Test report issued under the responsibility of:
EMITECH MONTPELLIER laboratory
MRA US-EU Designation Number: FR0006
Canadian CAB Identifier: FR0003

RADIO TEST REPORT

EUROCAE ED-62 Revision B, December 2018
+ Change 1, June 2020
(§3.8.5 & §5.5.6)
(Partial tests)
Qualification Test Plan DRD23114, index A V0, April 11, 2023

Company ..... :	**SAFRAN ELECTRONICS & DEFENSE BEACONS**
Address..... :	ZI DES CINQ CHEMINS 56520 GUIDEL FRANCE
Test item description. ..... :	**Emergency Locator Transmitter Survival (ELT-S)**
Trade Mark. ..... :	SAFRAN
Manufacturer..... :	SAFRAN ELECTRONICS & DEFENSE BEACONS
Model/Type reference..... :	KANNAD ULTIMA-S-04
Ratings..... :	10-12 Vdc
Testing Laboratory ..... :	**EMITECH MONTPELLIER laboratory**
Address..... :	145 rue de Massacan 34740 VENDARGUES FRANCE
Report Reference No..... :	**RR-EVE-23C799-2A**
Test procedure. ..... :	Qualification Test Plan DRD23114 §5
Diffusion..... :	M. DAVENEL
Applicant's name. ..... :	SAFRAN ELECTRONICS & DEFENSE BEACONS
Date of issue..... :	June 22, 2023
Total number of pages..... :	23
Revision..... :	0
Compiled by..... :	Célien FOUGEROLLE
Approved by (+ signature). ..... :	David MONTAULON (Technical Manager)

Duplication of this test report is only permitted for an integral photographic facsimile. It includes the number of pages referenced here above. This document is the result of testing a specimen or a sample of the product submitted. It does not imply an assessment of the conformity of the whole manufactured products of the tested sample.

REPORT INDEX:

REVISION HISTORY:

Revision	Date	Modified pages	Modifications
0	June 22, 2023	/	Creation

1. GENERAL INFORMATIONS

This document submits the results of Radio tests performed on the equipment **Emergency Locator Transmitter Survival (ELT-S) KANNAD ULTIMA-S-04** (denominated hereafter E.U.T.: equipment under test) according to document(s) listed in §2 of this test report.

TESTING PROCEDURE AND TESTING LOCATION:

Testing Location ..... :	Open Area Test Site of EMITECH MONTPELLIER laboratory
Address. ..... :	Route de Quissac 30250 SALINELLES FRANCE
Test procedure. ..... :	Qualification Test Plan DRD23114 §5
Tested by ..... :	Célien FOUGEROLLE & Olivier AELBRECHT
Test supervisor ..... :	David MONTAULON
Date of receipt of test item ..... :	From May 12, 2023
Date (s) of performance of tests ..... :	May 16 and 30, 2023

APPLICANT'S GENERAL INFORMATIONS:

Company name ..... :	SAFRAN ELECTRONICS & DEFENSE BEACONS
Company address. ..... :	ZI DES CINQ CHEMINS 56520 GUIDEL FRANCE
Person(s) present during the tests. ..... :	M. GARCIA-MELGARES, M. LEDUC (May 16, 2023)
Responsible. ..... :	M. DAVENEL

GENERAL REMARKS:

The information in italics is declared by the manufacturer and is under his responsibility
The test results presented in this report relate only to the object tested.
The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report.

"(see Enclosure #)" refers to additional information appended to the report.
"(see appended table)" refers to a table appended to the report.
Throughout this report the decimal separator is point.

POSSIBLE TEST CASE VERDICTS:

Test case does not apply to the test object.:	N/A
Test case not performed..... :	N/P
Test object does meet the requirement..... :	P (Pass)
Test object does not meet the requirement. ..... :	F (Fail)

DEFINITIONS AND ABBREVIATIONS:

E.U.T.	Equipment Under Test	AE	Ancillary Equipment	Pk	Peak detector
RBW	Resolution BandWidth	VBW	Video BandWidth	QP	Quasi-peak detector
FSOATS	Free Space Open Area Test Site	FAR	Full Anechoic Room	Av	Average detector
VP	Vertical Polarization	HP	Horizontal Polarization	RMS	Root Mean Square
RF	Radio Frequency	N.T.R	Nothing To Report	N/C	Not Communicated
SAC	Semi Anechoic Chamber				

2. REFERENCE DOCUMENT(S)

NORMATIVE REFERENCES:

The following referenced documents are necessary for the application of the present test report.

EUROCAE ED-62 Revision B, December 2018
+ Change 1, June 2020
MINIMUM OPERATIONAL PERFORMANCE STANDARD FOR AIRCRAFT EMERGENCY LOCATOR TRANSMITTERS 406 MHZ

Qualification Test Plan DRD23114, index A V0, April 11, 2023
RAVEN / TAUCETI FCC & ISED Qualification Test Plan

INFORMATIVE REFERENCES:

The following referenced documents are not necessary for the application of the present test report but they assist the user with regard to a particular subject area.

FCC CFR 47 Part 2, Arpil 11, 2023
Code of Federal Regulations - Frequency Allocations and Radio Treaty Matters; General Rules and Regulations

FCC CFR 47 Part 87, Arpil 11, 2023
Code of Federal Regulations – Aviation Services

ISED RSS-Gen, Issue 5, April 2018
Innovation, Science and Economic Development Canada - General Requirements for Compliance of Radio Apparatus

ISED RSS-287, Issue 2, March 2014
Innovation, Science and Economic Development Canada - Emergency Position Indicating Radio Beacons (EPIRB), Emergency Locator Transmitters (ELT), Personal Locator Beacons (PLB), and Maritime Survivor Locator Devices (MSLD)

3. EQUIPMENT TECHNICAL DESCRIPTION

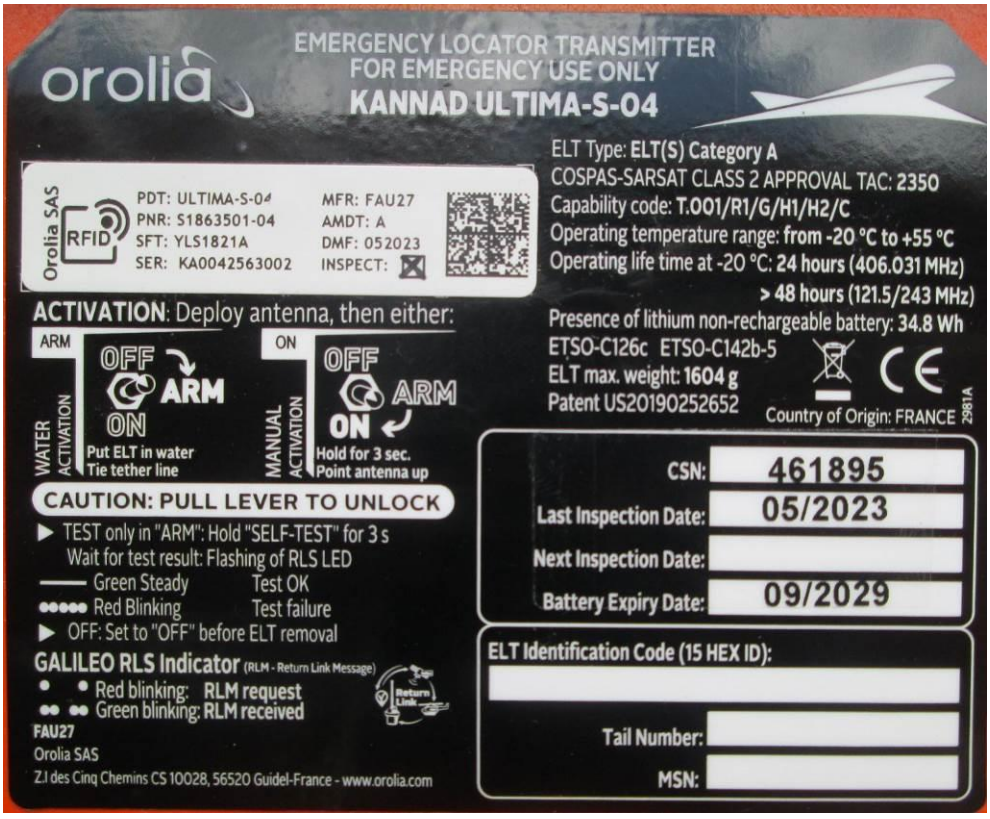
3.1. Test Conditions

Test item description. ..... :	*Emergency Locator Transmitter Survival (ELT-S)*
Model/Type reference..... :	*KANNAD ULTIMA-S-04*
Trade Mark. ..... :	SAFRAN
Serial number (S/N). ..... :	*KA0042563002*
Part number (P/N). ..... :	*S1863501-04 (ULTIMA-S-04)*
Software version. ..... :	*YLS1821A*
Firmware version. ..... :	*N/C*
Type of sample. ..... :	*Series Standard equipment*
Function(s)..... :	*The ULTIMA-S is an Emergency Locator Transmitters: an ELT(S), designed to be removed after crash from a fixed wing commercial aircraft.*
Manufacturer name. ..... :	SAFRAN ELECTRONICS & DEFENSE BEACONS
Address. ..... :	ZI DES CINQ CHEMINS 56520 GUIDEL FRANCE

General product information:

KANNAD ULTIMA-S Category A belongs to the ELT(S) type of ELTs which are intended to be removed from the aircraft after a crash and activated manually by survivors or water activated. This type of ELT is intended to aid SAR teams in locating survivor(s). The ELT(S) should be mounted either in the cabin compartment or in the galley of an aircraft. It should be easily accessible to the crew.

3.2. E.U.T. Main label



3.3. E.U.T. General view

3.3. E.U.T. General view

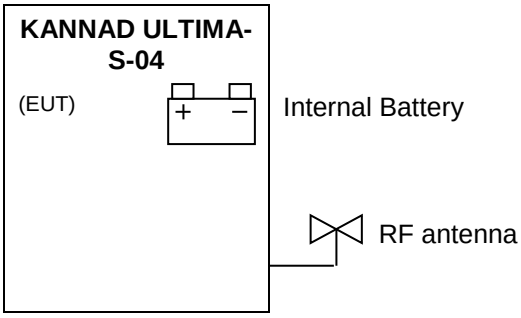
3.4. E.U.T. Mechanical and Electrical Design

Power supply.	:	*12 Vdc (internal batteries)*
Power supply range.	:	*10-12 Vdc battery*
Power type.	:	*Internal batteries (Lithium Primary Battery)*
Power (W).	:	*12-15*
Nominal current (A).	:	*0.2-1.5*
Dimensions (L x W x H) (m).	:	*0.64 x 0.2 x 0.1*
Weight (kg).	:	*1.85*
Temperature range (°C).	:	*-20 to +55*
Ground bounding strap.	:	*No*

Comments:

N/A

3.5. E.U.T. Input/Output ports



PORT	NAME	TYPE	LENGTH	CABLE TYPE	COMMENTS
0	Main frame	N/E	N/A	Plastic	-
1	Internal Battery	DC	N/A	N/A	
2	RF antenna	RF	N/A	N/A	Dedicated external antenna

AC/DC :	AC/DC Converter port	AC..... :	Alternative current port	DC..... :	Direct current port
I/O .....:	Input or Output port	TP ..... :	Telecommunication port	RF ..... :	Radio frequency port
N/E .....:	Non Electrical port				

3.6. Supporting Equipment Used During Test

Sample subject to the tests was tested with following equipment.

PRODUCT TYPE	MANUFACTURER	MODEL	N°EMITECH / COMMENTS
Metallic plate	N/A	N/A	Provided by the customer

3.7. EUT Radio Specifications

○ GENERAL INFORMATIONS	
According to manufacturer's declarations :	
EUT type	*Transmitter*
Technology	*N/C*
Environmental profile	*Data transmission*
Temperature range	*-20°C to +55°C*
Antenna type	*Dedicated external antenna*
Antenna Gain	*N/C*
Comments:	
N/A	

TRANSMITTER PARAMETERS (TX)	
Frequency bands	*121.50 MHz, 243 MHz and 406.00 MHz*
RF Power	*26 dBm max for f = 121.50 MHz & 243 MHz* *37.5 dBm for f = 406.00 MHz*
Number of channels / Separation	*N/A refer to Cospas Sarsat Standard T.001*
Modulation type	*N/A refer to Cospas Sarsat Standard T.001*
Duty cycle	*35-40 %*
Tested frequency	*121.65 MHz (121.5 MHz offset)* *243.3 MHz (243 MHz offset)*

RECEIVER PARAMETERS (RX)	
Frequency bands	*Not communicated*
Category/Class	*Not communicated*
Bandwidth	*Not communicated*

4. RESULT SUMMARY

TEST DESIGNATION	SEVERITY	VERDICT	BASIC STANDARDS / COMMENTS
Effective Isotropic Radiated Power (EIRP) ○ Maximum EIRP ○ Pattern deviation	See results tables	**PASS** PASS PASS	**ED-62B §3.8.5 and §5.5.6**

Sample subject to the test complies with the requirements of the reference document(s) listed in §2 of this test report and, where applicable, with deviation(s) specified in this document.

The uncertainty of the results was not explicitly taken into account to declare the compliance (or lack thereof) with the specification.

TEST(S) PERFORMED	MODIFICATION(S)
ED-62B §3.8.5 and §5.5.6	N/A

5. MEASUREMENT UNCERTAINTY

PARAMETER	MAXIMAL EMITECH UNCERTAINTY	MINIMAL STANDARD UNCERTAINTY
Radio frequency	± 1 x 10^{-7}	±1 x 10^{-7}
Radiated emission (EIRP)		
62.5 MHz - 1 GHz	± 5.8 dB	± 6 dB
1 GHz - 18 GHz	± 5.6 dB	± 6 dB
Temperature	± 1 °C	± 1°C
Humidity	± 5 %	± 5 %
Radiated emission (electric field)		
30MHz – 1GHz	± 5.0 dB	/
1GHz – 18GHz	± 5.3 dB	/
18GHz – 40GHz	± 6.1 dB	/
40GHz – 140GHz	± 5.7 dB	/

For the calculation of expanded uncertainty, the confidence interval is 95 % (k=2).

6. TEST CONDITIONS AND RESULTS

6.1. Effective isotropic radiated power (EIRP)

Reference standard:	EUROCAE ED-62 Revision B, December 2018 + Change 1, June 2020
Test method:	ED-62B §3.8.5 and §5.5.6

Test description: Measurements were performed in a reference test site that complies to CISPR 16-1-4 (OATS).

ELT in portable configuration is tested in the following configurations:

a) Placed in the center of a ground plane with radius of 125 cm ± 5 cm mounted at 0.75 m above ground level.

b) Placed in the center of a plane made of RF absorbing material with radius of 125 cm ± 5 cm just above the upper surface of the RF absorbing material

c) And for ELT designed to operate in water, placed such that he flotation line of the ELT is level with and in the center of a ground plane with radius of 125 cm ± 5 cm mounted at 0.75 m above ground level.

Measurement of the radiated signals for all configurations is made at a point 10 m from the ELT. At this point, an insulated antenna mast with a movable boom is arranged so that a search antenna is raised and lowered through an elevation of 1m to 4m.

The Power EIRP values are obtained with the following formula:

$$\text{PEIRP} = LOG^{-1}\frac{P_{REC} - G_{REC} + L_C + L_P}{10}$$

Where:

P_{REC} = Measured Power level from spectrum analyzer (dBm)

G_{REC} = Antenna gain of search antenna (dB)

L_C = Receive system attenuator and cable loss (dB)

L_P = Free space propagation loss (dB)

TEST CASE	PARAMETER	SEVERITY	RESULT TAB.	VERDICT
Maximum EIRP – Ground plane config	121.65 MHz 243.3 MHz	>17dBm <26dBm	EMI4591	**PASS**
Pattern deviation – Ground plane config	121.65 MHz	-6 dB	EMI4592	**PASS**
Pattern deviation – Ground plane config	243.3 MHz	-6 dB	EMI4593	**PASS**
Maximum EIRP – RF absorbing material config – EUT height = 0cm	121.65 MHz 243.3 MHz	>7dBm	EMI4594	**PASS**
Maximum EIRP – RF absorbing material config – EUT height = 20cm	121.65 MHz 243.3 MHz	>7dBm	EMI4595	**PASS**
Pattern deviation – RF absorbing material config – EUT height = 0cm	121.65 MHz	-6 dB	EMI4596	**PASS**
Pattern deviation – RF absorbing material config – EUT height = 0cm	243.3 MHz	-6 dB	EMI4597	**PASS**
Pattern deviation – RF absorbing material config – EUT height = 20cm	121.65 MHz	-6 dB	EMI4598	**PASS**
Pattern deviation – RF absorbing material config – EUT height = 20cm	243.3 MHz	-6 dB	EMI4599	**PASS**

TEST CASE	PARAMETER	SEVERITY	RESULT TAB.	VERDICT
Maximum EIRP – Flotation line config	121.65 MHz 243.3 MHz	>14dBm <26dBm	EMI4600	**PASS**
Pattern deviation – Flotation line config	121.65 MHz	-6 dB	EMI4601	**PASS**
Pattern deviation – Flotation line config	243.3 MHz	-6 dB	EMI4602	**PASS**

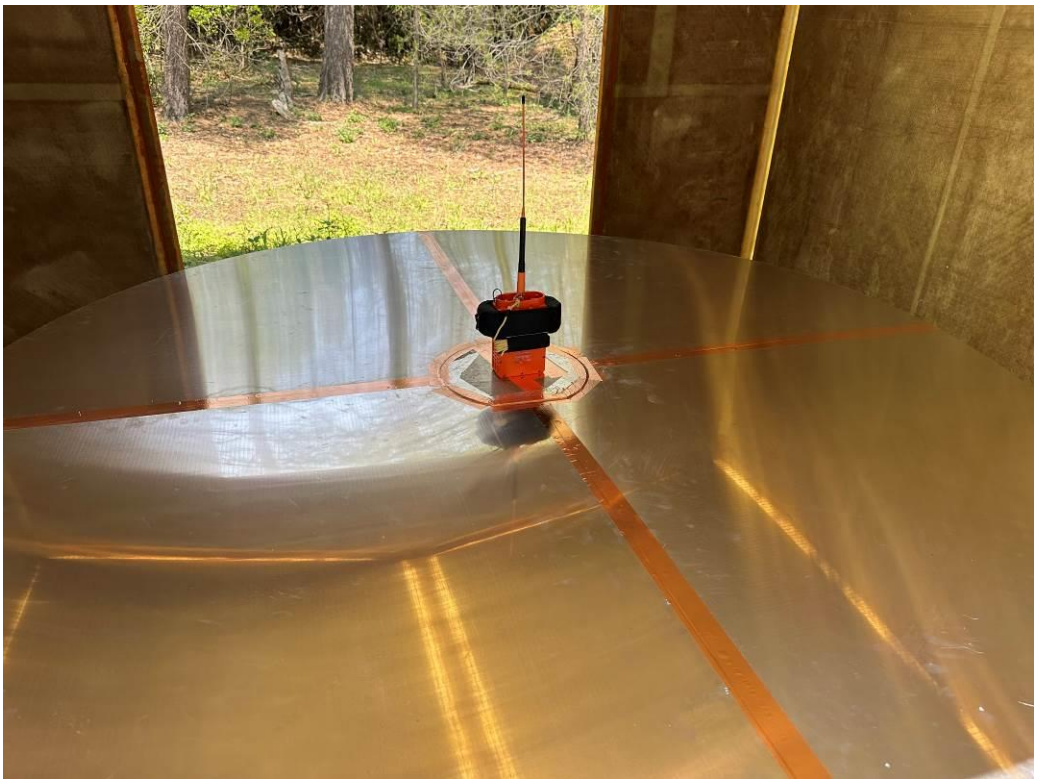
LABORATORY PARAMETERS:	REQUIRED PRIOR TO THE TEST	DURING THE TEST
Ambient Temperature	15 to 35 °C	24.5°C(1), 28 °C
Relative Humidity	20 to 75 %	33 %(1), 41 %
Atmospheric pressure	N/A	1010 hPa(1), 1014 hPa
Test method deviation: N/A		
Supplementary information: 406.00 MHz frequency is rejected by a notch filter.		

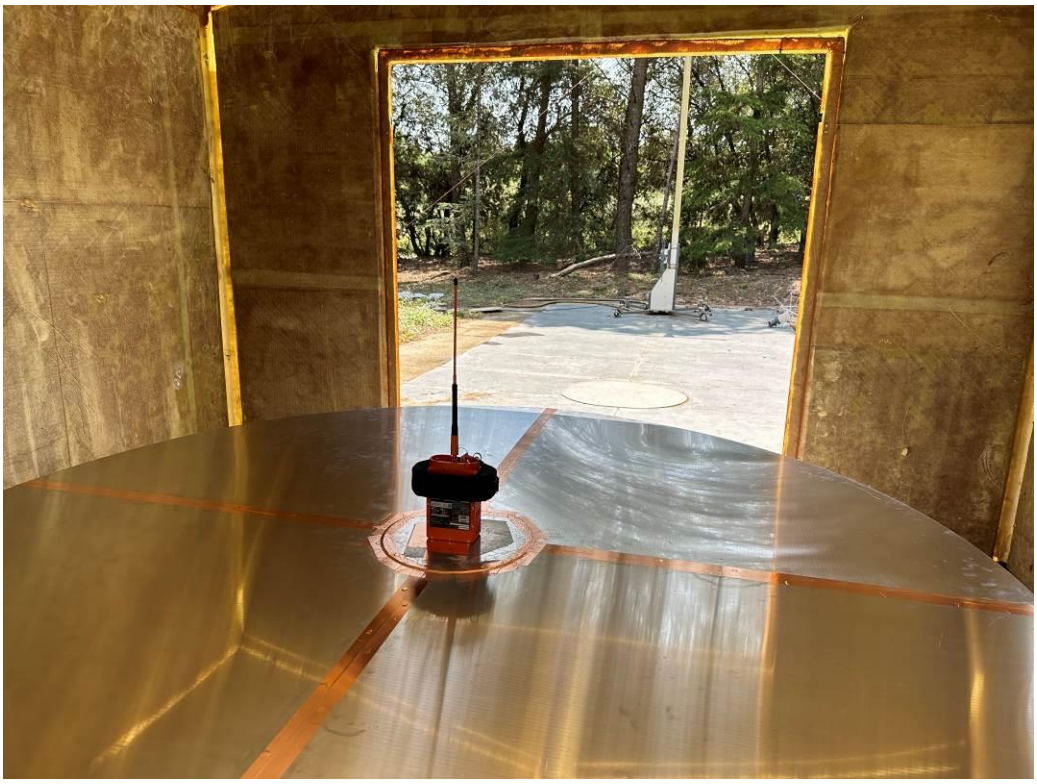
TEST EQUIPMENT USED					
CATEGORY	**BRAND**	**TYPE**	**IDENTIFIER**	**CAL. DATE**	**CAL. DUE**
Antenna	Electro Metrics	BIA-30HF	1107	21/08/2021	21/10/2024
Antenna	Rohde & Schwarz	HL223	1137	21/08/2021	21/10/2024
Antenna	Electro Metrics	BIA-30HF	0824(1)	21/08/2021	21/10/2024
Antenna	Rohde & Schwarz	HL223	3126(1)	21/08/2021	21/10/2024
Attenuator	Radiall	R412710124	17329	22/06/2020	22/08/2023
Attenuator	Radiall	R412710124	16489	05/08/2022	05/10/2025
Cable	Huber + Suhner	N-20m	8385	07/01/2022	07/03/2024
Cable	Techniwave	N-1m	18344	25/01/2022	25/03/2024
Notch Filter	Wainwright Instruments	WTRCDB5-375-475-2-12-50EEK	18004	02/12/2021	02/02/2024
Open Area Test Site	EMITECH	Salinelles	3482	21/08/2021	21/10/2024
Receiver	Rohde & Schwarz	FPL1007	17908	02/11/2022	02/01/2024

BAT-EMC software version: V3.18.0.26 Blank cells = Permanent validity

(1) May 16, 2023 only.

TEST SETUP PHOTO(S)- MEASURING ANTENNAS

TEST SETUP PHOTO(S) – GROUND PLANE CONFIG
EUT placed in the center of a ground plane with radius of 125 cm ± 5 cm (EUT height=0cm), initial position (0°) 

TEST SETUP PHOTO(S) – GROUND PLANE CONFIG
EUT placed in the center of a ground plane with radius of 125 cm ± 5 cm (EUT height=0cm), initial position (0°) in line of sight of receive antenna. 

EFFECTIVE ISOTROPIC RADIATED POWER – TEST PARAMETERS						
GROUND PLANE CONFIG						
EUT mode:	ON				**T (°C):**	28
Test Date:	30/05/2023				**H (%):**	41
Test Operator:	CFO + DMO				**P (hPa):**	1014
POSITION	**FREQUENCIES**	**RBW**	**VBW**	**Span**	**DETECTOR**	
Vertical	121.65MHz	100kHz	300kHz	500kHz	Peak	
Vertical	243.3MHz	100kHz	300kHz	500kHz	Peak	
Configuration:	EUT is set at 0cm above the ground plane					
Comments:	N/A					
EUT modification(s): N/A						

- **MAXIMUM EFFECTIVE ISOTROPIC RADIATED POWER**

EFFECTIVE ISOTROPIC RADIATED POWER – TABULATED RESULTS					
GROUND PLANE CONFIG				EMI4591	
Frequency (MHz)	**Azimuth (°)**	**Polarization (antenna height)**	**Level (dBm)**	**Limit down (dBm)**	**Limit up (dBm)**
121.65 MHz	$Azim_{max}$=330°	Vertical ($elev_{max}$=110cm)	**22.69**	17.00	26.00
243.3 MHz	$Azim_{max}$=0°	Vertical ($elev_{max}$=100cm)	**25.96**	17.00	26.00

- **PATTERN DEVIATION OF EFFECTIVE ISOTROPIC RADIATED POWER**

The pattern deviation shall not be greater than 6 dB from the reference signal at any selected point.
The **reference signal** is the maximum level of Effective Isotropic Radiated Power.

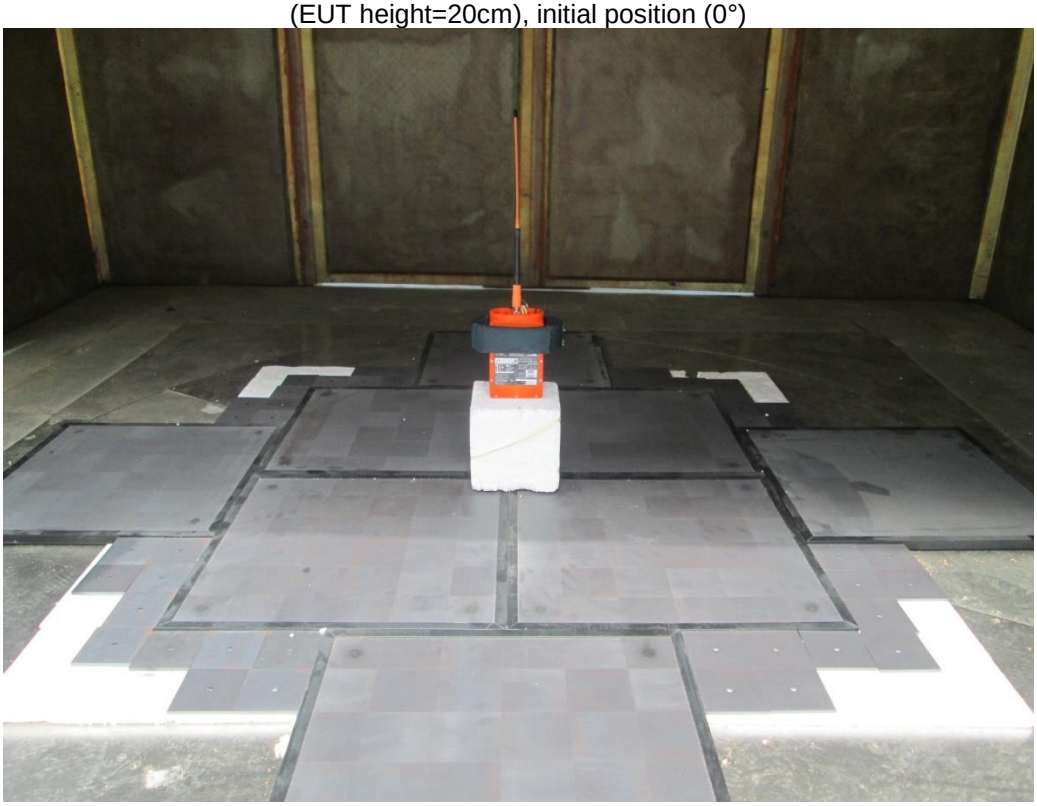
EFFECTIVE ISOTROPIC RADIATED POWER - PATTERN DEVIATION – TABULATED RESULTS					
GROUND PLANE CONFIG				EMI4592	
Frequency (MHz)	**Azimuth (°)**	**Polarization (antenna height)**	**Level (dBm)**	**Pattern deviation (dB)**	**Pattern deviation Limit (dB)**
121.65 MHz	0	Vertical (110cm)	22.6	-0.09	-6.00
121.65 MHz	30	Vertical (110cm)	22.52	-0.17	-6.00
121.65 MHz	60	Vertical (110cm)	22.48	-0.21	-6.00
121.65 MHz	90	Vertical (110cm)	22.46	-0.23	-6.00
121.65 MHz	120	Vertical (110cm)	22.4	-0.29	-6.00
121.65 MHz	150	Vertical (110cm)	22.37	-0.32	-6.00
121.65 MHz	180	Vertical (110cm)	22.39	-0.3	-6.00
121.65 MHz	210	Vertical (110cm)	22.42	-0.27	-6.00
121.65 MHz	240	Vertical (110cm)	22.52	-0.17	-6.00
121.65 MHz	270	Vertical (110cm)	22.62	-0.07	-6.00
121.65 MHz	300	Vertical (110cm)	22.66	-0.03	-6.00
121.65 MHz	330	Vertical (110cm)	**22.69**	0	-6.00

Note: Values given in grey are done for information.

EFFECTIVE ISOTROPIC RADIATED POWER - PATTERN DEVIATION – TABULATED RESULTS					
GROUND PLANE CONFIG				EMI4593	
Frequency (MHz)	**Azimuth (°)**	**Polarization (antenna height)**	**Level (dBm)**	**Pattern deviation (dB)**	**Pattern deviation Limit (dB)**
243.3 MHz	0	Vertical (100cm)	**25.96**	0	-6.00
243.3 MHz	30	Vertical (100cm)	25.74	-0.22	-6.00
243.3 MHz	60	Vertical (100cm)	25.51	-0.45	-6.00
243.3 MHz	90	Vertical (100cm)	25.23	-0.73	-6.00
243.3 MHz	120	Vertical (100cm)	24.93	-1.03	-6.00
243.3 MHz	150	Vertical (100cm)	24.79	-1.17	-6.00
243.3 MHz	180	Vertical (100cm)	24.84	-1.12	-6.00
243.3 MHz	210	Vertical (100cm)	24.75	-1.21	-6.00
243.3 MHz	240	Vertical (100cm)	25.05	-0.91	-6.00
243.3 MHz	270	Vertical (100cm)	25.25	-0.71	-6.00
243.3 MHz	300	Vertical (100cm)	25.57	-0.39	-6.00
243.3 MHz	330	Vertical (100cm)	25.78	-0.18	-6.00

Note: Values given in grey are done for information.

TEST SETUP PHOTO(S) – RF ABSORBING MATERIAL CONFIG
EUT placed in the center of a RF absorbing material (EUT height=0cm), initial position (0°) 

TEST SETUP PHOTO(S) – RF ABSORBING MATERIAL CONFIG
EUT placed in the center of a RF absorbing material (EUT height=20cm), initial position (0°) 

EFFECTIVE ISOTROPIC RADIATED POWER – TEST PARAMETERS						
RF ABSORBING MATERIAL CONFIG						
EUT mode:	ON				**T (°C):**	24.5
Test Date:	16/05/2023				**H (%):**	33
Test Operator:	OAT + DMO				**P (hPa):**	1010
POSITION	**FREQUENCIES**	**RBW**	**VBW**	**Span**	**DETECTOR**	
Vertical	121.65MHz	100kHz	300kHz	500kHz	Peak	
Vertical	243.3MHz	100kHz	300kHz	500kHz	Peak	
Configuration:	An additional measurement with a support of EUT at 20 cm height has been done.					
Comments:	N/A					
EUT modification(s): N/A						

- **MAXIMUM EFFECTIVE ISOTROPIC RADIATED POWER**

EFFECTIVE ISOTROPIC RADIATED POWER – TABULATED RESULTS					
RF ABSORBING MATERIAL CONFIG – EUT HEIGHT = 0CM				EMI4594	
Frequency (MHz)	**Azimuth (°)**	**Polarization (antenna height)**	**Level (dBm)**	**Limit down (dBm)**	**Limit up (dBm)**
121.65 MHz	$Azim_{max}$=90°	Vertical ($elev_{max}$=110cm)	**17.47**	>7.00	26.00
243.3 MHz	$Azim_{max}$=60°	Vertical ($elev_{max}$=110cm)	**20.27**	>7.00	26.00

EFFECTIVE ISOTROPIC RADIATED POWER – TABULATED RESULTS					
RF ABSORBING MATERIAL CONFIG – EUT HEIGHT = 20CM				EMI4595	
Frequency (MHz)	**Azimuth (°)**	**Polarization (antenna height)**	**Level (dBm)**	**Limit down (dBm)**	**Limit up (dBm)**
121.65 MHz	$Azim_{max}$=270°	Vertical ($elev_{max}$=110cm)	**18.59**	>7.00	26.00
243.3 MHz	$Azim_{max}$=210°	Vertical ($elev_{max}$=110cm)	**23.77**	>7.00	26.00

- **PATTERN DEVIATION OF EFFECTIVE ISOTROPIC RADIATED POWER**

The pattern deviation shall not be greater than 6 dB from the reference signal at any selected point.
The **reference signal** is the maximum level of Effective Isotropic Radiated Power.

EFFECTIVE ISOTROPIC RADIATED POWER - PATTERN DEVIATION – TABULATED RESULTS					
RF ABSORBING MATERIAL CONFIG – EUT HEIGHT = 0CM				EMI4596	
Frequency (MHz)	**Azimuth (°)**	**Polarization (antenna height)**	**Level (dBm)**	**Pattern deviation (dB)**	**Pattern deviation Limit (dB)**
121.65 MHz	0	Vertical (110cm)	17.33	-0.14	-6.00
121.65 MHz	30	Vertical (110cm)	17.1	-0.37	-6.00
121.65 MHz	60	Vertical (110cm)	17.07	-0.4	-6.00
121.65 MHz	90	Vertical (110cm)	**17.47**	0	-6.00
121.65 MHz	120	Vertical (110cm)	17.21	-0.26	-6.00
121.65 MHz	150	Vertical (110cm)	17.35	-0.12	-6.00
121.65 MHz	180	Vertical (110cm)	17.44	-0.03	-6.00
121.65 MHz	210	Vertical (110cm)	17.04	-0.43	-6.00
121.65 MHz	240	Vertical (110cm)	16.86	-0.61	-6.00
121.65 MHz	270	Vertical (110cm)	17.15	-0.32	-6.00
121.65 MHz	300	Vertical (110cm)	16.61	-0.86	-6.00
121.65 MHz	330	Vertical (110cm)	16.65	-0.82	-6.00

Note: Values given in grey are done for information.

EFFECTIVE ISOTROPIC RADIATED POWER - PATTERN DEVIATION – TABULATED RESULTS					
RF ABSORBING MATERIAL CONFIG – EUT HEIGHT = 0CM				EMI4597	
Frequency (MHz)	**Azimuth (°)**	**Polarization (antenna height)**	**Level (dBm)**	**Pattern deviation (dB)**	**Pattern deviation Limit (dB)**
243.3 MHz	0	Vertical (110cm)	19.55	-0.72	-6.00
243.3 MHz	30	Vertical (110cm)	19.89	-0.38	-6.00
243.3 MHz	60	Vertical (110cm)	**20.27**	0	-6.00
243.3 MHz	90	Vertical (110cm)	19.86	-0.41	-6.00
243.3 MHz	120	Vertical (110cm)	20.12	-0.15	-6.00
243.3 MHz	150	Vertical (110cm)	19.97	-0.3	-6.00
243.3 MHz	180	Vertical (110cm)	20.08	-0.19	-6.00
243.3 MHz	210	Vertical (110cm)	20.07	-0.2	-6.00
243.3 MHz	240	Vertical (110cm)	19.94	-0.33	-6.00
243.3 MHz	270	Vertical (110cm)	19.82	-0.45	-6.00
243.3 MHz	300	Vertical (110cm)	19.69	-0.58	-6.00
243.3 MHz	330	Vertical (110cm)	19.74	-0.53	-6.00

Note: Values given in grey are done for information.

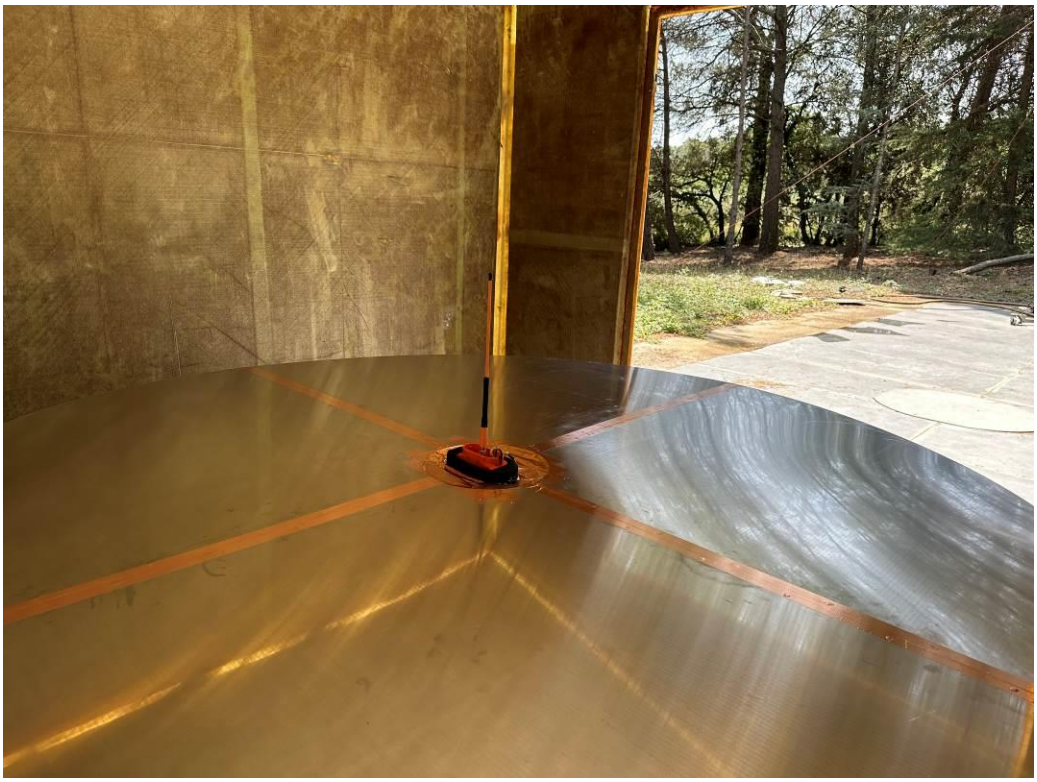
EFFECTIVE ISOTROPIC RADIATED POWER - PATTERN DEVIATION – TABULATED RESULTS					
RF ABSORBING MATERIAL CONFIG – EUT HEIGHT = 20CM				EMI4598	
Frequency (MHz)	**Azimuth (°)**	**Polarization (antenna height)**	**Level (dBm)**	**Pattern deviation (dB)**	**Pattern deviation Limit (dB)**
121.65 MHz	0	Vertical (110cm)	18.16	-0.43	-6.00
121.65 MHz	30	Vertical (110cm)	17.88	-0.71	-6.00
121.65 MHz	60	Vertical (110cm)	18.13	-0.46	-6.00
121.65 MHz	90	Vertical (110cm)	18.14	-0.45	-6.00
121.65 MHz	120	Vertical (110cm)	17.87	-0.72	-6.00
121.65 MHz	150	Vertical (110cm)	17.9	-0.69	-6.00
121.65 MHz	180	Vertical (110cm)	18.57	-0.02	-6.00
121.65 MHz	210	Vertical (110cm)	17.76	-0.83	-6.00
121.65 MHz	240	Vertical (110cm)	17.86	-0.73	-6.00
121.65 MHz	270	Vertical (110cm)	**18.59**	0	-6.00
121.65 MHz	300	Vertical (110cm)	18.2	-0.39	-6.00
121.65 MHz	330	Vertical (110cm)	18.4	-0.19	-6.00

Note: Values given in grey are done for information.

EFFECTIVE ISOTROPIC RADIATED POWER - PATTERN DEVIATION – TABULATED RESULTS					
RF ABSORBING MATERIAL CONFIG – EUT HEIGHT = 20CM				EMI4599	
Frequency (MHz)	**Azimuth (°)**	**Polarization (antenna height)**	**Level (dBm)**	**Pattern deviation (dB)**	**Pattern deviation Limit (dB)**
243.3 MHz	0	Vertical (110cm)	23.04	-0.73	-6.00
243.3 MHz	30	Vertical (110cm)	23.16	-0.61	-6.00
243.3 MHz	60	Vertical (110cm)	23.65	-0.12	-6.00
243.3 MHz	90	Vertical (110cm)	23.36	-0.41	-6.00
243.3 MHz	120	Vertical (110cm)	23.69	-0.08	-6.00
243.3 MHz	150	Vertical (110cm)	23.75	-0.02	-6.00
243.3 MHz	180	Vertical (110cm)	23.48	-0.29	-6.00
243.3 MHz	210	Vertical (110cm)	23.77	0	-6.00
243.3 MHz	240	Vertical (110cm)	23.72	-0.05	-6.00
243.3 MHz	270	Vertical (110cm)	23.39	-0.38	-6.00
243.3 MHz	300	Vertical (110cm)	23.56	-0.21	-6.00
243.3 MHz	330	Vertical (110cm)	23.45	-0.32	-6.00

Note: Values given in grey are done for information.

TEST SETUP PHOTO(S) – FLOTATION LINE CONFIG
EUT placed in the center of a ground plane with radius of 125 cm ± 5 cm Initial position in line of sight of measuring antenna (0°)



TEST SETUP PHOTO(S) – FLOTATION LINE CONFIG
EUT placed in the center of a ground plane with radius of 125 cm ± 5 cm

EFFECTIVE ISOTROPIC RADIATED POWER – TEST PARAMETERS						
FLOTATION LINE CONFIG						
EUT mode:	ON				**T (°C):**	28
Test Date:	30/05/2023				**H (%):**	41
Test Operator:	CFO + DMO				**P (hPa):**	1014
POSITION	**FREQUENCIES**	**RBW**	**VBW**	**Span**	**DETECTOR**	
Vertical	121.65MHz	100kHz	300kHz	500kHz	Peak	
Vertical	243.3MHz	100kHz	300kHz	500kHz	Peak	
Configuration:	EUT is set at flotation line level (see photo)					
Comments:	N/A					
EUT modification(s): N/A						

- **MAXIMUM EFFECTIVE ISOTROPIC RADIATED POWER**

EFFECTIVE ISOTROPIC RADIATED POWER – TABULATED RESULTS					
FLOTATION LINE CONFIG				EMI4600	
Frequency (MHz)	**Azimuth (°)**	**Polarization (antenna height)**	**Level (dBm)**	**Limit down (dBm)**	**Limit up (dBm)**
121.65 MHz	$Azim_{max}$=0°	Vertical ($elev_{max}$=110cm)	**22.84**	14.00	26.00
243.3 MHz	$Azim_{max}$=330°	Vertical ($elev_{max}$=100cm)	**25.97**	14.00	26.00

- **PATTERN DEVIATION OF EFFECTIVE ISOTROPIC RADIATED POWER**

The pattern deviation shall not be greater than 6 dB from the reference signal at any selected point.
The **reference signal** is the maximum level of Effective Isotropic Radiated Power.

EFFECTIVE ISOTROPIC RADIATED POWER - PATTERN DEVIATION – TABULATED RESULTS					
FLOTATION LINE CONFIG				EMI4601	
Frequency (MHz)	**Azimuth (°)**	**Polarization (antenna height)**	**Level (dBm)**	**Pattern deviation (dB)**	**Pattern deviation Limit (dB)**
121.65 MHz	0	Vertical (110cm)	**22.84**	0	-6.00
121.65 MHz	30	Vertical (110cm)	22.24	-0.6	-6.00
121.65 MHz	60	Vertical (110cm)	22.19	-0.65	-6.00
121.65 MHz	90	Vertical (110cm)	22.23	-0.61	-6.00
121.65 MHz	120	Vertical (110cm)	22.78	-0.06	-6.00
121.65 MHz	150	Vertical (110cm)	22.21	-0.63	-6.00
121.65 MHz	180	Vertical (110cm)	22.82	-0.02	-6.00
121.65 MHz	210	Vertical (110cm)	22.22	-0.62	-6.00
121.65 MHz	240	Vertical (110cm)	22.21	-0.63	-6.00
121.65 MHz	270	Vertical (110cm)	22.78	-0.06	-6.00
121.65 MHz	300	Vertical (110cm)	22.29	-0.55	-6.00
121.65 MHz	330	Vertical (110cm)	22.28	-0.56	-6.00

Note: Values given in grey are done for information.

EFFECTIVE ISOTROPIC RADIATED POWER - PATTERN DEVIATION – TABULATED RESULTS					
GROUND PLANE CONFIG				EMI4602	
Frequency (MHz)	Azimuth (°)	Polarization (antenna height)	Level (dBm)	Pattern deviation (dB)	Pattern deviation Limit (dB)
243.3 MHz	0	Vertical (100cm)	25.89	-0.08	-6.00
243.3 MHz	30	Vertical (100cm)	25.81	-0.16	-6.00
243.3 MHz	60	Vertical (100cm)	25.8	-0.17	-6.00
243.3 MHz	90	Vertical (100cm)	25.44	-0.53	-6.00
243.3 MHz	120	Vertical (100cm)	25.25	-0.72	-6.00
243.3 MHz	150	Vertical (100cm)	25.31	-0.66	-6.00
243.3 MHz	180	Vertical (100cm)	25.19	-0.78	-6.00
243.3 MHz	210	Vertical (100cm)	25.26	-0.71	-6.00
243.3 MHz	240	Vertical (100cm)	25.44	-0.53	-6.00
243.3 MHz	270	Vertical (100cm)	25.63	-0.34	-6.00
243.3 MHz	300	Vertical (100cm)	25.95	-0.02	-6.00
243.3 MHz	330	Vertical (100cm)	**25.97**	0	-6.00

Note: Values given in grey are done for information.

End of test report