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Report On

FCC Testing of the
Iridium Communications Inc. 9603N
In accordance with FCC CFR 47 Part 15B

COMMERCIAL-IN-CONFIDENCE

FCC ID: Q639603N

Document 75926443 Report 06 Issue 2

August 2014



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COMMERCIAL-IN-CONFIDENCE

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PREPARED FOR

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Authorised Signatory

DATED

07 August 2014

This report This report has been up-issued to Issue 2 to include an amended model number

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC CFR 47 Part 15B. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

G Lawler





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SECTION 1

REPORT SUMMARY

FCC Testing of the
Iridium Communications Inc. 9603N
In accordance with FCC CFR 47 Part 15B



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1.1 INTRODUCTION

The information contained in this report is intended to show the verification of FCC Testing of the Iridium Communications Inc. 9603N to the requirements of FCC CFR 47 Part 15B.

Objective	To perform FCC Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	Iridium Communications Inc
Model Number(s)	9603N
Serial Number(s)	124
Number of Samples Tested	1
Test Specification/Issue/Date	FCC CFR 47 Part 15B (2013)
Incoming Release Date	Application Form 22 May 2014
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	23491/WH 07 April 2014
Start of Test	4 June 2014
Finish of Test	4 June 2014
Name of Engineer(s)	G Lawler
Related Document(s)	ANSI C63.4 (2003)



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1.2 BRIEF SUMMARY OF RESULTS

A brief summary of the tests carried out in accordance with FCC CFR 47 Part 15B is shown below.

Section	Spec Clause	Test Description	Result	Comments/Base Standard
EUT State: Idle				
2.1	15.109	Radiated Emissions	Pass	ANSI C63.4 (2003)



1.3 APPLICATION FORM

APPLICATION FORM FOR TESTING TO FCC/INDUSTRY CANADA REQUIREMENTS

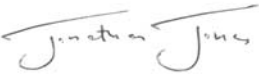
APPLICANT'S DETAILS	
COMPANY NAME :	Cambridge Consultants Ltd.
ADDRESS :	Science Park, Milton Road Cambridge England, CB5 0DW
NAME FOR CONTACT PURPOSES :	David Freeborough
TELEPHONE NO: +44 1223 392029	FAX NO: +44 1223 423373
E-MAIL: david.freeborough@cambridgeconsultants .com	

EQUIPMENT INFORMATION			
Model name/number	9603N	Identification/Part number	9603N
Hardware Version	rev D4	Software Version	TA14roc dev: 3681
Manufacturer	Iridium Communications Inc.	Country of Origin	UK
FCC ID	Q639603N	Industry Canada ID	4629A-9603N
Technical description (a brief description of the intended use and operation)			
Satellite Short Burst Data Modem			
<u>Supply Voltage:</u>			
[]	AC mains	State AC voltage	V and AC frequency Hz
[X]	DC (external)	State DC voltage	5.0V and DC current 2.0A
[]	DC (internal)	State DC voltage	V and Battery type
<u>Frequency characteristics:</u>			
Transmitter Frequency range	1616 MHz to 1626.5MHz	Channel spacing	41.667KHz (if channelized)
Receiver Frequency range (if different)	1616 MHz to 1626.5MHz	Channel spacing	41.667KHz (if channelized)
Designated test frequencies:			
Bottom:	1616.020833 MHz	Middle:	1621.020833 MHz
Top:	1625.979167 MHz	Intermediate Frequencies :	0.6 MHz
Highest Internally Generated Frequency :	3253 MHz		
<u>Power characteristics:</u>			
Maximum transmitter power	1.479 W	Minimum transmitter power	..... W (if variable)
[]	Continuous transmission		
[X]	Intermittent transmission	State duty cycle	9.2%
	If intermittent, can transmitter be set to continuous transmit test mode?		N
<u>Antenna characteristics:</u>			
[X]	Antenna connector	State impedance	50 ohm
[]	Temporary antenna connector	State impedance	..... ohm
[]	Integral antenna Type	State gain	..... dBi
[X]	External Antenna Type Monopole	State gain	3.0dBi
<u>Modulation characteristics:</u>			
[]	Amplitude	[X]	Other
[]	Frequency	Details: DE-QPSK/DE-BPSK	
[]	Phase		
Can the transmitter operate un-modulated?		Y (Only in test mode)	
ITU Class of emission: 41K7Q7D			
<u>Battery/Power Supply</u>			
Model name/number	N/A	Identification/Part number	.....
Manufacturer	.....	Country of Origin	.....
<u>Ancillaries (if applicable)</u>			
Model name/number	N/A	Identification/Part number	.....
Manufacturer	.....	Country of Origin	.....
<u>Extreme conditions:</u>			
Maximum temperature	70 °C	Minimum temperature	-40 °C
Maximum supply voltage	5.5 V	Minimum supply voltage	4.5V



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I hereby declare that I am entitled to sign on behalf of the applicant and that the information supplied is correct and complete.

Signature : 

Name : Jonathan Jones

Position held : Senior Engineer

Date : 22/05/2014



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1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a Iridium Communications Inc. 9603N. A full technical description can be found in the manufacturer's documentation.

1.5 TEST CONDITIONS

For all tests the EUT was set up in accordance with the relevant test standard and to represent typical operating conditions. Tests were applied with the EUT situated in a shielded enclosure.

The EUT was powered from a 5.0 V DC supply.

FCC Measurement Facility Registration Number
90987 Octagon House, Fareham Test Laboratory

1.6 DEVIATIONS FROM THE STANDARD

No deviations from the applicable test standard were made during testing.

1.7 MODIFICATION RECORD

Modification 0 - No modifications were made to the test sample during testing.



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SECTION 2

TEST DETAILS

FCC Testing of the
Iridium Communications Inc. 9603N
In accordance with FCC CFR 47 Part 15B



2.1 RADIATED EMISSIONS

2.1.1 Specification Reference

FCC CFR 47 Part 15B, Clause 15.109

2.1.2 Equipment Under Test and Modification State

Iridium Communications Inc. 9603N S/N: 124- Modification State 0

2.1.3 Date of Test

4 June 2014

2.1.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.1.5 Test Procedure

A test environment and testing arrangement meeting the specification of ANSI C63.4 was used during all testing. The Equipment Under Test (EUT) was set upon a non-conducting platform at an elevation of 80 cm above a horizontal reference ground plane. The EUT was configured in a continuous 'receive-only' state which was configured using the test mode commands provided by the manufacturer.

The horizontal reference ground plane encompasses a turntable which is used to adjust the azimuth of the EUT. An antenna positioner is used to elevate the measuring antenna above the horizontal reference ground plane whereby the antenna elevation is adjustable between 1 m and 4 m.

Exploratory radiated emissions measurements were made by azimuth emissions searches over a range of 0° and 360°. These exploratory radiated emissions measurements were made using a peak detector over a frequency range of 30 MHz to 10 GHz, with the measuring antenna in both vertical and horizontal polarizations.

At least six of the greatest peak emissions, frequency positions were selected from the exploratory radiated emissions measurements for further evaluation as final measuring points.

To ascertain the azimuth and measuring antenna polarization that yields the highest peak emission level, each final measurement frequency was investigated by continuous azimuth emissions searching with the measuring antenna in both vertical and horizontal polarizations. For each final measurement frequency, the respective peak emission azimuth and measuring antenna polarization was used during a measuring antenna elevation search from 1 m to 4 m. Each final measurement frequency was then measured with the EUT azimuth, measuring antenna height and polarization that yielded the greatest peak emission level.

Final measurement points over the frequency range of 30 MHz to 1 GHz were measured using a quasi-peak detector. Final measurement points over the frequency range of 1 GHz and 10 GHz were measured using peak and average methods. Peak measurements were made using a peak detector with 1 MHz resolution and video bandwidths. Average measurements were made using a resolution bandwidth of 1 MHz and a video bandwidth of 10 Hz.



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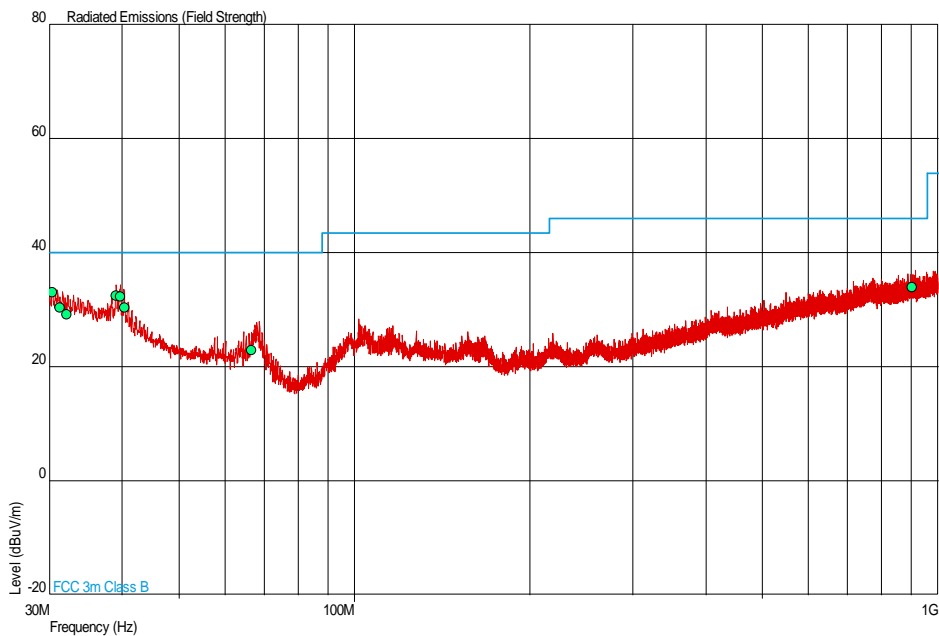
All final measurements were assessed against the Class B emission limits in Clause 15.109 of FCC CFR 47 FCC Part 15B.

2.1.6 Environmental Conditions

Ambient Temperature 21.4°C
 Relative Humidity 42.0%

2.1.7 Test Results

30 MHz to 1 GHz

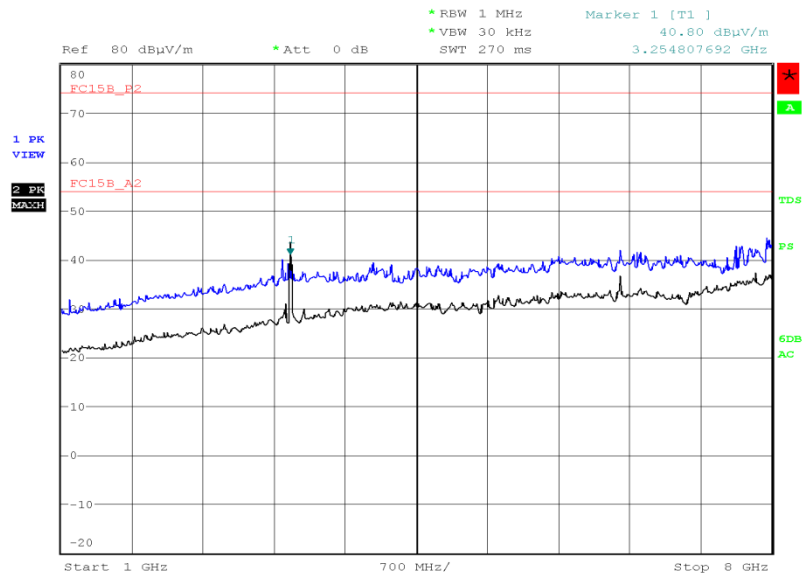


Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP Limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (Deg)	Height (m)	Polarity
30.402	33.0	44.7	40.0	100	-7.0	-55.3	253	1.00	Vertical
31.277	30.3	32.7	40.0	100	-9.7	-67.3	9	1.02	Vertical
32.142	29.2	28.8	40.0	100	-10.8	-71.2	360	1.00	Vertical
39.059	32.5	42.2	40.0	100	-7.5	-57.8	316	1.00	Vertical
39.756	32.3	41.2	40.0	100	-7.7	-58.8	243	1.00	Vertical
40.352	30.4	33.1	40.0	100	-9.6	-66.9	119	1.00	Vertical
66.654	23.0	14.1	40.0	100	-17.0	-85.9	94	1.00	Vertical
902.192	34.0	50.1	46.0	200	-12.0	-149.9	260	1.00	Vertical



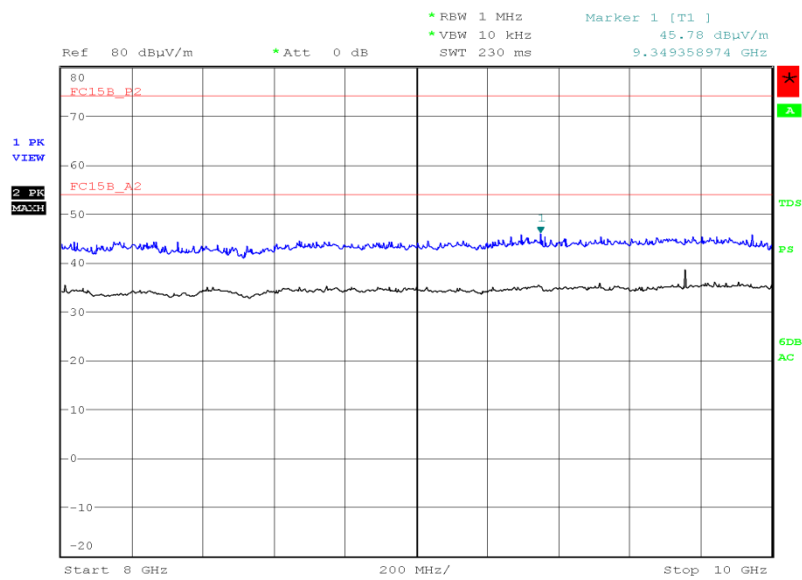
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1 GHz to 8 GHz



Date: 3.JUN.2014 22:44:54

8 GHz to 10 GHz



Date: 3.JUN.2014 22:37:47

No emissions were detected within 20 dB of the limit.



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SECTION 3

TEST EQUIPMENT USED



3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.1 - Radiated Emissions					
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	234	12	2-May-2015
Screened Room (5)	Rainford	Rainford	1545	24	10-Jan-2015
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Antenna (Bilog)	Chase	CBL6143	2904	24	10-Jun-2015
Amplifier (8 - 18GHz)	Phase One	PS06-0061	3176	12	9-Aug-2014
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	22-Oct-2014
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	-	TU
Tilt Antenna Mast	maturo GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	maturo GmbH	NCD	3917	-	TU
1 Metre SMA Cable	Rhophase	3PS-1801A-1000-3PS	4101	12	5-Nov-2014

TU – Traceability Unscheduled



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3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:-

Test Discipline	MU
Radiated Emissions	30MHz to 1GHz: ± 5.1 dB 1GHz to 40GHz: ± 6.3 dB



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SECTION 4

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



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4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



This report relates only to the actual item/items tested.

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation.

Results of tests not covered by our UKAS Accreditation Schedule are marked NUA
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