
REPORT ON

Testing of the ACR Electronics, Inc PLB-300
in accordance with RTCM Paper 76 – 2002 / SC110-STD

COMMERCIAL-IN-CONFIDENCE

Report No RM615355/02 Issue 1

December 2006



Product Service





Product Service

Competence. Certainty. Quality

COMMERCIAL-IN-CONFIDENCE

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REPORT ON

Testing of the ACR Electronics, Inc PLB-300
in accordance with RTCM Paper 76 – 2002 / SC110-STD

Report No RM615355/02 Issue 1

December 2006

PREPARED FOR

ACR Electronics
5757 Ravenswood Road
Ft Lauderdale
USA

PREPARED BY



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Project Manager

APPROVED BY



M J Hardy
Authorised Signatory

DATED

13th December 2006

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SECTION 1

REPORT SUMMARY

Testing of the ACR Electronics, Inc PLB-300
in accordance with RTCM Paper 76 – 2002 / SC110-STD



Product Service

1.1 STATUS

Name and Address of Client	ACR Electronics 5757 Ravenswood Road Ft Lauderdale USA
Model Number	PLB-300
Serial Number	TUV Ref OS615355_03
Test Specification/Issue/Date	RTCM Paper 76 – 2002 / SC110-STD
Number of Items Tested	One
Security Classification of EUT	Unclassified
Incoming Release Date	Application Form 28 th August 2006
Order Number Date	84638 21 st June 2006
Start of Test	30 th August 2006
Finish of Test	9 th October 2006

1.2 BRIEF SUMMARY OF RESULTS

A brief summary of the tests carried out to RTCM Paper 76 is shown below.

Section	RTCM Clause	Details	Result
2.1		Initial Functional test	Pass
2.2	A3.0	Vibration Test	Pass
2.3	A4.0	Bump Test	Pass
2.4	A5.0	Salt Fog Test	Pass
2.5	A6.0	Drop Test (onto hard surface)	Pass
2.6	A7.0	Leakage and Immersion Tests	Pass
2.7	A8.0	Spurious Emissions Test	Pass
2.8	A9.0	COSPAS-SARSAT TYPE APPROVAL TO T.007	See C/S Test Report
2.9	A10.1	Operational Life Test	Pass
2.10	A10.2	Self Test	Pass
2.11	A11.0	Buoyancy (Category 1 only)	Pass
2.12	A12.0	Auxiliary Radio-Locating Device Transmitter Test	Pass
2.13	A12.3	PEIRP (Radiated)	Pass

1.3 APPLICATION FORM

1.3.1 Beacon Manufacturer and Beacon Model

Beacon Manufacturer	ACR Electronics, Inc.
Beacon Model	PLB-300

1.3.2 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	<input type="checkbox"/>
PLB	On ground and above ground	<input checked="" type="checkbox"/>
	On ground and above ground and floating in water	<input type="checkbox"/>
ELT Survival	On ground and above ground	<input type="checkbox"/>
	On ground and above ground and floating in water	<input type="checkbox"/>
ELT Auto Fixed	Fixed ELT with aircraft external antenna	<input type="checkbox"/>
ELT Auto Portable	In aircraft with an external antenna	<input type="checkbox"/>
	On ground, above ground, or in a safety raft with an integrated antenna	<input type="checkbox"/>
ELT Auto Deployable	Deployable ELT with attached antenna	<input type="checkbox"/>
Other (specify)		<input type="checkbox"/>

1.3.3 Beacon Characteristics

Characteristic	Specification
Operating temperature range	Tmin = -20°C Tmax= +55°C
Operating lifetime	24 hours
Battery chemistry	LiMnO2
Battery cell size and number of cells	2/3A size, 6 cells (2x3 cells)
Battery manufacturer	Sanyo, CR123A
Battery pack manufacturer and part number	ACR, A3-06-2511
Oscillator type (e.g. OCXO, MCXO, TCXO)	TCXO
Oscillator manufacturer	C-MAC
Oscillator part name and number	A1-11-0687-1 (E3499)
Oscillator satisfies long-term frequency stability requirements (Yes or No)	Yes



1.3 APPLICATION FORM

1.3.3 Beacon Characteristics (Continued...)

Characteristic	Specification
Antenna type (Integrated or External)	Integrated
Antenna manufacturer	ACR Electronics, Inc.
Antenna part name and number	A3-06-2493
Navigation device type (Internal, External or None)	Internal
Features in beacon that prevent degradation to 406 MHz signal or beacon lifetime resulting from a failure of navigation device or failure to acquire position data (Yes, No, or N/A)	Yes
Features in beacon that ensures erroneous position data is not encoded into the beacon message (Yes, No or N/A)	Yes
Navigation device capable of supporting global coverage (Yes, No or N/A)	Yes
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	ZX4125P-4, A1-11-0688
- GNSS system supported (e.g. GPS, GLONASS, Galileo)	GPS
For External Navigation Devices	
- Data protocol for GNSS receiver to beacon interface	N/A
- Physical interface for beacon to navigation device	N/A
- Electrical interface for beacon to navigation device	N/A
- Navigation device model and manufacturer (if beacon designed to use specific devices)	N/A

1.3 APPLICATION FORM

1.3.3 Beacon Characteristics (Continued...)

Characteristic	Specification
Self-Test Mode Characteristics	
- 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.)	4 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,406 PWR,Lock Det.
- Self-test transmission burst duration (440 or 520 ms)	440 ms
- Self-test format bit ("0" or "1")	1
Beacon includes a homer transmitter (if yes identify frequency of transmission)	121.5 MHz
-Homer Transmit Power	17 dBm
-Homer Duty Cycle	98 %
-Duty Cycle of Homer Swept Tone	37.5 %

1.3 APPLICATION FORM

1.3.3 Beacon Characteristics (Continued...)

Characteristic	Specification
Beacon includes a strobe light (Yes or No)	No
- Strobe light intensity	
- Strobe light flash rate	
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.	N/A
Beacon includes automatic activation mechanism (Yes or No)	No

1.3.4 Information Provided by the Test Facility

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

Date of Submission for Testing: 30th August 2006



1.3 APPLICATION FORM

1.3.5 Applicant Details

Company Name	ACR Electronics, Inc.		
Address	5757 Ravenswood Road Ft Lauderdale USA		
Category of Applicant	<input checked="" type="checkbox"/> Manufacturer	<input type="checkbox"/> Importer	
	<input type="checkbox"/> Distributor	<input type="checkbox"/> Agent	
Contact Name	Chung Tong	Telephone	954-981-3333, ext. 186
Email	ctong@acrelectronics.com	Facsimile	954-983-5087

1.3.6 Manufacturer Details

Company Name	Same as above		
Address			
Contact Name		Telephone	
Email		Facsimile	

1.3.7 Declaration of Build Status

Hardware Version	
- PCB Revision	Rev.A (same as T2)
- Battery Model	A3-06-2511
Software Version	
Firmware Version	Rev.A (same as T9.3)
Other (Specify)	

1.3.8 Applicant's Declaration

I hereby declare that I am entitled to sign on the behalf of the applicant and that the information supplied is correct and complete

Signed: Chung Tong

Name: Chung Tong

Position Held: Principal electrical Engineer

Date: 8/28/06

1.4 MODIFICATIONS

No modifications were made to the test sample during testing.

1.5 DEVIATIONS FROM THE STANDARD

Section 2.2: Vibration Test

In order to combine the Vibration Tests of RTCM Paper 76-2002 and ETSI EN 302 152-1 the test was performed in accordance with the following test plan (agreed by RTCM – R L Markle)

EUT mounted in its normal orientation

Subject to the following sinusoidal vibration

Vertical Axis

<i>4Hz to 10Hz</i>	<i>2.5mm Peak Amplitude</i>	<i>(5mm p-p)</i>
<i>10Hz to 15Hz</i>	<i>0.8 mm Peak Amplitude</i>	<i>(1.6mm p-p)</i>
<i>15Hz to 25Hz</i>	<i>0.4mm Peak Amplitude</i>	<i>(0.8mm p-p)</i>
<i>25Hz to 33Hz</i>	<i>0.2mm Peak Amplitude</i>	<i>(0.4mm p-p)</i>
<i>33Hz to 50Hz</i>	<i>0.1mm Peak Amplitude</i>	<i>(0.2mm p-p)</i>

Sweep 4Hz – 50Hz at 15 minute/octave (~50 min in total)

During the above test, perform resonance search

If resonances detected perform a 2 hour endurance test at the frequency giving the highest magnification.

Repeat the above for each axis (3 axes in total)

1.6 REPORT MODIFICATION RECORD

Issue 1 – First Issue

SECTION 2

TEST DETAILS

Testing of the ACR Electronics, Inc PLB-300
in accordance with RTCM Paper 76 – 2002 / SC110-STD

TABLE OF TEST RESULTS

PARAMETER TO BE MEASURED	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			T _{min} (-20°C)	T _{amb} (+23°C)	T _{max} (+55°C)	
1. INITIAL ALIVENESS TEST (A1.0)						Section 2.1
• Carrier Frequency	406.028±0.001	MHz		Max: 406.02751 Min: 406.02750		
• Power Output	35 – 39	dBm		Max: 38.46 Min: 37.08		
2. VIBRATION TEST (A3.0)						Section 2.2
• Exterior Mechanical Inspection	No damage	✓		✓		
• Aliveness Test	Successful self-test	✓		✓		
• Activation	No activation during test	✓		✓		
3 BUMP TEST (A4.0)						Section 2.3
• Exterior Mechanical Inspection	No damage	✓		✓		
• Aliveness Test	Successful self-test	✓		✓		
• Activation	No activation during test	✓		✓		
4. SALT FOG TEST (A5.0)						Section 2.4
• Exterior Mechanical Inspection	No damage	✓		✓		
• Aliveness Test	Successful self-test	✓		✓		

TABLE OF TEST RESULTS

PARAMETER TO BE MEASURED	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			T _{min} (-20°C)	T _{amb} (+23°C)	T _{max} (+55°C)	
5. DROP TEST (A6.0)						Section 2.5
• Exterior Mechanical Inspection	No damage	✓	✓			Pre-condition as per Clause A6.0
• Aliveness Test	Successful self-test	✓	✓			-40°C
• Activation	No Activation during test	✓	✓			
6. LEAKAGE AND IMMERSION TEST (A7.0)						Section 2.6
• Leakage & Immersion						
- Interior Inspection	No water	✓		✓		
- Aliveness Test	Successful self-test	✓		✓		
7. SPURIOUS EMISSIONS TEST (A8.0)						Section 2.7
• 406 MHz	Figure 2-1	✓	✓	✓	✓	
• 121.5 MHz	Figure 2-5	✓	✓	✓	✓	
8. COSPAS-SARSAT TYPE APPROVAL (A9.0)	C-S Certificate					Section 2.8

TABLE OF TEST RESULTS

PARAMETER TO BE MEASURED	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			T _{min} (-20°C)	T _{amb} (+23°C)	T _{max} (+55°C)	
9. OPERATIONAL LIFE AND STROBE LIGHT (A 10.1)						Section 2.9
Operational Life	Time to first Failure	Hours	58.1			
Frequency						
• Nominal Carrier	406.028±0.001	MHz	Min: 406.027504 Max: 406.027508			
• Short-term stability	0.002	Parts/million in 100ms	Min: 6.943x10 ⁻¹¹ Max: 4.387x10 ⁻¹⁰			
Medium-term stability						
• Mean slope	0.001	Parts/million/min	Min: -7.713x10 ⁻¹¹ Max: 8.875x10 ⁻¹¹			
• Residual variation	0.003	Parts/million	Min: 5.044x10 ⁻¹¹ Max: 3.289x10 ⁻¹⁰			
RF output power	35 – 39	dBm	Min: 35.12 Max: 38.06			
Strobe flash rate	20 – 30	/min	-			Not applicable
Auxiliary PEIRP	14 - 20	dBm	Max: 20.315* Min: 18.794			* Pass within MU
10. SELF-TEST (A 10.2)						Section 2.10
• RF pulse duration	0.444 sec or 0.525 sec	✓	✓	✓	✓	
• Frame synchronisation pattern	0 1101 0000	✓	✓	✓	✓	
• Number of RF bursts	1 – burst	✓	✓	✓	✓	
- Beacon 15 Hex ID	Must be provided by self-test burst	✓	✓	✓	✓	
- 121.5 MHz transmission	1 sec / 3 sweeps	✓	✓	✓	✓	
11. BUOYANCY TEST (Category 1 only) (A11.0)						Section 2.11
• Buoyancy	Floats	✓		✓		Fitted with flotation pouch
• Reserve Buoyancy	>5%	%		11.4		

TABLE OF TEST RESULTS

PARAMETER TO BE MEASURED	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			T _{min} (-20°C)	T _{amb} (+23°C)	T _{max} (+55°C)	
12. AUXILIARY RADIO-LOCATING DEVICE TRANSMITTER TEST (A12.0)						Section 2.12
• Carrier frequency	121.5 ± 0.006	MHz	121.503249	121.500528	121.497861	
• Transmission Duty Cycle	Continuous	%	96.57	96.43	95.25	
Modulation						
• Frequency	700Hz within range of 300 – 1600 Hz	Hz	940.56	940.53	940.96	
• Duty cycle	33 – 55	%	34.11	33.54	33.74	
• Factor	0.85 – 1.0	✓	0.95	0.96	0.96	
• Sweep repetition rate	2 – 4	Hz	2.56	2.56	2.56	
• Frequency Coherence		✓	✓	✓	✓	
PEIRP (Radiated)						Section 2.12
• Antenna (Radiated) Pattern						
- Pattern	Omnidirectional	✓		✓		
-Polarization	Vertical	✓		✓		
-VSWR	1.5 : 1	✓		✓		

2.1 INITIAL ALIVENESS TEST

2.1.1 Specification Reference

RTCM Paper 76 (A 1.0)

2.1.2 Test Results

	Minimum	Maximum
Nominal Frequency	406.02750MHz	406.02751MHz
Output Power	37.08dBm	38.46dBm

Beacon Test Report

2DDC6487ACFFBFF

Organization: TUV Product Service Ltd
 Tested By: Emergency Beacons Dept.
 Date: 30-Aug-06 12:41:29 PM
 Tester Model/Serial No./File Name: BT100S/1025/acr-1
 Tester Cal Due Date: Nov 10, 2006
 Tester Temperature: 25°C

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

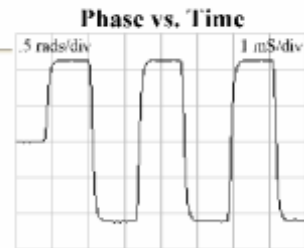
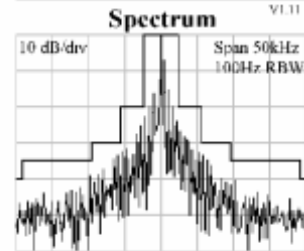
Notes: Add text comments here.

15 Hex ID: 2DDC6487ACFFBFF
 Full Hex: FFFE2F96EE3243D67FDFFC5C227783E0F66C
 Burst Mode: Normal Mode (Long)
 Protocol: Standard Test Protocol
 Country 366: United States
 Bits 41 - 64: 3294166

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

406 MHz Measurements
 406 Frequency (INT REF): 406.0275 MHz
 406 Power (INT ANT): 89%
 Power Rise Time: < 5 ms
 Phase Deviation: -1.1 +1.12 radians
 Modulation Rise Time: 188 uS
 Modulation Fall Time: 188 uS
 Modulation Symmetry: 1.9%
 Modulation Bit Rate: 398.1 bps
 CW Preamble: 160.7 ms

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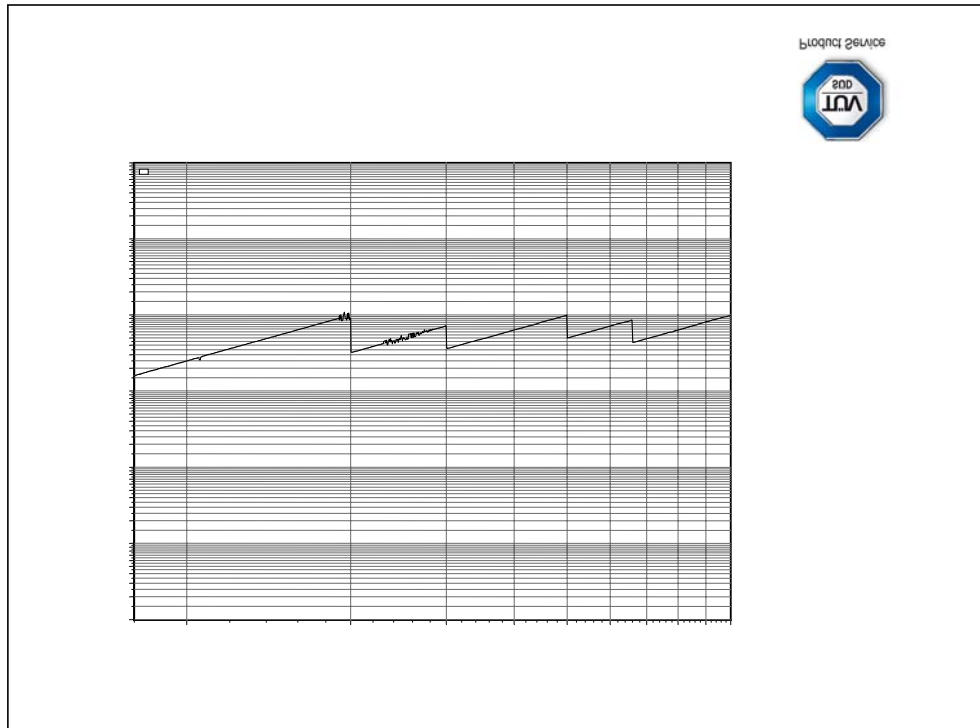
Beacon Test Report - Initial Functional Test

2.2 VIBRATION TEST

2.2.1 Specification Reference

RTCM Paper 76 (A 3.0)

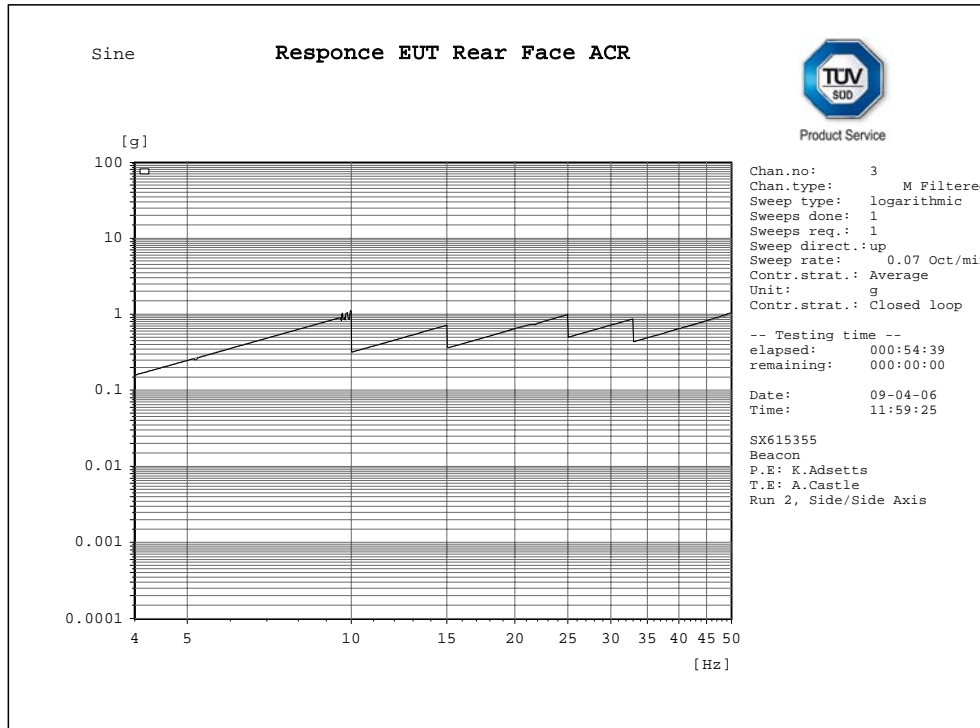
2.2.2 Vibration Plots



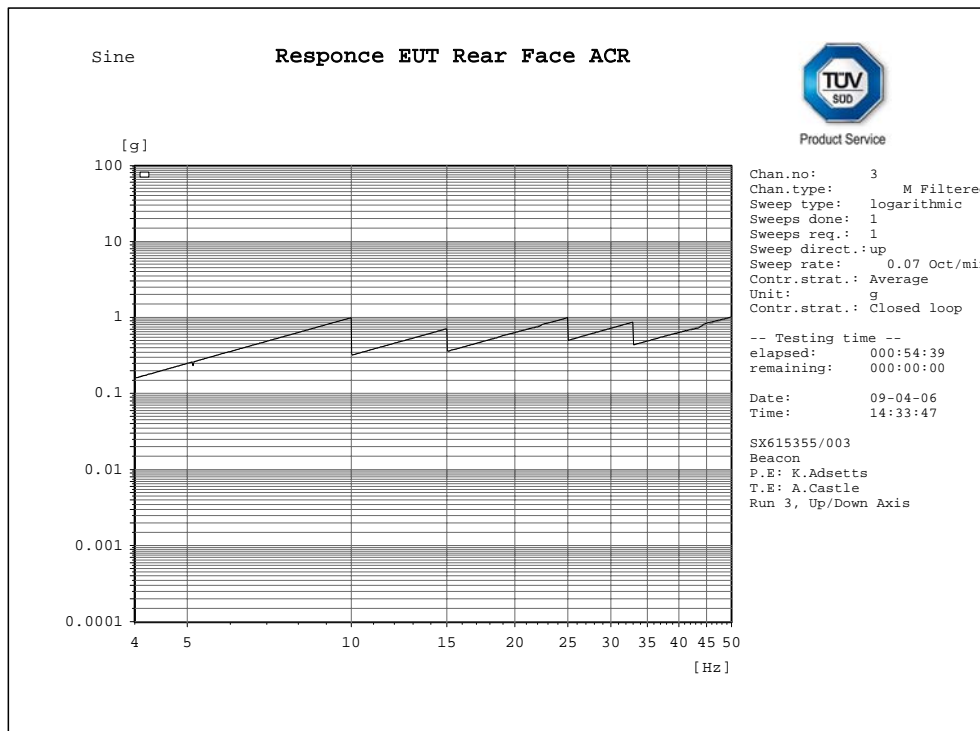
Plot showing responses – Front / Back Axis

2.2 VIBRATION TEST

2.2.2 Vibration Plots



Plot showing responses – Side / Side Axis



Plot showing responses – Vertical Axis

2.2 VIBRATION TEST

2.2.3 Set-up Photographs



Photographs showing EUT mounted on Vibration machine

2.2 VIBRATION TEST

2.2.4 Test Results

Beacon Test Report

2DDC6487ACFFBFF

Organization: TUV Product Service Ltd
Tested By: Emergency Beacons Dept.
Date: 04-Sep-06 10:42:46 AM
Tester Model/Serial No./File Name: BT100S/1025/acr 10-9
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 23°C

PASS FAIL INITIALS: _____

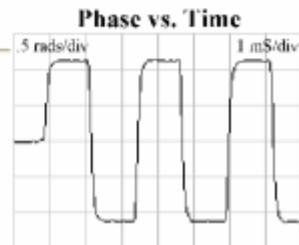
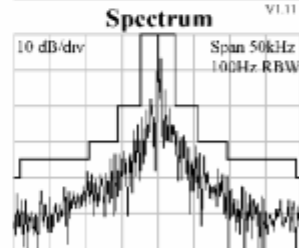
Notes: Add text comments here.

15 Hex ID: 2DDC6487ACFFBFF
Full Hex: FFFE2F96EE3243D67FDFFC5C227783E0F66C
Burst Mode: Normal Mode (Long)
Protocol: Standard Test Protocol
Country 366: United States
Bits 41 - 64: 3294166

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

406 MHz Measurements
406 Frequency (INT REF): 406.0276 MHz
406 Power (INT ANT): 53%
Power Rise Time: < 5 ms
Phase Deviation: -1.11 +1.11 radians
Modulation Rise Time: 188 uS
Modulation Fall Time: 177 uS
Modulation Symmetry: 1.9%
Modulation Bit Rate: 398.1 bps
CW Preamble: 161 ms

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Beacon Test Report following Vibration Test (Back/Front Axis)

2.2 VIBRATION TEST

2.2.4 Test Results

Beacon Test Report

2DDC6487ACFFBFF

Organization: TUV Product Service Ltd
Tested By: Emergency Beacons Dept.
Date: 04-Sep-06 12:06:16 PM
Tester Model/Serial No./File Name: BT100S/1025/acr-5
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 28°C

PASS FAIL INITIALS: _____

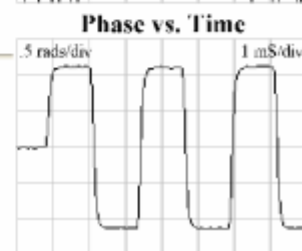
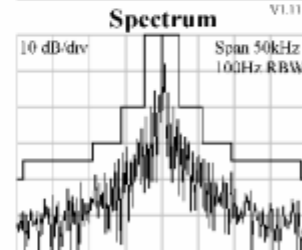
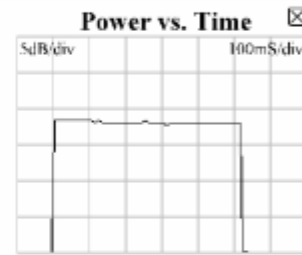
Notes: Add text comments here.

15 Hex ID: 2DDC6487ACFFBFF
Full Hex: FFEE2F96EE3243D67FDFFC5C227783E0F66C
Burst Mode: Normal Mode (Long)
Protocol: Standard Test Protocol
Country 366: United States
Bits 41 - 64: 3294166

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

406 MHz Measurements
406 Frequency (INT REF): 406.0276 MHz
406 Power (INT ANT): 78%
Power Rise Time: < 5 ms
Phase Deviation: -1.12 +1.09 radians
Modulation Rise Time: 188 uS
Modulation Fall Time: 177 uS
Modulation Symmetry: 1.9%
Modulation Bit Rate: 398.3 bps
CW Preamble: 161 ms

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Beacon Test Report following Vibration Test (Side/side Axis)

2.2 VIBRATION TEST

2.2.4 Test Results

Beacon Test Report

2DDC6487ACFFBFF

Organization: TUV Product Service Ltd
Tested By: Emergency Beacons Dept.
Date: 04-Sep-06 2:36:18 PM
Tester Model/Serial No./File Name: BT100S/1025/acr-8
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 27°C

PASS FAIL INITIALS: _____

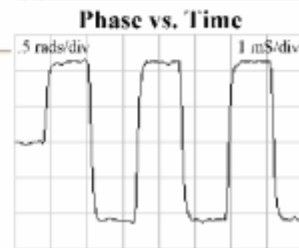
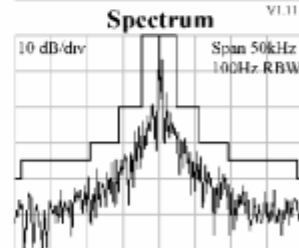
Notes: Add text comments here.

15 Hex ID: 2DDC6487ACFFBFF
Full Hex: FFFE2F96EE3243D67FDFFC5C227783E0F66C
Burst Mode: Normal Mode (Long)
Protocol: Standard Test Protocol
Country 366: United States
Bits 41 - 64: 3294166

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

406 MHz Measurements
406 Frequency (INT REF): 406.0276 MHz
406 Power (INT ANT): 17%
Power Rise Time: < 5 ms
Phase Deviation: -1.08 +1.11 radians
Modulation Rise Time: 177 uS
Modulation Fall Time: 165 uS
Modulation Symmetry: 1.9%
Modulation Bit Rate: 398.1 bps
CW Preamble: 160.8 ms

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Beacon Test Report following Vibration Test (Vertical Axis)

2.3 RUGGEDNESS TEST (BUMPS)

2.3.1 Specification Reference

RTCM Paper 76 (A 6.0)

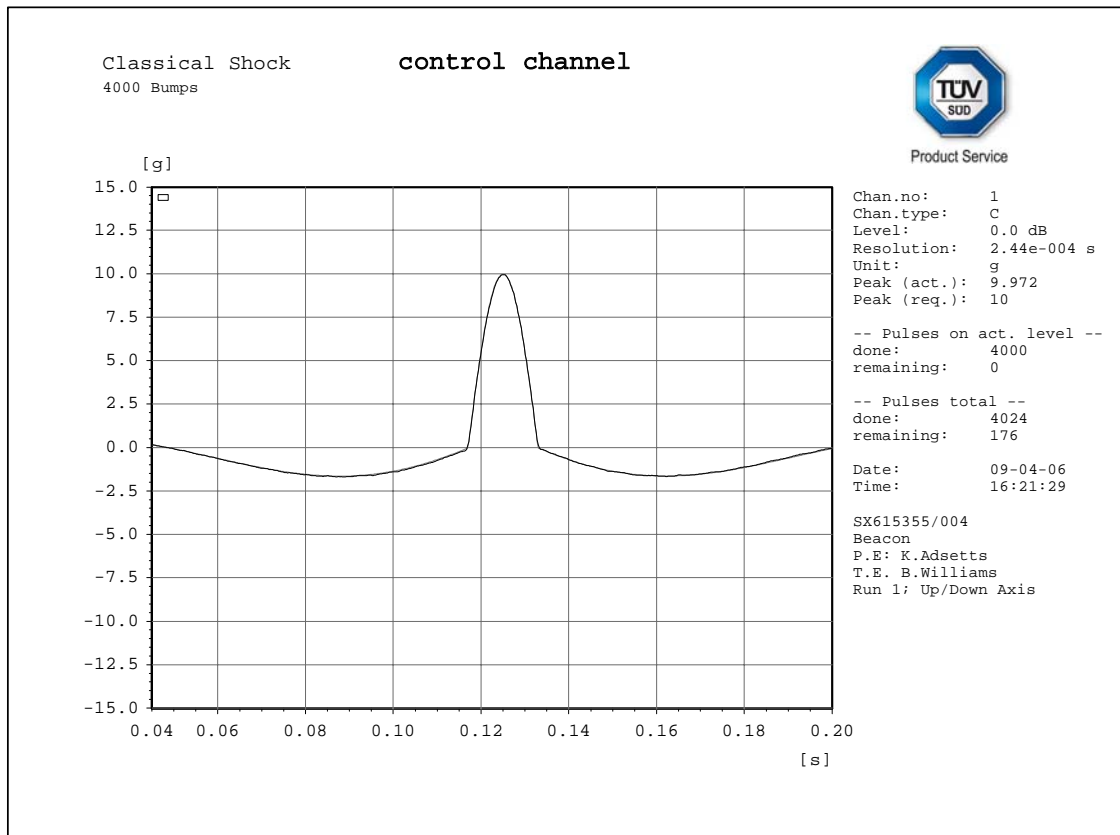
2.3.2 Set-up Photographs



Photograph showing Ruggedness Test Set-up

2.3 RUGGEDNESS TEST (BUMPS)

2.3.3 Test Results



Plot showing Control Channel for the Ruggedness Test

2.3 RUGGEDNESS TEST (BUMPS)

2.3.3 Test Results

Beacon Test Report

2DDC6487ACFFBFF

Organization: TUV Product Service Ltd
 Tested By: Emergency Beacons Dept.
 Date: 04-Sep-06 4:51:44 PM
 Tester Model/Serial No./File Name: BT100S/1025/acr-4
 Tester Cal Due Date: Nov 10, 2006
 Tester Temperature: 30°C

PASS FAIL INITIALS: _____

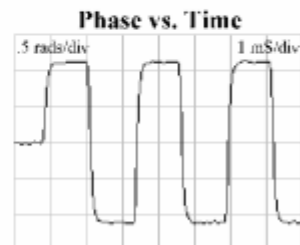
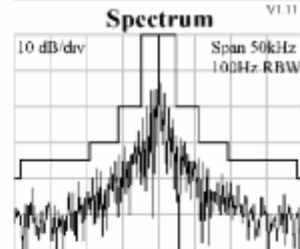
Notes: Add text comments here.

15 Hex ID: 2DDC6487ACFFBFF
 Full Hex: FFFE2F96EE3243D67DFDFC5C227783E0F66C
 Burst Mode: Normal Mode (Long)
 Protocol: Standard Test Protocol
 Country 366: United States
 Bits 41 - 64: 3294166

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

406 MHz Measurements
 406 Frequency (INT REF): 406.0276 MHz
 406 Power (INT ANT): 89%
 Power Rise Time: < 5 ms
 Phase Deviation: -1.1 +1.11 radians
 Modulation Rise Time: 177 uS
 Modulation Fall Time: 177 uS
 Modulation Symmetry: 1.6%
 Modulation Bit Rate: 398.3 bps
 CW Preamble: 160.8 ms

121.5 MHz Measurements
 121 Frequency (INT REF): Out of Range.
 121 Power (INT ANT): 16%
 Sweep Direction: Downwards
 Audio Frequency: 375 Hz to 1375 Hz
 Sweep Range: 1000 Hz
 Sweep Rep Rate: 2.7 Hz
 Modulation Factor: N/A
 Duty Cycle: 96 %



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.

Beacon Test Report following Ruggedness Test

2.4 SALT FOG TEST

2.4.1 Specification Reference

RTCM Paper 76 (A 5.0)

2.4.2 Test Photographs



Photograph of EUT in the Salt Spray Chamber

2.4 SALT FOG TEST

2.4.2 Test Photographs



Photograph of EUT prior to the test



Photograph of EUT following the test

2.4 SALT FOG TEST

2.4.2 Test Results

Beacon Test Report

2DDC6487ACFFBFF

Organization: TUV Product Service Ltd
Tested By: Emergency Beacons Dept.
Date: 12-Sep-06 9:49:37 AM
Tester Model/Serial No./File Name: BT100S/1025/acr salt-3
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 24°C

PASS FAIL INITIALS: _____

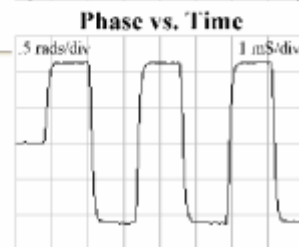
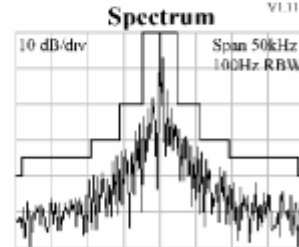
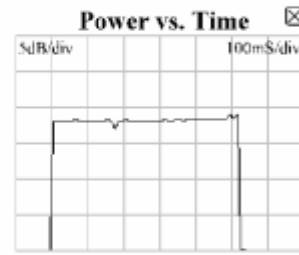
Notes: Add text comments here.

15 Hex ID: 2DDC6487ACFFBFF
Full Hex: FFFE2F96EE3243D67FDFFC5C227783E0F66C
Burst Mode: Normal Mode (Long)
Protocol: Standard Test Protocol
Country 366: United States
Bits 41 - 64: 3294166

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

406 MHz Measurements
406 Frequency (INT REF): 406.0276 MHz
406 Power (INT ANT): 82%
Power Rise Time: < 5 ms
Phase Deviation: -1.1 +1.12 radians
Modulation Rise Time: 188 uS
Modulation Fall Time: 188 uS
Modulation Symmetry: 1.9%
Modulation Bit Rate: 398.1 bps
CW Preamble: 160.7 ms

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Beacon Test Report following the Salt Fog Test

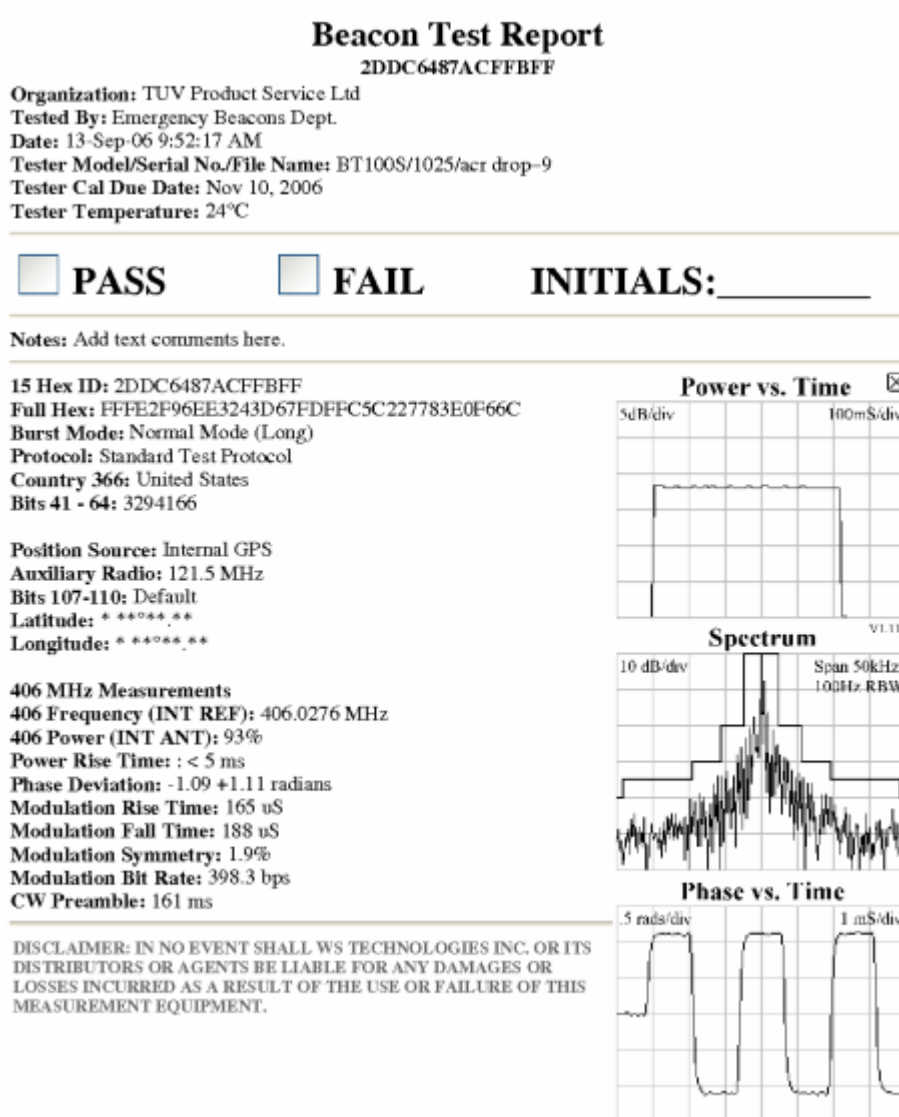
2.5 DROP TEST (On Hard Surface)

2.5.1 Specification Reference

RTCM Paper 76 (A 6.0)

2.5.2 Test Results

The EUT showed no sign of damage or deterioration following the test and did not activate during the test.



Beacon Test Report following Drop test on to hard surface

2.6 LEAKAGE AND IMMERSION TEST

2.6.1 Specification Reference

RTCM Paper 76: A7.0

2.6.2 Test Results

The EUT showed no sign of damage or deterioration following the test. There was no evidence of water ingress and the EUT did not activate during the test.

Beacon Test Report

2DDC6487ACFFBFF

Organization: TUV Product Service Ltd
Tested By: Emergency Beacons Dept.
Date: 15-Sep-06 2:42:11 PM
Tester Model/Serial No./File Name: BT100S/1025/acr leakage-5
Tester Cal Due Date: Nov 10, 2006
Tester Temperature: 25°C

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

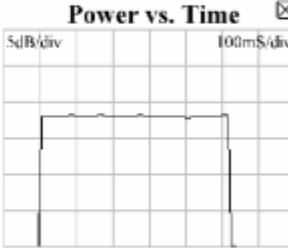
Notes: Add text comments here.

15 Hex ID: 2DDC6487ACFFBFF
Full Hex: FFFE2F96EE3243D67FDFFC5C227783E0F66C
Burst Mode: Normal Mode (Long)
Protocol: Standard Test Protocol
Country 366: United States
Bits 41 - 64: 3294166

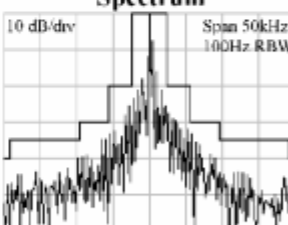
Position Source: Internal GPS
Auxiliary Radio: 121.5 MHz
Bits 107-110: Default
Latitude: * **°**.**
Longitude: * **°**.**

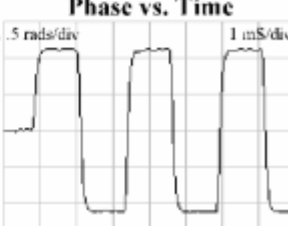
406 MHz Measurements
406 Frequency (INT REF): 406.0276 MHz
406 Power (INT ANT): 90%
Power Rise Time: < 5 ms
Phase Deviation: -1.11 +1.1 radians
Modulation Rise Time: 165 µs
Modulation Fall Time: 188 µs
Modulation Symmetry: 1.6%
Modulation Bit Rate: 398.3 bps
CW Preamble: 160.7 ms

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V1.11





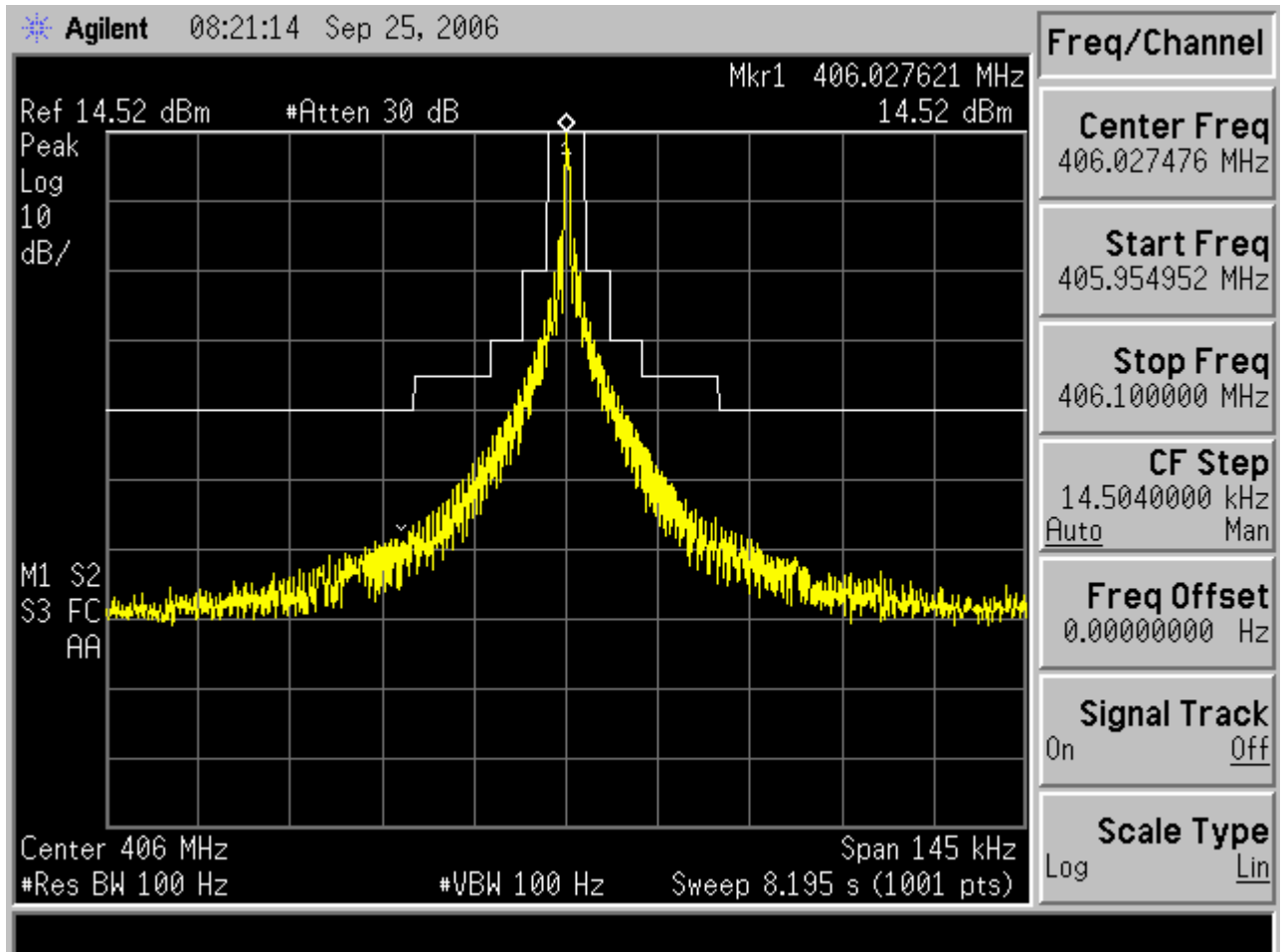
Beacon Test Report following the Leakage and Immersion tests

2.7 SPURIOUS EMISSIONS TEST

2.7.1 Specification Reference

RTCM Paper 76 (A 8.0)

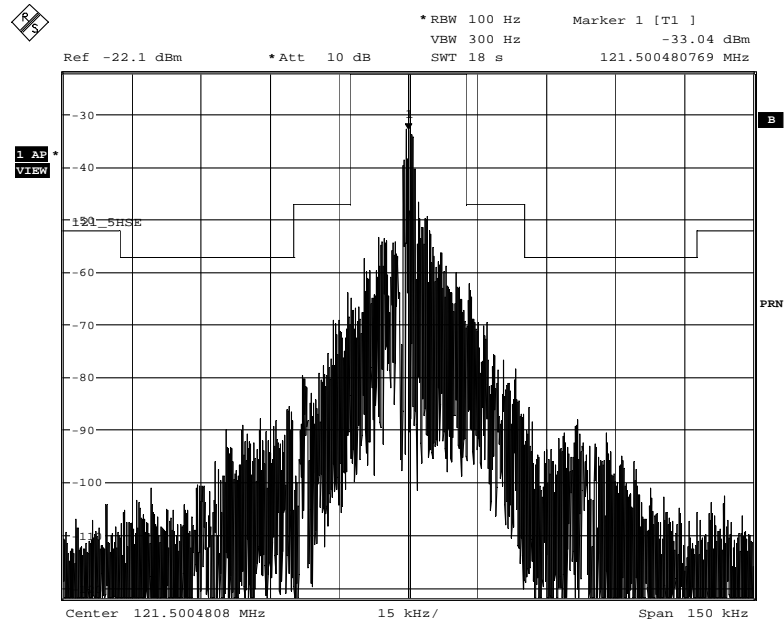
2.7.2 Test Results (406MHz)



Combined Spurious Emissions Plot at Ambient Temperature, +55°C and -20°C

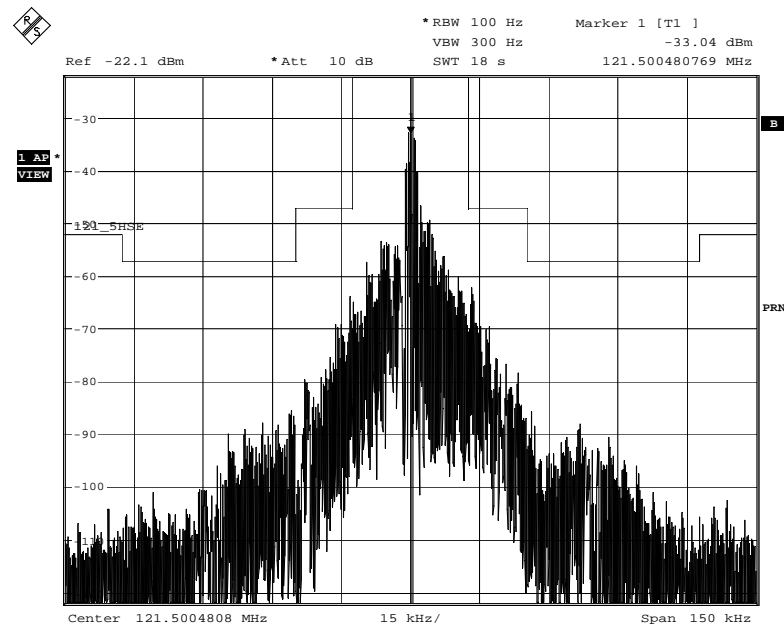
2.7 SPURIOUS EMISSIONS TEST

2.7.3 Test Results (121.5MHz)



Date: 5.OCT.2006 11:05:38

Plot showing 121.5MHz Spurious Emissions at Ambient Temperature

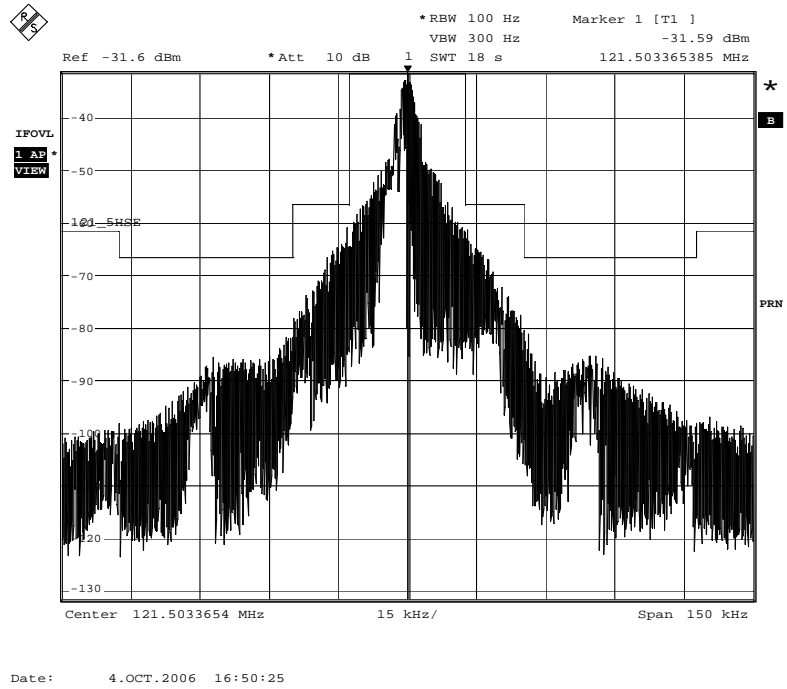


Date: 5.OCT.2006 11:05:38

Plot showing 121.5MHz Spurious Emissions at High Temperature (+55°C)

2.7 SPURIOUS EMISSIONS TEST

2.7.3 Test Results (121.5MHz)



Plot showing 121.5MHz Spurious Emissions at Low Temperature (-20°C)

2.8 COSPAS-SARSAT TYPE APPROVAL

2.8.1 Specification Reference

RTCM Paper 76 (A 9.0)

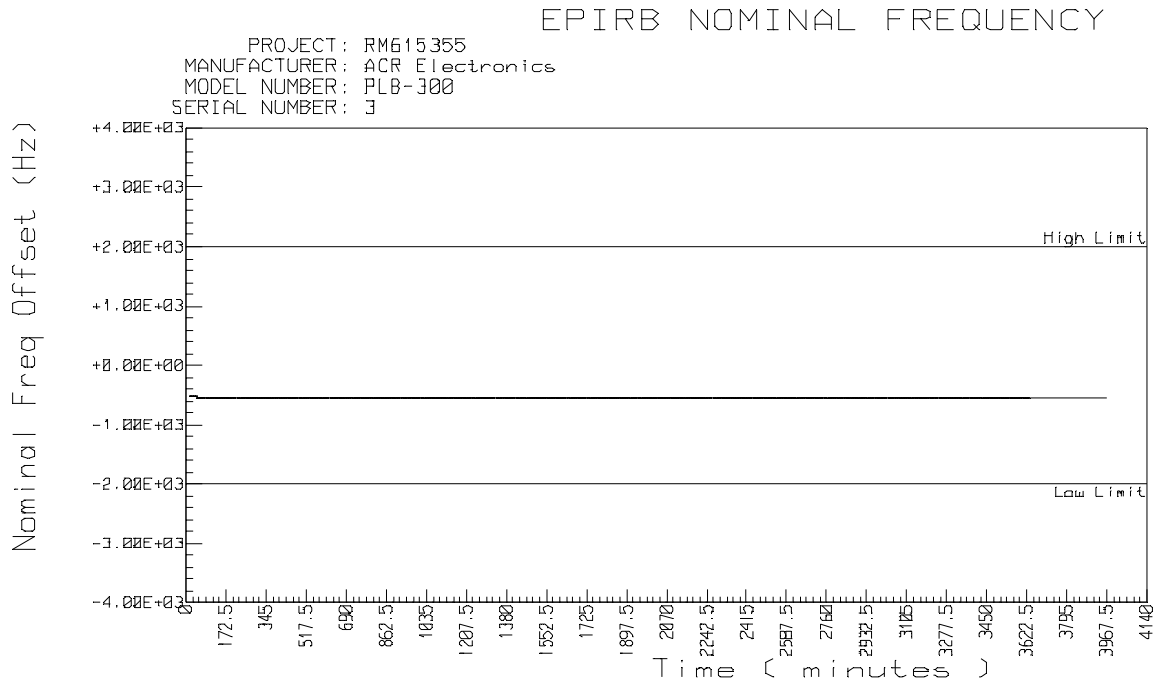
2.8.2 Refer to C/S Certificate/report

2.9 OPERATIONAL LIFE AND STROBE LIGHT

2.9.1 Specification Reference

RTCM Paper 76: A 10.0

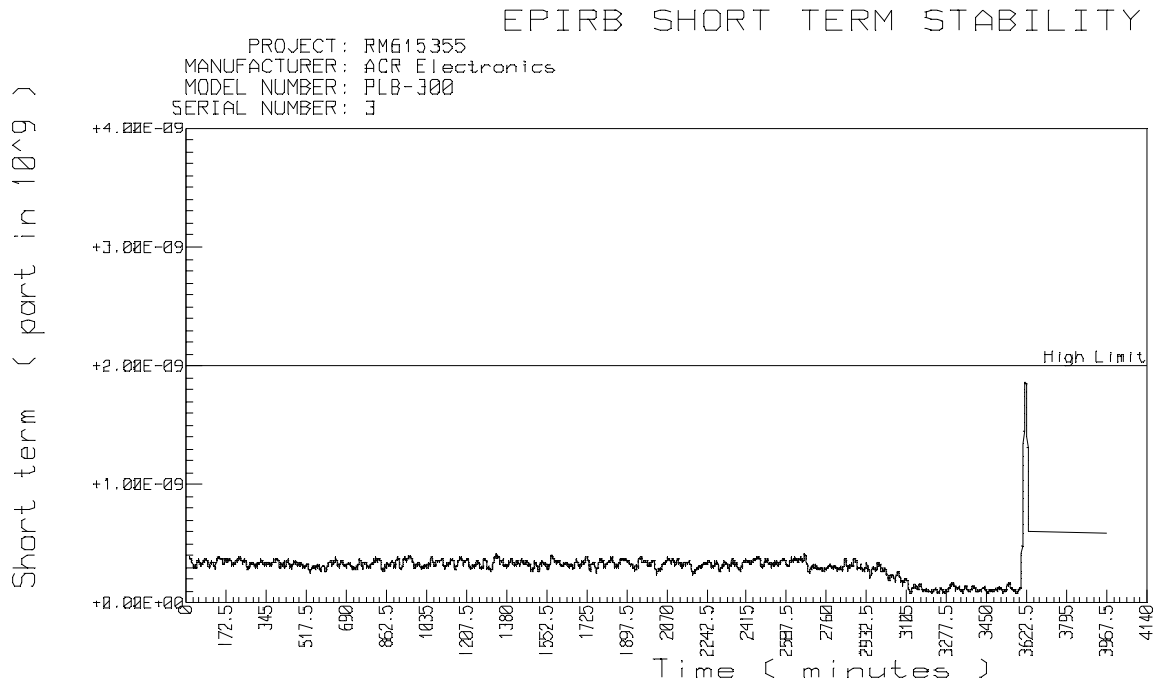
2.9.2 Test Results



Operating Lifetime at Minimum Temperature - Nominal Frequency

2.9 OPERATIONAL LIFE AND STROBE LIGHT

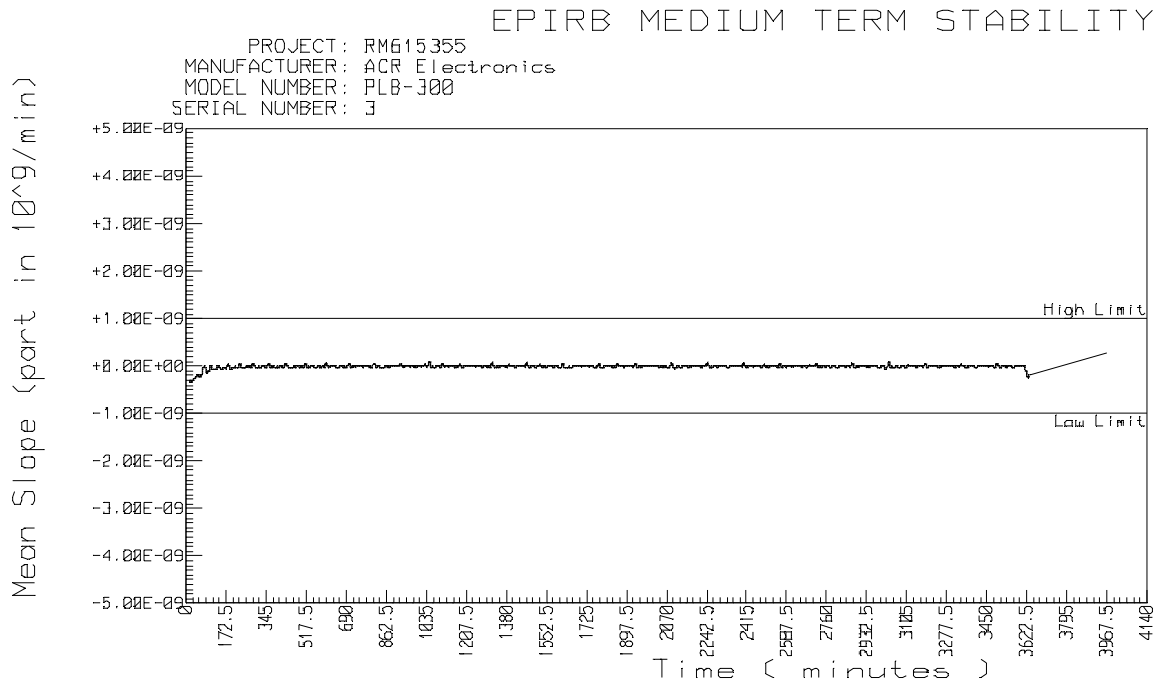
2.9.2 Test Results



Operating Lifetime at Minimum Temperature - Short Term Stability

2.9 OPERATIONAL LIFE AND STROBE LIGHT

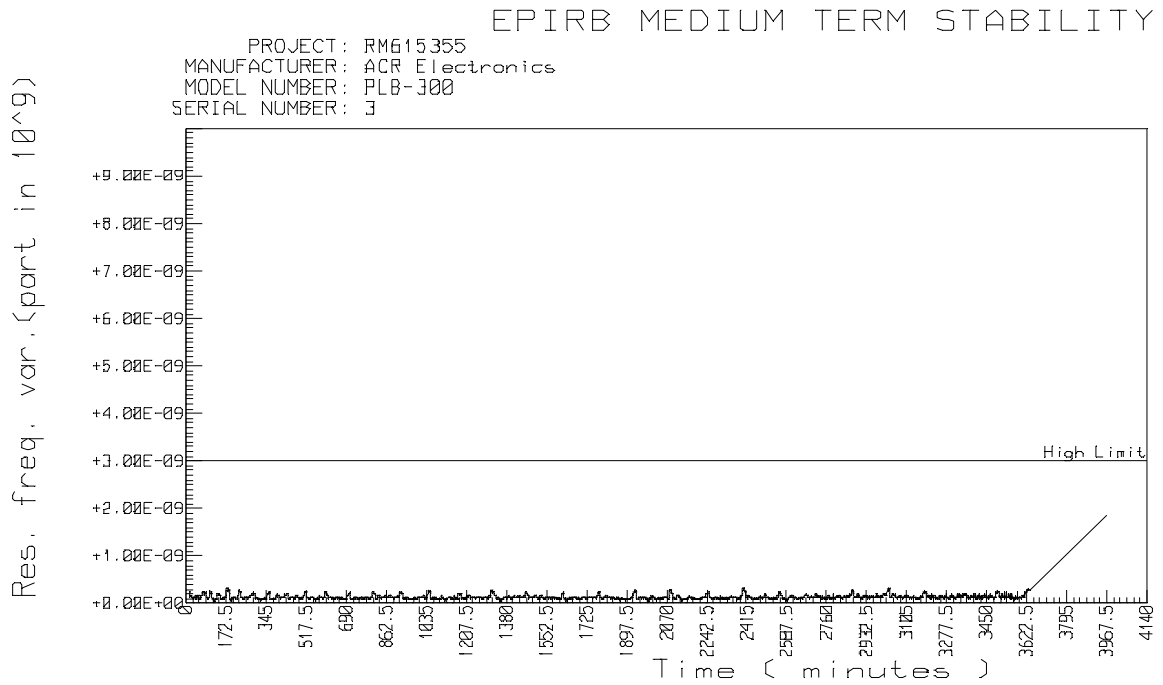
2.9.2 Test Results



Operating Lifetime at Minimum Temperature - Medium Term Stability, Mean Slope

2.9 OPERATIONAL LIFE AND STROBE LIGHT

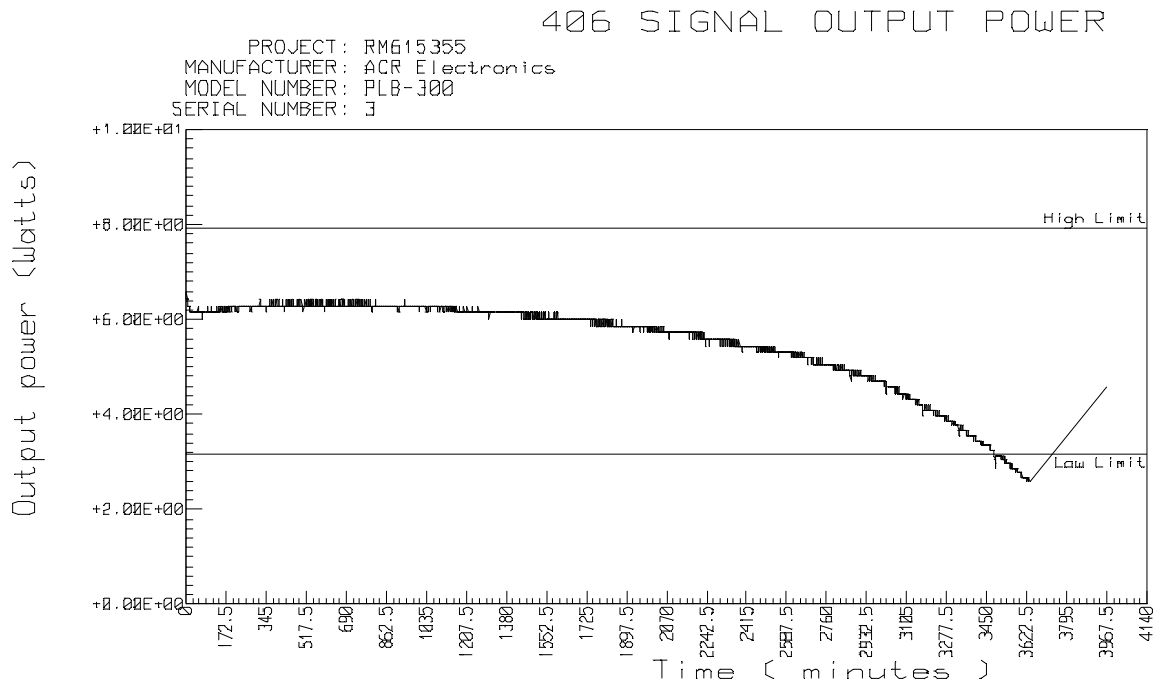
2.9.2 Test Results



Operating Lifetime at Minimum Temperature - Medium Term Stability, Residual Frequency Variation

2.9 OPERATIONAL LIFE AND STROBE LIGHT

2.9.2 Test Results



Operating Lifetime at Minimum Temperature - Output Power

2.9 OPERATIONAL LIFE AND STROBE LIGHT

2.9.3 Battery Current Measurement Results

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 : 20.7 minutes (1239800 ms)

Self-test Current : 9.99 seconds (9990 ms)

Long GPS Test : 10 minutes (599950 ms)

Operating Current : 26.2 minutes (1573450 ms)

Assumptions / Supplied Data

Battery Replacement Interval : 5 years

Battery Capacity : 2.8 Ah

Battery Self Drain : 1.00 % per year

Self-test Interval : 12 tests per year

Long GPS Test Interval : 1 test per battery

Test Results

Mode Current = Accumulated Charge / Time

Standby Current = 5332538 pC / 1239800 ms = 4.30 nA

Self-test Current = 1370996.8 uC / 9990 ms = 137.24 mA

Long GPS Test = 15424532 uC / 599950 ms = 25.71 mA

Operating Current = 110263781 uC / 1573450 ms = 70.08 mA

2.9 OPERATIONAL LIFE AND STROBE LIGHT

2.9.3 Battery Current Measurement Results - Continued

Battery Preconditioning / Discharge Time Calculations

$$\begin{aligned}\text{Battery Self Drain} &= \text{Capacity} - [(100\% - \text{Self Drain/Year}\%)^{\text{Replacement Interval}} \times \text{Capacity}] \\ &= 2.8 - ((1 - 0.0100)^5 \times 2.8) = 0.1372 \text{ Ah}\end{aligned}$$

$$\begin{aligned}\text{Standby Drain} &= \text{Hours per year} \times \text{Battery Replacement Interval} \times \text{Standby Current} \\ &= 365 \times 24 \times 5 \times 4.30 \times 10^{-9} = 0.0002 \text{ Ah}\end{aligned}$$

$$\text{Worst Case} = 1.65 \times 0.0002 \text{ Ah} = 0.0003 \text{ Ah}$$

$$\begin{aligned}\text{Self-test Drain} &= \text{Self-tests per battery} \times \text{Self-test Current} \times \text{Self-test duration (in hours)} \\ &= 12 \times 5 \times 137.24 \times 10^{-3} \times (9.99 / 3600) = 0.0228 \text{ Ah}\end{aligned}$$

$$\text{Worst Case} = 1.65 \times 0.0228 \text{ Ah} = 0.0377 \text{ Ah}$$

$$\begin{aligned}\text{Long GPS Test} &= \text{Tests per battery} \times \text{Long GPS Test Current} \times \text{Test duration (in hours)} \\ &= 1 \times 1 \times 25.71 \times 10^{-3} \times (10 / 60) = 0.0043 \text{ Ah}\end{aligned}$$

$$\text{Worst Case} = 1.65 \times 0.0043 \text{ Ah} = 0.0071 \text{ Ah}$$

$$\begin{aligned}\text{Total Drain} &= \text{Self Drain} + \text{Standby Drain}^* + \text{Self-test Drain}^* + \text{Long GPS Test Drain}^* \\ &= 0.1372 + 0.0003 + 0.0377 + 0.0071 = 0.1795 \text{ Ah}\end{aligned}$$

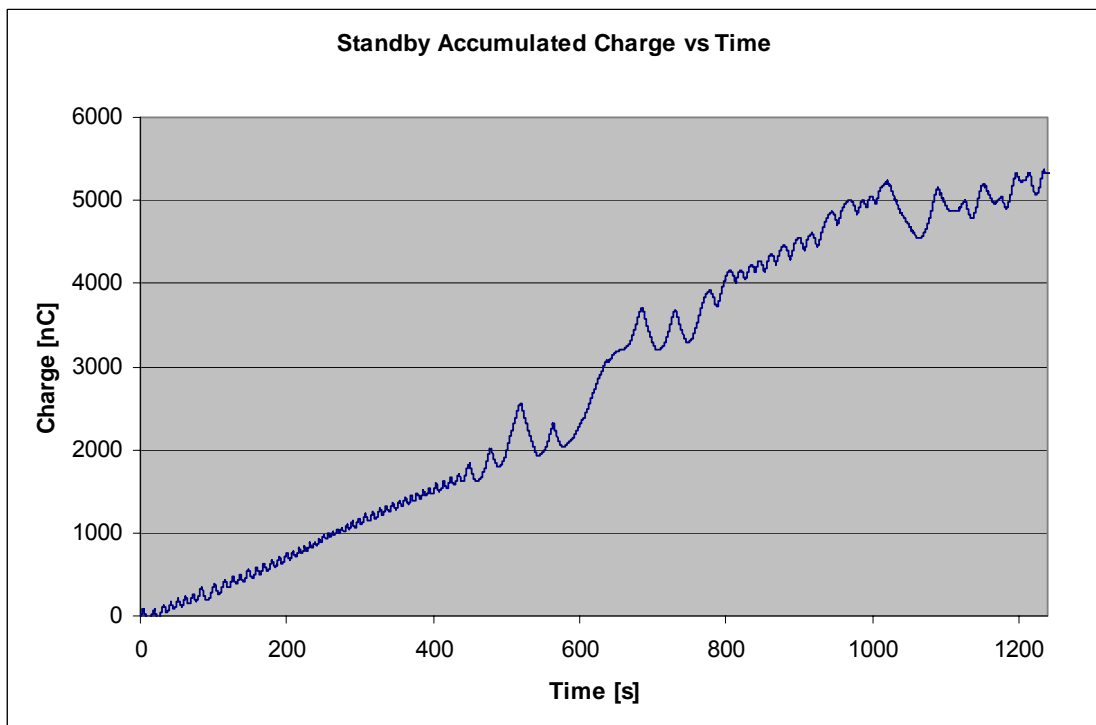
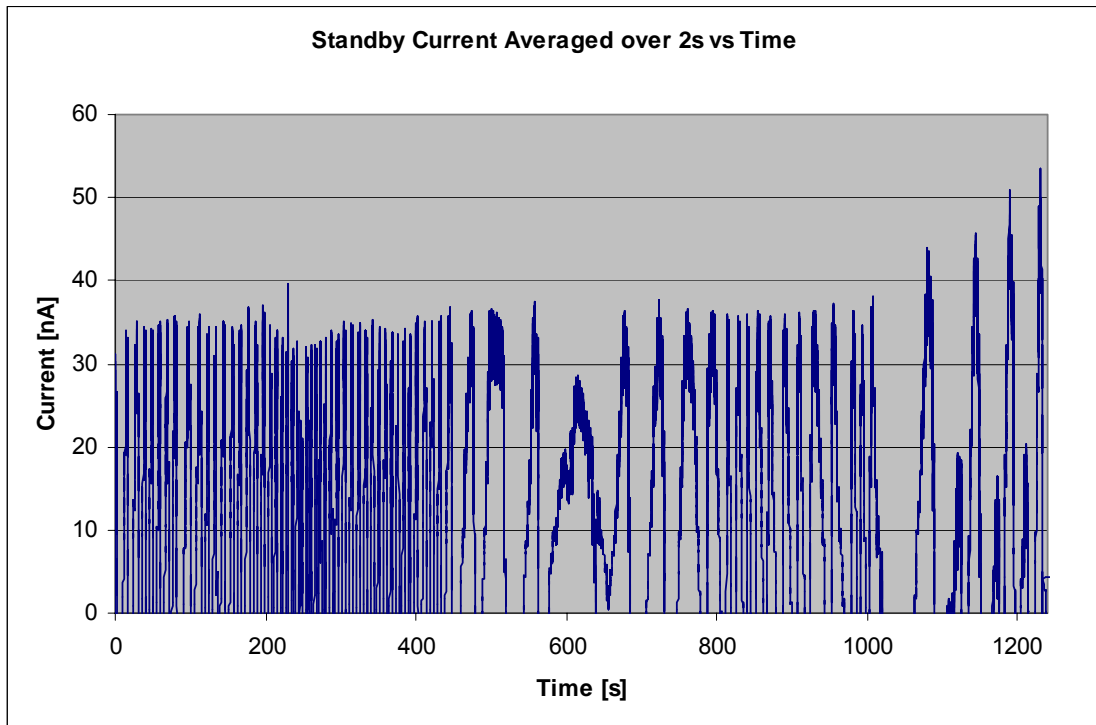
* Worst Case

$$\begin{aligned}\text{Battery Preconditioning / Discharge Time} &= \text{Worst Case drain} / \text{Operational Current} \\ &= 0.1795 / (70.08 \times 10^{-3}) \\ &= \underline{2.56 \text{ hours}}\end{aligned}$$

2.9 OPERATIONAL LIFE AND STROBE LIGHT

2.9.3 Battery Current Measurement Results

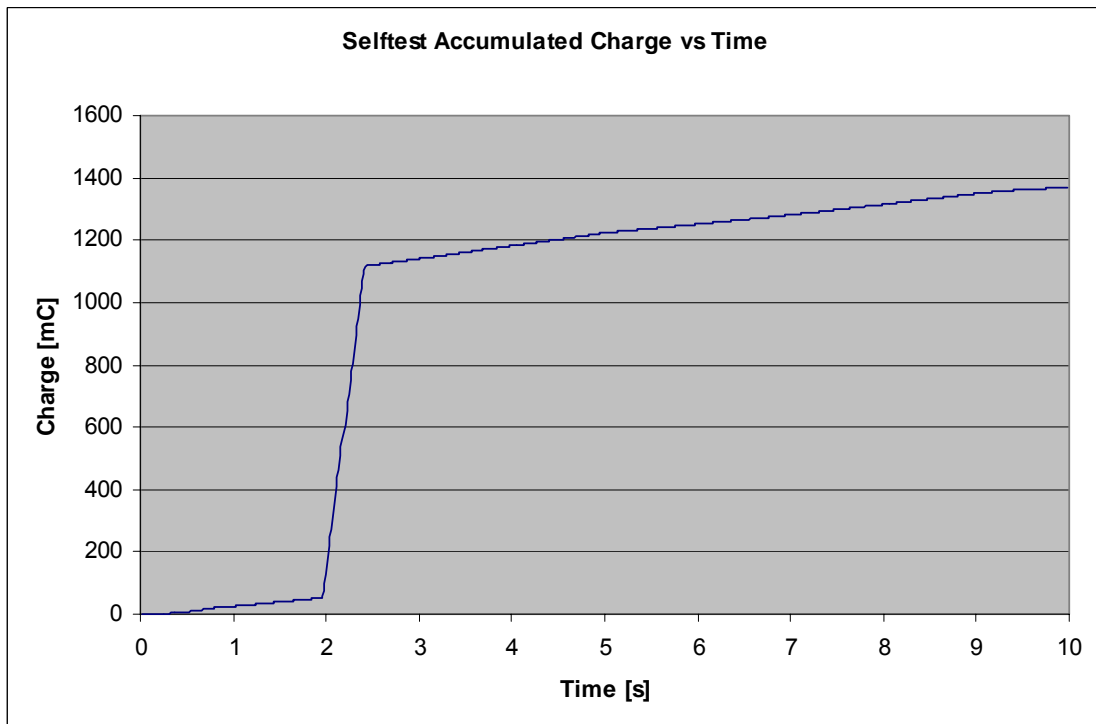
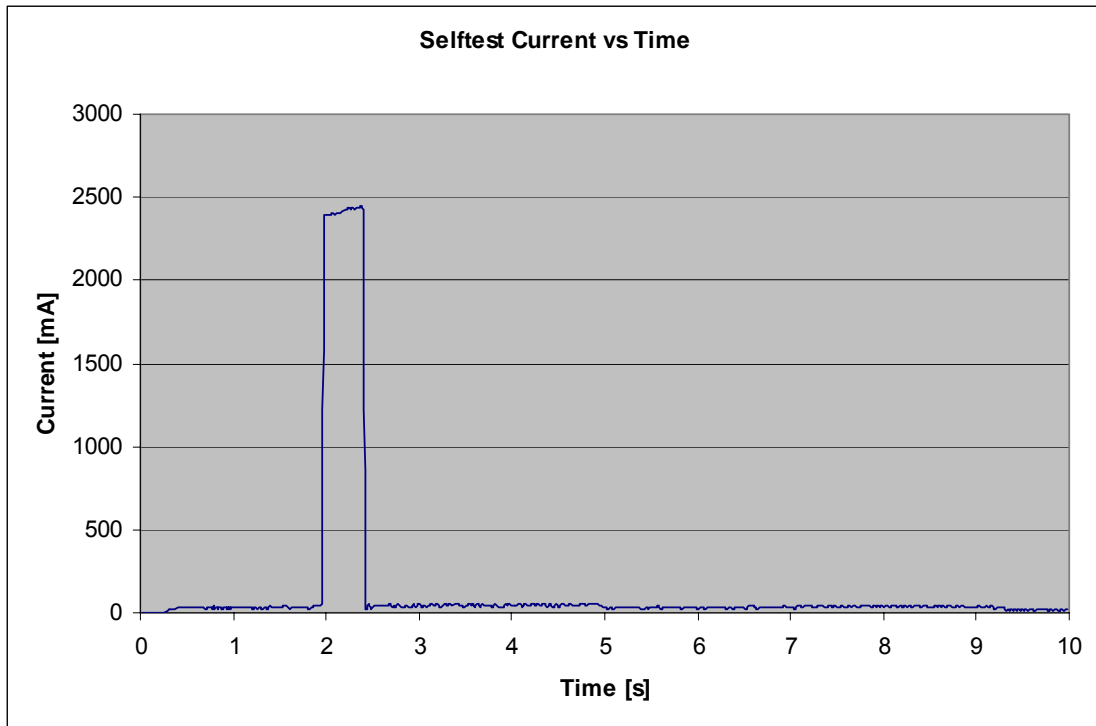
Battery Current Measurement Results (continued) - Standby Mode



2.9 OPERATIONAL LIFE AND STROBE LIGHT

2.9.3 Battery Current Measurement Results

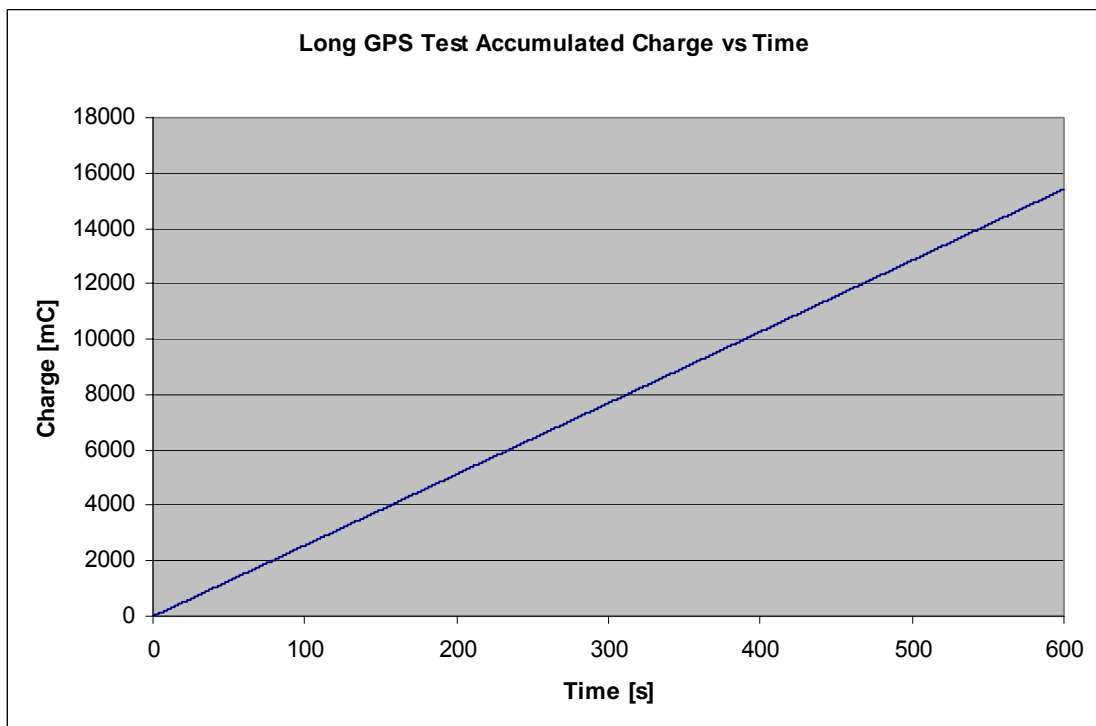
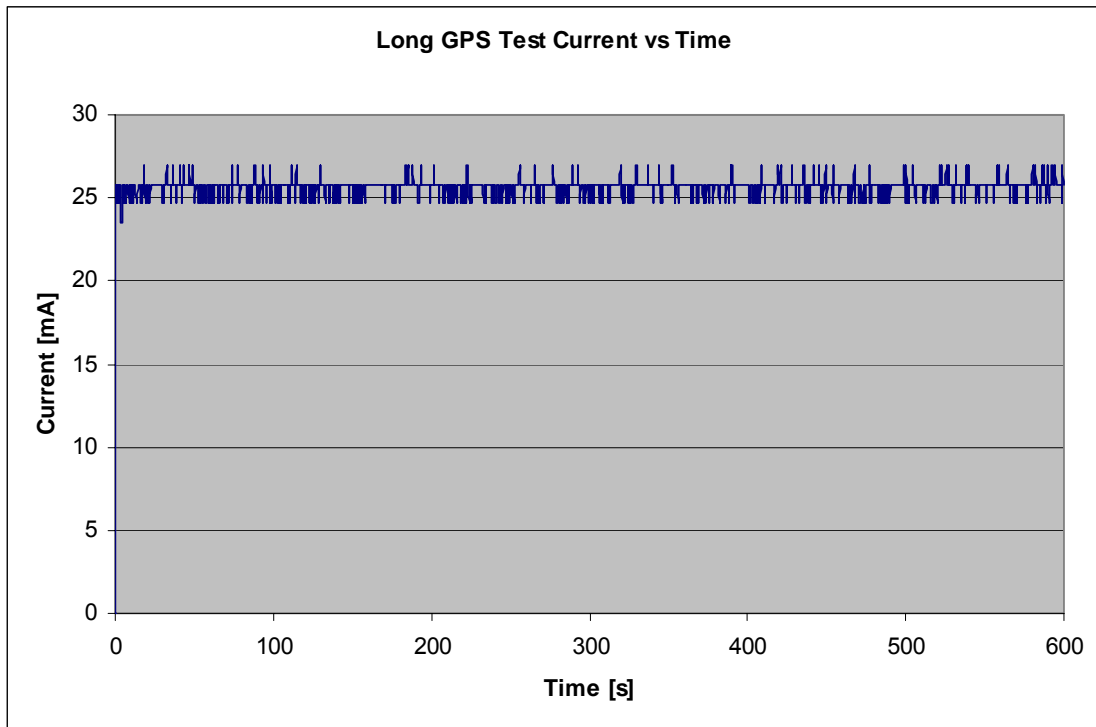
Battery Current Measurement Results (continued) - Selftest Mode



2.9 OPERATIONAL LIFE AND STROBE LIGHT

2.9.3 Battery Current Measurement Results

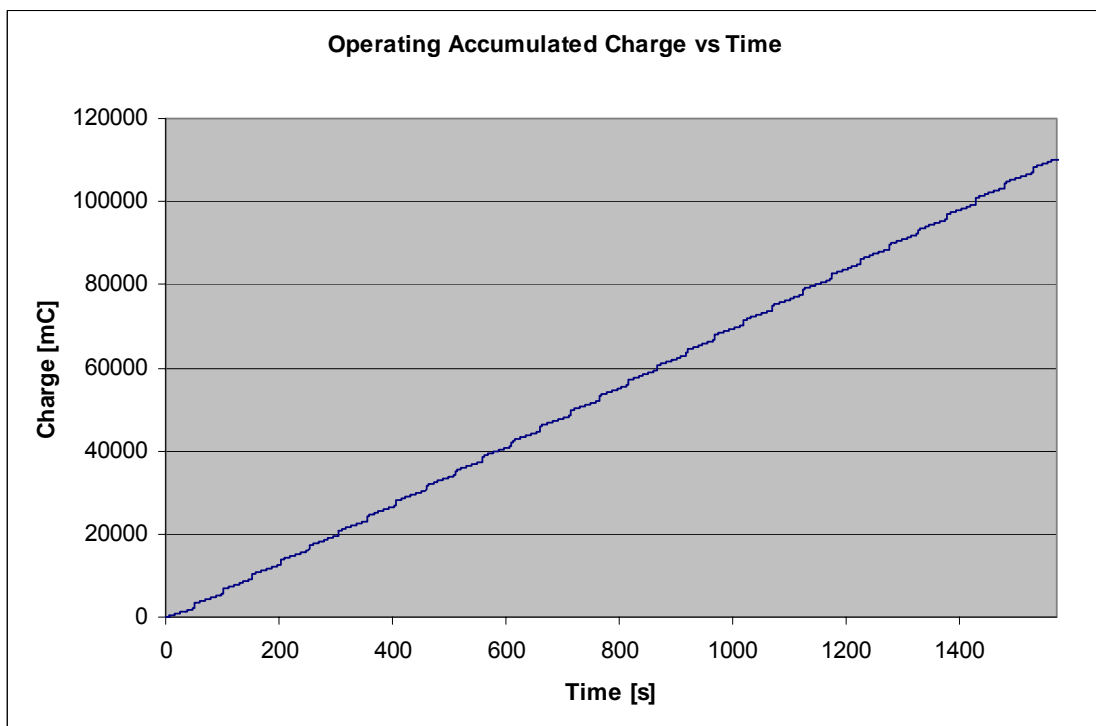
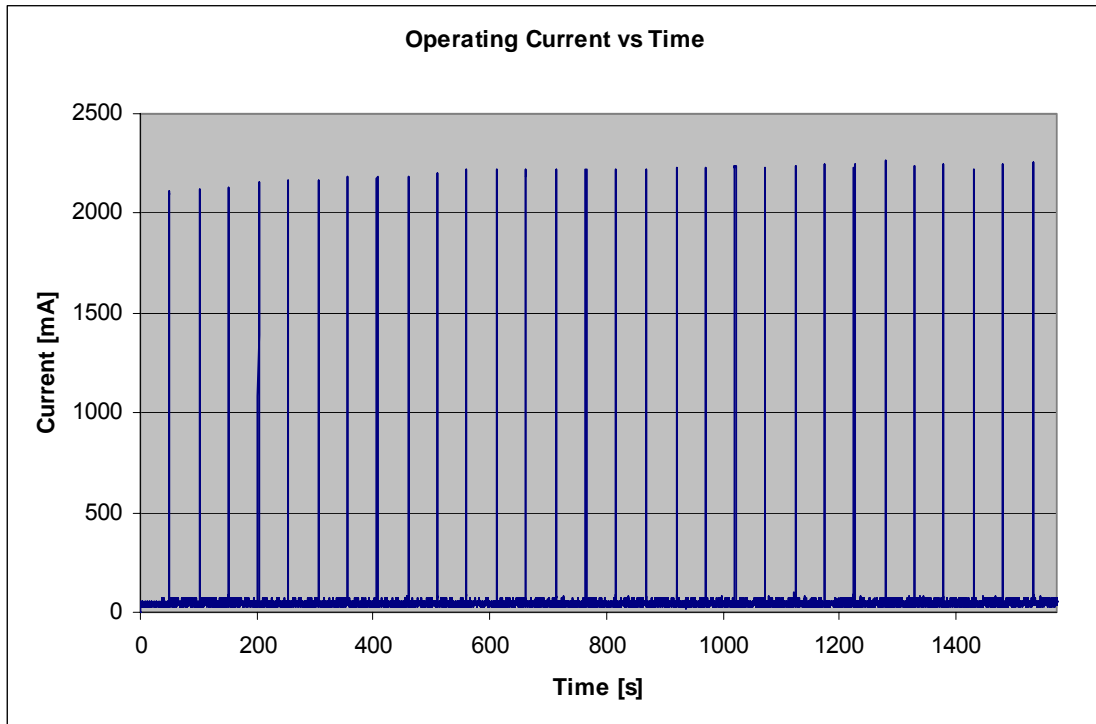
Battery Current Measurement Results (continued) – GPS Test Mode



2.9 OPERATING LIFETIME AT MINIMUM TEMPERATURE

2.9.4 Battery Current Measurement Results

Battery Current Measurement Results (continued) - Operational Mode



2.10 SELF TEST

2.10.1 Specification Reference

RTCM Paper 76 (A 10.2)

2.10.2 Decoded Message

Beacon Id Format..... 22 Hex Id, Short Message, Bits 25-112
 15 Hex (Bits 26- 85) = 2DDC6487AEFFBFF 2DDC6487AEFFBFF Default_Id
 30 Hex (Bits 25-144) = 96EE3243D77FDFFE7A6A7700000000

```

    26  30  34  38  42  46  50  54  58  62  66  70  74  78  82
    |  |  |  |  |  |  |  |  |  |  |  |  |  |
1  0010 1101 1101 1100 0110 0100 1000 0111 1010 1110 1111 1111 1011 1111 1111
    1100 1111 0100 1101 0100 1110 1110 0000 0000 0000 0000 0000 0000 0000 000
    |  |  |  |  |  |  |  |  |  |  |  |  |  |
    86  90  94  98  102 106  110  114  118  122  126  130  134  138  142
    
```

Field Name	Bit Pos	Value Decode	Bits
Format Flag	25	1 Long Message: bcn entered Short Non-Spec	1
Protocol Flag	26	0 Location NEW	0
MID	27- 36	366 USA	0101 1011 10
Protocol Code	37- 40	14 Test Serial (Standard)	1110
Spare	41- 64		0011 0010 0100 0011 1101 0111
Coarse Position	65- 85	DEFAULT	0111 1111 1101 1111 1111 1
BCH Encoded	86-106	Errors=0	1100 1111 0100 1101 0100 1
BCH Generated	86-106		1100 1111 0100 1101 0100 1
Fixed Bits	107-109		110
Fixed Bit	110	1	1
Encode Pos Device	111	1 Internal	1
121.5 Homing	112	1 YES	1
Resultant Position		--> Not Defined	

Decoded Message at Ambient Temperature

2.10 SELF TEST

2.10.1 Specification Reference

RTCM Paper 76 (A 10.2)

2.10.2 Decoded Message

Beacon Id Format..... 22 Hex Id, Short Message, Bits 25-112
 15 Hex (Bits 26- 85) = 2DDC6487A0FFBFF 2DDC6487A0FFBFF Default_Id
 30 Hex (Bits 25-144) = 96EE3243D07FDFF93FEAB700000000

```

    26  30  34  38  42  46  50  54  58  62  66  70  74  78  82
    |  |  |  |  |  |  |  |  |  |  |  |  |  |
1  0010 1101 1101 1100 0110 0100 1000 0111 1010 0000 1111 1111 1011 1111 1111
    0010 0111 1111 1101 0101 0110 1110 0000 0000 0000 0000 0000 0000 0000 000
    |  |  |  |  |  |  |  |  |  |  |  |  |  |
    86  90  94  98  102 106  110  114  118  122  126  130  134  138  142
  
```

Field Name	Bit Pos	Value Decode	Bits
Format Flag	25	1 Long Message: bcn entered Short Non-Spec	1
Protocol Flag	26	0 Location NEW	0
MID	27- 36	366 USA	0101 1011 10
Protocol Code	37- 40	14 Test Serial (Standard)	1110
Spare	41- 64		0011 0010 0100 0011 1101 0000
Coarse Position	65- 85	DEFAULT	0111 1111 1101 1111 1111 1
BCH Encoded	86-106	Errors=0	0010 0111 1111 1101 0101 0
BCH Generated	86-106		0010 0111 1111 1101 0101 0
Fixed Bits	107-109		110
Fixed Bit	110	1	1
Encode Pos Device	111	1 Internal	1
121.5 Homing	112	1 YES	1
Resultant Position		--> Not Defined	

Decoded Message at -20°C

2.10 SELF TEST

2.10.1 Specification Reference

RTCM Paper 76 (A 10.2)

2.10.2 Decoded Message

Beacon Id Format..... 22 Hex Id, Short Message, Bits 25-112
 15 Hex (Bits 26- 85) = 2DDC6487A0FFBFF 2DDC6487A0FFBFF Default_Id
 30 Hex (Bits 25-144) = 96EE3243D07FDFF93FEAB700000000

```

    26  30  34  38  42  46  50  54  58  62  66  70  74  78  82
    |  |  |  |  |  |  |  |  |  |  |  |  |  |
1  0010 1101 1101 1100 0110 0100 1000 0111 1010 0000 1111 1111 1011 1111 1111
    0010 0111 1111 1101 0101 0110 1110 0000 0000 0000 0000 0000 0000 0000 000
    |  |  |  |  |  |  |  |  |  |  |  |  |  |
    86  90  94  98  102 106  110  114  118  122  126  130  134  138  142
  
```

Field Name	Bit Pos	Value Decode	Bits
Format Flag	25	1 Long Message: bcn entered Short Non-Spec	1
Protocol Flag	26	0 Location NEW	0
MID	27- 36	366 USA	0101 1011 10
Protocol Code	37- 40	14 Test Serial (Standard)	1110
Spare	41- 64		0011 0010 0100 0011 1101 0000
Coarse Position	65- 85	DEFAULT	0111 1111 1101 1111 1111 1
BCH Encoded	86-106	Errors=0	0010 0111 1111 1101 0101 0
BCH Generated	86-106		0010 0111 1111 1101 0101 0
Fixed Bits	107-109		110
Fixed Bit	110	1	1
Encode Pos Device	111	1 Internal	1
121.5 Homing	112	1 YES	1
Resultant Position		--> Not Defined	

Decoded Message at +55°C

2.11 BUOYANCY TEST (Category 1 only)

2.11.1 Specification Reference

RTCM Paper 76 (A 11.0)

2.11.2 Test Results

Following release the PLB 300, fitted with a permanently fixed floatation pouch, floated in fresh water

The reserve buoyancy of the PLB 300 was determined by dividing the buoyant force by the weight of the unit:

Weight of Unit = 0.323kg (3.169N)

Buoyant force of submerged unit = 0.037kg (0.361N)

Buoyant Force/ Weight of Unit = Reserve Buoyancy

$0.36N / 3.169N = 11.4\%$



Photograph showing EUT (fitted with floatation pouch) floating in fresh water

2.12 AUXILIARY RADIO-LOCATING DEVICE TRANSMITTER TEST

2.12.1 Specification Reference

RTCM Paper 76 (A 12.0)

2.12.2 CARRIER FREQUENCY (Clause A12.1)

Test Date: 4th October 2006

Ambient Temperature 21°C Relative Humidity 40%

TEST CONDITIONS	FREQUENCY ERROR (Hz)		
		121.500 MHz*	
T _{nom} (+21°C)		+528	
T _{min} (-20°C)		+3249	
T _{max} (55°C)		-2,139	
Maximum freq. Error (ppm)		26.74	
Measurement uncertainty (Hz)	± 46 Hz		

Remarks

*The homing device operating frequency was offset to prevent false emergency alert.

2.12.3 TRANSMITTER DUTY CYCLE (Clause A12.2.1)

Test Date:

Ambient Temperature 23°C Relative Humidity 36%

TRANSMITTER DUTY CYCLE	RESULT (%)		
		121.500 MHz	
T _{nom} (+20°C)		96.43	
T _{min} (-20°C)		96.57	
T _{max} (+55°C)		95.25	
MEASUREMENT UNCERTAINTY	± 5 %		

Does the carrier transmit continuously except for a period of up to 2 seconds during the 406MHz transmission?

Yes [✓] No []

2.12 AUXILIARY RADIO-LOCATING DEVICE TRANSMITTER TEST

2.12.4 MODULATION FREQUENCY AND SWEEP REPETITION RATE (Clause A12.2.2)

Test Date: 4th October 2006

Ambient Temperature 22°C

Relative Humidity 42%

TEST CONDITIONS	MODULATION PARAMETERS	
T _{nom} (+22°C)	Sweep Direction	Downward
	Minimum Audio Frequency	337.99Hz
	Maximum Audio Frequency	1278.52Hz
	Audio Frequency Range	940.53Hz
	Sweep Repetition Rate	2.56Hz
T _{min} (-20°C)	Sweep Direction	Downward
	Minimum Audio Frequency	338.30Hz
	Maximum Audio Frequency	1278.86Hz
	Audio Frequency Range	940.56Hz
	Sweep Repetition Rate	2.56Hz
T _{max} (+55°C)	Sweep Direction	Downward
	Minimum Audio Frequency	338.10Hz
	Maximum Audio Frequency	1279.06Hz
	Audio Frequency Range	940.96Hz
	Sweep Repetition Rate	2.56Hz
Measurement uncertainty	Minimum Audio Frequency	± 22.4 Hz
	Maximum Audio Frequency	± 121.56 Hz
	Audio Frequency Range	± 123.6 Hz
	Sweep Repetition Rate	± 5 %

Minimum Audio Frequency	≥ 300 Hz
Maximum Audio Frequency	≤ 1600 Hz
Audio Frequency Range	≥ 700 Hz

Sweep Repetition Rate	2 to 4 Hz
-----------------------	-----------

Test Equipment Used

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

2.12 AUXILIARY RADIO-LOCATING DEVICE TRANSMITTER TEST

2.12.5 MODULATION DUTY CYCLE (Clause A12.2.3)

Test Date: 4th October 2006

Ambient Temperature 22°C Relative Humidity 42%

PARAMETER	RESULT (%)		
	121.500 MHz		
	-20°C	Ambient	+55°C
Modulation Duty Cycle	34.11	33.54	33.74
MEASUREMENT UNCERTAINTY	± 5 %		

2.12.6 MODULATION FACTOR (Clause A12.2.4)

Test Date:

Ambient Temperature 22°C Relative Humidity 42%

PARAMETER	RESULT (%)		
	121.500 MHz		
	-20°C	Ambient	+55°C
Modulation Factor	0.95	0.96	0.96
MEASUREMENT UNCERTAINTY	± 5 %		

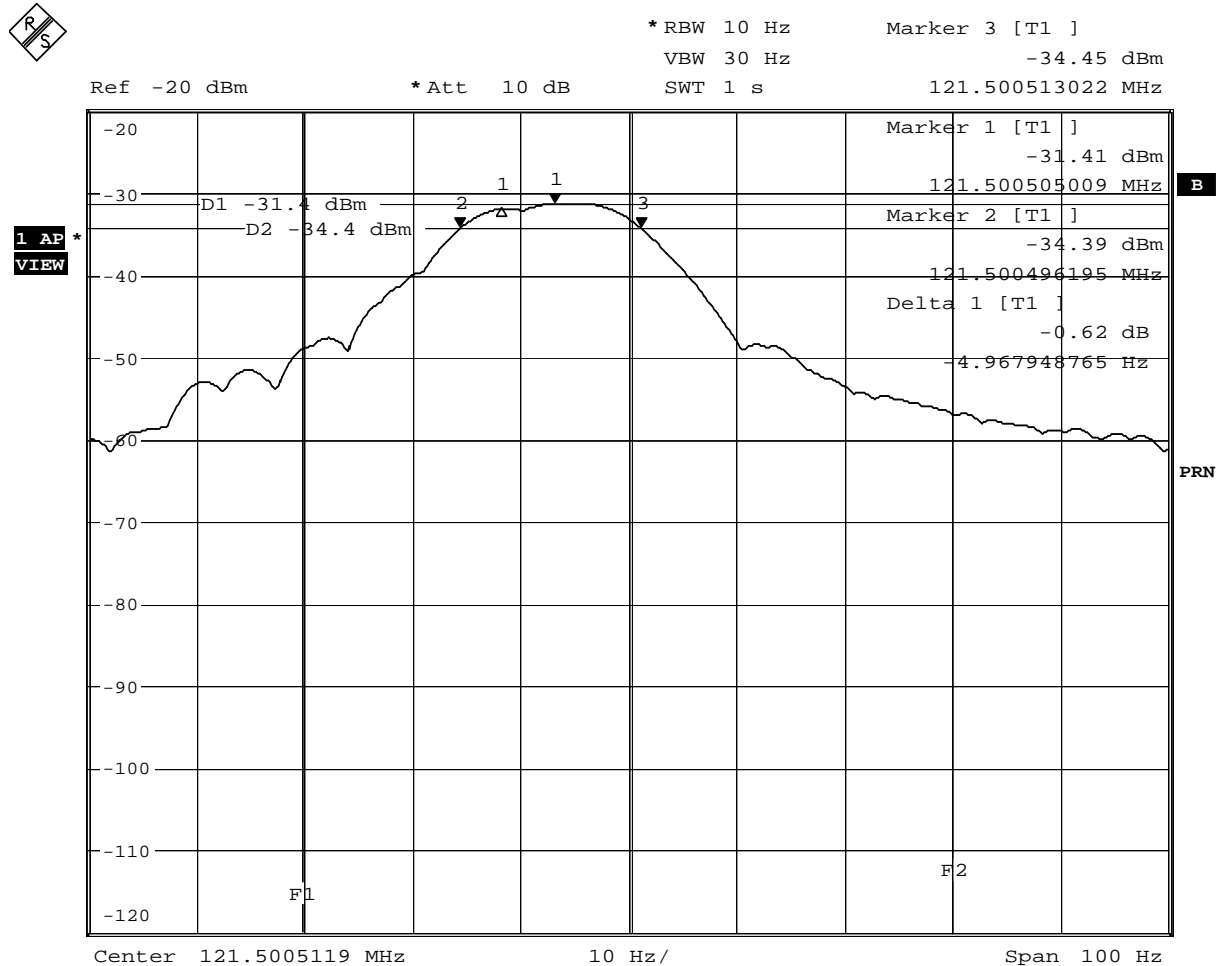
2.12 AUXILIARY RADIO-LOCATING DEVICE TRANSMITTER TEST

2.12.7 FREQUENCY COHERENCE (Clause A12.2.5)

The following plot is a measurement showing 30% of the total power emitted during a transmission cycle.

Frequency Lines (F1 & F2) are at ± 30 Hz to the centre frequency (carrier)

Temperature: Ambient



Date: 5.OCT.2006 10:31:33

Is the transmission interrupted by the 406MHz burst?	Yes
If yes:- Frequency Shift (Hz)	-4.97Hz

Limit	The carrier frequency must not shift by more than ± 30 Hz.
-------	--

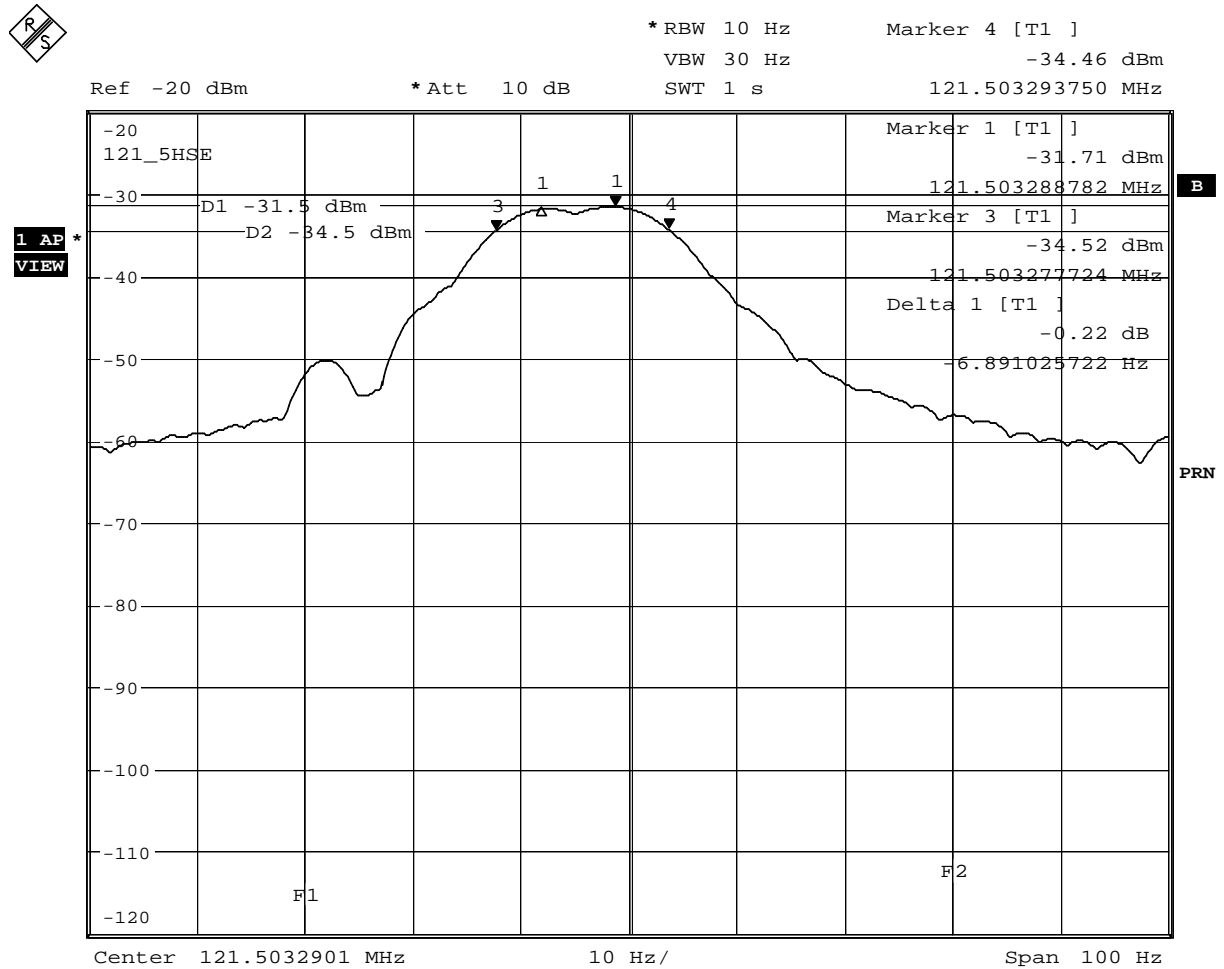
2.12 AUXILIARY RADIO-LOCATING DEVICE TRANSMITTER TEST

2.12.7 FREQUENCY COHERENCE (Clause A12.2.5)

The following plot is a measurement showing 30% of the total power emitted during a transmission cycle.

Frequency Lines (F1 & F2) are at ± 30 Hz to the centre frequency (carrier)

Temperature: -20°C



Date: 4.OCT.2006 16:24:18

Is the transmission interrupted by the 406MHz burst?	Yes
If yes:- Frequency Shift (Hz)	-6.89Hz

Limit	The carrier frequency must not shift by more than ± 30 Hz.
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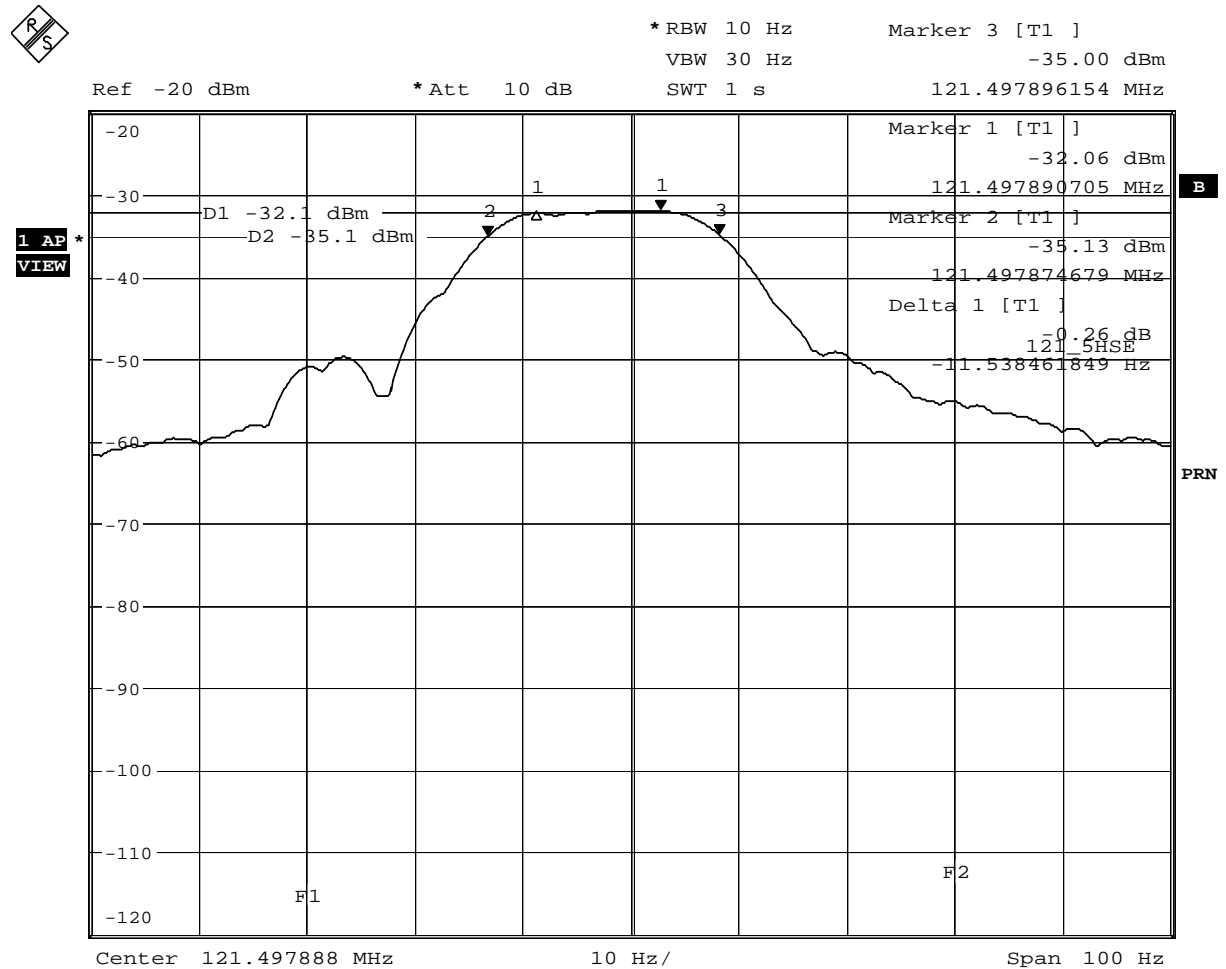
2.12 AUXILIARY RADIO-LOCATING DEVICE TRANSMITTER TEST

2.12.7 FREQUENCY COHERENCE (Clause A12.2.5)

The following plot is a measurement showing 30% of the total power emitted during a transmission cycle.

Frequency Lines (F1 & F2) are at ± 30 Hz to the centre frequency (carrier)

Temperature: +55°C



Date: 9.OCT.2006 14:00:31

Is the transmission interrupted by the 406MHz burst?	Yes
If yes:- Frequency Shift (Hz)	-11.54Hz
Limit	The carrier frequency must not shift by more than ± 30 Hz.

2.12 AUXILIARY RADIO-LOCATING DEVICE TRANSMITTER TEST

2.12.8 PEAK EQUIVALENT ISOTROPIC RADIATED POWER (PEIRP) (Clause A12.3)

Test Date: 20th October 2006

Angle of Rotation (°)	PEIRP (dBm)
0	17.5
30	17.5
60	17.5
90	17.5
120	17.6
150	17.6
180	17.6
210	17.6
240	17.8
270	17.6
300	17.5
330	17.7
Measurement Uncertainty	± 5.1dB

LIMIT CLAUSE D.4.2.a)

PEIRP	+17dBm ± 3dB
Maximum to minimum ratio	≤ 6 dB

Remarks

The elevation angle producing the maximum gain was 10°

SECTION 3

TEST EQUIPMENT

3.1 TEST EQUIPMENT

List of absolute measuring and other principal items of test equipment.

Instrument	Manufacturer	Type No	TE Number	Calibration Due
Section 2.7 Radio (Tx) - Conducted Spurious Emissions				
Oscilloscope	Lecroy	LC534AL	79	11/01/2007
Climatic Chamber	Heraeus Votsch	VM 04/100	85	TU
Load (50ohm, 50W)	Radio Spares	613-690	353	22/11/2006
Attenuator 10dB/250W	Weinschel	45-10-43	383	29/08/2007
Directional Coupler	Narda	3020A	419	OP MON
Crystal Detector	Hewlett Packard	8470B	484	OP MON
Power Divider	Weinschel	1506A	601	07/08/2007
Digital Temperature Indicator	Fluke	51	1385	03/08/2007
High Pass Filter	Mini-Circuits	NHP-300	1640	12/08/2007
Spectrum Analyser	Hewlett Packard	8562A	2044	17/02/2007
Spectrum Analyser	Rohde & Schwarz	FSU26	2747	03/02/2007
Hygrometer	Rotronic	I-1000	3068	06/04/2007
2m N(m)-N(m) RF Cable	Reynolds	269-0088-2000	3224	05/08/2007
Section 2.12 Radio (Tx) - Frequency Characteristics				
Climatic Chamber	Heraeus Votsch	VM 04/100	85	TU
Signal Generator	Hewlett Packard	8644A	96	17/12/2006
Time Interval Analyser	Yokogawa	TA720	181	17/11/2006
Oscilloscope	Gould	840	182	31/01/2007
Digital Temperature Indicator	Fluke	51	1385	03/08/2007
SMA-SMA Cable (1m)	Reynolds	262-0248-1000	2407	27/07/2007
20dB/20W Attenuator	JFW	50FHC-020-20	2774	18/02/2007
Beacon RF Unit	TUV	N/A	3066	TU
Hygrometer	Rotronic	I-1000	3068	06/04/2007
20dB/75W Attenuator	Bird	8308-200	3076	18/02/2007
1m RF Cable SMA	Reynolds	262-0248-1000	3221	27/07/2007

3.1 TEST EQUIPMENT

Section 2.12 Radio (Tx) - Modulation Characteristics				
Oscilloscope	Lecroy	LC534AL	79	11/01/2007
Climatic Chamber	Heraeus Votsch	VM 04/100	85	TU
Signal Generator	Hewlett Packard	8644A	96	17/12/2006
Time Interval Analyser	Yokogawa	TA720	181	17/11/2006
Oscilloscope	Gould	840	182	31/01/2007
Load (50ohm, 50W)	Radio Spares	613-690	353	22/11/2006
Attenuator 10dB/250W	Weinschel	45-10-43	383	29/08/2007
Directional Coupler	Narda	3020A	419	OP MON
Crystal Detector	Hewlett Packard	8470B	484	OP MON
Power Divider	Weinschel	1506A	601	07/08/2007
Digital Temperature Indicator	Fluke	51	1385	03/08/2007
High Pass Filter	Mini-Circuits	NHP-300	1640	12/08/2007
Spectrum Analyser	Hewlett Packard	8562A	2044	17/02/2007
SMA-SMA Cable (1m)	Reynolds	262-0248-1000	2407	27/07/2007
Spectrum Analyser	Rohde & Schwarz	FSU26	2747	03/02/2007
20dB/20W Attenuator	JFW	50FHC-020-20	2774	18/02/2007
Beacon RF Unit	TUV	N/A	3066	TU
Hygrometer	Rotronic	I-1000	3068	06/04/2007
20dB/75W Attenuator	Bird	8308-200	3076	18/02/2007
1m RF Cable sma-sma	Reynolds	262-0248-1000	3221	27/07/2007
2m N(m)-N(m) RF Cable	Reynolds	269-0088-2000	3224	05/08/2007

3.1 TEST EQUIPMENT

Section 2.12 Radio (Tx) - Power Characteristics				
Oscilloscope	Lecroy	LC534AL	79	11/01/2007
Climatic Chamber	Heraeus Votsch	VM 04/100	85	TU
Load (50ohm, 50W)	Radio Spares	613-690	353	22/11/2006
Attenuator 10dB/250W	Weinschel	45-10-43	383	29/08/2007
Directional Coupler	Narda	3020A	419	OP MON
Crystal Detector	Hewlett Packard	8470B	484	OP MON
Power Divider	Weinschel	1506A	601	07/08/2007
Digital Temperature Indicator	Fluke	51	1385	03/08/2007
High Pass Filter	Mini-Circuits	NHP-300	1640	12/08/2007
Spectrum Analyser	Hewlett Packard	8562A	2044	17/02/2007
Spectrum Analyser	Rohde & Schwarz	FSU26	2747	03/02/2007
Hygrometer	Rotronic	I-1000	3068	06/04/2007
2m N(m)-N(m) RF Cable	Reynolds	269-0088-2000	3224	05/08/2007

3.1 TEST EQUIPMENT

Instrument	Manufacturer	Type No	TE Number	Calibration Due
Section 2.9 Beacons - Operating Lifetime				
Climatic Chamber	Heraeus Votsch	VMT 04/30	40	TU
Power Meter	Hewlett Packard	436A	47	21/06/2007
Signal Generator	Rohde & Schwarz	SMY01	49	19/06/2007
Frequency -Time Analyser	Hewlett Packard	5372A	93	27/07/2007
Digital Temperature Indicator	Fluke	51	412	21/09/2006 *
Signal Generator	Hewlett Packard	8663A	1172	01/08/2007
Power Sensor	Hewlett Packard	8482A	1341	19/09/2006 *
Data Logger	Pico Technology Ltd	ADC-42	2395	21/09/2006*
50ohm/15W Termination	Radio Spares	612-192	2416	02/08/2007
TERMINATION: 50ohm/15W	Radio Spares	612-192	2425	02/08/2007
Distress Beacon RF Unit	TUV		2445	TU
Logic Analyser	Hewlett Packard	1631D	2757	28/07/2007
Multimeter	Hewlett Packard	3478A	2758	21/07/2007
Hygrometer	Rotronic	I-1000	3068	06/04/2007
20dB/10W Attenuator	Aeroflex / Weinschel	23-20-34	3160	01/06/2007
3dB/20W Attenuator	Aeroflex / Weinschel	23-3-34	3161	01/06/2007
Bandpass Filter	Trilithic	5BE406/35-1-AA	3205	TU

* Equipment Used on 05/09/2006.

3.1 TEST EQUIPMENT

Instrument	Manufacturer	Type No	TE Number	Calibration Due
Section 2.6 Climatic - High Temperature				
Temperature Chamber	Instron	906	2128	26/12/2006
Section 2.6, 2.11 Climatic - Wet Tests				
0 - 20N Force Gauge	Hahn & Kolb	321-20N	892	15/08/2007
Thermocouple	Global	T-Type	1504	18/03/2007
Digital Pressure Indicator	Druck	RPT301	2345	07/10/2006*
Data Logging Thermometer	Digitron	2098T	2348	TU
Section 2.2 Vibration/ Ruggedness				
Charge Amplifier	Endevco	133	2504	04/07/2007
Vibration Controller	Hewlett Packard	E1434A	2507	02/03/2007
Accelerometer	Endevco	256-10	2559	07/12/2006
Charge Amplifier	Endevco	133	2725	06/07/2007
Isotron Accelerometer	Endevco	256-10	3114	13/10/2006
Isotron Accelerometer	Endevco	256-10	3119	13/10/2006
Vibration Table	Ling Dynamic Systems	875	3170	06/12/2006

* Equipment Used on 15/09/2006

TU - Traceability Unscheduled

OP Mon - Output Monitored

SECTION 4

DISCLAIMERS AND COPYRIGHT

4.1 DISCLAIMERS AND COPYRIGHT

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