EMC Test Report
Application for Grant of Equipment Authorization
Class II Permissive Change/Reassessment
pursuant to
Industry Canada RSS-Gen Issue 2 / RSS 210 Issue 7
FCC Part 15, Subpart E
Model: SDC-PE15N

IC CERTIFICATION #:	6616A-SDCPE15N
FCC ID:	TWG-SDCPE15N
APPLICANT:	Summit Data Communications Inc. 526 South Main St. Suite 805 Akron, OH 44311
TEST SITE(S):	Elliott Laboratories 684 W. Maude Avenue Sunnyvale, CA 94085
and	41039 Boyce Road. Fremont, CA. 94538-2435
IC SITE REGISTRATION #:	2845A-2; 2845B-3
REPORT DATE:	January 26, 2010
FINAL TEST DATES:	November 6, November 17, November 18, November 19, December 1, December 3, December 4 and December 29, 2009

AUTHORIZED SIGNATORY:

Mark E. Hill
Staff Engineer
Elliott Laboratories

ACCREDITED

Testing Cert #2016.01

REVISION HISTORY

Rev#	Date	Comments	Modified By
-	January 26, 2010	First release	

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SCOPE

An electromagnetic emissions test has been performed on the Summit Data Communications Inc. model SDC-PE15N, pursuant to the following rules:

Industry Canada RSS-Gen Issue 2
RSS 210 Issue 7 "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 Summit Data Communications Inc. model SDC-PE15N complied with the requirements of the following regulations:

RSS 210 Issue 7 "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 Summit Data Communications Inc. model SDC-PE15N and therefore apply only to the tested sample. The sample was selected and prepared by Ron Seide of Summit Data Communications Inc..

DEVIATIONS FROM THE STANDARDS

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

TEST RESULTS SUMMARY

UNII / LELAN DEVICES

Operation in the 5.15 – 5.25 GHz Band

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
15.407(e)		Indoor operation only	-	-	Note 1
15.407(a) (1)		26dB Bandwidth	-		Note 1
15.407 (a) (1)	A9.2(1)	Output Power	-	-	Note 2
15.407 (a) (1)	-	Power Spectral Density	-	-	Note 1
-	A9.5 (2)			-	Note 1
15.407(b) (5) / 15.209	A9.3	Spurious Emissions below 1GHz	50.9dBµV/m @ 5149.8MHz (-3.1dB)	Refer to Standard	Complies
15.407(b) (2)	A9.3	Spurious Emissions above 1GHz			
15.407(a)(6)	-	Peak Excursion Ratio	-	-	Note 1

Note 1: Not included in this permissive change. Addition of new antennas would not change previous results.
Note 2: Prior to testing, the output power on the EUT was measured and compared to the original filing. Summit limits the power via their client utility to a level below that listed in the original certification.

Operation in the 5.25 – 5.35 GHz Band

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.407(a) (2)		26dB Bandwidth	-	-	Note 1
15.407(a) (2)	A9.2(2)	Output Power	-	-	Note 2
15.407(a) (2))	-	Power Spectral Density	-	-	Note 1
-	A9.2(2) / A9.5 (2)	Power Spectral Density		-	Note 1
-	A9.5 (2)	Peak Spectral Density	-	-	Note 1
15.407(b) (5) / 15.209	A9.3	Spurious Emissions below 1GHz	53.1dBµV/m @ 5350.0MHz (-0.9dB)	Refer to Standard	Complies
15.407(b) (2)	A9.3	Spurious Emissions above 1GHz			
15.407(a)(6)	-	Peak Excursion Ratio	-	-	Note 1

Note 1: Not included in this permissive change. Addition of new antennas would not change previous results.
Note 2: Prior to testing, the output power on the EUT was measured and compared to the original filing. Summit limits the power via their client utility to a level below that listed in the original certification.

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	-		Note 1
15.407(a) (2)	A9.2(2)	Output Power	-	-	Note 2
15.407(a) (2))		Power Spectral Density	-	-	Note 1
	A9.2(2) / A9.5 (2)	Power Spectral Density		-	Note 1
N/A	A9	Non-operation in 5600 – 5650 MHz sub band	Device is a client device with no ad-hoc capability		Note 1
15.407(b) (5) / 15.209	A9.3	Spurious Emissions below 1GHz	50.6dBµV/m @ 5459.0MHz (-3.4dB)	Refer to Standard	Complies
15.407(b) (2)	A9.3	Spurious Emissions above 1GHz			
15.407(a)(6)	-	Peak Excursion Ratio	-	-	Note 1

Note 1: Not included in this permissive change. Addition of new antennas would not change previous results.

Note 2: Prior to testing, the output power on the EUT was measured and compared to the original filing. Summit limits the power via their client utility to a level below that listed in the original certification.

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	-	-	Note 1
	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	Complies
15			Measurements on three channels in each band		Complies
15.407 (c)	A9.5(4)	Operation in the absence of information to transmit	-	-	Note 1
15.407 (g)	A9.5 (5)	Frequency Stability	-	-	Note 1
15.407 (h1)	A9.4	Transmit Power Control	-	-	Note 1
15.407 (h2)	A9.4	Dynamic frequency Selection (device without radar detection)	-	-	Note 1
	A9.9g	User Manual information	-	-	Note 1

Note 1: Not included in this permissive change. Addition of new antennas would not change previous results.

GENERAL REQUIREMENTS APPLICABLE TO ALL BANDS

FCC Rule Part	RSS Rule part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.203	-	RF Connector	-	-	Note 1
15.109	RSS GEN 7.2.3 Table 1	Receiver spurious emissions	No Receiver Spurious Emissions Detected	-	Complies
15.207	RSS GEN Table 2	AC Conducted Emissions	-	-	Note 1
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	-	-	Note 1
-	RSP 100 RSS GEN 7.1.5	User Manual	-	-	Note 1
-	RSP 100 RSS GEN 4.4.1	99% Bandwidth	-	-	Note 1

Note 1: Not included in this permissive change. Addition of new antennas would not change previous results.

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	Frequency Range (MHz)	Calculated Uncertainty (dB)
Conducted Emissions	0.15 to 30	± 2.4
Radiated Emissions	0.015 to 30	± 3.0
Radiated Emissions	30 to 1000	± 3.6
Radiated Emissions	1000 to 40000	± 6.0

EQUIPMENT UNDER TEST (EUT) DETAILS

GENERAL

The Summit Data Communications Inc. model SDC-PE15N is a 802.11abgn PCI-E module that is designed to provide wireless network connectivity in the 2.4 and 5GHz bands. Since the EUT would be placed on a table top during operation, the EUT was treated as table-top equipment during testing to simulate the end-user environment. The EUT is powered from the host device.

The sample was received on November 6, 2009 and tested on November 6, November 17, November 18, November 19, December 1, December 3, December 4 and December 29, 2009. The EUT consisted of the following component(s):

Company	Model	Description	Serial Number	FCC ID
Summit Data Communications	SDC-PE15N	802.11abgn PCI-E module	PE15N0908240001FS	TWG-SDCPE15N

ANTENNA SYSTEM

The antenna connects to the EUT via a non-standard u.FL antenna connector, thereby meeting the requirements of FCC 15.203.

Antennas to be included in this permissive change:
Monopole Antenna - 2.4 and 5GHz bands, Huber+Suhner, SOA 2459/360/5/0/V_C, 3dBi (2.4GHz), 6.5dBi (5GHz)
Dipole Antenna #1 - 2.4 GHz only - Summit SDC-CF22G - 0dBi (2.4GHz)
Dipole Antenna #2 - 2.4 and 5GHz bands - Larsen, R380.500.314, 1.6dBi (2.4GHz), 5dBi (5GHz)
Dipole Antenna #3 - 2.4 GHz only - Cisco Air-Ant 4941 2.2dBi(2.4GHz)

ENCLOSURE

The EUT does not have an enclosure as it is designed to be installed within the enclosure of a host computer or system.

MODIFICATIONS

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

SUPPORT EQUIPMENT

The following equipment was used as support equipment for testing:

Company	Model	Description	Serial Number	FCC ID
Lenovo	4446	Laptop	L3-BNN1E	DoC
Lenovo	PA-1650-52LC	AC Adapter	-	N/A

No remote support equipment was used during testing.

EUT INTERFACE PORTS

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

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
PCMCIA	EUT Extender Board	N/A - Direct Connection	-	-
AC Power Adapter	AC Mains	3Wire	Unshielded	1.5
DC Power Laptop	AC Adapter	Multiconductor	Shielded	1.5

EUT OPERATION

During emissions testing the EUT was configured to transmit on a selected channel at the desired output power. Unless otherwise noted, the EUT was configured to transmit at 1Mbs for 802.11b mode testing, 6 Mbs for 802.11g and a mode testing, and HT0 for HT20 and HT40 testing.

TEST SITE

GENERAL INFORMATION

Final test measurements were taken on December 11, December 14, December 21, December 23, December 28, December 29 and December 30, 2009 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	
SVOATS #2	90593	2845A-2	684 West Maude Ave, Sunnyvale CA 94085-3518
Chamber 3	769238	2845B-3	41039 Boyce Road Fremont, CA 94538-2435

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 with the exception, on OATS sites, of predictable local TV, radio, and mobile communications traffic. 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.

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.

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.

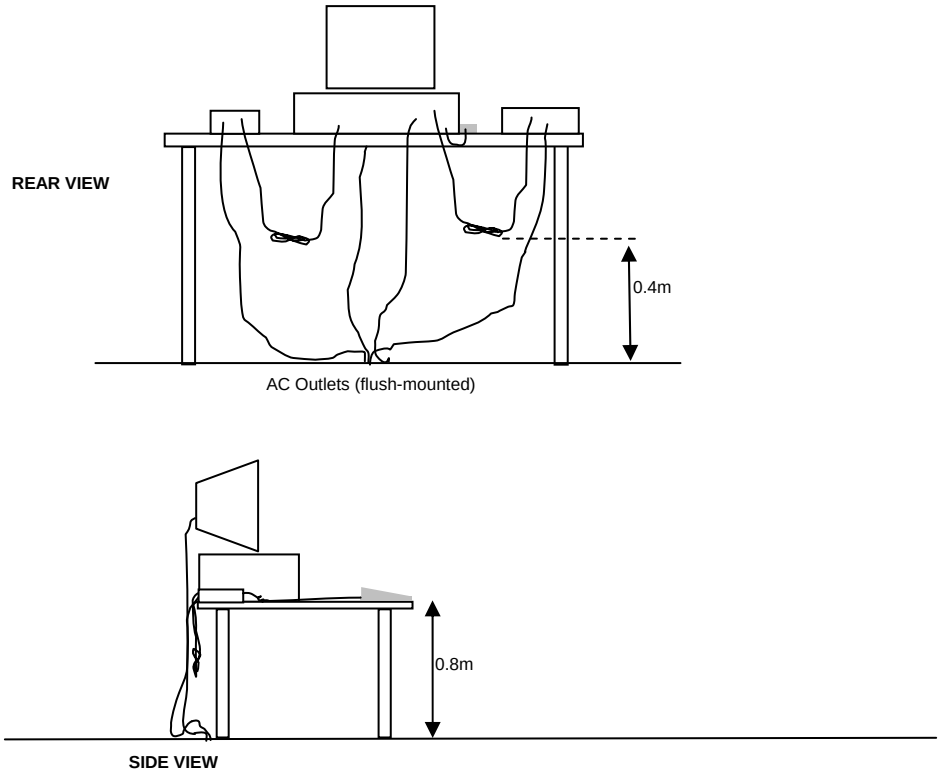
RADIATED EMISSIONS

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.

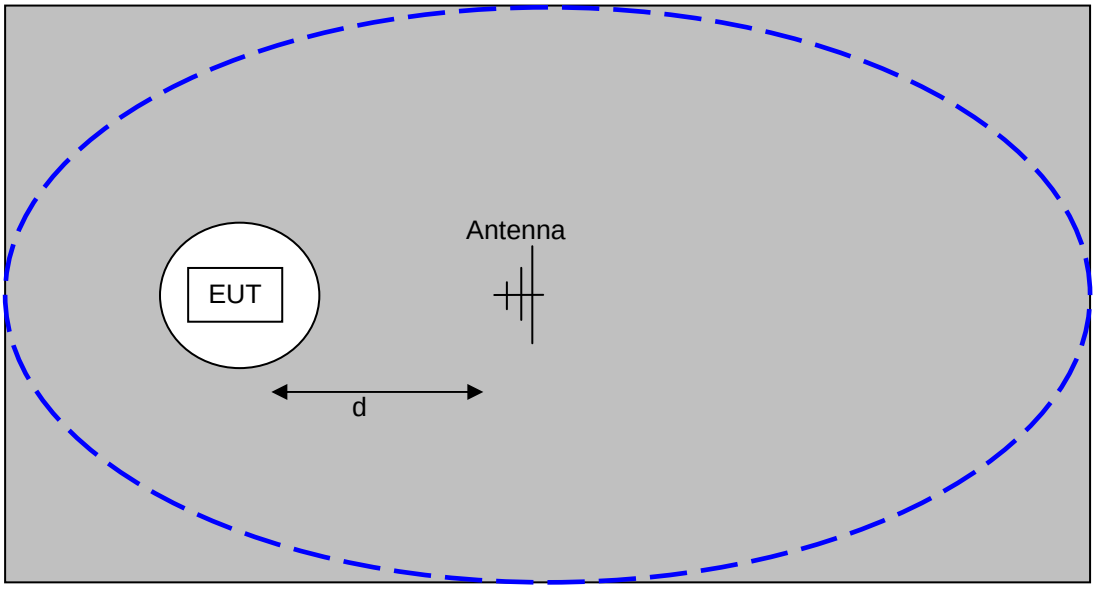
A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

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.

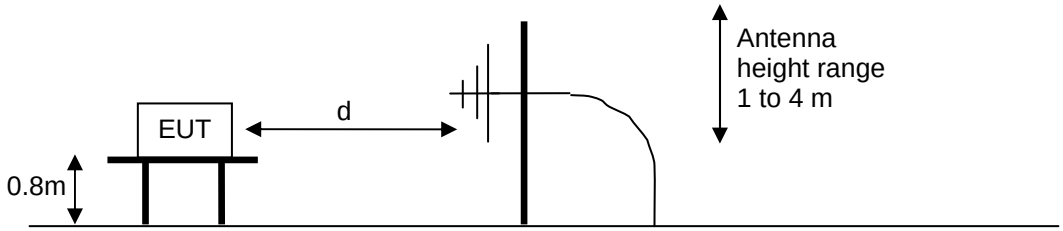
When testing above 18 GHz, the receive antenna is located at 1meter from the EUT and the antenna height is restricted to a maximum of 2.5 meters.



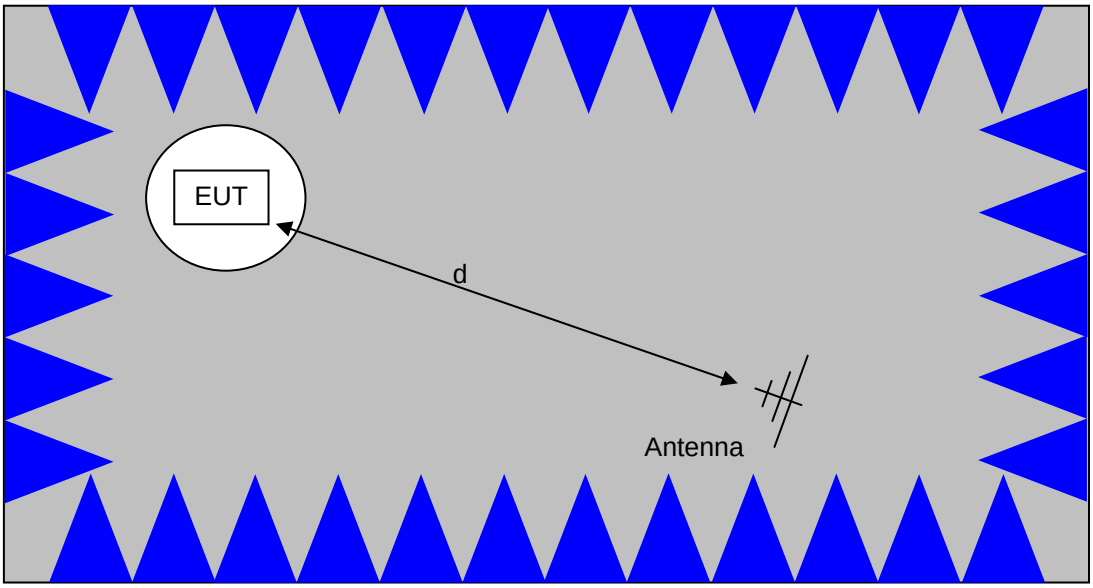
Typical Test Configuration for Radiated Field Strength Measurements



The ground plane extends beyond the ellipse defined in CISPR 16 / CISPR 22 / ANSI C63.4 and is large enough to accommodate test distances (d) of 3m and 10m. Refer to the test data tables for the actual measurement distance.

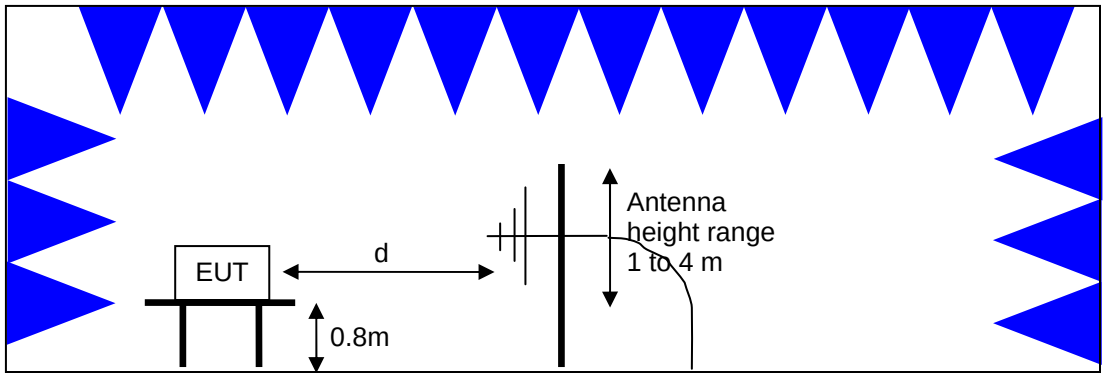


Test Configuration for Radiated Field Strength Measurements
OATS- Plan and Side Views



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

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[1] (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

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.

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

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)[2] 1W (30dBm) eirp	11 dBm/MHz
5470 - 5725	250 mW (24 dBm)[3] 1W (30dBm) eirp	11 dBm/MHz
5725 – 5825	1 Watts (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.

OUTPUT POWER AND SPURIOUS 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 a field strength of 68.3dBuV/m/MHz at a distance of 3m. This is an average limit so the peak value of the emission may not exceed –7dBm/MHz (68.3dBuV/m/MHz at a distance of 3m). 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.

[2] If EIRP exceeds 500mW the device must employ TPC
[3] If EIRP exceeds 500mW the device must employ TPC

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 3m from the equipment under test:

$$E = \frac{1000000 \sqrt{30 P}}{3} \text{ microvolts per meter}$$

where P is the eirp (Watts)

Appendix A Test Equipment Calibration Data

Radio Antenna Port (Power), 16-Oct-09
Engineer: John Caizzi

Manufacturer	Description	Model #	Asset #	Cal Due
Agilent	PSA, Spectrum Analyzer, (installed options, 111, 115, 123, 1DS, B7J, HYX,	E4446A	2139	30-Dec-09

Radio Antenna Port (Power), 22-Oct-09
Engineer: Mehran Birgani

Manufacturer	Description	Model #	Asset #	Cal Due
Agilent	PSA, Spectrum Analyzer, (installed options, 111, 115, 123, 1DS, B7J, HYX,	E4446A	2139	30-Dec-09

Radiated Emissions, 30 - 40,000 MHz, 06-Nov-09
Engineer: Mehran Birgani

Manufacturer	Description	Model #	Asset #	Cal Due
EMCO	Antenna, Horn, 1-18 GHz	3115	487	15-Jul-10
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	19-Aug-10
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	12-Mar-10

Radio Antenna Spurious Emissions, 18-Nov-09
Engineer: Suhaila Khushzad

Manufacturer	Description	Model #	Asset #	Cal Due
EMCO	Antenna, Horn, 1-18 GHz	3115	487	15-Jul-10
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	19-Aug-10
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	12-Mar-10
Hewlett Packard	High Pass filter, 8.2 GHz (Red System)	P/N 84300-80039 (84125C)	1152	28-Sep-10

Radiated Emissions, 30 - 40,000 MHz, 19-Nov-09
Engineer: Mehran Birgani

Manufacturer	Description	Model #	Asset #	Cal Due
EMCO	Antenna, Horn, 1-18 GHz	3115	487	15-Jul-10
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	19-Aug-10
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	12-Mar-10

Radio Antenna Port (Power and Spurious Emissions), 04-Dec-09
Engineer: Mehran Birgani

Manufacturer	Description	Model #	Asset #	Cal Due
Agilent	PSA, Spectrum Analyzer, (installed options, 111, 115, 123, 1DS, B7J, HYX,	E4446A	2139	30-Dec-09

Radiated Emissions, 30 - 26,500 MHz, 29-Dec-09
Engineer: Rafael Varelas

Manufacturer	Description	Model #	Asset #	Cal Due
EMCO	Antenna, Horn, 1-18 GHz (SA40-Blu)	3115	1386	02-Sep-10
Hewlett Packard	SpecAn 9 kHz - 40 GHz, FT (SA40) Blue	8564E (84125C)	1393	10-Apr-10
Hewlett Packard	Head (Inc W1-W4, 1742 , 1743) Blue	84125C	1620	06-May-10
Micro-Tronics	Band Reject Filter, 5725-5875 MHz	BRC50705-02	1728	25-Sep-10
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	1780	17-Sep-10
A.H. Systems	Blue System Horn, 18-40GHz	SAS-574, p/n: 2581	2159	17-Mar-10

Radiated Emissions, 1000 - 18,000 MHz, 20-Jan-10
Engineer: Rafael Varelas

Manufacturer	Description	Model #	Asset #	Cal Due
EMCO	Antenna, Horn, 1-18 GHz	3115	487	15-Jul-10
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	19-Aug-10
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	12-Mar-10

Appendix B Test Data

T76863 43 Pages

Client:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		-
Emissions Standard(s):	FCC 15.407, RSS-210	Class:	-
Immunity Standard(s):	-	Environment:	-

EMC Test Data

For The

Summit Data Communications

Model

802.11abgn Module

Date of Last Test: 1/20/2010

Client:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, 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.

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

Ambient Conditions:

Temperature: 15-20 °C

Rel. Humidity: 40-60 %

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:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, RSS-210	Class:	N/A

Summary of Results

Run #	Mode	Channel	Power Setting	Antenna	Test Performed	Limit	Result / Margin
1	802.11a Chain A	5150-5250 Low	Max	H&S Monopole	Restricted Band Edge at 5150 MHz	15.209	43.6dBµV/m @ 5147.3MHz (-10.4dB)
	802.11a Chain A	5250-5350 High	Max	H&S Monopole	Restricted Band Edge at 5350 MHz	15.209	45.5dBµV/m @ 5356.1MHz (-8.5dB)
	802.11a Chain A	5470-5725 Low	Max	H&S Monopole	Restricted Band Edge at 5460 MHz	15.209	45.5dBµV/m @ 5457.0MHz (-8.5dB)
2	802.11 HT20	5150-5250 Low	Max	H&S Monopole	Restricted Band Edge at 5150 MHz	15.209	43.3dBµV/m @ 5142.5MHz (-10.7dB)
	802.11 HT20	5250-5350 High	Max	H&S Monopole	Restricted Band Edge at 5350 MHz	15.209	47.8dBµV/m @ 5351.8MHz (-6.2dB)
	802.11 HT20	5470-5725 Low	Max	H&S Monopole	Restricted Band Edge at 5460 MHz	15.209	46.4dBµV/m @ 5457.8MHz (-7.6dB)
3	802.11 HT40	5150-5250 Low	Max	H&S Monopole	Restricted Band Edge at 5150 MHz	15.209	47.9dBµV/m @ 5149.9MHz (-6.1dB)
	802.11 HT40	5250-5350 High	Max	H&S Monopole	Restricted Band Edge at 5350 MHz	15.209	50.7dBµV/m @ 5350.0MHz (-3.3dB)
	802.11 HT40	5470-5725 Low	Max	H&S Monopole	Restricted Band Edge at 5460 MHz	15.209	47.4dBµV/m @ 5460.0MHz (-6.6dB)

Client:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, RSS-210	Class:	N/A

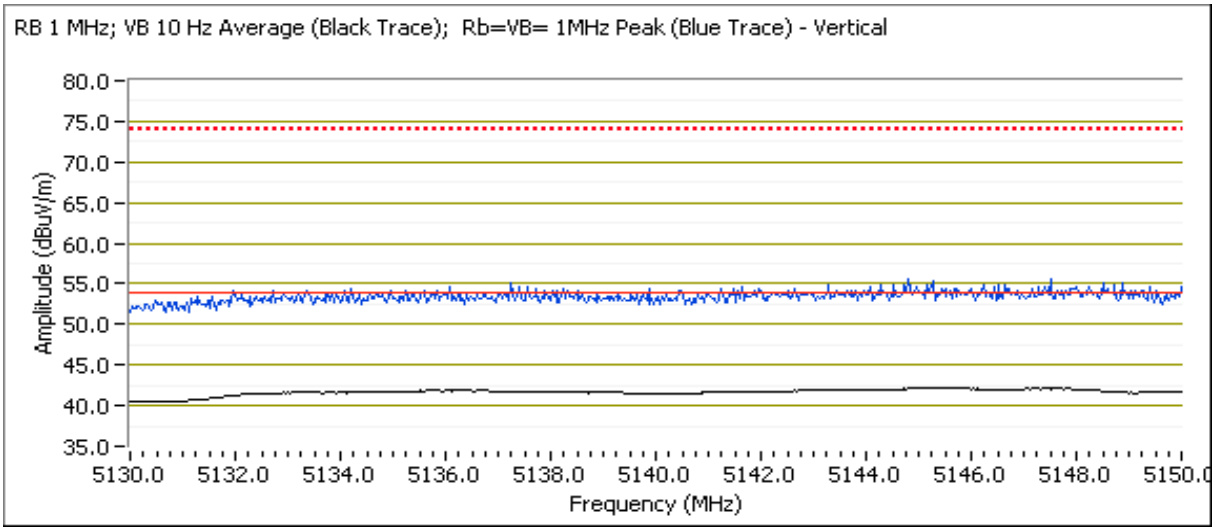
Run #1, Radiated Band Edge, 802.11a

Date: 11/6/2009 Engineer: Mehran Birgani Location: OATS #2

Antenna: Monopole #2 - Huber+Suhner, SOA 2459/360/5/0/V_C, 6.5dBi (5GHz), Asst # 2009-1632 & 1633
MAC: 00172309A9FB **DRIVER:** V2.03.07 SCU: V3.00.37

Run #1a: Low Channel (5150-5250 MHz)
5150 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	
5145.130	43.6	H	54.0	-10.4	AVG	144	1.6	
5147.300	43.6	V	54.0	-10.4	AVG	109	1.6	
5137.070	53.6	H	74.0	-20.4	PK	144	1.6	
5147.270	55.3	V	74.0	-18.7	PK	109	1.6	

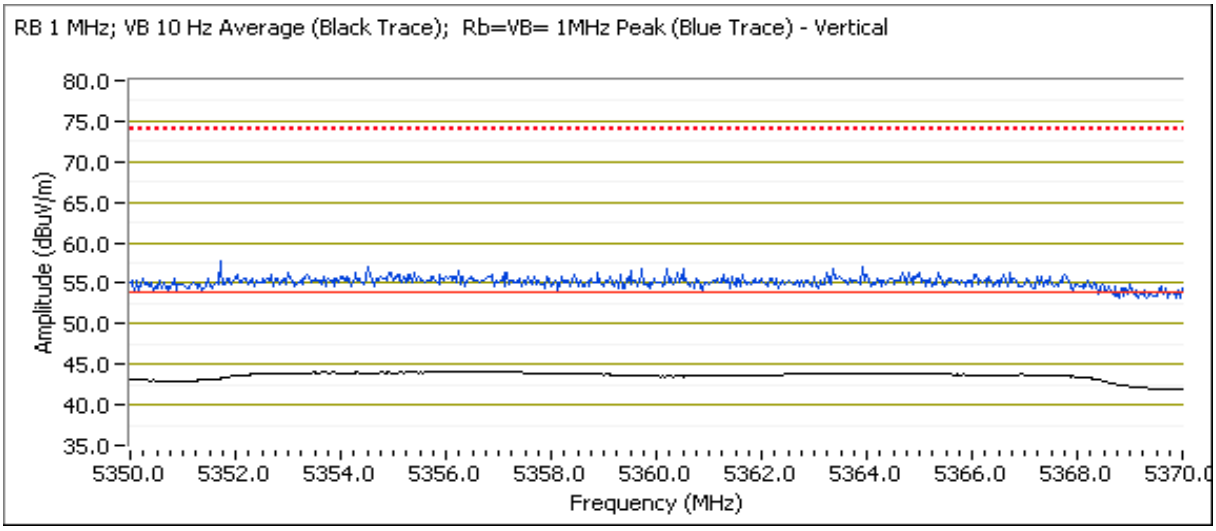


Client:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, RSS-210	Class:	N/A

Run #1b: High Channel (5250-5350 MHz)

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	
5353.230	45.3	H	54.0	-8.7	AVG	143	1.7	
5356.070	45.5	V	54.0	-8.5	AVG	108	1.7	
5351.200	56.2	V	74.0	-17.8	PK	108	1.7	
5355.400	56.9	H	74.0	-17.1	PK	143	1.7	

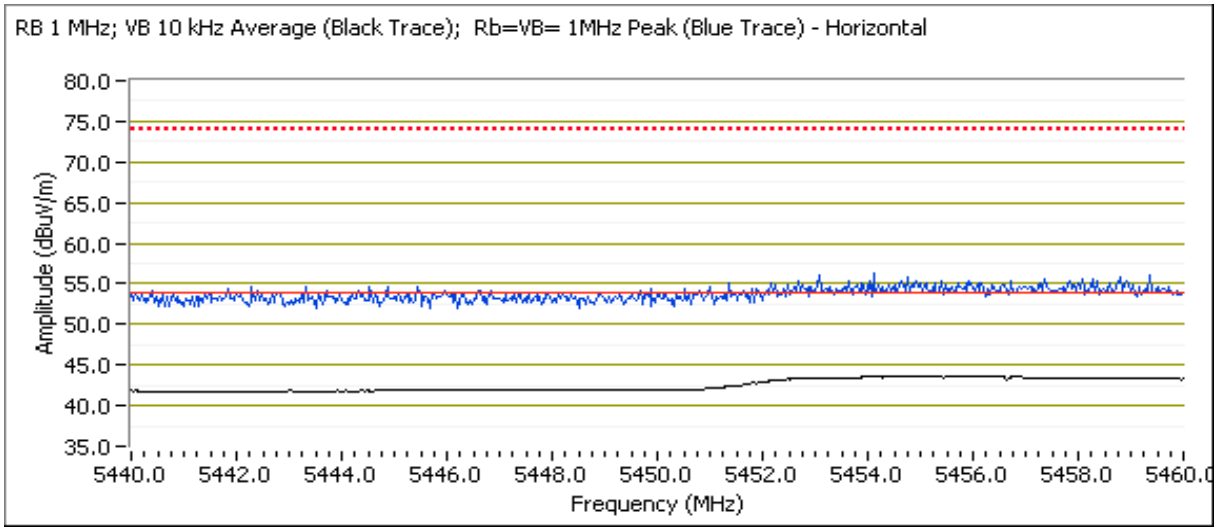


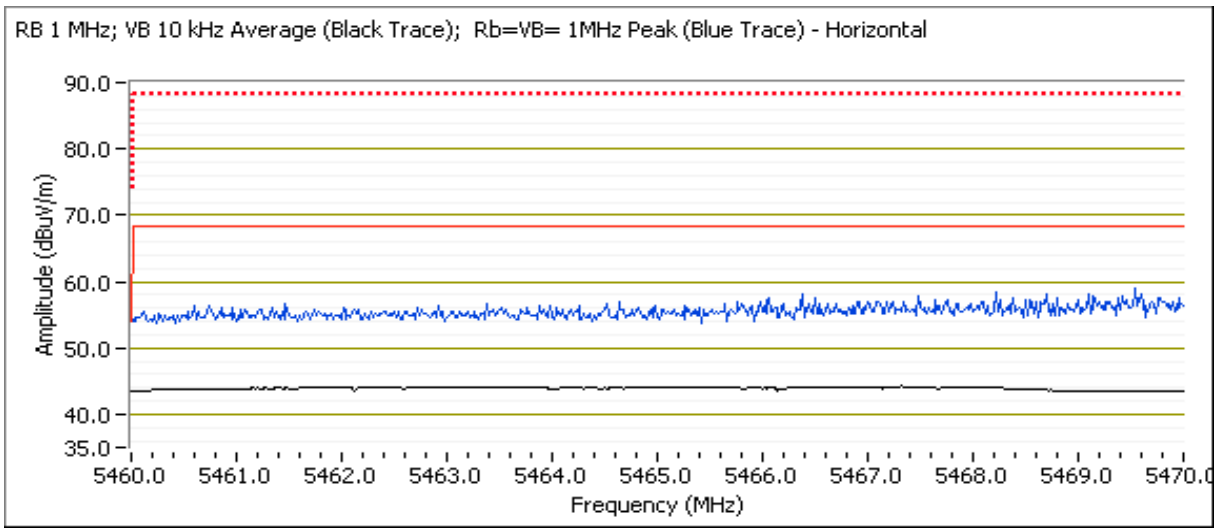
Client:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, RSS-210	Class:	N/A

Run #1c: Low Channel (5470-5725 MHz)

5460 MHz Band Edge 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	
5455.630	45.2	V	54.0	-8.8	AVG	148	1.9	
5457.000	45.5	H	54.0	-8.5	AVG	148	1.7	
5452.800	56.7	V	74.0	-17.3	PK	148	1.9	
5456.230	56.2	H	74.0	-17.8	PK	148	1.7	





Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).

Client:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, RSS-210	Class:	N/A

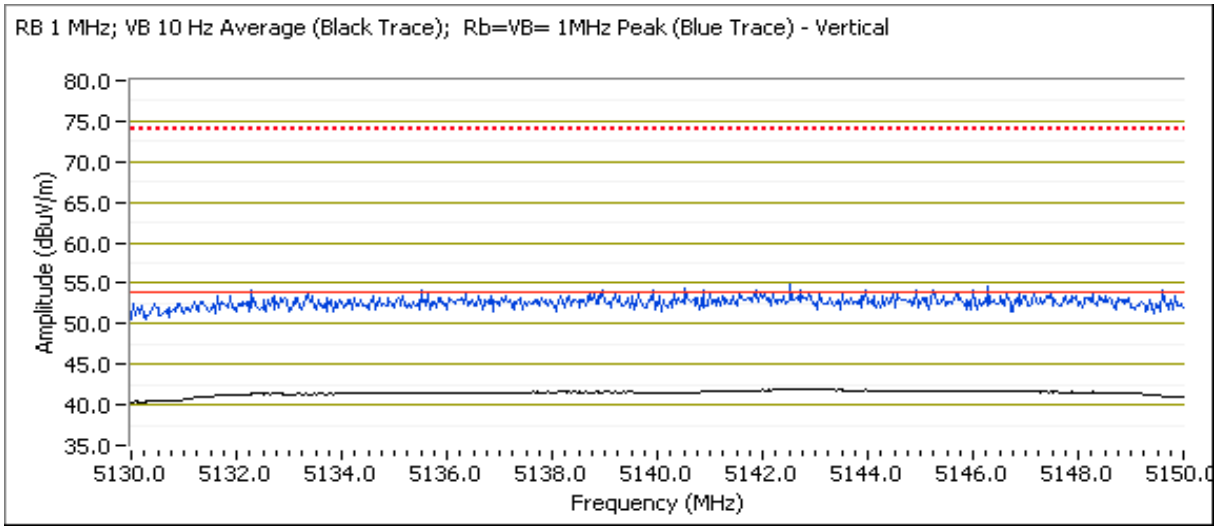
Run #2, Radiated Band Edge, 802.11 HT20

Date: 11/6/2009 Engineer: Mehran Birgani Location: OATS #2

Antenna: Monopole #2 - Huber+Suhner, SOA 2459/360/5/0/V_C, 6.5dBi (5GHz), Asst # 2009-1632 & 1633
MAC: 00172309A9FB **DRIVER:** V2.03.07 SCU: V3.00.37

Run #2a: Low Channel (5150-5250 MHz)
5150 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	
5142.430	42.6	H	54.0	-11.4	AVG	147	1.7	
5142.470	43.3	V	54.0	-10.7	AVG	106	1.5	
5136.670	54.9	V	74.0	-19.1	PK	106	1.5	
5144.730	54.4	H	74.0	-19.6	PK	147	1.7	

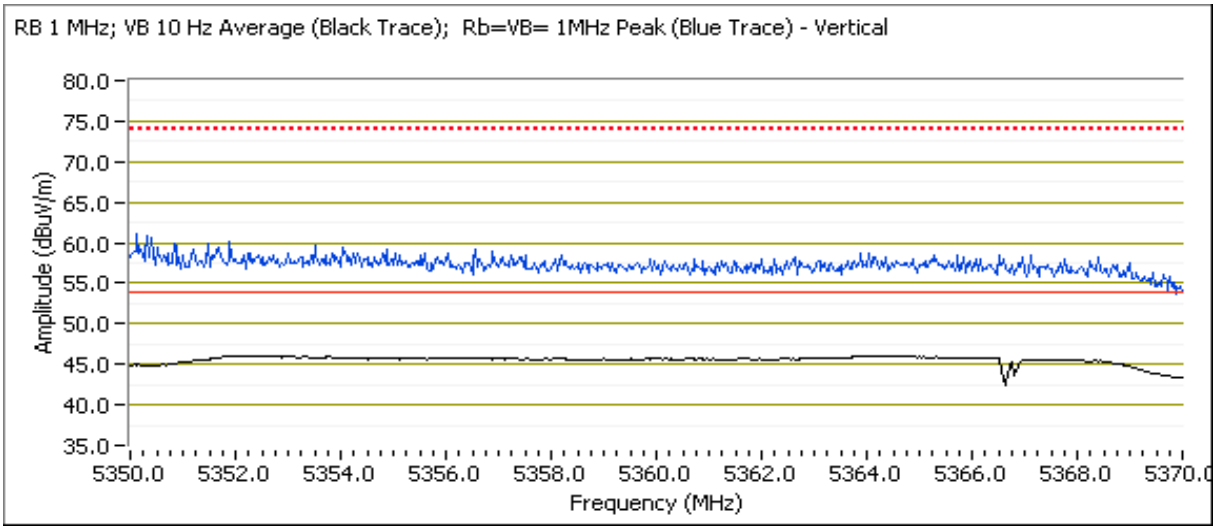


Client:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, RSS-210	Class:	N/A

Run #2b: High Channel (5250-5350 MHz)

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	
5351.830	47.8	V	54.0	-6.2	AVG	109	1.7	
5352.030	47.1	H	54.0	-6.9	AVG	149	1.9	
5350.800	58.9	H	74.0	-15.1	PK	149	1.9	
5354.370	60.5	V	74.0	-13.5	PK	109	1.7	

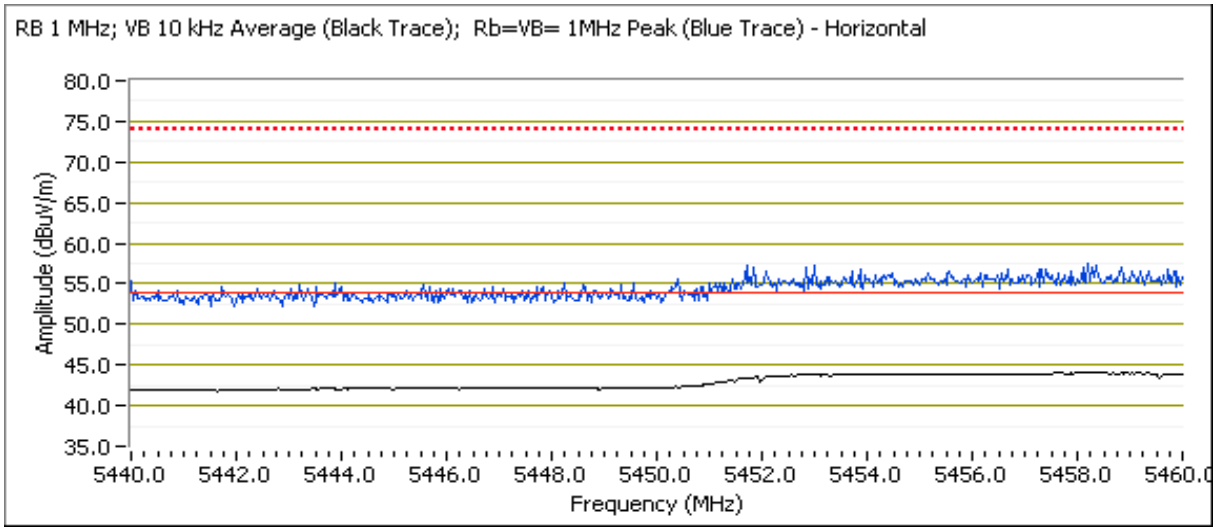


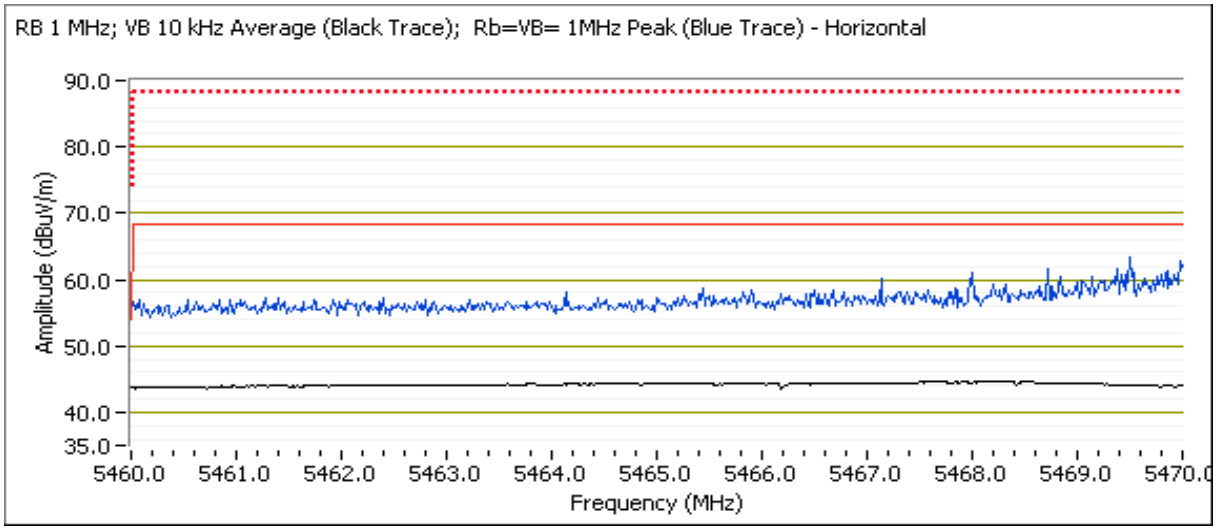
Client:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, RSS-210	Class:	N/A

Run #2c: Low Channel (5470-5725 MHz)

5460 MHz Band Edge 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	
5457.830	46.4	H	54.0	-7.6	AVG	146	1.8	
5458.330	45.5	V	54.0	-8.5	AVG	147	1.6	
5456.030	56.8	V	74.0	-17.2	PK	147	1.6	
5458.670	59.0	H	74.0	-15.0	PK	146	1.8	





Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).

Client:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, RSS-210	Class:	N/A

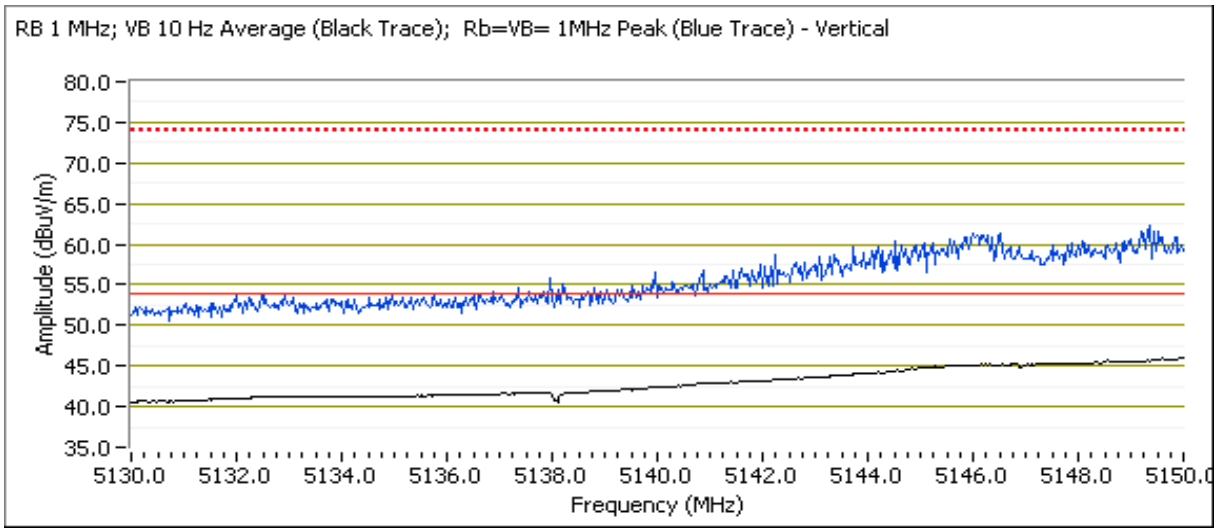
Run #3, Radiated Band Edge, 802.11 HT40

Date: 11/6/2009 Engineer: Mehran Birgani Location: OATS #2

Antenna: Monopole #2 - Huber+Suhner, SOA 2459/360/5/0/V_C, 6.5dBi (5GHz), Asst # 2009-1632 & 1633
MAC: 00172309A9FB **DRIVER:** V2.03.07 SCU: V3.00.37

Run #3a: Low Channel (5150-5250 MHz)
5150 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	
5149.870	47.9	V	54.0	-6.1	AVG	103	1.4	
5150.000	46.6	H	54.0	-7.4	AVG	153	1.7	
5146.030	62.2	V	74.0	-11.8	PK	103	1.4	
5148.600	59.5	H	74.0	-14.5	PK	153	1.7	

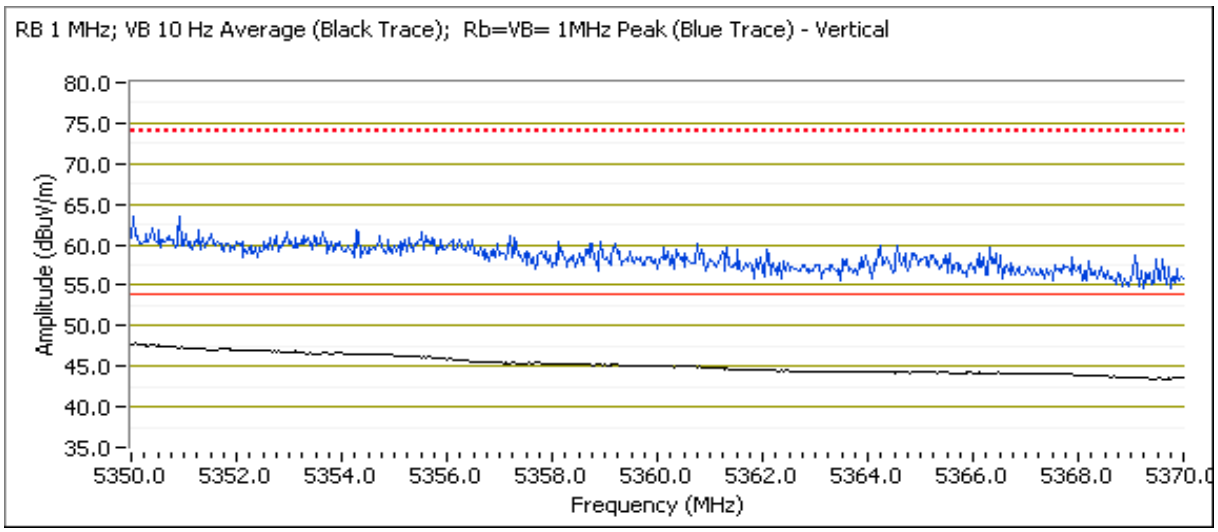


Client:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, RSS-210	Class:	N/A

Run #3b: High Channel (5250-5350 MHz)

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	
5350.000	50.7	H	54.0	-3.3	AVG	145	1.7	
5350.000	49.9	V	54.0	-4.1	AVG	134	1.7	
5350.470	62.6	V	74.0	-11.4	PK	134	1.7	
5353.800	62.5	H	74.0	-11.5	PK	145	1.7	

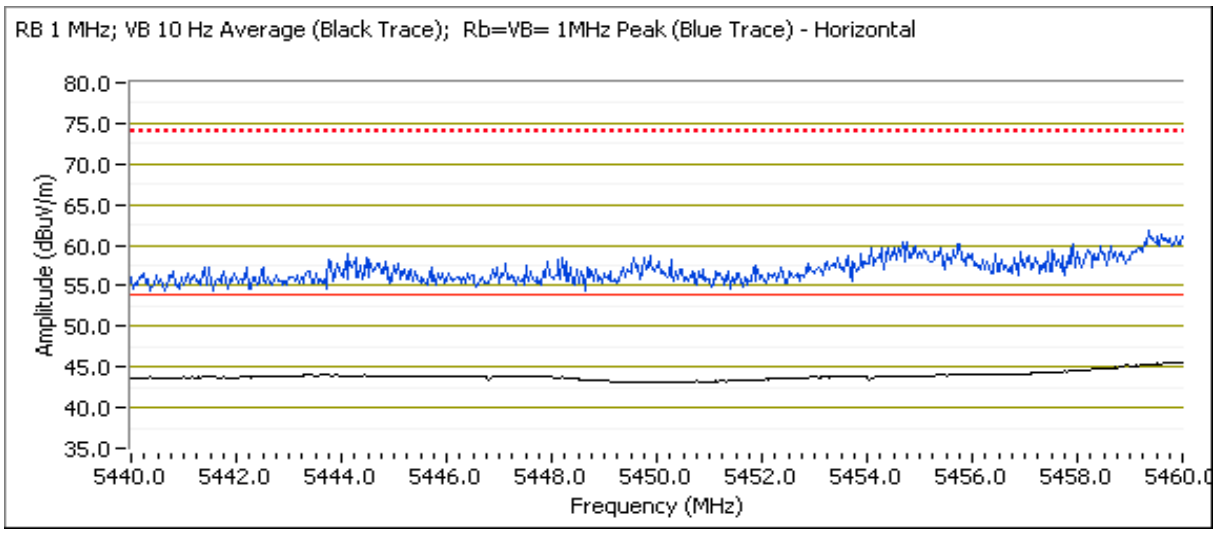


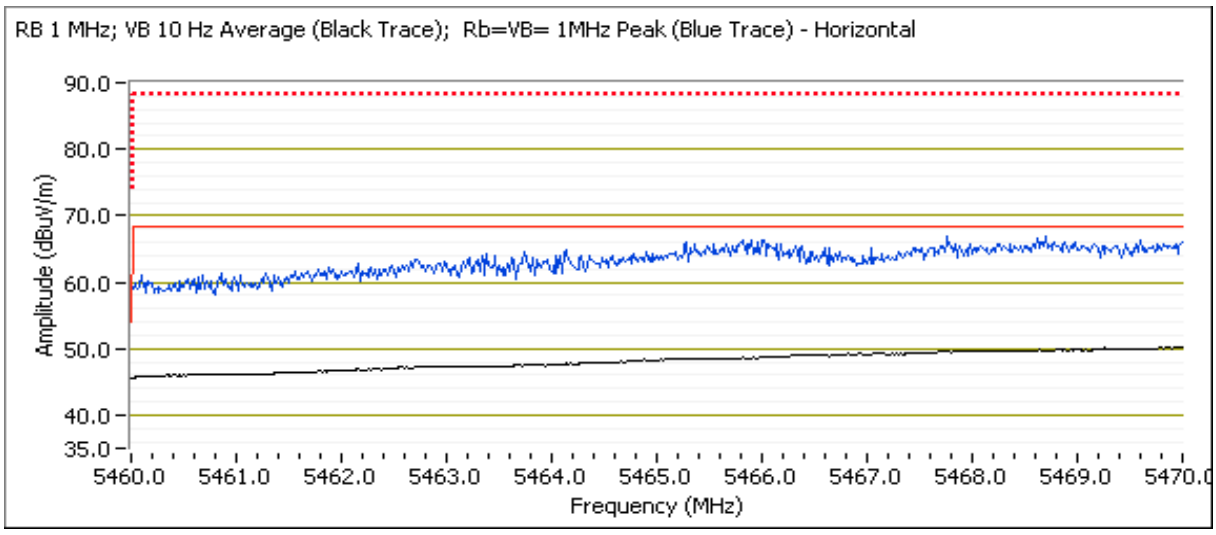
Client:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, RSS-210	Class:	N/A

Run #3c: Low Channel (5470-5725 MHz)

5460 MHz Band Edge 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	
5459.730	45.7	V	54.0	-8.3	AVG	147	1.6	
5459.970	47.4	H	54.0	-6.6	AVG	147	1.7	
5459.570	59.0	V	74.0	-15.0	PK	147	1.6	
5459.730	61.3	H	74.0	-12.7	PK	147	1.7	





Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).

Client:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, 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.

Ambient Conditions:

Temperature: 15-20 °C

Rel. Humidity: 40-60 %

Summary of Results

Run #	Mode	Channel	Power Setting	Antenna	Test Performed	Limit	Result / Margin
1	802.11a Chain A	5150-5250 Low	Max	H&S Monopole	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	39.7dBµV/m @ 15538.5MHz (-14.3dB)
	802.11a Chain A	5150-5250 Center	Max	H&S Monopole	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	39.9dBµV/m @ 15598.5MHz (-14.1dB)
	802.11a Chain A	5150-5250 High	Max	H&S Monopole	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	40.2dBµV/m @ 15718.5MHz (-13.8dB)
2	802.11a Chain A	5250-5350 Low	Max	H&S Monopole	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	82.5dBµV/m @ 10519.4MHz (-5.8dB)
	802.11a Chain A	5250-5350 Center	Max	H&S Monopole	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	43.1dBµV/m @ 15898.5MHz (-10.9dB)
	802.11a Chain A	5250-5350 High	Max	H&S Monopole	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	41.3dBµV/m @ 15958.5MHz (-12.7dB)
3	802.11a Chain A	5470-5725 Low	Max	H&S Monopole	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	40.2dBµV/m @ 11000.1MHz (-13.8dB)
	802.11a Chain A	5470-5725 Center	Max	H&S Monopole	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	40.2dBµV/m @ 11161.3MHz (-13.8dB)
	802.11a Chain A	5470-5725 High	Max	H&S Monopole	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	39.2dBµV/m @ 11400.2MHz (-14.8dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, RSS-210	Class:	N/A

Run #1, Radiated Spurious Emissions, 30 - 40,000 MH. Operation in the 5150-5250 MHz Band, 802.11a Mode

Date: 11/6/2009 Engineer: Peter Sales Location: OATS #2

Antenna: Monopole #2 - Huber+Suhner, SOA 2459/360/5/0/V_C, 6.5dBi (5GHz), Asst # 2009-1632 & 1633
MAC: 00172309A9FB **DRIVER:** V2.03.07 SCU: V3.00.37

Run #1a: Low Channel
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	
10359.230	39.6	V	68.3	-28.7	AVG	295	1.0	RB 1 MHz; VB: 10 Hz
10359.960	51.6	H	88.3	-36.7	PK	240	1.0	RB 1 MHz; VB: 1 MHz
10360.270	51.7	V	88.3	-36.6	PK	295	1.0	RB 1 MHz; VB: 1 MHz
10361.080	39.9	H	68.3	-28.4	AVG	240	1.0	RB 1 MHz; VB: 10 Hz
15538.500	39.7	H	54.0	-14.3	AVG	63	1.0	RB 1 MHz; VB: 10 Hz
15538.620	39.5	V	54.0	-14.5	AVG	145	1.0	RB 1 MHz; VB: 10 Hz
15539.530	51.4	H	74.0	-22.6	PK	63	1.0	RB 1 MHz; VB: 1 MHz
15541.250	51.0	V	74.0	-23.0	PK	145	1.0	RB 1 MHz; VB: 1 MHz

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).

Run #1b: Center Channel
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	
10390.930	40.0	V	68.3	-28.3	AVG	359	1.0	RB 1 MHz; VB: 10 Hz
10399.580	52.3	H	88.3	-36.0	PK	161	1.0	RB 1 MHz; VB: 1 MHz
10400.970	40.2	H	68.3	-28.1	AVG	161	1.0	RB 1 MHz; VB: 10 Hz
10413.870	51.6	V	88.3	-36.7	PK	359	1.0	RB 1 MHz; VB: 1 MHz
15598.500	39.6	H	54.0	-14.4	AVG	145	1.0	RB 1 MHz; VB: 10 Hz
15598.540	39.9	V	54.0	-14.1	AVG	134	1.0	RB 1 MHz; VB: 10 Hz
15598.580	51.3	V	74.0	-22.7	PK	134	1.0	RB 1 MHz; VB: 1 MHz
15599.040	51.4	H	74.0	-22.6	PK	145	1.0	RB 1 MHz; VB: 1 MHz

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).

Client:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, RSS-210	Class:	N/A

Run #1c: High Channel

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	
10479.800	39.2	V	68.3	-29.1	AVG	20	1.0	RB 1 MHz; VB: 10 Hz
10479.930	50.7	V	88.3	-37.6	PK	20	1.0	RB 1 MHz; VB: 1 MHz
10480.090	39.3	H	68.3	-29.0	AVG	20	1.0	RB 1 MHz; VB: 10 Hz
10480.200	53.2	H	88.3	-35.1	PK	20	1.0	RB 1 MHz; VB: 1 MHz
15718.500	39.5	H	54.0	-14.5	AVG	6	1.9	RB 1 MHz; VB: 10 Hz
15720.870	50.6	H	74.0	-23.4	PK	6	1.9	RB 1 MHz; VB: 1 MHz
15718.500	40.2	V	54.0	-13.8	AVG	84	1.0	RB 1 MHz; VB: 10 Hz
15719.140	51.2	V	74.0	-22.8	PK	84	1.0	RB 1 MHz; VB: 1 MHz

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).

Client:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, RSS-210	Class:	N/A

Run #2, Radiated Spurious Emissions, 30 - 40,000 MH. Operation in the 5250-5350 MHz Band, 802.11a Mode

Date: 11/6/2009 Engineer: Peter Sales Location: OATS #2

Antenna: Monopole #2 - Huber+Suhner, SOA 2459/360/5/0/V_C, 6.5dBi (5GHz), Asst # 2009-1632 & 1633
MAC: 00172309A9FB **DRIVER:** V2.03.07 SCU: V3.00.37

Run #2a: Low Channel
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	
10519.410	82.5	H	88.3	-5.8	PK	261	1.0	RB 1 MHz; VB: 1 MHz
10520.010	71.0	V	88.3	-17.3	PK	17	1.0	RB 1 MHz; VB: 1 MHz
10520.100	41.4	V	68.3	-26.9	AVG	17	1.0	RB 1 MHz; VB: 10 Hz
10520.340	43.2	H	68.3	-25.1	AVG	261	1.0	RB 1 MHz; VB: 10 Hz
15778.500	42.4	V	54.0	-11.6	AVG	85	1.2	RB 1 MHz; VB: 10 Hz
15778.500	40.2	H	54.0	-13.8	AVG	101	1.0	RB 1 MHz; VB: 10 Hz
15778.850	51.4	H	74.0	-22.6	PK	101	1.0	RB 1 MHz; VB: 1 MHz
15779.920	54.0	V	74.0	-20.0	PK	85	1.2	RB 1 MHz; VB: 1 MHz

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).

Run #2b: Center Channel
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	
10598.500	38.6	H	68.3	-29.7	AVG	148	1.0	RB 1 MHz; VB: 10 Hz
10599.620	51.2	V	88.3	-37.1	PK	97	1.8	RB 1 MHz; VB: 1 MHz
10599.760	50.8	H	88.3	-37.5	PK	148	1.0	RB 1 MHz; VB: 1 MHz
10599.830	39.5	V	68.3	-28.8	AVG	97	1.8	RB 1 MHz; VB: 10 Hz
15898.500	40.9	H	54.0	-13.1	AVG	123	1.0	RB 1 MHz; VB: 10 Hz
15898.500	43.1	V	54.0	-10.9	AVG	86	1.2	RB 1 MHz; VB: 10 Hz
15899.360	52.2	H	74.0	-21.8	PK	123	1.0	RB 1 MHz; VB: 1 MHz
15899.380	55.2	V	74.0	-18.8	PK	86	1.2	RB 1 MHz; VB: 1 MHz

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).

Client:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, RSS-210	Class:	N/A

Run #2c: High Channel

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	
10638.500	38.4	V	54.0	-15.6	AVG	157	1.0	RB 1 MHz; VB: 10 Hz
10638.500	38.4	H	54.0	-15.6	AVG	237	1.0	RB 1 MHz; VB: 10 Hz
10639.440	49.6	V	74.0	-24.4	PK	157	1.0	RB 1 MHz; VB: 1 MHz
10640.660	49.9	H	74.0	-24.1	PK	237	1.0	RB 1 MHz; VB: 1 MHz
15958.500	41.3	V	54.0	-12.7	AVG	89	1.0	RB 1 MHz; VB: 10 Hz
15958.500	40.7	H	54.0	-13.3	AVG	102	1.0	RB 1 MHz; VB: 10 Hz
15960.870	52.4	H	74.0	-21.6	PK	102	1.0	RB 1 MHz; VB: 1 MHz
15961.490	53.0	V	74.0	-21.0	PK	89	1.0	RB 1 MHz; VB: 1 MHz

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).

Client:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, RSS-210	Class:	N/A

Run #3, Radiated Spurious Emissions, 30 - 40,000 MH. Operation in the 5470-5725 MHz Band

Date: 11/6/2009 Engineer: Peter Sales Location: OATS #2

Antenna: Monopole #2 - Huber+Suhner, SOA 2459/360/5/0/V_C, 6.5dBi (5GHz), Asst # 2009-1632 & 1633
MAC: 00172309A9FB **DRIVER:** V2.03.07 SCU: V3.00.37

Run #3a: Low Channel
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	
10998.830	51.9	V	74.0	-22.1	PK	164	1.0	RB 1 MHz; VB: 1 MHz
10999.460	51.7	H	74.0	-22.3	PK	164	1.0	RB 1 MHz; VB: 1 MHz
11000.130	40.2	H	54.0	-13.8	AVG	164	1.0	RB 1 MHz; VB: 10 Hz
11000.680	40.1	V	54.0	-13.9	AVG	164	1.0	RB 1 MHz; VB: 10 Hz
16498.500	40.4	H	68.3	-27.9	AVG	164	1.0	RB 1 MHz; VB: 10 Hz
16498.500	40.9	V	68.3	-27.4	AVG	138	1.0	RB 1 MHz; VB: 10 Hz
16499.510	53.1	V	88.3	-35.2	PK	138	1.0	RB 1 MHz; VB: 1 MHz
16501.380	52.9	H	88.3	-35.4	PK	164	1.0	RB 1 MHz; VB: 1 MHz

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).

Run #3b: Center Channel
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	
11160.410	51.9	H	74.0	-22.1	PK	263	1.3	
11161.160	40.1	V	54.0	-13.9	AVG	247	1.0	
11161.280	40.2	H	54.0	-13.8	AVG	263	1.3	
11161.330	51.4	V	74.0	-22.6	PK	247	1.0	
16738.500	42.9	V	68.3	-25.4	AVG	238	1.0	
16738.760	42.3	H	68.3	-26.0	AVG	223	1.0	
16739.790	55.2	V	88.3	-33.1	PK	238	1.0	
16739.950	53.6	H	88.3	-34.7	PK	223	1.0	

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).

Client:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, RSS-210	Class:	N/A

Run #3c: High Channel

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	
11398.720	51.2	H	74.0	-22.8	PK	311	1.0	
11399.080	51.1	V	74.0	-22.9	PK	192	1.0	
11399.540	39.1	H	54.0	-14.9	AVG	311	1.0	
11400.200	39.2	V	54.0	-14.8	AVG	192	1.0	
17098.500	43.2	H	68.3	-25.1	AVG	192	1.0	
17098.510	44.3	V	68.3	-24.0	AVG	240	2.0	
17098.850	55.6	H	88.3	-32.7	PK	192	1.0	
17099.570	57.4	V	88.3	-30.9	PK	240	2.0	

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).

Client:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, 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.

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

Ambient Conditions:

Temperature:	15-20 °C
Rel. Humidity:	40-50 %

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:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, RSS-210	Class:	N/A

Summary of Results

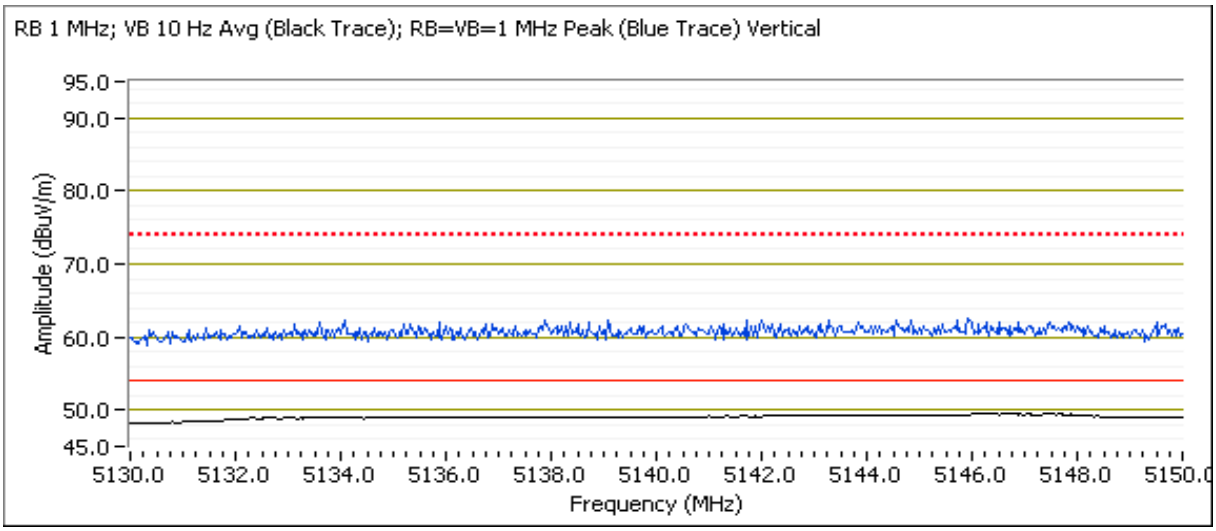
Run #	Mode	Channel	Power Setting	Antenna	Test Performed	Limit	Result / Margin
1	802.11a Chain A	5150-5250 Low(5180M)	100%	Larsen Dipole	Restricted Band Edge at 5150 MHz	15.209	49.5dBµV/m @ 5147.0MHz (-4.5dB)
	802.11a Chain A	5250-5350 High(5320M)	100%	Larsen Dipole	Restricted Band Edge at 5350 MHz	15.209	49.3dBµV/m @ 5352.6MHz (-4.7dB)
	802.11a Chain A	5470-5725 Low(5500M)	100%	Larsen Dipole	Restricted Band Edge at 5460 MHz	15.209	49.7dBµV/m @ 5457.1MHz (-4.3dB)
2	802.11 HT20	5150-5250 Low(5180M)	100%	Larsen Dipole	Restricted Band Edge at 5150 MHz	15.209	49.3dBµV/m @ 5147.2MHz (-4.7dB)
	802.11 HT20	5250-5350 High(5320M)	100%	Larsen Dipole	Restricted Band Edge at 5350 MHz	15.209	51.9dBµV/m @ 5351.8MHz (-2.1dB)
	802.11 HT20	5470-5725 Low(5500M)	100%	Larsen Dipole	Restricted Band Edge at 5460 MHz	15.209	49.9dBµV/m @ 5457.3MHz (-4.1dB)
3	802.11 HT40	5150-5250 Low(5190M)	100%	Larsen Dipole	Restricted Band Edge at 5150 MHz	15.209	50.9dBµV/m @ 5149.8MHz (-3.1dB)
	802.11 HT40	5250-5350 High(5310M)	100%	Larsen Dipole	Restricted Band Edge at 5350 MHz	15.209	53.1dBµV/m @ 5350.0MHz (-0.9dB)
	802.11 HT40	5470-5725 Low	100%	Larsen Dipole	Restricted Band Edge at 5460 MHz	15.209	50.6dBµV/m @ 5459.0MHz (-3.4dB)

Client:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, RSS-210	Class:	N/A

Run #1, Radiated Band Edge, 802.11a
Run #1a: Low Channel @ 5180 MHz(5150-5250 MHz)
5150 MHz Band Edge Signal Radiated Field Strength

Date: 12/29/2009 Engineer: Rafael Varelas Location: FT Chamber #3
Antenna: Larsen Dipole, R380.500.314, 5.0dBi (5GHz), Asst # 2009-1628 & 1629
MAC: 00172309A9FB **DRIVER:** V2.03.14 SCU: V2.03.14

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5147.000	49.5	V	54.0	-4.5	Avg	327	1.0	RB 1 MHz; VB: 10 Hz
5147.370	61.9	V	74.0	-12.1	PK	327	1.0	RB 1 MHz; VB: 1 MHz
5147.210	48.0	H	54.0	-6.0	Avg	165	1.7	RB 1 MHz; VB: 10 Hz
5147.210	60.8	H	74.0	-13.2	PK	165	1.7	RB 1 MHz; VB: 1 MHz

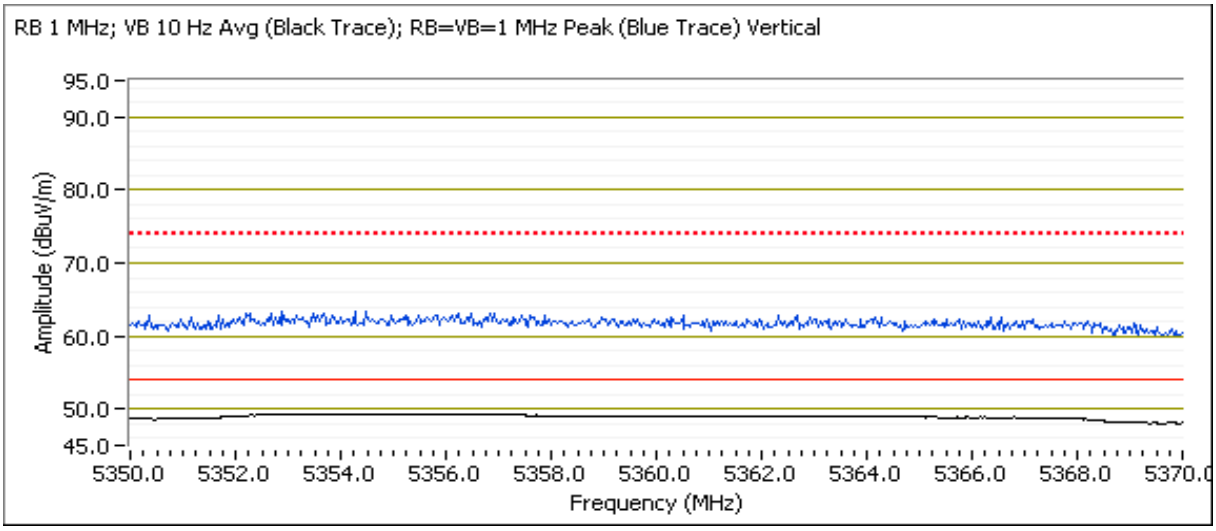


Client:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, RSS-210	Class:	N/A

Run #1b: High Channel 5320(5250-5350 MHz)
5350 MHz Band Edge Signal Radiated Field Strength

Date: 12/29/2009 Engineer: Rafael Varelas Location: FT Chamber #3
Antenna: Larsen Dipole, R380.500.314, 5.0dBi (5GHz), Asst # 2009-1628 & 1629
MAC: 00172309A9FB **DRIVER:** V2.03.14 SCU: V2.03.14

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5352.610	49.3	V	54.0	-4.7	Avg	142	1.0	RB 1 MHz; VB: 10 Hz
5352.190	61.8	V	74.0	-12.2	PK	142	1.0	RB 1 MHz; VB: 1 MHz
5351.890	48.2	H	54.0	-5.8	Avg	164	1.5	RB 1 MHz; VB: 10 Hz
5352.710	61.3	H	74.0	-12.7	PK	164	1.5	RB 1 MHz; VB: 1 MHz

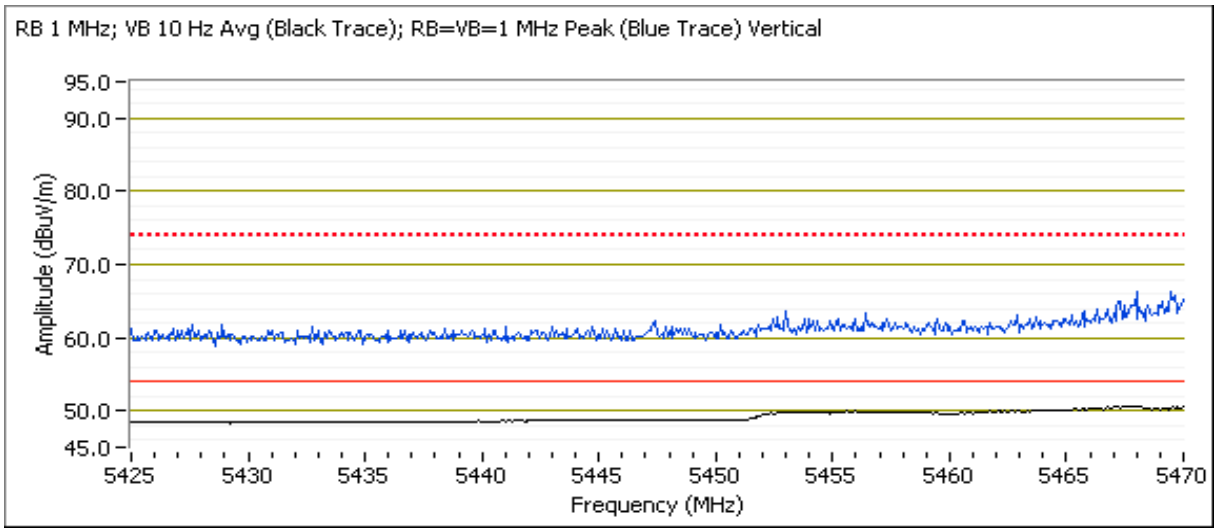


Client:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, RSS-210	Class:	N/A

Run #1c: Low Channel @ 5500 MHz (5470-5725 MHz)
5460 MHz Band Edge Radiated Field Strength

Date: 12/29/2009 Engineer: Rafael Varelas Location: FT Chamber #3
Antenna: Larsen Dipole, R380.500.314, 5.0dBi (5GHz), Asst # 2009-1628 & 1629
MAC: 00172309A9FB **DRIVER:** V2.03.14 SCU: V2.03.14

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5457.060	49.7	V	54.0	-4.3	Avg	144	1.0	RB 1 MHz; VB: 10 Hz
5459.420	61.4	V	74.0	-12.6	PK	144	1.0	RB 1 MHz; VB: 1 MHz
5457.040	48.3	H	54.0	-5.7	Avg	167	1.5	RB 1 MHz; VB: 10 Hz
5459.580	61.1	H	74.0	-12.9	PK	167	1.5	RB 1 MHz; VB: 1 MHz



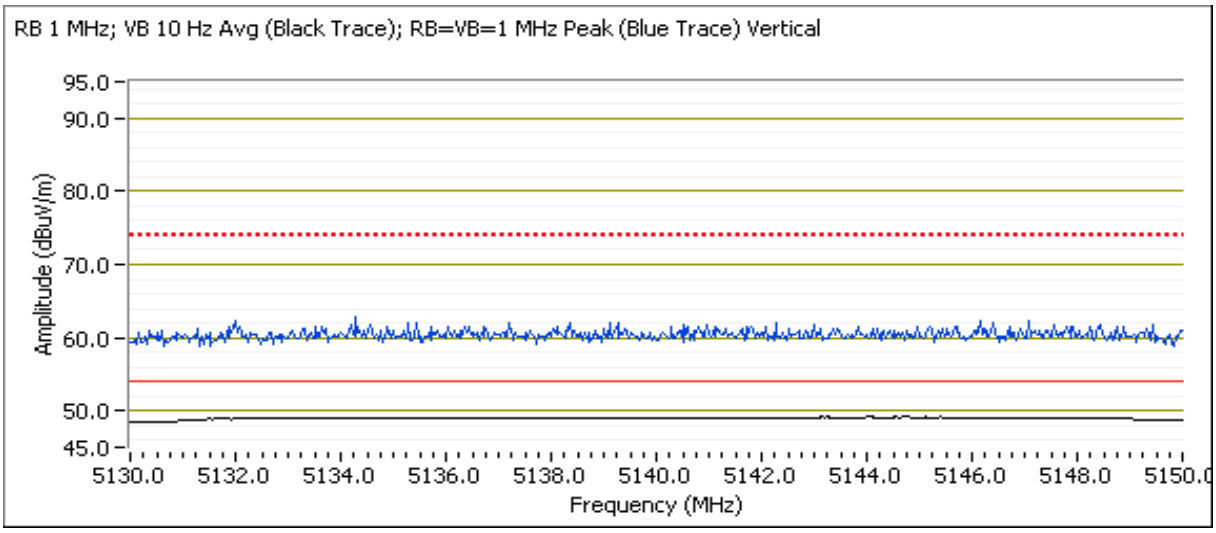
Client:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, RSS-210	Class:	N/A

Run #2, Radiated Band Edge, 802.11 HT20

Run #2a: Low Channel @ 5180 MHz(5150-5250 MHz)
5150 MHz Band Edge Signal Radiated Field Strength

Date: 12/29/2009 Engineer: Rafael Varelas Location: FT Cchamber #3
Antenna: Larsen Dipole, R380.500.314, 5.0dBi (5GHz), Asst # 2009-1628 & 1629
MAC: 00172309A9FB **DRIVER:** V2.03.14 SCU: V2.03.14

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5147.210	49.3	V	54.0	-4.7	Avg	324	1.0	RB 1 MHz; VB: 10 Hz
5147.940	61.9	V	74.0	-12.1	PK	324	1.0	RB 1 MHz; VB: 1 MHz
5147.500	48.1	H	54.0	-5.9	Avg	168	2.0	RB 1 MHz; VB: 10 Hz
5149.460	62.0	H	74.0	-12.0	PK	168	2.0	RB 1 MHz; VB: 1 MHz



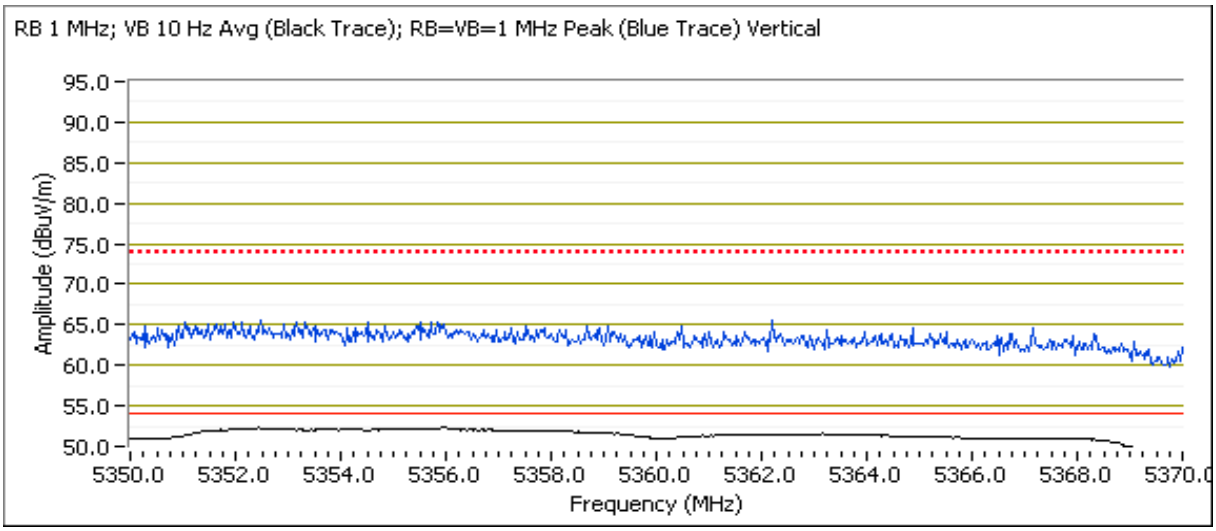
Client:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, RSS-210	Class:	N/A

Run #2b: High Channel @ 5320 MHz (5250-5350 MHz)
5350 MHz Band Edge Signal Radiated Field Strength

Date: 12/29/2009 Engineer: Rafael Varelas Location: FT Cchamber #3
Antenna: Larsen Dipole, R380.500.314, 5.0dBi (5GHz), Asst # 2009-1628 & 1629
MAC: 00172309A9FB **DRIVER:** V2.03.14 SCU: V2.03.14

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	
5351.820	51.9	V	54.0	-2.1	Avg	142	1.0	RB 1 MHz; VB: 10 Hz
5352.110	66.3	V	74.0	-7.7	PK	142	1.0	RB 1 MHz; VB: 1 MHz
5351.460	48.9	H	54.0	-5.1	Avg	169	1.6	RB 1 MHz; VB: 10 Hz
5352.790	61.8	H	74.0	-12.2	PK	169	1.6	RB 1 MHz; VB: 1 MHz

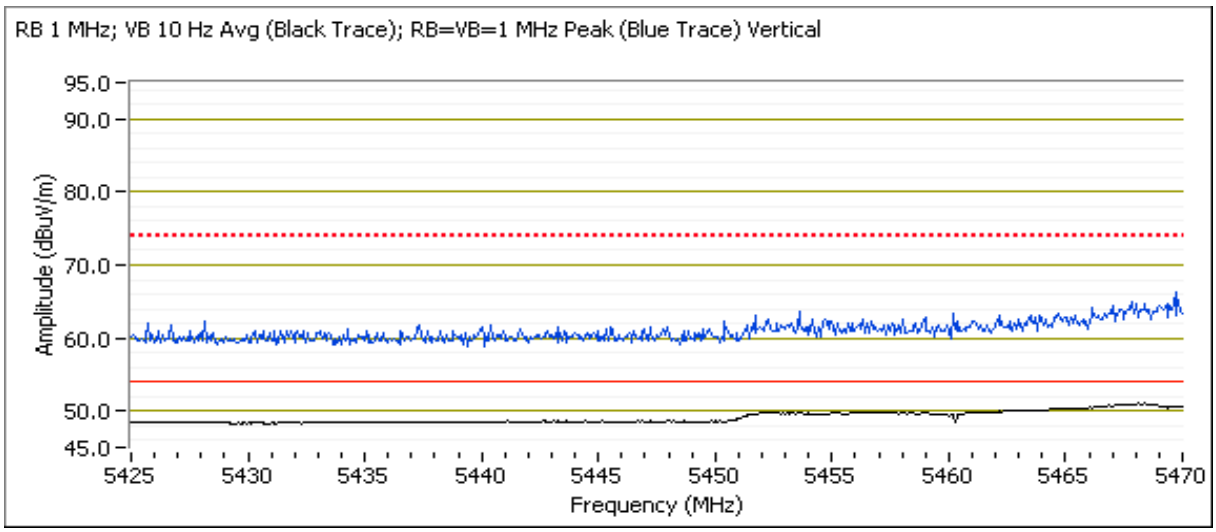


Client:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, RSS-210	Class:	N/A

Run #2c: Low Channel @ 5500 MHz(5470-5725 MHz)
5460 MHz Band Edge Radiated Field Strength

Date: 12/29/2009 Engineer: Rafael Varelas Location: FT Cchamber #3
Antenna: Larsen Dipole, R380.500.314, 5.0dBi (5GHz), Asst # 2009-1628 & 1629
MAC: 00172309A9FB **DRIVER:** V2.03.14 SCU: V2.03.14

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5457.290	49.9	V	54.0	-4.1	Avg	146	1.0	RB 1 MHz; VB: 10 Hz
5458.190	62.5	V	74.0	-11.5	PK	146	1.0	RB 1 MHz; VB: 1 MHz
5457.470	48.7	H	54.0	-5.3	Avg	163	1.6	RB 1 MHz; VB: 10 Hz
5459.650	61.4	H	74.0	-12.6	PK	163	1.6	RB 1 MHz; VB: 1 MHz



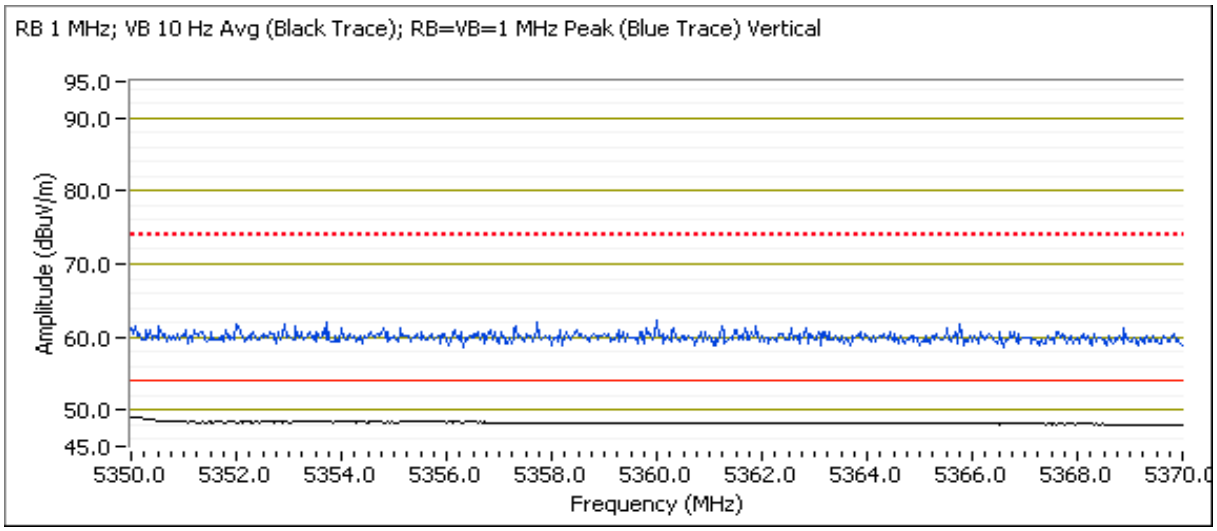
Client:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, RSS-210	Class:	N/A

Run #3, Radiated Band Edge, 802.11 HT40

Date: 12/29/2009 Engineer: Rafael Varelas Location: FT Cchamber #3
Antenna: Larsen Dipole, R380.500.314, 5.0dBi (5GHz), Asst # 2009-1628 & 1629
MAC: 00172309A9FB **DRIVER:** V2.03.14 SCU: V2.03.14

Run #3a: Low Channel @ 5190 MHz(5150-5250 MHz)
5150 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	
5149.830	50.9	V	54.0	-3.1	Avg	155	1.0	RB 1 MHz; VB: 10 Hz
5148.000	66.2	V	74.0	-7.8	PK	155	1.0	RB 1 MHz; VB: 1 MHz
5149.830	48.5	H	54.0	-5.5	Avg	168	1.7	RB 1 MHz; VB: 10 Hz
5147.580	61.4	H	74.0	-12.6	PK	168	1.7	RB 1 MHz; VB: 1 MHz

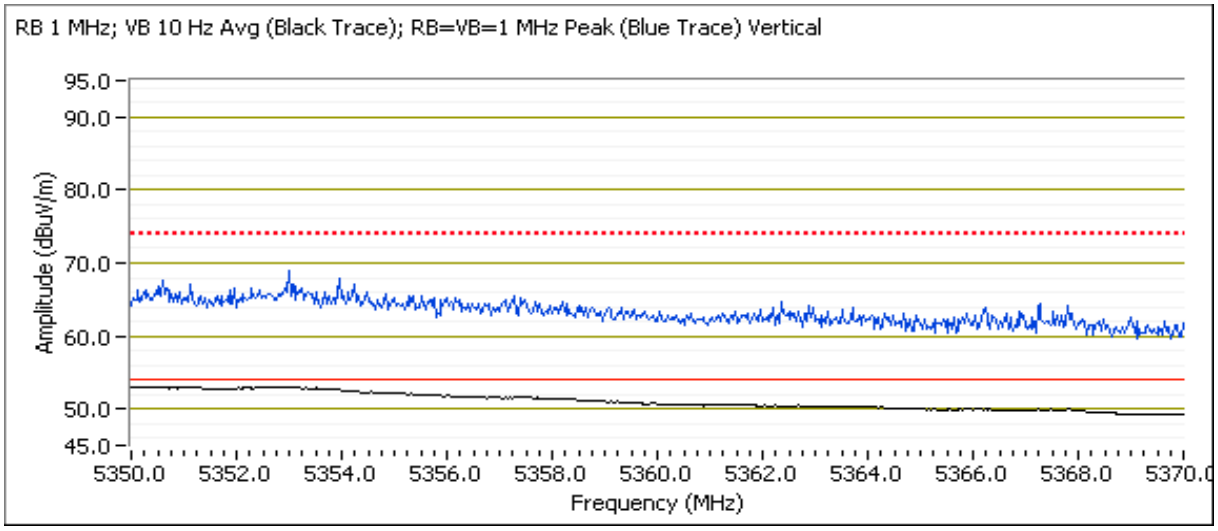


Client:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, RSS-210	Class:	N/A

Run #3b: High Channel @ 5310 MHz(5250-5350 MHz)
5350 MHz Band Edge Signal Radiated Field Strength

Date: 12/29/2009 Engineer: Rafael Varelas Location: FT Cchamber #3
Antenna: Larsen Dipole, R380.500.314, 5.0dBi (5GHz), Asst # 2009-1628 & 1629
MAC: 00172309A9FB **DRIVER:** V2.03.14 SCU: V2.03.14

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dBµV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5350.030	53.1	V	54.0	-0.9	Avg	137	1.0	RB 1 MHz; VB: 10 Hz
5351.270	66.7	V	74.0	-7.3	PK	137	1.0	RB 1 MHz; VB: 1 MHz
5350.000	49.3	H	54.0	-4.7	Avg	166	1.6	RB 1 MHz; VB: 10 Hz
5350.330	62.0	H	74.0	-12.0	PK	166	1.6	RB 1 MHz; VB: 1 MHz



Client:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, RSS-210	Class:	N/A

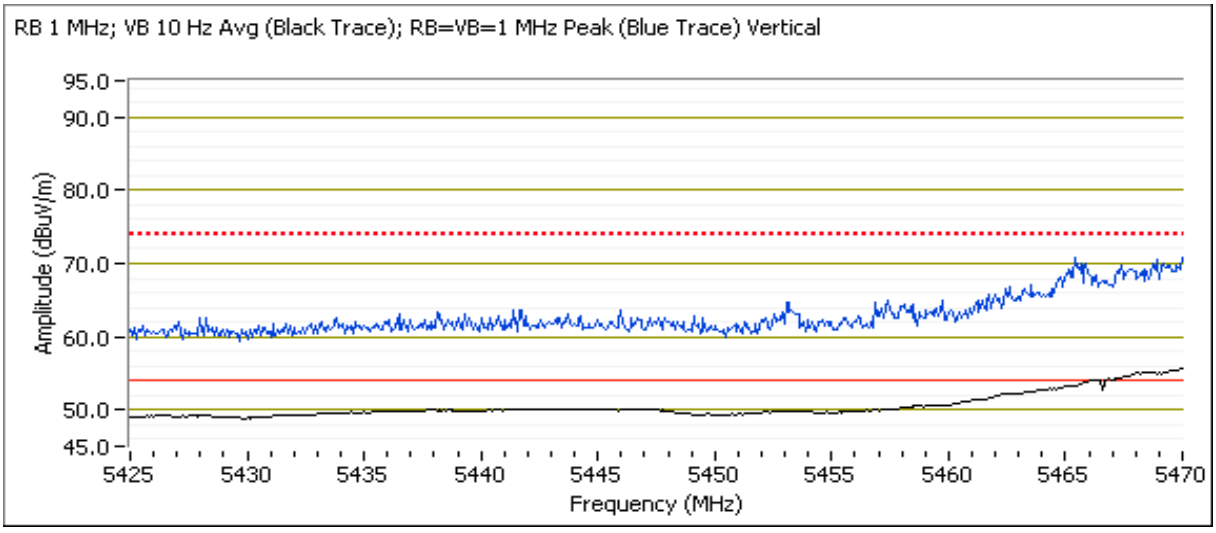
Run #3c: Low Channel @ 5510 MHz (5470-5725 MHz)
5460 MHz Band Edge Radiated Field Strength

Date: 12/29/2009 Engineer: Rafael Varelas Location: FT Cchamber #3
Antenna: Larsen Dipole, R380.500.314, 5.0dBi (5GHz), Asst # 2009-1628 & 1629
MAC: 00172309A9FB **DRIVER:** V2.03.14 SCU: V2.03.14

5460 MHz Band Edge 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	
5458.980	50.6	V	54.0	-3.4	Avg	140	1.0	RB 1 MHz; VB: 10 Hz
5459.310	65.5	V	74.0	-8.5	PK	140	1.0	RB 1 MHz; VB: 1 MHz
5459.740	48.7	H	54.0	-5.3	Avg	178	1.6	RB 1 MHz; VB: 10 Hz
5458.650	61.5	H	74.0	-12.5	PK	178	1.6	RB 1 MHz; VB: 1 MHz

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).



Client:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, 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: See Below
Test Engineer: See Below
Test Location: See Below
Config. Used: 1
Config Change: None
EUT Voltage: 120V/ 60Hz

General Test Configuration

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

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

Ambient Conditions:

Temperature: 11 °C
Rel. Humidity: 94 %

Summary of Results

Run #	Mode	Channel	Power Setting	Antenna	Test Performed	Limit	Result / Margin
1	802.11a Chain A	5150-5250 Low	100%	Larsen Dipole	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	39.8dBµV/m @ 15540.5MHz (-14.2dB)
	802.11a Chain A	5150-5250 Center	100%	Larsen Dipole	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	40.0dBµV/m @ 15599.5MHz (-14.0dB)
	802.11a Chain A	5150-5250 High	100%	Larsen Dipole	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	40.4dBµV/m @ 15718.5MHz (-13.6dB)
2	802.11a Chain A	5250-5350 Low	100%	Larsen Dipole	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	40.9dBµV/m @ 15537.8MHz (-13.1dB)
	802.11a Chain A	5250-5350 Center	100%	Larsen Dipole	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	43.7dBµV/m @ 15897.9MHz (-10.3dB)
	802.11a Chain A	5250-5350 High	100%	Larsen Dipole	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	42.4dBµV/m @ 15958.6MHz (-11.6dB)
3	802.11a Chain A	5470-5725 Low	100%	Larsen Dipole	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	41.6dBµV/m @ 11010.1MHz (-12.4dB)
	802.11a Chain A	5470-5725 Center	100%	Larsen Dipole	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	43.5dBµV/m @ 16740.1MHz (-10.5dB)
	802.11a Chain A	5470-5725 High	100%	Larsen Dipole	Radiated Emissions, 1 - 40 GHz	FCC 15.209 / 15 E	45.0dBµV/m @ 17101.1MHz (-9.0dB)

Client:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, 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, 30 - 40,000 MH. Operation in the 5150-5250 MHz Band, 802.11a Mode

Date of Test: 11/17/2009
Test Engineer: Rafael Varelas
Test Location: OATS # 2

Antenna: Elliott Asset Number: 2009-1628 (AIR-ANT4941)
MAC S/N: 00172309A9FB Driver: V2.03.07 SCU: V3.00.37

Run #1a: Low Channel

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	
10361.070	39.6	V	54.0	-14.4	AVG	289	1.0	
10361.180	39.7	H	54.0	-14.3	AVG	330	1.0	
15539.580	39.7	H	54.0	-14.3	AVG	345	1.0	
15540.520	39.8	V	54.0	-14.2	AVG	291	1.0	
10359.850	50.8	H	74.0	-23.2	PK	330	1.0	
10360.920	51.0	V	74.0	-23.0	PK	289	1.0	
15538.760	50.9	V	74.0	-23.1	PK	291	1.0	
15541.360	51.0	H	74.0	-23.0	PK	345	1.0	

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).

Client:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, RSS-210	Class:	N/A

Run #1b: Center Channel

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	
10401.320	39.9	V	54.0	-14.1	AVG	265	1.0	
10401.430	39.7	H	54.0	-14.3	AVG	231	1.0	
15599.500	40.0	V	54.0	-14.0	AVG	285	1.0	
15599.750	39.6	H	54.0	-14.4	AVG	255	1.0	
10398.600	51.0	V	74.0	-23.0	PK	265	1.0	
10400.950	51.4	H	74.0	-22.6	PK	231	1.0	
15598.530	51.6	V	74.0	-22.4	PK	285	1.0	
15599.700	51.2	H	74.0	-22.8	PK	255	1.0	

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).

Run #1c: High Channel

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	
10481.400	38.8	V	54.0	-15.2	AVG	233	1.0	
10481.430	39.0	H	54.0	-15.0	AVG	0	1.0	
15718.500	40.4	V	54.0	-13.6	AVG	305	1.0	
15718.500	40.3	H	54.0	-13.7	AVG	15	1.0	
10480.710	53.2	H	74.0	-20.8	PK	0	1.0	
10481.440	50.2	V	74.0	-23.8	PK	233	1.0	
15719.260	51.5	V	74.0	-22.5	PK	305	1.0	
15719.460	51.9	H	74.0	-22.1	PK	15	1.0	

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).

Client:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, RSS-210	Class:	N/A

Run #2, Radiated Spurious Emissions, 30 - 40,000 MH. Operation in the 5250-5350 MHz Band, 802.11a Mode

Date of Test: 11/18/2009
Test Engineer: Suhaila Khushzad
Test Location: OATS#2

Antenna: Larsen Dipole

Run #2a: Low Channel @ 5180 MHz
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	
10351.530	40.9	H	68.3	-27.4	AVG	228	1.1	
10360.730	41.3	V	68.3	-27.0	AVG	44	1.0	
15520.530	40.7	H	54.0	-13.3	AVG	142	1.0	
15537.800	40.9	V	54.0	-13.1	AVG	0	1.0	
10357.600	52.7	V	88.3	-35.6	PK	44	1.0	
10372.930	52.1	H	88.3	-36.2	PK	228	1.1	
15522.470	52.5	V	74.0	-21.5	PK	0	1.0	
15544.000	51.9	H	74.0	-22.1	PK	142	1.0	

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).

Run #2b: Center Channel @ 5300 MHz
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	
10592.270	40.1	H	68.3	-28.2	AVG	3	1.6	
10600.000	41.2	V	68.3	-27.1	AVG	271	1.9	
15897.530	42.3	H	54.0	-11.7	AVG	360	1.5	
15897.870	43.7	V	54.0	-10.3	AVG	360	1.2	
10589.330	50.8	H	88.3	-37.5	PK	3	1.6	
10616.400	58.0	V	74.0	-16.0	PK	271	1.9	
15898.670	54.7	V	74.0	-19.3	PK	360	1.2	
15909.130	53.3	H	74.0	-20.7	PK	360	1.5	

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).

Client:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, RSS-210	Class:	N/A

Run #2c: High Channel @ 5320 MHz
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	
10620.000	39.8	H	54.0	-14.2	AVG	246	1.0	
10620.070	39.9	V	54.0	-14.1	AVG	104	1.0	
15947.800	41.8	H	54.0	-12.2	AVG	109	1.0	
15958.600	42.4	V	54.0	-11.6	AVG	143	1.0	
10625.930	50.8	H	74.0	-23.2	PK	246	1.0	
10649.330	51.9	V	74.0	-22.1	PK	104	1.0	
15949.070	52.9	H	74.0	-21.1	PK	109	1.0	
15960.930	53.4	V	74.0	-20.6	PK	143	1.0	

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).

Client:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, RSS-210	Class:	N/A

Run #3, Radiated Spurious Emissions, 30 - 40,000 MH. Operation in the 5470-5725 MHz Band

Date: 11/19/2009 Engineer: Mehran Birgani Location: OATS #2

Antenna: Larsen Dipole, R380.500.314, 5.0dBi (5GHz), Asst # 2009-1629
MAC: 00172309A9FB **DRIVER:** V2.03.07 SCU: V3.00.37

Run #3a: Low Channel @ 5500 MHz
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	
11005.800	41.5	V	54.0	-12.5	AVG	34	1.0	
11010.070	41.6	H	54.0	-12.4	AVG	46	1.0	
16497.870	44.3	V	68.3	-24.0	AVG	151	1.0	
16511.200	41.7	H	68.3	-26.6	AVG	198	2.1	
11005.530	53.2	V	74.0	-20.8	PK	34	1.0	
11013.530	53.1	H	74.0	-20.9	PK	46	1.0	
16499.530	57.1	V	88.3	-31.2	PK	151	1.0	
16515.930	52.9	H	88.3	-35.4	PK	198	2.1	

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).

Client:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, RSS-210	Class:	N/A

Run #3b: Center Channel @ 5580 MHz

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	
11155.050	39.5	H	54.0	-14.5	AVG	224	1.0	
11162.420	39.9	V	54.0	-14.1	AVG	51	1.0	
16739.920	43.2	H	54.0	-10.8	AVG	0	1.0	
16740.100	43.5	V	54.0	-10.5	AVG	6	1.0	
11155.420	51.2	H	74.0	-22.8	PK	224	1.0	
11157.880	51.3	V	74.0	-22.7	PK	51	1.0	
16736.220	54.4	V	74.0	-19.6	PK	6	1.0	
16742.050	54.0	H	74.0	-20.0	PK	0	1.0	

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).

Run #3c: High Channel @ 5700 MHz

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	
11397.550	41.5	H	54.0	-12.5	AVG	52	1.0	
11403.570	41.3	V	54.0	-12.7	AVG	200	1.0	
17101.070	45.0	H	54.0	-9.0	AVG	100	1.0	
17103.530	45.0	V	54.0	-9.0	AVG	360	1.0	
11395.980	52.4	V	74.0	-21.6	PK	200	1.0	
11397.170	53.0	H	74.0	-21.0	PK	52	1.0	
17098.780	56.1	V	74.0	-17.9	PK	360	1.0	
17101.730	56.4	H	74.0	-17.6	PK	100	1.0	

Note 1:	For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the average limit was set to -27dBm/MHz (~68dBuV/m).

Client:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, RSS-210	Class:	N/A

RSS-210 (LELAN) and FCC 15.407(UNII)
Antenna Port Measurements (Power)

Test Specific Details

Objective: Determine the power settings to match the original filing

Date of Test: 12/4/2009
Test Engineer: Mehran Birgani
Test Location: Environmental Lab

Config. Used: -
Config Change: -
Host EUT Voltage: 120V/ 60Hz

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: 18-20 °C
Rel. Humidity: 40-45 %

Client:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, RSS-210	Class:	N/A

Run #1: Bandwidth, Output Power and Power spectral Density

MAC: 00172309A9FB **DRIVER:** V2.03.13 SCU: V2.03.09

	Chain 1	Chain 2	Chain 3	Coherent	Effective[5]
Antenna Gain (dBi):			4.3	Yes	4.3

Notes - Test using the CCS methods and determine the output power settings that match the final report. These will be used for the radiated measurements. Power needs to be within 0.5dB of the original measurements

Frequency (MHz)	Software Setting	26dB BW (MHz)	Measured Output Power[1] dBm			Total		Test Method	Total from CCS
			Chain 1	Chain 2	Chain 3	mW	dBm		
802.11a mode									
5180	ch 36		6.4			4.4	6.4	PSA, channel power, sample det, 100 sweep average	14.33
5320	ch 64		8.5			7.1	8.5		15.53
5500	ch 100		10.4			11.0	10.4		17.26
802.11 HT20 mode									
5180	ch 36		5.4	4.4		6.3	8.0	PSA, channel power, sample det, 100 sweep average	13.18
5320	ch 64		9.6	9.6		18.2	12.6		17.38
5500	ch 100		9.7	8.7		16.7	12.2		19.62
802.11 HT40 mode									
5190	ch 36		4.6	3.2		5.0	7.0	PSA, channel power, sample det, 100 sweep average	15.20
5310	ch 60		8.6	7.8		13.3	11.2		15.63
5510	ch 100		7.6	6.1		9.9	9.9		18.62

Client:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, RSS-210	Class:	-

Radiated Emissions - RSS-210

Test Specific Details

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

Date of Test: 1/20/2010 17:58
Test Engineer: Rafael Varelas
Test Location: Chamber #2

Config. Used: 1
Config Change: None
EUT Voltage: 120V/60Hz

General Test Configuration

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

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

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

Ambient Conditions:

Temperature: 19.4 °C
Rel. Humidity: 38 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1-3	RE, 1000 - 18,000 MHz, Maximized Emissions	RSS-210	Pass	44.5dBµV/m @ 4997.6MHz (-9.5dB)

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.

NOTE - This preliminary data shows no emissions related to the receive mode. No formal measurements performed.

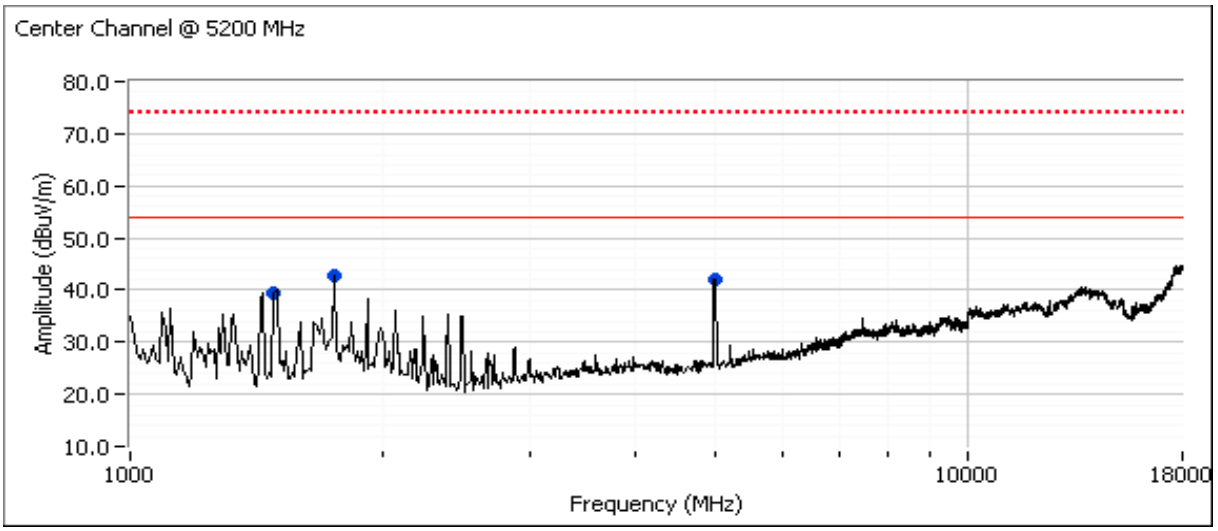
Client:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, RSS-210	Class:	-

Run #1: Maximized readings, 1000 - 18,000 MHz. Rx Mode
Center Channel @ 5200 MHz
Antenna: Elliott Asset Number: 2009-1632 (H&S Monopole Antenna)
Antenna: Elliott Asset Number: 2009-1633 (H&S Monopole Antenna)

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
1000 - 18,000 MHz	1	3	-9.5

Frequency	Level	Pol	RSS-210		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
1499.600	39.6	V	54.0	-14.4	Peak	169	1.7	Pk Reading vs. avg limit
1760.210	42.6	V	54.0	-11.4	Peak	269	1.7	Pk Reading vs. avg limit
4995.600	42.2	V	54.0	-11.8	Peak	157	1.7	Pk Reading vs. avg limit

Note 1:



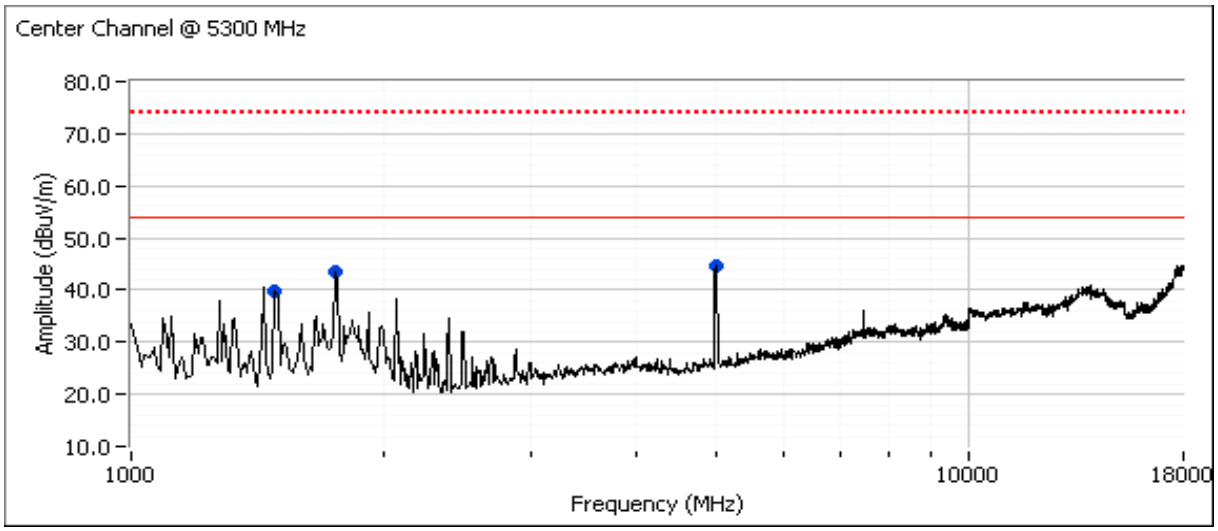
Client:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, RSS-210	Class:	-

Run #2: Maximized readings, 1000 - 18,000 MHz. Rx Mode
Center Channel @ 5300 MHz
Antenna: Elliott Asset Number: 2009-1632 (H&S Monopole Antenna)
Antenna: Elliott Asset Number: 2009-1633 (H&S Monopole Antenna)

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
1000 - 18,000 MHz	1	3	-9.5

Frequency	Level	Pol	RSS-210		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4997.640	44.5	V	54.0	-9.5	Peak	136	1.7	Pk Reading vs. avg limit
1498.750	39.7	V	54.0	-14.3	Peak	162	1.7	Pk Reading vs. avg limit
1760.210	43.4	V	54.0	-10.6	Peak	73	1.7	Pk Reading vs. avg limit

Note 1:



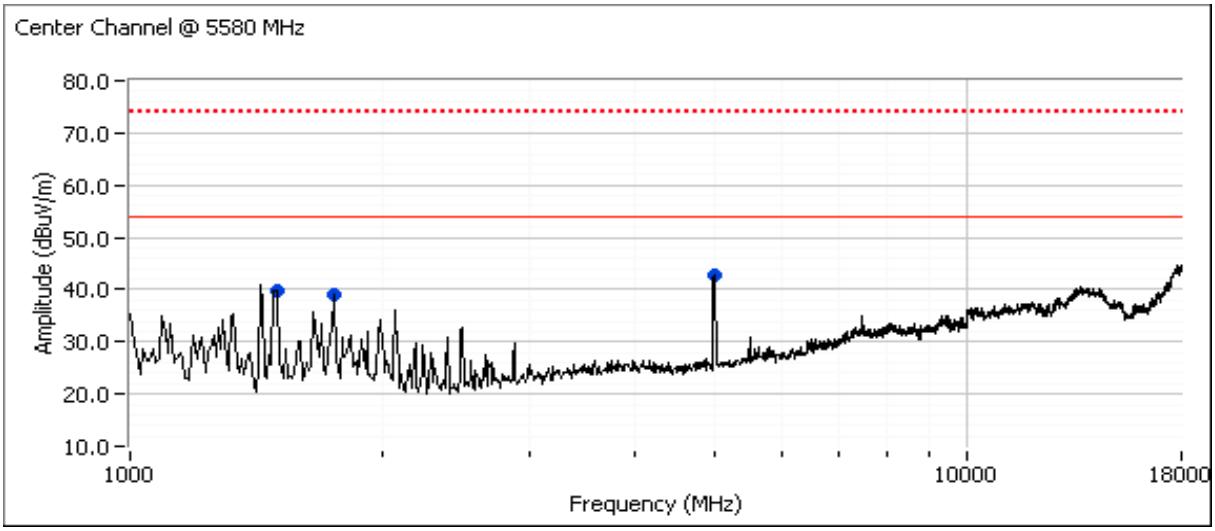
Client:	Summit Data Communications	Job Number:	J76855
Model:	802.11abgn Module	T-Log Number:	T76863
		Account Manager:	Christine Krebill
Contact:	Ron Seide		
Standard:	FCC 15.407, RSS-210	Class:	-

Run #3: Maximized readings, 1000 - 18,000 MHz. Rx Mode
Center Channel @ 5580 MHz
Antenna: Elliott Asset Number: 2009-1632 (H&S Monopole Antenna)
Antenna: Elliott Asset Number: 2009-1633 (H&S Monopole Antenna)

Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
1000 - 18,000 MHz	1	3	-9.5

Frequency	Level	Pol	RSS-210		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4995.930	42.7	V	54.0	-11.3	Peak	177	1.7	Pk Reading vs. avg limit
1499.160	39.9	V	54.0	-14.1	Peak	0	1.7	Pk Reading vs. avg limit
1760.320	39.2	V	54.0	-14.8	Peak	247	1.7	Pk Reading vs. avg limit

Note 1:



Appendix C Photographs of Test Configurations

Uploaded as a separate exhibit

Appendix D Operator's Manual

Uploaded as a separate exhibit

Appendix E RF Exposure Information

Uploaded as a separate exhibit