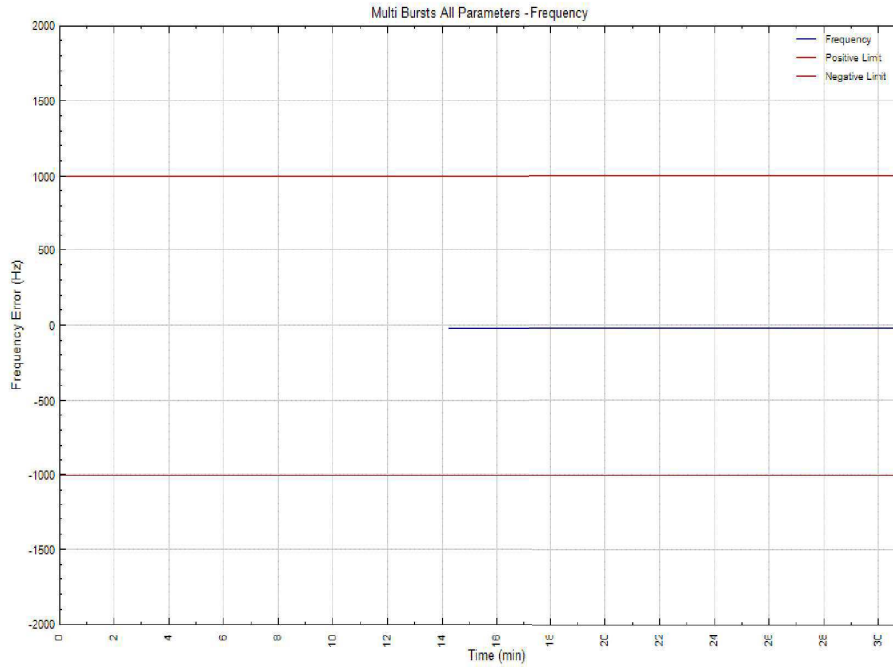## Burst 1

Decoded Beacon Message

Hexadecimal code: **FFFE2F8C9DFE7018DFEFF8129DF861F0FABE**

The code consists of 36 hexadecimal characters representing a first generation beacon message with the format flag set to Long including bit and frame synchronization pattern prefix (24 bits) as defined by T.001 Issue 4 - Rev.6.
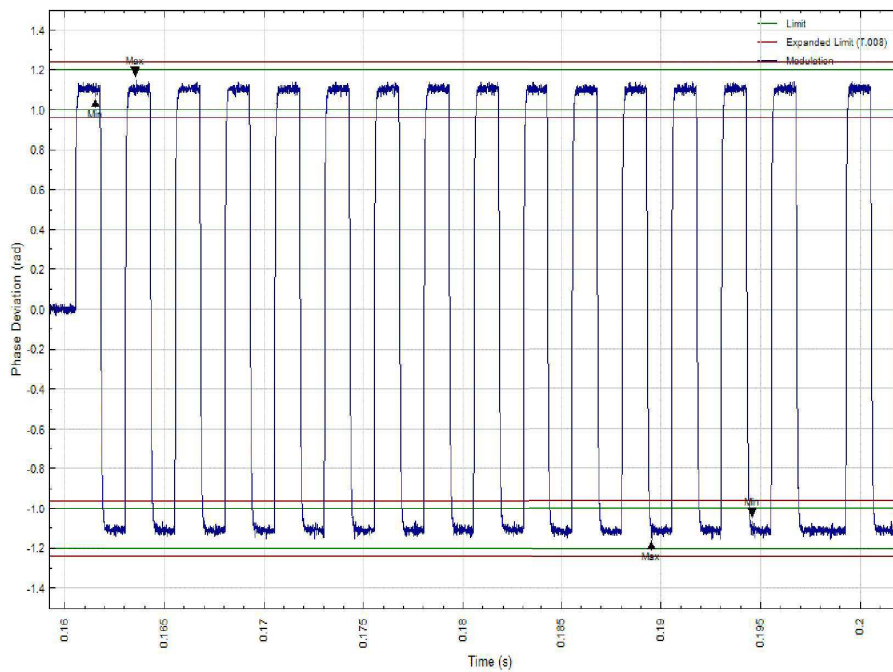
Unique identifier:
193BFCE031BFDFF

Binary Range	Binary Content	Field Name	Decoded Value
1-15	111111111111111	Bit-synchronization pattern consisting of "1"s shall occupy the first 15-bit positions	True
16-24	000101111	Frame Synchronization Pattern	Normal beacon operation
25	1	Format Flag	Long Message
26	0	Protocol Flag	Location, further information provided in "Protocol Code"
27-36	0011001001	Country code:	Albania - 201
		For associated SAR Points of Contact (SPOC) related to Albania - 201 :	Search Contact list here
37-40	1101	Protocol Code	RLS Location Protocol
41-42	11	Beacon type	RLS Test Location
43-46	1111	Identification type	RLS protocol coded with MMSI last 6 digits
47-66	10011100000001100011	Last 6 digits MMSI	639075
67-75	011111111	Latitude	Default - no location (Default - no location)
76-85	0111111111	Longitude	Default - no location (Default - no location)
86-106	000000100101001110111	BCH-1 error correcting code	BCH-1 code in message matches the recalculated BCH-1 from the PDF-1 field
107	1	Encoded position source	Encoded position data is provided by an internal navigation device
108	1	121.5 Mhz Homing Device	Included in beacon
109	1	Beacon capability to process and automatically generated RLM Type-1	Capable to process an automatically generated RLM Type-1
110	0	Beacon capability to process a manually generated RLM Type-1 RLM Type-2	Not capable to process a manually generated RLM Type-2
111	0	Beacon Feedback on receipt of RLM Type-1	RLM Type-1 (automatic) not received by this beacon
112	0	Beacon Feedback on receipt of RLM Type-2	RLM Type-2 (manual) not received by this beacon
113-114	01	RLS Provider Identification	GALILEO Return Link Service Provider
115-123	100001111	Latitude offset	Default value
124-132	100001111	Longitude offset	Default value
133-144	101010111110	BCH-2 error correcting code	BCH-2 code in message matches the recalculated BCH-2 from the PDF-2 field

Frequency Plot

Modulation Plot

Low Temperature (-20°C)
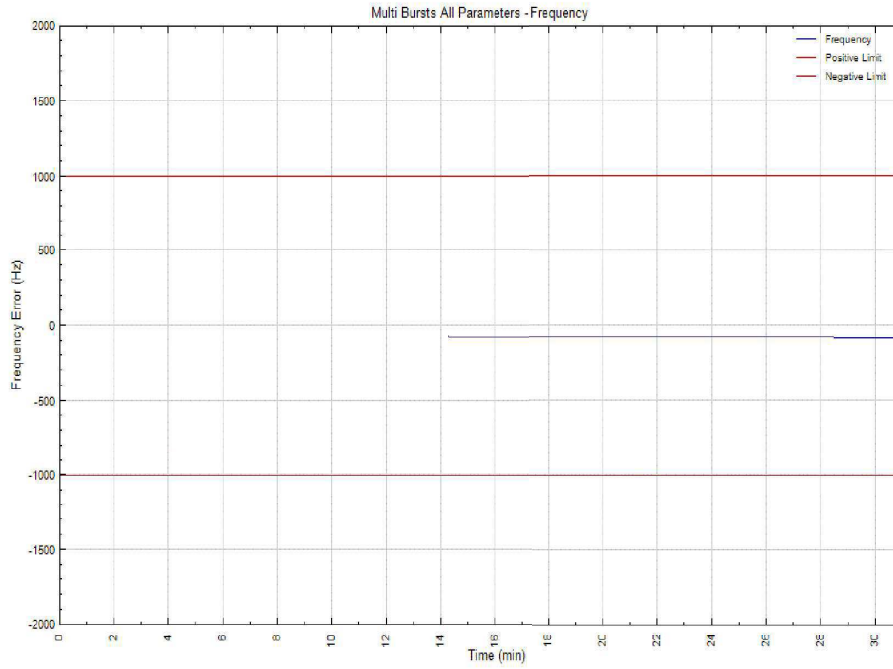
Burst 1

Decoded Beacon Message

Hexadecimal code: **FFFE2F8C9DFE7018DFEFF8129DF861F0FABE**

The code consists of 36 hexadecimal characters representing a first generation beacon message with the format flag set to Long including bit and frame synchronization pattern prefix (24 bits) as defined by T.001 Issue 4 - Rev.6.
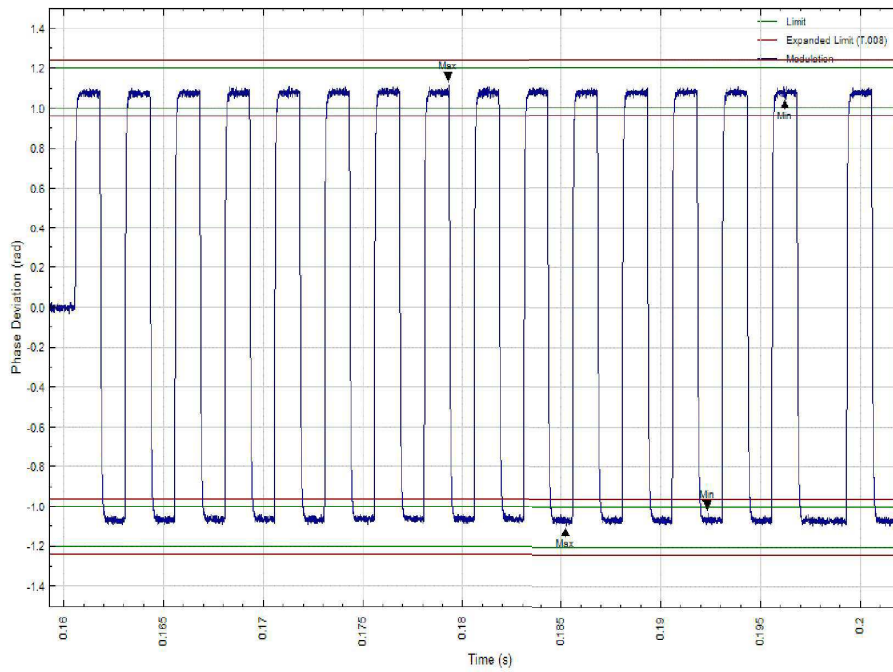
Unique identifier:
193BFCE031BFDFF

Binary Range	Binary Content	Field Name	Decoded Value
1-15	111111111111111	Bit-synchronization pattern consisting of "1"s shall occupy the first 15-bit positions	True
16-24	000101111	Frame Synchronization Pattern	Normal beacon operation
25	1	Format Flag	Long Message
26	0	Protocol Flag	Location, further information provided in "Protocol Code"
27-36	0011001001	Country code:	Albania - 201
		For associated SAR Points of Contact (SPOC) related to Albania - 201 :	Search Contact list here
37-40	1101	Protocol Code	RLS Location Protocol
41-42	11	Beacon type	RLS Test Location
43-46	1111	Identification type	RLS protocol coded with MMSI last 6 digits
47-66	10011100000001100011	Last 6 digits MMSI	639075
67-75	011111111	Latitude	Default - no location (Default - no location)
76-85	0111111111	Longitude	Default - no location (Default - no location)
86-106	000000100101001110111	BCH-1 error correcting code	BCH-1 code in message matches the recalculated BCH-1 from the PDF-1 field
107	1	Encoded position source	Encoded position data is provided by an internal navigation device
108	1	121.5 Mhz Homing Device	Included in beacon
109	1	Beacon capability to process and automatically generated RLM Type-1	Capable to process an automatically generated RLM Type-1
110	0	Beacon capability to process a manually generated RLM Type-1 RLM Type-2	Not capable to process a manually generated RLM Type-2
111	0	Beacon Feedback on receipt of RLM Type-1	RLM Type-1 (automatic) not received by this beacon
112	0	Beacon Feedback on receipt of RLM Type-2	RLM Type-2 (manual) not received by this beacon
113-114	01	RLS Provider Identification	GALILEO Return Link Service Provider
115-123	100001111	Latitude offset	Default value
124-132	100001111	Longitude offset	Default value
133-144	101010111110	BCH-2 error correcting code	BCH-2 code in message matches the recalculated BCH-2 from the PDF-2 field

Frequency Plot

Modulation Plot

High Temperature (+55°C)
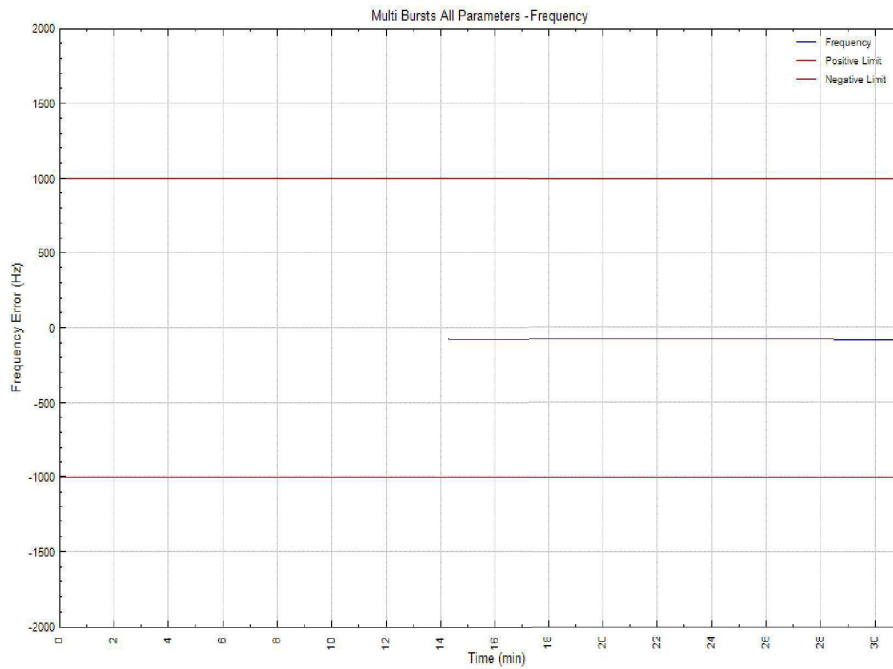
Burst 1
Decoded Beacon Message

Hexadecimal code: **FFFE2F8C9DFE7018DFEFF8129DF861F0FABE**

The code consists of 36 hexadecimal characters representing a first generation beacon message with the format flag set to Long including bit and frame synchronization pattern prefix (24 bits) as defined by T.001 Issue 4 - Rev.6.
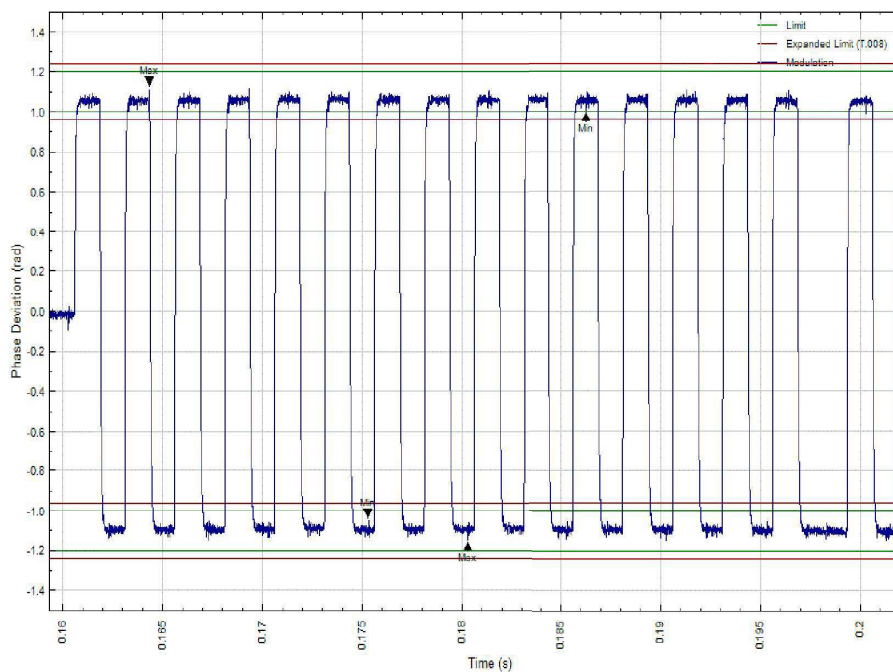
Unique identifier:
193BFCE031BFDFF

Binary Range	Binary Content	Field Name	Decoded Value
1-15	111111111111111	Bit-synchronization pattern consisting of "1"s shall occupy the first 15-bit positions	True
16-24	000101111	Frame Synchronization Pattern	Normal beacon operation
25	1	Format Flag	Long Message
26	0	Protocol Flag	Location, further information provided in "Protocol Code"
27-36	0011001001	Country code:	Albania - 201
		For associated SAR Points of Contact (SPOC) related to Albania - 201 :	Search Contact list here
37-40	1101	Protocol Code	RLS Location Protocol
41-42	11	Beacon type	RLS Test Location
43-46	1111	Identification type	RLS protocol coded with MMSI last 6 digits
47-66	10011100000001100011	Last 6 digits MMSI	639075
67-75	011111111	Latitude	Default - no location (Default - no location)
76-85	0111111111	Longitude	Default - no location (Default - no location)
86-106	00000010010100111011 1	BCH-1 error correcting code	BCH-1 code in message matches the recalculated BCH-1 from the PDF-1 field
107	1	Encoded position source	Encoded position data is provided by an internal navigation device
108	1	121.5 Mhz Homing Device	Included in beacon
109	1	Beacon capability to process and automatically generated RLM Type-1	Capable to process an automatically generated RLM Type-1
110	0	Beacon capability to process a manually generated RLM Type-1 RLM Type-2	Not capable to process a manually generated RLM Type-2
111	0	Beacon Feedback on receipt of RLM Type-1	RLM Type-1 (automatic) not received by this beacon
112	0	Beacon Feedback on receipt of RLM Type-2	RLM Type-2 (manual) not received by this beacon
113-114	01	RLS Provider Identification	GALILEO Return Link Service Provider
115-123	100001111	Latitude offset	Default value
124-132	100001111	Longitude offset	Default value
133-144	101010111110	BCH-2 error correcting code	BCH-2 code in message matches the recalculated BCH-2 from the PDF-2 field

Frequency Plot

Modulation Plot

Summary

The EUT complies with clause A.3.3 of Cospas-Sarsat T.007.

2.7 SELF-TEST MODES

2.7.1 Specification

Cospas-Sarsat T.007, Clause A.2.1 (h)

2.7.2 Equipment Under Test and Modification State

RLB-44 S/N: TA000003 - Modification State 1

2.7.3 Date of Test

14 March 2022, 16 March 2022, 18 March 2022 & 21 March 2022

2.7.4 Test Equipment Used

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

2.7.5 Laboratory Environmental Conditions

Ambient Temperature 21.2 - 26.6°C
Relative Humidity 26.7 - 37.1%

2.7.6 Test Results

Self-test Mode

Ambient Temperature

Burst 1
Decoded Beacon Message

Hexadecimal code: **FFFE2F8C9DFE7018CCF024AD44F84ECA2A3C**

The code consists of 36 hexadecimal characters representing a first generation beacon message with the format flag set to Long including bit and frame synchronization pattern prefix (24 bits) as defined by T.001 Issue 4 - Rev.6.

Unique identifier:
193BFCE031BFDFF

Binary Range	Binary Content	Field Name	Decoded Value
1-15	111111111111111	Dit-synchronization pattern consisting of "1"s shall occupy the first 15-bit positions	True
16-24	000101111	Frame Synchronization Pattern	Normal beacon operation
25	1	Format Flag	Long Message
26	0	Protocol Flag	Location, further information provided in "Protocol Code"
27-36	0011001001	Country code:	Albania - 201
		For associated SAR Points of Contact (SPOC) related to Albania - 201 :	Search Contact list here
37-40	1101	Protocol Code	RLS Location Protocol
41-42	11	Beacon type	RLS Test Location
43-46	1111	Identification type	RLS protocol coded with MMSI last 6 digits
47-66	10011100000001100011	Last 6 digits MMSI	639075
67-75	001100111	Latitude	51.5 Degrees North (51.5)
76-85	1000000100	Longitude	2.0 Degrees West (-2.0)
86-106	100101011010100010011	BCH-1 error correcting code	BCH-1 code in message matches the recalculated BCH-1 from the PDF-1 field
107	1	Encoded position source	Encoded position data is provided by an internal navigation device
108	1	121.5 Mhz Homing Device	Included in beacon
109	1	Beacon capability to process and automatically generated RLM Type-1	Capable to process an automatically generated RLM Type-1
110	0	Beacon capability to process a manually generated RLM Type-1 RLM Type-2	Not capable to process a manually generated RLM Type-2
111	0	Beacon Feedback on receipt of RLM Type-1	RLM Type-1 (automatic) not received by this beacon
112	0	Beacon Feedback on receipt of RLM Type-2	RLM Type-2 (manual) not received by this beacon
113-114	01	RLS Provider Identification	GALILEO Return Link Service Provider
115-123	001110110	Latitude offset	7.0 minutes 24.0 seconds (negative)
124-132	010100010	Longitude offset	10.0 minutes 8.0 seconds (negative)
133-144	101000111100	BCH-2 error correcting code	BCH-2 code in message matches the recalculated BCH-2 from the PDF-2 field
		Composite location	51.377 -1.831

Note: Self-test at ambient temperature was carried out with navigation data applied. The EUT was activated and allowed to obtain a fix. It was then deactivated and a Self-test was performed to show the EUT encoded default values. This is shown from the decoded message below.

Burst 3
Decoded Beacon Message

Hexadecimal code: **FFFED08C9DFE7018DFEFF8129DF861F0FABE**

The code consists of 36 hexadecimal characters representing a first generation beacon message with the format flag set to Long including bit and frame synchronization pattern prefix (24 bits) as defined by T.001 Issue 4 - Rev.6.

Unique identifier:
193BFCE031BFDFF

Binary Range	Binary Content	Field Name	Decoded Value
1-15	111111111 11111	Bit-synchronization pattern consisting of "1"s shall occupy the first 15-bit positions	True
16-24	011010000	Frame Synchronization Pattern	Test protocol message coded for non-operational use
25	1	Format Flag	Long Message
26	0	Protocol Flag	Location, further information provided in "Protocol Code"
27-36	0011001001	Country code:	Albania - 201
		For associated SAR Points of Contact (SPOC) related to Albania - 201 :	Search Contact list here
37-40	1101	Protocol Code	RLS Location Protocol
41-42	11	Beacon type	RLS Test Location
43-46	1111	Identification type	RLS protocol coded with MMSI last 6 digits
47-66	1001110000 0001100011	Last 6 digits MMSI	639075
67-75	011111111	Latitude	Default - no location (Default - no location)
76-85	0111111111	Longitude	Default - no location (Default - no location)
86-106	0000001001 0100111011 1	BCH-1 error correcting code	BCH-1 code in message matches the recalculated BCH-1 from the PDF-1 field
107	1	Encoded position source	Encoded position data is provided by an internal navigation device
108	1	121.5 Mhz Homing Device	Included in beacon
109	1	Beacon capability to process and automatically generated RLM Type-1	Capable to process an automatically generated RLM Type-1
110	0	Beacon capability to process a manually generated RLM Type-1 RLM Type-2	Not capable to process a manually generated RLM Type-2
111	0	Beacon Feedback on receipt of RLM Type-1	RLM Type-1 (automatic) not received by this beacon
112	0	Beacon Feedback on receipt of RLM Type-2	RLM Type-2 (manual) not received by this beacon
113-114	01	RLS Provider Identification	GALILEO Return Link Service Provider
115-123	100001111	Latitude offset	Default value
124-132	100001111	Longitude offset	Default value
133-144	1010101111 10	BCH-2 error correcting code	BCH-2 code in message matches the recalculated BCH-2 from the PDF-2 field

Low Temperature (-20°C)

Burst 1
Decoded Beacon Message

Hexadecimal code: **FFFED08C9DFE7018DFEFF8129DF861F0FABE**

The code consists of 36 hexadecimal characters representing a first generation beacon message with the format flag set to Long including bit and frame synchronization pattern prefix (24 bits) as defined by T.001 Issue 4 - Rev.6.

Unique identifier:
193BFCE031BFDFF

Binary Range	Binary Content	Field Name	Decoded Value
1-15	111111111111111	Bit-synchronization pattern consisting of "1"s shall occupy the first 15-bit positions	True
16-24	011010000	Frame Synchronization Pattern	Test protocol message coded for non-operational use
25	1	Format Flag	Long Message
26	0	Protocol Flag	Location, further information provided in "Protocol Code"
27-36	0011001001	Country code:	Albania - 201
		For associated SAR Points of Contact (SPOC) related to Albania - 201 :	Search Contact list here
37-40	1101	Protocol Code	RLS Location Protocol
41-42	11	Beacon type	RLS Test Location
43-46	1111	Identification type	RLS protocol coded with MMSI last 6 digits
47-66	10011100000001100011	Last 6 digits MMSI	639075
67-75	011111111	Latitude	Default - no location (Default - no location)
76-85	0111111111	Longitude	Default - no location (Default - no location)
86-106	000000100101001110111	BCH-1 error correcting code	BCH-1 code in message matches the recalculated BCH-1 from the PDF-1 field
107	1	Encoded position source	Encoded position data is provided by an internal navigation device
108	1	121.5 Mhz Homing Device	Included in beacon
109	1	Beacon capability to process and automatically generated RLM Type-1	Capable to process an automatically generated RLM Type-1
110	0	Beacon capability to process a manually generated RLM Type-1 RLM Type-2	Not capable to process a manually generated RLM Type-2
111	0	Beacon Feedback on receipt of RLM Type-1	RLM Type-1 (automatic) not received by this beacon
112	0	Beacon Feedback on receipt of RLM Type-2	RLM Type-2 (manual) not received by this beacon
113-114	01	RLS Provider Identification	GALILEO Return Link Service Provider
115-123	100001111	Latitude offset	Default value
124-132	100001111	Longitude offset	Default value
133-144	101010111110	BCH-2 error correcting code	BCH-2 code in message matches the recalculated BCH-2 from the PDF-2 field

High Temperature (+55°C)

Burst 1
Decoded Beacon Message

Hexadecimal code: **FFFED08C9DFE7018DFEFF8129DF861F0FABE**

The code consists of 36 hexadecimal characters representing a first generation beacon message with the format flag set to Long including bit and frame synchronization pattern prefix (24 bits) as defined by T.001 Issue 4 - Rev.6.

Unique identifier:
193BFCE031BFDFF

Binary Range	Binary Content	Field Name	Decoded Value
1-15	111111111111111	Bit-synchronization pattern consisting of "1"s shall occupy the first 15-bit positions	True
16-24	011010000	Frame Synchronization Pattern	Test protocol message coded for non-operational use
25	1	Format Flag	Long Message
26	0	Protocol Flag	Location, further information provided in "Protocol Code"
27-36	0011001001	Country code:	Albania - 201
		For associated SAR Points of Contact (SPOC) related to Albania - 201 :	Search Contact list here
37-40	1101	Protocol Code	RLS Location Protocol
41-42	11	Beacon type	RLS Test Location
43-46	1111	Identification type	RLS protocol coded with MMSI last 6 digits
47-66	10011100000001100011	Last 6 digits MMSI	639075
67-75	011111111	Latitude	Default - no location (Default - no location)
76-85	0111111111	Longitude	Default - no location (Default - no location)
86-106	00000010010100111011 1	BCH-1 error correcting code	BCH-1 code in message matches the recalculated BCH-1 from the PDF-1 field
107	1	Encoded position source	Encoded position data is provided by an internal navigation device
108	1	121.5 Mhz Homing Device	Included in beacon
109	1	Beacon capability to process and automatically generated RLM Type-1	Capable to process an automatically generated RLM Type-1
110	0	Beacon capability to process a manually generated RLM Type-1 RLM Type-2	Not capable to process a manually generated RLM Type-2
111	0	Beacon Feedback on receipt of RLM Type-1	RLM Type-1 (automatic) not received by this beacon
112	0	Beacon Feedback on receipt of RLM Type-2	RLM Type-2 (manual) not received by this beacon
113-114	01	RLS Provider Identification	GALILEO Return Link Service Provider
115-123	100001111	Latitude offset	Default value
124-132	100001111	Longitude offset	Default value
133-144	101010111110	BCH-2 error correcting code	BCH-2 code in message matches the recalculated BCH-2 from the PDF-2 field

Table F-E.3: Self-test Mode Actions and Indications

No.	Action/Indication	Time-stamp (HH:MM:SS)	Description of action/indication	Duration of action/indication (sec)	Notes
1	Self-Test mode initiation (distinct action)	00:00:00	Hold the 'Test' button in until the red LED starts flashing, then release	3 Sec	
2	Distinct indication of the Self-test initiation	00:00:04	LED flashes white	1 Sec	
3	Self-test single burst transmission	00:00:05		520mS	Observed on Spectrum Analyser
4	Self-test message default values	00:00:05	Self-test message structure and bit values confirmed correct		Decoded using TUV test system
5	Distinct indication of RF transmission	00:00:05		None	121.5 MHz AIS 406 MHz
6	Distinct indication of the Self-test PASS result	00:00:06	A series of Blue LED flashes (if RLS) or Green LED flashes (if NON RLS)	Up to 10 Sec	Dependent on number of flashes. See manufacturers user manual for description of self-test indications.
7	Distinct indication of the Self-test FAIL result	00:00:06	A series of Magenta (if RLS) or Orange (if non RLS) LED flashes	Up to 10 Sec	Dependent on number of flashes. See manufacturers user manual for description of self-test indications.
8	Distinct indication of Insufficient Battery Energy	00:00:06	A series of Magenta (if RLS) or Orange (if non RLS) LED flashes	Up to 10 Sec	Dependent on number of flashes. See manufacturers user manual for description of self-test indications.
9	Automatic termination of the Self-test mode, irrespectively of the switch position		'Test' button held in	21 seconds	If the 'Test' button is held in, the EUT turns off. The EUT ceases to draw residual current after this. See battery current measurements for details.
10	Duration of the Self-test mode				Dependent on number of flashes. See manufacturers user manual for description of self-test indications.

Testing Insufficient Battery Energy

Table F-E.5: Indication of Insufficient Battery Energy

Parameter	Units	Declared by beacon manufacturer	Verified and evaluated by accepted test facility	Notes
Minimum duration of continuous operation (C_{CO})	hours	50*	-	C_{CO} is declared in Annex G as "Operating Lifetime". C_{CO} is required for the test. Minimum duration of continuous operation (C_{CO})
Full Battery Pack Capacity (C_{BP})	hours	105.26	-	If needed to calculate C_{SP-AMB}
Battery Pre-Operational Losses (C_{PO})	hours	9.32	-	Corresponds to L_{CDC}, as defined in the Table F- E.2
Spare Battery Capacity at ambient temperature (C_{SP-AMB})	hours	45.94	-	C_{SP-AMB} is required for the test, and shall be defined by testing (see Footnote 4 to section A.3.6.2.2), or by calculation, as follows: $C_{SP-AMB} = C_{BP} - (C_{PO} + C_{CO})$
Criteria and conditions to trigger **PIE** indication		2 Hour operation **See description below	-	Description of PIE criteria and conditions to be met to trigger PIE indication. Use a separate sheet if needed
Step-1: battery pack discharge	hours	-	1.5h	Battery discharge shall correspond to: C_{PO} - **30 minutes,** or the value declared by the beacon manufacturer less 30 minutes
Step-1: beacon conditions (if applicable)		-	The battery was discharged in the EUT for 1.5 hours	Description of conditions recreated during the Step-1 for which the PIE criteria is not met
Step-1: observations of self-test indication		-	The LED indicator flashes blue once and then repeats. If RLS is not enabled the LED indicator will flash green once and then repeats.	Test facility observations of self-test indication: time, duration, type of indication
Step-2: battery pack discharge	hours	-	The battery was discharged in the EUT for a further 1 hour	Total battery discharge shall correspond to: C_{PO} + C_{SP-AMB} + **30 minutes** or the value declared by the beacon manufacturer plus 30 minutes
Step-2: beacon conditions (if applicable)	-	-	Step-1: battery pack discharge + Step-2: battery pack discharge = 2.5h	Description of conditions recreated during the Step-2 for which the PIE criteria is met
Step-2: observations of distinct PIE indication		-	The LED indicator flashes magenta for a series of flashes and then repeats. If RLS is not enabled the LED indicator flashes amber for a series of flashes and then repeats.	Test facility observations of PIE indication: time, duration, type of indication

*CCO set to 50 hours as we provide for two hours of use before we tell the user the battery needs changing. This way even after two hours of use the product will still meet the operational requirement of 48 hours use.

**PIE Indication

For RLS protocol disabled, if the PIE criterion has been met the pass indication of the Self-Test shall change from a flashing Green LED to a flashing Amber LED.

For RLS protocol enabled, if the PIE criterion has been met the pass indication of the Self-Test shall change from a flashing Blue LED to a flashing Magenta LED.

For these criteria to be met the beacon must have been operated for 2 hours.

This operation time can be accumulated through Self-Testing, GNSS Self-Testing and activation. The Amber or Magenta LED indicates that the beacon may not have sufficient capacity to last for 48 hours operation and the battery should be replaced.

GNSS Self-test mode

General

All duration measurements below include activation method time, i.e. they start from test switch press and include any "hold for x seconds" requirement and they end when all visual and audible activity appeared to cease.

All positional accuracy values below were calculated using the Haversine Formula; the Earth's radius was taken as 6367 km.

Example decodes are shown only for RLS Location Protocol at ambient temperature, however all protocols and temperatures (High, Ambient, Low) were measured, decoded, and found to be compliant.

GNSS Self-test Observations

Parameter	Actual	Declared
GNSS Self-test count	60	60
GNSS Self-test maximum duration (s) incl. activation method	114	140
Indication of GNSS Self-test activation/completion	A GNSS self-test activation is activated by holding the TEST button in until the red LED stops flashing and becomes steady. It should be released. If navigation data is detected, the LED will flash green a number of times as described below. If no navigation data is detected, the LED will flash red a number of times as described below. The number of flashes indicates the number of GNSS Self-Tests remaining, up to a maximum of 10 times. The test result will then be repeated after 2 seconds.	
Indication of GNSS Self-test count limit reached	If there are no tests remaining the LED will either flash green or red 13 times depending on whether the GNSS Self-Test was successful.	

Summary: GNSS Self-test with Valid Navigation Input

Protocol	RLS Location Protocol		
Temperature (°C)	-20	+22	+55
Frame sync verification	011010000	011010000	011010000
Format Flag (1 bit)	1	1	1
Single Radiated burst (ms)	520.093	520.115	520.109
Position data	P	P	P
Single burst verification	P	P	P
Actual duration (s) incl. activation method	75	70	71
Position Input Latitude	N 51° 22' 35"		
Position Input Longitude	W 1° 49' 50"		
Position Output Latitude	N 51° 22' 36"	N 51° 22' 36"	N 51° 22' 36"
Position Output Longitude	W 1° 49' 52"	W 1° 49' 52"	W 1° 49' 52"
Position Error (m)	74.6	74.6	74.6

Protocol	Standard Location Protocol		
Temperature (°C)	-20	+22	+55
Frame sync verification	011010000	011010000	011010000
Format Flag (1 bit)	1	1	1
Single Radiated burst (ms)	520.091	520.097	520.102
Position data	P	P	P
Single burst verification	P	P	P
Actual duration (s) incl. activation method	74	64	73
Position Input Latitude	N 51° 22' 35"		
Position Input Longitude	W 1° 49' 50"		
Position Output Latitude	N 51° 22' 36"	N 51° 22' 36"	N 51° 22' 36"
Position Output Longitude	W 1° 49' 52"	W 1° 49' 52"	W 1° 49' 52"
Position Error (m)	49.3	49.3	49.3

Summary: GNSS Self-test without Valid Navigation Input

Protocol	RLS Location Protocol		
Temperature (°C)	-20	+22	+55
Frame sync verification	N/A	N/A	N/A
Format Flag (1 bit)	N/A	N/A	N/A
Single Radiated burst (ms)	N/A	N/A	N/A
Default Position data	N/A	N/A	N/A
Single burst verification	N/A	N/A	N/A
Actual duration (s) incl. activation method	113	113	114

Protocol	Standard Location Protocol		
Temperature (°C)	-20	+22	+55
Frame sync verification	N/A	N/A	N/A
Format Flag (1 bit)	N/A	N/A	N/A
Single Radiated burst (ms)	N/A	N/A	N/A
Default Position data	N/A	N/A	N/A
Single burst verification	N/A	N/A	N/A
Actual duration (s) incl. activation method	113	113	113

Full Hex Messages	
RLS Protocol with Navigation data applied	
+55°C	FFFED08C9DFE7018CCF024AD44F84ECA2A3C
Ambient	FFFED08C9DFE7018CCF024AD44F84ECA2A3C
-20°C	FFFED08C9DFE7018CCF024AD44F84ECA2A3C
RLS Protocol without Navigation data applied	
+55°C	N/A
Ambient	N/A
-20°C	N/A
Standard Location Protocol with Navigation data applied	
+55°C	FFFED08C9EF9C06333A03ECA66771DA4D4D0
Ambient	FFFED08C9EF9C06333A03ECA66771DA4D4D0
-20°C	FFFED08C9EF9C06333A03ECA66771DA4D4D0
Standard Location Protocol without Navigation data applied	
+55°C	N/A
Ambient	N/A
-20°C	N/A

Decoded Beacon Message

Hexadecimal code: **FFFED08C9DFE7018CCF024AD44F84ECA2A3C**

The code consists of 36 hexadecimal characters representing a first generation beacon message with the format flag set to Long including bit and frame synchronization pattern prefix (24 bits) as defined by T.001 Issue 4 - Rev.6.

Unique identifier:
193BFCE031BFDFF

Binary Range	Binary Content	Field Name	Decoded Value
1-15	111111111111111	Bit-synchronization pattern consisting of "1"s shall occupy the first 15-bit positions	True
16-24	011010000	Frame Synchronization Pattern	Test protocol message coded for non-operational use
25	1	Format Flag	Long Message
26	0	Protocol Flag	Location, further information provided in "Protocol Code"
27-36	0011001001	Country code:	Albania - 201
		For associated SAR Points of Contact (SPOC) related to Albania - 201 :	Search Contact list here
37-40	1101	Protocol Code	RLS Location Protocol
41-42	11	Beacon type	RLS Test Location
43-46	1111	Identification type	RLS protocol coded with MMSI last 6 digits
47-66	10011100000001100011	Last 6 digits MMSI	639075
67-75	001100111	Latitude	51.5 Degrees North (51.5)
76-85	1000000100	Longitude	2.0 Degrees West (-2.0)
86-106	100101011010100010011	BCH-1 error correcting code	BCH-1 code in message matches the recalculated BCH-1 from the PDF-1 field
107	1	Encoded position source	Encoded position data is provided by an internal navigation device
108	1	121.5 Mhz Homing Device	Included in beacon
109	1	Beacon capability to process and automatically generated RLM Type-1	Capable to process an automatically generated RLM Type-1
110	0	Beacon capability to process a manually generated RLM Type-1 RLM Type-2	Not capable to process a manually generated RLM Type-2
111	0	Beacon Feedback on receipt of RLM Type-1	RLM Type-1 (automatic) not received by this beacon
112	0	Beacon Feedback on receipt of RLM Type-2	RLM Type-2 (manual) not received by this beacon
113-114	01	RLS Provider Identification	GALILEO Return Link Service Provider
115-123	001110110	Latitude offset	7.0 minutes 24.0 seconds (negative)
124-132	010100010	Longitude offset	10.0 minutes 8.0 seconds (negative)
133-144	101000111100	BCH-2 error correcting code	BCH-2 code in message matches the recalculated BCH-2 from the PDF-2 field
		Composite location	51.377 -1.831

Table F-E.4: GNSS Self-test Mode Actions and Indications

No.	Action/Indication	Time-stamp (HH:MM:SS)	Description of action/indication	Duration of action/indication (sec)	Notes
1	GNSS Self-test mode initiation (distinct action)	00:00:00	Hold the 'TEST' button in and when the red LED stops flashing and becomes steady, release the 'TEST' button	7 sec	
2	Distinct indication of the GNSS Self-test initiation	00:00:07	The LED will flash green once and then goes into the LED sequence described below	1 sec	
3	GNSS Self-test single burst transmission			520ms (with Nav input)	Observed on spectrum analyser
4	GNSS Self-test message position encoding		GNSS self-test message structure and bit values confirmed correct	1 sec (with Nav input)	Decode using TUV test system
5	Distinct indication of the GNSS Self-test PASS result	00:00:56	The LED flashes green to indicate a pass result and how many GNSS Self-Tests remain	15 sec	406 MHz burst with navigation acknowledgment
6	Distinct indication of the GNSS Self-test FAIL result	00:01:39	The LED flashes red twice and then enters the LED sequence for a failed result	15 sec	
7	Distinct indication that the manufacturer-declared limited number of GNSS Self-tests is attained				The LED will either flash green or red 13 times depending on whether the GNSS Self-Test was successful.
8	Automatic termination of the Self-test mode, irrespectively of the switch position		'Test' button held in	21 sec	If the 'Test' button is held in, the EUT turns off. The EUT ceases to draw residual current after this. See battery current measurements for details.
9	Duration of the GNSS Self-test mode	00:01:11 (with Nav input) 00:01:54 (without Nav input)			

Summary

The EUT complies with clause A.3.6 of Cospas-Sarsat T.007.

2.8 THERMAL SHOCK

2.8.1 Specification

Cospas-Sarsat T.007, Clause A.2.2

2.8.2 Equipment Under Test and Modification State

RLB-44 S/N: TA000003 - Modification State 1

2.8.3 Date of Test

22 March 2022

2.8.4 Test Equipment Used

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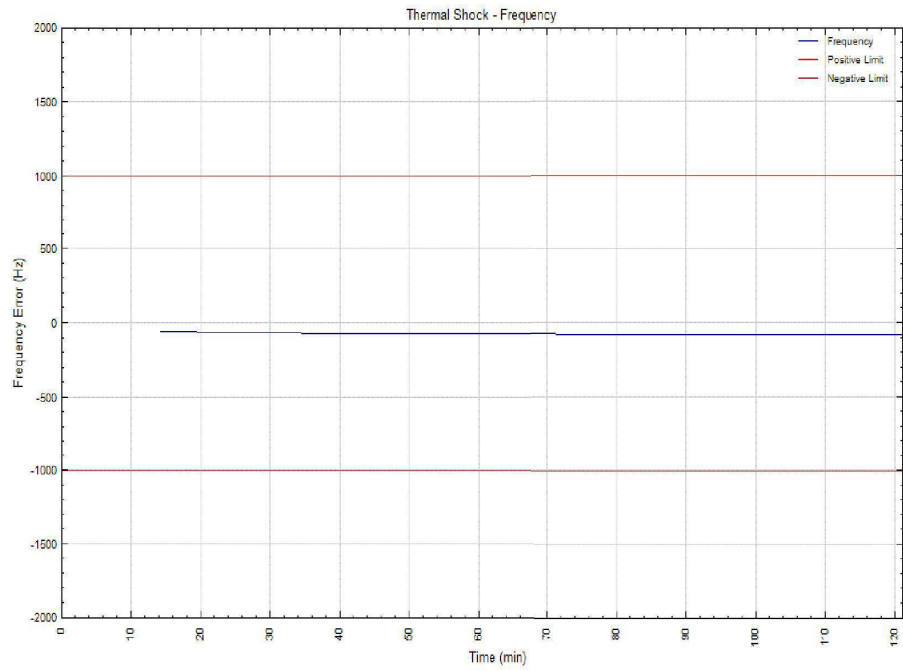
2.8.5 Laboratory Environmental Conditions

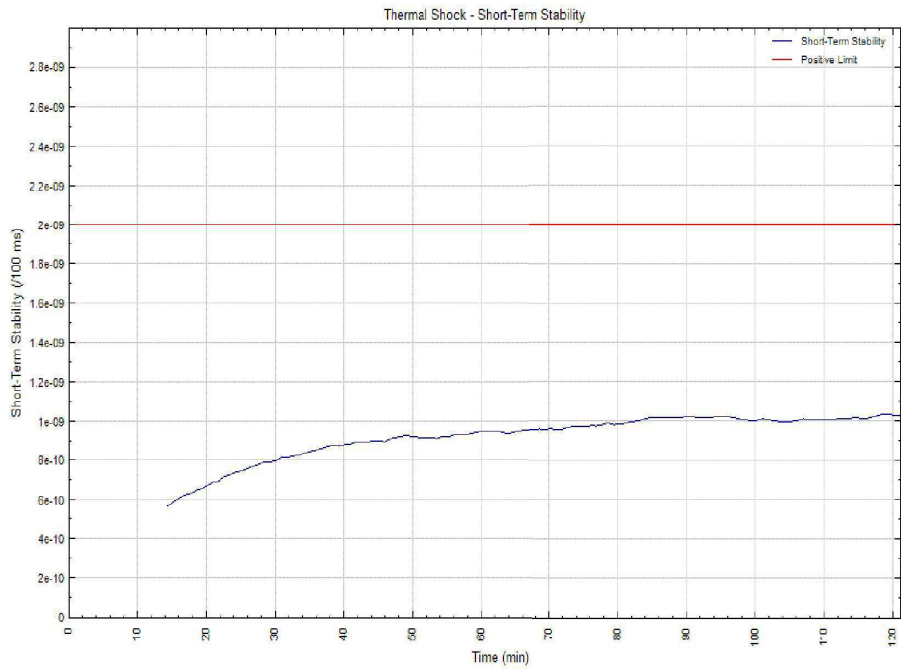Ambient Temperature 26.1°C
Relative Humidity 30.4%

2.8.6 Test Results

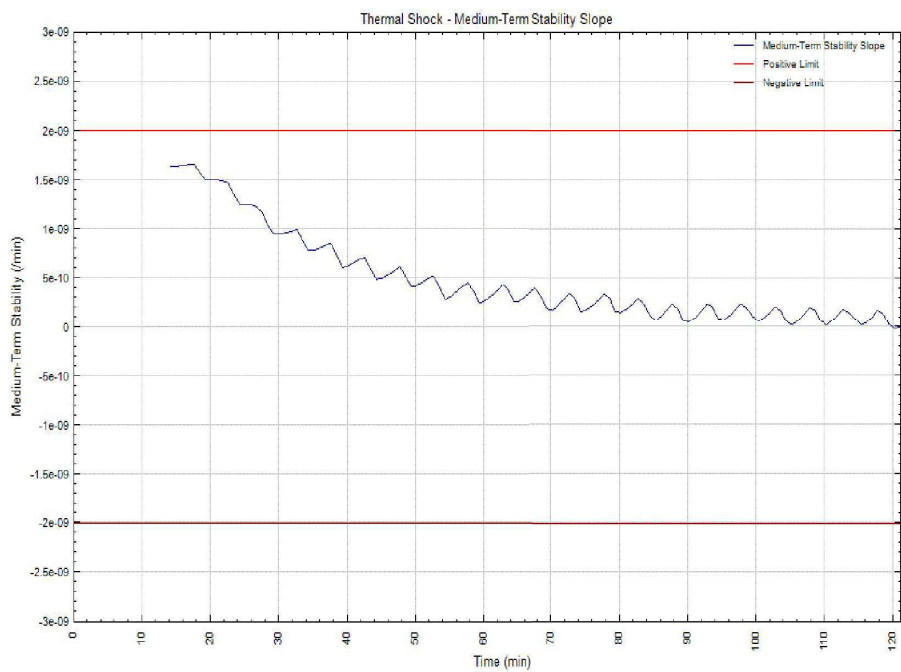Soak Temperature 20°C
Test Temperature -10°C
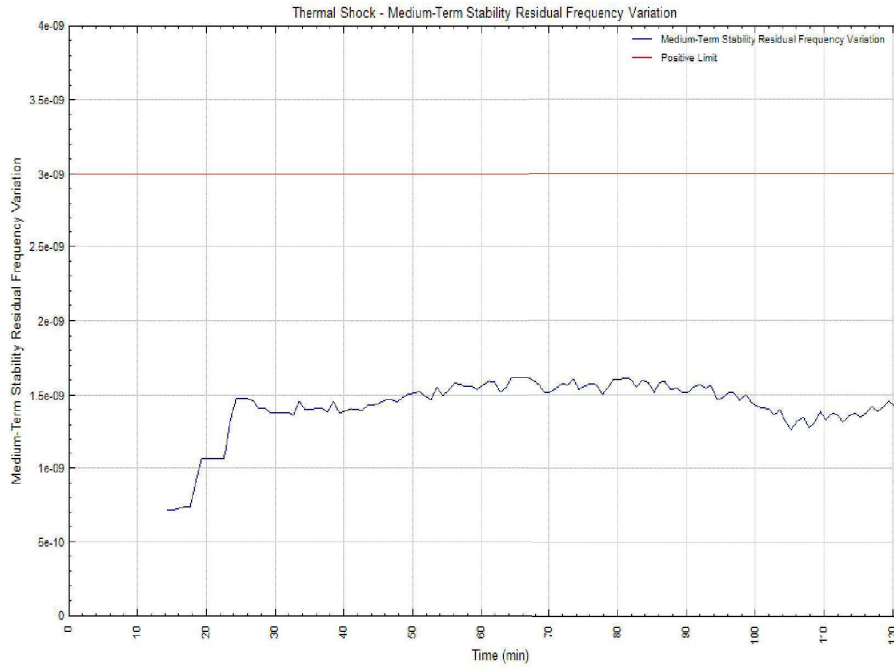
Nominal Frequency

Short Term Stability

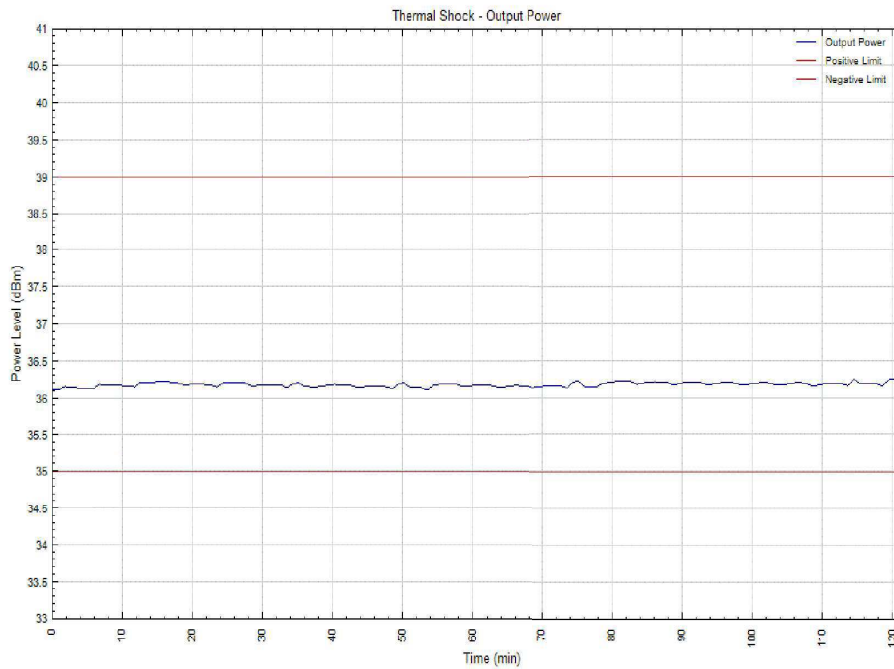
Medium Term Stability, Mean Slope

Medium Term Stability, Residual Frequency Variation

Output Power

Digital Message

Burst 1

Decoded Beacon Message

Hexadecimal code: **FFFE2F8C9DFE7018DFEFF8129DF861F0FABE**

The code consists of 36 hexadecimal characters representing a first generation beacon message with the format flag set to Long including bit and frame synchronization pattern prefix (24 bits) as defined by T.001 Issue 4 - Rev.6.

Unique identifier:
193BFCE031BFDFF

Binary Range	Binary Content	Field Name	Decoded Value
1-15	1111111111 11111	Bit-synchronization pattern consisting of "1"s shall occupy the first 15-bit positions	True
16-24	000101111	Frame Synchronization Pattern	Normal beacon operation
25	1	Format Flag	Long Message
26	0	Protocol Flag	Location, further information provided in "Protocol Code"
27-36	0011001001	Country code:	Albania - 201
		For associated SAR Points of Contact (SPOC) related to Albania - 201 :	Search Contact list here
37-40	1101	Protocol Code	RLS Location Protocol
41-42	11	Beacon type	RLS Test Location
43-46	1111	Identification type	RLS protocol coded with MMSI last 6 digits
47-66	1001110000 0001100011	Last 6 digits MMSI	639075
67-75	011111111	Latitude	Default - no location (Default - no location)
76-85	0111111111	Longitude	Default - no location (Default - no location)
86-106	0000001001 0100111011 1	BCH-1 error correcting code	BCH-1 code in message matches the recalculated BCH-1 from the PDF-1 field
107	1	Encoded position source	Encoded position data is provided by an internal navigation device
108	1	121.5 Mhz Homing Device	Included in beacon
109	1	Beacon capability to process and automatically generated RLM Type-1	Capable to process an automatically generated RLM Type-1
110	0	Beacon capability to process a manually generated RLM Type-1 RLM Type-2	Not capable to process a manually generated RLM Type-2
111	0	Beacon Feedback on receipt of RLM Type-1	RLM Type-1 (automatic) not received by this beacon
112	0	Beacon Feedback on receipt of RLM Type-2	RLM Type-2 (manual) not received by this beacon
113-114	01	RLS Provider Identification	GALILEO Return Link Service Provider
115-123	100001111	Latitude offset	Default value
124-132	100001111	Longitude offset	Default value
133-144	1010101111 10	BCH-2 error correcting code	BCH-2 code in message matches the recalculated BCH-2 from the PDF-2 field

Summary

The EUT complies with clause A.2.2 of Cospas-Sarsat T.007.

2.9 SATELLITE QUALITATIVE TESTS

2.9.1 Specification

Cospas-Sarsat T.007, Clause A.2.5

2.9.2 Equipment Under Test and Modification State

RLB-44 S/N: TA000007 - Modification State 1 (SLP Configurations 5 and 8)
RLB-44 S/N: TA000007 - Modification State 1 (RLS Configuration 7)

2.9.3 Date of Test

16 March 2022, 17 March 2022 & 22 March 2022

2.9.4 Test Equipment Used

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

2.9.5 Laboratory Environmental Conditions

Ambient Temperature 10.7 - 19.2°C
Relative Humidity 46.4 - 97.7%

2.9.6 Test Results

Configuration 5

Test Start: 17:23:18
Test End: 09:14:36
15 Hex ID: 193DF380C665C05

Actual location of the test beacon: 50.814305
(Daedalus Airfield, Lee-on-the-Solent, Central) -1.2017598

Satellite ID	Satellite Pass Number	15 Hex ID Provided by LUT	Doppler Latitude	Doppler Longitude	TCA	CTA (deg)	Location Error (km)
12	67522	193DF380C665C05*	50.816	-1.198	2022-03-15 17:16:27	13.995	0.324
13	49243	193DF380C665C05*	50.82	-1.201	2022-03-15 19:09:46	14.758	0.635
12	67524	193DF380C665C05*	50.822	-1.193	2022-03-15 20:37:56	-16.426	1.053
13	49245	193DF380C665C05*	50.816	-1.181	2022-03-15 22:29:57	-15.433	1.470
114	14012	193DF380C665C05*	50.816	-1.202	2022-03-16 03:04:17	-5.569	0.189
114	14013	193DF380C665C05*	50.816	-1.208	2022-03-16 04:44:02	9.525	0.477
12	67530	193DF380C665C05*	50.815	-1.202	2022-03-16 07:12:47	-11.244	0.079
10	86689	193DF380C665C05*	50.805	-1.119	2022-03-15 22:33:17	-10.276	5.903

Location Errors greater than 5 km are marked in red text.

Ratio of Successful Solutions $= \dfrac{\text{number of Doppler solutions within 5 km with } 1°<CTA<21°}{\text{number of satellite passes over test duration with } 1°<CTA<21°}$

$= \dfrac{7}{8}$

$= 87.5\%$

*NOTE: Hex ID is provided with location - the Hex ID with default values is 193DF380C6FFBFF.

Configuration 7

Test Start: 15:50
Test End: 08:34
15 Hex ID: 193BFCE03199A02
RLM Received: 15:51

Actual location of the test beacon: 50.814305
(Daedalus Airfield, Lee-on-the-Solent, Central) -1.2017598

Satellite ID	Satellite Pass Number	15 Hex ID Provided by LUT	Doppler Latitude	Doppler Longitude	TCA	CTA (deg)	Location Error (km)
12	67607	193BFCE03199A02*	50.8	-1.215	2022-03-21 17:45:46	10.156	1.842
12	67608	193BFCE03199A02*	50.818	-1.203	2022-03-21 19:26:12	-4.924	0.420
10	86772	193BFCE03199A02*	50.816	-1.2	2022-03-21 19:41:09	15.351	0.225
13	49329	193BFCE03199A02*	50.818	-1.195	2022-03-21 20:24:59	4.116	0.628
10	86773	193BFCE03199A02*	50.821	-1.183	2022-03-21 21:21:02	1.129	1.513
13	49330	193BFCE03199A02*	50.833	-1.231	2022-03-21 22:05:25	-11.521	2.920
10	86774	193BFCE03199A02*	50.823	-1.22	2022-03-21 23:02:21	-14.768	1.604
114	14097	193BFCE03199A02*	50.815	-1.208	2022-03-22 02:26:37	-11.558	0.445

Location Errors greater than 5 km are marked in red text.

Ratio of Successful Solutions $= \dfrac{\text{number of Doppler solutions within 5 km with } 1°<CTA<21°}{\text{number of satellite passes over test duration with } 1°<CTA<21°}$

$$= \frac{8}{8}$$

$$= 100\%$$

*NOTE: Hex ID is provided with location - the Hex ID with default values is 193BFCE031BFDFF.

Configuration 8

Test Start: 15:34
Test End: 08:40
15 Hex ID: 193DF380C665C05

Actual location of the test beacon: 50.814305
(Daedalus Airfield, Lee-on-the-Solent, Central)   -1.2017598

Satellite ID	Satellite Pass Number	15 Hex ID Provided by LUT	Doppler Latitude	Doppler Longitude	TCA	CTA (deg)	Location Error (km)
114	14020	193DF380C665C05*	50.818	-1.201	2022-03-16 16:11:27	-18.533	0.414
12	67536	193DF380C665C05*	50.815	-1.2	2022-03-16 17:04:47	15.522	0.146
12	67537	193DF380C665C05*	50.82	-1.19	2022-03-16 18:44:39	1.39	1.040
10	86701	193DF380C665C05*	50.817	-1.201	2022-03-16 19:01:10	20.131	0.304
12	67538	193DF380C665C05*	50.82	-1.203	2022-03-16 20:25:55	-14.496	0.639
10	86702	193DF380C665C05*	50.819	-1.197	2022-03-16 20:40:28	7.152	0.620
13	49259	193DF380C665C05*	50.825	-1.228	2022-03-16 22:08:57	-12.077	2.192
13	49258	193DF380C665C05*	50.826	-1.199	2022-03-16 20:28:28	3.597	1.314
13	49257	193DF380C665C05*	50.826	-1.211	2022-03-16 18:49:23	17.348	1.453
10	86703	193DF380C665C05*	50.823	-1.215	2022-03-16 22:21:12	-8.292	1.341
114	14026	193DF380C665C05*	50.815	-1.206	2022-03-17 02:41:14	-9.219	0.308
114	14027	193DF380C665C05*	50.816	-1.211	2022-03-17 04:21:19	6.233	0.676
114	14028	193DF380C665C05*	50.831	-1.237	2022-03-17 06:00:00	19.383	3.092
12	67544	193DF380C665C05*	50.813	-1.206	2022-03-17 07:00:48	-13.171	0.331

Location Errors greater than 5 km are marked in red text.

Ratio of Successful Solutions = $\dfrac{\text{number of Doppler solutions within 5 km with } 1° < CTA < 21°}{\text{number of satellite passes over test duration with } 1° < CTA < 21°}$

= $\dfrac{14}{14}$

= 100%

*NOTE: Hex ID is provided with location - the Hex ID with default values is 193DF380C6FFBFF.

Summary

The EUT complies with clause A.2.5 of Cospas-Sarsat T.007.

2.10 OPERATING LIFETIME AT MINIMUM TEMPERATURE

2.10.1 Specification

Cospas-Sarsat T.007, Clause A.2.3

2.10.2 Equipment Under Test and Modification State

RLB-44 S/N: TA000003 - Modification State 1 – Battery Current Measurements
RLB-44 S/N: TA000022 - Modification State 2 – Operating Lifetime and Minimum Temperature

TA000003 was initially used for the battery current measurements. The EUT was returned to the Manufacturer with a fault; the TCXO was changed. On return to TUV SUD it was re assigned the serial number TA000022. The Manufacturer advised that the TCXO current consumption is 3 mA at 3.3 V (approximatley 1 mA from battery) and the unit to unit variation is minimal.

2.10.3 Date of Test

07 March 2022, 08 March 2022 & 09 March 2022 – Battery Current Measurements*
04 May 2022 – Operating Lifetime at Minimum Temperature

2.10.4 Test Equipment Used

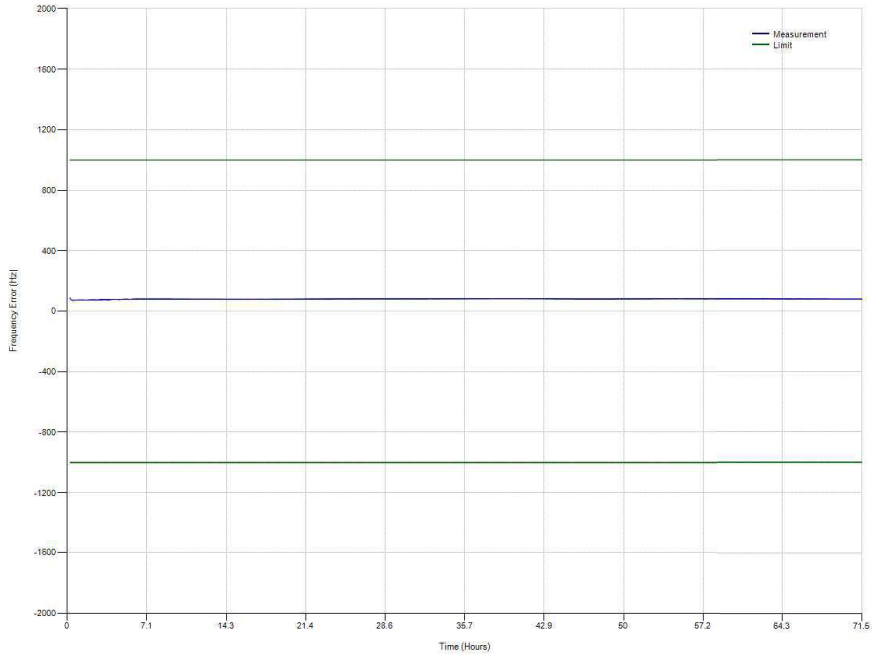The major items of test equipment used for the above tests are identified in Section 3.1.

2.10.5 Laboratory Environmental Conditions

Ambient Temperature 21.0 - 25.7°C
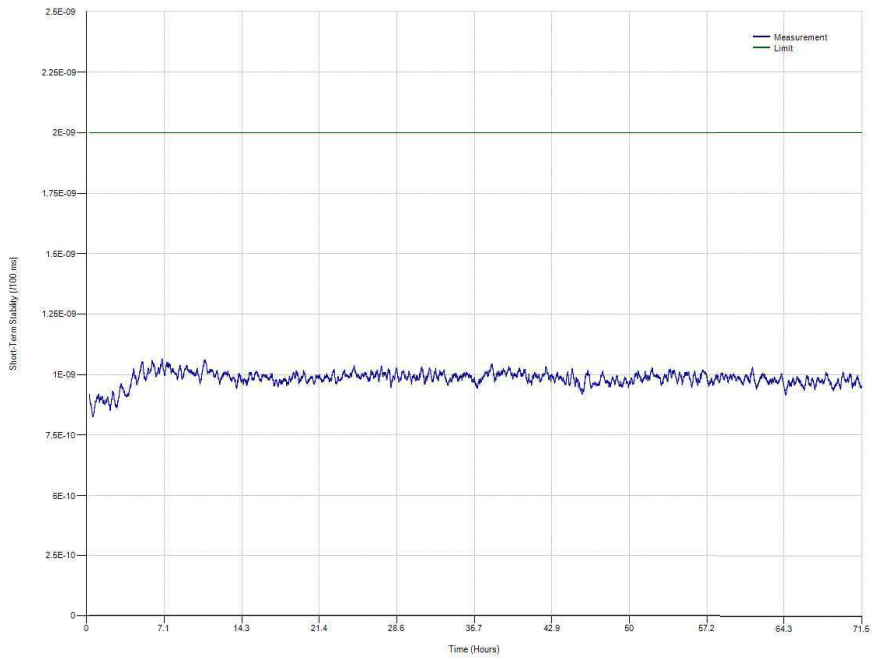Relative Humidity 20.8 - 33.8%

2.10.6 Test Results

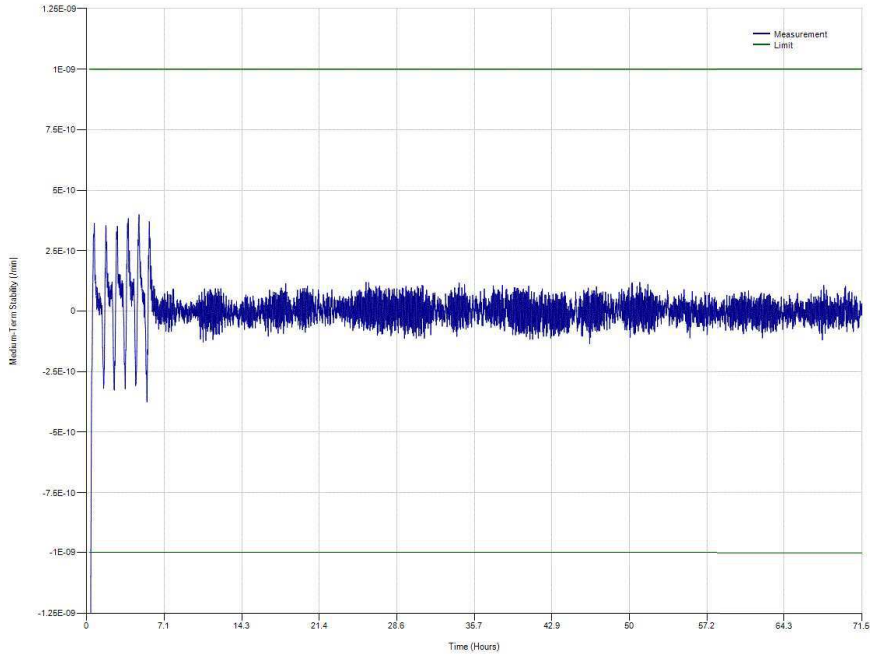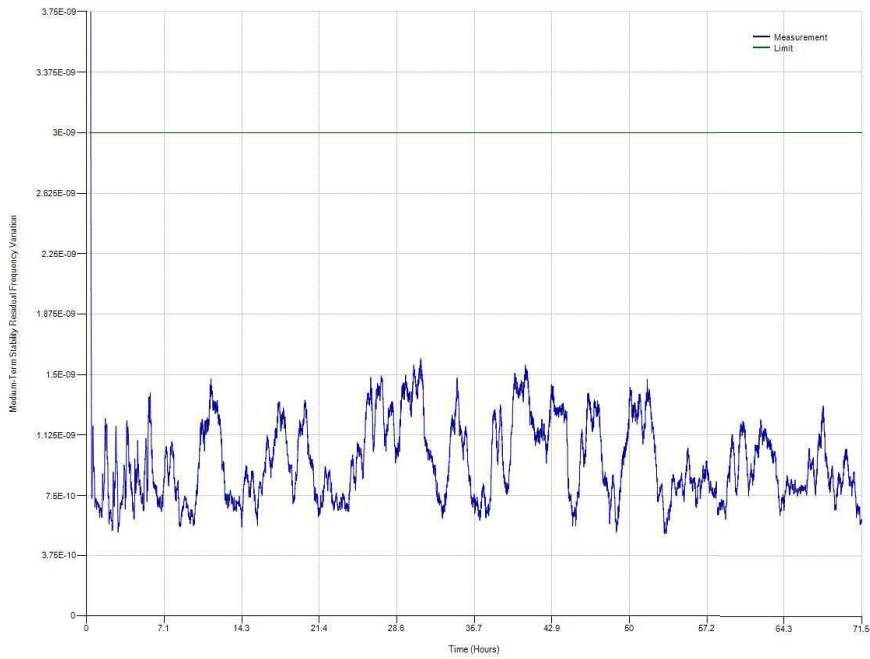## Nominal Frequency

Short Term Stability

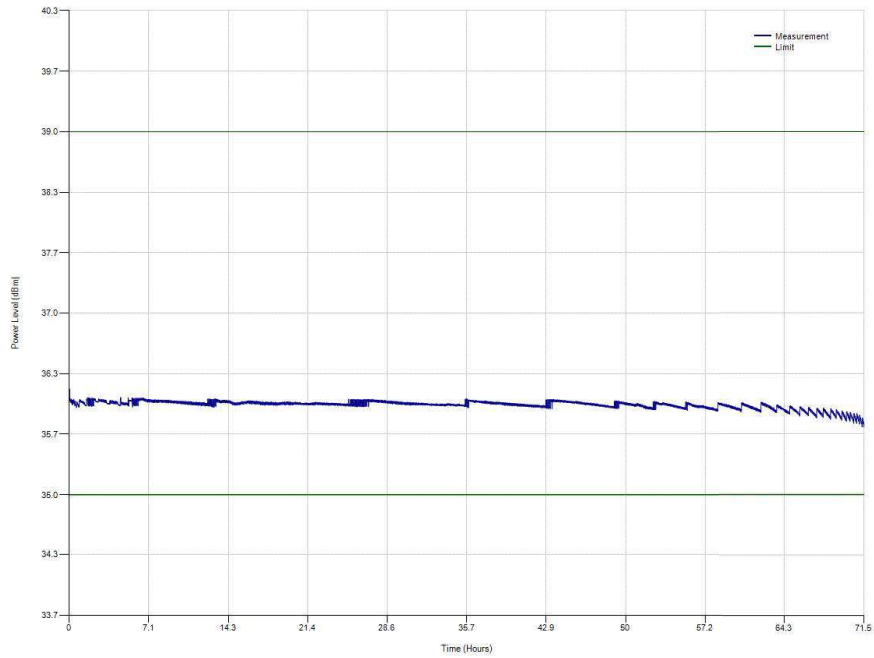## Medium Term Stability, Mean Slope

Medium Term Stability, Residual Frequency Variation

Output Power

Digital Message - Navigation data supplied at the start of the test

Message	FFFE2F8C9DFE7018CCF024AD44F84ECA2A3C		
Hex ID	193BFCE03199E04		
Position	51°22'36" N 1°49'52" W		
Parameter	Bit	Data Bits	Decoded Value
Bit synchronization	1-15	111111111111111	111111111111111
Frame synchronization	16-24	000101111	000101111
Format Flag	25	1	1
Protocol Flag	26	0	0
Country Code	27-36	0011001001	Albania (Republic of)
Protocol Code	37-40	1101	RLS Location Protocol
Beacon Type	41-42	11	Location Test Protocol
RLS TAC	43-52	1111100111	999
RLS ID Serial Number	53-66	00000001100011	99
N/S	67	0	North
Latitude Degrees	68-75	01100111	51.5
E/W	76	1	West
Longitude Degrees	77-85	000000100	2
BCH Code (21 Bit)	86-106	100101011010100010011	100101011010100010011
Calculated BCH Code (21 Bit)	-	100101011010100010011	100101011010100010011
Encoded Position Data Source	107	1	Internal navigation device
121.5 MHz Radio Locating Device	108	1	Yes
Capability to process RLM Type-1:	109	1	Acknowledgement Type-1 accepted by this beacon
Capability to process manually generated RLM	110	0	Manually generated RLM not accepted by this beacon
Feedback on RLM Type-1:	111	0	Acknowledgement Type-1 not (yet) received by this beacon
Feedback on RLM Type-2	112	0	RLM Type-2 not (yet) received by this beacon
RLS Provider Identification:	113-114	01	GALILEO Return Link Service Provider
Delta Latitude +/-	115	0	-
Delta Latitude Minutes	116-119	0111	7
Delta Latitude Seconds	120-123	0110	24
Delta Longitude +/-	124	0	-
Delta Longitude Minutes	125-128	1010	10
Delta Longitude Seconds	129-132	0010	8
BCH Code (12 Bit)	133-144	101000111100	101000111100
Calculated BCH Code (12 Bit)	-	101000111100	101000111100

Digital Message – Default Navigation data after 4 hours

| Message		FFFE2F8C9DFE7018DFEFF8129DF861F0FABE	
Hex ID		193BFCE031BFDFF	
Position		None - Default Values	
Parameter	Bit	Data Bits	Decoded Value
Bit synchronization	1-15	111111111111111	111111111111111
Frame synchronization	16-24	000101111	000101111
Format Flag	25	1	1
Protocol Flag	26	0	0
Country Code	27-36	0011001001	Albania (Republic of)
Protocol Code	37-40	1101	RLS Location Protocol
Beacon Type	41-42	11	Location Test Protocol
RLS TAC	43-52	1111100111	999
RLS ID Serial Number	53-66	00000001100011	99
N/S	67	0	Default
Latitude Degrees	68-75	11111111	Default
E/W	76	0	Default
Longitude Degrees	77-85	111111111	Default
BCH Code (21 Bit)	86-106	000000100101001110111	000000100101001110111
Calculated BCH Code (21 Bit)	-	000000100101001110111	000000100101001110111
Encoded Position Data Source	107	1	Internal navigation device
121.5 MHz Radio Locating Device	108	1	Yes
Capability to process RLM Type-1:	109	1	Acknowledgement Type-1 accepted by this beacon
Capability to process manually generated RLM	110	0	Manually generated RLM not accepted by this beacon
Feedback on RLM Type-1:	111	0	Acknowledgement Type-1 not (yet) received by this beacon
Feedback on RLM Type-2	112	0	RLM Type-2 not (yet) received by this beacon
RLS Provider Identification:	113-114	01	GALILEO Return Link Service Provider
Delta Latitude +/-	115	1	Default
Delta Latitude Minutes	116-119	0000	Default
Delta Latitude Seconds	120-123	1111	Default
Delta Longitude +/-	124	1	Default
Delta Longitude Minutes	125-128	0000	Default
Delta Longitude Seconds	129-132	1111	Default
BCH Code (12 Bit)	133-144	101010111110	101010111110
Calculated BCH Code (12 Bit)	-	101010111110	101010111110

Test Data (0 min - 30 min)

| #	Nominal Frequency (Hz)	Short Term Stability (/100 ms)	Medium Term Stability – Slope (/min)	Medium Term Stability – Residual Frequency Variation (no units)	Output Power (dBm)	Time (h)
1	-	-	-	-	36.11	0.000
2	-	-	-	-	36.16	0.014
3	-	-	-	-	36.08	0.029
4	-	-	-	-	36.04	0.043
5	-	-	-	-	36.05	0.056
6	-	-	-	-	36.06	0.070
7	-	-	-	-	36.03	0.083
8	-	-	-	-	36.04	0.098
9	-	-	-	-	36.02	0.111
10	-	-	-	-	36.05	0.125
11	-	-	-	-	36.03	0.140
12	-	-	-	-	36.02	0.154
13	-	-	-	-	36.01	0.168
14	-	-	-	-	36.05	0.181
15	-	-	-	-	36.04	0.195
16	-	-	-	-	36.02	0.208
17	-	-	-	-	36	0.223
18	406.0311	9.20E-10	-8.80E-09	1.15E-08	36.04	0.236
19	406.0311	9.08E-10	-7.87E-09	1.23E-08	36.02	0.250
20	406.0311	8.99E-10	-6.82E-09	1.24E-08	35.99	0.265
21	406.0311	8.95E-10	-5.81E-09	1.22E-08	36.02	0.279
22	406.0311	8.88E-10	-4.87E-09	1.16E-08	35.99	0.293
23	406.0311	8.79E-10	-3.97E-09	1.06E-08	36.02	0.307
24	406.0311	8.76E-10	-3.07E-09	9.10E-09	36	0.320
25	406.0311	8.77E-10	-2.26E-09	7.10E-09	36.04	0.334
26	406.0311	8.82E-10	-1.59E-09	4.91E-09	36.02	0.348
27	406.0311	8.79E-10	-1.10E-09	2.85E-09	36.01	0.361
28	406.0311	8.78E-10	-8.68E-10	2.02E-09	36.05	0.375
29	406.0311	8.73E-10	-6.97E-10	1.70E-09	36.04	0.389
30	406.0311	8.66E-10	-5.49E-10	1.48E-09	36.02	0.403
31	406.0311	8.66E-10	-4.07E-10	1.20E-09	36.01	0.417
32	406.0311	8.63E-10	-2.98E-10	9.27E-10	36.04	0.431
33	406.0311	8.56E-10	-2.49E-10	7.47E-10	36.02	0.444
34	406.0311	8.54E-10	-2.43E-10	7.34E-10	36.01	0.457
35	406.0311	8.50E-10	-2.43E-10	7.34E-10	36	0.472
36	406.0311	8.45E-10	-1.97E-10	7.40E-10	35.98	0.485
37	406.0311	8.37E-10	-1.11E-10	9.15E-10	36.03	0.499

Results outside of the specification are marked in red text.

121MHz Homing Transmitter - Duty Cycle (Start of Test)
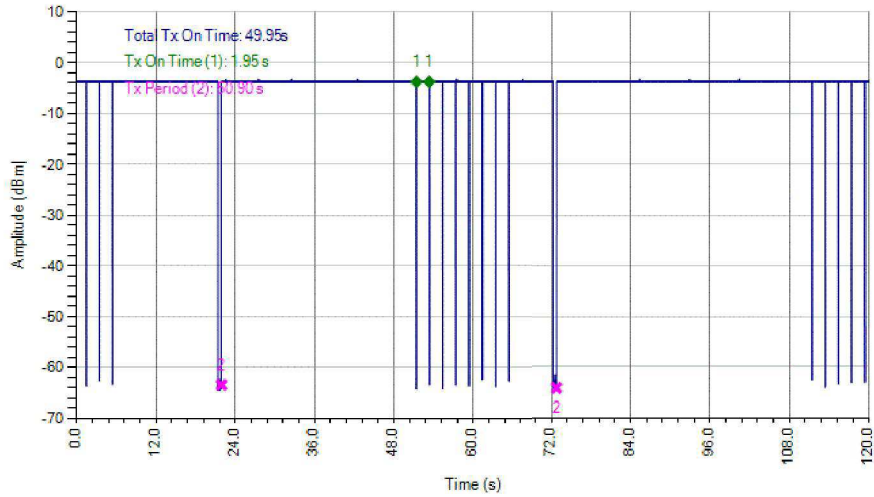
Duty Cycle = 49.951 / (49.951+0.952) = 98.13%

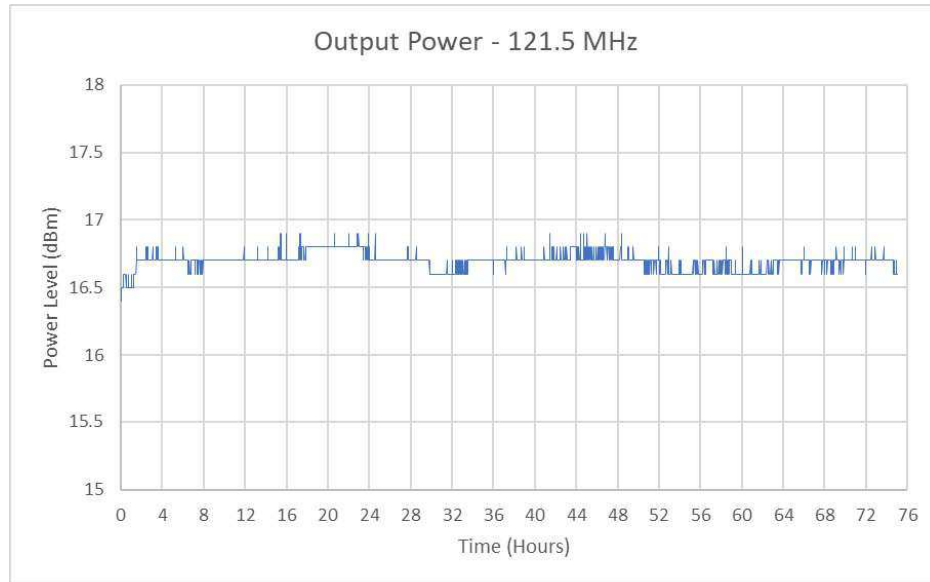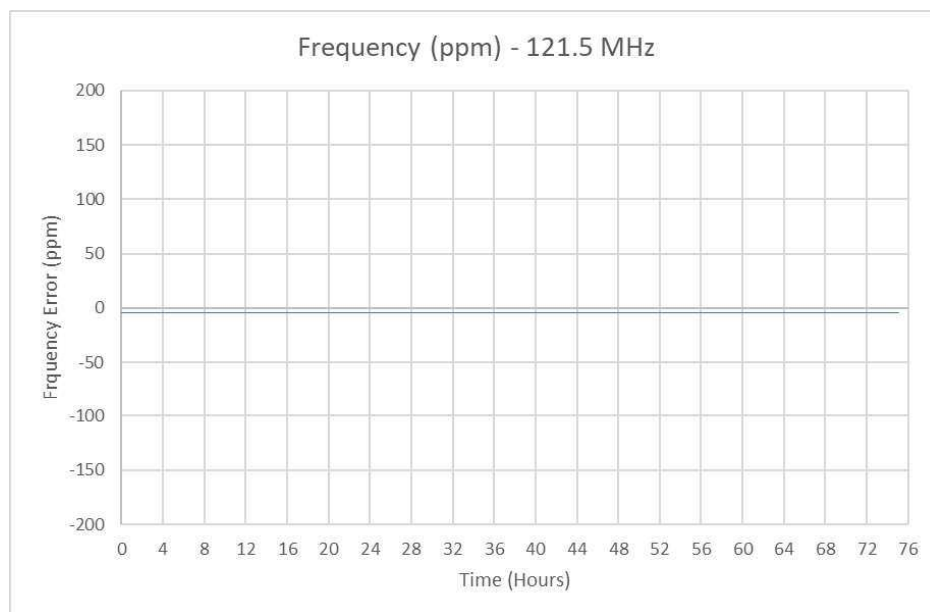## 121MHz Homing Transmitter - Duty Cycle (End of Test)
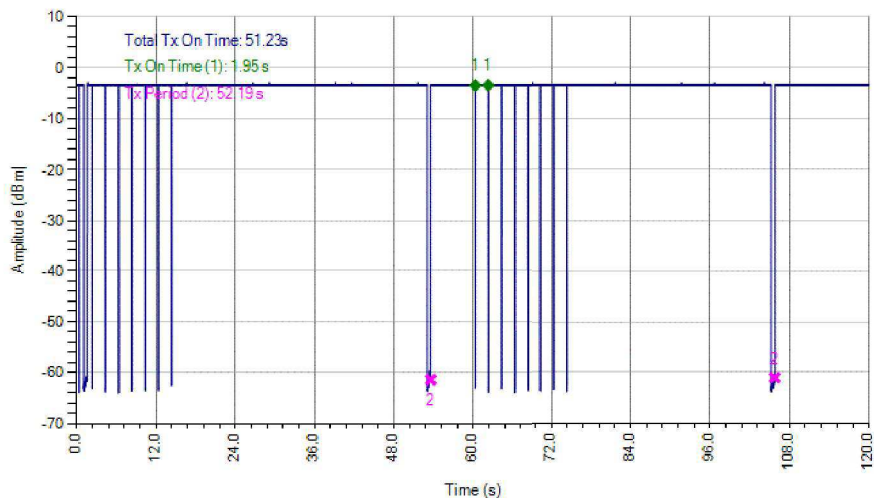
Duty Cycle = 51.226 / (51.226+0.967) = 98.15%

121MHz Homing Transmitter Power

Output Power - 121.5 MHz

121MHz Homing Transmitter Frequency

Frequency (ppm) - 121.5 MHz

AIS Bursts – Start of Test

RBW 3 MHz
VBW 10 MHz

Ref   20 dBm   Att   45 dB   SWT 50 s

```
  20
  10                              ┌┐ ┌┐ ┌┐   ┌┐ ┌┐ ┌┐  ┌┐ ┌┐ ┌┐
   0
 -10
 -20
 -30
 -40
 -50
 -60
 -70
 -80
```

1 PK
MAXH

A
SGL

PRN
EXT

Center 162 MHz   5 s/
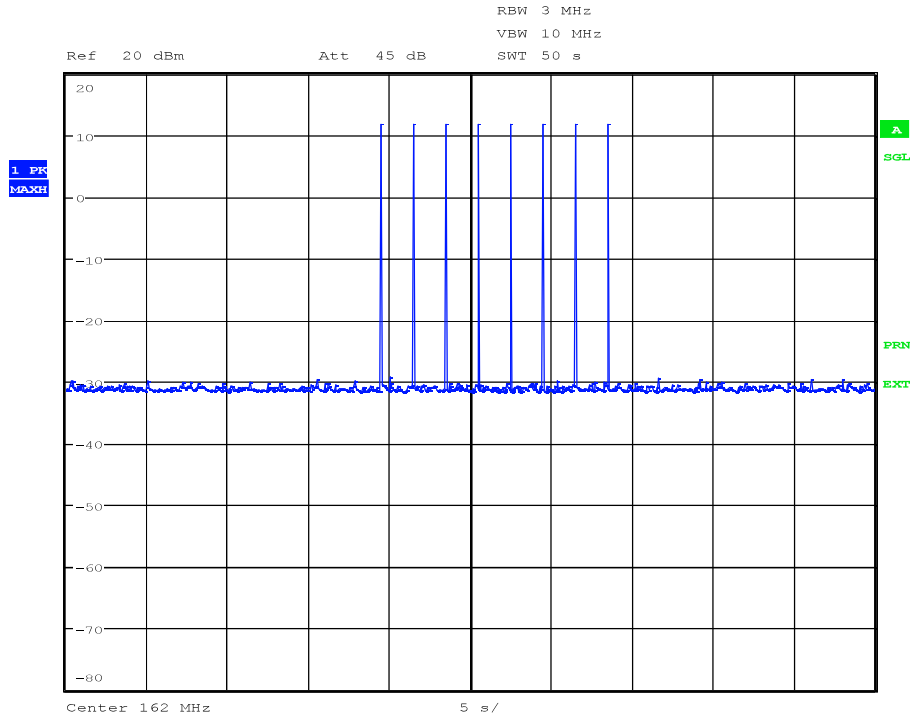
Date: 4.MAY.2022   09:05:23

AIS Bursts – End of Test

RBW 3 MHz
VBW 10 MHz
Ref 20 dBm   Att 45 dB   SWT 50 s

Center 162 MHz   5 s/
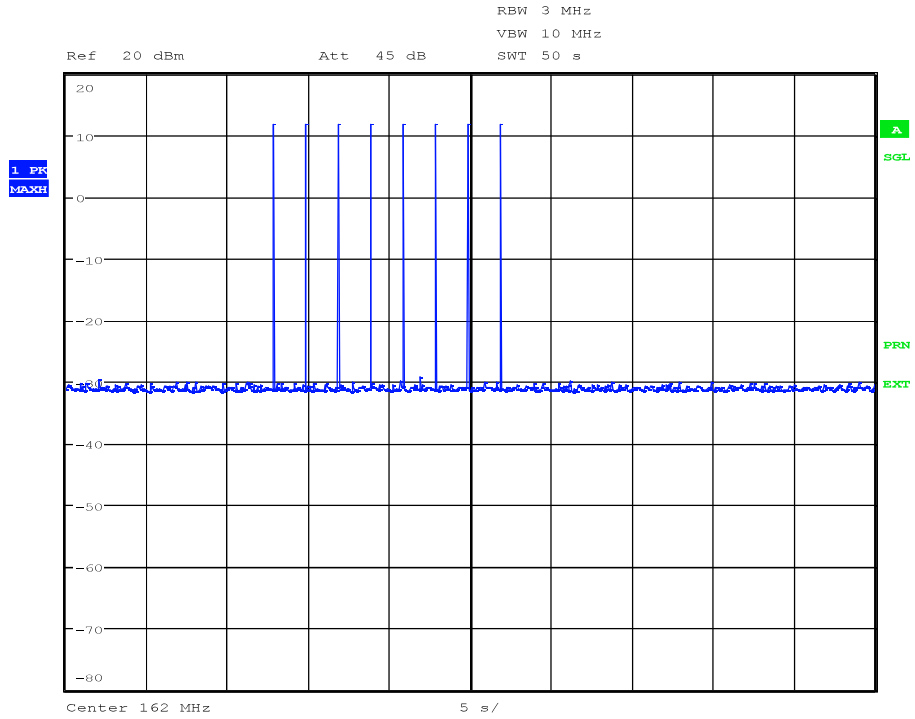
Date: 6.MAY.2022 09:02:55

NOTE: The AIS was monitored with a Class A receiver over the complete duration of the Operating Lifetime at Minimum Temperature Test.

Operating Current Measurements and Analysis

System Configurations and Operating Modes

System Configuration/Operating Mode Matrix (SCOMM):

System Configuration → Operational Mode ↓	A, Non RLS No Ancillaries	B, RLS No Ancillaries	C, RLS in Free Float Case	D, RLS in Manual Bracket
1, Standby	A1	B1	C1	D1
2, ON at EUT Average	A2	B2	C2	D2
3, ON at EUT (GNSS Search)	A3	B3	C3	D3
4, ON at EUT (GNSS Sleep)	A4	B4	C4	D4
5, ON at EUT Water Contacts Average	A5	B5	N/A	N/A
6, ON at EUT Water Contacts (GNSS Search)	A6	B6	N/A	N/A
7, ON at EUT Water Contacts (GNSS Sleep)	A7	B7	N/A	N/A
8, Self-Test	A8	B8	C8	D8
9, GNSS Self-Test (Timeout)	A9	B9	C9	D9
10, GNSS Self-Test (Burst)	A10	B10	C10	D10
11, Self-Test Held	A11	B11	C11	D11
12, NFC Interrogation	A12	B12	C12	D12
13, ON at EUT (GNSS fix, waiting RLM acknowledgement)	N/A	B13	C13	D13
14, ON at EUT (GNSS fix, RLM acknowledgement received)	N/A	B14	C14	D14

SCOMM Results as per C/S T.007 Table F-E.1:

Beacon Operating Mode	Mode: Manually selectable or Automatic	Measurement interval, sec	Average Current, mA	Peak Current, mA
A1	Manual	598.3	0.00001731	0.000019
B1	Manual	598.3	0.00001741	0.000018
C1	Manual	598.3	0.00001803	0.000019
D1	Manual	598.3	0.00001901	0.000021
A2	Manual	2397	35.83	1211
B2	Manual	2397	38.03	1198
C2	Manual	2397	38.26	1217
D2	Manual	2397	38.42	1214
A3	Manual	200	42.12	1196
B3	Manual	200	43.67	1196
C3	Manual	200	43.18	1213
D3	Manual	200	42.37	1209
A4	Automatic*	200	31.65	1209
B4	Automatic*	200	35.16	1204
C4	Automatic*	200	32.27	1208
D4	Automatic*	200	33.81	1211
A5	Automatic*	2397	37.03	1214
B5	Automatic*	2397	36.73	1227
A6	Automatic*	200	41.51	1206
B6	Automatic*	200	41.37	1198
A7	Automatic*	200	31.32	1205
B7	Automatic*	200	31.36	1201
A8	Manual	15.7	70.97	1207
B8	Manual	15.7	70.24	1200
C8	Manual	15.7	72.57	1198
D8	Manual	15.7	75.03	1186
A9	Manual	114.1	26.88	30.39
B9	Manual	114.1	26.43	29.96
C9	Manual	114.1	26.27	29.76
D9	Manual	114.1	26.1	29.44
A10	Manual	74**	29	1208
B10	Manual	74**	27.01	1185
C10	Manual	74**	28.01	1164
D10	Manual	74**	29.8	1196
A11	Manual	30	0	0
B11	Manual	30	0	0
C11	Manual	30	0	0
D11	Manual	30	0	0

Beacon Operating Mode	Mode: Manually selectable or Automatic	Measurement interval, sec	Average Current, mA	Peak Current, mA
A12	Manual	298.2	0.00001737	0.000019
B12	Manual	298.2	0.00001800	0.000019
C12	Manual	298.2	0.00001769	0.000019
D12	Manual	298.2	0.00001829	0.000019
B13	Manual	200	43.75	1196
C13	Manual	200	41.86	1209
D13	Manual	200	43.23	1191
B14	Automatic*	200	31.77	1191
C14	Automatic*	200	32.01	1202
D14	Automatic*	200	31.41	1188

The sampling interval was a nominal 100 ms for all measurements.

* NOTES, * GNSS sleep denoted as Automatic; in RLS protocol, upon beacon activation the beacon enters GNSS search mode for 30 minutes, if a valid RLM message is received then this time is reduced to 18 minutes. For non RLS protocols the GNSS will remain active for only 18 minutes. After the initial active time, the beacon automatically enters GNSS sleep mode, and cycles over a period of 5 minutes. During which the GNSS receiver is active for 60 – 91 seconds and inactive for the remaining period. RLM acknowledgement received denoted as automatic as this depends on when the GNSS receives an acknowledgment.
**The GNSS Self-Test Burst measurement window was chosen by using the longest duration seen and applying it to the other measurements. This was done so that the different configurations could be analysed equally and show a more accurate average current.

Worst Case System Configurations / Operating Modes

"Lifetime in service" drains (highest average current):
        Standby: D1 – Standby, RLS Protocol in Manual Bracket
        Self-test: D8 – Self-Test, RLS Protocol in Manual Bracket
        GNSS Self-test (Timeout):   A9 – GNSS Self-Test, Standard Location Protocol,
                              No Ancillaries
        GNSS Self-test (Burst):   D10 – GNSS Self-Test, RLS Protocol in Manual
                              Bracket

Operating mode used for battery conditioning calculations (equal or lower average current than mode used for conditioning)
        B7 – ON at EUT Water Contacts, RLS Protocol, No Ancillaries

Operating mode used for actual battery conditioning (equal or higher average current than mode used for calculations):
        B2 – ON at EUT, RLS Protocol, No Ancillaries, GNSS in normal operating duty cycle

Conditions during battery conditioning:
        Temperature: Ambient
        GNSS Signals: None applied

Note: Battery conditioning is a flexible term used to mean either pre-test discharge and/or extension time as appropriate, see Battery Conditioning Results, below.
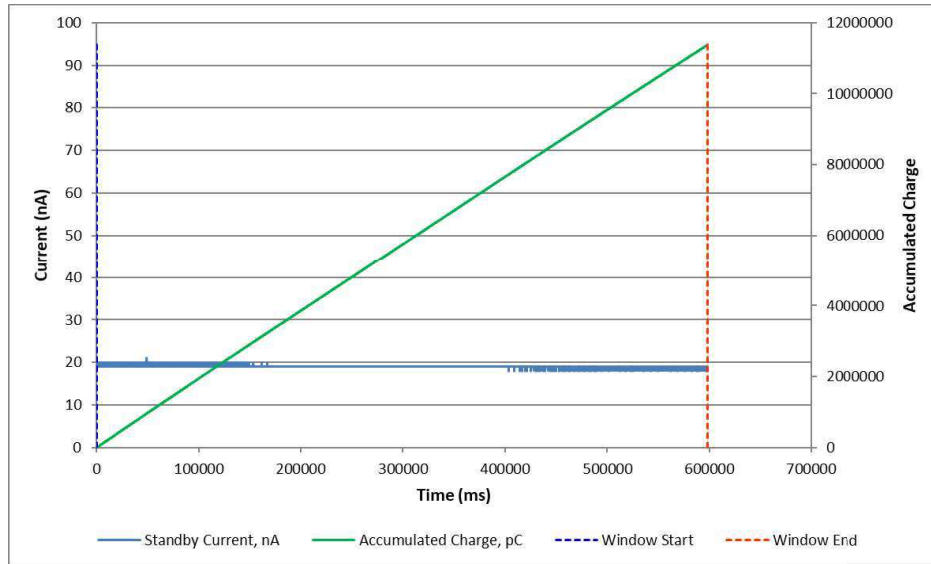
Operating mode during lifetime test (highest average current):
        B13 – ON at EUT, RLS Protocol, No Ancillaries, GNSS in normal operating duty cycle
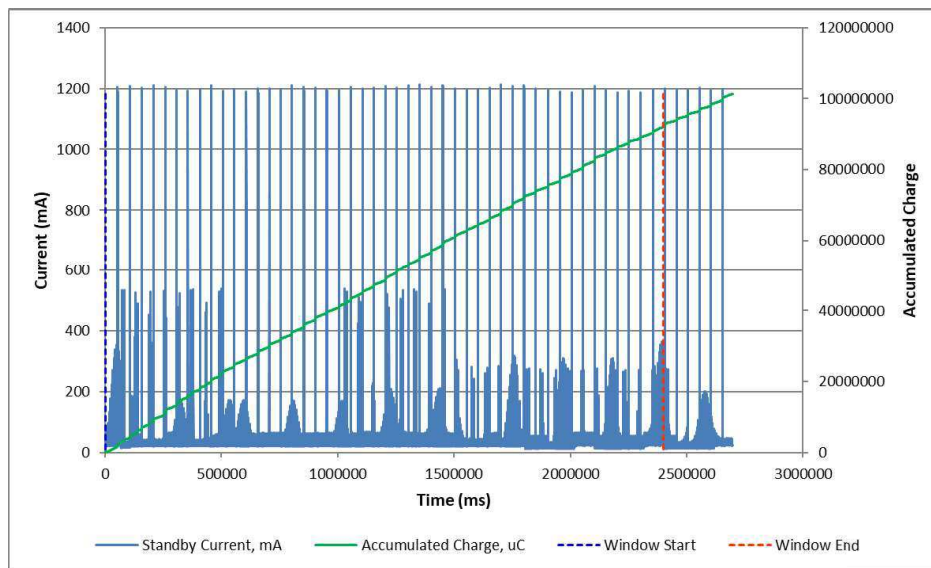Conditions during lifetime test:
        GNSS Signals: External Data Applied at the start of the test. Once a fix had been obtained, the navigation data was removed.

Current Measurement Plots

Worst Case Standby: D1

Worst Case On at EUT Average: D2