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Report On

Emergency Beacons RTCM Testing of the
ACR Electronics, Inc.
RLB-36

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Document 75902695 Report 03 Issue 1 July 2008

Product Service

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REPORT ON

Emergency Beacons Testing of the
ACR Electronics, Inc.
RLB-36

Document 75902695 Report 03 Issue 1

July 2008

PREPARED FOR

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APPROVED BY

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DATED

23 July 2008

Product Service

CONTENTS

Product Service

SECTION 1

REPORT SUMMARY

Emergency Beacons Testing of the
ACR Electronics, Inc.
RLB-36

Product Service

1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Emergency Beacons Testing of the ACR Electronics, Inc. RLB-36 to the requirements of RTCM Paper 77-2002/SC110-STD.

Objective	To perform Emergency Beacons Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.	
Manufacturer	ACR Electronics, Inc.	
Model Number(s)	RLB-36	
Serial Number(s)	75902695_50	RLB-36, "Unit #10"
	75902695_57	RLB-36 Serial Number 007 (Modified sample to incorporate 50Ω output)
	75902695_49	RLB-36, "Unit #3"
	75902695_46	RLB-36, "Unit #4"
Number of Samples Tested	Four	
Test Specification/Issue/Date	RTCM Paper 77-2002/SC110-STD, Version 2.1 June 20, 2002	
Incoming Release Date	Application Form 16 January 2008	
Order Number Date	PO90763-00 04 December 2007	
Start of Test	18 February 2008	
Finish of Test	10 July 2008	
Name of Engineer(s)	R Hampton M Hardy C Hedley C Bowles S Mooney A Castle	

Product Service

Related Document(s)	MIL-STD-810D (19 July 1983), method 509.2.
	COSPAS-SARSAT C/S T.001, Specification for COSPAS-SARSAT 406 MHz Distress Beacons.
	COSPAS-SARSAT C/S T.007, COSPAS-SARSAT 406 MHz Distress Beacon Type Approval Standard.
	International Maritime Organization (IMO), Assembly Resolution A.810(19), Performance Standards for Float-Free Satellite Emergency Position-Indicating Radio Beacons (EPIRBs) Operating on 406 MHz.
	International Maritime Organization (IMO), Assembly Resolution A.662(16), Performance Standards for Float-Free Release and Activation Arrangements for Emergency Radio Equipment.
	International Maritime Organization (IMO), Assembly Resolution A.689(17), Recommendation on Testing of Life-Saving Appliances.
	U.S. Government Printing Office, U.S. Code of Federal Regulations, Title 46, Subpart 160.062, Releases. Lifesaving Equipment, Hydraulic and Manual.
	U.S. Government Printing Office, U.S. Code of Federal Regulations, Title 46, Subpart 164.018, Retroreflective Material for Lifesaving Equipment.
	Naval Publications and Forms Center (NPFC) MIL-STD-81OD, method 509.2, 19 July 1983, Environmental Test Methods and Engineering Guidelines, pp.509.2-5 to 509.2-10.
	Naval Publications and Forms Center (NPFC) MIL-O-55310B, Military Specification, General Specifications for Crystal Oscillators, page 44, paragraph 4.9.34.2.1, 1 April 1987.

Product Service

1.2 APPLICATION FORM

1.2.1 Beacon Manufacturer and Beacon Model

Beacon Manufacturer	ACR Electronics, Inc.
Beacon Model	RLB-36
Other Model Names	

1.2.2 Beacon Type and Operational Configurations

Beacon Type	Beacon used while:	Tick where appropriate
EPIRB	Floating in water or on deck or in a safety raft	X
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)		☐

1.2.3 Beacon Characteristics

Characteristic	Specification
Operating temperature range	Tmin = -20°C Tmax = +55°C
Operating lifetime	48 hours
Battery chemistry	LiMnO2
Battery cell size and number of cells	2/3A size, 3 battery packs, 3 cells each
Battery cell manufacturer	Sanyo, CR123A
Battery pack manufacturer and part number	ACR, A3-06-2449
Oscillator type (e.g. OCXO, MCXO, TCXO)	TCXO
Oscillator manufacturer	C-MAC / RAKON (E4520)
Oscillator part name and number	A1-11-0786-1
Oscillator satisfies long-term frequency stability requirements (Yes or No)	Yes

Product Service

Characteristic	Specification
Antenna type: Integral or Other (e.g. External, Detachable – specify type)	Integral
Antenna manufacturer	ACR Electronics, Inc.
Antenna part name and number	A3-06-2554
Navigation device type (Internal, External or None)	Both Internal and External
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
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	Wonde Proud
- Navigation device model name and part Number	A1-11-0688
- GNSS system supported (e.g. GPS, GLONASS, Galileo)	GPS
For External Navigation Devices	
- Data protocol for GNSS receiver to beacon interface	NMEA 0183
- Physical interface for beacon to navigation device	A plug to a keyed GPS bezel
- Electrical interface for beacon to navigation device	GPS Optical Interface
- Navigation device model and manufacturer (if beacon designed to use specific devices)	Any Nav. devices with NMEA 0183 protocol; ie, Garmin GPS handheld

Product Service

Characteristic	Specification	
Self-Test Mode Characteristics	Self-Test Mode	Optional GNSS Self-Test Mode
- Self-test has separate switch position (Yes or No)	Yes	
- Self-test switch automatically returns to normal position when released (Yes or No)	Yes	
- Self-test activation can cause an operational mode transmission (Yes or No)	No	
- Self-test causes a single beacon self-test message burst only regardless of how long the self-test activation mechanism applied (Yes or No)	Yes	
- Results of self-test indicated by (e.g. Pass / Fail Indicator Light, Strobe Light, etc.)	5 beeps and green light	
- Self-test can be activated from beacon remote activation points (Yes or No)	No	
- Self-test performs an internal check and indicates that RF power emitted at 406 MHz and 121.5 MHz if beacon includes a 121.5 MHz homer (Yes or No)	No	
- Self-test transmits a signal(s) other than at 406 MHz (Yes & details or No)	No	
- Self-test can be activated directly at beacon (Yes or No)	Yes	
- List of Items checked by self-test	Battery, Lock detect, 406 PWR, Strobe light	
- Self-test transmission burst duration (440 or 520 ms)	440 ms	
- Self-test format bit (“0” or “1”)	1	
- Maximum duration of GNSS Self Test	N/A	
- Maximum number of GNSS Self Tests (beacons with internal navigation devices only)	N/A	
Beacon includes a homer transmitter (if yes identify frequency of transmission)	121.5MHz	
-Homer Transmit Power	17dBm	
-Homer Duty Cycle	98%	
-Duty Cycle of Homer Swept Tone	37.5%	

Product Service

Characteristic	Specification
Beacon includes a strobe light (Yes or No)	Yes
- Strobe light intensity	> 0.75 cd
- Strobe light flash rate	21/minute
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). List details on a separate sheet if insufficient space to describe.	na
Beacon includes automatic activation mechanism (Yes or No) Specify type of automatic beacon activation mechanism	Yes, ACR Hydrostatic release unit, part # A3-06-2429
Beacon includes software or hardware features and functions not listed above and non-related to 406 MHz (Yes or No) List features and use a separate sheet if insufficient space	Yes, OLED display is used as secondary indicators besides beep/LED indicators

Product Service

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)	X	EPIRB with MMSI
	X	EPIRB with Serial Number
	☐	ELT with 24-bit Address
	☐	ELT with Aircraft Operator Designator
	☐	ELT with Serial Number
	☐	PLB with Serial Number
National Location Protocol (tick where appropriate)	X	National Location: EPIRB
	☐	National Location: ELT
	☐	National Location: PLB
User Location 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

Product Service

1.2.4 Information Provided by the Cospas-Sarsat Accepted Test Facility

Name and Location of Beacon Test Facility: TUV Product Service Ltd, United Kingdom

Date of Submission for Testing: 18 February 2008

Applicable C/S Standards:

Document	Issue	Revision	Date
C/S T.001	3	8	Nov-07
C/S T.007	4	2	Nov-07

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.

Signed: M Hardy

Name: M J Hardy

Position Held: Authorised Signatory

Date: 23 July 2008

Product Service

1.3 PRODUCT INFORMATION

1.3.1 Technical Description

The Equipment Under Test (EUT) was a ACR Electronics, Inc. RLB-36 as shown in the photograph below. A full technical description can be found in the manufacturer's documentation.

Equipment Under Test

Product Service

1.3.2 Test Configuration

Environmental tests designed to stress/test the physical design were conducted on the main unit which was similar to the proposed production units.

Tests requiring a conducted link to the EUT's transmitter were not performed on the primary test sample (Unit #10). A second sample was used which was modified, by the manufacturer, to provide two 50Ω output ports, one for 121 MHz measurements, the other for 406 MHz measurements.

1.3.3 Modes of Operation

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

Test Mode 1: Idle; Beacon in quiescent state (main switch set to 'READY').

Test Mode 2: Operating; Beacon activated using the main switch. 406 MHz and 121MHz Transmitters active, EUT programmed with test mode as per Cospas-Sarsat T.007. Note: this is sometimes referred to as "Normal" mode due to the normal frame sync.

Test Mode 3: Self-test mode; Beacon activated using the main switch. Pre-programmed self-test mode runs and beacon subsequently returns to idle mode.

Specific test modes used are detailed in the test procedure for each individual test.

The EUT was powered by its internal battery.

1.3.4 Monitoring of Performance

Aliveness Test comprises successful self-test of beacon (captured by a beacon tester where results are displayed) and confirmation LCD readout on EUT as follows: ☺☺☺ ☑

1.3.5 Performance Criterion

EUT must successfully complete the aliveness test.

1.3.6 Additional Variants

No Variants of the RLB-36 were declared by the customer.

Product Service

1.4 DEVIATIONS FROM THE STANDARD

Primary EUT for test programme (RLB-36, Unit #10) was not equipped with conducted output, hence, power outputs displayed for this unit are radiated and not accurate, they can be used only for comparison. Cospas-Sarsat T.007 Antenna Characteristics testing conducted after environmental tests should be used to demonstrate correct power output. Likewise, the Cospas-Sarsat Accreditation should further demonstrate this.

Whereas the present standard specifies a Nominal frequency of 406.028 ± 0.001 MHz, the beacon is manufactured in line with latest Cospas-Sarsat requirements, presently 406.037 ± 0.001 MHz.

1.5 MODIFICATION RECORD

The table below details modifications made to the EUT during the test programme. The modifications incorporated during each test are recorded on the appropriate test pages.

Modification State	Description of Modification still fitted to EUT	Modification Fitted By	Date Modification Fitted
0	As supplied by the customer All samples were originally supplied in this state. However, the Cospas-Sarsat test programme (run concurrently with the testing for this report) was aborted after encountering message errors. The issue was resolved through modification and the Cospas-Sarsat test programme was restarted. The main sample for this report remained in the original modification state as it was already far into the programme and the customer stated that their modification would not affect any of the test results. Note: This modification state applies only to the sample: Unit #10.	N/A	N/A
1	As supplied by the customer This is the modification state to fix the message error. One sample at this modification state also included a modification to enable measurements conducted into 50Ω. Note: This modification state applies only to the samples: Unit #3, Unit #4 and Serial Number 007	ACR Electronics Inc.	N/A (See Description of Mod State 0)
2	Untested Modification State. Due to 121.5 MHz transmitter interruption duration being in excess of 2 seconds the customer modified the software design to shorten the duration. See Section 2.20 and Annex A for details	ACR Electronics Inc.	N/A (See Description of Mod State 2)

Note: Details of the message errors present in modification state 0 can be found at Annex A: Customer Supplied Information. The customer declared that the modification would have no impact upon the results of the tests undertaken by the Modification State 0 sample – as these tests do not relate to the digital message output and the modification is one of software, not hardware or physical configuration.

Product Service

1.6 ALTERNATIVE TEST SITE

Under our group UKAS Accreditation, TÜV Product Service Ltd conducted the following tests at Bearley, Stratford-upon-Avon Test Laboratory:

2.24 Peak Equivalent Radiated Power

Under our group UKAS Accreditation, TÜV Product Service Ltd conducted the following tests at MPI Services (UK) Limited, trading as Manor Marine, Portland, Dorset:

2.8 Drop Test in Water

Under our group UKAS Accreditation, TÜV Product Service Ltd conducted the following tests at Warsash Maritime Academy, Newtown Road, Warshash, Southampton, Hampshire:

2.18 Inadvertent Activation Test

Product Service

SECTION 2

TEST DETAILS

Emergency Beacons Testing of the
ACR Electronics, Inc.
RLB-36

Product Service

TEST RESULTS TABLE

Parameter To Be Measured	Range Of Specification	Units	Test Results			Comments
			T_{min} (-20°C)	T_{amb}	T_{max} (+55°C)	
1. Initial Aliveness Test (A1.0)						Section 2.1
• Aliveness Test:						
– Carrier Frequency	406.028±0.001	MHz		406.036644		Present Cospas-Sarsat requirement is 406.037±0.001 with which the beacon complies.
– Power Output	35 - 39	dBm		18.9		Radiated power for comparison only; see Section 1.4 for details.
2. Dry Heat Cycle (A3.0)						Section 2.2
• Aliveness Test (during 2 hour period)	Successful	✓			✓	
• Aliveness Test (at end of 2 hour period)	Successful	✓			✓	
3. Damp Heat Cycle (A4.0)						Section 2.3
• Aliveness Test (during 2 hour period)	Successful	✓			✓	
• Aliveness Test (at end of 2 hour period)	Successful	✓			✓	
4. Vibration Test (A5.0)						Section 2.4
• Exterior Mechanical Inspection	No damage	✓		✓		
• Aliveness Test	Successful	✓		✓		
• Activation	No activation during test	✓		✓		
5. Bump Test (A6.0)						Section 2.5
• Exterior Mechanical Inspection	No damage	✓		✓		
• Aliveness Test	Successful	✓		✓		
• Activation	No activation during test	✓		✓		
6. Salt Fog Test (A7.0)						Section 2.6
• Exterior Mechanical Inspection	No damage	✓		✓		
• Aliveness Test	Successful	✓		✓		

Product Service

Parameter To Be Measured	Range Of Specification	Units	Test Results			Comments
			T_{min} (-20°C)	T_{amb}	T_{max} (+55°C)	
7-A. Drop Test On Hard Surface (A8.1)						Section 2.7
• Exterior Mechanical Inspection	No damage	✓	✓			The EUT was soaked at the minimum stowage temperature (-30°C) prior to the drop.
• Aliveness Test	Successful	✓	✓			
• Activation	No activation during test	✓	✓			
7-B. Drop Test In Water (A8.2)						Section 2.8
• Exterior Mechanical Inspection	No damage	✓		✓		
• Aliveness Test	Successful	✓		✓		
8. Leakage And Immersion Test (A9.0)						Section 2.9
Leakage & Immersion						
• Aliveness Test	Successful	✓		✓		
• Interior Inspection	No water	✓		✓		
9. Spurious Emissions Test (A10.0)						Section 2.10
• 406 MHz	Figure 2-1	✓	✓	✓	✓	
• 121.5 MHz	Figure 2-6	✓	✓	✓	✓	

Product Service

Parameter To Be Measured	Range Of Specification	Units	Test Results			Comments
10. Thermal Shock (A11.0)			High-Temperature		Low-Temperature	Sections 2.12 & 2.11 respectively
• Self-activation in fresh water	5	minutes	<1		<1	
• Self-activation in salt water (5% NaCl*)	5	minutes	<1		<1	*5% NaCl by mass
• Aliveness Test:						
– Carrier Frequency	406.028±0.001	MHz	406.0366310 406.0366309		406.0366217 406.0366206	Present Cospas-Sarsat requirement is 406.037±0.001 with which the beacon complies. Where two values are stated these are the maximum and minimum respectively
• Frequency Stability:						
– short term stability	< 0.002	parts/ million in 100ms	8.347×10^{-05} 7.792×10^{-05}		8.815×10^{-05} 7.098×10^{-05}	
– medium term stability:						
– mean slope	< 0.001	parts/ million/ minute	1.253×10^{-04} 1.248×10^{-04}		5.456×10^{-04} 4.934×10^{-04}	
– residual frequency variation	< 0.003	parts/ million	1.032×10^{-04} 1.001×10^{-04}		1.640×10^{-04} 8.965×10^{-05}	
11. Cospas-Sarsat Type Approval (A12.0)						
Cospas-Sarsat Certificate	Provided (attach test report)	Y/N	N			Approval Pending

Product Service

Parameter To Be Measured	Range Of Specification	Units	Test Results			Comments
			T_{min} (-20°C)	T_{amb}	T_{max} (+55°C)	
12. Operational Life, Strobe Light and Self-tests (A13.1)						Section 2.13
• Operational Life	Time to first Failure	Hours	72.35			
• Frequency:						
– Nominal Carrier	406.037±0.001	MHz	406.0366877 406.0367114			Where two values are stated these are the minimum and maximum up to 48 hours.
– Short-term stability	0.002	parts/ million in 100ms	6.151×10^{-5} 2.110×10^{-4}			
• Medium-term stability:						
– Mean Slope	0.001	parts/ million/ minute	-1.058×10^{-4} 1.542×10^{-4}			
– Residual Variation	0.003	parts/ million	5.589×10^{-5} 5.483×10^{-4}			
• RF output power	35 - 39	dBm	37.81 38.60			
• Auxiliary radio-locating Peak envelope power	14 - 20	dBm	18.51 19.09			
13. Strobe Light Test (A13.2)						Section 2.14
• Flash Rate	20 - 30	/min	20	21	21	
• Effective intensity	0.75	Cd	1.00	1.00	0.9	Results from Subcontractor, See Annex B
• Pulse Duration	10^{-6} to 10^{-2}	s	0.039	0.039	0.039	
14. Self-test (A13.3)						Section 2.15
• RF pulse duration	<444 or <525*	ms	439.9193	439.9327	439.9418	* Range Of Specification dependant on message length. EUT coded with long message, hence limit is <525ms.
• Frame synchronisation pattern	0 1101 0000	✓	✓	✓	✓	EUT also utilises the truncated self-test message, hence, also satisfies the <444 ms criterion.
• Number of RF bursts	1-burst	✓	✓	✓	✓	

Product Service

Parameter To Be Measured	Range Of Specification	Units	Test Results			Comments
			T_{min} (-20°C)	T_{amb}	T_{max} (+55°C)	
15. Automatic Release Mechanism Test (A14.0)						Section 2.16
• Normal mounted orientation	Release and float free before 4 meters; automatic activation	✓	✓	✓	✓	Results from Subcontractor, See Annex B
• Rolling 90° starboard		✓		✓		
• Rolling 90° port		✓		✓		
• Rolling 90° bow down		✓		✓		
• Rolling 90° stern down		✓		✓		
• Upside down		✓		✓		
16. Stability and Buoyancy Test (A15.0)						Section 2.17
• Time to upright	< 2	seconds		1.72		
• Reserve buoyancy	> 5	%		28.2		
• Float upright; Antenna base	> 4	cm		4.5		
17. Inadvertent Activation Test (A16.0)						Section 2.18
• Activation/Release	EUT should not release from bracket or automatically activate	✓		✓		

Product Service

Parameter To Be Measured	Range Of Specification	Units	Test Results			Comments
			T_{min} (-20°C)	T_{amb}	T_{max} (+55°C)	
18. Auxiliary Radio-Locating Device Transmitter Test (A17.0)						
• Carrier frequency	121.5 ± 0.006	MHz	121.497469		121.499082	Section 2.18.2
• Duty cycle	100	%	95.92		95.85	Section 2.20 Duty cycle shown includes the allowed ≤2s gap for 406MHz burst, excluding this the duty cycle is 100%. ≤2s gap is verified at the appropriate section.
• Modulation:						
– Frequency	700 Hz within the range of 300 - 1600 Hz	✓	✓		✓	Section 2.21
– Range	> 700	Hz	1026.74		1032.75	
– Minimum	> 300	Hz	540.50		533.30	
– Maximum	< 1600	Hz	1567.24		1566.05	
– Direction	Upward	Upward / Downward	Downward		Downward	* EUT capable of both directions. See Annex A
– Duty cycle	33 - 55	%	35.71		36.09	
– Sweep repetition rate	2 - 4	Hz	2.56		2.56	
– Factor	0.85 - 1.0	#	0.94		0.95	Section 2.22
– Frequency Coherence	30% Power < ±30 Hz	✓	✓		✓	Section 2.23
– Frequency shift after 406 MHz burst	Shift < ±30 Hz	✓	✓		✓	
• PERP	14 - 20	dBm		19.95		Section 2.24
• Antenna:						
– Pattern	Omnidirectional	✓		✓		
– Polarisation	Vertical	✓		✓		
– VSWR	< 1.5:1	✓		N/A		Section 2.25

Product Service

Parameter To Be Measured	Range Of Specification	Units	Test Results			Comments
			T_{min} (-20°C)	T_{amb}	T_{max} (+55°C)	
19. Humidity Test (A18.0)						Section 2.26
• Aliveness Test	Successful	✓			✓	
20. Orientation Test (A19.0)						Section 2.27
Vertical						
• Aliveness Test	Successful	✓		✓		
Upside Down						
• Aliveness Test	Successful	✓		✓		
Horizontal						
• Aliveness Test	Successful	✓		✓		

Product Service

2.1 INITIAL ALIVENESS TEST

2.1.1 Specification Reference

RTCM Paper 77-2002/SC110-STD, Clause A1.0

2.1.2 Equipment Under Test

RLB-36, Unit #10

2.1.3 Date of Test and Modification State

18 February 2008 - Modification State 0

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 Operating Modes

The test was performed with the EUT in the following mode(s): Normal and Self-test.

2.1.6 Environmental Conditions

Ambient Temperature	25.1°C
Atmospheric Pressure	1026mbar

2.1.7 Test Results

An Aliveness test consisting of (minimum) one self-test of the beacon followed by a short period of activation (minimum four normal messages obtained). During the Aliveness Test the following parameters were checked:

- Self-test message capture
- Self-test “Pass” indication
- Strobelight operation
- Normal message capture
- 121 MHz homer frequency and power (radiated for comparison only, as per 406 MHz)

However, only the following paratmeters were recorded (as required by The Standard). Note that this procedure was used for every Aliveness Test as detailed in this report unless otherwise stated. The beacon test reports contained within this report show several other parameters (e.g. modulation characteristics), whilst these were checked, due to the measurements being radiated and the results are not considered accurate and should be for reference/comparison only.

Parameter	Value	Units
Carrier Frequency	406.036644	MHz
Power Output	18.9	dBm
Data message received & decoded	Yes	Yes/No

Note: Power Output for comparison only, see section 1.4, Deviations From The Standard for details.

Product Service

Beacon Test Report (Normal Message)

Beacon Test Report

2DDC4407D2FFBFF

Organization: TÜV Product Service Ltd
Tested By: Emergency Beacons Dept
Date: 2/18/08 12:17:41 PM
Tester Model/Serial No./File Name: BT100S/1025/02695_InitialAliveness--4
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 28°C

☐ **PASS** ☐ **FAIL** **INITIALS:_____**

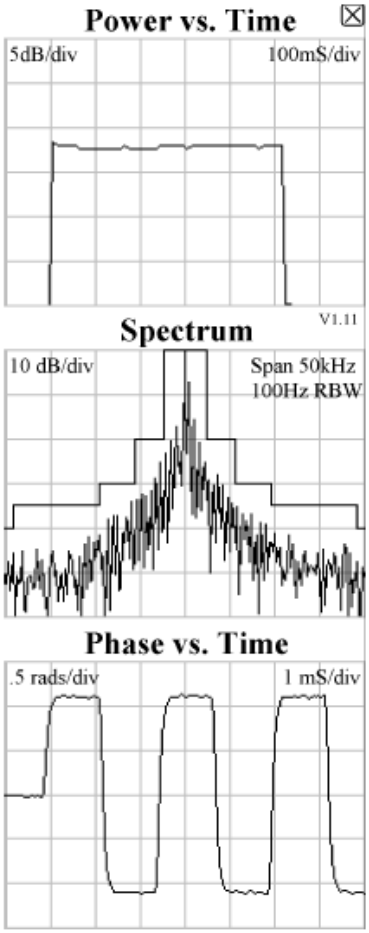
Notes: Add text comments here.

15 Hex ID: 2DDC4407D2FFBFF
Full Hex: FFFE2F96EE2203E97FDFFA885FF783E0F66C
Burst Mode: Normal Mode (Long)
Protocol: Standard Test Protocol
Country 366: United States
Bits 41 - 64: 2229225

Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-110: Default
Latitude: * **°**.**
Longitude: * **°**.**

406 MHz Measurements
406 Frequency (EXT REF): 406.036644 MHz
406 Power (INT ANT): 69%
Power Rise Time: < 5 ms
Phase Deviation: -1.1 +1.11 radians
Modulation Rise Time: 188 uS
Modulation Fall Time: 188 uS
Modulation Symmetry: 0%
Modulation Bit Rate: 399.8 bps
CW Preamble: 160.1 ms

121.5 MHz Measurements
121 Frequency (EXT REF): Out of Range.
121 Power (INT ANT): 23%
Sweep Direction: Downwards
Audio Frequency: 562 Hz to 1500 Hz
Sweep Range: 938 Hz
Sweep Rep Rate: 2.6 Hz
Modulation Factor: N/A
Duty Cycle: 30 %



DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.

Note: Beacon tester out of calibration, traceability maintained for frequency measurement by using a calibrated external reference. Power measurement for reference/comparison only and hence traceability unimportant. Similarly for the other parameters (e.g. modulation details).

Product Service

Beacon Test Report (Self-test Message)

Beacon Test Report

2DDC4407D2FFBFF

Organization: TÜV Product Service Ltd
Tested By: Emergency Beacons Dept
Date: 2/18/08 12:22:10 PM
Tester Model/Serial No./File Name: BT100S/1025/02695_InitialAliveness–8
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 27°C

☐ **PASS** ☐ **FAIL** **INITIALS:_____**

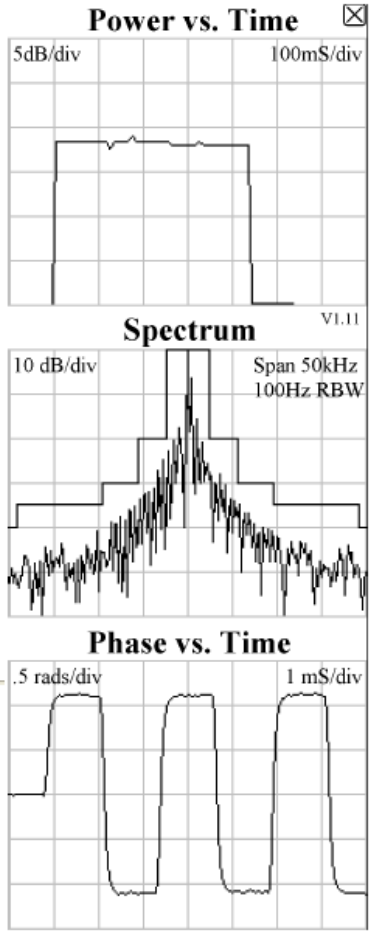
Notes: Add text comments here.

15 Hex ID: 2DDC4407D2FFBFF
Full Hex: FFFED096EE2203E97FDFFA885FF7
Burst Mode: Self Test Mode (Short)
Protocol: Standard Test Protocol
Country 366: United States
Bits 41 - 64: 2229225

Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-110: Default
Latitude: * **°**.**
Longitude: * **°**.**

406 MHz Measurements
406 Frequency (EXT REF): 406.036665 MHz
406 Power (5 Watt): 18.9 dBm
Power Rise Time: < 5 ms
Phase Deviation: -1.1 +1.1 radians
Modulation Rise Time: 188 uS
Modulation Fall Time: 198 uS
Modulation Symmetry: 0%
Modulation Bit Rate: 399.8 bps
CW Preamble: 160.2 ms

DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.



Note: Beacon tester out of calibration, traceability maintained for frequency measurement by using a calibrated external reference. Power measurement for reference/comparison only and hence traceability unimportant. Similarly for the other parameters (e.g. modulation details).

Product Service

2.2 DRY HEAT CYCLE

2.2.1 Specification Reference

RTCM Paper 77-2002/SC110-STD, Clause A3.0

2.2.2 Equipment Under Test

RLB-36, Unit #10

2.2.3 Date of Test and Modification State

18 to 19 February 2008 - Modification State 0

2.2.4 Test Equipment Used

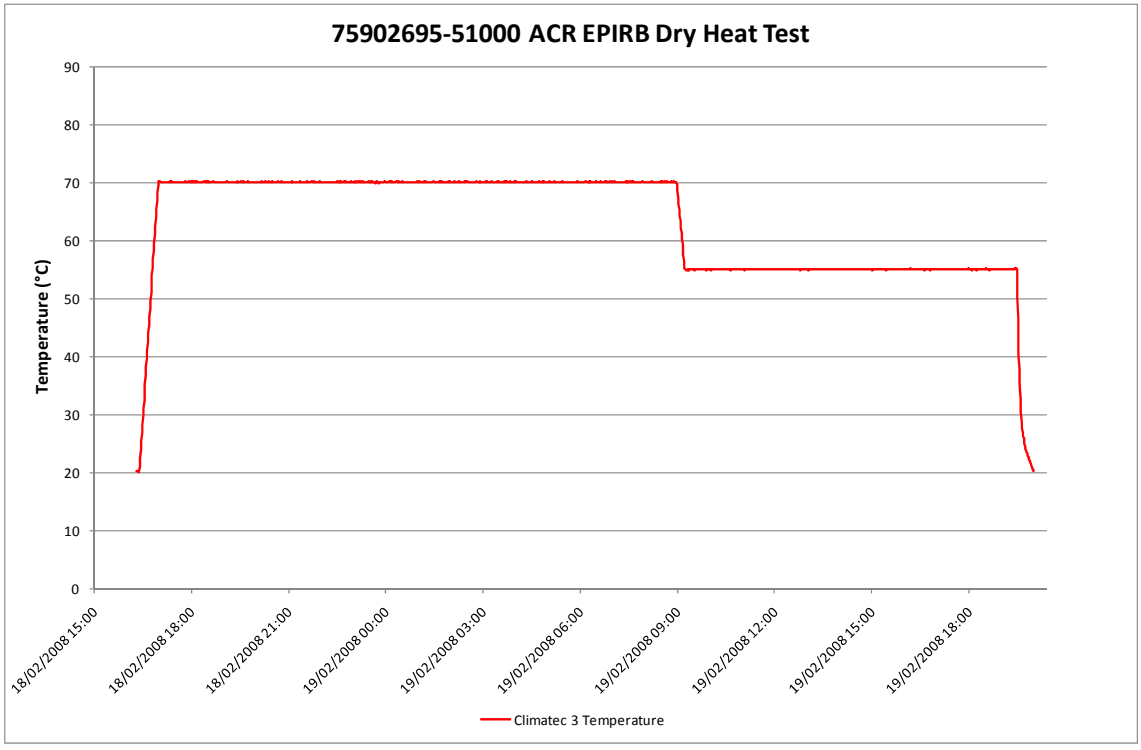
The major items of test equipment used for the above tests are identified in Section 3.1.

2.2.5 Test Set-up and Operating Modes

The test was performed with the EUT in the following mode(s): Idle and Operating as per "Specification Reference", above.

2.2.6 Environmental Conditions

Dry Heat Cycle Temperature Plot



Product Service

2.2.7 Test Results

Summary of Aliveness test results

Stage	Pass / Fail
During Two Hour Dwell, Self-test Message	Pass
During Two Hour Dwell, Normal Message	Pass
End Of Two Hour Dwell, Self-test Message	Pass
End Of Two Hour Dwell, Normal Message	Pass

Product Service

Beacon Test Report (Aliveness Test, During Two Hour Dwell, Self-test Message)

Beacon Test Report

2DDC4407D2FFBFF

Organization: TÜV Product Service Ltd
Tested By: Emergency Beacons Dept
Date: 2/19/08 9:43:05 AM
Tester Model/Serial No./File Name: BT100S/1025/02695_DryHeat1–2
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 19°C

☐ **PASS** ☐ **FAIL** **INITIALS:_____**

Notes: Add text comments here.

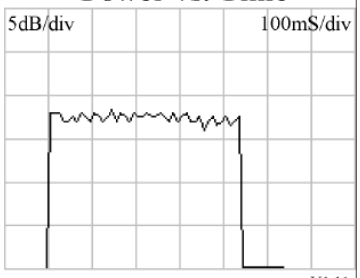
15 Hex ID: 2DDC4407D2FFBFF
Full Hex: FFFED096EE2203E97FDFFA885FF7
Burst Mode: Self Test Mode (Short)
Protocol: Standard Test Protocol
Country 366: United States
Bits 41 - 64: 2229225

Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-110: Default
Latitude: * **°**.**
Longitude: * **°**.**

406 MHz Measurements
406 Frequency (EXT REF): 406.036647 MHz
406 Power (5 Watt): 17.5 dBm
Power Rise Time: < 5 ms
Phase Deviation: -1.05 +1.15 radians
Modulation Rise Time: 177 uS
Modulation Fall Time: 177 uS
Modulation Symmetry: 0.4%
Modulation Bit Rate: 399.8 bps
CW Preamble: 160.2 ms

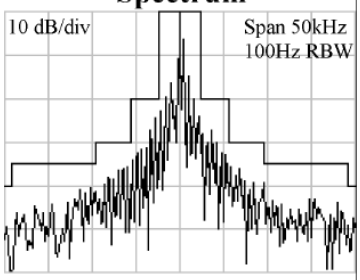
DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.

Power vs. Time

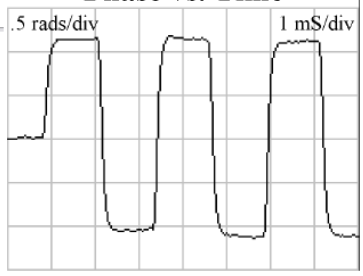


V1.11

Spectrum



Phase vs. Time



Note: Beacon tester out of calibration, traceability maintained for frequency measurement by using a calibrated external reference. Power measurement for reference/comparison only and hence traceability unimportant. Similarly for the other parameters (e.g. modulation details).

Product Service

Beacon Test Report (Aliveness Test, During Two Hour Dwell, Normal Message)

Beacon Test Report

2DDC4407D2FFBFF

Organization: TÜV Product Service Ltd
Tested By: Emergency Beacons Dept
Date: 2/19/08 9:51:50 AM
Tester Model/Serial No./File Name: BT100S/1025/02695_DryHeat1–7
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 24°C

☐ **PASS** ☐ **FAIL** **INITIALS:**_____

Notes: Add text comments here.

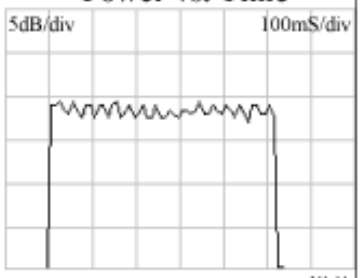
15 Hex ID: 2DDC4407D2FFBFF
Full Hex: FFFE2F96EE2203E97FDFFA885FF783E0F66C
Burst Mode: Normal Mode (Long)
Protocol: Standard Test Protocol
Country 366: United States
Bits 41 - 64: 2229225

Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-110: Default
Latitude: * **°**.**
Longitude: * **°**.**

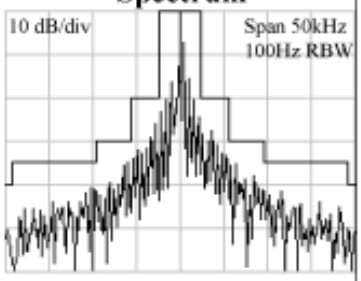
406 MHz Measurements
406 Frequency (EXT REF): 406.036623 MHz
406 Power (INT ANT): 88%
Power Rise Time: < 5 ms
Phase Deviation: -0.89 +1.32 radians
Modulation Rise Time: 177 uS
Modulation Fall Time: 188 uS
Modulation Symmetry: 0.3%
Modulation Bit Rate: 399.8 bps
CW Preamble: 160 ms

DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.

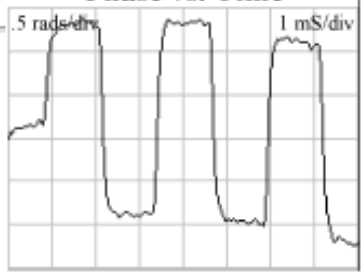
Power vs. Time



Spectrum



Phase vs. Time



Note: Beacon tester out of calibration, traceability maintained for frequency measurement by using a calibrated external reference. Power measurement for reference/comparison only and hence traceability unimportant. Similarly for the other parameters (e.g. modulation details).

Product Service

Beacon Test Report (Aliveness Test, End Of Two Hour Dwell, Self-test Message)

Beacon Test Report

2DDC4407D2FFBFF

Organization: TÜV Product Service Ltd
Tested By: Emergency Beacons Dept
Date: 2/19/08 11:37:11 AM
Tester Model/Serial No./File Name: BT100S/1025/02695_DryHeat2–7
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 29°C

☐ **PASS** ☐ **FAIL** **INITIALS:**_____

Notes: Add text comments here.

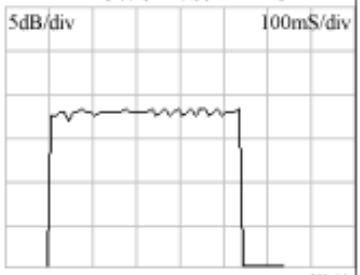
15 Hex ID: 2DDC4407D2FFBFF
Full Hex: FFFED096EE2203E97FDFFA885FF7
Burst Mode: Self Test Mode (Short)
Protocol: Standard Test Protocol
Country 366: United States
Bits 41 - 64: 2229225

Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-110: Default
Latitude: * **°**.**
Longitude: * **°**.**

406 MHz Measurements
406 Frequency (EXT REF): 406.036624 MHz
406 Power (INT ANT): 95%
Power Rise Time: < 5 ms
Phase Deviation: -0.97 +1.28 radians
Modulation Rise Time: 177 uS
Modulation Fall Time: 165 uS
Modulation Symmetry: 0%
Modulation Bit Rate: 399.8 bps
CW Preamble: 160.1 ms

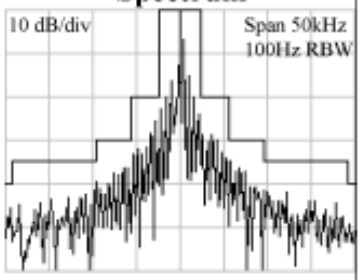
DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.

Power vs. Time



V1.11

Spectrum



Phase vs. Time

Note: Beacon tester out of calibration, traceability maintained for frequency measurement by using a calibrated external reference. Power measurement for reference/comparison only and hence traceability unimportant. Similarly for the other parameters (e.g. modulation details).

Product Service

Beacon Test Report (Aliveness Test, End Of Two Hour Dwell, Normal Message)

Beacon Test Report

2DDC4407D2FFBFF

Organization: TÜV Product Service Ltd
Tested By: Emergency Beacons Dept
Date: 2/19/08 11:34:14 AM
Tester Model/Serial No./File Name: BT100S/1025/02695_DryHeat2–5
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 29°C

☐ **PASS** ☐ **FAIL** **INITIALS:_____**

Notes: Add text comments here.

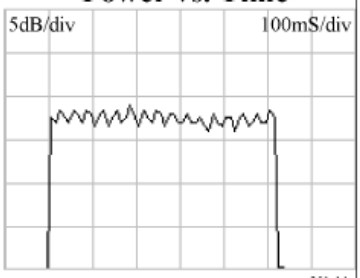
15 Hex ID: 2DDC4407D2FFBFF
Full Hex: FFFE2F96EE2203E97FDFFA885FF783E0F66C
Burst Mode: Normal Mode (Long)
Protocol: Standard Test Protocol
Country 366: United States
Bits 41 - 64: 2229225

Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-110: Default
Latitude: * **°**.**
Longitude: * ***°**.**

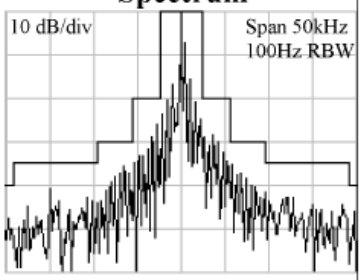
406 MHz Measurements
406 Frequency (EXT REF): 406.036633 MHz
406 Power (INT ANT): 88%
Power Rise Time: < 5 ms
Phase Deviation: -1.39 +0.84 radians
Modulation Rise Time: 177 uS
Modulation Fall Time: 188 uS
Modulation Symmetry: 0.4%
Modulation Bit Rate: 400 bps
CW Preamble: 160.4 ms

DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.

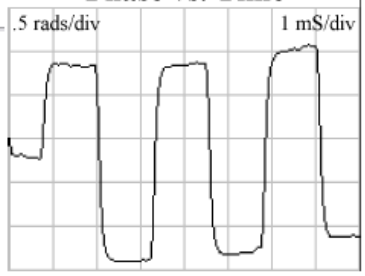
Power vs. Time



Spectrum



Phase vs. Time



Note: Beacon tester out of calibration, traceability maintained for frequency measurement by using a calibrated external reference. Power measurement for reference/comparison only and hence traceability unimportant. Similarly for the other parameters (e.g. modulation details).

Product Service

2.3 DAMP HEAT CYCLE

2.3.1 Specification Reference

RTCM Paper 77-2002/SC110-STD, Clause A4.0

2.3.2 Equipment Under Test

RLB-36, Unit #10

2.3.3 Date of Test and Modification State

19 and 20 February 2008 - Modification State 0

2.3.4 Test Equipment Used

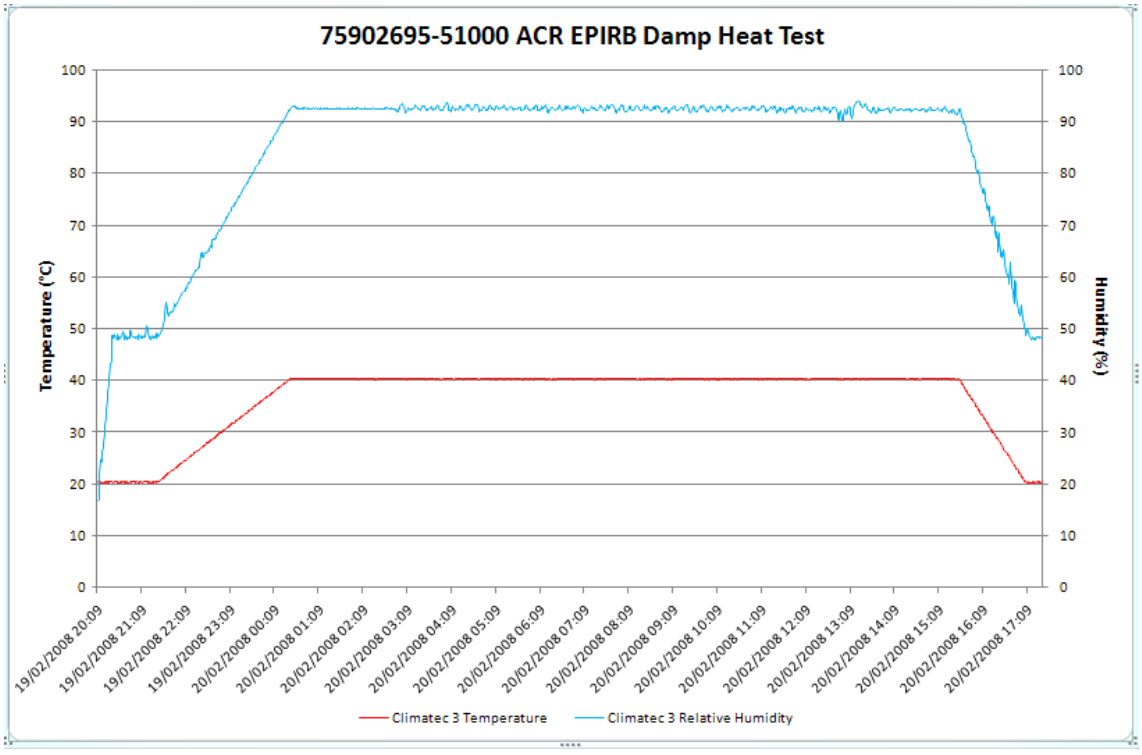
The major items of test equipment used for the above tests are identified in Section 3.1.

2.3.5 Test Set-up and Operating Modes

The test was performed with the EUT in the following mode(s): Operating.

2.3.6 Environmental Conditions

Damp Heat Cycle Temperature Plot



Product Service

2.3.7 Test Results

Summary of Aliveness test results

Stage	Pass / Fail
During Two Hour Dwell, Self-test Message	Pass
During Two Hour Dwell, Normal Message	Pass
End Of Two Hour Dwell, Self-test Message	Pass
End Of Two Hour Dwell, Normal Message	Pass

Product Service

Beacon Test Report (Aliveness Test, During Two Hour Dwell, Self-test Message)

Beacon Test Report

2DDC4407D2FFBFF

Organization: TÜV Product Service Ltd
Tested By: Emergency Beacons Dept
Date: 2/20/08 12:57:38 PM
Tester Model/Serial No./File Name: BT100S/1025/02695_DampHeat1–2
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 26°C

☐ **PASS** ☐ **FAIL** **INITIALS:_____**

Notes: Add text comments here.

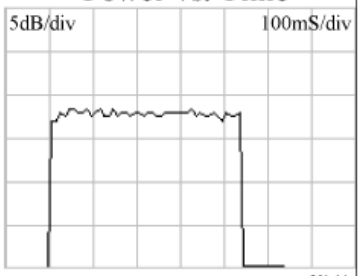
15 Hex ID: 2DDC4407D2FFBFF
Full Hex: FFFED096EE2203E97FDFFA885FF7
Burst Mode: Self Test Mode (Short)
Protocol: Standard Test Protocol
Country 366: United States
Bits 41 - 64: 2229225

Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-110: Default
Latitude: * **°**.**
Longitude: * ***°**.**

406 MHz Measurements
406 Frequency (EXT REF): 406.036636 MHz
406 Power (5 Watt): 14.5 dBm
Power Rise Time: > 5 ms
Phase Deviation: -1.2 +0.99 radians
Modulation Rise Time: 177 uS
Modulation Fall Time: 177 uS
Modulation Symmetry: 0%
Modulation Bit Rate: 399.8 bps

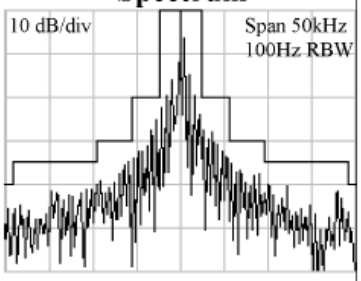
DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.

Power vs. Time

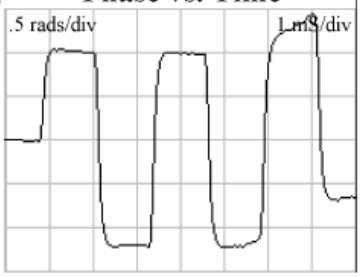


V1.11

Spectrum



Phase vs. Time



Note: Beacon tester out of calibration, traceability maintained for frequency measurement by using a calibrated external reference. Power measurement for reference/comparison only and hence traceability unimportant. Similarly for the other parameters (e.g. modulation details).

Product Service

Beacon Test Report (Aliveness Test, During Two Hour Dwell, Normal Message)

Beacon Test Report

2DDC4407D2FFBFF

Organization: TÜV Product Service Ltd
Tested By: Emergency Beacons Dept
Date: 2/20/08 1:18:02 PM
Tester Model/Serial No./File Name: BT100S/1025/02695_DampHeat1–21
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 28°C

☐ **PASS** ☐ **FAIL** **INITIALS:_____**

Notes: Add text comments here.

15 Hex ID: 2DDC4407D2FFBFF
Full Hex: FFFE2F96EE2203E97FDFFA885FF7
Burst Mode: Normal Mode (Short)
Protocol: Standard Test Protocol
Country 366: United States
Bits 41 - 64: 2229225

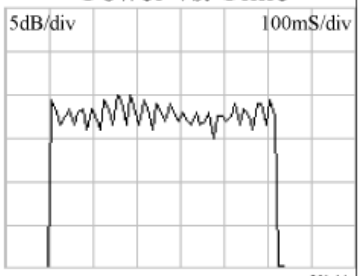
Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-110: Default
Latitude: * **°**.**
Longitude: * **°**.**

406 MHz Measurements
406 Frequency (EXT REF): 406.036636 MHz
406 Power (INT ANT): 62%
Power Rise Time: < 5 ms
Phase Deviation: -1.3 +0.87 radians
Modulation Rise Time: 153 uS
Modulation Fall Time: 177 uS
Modulation Symmetry: 0%
Modulation Bit Rate: 400 bps
CW Preamble: 160 ms

121.5 MHz Measurements
121 Frequency (EXT REF): Out of Range.
121 Power (INT ANT): 16%
Signal was unmodulated.

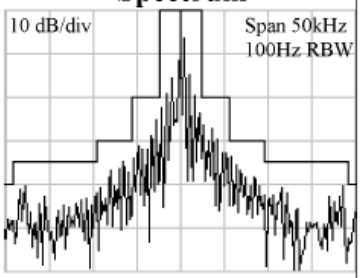
DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.

Power vs. Time

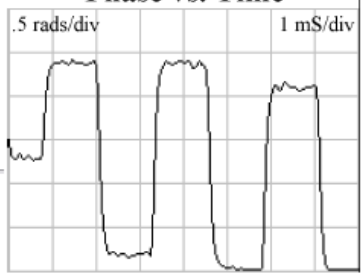


V1.11

Spectrum



Phase vs. Time



Note: Beacon tester out of calibration, traceability maintained for frequency measurement by using a calibrated external reference. Power measurement for reference/comparison only and hence traceability unimportant. Similarly for the other parameters (e.g. modulation details).

Furthermore, in this instance the tester appears only to have decoded the truncated (short) message, however, the power trace shows that the full 520ms was received.

Product Service

Beacon Test Report (Aliveness Test, End Of Two Hour Dwell, Self-test Message)

Beacon Test Report

2DDC4407D2FFBFF

Organization: TÜV Product Service Ltd
Tested By: Emergency Beacons Dept
Date: 2/20/08 3:34:20 PM
Tester Model/Serial No./File Name: BT100S/1025/02695_Damp-Heat2–13
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 28°C

☐ **PASS** ☐ **FAIL** **INITIALS:_____**

Notes: Add text comments here.

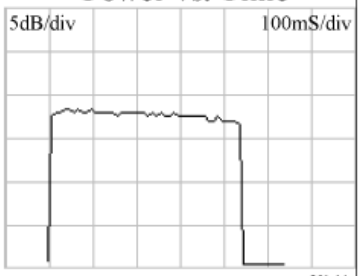
15 Hex ID: 2DDC4407D2FFBFF
Full Hex: FFFED096EE2203E97FDFFA885FF7
Burst Mode: Self Test Mode (Short)
Protocol: Standard Test Protocol
Country 366: United States
Bits 41 - 64: 2229225

Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-110: Default
Latitude: * **°**.**
Longitude: * ***°**.**

406 MHz Measurements
406 Frequency (EXT REF): 406.036633 MHz
406 Power (5 Watt): 10.5 dBm
Power Rise Time: < 5 ms
Phase Deviation: -0.94 +1.33 radians
Modulation Rise Time: 209 uS
Modulation Fall Time: 153 uS
Modulation Symmetry: 0.3%
Modulation Bit Rate: 399.8 bps
CW Preamble: 160 ms

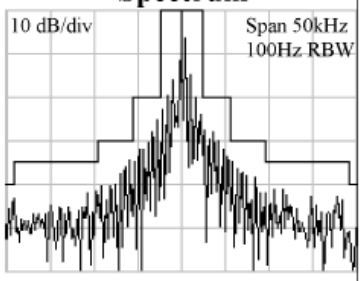
DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.

Power vs. Time



V1.11

Spectrum



Phase vs. Time

Note: Beacon tester out of calibration, traceability maintained for frequency measurement by using a calibrated external reference. Power measurement for reference/comparison only and hence traceability unimportant. Similarly for the other parameters (e.g. modulation details).

Product Service

Beacon Test Report (Aliveness Test, End Of Two Hour Dwell, Normal Message)

Beacon Test Report

2DDC4407D2FFBFF

Organization: TÜV Product Service Ltd
Tested By: Emergency Beacons Dept
Date: 2/20/08 3:32:47 PM
Tester Model/Serial No./File Name: BT100S/1025/02695_Damp-Heat2–11
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 29°C

☐ **PASS** ☐ **FAIL** **INITIALS:_____**

Notes: Add text comments here.

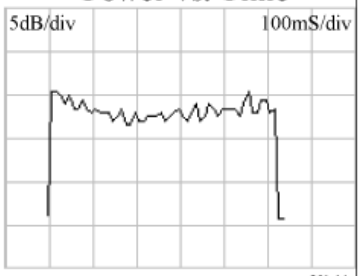
15 Hex ID: 2DDC4407D2FFBFF
Full Hex: FFFE2F96EE2203E97FDFFA885FF783E0F66C
Burst Mode: Normal Mode (Long)
Protocol: Standard Test Protocol
Country 366: United States
Bits 41 - 64: 2229225

Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-110: Default
Latitude: * **°**.**
Longitude: * **°**.**

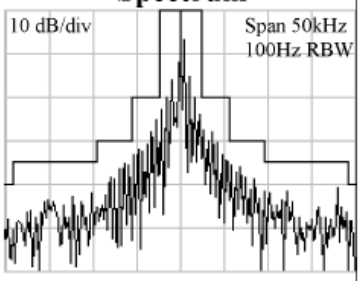
406 MHz Measurements
406 Frequency (EXT REF): 406.036636 MHz
406 Power (5 Watt): 5.1 dBm
Power Rise Time: < 5 ms
Phase Deviation: -1.24 +0.57 radians
Modulation Rise Time: 92 uS
Modulation Fall Time: 220 uS
Modulation Symmetry: 0.8%
Modulation Bit Rate: 399.8 bps
CW Preamble: 160.3 ms

DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.

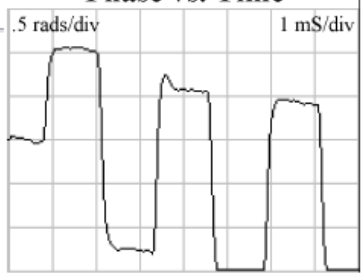
Power vs. Time



Spectrum



Phase vs. Time



Note: Beacon tester out of calibration, traceability maintained for frequency measurement by using a calibrated external reference. Power measurement for reference/comparison only and hence traceability unimportant. Similarly for the other parameters (e.g. modulation details).

Product Service

2.4 VIBRATION TEST

2.4.1 Specification Reference

RTCM Paper 77-2002/SC110-STD, Clause A5.0

2.4.2 Equipment Under Test

RLB-36, Unit #10

2.4.3 Date of Test and Modification State

21 and 22 February 2008 - Modification State 0

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 Test Set-up and Operating Modes

The test was performed with the EUT in the following mode(s): Idle as per “Specification Reference”, above.

Test Set-up

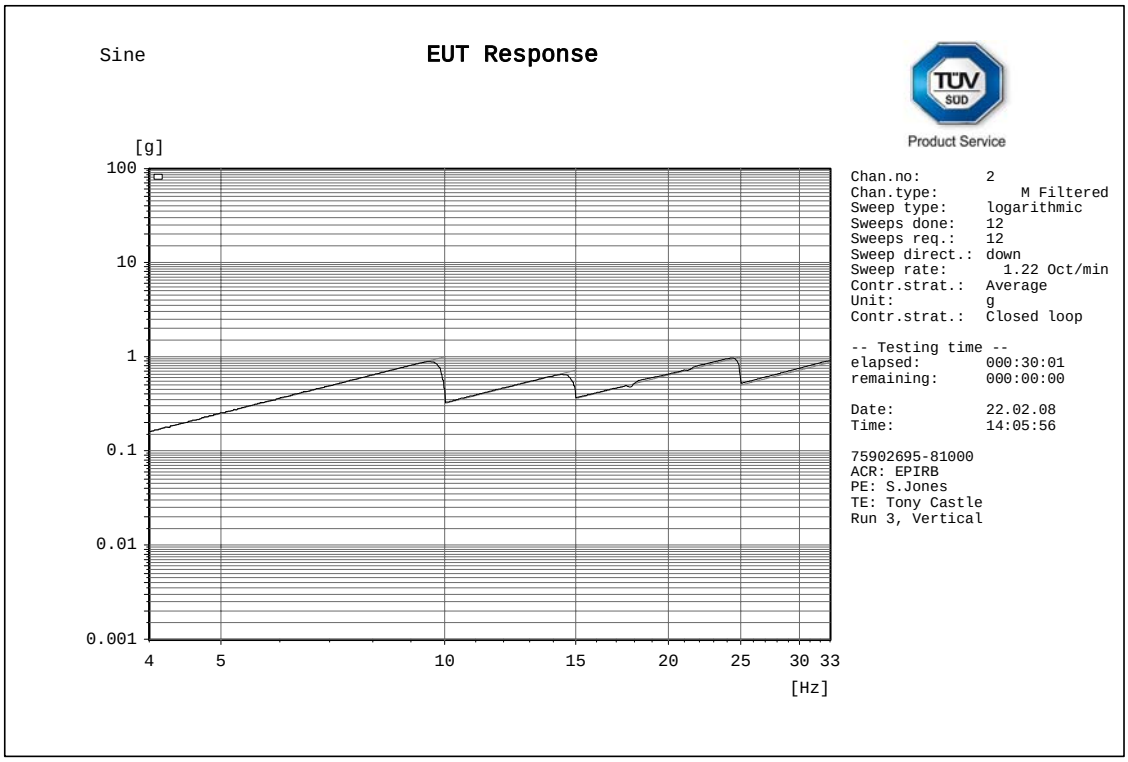
2.4.6 Environmental Conditions

Ambient Temperature	22.5°C
Relative Humidity	40%

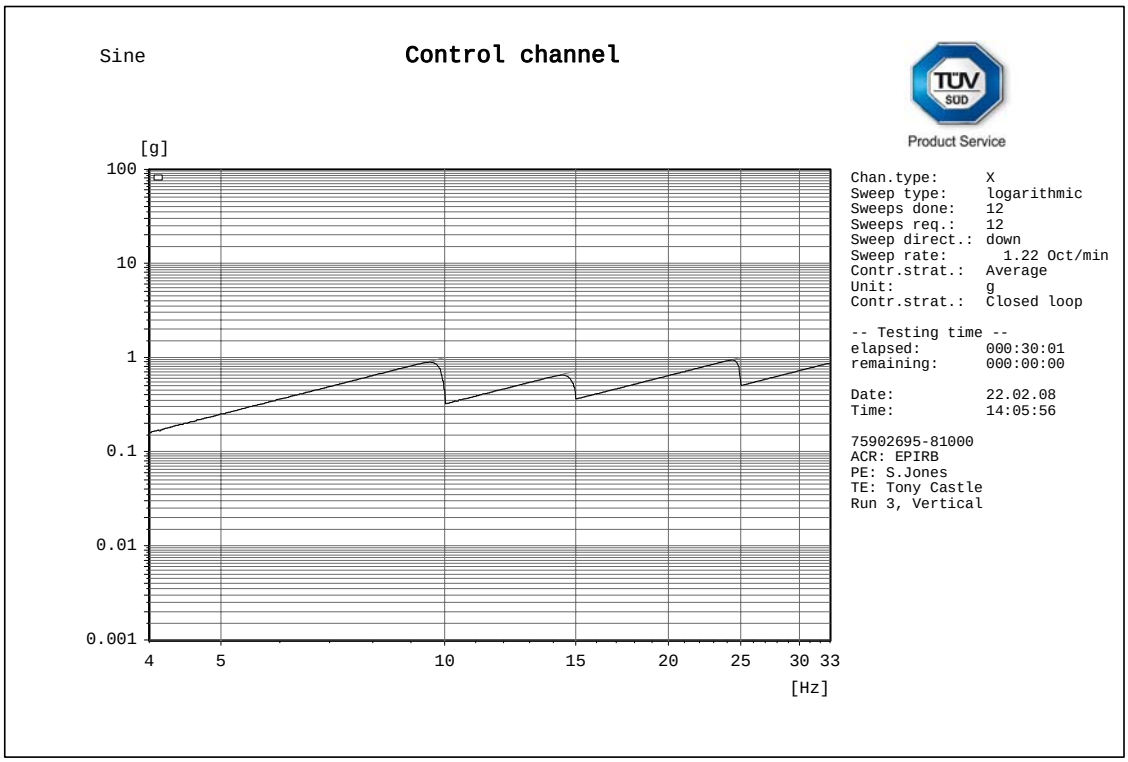
Product Service

2.4.7 Test Results

Vertical axis



C:\VcpNT\Daten\m+p\ACR\swept endurance 006.rsn

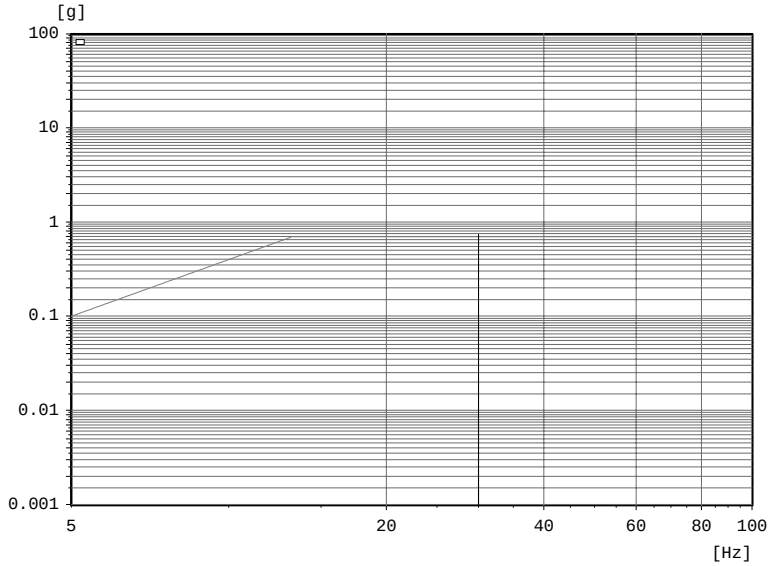


C:\VcpNT\Daten\m+p\ACR\swept endurance 006.rsn

Product Service

Sine Dwell

EUT Response



Chan.no: 2
Chan.type: M Filtered
Sweep type: logarithmic
Sweeps done: 0
Sweeps req.: 1
Sweep direct.: up
Contr.strat.: Average
Unit: g
Contr.strat.: Closed loop

-- Testing time --
elapsed: 002:00:00
remaining: 000:00:00

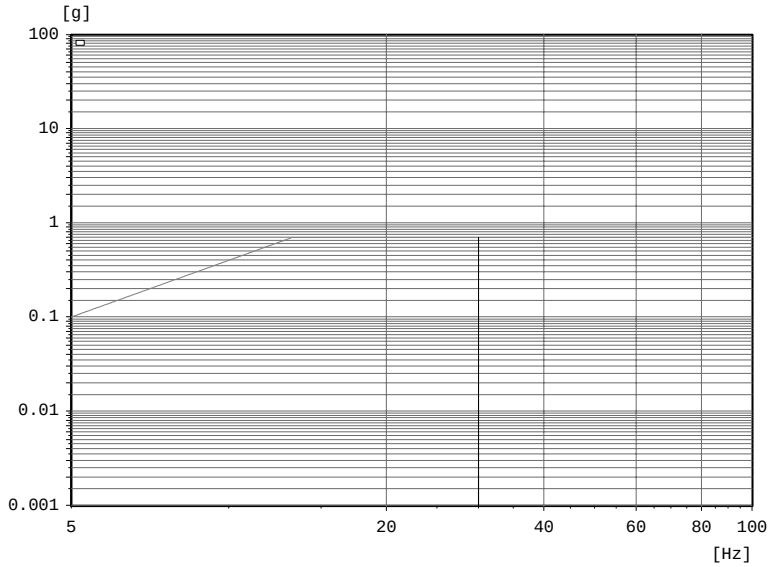
Date: 21.02.08
Time: 14:37:32

75902695-81000
ACR: EPIRB
PE: S.Jones
TE: Tony Castle
Run 2, Vertical

C:\VcpNT\Daten\m+p\ACR\30 Hz 001.rsd

Sine Dwell

Control channel



Chan.type: X
Sweep type: logarithmic
Sweeps done: 0
Sweeps req.: 1
Sweep direct.: up
Contr.strat.: Average
Unit: g
Contr.strat.: Closed loop

-- Testing time --
elapsed: 002:00:00
remaining: 000:00:00

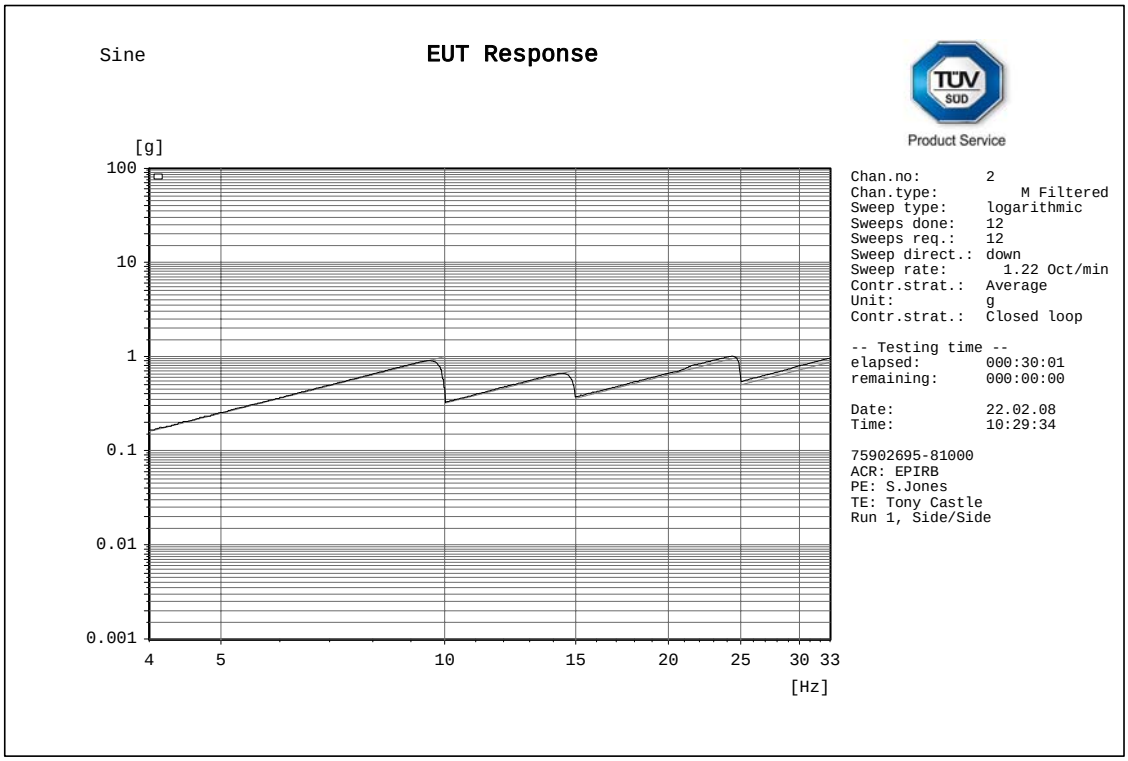
Date: 21.02.08
Time: 14:37:32

75902695-81000
ACR: EPIRB
PE: S.Jones
TE: Tony Castle
Run 2, Vertical

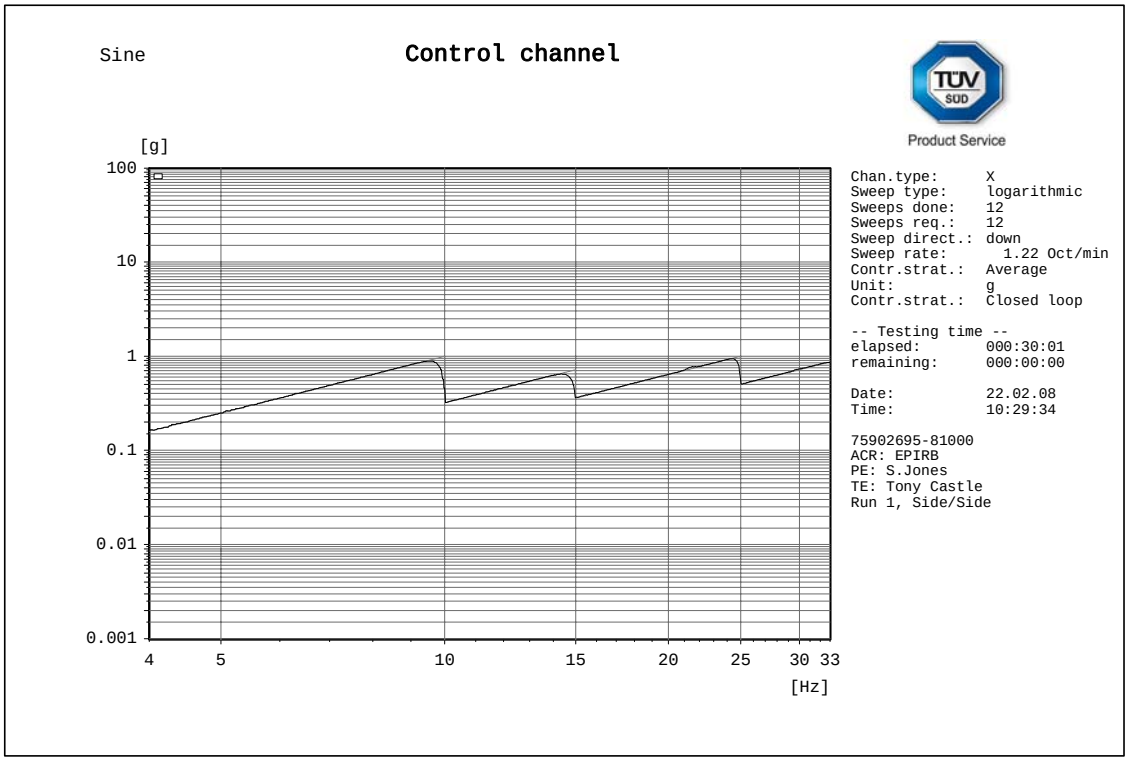
C:\VcpNT\Daten\m+p\ACR\30 Hz 001.rsd

Product Service

Lateral axis



C:\VcpNT\Daten\m+p\ACR\swept endurance 001.rsn

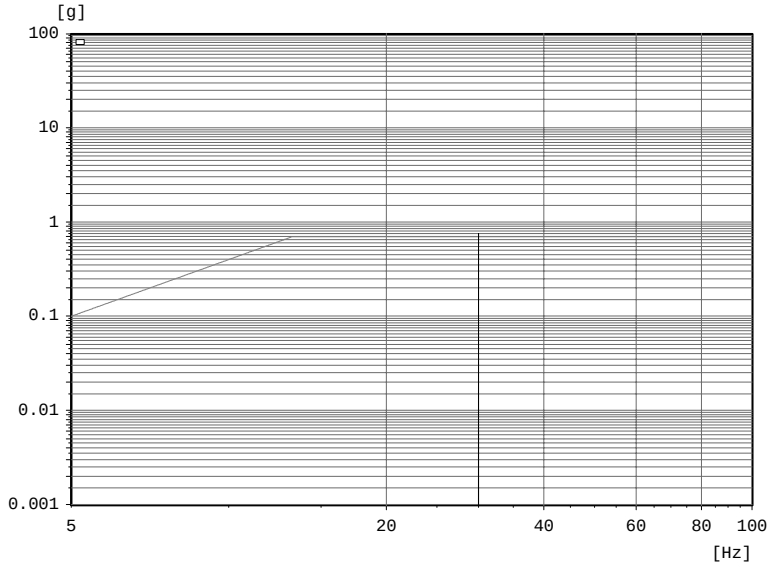


C:\VcpNT\Daten\m+p\ACR\swept endurance 001.rsn

Product Service

Sine Dwell

EUT Response

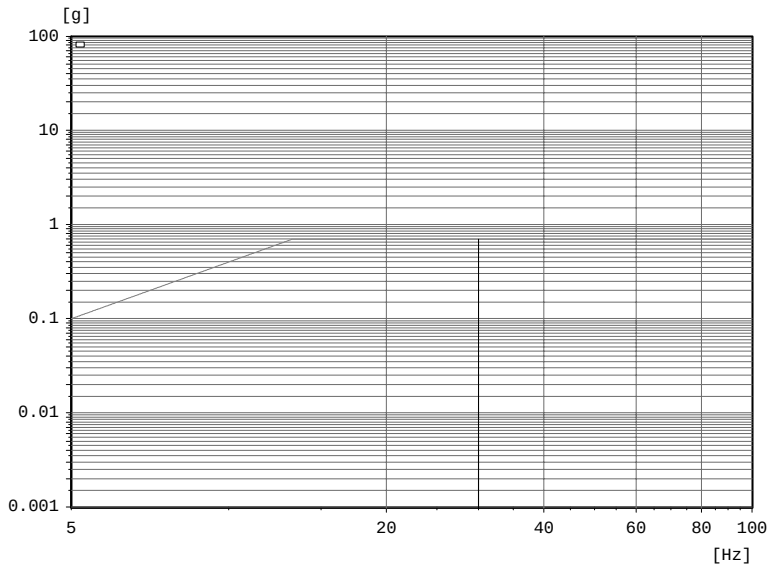



```
Chan.no:          2
Chan.type:            M Filtered
Sweep type:       logarithmic
Sweeps done:      0
Sweeps req.:      1
Sweep direct.:    up
Contr.strat.:     Average
Unit:             g
Contr.strat.:     Closed loop

-- Testing time --
elapsed:          002:00:00
remaining:        000:00:00

Date:             22.02.08
Time:             07:14:41

75902695-81000
ACR: EPIRB
PE: S.Jones
TE: Tony Castle
Run 4, Front/Back
```

C:\VcpNT\Daten\m+p\ACR\30 Hz 004.rsd

Sine Dwell

Control channel

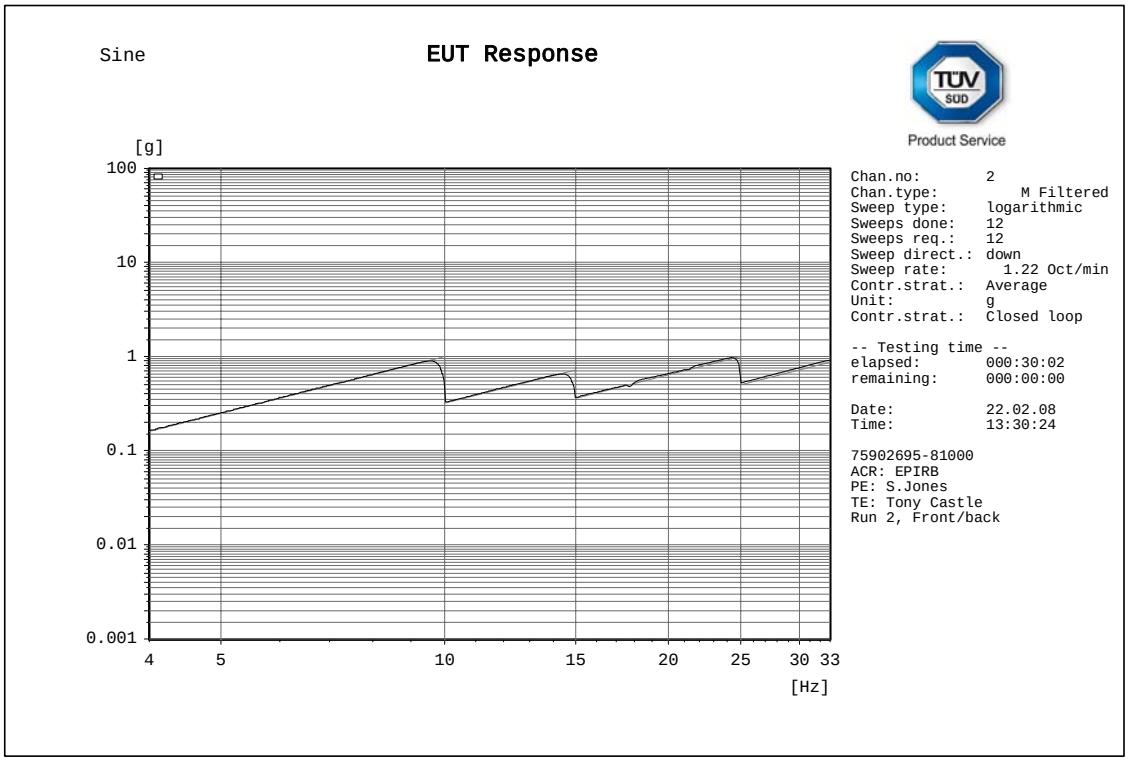



```
Chan.type:        X
Sweep type:       logarithmic
Sweeps done:      0
Sweeps req.:      1
Sweep direct.:    up
Contr.strat.:     Average
Unit:             g
Contr.strat.:     Closed loop

-- Testing time --
elapsed:          002:00:00
remaining:        000:00:00

Date:             22.02.08
Time:             07:14:41

75902695-81000
ACR: EPIRB
PE: S.Jones
TE: Tony Castle
Run 4, Front/Back
```

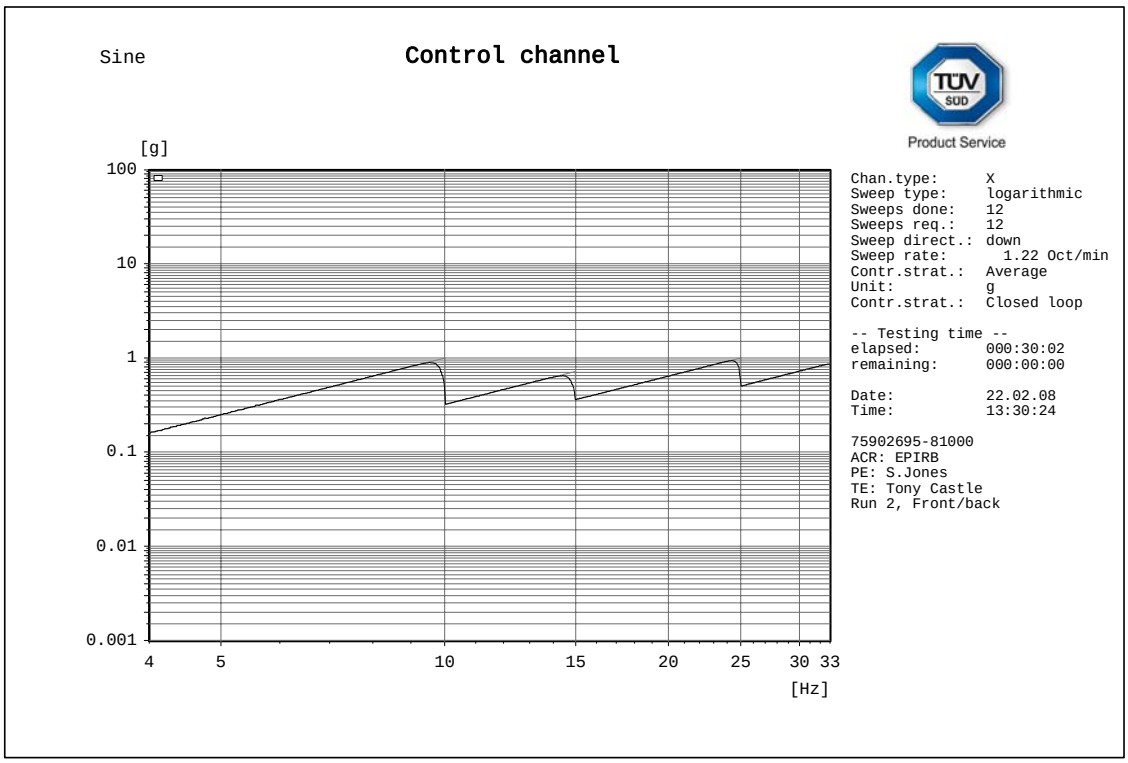
C:\VcpNT\Daten\m+p\ACR\30 Hz 004.rsd

Product Service

Longitudinal axis



C:\VcpNT\Daten\m+p\ACR\swept endurance 005.rsn

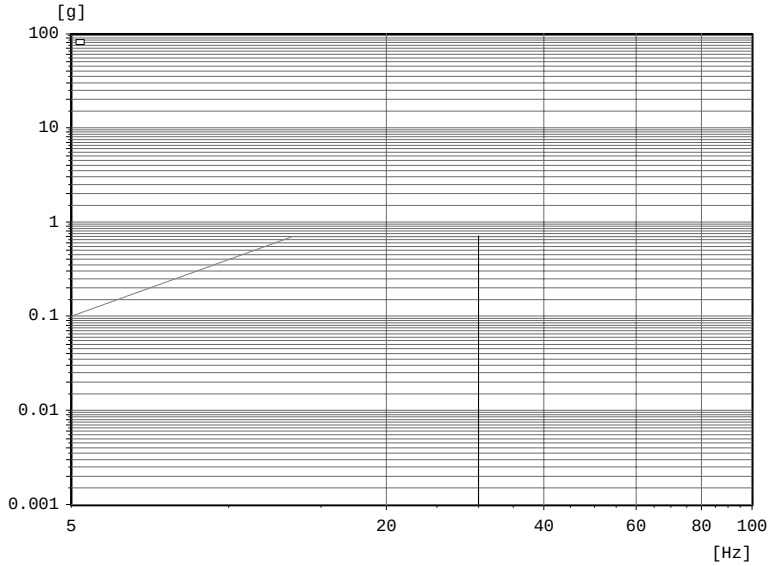


C:\VcpNT\Daten\m+p\ACR\swept endurance 005.rsn

Product Service

Sine Dwell

EUT Response

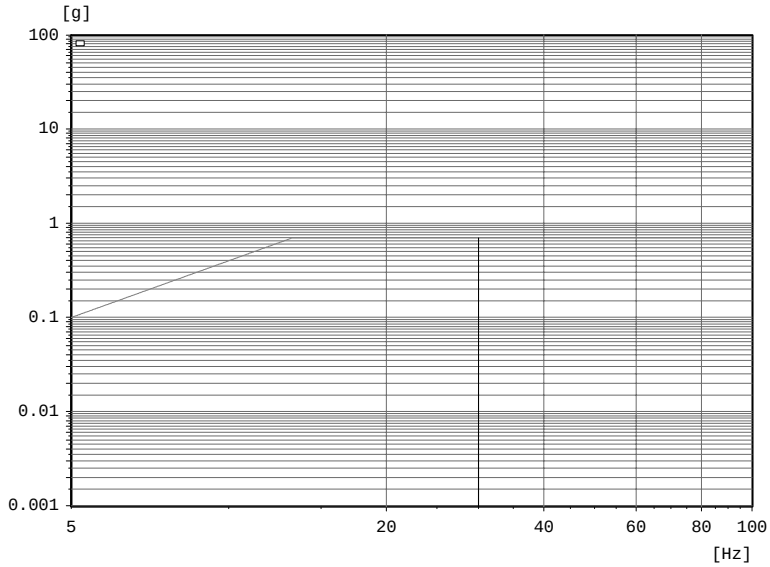



```
Chan.no:        2
Chan.type:          M Filtered
Sweep type:     logarithmic
Sweeps done:    0
Sweeps req.:    1
Sweep direct.:  up
Contr.strat.:   Average
Unit:           g
Contr.strat.:   Closed loop

-- Testing time --
elapsed:        002:00:00
remaining:      000:00:00

Date:           21.02.08
Time:           17:26:01

75902695-81000
ACR: EPIRB
PE: S.Jones
TE: Tony Castle
Run 4, Front/Back
```

C:\VcpNT\Daten\m+p\ACR\30 Hz 003.rsd

Sine Dwell

Control channel




```
Chan.type:      X
Sweep type:     logarithmic
Sweeps done:    0
Sweeps req.:    1
Sweep direct.:  up
Contr.strat.:   Average
Unit:           g
Contr.strat.:   Closed loop

-- Testing time --
elapsed:        002:00:00
remaining:      000:00:00

Date:           21.02.08
Time:           17:26:01

75902695-81000
ACR: EPIRB
PE: S.Jones
TE: Tony Castle
Run 4, Front/Back
```

C:\VcpNT\Daten\m+p\ACR\30 Hz 003.rsd

Product Service

Mechanical Inspection

Test Engineer (A.C.Castle) reported: “Post this test no signs of mechanical degradation could be witnessed. R.Hampton reported the EUT to be functioning as normal.”

Summary of Aliveness test results

Stage	Pass / Fail
Post-run 1	Pass
Post-run 2	Pass
Post-run 3	Pass

Product Service

Beacon Test Report (Aliveness Test, Post-Test)

Beacon Test Report

2DDC4407D2FFBFF

Organization: TÜV Product Service Ltd
Tested By: Emergency Beacons Dept.
Date: 2/26/08 10:12:18 AM
Tester Model/Serial No./File Name: BT100S/1025/02695_Post-Vib_Bump_Pre-Salt–5
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 24°C

☐ **PASS** ☐ **FAIL** **INITIALS:_____**

Notes: Add text comments here.

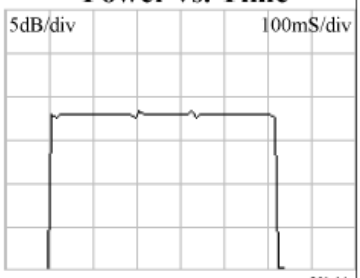
15 Hex ID: 2DDC4407D2FFBFF
Full Hex: FFFE2F96EE2203E97FDFFA885FF783E0F66C
Burst Mode: Normal Mode (Long)
Protocol: Standard Test Protocol
Country 366: United States
Bits 41 - 64: 2229225

Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-110: Default
Latitude: * **°**.**
Longitude: * ***°**.**

406 MHz Measurements
406 Frequency (EXT REF): 406.03664 MHz
406 Power (INT ANT): 105%
Power Rise Time: < 5 ms
Phase Deviation: -1.08 +1.1 radians
Modulation Rise Time: 188 uS
Modulation Fall Time: 188 uS
Modulation Symmetry: 0%
Modulation Bit Rate: 399.8 bps
CW Preamble: 159.9 ms

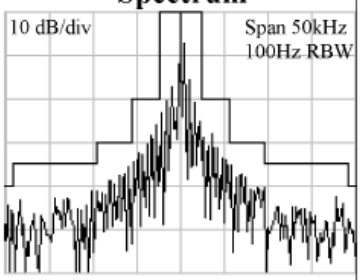
121.5 MHz Measurements
121 Frequency (EXT REF): Out of Range.
121 Power (INT ANT): 45%
Sweep Direction: Downwards
Audio Frequency: 500 Hz to 1562 Hz
Sweep Range: 1062 Hz
Sweep Rep Rate: 2.5 Hz
Modulation Factor: N/A
Duty Cycle: 30 %

Power vs. Time

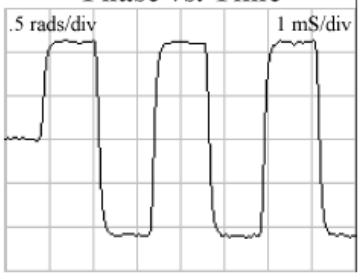


V1.11

Spectrum



Phase vs. Time



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Product Service

Beacon Test Report

2DDC4407D2FFBFF

Organization: TÜV Product Service Ltd
Tested By: Emergency Beacons Dept.
Date: 2/26/08 10:07:22 AM
Tester Model/Serial No./File Name: BT100S/1025/02695_Post-Vib_Bump_Pre-Salt–1
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 24°C

☐ **PASS** ☐ **FAIL** **INITIALS:_____**

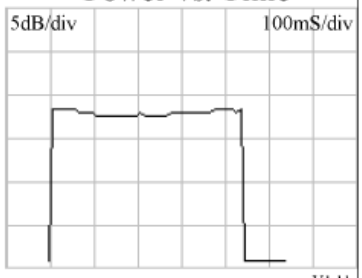
Notes: Add text comments here.

15 Hex ID: 2DDC4407D2FFBFF
Full Hex: FFFED096EE2203E97FDFFA885FF7
Burst Mode: Self Test Mode (Short)
Protocol: Standard Test Protocol
Country 366: United States
Bits 41 - 64: 2229225

Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-110: Default
Latitude: * **°**.**
Longitude: * **°**.**

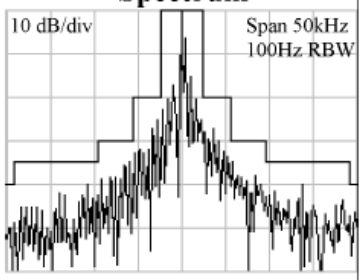
406 MHz Measurements
406 Frequency (EXT REF): 406.036661 MHz
406 Power (5 Watt): 9.4 dBm
Power Rise Time: < 5 ms
Phase Deviation: -1.09 +1.11 radians
Modulation Rise Time: 188 uS
Modulation Fall Time: 165 uS
Modulation Symmetry: 0%
Modulation Bit Rate: 399.8 bps
CW Preamble: 160.1 ms

Power vs. Time

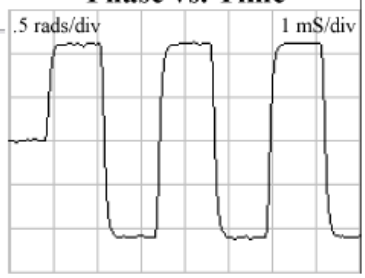


Spectrum

V1.11



Phase vs. Time



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Product Service

2.5 BUMP TEST

2.5.1 Specification Reference

RTCM Paper 77-2002/SC110-STD, Clause A6.0

2.5.2 Equipment Under Test

RLB-36, Unit #10

2.5.3 Date of Test and Modification State

25 and 26 February 2008 - Modification State 0

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 Test Set-up and Operating Modes

The test was performed with the EUT in the following mode(s): Idle.

Test Set-up

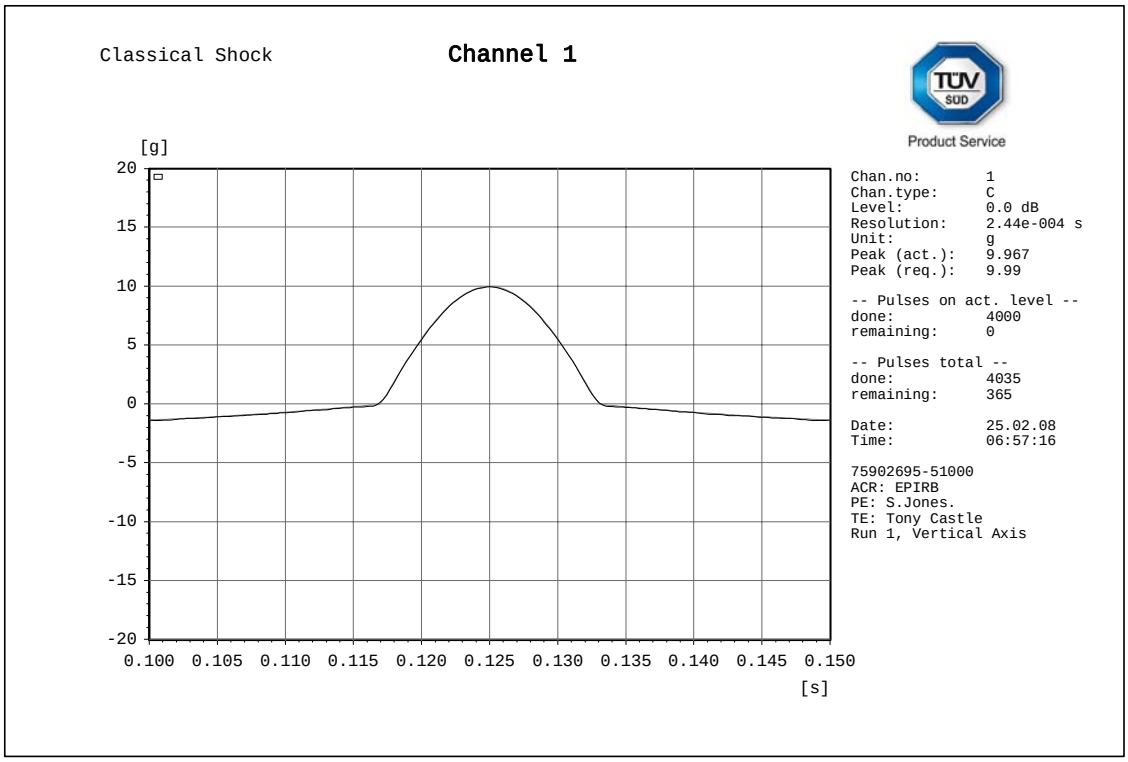
Product Service

2.5.6 Environmental Conditions

Ambient Temperature	22.0°C
Relative Humidity	39.1%

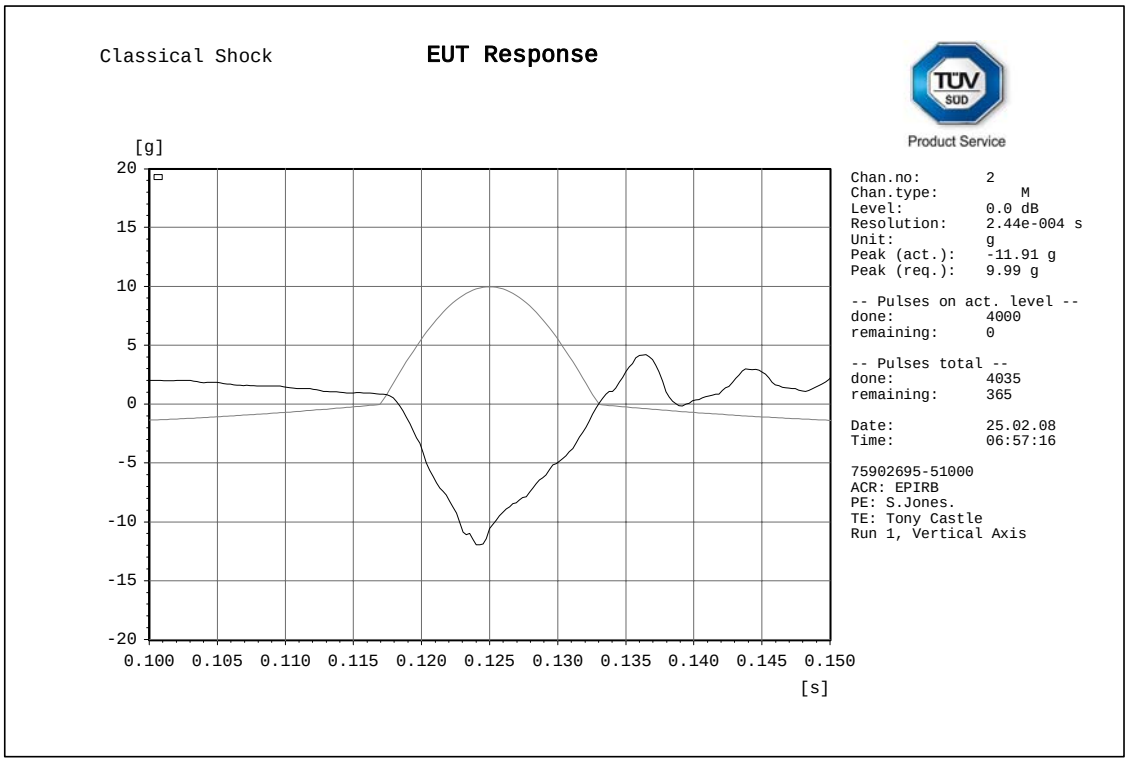
2.5.7 Test Results

Vertical axis, 4000 Bumps



C:\VcpNT\Daten\m+p\ACR\Bump Test 4000@10g 16ms 002.rcs

Product Service



C:\VcpNT\Daten\m+p\ACR\Bump Test 4000@10g 16ms 002.rcs

Mechanical Inspection

Test Engineer (A.C.Castle) reported: “Post this test no signs of mechanical degradation could be witnessed. R. Hampton reported the EUT to be functioning as normal.”

Product Service

Beacon Test Report (Aliveness Test, Post-test)

Beacon Test Report

2DDC4407D2FFBFF

Organization: TÜV Product Service Ltd
Tested By: Emergency Beacons Dept.
Date: 2/26/08 10:07:22 AM
Tester Model/Serial No./File Name: BT100S/1025/02695_Post-Vib_Bump_Pre-Salt–1
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 24°C

☐ **PASS** ☐ **FAIL** **INITIALS:_____**

Notes: Add text comments here.

15 Hex ID: 2DDC4407D2FFBFF
Full Hex: FFFED096EE2203E97FDFFA885FF7
Burst Mode: Self Test Mode (Short)
Protocol: Standard Test Protocol
Country 366: United States
Bits 41 - 64: 2229225

Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-110: Default
Latitude: * **°**.**
Longitude: * ***°**.**

406 MHz Measurements
406 Frequency (EXT REF): 406.036661 MHz
406 Power (5 Watt): 9.4 dBm
Power Rise Time: < 5 ms
Phase Deviation: -1.09 +1.11 radians
Modulation Rise Time: 188 uS
Modulation Fall Time: 165 uS
Modulation Symmetry: 0%
Modulation Bit Rate: 399.8 bps
CW Preamble: 160.1 ms

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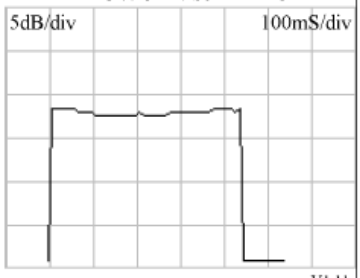
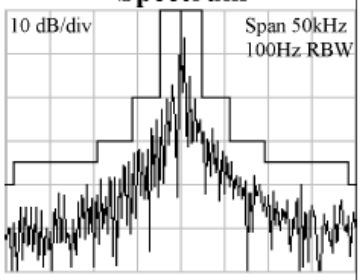
Power vs. Time

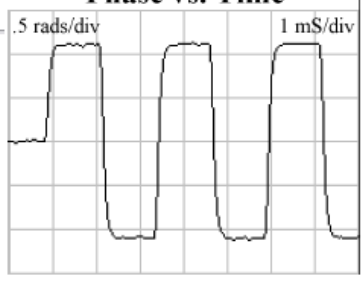


Spectrum

V1.11



Phase vs. Time



Note: Beacon tester out of calibration, traceability maintained for frequency measurement by using a calibrated external reference. Power measurement for reference/comparison only and hence traceability unimportant. Similarly for the other parameters (e.g. modulation details).

Product Service

Beacon Test Report

2DDC4407D2FFBFF

Organization: TÜV Product Service Ltd
Tested By: Emergency Beacons Dept.
Date: 2/26/08 10:12:18 AM
Tester Model/Serial No./File Name: BT100S/1025/02695_Post-Vib_Bump_Pre-Salt–5
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 24°C

☐ **PASS** ☐ **FAIL** **INITIALS:_____**

Notes: Add text comments here.

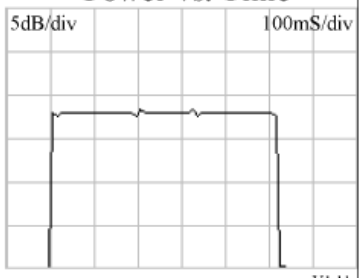
15 Hex ID: 2DDC4407D2FFBFF
Full Hex: FFFE2F96EE2203E97FDFFA885FF783E0F66C
Burst Mode: Normal Mode (Long)
Protocol: Standard Test Protocol
Country 366: United States
Bits 41 - 64: 2229225

Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-110: Default
Latitude: * **°**.**
Longitude: * **°**.**

406 MHz Measurements
406 Frequency (EXT REF): 406.03664 MHz
406 Power (INT ANT): 105%
Power Rise Time: < 5 ms
Phase Deviation: -1.08 +1.1 radians
Modulation Rise Time: 188 uS
Modulation Fall Time: 188 uS
Modulation Symmetry: 0%
Modulation Bit Rate: 399.8 bps
CW Preamble: 159.9 ms

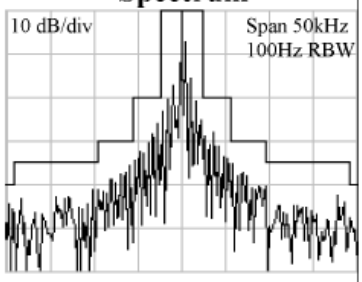
121.5 MHz Measurements
121 Frequency (EXT REF): Out of Range.
121 Power (INT ANT): 45%
Sweep Direction: Downwards
Audio Frequency: 500 Hz to 1562 Hz
Sweep Range: 1062 Hz
Sweep Rep Rate: 2.5 Hz
Modulation Factor: N/A
Duty Cycle: 30 %

Power vs. Time

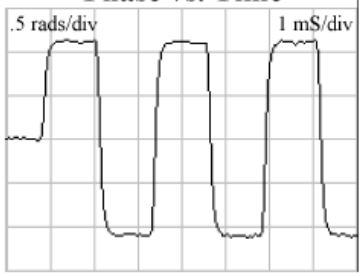


V1.11

Spectrum



Phase vs. Time



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Note: Beacon tester out of calibration, traceability maintained for frequency measurement by using a calibrated external reference. Power measurement for reference/comparison only and hence traceability unimportant. Similarly for the other parameters (e.g. modulation details).

Product Service

2.6 SALT FOG TEST

2.6.1 Specification Reference

RTCM Paper 77-2002/SC110-STD, Clause A7.0

2.6.2 Equipment Under Test

RLB-36, Unit #10

2.6.3 Date of Test and Modification State

26 February 2008 to 03 March 2008 - Modification State 0

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 Test Set-up and Operating Modes

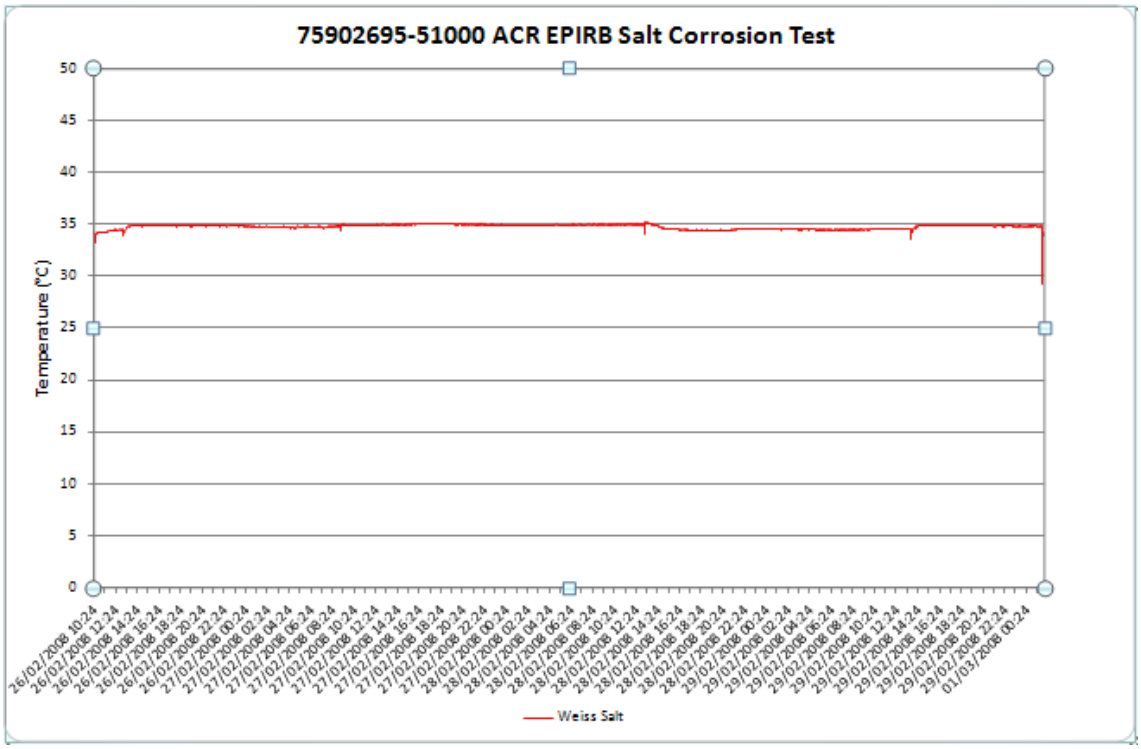
The test was performed with the EUT in the following mode(s): Idle

Test Set-up

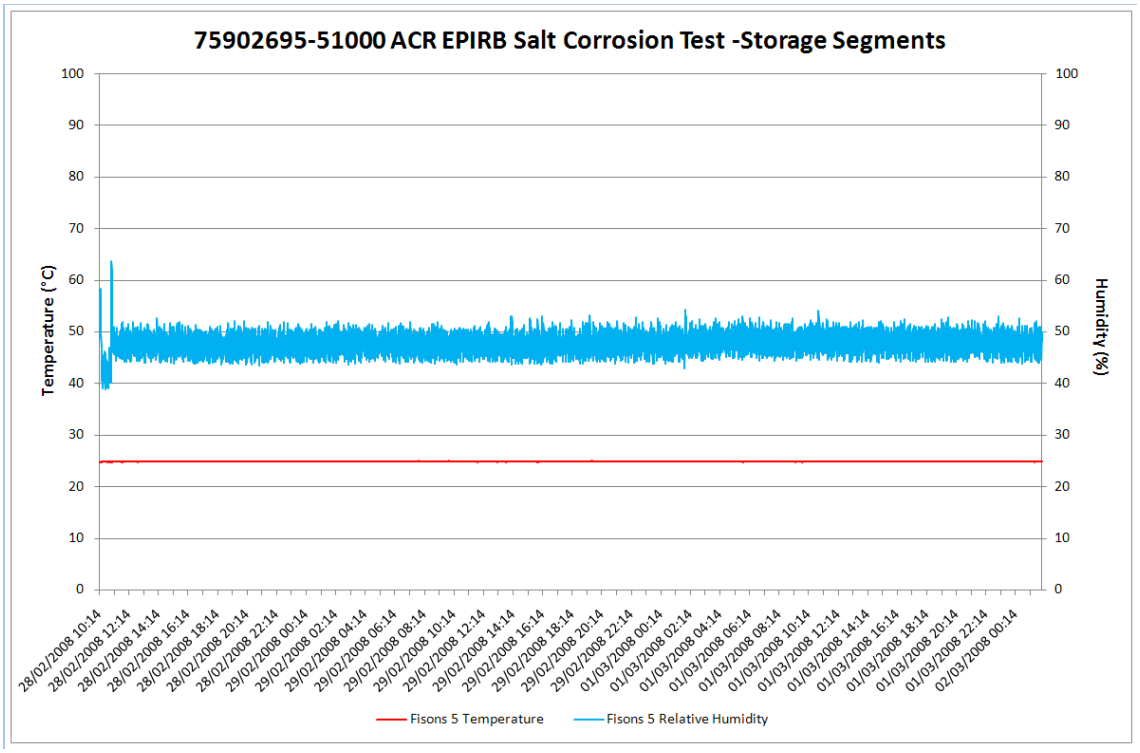
Product Service

2.6.6 Environmental Conditions

Salt Spray Temperature Plot



Ambient Storage Temperature Plot



Product Service

Beacon Test Report (Aliveness Test, Post-test)

Beacon Test Report

2DDC4407D2FFBFF

Organization: TÜV Product Service Ltd
Tested By: Emergency Beacons Dept.
Date: 3/3/08 4:17:26 PM
Tester Model/Serial No./File Name: BT100S/1025/02695_Post-Salt_Pre-Drop–1
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 21°C

☐ **PASS** ☐ **FAIL** **INITIALS:_____**

Notes: Add text comments here.

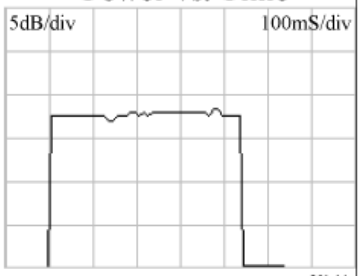
15 Hex ID: 2DDC4407D2FFBFF
Full Hex: FFFED096EE2203E97FDFFA885FF7
Burst Mode: Self Test Mode (Short)
Protocol: Standard Test Protocol
Country 366: United States
Bits 41 - 64: 2229225

Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-110: Default
Latitude: * **°**.**
Longitude: * **°**.**

406 MHz Measurements
406 Frequency (EXT REF): 406.040701 MHz
406 Power (5 Watt): 19.1 dBm
Power Rise Time: < 5 ms
Phase Deviation: -1.13 +1.07 radians
Modulation Rise Time: 177 uS
Modulation Fall Time: 188 uS
Modulation Symmetry: 0%
Modulation Bit Rate: 399.8 bps
CW Preamble: 160.2 ms

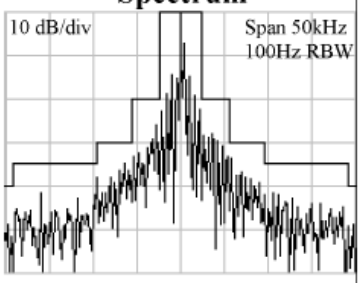
DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.

Power vs. Time

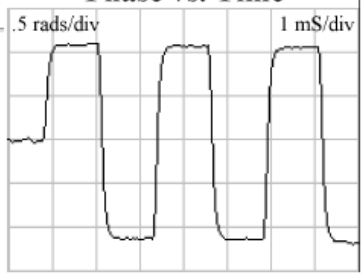


V1.11

Spectrum



Phase vs. Time



Note: Beacon tester out of calibration, traceability maintained for frequency measurement by using a calibrated external reference. Power measurement for reference/comparison only and hence traceability unimportant. Similarly for the other parameters (e.g. modulation details).

Product Service

Beacon Test Report

2DDC4407D2FFBFF

Organization: TÜV Product Service Ltd
Tested By: Emergency Beacons Dept.
Date: 3/3/08 4:20:39 PM
Tester Model/Serial No./File Name: BT100S/1025/02695_Post-Salt_Pre-Drop–3
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 24°C

☐ **PASS** ☐ **FAIL** **INITIALS:_____**

Notes: Add text comments here.

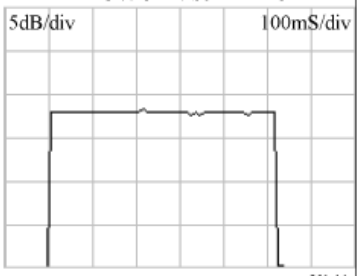
15 Hex ID: 2DDC4407D2FFBFF
Full Hex: FFFE2F96EE2203E97FDFFA885FF783E0F66C
Burst Mode: Normal Mode (Long)
Protocol: Standard Test Protocol
Country 366: United States
Bits 41 - 64: 2229225

Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-110: Default
Latitude: * **°**.**
Longitude: * ***°**.**

406 MHz Measurements
406 Frequency (EXT REF): 406.036626 MHz
406 Power (INT ANT): 85%
Power Rise Time: < 5 ms
Phase Deviation: -1.08 +1.11 radians
Modulation Rise Time: 188 uS
Modulation Fall Time: 198 uS
Modulation Symmetry: 0%
Modulation Bit Rate: 399.8 bps
CW Preamble: 160.4 ms

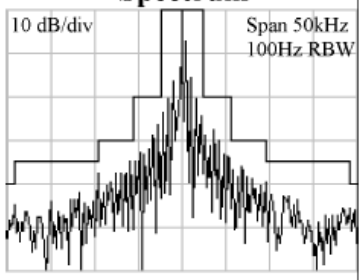
DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.

Power vs. Time

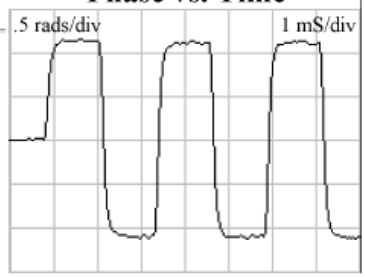


V1.11

Spectrum



Phase vs. Time



Note: Beacon tester out of calibration, traceability maintained for frequency measurement by using a calibrated external reference. Power measurement for reference/comparison only and hence traceability unimportant. Similarly for the other parameters (e.g. modulation details).

Product Service

2.7 DROP TEST (ON HARD SURFACE)

2.7.1 Specification Reference

RTCM Paper 77-2002/SC110-STD, Clause A8.1

2.7.2 Equipment Under Test

RLB-36, Unit #10

2.7.3 Date of Test and Modification State

03 and 04 March 2008 - Modification State 0

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 Test Set-up and Operating Modes

The test was performed with the EUT in the following mode(s): Idle

2.7.6 Test Results

EUT placed in chamber set to -30°C, and stabilised for a minimum of 2 hours.

The test piece was removed and the Drop-test was performed as follows:

- 1 drop from a height of 1 metre onto the test surface

On completion Rob Hampton tested the EUT and reported it as satisfactory.

Product Service

Beacon Test Report (Aliveness Test, Pre-test)

Beacon Test Report

2DDC4407D2FFBFF

Organization: TÜV Product Service Ltd
Tested By: Emergency Beacons Dept.
Date: 3/3/08 4:17:26 PM
Tester Model/Serial No./File Name: BT100S/1025/02695_Post-Salt_Pre-Drop–1
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 21°C

☐ **PASS** ☐ **FAIL** **INITIALS:_____**

Notes: Add text comments here.

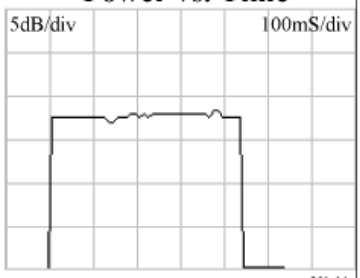
15 Hex ID: 2DDC4407D2FFBFF
Full Hex: FFFED096EE2203E97FDFFA885FF7
Burst Mode: Self Test Mode (Short)
Protocol: Standard Test Protocol
Country 366: United States
Bits 41 - 64: 2229225

Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-110: Default
Latitude: * **°**.**
Longitude: * **°**.**

406 MHz Measurements
406 Frequency (EXT REF): 406.040701 MHz
406 Power (5 Watt): 19.1 dBm
Power Rise Time: < 5 ms
Phase Deviation: -1.13 +1.07 radians
Modulation Rise Time: 177 uS
Modulation Fall Time: 188 uS
Modulation Symmetry: 0%
Modulation Bit Rate: 399.8 bps
CW Preamble: 160.2 ms

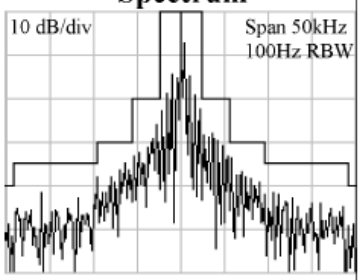
DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.

Power vs. Time ☒

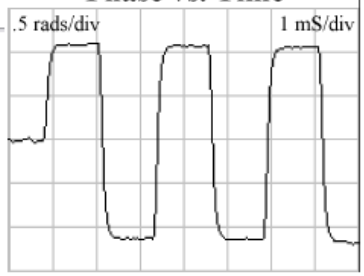


V1.11

Spectrum



Phase vs. Time



Note: Beacon tester out of calibration, traceability maintained for frequency measurement by using a calibrated external reference. Power measurement for reference/comparison only and hence traceability unimportant. Similarly for the other parameters (e.g. modulation details).

Product Service

Beacon Test Report

2DDC4407D2FFBFF

Organization: TÜV Product Service Ltd
Tested By: Emergency Beacons Dept.
Date: 3/3/08 4:20:39 PM
Tester Model/Serial No./File Name: BT100S/1025/02695_Post-Salt_Pre-Drop–3
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 24°C

☐ **PASS** ☐ **FAIL** **INITIALS:_____**

Notes: Add text comments here.

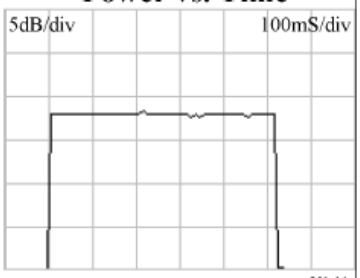
15 Hex ID: 2DDC4407D2FFBFF
Full Hex: FFFE2F96EE2203E97FDFFA885FF783E0F66C
Burst Mode: Normal Mode (Long)
Protocol: Standard Test Protocol
Country 366: United States
Bits 41 - 64: 2229225

Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-110: Default
Latitude: * **°**.**
Longitude: * ***°**.**

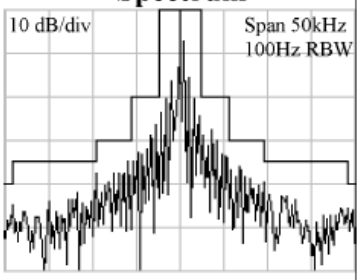
406 MHz Measurements
406 Frequency (EXT REF): 406.036626 MHz
406 Power (INT ANT): 85%
Power Rise Time: < 5 ms
Phase Deviation: -1.08 +1.11 radians
Modulation Rise Time: 188 uS
Modulation Fall Time: 198 uS
Modulation Symmetry: 0%
Modulation Bit Rate: 399.8 bps
CW Preamble: 160.4 ms

DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.

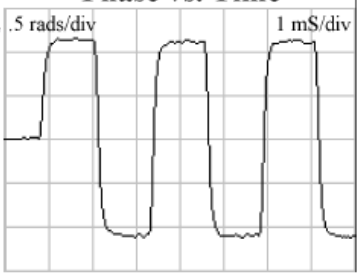
Power vs. Time



Spectrum



Phase vs. Time



Note: Beacon tester out of calibration, traceability maintained for frequency measurement by using a calibrated external reference. Power measurement for reference/comparison only and hence traceability unimportant. Similarly for the other parameters (e.g. modulation details).

Product Service

Beacon Test Report (Aliveness Test, Post-test)

Beacon Test Report

2DDC4407D2FFBFF

Organization: TÜV Product Service Ltd
Tested By: Emergency Beacons Dept.
Date: 3/4/08 9:44:16 AM
Tester Model/Serial No./File Name: BT100S/1025/02695_Drop-Hard-Surface–1
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 22°C

☐ **PASS** ☐ **FAIL** **INITIALS:_____**

Notes: Add text comments here.

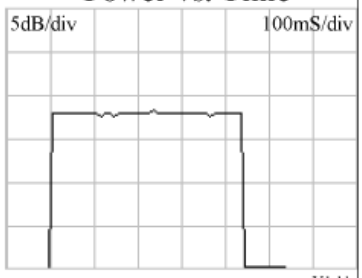
15 Hex ID: 2DDC4407D2FFBFF
Full Hex: FFFED096EE2203E97FDFFA885FF7
Burst Mode: Self Test Mode (Short)
Protocol: Standard Test Protocol
Country 366: United States
Bits 41 - 64: 2229225

Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-110: Default
Latitude: * **°**.**
Longitude: * **°**.**

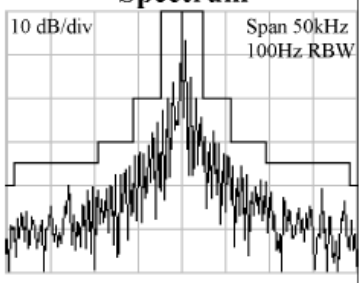
406 MHz Measurements
406 Frequency (EXT REF): 406.036524 MHz
406 Power (5 Watt): 14.9 dBm
Power Rise Time: < 5 ms
Phase Deviation: -1.09 +1.11 radians
Modulation Rise Time: 165 uS
Modulation Fall Time: 177 uS
Modulation Symmetry: 0%
Modulation Bit Rate: 399.8 bps
CW Preamble: 160.3 ms

DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.

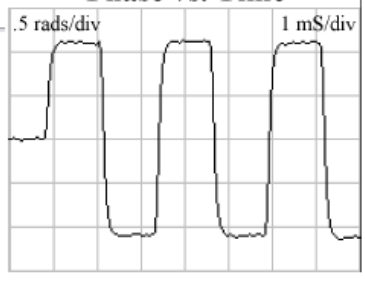
Power vs. Time



Spectrum



Phase vs. Time



Note: Beacon tester out of calibration, traceability maintained for frequency measurement by using a calibrated external reference. Power measurement for reference/comparison only and hence traceability unimportant. Similarly for the other parameters (e.g. modulation details).

Product Service

Beacon Test Report

2DDC4407D2FFBFF

Organization: TÜV Product Service Ltd
Tested By: Emergency Beacons Dept.
Date: 3/4/08 9:55:33 AM
Tester Model/Serial No./File Name: BT100S/1025/02695_Drop-Hard-Surface–9
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 25°C

☐ **PASS** ☐ **FAIL** **INITIALS:_____**

Notes: Add text comments here.

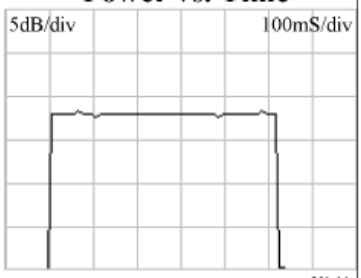
15 Hex ID: 2DDC4407D2FFBFF
Full Hex: FFFE2F96EE2203E97FDFFA885FF783E0F66C
Burst Mode: Normal Mode (Long)
Protocol: Standard Test Protocol
Country 366: United States
Bits 41 - 64: 2229225

Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-110: Default
Latitude: * **°**.**
Longitude: * **°**.**

406 MHz Measurements
406 Frequency (EXT REF): 406.036617 MHz
406 Power (INT ANT): 72%
Power Rise Time: < 5 ms
Phase Deviation: -1.11 +1.09 radians
Modulation Rise Time: 177 uS
Modulation Fall Time: 198 uS
Modulation Symmetry: 0%
Modulation Bit Rate: 399.8 bps
CW Preamble: 160.4 ms

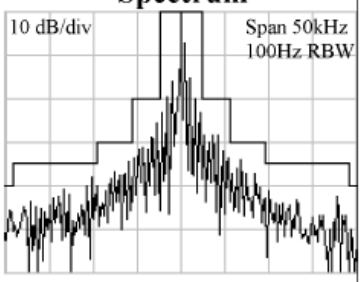
121.5 MHz Measurements
121 Frequency (EXT REF): Out of Range.
121 Power (INT ANT): 59%
Sweep Direction: Downwards
Audio Frequency: 500 Hz to 1562 Hz
Sweep Range: 1062 Hz
Sweep Rep Rate: 2.8 Hz
Modulation Factor: 90 %
Duty Cycle: 30 %

Power vs. Time

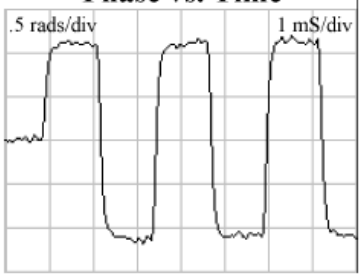


V1.11

Spectrum



Phase vs. Time



DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.

Note: Beacon tester out of calibration, traceability maintained for frequency measurement by using a calibrated external reference. Power measurement for reference/comparison only and hence traceability unimportant. Similarly for the other parameters (e.g. modulation details).

Product Service

2.8 DROP TEST (IN WATER)

2.8.1 Specification Reference

RTCM Paper 77-2002/SC110-STD, Clause A8.2

2.8.2 Equipment Under Test

RLB-36, Unit #10

2.8.3 Date of Test and Modification State

06 March 2008 - Modification State 0

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 Test Set-up and Operating Modes

The test was performed with the EUT in the following mode(s): Idle*

*Note: EUT activated (entered Operating mode automatically) on contact with water.

2.8.6 Test Results

Summary of Aliveness test results

The beacon was dropped three times in three orthogonal planes as described in the standard. The beacon activated upon immersion and deactivated automatically when removed. After each drop and at the end of the test the beacon was visually inspected and no damage or water ingress was visible. The beacon was subsequently inspected internally and no water ingress was found.

After the test the beacon was subjected to and successfully passed an aliveness test, see Beacon Test Reports below.

Product Service

Beacon Test Report (Aliveness Test, Self-test Message)

Beacon Test Report

2DDC4407D2FFBFF

Organization: TÜV Product Service Ltd
Tested By: Emergency Beacons Dept.
Date: 3/6/08 12:28:34 PM
Tester Model/Serial No./File Name: BT100S/1025/02695_Post-Drop-Water–1
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 11°C

☐ **PASS** ☐ **FAIL** **INITIALS:_____**

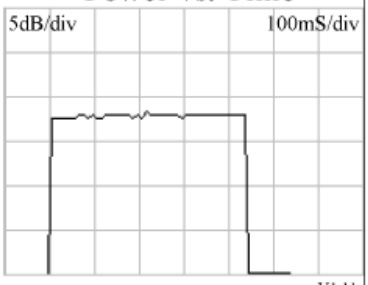
Notes: Add text comments here.

15 Hex ID: 2DDC4407D2FFBFF
Full Hex: FFFED096EE2203E97FDFFA885FF7
Burst Mode: Self Test Mode (Short)
Protocol: Standard Test Protocol
Country 366: United States
Bits 41 - 64: 2229225

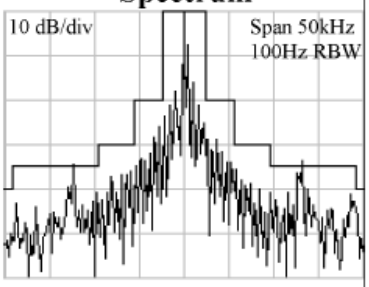
Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-110: Default
Latitude: * **°**.**
Longitude: * ***°**.**

406 MHz Measurements
406 Frequency (EXT REF): 406.036651 MHz
406 Power (5 Watt): 29.6 dBm
Power Rise Time: < 5 ms
Phase Deviation: -1.1 +1.1 radians
Modulation Rise Time: 188 uS
Modulation Fall Time: 177 uS
Modulation Symmetry: 0%
Modulation Bit Rate: 399.8 bps
CW Preamble: 160.1 ms

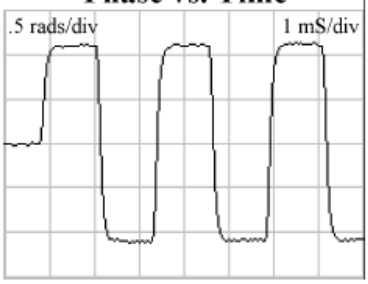
Power vs. Time



Spectrum V1.11



Phase vs. Time



DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.

Note: Beacon tester out of calibration, traceability maintained for frequency measurement by using a calibrated external reference. Power measurement for reference/comparison only and hence traceability unimportant. Similarly for the other parameters (e.g. modulation details).

Product Service

Beacon Test Report (Aliveness Test, Normal Message)

Beacon Test Report

2DDC4407D2FFBFF

Organization: TÜV Product Service Ltd
Tested By: Emergency Beacons Dept.
Date: 3/6/08 12:35:32 PM
Tester Model/Serial No./File Name: BT100S/1025/02695_Post-Drop-Water–7
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 14°C

☐ **PASS** ☐ **FAIL** **INITIALS:_____**

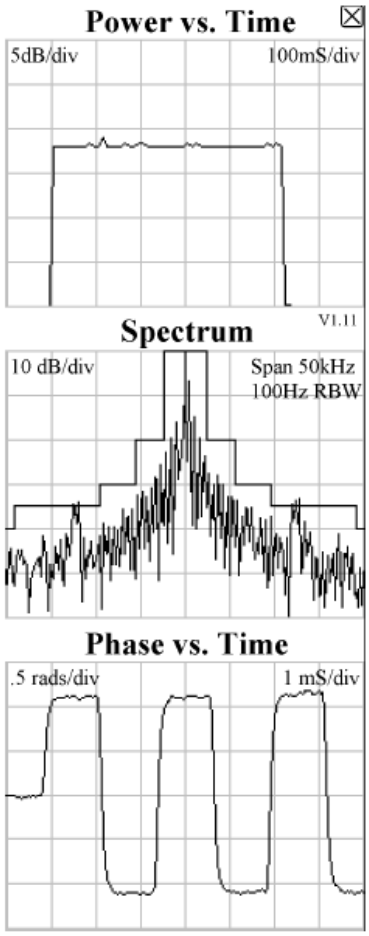
Notes: Add text comments here.

15 Hex ID: 2DDC4407D2FFBFF
Full Hex: FFFE2F96EE2203E97FDFFA885FF783E0F66C
Burst Mode: Normal Mode (Long)
Protocol: Standard Test Protocol
Country 366: United States
Bits 41 - 64: 2229225

Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-110: Default
Latitude: * **°**.**
Longitude: * ***°**.**

406 MHz Measurements
406 Frequency (EXT REF): 406.036626 MHz
406 Power (5 Watt): 29.7 dBm
Power Rise Time: < 5 ms
Phase Deviation: -1.1 +1.1 radians
Modulation Rise Time: 188 uS
Modulation Fall Time: 188 uS
Modulation Symmetry: 0%
Modulation Bit Rate: 399.8 bps
CW Preamble: 159.9 ms

121.5 MHz Measurements
121 Frequency (EXT REF): Out of Range.
121 Power (5 Watt): -10.1 dBm
Sweep Direction: Downwards
Audio Frequency: Out of Range
Sweep Range: Out of Range
Sweep Rep Rate: 2.6 Hz
Modulation Factor: N/A
Duty Cycle: 30 %



DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.

Note: Beacon tester out of calibration, traceability maintained for frequency measurement by using a calibrated external reference. Power measurement for reference/comparison only and hence traceability unimportant. Similarly for the other parameters (e.g. modulation details).

Product Service

2.9 LEAKAGE AND IMMERSION TEST

2.9.1 Specification Reference

RTCM Paper 77-2002/SC110-STD, Clause A9.0

2.9.2 Equipment Under Test

RLB-36, Unit #10

2.9.3 Date of Test and Modification State

11 to 13 March 2008 - Modification State 0

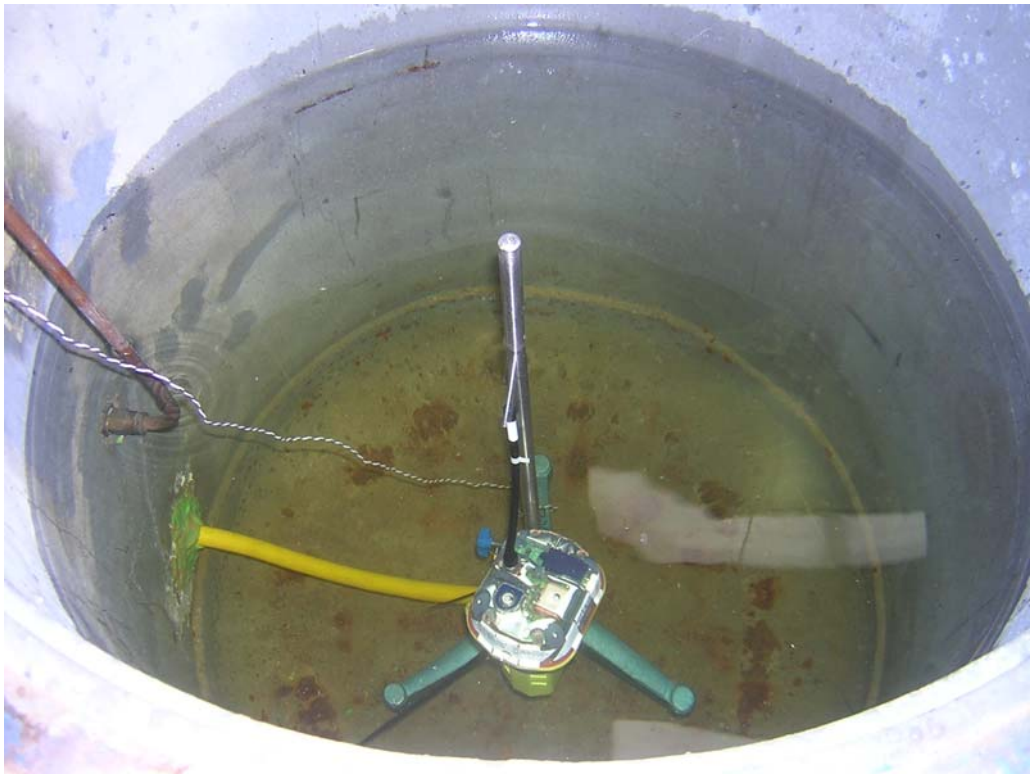
2.9.4 Test Equipment Used

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

2.9.5 Test Set-up and Operating Modes

The test was performed with the EUT in the following mode(s): Idle*

*Note: EUT activated (entered Operating mode automatically) on contact with water.

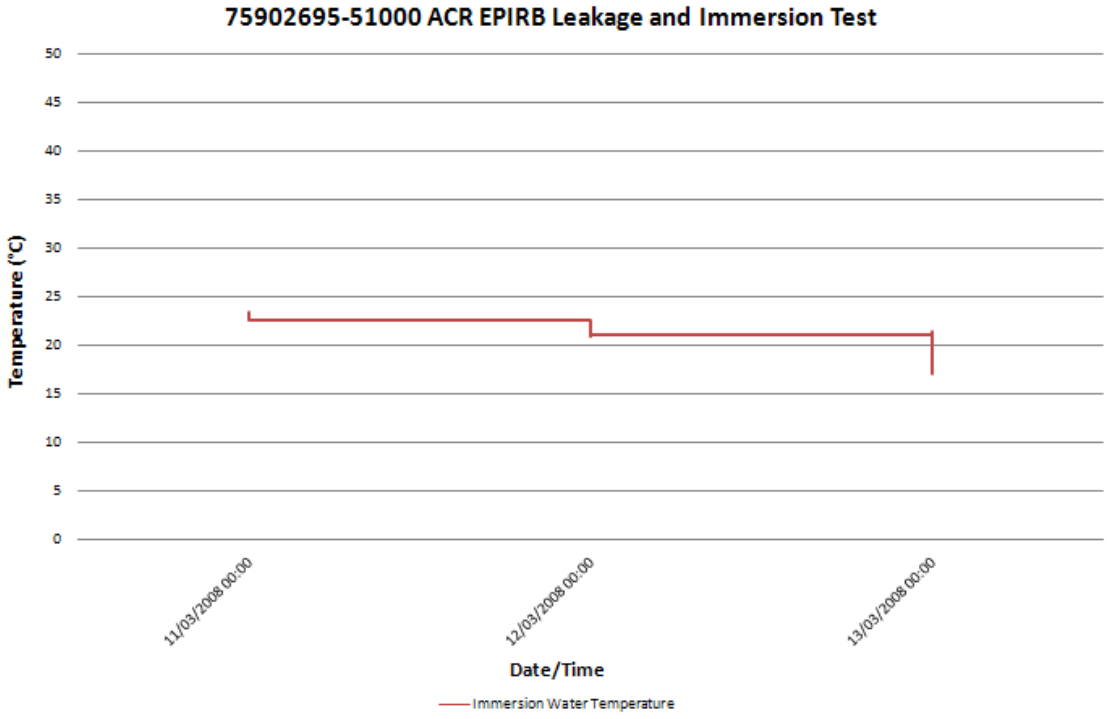


Test Set-up

Product Service

2.9.6 Environmental Conditions

Water Temperature Plot



Product Service

2.9.7 Test Results

11th March 2008

Prior to the commencement of the testing the EUT was subjected to an Aliveness Test and weighed:

- The test item operated correctly.
- Dry weight = 600g

The EUT was placed in the climatic chamber and preconditioned at a temperature of +65°C for 1 hour.

The EUT was located into the pressure vessel which had been filled with water (water temperature 19.6°C).

The unit activated the moment it was immersed. The unit was prevented from floating to the surface with the use of a metal stand which held it 100mm below the surface of the water (measured to the highest point of the EUT).

13th March 2008

48 hours after immersion the pressure was increased to +981 mbar (relative to atmospheric pressure) and maintained for a duration of 5 minutes.

The EUT was removed from the pressure vessel for post-test inspection. The test item was dried and its weight was recorded:

- Unit weight (post-test): 608g
- An Aliveness Test was conducted (see Beacon Test Report, below).

Subsequent to the test the EUT was inspected internally and no sign of ingress was found. The additional 8g of weight was deemed to have been water trapped in the lanyard and various crevices about the casing.

Product Service

Beacon Test Report (Aliveness Test, Post-test Self-test Message)

Beacon Test Report

2DDC4407D2FFBFF

Organization: TÜV Product Service Ltd
Tested By: Emergency Beacons Dept.
Date: 3/13/08 4:27:02 PM
Tester Model/Serial No./File Name: BT100S/1025/02695-Post-Leak_Imm–7
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 23°C

☐ **PASS** ☐ **FAIL** **INITIALS:_____**

Notes: Add text comments here.

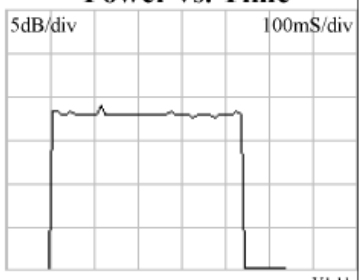
15 Hex ID: 2DDC4407D2FFBFF
Full Hex: FFFED096EE2203E97FDFFA885FF7
Burst Mode: Self Test Mode (Short)
Protocol: Standard Test Protocol
Country 366: United States
Bits 41 - 64: 2229225

Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-110: Default
Latitude: * **°**.**
Longitude: * **°**.**

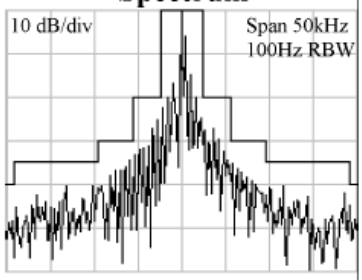
406 MHz Measurements
406 Frequency (EXT REF): 406.036655 MHz
406 Power (5 Watt): 19.7 dBm
Power Rise Time: < 5 ms
Phase Deviation: -1.11 +1.09 radians
Modulation Rise Time: 177 uS
Modulation Fall Time: 165 uS
Modulation Symmetry: 0%
Modulation Bit Rate: 399.8 bps
CW Preamble: 160.1 ms

DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.

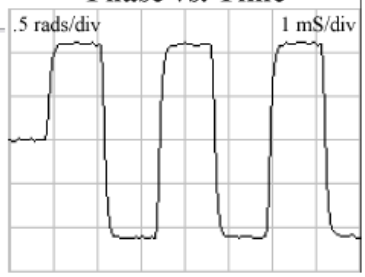
Power vs. Time



Spectrum V1.11



Phase vs. Time



Product Service

Beacon Test Report (Aliveness Test, Post-test Normal Message)

Beacon Test Report

2DDC4407D2FFBFF

Organization: TÜV Product Service Ltd
Tested By: Emergency Beacons Dept.
Date: 3/13/08 4:30:41 PM
Tester Model/Serial No./File Name: BT100S/1025/02695-Post-Leak_Imm–9
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 26°C

☐ **PASS** ☐ **FAIL** **INITIALS:_____**

Notes: Add text comments here.

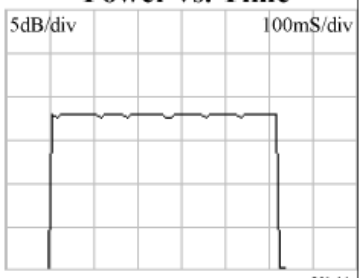
15 Hex ID: 2DDC4407D2FFBFF
Full Hex: FFFE2F96EE2203E97FDFFA885FF783E0F66C
Burst Mode: Normal Mode (Long)
Protocol: Standard Test Protocol
Country 366: United States
Bits 41 - 64: 2229225

Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-110: Default
Latitude: * **°**.**
Longitude: * **°**.**

406 MHz Measurements
406 Frequency (EXT REF): 406.036634 MHz
406 Power (INT ANT): 65%
Power Rise Time: < 5 ms
Phase Deviation: -1.09 +1.11 radians
Modulation Rise Time: 198 uS
Modulation Fall Time: 177 uS
Modulation Symmetry: 0%
Modulation Bit Rate: 399.8 bps
CW Preamble: 160.2 ms

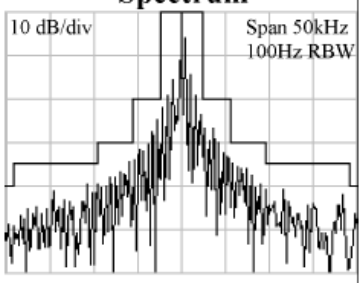
121.5 MHz Measurements
121 Frequency (EXT REF): Out of Range.
121 Power (INT ANT): 41%
Sweep Direction: Downwards
Audio Frequency: 500 Hz to 1500 Hz
Sweep Range: 1000 Hz
Sweep Rep Rate: 2.5 Hz
Modulation Factor: N/A
Duty Cycle: 32 %

Power vs. Time ☒

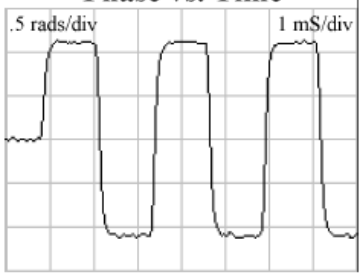


V1.11

Spectrum



Phase vs. Time



DISCLAIMER: IN NO EVENT SHALL WS TECHNOLOGIES INC. OR ITS DISTRIBUTORS OR AGENTS BE LIABLE FOR ANY DAMAGES OR LOSSES INCURRED AS A RESULT OF THE USE OR FAILURE OF THIS MEASUREMENT EQUIPMENT.

Product Service

2.10 SPURIOUS EMISSIONS TEST

2.10.1 Specification Reference

RTCM Paper 77-2002/SC110-STD, Clause A10.0

2.10.2 Equipment Under Test

RLB-36, Serial Number 007

2.10.3 Date of Test and Modification State

406 MHz Test at +55°C, Ambient and -20°C:	11 March 2008	- Modification State 1
121 MHz Test at +55°C:	01 July 2008	- Modification State 1
121 MHz Test at -20°C:	27 June 2008	- Modification State 1
121 MHz Test at Ambient:	01 July 2008	- Modification State 1

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 Test Set-up and Operating Modes

The test was performed with the EUT in the following mode(s): Operating

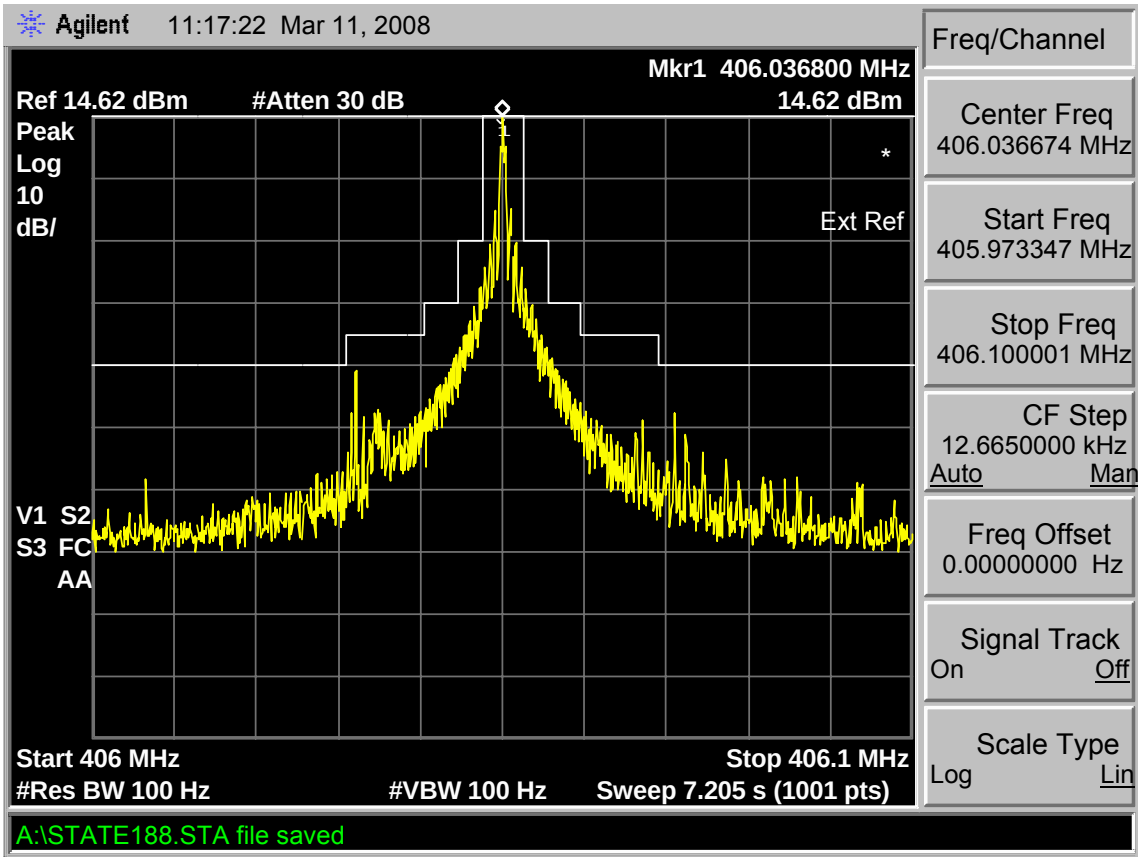
2.10.6 Environmental Conditions

	11 March 2008	01 July 2008
Ambient Temperature	23.8°C	24.2°C

Product Service

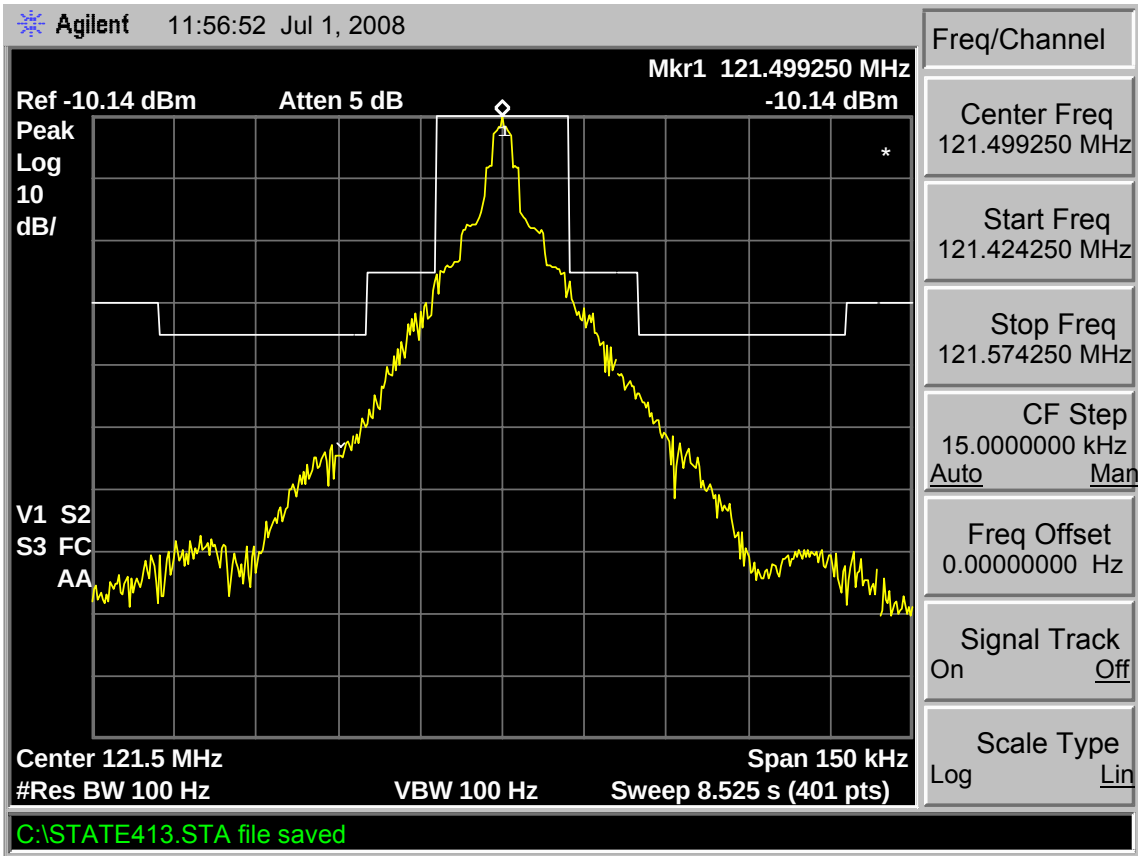
2.10.7 Test Results

406 MHz Test at +55°C, Ambient and -20°C



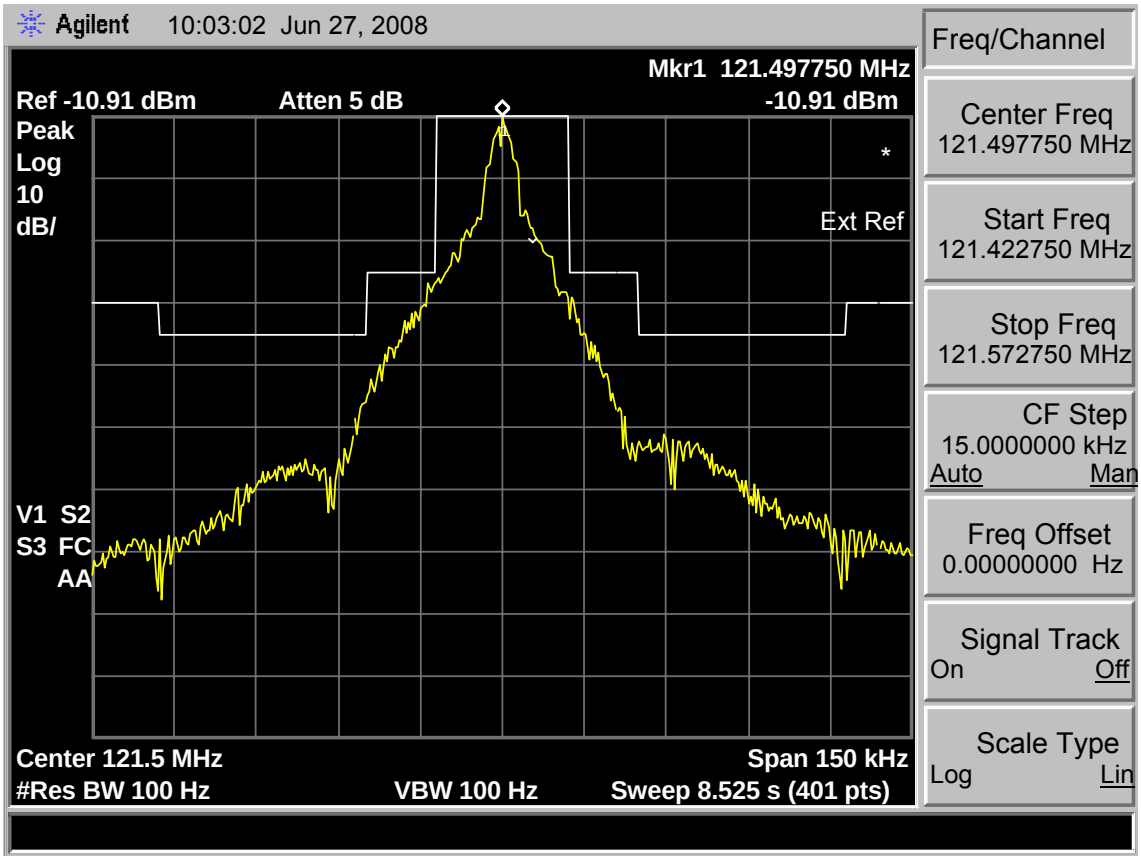
Product Service

121 MHz Test at +55°C



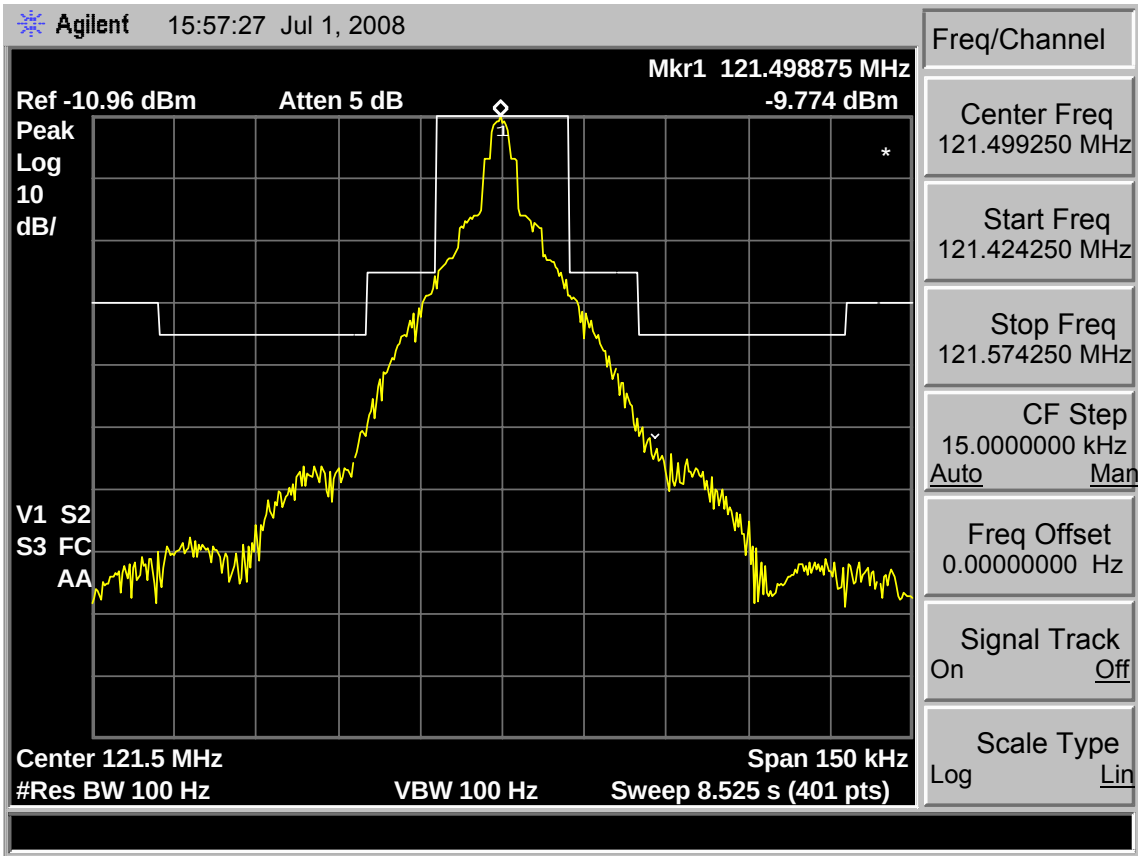
Product Service

121 MHz Test at -20°C



Product Service

121 MHz Test at Ambient



Product Service

2.11 LOW-TEMPERATURE THERMAL SHOCK TEST

2.11.1 Specification Reference

RTCM Paper 77-2002/SC110-STD, Clause A11.1

2.11.2 Equipment Under Test

RLB-36, Unit #10

2.11.3 Date of Test and Modification State

26 March 2008 - Modification State 0

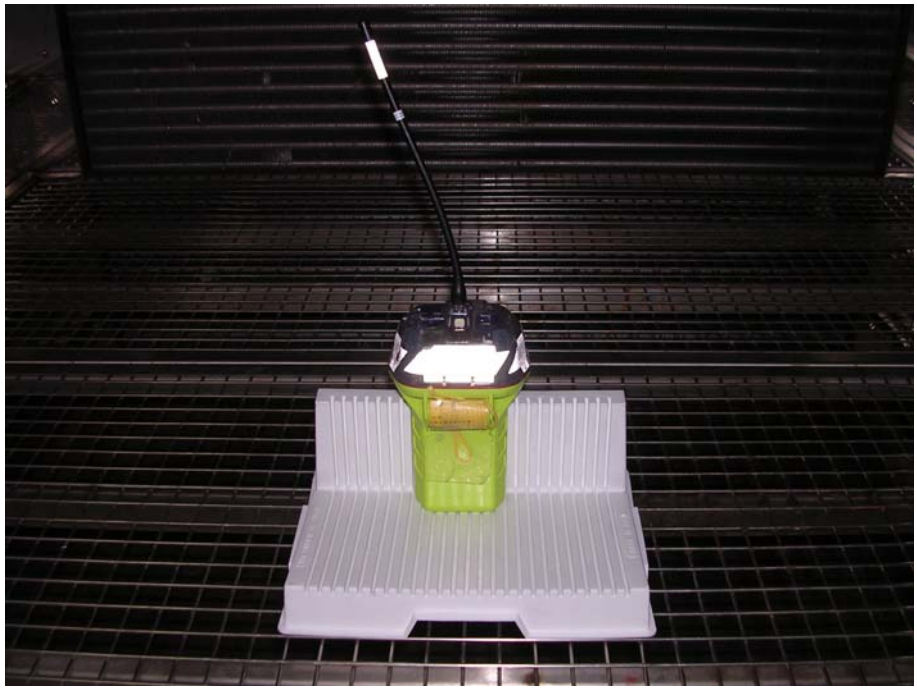
2.11.4 Test Equipment Used

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

2.11.5 Test Set-up and Operating Modes

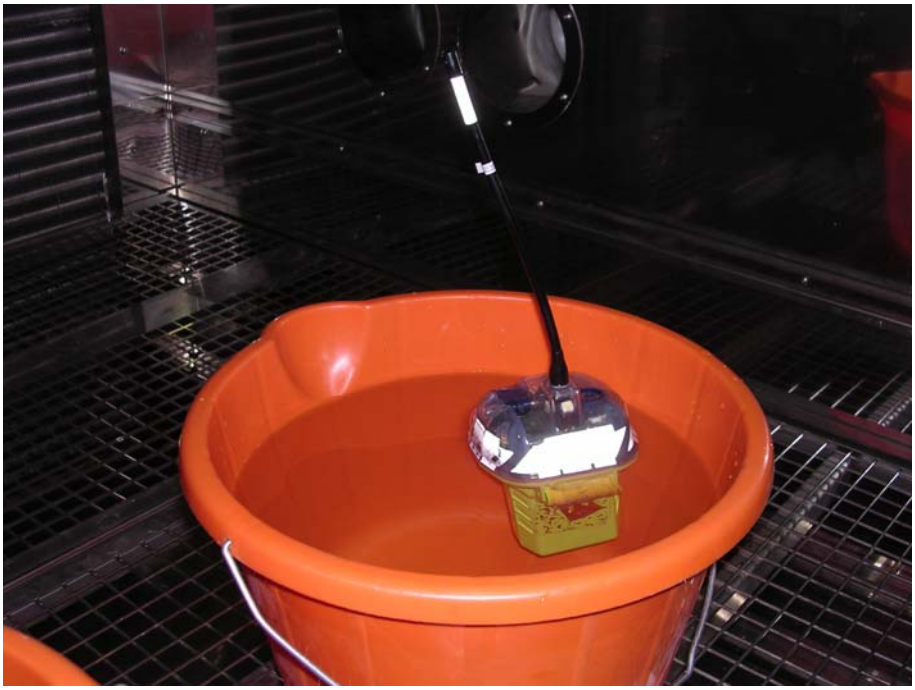
The test was performed with the EUT in the following mode(s): Idle (“Ready Condition”)*

*Note: EUT activated (entered Operating mode automatically) on contact with water.



Test Set-up – Preconditioning

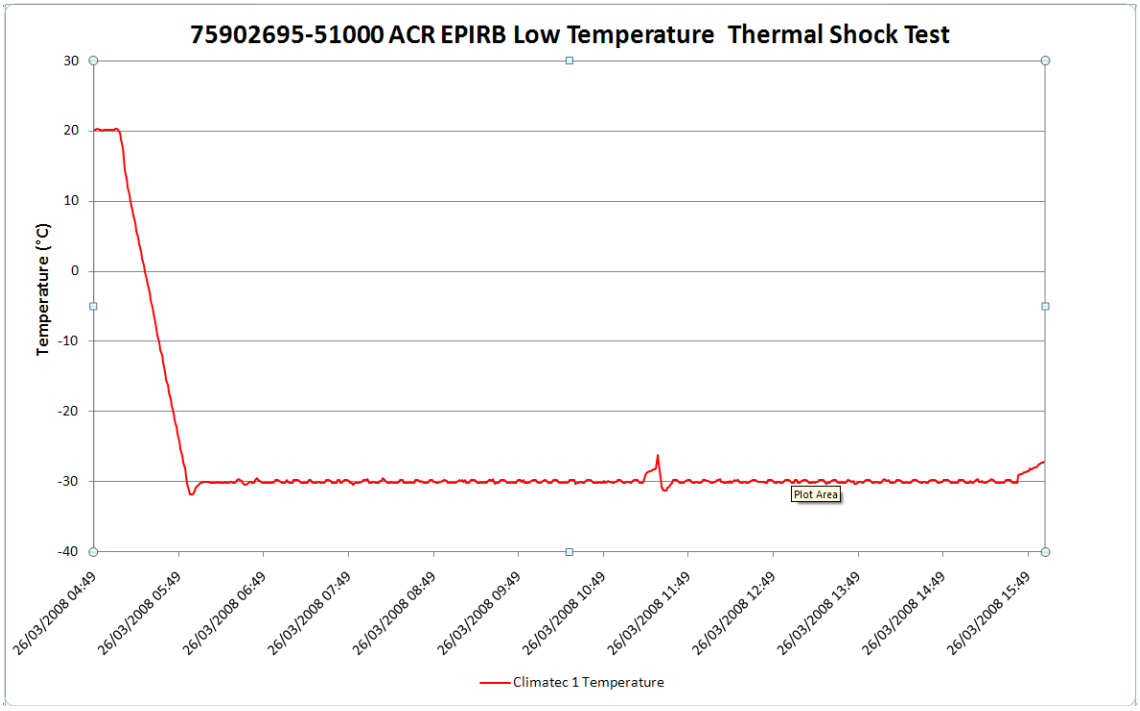
Product Service



Test Set-up – During Test

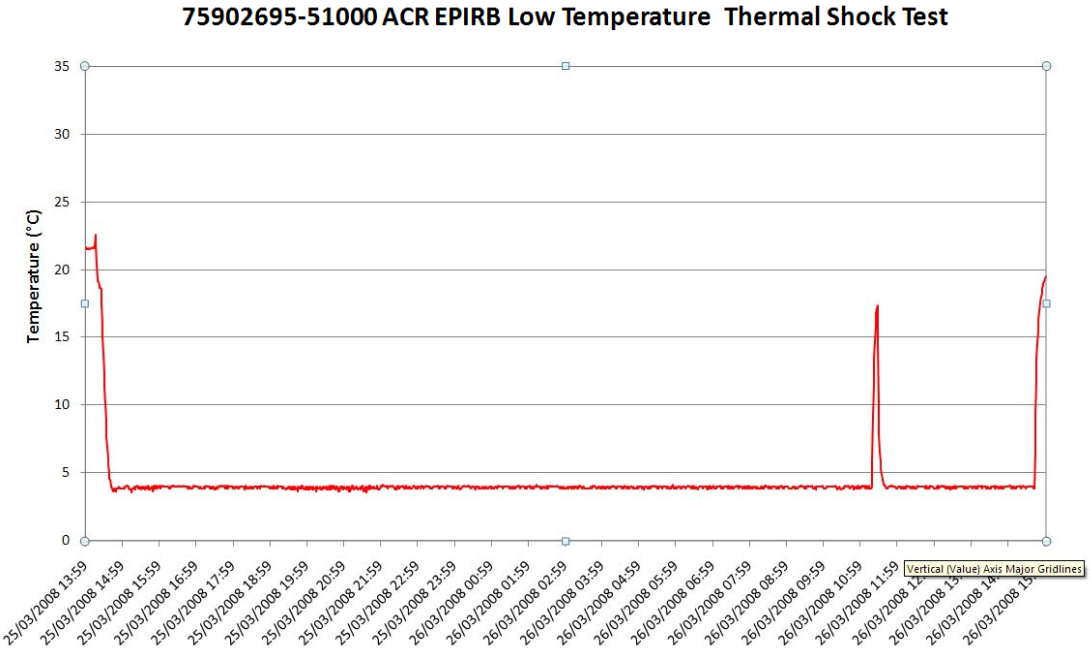
2.11.6 Environmental Conditions

EUT Preconditioning Temperature Plot



Product Service

Water Conditioning Temperature Plot



2.11.7 Test Results

EUT set to the Ready Condition and placed in the climatic chamber set to -30°C for a stabilisation of at least 3 hours.

EUT removed from chamber and totally immersed in fresh water at +4.0°C for 10 seconds, then allowed to float in water maintained at that temperature. The Aliveness Test was performed, see Beacon Test Report below.

EUT removed from water, dried and deactivated automatically then set to the Ready condition then replaced in the climatic chamber, chamber temperature still -30°C.

EUT removed from chamber after stabilisation of at least 3 hours and totally immersed in salt water at +4.0°C for 10 seconds then allowed to float in the same water. EUT self-activated immediately as it was immersed and an Aliveness Test was performed, see Beacon Test Report below.

After 20 minutes the following measurements were conducted (results can be found in the Test Results Table, starting on page 17):

- Short-term frequency stability
- Medium-term frequency stability
    - o Mean slope
    - o Residual frequency variation

EUT was removed from water, dried and deactivated.

Product Service

Beacon Test Report (Aliveness Test, Normal Message)

Beacon Test Report

2DDC4407D2FFBFF

Organization: TÜV Product Service Ltd
Tested By: Emergency Beacons Dept.
Date: 3/26/08 3:43:51 PM
Tester Model/Serial No./File Name: BT100S/1025/02695_Shock Low Retest2–3
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 24°C

☐ **PASS** ☐ **FAIL** **INITIALS:**_____

Notes: Add text comments here.

15 Hex ID: 2DDC4407D2FFBFF
Full Hex: FFFE2F96EE2203E97FDFFA885FF783E0F66C
Burst Mode: Normal Mode (Long)
Protocol: Standard Test Protocol
Country 366: United States
Bits 41 - 64: 2229225

Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-110: Default
Latitude: * **°**.**
Longitude: * **°**.**

406 MHz Measurements
406 Frequency (EXT REF): 406.036643 MHz
406 Power (INT ANT): 71%
Power Rise Time: < 5 ms
Phase Deviation: -1.11 +1.08 radians
Modulation Rise Time: 188 uS
Modulation Fall Time: 188 uS
Modulation Symmetry: 0%
Modulation Bit Rate: 399.8 bps
CW Preamble: 160.3 ms

121.5 MHz Measurements
121 Frequency (EXT REF): Out of Range.
121 Power (INT ANT): 15%
Unable to measure details.

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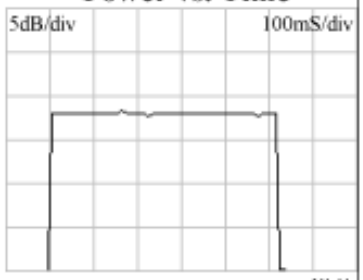
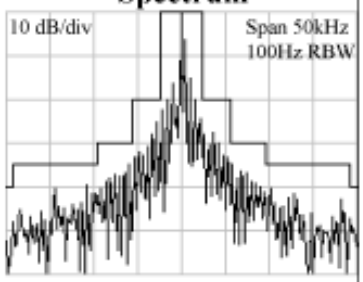
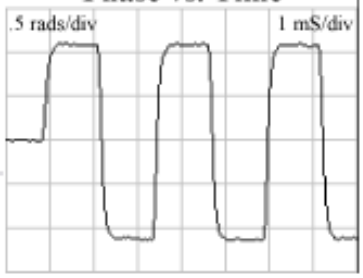
Power vs. Time



Spectrum



Phase vs. Time



Note: Beacon tester out of calibration, traceability maintained for frequency measurement by using a calibrated external reference. Power measurement for reference/comparison only and hence traceability unimportant. Similarly for the other parameters (e.g. modulation details).

A self-test message was not available due to the beacon automatically activating.

Product Service

2.12 HIGH-TEMPERATURE THERMAL SHOCK TEST

2.12.1 Specification Reference

RTCM Paper 77-2002/SC110-STD, Clause A11.2

2.12.2 Equipment Under Test

RLB-36, Unit #10

2.12.3 Date of Test and Modification State

20 and 25 March 2008 - Modification State 0

2.12.4 Test Equipment Used

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

2.12.5 Test Set-up and Operating Modes

The test was performed with the EUT in the following mode(s): Idle (“Ready Condition”)*

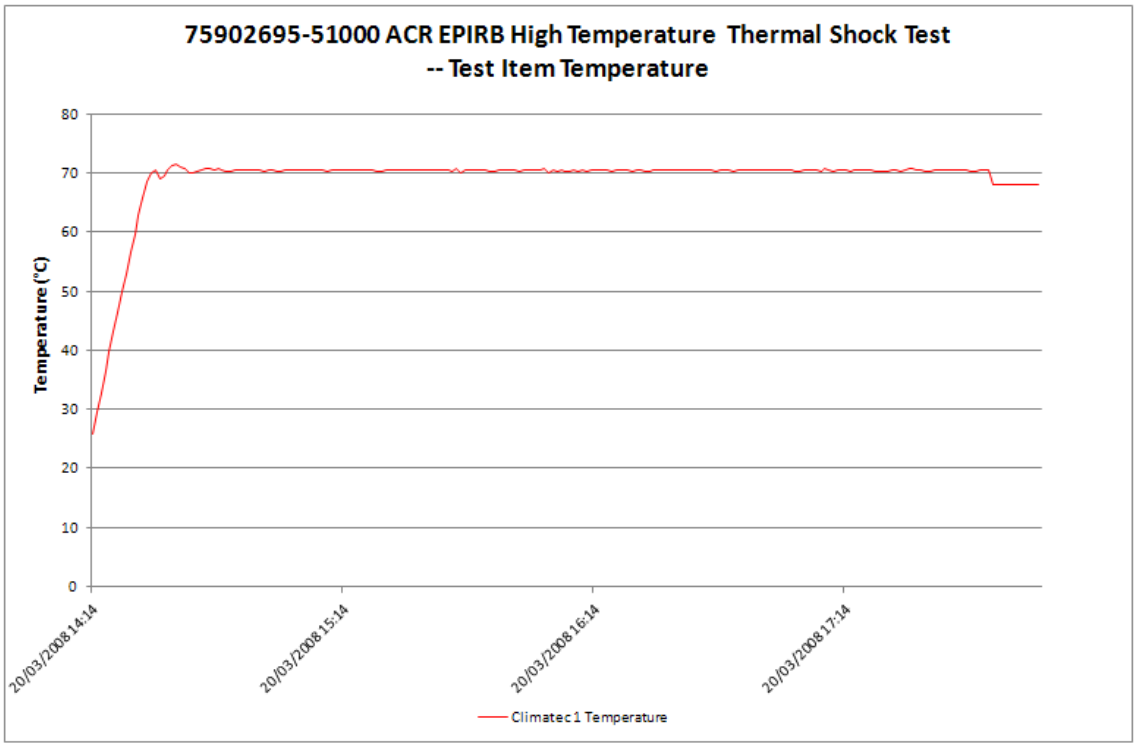
*Note: EUT activated (entered Operating mode automatically) on contact with water.

Physical test configuration: as per Low-Temperature Thermal Shock Test, above.

Product Service

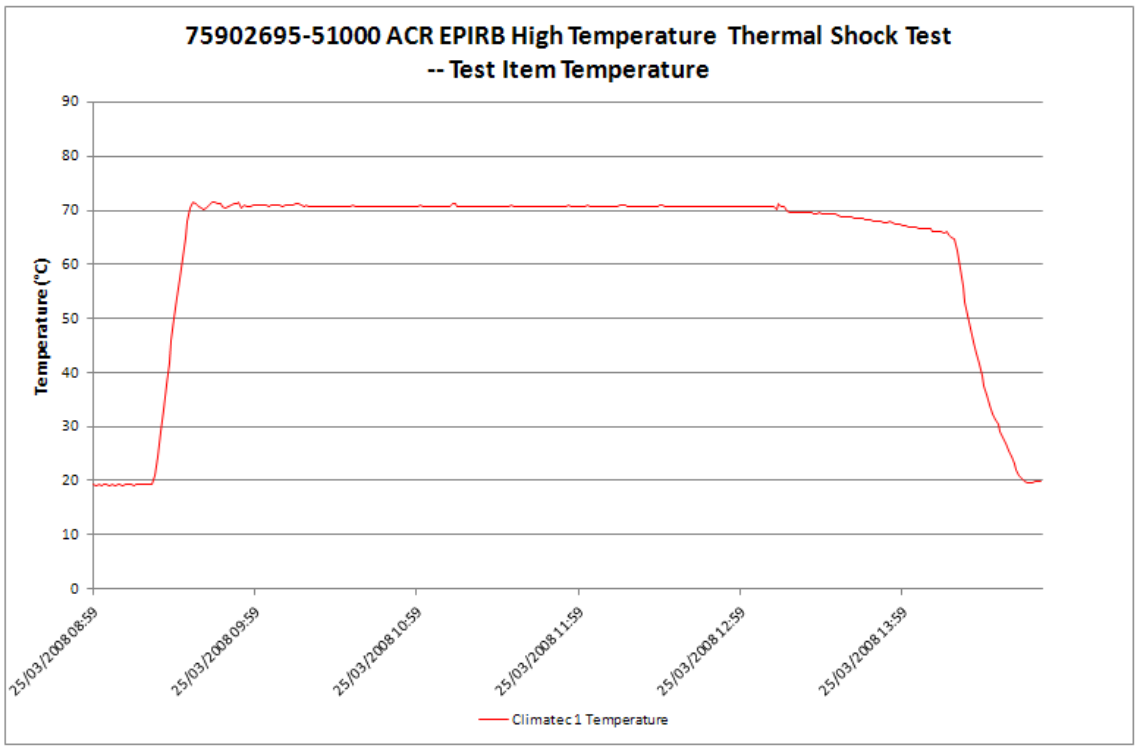
2.12.6 Environmental Conditions

Preconditioning Temperature Plot 1

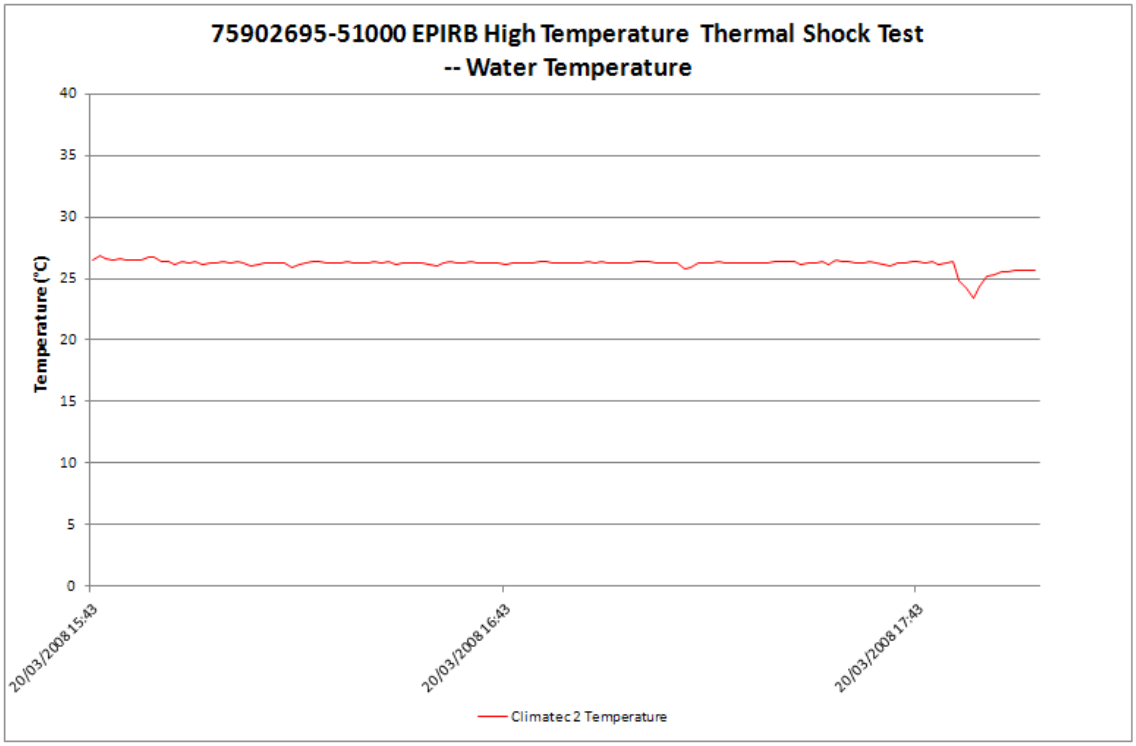


Product Service

Preconditioning Temperature Plot 2

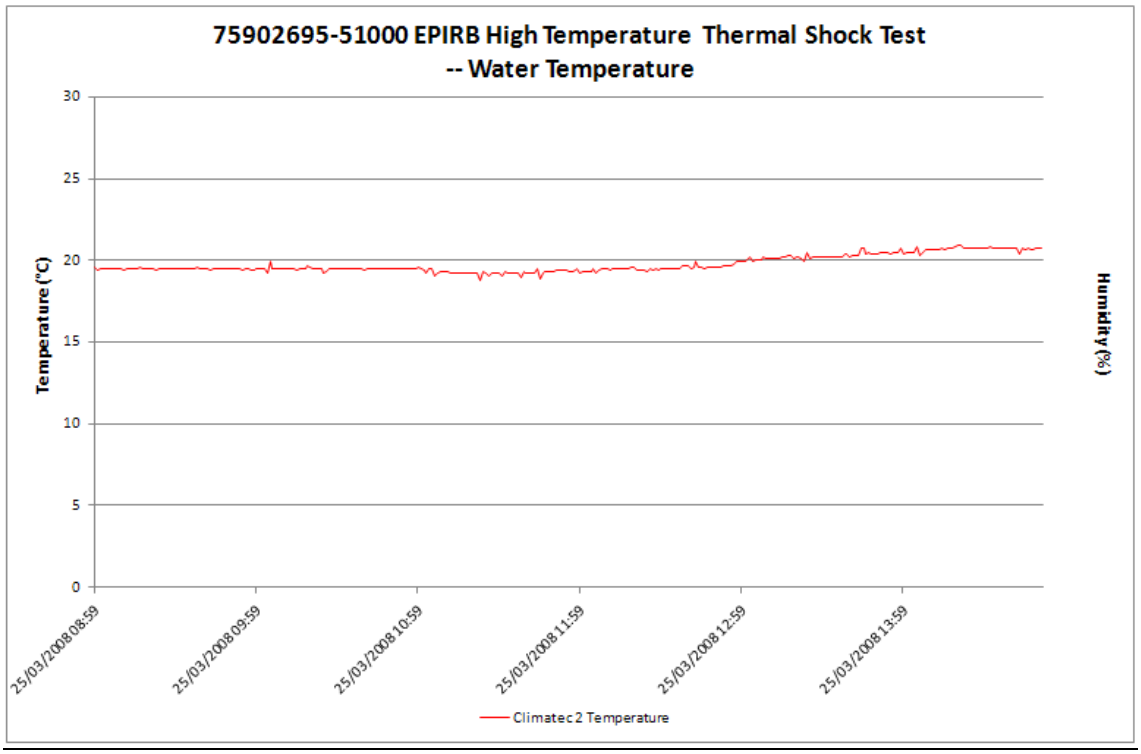


Water Conditioning Temperature Plot 1 (Fresh Water)



Product Service

Water Conditioning Temperature Plot 2 (Salt Water)



2.12.7 Test Results

EUT set to the Ready condition then placed in the climatic chamber. Chamber set to +70°C for a stabilisation of at least 3 hours.

EUT removed from chamber and totally immersed in fresh water at 25°C for 10 seconds then allowed to float in the same water for a further 5 minutes. EUT self-activated immediately as it was immersed and an Aliveness Test was performed, see Beacon Test Report below.

EUT removed from water, dried and deactivated automatically then set to the Ready condition then replaced in the climatic chamber, chamber temperature still +70°C.

EUT removed from chamber after stabilisation of at least 3 hours and totally immersed in salt water at 25°C for 10 seconds then allowed to float in the same water. EUT self-activated immediately as it was immersed and an Aliveness Test was performed, see Beacon Test Report below.

After 20 minutes the following measurements were conducted (results can be found in the Test Results Table, starting on page 17):

- Short-term frequency stability
- Medium-term frequency stability
    - Mean slope
    - Residual frequency variation

EUT was removed from water, dried and deactivated.

Product Service

Beacon Test Report (Aliveness Test)

Beacon Test Report

2DDC4407D2FFBFF

Organization: TÜV Product Service Ltd
Tested By: Emergency Beacons Dept.
Date: 3/20/08 1:34:13 PM
Tester Model/Serial No./File Name: BT100S/1025/02695_TShock2–27
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 13°C

☐ **PASS** ☐ **FAIL** **INITIALS:_____**

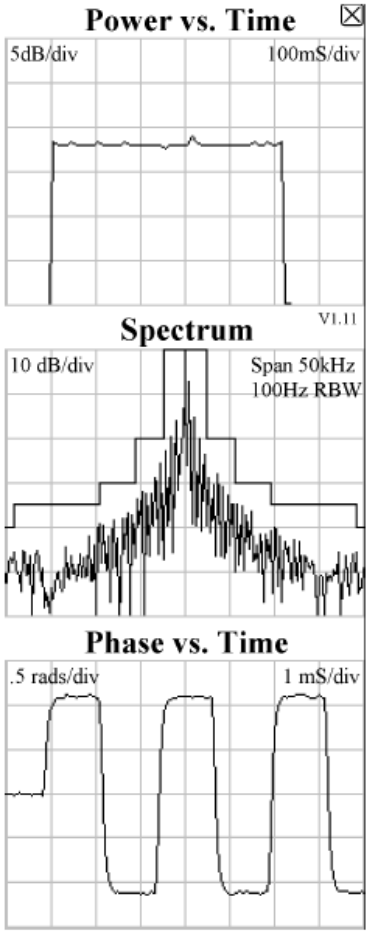
Notes: Add text comments here.

15 Hex ID: 2DDC4407D2FFBFF
Full Hex: FFFE2F96EE2203E97FDFFA885FF583E0FAA8
Burst Mode: Normal Mode (Long)
Protocol: Standard Test Protocol
Country 366: United States
Bits 41 - 64: 2229225

Position Source: External GPS
Auxiliary Radio: 121.5 MHz
Bits 107-110: Default
Latitude: * **°**.**
Longitude: * ***°**.**

406 MHz Measurements
406 Frequency (EXT REF): 406.036618 MHz
406 Power (INT ANT): 77%
Power Rise Time: < 5 ms
Phase Deviation: -1.11 +1.09 radians
Modulation Rise Time: 177 uS
Modulation Fall Time: 188 uS
Modulation Symmetry: 0%
Modulation Bit Rate: 399.8 bps
CW Preamble: 160.1 ms

121.5 MHz Measurements
121 Frequency (EXT REF): Out of Range.
121 Power (INT ANT): 46%
Sweep Direction: Downwards
Audio Frequency: 562 Hz to 1437 Hz
Sweep Range: 875 Hz
Sweep Rep Rate: 2.6 Hz
Modulation Factor: N/A
Duty Cycle: 29 %



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Note: Beacon tester out of calibration, traceability maintained for frequency measurement by using a calibrated external reference. Power measurement for reference/comparison only and hence traceability unimportant. Similarly for the other parameters (e.g. modulation details).

Product Service

2.13 OPERATIONAL LIFE TEST

2.13.1 Specification Reference

RTCM Paper 77-2002/SC110-STD, Clause A13.1

2.13.2 Equipment Under Test

RLB-36, Serial Number 007

2.13.3 Date of Test and Modification State

15 to 18 March 2008 - Modification State 0

2.13.4 Test Equipment Used

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

2.13.5 Test Set-up and Operating Modes

The test was performed with the EUT in the following mode(s): Operating

Product Service

2.13.6 Pre-Test 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	:	30 minutes	(1799920 ms)
Self-test Current	:	12 seconds	(11920 ms)
GPS test Current	:	11.6 minutes	(698000 ms)
Operating Current	:	12.37 minutes	(741920 ms)

Assumptions / Supplied Data

Battery Replacement Interval	: 5 years	
Battery Capacity	: 4.2 Ah	(3 parallel packs of 1.4Ah each)
Battery Self Drain	: 1.02 % per year	(5% per 5 years, customer stated max.)
Self-test Interval	: 12 tests per year	
GPS-test Interval	: 0.2 tests per year	(1 test every 5 years (once per beacon))

Test Results

Mode Current	= Accumulated Charge / Time		
Standby Current	= 8286522887 pC / 1799920 ms	=	4604 nA
Self-test Current	= 895823.04 uC / 11920 ms	=	75.15 mA
GPS-test Current	= 16730748.4 uC / 698000 ms	=	23.97 mA
Operating Current	= 24308483.1 uC / 741920 ms	=	32.76 mA

Product Service

Battery Preconditioning / Discharge Time Calculations

Battery Self Drain = Capacity - [(100% - Self Drain/Year%)$^{\text{Replacement Interval}}$ x Capacity]
= 4.2- ((1- 0.0102)^{5} x 4.2) = 0.2099 Ah

Standby Drain = Hours per year x Battery Replacement Interval x Standby Current
= 365 x 24 x 5 x 4604 x 10^{-9} = 0.2016 Ah
Worst Case = 1.65 x 0.2016 Ah = 0.3327 Ah

Self-test Drain = Self-tests per battery x Self-test Current x Self-test duration (in hours)
= 12 x 5 x 75.15 x 10^{-3} x (11.9 / 3600) = 0.0149 Ah
Worst Case = 1.65 x 0.0149 Ah = 0.0246 Ah

GPS-test Drain = GPS-tests per battery x GPS-test Current x GPS-test duration (in hours)
= 0.2 x 5 x 23.97 x 10^{-3} x (11.6 / 60) = 0.0046 Ah
Worst Case = 1.65 x 0.0046 Ah = 0.0077 Ah

Total Drain = Self Drain + Standby Drain* + Self-test Drain* + GPS-test Drain
= 0.2099 + 0.3327 + 0.0246 + 0.0077 = 0.5719 Ah

* Worst case

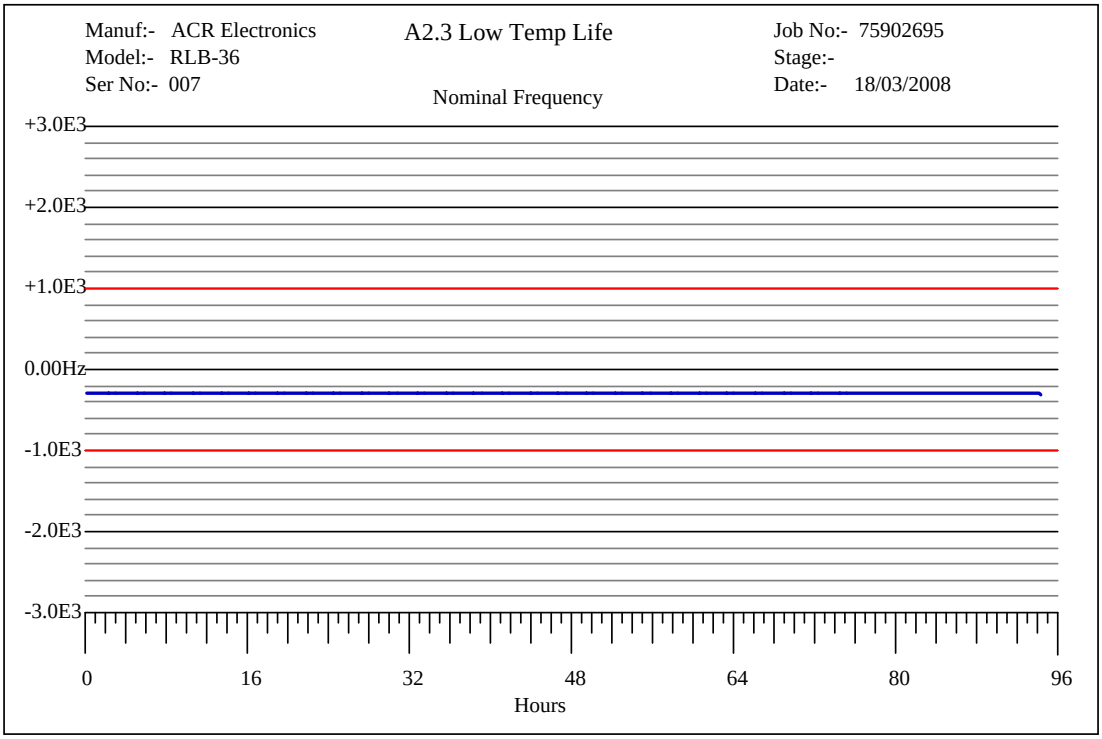
Battery Preconditioning / Discharge Time = Worst Case drain / Operational Current
= 0.5719 / (32.76 x 10^{-3})
= 17.45 hours

The battery was discharged prior to the test by operating the beacon at ambient for 17.5 hours.

Product Service

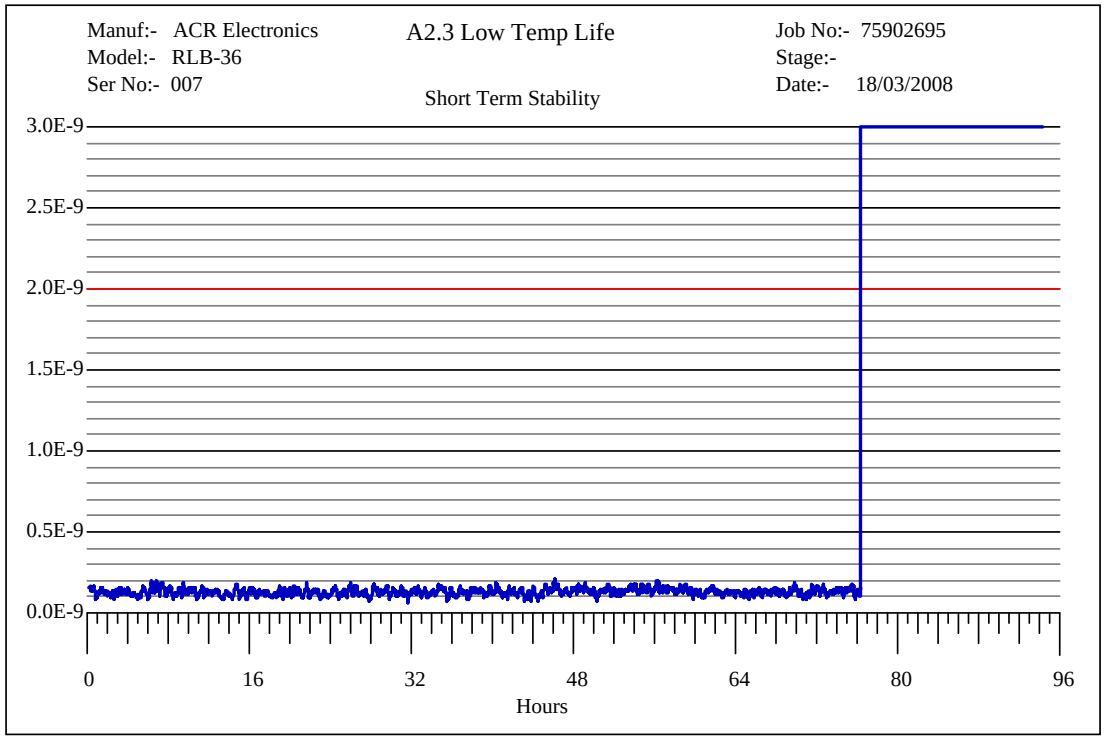
2.13.7 Test Results

406 MHz Test Results

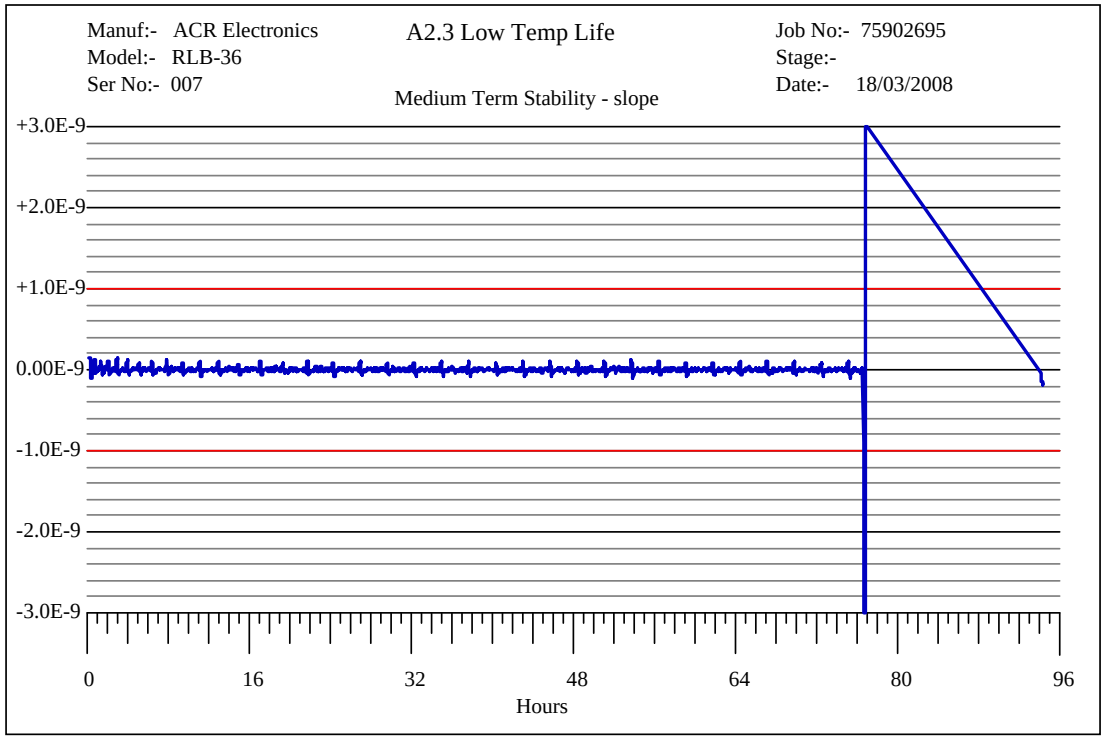


Nominal Frequency Offset

Product Service

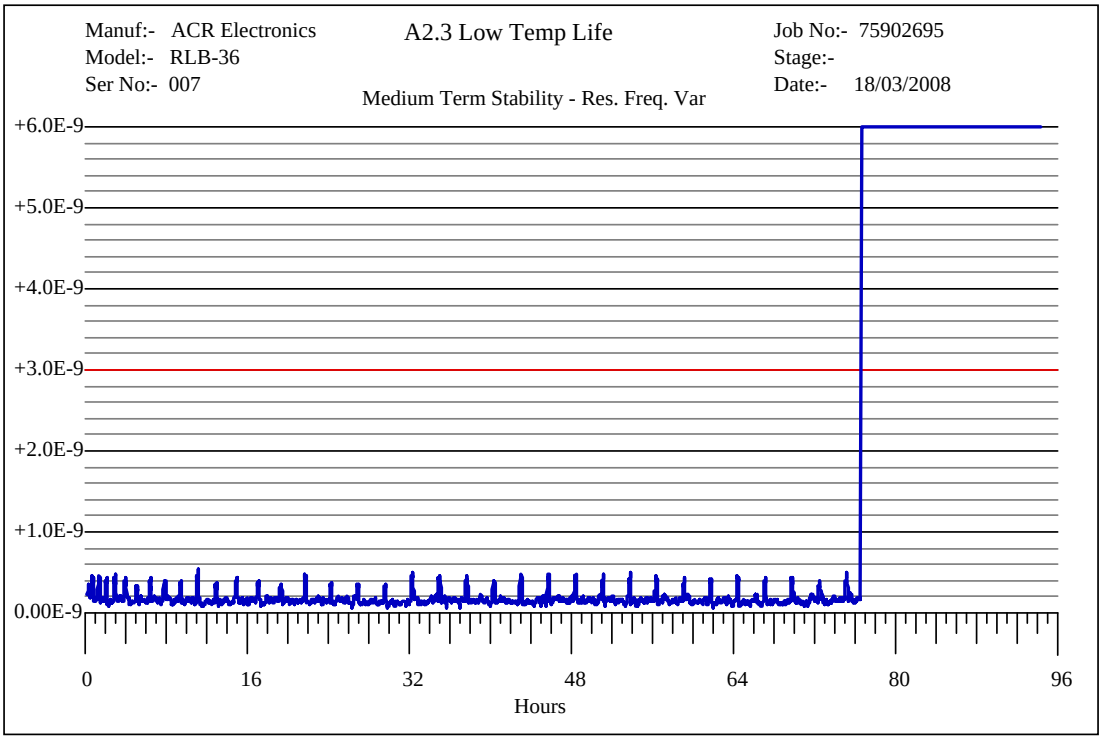


Short Term Stability



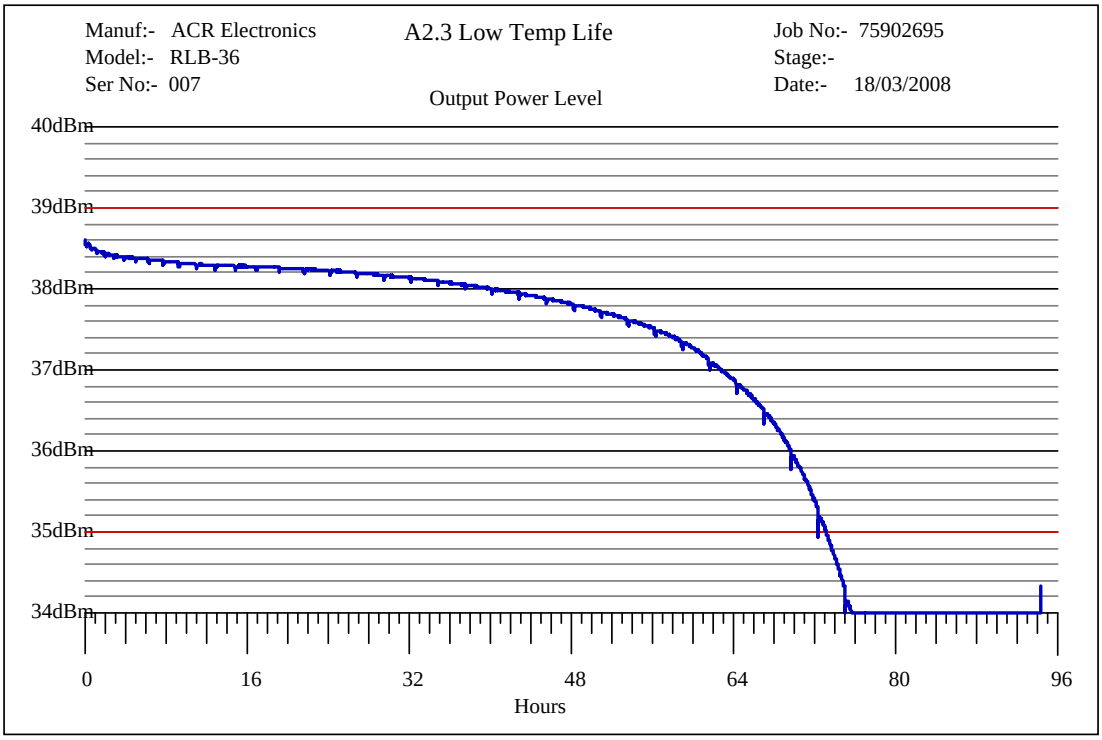
Medium Term Stability – Slope

Product Service



Medium Term Stability – Residual Frequency Variation

Product Service

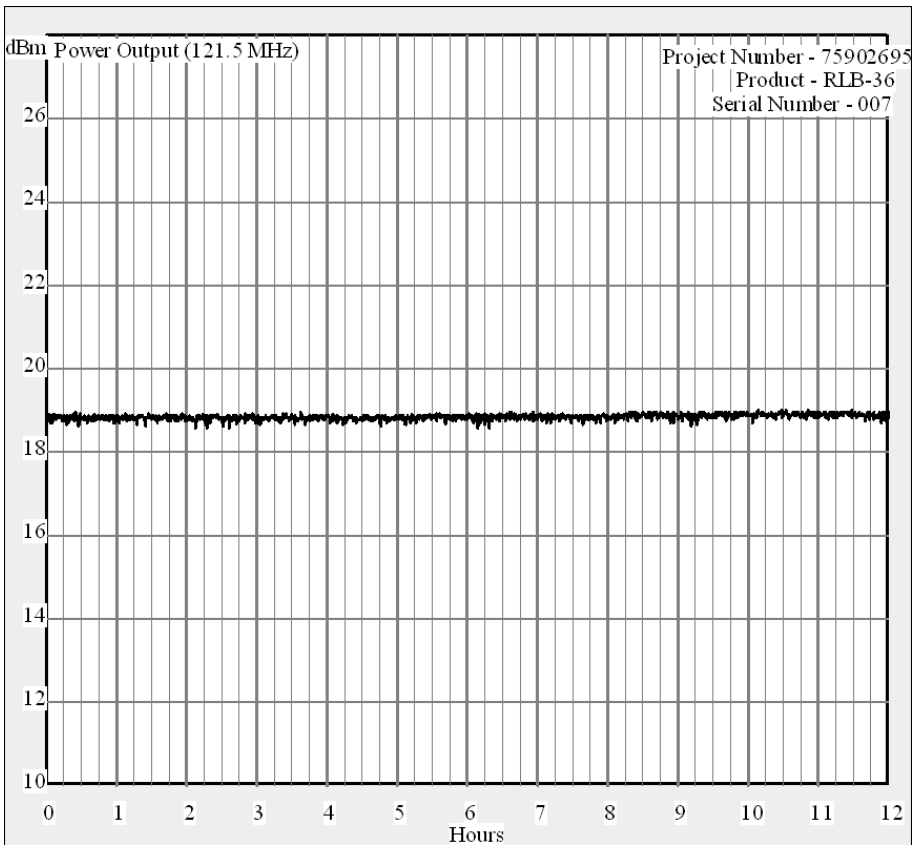


Output Power

Product Service

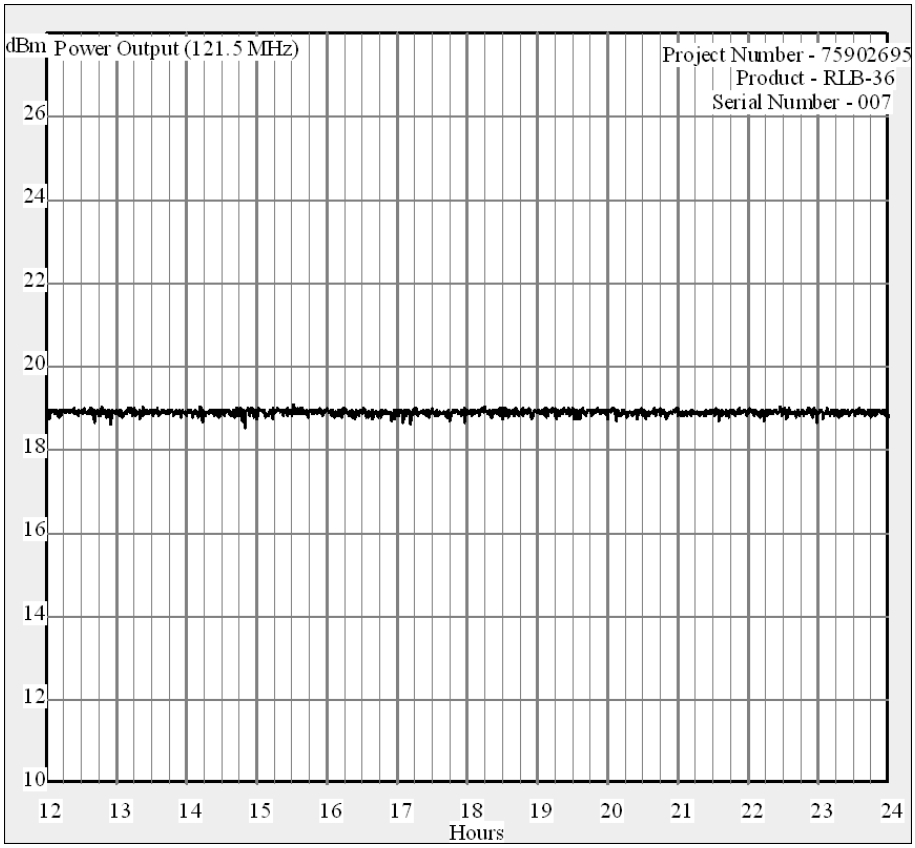
121 MHz Test Results (Auxiliary Radio-locating Device Peak Envelope Output Power)

Summary of results can be found in the Test Results Table, starting on page 17.



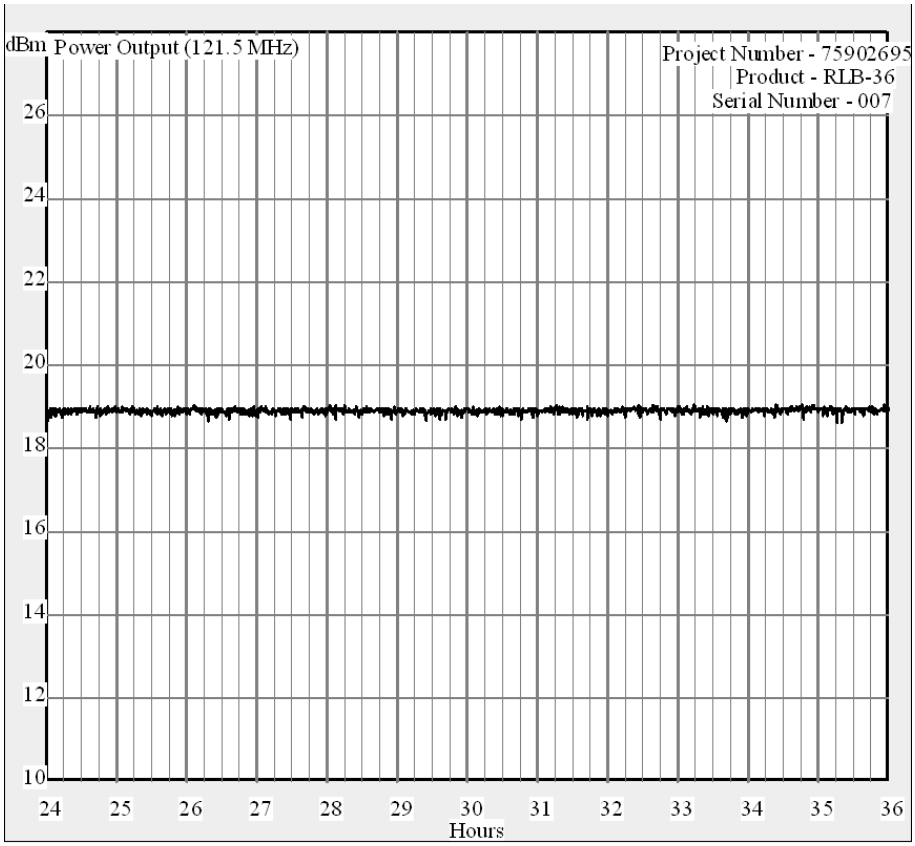
PEOP Graph 1

Product Service



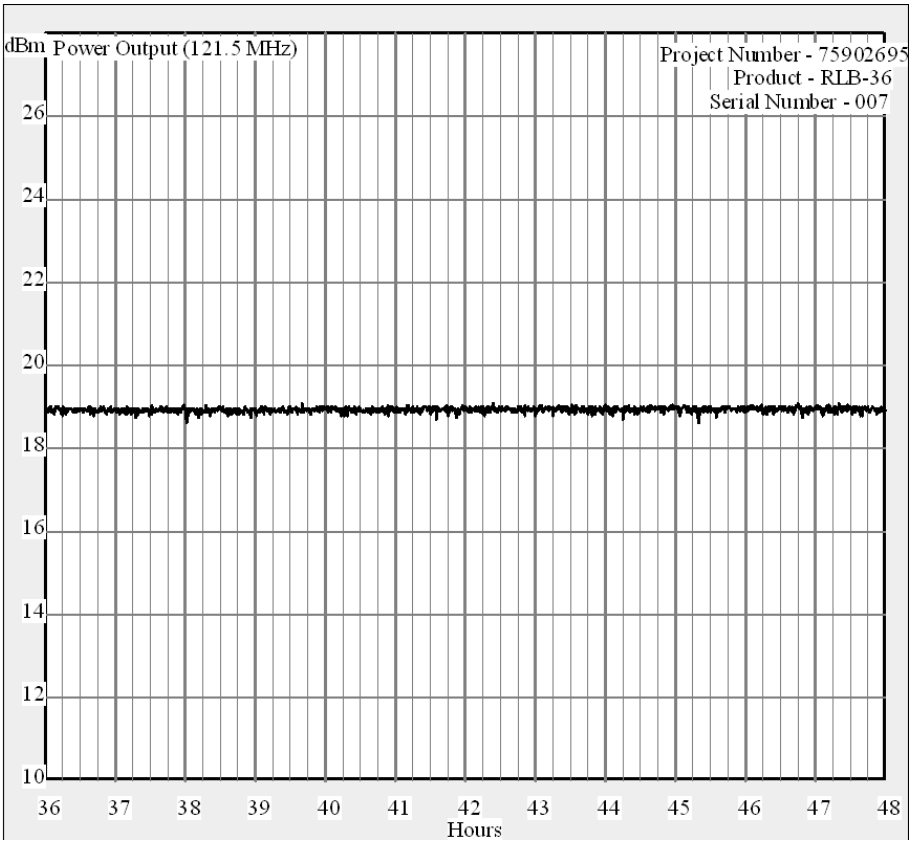
PEOP Graph 2

Product Service



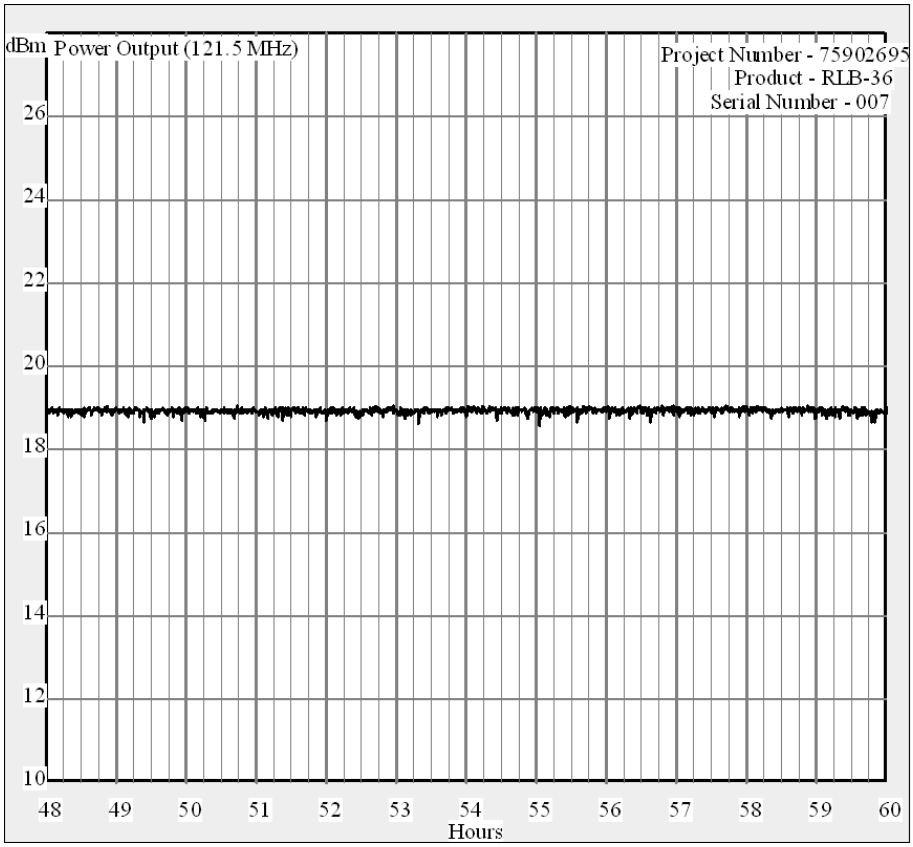
PEOP Graph 3

Product Service



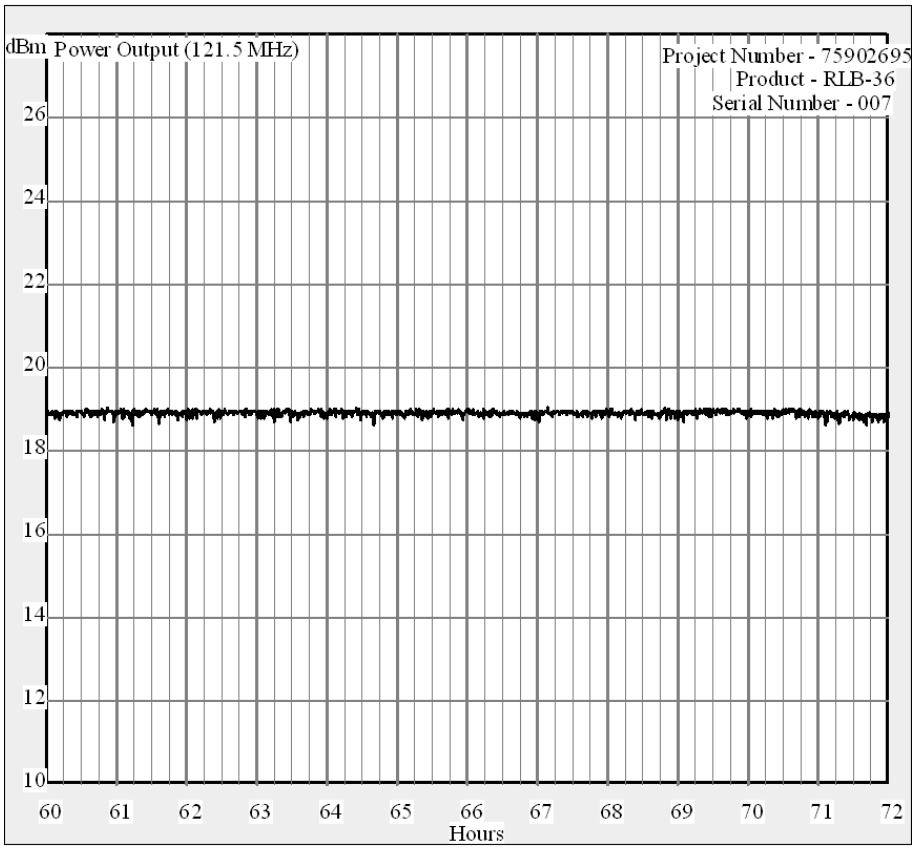
PEOP Graph 4

Product Service



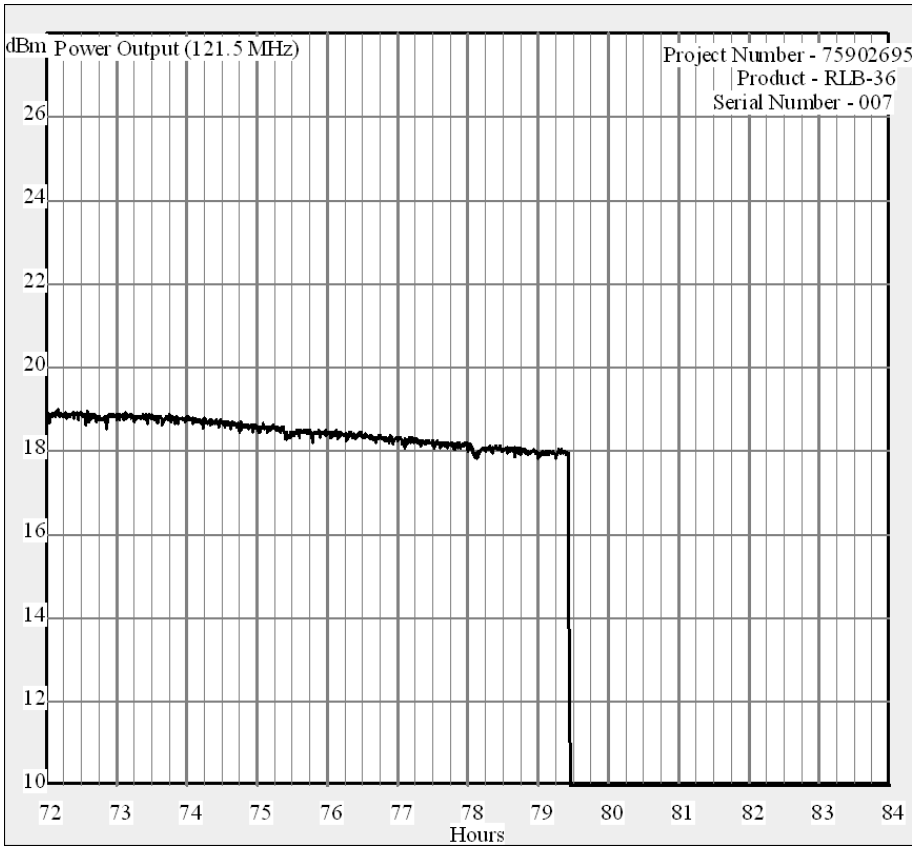
PEOP Graph 5

Product Service



PEOP Graph 6

Product Service



PEOP Graph 7