



Product Service

**Choose certainty.
Add value.**

Report On

FCC and Industry Canada Testing of the
Iridium Core 9523N

In accordance with FCC 47 CFR Part 15B and ICES-003

COMMERCIAL-IN-CONFIDENCE

FCC ID: Q639523N

IC: 4629A-9523N

Document 75932207 Report 05 Issue 3

November 2015



Product Service

TÜV SÜD Product Service, Octagon House, Concorde Way, Segensworth North,
Fareham, Hampshire, United Kingdom, PO15 5RL
Tel: +44 (0) 1489 558100. Website: www.tuv-sud.co.uk

COMMERCIAL-IN-CONFIDENCE

REPORT ON

FCC and Industry Canada Testing of the
Iridium Core 9523N
In accordance with FCC 47 CFR Part 15B and ICES-003

Document 75932207 Report 05 Issue 3

November 2015

PREPARED FOR

Iridium Satellite LLC
1750 Tysons Boulevard
Suite 1400
McLean
VA 22102
United States

PREPARED BY

Natalie Bennett
Senior Administrator, Project Support

APPROVED BY

Matthew Russell
Authorised Signatory

DATED

30 November 2015

This report has been up-issued to Issue 3 to include an amended Declaration of Build Status.

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 47 CFR Part 15B and ICES-003. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

G Lawler





Product Service

CONTENTS

Section	Page No
1	REPORT SUMMARY 3
1.1	Introduction 4
1.2	Brief Summary of Results 5
1.3	Declaration of Build Status 6
1.4	Product Information 7
1.5	Test Conditions 7
1.6	Deviations from the Standard 7
1.7	Modification Record 7
2	TEST DETAILS 8
2.1	Radiated Emissions 9
3	TEST EQUIPMENT USED 13
3.1	Test Equipment Used 14
3.2	Measurement Uncertainty 15
4	ACCREDITATION, DISCLAIMERS AND COPYRIGHT 16
4.1	Accreditation, Disclaimers and Copyright 17



Product Service

SECTION 1

REPORT SUMMARY

FCC and Industry Canada Testing of the
Iridium Core 9523N
In accordance with FCC 47 CFR Part 15B and ICES-003



Product Service

1.1 INTRODUCTION

The information contained in this report is intended to show the verification of FCC and Industry Canada Testing of the Iridium Core 9523N to the requirements of FCC 47 CFR Part 15B and ICES-003.

Objective	To perform FCC and Industry Canada Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	Iridium Satellite LLC
Model Number(s)	9523N
Serial Number(s)	27
Number of Samples Tested	1
Test Specification/Issue/Date	FCC 47 CFR Part 15B (2014) ICES-003 (2012)
Incoming Release Date	Declaration of Build Status 13 October 2015
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	31734 5 October 2015
Start of Test	25 October 2015
Finish of Test	27 October 2015
Name of Engineer(s)	G Lawler
Related Document(s)	ANSI C63.4 (2014)



Product Service

1.2 BRIEF SUMMARY OF RESULTS

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 15B and ICES-003 is shown below.


Section	Specification Clause		Test Description	Result	Comments/Base Standard
	Part 15B	ICES-003			
Idle					
2.1	15.109	6.2	Radiated Emissions	Pass	



Product Service

1.3 DECLARATION OF BUILD STATUS

MAIN EUT	
MANUFACTURING DESCRIPTION	Voice and data satellite transceiver module.
MANUFACTURER	Iridium Satellite LLC
TYPE	9523N
PART NUMBER	IRIDN0125
SERIAL NUMBER	024, 027, 030, 031
HARDWARE VERSION	Rev B/V1 at modification state: P1638-CN-024 V0.8
SOFTWARE VERSION	DB15006
TRANSMITTER FREQUENCY OPERATING RANGE (MHz)	1616MHz to 1626.5MHz
RECEIVER FREQUENCY OPERATING RANGE (MHz)	1616MHz to 1626.5MHz
COUNTRY OF ORIGIN	UK
INTERMEDIATE FREQUENCIES	200kHz, 400kHz, 600kHz, 800kHz, 16.8MHz reference clock
ÉMISSION DESIGNATOR(S): (i.e. G1D, GXW)	41K7Q7W
MODULATION TYPES: (i.e. GMSK, QPSK)	DE-QPSK/DE-BPSK
HIGHEST INTERNALLY GENERATED FREQUENCY	3252MHz
OUTPUT POWER (W or dBm)	6.607W (38.2dBm)
FCC ID	Q639523N
INDUSTRY CANADA ID	4629A-9523N
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	Module for the transmission and reception of voice and data to and from the Iridium satellite network.
BATTERY/POWER SUPPLY	
MANUFACTURING DESCRIPTION	
MANUFACTURER	
TYPE	
PART NUMBER	
VOLTAGE	
COUNTRY OF ORIGIN	
MODULES (if applicable)	
MANUFACTURING DESCRIPTION	
MANUFACTURER	
TYPE	
POWER	
FCC ID	
COUNTRY OF ORIGIN	
INDUSTRY CANADA ID	
EMISSION DESIGNATOR	
DHSS/FHSS/COMBINED OR OTHER	
ANCILLARIES (if applicable)	
MANUFACTURING DESCRIPTION	
MANUFACTURER	
TYPE	
PART NUMBER	
SERIAL NUMBER	
COUNTRY OF ORIGIN	

Signature 
 Date 13/10/2015
 Declaration of Build Status Serial Number



Product Service

1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was an Iridium Core 9523N. 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 an external DC supply via a test interface board. The nominal voltage conditions declared by the manufacturer were as follows:

$$V_{\text{bat}} = 3.7 \text{ V DC}$$

$$V_{\text{boost}} = 27.0 \text{ V DC}$$

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

Industry Canada Company Address Code
IC2932B-1 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.



Product Service

SECTION 2

TEST DETAILS

FCC and Industry Canada Testing of the
Iridium Core 9523N
In accordance with FCC 47 CFR Part 15B and ICES-003



2.1 RADIATED EMISSIONS

2.1.1 Specification Reference

FCC 47 CFR Part 15B, Clause 15.109
ICES-003, Clause 6.2

2.1.2 Equipment Under Test and Modification State

9523N S/N: 27 - Modification State 0

2.1.3 Date of Test

25 October 2015 & 27 October 2015

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

The test was performed in accordance with ANSI C63.4, Clause 8 and ICES-003, Clause 6.2.

Remarks

The EUT is not supplied with a dedicated antenna therefore the receiver antenna terminal was connected to a 50 Ω load during testing.

The plots shown in this report are of the characterisation sweep that was performed of the EUT. All final measurements were performed with the procedure defined in ANSI C63.4, clause 8.

All final measurements were assessed against the Class B emission limits in FCC 47 CFR Part 15, Clause 15.109 and ICES-003, Clause 6.2.

2.1.6 Environmental Conditions

Ambient Temperature	20.1 - 20.3°C
Relative Humidity	34.0 - 53.0%

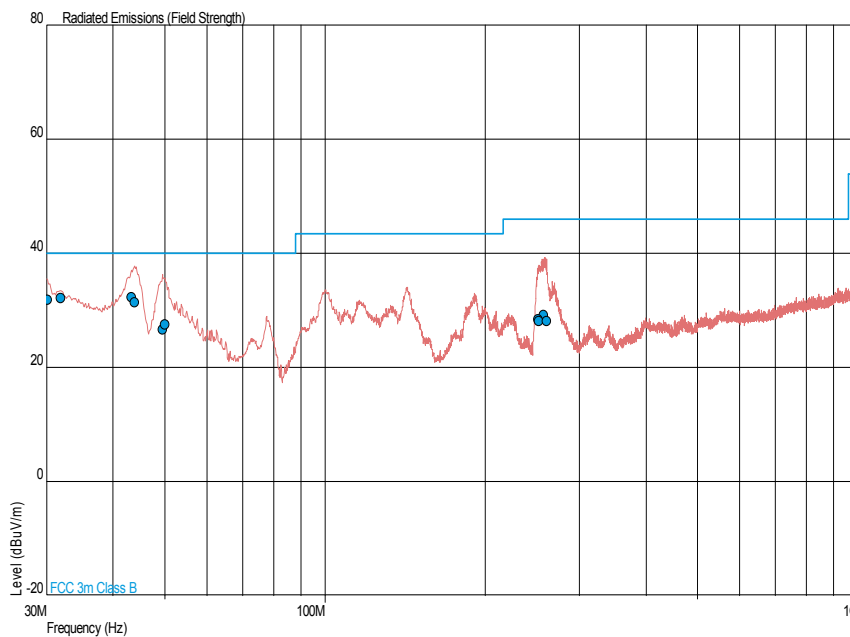


2.1.7 Test Results

Idle, 30 MHz to 1 GHz Results

Frequency (MHz)	Quasi-Peak Level (dBµV/m)	Quasi-Peak Level (µV/m)	Quasi-Peak Margin (dµV/m)	Quasi-Peak Margin (µV/m)	Angle (°)	Height (m)	Polarisation
30.135	31.9	39.4	-8.1	-60.6	112	3.38	Horizontal
31.872	32.2	40.7	-7.8	-59.3	155	2.90	Horizontal
43.284	32.3	41.2	-7.7	-58.8	19	1.00	Vertical
43.904	31.5	37.6	-8.5	-62.4	58	1.00	Vertical
49.625	26.6	21.4	-13.4	-78.6	360	1.00	Vertical
50.066	27.5	23.7	-12.5	-76.3	45	1.38	Vertical
251.306	28.4	26.3	-17.6	-173.7	82	1.00	Vertical
251.857	28.1	25.4	-17.9	-174.6	192	1.04	Horizontal
257.211	29.2	28.8	-16.8	-171.2	208	1.00	Horizontal
260.355	28.1	25.4	-17.9	-174.6	45	1.00	Vertical

Idle, 30 MHz to 1 GHz Plot



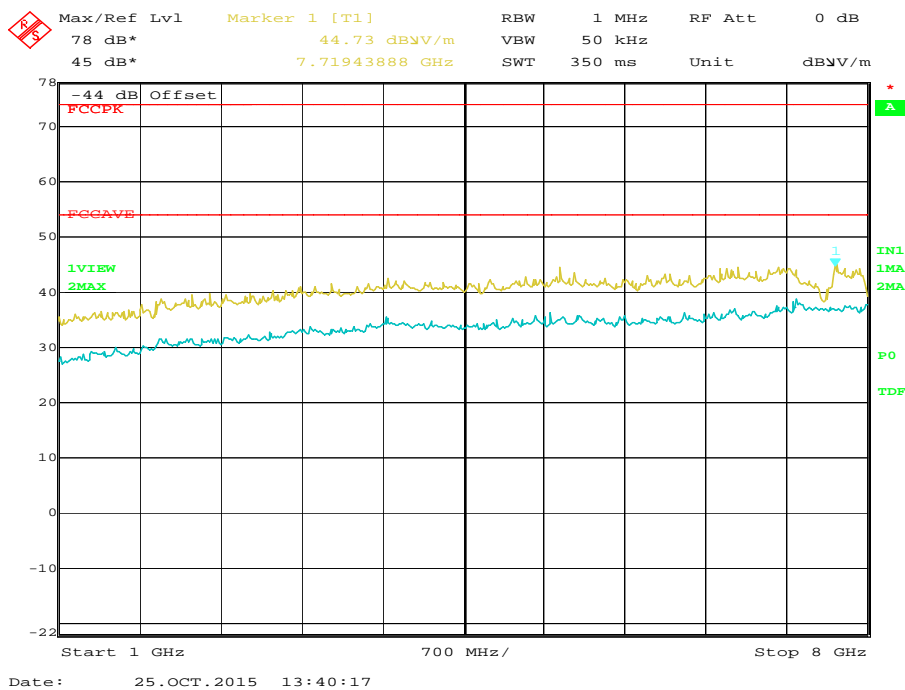


Idle, 1 GHz to 17 GHz Results

Frequency (MHz)	Average Level (dBµV/m)	Peak Level (dBµV/m)	Average Level (µV/m)	Peak Level (µV/m)	Angle (deg)	Height (m)	Polarisation
*							

*No emissions were detected within 10 dB of the limit.

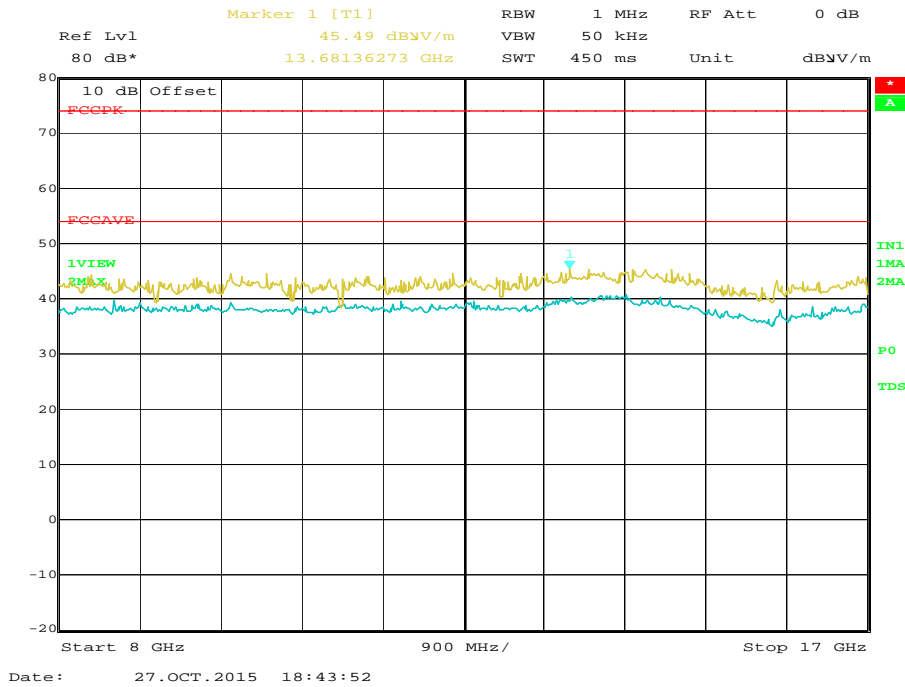
Idle, 1 GHz to 8 GHz Plot





Product Service

Idle, 8 GHz to 17 GHz Plot



FCC 47 CFR Part 15, Limit Clause 15.109

Class B

Frequency of Emission (MHz)	Field Strength (µV/m)
30 to 88	100.0
88 to 216	150.0
216 to 960	200.0
Above 960	500.0

ICES-003, Limit Clause 6.2

Class B

Frequency of Emission (MHz)	Quasi-Peak (dBµV/m)
30 to 88	40.0
88 to 216	43.5
216 to 960	46.0
960 to 1000	54.0

Frequency of Emission (MHz)	Field Strength (dBµV/m)	
	Linear Average Detector	Peak Detector
Above 1000	54.0	74.0



Product Service

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	29-Apr-2016
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	235	22	28-Nov-2015
Antenna (Bilog)	Schaffner	CBL6143	287	24	3-Feb-2016
Power Supply Unit	Farnell	H60-25	1092	-	O/P Mon
Pre-Amplifier	Phase One	PS04-0086	1533	12	30-Jul-2016
Screened Room (5)	Rainford	Rainford	1545	36	20-Dec-2017
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Power Supply	Hewlett Packard	6104A	1948	-	TU
EMI Test Receiver	Rohde & Schwarz	ESIB26	2028	12	16-Jun-2016
Hygrometer	Rotronic	A1	2138	12	3-Dec-2015
Multimeter	Iso-tech	IDM101	2417	12	29-Sep-2016
Filter (Hi Pass)	Lorch	9HP7-7000-SR	2833	12	5-Feb-2016
Power Supply	Farnell	LT30-2	2903	-	TU
Amplifier (1 - 8GHz)	Phase One	PS06-0060	3175	12	11-Aug-2016
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	18-Feb-2016
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	27-Oct-2015
7m Armoured RF Cable	SSI Cable Corp.	1501-13-13-7m WA(-)	3600	-	TU
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
Suspended Substrate Highpass Filter	Advance Power Components	11SH10- 3000/X18000-O/O	4412	12	24-Mar-2016
2m K-Type Cable (Rx)	Scott Cables	KPS-1501-2000- KPS	4527	-	TU
0.5m SMA Cable (Rx)	Scott Cables	SLSLL18-SMSM- 00.50M	4528	6	19-Feb-2016

TU – Traceability Unscheduled

O/P MON – Output Monitored with Calibrated Equipment



Product Service

3.2 MEASUREMENT UNCERTAINTY

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

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



Product Service

SECTION 4

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



Product Service

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 (Not UKAS Accredited).

This report must not be reproduced, except in its entirety, without the written permission of TÜV SÜD Product Service

© 2015 TÜV SÜD Product Service