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Report On

FCC and Industry Canada Testing of the Iridium Extreme 9575N In accordance with FCC 47 CFR Part 25, FCC 47 CFR Part 2, Industry Canada RSS-170 and Industry Canada RSS-GEN

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FCC ID: Q639575N IC: 4629A-9575N

Document 75934781 Report 09 Issue 2

August 2016



Product Service

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August 2016

PREPARED FOR

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PREPARED BY

APPROVED BY

Natalie Bennett Senior Administrator, Project Support

Nic Forsyth Authorised Signatory

DATED

30 August 2016

This report has been up-issued to Issue 2 to amend the serial numbers.

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 25, FCC 47 CFR Part 2, Industry Canada RSS-170 and Industry Canada RSS-GEN. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

J Tuckwell





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SECTION 1

REPORT SUMMARY

FCC and Industry Canada Testing of the Iridium Extreme 9575N In accordance with FCC 47 CFR Part 25, FCC 47 CFR Part 2, Industry Canada RSS-170 and Industry Canada RSS-GEN



1.1 INTRODUCTION

The information contained in this report is intended to show the verification of FCC and Industry Canada Testing of the Iridium Extreme 9575N to the requirements of FCC 47 CFR Part 25, FCC 47 CFR Part 2, Industry Canada RSS-170 and Industry Canada RSS-GEN.

Objective Manufacturer	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. Iridium Satellite LLC
Manulacturer	
Model Number(s)	Iridium Extreme 9575N
Serial Number(s)	P1638-GR-072 (E10006)
Number of Samples Tested	1
Test Specification/Issue/Date	FCC 47 CFR Part 25 (2015) FCC 47 CFR Part 2 (2015) Industry Canada RSS-170 (Issue 3, 2015 Industry Canada RSS-GEN (Issue 4, 2014)
Incoming Release Date	Application Form 12 July 2016
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	35884 04 May 2016
Start of Test	9 July 2016
Finish of Test	22 July 2016
Name of Engineer(s)	J Tuckwell M Russell T Guy
Related Document(s)	ANSI C63.4 (2013)



1.2 BRIEF SUMMARY OF RESULTS

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 25, FCC 47 CFR Part 2, Industry Canada RSS-170 and Industry Canada RSS-GEN is shown below.

Continn	Specification Clause					Deput	Commonto/Doog Standard
Section	Part 25	Part 2	RSS-170	RSS-GEN	Test Description	Result	Comments/Base Standard
Transmit							
2.1	-	2.1047(d)	-	-	Modulation Characteristics	-	Customer Declaration
2.2	-	2.1049	-	6.6	Occupied Bandwidth	Pass	
2.3	25.202(d)	2.1055	5.2	-	Frequency Tolerance	Pass	
2.4	25.202(f)	2.1051	5.4.3.1	6.13	Spurious Emissions at Antenna Terminals	Pass	
2.5	25.202(f)	2.1053	5.4.3.1	6.13	Radiated Spurious Emissions	Pass	
2.6	25.204	-	5.3	-	Conducted Output Power	Pass	
2.7	25.216	-	5.4.3	-	Limits on Emissions from Mobile Earth Stations for Protection of Aeronautical Radionavigation-Satellite Service	Pass	



1.3 APPLICATION FORM

	E	QUIPMENT DESCRIPTION		
Model Name/Number	lridum Ext	reme / 9575N		
Part Number	IRIDN021	5		
Hardware Version	Sim Board 9523N: re	Application Board: Rev K Sim Board: Rev C 9523N: rev D./V3, P1638-CN-028 V0.4, P1638-CN-030 V0.2, Engineering Mod # (P1638-HLOG-005 V1.49)		
Software Version	HL16001 (Bluecore: 7662_3, ATMega: 7600, Transceiver: DB16003)		
FCC ID (if applicable)		Q639575N		
Industry Canada ID (if applicable)		4629A-9575N		
Technical Description (Please description of the intended use o		Satellite phone for use with the Iricium satellite network.		

			P	OWER S	OURC	E			
	AC mains			State	e voltag	e 100~24	OVAC to 6	WDC (AC to	DC power adaptor)
AC sup	ply frequency	50~6 0	(Hz)						
100~ 240	VAC								
150m A (AC/D C	Max Current								
a dapt or input)									
50~6 0	Hz								
\boxtimes	Single phase				Thre	e phase			
And / C)r								
\boxtimes	External DC s	upply							
	Nominal voltag	je		Batte Terr Volta =3.7	unal ge	MaxC	urrent	Batter y Termi nal Curre nt =2.2A	A
	Extreme uppe	r voltage		Batte Tern Volta V					
	Extreme lower	voltage		call	uinal ge V (in e)/3.3V dle				
Battery	,								
	Nickel Cadmiu	Im			Lead	l acid (Veł	nide regul	ated)	
	Alkaline				Leda	anche			
\boxtimes	Lithium				Othe	r Details			
3.7V	3	√olts nom	inal.						
End po	oint voltage as qu	uoted by e	equipment manufacturer			2.75	V		



FREQUENCY INFORMATION							
Frequency Range	1616 to 163	26 Mł	Ηz				
Channel Spacing (where applicable)	41.667kHz						
Receiver Frequency Range (if different)	1616 to 163	26.S Mł	Ηz				
Channel Spacing ((fdifferent)							
Test Frequencies*	Bottom	1616.02 0833	MHz	Channel Number (if applicable)	1		
	Middle	1621.02 0833	MHz	Channel Number (if applicable)	121		
	Тор	1625.97 9167	MHz	Channel Number (if applicable)	240		
Intermediate Frequencies			2MHz, 0.4N 032768MH	1Hz, 0.6MHz, 0.8MHz, 16.8MHz 26MH z MHz	z,14.8MHz,		
Highest Internally Generated Frequence	ov :	32	54.6 MHz				



			POWER CHA	RACTERISTICS					
Max	imum TX power	5.888 (37.7) avera transt burst	æBm) gein						
Mini	mum TX power	0.933 29.7d avera transr burst	Bm) gein nit	ble)					
lstr	ansmitter intended for :								
Сог	tinuous duty						Yes	\boxtimes	No
Inte	mittent duty						Yes		No
lfin	ermittent state DUTY CYCLE								
Trar	nsmitter ON	8.28n	a seconds						
Trar	nsmitter OFF	81,72	m seconds						
			ANTENNA CU	ARACTERISTICS					
57	Anterna cornector		ANTENNA CO		50	Ohm			
	All a service we have a service of the			State impedance	50				
	Temporary antenna connector			State impedance		Ohm			
	Integral antenna	Туре	RHP Quadrifilar Helix Antenna	State gain	3.0	d⊟i			
	External antenna	Туре	Passive	State gain	3.0	dBi			

	MODULATION CHARACTERISTICS							
	Amplitude		Frequency					
	Phase		Other (please provide details): DE-QF5K/DE-BF5K					
Can	the transmitter operate un-modulated?		🗆 Yes 🖾 No					

CLASS OF EMISSION USED					
ITU designation or	r Class of Emission:				
1	41K7Q7W				
(if applicable) 2					
(if applicable) 3					
If more than three classes of emission, list separately.					

BATTERY POWER SUPPLY					
Model name,humber	lridiu m Extrem E	Identification/Part number	BAT31 001		
Manufacturer	Batter y Iridiu	Country of Origin	Assem		
	m/Pall adium Energy	6	bled in China (Cells manuf		
			acture d in		

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∫apan)

	ANC	ILLARIES (If applicable)	
Model name <i>l</i> humber	AC Travel Charge	Identification/Part number	ACTC0 401
	r (Note: there are other		
	ancila ries which		
	are not listed here due to		
	mieto lackof space)		
Manufacturer	fridiu m	Country of Origin	Germa ny
	EX	TREME CONDITIONS	
Extreme test voltages (Max)	Battery V Termin al Voltag e=4.2V DC	Extreme test voltages (Min)	Batter V y Termi nal Vultag e

				=3.1V (in call mode) /3.3V(in idle mode)	
Nominal DC Vottage	Batten Termin al Voltag e=3.7% DC	ì	DC Maximum Current	Battery Termin Ia Curren t=2.2A	A
Maximum temperature	55	"C	Minimum temperature	-10	°C

I hereby declare that that the information supplied is correct and complete.

Name: Jonathan Jones Date: 12/07/2016

I

Position held:

Senior Engineer



1.4 **PRODUCT INFORMATION**

1.4.1 Technical Description

The Equipment Under Test (EUT) was a Iridium Extreme 9575N. 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 3.7 V Battery charging via AC/DC adapter through 100 V AC supply.

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.



SECTION 2

TEST DETAILS

FCC and Industry Canada Testing of the Iridium Extreme 9575N In accordance with FCC 47 CFR Part 25, FCC 47 CFR Part 2, Industry Canada RSS-170 and Industry Canada RSS-GEN



2.1 MODULATION CHARACTERISTICS

2.1.1 Specification Reference

FCC 47 CFR Part 2, Clause 2.1047(d)

2.1.2 Equipment Under Test

Iridium Extreme 9575N

2.1.3 Test Results

Transmit, Modulation Characteristics, Customer Description

Traffic, broadcast, and ring alert channels use differentially encoded quadrature phase shift keyed (DE-QPSK) modulation with 40% square root raised cosine pulse shaping. The burst transmission rate is 25ksps or 50 kbps. The phase of the QPSK symbol states relative to the carrier phase is (Symbol State/Phase in deg): 00/0, 01/-90, 10/+90, 11/180. The acquisition channel uses differentially encoded binary phase shift keyed (DE-BPSK) with 40% square root raised cosine pulse shaping. The burst rate on these channels is 25 kbps. The sync channel uses 25 kbps DE-BPSK on the uplink and 50 kbps DE-QPSK on the downlink. Both with 40% square root raised cosine pulse shaping.

FCC 47 CFR Part 2, Limit Clause 2.1047 (d)

A curve or equivalent data which shows that the equipment will meet the modulation requirements of the rules under which the equipment is to be licensed.



2.2 OCCUPIED BANDWIDTH

2.2.1 Specification Reference

FCC 47 CFR Part 2, Clause 2.1049 Industry Canada RSS-GEN, Clause 6.6

2.2.2 Equipment Under Test and Modification State

Iridium Extreme 9575N S/N: P1638-GR-072 (E10006) - Modification State 0

2.2.3 Date of Test

18 July 2016

2.2.4 Test Equipment Used

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

2.2.5 Test Procedure

The EUT was connected to a spectrum analyser via a cable and attenuator. The EUT was configured to transmit on bottom, middle and top channels at maximum power with modulation. The spectrum analyser was configured with an RBW of 910 Hz and VBW of 9.1 kHz using a peak detector and max hold trace. The Occupied bandwidth measurement function of the analyser was then utilized to make the measurement and the 99% occupied bandwidth was recorded.

2.2.6 Environmental Conditions

Ambient Temperature	23.6°C
Relative Humidity	66.9%

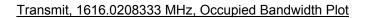


2.2.7 Test Results

3.7 V DC Supply

Transmit, Occupied Bandwidth Results

1616.0208333 MHz	1621.0208333 MHz	1625.979166 MHz
kHz	kHz	kHz
31.603	31.511	31.420







enter Freq 1.6210	ccupied BW 2 DC 20833 GHz	#IFGain:	Ce	EXT SOURCE nter Freq: ig: Free Ru tten: 30 dE	1.621020 in	833 GH		0/10	Radio S	17:33 AM Jul 18, 201 td: None evice: BTS
0 dB/div Ref 50.0	00 dBm		Î I							
			, m	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	<u>~~</u> ~~	m _e	m			
	hoursen	vw ⁴						W.		a man
0.0										
enter 1.621 GHz es BW 910 Hz				VBW	9.1 kH	z				Span 100 kH eep 143.9 n
	dwidth	Total x dB	Power	45.9 d						
Occupied Band 31.511	kHz		Ref Pwr	-26.00 34.1 d		at∆	-3.200	0 kHz		
	kHz	x dB l	Ref Pwr			at∆	-3.200		Boundary	
31.511	Offset F	x dB I	er Boundary Abs Power	34.1 d	Bm tel Power	at∆	Offset Free	Upper	Abs Power	
		x dB I	er Boundary	34.1 d	Bm	at ∆		Upper	,	Rel Pow -24.9 df

Transmit, 1621.0208333 MHz, Occupied Bandwidth Plot

Transmit, 1625.979166 MHz, Occupied Bandwidth Plot





FCC 47 CFR Part 2, Limit Clause 2.1049

None specified.

Industry Canada RSS-GEN, Limit Clause

None specified.



2.3 FREQUENCY TOLERANCE

2.3.1 Specification Reference

FCC 47 CFR Part 25, Clause 25.202(d) FCC 47 CFR Part 2, Clause 2.1055 Industry Canada RSS-170, Clause 5.2

2.3.2 Equipment Under Test and Modification State

Iridium Extreme 9575N S/N: P1638-GR-072 (E10006) - Modification State 0

2.3.3 Date of Test

22 July 2016

2.3.4 Test Equipment Used

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

2.3.5 Test Procedure

The test was performed in accordance with FCC Part 2, clause 2.1055.

Remarks

The frequency error was determined by finding the midpoint between the upper and lower points containing the 99% occupied bandwidth.

The voltage on the external DC power supply was set to the voltage corresponding to 3.1, 3.7 and 4.2 V DC as measured at the EUT battery terminals during the transmitted burst using an oscilloscope.

2.3.6 Environmental Conditions

Ambient Temperature	22.9°C
Relative Humidity	53.3%



2.3.7 Test Results

3.7 V DC Supply

Transmit, 1621.0208333 MHz, Frequency Stability Under Temperature Variations Results

	Frequency Error		
Temperature Interval	%	ppm	
-30 °C	-0.00012	-1.160	
-20 °C	-0.00009	-0.934	
-10 °C	-0.00006	-0.554	
0 °C	-0.00004	-0.440	
+10 °C	-0.00011	-1.120	
+20 °C	-0.00007	-0.727	
+30 °C	-0.00004	-0.396	
+40 °C	-0.00004	-0.374	
+50 °C	-0.00002	-0.176	

Transmit, 1621.0208333 MHz, Frequency Stability Under Voltage Variations Results

	Frequency Error		
DC Voltage	%	ppm	
3.7 V DC	-0.00007	-0.727	
3.2 V DC	-0.00003	-0.266	
4.2 V DC	-0.00004	-0.416	

FCC 47 CFR Part 2, Limit Clause 25.202(d)

Frequency tolerance, Earth stations. The carrier frequency of each earth station transmitter authorized in these services shall be maintained within 0.001 percent of the reference frequency.

Industry Canada RSS-170, Limit Clause 5.2

For mobile earth station equipment, the carrier frequency shall not depart from the reference frequency by more than ± 10 ppm.



2.4 SPURIOUS EMISSIONS AT ANTENNA TERMINALS

2.4.1 Specification Reference

FCC 47 CFR Part 25, Clause 25.202(f), FCC 47 CFR Part 2, Clause 2.1051 Industry Canada RSS-170, Clause 5.4.3.1 Industry Canada RSS-GEN, Clause 6.13

2.4.2 Equipment Under Test and Modification State

Iridium Extreme 9575N S/N: P1638-GR-072 (E10006) - Modification State 0

2.4.3 Date of Test

18 July 2016

2.4.4 Test Equipment Used

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

2.4.5 Test Procedure

For emissions within 250% of the authorized bandwidth (41.66 kHz):

The EUT was connected to a spectrum analyser via a cable and attenuator. The offset was the sum of the path loss, as measured using a network analyser, the antenna gain, as declared by the manufacturer and a measurement bandwidth correction factor of 10 log (4) as a 1 kHz RBW was used as opposed to a 4 kHz RBW. The reference level was set to the EIRP result as measured for 25.204. The spectrum analyser gated trigger was used to measure only over the average part of the burst.

For emissions greater than 250% of the authorized bandwidth (41.66 kHz):

The EUT was connected to a spectrum analyser via a cable and attenuator. For frequencies greater than 3 GHz a high pass filter with a 3 GHz cut off frequency was used. The offset was the sum of the path loss, as measured using a network analyser and the antenna gain, as declared by the manufacturer.

2.4.6 Environmental Conditions

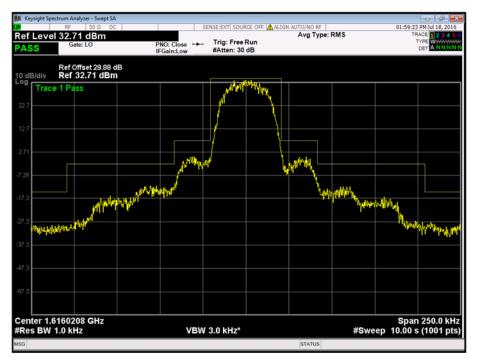
Ambient Temperature	20.5°C
Relative Humidity	55.8%

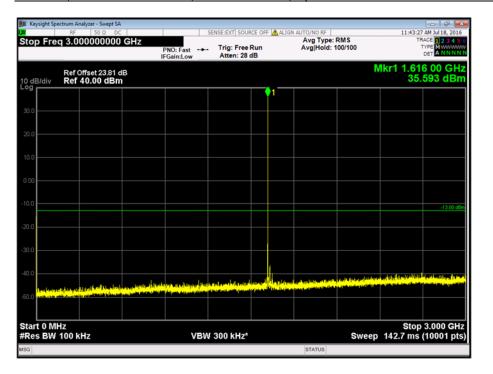


2.4.7 Test Results

3.7 V DC Supply

Transmit, 1616.0208333 MHz, Mask, Spurious Emissions at Antenna Terminals Plot

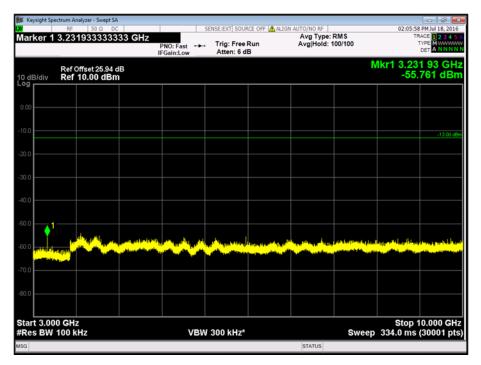




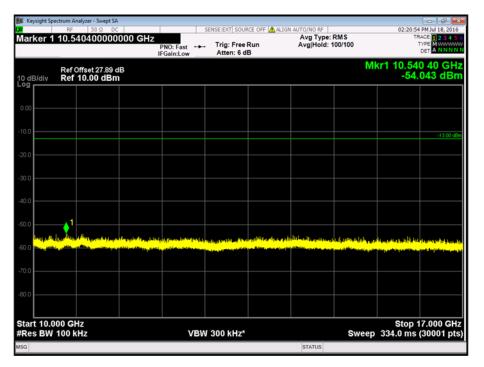
Transmit, 1616.0208333 MHz, 9 kHz to 3 GHz, Spurious Emissions at Antenna Terminals Plot



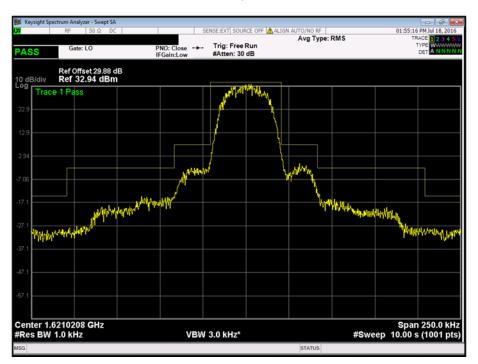
Transmit, 1616.0208333 MHz, 3 GHz to 10 GHz, Spurious Emissions at Antenna Terminals Plot



Transmit, 1616.0208333 MHz, 10 GHz to 17 GHz, Spurious Emissions at Antenna Terminals Plot

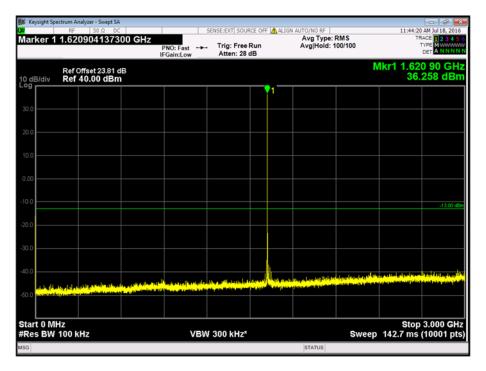






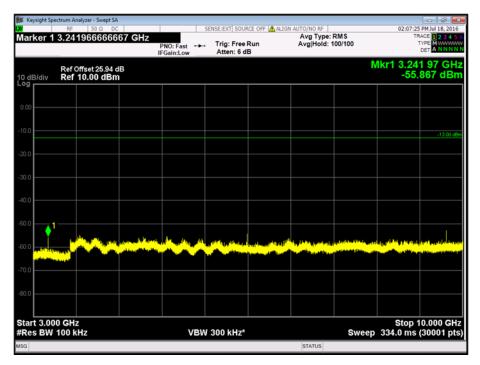
Transmit, 1621.0208333 MHz, Mask, Spurious Emissions at Antenna Terminals Plot

Transmit, 1621.0208333 MHz, 9 kHz to 3 GHz, Spurious Emissions at Antenna Terminals Plot

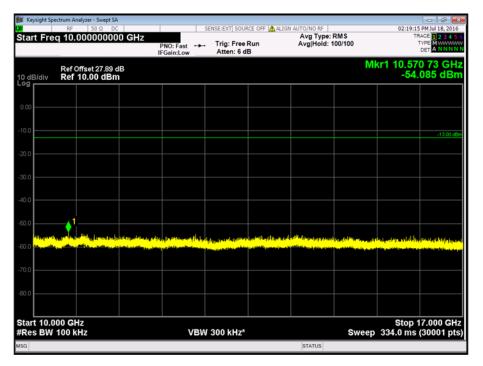




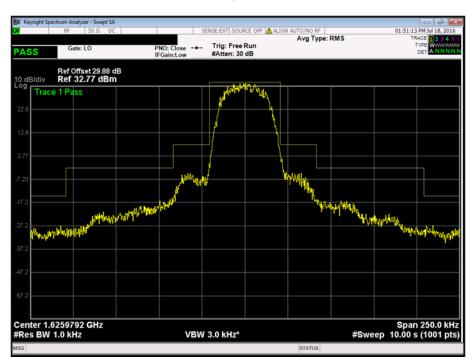
Transmit, 1621.0208333 MHz, 3 GHz to 10 GHz, Spurious Emissions at Antenna Terminals Plot



Transmit, 1621.0208333 MHz, 10 GHz to 17 GHz, Spurious Emissions at Antenna Terminals Plot

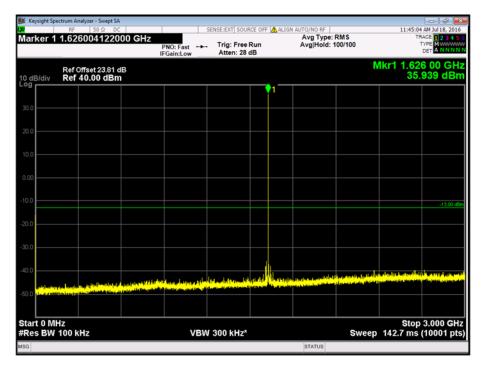






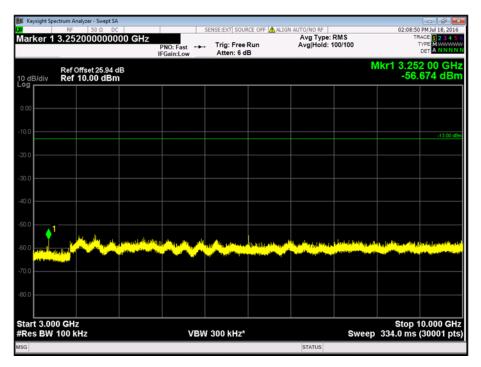
Transmit, 1625.979166 MHz, Mask, Spurious Emissions at Antenna Terminals Plot

Transmit, 1625.979166 MHz, 9 kHz to 3 GHz, Spurious Emissions at Antenna Terminals Plot

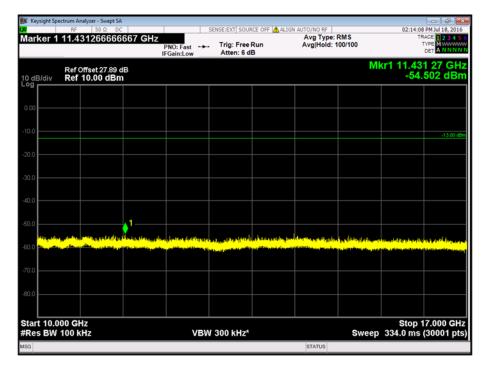




Transmit, 1625.979166 MHz, 3 GHz to 10 GHz, Spurious Emissions at Antenna Terminals Plot



Transmit, 1625.979166 MHz, 10 GHz to 17 GHz, Spurious Emissions at Antenna Terminals Plot





FCC 47 CFR Part 2, Limit Clause 25.202(f)

The average power of unwanted emissions shall be attenuated below the average output power, P(dBW), of the transmitter, as specified below:

- 1) 25 dB in any 4 kHz band, the centre frequency of which is offset from the channel frequency by more than 50%, up to and including 100% of the authorised bandwidth;
- 2) 35 dB in any 4 kHz band, the centre frequency of which is offset from the channel frequency by more than 100%, up to and including 250% of the authorised bandwidth;
- 3) 43 + 10 Log p (watts) in any 4 kHz band, the centre frequency of which is offset from the channel frequency by more than 250% of the authorised bandwidth.

Industry Canada RSS-170, Limit Clause 5.4.3.1

The average power of unwanted emissions shall be attenuated below the average output power, P(dBW), of the transmitter, as specified below:

- 25 dB in any 4 kHz band, the centre frequency of which is offset from the channel frequency by more than 50%, up to and including 100% of the occupied bandwidth or necessary bandwidth, whichever is greater
- 35 dB in any 4 kHz band, the centre frequency of which is offset from the channel frequency by more than 100%, up to and including 250% of the occupied bandwidth or necessary bandwidth, whichever is greater
- 43 + 10 Log p (watts) in any 4 kHz band, the centre frequency of which is offset from the channel frequency by more than 250% of the occupied bandwidth or necessary bandwidth, whichever is greater.



2.5 RADIATED SPURIOUS EMISSIONS

2.5.1 Specification Reference

FCC 47 CFR Part 25, Clause 25.202(f), FCC 47 CFR Part 2, Clause 2.1053 Industry Canada RSS-170, Clause 5.4.3.1 Industry Canada RSS-GEN, Clause 6.13

2.5.2 Equipment Under Test and Modification State

Iridium Extreme 9575N S/N: P1638-GR-072 (E10006) - Modification State 0

2.5.3 Date of Test

9 July 2016

2.5.4 Test Equipment Used

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

2.5.5 Test Procedure

For radiated testing, a preliminary profile of the Spurious Radiated Emissions was obtained up to the 10th harmonic by operating the EUT on a remotely controlled turntable within a semianechoic chamber. Measurements of emissions from the EUT were obtained with the Measurement Antenna in both Horizontal and Vertical Polarisations. The profiling produced a list of the worst-case emissions together with the EUT azimuth and antenna polarisation.

Using the information from the preliminary profiling of the EUT, the list of emissions was then confirmed or updated under Alternative Open Site conditions. Emission levels were maximised by adjusting the antenna height, antenna polarisation and turntable azimuth.

The EUT was set to transmit on maximum power with both channels operating simultaneously.

For any emissions found the EUT was then removed from the chamber and replaced with a substitution antenna. Using a signal generator the level was adjusted to achieve the same value on the measuring instrument as previously recorded with the EUT. The final result was determined by a calculation using the signal generator level, antenna gain and cable loss.

The measurements were performed at a 3m distance unless otherwise stated.

2.5.6 Environmental Conditions

Ambient Temperature	21.9°C
Relative Humidity	53.0%



2.5.7 Test Results

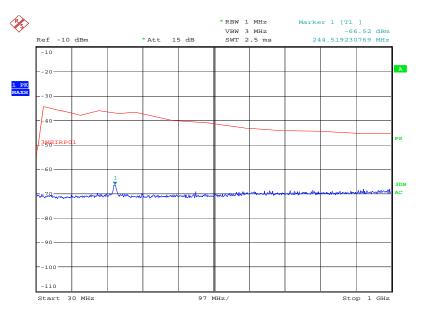
3.7 V DC Supply

Transmit, 1616.0208333 MHz, 30 MHz to 17 GHz, Radiated Spurious Emissions Results

Frequency (MHz)	Emission Results (dBm)
*	

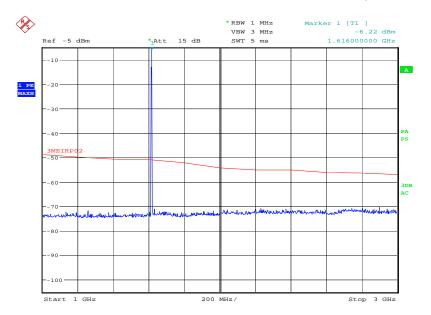
*No emissions were detected within 10 dB of the limit.

Transmit, 1616.0208333 MHz, 30 MHz to 1 GHz, Radiated Spurious Emissions Plot



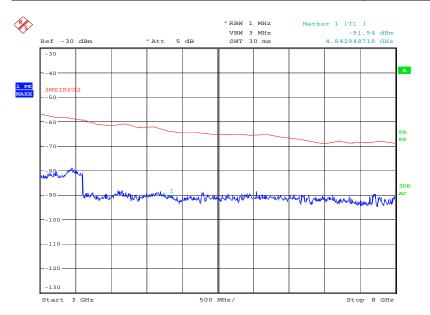
Date: 9.JUL.2016 14:54:42





Transmit, 1616.0208333 MHz, 1 GHz to 3 GHz, Radiated Spurious Emissions Plot

Date: 9.JUL.2016 13:12:03



Transmit, 1616.0208333 MHz, 3 GHz to 8 GHz, Radiated Spurious Emissions Plot

Date: 9.JUL.2016 13:08:21



× * RBW 1 MHz VBW 3 MHz SWT 55 ms Marker 1 [T1] -64.09 dBm 11.307000000 GHz *Att 10 dB Ref -10 dBm -10 А -20 1 PK MAXH 3MEIRI - 30 -----40 -50 60 how any of the state of the second m dua / M mohan sale. DE -70-AC -80 -90 -100 -110 Stop 17 GHz Start 8 GHz 900 MHz/

Transmit, 1616.0208333 MHz, 8 GHz to 17 GHz, Radiated Spurious Emissions Plot

Date: 9.JUL.2016 14:04:13

COMMERCIAL-IN-CONFIDENCE

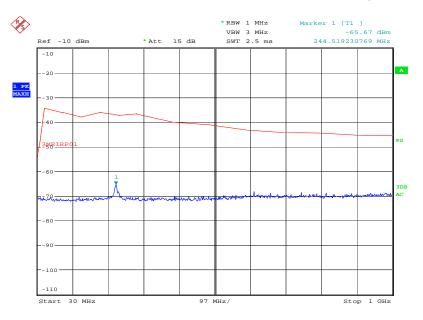


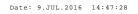
Transmit, 1621.0208333 MHz, 30 MHz to 17 GHz, Radiated Spurious Emissions Results

Frequency (MHz)	Emission Results (dBm)
*	

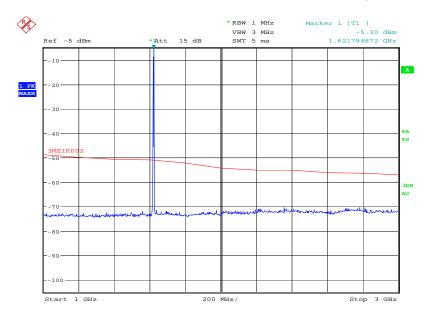
*No emissions were detected within 10 dB of the limit.

Transmit, 1621.0208333 MHz, 30 MHz to 1 GHz, Radiated Spurious Emissions Plot



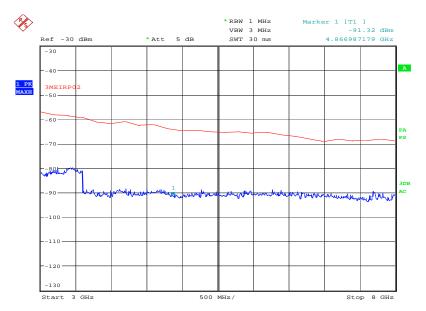


Transmit, 1621.0208333 MHz, 1 GHz to 3 GHz, Radiated Spurious Emissions Plot



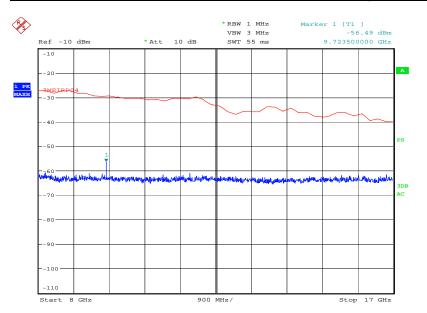
Date: 9.JUL.2016 12:54:22





Transmit, 1621.0208333 MHz, 3 GHz to 8 GHz, Radiated Spurious Emissions Plot

Date: 9.JUL.2016 13:00:15



Transmit, 1621.0208333 MHz, 8 GHz to 17 GHz, Radiated Spurious Emissions Plot

Date: 9.JUL.2016 14:09:45

COMMERCIAL-IN-CONFIDENCE

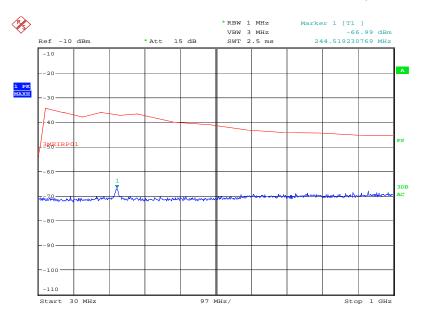


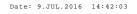
Transmit, 1621.0208333 MHz, 30 MHz to 17 GHz, Radiated Spurious Emissions Results

Frequency (MHz)	Emission Results (dBm)
*	

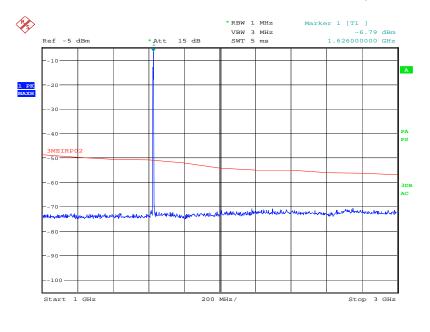
*No emissions were detected within 10 dB of the limit.

Transmit, 1625.979166 MHz, 30 MHz to 1 GHz, Radiated Spurious Emissions Plot



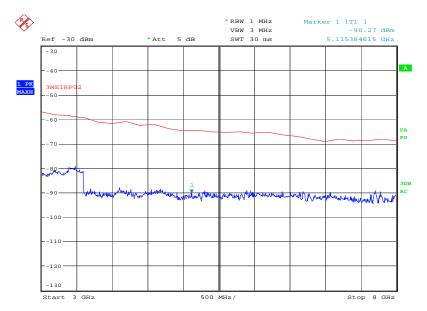


Transmit, 1621.0208333 MHz, 1 GHz to 3 GHz, Radiated Spurious Emissions Plot



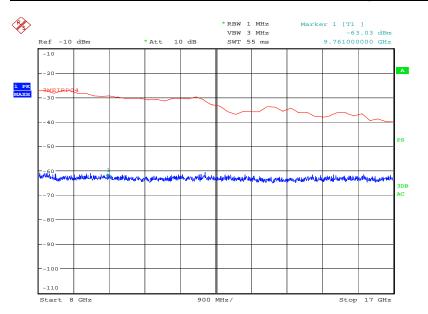
Date: 9.JUL.2016 13:21:20





Transmit, 1621.0208333 MHz, 3 GHz to 8 GHz, Radiated Spurious Emissions Plot

Date: 9.JUL.2016 13:24:35



Transmit, 1621.0208333 MHz, 8 GHz to 17 GHz, Radiated Spurious Emissions Plot

Date: 9.JUL.2016 14:35:12



FCC 47 CFR Part 2, Limit Clause 25.202(f)

The average power of unwanted emissions shall be attenuated below the average output power, P(dBW), of the transmitter, as specified below:

- 4) 25 dB in any 4 kHz band, the centre frequency of which is offset from the channel frequency by more than 50%, up to and including 100% of the authorised bandwidth;
- 5) 35 dB in any 4 kHz band, the centre frequency of which is offset from the channel frequency by more than 100%, up to and including 250% of the authorised bandwidth;
- 6) 43 + 10 Log p (watts) in any 4 kHz band, the centre frequency of which is offset from the channel frequency by more than 250% of the authorised bandwidth.

Industry Canada RSS-170, Limit Clause 5.4.3.1

The average power of unwanted emissions shall be attenuated below the average output power, P(dBW), of the transmitter, as specified below:

- 4) 25 dB in any 4 kHz band, the centre frequency of which is offset from the channel frequency by more than 50%, up to and including 100% of the occupied bandwidth or necessary bandwidth, whichever is greater
- 5) 35 dB in any 4 kHz band, the centre frequency of which is offset from the channel frequency by more than 100%, up to and including 250% of the occupied bandwidth or necessary bandwidth, whichever is greater
- 6) 43 + 10 Log p (watts) in any 4 kHz band, the centre frequency of which is offset from the channel frequency by more than 250% of the occupied bandwidth or necessary bandwidth, whichever is greater.



2.6 CONDUCTED OUTPUT POWER

2.6.1 Specification Reference

FCC 47 CFR Part 25, Clause 25.204 Industry Canada RSS-170, Clause 5.3

2.6.2 Equipment Under Test and Modification State

Iridium Extreme 9575N S/N: P1638-GR-072 (E10006) - Modification State 0

2.6.3 Date of Test

18 July 2016

2.6.4 Test Equipment Used

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

2.6.5 Test Procedure

The EUT was connected to a spectrum analyser via a cable and 20dB attenuator. The path loss was measured using a network analyser and entered as a reference level offset into the instrumentation. The spectrum analyser was configured with an RBW of 3.9 kHz and VBW of 12 kHz. 10Log(4/3.9) = 0.11 dB was added to the reference level offset to make the result relative to any 4 kHz band as per the requirement in 25.204(a). The 3.0 dBi antenna gain as declared by the manufacturer was also included in this offset to report the result as EIRP. The transmit power was measured over the active part of the burst using an RMS detector, the spectrum analyser sweep time was set to 10s and the peak result recorded.

2.6.6 Environmental Conditions

Ambient Temperature23.1°CRelative Humidity66.9%



2.6.7 Test Results

3.7 V DC Supply

Transmit, EIRP, Conducted, Power Limits Results

1616.0208333 MHz	1621.0208333 MHz	1625.979166 MHz	
dBW	dBW	dBW	
2.71	2.94	2.77	

FCC 47 CFR Part 25, Limit Clause 25.204

+40 dBW in any 4 kHz band for $\theta \le 0^{\circ}$ +40 + 30 dBW in any 4 kHz band for $0^{\circ} < \theta \le 5^{\circ}$ For angles of elevation of the horizon greater than 5° there shall be no restriction as to the equivalent isotropically radiated power transmitted by an earth station towards the horizon.

Industry Canada RSS-170, Limit Clause 5.3

The application for MES certification shall state the MES e.i.r.p. that is necessary for satisfactory communication. The maximum permissible e.i.r.p. will be the stated necessary e.i.r.p. plus a 2 dB margin. If a detachable antenna is used, the certification application shall state the recommended antenna type and manufacturer, the antenna gain and the maximum transmitter output power at the antenna terminal.



2.7 LIMITS ON EMISSIONS FROM MOBILE EARTH STATIONS FOR PROTECTION OF AERONAUTICAL RADIONAVIGATION-SATELLITE SERVICE

2.7.1 Specification Reference

FCC 47 CFR Part 25, Clause 25.216 Industry Canada RSS-170, Clause 5.4.3

2.7.2 Equipment Under Test and Modification State

Iridium Extreme 9575N S/N: P1638-GR-072 (E10006) - Modification State 0

2.7.3 Date of Test

18 July 2016 & 19 July 2016

2.7.4 Test Equipment Used

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

2.7.5 Test Procedure

The EUT was set to transmit at maximum power using modulation as described in the manufacturers application form. The EUT was connected to a spectrum analyser via a cable and attenuator. The path loss was measured using a vector network analyser and entered as a reference level offset in the EUT. The gated trigger of the analyser was used so that average measurements were taken over a 2 ms period of the active burst.

Any spur within 20 dB of -70 dBm/MHz was investigated further to determine the bandwidth of the emission. Each spur was individually investigated and the RBW of the analyser was reduced to allow an approximation of the emission bandwidth of the spur. It was confirmed that any discrete emissions have a power density less than -80 dBm/MHz. Measurements of the bottom channel in the frequency range 1605 MHz to 1610 MHz had a reduced limit of 10Log(1000/100) = 10 dB as the RBW was reduced to 100 kHz.

For emissions in the carrier off state, the EUT was configured in a state of continuous non-transmission.

2.7.6 Environmental Conditions

Ambient Temperature	21.7 - 23.0°C
Relative Humidity	66.4 - 67.6%



2.7.7 Test Results

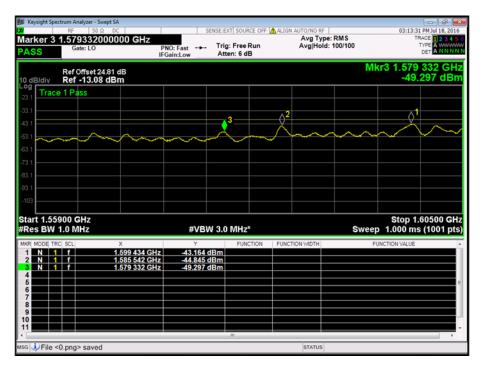
3.7 V DC Supply

<u>Transmit, 1616.0208333 MHz, EIRP Density – Broadband Emissions, Limits on Emissions from</u> <u>Mobile Earth Stations for Protection of Aeronautical Radionavigation-Satellite Service Results</u>

Frequency (MHz)	dBW
1599.4	-73.16
1585.5	-74.19

No other emissions within 6 dB of the limit were detected.

<u>Transmit, 1616.0208333 MHz, EIRP Density – Broadband Emissions, 1559 MHz to 1605 MHz,</u> <u>Limits on Emissions from Mobile Earth Stations for Protection of Aeronautical Radionavigation-</u> <u>Satellite Service Plot</u>





Transmit, 1616.0208333 MHz, EIRP Density – Broadband Emissions, 1605 MHz to 1610 MHz, Limits on Emissions from Mobile Earth Stations for Protection of Aeronautical Radionavigation-Satellite Service Plot

	RF 50 Ω DC	CORREC	SENSE:EXT	SOURCE OFF ALI	GN AUTO/NO RF		09:33:47 AM Jul 19, 2016
verage/l	Hold Number Gate: LO			Free Run : 6 dB	Avg Type: RMS Avg Hold: 100/1		TRACE 1 2 3 4 5 TYPE A WWW DET A NNNN
dB/div	Ref Offset 24.81 o Ref 10.00 dBm	IB I				Mkr1 1.5	79 200 1 GH dBr
^g Trace	1 Pass						
.0							
.0							
.0							
			man and the	mm		man	manymen
	mm	V-1444444					
.0							
.0							
art 1.605 tes BW 1	5000 GHz 100 kHz		VBW 300 ki	Hz*		Sto Sweep 2.667	p 1.610000 GH 7 ms (10001 pt

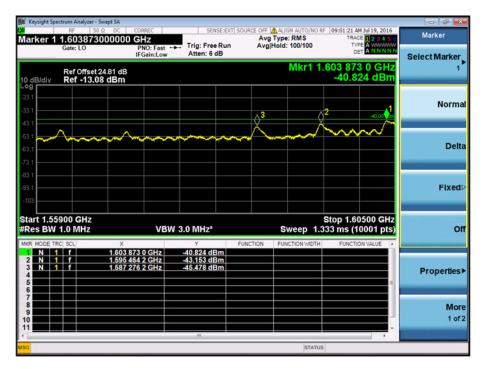


Transmit, 1621.0208333 MHz, EIRP Density – Broadband Emissions, Limits on Emissions from Mobile Earth Stations for Protection of Aeronautical Radionavigation-Satellite Service Results

Frequency (MHz)	Frequency (MHz)
1603.90	-70.82
1595.46	-73.15
1587.30	-75.48

No other emissions within 6 dB of the limit were detected.

<u>Transmit, 1621.0208333 MHz, EIRP Density – Broadband Emissions, 1559 MHz to 1605 MHz,</u> <u>Limits on Emissions from Mobile Earth Stations for Protection of Aeronautical Radionavigation-</u> <u>Satellite Service Plot</u>





Transmit, 1621.0208333 MHz, EIRP Density – Broadband Emissions, 1605 MHz to 1610 MHz, Limits on Emissions from Mobile Earth Stations for Protection of Aeronautical Radionavigation-Satellite Service Plot

	RF 50 Ω DC	CORREC	SENSE:EXT SO	URCE OFF ALIGN AUTO/NO RF		Marker
arker 1 ASS	1.60977000000 Gate: LO	PNO: Wide +++ IFGain:Low	Trig: Free Run Atten: 6 dB	Avg Type: RMS Avg Hold: 100/100	TYPE A WWWWW DET A NNNN	Marker Tabl
) dB/div	Ref Offset 24.81 dB Ref 20.00 dBm			Mkr1 1.	609 770 0 GHz -39.824 dBm	
0.0	e 1 Pass					Marker Count [Off]
						Coup Marker On <u>C</u>
0.0						
10					↓ ¹	
MM an	~~~~~	and the second second				
.0						All Markers O
art 1.60	5000 GHz				top 1.610000 GHz	Mo 2 of
	1.0 MHz	VBW 3	0 MHz*		67 ms (10001 pts)	



Transmit, 1625.979166 MHz, EIRP Density – Broadband Emissions, Limits on Emissions from Mobile Earth Stations for Protection of Aeronautical Radionavigation-Satellite Service Results

Frequency (MHz)	dBW
1592.5	-70.58

No other emissions within 6 dB of the limit were detected.

<u>Transmit, 1625.979166 MHz, EIRP Density – Broadband Emissions, 1559 MHz to 1605 MHz,</u> Limits on Emissions from Mobile Earth Stations for Protection of Aeronautical Radionavigation-Satellite Service Plot

sight Sp	ectrum Analyzer - Swept SA							
EFro	RF 50 Ω DC g 1.559000000 GH	CORREC	SENSE:	EXT SOURCE OFF	ALIGN AUTO/NO RF Avg Type: I	RMS		9 AM Jul 19, 201
. rre	Gate: LO	PNO: Fast IFGain:Lov		g: Free Run ten: 6 dB	Avg Hold: 1	00/100		
/div	Ref Offset 24.81 dB Ref -10.00 dBm					Mk	r1 1.592 5 -40	38 6 GI 584 dB
						♦ ¹		-40.00
						\wedge		
						$ \land $		
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~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~	~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~	/	****	Anna Maraa
~			~~~	~~~	~~~	/		
~		~~~~~		~~~	~~~	/		
						/		
	9900 GHz 1.0 MHz		VBW 3.0					.60500 Gł



<u>Transmit, 1625.979166 MHz, EIRP Density – Broadband Emissions, 1605 MHz to 1610 MHz,</u> <u>Limits on Emissions from Mobile Earth Stations for Protection of Aeronautical Radionavigation-</u> <u>Satellite Service Plot</u>





Transmit, 1616.0208333 MHz, EIRP Density – Discrete Emissions, Limits on Emissions from Mobile Earth Stations for Protection of Aeronautical Radionavigation-Satellite Service Results

Frequency (MHz)	dBW
1579.2	-80.36

No other emissions within 6 dB of the limit were detected.

<u>Transmit, 1616.0208333 MHz, EIRP Density – Discrete Emissions, Limits on Emissions from</u> <u>Mobile Earth Stations for Protection of Aeronautical Radionavigation-Satellite Service Plot</u>

_							ctrum Analyzer - Swept SA	📕 Keysight Spe
6 Peak Search	4 Jul 18, 2016 E 1 2 3 4 5 6 E A ********	TRAC	ALIGN AUTO/NO RI Type: RMS Hold: 10/10	Avg			RF 50 Ω DC 1.579200140000	Marker 1
Next Pe	14 GHz	79 200	Mkr1 1.5		Atten: 6 dB	PNO: Close IFGain:Low	Gate: LO Ref Offset 24.81 dB	
	58 dBm	-50.3					Ref -13.08 dBm	10 dB/div Log
Next Pk Rig								-23.1
	-50.00 dBm				1			-43.1
Next Pk L								-53.1
								-73.1
Marker De								-83.1
								-103
Z Mkr→4	0.00 kHz 1001 pts)	Span 2 .933 ms (Sweep 7.		3.0 kHz*	VBW	57920020 GHz 1.0 kHz	Center 1. #Res BW
	N VALUE	FUNCTION	FUNCTION WIDTH	FUNCTION	Y -50,358 dBm	0 14 GHz		MKR MODE TH
Mkr→RefL								2 3
	E							4 5 6
Mo								7 8 9
1 0								10
	,	1	STATUS		m			4 ASG



Transmit, 1621.0208333 MHz, EIRP Density – Discrete Emissions, Limits on Emissions from Mobile Earth Stations for Protection of Aeronautical Radionavigation-Satellite Service Results

Frequency (MHz)	dBW
1579.2	-80.76

No other emissions within 6 dB of the limit were detected.

<u>Transmit, 1621.0208333 MHz, EIRP Density – Discrete Emissions, Limits on Emissions from</u> <u>Mobile Earth Stations for Protection of Aeronautical Radionavigation-Satellite Service Plot</u>

Keysight Spectrum Analyzer - Swept SA RF 50 Ω DC	CORREC SENSE:EXT S	OURCE OFF 🔥 ALIGN AUTO/NO RF		
larker 1 1.579200146000 Gate: LO	PNO: Close - Trig: Free Run	Avg Type: RMS Avg Hold: 10/10	TRACE 1 2 3 4 5 6 TYPE A WWWWW DET A N N N N N	Peak Search
Ref Offset 24,81 dB 0 dB/div Ref -13.08 dBm	IFGain:Low Atten: 6 dB	Mkr1 1.579	200 146 GHz -50.759 dBm	Next Pea
3.1				Next Pk Righ
3.1	1			Next Pk Le
3.1			-50.00 dBm	Marker Del
			~~~	Mkr→C
				Mkr→RefL
enter 1.57920015 GHz		Swaan - 9.00	Span 20.00 kHz	Mor 1 of
Res BW 1.0 kHz	VBW 3.0 kHz*	Sweep 8.000	0 ms (10001 pts)	

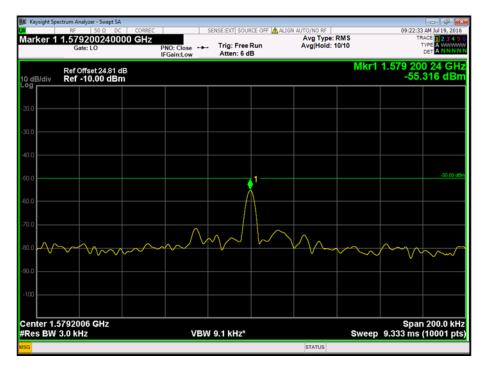


Transmit, 1625.979166 MHz, EIRP Density – Discrete Emissions, Limits on Emissions from Mobile Earth Stations for Protection of Aeronautical Radionavigation-Satellite Service Results

Frequency (MHz)	dBW
1579.2	-85.32

No other emissions within 6 dB of the limit were detected.

<u>Transmit, 1625.979166 MHz, EIRP Density – Discrete Emissions, Limits on Emissions from</u> <u>Mobile Earth Stations for Protection of Aeronautical Radionavigation-Satellite Service Plot</u>





<u>Transmit, 1616.0208333 MHz, EIRP Density – Carrier-off State Emissions, Limits on Emissions</u> from Mobile Earth Stations for Protection of Aeronautical Radionavigation-Satellite Service

Frequency (MHz)	dBW
*	

*No emissions within 6 dB of the limit were detected.

Transmit, 1616.0208333 MHz, EIRP Density – Carrier-off State Emissions, Limits on Emissions from Mobile Earth Stations for Protection of Aeronautical Radionavigation-Satellite Service Plot

	ectrum Analyzer - Swept SA RF 50 Ω DC CORI	REC	SENSE:EXT SOURCE OFF		09:35:35 AM Jul 19, 20
art Fre	q 1.559000000 GHz	PNO: Fast ++ IFGain:Low	Trig: Free Run #Atten: 2 dB	Avg Type: RMS Avg Hold: 1000/1000	TRACE 1 2 3 4 TYPE A WWW DET A NNN
dB/div	Ref Offset 24.81 dB Ref -10.00 dBm			Mk	r1 1.599 381 8 GI -65.747 dB
,					
					1
$\vdash$					
rt 1 55	900 GHz				Stop 1.61000 G
	1.0 MHz	VBV	V 3.0 MHz*	#Swee	p 2.000 ms (10001 p
				STATUS	



<u>Transmit, 1621.0208333 MHz, EIRP Density – Carrier-off State Emissions, Limits on Emissions</u> from Mobile Earth Stations for Protection of Aeronautical Radionavigation-Satellite Service

Frequency (MHz)	dBW
*	

*No emissions within 6 dB of the limit were detected.

Transmit, 1621.0208333 MHz, EIRP Density – Carrier-off State Emissions, Limits on Emissions from Mobile Earth Stations for Protection of Aeronautical Radionavigation-Satellite Service Plot

arker 1 1	RF 50 Ω DC		SENSE:EXT SOURCE	OFF ALIGN AUTO/NO RF	RMS	09:36:08 AM Jul 19, 201 TRACE 1 2 3 4 5
	.50421440000	PNO: Fas IFGain:Lo	t Trig: Free Ru W #Atten: 2 dB	in Avg Hold	: 1000/1000	DET A NNN
dB/div	Ref Offset 24.81 d Ref -10.00 dBm	B 1			Mkr1 1.	.584 214 4 GH -66.066 dBr
.0						
.0						
.0						-50.00 d
.0			1			
0						
0						
0						
art 1.5590 es BW 1.			VBW 3.0 MHz*		#Sweep 2.0	Stop 1.61000 GH 000 ms (10001 pt
	• • • • • • • • • • • • • • • • • • • •			STATUS	"etreep zie	aa ma (1000 i pi



<u>Transmit, 1625.979166 MHz, EIRP Density – Carrier-off State Emissions, Limits on Emissions</u> <u>from Mobile Earth Stations for Protection of Aeronautical Radionavigation-Satellite Service</u>

Frequency (MHz)	dBW
*	

*No emissions within 6 dB of the limit were detected.

<u>Transmit, 1625.979166 MHz, EIRP Density – Carrier-off State Emissions, Limits on Emissions</u> from Mobile Earth Stations for Protection of Aeronautical Radionavigation-Satellite Service Plot

	m Analyzer - Swept SA RF 50 Ω DC CORF 604360600000 GH		SENSE:EXT  SOURCE OFF 🛕 . Trig: Free Run #Atten: 2 dB	Avg Type: RMS Avg Hold: 1000/1000	09:46:59 AM Jul 19, 201 TRACE 2 2 3 4 TYPE A DET A NNN
	ef Offset 24.81 dB tef -10.00 dBm			Mkı	1 1.604 360 6 GH -65.753 dBi
0					
,					
,					
,					
,					
,					
,					
,					
1 5500	0 CH2				Stop 1 60500 Cl
art 1.5590 es BW 1.0		VBV	V 3.0 MHz*	#Sweep	Stop 1.60500 Gł 2.000 ms (10001 pł



# FCC 47 CFR Part 25, Limit Clause 25.216

25.216(c) The e.i.r.p. density of emissions from mobile earth stations placed in service after July 21, 2002 with assigned uplink frequencies between 1610 MHz and 1660.5 MHz shall not exceed -70 dBW/MHz, averaged over any 2 millisecond active transmission interval, in the band 1559–1605 MHz. The e.i.r.p. of discrete emissions of less than 700 Hz bandwidth from such stations shall not exceed -80 dBW, averaged over any 2 millisecond active transmission interval, in the 1559–1605 MHz band.

25.216(g) Mobile earth stations manufactured more than six months after FEDERAL REGISTER publication of the rule changes adopted in FCC 03–283 with assigned uplink frequencies in the 1610–1626.5 MHz band shall suppress the power density of emissions in the 1605–1610 MHz band-segment to an extent determined by linear interpolation from -70 dBW/MHz at 1605 MHz to -10 dBW/MHz at 1610 MHz averaged over any 2 millisecond active transmission interval. The e.i.r.p of discrete emissions of less than 700 Hz bandwidth from such stations shall not exceed a level determined by linear interpolation from -80 dBW at 1605 MHz to -20 dBW at 1610 MHz, averaged over any 2 millisecond active transmission interval.

25.216(i) The e.i.r.p density of carrier-off state emissions from mobile earth stations manufactured more than six months after FEDERAL REGISTER publication of the rule changes adopted in FCC 03–283 with assigned uplink frequencies between 1 and 3 GHz shall not exceed -80 dBW/MHz in the 1559–1610 MHz band averaged over any two millisecond interval.

#### Industry Canada RSS-170, Limit Clause 5.4.3.2

#### Band 1610 to 1626.5 MHz

- -70 dBW/MHz at 1605 MHz, linearly interpolated to -10 dBW/MHz at 1610 MHz for broadband emissions.
- -80 dBW/MHz at 1605 MHz, linearly interpolated to -20 dBW/MHz at 1610 MHz for discrete emissions.

#### Band 1626.5 to 1660.5 MHz

- -70 dBW/MHz at 1605 MHz, linearly interpolated to -46 dBW/MHz at 1610 MHz for broadband emissions.
- -80 dBW/MHz at 1605 MHz, linearly interpolated to -56 dBW/MHz at 1610 MHz for discrete emissions.



**SECTION 3** 

# **TEST EQUIPMENT USED**



# 3.1 TEST EQUIPMENT USED

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

Instrument	Manufacturer	Туре No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.2 - Occupied Bandw	idth				
10dB/1W SMA Attenuator dc - 18GHz	Sealectro	60-674-1010-89	3	12	30-Jun-2017
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	3-Sep-2016
Power Supply	Iso-tech	IPS 2010	2439	-	O/P Mon
Power Supply	Iso-tech	IPS 2010	2440	-	O/P Mon
Attenuator (10dB, 50W)	Aeroflex / Weinschel	47-10-34	3166	12	16-Sep-2016
Hygrometer	Rotronic	I-1000	3220	12	19-Aug-2016
TRUE RMS MULTIMETER	Fluke	179	4006	12	9-Dec-2016
Frequency Standard	Spectracom	Secure Sync 1200- 0408-0601	4393	6	3-Sep-2016
1 metre SMA Cable	Florida Labs	SMS-235SP-39.4- SMS	4514	12	16-Feb-2017
PXA Signal Analyser	Keysight Technologies	N9030A	4654	12	8-Oct-2016
Section 2.3 - Frequency Tolera		·	•	•	•
Temperature Chamber	Montford	2F3	467	-	O/P Mon
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	3-Sep-2016
Attenuator (10dB, 10W)	Trilithic	HFP-50N	1377	12	23-Oct-2016
Power Supply	Iso-tech	IPS 2010	2439	-	O/P Mon
Power Supply	Iso-tech	IPS 2010	2440	-	O/P Mon
Attenuator (10dB, 50W)	Aeroflex / Weinschel	47-10-34	3166	12	16-Sep-2016
Thermocouple Thermometer	Fluke	51	3174	12	9-Dec-2016
Hygrometer	Rotronic	I-1000	3220	12	19-Aug-2016
TRUE RMS MULTIMETER	Fluke	179	4006	12	9-Dec-2016
Oscilloscope	Agilent Technologies	DSO9104A	4142	12	2-Sep-2016
Frequency Standard	Spectracom	Secure Sync 1200- 0408-0601	4393	6	3-Sep-2016
2 metre N-Type Cable	IW Microwave	NPS-1806LC-788- NPS	4503	12	26-May-2017
Section 2.4 - Spurious Emission	ons at Antenna Termina			•	•
10dB/1W SMA Attenuator dc - 18GHz	Sealectro	60-674-1010-89	3	12	30-Jun-2017
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	3-Sep-2016
Power Supply	Iso-tech	IPS 2010	2439	-	O/P Mon
Power Supply	Iso-tech	IPS 2010	2440	-	O/P Mon
Attenuator (10dB, 50W)	Aeroflex / Weinschel	47-10-34	3166	12	16-Sep-2016
Hygrometer	Rotronic	I-1000	3220	12	19-Aug-2016
Function Generator	Thurlby Thandar Instruments	TG2000	3334	-	TU
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	2-Sep-2016
TRUE RMS MULTIMETER	Fluke	179	4006	12	9-Dec-2016
Calibration Unit	Rohde & Schwarz	ZV-Z54	4368	12	7-Sep-2016
Frequency Standard	Spectracom	Secure Sync 1200- 0408-0601	4393	6	3-Sep-2016
Suspended Substrate Highpass Filter	Advance Power Components	11SH10- 3000/X18000-O/O	4412	12	23-Mar-2017
1 metre SMA Cable	Florida Labs	SMS-235SP-39.4- SMS	4514	12	16-Feb-2017
PXA Signal Analyser	Keysight Technologies	N9030A	4654	12	8-Oct-2016

# COMMERCIAL-IN-CONFIDENCE



#### Product Service

Instrument	Manufacturer	Туре No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.5 - Radiated Spuriou					
Dual Power Supply Unit	Thurlby	PL320	288	-	TU
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
Hygromer	Rotronic	Hygropalm	2404	12	21-Aug-2016
Programmable Power Supply	Iso-tech	IPS 2010	2435	-	O/P Mon
Antenna (Bilog)	Chase	CBL6143	2904	24	11-Jun-2017
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	2-Nov-2016
Tilt Antenna Mast	maturo Gmbh	TAM 4.0-P	3916	-	TU
Mast Controller	maturo Gmbh	NCD	3917	-	TU
Suspended Substrate	Advance Power	11SH10-	4411	12	23-Mar-2017
Highpass Filter	Components	3000/X18000-O/O			
Double Ridged Waveguide Horn Antenna	ETS-Lindgren	3117	4722	12	29-Dec-2016
Section 2.6 – Conducted Outp	ut Power		1		
10dB/1W SMA Attenuator dc - 18GHz	Sealectro	60-674-1010-89	3	12	30-Jun-2017
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	3-Sep-2016
Power Supply	Iso-tech	IPS 2010	2439	-	O/P Mon
Power Supply	Iso-tech	IPS 2010	2440	-	O/P Mon
Attenuator (10dB, 50W)	Aeroflex / Weinschel	47-10-34	3166	12	16-Sep-2016
Hygrometer	Rotronic	I-1000	3220	12	19-Aug-2016
Function Generator	Thurlby Thandar	TG2000	3334	-	TU
	Instruments			10	
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	2-Sep-2016
TRUE RMS MULTIMETER	Fluke	179	4006	12	9-Dec-2016
Calibration Unit	Rohde & Schwarz	ZV-Z54	4368	12	7-Sep-2016
Frequency Standard	Spectracom	Secure Sync 1200- 0408-0601	4393	6	3-Sep-2016
1 metre SMA Cable	Florida Labs	SMS-235SP-39.4- SMS	4514	12	16-Feb-2017
PXA Signal Analyser	Keysight Technologies	N9030A	4654	12	8-Oct-2016
Section 2.7 - Limits on Emissi Service		tations for Protection	of Aerona	utical Radiona	vigation-Satellite
10dB/1W SMA Attenuator dc - 18GHz	Sealectro	60-674-1010-89	3	12	30-Jun-2017
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	3-Sep-2016
Power Supply	Iso-tech	IPS 2010	2439	-	O/P Mon
Power Supply	Iso-tech	IPS 2010	2440	-	O/P Mon
Attenuator (10dB, 50W)	Aeroflex / Weinschel	47-10-34	3166	12	16-Sep-2016
Hygrometer	Rotronic	I-1000	3220	12	19-Aug-2016
Function Generator	Thurlby Thandar Instruments	TG2000	3334	-	TU
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	2-Sep-2016
TRUE RMS MULTIMETER	Fluke	179	4006	12	9-Dec-2016
Calibration Unit	Rohde & Schwarz	ZV-Z54	4368	12	7-Sep-2016
Frequency Standard	Spectracom	Secure Sync 1200- 0408-0601	4393	6	3-Sep-2016
1 metre SMA Cable	Florida Labs	SMS-235SP-39.4- SMS	4514	12	16-Feb-2017
PXA Signal Analyser	Keysight Technologies	N9030A	4654	12	8-Oct-2016

TU – Traceability Unscheduled O/P MON – Output Monitored with Calibrated Equipment



# 3.2 MEASUREMENT UNCERTAINTY

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

Test Discipline	MU
Occupied Bandwidth	± 16.74 kHz
Modulation Characteristics	-
Frequency Tolerance	± 3.54 Hz
Spurious Emissions at Antenna Terminals	± 3.08 dB
Conducted Output Power	± 0.70 dB
Limits on Emissions from Mobile Earth Stations for Protection of Aeronautical Radionavigation-Satellite Service	± 3.08 dB
Radiated Spurious Emissions	30 MHz to 1 GHz: ± 5.1 dB 1 GHz to 17 GHz: ± 6.3 dB



**SECTION 4** 

# ACCREDITATION, DISCLAIMERS AND COPYRIGHT



# 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).

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