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Report On

Cospas-Sarsat T.007 Limited Testing of the
McMurdo A Division of Signature Industries Ltd
Fastfind PLB 210 with a Panasonic Battery Pack

Document 75904389 Report 03 Issue 3

January 2009



Product Service

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REPORT ON

Emergency Beacons Limited Testing of the
McMurdo A Division of Signature Industries Ltd
Fastfind PLB 210 with a Panasonic Battery Pack

Document 75904389 Report 03 Issue 3

January 2009

PREPARED FOR

McMurdo A Division of Signature Industries Ltd
Silver Point,
Airport Service Road,
Portsmouth,
Hants,
PO3 5PB

PREPARED BY

A handwritten signature in black ink, appearing to read 'R Hampton'.

R Hampton
Test Engineer

APPROVED BY

A handwritten signature in black ink, appearing to read 'N Forsyth'.

N Forsyth
Authorised Signatory

DATED

30 January 2009



Product Service

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SECTION 1

REPORT SUMMARY

Cospas-Sarsat T.007 Limited Testing of the
McMurdo A Division of Signature Industries Ltd
Fastfind PLB 210 with a Panasonic Battery Pack



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1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Emergency Beacon Testing of the McMurdo A Division of Signature Industries Ltd Fastfind PLB 210 with a Panasonic Battery Pack to the requirements of T.007 Issue 4 – Rev 2 November 2007.

Objective	To perform Cospas-Sarsat T.007 Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.	
Manufacturer	McMurdo A Division of Signature Industries Ltd	
Model Number(s)	Fastfind PLB 210 with a Panasonic Battery Pack	
Serial Number(s)	75904389_03	Fastfind PLB 210 with a Panasonic Battery Pack, S/N: TÜV 3
Number of Samples Tested	One	
Test Specification/Issue/Date	Cospas-Sarsat T.007 Issue 4 – Rev 2 November 2007	
Incoming Release Date	Application Form 06 August 2008	
Date of Receipt of Test Samples	26 August 2008	
Order Number	PC0003427	
Date	24 July 2008	
Start of Test	29 August 2008	
Finish of Test	24 November 2008	
Name of Engineer(s)	R Henley R Hampton M Hardy	



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1.2 APPLICATION FORM

1.2.1 Beacon Manufacturer and Beacon Model

Beacon Manufacturer	Signature Industries
Beacon Model	McMurdo Fastfind PLB 210
Other Model Names	McMurdo Fastfind PLB 211

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	☐
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	24 hours
Battery chemistry	Lithium Manganese Dioxide
Battery cell size and number of cells	CR 2/3 AH x4 cells Alt Batt: CR123 x4 cells
Battery cell manufacturer	Varta Microbattery Alt Batt: Panasonic
Battery pack manufacturer and part number	Varta Microbattery /91-156D Alt Batt: Panasonic
Oscillator type (e.g. OCXO, MCXO, TCXO)	TCXO
Oscillator manufacturer	Rakon
Oscillator part name and number	E4892LF
Oscillator satisfies long-term frequency stability requirements (Yes or No)	Yes



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Characteristic	Specification
Antenna type: Integral or Other (e.g. External, Detachable – specify type)	Integrated
Antenna manufacturer	Doig
Antenna part name and number	91-206
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	uBlox
- Navigation device model name and part Number	LEA 5A
- GNSS system supported (e.g. GPS, GLONASS, Galileo)	GPS, Galileo
For External Navigation Devices	N/A
- Data protocol for GNSS receiver to beacon interface	
- Physical interface for beacon to navigation device	
- Electrical interface for beacon to navigation device	
- Navigation device model and manufacturer (if beacon designed to use specific devices)	



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Characteristic	Specification	
Self-Test Mode Characteristics	Self-Test Mode	Optional GNSS Self-Test Mode
- Self-test has separate switch position (Yes or No)	Yes	Yes
- Self-test switch automatically returns to normal position when released (Yes or No)	Yes	Yes
- Self-test activation can cause an operational mode transmission (Yes or No)	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	Yes
- Results of self-test indicated by (e.g. Pass / Fail Indicator Light, Strobe Light, etc.)	Pass/ Fail LED	Pass / Fail LED
- Self-test can be activated from beacon remote activation points (Yes or No)	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)	Yes	No
- Self-test transmits a signal(s) other than at 406 MHz (Yes & details or No)	Yes 121.5MHz	No
- Self-test can be activated directly at beacon (Yes or No)	Yes	Yes
- List of Items checked by self-test	406.037/ 121.5MHz Power, PLL lock, GPS Module	GPS position fix
- Self-test transmission burst duration (440 or 520 ms)	440 ms	520 ms
- Self-test format bit ("0" or "1")	1	
- Maximum duration of GNSS Self Test	N/A	5 mins ±10 secs
- Maximum number of GNSS Self Tests (beacons with internal navigation devices only)	N/A	10
Beacon includes a homer transmitter (if yes identify frequency of transmission)	121.5MHz	
-Homer Transmit Power	16.5dBm	
-Homer Duty Cycle	99.13%	
-Duty Cycle of Homer Swept Tone	35%	



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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.	None
Beacon includes automatic activation mechanism (Yes or No) Specify type of automatic beacon activation mechanism	No
Beacon includes software or hardware features and functions not listed above and non-related to 406 MHz (Yes or No)	No
List features and use a separate sheet if insufficient space	



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)	☒ EPIRB with MMSI
	☒ 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)	☒ 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



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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: 26 August 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:

Name:

N Forsyth

Position Held:

Authorised Signatory

Date:

30 January 2009



Product Service

1.2.5 Applicant Details

Company Name	Signature Industries		
Address	Silver Point, Airport Service Road, Portsmouth, P03 5PB		
Category of Applicant	☒ Manufacturer	☐ Importer	
	☐ Distributor	☐ Agent	
Contact Name	Neil Jordan	Telephone	02392 623934
Email	neiljordan@mcmurdo.co.uk	Facsimile	02392 623997

1.2.6 Manufacturer Details

Company Name	Same as above		
Address			
Contact Name		Telephone	
Email		Facsimile	

1.2.7 Declaration of Build Status

Hardware Version	
- PCB Revision	1
- Battery Model	Varta CR 2/3 AH / Panasonic CR123A
Software Version	N/A
Firmware Version	1.1.165
Other (Specify)	

1.2.8 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: _____

Name: Neil Jordan

Position Held: Engineering Manager

Date: 25-11-08

1.3 PRODUCT INFORMATION

1.3.1 Technical Description

The Equipment Under Test (EUT) was a McMurdo A Division of Signature Industries Ltd Fastfind PLB 210 with a Panasonic Battery Pack as shown in the photograph below. A full technical description can be found in the manufacturer's documentation.



Equipment Under Test

1.3.2 Physical Test Configuration

The Equipment Under Test (EUT) was operated using its own power source (internal Panasonic Batteries, note that the alternative VARTA batteries are the subject of a separate document). The EUT was configurable so that it could be either connected to the 50Ω test system using a coaxial cable or so that it radiated through its normal antenna as per normal operational configuration. In the 50Ω-conducted mode, the 406MHz and 121MHz transmissions came from separate ports as can be seen in the photo above.

The test configuration for all tests was the 50Ω-conducted configuration with the exception of Satellite Qualitative and Battery Current Measurements in Self-test mode*. The radiated configuration was used for these tests.

* An explanation can be found on page 36



Product Service

1.3.3 Modes of Operation

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

Standby Mode:

- No apparent EUT activity
- No ancillary devices were declared

Self-test:

- "TEST" button depressed until White LED light indicated Self-test operation
- List of features tested as per Application Form

(Long/GPS Self-test):

- "TEST" button depressed until White LED light indicated GNSS Self-test operation, note that the normal Self-test routine is completed in the interim
- List of features tested as per Application Form

Operating:

- 121 MHz homer active and offset to 121.65 MHz
- 243 MHz homer not declared
- GPS active and in search mode (no signals supplied) unless otherwise declared
- Physical configuration as above



Product Service

1.4 MODIFICATIONS

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	N/A	N/A
1	After an evaluation of the unit at McMurdo the following was discovered (customer statement): "The Ublox LEA 5A voltage supply rail decoupling capacitor C10 was found to be defective. This capacitor was replaced and the unit re-tested for 2 hours and performed correctly. We consider this a successful repair of the unit and give permission for TUV to continue testing. No change or modification to the build standard has taken place."	McMurdo A Division of Signature Industries Ltd	01 October 2008

1.5 REPORT MODIFICATION RECORD

Issue 1 – First Issue

Issue 2 – Modifications made in line with Cospas-Sarsat document "Worksheet-1_2008-27_McMurdo Fastfind PLB 200-210_18 DEC 08". Changes include:

- Customer supplied information: Application Form (Section 1.2)
- Test Results Table Section 10. Values now to 24 hours not 34.34 hours
- Operational Lifetime Test (Battery Pre-test Discharge Calculations) GPS Self-test data now excludes 'Normal' Self-test data. Final result: Pre-test discharge now 6 minutes shorter.
- Test Name "Digital Message Coding" changed to "Digital Message"
- Modulus of all CTA values now replace original data for Satellite Qualitative Tests (Section 2.4)

Issue 3 – Modifications made in line with Cospas-Sarsat document "Worksheet-1_2008-27_McMurdo Fastfind PLB 200-210_29 JAN 09". Changes include:

- Customer supplied information: Application Form (Section **Error!**
Reference source not found.)

Operational Lifetime Test (Battery Pre-test Discharge Calculations)



Product Service

SECTION 2

TEST DETAILS

Cospas-Sarsat T.007 Limited Testing of the
McMurdo A Division of Signature Industries Ltd
Fastfind PLB 210 with a Panasonic Battery Pack



Product Service

TEST RESULTS TABLE

TEST RESULTS TABLE

Parameter	Limits	Units	Test Results			Comments
			Tmin	Tamb	Tmax	
			(-20°C)	(22.7°C)	(+55°C)	
1. Power Output						Test Sample: 75904389_03 Mod State: 0* Result: Pass
Transmitter power output	35 - 39	dBm	36.55	37.00	36.872	* Except Power output rise time and Power output 1ms before burst at Tmin and Tamb, these 4 tests were performed at Mod State 1 and are asterisked (*) for clarity
Power output rise time	< 5	ms	2.380*	2.286*	2.404	
Power output 1ms before burst	< -10	dBm	-19.02*	-22.00*	-22.15	
2. Digital Message						Test Sample: 75904389_03 Mod State: 0 Result: Pass
Bit Numbers						Decoded Message: Page 20
Bit Sync	1 - 15	15 bits "1"	P / F	P	P	
Frame sync	16 - 24	"000101111"	P / F	P	P	
Format flag	25	1 bit	bit value	1	1	
Protocol flag	26	1 bit	bit value	0	0	
Identification / position data	27 - 85	59 bits	P / F	P	P	
BCH code	86 -106	21 bits	P / F	P	P	
Emerg. Code/nat. use/supplem. Data	107 - 112	6 bits	bit value	110111	110111	
Additional data / BCH (if applicable)	112 - 144	32 bits	P / F	P	P	
Position Error (if applicable)	< 5	km	N/A	N/A	N/A	
3. Digital Message Generator						Test Sample: 75904389_03 Mod State: 0* Result: Pass
Repetition rate, TR:						*Except Tmin, these tests were performed at Mod State 1 and are asterisked (*) for clarity
Average TR	48.5 ≤ TRavg ≤ 51.5	seconds	49.955*	49.953	49.938	
Minimum TR	47.5 ≤ TRmin ≤ 48.0	seconds	47.750*	47.812	47.844	
Maximum TR	52.0 ≤ TRmax ≤ 52.5	seconds	52.218*	52.234	52.172	
Standard deviation	0.5 - 2.0	seconds	1.365*	1.349	1.342	
Bit rate						
Minimum fb	≥ 396	bits/sec	400.127*	400.333	400.479	
Maximum fb	≤ 404	bits/sec	400.171*	400.362	400.500	
Total transmission time						
Short message	435.6 - 444.4	ms	N/A	N/A	N/A	
Long message	514.8 - 525.2	ms	519.753*	520.217	520.236	
Unmodulated carrier						
Minimum T1	≥ 158.4	ms	158.943*	159.590	159.691	
Maximum T1	≤ 161.6	ms	159.318*	159.770	159.845	
First burst delay	≥ 47.5	seconds	51*	51	50	



Product Service

Parameter	Limits	Units	Test Results			Comments
			T _{min}	T _{amb}	T _{max}	
			(-20°C)	(22.7°C)	(+55°C)	
4. Modulation						Test Sample: 75904389_03 Mod State: 0 Result: Pass
Biphase-L	P / F	P / F	P	P	P	
Rise time	50 - 250	µs	153.15	165.16	160.16	
Fall time	50 - 250	µs	159.19	173.37	166.4	
Phase deviation: positive	+(1.0 to 1.2)	radians	1.0844	1.1112	1.0838	
Phase deviation: negative	-(1.0 to 1.2)	radians	-1.1234	-1.1315	-1.1113	
Symmetry measurement	≤ 0.05		0.0038	0.0041	0.0037	
5. 406 MHz Transmitted Frequency						Test Sample: 75904389_03 Mod State: 0 Result: Pass
Nominal Value	C/S T.001	MHz	406.037095	406.037082	406.037085	
Short-term stability	≤ 2x10 ⁻⁹	/100ms	1.068x10 ⁻¹⁰	8.044x10 ⁻¹¹	2.011x10 ⁻¹⁰	
Medium-term stability – Slope	(-1 to +1)x10 ⁻⁹	/minutes	1.028x10 ⁻¹¹	-6.569x10 ⁻¹²	-6.553x10 ⁻¹²	
Medium-term stability – Residual frequency variation	≤ 3x10 ⁻⁹		7.896x10 ⁻¹⁰	7.735x10 ⁻¹⁰	4.692 x10 ⁻¹⁰	



Product Service

Parameter	Limits	Units	Test Results		Comments
9. Thermal Shock					Test Sample: 75904389_03 Mod State: 1 Result: Pass
Soak Temperature	30°C difference	°C	+24		Test Data: Page 23
Measurement Temperature		°C	+55		
Transmitted Frequency	C/S T.001	MHz	Min	Max	
Nominal value			406.0370753	406.0370771	
Short-term stability		/100ms	7.212E-11	1.447E-10	
Medium-term stability – Slope		/min	-2.103E-10	4.779E-10	
Medium-term stability – Residual frequency variation		≤ 3x10 ⁻⁹	1.663E-10	8.618E-10	
Transmitter power output	35 - 39	dBm	36.685	36.798	Decoded Message: Page 28
Digital message	correct	P/F	P		
10 Operating Lifetime at Minimum Temperature					Test Sample: 75904389_03 Mod State: 1 Result: Pass
Pre-test battery discharge duration (operating)	>24	hours	5.38		Test Data: Page 29
duration		hours	34.34 Hours at Tmin = -20 °C		A pre-test battery discharge of 5.97 hours was performed prior to the start of the Operating Lifetime at Minimum Temperature.
Transmitted Frequency	C/S T.001	MHz	Min	Max	Max and Min values are to 24 hours
Nominal value			406.0370836	406.0370957	
Short-term stability		/100ms	4.732x10 ⁻¹¹	1.599x10 ⁻¹⁰	
Medium-term stability – Slope		/min	-1.854x10 ⁻¹⁰	2.853x10 ⁻¹⁰	
Medium-term stability – Residual frequency variation		≤ 3x10 ⁻⁹	6.675x10 ⁻¹¹	1.018x10 ⁻⁹	First failure on Power output at 34.34hours Decoded Message: Page 34
Transmitter power output	35 - 39	dBm	35.98	36.07	
Digital message	correct	P/F	P		



Product Service

Parameter	Limits	Units	Test Results		Comments
12. Oscillator Aging					
Data	provided	Y / N	N		Applicant's data: To be provided as part of the Application
13. Protection Against Continuous Transmission					
Description	provided	Y / N	Y		Applicant's data: Provided but not included in this report. Please see the latest issue of TÜV Document 75904389 Report 01
14. Satellite Qualitative Tests					Test Sample: 75904389_03 Mod State: 0 Result: Pass
Test Configuration	As per C/S T.007		On dry ground	Figure B.5	Test Data: Page 41
15 Hex ID Decoded by LUT	correct	P / F	P	P	
Doppler Location results with error ≤5km	≥80	%	100	100	



Product Service

2.1 DIGITAL MESSAGE

2.1.1 Equipment Under Test

Fastfind PLB 210 with a Panasonic Battery Pack, Serial Number: TUV 3

2.1.2 Date of Test and Modification State

02 September 2008 - Modification State 0

2.1.3 Test Equipment Used

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

2.1.4 Test Results

Ambient Temperature

Beacon Id Format..... 30 Hex Id, Long Message, Bits 25-144
 15 Hex (Bits 26- 85) = 193DF380C6FFBFF 193DF380C6FFBFF Default_Id
 36 Hex (Bits 25-144) = FFFE2F8C9EF9C0637FDFF83D15B783E0F66C

26	30	34	38	42	46	50	54	58	62	66	70	74	78	82
1 0001	1001	0011	1101	1111	0011	1000	0000	1100	0110	1111	1111	1011	1111	1111
0000	0111	1010	0010	1011	0110	1111	0000	0111	1100	0001	1110	1100	1101	100
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	1
Protocol Flag	26	0 Location NEW	0
MID	27- 36	201 ALBANIA	0011 0010 01
Protocol Code	37- 40	14 Test Serial (Standard)	1110
Spare	41- 64		1111 1001 1100 0000 0110 0011
Coarse Position	65- 85	DEFAULT	0111 1111 1101 1111 1111 1
BCH Encoded	86-106	Errors=0	0000 0111 1010 0010 1011 0
BCH Generated	86-106		0000 0111 1010 0010 1011 0
Long Message	107-144	Data Present	
Fixed Bits	107-109		110
Fixed Bit	110	1	1
Encode Pos Device	111	1 Internal	1
121.5 Homing	112	1 YES	1
Position Change	113-132	DEFAULT	1000 0011 1110 0000 1111
Resultant Position		--> Not Defined	
BCH Encoded	133-144	Errors=0	0110 0110 1100
BCH Generated	133-144		0110 0110 1100



Product Service

Minimum Temperature

Beacon Id Format..... 30 Hex Id, Long Message, Bits 25-144

15 Hex (Bits 26- 85) = 193DF380C6FFBFF 193DF380C6FFBFF Default_Id

36 Hex (Bits 25-144) = FFFE2F8C9EF9C0637FDFF83D15B783E0F66C

26	30	34	38	42	46	50	54	58	62	66	70	74	78	82
1	0001	1001	0011	1101	1111	0011	1000	0000	1100	0110	1111	1111	1011	1111
	0000	0111	1010	0010	1011	0110	1111	0000	0111	1100	0001	1110	1100	1101
														100
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	1
Protocol Flag	26	0 Location NEW	0
MID	27- 36	201 ALBANIA	0011 0010 01
Protocol Code	37- 40	14 Test Serial (Standard)	1110
Spare	41- 64		1111 1001 1100 0000 0110 0011
Coarse Position	65- 85	DEFAULT	0111 1111 1101 1111 1111 1
BCH Encoded	86-106	Errors=0	0000 0111 1010 0010 1011 0
BCH Generated	86-106		0000 0111 1010 0010 1011 0
Long Message	107-144	Data Present	
Fixed Bits	107-109		110
Fixed Bit	110	1	1
Encode Pos Device	111	1 Internal	1
121.5 Homing	112	1 YES	1
Position Change	113-132	DEFAULT	1000 0011 1110 0000 1111
Resultant Position		--> Not Defined	
BCH Encoded	133-144	Errors=0	0110 0110 1100
BCH Generated	133-144		0110 0110 1100



Product Service

Maximum Temperature

Beacon Id Format..... 30 Hex Id, Long Message, Bits 25-144

15 Hex (Bits 26- 85) = 193DF380C6FFBFF 193DF380C6FFBFF Default_Id

36 Hex (Bits 25-144) = FFFE2F8C9EF9C0637FDFF83D15B783E0F66C

26	30	34	38	42	46	50	54	58	62	66	70	74	78	82
1	0001	1001	0011	1101	1111	0011	1000	0000	1100	0110	1111	1111	1011	1111
	0000	0111	1010	0010	1011	0110	1111	0000	0111	1100	0001	1110	1100	1101
														100
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	1
Protocol Flag	26	0 Location NEW	0
MID	27- 36	201 ALBANIA	0011 0010 01
Protocol Code	37- 40	14 Test Serial (Standard)	1110
Spare	41- 64		1111 1001 1100 0000 0110 0011
Coarse Position	65- 85	DEFAULT	0111 1111 1101 1111 1111 1
BCH Encoded	86-106	Errors=0	0000 0111 1010 0010 1011 0
BCH Generated	86-106		0000 0111 1010 0010 1011 0
Long Message	107-144	Data Present	
Fixed Bits	107-109		110
Fixed Bit	110	1	1
Encode Pos Device	111	1 Internal	1
121.5 Homing	112	1 YES	1
Position Change	113-132	DEFAULT	1000 0011 1110 0000 1111
Resultant Position		--> Not Defined	
BCH Encoded	133-144	Errors=0	0110 0110 1100
BCH Generated	133-144		0110 0110 1100



Product Service

2.2 THERMAL SHOCK

2.2.1 Equipment Under Test

Fastfind PLB 210 with a Panasonic Battery Pack, Serial Number: TUV 3

2.2.2 Date of Test and Modification State

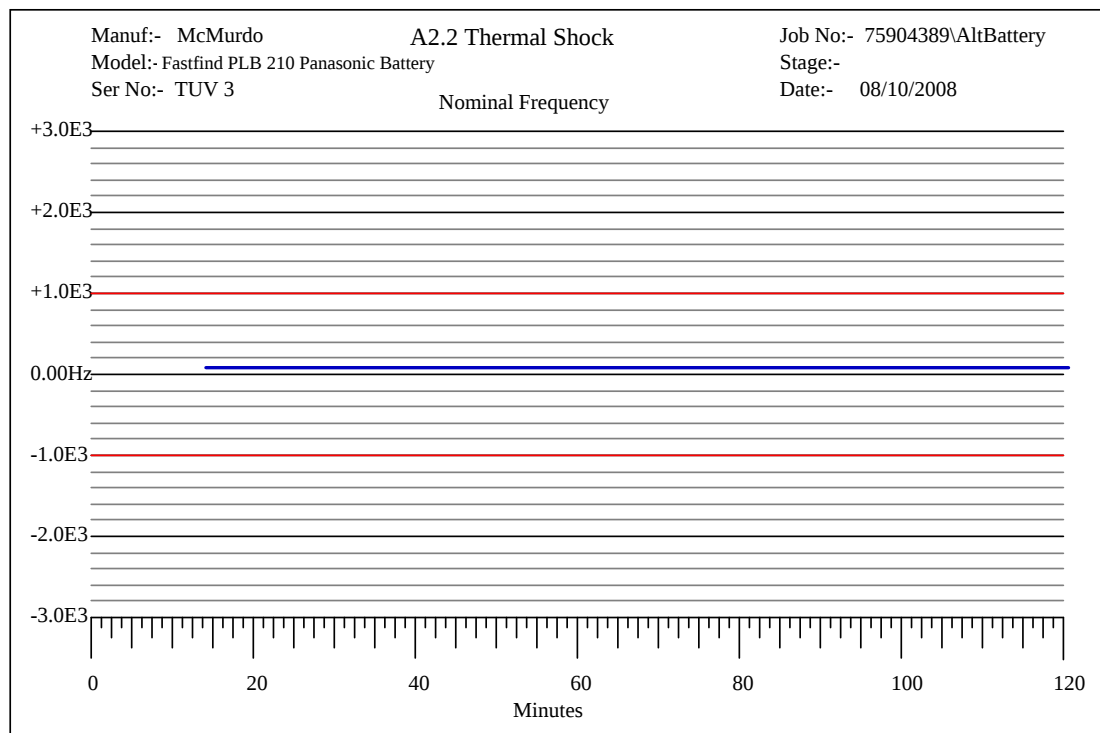
08 October 2008 - Modification State 1

2.2.3 Test Equipment Used

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

2.2.4 Test Results

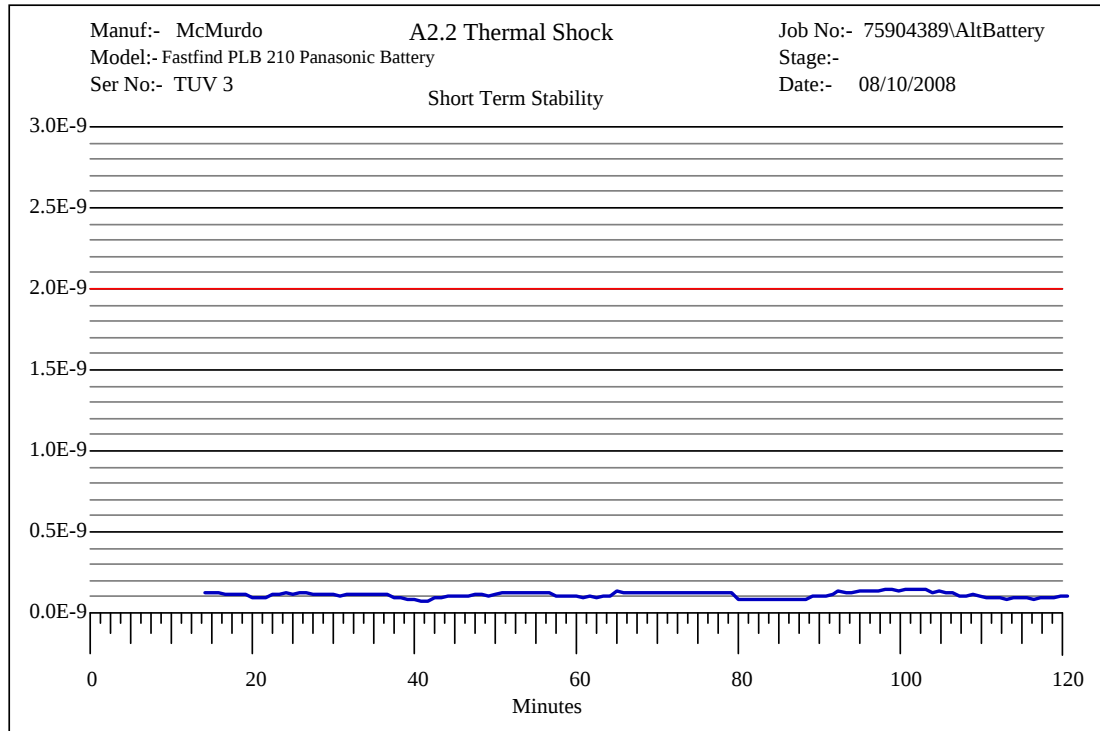
Nominal Frequency





Product Service

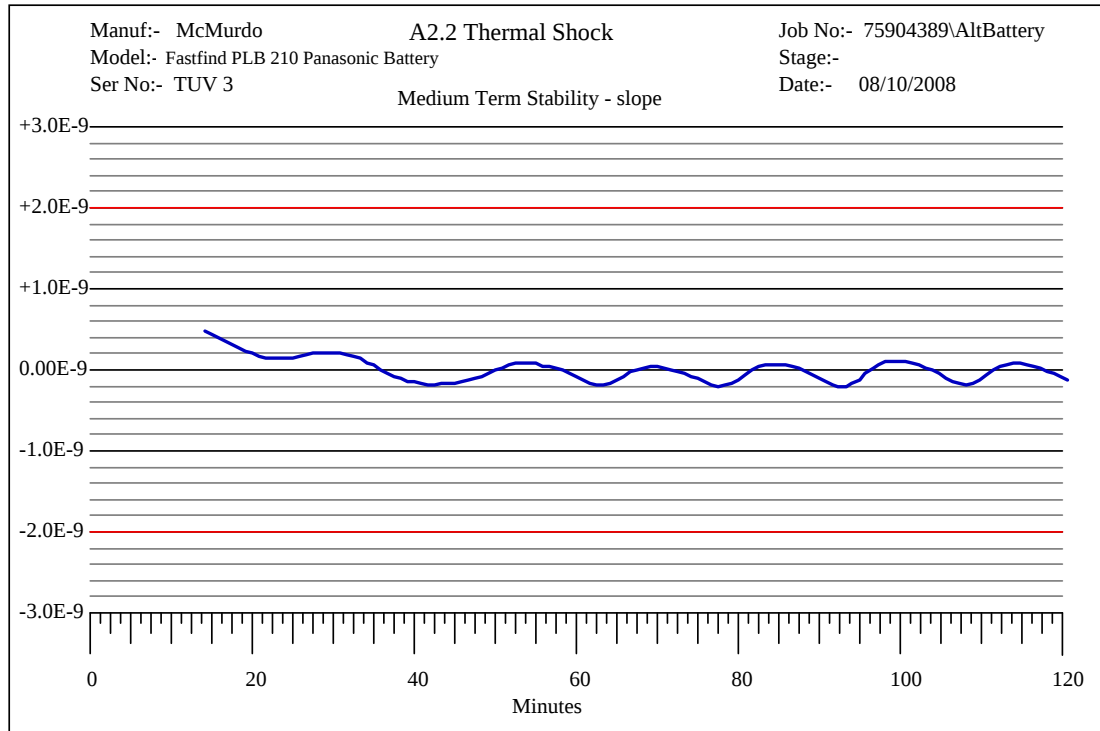
Short Term Stability





Product Service

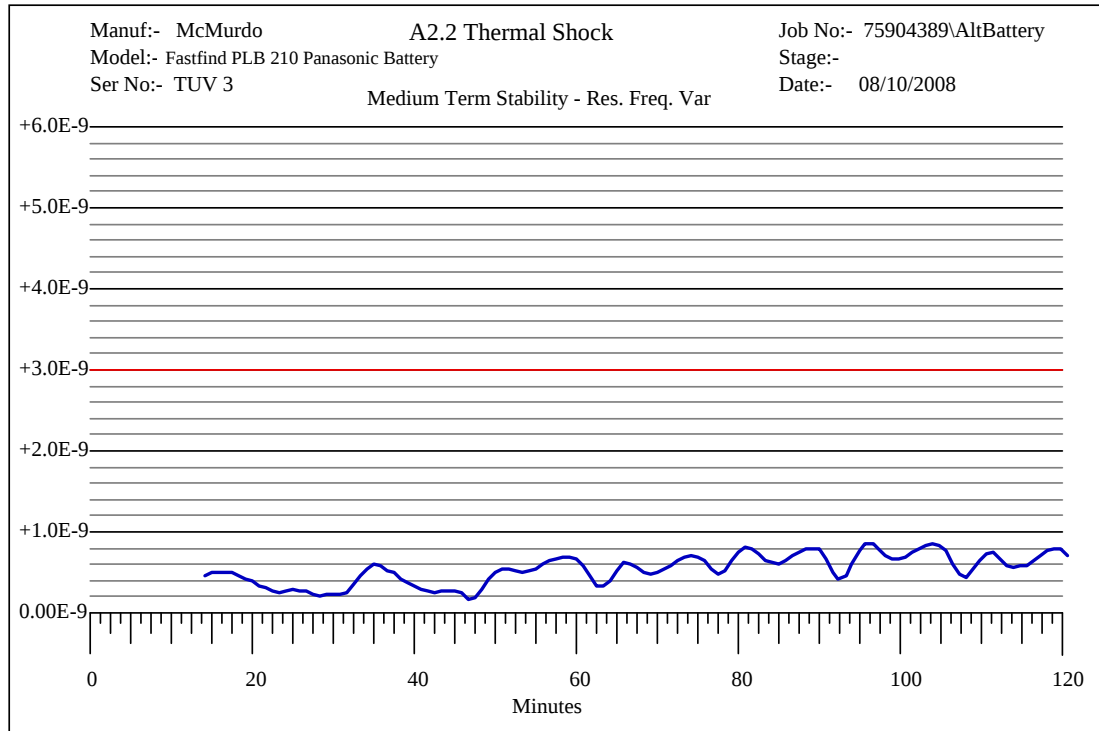
Medium Term Stability, Mean Slope





Product Service

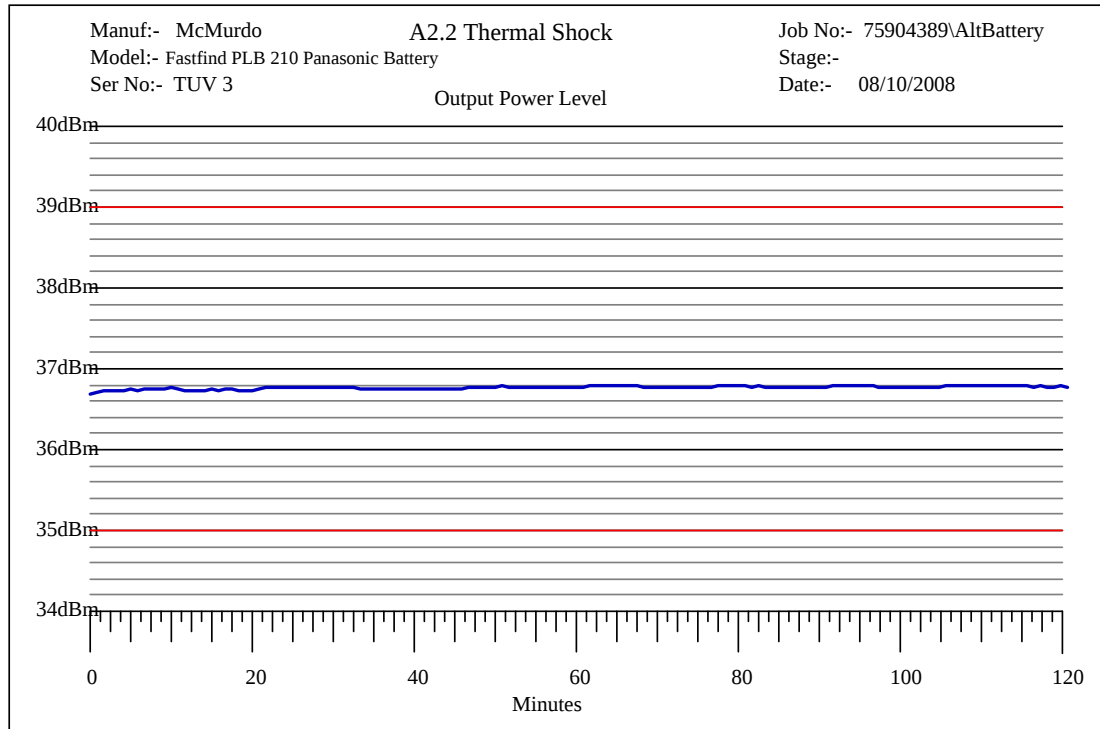
Medium Term Stability, Residual Frequency Variation





Product Service

Output Power





Product Service

Digital Message

Message Content

```
Expected Message  FFFE2F8C9EF9C0637FDFF83D15B783E0F66C
Actual Message    FFFE2F8C9EF9C0637FDFF83D15B783E0F66C
Message Error Count 00
```

Beacon Id Format..... 30 Hex Id, Long Message, Bits 25-144

```
15 Hex (Bits 26- 85) = 193DF380C6FFBFF          193DF380C6FFBFF Default_Id
30 Hex (Bits 25-144) = 8C9EF9C0637FDFF83D15B783E0F66C
```

```

26  30  34  38  42  46  50  54  58  62  66  70  74  78  82
|   |   |   |   |   |   |   |   |   |   |   |   |   |
1 0001 1001 0011 1101 1111 0011 1000 0000 1100 0110 1111 1111 1011 1111 1111
   0000 0111 1010 0010 1011 0110 1111 0000 0111 1100 0001 1110 1100 1101 100
   |   |   |   |   |   |   |   |   |   |   |   |   |   |
  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	1
Protocol Flag	26	0 Location NEW	0
MID	27- 36	201 ALBANIA	0011 0010 01
Protocol Code	37- 40	14 Test Serial (Standard)	1110
Spare	41- 64		1111 1001 1100 0000 0110 0011
Coarse Position	65- 85	DEFAULT	0111 1111 1101 1111 1111 1
BCH Encoded	86-106	Errors=0	0000 0111 1010 0010 1011 0
BCH Generated	86-106		0000 0111 1010 0010 1011 0
Long Message	107-144	Data Present	
Fixed Bits	107-109		110
Fixed Bit	110	1	1
Encode Pos Device	111	1 Internal	1
121.5 Homing	112	1 YES	1
Position Change	113-132	DEFAULT	1000 0011 1110 0000 1111
Resultant Position		--> Not Defined	
BCH Encoded	133-144	Errors=0	0110 0110 1100
BCH Generated	133-144		0110 0110 1100



Product Service

2.3 OPERATING LIFETIME AT MINIMUM TEMPERATURE

2.3.1 Equipment Under Test

Fastfind PLB 210 with a Panasonic Battery Pack, Serial Number: TUV 3

2.3.2 Date of Test and Modification State

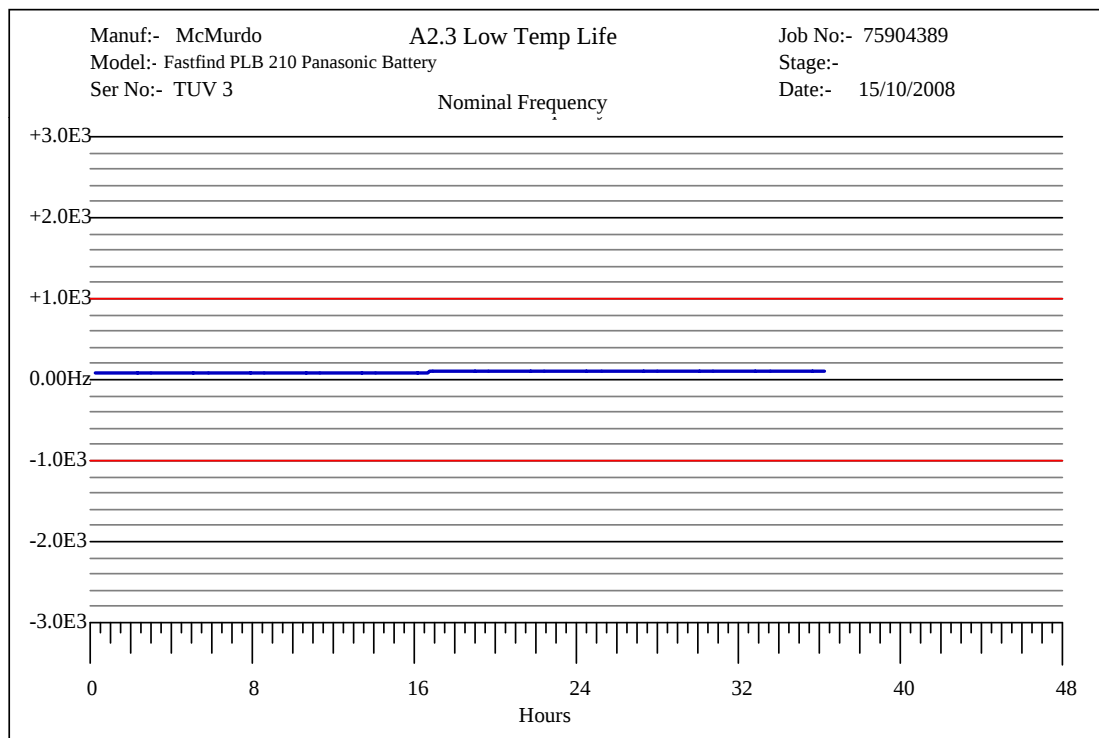
13 to 15 October 2008 - Modification State 1

2.3.3 Test Equipment Used

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

2.3.4 Test Results

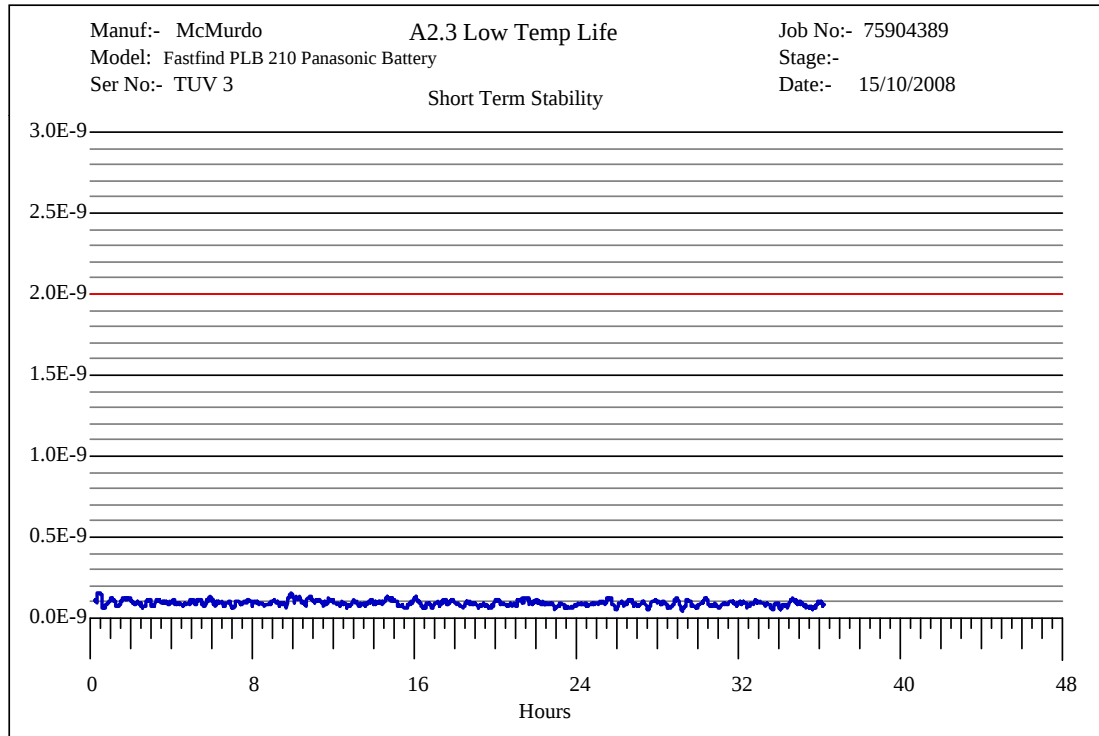
Nominal Frequency





Product Service

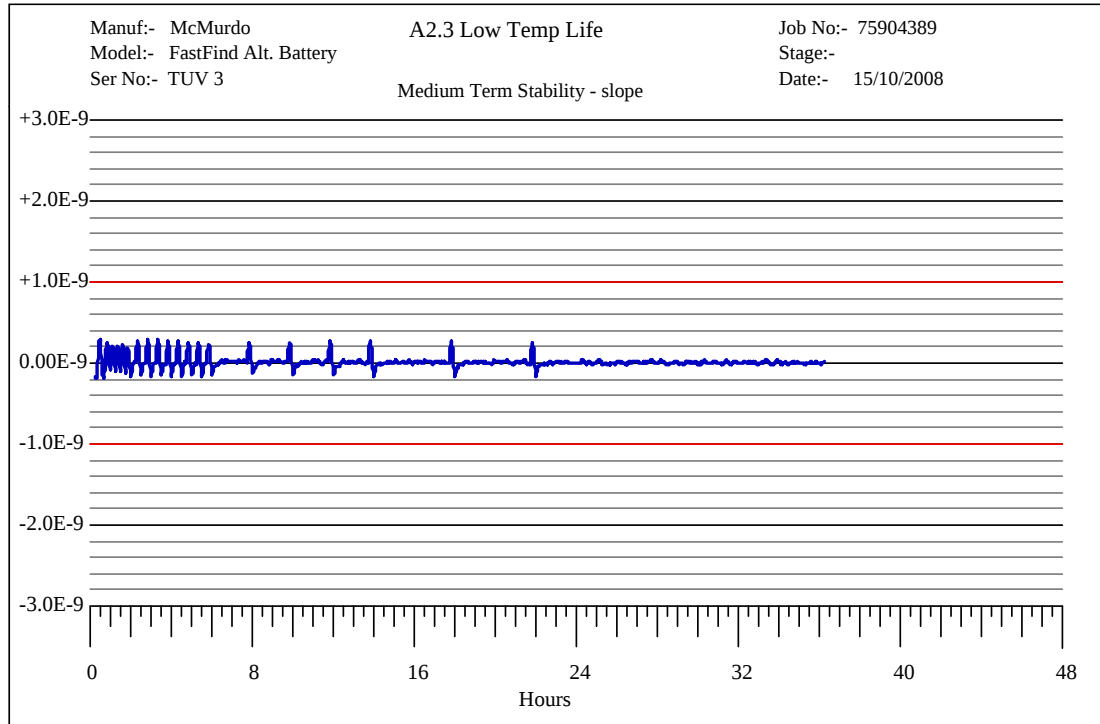
Short Term Stability





Product Service

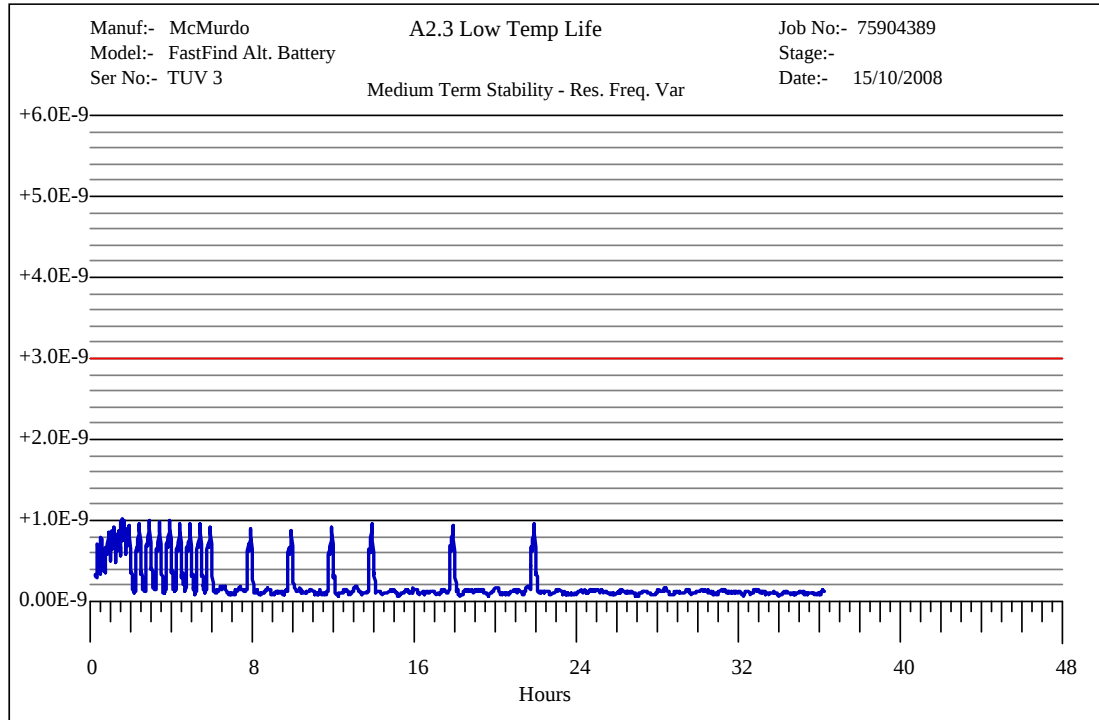
Medium Term Stability, Mean Slope





Product Service

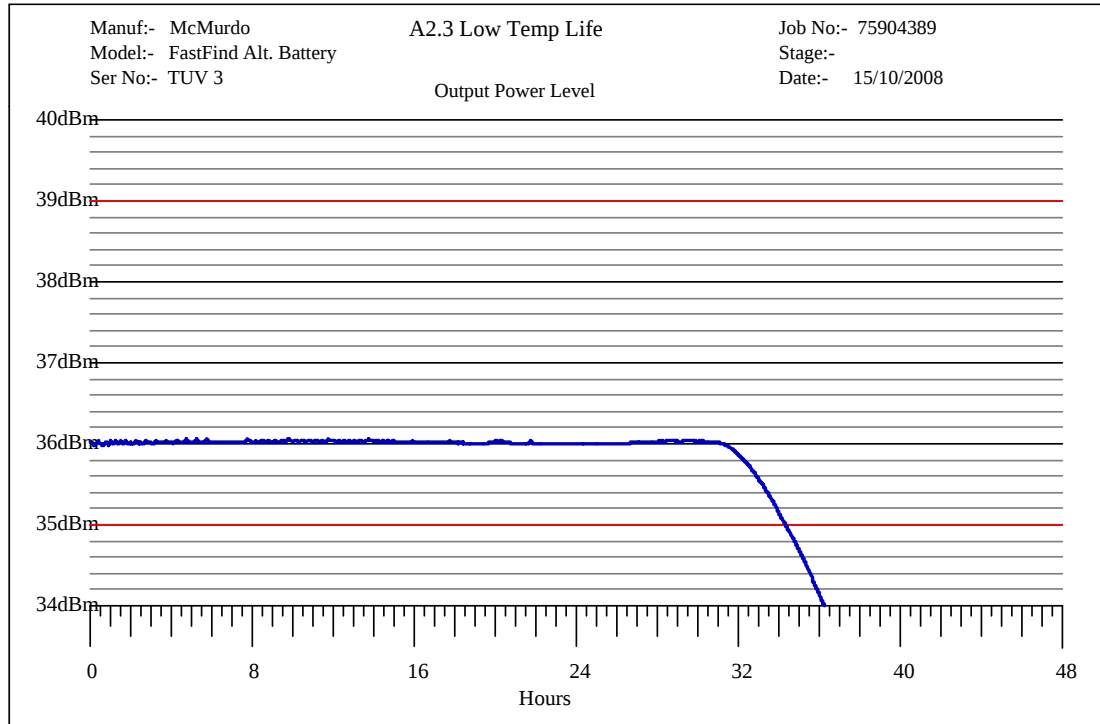
Medium Term Stability, Residual Frequency Variation





Product Service

Output Power





Product Service

Digital Message

Message Content

Expected Message FFFE2F8C9EF9C0637FDFF83D15B783E0F66C
Actual Message FFFE2F8C9EF9C0637FDFF83D15B783E0F66C
Message Error Count 00

Beacon Id Format..... 30 Hex Id, Long Message, Bits 25-144

15 Hex (Bits 26- 85) = 193DF380C6FFBFF 193DF380C6FFBFF Default_Id
30 Hex (Bits 25-144) = 8C9EF9C0637FDFF83D15B783E0F66C

26	30	34	38	42	46	50	54	58	62	66	70	74	78	82
1	0001	1001	0011	1101	1111	0011	1000	0000	1100	0110	1111	1111	1011	1111
	0000	0111	1010	0010	1011	0110	1111	0000	0111	1100	0001	1110	1100	1101
														100
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	1
Protocol Flag	26	0 Location NEW	0
MID	27- 36	201 ALBANIA	0011 0010 01
Protocol Code	37- 40	14 Test Serial (Standard)	1110
Spare	41- 64		1111 1001 1100 0000 0110 0011
Coarse Position	65- 85	DEFAULT	0111 1111 1101 1111 1111 1
BCH Encoded	86-106	Errors=0	0000 0111 1010 0010 1011 0
BCH Generated	86-106		0000 0111 1010 0010 1011 0
Long Message	107-144	Data Present	
Fixed Bits	107-109		110
Fixed Bit	110	1	1
Encode Pos Device	111	1 Internal	1
121.5 Homing	112	1 YES	1
Position Change	113-132	DEFAULT	1000 0011 1110 0000 1111
Resultant Position		--> Not Defined	
BCH Encoded	133-144	Errors=0	0110 0110 1100
BCH Generated	133-144		0110 0110 1100



Product Service

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	: 30 minutes	(1799840 ms)
Self-test Current	: 14.9 seconds	(14880 ms)
GPS Test Current	: 306 seconds	(306400 ms)
Operating Current	: 4.96 minutes	(297520 ms)

Assumptions / Supplied Data

Battery Replacement Interval	: 6 years
Battery Capacity	: 1.55 Ah
Battery Self Drain	: 1.00 % per year
Self-test Interval	: 12 tests per year
GPS Tests	: 10 tests per life of beacon (limited)

Test Results

Mode Current	= Accumulated Charge / Time	
Standby Current	= 102013471.3 pC / 1799840 ms	= 56.68 nA
Self-test Current	= 429336 uC / 14880 ms	= 28.85 mA
GPS Test Current	= 9906456 uC / 306400 ms	= 32.33 mA
Operating Current	= 8589300.76 uC / 297520 ms	= 28.87 mA



Product Service

Battery Preconditioning / Discharge Time Calculations

$$\begin{aligned}
 \text{Battery Self Drain} &= \text{Capacity} - [(100\% - \text{Self Drain/Year}\%)^{\text{Replacement Interval}} \times \text{Capacity}] \\
 &= 1.55 - ((1 - 0.0100)^6 \times 1.55) = 0.0907 \text{ Ah} \\
 \\
 \text{Standby Drain} &= \text{Hours per year} \times \text{Battery Replacement Interval} \times \text{Standby Current} \\
 &= 365 \times 24 \times 6 \times 56.68 \times 10^{-9} = 0.0030 \text{ Ah} \\
 \text{Worst Case} &= 1.65 \times 0.0030 \text{ Ah} = 0.0049 \text{ Ah} \\
 \\
 \text{Self-test Drain} &= \text{Self-tests per battery} \times \text{Self-test Current} \times \text{Self-test duration (in hours)} \\
 &= (12 \times 6 + 10) \times 28.85 \times 10^{-3} \times (15 / 3600) = 0.0098 \text{ Ah} \\
 \text{Worst Case} &= 1.65 \times 0.0098 \text{ Ah} = 0.0161 \text{ Ah} \\
 \\
 \text{GPS Test Drain} &= \text{Self-tests per beacon} \times \text{Self-test Current} \times \text{Self-test duration (in hours)} \\
 &= 10 \times 32.33 \times 10^{-3} \times (306 / 3600) + 10 \times (0.4 \times 0.52 / 3600) = 0.0281 \text{ Ah} \\
 \text{Worst Case} &= 1.65 \times 0.0281 \text{ Ah} = 0.0464 \text{ Ah} \\
 \\
 \text{Total Drain} &= \text{Self Drain} + \text{Standby Drain (Worst Case)} + \text{Self-test Drain (Worst Case)} \\
 &= 0.0907 + 0.0049 + 0.0161 + 0.0464 = 0.1581 \text{ Ah}
 \end{aligned}$$

$$\begin{aligned}
 \text{Battery Preconditioning / Discharge Time} &= \text{Worst Case drain} / \text{Operational Current} \\
 &= 0.1581 / (28.87 \times 10^{-3}) \\
 &= \underline{5.48 \text{ hours}}
 \end{aligned}$$

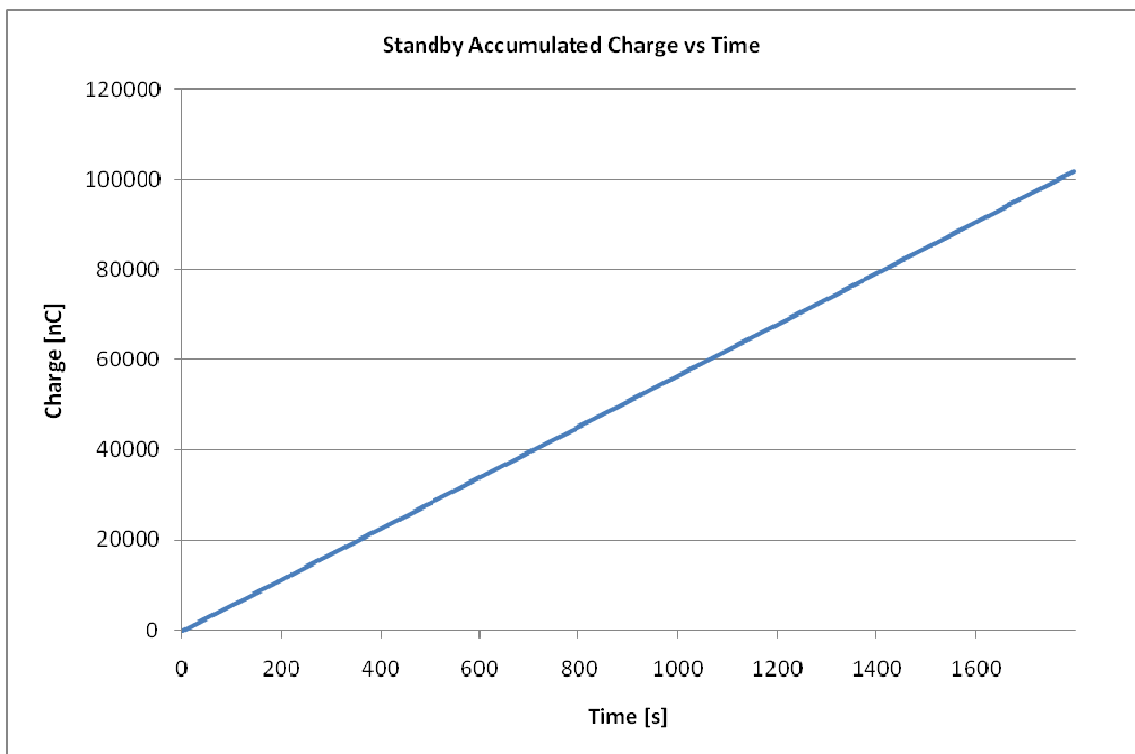
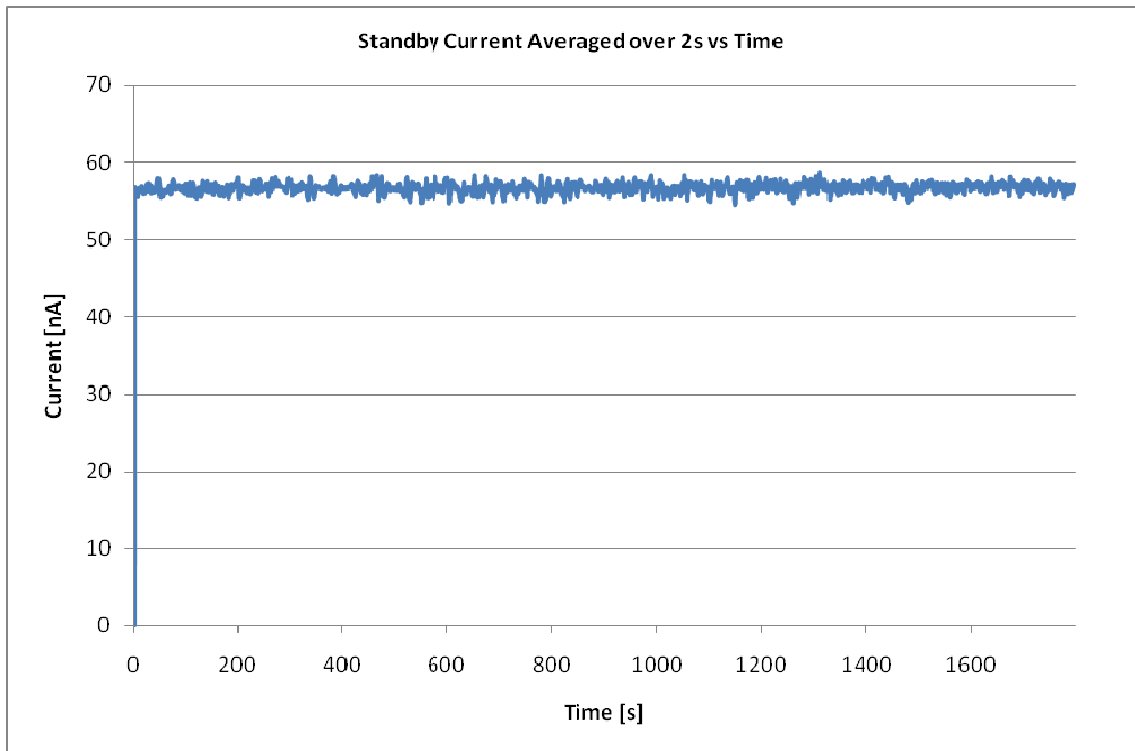
5.48 hours = 5 hours and 29 minutes. EUT Battery was discharged by operating the beacon into a 50Ω load (the same configuration in which the operating current was measured).

Note: Measurements were conducted in the 50Ω-conducted configuration with the exception of the Self-test current and the GNSS Self-test current. This was to enable accurate “real life” equivalent measurements as, in the conducted configuration; the EUT would not pass its Self-test routine and produce the three confirmation flashes of the White LED light.

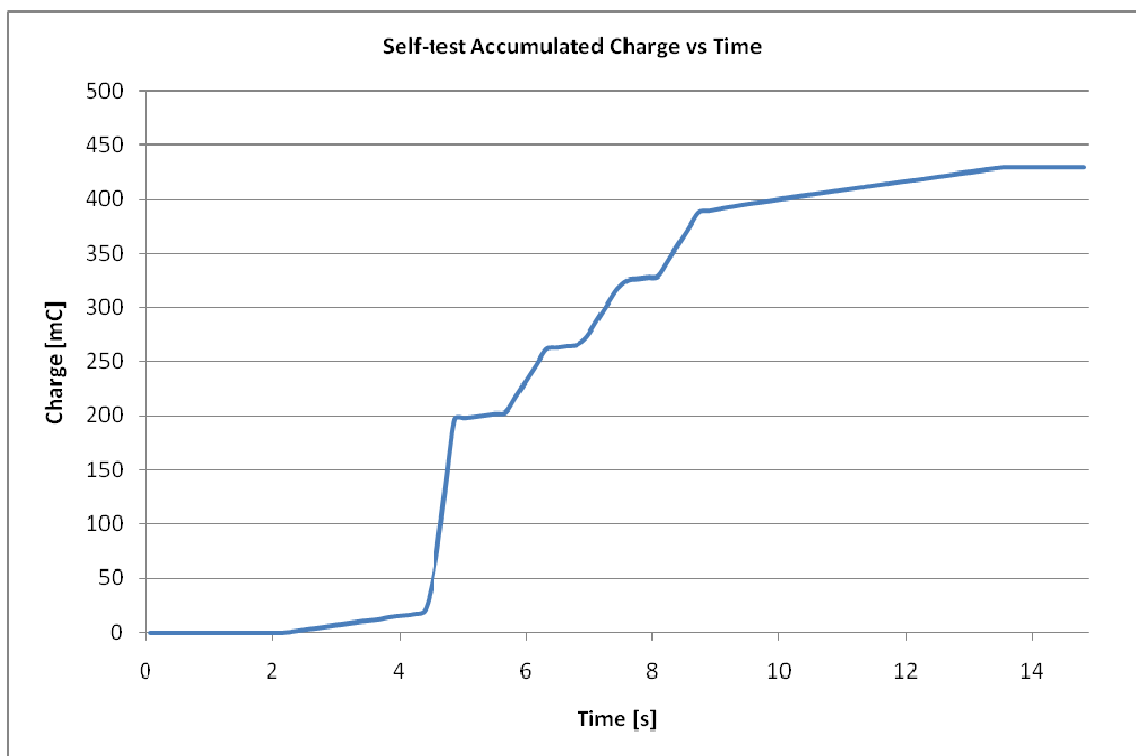
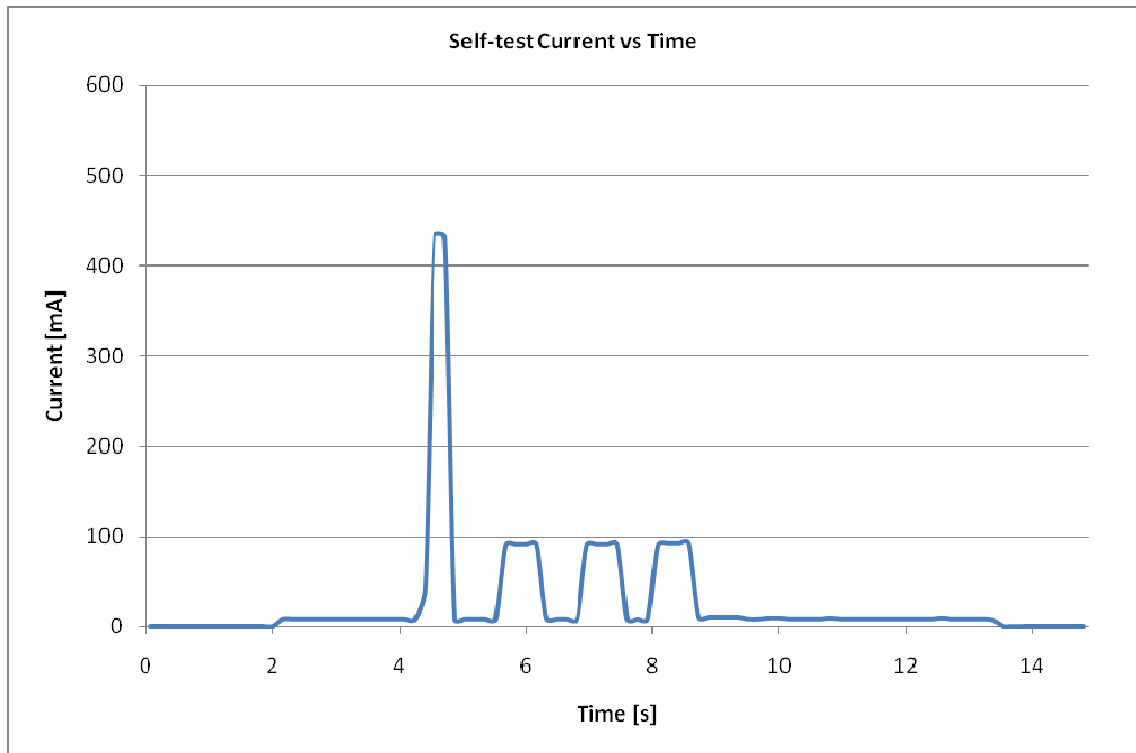
In this configuration the peak current is less than in the operating mode, this is apparently due to antenna mismatch as, with the antenna extended; the peak current was similar to that of the operating mode. Since the normal Self-test physical configuration would be with the ‘safely cap’ on, the measurements shown and used in the calculations are that with the antenna folded in that position.

10 406 bursts were added to the GNSS self test. Since the normal Self-test physical configuration would be with the ‘safely cap’ on, the measurements shown and used in the calculations are that with the antenna folded in that position.

Standby Mode Graphs



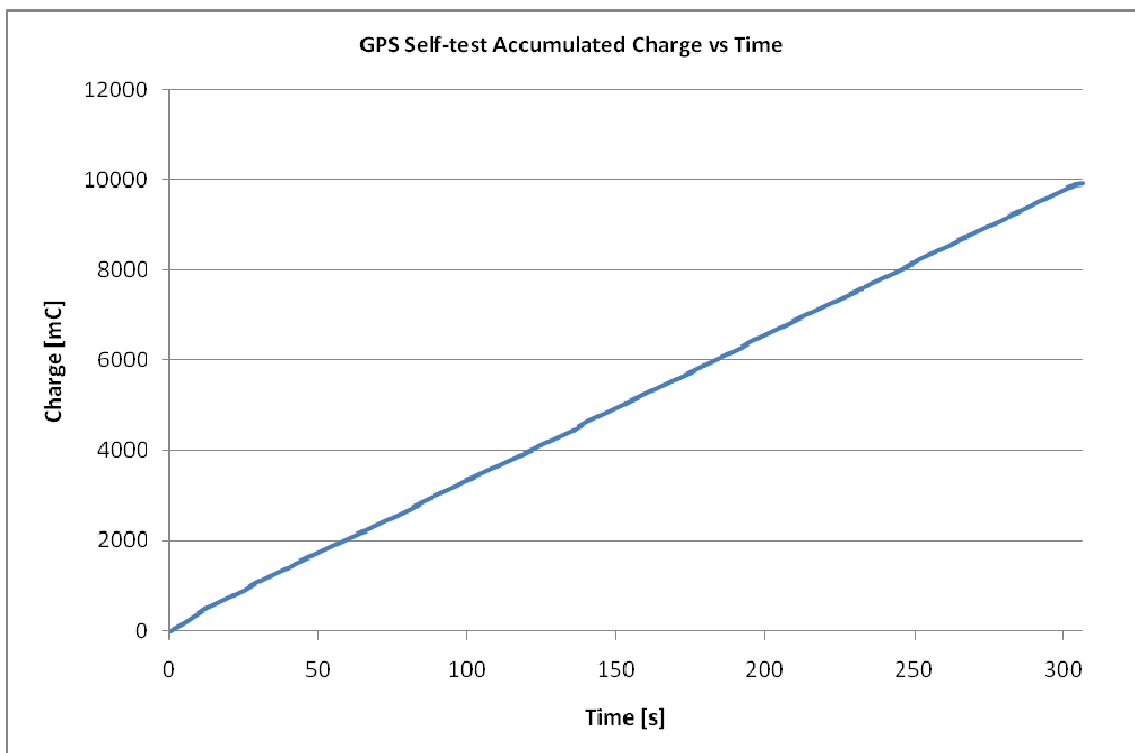
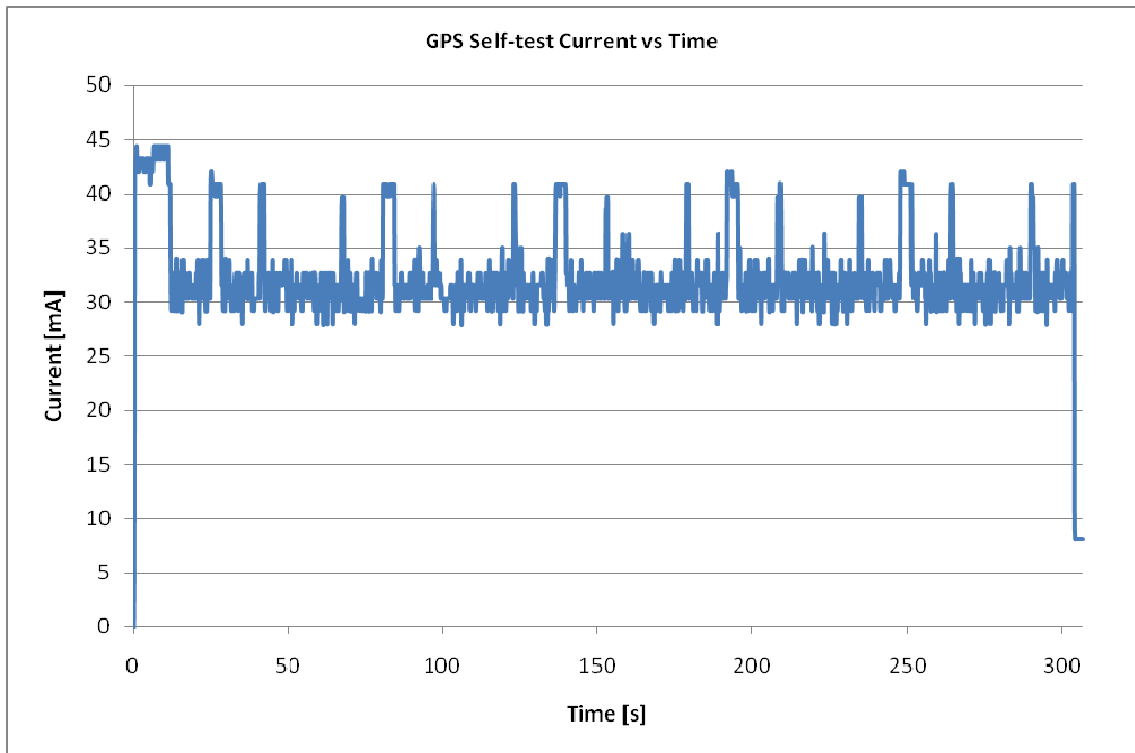
Self-test Mode Graphs



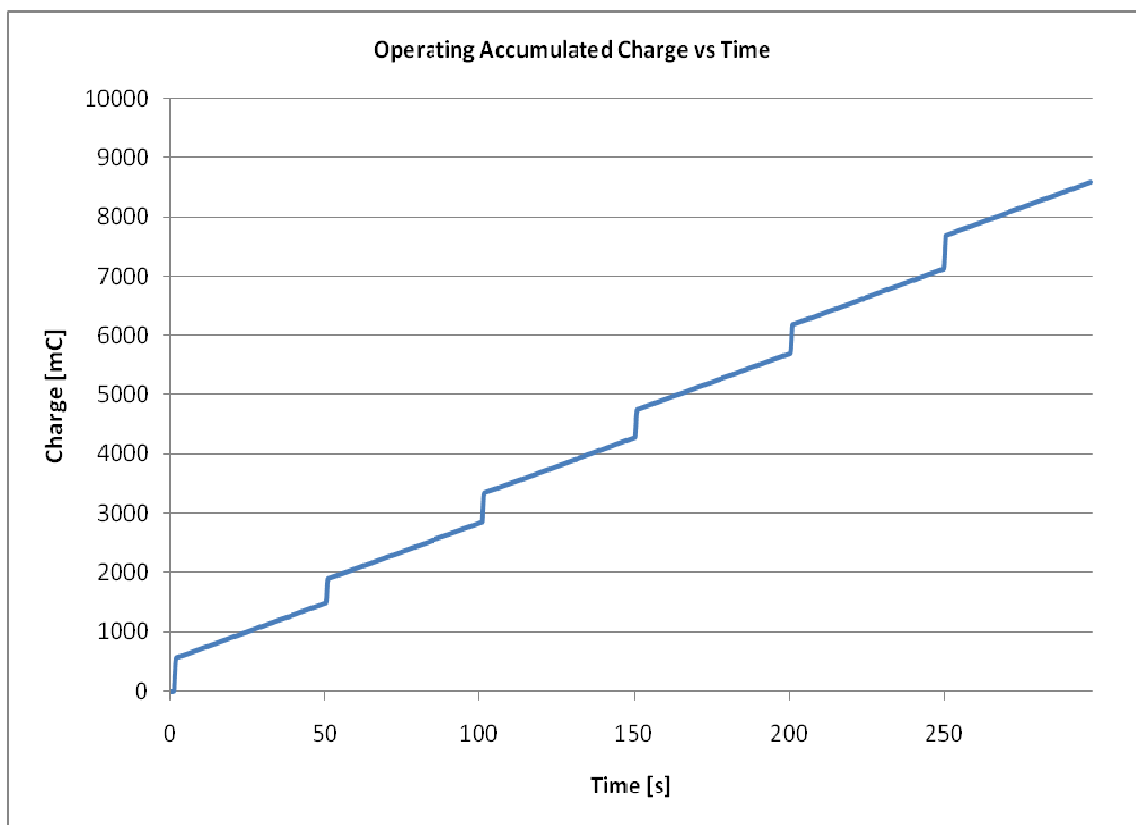
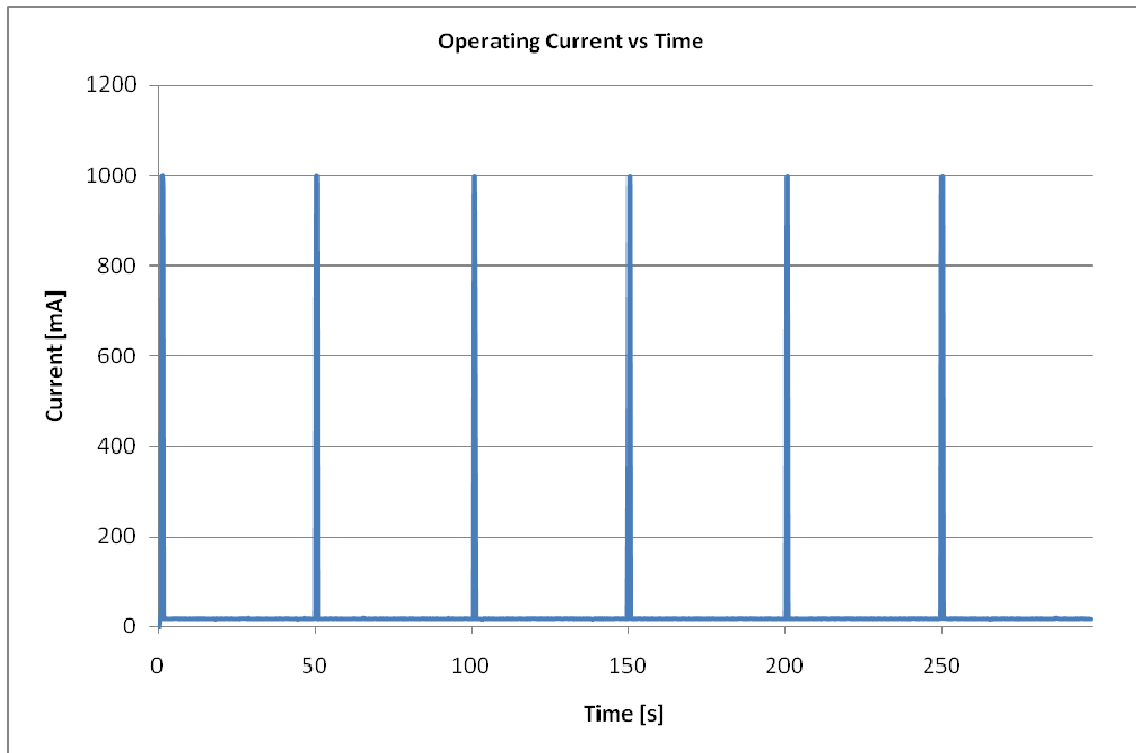


Product Service

GPS Self-test Mode Graphs



Operating Mode Graphs





Product Service

2.4 SATELLITE QUALITATIVE TESTS

2.4.1 Equipment Under Test

Fastfind PLB 210 with a Panasonic Battery Pack, Serial Number: TUV 3

2.4.2 Date of Test and Modification State

Config' 7 – 02 September 2008, 16:15 to 03 September 2008, 10:00 - Modification State 0

Config' 8 – 04 September 2008, 10:30 to 05 September 2008, 10:00 - Modification State 0

2.4.3 Test Equipment Used

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

2.4.4 Test Results

Configuration 7

Beacon 15 Hex ID:

193DF 380C6 FFBFF

Actual location of the test beacon:

Latitude: 050° 49.091'N

Longitude: 001° 11.870'W

Satellite ID	Satellite Pass Number	15 Hex ID Provided by LUT	Doppler Latitude	Doppler Longitude	Mean Rx Power (dBm)	TCA	CTA (deg)	Location Error (km)
S7	53591	193DF 380C6 FFBFF	50.82073	-1.21568	-123.72	04:43:38	9.599	1.285
S8	40979	193DF 380C6 FFBFF	50.81776	-1.19415	-123.86	07:01:39	10.279	0.263
S9	32184	193DF 380C6 FFBFF	50.81465	-1.19255	-129.74	18:40:21	20.563	0.540
S10	16946	193DF 380C6 FFBFF	50.81717	-1.19570	-123.49	03:22:33	8.339	0.187
S11	9720	193DF 380C6 FFBFF	50.82300	-1.19152	-122.39	22:27:08	14.937	0.695

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



Product Service

Configuration 8

Beacon 15 Hex ID:

193DF 380C6 FFBFF

Actual location of the test beacon:

Latitude: 050° 49.091'N

Longitude: 001° 11.870'W

Satellite ID	Satellite Pass Number	15 Hex ID Provided by LUT	Doppler Latitude	Doppler Longitude	Mean Rx Power (dBm)	TCA	CTA (deg)	Location Error (km)
S9	32215	193DF 380C6 FFBFF	50.82065	-1.19048	-122.19	22:53:02	16.237	0.584
S10	16967	193DF 380C6 FFBFF	50.81934	-1.19712	-125.03	14:45:16	16.744	0.138
S11	9754	193DF 380C6 FFBFF	50.81573	-1.19921	-122.07	08:15:59	19.271	0.289
S7	53621	193DF 380C6 FFBFF	50.81439	-1.19991	-121.51	07:15:21	13.225	0.446
S8	41006	193DF 380C6 FFBFF	50.81717	-1.19854	-121.56	04:57:31	8.541	0.123

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



Product Service

SECTION 3

TEST EQUIPMENT USED



Product Service

3.1 TEST EQUIPMENT

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

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.1 Beacons - Constant Temperature Tests					
Climatic Chamber	Heraeus Votsch	VMT 04/30	40	-	O/P Mon
Power Meter	Hewlett Packard	436A	47	12	8-Jul-2009
Power Meter	Hewlett Packard	436A	83	12	13-Aug-2009
Climatic Chamber	Heraeus Votsch	VM 04/100	85	-	O/P Mon
Rubidium Frequency Standard	Quartzlock	A10-B	92	12	2-Jan-2009
Signal Generator	Hewlett Packard	8644A	96	12	17-Apr-2009
Climatic Chamber	Votsch	VT4002	161	-	O/P Mon
Time Interval Analyser	Yokogawa	TA720	181	12	27-Feb-2009
High Resolution Oscilloscope	Gould	840	182	12	6-Mar-2009
Signal Generator	Hewlett Packard	8644A	199	12	29-Jul-2009
Attenuator 10dB/10W)	Trilithic	HFP-50N	454	12	22-Jul-2009
Attenuator: 6dB/10W	Trilithic	HFP-50N	476	12	22-Jul-2009
Attenuator: 10dB/20W	Narda	766-10	480	12	22-Jul-2009
Signal Generator (100kHz to 2.6GHz)	Hewlett Packard	8663A	1063	12	13-Feb-2009
Power Sensor	Hewlett Packard	8482A	1341	12	15-Oct-2008
Termination (50ohm, 15W)	Radio Spares	612-192	2416	12	1-Sep-2009
Distress Beacon RF Unit	TUV	-	2445	-	TU
Stop Clock	R.S Components	RS328 061	2674	-	TU
Beacon RF Unit	TUV	N/A	3066	-	TU
Hygrometer	Rotronic	I-1000	3068	12	26-Jun-2009
Termination (50ohm, 2W)	Omni-Spectra	3001-6100	3081	12	15-Mar-2009
Termination (50ohm, 15W)	Diamond Antenna	DL-30N	3096	12	15-Mar-2009
Termination (50ohm, 15W)	Diamond Antenna	DL-30N	3097	12	15-Mar-2009
Attenuator (20dB, 10W)	Aeroflex / Weinschel	23-20-34	3158	12	18-Jun-2009
Attenuator (3dB, 20W)	Aeroflex / Weinschel	23-3-34	3161	12	2-Jun-2009
Attenuator (3dB, 20W)	Aeroflex / Weinschel	23-3-34	3162	12	18-Jun-2009
Attenuator (3dB, 20W)	Aeroflex / Weinschel	23-3-34	3163	12	2-Jun-2009
Thermocouple Thermometer	Fluke	51	3172	12	3-Jul-2009
Thermocouple Thermometer	Fluke	51	3174	12	26-Jun-2009
Bandpass Filter	Trilithic	5BE406/35-1-AA	3205	12	1-Aug-2009
Bandpass filter	Trilithic	5BE406/35-1-AA	3206	12	1-Aug-2009
Time Interval Analyser	Yokogawa	TA720 704510	3253	12	6-Nov-2008
ScopeCorder	Yokogawa	DL750 701210	3254	12	6-Nov-2008



Product Service

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.1 Beacons - Constant Temperature Tests - continued					
Short Circuit	TUV	Short Circuit	3272	-	TU
Power Sensor	Agilent	8482A	3290	12	26-Nov-2008
Cable (1m, N type)	Rhophase	NPS-1601-1000-NPS	3350	12	22-Apr-2009
Cable (1m, N Type)	Rhophase	NPS-1601-1000-NPS	3354	12	22-Apr-2009
Cable (2m, N Type)	Rhophase	NPS-1601-2000-NPS	3357	12	22-Apr-2009
Cable (2m, N Type)	Rhophase	NPS-1601-2000-NPS	3358	12	22-Apr-2009
Cable (2m, N Type)	Rhophase	NPS-1601-2000-NPS	3359	12	22-Apr-2009
Cable (3m, N-type)	Rhophase	NPS-1601-3000-NPS	3360	12	22-Apr-2009
Timer ('Electronic Clock Timer')	R.S Components	870A	3558	-	TU
Section 2.3 Beacons - Operating Lifetime					
Power Meter	Hewlett Packard	436A	47	12	8-Jul-2009
Power Meter	Hewlett Packard	436A	83	12	13-Aug-2009
Climatic Chamber	Heraeus Votsch	VM 04/100	85	-	O/P Mon
Rubidium Frequency Standard	Quartzlock	A10-B	92	12	2-Jan-2009
Signal Generator	Hewlett Packard	8644A	96	12	17-Apr-2009
Load (50ohm, 15W)	Diamond Antenna	DL-30N	337	12	1-Sep-2009
Attenuator: 10dB/20W	Narda	766-10	480	12	22-Jul-2009
Signal Generator (100kHz to 2.6GHz)	Hewlett Packard	8663A	1063	12	13-Feb-2009
Power Sensor	Hewlett Packard	8482A	1341	12	15-Oct-2008
Stop Clock	R.S Components	RS328 061	2674	-	TU
Beacon RF Unit	TUV	N/A	3066	-	TU
Termination (50ohm, 2W)	Omni-Spectra	3001-6100	3081	12	15-Mar-2009
Termination (50ohm, 15W)	Diamond Antenna	DL-30N	3096	12	15-Mar-2009
Attenuator (20dB, 10W)	Aeroflex / Weinschel	23-20-34	3158	12	18-Jun-2009
Attenuator (3dB, 20W)	Aeroflex / Weinschel	23-3-34	3162	12	18-Jun-2009
Thermocouple Thermometer	Fluke	51	3172	12	3-Jul-2009
Bandpass Filter	Trilithic	5BE406/35-1-AA	3205	12	1-Aug-2009
Time Interval Analyser	Yokogawa	TA720 704510	3253	12	6-Nov-2008
ScopeCorder	Yokogawa	DL750 701210	3254	12	6-Nov-2008
Timer	Radio Spares	427-590	3282	-	TU
Power Sensor	Agilent	8482A	3290	12	26-Nov-2008
ESA-E Series Spectrum Analyser	Agilent	E4402B	3348	12	21-Apr-2009
Cable (1m, N Type)	Rhophase	NPS-1601-1000-NPS	3354	12	22-Apr-2009



Product Service

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.3 Beacons - Operating Lifetime - continued					
Cable (2m, N Type)	Rhophase	NPS-1601-2000-NPS	3355	12	22-Apr-2009
Cable (2m, N Type)	Rhophase	NPS-1601-2000-NPS	3357	12	22-Apr-2009
Cable (2m, N Type)	Rhophase	NPS-1601-2000-NPS	3359	12	22-Apr-2009
1m RF Cable sma(m)-sma(m)	Reynolds	262-0248-1000	3453	12	OP MON
Network Analyser	Rohde & Schwarz	ZVA 40	3548	12	16-Apr-2009
Timer ('Electronic Clock Timer')	R.S Components	870A	3558	-	TU
Section 2.4 Beacons - Satellite Qualitative Test					
Copper GRP	TUV	27cm Diameter	3537	-	TU
Section 2.2 Beacons - Thermal Shock					
Climatic Chamber	Heraeus Votsch	VMT 04/30	40	-	O/P Mon
Power Meter	Hewlett Packard	436A	47	12	8-Jul-2009
Power Meter	Hewlett Packard	436A	83	12	13-Aug-2009
Climatic Chamber	Heraeus Votsch	VM 04/100	85	-	O/P Mon
Beacon Tester	WS Technologies	BT 100S	87	-	TU
Rubidium Frequency Standard	Quartzlock	A10-B	92	12	2-Jan-2009
Signal Generator	Hewlett Packard	8644A	96	12	17-Apr-2009
Time Interval Analyser	Yokogawa	TA720	181	12	27-Feb-2009
High Resolution Oscilloscope	Gould	840	182	12	6-Mar-2009
Signal Generator	Hewlett Packard	8644A	199	12	29-Jul-2009
Load (50ohm, 15W)	Diamond Antenna	DL-30N	337	12	1-Sep-2009
Attenuator 10dB 25W	Weinschel	46-10-43	400	12	6-May-2009
Attenuator 10dB/10W	Trilithic	HFP-50N	454	12	22-Jul-2009
Attenuator (10dB, 75W)	Bird	8308-100	469	12	29-Nov-2008
Attenuator: 6dB/10W	Trilithic	HFP-50N	476	12	22-Jul-2009
Attenuator: 10dB/20W	Narda	766-10	480	12	22-Jul-2009
Signal Generator (100kHz to 2.6GHz)	Hewlett Packard	8663A	1063	12	13-Feb-2009
Power Sensor	Hewlett Packard	8482A	1341	12	15-Oct-2008
Montford 8F3	Montford	8FT CUBED	2127	12	31-Mar-2009
Temperature Chamber	Instron	906	2128	12	4-Dec-2008
Termination (50ohm, 15W)	Radio Spares	612-192	2416	12	1-Sep-2009
Distress Beacon RF Unit	TUV	-	2445	-	TU
Stop Clock	R.S Components	RS328 061	2674	-	TU
Beacon RF Unit	TUV	N/A	3066	-	TU
Hygrometer	Rotronic	I-1000	3068	12	26-Jun-2009
Termination (50ohm, 6W)	Micronde	R404613	3074	12	15-Mar-2009
Termination (50ohm, 1W)	Suhner	-	3080	12	15-Mar-2009
Termination (50ohm, 2W)	Omni-Spectra	3001-6100	3081	12	15-Mar-2009
Termination (50ohm, 15W)	Diamond Antenna	DL-30N	3096	12	15-Mar-2009



Product Service

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.2 Beacons - Thermal Shock - continued					
Termination (50ohm, 15W)	Diamond Antenna	DL-30N	3097	12	15-Mar-2009
Attenuator (20dB, 10W)	Aeroflex / Weinschel	23-20-34	3158	12	18-Jun-2009
Attenuator (20dB, 10W)	Aeroflex / Weinschel	23-20-34	3160	12	2-Jun-2009
Attenuator (3dB, 20W)	Aeroflex / Weinschel	23-3-34	3161	12	2-Jun-2009
Attenuator (3dB, 20W)	Aeroflex / Weinschel	23-3-34	3162	12	18-Jun-2009
Attenuator (3dB, 20W)	Aeroflex / Weinschel	23-3-34	3163	12	2-Jun-2009
Thermocouple Thermometer	Fluke	51	3172	12	3-Jul-2009
Thermocouple Thermometer	Fluke	51	3174	12	26-Jun-2009
Bandpass Filter	Trilithic	5BE406/35-1-AA	3205	12	1-Aug-2009
Bandpass filter	Trilithic	5BE406/35-1-AA	3206	12	1-Aug-2009
Bandpass Filter	Trilithic	5BE406/35-1-AA	3207	12	1-Aug-2009
Time Interval Analyser	Yokogawa	TA720 704510	3253	12	6-Nov-2008
ScopeCorder	Yokogawa	DL750 701210	3254	12	6-Nov-2008
Timer	Radio Spares	427-590	3282	-	TU
Power Sensor	Agilent	8482A	3290	12	26-Nov-2008
Cable (1m, N Type)	Rhophase	NPS-1601-1000-NPS	3353	12	22-Apr-2009
Cable (1m, N Type)	Rhophase	NPS-1601-1000-NPS	3354	12	22-Apr-2009
Cable (2m, N Type)	Rhophase	NPS-1601-2000-NPS	3355	12	22-Apr-2009
Cable (2m, N Type)	Rhophase	NPS-1601-2000-NPS	3356	12	22-Apr-2009
Cable (2m, N Type)	Rhophase	NPS-1601-2000-NPS	3357	12	22-Apr-2009
Cable (2m, N Type)	Rhophase	NPS-1601-2000-NPS	3358	12	22-Apr-2009
Cable (2m, N Type)	Rhophase	NPS-1601-2000-NPS	3359	12	22-Apr-2009
Cable (3m, N-type)	Rhophase	NPS-1601-3000-NPS	3360	12	22-Apr-2009
Rubidium Frequency Standard	Symmetrcom	8040C	3490	12	21-Feb-2009
5 metre Tape Measure	Stanley	33-719	3549	-	TU

TU – Traceability Unscheduled

OP MON – Output Monitored with Calibrated Equipment



Product Service

SECTION 4

PHOTOGRAPHS

4.1 PHOTOGRAPHS OF EQUIPMENT UNDER TEST (EUT)



Front of EUT (50 Ω -Conducted Mode)



Rear of EUT (50Ω-Conducted Mode)



EUT (Radiated Mode) Configuration 7



Product Service

SECTION 5

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



Product Service

5.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



This report relates only to the actual item/items tested.

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation.

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