

# **Test Certificate**

A sample of the following product received on October 21, 2011 and tested on October 21, 2011 complied with the radiated immunity requirements (2.0 to 2.7GHz only) of,

- EN 301 489-1 V1.8.1 "Electromagnetic compatibility and Radio spectrum Matters (ERM);
   ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements"
- EN 301 489-17 V2.1.1 "Electromagnetic compatibility and Radio spectrum Matters (ERM);
   ElectroMagnetic Compatibility (EMC) standard for radio equipment; Part 17: Specific conditions for Broadband Data Transmission Systems"

given the measurement uncertainties as detailed in Elliott report R85250.

## **Summit Data Communications**

**Model SDC-CF10G** 

Mark E Hill
Staff Engineer

**Summit Data Communications** 

Printed Name



Testing Cert #2016.01

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## EMC Test Report

## Radiated Immunity Requirements (2.0 – 2.7GHz ony) EN 301 489-1 v1.8.1

Model: SDC-CF10G

COMPANY: Summit Data Communications

526 South Main St. Suite 805

Akron, OH 44311

TEST SITE(S): 41039 Boyce Road.

Fremont, CA. 94538-2435

REPORT DATE: November 8, 2011

FINAL TEST DATES: October 21, 2011

TOTAL NUMBER OF PAGES: 26

PROGRAM MGR /

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## REVISION HISTORY

Rev#	Date	Comments	Modified By
-	11-8-2011	First release	

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#### **SCOPE**

The European Committee for Electrotechnical Standardization (CENELEC), the European Telecommunications Standards Institute (ETSI) and the International Electrotechnical Commission (IEC) publish standards regarding the electromagnetic compatibility of electronic devices. Electromagnetic compatibility tests have been performed on the Summit Data Communications model SDC-CF10G in accordance with these standards. The tests were performed in accordance with the current, published versions of the basic standards referenced in the following standards, as outlined in Elliott Laboratories test procedures. The test data has been provided as an appendix to this report for reference.

Standard	Title	Date
EN 301 489-1	Electromagnetic compatibility and Radio spectrum	2008-04
	Matters (ERM); ElectroMagnetic Compatibility	(V1.8.1)
	(EMC) standard for radio equipment and services;	
	Part 1: Common technical requirements	
	Radiated Immunity (2.0 – 2.7GHz only)	
EN 301 489-17	Electromagnetic compatibility and Radio spectrum	2009-05
	Matters (ERM); ElectroMagnetic Compatibility	(V2.1.1)
	(EMC) standard for radio equipment; Part 17:	
	Specific conditions for Broadband Data Transmission	
	Systems	
	(2.0 - 2.7 GHz only)	

#### **OBJECTIVE**

The objective of the manufacturer is to declare conformity with one of the essential requirements of the R&TTE Directive 1999/5/EC. 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.

Previous testing was performed against EN 301 489-1 v1.5.1 (2004-11), EN 301 489-17 v1.2.1 (2002-08), ADT Corp Report No.: RM941208L11B.

Only those requirements of current EN 301 489 standards that exceeded the previously tested version were evaluated; radiated immunity 2.0 to 2.7GHz.

#### STATEMENT OF COMPLIANCE

The tested sample of Summit Data Communications model SDC-CF10G, given the performance criteria as specified by the manufacturer, complied with the requirements radiated immunity requirements (2.0- - 2.7 GHz only) of the following standards:

Standard/Regulation	Version	Standard Date
EN 301 489-1	1.8.1	2008-04
EN 301 489-17	2.1.1	2009-05

The test results recorded herein are based on a single type test of the Summit Data Communications model SDC-CF10G and therefore apply only to the tested sample. The sample was selected and prepared by Sue White of Summit Data Communications

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product that could result in increased emissions should be checked to ensure compliance has been maintained (i.e., printed circuit board layout changes, different enclosure, different line filter or power supply, harnessing and/or interface cable changes, etc.).

#### DEVIATIONS FROM THE STANDARD

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

#### TEST RESULTS

The following tests were performed on the Summit Data Communications model SDC-CF10G. The results are based upon performance criteria defined by the manufacturer. The actual test results and associated performance criteria are contained within an appendix of this report.

#### **EMISSIONS TESTING**

Emissions tests were not performed as they were not requested.

#### **IMMUNITY TESTING**

Test	Basic Standard	Level Required	Level Tested	Criterion Met	Status
ElectroStatic Discharge	EN 61000-4-2	Testing was not requested			
Radio frequency Electromagnetic Field	EN 61000-4-3	80-1400 MHz 1400-2700 MHz 3 V/m 80% 1 KHz AM	2.0GHz-2.7GHz 1kHz 80% AM 3 V/m	A / CT / CR	Complied
Fast Transients	EN 61000-4-4		Testing was not requ	ested	
Surge	EN 61000-4-5		Testing was not requ	ested	
Radio Frequency Common Mode	EN 61000-4-6	Testing was not requested			
Voltage Dips and Interrupts	EN 61000-4-11	Testing was not requested			

#### **MEASUREMENT UNCERTAINTIES**

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the test results be included in the report. The measurement uncertainties given below are based on a standard uncertainty multiplied by a coverage factor of k=2, providing a 95% confidence level and were calculated in accordance with NAMAS document LAB 34. For emissions tests, the uncertainties were calculated using the approach described in CISPR 16-4-2:2003 and the levels were found to be below levels of Ucispr and therefore no adjustment of the data for measurement uncertainty is required.

Measurement Type	Measurement Unit	Frequency Range	Expanded Uncertainty
Radiated Immunity	V/m	80 – 2500 MHz	- 26.3%, + 29.97%

### EQUIPMENT UNDER TEST (EUT) DETAILS

#### **GENERAL**

The Summit Data Communications model SDC-CF10G is an 802.11g Compact Flash Module with Antenna Connectors (Model: SDC-CF10G) that is designed to provide wireless local area networking connectivity. Since the EUT would be placed on a table top during operation, the EUT was treated as table-top equipment during testing to simulate the end-user environment. The electrical rating of the host computer is 230/120 Volts, 50/60 Hz, 3.3 Amps.

The sample was received on October 21, 2011 and tested on October 21, 2011. The EUT consisted of the following component(s):

Manufacturer	Model	Description	Serial Number
Summit Data Communications	SDC-CF10G	802.11g Compact	2CK7250TC5
		Flash Module	

#### OTHER EUT DETAILS

The following EUT details should be noted: The 802.11g Compact Flash Module has Antenna Connectors (Model: SDC-CF10G)

#### **EUT CLASSIFICATION**

#### **ENCLOSURE**

The EUT enclosure is primarily constructed of metal. It measures approximately 5.5 cm wide by 0.3 cm deep by 8.5 cm high.

#### **MODIFICATIONS**

The EUT did not require modifications during testing in order to comply with the immunity specification.

#### SUPPORT EQUIPMENT

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

Manufacturer	Model	Description	Serial Number
Dell	Inspiron 2200	Laptop PC	-
Airlink	101	Super G Wireless Router	-
Dell	iPaq	Host System – PDA	-

No equipment was used as remote support equipment for immunity testing:

#### **EUT INTERFACE PORTS**

The EUT does not have any interface ports.

#### EUT OPERATION DURING IMMUNITY TESTING

During immunity test the EUT was exercised by continuously being pinged in Tx mode. The EUT was also tested in a standby mode for un-intentional transmissions by using a spectrum analyzer to monitor the operating band.

Normal operation is indicated by replies from EUT reported on the display of the host system.

#### **EUT PERFORMANCE CRITERIA**

#### Criterion A /CT / CR:

During and after testing the EUT shall continue to successfully ping during Tx mode testing. During standby mode, no transmissions shall be observed on the spectrum analyzer.

#### *IMMUNITY TEST DESCRIPTIONS*

#### GENERAL INFORMATION

Final tests were performed at the Elliott Laboratories Test Sites located at 41039 Boyce Road, Fremont, CA 94538-2435. Considerable engineering effort has been expended to ensure that the facilities conform to all pertinent CENELEC and IEC standards.

#### **MEASUREMENT INSTRUMENTATION**

#### ELECTROMAGNETIC FIELD TEST SYSTEM

A signal generator and power amplifiers are used to provide a signal at the appropriate power and frequency to an antenna to obtain the required electromagnetic field at the position of the EUT in accordance with the EN61000-4-3 basic EMC publication.

#### **INSTRUMENT CALIBRATION**

All test equipment is regularly checked to ensure that performance is maintained in accordance with the company's specifications. An appendix of this report contains the list of test equipment used and calibration information.

#### *IMMUNITY TEST PROCEDURES*

#### **EQUIPMENT PLACEMENT**

EN 61000-4-3 specifies that a tabletop EUT be placed on a non-conducting table 80 centimeters above a ground reference plane and that floor-mounted equipment shall be placed on an insulating support approximately 10 centimeters above a ground plane. During the EN 61000-4-3 tests, the EUT is positioned in a shielded anechoic test chamber to reduce reflections from the internal surfaces of the chamber. During the EN 61000-4-4 tests, the EUT is positioned over a ground reference plane or in a shielded chamber in conformance with this requirement.

#### APPLICATION OF ELECTROMAGNETIC FIELD

The electromagnetic field is established at the front edge of the EUT. The frequency range is swept through the frequency range of the test using a power level necessary to obtain the required field strength at the EUT. The field is amplitude modulated using a 1KHz or 400Hz sine wave to a depth of 80% for the swept frequency test in accordance with EN 61000-4-3.

The test is repeated with each of the four sides of the EUT facing the field generating antenna. For small, portable products the test is also performed with the top and bottom sides of the EUT facing the antenna.

# Appendix A Test Equipment Calibration Data

### Radiated Immunity, 2,000 - 2,700 MHz, 21-Oct-11

<u>Manufacturer</u>	<u>Description</u>	<u>Model</u>	Asset #	Cal Due
Rohde & Schwarz	Power Sensor, 1uW-100mW,	NRV-Z51	1069	7/8/2012
	DC-18 GHz, 50ohms			
EMCO	Antenna, Horn, 1-18 GHz	3115	1242	N/A
Rohde & Schwarz	Power Meter, Dual Channel, DC	NRVD	1787	12/23/2011
	to 40 GHz, 100 pW to 30 W, 9			
	kHz to 3 GHz, 200µV to 1000V			
Amplifier Research	Amplifier, 25w, 0.8-4.2GHz	25S1G4AM3	1805	N/A
Agilent	MXG Analog Signal Generator	N5181A	2146	1/26/2012
Advanced Technical	Directional Coupler, 1.0-	CHP223G-35FNF	2320	N/A
Materials Inc. (ATM)	11.0GHz, 35dB, 50w			
Hewlett Packard	EMC Spectrum Analyzer, 9 KHz-	8593EM	1141	12/14/2011
	26.5 GHz			

## Appendix B Test Data Log Sheets

ELECTROMAGNETIC EMISSIONS
TEST LOG SHEETS

**AND** 

**MEASUREMENT DATA** 

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<b>Ellio</b>	ott Scompany	El	MC Test Data
Client:	Summit Data Communications	Job Number:	J85053
Model:	802.11g Compact Flash Module with	T-Log Number:	T85149
	Antenna Connectors (Model: SDC-CF10G)	Account Manager:	Christine Krebill
Contact:	Sue White		-
Emissions Standard(s):		Class:	-
Immunity Standard(s):	489-1v1.8.1/-17v1.3.2	Environment:	-

## **EMC Test Data**

For The

# **Summit Data Communications**

Model

802.11g Compact Flash Module with Antenna Connectors (Model: SDC-CF10G)

Date of Last Test: 11/4/2011

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## EMC Test Data

All Dead Company				
Client:	Summit Data Communications	Job Number:	J85053	
Model:	802.11g Compact Flash Module with	T-Log Number:	T85149	
	Antenna Connectors (Model: SDC-CF10G)	Account Manager:	Christine Krebill	
Contact:	Sue White			
Immunity Standard(s):	489-1v1.8.1/-17v1.3.2	Environment:	-	

## Radiated Immunity (EN 61000-4-3)

### **Test Specific Details**

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

listed above.

Date of Test: 10/21/2011 9:35 Config. Used: 1
Test Engineer: Scott Smith Config Change: None
Test Location: Fremont Chamber #1 Host Unit Voltage 230V/50Hz

### General Test Configuration

The EUT and all local support equipment were located on a turntable in an anechoic chamber. All remote support equipment was located outside the chamber. Interface cabling to the remote support equipment was routed along the floor and, where possible, passed through ferrite clamps at the exit point from the chamber.

Ambient Conditions: Temperature: 23 °C

Rel. Humidity: 39 %

Summary of Results-Radiated Immunity

Run#	Port	Test Level		Performan	ce Criteria	Comments		
IXuII π	TOIL	Required	Applied	Required	Met / Result	Confinents		
EN 301 489-1 V1.8.1 Requirements								
1	Enclosure	80-1000 MHz 1.4GHz-2.7GHz 1kHz 80% AM 3 V/m	2.0GHz-2.7GHz 1kHz 80% AM 3 V/m	А	A / Pass	Consisted of both Tx and Rx mode		

### 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

KII DUL	Company		
Client:	Summit Data Communications	Job Number:	J85053
Model:	802.11g Compact Flash Module with	T-Log Number:	T85149
	Antenna Connectors (Model: SDC-CF10G)	Account Manager:	Christine Krebill
Contact:	Sue White		
Immunity Standard(s):	489-1v1.8.1/-17v1.3.2	Environment:	-

Run #1: Radiated Immunity, 80-2700 MHz (EN61000-4-3)

<u>.j,</u>	(		
Frequency:	80-1000 MHz	1-2.0 GHz	2.0-2.7 GHz
Step Size:	1 %	1 %	1 %
Dwell time:	2874 ms	2874 ms	2874 ms
Field Uniformity:	1.5m x 1.5m	1.0m x 1.0m	1.0m x 1.0m
Test Distance:	???	???	2m

Modulation Details							
Modulating Frequency:	1 kHz						
Modulation:	AM						
Depth / Deviation:	80%						

Frequency	Level	Fre	ont	Left	Side	Re	ear	Ri	ght	To	эр	Bot	tom
Range (MHz)	V/m	Vert.	Horiz.	Vert.	Horiz.	Vert.	Horiz.	Vert.	Horiz.	Vert.	Horiz.	Vert.	Horiz.
80-1000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1000-2000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2000-2700	3	Note 1	N/A	N/A	N/A	N/A							

Test files used for this run:

Tip of Antenna 2m from UFA, 1.4m high 1000 MHz - 4200 MHz H 3Vm.crf Tip of Antenna 2m from UFA, 1.4m high 1000 MHz - 4200 MHz V 3Vm.crf

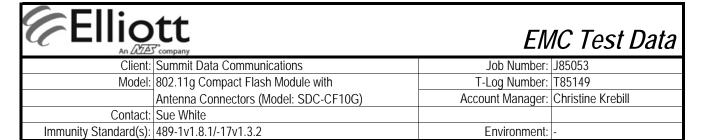
Note: An "X" indicates that the unit continued to operate as intended. Continiously pinged device under test and monitored response by video. There were no data errors reported by the monitoring video.

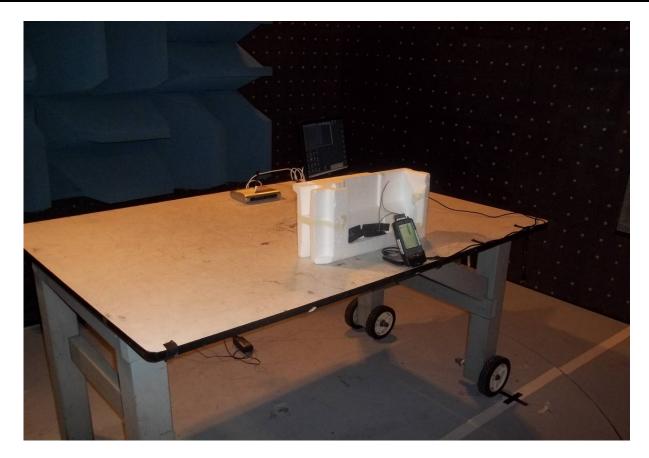
Note 1: Monitor received "Request timed out" at various points at approximately 2464MHz but recovered in Tx mode. No errors in Rx mode

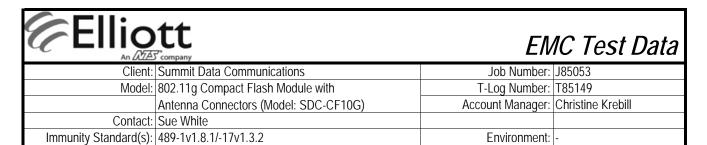
Ellio AN ANDE	Company	EMC Test Data			
Client:	Summit Data Communications	Job Number:	J85053		
Model:	802.11g Compact Flash Module with	T-Log Number:	T85149		
	Antenna Connectors (Model: SDC-CF10G)	Account Manager:	Christine Krebill		
Contact:	Sue White				
Immunity Standard(s):	489-1v1.8.1/-17v1.3.2	Environment:	-		

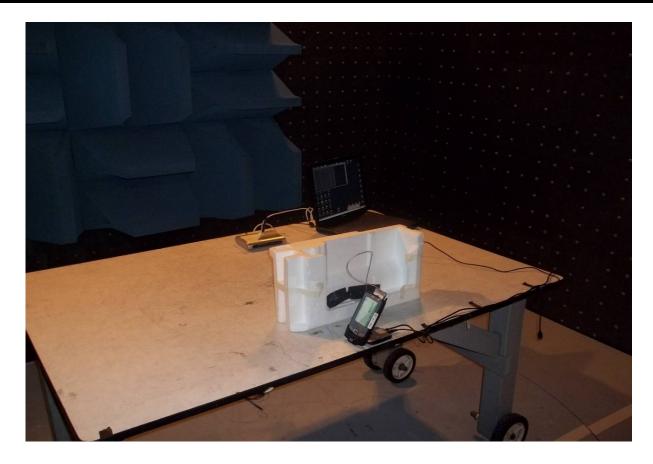
## Test Configuration Photograph(s)

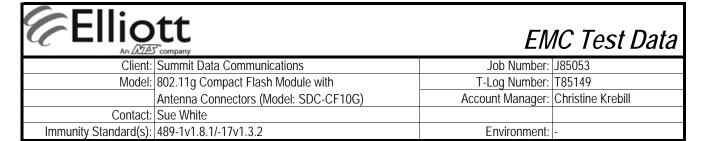


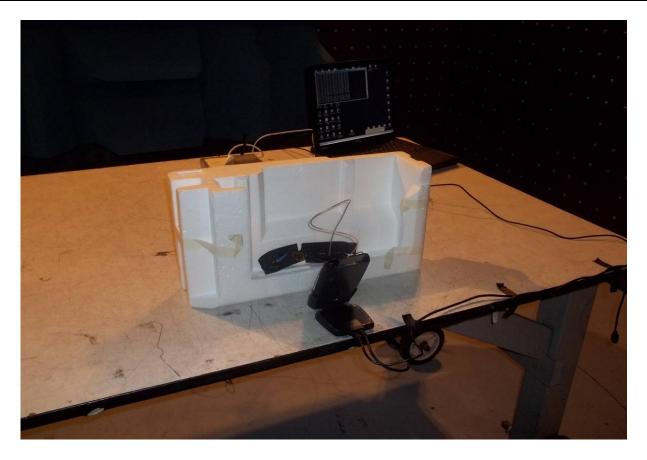


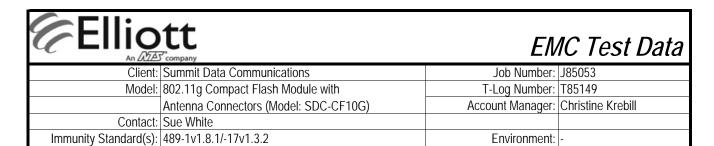




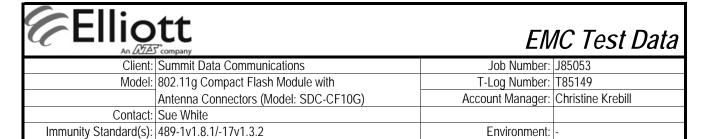


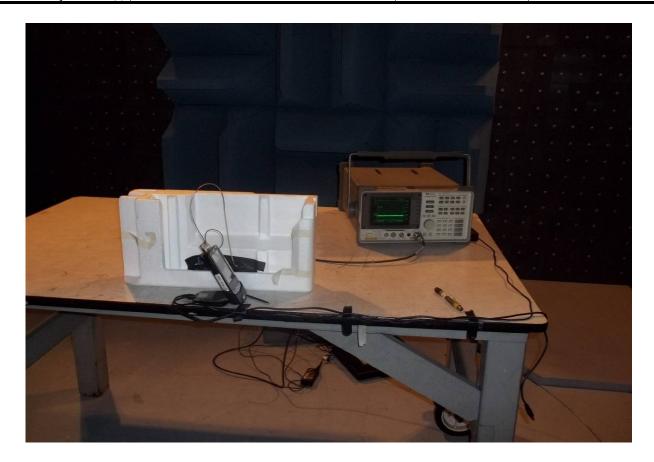


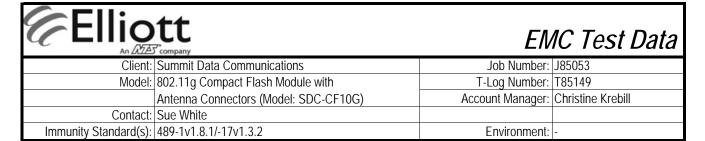




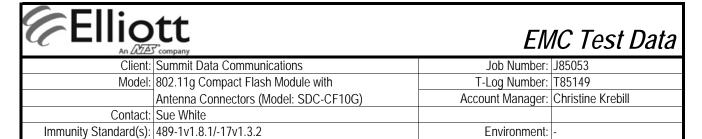




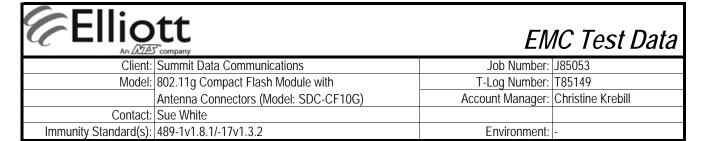














## End of Report

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