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Electromagnetic Emissions Test Report In Accordance With Industry Canada RSS- 131 Issue 2 and FCC Part 90 on the GE MDS LLC Amplifier Model: ENET-L2TU

FCC ID:	E5MDS-ENETL2TU
UPN:	101D-ENETL2TU
GRANTEE:	GE MDS LLC 175 Science Parkway Rochester, NY 14620
TEST SITE:	Elliott Laboratories, Inc. 41039 Boyce Road Fremont, CA 94538
REPORT DATE:	October 16, 2007
FINAL TEST DATE:	October 5, 2007
AUTHORIZED SIGNATORY:	David W. Bare Chief Technical Officer

ACCREDITED
2016-01

REVISION HISTORY

Revision #	Date	Comments	Modified By
1	November 2, 2007	Initial Release	David Guidotti

TABLE OF CONTENTS

FCC CERTIFICATION INFORMATION

The following information is in accordance with FCC Rules, 47CFR Part 2, Subpart J, Section 2.1033(C) & to Industry Canada RSP-100.

2.1033(c)(1) Applicant:

GE MDS LLC
175 Science Parkway
Rochester, NY 14620

2.1033(c)(2) & RSP-100 (4) FCC ID: E5MDS-ENETL2TU
UPN: 101D-ENETL2TU

2.1033(c)(3) & RSP-100 (7.2(a)) Instructions/Installation Manual

Please refer to Exhibit 7: Installation Manual

2.1033(c)(4) & RSP-100 (7.2(b)(iii)) Type of emissions

FCC 90 & RSS-131**: F1D**

2.1033(c)(5) & RSP-100 (7.2(a)) Frequency Range

FCC 90 & RSS-131**: 220-222 MHz**

2.1033(c)(6) & RSP-100 (7.2(a)) Range of Operation Power

FCC 90 & RSS-131**: 10 – 40 Watts**

2.1033(c)(7) & RSP-100 (7.2(a)) Maximum FCC & IC Allowed Power Level

FCC 90.205(f) & RSS-131**: 50 Watts Maximum**

2.1033(c)(8) & RSP-100 (7.2(a)) Applied voltage and currents into the final transistor elements

14Vdc, 5 Amps

2.1033(c)(9) & RSP-100 (7.2(a)) Tune-up Procedure

Please refer to Exhibit 7: User Manual and Theory of Operation

2.1033(c)(10) & RSP 100 (7.2(a)) Schematic Diagram of the Transmitter

Refer to Exhibit 6: Schematic diagram

2.1033(c)(10) & RSP-100 (7.2(a)) Means for Frequency Stabilization

Not applicable EUT is an amplifier

2.1033(c)(10) & RSP-100 (7.2(a)) Means for Suppression of Spurious radiation

Please refer to Exhibit 6: Schematic diagram.

2.1033(c)(10) & RSP-100 (7.2(a)) Means for Limiting Modulation

Not applicable EUT is an amplifier.

2.1033(c)(10) & RSP-100 (7.2(a)) Means for Limiting Power

A variable resistor that can only be varied between 10 and 40 watts controls the power limitation.

2.1033(c)(11) & RSP-100 (7.2(g)) Photographs or Drawing of the Equipment Identification Plate or Label

Refer to Exhibit 4

2.1033(c)(12) & RSP-100 (7.2(c)) Photographs of equipment

Refer to Exhibit 5

2.1033(c)(13) & RSP-100 (7.2(a)) Equipment Employing Digital Modulation & 90.203 (Certification Requirements)

Not applicable EUT is an amplifier

2.1033(c)(14) & RSP-100 (7.2(b)(ii)) Data taken per Section 2.1046 to 2.1057 and RSS-131.

Refer to Exhibit 2

DECLARATIONS OF COMPLIANCE

Equipment Name and Model:
ENET-L2TU

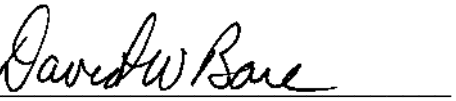
Manufacturer:
GE MDS LLC
175 Science Parkway
Rochester, NY 14620

Tested to applicable standards:
RSS-131, Issue 2 (Zone Enhancers for the Land Mobile Service)
FCC Part 90 (Private Land Mobile Radio Service)

Measurement Facility Description Filed With Industry Canada:

Departmental Acknowledgement Number: IC4549A-3 Dated March 10, 2006

I declare that the testing was performed or supervised by me; that the test measurements were made in accordance with the above mentioned departmental standards (through the use of TIA/EIA-603 and the specific RSS standards applicable to this device); and that the equipment performed in accordance with the data submitted in this report.

Signature	
Name	David W. Bare
Title	Chief Technical Officer Elliott Laboratories Inc.
Address	684 W. Maude Ave Sunnyvale, CA 94086 USA
Date:	October 16, 2007

Maintenance of compliance with the above standards is the responsibility of the manufacturer. Any modification of the product which may result in increased emissions should be checked to ensure compliance has been maintained (i.e., printed circuit board layout changes, different line filter, different power supply, harnessing or I/O cable changes, etc.).

SCOPE

FCC Part 90 & IC RSS-131 testing was performed for the equipment mentioned in this report. The equipment was tested in accordance with the procedures specified in Sections 2.1046 to 2.1057 of the FCC Rules & IC RSS-131. TIA-603 was also used as a test procedure guideline to perform some of the required tests.

The intentional radiator above was tested in a simulated typical installation to demonstrate compliance with the relevant FCC & RSS performance and procedural standards.

Final system data was gathered in a mode that tended to maximize emissions by varying orientation of EUT, orientation of power and I/O cabling, antenna search height, and antenna polarization.

Every practical effort was made to perform an impartial test using appropriate test equipment of known calibration. All pertinent factors have been applied to reach the determination of compliance.

OBJECTIVE

The primary objective of the manufacturer is compliance with the FCC Part 90 & IC RSS-131. Certification of these devices is required as a prerequisite to marketing as defined in Section 2.1033 & RSP-100.

Certification is a procedure where the manufacturer or a contracted laboratory makes measurements and submits the test data and technical information to FCC & Industry Canada. FCC & Industry Canada issues a grant of equipment authorization and a certification number upon successful completion of their review of the submitted documents. Once the equipment authorization has been obtained, the label indicating compliance must be attached to all identical units subsequently manufactured.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product that may result in increased emissions should be checked to ensure compliance has been maintained (i.e., printed circuit board layout changes, different line filter, different power supply, harnessing or I/O cable changes, etc.).

SUMMARY OF TEST RESULTS

Part 90 and RSS-131 Test Summary

Measurement Required	FCC Part 2 & 90 Sections	RSS-131 Section	Test Performed	Measured Value	Test Procedure Used	Result
Modulation Tested	GMSK	GMSK	-	-	-	-
Modulation characteristics	2.1047	2	Modulated with appropriated signal	-	H	-
Radiated RF power output (ERP/EIRP)	2.1046 / 90.279 & 90.205(g)	4.3.2	Radiated Output Power Test	-	N/A	Measured Conducted
Conducted RF power output	2.1046 / 90.279 & 90.205(g)	4.3.2	Conducted Output Power Test	46.1 dBm (40.7 Watts)	B	Complies
Spurious emissions at antenna Port	2.1051/ 90.210(d)	4.4.2 & 6.4	Emission Limits and/or Unwanted Emissions 30MHz – 5GHz (Antenna Conducted)	-26.4dBm @ 160.000MHz (-1.4dB)	J	Complies
Occupied Bandwidth, Input and output	2.1049/ 90.210(c) & (d)	4.3.2 & 6.3.2	Emission Mask and 99% Bandwidth	Refer to Plots	C & D	Complies
Field strength of spurious radiation	2.1053 / 90.210(d)	4.4.2 & 6.4	Radiated Spurious Emissions 30MHz – 5GHz	-35.8dBm @ 888.008MHz (-10.8dB)	N	Complies
Frequency stability	2.1055 / 90.213	N/A	Frequency Vs. Temperature	-	N/A	Unit is an Amplifier
Frequency stability	2.1055 / 90.213	N/A	Frequency Vs. Voltage	-	N/A	Unit is an Amplifier
Transient Frequency Behavior	90.214	N/A	Transient Behavior	-	N/A	Unit is an Amplifier
Exposure to Mobile devices	2.1091	N/A	Exposure of Humans to RF Fields	-	-	-
Receiver	15.109	N/A	Receiver Spurious Emissions	-	N/A	-

MEASUREMENT UNCERTAINTIES

ISO Guide 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below were calculated using the approach described in CISPR 16-4-2:2003 using a coverage factor of k=2, which gives a level of confidence of approximately 95%. The levels were found to be below levels of *U*cispr and therefore no adjustment of the data for measurement uncertainty is required.

Measurement Type	Frequency Range (MHz)	Calculated Uncertainty (dB)
Conducted Emissions	0.15 to 30	± 2.4
Radiated Emissions	30 to 1000	± 3.6

EQUIPMENT UNDER TEST (EUT) DETAILS

GENERAL

The GE MDS LLC model ENET-L2TU is a RF power amplifier that is designed to extend the range of transceivers. The EUT can be used in multiple locations. For testing the EUT was placed on a table top during testing to simulate the end-user environment. The electrical rating of the EUT is 13.8Vdc, 6Amps.

The sample was received on October 5, 2007 and tested on October 5, 2007. The EUT consisted of the following component(s):

Manufacturer	Model	Description	Serial Number	FCC ID
GE MDS LLC	ENET-L2TU	RF Amplifier (40 watt)	-	E5MDS-ENETL2TU

EUT ANTENNA DETAILS

The antennas used with the EUT are selected at the time of installation as this product is used with licensed radios.

ENCLOSURE

The EUT enclosure is primarily constructed of metal. It measures approximately 10 cm wide by 10 cm deep by 3.5 cm high.

MODIFICATIONS

The EUT did not require modifications during testing in order to comply with the emission specifications.

SUPPORT EQUIPMENT

The following equipment was used as local support equipment for emissions testing:

Manufacturer	Model	Description	Serial Number
Dell	Inspiron 2200	Laptop	28123497073

No remote support equipment was used during emissions testing.

EUT INTERFACE PORTS

The I/O cabling configuration during emissions testing was as follows:

Port	Connected to	Description	Shielded or Unshielded	Length (m)
Control	Transceiver	Multiwire	Unshielded	
RF in	Transceiver	Coax	Shielded	0.4
RF Out	Terminator	Direct	-	-
DC Power	DC power supply	two wire	Unshielded	1.5
Transceiver Com1	Port adapter board	Multiwire	Unshielded	0.3

EUT OPERATION DURING TESTING

During emissions testing the EUT was set to provide 40W output when driven by the transceiver.

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TEST SITE

GENERAL INFORMATION

Final test measurements were taken on October 5, 2007 at the Elliott Laboratories Anechoic Chambers 3 and 5 located at 41039 Boyce Road, Fremont, California. Pursuant to Section 2.948 of the FCC Rules, construction, calibration, and equipment data has been filed with the Commission.

CONDUCTED EMISSIONS CONSIDERATIONS

Conducted emissions testing are performed in conformance with Section 2 of FCC Rules. Measurements are made with the EUT connected to a spectrum analyzer through an attenuator to prevent overloading the analyzer.

RADIATED EMISSIONS CONSIDERATIONS

Radiated measurements are performed in an open field environment or Anechoic Chamber. The test site is maintained free of conductive objects within the CISPR 16-1 defined elliptical area.

MEASUREMENT INSTRUMENTATION

RECEIVER SYSTEM

An EMI receiver as specified in CISPR 16-1 is used for emissions measurements. The receivers are capable of measuring over the frequency range of 9 kHz up to 2000 MHz. These receivers allow both ease of measurement and high accuracy to be achieved. The receivers have Peak, Average, and CISPR (Quasi-peak) detectors built into their design so no external adapters are necessary. The receiver automatically sets the required bandwidth for the particular detector used during measurements.

For measurements above the frequency range of the receivers, a spectrum analyzer is utilized because it provides visibility of the entire spectrum along with the precision and versatility required to support engineering analysis. If average measurements above 1000MHz are performed, the linear-average method with a resolution bandwidth of 1 MHz and a video bandwidth of 10 Hz is used.

INSTRUMENT CONTROL COMPUTER

A personal computer is utilized to record the receiver measurements of the field strength at the antenna, which is then compared directly with the appropriate specification limit. The receiver is programmed with appropriate factors to convert the received voltage into filed strength at the antenna. Results are printed in a graphic and/or tabular format, as appropriate.

The test receiver also provides a visual display of the signal being measured.

PEAK POWER METER

A peak power meter and thermister mount may be used for output power measurements from transmitters as they provide a broadband indication of the power output.

FILTERS/ATTENUATORS

External filters and precision attenuators are often connected between the receiving antenna or EUT and the receiver. This eliminates saturation effects and non-linear operation due to high amplitude transmitters and transient events.

ANTENNAS

A biconical antenna is used to cover the range from 30 MHz to 300 MHz and a log periodic antenna is utilized from 300 MHz to 1000 MHz. Narrowband tuned dipole antennas are used over the 30 to 1000 MHz range for precision measurements of field strength. Above 1000 MHz, a horn antenna is used. The antenna calibration factors are included in site factors programmed into the test receivers

ANTENNA MAST AND EQUIPMENT TURNTABLE

The antennas used to measure the radiated electric field strength are mounted on a non-conductive antenna mast equipped with a motor drive to vary the antenna height.

The requirements of ANSI C63.4:2003 were used for configuration of the equipment turntable. It specifies that the test height above ground for table-mounted devices shall be 80 centimeters. Floor mounted equipment shall be placed on the ground plane if the device is normally used on a conductive floor or separated from the ground plane by insulating material from 3 to 12 mm if the device is normally used on a non-conductive floor. During radiated measurements, the EUT is positioned on a motorized turntable in conformance with this requirement.

INSTRUMENT CALIBRATION

All test equipment is regularly checked to ensure that performance is maintained in accordance with the manufacturer's specifications. All antennas are calibrated at regular intervals with respect to tuned half-wave dipoles. An appendix of this report contains the list of test equipment used and calibration information.

TEST PROCEDURES

General: For Transmitters with detachable antenna, direct measurements for output power, modulation characterization, occupied bandwidth, and frequency stability are performed with the antenna port of the EUT connected to either the power meter, modulation analyzer, or spectrum analyzer via a suitable attenuator and/or filter. The attenuators and/or filters are used to ensure that the transmitter fundamental will not overload the front end of the measurement instrument.

Procedure B – Power Measurement (Conducted Method): The following procedure was used for transmitters that do use external antennas.

1) Set the EUT to maximum power and to the lowest channel.
2) Either a power meter or a spectrum analyzer was used to measure the power output.
3) If a spectrum analyzer was used a resolution and video bandwidth 10kHz was used to measure the power output. Corrected for any external attenuation used for the protection of the input of analyzer. In addition, For CDMA or TDMA modulations set spectrum analyzer resolution to 1MHz and video to 30 kHz. Use video averaging with a 100-sample rate.
4) If a power meter was used, corrected for any external attenuation used for the protection of the input of the sensor head. Also set the power sensor correction by setting up the frequency range that will be measured.
5) Repeat this for the high channel and all modulations that will be used and all output ports used for transmission

Procedure C - Occupied Bandwidth (Conducted Method): Either for analog, digital, or data modulations, occupied bandwidth was performed. The EUT was set to transmit the appropriate modulation at maximum power. The bandwidth was measured using following methods:

1) The built-in 99% function of the spectrum analyzer was used.
2) If the built-in 99% is not available then the following method is used:

   26-dB or 20-dB was subtracted to the maximum peak of the emission. Then the display line function was used, in conjunction with the marker delta function, to measure the emissions bandwidth.

3) For the above two methods a resolution and video bandwidth of 100 or 300 Hz was used to measure the emission's bandwidth.

Procedure D – Amplifier Bandwidth (Conducted Method): If the EUT is an amplification device, the following procedure was performed:

1) Set the EUT to maximum power and to the lowest channel. Set the Resolution and Video Bandwidth to 300 Hz, with no averaging. These settings were used to show the true representation of the signal bandwidth.
2) Made a plot of the EUT output port and label it "Output"
3) With the same setting on the spectrum analyzer connect the cable that was connected to the input port of the amplifier to the analyzer. Made a plot and label it "Input" Repeat this for the high channel and all modulations that will be used and all output ports used for transmission

RSS 131: 6.3 Non-Linearity & 6.3.2 Single Channel Enhancer

Transmitter signals amplified by a non-linear device (enhancer or translator) will alter the occupied bandwidth of the transmitted signals; therefore, the extent of non-linearity shall be tested.

For a single channel amplifier, the 99% emission bandwidth shall be measured under the conditions described in section 4.3.2 and the spectrum analyzer plots submitted in the test report. Set the resolution bandwidth of the spectrum analyzer from 1% to 3% of the 99% emission bandwidth and set the video bandwidth to 3 times the resolution bandwidth. Record both the amplifier input and output signals.

Procedure J – Antenna Conducted Emissions: For spurious emission measurements at the antenna terminal the following procedure was performed:

1) Set the transmitting signal at the middle of the operating range of the transmitter, as specified in the standard. Power is set to maximum and then to minimum.
2) Set the spectrum analyzer display line function to –25dBm.
3) Set the spectrum analyzer bandwidth to 10kHz <1GHz and 1 MHz >1GHz.
4) For the spectrum analyzer, the start frequency was set to 30 MHz and the stop frequency set to the 10^{th} harmonic of the fundamental. All spurious or intermodulation emission must not exceed the –25dBm limit.
5) Steps 1 to 4 were repeated for all modulations and output ports that will be used for transmission.

RSS 131: 4.4.2 Single Channel Enhancer & 6.4 Spurious Emissions

The enhancer shall be operated as described in section 4.3.2 during the search for spurious emissions. Using a spectrum analyser with a resolution bandwidth set at 100 kHz, search for spurious emissions from 30 MHz to at least 5 times the highest RF passband frequency. The search may omit the band that contains the input signal.

Spurious emissions of zone enhancers and translators shall be suppressed as much as possible. Spurious emissions shall be attenuated below the rated power of the enhancer by at least: $43 + 10 \text{ Log}_{10} (P_{rated}$ in watts), or 70 dB, whichever is less stringent.

Procedure H - Other Types of Equipment: Either digital or data modulated signals were simulated, by software or external sources, to performed the required tests. The EUT was set to transmit the appropriate digital modulation.

Procedure K - Frequency Stability: The EUT is placed inside a temperature chamber with all support and test equipment located outside of the chamber. The spectrum analyzer is configured to give a 6-digit display for the marker-frequency function. The spectrum analyzer's built-in frequency counter is used to measure the maximum deviation of the fundamental frequency at each temperature. The Temperature chamber was varied from –30 to +50° C (or +60° C for some IC RSS standards, if applicable) in 10 degrees increment. The EUT was allowed enough time to stabilize for each temperature variation.

Procedure L - Frequency Stability: For AC or DC operated devices the nominal voltage is varied to 85% and to 115% at either room temperature or at a controlled +20°C temperature.

Procedure M - Frequency Stability: For battery-powered devices the voltage battery end-point is determined by reducing the dc voltage until the unit ceases to function. This is performed at either room temperature or at a controlled +20°C temperature.

Procedure N - Field Strength Measurement: The EUT was set on the turntable and the search antenna position 3 meters away. The output antenna terminal was terminated with a 50-ohm terminator. The EUT was set at the middle of the frequency band and set at maximum output power.

For the first scan, a preliminary measurement is performed. A preliminary scan of emissions is conducted in which all significant EUT frequencies are identified with the system in a nominal configuration. One or more of these is with the antenna polarized vertically while the one or more of these are with the antenna polarized horizontally. During the preliminary scans, the EUT is rotated through 360˚, the antenna height is varied and cable positions are varied to determine the highest emission relative to the limit.

For the final measurement, Substitution method is performed on spurious emissions not being 20-dB below the calculated radiated limit. Substitution method is performed by replacing the EUT with a horn antenna and signal generator. The horn antenna factors can be reference to a half-wave dipole in dBi. The signal generator power level was adjusted until a similar level, which was measured on the first scan, is achieved on the spectrum analyzer. The level on the signal generator is than added to the antenna factor, in dBi, which will give the corrected value.

Procedure I – Transient Frequency Behavior: The TIA/EIA 603 procedure was used to determine compliance to radio being keyed on and off.

1) Connected the Test Receiver DOP or Video Output to Channel 1 of the oscilloscope. The output of the RF crystal detector was connected to Auxiliary channel 1, which served as a trigger input. The output of the combiner was connected to the Test Receiver.

2) Set the EUT to maximum power and connected as illustrated above. Set the signal generator to the assigned transmitter frequency and modulate it with a 1 kHz tone at 6.25kHz, 12.5 kHz, or 25 kHz deviation and set its output to –100 dBm, then turn on the EUT.

3) The Combiner output side was connected to the Test Receiver, which was used to measure the Power. Used enough external attenuation so that the output at the combiner was set to 40 dB below the maximum input of the Test Receiver, then turn off the EUT.

4) Set the signal generator output to the same level in step 3. This level was maintained for the remainder of the test.

5) Set the horizontal sweep rate on the storage oscilloscope to 10 milliseconds per division and adjusted the display to continuously view the 1 kHz tone from the DOP or Video Output. Adjusted the vertical amplitude control to display the 1 kHz at +/- 4 divisions vertically centered on the display.

6) Set the oscilloscope to trigger at the AUX channel 1 input port.

7) Removed enough external attenuation so that the input to the RF detector and combiner is increased by 30 dB.

8) Turn on the transmitter and plotted the result for **Ton**, **T1**, and **T2**.

9) Set the oscilloscope to trigger in decreasing magnitude from the RF crystal detector.

10) Turn off the transmitter and plotted the result for **T3**.

SPECIFICATION LIMITS AND SAMPLE CALCULATIONS

RADIATED EMISSIONS SPECIFICATION LIMITS

The limits for radiated emissions are based on the power of the transmitter at the operating frequency. Data is measured in the logarithmic form of decibels relative to one milliwatt (dBm) or one microvolt/meter (dBuV/m,). The field strength of the emissions from the EUT is measured on a test site with a receiver.

Below is a formula example used to calculate the attenuation requirement, relative to the transmitters power output, in dBuV/m. For this example an operating power range of 3 watts is used. The radiated emissions limit for spurious signals outside of the assigned frequency block is $43+10\text{Log}_{10}$ (mean output power in watts) dB below the measured amplitude at the operating power.

CALCULATIONS – EFFECTIVE RADIATED POWER

$$E(V/m) = \frac{\sqrt{30 * P * G}}{d}$$

E= Field Strength in V/m
P= Power in Watts (for this example we use 3 watts)
G= Gain of antenna in numeric gain (Assume 1.64 for ERP)
d= distance in meters

$$E(V/m) = \frac{\sqrt{30 * 3 \text{ watts} * 1.64 \text{ dB}}}{3 \text{ meters}}$$

20 * log (4.049 V/m * 1,000,000) = 132.14 dBuV/m @ 3 meters

FCC Rules request an attenuation of 43 + 10 log (3) or 47.8 dB for all emissions outside the assigned block, the limit for spurious and harmonic emissions is:

132.1 dBuV/m – 47.8 dB = 84.3 dBuV/m @ 3 meter.

Note: Substitution Method is performed for spurious emission not being 20-dB below the calculated field strength.

EXHIBIT 1: Test Equipment Calibration Data

1 Page

Radio Antenna Port (Power and Spurious Emissions), 05-Oct-07
Engineer: David Bare

Manufacturer	Description	Model #	Asset #	Cal Due
Rohde & Schwarz	Signal Generator, 9 kHz-1.04 GHz	SMY01	1450	30-Oct-07
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1538	25-Aug-08
Rohde & Schwarz	Power Sensor 100 uW - 2 Watts	NRV-Z32	1423	21-Oct-07
Rohde & Schwarz	Power Meter, Dual Channel	NRVD	1786	26-Dec-07

Radiated Emissions, 30 - 4000 MHz, 06-Oct-07
Engineer: Rafael Varelas

Manufacturer	Description	Model #	Asset #	Cal Due
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	785	29-May-08
EMCO	Antenna, Horn, 1-18 GHz	3115	786	28-Nov-07
Filtek	Filter, 1 GHz High Pass	HP12/1000-5BA	955	16-Mar-08
Hewlett Packard	EMC Spectrum Analyzer, 9 KHz-26.5 GHz	8593EM	1141	30-Oct-07
Rohde & Schwarz	Power Sensor 100 uW - 2 Watts	NRV-Z32	1423	21-Oct-07
Rohde & Schwarz	Signal Generator, 9 kHz-1.04 GHz	SMY01	1450	30-Oct-07
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	1549	23-May-09
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	1657	03-May-08
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1756	02-Nov-07
Rohde & Schwarz	Power Meter, Dual Channel	NRVD	1786	26-Dec-07

EXHIBIT 2: Test Data Log Sheets

ELECTROMAGNETIC EMISSIONS

TEST LOG SHEETS

AND

MEASUREMENT DATA

T69433 32 Pages

Client:	GE MDS, LLC	Job Number:	J69344
Model:	-	T-Log Number:	T69433
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		-
Emissions Standard(s):	FCC Part 90, RSS-131	Class:	-
Immunity Standard(s):	-	Environment:	Radio

EMC Test Data

For The

GE MDS, LLC

Model

-

Date of Last Test: 10/6/2007

Client:	GE MDS, LLC	Job Number:	J69344
Model:	-	T-Log Number:	T69433
		Account Manger:	Susan Pelzl
Contact:	Dennis McCarthy		
Emissions Standard(s):	FCC Part 90, RSS-131	Class:	-
Immunity Standard(s):	-	Environment:	Radio

EUT INFORMATION

The following information was collected during the test session(s).

General Description

The EUT is a RF power amplifier that is designed to extend the range of transceivers. The EUT can be used in multiple locations. For testing the EUT was placed on a table top during testing to simulate the end-user environment. The electrical rating of the EUT is 13.8Vdc.

Equipment Under Test

Manufacturer	Model	Description	Serial Number	FCC ID
GE MDS LLC	ENET-L2TU	RF Amplifier (40 watt)		E5MDS-ENETL2TU

Other EUT Details

The following EUT details should be noted:

EUT Antenna (Intentional Radiators Only)

The antennas used with the EUT are selected at the time of installation as this product is used with licensed radios.

EUT Enclosure

The EUT enclosure is primarily constructed of metal. It measures approximately 10 cm wide by 10 cm deep by 3.5 cm high.

Client:	GE MDS, LLC	Job Number:	J69344
Model:	-	T-Log Number:	T69433
		Account Manger:	Susan Pelzl
Contact:	Dennis McCarthy		
Emissions Standard(s):	FCC Part 90, RSS-131	Class:	-
Immunity Standard(s):	-	Environment:	Radio

Modification History

Mod. #	Test	Date	Modification
1			
2			
3			

Modifications applied are assumed to be used on subsequent tests unless otherwise stated as a further modification.

Client:	GE MDS, LLC	Job Number:	J69344
Model:	-	T-Log Number:	T69433
		Account Manger:	Susan Pelzl
Contact:	Dennis McCarthy		
Emissions Standard(s):	FCC Part 90, RSS-131	Class:	-
Immunity Standard(s):	-	Environment:	Radio

Test Configuration #1

The following information was collected during the test session(s).

Local Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
Dell	Inspiron 2200	Laptop	28123497073	-

Remote Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
-	-	-	-	-

Cabling and Ports

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
Control	Transceiver	Multiwire	Unshielded	
RF in	Transceiver	Coax	Shielded	0.4
RF Out	Terminator	Direct	-	-
DC Power	DC power supply	two wire	Unshielded	1.5
Transceiver Com1	Port adapter board	Multiwire	Unshielded	0.3
Port adapter board	Laptop	Cat 5 serial	Unshielded	1.5

EUT Operation During Emissions Tests

During emissions testing the EUT was set to provide 40W output when driven by the transceiver.

Client:	GE MDS, LLC	Job Number:	J69344
Model:	-	T-Log Number:	T69433
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-131	Class:	N/A

FCC Part 90 RF Port Tests

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 10/5/2007 9:00
Test Engineer: David Bare
Test Location: Chamber #3
Config. Used: 1
Config Change: None
EUT Voltage: 13.8Vdc

General Test Configuration

When measuring the conducted emissions from the EUT's antenna port, the antenna port of the EUT was connected to the spectrum analyzer or power meter via a suitable attenuator to prevent overloading the measurement system. All measurements are corrected to allow for the external attenuators used.

Ambient Conditions:

Temperature: 18 °C
Rel. Humidity: 42 %

Summary of Results

Run #	Test Performed	Limit	Result	Level
1	99% Bandwidth; In and out	Part 90.210	Pass	Refer to Plots
2	Output Power	Part 90.210	Pass	46.1dBm
3	Out of Band; 30 - 2,200MHz	Part 90.210	Pass	-26.4dBm @ 160.000MHz (-1.4dB)

Modifications Made During Testing

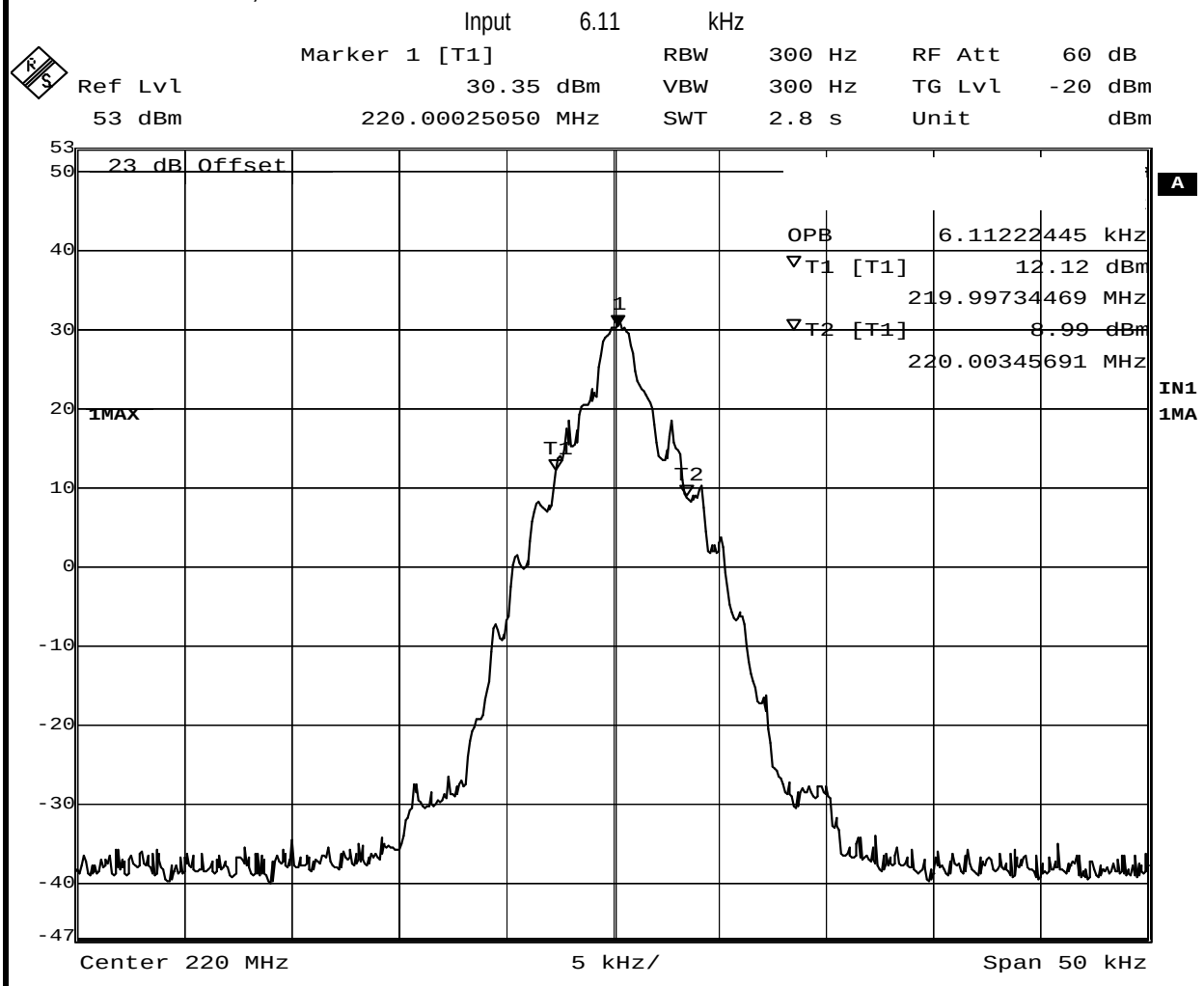
No modifications were made to the EUT during testing

Deviations From The Standard

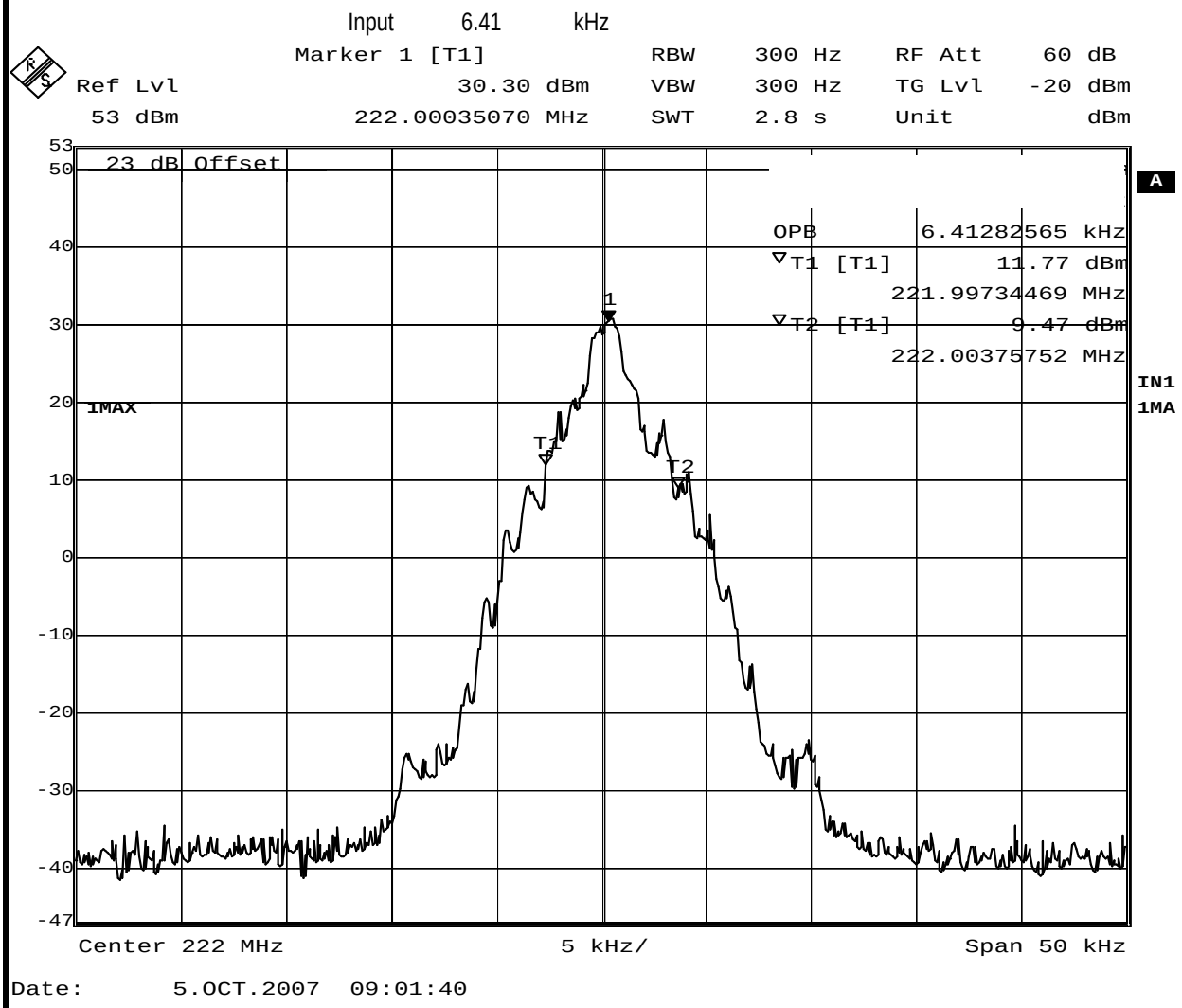
No deviations were made from the requirements of the standard.

Client:	GE MDS, LLC	Job Number:	J69344
Model:	-	T-Log Number:	T69433
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-131	Class:	N/A

Run #1: 99% bandwidth; In and Out

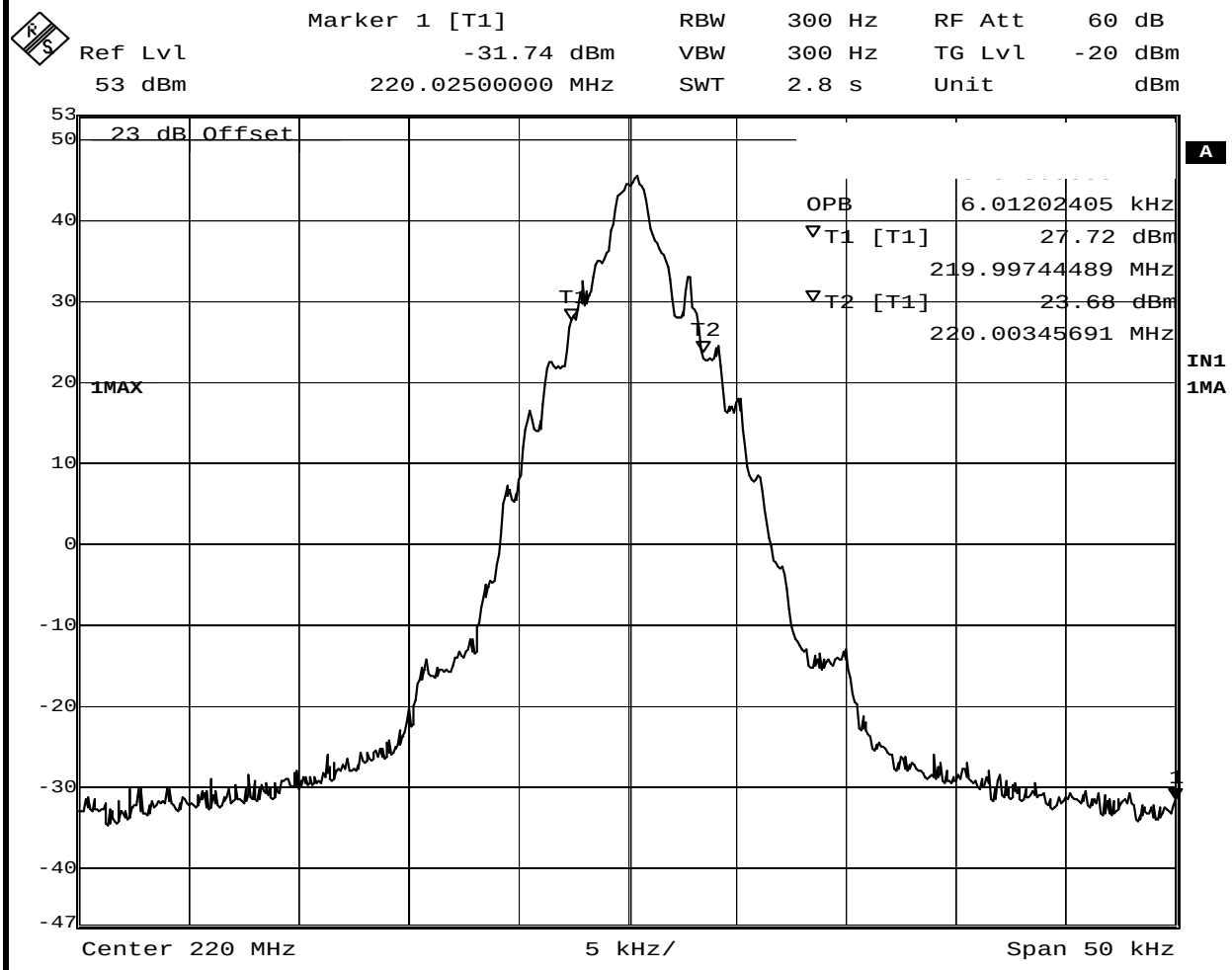


Client:	GE MDS, LLC	Job Number:	J69344
Model:	-	T-Log Number:	T69433
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-131	Class:	N/A



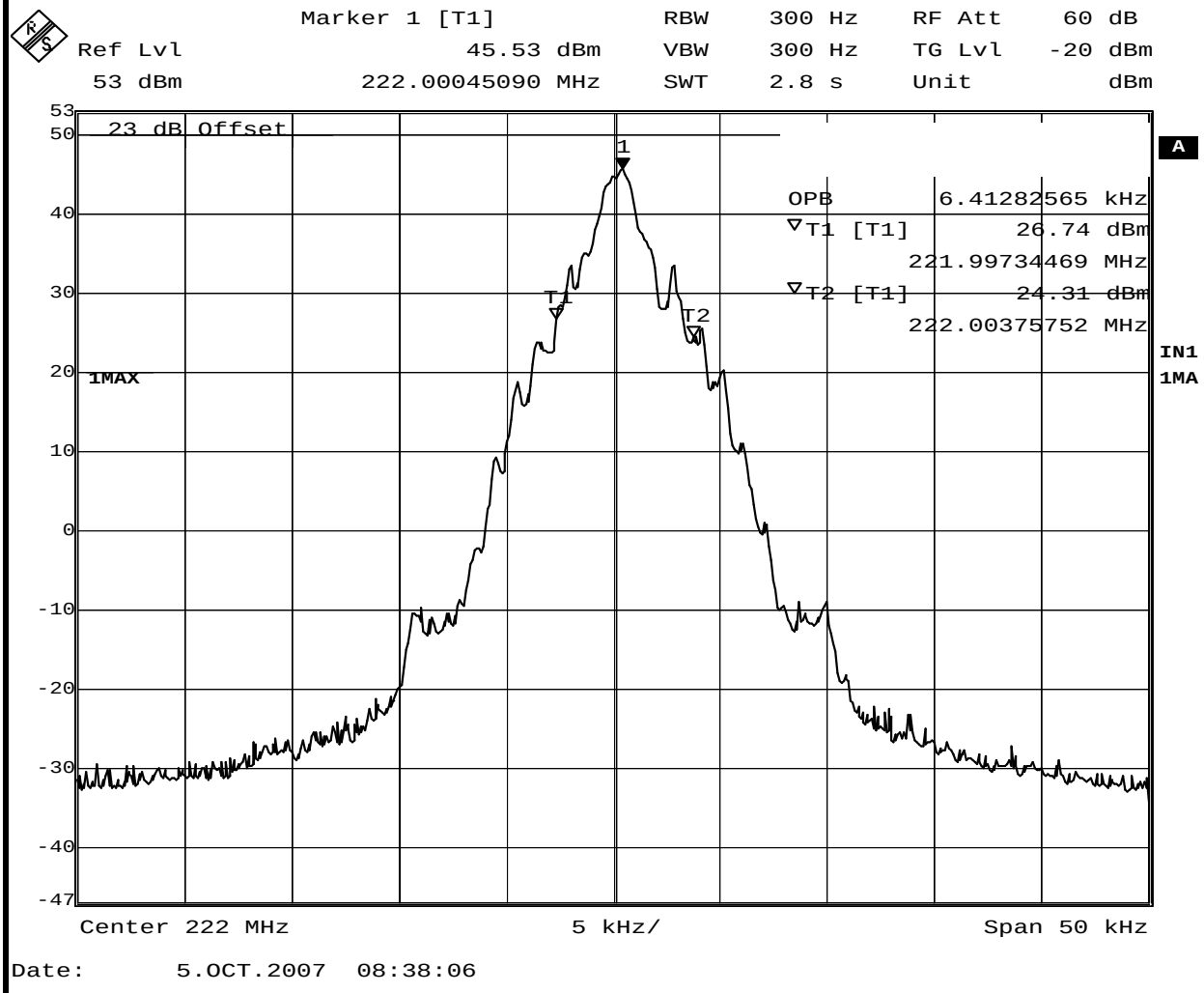
Client:	GE MDS, LLC	Job Number:	J69344
Model:	-	T-Log Number:	T69433
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-131	Class:	N/A

Output 6.01 kHz



Client:	GE MDS, LLC	Job Number:	J69344
Model:	-	T-Log Number:	T69433
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-131	Class:	N/A

Output 6.41 kHz

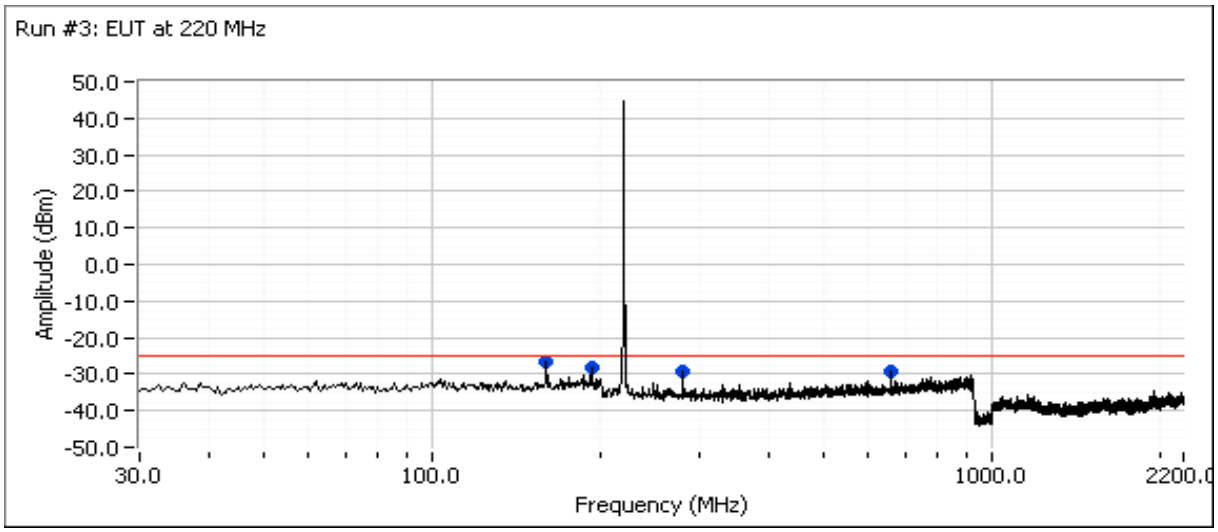


Run #2: Output Power with Power meter.

Channel	Frequency (MHz)	Output Power
Low	220	46.0
High	222	46.1

Client:	GE MDS, LLC	Job Number:	J69344
Model:	-	T-Log Number:	T69433
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-131	Class:	N/A

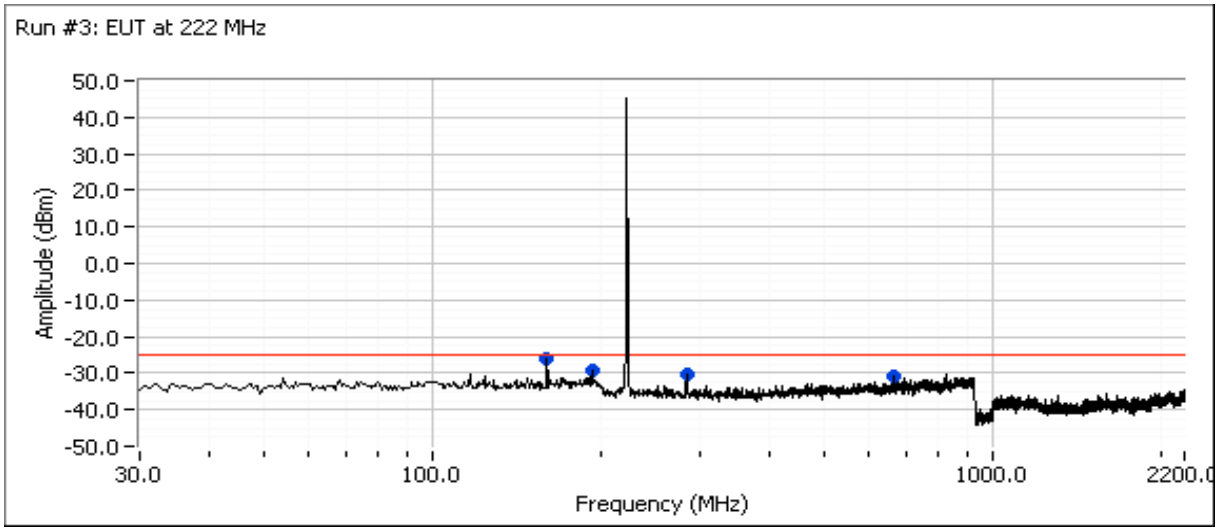
Run #3: Out of Band Emission; 30 - 2,200 MHz
External 23dB Attenuation



Frequency	Level	Port	Part 90		Detector	Azimuth	Height	Comments
MHz	dBm		Limit	Margin	Pk/QP/Avg	degrees	meters	
160.000	-26.6	RF Port	-25.0	-1.6	Peak	-	-	RBW=VBW= 30kHz (50dB int. att.)
192.000	-28.3	RF Port	-25.0	-3.3	Peak	-	-	RBW=VBW= 30kHz (50dB int. att.)
280.000	-29.2	RF Port	-25.0	-4.2	Peak	-	-	RBW=VBW= 30kHz (50dB int. att.)
660.000	-29.5	RF Port	-25.0	-4.5	Peak	-	-	RBW=VBW= 30kHz (50dB int. att.)
160.000	-26.3	RF Port	-25.0	-1.3	Peak	-	-	RBW=VBW=10kHz (30dB int att.)
192.000	-30.9	RF Port	-25.0	-5.9	Peak	-	-	RBW=VBW=10kHz (30dB int att.)
280.000	-30.7	RF Port	-25.0	-5.7	Peak	-	-	RBW=VBW=10kHz (30dB int att.)
660.000	-32.3	RF Port	-25.0	-7.3	Peak	-	-	RBW=VBW=10kHz (30dB int att.)

Note 1:	All emissions observed were narrowband.

Client:	GE MDS, LLC	Job Number:	J69344
Model:	-	T-Log Number:	T69433
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-131	Class:	N/A



Frequency	Level	Port	Part 90		Detector	Azimuth	Height	Comments
MHz	dBm		Limit	Margin	Pk/QP/Avg	degrees	meters	
160.000	-26.4	RF Port	-25.0	-1.4	Peak	-	-	RBW=VBW= 30kHz (50dB int. att.)
192.000	-28.1	RF Port	-25.0	-3.1	Peak	-	-	RBW=VBW= 30kHz (50dB int. att.)
280.000	-29.6	RF Port	-25.0	-4.6	Peak	-	-	RBW=VBW= 30kHz (50dB int. att.)
666.000	-29.5	RF Port	-25.0	-4.5	Peak	-	-	RBW=VBW= 30kHz (50dB int. att.)
160.000	-28.0	RF Port	-25.0	-3.0	Peak	-	-	RBW=VBW= 10kHz (40dB int. att.)
192.000	-31.2	RF Port	-25.0	-6.2	Peak	-	-	RBW=VBW= 10kHz (40dB int. att.)
280.000	-31.6	RF Port	-25.0	-6.5	Peak	-	-	RBW=VBW= 10kHz (40dB int. att.)
666.000	-34.4	RF Port	-25.0	-9.4	Peak	-	-	RBW=VBW= 10kHz (40dB int. att.)

Note 1:	All emissions observed were narrowband.

Client:	GE MDS, LLC	Job Number:	J69344
Model:	-	T-Log Number:	T69433
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-131	Class:	N/A

RSS-131 RF Port Tests

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 10/5/2007 9:00
Test Engineer: David Bare
Test Location: Chamber #3
Config. Used: 1
Config Change: None
EUT Voltage: 13.8Vdc

General Test Configuration

When measuring the conducted emissions from the EUT's antenna port, the antenna port of the EUT was connected to the spectrum analyzer or power meter via a suitable attenuator to prevent overloading the measurement system. All measurements are corrected to allow for the external attenuators used.

Ambient Conditions:

Temperature: 18 °C
Rel. Humidity: 42 %

Summary of Results

Run #	Test Performed	Limit	Result	Level
1	Passband Bandwidth	RSS-131 (4.2 & 6.1)	Pass	Refer to plots
2	Passband Gain	RSS-131 (4.2 & 6.1)	Pass	Refer to run
3	Power Output & 99% BW	RSS-131 (4.3.2 & 6.3.2)	Pass	46.1 dBm & 192.99 MHz
4	Spurious Emissions (Conducted)	RSS-131 (4.4.2 & 6.4)	Pass	-31.3dBm @ 160.000MHz (-18.3dB)

Modifications Made During Testing

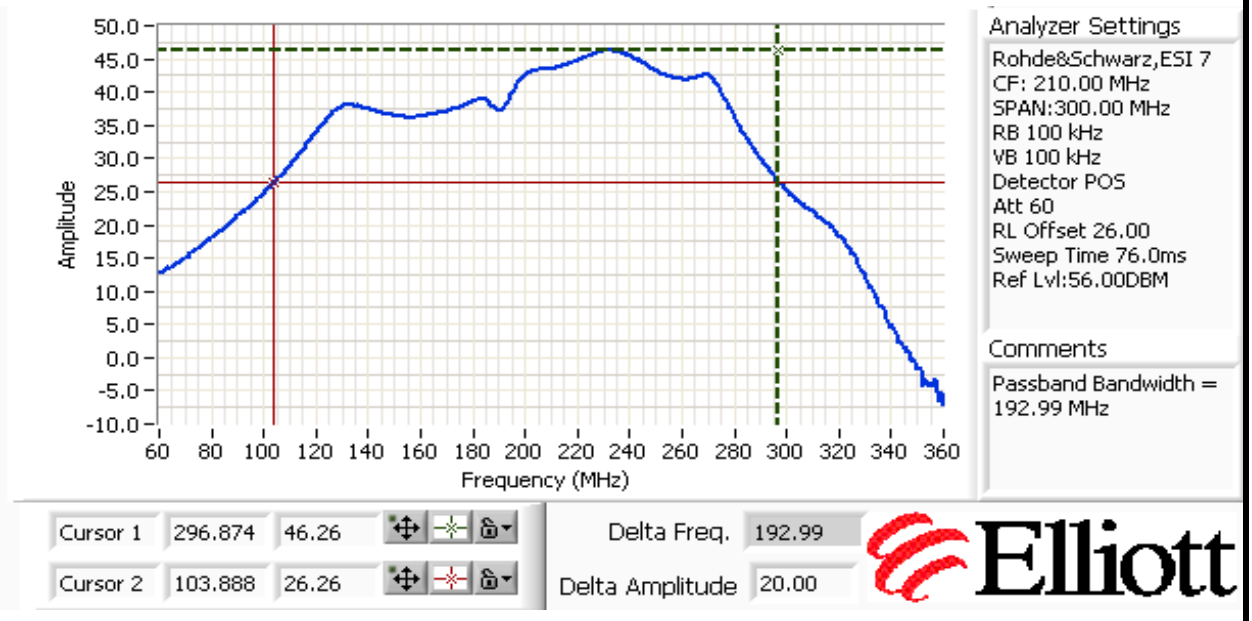
No modifications were made to the EUT during testing

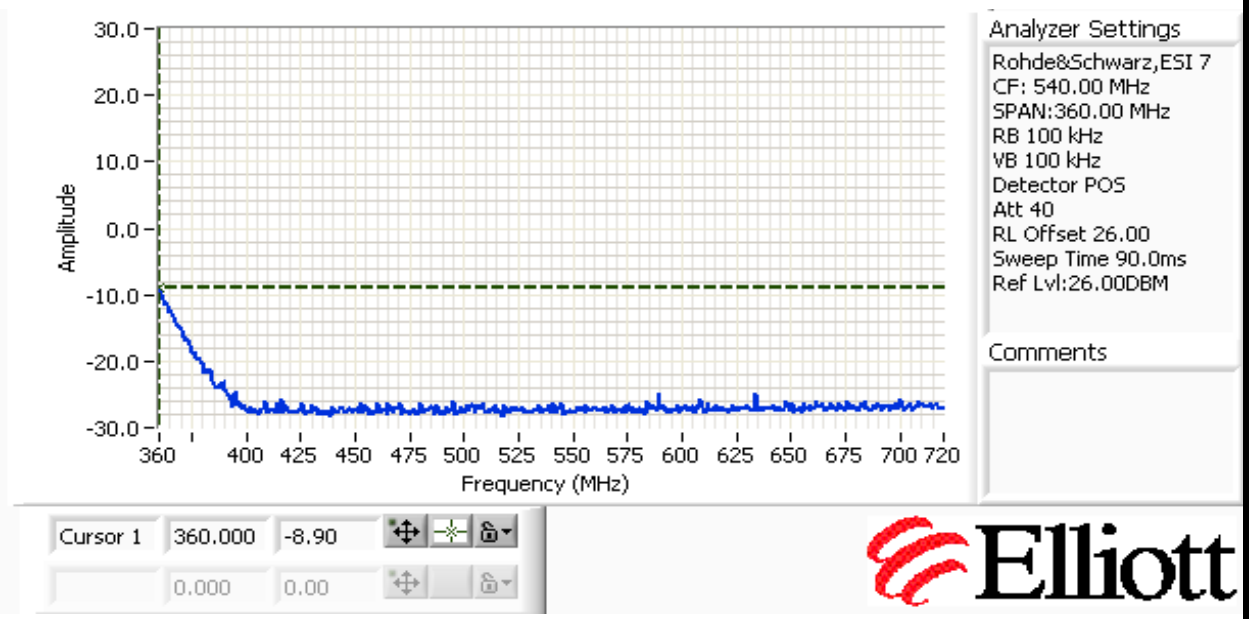
Deviations From The Standard

No deviations were made from the requirements of the standard.

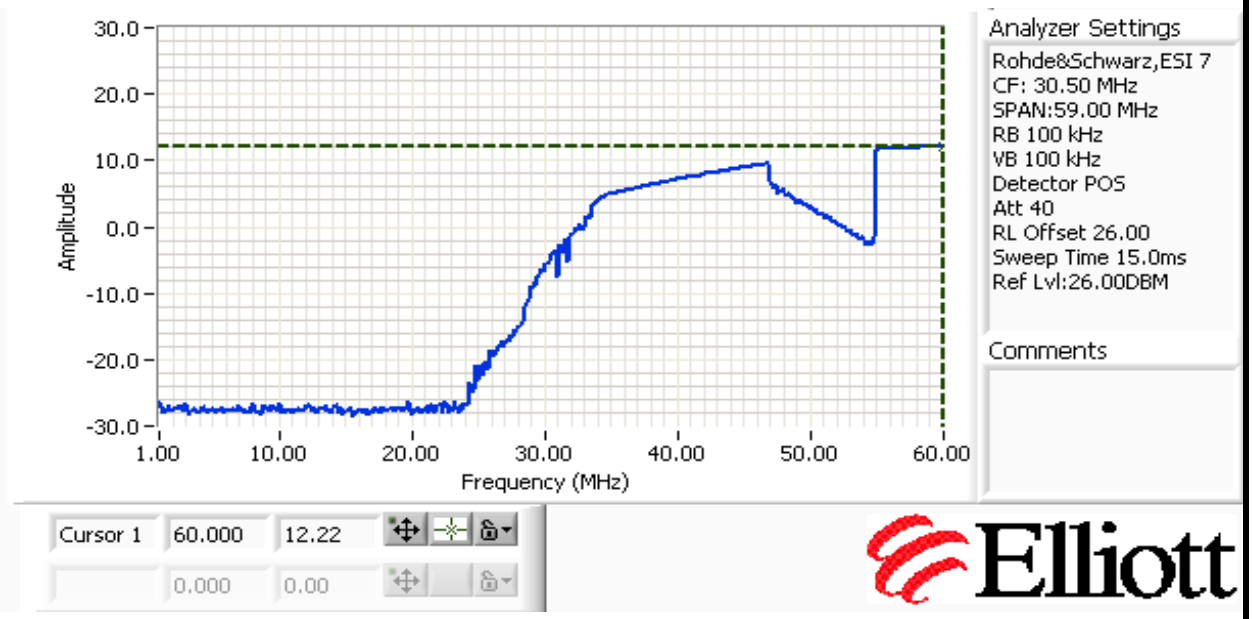
Client:	GE MDS, LLC	Job Number:	J69344
Model:	-	T-Log Number:	T69433
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-131	Class:	N/A

Run #1: Passband bandwidth





Client:	GE MDS, LLC	Job Number:	J69344
Model:	-	T-Log Number:	T69433
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-131	Class:	N/A



Run #2: Passband Gain

The passband gain shall not exceed the nominal gain by more than 1.0 dB. The 20 dB bandwidth shall not exceed the nominal bandwidth that is stated by the manufacturer. Outside of the 20 dB bandwidth, the gain shall not exceed the gain at the 20 dB point

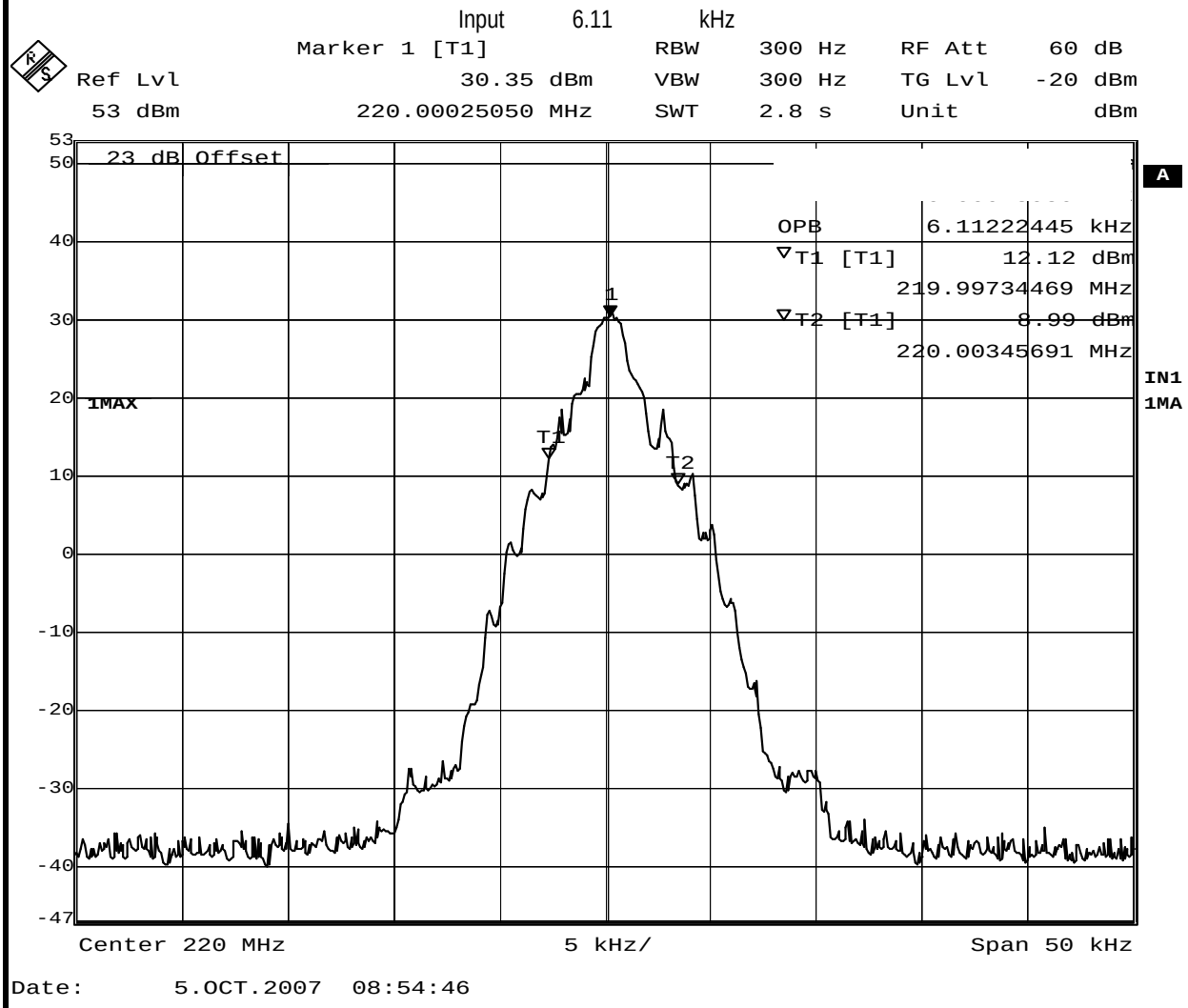
	dBm	Watts
Input	19.3	0.09
output	46	39.81
Amplifier Gain (dB)	26.7	

Measure Gain @ 20-dB point	Amplifier Gain Limit	Margin	
(dB)	(dB)	(dB)	
10.5	26.7	-16.2	@ 296.87 MHz
9.6	26.7	-17.1	@ 103.89 MHz

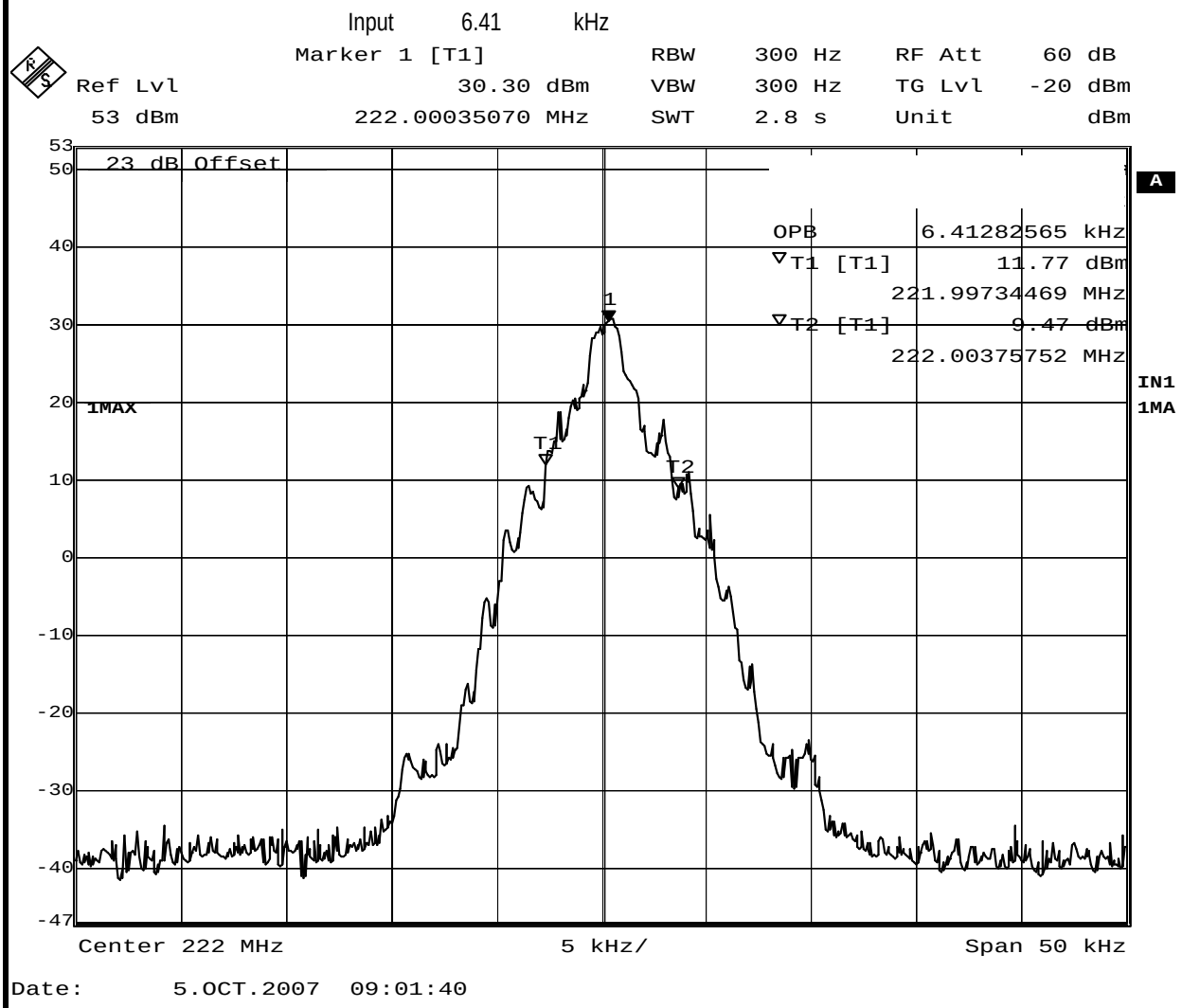
Client:	GE MDS, LLC	Job Number:	J69344
Model:	-	T-Log Number:	T69433
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-131	Class:	N/A

Run #3: Output Power with Power meter and 99% bandwidth

Channel	Frequency (MHz)	Output Power
Low	220	46.0
High	222	46.1

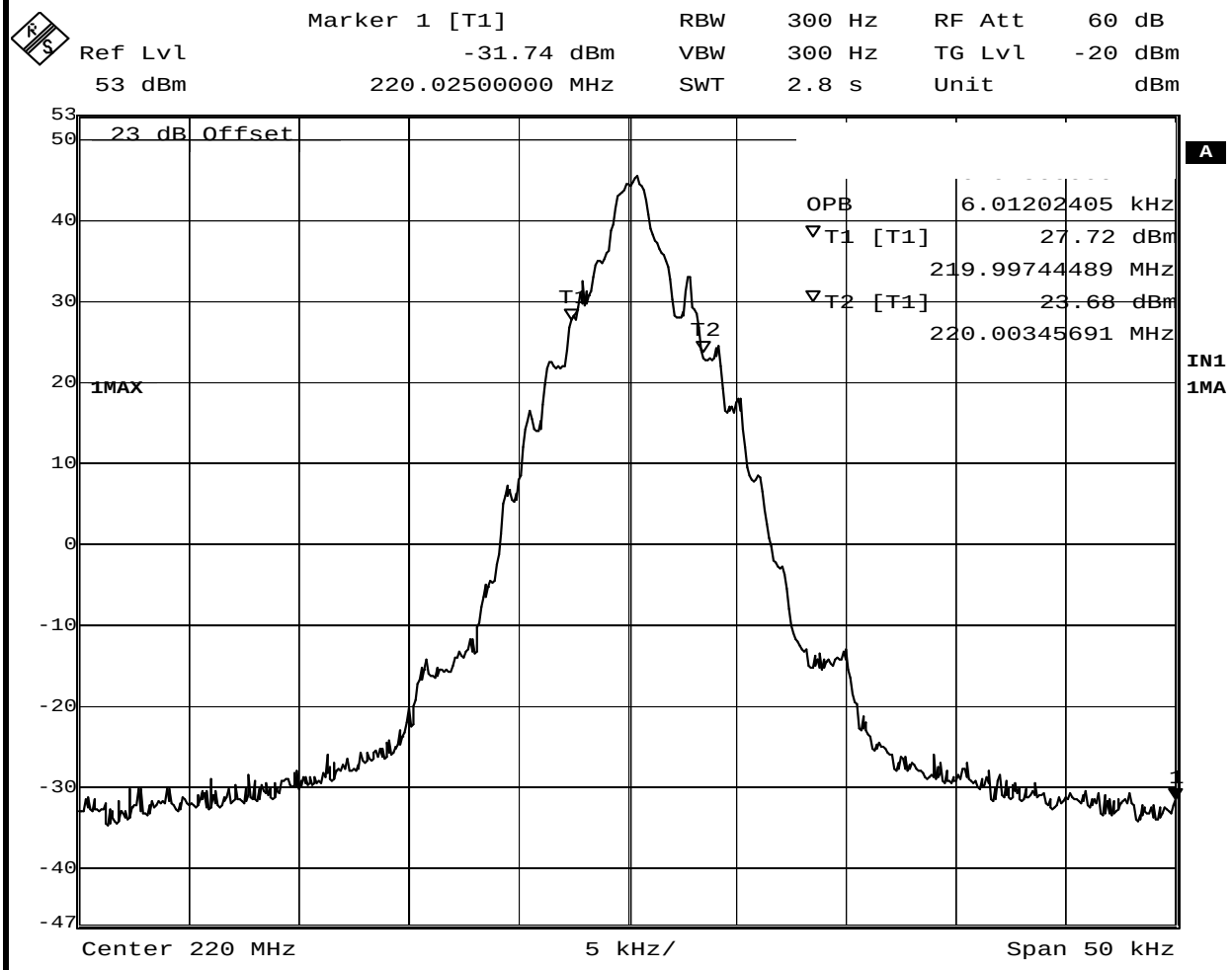


Client:	GE MDS, LLC	Job Number:	J69344
Model:	-	T-Log Number:	T69433
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-131	Class:	N/A



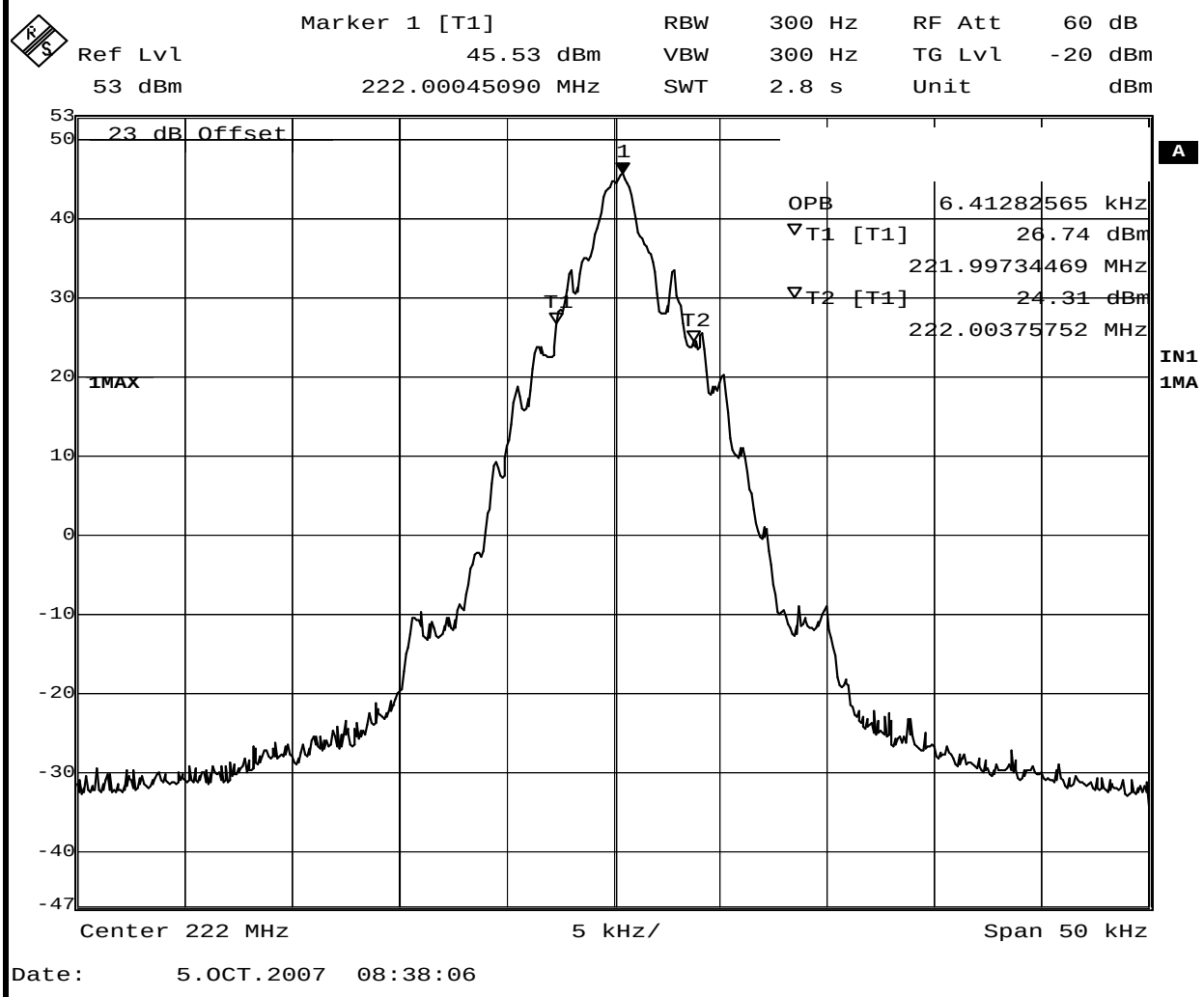
Client:	GE MDS, LLC	Job Number:	J69344
Model:	-	T-Log Number:	T69433
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-131	Class:	N/A

Output 6.01 kHz



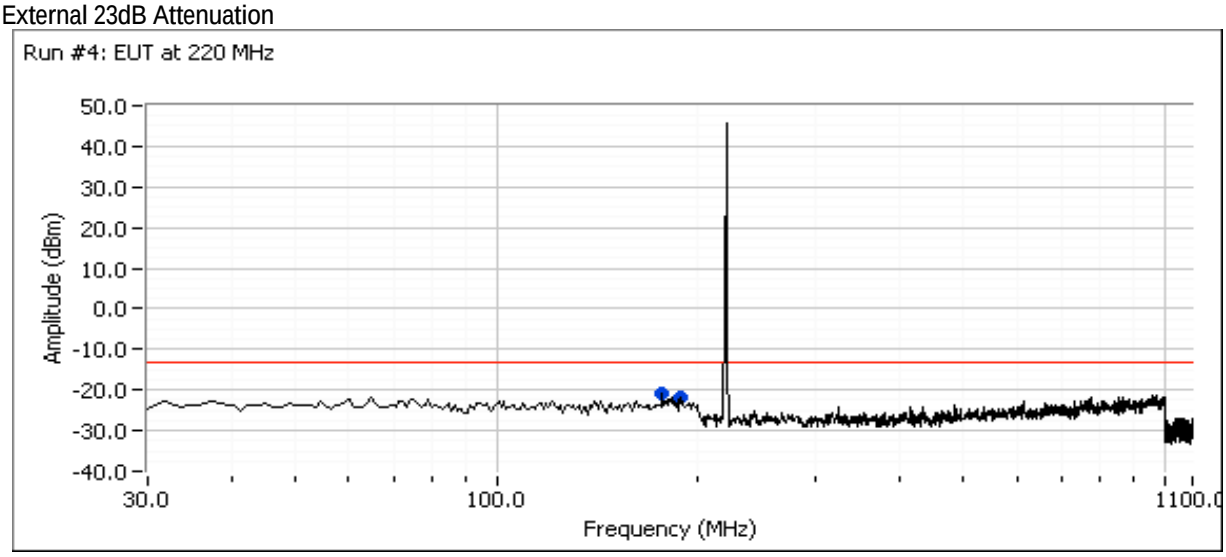
Client:	GE MDS, LLC	Job Number:	J69344
Model:	-	T-Log Number:	T69433
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-131	Class:	N/A

Output 6.41 kHz



Client:	GE MDS, LLC	Job Number:	J69344
Model:	-	T-Log Number:	T69433
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-131	Class:	N/A

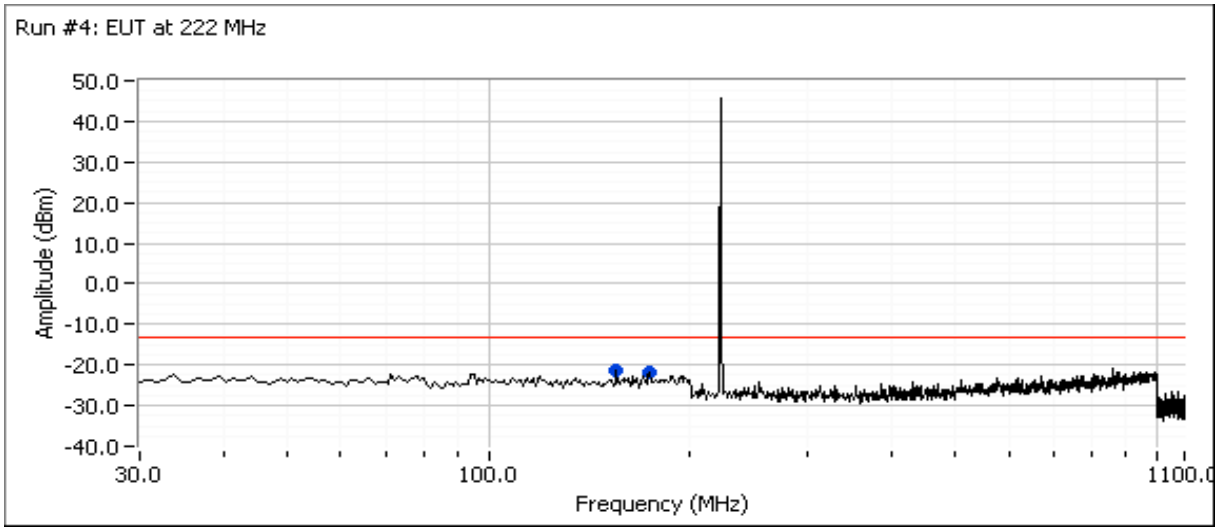
Run #4: Out of Band Emission; 30 - 1,100 MHz
External 23dB Attenuation



Frequency	Level	Port	RSS-131		Detector	Azimuth	Height	Comments
MHz	dBm		Limit	Margin	Pk/QP/Avg	degrees	meters	
160.000	-31.3	RF Port	-13.0	-18.3	Peak	-	-	RBW=VBW= 100kHz (40dB int. att.)
192.000	-31.4	RF Port	-13.0	-18.4	Peak	-	-	RBW=VBW= 100kHz (40dB int. att.)

Note 1:	All emissions observed were narrowband.

Client:	GE MDS, LLC	Job Number:	J69344
Model:	-	T-Log Number:	T69433
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-131	Class:	N/A



Frequency	Level	Port	RSS-131		Detector	Azimuth	Height	Comments
MHz	dBm		Limit	Margin	Pk/QP/Avg	degrees	meters	
160.000	-31.3	RF Port	-13.0	-18.3	Peak	-	-	RBW=VBW= 100kHz (40dB int. att.)
192.000	-31.8	RF Port	-13.0	-18.8	Peak	-	-	RBW=VBW= 100kHz (40dB int. att.)

Note 1:	All emissions observed were narrowband.

Client:	GE MDS, LLC	Job Number:	J69344
Model:	-	T-Log Number:	T69433
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-131	Class:	-

Radiated Emissions

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test:	10/5/2007 0:00	Config. Used:	1
Test Engineer:	Rafael Varelas	Config Change:	None
Test Location:	FT Chamber #5	EUT Voltage:	13.8Vdc

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated emissions testing.

The test distance and extrapolation factor (if applicable) are detailed under each run description.

Note, **preliminary** testing indicates that the emissions were maximized by orientation of the EUT and elevation of the measurement antenna. **Maximized** testing indicated that the emissions were maximized by orientation of the EUT, elevation of the measurement antenna, and manipulation of the EUT's interface cables.

Ambient Conditions:

Temperature:	23.4 °C
Rel. Humidity:	39 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1a-1b	RE, 30 -2200 MHz, Preliminary Scans	Part 90.210	-	-
2	RE, 30 -2200 MHz, Subsitution Method	Part 90.210	Pass	-35.8dBm @ 888.008MHz (-10.8dB)

Modifications Made During Testing:

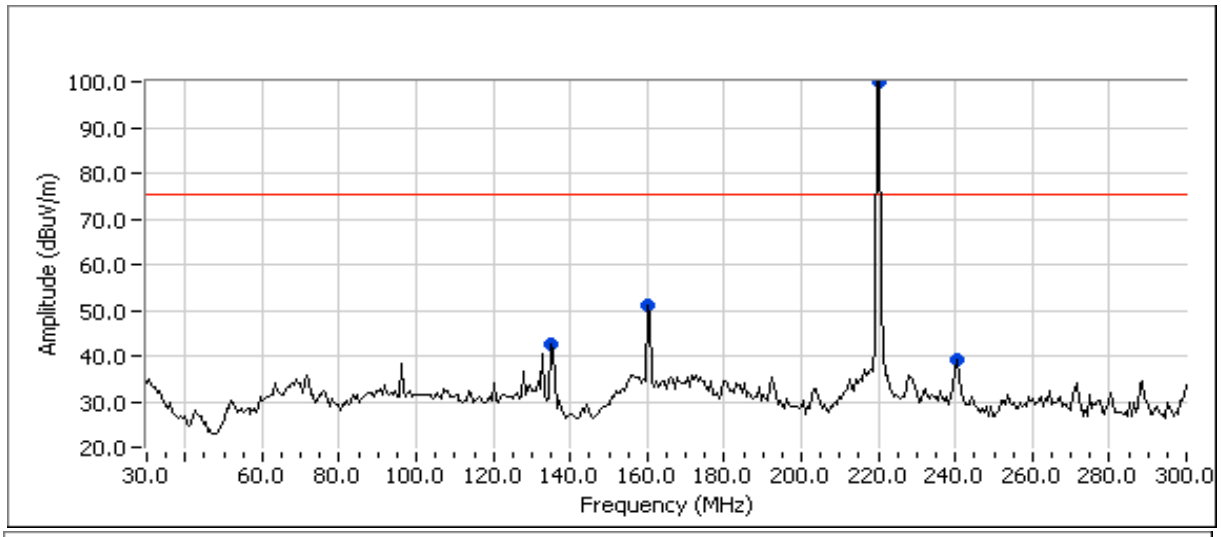
No modifications were made to the EUT during testing

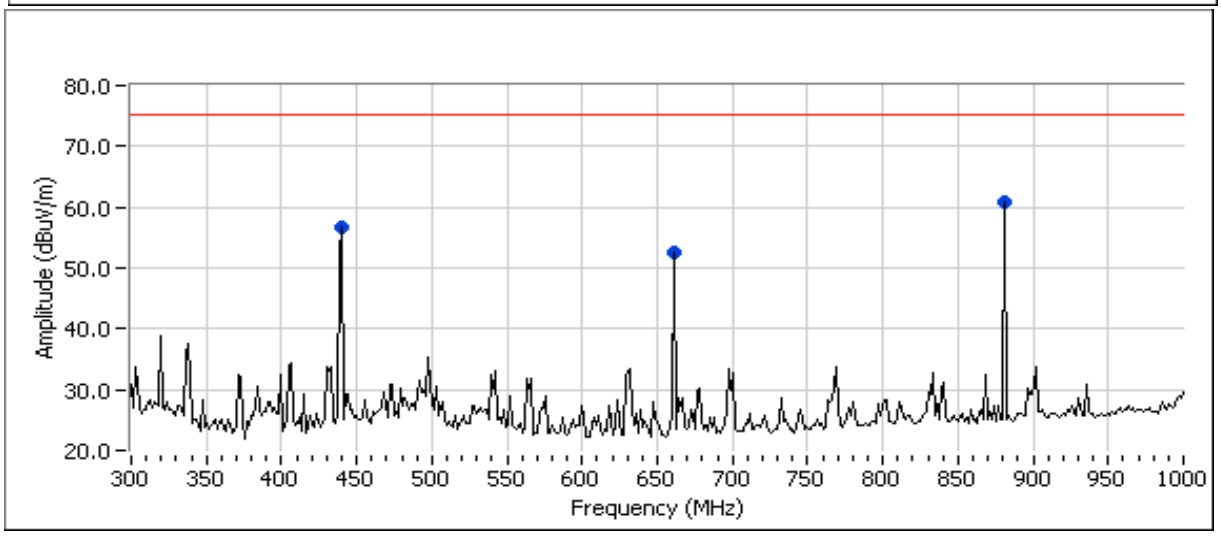
Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	GE MDS, LLC	Job Number:	J69344
Model:	-	T-Log Number:	T69433
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-131	Class:	-

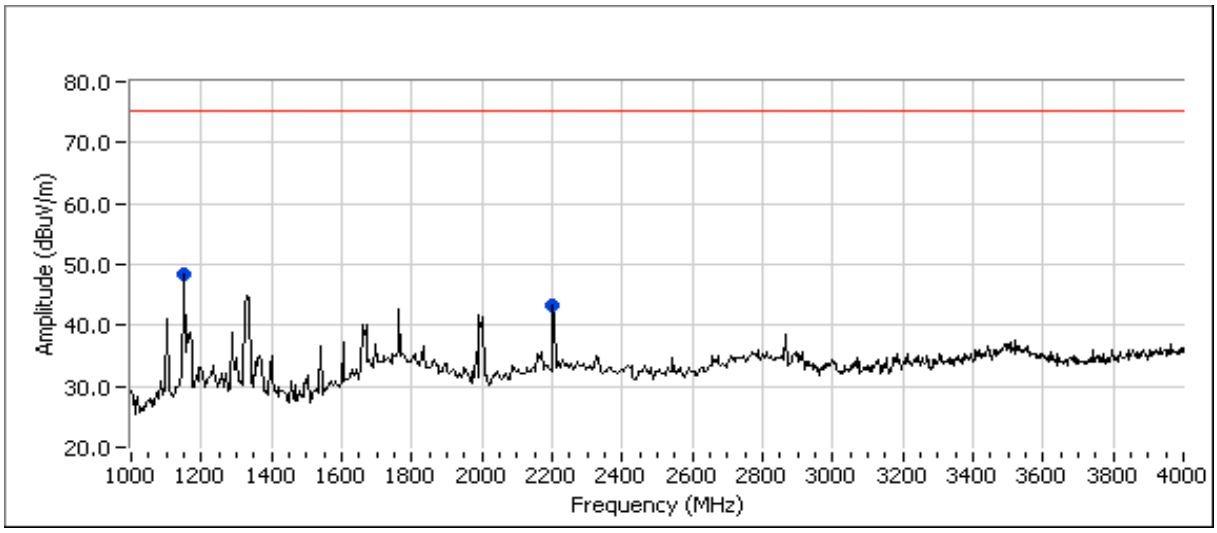
Run #1a: Radiated Spurious Emissions, Transmit Mode, 30 - 4000 MHz. EUT @ 220 MHz





Client:	GE MDS, LLC	Job Number:	J69344
Model:	-	T-Log Number:	T69433
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-131	Class:	-

Run #1a: Continued

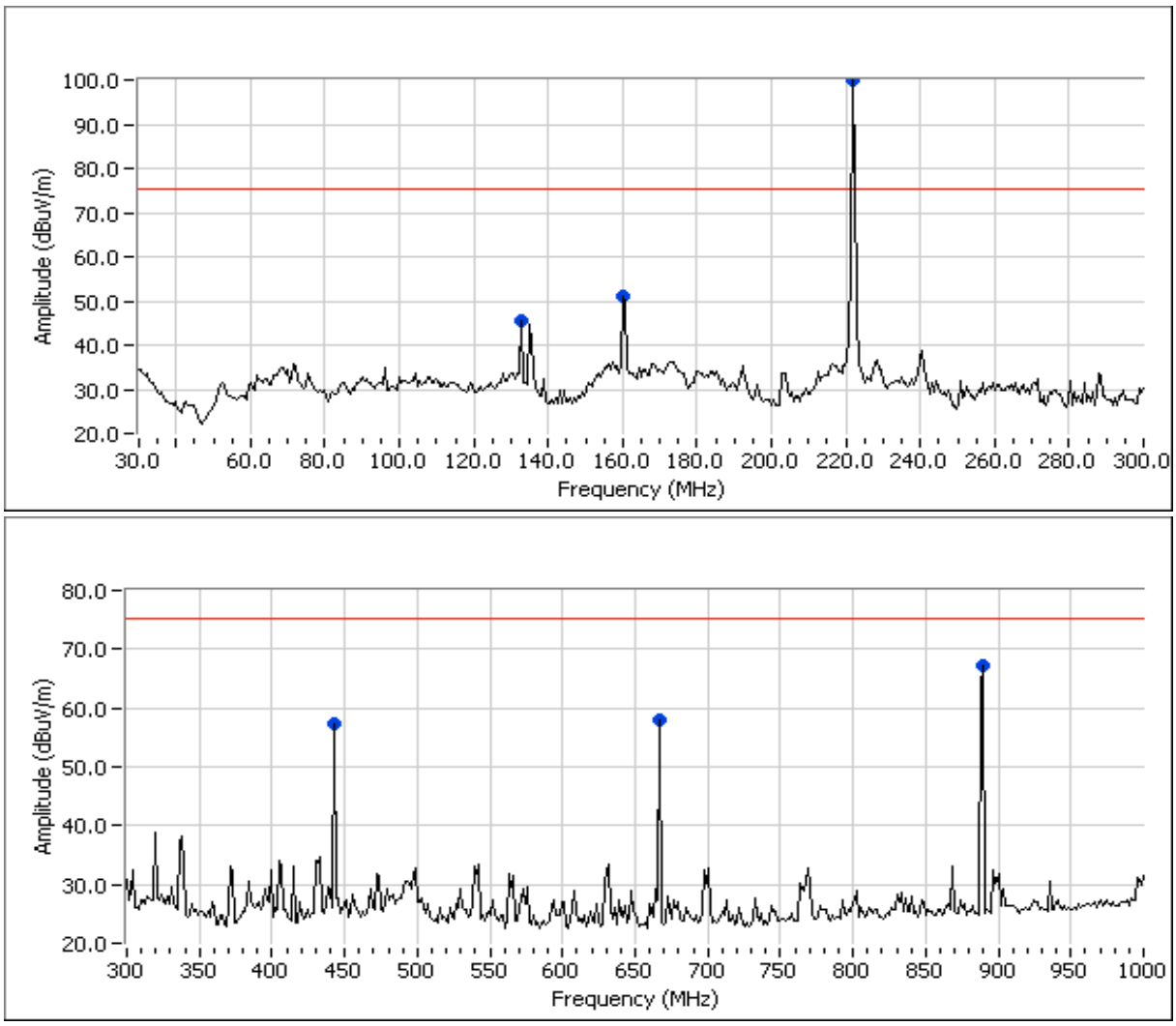


Frequency	Level	Pol	FCC 90.210		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
134.970	42.4	H	70.3	-32.9	Peak	119	2.5	
159.860	51.1	H	70.3	-24.2	Peak	267	2.0	
220.461	99.9	H	-	-	Peak	319	2.0	Fundamental
240.481	39.0	H	70.3	-36.3	Peak	177	1.0	
440.003	56.8	H	70.3	-18.5	Peak	190	1.0	
879.996	60.8	H	70.3	-14.5	Peak	17	1.0	
660.521	52.7	H	70.3	-22.6	Peak	154	1.0	
1152.000	48.3	V	70.3	-27.0	Peak	121	1.0	
2201.750	43.4	H	70.3	-31.9	Peak	179	1.0	

Note 1:	The limit in the table above is an approximate field strength limit. It has been calculated form the erp or eirp limit detailed in the standard using Friis' equation for free space propagation: E = 30PG/d . This limit is a conservative limit because it does not consider the presence of the ground plane. The actual signal level, in terms of erp or eirp, is determined from a substitution measurement for all signals with less than 20dB of margin relative to the calculated field strength limit.

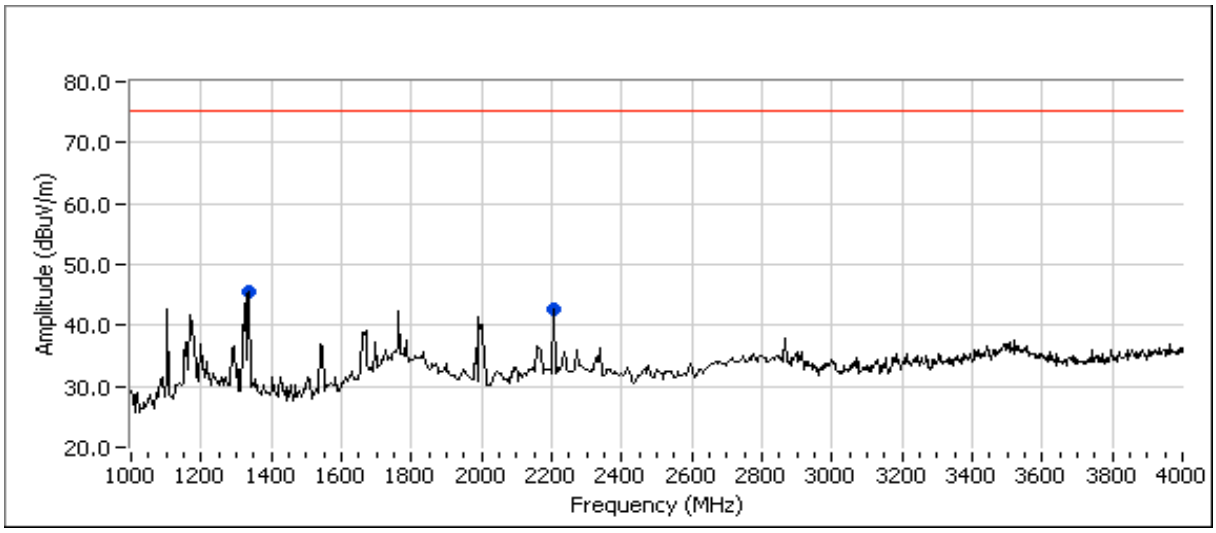
Client:	GE MDS, LLC	Job Number:	J69344
Model:	-	T-Log Number:	T69433
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-131	Class:	-

Run #1b: Radiated Spurious Emissions, Transmit Mode, 30 - 4000 MHz. EUT @ 222 MHz



Client:	GE MDS, LLC	Job Number:	J69344
Model:	-	T-Log Number:	T69433
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-131	Class:	-

Run #1b: Continued



Frequency	Level	Pol	Part 90		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
132.806	45.5	H	70.3	-29.8	Peak	75	4.0	
159.860	50.9	H	70.3	-24.4	Peak	261	2.0	
222.084	99.9	H	-	-	Peak	47	2.5	Fundamental
444.003	57.4	H	70.3	-17.9	Peak	190	1.0	
666.006	58.0	H	70.3	-17.3	Peak	157	1.0	
888.008	67.3	V	70.3	-8.0	Peak	32	1.0	
1337.250	45.5	V	70.3	-29.8	Peak	133	1.0	
2206.500	42.7	V	70.3	-32.6	Peak	64	2.0	

Note 1:	The limit in the table above is an approximate field strength limit. It has been calculated form the erp or eirp limit detailed in the standard using Friis' equation for free space propagation: E = 30PG/d . This limit is a conservative limit because it does not consider the presence of the ground plane. The actual signal level, in terms of erp or eirp, is determined from a substitution measurement for all signals with less than 20dB of margin relative to the calculated field strength limit.

Client:	GE MDS, LLC	Job Number:	J69344
Model:	-	T-Log Number:	T69433
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-131	Class:	-

Run #2: Radiated Spurious Emissions, Transmit Mode: Final Field Strength and Substitution Measurements

Frequency	Level	Pol	Part 90		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
444.003	56.8	H	70.3	-18.5	PK	190	1.0	
666.006	58.5	H	70.3	-16.8	PK	157	1.0	
888.008	63.8	V	70.3	-11.5	PK	32	1.0	
879.996	59.7	H	70.3	-15.6	PK	17	1.0	
440.003	56.3	H	70.3	-19.0	PK	190	1.0	

Frequency	Substitution measurements			Site	EUT measurements			eirp Limit	erp Limit	Margin
MHz	Pin[1]	Gain[2]	FS[3]	Factor[4]	FS[5]	eirp (dBm)	erp (dBm)	dBm	dBm	dB
444.003	-5.0	6.1	101.6	100.5	56.8	-43.7	-45.9		-25.0	-20.9
666.006	-6.2	6.4	100.1	99.9	58.5	-41.4	-43.6		-25.0	-18.6
888.008	-7.6	6.7	96.5	97.4	63.8	-33.6	-35.8		-25.0	-10.8
879.996	-7.6	6.7	98.4	99.3	59.7	-39.6	-41.8		-25.0	-16.8
440.003	-5.0	6.1	101.7	100.6	56.3	-44.3	-46.5		-25.0	-21.5

Note 1:	Pin is the input power (dBm) to the substitution antenna
Note 2:	Gain is the gain (dBi) for the substitution antenna. A dipole has a gain of 2.2dBi.
Note 3:	FS is the field strength (dBuV/m) measured from the substitution antenna.
Note 4:	Site Factor - this is the site factor to convert from a field strength in dBuV/m to an eirp in dBm.
Note 5:	EUT field strength as measured during initial run.

Client:	GE MDS, LLC	Job Number:	J69344
Model:	-	T-Log Number:	T69433
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-131	Class:	-

Radiated Emissions

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test:	10/5/2007 0:00	Config. Used:	1
Test Engineer:	Rafael Varelas	Config Change:	None
Test Location:	FT Chamber #5	EUT Voltage:	13.8Vdc

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated emissions testing.

The test distance and extrapolation factor (if applicable) are detailed under each run description.

Note, **preliminary** testing indicates that the emissions were maximized by orientation of the EUT and elevation of the measurement antenna. **Maximized** testing indicated that the emissions were maximized by orientation of the EUT, elevation of the measurement antenna, and manipulation of the EUT's interface cables.

Ambient Conditions:

Temperature:	23.4 °C
Rel. Humidity:	39 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1a-1b	RE, 30 -1100 MHz, Preliminary Scan	RSS-131	-	-
2	RE, 30 -1100 MHz, Subsitution Method	RSS-131	Pass	-35.8dBm @ 888.008MHZ (-22.8)

Modifications Made During Testing:

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

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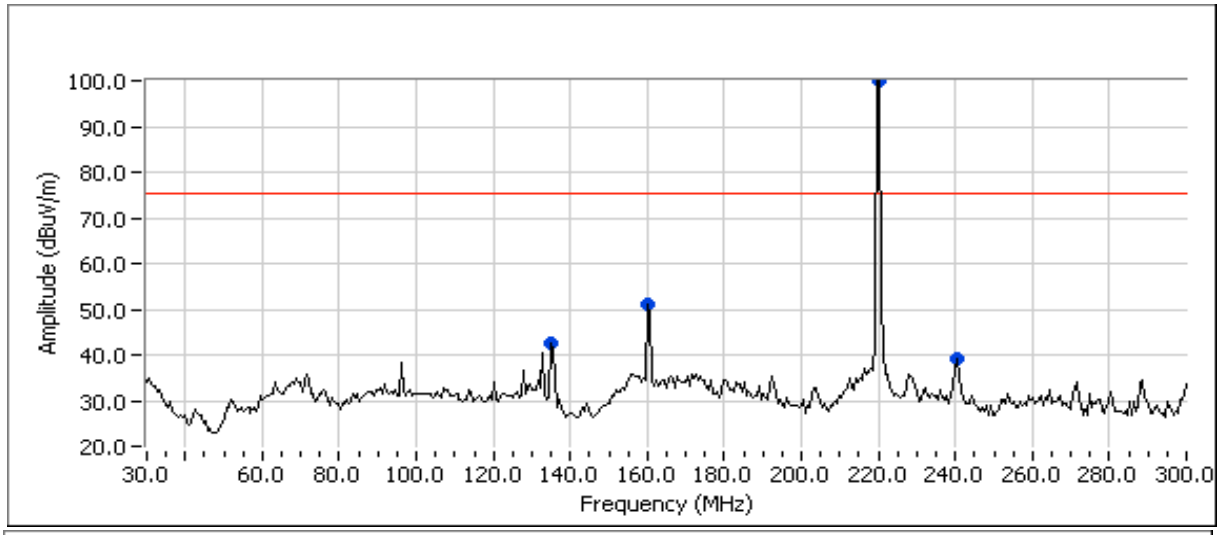
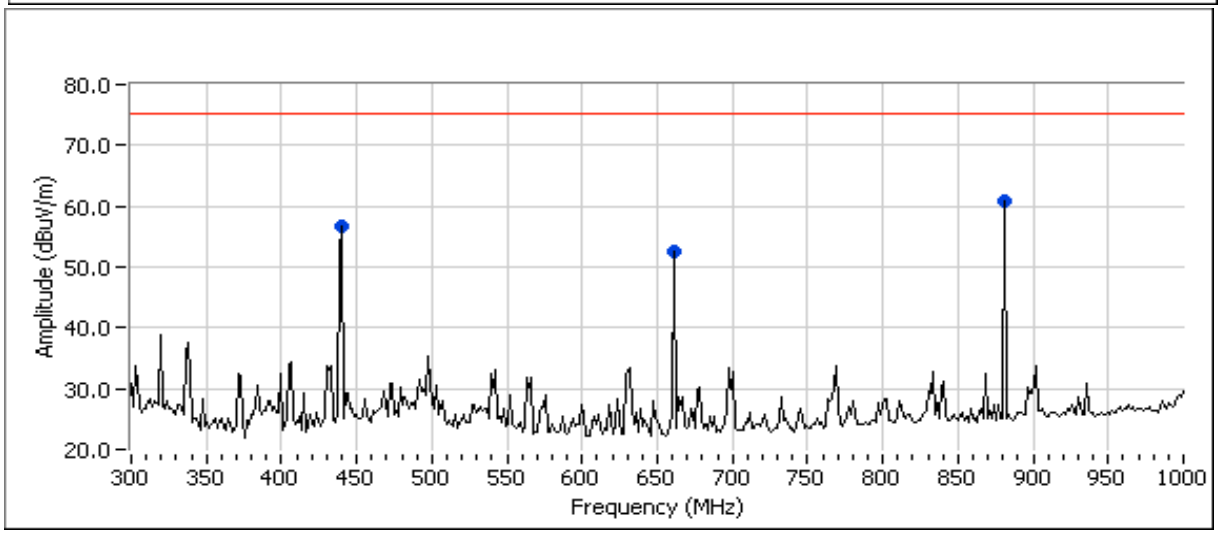
Run #1a: Radiated Spurious Emissions, Transmit Mode, 30 - 4000 MHz. EUT @ 220 MHz





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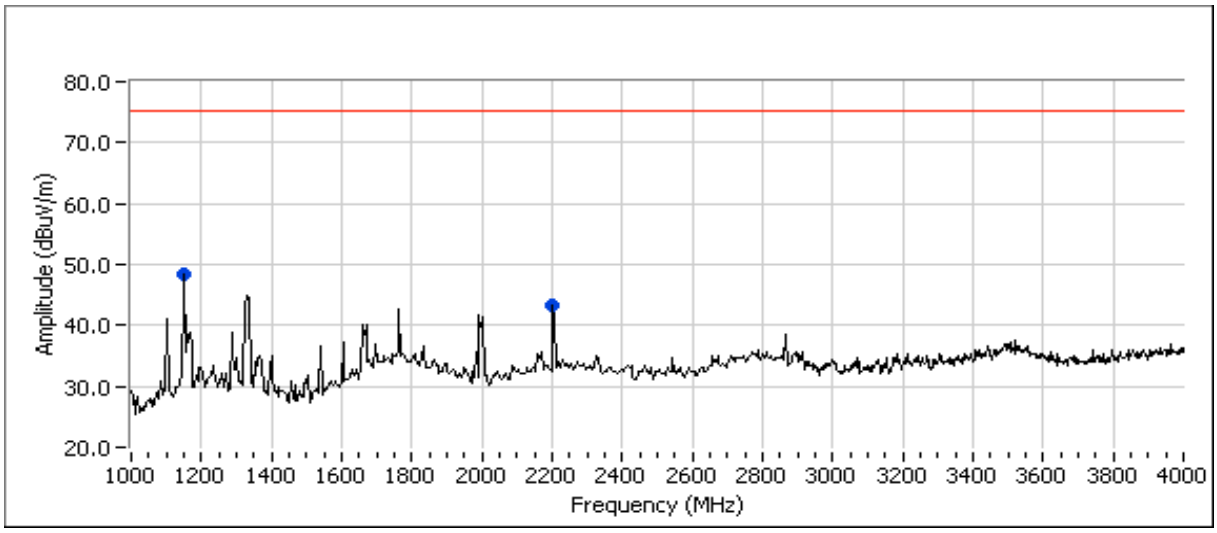
Standard:	FCC Part 90, RSS-131	Class:	-

Run #1a: Continued



Frequency	Level	Pol	RSS-131		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
134.970	42.4	H	82.2	-39.8	Peak	119	2.5	
159.860	51.1	H	82.2	-31.1	Peak	267	2.0	
220.461	99.9	H	-	-	Peak	319	2.0	Fundamental
240.481	39.0	H	82.2	-43.2	Peak	177	1.0	
440.003	56.8	H	82.2	-25.4	Peak	190	1.0	
879.996	60.8	H	82.2	-21.4	Peak	17	1.0	
660.521	52.7	H	82.2	-29.5	Peak	154	1.0	
1152.000	48.3	V	82.2	-33.9	Peak	121	1.0	
2201.750	43.4	H	82.2	-38.8	Peak	179	1.0	

Note 1:	The limit in the table above is an approximate field strength limit. It has been calculated form the erp or eirp limit detailed in the standard using Friis' equation for free space propagation: E = 30PG/d . This limit is a conservative limit because it does not consider the presence of the ground plane. The actual signal level, in terms of erp or eirp, is determined from a substitution measurement for all signals with less than 20dB of margin relative to the calculated field strength limit.

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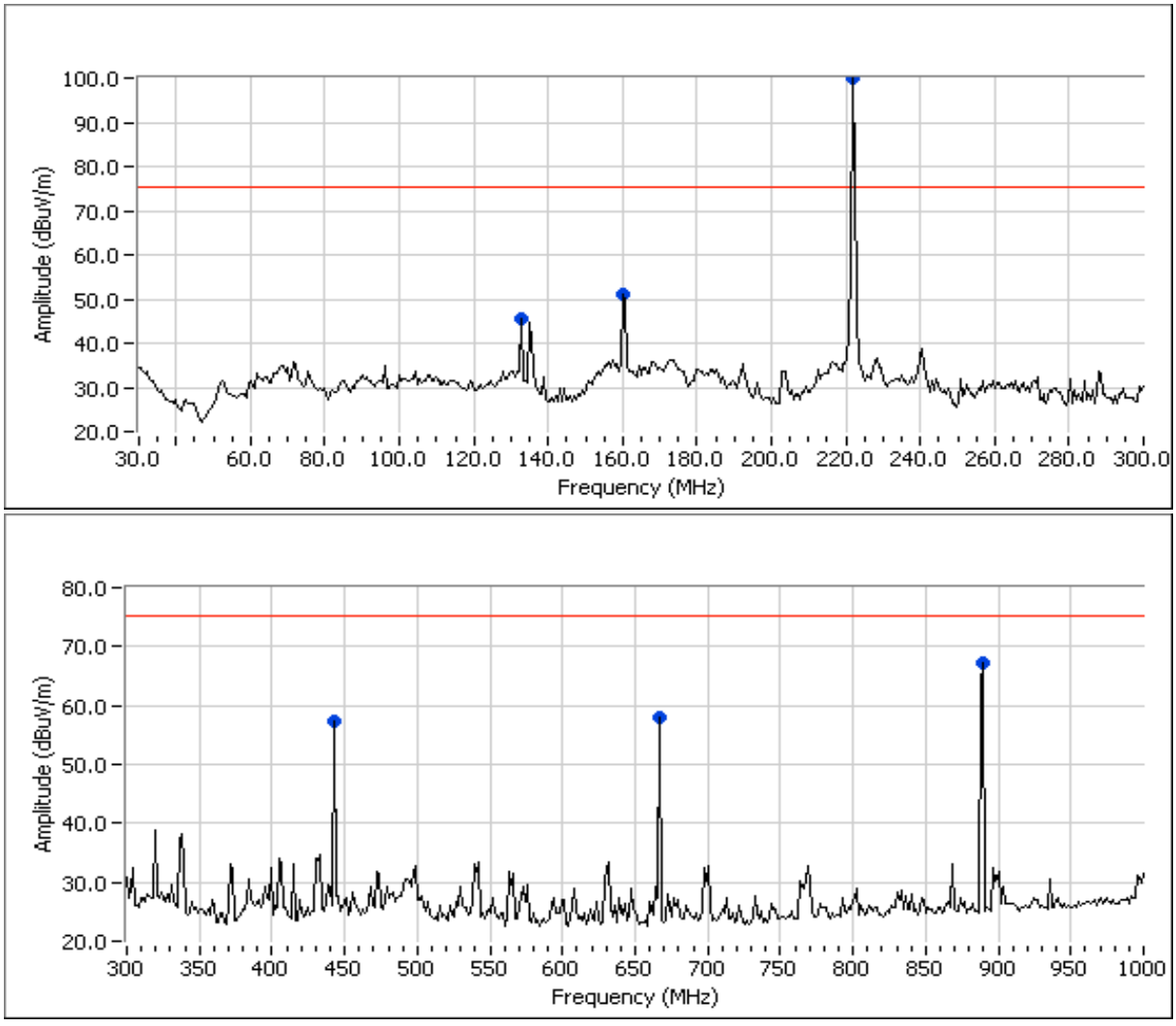
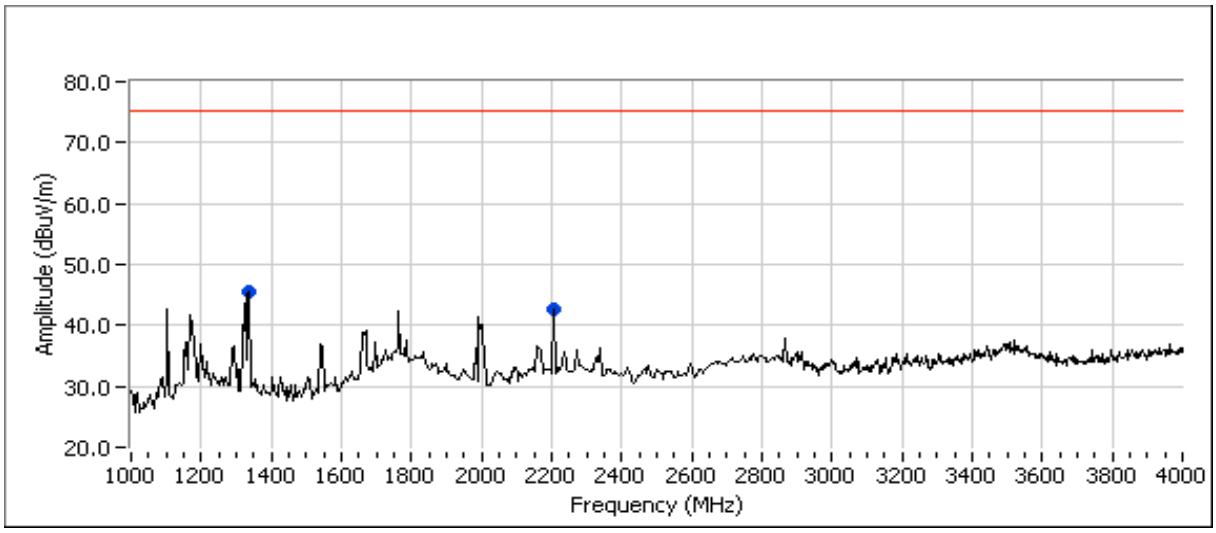
Standard:	FCC Part 90, RSS-131	Class:	-

Run #1b: Radiated Spurious Emissions, Transmit Mode, 30 - 4000 MHz. EUT @ 222 MHz



Client:	GE MDS, LLC	Job Number:	J69344
Model:	-	T-Log Number:	T69433
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-131	Class:	-

Run #1b: Continued



Frequency	Level	Pol	RSS-131		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
132.806	45.5	H	82.2	-36.7	Peak	75	4.0	
159.860	50.9	H	82.2	-31.3	Peak	261	2.0	
222.084	99.9	H	-	-	Peak	47	2.5	Fundamental
444.003	57.4	H	82.2	-24.8	Peak	190	1.0	
666.006	58.0	H	82.2	-24.2	Peak	157	1.0	
888.008	67.3	V	82.2	-14.9	Peak	32	1.0	
1337.250	45.5	V	82.2	-36.7	Peak	133	1.0	
2206.500	42.7	V	82.2	-39.5	Peak	64	2.0	

Note 1:	The limit in the table above is an approximate field strength limit. It has been calculated form the erp or eirp limit detailed in the standard using Friis' equation for free space propagation: E = 30PG/d . This limit is a conservative limit because it does not consider the presence of the ground plane. The actual signal level, in terms of erp or eirp, is determined from a substitution measurement for all signals with less than 20dB of margin relative to the calculated field strength limit.

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Standard:	FCC Part 90, RSS-131	Class:	-

Run #2: Radiated Spurious Emissions, Transmit Mode: Final Field Strength and Substitution Measurements

Frequency	Level	Pol	RSS-131		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
888.008	63.8	V	82.2	-18.4	PK	32	1.0	

Frequency	Substitution measurements			Site	EUT measurements			eirp Limit	erp Limit	Margin
MHz	Pin[1]	Gain[2]	FS[3]	Factor[4]	FS[5]	eirp (dBm)	erp (dBm)	dBm	dBm	dB
888.008	-7.6	6.7	96.5	97.4	63.8	-33.6	-35.8		-13.0	-22.8

Note 1:	Pin is the input power (dBm) to the substitution antenna
Note 2:	Gain is the gain (dBi) for the substitution antenna. A dipole has a gain of 2.2dBi.
Note 3:	FS is the field strength (dBuV/m) measured from the substitution antenna.
Note 4:	Site Factor - this is the site factor to convert from a field strength in dBuV/m to an eirp in dBm.
Note 5:	EUT field strength as measured during initial run.

EXHIBIT 3: Test Configuration Photographs

Uploaded as A Separate Attachment

EXHIBIT 4: Theory of Operation GE MDS LLC Model ENET-L2TU

Uploaded as A Separate Attachment

EXHIBIT 5: Proposed FCC ID Label & Label Location

Uploaded as A Separate Attachment

EXHIBIT 6: Detailed Photographs GE MDS LLC Model ENET-L2TU

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EXHIBIT 7: Installation Guide GE MDS LLC Model ENET-L2TU

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EXHIBIT 8: Block Diagram GE MDS LLC Model ENET-L2TU

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EXHIBIT 9: Schematic Diagrams GE MDS LLC Model ENET-L2TU

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