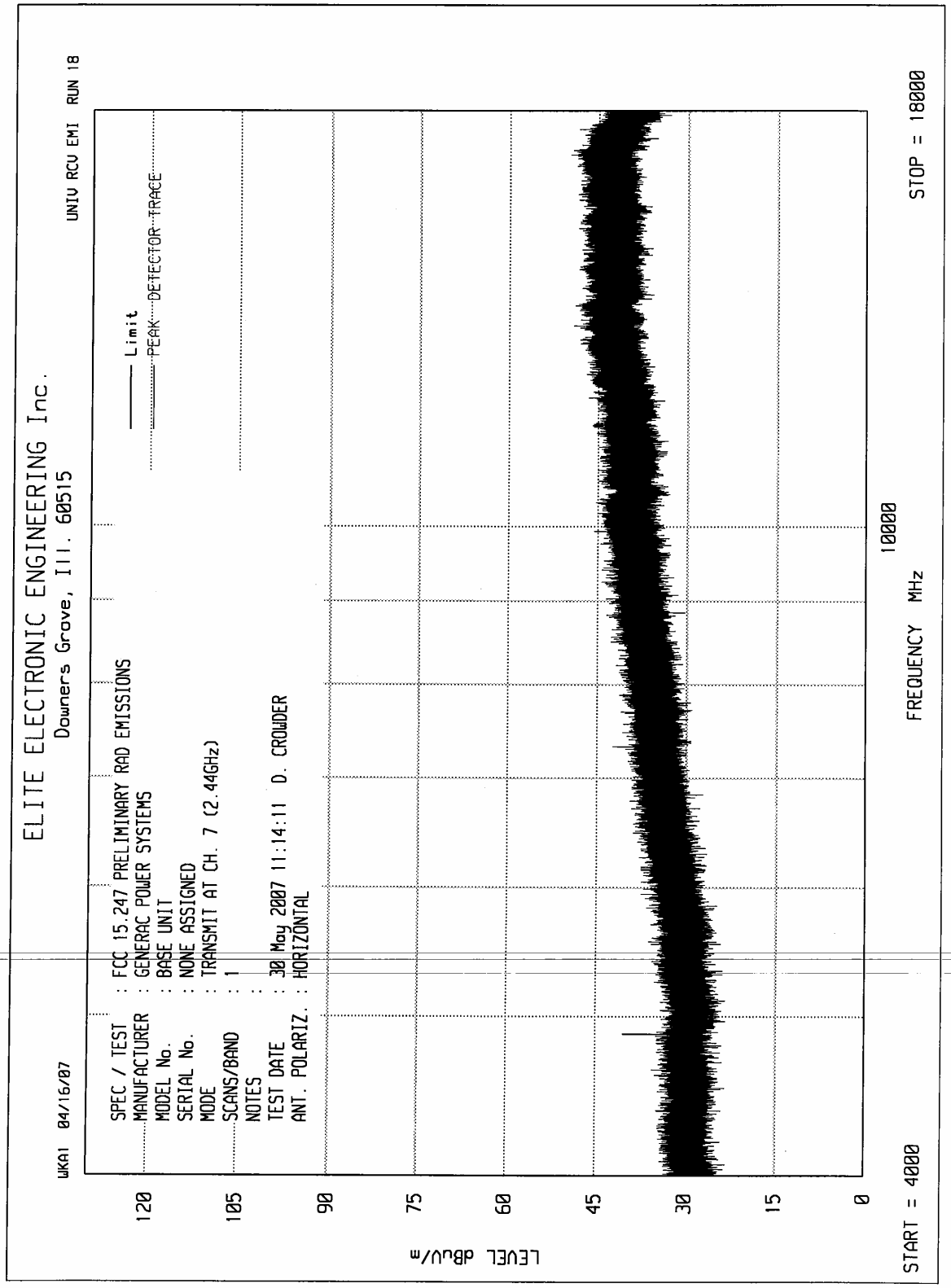
Freq (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	Cbl Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Total dBuV/m at 3 M	Total uV/m at 3M	Limit uV/m at 3M	Margin (dB)
4810.0	H	44.1		4.9	34.5	-40.1	43.4	148.5	500.0	-10.5
4810.0	V	49.4		4.9	34.5	-40.1	48.7	273.4	500.0	-5.2
12025.0	H	33.0	Ambient	8.5	41.4	-39.6	43.3	145.6	500.0	-10.7
12025.0	V	32.4	Ambient	8.5	41.4	-39.6	42.7	135.9	500.0	-11.3
19240.0	H	21.5	Ambient	2.2	40.4	-27.5	36.7	68.0	500.0	-17.3
19240.0	V	21.1	Ambient	2.2	40.4	-27.5	36.3	64.9	500.0	-17.7

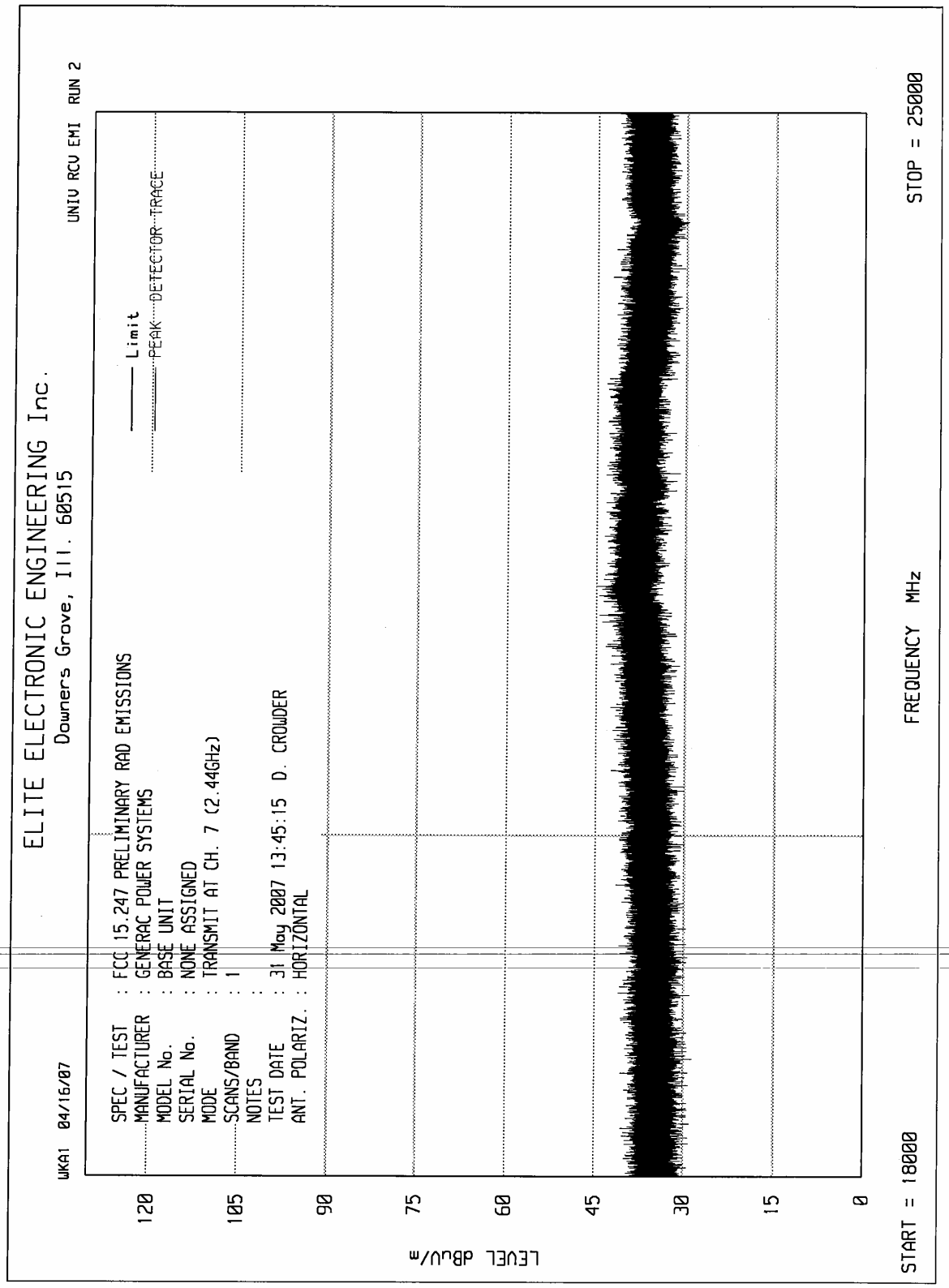
Total = Meter Reading + Cable Loss + Antenna Factor + Preamp Gain

Checked By: 


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 2
WKA1 04/16/07
SPEC / TEST : FCC 15.247 PRELIMINARY RAD EMISSIONS
MANUFACTURER : GENERAC POWER SYSTEMS
MODEL No. : BASE UNIT
SERIAL No. : NONE ASSIGNED
MODE : TRANSMIT AT CH. 7 (2.44GHz)
SCANS/BAND : 1
NOTES :
TEST DATE : 30 May 2007 08:57:37 D. CROWDER
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 30
100
1000
STOP = 2000
FREQUENCY MHz


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 14
WKA1 04/16/07
SPEC / TEST : FCC 15.247 PRELIMINARY RAD EMISSIONS
MANUFACTURER : GENERAC POWER SYSTEMS
MODEL No. : BASE UNIT
SERIAL No. : NONE ASSIGNED
MODE : TRANSMIT AT CH. 7 (2.44GHz)
SCANS/BAND : 1
NOTES :
TEST DATE : 30 May 2007 10:37:28 D. CROWDER
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 2000
FREQUENCY MHz
STOP = 4000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 18
WKAI 04/16/07
SPEC / TEST : FCC 15.247 PRELIMINARY RAD EMISSIONS
MANUFACTURER : GENERAC POWER SYSTEMS
MODEL No. : BASE UNIT
SERIAL No. : NONE ASSIGNED
MODE : TRANSMIT AT CH. 7 (2.44GHz)
SCANS/BAND : 1
NOTES :
TEST DATE : 30 May 2007 11:14:11 D. CROWDER
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 4000
10000
STOP = 18000
FREQUENCY MHz

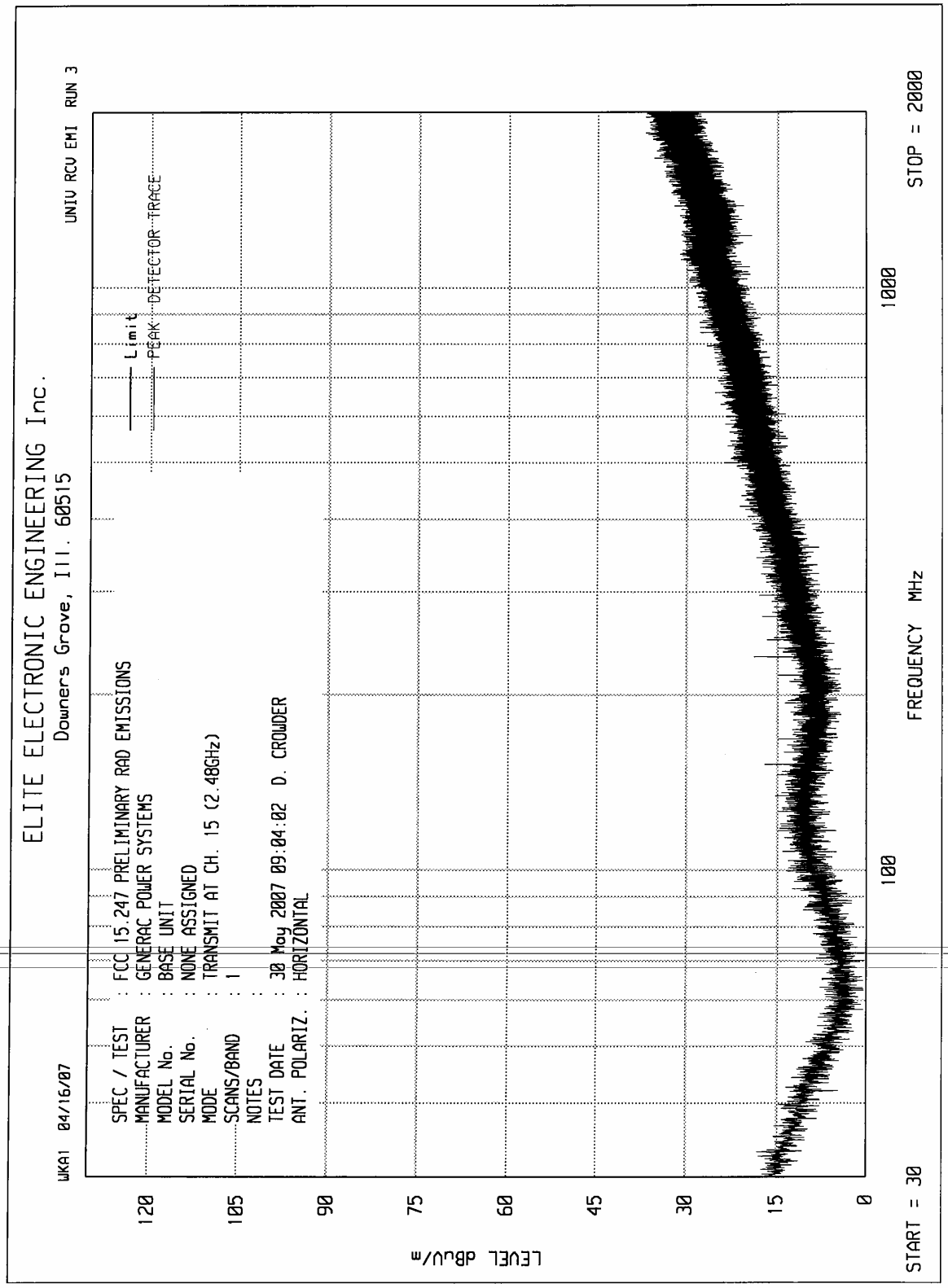

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 2
WKA1 04/16/07
SPEC / TEST : FCC 15.247 PRELIMINARY RAD EMISSIONS
MANUFACTURER : GENERAC POWER SYSTEMS
MODEL No. : BASE UNIT
SERIAL No. : NONE ASSIGNED
MODE : TRANSMIT AT CH. 7 (2.44GHz)
SCANS/BAND : 1
NOTES :
TEST DATE : 31 May 2007 13:45:15 D. CROWDER
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000

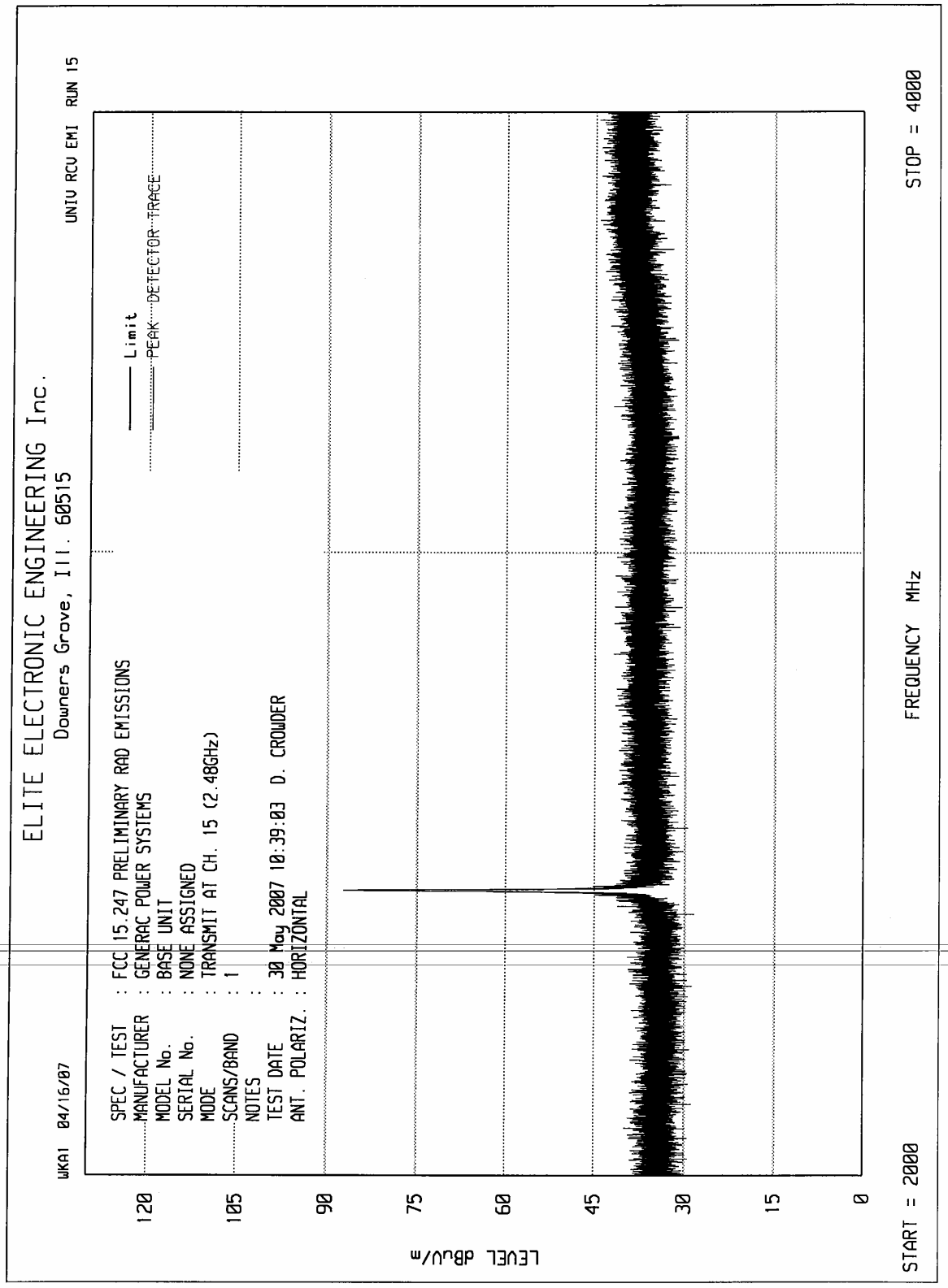
Manufacturer : Generac Power Systems
Test Item : 0G6020 Base Unit
Model No. : 0G6020 Base Unit
Serial No. : None Assigned
Test Specification : FCC Part 15, Subpart C, Section 15.247, Radiated Emissions
Date : May 29, 2007 through June 1, 2007
Mode : Transmit @ 2440MHz
Test Distance : 3 meters
Notes : -3dBm power setting

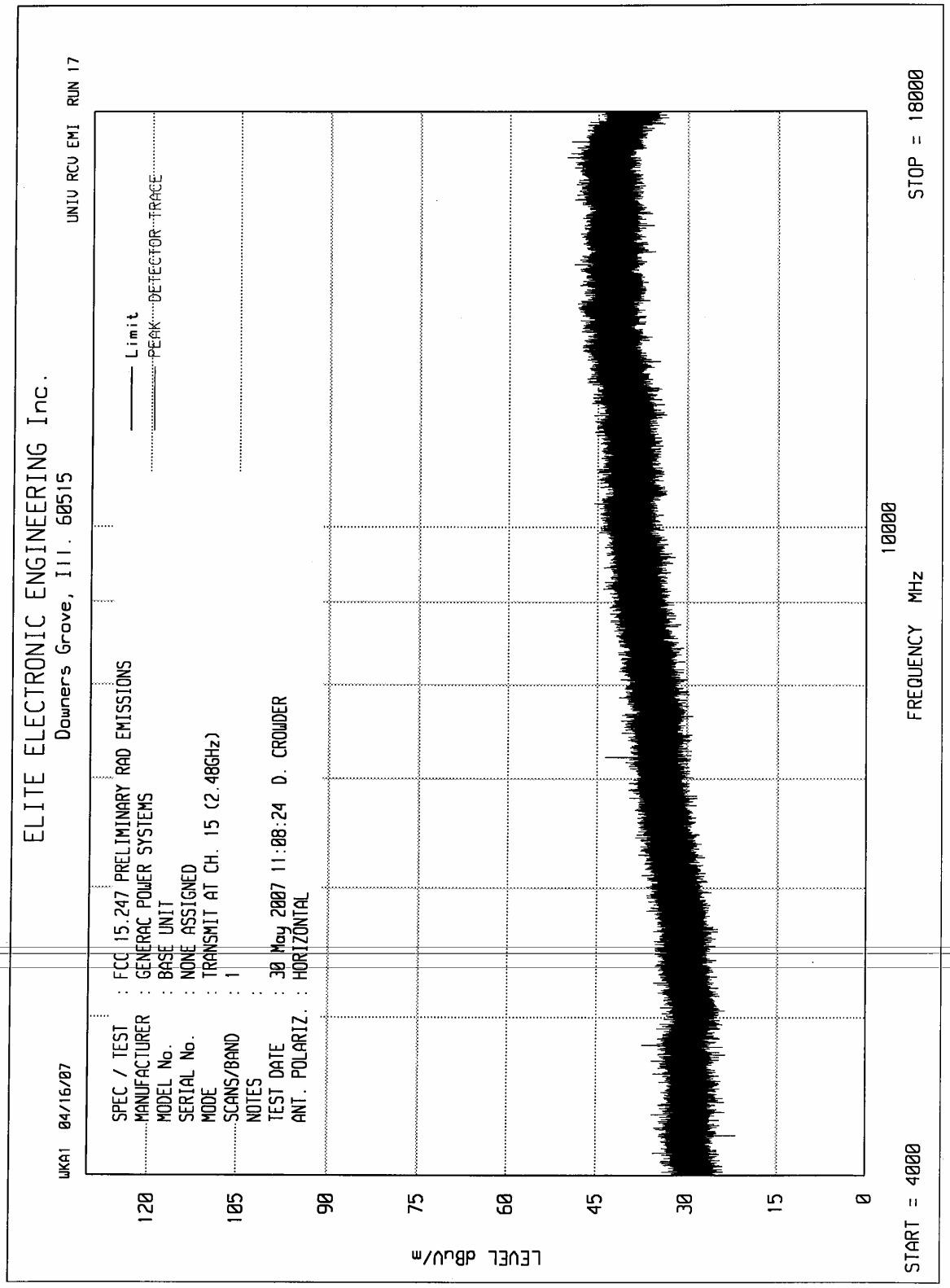
Freq (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	Cbl Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Total dBuV/m at 3 M	Total uV/m at 3M	Limit uV/m at 3M	Margin (dB)
4880.0	H	47.1		5.0	34.5	-40.1	46.4	209.8	500.0	-7.5
4880.0	V	44.8		5.0	34.5	-40.1	44.1	161.0	500.0	-9.8
7320.0	H	36.1		6.7	38.1	-39.8	41.1	113.2	500.0	-12.9
7320.0	V	37.1		6.7	38.1	-39.8	42.1	127.0	500.0	-11.9
12200.0	H	31.7	Ambient	8.7	41.4	-39.4	42.3	130.5	500.0	-11.7
12200.0	V	31.9	Ambient	8.7	41.4	-39.4	42.5	133.5	500.0	-11.5
19520.0	H	21.8	Ambient	2.2	40.4	-27.2	37.2	72.8	500.0	-16.7
19520.0	V	22.0	Ambient	2.2	40.0	-27.2	37.0	71.1	500.0	-16.9

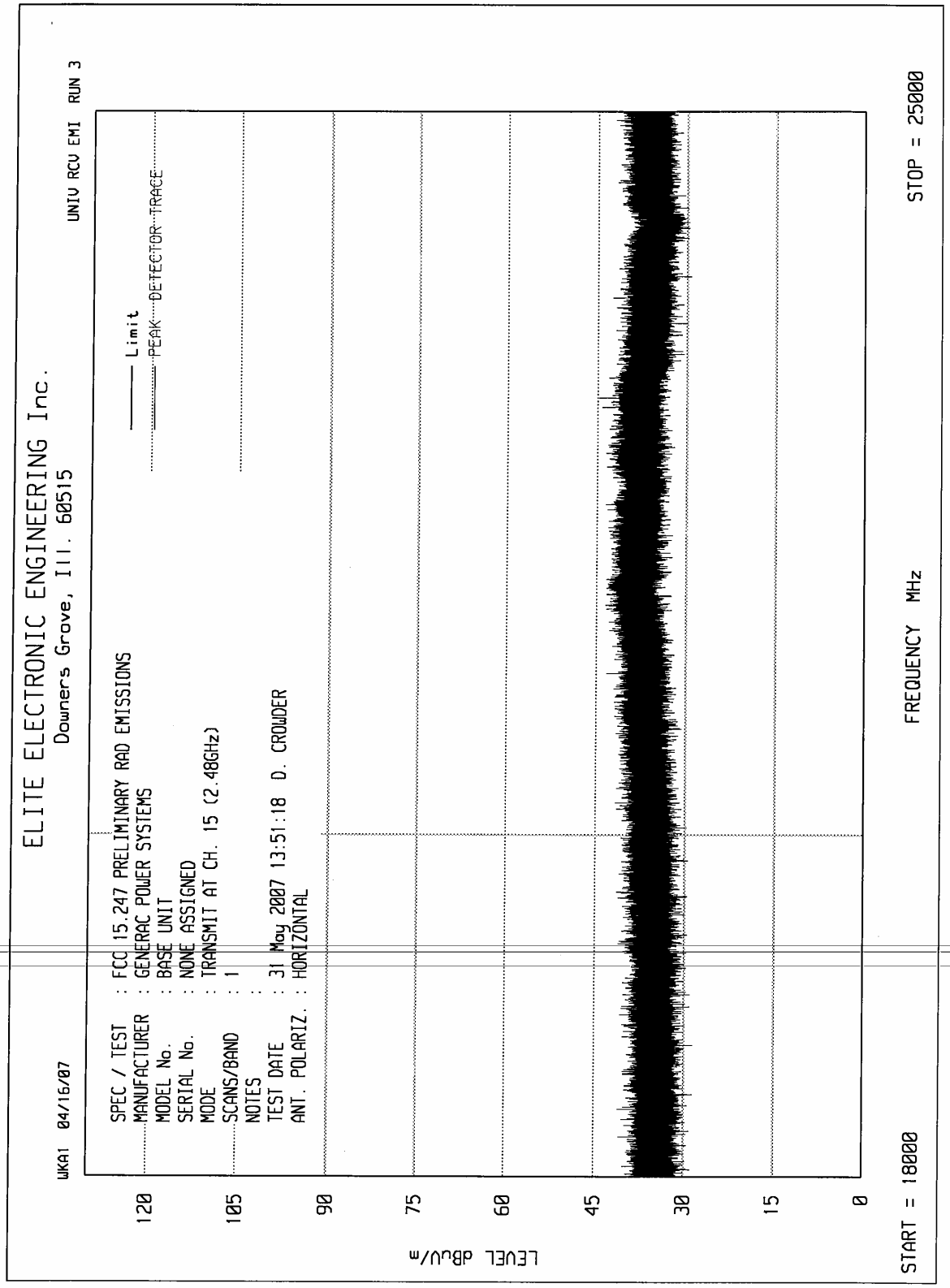
Total = Meter Reading + Cable Loss + Antenna Factor + Preamp Gain

Checked By: 


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 3
WKA1 04/16/07
SPEC / TEST : FCC 15.247 PRELIMINARY RAD EMISSIONS
MANUFACTURER : GENERAC POWER SYSTEMS
MODEL No. : BASE UNIT
SERIAL No. : NONE ASSIGNED
MODE : TRANSMIT AT CH. 15 (2.48GHz)
SCANS/BAND : 1
NOTES :
TEST DATE : 30 May 2007 09:04:02 D. CROWDER
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 30
100
1000
STOP = 2000
FREQUENCY MHz


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 15
WKA1 04/16/07
SPEC / TEST : FCC 15.247 PRELIMINARY RAD EMISSIONS
MANUFACTURER : GENERAC POWER SYSTEMS
MODEL No. : BASE UNIT
SERIAL No. : NONE ASSIGNED
MODE : TRANSMIT AT CH. 15 (2.48GHz)
SCANS/BAND : 1
NOTES :
TEST DATE : 30 May 2007 10:39:03 D. CROWDER
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 2000
FREQUENCY MHz
STOP = 4000


ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 17
WKA1 04/16/07
SPEC / TEST : FCC 15.247 PRELIMINARY RAD EMISSIONS
MANUFACTURER : GENERAC POWER SYSTEMS
MODEL No. : BASE UNIT
SERIAL No. : NONE ASSIGNED
MODE : TRANSMIT AT CH. 15 (2.48GHz)
SCANS/BAND : 1
NOTES :
TEST DATE : 30 May 2007 11:08:24 D. CROWDER
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 4000
10000
FREQUENCY MHz
STOP = 18000

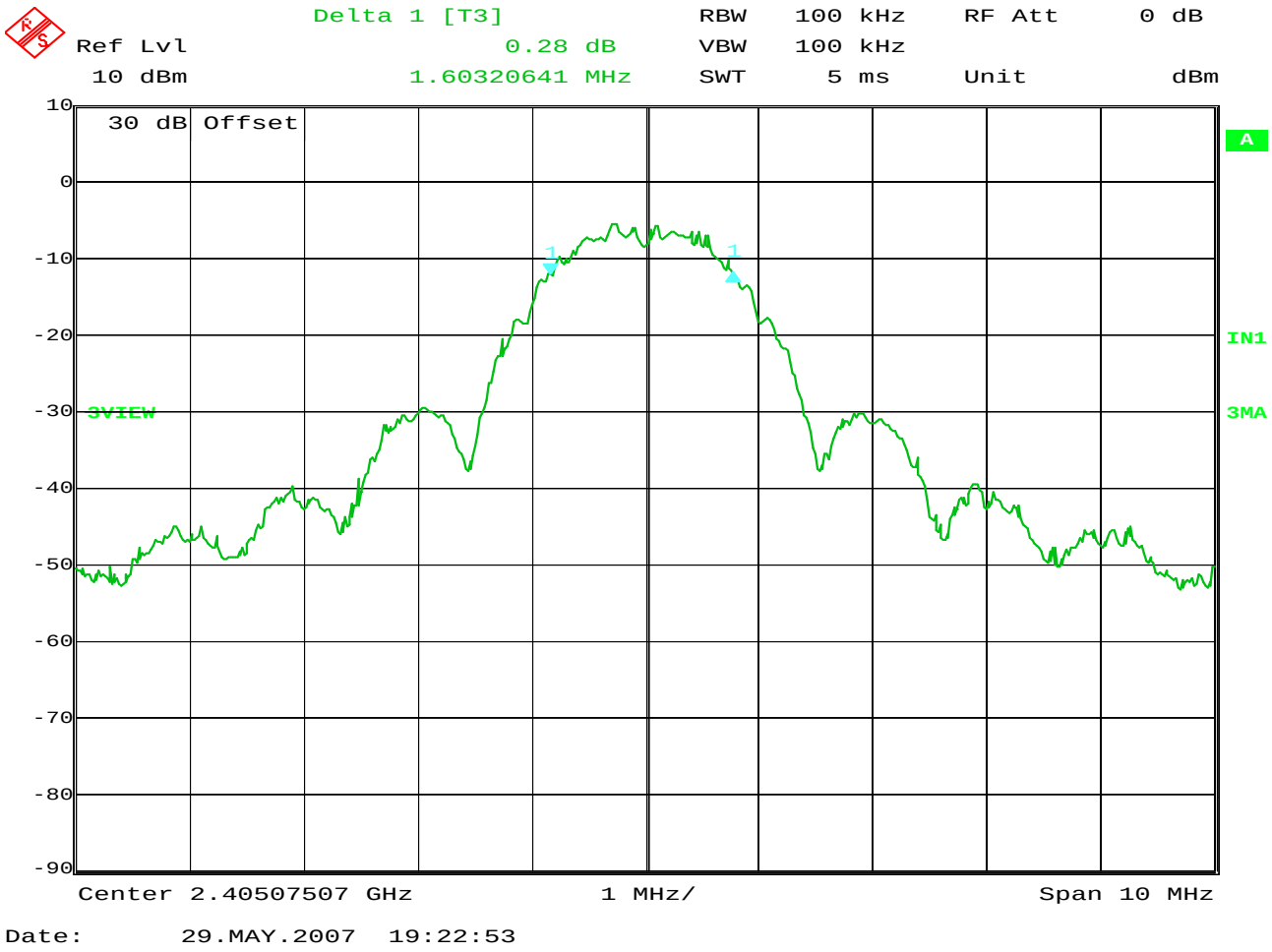

ELITE ELECTRONIC ENGINEERING Inc.
Downers Grove, Ill. 60515
UNIV RCV EMI RUN 3
WKA1 04/16/07
SPEC / TEST : FCC 15.247 PRELIMINARY RAD EMISSIONS
MANUFACTURER : GENERAC POWER SYSTEMS
MODEL No. : BASE UNIT
SERIAL No. : NONE ASSIGNED
MODE : TRANSMIT AT CH. 15 (2.480GHz)
SCANS/BAND : 1
NOTES :
TEST DATE : 31 May 2007 13:51:18 D. CROWDER
ANT. POLARIZ. : HORIZONTAL
Limit
PEAK DETECTOR TRACE
LEVEL dBuV/m
120
105
90
75
60
45
30
15
0
START = 18000
FREQUENCY MHz
STOP = 25000

Manufacturer : Generac Power Systems
Test Item : 0G6020 Base Unit
Model No. : 0G6020 Base Unit
Serial No. : None Assigned
Test Specification : FCC Part 15, Subpart C, Section 15.247, Radiated Emissions
Date : May 29, 2007 through June 1, 2007
Mode : Transmit @ 2480MHz
Test Distance : 3 meters
Notes : -3dBm power setting

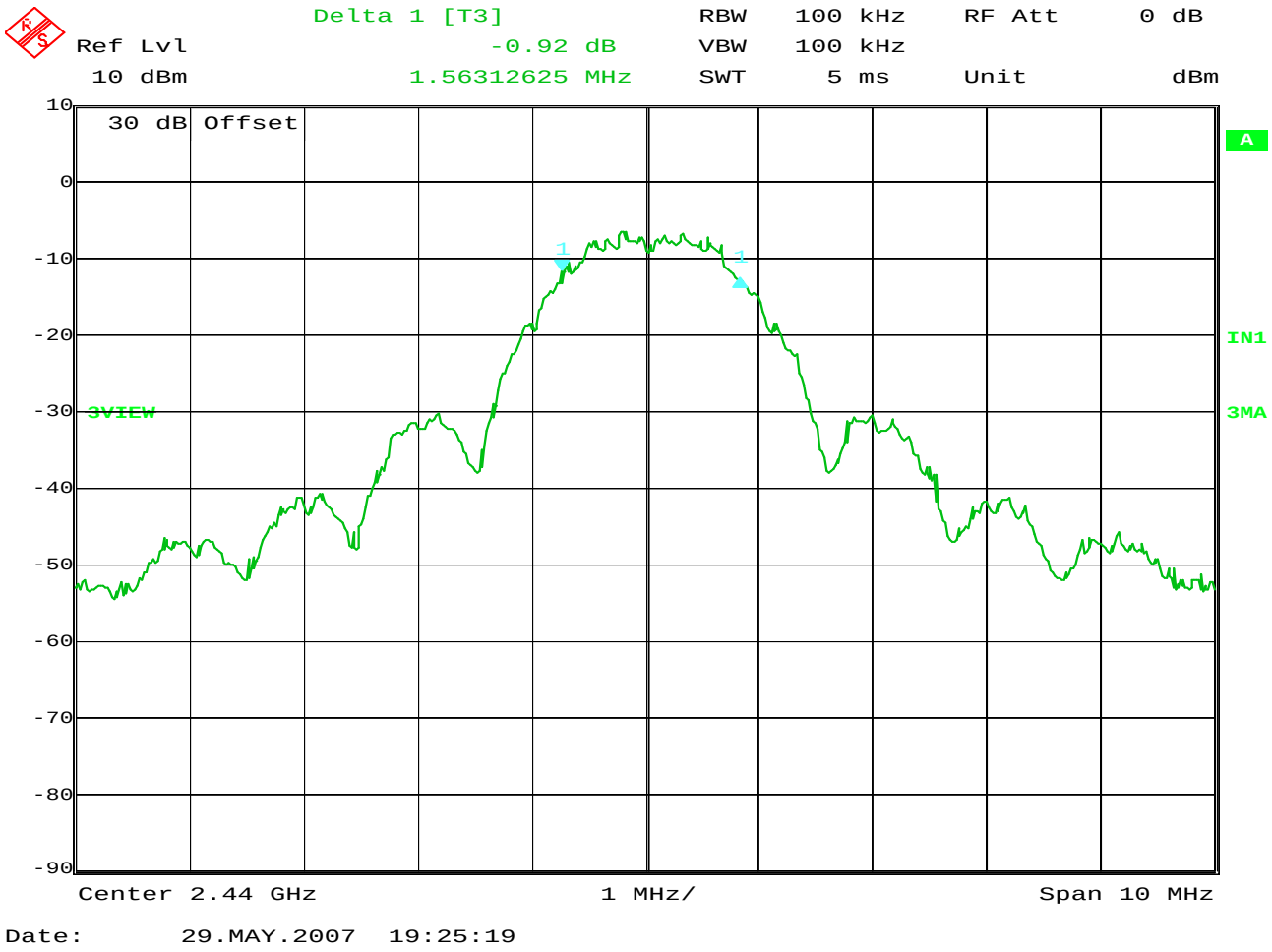
Freq (MHz)	Ant Pol	Meter Reading (dBuV)	Ambient	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Total dBuV/m at 3 M	Total uV/m at 3M	Limit uV/m at 3M	Margin (dB)
4960.0	H	50.8		5.0	34.5	-40.2	50.1	321.4	500.0	-3.8
4960.0	V	51.0		5.0	34.5	-40.2	50.3	328.9	500.0	-3.6
7440.0	H	41.4		6.7	38.1	-39.7	46.5	211.3	500.0	-7.5
7440.0	V	41.6		6.7	38.1	-39.7	46.7	216.2	500.0	-7.3
12400.0	H	31.8	Ambient	8.9	41.3	-39.3	42.8	138.1	500.0	-11.2
12400.0	V	32.1	Ambient	8.9	41.3	-39.3	43.1	143.0	500.0	-10.9
19840.0	H	21.4	Ambient	2.2	40.4	-26.9	37.2	72.2	500.0	-16.8
19840.0	V	21.3	Ambient	2.2	40.4	-26.9	37.1	71.4	500.0	-16.9
22320.0	H	22.8	Ambient	2.2	40.6	-27.1	38.6	84.7	500.0	-15.4
22320.0	V	23.0	Ambient	2.2	40.6	-27.1	38.8	86.7	500.0	-15.2

Total = Meter Reading + Cable Loss + Antenna Factor + Preamp Gain + Duty Cycle Factor

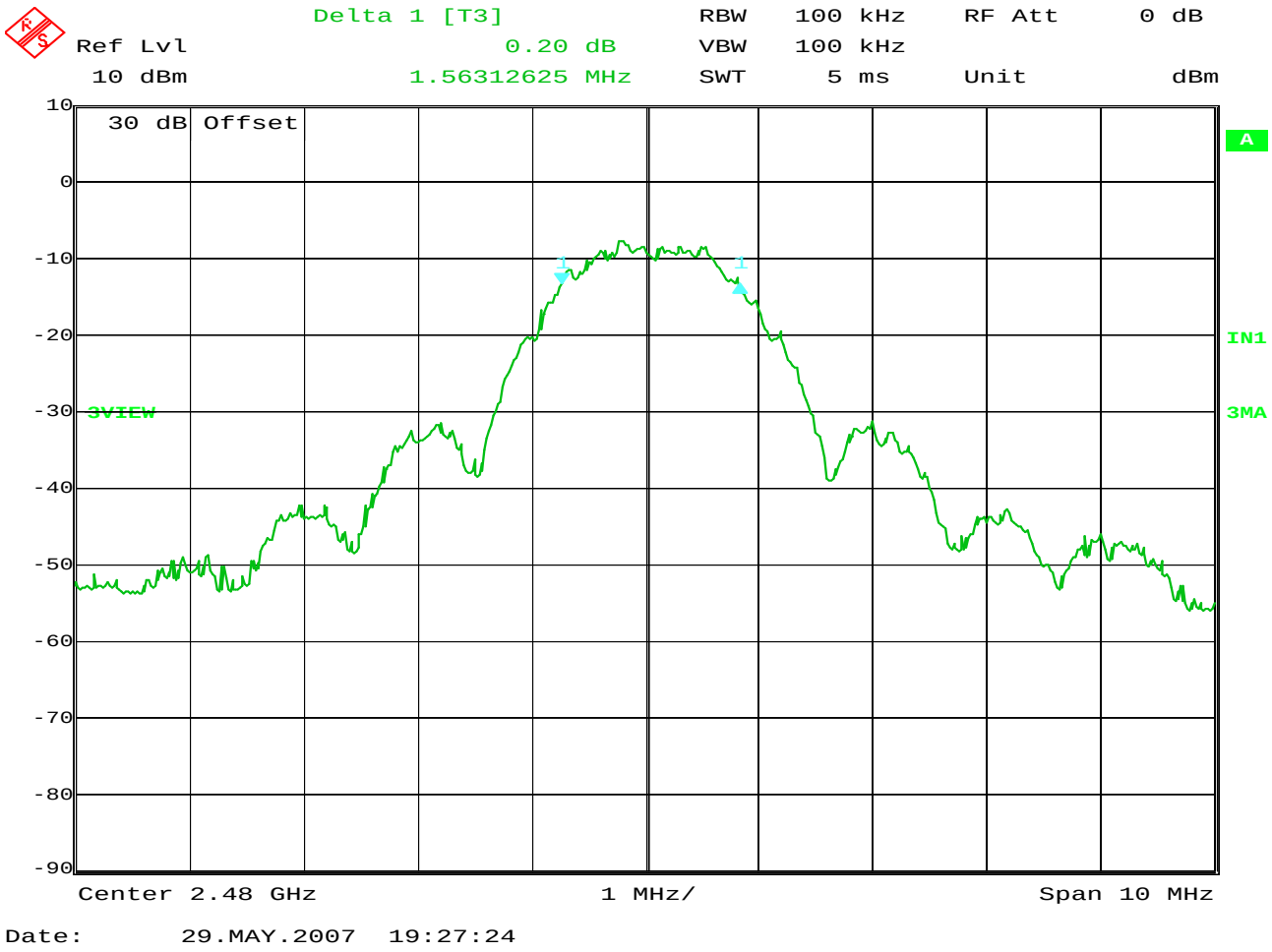
Checked By: 



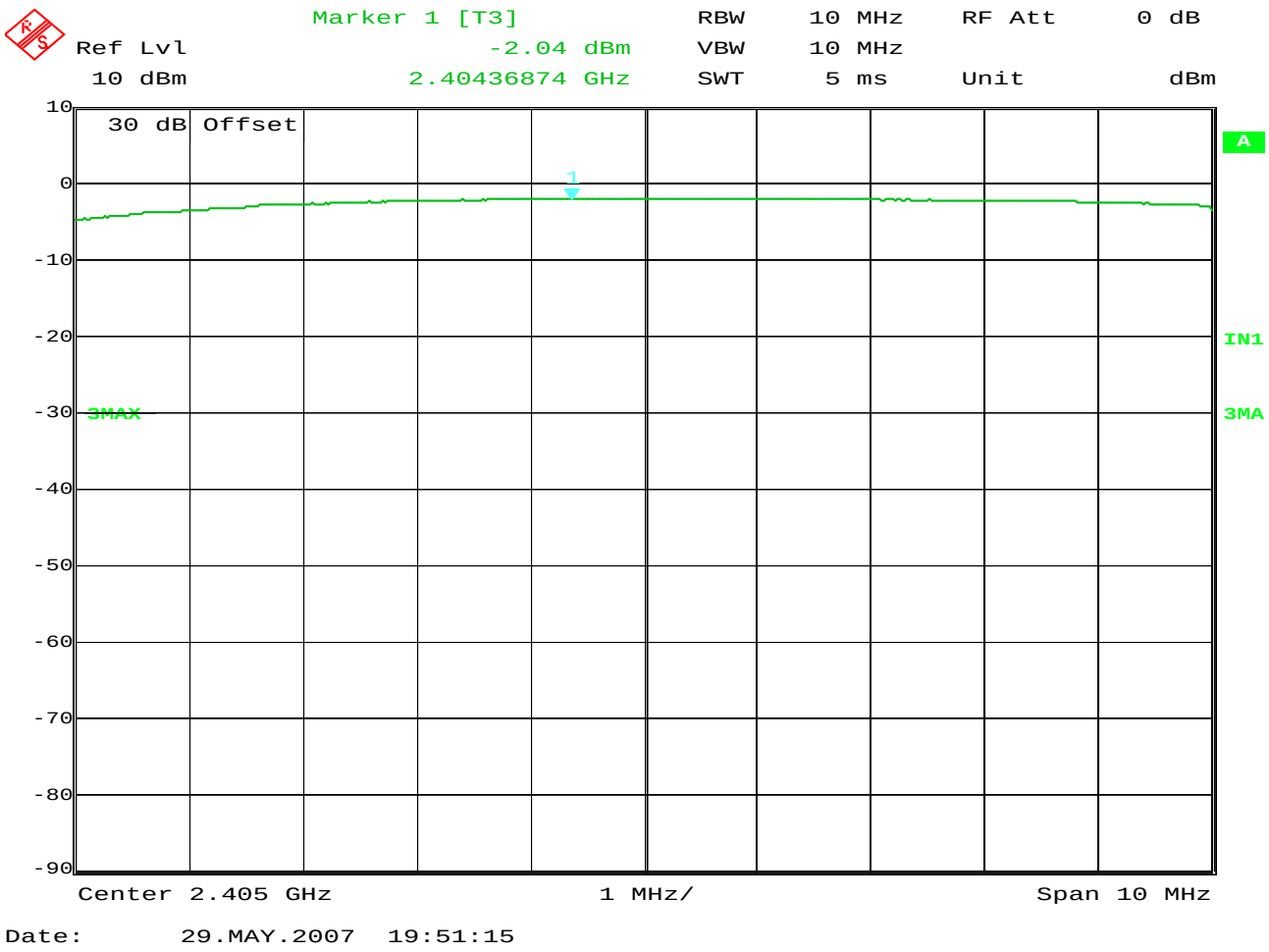
MANUFACTURER :Generac Power Systems
MODEL NUMBER :Base Station
SERIAL NUMBER :None Assigned
TEST MODE :Tuned to Ch 0(2.40GHz)
TEST PARAMETERS :6 dB Bandwidth
NOTES :
EQUIPMENT USED :RBB0



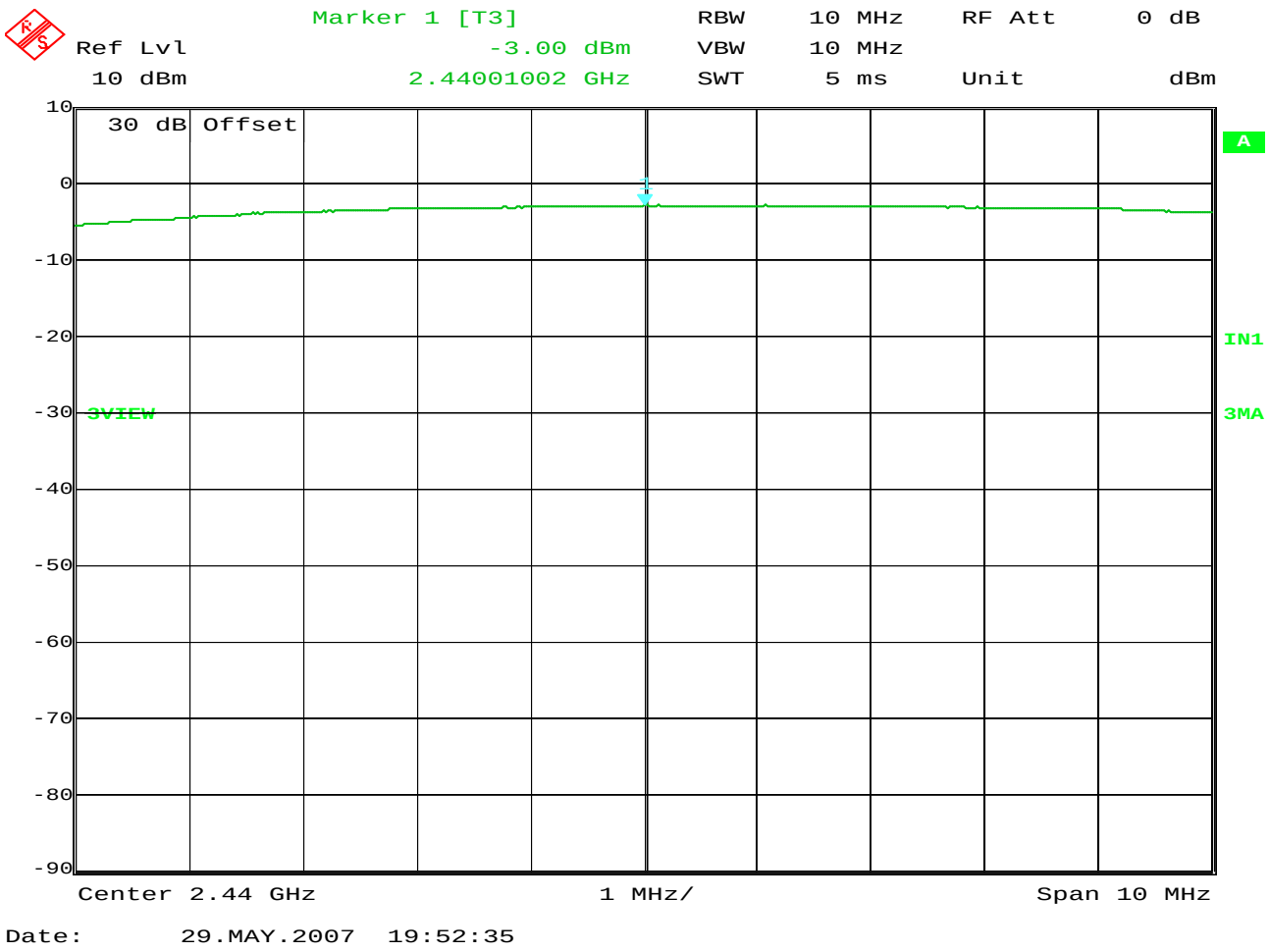
MANUFACTURER :Generac Power Systems
MODEL NUMBER :Base Station
SERIAL NUMBER :None Assigned
TEST MODE :Tuned to Ch 7(2.44GHz)
TEST PARAMETERS :6 dB Bandwidth
NOTES :
EQUIPMENT USED :RBB0



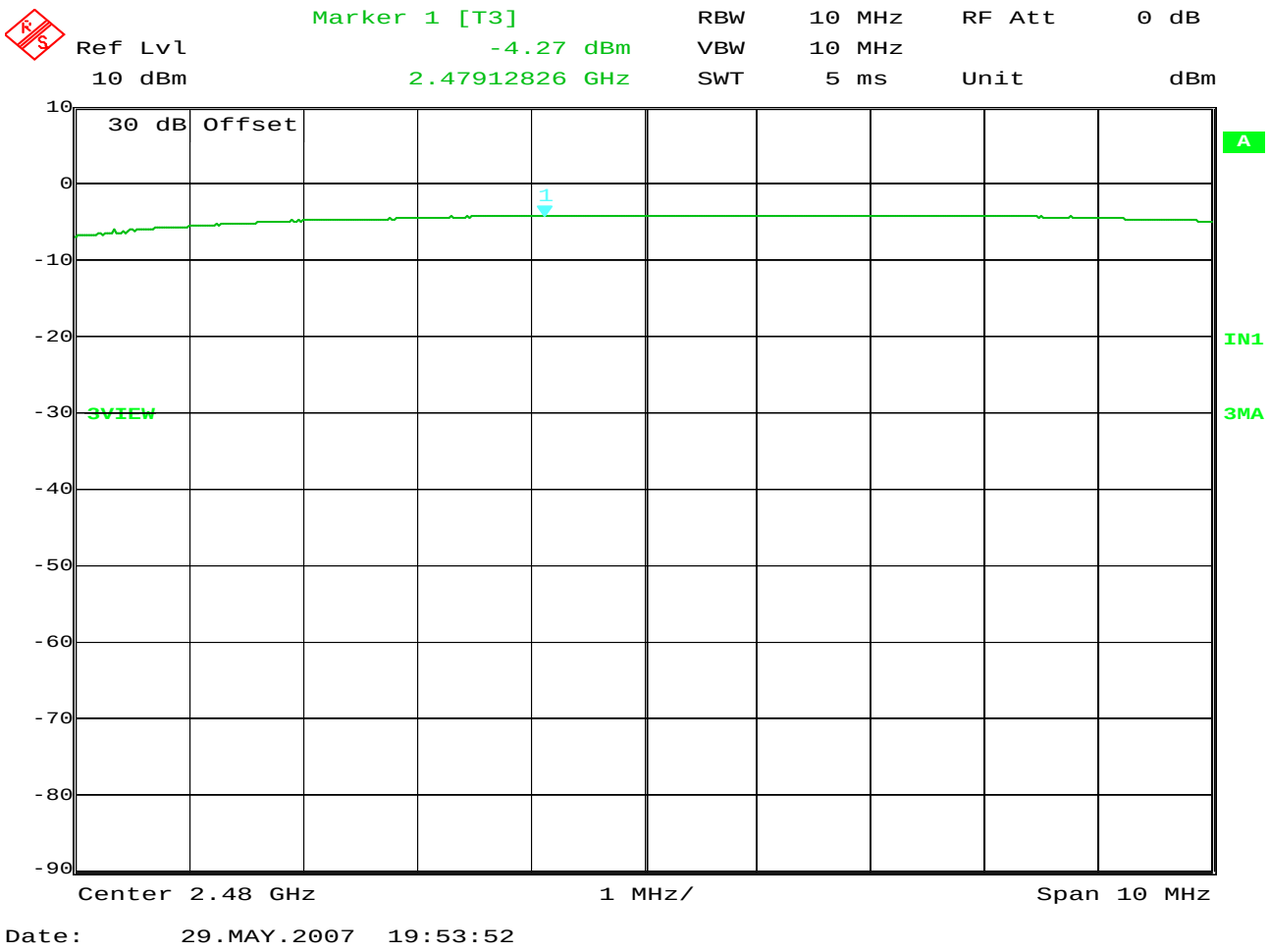
MANUFACTURER :Generac Power Systems
MODEL NUMBER :Base Station
SERIAL NUMBER :None Assigned
TEST MODE :Tuned to Ch 15(2.48GHz)
TEST PARAMETERS :6 dB Bandwidth
NOTES :
EQUIPMENT USED :RBB0



MANUFACTURER :Generac Power Systems
MODEL NUMBER :Base Station
SERIAL NUMBER :None Assigned
TEST MODE :Tuned to Ch 0(2.405GHz)
TEST PARAMETERS :Power Output
NOTES :
EQUIPMENT USED :RBB0



MANUFACTURER :Generac Power Systems
MODEL NUMBER :Base Station
SERIAL NUMBER :None Assigned
TEST MODE :Tuned to Ch 7(2.44GHz)
TEST PARAMETERS :Power Output
NOTES :
EQUIPMENT USED :RBB0



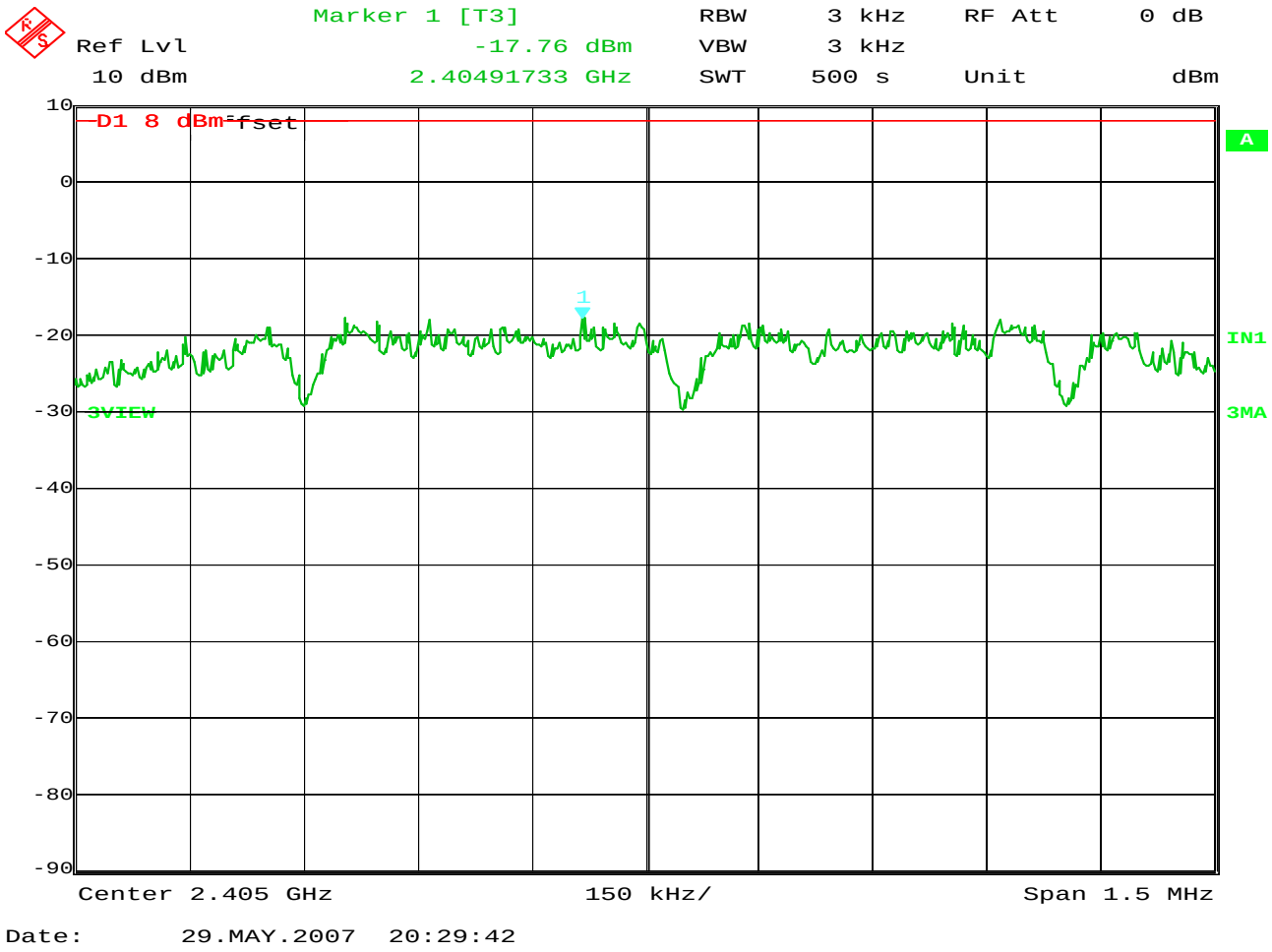
MANUFACTURER :Generac Power Systems
MODEL NUMBER :Base Station
SERIAL NUMBER :None Assigned
TEST MODE :Tuned to Ch 15(2.48GHz)
TEST PARAMETERS :Power Output
NOTES :
EQUIPMENT USED :RBB0

Manufacturer : Generac Power Systems
Test Item : 0G6020 Base Unit
Model No. : 0G6020 Base Unit
Serial No. : None Assigned
Test Specification : FCC Part 15, Subpart C, Section 15.247, Peak Output Power
Date : May 29, 2007 through June 1, 2007
Mode : See Below
Notes :

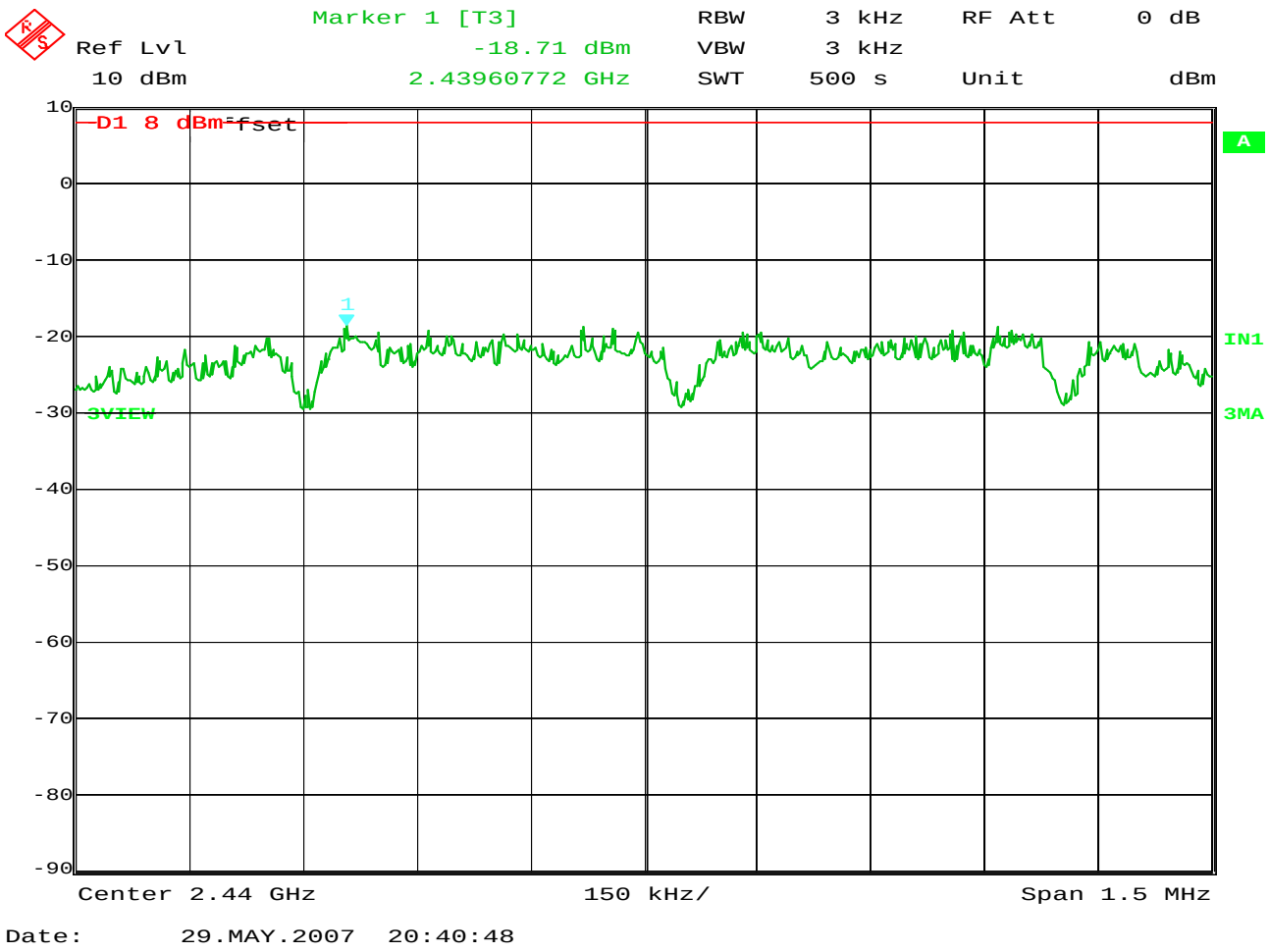
Frequency MHz	Antenna Polarity	Meter Reading dBuV		Matched Signal dBm	Cable Loss dBm	Antenna Gain dB	EIRP Total dBm	EIRP Limit dBm
Transmit @ 2405MHz								
2405	V	64.7		0.8	2.8	6.5	4.5	36
2405	H	59.9		-4.0	2.8	6.5	-0.3	36
Transmit @ 2440MHz								
2440	V	65.3		1.3	2.8	6.7	5.2	36
2440	H	59.6		-4.4	2.8	6.7	-0.5	36
Transmit @ 2480MHz								
2480	V	61.1		-2.8	2.9	6.7	1.0	36
2480	H	57.6		-6.3	2.9	6.7	-2.5	36

EIRP = Matched Signal - Cable Loss + Antenna Gain

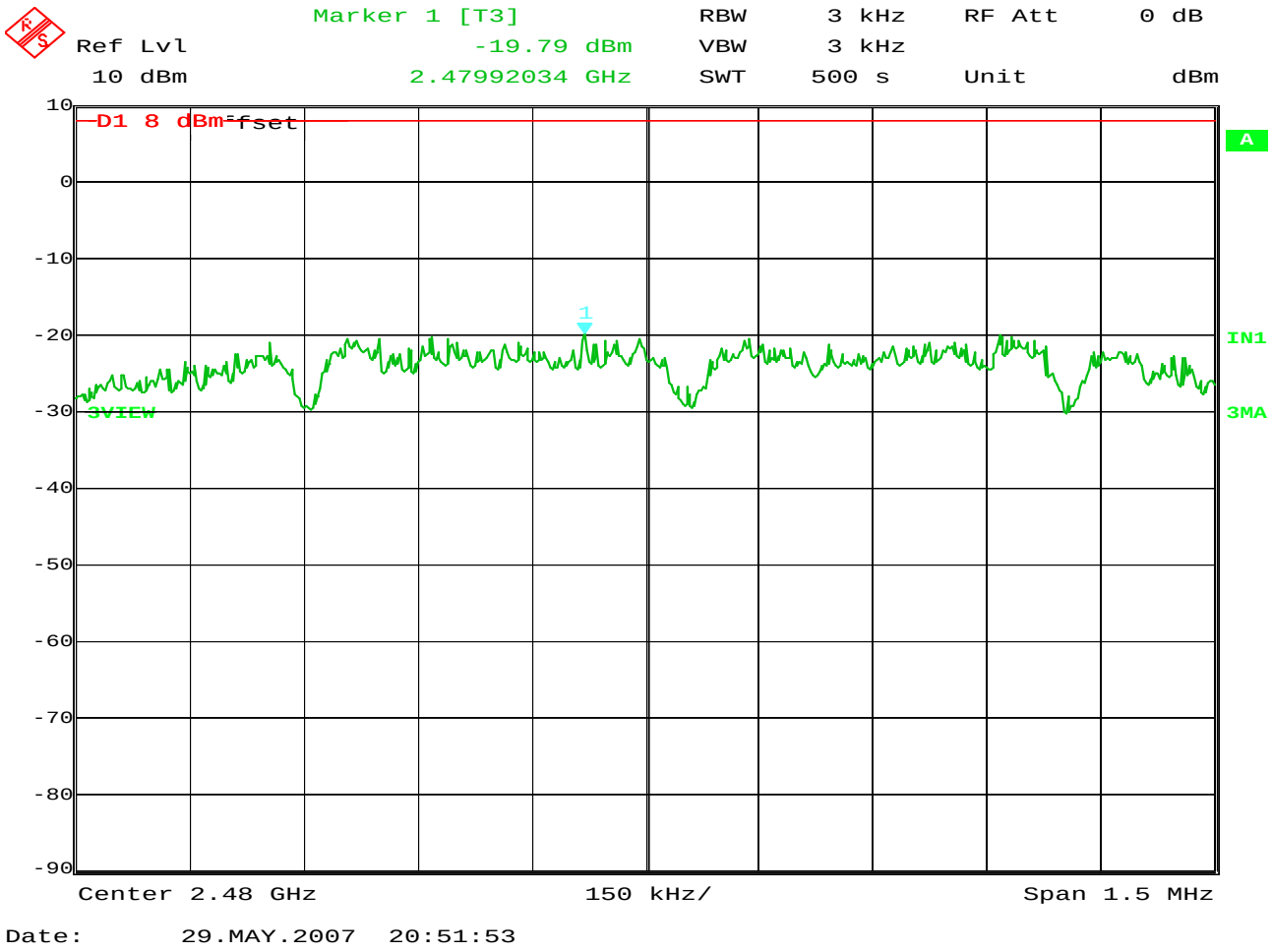
Checked By: 



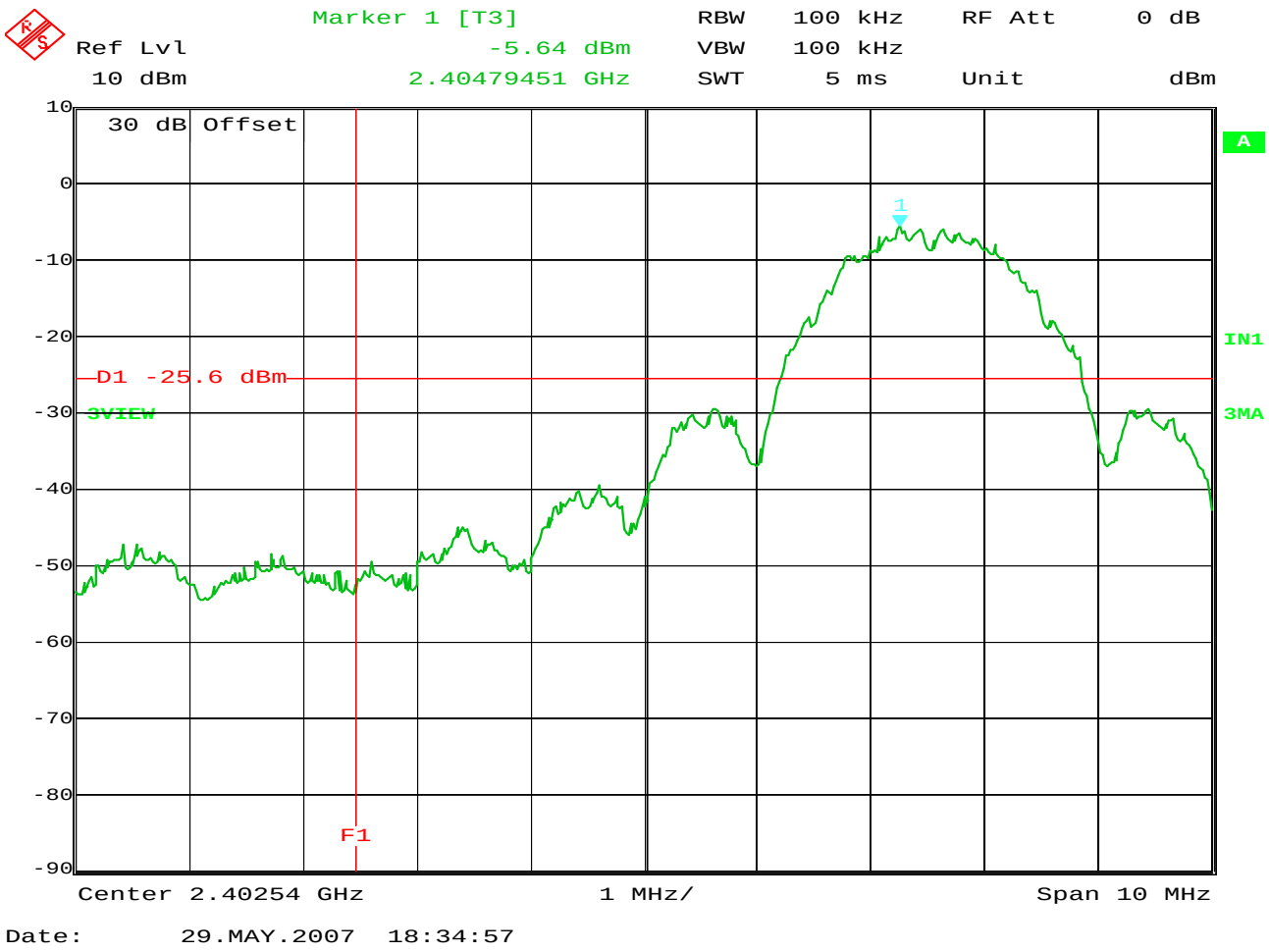
MANUFACTURER :Generac Power Systems
MODEL NUMBER :Base Station
SERIAL NUMBER :None Assigned
TEST MODE :Tuned to Ch 0(2.405GHz)
TEST PARAMETERS :Power Spectral Density
NOTES :
EQUIPMENT USED :RBB0



MANUFACTURER :Generac Power Systems
MODEL NUMBER :Base Station
SERIAL NUMBER :None Assigned
TEST MODE :Tuned to Ch 7(2.44GHz)
TEST PARAMETERS :Power Spectral Density
NOTES :
EQUIPMENT USED :RBB0



MANUFACTURER :Generac Power Systems
MODEL NUMBER :Base Station
SERIAL NUMBER :None Assigned
TEST MODE :Tuned to Ch 15(2.48GHz)
TEST PARAMETERS :Power Spectral Density
NOTES :
EQUIPMENT USED :RBB0



MANUFACTURER :Generac Power Systems
MODEL NUMBER :Base Station
SERIAL NUMBER :None Assigned
TEST MODE :Tuned to Ch 0(2.40GHz)
TEST PARAMETERS :Bandedge
NOTES :Display line D1 shows 20dB down point, Frequency line F1 show 2.4GHz
EQUIPMENT USED :RBB0

Manufacturer : Generac Power Systems
Test Item : 0G6020 Base Unit
Model No. : 0G6020 Base Unit
Serial No. : None Assigned
Test Specification : FCC Part 15, Subpart C, Section 15.247, Band-edge compliance
Date : May 29, 2007 through June 1, 2007
Mode : Transmit @ 2480MHz
Test Distance : 3 meters
Notes :

Frequency MHz	Antenna Polarity	Meter Reading dBuV	Amb	Cable Loss dB	Antenna Factor dB	Total dBuV/m	Total uV/m	Limit uV/m
2483.5	H	14.6		3.5	31.4	49.5	299.6	500.0
2483.5	V	16.5		3.5	31.4	51.4	372.9	500.0

Total = Meter Reading + Cable Loss + Antenna Factor

Checked By: