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Electromagnetic Emissions Test Report
In Accordance With
FCC Part 90
on the
GE MDS LLC
Transmitter
Model: Mercury 3650

FCC ID NUMBER:	E5MDS-MERCURY3650
GRANTEE:	GE MDS LLC 175 Science Parkway Rochester, NY 14620
TEST SITE:	Elliott Laboratories 684 W. Maude Avenue Sunnyvale, CA 94086
REPORT DATE:	August 15, 2008
FINAL TEST DATE:	July 23, August 14 and August 15, 2008
AUTHORIZED SIGNATORY:	David W. Bare Chief Engineer

ACCREDITED

Testing Cert #2016-01

REVISION HISTORY

Revision #	Date	Comments	Modified By
1	August 15, 2008	Initial Release	-

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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) FCC ID: E5MDS-MERCURY3650

2.1033(c)(3) Instructions/Installation Manual

Please refer to Exhibit 7: User Manual

2.1033(c)(4) Type of emissions

FCC 90**: G1D with 1.7, 3.2, 4.6, 6.3, 9.2 and 12.7 MHz 99% BW**

2.1033(c)(5) Frequency Range

FCC 90**: 3650 – 3675 MHz**

2.1033(c)(6) Range of Operation Power

FCC 90**: 25 200mW Conducted**

2.1033(c)(7) Maximum FCC Allowed Power Level

FCC 90**:** 90.1321: 25 watts EIRP, PSD limited to 1 W/MHz EIRP

2.1033(c)(8) Applied voltage and currents into the final transistor elements

5V DC, 2A

2.1033(c)(9) Tune-up Procedure

Please refer to letter stating that no tune-up procedure is required.

2.1033(c)(10) Schematic Diagram of the Transmitter

Refer to Exhibit 6: Schematic diagram

2.1033(c)(10) Means for Frequency Stabilization

Please refer to Schematic diagram and operational description.

2.1033(c)(10) Means for Suppression of Spurious radiation

Please refer to Schematic diagram and operational description.

2.1033(c)(10) Means for Limiting Modulation

Please refer to Schematic diagram and operational description.

2.1033(c)(10) Means for Limiting Power

Please refer to operational description.

2.1033(c)(11) Photographs or Drawing of the Equipment Identification Plate or Label

Refer to Exhibit 4

2.1033(c)(12) Photographs of equipment

Refer to Exhibit 5

2.1033(c)(13) Equipment Employing Digital Modulation & 90.203 (Certification Requirements)

90.203(J)(2)(ii)&(iii): 421–512 MHz bands, received on or after February 14, 1997, must include a certification that the equipment meets a spectrum efficiency standard of one voice channel per 12.5 kHz of channel bandwidth. Additionally, if the equipment is capable of transmitting data, has transmitter output power greater than 500 mW, and has a channel bandwidth of more than 6.25 kHz, the equipment must be capable of sup-porting a minimum data rate of 4800 bits per second per 6.25 kHz of channel bandwidth.

This section is not applicable.

2.1033(c)(14) Data taken per Section 2.1046 to 2.1057 and RSS-133 issue 2, Rev. 1.

Refer to Exhibit 2

SCOPE

FCC Part 90 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. 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. Certification of these devices is required as a prerequisite to marketing as defined in Section 2.1033.

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-119 Test Summary

Measurement Required	FCC Part 2 & 90 Sections	Test Performed	Measured Value	Test Procedure Used	Result
Modulation Tested	OFDM with (BPSK, QAM16, QAM64 and QPSK)	-	-	-	-
Modulation characteristics	2.1047	Modulated with appropriated signal	-	H	-
Radiated RF power output (ERP/EIRP)	2.1046 / 90.1321	Radiated Output Power Test	Measured conducted with antenna gain added	-	-
Conducted RF power output	2.1046 / 90.1321	Conducted Output Power Test	37.3 dBm EIRP 29.9dBm PSD EIRP	B	Complies
Spurious emissions at antenna Port	2.1051/ 90.1323 90.210(b)	Emission Limits and/or Unwanted Emission 30MHz – 5GHz	-35.8dBm @ 250349MHz (-22.8dB)	J	Complies
Occupied Bandwidth	2.1049/ 90.210(b)	Emission Mask and 99% Bandwidth	Refer to Plots	C & D	Complies
Field strength of spurious radiation	2.1053 / 90.1323 90.210(b)	Radiated Spurious Emissions 30MHz – 5GHz	50.1dBµV/m @ 10958.9MHz (-32.1dB)	N	Complies
Frequency stability	2.1055 / 90.213	Frequency Vs. Temperature	Highest Drift: 783 Hz	K	Complies
Frequency stability	2.1055 / 90.213	Frequency Vs. Voltage	Highest Drift 75Hz	L & M	Complies
Transient Frequency Behavior	90.214	Transient Behavior	-	I	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 Mercury 3650 is a broadband wireless transceiver which is designed to transmit and receive data in the 3.65 - 3.675 GHz band. Normally, the EUT would be placed on a tabletop or in a rack during operation. The EUT was, therefore, placed on a table during emissions testing to simulate the end user environment. The electrical rating of the EUT is 10-30Vdc, 2.5 Amps.

The sample was received on July 23, 2008 and tested on July 23, August 14 and August 15, 2008. The EUT consisted of the following component(s):

Manufacturer	Model	Description	Serial Number	FCC ID
GE MDS LLC	Mercury 3650	Digital UHF Radio	Not serialized	E5MDS-MERCURY3650

OTHER EUT DETAILS

The EUT can be used with antennas of 13 or 18 dBi and a cable with 3dB of loss.

ENCLOSURE

The EUT enclosure is primarily constructed of die cast metal. It measures approximately 20cm wide by 11cm deep by 5cm 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	FCC ID
IBM	Thinkpad	Laptop	L3-C3706	DoC
MECA	465-1	50 ohm termination	-	-

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

Manufacturer	Model	Description	Serial Number	FCC ID
Netgear	RP114	Router	RP14BC452759	DoC

EUT INTERFACE PORTS

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

Port	Connected to	Description	Shielded or Unshielded	Length (m)
Antenna	50 ohms Termination	-	-	-
Data Interface	Laptop	DB25	Shielded	2.0
LAN	Router	CAT 5	Unshielded	10.0

EUT OPERATION DURING TESTING

During emissions testing the EUT was set to transmit mode either unmodulated or modulated as required for testing.

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TEST SITE

GENERAL INFORMATION

Final test measurements were taken on July 23, August 14 and August 15, 2008 at the Elliott Laboratories Open Area Test Site #2 located at 684 West Maude Avenue, Sunnyvale, 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 Semi- 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 - Occupied Bandwidth (Conducted Emission Mask): Either for analog, digital, or data modulations, emission mask was performed. The EUT was set to transmit the appropriate modulation at maximum power. The following method was used:

1) The EUT was connected directly to the spectrum analyzer and used an attenuator to protect the input of the analyzer. The EUT antenna was removable, so conducted measurements was performed. The EUT was set to transmit continuous packets of data and the Fundamental Frequency set to the middle of the EUT frequency range.

2) Since EUT is designed with a 12.5 kHz channel Section 90.210 (d)(1)(2)(3) was used to show compliance to the emission mask.

3) Any emission must be attenuated below the power (P) as follow:

90.210 (d)(1): 5.625 kHz: 0 dB

90.210(d)(2): 5.625 kHz: 20 dB
12.5 kHz: 70 dB

90.210(d)(3): more than 12.5 kHz: -20 dBm (50+10*log(P))

The following Resolution and Video bandwidth was used to show compliance for the above requirement: 100 Hz.

4) Since EUT is designed with a 25 kHz channel Section 90.210 (c)(1)(2)(3) was used to show compliance to the emission mask.

5) Any emission must be attenuated below the power (P) as follow:

90.210 (c)(1): 5 kHz but no more then 10kHz: 83*log(F_d / 5) dB

90.210(c)(2): 10kHz but no more then 250%: At least 29 log (fd 2/11) dB or 50 dB, whichever is the lesser attenuation

90.210(c)(3): more than 250%: -13 dBm (43+10*log(P))

The following Resolution and Video bandwidth was used to show compliance for the above requirement: 300 Hz.

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 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 –20-dBm.
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 –20dBm limit.
5) Steps 1 to 4 were repeated for all modulations and output ports that will be used for transmission.

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 pre-liminary 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), 15-Jul-08
Engineer: Mehran Birgani

Manufacturer	Description	Model #	Asset #	Cal Due
Hewlett Packard	EMC Spectrum Analyzer, 9 KHz-26.5 GHz	8593EM	1141	29-Nov-08
Rohde & Schwarz	Power Sensor 100 uW - 2 Watts	NRV-Z32	1423	07-Nov-08
Rohde & Schwarz	Power Meter, Dual Channel	NRVD	1539	21-Aug-08

Radio Antenna Port (Power and Spurious Emissions), 18-Jul-08
Engineer: Mehran Birgani

Manufacturer	Description	Model #	Asset #	Cal Due
Rohde & Schwarz	Power Meter, Dual Channel	NRVD	1071	01-Jul-09
Rohde & Schwarz	Power Sensor 100 uW - 2 Watts	NRV-Z32	1423	07-Nov-08
Hewlett Packard	SpecAn 9 kHz - 40 GHz, (SA40)	8564E	CH5273	20-Jul-08

Radiated Emissions, 30 - 37,000 MHz, 23-Jul-08
Engineer: Mehran Birgani

Manufacturer	Description	Model #	Asset #	Cal Due
Elliott Laboratories	Biconical Antenna, 30-300 MHz	EL30.300	54	26-Mar-09
EMCO	Log Periodic Antenna, 0.3-1 GHz	3146A	364	13-Dec-08
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	08-Nov-08
Hewlett Packard	Head (Inc W1-W4, 1143, 1144) Red	84125C	1145	16-Nov-08
EMCO	Antenna, Horn, 18-26.5 GHz (SA40-Red)	3160-09 (84125C)	1150	05-Nov-08
EMCO	Antenna, Horn, 26.5-40 GHz (SA40-Red)	3160-10 (84125C)	1151	05-Nov-08
EMCO	Antenna, Horn, 1-18 GHz	3115	1561	10-Jun-10
Hewlett Packard	Preamplifier, 100 kHz - 1.3 GHz	8447D OPT 010	1826	29-May-09
Hewlett Packard	SpecAn 9 kHz - 40 GHz, (SA40)	8564E	CH5273	20-Sep-08

Environmental Test, 24-Jul-08
Engineer: Mehran Birgani

Manufacturer	Description	Model #	Asset #	Cal Due
Hewlett Packard	SpecAn 9 kHz - 40 GHz, (SA40)	8564E	CH5273	20-Sep-08

Radiated Emissions, 30 - 37,000 MHz, 28-Jul-08
Engineer: Mehran Birgani

Manufacturer	Description	Model #	Asset #	Cal Due
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	08-Nov-08
EMCO	Antenna, Horn, 1-18 GHz (SA40-Blu)	3115	1386	11-Aug-08
Hewlett Packard	SpecAn 9 kHz - 40 GHz, (SA40)	8564E	CH5273	20-Sep-08

Radio Antenna Port (Power and Spurious Emissions), 29-Jul-08
Engineer: Mehran Birgani

Manufacturer	Description	Model #	Asset #	Cal Due
Rohde & Schwarz	Power Meter, Dual Channel	NRVD	1071	01-Jul-09
Rohde & Schwarz	Power Sensor 100 uW - 2 Watts	NRV-Z32	1423	07-Nov-08
Hewlett Packard	SpecAn 9 kHz - 40 GHz, (SA40)	8564E	CH5273	20-Sep-08

Power, PSD, BW and Spurious, 15-Aug-08
Engineer: Mehran Birgani and David Bare

Manufacturer	Description	Model #	Asset #	Cal Due
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1538	25-Aug-08
Hewlett Packard	SpecAn 9 kHz - 40 GHz, (SA40)	8564E	CH5273	20-Sep-08

EXHIBIT 2: Test Data Log Sheets

ELECTROMAGNETIC EMISSIONS

TEST LOG SHEETS

AND

MEASUREMENT DATA

T72175 37 Pages

Client:	GE MDS LLC	Job Number:	J72039
Model:	Mercury 3650	T-Log Number:	T72175
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		-
Emissions Standard(s):	RSS 119, FCC Part 90	Class:	A
Immunity Standard(s):	-	Environment:	-

EMC Test Data

For The

GE MDS LLC

Model

Mercury 3650

Date of Last Test: 8/15/2008

Client:	GE MDS LLC	Job Number:	J72039
Model:	Mercury 3650	T-Log Number:	T72175
		Account Manger:	Susan Pelzl
Contact:	Dennis McCarthy		
Emissions Standard(s):	RSS 119, FCC Part 90	Class:	A
Immunity Standard(s):	-	Environment:	-

EUT INFORMATION

General Description

The EUT is a broadband wireless transceiver which is designed to transmit and receive data in the 3.65 - 3.675 GHz band. Normally, the EUT would be placed on a tabletop or in a rack during operation. The EUT was, therefore, placed on a table during emissions testing to simulate the end user environment. The electrical rating of the EUT is 10-30Vdc, 2.5 Amps.

Equipment Under Test

Manufacturer	Model	Description	Serial Number	FCC ID
GE MDS LLC	Mercury 3650	Digital UHF Radio	Not serialized	E5MDS-Mercury3600

Other EUT Details

None

EUT Antenna (Intentional Radiators Only)

The EUT can be used with antennas of 13 or 18 dBi and a cable with 3dB of loss.

EUT Enclosure

The EUT enclosure is primarily constructed of die cast metal. It measures approximately 20cm wide by 11cm deep by 5cm high.

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:	J72039
Model:	Mercury 3650	T-Log Number:	T72175
		Account Manger:	Susan Pelzl
Contact:	Dennis McCarthy		
Emissions Standard(s):	RSS 119, FCC Part 90	Class:	A
Immunity Standard(s):	-	Environment:	-

Test Configuration #1

FCC Part 90

Local Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
IBM	Thinkpad	Laptop	L3-C3706	DoC
MECA	465-1	50 ohm termination	-	-

Remote Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
Netgear	RP114	Router	RP14BC452759	DoC

Cabling and Ports

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
Antenna	50 ohms Termination	-	-	-
Data Interface	Laptop	DB25	Shielded	2.0
GPS	Terminator	Coax	Shielded	2.0
LAN	Router	CAT 5	Unshielded	10.0
DC Power	13.8V DC Source	2 wire	Unshielded	2.0

EUT Operation During Emissions Tests

During emissions testing the EUT was set to transmit mode either unmodulated or modulated as required for testing.

Client:	GE MDS LLC	Job Number:	J72039
Model:	Mercury 3650	T-Log Number:	T72175
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	RSS 119, FCC Part 90	Class:	N/A

RSS 119 and FCC Part 90
Frequency Stability

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.

General Test Configuration

The EUT's rf port was connected to the measurement instrument's rf port, via an attenuator or dc-block if necessary. EUT was place inside an environmental chamber.

Ambient Conditions:

Temperature: 20 °C
Rel. Humidity: 36 %

Summary of Results

Run #	Test Performed	Limit	Result	Value / Margin
1-2	Frequency and Voltage Stability	Part 90.213	Pass	Highest Drift: 783 Hz

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:	J72039
Model:	Mercury 3650	T-Log Number:	T72175
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	RSS 119, FCC Part 90	Class:	N/A

Run #1: Temperature Vs. Frequency (Fixed stations in the 3650-3675 MHz band)

Note 1:	For all tests: Unmodulated signal using mode BPSK at frequency (3662MHz) with power setting of 23dBm was used. Analyzer settings were as follow: RBW=VBW= 1kHz and Span=5kHz.
Note 2:	Frequency stability is to be specified in the station authorization.

Temperature	Reference Frequency	Measured frequency	Drift	Limit
(Celsius)	(MHz)	(MHz)	(Hz)	(Hz)
-30	3662.002705	3662.002205	500	Note 2
-20	3662.002705	3662.002622	83	Note 2
-10	3662.002705	3662.002405	300	Note 2
0	3662.002705	3662.002922	217	Note 2
10	3662.002705	3662.003405	700	Note 2
20	3662.002705	3662.002705	0	Note 2
30	3662.002705	3662.003488	783	Note 2
40	3662.002705	3662.002738	33	Note 2
50	3662.002705	3662.002196	509	Note 2

Run #2: Voltage Vs. Frequency

Nominal Voltage is 13.8Vdc.

Voltage	Reference Frequency	Frequency Drift	Drift	Limit
(Dc)	(MHz)	(MHz)	(Hz)	(Hz)
85%	3662.002705	3662.002638	67	Note 2
115%	3662.002705	3662.002630	75	Note 2

Worst case drift: 783.0 Hz
0.21 ppm

Client:	GE MDS LLC	Job Number:	J72039
Model:	Mercury 3650	T-Log Number:	T72175
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	RSS 119, FCC Part 90	Class:	N/A

RSS 119 and FCC Part 90

Power, PSD, Occupied Bandwidth and Spurious 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: 8/14 and 8/15/2008
Test Engineer: M. Birgani, D. Bare
Test Location: Chamber #2

Config. Used: 1
Config Change: None
EUT Voltage: 13.8VDC

General Test Configuration

The EUT was connected to the spectrum analyzer or power meter via a suitable attenuator.

All measurements have been corrected to allow for the external attenuators used.

Ambient Conditions:

	8/14/2008	8/15/5008
Temperature:	22 °C	21 °C
Rel. Humidity:	36 %	40 %

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Maximim Output Power	FCC Part 90	Pass	37.3 dBm EIRP
2	99% Bandwidth	-	-	Refer to run
2	PSD	FCC Part 90	Pass	29.9 dBm/MHz EIRP
3	Unwanted emissions (Mask)	FCC Part 90 - Mask B	Pass	See plots
4	Antenna Port Conducted Spurious Emissions 30 - 5500 MHz	FCC Part 90	Pass	-35.8dBm @ 250349MHz (-22.8dB)

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:	J72039
Model:	Mercury 3650	T-Log Number:	T72175
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	RSS 119, FCC Part 90	Class:	N/A

Run #1: Maximum Power Measurements

Run #1a: Maximum Power Measurements, modulated at 5MHz

Freq.	Mod	BW	Setting	Pmeas	Ant. G	Cable	Duty Cycle	Pout
3653	BPSK	5 MHz	12	19.3	13.0	-3.0	100%	29.3
3662	BPSK	5 MHz	12	19.3	13.0	-3.0	100%	29.3
3672	BPSK	5 MHz	12	19.4	13.0	-3.0	100%	29.4
3653	QAM16	5 MHz	12	18.7	13.0	-3.0	100%	28.7
3662	QAM16	5 MHz	12	18.8	13.0	-3.0	100%	28.8
3672	QAM16	5 MHz	12	18.8	13.0	-3.0	100%	28.8
3653	QAM64	5 MHz	12	19.1	13.0	-3.0	100%	29.1
3662	QAM64	5 MHz	12	19.1	13.0	-3.0	100%	29.1
3672	QAM64	5 MHz	12	19.0	13.0	-3.0	100%	29.0
3653	QPSK	5 MHz	12	18.3	13.0	-3.0	100%	28.3
3662	QPSK	5 MHz	12	18.2	13.0	-3.0	100%	28.2
3672	QPSK	5 MHz	12	18.4	13.0	-3.0	100%	28.4

Note 1:	Output power measured ESI Test Receiver with RBW=100kHz VBW=300kHz and detector set to RMS.
Note 2:	BPSK modulation gives highest output, QPSK gives lowest.

Run #1b: Maximum Power Measurements, modulated at 1.75, 3.5, 7, 5, 10 & 14MHz using BPSK and QAM64 Modulation

Freq.	Mod	BW	Setting	Pmeas	Ant. G	Cable	Duty Cycle	Pout
3652	BPSK	1.75 MHz	21	20.2	13.0	-3.0	100%	30.2
3662	BPSK	1.75 MHz	21	20.6	13.0	-3.0	100%	30.6
3673	BPSK	1.75 MHz	21	19.9	13.0	-3.0	100%	29.9
3653	BPSK	3.5 MHz	23	22.0	13.0	-3.0	100%	32.0
3662	BPSK	3.5 MHz	23	22.1	13.0	-3.0	100%	32.1
3672	BPSK	3.5 MHz	23	21.6	13.0	-3.0	100%	31.6
3654	BPSK	5.0 MHz	23	22.3	13.0	-3.0	100%	32.3
3662	BPSK	5.0 MHz	23	22.0	13.0	-3.0	100%	32.0
3671	BPSK	5.0 MHz	23	21.7	13.0	-3.0	100%	31.7
3654	BPSK	7.0 MHz	23	22.6	13.0	-3.0	100%	32.6
3662	BPSK	7.0 MHz	23	22.5	13.0	-3.0	100%	32.5
3671	BPSK	7.0 MHz	23	22.2	13.0	-3.0	100%	32.2
3656	BPSK	10.0 MHz	23	22.0	13.0	-3.0	100%	32.0
3662	BPSK	10.0 MHz	23	21.9	13.0	-3.0	100%	31.9
3669	BPSK	10.0 MHz	23	21.6	13.0	-3.0	100%	31.6
3658	BPSK	14.0 MHz	23	22.3	13.0	-3.0	100%	32.3
3662	BPSK	14.0 MHz	23	21.8	13.0	-3.0	100%	31.8
3667	BPSK	14.0 MHz	23	21.8	13.0	-3.0	100%	31.8

Client:	GE MDS LLC	Job Number:	J72039
Model:	Mercury 3650	T-Log Number:	T72175
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	RSS 119, FCC Part 90	Class:	N/A

Freq.	Mod	BW	Setting	Pmeas	Ant. G	Cable	Duty Cycle	Pout
3652	BPSK	1.75 MHz	15	14.7	18.0	-3.0	100%	29.7
3662	BPSK	1.75 MHz	15	14.4	18.0	-3.0	100%	29.4
3673	BPSK	1.75 MHz	15	14.4	18.0	-3.0	100%	29.4
3653	BPSK	3.5 MHz	17	16.4	18.0	-3.0	100%	31.4
3662	BPSK	3.5 MHz	17	16.2	18.0	-3.0	100%	31.2
3672	BPSK	3.5 MHz	17	16.0	18.0	-3.0	100%	31.0
3654	BPSK	5.0 MHz	19	18.0	18.0	-3.0	100%	33.0
3662	BPSK	5.0 MHz	19	18.1	18.0	-3.0	100%	33.1
3671	BPSK	5.0 MHz	19	17.5	18.0	-3.0	100%	32.5
3654	BPSK	7.0 MHz	21	20.5	18.0	-3.0	100%	35.5
3662	BPSK	7.0 MHz	21	20.6	18.0	-3.0	100%	35.6
3671	BPSK	7.0 MHz	21	20.1	18.0	-3.0	100%	35.1
3656	BPSK	10.0 MHz	23	22.0	18.0	-3.0	100%	37.0
3662	BPSK	10.0 MHz	23	21.9	18.0	-3.0	100%	36.9
3669	BPSK	10.0 MHz	23	21.6	18.0	-3.0	100%	36.6
3658	BPSK	14.0 MHz	23	22.3	18.0	-3.0	100%	37.3
3662	BPSK	14.0 MHz	23	21.8	18.0	-3.0	100%	36.8
3667	BPSK	14.0 MHz	23	21.8	18.0	-3.0	100%	36.8

Freq.	Mod	BW	Setting	Pmeas	Ant. G	Cable	Duty Cycle	Pout
3652	QAM64	1.75 MHz	20	19.5	13.0	-3.0	100%	29.5
3662	QAM64	1.75 MHz	20	19.0	13.0	-3.0	100%	29.0
3673	QAM64	1.75 MHz	20	19.2	13.0	-3.0	100%	29.2
3653	QAM64	3.5 MHz	23	22.7	13.0	-3.0	100%	32.7
3662	QAM64	3.5 MHz	23	22.3	13.0	-3.0	100%	32.3
3672	QAM64	3.5 MHz	23	21.8	13.0	-3.0	100%	31.8
3654	QAM64	5.0 MHz	23	22.4	13.0	-3.0	100%	32.4
3662	QAM64	5.0 MHz	23	22.2	13.0	-3.0	100%	32.2
3671	QAM64	5.0 MHz	23	22.2	13.0	-3.0	100%	32.2
3654	QAM64	7.0 MHz	23	22.7	13.0	-3.0	100%	32.7
3662	QAM64	7.0 MHz	23	22.4	13.0	-3.0	100%	32.4
3671	QAM64	7.0 MHz	23	22.3	13.0	-3.0	100%	32.3
3656	QAM64	10.0 MHz	23	21.9	13.0	-3.0	100%	31.9
3662	QAM64	10.0 MHz	23	21.7	13.0	-3.0	100%	31.7
3669	QAM64	10.0 MHz	23	21.8	13.0	-3.0	100%	31.8
3658	QAM64	14.0 MHz	23	22.1	13.0	-3.0	100%	32.1
3662	QAM64	14.0 MHz	23	22.0	13.0	-3.0	100%	32.0
3667	QAM64	14.0 MHz	23	21.8	13.0	-3.0	100%	31.8

Client:	GE MDS LLC	Job Number:	J72039
Model:	Mercury 3650	T-Log Number:	T72175
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	RSS 119, FCC Part 90	Class:	N/A

Freq.	Mod	BW	Setting	Pmeas	Ant. G	Cable	Duty Cycle	Pout
3652	QAM64	1.75 MHz	14	13.9	18.0	-3.0	100%	28.9
3662	QAM64	1.75 MHz	14	13.5	18.0	-3.0	100%	28.5
3673	QAM64	1.75 MHz	14	14.0	18.0	-3.0	100%	29.0
3653	QAM64	3.5 MHz	17	14.7	18.0	-3.0	100%	29.7
3662	QAM64	3.5 MHz	17	13.7	18.0	-3.0	100%	28.7
3672	QAM64	3.5 MHz	17	14.0	18.0	-3.0	100%	29.0
3654	QAM64	5.0 MHz	19	14.3	18.0	-3.0	100%	29.3
3662	QAM64	5.0 MHz	19	14.5	18.0	-3.0	100%	29.5
3671	QAM64	5.0 MHz	19	14.9	18.0	-3.0	100%	29.9
3654	QAM64	7.0 MHz	20	14.8	18.0	-3.0	100%	29.8
3662	QAM64	7.0 MHz	20	14.0	18.0	-3.0	100%	29.0
3671	QAM64	7.0 MHz	20	14.7	18.0	-3.0	100%	29.7
3656	QAM64	10.0 MHz	23	14.6	18.0	-3.0	100%	29.6
3662	QAM64	10.0 MHz	23	14.4	18.0	-3.0	100%	29.4
3669	QAM64	10.0 MHz	23	14.7	18.0	-3.0	100%	29.7
3658	QAM64	14.0 MHz	23	14.2	18.0	-3.0	100%	29.2
3662	QAM64	14.0 MHz	23	14.8	18.0	-3.0	100%	29.8
3667	QAM64	14.0 MHz	23	13.4	18.0	-3.0	100%	28.4

Run #2: Signal Bandwidth, 5MHz

Run #2a: Signal Bandwidth, 5MHz

Power Setting	Mod Type	BW Type	Frequency (MHz)	Resolution Bandwidth	99% BW (MHz)		
23	BPSK	5 MHz	3653	1 MHz	6.8		
23	BPSK	5 MHz	3662	1 MHz	6.8		
23	BPSK	5 MHz	3672	1 MHz	6.8		
23	QAM16	5 MHz	3653	1 MHz	7.0		
23	QAM16	5 MHz	3662	1 MHz	7.0		
23	QAM16	5 MHz	3672	1 MHz	7.0		
23	QAM64	5 MHz	3653	1 MHz	7.3		
23	QAM64	5 MHz	3662	1 MHz	7.2		
23	QAM64	5 MHz	3672	1 MHz	7.2		
23	QPSK	5 MHz	3653	1 MHz	7.0		
23	QPSK	5 MHz	3662	1 MHz	7.0		
23	QPSK	5 MHz	3672	1 MHz	7.0		

Note 1:	Based on result from run 2a, PSD and bandwidth were tested at highest and lowest PSD and bandwidth. BPSK had highest PSD and lowest bandwidth values. QAM64 had lowest PSD and highest bandwidth values.

Client:	GE MDS LLC	Job Number:	J72039
Model:	Mercury 3650	T-Log Number:	T72175
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	RSS 119, FCC Part 90	Class:	N/A

Run #2b: Signal Bandwidth and PSD, 1.75, 3.5, 5, 7, 10 & 14MHz using BPSK and QAM64 Modulation

13dBi - 3dB cable

Power Setting	Mod Type	BW Type	Frequency (MHz)	Resolution Bandwidth	99% BW (MHz)	Resolution Bandwidth	PSD dBm/MHz	PSD (eirp)
21	BPSK	1.75 MHz	3652	100 kHz	1.7	1 MHz	19.8	29.8
21	BPSK	1.75 MHz	3662	100 kHz	1.7	1 MHz	19.8	29.8
21	BPSK	1.75 MHz	3673	100 kHz	1.7	1 MHz	19.7	29.7
23	BPSK	3.5 MHz	3653	100 kHz	3.2	1 MHz	19.9	29.9
23	BPSK	3.5 MHz	3662	100 kHz	3.2	1 MHz	19.7	29.7
23	BPSK	3.5 MHz	3672	100 kHz	3.2	1 MHz	18.8	28.8
23	BPSK	5.0 MHz	3653	100 kHz	4.6	1 MHz	17.9	27.9
23	BPSK	5.0 MHz	3662	100 kHz	4.6	1 MHz	17.2	27.2
23	BPSK	5.0 MHz	3672	100 kHz	4.6	1 MHz	17.2	27.2
23	BPSK	7.0 MHz	3654	100 kHz	6.3	1 MHz	16.7	26.7
23	BPSK	7.0 MHz	3662	100 kHz	6.3	1 MHz	16.4	26.4
23	BPSK	7.0 MHz	3671	100 kHz	6.3	1 MHz	17.0	27.0
23	BPSK	10.0 MHz	3656	300 kHz	9.2	1 MHz	14.6	24.6
23	BPSK	10.0 MHz	3662	300 kHz	9.2	1 MHz	14.5	24.5
23	BPSK	10.0 MHz	3669	300 kHz	9.2	1 MHz	14.1	24.1
23	BPSK	14.0 MHz	3658	300 kHz	12.6	1 MHz	13.2	23.2
23	BPSK	14.0 MHz	3662	300 kHz	12.6	1 MHz	14.0	24.0
23	BPSK	14.0 MHz	3667	300 kHz	12.7	1 MHz	13.2	23.2

18dBi - 3dB cable

Power Setting	Mod Type	BW Type	Frequency (MHz)	Resolution Bandwidth	99% BW (MHz)	Resolution Bandwidth	PSD dBm/MHz	PSD (eirp)
15	BPSK	1.75 MHz	3652	100 kHz	1.7	1 MHz	14.7	29.7
15	BPSK	1.75 MHz	3662	100 kHz	1.7	1 MHz	14.9	29.9
15	BPSK	1.75 MHz	3673	100 kHz	1.7	1 MHz	14.0	29.0
17	BPSK	3.5 MHz	3653	100 kHz	3.2	1 MHz	14.4	29.4
17	BPSK	3.5 MHz	3662	100 kHz	3.2	1 MHz	14.0	29.0
17	BPSK	3.5 MHz	3672	100 kHz	3.2	1 MHz	13.5	28.5
19	BPSK	5.0 MHz	3653	100 kHz	4.6	1 MHz	14.5	29.5
19	BPSK	5.0 MHz	3662	100 kHz	4.5	1 MHz	14.1	29.1
19	BPSK	5.0 MHz	3672	100 kHz	4.6	1 MHz	14.1	29.1
21	BPSK	7.0 MHz	3654	100 kHz	6.3	1 MHz	14.8	29.8
21	BPSK	7.0 MHz	3662	100 kHz	6.3	1 MHz	14.8	29.8
21	BPSK	7.0 MHz	3671	100 kHz	6.3	1 MHz	14.6	29.6
23	BPSK	10.0 MHz	3656	300 kHz	9.2	1 MHz	14.6	29.6
23	BPSK	10.0 MHz	3662	300 kHz	9.2	1 MHz	14.5	29.5
23	BPSK	10.0 MHz	3669	300 kHz	9.2	1 MHz	14.1	29.1
23	BPSK	14.0 MHz	3658	300 kHz	12.6	1 MHz	13.2	28.2
23	BPSK	14.0 MHz	3662	300 kHz	12.6	1 MHz	14.0	29.0
23	BPSK	14.0 MHz	3667	300 kHz	12.7	1 MHz	13.2	28.2

Client:	GE MDS LLC	Job Number:	J72039
Model:	Mercury 3650	T-Log Number:	T72175
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	RSS 119, FCC Part 90	Class:	N/A

13dBi - 3dB cable

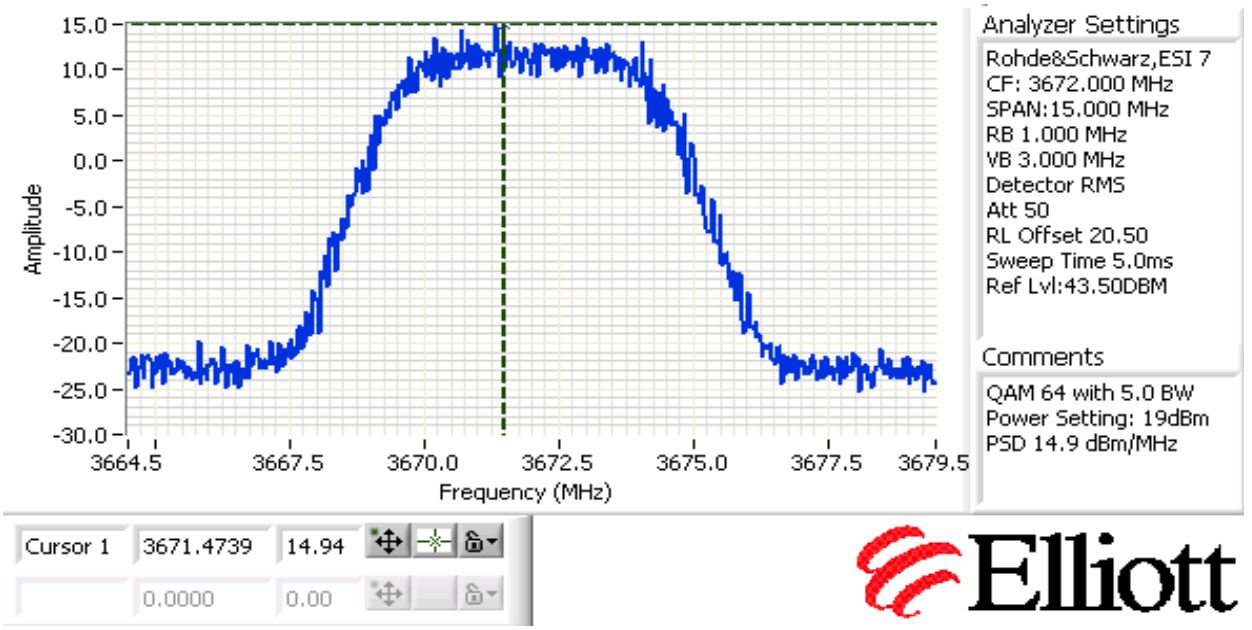
Power Setting	Mod Type	BW Type	Frequency (MHz)	Resolution Bandwidth	99% BW (MHz)	Resolution Bandwidth	PSD dBm/MHz	PSD (eirp)
20	QAM64	1.75 MHz	3652	100 kHz	1.7	1 MHz	19.3	29.3
20	QAM64	1.75 MHz	3662	100 kHz	1.7	1 MHz	19.2	29.2
20	QAM64	1.75 MHz	3673	100 kHz	1.7	1 MHz	18.6	28.6
23	QAM64	3.5 MHz	3653	100 kHz	3.2	1 MHz	19.6	29.6
23	QAM64	3.5 MHz	3662	100 kHz	3.2	1 MHz	19.7	29.7
23	QAM64	3.5 MHz	3672	100 kHz	3.2	1 MHz	19.7	29.7
23	QAM64	5.0 MHz	3653	100 kHz	4.5	1 MHz	19.1	29.1
23	QAM64	5.0 MHz	3662	100 kHz	4.6	1 MHz	18.2	28.2
23	QAM64	5.0 MHz	3672	100 kHz	4.6	1 MHz	17.8	27.8
23	QAM64	7.0 MHz	3654	100 kHz	6.4	1 MHz	17.7	27.7
23	QAM64	7.0 MHz	3662	100 kHz	6.3	1 MHz	16.8	26.8
23	QAM64	7.0 MHz	3671	100 kHz	6.3	1 MHz	16.9	26.9
23	QAM64	10.0 MHz	3656	300 kHz	9.2	1 MHz	14.6	24.6
23	QAM64	10.0 MHz	3662	300 kHz	9.2	1 MHz	14.4	24.4
23	QAM64	10.0 MHz	3669	300 kHz	9.2	1 MHz	14.7	24.7
23	QAM64	14.0 MHz	3658	300 kHz	12.7	1 MHz	14.2	24.2
23	QAM64	14.0 MHz	3662	300 kHz	12.6	1 MHz	14.8	24.8
23	QAM64	14.0 MHz	3667	300 kHz	12.5	1 MHz	13.4	23.4

18dBi - 3dB cable

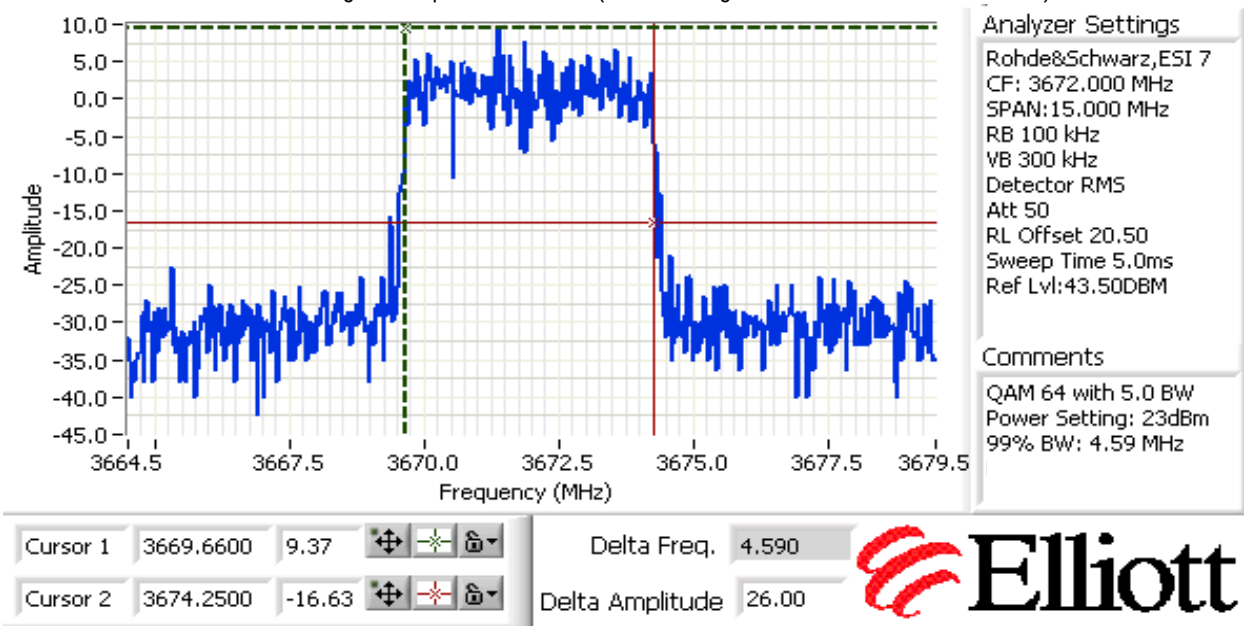
Power Setting	Mod Type	BW Type	Frequency (MHz)	Resolution Bandwidth	99% BW (MHz)	Resolution Bandwidth	PSD dBm/MHz	PSD (eirp)
14	QAM64	1.75 MHz	3652	100 kHz	1.7	1 MHz	13.9	28.9
14	QAM64	1.75 MHz	3662	100 kHz	1.6	1 MHz	13.5	28.5
14	QAM64	1.75 MHz	3673	100 kHz	1.7	1 MHz	14.0	29.0
17	QAM64	3.5 MHz	3653	100 kHz	3.2	1 MHz	14.7	29.7
17	QAM64	3.5 MHz	3662	100 kHz	3.2	1 MHz	13.7	28.7
17	QAM64	3.5 MHz	3672	100 kHz	3.2	1 MHz	14.0	29.0
19	QAM64	5.0 MHz	3653	100 kHz	4.6	1 MHz	14.3	29.3
19	QAM64	5.0 MHz	3662	100 kHz	4.6	1 MHz	14.5	29.5
19	QAM64	5.0 MHz	3672	100 kHz	4.6	1 MHz	14.9	29.9
20	QAM64	7.0 MHz	3654	100 kHz	6.3	1 MHz	14.8	29.8
20	QAM64	7.0 MHz	3662	100 kHz	6.3	1 MHz	14.0	29.0
20	QAM64	7.0 MHz	3671	100 kHz	6.3	1 MHz	14.7	29.7
23	QAM64	10.0 MHz	3656	300 kHz	9.2	1 MHz	14.6	29.6
23	QAM64	10.0 MHz	3662	300 kHz	9.2	1 MHz	14.4	29.4
23	QAM64	10.0 MHz	3669	300 kHz	9.2	1 MHz	14.7	29.7
23	QAM64	14.0 MHz	3658	300 kHz	12.7	1 MHz	14.2	29.2
23	QAM64	14.0 MHz	3662	300 kHz	12.6	1 MHz	14.8	29.8
23	QAM64	14.0 MHz	3667	300 kHz	12.5	1 MHz	13.4	28.4

Note 1: PSD measured with ESI Test Receiver with RBW=1MHz VBW=3MHz and detector set to RMS.

Client:	GE MDS LLC	Job Number:	J72039
Model:	Mercury 3650	T-Log Number:	T72175
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	RSS 119, FCC Part 90	Class:	N/A



Highest amplitude PSD Plot (Same settings used for all PSD measurments)



Highest Amplitude Power Plot (Same settings used for all power measurments)

Client:	GE MDS LLC	Job Number:	J72039
Model:	Mercury 3650	T-Log Number:	T72175
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	RSS 119, FCC Part 90	Class:	N/A

Run #3: Unwanted emissions (Masks), Power Setting of 23, QAM64 modulation

Elliott

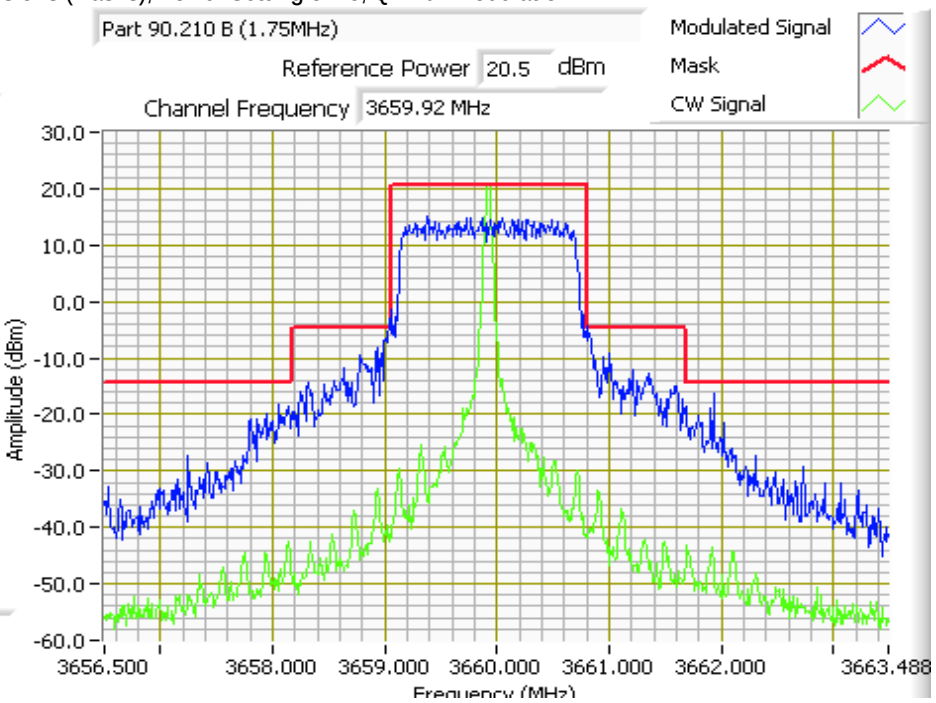
Analyzer Settings

Max Hold 10
CF: 3660.00 MHz
SPAN:7.000 MHz
RB 30 kHz
VB 100 kHz
Detector POS
Att 10
RL Offset 0.00
Sweep Time 50.0ms
Ref Lvl:0.00DBM

Notes

Analyzer HP8564E

PASS



Elliott

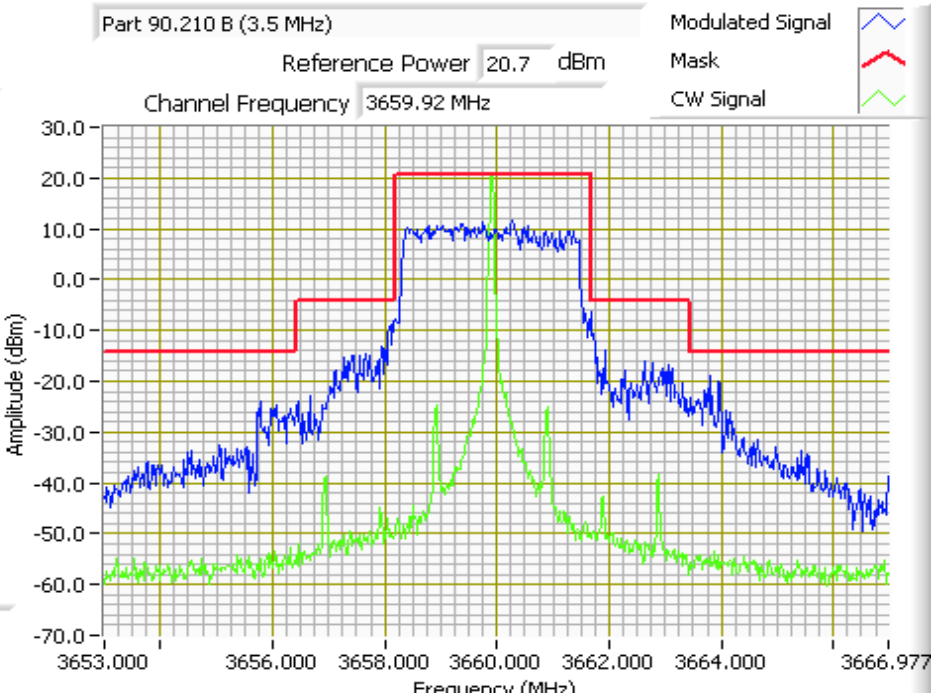
Analyzer Settings

Max Hold 10
CF: 3660.00 MHz
SPAN:14.00 MHz
RB 30 kHz
VB 100 kHz
Detector POS
Att 10
RL Offset 0.00
Sweep Time 50.0ms
Ref Lvl:0.00DBM

Notes

Analyzer HP8564E

PASS



Client:	GE MDS LLC	Job Number:	J72039
Model:	Mercury 3650	T-Log Number:	T72175
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	RSS 119, FCC Part 90	Class:	N/A

Elliott

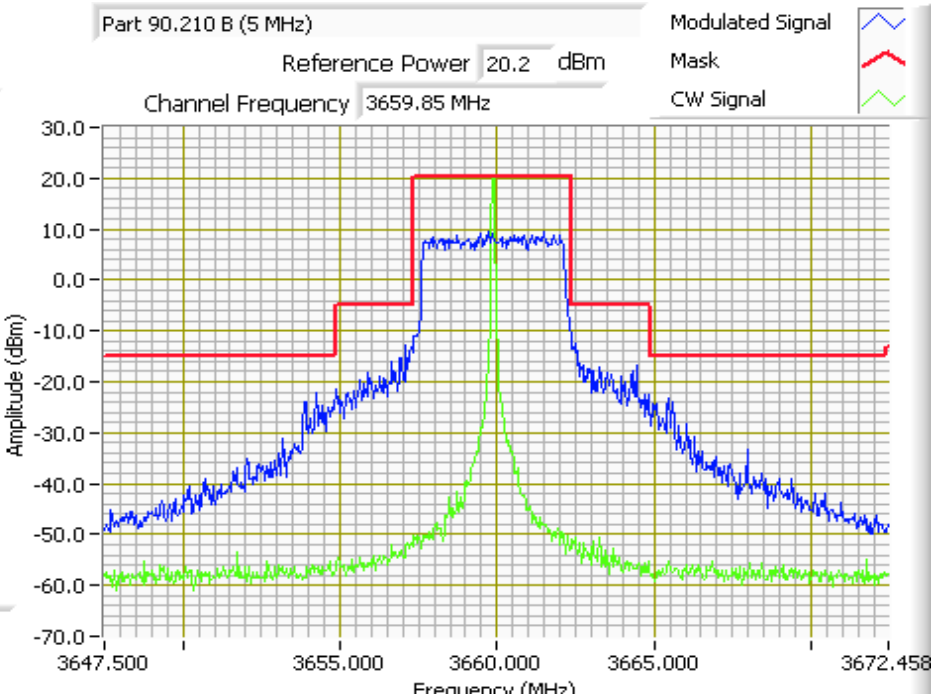
Analyzer Settings

Max Hold 10
CF: 3660.00 MHz
SPAN:25.00 MHz
RB 30 kHz
VB 100 kHz
Detector POS
Att 10
RL Offset 0.00
Sweep Time 70.0ms
Ref Lvl:0.00DBM

Notes

Analyzer HP8564E

PASS



Elliott

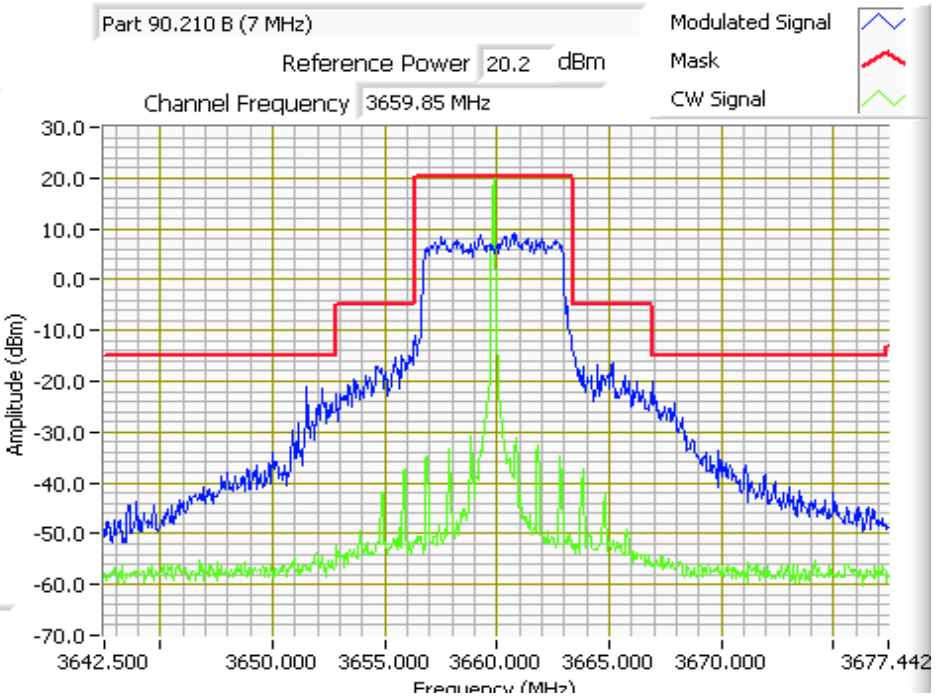
Analyzer Settings

Max Hold 10
CF: 3660.00 MHz
SPAN:35.00 MHz
RB 30 kHz
VB 100 kHz
Detector POS
Att 10
RL Offset 0.00
Sweep Time 98.0ms
Ref Lvl:0.00DBM

Notes

Analyzer HP8564E

PASS



Client:	GE MDS LLC	Job Number:	J72039
Model:	Mercury 3650	T-Log Number:	T72175
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	RSS 119, FCC Part 90	Class:	N/A

Elliott

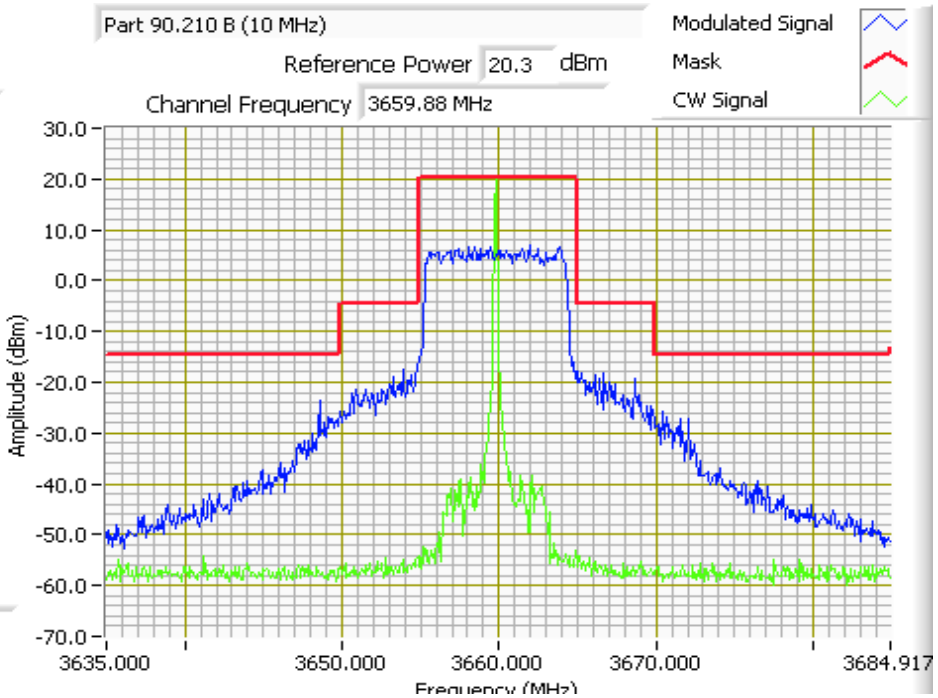
Analyzer Settings

Max Hold 10
CF: 3660.00 MHz
SPAN:50.00 MHz
RB 30 kHz
VB 100 kHz
Detector POS
Att 10
RL Offset 0.00
Sweep Time 140.0ms
Ref Lvl:0.00DBM

Notes

Analyzer HP8564E

PASS



Elliott

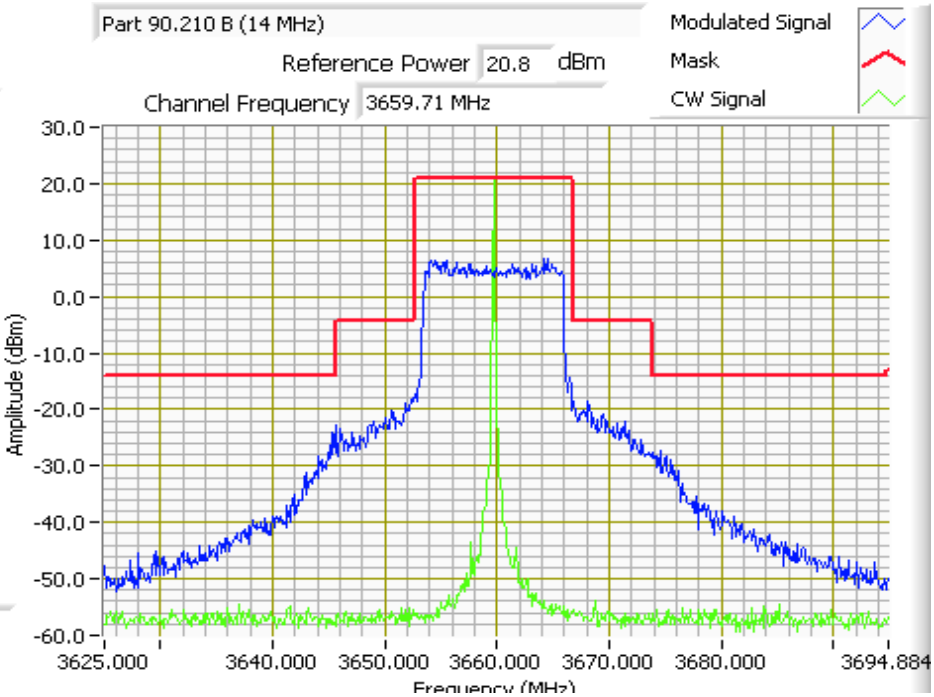
Analyzer Settings

Max Hold 10
CF: 3660.00 MHz
SPAN:70.00 MHz
RB 30 kHz
VB 100 kHz
Detector POS
Att 10
RL Offset 0.00
Sweep Time 200.0ms
Ref Lvl:-0.50DBM

Notes

Analyzer HP8564E

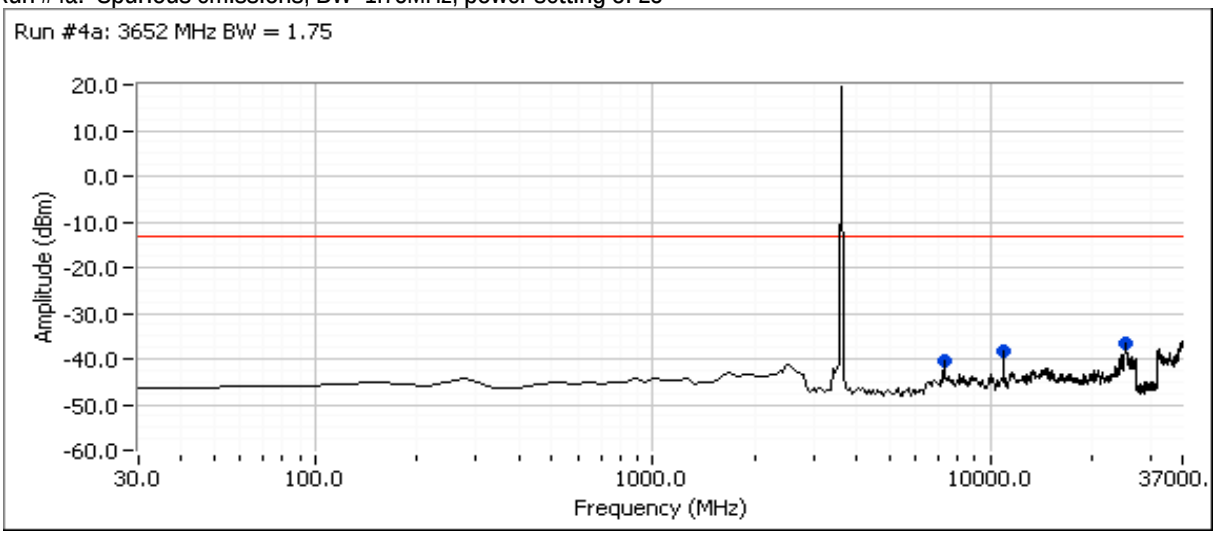
PASS

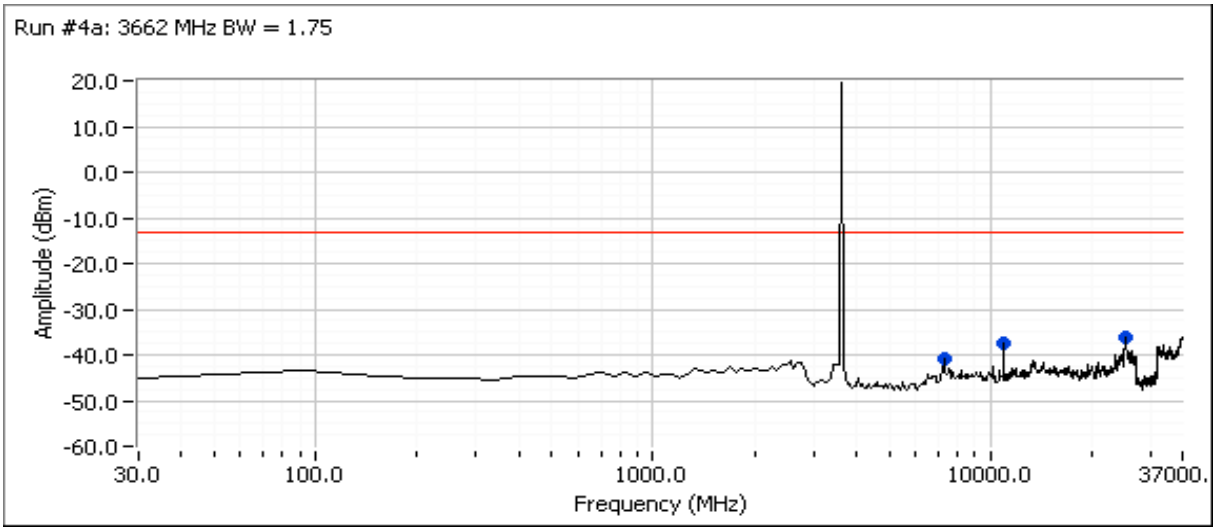


Client:	GE MDS LLC	Job Number:	J72039
Model:	Mercury 3650	T-Log Number:	T72175
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	RSS 119, FCC Part 90	Class:	N/A

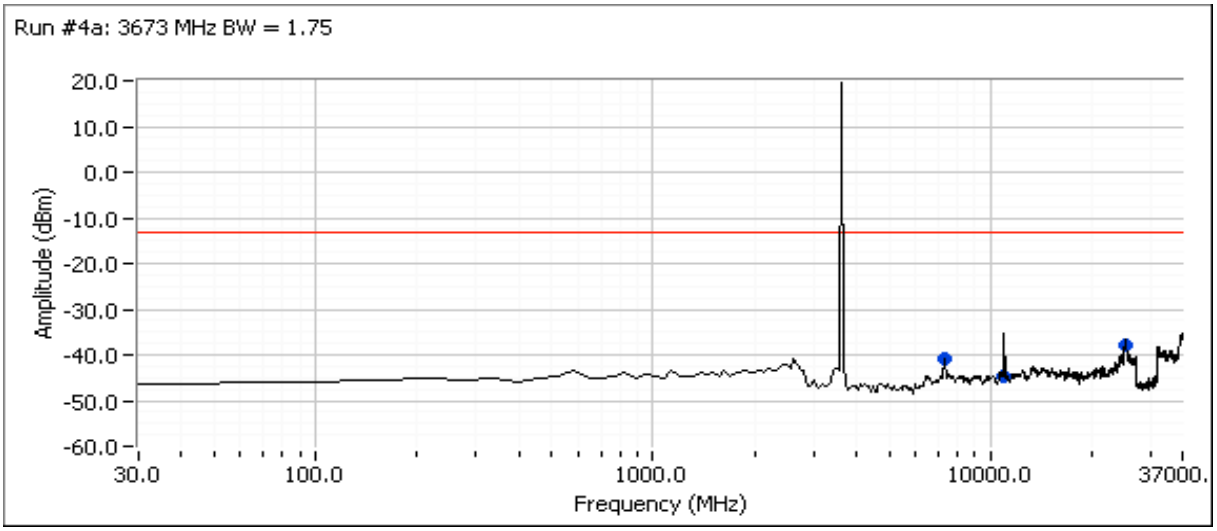
Run #4: Antenna Port Conducted Spurious Emissions 30 - 37000 MHz

Run #4a: Spurious emissions, BW=1.75MHz, power setting of 23





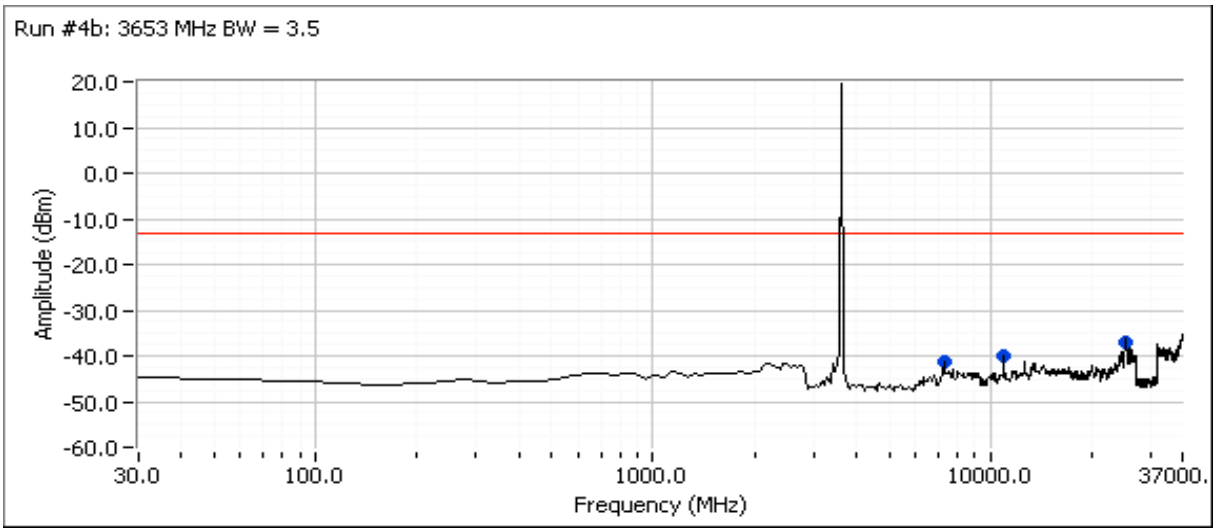
Client:	GE MDS LLC	Job Number:	J72039
Model:	Mercury 3650	T-Log Number:	T72175
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	RSS 119, FCC Part 90	Class:	N/A

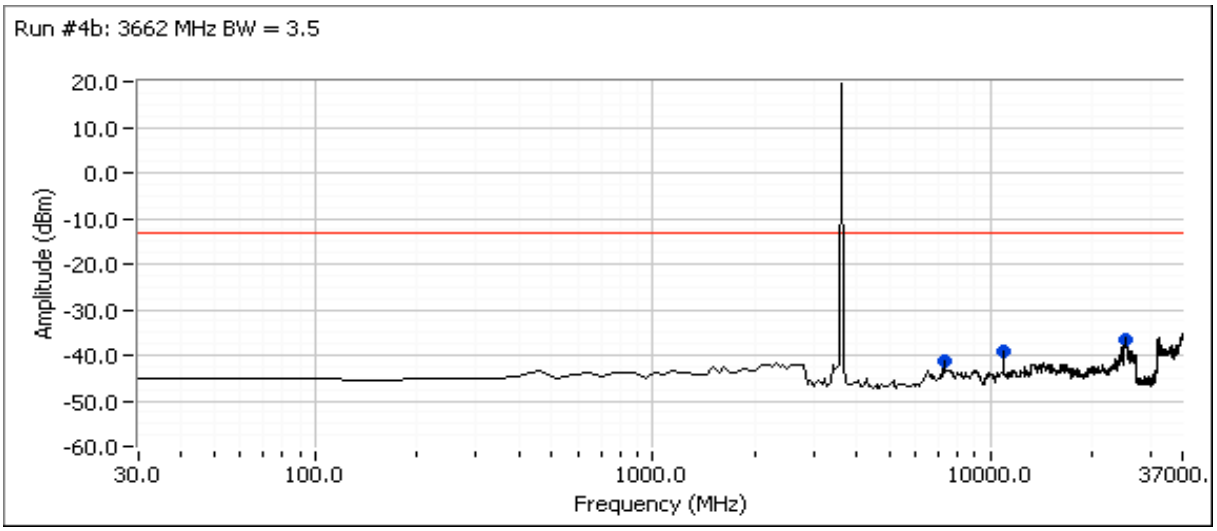


Frequency	Level	Port	FCC Part 90		Detector	Channel	Mode	Comments
MHz	dBm		Limit	Margin				
7304.460	-40.3	RF Port	-13.0	-27.3	Peak	3652	BPSK	1.75 MHz
10956.450	-38.2	RF Port	-13.0	-25.2	Peak	3652	BPSK	1.75 MHz
25083.990	-36.8	RF Port	-13.0	-23.8	Peak	3652	BPSK	1.75 MHz
7324.000	-40.7	RF Port	-13.0	-27.7	Peak	3662	BPSK	1.75 MHz
10979.830	-37.5	RF Port	-13.0	-24.5	Peak	3662	BPSK	1.75 MHz
25050.460	-36.3	RF Port	-13.0	-23.3	Peak	3662	BPSK	1.75 MHz
7347.520	-41.0	RF Port	-13.0	-28.0	Peak	3673	BPSK	1.75 MHz
11019.500	-44.5	RF Port	-13.0	-31.5	Peak	3673	BPSK	1.75 MHz
25056.920	-38.0	RF Port	-13.0	-25.0	Peak	3673	BPSK	1.75 MHz

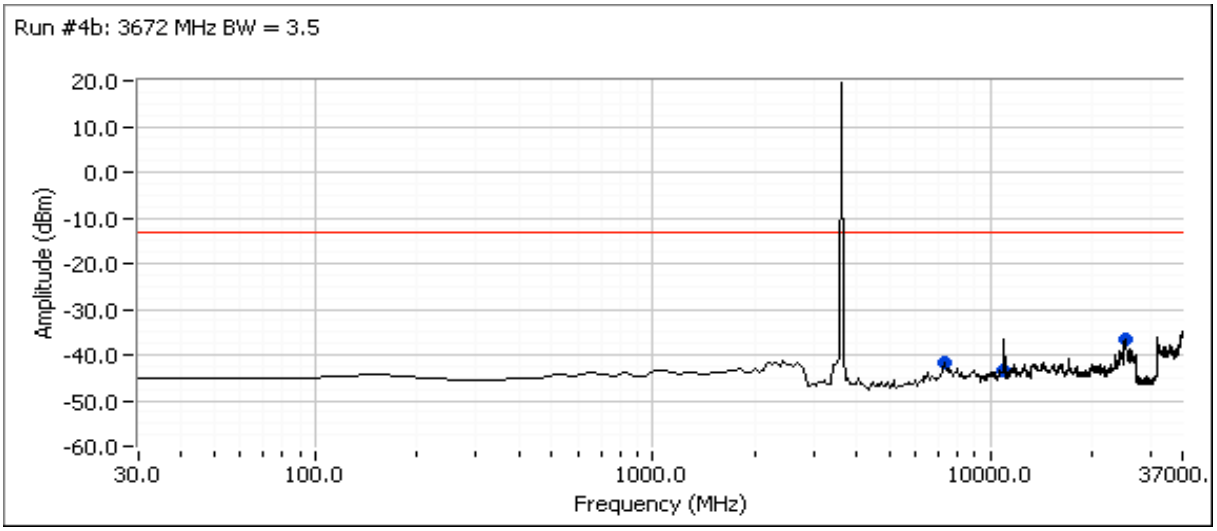
Client:	GE MDS LLC	Job Number:	J72039
Model:	Mercury 3650	T-Log Number:	T72175
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	RSS 119, FCC Part 90	Class:	N/A

Run #4b: Spurious emissions, BW=3.5MHz, power setting of 23





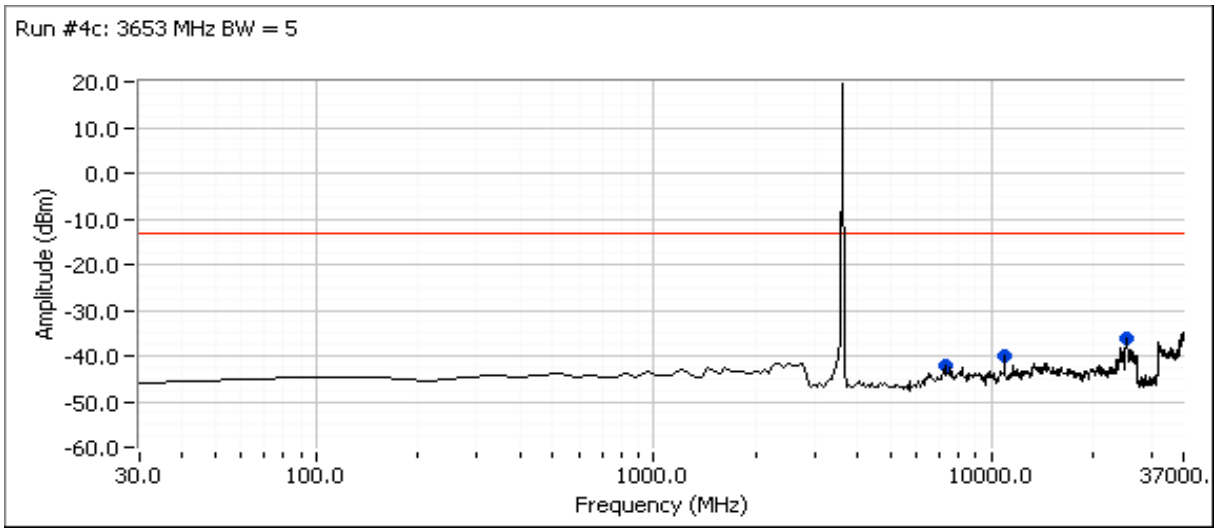
Client:	GE MDS LLC	Job Number:	J72039
Model:	Mercury 3650	T-Log Number:	T72175
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	RSS 119, FCC Part 90	Class:	N/A

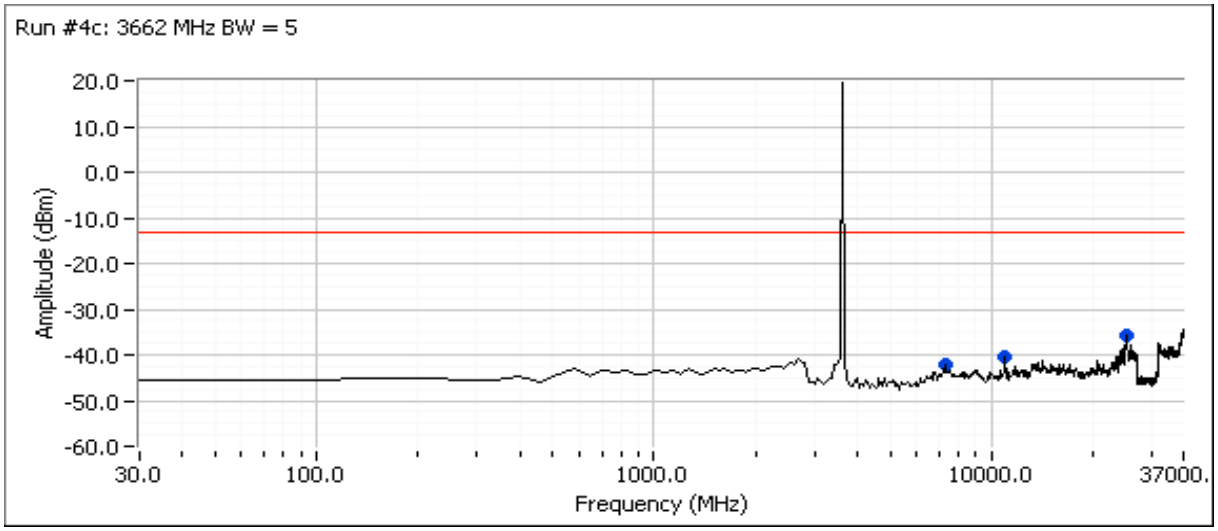


Frequency MHz	Level dBm	Port	FCC Part 90 Limit	FCC Part 90 Margin	Detector	Channel	Mode	Comments
7305.690	-41.3	RF Port	-13.0	-28.3	Peak	3653	BPSK	3.5 MHz
10960.140	-39.8	RF Port	-13.0	-26.8	Peak	3653	BPSK	3.5 MHz
25047.080	-37.0	RF Port	-13.0	-24.0	Peak	3653	BPSK	3.5 MHz
7324.450	-41.2	RF Port	-13.0	-28.2	Peak	3662	BPSK	3.5 MHz
10983.820	-39.0	RF Port	-13.0	-26.0	Peak	3662	BPSK	3.5 MHz
25070.150	-36.5	RF Port	-13.0	-23.5	Peak	3662	BPSK	3.5 MHz
7344.750	-41.5	RF Port	-13.0	-28.5	Peak	3672	BPSK	3.5 MHz
11014.270	-43.5	RF Port	-13.0	-30.5	Peak	3672	BPSK	3.5 MHz
25101.520	-36.8	RF Port	-13.0	-23.8	Peak	3672	BPSK	3.5 MHz

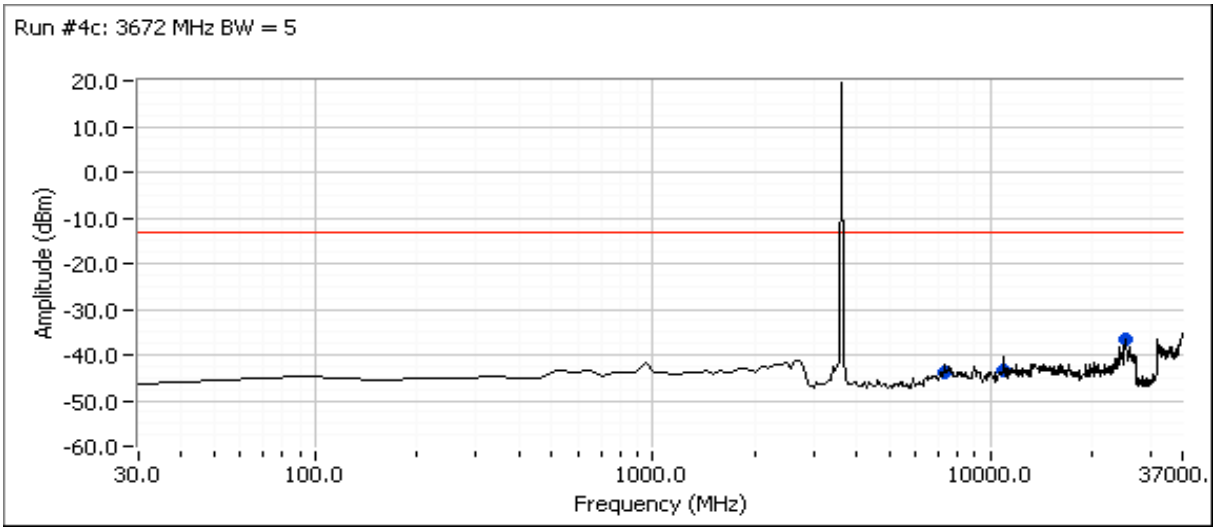
Client:	GE MDS LLC	Job Number:	J72039
Model:	Mercury 3650	T-Log Number:	T72175
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	RSS 119, FCC Part 90	Class:	N/A

Run #4c: Spurious emissions, BW=5MHz, power setting of 23





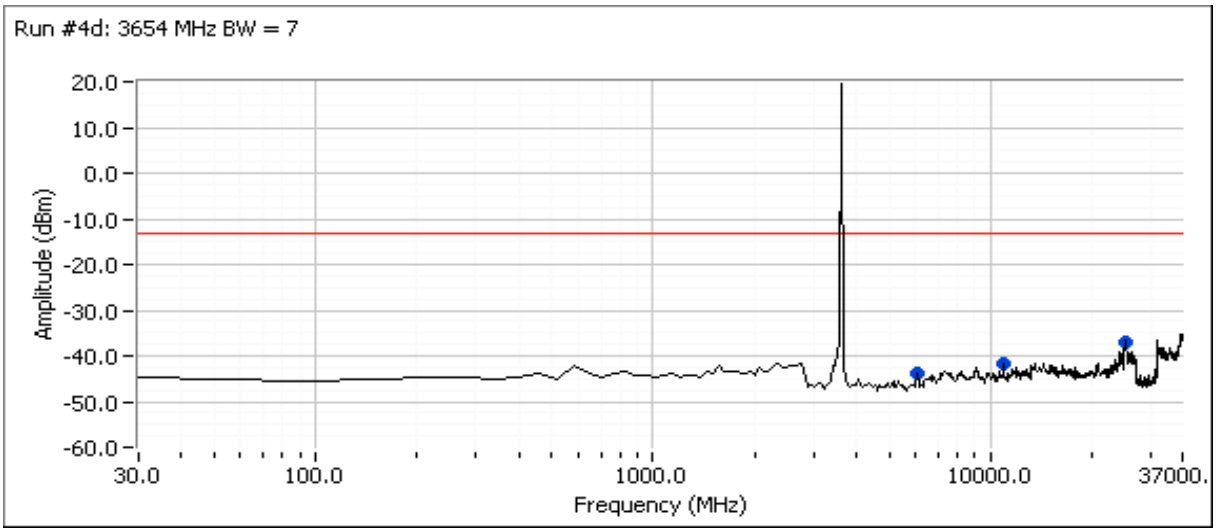
Client:	GE MDS LLC	Job Number:	J72039
Model:	Mercury 3650	T-Log Number:	T72175
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	RSS 119, FCC Part 90	Class:	N/A

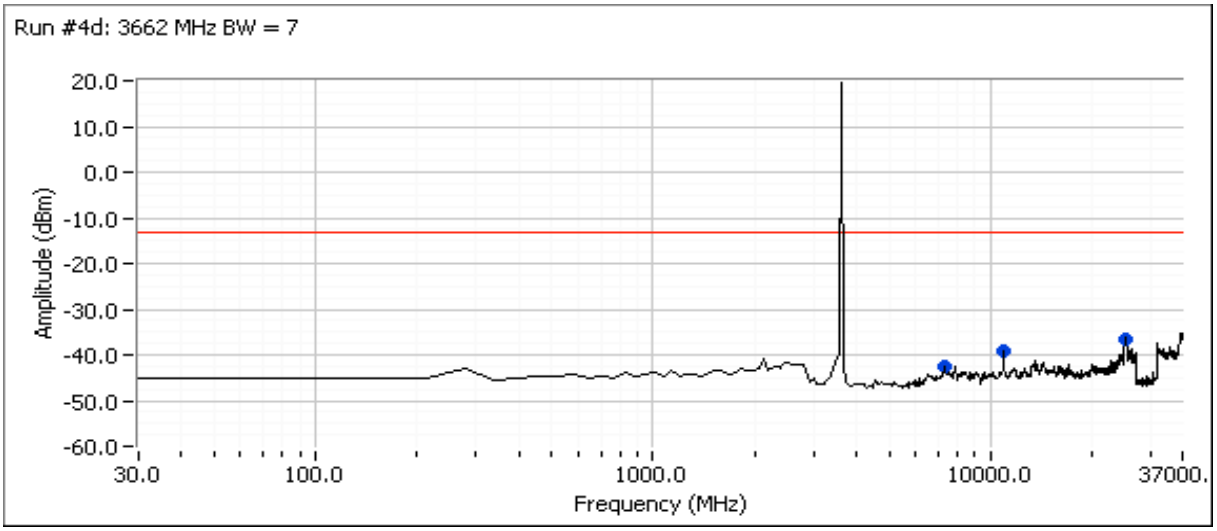


Frequency	Level	Port	FCC Part 90		Detector	Channel	Mode	Comments
MHz	dBm		Limit	Margin				
7306.920	-42.3	RF Port	-13.0	-29.3	Peak	3653	BPSK	5 MHz
10957.070	-40.2	RF Port	-13.0	-27.2	Peak	3653	BPSK	5 MHz
25048.620	-36.0	RF Port	-13.0	-23.0	Peak	3653	BPSK	5 MHz
7323.220	-42.2	RF Port	-13.0	-29.2	Peak	3662	BPSK	5 MHz
10988.130	-40.3	RF Port	-13.0	-27.3	Peak	3662	BPSK	5 MHz
25034.160	-35.8	RF Port	-13.0	-22.8	Peak	3662	BPSK	5 MHz
7344.140	-43.8	RF Port	-13.0	-30.8	Peak	3672	BPSK	5 MHz
11013.660	-43.2	RF Port	-13.0	-30.2	Peak	3672	BPSK	5 MHz
25061.840	-36.7	RF Port	-13.0	-23.7	Peak	3672	BPSK	5 MHz

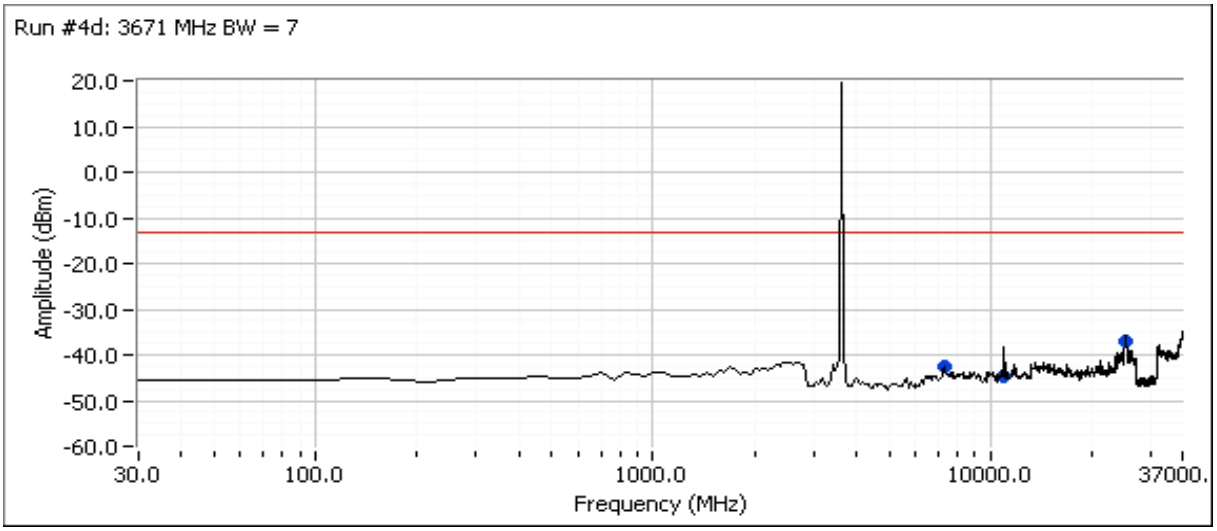
Client:	GE MDS LLC	Job Number:	J72039
Model:	Mercury 3650	T-Log Number:	T72175
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	RSS 119, FCC Part 90	Class:	N/A

Run #4d: Spurious emissions, BW=7MHz, power setting of 23





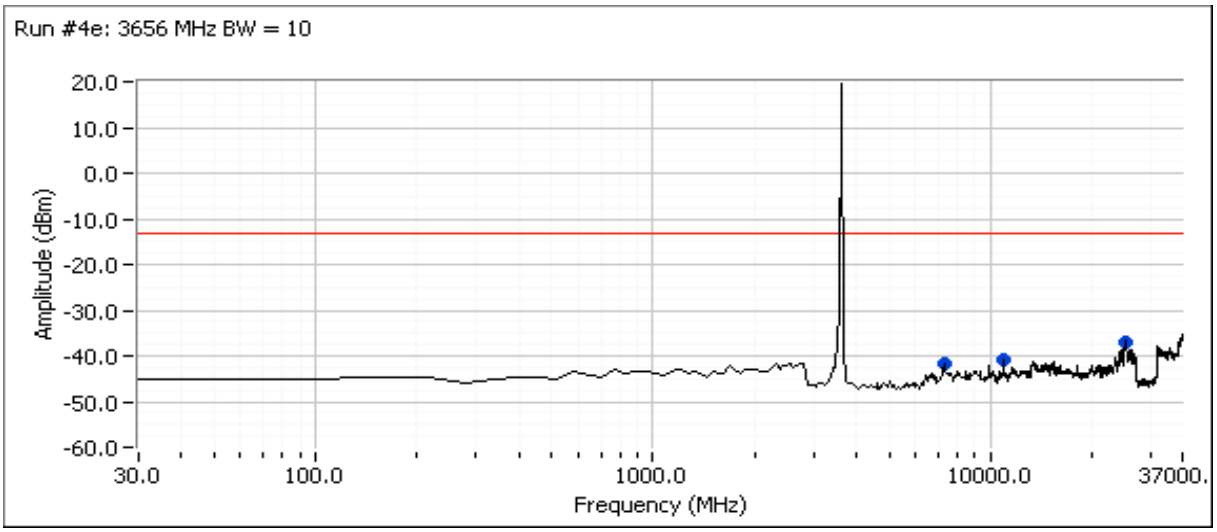
Client:	GE MDS LLC	Job Number:	J72039
Model:	Mercury 3650	T-Log Number:	T72175
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	RSS 119, FCC Part 90	Class:	N/A

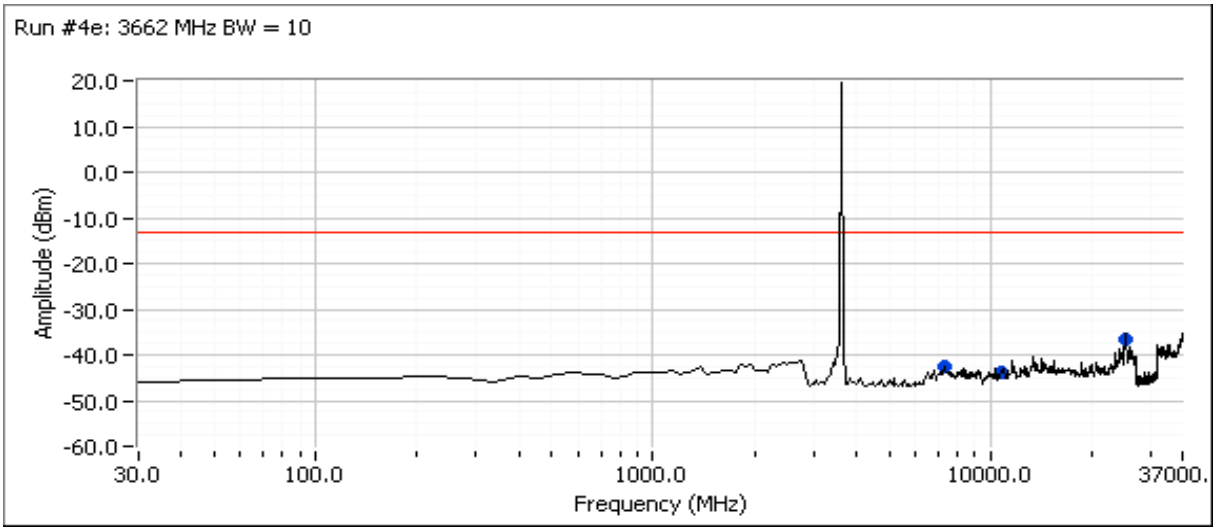


Frequency MHz	Level dBm	Port	FCC Part 90 Limit	FCC Part 90 Margin	Detector	Channel	Mode	Comments
7310.150	-43.8	RF Port	-13.0	-30.8	Peak	3654	BPSK	7 MHz
10959.220	-41.8	RF Port	-13.0	-28.8	Peak	3654	BPSK	7 MHz
25087.990	-37.2	RF Port	-13.0	-24.2	Peak	3654	BPSK	7 MHz
7324.760	-42.7	RF Port	-13.0	-29.7	Peak	3662	BPSK	7 MHz
10987.510	-39.3	RF Port	-13.0	-26.3	Peak	3662	BPSK	7 MHz
25046.470	-36.5	RF Port	-13.0	-23.5	Peak	3662	BPSK	7 MHz
7342.600	-42.5	RF Port	-13.0	-29.5	Peak	3671	BPSK	7 MHz
11013.970	-44.7	RF Port	-13.0	-31.7	Peak	3671	BPSK	7 MHz
25067.690	-37.2	RF Port	-13.0	-24.2	Peak	3671	BPSK	7 MHz

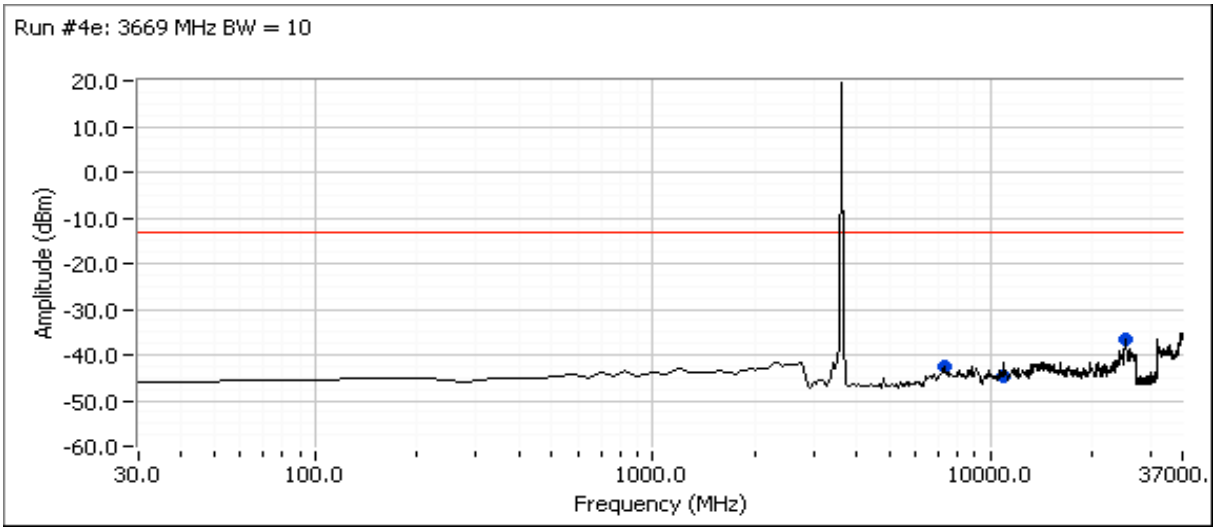
Client:	GE MDS LLC	Job Number:	J72039
Model:	Mercury 3650	T-Log Number:	T72175
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	RSS 119, FCC Part 90	Class:	N/A

Run #4e: Spurious emissions, BW=10MHz, power setting of 23





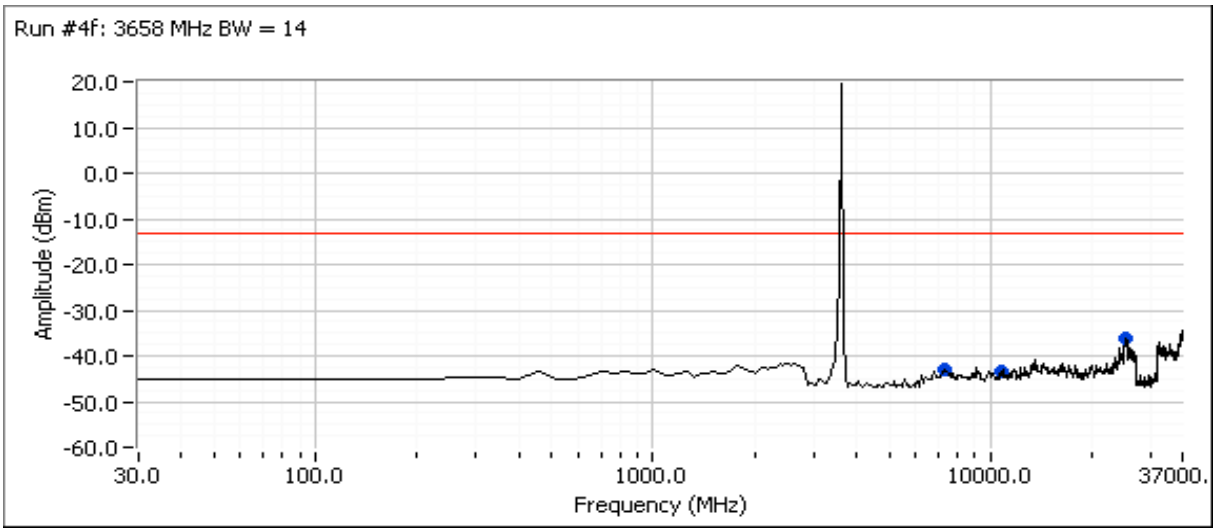
Client:	GE MDS LLC	Job Number:	J72039
Model:	Mercury 3650	T-Log Number:	T72175
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	RSS 119, FCC Part 90	Class:	N/A

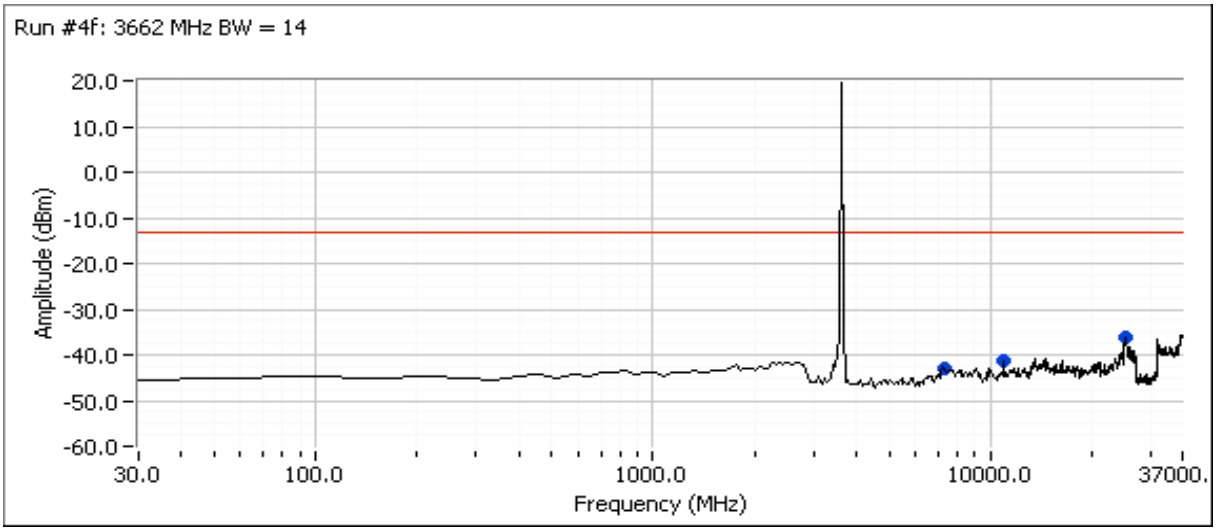


Frequency	Level	Port	FCC Part 90		Detector	Channel	Mode	Comments
MHz	dBm		Limit	Margin				
7312.000	-41.5	RF Port	-13.0	-28.5	Peak	3656	BPSK	10 MHz
10968.060	-40.7	RF Port	-13.0	-27.7	Peak	3656	BPSK	10 MHz
25073.840	-37.0	RF Port	-13.0	-24.0	Peak	3656	BPSK	10 MHz
7324.150	-42.7	RF Port	-13.0	-29.7	Peak	3662	BPSK	10 MHz
10986.620	-44.0	RF Port	-13.0	-31.0	Peak	3662	BPSK	10 MHz
25062.150	-36.5	RF Port	-13.0	-23.5	Peak	3662	BPSK	10 MHz
7338.290	-42.7	RF Port	-13.0	-29.7	Peak	3669	BPSK	10 MHz
11007.510	-44.7	RF Port	-13.0	-31.7	Peak	3669	BPSK	10 MHz
25070.150	-36.7	RF Port	-13.0	-23.7	Peak	3669	BPSK	10 MHz

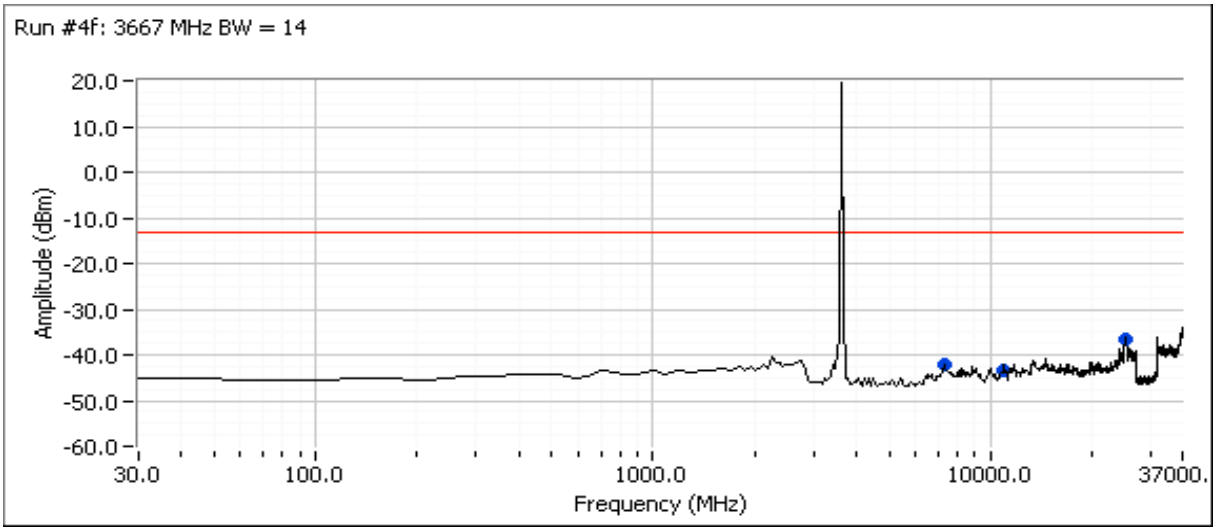
Client:	GE MDS LLC	Job Number:	J72039
Model:	Mercury 3650	T-Log Number:	T72175
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	RSS 119, FCC Part 90	Class:	N/A

Run #4f: Spurious emissions, BW=14MHz, power setting of 23





Client:	GE MDS LLC	Job Number:	J72039
Model:	Mercury 3650	T-Log Number:	T72175
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	RSS 119, FCC Part 90	Class:	N/A



Frequency MHz	Level dBm	Port	FCC Part 90 Limit	FCC Part 90 Margin	Detector	Channel	Mode	Comments
7315.840	-42.8	RF Port	-13.0	-29.8	Peak	3658	BPSK	14 MHz
10974.610	-43.3	RF Port	-13.0	-30.3	Peak	3658	BPSK	14 MHz
25064.300	-36.3	RF Port	-13.0	-23.3	Peak	3658	BPSK	14 MHz
7323.690	-43.0	RF Port	-13.0	-30.0	Peak	3662	BPSK	14 MHz
10988.030	-41.2	RF Port	-13.0	-28.2	Peak	3662	BPSK	14 MHz
25074.150	-36.3	RF Port	-13.0	-23.3	Peak	3662	BPSK	14 MHz
7333.730	-42.3	RF Port	-13.0	-29.3	Peak	3667	BPSK	14 MHz
11001.050	-43.2	RF Port	-13.0	-30.2	Peak	3667	BPSK	14 MHz
25081.730	-36.8	RF Port	-13.0	-23.8	Peak	3667	BPSK	14 MHz

Client:	GE MDS LLC	Job Number:	J72039
Model:	Mercury 3650	T-Log Number:	T72175
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	RSS 119, FCC Part 90	Class:	N/A

RSS 119 and FCC Part 90
Spurious 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: 7/23/2008
Test Engineer: Mehran Birgani
Test Location: Refer to each run

Config. Used: 1
Config Change: None
EUT Voltage: 13.8Vdc

General Test Configuration

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

The measurement antenna was located 3 meters from the EUT.

Ambient Conditions:

Temperature: 12 °C
Rel. Humidity: 75 %

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
2	Spurious Emissions Transmit Mode, 30 - 37000 MHz	FCC 90.210/ RSS 119 -13dBm erp	Pass	50.1dBµV/m @ 10958.9MHz (-32.1dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

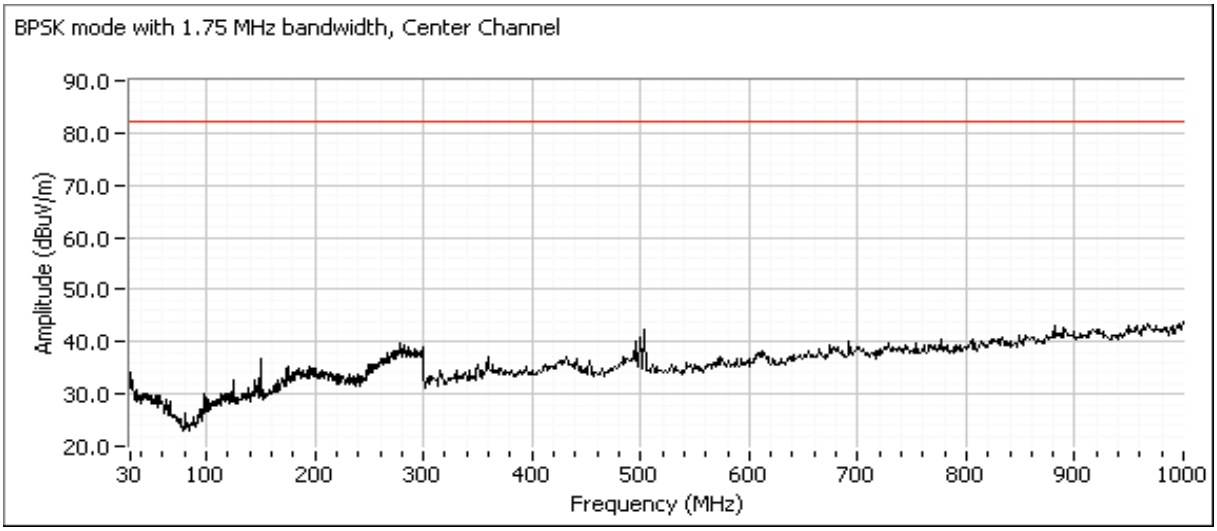
Deviations From The Standard

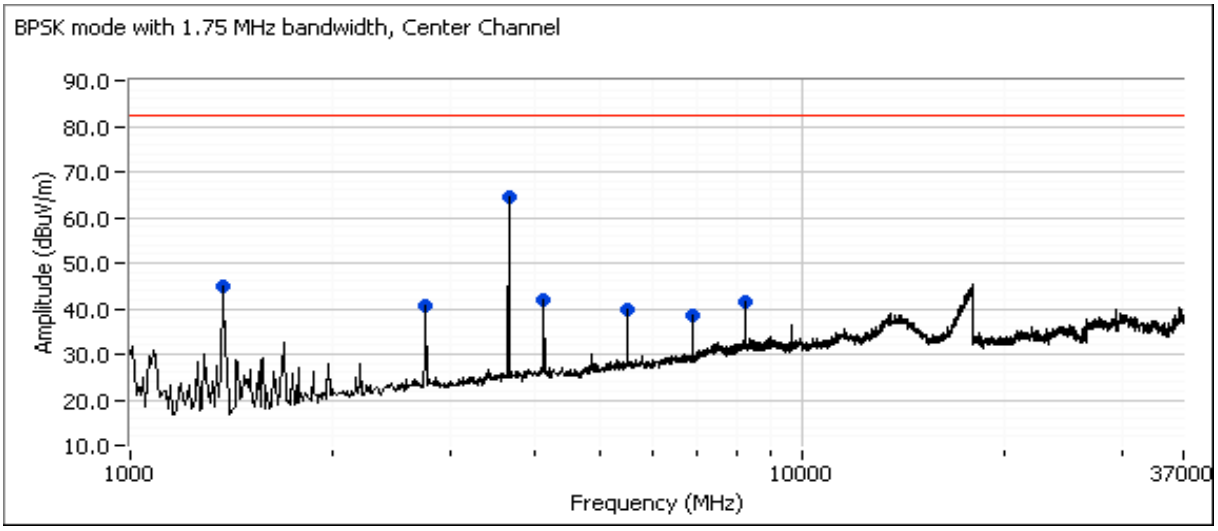
No deviations were made from the requirements of the standard.

Client:	GE MDS LLC	Job Number:	J72039
Model:	Mercury 3650	T-Log Number:	T72175
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	RSS 119, FCC Part 90	Class:	N/A

Run #1: Radiated Spurious Emissions, Transmit Mode, 30 - 37000 MHz (Perform at chamber #2)

Run #1a: 3662 GHz with power setting of 23 with bandwidth 1.75 MHz (Center Channel)

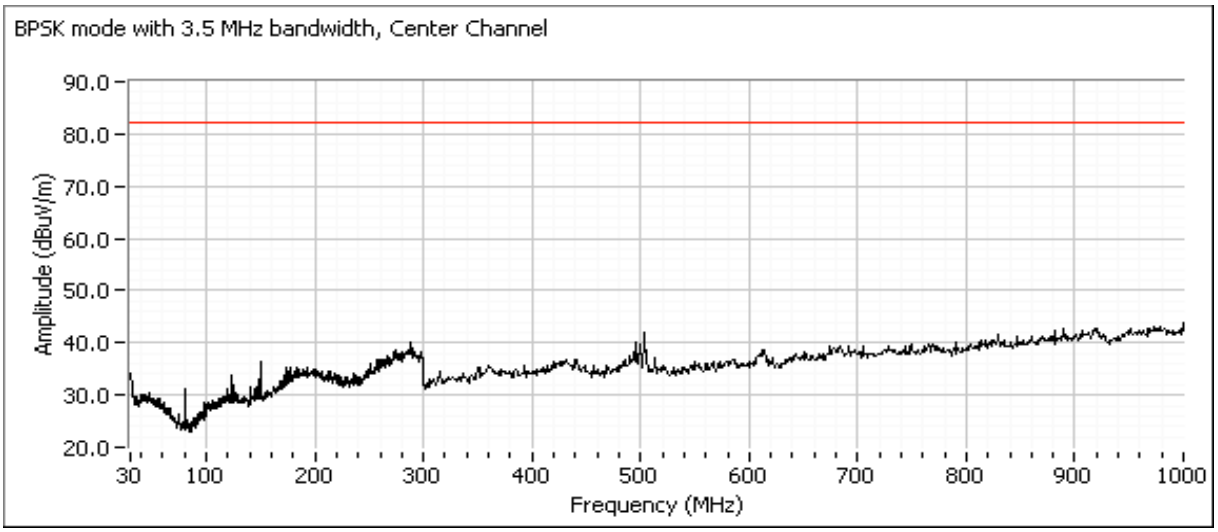


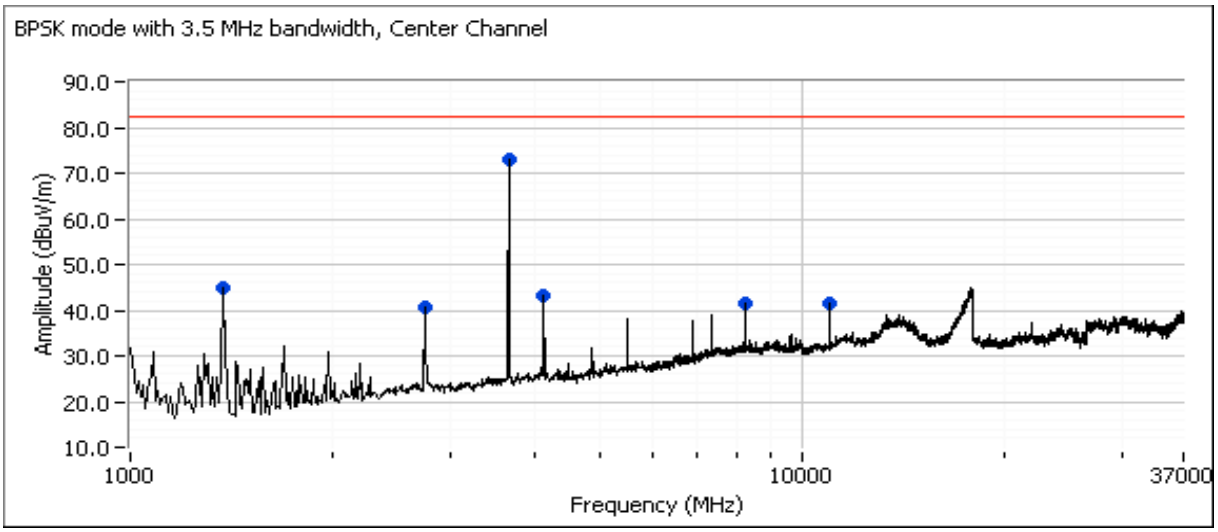


Frequency	Level	Pol	FCC 90.210		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
3661.900	64.6	V	N/A	N/A	Peak	121.0	1.7	Fundamental
1376.970	45.1	V	82.2	-37.1	Peak	290.0	1.7	
4130.590	42.1	V	82.2	-40.1	Peak	220.0	1.7	
8258.930	41.6	V	82.2	-40.6	Peak	305.0	1.7	
2753.760	40.8	V	82.2	-41.4	Peak	280.0	1.7	
5507.060	39.6	V	82.2	-42.6	Peak	270.0	1.7	

Client:	GE MDS LLC	Job Number:	J72039
Model:	Mercury 3650	T-Log Number:	T72175
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	RSS 119, FCC Part 90	Class:	N/A

Run #1b: 3662 GHz with power setting of 23 with bandwidth 3.5 MHz (Center Channel)

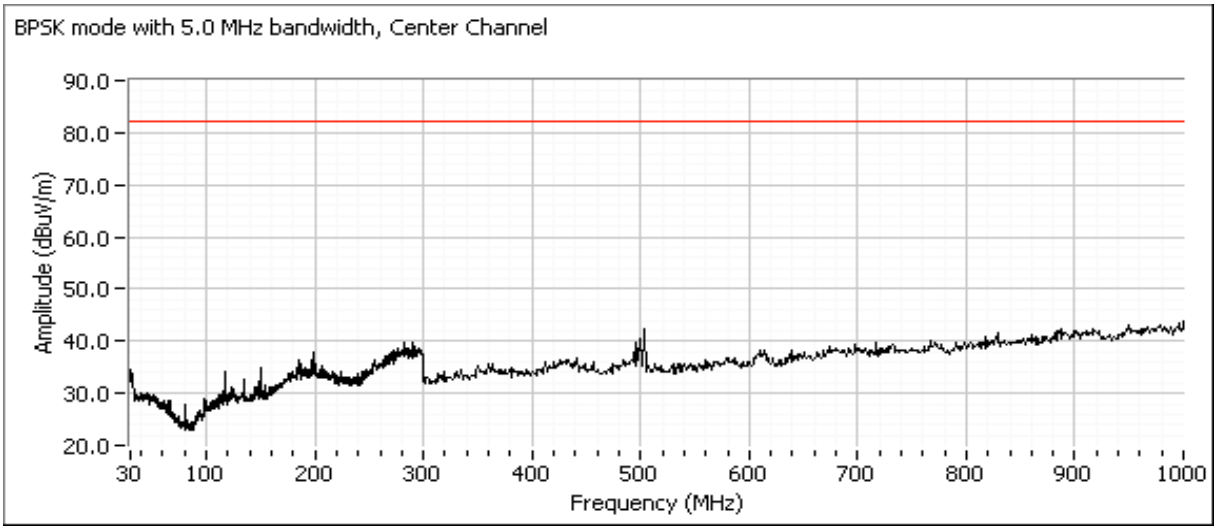


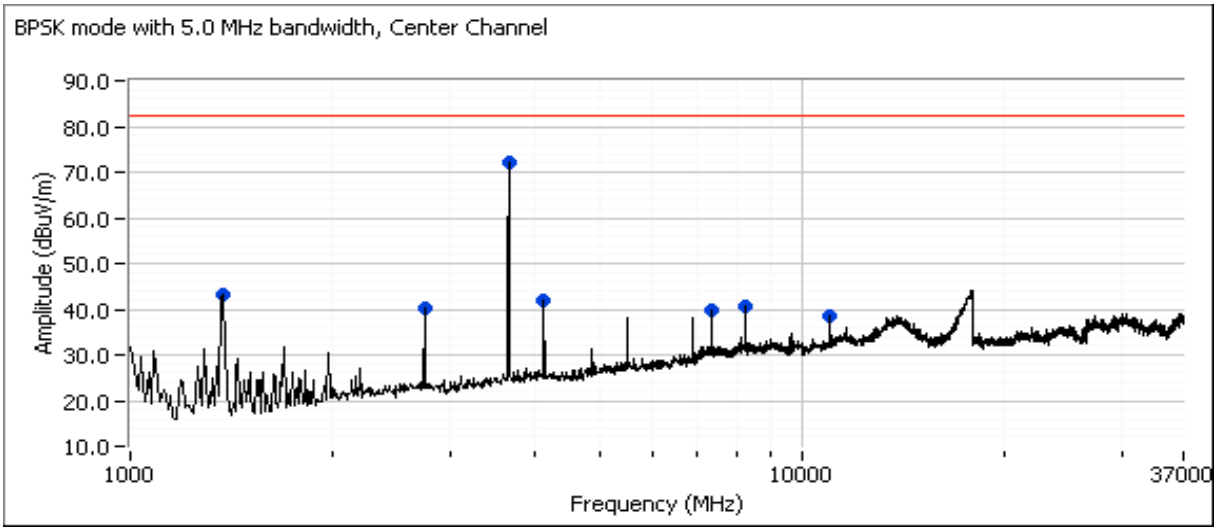


Frequency	Level	Pol	FCC 90.210		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
3661.990	73.1	V	N/A	N/A	Peak	121.0	1.7	Fundamental
1376.260	44.7	V	82.2	-37.5	Peak	288.0	1.7	
4128.270	43.1	V	82.2	-39.1	Peak	243.0	1.7	
8257.770	41.7	V	82.2	-40.5	Peak	296.0	1.7	
10986.400	41.5	V	82.2	-40.7	Peak	235.0	1.7	
2751.920	40.6	V	82.2	-41.6	Peak	278.0	1.7	

Client:	GE MDS LLC	Job Number:	J72039
Model:	Mercury 3650	T-Log Number:	T72175
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	RSS 119, FCC Part 90	Class:	N/A

Run #1c: 3662 GHz with power setting of 23 with bandwidth 5.0 MHz (Center Channel)

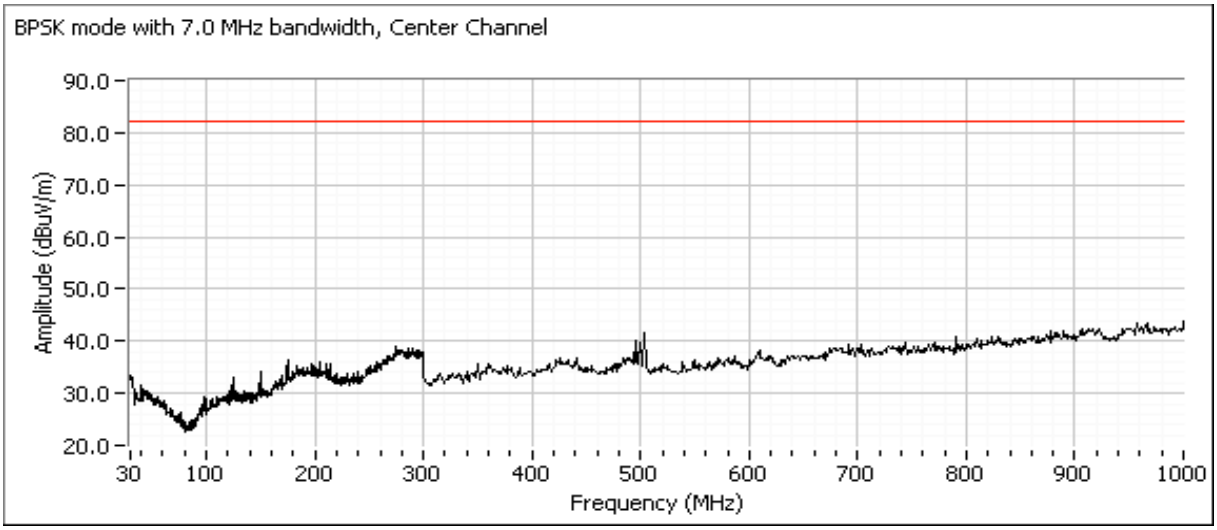


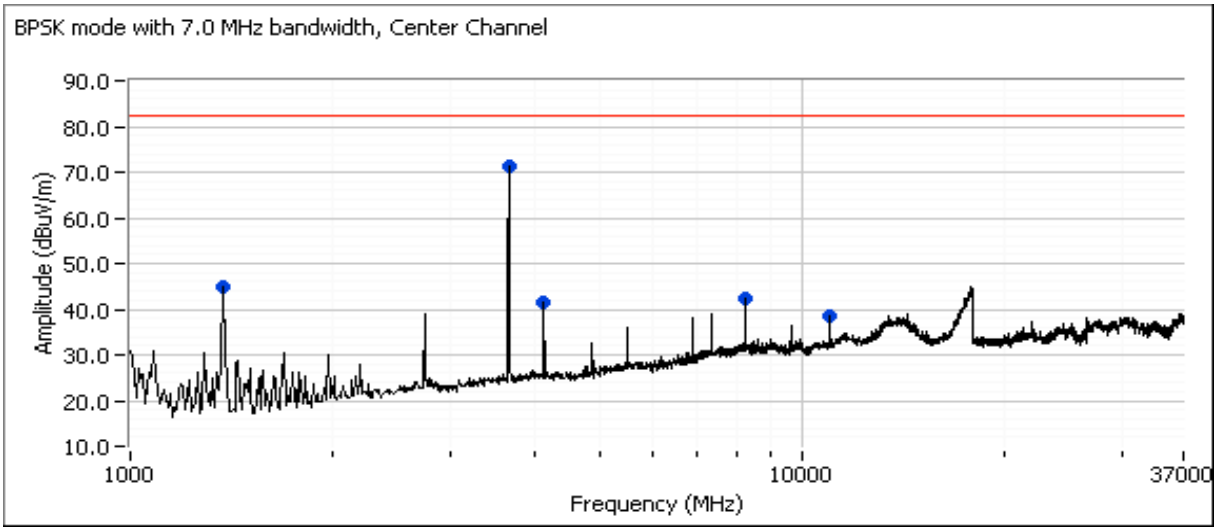


Frequency	Level	Pol	FCC 90.210		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
3661.870	72.1	V	N/A	N/A	Peak	147.0	1.7	Fundamental
1375.830	43.1	V	82.2	-39.1	Peak	271.0	1.7	
4127.600	41.8	V	82.2	-40.4	Peak	252.0	1.7	
8253.620	40.6	V	82.2	-41.6	Peak	293.0	1.7	
2751.530	40.3	V	82.2	-41.9	Peak	262.0	1.7	
7324.840	39.6	V	82.2	-42.6	Peak	272.0	1.7	
10986.400	38.7	V	82.2	-43.5	Peak	231.0	1.7	

Client:	GE MDS LLC	Job Number:	J72039
Model:	Mercury 3650	T-Log Number:	T72175
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	RSS 119, FCC Part 90	Class:	N/A

Run #1d: 3662 GHz with power setting of 23 with bandwidth 7.0 MHz (Center Channel)

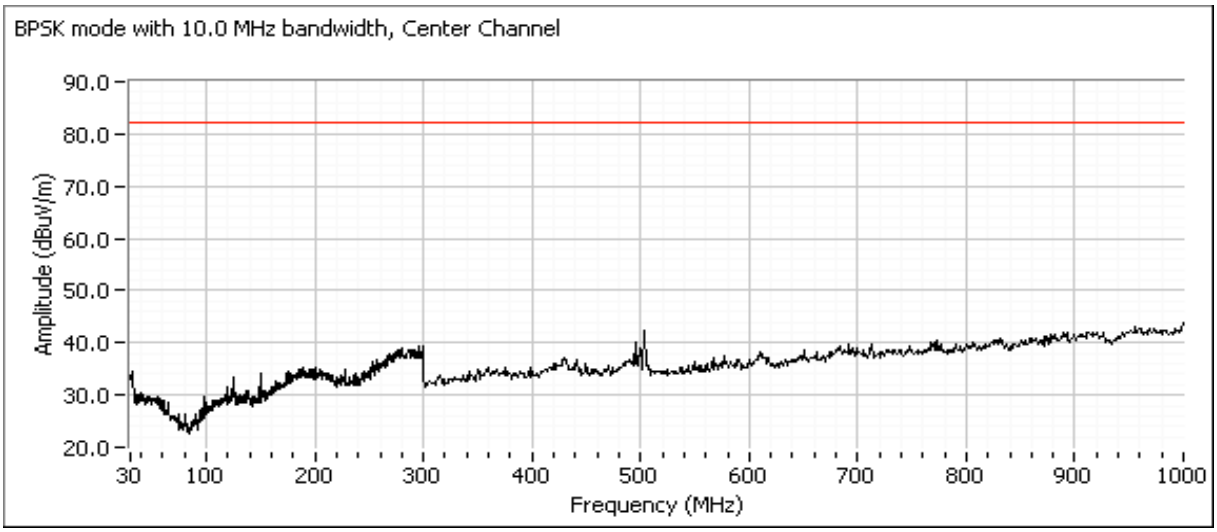


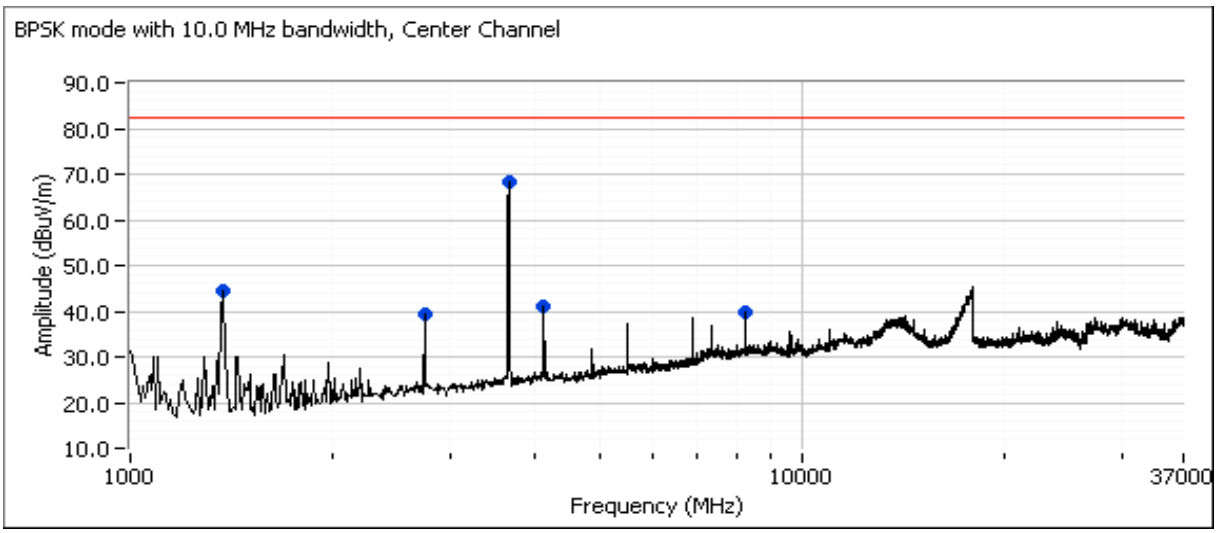


Frequency	Level	Pol	FCC 90.210		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
3661.810	71.4	V	N/A	N/A	Peak	154.0	1.7	Fundamental
1376.380	44.9	V	82.2	-37.3	Peak	293.0	1.7	
8256.640	42.4	V	82.2	-39.8	Peak	289.0	1.7	
4128.760	41.6	V	82.2	-40.6	Peak	239.0	1.7	
10986.640	38.3	V	82.2	-43.9	Peak	34.0	1.7	

Client:	GE MDS LLC	Job Number:	J72039
Model:	Mercury 3650	T-Log Number:	T72175
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	RSS 119, FCC Part 90	Class:	N/A

Run #1e: 3662 GHz with power setting of 23 with bandwidth 10.0 MHz (Center Channel)

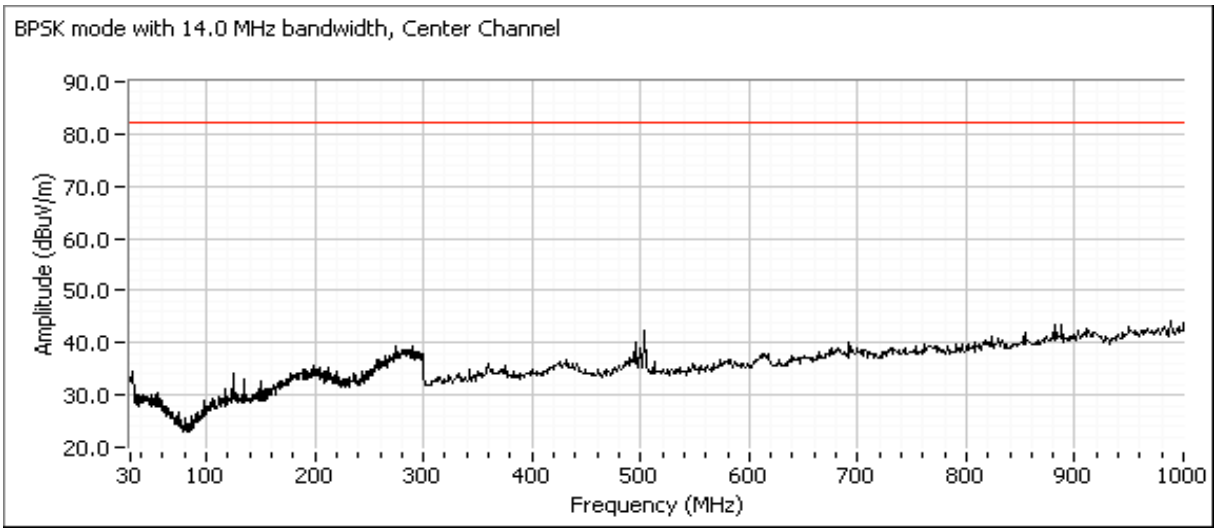


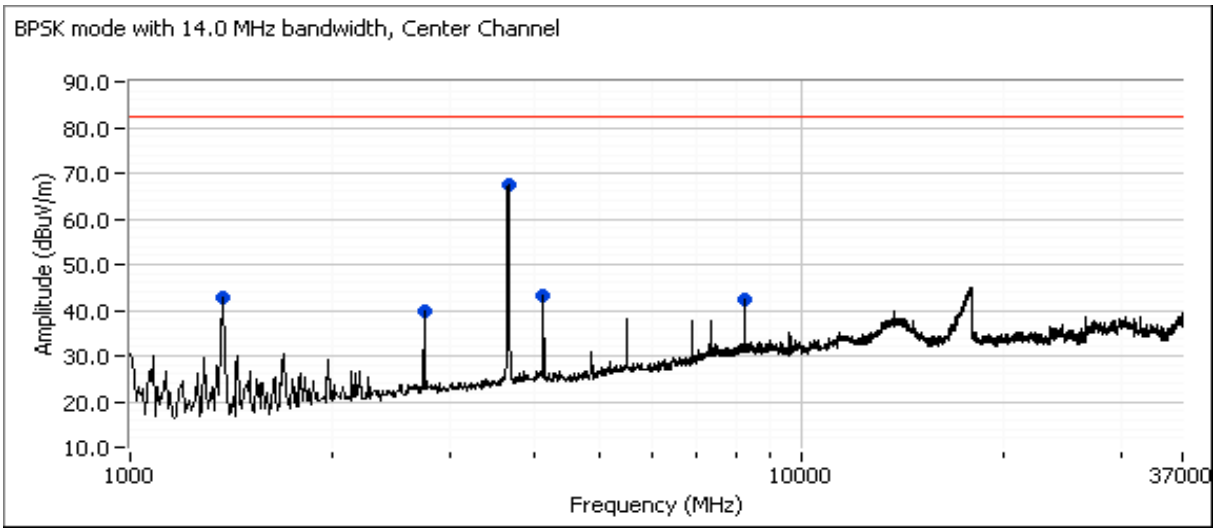


Frequency	Level	Pol	FCC 90.210		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
3662.050	68.4	V	N/A	N/A	Peak	142	1.7	Fundamental
1375.590	44.6	V	82.2	-37.6	Peak	282	1.7	
4126.750	41.0	V	82.2	-41.2	Peak	301	1.7	
8252.830	39.9	V	82.2	-42.3	Peak	294	1.7	
2751.130	39.4	V	82.2	-42.8	Peak	262	1.7	

Client:	GE MDS LLC	Job Number:	J72039
Model:	Mercury 3650	T-Log Number:	T72175
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	RSS 119, FCC Part 90	Class:	N/A

Run #1f: 3662 GHz with power setting of 23 with bandwidth 14.0 MHz (Center Channel)

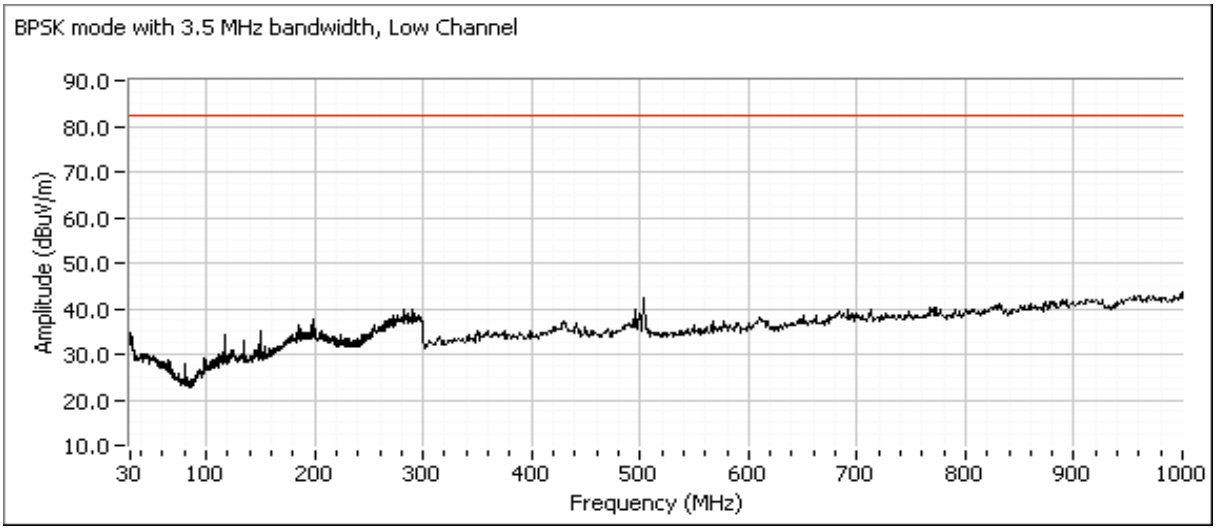


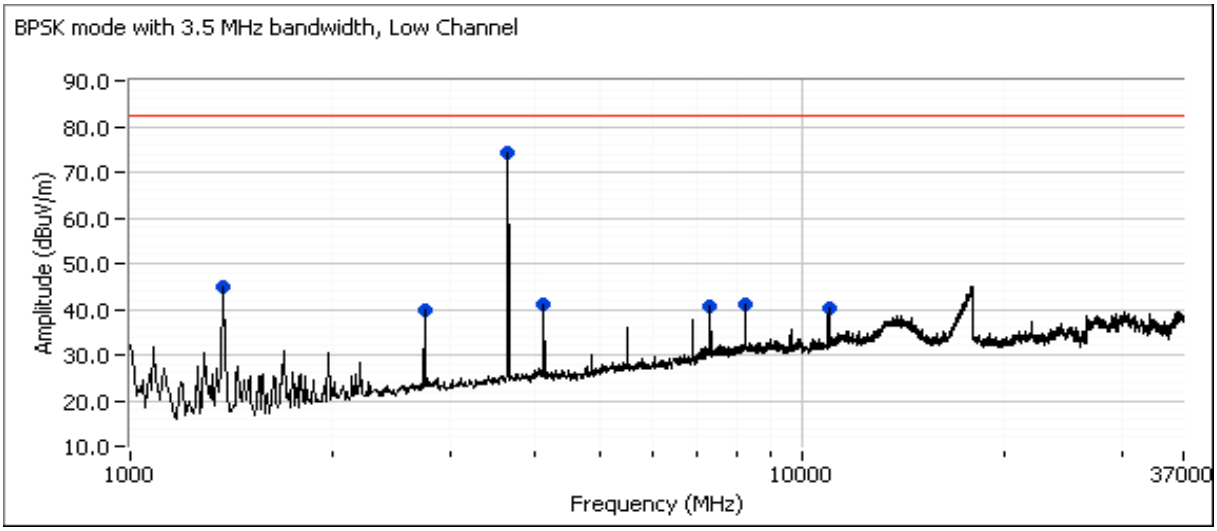


Frequency	Level	Pol	FCC 90.210		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
3661.870	67.6	V	N/A	N/A	Peak	158	1.7	Fundamental
4126.500	43.0	V	82.2	-39.2	Peak	243	1.7	
1375.460	42.7	V	82.2	-39.5	Peak	256	1.7	
8252.020	42.4	V	82.2	-39.8	Peak	290	1.7	
2750.880	39.6	V	82.2	-42.6	Peak	276	1.7	

Client:	GE MDS LLC	Job Number:	J72039
Model:	Mercury 3650	T-Log Number:	T72175
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	RSS 119, FCC Part 90	Class:	N/A

Run #1g: 3653 GHz with power setting of 23 with bandwidth 3.5 MHz (Low Channel)

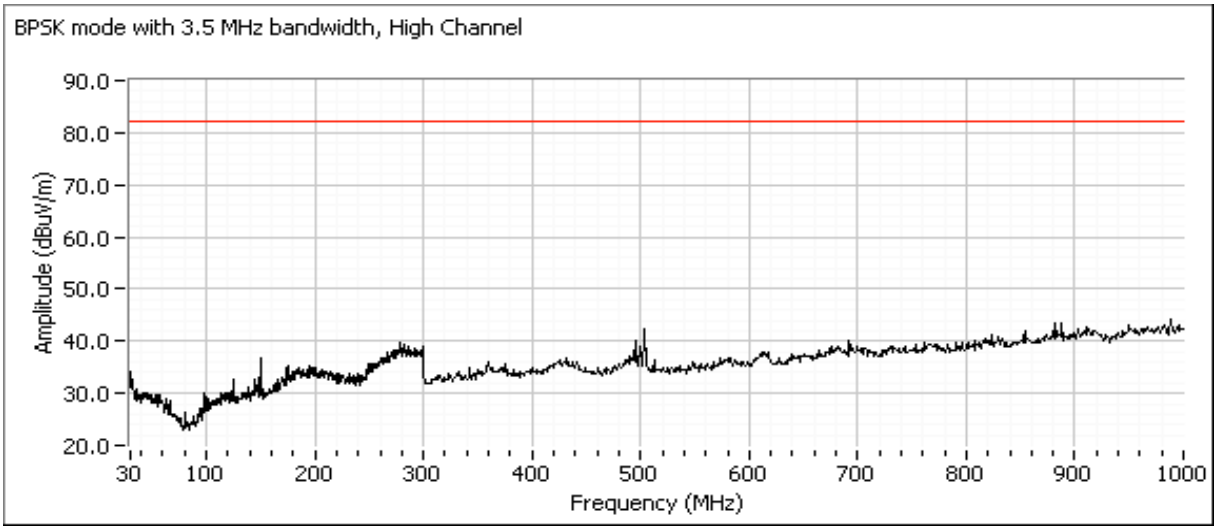


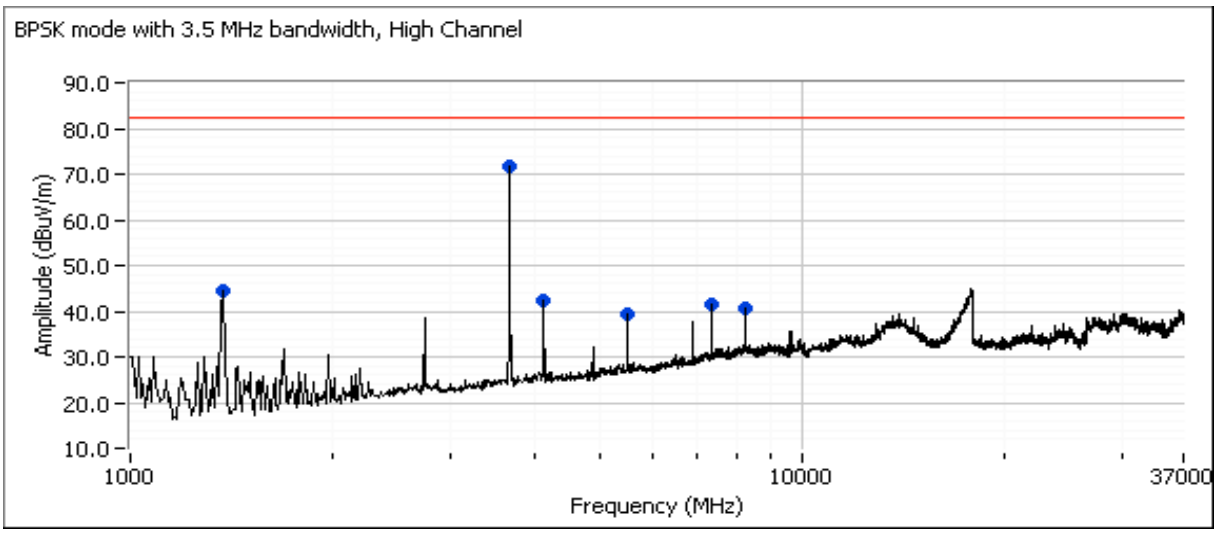


Frequency	Level	Pol	FCC 90.210		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
3652.950	74.1	V	N/A	N/A	Peak	146	1.7	Fundamental
1375.950	45.1	V	82.2	-37.1	Peak	276	1.7	
4127.720	41.0	V	82.2	-41.2	Peak	295	1.7	
8253.610	40.9	V	82.2	-41.3	Peak	295	1.7	
7306.240	40.7	V	82.2	-41.5	Peak	269	1.7	
10958.940	40.2	V	82.2	-42.0	Peak	255	1.7	
2751.490	39.9	V	82.2	-42.3	Peak	265	1.7	

Client:	GE MDS LLC	Job Number:	J72039
Model:	Mercury 3650	T-Log Number:	T72175
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	RSS 119, FCC Part 90	Class:	N/A

Run #1h: 3672 GHz with power setting of 23 with bandwidth 3.5 MHz (High Channel)





Frequency	Level	Pol	FCC 90.210		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
3671.890	71.9	V	N/A	N/A	Peak	158	1.7	Fundamental
1375.520	44.6	V	82.2	-37.6	Peak	297	1.7	
4126.800	42.5	V	82.2	-39.7	Peak	268	1.7	
7344.040	41.3	V	82.2	-40.9	Peak	266	1.7	
8251.680	40.7	V	82.2	-41.5	Peak	292	1.7	
5501.980	39.3	V	82.2	-42.9	Peak	268	1.7	

Client:	GE MDS LLC	Job Number:	J72039
Model:	Mercury 3650	T-Log Number:	T72175
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	RSS 119, FCC Part 90	Class:	N/A

Run #2: Radiated Spurious Emissions, Transmit Mode: Final Field Strength and Substitution Measurements
Test performed at SVOATS #2
Based on results above, spurious emissions at highest and lowest channels for each BW were considered unnecessary

Frequency	Level	Pol	FCC 90.210		Detector	Azimuth	Height	Comments	Operating
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters		Frequency
1376.970	40.6	V	82.2	-41.6	PK	200	1.0	Run 1a	3662MHz, 1.75BW
2750.880	39.9	V	82.2	-42.3	PK	203	1.3	Run 1g	3653MHz, 3.5BW
4130.590	41.5	V	82.2	-40.7	PK	203	1.1	Run 1a	3662MHz, 1.75BW
5507.060	44.6	V	82.2	-37.6	PK	258	1.0	Run 1a	3662MHz, 1.75BW
7306.240	46.8	V	82.2	-35.4	PK	304	1.0	Run 1h	3672MHz, 3.5BW
8252.020	47.5	V	82.2	-34.7	PK	192	1.0	Run 1g	3653MHz, 3.5BW
8258.930	47.7	V	82.2	-34.5	PK	187	1.0	Run 1a	3662MHz, 1.75BW
10958.940	50.1	V	82.2	-32.1	PK	219	1.0	Run 1h	3672MHz, 3.5BW

Horizontal

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
All signals were more than 20dB below the computed FS limit										

Vertical

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
All signals were more than 20dB below the computed FS limit										

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 Mercury 3650

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 Mercury 3650

Uploaded as A Separate Attachment

EXHIBIT 7: Installation Guide GE MDS LLC Model Mercury 3650

Uploaded as A Separate Attachment

EXHIBIT 8: Block Diagram GE MDS LLC Model Mercury 3650

Uploaded as A Separate Attachment

EXHIBIT 9: Schematic Diagrams GE MDS LLC Model Mercury 3650

Uploaded as A Separate Attachment