

FCC and ISED Test Report

Ocean Signal Limited

Model: PLB-450

In accordance with FCC 47 CFR Part 95, FCC 47 CFR Part 2, ISED RSS-287 and ISED RSS-GEN (121.5 MHz Homer)

Prepared for: Ocean Signal Limited
Ocivan Way, Margate
CT9 4NN, United Kingdom

FCC ID: XYE PLB3

IC: 9296A PLB3

COMMERCIAL-IN-CONFIDENCE

Document 75950037-06 Issue 01



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SIGNATURE

NAME	JOB TITLE	RESPONSIBLE FOR	ISSUE DATE
Matthew Russell	Senior Engineer	Authorised Signatory	17 June 2022

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

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 95, FCC 47 CFR Part 2, ISED RSS-287 and ISED RSS-GEN. The sample tested was found to comply with the requirements defined in the applied rules.

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Testing	Neil Rousell	17 June 2022	
Testing	Christopher Bland	17 June 2022	
Testing	Graeme Lawler	17 June 2022	

FCC Accreditation
90987 Octagon House, Fareham Test Laboratory

ISED Accreditation
12669A Octagon House, Fareham Test Laboratory

EXECUTIVE SUMMARY

A sample of this product was tested and found to be compliant with FCC 47 CFR Part 95: 2020, FCC 47 CFR Part 2: 2020, ISED RSS-287: Issue 2 (03-2014) and ISED RSS-GEN Issue 5 (04:2018) + A2 (02-2021) for the tests detailed in section 1.3.



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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	17 June 2022

Table 1

1.2 Introduction

Applicant	Ocean Signal Limited
Manufacturer	Ocean Signal Limited
Model Number(s)	PLB-450
Manufacturer Declared Variant	PLB3
Serial Number(s)	TA000009 (conducted PLB-450) TA000011 (radiated PLB-450)
Hardware Version(s)	Issue 01.00
Software Version(s)	00.03.00
Number of Samples Tested	2
Test Specification/Issue/Date	FCC 47 CFR Part 95: 2020 FCC 47 CFR Part 2: 2020 ISED RSS-287: Issue 2 (03-2014) ISED RSS-GEN: Issue 5 (04-2018) + A2 (02-2021)
Order Number	10113
Date	16-September-2020
Date of Receipt of EUT	07-June-2021 and 26-July-2021
Start of Test	20-November-2021
Finish of Test	24-February-2022
Name of Engineer(s)	Neil Rousell, Christopher Bland and Graeme Lawler
Related Document(s)	RTCM 11010.3 (June 25, 2018)



1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 95, FCC 47 CFR Part 2, ISSED RSS-287 and ISSED RSS-GEN is shown below.

Section	Specification Clause				Test Description	Result	Comments/Base Standard
	FCC Part 95	FCC Part 2	RSS-287	RSS-GEN			
Configuration and Mode: Battery Powered - 121 only							
2.1	-	2.1049	-	6.7	Occupied Bandwidth	Satisfactory	
2.2	-	2.1053	7.4.4	6.13	Radiated Spurious Emissions	Pass	
2.3	RTCM 11010.3 A.16.1	2.1055	7.4.2	6.11	Transmitter Frequency and Output Power Stabilities	Pass	
2.4	RTCM 11010.3 A.16.2	2.1047	7.4.1	-	Modulation Characteristics	Pass	
2.5	RTCM 11010.3 A.16.2(e)	-	7.4.5	-	Spectrum Characteristics	Pass	
2.6	RTCM 11010.3 A.16.3	2.1046	7.4.3	6.12	Peak Equivalent Isotropic Radiated Power	Pass	
2.7	RTCM 11010.3 4.2.4	2.1051	7.4.4	6.13	Spurious Emissions at Antenna Terminals	Pass	

Table 2



1.4 Application Form

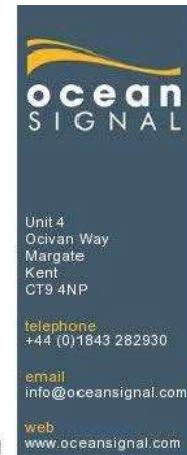
MAIN EUT	
MANUFACTURING DESCRIPTION	Personal Locator Beacon
MANUFACTURER	Ocean Signal Ltd
MODEL	PLB3, RescueME PLB3, PLB-450, ResQLink AIS
PART NUMBER	900S-03356 (PLB3, RescueME PLB3) , 900S-03767 (PLB-450, ResQLink AIS)
HARDWARE VERSION	Issue 01.00 (All models)
SOFTWARE VERSION	Not Applicable
FIRMWARE VERSION	500S-03492 Issue 00.03.00
PSU VOLTAGE/FREQUENCY/CURRENT	6V
HIGHEST INTERNALLY GENERATED FREQUENCY	406.031 MHz
FCC ID (if applicable)	XYE PLB3
INDUSTRY CANADA ID (if applicable)	9296A PLB3
TECHNICAL DESCRIPTION (a brief technical description of the intended use and operation)	Personal Locator Beacon incorporating 162 MHz AIS Man Overboard positioning, 406MHz Cospas Sarsat Satellite rescue and 121.5MHz homing capabilities.Product is designed to operate whilst attached to a lifejacket.
COUNTRY OF ORIGIN	UK
RF CHARACTERISTICS (if applicable)	
TRANSMITTER FREQUENCY OPERATING RANGE (MHz)	121.5MHz, 161.975MHz, 162.025 MHz & 406.031MHz
RECEIVER FREQUENCY OPERATING RANGE (MHz)	N/A
INTERMEDIATE FREQUENCIES	N/A
EMISSION DESIGNATOR(S): https://fccid.io/Emissions-Designator/	3K20A3X, 16K0GXW, 16K0G1D
MODULATION TYPES: (i.e. GMSK, QPSK)	Swept tone AM, GMSK, BPSK
OUTPUT POWER (W or dBm)	16dBm $\pm$ 2dBm (121.5MHz), 31.2 dBm (AIS), 37dBm (406MHz)
SEPARATE BATTERY/POWER SUPPLY (if applicable)	

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

Name:  Mark Newton
Position held: Approvals Manager
Date: 12-04-2022



1.5 Manufacturer's Declared Variants



16th December 2021

Ocean Signal Limited PLB3 (rescueME PLB3) and ACR PLB-450 (ResQLink AIS) – Statement of Equivalence

Dear Sir/Madam,

The Ocean Signal PLB3 and ACR PLB-450 are essentially the same product with different exterior labels and body colours (Ocean Signal Yellow and ACR Chartreuse) as shown in Figure 1.

The electronics, battery, firmware and functionality are identical in both products.

Both products are manufactured by Ocean Signal Limited at their manufacturing site in the UK under the same quality system and testing regime.

The Manuals, Quick Start guides and retail boxes for each product have different branding accordingly.

Justification for acceptance of both models as having equivalent performance is based upon comparison Satellite Quality testing during Cospas Sarsat Pre - Application Type Approval. (Reference email from Eric Harpell, 13/09/2021).

The two branded products will also have additional names that may be used in different markets as follows:

PLB3 will also be known as rescueME PLB3.
PLB-450 will also be known as ResQLink AIS.

Signed on behalf of Ocean Signal Limited.

Mark Newton
Approvals Manager

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Vat No
938 4374 89

Registered Office
27 New Dover Road
Canterbury
Kent
CT1 3DN



Figure 1



1.6 Product Information

1.6.1 Technical Description

The Equipment under test (EUT) was an Ocean Signal Ltd, PLB-450.

The primary function of the EUT is to be used as a personal locator beacon.

1.7 Deviations from the Standard

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

1.8 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: PLB-450, Serial Number: TA000009			
2	Update to FW V.03.00	Ocean Signal	27-October-2021
Model: PLB-450, Serial Number: TA000011			
2	Update to FW V.03.00	Ocean Signal	27-October-2021

Table 3



1.9 Test Location

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

Test Name	Name of Engineer(s)	Accreditation
Configuration and Mode: Battery Powered - 121 only		
Occupied Bandwidth	Neil Rousell	UKAS
Radiated Spurious Emissions	Graeme Lawler	UKAS
Transmitter Frequency and Output Power Stabilities	Neil Rousell	UKAS
Modulation Characteristics	Neil Rousell	UKAS
Spectrum Characteristics	Neil Rousell	UKAS
Peak Equivalent Isotropic Radiated Power	Christopher Bland	UKAS
Spurious Emissions at Antenna Terminals	Neil Rousell	UKAS

Table 4

Office Address:

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



2 Test Details

2.1 Occupied Bandwidth

2.1.1 Specification Reference

FCC 47 CFR Part 2, Clause 2.1049
ISED RSS-GEN, Clause 6.7

2.1.2 Equipment Under Test and Modification State

PLB-450, S/N: TA000009 - Modification State 2

2.1.3 Date of Test

13-January-2022

2.1.4 Test Method

This test was performed in accordance with ANSI C63.26, clause 5.4.3.

2.1.5 Environmental Conditions

Ambient Temperature	22.2 °C
Relative Humidity	33.5 %



2.1.6 Test Results

Battery Powered - 121 only

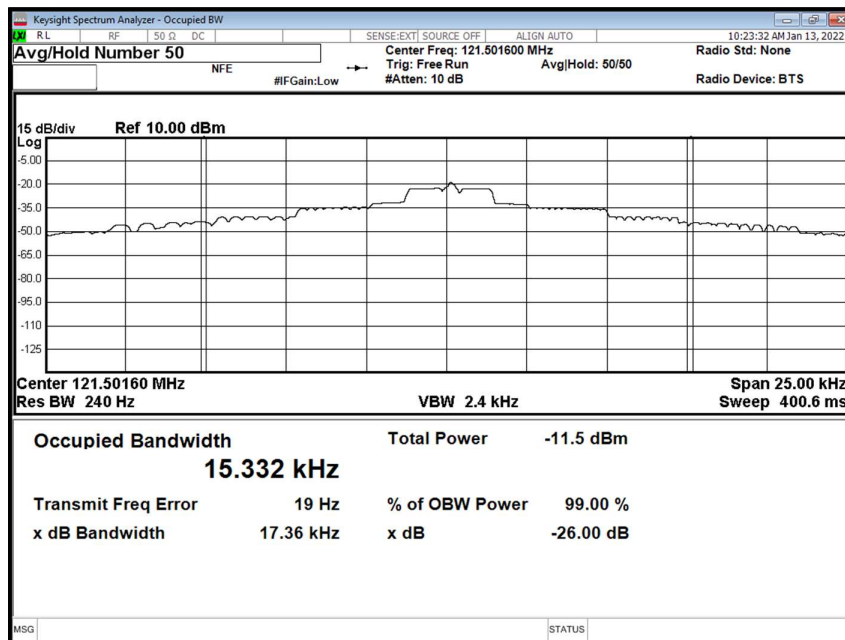


Figure 1 - 99% Occupied Bandwidth

FCC Part 95 and Industry Canada RSS-287 Limit Clause

None Specified



2.1.7 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
Frequency Standard	Spectracom	SecureSync 1200-0408-0601	4393	6	30-Jun-2022
1 metre K-Type Cable	Florida Labs	KMS-180SP-39.4-KMS	4519	12	18-Nov-2022
PXA Signal Analyser	Keysight Technologies	N9030A	4654	12	24-Nov-2022
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB-40	5475	12	06-Apr-2022
Attenuator 5W 30dB DC-18GHz	Aaren	AT40A-4041-D18-30	5503	12	14-Apr-2022

Table 5



2.2 Radiated Spurious Emissions

2.2.1 Specification Reference

FCC 47 CFR Part 2, Clause 2.1053
ISED RSS-287, Clause 7.4.4
ISED RSS-GEN, Clause 6.13

2.2.2 Equipment Under Test and Modification State

PLB-450, S/N: TA000011 - Modification State 2

2.2.3 Date of Test

14-February-2022

2.2.4 Test Method

This test was performed in accordance with ANSI C63.26, clause 5.5.

Measurements were made at a distance of 3m. Field strength limits were calculated using the following formula:

Limit (Field Strength) = Limit (EIRP) + 95.2 dB
82.2 dBμV/m = -13 dBm + 95.2 dB

2.2.5 Environmental Conditions

Ambient Temperature	23.0 °C
Relative Humidity	28.7 %

2.2.6 Test Results

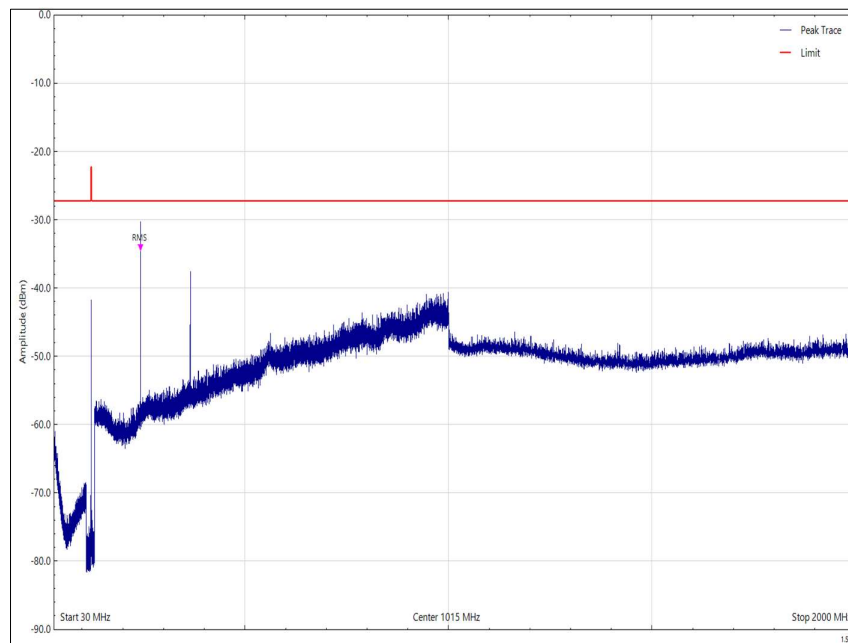


Figure 2 - EUT Orientation X: 30 MHz to 2 GHz - Vertical

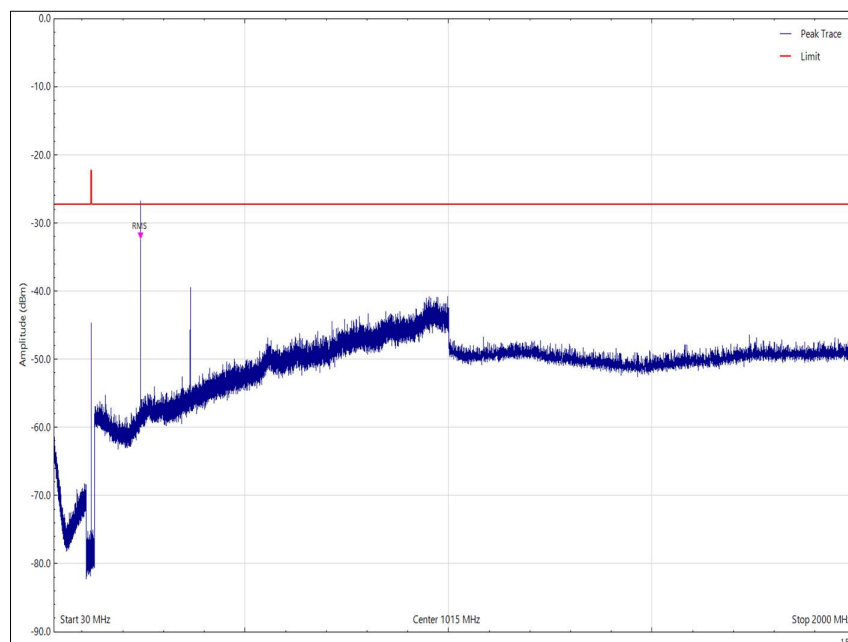


Figure 3 - EUT Orientation X: 30 MHz to 2 GHz - Horizontal

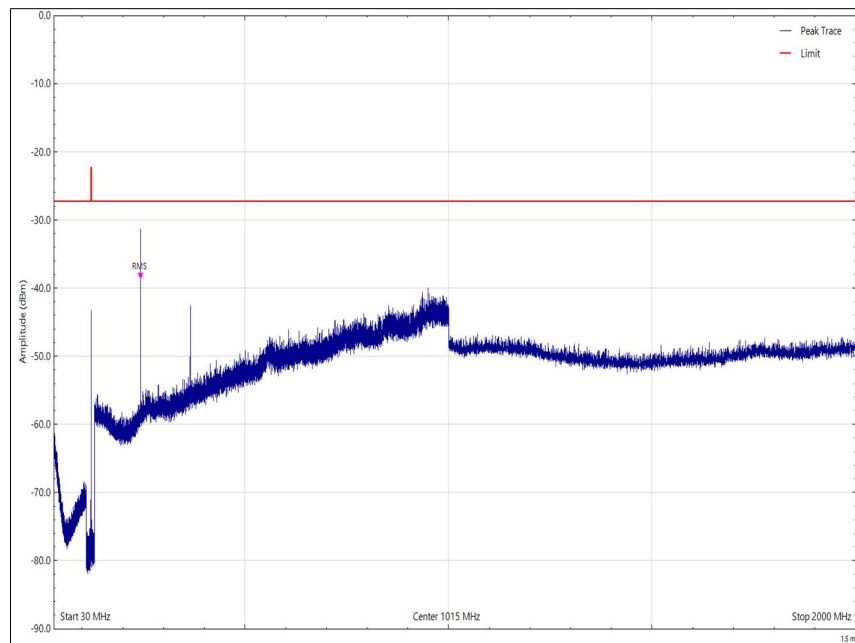


Figure 4 - EUT Orientation Y: 30 MHz to 2 GHz - Vertical

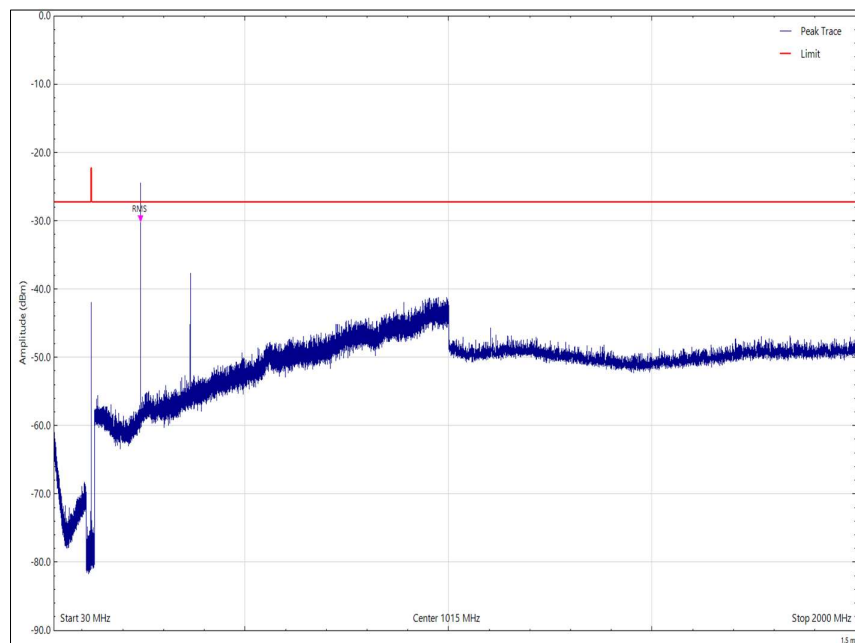


Figure 5 - EUT Orientation Y: 30 MHz to 2 GHz - Horizontal

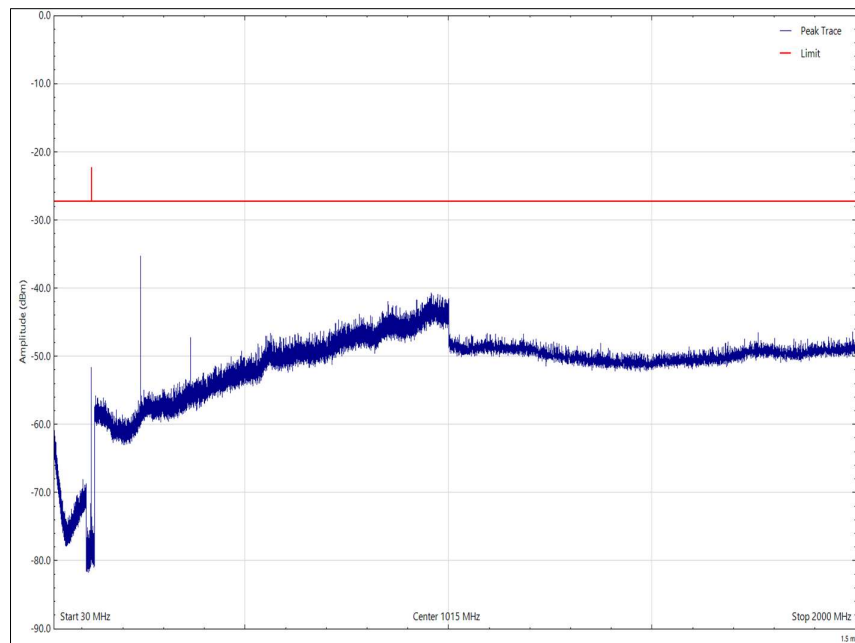


Figure 6 - EUT Orientation Z: 30 MHz to 2 GHz - Vertical

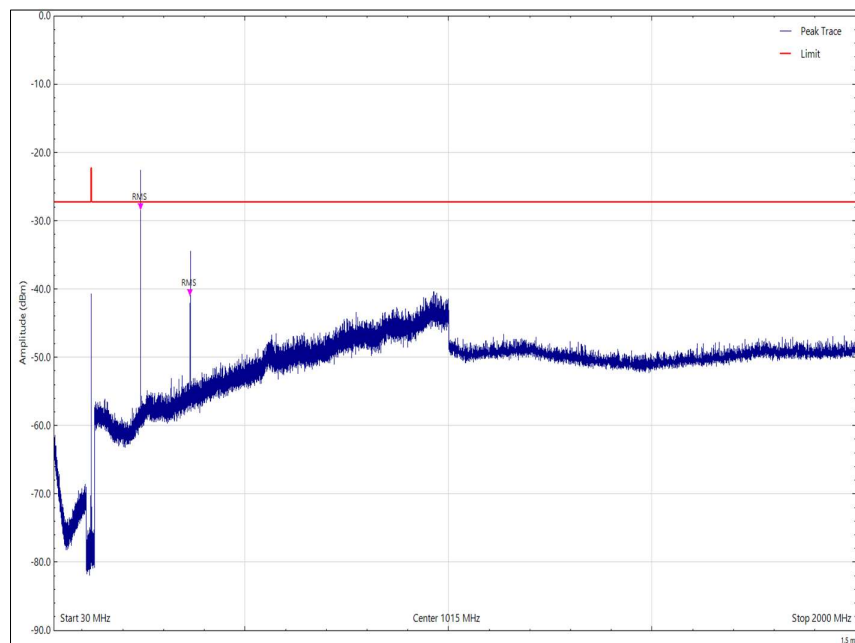


Figure 7 - EUT Orientation Z: 30 MHz to 2 GHz - Horizontal



2.2.7 Test Location and Test Equipment Used

This test was carried out in EMC Chamber 12.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Comb Generator	Schaffner	RSG1000	3034	-	TU
Test Receiver	Rohde & Schwarz	ESU40	3506	12	18-Mar-2022
Cable (K-Type to K-Type, 2 m)	Scott Cables	KPS-1501-2000-KPS	4526	6	06-Mar-2022
Emissions Software	TUV SUD	EmX V2.1.11 V.2.1.11	5125	-	N/A - Software
Cable (N-Type to N-Type, 8 m)	Teledyne	PR90-088-8MTR	5450	6	8-Mar-2022
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB-40	5481	12	31-Mar-2022
Antenna (DRG, 1 GHz to 10 GHz)	Schwarzbeck	BBHA 9120 B	5611	12	15-Oct-2022
Turntable & Mast Controller	Maturo Gmbh	NCD/498/2799.01	5612	-	TU
Tilt Antenna Mast	Maturo Gmbh	TAM 4.0-P	5613	-	TU
Turntable	Maturo Gmbh	Turntable 1.5 SI-2t	5614	-	TU
Antenna (Bi-Log, 30 MHz to 1 GHz)	Teseq	CBL6111D	5615	24	16-Oct-2022
Screened Room (12)	MVG	EMC-3	5621	36	11-Aug-2023

Table 6

TU – Traceability Unscheduled



2.3 Transmitter Frequency and Output Power Stabilities

2.3.1 Specification Reference

FCC 47 CFR Part 95, Clause RTCM 11010.3 A.16.1
FCC 47 CFR Part 2, Clause 2.1055
ISED RSS-287, Clause 7.4.2
ISED RSS-GEN, Clause 6.11

2.3.2 Equipment Under Test and Modification State

PLB-450, S/N: TA000009 - Modification State 2

2.3.3 Date of Test

14-January-2022

2.3.4 Test Method

This test was performed in accordance with ANSI C63.26 clause 5.6 and RSS-287 clause 6.1.

Testing was performed after the battery was discharged for a minimum of 24 hours of 'normal operation' which was the operating lifetime of the EUT as declared by the manufacturer.

2.3.5 Environmental Conditions

Ambient Temperature	22.2 °C
Relative Humidity	34.6 %



2.3.6 Test Results

Battery Powered - 121 only

Temperature	Measured Frequency (MHz)	Frequency Error (ppm)	Carrier Power (dBm)
+55.0 °C	121.501158	-1.80	14.1
+50.0 °C	121.501603	-1.99	13.6
+40.0 °C	121.501847	-1.89	13.8
+30.0 °C	121.501796	-0.27	13.7
+20.0 °C	121.501645	-	13.3
+10.0 °C	121.501522	1.24	12.3
0 °C	121.501325	1.66	11.8
-10.0 °C	121.501313	-0.35	12.5
-20.0 °C	121.501336	-3.27	11.8

Table 7 - Frequency Stability Under Temperature Variations

RTCM 11010.2, Limit Clause A.16.1

The carrier frequency, measured at the minimum and maximum operating temperatures, shall be 121.5 MHz $\pm$ 50 parts/million.

ISED RSS-287, Limit Clause 7.4.2

The carrier frequency shall not depart by more than 0.005% ($\pm$ 50 ppm) from that measured at 20°C and the rated supply voltage.



2.3.7 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
Digital Temperature Indicator	Fluke	51	1385	12	02-Mar-2022
Frequency Standard	Spectracom	SecureSync 1200-0408-0601	4393	6	30-Jun-2022
1 metre K-Type Cable	Florida Labs	KMS-180SP-39.4-KMS	4519	12	18-Nov-2022
PXA Signal Analyser	Keysight Technologies	N9030A	4654	12	24-Nov-2022
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB-40	5475	12	06-Apr-2022
Attenuator 5W 30dB DC-18GHz	Aaren	AT40A-4041-D18-30	5503	12	14-Apr-2022

Table 8

O/P Mon – Output Monitored using calibrated equipment



2.4 Modulation Characteristics

2.4.1 Specification Reference

FCC 47 CFR Part 95, Clause RTCM 11010.3 A.16.2
FCC 47 CFR Part 2, Clause 2.1047
ISED RSS-287, Clause 7.4.1

2.4.2 Equipment Under Test and Modification State

PLB-450, S/N: TA000009 - Modification State 2

2.4.3 Date of Test

20-January-2022

2.4.4 Test Method

This test was performed in accordance with RTCM 11010.2, clause A.16.2 and RSS-287 clause 6.4.

Note that AIS transmission was disabled for test. If enabled would have also interrupted the transmission.

2.4.5 Environmental Conditions

Ambient Temperature	22.9 °C
Relative Humidity	32.4 %



2.4.6 Test Results

Battery Powered - 121 only

Requirement	Result			Unit
	-20 °C	Ambient	+55 °C	
The carrier is not interrupted (except for two seconds encompassing the transmission of the 406 MHz pulse plus the additional time required for the Morse "P" transmission).	True	True	True	-
Lower Audio Frequency	405	405	405	Hz
Upper Audio Frequency	1197	1197	1197	Hz
Range of Audio Frequency	792	792	792	Hz
Sweep Repetition Rate	3	3	3	Hz
Modulation Duty Cycle (near start)	36	36	36	%
Modulation Duty Cycle (near midpoint)	36	36	36	%
Modulation Duty Cycle (near end)	36	36	36	%
Modulation Factor	0.98	0.98	0.98	%
Morse Code P - Dot Length	115	115	115	ms
Morse Code P - Dash Length	345	345	345	ms
Morse Code P - Gap Length	115	115	115	ms
Morse Code P - Modulating Frequency	1000	1000	1000	Hz

Table 9 - Modulation Characteristics



RTCM 11010.2, Limit Clause A.16.2 and ISSED RSS-287, Limit Clause 7.4.1

Requirement	Limit
The carrier is not interrupted (except for two seconds encompassing the transmission of the 406 MHz pulse plus the additional time required for the Morse "P" transmission).	True
Lower Audio Frequency	> 300 Hz
Upper Audio Frequency	< 1600 Hz
Audio Frequency Range	> 700 Hz
Sweep Repetition Rate	Between 2 Hz and 4 Hz
Modulation Duty Cycle	Between 33% and 55%
Modulation Factor	Between 85% and 100%
Morse Letter P: Dot Length Dash Length Gap Length Modulating Frequency	115 ms $\pm$ 5% 345 ms $\pm$ 5% 115 ms $\pm$ 5% 1000 Hz $\pm$ 50 Hz

Table 10 - Modulation Characteristic Limits

2.4.7 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	29-Jan-2022
Calibration Unit	Rohde & Schwarz	ZV-Z54	4368	12	31-Jan-2022
Frequency Standard	Spectracom	SecureSync 1200-0408-0601	4393	6	30-Jun-2022
1 metre K-Type Cable	Florida Labs	KMS-180SP-39.4-KMS	4519	12	18-Nov-2022
PXA Signal Analyser	Keysight Technologies	N9030A	4654	12	24-Nov-2022
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB-40	5475	12	06-Apr-2022
Attenuator 5W 30dB DC-18GHz	Aaren	AT40A-4041-D18-30	5503	12	14-Apr-2022

Table 11



2.5 Spectrum Characteristics

2.5.1 Specification Reference

FCC 47 CFR Part 95, Clause RTCM 11010.3 A.16.2(e)
ISED RSS-287, Clause 7.4.5

2.5.2 Equipment Under Test and Modification State

PLB-450, S/N: TA000009 - Modification State 2

2.5.3 Date of Test

21-January-2022

2.5.4 Test Method

This test was performed in accordance with RSS-287, clause 6.5.

2.5.5 Environmental Conditions

Ambient Temperature	20.7 - 25.5 °C
Relative Humidity	28.9 - 33.5 %



2.5.6 Test Results

Battery Powered - 121 only

Parameter	Result
Total (Wideband) Power (dBm)	13.28
Power within the resolution bandwidth (dBm)	9.30
Difference (dB)	3.98

Table 12 - Spectrum Characteristics

RTCM 1010.2, Limit Clause A.16.2(e)

Measurements must be made to show that at least 30% of the total power emitted during any transmission cycle with or without modulation shall be contained within ± 30 Hz of the carrier frequency. Additionally, if the emission is interrupted by the transmission of the 406 MHz burst, the carrier frequency must not shift more than ± 30 Hz.

Industry Canada RSS-287 Limit Clause 7.4.5

The total power in the resolution bandwidth shall not drop by more than 5 dB below the transmitter mean output power that is measured by a wideband meter, indicating that at least 30% of the power resides within the band $f_c \pm 30$ Hz (at 121.5 MHz) and within the band $f_c \pm 60$ Hz (at 243 MHz).

2.5.7 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
Rubidium Standard	Rohde & Schwarz	XSRM	1316	-	03-Dec-2021
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	29-Jan-2022
Calibration Unit	Rohde & Schwarz	ZV-Z54	4368	12	31-Jan-2022
Frequency Standard	Spectracom	SecureSync 1200-0408-0601	4393	6	30-Jun-2022
1 metre K-Type Cable	Florida Labs	KMS-180SP-39.4-KMS	4519	12	18-Nov-2022
PXA Signal Analyser	Keysight Technologies	N9030A	4654	12	24-Nov-2022
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB-40	5475	12	06-Apr-2022
Attenuator 5W 30dB DC-18GHz	Aaren	AT40A-4041-D18-30	5503	12	14-Apr-2022
Attenuator 5W 30dB DC-18GHz	Aaren	AT40A-4041-D18-30	5504	12	14-Apr-2022

Table 13



2.6 Peak Equivalent Isotropic Radiated Power

2.6.1 Specification Reference

FCC 47 CFR Part 95, Clause RTCM 11010.3 A.16.3
FCC 47 CFR Part 2, Clause 2.1046
ISED RSS-287, Clause 7.4.3
ISED RSS-GEN Clause, 6.12.

2.6.2 Equipment Under Test and Modification State

PLB-450, S/N: TA000011 - Modification State 2

2.6.3 Date of Test

20-November-2021

2.6.4 Test Method

This test was performed in accordance with RTCM 11010.2 clause A.16.3 and A.16.4 and RSS-287 clause 6.2.

2.6.5 Environmental Conditions

Ambient Temperature	14.9 °C
Relative Humidity	74.3 %



2.6.6 Test Results

Battery Powered - 121 only

Azimuth (°)	PEIRP (mW) at maximum Elevation (7°)
30	25.37
30	25.13
60	24.96
90	24.85
120	26.02
150	24.62
180	25.25
210	25.37
240	25.25
270	24.85
300	24.85
330	25.08
Median PEIRP	25.11
Maximum to Minimum Ratio (dB)	0.20

Table 14 - On Ground Plane, Peak EIRP

Azimuth (°)	PEIRP (mW) at maximum Elevation (7°)
Minimum PEIRP	8.07
0	9.8
90	9.33
180	8.07
270	9.44

Table 15 - Above Ground Plane, Peak EIRP

RTCM 11010.2 Limit Clause A.16.3 and A.16.4

On Ground Plane: The median PEIRP shall be between 25 and 100 mW. The ratio of maximum to minimum of the 11 highest values of PEIRP shall not exceed 4 to 1 (6 dB).

Above Ground Plane: The minimum value of PEIRP measured at each of the 4 azimuth angle increments shall be at least 2 mW.

ISED RSS-287, Limit Clause 7.4.3

≥ 25 mW



2.6.7 Test Location and Test Equipment Used

This test was carried out in EMC Open Area Test Site.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Expires
Antenna, (Tuned Dipole Set)	Roberts Antenna	A-100	569	12	05-Aug-2022
Spectrum Analyser	Rohde & Schwarz	FSU26	2747	12	05-Mar-2022
Hygrometer	Rotronic	HP21	3718	12	14-Apr-2022
LCD Inclinometer	R.S Components	e level module	4180	12	17-May-2022
Tilt Antenna Mast	Maturo Gmbh	TAM 4.0-P	4811	-	TU
Non-conductive Standoff Box	TUV SUD	-	4966	-	TU
30m LMR-400-DB COAXIAL CABLE	IntelliConnect Limited	C-NPNP-LMR300DB-30M	5587	12	31-Aug-2022

Table 16

TU – Traceability Unscheduled



2.7 Spurious Emissions at Antenna Terminals

2.7.1 Specification Reference

FCC 47 CFR Part 95, Clause RTCM 11010.3 4.2.4
FCC 47 CFR Part 2, Clause 2.1051
ISED RSS-287, Clause 7.4.4
ISED RSS-GEN, Clause, 6.13

2.7.2 Equipment Under Test and Modification State

PLB-450, S/N: TA000009 - Modification State 2

2.7.3 Date of Test

24-February-2022

2.7.4 Test Method

This test was performed in accordance with ANSI C63.26, clause 5.7.

2.7.5 Environmental Conditions

Ambient Temperature	21.7 °C
Relative Humidity	38.8 %

2.7.6 Test Results

Battery Powered - 121 only

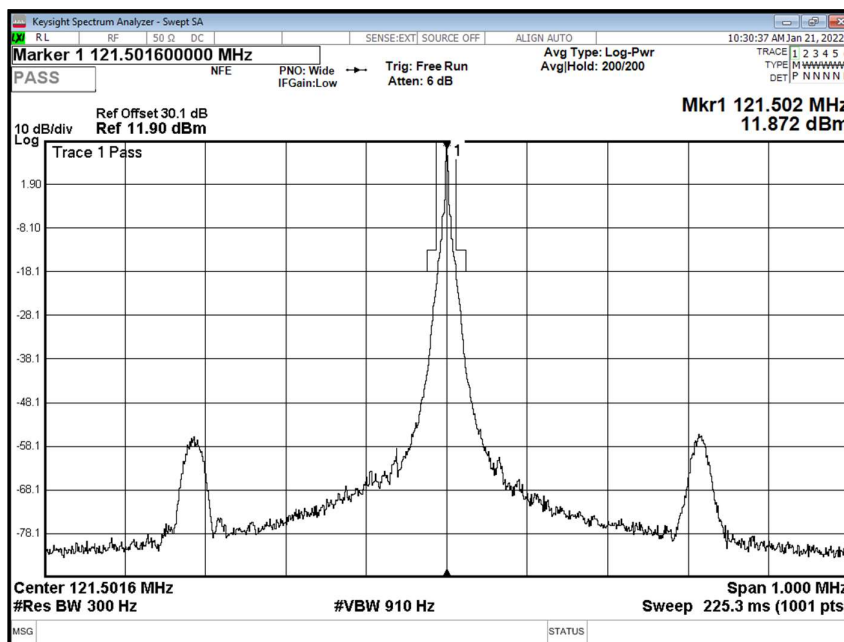


Figure 8 - Transmitter Mask (RSS-287 clause 7.4.4)

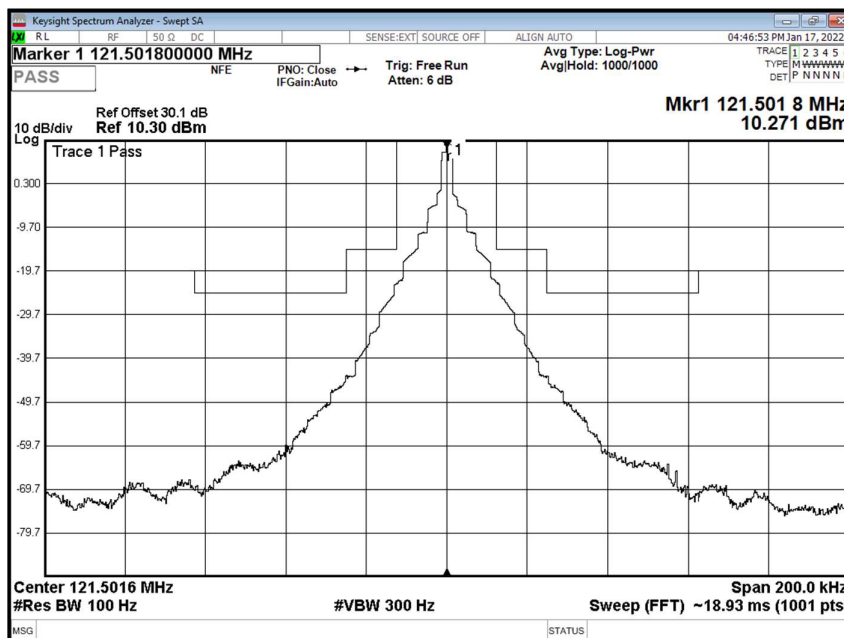


Figure 9 - Transmitter Mask (RTCM 1010.2 clause 4.2.3)

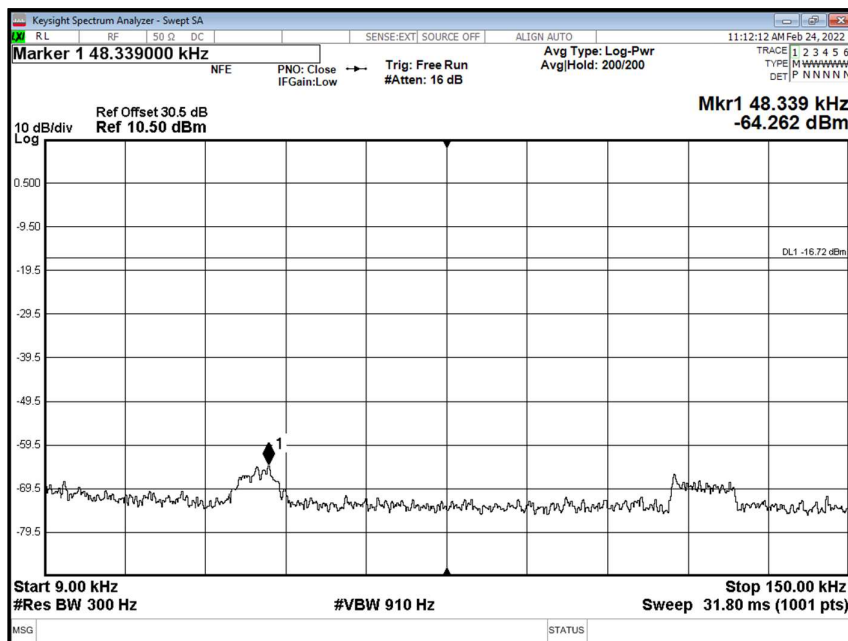


Figure 10 - 9 kHz to 150 kHz

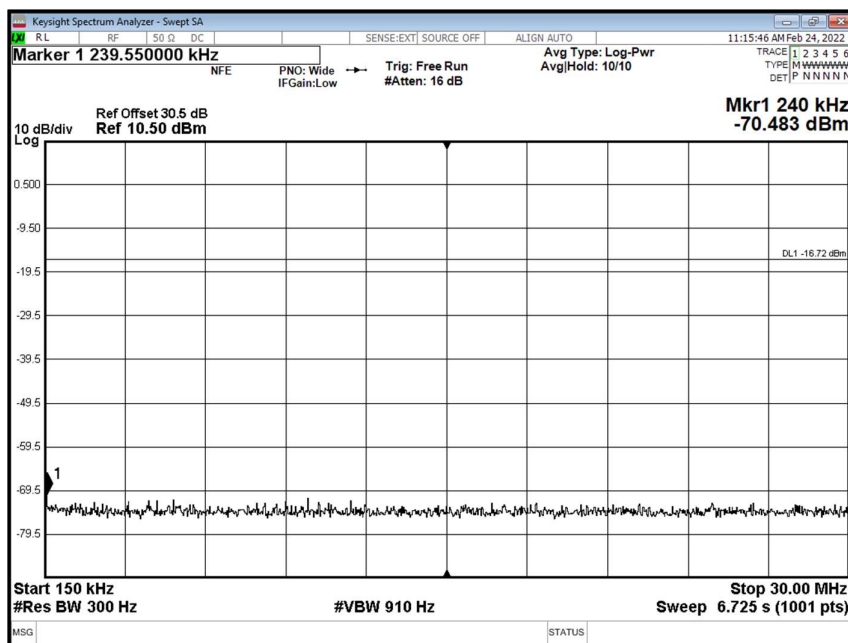


Figure 11 - 150 kHz to 30 MHz

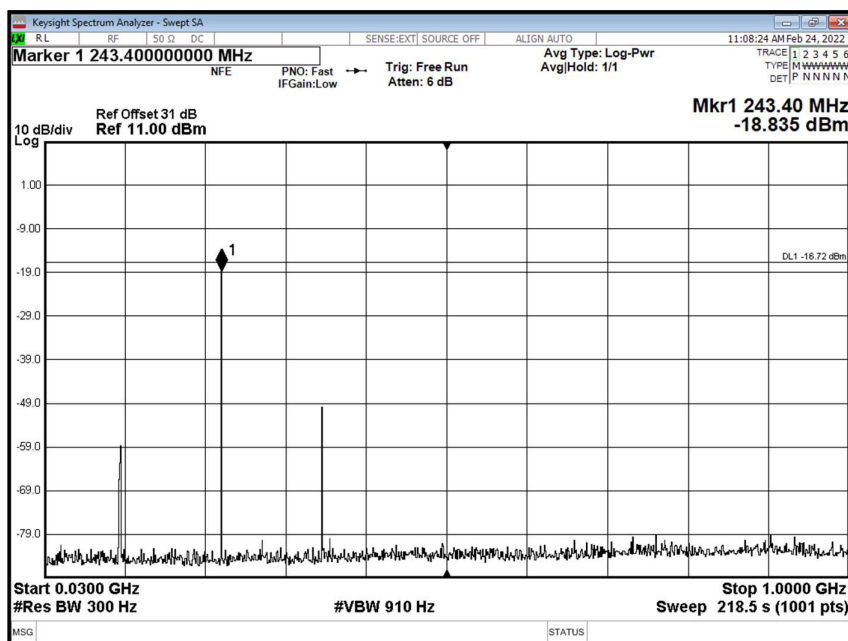


Figure 12 - 30 MHz to 1 GHz

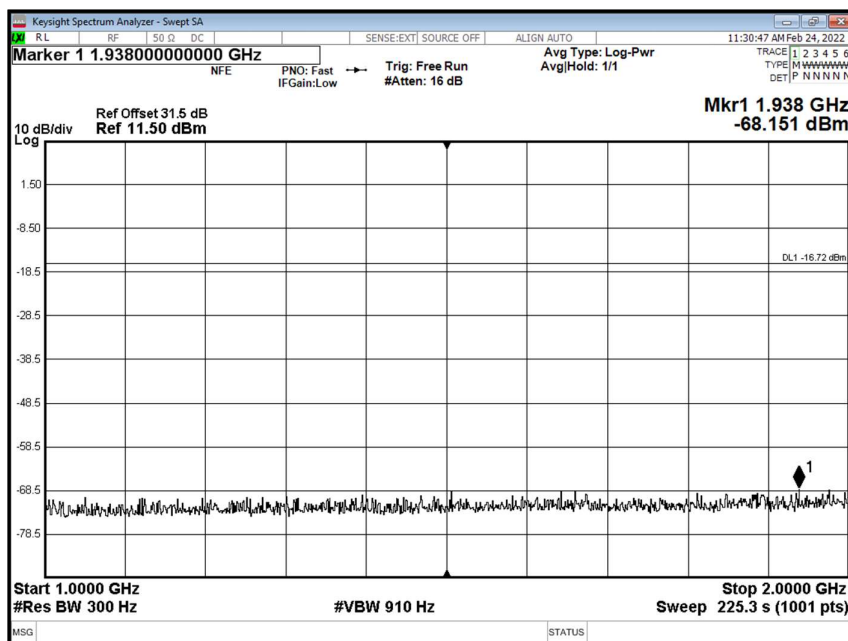


Figure 13 - 1 GHz to 2 GHz



ISED RSS-287, Limit Clause 7.4.4

The average power of unwanted emissions in a 300 Hz resolution bandwidth shall be attenuated below the level of the average transmitter power P (dBW) by:

- (a) at least 25 dB on any frequency removed from the centre of the authorized bandwidth by more than 50%, up to and including 100% of the authorized bandwidth; and
- (b) at least 30 dB on any frequency removed from the centre of the authorized bandwidth by more than 100%

where the authorized bandwidth is set at 25 kHz with the transmit frequency at the centre of the bandwidth.

2.7.7 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
Tunable Notch Filter	Wainwright	WRCD 100.0/130.0-0.05/50-5EEK	3426	-	TU
Frequency Standard	Spectracom	SecureSync 1200-0408-0601	4393	6	30-Jun-2022
1 metre K-Type Cable	Florida Labs	KMS-180SP-39.4-KMS	4519	12	18-Nov-2022
1 metre K-Type Cable	Florida Labs	KMS-180SP-39.4-KMS	4520	12	18-Nov-2022
PXA Signal Analyser	Keysight Technologies	N9030A	4654	12	24-Nov-2022
Network Analyser	Keysight Technologies	E5063A	5018	12	30-Jul-2022
Electronic Calibration Module	Keysight Technologies	85093C	5188	12	22-Jul-2022
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB-40	5475	12	06-Apr-2022
Attenuator 5W 30dB DC-18GHz	Aaren	AT40A-4041-D18-30	5503	12	14-Apr-2022

Table 17

TU - Traceability Unscheduled

3 Photographs

3.1 Test Setup Photographs

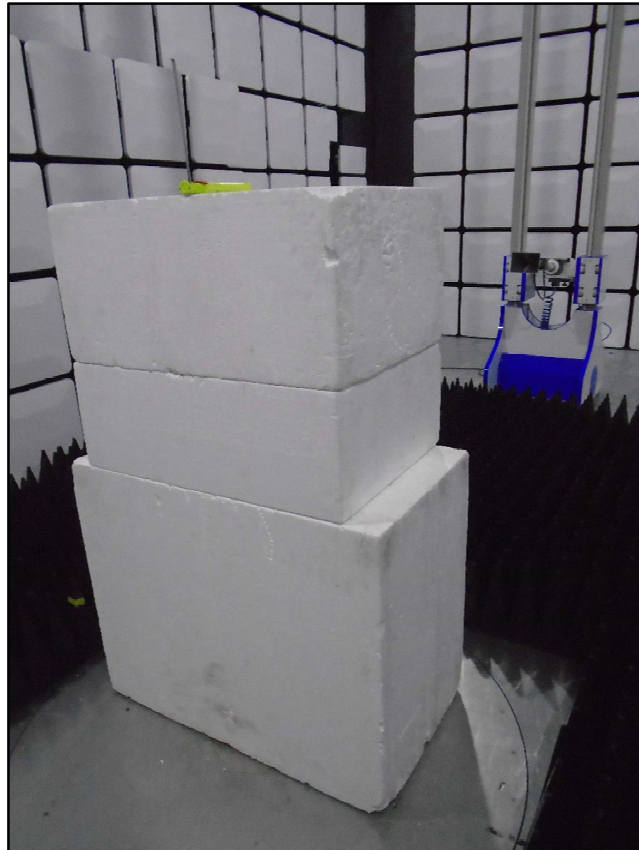


Figure 14 – Test Setup - 1 GHz to 2 GHz, Orientation X

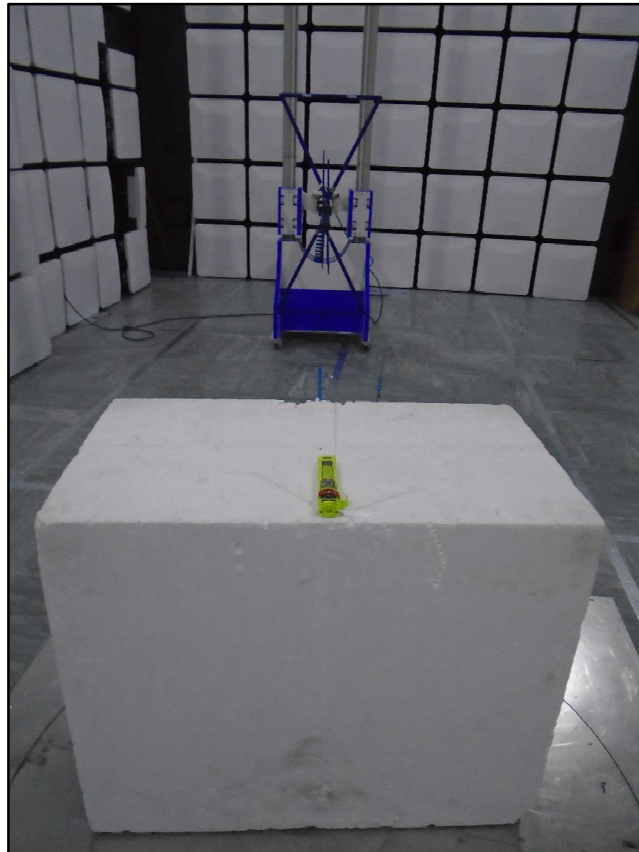


Figure 15 – Test Setup - 30 MHz to 1 GHz, Orientation X