EMC Test Report
Industry Canada RSS-Gen Issue 3 / RSS 210 Issue 8
FCC Part 15, Subpart E
Model: LocoM5

IC CERTIFICATION #:	6545A-M5LB
FCC ID:	SWX-M5LD
APPLICANT:	Ubiquiti Networks 91 E. Tasman Drive San Jose, CA 95134
TEST SITE(S):	Elliott Laboratories 41039 Boyce Road. Fremont, CA. 94538-2435
IC SITE REGISTRATION #:	2845B-3; 2845B-4, 2845B-5, 2845B-7
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PROGRAM MGR /
TECHNICAL REVIEWER:

Mark Briggs
Staff Engineer

QUALITY ASSURANCE DELEGATE /
FINAL REPORT PREPARER:

David Guidotti
Senior Technical Writer

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REVISION HISTORY

Rev#	Date	Comments	Modified By
-	08-05-2011	First release	

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SCOPE

An electromagnetic emissions test has been performed on the Ubiquiti Networks model LocoM5, pursuant to the following rules:

Industry Canada RSS-Gen Issue 3
RSS 210 Issue 8 "Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment"
FCC Part 15, Subpart E requirements for UNII Devices (using FCC DA 02-2138, August 30, 2002)

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 Elliott Laboratories test procedures:

ANSI C63.4:2003
FCC UNII test procedure 2002-08 DA-02-2138, August 2002

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

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

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

OBJECTIVE

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

Prior to marketing in the USA, all unlicensed transmitters and transceivers require certification. Receive-only devices operating between 30 MHz and 960 MHz are subject to either certification or a manufacturer's declaration of conformity, with all other receive-only devices exempt from the technical requirements.

Prior to marketing in Canada, Class I transmitters, receivers and transceivers require certification. Class II devices are required to meet the appropriate technical requirements but are exempt from certification requirements.

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.).

STATEMENT OF COMPLIANCE

The tested sample of Ubiquiti Networks model LocoM5 complied with the requirements of the following regulations:

RSS 210 Issue 8 "Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment"
FCC Part 15, Subpart E requirements for UNII Devices

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.

The test results recorded herein are based on a single type test of Ubiquiti Networks model LocoM5 and therefore apply only to the tested sample. The sample was selected and prepared by Jennifer Sanchez of Ubiquiti Networks.

DEVIATIONS FROM THE STANDARDS

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

TEST RESULTS SUMMARY

Operation in the 5.25 – 5.35 GHz Band
Note: The device may be used outdoors, therefore the spectral density of spurious emissions in the 5.15 – 5.25 GHz band were limited to the -27dBm/MHz limit.

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.407(a) (2)		26dB Bandwidth	802.11a: >20MHz HT5: 8.3 MHz HT8: 10.8 MHz HT10: 13.4 MHz HT20: > 20MHz HT30: > 20MHz HT40: > 20MHz	N/A – limits output power if < 20MHz	N/A
15.407(a) (2)	A9.2(2)	Output Power	802.11a: 7.6 mW HT5: 5.8 mW HT8: 7.4 mW HT10: 11.5 mW HT20: 13.7 mW **HT30: 23.5 mW** HT40: 5.5 mW	SISO: 17dBm (50mW) MIMO: 14dBm (25mW) [1]	Complies
15.407(a) (2)	-	Power Spectral Density	802.11a: -3.9dBm/MHz HT5: 0.91 dBm/MHz HT8: 0.3 dBm/MHz HT10: 0.9 dBm/MHz HT20: 0.7 dBm/MHz HT30: -0.9 dBm/MHz HT40: -7.5 dBm/MHz	SISO: 4 dBm/MHz MIMO: 1dBm/MHz	Complies
-	A9.2(2) / A9.5 (2)	Power Spectral Density		11 dBm / MHz	Complies

[1] As the antenna gain is 13dBi (with effective gain of 16dBi for MIMO modes due to correlation between transmit chains) the maximum allowed output power for this device is 17dBm for SISO modes and 14dBm for MIMO modes to maintain the eirp below 30dBm.

Operation in the 5.47 – 5.725 GHz Band

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.407(a) (2)		26dB Bandwidth	802.11a: >20MHz HT5: 8.3 MHz HT8: 11.5 MHz HT10: 15.0 MHz HT20: > 20MHz HT30: > 20MHz HT40: > 20MHz	N/A – limits output power if < 20MHz	N/A
15.407(a) (2)	A9.2(2)	Output Power	802.11a: 17.8 mW HT5: 6.0 mW HT8: 9.6 mW HT10: 11.9 mW HT20: 23.3 mW **HT30: 24.1 mW** HT40: 21.6 mW	SISO: 17dBm (50mW) MIMO: 14dBm (25mW) [2]	Complies
15.407(a) (2))		Power Spectral Density	802.11a: -0.3dBm/MHz HT5: 1.0 dBm/MHz HT8: 0.9 dBm/MHz HT10: 0.9 dBm/MHz HT20: 1.5 dBm/MHz HT30: -0.7 dBm/MHz HT40: -2.8 dBm/MHz	SISO: 4 dBm/MHz MIMO: 1dBm/MHz	Complies
	A9.2(2) / A9.5 (2)	Power Spectral Density		11 dBm / MHz	Complies
KDB 443999	A9	Non-operation in 5600 – 5650 MHz sub band	Device cannot operate in the 5600 – 5650 MHz band –refer to Operational Description		Complies

[2] As the antenna gain is 13dBi (with effective gain of 16dBi for MIMO modes due to correlation between transmit chains) the maximum allowed output power for this device is 17dBm for SISO modes and 14dBm for MIMO modes to maintain the eirp below 30dBm.

Requirements for all U-NII/LELAN bands

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
15.407	A9.5a	Modulation	Digital Modulation is used (OFDM with BPSK-64 QAM))	Digital modulation is required	Complies
15.407(b) (5) / 15.209	A9.3	Spurious Emissions below 1GHz	Note 1	Refer to page 22	-
15.407(b) (5) / 15.209	A9.3	Spurious Emissions above 1GHz	54.0dBµV/m @ 5357.6MHz (802.11a Mode)		Complies (- 0.0 dB)
15.407(a)(6)	-	Peak Excursion Ratio	12.9dB (HT10 mode)	< 13dB	Complies
	A9.5 (3)	Channel Selection	Spurious emissions tested at outermost channels in each band	Device was tested on the top, bottom and center channels in each band for each operating mode.	N/A
15			Measurements on three channels in each band		
15.407 (c)	A9.5(4)	Operation in the absence of information to transmit	Operation is discontinued in the absence of information (refer to Operational Description)	Device shall automatically discontinue operation in the absence of information to transmit	Complies
15.407 (g)	A9.5 (5)	Frequency Stability	Frequency stability is better than 10ppm (Operational Description)	Signal shall remain within the allocated band	Complies
15.407 (h1)	A9.4	Transmit Power Control	TPC mechanism is discussed in the Operational Description. Power measurements were made to show the device has the required dynamic range.	The U-NII device shall have the capability to operate with a mean EIRP value lower than 24dBm (250mW)	Complies
15.407 (h2)	A9.4	Dynamic frequency Selection (device with radar detection)	Refer to separate test report, reference R83910	Threshold --64dBm Channel Availability Check > 60s Channel closing transmission time < 260ms Channel move time < 10s Non occupancy period > 30minutes	Complies
	A9.9g	User Manual information	Refer to Exhibit 6 for details	Warning regarding interference from Satellite Systems	Complies

GENERAL REQUIREMENTS APPLICABLE TO ALL BANDS

FCC Rule Part	RSS Rule part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.203	-	RF Connector	Integral antenna	Unique or integral antenna required	Complies
15.207	RSS GEN Table 2	AC Conducted Emissions	Not evaluated, the C2PC to add the NII frequency bands does not affect the previously reported measurement data for AC conducted emissions.		
15.109	RSS GEN 7.2.3 Table 1	Receiver spurious emissions	43.0dBµV/m @ 1440.0MHz	Refer to page 21	Complies (- 11 dB)
15.247 (b) (5) 15.407 (f)	RSS 102	RF Exposure Requirements	Refer to MPE calculations in Exhibit 11, RSS 102 declaration and User Manual statements.	Refer to OET 65, FCC Part 1 and RSS 102	Complies
-	RSP 100 RSS GEN 7.1.5	User Manual	Refer to Manual	Statement required regarding non-interference	Complies
-	RSP 100 RSS GEN 4.4.1	99% Bandwidth	802.11a: 17.1MHz HT5: 8.3 MHz HT8: 7.5 MHz HT10: 9.4 MHz HT20: 18.2MHz HT30: 27.0MHz HT40: 36.9MHz	Information only	N/A

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 and were calculated in accordance with UKAS document LAB 34.

Measurement Type	Measurement Unit	Frequency Range	Expanded Uncertainty
RF power, conducted (power meter)	dBm	25 to 7000 MHz	± 0.52 dB
RF power, conducted (Spectrum analyzer)	dBm	25 to 7000 MHz	± 0.7 dB
Conducted emission of transmitter	dBm	25 to 26500 MHz	± 0.7 dB
Conducted emission of receiver	dBm	25 to 26500 MHz	± 0.7 dB
Radiated emission (substitution method)	dBm	25 to 26500 MHz	± 2.5 dB
Radiated emission (field strength)	dBµV/m	25 to 1000 MHz	± 3.6 dB
		1000 to 40000 MHz	± 6.0 dB
Conducted Emissions (AC Power)	dBµV	0.15 to 30 MHz	± 2.4 dB

EQUIPMENT UNDER TEST (EUT) DETAILS

GENERAL

The Ubiquiti Networks model LocoM5 is a proprietary Access Point which is designed to provide wireless communications links using MIMO technology with bandwidths of between 5 and 40 MHz. The system also supports one MISO operating bandwidth of 20MHz. The operating frequency ranges for each mode are:

Mode	Frequency Range	Bandwidth
HT5	5255-5340 MHz, 5475-5595 MHz, 5655-5715 MHz	5 MHz
HT8	5260-5330MHz, 5480-5595MHz, 5655-5715 MHz	8 MHz
HT10	5260-5330MHz, 5480-5590MHz, 5660-5710 MHz	10 MHz
HT20	5265-5320MHz, 5500-5580MHz, 5660-5700MHz	20 MHz
HT30	5275-5315MHz, 5500-5580MHz, 5665-5680 MHz	30 MHz
HT40	5275-5310 MHz, 5510 MHz-5550 MHz, 5670 MHz	40 MHz
802.11a	5270-5320MHz, 5500-5580MHz, 5660-5700MHz	20 MHz

Since the EUT would normally be pole or wall mounted during operation, the EUT was located on a pole at a height of approximately 0.8m to 1.0m above the ground plane. The device is designed to be powered via Power-over-Ethernet and the PoE adapter used during testing was rated at 100-240 Volts, 50-60 Hz, .3 Amps.

The sample was received on April 12, 2011 and tested on April 12, 14, 18, 22, May 3, 4, 5, 9, 19, 25, 26, June 1 and June 14, 2011. The EUT consisted of the following component(s):

Company	Model	Description	Serial Number	FCC ID
Ubiquiti Networks	NanoStation Loco M5 wideband Wireless Access Point/bridge	Sample for conducted measurements	-	SWX-M5LD
		Sample for radiated measurements	-	

ANTENNA SYSTEM

The antenna is integral to the device and has 13 dBi gain per element.

ENCLOSURE

The EUT enclosure is primarily constructed of plastic. It measures approximately 8 cm wide by 28 cm deep by 6 cm high.

MODIFICATIONS

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

SUPPORT EQUIPMENT

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

Company	Model	Description	Serial Number
DELL	Vostro 1000	Laptop	28832224069
Ubiquiti	UBI-POE-24-1	PoE	0912-0000635

EUT INTERFACE PORTS

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

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
Ethernet	POE Injector	Cat 5 UTP	Unshielded	10
PoE Injector	Laptop	Cat 5 UTP	Unshielded	3
PoE Injector	AC-DC adapter	2-wire	Unshielded	1

EUT OPERATION

During testing, the EUT was configured via the ART test utility to either transmit continuously or be in a continuous receive mode. The transmit mode measurements were made win each of the modes supported at the lowest data rate in that mode (the highest power in each mode is achieved at the lowest data rate). There was one MISO mode (802.11a) and 6 different MIMO modes supporting bandwidths of 5 MHz, 8 MHz, 10MHz, 20MHz, 30 MHz and 40MHz.

TEST SITE

GENERAL INFORMATION

Final test measurements were taken at the test sites listed below. Pursuant to section 2.948 of the FCC's Rules and section 3.3 of RSP-100, construction, calibration, and equipment data has been filed with the Commission and with industry Canada.

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

ANSI C63.4:2003 recommends that ambient noise at the test site be at least 6 dB below the allowable limits. Ambient levels are below this requirement. The test site(s) contain separate areas for radiated and conducted emissions testing. Considerable engineering effort has been expended to ensure that the facilities conform to all pertinent requirements of ANSI C63.4:2003.

CONDUCTED EMISSIONS CONSIDERATIONS

Conducted emissions testing is performed in conformance with ANSI C63.4:2003. Measurements are made with the EUT connected to the public power network through a nominal, standardized RF impedance, which is provided by a line impedance stabilization network, known as a LISN. A LISN is inserted in series with each current-carrying conductor in the EUT power cord.

RADIATED EMISSIONS CONSIDERATIONS

The FCC has determined that radiation measurements made in a shielded enclosure are not suitable for determining levels of radiated emissions. Radiated measurements are performed in an open field environment or in a semi-anechoic chamber. The test sites are maintained free of conductive objects within the CISPR defined elliptical area incorporated in ANSI C63.4:2003 guidelines and meet the Normalized Site Attenuation (NSA) requirements of ANSI C63.4:2003.

MEASUREMENT INSTRUMENTATION

RECEIVER SYSTEM

An EMI receiver as specified in CISPR 16-1-1 is used for emissions measurements. The receivers used can measure over the frequency range of 9 kHz up to 2000 MHz. These receivers allow both ease of measurement and high accuracy to be achieved. The receivers have Peak, Average, and CISPR (Quasi-peak) detectors built into their design so no external adapters are necessary. The receiver automatically sets the required bandwidth for the CISPR detector used during measurements. If the repetition frequency of the signal being measured is below 20Hz, peak measurements are made in lieu of Quasi-Peak measurements.

For measurements above the frequency range of the receivers, a spectrum analyzer is utilized because it provides visibility of the entire spectrum along with the precision and versatility required to support engineering analysis. Average measurements above 1000MHz are performed on the spectrum analyzer using the linear-average method with a resolution bandwidth of 1 MHz and a video bandwidth of 10 Hz, unless the signal is pulsed in which case the average (or video) bandwidth of the measuring instrument is reduced to onset of pulse desensitization and then increased.

INSTRUMENT CONTROL COMPUTER

The receivers utilize either a Rohde & Schwarz EZM Spectrum Monitor/Controller or contain an internal Spectrum Monitor/Controller to view and convert the receiver measurements to the field strength at an antenna or voltage developed at the LISN measurement port, which is then compared directly with the appropriate specification limit. This provides faster, more accurate readings by performing the conversions described under Sample Calculations within the Test Procedures section of this report. Results are printed in a graphic and/or tabular format, as appropriate. A personal computer is used to record all measurements made with the receivers.

The Spectrum Monitor provides a visual display of the signal being measured. In addition, the controller or a personal computer run automated data collection programs which control the receivers. This provides added accuracy since all site correction factors, such as cable loss and antenna factors are added automatically.

LINE IMPEDANCE STABILIZATION NETWORK (LISN)

Line conducted measurements utilize a fifty microhenry Line Impedance Stabilization Network as the monitoring point. The LISN used also contains a 250 uH CISPR adapter. This network provides for calibrated radio frequency noise measurements by the design of the internal low pass and high pass filters on the EUT and measurement ports, respectively.

FILTERS/ATTENUATORS

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

ANTENNAS

A loop antenna is used below 30 MHz. For the measurement range 30 MHz to 1000 MHz either a combination of a biconical antenna and a log periodic or a bi-log antenna is used. Above 1000 MHz, horn antennas are used. The antenna calibration factors to convert the received voltage to an electric field strength are included with appropriate cable loss and amplifier gain factors to determine an overall site factor, which is then programmed into the test receivers or incorporated into the test software.

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. Measurements below 30 MHz are made with the loop antenna at a fixed height of 1m above the ground plane.

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

INSTRUMENT CALIBRATION

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

TEST PROCEDURES

EUT AND CABLE PLACEMENT

The regulations require that interconnecting cables be connected to the available ports of the unit and that the placement of the unit and the attached cables simulate the worst case orientation that can be expected from a typical installation, so far as practicable. To this end, the position of the unit and associated cabling is varied within the guidelines of ANSI C63.4:2003, and the worst-case orientation is used for final measurements.

CONDUCTED EMISSIONS

Conducted emissions are measured at the plug end of the power cord supplied with the EUT. Excess power cord length is wrapped in a bundle between 30 and 40 centimeters in length near the center of the cord. Preliminary measurements are made to determine the highest amplitude emission relative to the specification limit for all the modes of operation. Placement of system components and varying of cable positions are performed in each mode. A final peak mode scan is then performed in the position and mode for which the highest emission was noted on all current carrying conductors of the power cord.

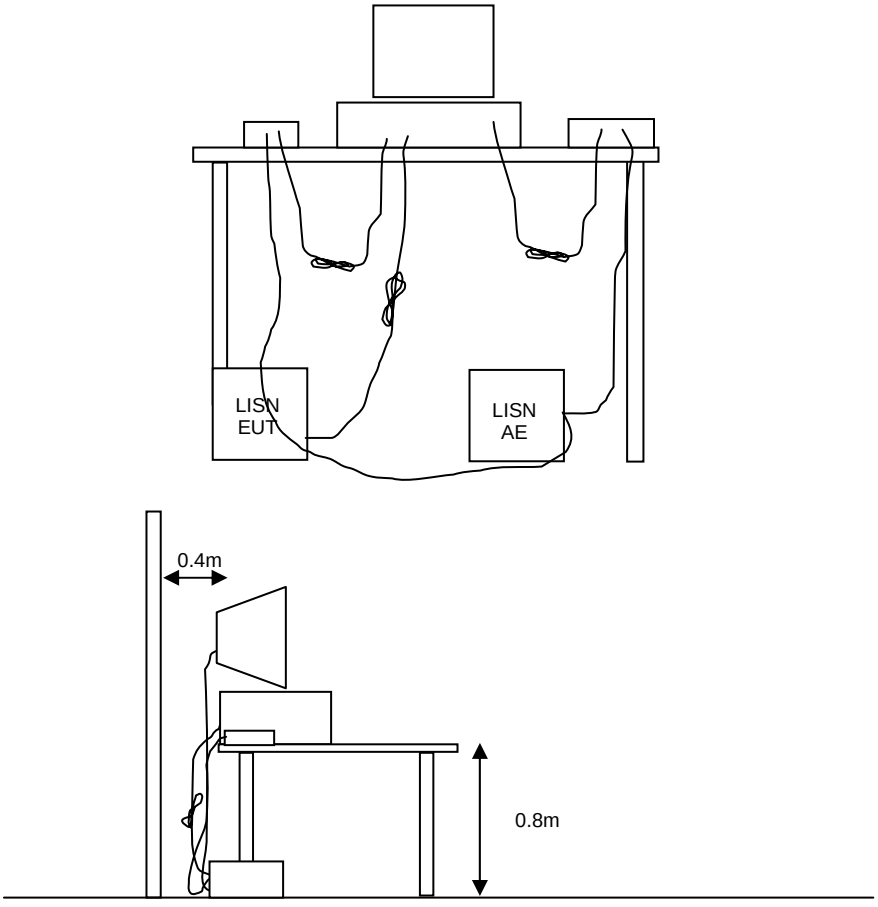


Figure 1 Typical Conducted Emissions Test Configuration

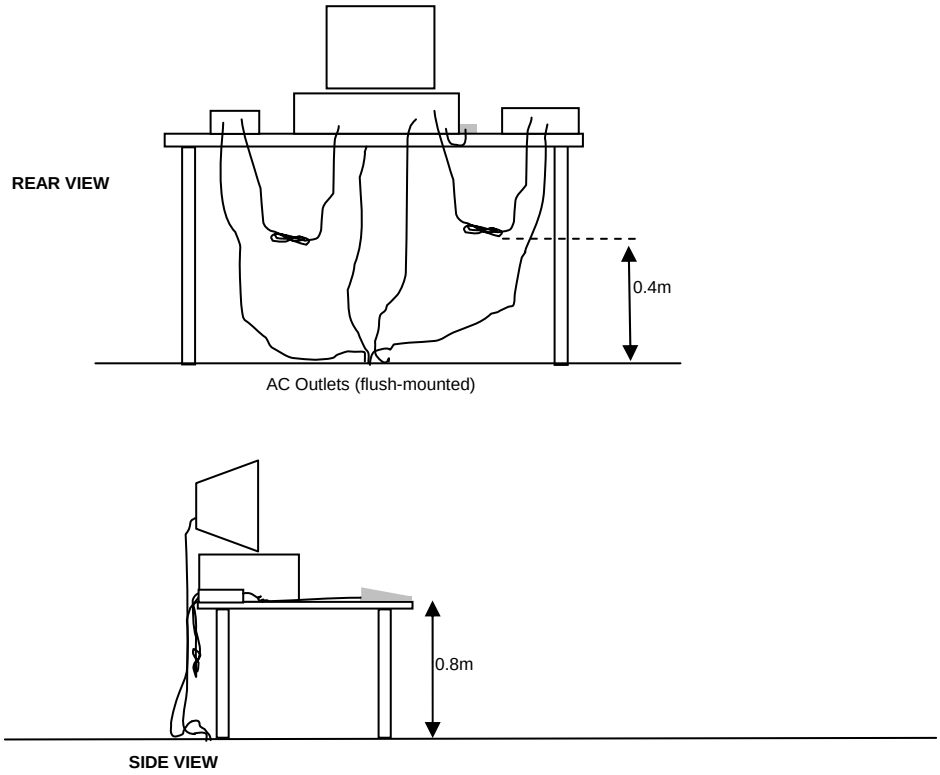
RADIATED EMISSIONS

A preliminary scan of the radiated emissions is performed in which all significant EUT frequencies are identified with the system in a nominal configuration. At least two scans are performed, one scan for each antenna polarization (horizontal and vertical; loop parallel and perpendicular to the EUT). During the preliminary scans, the EUT is rotated through 360˚, the antenna height is varied (for measurements above 30 MHz) and cable positions are varied to determine the highest emission relative to the limit. Preliminary scans may be performed in a fully anechoic chamber for the purposes of identifying the frequencies of the highest emissions from the EUT.

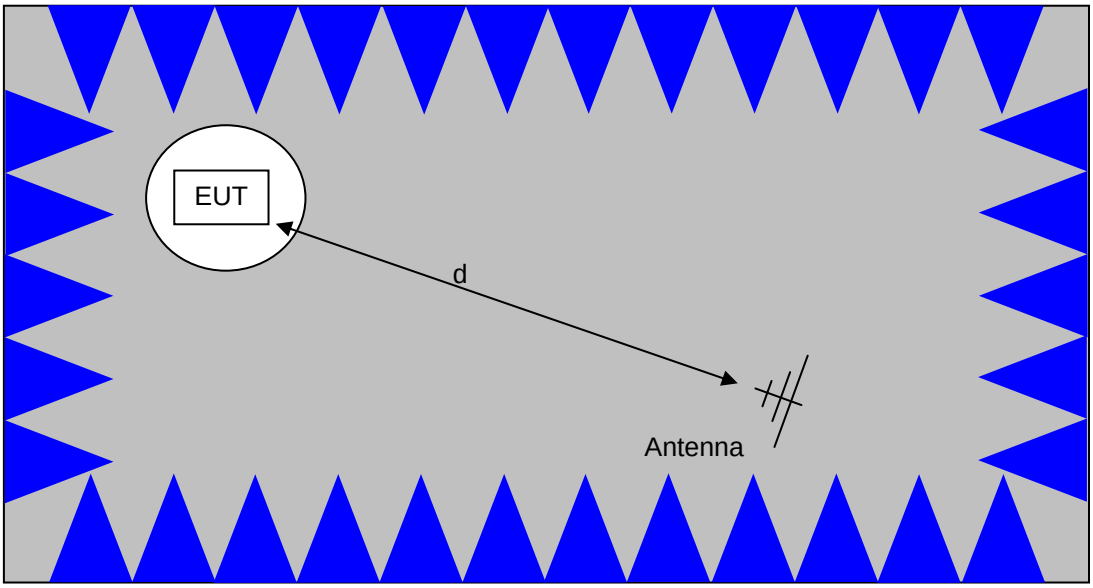
A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

Final maximization is a phase in which the highest amplitude emissions identified in the spectral search are viewed while the EUT azimuth angle is varied from 0 to 360 degrees relative to the receiving antenna. The azimuth, which results in the highest emission is then maintained while varying the antenna height from one to four meters (for measurements above 30 MHz, measurements below 30 MHz are made with the loop antenna at a fixed height of 1m). The result is the identification of the highest amplitude for each of the highest peaks. Each recorded level is corrected in the receiver using appropriate factors for cables, connectors, antennas, and preamplifier gain.

When testing above 18 GHz, the receive antenna is located at 1meter from the EUT and the antenna height is restricted to a maximum of 2.5 meters.

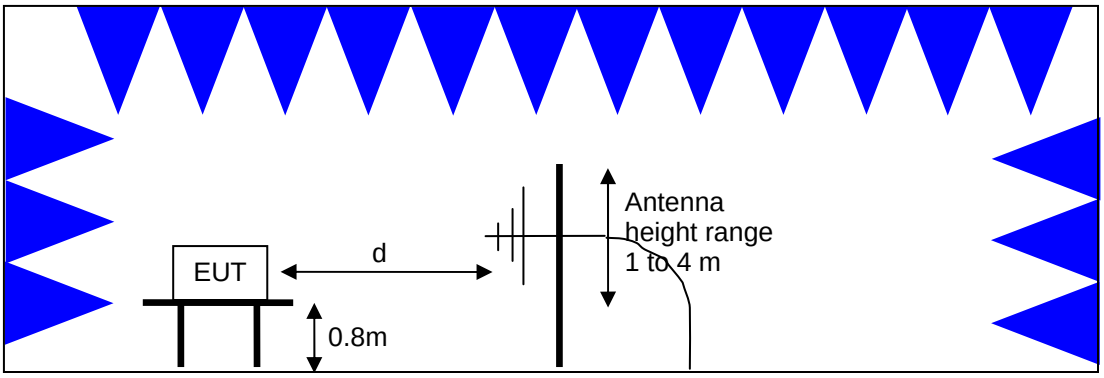


Typical Test Configuration for Radiated Field Strength Measurements



The anechoic materials on the walls and ceiling ensure compliance with the normalized site attenuation requirements of CISPR 16 / CISPR 22 / ANSI C63.4 for an alternate test site at the measurement distances used.

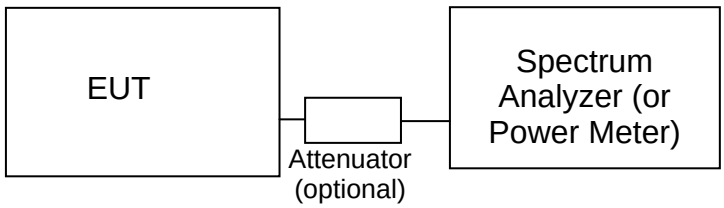
Floor-standing equipment is placed on the floor with insulating supports between the unit and the ground plane.



Test Configuration for Radiated Field Strength Measurements
Semi-Anechoic Chamber, Plan and Side Views

CONDUCTED EMISSIONS FROM ANTENNA PORT

Direct measurements of power, bandwidth and power spectral density are performed, where possible, with the antenna port of the EUT connected to either the power meter or spectrum analyzer via a suitable attenuator and/or filter. These are used to ensure that the front end of the measurement instrument is not overloaded by the fundamental transmission.



Test Configuration for Antenna Port Measurements

Measurement bandwidths (video and resolution) are set in accordance with the relevant standards and Elliott's test procedures for the type of radio being tested. When power measurements are made using a resolution bandwidth less than the signal bandwidth the power is calculated by summing the power across the signal bandwidth using either the analyzer channel power function or by capturing the trace data and calculating the power using software. In both cases the summed power is corrected to account for the equivalent noise bandwidth (ENBW) of the resolution bandwidth used.

If power averaging is used (typically for certain digital modulation techniques), the EUT is configured to transmit continuously. Power averaging is performed using either the built-in function of the analyzer or, if the analyzer does not feature power averaging, using external software. In both cases the average power is calculated over a number of sweeps (typically 100). When the EUT cannot be configured to continuously transmit then either the analyzer is configured to perform a gated sweep to ensure that the power is averaged over periods that the device is transmitting or power averaging is disabled and a max-hold feature is used.

If a power meter is used to make output power measurements the sensor head type (peak or average) is stated in the test data table.

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.

SPECIFICATION LIMITS AND SAMPLE CALCULATIONS

The limits for conducted emissions are given in units of microvolts, and the limits for radiated emissions are given in units of microvolts per meter at a specified test distance. Data is measured in the logarithmic form of decibels relative to one microvolt, or dB microvolts (dBuV). For radiated emissions, the measured data is converted to the field strength at the antenna in dB microvolts per meter (dBuV/m). The results are then converted to the linear forms of uV and uV/m for comparison to published specifications.

For reference, converting the specification limits from linear to decibel form is accomplished by taking the base ten logarithm, then multiplying by 20. These limits in both linear and logarithmic form are as follows:

GENERAL TRANSMITTER RADIATED EMISSIONS SPECIFICATION LIMITS

The table below shows the limits for the spurious emissions from transmitters that fall in restricted bands[3] (with the exception of transmitters operating under FCC Part 15 Subpart D and RSS 210 Annex 9), the limits for all emissions from a low power device operating under the general rules of RSS 310 (tables 3 and 4), RSS 210 (table 2) and FCC Part 15 Subpart C section 15.209.

Frequency Range (MHz)	Limit (uV/m)	Limit (dBuV/m @ 3m)
0.009-0.490	$2400/F_{KHz}$ @ 300m	$67.6-20*\log_{10}(F_{KHz})$ @ 300m
0.490-1.705	$24000/F_{KHz}$ @ 30m	$87.6-20*\log_{10}(F_{KHz})$ @ 30m
1.705 to 30	30 @ 30m	29.5 @ 30m
30 to 88	100 @ 3m	40 @ 3m
88 to 216	150 @ 3m	43.5 @ 3m
216 to 960	200 @ 3m	46.0 @ 3m
Above 960	500 @ 3m	54.0 @ 3m

[3] The restricted bands are detailed in FCC 15.203, RSS 210 Table 1 and RSS 310 Table 2

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

FCC 15.407 (a) OUTPUT POWER LIMITS

The table below shows the limits for output power and output power density. Where the signal bandwidth is less than 20 MHz the maximum output power is reduced to the power spectral density limit plus 10 times the log of the bandwidth (in MHz).

Operating Frequency (MHz)	Output Power	Power Spectral Density
5150 – 5250	50mW (17 dBm)	4 dBm/MHz
5250 – 5350	250 mW (24 dBm)	11 dBm/MHz
5725 – 5825	1 Watts (30 dBm)	17 dBm/MHz

For system using antennas with gains exceeding 6dBi, the output power and power spectral density limits are reduced by 1dB for every dB the antenna gain exceeds 6dBi. Fixed point-to-point applications using the 5725 – 5825 MHz band may use antennas with gains of up to 23dBi without this limitation. If the gain exceeds 23dBi then the output power limit of 1 Watt is reduced by 1dB for every dB the gain exceeds 23dBi.

The peak excursion envelope is limited to 13dB.

OUTPUT POWER LIMITS –LELAN DEVICES

The table below shows the limits for output power and output power density defined by RSS 210. Where the signal bandwidth is less than 20 MHz the maximum output power is reduced to the power spectral density limit plus 10 times the log of the bandwidth (in MHz).

Operating Frequency (MHz)	Output Power	Power Spectral Density
5150 – 5250	200mW (23 dBm) eirp	10 dBm/MHz eirp
5250 – 5350	250 mW (24 dBm)[4] 1W (30dBm) eirp	11 dBm/MHz
5470 – 5725	250 mW (24 dBm)[5] 1W (30dBm) eirp	11 dBm/MHz
5725 – 5825	1 Watt (30 dBm) 4W eirp	17 dBm/MHz

In addition, the power spectral density limit shall be reduced by 1dB for every dB the highest power spectral density exceeds the "average" power spectral density) by more than 3dB. The "average" power spectral density is determined by dividing the output power by 10log(EBW) where EBW is the 99% power bandwidth.

Fixed point-to-point applications using the 5725 – 5825 MHz band may use antennas with gains of up to 23dBi without this limitation. If the gain exceeds 23dBi then the output power limit of 1 Watt is reduced by 1dB for every dB the gain exceeds 23dBi.

SPURIOUS EMISSIONS LIMITS –UNII and LELAN DEVICES

The spurious emissions limits for signals below 1GHz are the FCC/RSS-GEN general limits. For emissions above 1GHz, signals in restricted bands are subject to the FCC/RSS GEN general limits. All other signals have a limit of –27dBm/MHz, which is equivalent to a field strength of 68.3dBuV/m/MHz at a distance of 3m. Measurements against this limit use the same measurement method as those used to determine the in-band power spectral density. For devices operating in the 5725-5850MHz bands under the LELAN/UNII rules, the limit within 10MHz of the allocated band is increased to –17dBm/MHz.

[4] If EIRP exceeds 500mW the device must employ TPC
[5] If EIRP exceeds 500mW the device must employ TPC

SAMPLE CALCULATIONS - CONDUCTED EMISSIONS

Receiver readings are compared directly to the conducted emissions specification limit (decibel form) as follows:

$$R_r - S = M$$

where:

R_r = Receiver Reading in dBuV
S = Specification Limit in dBuV
M = Margin to Specification in +/- dB

SAMPLE CALCULATIONS - RADIATED EMISSIONS

Receiver readings are compared directly to the specification limit (decibel form). The receiver internally 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, when used for electric field measurements above 30MHz, is calculated 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:

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

Measurement Distance is the distance at which the measurements were taken and Specification Distance is the distance at which the specification limits are based. The antenna factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements.
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 - FIELD STRENGTH TO EIRP CONVERSION

Where the radiated electric field strength is expressed in terms of the equivalent isotropic radiated power (eirp), or where a field strength measurement of output power is made in lieu of a direct measurement, the following formula is used to convert between eirp and field strength at a distance of d (meters) from the equipment under test:

$$E = \frac{1000000 \sqrt{30 P}}{d} \quad \text{microvolts per meter}$$

where P is the eirp (Watts)

For a measurement at 3m the conversion from a logarithmic value for field strength (dBuV/m) to an eirp power (dBm) is -95.3dB.

Appendix A Test Equipment Calibration Data

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

Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	SpecAn 9 KHz-26.5 GHz, Non-Program	8563E	284	1/13/2012

Radio Antenna Port (Power and Spurious Emissions), 15-Apr-11

Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	SpecAn 9 kHz - 40 GHz, FT (SA40) Blue	8564E (84125C)	1393	5/14/2011

Radio Antenna Port (Power and Spurious Emissions), 18-Apr-11

Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	7/12/2011

Radiated Emissions, 1000 - 18,000 MHz, 19-Apr-11

Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	263	12/8/2011
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	7/12/2011
EMCO	Antenna, Horn, 1-18 GHz (SA40-Blu)	3115	1386	9/21/2012
Micro-Tronics	Band Reject Filter, 5150-5350 MHz	BRC50703-02	2251	10/21/2011

UNII Bandedge, 22-Apr-11

Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	263	12/8/2011
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	7/12/2011
EMCO	Antenna, Horn, 1-18 GHz (SA40-Blu)	3115	1386	9/21/2012

Radio Antenna Port (Power and Spurious Emissions), 28-Apr-11

Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	SpecAn 9 kHz - 40 GHz, FT (SA40) Blue	8564E (84125C)	1393	5/14/2011

Radio Antenna Port (Power and Spurious Emissions), 04-May-11

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

Radio Antenna Port (Power and Spurious Emissions), 11-May-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, 1000 - 40000MHz, 27-May-11

Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	263	12/8/2011
Hewlett Packard	SpecAn 9 kHz - 40 GHz, FT (SA40) Blue	8564E (84125C)	1393	6/14/2011
EMCO	Antenna, Horn, 1-18 GHz	3115	1561	6/22/2012

Radiated Spurious Emissions, 1 - 18 GHz, 27-May-11

Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	263	12/8/2011
EMCO	Antenna, Horn, 1-18 GHz	3115	487	7/6/2012
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	7/12/2011

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

Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	7/12/2011

Appendix B Test Data

T82792 Pages 28 - 197

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		-
Emissions Standard(s):	FCC 15E, RSS-210	Class:	-
Immunity Standard(s):	-	Environment:	-

EMC Test Data

For The

Ubiquiti Networks

Model

NanoStation Loco M5

Date of Last Test: 6/15/2011

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

RSS-210 (LELAN) and FCC 15.407(UNII)
Antenna Port Measurements
Power, PSD, Peak Excursion, 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: 4/12/2011 18:25
Test Engineer: Rafael Varelas, Joseph Cadigal
Test Location: Fremont Chamber #7
Config. Used: 1
Config Change: none
EUT Voltage: POE

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Power, 5250 - 5350MHz	15.407(a) (1), (2)	Pass	802.11a: 7.6 mW
1	PSD, 5250 - 5350MHz	15.407(a) (1), (2)	Pass	802.11a: -3.9 dBm/MHz
1	Power, 5470 - 5725MHz	15.407(a) (1), (2)	Pass	802.11a: 17.8 mW
1	PSD, 5470 - 5725MHz	15.407(a) (1), (2)	Pass	802.11a: -0.3 dBm/MHz
1	26dB Bandwidth	15.407 (Information only)	-	> 20MHz
1	99% Bandwidth	RSS 210 (Information only)	N/A	802.11a (20MHz): 17.1 MHz
2	Peak Excursion Envelope	15.407(a) (6)	Pass	802.11a (20MHz): 11.5dB
3	Antenna Conducted - Out of Band Spurious (802.11a 20MHz)	15.407(b) -27dBm/MHz	Pass	All emissions below -27dBm/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: 20.7 °C
Rel. Humidity: 36 %

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:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

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

Note 1:	Output power measured using a spectrum analyzer (see plots below). RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was continuous) and power integration over **50** MHz (method 1 of DA-02-2138A1).
Note 2:	Measured using the same analyzer settings used for output power.
Note 3:	For RSS-210 the limits are corrected for instances where the highest measured value of the PSD exceeds the average PSD (calculated from the measured power divided by the measured 99% bandwidth) by more than 3dB by the amount that the measured value exceeds the average by more than 3dB.
Note 4:	99% Bandwidth measured in accordance with RSS GEN - RB > 1% of span and VB >=3xRB
Note 5:	Software settings in blue are the power levels in Art Build 930.

Date of Test: 6/13/2011 Test Location: FTChamber#4

Test Engineer: Joseph Cadigal Config Change: none

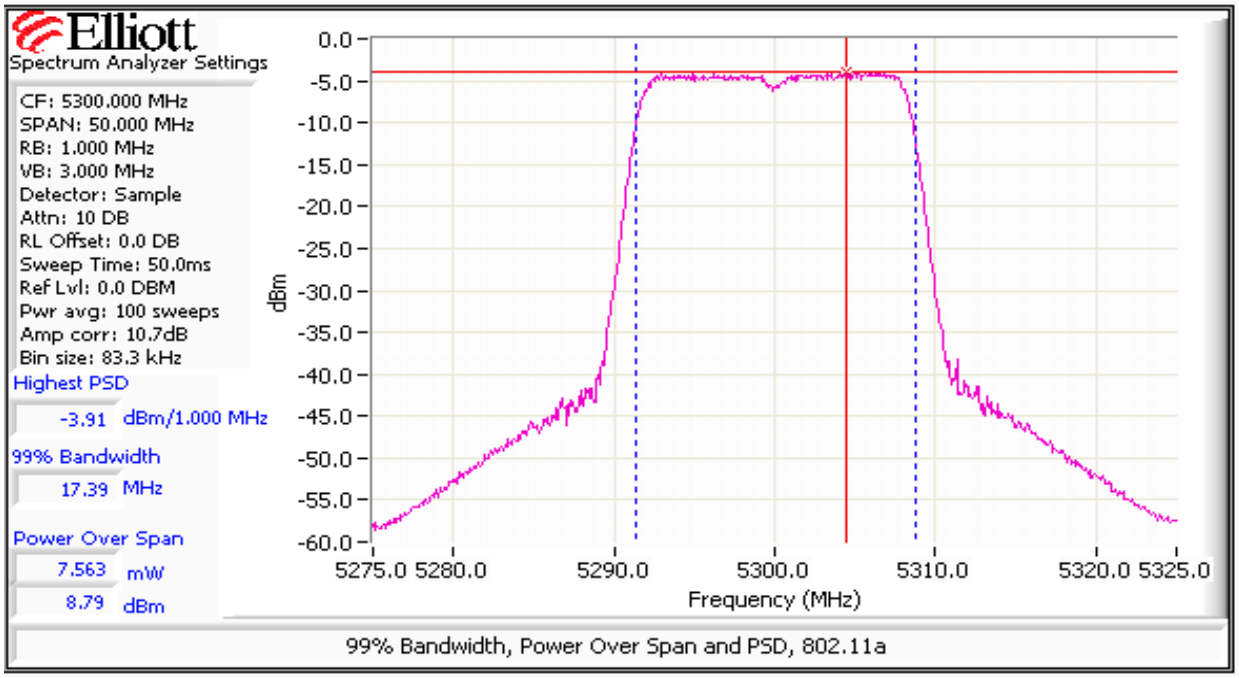
Single Chain Operation, 5250-5350 MHz Band

Antenna Gain (dBi): 13 EIRP: 151.0 mW 21.8 dBm

Frequency (MHz)	Software Setting	Bandwidth 26dB	Bandwidth 99%[4]	Output Power[1] dBm Measured	Output Power[1] dBm Limit	Power (Watts)	PSD[2] dBm/MHz Measured	PSD[2] dBm/MHz FCC Limit	PSD[2] dBm/MHz RSS Limit[3]	Result
802.11a - 20MHz										
5270	8.0	28.5	17.3	8.5	17.0	0.0071	-4.0	4.0	11.0	Pass
5300	8.0	32.3	17.1	**8.8**	17.0	**0.0076**	**-3.9**	4.0	11.0	Pass
5320	5.0	29.0	17.0	5.7	17.0	0.0037	-6.8	4.0	11.0	Pass

Output Power at Low Power Setting - 5250-5350 MHz Band

As EIRP does not exceed 500mW TPC is not required.



Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Date of Test: 6/13/2011 Test Location: FTChamber#4
Test Engineer: Joseph Cadigal Config Change: none

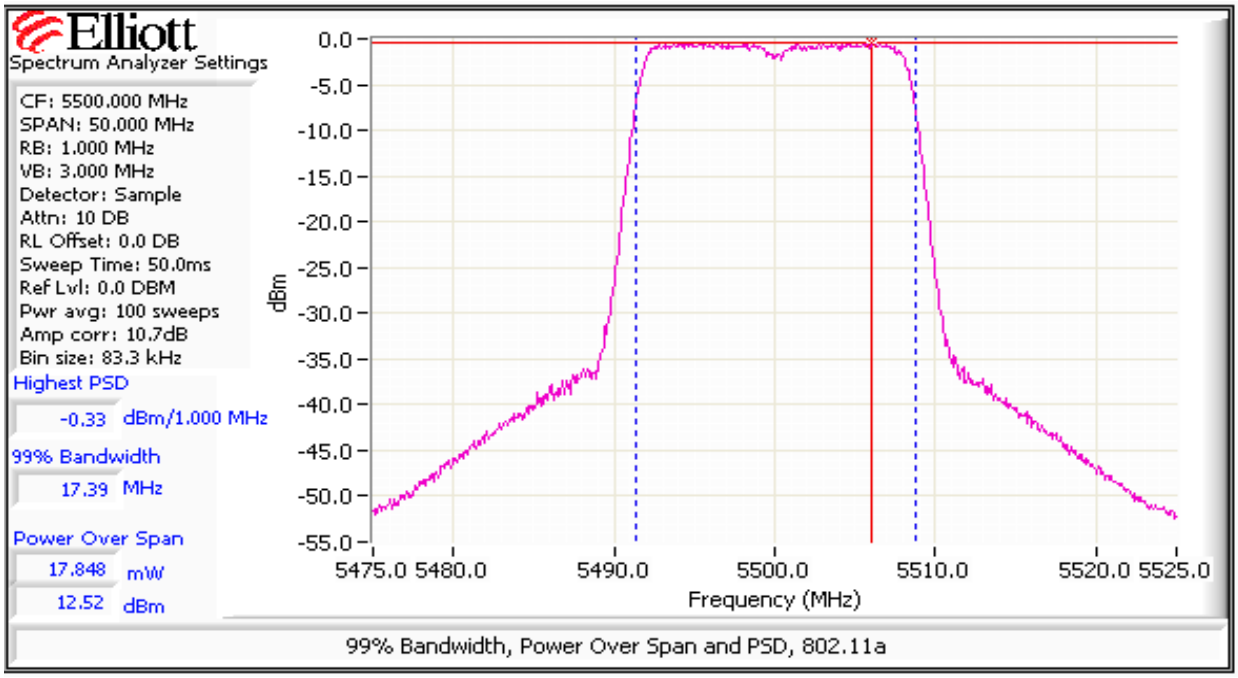
Single Chain Operation, 5470- 5725 MHz Band

Antenna Gain (dBi): 13 EIRP: 356.5 mW 25.5 dBm

Frequency (MHz)	Software Setting	Bandwidth 26dB	Bandwidth 99%[4]	Output Power[1] dBm Measured	Output Power[1] dBm Limit	Power (Watts)	PSD[2] dBm/MHz Measured	PSD[2] dBm/MHz FCC Limit	PSD[2] dBm/MHz RSS Limit[3]	Result
5500	12.0	41.5	17.1	**12.5**	17.0	**0.018**	**-0.3**	4.0	11.0	Pass
5580	12.0	39.0	17.1	12.2	17.0	0.017	-0.7	4.0	11.0	Pass
5700	9.0	37.3	17.1	8.6	17.0	0.007	-4.2	4.0	11.0	Pass

Output Power at Low Power Setting - 5470-5725 MHz Band

EIRP does not exceed 500mW, therefore TPC is not required and measurements at a low power setting are not required.



Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run #2: Peak Excursion Measurement

20MHz: Device meets the requirement for the peak excursion

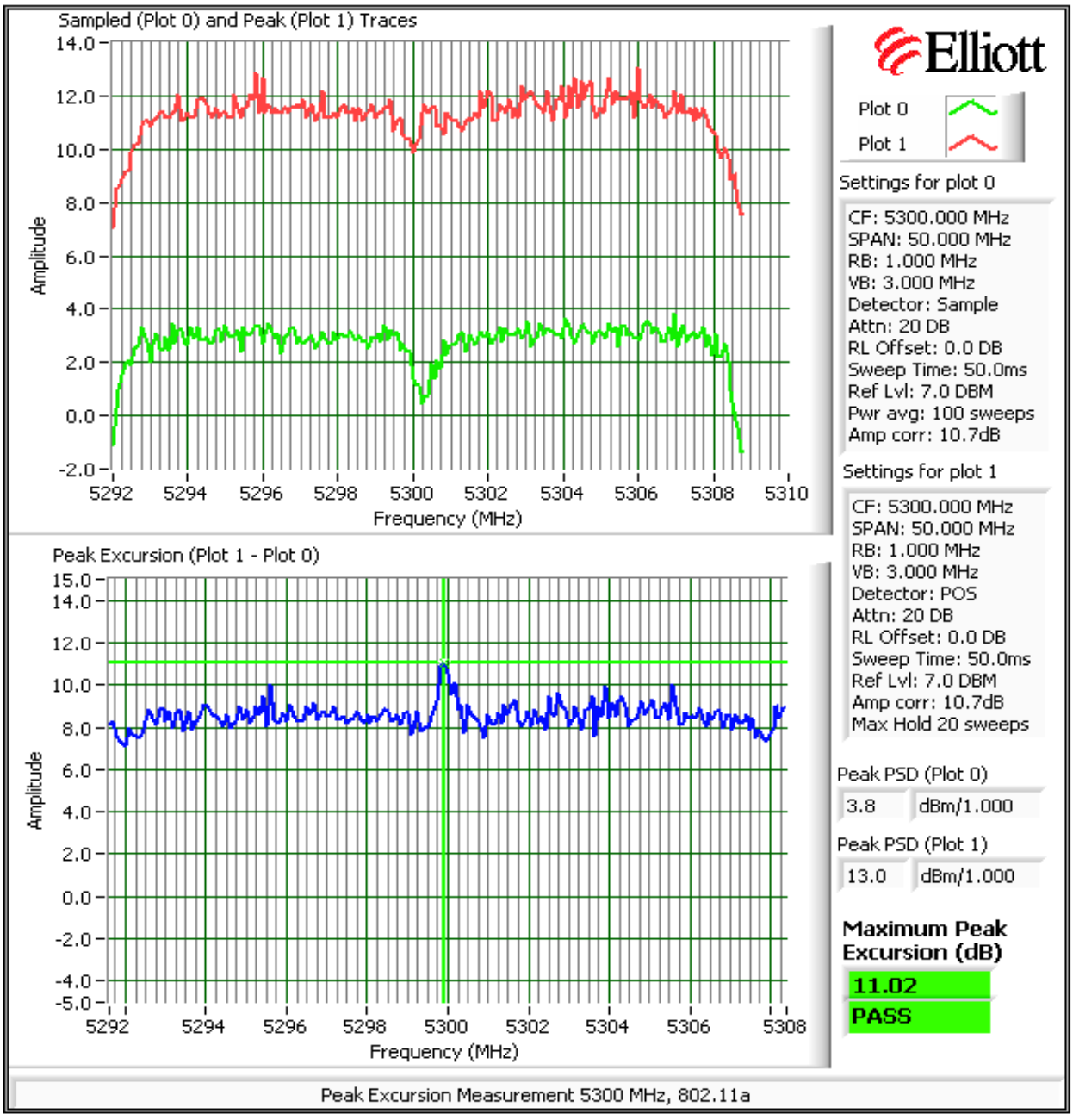
Freq	Peak Excursion(dB)		Freq	Peak Excursion(dB)	
(MHz)	Value	Limit	(MHz)	Value	Limit
5270	11.2	13.0	5500	**11.5**	13.0
5300	11.0	13.0	5580	10.7	13.0
5320	11.0	13.0	5700	11.4	13.0

Plots Showing Peak Excursion Measurement

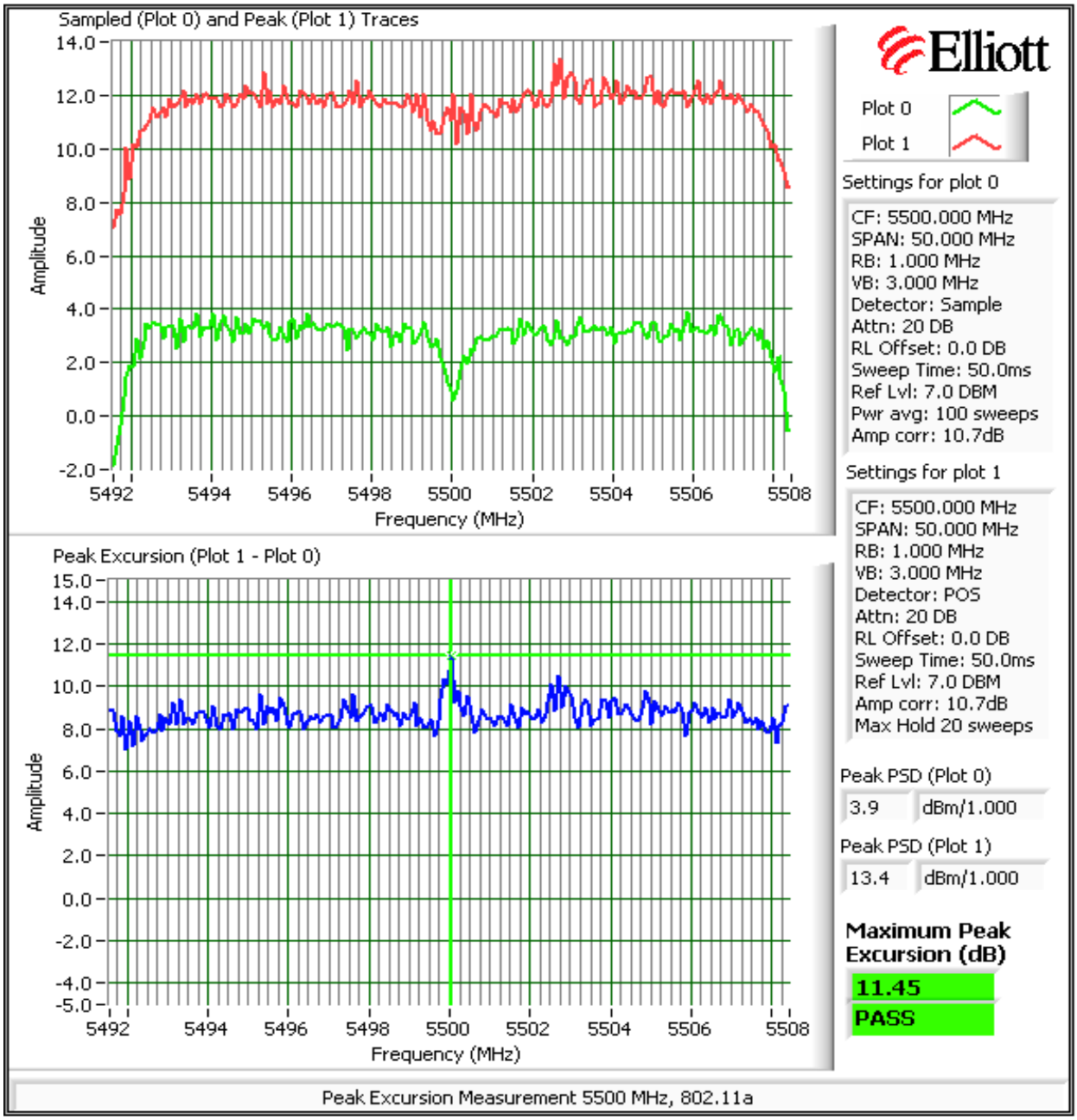
Trace A: RBW = 1MHz, VBW = 3MHz, Peak hold

Trace B: Same settings as used for power/PSD measurements (RBW = 1 MHz, VBW = 3MHz, Integrated **average** power)

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A



Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A



Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

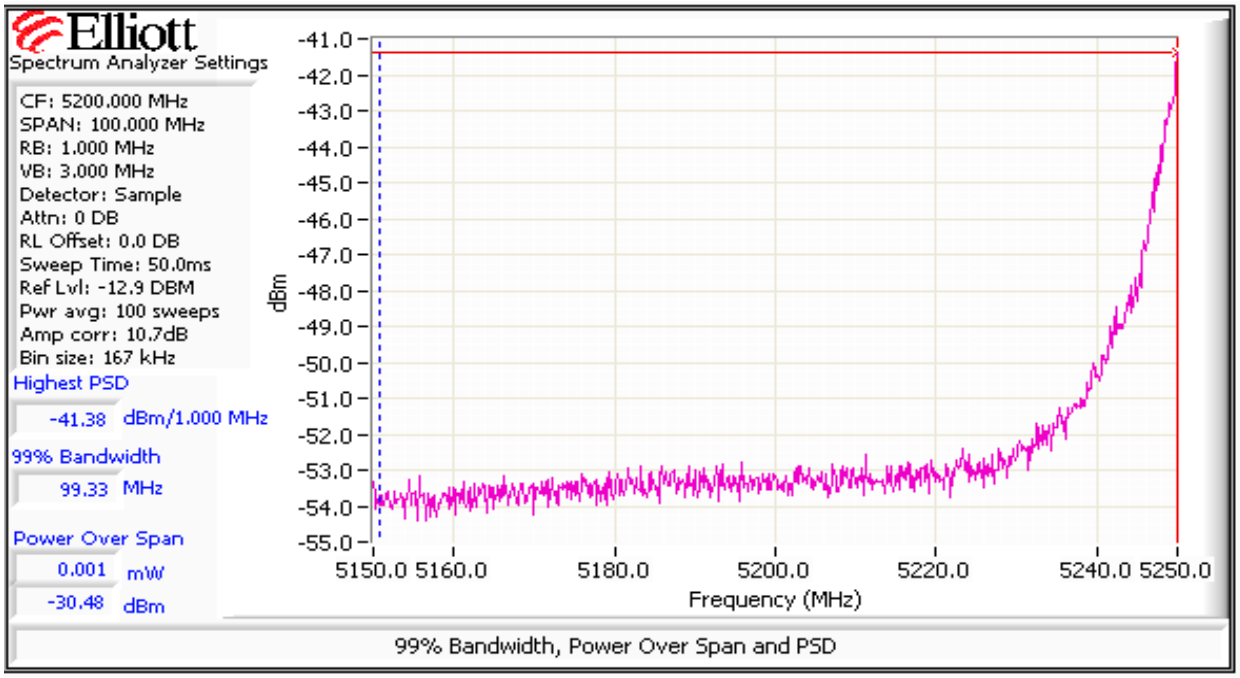
Run #3: Out Of Band Spurious Emissions - Antenna Conducted

Maximum Antenna Gain: 13.0 dBi
Spurious Limit: -27.0 dBm/MHz eirp
Limit Used On Plots [Note 1]: -40.0 dBm/MHz Measurement method is method used for PSD

Note 1:	The -27dBm/MHz limit is an eirp limit. The limit for antenna port conducted measurements is adjusted to take into consideration the maximum antenna gain (limit = -27dBm - antenna gain). Radiated field strength measurements for signals more than 50MHz from the bands and that are close to the limit are made to determine compliance as the antenna gain is not known at these frequencies.
Note 2:	All spurious signals below 1GHz are measured during digital device radiated emissions test.
Note 3:	Signals within 10MHz of the 5.725 or 5.825 Band edge are subject to a limit of -17dBm EIRP
Note 4:	If the device is for outdoor use then the -27dBm eirp limit also applies in the 5150 - 5250 MHz band.
Note 5:	Signals that fall in the restricted bands of 15.205 are subject to the limit of 15.209.

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

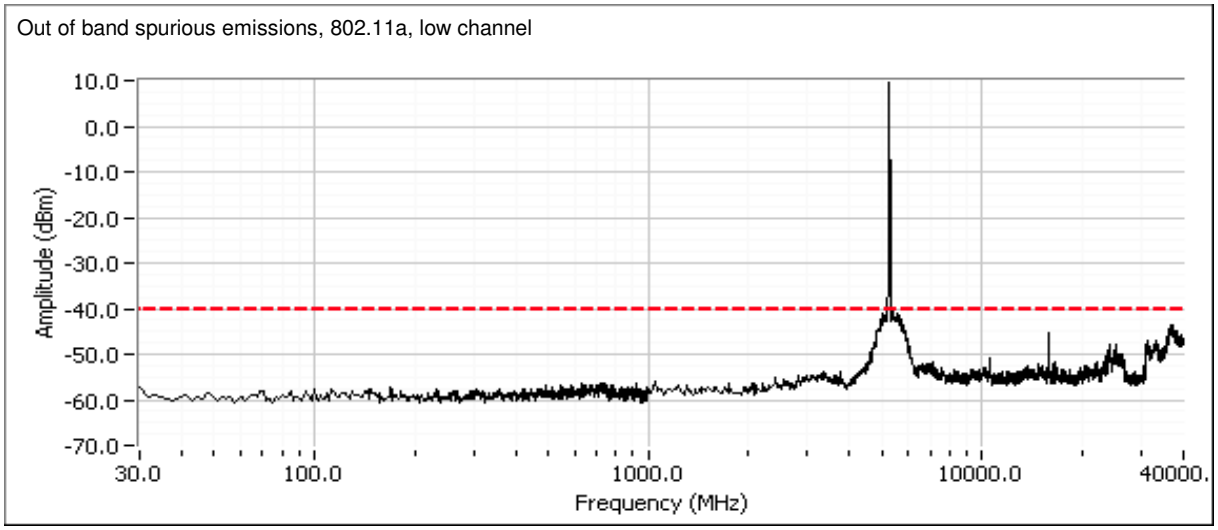
Low channel, 5250 - 5350 MHz Band: 20MHz Mode (5270 MHz)
Plot showing compliance with the -27dBm/MHz limit in the 5150 - 5250 MHz band. Start and stop frequencies set to 5150-5250 MHz, RB=1MHz, VB=3MHz, power averaging enabled (100 traces):



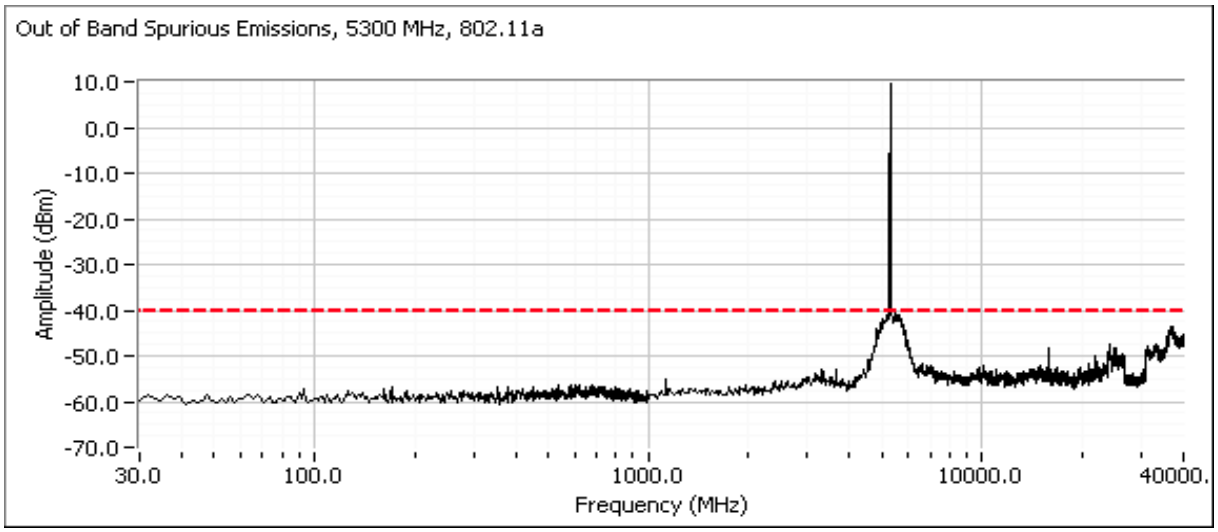
	Power Setting	Band edge Level dBm/MHz	Band edge Level mW/MHz	Antenna Gain (dBi)	EIRP mW/MHz	EIRP dBm/MHz	Limit dBm/MHz	Result
Chain 1	5	-41.4	0.00007	13.0	0.0014521	-28.4	-27	PASS

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Wide-band plot, RB=VB=1MHz (Peak measurements versus limit).



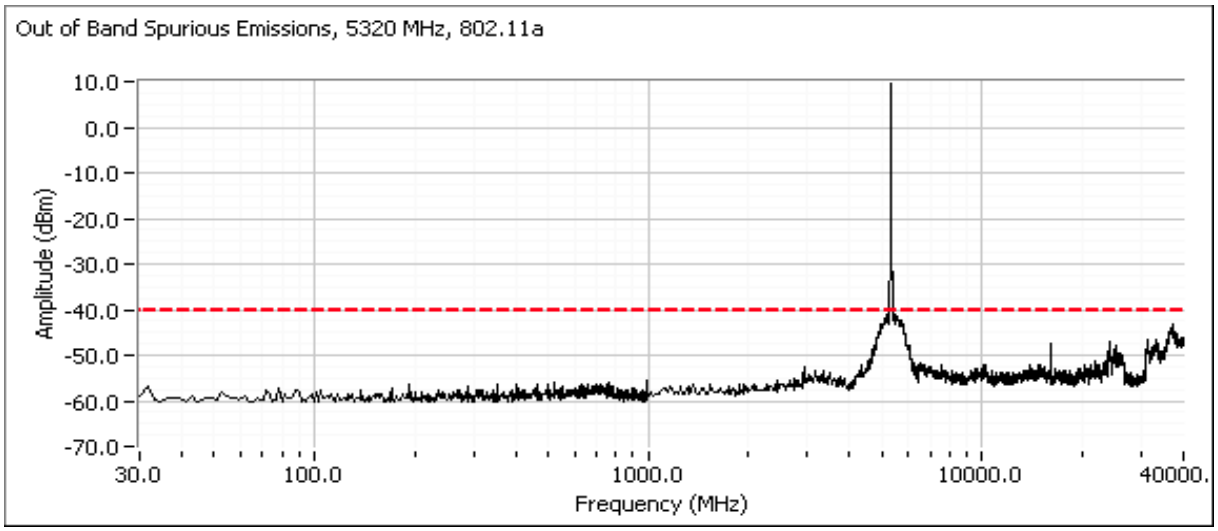
Center channel, 5250 - 5350 MHz Band: 20MHz Mode



Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

High channel, 5250 - 5350 MHz Band: 20MHz Mode

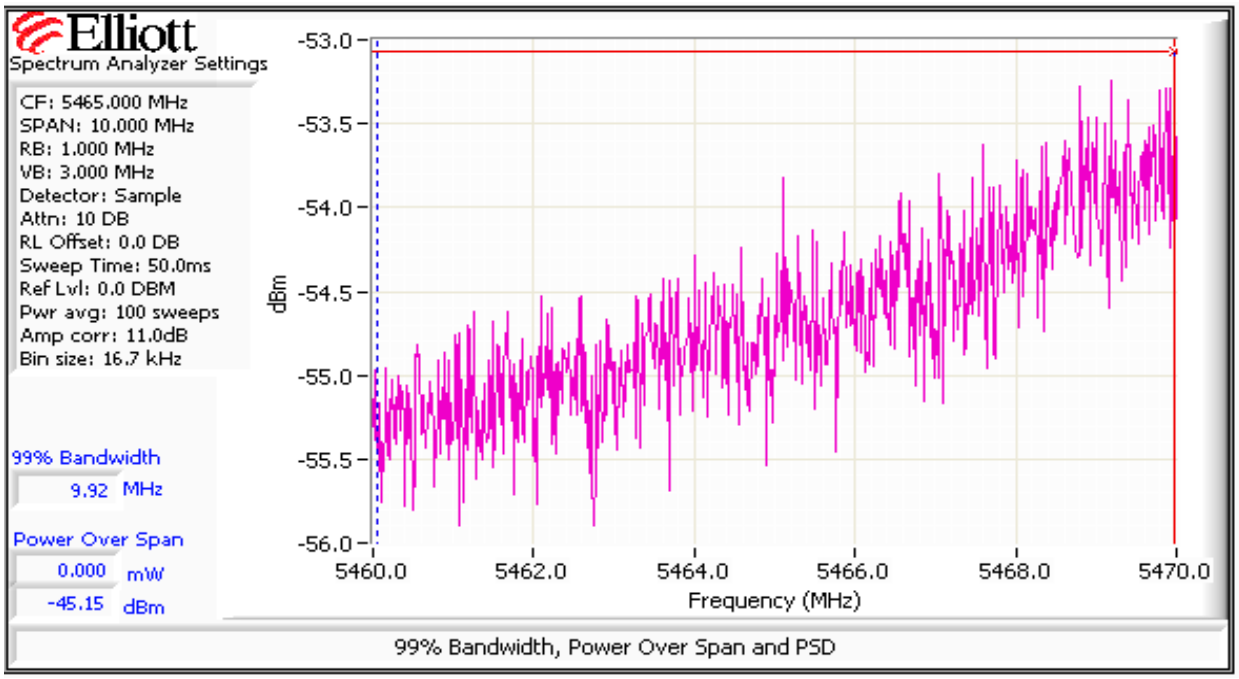
Note - compliance with the radiated limits for the restricted band immediately above 5350MHz is demonstrated through the radiated emissions tests.



Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

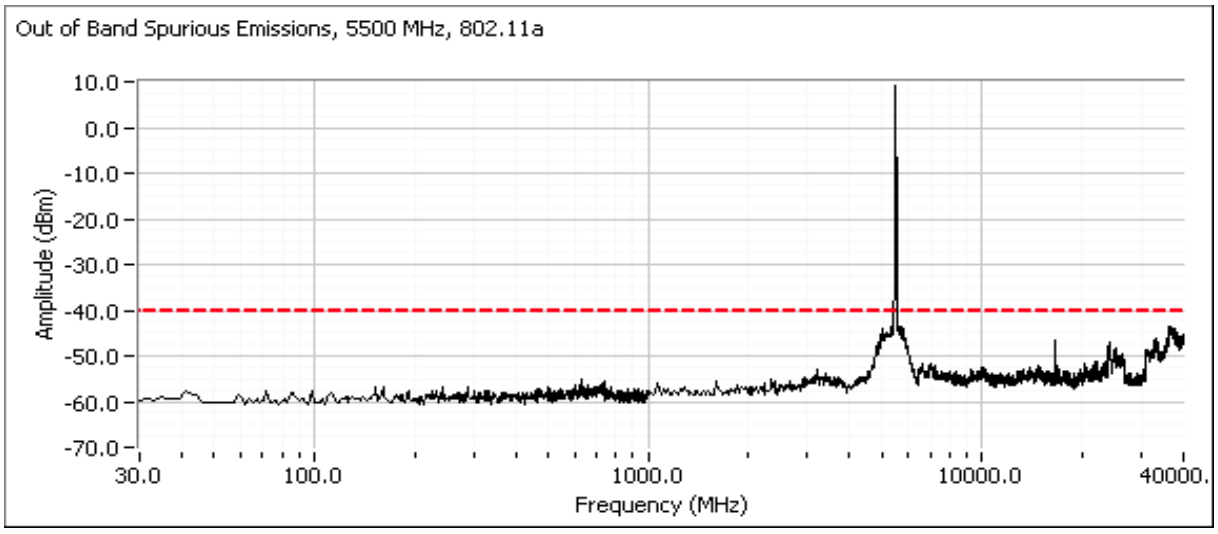
Low channel, 5470 - 5725 MHz Band: 20MHz Mode

Plot showing compliance with the -27dBm/MHz limit for the 5460 - 5470 MHz band edge. Start and stop frequencies set to 5460-5470 MHz, RB=1MHz, VB=3MHz, power averaging enabled (100 traces). **Note** - compliance with the radiated limits for the restricted band immediately below 5460MHz is demonstrated through the radiated emissions tests.



Level at 5460MHz is -53dBm\MHz, eirp = -53dBm + 13dBi = -40dBm/MHz, which is below the limit of -27dBm/MHz

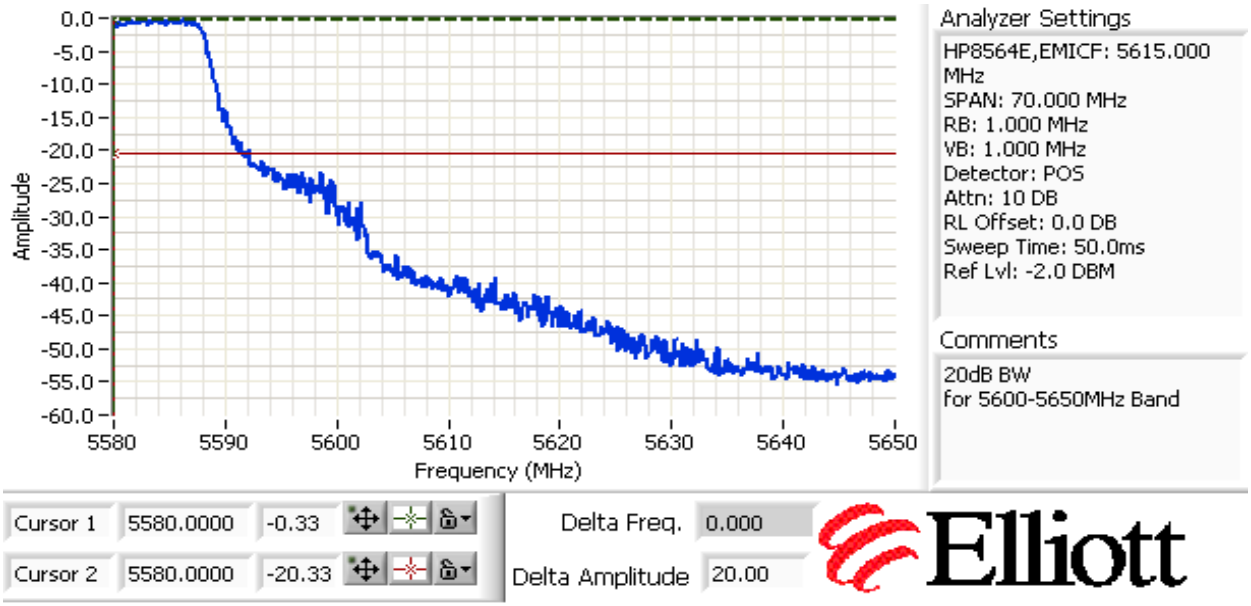
Wide-band plot, RB=VB=1MHz (Peak measurements versus limit).



Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

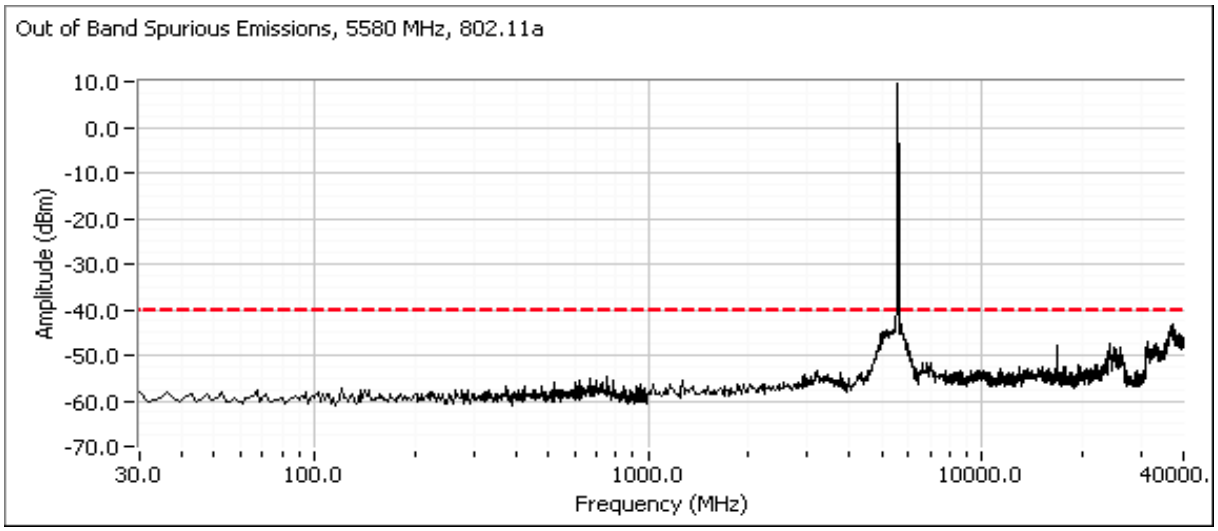
Center channel, 5470 - 5725 MHz Band: 20MHz Mode

For **master** devices - This plot is showing that the 20dB bandwidth of the channel closest to 5600 MHz does not spill into the 5600-5650 MHz band. RB > 1% of span.



20dB bandwidth is contained below 5600MHz.

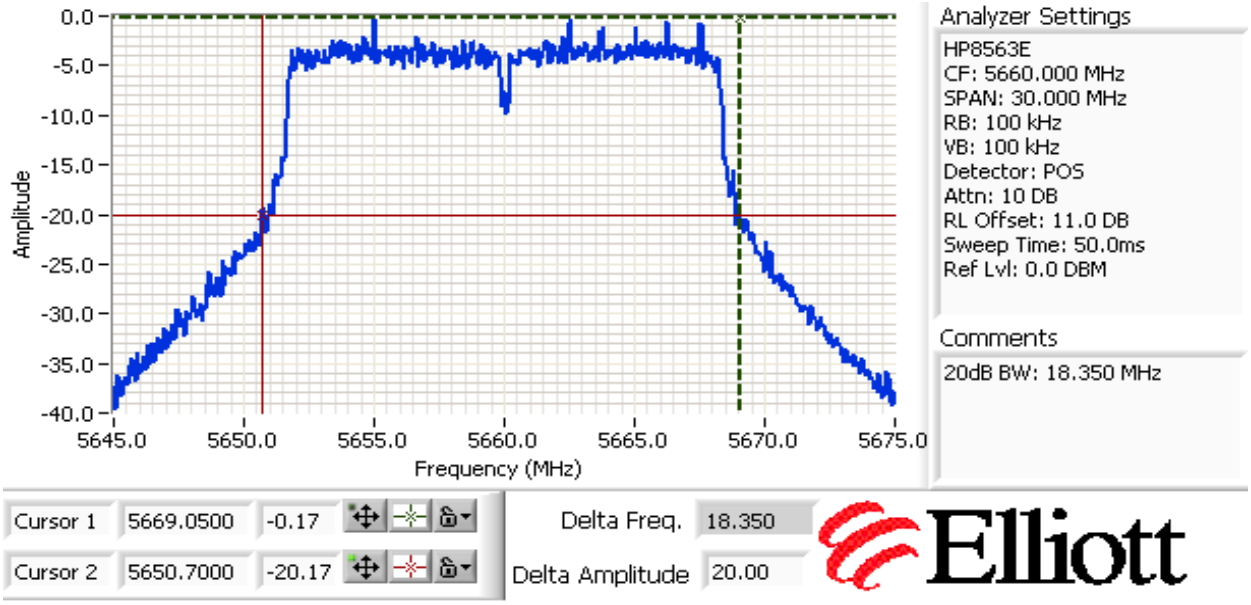
Wide-band plot, RB=VB=1MHz (Peak measurements versus limit).



Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Channel adjacent to 5650 MHz: 20MHz Mode (channel at 5660MHz)
Plot showing that the 20dB bandwidth of the channel closest to 5650 MHz does not spill into the 5600-5650 MHz band. RB > 1% of span. (20dB bandwidth starts at 5650.7MHz)

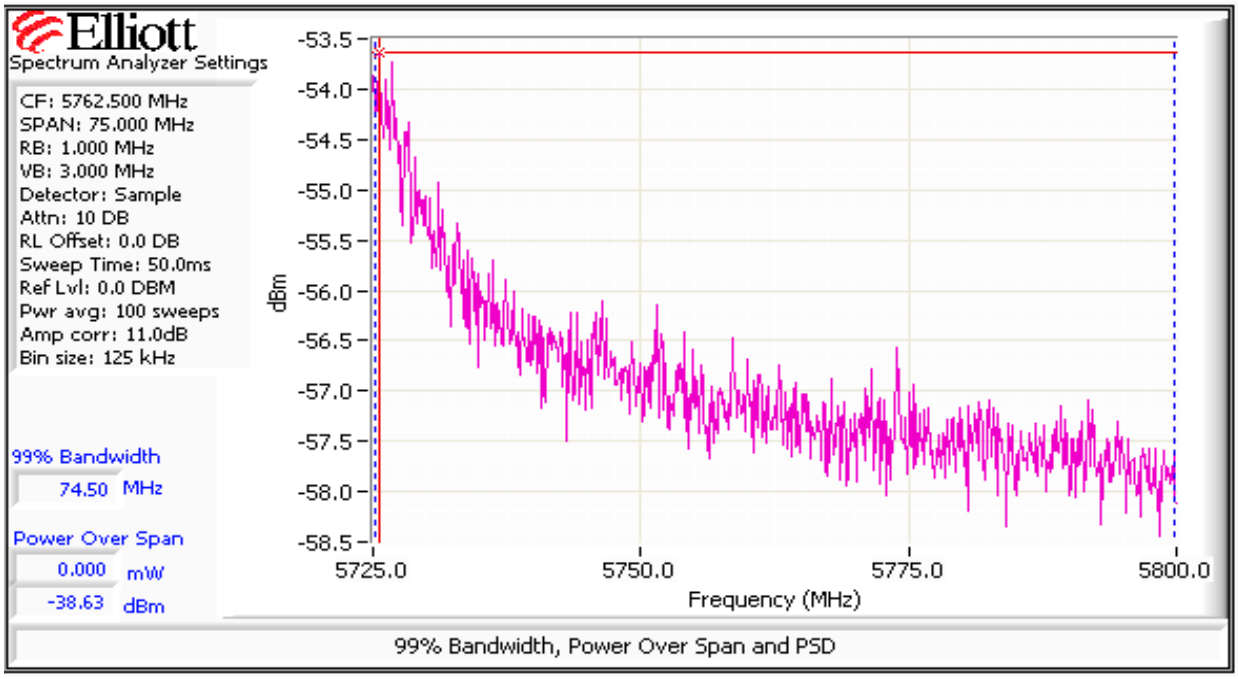
setting = 12



Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

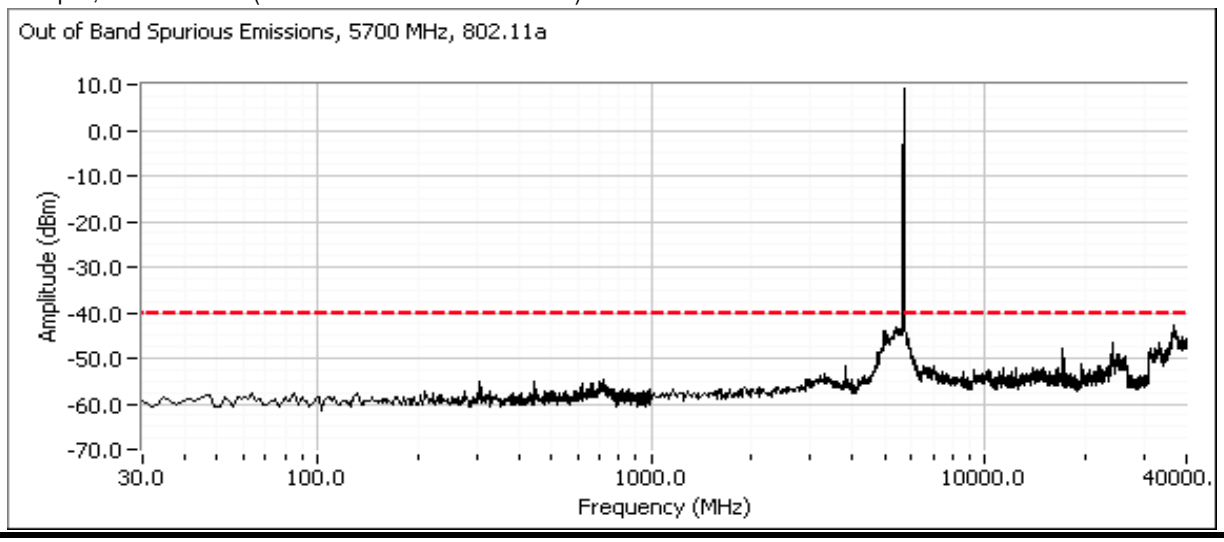
High channel, 5470 - 5725 MHz Band: 20MHz Mode

Plots showing compliance with the -27dBm/MHz limit above the 5725MHz band edge. Start and stop frequencies set to 5725-5800 MHz, RB=1MHz, VB=3MHz, power averaging enabled (100 traces):



	Band edge Level		Antenna	EIRP		Limit	Result
	dBm/MHz	mW/MHz	Gain (dBi)	mW/MHz	dBm/MHz	dBm/MHz	
Chain 1	-53.6	0.00000	13.0	8.71E-05	-40.6	-27	PASS

Wide-band plot, RB=VB=1MHz (Peak measurements versus limit).



Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

RSS-210 (LELAN) and FCC 15.407(UNII)
Antenna Port Measurements, 5 MHz Bandwidth
Power, PSD, Peak Excursion, 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: 5/3 and 4/2011
Test Engineer: M. Birgani/ R. Varelas
Test Location: FT5

Config. Used: 1
Config Change: none
EUT Voltage: POE

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Power, 5250 - 5350MHz	15.407(a) (1), (2)	Pass	5.8 mW
1	PSD, 5250 - 5350MHz	15.407(a) (1), (2)	Pass	0.91 dBm/MHz
1	Max EIRP 5250 - 5350MHz	TPC not required EIRP ≥ 200mW (23dBm) DFS threshold = -64dBm.	NA	
1	Power, 5470 - 5725MHz	15.407(a) (1), (2)	Pass	6.0 mW
1	PSD, 5470 - 5725MHz	15.407(a) (1), (2)	Pass	0.97 dBm/MHz
1	Max EIRP 5470 - 5725MHz	TPC not required EIRP ≥ 200mW (23dBm) DFS threshold = -64dBm.	NA	
1	26dB Bandwidth	15.407 (Determines max power)	Pass	8.3 MHz
1	99% Bandwidth	RSS 210	N/A	5.6 MHz
2	Peak Excursion Envelope	15.407(a) (6) 13dB	Pass	12.3 dB
3	Antenna Conducted - Out of Band Spurious	15.407(b) -27dBm/MHz	Pass	All emissions below -27dBm/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.

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		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Ambient Conditions: Temperature: 23 °C
Rel. Humidity: 33 %

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

Note 1:	Output power measured using a spectrum analyzer (see plots below). RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was continuous) and power integration over 50 MHz (method 1 of DA-02-2138A1).
Note 2:	Measured using the same analyzer settings used for output power. PSD is highest value on the plot.
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.

MIMO Device - 5250-5350 MHz Band

	Chain 1	Chain 2	Chain 3	Coherent	Effective[5]	EIRP (mW)	EIRP (dBm)
Antenna Gain (dBi):	13	13		Yes	16.0	230.4	23.6

Power

Frequency (MHz)	Software Setting	26dB BW (MHz)	Measured Output Power[1] dBm			Total		Limit (dBm)	Max Power (W)	Pass or Fail
			Chain 1	Chain 2	Chain 3	mW	dBm			
5255	4.5	8.3	3.8	4.5		5.2	7.2	10.2	0.006	PASS
5300	4.5	8.4	4.8	4.4		5.8	7.6	10.2		PASS
5340	4.0	9.4	4.5	3.6		5.1	7.1	10.7		PASS

PSD

Frequency (MHz)	99%[4] BW	Total Power	PSD[2] dBm/MHz			Total PSD		Limit		Pass or Fail
			Chain 1	Chain 2	Chain 3	mW/MHz	dBm/MHz	FCC	RSS 210[3]	
5255	5.1	7.2	-3.0	-2.4		1.1	0.32	1.0	11.0	PASS
5300	5.1	7.6	-1.9	-2.3		1.2	0.91	1.0	11.0	PASS
5340	5.1	7.1	-2.3	-2.7		1.1	0.5	1.0	11.0	PASS

Need data for chain 1 - connector came off during measurements
EIRP does not exceed 500mW, therefore TPC is not required and measurements at a low power setting are not required.

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Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

MIMO Device - 5470-5725 MHz Band

	Chain 1	Chain 2	Chain 3	Coherent	Effective[5]	EIRP (mW)	EIRP (dBm)
Antenna Gain (dBi):	13	13		Yes	16.0	242.6	23.8

Power

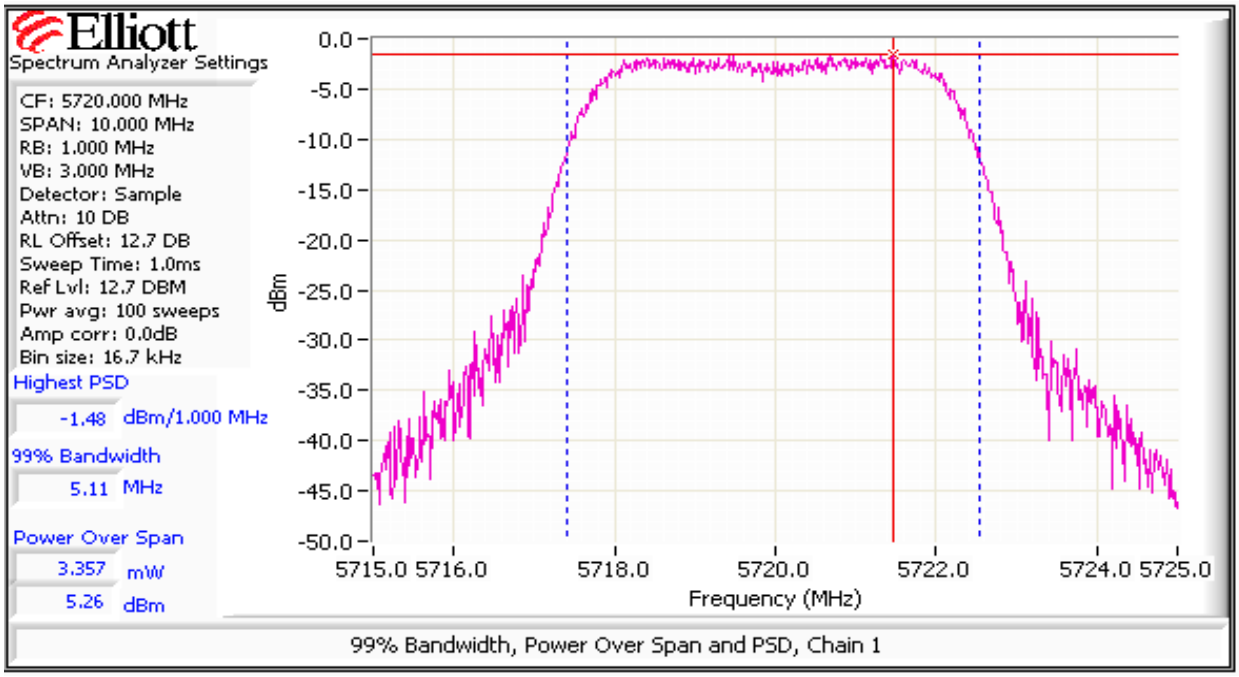
Frequency (MHz)	Software Setting	26dB BW (MHz)	Measured Output Power[1] dBm			Total		Limit (dBm)	Max Power (W)	Pass or Fail
			Chain 1	Chain 2	Chain 3	mW	dBm			
5475	5.0	8.5	5.0	3.5		5.4	7.3	10.3	0.006	PASS
5595	4.5	8.7	3.9	5.3		5.8	7.7	10.4		PASS
5720	4.5	8.4	5.3	4.3		**6.1**	**7.8**	10.2		PASS

PSD

Frequency (MHz)	99%[4] BW	Total Power	PSD[2] dBm/MHz			Total PSD		Limit		Pass or Fail
			Chain 1	Chain 2	Chain 3	mW/MHz	dBm/MHz	FCC	RSS 210[3]	
5475	5.1	7.3	-1.6	-3.1		1.18	0.72	1.0	11.0	PASS
5595	5.1	7.7	-2.5	-1.6		1.25	0.95	1.0	11.0	PASS
5720	5.1	7.8	-2.6	-1.5		1.25	**0.97**	1.0	11.0	PASS

Output Power at Low Power Setting - 5470-5725 MHz Band

EIRP does not exceed 500mW, therefore TPC is not required and measurements at a low power setting are not required.



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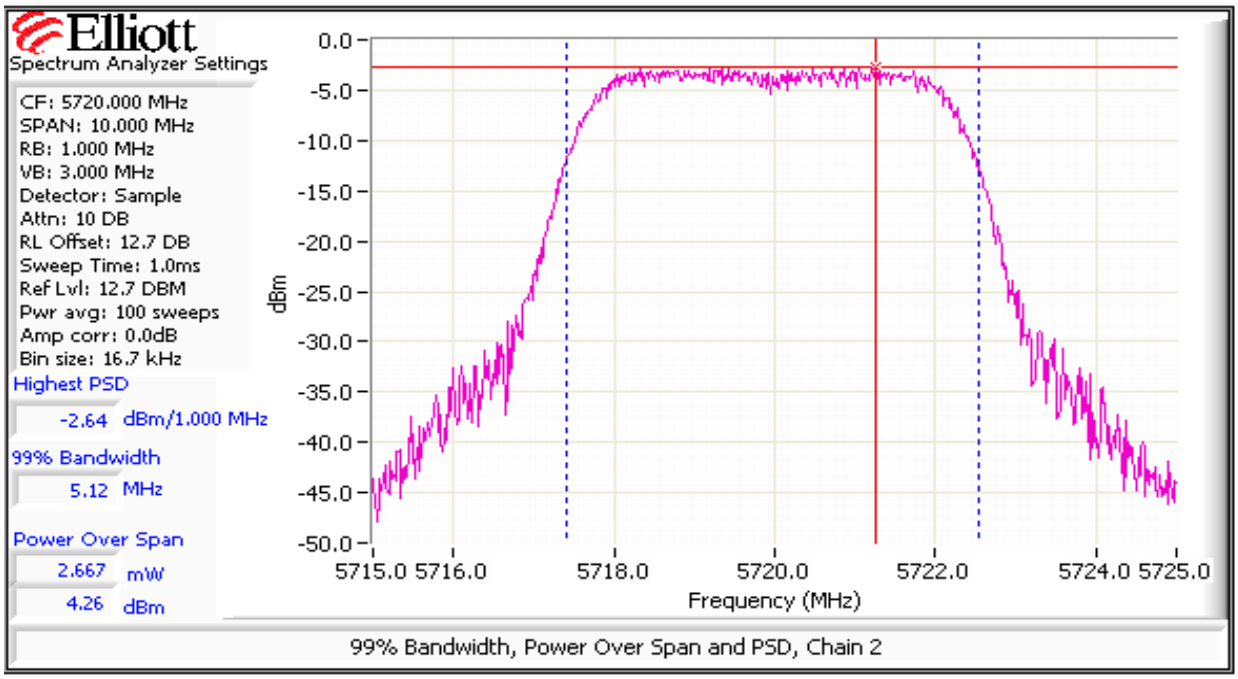
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A



Run #2: Peak Excursion Measurement

HT5 Device meets the requirement for the peak excursion

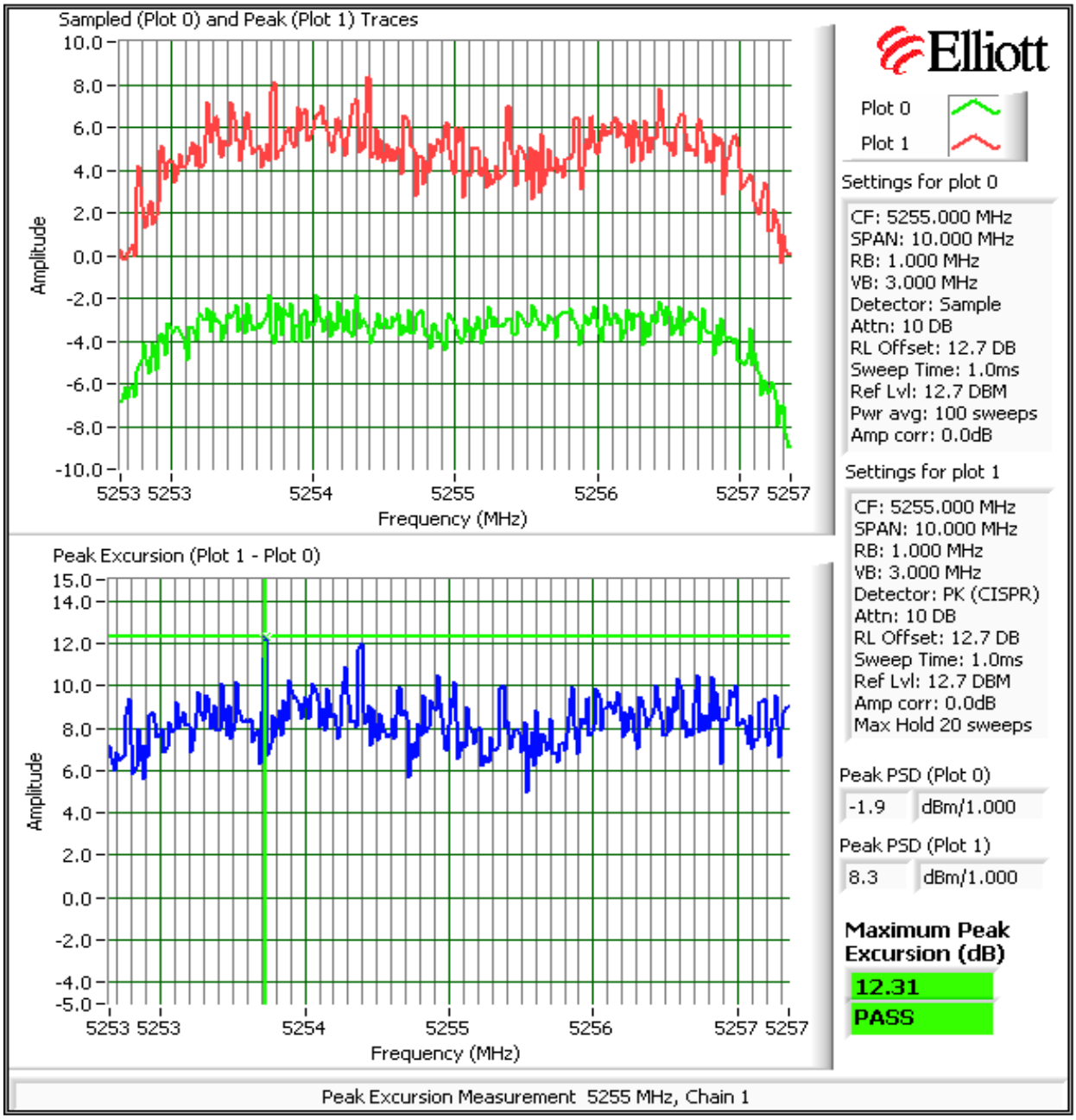
Freq	Peak Excursion(dB)		Freq	Peak Excursion(dB)	
(MHz)	Value	Limit	(MHz)	Value	Limit
5255	**12.3/12.2**	13.0	5475	12.1/10.8	13.0
5300	11.4/11.5	13.0	5595	10.1/10.6	13.0
5340	11.6/11.9	13.0	5720	11.4/10.8	13.0

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

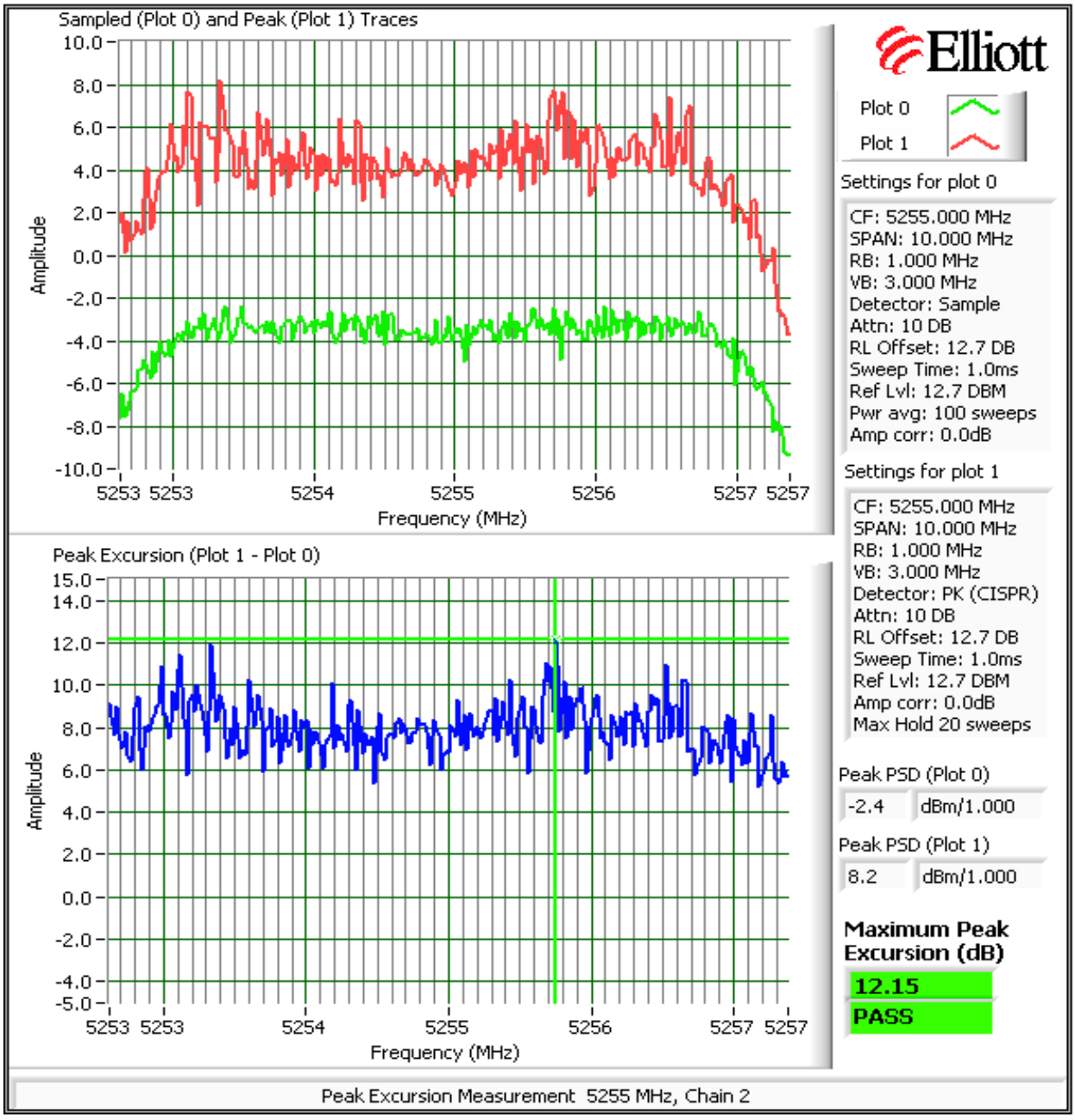
Plots Showing Peak Excursion

Trace A: RBW = 1MHz, VBW = 3MHz, Peak hold

Trace B: Same settings as used for power/PSD measurements (RBW = 1 MHz, VBW = 3MHz, Integrated **average** power)



Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A



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Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run #3: Out Of Band Spurious Emissions - Antenna Conducted

MIMO Devices: Antenna gain used is the individual antenna antenna gain (the spurious emissions at the band edges are not considered to be coherent between chains and spurious removed from the band edges are evaluated as radiated emissions if close to the limit). The plots were obtained for each chain individually and the limit was adjusted to account for all chains transmitting simultaneously

Number of transmit chains:	2		
Maximum Antenna Gain:	13.0	dBi	
Spurious Limit:	-27.0	dBm/MHz eirp	
Adjustment for 2 chains:	-3.0	dB	adjustment for multiple chains.
Limit Used On Plots [Note 1]:	-43.0	dBm/MHz	Average Limit (RB=1MHz, VB=10Hz)

Note 1:	The -27dBm/MHz limit is an eirp limit. The limit for antenna port conducted measurements is adjusted to take into consideration the maximum antenna gain and number of transmitters (limit = -27dBm - antenna gain - 10Log[N]). Radiated field strength measurements for signals more than 50MHz from the bands and that are close to the limit are made to determine compliance as the antenna gain is not known at these frequencies.
Note 2:	All spurious signals below 1GHz are measured during digital device radiated emissions test.
Note 3:	Signals within 10MHz of the 5.725 or 5.825 Band edge are subject to a limit of -17dBm EIRP
Note 4:	If the device is for outdoor use then the -27dBm eirp limit also applies in the 5150 - 5250 MHz band.
Note 5:	Signals that fall in the restricted bands of 15.205 are subject to the limit of 15.209.

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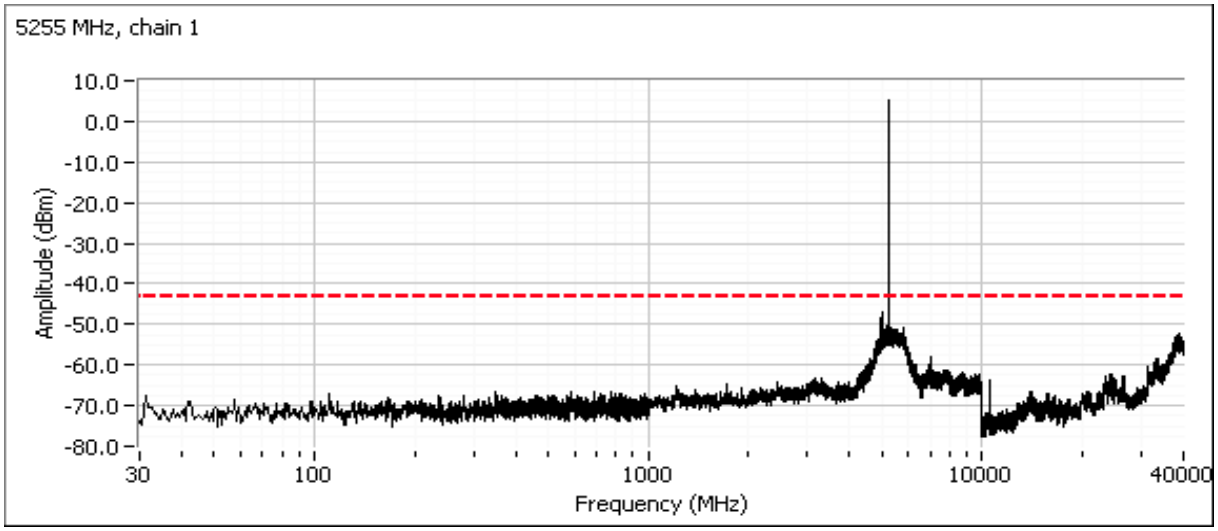
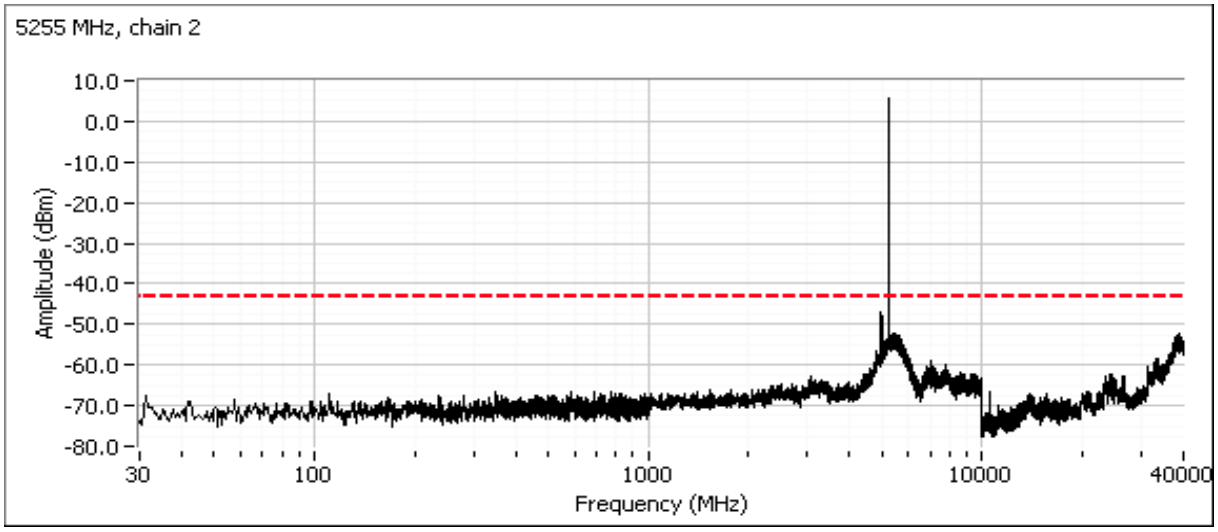
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Plots Showing Out-Of-Band Emissions

Low channel, 5250 - 5350 MHz Band



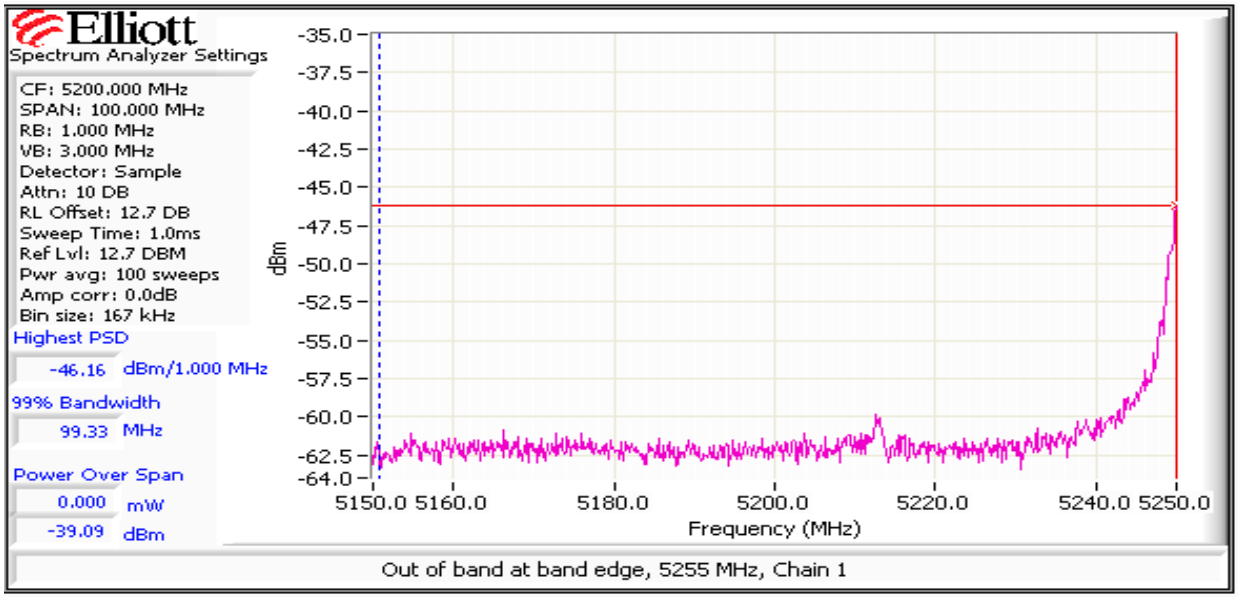


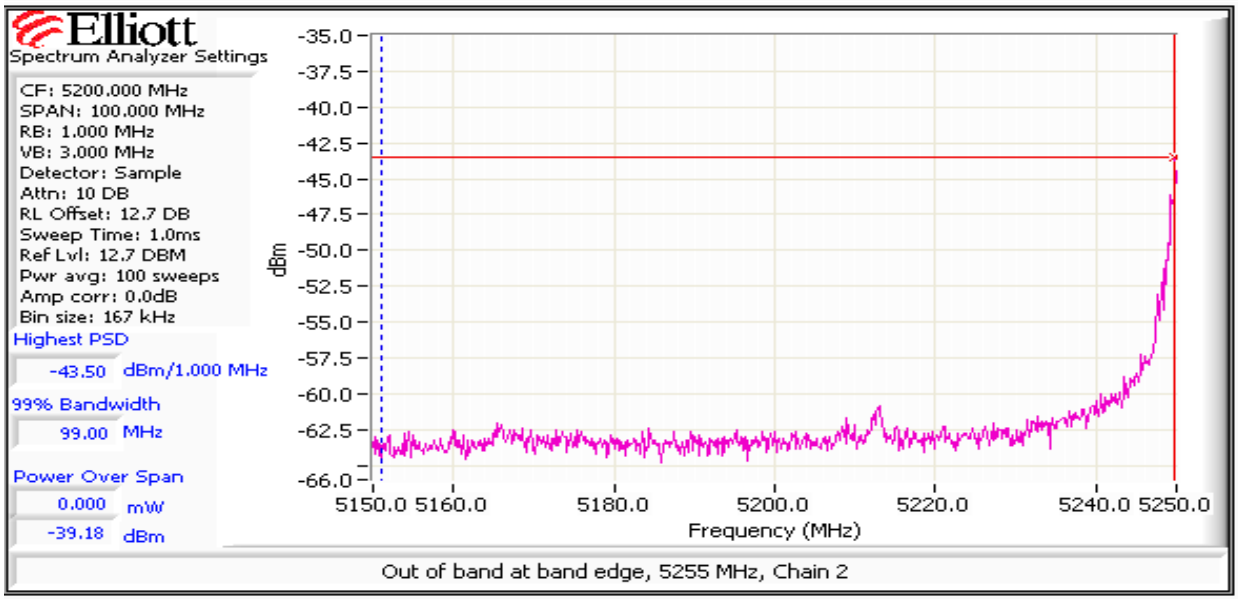
Wide-band plot, RB=VB=1MHz (Peak measurements versus limit).

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Plots for each chain showing compliance with the -27dBm/MHz limit in the 5150 - 5250 MHz band. RB=1MHz, VB=3MHz, power averaging enabled (100 traces).

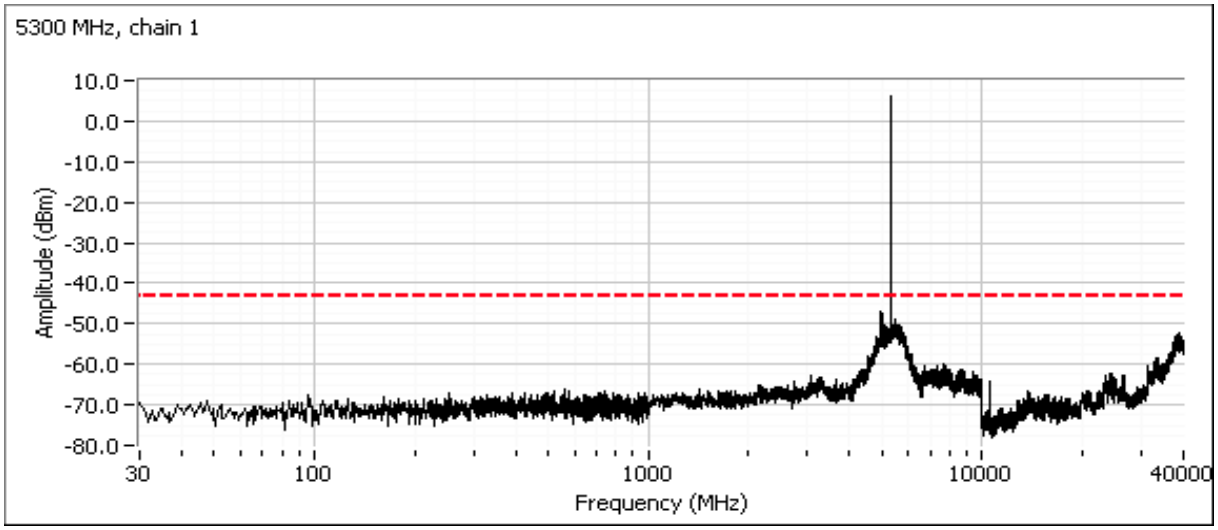
	Power Setting	Band edge Level		Antenna Gain (dBi)	EIRP		Total EIRP dBm/MHz	Limit dBm/MHz	Result
		dBm/MHz	mW/MHz		mW/MHz	dBm/MHz			
Chain 1	4.5	-43.5	0.00004	13.0	0.0008913	-30.5	-28.6	-27	PASS
Chain 2		-46.2	0.00002	13.0	0.0004786	-33.2			

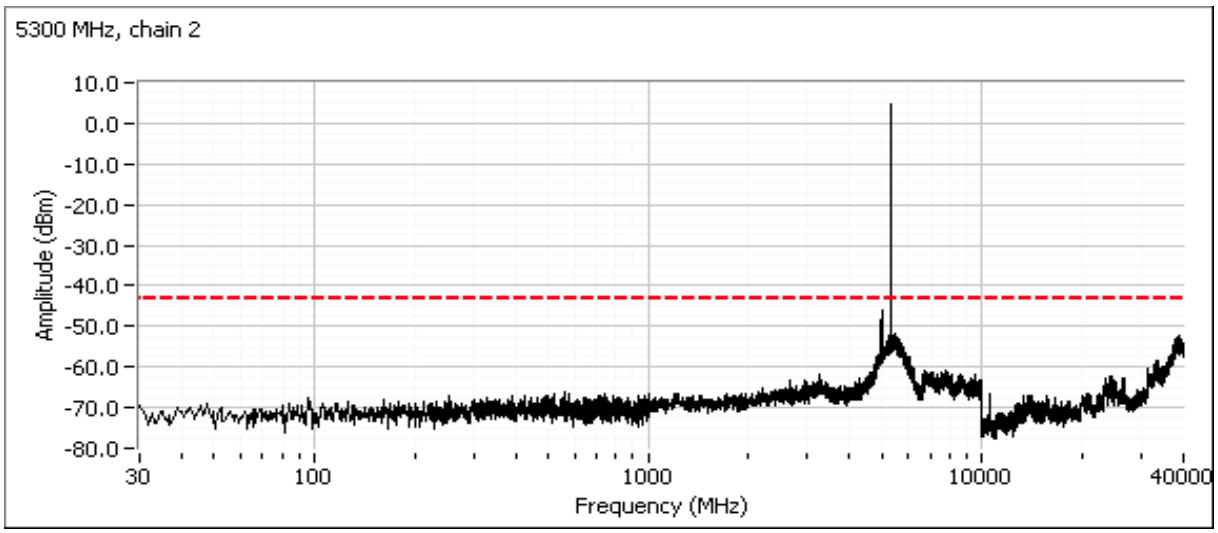




Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Center channel, 5250 - 5350 MHz Band



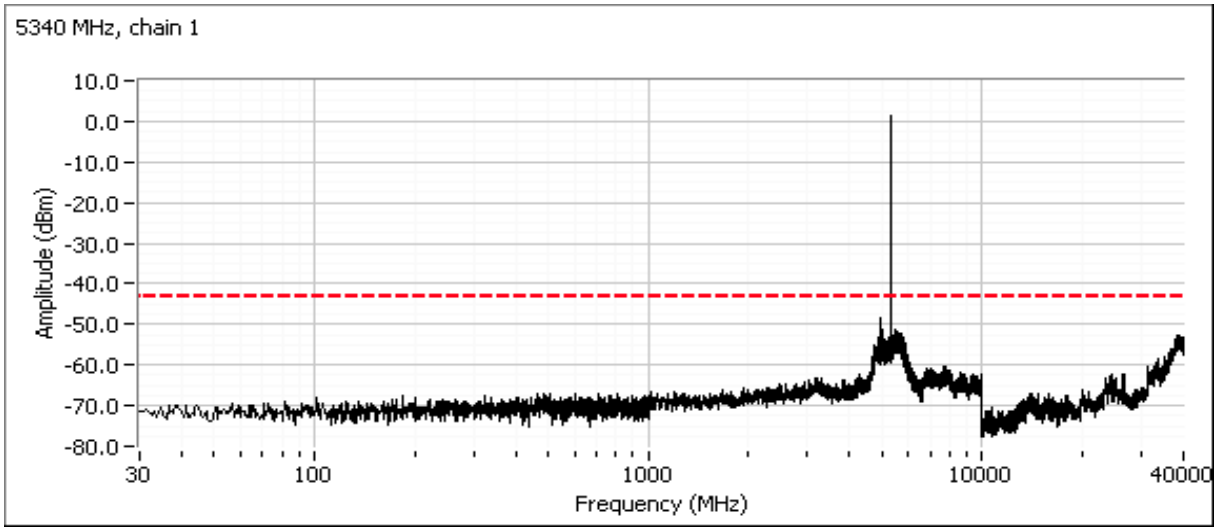


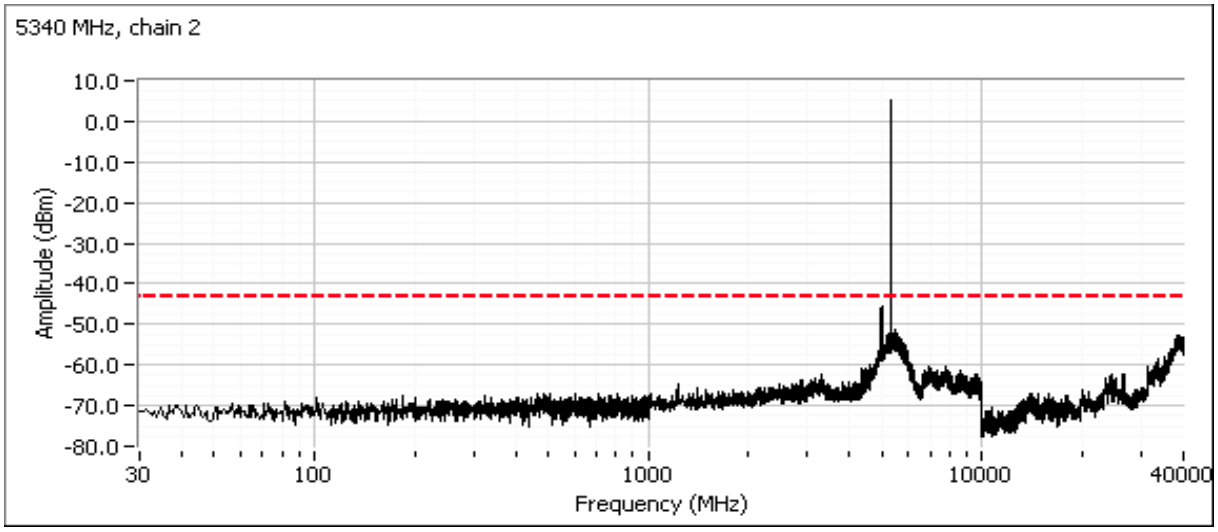
Wide-band plot, RB=VB=1MHz (Peak measurements versus limit).

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

High channel, 5250 - 5350 MHz Band

Note - compliance with the radiated limits for the restricted band immediately above 5350MHz is demonstrated through the radiated emissions tests.

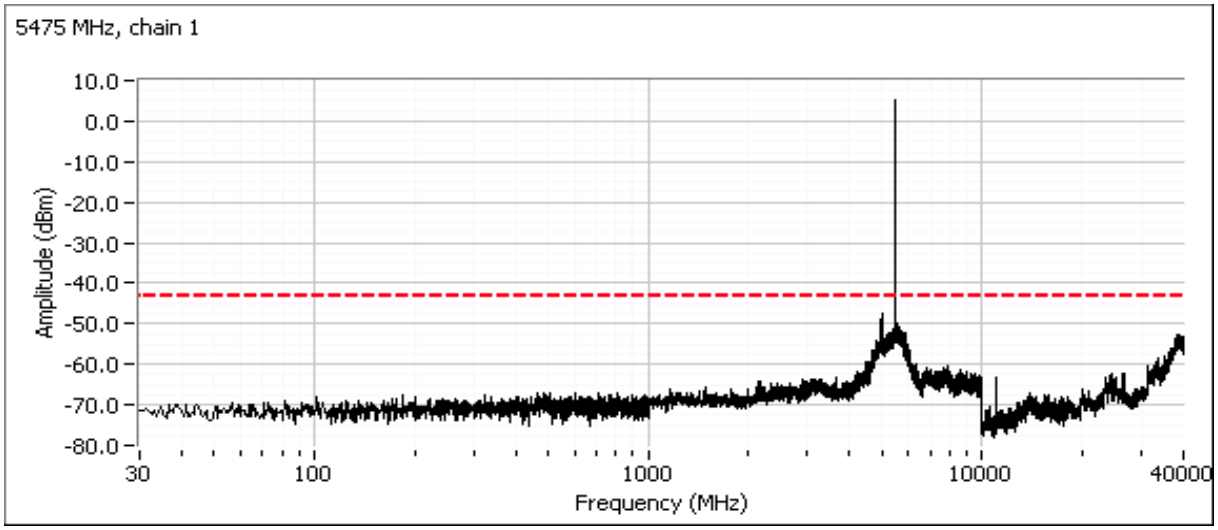


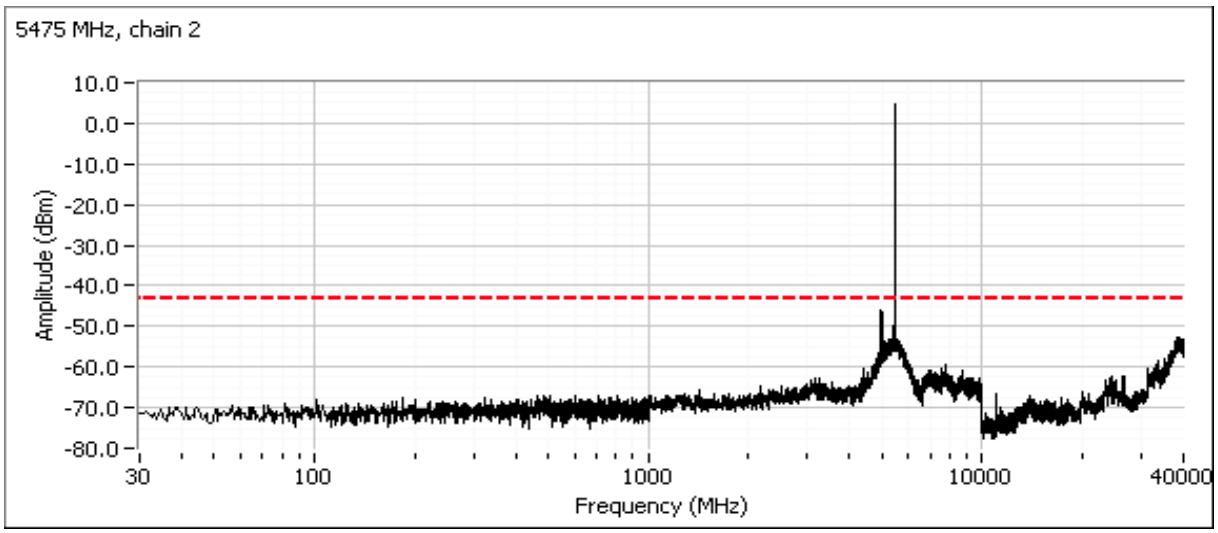


Wide-band plot, RB=VB=1MHz (Peak measurements versus limit).

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Low channel, 5470 - 5725 MHz Band



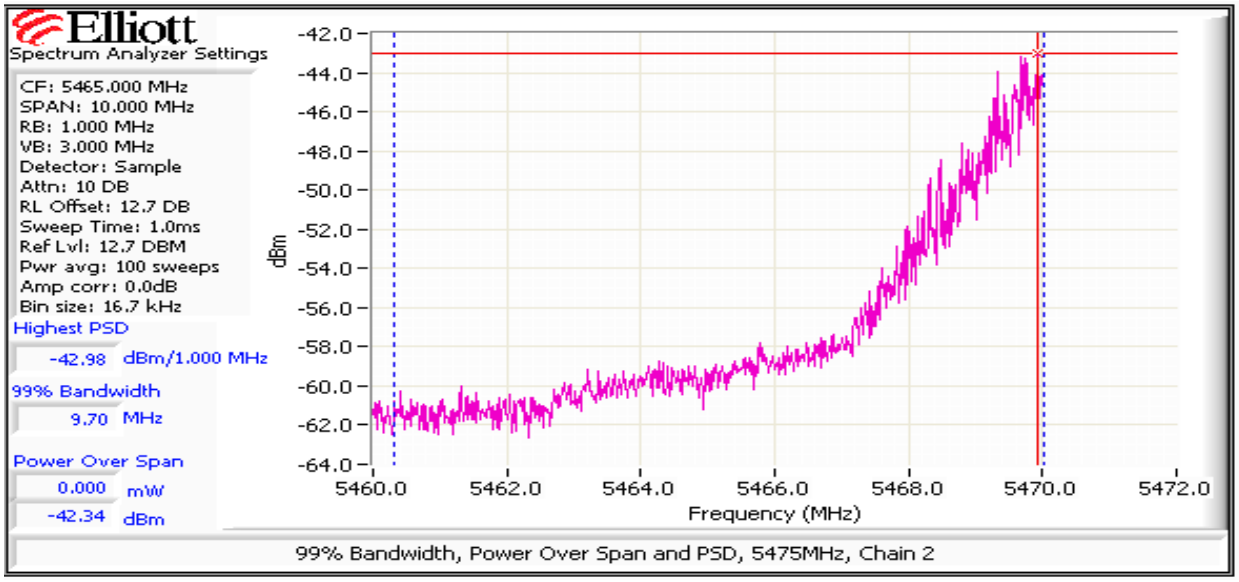


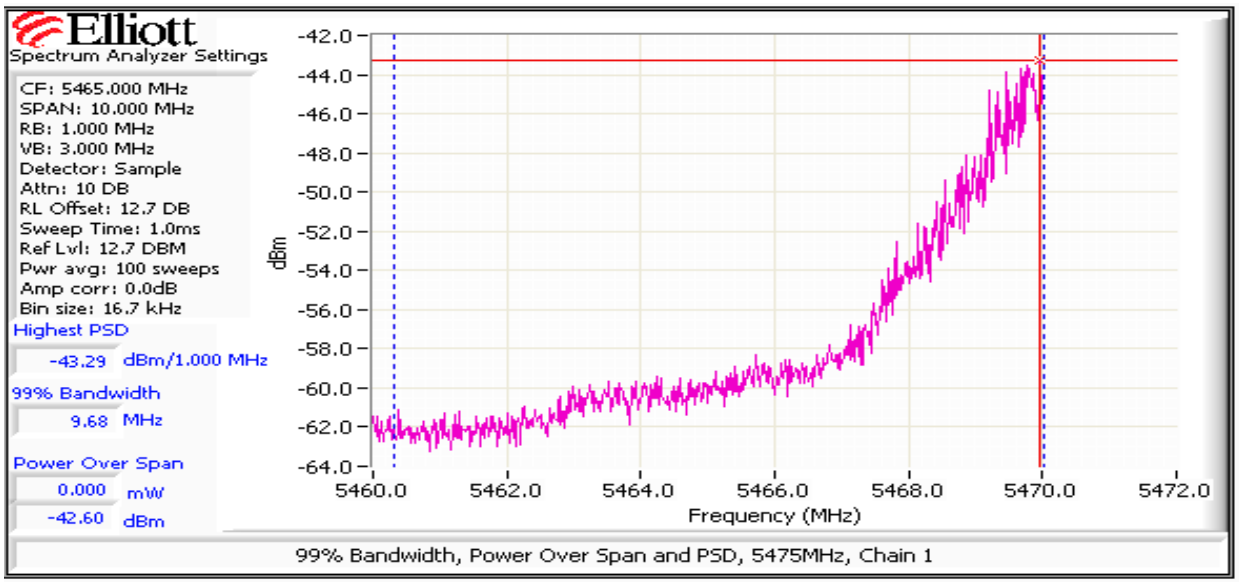
Wide-band plot, RB=VB=1MHz (Peak measurements versus limit).

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Plots for each chain showing compliance with the -27dBm/MHz limit for the 5460 - 5470 MHz band edge. RB=1MHz, VB=3MHz, power averaging enabled (100 traces). **Note** - compliance with the radiated limits for the restricted band immediately below 5460MHz is demonstrated through the radiated emissions tests.

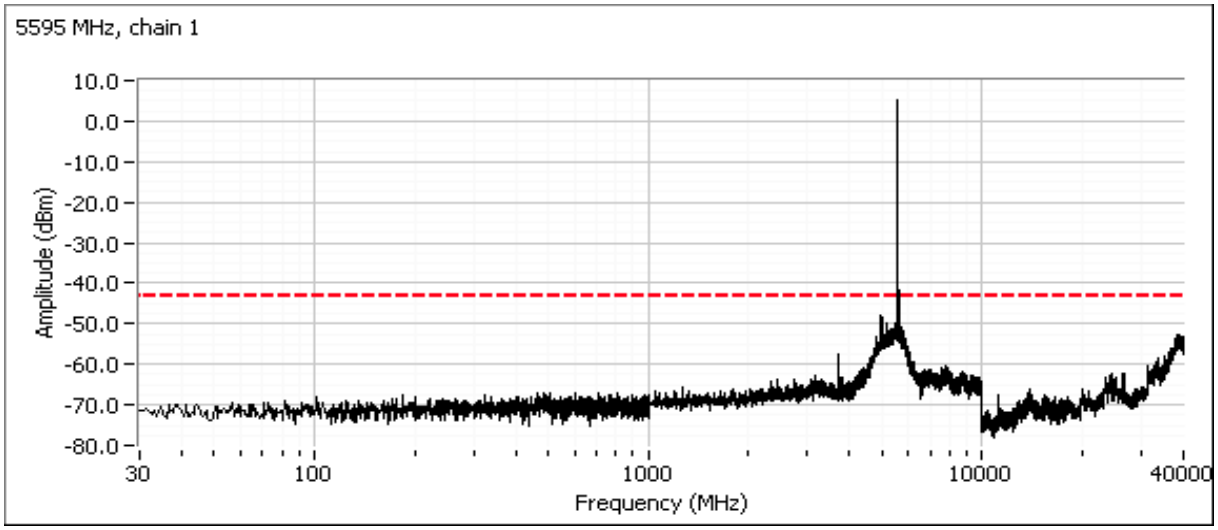
	Power Setting	Band edge dBm/MHz	mW/MHz	Antenna Gain (dBi)	EIRP mW/MHz	EIRP dBm/MHz	Total EIRP dBm/MHz	Limit dBm/MHz	Result
Chain 1	5	-43.3	0.00005	13.0	0.0009333	-30.3	-27.1	-27	PASS
Chain 2		-43.0	0.00005	13.0	0.0010046	-30.0			

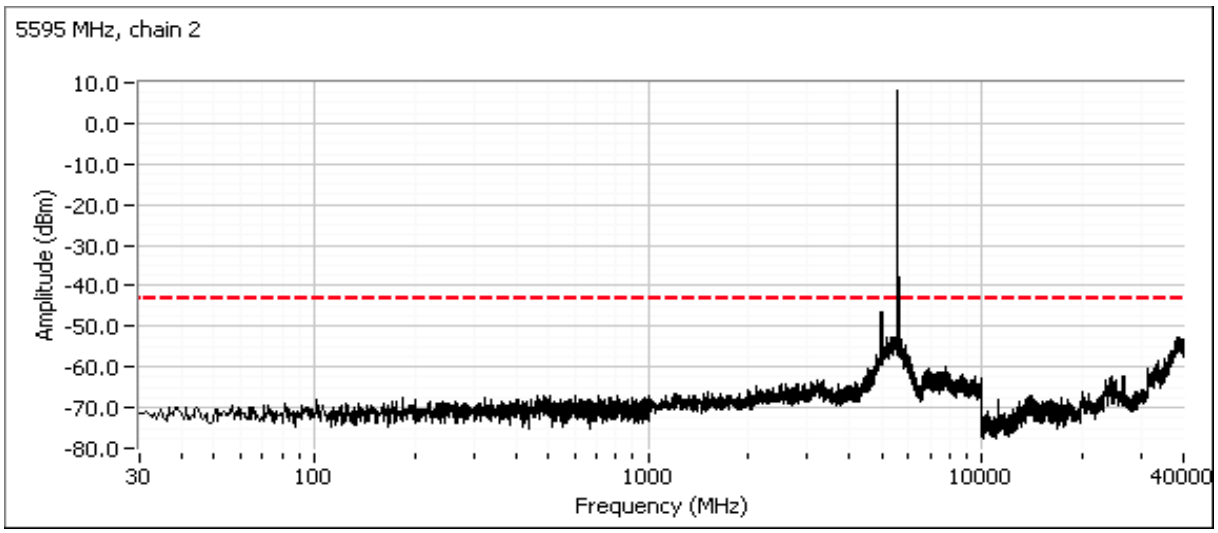




Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Center channel, 5470 - 5725 MHz Band

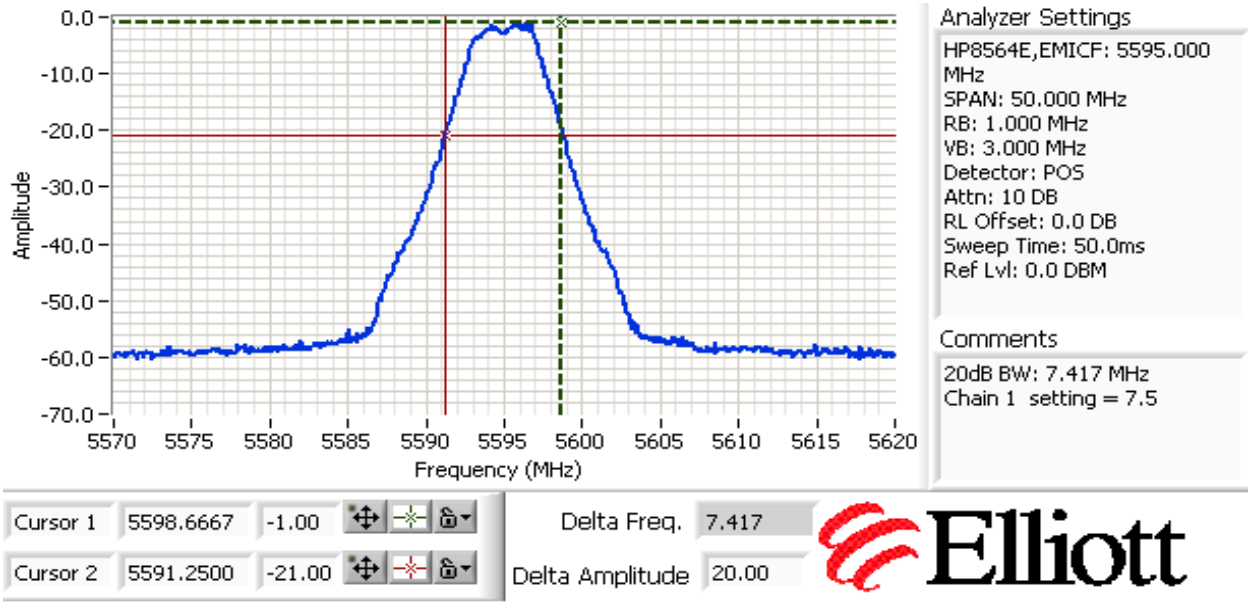


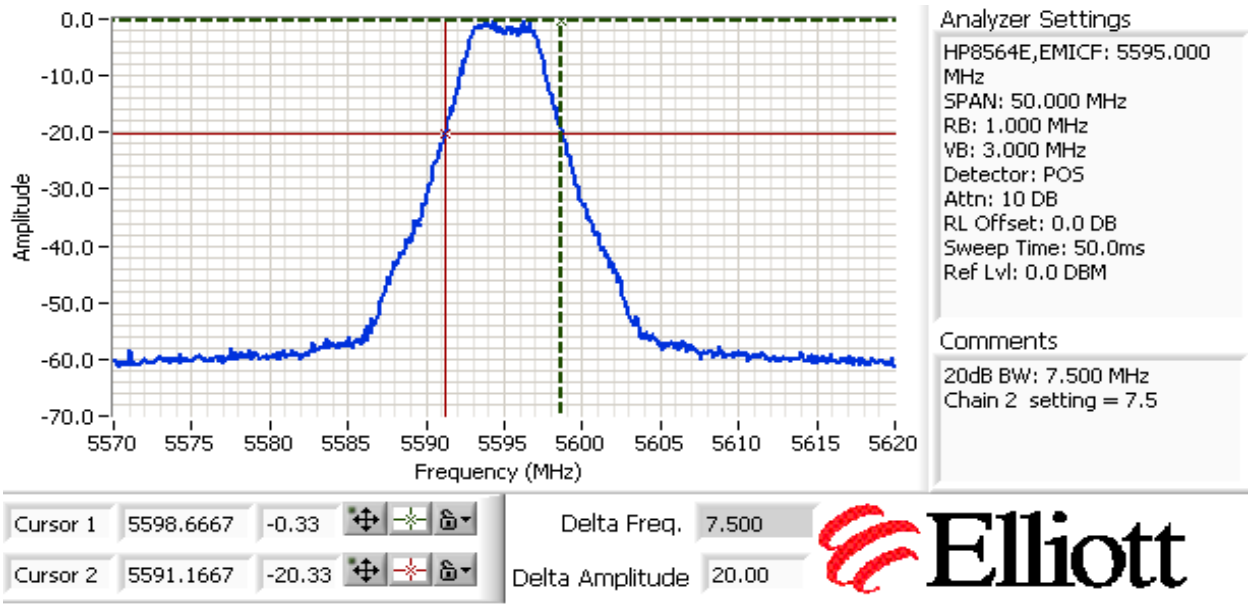


Wide-band plot, RB=VB=1MHz (Peak measurements versus limit).

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

For **master** devices - This plot is showing that the 20dB bandwidth of the channel closest to 5600 MHz does not spill into the 5600-5650 MHz band. RB > 1% of span.

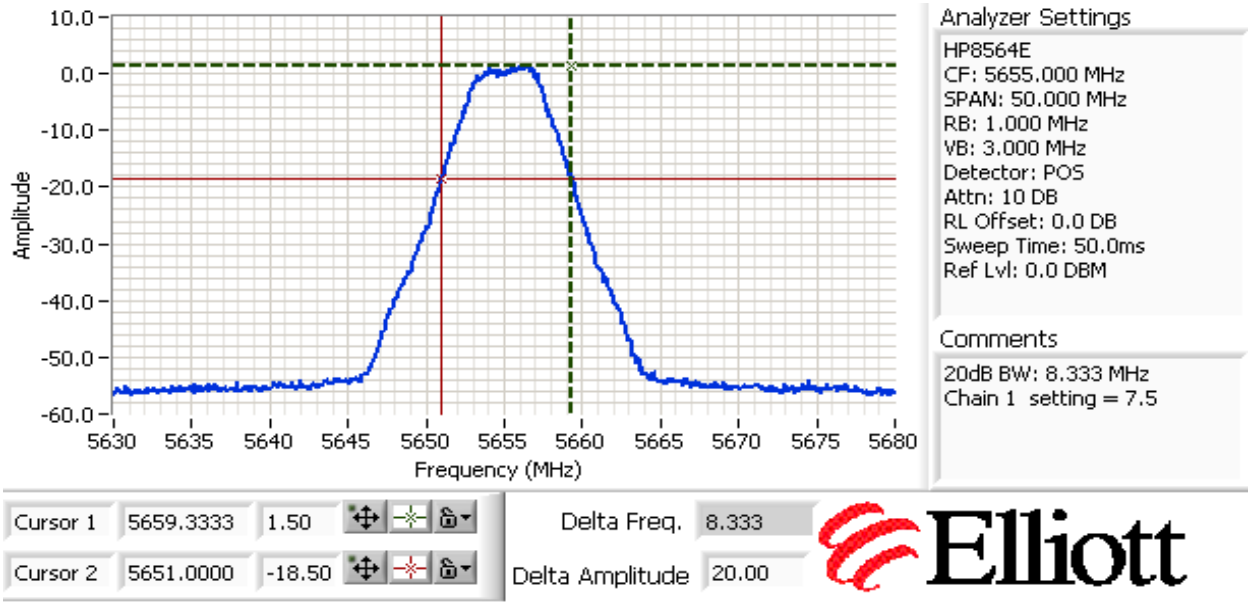


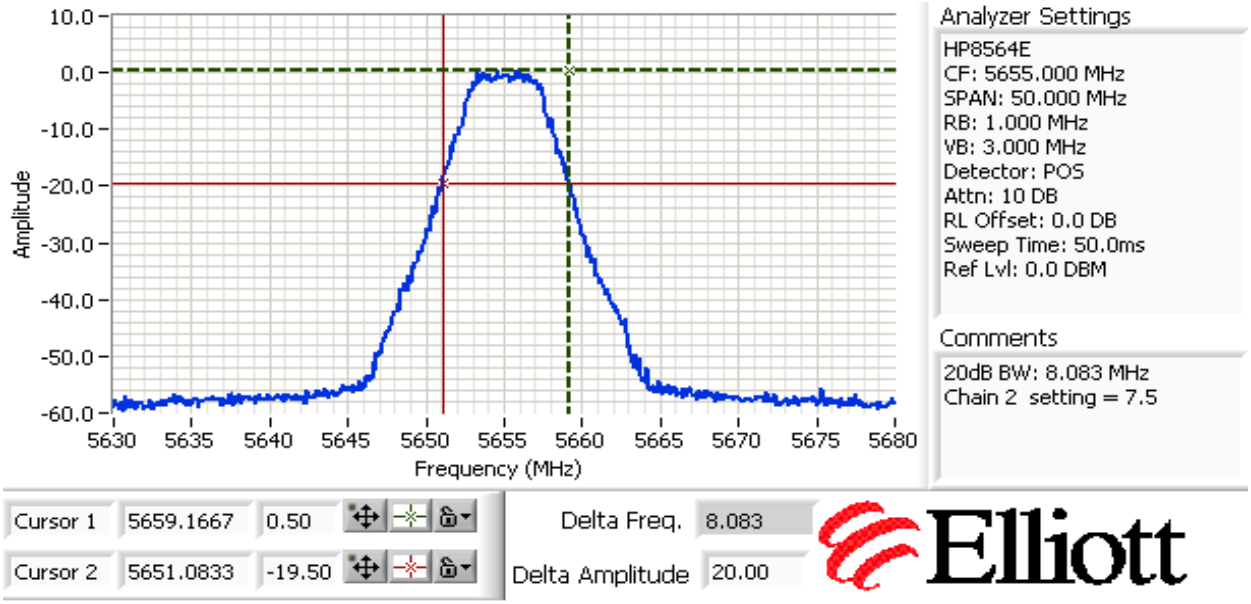


Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Channel adjacent to 5650 MHz

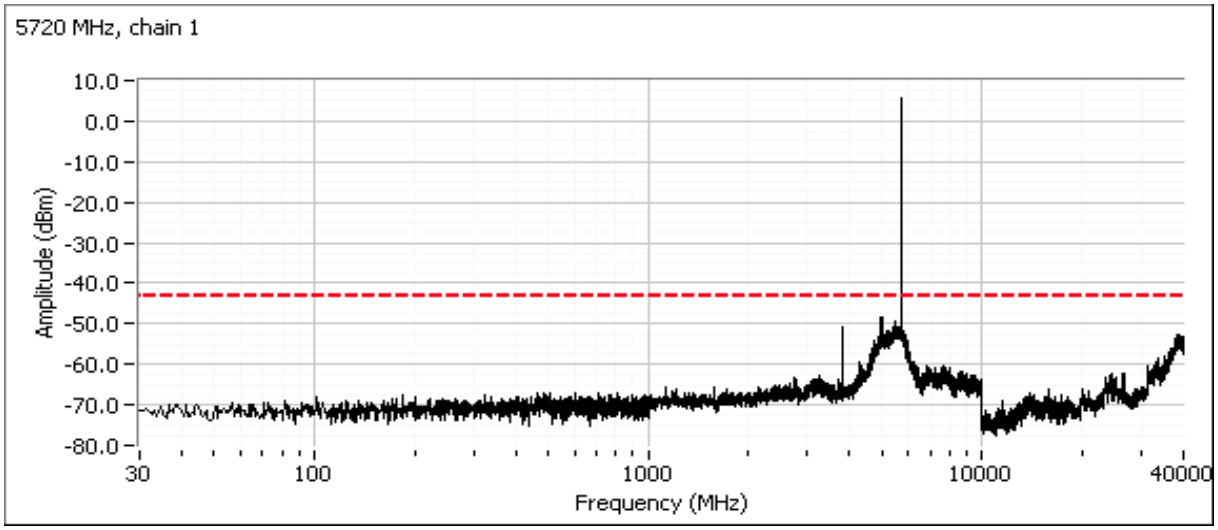
Plots showing that the 20dB bandwidth of the channel closest to 5650 MHz does not spill into the 5600-5650 MHz band. RB > 1% of span.

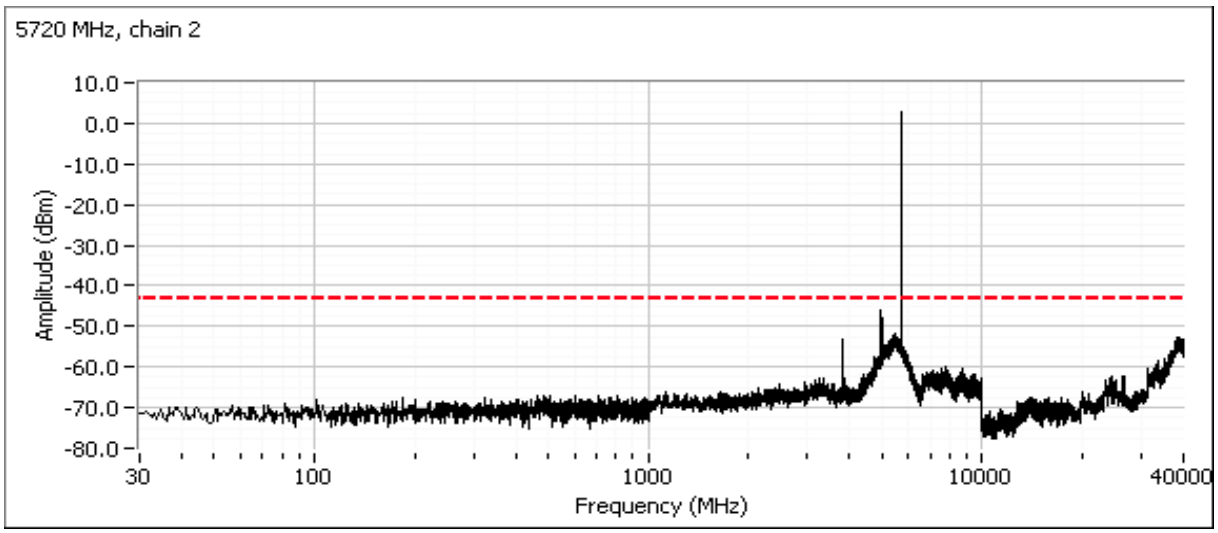




Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

High channel, 5470 - 5725 MHz Band



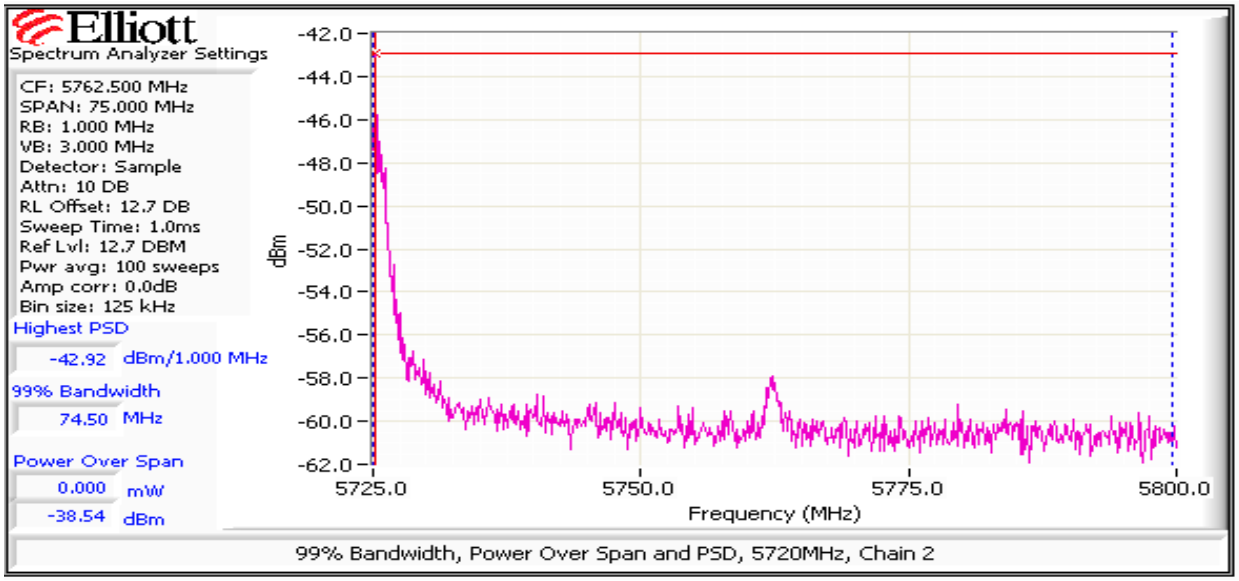


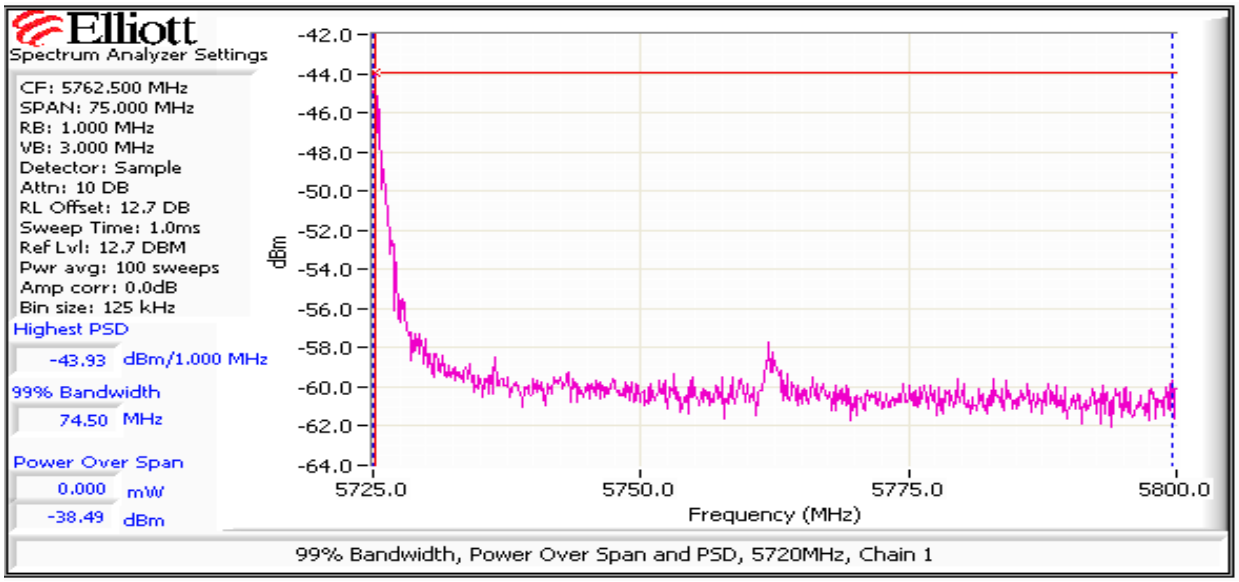
Wide-band plot, RB=VB=1MHz (Peak measurements versus limit).

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Plots for each chain showing compliance with the -27dBm/MHz limit above the 5725MHz band edge. Start and stop frequencies set to 5725-5800 MHz, RB=1MHz, VB=3MHz, power averaging enabled (100 traces).

	Power Setting	Band edge dBm/MHz	mW/MHz	Antenna Gain (dBi)	EIRP mW/MHz	EIRP dBm/MHz	Total EIRP dBm/MHz	Limit dBm/MHz	Result
Chain 1	4.5	-43.9	0.00004	13.0	0.0008072	-30.9	-27.4	-27	PASS
Chain 2		-42.9	0.00005	13.0	0.0010186	-29.9			





Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

RSS-210 (LELAN) and FCC 15.407(UNII)
Antenna Port Measurements, 8 MHz Mode
Power, PSD, Peak Excursion, 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: 5/3 and 4/2011
Test Engineer: R. Varelas, M. Birgani
Test Location: FT Lab #4

Config. Used: 1
Config Change: none
EUT Voltage: POE

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Power, 5250 - 5350MHz	15.407(a) (1), (2)	Pass	7.9 mW
1	PSD, 5250 - 5350MHz	15.407(a) (1), (2)	Pass	0.5 dBm/MHz
1	Max EIRP 5250 - 5350MHz	TPC required if EIRP≥ 500mW (27dBm). EIRP ≥ 200mW (23dBm) DFS threshold = -64dBm.	N/A	EIRP = 25.0 dBm (317.7 mW)
1	Power, 5470 - 5725MHz	15.407(a) (1), (2)	Pass	9.6 mW
1	PSD, 5470 - 5725MHz	15.407(a) (1), (2)	Pass	0.9 dBm/MHz
1	Max EIRP 5470 - 5725MHz	TPC required if EIRP≥ 500mW (27dBm). EIRP ≥ 200mW (23dBm) DFS threshold	N/A	EIRP = 25.8 dBm (382.4 mW)
1	26dB Bandwidth	15.407 (Determines max power)	-	11.8 MHz
1	99% Bandwidth	RSS 210	N/A	7.5 MHz
2	Peak Excursion Envelope	15.407(a) (6) 13dB	PASS	12.3 dB
3	Antenna Conducted - Out of Band Spurious	15.407(b) -27dBm/MHz	PASS	All emissions below the -27dBm/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.

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Ambient Conditions: Temperature: 20.1 °C
Rel. Humidity: 34 %

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

Note 1:	Output power measured using a spectrum analyzer (see plots below). RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was continuous) and power integration over 50 MHz (method 1 of DA-02-2138A1).
Note 2:	Measured using the same analyzer settings used for output power. PSD is highest value on the plot.
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.

MIMO Device - 5250-5350 MHz Band

	Chain 1	Chain 2	Chain 3	Coherent	Effective[5]	EIRP (mW)	EIRP (dBm)
Antenna Gain (dBi):	13	13		Yes	16.0	296.6	24.7

Power

Frequency (MHz)	Software Setting	26dB BW (MHz)	Measured Output Power[1] dBm			Total		Limit (dBm)	Max Power (W)	Pass or Fail
			Chain 1	Chain 2	Chain 3	mW	dBm			
5260	5.0	12.3	4.1	3.0		4.5	6.6	11.9	0.007	PASS
5300	5.5	11.8	5.6	5.8		**7.4**	**8.7**	11.7		PASS
5330	5.0	10.8	2.7	2.6		3.7	5.7	11.3		PASS

PSD

Frequency (MHz)	99%[4] BW	Total Power	PSD[2] dBm/MHz			Total PSD		Limit		Pass or Fail
			Chain 1	Chain 2	Chain 3	mW/MHz	dBm/MHz	FCC	RSS 210[3]	
5260	7.8	6.6	-3.4	-4.9		0.8	-1.1	1.0	11.0	PASS
5300	7.5	8.7	-2.8	-2.6		**1.1**	**0.3**	1.0	11.0	PASS
5330	7.7	5.7	-4.9	-5.2		0.6	-2.0	1.0	11.0	PASS

Output Power at Low Power Setting - 5250-5350 MHz Band

EIRP does not exceed 500mW, therefore TPC is not required and measurements at a low power setting are not required.

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

MIMO Device - 5470-5725 MHz Band

	Chain 1	Chain 2	Chain 3	Coherent	Effective[5]	EIRP (mW)	EIRP (dBm)
Antenna Gain (dBi):	13	13		Yes	16.0	382.4	25.8

Power

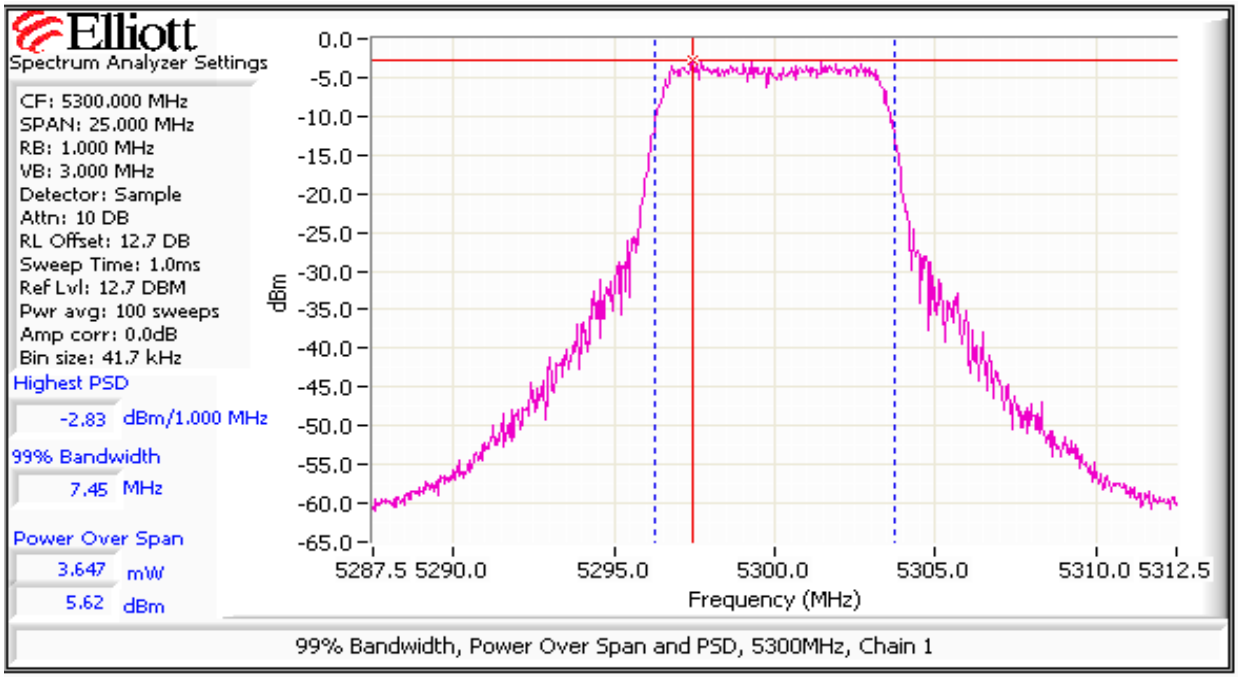
Frequency (MHz)	Software Setting	26dB BW (MHz)	Measured Output Power[1] dBm			Total		Limit (dBm)	Max Power (W)	Pass or Fail
			Chain 1	Chain 2	Chain 3	mW	dBm			
5480	4.5	11.5	6.7	5.2		8.0	9.0	11.6	0.010	PASS
5595	4.5	11.5	6.1	6.8		8.9	9.5	11.6		PASS
5715	5.5	11.5	7.0	6.6		9.6	9.8	11.6		PASS

PSD

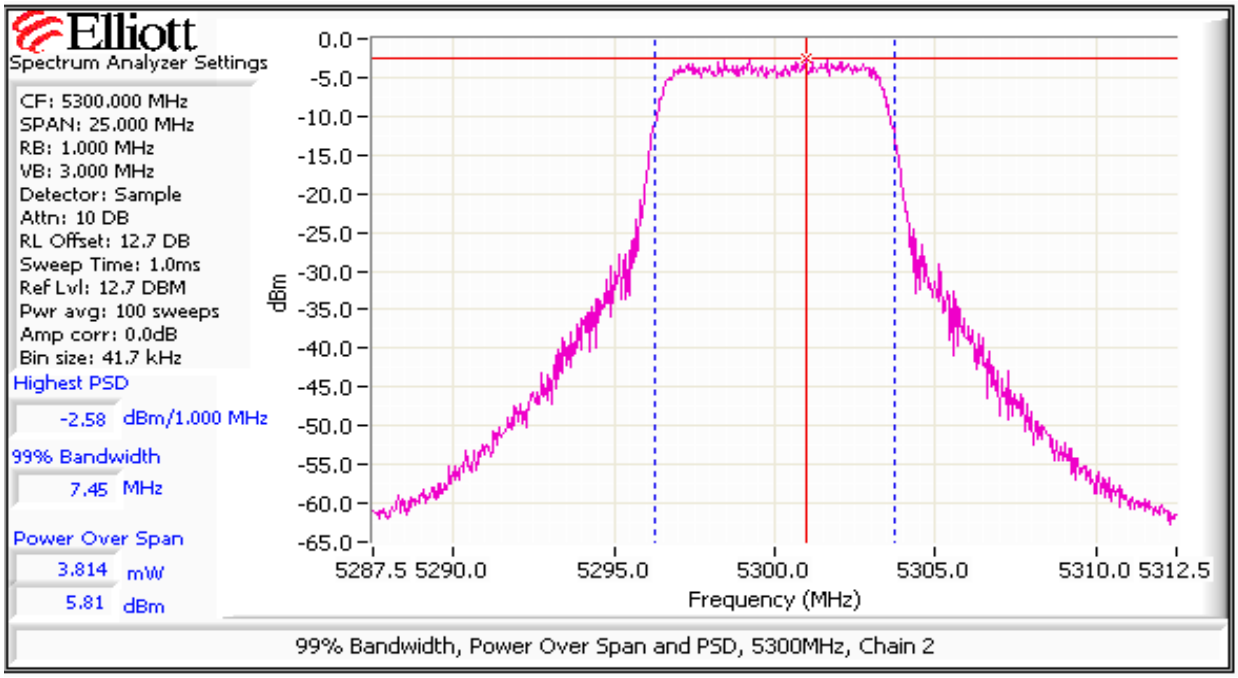
Frequency (MHz)	99%[4] BW	Total Power	PSD[2] dBm/MHz			Total PSD		Limit		Pass or Fail
			Chain 1	Chain 2	Chain 3	mW/MHz	dBm/MHz	FCC	RSS 210[3]	
5480	7.5	9.0	-2.0	-3.7		1.1	0.2	1.0	11.0	PASS
5595	7.5	9.5	-2.5	-2.1		1.2	0.7	1.0	11.0	PASS
5715	7.5	9.8	-1.9	-2.3		1.2	0.9	1.0	11.0	PASS

Output Power at Low Power Setting - 5470-5725 MHz Band

EIRP does not exceed 500mW, therefore TPC is not required and measurements at a low power setting are not required.



Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A



Run #2: Peak Excursion Measurement

HT 8 Device meets the requirement for the peak excursion

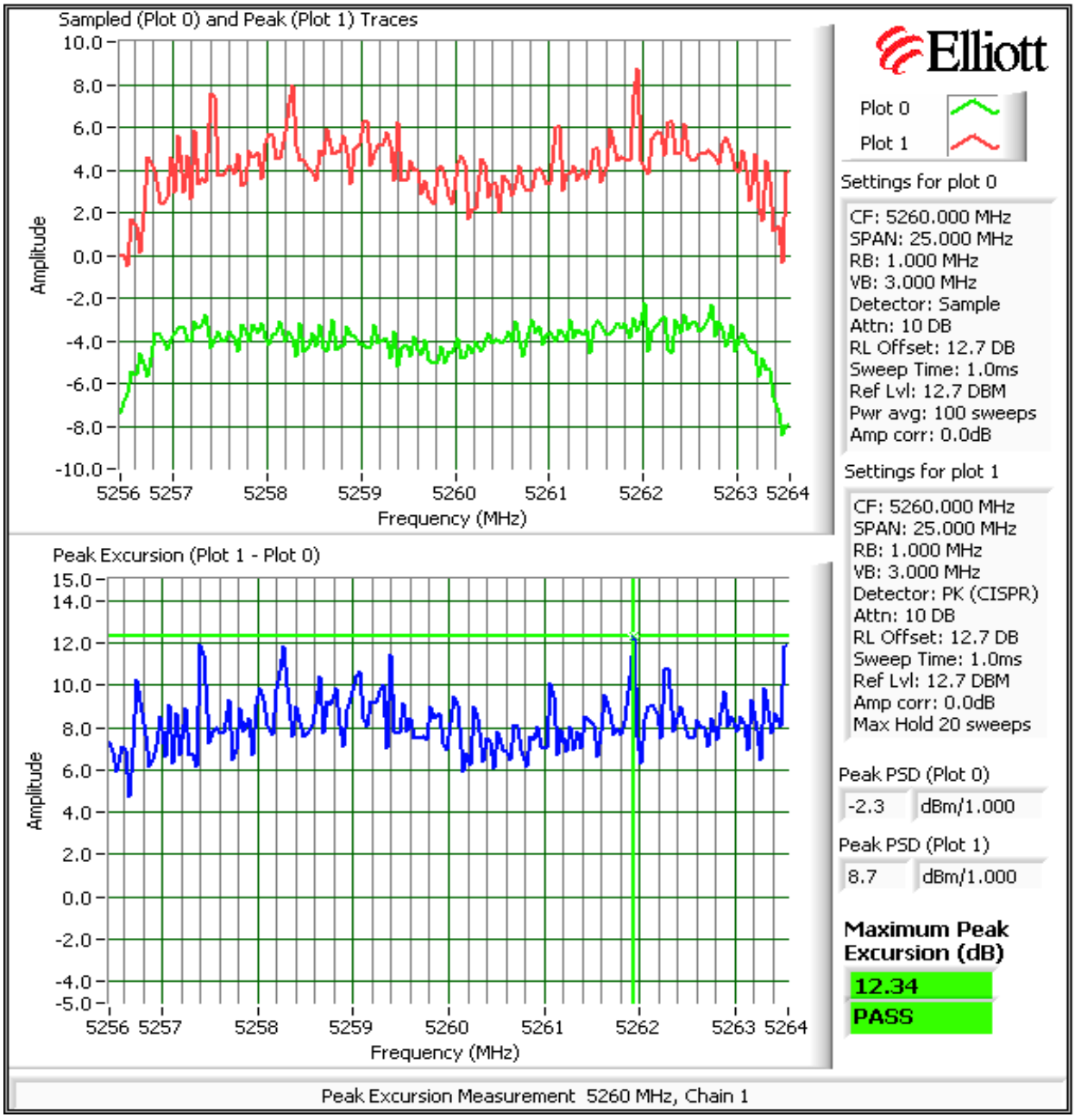
Freq	Peak Excursion(dB)		Freq	Peak Excursion(dB)	
(MHz)	Value	Limit	(MHz)	Value	Limit
5260	**12.3/11.7**	13.0	5480	10.4/10.3	13.0
5300	11.5/11.3	13.0	5595	11.4/10.4	13.0
5330	11.8/11.4	13.0	5715	10.7/10.2	13.0

Plots Showing Peak Excursion

Trace A: RBW = 1MHz, VBW = 3MHz, Peak hold

Trace B: Same settings as used for power/PSD measurements (RBW = 1 MHz, VBW = 3MHz, Integrated **average** power)

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A



Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run #3: Out Of Band Spurious Emissions - Antenna Conducted

MIMO Devices: Antenna gain used is the individual antenna antenna gain (the spurious emissions at the band edges are not considered to be coherent between chains and spurious removed from the band edges are evaluated as radiated emissions if close to the limit). The plots were obtained for each chain individually and the limit was adjusted to account for all chains transmitting simultaneously

Number of transmit chains:	2		
Maximum Antenna Gain:	13.0	dBi	
Spurious Limit:	-27.0	dBm/MHz eirp	
Adjustment for 2 chains:	-3.0	dB adjustment for multiple chains.	
Limit Used On Plots [Note 1]:	-43.0	dBm/MHz	Average Limit (RB=1MHz, VB=10Hz)

Note 1:	The -27dBm/MHz limit is an eirp limit. The limit for antenna port conducted measurements is adjusted to take into consideration the maximum antenna gain and number of transmitters (limit = -27dBm - antenna gain - 10Log[N]). Radiated field strength measurements for signals more than 50MHz from the bands and that are close to the limit are made to determine compliance as the antenna gain is not known at these frequencies.
Note 2:	All spurious signals below 1GHz are measured during digital device radiated emissions test.
Note 3:	Signals within 10MHz of the 5.725 or 5.825 Band edge are subject to a limit of -17dBm EIRP
Note 4:	If the device is for outdoor use then the -27dBm eirp limit also applies in the 5150 - 5250 MHz band.
Note 5:	Signals that fall in the restricted bands of 15.205 are subject to the limit of 15.209.

Client:	Ubiquiti Networks	Job Number:	J82749
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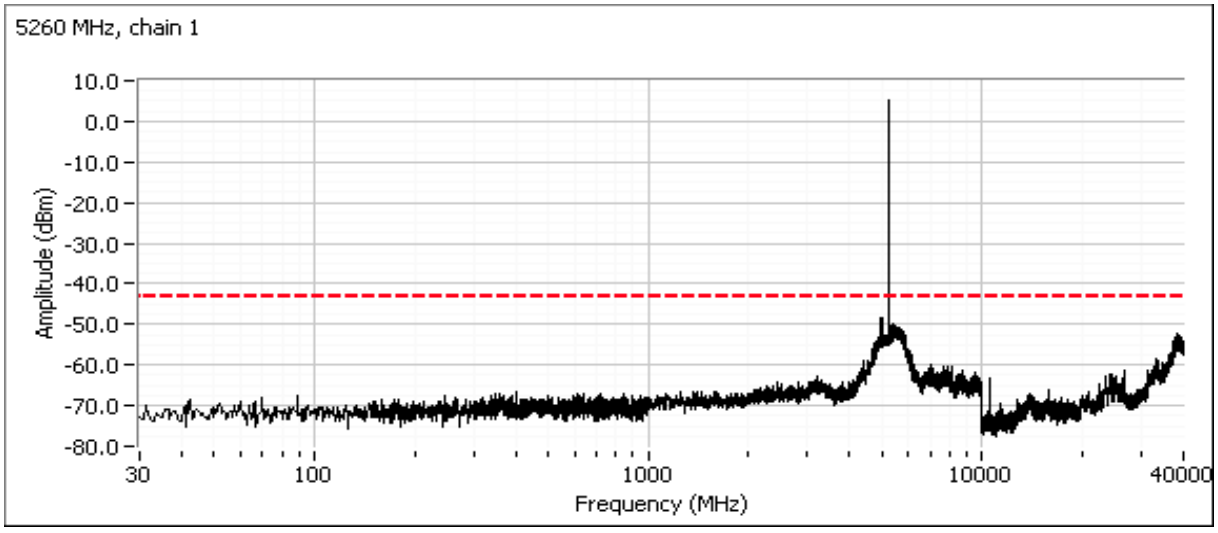
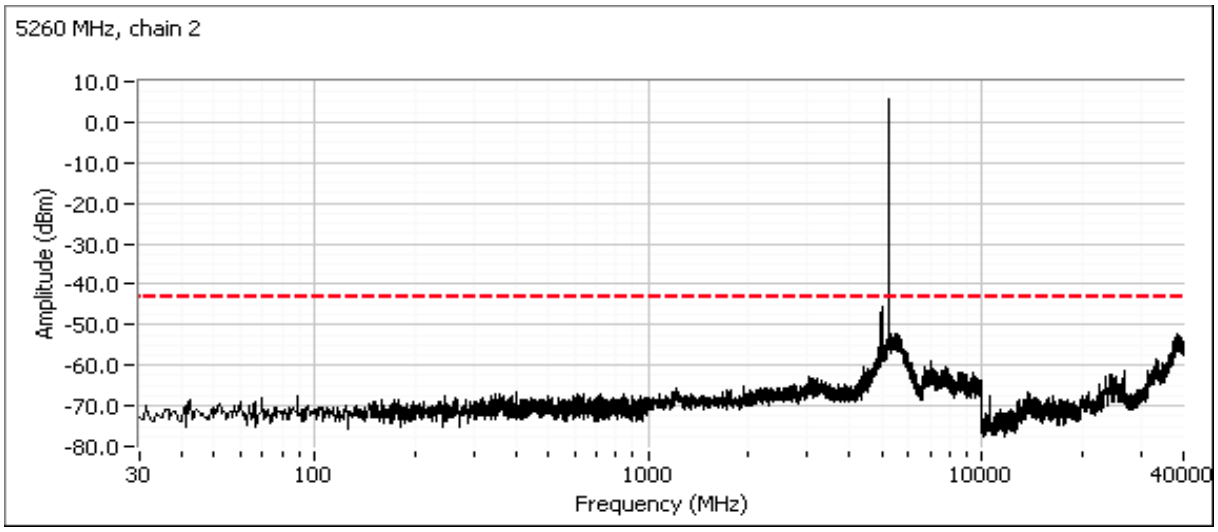
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

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

Low channel, 5250 - 5350 MHz Band

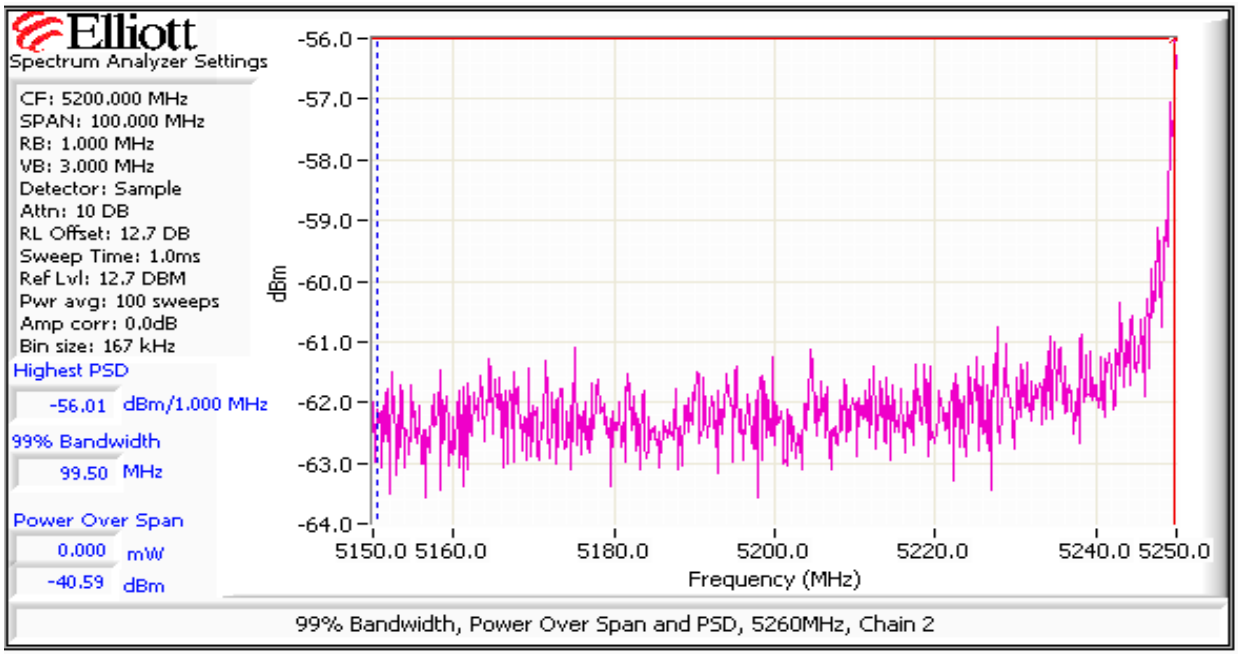
Plots for each chain showing compliance with the -27dBm/MHz limit in the 5150 - 5250 MHz band. Start and stop frequencies set to 5150-5250 MHz, RB=1MHz, VB=3MHz, power averaging enabled (100 traces) **[OR** use power plot if it clearly shows level at/below 5250 MHz and level is dropping]



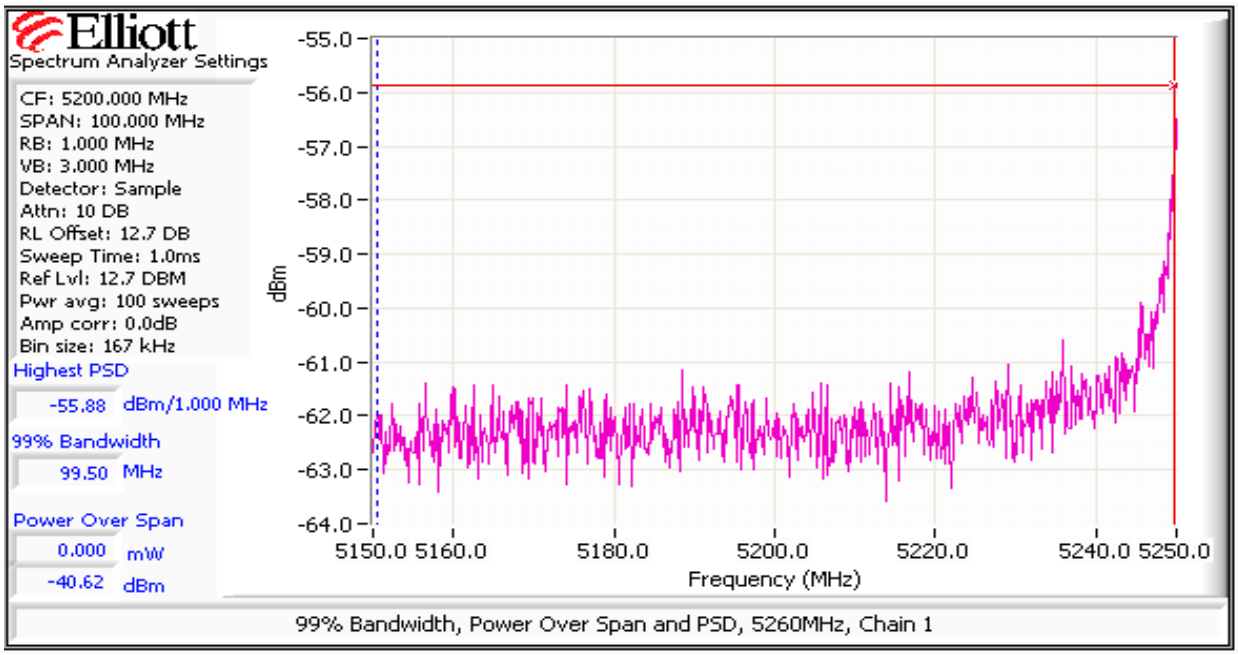


Wide-band plot, RB=VB=1MHz (Peak measurements versus limit).

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A



99% Bandwidth, Power Over Span and PSD, 5260MHz, Chain 2

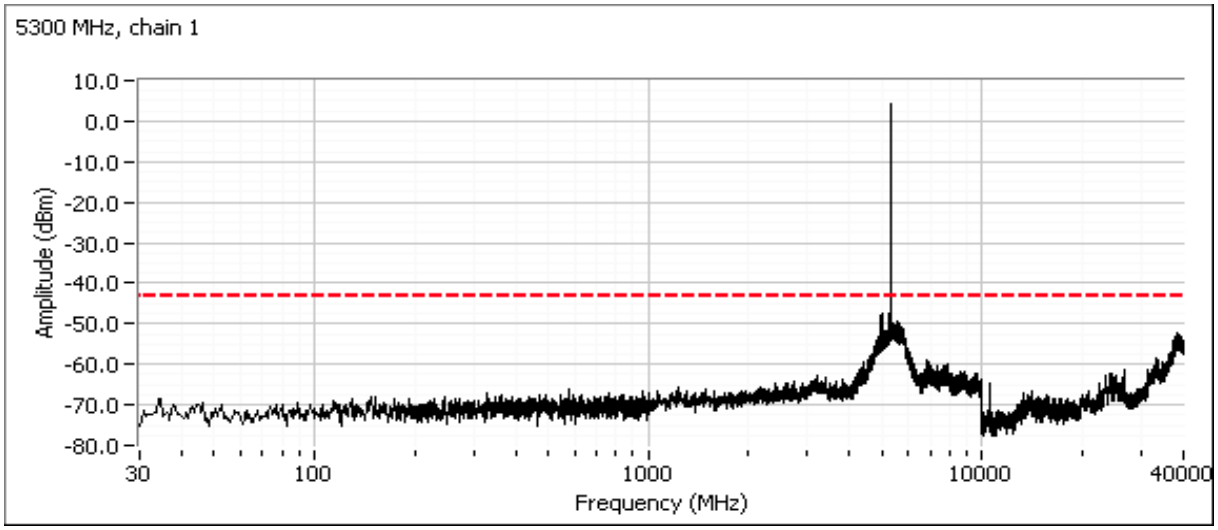


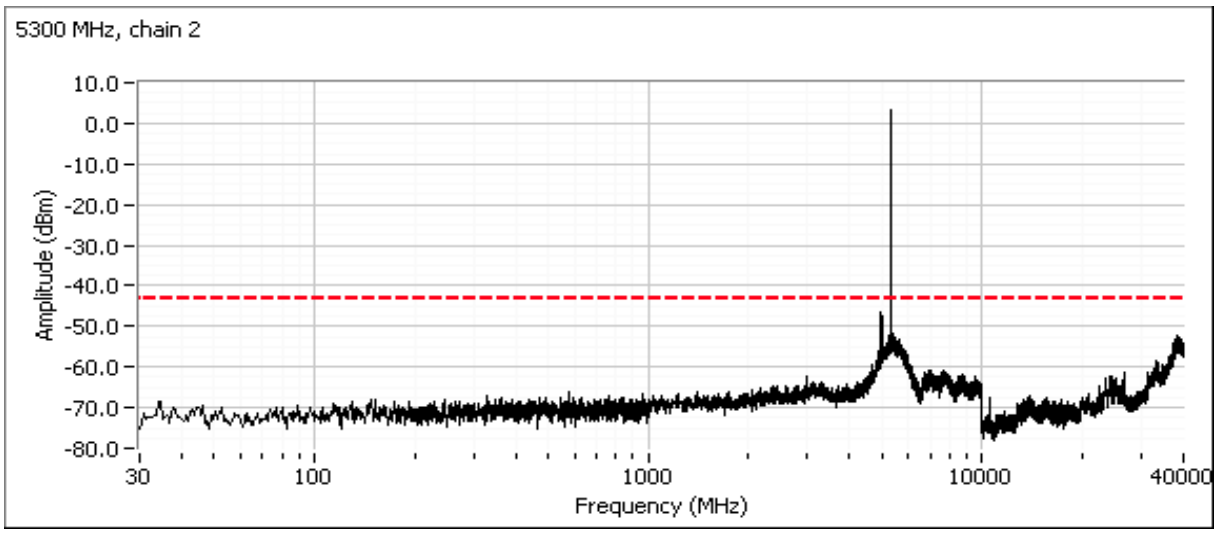
99% Bandwidth, Power Over Span and PSD, 5260MHz, Chain 1

	Power Setting	Band edge Level		Antenna Gain (dBi)	EIRP		Total EIRP dBm/MHz	Limit dBm/MHz	Result
		dBm/MHz	mW/MHz		mW/MHz	dBm/MHz			
Chain 1	6.5	-55.8	0.00000	13.0	5.248E-05	-42.8	-39.9	-27	PASS
Chain 2		-56.0	0.00000	13.0	5.012E-05	-43.0			

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Center channel, 5250 - 5350 MHz Band





High channel, 5250 - 5350 MHz Band

Note - compliance with the radiated limits for the restricted band immediately above 5350MHz is demonstrated through the radiated emissions tests.

Center channel plots show worst-case, no wide-band plots provided for the high channel to reduce file size.

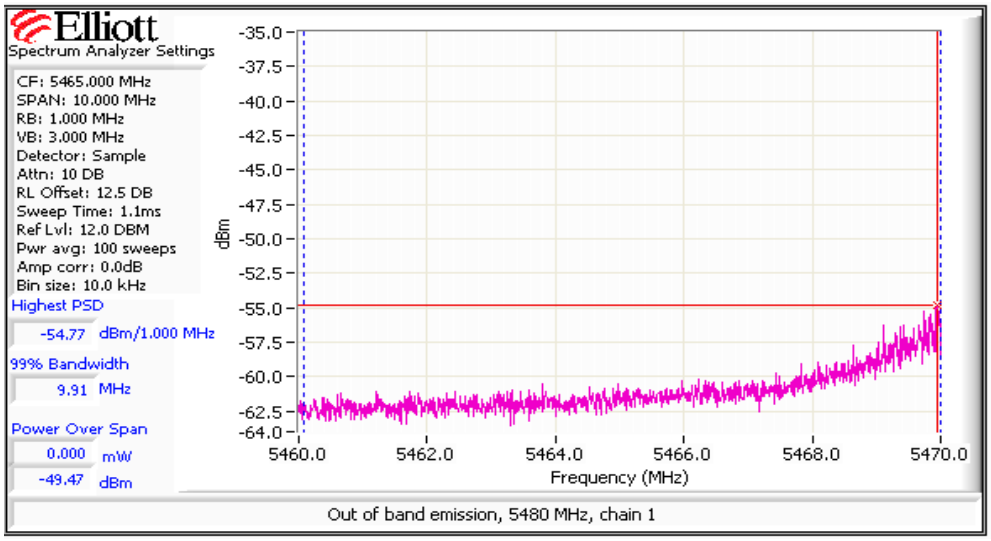
Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

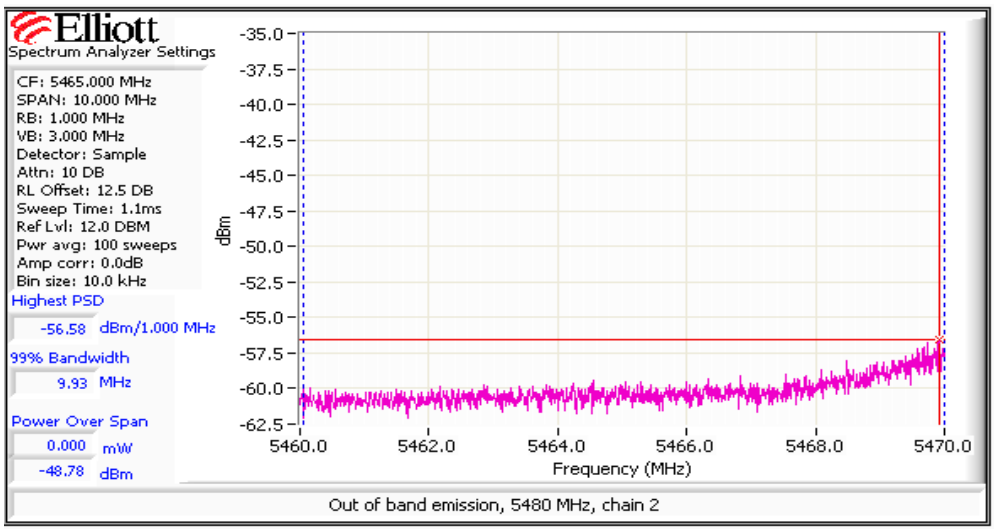
Low channel, 5470 - 5725 MHz Band

Plots for each chain showing compliance with the -27dBm/MHz limit for the 5460 - 5470 MHz band edge. Start and stop frequencies set to 5460-5470 MHz, RB=1MHz, VB=3MHz, power averaging enabled (100 traces). **Note** - compliance with the radiated limits for the restricted band immediately below 5460MHz is demonstrated through the radiated emissions tests.

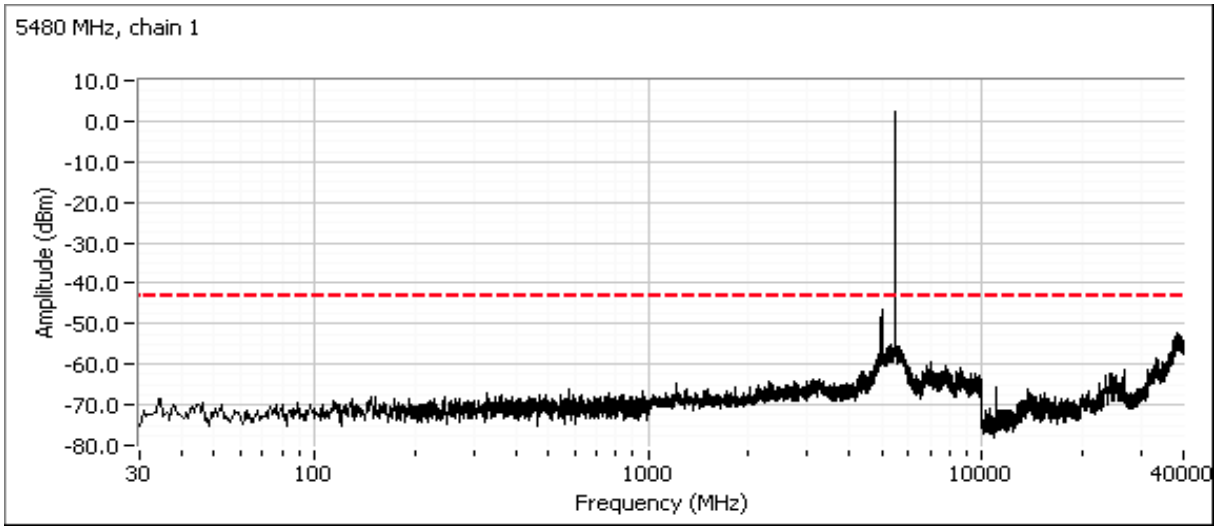
System transmitting at 5480MHz.

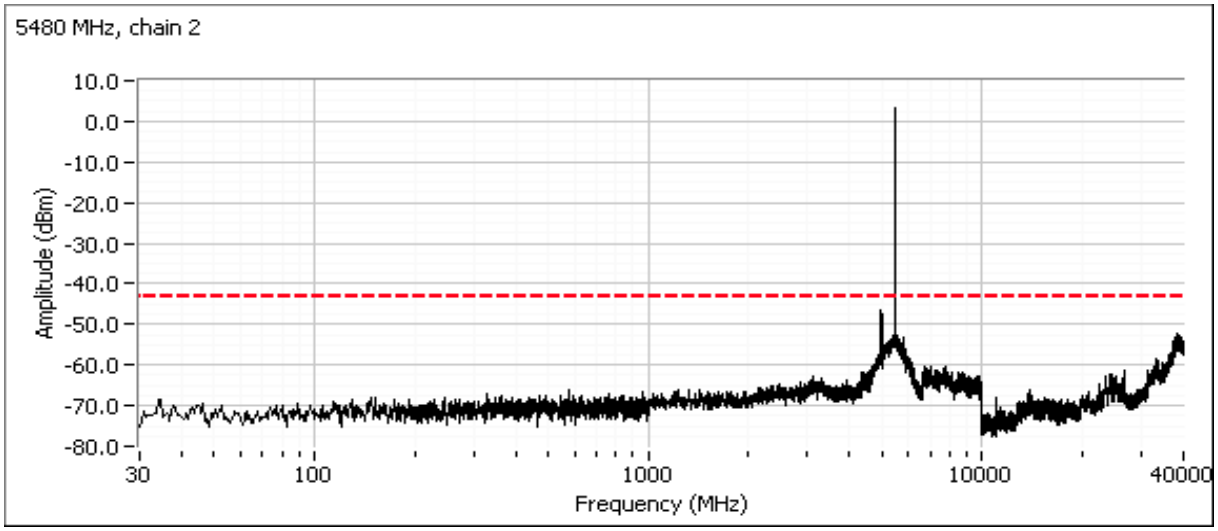
	Power Setting	Band edge Level		Antenna Gain (dBi)	EIRP		Total EIRP dBm/MHz	Limit dBm/MHz	Result
		dBm/MHz	mW/MHz		mW/MHz	dBm/MHz			
Chain 1	4.5	-54.8	0.00000	13.0	6.607E-05	-41.8	-39.6	-27	PASS
Chain 2		-56.6	0.00000	13.0	4.365E-05	-43.6			





Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A



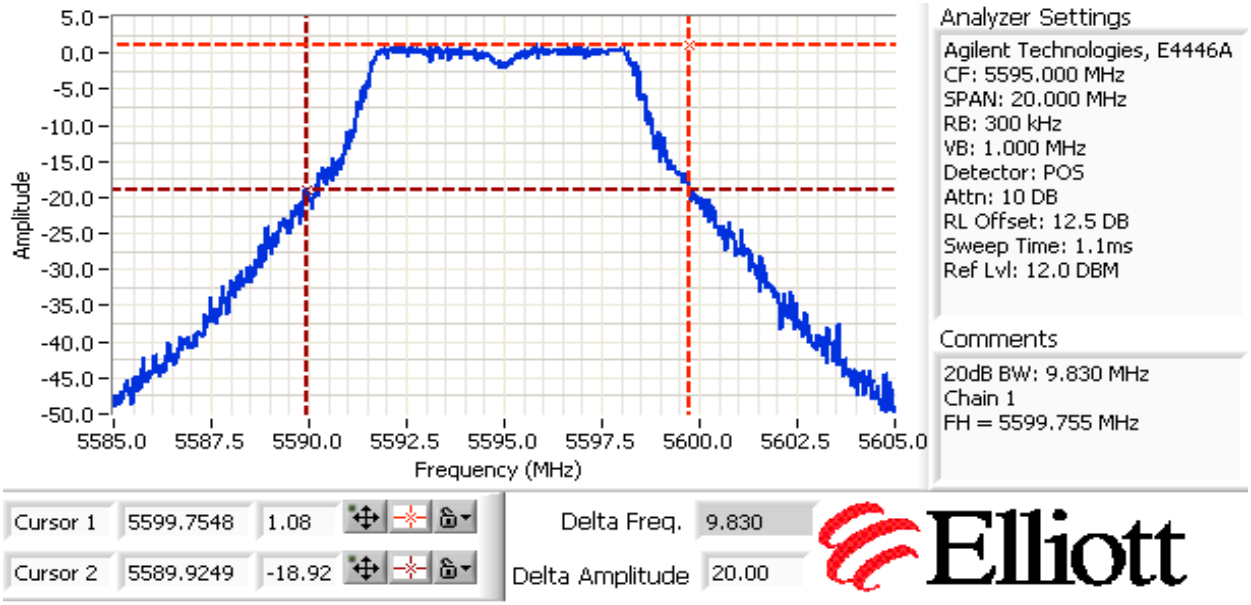


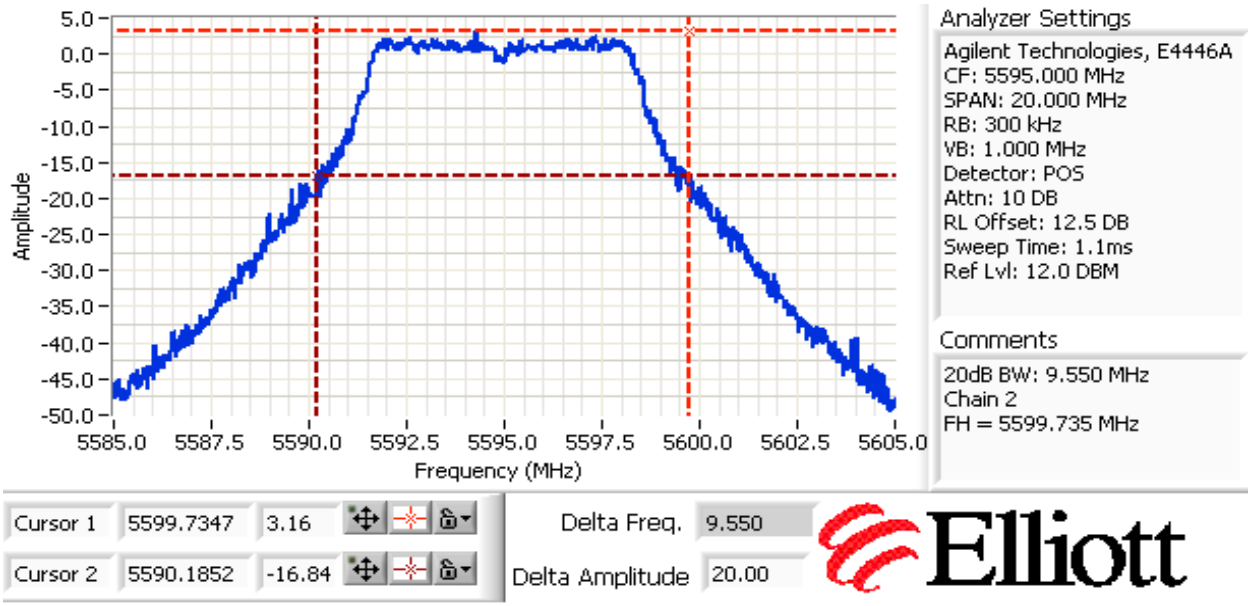
Wide-band plot, RB=VB=1MHz (Peak measurements versus limit).

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Center channel, 5470 - 5725 MHz Band

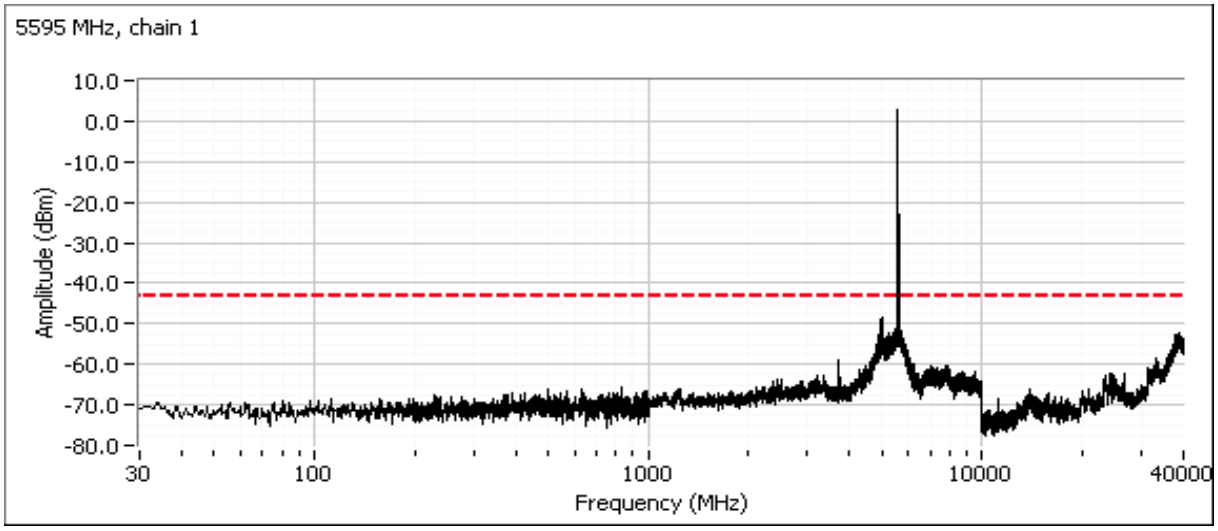
For **master** devices - This plot is showing hat the 20dB bandwidth of the channel closest to 5600 MHz does not spill into the 5600-5650 MHz band.

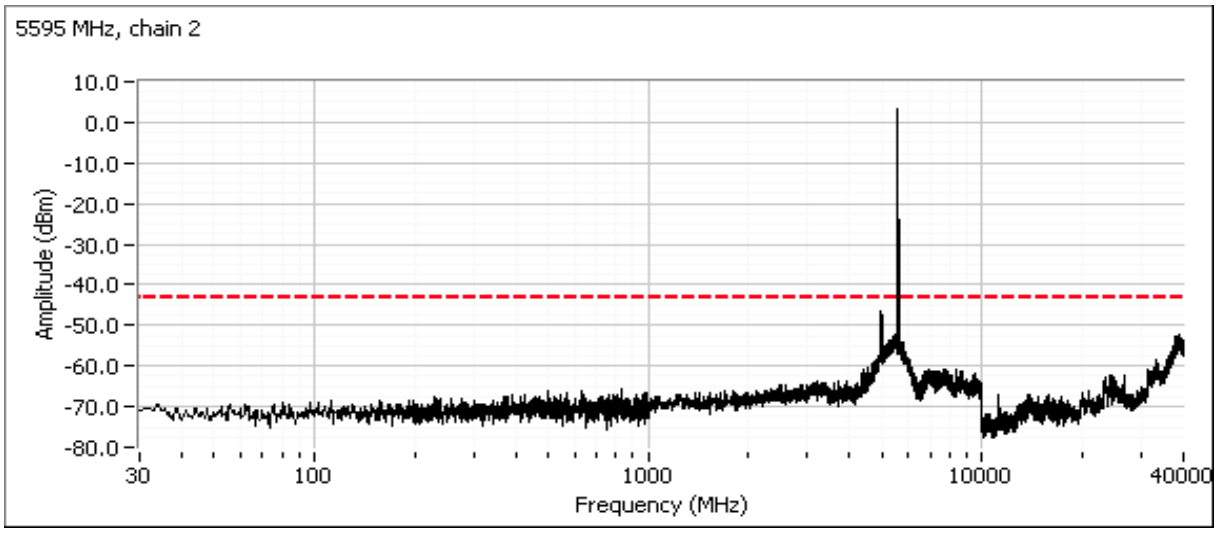




Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Wide-band plot, RB=VB=1MHz (Peak measurements versus limit).

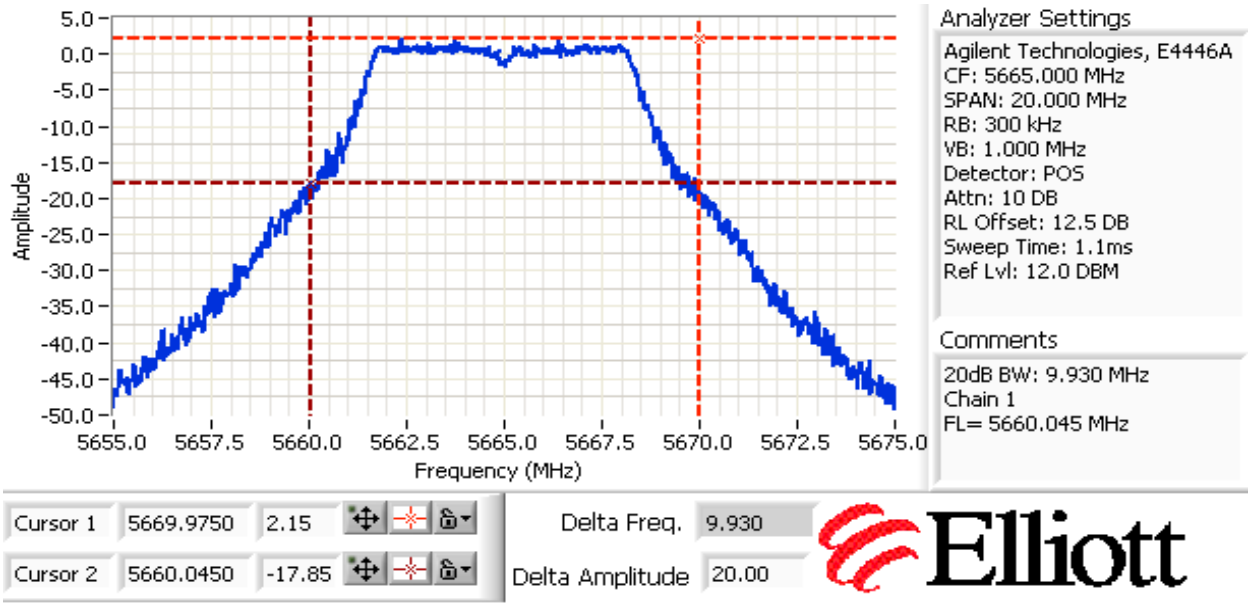


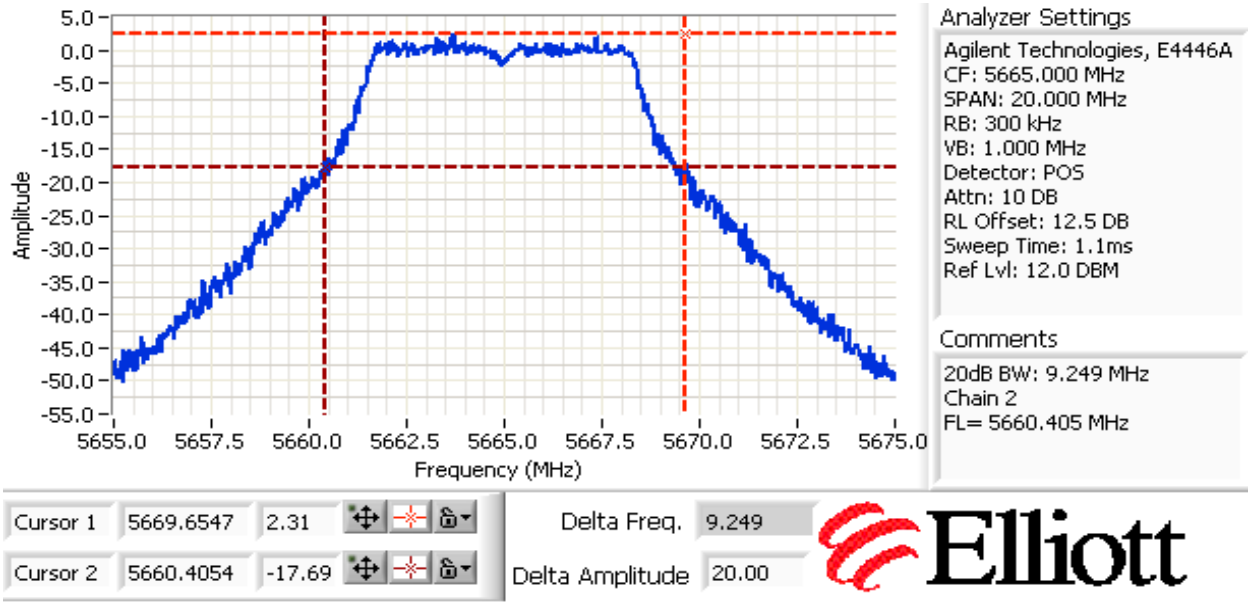


Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Channel adjacent to 5650 MHz

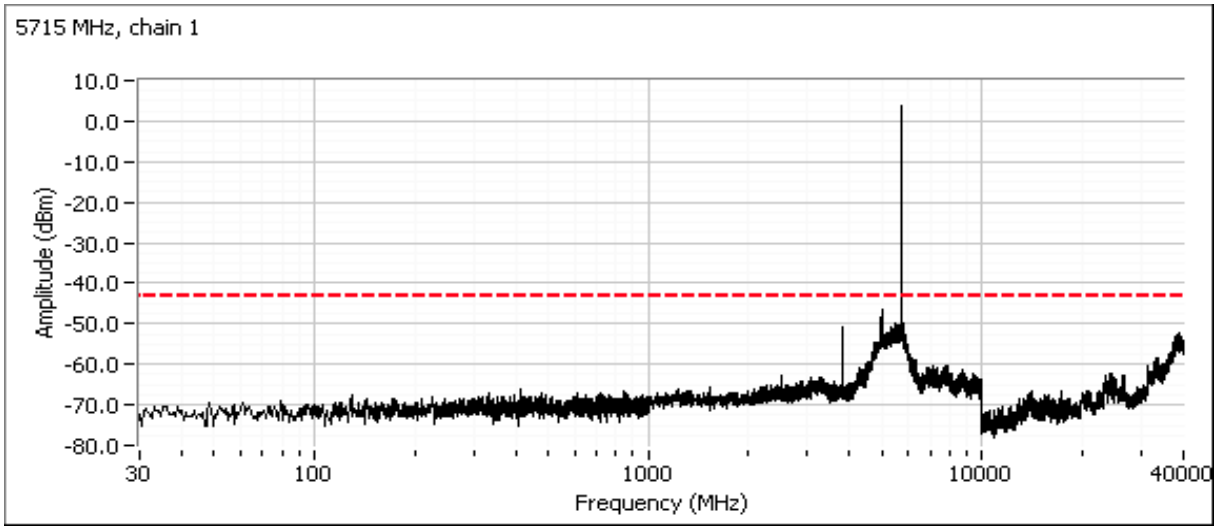
Plots showing that the 20dB bandwidth of the channel closest to 5650 MHz does not spill into the 5600-5650 MHz band.

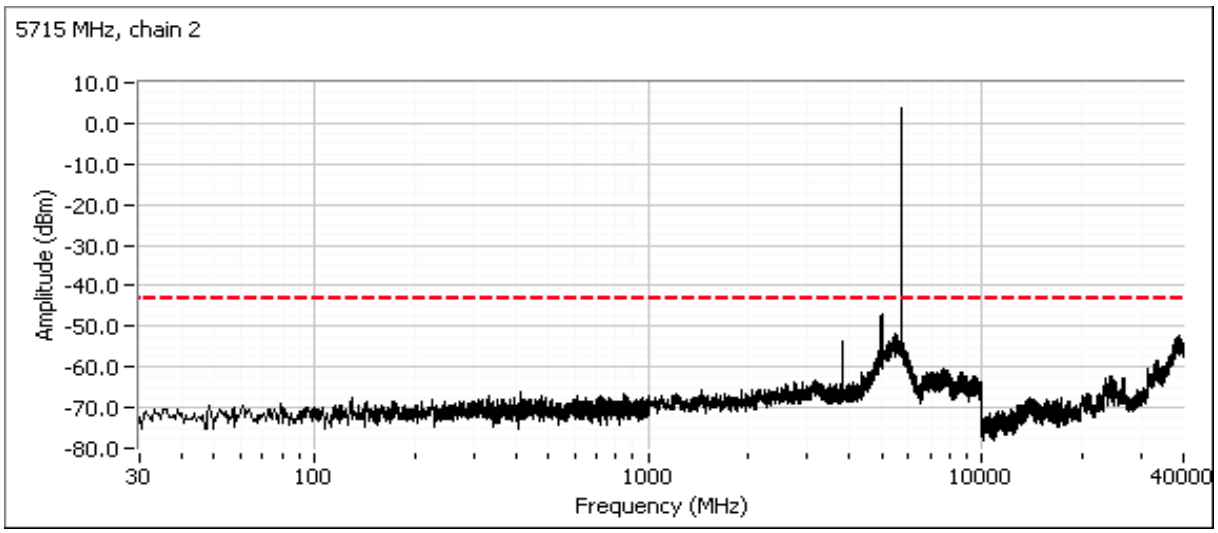




Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

High channel, 5470 - 5725 MHz Band



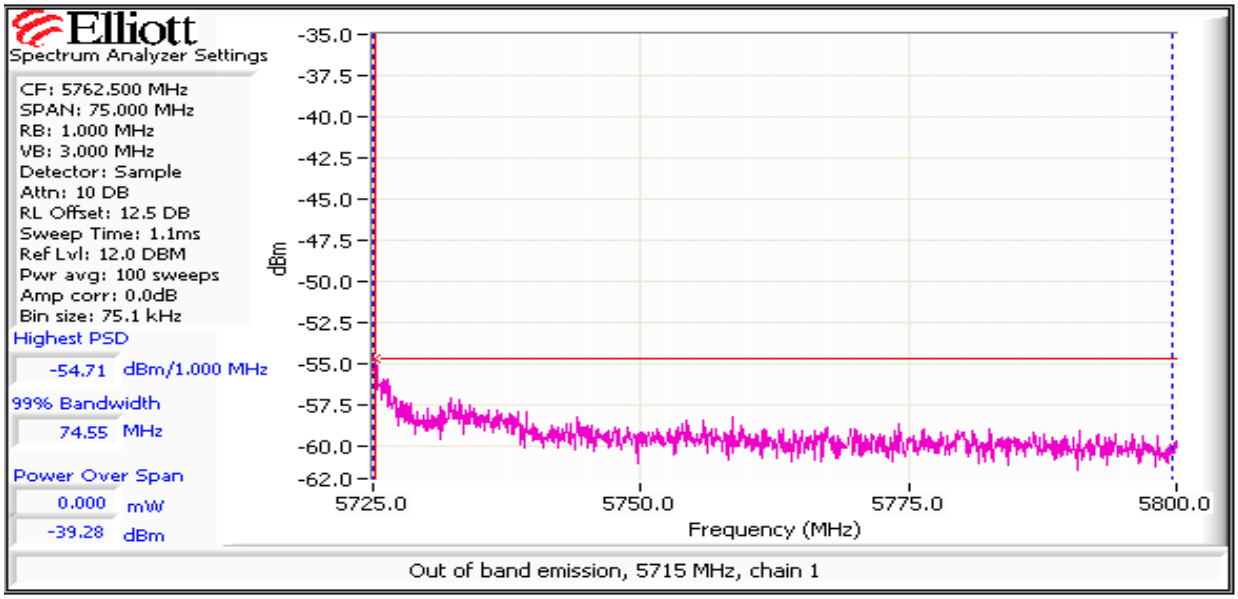


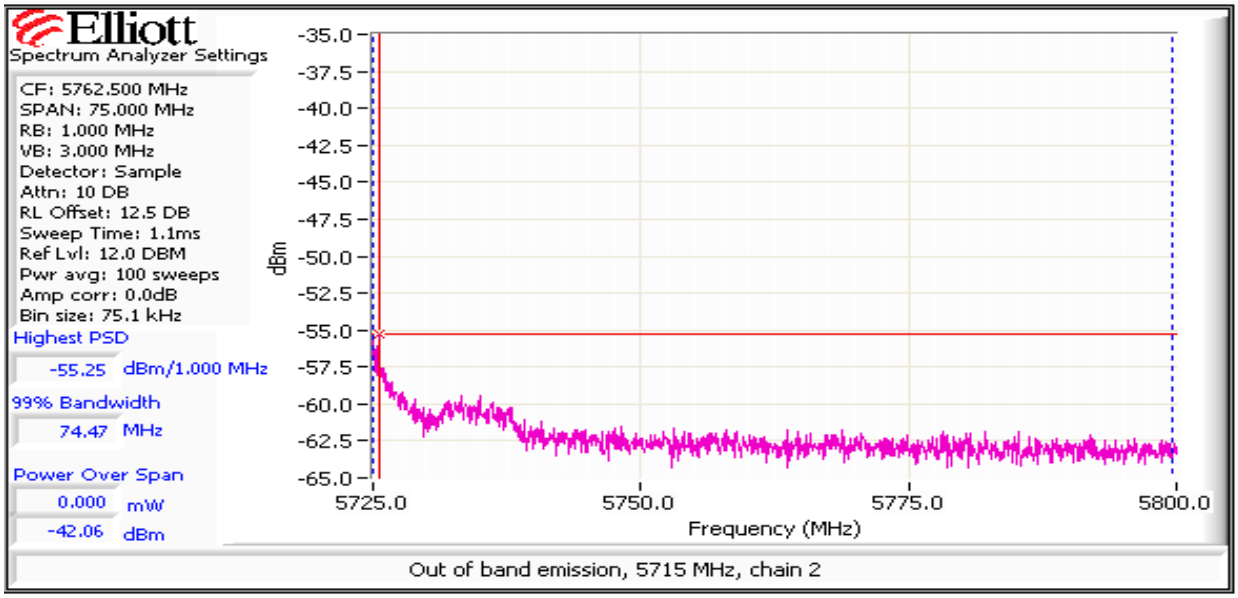
Wide-band plot, RB=VB=1MHz (Peak measurements versus limit).

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Plots for each chain showing compliance with the -27dBm/MHz limit above the 5725MHz band edge. Start and stop frequencies set to 5725-5800 MHz, RB=1MHz, VB=3MHz, power averaging enabled (100 traces):

	Power Setting	Band edge Level		Antenna Gain (dBi)	EIRP		Total EIRP dBm/MHz	Limit dBm/MHz	Result
		dBm/MHz	mW/MHz		mW/MHz	dBm/MHz			
Chain 1	5.5	-54.7	0.00000	13.0	6.761E-05	-41.7	-39.0	-27	PASS
Chain 2		-55.3	0.00000	13.0	5.888E-05	-42.3			





Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

RSS-210 (LELAN) and FCC 15.407(UNII)
Antenna Port Measurements
Power, PSD, Peak Excursion, 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: 5/5/2011
Test Engineer: M. Birgani
Test Location: FT Lab #4

Config. Used: -
Config Change: -
EUT Voltage: PoE

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Power, 5250 - 5350MHz	15.407(a) (1), (2)	PASS	11.5 mW
1	PSD, 5250 - 5350MHz	15.407(a) (1), (2)	PASS	0.9 dBm/MHz
1	Max EIRP 5250 - 5350MHz	TPC required if EIRP≥ 500mW (27dBm). EIRP ≥ 200mW (23dBm) DFS threshold = -64dBm.	N/A	EIRP = 26.6 dBm (459.4 mW)
1	Power, 5470 - 5725MHz	15.407(a) (1), (2)	PASS	11.5 mW
1	PSD, 5470 - 5725MHz	15.407(a) (1), (2)	PASS	0.9 dBm/MHz
1	Max EIRP 5470 - 5725MHz	TPC required if EIRP≥ 500mW (27dBm). EIRP ≥ 200mW (23dBm) DFS threshold	N/A	EIRP = 26.6 dBm (459.4 mW)
1	26dB Bandwidth	15.407 (Determines max power)	-	15.2 MHz
1	99% Bandwidth	RSS 210	N/A	9.4 MHz
2	Peak Excursion Envelope	15.407(a) (6) 13dB	PASS	12.9 dB
3	Antenna Conducted - Out of Band Spurious	15.407(b) -27dBm/MHz	PASS	All emissions below the -27dBm/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.

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Ambient Conditions:

Temperature: 18-23 °C
Rel. Humidity: 30-35 %

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

Note 1:	Output power measured using a peak power meter
Note 1:	Output power measured using a spectrum analyzer (see plots below). RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was continuous) and power integration over **20** MHz (method 1 of DA-02-2138A1).
Note 2:	Measured using the same analyzer settings used for output power. PSD is highest value on the plot.
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.

MIMO Device - 5250-5350 MHz Band

	Chain 1	Chain 2	Chain 3	Coherent	Effective[5]	EIRP (mW)	EIRP (dBm)
Antenna Gain (dBi):	13	13		Yes	16.0	459.4	26.6

Power

Frequency (MHz)	Software Setting	26dB BW (MHz)	Measured Output Power[1] dBm			Total		Limit (dBm)	Max Power (W)	Pass or Fail
			Chain 1	Chain 2	Chain 3	mW	dBm			
5260	5.0	13.4	3.5	3.8		4.6	6.7	12.3	0.012	PASS
5300	6.0	15.1	7.5	7.7		11.5	**10.6**	12.8		PASS
5330	5.0	15.1	7.1	7.2		10.4	10.2	12.8		PASS

PSD

Frequency (MHz)	99%[4] BW	Total Power	PSD[2] dBm/MHz			Total PSD		Limit		Pass or Fail
			Chain 1	Chain 2	Chain 3	mW/MHz	dBm/MHz	FCC	RSS 210[3]	
5260	9.7	6.7	-5.3	-5.3		0.6	-2.3	1.0	11.0	PASS
5300	9.4	10.6	-2.1	-2.2		1.2	**0.9**	1.0	11.0	PASS
5330	9.4	10.2	-2.2	-2.5		1.2	0.7	1.0	11.0	PASS

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

MIMO Device - 5470-5725 MHz Band

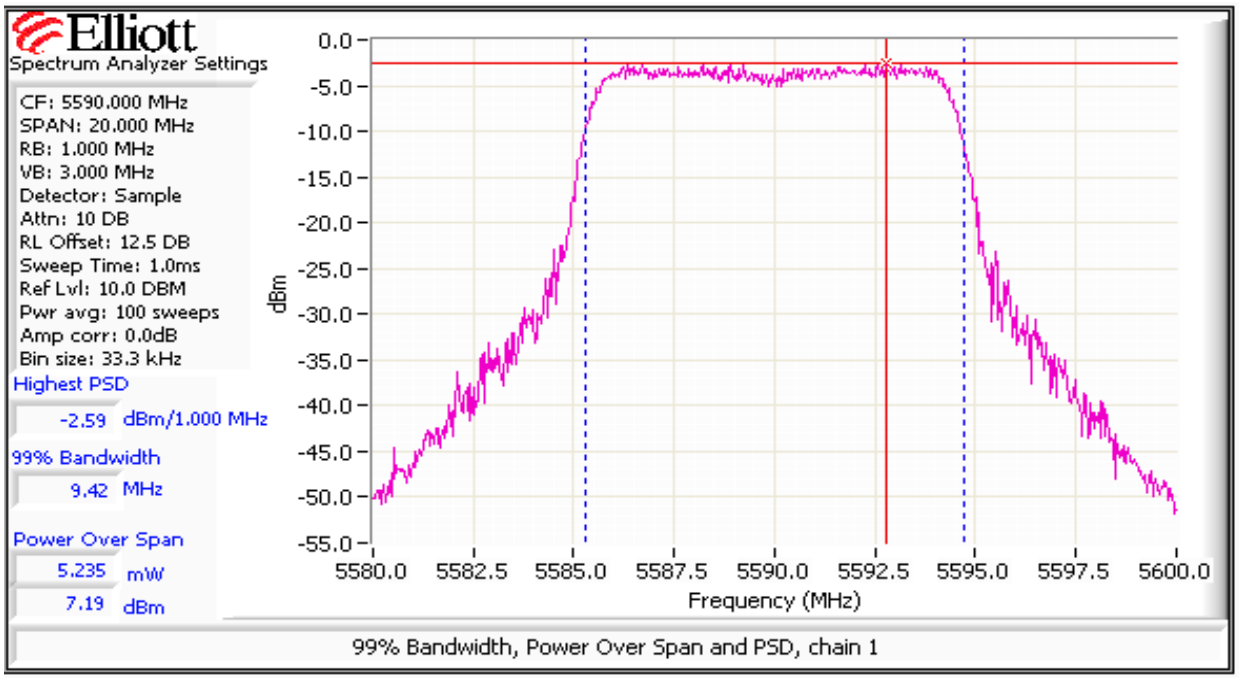
	Chain 1	Chain 2	Chain 3	Coherent	Effective[5]	EIRP (mW)	EIRP (dBm)
Antenna Gain (dBi):	13	13		Yes	16.0	473.1	26.7

Power

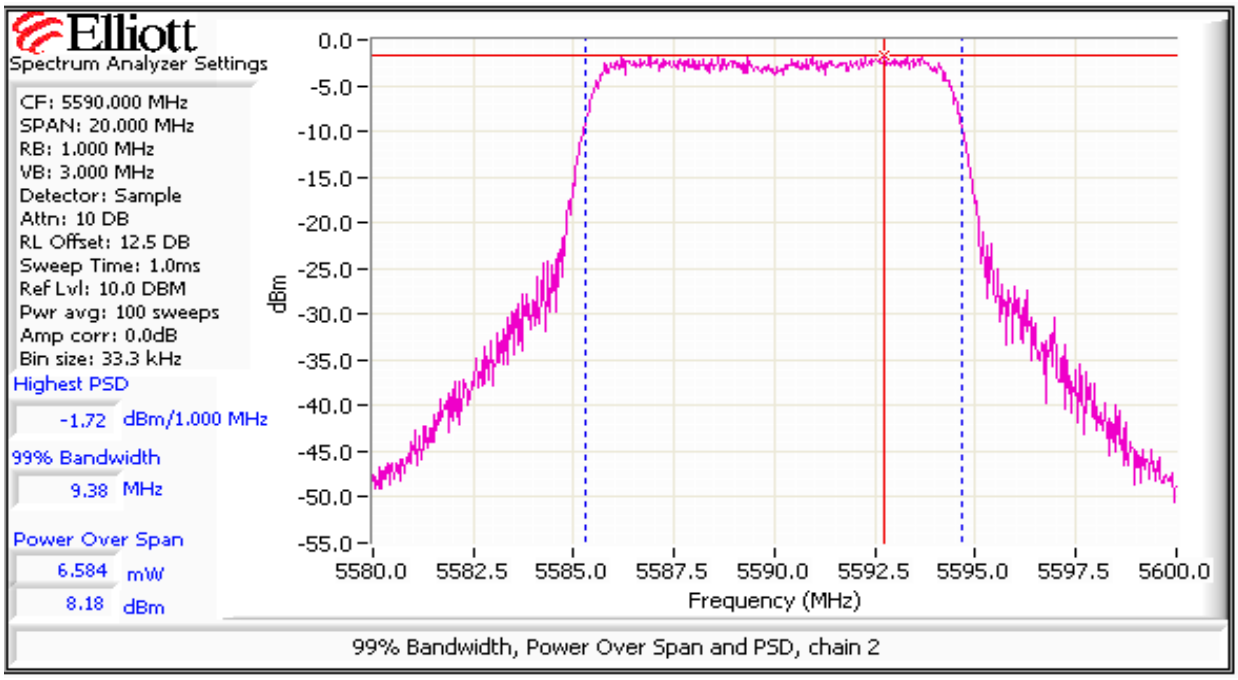
Frequency (MHz)	Software Setting	26dB BW (MHz)	Measured Output Power[1] dBm			Total		Limit (dBm)	Max Power (W)	Pass or Fail
			Chain 1	Chain 2	Chain 3	mW	dBm			
5480	6.0	15.2	7.7	7.6		11.6	10.7	12.8	0.012	PASS
5590	5.5	15.2	7.2	8.2		**11.9**	**10.7**	12.8		PASS
5710	6.5	15.0	7.5	7.4		11.1	10.5	12.8		PASS

PSD

Frequency (MHz)	99%[4] BW	Total Power	PSD[2] dBm/MHz			Total PSD		Limit		Pass or Fail
			Chain 1	Chain 2	Chain 3	mW/MHz	dBm/MHz	FCC	RSS 210[3]	
5480	9.4	10.7	-2.0	-2.3		1.2	0.9	1.0	11.0	PASS
5590	9.4	10.7	-2.6	-1.7		1.2	0.9	1.0	11.0	PASS
5710	9.4	10.5	-2.4	-2.2		1.2	0.7	1.0	11.0	PASS



Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

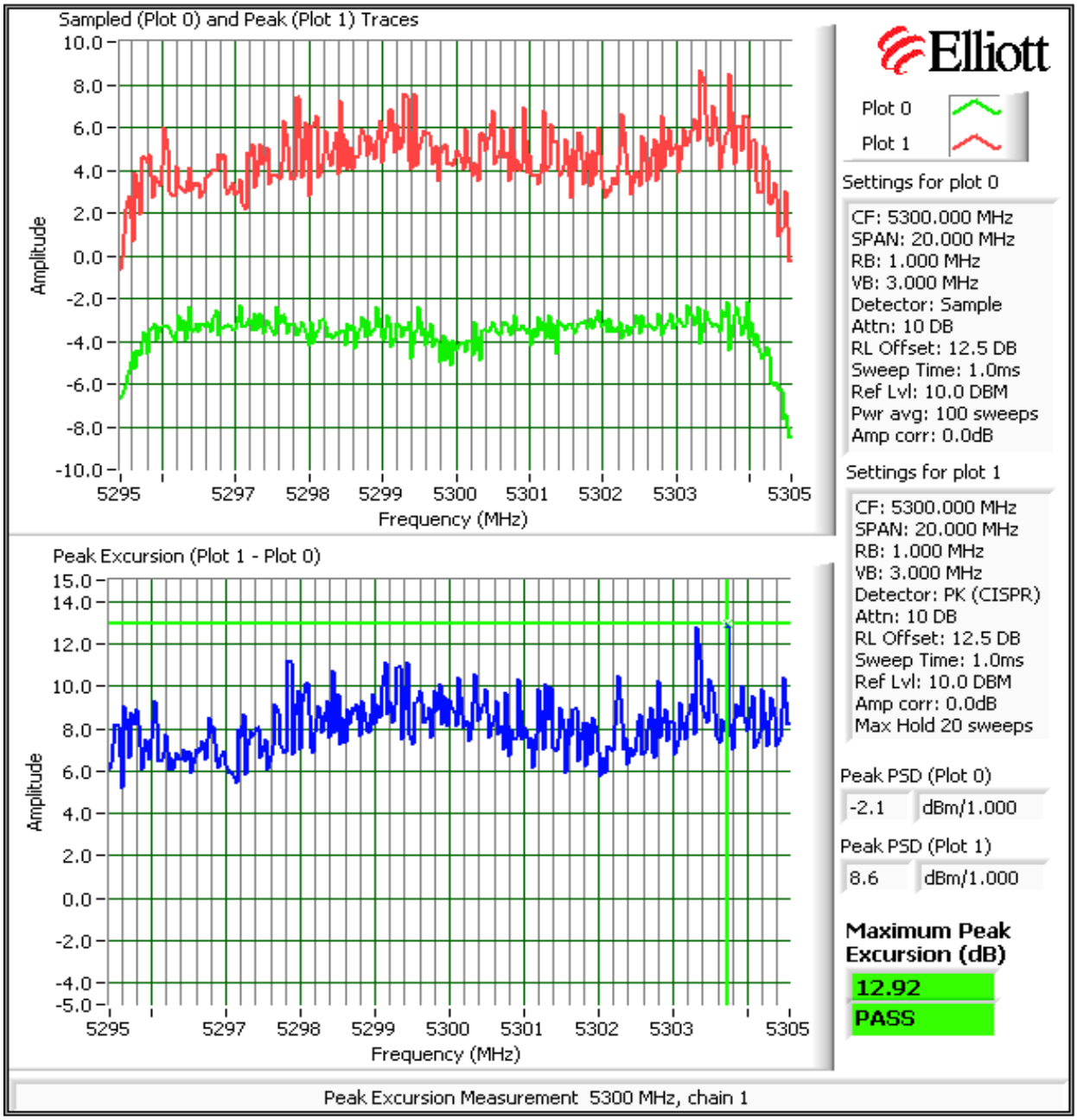


Run #2: Peak Excursion Measurement

HT 10 Device meets the requirement for the peak excursion

Freq	Peak Excursion(dB)		Freq	Peak Excursion(dB)	
(MHz)	Value	Limit	(MHz)	Value	Limit
5260	11.3/11.4	13.0	5480	11.1/10.4	13.0
5300	**12.9/11.4**	13.0	5590	9.9/9.8	13.0
5330	12.2/11.6	13.0	5710	10.2/10.1	13.0

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A



Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run #3: Out Of Band Spurious Emissions - Antenna Conducted

MIMO Devices: Antenna gain used is the individual antenna antenna gain (the spurious emissions at the band edges are not considered to be coherent between chains and spurious removed from the band edges are evaluated as radiated emissions if close to the limit). The plots were obtained for each chain individually and the limit was adjusted to account for all chains transmitting simultaneously

Number of transmit chains:	2		
Maximum Antenna Gain:	13.0	dBi	
Spurious Limit:	-27.0	dBm/MHz eirp	
Adjustment for 2 chains:	-3.0	dB adjustment for multiple chains.	
Limit Used On Plots [Note 1]:	-43.0	dBm/MHz	Average Limit (RB=1MHz, VB=10Hz)

Note 1:	The -27dBm/MHz limit is an eirp limit. The limit for antenna port conducted measurements is adjusted to take into consideration the maximum antenna gain and number of transmitters (limit = -27dBm - antenna gain - 10Log[N]). Radiated field strength measurements for signals more than 50MHz from the bands and that are close to the limit are made to determine compliance as the antenna gain is not known at these frequencies.
Note 2:	All spurious signals below 1GHz are measured during digital device radiated emissions test.
Note 3:	Signals within 10MHz of the 5.725 or 5.825 Band edge are subject to a limit of -17dBm EIRP
Note 4:	If the device is for outdoor use then the -27dBm eirp limit also applies in the 5150 - 5250 MHz band.
Note 5:	Signals that fall in the restricted bands of 15.205 are subject to the limit of 15.209.

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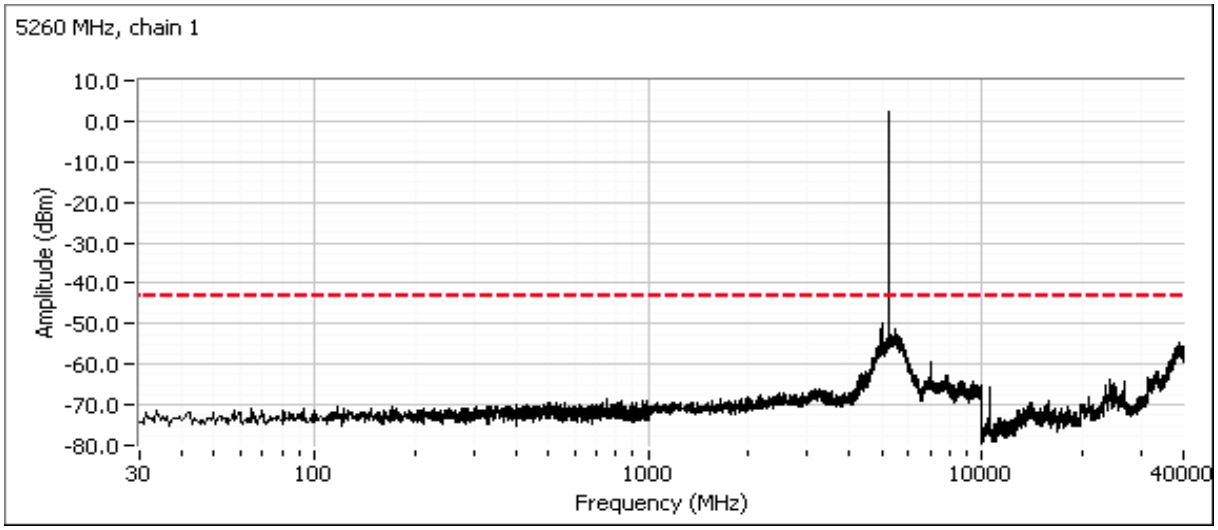
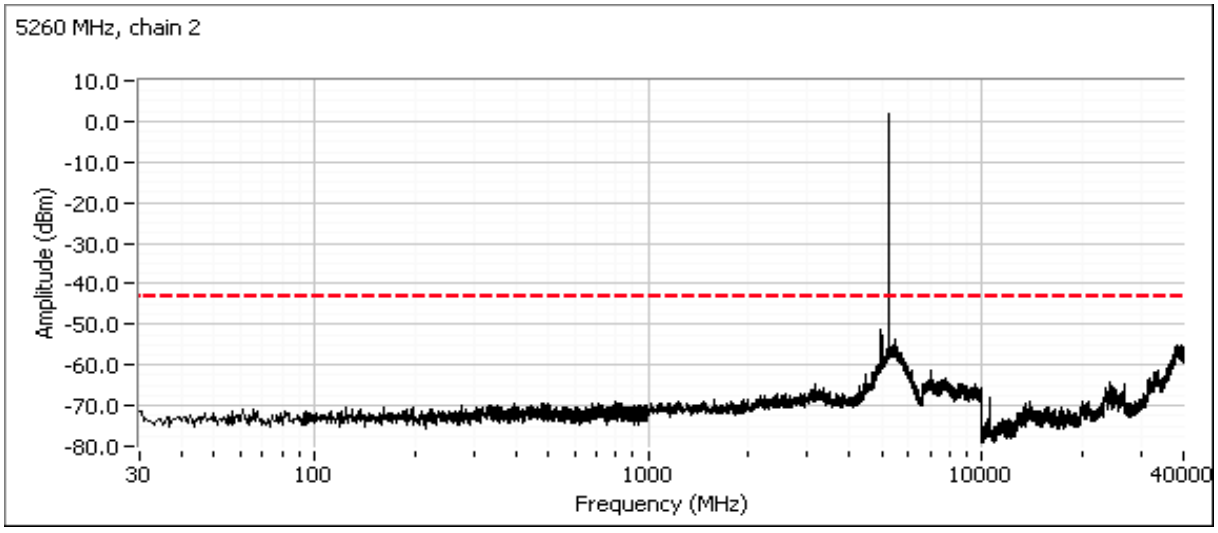
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Low channel, 5250 - 5350 MHz Band





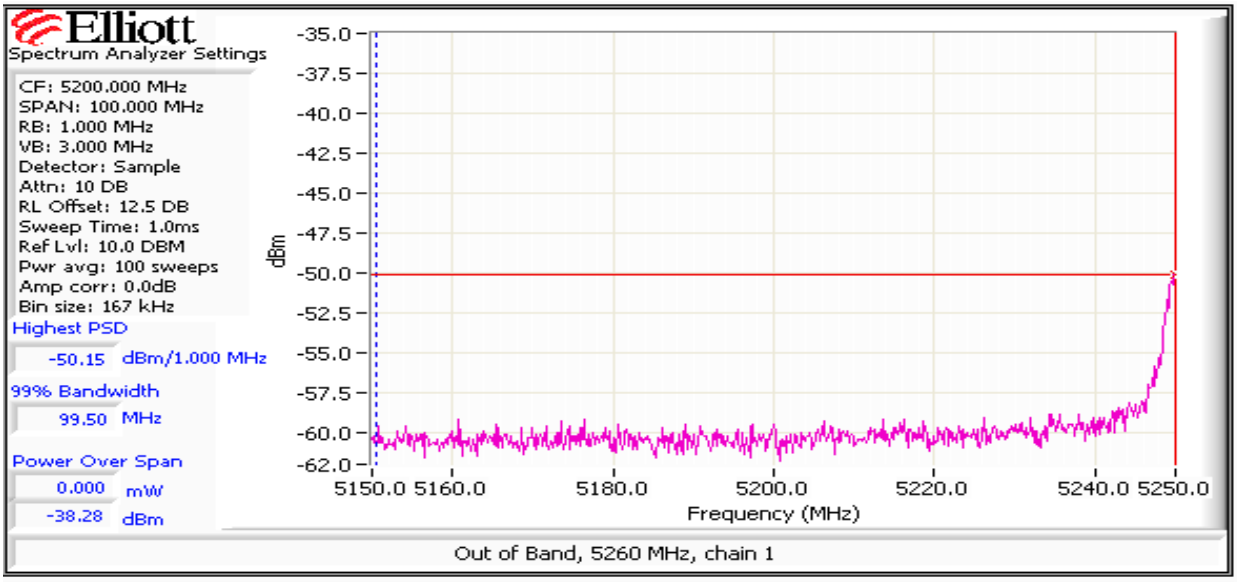
Wide-band plot, RB=VB=1MHz (Peak measurements versus limit).

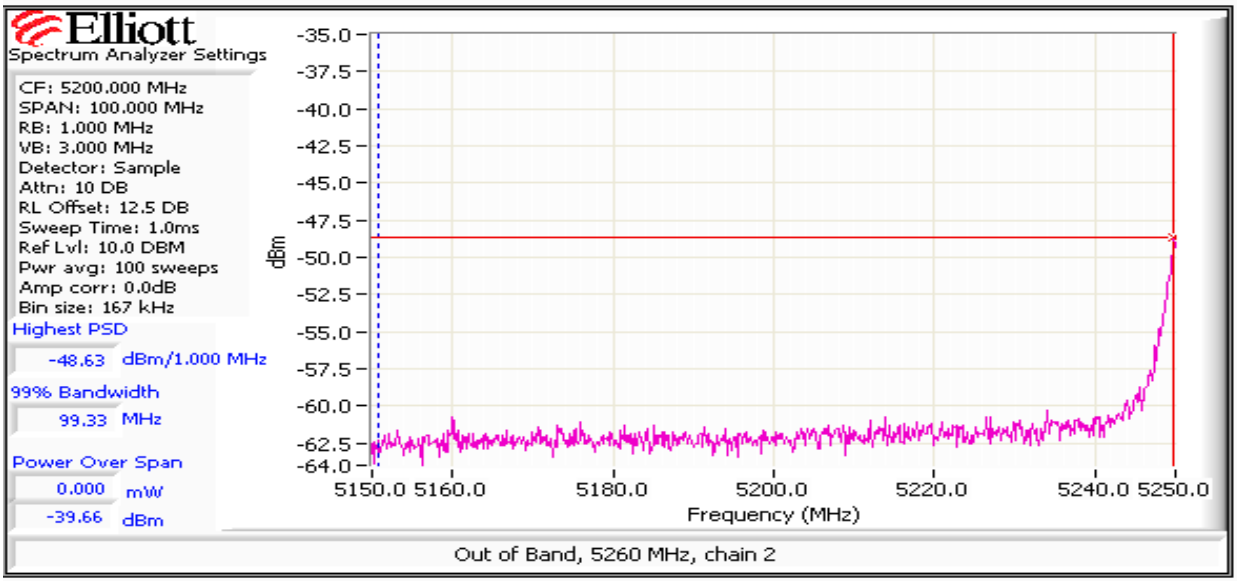
Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Low channel, 5250 - 5350 MHz Band

Plots for each chain showing compliance with the -27dBm/MHz limit in the 5150 - 5250 MHz band. Start and stop frequencies set to 5150-5250 MHz, RB=1MHz, VB=3MHz, power averaging enabled (100 traces).

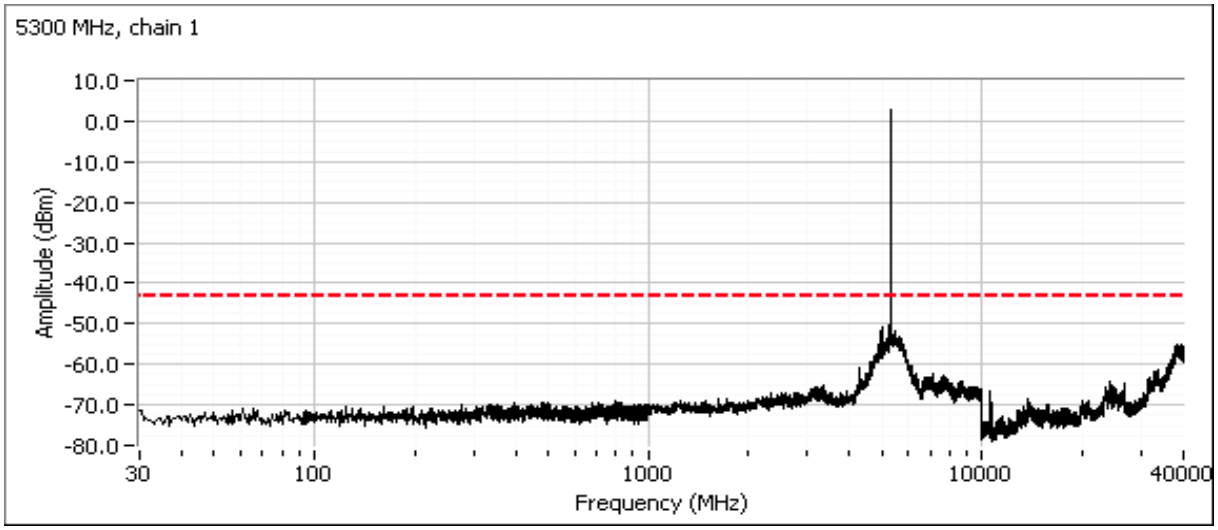
	Power Setting	Band edge Level		Antenna Gain (dBi)	EIRP		Total EIRP dBm/MHz	Limit dBm/MHz	Result
		dBm/MHz	mW/MHz		mW/MHz	dBm/MHz			
Chain 1	6.0	-50.2	0.00001	13.0	0.0001905	-37.2	-33.3	-27	PASS
Chain 2		-48.6	0.00001	13.0	0.0002754	-35.6			

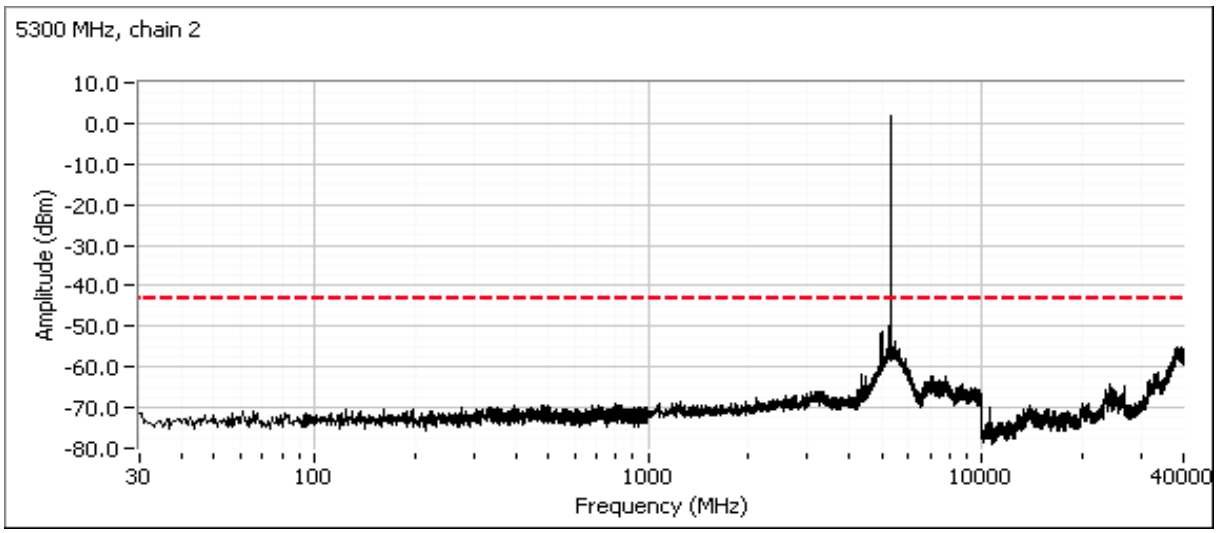




Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Center channel, 5250 - 5350 MHz Band



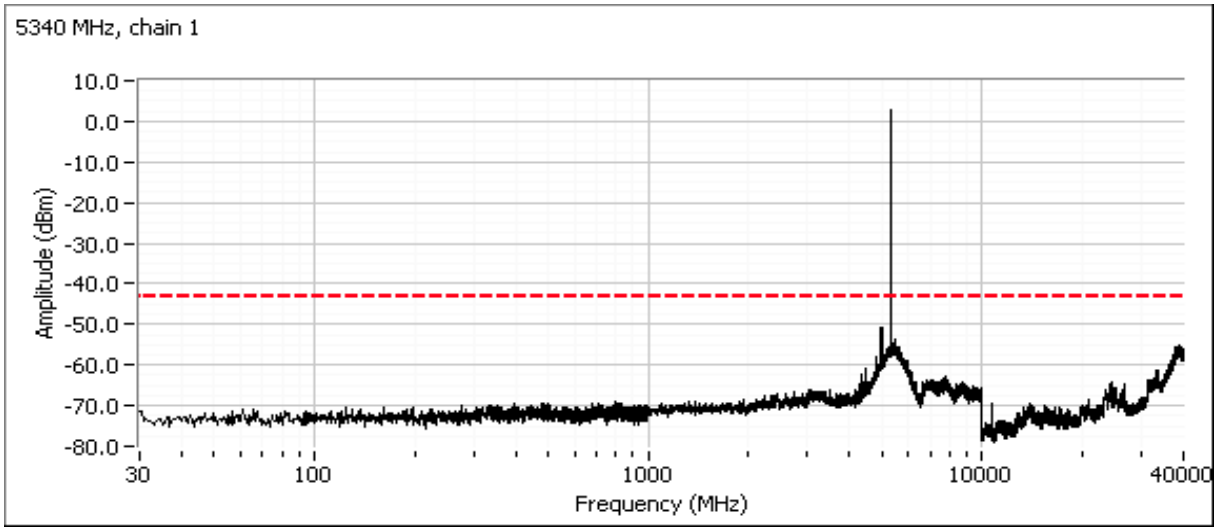


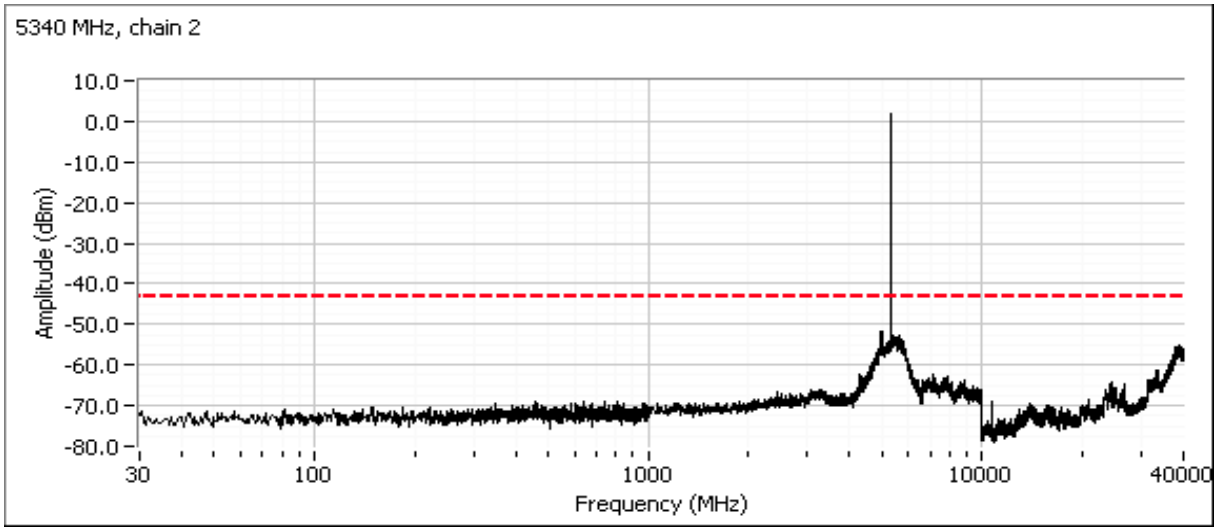
Wide-band plot, RB=VB=1MHz (Peak measurements versus limit).

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

High channel, 5250 - 5350 MHz Band

Note - compliance with the radiated limits for the restricted band immediately above 5350MHz is demonstrated through the radiated emissions tests.

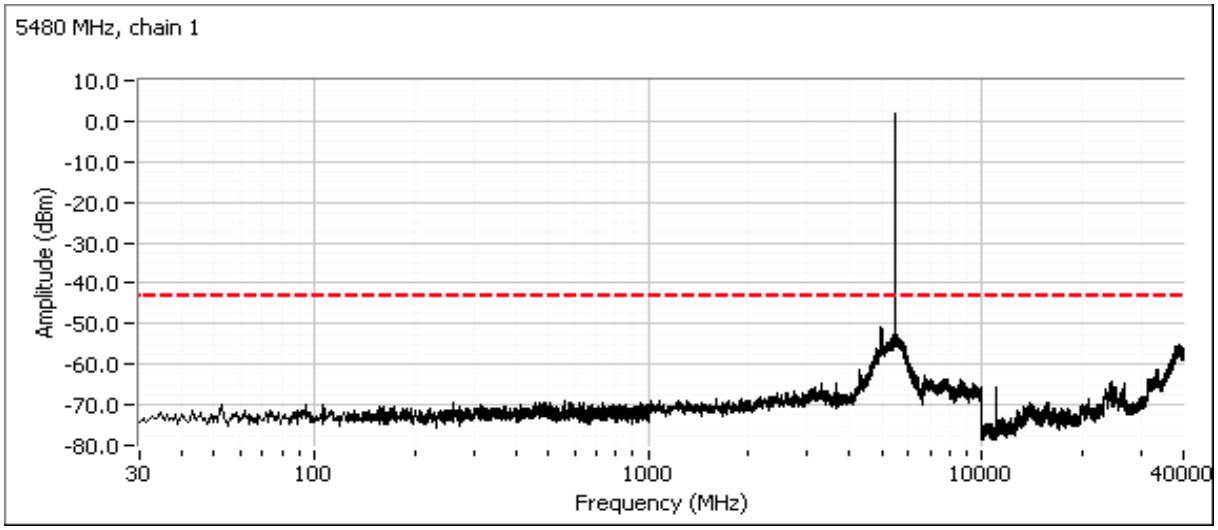


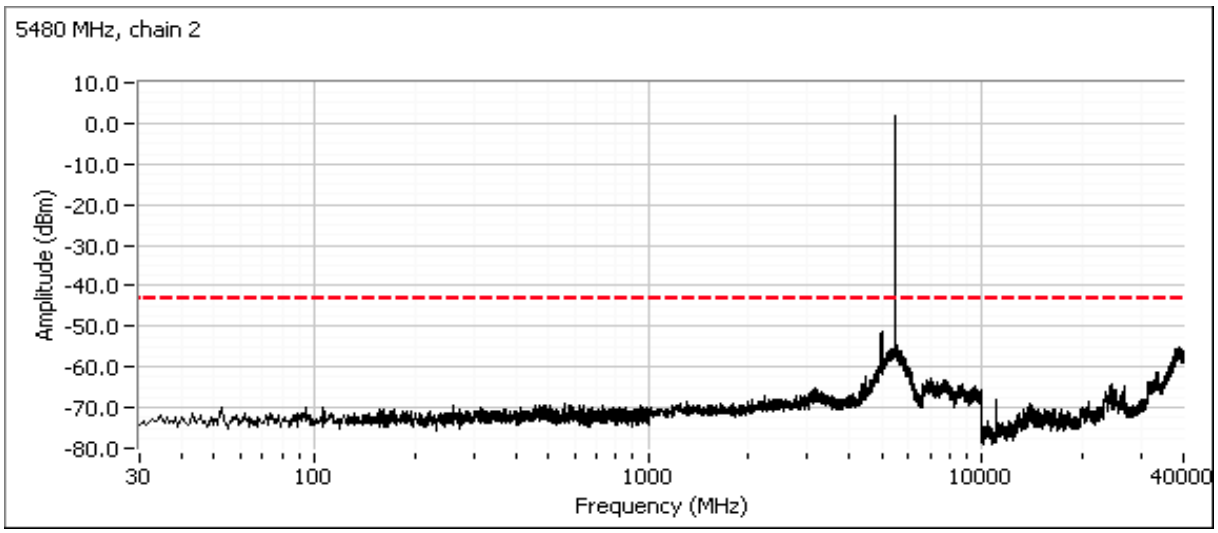


Wide-band plot, RB=VB=1MHz (Peak measurements versus limit).

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Low channel, 5470 - 5725 MHz Band



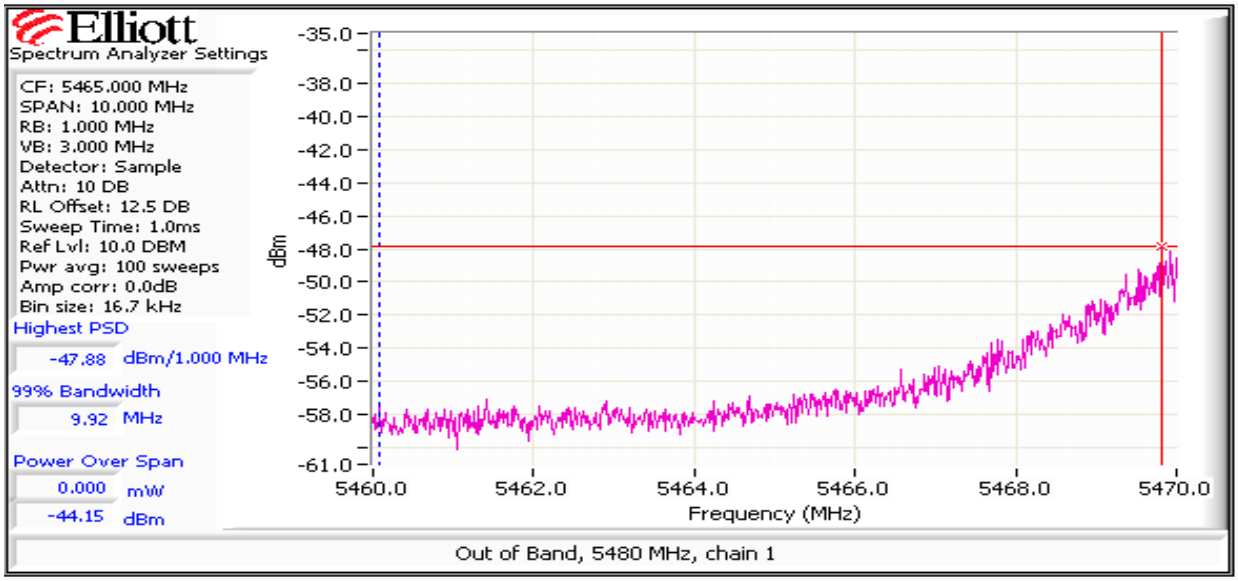


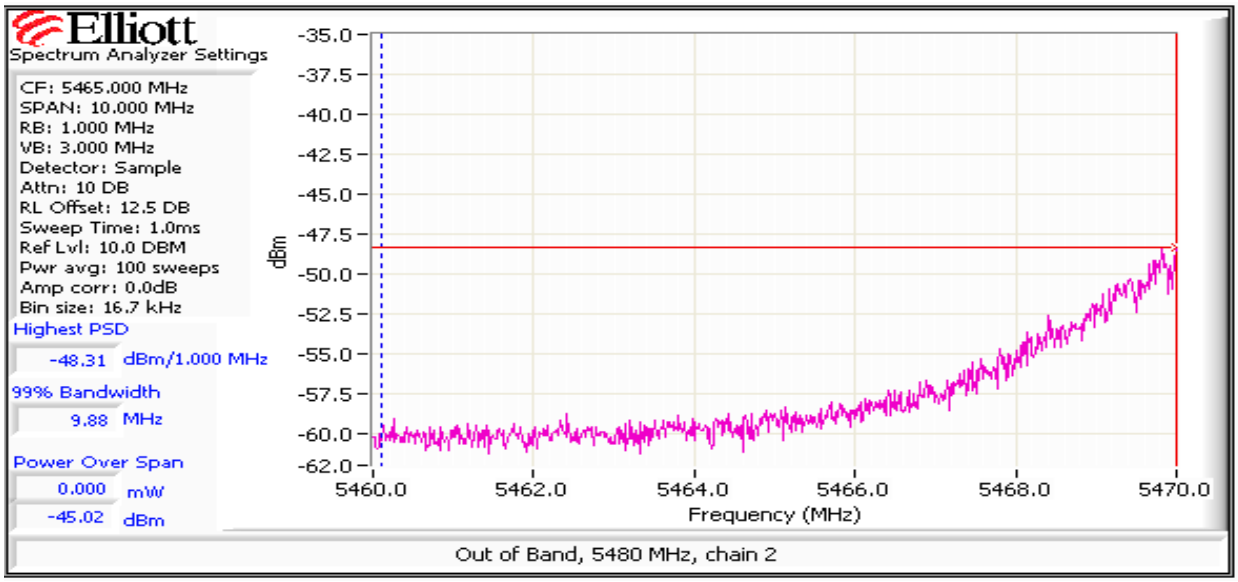
Wide-band plot, RB=VB=1MHz (Peak measurements versus limit).

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Plots for each chain showing compliance with the -27dBm/MHz limit for the 5460 - 5470 MHz band edge. Start and stop frequencies set to 5460-5470 MHz, RB=1MHz, VB=3MHz, power averaging enabled (100 traces).

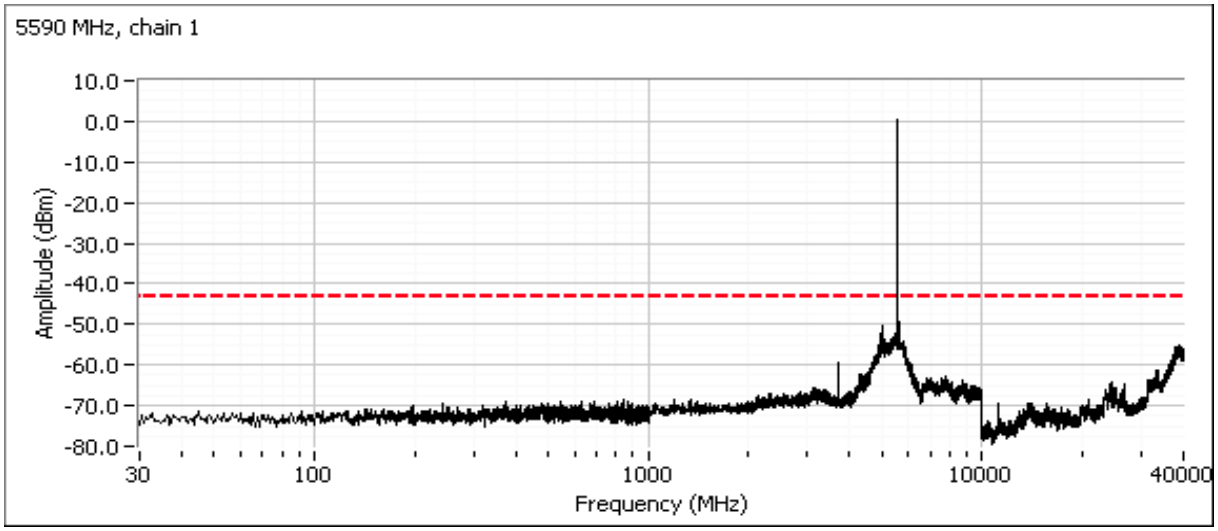
	Power Setting	Band edge Level		Antenna Gain (dBi)	EIRP		Total EIRP dBm/MHz	Limit dBm/MHz	Result
		dBm/MHz	mW/MHz		mW/MHz	dBm/MHz			
Chain 1	6	-47.9	0.00002	13.0	0.0003236	-34.9	-32.1	-27	PASS
Chain 2		-48.3	0.00001	13.0	0.0002951	-35.3			

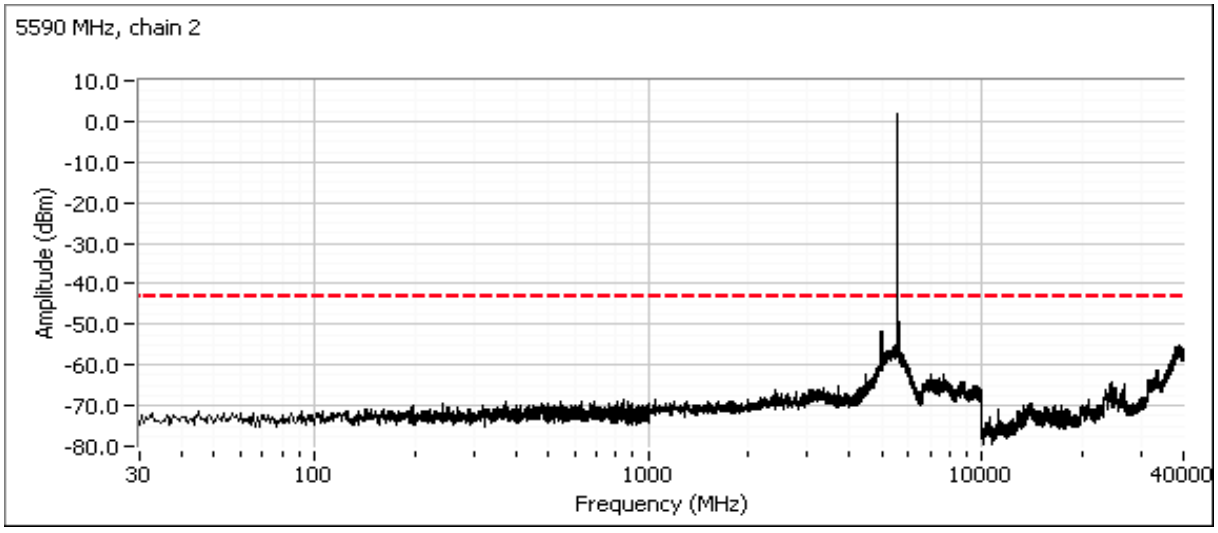




Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Center channel, 5470 - 5725 MHz Band

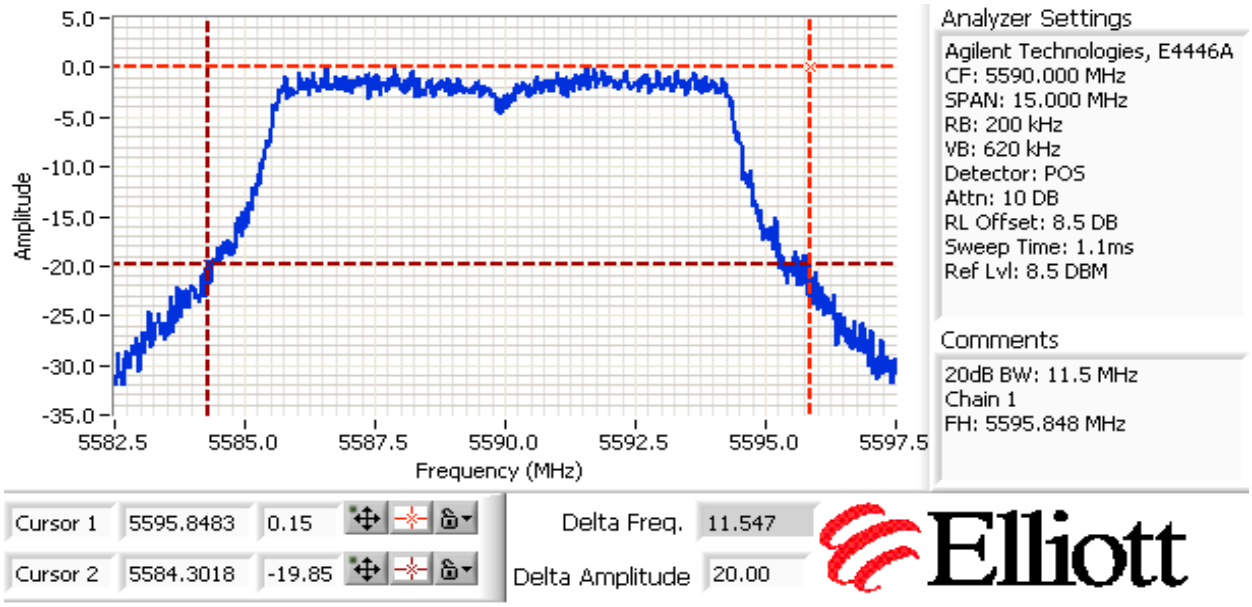


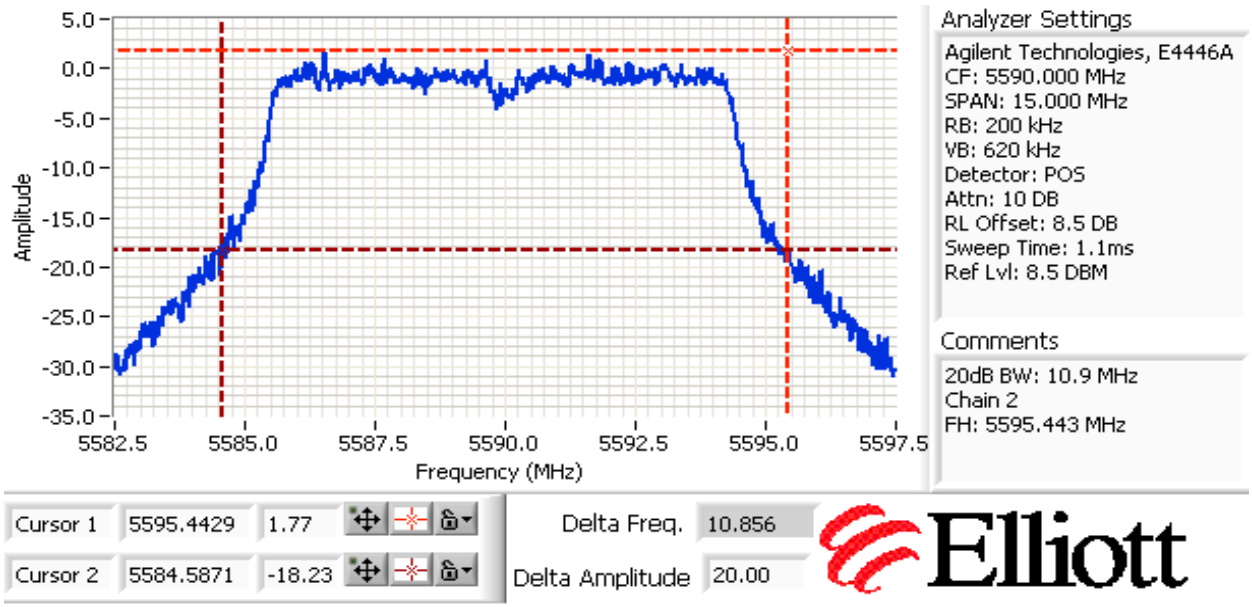


Wide-band plot, RB=VB=1MHz (Peak measurements versus limit).

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

For **master** devices - This plot is showing hat the 20dB bandwidth of the channel closest to 5600 MHz does not spill into the 5600-5650 MHz band. RB > 1% of span.

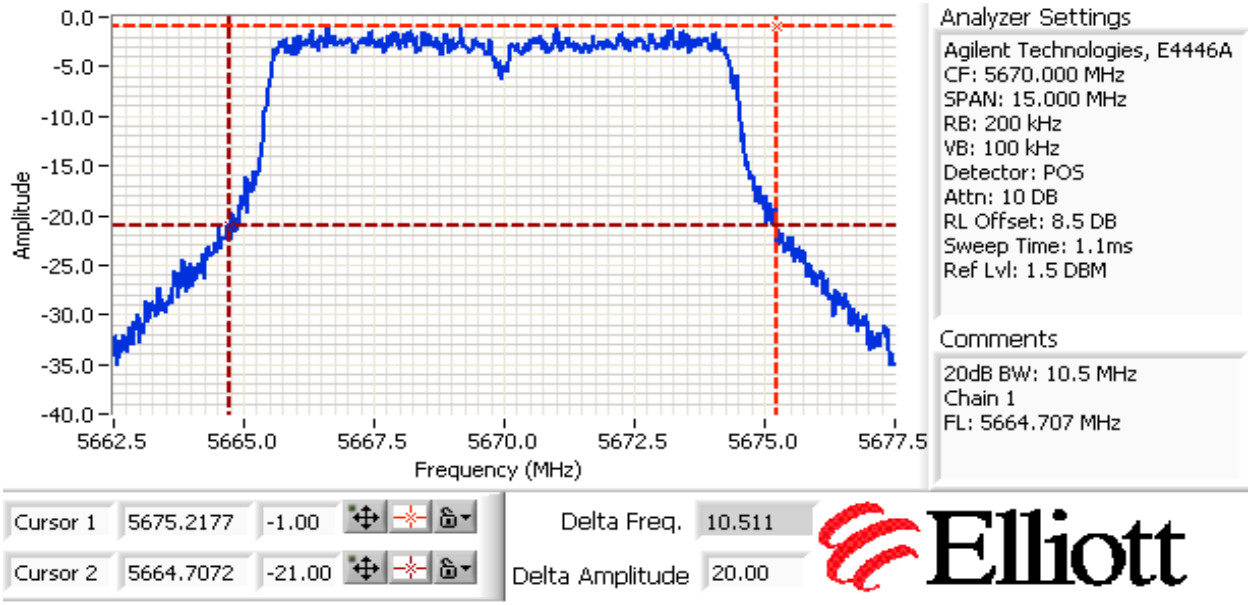


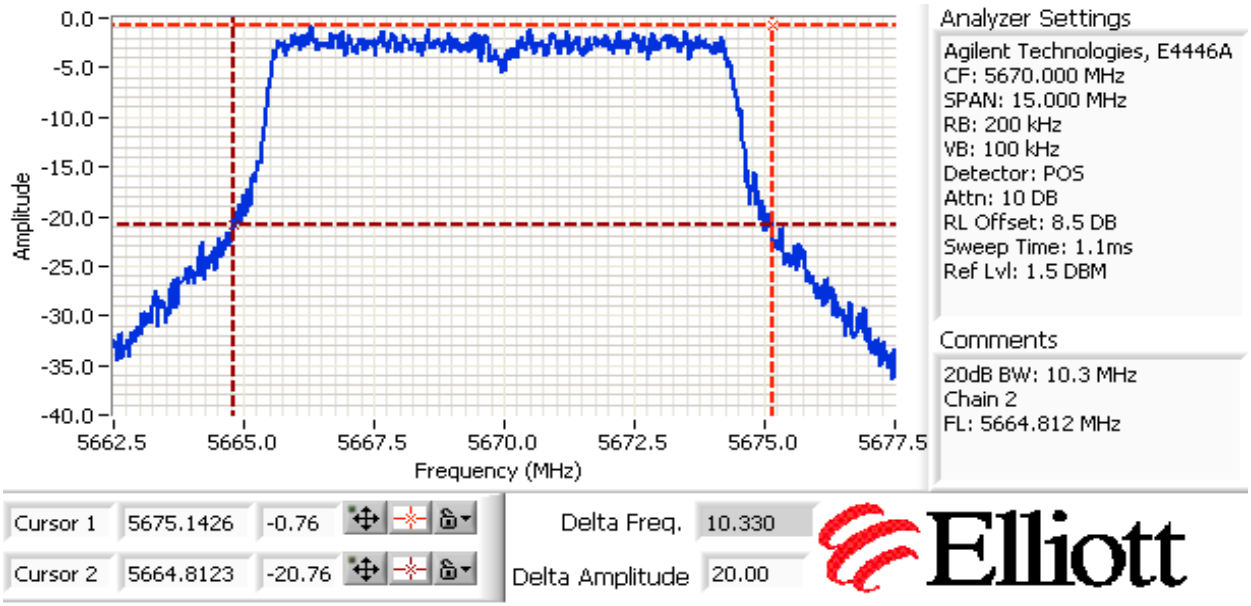


Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Channel adjacent to 5650 MHz

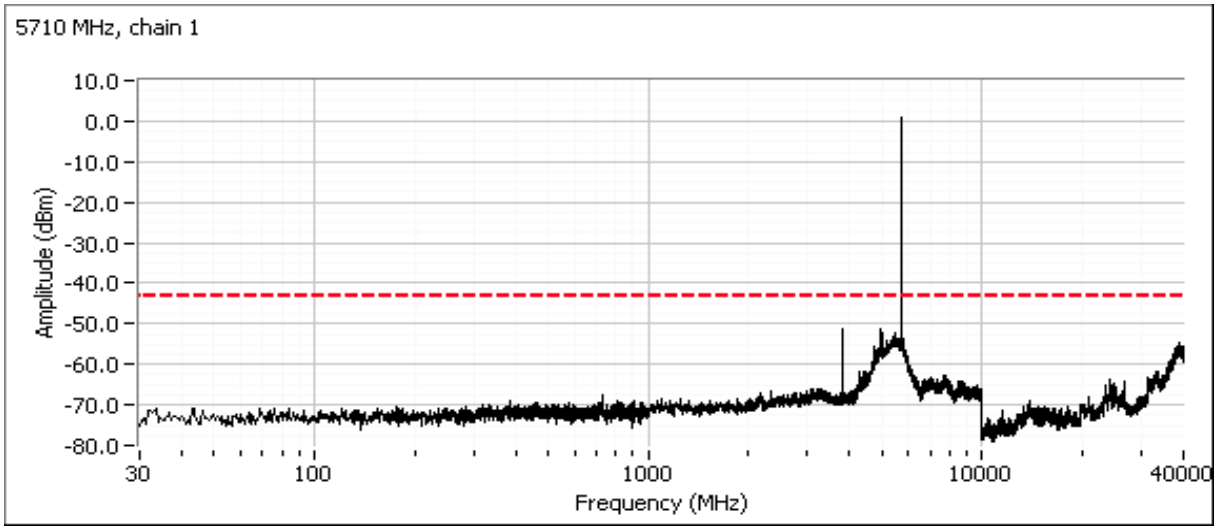
Plots showing that the 20dB bandwidth of the channel closest to **5650 MHz does not spill into the 5600-5650 MHz band.** RB > 1% of span.

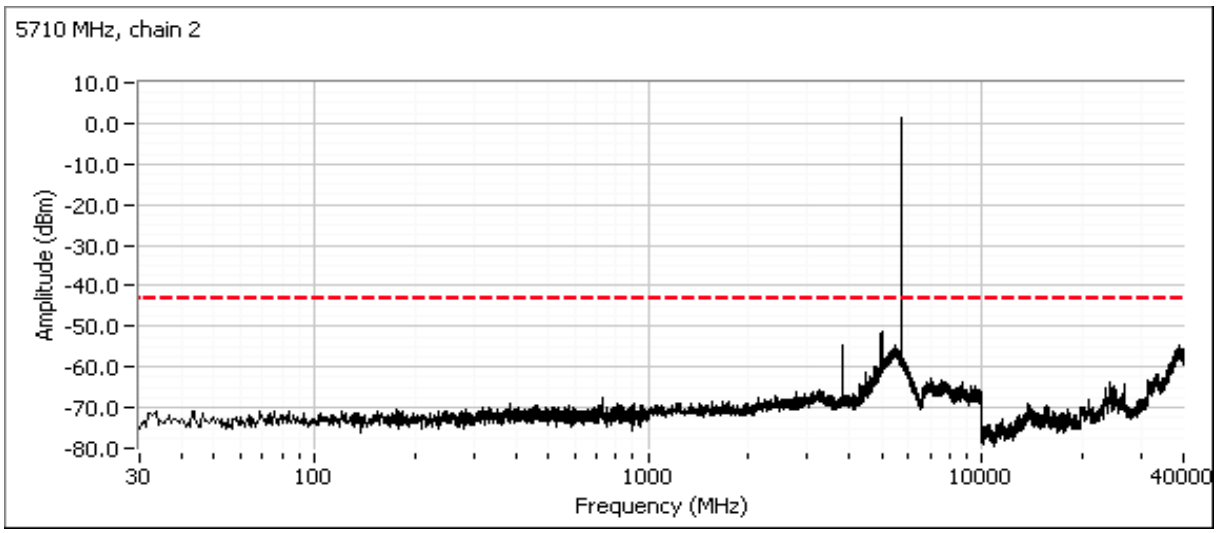




Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

High channel, 5470 - 5725 MHz Band



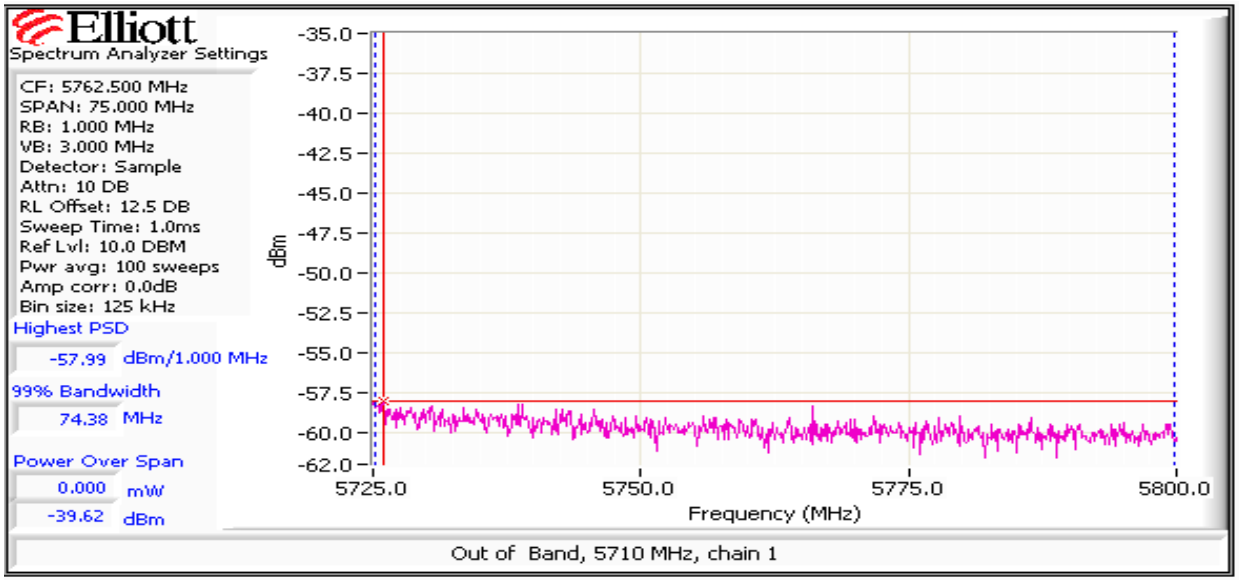


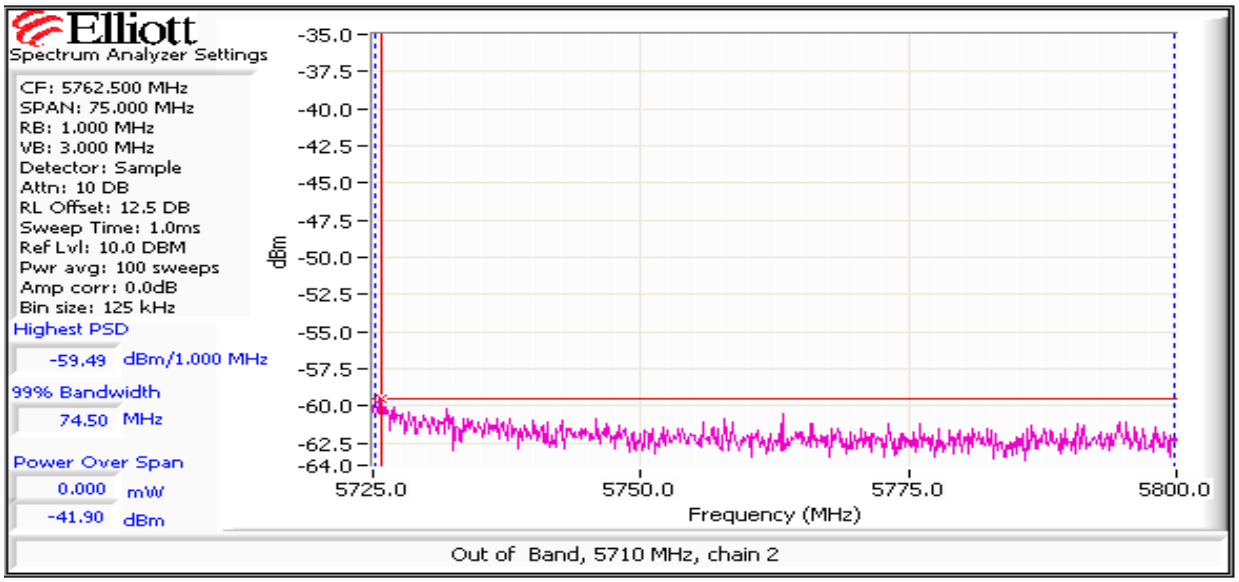
Wide-band plot, RB=VB=1MHz (Peak measurements versus limit).

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Plots for each chain showing compliance with the -27dBm/MHz limit above the 5725MHz band edge. Start and stop frequencies set to 5725-5800 MHz, RB=1MHz, VB=3MHz, power averaging enabled (100 traces):

	Power Setting	Band edge Level		Antenna Gain (dBi)	EIRP		Total EIRP dBm/MHz	Limit dBm/MHz	Result
		dBm/MHz	mW/MHz		mW/MHz	dBm/MHz			
Chain 1	6.5	-59.5	0.00000	13.0	2.239E-05	-46.5	-42.7	-27	PASS
Chain 2		-58.0	0.00000	13.0	3.162E-05	-45.0			





Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

RSS-210 (LELAN) and FCC 15.407(UNII)
Antenna Port Measurements
Power, PSD, Peak Excursion, 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: 4/14/2011
Test Engineer: Joseph Cadigal/R. Varelas
Test Location: FT Chamber#5

Config. Used: 1
Config Change: none
EUT Voltage: POE

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Power, 5250 - 5350MHz	15.407(a) (1), (2)	Pass	13.7 mW
1	PSD, 5250 - 5350MHz	15.407(a) (1), (2)	Pass	0.7 dBm/MHz
1	Max EIRP 5250 - 5350MHz	TPC required if EIRP≥ 500mW (27dBm). EIRP ≥ 200mW DFS threshold = -64dBm.	Pass	EIRP = 27.4 dBm (546 mW)
1	Power, 5470 - 5725MHz	15.407(a) (1), (2)	Pass	23.3 mW
1	PSD, 5470 - 5725MHz	15.407(a) (1), (2)	Pass	1.5 dBm/MHz
1	Max EIRP 5470 - 5725MHz	TPC required if EIRP≥ 500mW (27dBm). EIRP ≥ 200mW DFS threshold = -64dBm.	Pass	EIRP = 29.7 dBm (929 mW)
1	26dB Bandwidth	15.407 (Determines max power)	Pass	> 20MHz for all modes
1	99% Bandwidth	RSS 210 (Information only)	Pass	18.2 MHz
2	Peak Excursion Envelope	15.407(a) (6) 13dB	Pass	11.81dB
3	Antenna Conducted - Out of Band Spurious	15.407(b) -27dBm/MHz	Pass	All emissions below -27dBm/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.

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Ambient Conditions:

Temperature:	25 °C
Rel. Humidity:	37 %

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

Note 1:	Output power measured using a spectrum analyzer (see plots below). RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was continuous) and power integration over **50** MHz (method 1 of DA-02-2138A1).
Note 2:	Measured using the same analyzer settings used for output power. PSD is highest value on the plot.
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:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

MIMO Device - 5250-5350 MHz Band

Date of Test: 6/13/2011 Test Location: FTChamber#4
Test Engineer: Joseph Cadigal Config Change: none

MIMO Device - 5250-5350 MHz Band

	Chain 1	Chain 2	Chain 3	Coherent	Effective[5]	EIRP (mW)	EIRP (dBm)
Antenna Gain (dBi):	13	13		Yes	16.0	545.6	27.4

Power

Frequency (MHz)	Software Setting	26dB BW (MHz)	Measured Output Power[1] dBm			Total		Limit (dBm)	Max Power (W)	Pass or Fail
			Chain 1	Chain 2	Chain 3	mW	dBm			
5265	5.0	27.3	5.5	5.2		6.9	8.4	14.0	0.014	PASS
5300	**7.5**	**28.4**	**8.7**	**7.9**		**13.7**	**11.4**	14.0		PASS
5320	5.0	28.3	5.8	4.8		6.8	8.3	14.0		PASS

PSD

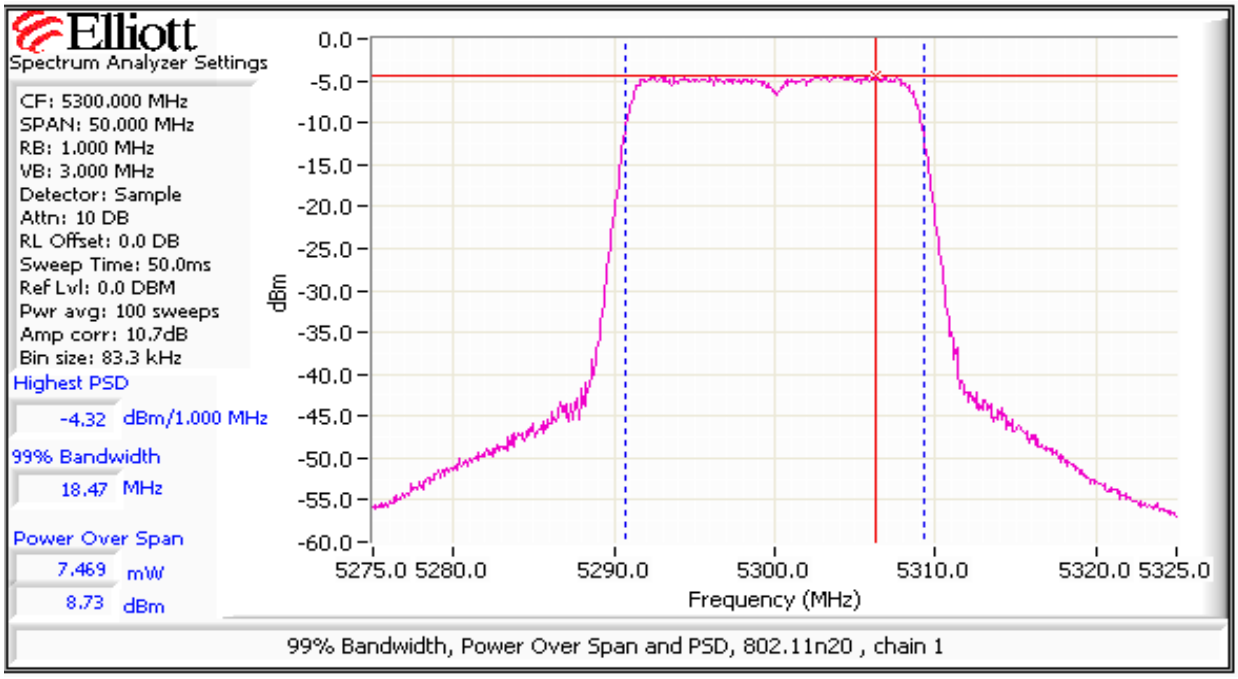
Frequency (MHz)	99%[4] BW	Total Power	PSD[2] dBm/MHz			Total PSD		Limit		Pass or Fail
			Chain 1	Chain 2	Chain 3	mW/MHz	dBm/MHz	FCC	RSS 210[3]	
5265	17.3	8.4	-7.6	-7.9		0.3	-4.7	1.0	11.0	PASS
5300	18.4	11.4	-4.3	-5.2		**0.7**	**-1.7**	1.0	11.0	PASS
5320	18.4	8.3	-7.3	-7.9		0.3	-4.6	1.0	11.0	PASS

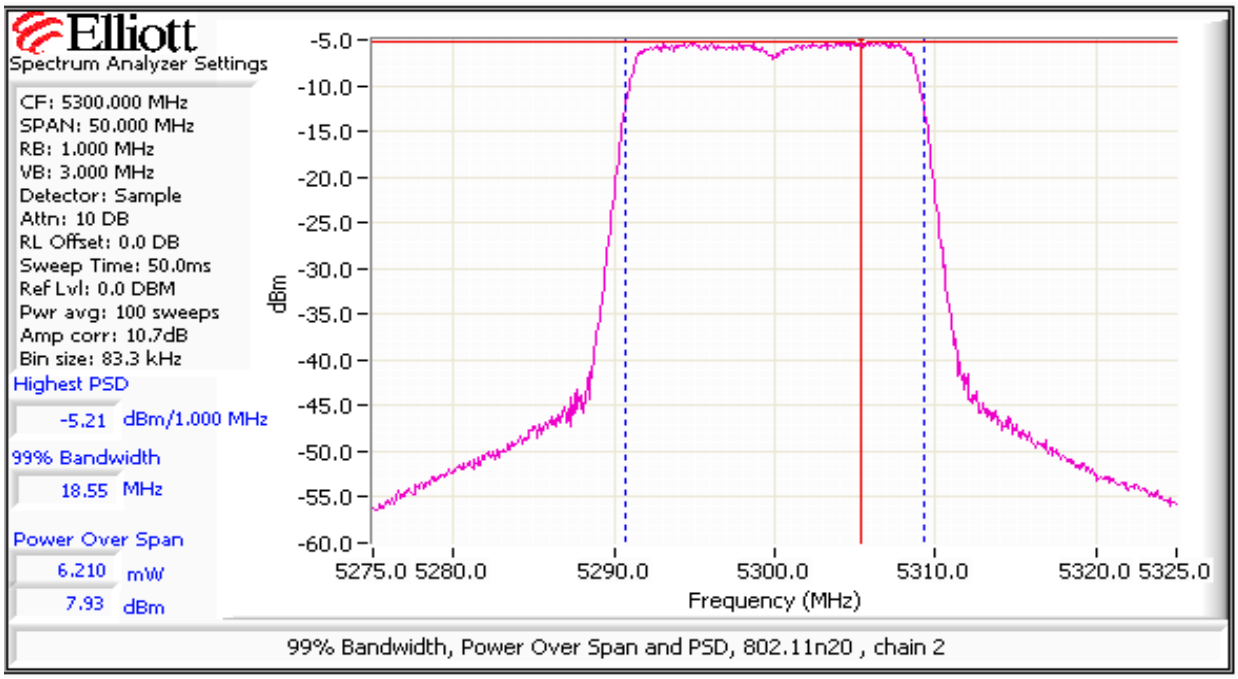
Output Power at Low Power Setting - 5250-5350 MHz Band

As EIRP exceeds 500mW TPC is required - measurements to show eirp < 250mW.
Limit is set to 24dBm (250mW) minus the antenna gain (dBi).

Frequency (MHz)	Software Setting	26dB BW (MHz)	Measured Output Power[1] dBm			Total		Limit (dBm)	Max Power (W)	Pass or Fail
			Chain 1	Chain 2	Chain 3	mW	dBm			
5265	4.0		4.8	3.9		5.5	7.4	8.0	0.006	PASS
5300	5.0		4.7	4.2		5.6	7.5	8.0		PASS
5320	5.0		4.4	3.7		5.0	7.0	8.0		PASS

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A





Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

MIMO Device - 5470-5725 MHz Band

Date of Test: 6/13/2011 Test Location: FTChamber#4

Test Engineer: Joseph Cadigal Config Change: none

	Chain 1	Chain 2	Chain 3	Coherent	Effective[5]	EIRP (mW)	EIRP (dBm)
Antenna Gain (dBi):	13	13		Yes	16.0	929.1	29.7

Power

Frequency (MHz)	Software Setting	26dB BW (MHz)	Measured Output Power[1] dBm			Total		Limit (dBm)	Max Power (W)	Pass or Fail
			Chain 1	Chain 2	Chain 3	mW	dBm			
5500	9.0	27.8	9.7	9.1		17.4	12.4	14.0	0.023	PASS
5580	**11.5**	**27.8**	**10.6**	**10.7**		**23.3**	**13.7**	14.0		PASS
5700	8.5	28.0	7.8	7.6		11.7	10.7	14.0		PASS

PSD

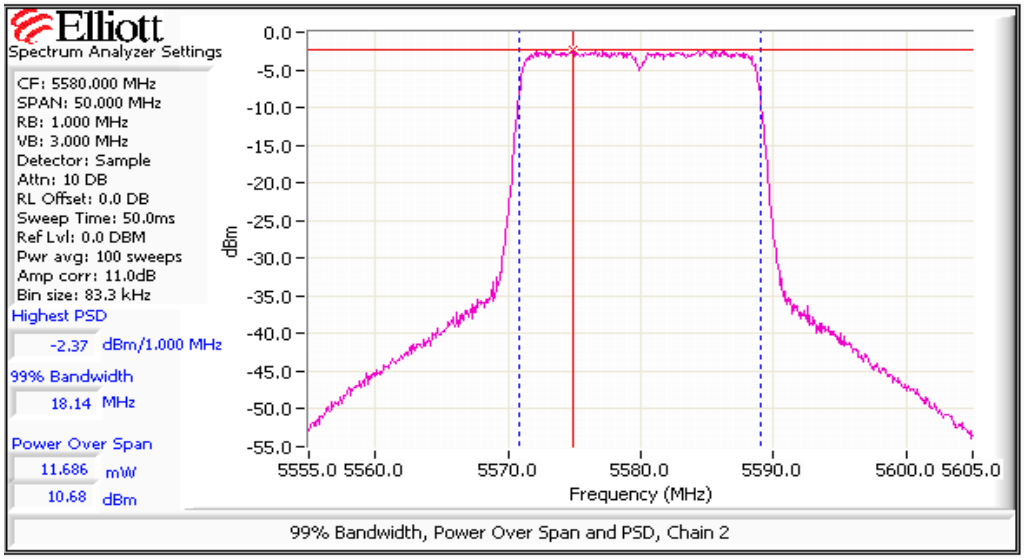
Frequency (MHz)	99%[4] BW	Total Power	PSD[2] dBm/MHz			Total PSD		Limit		Pass or Fail
			Chain 1	Chain 2	Chain 3	mW/MHz	dBm/MHz	FCC	RSS 210[3]	
5500	18.1	12.4	-3.3	-4.0		0.9	-0.6	1.0	11.0	PASS
5580	18.1	13.7	-1.4	-1.5		**1.4**	**1.5**	1.0	11.0	FAIL
5700	18.2	10.7	-5.3	-5.6		0.6	-2.4	1.0	11.0	PASS

Output Power at Low Power Setting - 5470-5725 MHz Band

As EIRP exceeds 500mW TPC is required - measurements to show eirp < 250mW.

Limit is set to 24dBm (250mW) minus the antenna gain (dBi).

Frequency (MHz)	Software Setting	26dB BW (MHz)	Measured Output Power[1] dBm			Total		Limit (dBm)	Max Power (W)	Pass or Fail
			Chain 1	Chain 2	Chain 3	mW	dBm			
5500	5.0		4.4	4.7		5.7	7.5	8.0	0.006	PASS
5580	5.5		4.1	4.4		5.3	7.2	8.0		PASS
5700	5.5		3.9	4.1		5.0	7.0	8.0		PASS



Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run #2: Peak Excursion Measurement

20MHz: Device meets the requirement for the peak excursion

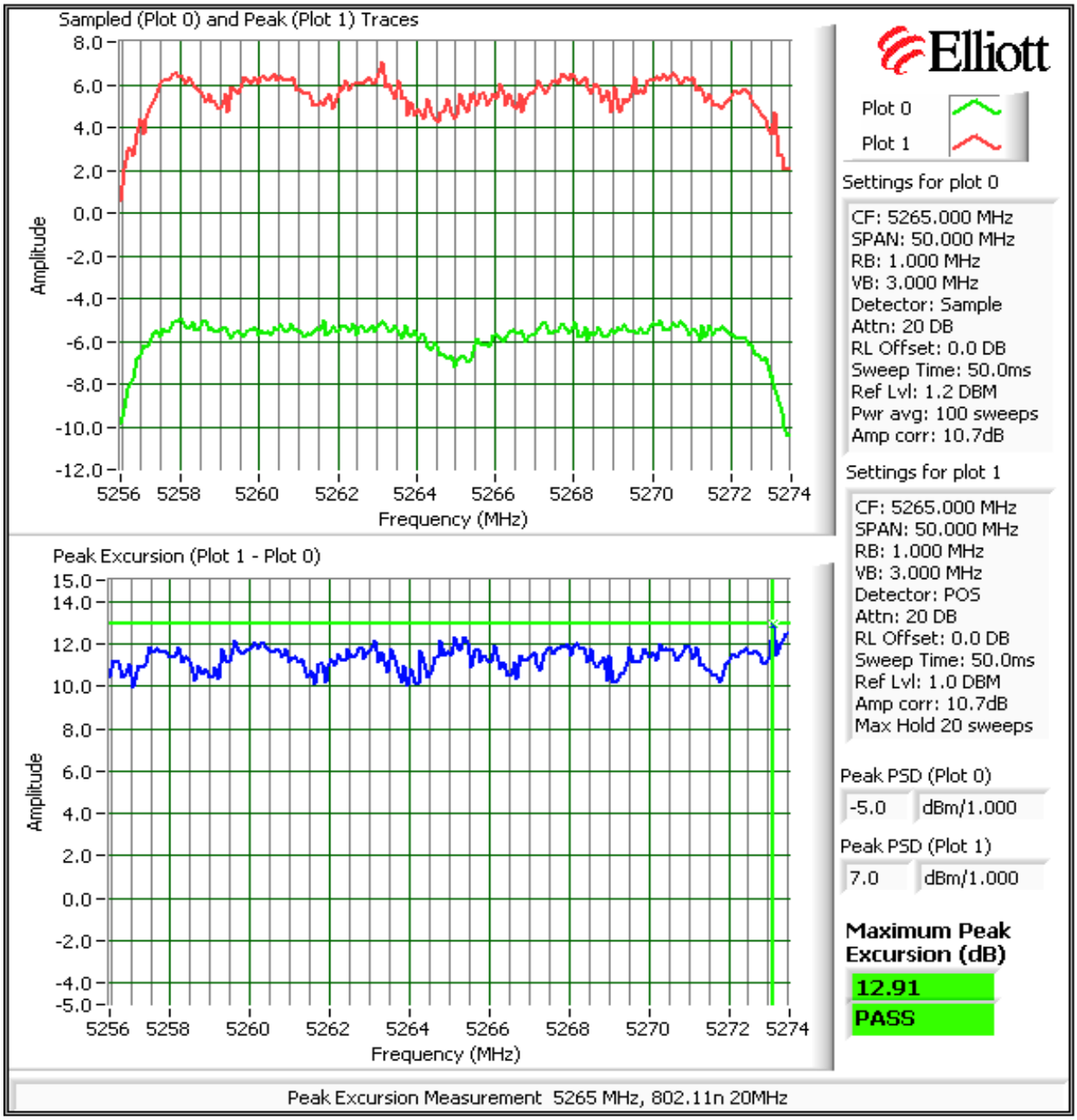
Freq	Peak Excursion(dB)		Freq	Peak Excursion(dB)	
(MHz)	Value	Limit	(MHz)	Value	Limit
5265	12.91/12.47	13.0	5500	11.62/11.04	13.0
5300	12.34/12.15	13.0	5580	11.67/11.57	13.0
5320	12.35/11.81	13.0	5700	**11.81**/10.65	13.0

Plots Showing Peak Excursion (Worst Case)

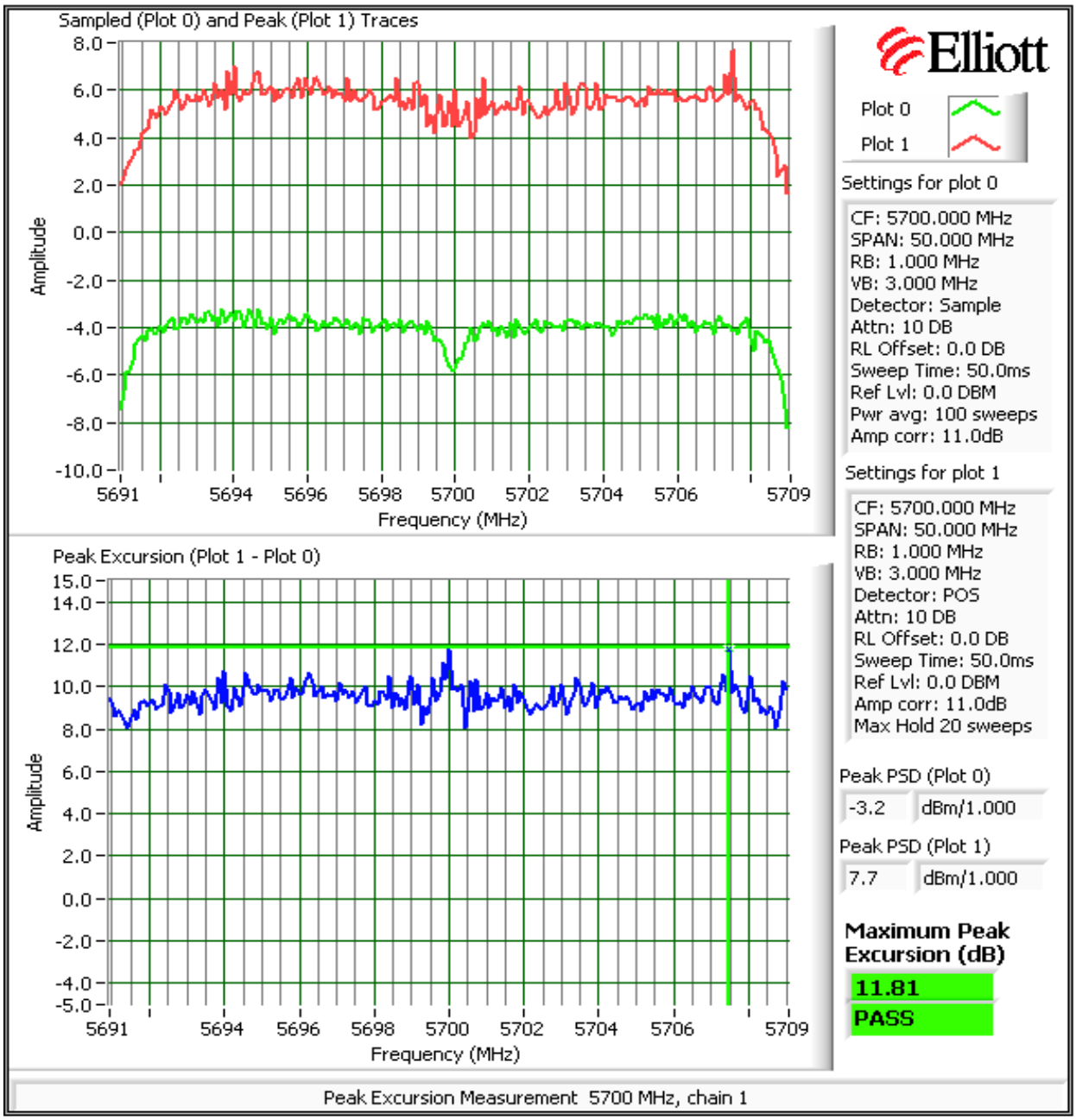
Trace A: RBW = 1MHz, VBW = 3MHz, Peak hold

Trace B: Same settings as used for power/PSD measurements (RBW = 1 MHz, VBW = 3MHz, Integrated **average** power)

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A



Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A



Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run #3: Out Of Band Spurious Emissions - Antenna Conducted

MIMO Devices: Antenna gain used is the individual antenna antenna gain (the spurious emissions at the band edges are not considered to be coherent between chains and spurious removed from the band edges are evaluated as radiated emissions if close to the limit). The plots were obtained for each chain individually and the limit was adjusted to account for all chains transmitting simultaneously

Number of transmit chains:	2		
Maximum Antenna Gain:	13.0	dBi	
Spurious Limit:	-27.0	dBm/MHz eirp	
Adjustment for 2 chains:	-3.0	dB adjustment for multiple chains.	
Limit Used On Plots [Note 1]:	-43.0	dBm/MHz	Average Limit (RB=1MHz, VB=10Hz)

Note 1:	The -27dBm/MHz limit is an eirp limit. The limit for antenna port conducted measurements is adjusted to take into consideration the maximum antenna gain and number of transmitters (limit = -27dBm - antenna gain - 10Log[N]). Radiated field strength measurements for signals more than 50MHz from the bands and that are close to the limit are made to determine compliance as the antenna gain is not known at these frequencies.
Note 2:	All spurious signals below 1GHz are measured during digital device radiated emissions test.
Note 3:	Signals within 10MHz of the 5.725 or 5.825 Band edge are subject to a limit of -17dBm EIRP
Note 4:	If the device is for outdoor use then the -27dBm eirp limit also applies in the 5150 - 5250 MHz band.
Note 5:	Signals that fall in the restricted bands of 15.205 are subject to the limit of 15.209.

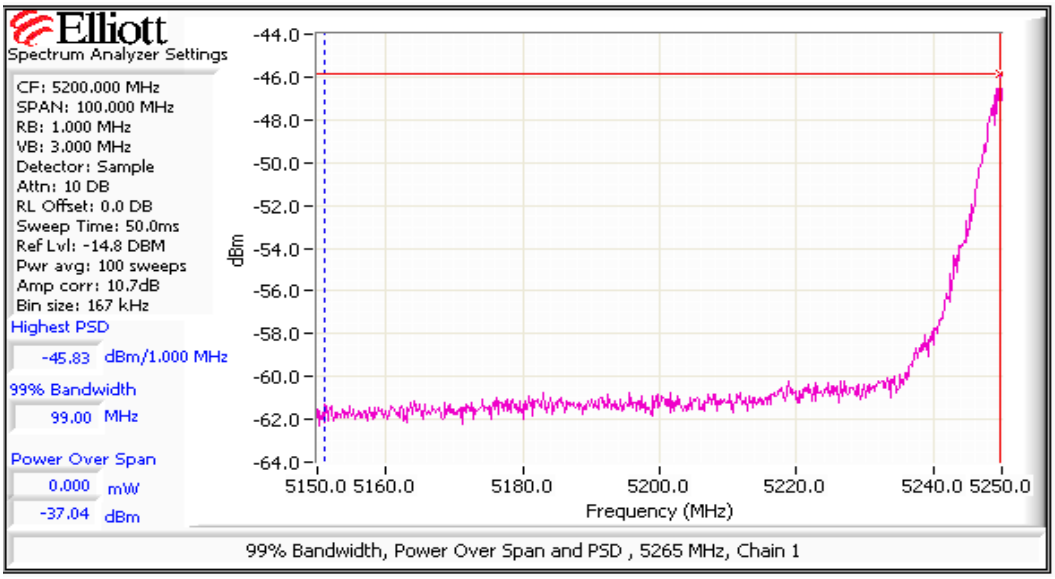
Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

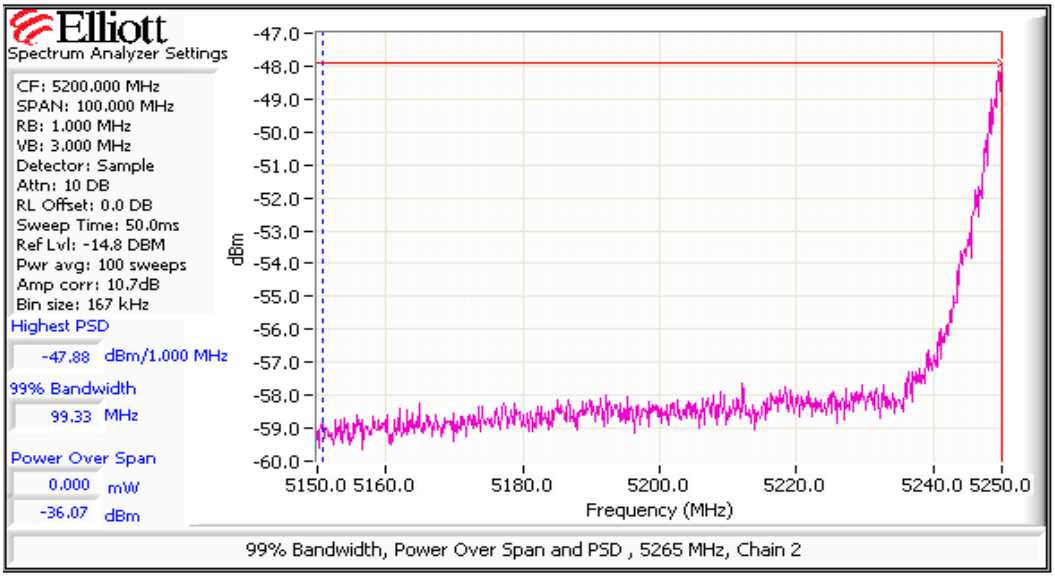
Low channel, 5250 - 5350 MHz Band

Plots for each chain showing compliance with the -27dBm/MHz limit in the 5150 - 5250 MHz band. Start and stop frequencies set to 5150-5250 MHz, RB=1MHz, VB=3MHz, power averaging enabled (100 traces):

Channel frequency: 5265 MHz

	Power Setting	Band edge Level		Antenna Gain (dBi)	EIRP		Total EIRP dBm/MHz	Limit dBm/MHz	Result
		dBm/MHz	mW/MHz		mW/MHz	dBm/MHz			
Chain 1	7.5	-45.8	0.00003	13.0	0.0005212	-32.8	-30.7	-27	PASS
Chain 2		-47.9	0.00002	13.0	0.0003251	-34.9			

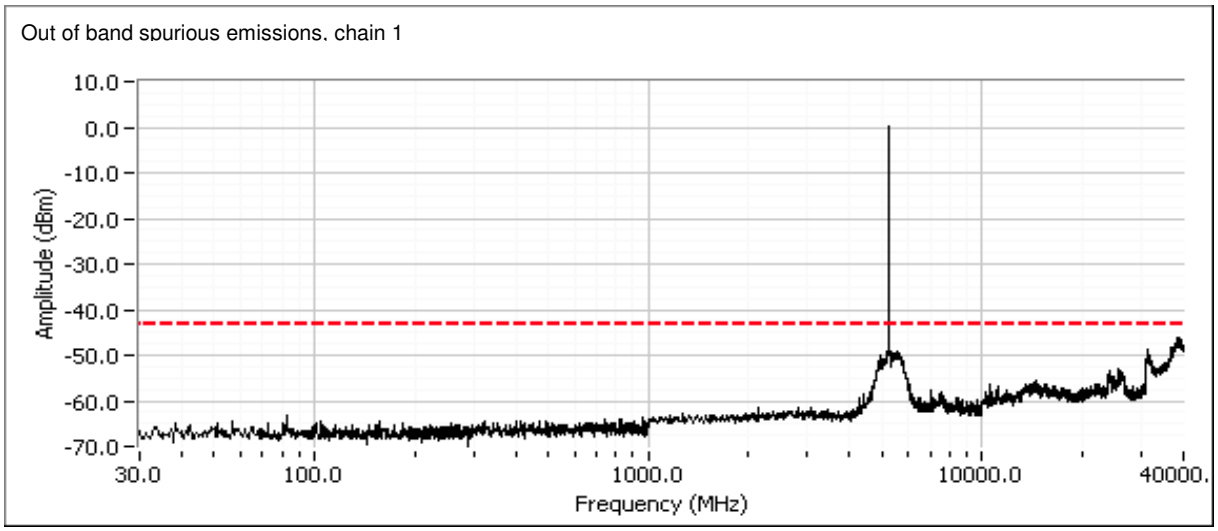




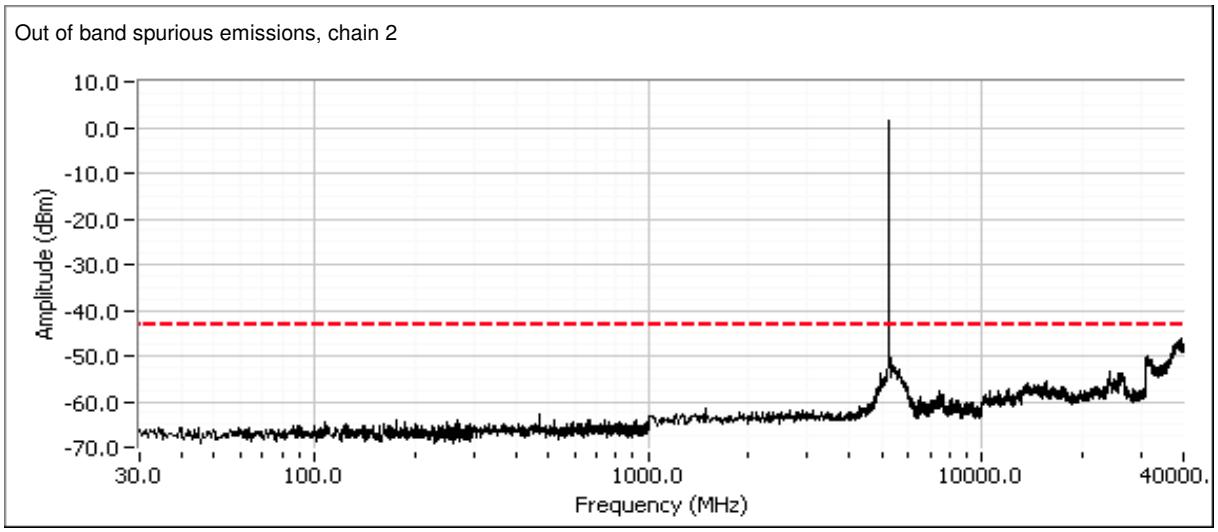
Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Wide-band plot, RB=VB=1MHz (Peak measurements versus limit).

Out of band spurious emissions, chain 1

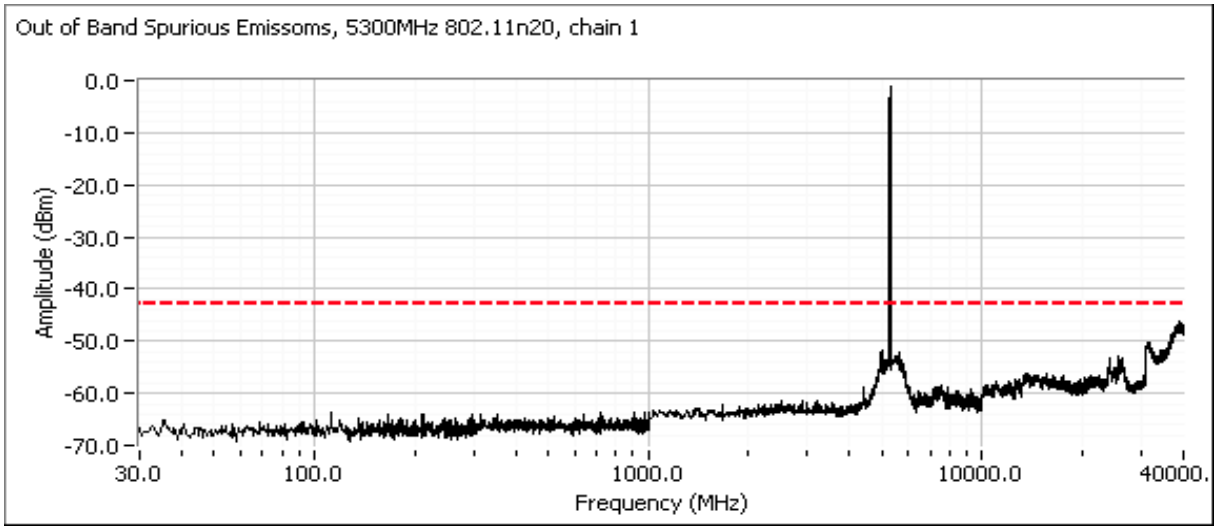


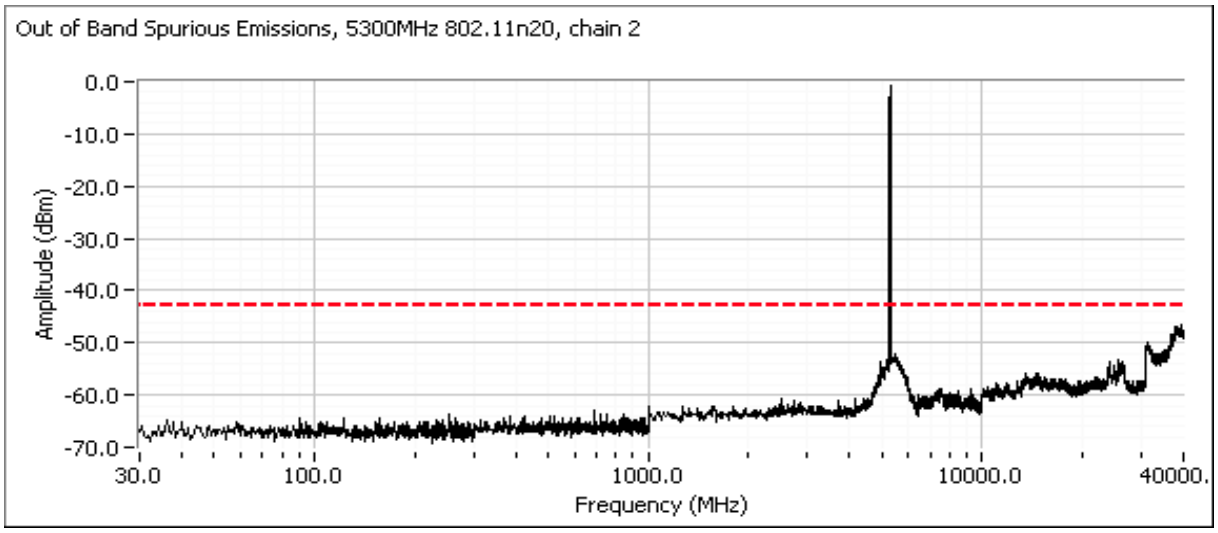
Out of band spurious emissions, chain 2



Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Center channel, 5250 - 5350 MHz Band





High channel, 5250 - 5350 MHz Band

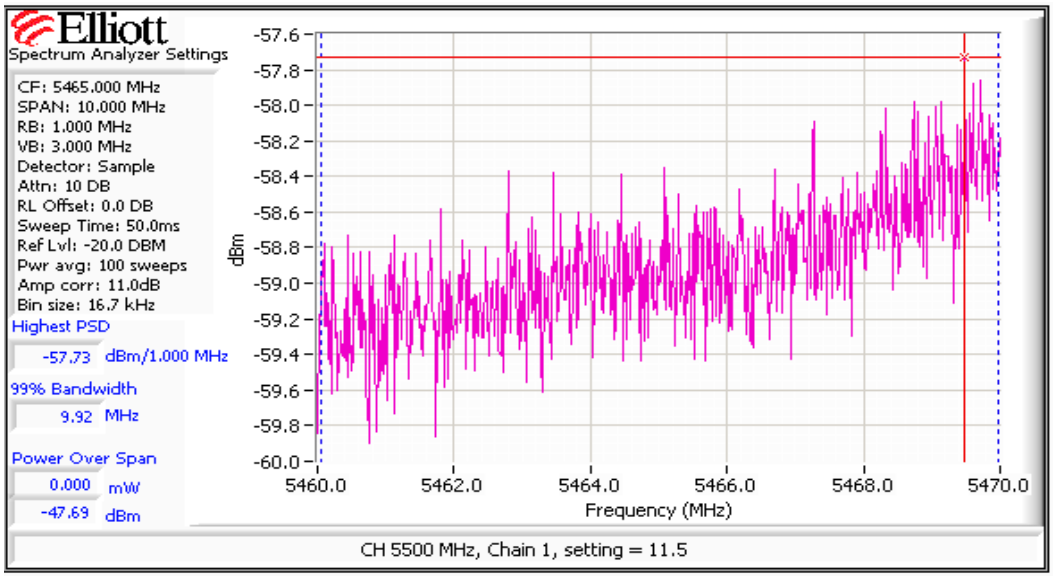
Note - compliance with the radiated limits for the restricted band immediately above 5350MHz is demonstrated through the radiated emissions tests.

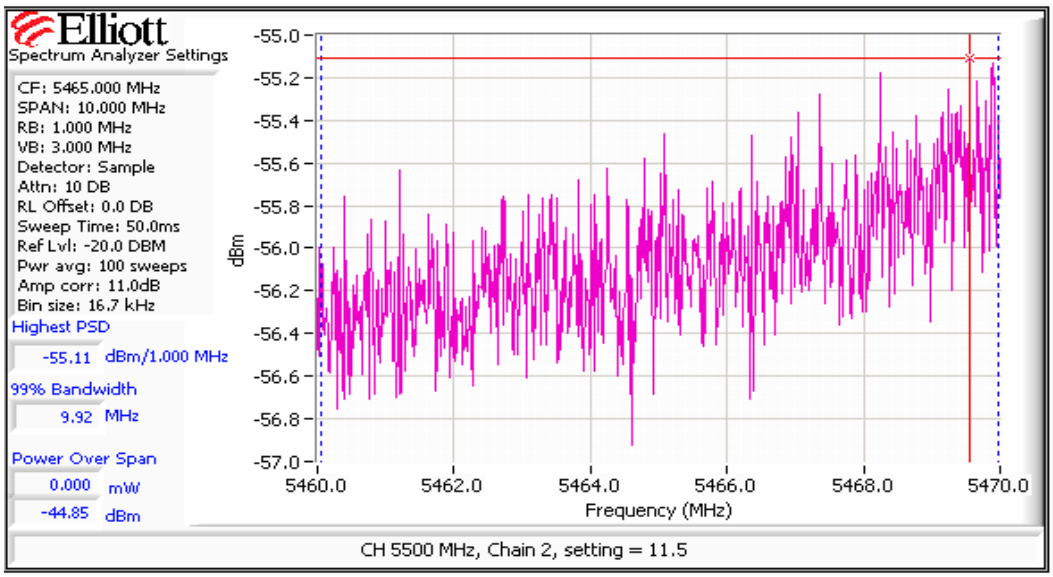
Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Low channel, 5470 - 5725 MHz Band

Plots for each chain showing compliance with the -27dBm/MHz limit for the 5460 - 5470 MHz band edge. Start and stop frequencies set to 5460-5470 MHz, RB=1MHz, VB=3MHz, power averaging enabled (100 traces). **Note** - compliance with the radiated limits for the restricted band immediately below 5460MHz is demonstrated through the radiated emissions tests.

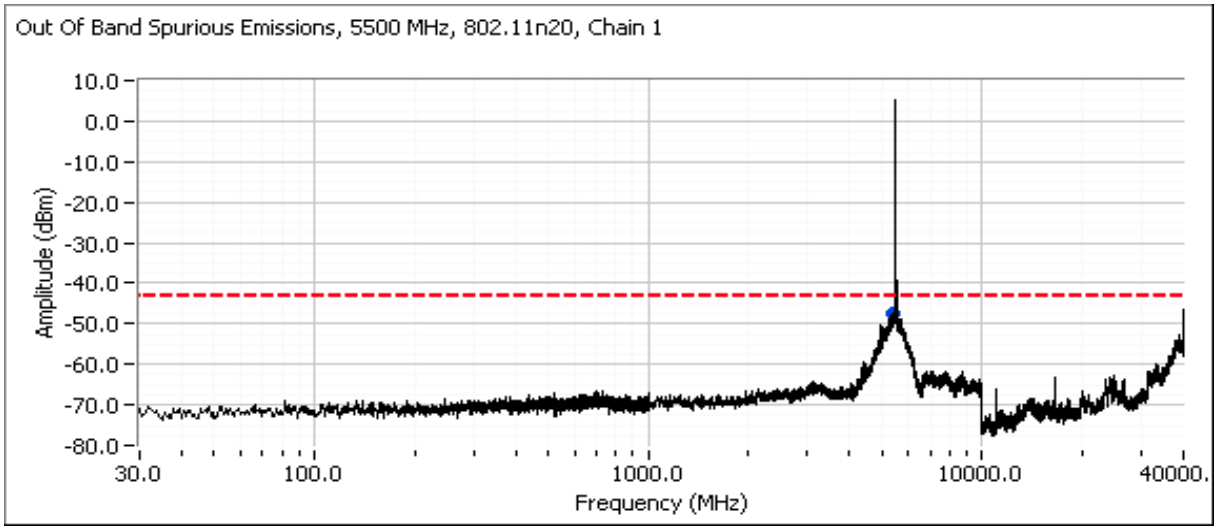
	Power Setting	Band edge Level		Antenna Gain (dBi)	EIRP		Total EIRP dBm/MHz	Limit dBm/MHz	Result
		dBm/MHz	mW/MHz		mW/MHz	dBm/MHz			
Chain 1	11.5	-57.7	0.00000	13.0	3.388E-05	-44.7	-40.2	-27	PASS
Chain 2		-55.1	0.00000	13.0	6.166E-05	-42.1			

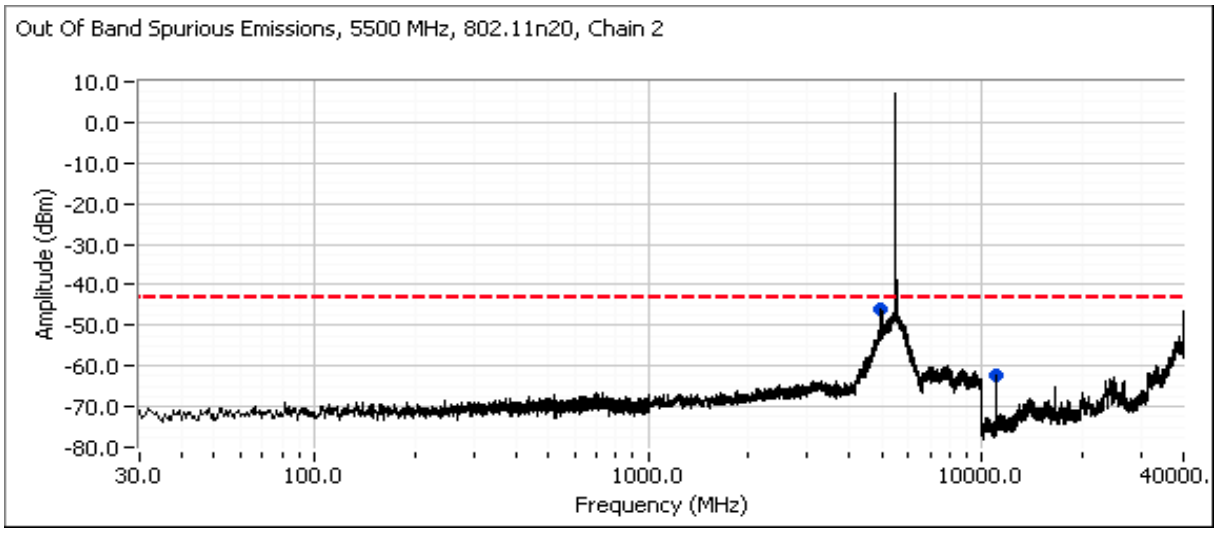




Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Wide-band plot, RB=VB=1MHz (Peak measurements versus limit). SA input attenuation lowered above 10 GHz.





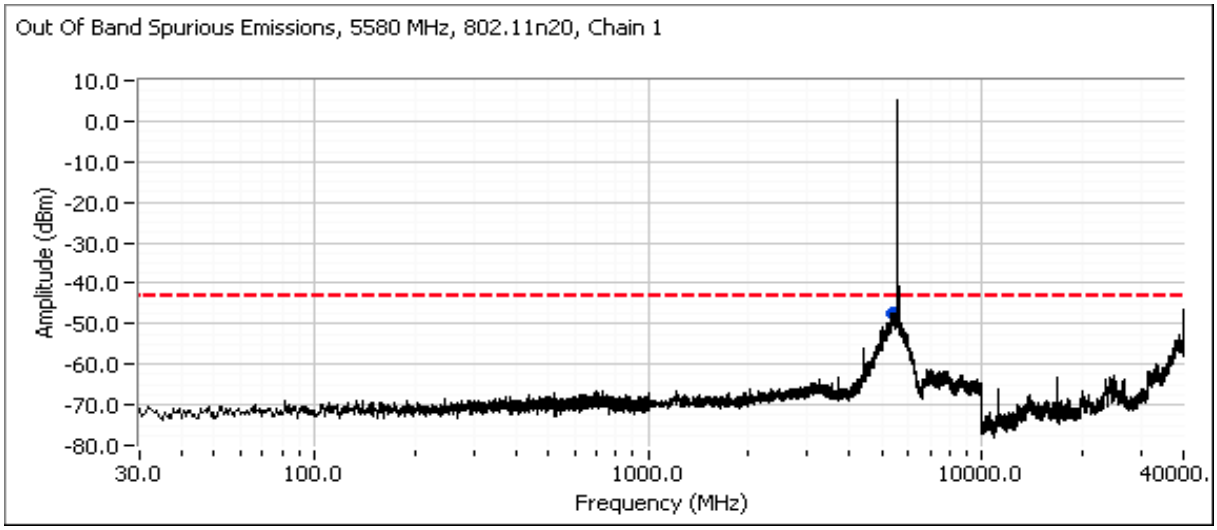
Peak readings

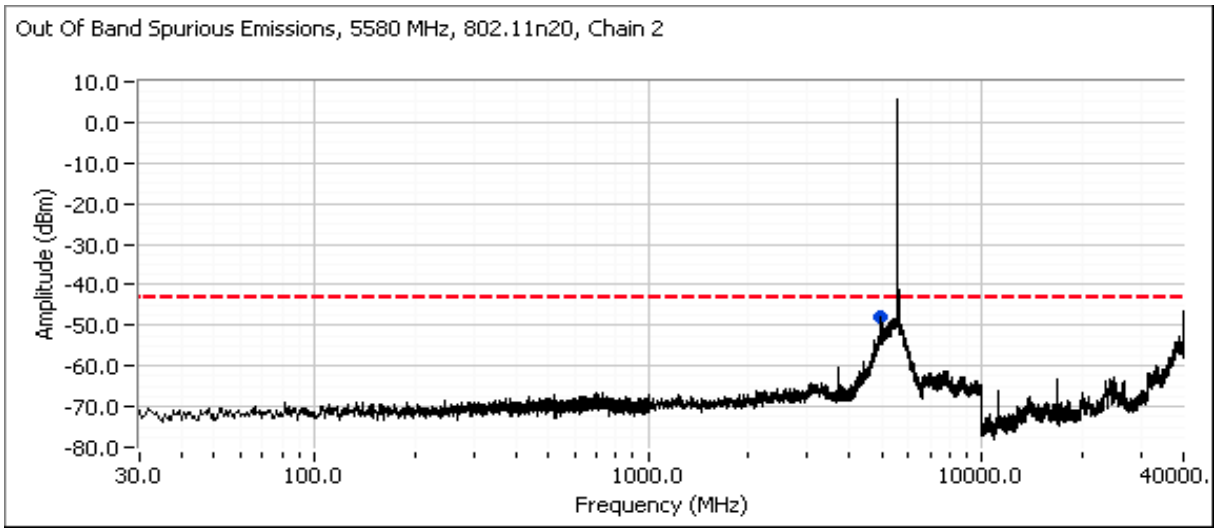
Frequency	Level	Port			Detector			Comments
MHz	dBm		Limit	Margin	Pk/QP/Avg			
5378.770	-47.6	RF Port	-43.0	-4.6	Peak			Chain 1
4974.790	-45.8	RF Port	-43.0	-2.8	Peak			Chain 2
10998.200	-62.2	RF Port	-43.0	-19.2	Peak			Chain 2

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Center channel, 5470 - 5725 MHz Band

Wide-band plot, RB=VB=1MHz (Peak measurements versus limit). SA input attenuation lowered above 10 GHz.





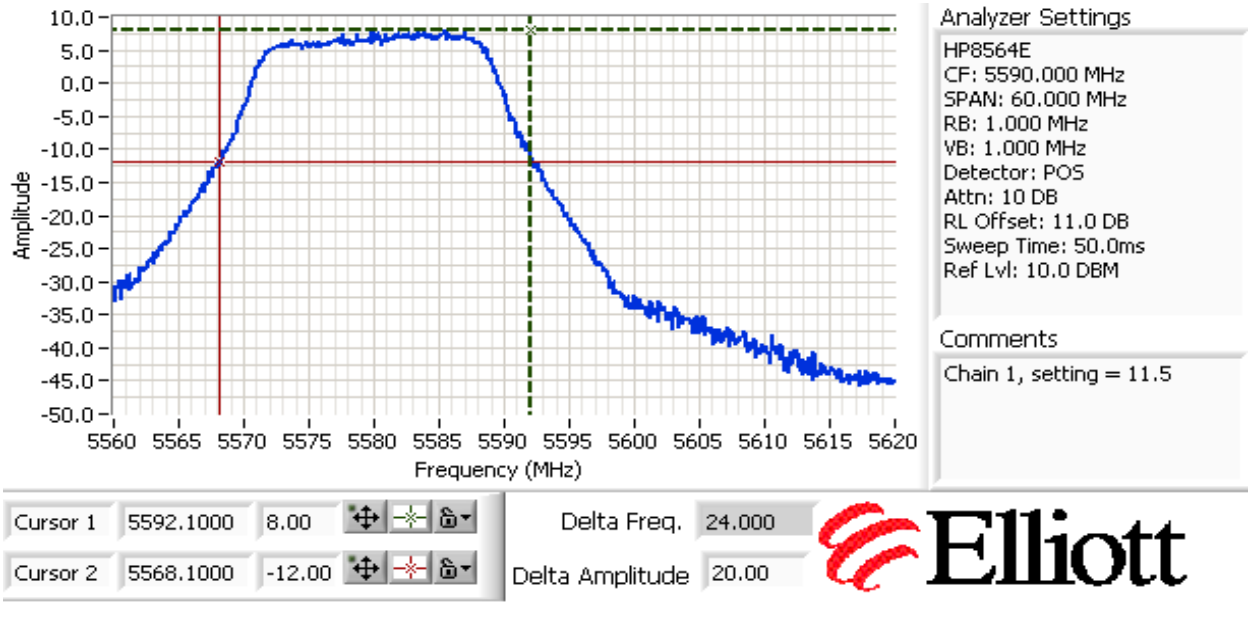
Peak readings

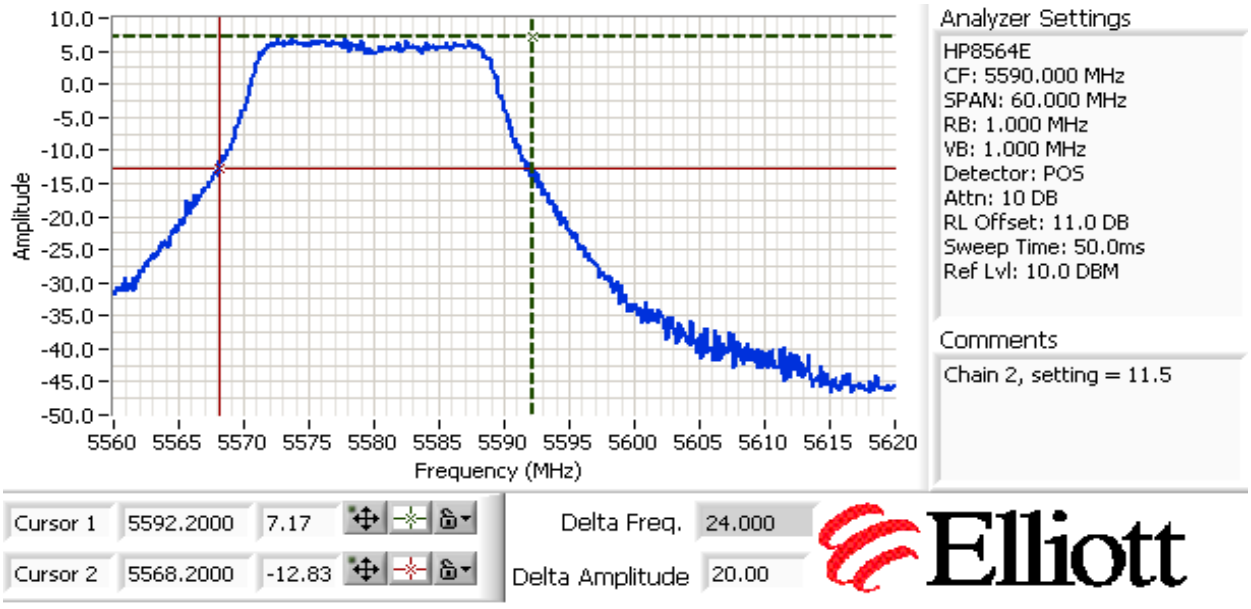
Frequency	Level	Port			Detector			Comments
MHz	dBm		Limit	Margin	Pk/QP/Avg			
5424.850	-47.4	RF Port	-43.0	-4.4	Peak			Chain 1
4982.810	-48.1	RF Port	-43.0	-5.1	Peak			Chain 2

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Channel adjacent to 5600 MHz

For **master** devices - Plots showing that the 20dB bandwidth of the channel closest to 5600 MHz does not spill into the 5600-5650 MHz band.

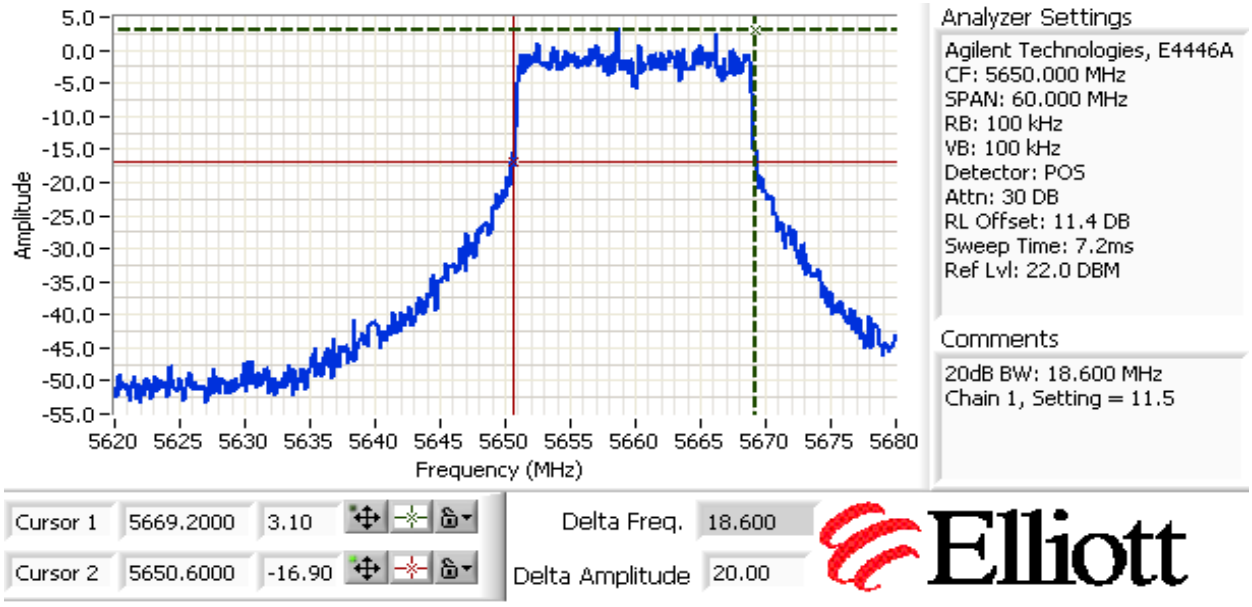


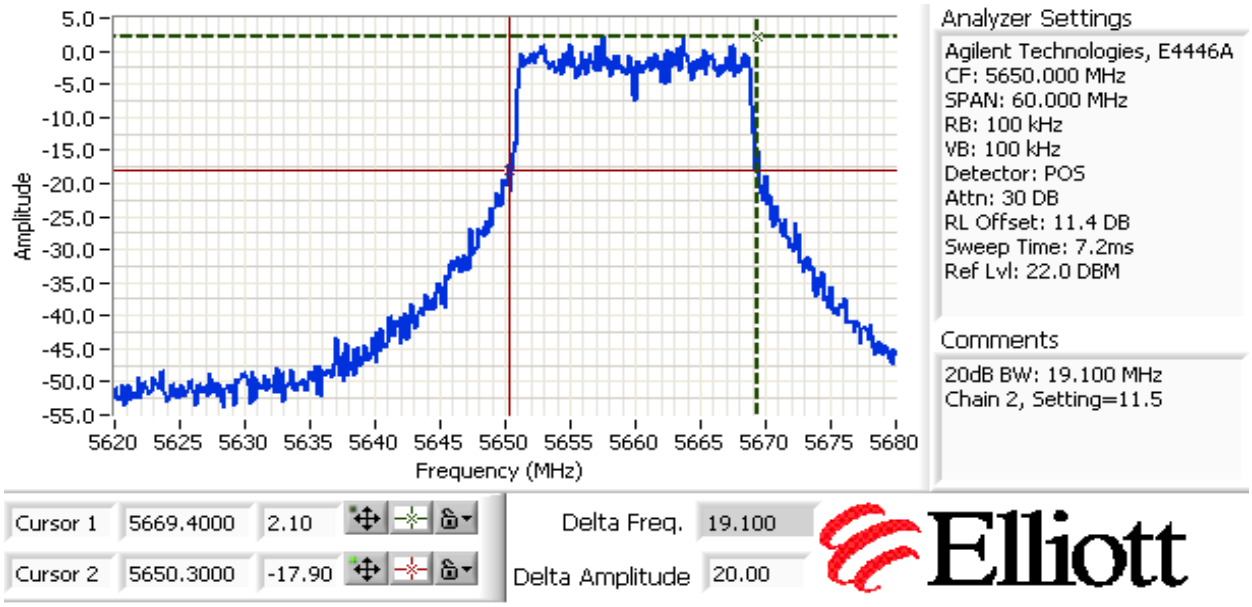


Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Channel adjacent to 5650 MHz

For master devices - Plots showing that the 20dB bandwidth of the channel closest to 5650 MHz does not spill into the 5600-5650 MHz band.



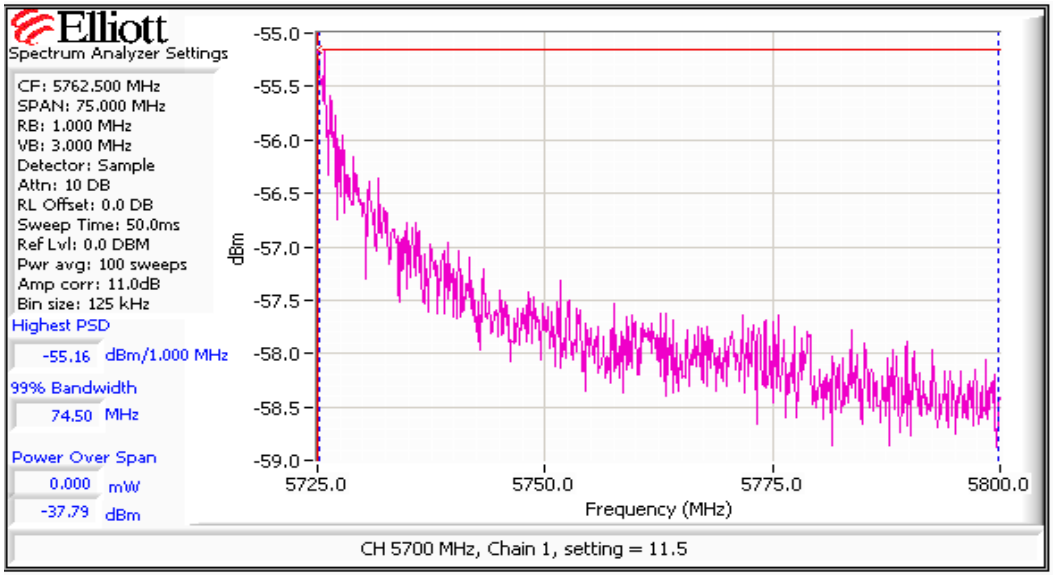


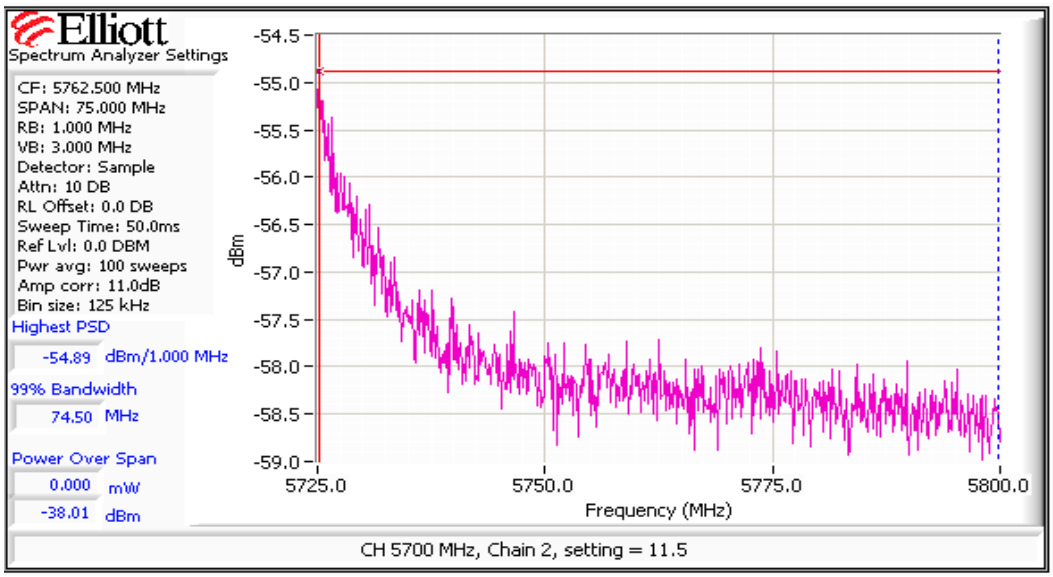
Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

High channel, 5470 - 5725 MHz Band

Plots for each chain showing compliance with the -27dBm/MHz limit above the 5725MHz band edge. Start and stop frequencies set to 5725-5800 MHz, RB=1MHz, VB=3MHz, power averaging enabled (100 traces):

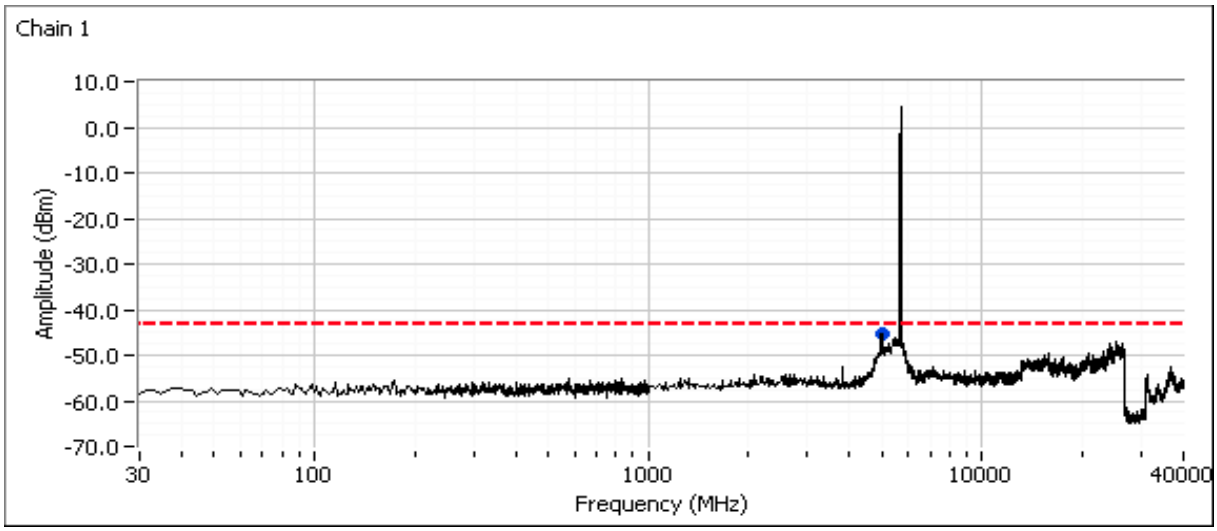
	Power Setting	Band edge Level		Antenna Gain (dBi)	EIRP		Total EIRP dBm/MHz	Limit dBm/MHz	Result
		dBm/MHz	mW/MHz		mW/MHz	dBm/MHz			
Chain 1	11.5	-55.2	0.00000	13.0	6.081E-05	-42.2	-39.0	-27	PASS
Chain 2		-54.9	0.00000	13.0	6.471E-05	-41.9			

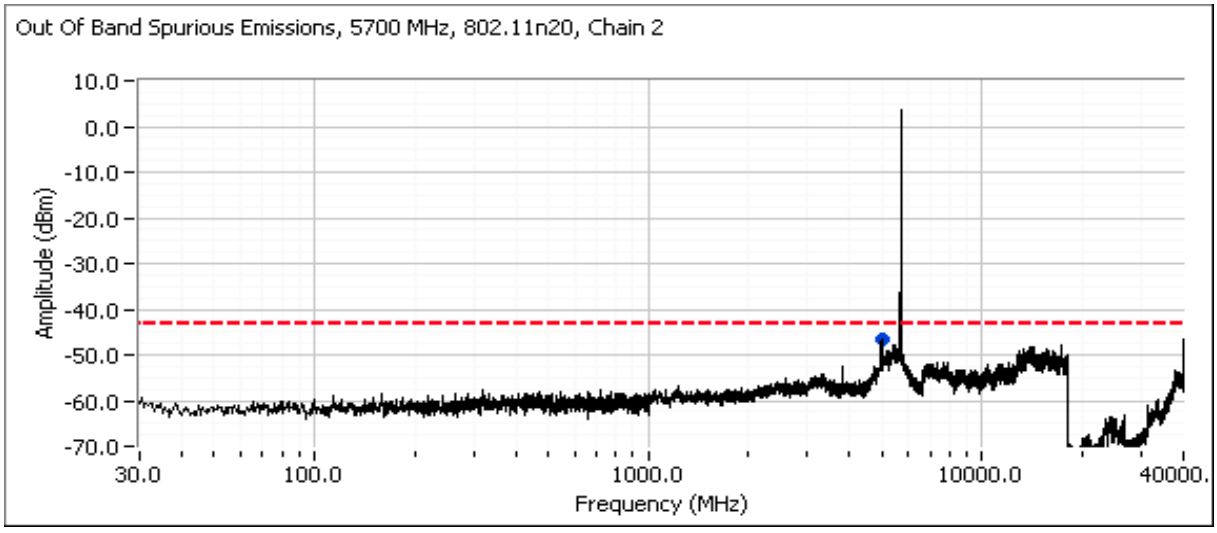




Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Wide-band plot, RB=VB=1MHz (Peak measurements versus limit). SA input attenuation lowered above 18 GHz.





Preliminary peak readings captured during pre-scan

Frequency	Level	Pol			Detector			Comments
MHz	dBm	v/h	Limit	Margin	Pk/QP/Avg			
5005.000	*-45.2*	*Line 1*	*-43.0*	*-2.2*	*Peak*			*Chain 1*
4996.830	-46.7	RF Port	-43.0	-3.7	Peak			Chain 2

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

RSS-210 (LELAN) and FCC 15.407(UNII)
Antenna Port Measurements
Power, PSD, Peak Excursion, 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: 5/5/2011
Test Engineer: M. Birgani, Joseph Cadigal
Test Location: FT Lab #4
Config. Used: -
Config Change: -
EUT Voltage: PoE

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Power, 5250 - 5350MHz	15.407(a) (1), (2)	PASS	24.0 mW
1	PSD, 5250 - 5350MHz	15.407(a) (1), (2)	PASS	-0.4 dBm/MHz
1	Max EIRP 5250 - 5350MHz	TPC required if EIRP≥ 500mW (27dBm). EIRP ≥ 200mW (23dBm) DFS threshold = -64dBm.	PASS	EIRP = 29.7 dBm (938 mW)
1	Power, 5470 - 5725MHz	15.407(a) (1), (2)	PASS	24.1 mW
1	PSD, 5470 - 5725MHz	15.407(a) (1), (2)	PASS	-0.7 dBm/MHz
1	Max EIRP 5470 - 5725MHz	TPC required if EIRP≥ 500mW (27dBm). EIRP ≥ 200mW (23dBm) DFS threshold	PASS	EIRP = 23.9 dBm (244.2 mW)
1	26dB Bandwidth	15.407 (Determines max power)	-	42.3 MHz
1	99% Bandwidth	RSS 210	N/A	27.0 MHz
2	Peak Excursion Envelope	15.407(a) (6) 13dB	PASS	10.4 dB
3	Antenna Conducted - Out of Band Spurious	15.407(b) -27dBm/MHz	PASS	All emissions below the -27dBm/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.

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Ambient Conditions:

Temperature: 18-23 °C
Rel. Humidity: 30-35 %

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

Note 1:	Output power measured using a peak power meter
Note 1:	Output power measured using a spectrum analyzer (see plots below). RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was continuous) and power integration over **50** MHz (method 1 of DA-02-2138A1).
Note 2:	Measured using the same analyzer settings used for output power. PSD is highest value on the plot.
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.

MIMO Device - 5250-5350 MHz Band

	Chain 1	Chain 2	Chain 3	Coherent	Effective[5]	EIRP (mW)	EIRP (dBm)
Antenna Gain (dBi):	13	13		Yes	16.0	937.9	29.7

Power

Frequency (MHz)	Software Setting	26dB BW (MHz)	Measured Output Power[1] dBm			Total		Limit (dBm)	Max Power (W)	Pass or Fail
			Chain 1	Chain 2	Chain 3	mW	dBm			
5275	5.0	40.3	2.1	3.7		4.0	6.0	14.0	0.024	PASS
5300	8.0	42.2	10.8	10.6		**23.5**	**13.7**	14.0		PASS
5315	5.0	41.3	3.9	2.4		4.2	6.2	14.0		PASS

PSD

Frequency (MHz)	99%[4] BW	Total Power	PSD[2] dBm/MHz			Total PSD		Limit		Pass or Fail
			Chain 1	Chain 2	Chain 3	mW/MHz	dBm/MHz	FCC	RSS 210[3]	
5275	27.1	6.0	-10.6	-9.8		0.2	-7.2	1.0	11.0	PASS
5300	26.9	13.7	-3.9	-3.9		0.8	**-0.9**	1.0	11.0	PASS
5315	27.1	6.2	-9.5	-10.7		0.2	-7.0	1.0	11.0	PASS

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

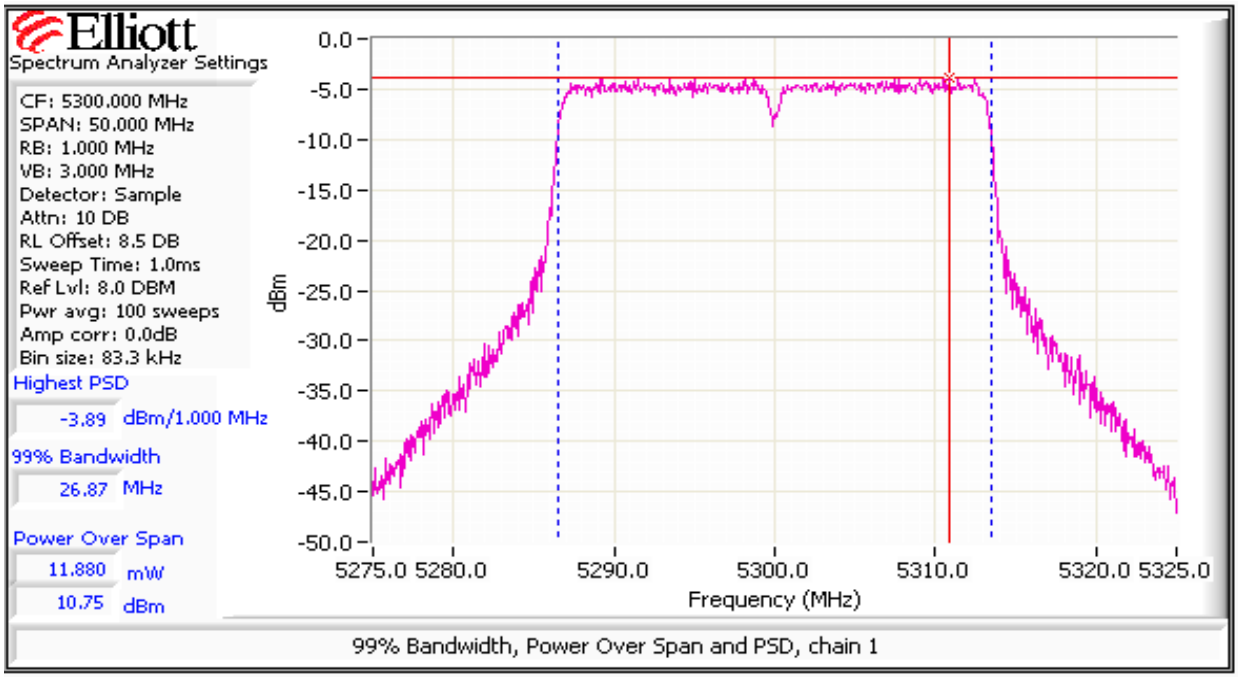
Output Power at Low Power Setting - 5250-5350 MHz Band

EIRP does not exceed 500mW, therefore TPC is not required and measurements at a low power setting are not required.

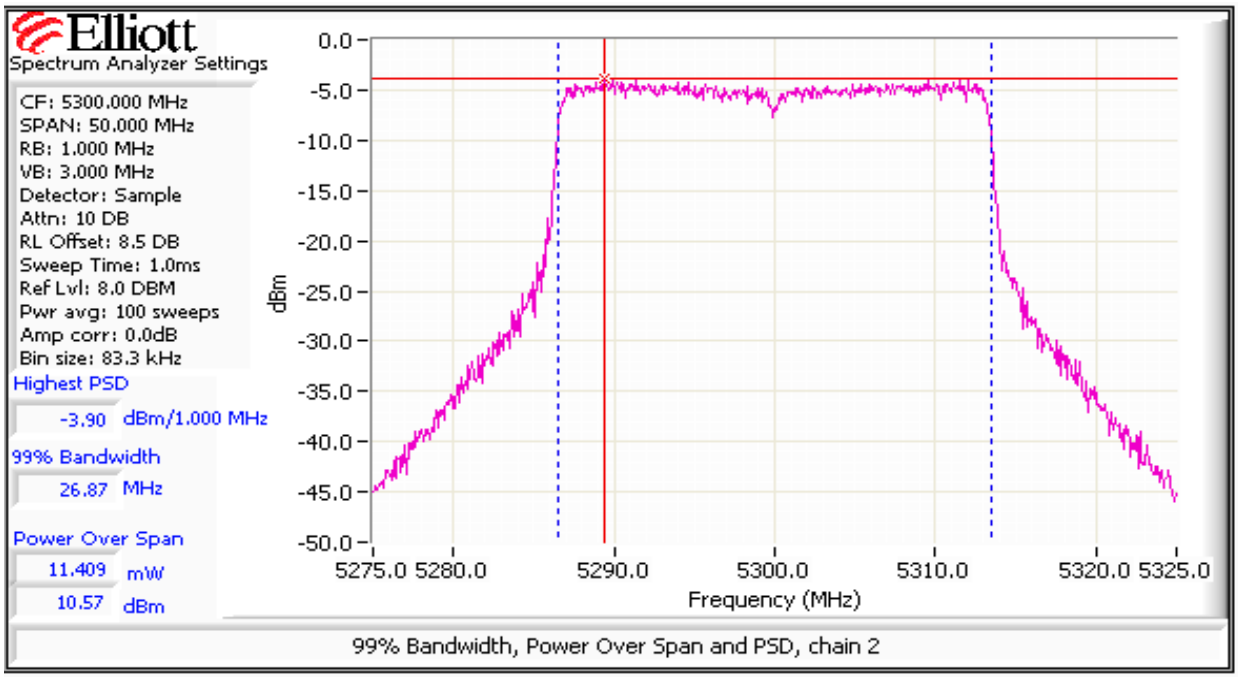
As EIRP exceeds 500mW TPC is required - measurements to show eirp < 250mW.

Limit is set to 24dBm (250mW) minus the antenna gain (dBi).

Frequency (MHz)	Software Setting	26dB BW (MHz)	Measured Output Power[1] dBm			Total		Limit (dBm)	Max Power (W)	Pass or Fail
			Chain 1	Chain 2	Chain 3	mW	dBm			
5275	3.0	40.3	5.1	4.2		5.9	7.7	8.0	0.006	PASS
5300	2.0	42.2	5.2	3.9		5.7	7.6	8.0		PASS
5315	2.5	41.3	5.3	3.0		5.4	7.3	8.0		PASS



Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A



MIMO Device - 5470-5725 MHz Band

	Chain 1	Chain 2	Chain 3	Coherent	Effective[5]	EIRP (mW)	EIRP (dBm)
Antenna Gain (dBi):	13	13		Yes	16.0	959.8	29.8

Power

Frequency (MHz)	Software Setting	26dB BW (MHz)	Measured Output Power[1] dBm			Total		Limit (dBm)	Max Power (W)	Pass or Fail
			Chain 1	Chain 2	Chain 3	mW	dBm			
5500	8.0	41.6	10.3	10.4		21.7	13.4	14.0	0.024	PASS
5580	8.0	42.1	10.7	10.9		**24.1**	**13.8**	14.0		PASS
5680	8.0	42.3	9.8	10.3		20.3	13.1	14.0		PASS

PSD

Frequency (MHz)	99%[4] BW	Total Power	PSD[2] dBm/MHz			Total PSD		Limit		Pass or Fail
			Chain 1	Chain 2	Chain 3	mW/MHz	dBm/MHz	FCC	RSS 210[3]	
5500	26.9	13.4	-4.1	-4.2		0.8	-1.1	1.0	11.0	PASS
5580	27.0	13.8	-3.8	-3.7		**0.8**	**-0.7**	1.0	11.0	PASS
5680	26.9	13.1	-4.7	-4.4		0.7	-1.5	1.0	11.0	PASS

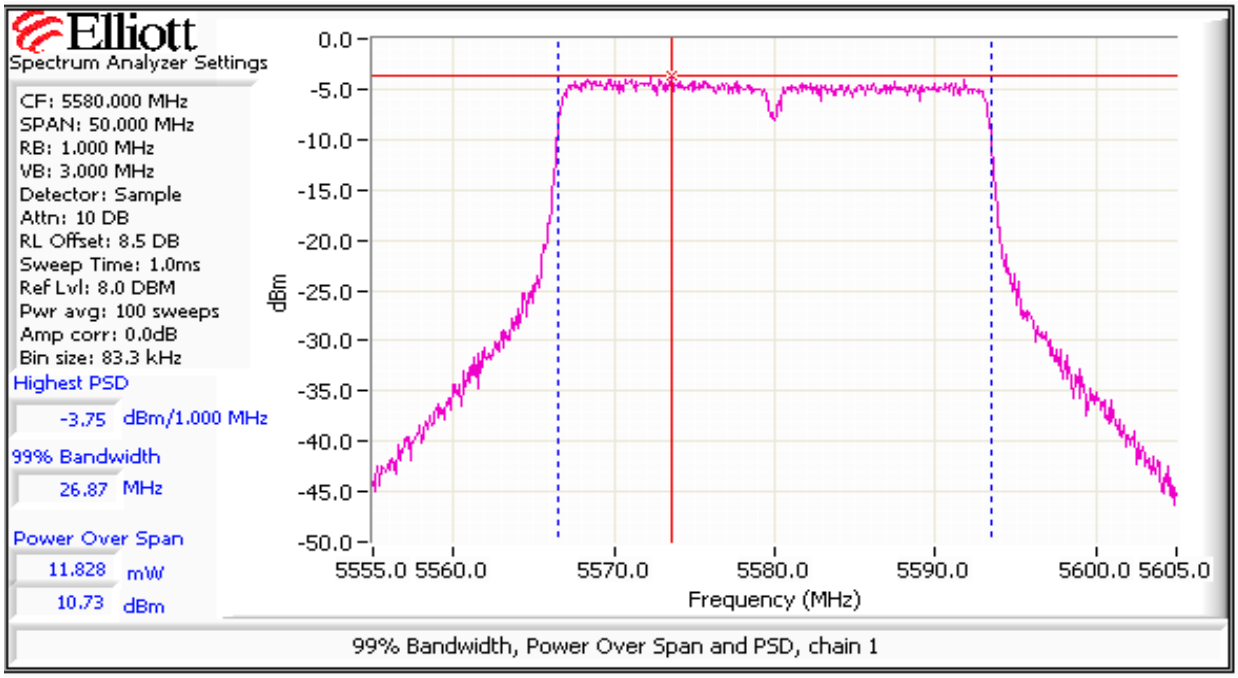
Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Output Power at Low Power Setting - 5470-5725 MHz Band

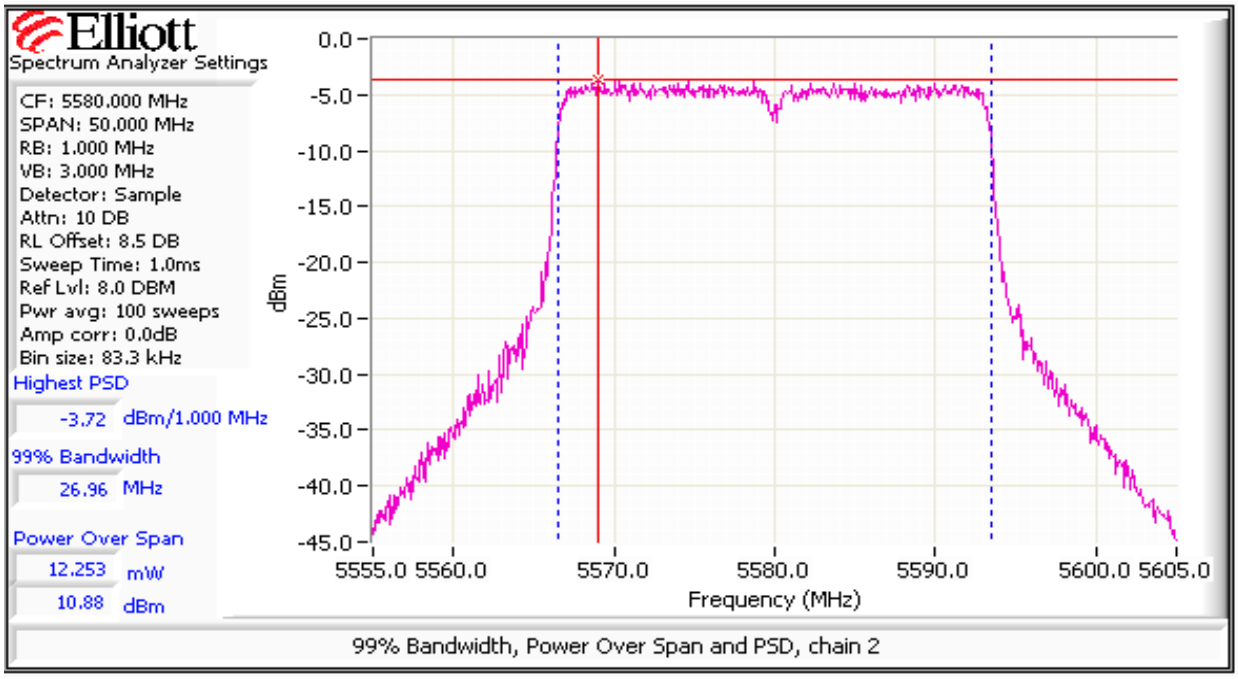
As EIRP exceeds 500mW TPC is required - measurements to show eirp < 250mW.

Limit is set to 24dBm (250mW) minus the antenna gain (dBi).

Frequency (MHz)	Software Setting	26dB BW (MHz)	Measured Output Power[1] dBm			Total		Limit (dBm)	Max Power (W)	Pass or Fail
			Chain 1	Chain 2	Chain 3	mW	dBm			
5500	2.0	41.6	5.0	2.5		4.9	6.9	8.0	0.006	PASS
5580	2.0	42.1	4.1	5.5		6.1	7.9	8.0		PASS
5680	2.0	42.3	5.2	3.7		5.7	7.5	8.0		PASS



Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

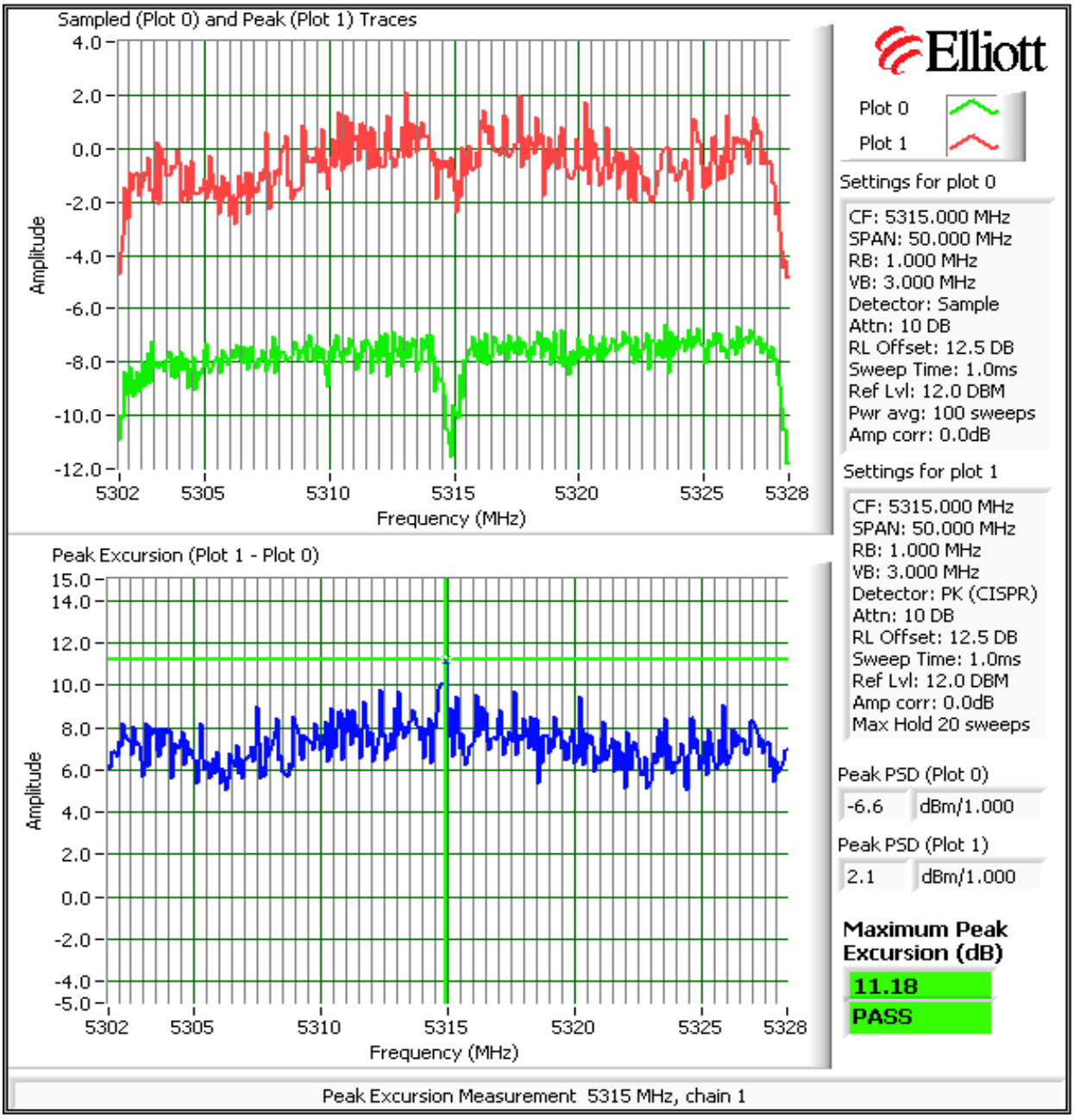


Run #2: Peak Excursion Measurement

HT 30 Device meets the requirement for the peak excursion

Freq	Peak Excursion(dB)		Freq	Peak Excursion(dB)	
(MHz)	Value	Limit	(MHz)	Value	Limit
5275	9.8/9.6	13.0	5500	9.8/8.7	13.0
5300	10.4/10.7	13.0	5580	8.8/8.5	13.0
5315	**11.2**/11.1	13.0	5680	8.6/8.8	13.0

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A



Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run #3: Out Of Band Spurious Emissions - Antenna Conducted

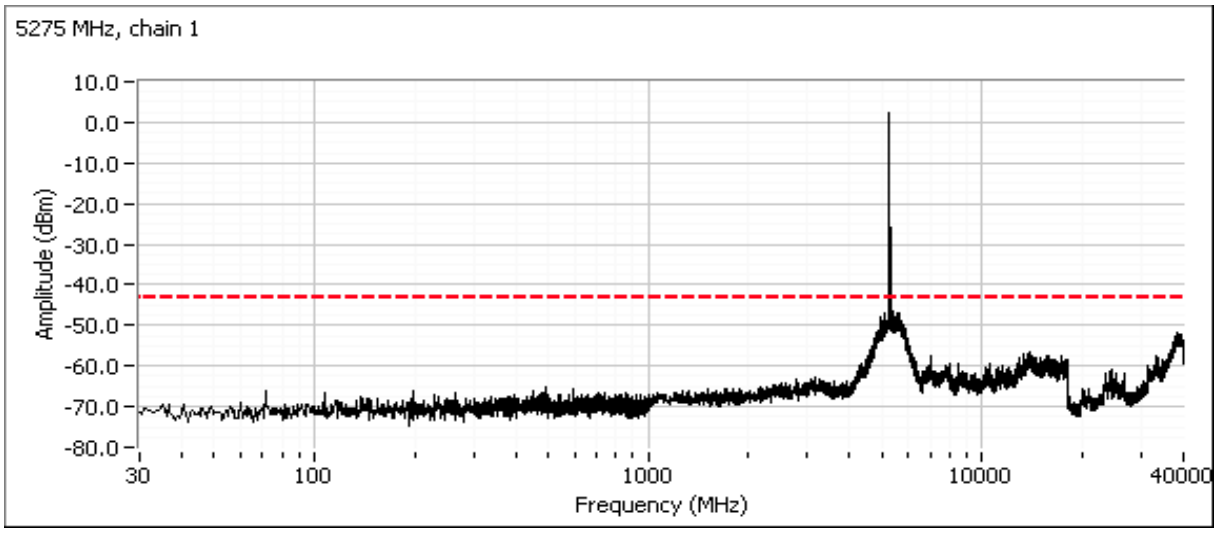
MIMO Devices: Antenna gain used is the individual antenna antenna gain (the spurious emissions at the band edges are not considered to be coherent between chains and spurious removed from the band edges are evaluated as radiated emissions if close to the limit). The plots were obtained for each chain individually and the limit was adjusted to account for all chains transmitting simultaneously

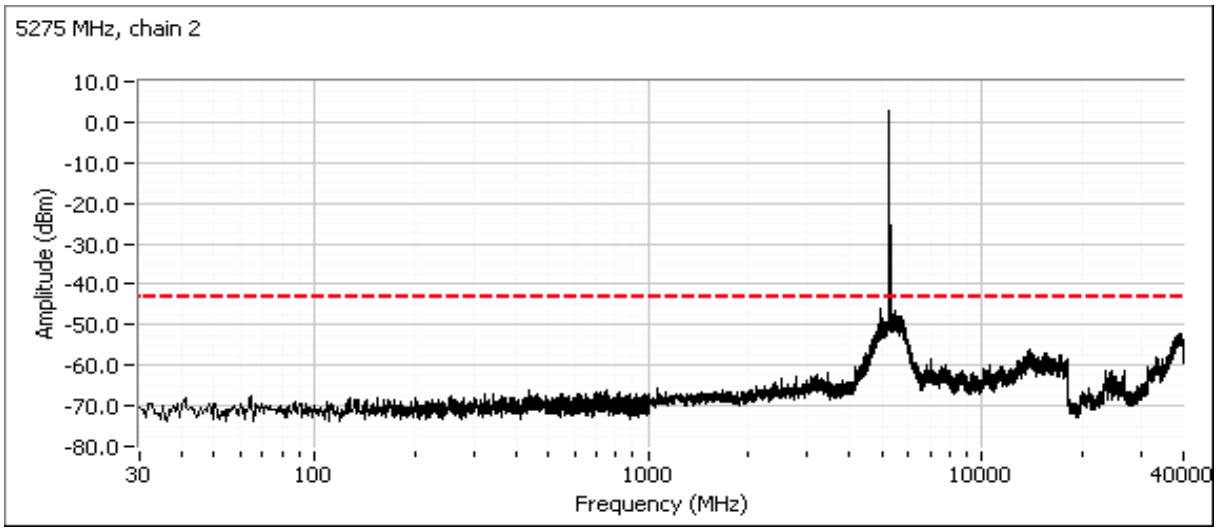
Number of transmit chains:	2		
Maximum Antenna Gain:	13.0	dBi	
Spurious Limit:	-27.0	dBm/MHz eirp	
Adjustment for 2 chains:	-3.0	dB adjustment for multiple chains.	
Limit Used On Plots [Note 1]:	-43.0	dBm/MHz	Average Limit (RB=1MHz, VB=10Hz)

Note 1:	The -27dBm/MHz limit is an eirp limit. The limit for antenna port conducted measurements is adjusted to take into consideration the maximum antenna gain and number of transmitters (limit = -27dBm - antenna gain - 10Log[N]). Radiated field strength measurements for signals more than 50MHz from the bands and that are close to the limit are made to determine compliance as the antenna gain is not known at these frequencies.
Note 2:	All spurious signals below 1GHz are measured during digital device radiated emissions test.
Note 3:	Signals within 10MHz of the 5.725 or 5.825 Band edge are subject to a limit of -17dBm EIRP
Note 4:	If the device is for outdoor use then the -27dBm eirp limit also applies in the 5150 - 5250 MHz band.
Note 5:	Signals that fall in the restricted bands of 15.205 are subject to the limit of 15.209.

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

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





Wide-band plot, RB=VB=1MHz (Peak measurements versus limit).

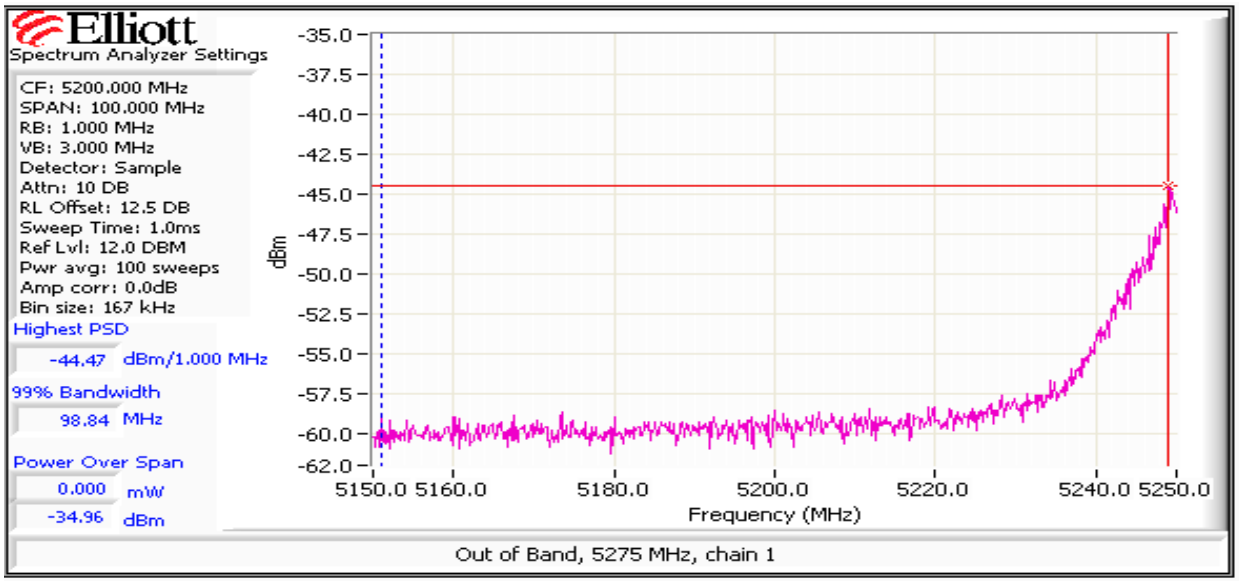
Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

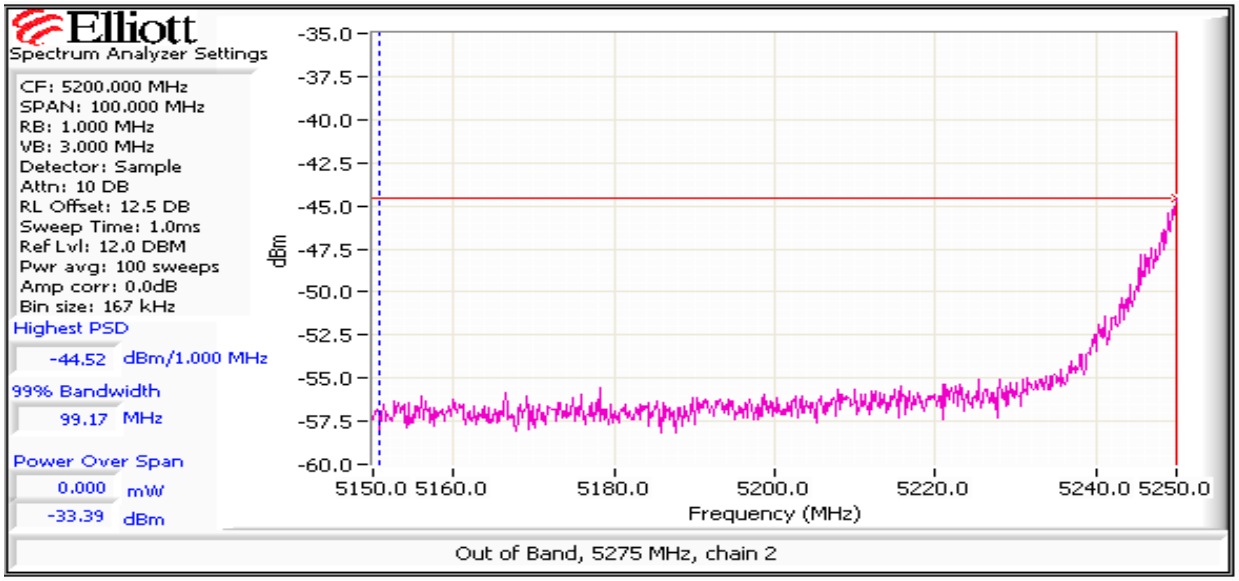
Low channel, 5250 - 5350 MHz Band

Plots for each chain showing compliance with the -27dBm/MHz limit in the 5150 - 5250 MHz band. Start and stop frequencies set to 5150-5250 MHz, RB=1MHz, VB=3MHz, power averaging enabled (100 traces)

5275MHz

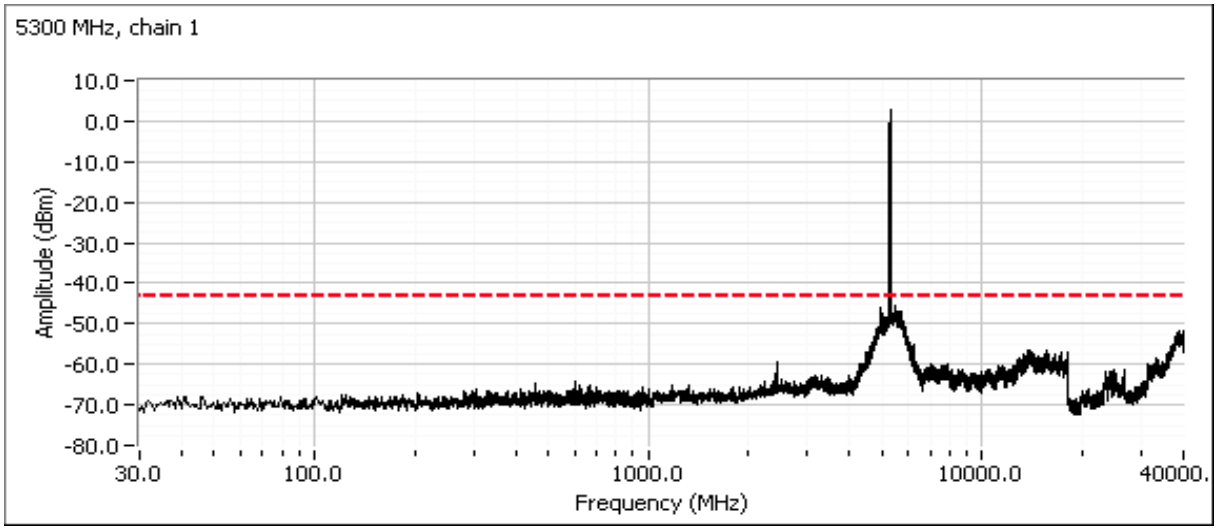
	Power Setting	Band edge Level dBm/MHz	Band edge Level mW/MHz	Antenna Gain (dBi)	EIRP mW/MHz	EIRP dBm/MHz	Total EIRP dBm/MHz	Limit dBm/MHz	Result
Chain 1	8	-44.5	0.00004	13.0	0.0007079	-31.5	-28.5	-27	**PASS**
Chain 2		-44.5	0.00004	13.0	0.0007079	-31.5			

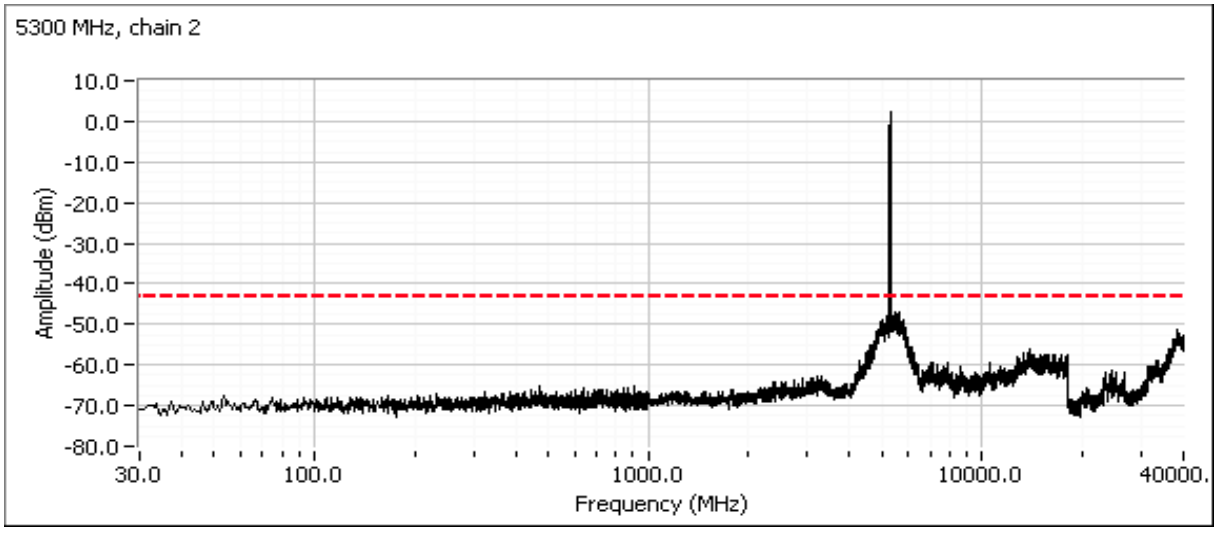




Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Center channel, 5250 - 5350 MHz Band



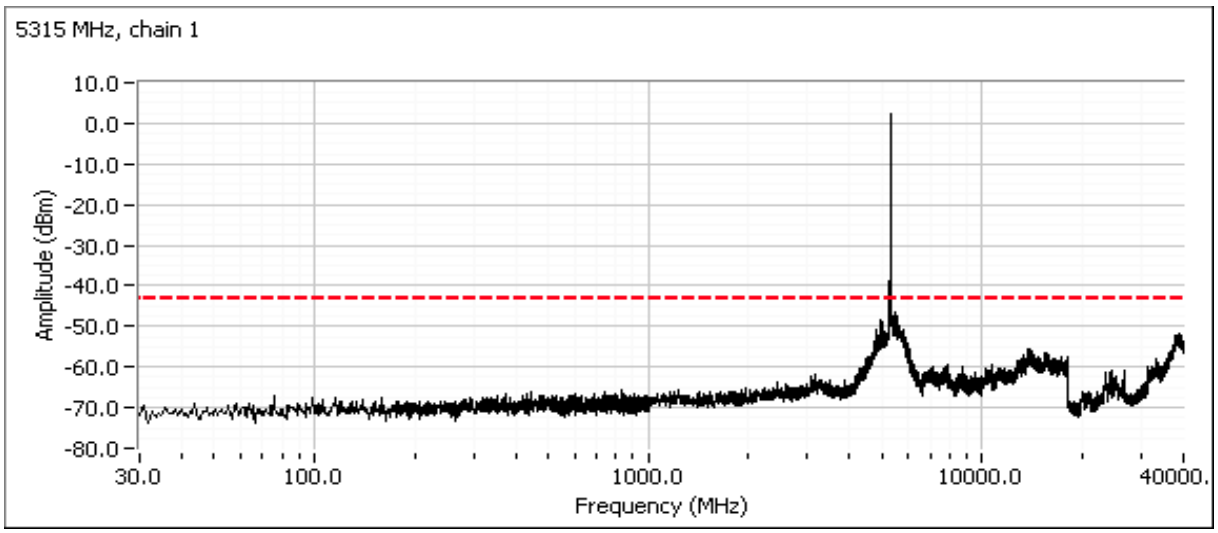


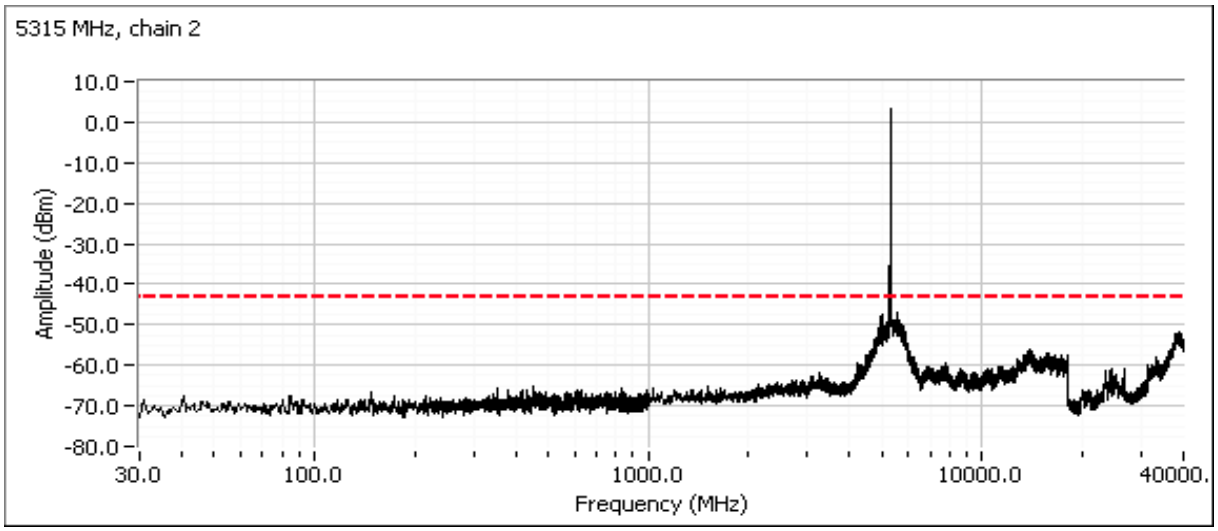
Wide-band plot, RB=VB=1MHz (Peak measurements versus limit).

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

High channel, 5250 - 5350 MHz Band

Note - compliance with the radiated limits for the restricted band immediately above 5350MHz is demonstrated through the radiated emissions tests.

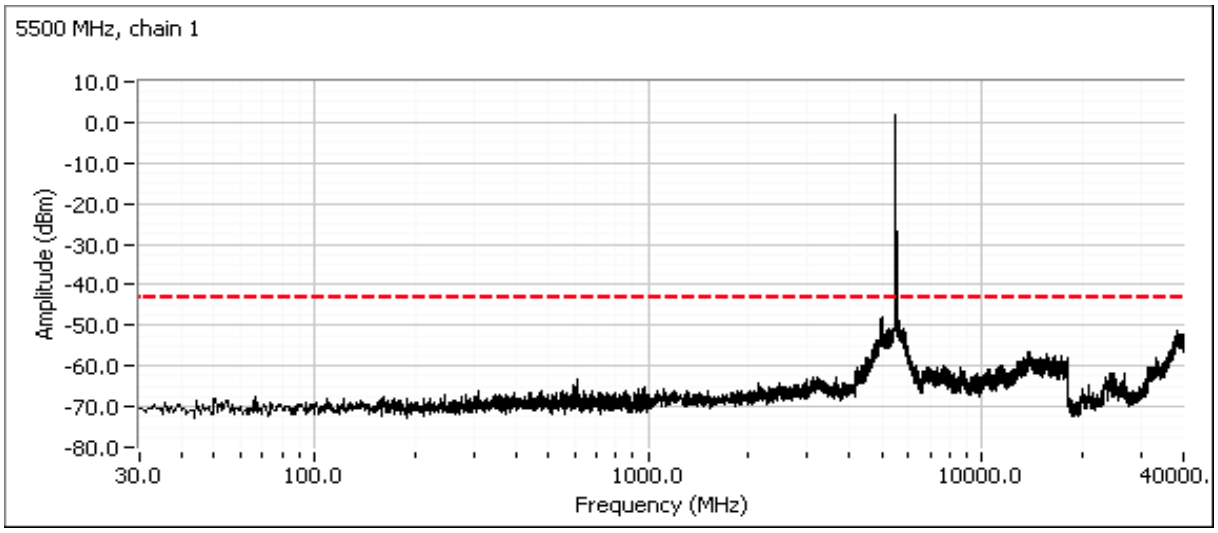


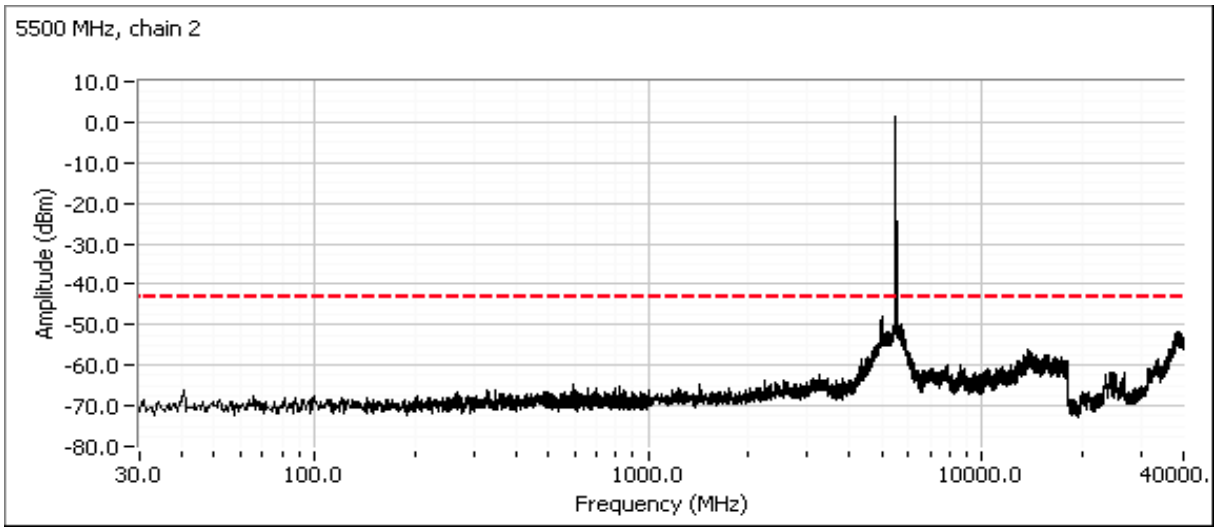


Wide-band plot, RB=VB=1MHz (Peak measurements versus limit).

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Low channel, 5470 - 5725 MHz Band



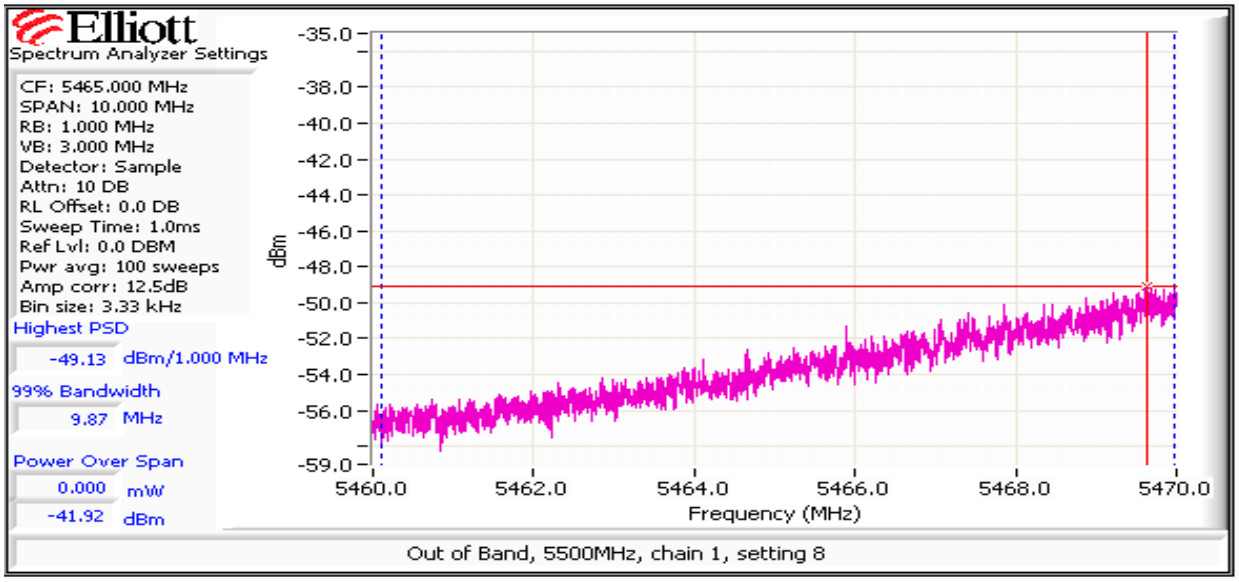


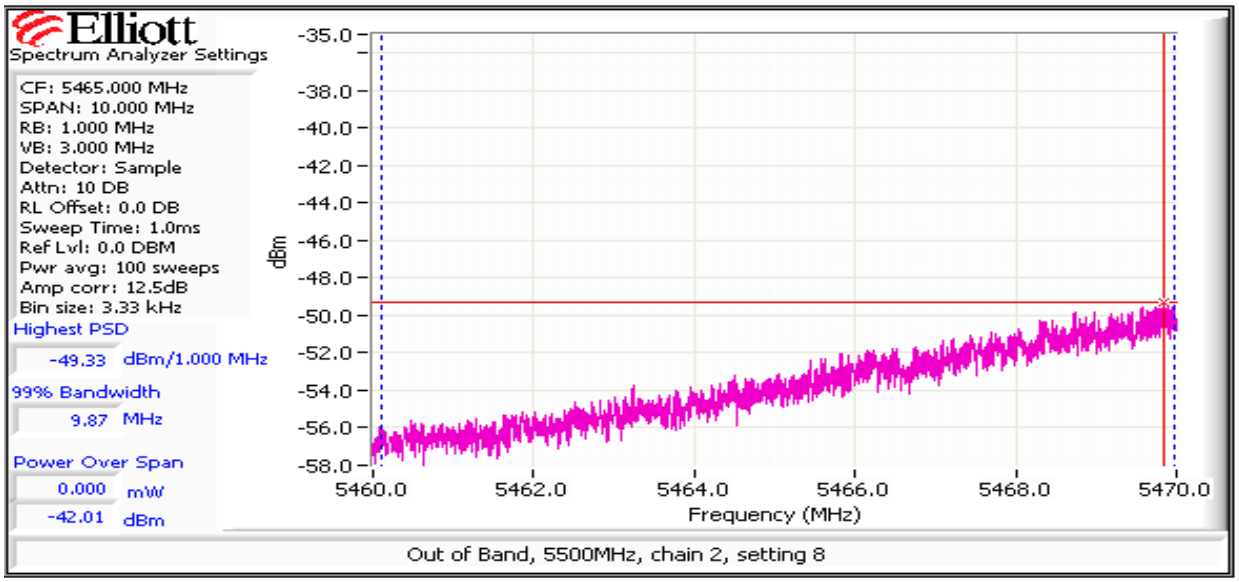
Wide-band plot, RB=VB=1MHz (Peak measurements versus limit).

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Plots for each chain showing compliance with the -27dBm/MHz limit for the 5460 - 5470 MHz band edge. Start and stop frequencies set to 5460-5470 MHz, RB=1MHz, VB=3MHz, power averaging enabled (100 traces). **Note** - compliance with the radiated limits for the restricted band immediately below 5460MHz is demonstrated through the radiated emissions tests.

	Power Setting	Band edge Level		Antenna Gain (dBi)	EIRP		Total EIRP dBm/MHz	Limit dBm/MHz	Result
		dBm/MHz	mW/MHz		mW/MHz	dBm/MHz			
Chain 1	8	-49.1	0.00001	13.0	0.0002438	-36.1	-33.2	-27	PASS
Chain 2		-49.3	0.00001	13.0	0.0002328	-36.3			

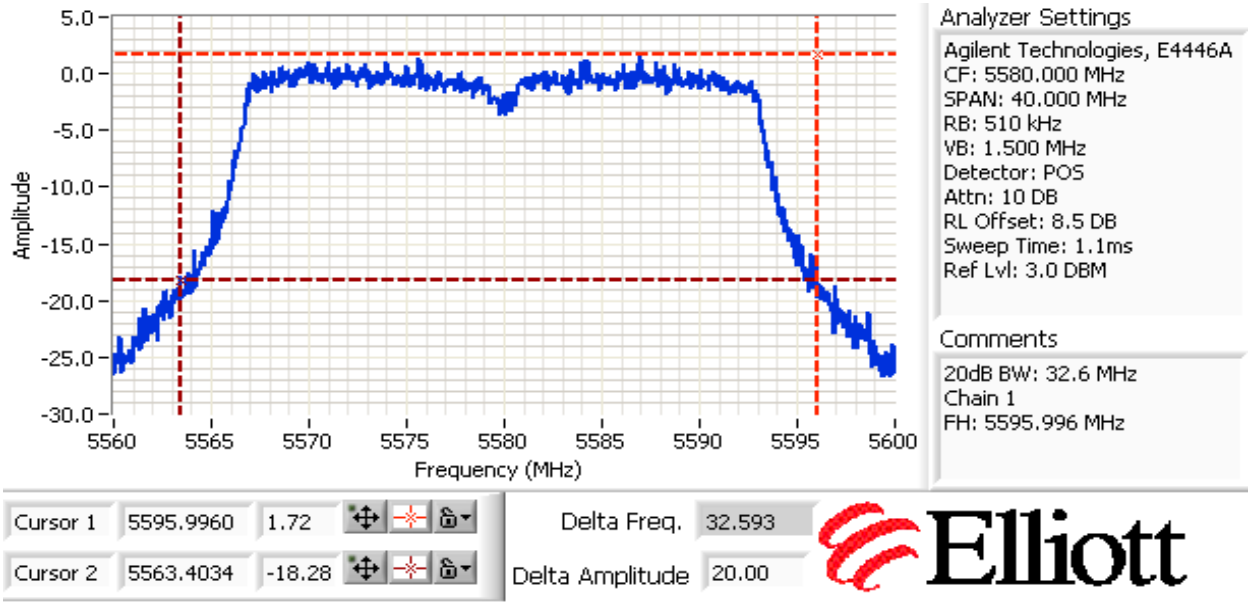


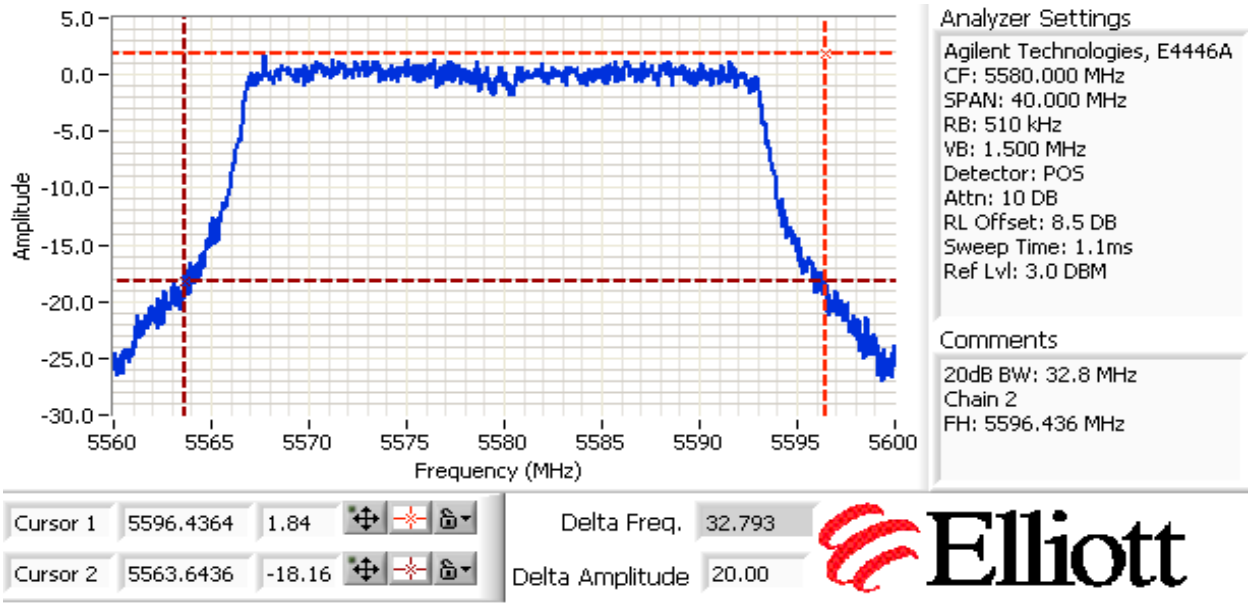


Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

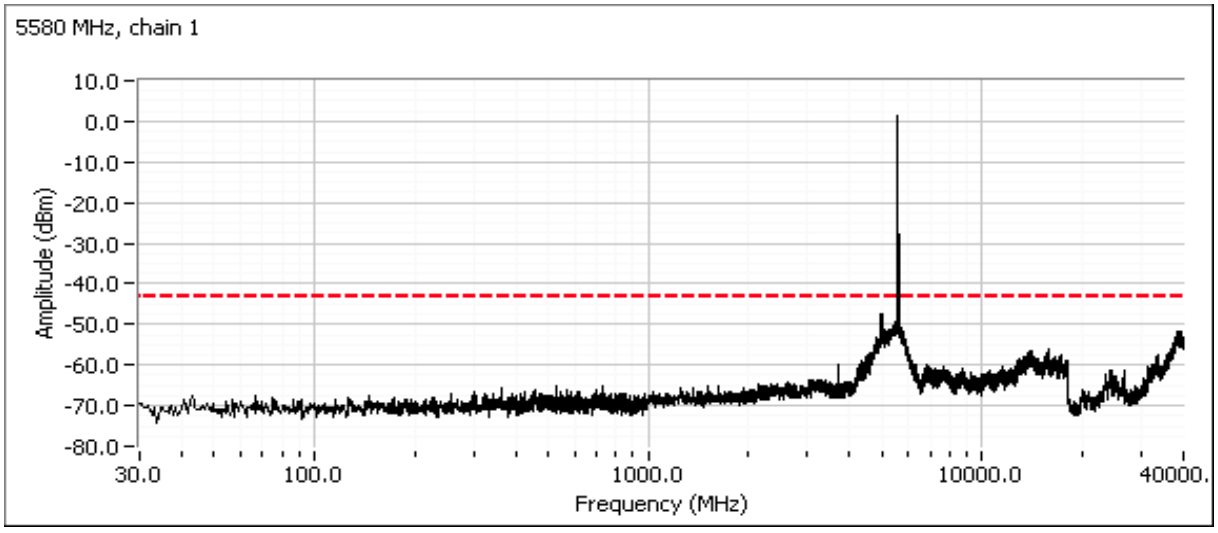
Center channel, 5470 - 5725 MHz Band

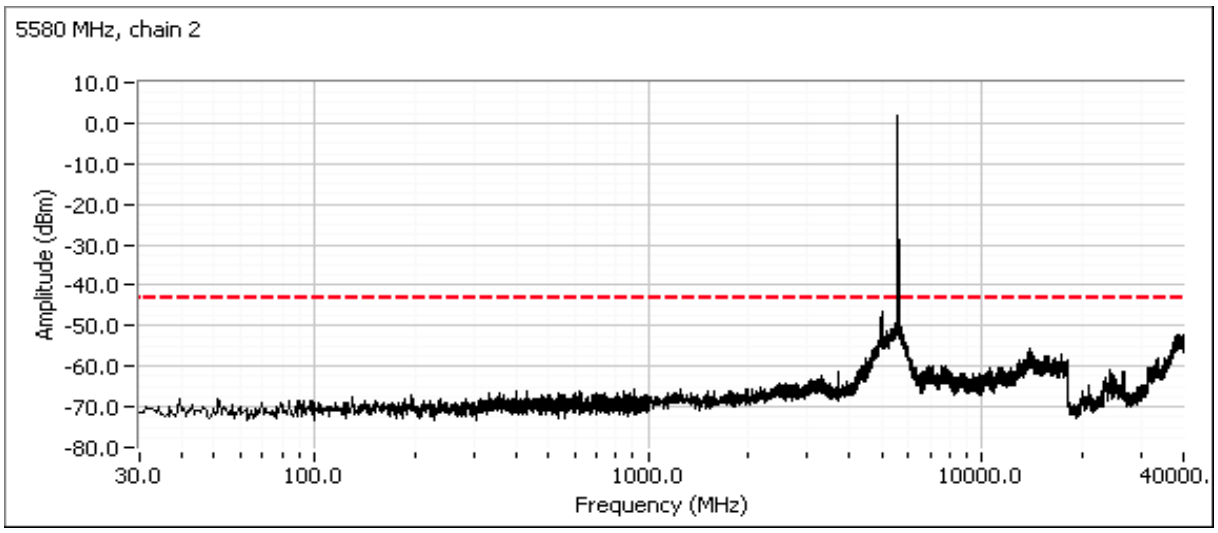
For **master** devices - This plot is showing hat the 20dB bandwidth of the channel closest to 5600 MHz does not spill into the 5600-5650 MHz band. RB > 1% of span.





Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A



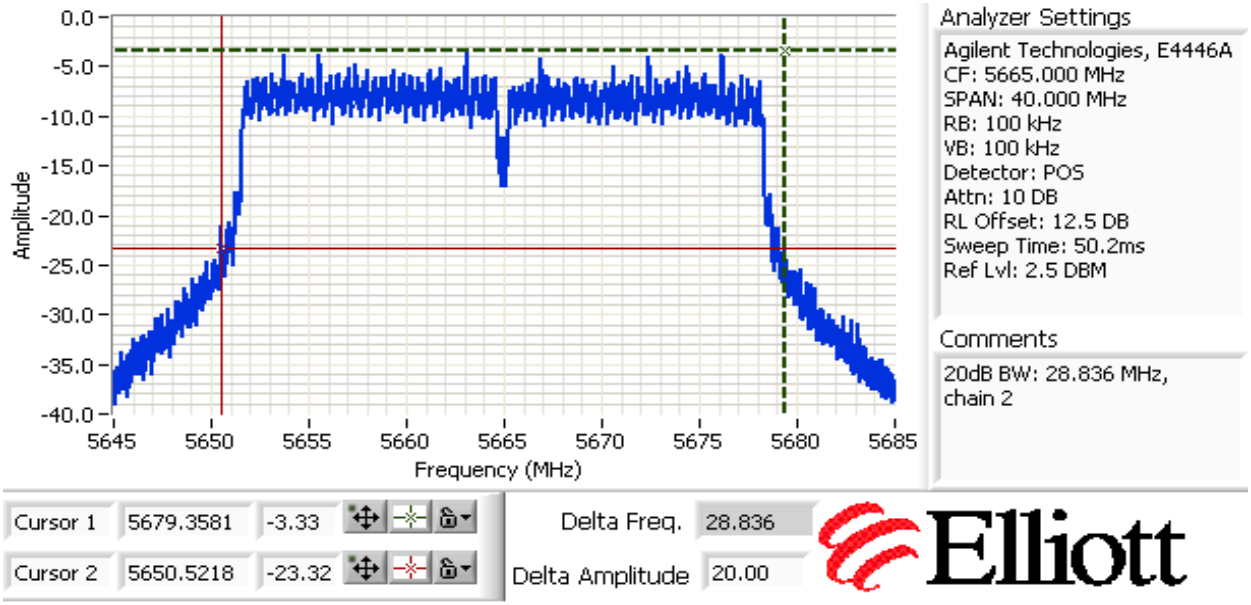


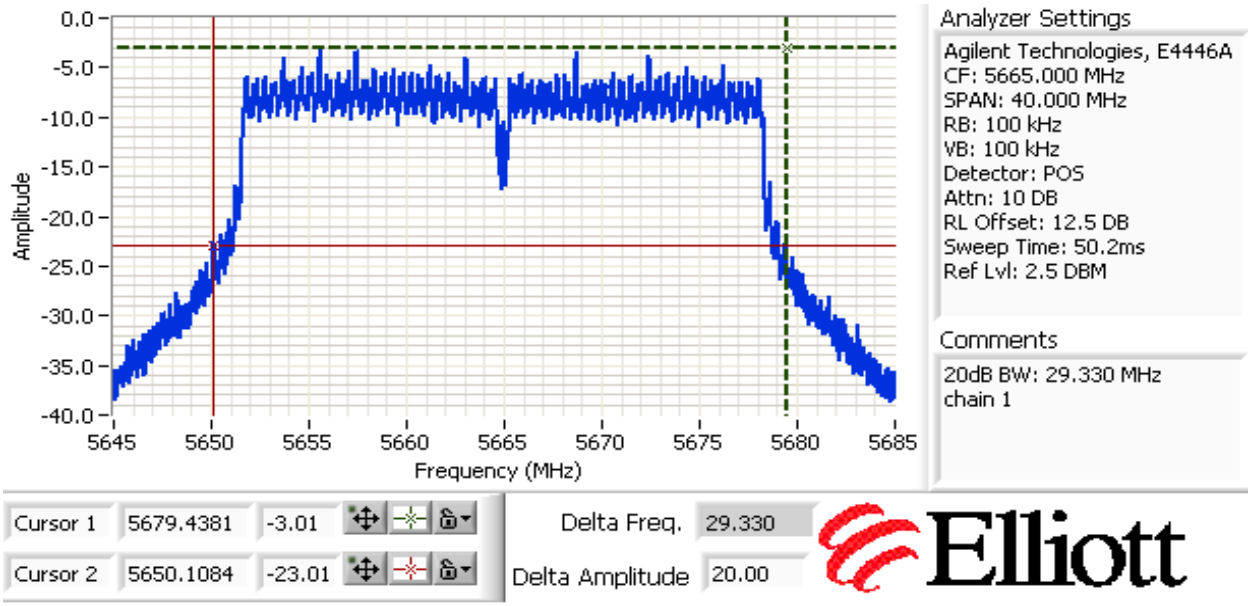
Wide-band plot, RB=VB=1MHz (Peak measurements versus limit).

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Channel adjacent to 5650 MHz

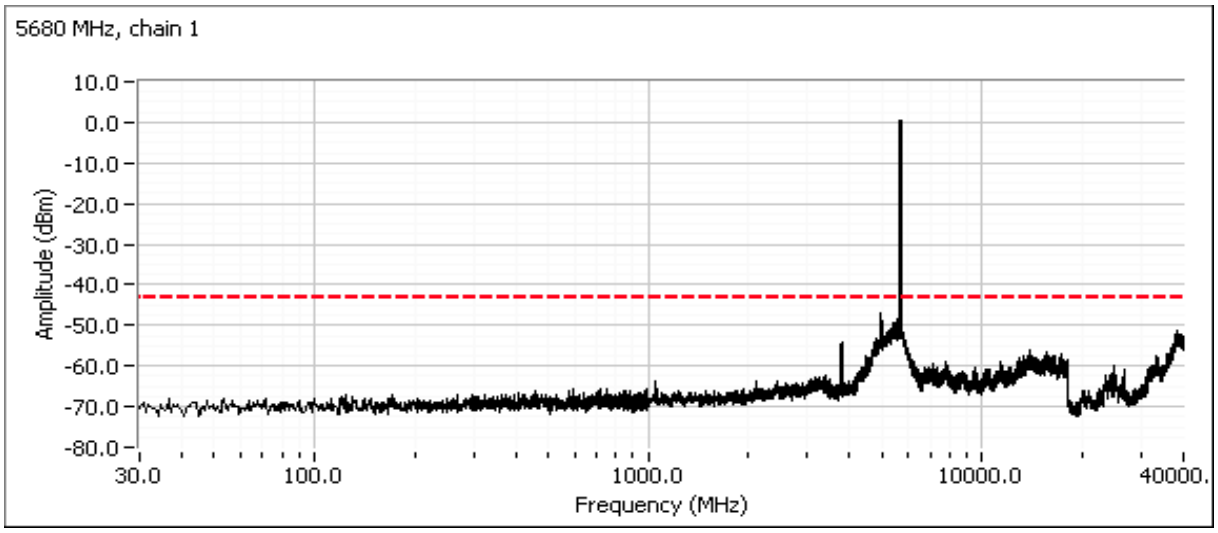
Plots showing that the 20dB bandwidth of the channel closest to 5650 MHz does not spill into the 5600-5650 MHz band. RB > 1% of span.

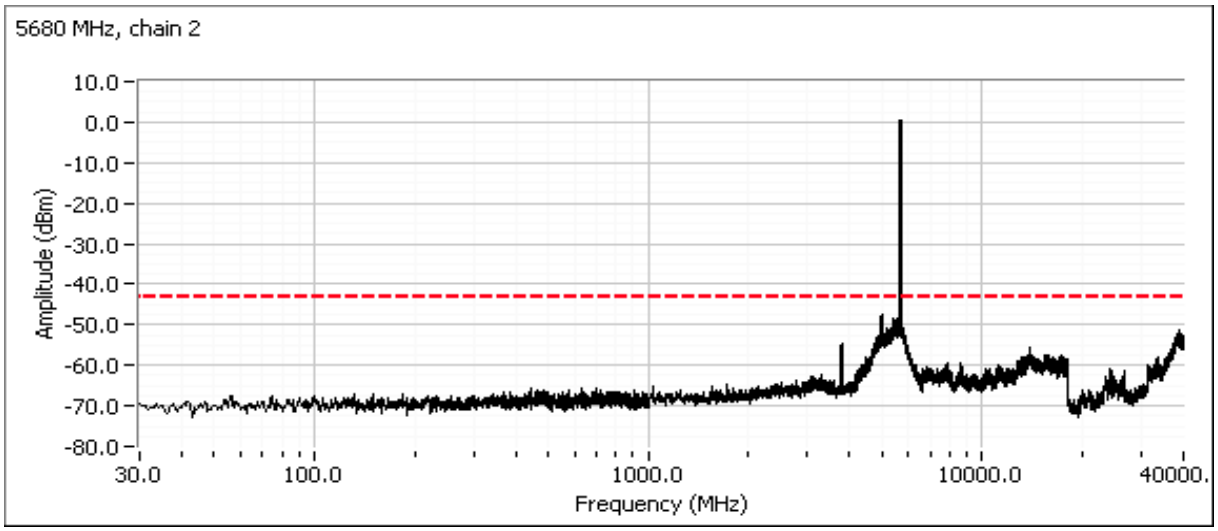




Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

High channel, 5470 - 5725 MHz Band



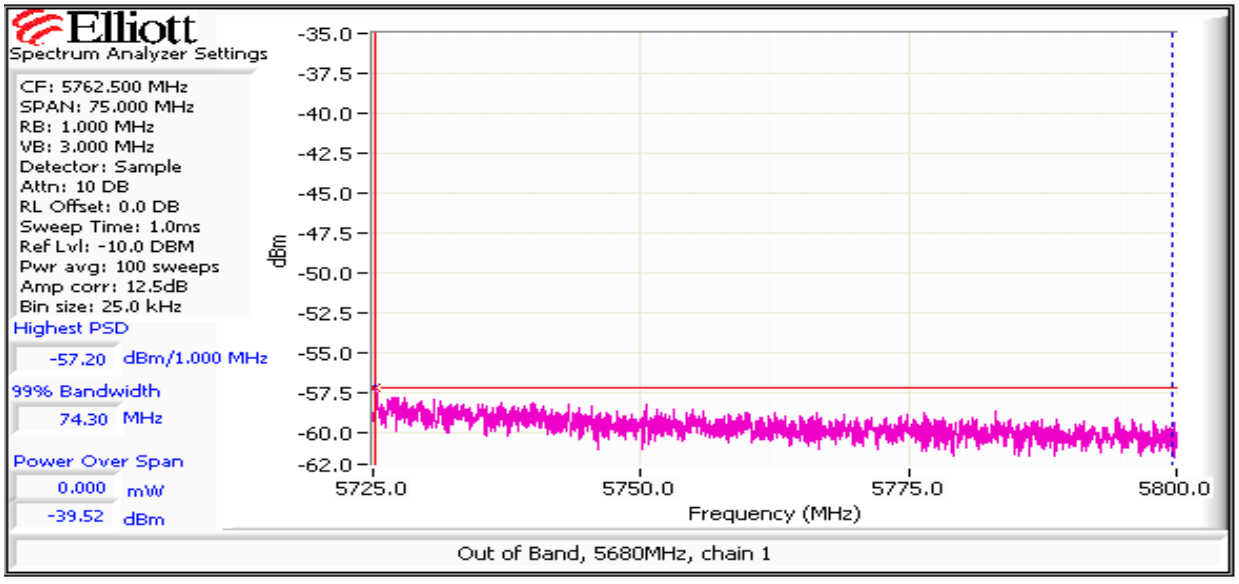


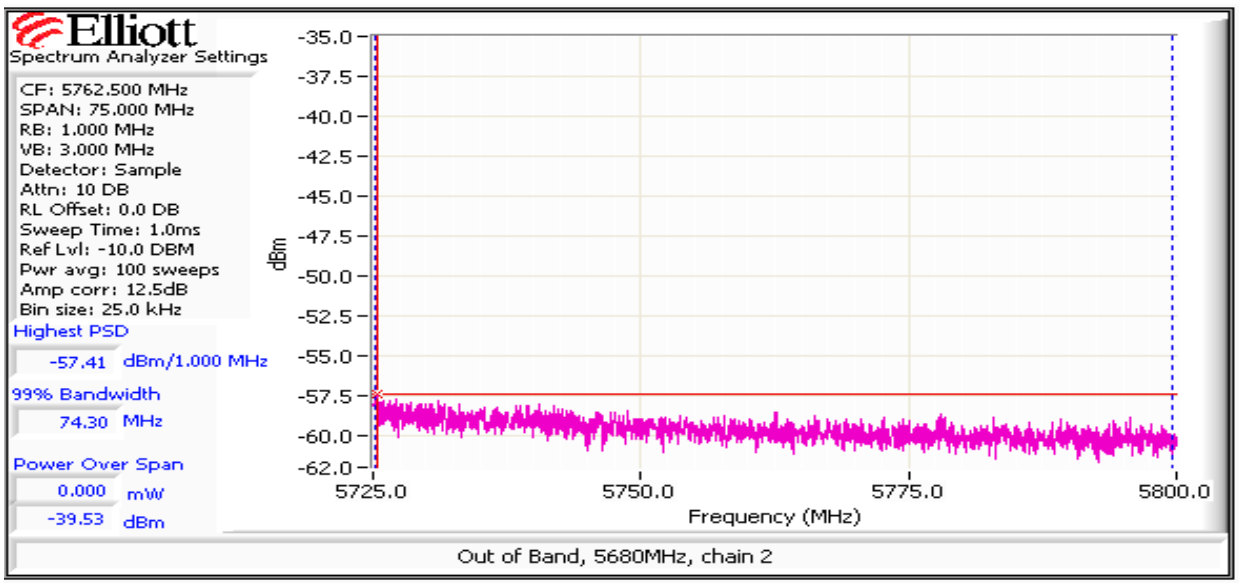
Wide-band plot, RB=VB=1MHz (Peak measurements versus limit).

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Plots for each chain showing compliance with the -27dBm/MHz limit above the 5725MHz band edge. Start and stop frequencies set to 5725-5800 MHz, RB=1MHz, VB=3MHz, power averaging enabled (100 traces):

	Power Setting	Band edge Level		Antenna Gain (dBi)	EIRP		Total EIRP dBm/MHz	Limit dBm/MHz	Result
		dBm/MHz	mW/MHz		mW/MHz	dBm/MHz			
Chain 1	8	-57.2	0.00000	13.0	3.802E-05	-44.2	-41.3	-27	PASS
Chain 2		-57.4	0.00000	13.0	3.622E-05	-44.4			





Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

RSS-210 (LELAN) and FCC 15.407(UNII)
Antenna Port Measurements
Power, PSD, Peak Excursion, 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: 4/18/2011 18:24
Test Engineer: Rafael Varelas
Test Location: Fremont Chamber #7
Config. Used: 1
Config Change: none
EUT Voltage: POE

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Power, 5250 - 5350MHz	15.407(a) (1), (2)	Pass	802.11n n40MHz: 15.5 mW
1	PSD, 5250 - 5350MHz	15.407(a) (1), (2)	Pass	802.11n n40MHz: -2.5 dBm/MHz
1	Max EIRP 5250 - 5350MHz	TPC required if EIRP≥ 500mW (27dBm). EIRP ≥ 200mW (23dBm) DFS threshold = -64dBm.	Pass	EIRP = 6.9 dBm (4.9 mW)
1	Power, 5470 - 5725MHz	15.407(a) (1), (2)	Pass	802.11n n40MHz: 22.9 mW
1	PSD, 5470 - 5725MHz	15.407(a) (1), (2)	Pass	802.11n n40MHz: -2.6 dBm/MHz
1	Max EIRP 5470 - 5725MHz	TPC required if EIRP≥ 500mW (27dBm). EIRP ≥ 200mW (23dBm) DFS threshold = -64dBm.		EIRP = 29.3 dBm (860.9 mW)
1	26dB Bandwidth	15.407 (Information only)	-	> 20MHz for all modes
1	99% Bandwidth	RSS 210 (Information only)	N/A	802.11n n40MHz: 36.9 MHz
2	Peak Excursion Envelope	15.407(a) (6) 13dB	Pass	12.8 dB
3	Antenna Conducted - Out of Band Spurious	15.407(b) -27dBm/MHz	Pass	All emissions below the -27dBm/MHz limit

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

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: 20 °C

Rel. Humidity: 36 %

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

Note 1:	Output power measured using a spectrum analyzer (see plots below). RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was continuous) and power integration over **100** MHz (method 1 of DA-02-2138A1).
Note 2:	Measured using the same analyzer settings used for output power.
Note 3:	For RSS-210 the limit for the 5150 - 5250 MHz band accounts for the antenna gain as the maximum eirp allowed is 10dBm/MHz. The limits are also corrected for instances where the highest measured value of the PSD exceeds the average PSD (calculated from the measured power divided by the measured 99% bandwidth) by more than 3dB by the amount that the measured value exceeds the average by more than 3dB.
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:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

MIMO Device - 5250-5350 MHz Band

	Chain 1	Chain 2	Chain 3	Coherent	Effective[5]	EIRP (mW)	EIRP (dBm)
Antenna Gain (dBi):	13	13		Yes	16.0	225.7	23.5

Power

Frequency (MHz)	Software Setting	26dB BW (MHz)	Measured Output Power[1] dBm			Total		Limit (dBm)	Max Power (W)	Pass or Fail
			Chain 1	Chain 2	Chain 3	mW	dBm			
5275	5.0	49.7	4.6	4.1		5.5	7.4	14.0	0.006	PASS
5310	3.0	45.0	5.2	3.7		**5.7**	**7.5**	14.0		PASS

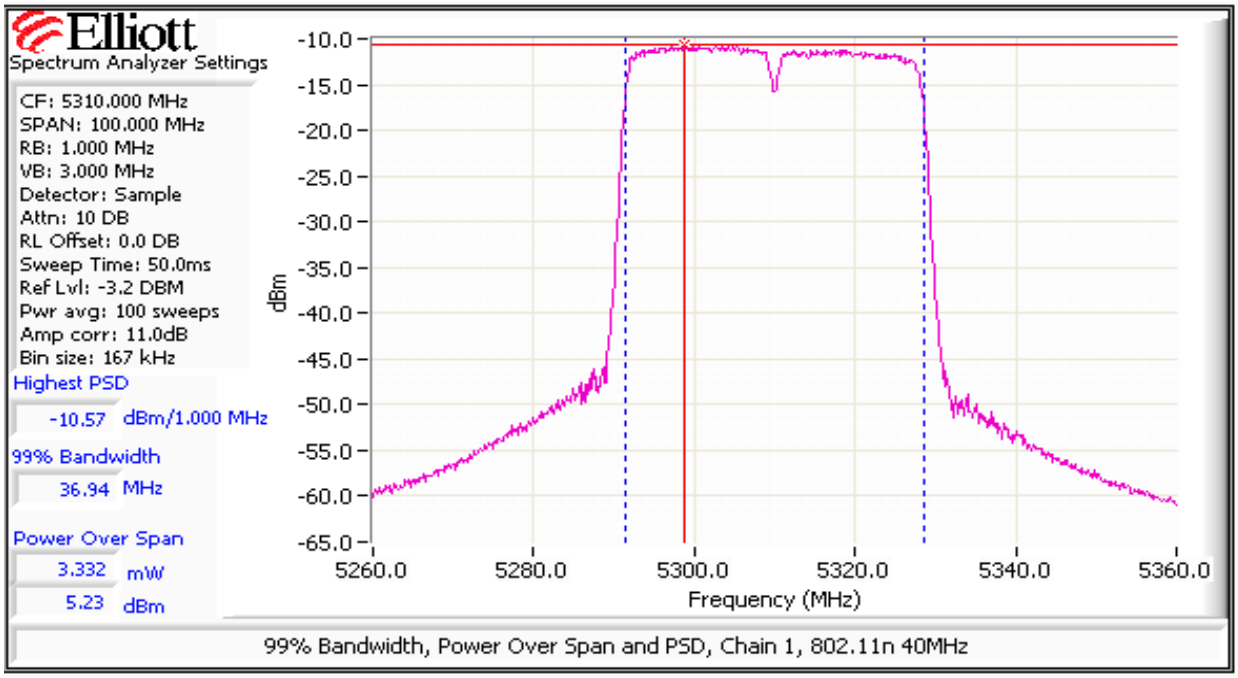
PSD

Frequency (MHz)	99%[4] BW	Total Power	PSD[2] dBm/MHz			Total PSD		Limit		Pass or Fail
			Chain 1	Chain 2	Chain 3	mW/MHz	dBm/MHz	FCC	RSS 210[3]	
5275	36.6	7.4	-9.9	-11.1		**0.2**	**-7.5**	1.0	11.0	PASS
5310	36.9	7.5	-10.6	-12.2		0.1	-8.3	1.0	11.0	PASS

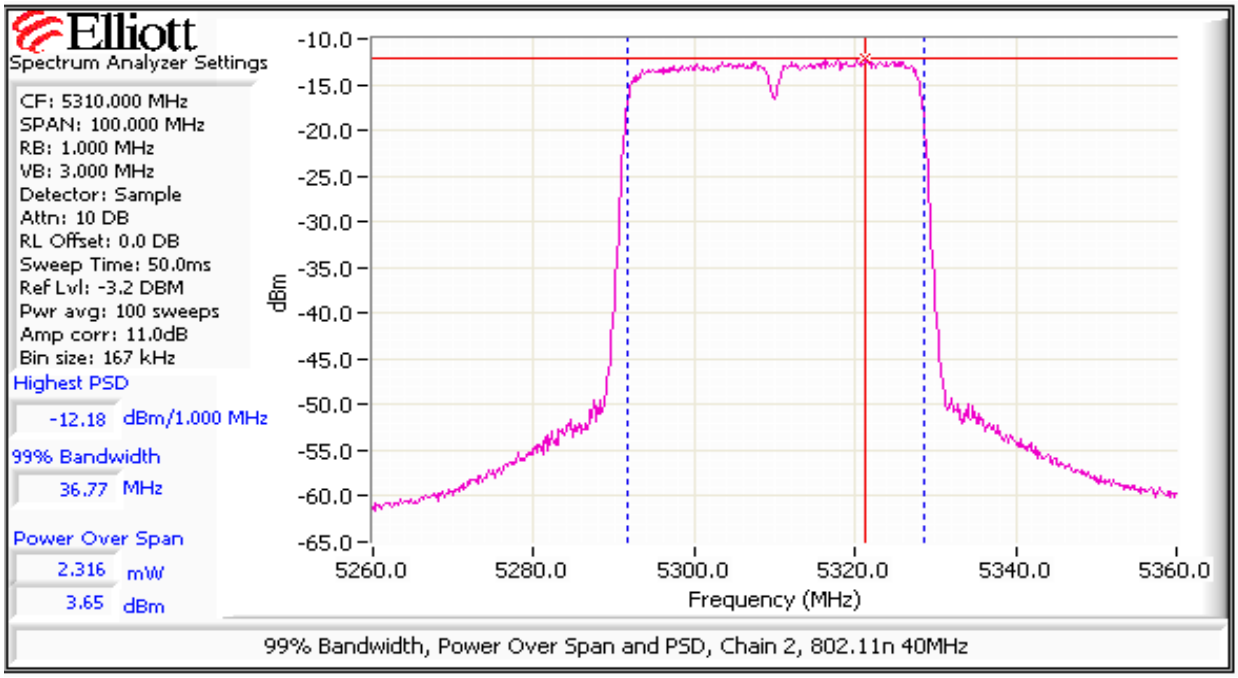
Note - high channel at 5310MHz only meets band edge radiated requirements when operating at the low power setting (see below).

Output Power at Low Power Setting - 5250-5350 MHz Band

As EIRP does not exceed 500mW TPC is not required.



Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A



Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

MIMO Device - 5470-5725 MHz Band

	Chain 1	Chain 2	Chain 3	Coherent	Effective[5]	EIRP (mW)	EIRP (dBm)
Antenna Gain (dBi):	13	13		Yes	16.0	860.9	29.3

Power (measured at two different settings for the low channel, power setting 9.5 does not meet band edge requirements)

Frequency (MHz)	Software Setting	26dB BW (MHz)	Measured Output Power[1] dBm			Total		Limit (dBm)	Max Power (W)	Pass or Fail
			Chain 1	Chain 2	Chain 3	mW	dBm			
5510	9.0	54.0	10.3	9.5		19.6	12.9	14.0	0.022	PASS
5550	9.5	53.8	10.8	9.8		**21.6**	**13.3**	14.0		PASS
5670	8.5	52.0	7.8	6.1		10.2	10.1	14.0		PASS

PSD

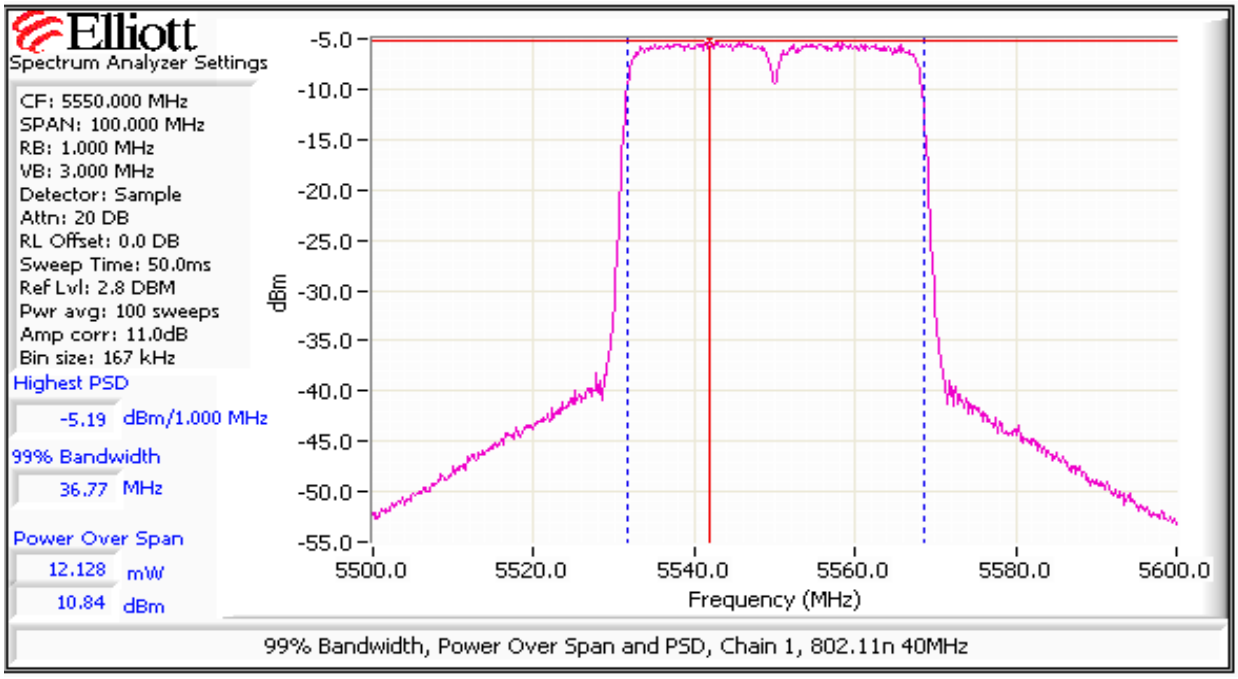
Frequency (MHz)	99%[4] BW	Total Power	PSD[2] dBm/MHz			Total PSD		Limit		Pass or Fail
			Chain 1	Chain 2	Chain 3	mW/MHz	dBm/MHz	FCC	RSS 210[3]	
5510	36.8	12.9	-5.6	-6.2		0.5	-2.9	1.0	11.0	PASS
5550	36.8	13.3	-5.2	-6.5		**0.5**	**-2.8**	1.0	11.0	PASS
5670	36.6	10.1	-8.0	-9.7		0.3	-5.7	1.0	11.0	PASS

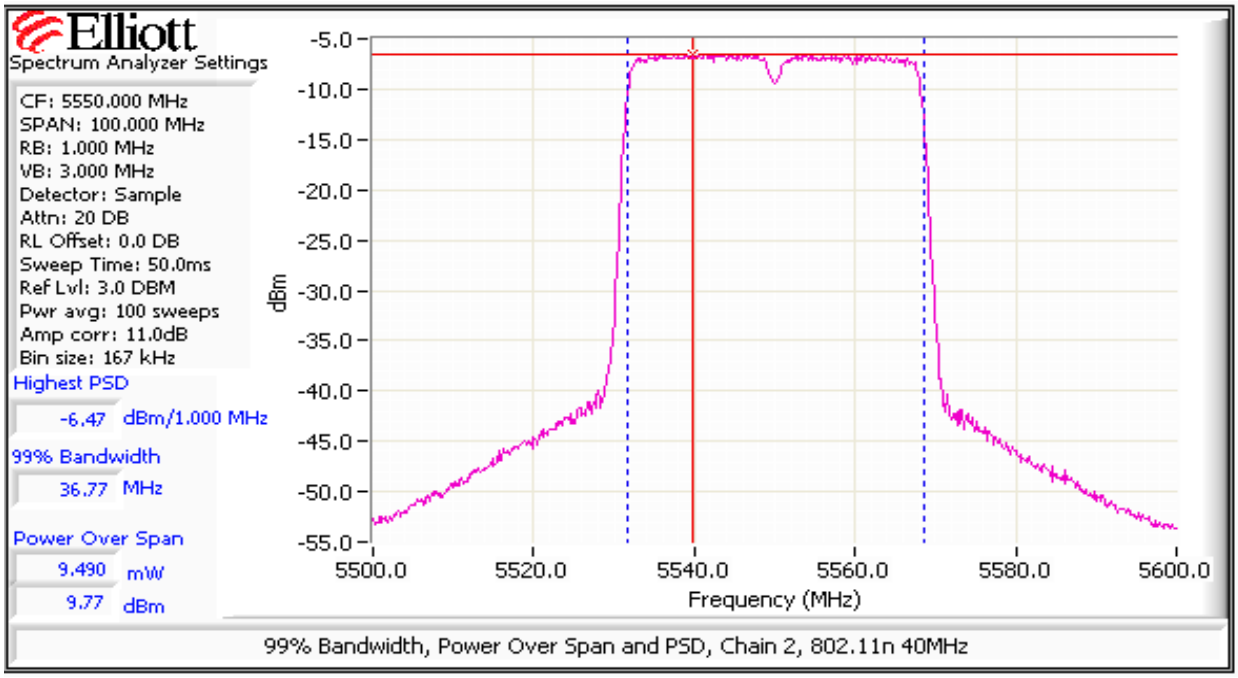
Output Power at Low Power Setting - 5470-5725 MHz Band

As EIRP exceeds 500mW TPC is required - measurements to show eirp < 250mW.
Limit is set to 24dBm (250mW) minus the antenna gain (dBi).

Frequency (MHz)	Software Setting	26dB BW (MHz)	Measured Output Power[1] dBm			Total		Limit (dBm)	Max Power (W)	Pass or Fail
			Chain 1	Chain 2	Chain 3	mW	dBm			
5510	4.0		5.6	3.9		6.1	7.8	8.0	0.006	PASS
5550	4.0		5.6	4.0		6.1	7.9	8.0		PASS
5670	4.5		5.3	4.0		5.9	7.7	8.0		PASS

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A





Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run #2: Peak Excursion Measurement

40MHz: Device meets the requirement for the peak excursion

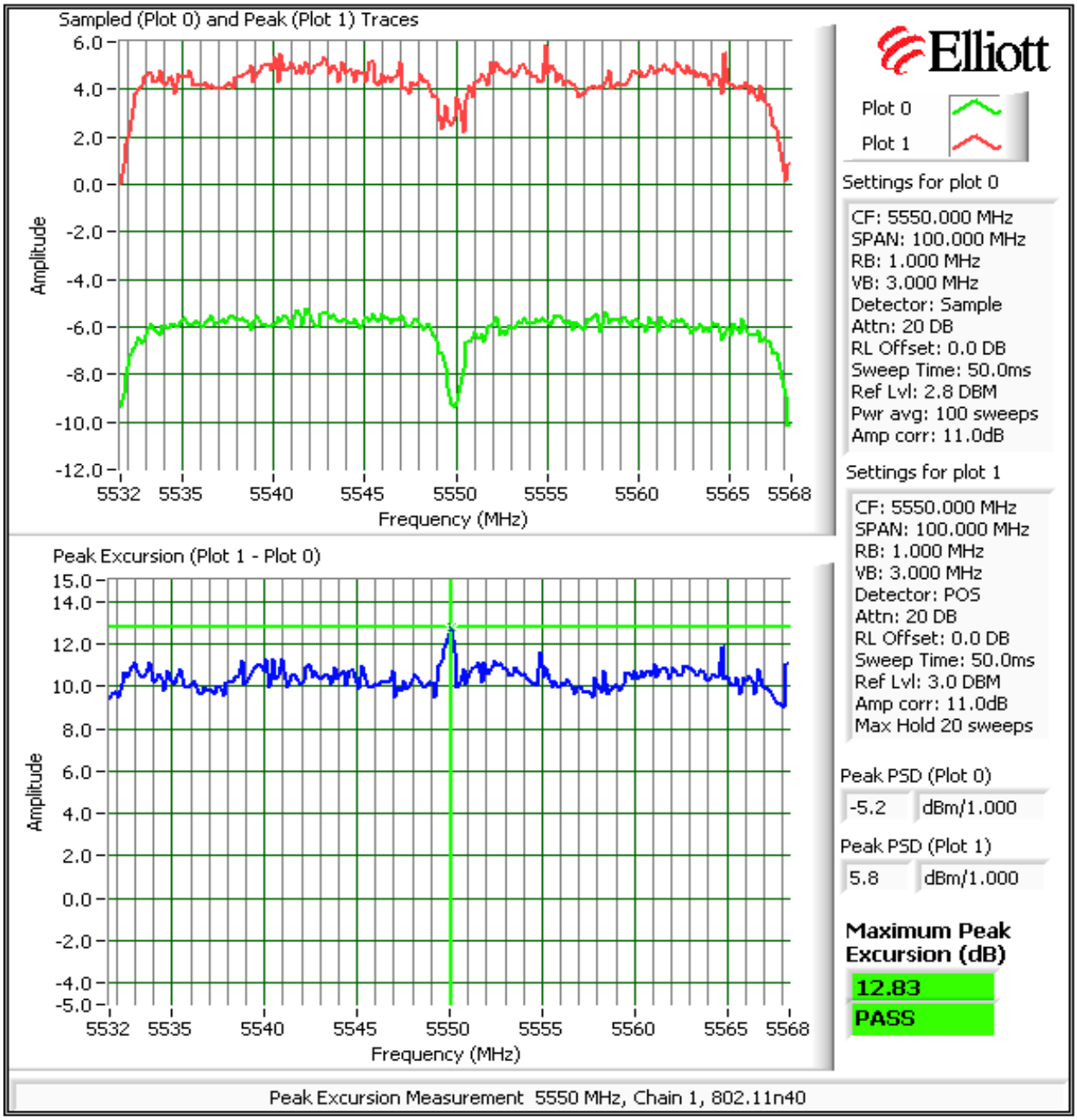
Freq	Peak Excursion(dB)		Freq	Peak Excursion(dB)		Freq	Peak Excursion(dB)	
(MHz)	Value	Limit	(MHz)	Value	Limit	(MHz)	Value	Limit
5190		13.0	5275	11.1	13.0	5510	12.6	13.0
5230		13.0	5310	12.7	13.0	5550	**12.8**	13.0
						5670	11.8	13.0

Plots Showing Peak Excursion

Trace A: RBW = 1MHz, VBW = 3MHz, Peak hold

Trace B: Same settings as used for power/PSD measurements (RBW = 1 MHz, VBW = 3MHz, Integrated **average** power)

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A



Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run #3: Out Of Band Spurious Emissions - Antenna Conducted

MIMO Devices: Antenna gain used is the effective gain calculated in the power section of this data sheet. The plots were obtained for each chain individually and the limit was adjusted to account for all chains transmitting simultaneously

Number of transmit chains:	2		
Maximum Antenna Gain:	13.0	dBi	
Spurious Limit:	-27.0	dBm/MHz eirp	
Adjustment for 2 chains:	-3.0	dB adjustment for multiple chains.	
Limit Used On Plots Note 1:	-43.0	dBm/MHz	Average Limit (RB=1MHz, VB=10Hz)
	-23.0	dBm/MHz	Peak Limit (RB=VB=1MHz)

Note 1:	The -27dBm/MHz limit is an eirp limit. The limit for antenna port conducted measurements is adjusted to take into consideration the maximum antenna gain (limit = -27dBm - antenna gain). Radiated field strength measurements for signals more than 50MHz from the bands and that are close to the limit are made to determine compliance as the antenna gain is not known at these frequencies.
Note 2:	All spurious signals below 1GHz are measured during digital device radiated emissions test.
Note 3:	Signals within 10MHz of the 5.725 or 5.825 Band edge are subject to a limit of -17dBm EIRP
Note 4:	If the device is for outdoor use then the -27dBm eirp limit also applies in the 5150 - 5250 MHz band.
Note 5:	Signals that fall in the restricted bands of 15.205 are subject to the limit of 15.209.

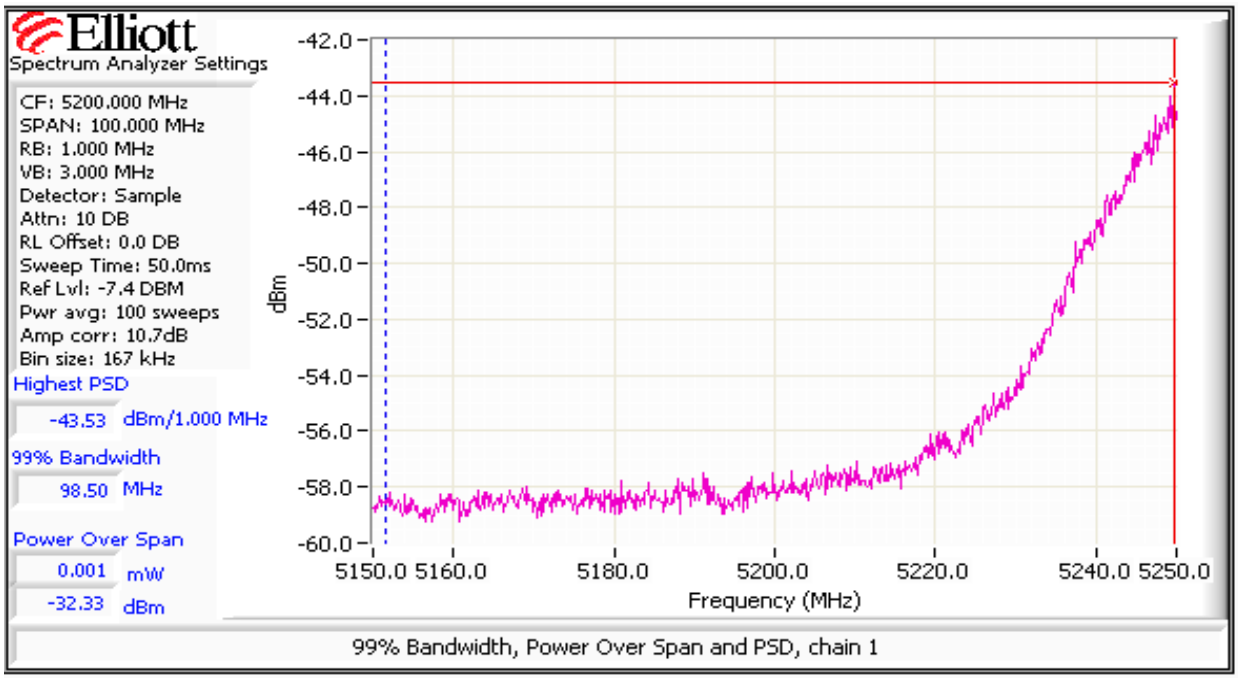
Plots Showing Out-Of-Band Emissions (RBW=VBW=1MHz)

Low channel, 5250 - 5350 MHz Band (5275 MHz)

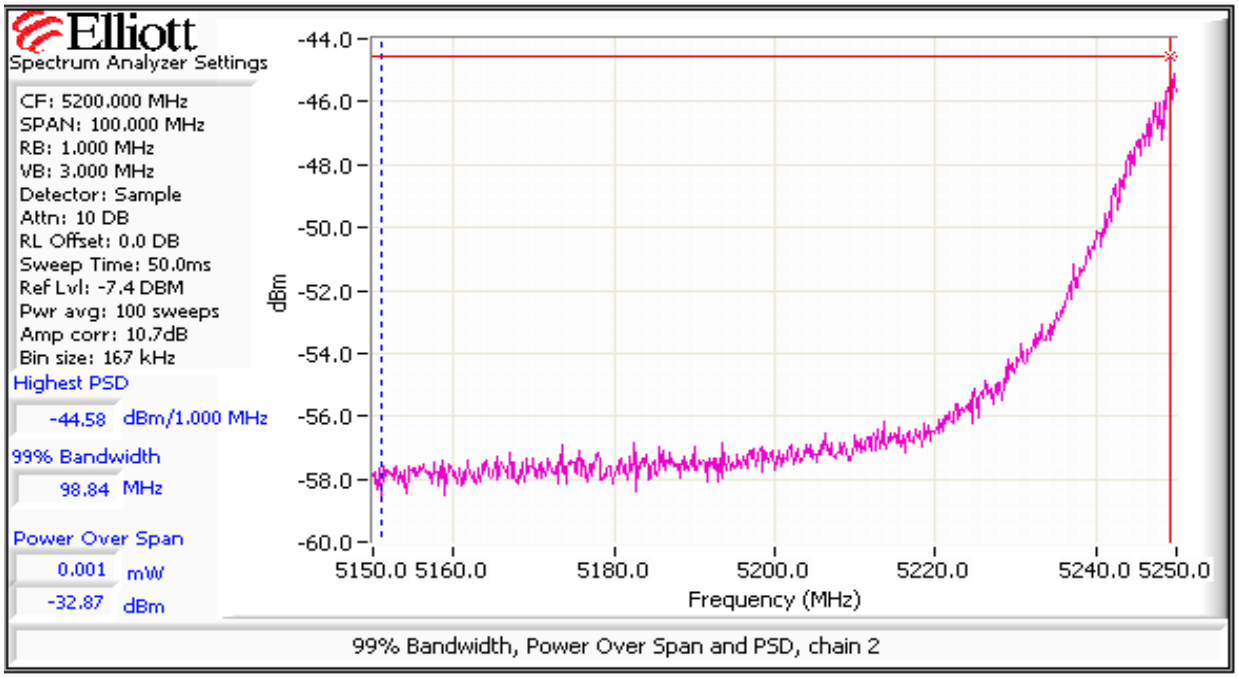
Plots for each chain showing compliance with the -27dBm/MHz limit in the 5150 - 5250 MHz band. Start and stop frequencies set to 5150-5250 MHz, RB=1MHz, VB=3MHz, power averaging enabled (100 traces):

	Power Setting	Band edge Level		Antenna Gain (dBi)	EIRP		Total EIRP	Limit	Result
		dBm/MHz	mW/MHz		mW/MHz	dBm/MHz	dBm/MHz	dBm/MHz	
Chain 1	7	-43.5	0.00004	13.0	0.0008851	-30.5	-28.0	-27	PASS
Chain 2		-44.6	0.00003	13.0	0.000695	-31.6			

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A



99% Bandwidth, Power Over Span and PSD, chain 1

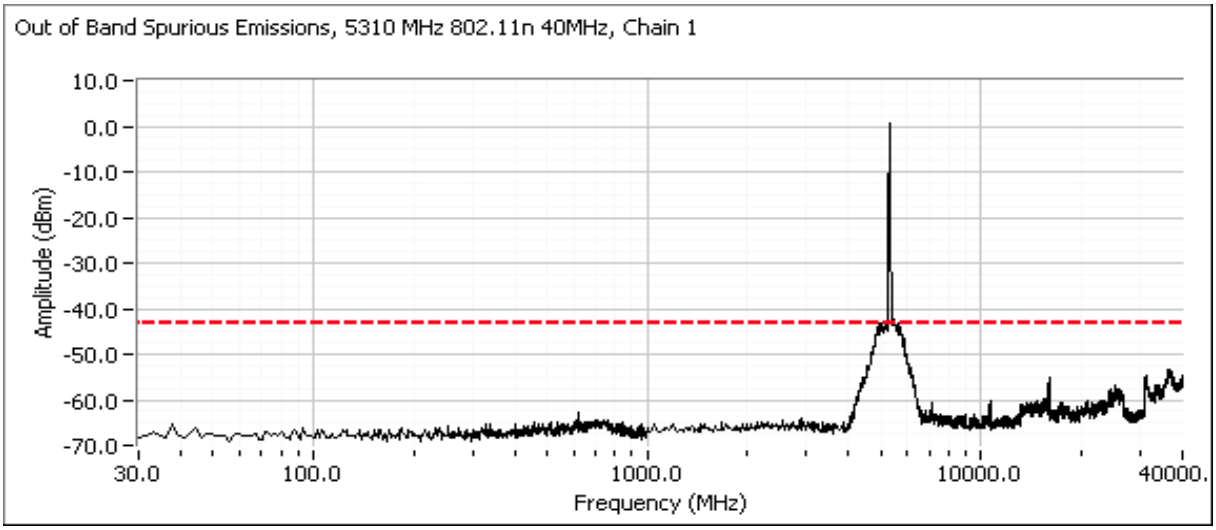


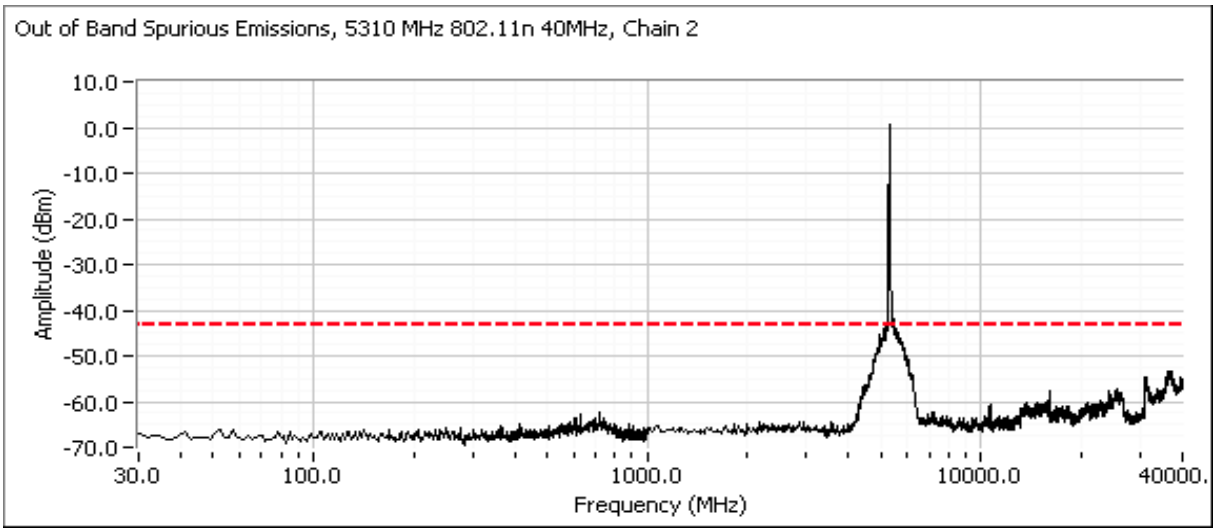
99% Bandwidth, Power Over Span and PSD, chain 2

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

High channel, 5250 - 5350 MHz Band

Compliance with the radiated limits for the restricted band immediately above 5350MHz is demonstrated through the radiated emissions tests.



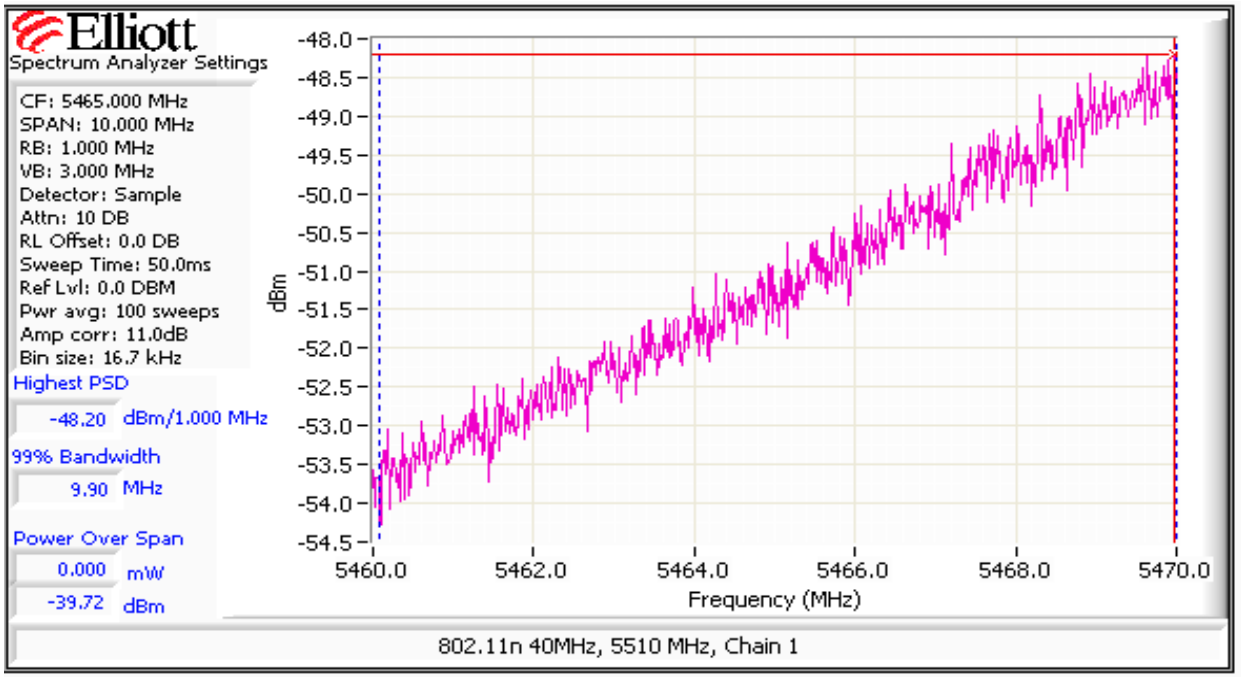


Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

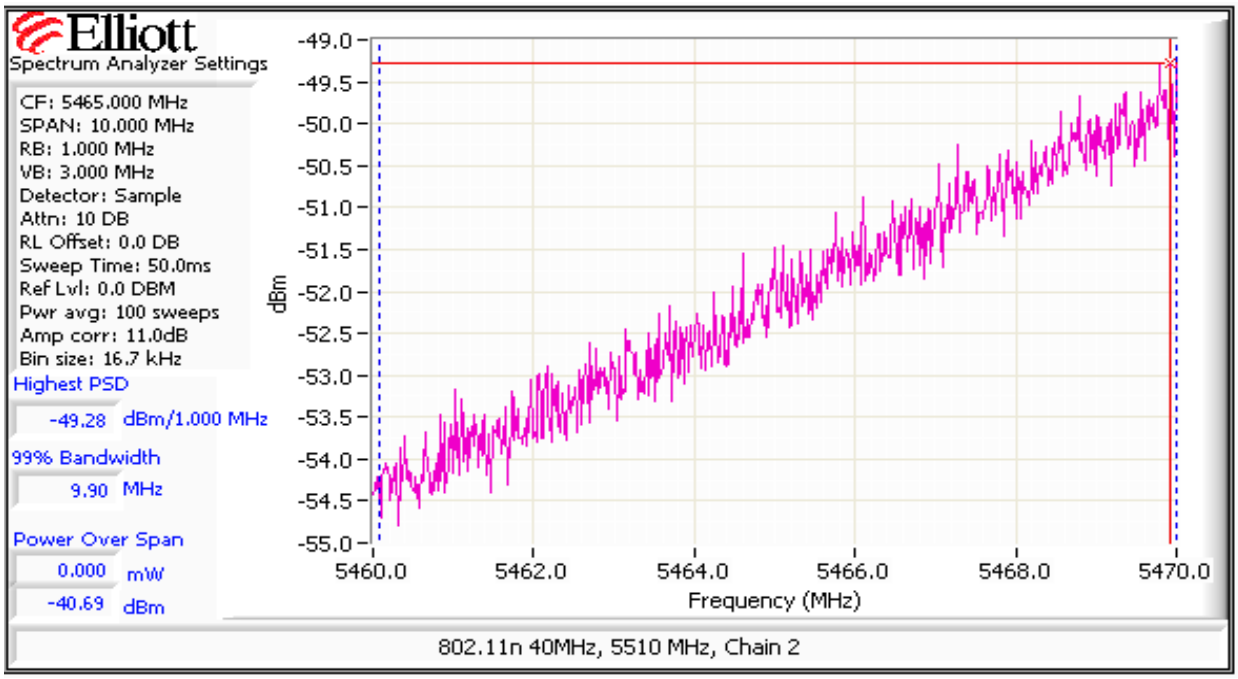
Low channel, 5470 - 5725 MHz Band

Plots for each chain showing compliance with the -27dBm/MHz limit for the 5460 - 5470 MHz band edge. Start and stop frequencies set to 5460-5470 MHz, RB=1MHz, VB=3MHz, power averaging enabled (100 traces). **Note** - compliance with the radiated limits for the restricted band immediately below 5460MHz is demonstrated through the radiated emissions tests.

	Power Setting	Band edge Level		Antenna Gain (dBi)	EIRP		Total EIRP dBm/MHz	Limit dBm/MHz	Result
		dBm/MHz	mW/MHz		mW/MHz	dBm/MHz			
Chain 1	9.5	-48.2	0.00002	13.0	0.000302	-35.2	-32.7	-27	PASS
Chain 2		-49.3	0.00001	13.0	0.0002344	-36.3			

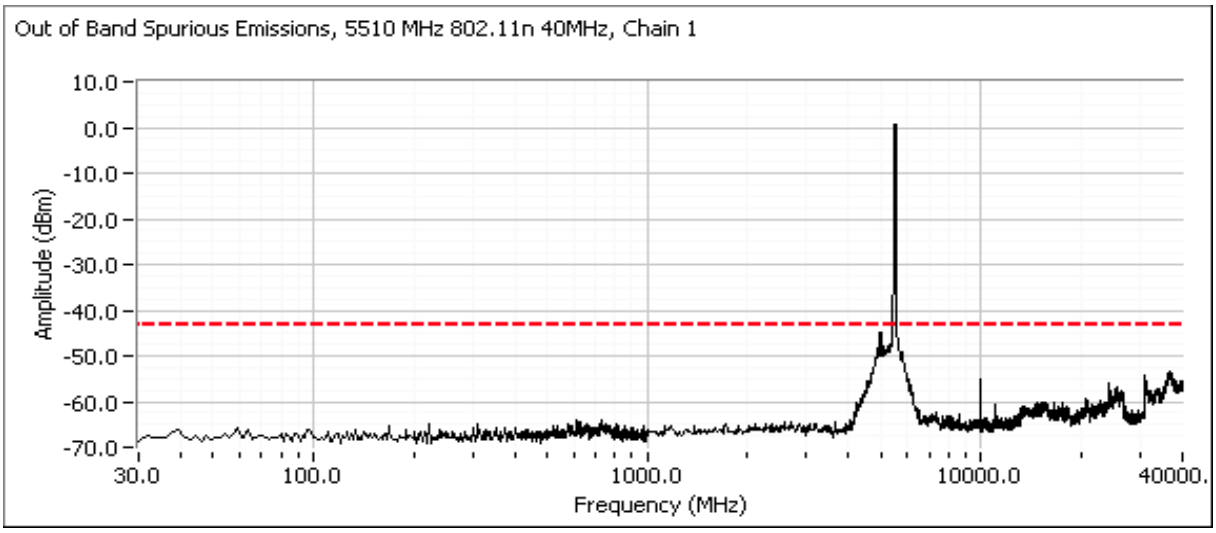


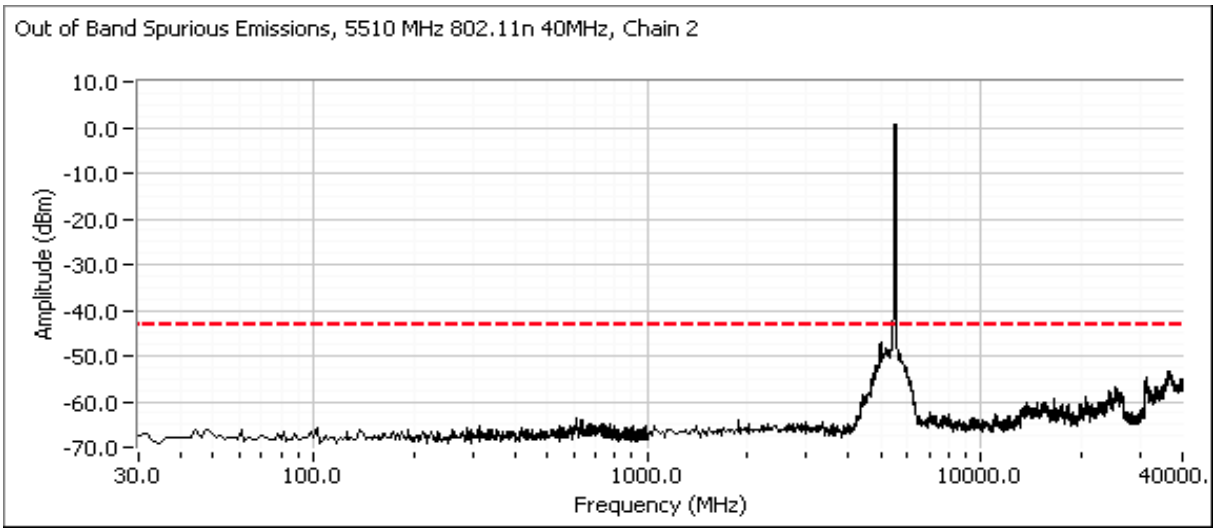
Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A



Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

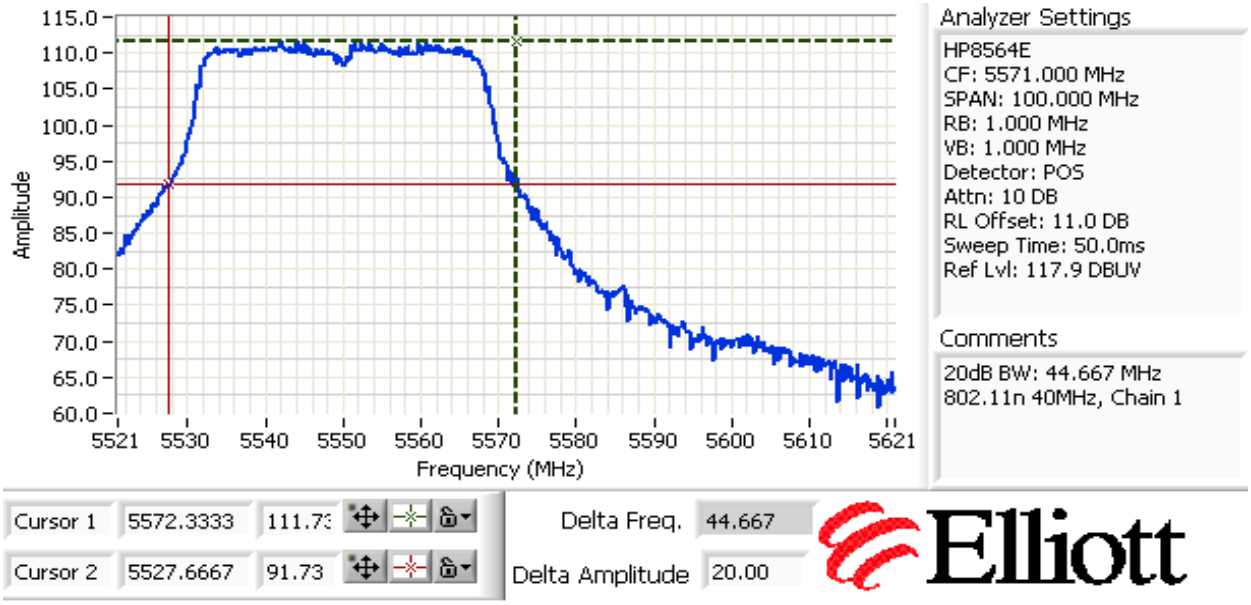
Wide-band plot, RB=VB=1MHz (Peak measurements versus limit).

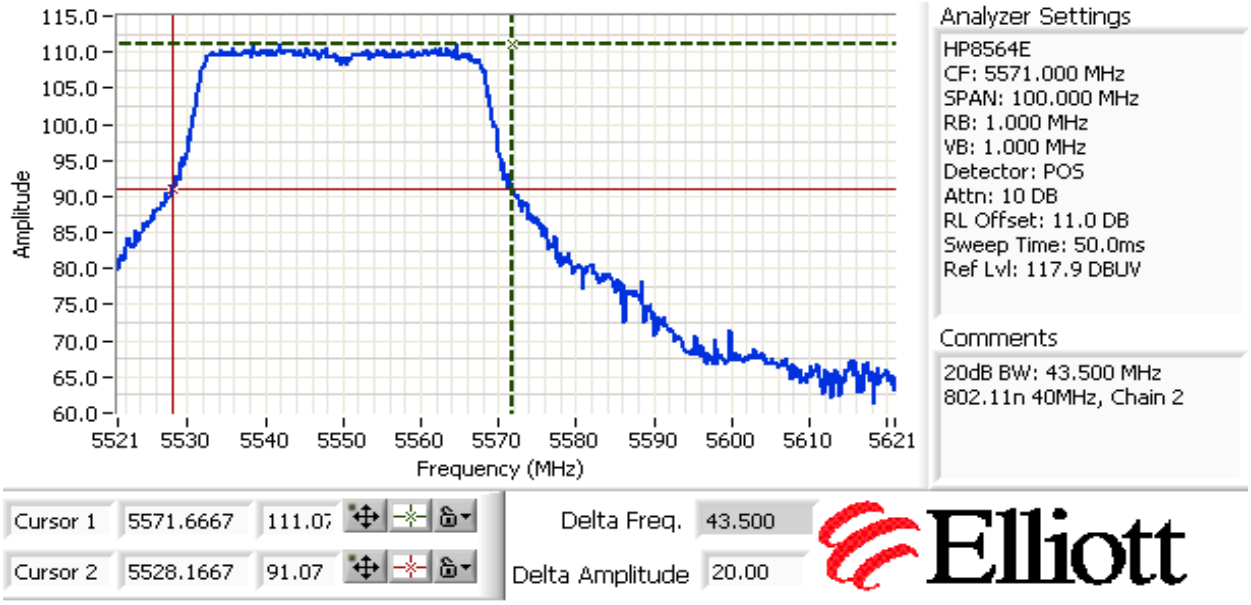




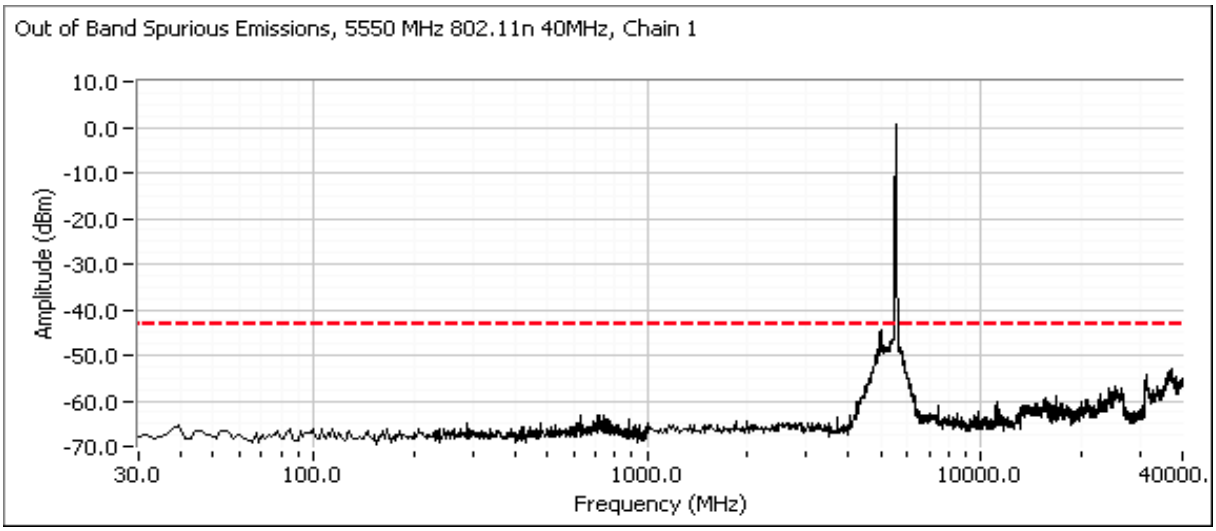
Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

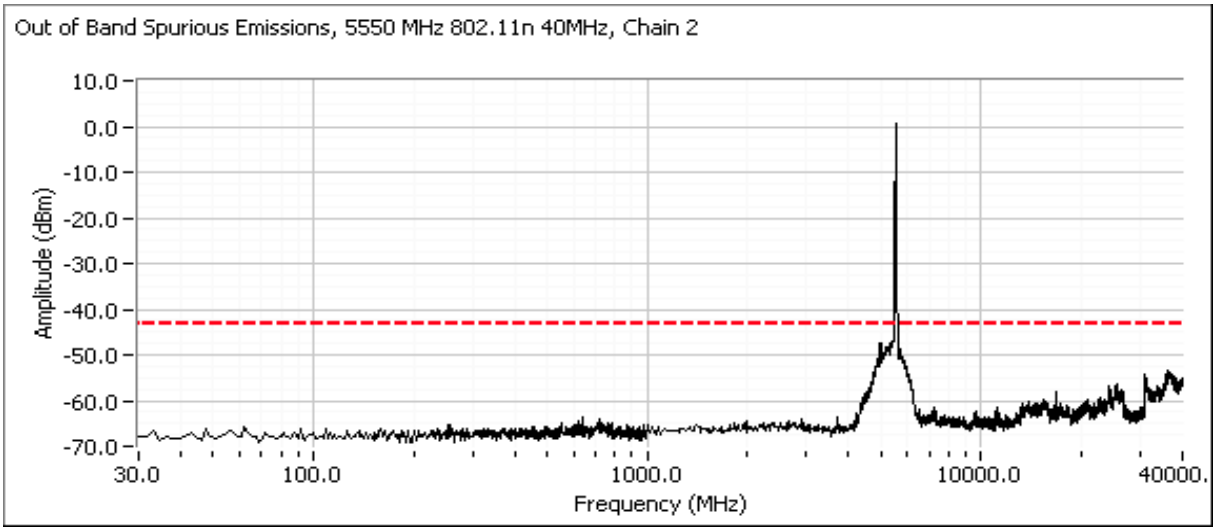
Center channel, 5470 - 5725 MHz Band (20Mhz channel use 5580 MHz, 40MHz channel use 5550 MHz)
For **master** devices - This plot is showing that the 20dB bandwidth of the channel closest to 5600 MHz does not spill into the 5600-5650 MHz band. RB > 1% of span.





Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A



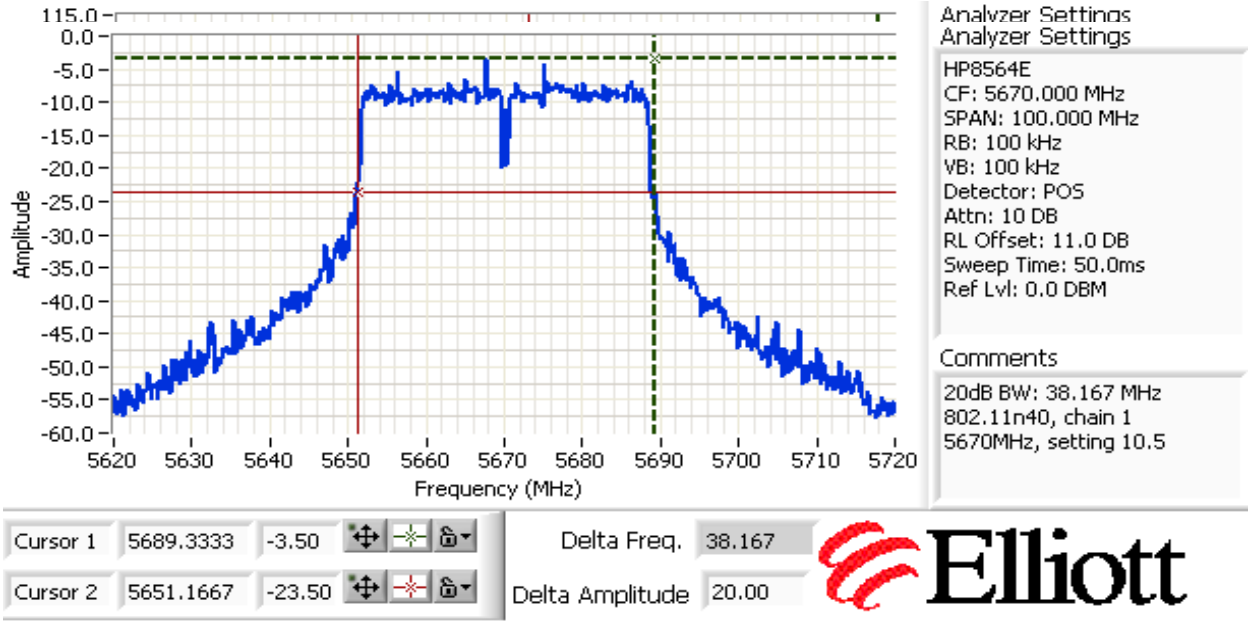


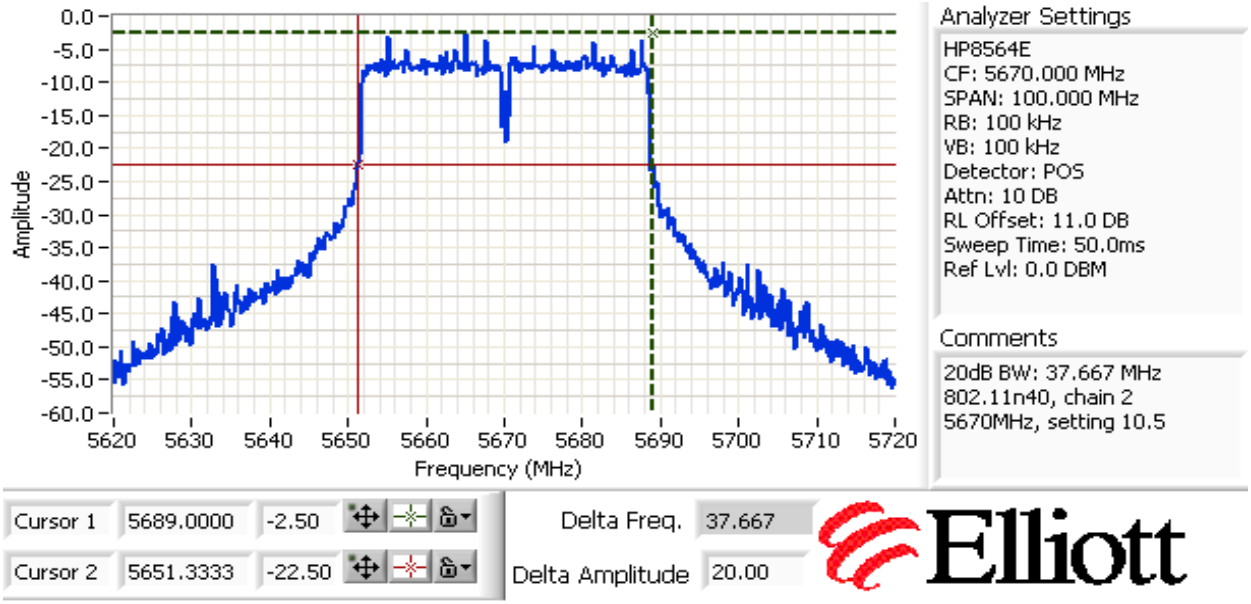
Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Channel adjacent to 5650 MHz

For **master** devices - This plot is showing that the 20dB bandwidth of the channel closest to 5650 MHz (for standard 802.11 devices these would be 5660 MHz for 802.11a and HT20 channel and **5670 MHz for HT40)** does not spill into the 5600-5650 MHz band.

Plots showing that the 20dB bandwidth of the channel closest to 5650 MHz does not spill into the 5600-5650 MHz band. RB > 1% of span.



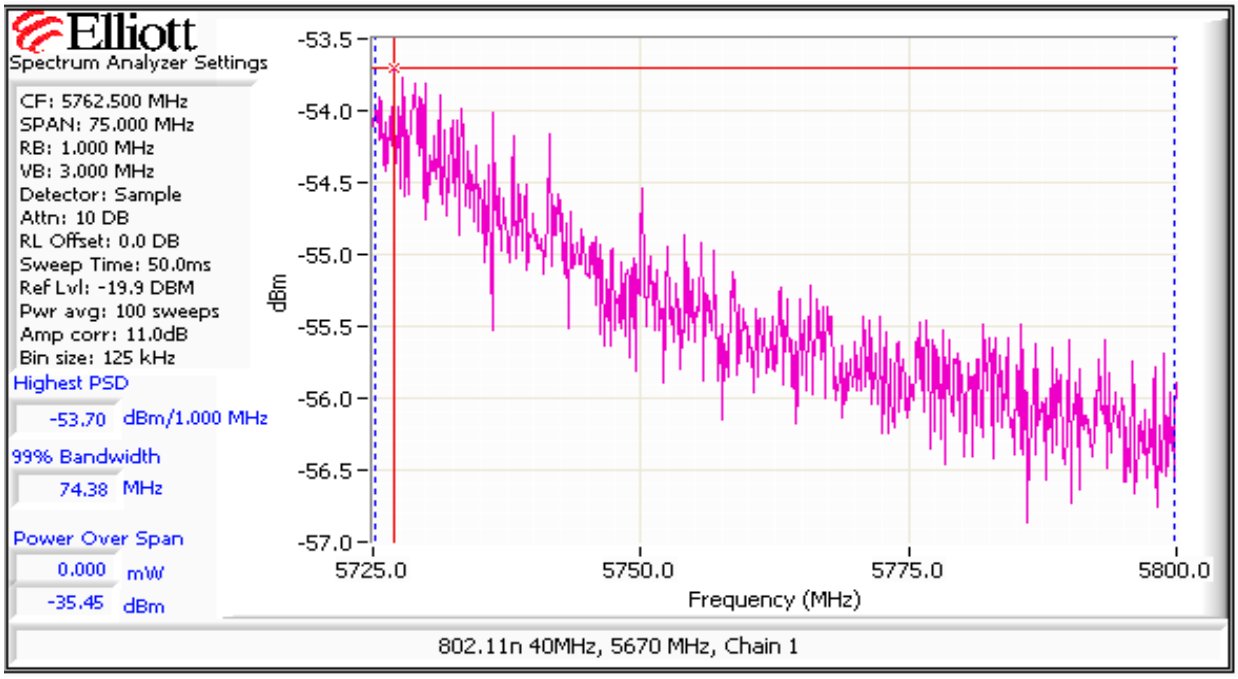


Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

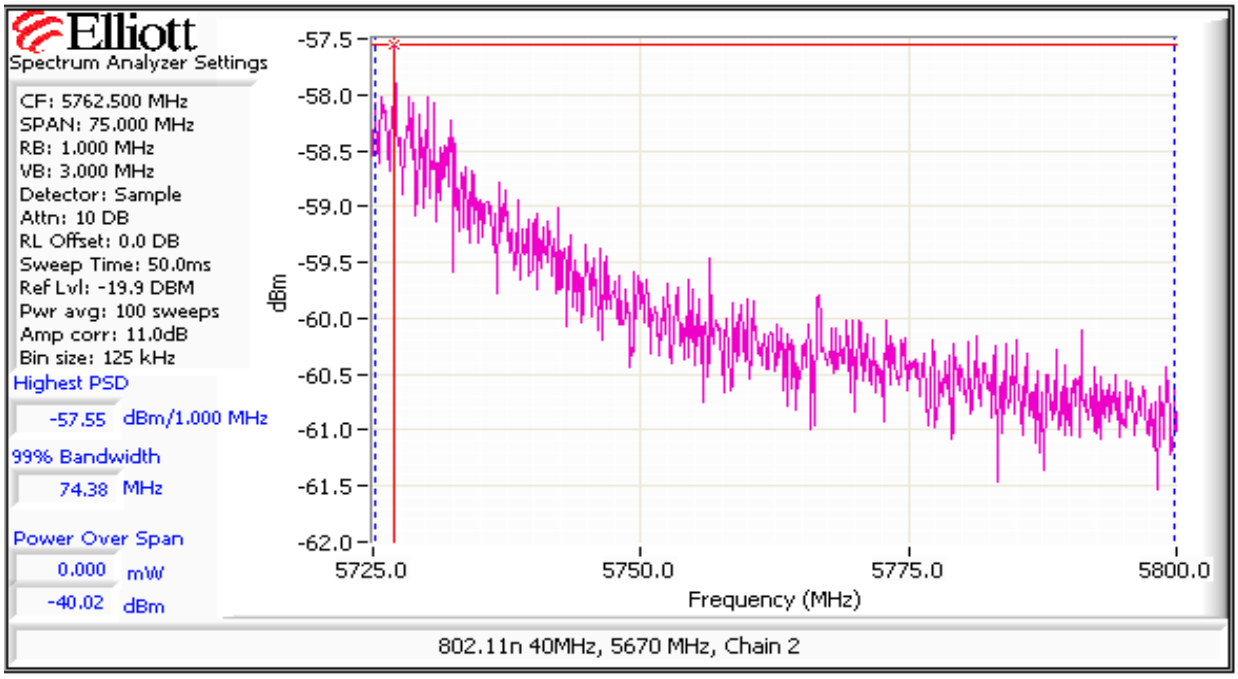
High channel, 5470 - 5725 MHz Band

Plots for each chain showing compliance with the -27dBm/MHz limit above the 5725MHz band edge. Start and stop frequencies set to 5725-5800 MHz, RB=1MHz, VB=3MHz, power averaging enabled (100 traces):

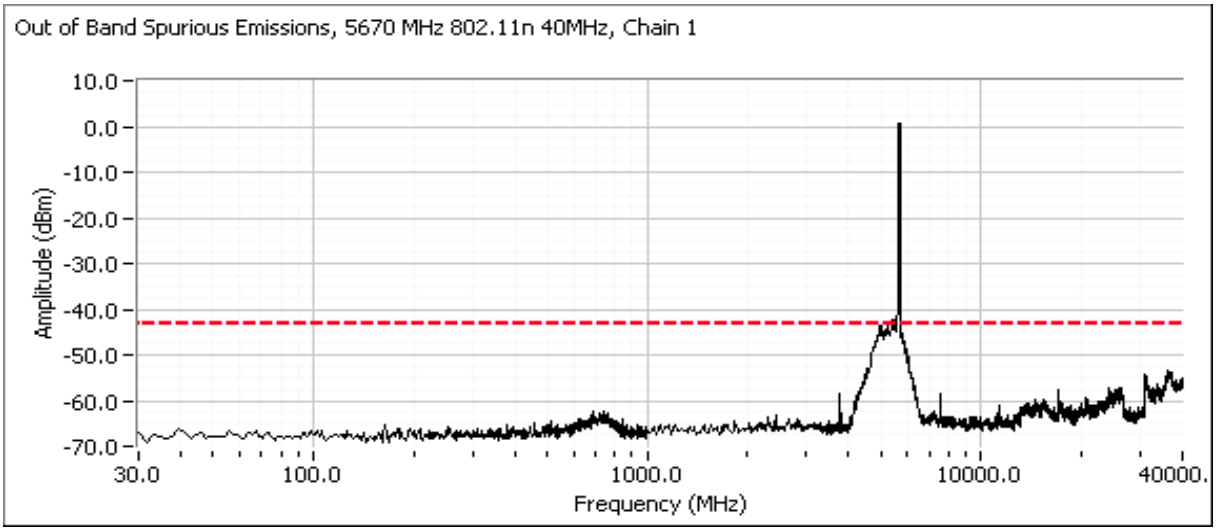
	Power Setting	Band edge Level		Antenna Gain (dBi)	EIRP		Total EIRP dBm/MHz	Limit dBm/MHz	Result
		dBm/MHz	mW/MHz		mW/MHz	dBm/MHz			
Chain 1	10.5	-53.7	0.00000	13.0	8.511E-05	-40.7	-39.2	-27	PASS
Chain 2		-57.6	0.00000	13.0	3.508E-05	-44.6			



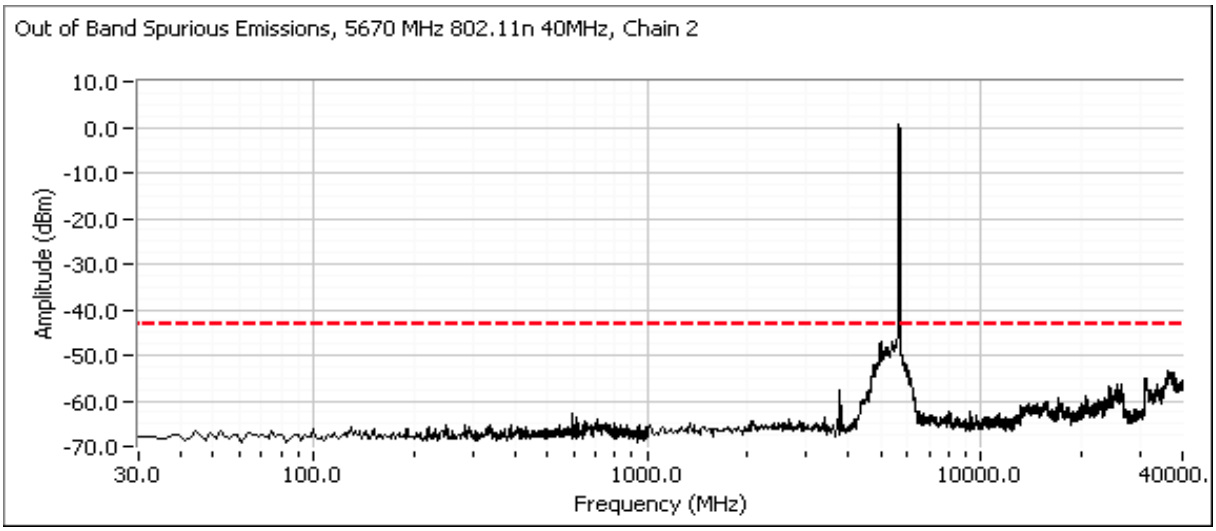
Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A



Wide-band plot, RB=VB=1MHz (Peak measurements versus limit).



Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A



Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

RSS 210 and FCC 15.407 (UNII) Radiated 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.

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 with cables routed beneath the floor.
For radiated emissions testing the measurement antenna was located 3 meters from the EUT.

Ambient Conditions:

Temperature: 20.4 °C
Rel. Humidity: 36 %

Summary of Results

Compliance with the -27dBm/MHz eirp limit in the frequency bands 5150-5250MHz, 5460-5470MHz and imediately above 5725 MHz is demonstarted through conducted measurements. Radiated measurements are used to demonstarte compliance in the 5350-5460MHz restricted band for the highest channel in the 5250-5350MHz band and the lowest channel in the 5470-5725 MHz band.
Final power setting is the power setting that is at the maximum rating for that particular mode/channel. In all cases the measurements were made at or above the final power level.

Run #	Mode	Channel	Final power Setting	Power Setting Tested	Test Performed	Limit	Result / Margin
Run #1	.11a (20) Chain A	5320MHz	5.0 (8 for adjacent channel)	11.0	Restricted Band Edge at 5350 MHz	15.209	53.8dBµV/m @ 5351.6MHz (-0.2dB)
		5500 MHz	12.0	12.0	Restricted Band Edge at 5460 MHz	15.209	52.1dBµV/m @ 5455.9MHz (-1.9dB)
Run # 3	HT20 Chain A+B	#64 5320MHz	5.0	9.5	Restricted Band Edge at 5350 MHz	15.209	51.7dBµV/m @ 5350.1MHz (-2.3dB)
		#100 5500MHz	9.0	11.5	Restricted Band Edge at 5460 MHz	15.209	52.1dBµV/m @ 5459.6MHz (-1.9dB)
Run # 4	HT40 Chain A+B	5275MHz	5.0	7.0	Restricted Band Edge at 5350 MHz	15.209	52.8dBµV/m @ 5350.3MHz (-1.2dB)
		5310MHz	3.0	3.0	Restricted Band Edge at 5350 MHz	15.209	53.0dBµV/m @ 5350.4MHz (-1.0dB)
		#102 5510MHz	9.0	9.0	Restricted Band Edge at 5460 MHz	15.209	53.7dBµV/m @ 5459.9MHz (-0.3dB)

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run #	Mode	Channel	Final power Setting	Power Setting Tested	Test Performed	Limit	Result / Margin
Run # 5	HT5 Chain A+B	5340MHz	4.5	8.5	Restricted Band Edge at 5350 MHz	15.209	53.3dBµV/m @ 5350.0MHz (-0.7dB)
		5475 MHz	5.0	10.5	Restricted Band Edge at 5460 MHz	15.209	52.9dBµV/m @ 5459.1MHz (-1.1dB)
Run # 6	HT8 Chain A+B	HT8 5330MHz	5.0	11.0	Restricted Band Edge at 5350 MHz	15.209	53.8dBµV/m @ 5350.3MHz (-0.2dB)
		HT8 5475 MHz	4.5	11.0	Restricted Band Edge at 5460 MHz	15.209	53.5dBµV/m @ 5459.9MHz (-0.5dB)
Run # 7	HT10 Chain A+B	HT10 5330MHz	5.0	9.0	Restricted Band Edge at 5350 MHz	15.209	53.8dBµV/m @ 5351.7MHz (-0.2dB)
		HT10 5480 MHz	6.0	10.5	Restricted Band Edge at 5460 MHz	15.209	52.5dBµV/m @ 5459.4MHz (-1.5dB)
Run # 8	HT30 Chain A+B	HT30 5315MHz	5.0	5.5	Restricted Band Edge at 5350 MHz	15.209	53.9dBµV/m @ 5350.0MHz (-0.1dB)
		HT30 5500 MHz	8.0	9.5	Restricted Band Edge at 5460 MHz	15.209	53.7dBµV/m @ 5459.2MHz (-0.3dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run #1, Band Edge Field Strength - .11a (20), Chain A
Run #1a, EUT on Channel #52 5260MHz - .11a (20), Chain A
Covered by antenna port measurement.

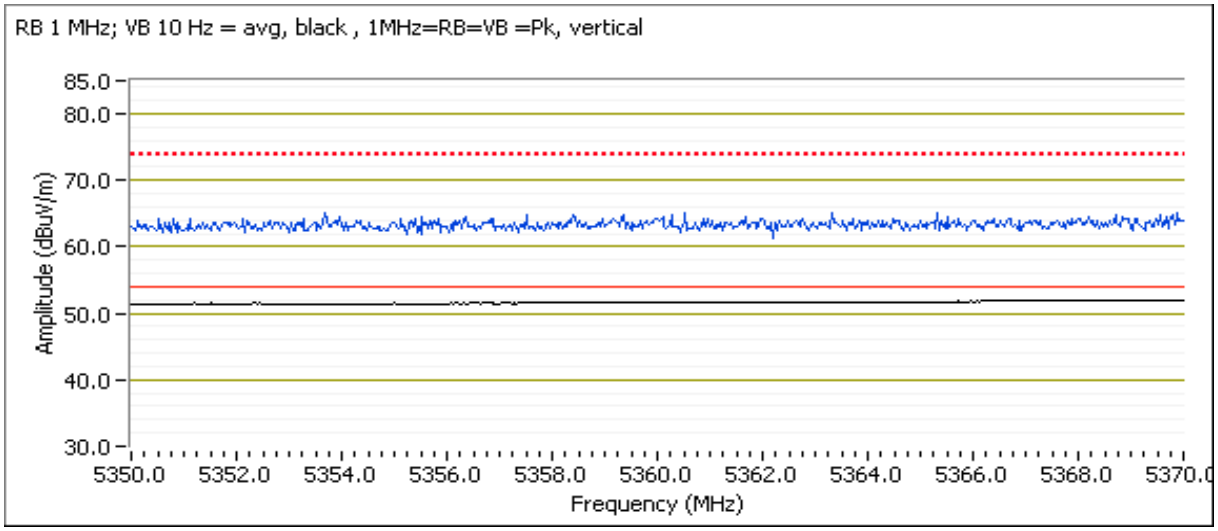
Run #1b, EUT on Channel 5280MHz - .11a (20), Chain A

Date of Test: 5/19/2011 Test Location: FT3
Test Engineer: Joseph Cadigal Config Change: none

Power Setting: 10.5

5350 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5368.030	**51.0**	V	54.0	**-3.0**	AVG	351	1.1	setting = 10.5
5361.200	61.5	V	74.0	-12.5	PK	351	1.1	setting = 10.5
5358.800	67.8	V	74.0	-6.2	PK	352	1.1	RB 1 MHz;VB 3 MHz;Pk
5357.270	55.9	H	74.0	-18.1	PK	28	1.0	RB 1 MHz;VB 3 MHz;Pk



Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run #1b, EUT on Channel 5300MHz - .11a (20), Chain A

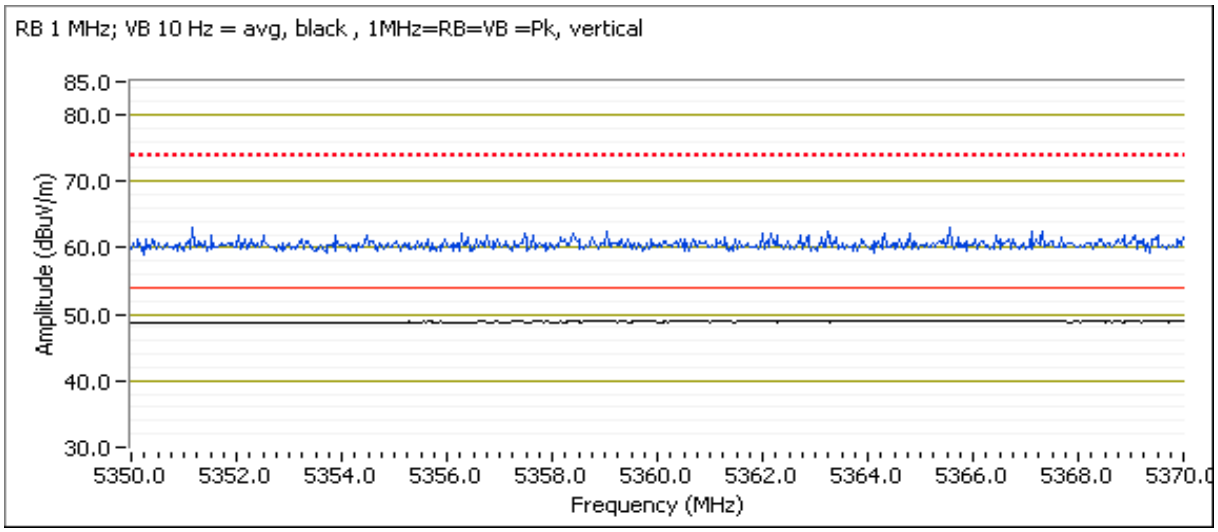
Date of Test: 5/19/2011 Test Location: FT3

Test Engineer: Joseph Cadigal Config Change: none

Power Setting: 10.0

5350 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5360.400	**51.3**	V	54.0	**-2.7**	AVG	350	1.0	setting = 10
5359.530	61.8	V	74.0	-12.2	PK	350	1.0	setting = 10
5361.730	44.5	H	54.0	-9.5	AVG	31	1.0	RB 1 MHz;VB 10 Hz;Pk
5356.830	56.4	H	74.0	-17.6	PK	31	1.0	RB 1 MHz;VB 3 MHz;Pk



Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run #1b, EUT on Channel 5310MHz - .11a (20), Chain A

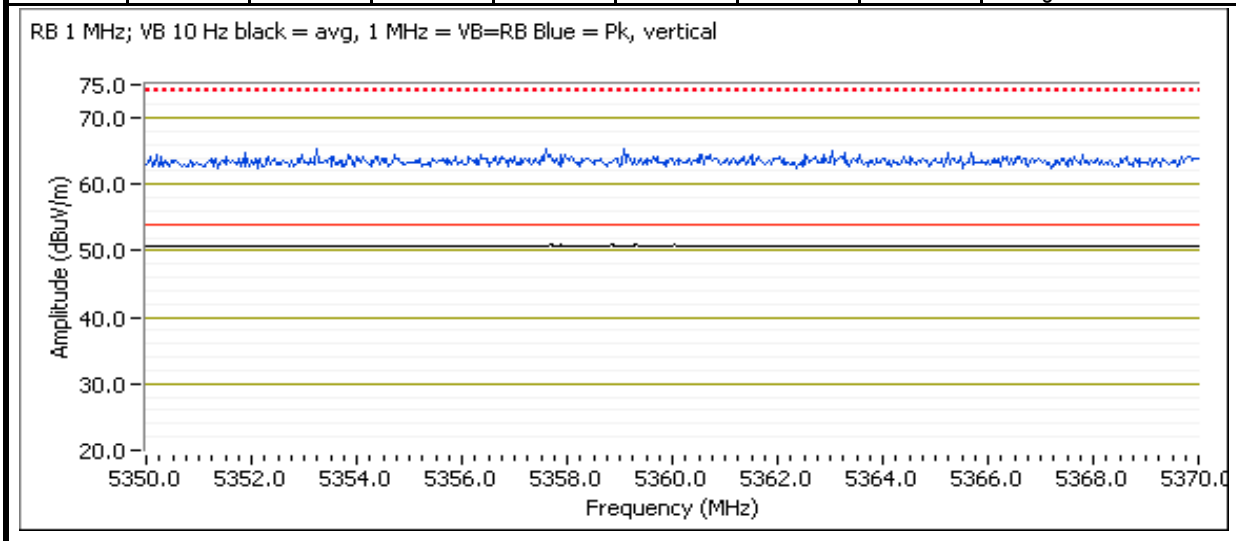
Date of Test: 5/9/2011 Test Location: FT4

Test Engineer: Joseph Cadigal Config Change: none

Power Setting: 11.0

5350 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5358.300	**53.2**	V	54.0	**-0.8**	AVG	360	1.2	setting =11
5361.130	65.0	V	74.0	-9.0	PK	360	1.2	setting =11
5361.970	37.6	H	54.0	-16.4	AVG	30	1.0	setting =11
5366.070	49.3	H	74.0	-24.7	PK	30	1.0	setting =11



Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run #1b, EUT on Channel 5315MHz - .11a (20), Chain A

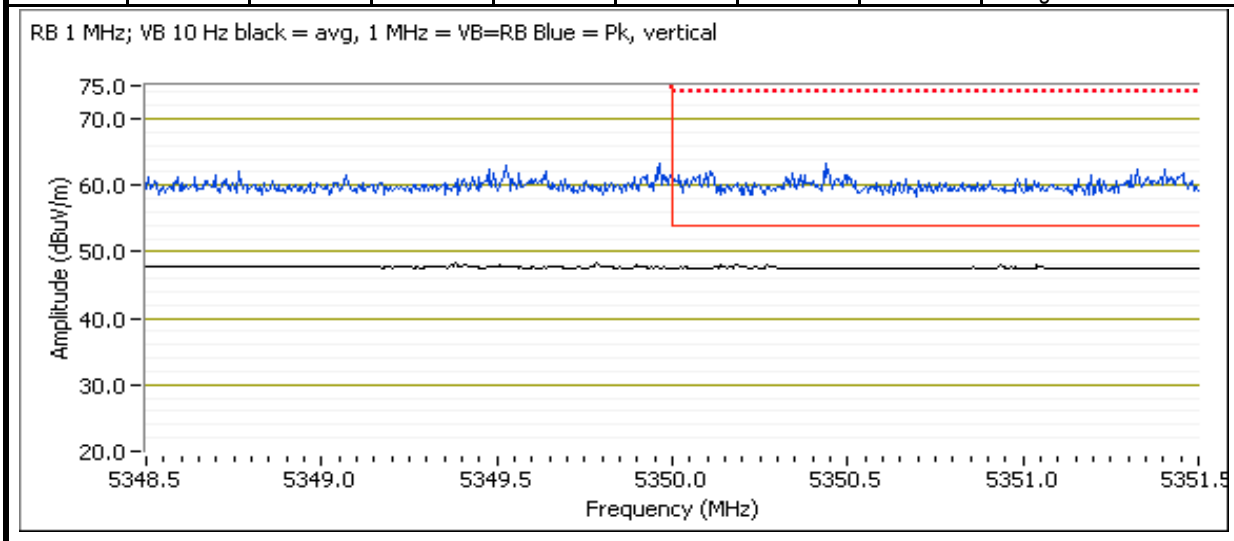
Date of Test: 5/9/2011 Test Location: FT4

Test Engineer: Joseph Cadigal Config Change: none

Power Setting: 10.0

5350 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5357.600	**54.0**	V	54.0	**0.0**	AVG	358	1.1	setting = 11
5363.970	65.3	V	74.0	-8.7	PK	358	1.1	setting = 11



Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run #1b, EUT on Channel #64 5320MHz - .11a (20), Chain A

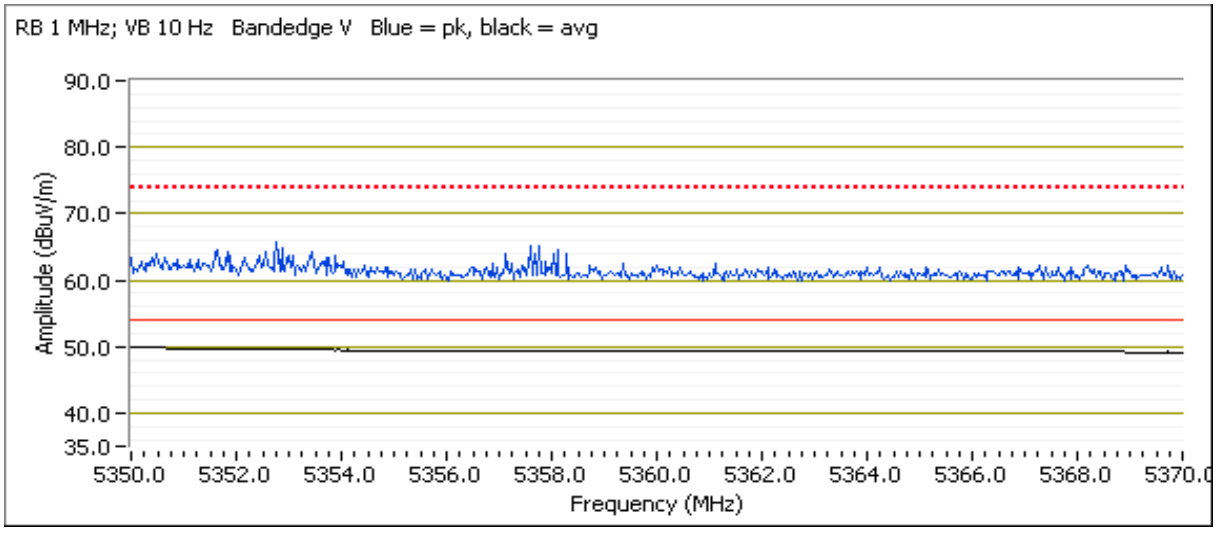
Date of Test: 4/22/2011 Test Location: FT7

Test Engineer: John Caizzi Config Change: none

Power Setting: 11.0

5350 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	Power Setting
5351.570	53.8	H	54.0	-0.2	AVG	12	1.00	11.0
5351.400	70.9	H	74.0	-3.1	PK	12	1.00	11.0



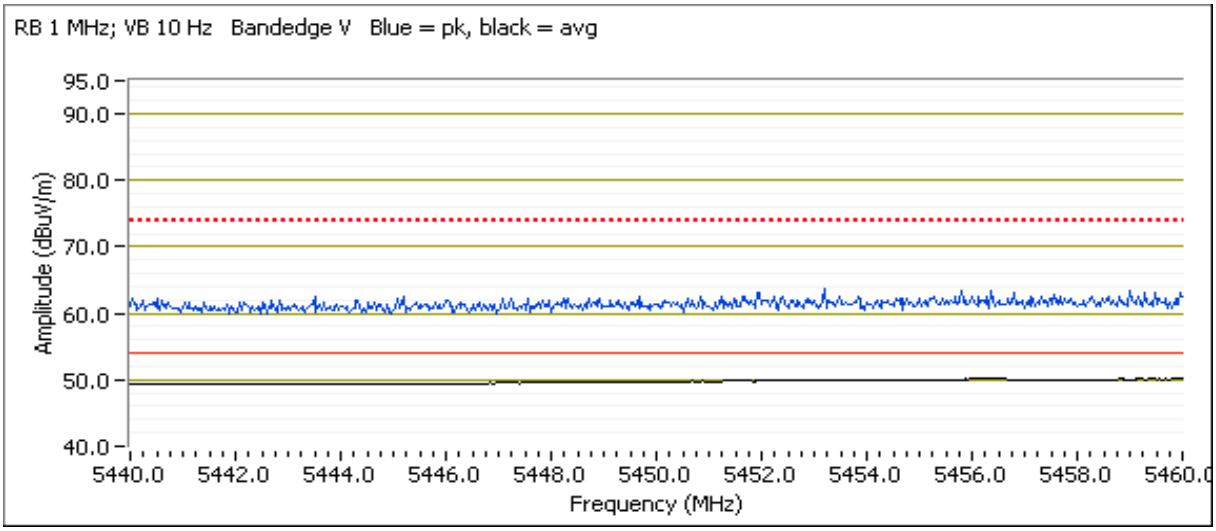
Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run #1c, EUT on Channel #100 5500MHz - .11a (20), Chain A

Power Setting: 12.0

5460 MHz Restricted Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5455.900	52.1	V	54.0	**-1.9**	AVG	0	1.00	
5457.230	62.8	V	74.0	-11.2	PK	0	1.00	



Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run # 3, Band Edge Field Strength - HT20, Chain A+B
Run # 3a, EUT on Channel #52 5260MHz - HT20, Chain A+B
5250 MHz Band Edge Signal Radiated Field Strength
Measured conducted.

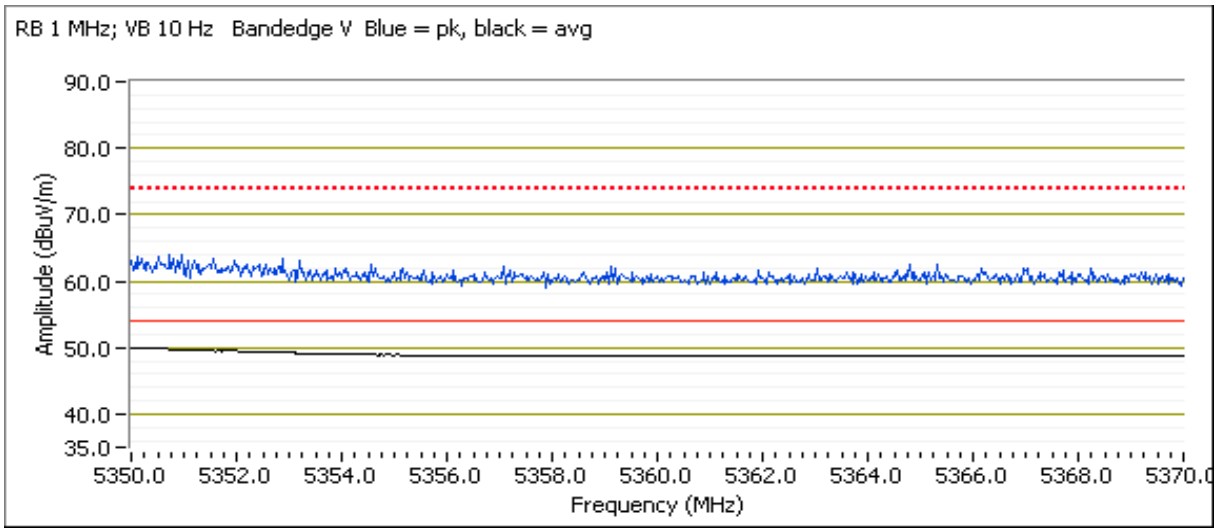
Run # 3b, EUT on Channel #64 5320MHz - HT20, Chain A+B

Date of Test: 4/22/2011 Test Location: FT7
Test Engineer: John Caizzi Config Change: none

Power Setting: 9.5

5350 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5350.130	51.7	V	54.0	**-2.3**	AVG	0	1.10	9.5
5355.530	63.7	V	74.0	-10.3	PK	0	1.10	9.5



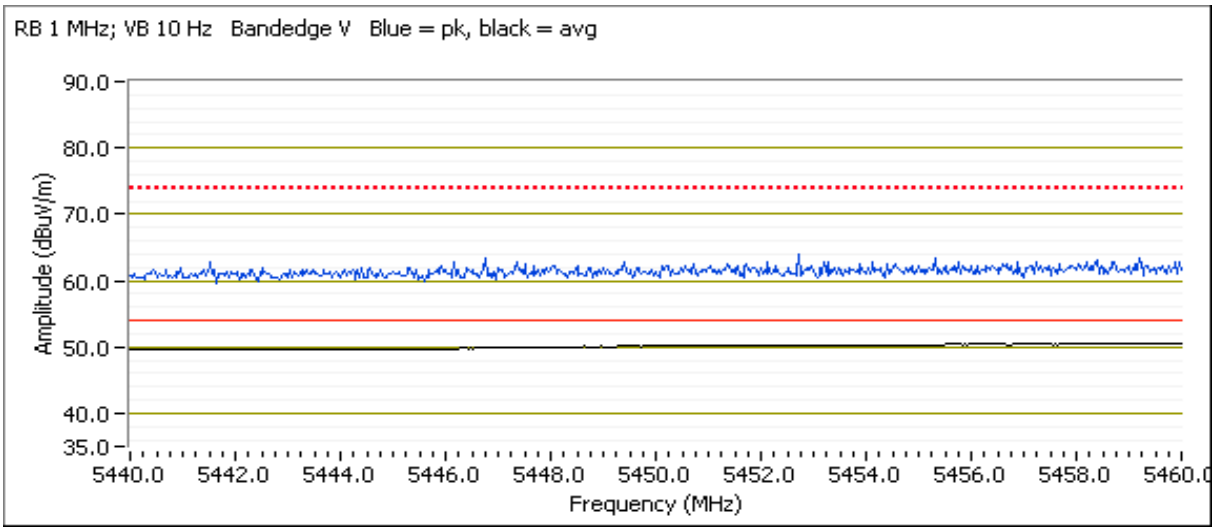
Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run # 3c, EUT on Channel #100 5500MHz - HT20, Chain A+B

Power Setting: 11.5

5460 MHz Restricted Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5459.600	52.1	V	54.0	**-1.9**	AVG	357	1.00	11.5
5459.770	63.8	V	74.0	-10.2	PK	357	1.00	11.5



5460-5470 MHz Band Edge Signal Radiated Field Strength

Compliance with -27dBm/MHz eirp limit demonstrated through a conducted measurement.

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run # 4, Band Edge Field Strength - HT40, Chain A+B
Run # 4a, EUT on low channel (5250-5350 MHz) - HT40, Chain A+B
Compliance with -27dBm/MHz eirp limit demonstrated through a conducted measurement.

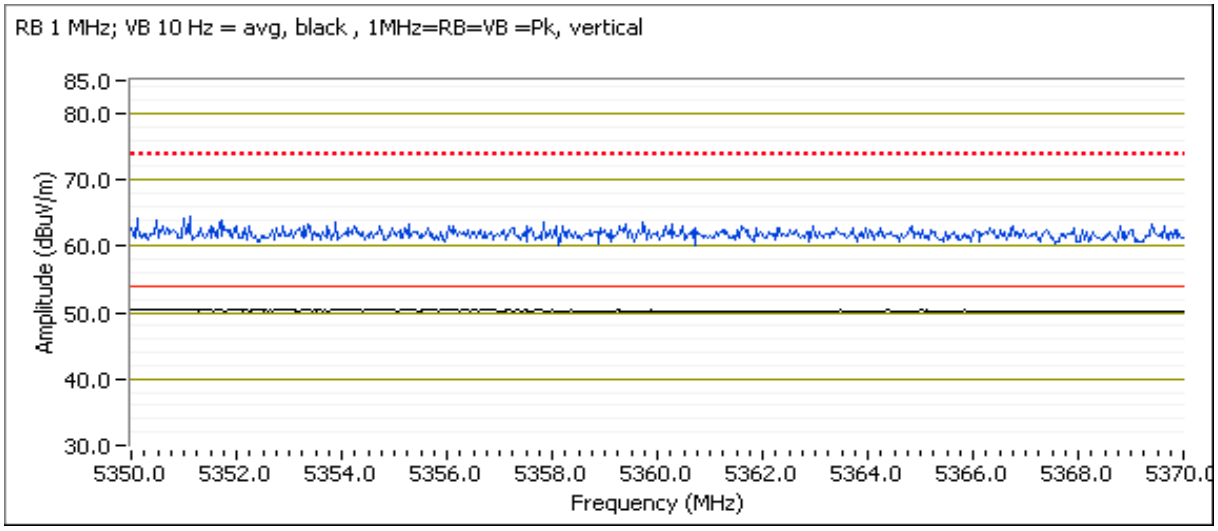
Run # 4b, EUT on Channel #5275MHz - HT40, Chain A+B

Date of Test: 5/19/2011 Test Location: FT3
Test Engineer: Joseph Cadigal Config Change: none

Power Setting: 7.0

5350 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5350.270	**52.8**	V	54.0	**-1.2**	AVG	355	1.0	MHz;VB 10 Hz;Pk
5354.230	51.9	H	54.0	-2.1	AVG	13	1.2	MHz;VB 10 Hz;Pk
5355.070	64.4	V	74.0	-9.6	PK	355	1.0	MHz;VB 3 MHz;Pk
5350.230	63.0	H	74.0	-11.0	PK	13	1.2	MHz;VB 3 MHz;Pk



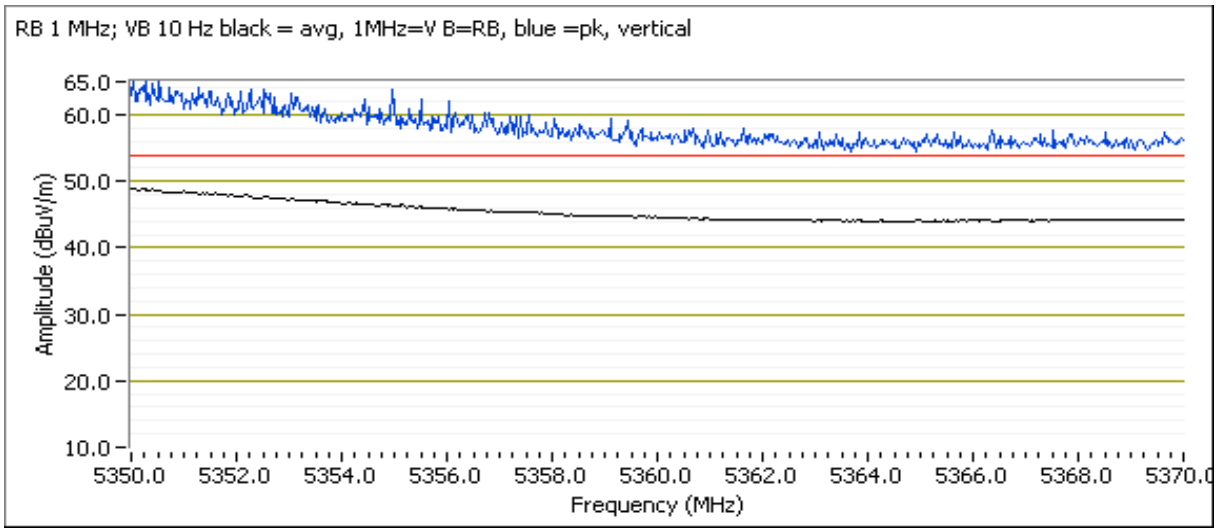
Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run # 4b, EUT on Channel #62 5310MHz - HT40, Chain A+B

Date of Test: 5/9/2011 Test Location: FT4
Test Engineer: Joseph Cadigal Config Change: none
Power Setting: 3.0

5350 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5350.400	**53.0**	V	54.0	**-1.0**	AVG	0	1.4	setting = 3
5350.370	51.0	H	54.0	-3.0	AVG	360	1.1	setting = 3
5351.230	64.0	V	74.0	-10.0	PK	0	1.4	setting = 3
5350.230	61.8	H	74.0	-12.2	PK	360	1.1	setting = 3



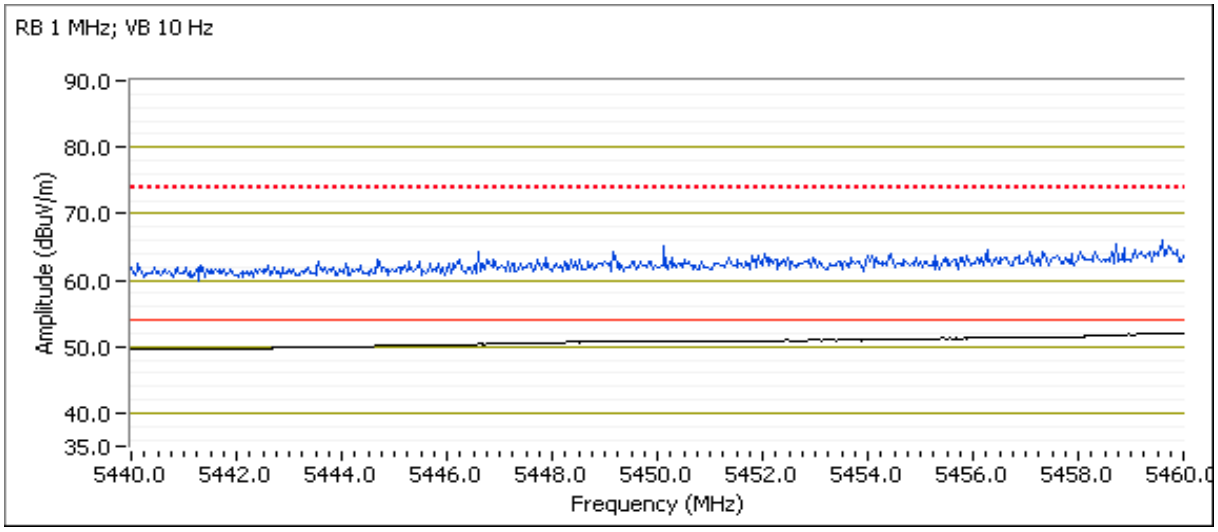
Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run # 4c, EUT on Channel #102 5510MHz - HT40, Chain A+B

Power Setting: 9.0

5460 MHz Restricted Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5459.900	53.7	V	54.0	**-0.3**	AVG	357	1.07	9.0
5448.770	64.8	V	74.0	-9.2	PK	357	1.07	9.0



5460-5470 MHz Band Edge Signal Radiated Field Strength

Compliance with -27dBm/MHz eirp limit demonstrated through a conducted measurement.

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run # 5, Band Edge Field Strength - HT5, Chain A+B
Run # 5a, EUT on Low Channel
5250 MHz Band Edge Signal Radiated Field Strength
Compliance with -27dBm/MHz eirp limit demonstrated through a conducted measurement.

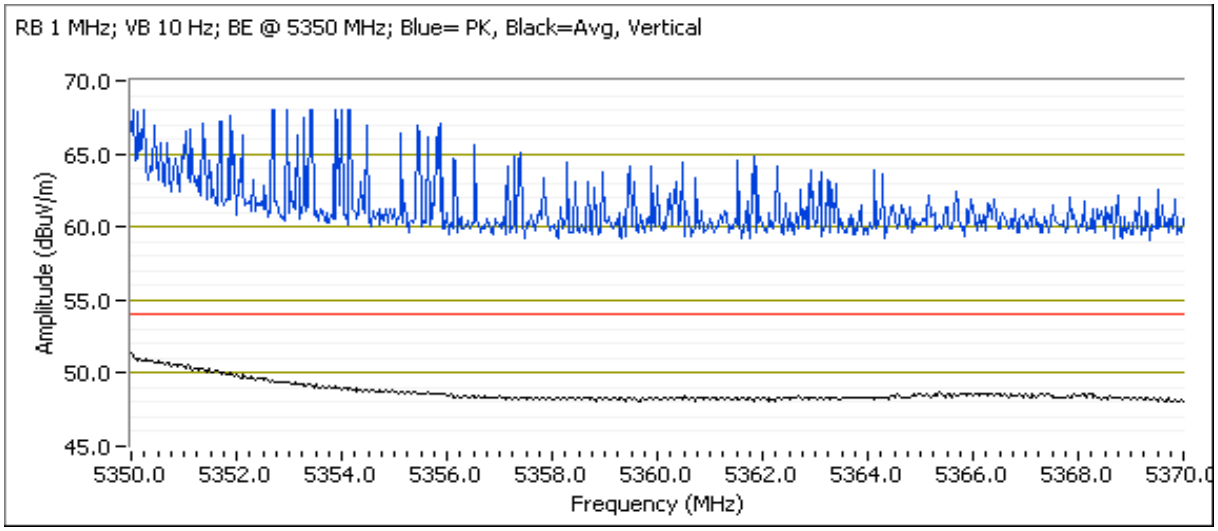
Run # 5b, EUT on 5340 MHz - HT5, Chain A+B

Date of Test: 4/25/2011 Test Location: FT Chamber #7
Test Engineer: Rafael Varelas/Joseph Cadigal Config Change: none

Power Setting: 8.5

5350 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5350.020	**53.3**	V	54.0	**-0.7**	AVG	360	1.0	setting 8.5
5352.850	68.7	V	74.0	-5.3	PK	360	1.0	setting 8.5
5350.020	51.0	H	54.0	-3.0	AVG	17	1.0	RB 1 MHz;VB 10 Hz;Pk
5352.890	72.0	H	74.0	-2.0	PK	17	1.0	RB 1 MHz;VB 3 MHz;Pk



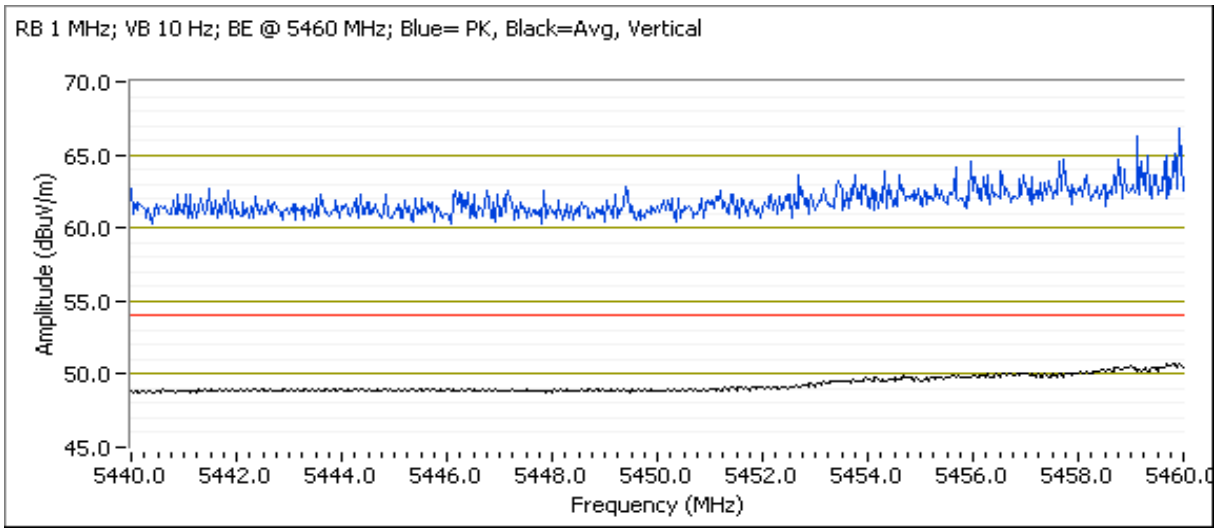
Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run # 5c, EUT on Channel HT5, 5475MHz (low channel), Chain A+B

Power Setting: 10.5

5460 MHz Restricted Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5459.120	52.9	V	54.0	-1.1	AVG	0	1.2	setting 10.5
5459.690	69.0	V	74.0	-5.0	PK	0	1.2	setting 10.5
5458.740	49.7	H	54.0	-4.3	AVG	0	1.0	setting 10.5
5459.970	72.9	H	74.0	-1.1	PK	0	1.0	setting 10.5



5460-5470 MHz Band Edge Signal Radiated Field Strength

Compliance with -27dBm/MHz eirp limit demonstrated through a conducted measurement.

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run # 6, Band Edge Field Strength - HT8, Chain A+B
Run # 6a, EUT on Low Channel in 5250-5350MHz Band
Compliance with -27dBm/MHz eirp limit demonstrated through a conducted measurement.

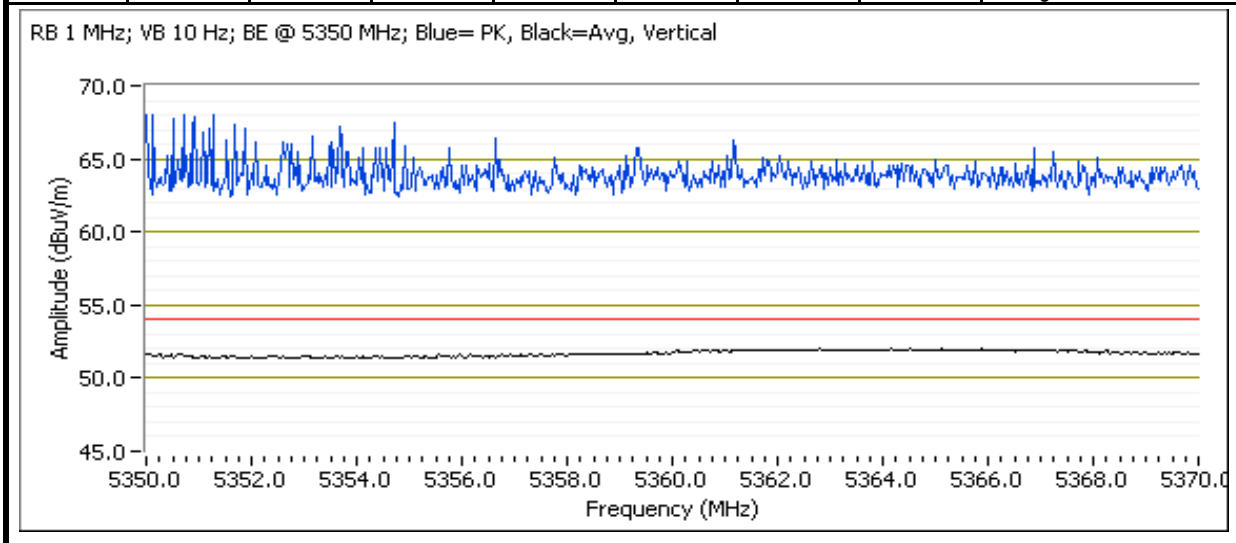
Run # 6b, EUT on 5330 MHz - HT8, Chain A+B

Date of Test: 4/25/2011 Test Location: FT Chamber #7
Test Engineer: Rafael Varelas/ Joseph Cadigal Config Change: none

Power Setting: 11.0

5350 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5350.270	**53.8**	V	54.0	**-0.2**	AVG	360	1.0	setting 11.0
5350.580	69.6	V	74.0	-4.4	PK	360	1.0	setting 11.0
5351.230	51.4	H	54.0	-2.6	AVG	19	1.0	setting 11.0
5351.140	73.6	H	74.0	-0.4	PK	19	1.0	setting 11.0



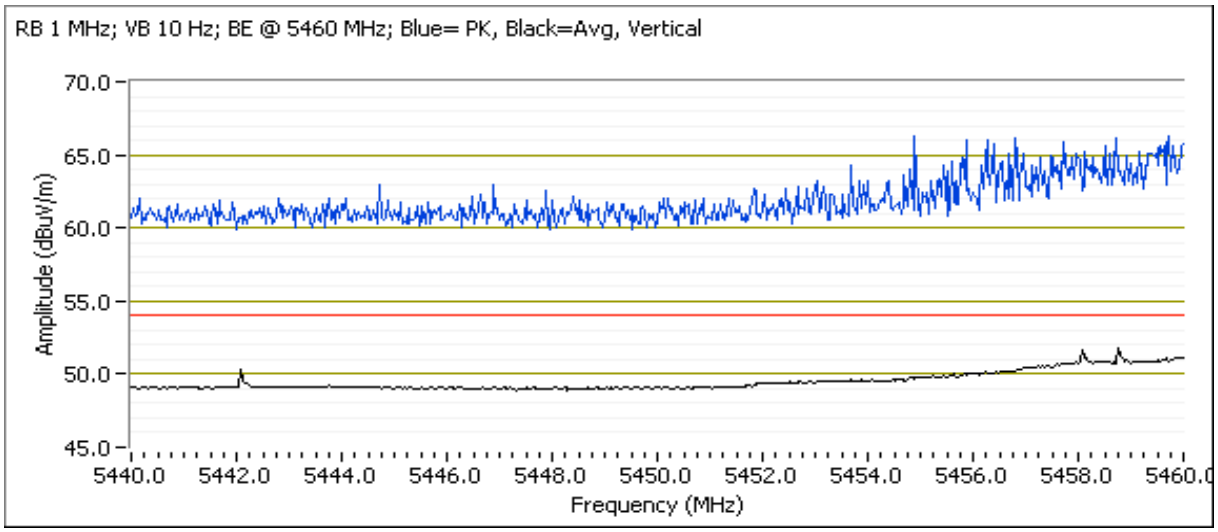
Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run # 6c, EUT on 5475 MHz - HT8, Chain A+B

Power Setting: 11.0

5460 MHz Restricted Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5459.890	53.5	V	54.0	-0.5	AVG	0	1.2	setting 11.0
5458.220	68.1	V	74.0	-5.9	PK	0	1.2	setting 11.0
5459.960	50.7	H	54.0	-3.3	AVG	0	1.0	setting 11.0
5459.330	71.1	H	74.0	-2.9	PK	0	1.0	setting 11.0



5460-5470 MHz Band Edge Signal Radiated Field Strength

Compliance with -27dBm/MHz eirp limit demonstrated through a conducted measurement.

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run # 7, Band Edge Field Strength - HT10, Chain A+B
Run # 7a, EUT on Low Channel (5250-5350MHz) - HT10, Chain A+B
5250 MHz Band Edge Signal Radiated Field Strength
Compliance with -27dBm/MHz eirp limit demonstrated through a conducted measurement.

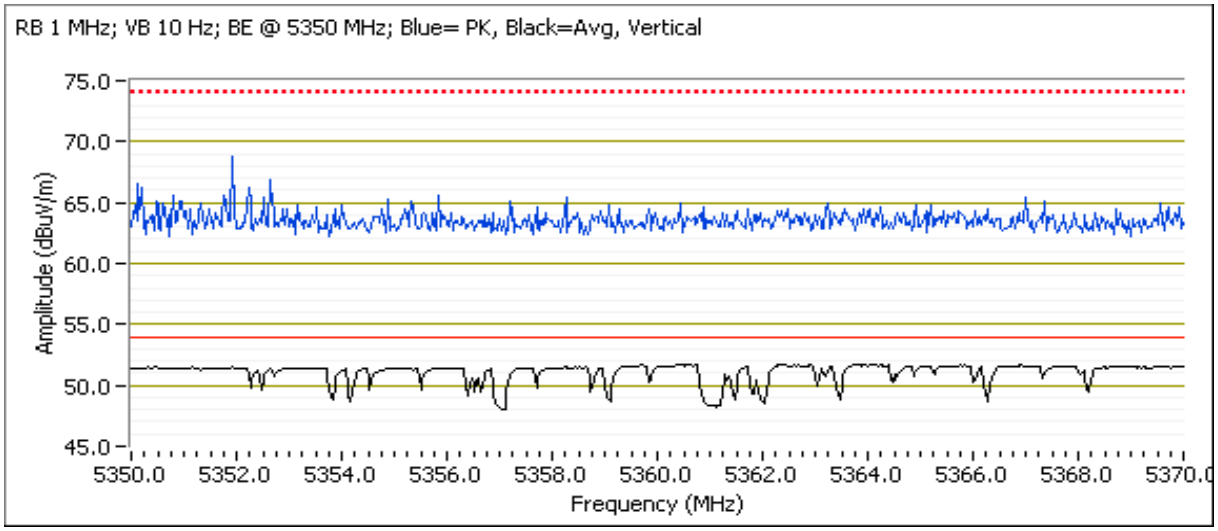
Run # 7b, EUT on 5330MHz - HT10, Chain A+B

Date of Test: 4/25/2011 Test Location: FT Chamber #7
Test Engineer: Rafael Varelas/Joseph Cadigal Config Change: none

Power Setting: 9.0

5350 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5351.700	**53.8**	V	54.0	**-0.2**	AVG	0	1.0	setting 9.0
5350.200	67.7	V	74.0	-6.3	PK	0	1.0	setting 9.0
5350.120	52.0	H	54.0	-2.0	AVG	13	1.1	setting 9.0
5352.130	69.5	H	74.0	-4.5	PK	13	1.1	setting 9.0



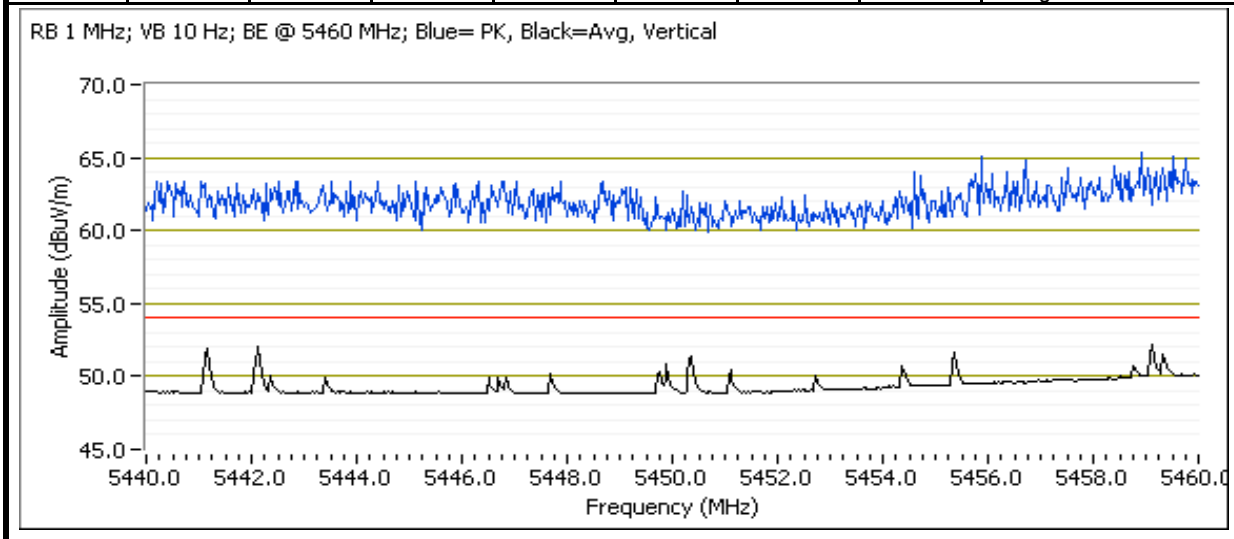
Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run # 7c, EUT on 5480MHz, HT10

Power Setting: 10.5

5460 MHz Restricted Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5459.370	52.5	V	54.0	-1.5	AVG	0	1.2	setting 10.5
5458.850	69.9	V	74.0	-4.1	PK	0	1.2	setting 10.5
5459.170	52.1	H	54.0	-1.9	AVG	0	1.0	setting 10.5
5459.170	65.6	H	74.0	-8.4	PK	0	1.0	setting 10.5



5460-5470 MHz Band Edge Signal Radiated Field Strength

Compliance with -27dBm/MHz eirp limit demonstrated through a conducted measurement.

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run # 8, Band Edge Field Strength - HT30, Chain A+B
Run # 8a, EUT on Low Channel (5250-5350MHz) HT30, Chain A+B
5250 MHz Band Edge Signal Radiated Field Strength
Compliance with -27dBm/MHz eirp limit demonstrated through a conducted measurement.

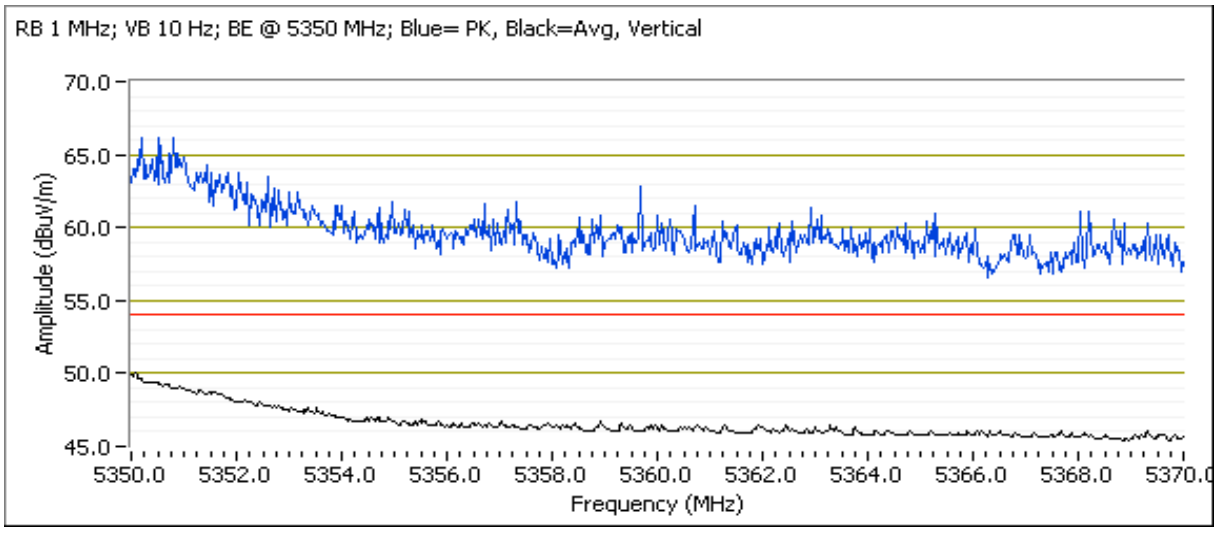
Run # 8b, EUT on 5315 MHz - HT30, Chain A+B

Date of Test: 4/25/2011 Test Location: FT Chamber #7
Test Engineer: Rafael Varelas/ Joseph Cadigal Config Change: none

Power Setting: 5.5

5350 MHz Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5350.020	**53.9**	V	54.0	**-0.1**	AVG	360	1.0	setting 5.5
5350.240	68.0	V	74.0	-6.0	PK	360	1.0	setting 5.5
5350.050	51.3	H	54.0	-2.7	AVG	13	1.1	setting 5.5
5351.790	64.2	H	74.0	-9.8	PK	13	1.1	setting 5.5



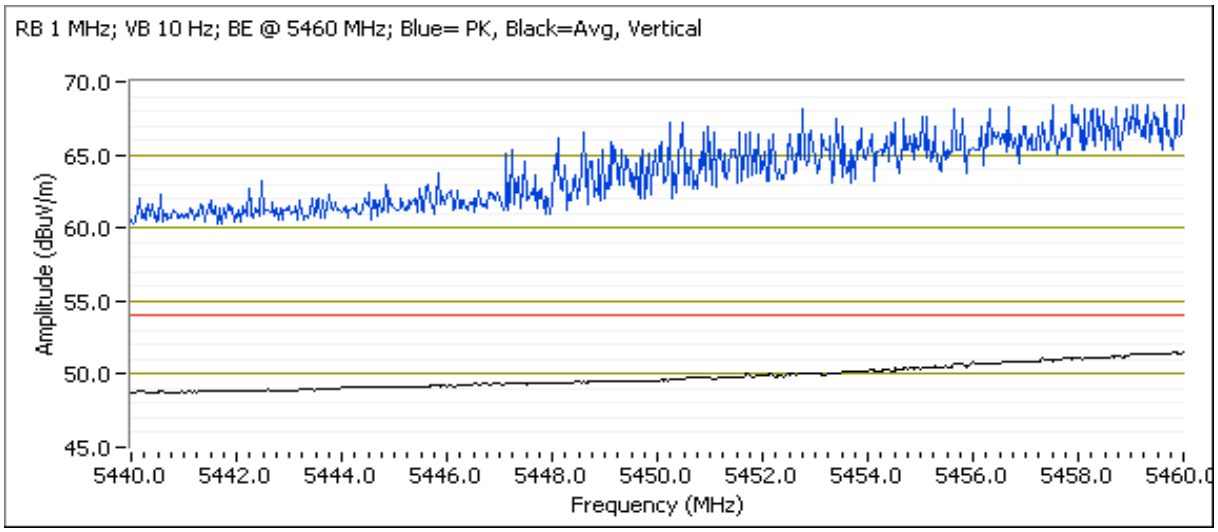
Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run # 8c, EUT on Channel HT30_L_3 - HT30, Chain A+B

Power Setting: 9.5

5460 MHz Restricted Band Edge Signal Radiated Field Strength

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5459.200	53.7	V	54.0	-0.3	AVG	360	1.1	setting 9.5
5459.090	68.9	V	74.0	-5.1	PK	360	1.1	setting 9.5
5458.660	53.6	H	54.0	-0.4	AVG	10	1.0	setting 9.5
5459.500	72.5	H	74.0	-1.5	PK	10	1.0	setting 9.5



5460-5470 MHz Band Edge Signal Radiated Field Strength

Compliance with -27dBm/MHz eirp limit demonstrated through a conducted measurement.

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

RSS 210 and FCC 15.407 (UNII) Radiated 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: 5/9 & 6/1/2011
Test Engineer: Joseph Cadigal/R. Varelas
Test Location: FT Chamber#4
Config. Used: 1
Config Change: none
EUT Voltage: POE

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 with cables routed beneath the floor.
For radiated emissions testing the measurement antenna was located 3 meters from the EUT.

Ambient Conditions:

Temperature: 20.4 °C
Rel. Humidity: 36 %

Summary of Results

Final power setting is the power setting that is at the maximum rating for that particular mode/channel. In all cases the measurements were made at or above the final power level.
Run #1: Preliminary measurements for operation in the 5250-5350 MHz Band. The center channel in each mode was evaluated to determine the worst-case MIMO mode. The high and low channels for that worst-case MIMO mode and for the 802.11a SISO mode were then evaluated. HT30 was the worst case MIMO mode for the 5250-5350MHz band.

Run #	Mode	Channel	Final power Setting Power	Power Setting Tested	Test Performed	Limit	Result / Margin
Run #1	802.11a Chain A	#60 5300MHz	8.0	8.0	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	**53.5dBµV/m @ 5416.7MHz (-0.5dB)**
	MIMO modes Chain A+B	5300MHz HT20	7.5	7.5			52.1dBµV/m @ 5418.2MHz (-1.9dB)
		5310MHz HT40	3.0	9.0			47.2dBµV/m @ 4982.0MHz (-6.8dB)
		5300MHz HT5	4.5	4.5			52.1dBµV/m @ 5429.9MHz (-1.9dB)
		5300MHz HT8	5.5	6.0			50.5dBµV/m @ 5426.6MHz (-3.5dB)
		5300MHz HT10	6.0	6.0			52.4dBµV/m @ 5416.2MHz (-1.6dB)
		5300MHz HT30	8.0	8.0			**53.4dBµV/m @ 5417.8MHz (-0.6dB)**

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run #2: Preliminary measurements for operation in the 5470-5725 MHz Band. The center channel in each mode was evaluated to determine the worst-case MIMO mode. The high and low channels for that worst-case MIMO mode and for the 802.11a SISO mode were then evaluated. HT20 was the worst case MIMO mode for the 5470-5725MHz band.

Run #	Mode	Channel	Final power Setting Power	Power Setting Tested	Test Performed	Limit	Result / Margin
Run # 2	802.11a Chain A	5580MHz 802.11a	12.0	12.0	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	51.1dBµV/m @ 5370.5MHz (-2.9dB)
	MIMO modes Chain A+B	5580MHz HT20	11.5	11.5			**53.8dBµV/m @ 5372.8MHz (-0.2dB)**
		5550MHz HT40	9.5	10.5	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	52.8dBµV/m @ 5371.8MHz (-1.2dB)
		5595MHz HT5	4.5	5.5			50.0dBµV/m @ 5372.0MHz (-4.0dB)
		5595MHz HT8	5.5	5.5			46.8dBµV/m @ 5372.6MHz (-7.2dB)
		5300 MHz HT10	6.5	6.5	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	52.0dBµV/m @ 5457.3MHz (-2.0dB)
		5300MHz HT30	8.0	8.0			52.2dBµV/m @ 5451.3MHz (-1.8dB)
Final measurements, top and bottom channel in SISO mode and worst case MIMO mode in each band:							
Run # 3	802.11a Chain A	5270MHz	8.0	8.0	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	51.4dBµV/m @ 5450.5MHz (-2.6dB)
		5320MHz	5.0	5.0			52.4dBµV/m @ 5456.4MHz (-1.6dB)
		5500MHz	12.0	12.0			53.2dBµV/m @ 5356.7MHz (-0.8dB)
		5700MHz	9.0	9.0			53.5dBµV/m @ 5353.0MHz (-0.5dB)
Run #4	MIMO modes Chain A+B	5275MHz HT30	5.0	5.0			**53.8dBµV/m @ 5456.0MHz (-0.2dB)**
		5315MHz HT30	5.0	5.0			53.1dBµV/m @ 5451.1MHz (-0.9dB)
		5500MHz HT20	9.0	9.0			52.8dBµV/m @ 5352.5MHz (-1.2dB)
		5700MHz HT20	8.5	8.5			52.1dBµV/m @ 5351.9MHz (-1.9dB)
Receiver Spurious							
Run #5	Receive Mode Chains A+B	5300 MHz	N/A	-	Radiated Emissions, 1 - 18 GHz	RSS GEN	31.8dBµV/m @ 1275.4MHz (-22.2dB)
		5580 MHz	N/A	-			**43.0dBµV/m @ 1440.0MHz (-11.0dB)**

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

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, Radiated Spurious Emissions, 1-40GHz, Various, Chain A+B

Date of Test: 5/9/2011 Test Location: FTChamber#4

Test Engineer: Joseph Cadigal Config Change: none

For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -27dBm eirp (68.3dBuV/m @3m), measured using ther same method used for the in-band PSD (power averaging).

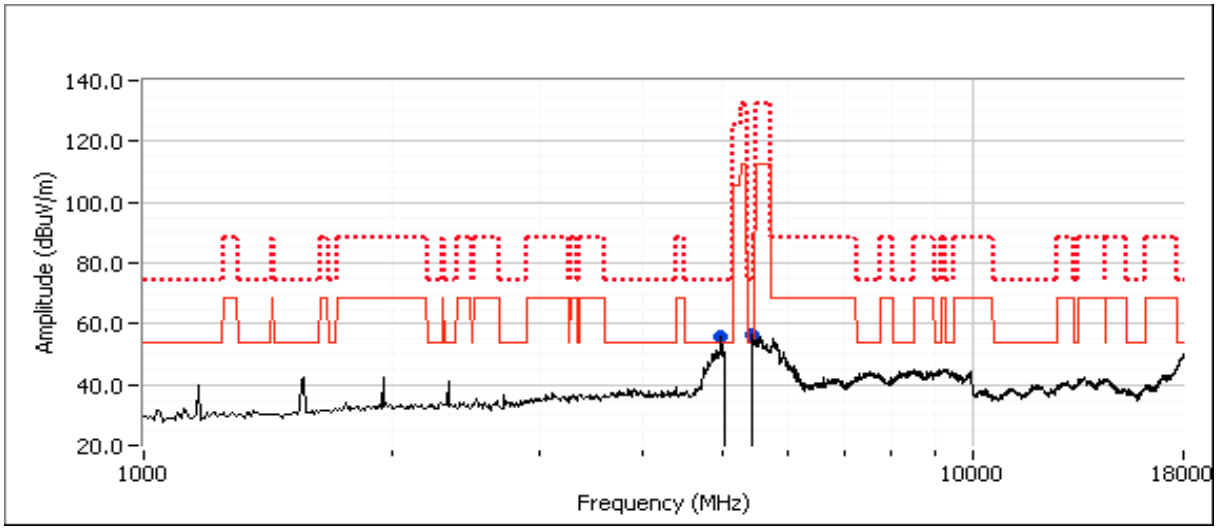
Run #1a: EUT on Channel #60 5300MHz 802.11a - Chain A

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Chain A	-	-	8.0

Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5416.670	**53.5**	V	54.0	**-0.5**	AVG	350	1.5	RB 1 MHz;VB 10 Hz;Pk
5415.170	63.5	V	74.0	-10.5	PK	350	1.5	RB 1 MHz;VB 3 MHz;Pk
4975.730	49.6	V	54.0	-4.4	AVG	350	1.5	RB 1 MHz;VB 10 Hz;Pk
4974.670	64.0	V	74.0	-10.0	PK	350	1.5	RB 1 MHz;VB 3 MHz;Pk

Note 2:	Scans made between 18 - 40GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no signifcant emissions in this frequency range



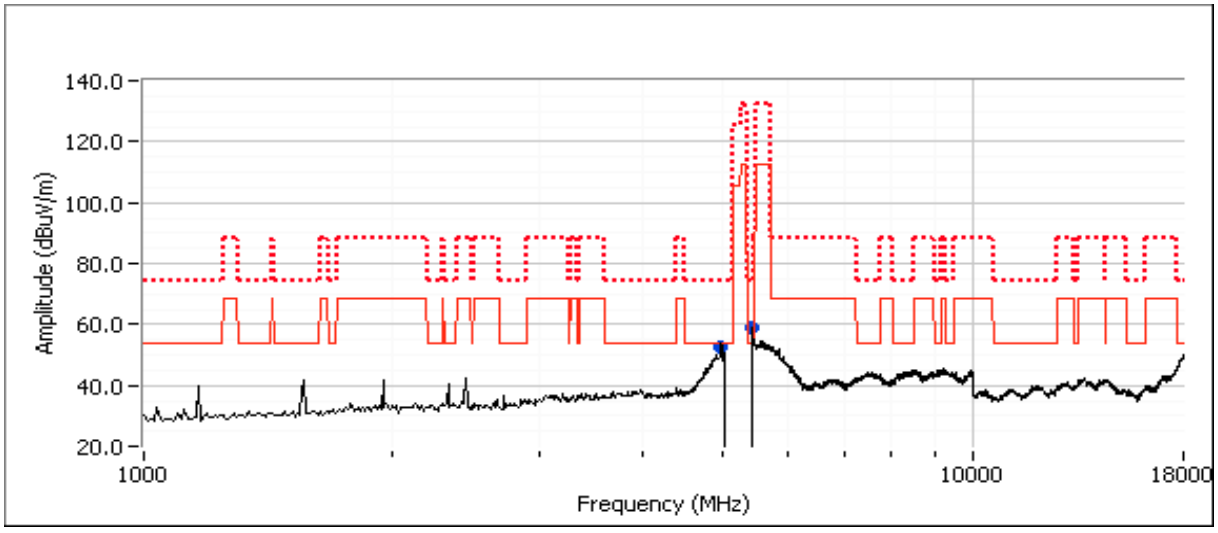
Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run #1c: EUT on Channel #60 5300MHz HT20 - Various, Chain A+B

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Chain A+B	-	-	7.5

Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5418.200	**52.1**	V	54.0	**-1.9**	AVG	348	1.0	RB 1 MHz;VB 10 Hz;Pk
5416.210	63.7	V	74.0	-10.3	PK	348	1.0	RB 1 MHz;VB 3 MHz;Pk
4978.440	47.6	V	54.0	-6.4	AVG	357	1.5	RB 1 MHz;VB 10 Hz;Pk
4978.370	61.8	V	74.0	-12.2	PK	357	1.5	RB 1 MHz;VB 3 MHz;Pk



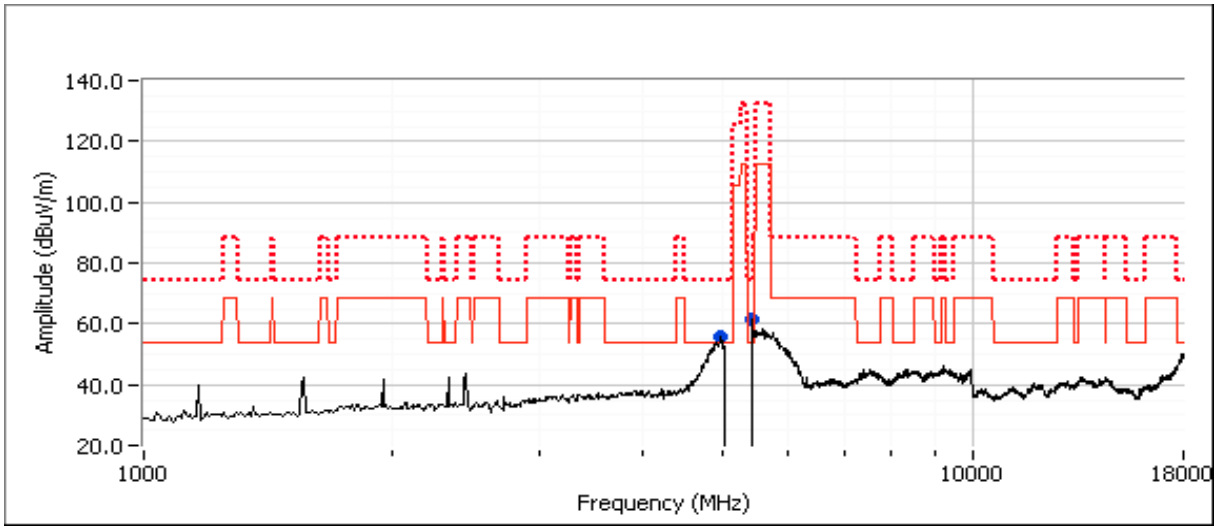
Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run #1d: EUT on Channel #62 5310MHz HT40 - Various, Chain A+B

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Chain A+B	-	-	9.0

Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4982.030	**47.2**	V	54.0	**-6.8**	AVG	360	2.0	RB 1 MHz;VB 10 Hz;Pk
4981.420	60.1	V	74.0	-13.9	PK	360	2.0	RB 1 MHz;VB 3 MHz;Pk



Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

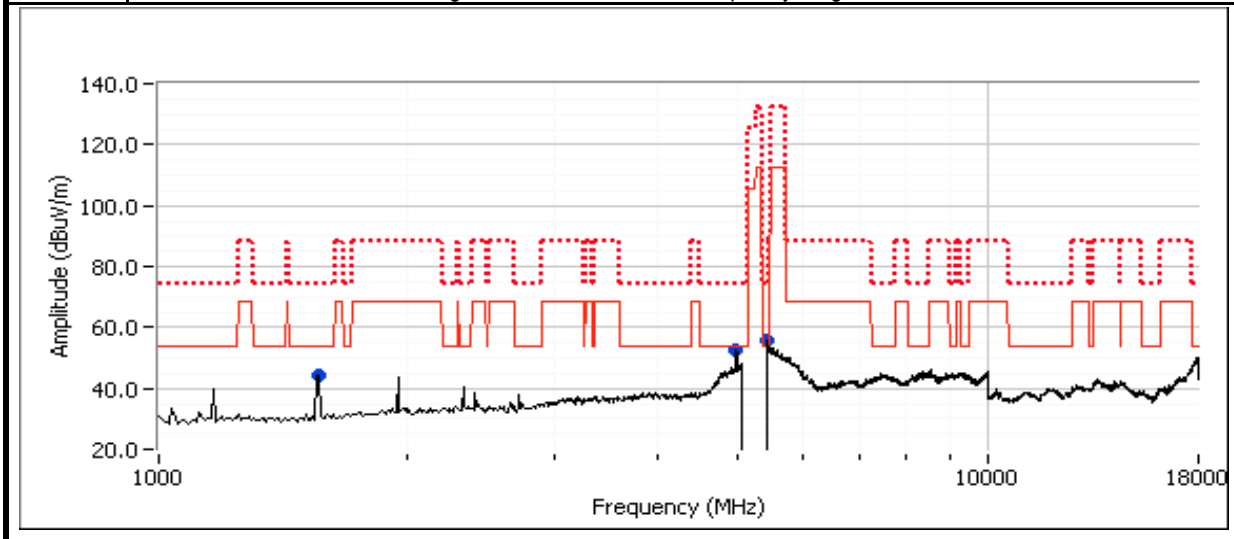
Run #1e: EUT on Channel 5300MHz HT5 - Various, Chain A+B

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Chain A+B	-	-	4.5

Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5429.920	**52.1**	H	54.0	**-1.9**	AVG	14	1.0	RB 1 MHz;VB 10 Hz;Pk
4978.850	45.1	V	54.0	-8.9	AVG	352	1.0	RB 1 MHz;VB 10 Hz;Pk
5429.960	63.4	H	74.0	-10.6	PK	14	1.0	RB 1 MHz;VB 3 MHz;Pk
1560.040	43.0	H	54.0	-11.0	AVG	182	1.0	RB 1 MHz;VB 10 Hz;Pk
4977.560	60.5	V	74.0	-13.5	PK	352	1.0	RB 1 MHz;VB 3 MHz;Pk
1560.060	45.4	H	74.0	-28.6	PK	182	1.0	RB 1 MHz;VB 3 MHz;Pk

Note 2:	Scans made between 18 - 40GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no signifcant emissions in this frequency range



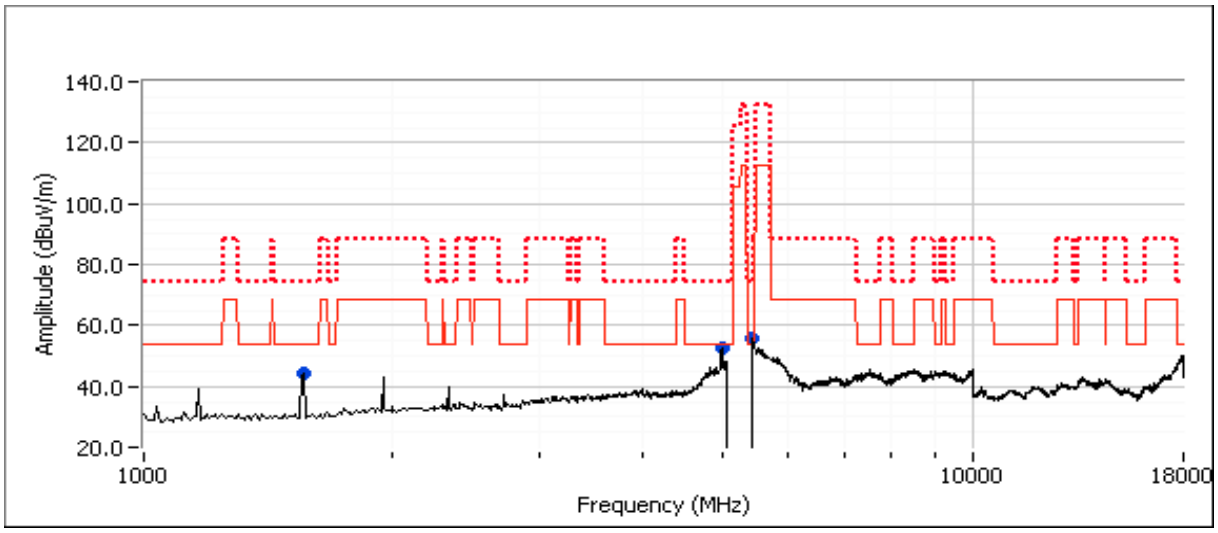
Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run #1f: EUT on Channel 5300MHz HT8 - Various, Chain A+B

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Chain A+B	-	-	6.0

Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5426.640	**50.5**	H	54.0	**-3.5**	AVG	12	1.3	RB 1 MHz;VB 10 Hz;Pk
4997.500	46.1	V	54.0	-7.9	AVG	345	1.3	RB 1 MHz;VB 10 Hz;Pk
1560.010	43.6	H	54.0	-10.4	AVG	163	1.0	RB 1 MHz;VB 10 Hz;Pk
5425.990	61.4	H	74.0	-12.6	PK	12	1.3	RB 1 MHz;VB 3 MHz;Pk
4996.740	60.2	V	74.0	-13.8	PK	345	1.3	RB 1 MHz;VB 3 MHz;Pk
1560.060	45.9	H	74.0	-28.1	PK	163	1.0	RB 1 MHz;VB 3 MHz;Pk



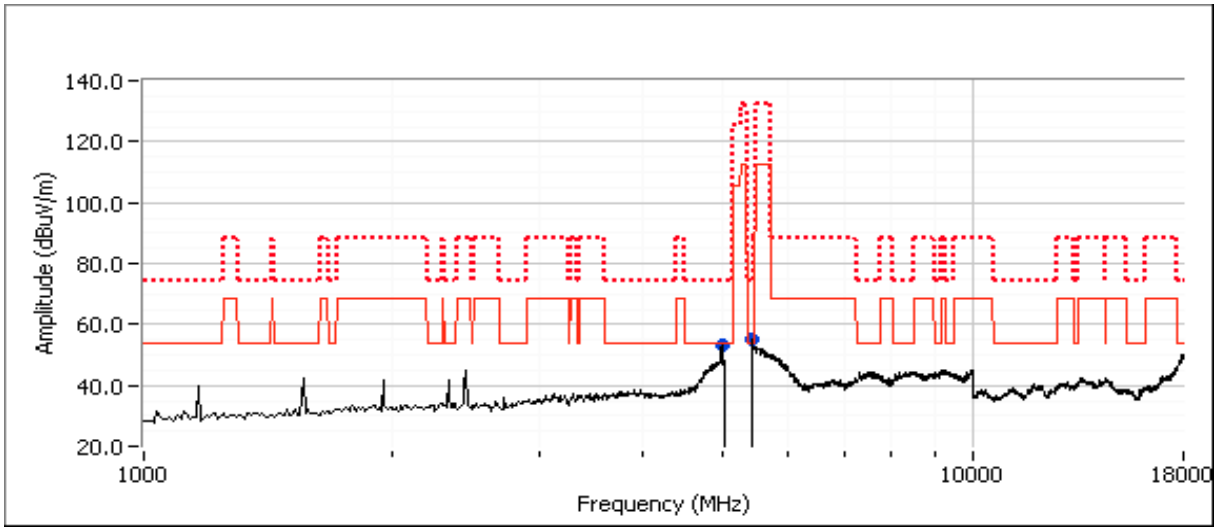
Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run #1g: EUT on Channel 5300MHz HT10 - Various, Chain A+B

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Chain A+B	-	-	6.0

Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5416.150	**52.4**	H	54.0	**-1.6**	AVG	360	1.0	RB 1 MHz;VB 10 Hz;Pk
5415.290	63.6	H	74.0	-10.4	PK	360	1.0	RB 1 MHz;VB 3 MHz;Pk
4983.470	47.1	V	54.0	-6.9	AVG	349	1.0	RB 1 MHz;VB 10 Hz;Pk
4985.250	62.9	V	74.0	-11.1	PK	349	1.0	RB 1 MHz;VB 3 MHz;Pk



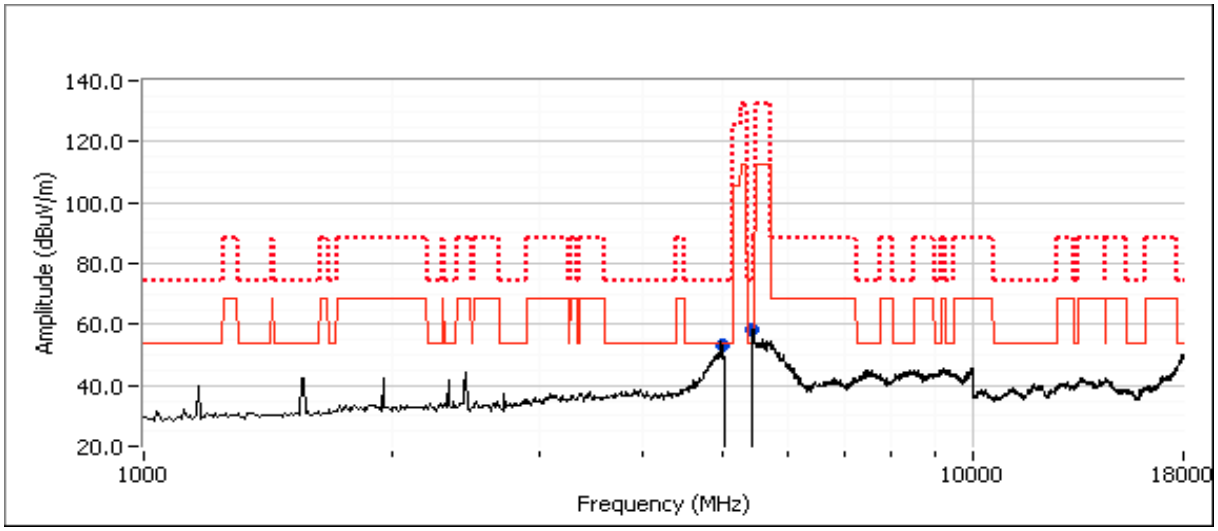
Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run #1h: EUT on Channel 5300MHz HT30 - Various, Chain A+B

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Chain A+B	-	-	8.0

Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5417.800	**53.4**	V	54.0	**-0.6**	AVG	0	1.5	RB 1 MHz;VB 10 Hz;Pk
5417.690	61.9	V	74.0	-12.1	PK	0	1.5	RB 1 MHz;VB 3 MHz;Pk
4984.070	45.7	V	54.0	-8.3	AVG	322	1.0	RB 1 MHz;VB 10 Hz;Pk
4983.370	57.8	V	74.0	-16.2	PK	322	1.0	RB 1 MHz;VB 3 MHz;Pk



Note 2:	Scans made between 18 - 40GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no signifcant emissions in this frequency range

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run # 2, Radiated Spurious Emissions, 1-40GHz, Various, Chain A+B

Date of Test: 5/26/2011 Test Location: FTChamber#3

Test Engineer: Joseph Cadigal Config Change: none

For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -27dBm eirp (68.3dBuV/m @3m), measured using ther same method used for the in-band PSD (power averaging).

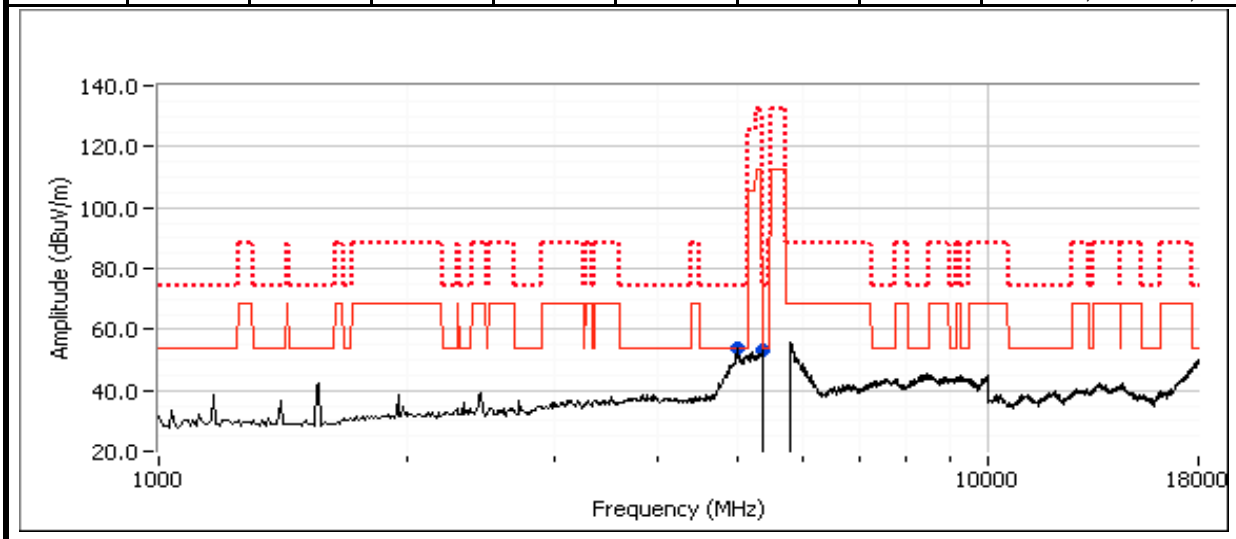
Run # 2a: EUT on Channel #116 5580MHz 802.11a

Run # 2a: EUT on Channel #116 5580MHz 802.11a (20) - Various, Chain A+B

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Chain A	16.0	-	12.0

Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5370.450	**51.1**	V	54.0	**-2.9**	AVG	349	1.0	RB 1 MHz;VB 10 Hz;Pk
4995.510	47.7	V	54.0	-6.3	AVG	356	1.0	RB 1 MHz;VB 10 Hz;Pk
5369.920	62.5	V	74.0	-11.5	PK	349	1.0	RB 1 MHz;VB 3 MHz;Pk
4993.330	62.1	V	74.0	-11.9	PK	356	1.0	RB 1 MHz;VB 3 MHz;Pk



Note 2:	Scans made between 18 - 40GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no signifcant emissions in this frequency range

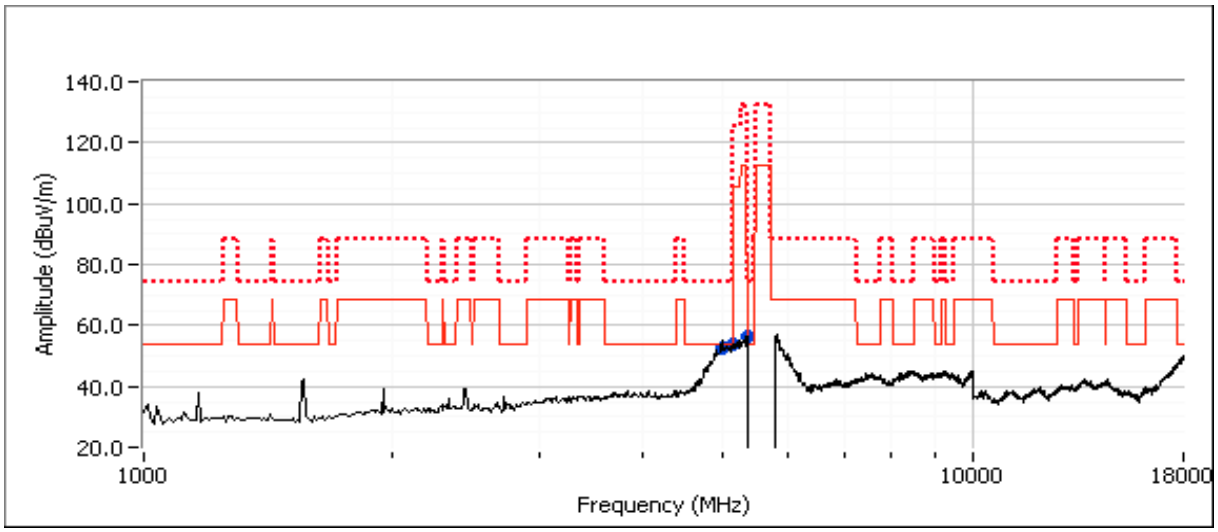
Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run # 2c: EUT on Channel #116 5580MHz HT20 - Various, Chain A+B

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Chain A+B	-	-	11.5

Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5372.750	**53.8**	V	54.0	**-0.2**	AVG	355	1.0	RB 1 MHz;VB 10 Hz;Pk
5142.300	49.8	V	54.0	-4.2	AVG	355	1.0	RB 1 MHz;VB 10 Hz;Pk
4997.110	49.4	V	54.0	-4.6	AVG	343	1.0	RB 1 MHz;VB 10 Hz;Pk
5374.740	64.6	V	74.0	-9.4	PK	355	1.0	RB 1 MHz;VB 3 MHz;Pk
4996.890	62.5	V	74.0	-11.5	PK	343	1.0	RB 1 MHz;VB 3 MHz;Pk
5142.200	61.0	V	74.0	-13.0	PK	355	1.0	RB 1 MHz;VB 3 MHz;Pk



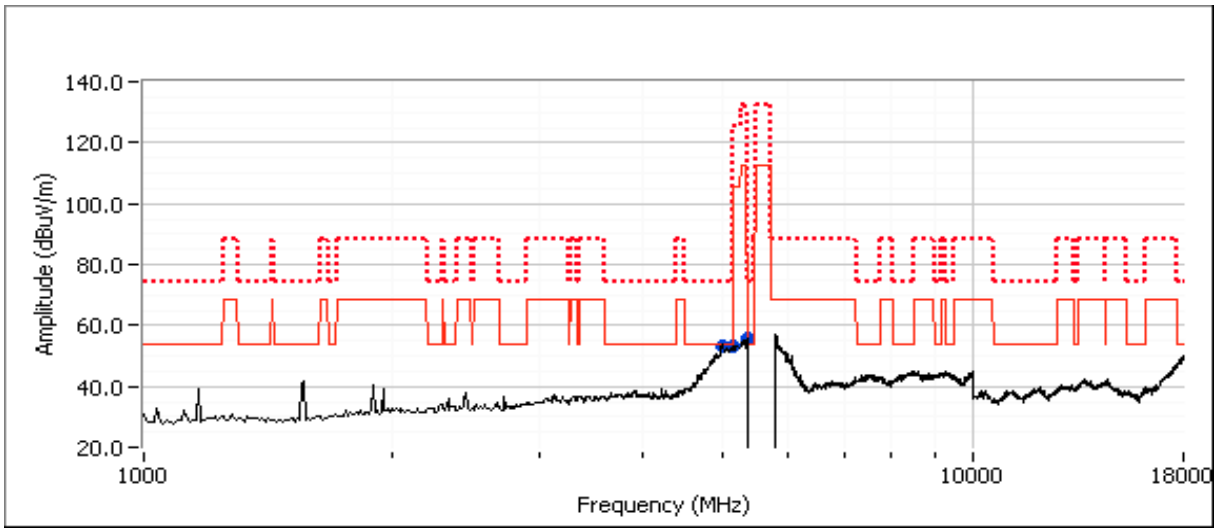
Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run # 2d: EUT on Channel #110 5550MHz HT40 - Various, Chain A+B

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Chain A+B	-	-	10.5

Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5371.830	**52.8**	H	54.0	**-1.2**	AVG	19	1.0	RB 1 MHz;VB 10 Hz;Pk
4989.400	49.1	V	54.0	-4.9	AVG	354	1.0	RB 1 MHz;VB 10 Hz;Pk
5133.210	49.1	V	54.0	-4.9	AVG	347	1.0	RB 1 MHz;VB 10 Hz;Pk
5371.960	63.8	H	74.0	-10.2	PK	19	1.0	RB 1 MHz;VB 3 MHz;Pk
4991.310	62.5	V	74.0	-11.5	PK	354	1.0	RB 1 MHz;VB 3 MHz;Pk
5133.230	60.2	V	74.0	-13.8	PK	347	1.0	RB 1 MHz;VB 3 MHz;Pk



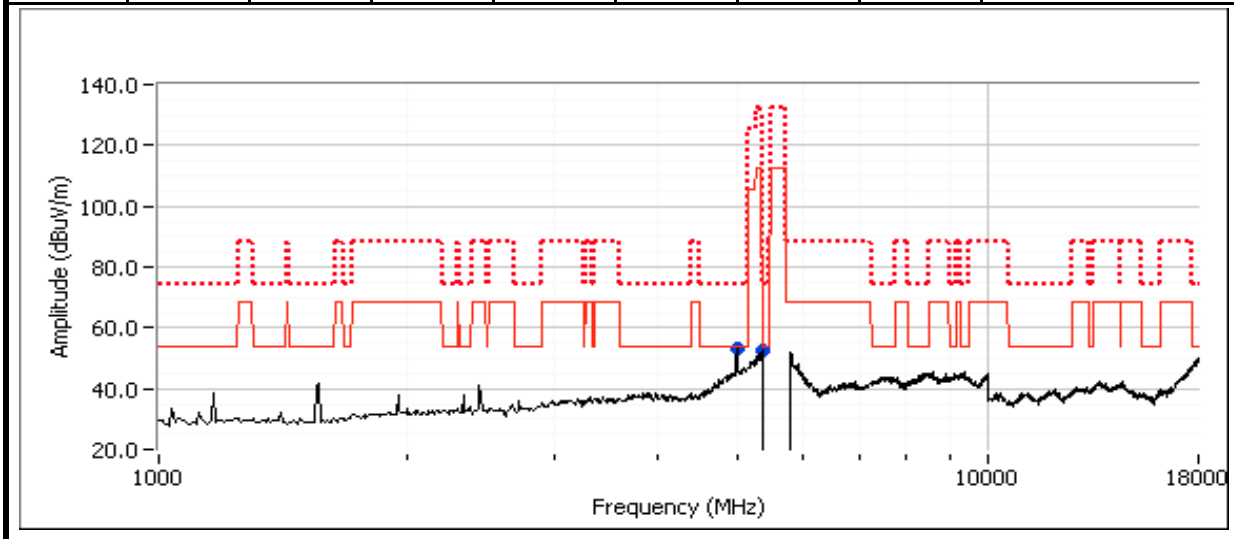
Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run # 2e: EUT on Channel 5595MHz HT5 - Various, Chain A+B

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Chain A+B	-	-	5.5

Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5371.980	**50.0**	H	54.0	**-4.0**	AVG	19	1.0	RB 1 MHz;VB 10 Hz;Pk
4997.380	45.3	V	54.0	-8.7	AVG	354	1.0	RB 1 MHz;VB 10 Hz;Pk
5372.280	61.2	H	74.0	-12.8	PK	19	1.0	RB 1 MHz;VB 3 MHz;Pk
4998.560	61.1	V	74.0	-12.9	PK	354	1.0	RB 1 MHz;VB 3 MHz;Pk



Note 2:	Scans made between 18 - 40GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no signifcant emissions in this frequency range

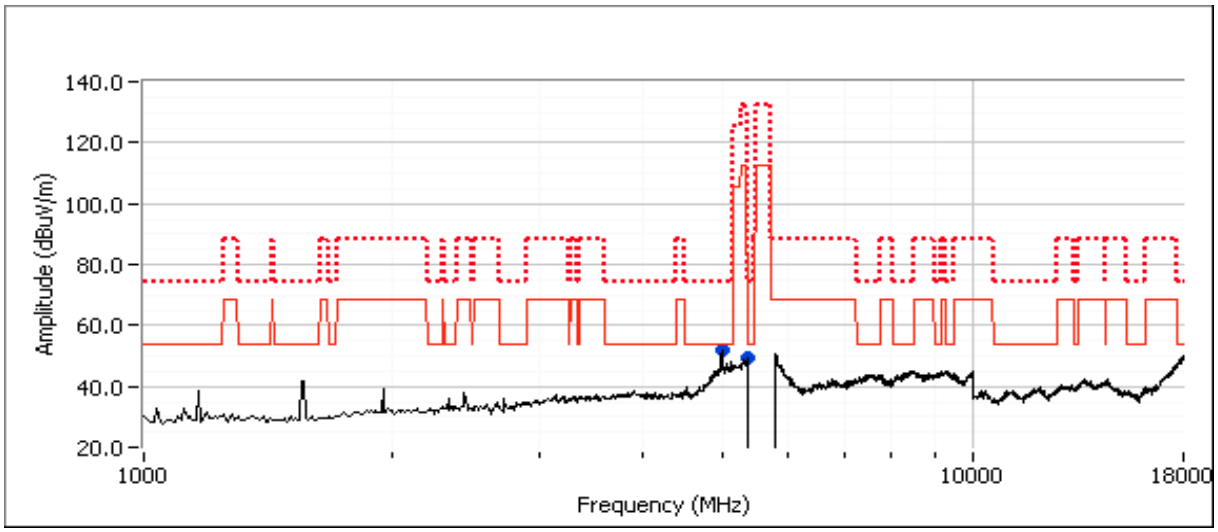
Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run # 2f: EUT on Channel 5595MHz HT8 - Various, Chain A+B

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Chain A+B	-	-	5.5

Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5372.580	**46.8**	V	54.0	**-7.2**	AVG	353	1.5	RB 1 MHz;VB 10 Hz;Pk
4986.900	44.8	V	54.0	-9.2	AVG	348	1.0	RB 1 MHz;VB 10 Hz;Pk
4986.510	60.3	V	74.0	-13.7	PK	348	1.0	RB 1 MHz;VB 3 MHz;Pk
5372.410	58.4	V	74.0	-15.6	PK	353	1.5	RB 1 MHz;VB 3 MHz;Pk



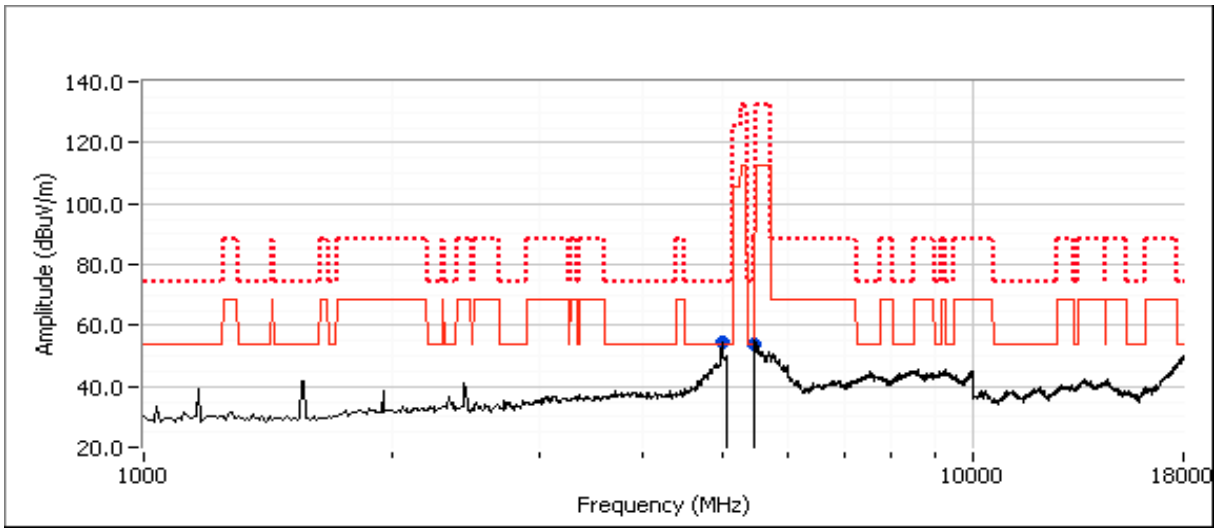
Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run # 2g: EUT on Channel C3_HT10 HT10 - Various, Chain A+B

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Chain A+B	-	-	6.5

Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5457.300	**52.0**	V	54.0	**-2.0**	AVG	6	1.0	RB 1 MHz;VB 10 Hz;Pk
4995.980	48.7	V	54.0	-5.3	AVG	0	1.0	RB 1 MHz;VB 10 Hz;Pk
4994.520	62.7	V	74.0	-11.3	PK	0	1.0	RB 1 MHz;VB 3 MHz;Pk
5456.420	62.2	V	74.0	-11.8	PK	6	1.0	RB 1 MHz;VB 3 MHz;Pk



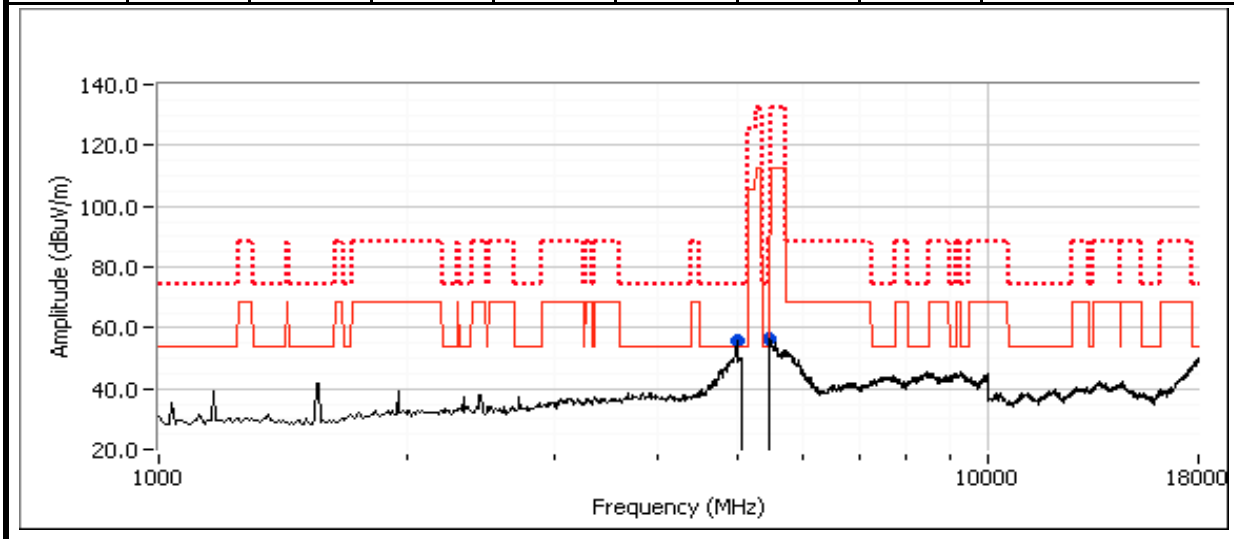
Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run # 2h: EUT on Channel 5300MHz HT30 - Various, Chain A+B

	Power Settings		
	Target (dBm)	Measured (dBm)	Software Setting
Chain A+B	-	-	8.0

Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5451.330	**52.2**	H	54.0	**-1.8**	AVG	359	1.5	RB 1 MHz;VB 10 Hz;Pk
4990.220	50.3	V	54.0	-3.7	AVG	2	1.0	RB 1 MHz;VB 10 Hz;Pk
4988.750	63.3	V	74.0	-10.7	PK	2	1.0	RB 1 MHz;VB 3 MHz;Pk
5449.780	62.8	H	74.0	-11.2	PK	359	1.5	RB 1 MHz;VB 3 MHz;Pk



Note 2:	Scans made between 18 - 40GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no signifcant emissions in this frequency range

Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run #3, Radiated Spurious Emissions, 1-40GHz, Low and High Channels

Date of Test: 6/1/2011 Test Location: FT Chamber #5

Test Engineer: Rafael Varelas Config Change: none

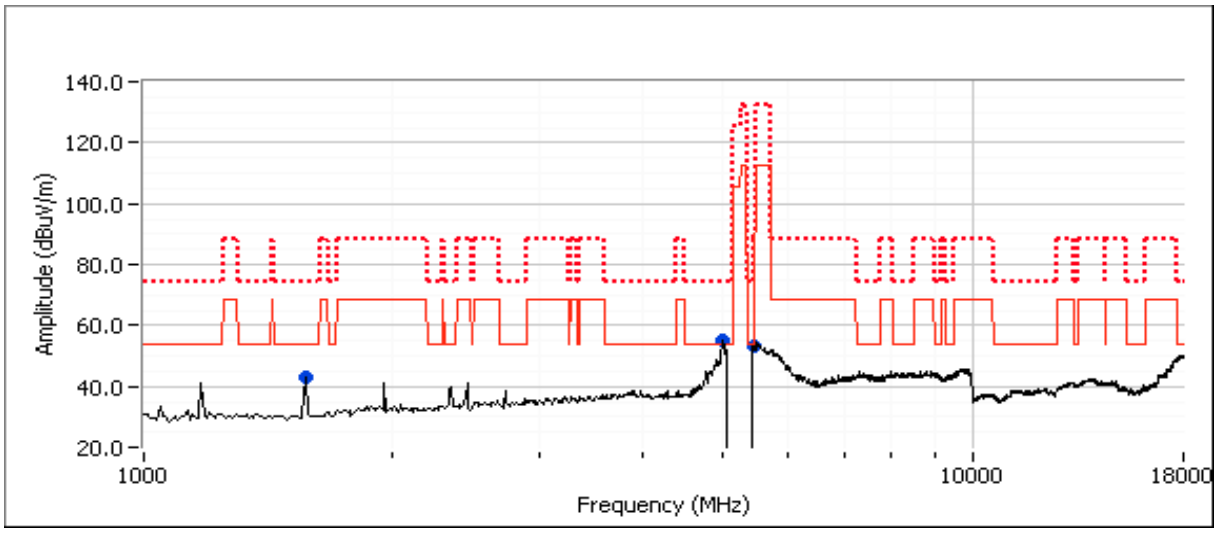
For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -27dBm eirp (68.3dBuV/m @3m), measured using ther same method used for the in-band PSD (power averaging).

Run #3a: EUT on 5250-5350MHz Low Channel (SISO Mode) 802.11a, 5270MHz, Chain A

	Power Settings	
	Target	Actual
Chain A	-	8.0

Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBmV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5450.500	51.4	V	54.0	-2.6	AVG	358	1.0	RB 1 MHz;VB 10 Hz;Pk
5451.460	62.5	V	74.0	-11.5	PK	358	1.0	RB 1 MHz;VB 3 MHz;Pk
4984.030	48.9	V	54.0	-5.1	AVG	6	1.2	RB 1 MHz;VB 10 Hz;Pk
4974.970	64.0	V	74.0	-10.0	PK	6	1.2	RB 1 MHz;VB 3 MHz;Pk
1560.150	42.9	H	54.0	-11.1	Peak	183	1.0	



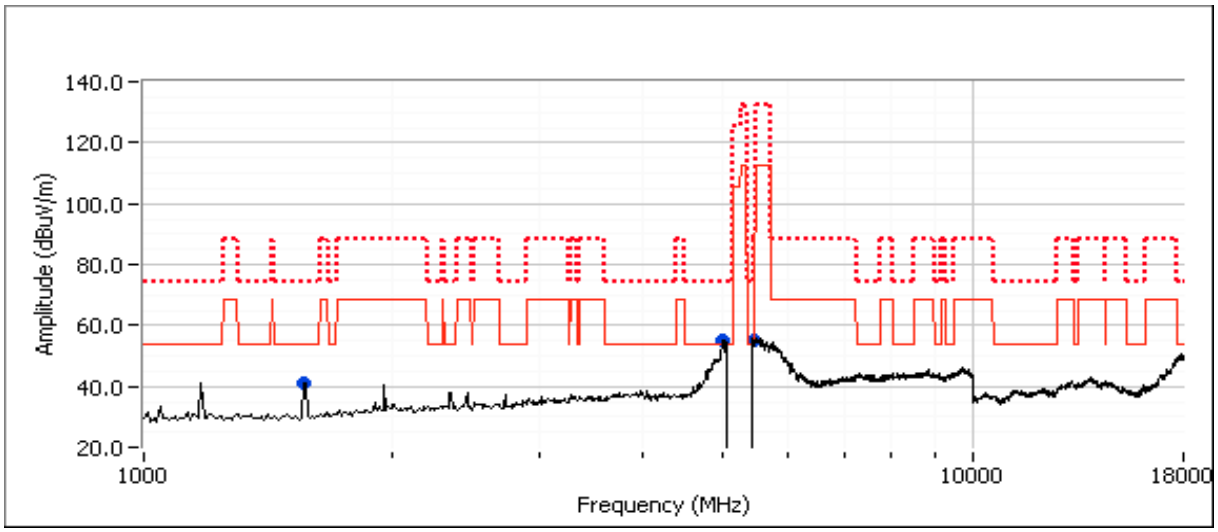
Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run #3b: EUT on 5250-5350MHz High Channel (SISO Mode) 802.11a, 5320MHz, Chain A

	Power Settings	
	Target	Actual
Chain A	-	5.0

Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBmV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5456.390	52.4	V	54.0	-1.6	AVG	357	1.0	RB 1 MHz;VB 10 Hz;Pk
5453.440	63.4	V	74.0	-10.6	PK	357	1.0	RB 1 MHz;VB 3 MHz;Pk
4979.120	51.2	V	54.0	-2.8	AVG	352	1.2	RB 1 MHz;VB 10 Hz;Pk
4975.190	65.3	V	74.0	-8.7	PK	352	1.2	RB 1 MHz;VB 3 MHz;Pk
1560.150	41.2	H	54.0	-12.8	Peak	174	1.6	



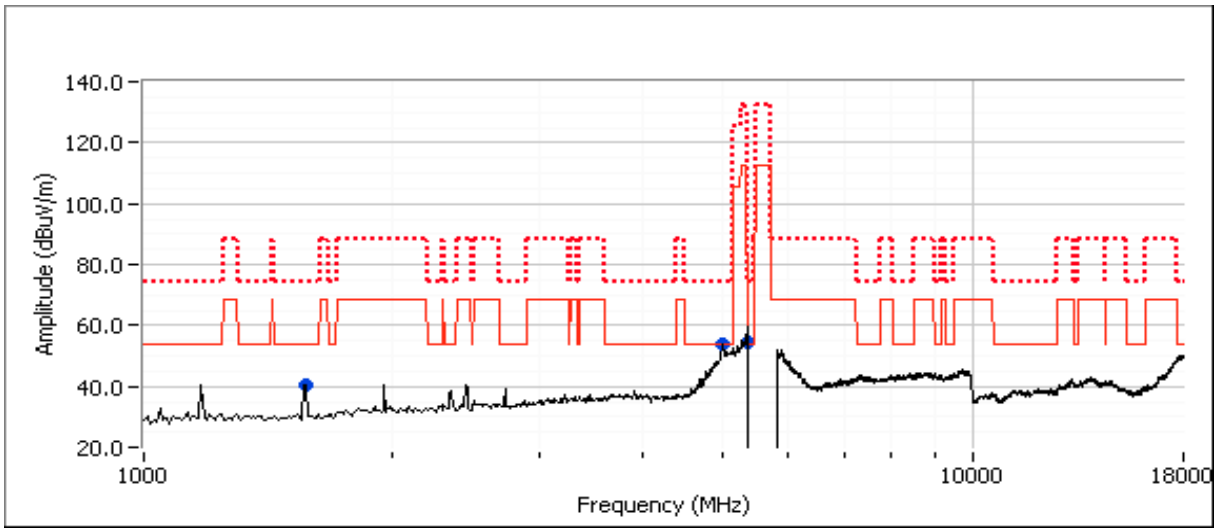
Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run #3d: EUT on 5470-5725MHz Low Channel (SISO Mode) 802.11a, 5500MHz, Chain A

	Power Settings	
	Target	Actual
Chain A	-	12.0

Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBmV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5356.650	53.2	V	54.0	-0.8	AVG	355	1.1	RB 1 MHz;VB 10 Hz;Pk
5356.760	64.9	V	74.0	-9.1	PK	355	1.1	RB 1 MHz;VB 3 MHz;Pk
4980.920	50.4	V	54.0	-3.6	AVG	355	1.1	RB 1 MHz;VB 10 Hz;Pk
4979.450	64.6	V	74.0	-9.4	PK	355	1.1	RB 1 MHz;VB 3 MHz;Pk
1560.150	40.7	H	54.0	-13.3	Peak	189	1.0	



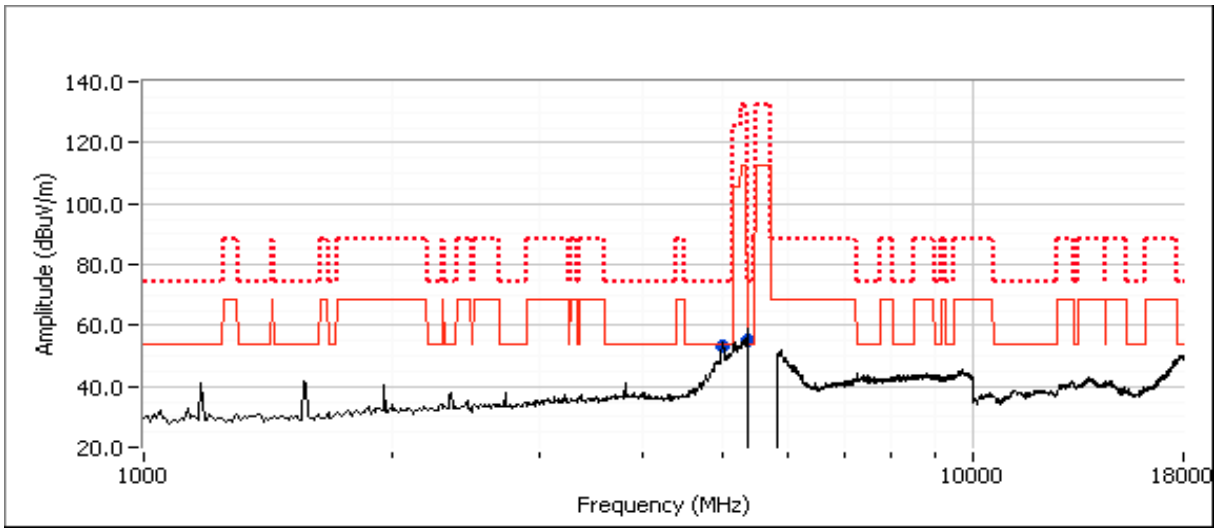
Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run #3e: EUT on 5470-5725MHz High Channel (SISO Mode) 802.11a, 5700MHz, Chain A

	Power Settings	
	Target	Actual
Chain A	-	9.0

Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBmV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5352.980	53.5	V	54.0	-0.5	AVG	348	1.0	RB 1 MHz;VB 10 Hz;Pk
5350.860	65.1	V	74.0	-8.9	PK	348	1.0	RB 1 MHz;VB 3 MHz;Pk
4988.050	51.5	V	54.0	-2.5	AVG	1	1.0	RB 1 MHz;VB 10 Hz;Pk
4992.720	62.6	V	74.0	-11.4	PK	1	1.0	RB 1 MHz;VB 3 MHz;Pk



Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run #4, Radiated Spurious Emissions, 1-40GHz, Low and High Channels

Date of Test: 6/1/2011 Test Location: FT Chamber #5

Test Engineer: Rafael Varelas Config Change: none

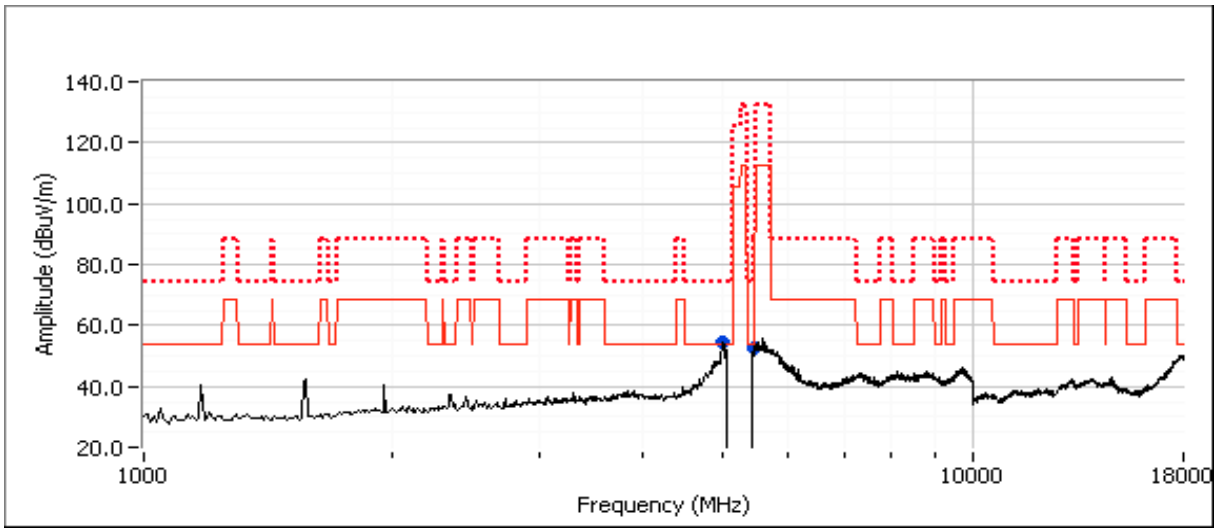
For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit is -27dBm eirp (68.3dBuV/m @3m), measured using ther same method used for the in-band PSD (power averaging).

Run #4a: EUT on 5250-5350MHz Low Channel (MIMO Mode) HT30, 5275MHz, Chain A

	Power Settings	
	Target	Actual
Chain A	-	5.0

Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBmV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5456.020	53.8	V	54.0	-0.2	AVG	357	1.0	RB 1 MHz;VB 10 Hz;Pk
5457.120	63.5	V	74.0	-10.5	PK	357	1.0	RB 1 MHz;VB 3 MHz;Pk
5028.790	51.9	V	54.0	-2.1	AVG	357	1.0	RB 1 MHz;VB 10 Hz;Pk
5043.530	62.1	V	74.0	-11.9	PK	357	1.0	RB 1 MHz;VB 3 MHz;Pk



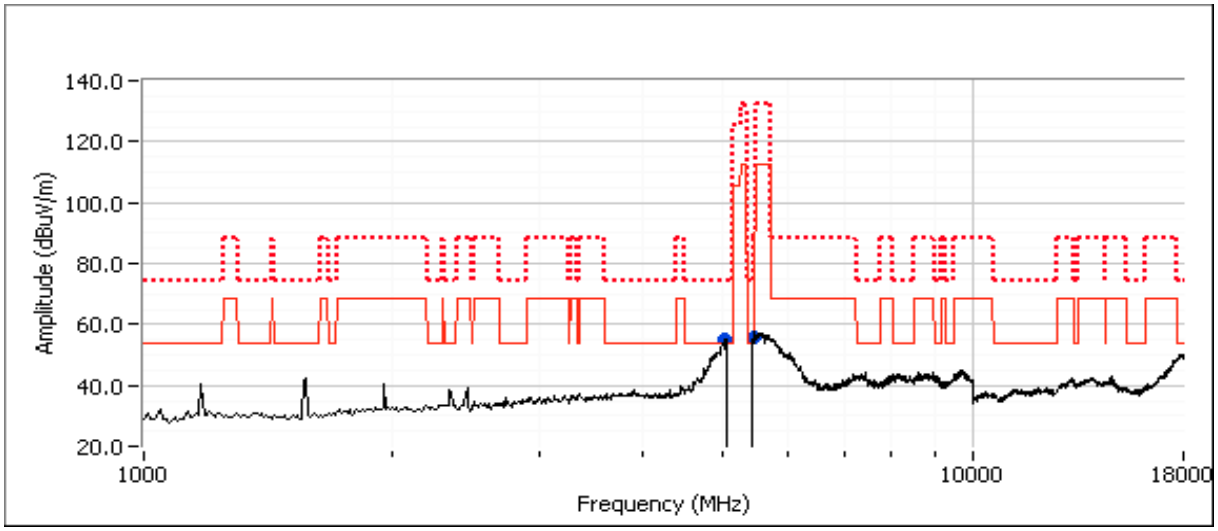
Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run #4b: EUT on 5250-5350MHz High Channel (MIMO Mode) HT30, 5315MHz, Chain A

	Power Settings	
	Target	Actual
Chain A	-	5.0

Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBmV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5451.100	53.1	V	54.0	-0.9	AVG	356	1.0	RB 1 MHz;VB 10 Hz;Pk
5454.680	65.1	V	74.0	-8.9	PK	356	1.0	RB 1 MHz;VB 3 MHz;Pk
5025.970	49.0	V	54.0	-5.0	AVG	356	1.0	RB 1 MHz;VB 10 Hz;Pk
5026.370	60.3	V	74.0	-13.7	PK	356	1.0	RB 1 MHz;VB 3 MHz;Pk



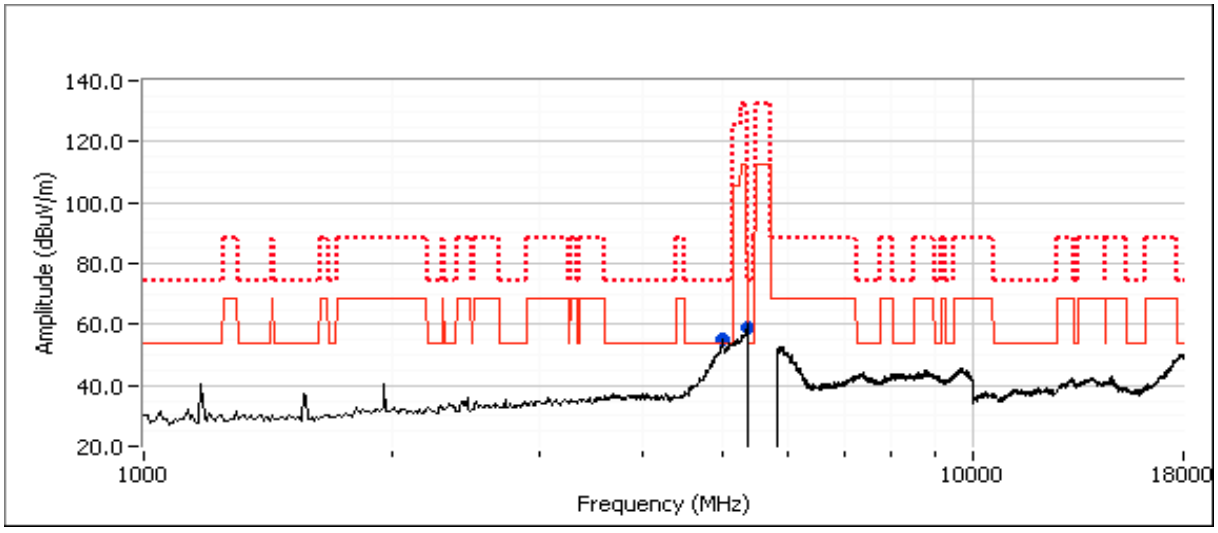
Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run #4d: EUT on 5470-5725MHz Low Channel (MIMO Mode) HT20, 5500MHz, Chain A+B

	Power Settings	
	Target	Actual
Chain A	-	9.0

Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBmV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5352.480	52.8	V	54.0	-1.2	AVG	0	1.0	RB 1 MHz;VB 10 Hz;Pk
5350.520	63.7	V	74.0	-10.3	PK	0	1.0	RB 1 MHz;VB 3 MHz;Pk
4997.240	48.0	V	54.0	-6.0	AVG	0	1.0	RB 1 MHz;VB 10 Hz;Pk
4978.970	62.2	V	74.0	-11.8	PK	0	1.0	RB 1 MHz;VB 3 MHz;Pk



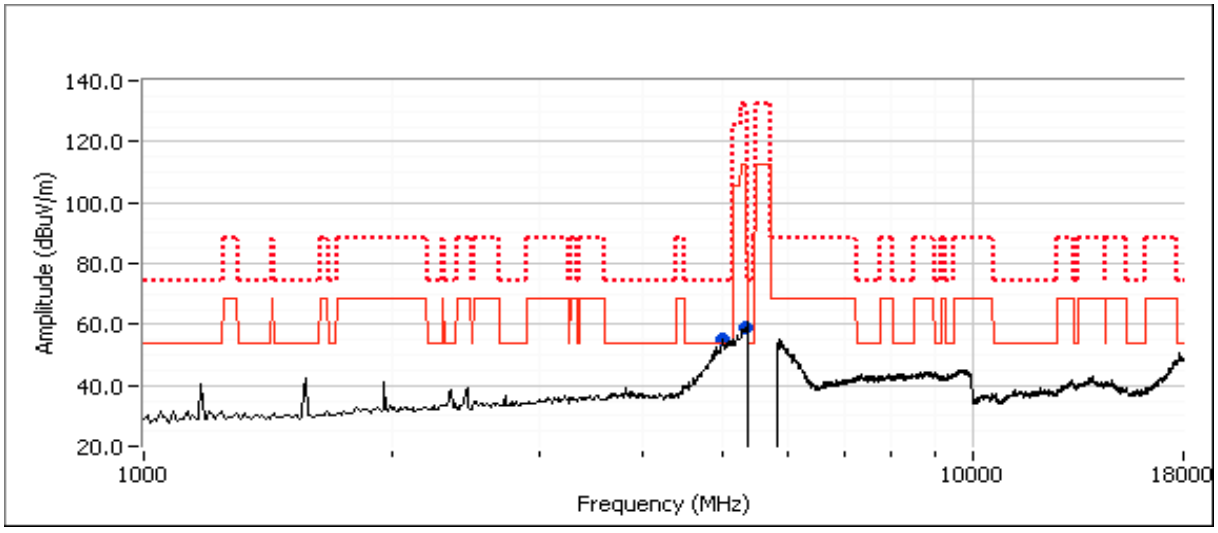
Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run #4e: EUT on 5470-5725MHz High Channel (MIMO Mode) HT20, 5700MHz, Chain A+B

	Power Settings	
	Target	Actual
Chain A	-	8.5

Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dBmV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5351.850	52.1	V	54.0	-1.9	AVG	357	1.0	RB 1 MHz;VB 10 Hz;Pk
5354.160	64.1	V	74.0	-9.9	PK	357	1.0	RB 1 MHz;VB 3 MHz;Pk
4990.500	47.6	V	54.0	-6.4	AVG	357	1.0	RB 1 MHz;VB 10 Hz;Pk
4994.760	61.4	V	74.0	-12.6	PK	357	1.0	RB 1 MHz;VB 3 MHz;Pk



Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

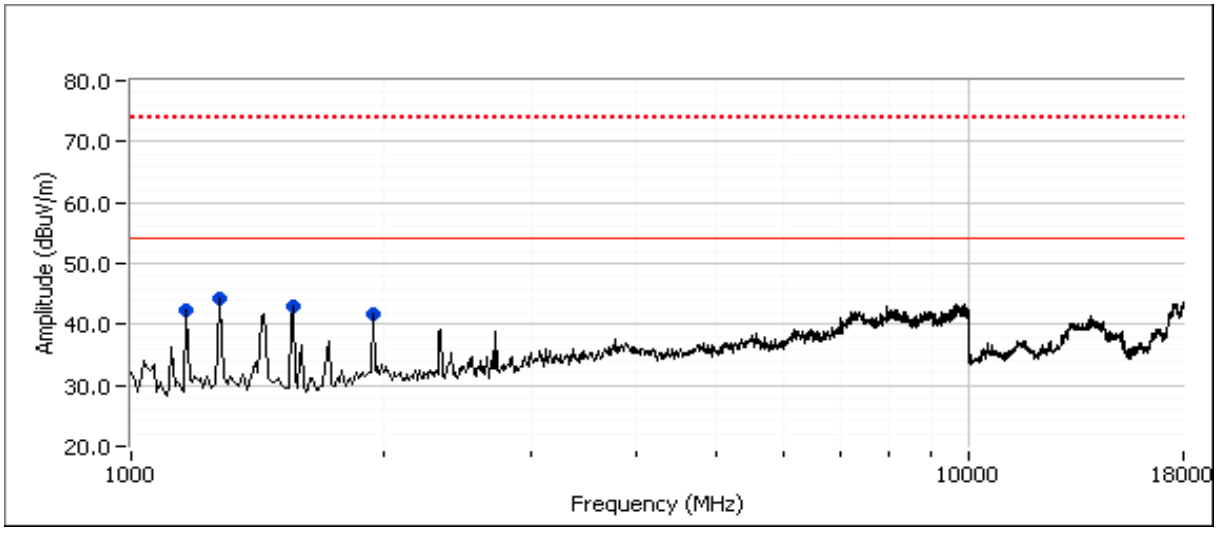
Run #5, Receiver Radiated Spurious Emissions, 1-18GHz, Low and High Channels

Date of Test: 5/27/2011 Test Location: FT5
Test Engineer: John Caizzi Config Change: none

Run #5a: EUT on 5250-5350MHz, Center Channel (Receive Mode) 5300MHz

Spurious Radiated Emissions:

Frequency	Level	Pol	RSS GEN		Detector	Azimuth	Height	Comments
MHz	dBmV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1275.000	*44.3*	*V*	*54.0*	*-9.7*	*Peak*	*215*	*1.3*	
1559.170	*43.0*	*H*	*54.0*	*-11.0*	*Peak*	*172*	*1.0*	
1165.000	*42.5*	*V*	*54.0*	*-11.5*	*Peak*	*175*	*1.3*	
1944.170	*41.6*	*H*	*54.0*	*-12.4*	*Peak*	*196*	*1.9*	
1275.370	31.8	V	54.0	-22.2	AVG	207	1.27	
1280.300	48.4	V	74.0	-25.6	PK	207	1.27	

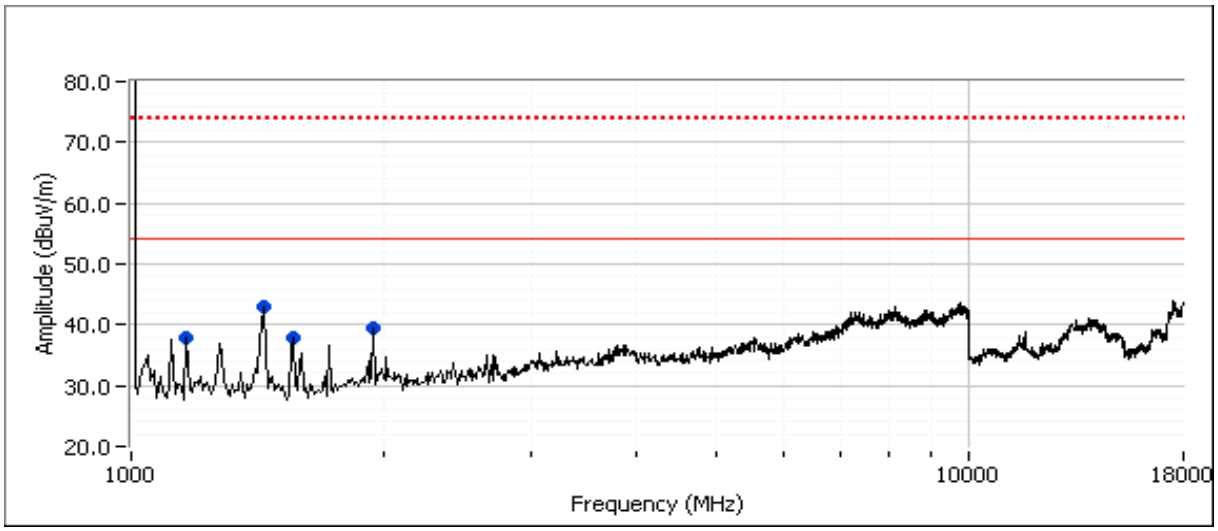


Client:	Ubiquiti Networks	Job Number:	J82749
Model:	NanoStation Loco M5	T-Log Number:	T82792
		Account Manager:	Susan Pelzl
Contact:	Jennifer Sanchez		
Standard:	FCC 15E, RSS-210	Class:	N/A

Run #5b: EUT on 5470-5725MHz , Center Channel (Receive Mode) 5580MHz

Spurious Radiated Emissions:

Frequency	Level	Pol	RSS GEN		Detector	Azimuth	Height	Comments
MHz	dBmV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1440.000	*43.0*	*V*	*54.0*	*-11.0*	*Peak*	*275*	*1.0*	
1944.170	*39.6*	*V*	*54.0*	*-14.4*	*Peak*	*238*	*1.0*	
1165.000	*38.0*	*V*	*54.0*	*-16.0*	*Peak*	*169*	*1.0*	
1559.170	*37.9*	*V*	*54.0*	*-16.1*	*Peak*	*169*	*1.0*	



Appendix C Photographs of Test Configurations

Uploaded as a separate exhibit

Appendix D Industry Canada / FCC ID Label & Label Location

Uploaded as a separate exhibit

Appendix E Operator's Manual

Uploaded as a separate exhibit

Appendix F Block Diagram

Uploaded as a separate exhibit

Appendix G Theory of Operation

Uploaded as a separate exhibit

Appendix H RF Exposure Information

The device is a fixed mounted device. The user's manual specifies a minimum separation distance of at least 20cm, consistent with this classification.

FCC part 1.1310, Table 1 limits the power density for uncontrolled exposure. The power density, P_d (mW/cm^2) calculated from the maximum EIRP, P_t (mW) and the distance, d (m), between the transmitting antenna and the closest person, can be calculated using:

$$P_d = P_t/(4 \pi d^2)$$

Frequency	MPE Limit (mW/cm^2)	Output Power (mW)	Max. Antenna Gain (dBi)	EIRP (mW)	Pd at 20cm (mW/cm^2)	Distance where Pd = limit (cm)
5250 to 5350 MHz	1.00	23.5	16.0	935.4	0.2	8.6
5470 to 5725 MHz	1.00	24.1	16.0	959.4	0.2	8.7

As shown in the calculations above, the power density 20cm from the device is below the maximum permitted level for uncontrolled exposure.

End of Report

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marks the last page of this test report.