

Radio Test Report

Ocean Signal Ltd.
AIS SART, Model: S200
Brand Variant: ACR Electronics Inc.
AIS SART, Model: Pathfinder AIS



In accordance with IEC 61097-14

Prepared for: Ocean Signal Ltd.
Ocivan Way
Margate
CT9 4NN
United Kingdom

COMMERCIAL-IN-CONFIDENCE

Document 75959389-02 Issue 02

SIGNATURE			
NAME	JOB TITLE	RESPONSIBLE FOR	ISSUE DATE
Matthew Russell	Chief Engineer	Authorised Signatory	22 September 2025
Nic Forsyth	Chief Engineer	Authorised Signatory	22 September 2025

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD document control rules.

EXECUTIVE SUMMARY
A sample of this product was tested and found to be compliant with IEC 61097-14: Edition 1 (2010-02) for the tests detailed in section 1.3.

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Registered in Scotland at East Kilbride,
Glasgow G75 0QF, United Kingdom
Registered number: SC215164

TÜV SÜD Ltd is a
TÜV SÜD Group Company

Phone: +44 (0) 1489 558100
Fax: +44 (0) 1489 558101
www.tuvsud.com/en

TÜV SÜD
Octagon House
Concorde Way
Fareham
Hampshire PO15 5RL
United Kingdom

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1 Report Summary

1.1 Report Modification Record

Alterations and additions to this report will be issued to the holders of each copy in the form of a complete document.

Issue	Description of Change	Date of Issue
1	First Issue	01-Sept-2025
2	Corrected results in Section 2.3 and corrected spelling mistake in Section 2.7.	22-Sept-2025

Table 1

1.2 Introduction

Applicant	Ocean Signal Ltd.
Manufacturer	Ocean Signal Ltd. / ACR Electronics Inc
Model Number(s)	S200 / Pathfinder AIS *
Serial Number(s)	TA000019 (TUV Ref: TSR0003) (S200: Conducted Unit) TA000016 (TUV Ref: TSR0004) (Pathfinder AIS: Radiated Unit)
Hardware Version(s)	01.00 / 01.00
Software Version(s)	01.00 / 01.00
Number of Samples Tested	2
Test Specification/Issue/Date	IEC 61097-14: Edition 1 (2010-02)
Order Number	P8980 - QAF
Date	14-September-2023
Date of Receipt of EUT	20-November-2023
Start of Test	05-April-2024
Finish of Test	03-July-2025
Name of Engineer(s)	Neil Rousell Martin Steindl Matt Sellers Matt Bushell
Related Document(s)	IEC 60945:2002

*Manufacturer declared variants: Refer to documents "Variant Relation Declaration - AIS SART Model Variants 300625.pdf" and "921S-06454 Issue 01.00 AIS SART Variant Comparison.pdf".



1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with IEC 61097-14 is shown below.

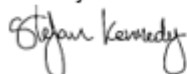
Section	Specification Clause	Test Description	Result	Comments/Base Standard
Configuration and Mode: Configuration 1 - AIS				
2.1	6.1	Operational Tests	-	See section for test results
2.2	6.2	Battery	Pass	
2.3	6.3	Unique Identifier	-	See section for test results
2.4	6.4	Environment	-	See TÜV SÜD Document 75959389-03
2.5	6.5	Range Performance	-	See section 2.14 in this report
2.6	6.6	Transmission Performance	-	See TÜV SÜD Document 75959389-04
2.7	6.7	Labelling	-	See section for test results
2.8	6.8	Manuals	-	See section for test results
2.9	6.9	Electronic Position Fixing System	-	See section for test results
2.10	6.10	Activator	Pass	
2.11	6.11	Indicator	Pass	
2.2	7.2	Frequency Error	Pass	
2.13	7.3	Conducted Power	Pass	
2.14	7.4	Radiated Power	Pass	Deviation to specification test method – see section 2.3.4 of this report.
2.15	7.5	Modulation Spectrum Slotted Transmission	Pass	
2.16	7.6	Transmitter Test Sequence and Modulation Accuracy	Pass	
2.17	7.7	Transmitter Output Power Versus Time Function	Pass	
2.18	7.8	Spurious Emissions from the Transmitter	Pass	

Table 2

1.4 Declaration of Build Status

MAIN EUT			
MANUFACTURING DESCRIPTION	AIS SART		
MANUFACTURER	Ocean Signal Ltd. / ACR Electronics Inc.		
MODEL	S200 / Pathfinder AIS		
PART NUMBER	900S-04810 / 900S-05232		
HARDWARE VERSION	01.00 / 01.00		
SOFTWARE VERSION	01.00 / 01.00		
PSU VOLTAGE/FREQUENCY/CURRENT	8V		
HIGHEST INTERNALLY GENERATED FREQUENCY	162.025 MHz		
FCC ID (if applicable)	XYES200		
INDUSTRY CANADA ID (if applicable)	9296A-S200		
TECHNICAL DESCRIPTION (a brief technical description of the intended use and operation)	Search And Rescue Transponder operating in the AIS frequency band.		
COUNTRY OF ORIGIN	United Kingdom		
RF CHARACTERISTICS (if applicable)			
TRANSMITTER FREQUENCY OPERATING RANGE (MHz)	161.975MHz - 162.025 MHz		
RECEIVER FREQUENCY OPERATING RANGE (MHz)	N/A		
INTERMEDIATE FREQUENCIES	N/A		
EMISSION DESIGNATOR(S): https://fccid.io/Emissions-Designator/	18K0GXW		
MODULATION TYPES: (i.e. GMSK, QPSK)	GMSK		
OUTPUT POWER (W or dBm)	30+3dBm		
SEPARATE BATTERY/POWER SUPPLY (if applicable)			
MANUFACTURING DESCRIPTION	Battery Module Assy LB3S: SART / Battery Module Assy: ACR SART		
MANUFACTURER	Ocean Signal Ltd. / ACR Electronics Inc.		
TYPE	Lithium/Iron Disulfide (Li/FeS2)		
PART NUMBER	901S-00325 / 901S-02018		
PSU VOLTAGE/FREQUENCY/CURRENT	8V		
COUNTRY OF ORIGIN	United Kingdom		
MODULES (if applicable)			
MANUFACTURING DESCRIPTION			
MANUFACTURER			
TYPE			
POWER			
FCC ID			
INDUSTRY CANADA ID			
EMISSION DESIGNATOR			
DHSS/FHSS/COMBINED OR OTHER			
COUNTRY OF ORIGIN			
ANCILLARIES (if applicable)			
MANUFACTURING DESCRIPTION	SART Optional 1m Mounting Pole		
MANUFACTURER	Ocean Signal Ltd		
TYPE	-		
PART NUMBER	711S-01802		
SERIAL NUMBER	-		
COUNTRY OF ORIGIN	China		

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



Name: Stefan Kennedy
Position held: R&D Director
Date: 30-06-2025

1.5 Product Information

The Equipment under test (EUT) was an Ocean Signal's S200 AIS (Automatic Identification System) SART (Search and Rescue Transponder).

The primary function of the EUT is to provide location data in emergencies.



Figure 1 - Equipment Under Test (EUT)

1.6 Deviations from the Standard

Clause 7.4 – Radiated Power: the measuring distance of 10m restricted the elevation search to approximately 20°, whereas the specification requirement is 30°. The specification states a minimum limit of 500mW at an elevation that returns the maximum power level. As the measurements made at 5.7° elevation meet the specification requirements, the test is considered Pass.



1.7 EUT Modification Record

The table below details modifications made to the EUT during the test programme.

The modifications incorporated during each test are recorded on the appropriate test pages.

Modification State	Description of Modification still fitted to EUT	Modification Fitted By	Date Modification Fitted
Model: S200, Serial Number: TA000019 (Conducted Unit)			
0	As supplied by the customer	Not Applicable	Not Applicable
1	Fitting an inductor the opposite direction to reduce the spurious emission from the transmitter. See manufacturer document "S200 Mod State 1 justification 030725.pdf".	Manufacturer	18-04-2024
Model: Pathfinder AIS, Serial Number: TA000016 (Radiated Unit)			
0	As supplied by the customer	Not Applicable	Not Applicable

Table 3



1.8 Test Locations

TÜV SÜD conducted the following tests at our Octagon House Test Laboratory.

Test Name	Name of Engineer(s)	Accreditation
Configuration and Mode: Configuration 1 - AIS		
Operational Tests	Matt Sellers	Non UKAS
Battery	Matt Sellers	Non UKAS
Unique Identifier	Matt Sellers	Non UKAS
Environment	-	UKAS
Range Performance	Martin Steindl	Non UKAS
Transmission Performance	Matt Bushell	UKAS
Labelling	Matt Sellers	Non UKAS
Manuals	Matt Sellers	Non UKAS
Electronic Position Fixing System	Matt Sellers	Non UKAS
Activator	Matt Sellers	Non UKAS
Indicator	Matt Sellers	Non UKAS
Frequency Error	Neil Rousell	UKAS
Conducted Power	Neil Rousell	UKAS
Modulation Spectrum Slotted Transmission	Neil Rousell	UKAS
Transmitter Test Sequence and Modulation Accuracy	Neil Rousell	UKAS
Transmitter Output Power Versus Time Function	Neil Rousell	UKAS
Spurious Emissions from the Transmitter	Neil Rousell	UKAS

Table 4

Office Address:

TÜV SÜD
Octagon House
Concorde Way
Fareham
Hampshire
PO15 5RL
United Kingdom



TÜV SÜD conducted the following tests at our Straubing Test Laboratory.

Test Name	Name of Engineer(s)	Accreditation
Configuration and Mode: Configuration 1 – AIS		
Radiated Power	Martin Steindl	Non UKAS

Table 5

Office Address:

TÜV SÜD
Äußere Frühlingstraße 45,
94315 Straubing,
Germany

2 Test Details

2.1 Operational Tests

2.1.1 Specification Reference

IEC 61097-14, Clause 6.1

2.1.2 Equipment Under Test and Modification State

S200, S/N: TA000019 - Modification State 1
Manufacturer User Manual - 912S-04650 issue 00.13 S200 AIS SART User Manual.pdf

2.1.3 Date of Test

19-June-2025 and 24-June-2025

2.1.4 Test Method

This test was performed in accordance with IEC 61097-14, clause 6.1.

2.1.5 Environmental Conditions

Ambient Temperature 20.9 °C
Relative Humidity 59.4 %

2.1.6 Test Results

Configuration 1 - AIS

6.1 – Operational Tests		
Requirement	Result	Verdict
be capable of being easily activated by unskilled personnel	The EUT can be easily activated, deactivated and a functional Test performed by an unskilled personnel member.	Pass
be fitted with means to prevent inadvertent activation	The EUT is fitted with a clear protective cover which needs to be broken off. The EUT then has a green switch which must be held to the left to enable the red switch to be pushed down for activation.	Pass
be equipped with a means which is either visual or audible, or both visual and audible, to indicate correct operation	The EUT has visual indications to indicate correct operation. See Section 5.3 of the manufacturer's user manual for further information of the visual indications.	-
be capable of manual activation and deactivation, provision for automatic activation may be included	The EUT is capable of manual activation and deactivation. It is not capable of being automatically activated.	Pass
be capable of withstanding without damage drops from a height of 20 m into water	See TÜV SÜD Document 75959389-03	-
be watertight at a depth of 10 m for at least 5 min	See TÜV SÜD Document 75959389-03	-
maintain water tightness when subjected to a thermal shock of 45 °C under specified conditions of immersion	See TÜV SÜD Document 75959389-03	-
be capable of floating (not necessarily in an operating position) if it is not an integral part of	The EUT with it's mounting system was placed in fresh water and successfully floated for 5 minutes.	Pass



the survival craft		
be equipped with a buoyant lanyard, suitable for use as a tether, if it is capable of floating. The buoyant lanyard shall have a length not less than 10 m	The lanyard was placed in fresh water and successfully remained buoyant. The length of the lanyard was confirmed to be greater than 10m.	Pass
be not unduly affected by seawater or oil	See manufacturer waiver "S200 Materials waiver and declaration 300625.pdf".	-
be resistant to deterioration in prolonged exposure to sunlight	See manufacturer waiver "S200 Materials waiver and declaration 300625.pdf".	-
be of a highly visible yellow/orange colour on all surfaces where this will assist detection	The EUT is a highly visible yellow colour.	-
have a smooth external construction to avoid damaging the survival craft	The EUT has a smooth external construction and no sharp edges.	Pass
be provided with an arrangement to bring the AIS-SART antenna to a level of at least 1 metre above sea level, together with illustrated instruction, The manufacturer shall provide a visible means of indicating the base of the antenna. The height of 1 metre shall be measured to the declared 1 metre mark from sea level. The instructions shall illustrate the minimum requirement of 1 metre above sea level during use along with the installation method.	The EUT is provided with a telescopic mounting pole to bring it to a level of 1m. Section 5 of the manufacturer's user manual contains illustrated instructions of how to mount the EUT onto the telescopic mounting pole to achieve the 1m height. It also shows the base of the EUT being where to measure the 1m from.	-
be capable of transmitting with a reporting interval of 1 minute or less	See TÜV SÜD Document 75959389-04	-
be equipped with an internal position source and be capable of transmitting its current position in each message	See TÜV SÜD Document 75959389-04	-
be capable of being tested for all functionalities using specific test information	See TÜV SÜD Document 75959389-04	-



2.1.7 Test Location and Test Equipment Used

This test was carried out in Beacons and NavE Laboratory.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Hygrometer	Rotronic	I-1000	2784	12	10-Oct-2025
Sharp Edge Tester	TES TEC GmbH	SET-50	2792	-	TU
Desktop Stopwatch	Radio Spares	RS Pro	5572	12	11-Sep-2025
50 ohm Termination Load	TUV SUD	N-Type	6790	12	25-Jul-2025
5m Measuring Tape	Stanley	N/A	6900	-	TU

Table 6

TU – Traceability Unscheduled



2.2 Battery

2.2.1 Specification Reference

IEC 61097-14, Clause 6.2

2.2.2 Equipment Under Test and Modification State

S200, S/N: TA000019 - Modification State 1

2.2.3 Date of Test

19-June-2025, 28-June-2025 and 03-July-2025

2.2.4 Test Method

This test was performed in accordance with IEC 61097-14, clause 6.2.

2.2.5 Environmental Conditions

Ambient Temperature 20.1 – 21.2 °C

Relative Humidity 59.4 – 67.2%

2.2.6 Test Results

Configuration 1 – AIS

6.2.1 – Battery Capacity Test		
Requirement	Result	Verdict
Using a fresh battery pack, the AIS-SART shall be activated (at the ambient temperature) for a period of time as stated by the manufacturer to be equivalent to the loss of battery capacity due to self-testing, stand-by loads as well as battery-pack self-discharge during the useful life of the battery pack (as defined in 3.3.2). The manufacturer shall substantiate the method used to determine this time.	A fresh battery pack was discharged across a variable resistor to remove enough capacity from the battery as close to the manufacturer declared discharge. The manufacturer declared 152.46 mAh to be removed. 153.086 mAh was removed from the battery.	Pass
The AIS-SART shall be placed in a chamber at normal room temperature. Then the temperature shall be reduced to and maintained at $-20\text{ °C} \pm 3\text{ °C}$ for a period of 10 h to 16 h. Any climatic control device provided in the equipment may be switched on at the conclusion of this period. The equipment shall be activated in its mode of maximum current draw (for example EPFS drawing maximum current) 30 min after the end of the period and shall then be kept working continuously for a period of 96 h. The temperature of the chamber shall be maintained as specified above for the whole of the period of 96 h. The operation of the AIS-SART during the test shall be verified.	The EUT was maintained at $-20\text{ °C} \pm 3\text{ °C}$ for a period of 16 h. Then 30min after the end of the period, it was activated in its maximum current mode and kept continuously working for a period of 96 h. The EUT was monitored throughout the test and was confirmed to be operating correctly.	Pass
In addition, at the end of the 96 h period, a performance test (see 5.2.3) shall be performed.	See Below	-

IEC 61097-14:2010 – Test Mode Tests – Clause 8.3.2

8.3.2 Transmission with EPFS data available

Method of measurement

Activate the AIS-SART in test mode with EPFS data available and record transmissions.

Required Results

The following is required.

- a) The AIS-SART starts transmission after valid GNSS data is available.
- b) A single burst of 8 messages in the correct order and correctly populated as per 3.7.2.
- c) User ID as configured in the AIS-SART.
- d) Navigational status = 15 (not defined).
- e) SOG = actual SOG from GNSS receiver.
- f) Position accuracy = according to the RAIM result if provided, otherwise 0.
- g) Position = actual position from internal GNSS receiver.
- h) COG = actual COG from internal GNSS receiver.
- i) Time stamp = actual UTC second (0...59).
- j) The communication state time-out always = 0 with sub message = 0.
- k) The transmission of Messages 1 and 14 stops after one burst of 8 messages.
- l) The text message in Message 14 is "SART TEST".
- m) Verify correct indication as per manufacturer's documentation.

Test Results

Clause	Requirement	Result	Verdict
a)	The AIS-SART starts transmission after valid GNSS data is available.	When the EUT got position, it transmitted the self-test	Pass
b)	A single burst of 8 messages in the correct order and correctly populated as per 3.7.2.	Messages are in correct order and contain 8 messages	Pass
c)	User ID as configured in the AIS-SART.	MMSI was correct.	Pass
d)	Navigational status = 15 (not defined).	Nav status is set to 15	Pass
e)	SOG = actual SOG from GNSS receiver.	SOG is 0 as position was not moving	Pass
f)	Position accuracy = according to the RAIM result if provided, otherwise 0.	PA set to low	Pass
g)	Position = actual position from internal GNSS receiver.	Live position was used, position EUT gave matched to where test was done.	Pass
h)	COG = actual COG from internal GNSS receiver.	COG is set to not available	Pass
i)	Time stamp = actual UTC second (0...59).	Time stamp is correct to the time of the transmission	Pass
j)	The communication state time-out always = 0 with sub message = 0.	Com state is 0 and the sub message is 0	Pass
k)	The transmission of Messages 1 and 14 stops after one burst of 8 messages.	Only one burst was recorded from the self test	Pass
l)	The text message in Message 14 is "SART TEST".	EUT says SART TEST	Pass
m)	Verify correct indication as per manufacturer's documentation.	Instructions and LED indications are in the "S200 AIS SART User Manual"	Pass

Table 7



Transmitted Messages						
Time	Slot	Chan	MMSI	Msg	Nav Status	Sentence
11:18:23	890	A	970000019	14	-	!AIVDM,1,1,0,A,>>M46Ti<59B1@E=@,0*5F
11:18:25	965	B	970000019	1	15	!AIVDM,1,1,1,B,1>M46TwP05OrCONM6pCN4?wP0000,0*77
11:18:27	1040	A	970000019	1	15	!AIVDM,1,1,2,A,1>M46TwP05OrCONM6pCN4?wT0000,0*73
11:18:29	1115	B	970000019	1	15	!AIVDM,1,1,3,B,1>M46TwP05OrCONM6pCN4?w'0000,0*45
11:18:31	1190	A	970000019	1	15	!AIVDM,1,1,4,A,1>M46TwP05OrCONM6pCN4?wd0000,0*45
11:18:33	1265	B	970000019	1	15	!AIVDM,1,1,5,B,1>M46TwP05OrCONM6pCN4?wh0000,0*4B
11:18:35	1340	A	970000019	1	15	!AIVDM,1,1,6,A,1>M46TwP05OrCONM6pCN4?wl0000,0*4F
11:18:37	1415	B	970000019	14	-	!AIVDM,1,1,7,B,>>M46Ti<59B1@E=@,0*5B

Table 8

Message 1 Decode	
!AIVDM,1,1,1,B,1>M46TwP05OrCONM6pCN4?wP0000,0*77	
Parameter	Decoded Value
Message ID	1 - Position report
Repeat Indicator	0
MMSI	970000019
Navigational Status	15 - not defined (also used by AIS-SART under test)
Rate Of Turn	no turn information available (default)
Speed Over Ground	0
Position Accuracy	0 - low (>10 m)
Longitude	1 14.6513 W
Latitude	50 52.1421 N
Course Over Ground	not available
True Heading	511 - not available
Time Stamp	48
Special Manoeuvre Indicator	0 - not available
Spare	0
RAIM Flag	0 - RAIM not in use
Communication State - Sync State	0
Communication State - Slot Timeout	0
Communication State - Sub Message	Slot Offset = 0

Table 9

Message 14 Decode: Text Message	
!AIVDM,1,1,0,A,>>M46Ti<59B1@E=@,0*5F	
Parameter	Decoded Value
Message ID	14
Repeat Indicator	0
MMSI	970000019
Spare	0
Safety related text	SART TEST

Table 10

6.2.2 – Expiry Date Indication		
Requirement	Result	Verdict
The AIS-SART shall be clearly and durably marked with the battery expiry date.	The EUT contains an expiry date label on the bottom of the EUT located on the battery module.	Pass



6.2.3 – Reverse Polarity Protection		
Requirement	Result	Verdict
It shall not be possible to connect the battery with the polarity reversed.	The battery comes as a complete module which can only be installed in the correct orientation.	Pass

2.2.7 Test Location and Test Equipment Used

This test was carried out in Beacons and NavE Laboratory.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Hygrometer	Rotronic	I-1000	2829	12	18-Jun-2026
Fused 100ohm Resistor Pack	TUV SUD	N/A	3823	-	O/P Mon
Data Logger	Pico Technology Ltd	TC-08	4651	12	11-Mar-2026
Type T PFA Insulated Thermocouple	TC Limited	Type-T	4739	12	17-Oct-2025
ACS 4 Climatic Chamber	ACS	DY110C	5448	12	17-Mar-2026
High Resolution Data Logger	Pico Technology Ltd	PicoLog ADC20	6252	12	10-Oct-2025
Cable N to N 1m	Junkosha	MWX221-01000NMSN/B	6776	12	22-Apr-2026
50 Ohm Termination Load	TUV SUD	N-Type	6792	12	25-Jul-2025
Desktop Timer	R.S Components	Black Digital Desktop Timer 10h	6802	12	11-Jun-2026
AIS Base Station	Saab	R40	7097	-	TU

Table 11

O/P Mon – Output Monitored using calibrated equipment
TU – Traceability Unscheduled



2.3 Unique Identifier

2.3.1 Specification Reference

IEC 61097-14, Clause 6.3

2.3.2 Equipment Under Test and Modification State

S200, S/N: TA000019 - Modification State 1

2.3.3 Date of Test

19-June-2025

2.3.4 Test Method

This test was performed in accordance with IEC 61097-14, clause 6.3.

2.3.5 Environmental Conditions

Ambient Temperature 20.9 °C

Relative Humidity 59.4 %

2.3.6 Test Results

Configuration 1 – AIS

6.3 – Unique Identifier		
Requirement	Result	Verdict
The AIS-SART shall have an unique identifier to ensure the integrity of the VHF data link.	The EUT was programmed with a MMSI value of 970000019 during testing.	Pass
The user ID for an AIS-SART is 970xxyyyy, where xx = manufacturer ID 01 to 99; yyyy = the sequence number 0000 to 9999.	The EUT was programmed with a MMSI value of 970000019 during testing.	Pass
The manufacturer ID xx = 00 is reserved for test purposes The unique identifier used for the purposes of type approval to this standard shall be in the format 97000yyyy.	The EUT was programmed with a MMSI value of 970000019 during testing.	Pass
After being programmed by the manufacturer, it shall not be possible for the user to change the unique identifier of the AIS SART.	See manufacturer document "S200 Unique ID entry and storage description 020725.pdf"	-
The configuration method for the unique identifier shall be as defined by the manufacturer and held in non-volatile memory.	See manufacturer document "S200 Unique ID entry and storage description 020725.pdf"	-

2.3.7 Test Location and Test Equipment Used

This test was carried out in Beacons and NavE Laboratory.

No test equipment was used.



2.4 Environment

2.4.1 Specification Reference

IEC 61097-14, Clause 6.4

See TÜV SÜD Document 75959389-03 Issue 01



2.5 Range Performance

2.5.1 Specification Reference

IEC 61097-14, Clause 6.5

See Section 2.14 below.



2.6 Transmission Performance

2.6.1 Specification Reference

IEC 61097-14, Clause 6.6

See TÜV SÜD Document 75959389-04.

2.7 Labelling

2.7.1 Specification Reference

IEC 61097-14, Clause 6.7
IEC 60945, Clause 4.9 and 4.5.3

2.7.2 Equipment Under Test and Modification State

Manufacturer Labelling Documents - AIS SART Labels and Markings.pdf

2.7.3 Date of Test

01-July-2025

2.7.4 Test Method

This test was performed in accordance with IEC 61097-14, clause 6.7.

2.7.5 Environmental Conditions

Ambient Temperature 21.6 °C
Relative Humidity 70.9 %

2.7.6 Test Results

Configuration 1 – AIS

6.7 – Labelling		
Requirement	Result	Verdict
In addition to the items specified in IEC 60945, the following shall be clearly indicated on the exterior of the equipment: a) brief operating and test instructions (in English);	The EUT contains operating and test instructions in English on the exterior of the equipment.	Satisfactory
b) expiry date (in English) for the primary battery used and	The EUT contains the expiry data in English for the battery on the exterior of the equipment.	Satisfactory
c) the unique identifier (user ID field of the AIS messages)	The EUT contains the AIS unique ID on the exterior of the equipment.	Satisfactory

IEC 60945		
4.9 – Marking and Identification		
Requirement	Result	Verdict
(A.694/9) Each unit of the equipment shall be marked externally with the following information which, where practicable, shall be clearly visible in the normal installed position:	-	-
1) identification of the manufacturer	The EUT contains the identification of the manufacturer on the exterior of the equipment.	Satisfactory
2) equipment type number or model identification under which it was type tested	The EUT contains the model identification on the exterior of the equipment.	Satisfactory
3) serial number of the unit. Alternatively, the marking may be presented on a display at equipment start-up.	The EUT contains the serial number on the exterior of the equipment.	Satisfactory



The equipment shall be marked either before delivery to the ship, or on the ship at the time of installation.	The manufacturer declared they do not have installable software or elements of software. They only contain product firmware which is not installable or changeable by the customer.	N/A
The title and version of each software element included in the installed software system shall be either marked or displayed on command on the equipment.	The manufacturer declared they do not have installable software or elements of software. They only contain product firmware which is not installable or changeable by the customer.	N/A
When the marking and the title and version of the software are displayed only on the display, such information shall also be included in the equipment manual.	The manufacturer declared they do not have installable software or elements of software. They only contain product firmware which is not installable or changeable by the customer.	N/A
Marking requirements for compass safe distance are given in 4.5.3.	See Clause 4.5.3 below.	-
4.5.3 – Compass Safe Distance		
Requirement	Result	Verdict
(A.694/6.3) Each unit of equipment normally to be installed in the vicinity of a standard or a steering magnetic compass shall be clearly marked with the minimum safe distance at which it may be mounted from such compasses. Alternatively, the minimum safe distance for fixed equipment may be given in the equipment manual, but portable equipment shall always be marked. ISO 694 defines "vicinity", relative to the compass, as within 5 m separation. For equipment not marked with compass safe distance, the equipment manual shall contain an instruction that the equipment shall be positioned outside the vicinity thus defined.	The EUT contains a marking on the compass safe distance on the exterior of the equipment.	Satisfactory

2.7.7 Test Location and Test Equipment Used

This test was carried out in Beacons and NavE Laboratory.

No test equipment was used.



2.8 Manuals

2.8.1 Specification Reference

IEC 61097-14, Clause 6.8
IEC 60945, Clause 4.8

2.8.2 Equipment Under Test and Modification State

Manufacturer User Manual - 912S-04650 issue 00.13 S200 AIS SART User Manual.pdf

2.8.3 Date of Test

19-June-2025

2.8.4 Test Method

This test was performed in accordance with IEC 61097-14, clause 6.8.

2.8.5 Environmental Conditions

Ambient Temperature 20.9 °C
Relative Humidity 59.4 %

2.8.6 Test Results

Configuration 1 – AIS

6.8 – Manuals		
Requirement	Result	Verdict
In addition to the requirements of IEC 60945, the manuals shall include instructions for periodic testing and maintenance for the AIS-SART.	The manufacturer's user manual provides instructions on periodic function testing and maintenance and troubleshooting in sections 6 and 8.1.	-

IEC 60945		
4.8 – Equipment Manuals		
Requirement	Result	Verdict
(A.694/8.3) Adequate information shall be provided to enable the equipment to be properly operated and maintained by suitably qualified members of a ship's crew. Operating and servicing manuals shall:	-	-
a) be written in English	The manufacturer's user manual is written in English.	Pass
b) identify the category of the equipment or units to which they refer (4.4)	The manufacturer's user manual contains this information in section 8.6.	Pass
c) (A.694/8.3.1) in the case of equipment so designed that fault diagnosis and repair down to component level are practicable, provide full circuit diagrams, component layouts and a component parts list	The EUT is not user serviceable apart from changing the battery. The manufacturer's user manual tells the user to contact a service representative if it fails the function test in section 8.1.	-
d) (A.694/8.3.2) in the case of equipment containing complex modules in which fault diagnosis and repair down to component level are not practicable, contain sufficient information	The EUT is not user serviceable apart from changing the battery. The manufacturer's user manual tells the user to contact a service representative if it fails the	-



to enable a defective complex module to be located, identified and replaced. Other modules and those discrete components which do not form part of modules shall also meet the requirements of 4.8 c) above.	function test in section 8.1.	
Moreover adequate information shall be provided to allow equipment to be installed so that it operates in accordance with the requirements of the relevant equipment standard, taking into account limitations imposed by the operation of other equipment also required to be installed on the bridge.	The manufacturer's user manual provides detailed information on the installation and operating instructions to ensure it operates in accordance to the relevant requirements.	-

2.8.7 Test Location and Test Equipment Used

This test was carried out in Beacons and NavE Laboratory.

No test equipment was used.



2.9 Electronic Position Fixing System

2.9.1 Specification Reference

IEC 61097-14, Clause 6.9

2.9.2 Equipment Under Test and Modification State

Manufacturer Documents - S200 Position source justification 010725.pdf
75950037 Report 09 Issue 1 iec 61108-1.pdf
BSH_454_GNSS_TUVSUDLtd_9-GPS_Galileo_TestReport.pdf

2.9.3 Date of Test

01-July-2025

2.9.4 Test Method

This test was performed in accordance with IEC 61097-14, clause 6.9.

2.9.5 Environmental Conditions

Ambient Temperature 21.6 °C
Relative Humidity 70.8 %

2.9.6 Test Results

Configuration 1 – AIS

6.9 – Electronic Position Fixing System		
Requirement	Result	Verdict
Electronic Position Fixing System (EPFS) provides the current position of the AIS-SART.	See manufacturer documents "S200 Position source justification 010725.pdf", "75950037 Report 09 Issue 1 iec 61108-1.pdf", "S200 Description of GNSS Receiver Cold Start 020725.pdf " and "BSH_454_GNSS_TUVSUDLtd_9-GPS_Galileo_TestReport.pdf".	-
An EPFS shall be used as the source for AIS-SART position reporting. The internal EPFS shall be a GNSS receiver that meets the following requirements of the IEC 61108 series: position accuracy, acquisition, re-acquisition, receiver sensitivity, RF dynamic range, position update, effects of specific interfering signals but with an minimum update of once per minute, provide a resolution of one ten-thousandth of a minute of arc and use WGS 84 datum. The manufacturer shall provide evidence that an internal EPFS device cold start is forced at every AIS-SART activation (cold start refers to the absence of time dependent or position dependent data in memory, which might affect the acquisition of the GNSS position).	See manufacturer documents "S200 Position source justification 010725.pdf", "75950037 Report 09 Issue 1 iec 61108-1.pdf", "S200 Description of GNSS Receiver Cold Start 020725.pdf " and "BSH_454_GNSS_TUVSUDLtd_9-GPS_Galileo_TestReport.pdf".	-
On activation, if the EPFS device is unable to provide a valid position fix, then the reported position shall be longitude = 181° = not available = default and latitude = 91° = not available = default, COG = not available = default, SOG = not available = default, and the time stamp field	See TUV report "Document 75959389-04 Issue 01-Draft 05 61097-14 Link layer.docx"	-



shall be set to a value of 63. If the EPFS data is lost then the AIS-SART shall continue to transmit with the last known position, COG and SOG, and the time stamp field shall be set to a value of 63 "positioning system inoperative" and with the synchronisation state set to 3.		
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2.9.7 Test Location and Test Equipment Used

This test was carried out in Beacons and NavE Laboratory.

No test equipment was used.

2.10 Activator

2.10.1 Specification Reference

IEC 61097-14, Clause 6.10

2.10.2 Equipment Under Test and Modification State

S200, S/N: TA000019 - Modification State 1

2.10.3 Date of Test

19-June-2025

2.10.4 Test Method

This test was performed in accordance with IEC 61097-14, clause 6.10.

2.10.5 Environmental Conditions

Ambient Temperature 20.9 °C

Relative Humidity 59.4 %

2.10.6 Test Results

Configuration 1 – AIS

6.10 – Activator		
Requirement	Result	Verdict
The Activator provides a means for manual activation and deactivation of the AIS-SART. Manual activation shall provide a means to avoid inadvertent activation such as the use of not less than two simple but independent actions.	The activator provides a means for manual activation and deactivation. It has a clear protective cover which must be broken off and a green switch which must be pushed to the left to be able to push the red activator switch down.	Pass
The AIS-SART shall be provided with means to indicate that the AIS-SART has been previously activated, to advise the users of a possible reduction of the required battery capacity. These means shall not be capable of reset by the user. For example, manual activation requires the breaking of a seal that cannot be replaced by the user.	The EUT has a clear protective cover over the green and red switches requiring the user to break it off to then activate the EUT. The user is not able to replace the protective cover.	Pass
This indication of previous activation shall be unaffected when initiating the test mode. The Activator provides a means for manual activation and deactivation of the AIS-SART test mode.	The indication of previous activation is unaffected when initiating the test mode. The activator provides a manual means of activation but is not able to deactivate the test mode. It has an automatic shut down depending on if a GNSS fix can be obtained or if after approximately five minutes has transpired without a GNSS fix.	Pass

2.10.7 Test Location and Test Equipment Used

This test was carried out in Beacons and NavE Laboratory.

No test equipment was used.



2.11 Indicator

2.11.1 Specification Reference

IEC 61097-14, Clause 6.11

2.11.2 Equipment Under Test and Modification State

S200, S/N: TA000019 - Modification State 1

2.11.3 Date of Test

19-June-2025

2.11.4 Test Method

This test was performed in accordance with IEC 61097-14, clause 6.11.

2.11.5 Environmental Conditions

Ambient Temperature 20.9 °C

Relative Humidity 59.4 %

2.11.6 Test Results

Configuration 1 – AIS

6.11 – Indicator		
Requirement	Result	Verdict
The indicator shall be visual and/or audible. The indicator shall indicate that the AIS-SART • has been activated, • is undergoing test, • has completed test. There shall be indication of the EPFS status whilst the AIS-SART is activated.	The EUT has an indicator which provides a visual indication that it's been activated, undergoing a test and that the test is completed with a pass or fail status. The EUT's visual indicator provides an indication of the EPFS status whilst the EUT is activated.	Pass

2.11.7 Test Location and Test Equipment Used

This test was carried out in Beacons and NavE Laboratory.

No test equipment was used.



2.12 Frequency Error

2.12.1 Specification Reference

IEC 61097-14, Clause 7.2

2.12.2 Equipment Under Test and Modification State

S200, S/N: TA000019 - Modification State 0

2.12.3 Date of Test

05-April-2024 to 09-April-2024

2.12.4 Test Method

This test was performed in accordance with IEC 61097-14, clause 7.2.2.

2.12.5 Environmental Conditions

Ambient Temperature 21.0 - 21.7 °C

Relative Humidity 45.6 - 51.5 %

2.12.6 Test Results

Configuration 1 - AIS

Temperature	Voltage	Error (Hz)	
		161.975 MHz	162.025 MHz
+21.0°C	Partially Used Battery	100	81.5
-20.0 °C	Battery at End of Usable Life	18	16.5
+55.0 °C	Brand New Battery	75	67.5

Table 12 - Frequency Error Results

IEC 61097-14, Limit Clause 7.2.3

The frequency error shall not exceed ± 0.5 kHz under normal and ± 1 kHz under extreme test conditions.



2.12.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 2.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Climatic Chamber	Votsch	VT4002	161	-	O/P Mon
Meter & T/C	R.S Components	Meter 615-8206 & Type K T/C	3612	12	14-Sep-2024
1 metre SMA Cable	Florida Labs	SMS-235SP-39.4-SMS	4512	12	24-Oct-2024
PXA Signal Analyser	Keysight Technologies	N9030A	4654	12	23-Jan-2025
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB 40	5605	12	07-Nov-2024
GPSDR Frequency standard	Orolia	SecureSync 2402-053	6339	6	14-Sep-2024
Attenuator 5W 30dB DC-18GHz	Aaren	AT40A-4041-D18-30	6563	12	18-Jun-2024

Table 13

O/P Mon – Output Monitored using calibrated equipment

2.13 Conducted Power

2.13.1 Specification Reference

IEC 61097-14, Clause 7.3

2.13.2 Equipment Under Test and Modification State

S200, S/N: TA000019 - Modification State 0

2.13.3 Date of Test

05-April-2024 to 09-April-2024

2.13.4 Test Method

This test was performed in accordance with IEC 61097-14 clause 7.3.2.

2.13.5 Environmental Conditions

Ambient Temperature 21.0 - 21.7 °C
Relative Humidity 45.6 - 51.5 %

2.13.6 Test Results

Configuration 1 - AIS

AIS Test Frequency for which this assessment was made: 161.975 MHz.

P_R : 28.06 dBm
 P_{20} : 31.27 dBm
 P_d : 0.0 dB
 G : -3.21 dB

where

G is the antenna gain (dB);

P_R is the radiated power level as measured in IEC 61097-14 clause 7.4.2 (dBm);

P_{20} is the conducted power level measured at normal test conditions (dBm);

P_d is the power output difference given in IEC 61097-14 clause 5.5 (dB).

Temperature	Voltage	Measured Power Result (dBm)	Corrected Power Result (dBm)
+21.0°C	Partially Used Battery	31.27	N/A
-20.0 °C	Battery at End of Usable Life	31.37	28.16
+55.0 °C	Brand New Battery	31.73	28.52

Table 14 - Conducted Power Results

IEC 61097-14, Limit Clause 7.3.3

The conducted power, corrected for the antenna gain shall be at least the values given in the table below:



Power	dBm
$P_{-20} + G + P_d$	27
$P_{55} + G + P_d$	27
NOTE: This power equates to the radiated power at extreme temperatures.	

Table 15 - Conducted Power Limit Table

2.13.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 2.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Climatic Chamber	Votsch	VT4002	161	-	O/P Mon
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	20-Feb-2025
Meter & T/C	R.S Components	Meter 615-8206 & Type K T/C	3612	12	14-Sep-2024
Calibration Unit	Rohde & Schwarz	ZV-Z54	4368	12	26-Feb-2025
1 metre SMA Cable	Florida Labs	SMS-235SP-39.4-SMS	4512	12	24-Oct-2024
PXA Signal Analyser	Keysight Technologies	N9030A	4654	12	23-Jan-2025
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB 40	5605	12	07-Nov-2024
GPSDR Frequency standard	Orolia	SecureSync 2402-053	6339	6	14-Sep-2024
Attenuator 5W 30dB DC-18GHz	Aaren	AT40A-4041-D18-30	6563	12	18-Jun-2024

Table 16

O/P Mon – Output Monitored using calibrated equipment



2.14 Radiated Power

2.14.1 Specification Reference

IEC 61097-14, Clause 7.4

2.14.2 Equipment Under Test and Modification State

Pathfinder AIS, S/N: TA000016 - Modification State 0

2.14.3 Date of Test

09 May 2025

2.14.4 Test Method

This test was performed in accordance with IEC 61097-14 clause 7.4.2.

Note: The measuring distance of 10m restricted the elevation search to approximately 20°, whereas the specification requirement is 30°. The specification states a minimum limit of 500mW at an elevation that returns the maximum power level. As the measurements made at 5.7° elevation meet the specification requirements, the test is considered Pass.

2.14.5 Environmental Conditions

Ambient Temperature	23.0°C
Relative Humidity	30.0%

2.14.6 Test Results

Measurements made at an elevation of 5.7° and at 10m from the EUT.

Azimuth°	Radiated Power (mW)
0	769.43
90	685.75
180	639.98
270	685.75

Table 17

NOTE: 639.98mW is equivalent to 28.06dBm.

IEC 61097-14, Limit Clause 7.4.3

The radiated power shall be at least 27 dBm (500 mW).



2.14.7 Test Location and Test Equipment Used

This test was carried out at TÜV Straubing.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
TRILOG Broadband Antenna	Schwarzbeck Mess-Elektronik	VULB 9163	19669	36	31-Oct-2026
Semi anechoic room	Albatross Projects GmbH	Cabin no. 8	19917	24	31-Aug-2026
EMI test receiver	Rohde & Schwarz GmbH & Co. KG	ESW26	28268	12	30-Jun-2025

Table 18

2.15 Modulation Spectrum Slotted Transmission

2.15.1 Specification Reference

IEC 61097-14, Clause 7.5

2.15.2 Equipment Under Test and Modification State

S200, S/N: TA000019 - Modification State 0

2.15.3 Date of Test

05-April-2024

2.15.4 Test Method

This test was performed in accordance with IEC 61097-14, clause 7.5.2.

2.15.5 Environmental Conditions

Ambient Temperature 21.0 °C
Relative Humidity 51.5 %

2.15.6 Test Results

Configuration 1 - AIS

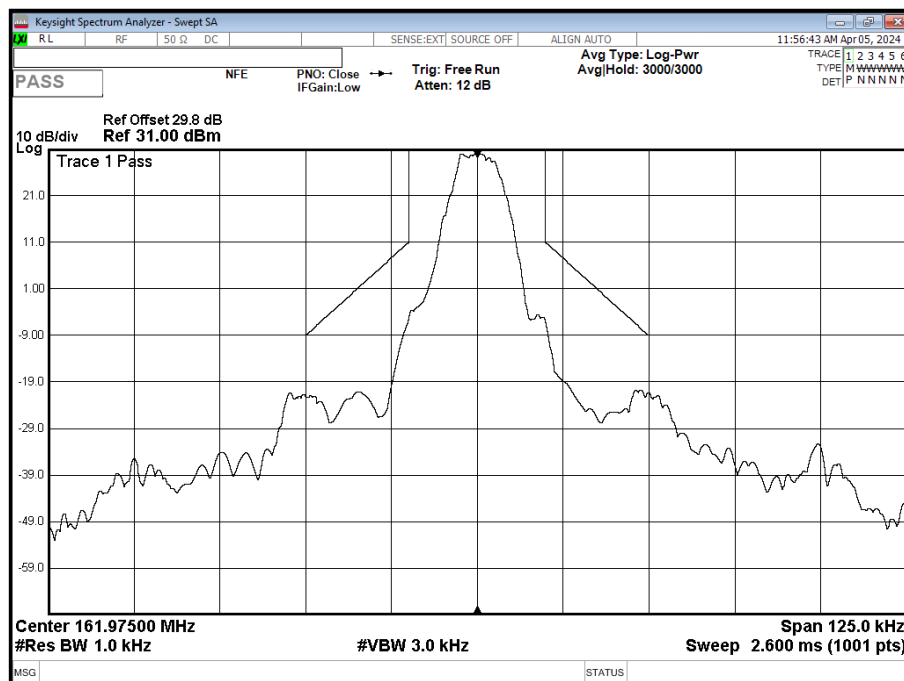


Figure 2 - Emission Mask, 161.975 MHz

IEC 61097-14, Limit Clause 7.5.3

The spectrum for slotted transmission shall be within the emission mask as follows:

- in the region between the carrier and ± 10 kHz removed from the carrier, the modulation and transient sidebands shall be below 0 dBc;
- at ± 10 kHz removed from the carrier, the modulation and transient sidebands shall be below -20 dBc;
- at ± 25 kHz to $\pm 62,5$ kHz removed from the carrier, the modulation and transient sidebands shall be below the lower value of -40 dBc;
- in the region between ± 10 kHz and ± 25 kHz removed from the carrier, the modulation and transient sidebands shall be below a line specified between these two points.

The reference level for the measurement shall be the carrier power (conducted) recorded for the appropriate test frequency in clause 7.3 of the test specification.

For information the emission mask specified above is shown below.

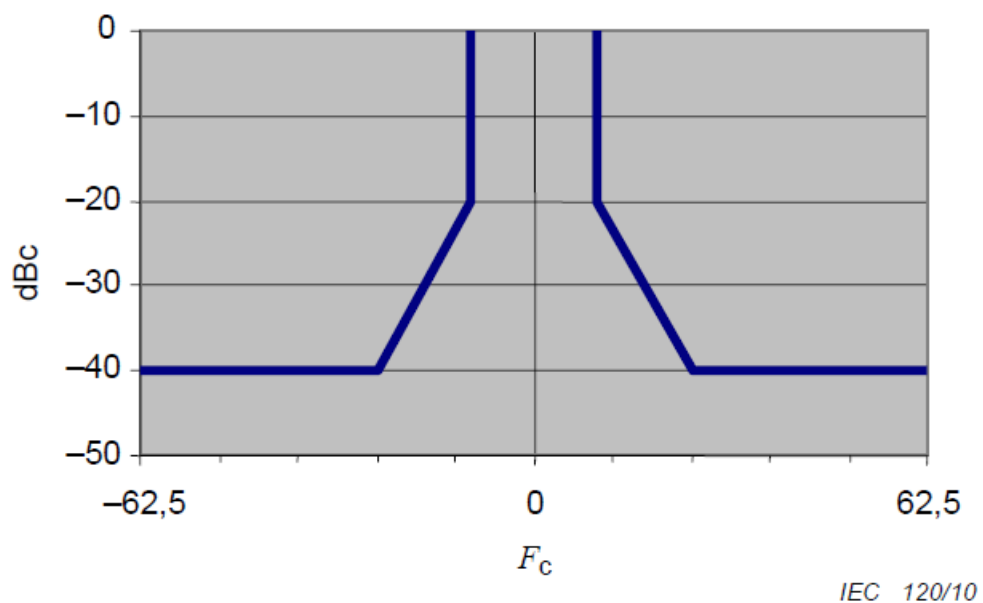


Figure 3 - Transmission Spectrum Mask Limit



2.15.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 2.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	20-Feb-2025
Calibration Unit	Rohde & Schwarz	ZV-Z54	4368	12	26-Feb-2025
1 metre SMA Cable	Florida Labs	SMS-235SP-39.4-SMS	4512	12	24-Oct-2024
PXA Signal Analyser	Keysight Technologies	N9030A	4654	12	23-Jan-2025
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB 40	5605	12	07-Nov-2024
GPSDR Frequency standard	Orolia	SecureSync 2402-053	6339	6	14-Sep-2024
Attenuator 5W 30dB DC-18GHz	Aaren	AT40A-4041-D18-30	6563	12	18-Jun-2024

Table 19

2.16 Transmitter Test Sequence and Modulation Accuracy

2.16.1 Specification Reference

IEC 61097-14, Clause 7.6

2.16.2 Equipment Under Test and Modification State

S200, S/N: TA000019 - Modification State 0

2.16.3 Date of Test

05-April-2024 to 09-April-2024

2.16.4 Test Method

This test was performed in accordance with IEC 61097-14, clause 7.6.2 (Configuration A).

2.16.5 Environmental Conditions

Ambient Temperature 21.0 - 21.7 °C
Relative Humidity 45.6 - 51.5 %

2.16.6 Test Results

Configuration 1 - AIS

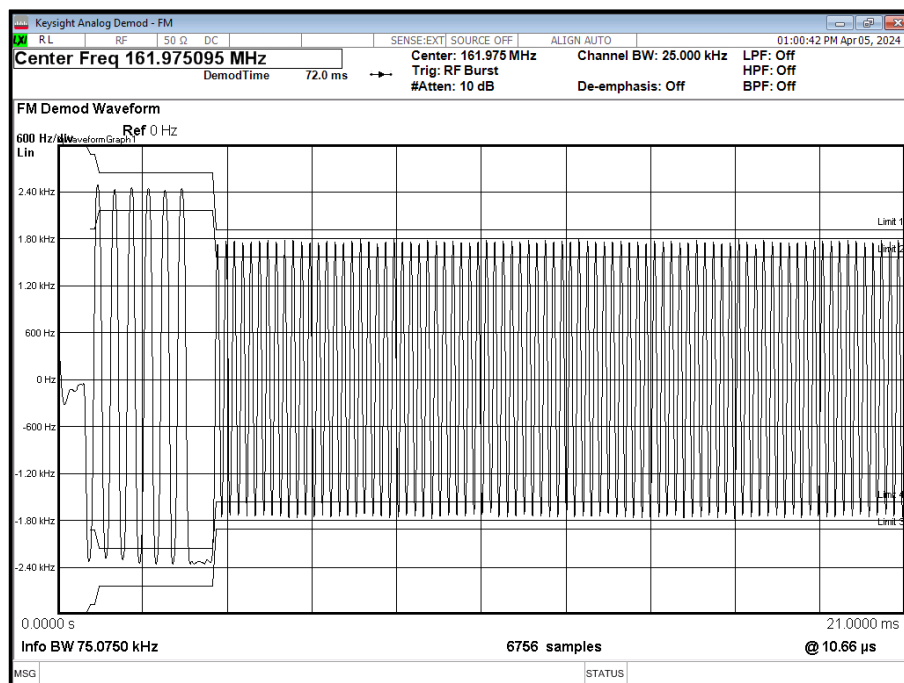


Figure 4 - 161.975 MHz, Test Signal #1, +21.0 °C, Partially Used Battery

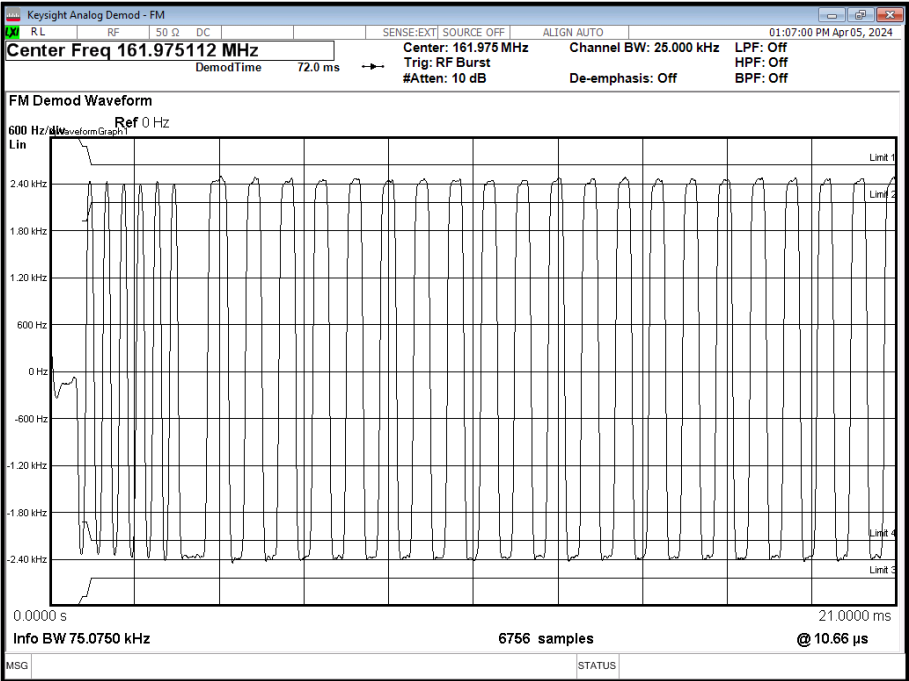


Figure 5 - 161.975 MHz, Test Signal #2, +21.0 °C, Partially Used Battery

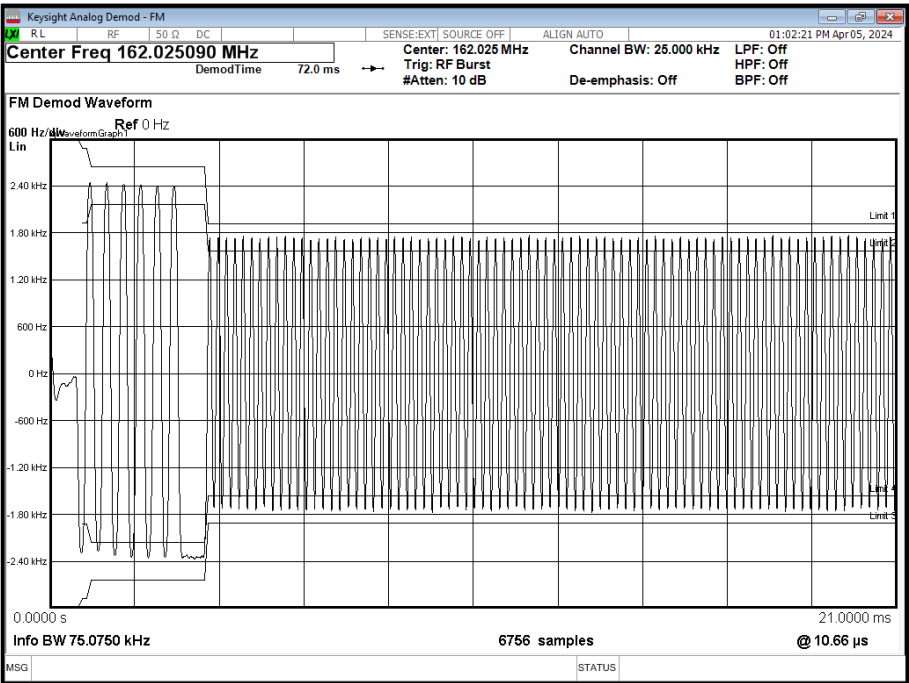


Figure 6 - 162.025 MHz, Test Signal #1, +21.0 °C, Partially Used Battery

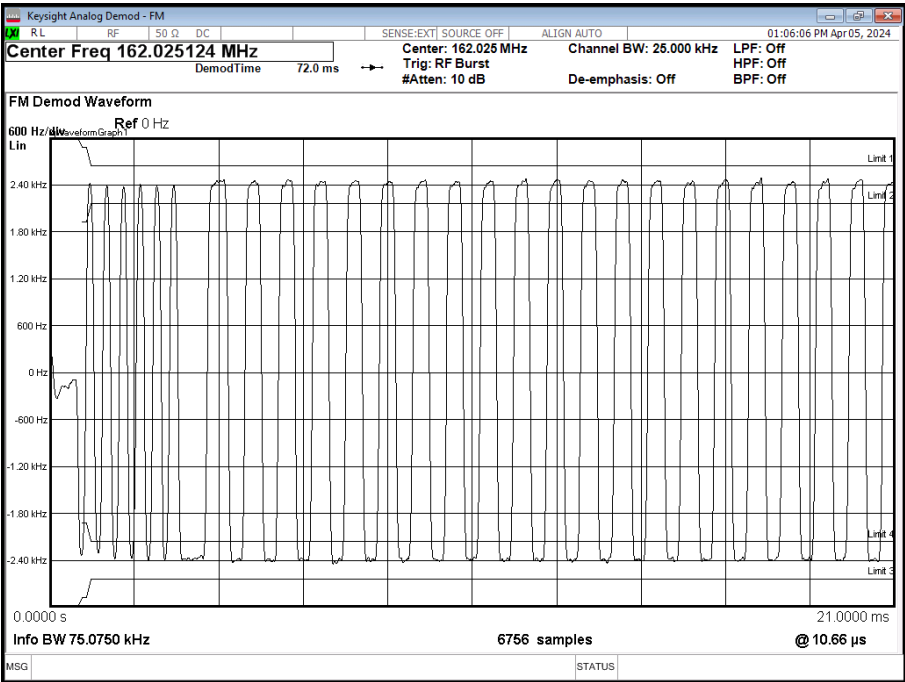


Figure 7 - 162.025 MHz, Test Signal #2, +21.0 °C, Partially Used Battery

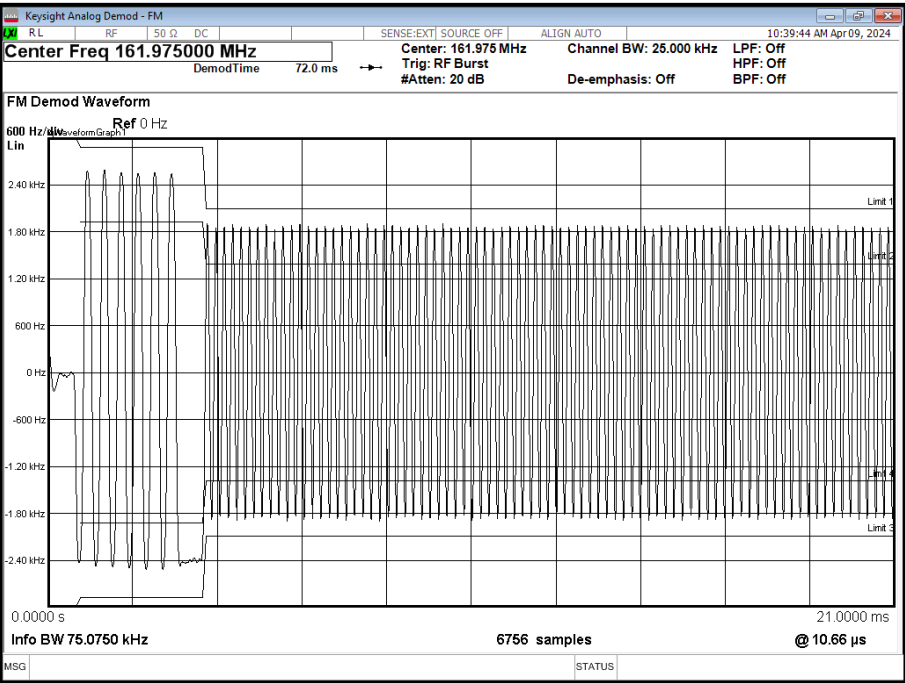
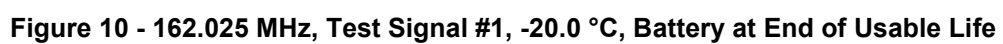
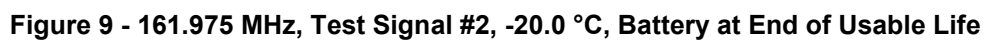


Figure 8 - 161.975 MHz, Test Signal #1, -20.0 °C, Battery at End of Usable Life



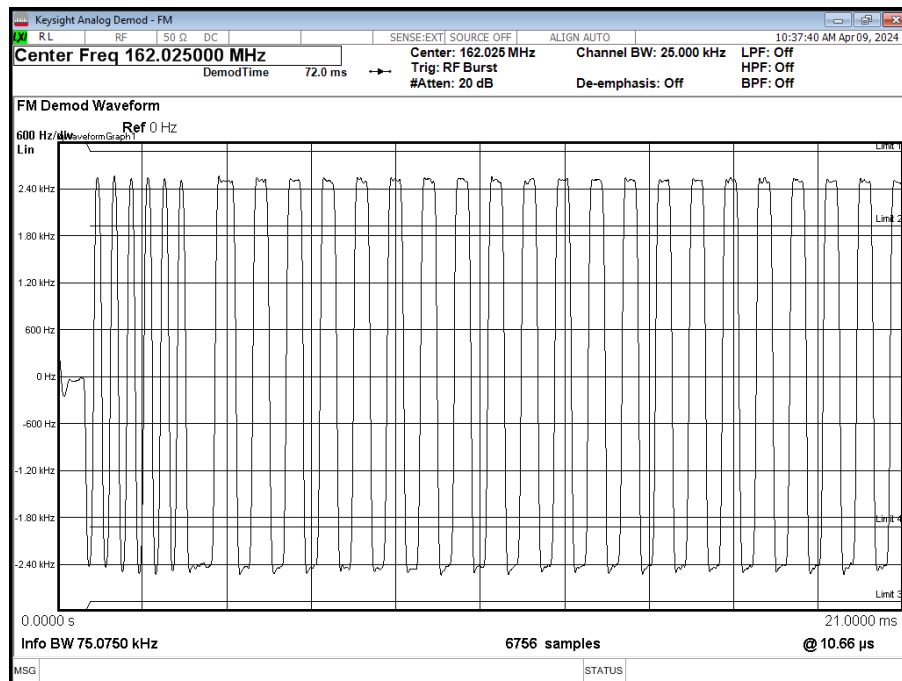


Figure 11 - 162.025 MHz, Test Signal #2, -20.0 °C, Battery at End of Usable Life

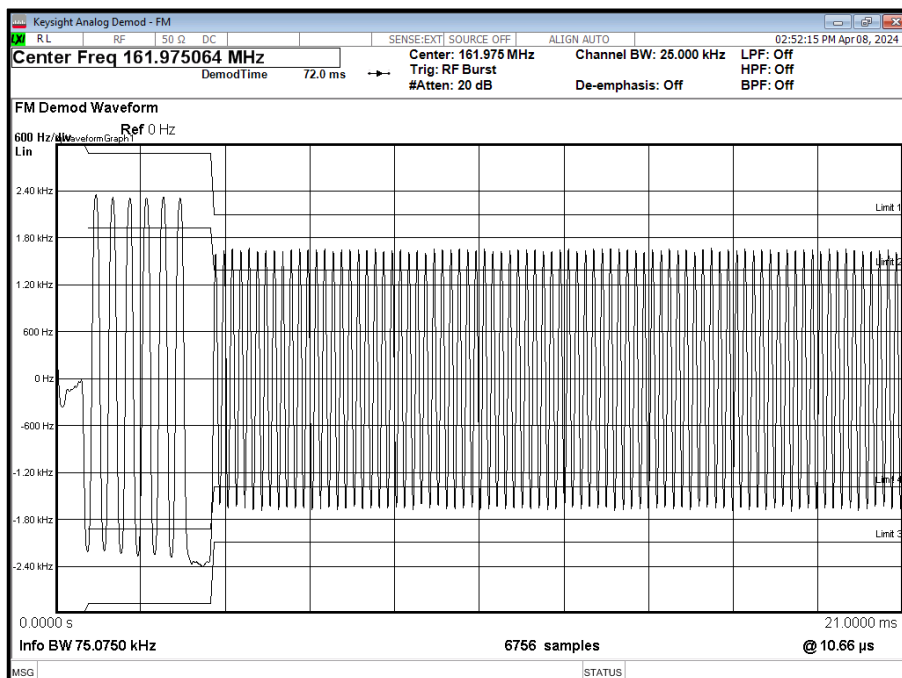


Figure 12 - 161.975 MHz, Test Signal #1, +55.0 °C, Brand New Battery

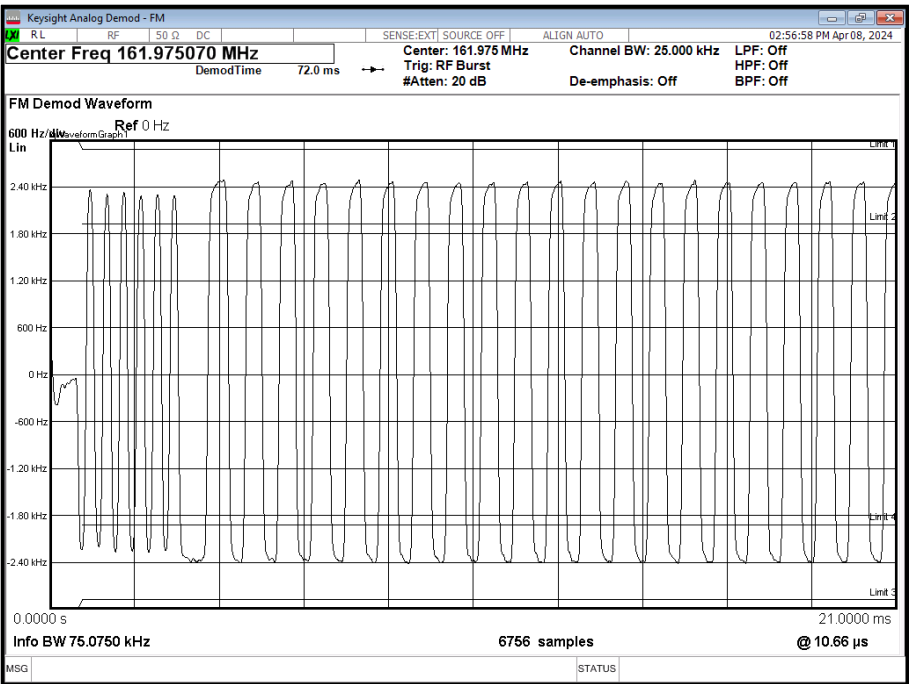


Figure 13 - 161.975 MHz, Test Signal #2, +55.0 °C, Brand New Battery

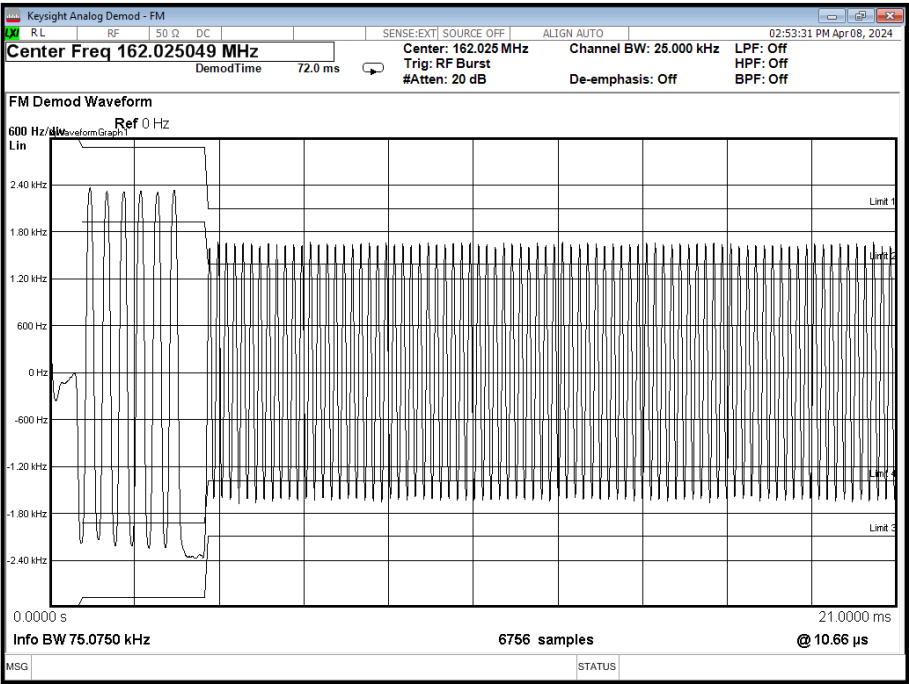


Figure 14 - 162.025 MHz, Test Signal #1, +55.0 °C, Brand New Battery

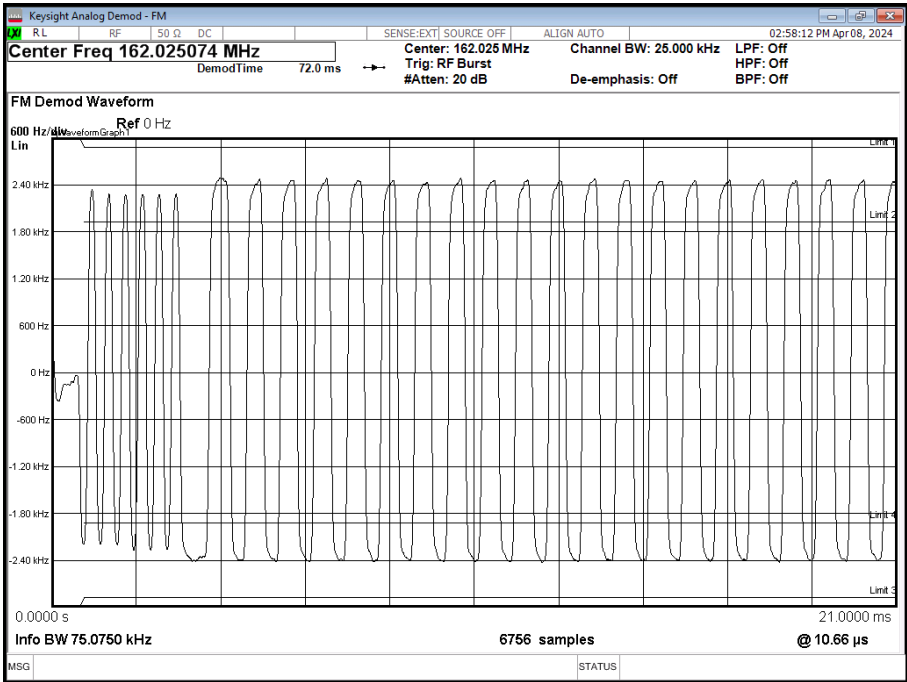


Figure 15 - 162.025 MHz, Test Signal #2, +55.0 °C, Brand New Battery

IEC 61097-14, Limit Clause 7.6.3

Measurement Period from Centre to Centre of each Bit	Test Signal 1		Test Signal 2	
	Normal	Extreme	Normal	Extreme
Bit 0 to Bit 1	< 3400 Hz			
Bit 2 to Bit 3	2400 ± 480 Hz			
Bit 4 to Bit 31	2400 ± 240 Hz	2400 ± 480 Hz	2400 ± 240 Hz	2400 ± 480 Hz
Bit 32 to Bit 199	1740 ± 175 Hz	1740 ± 350 Hz	2400 ± 240 Hz	2400 ± 480 Hz

Table 20 - Peak Frequency Deviation versus Time Limit



2.16.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 2.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Climatic Chamber	Votsch	VT4002	161	-	O/P Mon
Meter & T/C	R.S Components	Meter 615-8206 & Type K T/C	3612	12	14-Sep-2024
1 metre SMA Cable	Florida Labs	SMS-235SP-39.4-SMS	4512	12	24-Oct-2024
PXA Signal Analyser	Keysight Technologies	N9030A	4654	12	23-Jan-2025
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB 40	5605	12	07-Nov-2024
GPSDR Frequency standard	Orolia	SecureSync 2402-053	6339	6	14-Sep-2024
Attenuator 5W 30dB DC-18GHz	Aaren	AT40A-4041-D18-30	6563	12	18-Jun-2024

Table 21

O/P Mon – Output Monitored using calibrated equipment

2.17 Transmitter Output Power Versus Time Function

2.17.1 Specification Reference

IEC 61097-14, Clause 7.7

2.17.2 Equipment Under Test and Modification State

S200, S/N: TA000019 - Modification State 0

2.17.3 Date of Test

08-April-2024

2.17.4 Test Method

This test was performed in accordance with IEC 61097-14 clause 7.7.2.

Note. To fully display zoom ramp down the analyser settings were changed. This resulted in display of the trace update symbol "" shown on the ramp down zoom captured image.

2.17.5 Environmental Conditions

Ambient Temperature 21.7 °C
Relative Humidity 47.7 %

2.17.6 Test Results

Configuration 1 - AIS

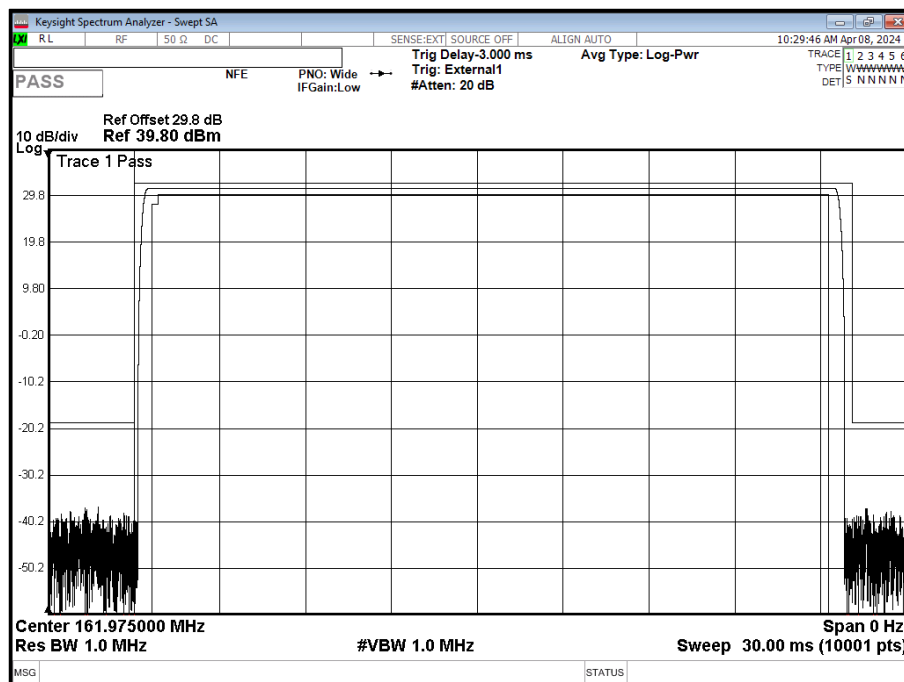


Figure 16 - PVT Mask, 161.975 MHz

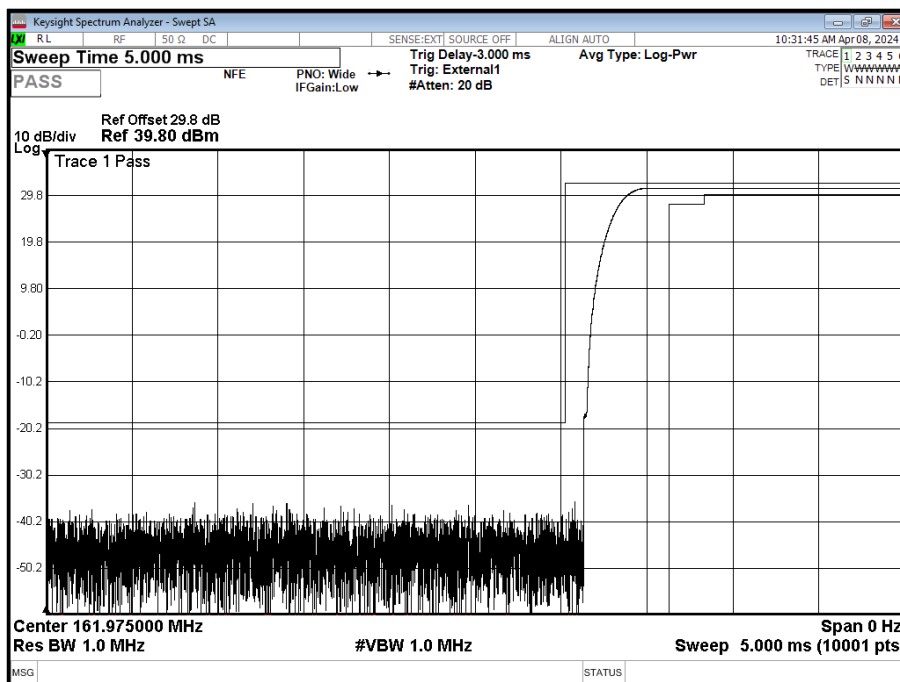


Figure 17 - Ramp Up Zoom, 161.975 MHz

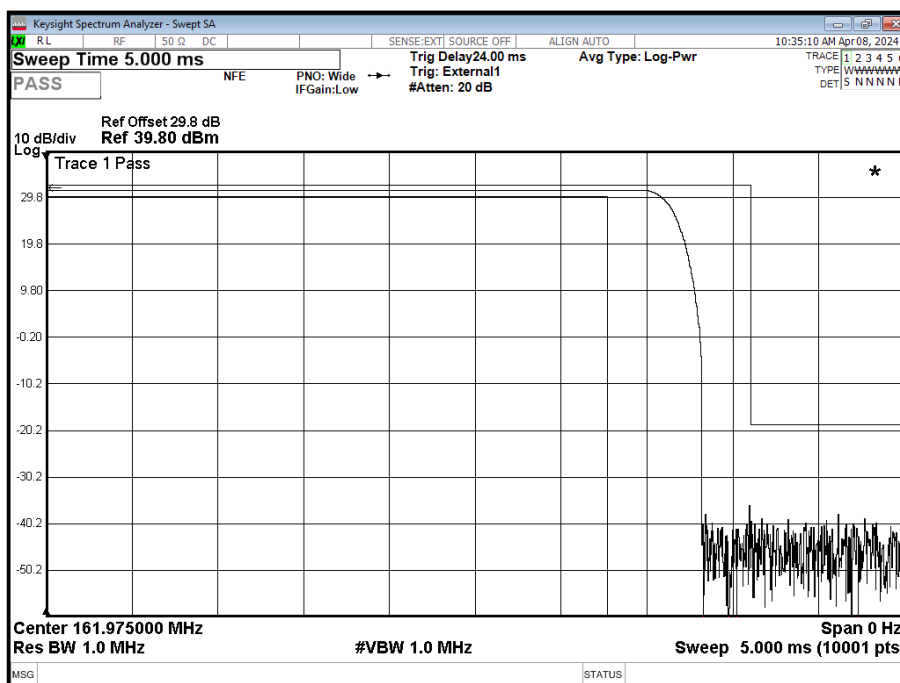


Figure 18 - Ramp Down Zoom, 161.975 MHz

IEC 61097-14, Limit Clause 7.7

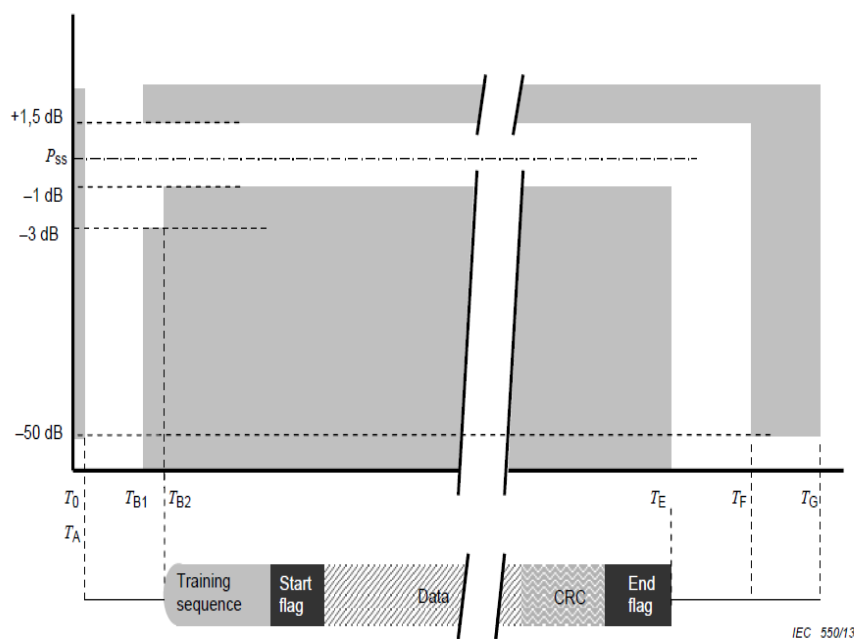


Figure 19 - Power Versus Time Mask

Reference		Bits	Time (ms)	Definitions
T ₀		0	0	Start of transmission slot. Power shall NOT exceed -50 dB of P _{SS} before T ₀
T _A		0 to 6	0 to 0.625	Power exceeds -50 dB of P _{SS}
T _B	T _{B1}	6	0.625	Power shall be within ±1.5 or -3 dB of P _{SS}
	T _{B2}	8	0.833	Power shall be within +1.5 or -1 dB of P _{SS} during the period T _{B2} to T _E (start of training sequence)
T _E (includes 1 stuffing bit)		233	24.271	Power shall remain within +1.5 or -1 dB of P _{SS} during the period T _{BE} to T _E
T _F (includes 1 stuffing bit)		241	25.104	Power shall be -50 dB of P _{SS} and stay below this
T _G		256	26.667	Start of next transmission time period

Table 22 - Definitions of Timing for Power Versus Time Mask



2.17.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 2.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	20-Feb-2025
Calibration Unit	Rohde & Schwarz	ZV-Z54	4368	12	26-Feb-2025
1 metre SMA Cable	Florida Labs	SMS-235SP-39.4-SMS	4512	12	24-Oct-2024
PXA Signal Analyser	Keysight Technologies	N9030A	4654	12	23-Jan-2025
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB 40	5605	12	07-Nov-2024
GPSDR Frequency standard	Orolia	SecureSync 2402-053	6339	6	14-Sep-2024
Attenuator 5W 30dB DC-18GHz	Aaren	AT40A-4041-D18-30	6563	12	18-Jun-2024

Table 23



2.18 Spurious Emissions from the Transmitter

2.18.1 Specification Reference

IEC 61097-14, Clause 7.8

2.18.2 Equipment Under Test and Modification State

S200, S/N: TA000019 - Modification State 1

2.18.3 Date of Test

15-May-2025

2.18.4 Test Method

This test was performed in accordance with IEC 61097-14, clause 7.8.2.

2.18.5 Environmental Conditions

Ambient Temperature 22.3 °C
Relative Humidity 39.7 %

2.18.6 Test Results

Configuration 1 - AIS

Frequency (MHz)	Level (dBm)
*	

Table 24 - Transmitter Emissions Results, 161.975 MHz

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

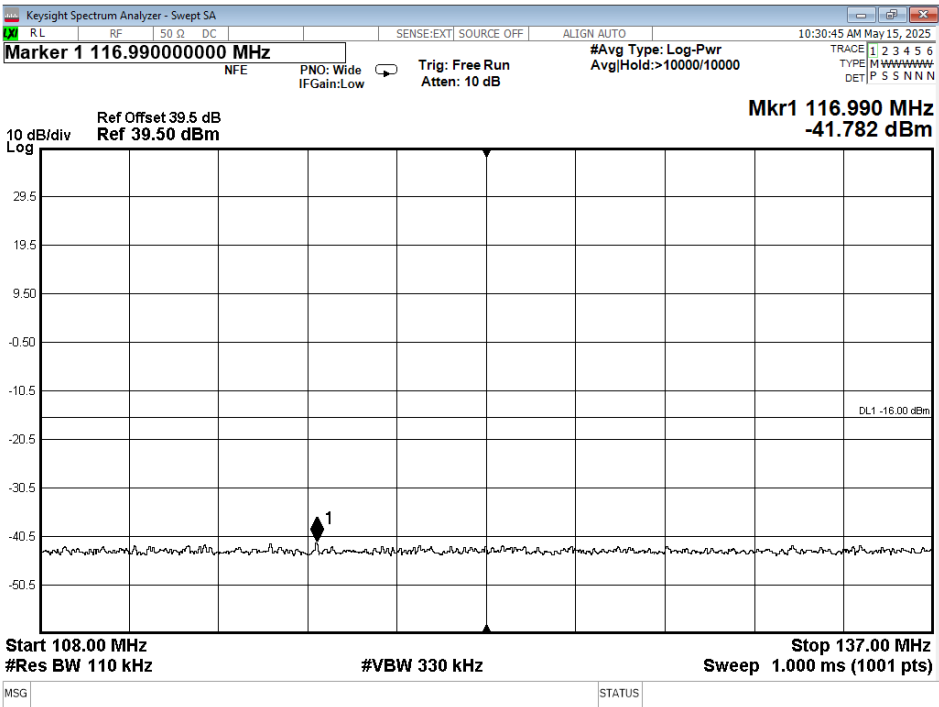


Figure 20 - 108 MHz to 137 MHz, 161.975 MHz

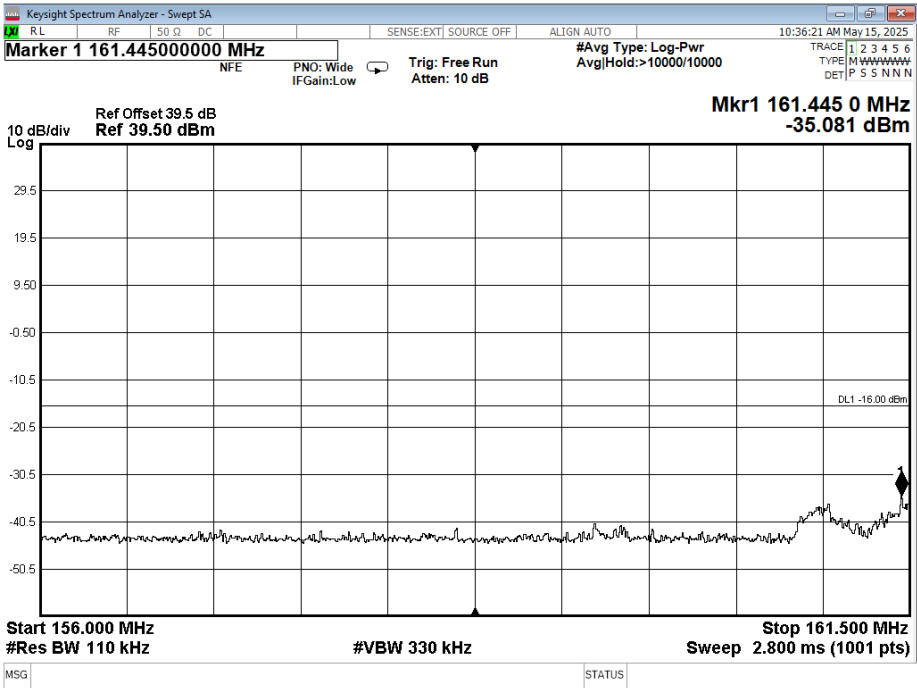


Figure 21 - 156 MHz to 161.5 MHz, 161.975 MHz

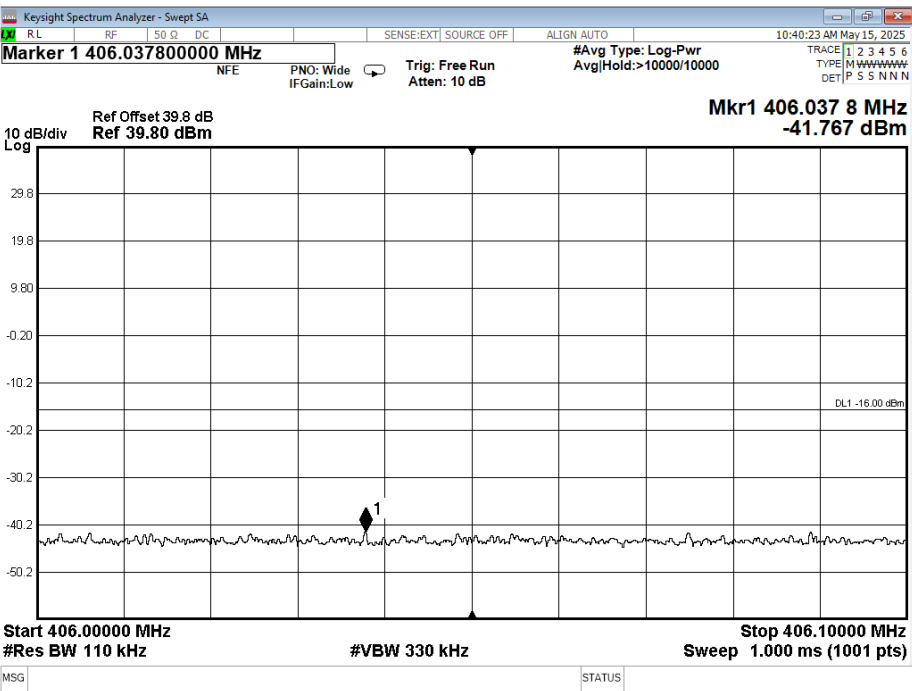


Figure 22 - 406.0 MHz to 406.1 MHz, 161.975 MHz

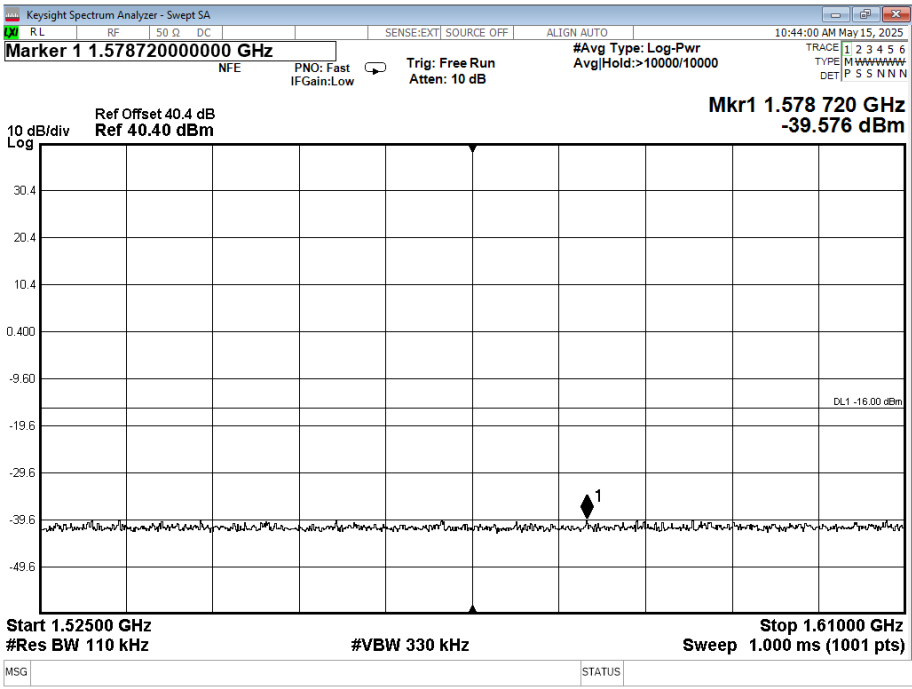


Figure 23 - 1525 MHz to 1610 MHz, 161.975 MHz



IEC 61097-14, Limit Clause 7.8.3

No signal level within these bands shall exceed 25 μ W.

2.18.7 Test Location and Test Equipment Used

This test was carried out in RF Laboratory 2.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	17-Mar-2026
Calibration Unit	Rohde & Schwarz	ZV-Z54	4368	12	17-Mar-2026
PXA Signal Analyser	Keysight Technologies	N9030A	4654	12	24-Feb-2026
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB 40	5604	12	26-Nov-2025
GPSDR Frequency standard	Orolia	SecureSync 2402-053	6339	6	18-Sep-2025
Attenuator	Weinschel	48-40-43-LIM	5134	12	13-Feb-2026

Table 25

3 Photographs

3.1 Equipment Under Test (EUT)



Figure 24 – S200, TA000019



Figure 25 – Pathfinder AIS, TA000016



Figure 26 – Radiated Power, TA000016

4 Measurement Uncertainty

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

Test Name	Measurement Uncertainty
Frequency Error	± 11 Hz
Conducted Power	± 0.45 dB
Modulation Spectrum Slotted Transmission	± 2.0 dB
Transmitter Test Sequence and Modulation Accuracy	± 2.0 dB
Transmitter Output Power Versus Time Function	± 2.0 dB
Spurious Emissions from the Transmitter	± 3.45 dB

Table 26

Measurement Uncertainty Decision Rule – Accuracy Method

Determination of conformity with the specification limits is based on the decision rule according to IEC Guide 115:2021, Clause 4.4.3 (Procedure 2). The measurement results are directly compared with the test limit to determine conformance with the requirements of the standard.

Risk: The uncertainty of measurement about the measured result is negligible with regard to the final pass/fail decision. The measurement result can be directly compared with the test limit to determine conformance with the requirement (compare IEC Guide 115). The level of risk to falsely accept and falsely reject items is further described in ILAC-G8.