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Report On

Emergency Beacons Testing of the
Ocean Signal SafeSea E101V EPIRB
In accordance with Cospas-Sarsat T.007



Product Service

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REPORT ON

Emergency Beacons Testing of the
Ocean Signal
SafeSea E101V EPIRB

Document 75931777 Report 04 Issue 1

December 2015

PREPARED FOR

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DATED

24 December 2015





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CONTENTS

Section	Page No
1	REPORT SUMMARY 3
1.1	Introduction 4
1.2	Application Form 5
1.3	Product Information 12
1.4	Modifications 16
1.5	Report Modification Record 16
2	TEST DETAILS 17
2.1	Digital Message 29
2.2	Modulation 33
2.3	Spurious Emission into 50 Ohms 36
2.4	406 MHz VSWR Check 38
2.5	Self-test Modes 45
2.6	Thermal Shock 50
2.7	Operating Lifetime at Minimum Temperature 55
2.8	Frequency Stability Test with Temperature Gradient 74
2.9	Satellite Qualitative Tests 80
2.10	Beacon Antenna Test 84
2.11	Navigation System Test 87
3	TEST EQUIPMENT USED 94
3.1	Test Equipment 95
4	PHOTOGRAPHS 98
4.1	Photographs of Equipment Under Test (EUT) 99
5	ACCREDITATION, DISCLAIMERS AND COPYRIGHT 108
5.1	Accreditation, Disclaimers and Copyright 109
ANNEX A	Customer Supplied Information A.2



Product Service

SECTION 1

REPORT SUMMARY

Emergency Beacons Testing of the
Ocean Signal
SafeSea E101V EPIRB



Product Service

1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Emergency Beacon Testing of the Ocean Signal SafeSea E101V EPIRB to the requirements of Cospas-Sarsat T.007.

Objective	To perform Emergency Beacon Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	Ocean Signal
Model Number(s)	SafeSea E101V EPIRB
Beacon model hardware part number (P/N) and version	900S-01864, issue 01.00
Beacon model software/firmware P/N, version	500S-01863, issue 01.00
Beacon model printed circuit board P/N and version	101S-01530, issue 01.00
Serial Number(s)	0800002P 0800003P
Number of Samples Tested	2
Test Specification/Issue/Date	Cospas-Sarsat T.007 Issue 4 - Rev 9 October 2014
Incoming Release Date	Application Form 14 September 2015
Date of Receipt of Test Samples	10 September 2015
Order Number Date	PO 01976 27 August 2015
Start of Test	26 September 2015
Finish of Test	21 November 2015
Name of Engineer(s)	M Hardy T Guy
Related Documents	Cospas-Sarsat T.001 Issue 3 Revision 15 October 2014 Cospas-Sarsat T.IP (TCXO) Issue 1 Revision 5 October 2013



Product Service

1.2 APPLICATION FORM

G - 1

C/S T.007

ANNEX G

APPLICATION FOR A COSPAS-SARSAT 406 MHz BEACON TYPE APPROVAL CERTIFICATE

G.1 Beacon Manufacturer and Beacon Model

Beacon Manufacturer	Ocean Signal Ltd.
Beacon Model	SafeSea E101V
Other Model Names	X-VDR FF-AMI

Beacon Type and Operational Configurations

Beacon Type	Beacon used while:	Tick where appropriate
EPIRB Float Free	Floating in water or on deck or in a safety raft	☐
EPIRB Non-Float Free (automatic and manual activation)	Floating in water or on deck or in a safety raft	☐
EPIRB Non-Float Free (manual activation only)	Floating in water or on deck or in a safety raft	☐
EPIRB Float Free with VDR	Floating in water or on deck or in a safety raft	☒
PLB	On ground and above ground	☐
	On ground and above ground and floating in water	☐
ELT Survival	On ground and above ground	☐
	On ground and above ground and floating in water	☐
ELT Auto Fixed	Fixed ELT with aircraft external antenna	☐
ELT Auto Portable	In aircraft with an external antenna	☐
	On ground, above ground, or in a safety raft with an integrated antenna	☐
ELT Auto Deployable	Deployable ELT with attached antenna	☐
Other (specify)		☐

Relating to: TÜV SÜD Report 75931777 Report 04

Beacon Characteristics

Characteristic	Specification
Operating frequency	406.040MHz
Operating temperature range	$T_{min} = -20^{\circ}\text{C}$ $T_{max} = +55^{\circ}\text{C}$
Temperature, at which minimum duration of continuous operation is expected	-20°C
Operating lifetime	168 hours
Beacon power supply type (internal, external, combined, other)	Internal
External power supply parameters (AC/DC and nominal voltage)	N/A
Is external power supply needed to energise the beacon or its ancillary devices in any of operation modes (N/A or Yes or No)	N/A
Battery cell chemistry	Lithium Manganese Dioxide
Battery cell model name, size and number of cells in a battery pack, and details of the battery pack electrical configuration	Ultralife U10013 'D' cells, 3 cells, series connected

Characteristic	Specification
Battery cell manufacturer	Ultralife
Battery pack manufacturer and part number	Ocean Signal Ltd, 901S-01741
Beacon manufacturers declared maximum allowed cell shelf-life (from date of cell manufacture to date of battery pack installation in the beacon)	2years
Declared beacon battery replacement period (from date of installation in the beacon to expiry date marked on the beacon)	8years
Oscillator type (e.g. OCXO, MCXO, TCXO)	TCXO
Oscillator manufacturer	Rakon Limited
Oscillator part name and number	E5344LF
Oscillator satisfies long-term frequency stability requirements (Yes or No)	Yes
Antenna type: Integral or Other (e.g. External, Detachable – specify type)	Integral
Antenna manufacturer	Ocean Signal Ltd.
Antenna part name and number	Ocean Signal Ltd.
Antenna cable assembly min/max RF- losses at 406 MHz, if applicable	N/A
Navigation device type (Internal, External or None)	Internal
Features in beacon that prevent degradation to 406 MHz signal or beacon lifetime resulting from a failure of navigation device or failure to acquire position data (Yes, No, or N/A)	Yes
Features in beacon that ensures erroneous position data is not encoded into the beacon message (Yes, No or N/A)	Yes
Navigation device capable of supporting global coverage (Yes, No or N/A)	Yes
Encoded position update capability (Yes, No, N/A)	Yes

Relating to: TÜV SÜD Report 75931777 Report 04

G - 3

C/S T.007

Encoded position update interval value (range)	
For Internal Navigation Devices	
- Geodetic reference system (WGS 84 or GTRF)	WGS-84
- GNSS receiver cold start forced at every beacon activation (Yes or No)	Yes
- Navigation device manufacturer	Quectel
- Navigation device model name and part Number	L70
- Internal navigation device antenna type (integrated, internal, external, passive/active), manufacturer and model	Internal, AEL Crystal Ltd., DAE1575R1820A
- GNSS system supported (e.g. GPS, GLONASS, Galileo)	GPS

Characteristic	Specification	
For External Navigation Devices	N/A	
- Data protocol for GNSS receiver to beacon interface		
- Physical interface for beacon to navigation device		
- Electrical interface for beacon to navigation device		
- Part number of the external navigation interface device (if applicable)		
- Navigation device model and manufacturer (if beacon designed to use specific devices)		
Self-Test Mode Characteristics	Self-Test Mode	Optional GNSS Self-Test Mode
- Activated by a separate switch / separate switch positions (Yes / No)	Yes	Yes
- Self-test / GNSS self-test mode switch automatically returns to normal position when released (Yes or No)	Yes	
- Self-test / GNSS activation can cause an operational mode transmission (Yes or No)	Yes	No
- Results in transmission of a single self-test burst only, regardless of how long the self-test activation mechanism is applied (yes or No)	Yes	N/A
- Results of self-test /GNSS self-test indicated by (provide details, e.g Pass /Fail indicator l, strobe light, etc.)	indicator LED Strobe light	indicator LED Strobe light
- The content of the encoded position data fields of the self-test message has default values	Yes	N/A
- Performs an internal check and indicates that RF power emitted at 408 MHz and 121.5 MHz, if beacon includes a 121.5 MHz homer (Yes or No)	Yes	N/A
- Self-test results in transmission of a signal other than at 408 MHz (Yes & details or No)	Yes, 121.5MHz	No
- Self-test can be activated directly at beacon (Yes or No)	Yes	Yes
- List of Items checked by self-test	408 Power, Synth,	GPS receiver

Relating to: TÜV SÜD Report 75931777 Report 04

G - 4

C/S T.007

	121.5 Power Battery Status	
- Self-test / GNSS self-test 406 MHz burst duration (440 or 520 ms)	520ms	N/A
- Self-test message length format flag in bit 25, bit ("0" or "1")	0	N/A
- Maximum duration of a self-test mode, sec	16.5Secs	315.5Secs
- Maximum recommended number of self-tests during battery pack replacement period	72	N/A
- Distinct indication of self-test start (Yes/No)	Yes	Yes
- Indication of self-test results (Yes/No)	Yes	Yes
- Distinct indication of insufficient battery capacity (Yes or No)	Yes	N/A
- Automatic termination of self-test mode immediately after completion of the self-test cycle (Yes or No)	Yes	Yes
- Maximum number of GNSS Self Tests (beacons with internal navigation devices only)	N/A	12
- GNSS Self-test results in transmission of a single burst, irrespective of the test result (Yes or No)	N/A	No
- Maximum number of self-tests during battery pack replacement period	≤280	N/A
- Self-test / GNSS self-test can be activated from beacon remote activation points (Yes & details or No)	No	No
List all methods of self-test mode and GNSS self-test mode activation. Provide details on a separate sheet to describe.	Test key only	Test key only

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Characteristic	Specification
Message Coding Protocols:	(x) Tick the boxes below against the intended protocol options
User Protocol (tick where appropriate)	☐ Maritime with MMSI
	☐ Maritime with Radio Call Sign
	☐ EPIRB Float Free with Serial Number
	☐ EPIRB Non Float Free with Serial Number
	☐ Radio Call Sign
	☐ Aviation
	☐ ELT with Serial Number
	☐ ELT with Aircraft Operator and Serial Number
	☐ ELT with Aircraft 24-bit Address
	☐ PLB with Serial Number
	☐ National (Short Message Format)
	☐ National (Long Message Format)
Standard Location Protocol (tick where appropriate)	☒ EPIRB with MMSI
	☒ EPIRB with Serial Number
	☐ ELT with 24-bit Address
	☐ ELT with Aircraft Operator Designator
	☐ ELT with Serial Number
National Location Protocol (tick where appropriate)	☐ PLB with Serial Number
	☒ National Location: EPIRB
	☐ National Location: ELT
RLS Location Protocol (tick where appropriate) ¹	☐ National Location: PLB
	☐ EPIRB
	☐ ELT
User Location Protocol (tick where appropriate)	☐ PLB
	☒ Maritime with MMSI
	☒ Maritime with Radio Call Sign
	☒ EPIRB Float Free with Serial Number
	☒ EPIRB Non Float Free with Serial Number
	☒ Radio Call Sign
	☐ Aviation
	☐ ELT with Serial Number
	☐ ELT with Aircraft Operator and Serial Number
	☐ ELT with Aircraft 24-bit Address
☐ PLB with Serial Number	

¹ RLS protocols will be effective as of 1 November 2015. The use of RLS-enabled beacons will be regulated by national administrations.

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Product Service

G - 6

C/S T.007

Characteristic	Specification
Beacon includes a homer transmitter(s) (Yes or No)	Yes
-Homer transmitter(s) frequency	121.5MHz
-Homer transmit(s) power	20dBm $\pm$ 2dB
-Homer transmitter(s) duty cycle	97%
-Duty cycle of homer swept tone	34%
Beacon includes a high intensity flashing light (e.g. Strobe)	Yes
-light intensity	>0.5cd
-flash rate	2.5Secs
Beacon transmission repetition period satisfies C/S T.001 requirement that two beacon's repetition periods are not synchronised closer than a few seconds over 5 minute period, and the time intervals between transmissions are randomly distributed on the interval 47.5 to 52.5 seconds (Yes or No)	Yes
Other ancillary devices (e.g. voice transceiver, remote control, external audio and light indicators, external activation device). List details on a separate sheet if insufficient space to describe.	None
Beacon includes automatic activation mechanism (Yes or No) Specify type of automatic beacon activation mechanism	Yes, Water activation
Beacon includes features and functions not listed above, related or non-related to 406 MHz (Yes or No) List features and use a separate sheet if insufficient space	VDR data recorder module completely separated from EPIRB electronics and fully isolated from the EPIRB power supply
Beacon model hardware part number (P/N) and version	900S-01864, issue 01.00
Beacon model software/firmware P/N, version, date of issue / releases	500S-01863, issue 01.00
Beacon model printed circuit board P/N and version	101S-01530, issue 01.00
Known non-compliances with C/S T.001 requirements (Yes or No) If Yes, provide details (or use a separate sheet if insufficient space)	No
Beacon Manufacturer Point of Contact (POC) for this Type Approval application:	David Sheekey Product and Approvals Manager david.sheekey@oceansignal.com +44 (0)1643 282930

Dated:

Signed: 
(Simon Nolan, Chief Technical Officer)

Relating to: TÜV SÜD Report 75931777 Report 04



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Information Provided by the Cospas-Sarsat Accepted Test Facility

Name and Location of Beacon Test Facility: TUV SUD Product Service, Fareham, UK

Date of Submission for Testing: 10 September 2015

Applicable Test Standards:

Document	Issue	Revision	Date
C/S T.001	3	15	Oct 2014
C/S T.007	4	9	Oct 2014
IP (TCXO)	-	5	Oct 2013

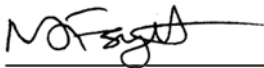
I hereby confirm that the 406 MHz beacon described above has been successfully tested in accordance with the Cospas-Sarsat Type Approval Standard (C/S T.007) and complies with the Specification for Cospas-Sarsat 406 MHz Distress Beacons (C/S T.001) as demonstrated in the attached report, with the exception of the non-compliances indicated below.

Detail any observed non-compliances and/or deviations from standard test procedures here:

Non-Compliances:

Deviations: the Operating Lifetime test was carried out in accordance with IEC61097-2 clause 5.15.1: an additional soak at -30°C was carried out prior to the requirements of T.007, clause A.2.3 at -20°C.

There were no other deviations from standard test procedures during the test program.

Signed: 

Name: Nic Forsyth

Position Held: Authorised Signatory

Date: 24 December 2015

1.3 PRODUCT INFORMATION

1.3.1 Technical Description

The Equipment Under Test (EUT) was a Ocean Signal SafeSea E101V EPIRB as shown in the photograph below. A full technical description can be found in the manufacturer's documentation.



Equipment Under Test

The following is a list of equipment provided by the manufacturer for Type Approval Testing:

Description	Manufacturer	Model	S/No./Version
Automatic Release Housing	Ocean Signal	ARH101	N/A
EPIRB with VDR (Modified Conducted Output)	Ocean Signal	E101V	0800002P
Automatic Release Housing	Ocean Signal	ARH101	N/A
EPIRB with VDR	Ocean Signal	E101V	0800003P
EPIRB programming cable	Ocean Signal	N/A	N/A
Crossover LAN Cable	RS	405-5379	N/A
'BeaconWidget' Programming Software	Ocean Signal	N/A	V01.07



Product Service

Physical Test Configuration

The Equipment Under Test (EUT) was operated using its own power source (internal battery). One EUT was configured so that the antenna port was connected to the 50Ω test system using a coaxial cable. The test configuration for all tests is identical with the exception of Antenna Characteristics, Satellite Qualitative and Navigation Tests.

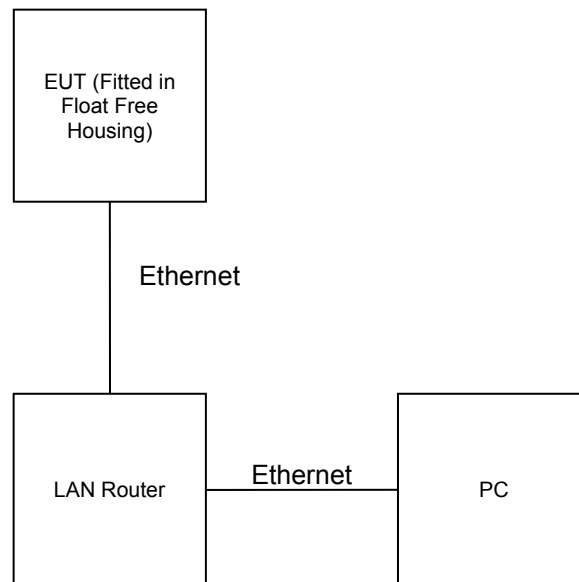
The second EUT was a fully packaged beacon, similar to the proposed production beacons equipped with its proper antenna. This EUT was used to perform Antenna Characteristics, Satellite Qualitative and Navigation Tests. The test configuration for these tests is a function of the beacon type and the operational environments supported by the beacon, as declared by the manufacturer.

For Configuration 1 (see System Configurations below), the EUT was fitted into a manufacturer supplied Float Free Housing (see Photographs in Section 4). The EUT also incorporated a VDR module, which in accordance with the manufacturers' information, is completely electrically isolated from the main EUT. To ensure that the VDR module did not affect EUT performance in any way, the VDR input was connected to an artificial network during battery current measurements. The manufacturer has declared that the EUT should not be activated whilst in the Float Free Housing. Therefore current measurements applied to Standby and Self Test modes only.

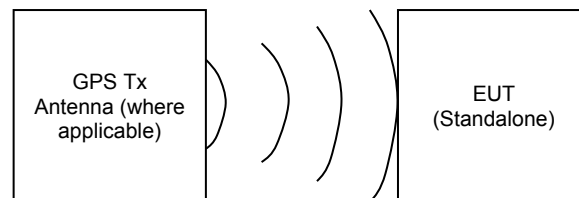
The physical configurations for tests within this report are as follows:

- 1) EUT fitted in manufacturer supplied Float Free Housing, with VDR module networked to test PC for:
 - Battery Current Measurements (Standby and Self-Test modes only)
- 2) EUT 'standalone' – no ancillaries connected to the EUT, VDR module inactive for:
 - Electrical and Functional Tests at Constant Temperature
 - Thermal Shock
 - Operating Lifetime at Minimum Temperature
 - Frequency Stability Test with Temperature Gradient
 - Satellite Qualitative
 - Beacon Antenna Test
 - Navigation System
 - Battery Current Measurements

System Configurations



Configuration 1 (Battery Current Measurements Only)



Configuration 2 (All other tests)



Product Service

1.3.2 Modes of Operation

Modes of operation of the EUT during testing were as follows:

Off/Standby Mode

- Main switch to “OFF” position
- No apparent activity

Self-test

- Test switch to “TEST” position for 2 seconds (approx)
- List of items checked as per Customer Supplied Information (Application Form)
- Navigation data applied at ambient temperature

GNSS Self-test

- Test switch to “TEST” position for 10 seconds (approx)
- List of items checked as per Customer Supplied Information (Application Form)
- Navigation data applied as applicable (e.g. none applied for timeout, data applied for ‘fast acquisition’)

Operating

- Main switch to “ON” position
- 121 Homer active and offset
- GPS operating in normal duty cycle for the following navigation input conditions
- No navigation data applied

All modes

All mode descriptions are applicable to all tests unless otherwise stated. Additional methods of activation include:

- Water contacts

All Navigation input descriptions are applicable to all tests unless otherwise stated.

During the first hour of operation, the manufacturers’ information states that in the absence of an external GPS signal, the EUT’s internal GPS receiver has the following duty cycle:

- ON for 5 minutes
- OFF for 5 minutes.

For the Electrical and Functional Tests at Constant Temperature, listed in section A.2.1 of T.007 (excluding spurious output and self-test modes), measurements were performed for 20 minutes (after a 15 minute warm up period). This ensured that measurements were made during periods when the internal GPS receiver of the EUT was active and inactive. Spurious output measurements were made over a 20 hour period, during which, the Climatic test chamber was set to Ambient, +55°C, and -20°C.



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1.4 MODIFICATIONS

Modification 0 - No modifications were made to the test sample during testing.

1.5 REPORT MODIFICATION RECORD

Issue 1 – First Issue



Product Service

SECTION 2

TEST DETAILS

Emergency Beacons Testing of the
Ocean Signal
SafeSea E101V EPIRB



Product Service

TEST RESULTS TABLE

Parameters to be Measured	Range of Specification	Units	Test Results			Comments	
			Tmin	Tamb	Tmax		
			(-20°C)	(+21°C)	(+55°C)		
1. Power Output						Result: Pass	
Model: SafeSea E101V EPIRB, S/N: 0800002P, TUV Ref: TSR13 and Modification State 0							
Transmitter power output	(maximum)	35 - 39	dBm	37.35	37.23	37.47	
	(minimum)			37.32	37.19	37.44	
Power output rise time	(maximum)	< 5	ms	0.42	0.52	0.51	
	(minimum)			0.40	0.51	0.49	
Power output 1ms before burst	(maximum)	< -10	dBm	-16.60	-18.05	-18.71	
	(minimum)			-17.24	-18.78	-19.52	
2. Digital Message Coding						Result: Pass	
Model: SafeSea E101V EPIRB, S/N: 0800002P, TUV Ref: TSR13 and Modification State 0							
Bit Sync	1 - 15	15 bits "1"	P / F	P	P	P	
Frame sync	16 - 24	"000101111"	P / F	P	P	P	
Format flag	25	1 bit	bit value	1	1	1	
Protocol flag	26	1 bit	bit value	0	0	0	
Identification / position data	27 - 85	59 bits	P / F	P	P	P	
BCH code	86 -106	21 bits	P / F	P	P	P	
Emerg. Code/nat. use/supplem. Data	107 - 112	6 bits	bit value	110111	110111	110111	
Additional data / BCH (if applicable)	112 - 144	32 bits	P / F	P	P	P	
Position Error (if applicable)		< 5	km	n/a	n/a	n/a	



Product Service

Parameters to be Measured	Range of Specification	Units	Test Results			Comments
			Tmin	Tamb	Tmax	
			(-20°C)	(+21°C)	(+55°C)	
3. Digital Message Generator						Result: Pass
Model: SafeSea E101V EPIRB, S/N: 0800002P, TUV Ref: TSR13 and Modification State 0						
Repetition rate, T _R :						
Average T _R	48.5 ≤ T _{Ravg} ≤ 51.5	seconds	50.166	50.209	50.209	
Minimum T _R	47.5 ≤ T _{Rmin} ≤ 48.0	seconds	47.705	47.721	47.705	
Maximum T _R	52.0 ≤ T _{Rmax} ≤ 52.5	seconds	52.011	52.026	52.026	
Standard deviation	0.5 - 2.0	seconds	1.44	1.44	1.44	
Bit rate						
Minimum fb	≥ 396	bits/sec	400.10	400.10	400.10	
Maximum fb	≤ 404	bits/sec	400.12	400.12	400.12	
Total transmission time						
Short message	(maximum)	435.6 - 444.4	ms	n/a	n/a	n/a
	(minimum)			n/a	n/a	n/a
Long message	(maximum)	514.8 - 525.2	ms	518.92	518.95	518.98
	(minimum)			518.87	518.89	518.91
Unmodulated carrier						
Minimum T1	≥ 158.4	ms	159.97	159.97	159.97	
Maximum T1	≤ 161.6	ms	160.03	160.03	160.04	
First burst delay	≥ 47.5	seconds	50	50	50	



Product Service

Parameters to be Measured	Range of Specification	Units	Test Results			Comments
			Tmin	Tamb	Tmax	
			(-20°C)	(+21°C)	(+55°C)	
4. Modulation						Result: Pass
Model: SafeSea E101V EPIRB, S/N: 0800002P, TUV Ref: TSR13 and Modification State 0						
Biphase-L	P / F	P / F	P	P	P	
Rise time	(maximum)	50 - 250	µs	152.4	153.3	152.4
	(minimum)	50 - 250	µs	136.3	136.3	136.3
Fall time	(maximum)	50 - 250	µs	166.7	167.6	163.6
	(minimum)	50 - 250	µs	152.7	151.7	149.6
Phase deviation: positive	(maximum)	+(1.0 to 1.2)	radians	1.1969	1.1886	1.1990
	(minimum)	+(1.0 to 1.2)	radians	1.0466	1.0400	1.0674
Phase deviation: negative	(maximum)	-(1.0 to 1.2)	radians	-1.1789	-1.1981	-1.1770
	(minimum)	-(1.0 to 1.2)	radians	-1.0278	-1.0545	-1.0500
Symmetry measurement		≤ 0.05		0.0219	0.0222	0.0230
5. 406 MHz Transmitted Frequency						Result: Pass
Model: SafeSea E101V EPIRB, S/N: 0800002P, TUV Ref: TSR13 and Modification State 0						
Nominal Value	(maximum)	C/S T.001	MHz	406.039989	406.0399845	406.039970
	(minimum)			406.039989	406.0399845	406.039969
Short-term stability	(maximum)	≤ 2x10 ⁻⁹	/100ms	87.648E-12	10.760E-11	50.145E-12
	(minimum)			80.974E-12	85.651E-12	36.877E-12
Medium-term stability – Slope	(maximum)	(-1 to +1)x10 ⁻⁹	/minutes	-17.215E-12	35.409E-12	10.164E-11
	(minimum)			-29.585E-12	-15.985E-12	71.551E-12
Medium-term stability – Residual frequency variation	(maximum)	≤ 3x10 ⁻⁹		25.622E-11	25.560E-11	89.679E-12
	(minimum)			24.214E-11	11.571E-11	66.072E-12
6. Spurious Emissions into 50ohms						Result: Pass
Model: SafeSea E101V EPIRB, S/N: 0800002P, TUV Ref: TSR13 and Modification State 0						
In band (406.0 – 406.1 MHz)	C/S T.001 mask	P / F	P			



Product Service

Parameters to be Measured	Range of Specification	Units	Test Results			Comments	
			Tmin	Tamb	Tmax		
			(-20°C)	(+21°C)	(+55°C)		
7. 406 MHz VSWR Check						Result: Pass	
Model: SafeSea E101V EPIRB, S/N: 0800002P, TUV Ref: TSR13 and Modification State 0							
Nominal Value	(maximum)	C/S T.001	MHz	406.039989	406.0399845	406.039970	
	(minimum)			406.039989	406.0399843	406.039970	
Modulation rise time	(maximum)	50-250	µs	152.3	151.3	148.4	
	(minimum)	50-250	µs	137.3	136.4	134.4	
Modulation fall time	(maximum)	50-250	µs	168.6	165.7	162.6	
	(minimum)	50-250	µs	152.6	151.7	149.7	
Modulation phase deviation: positive	(maximum)	+ (1.0 to 1.2)	radians	1.1996	1.1831	1.1846	
	(minimum)	+ (1.0 to 1.2)	radians	1.0504	1.0400	1.0765	
Modulation phase deviation: negative	(maximum)	- (1.0 to 1.2)	radians	-1.1846	-1.1950	-1.1726	
	(minimum)	- (1.0 to 1.2)	radians	-1.0187	-1.0476	-1.0645	
Modulation symmetry measurement		≤ 0.05		0.0226	0.0222	0.0218	
Digital Message		correct	P / F	P	P	P	



Product Service

Parameters to be Measured	Range of Specification	Units	Test Results			Comments
			Tmin	Tamb	Tmax	
			(-20°C)	(+21°C)	(+55°C)	
8(a). Self-test Mode						Result: Pass
Model: SafeSea E101V EPIRB, S/N: 0800002P, TUV Ref: TSR13 and Modification State 0						
Frame sync	011010000	P / F	P	P	P	Applicant's data: see Annex A
Format flag	1 / 0	bit value	1	1	1	
Single radiated burst	≤440 / 520 (±1%)	ms	518.930	518.931	518.961	
Default position data (if applicable)	correct	P / F	P	P	P	
Description	provided	Y / N	Y			
Design data on protection against repetitive self-test mode transmissions	provided	Y / N	Y			
Single burst verification	one burst	P / F	P	P	P	
Provides for 15 Hex ID	correct	P / F	P	P	P	
121.5 MHz RF power (if applicable)	verify that RF power emitted	P / F	P	P	P	
406 MHz power	verify that RF power emitted	P / F	P	P	P	
Distinct indication of Self-Test	provided	Y / N	Y	Y	Y	Self Test initiation is indicated by 3 red LED flashes. The manufacturer's operating manual states that the strobe light indicated that RF power has been emitted At Ambient, High and Low temperatures, the Self Test result returned six Amber LED flashes, indicating that the EUT had been previously activated for over 10 hours.
Distinct indication of RF power being emitted	provided	Y / N	Y	Y	Y	
Indication of Self-Test result	provided	Y / N	Y	Y	Y	
Maximum duration of Self-Test mode	≤ maximum duration of Self-Test	sec	13	13	13	
Automatic termination of Self-Test mode upon completion of Self-Test and indication of Self-Test results	verify automatic termination	Y / N	Y	Y	Y	



Product Service

Parameters to be Measured	Range of Specification	Units	Test Results			Comments
			Tmin	Tamb	Tmax	
			(-20°C)	(+21°C)	(+55°C)	
8 (b). GNSS Self-Test Mode (if applicable)						Result: Pass
Model: SafeSea E101V EPIRB, S/N: 0800002P, TUV Ref: TSR13 and Modification State 0						
Frame sync	011010000	P / F	n/a	n/a	n/a	The EUT does not transmit a 406 burst during a GNSS Self-Test. LED indication only.
Format flag	1 / 0	bit value	n/a	n/a	n/a	
Single radiated burst	≤ 520 (+1%)	ms	n/a	n/a	n/a	
Position data (if applicable)	must be within 500m (or 5.25km for User Location Protocol) of the actual position	P / F	n/a	n/a	n/a	Applicant's data: see Annex A
Design data showing how GNSS Self-test is limited in number of transmissions and duration	provided	Y / N		Y		
Single burst verification	one burst	P / F	n/a	n/a	n/a	
121.5 MHz RF power (if applicable)	GNSS self-test checks RF power is emitted	Y / N	N	N	N	
406 MHz power	GNSS self-test checks that RF power is emitted	Y / N	N	N	N	
Maximum duration of GNSS Self-test	Manufacturer to specify value	s	300	300	300	
Actual duration of Self-test with encoded location	Less than maximum duration	s	62	53	45	Manufacturer specified number: 12
Maximum number of GNSS Self-tests (only beacons with internal navigation devices)	Manufacturer to specify number	Number		12		
Distinct indication to register successful completion or failure of the GNSS self-test	must be provided	Y/N	Y	Y	Y	
Distinct indication that a maximum number of GNSS self-tests has been attained after GNSS self-test mode activation and without transmission of a test message of further GNSS receiver current drain	must be provided	Y/N		Y		
						A GNSS Self-Test is initiated by holding the test switch in the test position for 10 seconds. The EUT will display a continuously illuminated red LED, which will briefly flash green every five seconds, whilst the GNSS ST is in progress. If a GPS position is found, the strobe light will flash, and the LED will flash green for a number indicating how many GNSS Self-Tests remain for the operator. If no GPS signal is found within 5 minutes, the strobe light will flash twice, and the LED will flash red, 12 times.
						If further GNSS Self-Tests are attempted, the Red LED will flash whilst the test button is held, to indicate no further tests are available



Product Service

Parameters to be Measured	Range of Specification	Units	Test Results		Comments
9. Thermal Shock					Result: Pass
Model: SafeSea E101V EPIRB, S/N: 0800002P, TUV Ref: TSR13 and Modification State 0					
Soak Temperature	30°C difference	°C	20.0		
Measurement Temperature		°C	-10.0		
Transmitted Frequency	C/S T.001	MHz	Min	Max	
Nominal value			406.0399909	406.0399940	
Short-term stability		/100ms	62.466E-12	12.219E-11	
Medium-term stability – Slope		/min	-41.882E-11	10.340E-12	
Medium-term stability – Residual frequency variation		≤ 3x10 ⁻⁹	60.467E-12	22.022E-11	
Transmitter power output	35 - 39	dBm	37.14	37.39	
Digital message	correct	P/F	P		



Product Service

Parameters to be Measured	Range of Specification	Units	Test Results		Comments
10. Operating Lifetime at Minimum Temperature					Result: Pass
Model: SafeSea E101V EPIRB, S/N: 0800002P, TUV Ref: TSR13 and Modification State 0					
Pre-test battery discharge duration (operating) required		Hours	11.61		Capacity discharge required : 0.4123Ah
Pre-test battery discharge duration (operating) Duration	>24	Hours	18.5		Capacity discharge actual : 06571Ah
Effective Operating Lifetime duration	>24	Hours	214.5 Hours at Tmin = -20°C		End of test taken as 168 hours (Manufacturer declared value)
Transmitted Frequency			214.5 Hours at Tmin = -20°C		
Nominal value	C/S T.001	MHz	Min	Max	Results for MTS-Slope and MTS-Residual, exclude the first 30 mins of data.
Short-term stability	≤ 2x10 ⁻⁹	/100ms	406.0399941	406.0400086	
Medium-term stability – Slope	(-1 to +1)x10 ⁻⁹	/min	34.397E-12	43.629E-11	
Medium-term stability – Residual frequency variation	≤ 3x10 ⁻⁹		-7.13E-11	1.20E-10	
Transmitter power output	35 - 39	dBm	5.82E-11	1.99E-09	
Digital message	correct	P/F	36.42	37.39	
Homer transmitter continuous operation during the lifetime test		hours	P		
			>214.5		
Homer frequency		MHz	Start of Test	End of Test	
Homer peak power level		dBm	121.499	121.499	
Homer transmitter duty cycle		%	18.756	19.37	
			96.8	97.1	



Product Service

Parameters to be Measured	Range of Specification	Units	Test Results				Comments
11. Temperature Gradient (5°C/hr)							Result: Pass
Model: SafeSea E101V EPIRB, S/N: 0800002P, TUV Ref: TSR13 and Modification State 0							
Full Test							
Transmitted Frequency			Min		Max		Data for points A to B, C+15 min to D and E+15 min to F Data for points B to C+15 min and D to E+15 min
Nominal value	C/S T.007	MHz	406.0399687		406.0399971		
Short-term stability	≤ 2x10 ⁻⁹	/100ms	39.496E-12		24.838E-11		
Medium-term stability – Slope	(-1 to +1)x10 ⁻⁹	/min	-3.99E-11		4.15E-11		
	(-2 to +2)x10 ⁻⁹	/min	-1.71E-10		1.71E-10		
Medium-term stability – Residual frequency variation	≤ 3x10 ⁻⁹		36.012E-12		27.957E-11		
Transmitter power output	35 – 39	dBm	36.92		37.43		
Digital message	correct	P/F	P				See test results section (2.8) for result table
Interim TCXO Procedure	correct	P/F	P				
12. Oscillator Aging							
N/A							
Data	provided	Y / N	Y				Applicant's data: see Annex A
13. Protection Against Continuous Transmission							
Description	provided	Y / N	Y				Applicant's data: see Annex A
14. Satellite Qualitative Tests							Result: Pass
Model: SafeSea E101V EPIRB, S/N: 0800003P, TUV Ref: TSR1 and Modification State 0							
Test Configuration	As per C/S T.007		Configuration				
			5	6	7	8	
15 Hex ID Decoded by LUT	correct	P / F	P	-	P	P	
Doppler Location results with error ≤ 5km	≥ 80	%	100	-	92.86	86.66	



Product Service

Parameters to be Measured	Range of Specification	Units	Test Results				Comments
15. Antenna Characteristics							Result: Pass
Model: SafeSea E101V EPIRB, S/N: , TUV Ref: TSR and Modification State							
Test Configuration Polarisation VSWR EIRP _{Loss} EIRP _{maxEOL} EIRP _{minEOL}	As per C/S T.007		Configuration				Detachable Antennas Only
	linear or RHCP		1	2	3	4	
	≤ 1.5		linear	-	-	linear	
			-	-	-	-	
			0.81	-	-	0.81	
	≤ 43		42.8	-	-	41.3	
≥ 32	32.7	-	-	30.6	EIRP _{minEOL} limit decreases to 30 dBm for Configuration 4		
16. Beacon Coding Software							Result: Pass
Model: SafeSea E101V EPIRB, S/N: , TUV Ref: TSR and Modification State							
Sample message for each coding option of the applicable coding types	correct	P / F	P				Manufacturer supplied Information – See Annex A
Sample self-test message for each coding option of the applicable coding types	correct	P / F	P				



Product Service

Parameters to be Measured	Range of Specification	Units	Test Results			Comments
17. Navigation System						Result: Pass
Model: SafeSea E101V EPIRB, S/N: 0800003P, TUV Ref: TSR1 and Modification State 0						
Location protocol	C/S T.001	P / F	National	Standard	User	
Position data default values	correct		P	P	P	
Configuration 5						
Position accuracy - A.3.8.2.1	C/S T.001	m	73.2	73.2	2037.3	
Position Acquisition Time - A.3.8.2.1	<10/1	min	61sec	61sec	61sec	
Position accuracy - A.3.8.2.2	C/S T.001	m	22.7	22.7	1565.4	
Position Acquisition Time - A.3.8.2.2	<10/1	min	61sec	61sec	61sec	
Configuration 7						
Position accuracy - A.3.8.2.1	C/S T.001	m	73.2	73.2	2037.3	
Position Acquisition Time - A.3.8.2.1	<10/1	min	51sec	51sec	51sec	
Position accuracy - A.3.8.2.2	C/S T.001	m	22.7	22.7	1565.4	
Position Acquisition Time - A.3.8.2.2	<10/1	min	51sec	51sec	51sec	
Configuration 8						
Position accuracy - A.3.8.2.1	C/S T.001	m	73.2	73.2	2037.3	
Position Acquisition Time - A.3.8.2.1	<10/1	min	51sec	51sec	51sec	
Position accuracy - A.3.8.2.2	C/S T.001	m	22.7	22.7	1565.4	
Position Acquisition Time - A.3.8.2.2	<10/1	min	51sec	51sec	51sec	
Encoded position data update interval	>20	min	30min 01sec	30min 02sec	30min 02sec	
Position clearance after deactivation	cleared	P / F	P	P	P	
Position data input update interval (as applicable)	20/1	Min	N/A	N/A	N/A	
Position data encoding	correct	P / F	P	P	P	Manufacturer supplied Information – See Annex A
Retained last valid position after navigation input lost	240(±5)	min	240.16	240.16	240.16	
Default position data transmitted after 240(±5) minutes without valid position data	cleared	P / F	P	P	P	Applicant's data, see Annex A for details
Information on protection against beacon degradation due to navigation device, interface or signal failure or malfunction	provided	Y / N	Y			



Product Service

2.1 DIGITAL MESSAGE

2.1.1 Specification

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

2.1.2 Equipment Under Test and Modification State

E101V S/N: 0800002P - Modification State 0

2.1.3 Date of Test

19 October 2015, 20 October 2015 & 22 October 2015

2.1.4 Test Equipment Used

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

2.1.5 Environmental Conditions

Ambient Temperature 22.4 - 23.3°C
Relative Humidity 45.6 - 49.2%



Product Service

2.1.6 Test Results

EUT System Configuration: 2

Test Duration: 20 minutes

No. of bursts: 26

Ambient Temperature

Full 36 hex message	FFFE2F8C9EF9C0637FDFF83D15B783E0F66C
---------------------	--------------------------------------

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - Albania	27-36	0011001001
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	41-64	111110011100000001100011
Latitude Sign: default	65	0
Latitude Degrees: default	66-72	1111111
Latitude Minutes: default	73-74	11
Longitude Sign: default	75	0
Longitude Degrees: default	76-83	11111111
Longitude Minutes: default	84-85	11
BCH 1 Encoded:	86-106	000001111010001010110
BCH 1 Calculated:	N/A	000001111010001010110
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Device: 121.5 MHz homer	112	1
Latitude Offset Sign: default	113	1
Latitude Offset Minutes: default	114-118	00000
Latitude Offset Seconds: default	119-122	1111
Longitude Offset Sign: default	123	1
Longitude Offset Minutes: default	124-128	00000
Longitude Offset Seconds: default	129-132	1111
BCH 2 Encoded:	133-144	011001101100
BCH 2 Calculated:	N/A	011001101100
Composite Latitude: default	N/A	Composite Longitude: default
15 Hex ID:	N/A	193DF380C6FFBFF



Product Service

Low Temperature

Full 36 hex message	FFFE2F8C9EF9C0637FDFF83D15B783E0F66C
---------------------	--------------------------------------

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - Albania	27-36	0011001001
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	41-64	111110011100000001100011
Latitude Sign: default	65	0
Latitude Degrees: default	66-72	11111111
Latitude Minutes: default	73-74	11
Longitude Sign: default	75	0
Longitude Degrees: default	76-83	11111111
Longitude Minutes: default	84-85	11
BCH 1 Encoded:	86-106	000001111010001010110
BCH 1 Calculated:	N/A	000001111010001010110
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Device: 121.5 MHz homer	112	1
Latitude Offset Sign: default	113	1
Latitude Offset Minutes: default	114-118	00000
Latitude Offset Seconds: default	119-122	1111
Longitude Offset Sign: default	123	1
Longitude Offset Minutes: default	124-128	00000
Longitude Offset Seconds: default	129-132	1111
BCH 2 Encoded:	133-144	011001101100
BCH 2 Calculated:	N/A	011001101100
Composite Latitude: default	N/A	Composite Longitude: default
15 Hex ID:	N/A	193DF380C6FFBFF



Product Service

High Temperature

Full 36 hex message	FFFE2F8C9EF9C0637FDFF83D15B783E0F66C
---------------------	--------------------------------------

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - Albania	27-36	0011001001
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	41-64	111110011100000001100011
Latitude Sign: default	65	0
Latitude Degrees: default	66-72	1111111
Latitude Minutes: default	73-74	11
Longitude Sign: default	75	0
Longitude Degrees: default	76-83	11111111
Longitude Minutes: default	84-85	11
BCH 1 Encoded:	86-106	000001111010001010110
BCH 1 Calculated:	N/A	000001111010001010110
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Device: 121.5 MHz homer	112	1
Latitude Offset Sign: default	113	1
Latitude Offset Minutes: default	114-118	00000
Latitude Offset Seconds: default	119-122	1111
Longitude Offset Sign: default	123	1
Longitude Offset Minutes: default	124-128	00000
Longitude Offset Seconds: default	129-132	1111
BCH 2 Encoded:	133-144	011001101100
BCH 2 Calculated:	N/A	011001101100
Composite Latitude: default	N/A	Composite Longitude: default
15 Hex ID:	N/A	193DF380C6FFBFF

Test Summary

The results indicate compliance with Cospas-Sarsat T.007, Clause A.2.1 (b).



Product Service

2.2 MODULATION

2.2.1 Specification

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

2.2.2 Equipment Under Test and Modification State

E101V S/N: 0800002P - Modification State 0

2.2.3 Date of Test

19 October 2015, 20 October 2015 & 22 October 2015

2.2.4 Test Equipment Used

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

2.2.5 Environmental Conditions

Ambient Temperature 22.4 - 23.3°C
Relative Humidity 45.6 - 49.2%

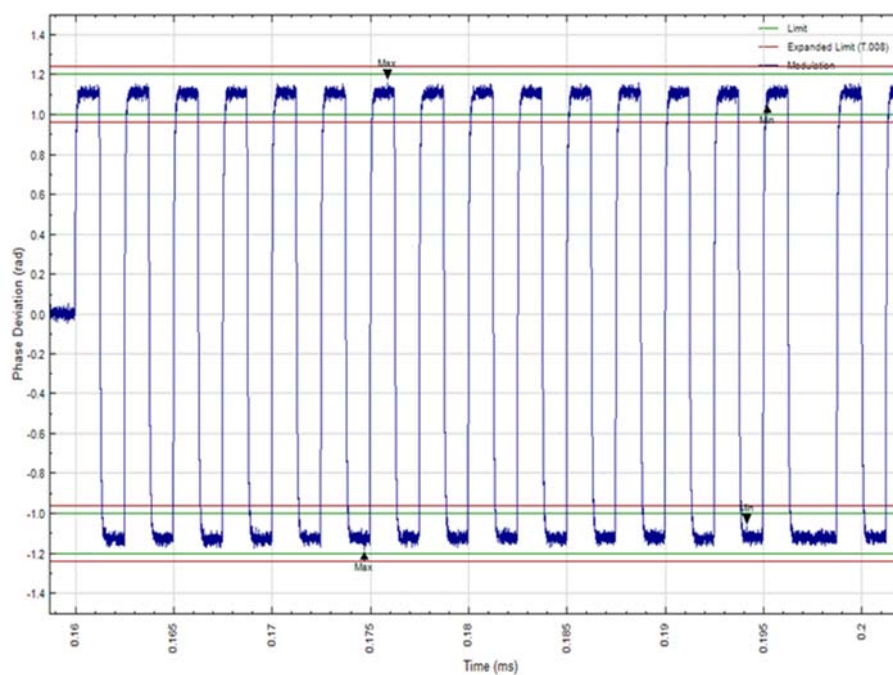
2.2.6 Test Results

EUT System Configuration: 2

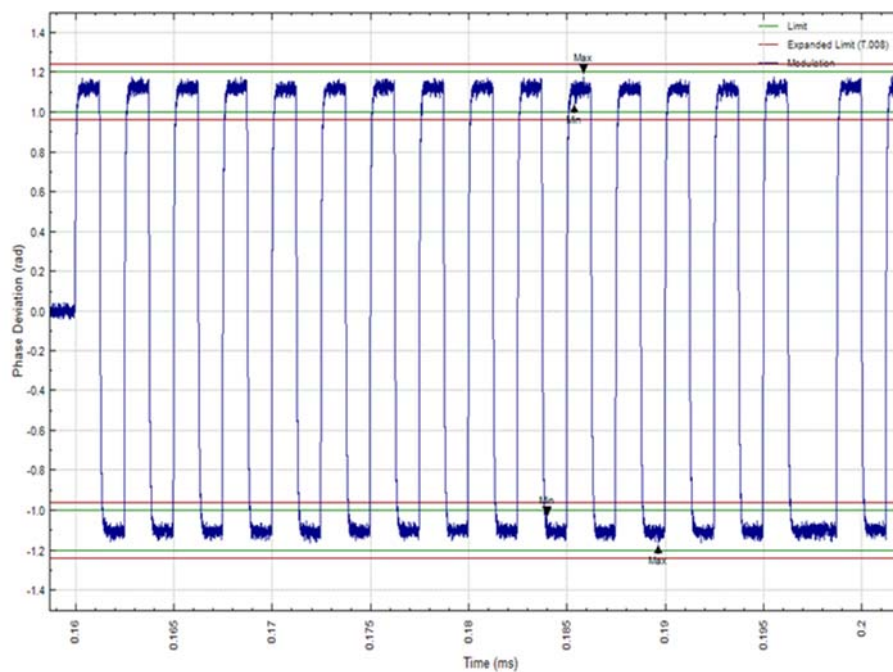
Test Duration: 20 minutes

No. of bursts: 26

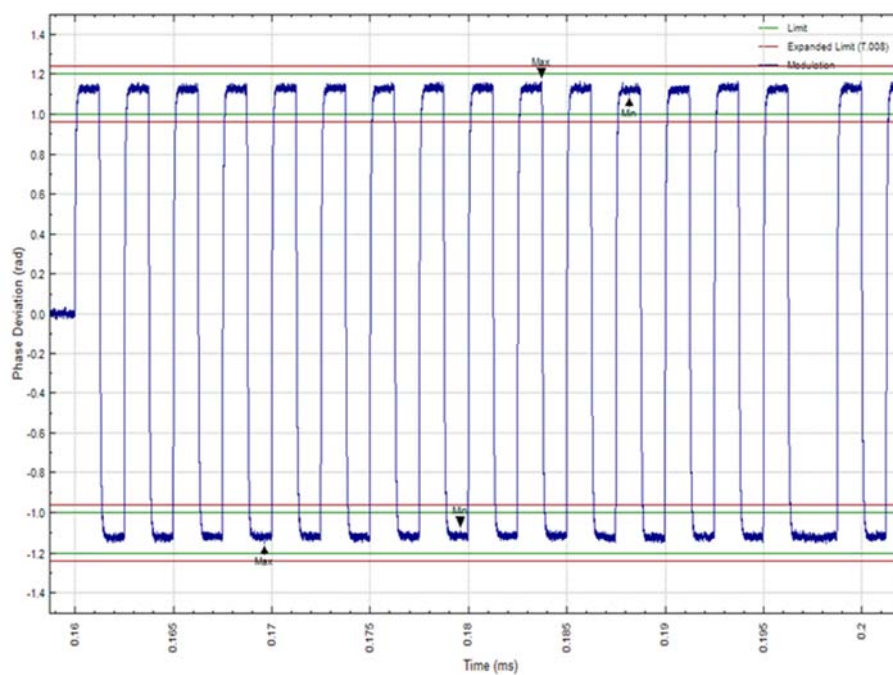
Ambient Temperature



Low Temperature



High Temperature



Test Summary

The results indicate compliance with Cospas-Sarsat T.007, Clause A.2.1 (d).



Product Service

2.3 SPURIOUS EMISSION INTO 50 OHMS

2.3.1 Specification

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

2.3.2 Equipment Under Test and Modification State

E101V S/N: 0800002P - Modification State 0

2.3.3 Date of Test

20 October 2015

2.3.4 Test Equipment Used

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

2.3.5 Environmental Conditions

Ambient Temperature 22.1°C
Relative Humidity 44.6%



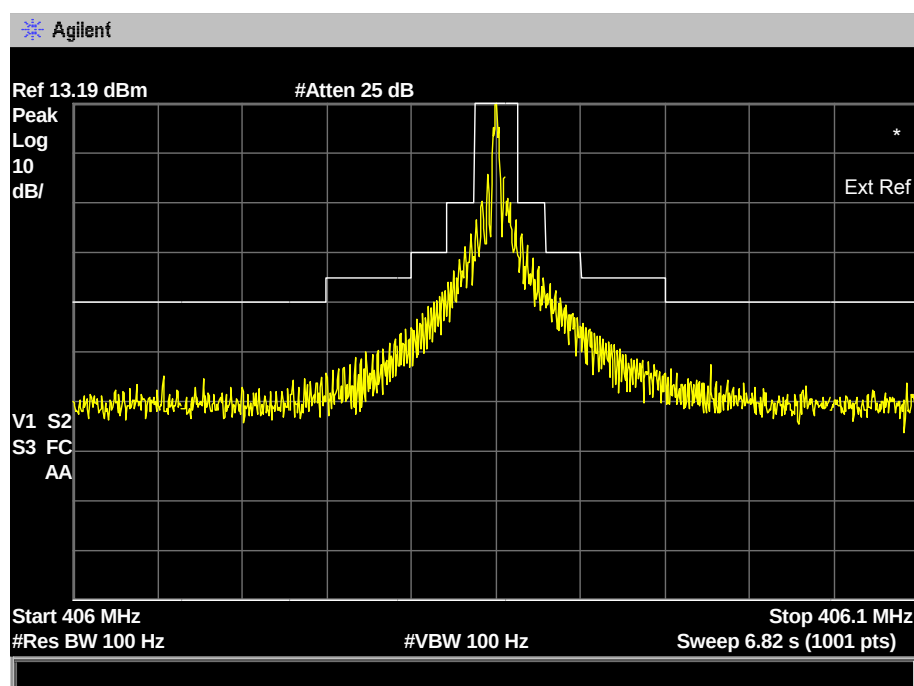
Product Service

2.3.6 Test Results

EUT System Configuration: 2

Test Duration: 20 hours

Combined Ambient, Low and High Temperature



Test Summary

The results indicate compliance with Cospas-Sarsat T.007, Clause A.2.1 (f).



Product Service

2.4 406 MHz VSWR CHECK

2.4.1 Specification

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

2.4.2 Equipment Under Test and Modification State

E101V S/N: 0800002P - Modification State 0

2.4.3 Date of Test

19 October 2015, 21 October 2015 & 22 October 2015

2.4.4 Test Equipment Used

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

2.4.5 Environmental Conditions

Ambient Temperature 22.4 - 23.4°C
Relative Humidity 41.3 - 49.2%



Product Service

2.4.6 Test Results

EUT System Configuration: 2

Test Duration: 20 minutes

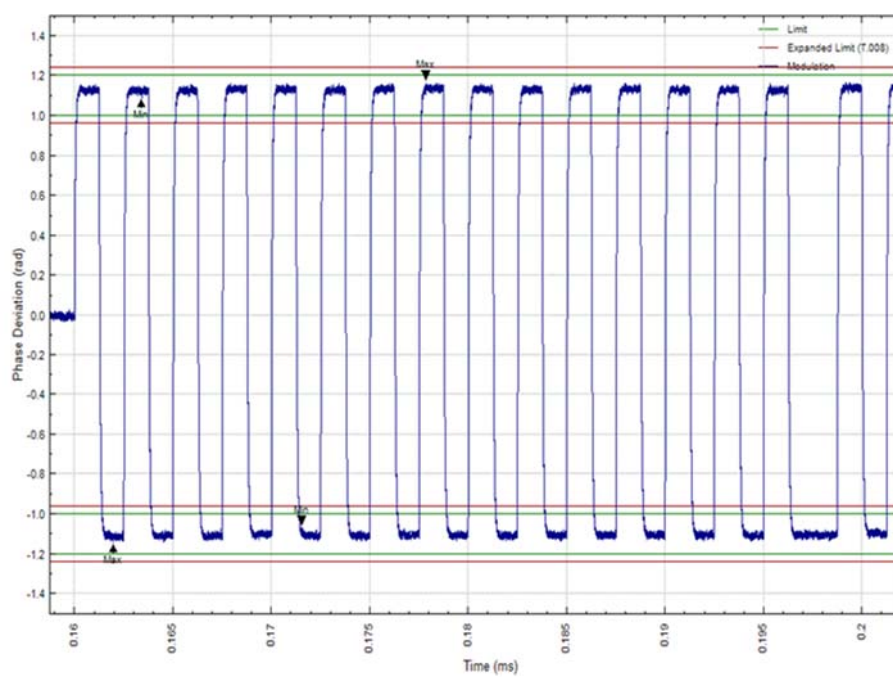
No. of bursts: 26

Ambient Temperature

Full 36 hex message	FFFE2F8C9EF9C0637FDFF83D15B783E0F66C
---------------------	--------------------------------------

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - Albania	27-36	0011001001
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	41-64	111110011100000001100011
Latitude Sign: default	65	0
Latitude Degrees: default	66-72	1111111
Latitude Minutes: default	73-74	11
Longitude Sign: default	75	0
Longitude Degrees: default	76-83	11111111
Longitude Minutes: default	84-85	11
BCH 1 Encoded:	86-106	000001111010001010110
BCH 1 Calculated:	N/A	000001111010001010110
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Device: 121.5 MHz homer	112	1
Latitude Offset Sign: default	113	1
Latitude Offset Minutes: default	114-118	00000
Latitude Offset Seconds: default	119-122	1111
Longitude Offset Sign: default	123	1
Longitude Offset Minutes: default	124-128	00000
Longitude Offset Seconds: default	129-132	1111
BCH 2 Encoded:	133-144	011001101100
BCH 2 Calculated:	N/A	011001101100
Composite Latitude: default	N/A	Composite Longitude: default
15 Hex ID:	N/A	193DF380C6FFBFF

Modulation Plot





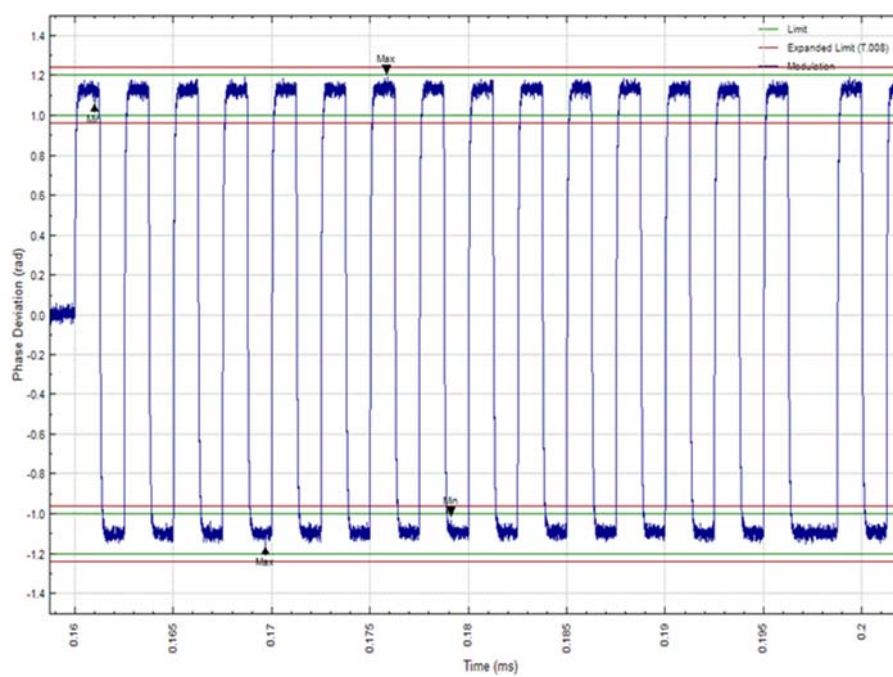
Product Service

Low Temperature

Full 36 hex message	FFFE2F8C9EF9C0637FDFF83D15B783E0F66C
---------------------	--------------------------------------

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - Albania	27-36	0011001001
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	41-64	111110011100000001100011
Latitude Sign: default	65	0
Latitude Degrees: default	66-72	1111111
Latitude Minutes: default	73-74	11
Longitude Sign: default	75	0
Longitude Degrees: default	76-83	11111111
Longitude Minutes: default	84-85	11
BCH 1 Encoded:	86-106	000001111010001010110
BCH 1 Calculated:	N/A	000001111010001010110
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Device: 121.5 MHz homer	112	1
Latitude Offset Sign: default	113	1
Latitude Offset Minutes: default	114-118	00000
Latitude Offset Seconds: default	119-122	1111
Longitude Offset Sign: default	123	1
Longitude Offset Minutes: default	124-128	00000
Longitude Offset Seconds: default	129-132	1111
BCH 2 Encoded:	133-144	011001101100
BCH 2 Calculated:	N/A	011001101100
Composite Latitude: default	N/A	Composite Longitude: default
15 Hex ID:	N/A	193DF380C6FFBFF

Modulation Plot





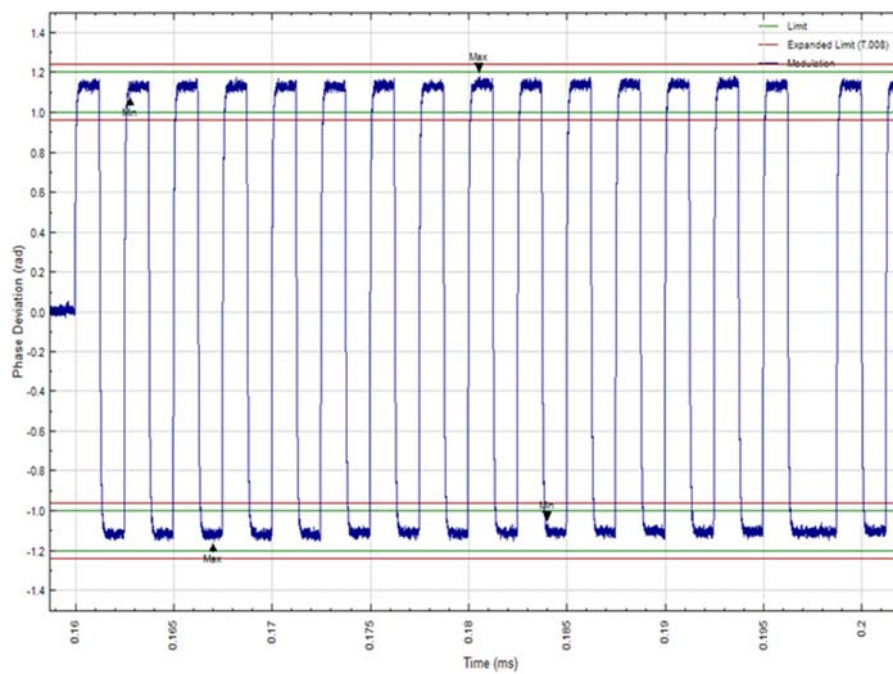
Product Service

High Temperature

Full 36 hex message	FFFE2F8C9EF9C0637FDFF83D15B783E0F66C
---------------------	--------------------------------------

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - Albania	27-36	0011001001
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	41-64	111110011100000001100011
Latitude Sign: default	65	0
Latitude Degrees: default	66-72	11111111
Latitude Minutes: default	73-74	11
Longitude Sign: default	75	0
Longitude Degrees: default	76-83	11111111
Longitude Minutes: default	84-85	11
BCH 1 Encoded:	86-106	000001111010001010110
BCH 1 Calculated:	N/A	000001111010001010110
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Device: 121.5 MHz homer	112	1
Latitude Offset Sign: default	113	1
Latitude Offset Minutes: default	114-118	00000
Latitude Offset Seconds: default	119-122	1111
Longitude Offset Sign: default	123	1
Longitude Offset Minutes: default	124-128	00000
Longitude Offset Seconds: default	129-132	1111
BCH 2 Encoded:	133-144	011001101100
BCH 2 Calculated:	N/A	011001101100
Composite Latitude: default	N/A	Composite Longitude: default
15 Hex ID:	N/A	193DF380C6FFBFF

Modulation Plot



Test Summary

The results indicate compliance with Cospas-Sarsat T.007, Clause A.2.1 (g).



Product Service

2.5 SELF-TEST MODES

2.5.1 Specification

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

2.5.2 Equipment Under Test and Modification State

E101V S/N: 0800002P - Modification State 0

2.5.3 Date of Test

22 October 2015, 23 October 2015 & 21 November 2015

2.5.4 Test Equipment Used

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

2.5.5 Environmental Conditions

Ambient Temperature 23.3 - 23.6°C
Relative Humidity 34.0 - 48.3%



Product Service

2.5.6 Test Results

EUT System Configuration: 2

Ambient Temperature

Full 36 hex message	FF FED08C9E F9C0637F DFF83D15B783E0F66C
---------------------	---

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - Albania	27-36	0011001001
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	41-64	111110011100000001100011
Latitude Sign: default	65	0
Latitude Degrees: default	66-72	1111111
Latitude Minutes: default	73-74	11
Longitude Sign: default	75	0
Longitude Degrees: default	76-83	11111111
Longitude Minutes: default	84-85	11
BCH 1 Encoded:	86-106	000001111010001010110
BCH 1 Calculated:	N/A	000001111010001010110
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Device: 121.5 MHz homer	112	1
Latitude Offset Sign: default	113	1
Latitude Offset Minutes: default	114-118	00000
Latitude Offset Seconds: default	119-122	1111
Longitude Offset Sign: default	123	1
Longitude Offset Minutes: default	124-128	00000
Longitude Offset Seconds: default	129-132	1111
BCH 2 Encoded:	133-144	011001101100
BCH 2 Calculated:	N/A	011001101100
Composite Latitude: default	N/A	Composite Longitude: default
15 Hex ID:	N/A	193DF380C6FFBFF

Note: Self-test at ambient temperature was carried out with navigation data applied.



Product Service

Low Temperature

Full 36 hex message	FF FED08C9E F9C0637F DFF83D15B783E0F66C
---------------------	---

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - Albania	27-36	0011001001
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	41-64	111110011100000001100011
Latitude Sign: default	65	0
Latitude Degrees: default	66-72	1111111
Latitude Minutes: default	73-74	11
Longitude Sign: default	75	0
Longitude Degrees: default	76-83	11111111
Longitude Minutes: default	84-85	11
BCH 1 Encoded:	86-106	000001111010001010110
BCH 1 Calculated:	N/A	000001111010001010110
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Device: 121.5 MHz homer	112	1
Latitude Offset Sign: default	113	1
Latitude Offset Minutes: default	114-118	00000
Latitude Offset Seconds: default	119-122	1111
Longitude Offset Sign: default	123	1
Longitude Offset Minutes: default	124-128	00000
Longitude Offset Seconds: default	129-132	1111
BCH 2 Encoded:	133-144	011001101100
BCH 2 Calculated:	N/A	011001101100
Composite Latitude: default	N/A	Composite Longitude: default
15 Hex ID:	N/A	193DF380C6FFBFF



Product Service

High Temperature

Full 36 hex message	FF FED08C9EF9C0637FDFF83D15B783E0F66C
---------------------	---------------------------------------

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - Albania	27-36	0011001001
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	41-64	111110011100000001100011
Latitude Sign: default	65	0
Latitude Degrees: default	66-72	1111111
Latitude Minutes: default	73-74	11
Longitude Sign: default	75	0
Longitude Degrees: default	76-83	11111111
Longitude Minutes: default	84-85	11
BCH 1 Encoded:	86-106	000001111010001010110
BCH 1 Calculated:	N/A	000001111010001010110
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Device: 121.5 MHz homer	112	1
Latitude Offset Sign: default	113	1
Latitude Offset Minutes: default	114-118	00000
Latitude Offset Seconds: default	119-122	1111
Longitude Offset Sign: default	123	1
Longitude Offset Minutes: default	124-128	00000
Longitude Offset Seconds: default	129-132	1111
BCH 2 Encoded:	133-144	011001101100
BCH 2 Calculated:	N/A	011001101100
Composite Latitude: default	N/A	Composite Longitude: default
15 Hex ID:	N/A	193DF380C6FFBFF

Test Observations:

- Self Test initiation is indicated by 3 red LED flashes.
- The manufacturer's operating manual states that the strobe light indicated that RF power has been emitted.
- 406 and 121 RF output power were confirmed during the test.
- At Ambient, High and Low temperatures, the Self Test result returned six Amber LED flashes, indicating that the EUT had been previously activated for over 10 hours.
- The Self-Test auto terminates on completion of the Self-Test procedure.



Product Service

GNSS Self-test mode

No results other than those stated in the summary table. EUT does not transmit a 406 burst during a GNSS Self-Test, regardless of the GPS input conditions. EUT provides LED indications only.

Test Observations:

- A GNSS Self-Test was initiated by holding the test switch in the test position for 10 seconds. The EUT displayed a continuously illuminated red LED, which briefly flashed green every five seconds, whilst the GNSS ST was in progress. When a GPS position was found, the strobe light flashed, and the LED flashed green for a number indicating how many GNSS Self-Tests remained for the operator. Where no GPS signal was found within 5 minutes, the strobe light flashed twice, and the LED flashed red 12 times.
- Maximum number of GNSS Self-Tests confirmed as 12.
- If further GNSS Self-Tests were attempted, the Red LED flashed whilst the test button was held, to indicate no further tests were available.

Test Summary

The results indicate compliance with Cospas-Sarsat T.007, Clause A.2.1 (h).



Product Service

2.6 THERMAL SHOCK

2.6.1 Specification

Cospas-Sarsat T.007, Clause A.2.2

2.6.2 Equipment Under Test and Modification State

E101V S/N: 0800002P - Modification State 0

2.6.3 Date of Test

22 October 2015

2.6.4 Test Equipment Used

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

2.6.5 Environmental Conditions

Ambient Temperature 23.1°C
Relative Humidity 38.6%

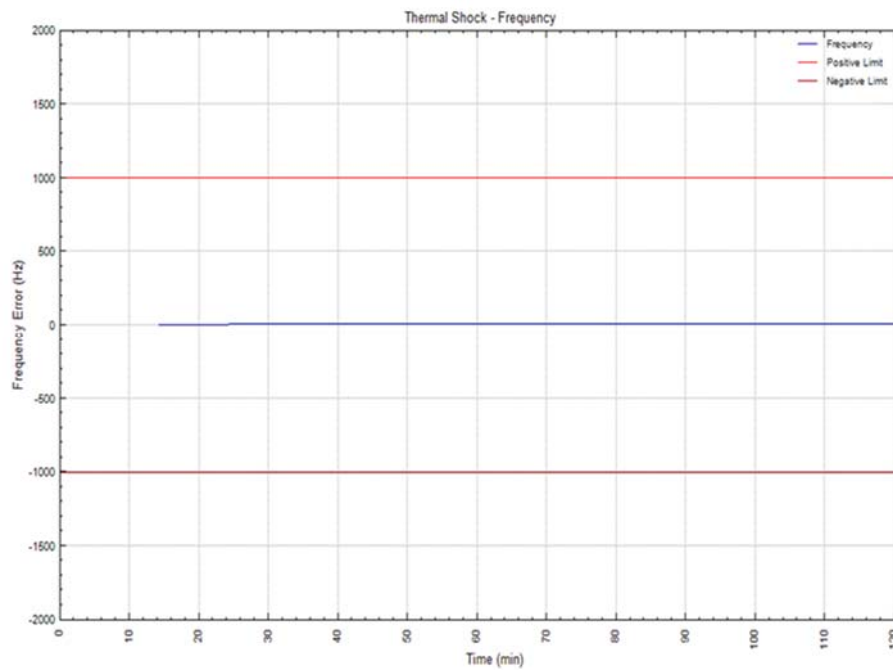
2.6.6 Test Results

EUT System Configuration: 2

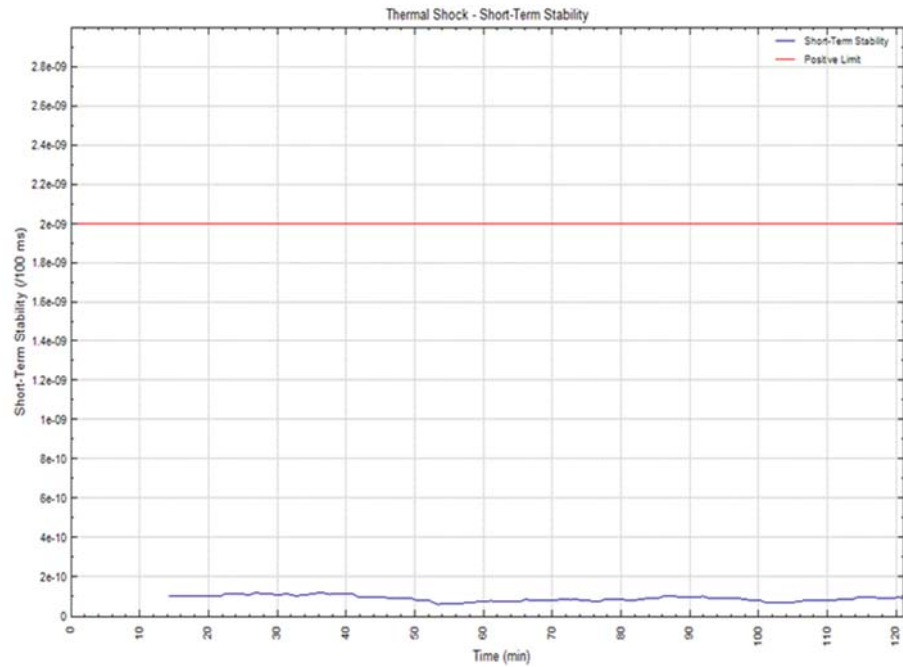
2 hour soak temperature: 20°C.

Test temperature: -10°C.

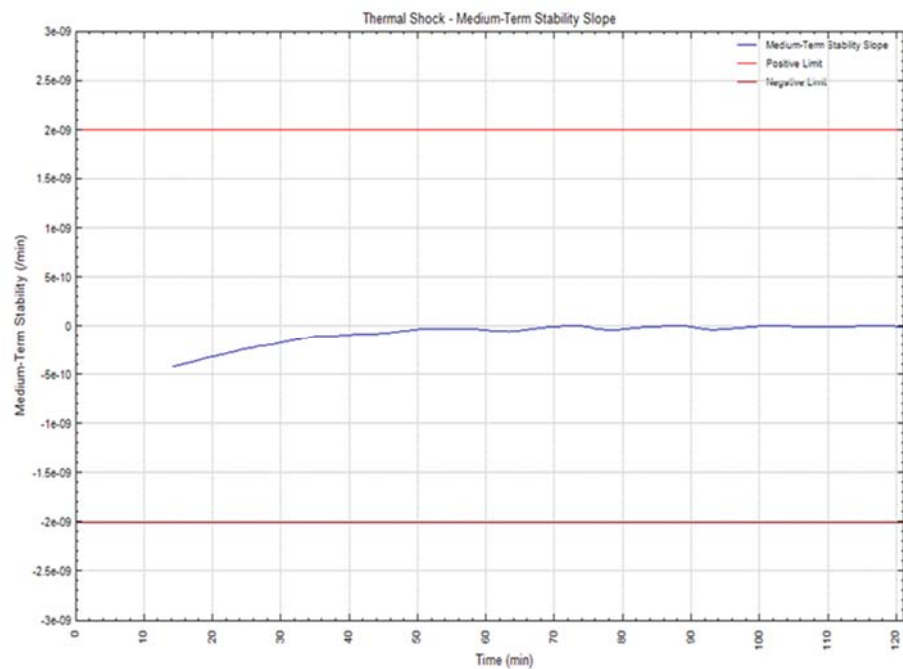
Nominal Frequency



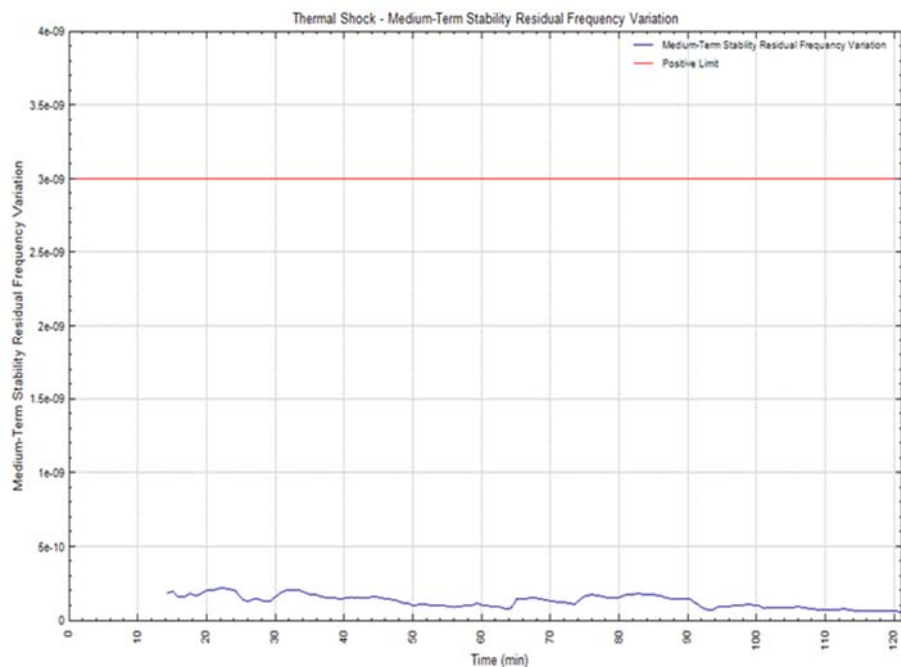
Short Term Stability



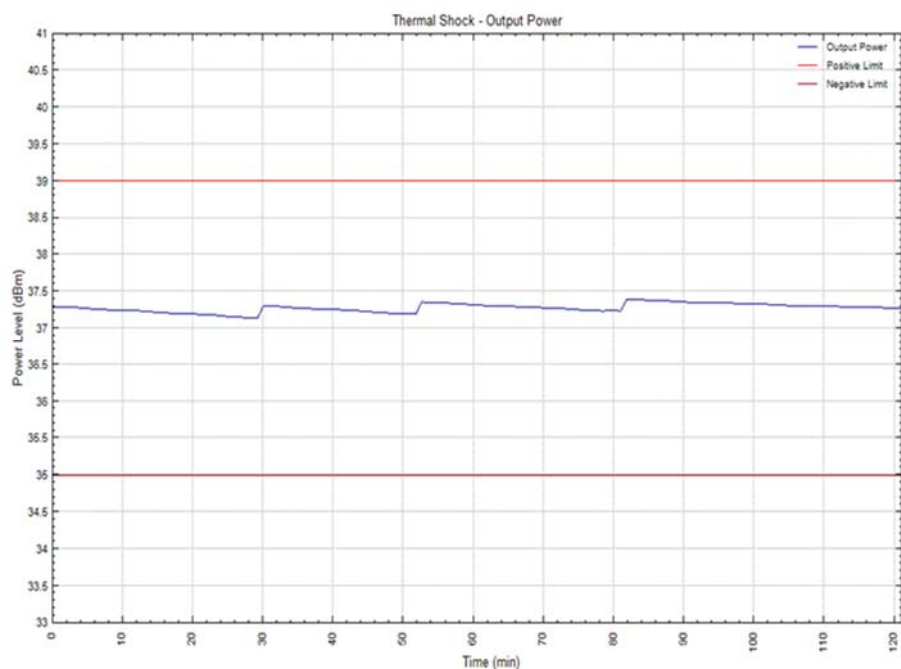
Medium Term Stability, Mean Slope



Medium Term Stability, Residual Frequency Variation



Output Power





Product Service

Digital Message

Full 36 hex message	FFFE2F8C9EF9C0637FDFF83D15B783E0F66C
---------------------	--------------------------------------

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - Albania	27-36	0011001001
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	41-64	111110011100000001100011
Latitude Sign: default	65	0
Latitude Degrees: default	66-72	1111111
Latitude Minutes: default	73-74	11
Longitude Sign: default	75	0
Longitude Degrees: default	76-83	11111111
Longitude Minutes: default	84-85	11
BCH 1 Encoded:	86-106	000001111010001010110
BCH 1 Calculated:	N/A	000001111010001010110
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Device: 121.5 MHz homer	112	1
Latitude Offset Sign: default	113	1
Latitude Offset Minutes: default	114-118	00000
Latitude Offset Seconds: default	119-122	1111
Longitude Offset Sign: default	123	1
Longitude Offset Minutes: default	124-128	00000
Longitude Offset Seconds: default	129-132	1111
BCH 2 Encoded:	133-144	011001101100
BCH 2 Calculated:	N/A	011001101100
Composite Latitude: default	N/A	Composite Longitude: default
15 Hex ID:	N/A	193DF380C6FFBFF

Test Summary

The results indicate compliance with Cospas-Sarsat T.007, Clause A.2.2.



Product Service

2.7 OPERATING LIFETIME AT MINIMUM TEMPERATURE

2.7.1 Specification

Cospas-Sarsat T.007, Clause A.2.3

Note: the Operating Lifetime test was carried out in accordance with IEC61097-2 clause 5.15.1: an additional soak at -30°C was carried out prior to the requirements of T.007, clause A.2.3 at -20°C.

2.7.2 Equipment Under Test and Modification State

E101V S/N: 0800002P - Modification State 0

2.7.3 Date of Test

29 October 2015 & 30 October 2015

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 Environmental Conditions

Ambient Temperature 22.3 - 22.7°C
Relative Humidity 59.1 - 64.3%



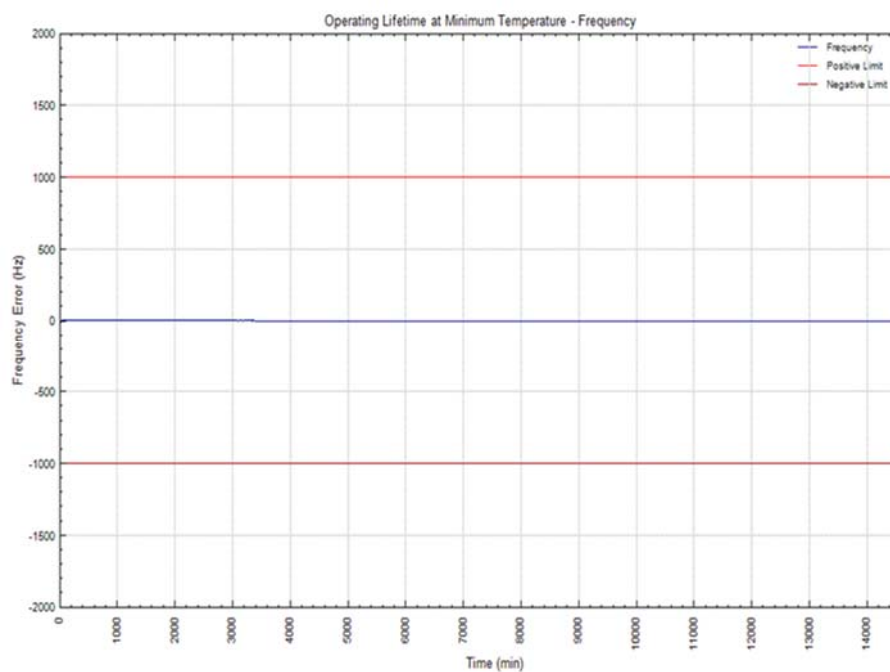
Product Service

2.7.6 Test Results

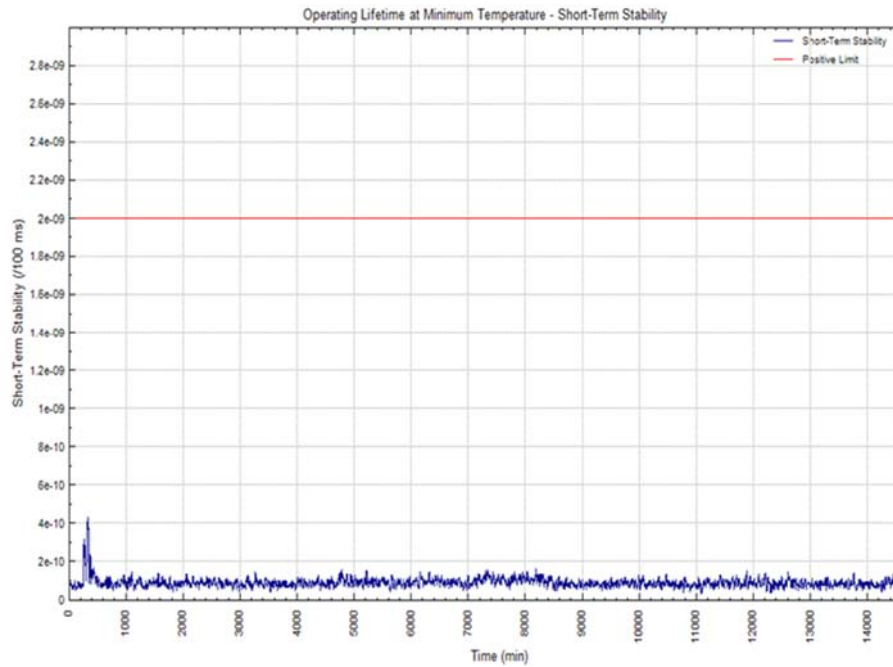
EUT System Configuration: 2

End of test taken as 168 hours (Manufacturer declared value)

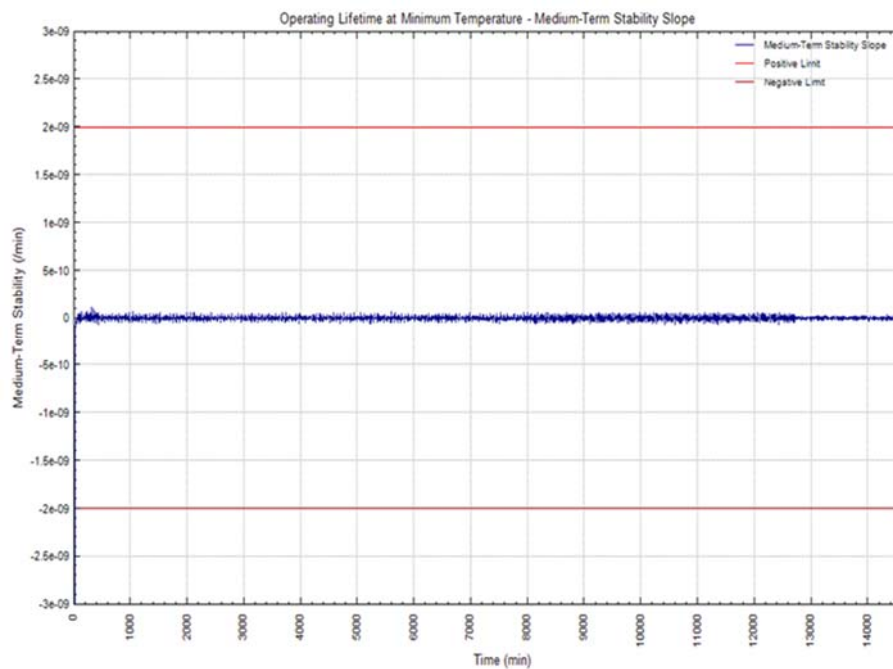
Nominal Frequency



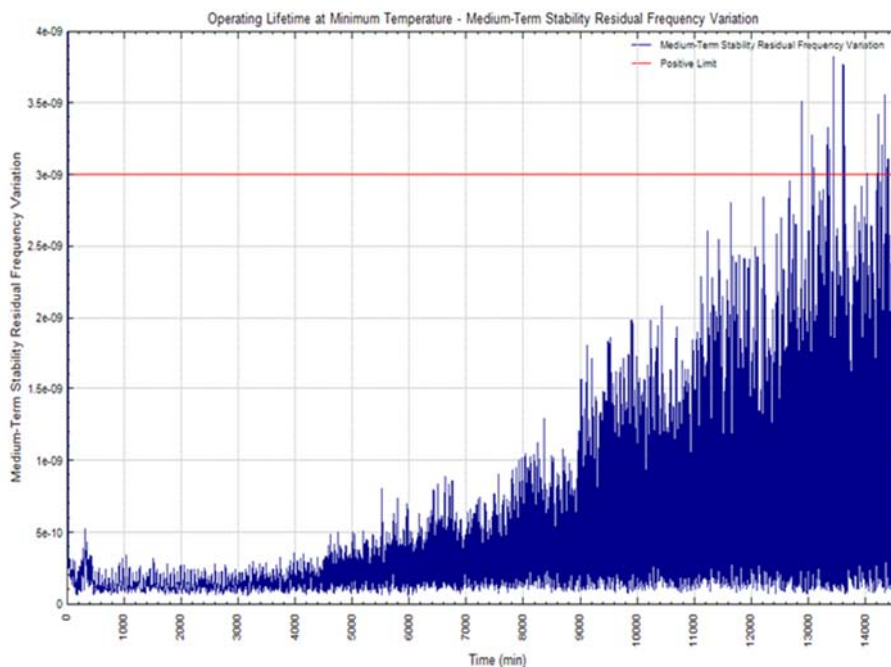
Short Term Stability



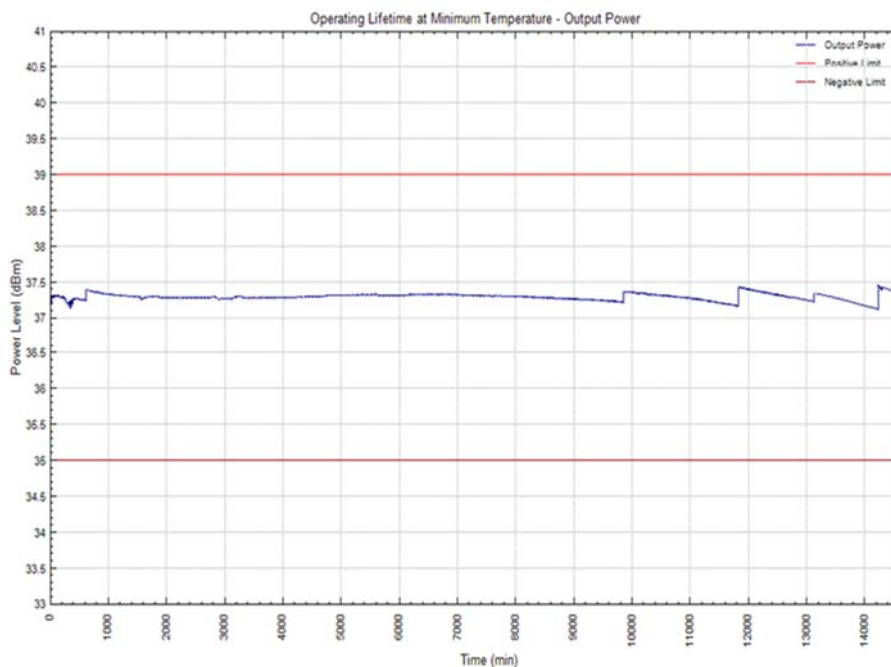
Medium Term Stability, Mean Slope



Medium Term Stability, Residual Frequency Variation



Output Power





Product Service

Digital Message

Full 36 hex message	FFFE2F8C9EF9C0637FDFF83D15B783E0F66C
---------------------	--------------------------------------

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - Albania	27-36	0011001001
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	41-64	111110011100000001100011
Latitude Sign: default	65	0
Latitude Degrees: default	66-72	1111111
Latitude Minutes: default	73-74	11
Longitude Sign: default	75	0
Longitude Degrees: default	76-83	11111111
Longitude Minutes: default	84-85	11
BCH 1 Encoded:	86-106	000001111010001010110
BCH 1 Calculated:	N/A	000001111010001010110
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Device: 121.5 MHz homer	112	1
Latitude Offset Sign: default	113	1
Latitude Offset Minutes: default	114-118	00000
Latitude Offset Seconds: default	119-122	1111
Longitude Offset Sign: default	123	1
Longitude Offset Minutes: default	124-128	00000
Longitude Offset Seconds: default	129-132	1111
BCH 2 Encoded:	133-144	011001101100
BCH 2 Calculated:	N/A	011001101100
Composite Latitude: default	N/A	Composite Longitude: default
15 Hex ID:	N/A	193DF380C6FFBFF



Product Service

Test Data (0 min - 30 min)

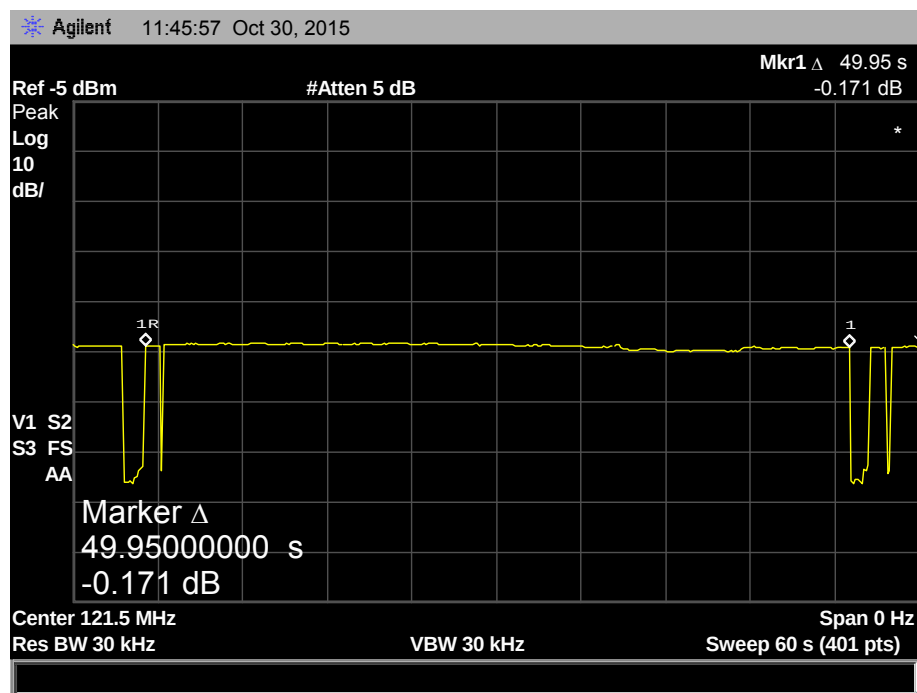
Burst	Frequency (MHz)	STS /100ms	MTS-Slope /min	MTS-Var	Power (dBm)	Time (hours)
1	-	-	-	-	36.42	0.00
2	-	-	-	-	37.22	0.01
3	-	-	-	-	37.31	0.03
4	-	-	-	-	37.33	0.04
5	-	-	-	-	37.35	0.06
6	-	-	-	-	37.22	0.07
7	-	-	-	-	37.22	0.08
8	-	-	-	-	37.22	0.10
9	-	-	-	-	37.21	0.11
10	-	-	-	-	37.21	0.13
11	-	-	-	-	37.21	0.14
12	-	-	-	-	37.21	0.15
13	-	-	-	-	37.2	0.17
14	-	-	-	-	37.19	0.18
15	-	-	-	-	37.19	0.19
16	-	-	-	-	37.32	0.21
17	-	-	-	-	37.32	0.22
18	406.0400086	8.46E-11	-8.20E-09	1.38E-08	37.32	0.24
19	406.0400064	8.27E-11	-7.33E-09	1.49E-08	37.32	0.25
20	406.0400043	8.21E-11	-6.44E-09	1.57E-08	37.32	0.26
21	406.0400023	8.58E-11	-5.44E-09	1.59E-08	37.31	0.28
22	406.0400005	8.71E-11	-4.37E-09	1.54E-08	37.31	0.29
23	406.0399989	8.67E-11	-3.28E-09	1.39E-08	37.31	0.31
24	406.0399974	9.11E-11	-2.21E-09	1.14E-08	37.31	0.32
25	406.0399962	8.72E-11	-1.22E-09	7.63E-09	37.31	0.33
26	406.0399953	7.92E-11	-5.03E-10	3.60E-09	37.3	0.35
27	406.0399948	9.25E-11	-1.51E-10	6.09E-10	37.31	0.36
28	406.0399948	9.27E-11	-1.01E-10	2.93E-10	37.3	0.38
29	406.0399947	9.18E-11	-9.23E-11	2.68E-10	37.3	0.39
30	406.0399947	9.13E-11	-8.39E-11	2.49E-10	37.31	0.40
31	406.0399946	9.37E-11	-7.26E-11	2.54E-10	37.3	0.42
32	406.0399946	9.26E-11	-6.77E-11	2.56E-10	37.3	0.43
33	406.0399946	9.23E-11	-6.02E-11	2.81E-10	37.3	0.44
34	406.0399946	9.12E-11	-5.16E-11	2.96E-10	37.3	0.46
35	406.0399946	9.05E-11	-5.46E-11	2.86E-10	37.3	0.47
36	406.0399946	8.96E-11	-5.38E-11	2.87E-10	37.29	0.49
37	406.0399946	8.67E-11	-5.75E-11	2.92E-10	37.29	0.50



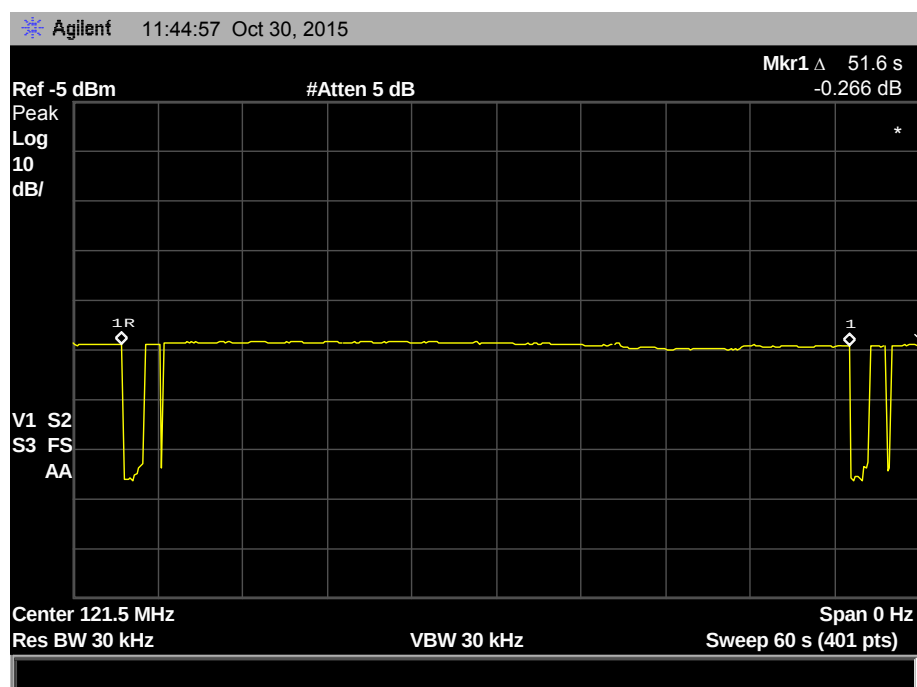
Product Service

121 Homing Transmitter - Duty Cycle (Start of Test)

On Time



On+Off Time



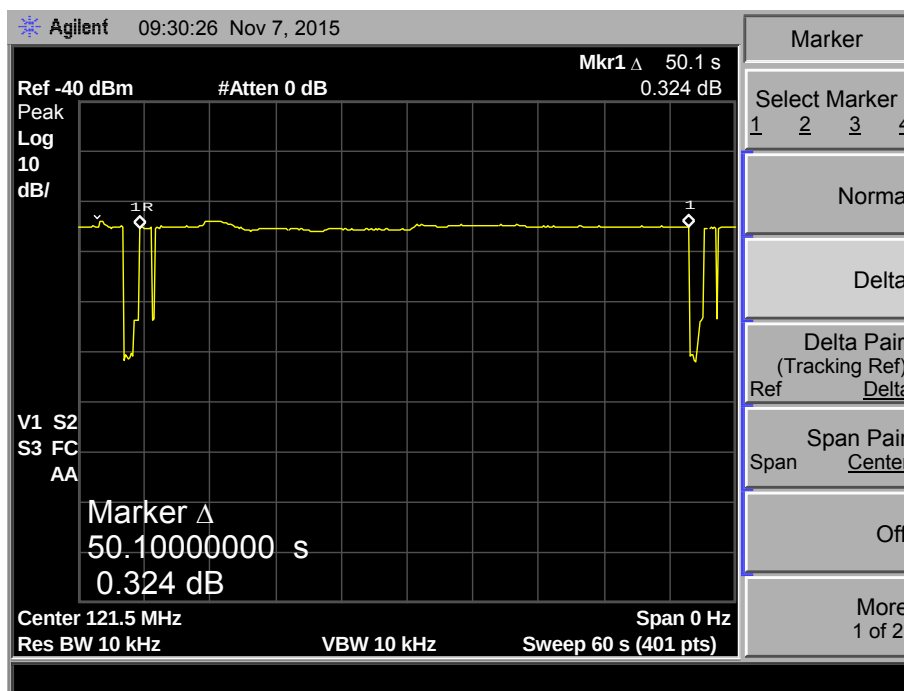
$$\text{Duty Cycle} = 49.95 / 51.6 = 0.968 = \underline{96.8\%}$$



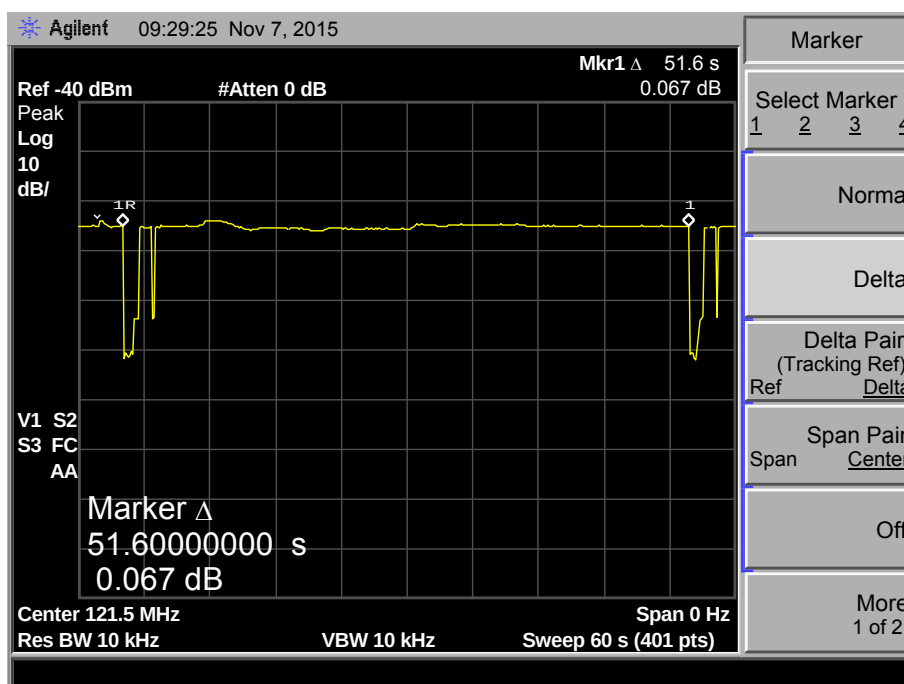
Product Service

121 Homing Transmitter - Duty Cycle (End of Test)

On Time



On+Off Time

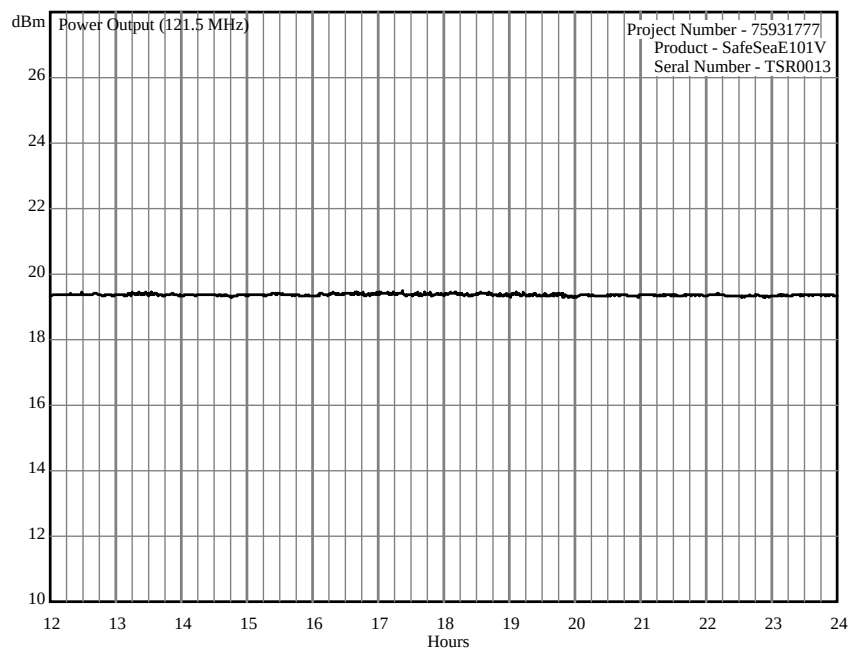
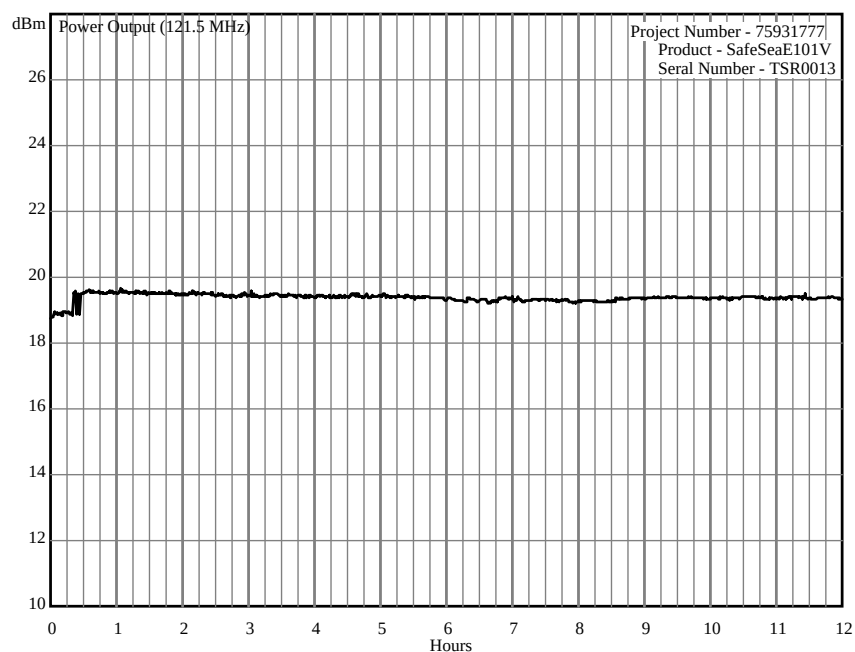


$$\text{Duty Cycle} = 50.1 / 51.6 = 0.971 = \underline{97.1\%}$$



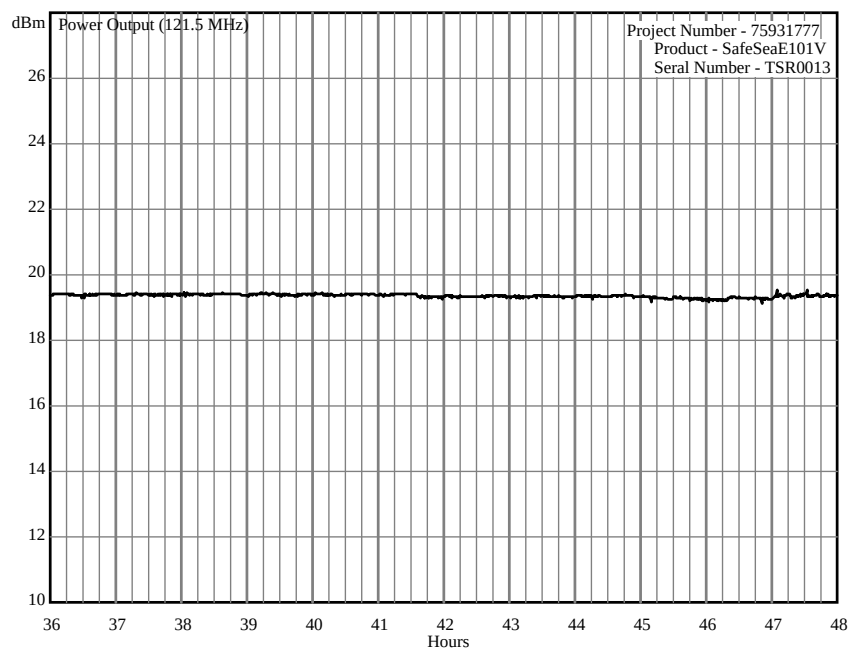
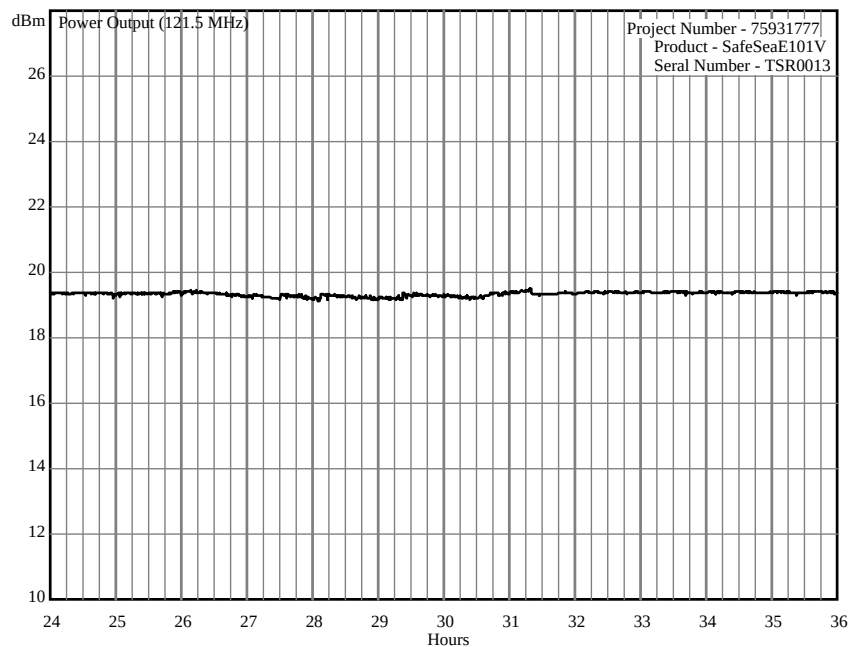
Product Service

121 Homing Transmitter Power (First 48 Hours of Operation)





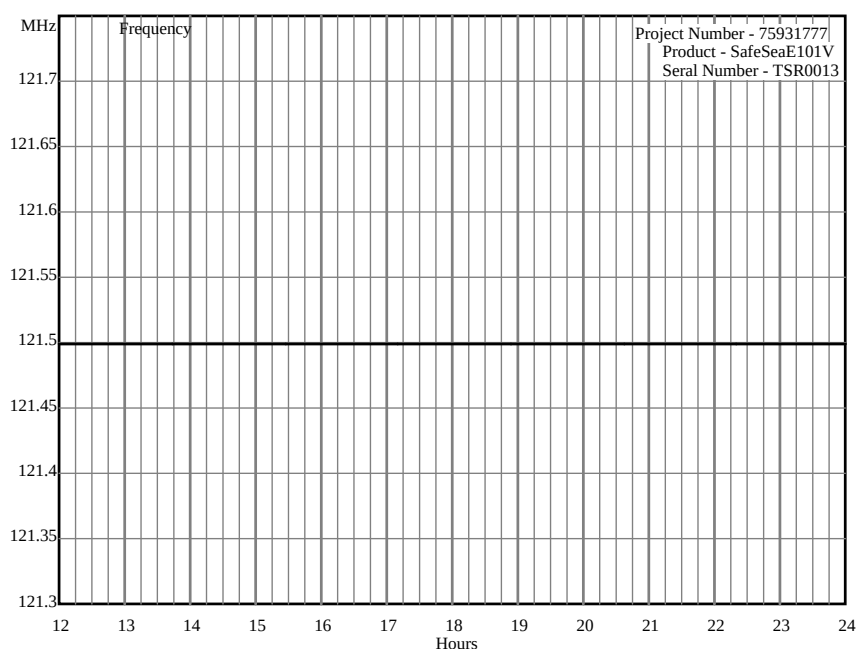
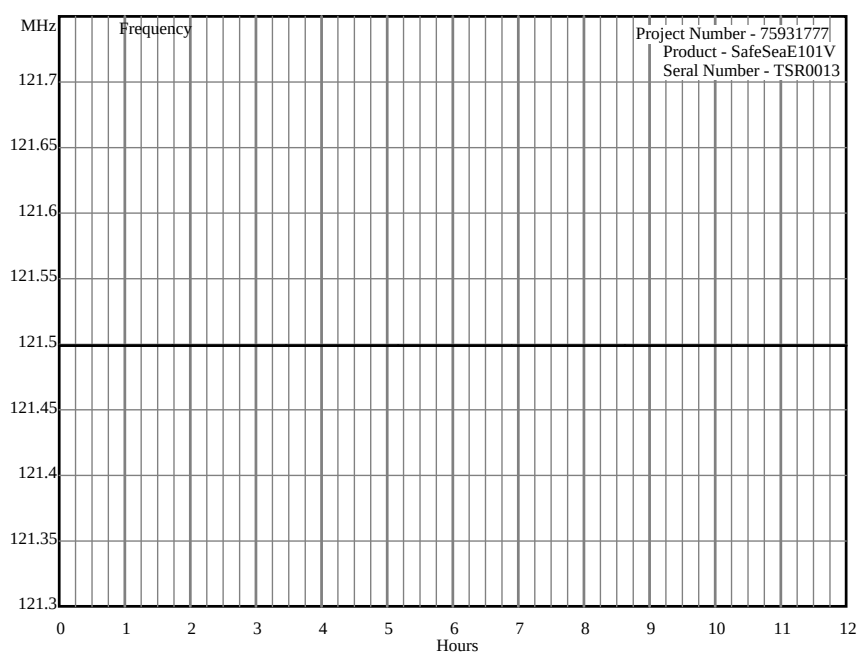
Product Service





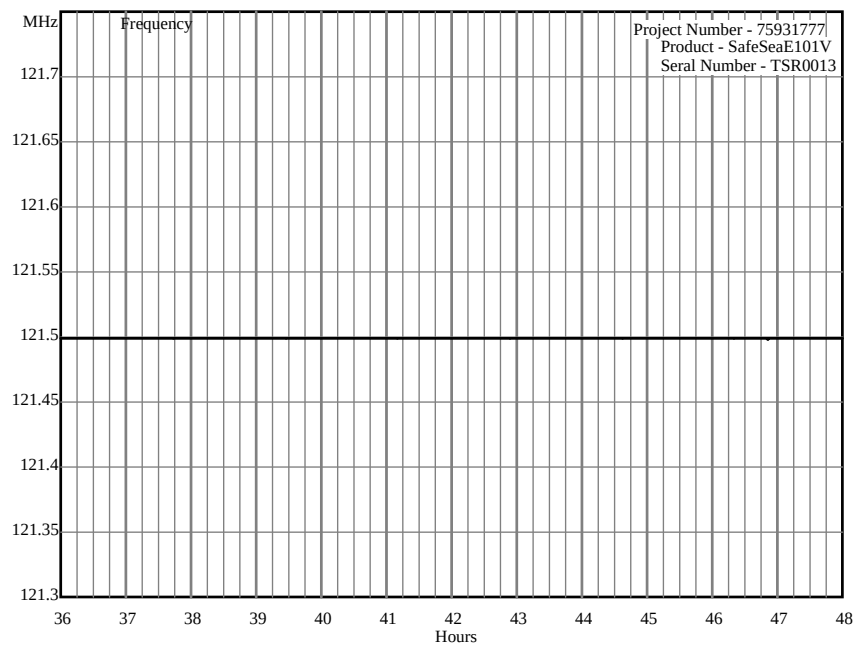
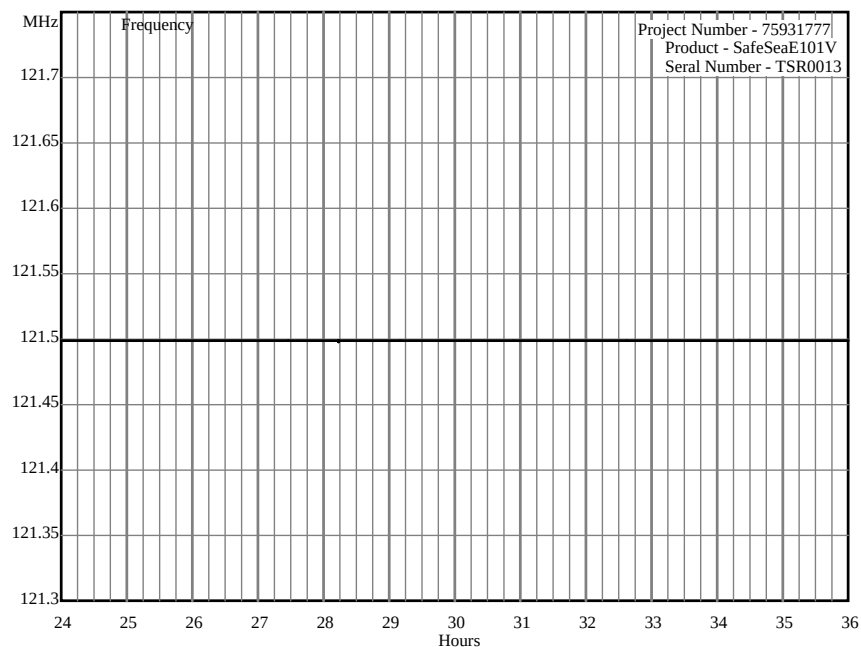
Product Service

121 Homing Transmitter Frequency (First 48 Hours of Operation)





Product Service





Product Service

Beacon Operating Current

EUT System Configurations: 1 (fitted in Float Free Case) + 2 (Standalone) where applicable

As per C/S T.007 Table F-E.1:

Beacon Operating Modes	Mode: Manually selectable or Automatic	Measurement interval, sec	Average Current, mA	Peak Current, mA
1) Standalone - Standby	A	900	0.0000009	0.000005
2) Float Free Case - Standby	A	900	0.0000006	0.000009
3) Standalone - 406MHz + Homer + GPS searching + Strobe +(VDR off) + manual activation*	M	48.72	44.75	1182
4) Standalone - 406MHz + Homer + GPS sleep + Strobe +(VDR off) + manual activation	M	51.84	38.47	1173
5) Standalone - 406MHz + Homer + GPS search + Strobe +(VDR off) + water contact activation	A	48.56	43.92	1195
6) Standalone - 406MHz + Homer + GPS sleep + Strobe +(VDR off) + water contact activation**	A	52.00	35.52	1186
7) Standalone - Self-test ^{Note1}	M	13.43	47.88	1083
8) Float Free Case - Self-test	M	13.99	46.90	1107
9) Standalone - GNSS Self-test	M	316.6	12.55	15.77
10) Float Free Case - GNSS Self-test	M	315.6	13.26	16.89

At all times the sampling interval was 80 ms nominal.

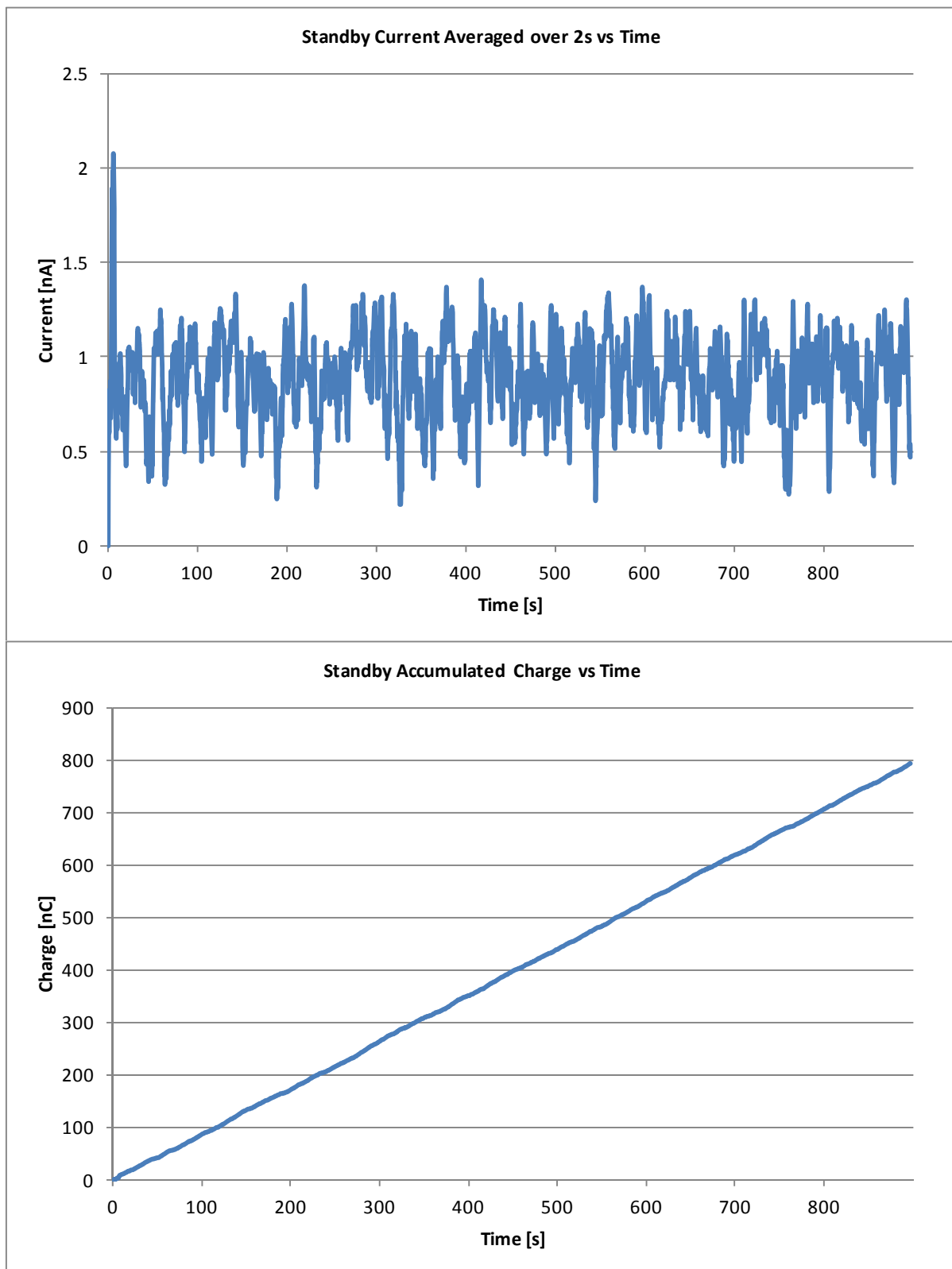
* Worst case (highest operating current) operating mode used during pre-test discharge the Operating Lifetime test.

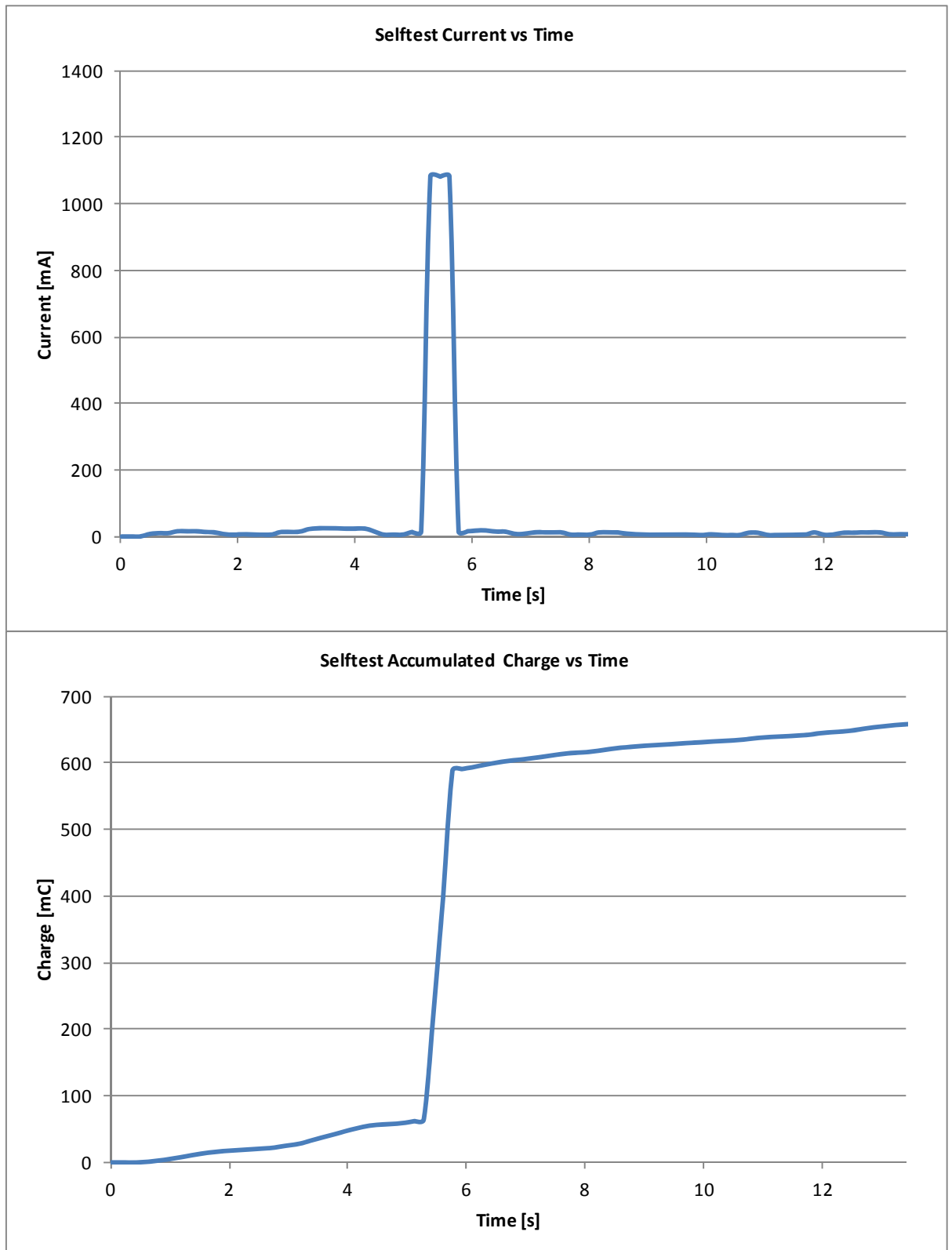
** Best case (lowest average current mode) figure used for the calculating the Operating Lifetime pre-test discharge (giving a longer discharge time). During pre-test discharge (and test itself) the average operating current was higher giving an “over-test” on the discharge.

Note 1; The Self-Test result indicator (LED flashes) is variable depending on how the long the EUT has been previously activated. The maximum Self-Test duration has been used in the measurements above (6 LED flashes), which indicates that the EUT has been previously active for in excess of 10 hours.

Observation – TUV measurements indicate mode 3 to be the marginally the worst case operating mode, whereas the manufacturer measured mode 5 to be marginally higher. The differences could be contributed to by the measurement uncertainty associated with the measurement made at TUV.

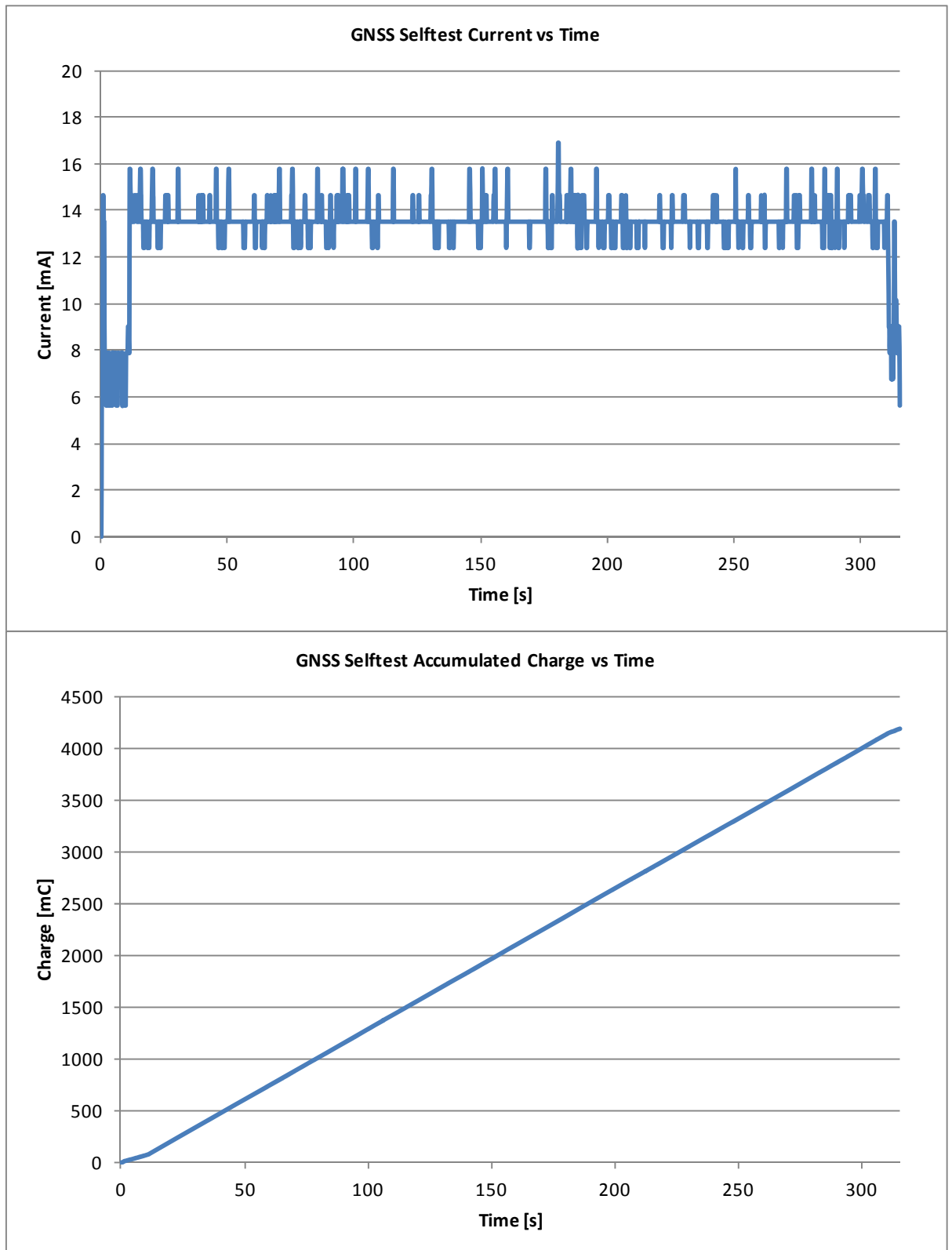
Battery Current Graphs

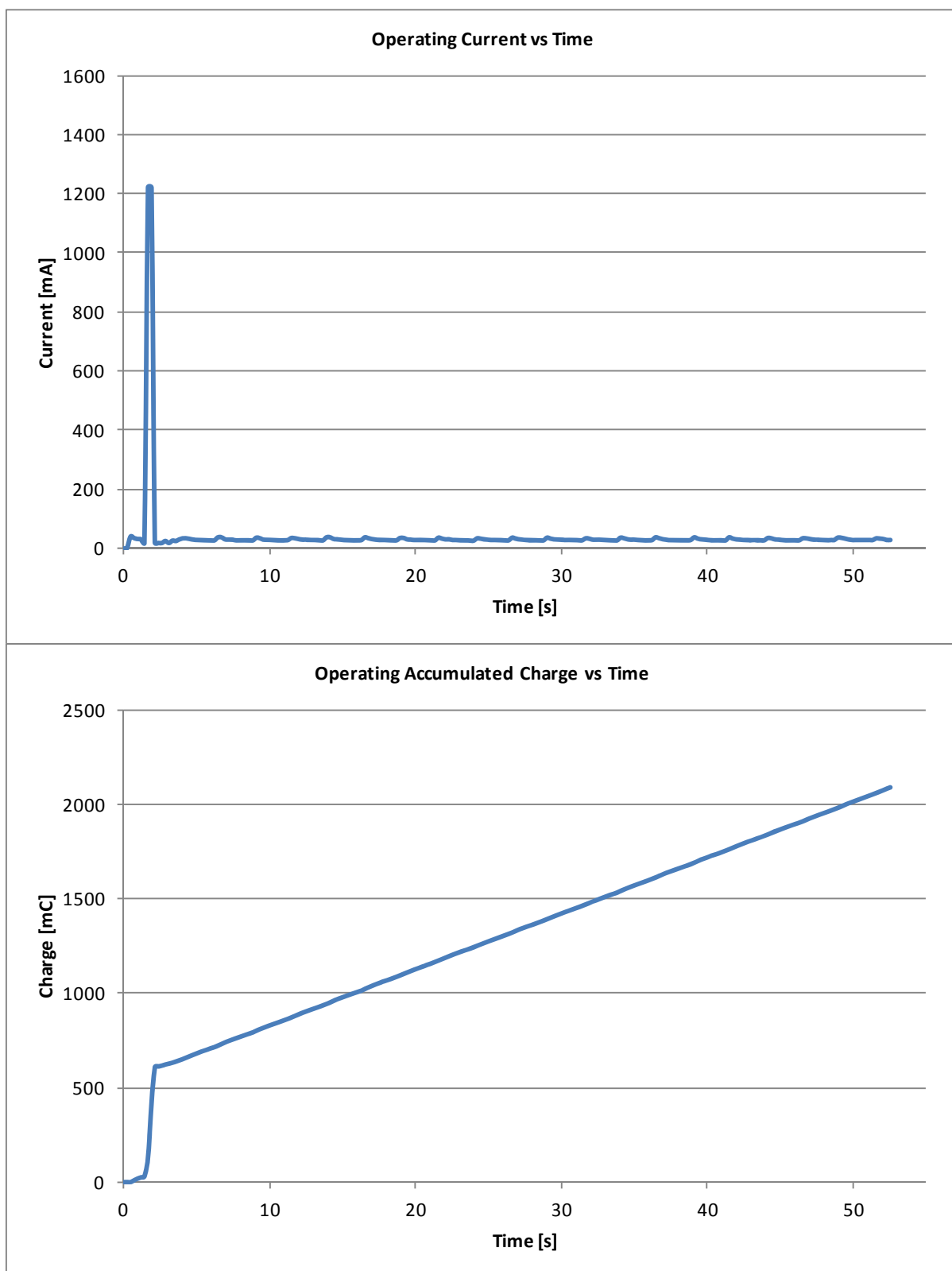






Product Service







Product Service

Battery Current Measurement Results

Battery Discharge Current:

The discharge current for the batteries was measured for each of the following beacon states.

Beacon in the Off or Standby State, "Standby Current"

Beacon performing a Self-test, "Self-test Current"

Beacon activated and transmitting, "Operating Current"

The individual tests were conducted for the following durations:

Standby Current	: 15 minutes	(899932 ms)
Self-test Current	: 13.4 seconds	(13432 ms)
GNSS ST Current	: 316 seconds	(315600 ms)
Operating Current	: 52 seconds	(51995 ms)

Assumptions / Supplied Data:

Battery Shelf-life	: 2 years
Battery Replacement Interval	: 8 years
Total Battery Life	: 10 years
Battery Capacity	: 11.1 Ah
Battery Self Drain	: 0.33 % per year
Self-test Interval	: 12 tests per year
GNSS STs per battery	: 12

Test Results:

Mode Current	= Accumulated Charge / Time	
Standby Current	= 795217.92 pC / 899932 ms	= 0.8836 nA
Self-test Current	= 643073.91 uC / 13432 ms	= 47.88 mA
GNSS Self-test	= 4185947.67 uC / 315600 ms	= 13.26 mA
Operating Current	= 1846752.09 uC / 51995 ms	= 35.52 mA

Battery Preconditioning / Discharge Time Calculations:

$$\begin{aligned} \text{Battery Self Drain} &= \text{Capacity} - [(100\% - \text{Self Drain/Year}\%)^{\text{Replacement Interval}} \times \text{Capacity}] \\ &= 11.1 - ((1 - 0.0033)^{10} \times 11.1) = 0.3609 \text{ Ah} \end{aligned}$$

$$\begin{aligned} \text{Standby Drain} &= \text{Hours per year} \times \text{Battery Replacement Interval} \times \text{Standby Current} \\ &= 365 \times 24 \times 8 \times 0.8836 \times 10^{-9} = 0.0001 \text{ Ah} \end{aligned}$$

$$\text{Worst Case} = 1.65 \times 0.0001 \text{ Ah} = 0.0001 \text{ Ah}$$

$$\begin{aligned} \text{Self-test Drain} &= \text{Self-tests per battery} \times \text{Self-test Current} \times \text{Self-test duration (in hours)} \\ &= 12 \times 8 \times 47.88 \times 10^{-3} \times (13 / 3600) = 0.0171 \text{ Ah} \end{aligned}$$

$$\text{Worst Case} = 1.65 \times 0.0171 \text{ Ah} = 0.0283 \text{ Ah}$$

$$\begin{aligned} \text{GNSS ST Drain} &= \text{GNSS STs per battery} \times \text{GNSS ST Current} \times \text{GNSS ST duration (in hours)} \\ &= 12 \times 1 \times 13.26 \times 10^{-3} \times (316 / 3600) = 0.0140 \text{ Ah} \end{aligned}$$

$$\text{Worst Case} = 1.65 \times 0.0140 \text{ Ah} = 0.0230 \text{ Ah}$$

$$\begin{aligned} \text{Total Drain} &= \text{Self discharge} + \text{Standby drain (wc)} + \text{ST drain (wc)} + \text{GNSS ST drain (wc)} \\ &= 0.3609 + 0.0001 + 0.0283 + 0.0230 = 0.4123 \text{ Ah} \end{aligned}$$

$$\begin{aligned} \text{Battery Preconditioning / Discharge Time} &= \text{Worst Case drain} / \text{Operational Current} \\ &= 0.4123 / (35.52 \times 10^{-3}) \\ &= \underline{11.61 \text{ hours}} \end{aligned}$$



Product Service

As per C/S T.007 Table F-E.2:

Characteristic	Designation	Units	Value	Comments
Beacon manufacturers declare maximum allowed cell shelf-life (from date of cell manufacture to date of battery pack installation in the beacon)	T_{CS} or TCS	Years	2	
Declared beacon battery replacement period (from date of manufacture)	T_{BR} or TBR	Years	8	
Battery pack electrical configuration	Three cells in Series			
Cell model and cell chemistry	Ultralife U10013 Lithium			
Nominal cell capacity		A-hrs	11.1	
Nominal battery pack capacity	C_{BN}	A-hrs	11.1	
Annual battery cell capacity loss (self-discharge) due to aging, as specified by cell manufacturer at ambient temperature	L_{SDC}	%	0.33	
Calculated battery pack capacity loss due to self-discharge: $L_{CBN} = C_{BN} \cdot [C_{BN} \cdot (1 - L_{SDC}/100)^{T_{BR} + T_{CS}}]$	L_{CBN}	A-hrs	0.3609	
Number of self-tests per year	N_{ST}		12	
Average battery current during a self-test	I_{ST}	mA	47.88	
Maximum duration of a self-test	T_{ST}	sec	13.5	
Calculated battery pack loss due to self-tests during battery replacement period: $L_{ST} = I_{ST} \cdot T_{ST} \cdot T_{BR} \cdot N_{ST} / 3600$	L_{ST}	mA-hrs	17.2	
Maximum number of GNSS self-tests between battery replacements	N_{GST}		12	
Average battery current during a GNSS self-test of maximum duration	I_{GST}	mA	13.26	
Maximum duration of a GNSS self-test	T_{GST}	sec	316	
Calculated battery pack loss due to GNSS self-tests during battery replacement period: $L_{GST} = I_{GST} \cdot T_{GST} \cdot N_{GST} / 3600$	L_{GST}	mA-hrs	13.96	
Average battery standby current	I_{SB}	mA	0.0000009	
Other Capacity Losses	L_{OTH}	mA-hrs	none	
Battery pack capacity loss due to constant operation of circuitry prior to beacon activation: $L_{ISB} = I_{SB} \cdot T_{BR} \cdot 8760$	L_{ISB}	mA-hrs	0.063	
Calculated value of the battery pack pre-test discharge: $L_{CDC} = L_{CBN} + 1.65 \cdot (L_{ST} + L_{GST} + L_{ISB}) / 1000 + L_{OTH} / 1000$	L_{CDC}	A-hrs	0.412	

Test Summary

The results indicate compliance with Cospas-Sarsat T.007, Clause A.2.3.



Product Service

2.8 FREQUENCY STABILITY TEST WITH TEMPERATURE GRADIENT

2.8.1 Specification

Cospas-Sarsat T.007, Clause A.2.4

2.8.2 Equipment Under Test and Modification State

E101V S/N: 0800002P - Modification State 0

2.8.3 Date of Test

13 October 2015

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 Environmental Conditions

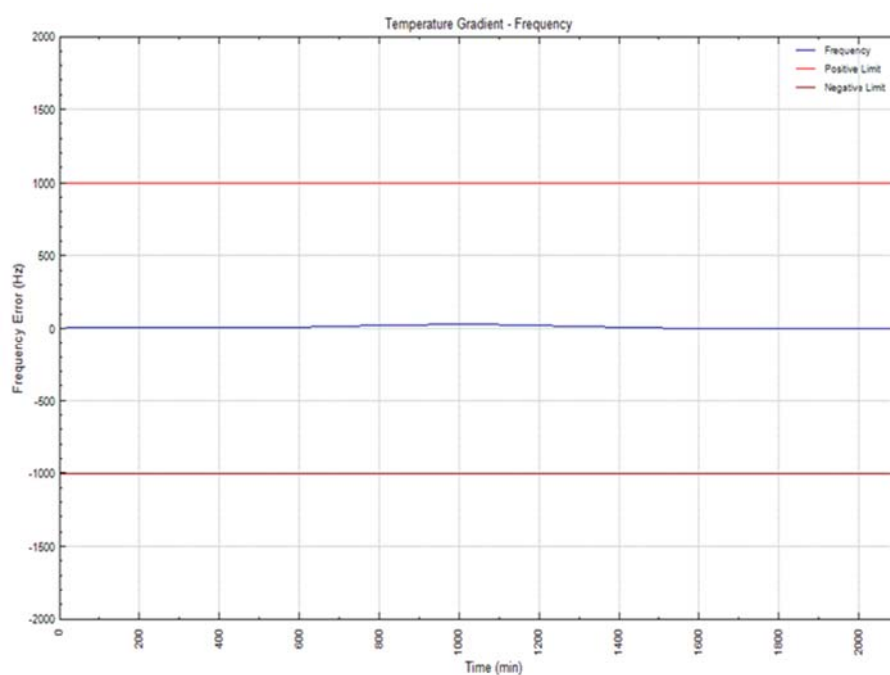
Ambient Temperature 21.4°C
Relative Humidity 41.6%

2.8.6 Test Results

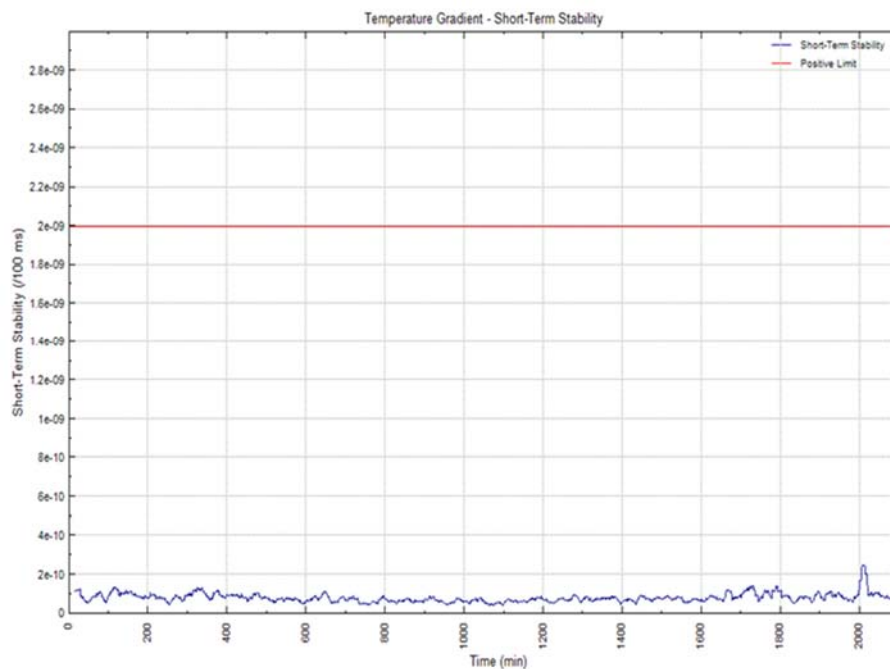
EUT System Configuration: 2

Full Test

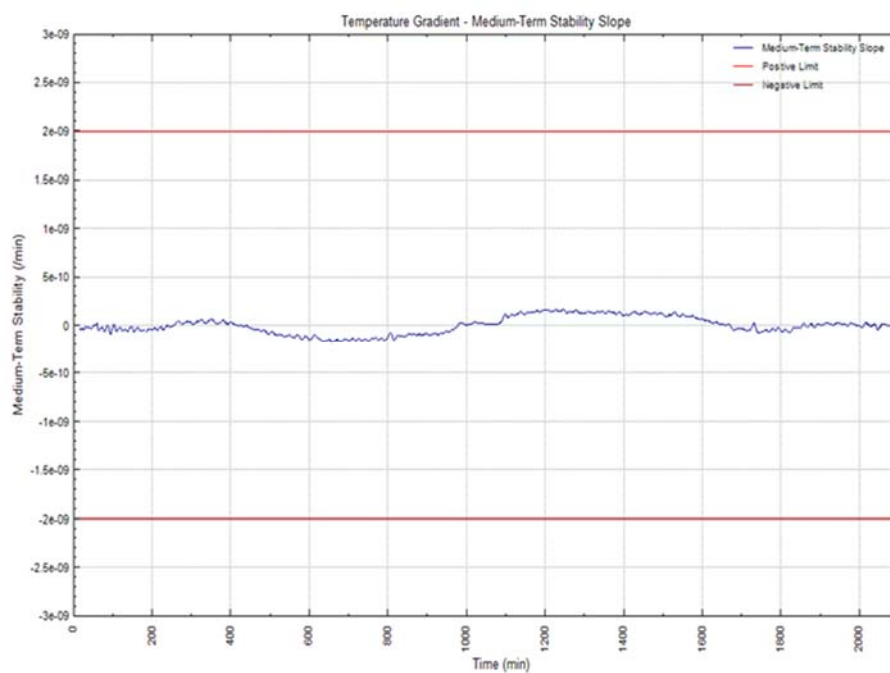
Nominal Frequency



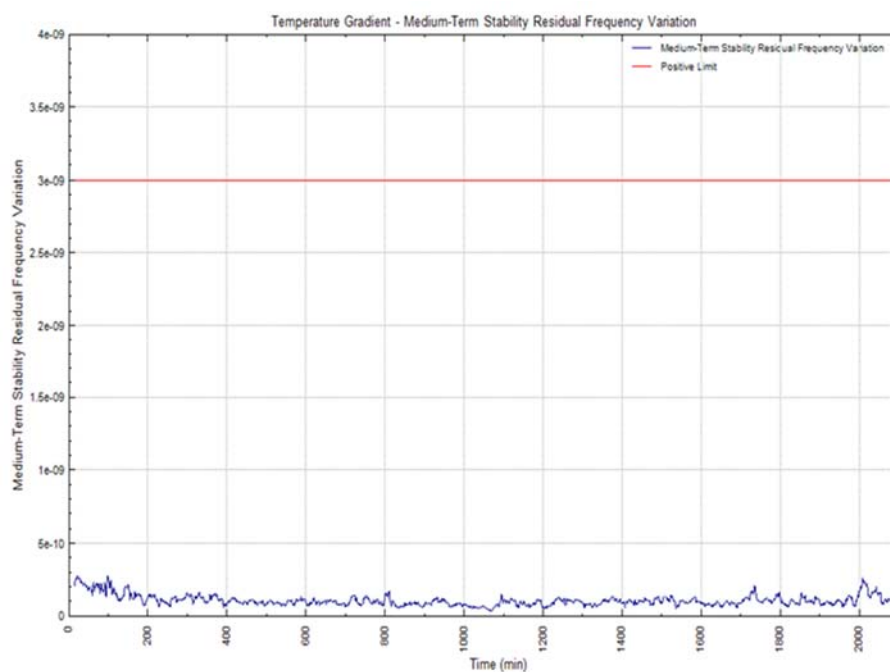
Short Term Stability



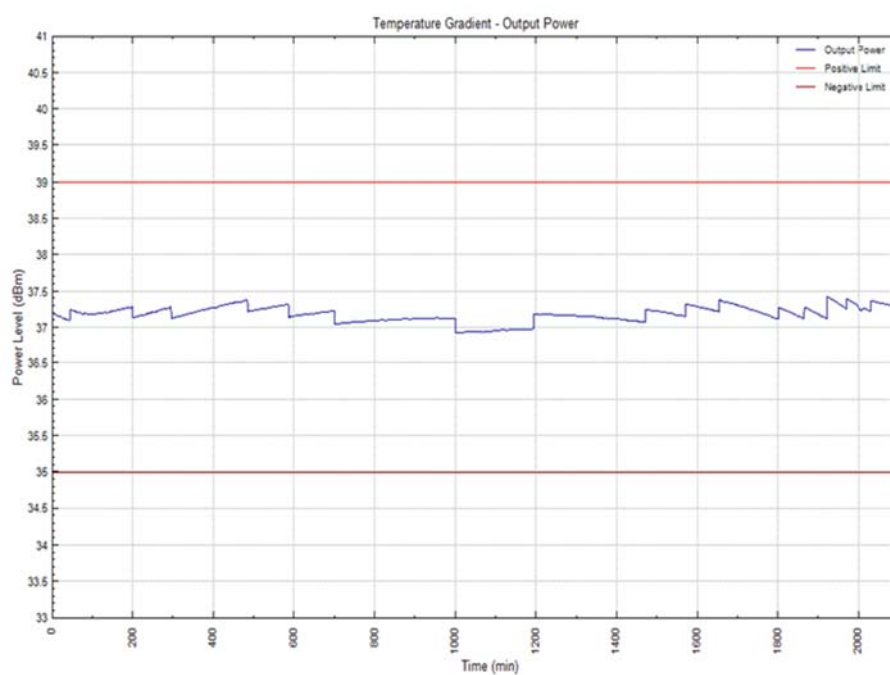
Medium Term Stability, Mean Slope



Medium Term Stability, Residual Frequency Variation



Output Power





Product Service

Digital Message

Full 36 hex message	FFFE2F8C9EF9C0637FDFF83D15B783E0F66C
---------------------	--------------------------------------

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 201 - Albania	27-36	0011001001
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	41-64	111110011100000001100011
Latitude Sign: default	65	0
Latitude Degrees: default	66-72	1111111
Latitude Minutes: default	73-74	11
Longitude Sign: default	75	0
Longitude Degrees: default	76-83	11111111
Longitude Minutes: default	84-85	11
BCH 1 Encoded:	86-106	000001111010001010110
BCH 1 Calculated:	N/A	000001111010001010110
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Device: 121.5 MHz homer	112	1
Latitude Offset Sign: default	113	1
Latitude Offset Minutes: default	114-118	00000
Latitude Offset Seconds: default	119-122	1111
Longitude Offset Sign: default	123	1
Longitude Offset Minutes: default	124-128	00000
Longitude Offset Seconds: default	129-132	1111
BCH 2 Encoded:	133-144	011001101100
BCH 2 Calculated:	N/A	011001101100
Composite Latitude: default	N/A	Composite Longitude: default
15 Hex ID:	N/A	193DF380C6FFBFF

Test Summary

The results indicate compliance with Cospas-Sarsat T.007, Clause A.2.4.



Product Service

Interim TCXO Procedure Summary

TCXO Test Sample Reference: Model E5344 S/No. MI 5758

MTS Characteristic	Time (h)	Temp. (°C)	tot	osc	beacon_wc	MAX-OSC	beacon_max	Ageing factor	beacon_5 year	Limit	Result
Residual	1.62	-16.8	2.796E-10	3.900E-10	2.796E-10	2.000E-09	2.019E-09	2.00E-10	2.219E-09	3.0E-09	Pass
Static Positive Mean Slope	33.51	-20.0	7.20E-12	-1.151E-10	1.153E-10	7.00E-10	7.094E-10	1.00E-10	8.094E-10	1.0E-09	Pass
Static Negative Mean Slope	16.27	55.0	-4.09E-12	9.727E-11	-9.735E-11	-7.00E-10	-7.067E-10	-1.00E-10	-8.067E-10	-1.0E-09	Pass
Gradient Positive Mean Slope	7.97	14.8	-5.34E-11	-1.927E-10	1.852E-10	1.7E-09	1.710E-09	1.00E-10	1.810E-09	2.0E-09	Pass
Gradient Negative Mean Slope	14.56	47.5	-9.82E-11	1.905E-10	-2.143E-10	-1.7E-09	-1.713E-09	-1.00E-10	-1.813E-09	-2.0E-09	Pass

Test Summary

The results indicate compliance with Cospas-Sarsat T.IP (TCXO) Issue 1, Revision 5.



Product Service

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

E101V S/N: 0800003P - Modification State 0

2.9.3 Date of Test

30 September 2015, 1 October 2015, 2 October 2015, 3 October 2015 & 6 October 2015

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 Environmental Conditions

Ambient Temperature 9.8 - 18.3°C
Relative Humidity 49.1 - 77.6%



Product Service

2.9.6 Test Results

EUT System Configuration: 2

Test Configuration 5

Test Start: 2015-10-02 17:22:58z
 Test End: 2015-10-03 07:27:46z
 15 Hex ID: 193DF380C6FFBFF

Actual location of the test beacon: 50.818263
 (Daedalus Airfield, Lee-on-the-Solent, West) -1.197454

Satellite ID	Satellite Pass Number	15 Hex ID Provided by LUT	Doppler Latitude	Doppler Longitude	Mean Rx Power (dBm)	TCA	CTA (deg)	Location Error (km)
S12	34257	193DF 380C6 FFBFF	50.80948	-1.19994	-127.25	01:16:01	-17.706	0.991
S12	34258	193DF 380C6 FFBFF	50.82247	-1.21563	-125.39	02:57:39	-1.691	1.359
S12	34259	193DF 380C6 FFBFF	50.81427	-1.19519	-125.66	04:37:50	12.973	0.471
S7	90409	193DF 380C6 FFBFF	50.80796	-1.20845	-126.27	05:04:18	-12.148	1.381
S10	53418	193DF 380C6 FFBFF	50.81829	-1.20114	-115.18	05:05:37	-10.068	0.259
S10	53419	193DF 380C6 FFBFF	50.80898	-1.19589	-126.55	06:46:30	5.515	1.037
S7	90410	193DF 380C6 FFBFF	50.81659	-1.19391	-116.88	06:44:30	3.493	0.311
S7	90417	193DF 380C6 FFBFF	50.83455	-1.18688	-125.40	18:10:06	-11.839	1.956
S10	53426	193DF 380C6 FFBFF	50.83429	-1.18268	-125.93	18:18:55	-15.728	2.061
S11	46456	193DF 380C6 FFBFF	50.82637	-1.20851	-127.05	19:01:29	15.580	1.189
S13	15772	193DF 380C6 FFBFF	50.83393	-1.22126	-128.42	19:55:46	8.622	2.413
S11	46457	193DF 380C6 FFBFF	50.82351	-1.18953	-126.70	20:40:46	1.439	0.806
S13	15773	193DF 380C6 FFBFF	50.83172	-1.19545	-128.61	21:35:46	-6.609	1.502
S11	46458	193DF 380C6 FFBFF	50.82183	-1.19459	-125.75	22:21:28	-14.366	0.444
S12	34271	193DF 380C6 FFBFF	50.80853	-1.19991	-131.05	01:04:31	-19.518	1.095
S12	34272	193DF 380C6 FFBFF	50.81569	-1.21629	-126.70	02:46:20	-3.461	1.353
S12	34273	193DF 380C6 FFBFF	50.81480	-1.19690	-126.26	04:26:41	11.448	0.387
S7	90423	193DF 380C6 FFBFF	50.80523	-1.19970	-126.89	04:39:10	-16.132	1.457
S10	53432	193DF 380C6 FFBFF	50.80568	-1.20393	-126.68	04:53:58	-11.943	1.470
S10	53433	193DF 380C6 FFBFF	50.81161	-1.18759	-127.89	06:35:01	3.790	1.013

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

$$\begin{aligned}
 \text{Ratio of Successful Solutions} &= \frac{\text{number of Doppler solutions within 5 km with } 1^\circ < \text{CTA} < 21^\circ}{\text{number of satellite passes over test duration with } 1^\circ < \text{CTA} < 21^\circ} \\
 &= \frac{20}{20} \\
 &= 100\%
 \end{aligned}$$



Product Service

EUT System Configuration: 2

Test Configuration 7

Test Start: 2015-09-30 16:38:00z
 Test End: 2015-10-01 07:02:00z
 15 Hex ID: 193DF380C6FFBFF

Actual location of the test beacon: 50.818263
 (Daedalus Airfield, Lee-on-the-Solent, West) -1.197454

Satellite ID	Satellite Pass Number	15 Hex ID Provided by LUT	Doppler Latitude	Doppler Longitude	Mean Rx Power (dBm)	TCA	CTA (deg)	Location Error (km)
S10	53397	193DF 380C6 FFBFF	50.83098	-1.19300	-128.91	17:00:37	-3.409	1.447
S7	90388	193DF 380C6 FFBFF	50.82867	-1.18729	-129.18	17:19:33	-3.876	1.359
S10	53398	193DF 380C6 FFBFF	50.82606	-1.18596	-134.04	18:42:24	-19.467	1.184
S7	90389	193DF 380C6 FFBFF	50.82383	-1.18092	-135.19	19:00:28	-19.800	1.315
S11	46428	193DF 380C6 FFBFF	50.82878	-1.20584	-133.26	19:42:26	10.053	1.309
S13	15744	193DF 380C6 FFBFF	50.82124	-1.21348	-133.71	20:36:59	2.532	1.173
S11	46429	193DF 380C6 FFBFF	50.82545	-1.19145	-129.52	21:22:17	-5.000	0.903
S13	15745	193DF 380C6 FFBFF	50.82746	-1.19221	-136.23	22:17:35	-13.229	1.086
S11	46430	193DF 380C6 FFBFF	50.82458	-1.19075	-134.87	23:03:38	-20.976	0.845
S12	34243	193DF 380C6 FFBFF	50.81510	-1.05912	-139.36	01:27:28	-15.798	9.719
S12	34245	193DF 380C6 FFBFF	50.82147	-1.19610	-129.88	04:48:58	14.450	0.369
S10	53404	193DF 380C6 FFBFF	50.80850	-1.20644	-131.04	05:17:15	-8.204	1.255
S7	90395	193DF 380C6 FFBFF	50.81051	-1.20440	-129.79	05:29:21	-8.166	0.990
S10	53405	193DF 380C6 FFBFF	50.81063	-1.20815	-130.24	06:57:58	7.205	1.133

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

$$\begin{aligned}
 \text{Ratio of Successful Solutions} &= \frac{\text{number of Doppler solutions within 5 km with } 1^\circ < \text{CTA} < 21^\circ}{\text{number of satellite passes over test duration with } 1^\circ < \text{CTA} < 21^\circ} \\
 &= \frac{13}{14} \\
 &= 92.86\%
 \end{aligned}$$



Product Service

EUT System Configuration: 2

Test Configuration 8

Test Start: 2015-10-01 17:21:01z
Test End: 2015-10-02 07:22:29z
15 Hex ID: 193DF380C6FFBFF

Actual location of the test beacon: 50.818263
(Daedalus Airfield, Lee-on-the-Solent, West) -1.197454

Satellite ID	Satellite Pass Number	15 Hex ID Provided by LUT	Doppler Latitude	Doppler Longitude	Mean Rx Power (dBm)	TCA	CTA (deg)	Location Error (km)
S7	90403	193DF 380C6 FFBFF	50.82963	-1.18817	-125.61	18:35:14	-15.824	1.421
S11	46442	193DF 380C6 FFBFF	50.82730	-1.20716	-125.81	19:21:56	12.885	1.214
S13	15757	193DF 380C6 FFBFF	50.82082	-1.20339	-125.56	18:37:27	18.943	0.504
S13	15758	193DF 380C6 FFBFF	50.82835	-1.20794	-126.38	20:16:21	5.618	1.341
S13	15759	193DF 380C6 FFBFF	50.82506	-1.18801	-129.59	21:56:38	-9.913	1.005
S11	46443	193DF 380C6 FFBFF	50.75567	-0.49030	-115.62	21:01:27	-2.167	50.165
S10	53412	193DF 380C6 FFBFF	50.82547	-1.28349	-123.79	18:30:39	-17.538	6.093
S11	46444	193DF 380C6 FFBFF	50.81534	-1.13018	-117.82	22:42:31	-17.722	4.734
S12	34257	193DF 380C6 FFBFF	50.80948	-1.19994	-127.25	01:16:01	-17.706	0.991
S12	34258	193DF 380C6 FFBFF	50.82247	-1.21563	-125.39	02:57:39	-1.691	1.359
S12	34259	193DF 380C6 FFBFF	50.81427	-1.19519	-125.66	04:37:50	12.973	0.471
S7	90409	193DF 380C6 FFBFF	50.80796	-1.20845	-126.27	05:04:18	-12.148	1.381
S10	53418	193DF 380C6 FFBFF	50.81829	-1.20114	-115.18	05:05:37	-10.068	0.259
S10	53419	193DF 380C6 FFBFF	50.80898	-1.19589	-126.55	06:46:30	5.515	1.037
S7	90410	193DF 380C6 FFBFF	50.81659	-1.19391	-116.88	06:44:30	3.493	0.311

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

$$\begin{aligned}
 \text{Ratio of Successful Solutions} &= \frac{\text{number of Doppler solutions within 5 km with } 1^\circ < \text{CTA} < 21^\circ}{\text{number of satellite passes over test duration with } 1^\circ < \text{CTA} < 21^\circ} \\
 &= \frac{13}{15} \\
 &= 86.66\%
 \end{aligned}$$

Test Summary

The results indicate compliance with Cospas-Sarsat T.007, Clause A.2.5.



Product Service

2.10 BEACON ANTENNA TEST

2.10.1 Specification

Cospas-Sarsat T.007, Clause A.2.6

2.10.2 Equipment Under Test and Modification State

E101V S/N: 0800003P - Modification State 0

2.10.3 Date of Test

10 September 2015

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 Environmental Conditions

Ambient Temperature 18.8 – 20.2°C
Relative Humidity 52 - 58%

2.10.6 Test Results

EUT System Configuration: 2

Note: Measurements were made using a dipole antenna in a fully screened semi-anechoic chamber.

Test Configuration 1 (B.4)

Azimuth Angle (Degrees)	Elevation Angle (degrees)									
	10		20		30		40		50	
	EIRP dBm	Ant dBi	EIRP dBm	Ant dBi	EIRP dBm	Ant dBi	EIRP dBm	Ant dBi	EIRP dBm	Ant dBi
0	38.8	1.5	41.0	3.8	42.8	5.6	39.3	2.1	33.6	-3.6
30	38.7	1.5	41.0	3.8	42.7	5.5	39.0	1.8	33.5	-3.7
60	38.8	1.6	40.9	3.7	42.6	5.4	39.0	1.8	33.7	-3.5
90	38.9	1.6	41.1	3.8	42.8	5.5	39.0	1.8	33.6	-3.6
120	38.9	1.6	40.9	3.7	42.6	5.4	39.0	1.8	33.6	-3.7
150	38.8	1.6	41.0	3.8	42.8	5.6	39.0	1.8	33.8	-3.4
180	38.8	1.6	41.0	3.8	42.7	5.4	39.0	1.8	33.6	-3.6
210	38.8	1.5	41.0	3.8	42.7	5.5	39.2	2.0	33.5	-3.7
240	38.6	1.3	41.3	4.0	42.7	5.5	39.2	2.0	33.9	-3.3
270	38.8	1.6	41.1	3.9	42.6	5.4	39.3	2.0	34.2	-3.1
300	38.7	1.5	41.2	4.0	42.8	5.6	39.3	2.1	33.8	-3.4
330	38.7	1.5	41.1	3.8	42.7	5.4	39.3	2.1	33.9	-3.3

Azimuth Angle (Degrees)	Elevation Angle (degrees)									
	10		20		30		40		50	
	Vv	Vh	Vv	Vh	Vv	Vh	Vv	Vh	Vv	Vh
0	110.4	88.2	112.3	88.1	113.4	88.9	108.8	90.5	101.6	72.7
30	110.4	84.5	112.3	87.8	113.3	89.8	108.5	92.0	101.5	80.4
60	110.5	87.6	112.2	88.0	113.2	88.3	108.5	90.4	101.7	69.3
90	110.5	86.7	112.3	85.9	113.3	88.3	108.5	90.9	101.6	77.3
120	110.6	87.0	112.2	87.2	113.2	89.4	108.5	90.5	101.5	77.3
150	110.5	87.9	112.3	87.0	113.4	89.2	108.5	91.3	101.8	79.3
180	110.5	84.2	112.3	89.3	113.2	91.3	108.5	91.3	101.6	80.1
210	110.4	88.6	112.3	85.6	113.3	88.8	108.7	90.2	101.5	79.9
240	110.3	82.6	112.5	88.9	113.3	90.3	108.6	91.5	101.9	80.0
270	110.5	87.4	112.4	87.3	113.2	89.2	108.7	90.7	102.1	78.9
300	110.4	85.7	112.5	89.7	113.4	91.0	108.7	91.4	101.8	76.7
330	110.4	87.7	112.3	86.9	113.2	89.4	108.8	92.4	101.9	80.3
Min (Vv-Vh)	21.8		22.8		21.9		16.4		21.1	

$$\text{EIRP}_{\text{LOSS}} = \text{Pt}_{\text{ambient}} - \text{Pt}_{\text{EOL}} = 37.23 - 36.42 = 0.81 \text{ dB}$$

$$\text{EIRP}_{\text{maxEOL}} = \text{Max}[\text{EIRP}_{\text{max}}, (\text{EIRP}_{\text{max}} - \text{EIRP}_{\text{LOSS}})] = \text{Max}[42.8, 42.0] = 42.8 \text{ dBm}$$

$$\text{EIRP}_{\text{minEOL}} = \text{Min}[\text{EIRP}_{\text{min}}, (\text{EIRP}_{\text{min}} - \text{EIRP}_{\text{LOSS}})] = \text{Min}[33.5, 32.7] = 32.7 \text{ dBm}$$



Product Service

Test Configuration 4 (B.5)

Azimuth Angle (Degrees)	Elevation Angle (degrees)									
	10		20		30		40		50	
	EIRP dBm	Ant dBi	EIRP dBm	Ant dBi	EIRP dBm	Ant dBi	EIRP dBm	Ant dBi	EIRP dBm	Ant dBi
0	37.7	0.5	40.8	3.6	36.7	-0.5	32.1	-5.2	31.4	-5.8
90	38.8	1.6	41.2	4.0	38.2	1.0	33.5	-3.7	29.2	-8.0
180	39.6	2.4	41.2	4.0	38.4	1.2	33.2	-4.1	19.5	-17.7
270	39.7	2.5	41.3	4.0	39.1	1.9	32.4	-4.8	20.0	-17.3

$$EIRP_{LOSS} = P_{t_{ambient}} - P_{t_{EOL}} = 37.23 - 36.42 = 0.81 \text{ dB}$$

$$EIRP_{maxEOL} = \text{Max}[EIRP_{max}, (EIRP_{max} - EIRP_{LOSS})] = \text{Max}[41.3, 40.5] = 41.3 \text{ dBm}$$

$$EIRP_{minEOL} = \text{Min}[EIRP_{min}, (EIRP_{min} - EIRP_{LOSS})] = \text{Min}[31.4, 30.6] = 30.6 \text{ dBm}$$

Test Summary

The results indicate compliance with Cospas-Sarsat T.007, Clause A.2.6.



Product Service

2.11 NAVIGATION SYSTEM TEST

2.11.1 Specification

Cospas-Sarsat T.007, Clause A.2.7

2.11.2 Equipment Under Test and Modification State

E101V S/N: 0800003P - Modification State 0

2.11.3 Date of Test

26 September 2015, 27 September 2015, 28 September 2015 & 3 October 2015

2.11.4 Test Equipment Used

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

2.11.5 Environmental Conditions

Ambient Temperature 9.8 - 22.6°C

Relative Humidity 42.7 - 64.5%

2.11.6 Test Results

EUT System Configuration: 2

National Protocol

Position Data Default Values (C/S T.007 A.3.8.1):

No position data was provided for > 4 hours before the test started. The beacon was activated and operated for 30 minutes without providing data. Message content was checked for all bursts during this period.

36 Hex Message	Message Count
FFFE2F8C9F00C05FC0FF06728BF79F3C0010	39



Product Service

Position Acquisition Time and Position Accuracy (C/S T.007 A.3.8.2)

Locations:

A.3.8.2.1: N 50° 49.096' W 001° 11.847' ①

A.3.8.2.2: N 50° 52.142' W 001° 14.680' ①

The appropriate position was applied, the EUT activated and time to first message containing valid position data timed.

Configuration as per C/S T.007	C/S T.007 Section A.3.8.2.1		C/S T.007 Section A.3.8.2.2	
	Time to Acquire Position (sec)	Location Error in metres	Time to Acquire Position (sec)	Location Error in metres
Configuration 5	61*	73.2	61*	22.7
Configuration 6	N/A	N/A	N/A	N/A
Configuration 7	51	73.2	51	22.7
Configuration 8	51	73.2	51	22.7

Positional accuracy was calculated using the Haversine Formula, The Earth's radius was taken as 6367 km.

① GPS Site Survey – Live Location

② Input from GPS simulator

* Approx 10 sec from immersion in salt water until beacon LEDs flash

Encoded Position Data Update Interval (C/S T.007 A.3.8.3):

Location: N 51° 22.583' W 1° 49.833' ②		
Data Acquired at	11:43:24	FFFE2F8C9F00C04CD701CAD575F79208025B
Location: N 50° 48.683' W 1° 37.417' ②		
Data Updated at	12:13:25	FFFE2F8C9F00C04CB1019F102A3794240FCD
Data Update Interval	30 min 02 s	

① GPS Site Survey – Live Location

② Input from GPS simulator

Position Clearance After Deactivation (C/S T.007 A.3.8.4)

Following the Encoded Position Data Update Interval test, the beacon was deactivated and reactivated without providing navigation data. The Digital Message output was encoded with the default position data.



Product Service

Position Data Input Update Interval (C/S T.007 A.3.8.5)

EUT does not accept external position input, test is not applicable.

Last Valid Position (C/S T.007 A.3.8.6)

Location: N 51° 22.583' W 1° 49.833' ②		
Data Acquired at	11:02:23	FFFE2F8C9F00C04CD701CAD575F79208025B
GPS Signal Navigation Data Removed		
Data Updated at	15:02:33	FFFE2F8C9F00C05FC0FF06728BF79F3C0010
Last Valid Position Held	240min 10s	
Return to Default Position	✓	

① GPS Site Survey – Live Location

② Input from GPS simulator



Product Service

Standard Protocol

Position Data Default Values (C/S T.007 A.3.8.1):

No position data was provided for > 4 hours before the test started. The beacon was activated and operated for 30 minutes without providing data. Message content was checked for all bursts during this period.

36 Hex Message	Message Count
FFFE2F8C9EF9C0637FDFF83D15B783E0F66C	41

Position Acquisition Time and Position Accuracy (C/S T.007 A.3.8.2)

Locations:

A.3.8.2.1: N 50° 49.096' W 001° 11.847' ①

A.3.8.2.2: N 50° 52.142' W 001° 14.680' ①

The appropriate position was applied, the EUT activated and time to first message containing valid position data timed.

Configuration as per C/S T.007	C/S T.007 Section A.3.8.2.1		C/S T.007 Section A.3.8.2.2	
	Time to Acquire Position (sec)	Location Error in metres	Time to Acquire Position (sec)	Location Error in metres
Configuration 5	61*	73.2	61*	22.7
Configuration 6	N/A	N/A	N/A	N/A
Configuration 7	51	73.2	51	22.7
Configuration 8	51	73.2	51	22.7

Positional accuracy was calculated using the Haversine Formula, The Earth's radius was taken as 6367 km.

① GPS Site Survey – Live Location

② Input from GPS simulator

* Approx 10 sec from immersion in salt water until beacon LEDs flash

Encoded Position Data Update Interval (C/S T.007 A.3.8.3):

Location: N 51° 22.583' W 1° 49.833' ②		
Data Acquired at	11:03:00	FFFE2F8C9EF9C06333A03ECA66771DA4D4D0
Location: N 50° 48.683' W 1° 37.417' ②		
Data Updated at	11:33:02	FFFE2F8C9EF9C06332E0311EC7778EA76951
Data Update Interval	30 min 02 s	



Product Service

- ① GPS Site Survey – Live Location
- ② Input from GPS simulator

Position Clearance After Deactivation (C/S T.007 A.3.8.4)

Following the Encoded Position Data Update Interval test, the beacon was deactivated and reactivated without providing navigation data. The Digital Message output was encoded with the default position data.

Position Data Input Update Interval (C/S T.007 A.3.8.5)

EUT does not accept external position input, test is not applicable.

Last Valid Position (C/S T.007 A.3.8.6)

Location: N 51° 22.583' W 1° 49.833' ①		
Data Acquired at	14:00:50	FFFE2F8C9EF9C06333A03ECA66771DA4D4D0
GPS Signal Navigation Data Removed		
Data Updated at	18:01:00	FFFE2F8C9EF9C0637FDFF83D15B783E0F66C
Last Valid Position Held	240min 10s	
Return to Default Position	✓	

- ① GPS Site Survey – Live Location
- ② Input from GPS simulator



Product Service

User Protocol

Position Data Default Values (C/S T.007 A.3.8.1):

No position data was provided for > 4 hours before the test started. The beacon was activated and operated for 30 minutes without providing data. Message content was checked for all bursts during this period.

36 Hex Message	Message Count
FFFE2FCC9E0A000C607CEDF5BA2FE0FF0146	38

Position Acquisition Time and Position Accuracy (C/S T.007 A.3.8.2)

Locations:

A.3.8.2.1: N 50° 49.096' W 001° 11.847' ①

A.3.8.2.2: N 50° 52.142' W 001° 14.680' ①

The appropriate position was applied, the EUT activated and time to first message containing valid position data timed.

Configuration as per C/S T.007	C/S T.007 Section A.3.8.2.1		C/S T.007 Section A.3.8.2.2	
	Time to Acquire Position (sec)	Location Error in metres	Time to Acquire Position (sec)	Location Error in metres
Configuration 5	61*	2037.3	61*	1565.4
Configuration 6	N/A	N/A	N/A	N/A
Configuration 7	51	2037.3	51	1565.4
Configuration 8	51	2037.3	51	1565.4

Positional accuracy was calculated using the Haversine Formula, The Earth's radius was taken as 6367 km.

① GPS Site Survey – Live Location

② Input from GPS simulator

* Approx 10 sec from immersion in salt water until beacon LEDs flash



Product Service

Encoded Position Data Update Interval (C/S T.007 A.3.8.3):

Location: N 51° 22.583' W 1° 49.833' ②		
Data Acquired at	12:26:37	FFFE2FCC9E0A000C607CEDF5BA266D01C026
Location: N 50° 48.683' W 1° 37.417' ②		
Data Updated at	12:56:39	FFFE2FCC9E0A000C607CEDF5BA265901967F
Data Update Interval	30 min 02 s	

- ① GPS Site Survey – Live Location
- ② Input from GPS simulator

Position Clearance After Deactivation (C/S T.007 A.3.8.4)

Following the Encoded Position Data Update Interval test, the beacon was deactivated and reactivated without providing navigation data. The Digital Message output was encoded with the default position data.

Position Data Input Update Interval (C/S T.007 A.3.8.5)

EUT does not accept external position input, test is not applicable.

Last Valid Position (C/S T.007 A.3.8.6)

Location: N 51° 22.583' W 1° 49.833' ①		
Data Acquired at	09:12:28	FFFE2FCC9E0A000C607CEDF5BA266D01C026
GPS Signal Navigation Data Removed		
Data Updated at	13:12:38	FFFE2FCC9E0A000C607CEDF5BA2FE0FF0146
Last Valid Position Held	240min 10s	
Return to Default Position	✓	

- ① GPS Site Survey – Live Location
- ② Input from GPS simulator

Test Summary

The results indicate compliance with Cospas-Sarsat T.007, Clause A.2.7.