Radio Test Report

FCC Part 90 Subpart Z
3650 MHz to 3700 MHz

Models: Mercury 3650 Base Station and Mercury 3650 Subscriber

COMPANY:	GE MDS LLC 175 Science Parkway Rochester, NY 14620
TEST SITE(S):	NTS Silicon Valley 41039 Boyce Road. Fremont, CA. 94538-2435
REPORT DATE:	July 19, 2012
FINAL TEST DATES:	October 11, 13, 14 and 20 and December 31, 2010 and January 20, February 14, 17 and 27, 2011
TOTAL NUMBER OF PAGES:	89

PROGRAM MGR / TECHNICAL REVIEWER:

David W. Bare
Chief Engineer

QUALITY ASSURANCE DELEGATE / FINAL REPORT PREPARER:

David Guidotti
Senior Technical Writer

ACCREDITED
Testing Cert #0214.26

REVISION HISTORY

Rev#	Date	Comments	Modified By
-	07-19-2012	First release	

TABLE OF CONTENTS

SCOPE

Tests have been performed on the GE MDS LLC models Mercury 3650 Base Station and Mercury 3650 Subscriber, pursuant to the relevant requirements of the following standard(s) in order to obtain device certification against the regulatory requirements of the Federal Communications Commission and Industry Canada.

- Code of Federal Regulations (CFR) Title 47 Part 2
- CFR 47 Part 90 (Private Land Mobile Radio Service) Subpart Z

Conducted and radiated emissions data has been collected, reduced, and analyzed within this report in accordance with measurement guidelines set forth in the following reference standards and as outlined in NTS Silicon Valley test procedures:

ANSI C63.4:2003
ANSI TIA-603-C August 17, 2004

The intentional radiator above has been tested in a simulated typical installation to demonstrate compliance with the relevant Industry Canada performance and procedural standards.

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.

The test results recorded herein are based on a single type test of the GE MDS LLC model Mercury 3650 Subscriber and therefore apply only to the tested sample. The sample was selected and prepared by Dennis McCarthy of GE MDS LLC.

OBJECTIVE

The primary objective of the manufacturer is compliance with the regulations outlined in the previous section.

Prior to marketing in the USA, the device requires certification. Prior to marketing in Canada, Class I transmitters, receivers and transceivers require certification.

Certification is a procedure where the manufacturer submits test data and technical information to a certification body and receives a certificate or grant of equipment authorization upon successful completion of the certification body's review of the submitted documents. Once the equipment authorization has been obtained, the label indicating compliance must be attached to all identical units, which are subsequently manufactured.

Maintenance of compliance 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.).

Testing was performed only on model Mercury 3650 Subscriber. This model was considered representative of the Mercury 3650 Base Station

STATEMENT OF COMPLIANCE

The tested sample of GE MDS LLC models Mercury 3650 Base Station and Mercury 3650 Subscriber complied with the requirements of the standards and frequency bands declared in the scope of this test report.

Maintenance of compliance is the responsibility of the manufacturer. Any modifications to the product should be assessed to determine their potential impact on the compliance status of the device with respect to the standards detailed in this test report.

DEVIATIONS FROM THE STANDARDS

No deviations were made from the published requirements listed in the scope of this report.

TEST RESULTS

FCC Part 90Z – Base and Fixed Stations, 3650 – 3700 MHz

FCC	Description	Measured	Limit	Result
Transmitter Modulation, output power and other characteristics				
§2.1033 (c) (5) § 90.1321(b)	Frequency ranges (Listed for each channel spacing)	3.5MHz 3653-3697 MHz 5.0MHz 3653-3697MHz 7.0MHz 3654-3696MHz 8.75MHz 3655-3695MHz .0MHz 3656-3694MHz	3650-3700 MHz Note 1	Complies
§2.1033 (c) (6) §2.1033 (c) (7) §2.1046 § 90.1321	EIRP – Total power (Maximum for each channel spacing)	3.5 MHz: 34.8dBm 5.0 MHz: 36.1dBm 7.0 MHz: 37.6dBm 8.75 MHz: 38.4dBm 10.0 MHz: 38.9dBm	25 Watts	Complies
	EIRP – PSD (Maximum)	3.5 MHz: 29.9dBm/MHz 5.0 MHz: 30.0dBm/MHz 7.0 MHz: 29.9dBm/MHz 8.75 MHz: 29.9dBm/MHz 10.0 MHz: 29.9dBm/MHz	30 dBm/MHz	Complies
§2.1033 (c) (4) §2.1047 § 90.210	Emission types	G1D	Information only	-
	Emission mask	Device complies with spectral mask – refer to test data	Mask B	Complies
§2.1049	Occupied (99%) Bandwidth	3.5 MHz: 3.3 MHz 5.0 MHz: 4.6 MHz 7.0 MHz: 6.6 MHz 8.75 MHz: 8.2 MHz 10.0 MHz: 9.2 MHz	Information only	-
Transmitter spurious emissions				
§2.1051 §2.1057 §90.1323	At the antenna terminals	-13.4 dBm	-13 dBm/MHz	Complies
	Radiated (eirp)	-30.2 dBm		Complies
Receiver spurious emissions				
15.109	Field strength	Not applicable, note 2		
Other details				
§90.1319	Policies of use	Refer to operational description for details of the implementation.	Device must employ a contention-based protocol.	Complies
§2.1055 §90.213(a)	Frequency stability	760 Hz / .21 ppm	To be specified in the station authorization	-
§1.1307(b) §2.1093 §90.1335	RF Exposure	Although RF exposure compliance is addressed at the time of licensing an MPE calculation has been provided to demonstrate compliance with limits at distances of 22cm or more from the antennas.		
§2.1033 (c) (8)	Final radio frequency amplifying circuit's dc voltages and currents for normal operation over the power range	6Vdc, 1.2A for each chain	Information only	-
-	Antenna Gain	This application is submitted for antennas of 13 and 18 dBi gain.		

Notes
1) The upper part of the allocated band from 3675 – 3700 MHz requires the device to use an unrestricted contention-based protocol.
2) Receiver spurious emissions requirements only apply to devices that operate (tune) below 960MHz.

EXTREME CONDITIONS

Frequency stability is determined over extremes of temperature and voltage. The extremes of voltage were 85 to 115 percent of the nominal value. The extremes of temperature were -30°C to +50°C as specified in FCC §2.1055(a)(1).

MEASUREMENT UNCERTAINTIES

ISO/IEC 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 are based on a 95% confidence level (based on a coverage factor (k=2) and were calculated in accordance with NAMAS document NIS 81 and M3003.

Measurement Type	Measurement Unit	Frequency Range	Expanded Uncertainty
RF frequency	Hz	25 to 7,000 MHz	1.7×10^{-7}
RF power, conducted	dBm	25 to 7,000 MHz	± 0.52 dB
Conducted emission of transmitter	dBm	25 to 40,000 MHz	± 0.7 dB
Conducted emission of receiver	dBm	25 to 40,000 MHz	± 0.7 dB
Radiated emission (substitution method)	dBm	25 to 40,000 MHz	± 2.5 dB
Radiated emission (field strength)	dBμV/m	25 to 1,000 MHz 1 to 40 GHz	± 3.6 dB ± 6.0 dB

EQUIPMENT UNDER TEST (EUT) DETAILS

GENERAL

The GE MDS LLC model Mercury 3650 Base Station and Mercury 3650 Subscriber are broadband wireless transceivers that are designed to transmit in the 3650-3700 MHz band using 2x2 spatial multiplexing MIMO with bandwidths of 3.3, 4.6, 6.6, 8.2 and 9.2 MHz. The electrical rating of the EUT is 10-30Vdc, 2.5 Amps.

The samples tested were received on October 11, 2010 and tested on October 11, 13, 14 and 20 and December 31, 2010 and January 20, February 14, 17 and 27, 2011. The EUT consisted of the following:

Company	Model	Description	Serial Number	IC UPN
GE MDS LLC	MERCURY 3650 Subscriber	Broadband Wireless Transceiver	Pre-Production	E5MDS-MERCIDU3A

OTHER EUT DETAILS

The Mercury 3650 can be used with antennas of 13dBi or 18dBi. The test data accounted for a minimum feed cable loss of 6dB between the devices rf port and the antenna when calculating the eirp values for power and power spectral density from the values measured at the device’s rf terminal. The Mercury 3650 Base Station and Mercury 3650 Subscriber are identical radios except that the Base Station has access point software and the Subscriber has client software. The performance of the radio is not affected by this software difference.

ENCLOSURE

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

MODIFICATIONS

No modifications were made to the EUT during the time the product was at Elliott.

SUPPORT EQUIPMENT

The EUT output was connected to a load or through an attenuator to a spectrum analyzer during testing

EUT OPERATION

During emissions testing the EUT set to transmit a continuous OFDM modulated signal at the selected frequency.

Preliminary measurements on all different data rates indicated that QAM16 was representative of the highest power, highest power spectral density and widest signal bandwidths for all modulations, therefore final measurements were made using this modulation.

TESTING

GENERAL INFORMATION

Antenna port measurements were taken at the NTS Silicon Valley test site located at 41039 Boyce Road, Fremont, CA 94538-2435.

Radiated spurious emissions measurements were taken at the NTS Silicon Valley Anechoic Chambers and/or Open Area Test Site(s) listed below. The sites conform to the requirements of ANSI C63.4: 2003 *American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz* and CISPR 16-1-4:2007 - *Specification for radio disturbance and immunity measuring apparatus and methods Part 1-4: Radio disturbance and immunity measuring apparatus Ancillary equipment Radiated disturbances*. They are on file with the FCC and industry Canada.

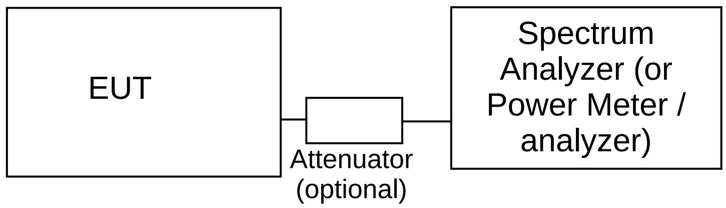
Site	Registration Numbers		Location
	FCC	Canada	
Chamber 3	**769238**	**IC 2845B-3**	41039 Boyce Road Fremont, CA 94538-2435
Chamber 4	211948	IC 2845B-4	
Chamber 5	211948	IC 2845B-5	
Chamber 7	A2LA Accredited	IC 2845B-7	

In the case of Open Area Test Sites, ambient levels are at least 6 dB below the specification limits with the exception of predictable local TV, radio, and mobile communications traffic.

Considerable engineering effort has been expended to ensure that the facilities conform to all pertinent requirements.

RF PORT MEASUREMENT PROCEDURES

Conducted measurements are performed with the EUT's rf input/output connected to the input of a spectrum analyzer, power meter or modulation analyzer. When required an attenuator, filter and/or dc block is placed between the EUT and the spectrum analyzer to avoid overloading the front end of the measurement device. Measurements are corrected for the insertion loss of the attenuators and cables inserted between the rf port of the EUT and the measurement equipment.



Test Configuration for Antenna Port Measurements

For devices with an integral antenna the output power and spurious emissions are measured as a field strength at a test distance of (typically) 3m and then converted to an eirp using a substitution measurement (refer to RADIATED EMISSIONS MEASUREMENTS). All other measurements are made as detailed below but with the test equipment connected to a measurement antenna directed at the EUT.

OUTPUT POWER

Output power is measured using a power meter and an average sensor head, a spectrum analyzer or a power meter and peak power sensor head as required by the relevant rule part(s). Where necessary measurements are gated to ensure power is only measured over periods that the device is transmitting.

Power measurements made directly on the rf power port are, when appropriate, converted to an EIRP by adding the gain of the highest gain antenna that can be used with the device under test, as specified by the manufacturer.

BANDWIDTH MEASUREMENTS

The 6dB, 20dB and/or 26dB signal bandwidth is measured in using the bandwidths recommended by ANSI C63.4. When required, the 99% bandwidth is measured using the methods detailed in RSS GEN. The measurement bandwidth is set to be at least 1% of the instrument's frequency span.

CONDUCTED SPURIOUS EMISSIONS

Initial scans are made using a peak detector (RBW=VBW) and using scan rates to ensure that the EUT transmits before the sweep moves out of each resolution bandwidth (for transmit mode measurements). Where the limits are expressed as an average power the spectrum analyzer is tunes to that frequency with a narrow span (wide enough to capture the emission and its sidebands) and the resolution and video bandwidths are adjusted as required by the reference measurement standards. For transmitter measurements the appropriate detector (average, peak, normal, sample, quasi-peak) is used when making measurements for licensed devices. For receiver conducted spurious measurements the detector is set to peak.

TRANSMITTER MASK MEASUREMENTS

The transmitter mask measurements are made using resolution bandwidths as specified in the pertinent rule part(s). Where narrower bandwidths are used the measurement is corrected to account for the reduced bandwidth by either using the adjacent channel power function of the spectrum analyzer to sum the power across the required measurement bandwidth. The frequency span of the analyzer is set to ensure the fundamental signal and all significant sidebands are displayed.

The top of the mask may be set by the total output power of the signal, the power of the unmodulated signal or the peak value of the signal in the reference bandwidth being used for the mask measurement.

FREQUENCY STABILITY

The EUT is placed inside a temperature chamber with all support and test equipment located outside of the chamber. The temperature is varied across the specified frequency range in 10 degree increments with frequency measurements made at each temperature step. The EUT is allowed enough time to stabilize at each temperature variation.

The spectrum analyzer is configured to give a 5- or 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. Where possible the device is set to transmit an unmodulated signal. Where this is not possible the frequency drift is determined by finding a stable point on the signal (e.g. the null at the centre of an OFDM signal) or by calculating a centre frequency based on the upper and lower XdB points (where X is typically 6dB or 10dB) on the signal’s skirts.

TRANSIENT FREQUENCY BEHAVIOR:

The TIA/EIA 603 procedure is used to determine compliance with transient frequency timing requirements as the radio is keyed on and off.

The EUTs rf output is connected via a combiner/splitter to the test receiver/spectrum analyzer and to a diode detector. The test receiver or spectrum analyzer video output is connected to an oscilloscope, which is triggered by the output from the diode detector.

Plots showing Ton, T1, and T2 are made when turning on the transmitter and showing T3 when turning off the transmitter.

RADIATED EMISSIONS MEASUREMENTS

Receiver radiated spurious emissions measurements are made in accordance with ANSI ANSI C63.4:2003 by measuring the field strength of the emissions from the device at a specific test distance and comparing them to a field strength limit. Where the field strength limit is specified at a longer distance than the measurement distance the measurement is extrapolated to the limit distance.

Transmitter radiated spurious emissions are initially measured as a field strength. The eirp or erp limit as specified in the relevant rule part(s) is converted to a field strength at the test distance and the emissions from the EUT are then compared to that limit. Emissions within 20dB of this limit are the subjected to a substitution measurement.

All radiated emissions measurements are performed in two phases. A preliminary scan of emissions is conducted in either an anechoic chamber or on an OATS during which all significant EUT frequencies are identified with the system in a nominal configuration. At least two scans are performed across the complete frequency range of interest and at each operating frequency identified in the reference standard. One or more of these is with the antenna polarized vertically while the one or more of these is with the antenna polarized horizontally. Initial scans are made using a peak detector (RBW=VBW) and using scan rates to ensure that the EUT transmits before the sweep moves out of each resolution bandwidth (for transmit mode).

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 transmitter spurious emissions, where the limit is expressed as an effective radiated power, the eirp or erp is converted to a field strength limit.

Final measurements are made on an OATS or in a semi-anechoic chamber at the significant frequencies observed during the preliminary scan(s) using the same process of rotating the EUT and raising/lowering the measurement antenna to find the highest level of the emission. The field strength is recorded and, for receiver spurious emissions, compared to the field strength limit. For the final measurement the appropriate detectors (average, peak, normal, sample, quasi-peak) are used. For receiver measurements below 1GHz the detector is a Quasi-Peak detector, above 1GHz a peak detector is used and the peak value (RB=VB=1MHz) and average value (RB=1MHz, VB=10Hz) are recorded.

For transmitter spurious emissions, the radiated power of all emissions within 20dB of the calculated field strength limit are determined using a substitution measurement. The substitution measurement is made by replacing the EUT with an antenna of known gain (typically a dipole antenna or a double-ridged horn antenna), connected to a signal source. The output power of the signal generator is adjusted until the maximum field strength from the substitution antenna is similar to the field strength recorded from the EUT. The erp of the EUT is then calculated.

INSTRUMENTATION

An EMI receiver as specified in CISPR 16-1-1 is used for radiated emissions measurements. The receivers used can measure over the frequency range of 9 kHz up to 7000 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.

For measurements above the frequency range of the receivers and for all conducted measurements a spectrum analyzer is utilized because it provides visibility of the entire spectrum along with the precision and versatility required to support engineering analysis.

Measurement bandwidths for the test instruments are set in accordance with the requirements of the standards referenced in this document.

Software control is used to correct the measurements for transducer factors (e.g. antenna) and the insertion loss of cables, attenuators and other series elements to obtain the final measurement value. This provides faster, more accurate readings by performing the conversions described under Sample Calculations within the Test Procedures section of this report. Results are exported in a graphic and/or tabular format, as appropriate.

FILTERS/ATTENUATORS

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

ANTENNAS

A combination of biconical, log periodic or bi-log antennas are used to cover the range from 30 MHz to 1000 MHz. Broadband antennas or tuned dipole antennas are used over the entire 25 to 1000 MHz frequency range as the reference antenna for substitution measurements.

Above 1000 MHz, a dual-ridge guide horn antenna or octave horn antenna are used as reference and measurement antennas.

The antenna calibration factors are included in site factors that are programmed into the test receivers and instrument control software when measuring the radiated field strength.

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.

Table mounted devices are placed on a non-conductive table at a height of 80 centimeters above the floor. Floor mounted equipment is 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. The EUT is positioned on a motorized turntable to allow it to be rotated during testing to determine the angel with the highest level of emissions.

SAMPLE CALCULATIONS

SAMPLE CALCULATIONS - CONDUCTED SPURIOUS EMISSIONS

Measurements are compared directly to the conducted emissions specification limit (decibel form). The calculation is as follows:

$$R_r - S = M$$

where:

R_r = Measured value in dBm
S = Specification Limit in dBm
M = Margin to Specification in +/- dB

SAMPLE CALCULATIONS –RADIATED FIELD STRENGTH

Measurements of radiated field strength are compared directly to the specification limit (decibel form). The receiver and/or control software corrects for cable loss, preamplifier gain, and antenna factor. The calculations are in the reverse direction of the actual signal flow, thus cable loss is added and the amplifier gain is subtracted. The Antenna Factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements.

A distance factor is used when measurements are made at a test distance that is different to the specified limit distance by using the following formula:

$$F_d = 20*LOG_{10} (D_m/D_s)$$

where:

F_d = Distance Factor in dB

D_m = Measurement Distance in meters

D_s = Specification Distance in meters

For electric field measurements below 30MHz the extrapolation factor is either determined by making measurements at multiple distances or a theoretical value is calculated using the formula:

$$F_d = 40*LOG_{10} (D_m/D_s)$$

The margin of a given emission peak relative to the limit is calculated as follows:

$$R_c = R_r + F_d$$

and

$$M = R_c - L_s$$

where:

R_r = Receiver Reading in dBuV/m

F_d = Distance Factor in dB

R_c = Corrected Reading in dBuV/m

L_S = Specification Limit in dBuV/m

M = Margin in dB Relative to Spec

SAMPLE CALCULATIONS –RADIATED POWER

The erp/eirp limits for transmitter spurious measurements are converted to a field strength in free space using the following formula:

$$E = \frac{\sqrt{30 P G}}{d}$$

where:

E = Field Strength in V/m
P = Power in Watts
G = Gain of isotropic antenna (numeric gain) = 1
D = measurement distance in meters

The field strength limit is then converted to decibel form (dBuV/m) and the margin of a given emission peak relative to the limit is calculated (refer to *SAMPLE CALCULATIONS –RADIATED FIELD STRENGTH*).

When substitution measurements are required (all signals with less than 20dB of margin relative to the calculated field strength limit) the eirp of the spurious emission is calculated using:

$$P_{EUT} = P_S – (E_S – E_{EUT})$$

and

$$P_S = G + P_{in}$$

where:

P_S = effective isotropic radiated power of the substitution antenna (dBm)
P_{in} = power input to the substitution antenna (dBm)
G = gain of the substitution antenna (dBi)
E_S = field strength the substitution antenna (dBm) at eirp P_S
E_{EUT} = field strength measured from the EUT

Where necessary the effective isotropic radiated power is converted to effective radiated power by subtracting the gain of a dipole (2.2dBi) from the eirp value.

RECEIVER RADIATED SPURIOUS EMISSIONS SPECIFICATION LIMITS

The table below shows the limits for the spurious emissions from receivers as detailed in FCC Part 15.109, RSS 210 Table 2, RSS GEN Table 1 and RSS 310 Table 3. Note that receivers operating outside of the frequency range 30 MHz – 960 MHz are exempt from the requirements of 15.109.

Frequency Range (MHz)	Limit (uV/m @ 3m)	Limit (dBuV/m @ 3m)
30 to 88	100	40
88 to 216	150	43.5
216 to 960	200	46.0
Above 960	500	54.0

Appendix A Test Equipment Calibration Data

Radio Antenna Port (Power and Spurious Emissions), 11 through 13-Oct-10

Manufacturer	Description	Model	Asset #	Cal Due
Tektronix	500MHz, 2CH, 5GS/s Scope	TDS5052B	2118	9/29/2011

Radiated Emissions, 1000 - 37,000 MHz, 13-Oct-10

Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	263	12/15/2010
EMCO	Antenna, Horn, 1-18 GHz (SA40-Red)	3115	1142	8/2/2012
Hewlett Packard	SpecAn 9 kHz - 40 GHz, FT (SA40) Blue	8564E (84125C)	1393	4/14/2011
Hewlett Packard	Head (Inc W1-W4, 1742 , 1743) Blue	84125C	1620	5/4/2011
A.H. Systems	Red System Horn, 18-40GHz	SAS-574, p/n: 2581	2161	3/5/2011

Radiated Emissions, 30 - 1,000 MHz, 14-Oct-10

Manufacturer	Description	Model	Asset #	Cal Due
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	1549	6/4/2011
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1630	3/31/2011
Com-Power Corp.	Preamplifier, 30-1000 MHz	PA-103A	2204	2/26/2011

Radiated Emissions, 30 - 11,100 MHz, 15-Oct-10

Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	6/25/2011
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1538	10/15/2010
EMCO	Antenna, Horn, 1-18 GHz	3115	1561	6/22/2012
Hewlett Packard	SpecAn 9 kHz - 40 GHz, (SA40) Purple	8564E (84125C)	1771	8/26/2011
Hewlett Packard	Preamplifier, 100 kHz - 1.3 GHz	8447D OPT 010	1826	5/27/2011
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	2197	12/29/2011

Radiated Emissions, 30 - 1,000 MHz and Masks, 18-Oct-10

Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	Preamplifier, 100 kHz - 1.3 GHz	8447E	1606	4/29/2011
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	1657	5/28/2012
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1756	3/16/2011

Radiated Emissions, 30 - 1,000 MHz, 19-Oct-10

Manufacturer	Description	Model	Asset #	Cal Due
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1538	11/15/2010
Hewlett Packard	Preamplifier, 100 kHz - 1.3 GHz	8447D OPT 010	1826	5/27/2011
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	2197	12/29/2011

Frequency Stability, 20-Oct-10

Manufacturer	Description	Model	Asset #	Cal Due
Fluke Mfg. Inc.	True RMS Multimeter	111	1557	3/9/2011
Agilent	PSA, Spectrum Analyzer, (installed options, 111, 115, 123, 1DS, B7J, HYX,	E4446A	2139	1/6/2011
Thermotron	Temp Chamber (w/ F4 Watlow Controller)	S1.2	2170	7/1/2011

Conducted Emissions - AC Power Ports, 20-Oct-10

Manufacturer	Description	Model	Asset #	Cal Due
EMCO	LISN, 10 kHz-100 MHz	3825/2	1292	3/12/2011
EMCO	LISN, 10 kHz-100 MHz	3825/2	1293	3/12/2011
Rohde & Schwarz	Pulse Limiter	ESH3 Z2	1594	5/27/2011
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1630	3/31/2011

Radiated Emissions, 30 - 1,000 MHz, 31-Dec-10

Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	EMC Spectrum Analyzer, 9 KHz - 22 GHz	8593EM	1319	11/22/2011
Rohde & Schwarz	Test Receiver, 9 kHz-2750 MHz	ESCS 30	1337	11/24/2011
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	1548	6/24/2012
Com-Power Corp.	Preamplifier, 30-1000 MHz	PAM-103	2234	5/19/2011

Rx Radiated Spurious, 20-Jan-11

Manufacturer	Description	Model	Asset #	Cal Due
EMCO	Antenna, Horn, 1-18 GHz (SA40-Red)	3115	1142	8/2/2012
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	7/12/2011
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	1549	6/4/2011
Hewlett Packard	Preamplifier, 100 kHz - 1.3 GHz	8447E	1606	4/29/2011
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1756	3/16/2011
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	2199	2/11/2011

Radio Antenna Port (Power and Spurious Emissions), 14-Feb-11

Manufacturer	Description	Model	Asset #	Cal Due
Agilent	PSA, Spectrum Analyzer, (installed options, 111, 115, 123, 1DS, B7J, HYX,	E4446A	2139	1/26/2012

Radiated Emissions, 30 - 18,000 MHz, 18-Feb-11

Manufacturer	Description	Model	Asset #	Cal Due
EMCO	Antenna, Horn, 1-18 GHz	3115	487	7/6/2012
Hewlett Packard	EMC Spectrum Analyzer, 9 KHz - 22 GHz	8593EM	1319	11/22/2011
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	1548	6/24/2012
Hewlett Packard	SpecAn 9 kHz - 40 GHz, (SA40) Purple	8564E (84125C)	1771	8/26/2011
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	6/25/2011

Radiated Emissions, 30 - 37,000MHz, 27-Feb-11

Manufacturer	Description	Model	Asset #	Cal Due
Rohde & Schwarz	Power Sensor, 1uW-100mW, DC-18 GHz, 50ohms	NRV-Z51	1069	7/19/2011
EMCO	Antenna, Horn, 1-18 GHz (SA40-Red)	3115	1142	8/2/2012
Hewlett Packard	Head (Inc flex cable, 1143, 2198) Red	84125C	1145	2/17/2012
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	7/12/2011
Hewlett Packard	EMC Spectrum Analyzer, 9 KHz - 22 GHz	8593EM	1319	11/22/2011
EMCO	Antenna, Horn, 1-18 GHz (SA40-Blu)	3115	1386	9/21/2012

Rohde & Schwarz	Power Meter, Single Channel, +1795+1796	NRVS	1534	5/13/2011
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	1548	6/24/2012
Anritsu	Signal Generator, 10MHz-20GHz	68347C	1785	11/22/2011
A.H. Systems	Purple System Horn, 18-40GHz	SAS-574, p/n: 2581	2160	5/7/2011
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	2199	2/23/2012
Com-Power Corp.	Preamplifier, 30-1000 MHz	PA-103A	2359	2/15/2012

Appendix B Test Data

T80830 Pages 22 - 88

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		-
Emissions Standard(s):	FCC Part 90, RSS-197	Class:	-
Immunity Standard(s):	-	Environment:	Radio

EMC Test Data

For The

GE MDS LLC

Model

Mercury 3650 Base Station and Mercury 3650 Subscriber

Date of Last Test: 3/3/2011

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

RSS 197 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: 2/17 & 2/27/2011
Test Engineer: Rafael Varelas
Test Location: Chamber #7

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. All remote support equipment was located outside the chamber.

For radiated emissions testing the measurement antenna was located 3 meters from the EUT.

Ambient Conditions:

Temperature: 20-25 °C
Rel. Humidity: 30-40 %

Summary of Results

Run #	Mode	Channel	BW		Test Performed	Limit	Result / Margin
	16QAM	High	All		Radiated Emissions, 30 MHz-37GHz	FCC 90.210 Mask B	-30.2dBm @ 7395.6MHz (-17.2dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

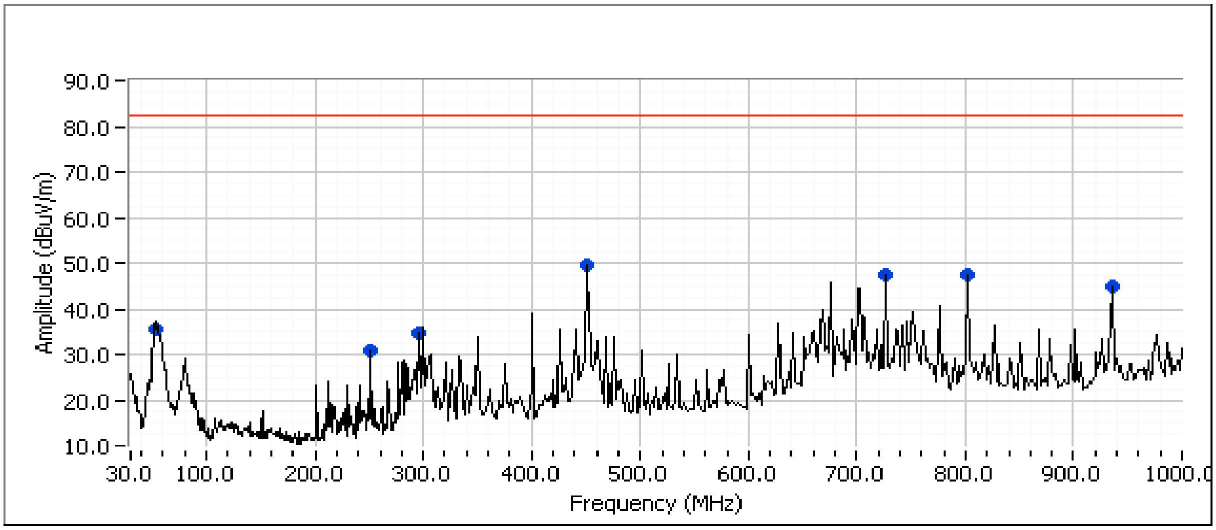
Deviations From The Standard

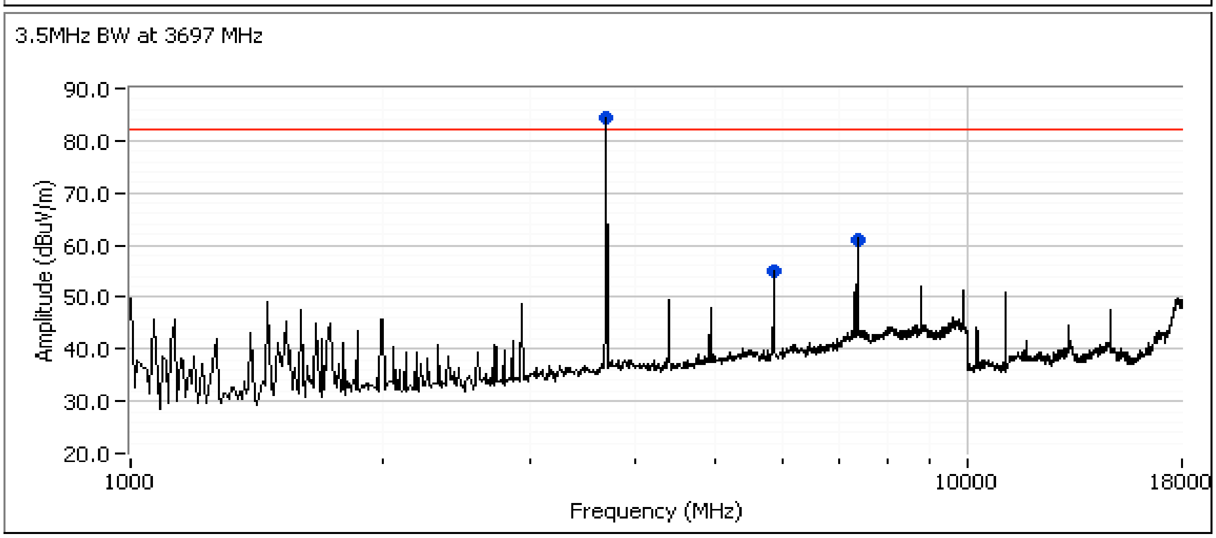
No deviations were made from the requirements of the standard.

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

Run #1: Radiated Spurious Emissions, 30 - 37000 MHz.

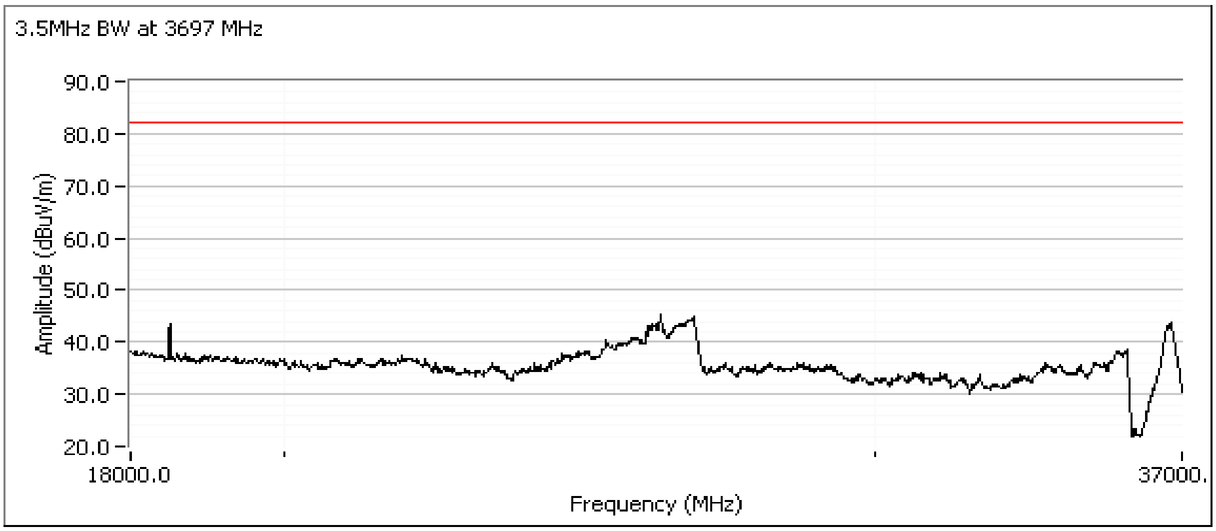
Run #1a: High Channel @ 3697 MHz. Operating Mode: 3.5 MHz





EMC Test Data

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

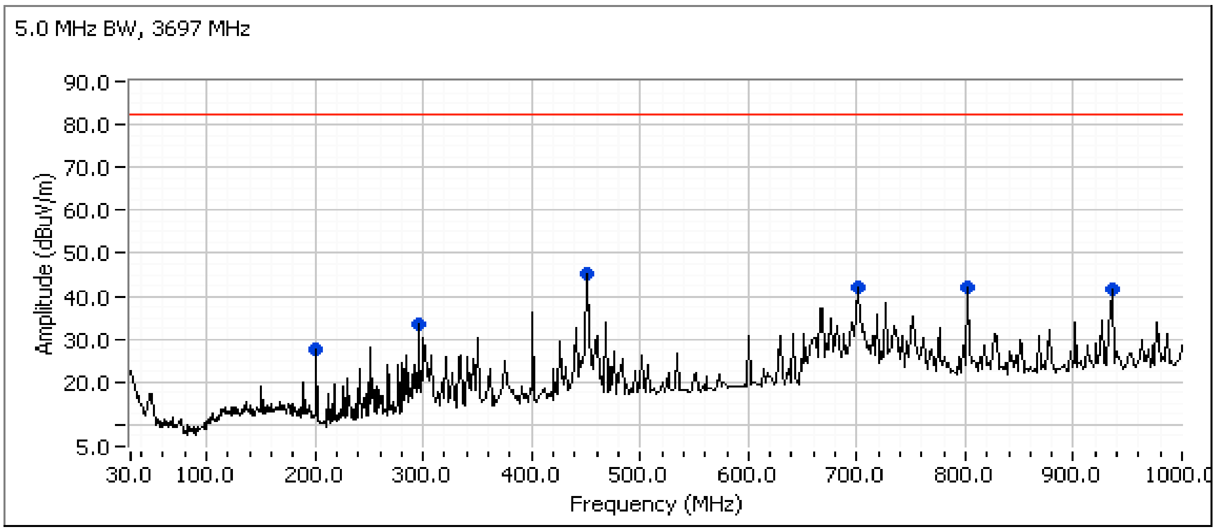


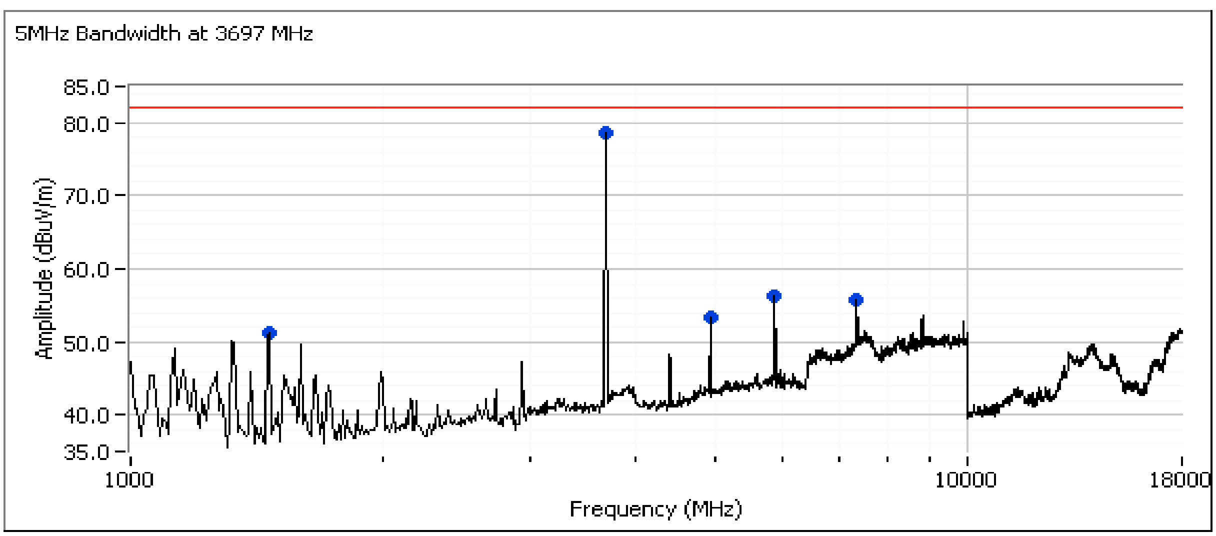
Run #1a: High Channel @ 3697 MHz. Operating Mode: 3.5 MHz

Frequency	Level	Pol	FCC 90.210		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
52.950	35.7	V	82.2	-46.5	Peak	208	1.0	
251.400	30.7	H	82.2	-51.5	Peak	217	1.0	
296.625	34.7	V	82.2	-47.5	Peak	177	2.0	
450.500	49.5	V	82.2	-32.7	Peak	224	1.0	
727.000	47.5	H	82.2	-34.7	Peak	303	1.0	
802.250	47.3	H	82.2	-34.9	Peak	84	1.0	
935.250	44.8	H	82.2	-37.4	Peak	77	1.5	
3697.000	84.5	V	-	-	Peak	293	1.6	Fundamental
5858.330	55.1	H	82.2	-27.1	Peak	155	1.0	
7393.320	61.0	V	82.2	-21.2	Peak	194	1.0	

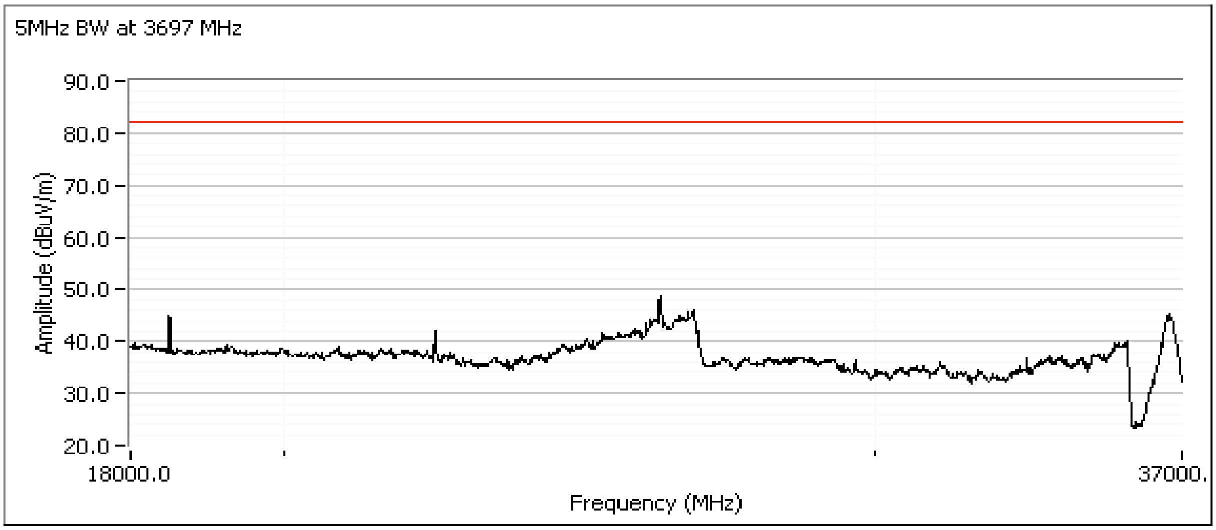
Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

Run #1b: High Channel @ 3697 MHz. Operating Mode: 5.0 MHz





Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

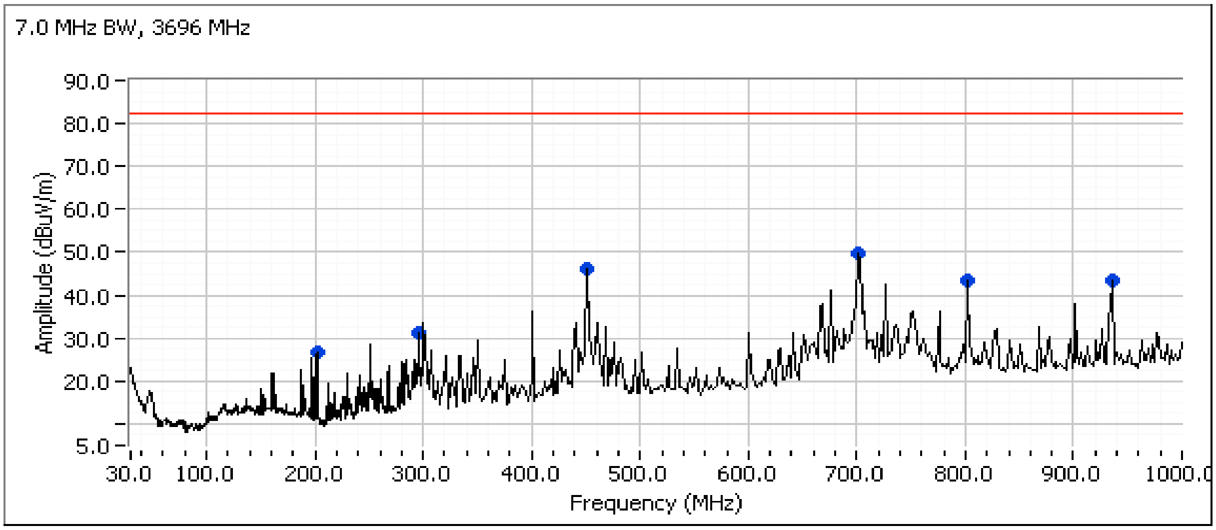


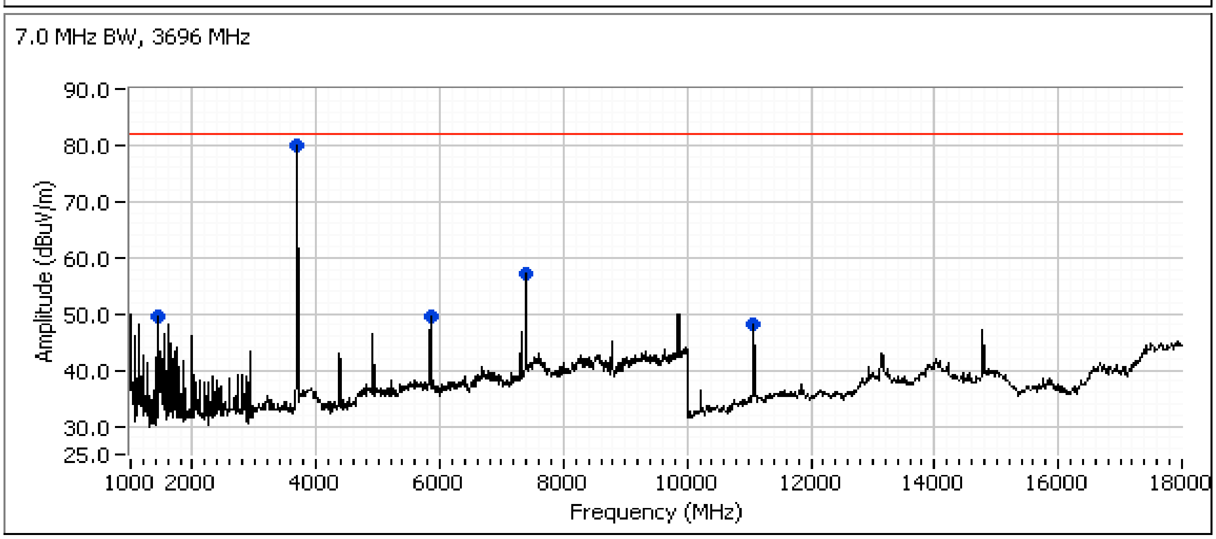
Run #1b: High Channel @ 3697 MHz. Operating Mode: 5.0 MHz

Frequency	Level	Pol	FCC 90.210		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
201.450	27.8	V	82.2	-54.4	Peak	18	1.0	
295.950	33.3	V	82.2	-48.9	Peak	157	1.0	
450.500	45.4	H	82.2	-36.8	Peak	252	1.0	
700.750	42.2	H	82.2	-40.0	Peak	245	2.0	
802.250	42.0	H	82.2	-40.2	Peak	106	1.5	
935.250	41.5	H	82.2	-40.7	Peak	82	1.5	
3685.830	*78.5*	*V*	-	-	*Peak*	*160*	*1.0*	*Fundamental*
5876.670	*56.4*	*H*	*82.2*	*-25.8*	*Peak*	*158*	*1.0*	
4923.330	*53.4*	*V*	*82.2*	*-28.8*	*Peak*	*165*	*1.0*	
1467.500	*51.2*	*V*	*82.2*	*-31.0*	*Peak*	*200*	*1.0*	
7345.830	*55.7*	*V*	*82.2*	*-26.5*	*Peak*	*193*	*1.3*	

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

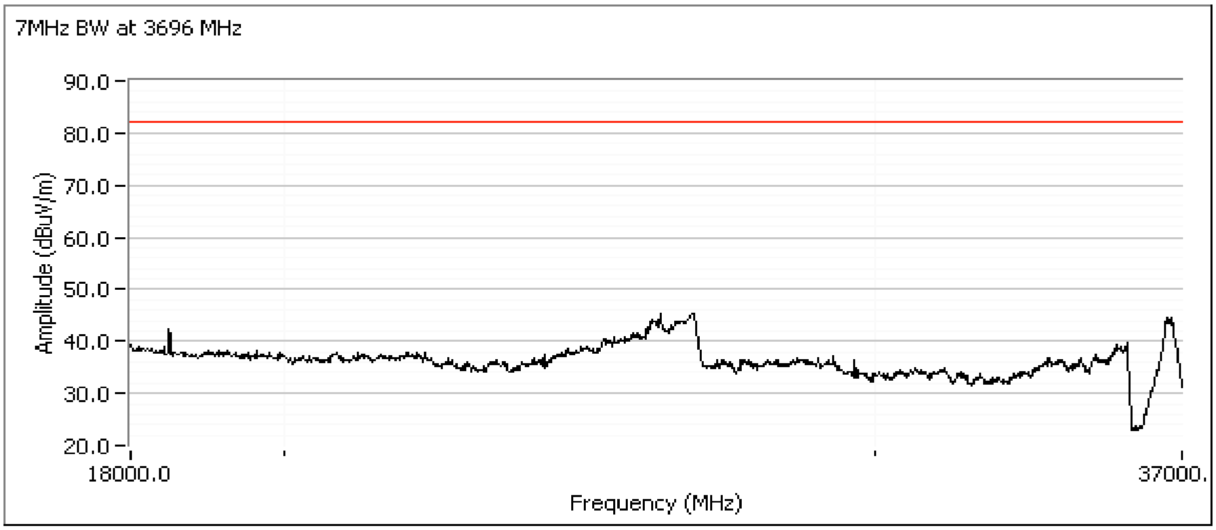
Run #1c: High Channel @ 3696 MHz. Operating Mode: 7.0 MHz





EMC Test Data

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

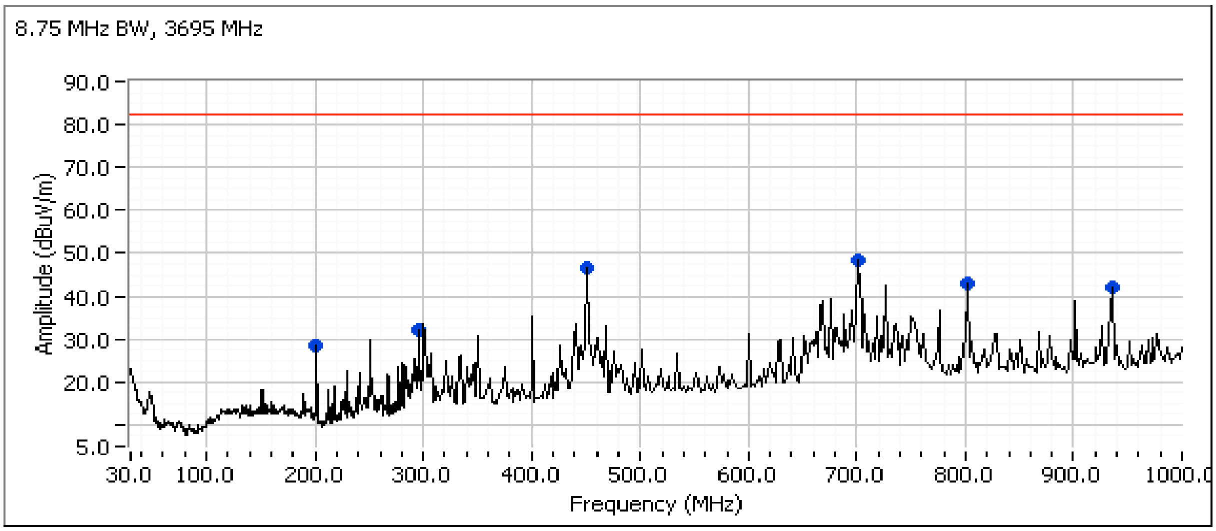


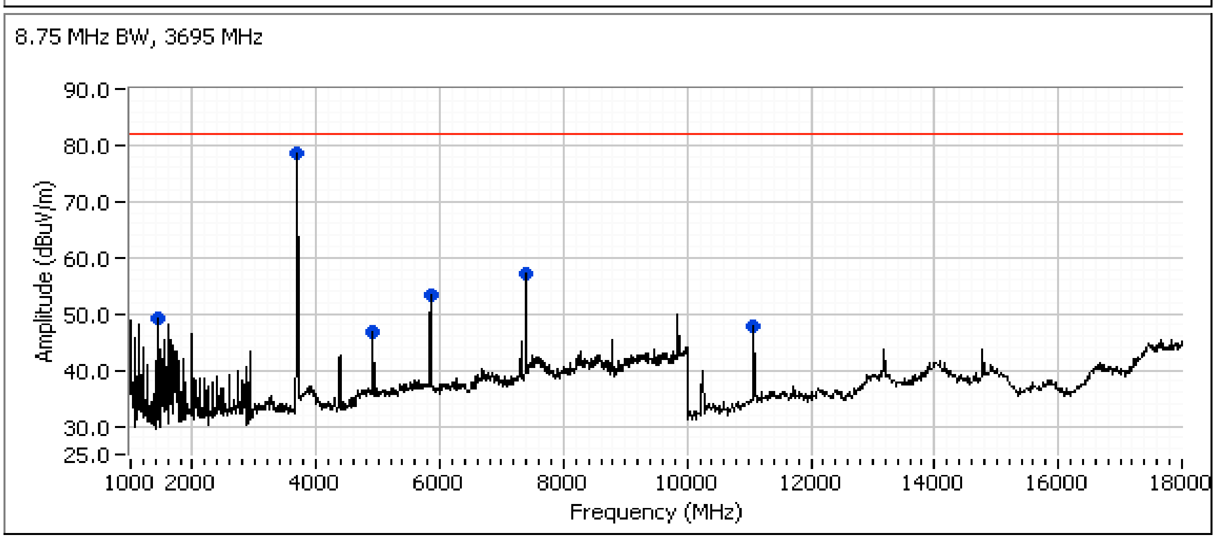
Run #1c: High Channel @ 3696 MHz. Operating Mode: 7.0 MHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
202.125	26.8	V	82.2	-55.4	Peak	299	2.5	
295.950	31.3	V	82.2	-50.9	Peak	168	4.0	
450.500	46.3	H	82.2	-35.9	Peak	276	1.0	
700.750	49.6	H	82.2	-32.6	Peak	234	2.0	
802.250	43.5	H	82.2	-38.7	Peak	261	1.5	
935.250	43.5	V	82.2	-38.7	Peak	178	1.0	
1458.330	49.7	V	82.2	-32.5	Peak	186	1.3	
3696.710	80.1	V	-	-	Peak	312	1.6	Fundamental
5849.170	49.4	V	82.2	-32.8	Peak	209	1.6	
7391.800	57.1	V	82.2	-25.1	Peak	160	1.6	
11080.000	48.2	V	82.2	-34.0	Peak	223	1.0	

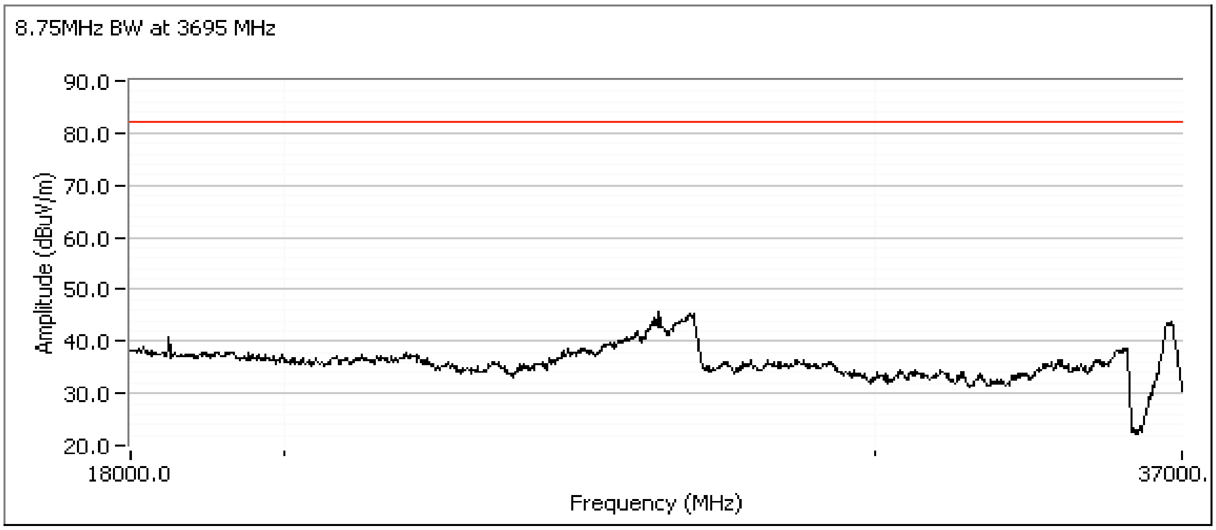
Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

Run #1d: High Channel @ 3695 MHz. Operating Mode: 8.75 MHz





Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-



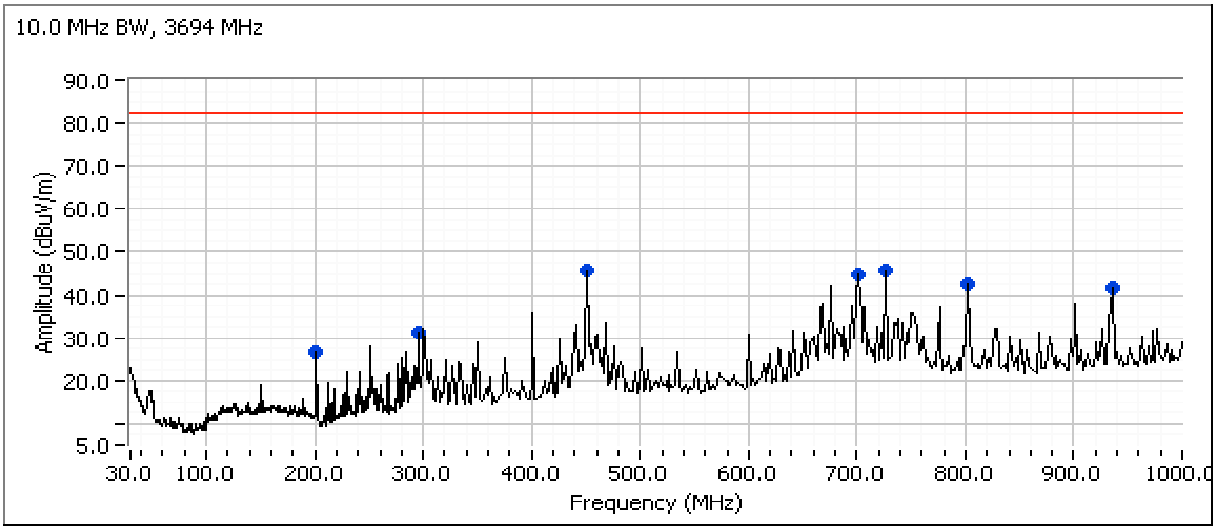
Run #1d: High Channel @ 3695 MHz. Operating Mode: 8.75 MHz

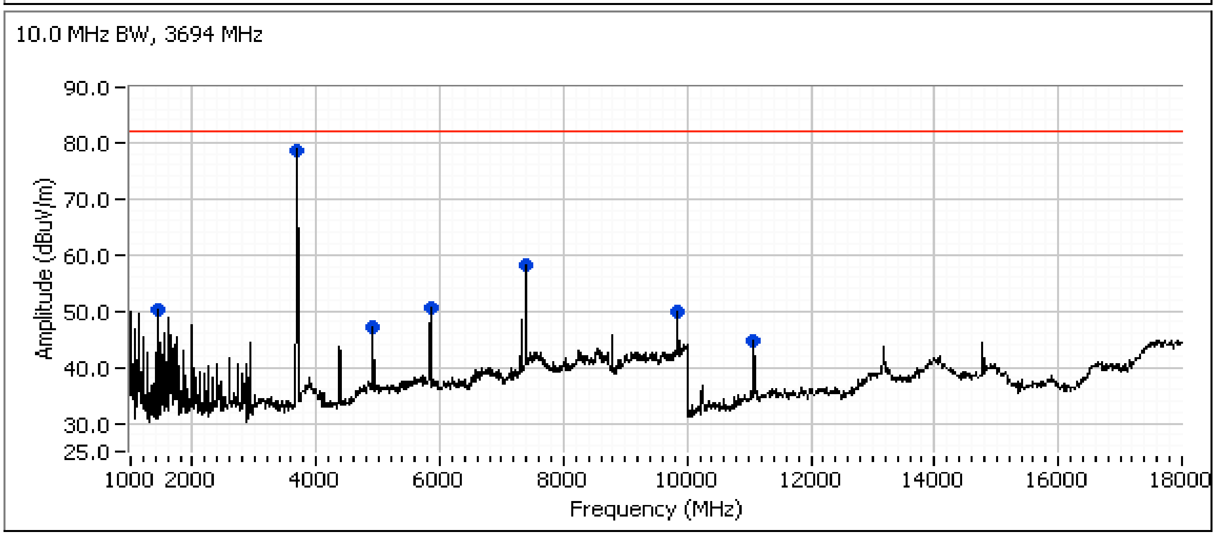
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
201.450	28.5	V	82.2	-53.7	Peak	6	1.0	
295.950	32.0	V	82.2	-50.2	Peak	164	3.5	
450.500	46.6	H	82.2	-35.6	Peak	268	1.5	
700.750	48.3	H	82.2	-33.9	Peak	21	3.5	
802.250	43.1	H	82.2	-39.1	Peak	73	1.5	
935.250	41.9	H	82.2	-40.3	Peak	84	1.5	
11080.000	*47.9*	*V*	*82.2*	*-34.3*	*Peak*	*205*	*1.0*	
1458.330	*49.2*	*V*	*82.2*	*-33.0*	*Peak*	*162*	*1.6*	
3695.120	78.6	V	-	-	Peak	318	1.3	Fundamental
4923.330	*46.9*	*V*	*82.2*	*-35.3*	*Peak*	*109*	*1.3*	
5849.170	*53.3*	*H*	*82.2*	*-28.9*	*Peak*	*148*	*1.0*	
7390.090	57.1	V	82.2	-25.1	Peak	180	1.0	

EMC Test Data

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

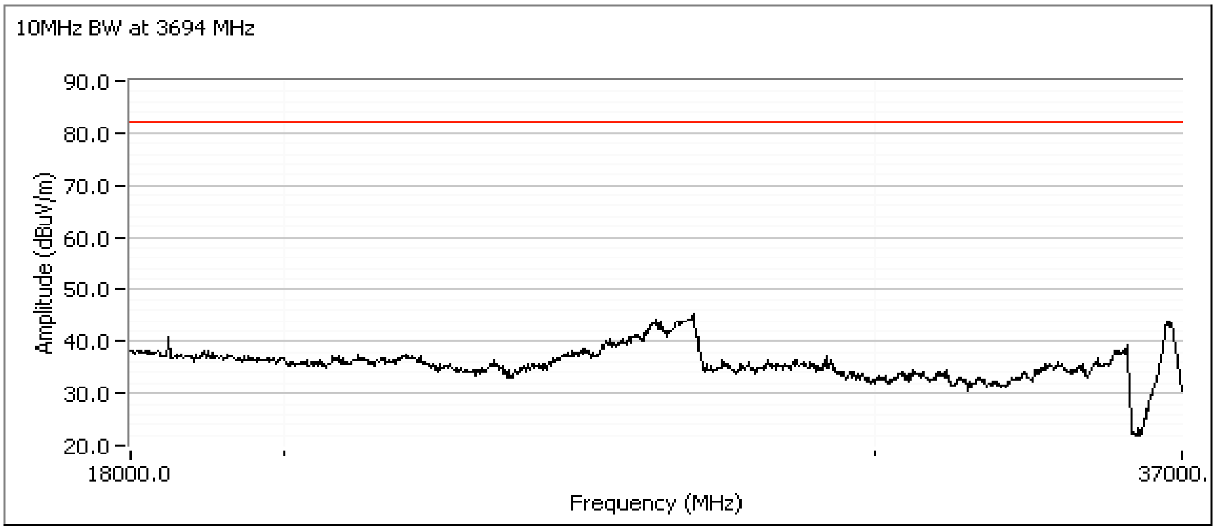
Run #1e: High Channel @ 3694 MHz. Operating Mode: 10.0 MHz





EMC Test Data

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-



Run #1e: High Channel @ 3694 MHz. Operating Mode: 10.0 MHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
201.450	26.8	V	82.2	-55.4	Peak	11	1.0	
295.950	31.4	V	82.2	-50.8	Peak	358	3.5	
450.500	45.8	H	82.2	-36.4	Peak	262	1.0	
700.750	44.6	H	82.2	-37.6	Peak	290	4.0	
727.000	45.6	H	82.2	-36.6	Peak	259	2.0	
802.250	42.6	H	82.2	-39.6	Peak	260	1.5	
935.250	41.8	V	82.2	-40.4	Peak	199	1.0	
1458.330	50.3	V	82.2	-31.9	Peak	172	1.3	
3694.130	78.6	V	-	-	Peak	318	1.3	Fundamental
4923.330	47.2	V	82.2	-35.0	Peak	190	1.3	
5849.170	50.6	H	82.2	-31.6	Peak	145	1.0	
7386.060	58.2	V	82.2	-24.0	Peak	183	1.0	
9848.330	49.9	V	82.2	-32.3	Peak	231	1.3	
11080.000	44.7	V	82.2	-37.5	Peak	193	1.0	

EMC Test Data

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

Run #2: Radiated Spurious Emissions, Transmit Mode: Substitution Measurements

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments	BW
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters		
7395.590	69.9	V	82.2	-12.3	PK	192	1.0	RB 1 MHz;VB 3 MHz;Pk	3.5MHz
7389.390	64.8	V	82.2	-17.4	PK	184	1.2	RB 1 MHz;VB 3 MHz;Pk	10MHz
7389.960	63.6	V	82.2	-18.6	PK	182	1.2	RB 1 MHz;VB 3 MHz;Pk	8.75MHz
7391.100	63.2	V	82.2	-19.0	PK	188	1.1	RB 1 MHz;VB 3 MHz;Pk	7.0MHz

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
7395.590	-20.6	10.0	87.3	97.9	69.9	-28.0	-30.2		-13.0	-17.2
7389.390	-20.4	10.0	87.0	97.4	64.8	-32.6	-34.8		-13.0	-21.8

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.

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

RSS-197 - Antenna Port Measurements

Power, PSD, 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: 1/14/2011
Test Engineer: M. Birgani/R. Varelas
Test Location: FT Lab #4

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

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Power	RSS-197	Pass	3.5 MHz: 34.3 dBm 5.0 MHz: 35.8 dBm 7.0 MHz: 37.5 dBm 8.75 MHz: 37.5 dBm 10.0 MHz: 37.6 dBm
2	PSD	1 Watt/MHz	Pass	3.5 MHz: 29.8 dBm/MHz 5.0 MHz: 30.0 dBm/MHz 7.0 MHz: 29.9 dBm/MHz 8.75 MHz: 29.1 dBm/MHz 10.0 MHz: 28.8 dBm/MHz
4	Antenna Conducted Out of Band Spurious	RSS-197	Pass	All emissions below the -13dBm/MHz limit

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 and cables used.

Ambient Conditions:

Temperature: 22 °C
Rel. Humidity: 41 %

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:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

Run #1: Bandwidth, Output Power and Power Spectral Density - MIMO Systems

Power

Frequency (MHz)	Software Setting[1]	Modulation	Measured Output Power[2] dBm			Total		Limit (dBm)	Max Power (W)	Pass or Fail
			Chain 1	Chain 2	Chain 3	mW	dBm			
7MHz Mode										
3662	2750	QPSK	26.7	26.9		957.5	29.8	-	-	-
3662	2800	16QAM	27.6	27.6		1150.9	30.6	-		-
3662	2800	64QAM	27.2	27.3		1061.8	30.3	-		-

PSD

Frequency (MHz)	99%[4] BW	Modulation	PSD[3] dBm/MHz			Total PSD		Limit		Pass or Fail
			Chain 1	Chain 2	Chain 3	mW/MHz	dBm/MHz			
7MHz Mode										
3662	6.85	QPSK	19.2	19.2		165.4	22.2	-	-	-
3662	6.90	16QAM	19.8	20.0		196.4	22.9	-	-	-
3662	6.90	64QAM	19.4	19.6		178.3	22.5	-	-	-

Note 1:	Power setting is the software setting used to set the output power.
Note 2:	Output power measured using RBW=100kHz VBW=300kHz , detector = rms, sweep time 10 seconds, max hold. The total power was integrated over the span (span > 2x channel bandwidth). Transmitted signal was not continuous but the analyzer was configured with a gated sweep such that the analyzer was only sweeping when the device was transmitting. The plot for the channel with the highest power is provided below.
Note 3:	The psd was measured using the following analyzer settings: RB=1MHz, VB=3MHz, detector = rms, sweep time 10 seconds, max hold. Multiple sweeps were made until the display had no new "peaks". The plot for the channel with the highest power is provided below.
Note 4:	99% Bandwidth measured in accordance with RSS GEN - RB > 1% of span and VB >=3xRB
Note 5:	For MIMO systems the total output power and total PSD are calculated form the sum of the powers of the individual chains (in linear terms).
Note 6:	Based on above results, Power and PSD for all types of modulations. 16-QAM had highest PSD and Power values. QPSK had lowest PSD and Power values and thus all other BW mode testing was performed using 16QAM.

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

Run #2: Output Power and Power Spectral Density - MIMO Systems

Note - the gain of 7dBi includes the minimum cable loss between antenna port and antenna.

Limits from 90.321(a): Base and fixed stations are limited to 25 watts/25 MHz equivalent isotropically radiated power (EIRP). In any event, the peak EIRP power density shall not exceed 1 Watt in any one-megahertz slice of spectrum (30dBm/MHz).

	Chain 1	Chain 2	Chain 3	Coherent	Effective[5]	EIRP (mW)	EIRP (dBm)
Antenna Gain (dBi):	7	7		Yes	10.0	5822.9	37.7

Power - Limit accounts for maximum antenna gain at this power setting.

Frequency (MHz)	Software Setting[1]	Modulation	Measured Output Power[2] dBm Chain 1	Chain 2	Chain 3	Total mW	Total dBm	EIRP dBm	Limit (eirp) dBm	Pass or Fail
3.5MHz Mode										
3697	2750 / 2650	16-QAM	21.4	21.2		270.5	24.3	34.3	44.0	PASS
5.0MHz Mode										
3697	3000 / 2800	16-QAM	23.4	22.0		377.6	25.8	35.8	44.0	PASS
7.0MHz Mode										
3696	3200 / 3000	16-QAM	25.2	23.5		556.6	27.5	37.5	44.0	PASS
8.75MHz Mode										
3695	3200 / 3200	16-QAM	24.7	24.2		557.5	27.5	37.5	44.0	PASS
10.0MHz Mode										
3694	3300 / 3300	16-QAM	24.9	24.4		580.9	27.6	37.7	44.0	PASS

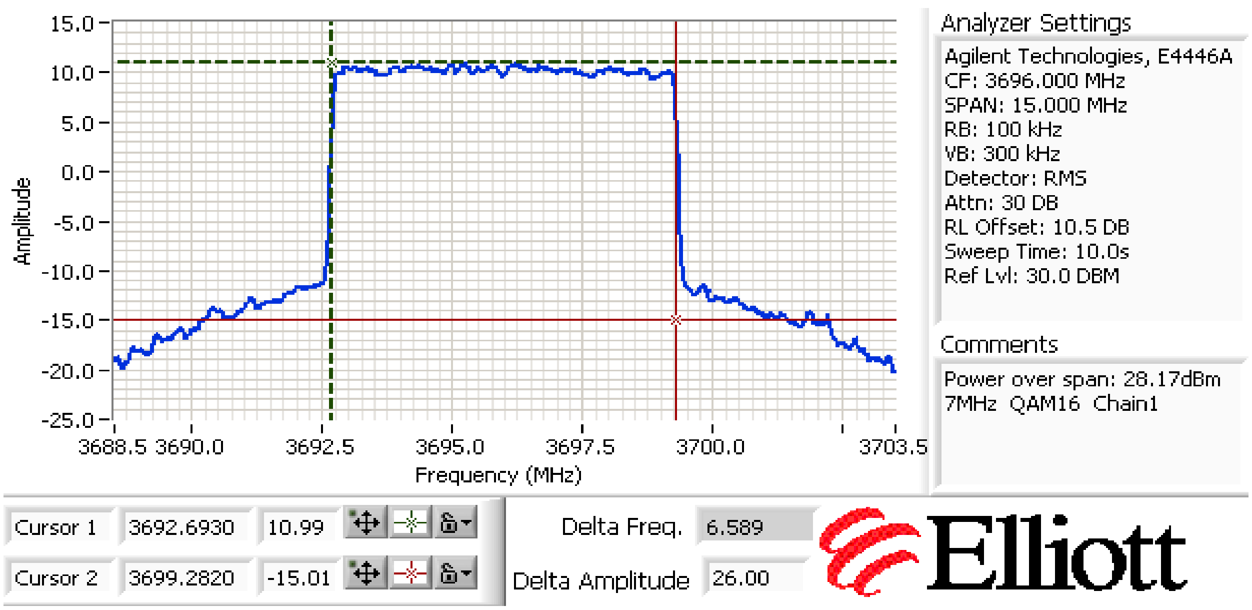
PSD

Frequency (MHz)	99%[4] BW	Modulation	PSD[3] dBm/MHz Chain 1	Chain 2	Chain 3	Total PSD mW/MHz	Total PSD dBm/MHz	PSD EIRP dBm/MHz	Limit (eirp) dBm/MHz	Pass or Fail
3.5MHz Mode										
3697		16-QAM	16.8	16.7		94.6	19.8	29.8	30.0	PASS
5.0MHz Mode										
3697		16-QAM	17.6	16.2		99.2	20.0	30.0	30.0	PASS
7.0MHz Mode										
3696		16-QAM	17.7	16.0		98.5	19.9	29.9	30.0	PASS
8.75MHz Mode										
3695		16-QAM	16.3	15.9		81.2	19.1	29.1	30.0	PASS
10.0MHz Mode										
3694		16-QAM	16.1	15.5		76.5	18.8	28.8	30.0	PASS

EMC Test Data

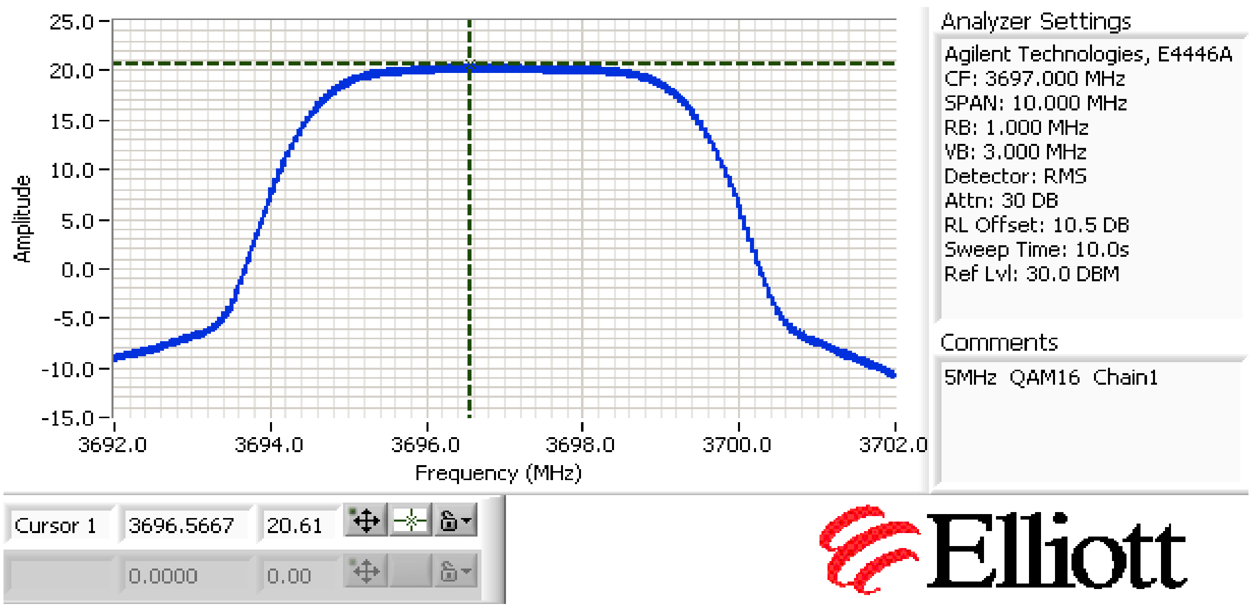
Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

Note 1:	Power setting is the software setting used to set the output power.
Note 2:	Output power measured using RBW=100kHz VBW=300kHz , detector = rms, sweep time 10 seconds, max hold. The total power was integrated over the span (span >= 1.5x channel bandwidth). The sweep time was such that the dwell itme per any one display piont was less than the "on-time" for the transmitter (4ms). The plot for the channel with the highest power is provided below.
Note 3:	The PSD was measured using the following analyzer settings: RB=1MHz, VB=3MHz, detector = rms, sweep time 10 seconds, max hold. Multiple sweeps were made until the display had no new "peaks". The plot for the channel with the highest power is provided below. The sweep time was such that the dwell itme per any one display point was less than the "on-time" for the transmitter (4ms).
Note 4:	99% Bandwidth measured in accordance with RSS GEN - RB > 1% of span and VB >=3xRB
Note 5:	For MIMO systems the total output power and total PSD are calculated form the sum of the powers of the individual chains (in linear terms). The antenna gain used to determine the EIRP and limits for PSD/Output power depends on the operating mode of the MIMO device. If the signals on the non-coherent between the transmit chains then the gain used to determine the limits is the highest gain of the individual chains and the EIRP is the sum of the products of gain and power on each chain. If the signals are coherent then the effective antenna gain is the sum (in linear terms) of the gains for each chain and the EIRP is the product of the effective gain and total power.



Note:	Power on plot is 3dB higher than actual due to additional 3dB Pad that was unaccounted for in the measurement setup.

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-



Note: PSD on plot is 3dB higher than actual due to additional 3dB Pad that was unaccounted for in the measurement setup.

	Chain 1	Chain 2	Chain 3	Coherent	Effective[5]	EIRP (mW)	EIRP (dBm)
Antenna Gain (dBi):	12	12		Yes	15.0	7501.4	38.8

Power - Limit accounts for maximum antenna gain at this power setting.

Frequency (MHz)	Software Setting[1]	Modulation	Measured Output Power[2] dBm Chain 1	Chain 2	Chain 3	Total mW	Total dBm	EIRP dBm	Limit (eirp) dBm	Pass or Fail
3.5MHz Mode										
3697	2200/2100	16-QAM	16.5	16.3		87.5	19.4	34.4	44.0	PASS
5.0MHz Mode										
3697	2500/2300	16-QAM	18.5	17.1		122.2	20.9	35.9	44.0	PASS
7.0MHz Mode										
3696	2700/2500	16-QAM	20.3	18.6		180.1	22.6	37.6	44.0	PASS
8.75MHz Mode										
3695	2750/2750	16-QAM	20.3	19.8		202.4	23.1	38.1	44.0	PASS
10.0MHz Mode										
3694	2900/2900	16-QAM	21.0	20.5		236.7	23.7	38.8	44.0	PASS

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

PSD

Frequency (MHz)	99%[4] BW	Modulation	PSD[2] dBm/MHz Chain 1	Chain 2	Chain 3	Total PSD mW/MHz	dBm/MHz	PSD EIRP dBm/MHz	Limit (eirp) dBm/MHz	Pass or Fail
3.5MHz Mode										
3697	3.3	16-QAM	11.9	11.8		30.6	14.9	29.9	30.0	PASS
5.0MHz Mode										
3697	4.6	16-QAM	12.6	11.2		31.4	15.0	30.0	30.0	PASS
7.0MHz Mode										
3696	6.6	16-QAM	12.7	11.0		31.2	14.9	29.9	30.0	PASS
8.75MHz Mode										
3695	8.2	16-QAM	11.9	11.5		29.5	14.7	29.7	30.0	PASS
10.0MHz Mode										
3694	9.2	16-QAM	12.2	11.6		31.2	14.9	29.9	30.0	PASS

Note 1:	Power setting is the software setting used to set the output power.
Note 2:	Output power measured using RBW=100kHz VBW=300kHz , detector = rms, sweep time 10 seconds, max hold. The total power was integrated over the span (span > 2x channel bandwidth). Transmitted signal was not continuous but the analyzer was configured with a gated sweep such that the analyzer was only sweeping when the device was transmitting. The plot for the channel with the highest power is provided below.
Note 3:	The psd was measured using the following analyzer settings: RB=1MHz, VB=3MHz, detector = rms, sweep time 10 seconds, max hold. Multiple sweeps were made until the display had no new "peaks". The plot for the channel with the highest power is provided below.
Note 4:	99% Bandwidth measured in accordance with RSS GEN - RB > 1% of span and VB >=3xRB
Note 5:	For MIMO systems the total output power and total PSD are calculated form the sum of the powers of the individual chains (in linear terms). The antenna gain used to determine the EIRP and limits for PSD/Output power depends on the operating mode of the MIMO device. If the signals on the non-coherent between the transmit chains then the gain used to determine the limits is the highest gain of the individual chains and the EIRP is the sum of the products of gain and power on each chain. If the signals are coherent then the effective antenna gain is the sum (in linear terms) of the gains for each chain and the EIRP is the product of the effective gain and total power.

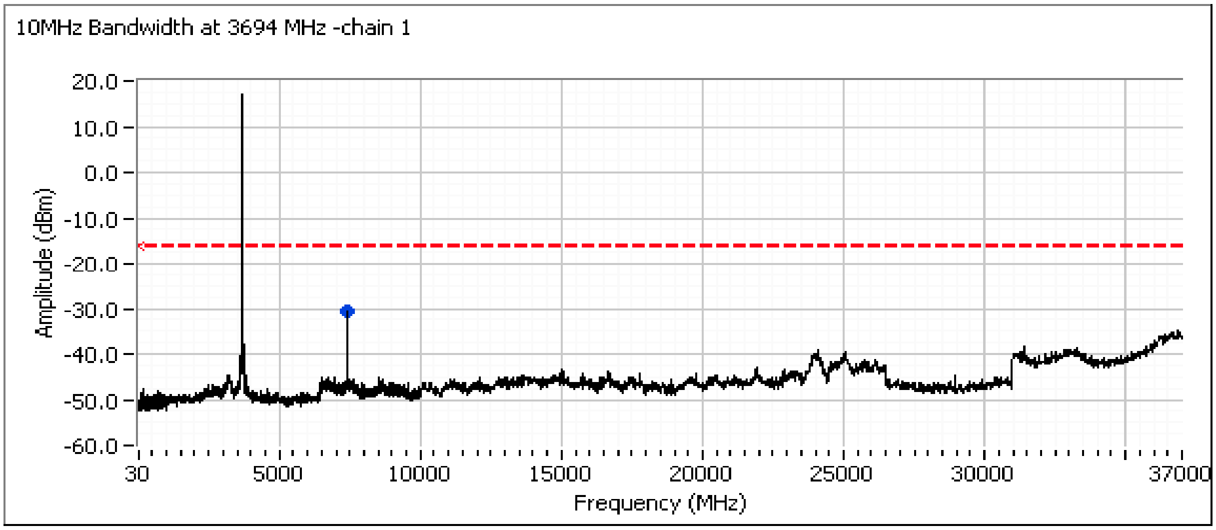
Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

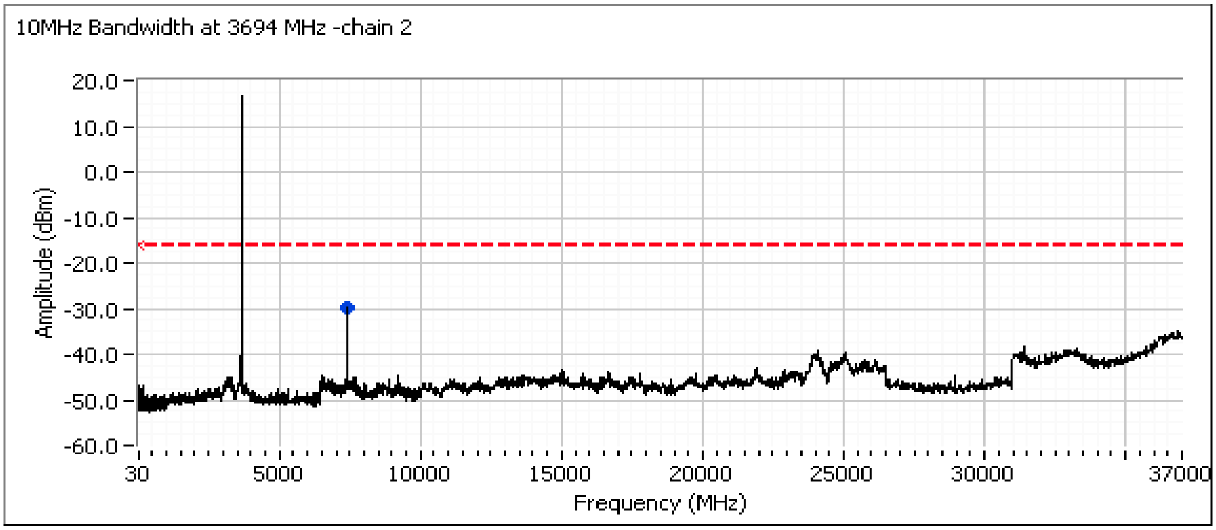
Run #3: Unwanted emissions, QAM16 at power setting used for Power measurements

Number of transmit chains:	2	
Spurious Limit:	-13.0	dBm/MHz eirp
Adjustment for 2 chains:	-3.0	dB adjustment for multiple chains.
Limit Used On Plots	-16.0	dBm/MHz

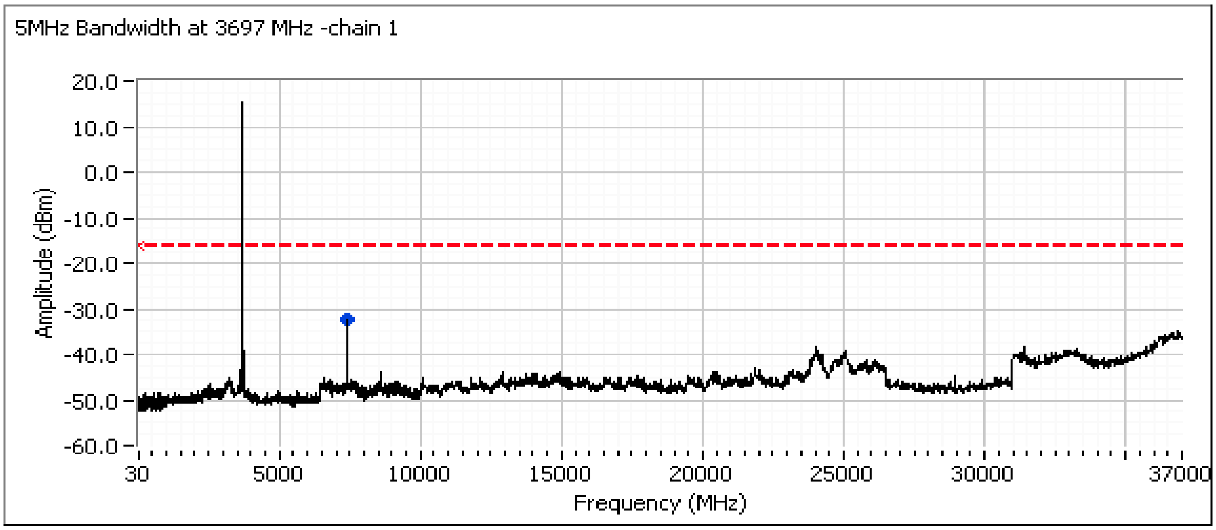
MIMO Devices: The plots were obtained for each chain individually and the limit was adjusted to account for all chains transmitting simultaneously

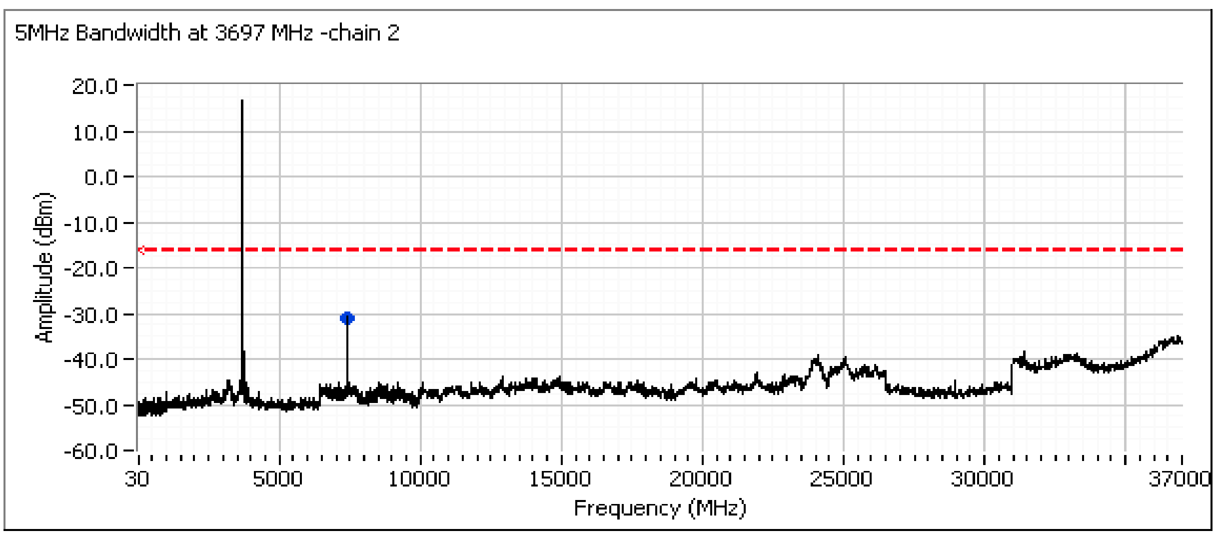
Plots Showing Out-Of-Band Emissions (RBW=VBW=1MHz)





Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

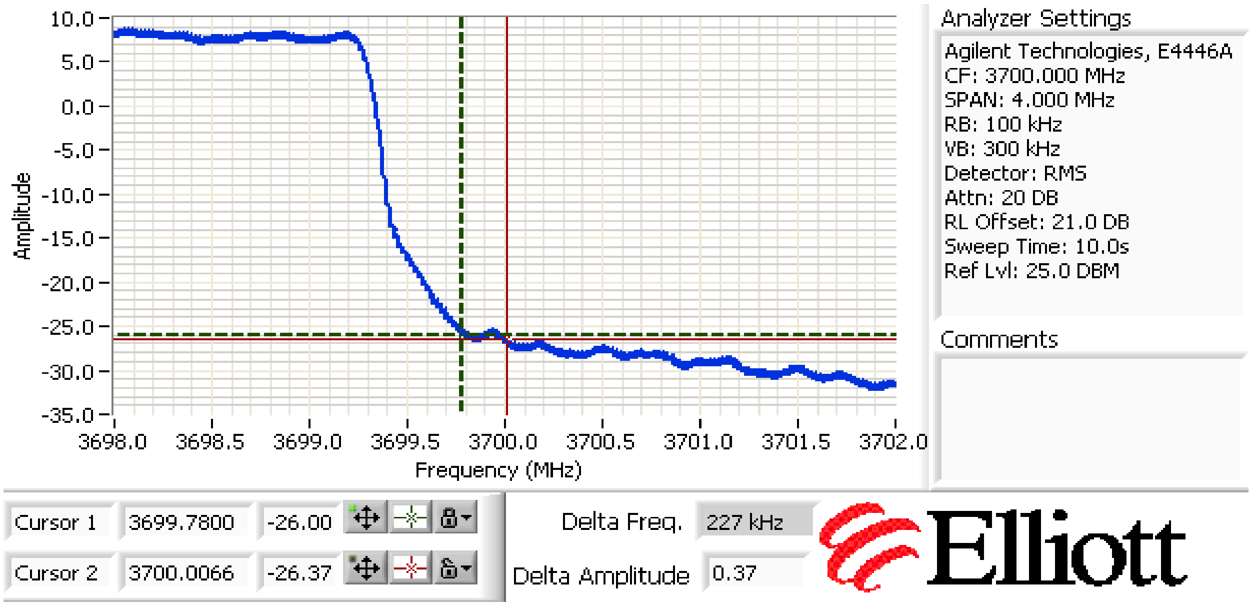




Frequency	Level	Port	FCC Part 90		Detector	Channel	Mode	Comments
MHz	dBm		Limit	Margin				
7392.500	-30.1	Port 1	-16.0	-14.1	Peak	High	16QAM	10MHz BW
7392.500	-29.8	Port 2	-16.0	-13.8	Peak	High	16QAM	10MHz BW
7392.500	-32.2	Port 1	-16.0	-16.2	Peak	High	16QAM	5MHz BW
7392.500	-31.0	Port 2	-16.0	-15.0	Peak	High	16QAM	5MHz BW

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

Run #2: Out of Band Spurious Emissions, Conducted Bandedge



Plot for high channel (3697 MHz), power setting(s) = 3000, BW= 5.0, MOD=QAM16
-26.4dBm in 100 kHz (corrected by 10*log(100kHz/1MHz)) yields -13.4dBm in 1 MHz for both chains

Frequency MHz	Level dBm	Port	RSS-197 Limit	RSS-197 Margin	Detector	Channel	Mode	Comments
3650.000	-14.4	RF	-13.0	-1.4	Avg	3656	QAM16	BW: 10.0
3700.000	-14.7	RF	-13.0	-1.7	Avg	3694	QAM16	BW: 10.0
3650.000	-18.7	RF	-13.0	-5.7	Avg	3655	QAM16	BW: 8.75
3700.000	-16.3	RF	-13.0	-3.3	Avg	3695	QAM16	BW: 8.75
3650.000	-16.5	RF	-13.0	-3.5	Avg	3654	QAM16	BW: 7.0
3700.000	-16.2	RF	-13.0	-3.2	Avg	3696	QAM16	BW: 7.0
3650.000	-16.4	RF	-13.0	-3.4	Avg	3653	QAM16	BW: 5.0
3700.000	-13.4	RF	-13.0	-0.4	Avg	3697	QAM16	BW: 5.0
3650.000	-17.3	RF	-13.0	-4.3	Avg	3653	QAM16	BW: 3.5
3700.000	-19.1	RF	-13.0	-6.1	Avg	3697	QAM16	BW: 3.5

EMC Test Data

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

RSS-197 and FCC 90Z - Antenna Port Measurements

Power, PSD, 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: 10/11/2010
Test Engineer: M. Birgani/R. Varelas
Test Location: FT Lab #4

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

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
2	Power	Part 90	Pass	3.5 MHz: 34.8dBm 5.0 MHz: 36.1dBm 7.0 MHz: 37.6dBm 8.75 MHz: 38.4dBm 10.0 MHz: 38.9dBm
2	PSD	1 Watt/MHz 90.1321(a)	Pass	3.5 MHz: 29.9dBm/MHz 5.0 MHz: 29.8dBm/MHz 7.0 MHz: 29.9dBm/MHz 8.75 MHz: 29.9dBm/MHz 10.0 MHz: 29.9dBm/MHz
2	99% Bandwidth	-	N/A	3.5 MHz: 3.3 MHz 5.0 MHz: 4.6 MHz 7.0 MHz: 6.6 MHz 8.75 MHz: 8.2 MHz 10.0 MHz: 9.2 MHz
3	Emissions Mask	90.210 Mask		All emissions within the Mask for each BW
4	Antenna Conducted Out of Band Spurious	90.210 Mask	Pass	All emissions below the -13dBm/MHz limit

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 and cables used.

Ambient Conditions:

Temperature: 22.1 °C
Rel. Humidity: 41 %

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

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.

Run #1: Bandwidth, Output Power and Power Spectral Density - MIMO Systems

Power

Frequency (MHz)	Software Setting[1]	Modulation	Measured Output Power[2] dBm			Total		Limit (dBm)	Max Power (W)	Pass or Fail
			Chain 1	Chain 2	Chain 3	mW	dBm			
7MHz Mode										
3662	2750	QPSK	26.7	26.9		957.5	29.8	-	-	-
3662	2800	16QAM	27.6	27.6		1150.9	30.6	-		-
3662	2800	64QAM	27.2	27.3		1061.8	30.3	-		-

PSD

Frequency (MHz)	99%[4] BW	Modulation	PSD[3] dBm/MHz			Total PSD		Limit		Pass or Fail
			Chain 1	Chain 2	Chain 3	mW/MHz	dBm/MHz			
7MHz Mode										
3662	6.85	QPSK	19.2	19.2		165.4	22.2	-	-	-
3662	6.90	16QAM	19.8	20.0		196.4	22.9	-	-	-
3662	6.90	64QAM	19.4	19.6		178.3	22.5	-	-	-

Note 1:	Power setting is the software setting used to set the output power.
Note 2:	Output power measured using RBW=100kHz VBW=300kHz , detector = rms, sweep time 10 seconds, max hold. The total power was integrated over the span (span > 2x channel bandwidth). Transmitted signal was not continuous but the analyzer was configured with a gated sweep such that the analyzer was only sweeping when the device was transmitting. The plot for the channel with the highest power is provided below.
Note 3:	The psd was measured using the following analyzer settings: RB=1MHz, VB=3MHz, detector = rms, sweep time 10 seconds, max hold. Multiple sweeps were made until the display had no new "peaks". The plot for the channel with the highest power is provided below.
Note 4:	99% Bandwidth measured in accordance with RSS GEN - RB > 1% of span and VB >=3xRB
Note 5:	For MIMO systems the total output power and total PSD are calculated form the sum of the powers of the individual chains (in linear terms).
Note 6:	Based on above results, Power and PSD for all types of modulations. 16-QAM had highest PSD and Power values. QPSK had lowest PSD and Power values and thus all other BW mode testing was performed using 16QAM.

EMC Test Data

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

Run #2: Bandwidth, Output Power and Power Spectral Density - MIMO Systems

Note - the gain of 7dBi includes the minimum cable loss between antenna port and antenna.

Limits from 90.321(a): Base and fixed stations are limited to 25 watts/25 MHz equivalent isotropically radiated power (EIRP). In any event, the peak EIRP power density shall not exceed 1 Watt in any one-megahertz slice of spectrum (30dBm/MHz).

	Chain 1	Chain 2	Chain 3	Coherent	Effective[5]	EIRP (mW)	EIRP (dBm)
Antenna Gain (dBi):	7	7		Yes	10.0	7629.9	38.8

Power - Limit accounts for maximum antenna gain at this power setting.

Frequency	Software	Modulation	Measured Output Power[2] dBm			Total		EIRP	Limit (eirp)	Pass or
(MHz)	Setting[1]		Chain 1	Chain 2	Chain 3	mW	dBm	dBm	dBm	Fail
3.5MHz Mode										
3653	2050	16-QAM	21.0	21.4		263.9	24.2	34.2	44.0	PASS
3662	2150	16-QAM	21.5	21.7		289.2	24.6	34.6	44.0	PASS
3672	2150	16-QAM	21.4	21.5		279.3	24.5	34.5	44.0	PASS
5.0MHz Mode										
3653	2150	16-QAM	22.6	22.9		377.0	25.8	35.8	44.0	PASS
3662	2150	16-QAM	22.2	22.7		352.2	25.5	35.5	44.0	PASS
3672	2200	16-QAM	22.8	23.3		404.3	26.1	36.1	44.0	PASS
7.0MHz Mode										
3654	2450	16-QAM	23.8	24.1		496.9	27.0	37.0	44.0	PASS
3662	2500	16-QAM	24.6	24.6		576.8	27.6	37.6	44.0	PASS
3671	2500	16-QAM	24.2	24.4		538.4	27.3	37.3	44.0	PASS
8.75MHz Mode										
3655	2500,2400	16-QAM	25.6	24.8		665.1	28.2	38.2	44.0	PASS
3662	2500,2400	16-QAM	25.2	25.0		647.4	28.1	38.1	44.0	PASS
3670	2500	16-QAM	25.0	25.1		639.8	28.1	38.1	44.0	PASS
10.0MHz Mode										
3656	2550	16-QAM	25.4	25.8		726.9	28.6	38.6	44.0	PASS
3662	2600,2550	16-QAM	26.0	25.6		761.2	28.8	38.8	44.0	PASS
3669	2600	16-QAM	25.9	25.5		743.9	28.7	38.7	44.0	PASS

EMC Test Data

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

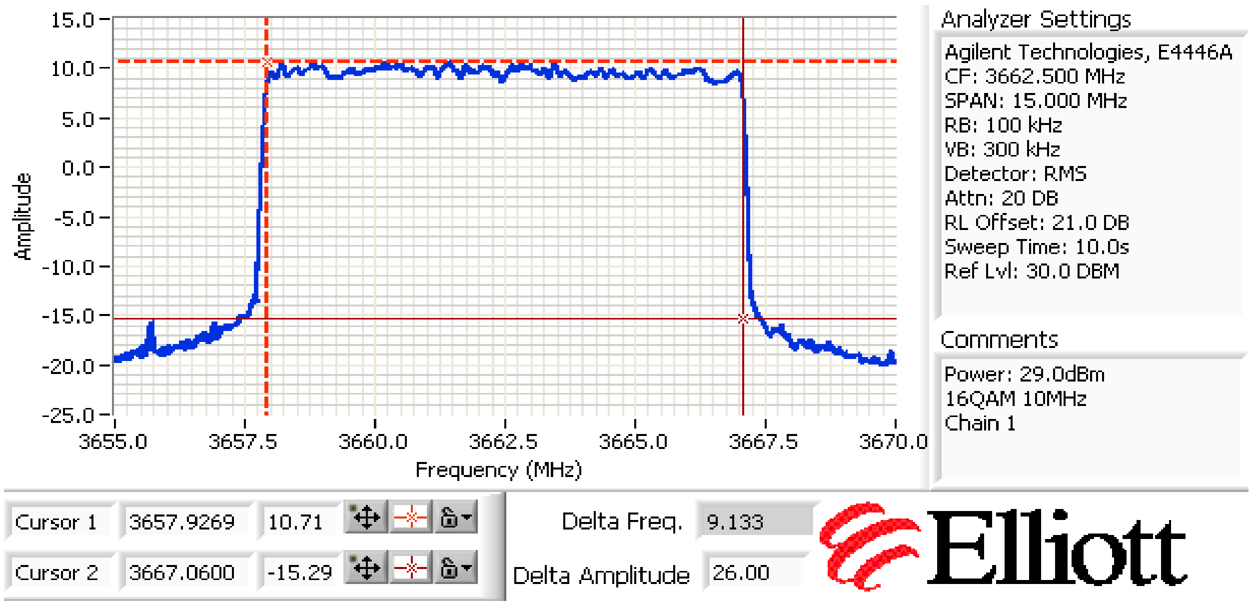
PSD

Frequency (MHz)	99%[4] BW	Modulation	PSD[3] dBm/MHz Chain 1	Chain 2	Chain 3	Total PSD mW/MHz	Total PSD dBm/MHz	PSD EIRP dBm/MHz	Limit (eirp) dBm/MHz	Pass or Fail
3.5MHz Mode										
3653	3.3	16-QAM	16.2	16.4		85.3	19.3	29.3	30.0	PASS
3662	3.3	16-QAM	16.6	16.8		93.6	19.7	29.7	30.0	PASS
3672	3.3	16-QAM	16.4	16.8		91.5	19.6	29.6	30.0	PASS
5.0MHz Mode										
3653	4.6	16-QAM	16.4	16.8		91.5	19.6	29.6	30.0	PASS
3662	4.6	16-QAM	16.1	16.4		84.4	19.3	29.3	30.0	PASS
3672	4.6	16-QAM	16.7	16.9		95.8	19.8	29.8	30.0	PASS
7.0MHz Mode										
3654	6.6	16-QAM	16.0	16.5		84.5	19.3	29.3	30.0	PASS
3662	6.6	16-QAM	16.8	17.0		98.0	19.9	29.9	30.0	PASS
3671	6.6	16-QAM	16.5	16.7		91.4	19.6	29.6	30.0	PASS
8.75MHz Mode										
3655	8.2	16-QAM	17.1	16.3		93.9	19.7	29.7	30.0	PASS
3662	8.2	16-QAM	16.8	16.6		93.6	19.7	29.7	30.0	PASS
3670	8.2	16-QAM	16.5	16.6		90.4	19.6	29.6	30.0	PASS
10.0MHz Mode										
3656	9.2	16-QAM	16.5	16.9		93.6	19.7	29.7	30.0	PASS
3662	9.2	16-QAM	17.0	16.6		95.8	19.8	29.8	30.0	PASS
3669	9.2	16-QAM	16.9	16.6		94.7	19.8	29.8	30.0	PASS

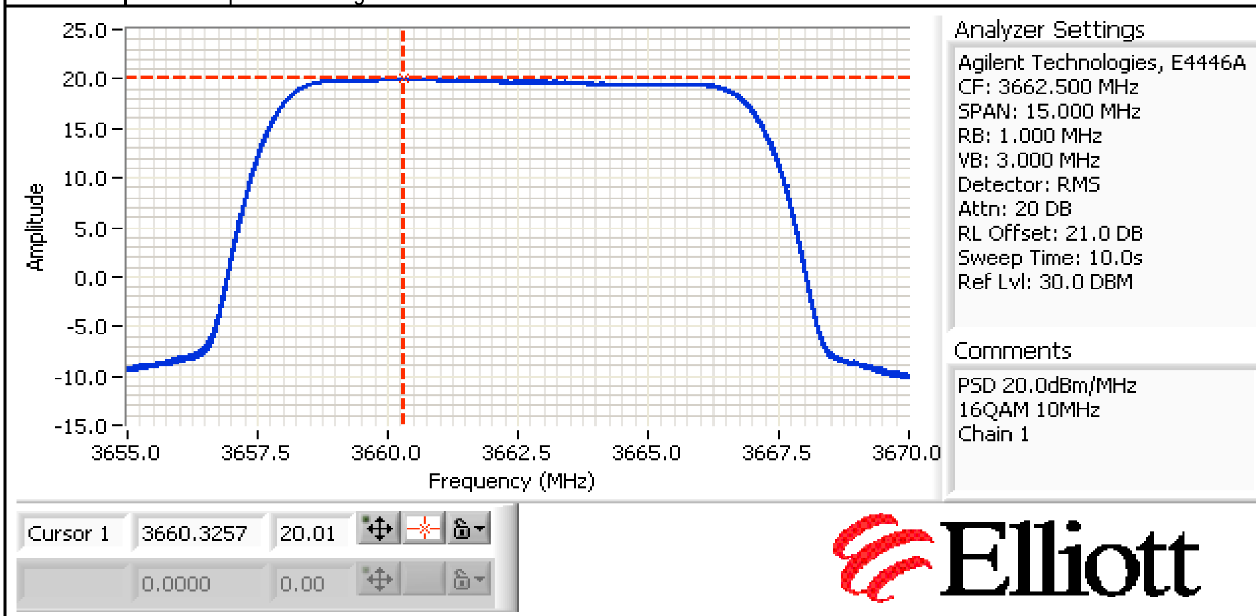
Note 1:	Power setting is the software setting used to set the output power.
Note 2:	Output power measured using RBW=100kHz VBW=300kHz , detector = rms, sweep time 10 seconds, max hold. The total power was integrated over the span (span >= 1.5x channel bandwidth). The sweep time was such that the dwell itme per any one display piont was less than the "on-time" for the transmitter (4ms). The plot for the channel with the highest power is provided below.
Note 3:	The PSD was measured using the following analyzer settings: RB=1MHz, VB=3MHz, detector = rms, sweep time 10 seconds, max hold. Multiple sweeps were made until the display had no new "peaks". The plot for the channel with the highest power is provided below. The sweep time was such that the dwell itme per any one display point was less than the "on-time" for the transmitter (4ms).
Note 4:	99% Bandwidth measured in accordance with RSS GEN - RB > 1% of span and VB >=3xRB
Note 5:	For MIMO systems the total output power and total PSD are calculated form the sum of the powers of the individual chains (in linear terms). The antenna gain used to determine the EIRP and limits for PSD/Output power depends on the operating mode of the MIMO device. If the signals on the non-coherent between the transmit chains then the gain used to determine the limits is the highest gain of the individual chains and the EIRP is the sum of the products of gain and power on each chain. If the signals are coherent then the effective antenna gain is the sum (in linear terms) of the gains for each chain and the EIRP is the product of the effective gain and total power.

EMC Test Data

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

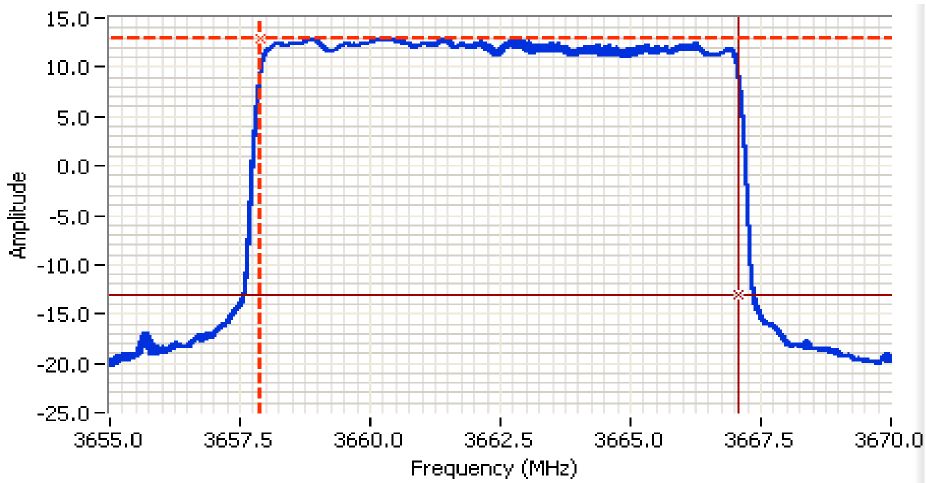


Note: Power on plot is 3dB higher than actual due to additional 3dB Pad that was unaccounted for in the measurement setup.



Note: PSD on plot is 3dB higher than actual due to additional 3dB Pad that was unaccounted for in the measurement setup.

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-



Analyzer Settings
Agilent Technologies, E4446A
CF: 3662.500 MHz
SPAN: 15.000 MHz
RB: 200 kHz
VB: 620 kHz
Detector: RMS
Attn: 20 DB
RL Offset: 21.0 DB
Sweep Time: 10.0s
Ref Lvl: 30.0 DBM

Comments
99% BW: 9.2 MHz
16QAM 10MHz

Cursor 1	3657.9062	12.91
Cursor 2	3667.0769	-13.09

Delta Freq. 9.171
Delta Amplitude 26.00

Elliott

EMC Test Data

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

	Chain 1	Chain 2	Chain 3	Coherent	Effective[5]	EIRP (mW)	EIRP (dBm)
Antenna Gain (dBi):	12	12		Yes	15.0	244539.5	53.9

Power - Limit accounts for maximum antenna gain at this power setting.

Frequency (MHz)	Software Setting[1]	Modulation	Measured Output Power[2] dBm Chain 1	Chain 2	Chain 3	Total mW	Total dBm	EIRP dBm	Limit (eirp) dBm	Pass or Fail
3.5MHz Mode										
3653	1850	16-QAM	16.7	16.9		95.8	19.8	34.8	44.0	PASS
3662	1850	16-QAM	16.3	16.6		88.4	19.5	34.5	44.0	PASS
3672	1900,1850	16-QAM	16.9	16.1		89.7	19.5	34.5	44.0	PASS
5.0MHz Mode										
3653	1900	16-QAM	18.0	18.2		129.2	21.1	36.1	44.0	PASS
3662	1900	16-QAM	17.6	17.7		116.4	20.7	35.7	44.0	PASS
3672	2000,1950	16-QAM	18.2	17.4		121.0	20.8	35.8	44.0	PASS
7.0MHz Mode										
3654	2200,2150	16-QAM	19.6	18.9		168.8	22.3	37.3	44.0	PASS
3662	2200	16-QAM	19.2	19.6		174.4	22.4	37.4	44.0	PASS
3671	2200,2250	16-QAM	18.9	19.1		158.9	22.0	37.0	44.0	PASS
8.75MHz Mode										
3655	2250,2200	16-QAM	20.1	20.3		209.5	23.2	38.2	44.0	PASS
3662	2250	16-QAM	19.8	20.9		218.5	23.4	38.4	44.0	PASS
3670	2300,2250	16-QAM	20.5	20.0		212.2	23.3	38.3	44.0	PASS
10.0MHz Mode										
3656	2350,2250	16-QAM	21.1	20.3		236.0	23.7	38.7	44.0	PASS
3662	2350,2300	16-QAM	20.7	21.0		243.4	23.9	38.9	44.0	PASS
3669	2350,2400	16-QAM	20.4	21.0		235.5	23.7	38.7	44.0	PASS

EMC Test Data

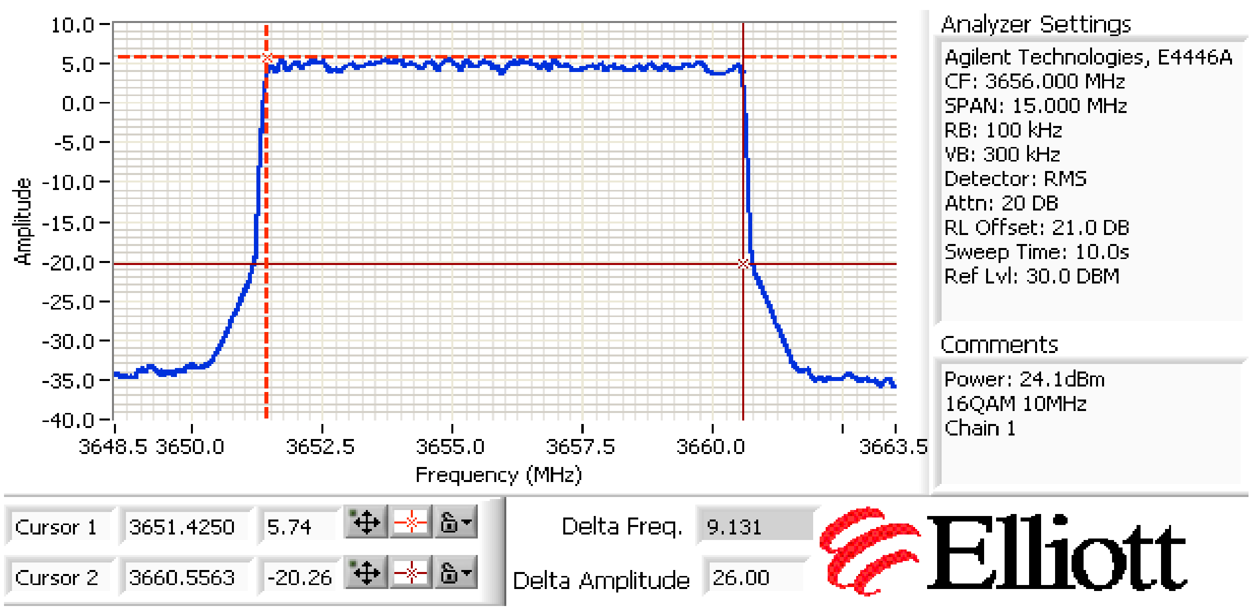
Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

PSD

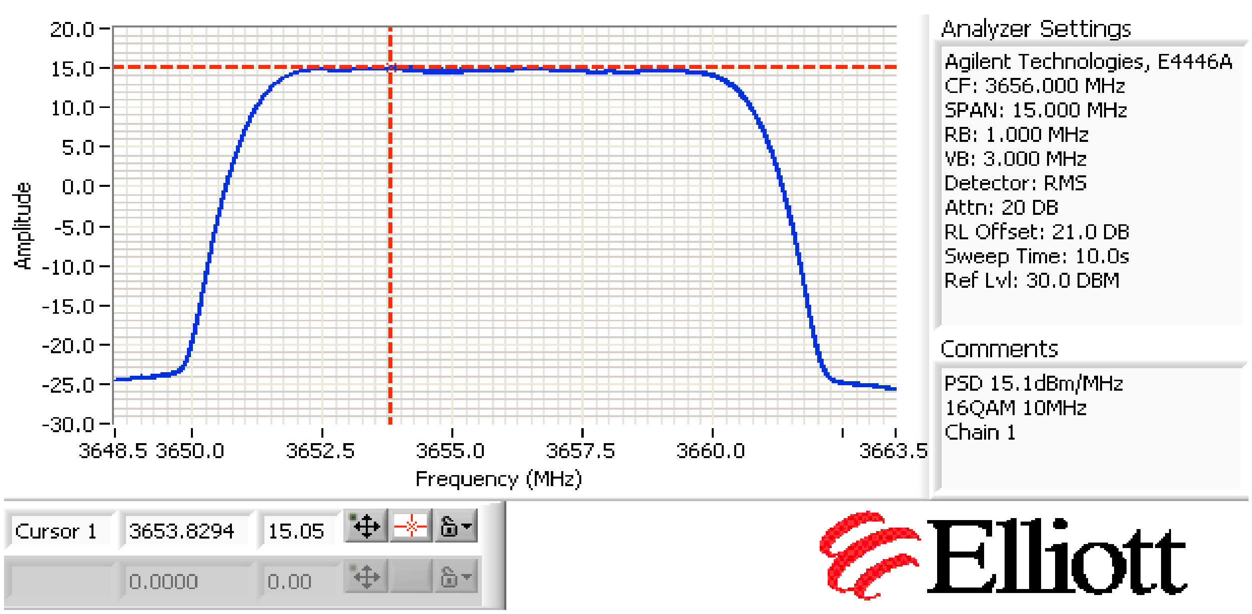
Frequency (MHz)	99%[4] BW	Modulation	PSD[2] dBm/MHz Chain 1	Chain 2	Chain 3	Total PSD mW/MHz	dBm/MHz	PSD EIRP dBm/MHz	Limit (eirp) dBm/MHz	Pass or Fail
3.5MHz Mode										
3653	3.3	16-QAM	11.8	12.0		31.0	14.9	29.9	30.0	PASS
3662	3.3	16-QAM	11.5	11.8		29.3	14.7	29.7	30.0	PASS
3672	3.3	16-QAM	12.0	11.3		29.3	14.7	29.7	30.0	PASS
5.0MHz Mode										
3653	4.6	16-QAM	11.7	11.9		30.3	14.8	29.8	30.0	PASS
3662	4.6	16-QAM	11.3	11.5		27.6	14.4	29.4	30.0	PASS
3672	4.6	16-QAM	12.0	11.2		29.0	14.6	29.6	30.0	PASS
7.0MHz Mode										
3654	6.6	16-QAM	12.0	11.3		29.3	14.7	29.7	30.0	PASS
3662	6.6	16-QAM	11.9	11.9		31.0	14.9	29.9	30.0	PASS
3671	6.6	16-QAM	11.2	11.5		27.3	14.4	29.4	30.0	PASS
8.75MHz Mode										
3655	8.2	16-QAM	11.6	11.7		29.2	14.7	29.7	30.0	PASS
3662	8.2	16-QAM	11.2	12.4		30.6	14.9	29.9	30.0	PASS
3670	8.2	16-QAM	11.9	11.6		29.9	14.8	29.8	30.0	PASS
10.0MHz Mode										
3656	9.2	16-QAM	12.1	11.4		30.0	14.8	29.8	30.0	PASS
3662	9.2	16-QAM	11.7	12.1		31.0	14.9	29.9	30.0	PASS
3669	9.2	16-QAM	11.4	12.1		30.0	14.8	29.8	30.0	PASS

Note 1:	Power setting is the software setting used to set the output power.
Note 2:	Output power measured using RBW=100kHz VBW=300kHz , detector = rms, sweep time 10 seconds, max hold. The total power was integrated over the span (span > 2x channel bandwidth). Transmitted signal was not continuous but the analyzer was configured with a gated sweep such that the analyzer was only sweeping when the device was transmitting. The plot for the channel with the highest power is provided below.
Note 3:	The psd was measured using the following analyzer settings: RB=1MHz, VB=3MHz, detector = rms, sweep time 10 seconds, max hold. Multiple sweeps were made until the display had no new "peaks". The plot for the channel with the highest power is provided below.
Note 4:	99% Bandwidth measured in accordance with RSS GEN - RB > 1% of span and VB >=3xRB
Note 5:	For MIMO systems the total output power and total PSD are calculated form the sum of the powers of the individual chains (in linear terms). The antenna gain used to determine the EIRP and limits for PSD/Output power depends on the operating mode of the MIMO device. If the signals on the non-coherent between the transmit chains then the gain used to determine the limits is the highest gain of the individual chains and the EIRP is the sum of the products of gain and power on each chain. If the signals are coherent then the effective antenna gain is the sum (in linear terms) of the gains for each chain and the EIRP is the product of the effective gain and total power.

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-



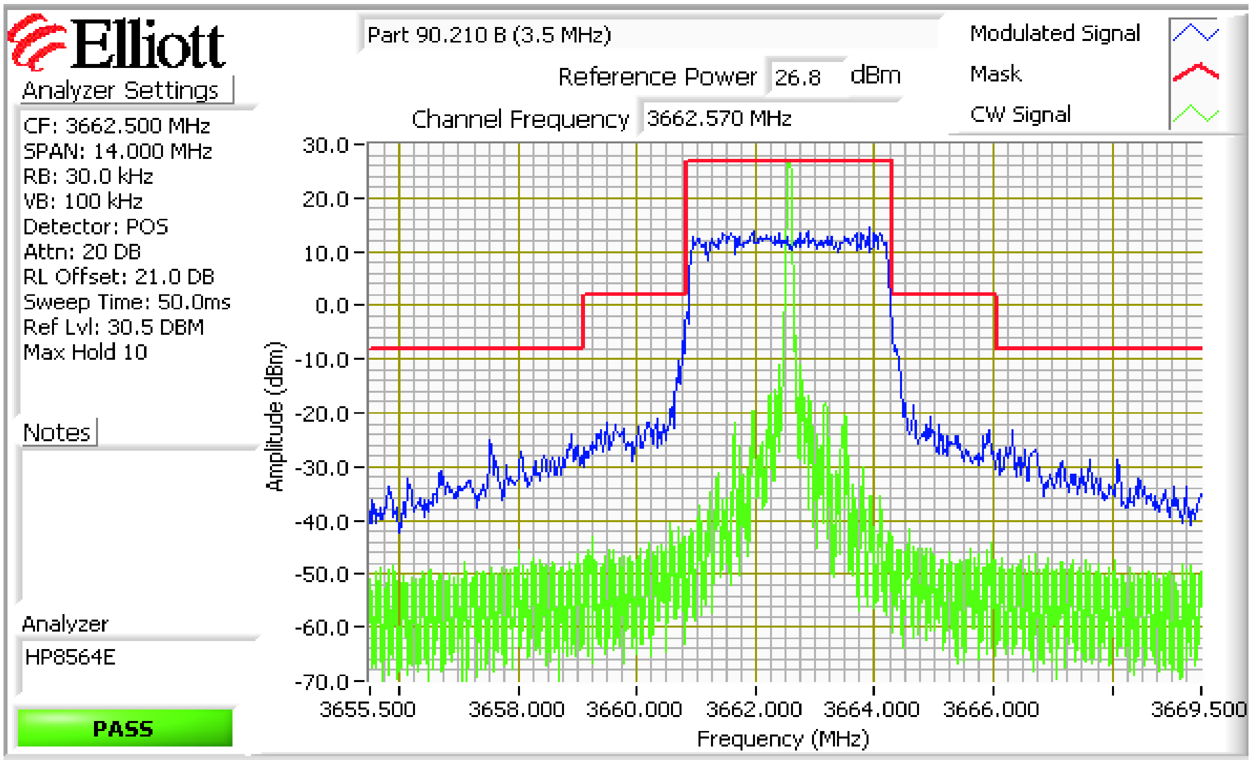
Note: Power on plot is 3dB higher than actual due to additional 3dB Pad that was unaccounted for in the measurement setup.



Note: PSD on plot is 3dB higher than actual due to additional 3dB Pad that was unaccounted for in the measurement setup.

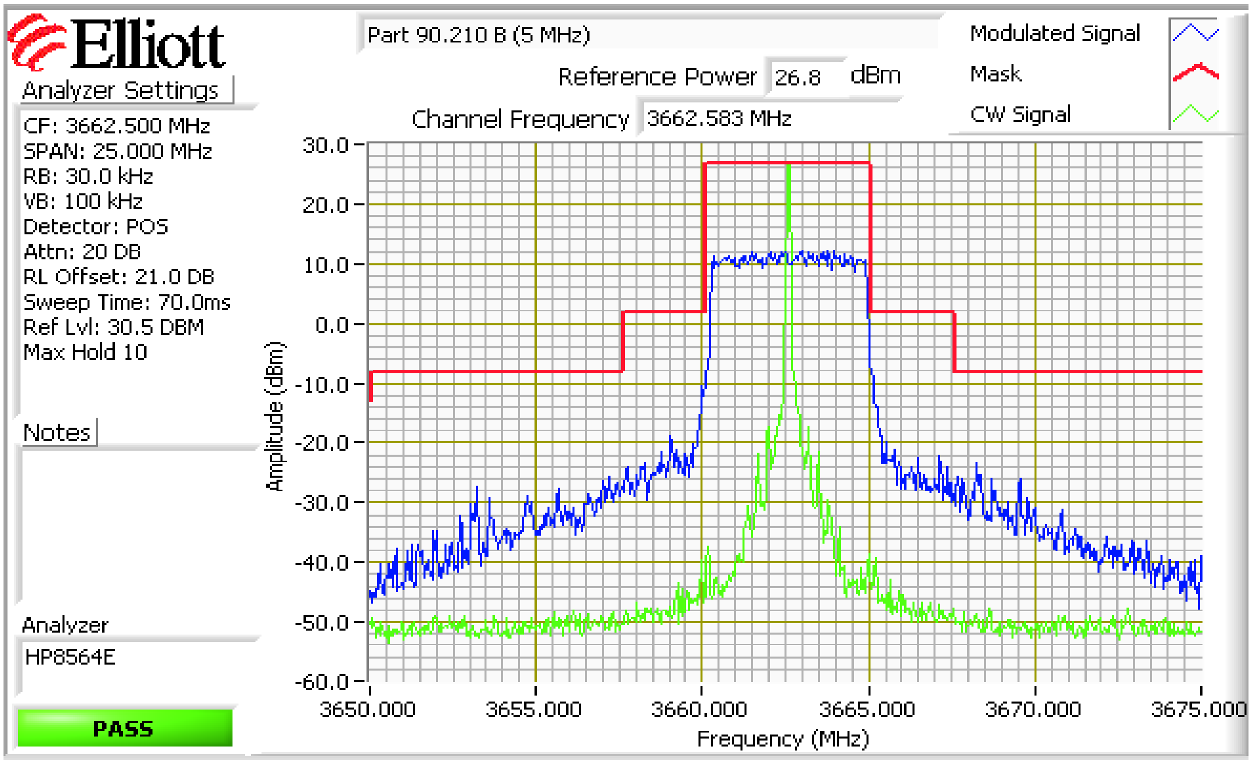
Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

Run #3: Unwanted emissions (Masks), QAM16 at power setting used for Power measurements



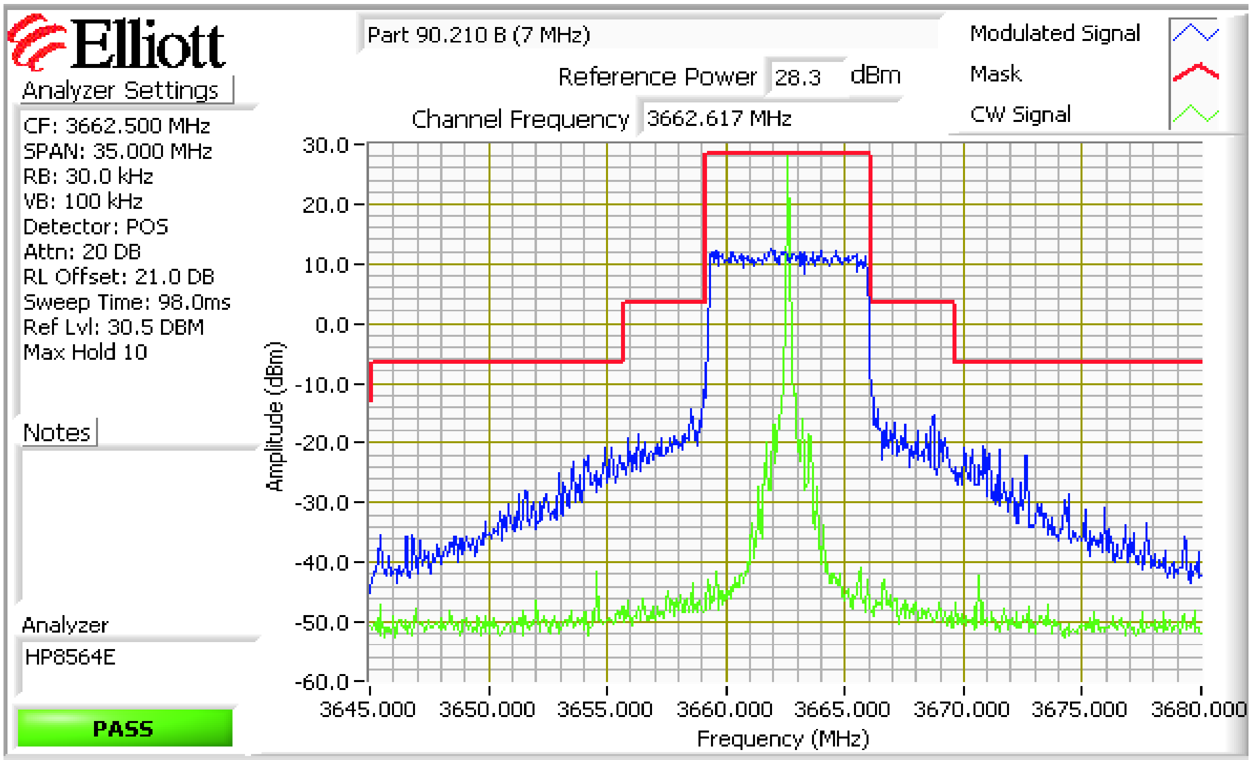
EMC Test Data

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-



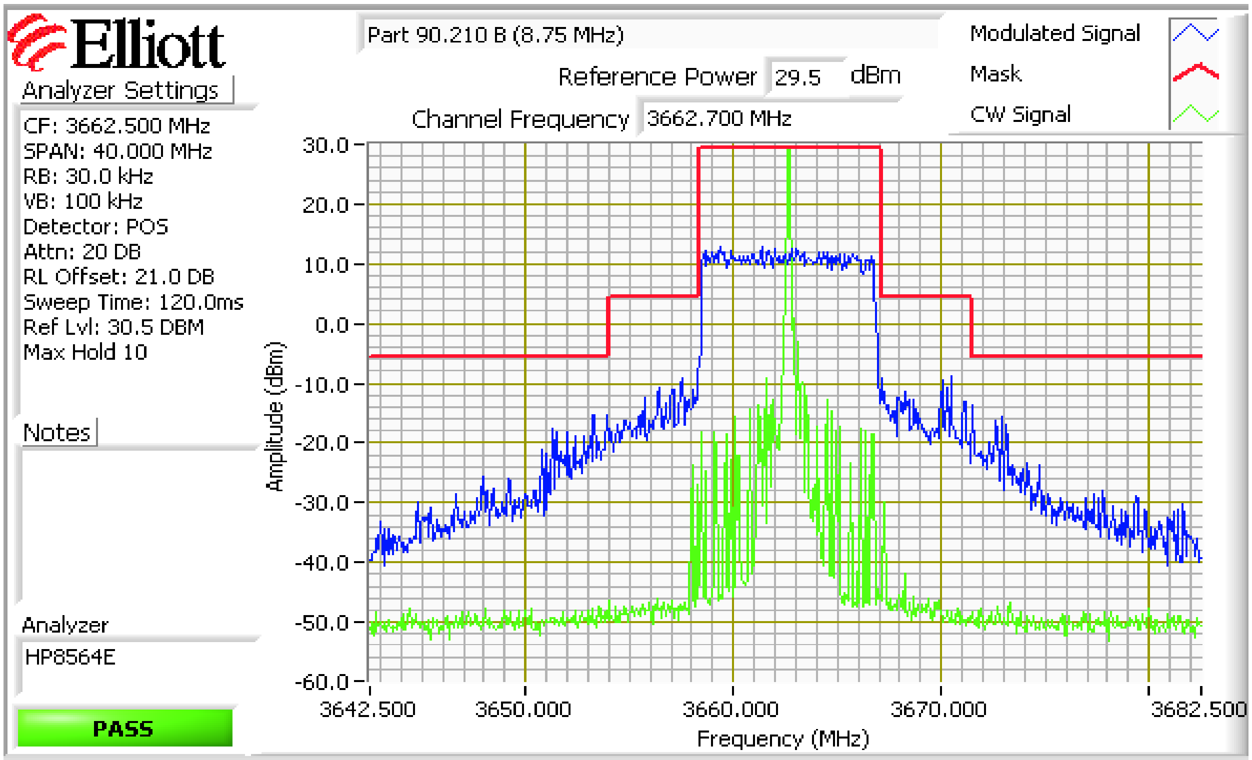
EMC Test Data

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-



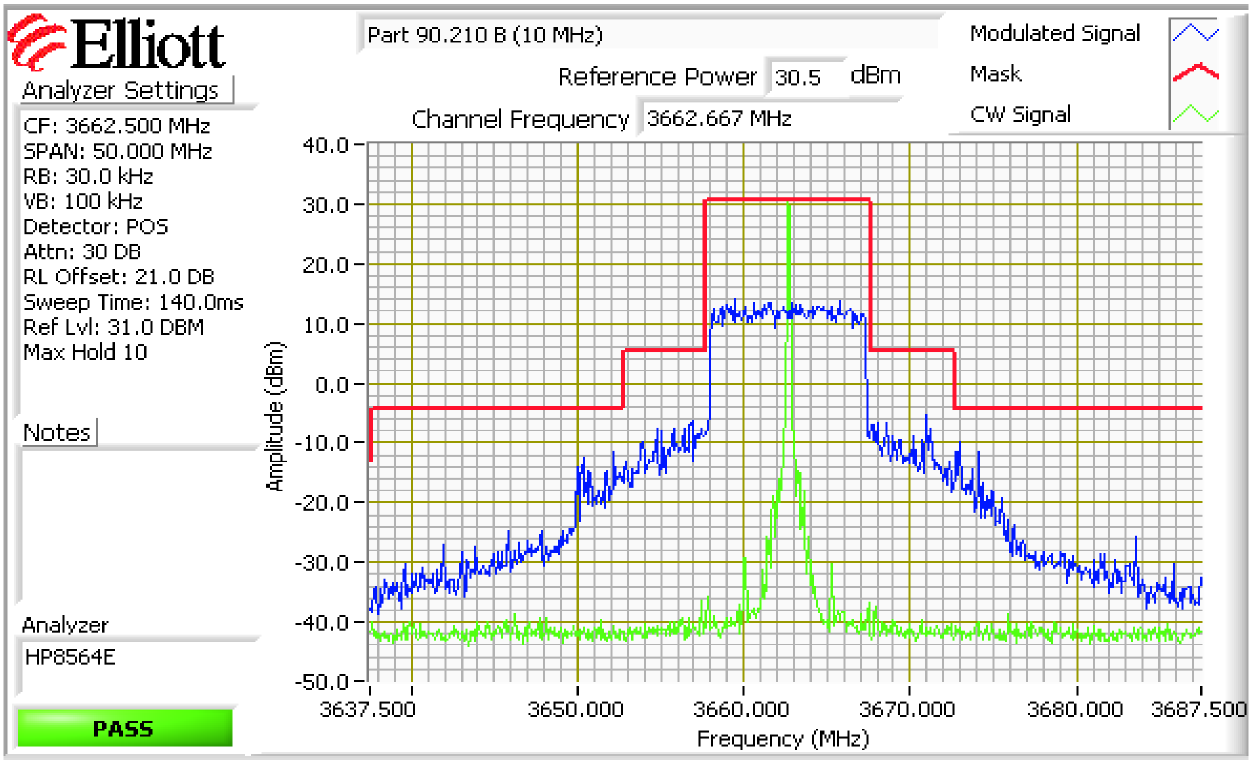
EMC Test Data

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-



EMC Test Data

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-



Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

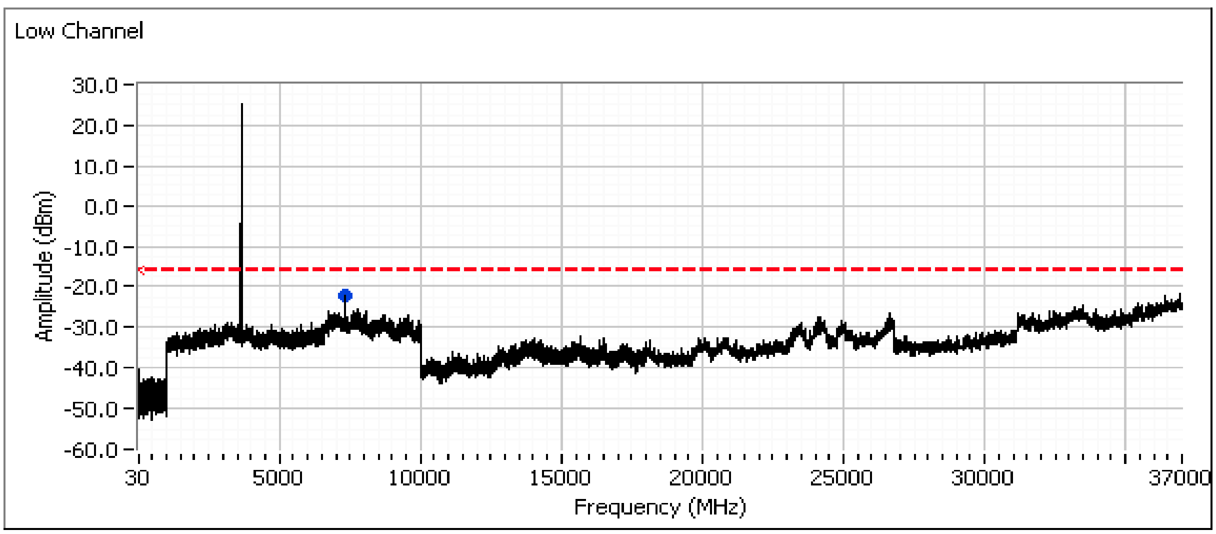
Run #4: Out Of Band Spurious Emissions - Antenna Conducted

Number of transmit chains:	2	
Spurious Limit:	-13.0	dBm/MHz eirp
Adjustment for 2 chains:	-3.0	dB adjustment for multiple chains.
Limit Used On Plots	-16.0	dBm/MHz

MIMO Devices: The plots were obtained for each chain individually and the limit was adjusted to account for all chains transmitting simultaneously

Plots Showing Out-Of-Band Emissions (RBW=VBW=1MHz above 1 GHz and 120 kHz below 1 GHz)

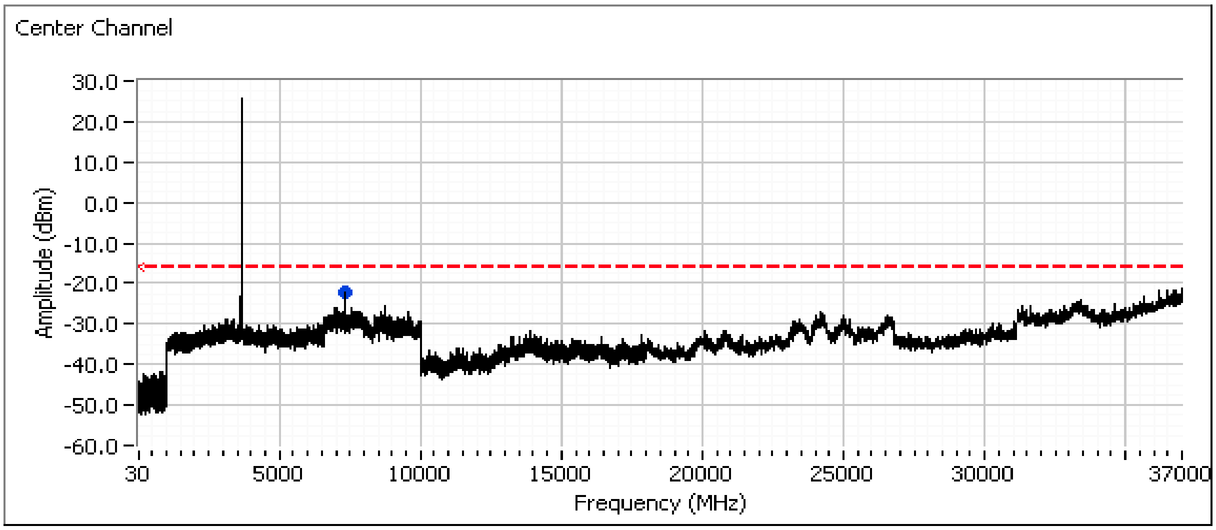
Low channel - 10 MHz BW on chain 1 for 7dBi antenna (highest power mode and chain)



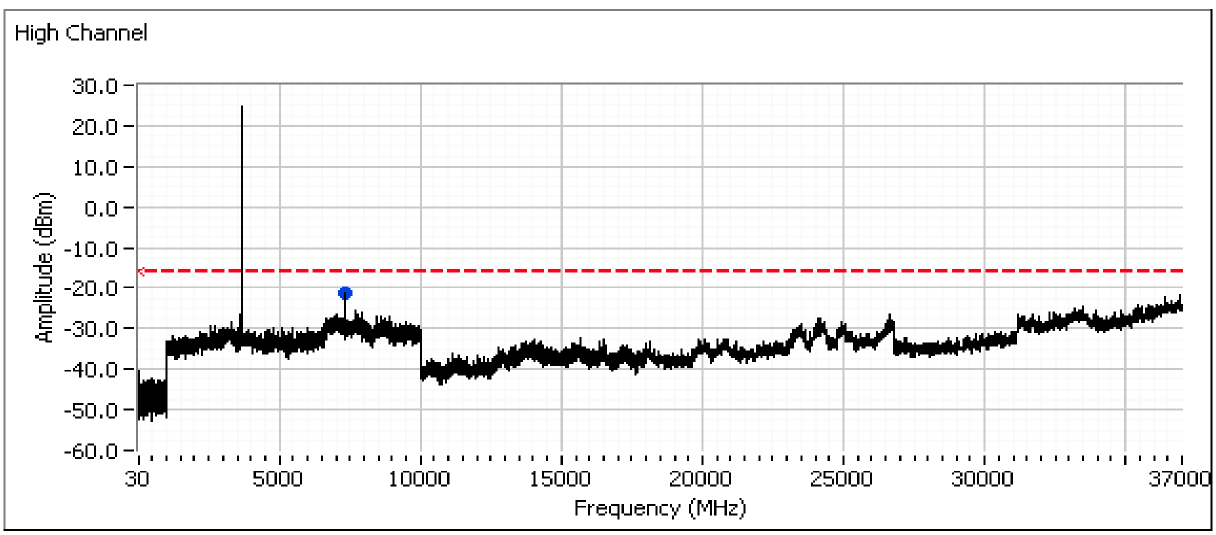
NTS	EMC Test Data

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

Center channel



High channel



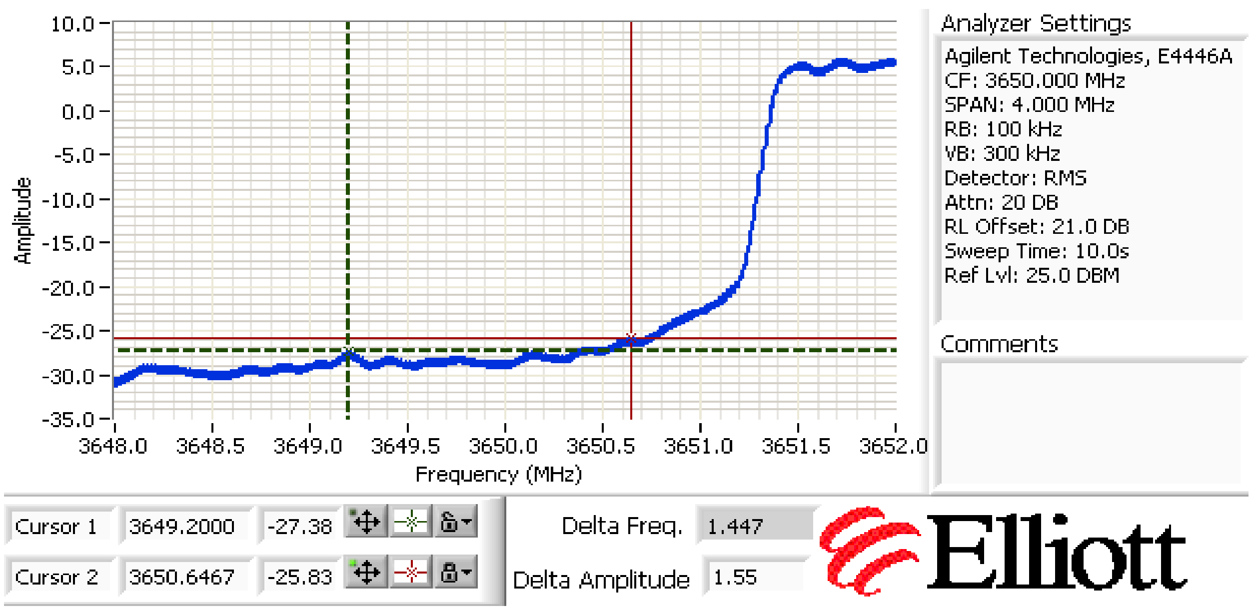
Frequency MHz	Level dBm	Port	FCC Part 90 Limit	Margin	Detector	Channel	Mode	Comments
7341.110	-21.3	RF	-16.0	-5.3	Peak	High	16QAM	
7326.110	-21.8	RF	-16.0	-5.8	Peak	Center	16QAM	
7308.100	-22.0	RF	-16.0	-6.0	Peak	Low	16QAM	

NTS WE ENGINEER SUCCESS

EMC Test Data

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

Run #4: Out of Band Spurious Emissions, Conducted Bandedge



Plot for low channel (3656 MHz), power setting(s) = 2350, BW= 10.0, MOD=QAM16

-27.4dBm in 100 kHz (corrected by 10*log(100kHz/1MHz)) yields -14.4dBm in 1 MHz for both chains

Frequency MHz	Level dBm	Port	RSS-197 Limit	RSS-197 Margin	Detector	Channel	Mode	Comments
3650.000	-14.4	RF	-13.0	-1.4	Avg	3656	QAM16	BW: 10.0
3675.000	-18.3	RF	-13.0	-5.3	Avg	3669	QAM16	BW: 10.0
3650.000	-18.7	RF	-13.0	-5.7	Avg	3655	QAM16	BW: 8.75
3675.000	-20.7	RF	-13.0	-7.7	Avg	3670	QAM16	BW: 8.75
3650.000	-16.5	RF	-13.0	-3.5	Avg	3654	QAM16	BW: 7.0
3675.000	-17.9	RF	-13.0	-4.9	Avg	3671	QAM16	BW: 7.0
3650.000	-16.4	RF	-13.0	-3.4	Avg	3653	QAM16	BW: 5.0
3675.000	-15.6	RF	-13.0	-2.6	Avg	3672	QAM16	BW: 5.0
3650.000	-17.3	RF	-13.0	-4.3	Avg	3653	QAM16	BW: 3.5
3675.000	-18.8	RF	-13.0	-5.8	Avg	3672	QAM16	BW: 3.5

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

RSS 197 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: 10/13-14/2010
Test Engineer: M. Birgani, R. Varelas
Test Location: Chamber #3

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. All remote support equipment was located outside the chamber.

For radiated emissions testing the measurement antenna was located 3 meters from the EUT.

Ambient Conditions:

Temperature: 20-25 °C
Rel. Humidity: 30-40 %

Summary of Results

Run #	Mode	Channel			Test Performed	Limit	Result / Margin
6	16QAM	All			Radiated Emissions, 30 MHz-37GHz	FCC 90.210 Mask B	All signal were more than 20dB below the limit

Modifications Made During Testing

No modifications were made to the EUT during testing

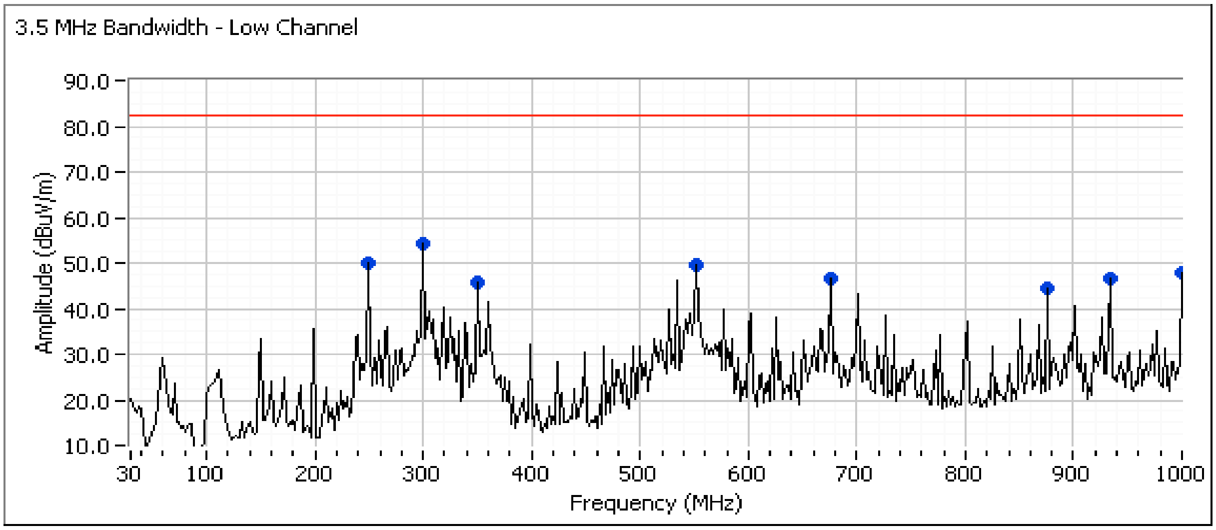
Deviations From The Standard

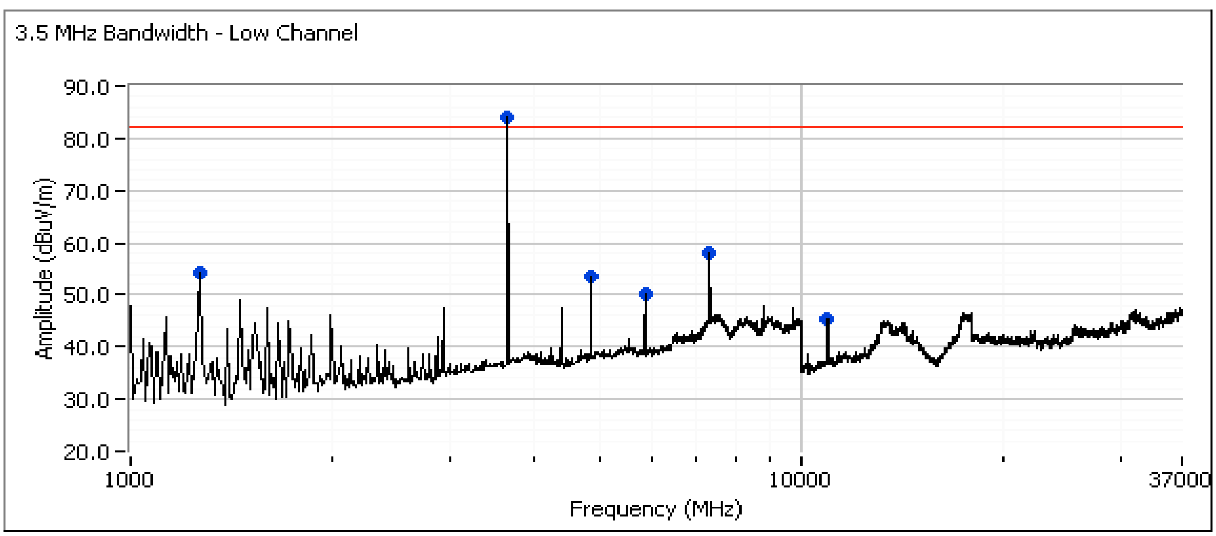
No deviations were made from the requirements of the standard.

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

Run #1: Radiated Spurious Emissions, 30 - 37000 MHz. Operating Mode: 3.5 MHz

Run #1a: Low Channel @ 3653.0 MHz





EMC Test Data

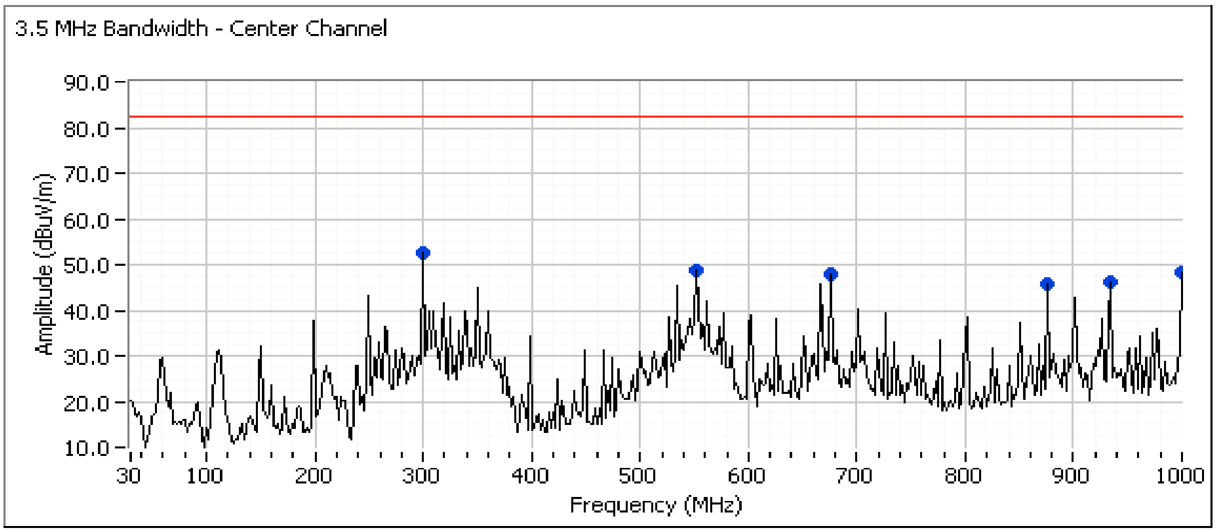
Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

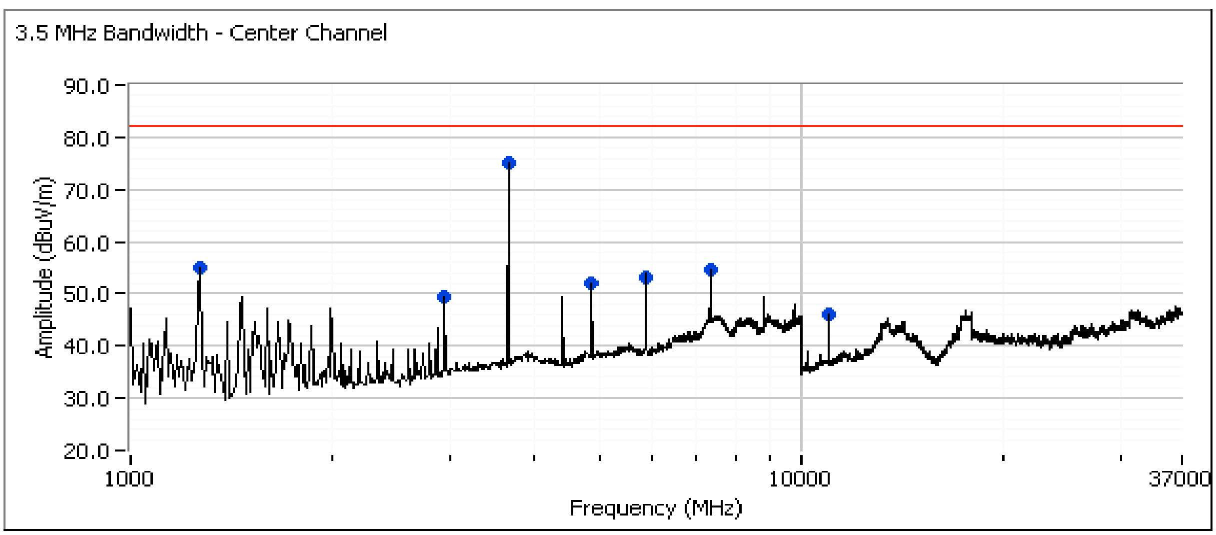
Run #1a: Low Channel @ 3653.0 MHz

Frequency	Level	Pol	FCC 90.210		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3649.170	84.2	V	-	-	Peak	198	1.3	Fundamental
7305.000	58.0	V	82.2	-24.2	Peak	188	1.3	
1265.830	54.2	V	82.2	-28.0	Peak	176	1.3	
300.200	54.1	V	82.2	-28.1	Peak	237	2.0	
4868.330	53.6	V	82.2	-28.6	Peak	180	1.0	
5849.170	50.2	V	82.2	-32.0	Peak	194	1.0	
249.659	50.0	V	82.2	-32.2	Peak	214	1.0	
550.962	49.4	V	82.2	-32.8	Peak	357	1.0	
1000.000	47.9	H	82.2	-34.3	Peak	269	1.5	
675.371	46.7	H	82.2	-35.5	Peak	89	1.0	
933.908	46.6	H	82.2	-35.6	Peak	128	1.5	
350.741	45.8	H	82.2	-36.4	Peak	234	1.0	
10946.670	45.2	H	82.2	-37.0	Peak	197	1.0	
875.591	44.4	H	82.2	-37.8	Peak	66	1.0	

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

Run #1b: Center Channel @ 3662.5 MHz





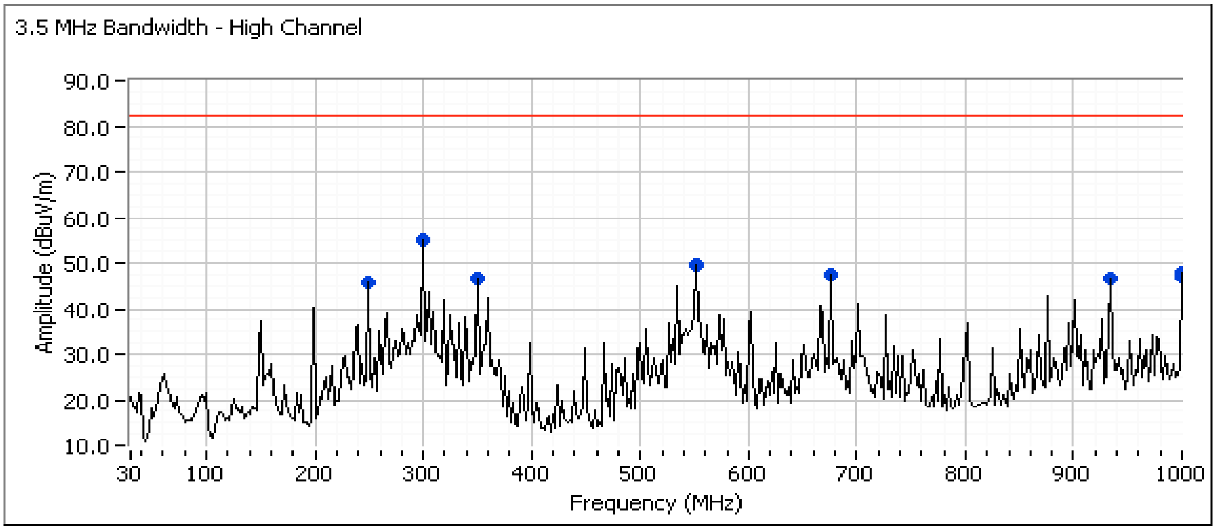
Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

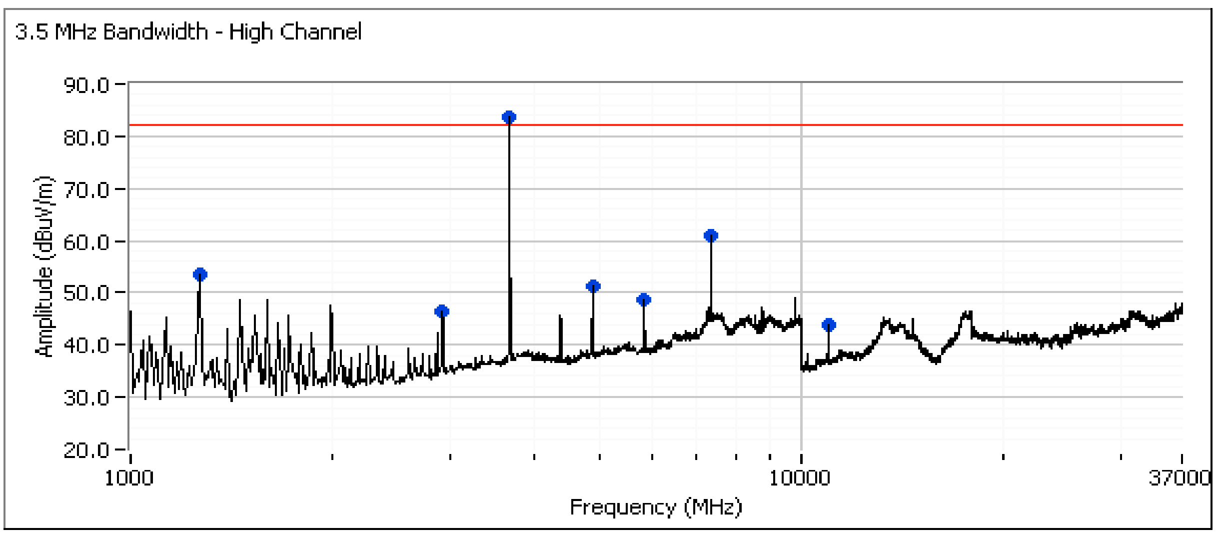
Run #1b: Center Channel @ 3662.5 MHz

Frequency	Level	Pol	FCC 90.210		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3658.330	75.2	H	-	-	Peak	112	1.1	Fundamental
1265.830	54.9	V	82.2	-27.3	Peak	172	1.3	
7328.330	54.5	V	82.2	-27.7	Peak	181	2.0	
5876.670	53.2	V	82.2	-29.0	Peak	191	1.0	
300.200	52.6	H	82.2	-29.6	Peak	25	1.0	
4877.500	51.9	V	82.2	-30.3	Peak	178	1.0	
2943.330	49.5	V	82.2	-32.7	Peak	140	1.0	
550.962	48.9	V	82.2	-33.3	Peak	34	1.0	
1000.000	48.2	H	82.2	-34.0	Peak	265	1.5	
675.371	47.8	H	82.2	-34.4	Peak	92	1.5	
10973.330	46.1	V	82.2	-36.1	Peak	209	1.3	
933.908	46.0	H	82.2	-36.2	Peak	78	1.5	
875.591	45.8	H	82.2	-36.4	Peak	82	1.0	

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

Run #1c: High Channel @ 3672.0 MHz





Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

Run #1c: High Channel @ 3672.0 MHz

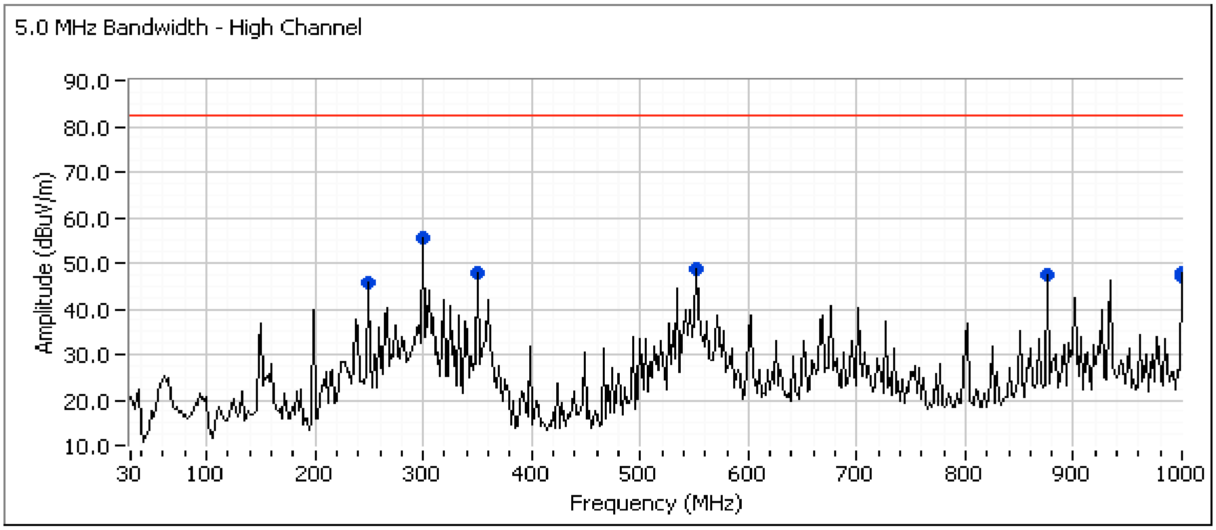
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3667.500	83.7	V	-	-	Peak	197	1.3	Fundmental
7345.830	60.8	V	82.2	-21.4	Peak	198	1.3	
300.200	55.1	H	82.2	-27.1	Peak	262	1.0	
1265.830	53.4	V	82.2	-28.8	Peak	184	1.3	
4886.670	51.1	V	82.2	-31.1	Peak	177	1.0	
550.962	49.4	V	82.2	-32.8	Peak	360	1.5	
5830.830	48.5	V	82.2	-33.7	Peak	332	1.0	
675.371	47.3	H	82.2	-34.9	Peak	118	2.5	
1000.000	46.9	H	82.2	-35.3	Peak	281	1.5	
350.741	46.7	H	82.2	-35.5	Peak	87	1.0	
2915.830	46.6	V	82.2	-35.6	Peak	0	1.3	
933.908	46.4	H	82.2	-35.8	Peak	103	1.5	
249.659	45.6	V	82.2	-36.6	Peak	288	1.0	
11013.330	*44.0*	*V*	*82.2*	*-38.2*	*Peak*	*160*	*1.3*	

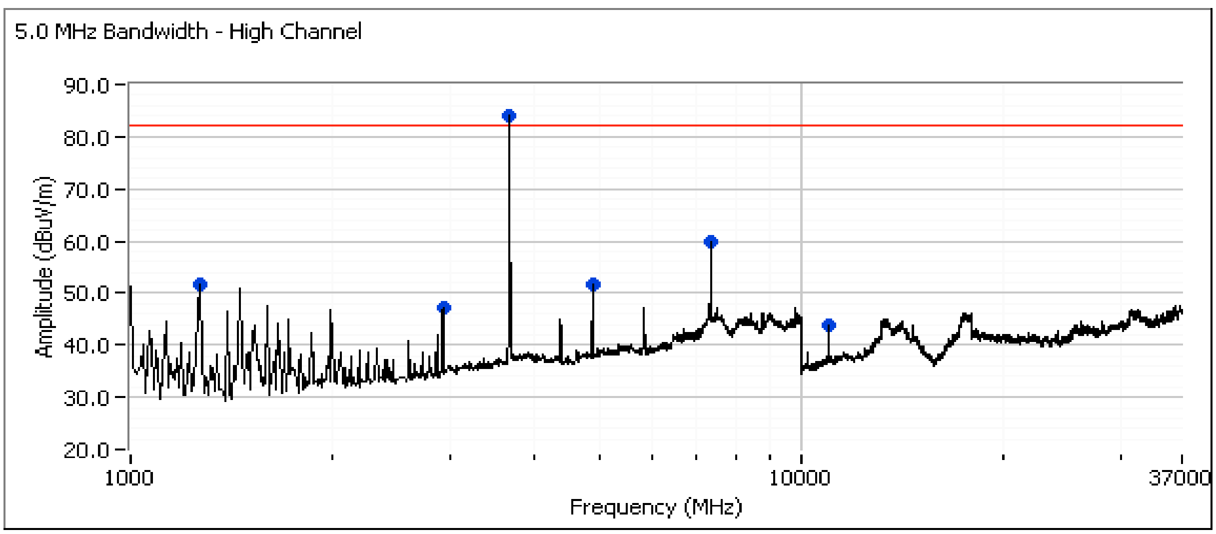
EMC Test Data

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

Run #2: Radiated Spurious Emissions, 30 - 37000 MHz. Operating Mode: 5 MHz

High Channel @ 3672.0 MHz





EMC Test Data

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

Run #2: Radiated Spurious Emissions, 30 - 37000 MHz. Operating Mode: 5 MHz

High Channel @ 3672.0 MHz

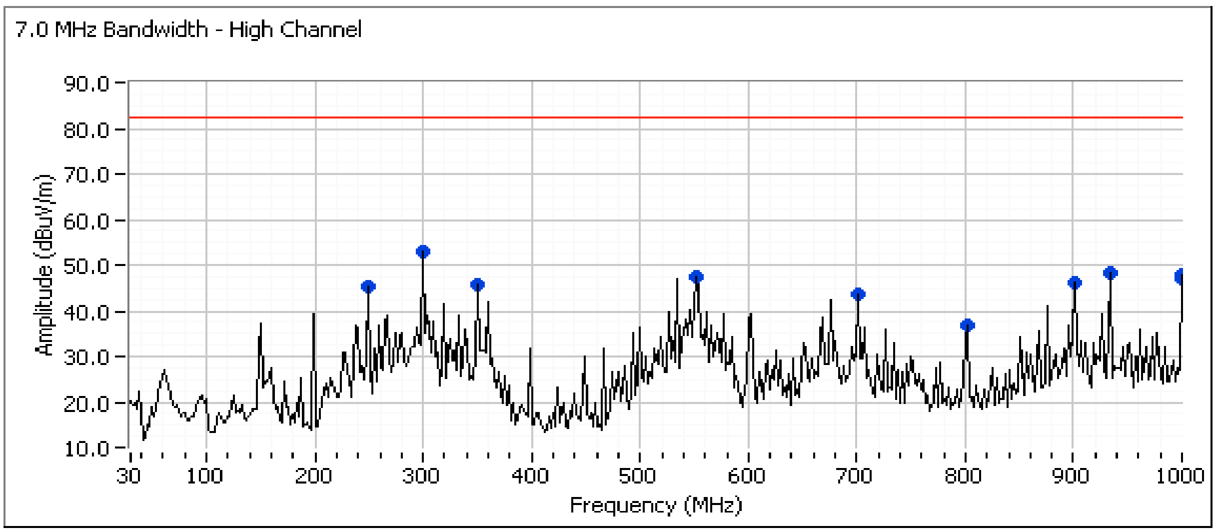
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3667.500	84.2	V	-	-	Peak	199	1.3	Fundamental
7345.830	59.8	V	82.2	-22.4	Peak	150	1.9	
300.200	55.5	H	82.2	-26.7	Peak	255	1.0	
1265.830	51.7	V	82.2	-30.5	Peak	18	1.3	
4886.670	51.6	V	82.2	-30.6	Peak	159	1.3	
550.962	48.7	V	82.2	-33.5	Peak	360	1.5	
350.741	47.8	H	82.2	-34.4	Peak	102	1.0	
875.591	47.4	H	82.2	-34.8	Peak	265	1.0	
1000.000	47.0	H	82.2	-35.2	Peak	264	1.5	
2925.000	47.0	V	82.2	-35.2	Peak	129	2.0	
249.659	45.6	H	82.2	-36.6	Peak	294	1.0	
11013.330	*44.0*	*V*	*82.2*	*-38.2*	*Peak*	*232*	*1.3*	

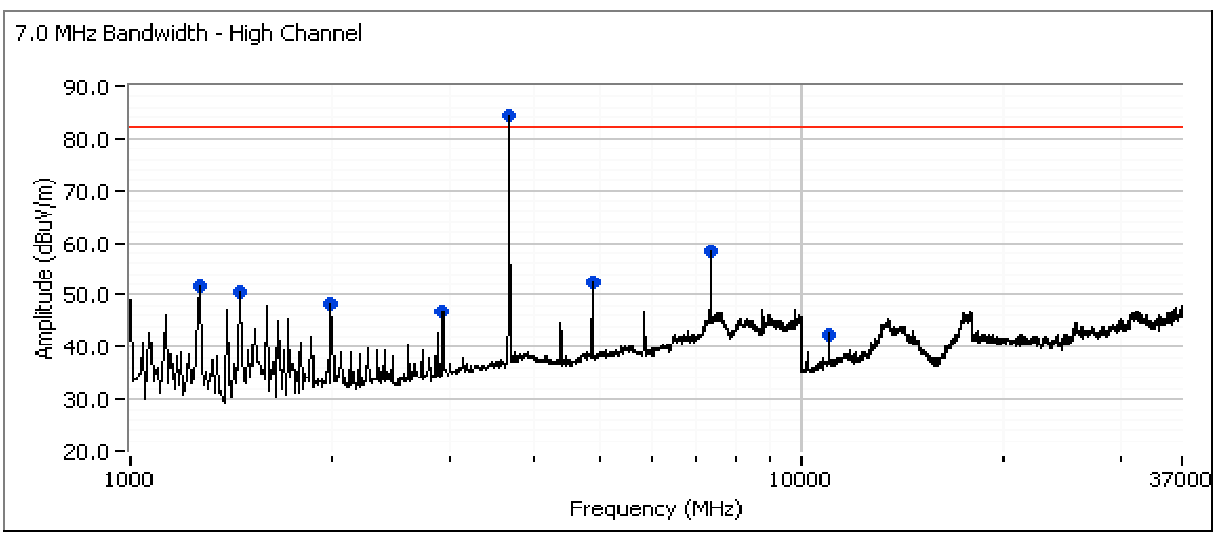
Note 1:	Based on the measurements at the three channels using 3.5 MHz mode, only measurements at the high channel were considered necessary in the 5 MHz mode.

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

Run #3: Radiated Spurious Emissions, 30 - 37000 MHz. Operating Mode: 7 MHz

High Channel @ 3671.0 MHz





NTS WE ENGINEER SUCCESS

EMC Test Data

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

Run #3: Radiated Spurious Emissions, 30 - 37000 MHz. Operating Mode: 7 MHz

High Channel @ 3671.0 MHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3667.500	84.4	V	-	-	Peak	196	1.3	Fundamental
7345.830	58.3	H	82.2	-23.9	Peak	205	1.7	
300.200	53.0	H	82.2	-29.2	Peak	93	1.0	
4886.670	52.3	V	82.2	-29.9	Peak	155	1.0	
1265.830	51.5	V	82.2	-30.7	Peak	31	1.3	
1458.330	50.7	H	82.2	-31.5	Peak	250	1.0	
933.908	48.4	H	82.2	-33.8	Peak	273	1.5	
1990.000	48.4	H	82.2	-33.8	Peak	243	1.0	
550.962	47.4	V	82.2	-34.8	Peak	191	1.0	
1000.000	47.3	H	82.2	-34.9	Peak	273	1.5	
2915.830	46.9	V	82.2	-35.3	Peak	133	1.0	
900.862	46.1	H	82.2	-36.1	Peak	237	2.5	
350.741	45.6	H	82.2	-36.6	Peak	239	1.0	
249.659	45.4	H	82.2	-36.8	Peak	127	1.0	
700.641	43.5	H	82.2	-38.7	Peak	102	2.0	
11013.330	42.2	H	82.2	-40.0	Peak	234	1.2	
801.723	36.8	H	82.2	-45.4	Peak	150	1.0	

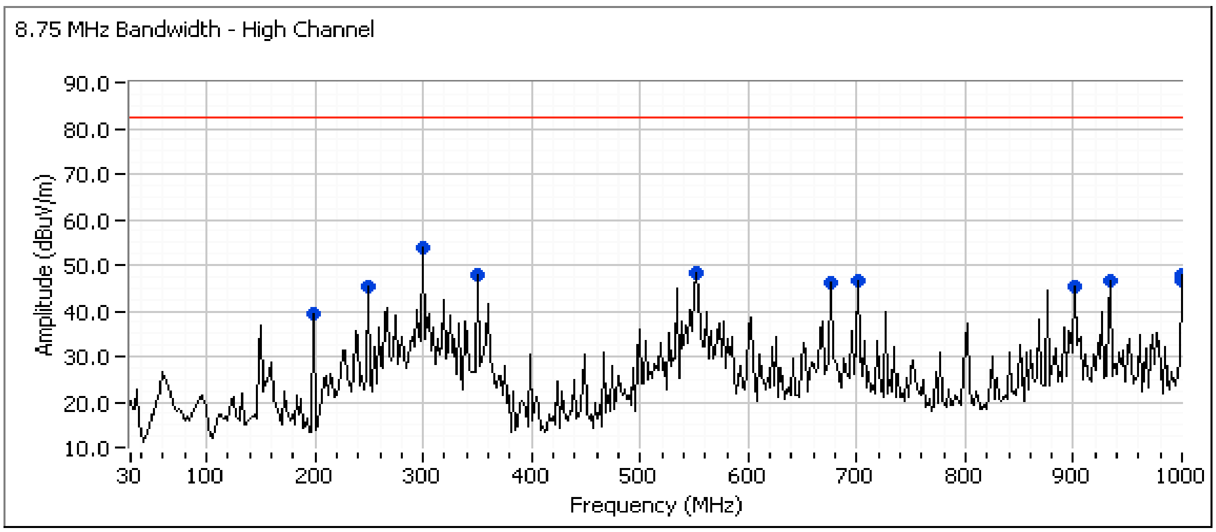
Note 1:	Based on the measurements at the three channels using 3.5 MHz mode, only measurements at the high channel were considered necessary in the 7 MHz mode.

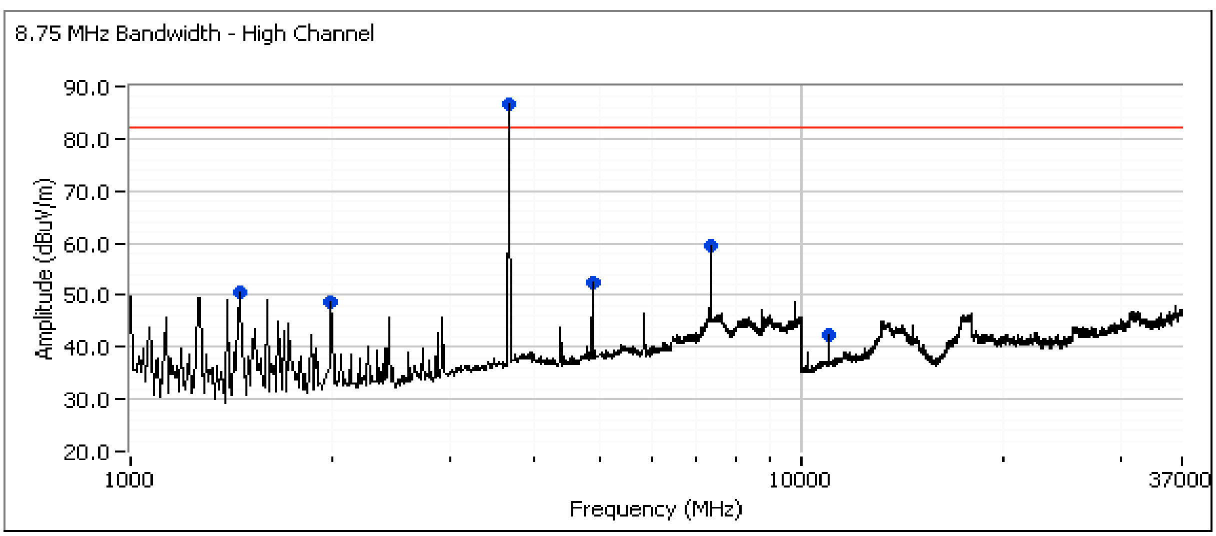
EMC Test Data

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

Run #4: Radiated Spurious Emissions, 30 - 37000 MHz. Operating Mode: 8.75 MHz

High Channel @ 3670.0 MHz





EMC Test Data

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

Run #4: Radiated Spurious Emissions, 30 - 37000 MHz. Operating Mode: 8.75 MHz

High Channel @ 3670.0 MHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3667.500	86.6	V	-	-	Peak	197	1.3	Fundamental
7345.830	59.5	V	82.2	-22.7	Peak	177	1.0	
300.200	54.0	H	82.2	-28.2	Peak	93	1.0	
4886.670	52.5	V	82.2	-29.7	Peak	154	1.0	
1458.330	50.5	H	82.2	-31.7	Peak	254	1.0	
1990.000	48.6	H	82.2	-33.6	Peak	246	1.0	
550.962	48.2	V	82.2	-34.0	Peak	24	1.0	
350.741	47.9	H	82.2	-34.3	Peak	247	1.0	
1000.000	46.8	H	82.2	-35.4	Peak	262	1.5	
933.908	46.7	H	82.2	-35.5	Peak	286	1.5	
700.641	46.5	H	82.2	-35.7	Peak	298	2.5	
675.371	46.2	H	82.2	-36.0	Peak	76	1.5	
900.862	45.5	H	82.2	-36.7	Peak	153	1.5	
249.659	45.2	H	82.2	-37.0	Peak	132	1.0	
11000.000	42.2	H	82.2	-40.0	Peak	233	1.2	
199.118	39.5	H	82.2	-42.7	Peak	60	1.5	

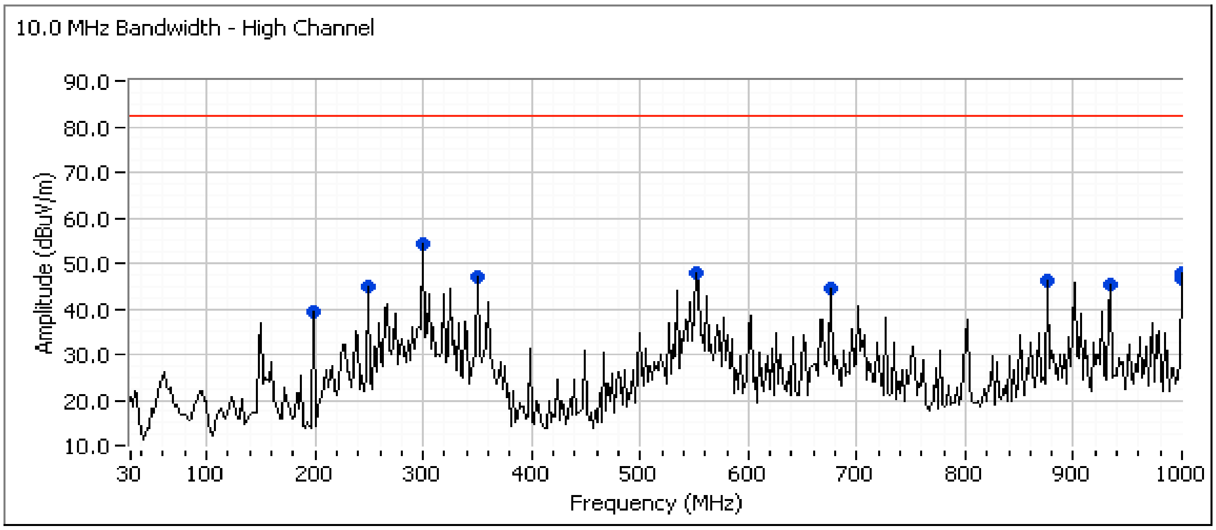
Note 1:	Based on the measurements at the three channels using 3.5 MHz mode, only measurements at the high channel were considered necessary in the 8.75 MHz mode.

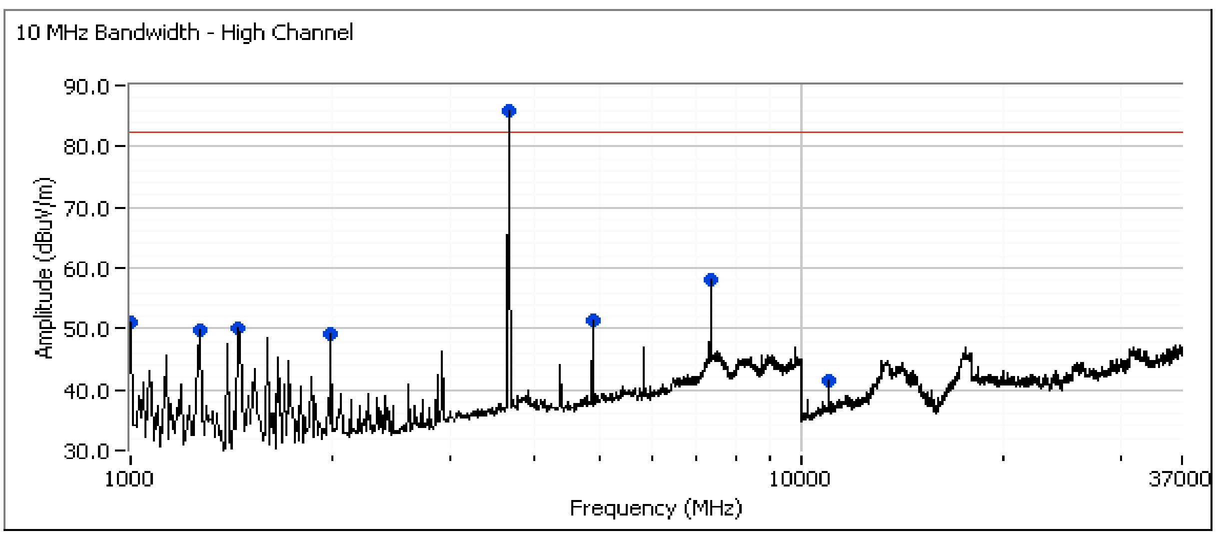
Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

EMC Test Data

Run #5: Radiated Spurious Emissions, 30 - 37000 MHz. Operating Mode: 10 MHz

High Channel @ 3669.0 MHz





Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

Run #5: Radiated Spurious Emissions, 30 - 37000 MHz. Operating Mode: 10 MHz

High Channel @ 3669.0 MHz

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
3658.330	85.7	V	-	-	Peak	193	1.3	Fundamental
7340.000	58.0	V	82.2	-24.2	Peak	148	2.0	
300.200	54.4	H	82.2	-27.8	Peak	250	1.5	
4886.670	51.3	V	82.2	-30.9	Peak	161	1.0	
1000.000	51.2	V	82.2	-31.0	Peak	133	1.0	
1449.170	50.1	H	82.2	-32.1	Peak	249	1.0	
1265.830	49.9	V	82.2	-32.3	Peak	15	1.3	
1990.000	49.3	H	82.2	-32.9	Peak	249	1.0	
550.962	47.9	V	82.2	-34.3	Peak	8	1.0	
350.741	47.2	H	82.2	-35.0	Peak	242	1.0	
875.591	46.3	H	82.2	-35.9	Peak	260	1.0	
933.908	45.2	H	82.2	-37.0	Peak	275	1.5	
249.659	45.0	H	82.2	-37.2	Peak	120	1.0	
675.371	44.4	H	82.2	-37.8	Peak	116	2.5	
11000.000	41.5	H	82.2	-40.7	Peak	201	1.0	
199.118	39.5	H	82.2	-42.7	Peak	38	1.5	

Note 1:	Based on the measurements at the three channels using 3.5 MHz mode, only measurements at the high channel were considered necessary in the 10 MHz mode.

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

Run #6: Radiated Spurious Emissions, Transmit Mode: Substitution Measurements

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
7345.830	60.8	V	82.2	-21.4	Peak	198	1.3	
300.200	55.1	H	82.2	-27.1	Peak	262	1.0	
1265.830	53.4	V	82.2	-28.8	Peak	184	1.3	
4886.670	51.1	V	82.2	-31.1	Peak	177	1.0	
550.962	49.4	V	82.2	-32.8	Peak	360	1.5	

Horizontal & 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.

NTS WE ENGINEER SUCCESS

Radio Test Data

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

RSS 197 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.

Date of Test: 10/20/2010
Test Engineer: John Caizzi
Test Location: FT EMC #4

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

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. The EUT was placed inside an environmental chamber.

Ambient Conditions:

Temperature: 23 °C
Rel. Humidity: 42 %

Summary of Results

Run #	Test Performed	Limit	Result	Value / Margin
1-2	Frequency and Voltage Stability	Part 90.213	NA	760 Hz / .21 ppm

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:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

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

Note 1:	For all tests: Unmodulated signal using mode QAM16 at frequency 3662.5 MHz with power setting of 27 dBm 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	3662.492600	3662.491840	760	Note 2
-20	3662.492600	3662.491970	630	Note 2
-10	3662.492600	3662.492220	380	Note 2
0	3662.492600	3662.493145	545	Note 2
10	3662.492600	3662.493245	645	Note 2
20	3662.492600	3662.492600	0	Note 2
30	3662.492600	3662.492243	357	Note 2
40	3662.492600	3662.492042	558	Note 2
50	3662.492600	3662.492268	332	Note 2

Run #2: Voltage Vs. Frequency

Nominal Voltage is 13.8Vdc.

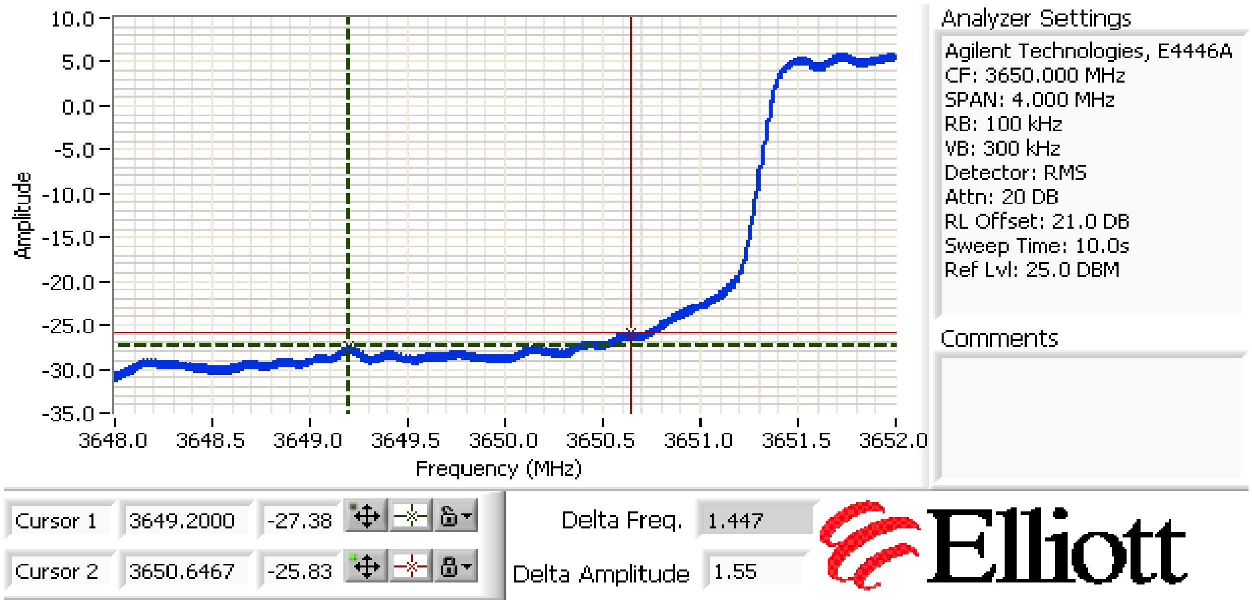
Voltage	Reference Frequency	Frequency Drift	Drift	Limit
(Dc)	(MHz)	(MHz)	(Hz)	(Hz)
85%	3662.492218	3662.492192	26	Note 2
115%	3662.492218	3662.492167	51	Note 2

Worst case drift: 760.0 Hz
0.21 ppm

Radio Test Data

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

Plots below show band edge amplitudes for worst case modulation at each BW. Adding worst case drift to show compliance with frequency stability requirements.



Plot of emissions at point when 43 + 10*log(p) limit is exceeded for two chains (-26.0dBm in 100 kHz = -16dBm in 1 MHz)

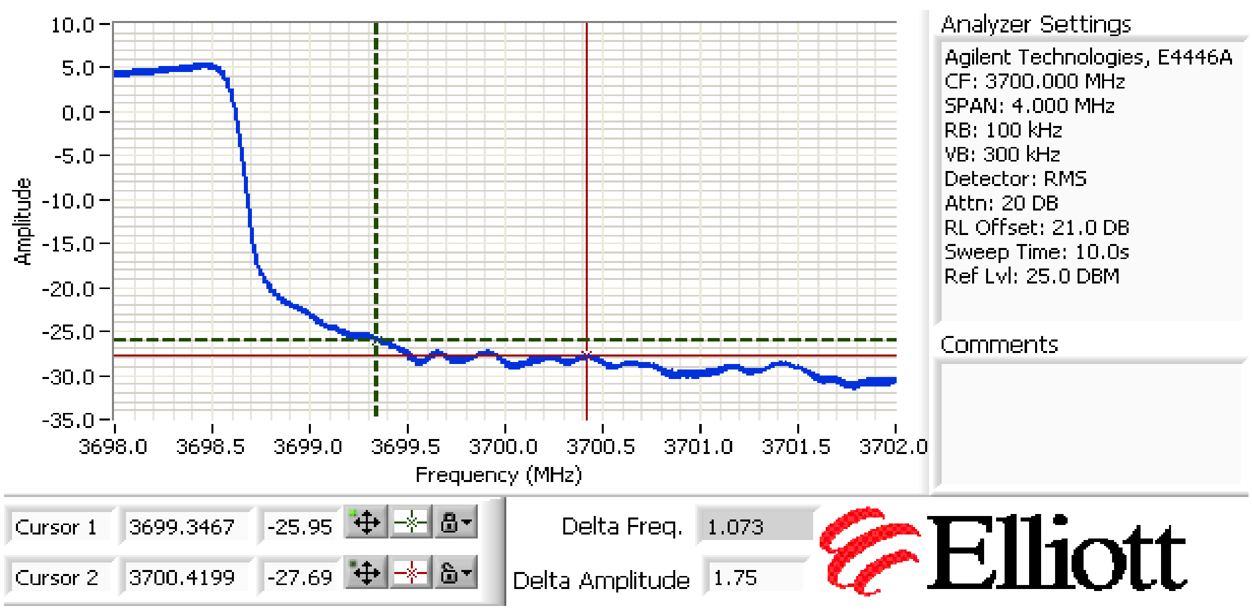
Freq. (MHz)	Modulation	Channel bandiwdth	Software setting[1]	Unwanted emissiom reference point	Worst case drift	F_H or F_L
3656	QAM16	10.00 MHz	2850	3650.646700	0.000760	3650.645940

Note 1: Power setting is the software setting used to set the output power.

NTS
WE ENGINEER SUCCESS

Radio Test Data

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-



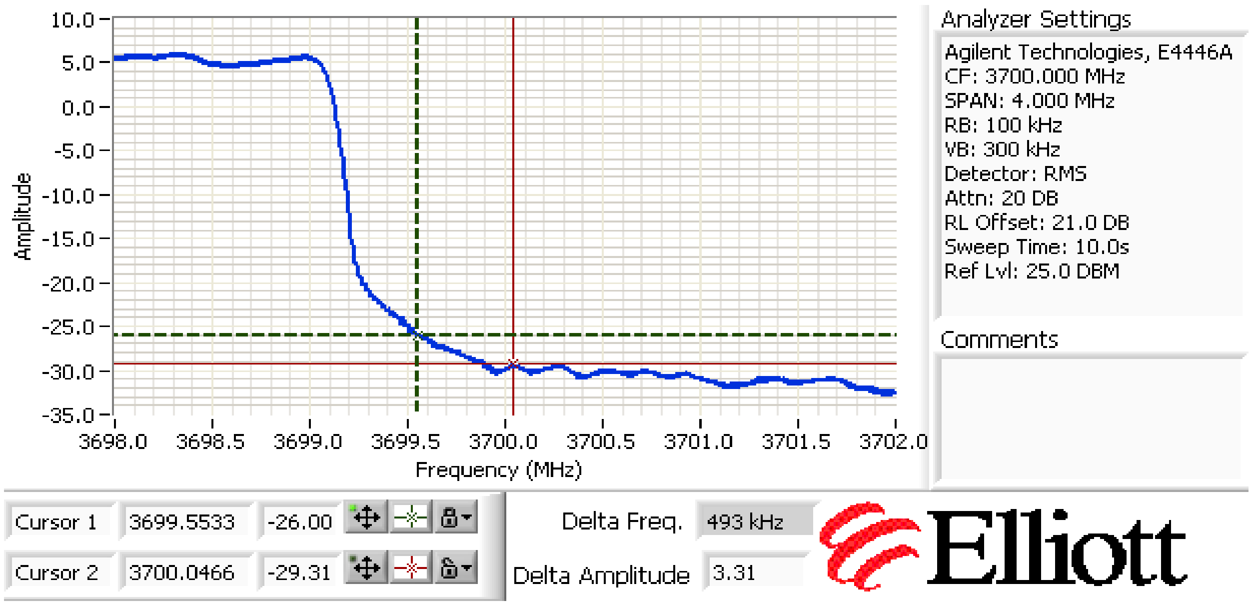
Plot of emissions at point when 43 + 10*log(p) limit is exceeded for two chains (-26.0dBm in 100 kHz = -16dBm in 1 MHz)

Freq. (MHz)	Modulation	Channel bandiwdth	Software setting[1]	Unwanted emissiom reference point	Worst case drift	F_H or F_L
3694	QAM16	10.00 MHz	3300	3699.346700	0.000760	3699.347460

Note 1: Power setting is the software setting used to set the output power.

Radio Test Data

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-



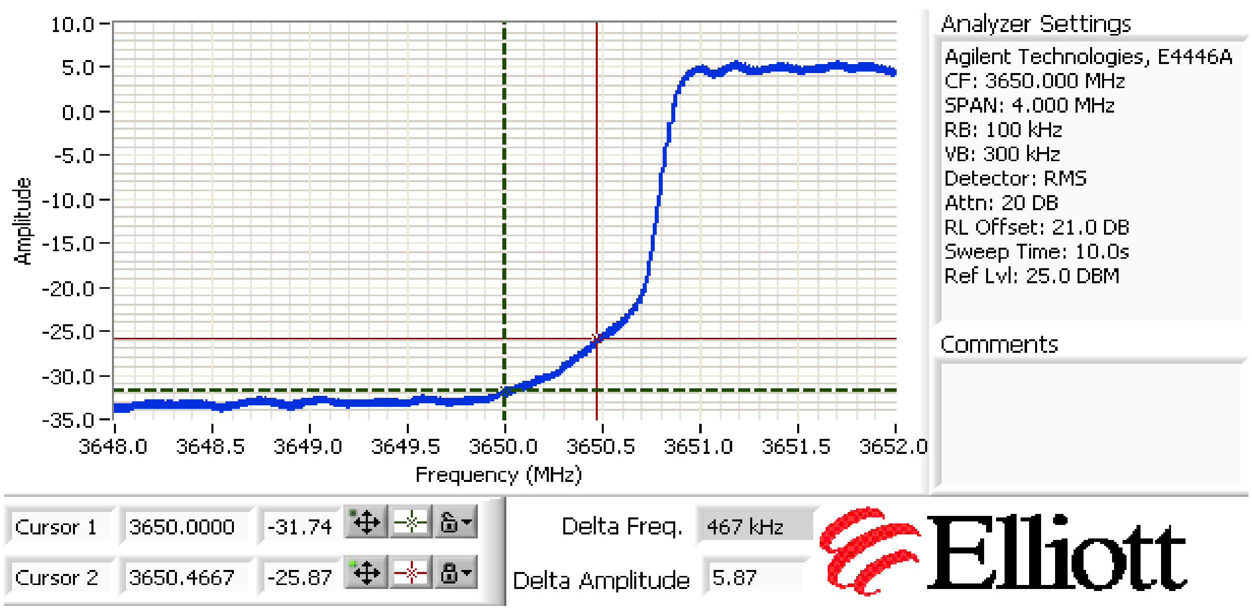
Plot of emissions at point when 43 + 10*log(p) limit is exceeded for two chains (-26.0dBm in 100 kHz = -16dBm in 1 MHz)

Freq. (MHz)	Modulation	Channel bandiwdth	Software setting[1]	Unwanted emissiom reference point	Worst case drift	F_H or F_L
3695	QAM16	8.75 MHz	3200	3699.820800	0.000760	3699.821560

Note 1: Power setting is the software setting used to set the output power.

Radio Test Data

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-



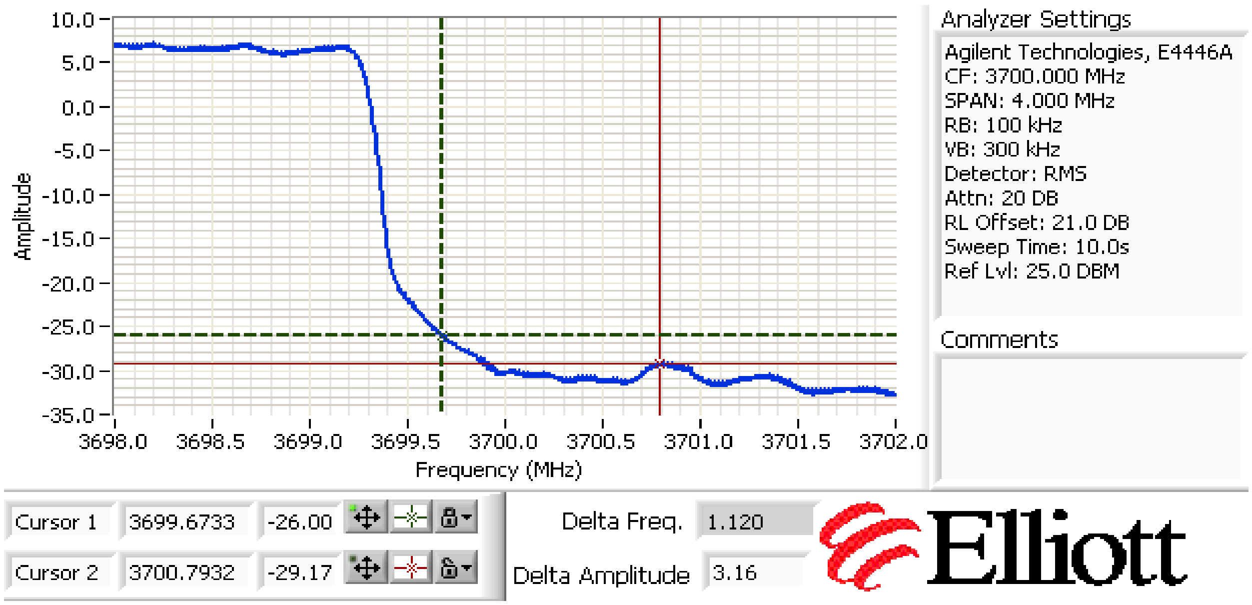
Plot of emissions at point when 43 + 10*log(p) limit is exceeded for two chains (-26.0dBm in 100 kHz = -16dBm in 1 MHz)

Freq. (MHz)	Modulation	Channel bandiwdth	Software setting[1]	Unwanted emissiom reference point	Worst case drift	F_H or F_L
3655	QAM16	8.75 MHz	2800	3650.466700	0.000760	3650.465940

Note 1: Power setting is the software setting used to set the output power.

NTS WE ENGINEER SUCCESS	Radio Test Data

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-



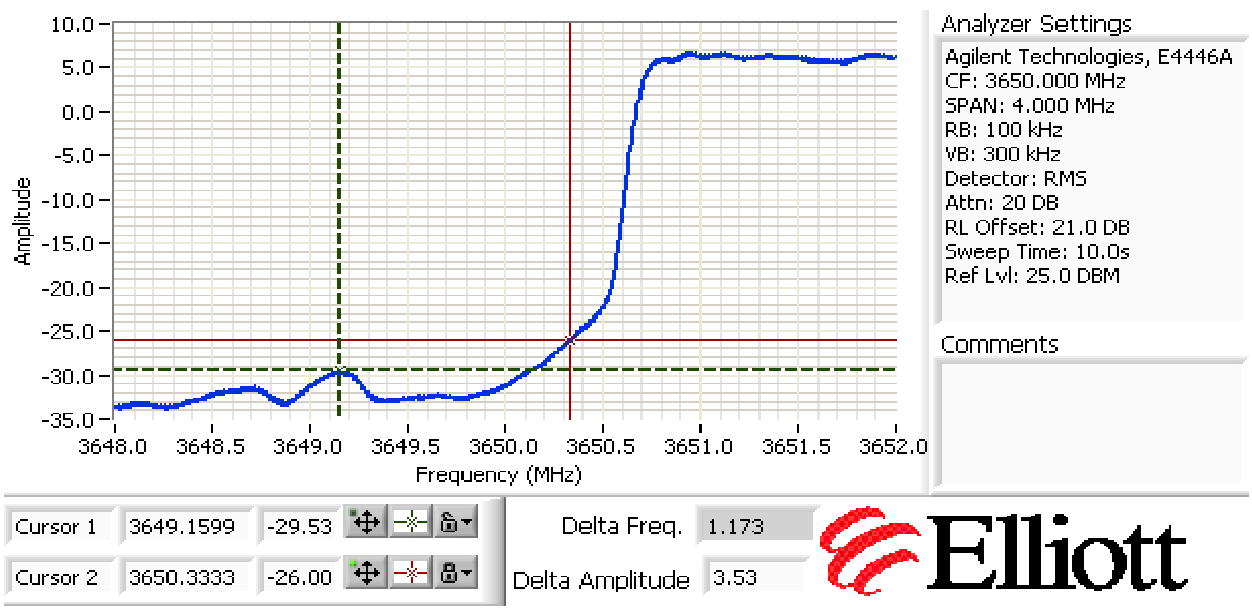
Plot of emissions at point when 43 + 10*log(p) limit is exceeded for two chains (-26.0dBm in 100 kHz = -16dBm in 1 MHz)

Freq. (MHz)	Modulation	Channel bandiwdth	Software setting[1]	Unwanted emissiom reference point	Worst case drift	F_H or F_L
3696	QAM16	7.00 MHz	3200	3699.673300	0.000760	3699.674060

Note 1: Power setting is the software setting used to set the output power.

Radio Test Data

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-



Plot of emissions at point when 43 + 10*log(p) limit is exceeded for two chains (-26.0dBm in 100 kHz = -16dBm in 1 MHz)

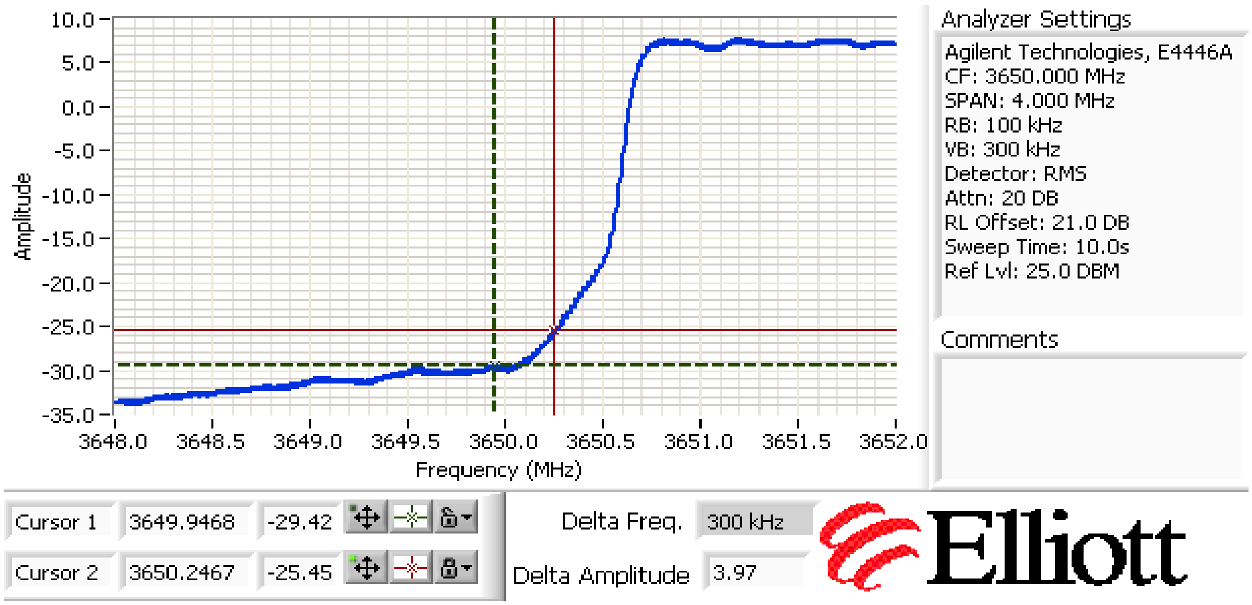
Freq. (MHz)	Modulation	Channel bandiwdth	Software setting[1]	Unwanted emissiom reference point	Worst case drift	F_H or F_L
3654	QAM16	7.00 MHz	2750	3650.333300	0.000760	3650.332540

Note 1: Power setting is the software setting used to set the output power.

Radio Test Data

NTS WE ENGINEER SUCCESS

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-

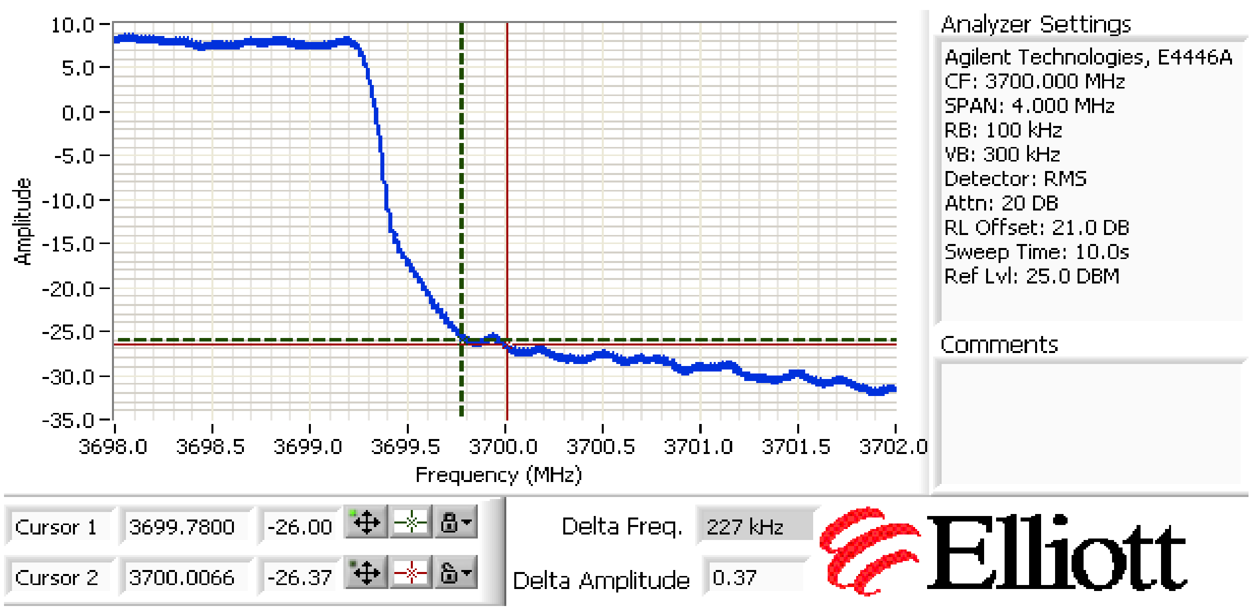


Plot of emissions at point when 43 + 10*log(p) limit is exceeded for two chains (-26.0dBm in 100 kHz = -16dBm in 1 MHz)

Freq. (MHz)	Modulation	Channel bandiwdth	Software setting[1]	Unwanted emission reference point	Worst case drift	F_H or F_L
3653	QAM16	5.00 MHz	2450	3650.246700	0.000760	3650.245940

Note 1: Power setting is the software setting used to set the output power.

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-



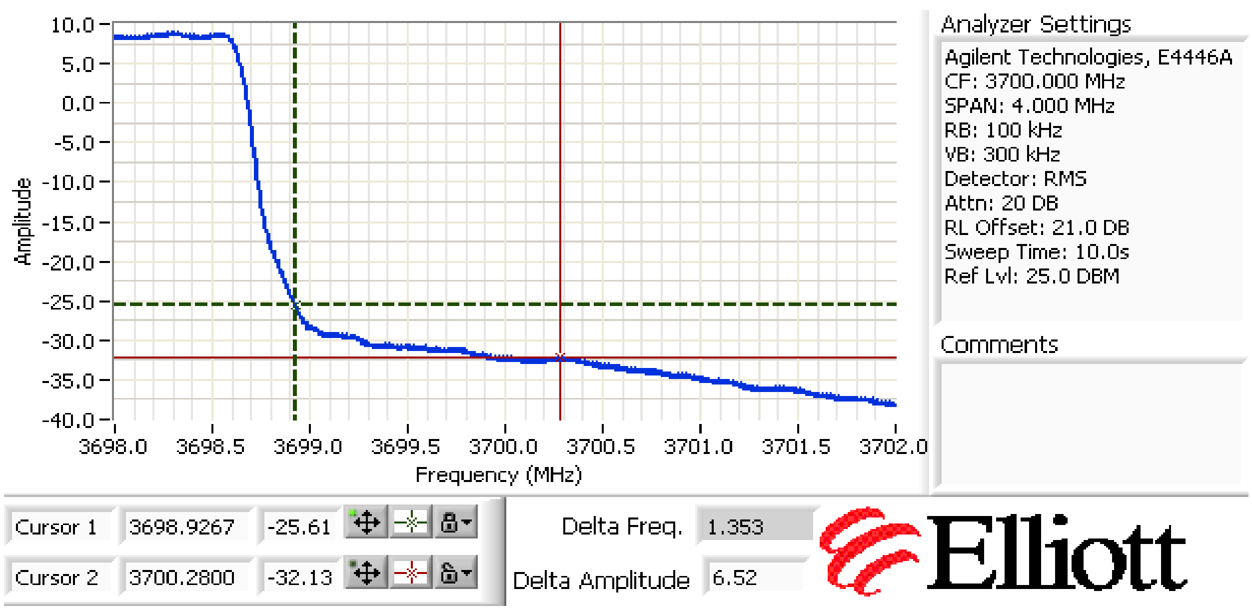
Plot of emissions at point when 43 + 10*log(p) limit is exceeded for two chains (-26.0dBm in 100 kHz = -16dBm in 1 MHz)

Freq. (MHz)	Modulation	Channel bandiwdth	Software setting[1]	Unwanted emission reference point	Worst case drift	F_H or F_L
3697	QAM16	5.00 MHz	3000	3699.780000	0.000760	3699.780760

Note 1: Power setting is the software setting used to set the output power.

Radio Test Data

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-



Plot of emissions at point when 43 + 10*log(p) limit is exceeded for two chains (-26.0dBm in 100 kHz = -16dBm in 1 MHz)

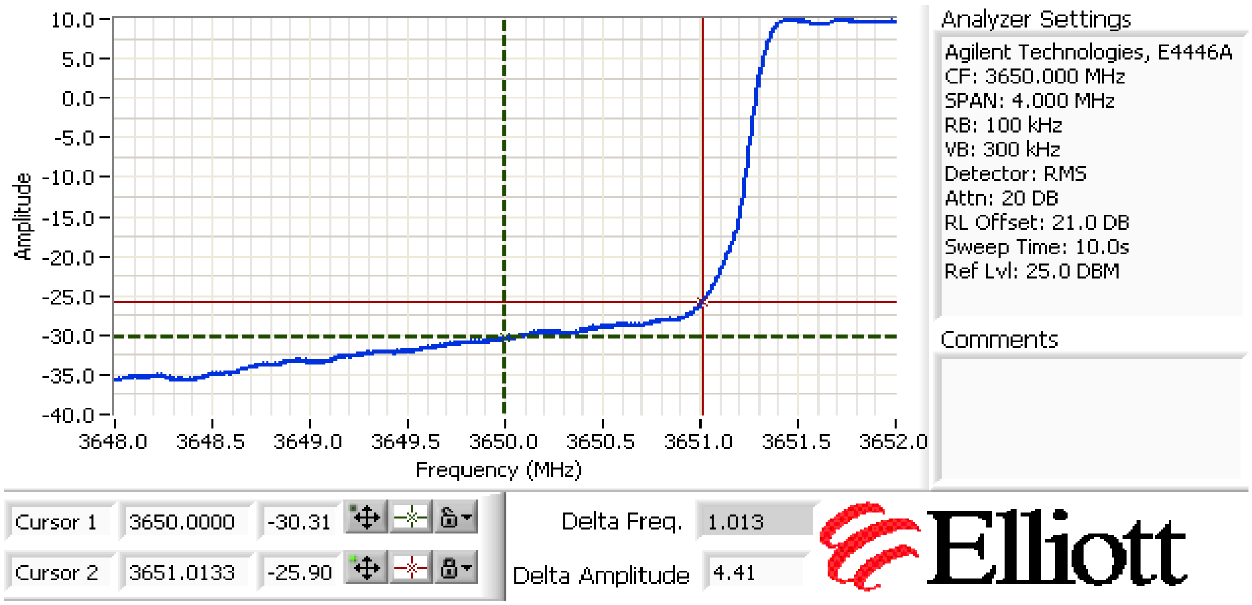
Freq. (MHz)	Modulation	Channel bandiwdth	Software setting[1]	Unwanted emissiom reference point	Worst case drift	F_H or F_L
3697	QAM16	3.50 MHz	2750	3698.926700	0.000760	3698.927460

Note 1: Power setting is the software setting used to set the output power.

NTS
WE ENGINEER SUCCESS

Radio Test Data

Client:	GE MDS LLC	Job Number:	J80799
Model:	Mercury 3650 Base Station and Mercury 3650 Subscriber	T-Log Number:	T80830
		Account Manager:	Susan Pelzl
Contact:	Dennis McCarthy		
Standard:	FCC Part 90, RSS-197	Class:	-



Plot of emissions at point when 43 + 10*log(p) limit is exceeded for two chains (-26.0dBm in 100 kHz = -16dBm in 1 MHz)

Freq. (MHz)	Modulation	Channel bandiwdth	Software setting[1]	Unwanted emissiom reference point	Worst case drift	F_H or F_L
3653	QAM16	3.50 MHz	2350	3651.013300	0.000760	3651.012540

Note 1: Power setting is the software setting used to set the output power.

End of Report

This page is intentionally blank and
marks the last page of this test report.