



Test Certificate

A sample of the following product received on January 4, 2008 and tested on January 4, February 26 and March 19, 2008 complied with the requirements of the following standard(s), given the measurement uncertainties as detailed in Elliott report R71185:

- EN 300 328 V1.7.1 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using wide band modulation techniques; Harmonized EN covering essential requirements under article 3.2 of the R&TTE Directive"

Summit Data Communications Model(s) SDC-CF10AG

Mark Briggs

Mark Briggs
Principal Engineer

Summit Data Communications

Printed Name



Testing Cert #2016-01

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Electromagnetic Compatibility Test Report

EN 300 328 V1.7.1

***ElectroMagnetic Compatibility and Radio spectrum Matters (ERM);
Wideband Transmission Systems;
Data transmission equipment operating in the 2,4 GHz ISM band and
using spread spectrum modulation techniques;***

***Summit Data Communications
Model: SDC-CF10AG***

MANUFACTURER: Summit Data Communications
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Akron, OH 44311

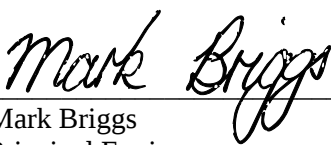
TEST SITE: Elliott Laboratories, Inc.
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REPORT DATE: March 27, 2008

REISSUE DATE: April 22, 2008

FINAL TEST DATE: January 4, February 26 and March 19, 2008

AUTHORIZED SIGNATORY:


Mark Briggs
Principal Engineer



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REVISION HISTORY

Rev #	Date	Comments	Modified By
1	March 31, 2008	Initial Release	Gary Izard
2	April 22, 2008	Reissued report to correct model name	David Guidotti

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SCOPE

The European Committee for Electrotechnical Standardization (CENELEC) and the European Telecommunications Standards Institute (ETSI) publish standards regarding ElectroMagnetic Compatibility and Radio spectrum Matters for radio-communications devices. Tests have been performed on the Summit Data Communications model SDC-CF10AG in accordance with these standards.

Electromagnetic compatibility test data has been taken pursuant to the relevant requirements of the following harmonized EN standard(s) covering essential requirements under article 3.2 of the R&TTE Directive:

- EN 300 328 V1.7.1 “Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband Transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using spread spectrum modulation techniques”

Tests were performed in accordance with these standards together with the current published versions of the basic standards referenced therein as outlined in Elliott Laboratories test procedures. The test data has been provided as an appendix to this report for reference.

The test results recorded herein are based on a single type test of the Summit Data Communications model SDC-CF10AG and therefore apply only to the tested sample. The sample was selected and prepared by Ron Seide of Summit Data Communications.

OBJECTIVE

The objective of the manufacturer is to comply with the harmonized standards identified in the previous section. In the case of most equipment, this document requires testing to other EN specifications.

In order to demonstrate compliance, the manufacturer or a contracted laboratory makes measurements and takes the necessary steps to ensure that the equipment complies with the appropriate technical standards.

STATEMENT OF COMPLIANCE

The tested sample of Summit Data Communications model SDC-CF10AG complied with the relevant requirements of:

EN 300 328 V1.7.1

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

DEVIATIONS FROM THE STANDARD

No deviations were made from the test methods and requirements detailed in the standards listed in this report.

PERFORMANCE ASSESSMENT

The Summit Data Communications model SDC-CF10AG primary function is to provide a WLAN interface (2.4GHz and 5150 – 5250 MHz) to the host devices into which it may be installed. All other characteristics of the product tested are detailed in the remainder of this report.

TEST RESULTS

EN 300 328 V1.7.1 – Digital Modulation

Section	Description	Measured	Limit	Result (Margin)
4.3.1.2	Average Effective Radiated Power (over normal and extreme conditions)	20dBm	100mw (20dBm)	Complies
4.3.2	Peak Power Density ¹	9.1 dBm(eirp) 8.1 mW(eirp)	10 dBm/1MHz	Complies
4.3.3	Frequency Range (over normal and extreme conditions)	2404.26-2479.97 MHz 2402.90-2481.25 MHz	2400 MHz – 2483.5 MHz	Complies
4.3.4	Number of hopping channels	-	Not applicable to digital modulation transmitters	-
4.3.4	Channel separation	-		
4.3.4	Maximum time of occupancy	-		
4.3.5	Medium Access Protocol	Uses 802.11 protocol	-	-
4.3.6	Transmit Mode Spurious Emissions (conducted)	-47.0dBm @ 1861.7MHz	EN 300 328 v1.4.1 Tables 2 and 3	Complies (0.0dB)
4.3.6	Transmit Mode Spurious Emissions (radiated)	All emissions are more than 10dB below the limit	EN 300 328 v1.4.1 Tables 2 and 3	Complies
4.3.7	Stand-By/Receive Mode Spurious Emissions (conducted)	More than 10dB below the limit	EN 300 328 v1.4.1 Tables 4 and 5	Complies
4.3.7	Stand-By/Receive Mode Spurious Emissions (radiated)	-54.7dBm @ 204.8MHz	EN 300 328 v1.4.1 Tables 4 and 5	Complies (-7.7dB)

EXTREME CONDITIONS

Voltage extremes used during testing were those for AC-powered equipment, +/-10% of nominal and were applied to the AC adapter of the test fixture (hand-held PC).

Temperature extremes used during testing were those for equipment intended for Indoor Use only (reference EN 300 328, range of 0°C to +35°C) extended to -10°C to +55°C (taken from AS/NZS 4268)

¹ Does not apply to systems that use frequency hopping modulation.

MEASUREMENT UNCERTAINTIES

ISO Guide 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2) and were calculated in accordance with NAMAS document NIS 81 and M3003.

Measurement Type	Measurement Unit	Frequency Range	Expanded Uncertainty
RF frequency	Hz	25 to 7000 MHz	1.7×10^{-7}
RF power, conducted	dBm	25 to 7000 MHz	± 0.52 dB
Conducted emission of transmitter	dBm	25 to 26500 MHz	± 0.7 dB
Conducted emission of receiver	dBm	25 to 26500 MHz	± 0.7 dB
Radiated emission of transmitter	dBm	25 to 26500 MHz	± 2.5 dB
Radiated emission of receiver	dBm	25 to 26500 MHz	± 2.5 dB

EQUIPMENT UNDER TEST (EUT) DETAILS**GENERAL**

The Summit Data Communications model SDC-CF10AG 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 electrical rating of the EUT is 3.3 VDC +/- 5% . Its typical power consumption is 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 January 4, 2008 and tested on March 11 and March 14, 2008. The EUT consisted of the following component(s):

Manufacturer	Model	Description	Serial Number
Summit Data Communications	SDC-CF10AG	Compact Flash Module	-

OTHER EN 301 893 V1.4.1 PRODUCT INFORMATION

Refer to Appendix C.

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 testing.

SUPPORT EQUIPMENT

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

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

EUT INTERFACE PORTS

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

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

EUT OPERATION

For test purposes the EUT was installed into a test jig. The test jig was comprised of a Compact Flash extender card installed into the compact flash slot of a Hewlett Packard iPAq handheld PC. The PC was used to set the operating channel, mode (transmit or receive) and data rate.

EMISSIONS TEST SITE**GENERAL INFORMATION**

Final test measurements were taken on January 4, February 26 and March 19, 2008 at the Elliott Laboratories Test Site located at 684 West Maude Avenue, Sunnyvale, California. The test sites contain separate areas for radiated and conducted emissions testing. The sites conform to the requirements of CISPR 16-1:1999. They are registered with the VCCI and are on file with the FCC and Industry Canada. Ambient levels are at least 6 dB below the specification limits with the exception of predictable local TV, radio, and mobile communications traffic. Considerable engineering effort has been expended to ensure that the facilities conform to all pertinent requirements.

CONDUCTED EMISSIONS CONSIDERATIONS

Conducted emissions measurements are performed with the EUT's rf input/output connected to the input of a spectrum analyzer. When required an attenuator or dc block is placed between the EUT and the spectrum analyzer.

RADIATED EMISSIONS CONSIDERATIONS

CISPR has determined that radiated measurements made in a shielded enclosure are not suitable for determining levels of radiated emissions. Radiated measurements are performed in an Open Area Test Site or anechoic chamber, as defined in CISPR 16-1 and Annex A of EN 300 328 / EN 301 893 / EN 300 440-1. The test site is maintained free of conductive objects within the CISPR defined elliptical area.

EMISSIONS 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.

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.

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

INSTRUMENT CONTROL COMPUTER

Software control is used to convert the receiver measurements to the field strength at an antenna, 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 exported in a graphic and/or tabular format, as appropriate.

The Spectrum Monitor provides a visual display of the signal being measured. In addition, the controller or a personal computer runs automated data collection programs that 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 EUT antenna port or receiving antenna and the test receiver. This eliminates saturation effects and non-linear operation due to high amplitude transient events.

ANTENNAS

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

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

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

ANTENNA MAST AND EQUIPMENT TURNTABLE

The antennas used to measure the radiated electric field strength are mounted on a non-conductive antenna mast equipped with a motor-drive to vary the antenna height.

The test height above ground for non-body worn devices shall be 150 centimeters. Floor mounted equipment will 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.

RADIO STANDARD TEST PROCEDURES**OUTPUT POWER**

Output power is measured using an average sensor head. If the device is operating with a duty cycle during the measurement the measurement time is set to exceed the on/off duty cycle and the measured value is then corrected by adding a factor of $10 \log(1/\text{duty cycle})$ to the measured value.

Peak power measurements as required by EN 300 328 are measured using a diode detector as detailed in EN 300 328 section 5.7.2.2.

Power density is initially measured as a peak bandwidth (RBW=VBW=1MHz). If the power density is within 3dB of the limit it is re-measured via the IF output of the spectrum analyzer using an average sensor.

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

FREQUENCY RANGE (EN 300 328, 2.4 GHz Band)

Frequency range is measured in accordance with EN 300 328 section 5.7.4.. Typically a bandwidth of 100kHz is used and the lower and upper frequencies at which the transmitted signal exceeds the spurious emission limit, adjusted for the measurement bandwidth, define the frequency range.

CONDUCTED SPURIOUS EMISSIONS

Conducted emissions are measured at the output of the device using a RF cable and attenuator if required. Initial scans are made using a peak detector (RBW=VBW) and using scan rates to ensure that the EUT transmits before the sweep moves out of each resolution bandwidth (for transmit mode).

RADIATED SPURIOUS EMISSIONS

Radiated emissions measurements are performed in two phases. A preliminary scan of emissions is conducted in either an anechoic chamber or on an OATS during which all significant EUT frequencies are identified with the system in a nominal configuration.

At least two scans are performed across the complete frequency range of interest and at each operating frequency identified in the reference standard. One or more of these is with the antenna polarized vertically while the one or more of these is with the antenna polarized horizontally. Initial scans are made using a peak detector (RBW=VBW) and using scan rates to ensure that the EUT transmits before the sweep moves out of each resolution bandwidth (for transmit mode).

During the preliminary scans, the EUT is rotated through 360°, the antenna height is varied and cable positions are varied to determine the highest emission relative to the limit. The limit is a field strength limit derived from the ERP limit specified in the standard(s).

All signals within 10dB of this calculated limit are re-measured on an OATS or Semi-anechoic chamber. The field strength is recorded and the EUT is then replaced with a substitution antenna of known gain (typically a dipole antenna or a double-ridged horn antenna). The erp of the substitution antenna is measured and used to calculate the erp of the EUT as outlined in section C3 of EN 300 328 and EN 301 893.

SAMPLE CALCULATIONS

SAMPLE CALCULATIONS - CONDUCTED SPURIOUS EMISSIONS

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

$$R_r - S = M$$

where:

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

SAMPLE CALCULATIONS - RADIATED SPURIOUS EMISSIONS

Receiver readings are compared directly to a converted specification limit (decibel form).

The conversion uses the effective radiated power limit specified in the standard to calculate the expected field strength in free space using the following formula:

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

where:

- E = Field Strength in V/m
- P = Power in Watts
- G = Gain of antenna in numeric gain¹
- D = distance in meters

The field strength limit is then converted to decibel form (dBuV/m) and the margin of a given emission peak relative to the limit is calculated as follows:

$$M = R_C - L_S$$

where:

- R_C = Corrected Receiver Reading in dBuV/m
- L_S = Calculated specification Limit in dBuV/m
- M = Margin in dB Relative to Spec

When substitution measurements are required (all signals with less than 6dB of margin relative the field strength limit) the margin of the emissions relative to the effective radiated power limit is calculated from:

$$P_S - S = M$$

where:

- P_S = effective radiated power determined from antenna substitution (dBm)
- S = Specification Limit in dBm
- M = Margin to Specification in +/- dB

¹ Although the gain relative to a dipole should be used for limits expressed as an erp, the isotropic gain is used as this produces a more conservative limit.

APPENDIX A: Test Equipment Calibration Data

2 Pages

Radio Antenna Port (Power and Spurious Emissions), 04-Jan-08**Engineer: jcaizzi**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Elliott Laboratories	Biconical Antenna, 30-300 MHz	EL30.300	54	26-Mar-08
Elliott Laboratories	Log Periodic Antenna 300-1000 MHz	EL300.1000	55	25-Jan-08
Hewlett Packard	EMC Spectrum Analyzer, 9 KHz-26.5 GHz	8593EM	1141	29-Nov-08
Hewlett Packard	Head (Inc W1-W4, 1143, 1144) Red	84125C	1145	16-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
Hewlett Packard	Microwave Preamplifier 0.5-26.5 GHz	83017A	1257	08-Jan-09
EMCO	Antenna, Horn, 1-18 GHz	3117	1662	21-Mar-08
Hewlett Packard	Preamplifier	8447D OPT 010	1826	25-May-08

Radiated Emissions, 30 - 26,500 MHz, 07-Jan-08**Engineer: jcaizzi**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Elliott Laboratories	Biconical Antenna, 30-300 MHz	EL30.300	54	26-Mar-08
Elliott Laboratories	Log Periodic Antenna 300-1000 MHz	EL300.1000	55	25-Jan-08
Hewlett Packard	EMC Spectrum Analyzer, 9 KHz-26.5 GHz	8593EM	1141	29-Nov-08
Hewlett Packard	Microwave Preamplifier 0.5-26.5 GHz	83017A	1257	29-Nov-08
EMCO	Antenna, Horn, 1-18 GHz	3117	1662	21-Mar-08
Hewlett Packard	Preamplifier	8447D OPT 010	1826	25-May-08

Radio Spurious Emissions, 21-Jan-08**Engineer: SuhailaKhushzad**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Elliott Laboratories	Log Periodic Antenna 300-1000 MHz	EL300.1000	55	25-Jan-08
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
EMCO	Log Periodic Antenna, 0.2-1 GHz	3146	1294	28-Aug-08
Rohde & Schwarz	Test Receiver, 9 kHz-2750 MHz	ESCS 30	1337	21-Sep-08
EMCO	Biconical Antenna, 30-300 MHz	3110B	1498	20-Mar-08
EMCO	Antenna, Horn, 1-18 GHz	3117	1662	21-Mar-08

Radiated Emissions, 30 - 26,500 MHz, 24-Jan-08**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	785	29-May-08
Rohde & Schwarz	Power Meter, Single Channel	NRVS	1290	12-Jul-08
EMCO	Antenna, Horn, 1-18 GHz (SA40-Blu)	3115	1386	11-Jul-08
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	1548	12-Apr-08
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	1549	23-May-09
EMCO	Antenna, Horn, 1-18 GHz	3115	1561	10-May-08
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1630	25-Jan-08
Com-Power Corp.	Preamplifier, 30-1000 MHz	PA-103	1632	25-May-08
Anritsu	Signal Generator, 100MHz-20GHz	68347C	1785	N/A
Rohde & Schwarz	Power Sensor 100 uW - 10 Watts	NRV-Z53	1796	12-Feb-08

Radiated Emissions, 30 - 26,500MHz, 11-Mar-08**Engineer: Mehran Birgani**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Elliott Laboratories	Biconical Antenna, 30-300 MHz	EL30.300	54	26-Mar-08
EMCO	Log Periodic Antenna, 0.3-1 GHz	3146A	364	13-Dec-08
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	870	08-Nov-08
Hewlett Packard	EMC Spectrum Analyzer, 9 KHz-26.5 GHz	8593EM	1141	29-Nov-08
Hewlett Packard	Preamplifier, 100 kHz - 1.3 GHz	8447D OPT 010	1826	25-May-08

Radiated Emissions, 30 - 26,500MHz, 11-Mar-08**Engineer: Mehran Birgani**

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Elliott Laboratories	Biconical Antenna, 30-300 MHz	EL30.300	54	26-Mar-08
EMCO	Log Periodic Antenna, 0.3-1 GHz	3146A	364	13-Dec-08
Rohde & Schwarz	Power Meter, Dual Channel	NRVD	1071	11-Jun-08

Rohde & Schwarz	Test Receiver, 0.009-2750 MHz	ESN	1332	29-Jan-09
EMCO	Log Periodic Antenna, 0.2-2 GHz	3148	1404	30-Mar-08
EMCO	Biconical Antenna, 30-300 MHz	3110B	1497	03-Jul-08
Rohde & Schwarz	Power Sensor, 1 nW-20 mW, 10 MHz-18 GHz, 50ohms	NRV-Z1	1798	21-Aug-08

Environmental Test, 14-Mar-08

Engineer: Mehran Birgani

<u>Manufacturer</u>	<u>Description</u>	<u>Model #</u>	<u>Asset #</u>	<u>Cal Due</u>
Hewlett Packard	Spectrum Analyzer 30 Hz -40 GHz, SV (SA40) Red	8564E (84125C)	1148	24-Aug-08
Rohde & Schwarz	Power Meter, Dual Channel	NRVD	1539	21-Aug-08
Rohde & Schwarz	Power Sensor, 1 uW-100 mW, DC-18 GHz, 50ohms	NRV-Z51	1797	21-Aug-08

APPENDIX B: Test Data Log Sheets

ELECTROMAGNETIC COMPATABILITY

TEST LOGS

T70349 24 Pages



EMC Test Data

Client:	Summit Data Corp	Job Number:	J68959
Model:	SDC-CF10AG	T-Log Number:	T70349
		Account Manager:	Dean Eriksen
Contact:	Ron Seide		-
Emissions Standard(s):	EN 300 328, EN 301 893	Class:	-
Immunity Standard(s):	-	Environment:	-

EMC Test Data

For The

Summit Data Corp

Model

SDC-CF10AG

Date of Last Test: 3/14/2008



EMC Test Data

Client:	Summit Data Corp	Job Number:	J68959
Model:	SDC-CF10AG	T-Log Number:	T70349
		Account Manger:	Dean Eriksen
Contact:	Ron Seide		
Emissions Standard(s):	EN 300 328, EN 301 893	Class:	-
Immunity Standard(s):	-	Environment:	-

EUT INFORMATION

*The following information was collected during the test session(s).
The client agreed to provide the following information after the test session(s).*

General Description

The Summit Data Communications model SDC-CF10AG 802.11 a/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 electrical rating of the EUT is 3.3 VDC +/- 5% . Its typical power consumption is 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	Compact Flash Module	-	TWG-SDCCF10AG

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.

Modification History

Mod. #	Test	Date	Modification
1	-	-	None made

Modifications applied are assumed to be used on subsequent tests unless otherwise stated as a further modification.



EMC Test Data

Client:	Summit Data Corp	Job Number:	J68959
Model:	SDC-CF10AG	T-Log Number:	T70349
		Account Manger:	Dean Eriksen
Contact:	Ron Seide		
Emissions Standard(s):	EN 300 328, EN 301 893	Class:	-
Immunity Standard(s):	-	Environment:	-

Test Configuration #1

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

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

For test purposes the EUT was installed into a test jog. The test jig was comprised of a Compact Flash extender card installed into the compact flash slot of a Hewlett Packard iPAq handheld PC. The PC was used to set the operating channel, mode (transmit or receive) and data rate.

Client:	Summit Data Corp	Job Number:	J68959
Model:	SDC-CF10AG	T-Log Number:	T70349
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	EN 300 328, EN 301 893	Class:	N/A

Radio Performance Test - EN 300 328

RF Port Measurements

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: 2/26/2008
 Test Engineer: Mehran Birgani
 Test Location: Environmental Chamber

Config. Used: 1
 Config Change: None
 Host Unit Voltage 230V/50Hz

General Test Configuration

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

Ambient Conditions:

Temperature: 19 °C
 Rel. Humidity: 55 %

Summary of Results

Run #	Test Performed	Limit	Result	Value / Margin
1	Power spectral density at normal conditions	EN 300 328	Pass	9.1 dBm(eirp) 8.1 mW(eirp)
2	Output Power over extreme conditions	EN 300 328	Pass	20.0 dBm(eirp) 100.0 mW(eirp)
2	Frequency Range over extreme conditions	EN 300 328	Pass	2404.26-2479.97 MHz 2402.90-2481.25 MHz
3	Transmitter spurious emissions 30MHz-12,750MHz (rf port)	EN 300 328	TBD	-47.0dBm @ 1861.7MHz (0.0dB)
3	Receiver spurious emissions 30MHz-12,750MHz (rf port)	EN 300 328	Pass	More than 10dB below the limit

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Note - Data revised on 2/22/08 to reflect maximum antenna gain

Note - Drive revision V2.00.37, SCU revision V2.00.34 and BG mode set to 96%

Client:	Summit Data Corp	Job Number:	J68959
Model:	SDC-CF10AG	T-Log Number:	T70349
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	EN 300 328, EN 301 893	Class:	N/A

Normal and Extreme Operating Conditions:
Test Notes

Voltage extremes:

X	Voltage extremes for AC-powered equipment +/-10% of nominal (nominal/normal voltage defined as 230 V)
	Voltage extremes for Lead-Acid Battery 1.3 and 0.9 times nominal
	Voltage extremes for Leclanché or lithium type battery: 0.85 and 1.15 times the nominal voltage of the battery
	Voltage extremes for Mercury or nickel-cadmium type of battery: 0.9 times and 1.15 times the nominal voltage of the battery

Temperature extremes:

	-20°C to +55°C (Limits for unrestricted use taken from EN 300 328 / EN 300 220)
	0°C to +35°C (Limits for indoor use taken from EN 300 328 / EN 300 220)
X	-10°C to +55°C (taken from AS/NZS 4268)

Run #1: Power Measurements - Spread spectrum (Digital Modulation)

Initial measurements made on the center channel to determine the data rate with the highest output power. All final measurements made with device operating at the highest power level.

8021.11b

Rate	Setting	Pmeas	Duty Cycle	Pout
1	Max	18.1	0.98	18.187739
11	Max	16.8	0.75	18.049387

Setting: software power setting of EUT

Pmeas: Measured output power (average)

Duty Cycle: Duty cycle of transmissions (1 = 100%)

8021.11g

Rate	Setting	Pmeas	Duty Cycle	Pout
6	Max	16.6	0.93	16.915171
54	Max	14.1	0.59	16.39148

Client:	Summit Data Corp	Job Number:	J68959
Model:	SDC-CF10AG	T-Log Number:	T70349
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	EN 300 328, EN 301 893	Class:	N/A

Run #1: Power Measurements - Spread spectrum (Digital Modulation)
Average Power¹ under normal and extreme operating conditions

Power Setting	Channel / Mode	Average Power (dBm) ¹ For Operating Condition					Max Antenna Gain ³	Duty Cycle ⁴	Max Average Power (EIRP) ⁵	Maximum permitted EIRP (dBm)
		Normal 20°C 230.0 V	Extreme		55°C					
			-10°C							
			207.0 V	253.0 V	207.0 V	253.0 V				
0.96	#1b	16.3	17.6	17.6	15.9	15.9	2.2	0.97	19.9	20.0
0.96	#6b	16.4	17.5	17.6	15.8	15.8	2.2	0.97	19.9	20.0
0.96	#13b	16.4	17.6	17.7	16.0	16.0	2.2	0.97	20.0	20.0
0.96	#1g	14.1	15.2	15.2	13.6	13.7	2.2	0.93	17.7	20.0
0.96	#6g	14.4	15.6	15.7	15.8	15.9	2.2	0.93	18.4	20.0
0.96	#13g	14.9	15.0	15.0	13.8	13.9	2.2	0.93	17.5	20.0

Power spectral Density (normal operating conditions)

Power Setting	Channel	Frequency	PSD ²	Gain ³	Duty	EIRP ⁵	PSD	
		MHz	dBm	dBi	Cycle ⁴	PSD	Limit	Margin
0.96	#1b	2409.375	6.1	2.2	0.97	8.4	10.0	-1.6
0.96	#6b	2434.313	6.7	2.2	0.97	9.1	10.0	-0.9
0.96	#13b	2469.375	6.1	2.2	0.97	8.4	10.0	-1.6
0.96	#1g	2413.313	2.5	2.2	0.93	5.0	10.0	-5.0
0.96	#6g	2438.375	3.2	2.2	0.93	5.7	10.0	-4.3
0.96	#13g	2477.063	2.7	2.2	0.93	5.2	10.0	-4.8

Note 1:	Average Power measured using a wideband, calibrated RF power meter with a thermocouple detector (or an equivalent thereof).
Note 2:	PSD measured using a thermocouple detector (or an equivalent thereof) connected to the IF output of the spectrum analyzer, with the analyzer set to positive peak detector with RB=VB= 1MHz for digital modulation and RB=VB= 100kHz for FHSS.
Note 3:	Gain is the maximum gain of the antenna assembly that can be used with the EUT at this power level.
Note 4:	Duty Cycle - the duty cycle of the transmitter during the power measurement [time on /(time off + time on)]. Measured using diode detector and oscilloscope or directly from the analyzer.
Note 5:	EIRP levels are the measured levels corrected for duty cycle [10log(duty cycle)] and EUT antenna gain.

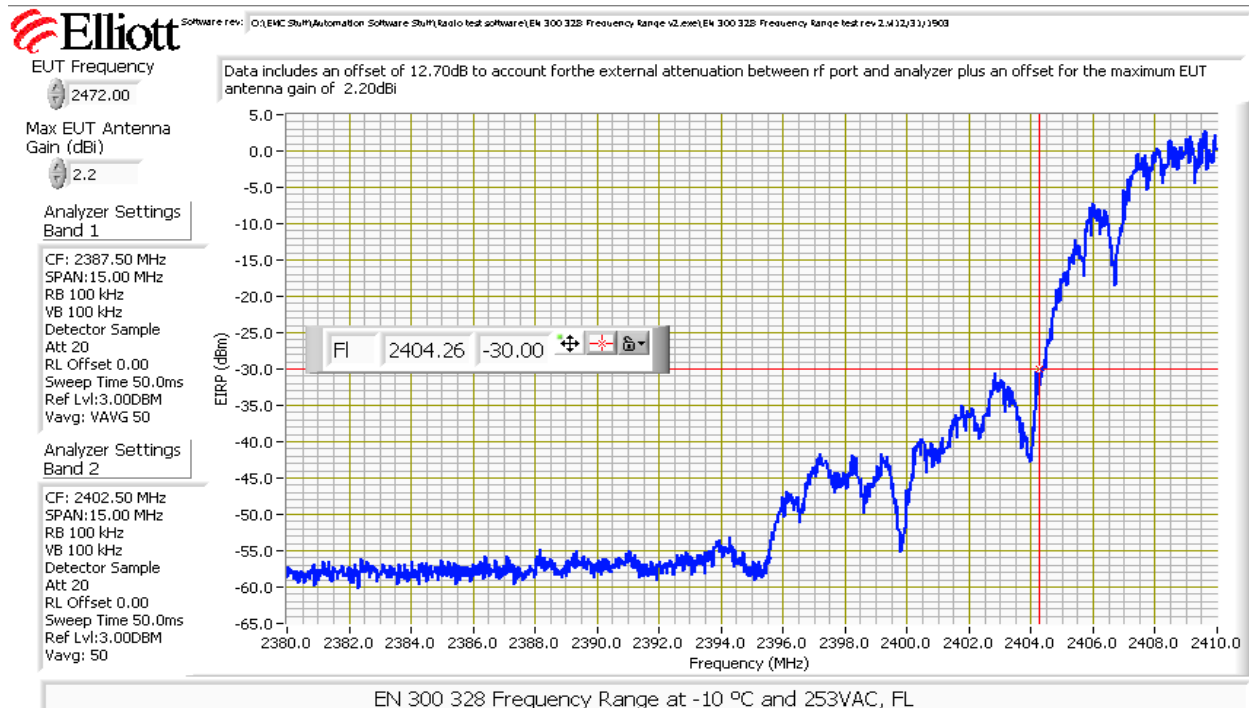
Client:	Summit Data Corp	Job Number:	J68959
Model:	SDC-CF10AG	T-Log Number:	T70349
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	EN 300 328, EN 301 893	Class:	N/A

Run #2: Frequency Range Under Normal and Extreme Conditions - EN 300 328

	Mode	Antenna Gain	Power Setting	Measured Frequency (MHz) For Operating Condition					Low F _L High F _H	Resultt
				Normal 20°C 230.0 V	Extreme					
					-10°C 207.0 V	253.0 V	207.0 V	253.0 V		
F _L (MHz)	b	2.20	0.96	2404.43	2404.31	2404.26	2404.53	2404.55	2404.26	PASS
F _H (MHz)	b	2.20	0.96	2479.87	2479.97	2479.95	2479.78	2479.78	2479.97	PASS
F _L (MHz)	g	2.20	0.96	2402.97	2402.90	2403.18	2403.20	2403.09	2402.90	PASS
F _H (MHz)	g	2.20	0.96	2481.10	2481.25	2481.13	2480.85	2480.80	2481.25	PASS

F_L and F_H are the lowest and highest frequencies above the spurious emission limit of -30dBm/100kHz eirp for the operating mode (data rate and modulation) that produced the widest frequency range.

If the device meets the frequency range requirements at the highest power setting and with the highest gain antenna then no further tests are required. If it does not then tests are made for each power setting using the highest gain that can be used with each power setting.



Client: Summit Data Corp	Job Number: J68959
Model: SDC-CF10AG	T-Log Number: T70349
Contact: Ron Seide	Account Manager: Dean Eriksen
Standard: EN 300 328, EN 301 893	Class: N/A



Software rev: C:\EMC\Shuff\Automation Software\Shuff\Radio test software\EN 300 328 Frequency Range v2.exe\EN 300 328 Frequency Range test rev 2.0\12\31\1903

EUT Frequency

2472.00

Max EUT Antenna
Gain (dBi)

2.2

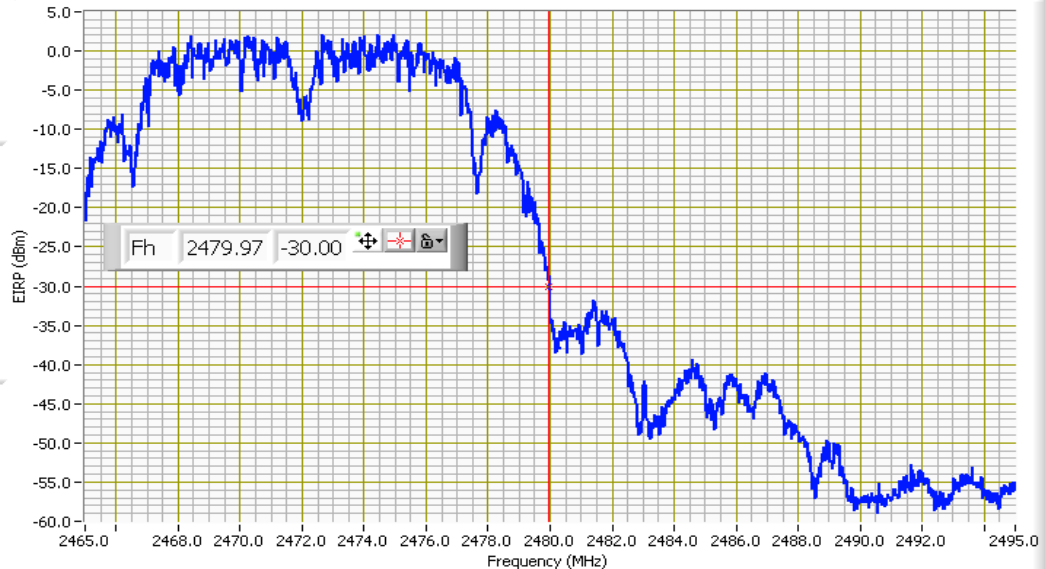
Analyzer Settings
Band 1

CF: 2472.50 MHz
SPAN: 15.00 MHz
RB 100 kHz
VB 100 kHz
Detector Sample
Att 20
RL Offset 0.00
Sweep Time 50.0ms
Ref Lvl: 3.00DBM
Vavg: VAVG 50

Analyzer Settings
Band 2

CF: 2487.50 MHz
SPAN: 15.00 MHz
RB 100 kHz
VB 100 kHz
Detector Sample
Att 20
RL Offset 0.00
Sweep Time 50.0ms
Ref Lvl: 3.00DBM
Vavg: 50

Data includes an offset of 12.70dB to account for the external attenuation between rf port and analyzer plus an offset for the maximum EUT antenna gain of 2.20dBi



Software rev: C:\EMC\Shuff\Automation Software\Shuff\Radio test software\EN 300 328 Frequency Range v2.exe\EN 300 328 Frequency Range test rev 2.0\12\31\1903

EUT Frequency

2412.00

Max EUT Antenna
Gain (dBi)

2.2

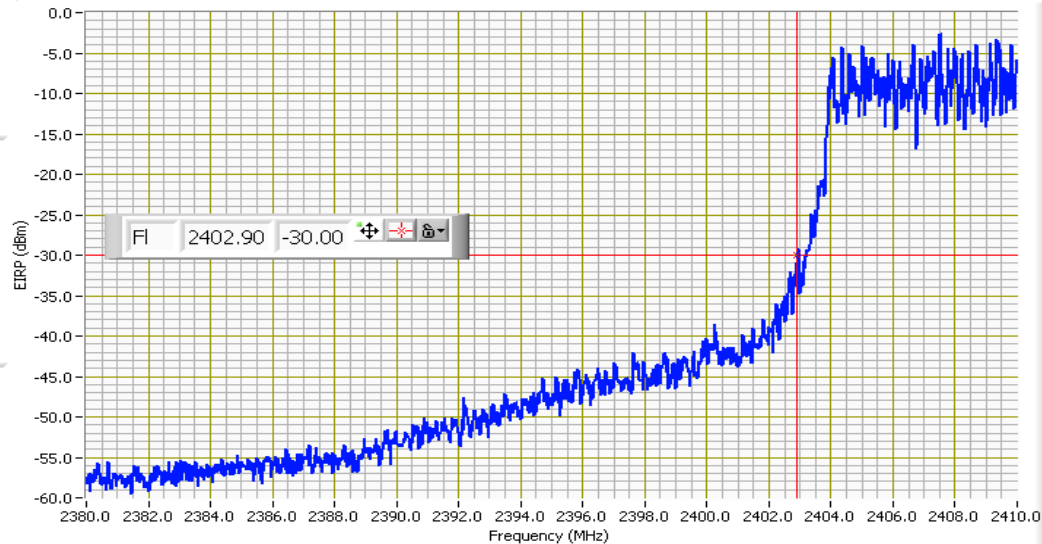
Analyzer Settings
Band 1

CF: 2387.50 MHz
SPAN: 15.00 MHz
RB 100 kHz
VB 100 kHz
Detector Sample
Att 20
RL Offset 0.00
Sweep Time 50.0ms
Ref Lvl: 3.00DBM
Vavg: VAVG 50

Analyzer Settings
Band 2

CF: 2402.50 MHz
SPAN: 15.00 MHz
RB 100 kHz
VB 100 kHz
Detector Sample
Att 20
RL Offset 0.00
Sweep Time 50.0ms
Ref Lvl: 3.00DBM
Vavg: 50

Data includes an offset of 12.70dB to account for the external attenuation between rf port and analyzer plus an offset for the maximum EUT antenna gain of 2.20dBi



Client:	Summit Data Corp	Job Number:	J68959
Model:	SDC-CF10AG	T-Log Number:	T70349
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	EN 300 328, EN 301 893	Class:	N/A



Software rev: C:\EMC Stuff\Automation Software Stuff\Radio test software\Ek 300 328 Frequency Range v2.eme\Ek 300 328 Frequency Range test rev 2.0\12\31\1903

EUT Frequency

2472.00

Max EUT Antenna
Gain (dBi)

2.2

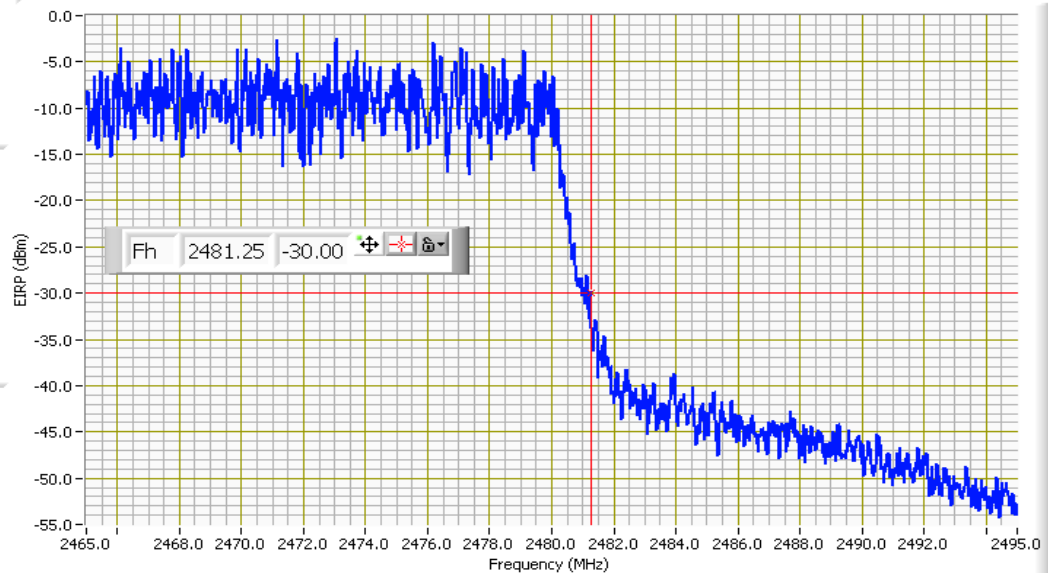
Analyzer Settings
Band 1

CF: 2472.50 MHz
SPAN: 15.00 MHz
RB 100 kHz
VB 100 kHz
Detector Sample
Att 20
RL Offset 0.00
Sweep Time 50.0ms
Ref Lvl: 3.00DBM
Vavg: VAVG 50

Analyzer Settings
Band 2

CF: 2487.50 MHz
SPAN: 15.00 MHz
RB 100 kHz
VB 100 kHz
Detector Sample
Att 20
RL Offset 0.00
Sweep Time 50.0ms
Ref Lvl: 3.00DBM
Vavg: 50

Data includes an offset of 12.70dB to account for the external attenuation between rf port and analyzer plus an offset for the maximum EUT antenna gain of 2.20dBi

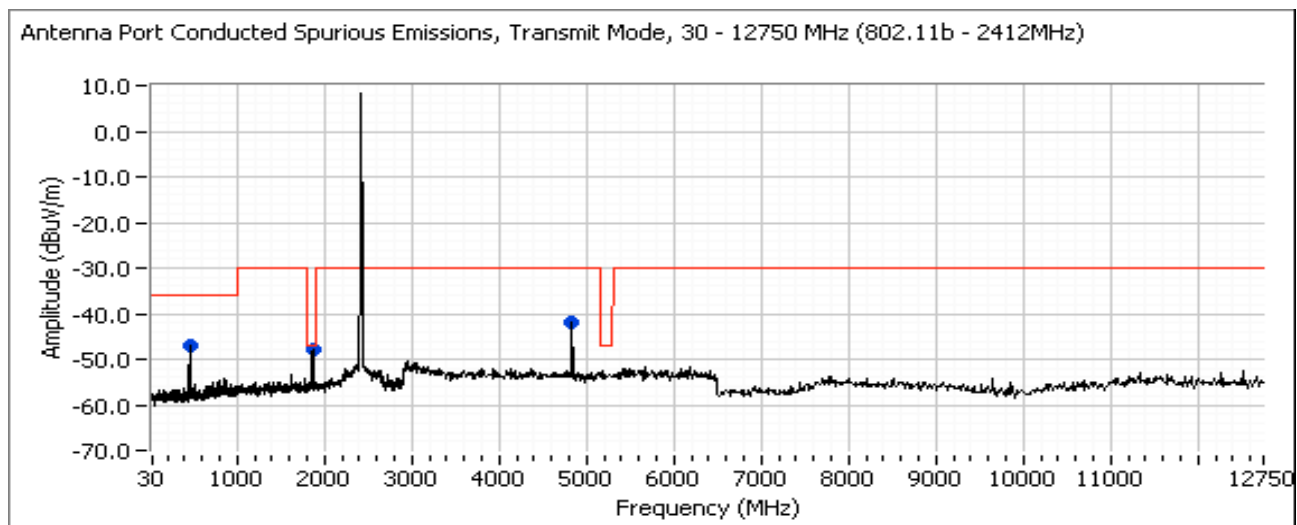


EN 300 328 Frequency Range at -10 °C and 207VAC, FH

Client:	Summit Data Corp	Job Number:	J68959
Model:	SDC-CF10AG	T-Log Number:	T70349
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	EN 300 328, EN 301 893	Class:	N/A

Run #3: Antenna Port Conducted Spurious Emissions, Transmit Mode, 30 - 12750 MHz

Run #3a: Transmit Mode, 802.11b at 2412 MHz

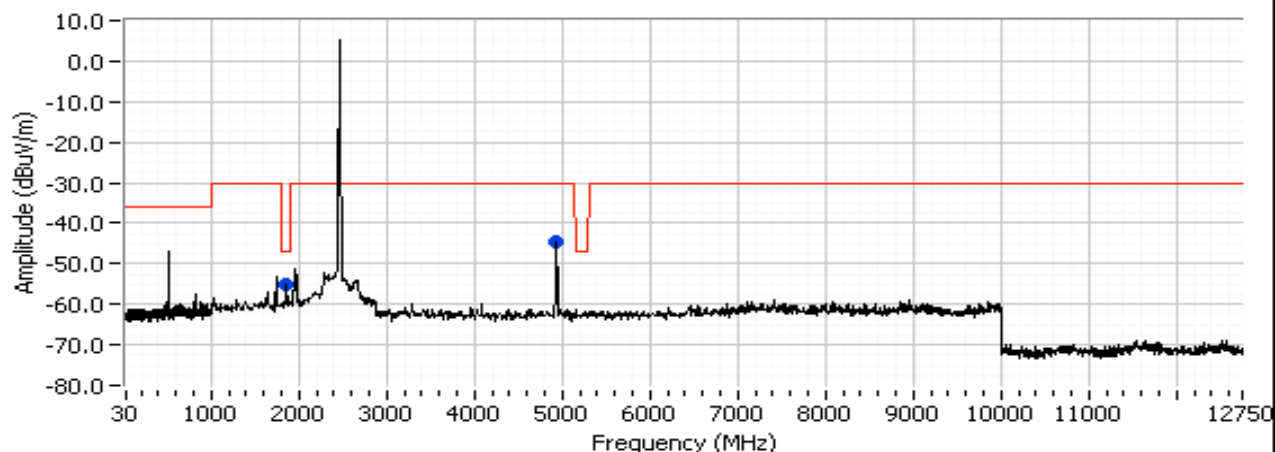


Frequency MHz	Level dBm	Port	EN 300 328		Detector	Channel	Mode	Comments
			Limit	Margin				
454.375	-47.1	RF Port	-36.0	-11.1	Peak	1	b	
1864.500	-47.9	RF Port	-47.0	-0.9	Peak	1	b	
4835.000	-42.0	RF Port	-30.0	-12.0	Peak	1	b	

Client:	Summit Data Corp	Job Number:	J68959
Model:	SDC-CF10AG	T-Log Number:	T70349
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	EN 300 328, EN 301 893	Class:	N/A

Run #3b: Transmit Mode, 802.11b at 2472 MHz

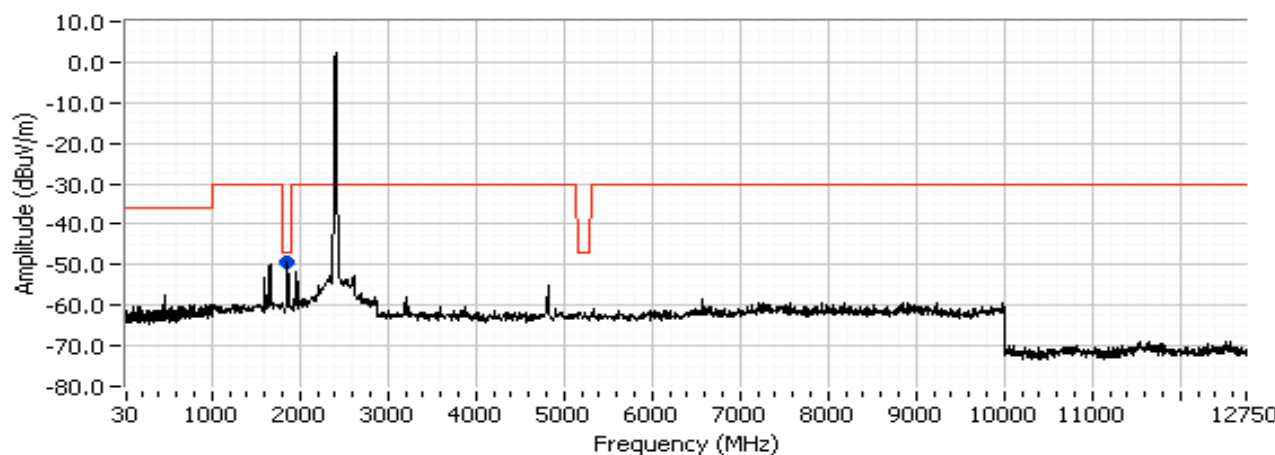
Antenna Port Conducted Spurious Emissions, Transmit Mode, 30 - 12750 MHz (802.11b - 2472MHz)



Frequency MHz	Level dBm	Port	EN 300 328 Limit	EN 300 328 Margin	Detector	Channel	Mode	Comments
1861.670	-55.0	RF Port	-47.0	-8.0	Peak	13	b	
4932.500	-44.8	RF Port	-30.0	-14.8	Peak	13	b	

Run #3c: Transmit Mode, 802.11g at 2412 MHz

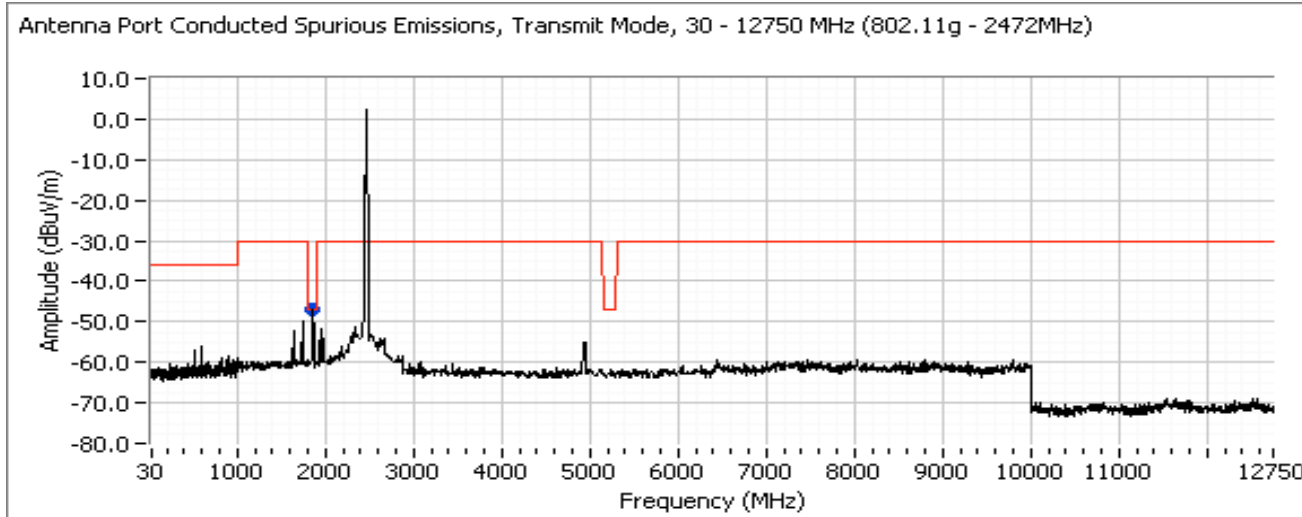
Antenna Port Conducted Spurious Emissions, Transmit Mode, 30 - 12750 MHz (802.11g - 2412MHz)



Frequency MHz	Level dBm	Port	EN 300 328 Limit	EN 300 328 Margin	Detector	Channel	Mode	Comments
1861.670	-49.0	RF Port	-47.0	-2.0	Peak	1	g	

Client:	Summit Data Corp	Job Number:	J68959
Model:	SDC-CF10AG	T-Log Number:	T70349
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	EN 300 328, EN 301 893	Class:	N/A

Run #3d: Transmit Mode, 802.11g at 2472 MHz

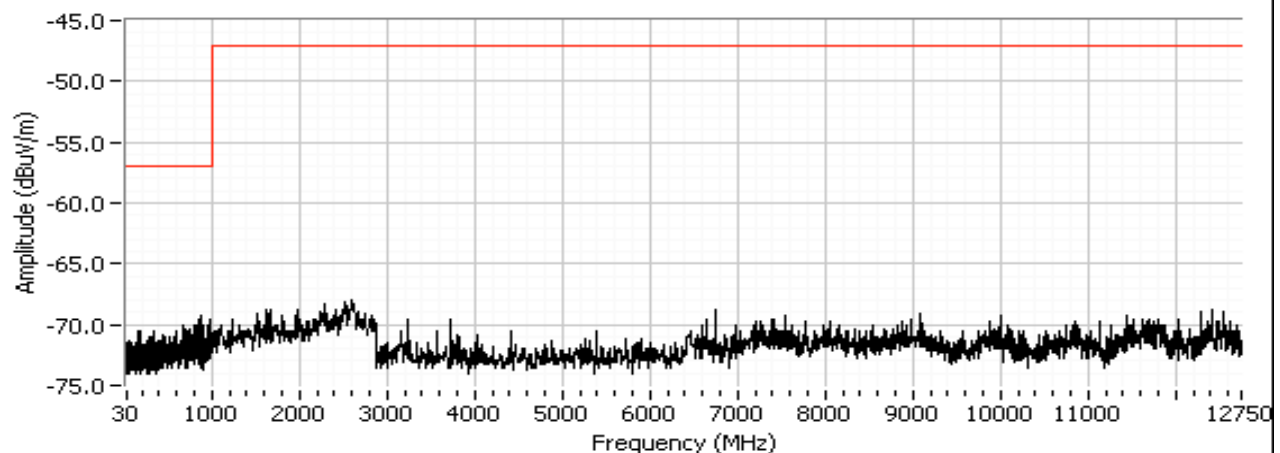


Frequency MHz	Level dBm	Port	EN 300 328		Detector	Channel	Mode	Comments
			Limit	Margin				
1861.670	-47.0	RF Port	-47.0	0.0	Peak	13	g	

Client:	Summit Data Corp	Job Number:	J68959
Model:	SDC-CF10AG	T-Log Number:	T70349
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	EN 300 328, EN 301 893	Class:	N/A

Run #4: Antenna Port Conducted Spurious Emissions, Receive Mode, 30 - 12,750 MHz
Run #4a: Receive Mode, 802.11b at 2412 MHz

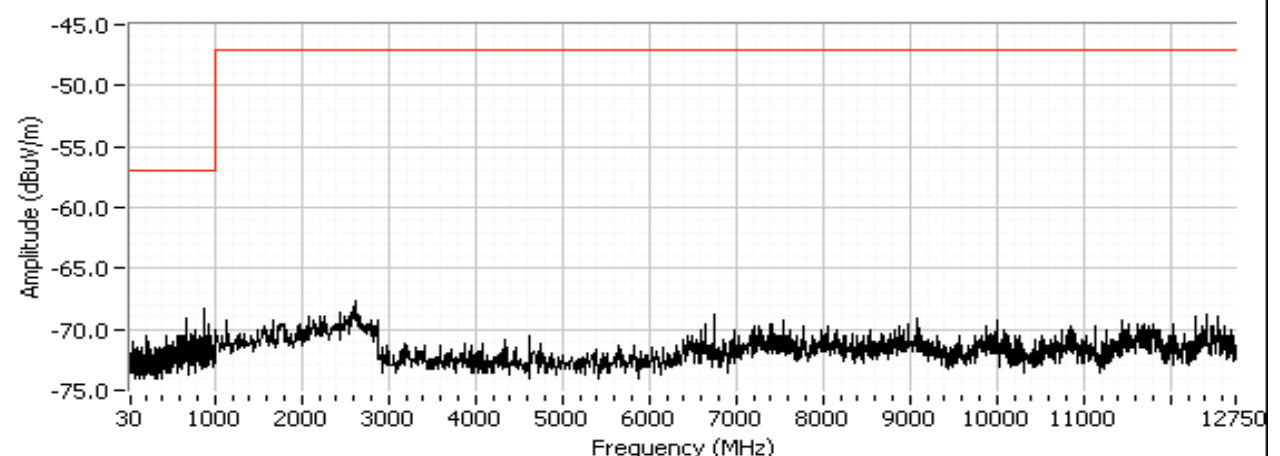
Antenna Port Conducted Spurious Emissions, Receive Mode, 30 - 12750 MHz (802.11b - 2412MHz)



Frequency MHz	Level dBm	Port	EN 300 328 Limit	Margin	Detector	Channel	Mode	Comments
All signals are more than 10dB below the limit								

Run #4b: Receive Mode, 802.11b at 2472 MHz

Antenna Port Conducted Spurious Emissions, Receive Mode, 30 - 12750 MHz (802.11b - 2472MHz)

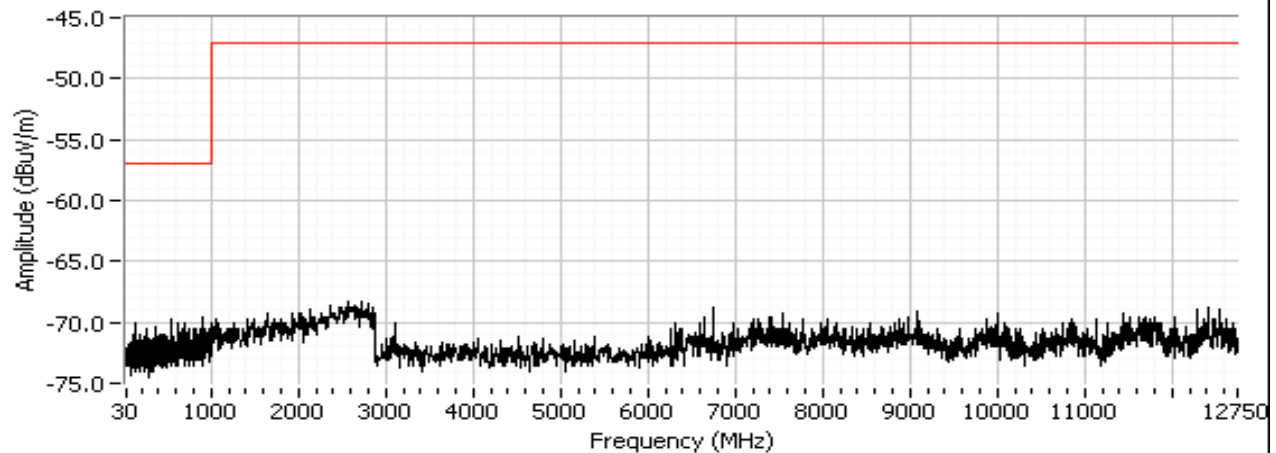


Frequency MHz	Level dBm	Port	EN 300 328 Limit	Margin	Detector	Channel	Mode	Comments
All signals are more than 10dB below the limit								

Client:	Summit Data Corp	Job Number:	J68959
Model:	SDC-CF10AG	T-Log Number:	T70349
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	EN 300 328, EN 301 893	Class:	N/A

Run #4c: Receive Mode, 802.11g at 2412 MHz

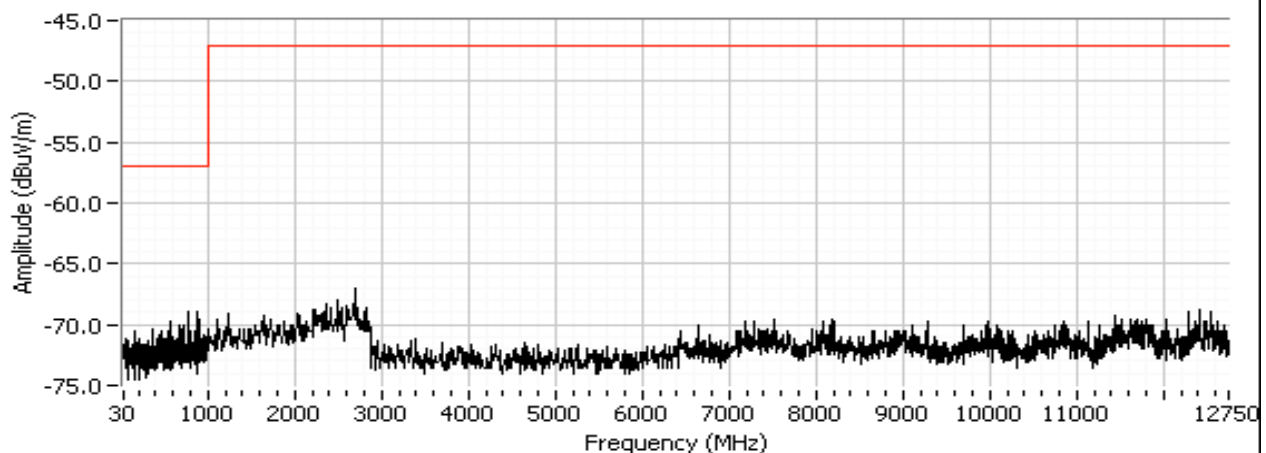
Antenna Port Conducted Spurious Emissions, Receive Mode, 30 - 12750 MHz (802.11g - 2412MHz)



Frequency MHz	Level dBm	Port	EN 300 328 Limit	Margin	Detector	Channel	Mode	Comments
All signals are more than 10dB below the limit								

Run #4d: Receive Mode, 802.11g at 2472 MHz

Antenna Port Conducted Spurious Emissions, Receive Mode, 30 - 12750 MHz (802.11g - 2472MHz)



Frequency MHz	Level dBm	Port	EN 300 328 Limit	Margin	Detector	Channel	Mode	Comments
All signals are more than 10dB below the limit								

Client:	Summit Data Corp	Job Number:	J68959
Model:	SDC-CF10AG	T-Log Number:	T70349
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	EN 300 328, EN 301 893	Class:	N/A

Radiated Spurious Emissions, EN 300 328

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: 1/4/2008

Config. Used: 1

Test Engineer: John Caizzi

Config Change: None

Test Location: Chamber #2

EUT Host Voltage: 230V/ 50Hz

General Test Configuration

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

The measurement antenna was located 3 meters from the EUT.

Ambient Conditions: Temperature: 20 °C
Rel. Humidity: 61 %

Summary of Results

Run #	Test Performed	Limit	Pass / Fail	Result / Margin
2	Spurious Emissions Transmit Mode, 30 - 12750 MHz	EN 300 328	Pass	All emissions are more than 10dB below the limit
4	Spurious Emissions Receive/Stand-By Mode 30 - 12750 MHz	EN 300 328	Pass	-54.7dBm @ 204.8MHz (-7.7dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

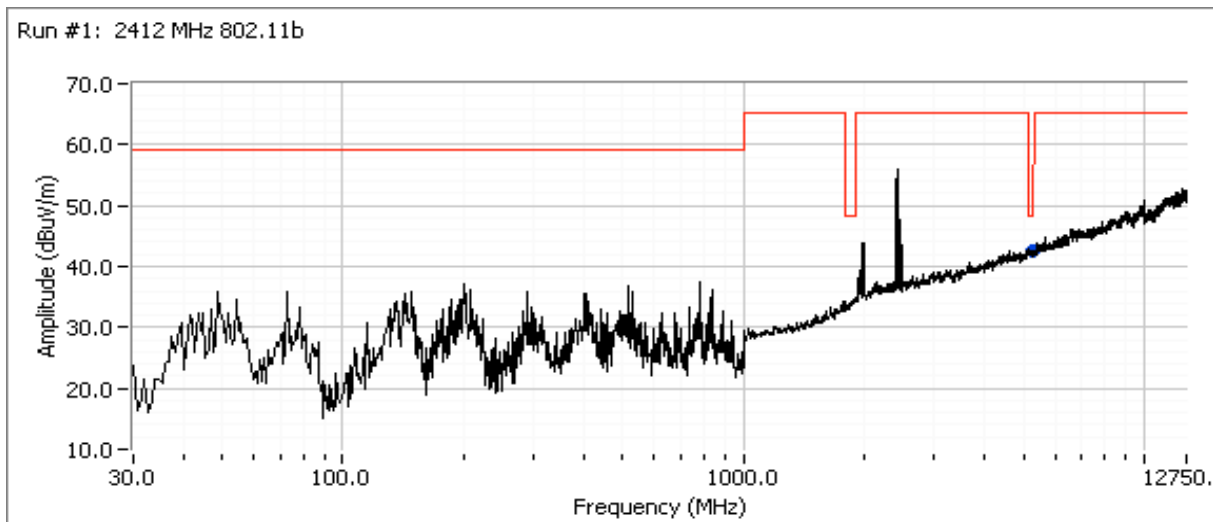
Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Summit Data Corp	Job Number:	J68959
Model:	SDC-CF10AG	T-Log Number:	T70349
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	EN 300 328, EN 301 893	Class:	N/A

Run #1: Radiated Spurious Emissions, Transmit Mode, 30 - 12,750 MHz
Measurements made at 3m

Run #1a: EUT @ 2412 MHz, 802.11b.

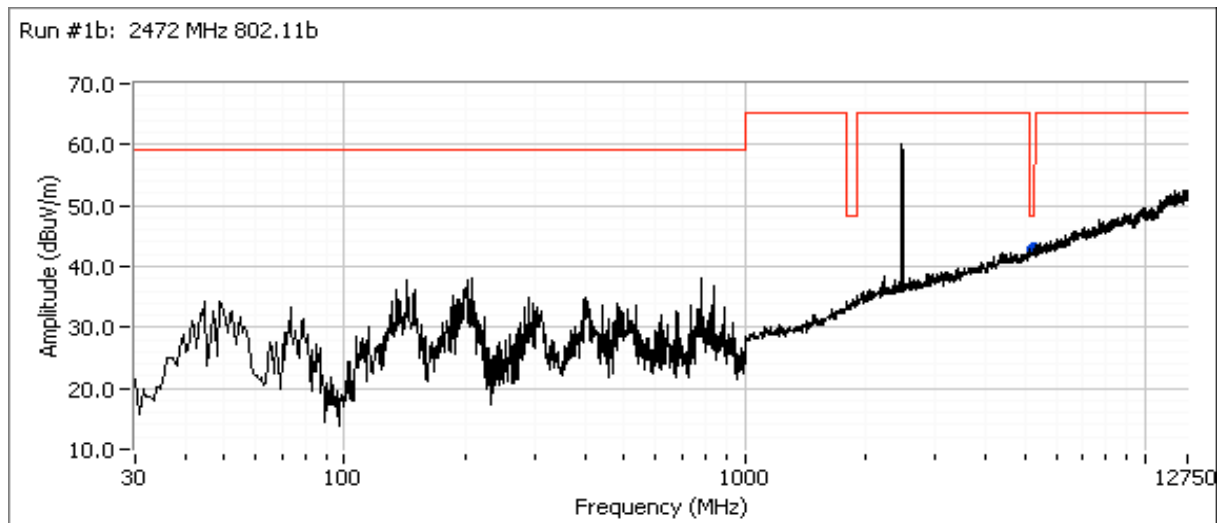


Frequency	Level	Pol	EN 300 328 ^{Note 1}		Detector	Azimuth	Height	Comments
MHz	dBuV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5249.000	42.6	V	48.3	-5.7	Peak	214	1.7	Noise floor

Note - no EUT signal observed at 52495 MHz.

Note 1: The field strength limit in the tables above was calculated from the erp/eirp limit detailed in the standard using the free space propagation equation: $E = \sqrt{(30PG)/d}$. This limit is conservative - it does not consider the presence of the ground plane and, for erp limits, the dipole gain (2.2dBi) has not been included. The erp or eirp for all signals with less than 10dB of margin relative to this field strength limit is determined using substitution measurements.

Client:	Summit Data Corp	Job Number:	J68959
Model:	SDC-CF10AG	T-Log Number:	T70349
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	EN 300 328, EN 301 893	Class:	N/A

Run #1b: EUT @ 2472 MHz, 802.11b.


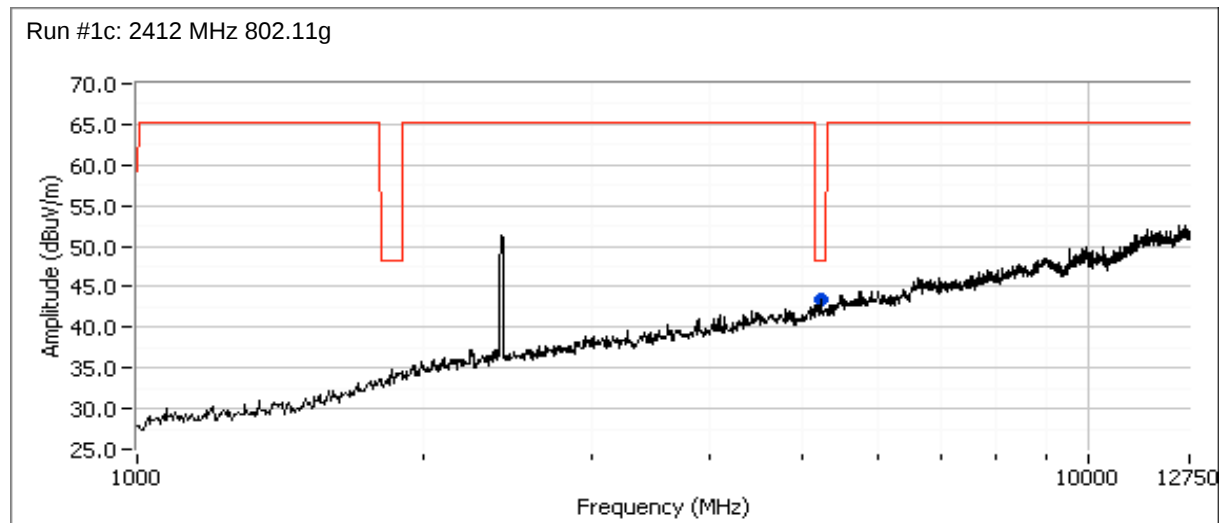
Frequency	Level	Pol	EN 300 328 ^{Note 1}		Detector	Azimuth	Height	Comments
MHz	dBuV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5285.000	42.9	H	48.3	-5.4	Peak	167	1.7	Noise floor

Note - no EUT signal observed at 5285 MHz.

Note 1:	The field strength limit in the tables above was calculated from the erp/eirp limit detailed in the standard using the free space propagation equation: $E = \sqrt{(30PG)/d}$. This limit is conservative - it does not consider the presence of the ground plane and, for erp limits, the dipole gain (2.2dBi) has not been included. The erp or eirp for all signals with less than 10dB of margin relative to this field strength limit is determined using substitution measurements.
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Client:	Summit Data Corp	Job Number:	J68959
Model:	SDC-CF10AG	T-Log Number:	T70349
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	EN 300 328, EN 301 893	Class:	N/A

Run #1c: EUT @ 2412 MHz, 802.11g.



Frequency	Level	Pol	EN 300 328 ^{Note 1}		Detector	Azimuth	Height	Comments
MHz	dBuV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5231.000	43.4	V	48.3	-4.9	Peak	186	1.7	Noise Floor

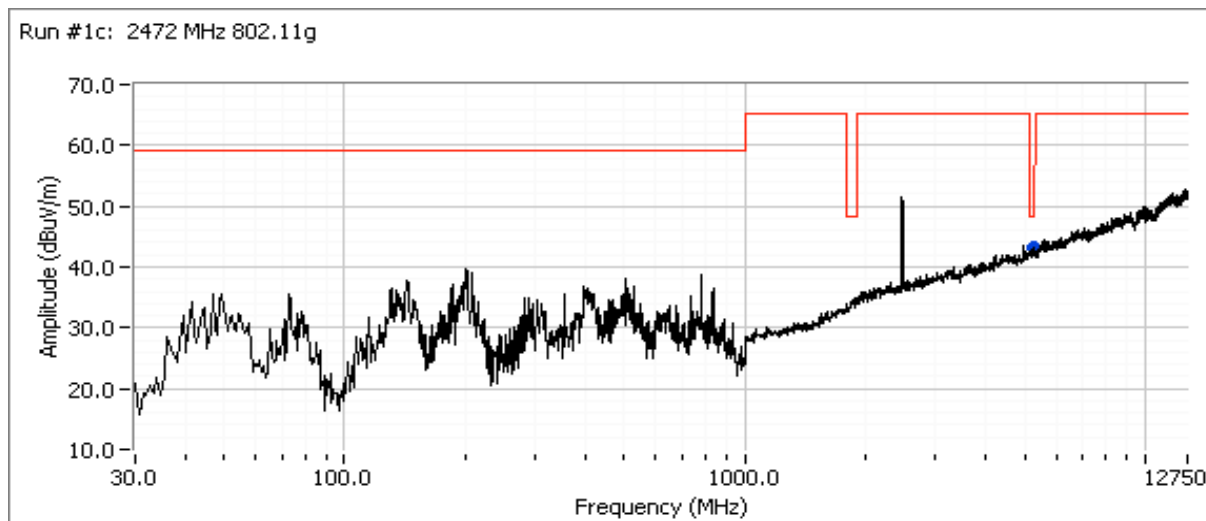
Note - no EUT signal observed at 5231 MHz.

Note 1: The field strength limit in the tables above was calculated from the erp/eirp limit detailed in the standard using the free space propagation equation: $E = \sqrt{(30PG)/d}$. This limit is conservative - it does not consider the presence of the ground plane and, for erp limits, the dipole gain (2.2dBi) has not been included. The erp or eirp for all signals with less than 10dB of margin relative to this field strength limit is determined using substitution measurements.

Note 2: Measurements < 1 GHz were not taken on this channel because the measurement at 2472 showed no difference between b and g modes. Therefore, it is unlikely that the result on this channel differs from b mode.

Client:	Summit Data Corp	Job Number:	J68959
Model:	SDC-CF10AG	T-Log Number:	T70349
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	EN 300 328, EN 301 893	Class:	N/A

Run #1d: EUT @ 2472 MHz, 802.11g.



Frequency	Level	Pol	EN 300 328 ^{Note 1}		Detector	Azimuth	Height	Comments
MHz	dBuV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
5276.000	43.3	V	48.3	-5.0	Peak	45	1.7	Noise floor

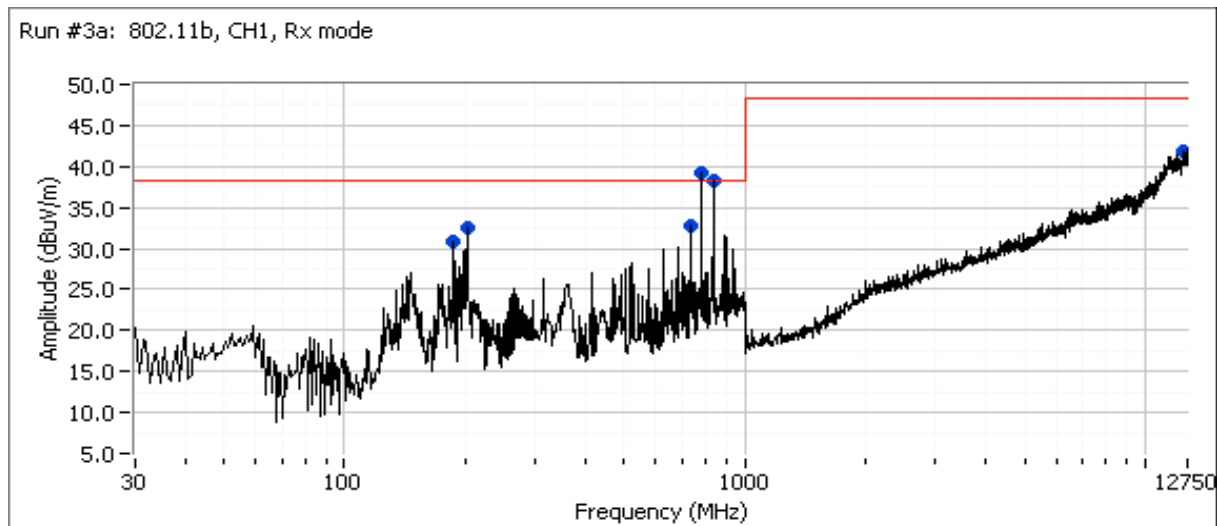
Note - no EUT signal observed at 5276 MHz.

Note 1: The field strength limit in the tables above was calculated from the erp/eirp limit detailed in the standard using the free space propagation equation: $E = \sqrt{(30PG)/d}$. This limit is conservative - it does not consider the presence of the ground plane and, for erp limits, the dipole gain (2.2dBi) has not been included. The erp or eirp for all signals with less than 10dB of margin relative to this field strength limit is determined using substitution measurements.

Client:	Summit Data Corp	Job Number:	J68959
Model:	SDC-CF10AG	T-Log Number:	T70349
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	EN 300 328, EN 301 893	Class:	N/A

Run #3: Radiated Spurious Emissions, Receive Mode, 25 - 12,750 MHz

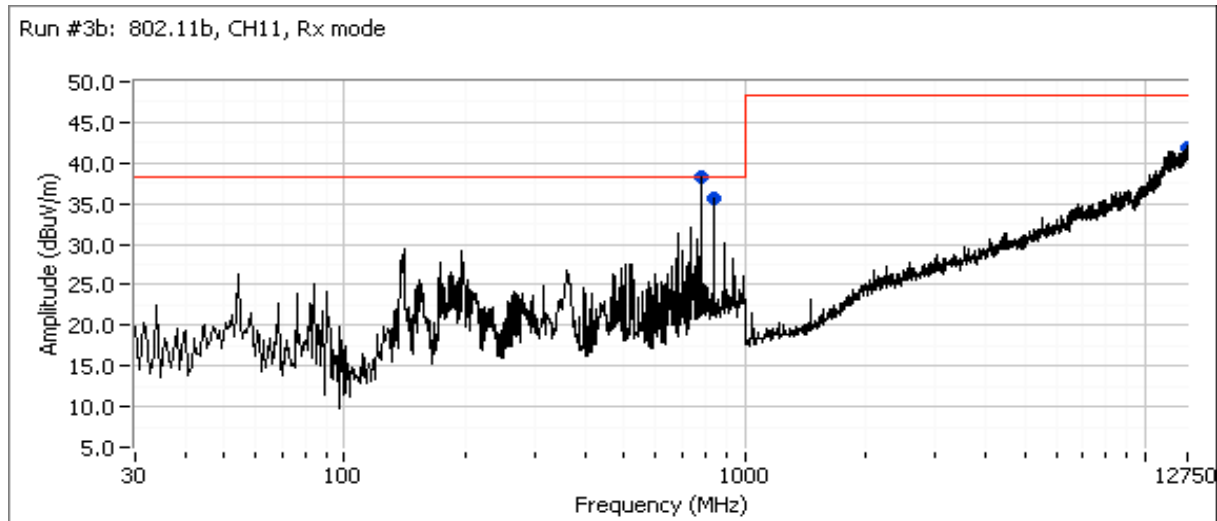
Run #3a: 802.11b, EUT @ 2412 MHz



Frequency	Level	Pol	EN 300 328 ^{Note 1}		Detector	Azimuth	Height	Comments
MHz	dBuV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
779.954	39.3	H	38.3	1.0	Peak	301	1.7	
831.956	38.3	H	38.3	0.0	Peak	296	1.7	
727.986	32.7	H	38.3	-5.6	Peak	269	1.7	
204.207	32.5	H	38.3	-5.8	Peak	121	1.7	
12399.37	41.9	H	48.3	-6.4	Peak	138	1.7	Noise Floor
187.275	30.9	H	38.3	-7.4	Peak	121	1.7	

Note 1: The field strength limit in the tables above was calculated from the erp/eirp limit detailed in the standard using the free space propagation equation: $E = \sqrt{(30PG)/d}$. This limit is conservative - it does not consider the presence of the ground plane and, for erp limits, the dipole gain (2.2dBi) has not been included. The erp or eirp for all signals with less than 10dB of margin relative to this field strength limit is determined using substitution measurements.

Client:	Summit Data Corp	Job Number:	J68959
Model:	SDC-CF10AG	T-Log Number:	T70349
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	EN 300 328, EN 301 893	Class:	N/A

Run #3b: 802.11b, EUT @ 2472 MHz


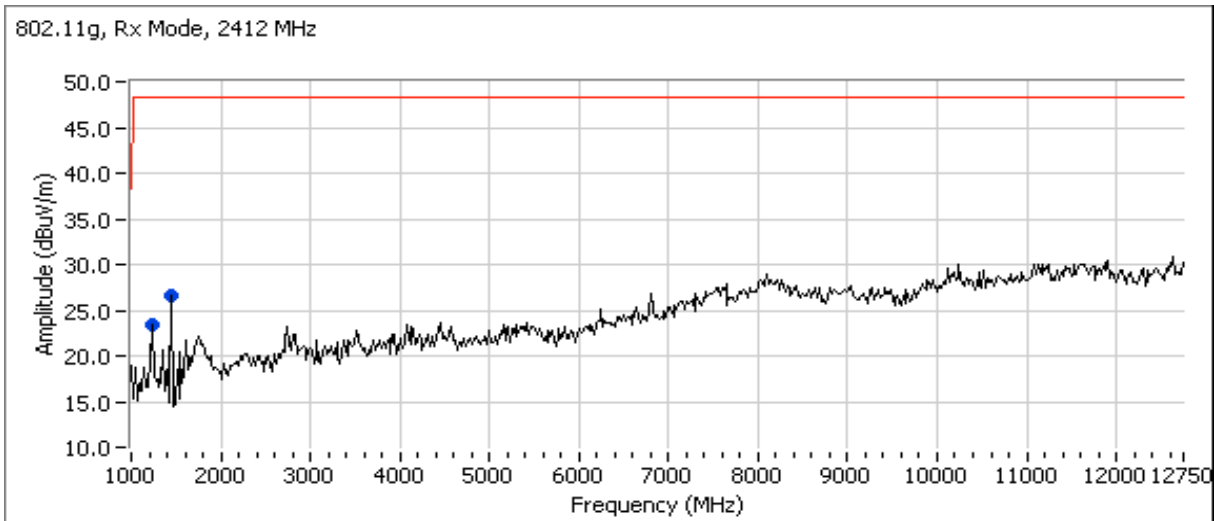
Frequency	Level	Pol	EN 300 328 ^{Note 1}		Detector	Azimuth	Height	Comments
MHz	dBuV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
779.954	38.3	H	38.3	0.0	Peak	75	1.7	
831.943	35.7	H	38.3	-2.6	Peak	69	1.7	
12701.87	41.9	V	48.3	-6.4	Peak	0	1.7	Noise Floor

Note 1:

The field strength limit in the tables above was calculated from the erp/eirp limit detailed in the standard using the free space propagation equation: $E = \sqrt{(30PG)/d}$. This limit is conservative - it does not consider the presence of the ground plane and, for erp limits, the dipole gain (2.2dBi) has not been included. The erp or eirp for all signals with less than 10dB of margin relative to this field strength limit is determined using substitution measurements.

Client:	Summit Data Corp	Job Number:	J68959
Model:	SDC-CF10AG	T-Log Number:	T70349
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	EN 300 328, EN 301 893	Class:	N/A

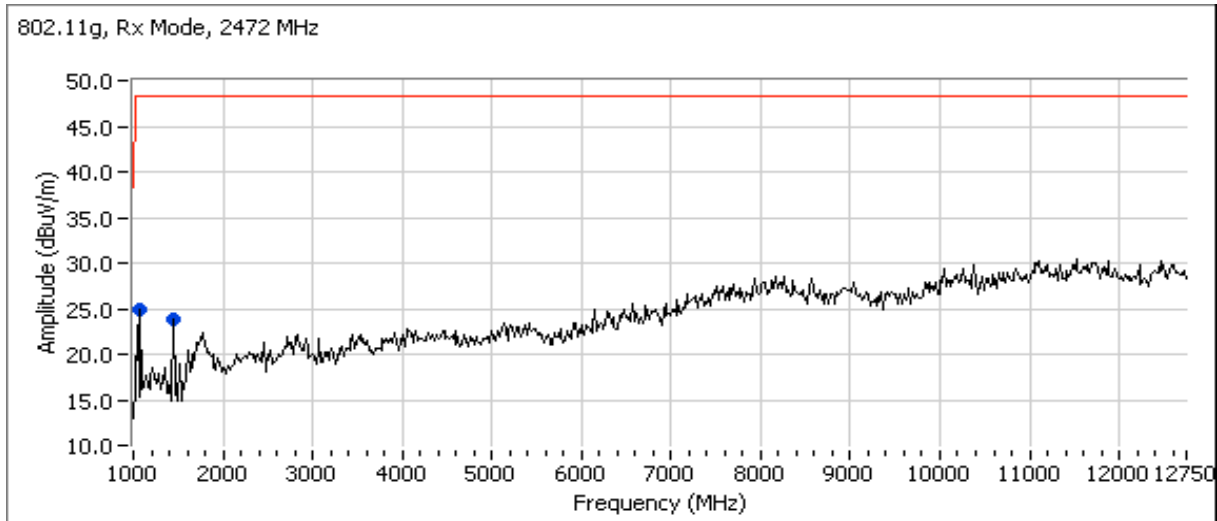
Run #3c: 802.11g, EUT @ 2412 MHz



Frequency	Level	Pol	EN 300 328 ^{Note 1}		Detector	Azimuth	Height	Comments
MHz	dBuV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
1235.000	23.5	H	48.3	-24.8	Peak	0	1.0	
1450.420	26.7	H	48.3	-21.6	Peak	0	1.0	

Note 1: The field strength limit in the tables above was calculated from the erp/eirp limit detailed in the standard using the free space propagation equation: $E = \sqrt{(30PG)/d}$. This limit is conservative - it does not consider the presence of the ground plane and, for erp limits, the dipole gain (2.2dBi) has not been included. The erp or eirp for all signals with less than 10dB of margin relative to this field strength limit is determined using substitution measurements.

Client:	Summit Data Corp	Job Number:	J68959
Model:	SDC-CF10AG	T-Log Number:	T70349
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	EN 300 328, EN 301 893	Class:	N/A

Run #3d: 802.11g, EUT @ 2472 MHz


Frequency	Level	Pol	EN 300 328 ^{Note 1}		Detector	Azimuth	Height	Comments
MHz	dBuV/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
1078.333	24.9	H	48.3	-23.4	Peak	356	1.0	
1450.420	23.9	H	48.3	-24.4	Peak	42	1.0	

Note 1: The field strength limit in the tables above was calculated from the erp/eirp limit detailed in the standard using the free space propagation equation: $E = \sqrt{(30PG)/d}$. This limit is conservative - it does not consider the presence of the ground plane and, for erp limits, the dipole gain (2.2dBi) has not been included. The erp or eirp for all signals with less than 10dB of margin relative to this field strength limit is determined using substitution measurements.



EMC Test Data

Client:	Summit Data Corp	Job Number:	J68959
Model:	SDC-CF10AG	T-Log Number:	T70349
Contact:	Ron Seide	Account Manager:	Dean Eriksen
Standard:	EN 300 328, EN 301 893	Class:	N/A

Run #4: Radiated Spurious Emissions, Receive Mode: Final Field Strength and Substitution Measurements Measurements made at 3m

Date of Test: 01/24/08
 Test Engineer: Rafael Varelas
 Test Location: FT Chamber #3

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

Frequency	Level	Pol	EN 300 328 ^{Note 1}		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	V/H	Limit	Margin	Pk/QP/Avg	degrees	meters	
727.986	41.1	H	38.3	2.8	PK	230	1.0	
831.937	44.6	H	41.3	3.3	PK	301	1.0	
779.949	43.0	H	38.3	4.7	PK	302	1.0	
204.873	45.9	H	38.3	7.6	PK	243	1.0	

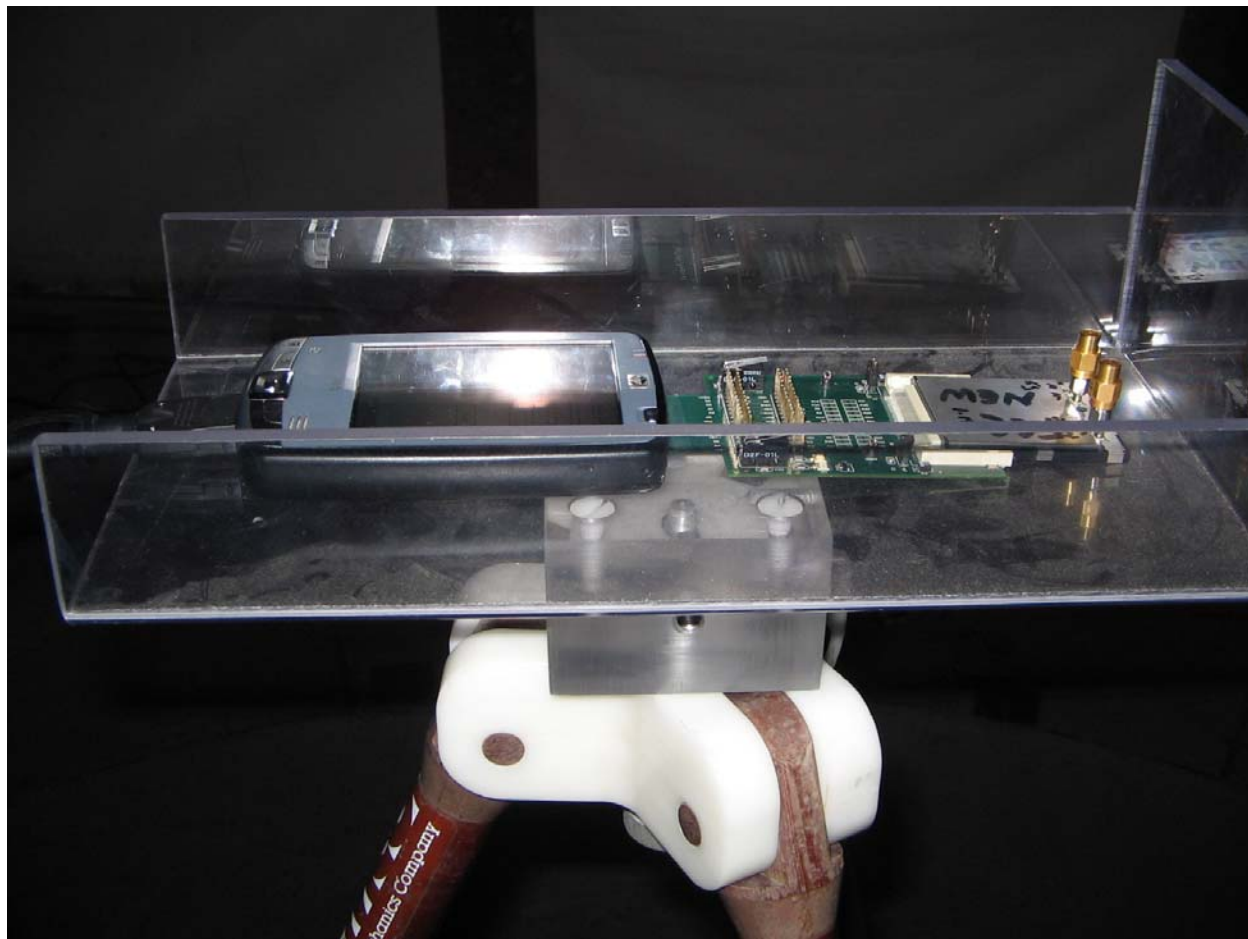
Horizontal

Frequency	Substitution measurements			Site	EUT measurements			eirp Limit	erp Limit	Margin
MHz	Pin ¹	Gain ²	FS ³	Factor ⁴	FS ⁵	eirp (dBm)	erp (dBm)	dBm	dBm	dB
831.960	-10.9	6.4	97.4	101.9	44.6	-57.3	-59.5	-47.0		-10.3
779.954	-10.8	6.5	97.5	101.8	43.0	-58.8	-61.0	-47.0		-11.8
204.873	-9.5	2.9	94.0	100.6	45.9	-54.7	-56.9	-47.0		-7.7
727.986	-10.8	6.5	97.5	101.8	41.1	-60.7	-62.9	-47.0		-13.7

Note 1:	Pin is the input power (dBm) to the substitution antenna
Note 2:	Gain is the gain (dBi) for the substitution antenna. A dipole has a nominal gain of 2.2dBi, however the dipole balun loss may reduce the gain of the substitution dipole used.
Note 3:	FS is the field strength (dB μ V/m) measured from the substitution antenna, maximized for receive antenna height and transmit antenna azimuth.
Note 4:	Site Factor - this is the site factor to convert from a field strength in dB μ V/m to an eirp in dBm.
Note 5:	EUT field strength as measured during initial run.

APPENDIX C: PHOTOGRAPHS

EUT on extender board plugged into HP iPAQ hand-held PC.



Photograph shows device in non-conductive support with rf ports terminated for radiated spurious emissions tests.