

*Electromagnetic Emissions Test Report
and
Application for Grant of Equipment Authorization
pursuant to
Industry Canada RSS-Gen Issue 2 / RSS 210 Issue 7
FCC Part 15, Subpart E
on the
Summit Data Communications
Transmitter
Model: SDC-CF10AG 802.11a/g Compact Flash Module with Antenna Connectors*

UPN: 6616A-SDCCF10AG
FCC ID: TWG-SDCCF10AG

GRANTEE: Summit Data Communications
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Akron, OH 44311

TEST SITE: Elliott Laboratories, Inc.
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REPORT DATE: March 5, 2008

FINAL TEST DATE: November 27, December 11,
December 19, 2007, and
January 24, February 29, March 4, 2008

AUTHORIZED SIGNATORY:



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Testing Cert #2016-01

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REVISION HISTORY

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SCOPE

An electromagnetic emissions test has been performed on the Summit Data Communications model SDC-CF10AG 802.11a/g Compact Flash Module with Antenna Connectors 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

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.

The test results recorded herein are based on a single type test of the Summit Data Communications model SDC-CF10AG 802.11a/g Compact Flash Module with Antenna Connectors and therefore apply only to the tested sample. The sample was selected and prepared by Ron Seide of Summit Data Communications.

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 model SDC-CF10AG 802.11a/g Compact Flash Module with Antenna Connectors 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 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.).

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	Refer to user's manual	N/A	Complies
15.407(a)(1)		26dB Bandwidth	17.7 MHz	N/A – limits output power if < 20MHz	N/A
15.407(a)(1)	A9.2(1)	Output Power	13.9 dBm (0.025W)	16.5 dBm	Complies
15.407(a)(1))	A9.2(1)	Power Spectral Density	3.4 dBm/MHz	4 dBm/MHz	Complies
	A9.5 (2)	Power Spectral Density	3.4 dBm/MHz	Shall not exceed the average value by more than 3dB	Complies

General UNII requirements for all bands

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
	A9.5a	Modulation	Digital Modulation is used (OFDM)	Digital modulation is required	Complies
	RSP 100	99% bandwidth	17.3 MHz	Information only	
15.407(b)(5) / 15.209	A9.3	Spurious Emissions below 1GHz	No Emissions Detected		Complies
15.407(b)(2)	A9.3	Spurious Emissions above 1GHz	65.0dBμV/m (1778.3μV/m) @ 5248.5MHz		Complies (-3.3dB)
15.407(a)(6)	-	Peak Excursion Ratio	7.8 dB	< 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	N/A
15			Measurements on three channels in each band		N/A
15.407 (c)	A9.5(4)	Operation in the absence of information to transmit	Operation is discontinued in the absence of information	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 20ppm (Operational Description page 1)		Complies
15.407 (h1)	A9.4	Transmit Power Control	Not applicable, device does not operate in either 5470 – 5725 or 5250 – 5350 MHz bands.		
15.407 (h2)	A9.4	Dynamic frequency Selection (device with radar detection)	Not applicable, device does not operate in either 5470 – 5725 or 5250 – 5350 MHz bands.		
	A9.9g	User Manual information	Refer to Exhibit 6 for details		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	The radio module uses a unique connector type		Complies
15.109	RSS GEN 7.2.3 Table 1	Receiver spurious emissions	46.4dB μ V/m (208.9 μ V/m) @ 17735.4MHz		Complies (-7.6dB)
15.207	RSS GEN Table 2	AC Conducted Emissions	55.6dB μ V @ 0.167MHz	Refer to standard	Complies (-9.5dB)
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		Statement required regarding non-interference	Complies

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 model SDC-CF10AG 802.11a/g Compact Flash Module with Antenna Connectors is an 802.11a/g compliant wireless LAN radio module which is designed to provide wireless local area networking connectivity. Normally, the EUT would be embedded in various types of mobile and stationary computing devices such as handheld and vehicle mounted data terminals during operation. The EUT was, therefore, placed on a tabletop during emissions testing to simulate the end user environment. The electrical rating of the EUT is 3.3 VDC +/- 5% With typical power consumption of 400 mA (1320mW) while in transmit mode, 180 mA (594mW) while in receive mode and 10 mA (33 mW) while in standby mode.

The sample was received on November 19, 2007 and tested on November 27, December 11 and December 19, 2007 and January 24, February 29, and March 4, 2008. The EUT consisted of the following component(s):

Manufacturer	Model	Description	Serial Number	FCC ID
Summit Data Communications	SDC-CF10AG	Compact Flash Module	-	TWG-SDCCF10AG

Note: The EUT was tested using an extender card that allowed for the card to be outside of the host system.

ANTENNA SYSTEM

There were three antennas included in the testing:

Laird Centurion, m/n NanoBlade, pcb antenna, 3.8dBi @ 2.45GHz, 5.1dBi @ 5.25GHz, 4.5dBi @ 5.8GHz

Volex, p/n VLX-51004-A, Omni, 2.3dBi @ 2.4GHz, 1.9dBi @ 5GHz

Larson, p/n R380.500.314, Omni, 1.6dBi @ 2.4GHz, 5dBi @ 5GHz

Note: The Volex Omni was used in the 2.4GHz band and the Larson Omni was used in the 5GHz bands. The Laird pcb antenna was also tested for both 2.4GHz and 5GHz.

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

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

SUPPORT EQUIPMENT

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

Manufacturer	Model	Description	Serial Number	FCC ID
Hewlett Packard	iPAQ	Handheld Computer	-	-

EUT INTERFACE PORTS

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

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
iPAQ Power	AC Mains	2wire	Unshielded	1.5
Flash Module	iPAQ Module Port	-	-	-

EUT OPERATION

During emissions testing the EUT was configured to transmit at the Low, Middle, and High Channel. Note, the radio was unable to transmit continuously due to limitations of the host device.

TEST SITE

GENERAL INFORMATION

Final test measurements were taken on November 27, December 11 and December 19, 2007 and January 24, 2008 at the Elliott Laboratories Open Area Test Site #2 located at 684 West Maude Avenue, Sunnyvale, California. Pursuant to section 2.948 of the FCC's Rules and section 3.3 of RSP-100, construction, calibration, and equipment data has been filed with the Commission.

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 of predictable local TV, radio, and mobile communications traffic. The test site contains 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 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.

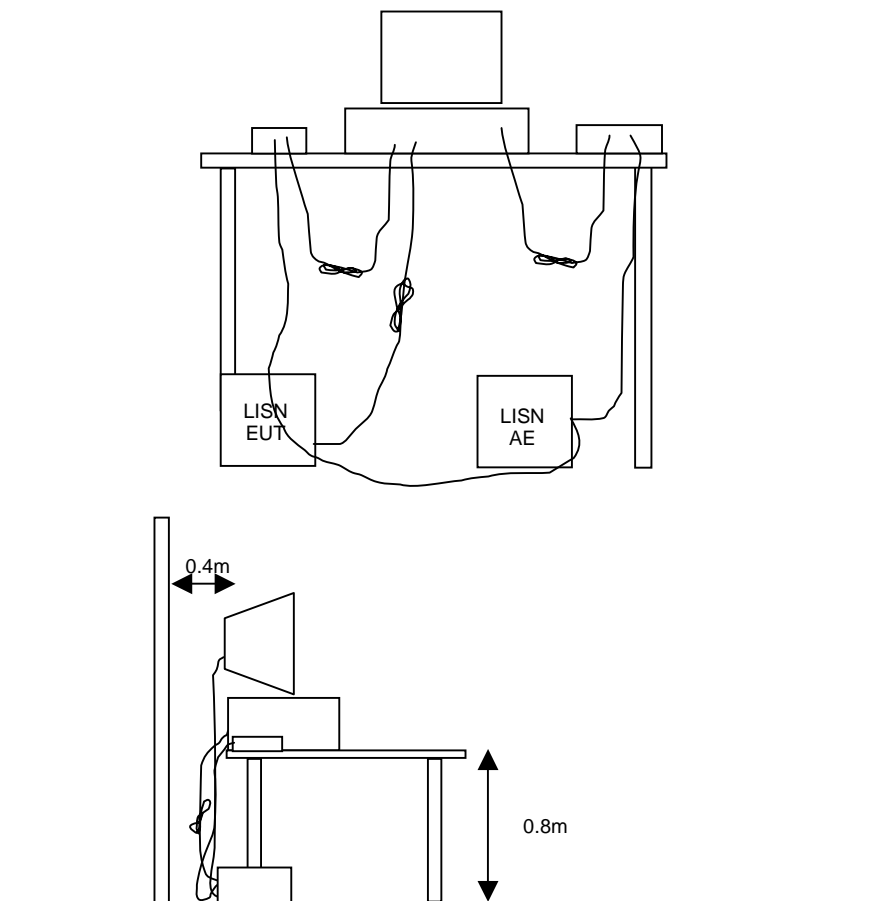
TEST PROCEDURES

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.



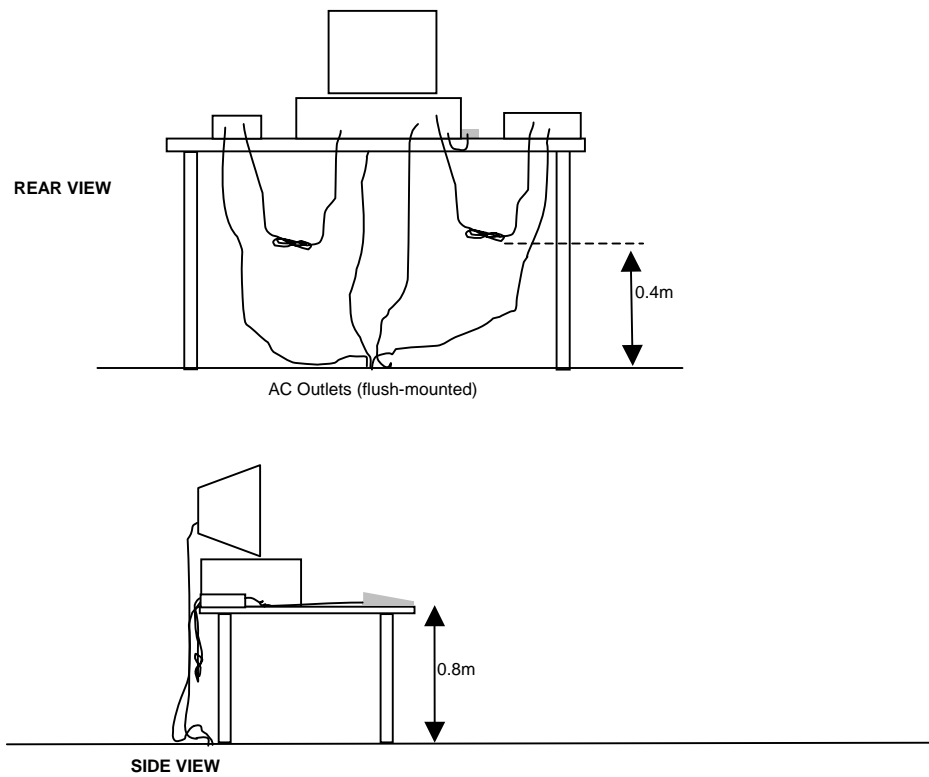
RADIATED EMISSIONS

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.

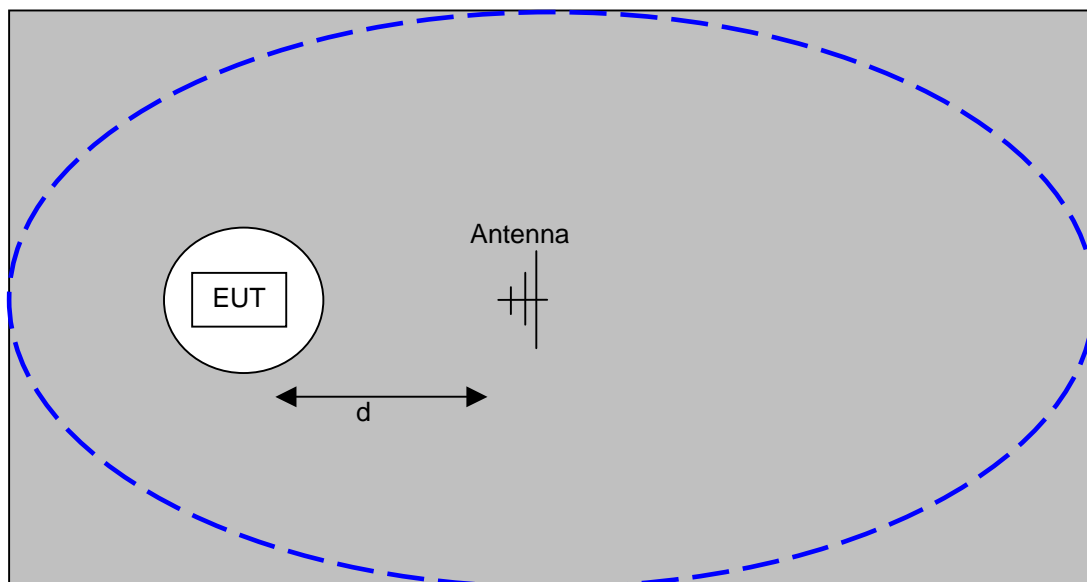
A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

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.

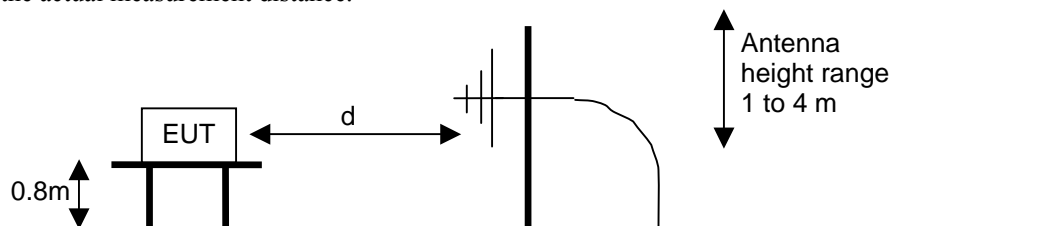
When testing above 18 GHz, the receive antenna is located at 1 meter from the EUT and the antenna height is restricted to a maximum of 2.5 meters.



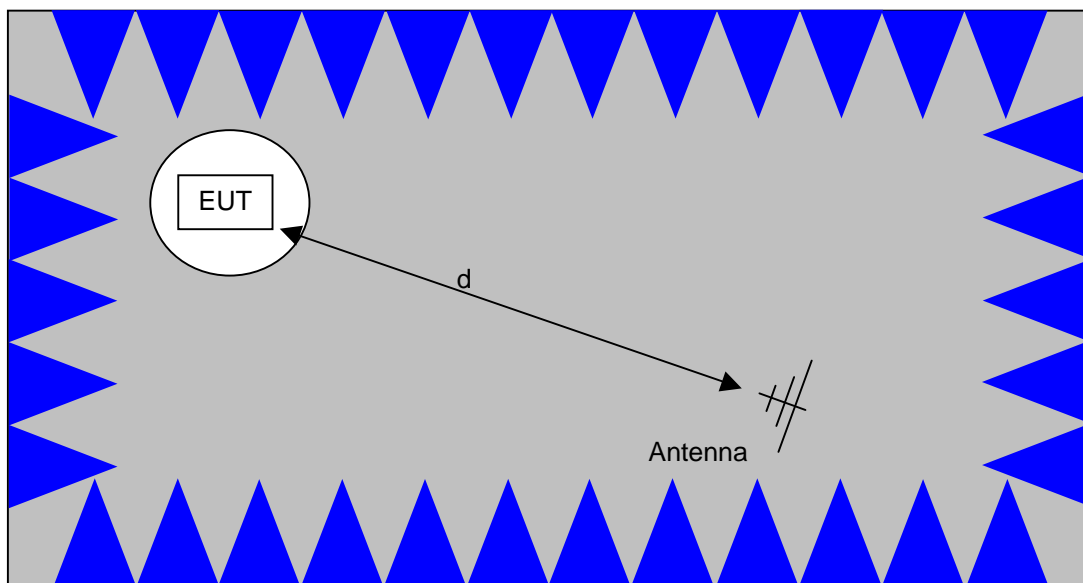
Typical Test Configuration for Radiated Field Strength Measurements



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.

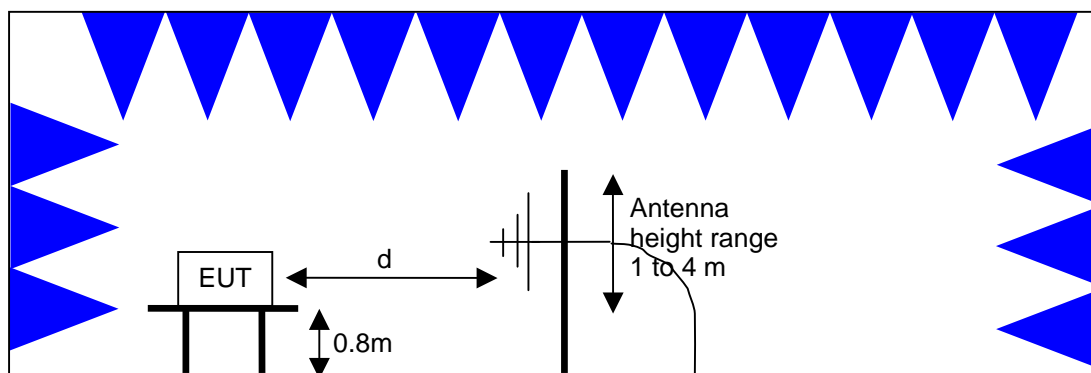


Test Configuration for Radiated Field Strength Measurements
OATS- Plan and Side Views



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

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:

CONDUCTED EMISSIONS SPECIFICATION LIMITS: FCC 15.207; FCC 15.107(a), RSS GEN

The table below shows the limits for the emissions on the AC power line from an intentional radiator and a receiver.

Frequency (MHz)	Average Limit (dBuV)	Quasi Peak Limit (dBuV)
0.150 to 0.500	Linear decrease on logarithmic frequency axis between 56.0 and 46.0	Linear decrease on logarithmic frequency axis between 66.0 and 56.0
0.500 to 5.000	46.0	56.0
5.000 to 30.000	50.0	60.0

GENERAL TRANSMITTER RADIATED EMISSIONS SPECIFICATION LIMITS

The table below shows the limits for the spurious emissions from transmitters that fall in restricted bands¹ (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.

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

OUTPUT POWER AND SPURIOUS LIMITS –UNII DEVICES

The table below shows the limits for output power and output power density defined by FCC Part 15 Subpart E. 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)	10 dBm/MHz
5250 - 5350	250 mW (24 dBm)	11 dBm/MHz
5470 - 5725	250 mW (24 dBm)	11 dBm/MHz
5725 – 5825	1 Watts (30 dBm)	17 dBm/MHz

The peak excursion envelope is limited to 13dB.

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.

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:

$$F_d = 20 * \text{LOG}_{10} (D_m/D_s)$$

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:

$$F_d = 40 * \text{LOG}_{10} (D_m/D_s)$$

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:

$$R_r = \text{Receiver Reading in dBuV/m}$$

$$F_d = \text{Distance Factor in dB}$$

$$R_c = \text{Corrected Reading in dBuV/m}$$

$$L_s = \text{Specification Limit in dBuV/m}$$

$$M = \text{Margin in dB Relative to Spec}$$

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:

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

where P is the eirp (Watts)

EXHIBIT 1: Test Equipment Calibration Data

3 Pages

Radiated Emissions, 30 - 26,500 MHz, 11-Oct-07**Engineer: Mehran Birgani**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	15-Nov-07
EMCO	Antenna, Horn, 1-18 GHz (SA40-Red)	3115	1142	07-Jun-08
Hewlett Packard	High Pass filter, 3.5 GHz (Blu System)	P/N 84300-80038 (84125C)	1391	29-May-08
Hewlett Packard	SpecAn 9 kHz - 40 GHz, FMT (SA40) Blue	8564E (84125C)	1393	17-Jan-08

Radiated Emissions, 30 - 26,500 MHz, 12-Oct-07**Engineer: jcaizzi**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	15-Nov-07
EMCO	Antenna, Horn, 1-18 GHz (SA40-Red)	3115	1142	07-Jun-08
Hewlett Packard	High Pass filter, 3.5 GHz (Blu System)	P/N 84300-80038 (84125C)	1391	29-May-08
Hewlett Packard	SpecAn 9 kHz - 40 GHz, FMT (SA40) Blue	8564E (84125C)	1393	17-Jan-08

Radiated Emissions, 30 - 18,000 MHz, 31-Oct-07**Engineer: Rafael Varelas**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
EMCO	Antenna, Horn, 1-18 GHz	3115	487	24-May-08
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	15-Nov-07
Hewlett Packard	EMC Spectrum Analyzer, 9 KHz - 22 GHz	8593EM	1319	18-May-08
Hewlett Packard	High Pass filter, 3.5 GHz (Blu System)	P/N 84300-80038 (84125C)	1391	29-May-08

Radiated Emissions, 30 - 12,000 MHz, 19-Nov-07**Engineer: Joseph Cadigal**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
EMCO	Antenna, Horn, 1-18 GHz	3115	487	24-May-08
Hewlett Packard	SpecAn 9 kHz - 40 GHz, FMT (SA40) Blue	8564E (84125C)	1393	17-Jan-08
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	1780	06-Nov-08

Radio Antenna Port (Power and Spurious Emissions), 26-Nov-07**Engineer: skhushzad**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	24-Aug-08

Radio Spurious Emissions, 27-Nov-07**Engineer: Suhaila Khushzad**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
EMCO	Antenna, Horn, 1-18 GHz	3115	487	24-May-08
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	08-Nov-08
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	24-Aug-08
Rohde & Schwarz	Test Receiver, 0.009-2750 MHz	ESN	1332	21-Dec-07
EMCO	Log Periodic Antenna, 0.2-2 GHz	3148	1404	30-Mar-08
EMCO	Biconical Antenna, 30-300 MHz	3110B	1497	03-Jul-08

Radio Spurious Emissions, 11-Dec-07**Engineer: Suhaila Khushzad**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
EMCO	Antenna, Horn, 1-18 GHz (SA40-Red)	3115	1142	07-Jun-08
Hewlett Packard	SpecAn 9 kHz - 40 GHz, FMT (SA40) Blue	8564E (84125C)	1393	17-Jan-08
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	1780	06-Nov-08

Radiated Emissions, 30 - 40,000 MHz, 12-Dec-07**Engineer: Mehran Birgani**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
EMCO	Antenna, Horn, 1-18 GHz	3115	487	24-May-08
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	08-Nov-08
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	24-Aug-08
EMCO	Antenna, Horn, 18-26.5 GHz (SA40-Red)	3160-09 (84125C)	1150	05-Nov-08
EMCO	Antenna, Horn, 26.5-40 GHz (SA40-Red)	3160-10 (84125C)	1151	05-Nov-08
Hewlett Packard	High Pass filter, 8.2 GHz (Red System)	P/N 84300-80039 (84125C)	1152	15-Oct-08

Radio Spurious Emissions, 14-Dec-07**Engineer: Suhaila Khushzad**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
EMCO	Antenna, Horn, 1-18 GHz (SA40-Red)	3115	1142	07-Jun-08
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	1780	06-Nov-08
Hewlett Packard	SpecAn 9 kHz - 40 GHz, FMT (SA40) Blue	8564E (84125C)	1393	17-Jan-08

Radio Spurious Emissions, 19-Dec-07**Engineer: Suhaila Khushzad**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
EMCO	Antenna, Horn, 1-18GHz	3115	868	26-Apr-08
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	08-Nov-08
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	24-Aug-08

Radiated Emissions, 30 - 16,000 MHz, 20-Dec-07**Engineer: Mehran Birgani**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
EMCO	Antenna, Horn, 1-18GHz	3115	868	26-Apr-08
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	08-Nov-08
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	24-Aug-08

Conducted Emissions - AC Power Ports, 21-Dec-07**Engineer: Rafael Varelas**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Elliott Laboratories	LISN, FCC / CISPR	LISN-4, OATS	362	18-Jul-08
Rohde & Schwarz	Pulse Limiter	ESH3 Z2	812	05-Feb-08
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	24-Aug-08
Rohde & Schwarz	Test Receiver, 9 kHz-2750 MHz	ESCS 30	1337	21-Sep-08

Radio Antenna Port (Power and Spurious Emissions), 07-Jan-08**Engineer: Suhaila Khushzad**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
EMCO	Antenna, Horn, 1-18 GHz	3115	487	24-May-08
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	24-Aug-08
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	1780	06-Nov-08

Radio Spurious Emissions, 10-Jan-08**Engineer: Suhaila Khushzad**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
EMCO	Antenna, Horn, 1-18 GHz	3115	487	24-May-08
Hewlett Packard	EMC Spectrum Analyzer, 9 kHz - 6.5 GHz	8595EM	780	09-Oct-08
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	24-Aug-08

Radio Antenna Port (Power and Spurious Emissions), 14-Jan-08**Engineer: jcaizzi**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Hewlett Packard	EMC Spectrum Analyzer, 9 kHz - 6.5 GHz	8595EM	787	21-Feb-08

Radiated Emissions, 30 - 26,500 MHz, 18-Jan-08**Engineer: jcaizzi**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
EMCO	Antenna, Horn, 1-18 GHz	3115	487	24-May-08
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	08-Nov-08
Hewlett Packard	SpecAn 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	24-Aug-08
Hewlett Packard	High Pass filter, 8.2 GHz	P/N 84300-80039	1156	29-May-08

Radio Antenna Port (Power and Spurious Emissions), 24-Jan-08**Engineer: Mehran Birgani**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1630	25-Jan-08

Conducted Emissions - AC Power Ports, 28-Jan-08**Engineer: Peter Sales**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Rohde & Schwarz	Test Receiver, 0.009-30 MHz	ESH3	215	29-Mar-08
Elliott Laboratories	LISN, FCC / CISPR	LISN-3, OATS	304	18-Jul-08
Hewlett Packard	EMC Spectrum Analyzer, 9 KHz-26.5 GHz	8593EM	1141	29-Nov-08
Rohde & Schwarz	Pulse Limiter	ESH3 Z2	1398	05-Feb-08

Radiated Emissions, 1000 - 40000 MHz, 04-Mar-08**Engineer: Pete Sales**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
EMCO	Antenna, Horn, 1-18 GHz	3115	487	24-May-08
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	08-Nov-08
Hewlett Packard	Head (Inc W1-W4, 1143, 1144) Red	84125C	1145	16-Nov-08
Hewlett Packard	Spectrum Analyzer 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	24-Aug-08
EMCO	Antenna, Horn, 18-26.5 GHz (SA40-Red)	3160-09 (84125C)	1150	05-Nov-08
EMCO	Antenna, Horn, 26.5-40 GHz (SA40-Red)	3160-10 (84125C)	1151	05-Nov-08

EXHIBIT 2: Test Measurement Data

36 Pages



EMC Test Data

Client:	Summit Data Communications	Job Number:	J68959
Model:	SDC-CF10AG 802.11a/g Compact Flash Module with	T-Log Number:	T69413
	Antenna Connectors	Account Manager:	Dean Eriksen
Contact:	Ron Seide		
Emissions Standard(s):	15.247 / 15.E / RSS-210	Class:	-
Immunity Standard(s):	-	Environment:	-

EMC Test Data

For The

Summit Data Communications

Model

SDC-CF10AG 802.11a/g Compact Flash Module with Antenna Connectors

Date of Last Test: 3/27/2008



EMC Test Data

Client:	Summit Data Communications	Job Number:	J68959
Model:	SDC-CF10AG 802.11a/g Compact Flash Module with	T-Log Number:	T69413
	Antenna Connectors	Account Manger:	Dean Eriksen
Contact:	Ron Seide		
Emissions Standard(s):	15.247 / 15.E / RSS-210	Class:	-
Immunity Standard(s):	-	Environment:	-

EUT INFORMATION

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

General Description

The EUT is a n 802.11a/g compliant wireless LAN radio module which is designed to provide wireless local area networking connectivity . Normally, the EUT would be embedded in various types of mobile and stationary computing devices such as handheld and vehicle mounted data terminals during operation. The EUT was, therefore, placed on a tabletop during emissions testing to simulate the end user environment. The electrical rating of the EUT is 3.3 VDC +/- 5% With typical power consumption of 400 mA (1320mW) while in transmit mode, 180 mA (594mW) while in receive mode and 10 mA (33 mW) while in standby mode.

Equipment Under Test

Manufacturer	Model	Description	Serial Number	FCC ID
Summit Data Communications	SDC-CF10AG 802.11a/g Compact Flash Module with Antenna Connectors	Compact Flash Module	TBP	TWG-SDCCF10AG

EUT Antenna (Intentional Radiators Only)

There were three antennas included in the testing:

Laird Centurion, m/n NanoBlade, pcb antenna, 3.8dBi @ 2.45GHz, 5.1dBi @ 5.25GHz, 4.5dBi @ 5.8GHz

Voilex, p/n VLX-51004-A, Omni, 2.3dBi @ 2.4GHz, 1.9dBi @ 5GHz

Larson, p/n R380.500.314, Omni, 1.6dBi @ 2.4GHz, 5dBi @ 5GHz

Note: The Voilex Omni was used in the 2.4GHz band and the Larson Omni was used in the 5GHz bands. The Laird pcb antenna was also tested for both 2.4GHz and 5GHz.

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

EUT Enclosure

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



EMC Test Data

Client:	Summit Data Communications	Job Number:	J68959
Model:	SDC-CF10AG 802.11a/g Compact Flash Module with	T-Log Number:	T69413
	Antenna Connectors	Account Manger:	Dean Eriksen
Contact:	Ron Seide		
Emissions Standard(s):	15.247 / 15.E / RSS-210	Class:	-
Immunity Standard(s):	-	Environment:	-

Test Configuration #1

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

Local Support Equipment

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

Remote Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
Hewlett Packard	iPAQ	Handheld Computer	-	-

Cabling and Ports

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
iPAQ Power	AC Mains	2wire	Unshielded	1.5
Flash Module	iPAQ Module Port	-	-	-

EUT Operation During Emissions Tests

During emissions testing the EUT was configured to transmit at the Low, Middle, and High Channel



EMC Test Data

Client:	Summit Data Communications	Job Number:	J68959
Model:	SDC-CF10AG 802.11a/g Compact Flash Module with Antenna Connectors	T-Log Number:	T69413
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	15.247 / 15.E / RSS-210	Class:	-

Conducted Emissions - Power Ports

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: 1/28/2008 22:01
Test Engineer: Peter Sales
Test Location: SVOATS #2

Config. Used: 1
Config Change: None
EUT Voltage: 120V/60Hz, 230V/50Hz

General Test Configuration

The EUT was located on a wooden table, 40 cm from a vertical coupling plane and 80cm from the LISN.

Ambient Conditions:
Temperature: 4 °C
Rel. Humidity: 76 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1	CE, AC Power, 230V/50Hz	EN 55022 B	Pass	43.1dBµV @ 0.215MHz (-19.9dB)
2	CE, AC Power, 120V/60Hz	EN 55022 B	Pass	55.6dBµV @ 0.167MHz (-9.5dB)

Modifications Made During Testing

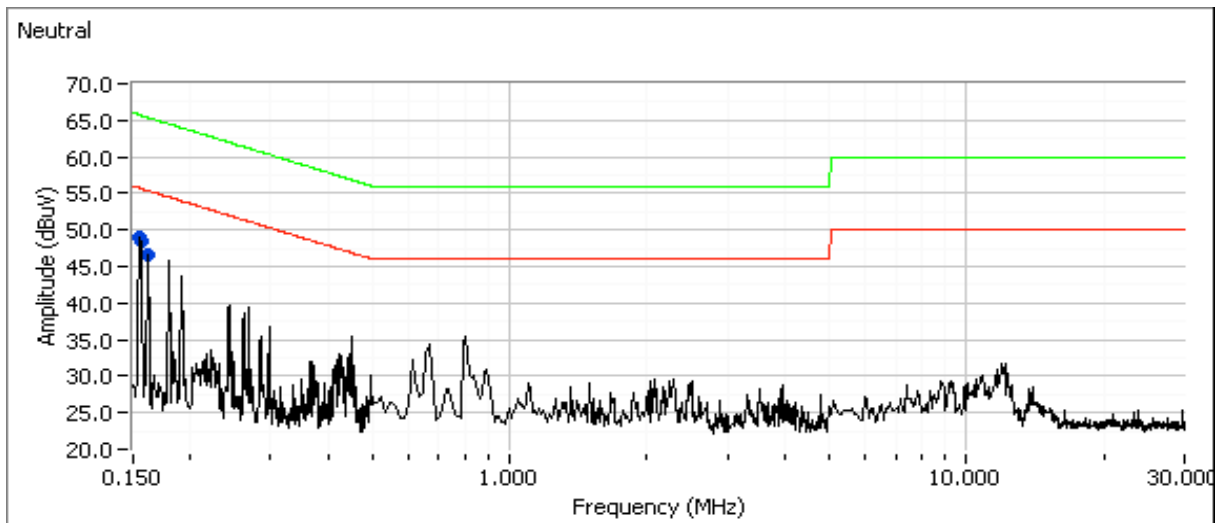
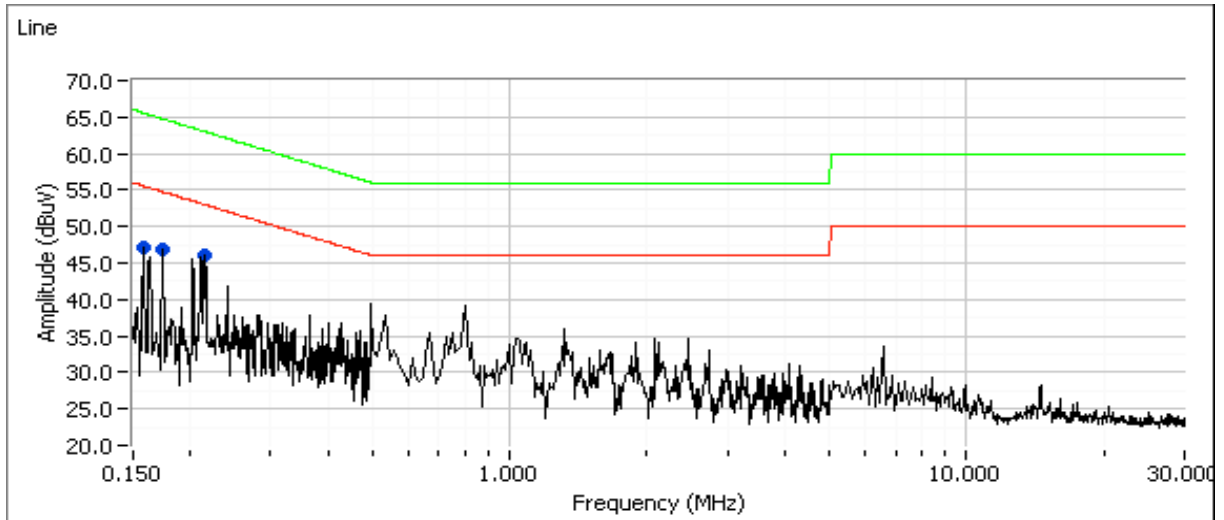
No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Summit Data Communications	Job Number:	J68959
Model:	SDC-CF10AG 802.11a/g Compact Flash Module with Antenna Connectors	T-Log Number:	T69413
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	15.247 / 15.E / RSS-210	Class:	-

Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 230V/50Hz



Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 230V/50Hz Continued Next Page...



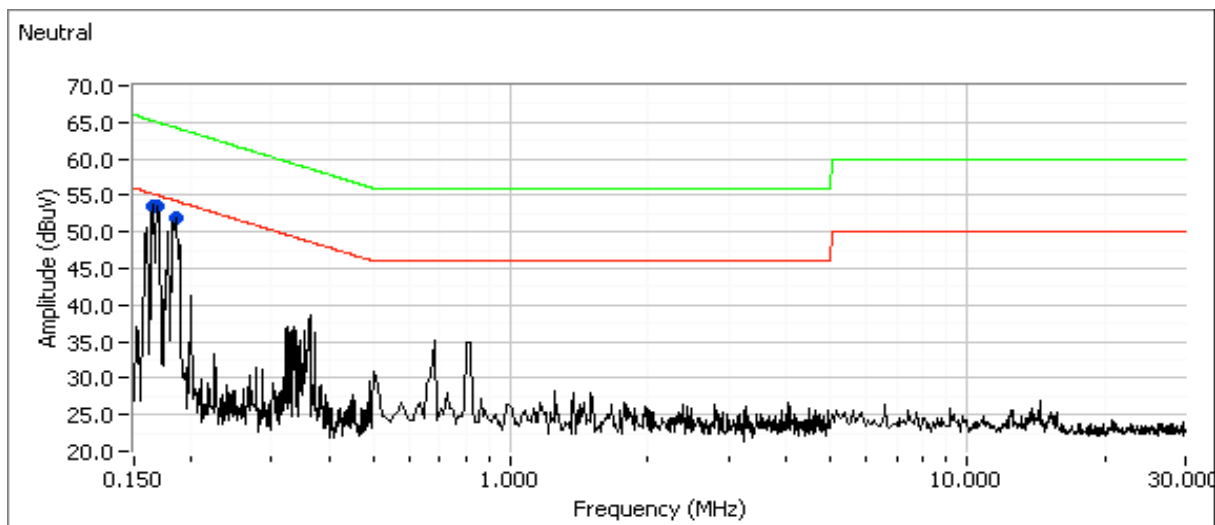
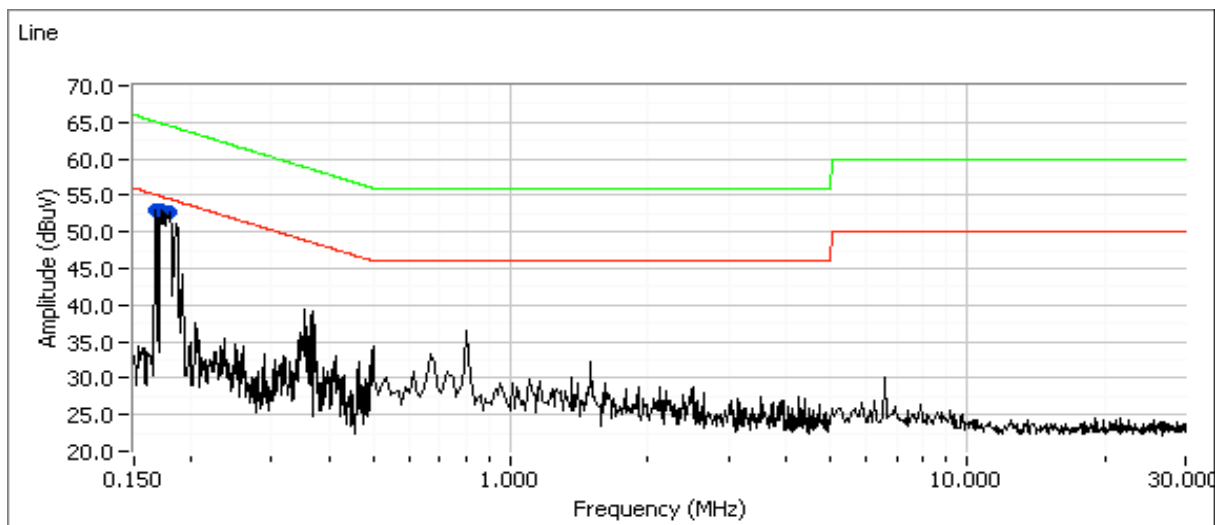
EMC Test Data

Client:	Summit Data Communications	Job Number:	J68959
Model:	SDC-CF10AG 802.11a/g Compact Flash Module with Antenna Connectors	T-Log Number:	T69413
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	15.247 / 15.E / RSS-210	Class:	-

Frequency MHz	Level dB μ V	AC Line	EN55022 B		Detector QP/Ave	Comments
			Limit	Margin		
0.215	43.1	Line 1	63.0	-19.9	QP	
0.153	44.9	Neutral	65.8	-20.9	QP	
0.157	44.5	Neutral	65.6	-21.1	QP	
0.162	43.9	Neutral	65.4	-21.5	QP	
0.159	44.0	Line 1	65.5	-21.5	QP	
0.173	42.5	Line 1	64.8	-22.3	QP	
0.215	21.0	Line 1	53.0	-32.0	AVG	
0.157	17.6	Neutral	55.6	-38.0	AVG	
0.153	17.7	Neutral	55.8	-38.1	AVG	
0.159	17.2	Line 1	55.5	-38.3	AVG	
0.162	17.0	Neutral	55.4	-38.4	AVG	
0.173	16.2	Line 1	54.8	-38.6	AVG	

Client:	Summit Data Communications	Job Number:	J68959
Model:	SDC-CF10AG 802.11a/g Compact Flash Module with Antenna Connectors	T-Log Number:	T69413
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	15.247 / 15.E / RSS-210	Class:	-

Run #2: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz



Run #2: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz Continued Next Page...



EMC Test Data

Client:	Summit Data Communications	Job Number:	J68959
Model:	SDC-CF10AG 802.11a/g Compact Flash Module with Antenna Connectors	T-Log Number:	T69413
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	15.247 / 15.E / RSS-210	Class:	-

Frequency MHz	Level dB μ V	AC Line	EN55022 B		Detector QP/Ave	Comments
			Limit	Margin		
0.167	55.6	Line 1	65.1	-9.5	QP	
0.165	55.7	Neutral	65.2	-9.5	QP	
0.169	54.1	Neutral	65.0	-10.9	QP	
0.180	53.4	Line 1	64.5	-11.1	QP	
0.184	52.6	Neutral	64.3	-11.7	QP	
0.172	53.1	Line 1	64.9	-11.8	QP	
0.169	28.7	Neutral	55.0	-26.3	AVG	
0.165	28.7	Neutral	55.2	-26.5	AVG	
0.167	28.1	Line 1	55.1	-27.0	AVG	
0.184	27.1	Neutral	54.3	-27.2	AVG	
0.172	27.6	Line 1	54.9	-27.3	AVG	
0.180	27.0	Line 1	54.5	-27.5	AVG	



EMC Test Data

Client:	Summit Data Communications	Job Number:	J68959
Model:	SDC-CF10AG 802.11a/g Compact Flash Module with Antenna Connectors	T-Log Number:	T69413
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	15.247 / 15.E / RSS-210	Class:	N/A

Radiated Emissions (FCC Part 15E/RSS 210 A9/RSS GEN)

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: 3/5/2008
Test Engineer: Peter Sales
Test Location: SVOATS #1

Config. Used: 1
Config Change: None
EUT Voltage: Powered from Host System

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: 10 °C
 Rel. Humidity: 76 %

Summary of Results

Run #1	TX Mode	Channel	Power Setting	Pass/Fail	Margin
1a	a	5180	Full	Pass	45.0dBμV/m (177.8μV/m) @ 10359.7MHz (-9.0dB)
1b	a	5200	Full	Pass	45.0dBμV/m (177.8μV/m) @ 10401.4MHz (-9.0dB)
1c	a	5240	Full	Pass	65.0dBμV/m (1778.3μV/m) @ 5248.5MHz (-3.3dB)

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.

Note: All tests will be performed in data rate of 54Mbps. Average band edge plots are for reference only, final measurements made with VB=1khz to avoid desensitization at 10Hz which reduced signal level by 6.6dB.



EMC Test Data

Client:	Summit Data Communications	Job Number:	J68959
Model:	SDC-CF10AG 802.11a/g Compact Flash Module with Antenna Connectors	T-Log Number:	T69413
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	15.247 / 15.E / RSS-210	Class:	N/A

Run #1a: Tx Radiated Spurious Emissions, 30 - 40000 MHz. 5150-5250 MHz Band
Low Channel @ 5180 MHz,
Full Power setting, Laird PCB Antenna with 5.1dBi, Rate = 54Mbps

Fundamental Signal Radiated Field Strength

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5178.100	100.4	H	-	-	AVG	319	1.0	Fundamental
5178.100	106.0	H	-	-	PK	319	1.0	Fundamental
5178.520	96.3	V	-	-	AVG	229	1.3	Fundamental
5178.520	102.5	V	-	-	PK	229	1.3	Fundamental

Band Edge Signal Radiated Field Strength at 5150 MHz

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5149.930	43.0	H	54.0	-11.0	AVG	319	1.0	
5149.940	40.8	V	54.0	-13.2	AVG	229	1.3	
5149.170	56.0	V	74.0	-18.0	PK	229	1.3	
5147.520	44.5	H	74.0	-29.5	PK	319	1.0	

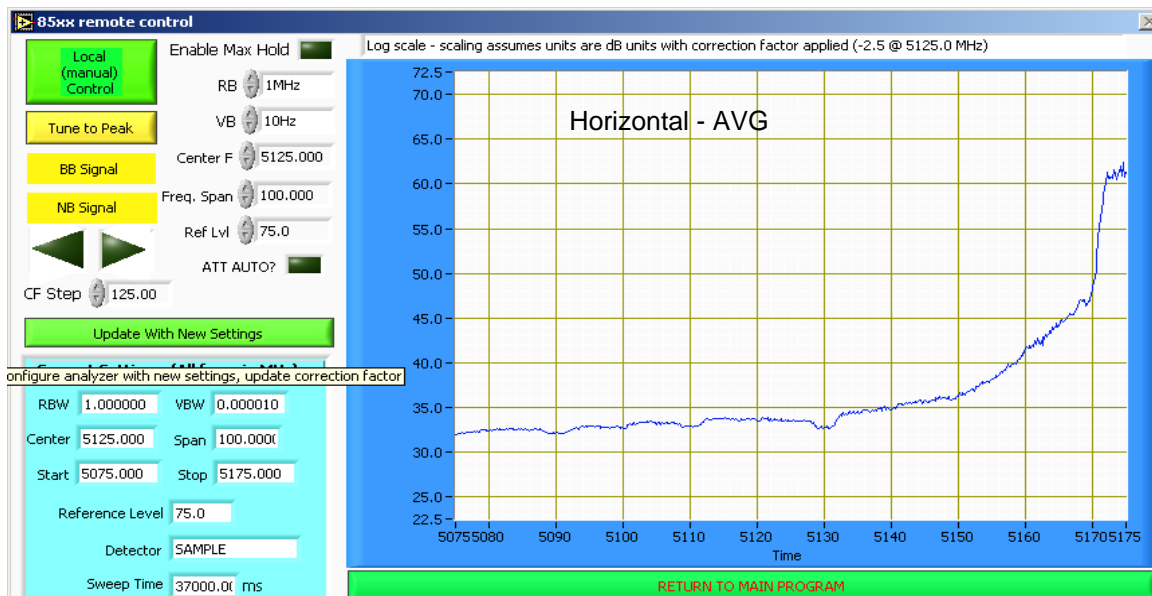
Other Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
10359.740	45.0	V	54.0	-9.0	AVG	273	1.0	
10360.160	44.5	H	55.0	-10.5	AVG	96	1.0	
15538.660	42.5	V	56.0	-13.5	AVG	30	1.9	
10359.740	51.4	V	74.0	-22.6	PK	273	1.0	
10360.160	49.4	H	74.0	-24.6	PK	96	1.0	
15538.660	47.1	V	74.0	-26.9	PK	30	1.9	

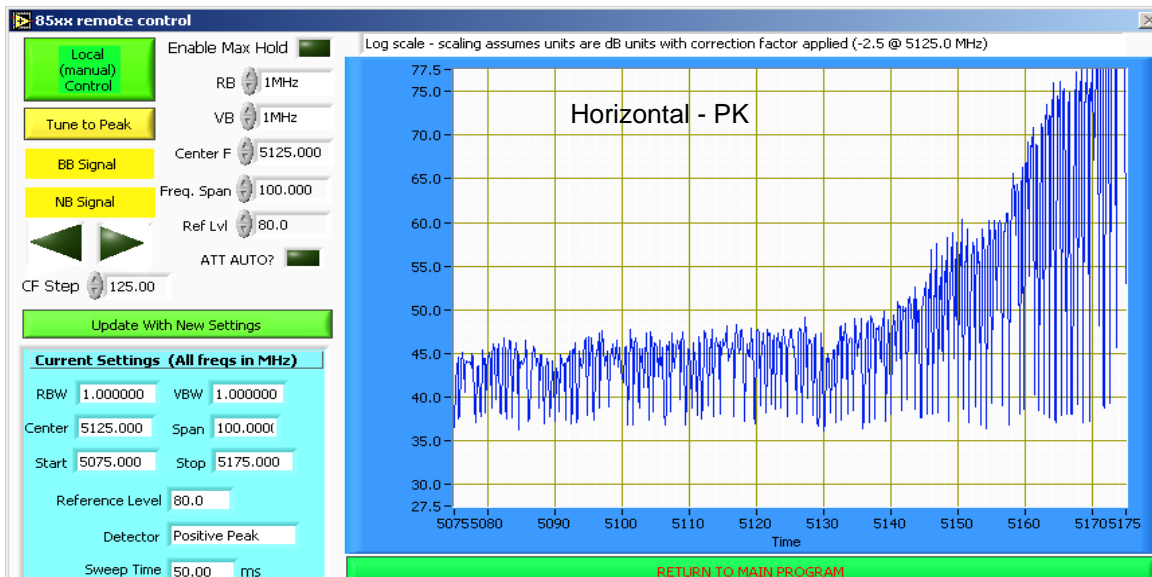
Note 1:

For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set to -27dBm/MHz (~68dB μ V/m).

Client:	Summit Data Communications	Job Number:	J68959
Model:	SDC-CF10AG 802.11a/g Compact Flash Module with Antenna Connectors	T-Log Number:	T69413
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	15.247 / 15.E / RSS-210	Class:	N/A



Note - final measurements made using a 3MHz span - if you want to avoid measuring a signal within 1.5MHz of the highest signal in the screen above you will need to utilize "USE CURRENT" as the detector. Remember to set RB and VB for the measurement.



Note - final measurements made using a 3MHz span - if you want to avoid measuring a signal within 1.5MHz of the highest signal in the screen above you will need to utilize "USE CURRENT" as the detector. Remember to set RB and VB for the measurement.



EMC Test Data

Client:	Summit Data Communications	Job Number:	J68959
Model:	SDC-CF10AG 802.11a/g Compact Flash Module with Antenna Connectors	T-Log Number:	T69413
		Account Manager:	Dean Eriksen
Contact:	Ron Seide		
Standard:	15.247 / 15.E / RSS-210	Class:	N/A

Run #1b: Tx Radiated Spurious Emissions, 30 - 40000 MHz. 5150 5250 MHz Band
Center Channel @ 5200 MHz,
Full Power setting, Laird PCB Antenna with 5.1dBi, Rate = 54Mbps

Other Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
10401.350	45.0	V	54.0	-9.0	AVG	315	1.0	
10400.580	45.0	H	55.0	-10.0	AVG	335	1.6	
15601.070	42.9	H	56.0	-13.1	AVG	123	1.0	
10400.580	53.6	H	74.0	-20.4	PK	335	1.6	
10401.350	53.1	V	74.0	-20.9	PK	315	1.0	
15601.070	47.7	H	74.0	-26.3	PK	123	1.0	

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



EMC Test Data

Client:	Summit Data Communications	Job Number:	J68959
Model:	SDC-CF10AG 802.11a/g Compact Flash Module with Antenna Connectors	T-Log Number:	T69413
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	15.247 / 15.E / RSS-210	Class:	N/A

Run #1c: Tx Radiated Spurious Emissions, 30 - 40000 MHz. 5150 5250 MHz Band
High Channel @ 5240 MHz,
Full Power setting, Laird PCB Antenna with 5.1dBi, Rate = 54Mbps

Fundamental Signal Radiated Field Strength

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5238.200	96.7	V	-	-	AVG	222	1.7	
5238.200	103.0	V	-	-	PK	222	1.7	
5238.130	95.4	H	-	-	AVG	325	1.2	
5238.130	101.3	H	-	-	PK	325	1.2	

Band Edge Signal Radiated Field Strength at 5250 MHz

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5248.530	65.0	V	68.3	-3.3	AVG	222	1.7	
5250.000	77.1	V	88.3	-11.2	PK	222	1.7	
5250.000	76.1	H	88.3	-12.2	PK	325	1.2	
5250.000	53.0	H	68.3	-15.3	AVG	325	1.2	

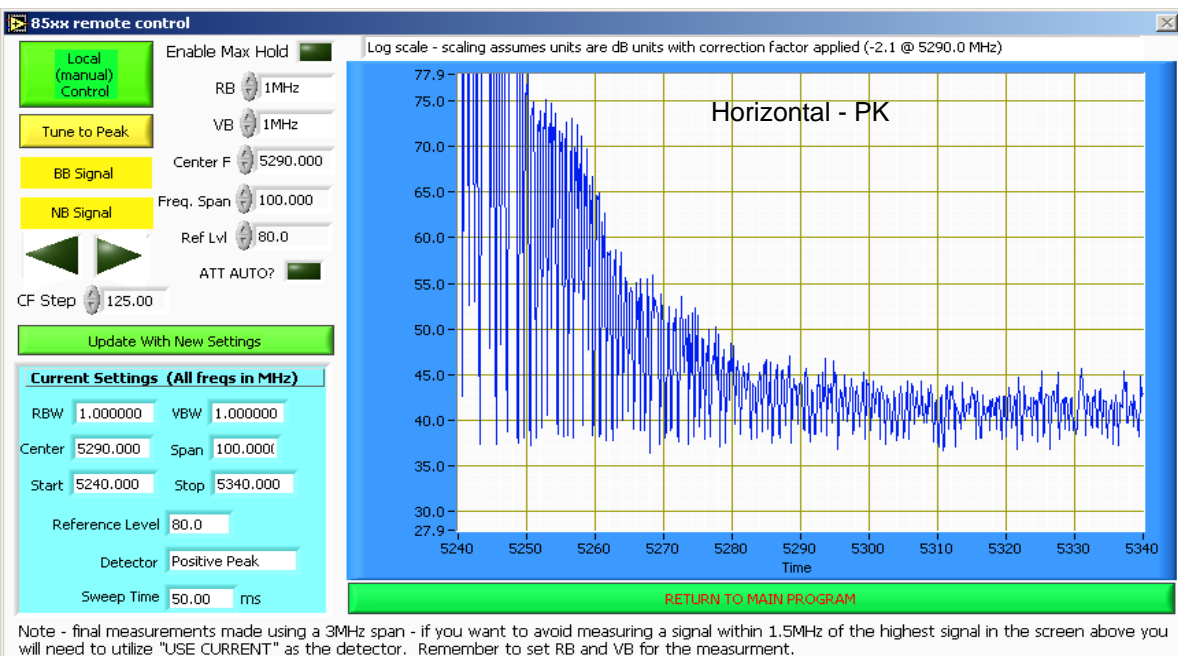
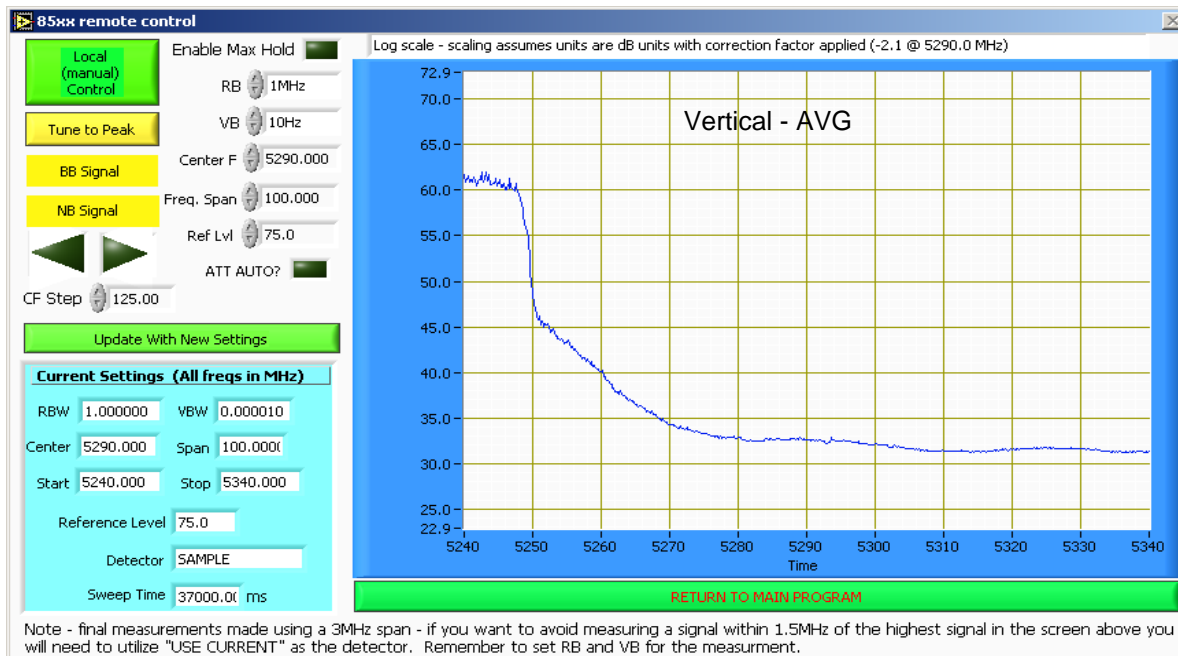
Other Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
10481.410	56.1	V	74.0	-17.9	PK	132	1.9	
10481.410	46.5	V	68.3	-21.8	AVG	132	1.9	
10481.490	50.1	H	74.0	-23.9	PK	298	1.6	
10481.490	44.2	H	68.3	-24.1	AVG	298	1.6	
15718.620	42.6	V	68.3	-25.7	AVG	72	1.0	
15718.620	47.8	V	74.0	-26.2	PK	72	1.0	

Note 1:

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

Client:	Summit Data Communications	Job Number:	J68959
Model:	SDC-CF10AG 802.11a/g Compact Flash Module with Antenna Connectors	T-Log Number:	T69413
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	15.247 / 15.E / RSS-210	Class:	N/A





EMC Test Data

Client:	Summit Data Communications	Job Number:	J68959
Model:	SDC-CF10AG 802.11a/g Compact Flash Module with Antenna Connectors	T-Log Number:	T69413
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	15.247 / 15.E / RSS-210	Class:	N/A

Radiated Emissions

Test Specific Details

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

Date of Test: 3/4/2008 0:00
Test Engineer: Peter Sales
Test Location: SVOATS #1

Config. Used: 1
Config Change: None
EUT Voltage: Powered from Host System

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: 10 °C
 Rel. Humidity: 76 %

Summary of Results

Run #1	TX Mode	Channel	Power Setting	Pass/Fail	Margin
1a	a	5180	Full	Pass	46.9dBµV/m (221.3µV/m) @ 10358.9MHz (-7.1dB)
1b	a	5200	Full	Pass	46.4dBµV/m (208.9µV/m) @ 10400.6MHz (-7.6dB)
1c	a	5240	Full	Pass	48.3dBµV/m (260.0µV/m) @ 10478.9MHz (-5.7dB)

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: All tests will be performed in data rate of 54Mbps. Average band edge plots are for reference only, final measurements made with VB=1khz to avoid desensitization at 10Hz which reduced signal level by 6.6dB.



EMC Test Data

Client:	Summit Data Communications	Job Number:	J68959
Model:	SDC-CF10AG 802.11a/g Compact Flash Module with Antenna Connectors	T-Log Number:	T69413
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	15.247 / 15.E / RSS-210	Class:	N/A

Run #1a: Tx Radiated Spurious Emissions, 30 - 40000 MHz. 5150-5250 MHz Band
 Low Channel @ 5180 MHz,
 Full Power setting, Flat Omni Antenna with 5dBi, Rate = 54Mbps

Fundamental Signal Radiated Field Strength

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5175.530	102.5	V	-	-	AVG	113	1.1	
5175.530	108.2	V	-	-	PK	113	1.1	
5178.520	89.0	H	-	-	AVG	342	1.0	
5178.520	95.0	H	-	-	PK	342	1.0	

Band Edge Signal Radiated Field Strength at 5150 MHz

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5147.380	44.5	V	54.0	-9.5	AVG	113	1.1	
5149.170	61.2	V	74.0	-12.8	PK	113	1.1	
5149.800	37.7	H	54.0	-16.3	AVG	342	1.0	
5149.580	48.8	H	74.0	-25.2	PK	342	1.0	

Other Spurious Radiated Emissions:

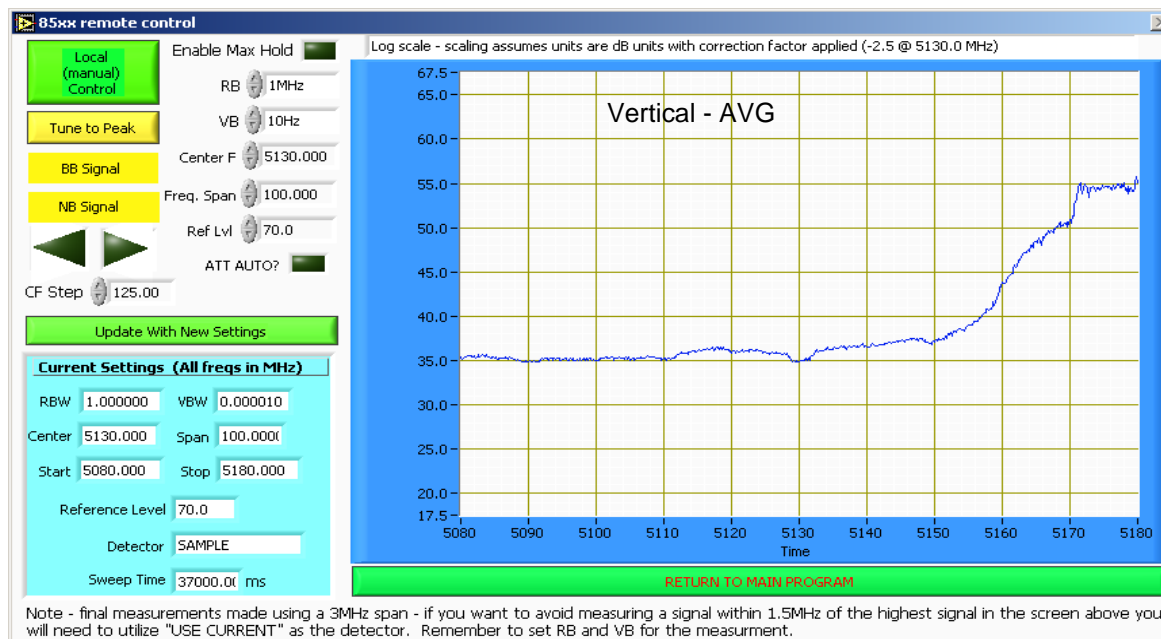
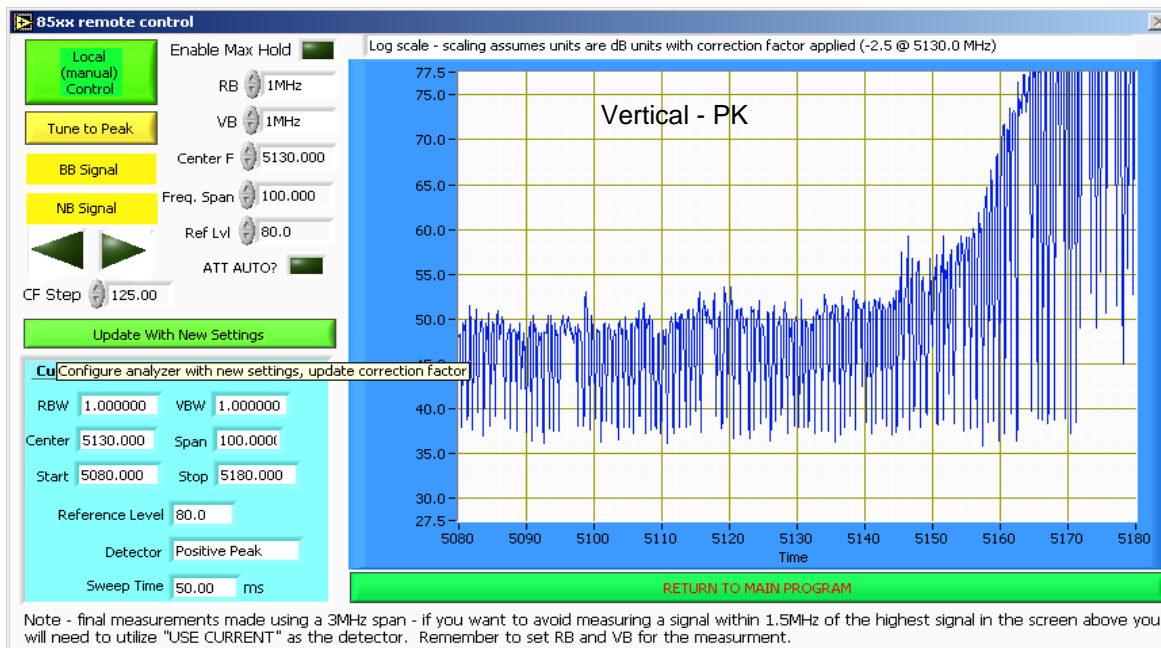
Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
10358.870	46.9	V	54.0	-7.1	AVG	22	1.0	
10360.700	45.3	H	55.0	-9.7	AVG	63	1.7	
15539.330	42.3	V	56.0	-13.7	AVG	6	1.0	
10358.870	55.3	V	74.0	-18.7	PK	22	1.0	
10360.700	51.0	H	74.0	-23.0	PK	63	1.7	
15539.330	47.5	V	74.0	-26.5	PK	6	1.0	

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



EMC Test Data

Client:	Summit Data Communications	Job Number:	J68959
Model:	SDC-CF10AG 802.11a/g Compact Flash Module with Antenna Connectors	T-Log Number:	T69413
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	15.247 / 15.E / RSS-210	Class:	N/A





EMC Test Data

Client:	Summit Data Communications	Job Number:	J68959
Model:	SDC-CF10AG 802.11a/g Compact Flash Module with Antenna Connectors	T-Log Number:	T69413
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	15.247 / 15.E / RSS-210	Class:	N/A

Run #1b: Tx Radiated Spurious Emissions, 30 - 40000 MHz. 5150 5250 MHz Band
Center Channel @ 5200 MHz,
Full Power setting, Flat Omni Antenna with 5dBi, Rate = 54Mbps

Other Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
10400.630	46.4	V	54.0	-7.6	AVG	286	1.0	
10400.060	44.5	H	55.0	-10.5	AVG	330	1.7	
15600.940	43.2	V	56.0	-12.8	AVG	270	1.0	
10400.630	55.7	V	74.0	-18.3	PK	286	1.0	
10400.060	49.6	H	74.0	-24.4	PK	330	1.7	
15600.940	48.5	V	74.0	-25.5	PK	270	1.0	

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



EMC Test Data

Client:	Summit Data Communications	Job Number:	J68959
Model:	SDC-CF10AG 802.11a/g Compact Flash Module with Antenna Connectors	T-Log Number:	T69413
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	15.247 / 15.E / RSS-210	Class:	N/A

Run #1c: Tx Radiated Spurious Emissions, 30 - 40000 MHz. 5150 5250 MHz Band
High Channel @ 5240 MHz,
Full Power setting, Flat Omni Antenna with 5dBi, Rate = 54Mbps

Fundamental Signal Radiated Field Strength

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
5238.500	90.6	V	-	-	AVG	114	2.0	
5238.500	96.9	V	-	-	PK	114	2.0	
5240.810	88.5	H	-	-	AVG	348	1.0	
5240.810	95.1	H	-	-	PK	348	1.0	

Band Edge Signal Radiated Field Strength at 5250 MHz

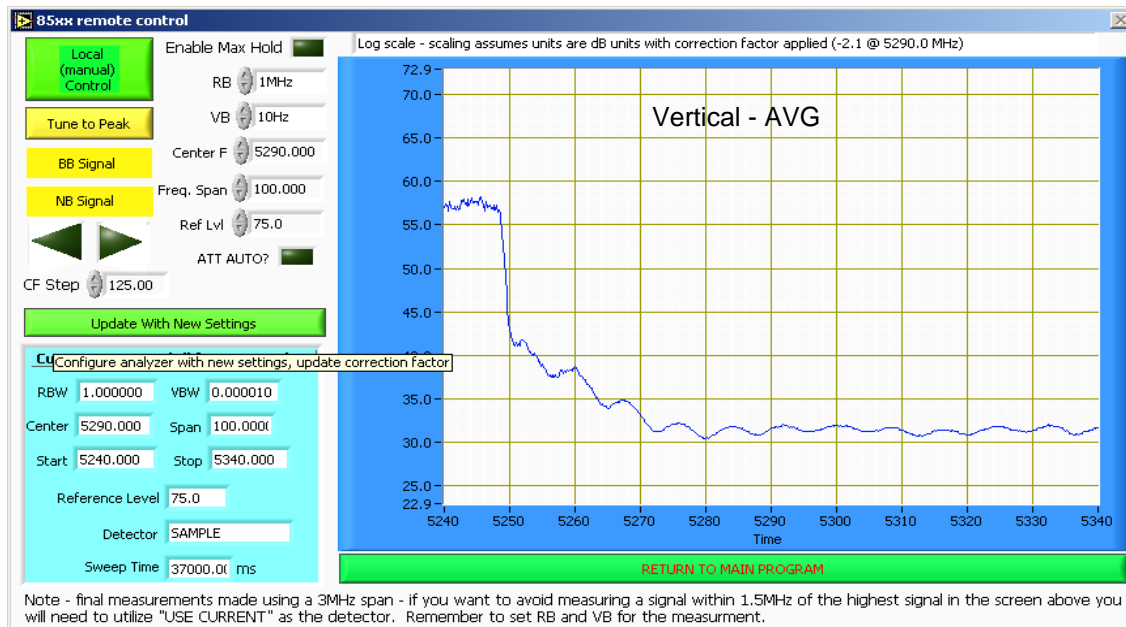
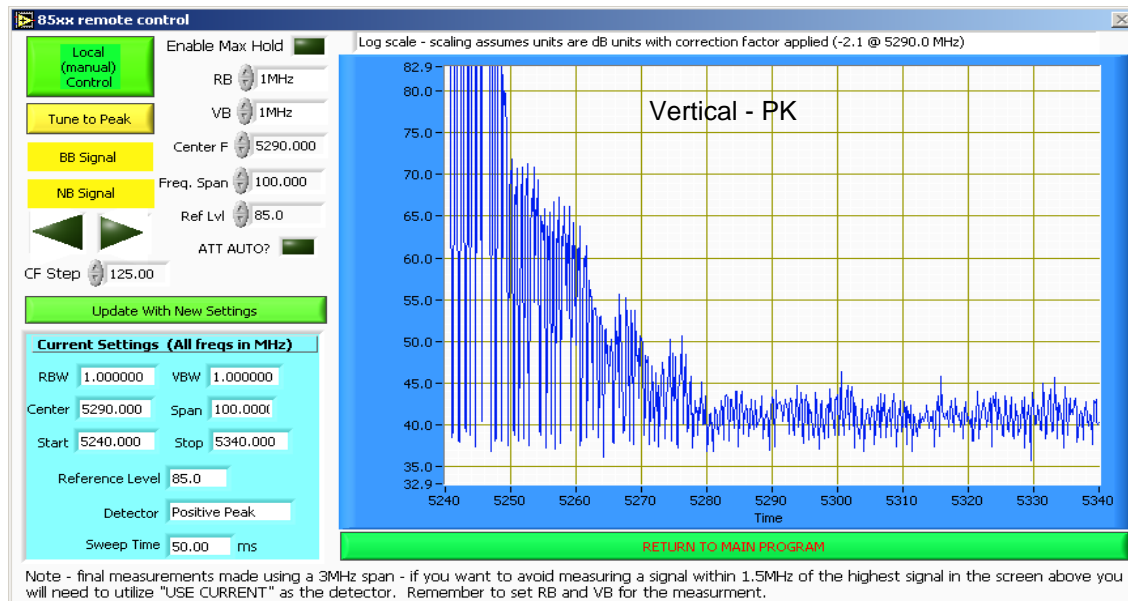
Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5252.690	72.3	V	88.3	-16.0	PK	114	2.0	
5250.030	50.2	V	68.3	-18.1	AVG	114	2.0	
5250.000	69.9	H	88.3	-18.4	PK	348	1.0	
5250.030	49.3	H	68.3	-19.0	AVG	348	1.0	

Other Spurious Radiated Emissions:

Frequency	Level	Pol	15.209 / 15E		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
10478.910	48.3	V	54.0	-5.7	AVG	114	1.6	
10481.230	44.4	H	54.0	-9.6	AVG	360	1.7	
15718.980	42.2	V	54.0	-11.8	AVG	159	1.0	
10478.910	57.7	V	74.0	-16.3	PK	114	1.6	
10481.230	50.7	H	74.0	-23.3	PK	360	1.7	
15718.980	46.5	V	74.0	-27.5	PK	159	1.0	

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

Client:	Summit Data Communications	Job Number:	J68959
Model:	SDC-CF10AG 802.11a/g Compact Flash Module with Antenna Connectors	T-Log Number:	T69413
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	15.247 / 15.E / RSS-210	Class:	N/A





EMC Test Data

Client:	Summit Data Communications	Job Number:	J68959
Model:	SDC-CF10AG 802.11a/g Compact Flash Module with Antenna Connectors	T-Log Number:	T69413
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	15.247 / 15.E / 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: 2/28/2008
Test Engineer: Rafael Varelas
Test Location: Chamber #5

Config. Used: -
Config Change: -
Host Unit 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: 18.9 °C
 Rel. Humidity: 39 %

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
1	Power, 5150 - 5250MHz	15.407(a) (1), (2)	Pass	13.9dBm (25mW)
1	PSD, 5150 - 5250MHz	15.407(a) (1), (2)	Pass	3.4 dBm/MHz
1	26dB Bandwidth	15.407	-	17.9 MHz
1	99% Bandwidth	RSS 210	-	17.3 MHz
2	Peak Excursion Envelope	15.407(a) (6)	Pass	7.8dBm
3	Antenna Conducted Out of Band Spurious	15.407(b)	Pass	Emissions at the Bandedges are under the -27dBm/MHz limit

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.



EMC Test Data

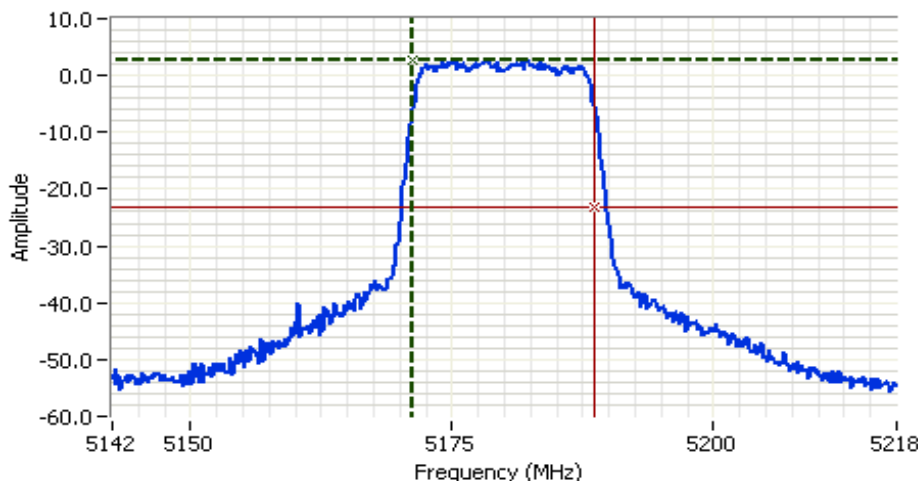
Client:	Summit Data Communications	Job Number:	J68959
Model:	SDC-CF10AG 802.11a/g Compact Flash Module with Antenna Connectors	T-Log Number:	T69413
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	15.247 / 15.E / RSS-210	Class:	N/A

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

Antenna Gain (dBi): 5.1

Frequency (MHz)	Software Setting	Bandwidth		Output Power ¹ dBm		Power (Watts)	PSD ² dBm/MHz			Result
		26dB	99% ⁴	Measured	Limit		Measured	FCC Limit	RSS Limit ³	
5180	Max	17.8	17.3	13.2	16.5	0.021	2.7	4.0	4.9	Pass
5200	Max	17.9	17.3	13.9	16.5	0.025	3.4	4.0	4.9	Pass
5240	Max	17.8	17.3	13.6	16.5	0.023	3.0	4.0	4.9	Pass

Note 1:	RBW=1MHz, VB=3 MHz, sample detector, power averaging on (transmitted signal was not continuous but the ESI analyzer was configured with a gated sweep such that the analyzer was only sweeping when the device was transmitting) and power integration over 50MHz
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



Analyzer Settings
 Rohde&Schwarz, ESI 7
 CF: 5180.00 MHz
 SPAN: 75.00 MHz
 RB 1.000 MHz
 VB 3.000 MHz
 Detector Sample
 Att 10
 RL Offset 21.00
 Sweep Time 5.0ms
 Ref Lvl: 18.00dBm

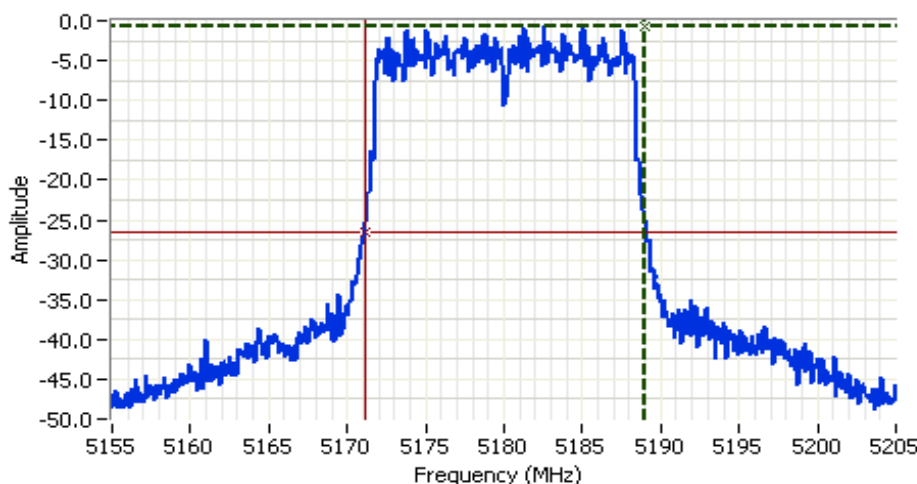
Comments
 99%: 17.25 MHz
 Power: 13.24dBm
 PSD: 2.74 dBm/MHz

Cursor 1 5171.30 2.74
 Cursor 2 5188.55 -23.26

Delta Freq. 17.25
 Delta Amplitude 26.00



Client:	Summit Data Communications	Job Number:	J68959
Model:	SDC-CF10AG 802.11a/g Compact Flash Module with Antenna Connectors	T-Log Number:	T69413
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	15.247 / 15.E / RSS-210	Class:	N/A



Analyzer Settings

HP8564E,EMI
CF: 5180.00 MHz
SPAN:50.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 20
RL Offset 21.00
Sweep Time 50.0ms
Ref Lvl:23.20DBM

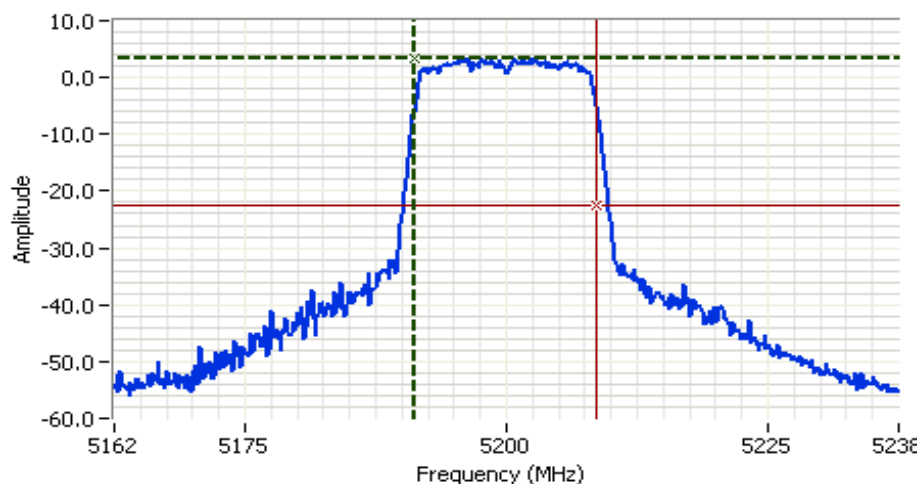
Comments

5180 MHz
26dB Bandwidth
802.11a

Cursor 1 5189.00(-0.63)
Cursor 2 5171.16(-26.63)

Delta Freq. 17.83

Delta Amplitude 26.00



Analyzer Settings

Rohde&Schwarz,ESI 7
CF: 5200.00 MHz
SPAN:75.00 MHz
RB 1.000 MHz
VB 3.000 MHz
Detector Sample
Att 10
RL Offset 21.00
Sweep Time 5.0ms
Ref Lvl:18.00DBM

Comments

99%: 17.25 MHz
Power: 13.90dBm
PSD: 3.36 dBm/MHz

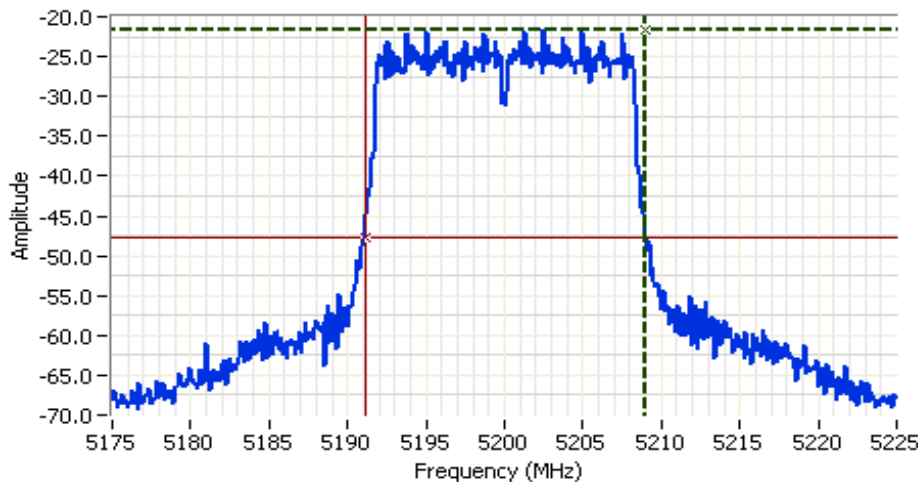
Cursor 1 5191.30(3.36)
Cursor 2 5208.55(-22.64)

Delta Freq. 17.25

Delta Amplitude 26.00



Client:	Summit Data Communications	Job Number:	J68959
Model:	SDC-CF10AG 802.11a/g Compact Flash Module with Antenna Connectors	T-Log Number:	T69413
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	15.247 / 15.E / RSS-210	Class:	N/A



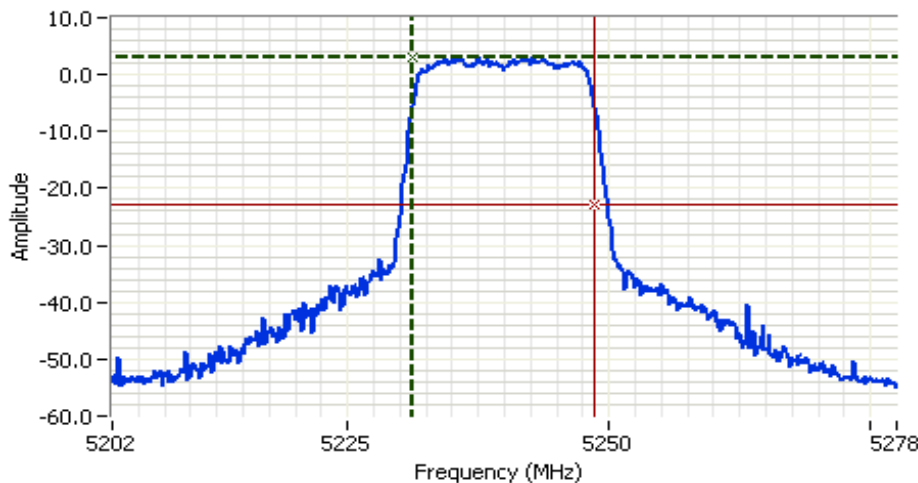
Analyzer Settings

HP8564E,EMI
CF: 5200.00 MHz
SPAN:50.00 MHz
RB 100 kHz
VB 100 kHz
Detector POS
Att 20
RL Offset 0.00
Sweep Time 50.0ms
Ref Lvl:4.00DBM

Comments

5200 MHz
26dB Bandwidth
802.11a

Cursor 1 5209.00 -21.67
Cursor 2 5191.08 -47.67
Delta Freq. 17.92
Delta Amplitude 26.00



Analyzer Settings

Rohde&Schwarz,ESI 7
CF: 5240.00 MHz
SPAN:75.00 MHz
RB 1.000 MHz
VB 3.000 MHz
Detector Sample
Att 10
RL Offset 21.00
Sweep Time 5.0ms
Ref Lvl:18.00DBM

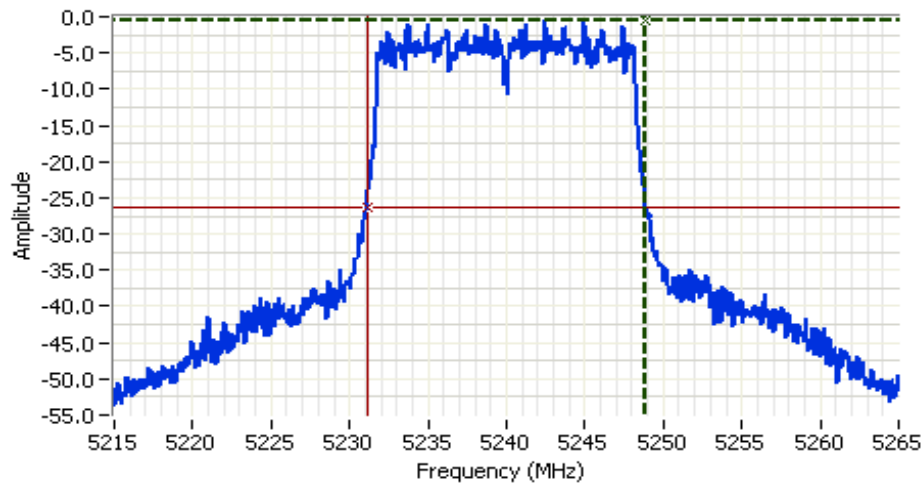
Comments

99%: 17.25 MHz
Power: 13.63dBm
PSD: 3.04 dBm/MHz

Cursor 1 5231.30 3.04
Cursor 2 5248.55 -22.96
Delta Freq. 17.25
Delta Amplitude 26.00



Client:	Summit Data Communications	Job Number:	J68959
Model:	SDC-CF10AG 802.11a/g Compact Flash Module with Antenna Connectors	T-Log Number:	T69413
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	15.247 / 15.E / RSS-210	Class:	N/A









Analyzer Settings

HP8564E,EMI
 CF: 5240.00 MHz
 SPAN:50.00 MHz
 RB 100 kHz
 VB 100 kHz
 Detector Normal
 Att 10
 RL Offset 21.00
 Sweep Time 50.0ms
 Ref Lvl:9.40DBM

Comments

5240 MHz
 26dB Bandwidth
 802.11a

Cursor 1	5248.91	-0.43			
Cursor 2	5231.08	-26.43			

Delta Freq. 17.83

Delta Amplitude 26.00



EMC Test Data

Client:	Summit Data Communications	Job Number:	J68959
Model:	SDC-CF10AG 802.11a/g Compact Flash Module with Antenna Connectors	T-Log Number:	T69413
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	15.247 / 15.E / RSS-210	Class:	N/A

Run #2: Peak Excursion Measurement

Device meets the requirement for the peak excursion

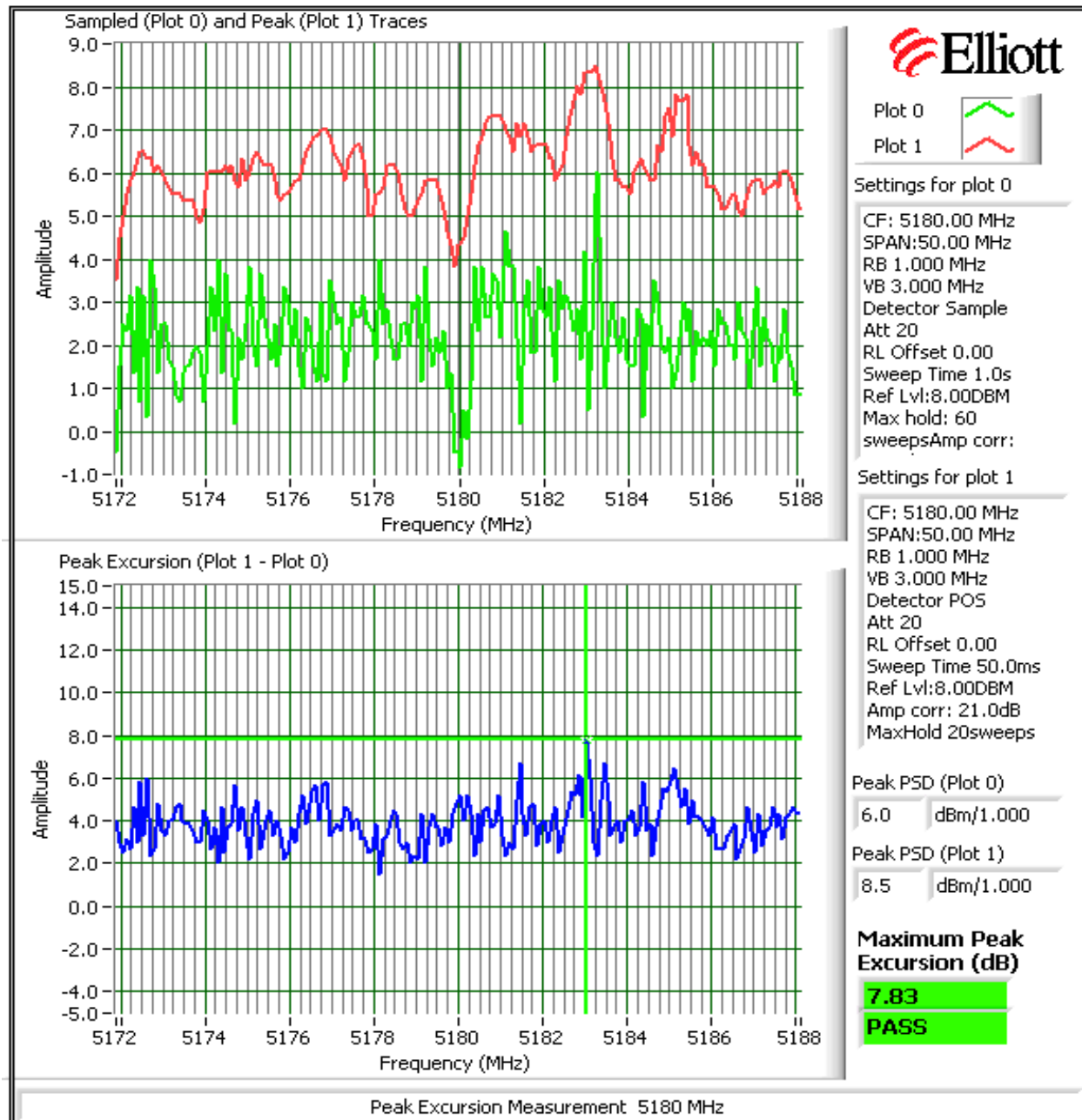
Freq	Peak Excursion(dB)		Freq	Peak Excursion(dB)		Freq	Peak Excursion(dB)	
(MHz)	Value	Limit	(MHz)	Value	Limit	(MHz)	Value	Limit
5180	7.8	13.0	5260		13.0	5500		13.0
5200	7.3	13.0	5300		13.0	5600		13.0
5240	7.3	13.0	5320		13.0	5700		13.0

Client:	Summit Data Communications	Job Number:	J68959
Model:	SDC-CF10AG 802.11a/g Compact Flash Module with Antenna Connectors	T-Log Number:	T69413
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	15.247 / 15.E / RSS-210	Class:	N/A

Plots Showing Peak Excursion

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

Trace B: RBW = 1 MHz, VBW = 3MHz, Integrated average power

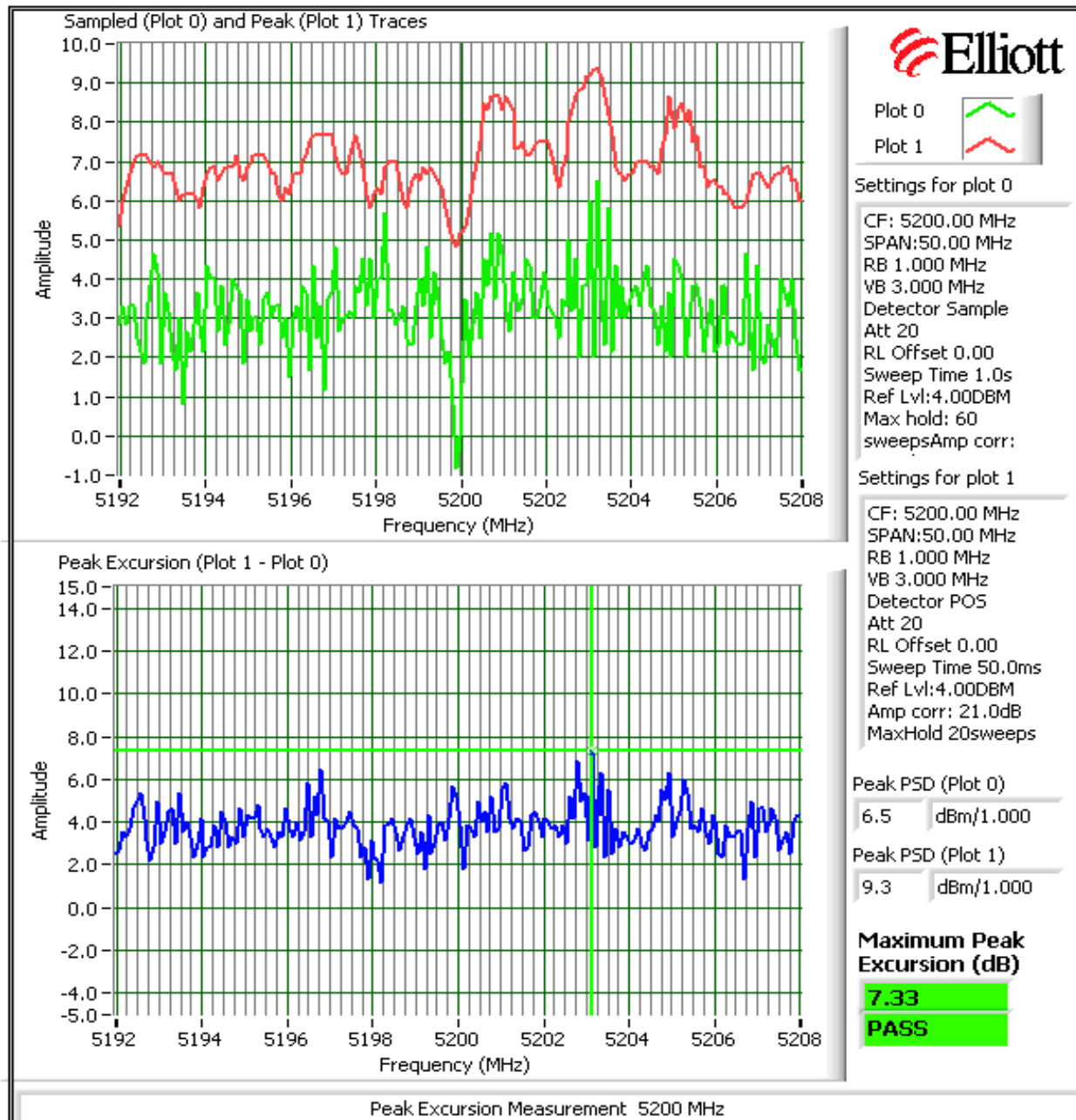


Client:	Summit Data Communications	Job Number:	J68959
Model:	SDC-CF10AG 802.11a/g Compact Flash Module with Antenna Connectors	T-Log Number:	T69413
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	15.247 / 15.E / RSS-210	Class:	N/A

Plots Showing Peak Excursion

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

Trace B: RBW = 1 MHz, VBW = 3MHz, Integrated average power

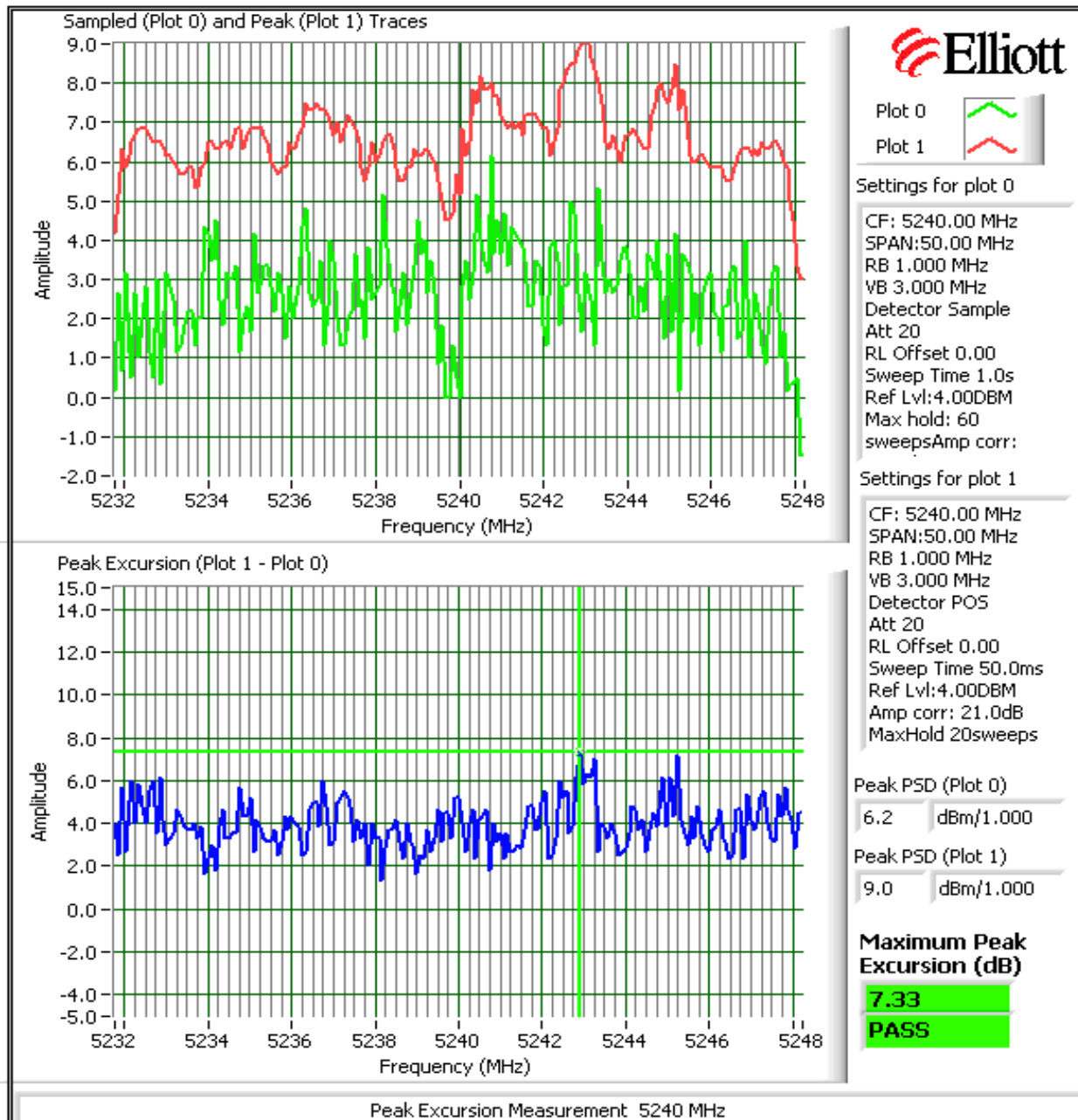


Client:	Summit Data Communications	Job Number:	J68959
Model:	SDC-CF10AG 802.11a/g Compact Flash Module with Antenna Connectors	T-Log Number:	T69413
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	15.247 / 15.E / RSS-210	Class:	N/A

Plots Showing Peak Excursion

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

Trace B: RBW = 1 MHz, VBW = 3MHz, Integrated average power

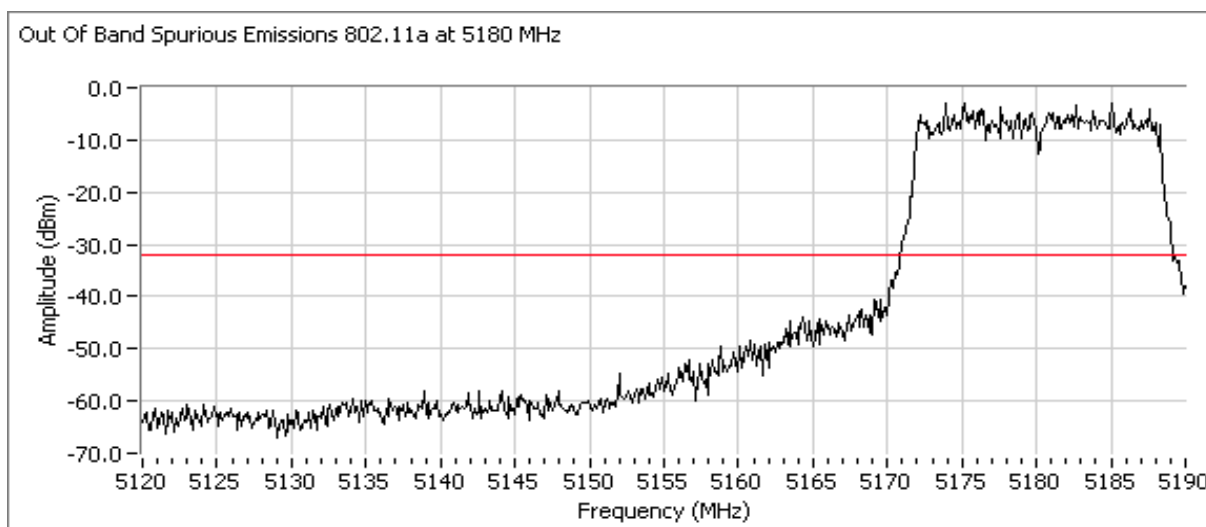


Client:	Summit Data Communications	Job Number:	J68959
Model:	SDC-CF10AG 802.11a/g Compact Flash Module with Antenna Connectors	T-Log Number:	T69413
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	15.247 / 15.E / RSS-210	Class:	N/A

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

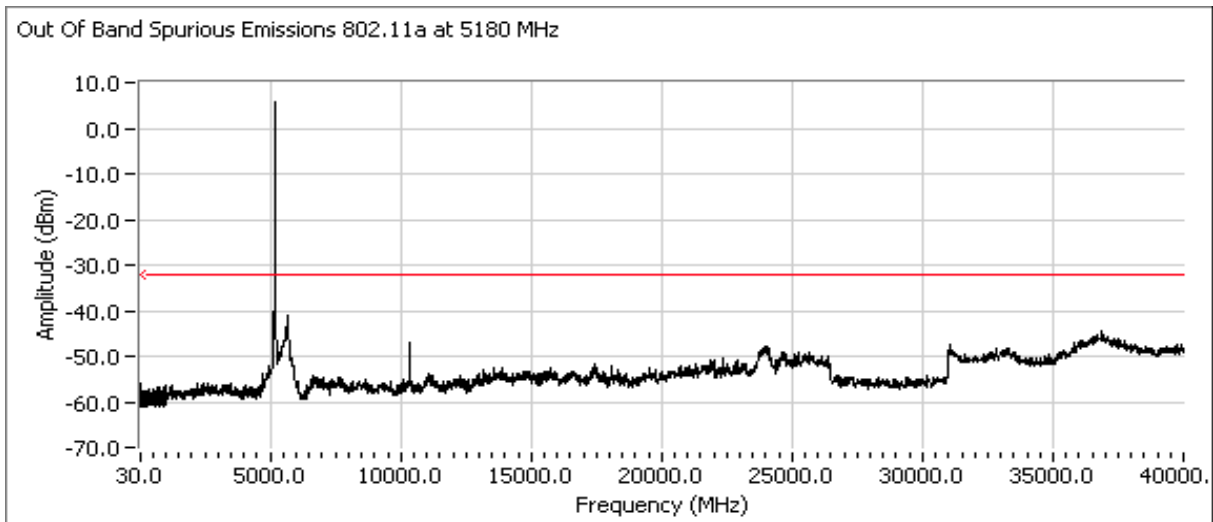
Maximum Antenna Gain: 5.1 dBi
 Spurious Limit: -27 dBm/MHz eirp
 Limit Used On Plots ^{Note 1}: -32.1 dBm/MHz

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.

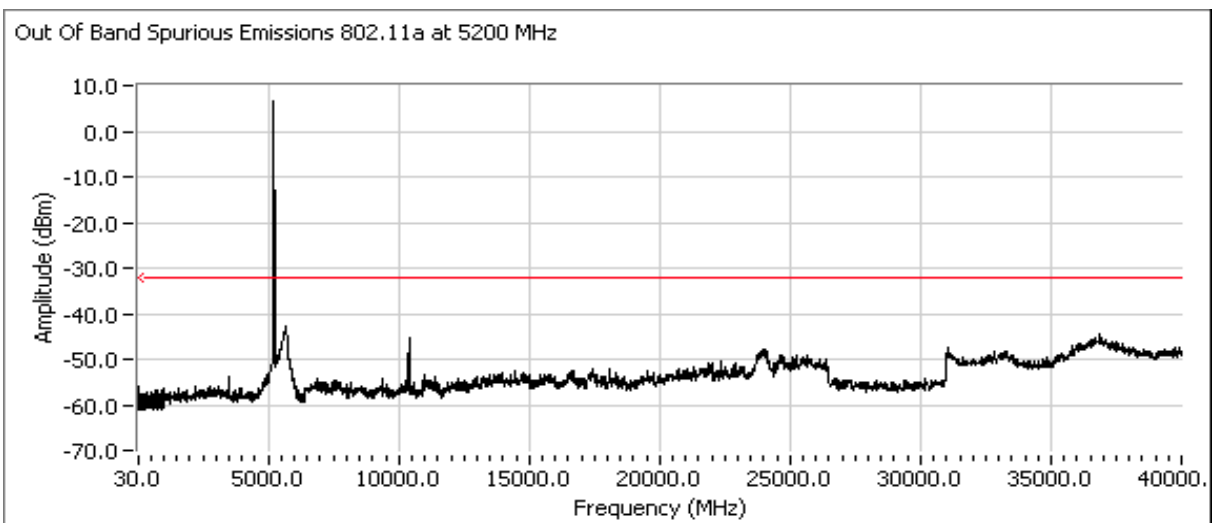
Plots Showing Out-Of-Band Emissions (RBW=VBW=100kHz)


Client:	Summit Data Communications	Job Number:	J68959
Model:	SDC-CF10AG 802.11a/g Compact Flash Module with Antenna Connectors	T-Log Number:	T69413
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	15.247 / 15.E / RSS-210	Class:	N/A

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

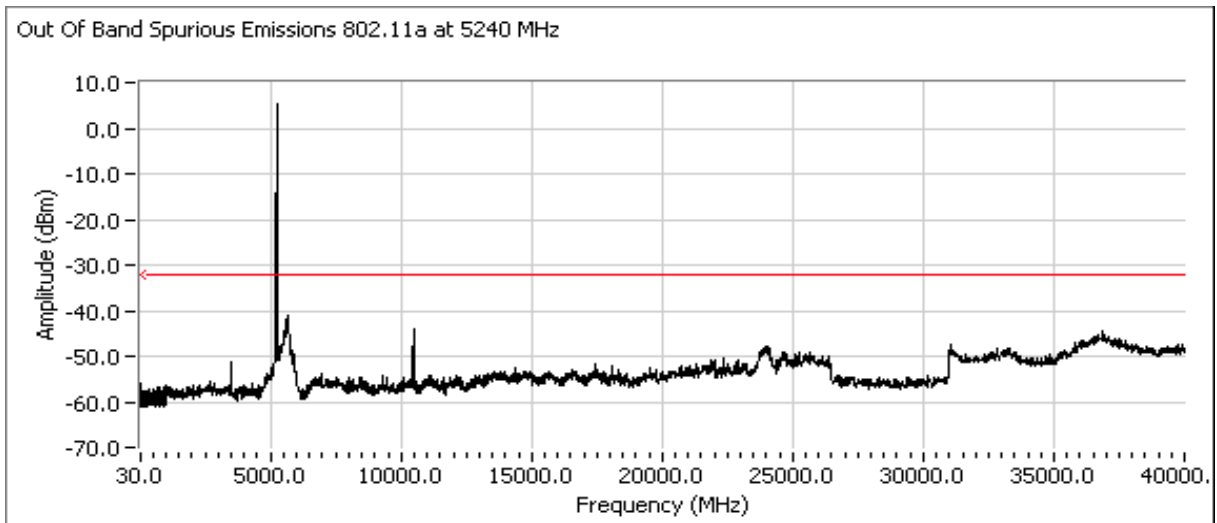


Plots Showing Out-Of-Band Emissions (RBW=VBW=1MHz)

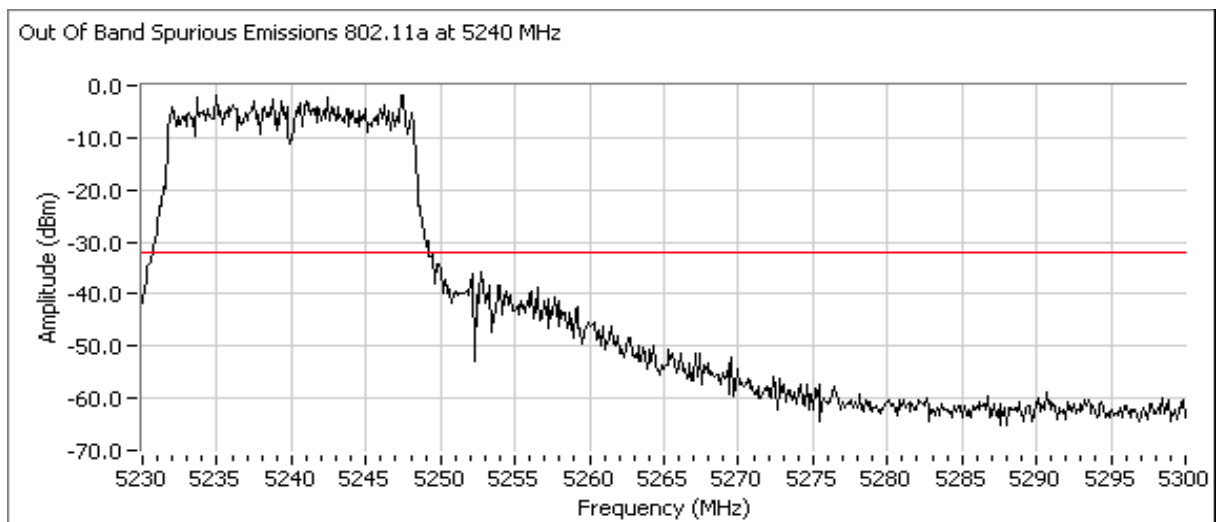


Client:	Summit Data Communications	Job Number:	J68959
Model:	SDC-CF10AG 802.11a/g Compact Flash Module with Antenna Connectors	T-Log Number:	T69413
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	15.247 / 15.E / RSS-210	Class:	N/A

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



Plots Showing Out-Of-Band Emissions (RBW=VBW=100kHz)





EMC Test Data

Client:	Summit Data Communications	Job Number:	J68959
Model:	SDC-CF10AG 802.11a/g Compact Flash Module with Antenna Connectors	T-Log Number:	T69413
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	15.247 / 15.E / RSS-210	Class:	N/A

RSS 210 and FCC 15.247 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: 11/27/2007 & 12/19/07 Config. Used: 1
Test Engineer: Suhaila Khushzad Config Change: None
Test Location: SVOATS #2 EUT Voltage: Powered from Host System

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 approximately 30 meters from the EUT with all I/O connections running on top of the groundplane or routed in overhead in the GR-1089 test configuration.

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

Ambient Conditions: Temperature: 11.7 °C
 Rel. Humidity: 63 %

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
3 (802.11a - 5200 MHz)	RE, 30 - 16000 MHz Spurious Emissions	RSS-GEN	Pass	46.4dBμV/m (208.9μV/m) @ 17735.4MHz (-7.6dB)

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.



EMC Test Data

Client:	Summit Data Communications	Job Number:	J68959
Model:	SDC-CF10AG 802.11a/g Compact Flash Module with Antenna Connectors	T-Log Number:	T69413
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	15.247 / 15.E / RSS-210	Class:	N/A

Run # 3: Rx Mode Radiated Spurious Emissions, 30 - 40000 MHz. Operating Mode: 802.11a
Round Omni Antenna with 1.9dBi Gain, Data Rate 54 Mbps
Center Channel @ 5200 MHz

Other Spurious Emissions

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
17735.38	46.4	H	54.0	-7.6	AVG	0	1.0	
17733.83	46.4	V	54.0	-7.6	AVG	341	1.0	
17733.83	59.0	V	74.0	-15.0	PK	341	1.0	
17735.38	58.8	H	74.0	-15.2	PK	0	1.0	
10387.08	37.8	H	54.0	-16.2	AVG	162	1.0	
15598.72	37.8	H	54.0	-16.2	AVG	265	1.0	
10376.00	37.6	V	54.0	-16.4	AVG	341	1.0	
15591.33	36.9	V	54.0	-17.1	AVG	200	1.0	
10387.08	49.5	H	74.0	-24.5	PK	162	1.0	
15598.72	49.2	H	74.0	-24.8	PK	265	1.0	
10376.00	48.5	V	74.0	-25.5	PK	341	1.0	
15591.33	48.4	V	74.0	-25.6	PK	200	1.0	



EMC Test Data

Client:	Summit Data Communications	Job Number:	J68959
Model:	SDC-CF10AG 802.11a/g Compact Flash Module with Antenna Connectors	T-Log Number:	T69413
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	15.247 / 15.E / RSS-210	Class:	N/A

RSS 210 and FCC 15.247 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: 12/19/2007
Test Engineer: Suhaila Khushzad
Test Location: SVOATS # 2

Config. Used: 1
Config Change: None
EUT Voltage: Powered form Host System

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 approximately 30 meters from the EUT with all I/O connections running on top of the groundplane or routed in overhead in the GR-1089 test configuration.

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

Ambient Conditions:

Temperature:	14.4 °C
Rel. Humidity:	53 %

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
3 (802.11a - 5200 MHz)	RE, 30 - 40000 MHz - Spurious Emissions	RSS-GEN	To be Review	45.7dBμV/m @ 17815.0MHz (-8.3dB)

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.



EMC Test Data

Client:	Summit Data Communications	Job Number:	J68959
Model:	SDC-CF10AG 802.11a/g Compact Flash Module with Antenna Connectors	T-Log Number:	T69413
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	15.247 / 15.E / RSS-210	Class:	N/A

Run # 3: Rx Mode Radiated Spurious Emissions, 30 - 40000 MHz. Operating Mode: 802.11a
Larson PCB Antenna with 3.8 dBi Gain, Data Rate 54 Mbps
Center Channel @ 5200 MHz

Other Spurious Emissions

Frequency	Level	Pol	RSS-GEN		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
17815.00	45.7	V	54.0	-8.3	AVG	271	1.0	
17572.50	45.6	H	54.0	-8.4	AVG	0	1.0	
10369.33	38.8	H	54.0	-15.2	AVG	188	1.0	
10382.17	37.8	V	54.0	-16.2	AVG	126	1.0	
17815.00	57.8	V	74.0	-16.2	PK	271	1.0	
15592.83	36.9	H	54.0	-17.1	AVG	0	1.0	
17572.50	56.8	H	74.0	-17.2	PK	0	1.0	
15602.83	36.7	V	54.0	-17.3	AVG	331	1.0	
10369.33	50.0	H	74.0	-24.0	PK	188	1.0	
10382.17	49.9	V	74.0	-24.1	PK	126	1.0	
15602.83	48.7	V	74.0	-25.3	PK	331	1.0	
15592.83	48.6	H	74.0	-25.4	PK	0	1.0	

Note 1:

EXHIBIT 3: Photographs of Test Configurations

4 Pages

EXHIBIT 4: Proposed FCC ID Label & Label Location

*EXHIBIT 5: Detailed Photographs
of Summit Data Communications Model SDC-CF10AG 802.11a/g Compact Flash
Module with Antenna Connectors Construction*

4 Pages

***EXHIBIT 6: Operator's Manual
for Summit Data Communications Model SDC-CF10AG 802.11a/g Compact Flash
Module with Antenna Connectors***

9 Pages

***EXHIBIT 7: Block Diagram
of Summit Data Communications Model SDC-CF10AG 802.11a/g Compact Flash
Module with Antenna Connectors***

1 Page

***EXHIBIT 8: Schematic Diagrams
for Summit Data Communications Model SDC-CF10AG 802.11a/g Compact Flash
Module with Antenna Connectors***

6 Pages

***EXHIBIT 9: Theory of Operation
for Summit Data Communications Model SDC-CF10AG 802.11a/g Compact Flash
Module with Antenna Connectors***

1 Page

EXHIBIT 10: RF Exposure Information

4 Pages