

No	Temp.	Slope	Sigma	P406	Short term	P121.5	
2401	-21,4					22,4	
2431	-21,4					22,4	
2461	-21,4					22,4	
2491	-21,4					22,3	
2521	-21,4					22,4	
2551	-21,4					22,3	
2581	-21,4					22,4	
2611	-21,4					22,3	
2641	-21,4					22,4	
2671	-21,4					22,3	
2701	-21,4					22,4	
2731	-21,4					22,3	
2761	-21,4					22,4	
2791	-21,4					22,4	
2821	-21,4					22,4	
2851	-21,4					22,4	
2881	-21,4					22,3	
2911	-21,4					22,4	
2941	-21,4					22,4	
2971	-21,4					22,4	
3001	-21,4					22,4	
3031	-21,4					22,4	
3061	-21,4					22,4	
3091	-21,4					22,4	
3121	-21,4					22,3	
3151	-21,4					22,4	
3181	-21,4					22,3	
3211	-21,4					22,4	
3241	-21,4					22,3	
3271	-21,4					22,4	
3301	-21,4					22,3	
3331	-21,4					22,4	
3361	-21,4					22,3	
3391	-21,4					22,4	
3421	-21,4					22,4	
3451	-21,4					22,4	48h
3481	-21,4					22,4	
3511	-21,4					22,4	
3541	-21,4					22,4	
3571	-21,4					22,4	
3601	-21,4					22,4	
3631	-21,4					22,3	
3661	-21,4					22,4	
3691	-21,4					22,4	
3721	-21,4					22,4	
3751	-21,4					22,4	
3781	-21,4					22,4	
3811	-21,4					22,3	
3841	-21,5					22,4	
3871	-21,4					22,4	
3901	-21,4					22,4	

No	Temp.	Slope	Sigma	P406	Short term	P121.5
3931	-21,4					22,4
3961	-21,4					22,4
3991	-21,4					22,4
4021	-21,5					22,4
4051	-21,5					22,4
4081	-21,4					22,4
4111	-21,4					22,4
4141	-21,4					22,4
4171	-21,4					22,4
4201	-21,4					22,4
4231	-21,4					22,4
4261	-21,4					22,4
4291	-21,5					22,3
4321	-21,4					22,4
4351	-21,5					22,4
4381	-21,4					22,4
4411	-21,4					22,4
4441	-21,5					22,4
4471	-21,5					22,4
4501	-21,5					22,4
4531	-21,5					22,4
4561	-21,4					22,4
4591	-21,4					22,4
4621	-21,4					22,4
4651	-21,4					22,4
4681	-21,4					22,3
4711	-21,4					22,4
4741	-21,4					22,3
4771	-21,5					22,4
4801	-21,5					22,4
4831	-21,4					22,4
4861	-21,4					22,4
4891	-21,5					22,4
4921	-21,4					22,4
4951	-21,5					22,3
4981	-21,5					22,4
5011	-21,4					22,4
5041	-21,4					22,4
5071	-21,5					22,3
5101	-21,5					22,4
5131	-21,4					22,4
5161	-21,4					22,4
5191	-21,4					22,4
5221	-21,5					22,4
5251	-21,5					22,4
5281	-21,5					22,4
5311	-21,4					22,4
5341	-21,5					22,4
5371	-21,5					22,4
5401	-21,4					22,4
5431	-21,4					22,4

No	Temp.	Slope	Sigma	P406	Short term	P121.5
5431	-21,5					22,4
5461	-21,5					22,3
5491	-21,5					22,4
5521	-21,5					22,4
5551	-21,4					22,4
5581	-21,4					22,3
5611	-21,5					22,4
5641	-21,5					22,4
5671	-21,5					22,4
5701	-21,5					22,4
5731	-21,4					22,4
5761	-21,5					22,3
5791	-21,5					22,4
5821	-21,5					22,4
5851	-21,4					22,4
5881	-21,5					22,4
5911	-21,5					22,4
5941	-21,4					22,4
5971	-21,5					22,4
6001	-21,5					22,4
6031	-21,5					22,4
6061	-21,5					22,4
6091	-21,5					22,4
6121	-21,5					22,4
6151	-21,4					22,1
6181	-21,5		121,5 / 243 MHz	85,5 hours		21,5
6211	-21,4					19,7
6241	-21,4					19,4
6271	-21,4					16,0
6301	-21,5					16,6
6331	-21,4					14,2

Beacon message during 24 hours of Operating Lifetime Test :

FFFE2F8C9EAF0F0F2B80348B18758E414D34

FFFE2F8C9EAF0F0F2B80348B18758E01401E

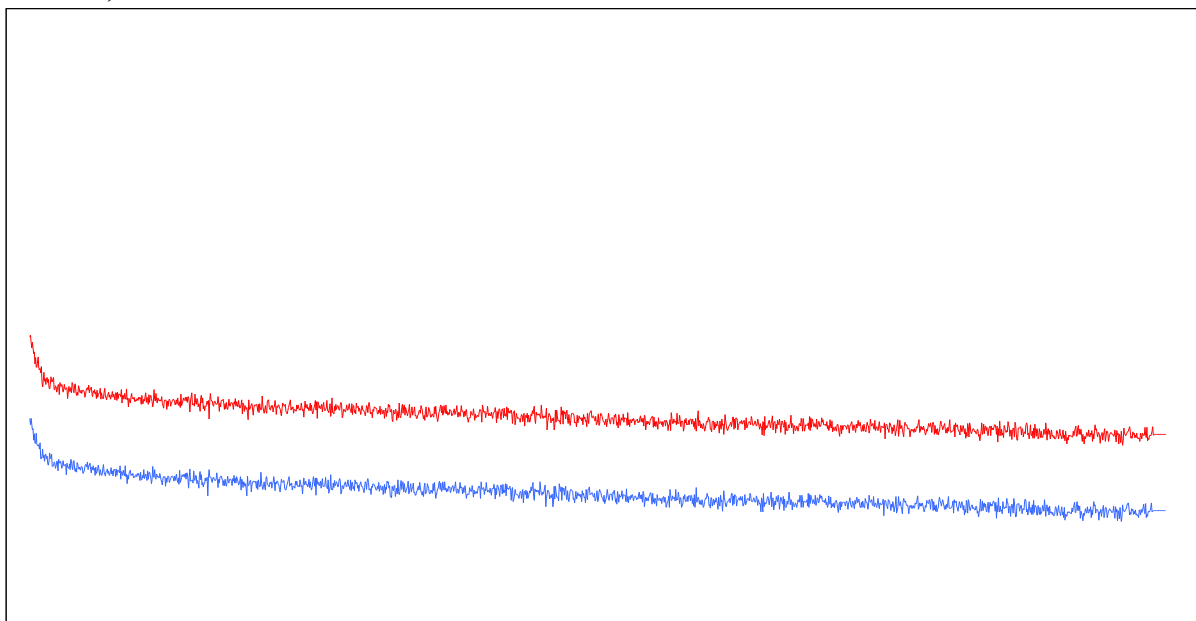
FFFE2F8C9EAF0F0F2B80348B18758EC1682B

FFFE2F8C9EAF0F0F2B80348B18758E4133A2

FFFE2F8C9EAF0F0F2B80348B18758E015527

Frequency variation

406027,805 kHz



406027,776 kHz

— Initial tracing — Smoothed tracing

LIFE TEST AT -20 °C

Manufacturer : Ameri-King Corp.

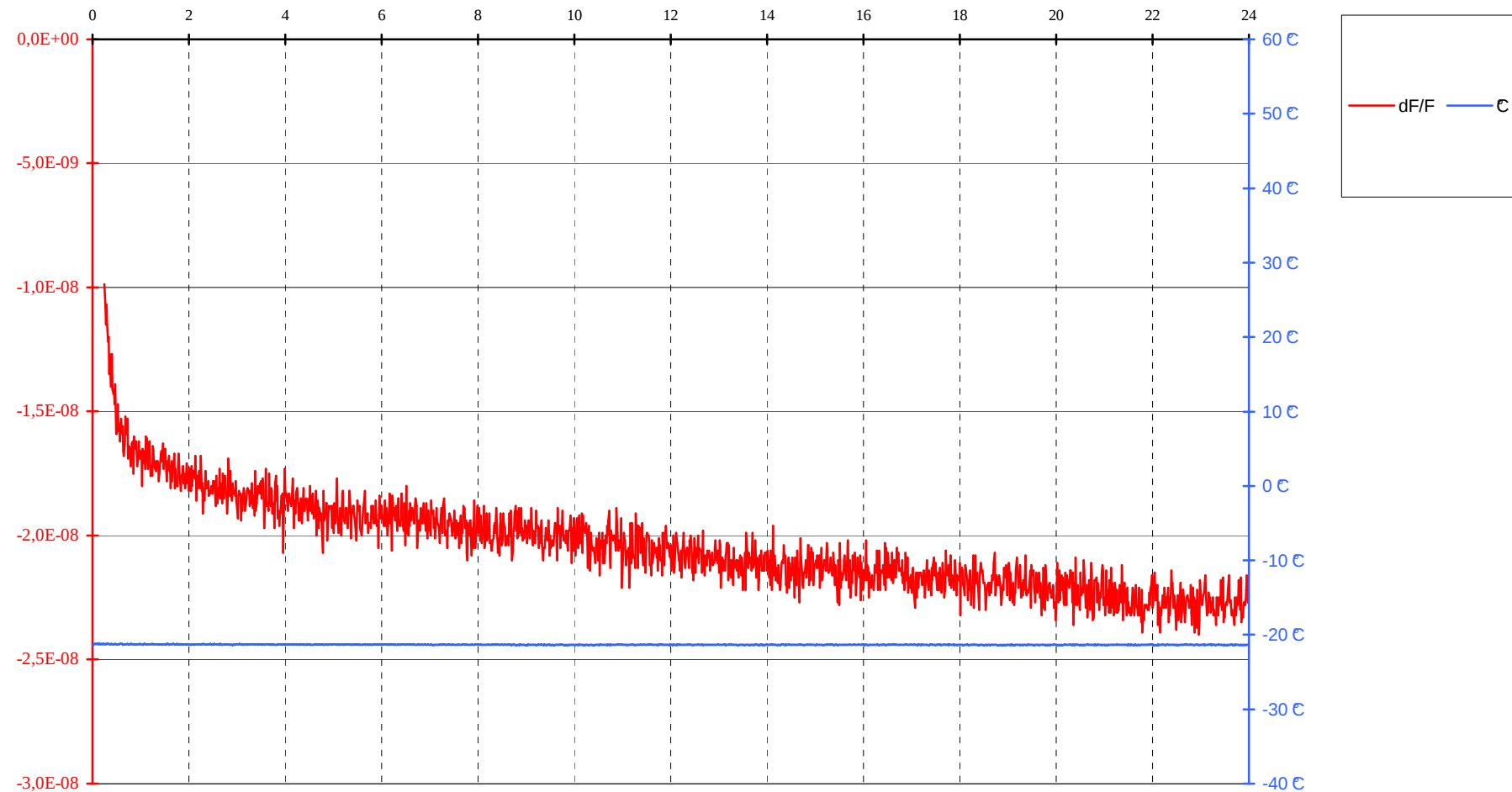
Model : AK-451 ()Series (AF)(AP)(S)(PLB)

Number : C/S 09 (But n° 1) (Saft L0263XC)

Date : 7 July 2006

Time : 17:31:37

FREQUENCY VARIATION



LIFE TEST AT -20 °C

Manufacturer : Ameri-King Corp.

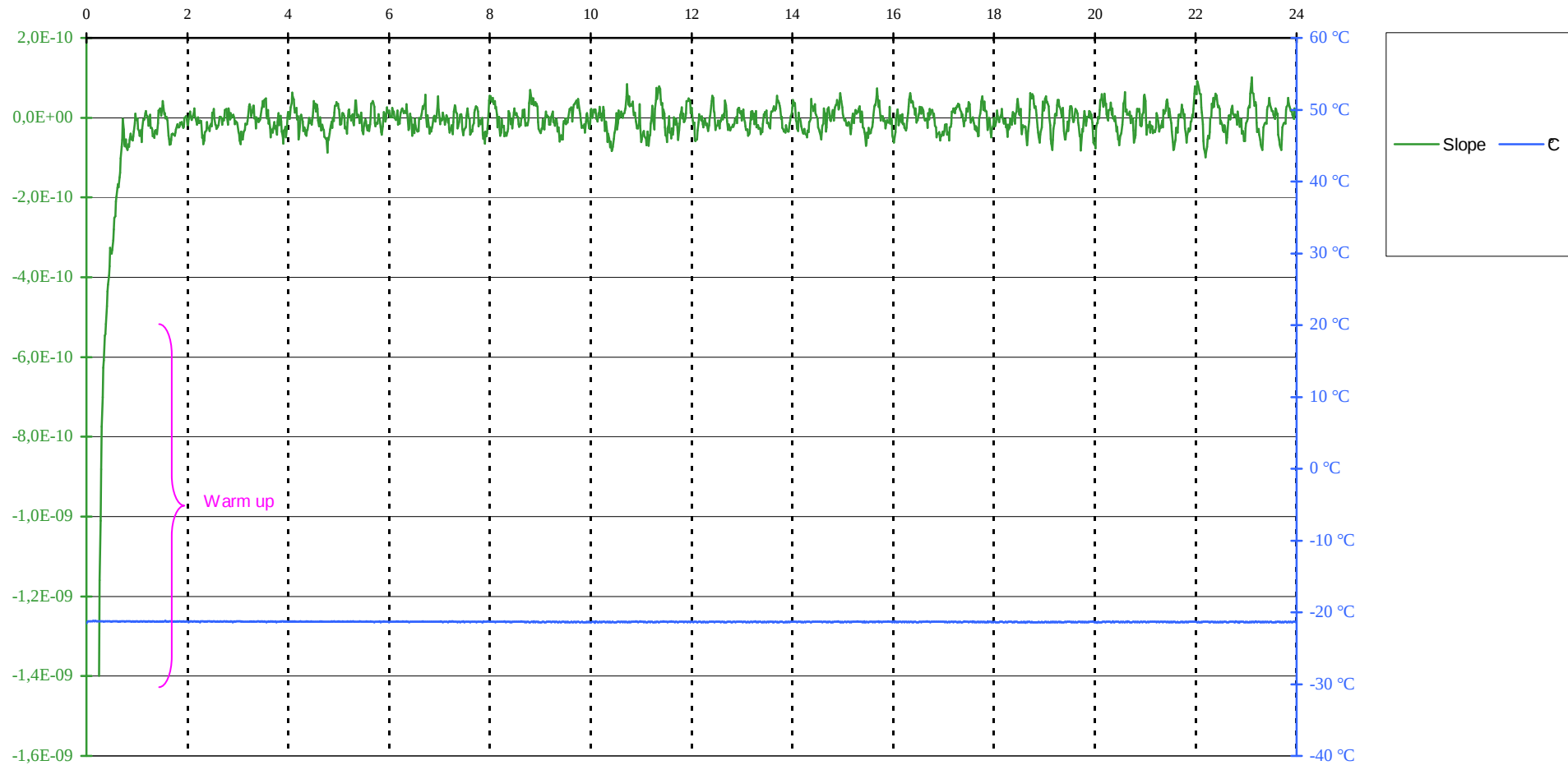
Model : AK-451 ()Series (AF)(AP)(S)(PLB)

Number : C/S 09 (But n° 1) (Saft L0263XC)

Date : 7 July 2006

Time : 17:31:37

MEDIUM TERM STABILITY : MEAN SLOPE /mn (-1,0E-9 to 1,0E-9)



LIFE TEST AT -20 °C

Manufacturer : Ameri-King Corp.

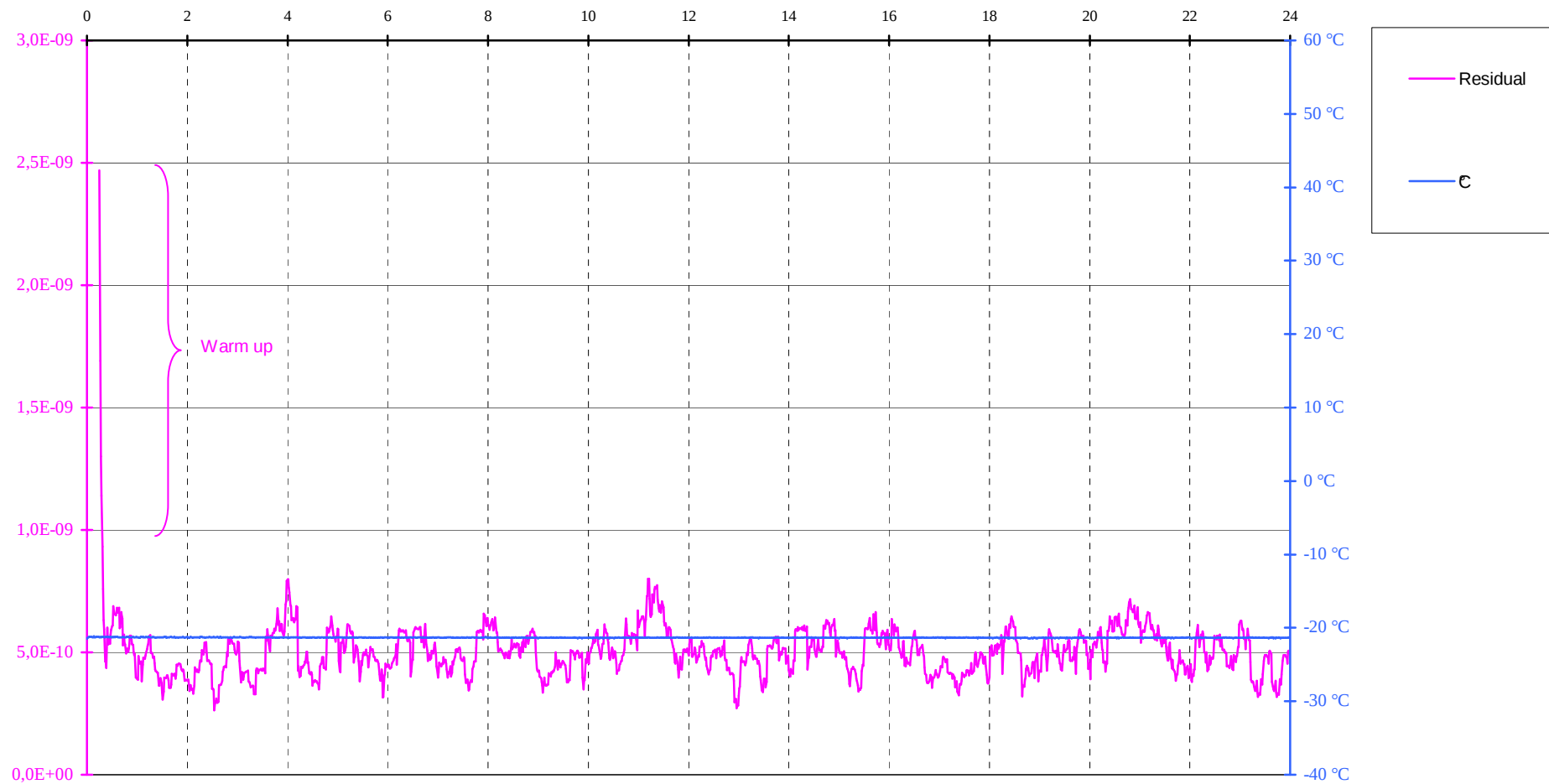
Model : AK-451 ()Series (AF)(AP)(S)(PLB)

Number : C/S 09 (But n° 1) (Saft L0263XC)

Date : 7 July 2006

Time : 17:31:37

MEDIUM TERM STABILITY : RESIDUAL ($\leq 3,0E-9$)



LIFE TEST AT -20 °C

Manufacturer : Ameri-King Corp.

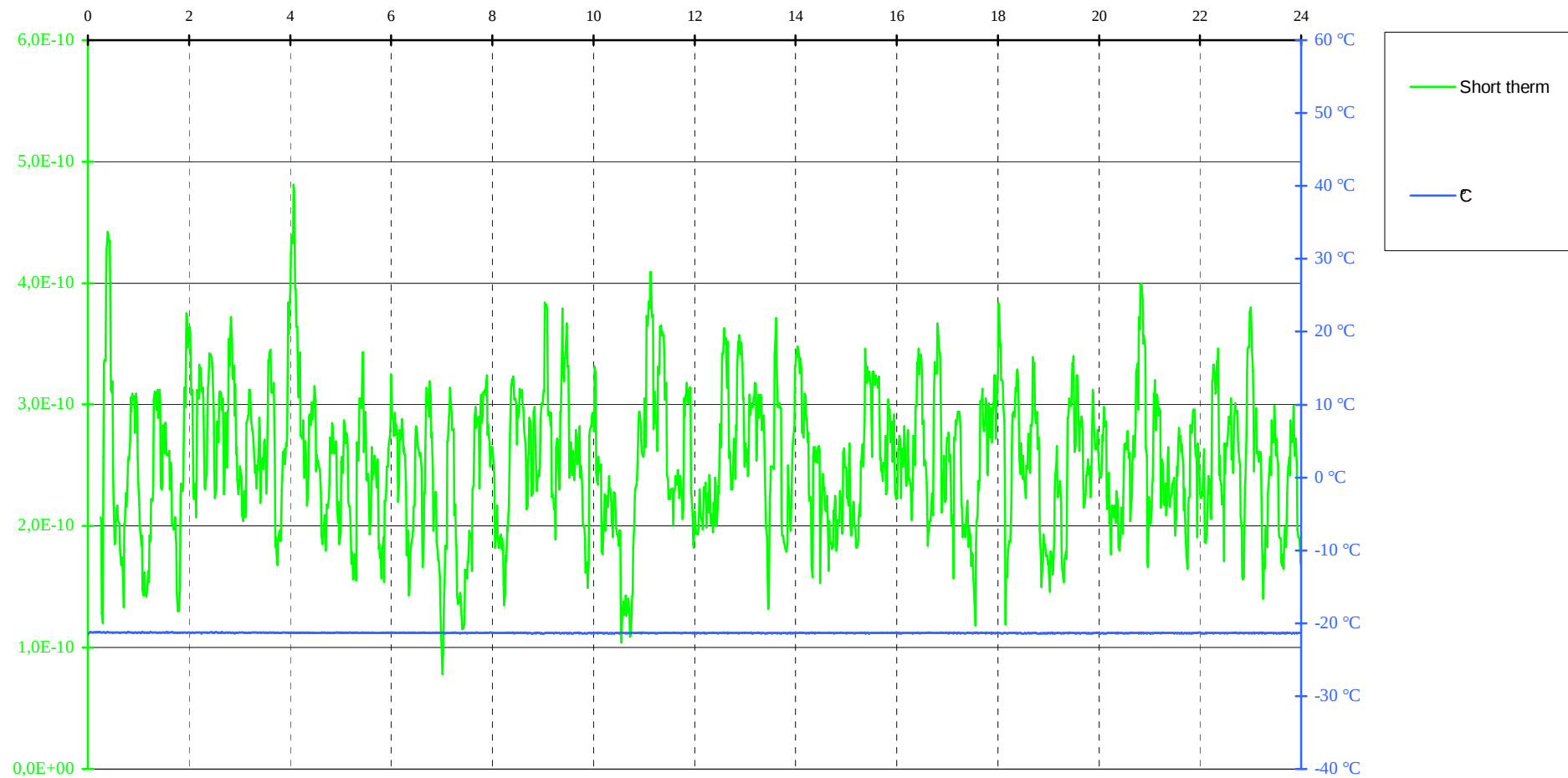
Model : AK-451 ()Series (AF)(AP)(S)(PLB)

Number : C/S 09 (But n° 1) (Saft L0263XC)

Date : 7 July 2006

Time : 17:31:37

SHORT TERM STABILITY /100 mS ($\leq 2,0E-9$)



LIFE TEST AT -20 °C

Manufacturer : Ameri-King Corp.

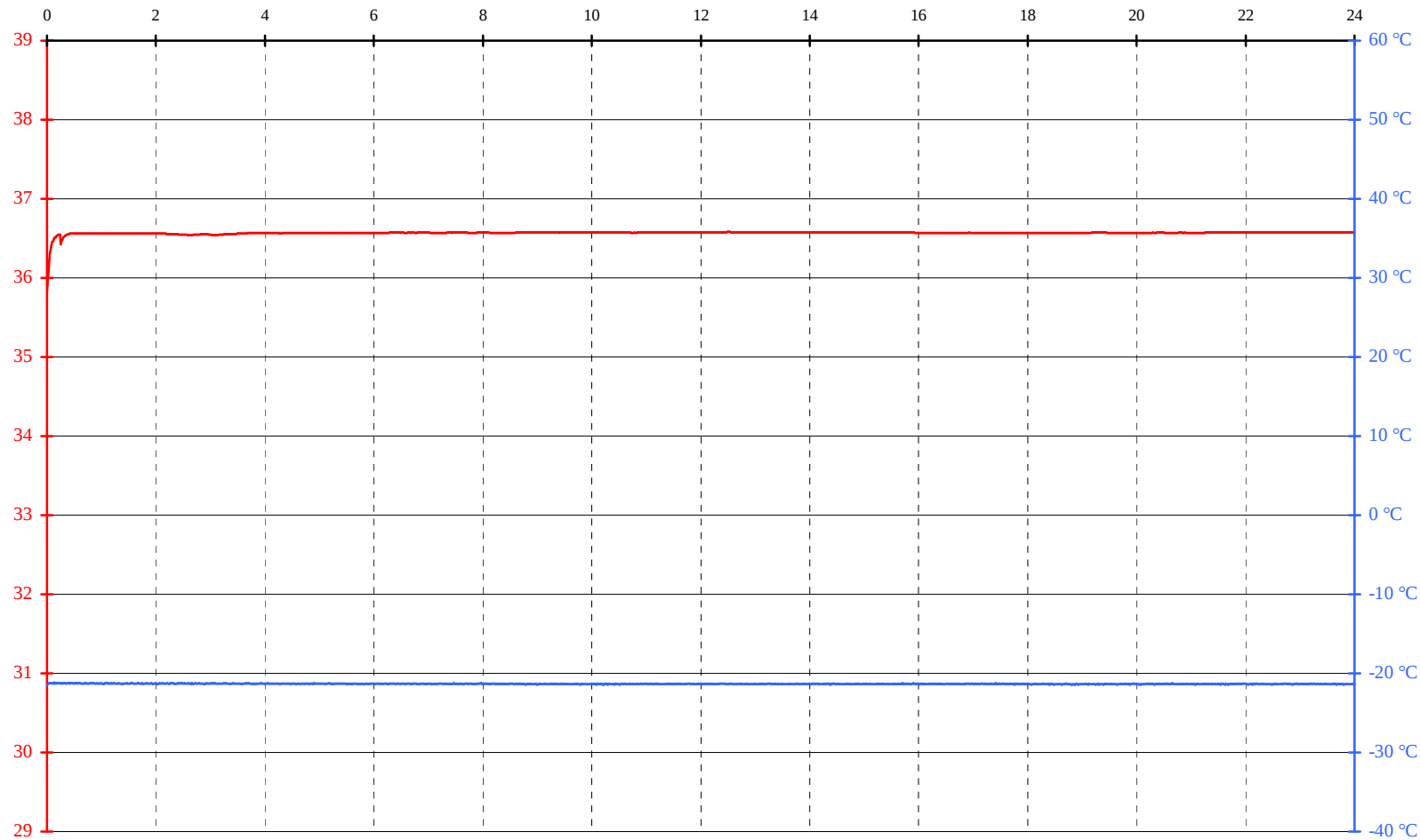
Model : AK-451 ()Series (AF)(AP)(S)(PLB)

Número : C/S 09 (But n° 1) (Saft L0263XC)

Date : 7 July 2006

Time : 17:31:37

OUTPUT POWER (35 to 39 dBm)



LIFE TEST AT -20 °C



Manufacturer : Ameri-King Corp.

Model : AK-451 ()Series (AF)(AP)(S)(PLB)

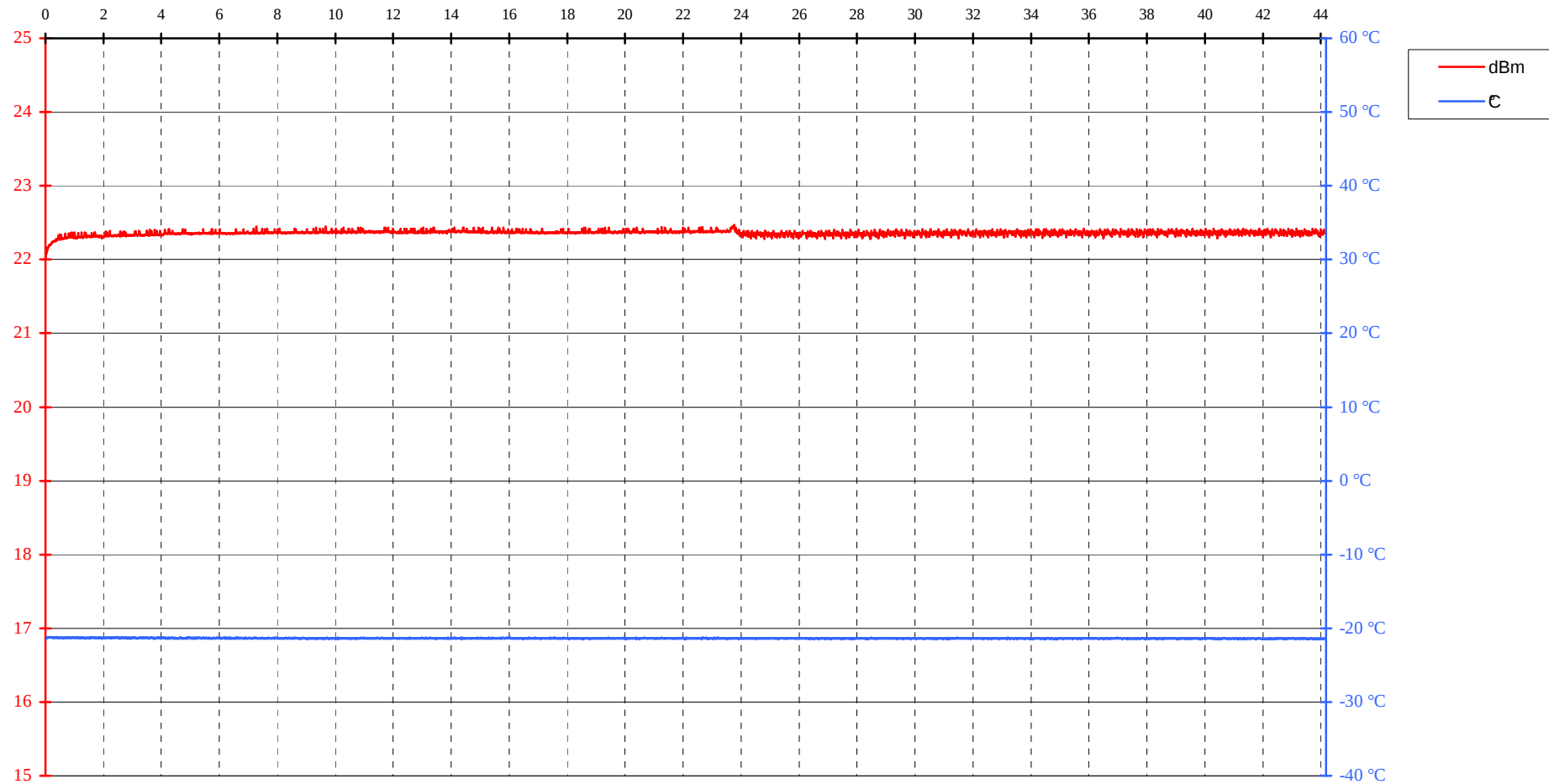
Numero : C/S 09 (But n° 1) (Saft L0263XC)

Ref : E6567-CS Annex C (Bat Saft LiSO2)

Date : 7 July 2006

Time : 17:31:37

121,5 MHz OUTPUT POWER



LIFE TEST AT -20 °C



Manufacturer : Ameri-King Corp.

Model : AK-451 ()Series (AF)(AP)(S)(PLB)

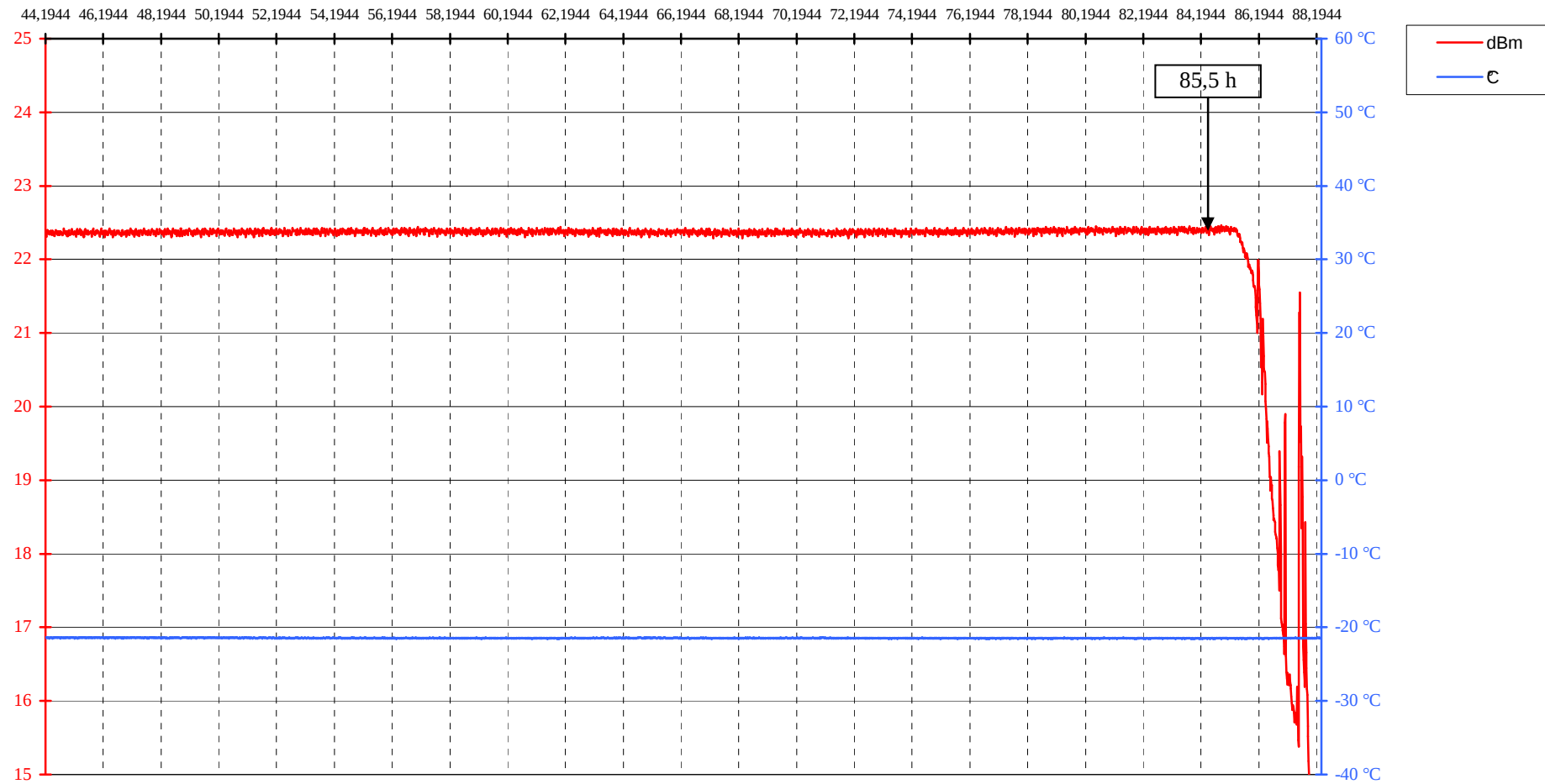
Numero : C/S 09 (But n° 1) (Saft L0263XC)

Ref : E6567-CS Annex C (Bat Saft LiSO2)

Date : 7 July 2006

Time : 17:31:37

121,5 MHz OUTPUT POWER



INTESPACE reference :
E6557-CS Annex D (Bat Saft LiMnO₂)

ANNEX D

C/S Alternative Batteries Test Report

BEACON :

Manufacturer	:	Ameri-King Corp.
Type	:	ELT & PLB
Model	:	AK-451 ()Series (AF)(AP)(S)(PLB)

BATTERY:

Chemistry	:	Li-MnO ₂
Manufacturer & model n°	:	SAFT LM33600
Size & number of cells	:	D / 4

1 - ADMINISTRATION

1.1. WORK ORDER

Manufacturer : Ameri-King Corp.
Address : 17881 Sampson Ln. Huntington Beach,
CA 92647, USA

Represented by : Mr Keith VAN

1.2. INTESPACE TEST CENTER

The test operations have been conducted by : Gerard PEYROU

1.3. SCHEDULE

Start of test: 26 june 2006
End of test : 11 July 2006

1.4. WORK REFERENCE : **E6557-CS Annex D (Bat Saft LiMnO₂)**

1.5. EQUIPMENT UNDER TEST

The results from this test report concern only the equipment
here after referenced :

- Commercial designation :
- Model : AK-451 ()Series (AF)(AP)(S)(PLB)
- Sérial number: C/S 09 (But n°1) (Saft LM33600) only for Operating Lifetime Test
C/S 07 (But n°2) (Saft LM33600) for other C/S Alternative Batteries Tests

Note : BUT n° 1, 2 and 3 are strictly sames beacons

2 - TEST FACILITIES

- ARGOS - COSPAS/SARSAT Certification Test Bench.
- Toulouse CNES MCC .

3 - STANDARDS AND TEST PROCEDURES APPLICABLE

COSPAS-SARSAT standards :

- "C/S T. 001- Issue 4 - Revision 7 - November 2005 "
- "C/S T. 007- Issue 4 - November 2005" § 6.3.1

INTESPACE Radio Beacon Test Procédures :

- | | |
|--------------------------------------|------------------------|
| - " COSPAS-SARSAT Certification | Réf. ITS : 572 AP/QA |
| - " 406 MHz Characteristic Antenna T | Réf. ITS : 566 AP/QA |
| - " Radio Beacon Test Report " | Réf. ITS : 579 AP/QA-f |

Note : Before the Operating Lifetime at the Minimum Temperature Test the battery pack have not been submitted to the capacity reduction.

The Operating Lifetime at the Minimum Temperature has been determined by reducing the manufacturer calculation of battery discharge during 5 years beacon stowage to the total of the operating lifetime at minimum temperature test result.

4 - RESULTS

See the following pages :

- Summary of C/S Alternative Batteries test results
- C/S Appendix A Annex F : Summary of Satellite Qualitative Test Results with Saft LO263XC Battery pack
- Test results : data and graphs

PARAMÈTRES TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			T _{min.} -20°C (±3)	T _{amb.} 22°C (±3)	T _{max.} 55°C (±3)	
1 - POWER OUTPUT						
o transmitter power output	35 - 39	dBm	35,9	36,3	35,9	
o Power output rise time	< 5	ms	0,05	0,06	0,05	Graphs p, 17, 20 and 23
o power output 1 ms before burst	< -10 dBm	√ *	√	√	√	Graphs pages 11 to 13 of E6567-CS Annex D
2 - DIGITAL MESSAGE						
	Bits number					
o bit sync	1-15	15 bits "1"	√	√	√	Data and graphs pages 15 to 23 of E6567-CS Annex D
o frame sync	16-24	9 bits (000101111)	√	√	√	
o format flag	25	1 bit	√	1	1	
o protocol flag	26	1 bit	√	0	0	
o identification/position code	27-85	59 bits	√	√	√	
o BCH code	86-106	21 bits	√	√	√	
o emerg. code/nat. use/supplem. data	107-112	6 bits	data bits	110101	110101	
o additional data/BCH (if applicable)	113-144	32 bits	√	√	√	
o position error (if applicable)	< 5	km	0,076 km	0,076 km	0,076 km	

PARAMÈTRES TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			T _{min.} -20°C (±3)	T _{amb.} 22°C (±3)	T _{max.} 55°C (±3)	
3 - DIGITAL MESSAGE GENERATOR						Data and graphs pages 15 to 23
o repetition rate T _R :						
average T _R =	48,5 - 51,5	seconds	50,11	50,11	50,11	of E6567-CS Annex D
minimum T _R =	47,5≤T _R ≤48,0	seconds	48,00	48,00	48,00	
maximum T _R =	52,0≤T _R ≤52,5	seconds	52,01	52,01	52,01	
standard deviation =	0,5 - 2,0		1,56	1,56	1,56	
o bit rate						
minimum f _b =	396	bits/sec.	399,77	399,76	399,74	
maximum f _b =	404	bits/sec.	399,81	399,82	399,80	
o total transmission time :						
short message =	435.6 - 444.4	ms				
long message =	514.8 - 525.2	ms	520,39	520,34	520,33	
o unmodulated carrier						
minimum T ₁ =	158,4	ms	159,85	159,81	159,77	
maximum T ₁ =	161,6	ms	159,87	159,82	159,79	
o first burst delay	> 47,5	seconds	> 50	> 50	> 50	

PARAMÈTRES TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			T _{min.} -20°C (±3)	T _{amb.} 22°C (±3)	T _{max.} 55°C (±3)	
4 - MODULATION						Data and graphs pages 15 to 23 of E6567-CS Annex D
o biphasé-L		√	√	√	√	
o rise time	50 - 250	microsec.	60	80	80	
o fall time	50 - 250	microsec.	110	110	90	
o phase deviation : positive	+ (1.0 to 1.2)	radians	+ 1,12	+ 1,13	+ 1,18	
o phase deviation : negative	- (1.0 to 1.2)	radians	- 1,16	- 1,20	- 1,18	
o symmetry measurement	≤ 0.05		4,01E-06	+ 0,0201	+ 0,0120	
5 - 406 MHz TRANSMITTED FREQUENCY						Data pages 15, 18 and 21 of E6567-CS Annex D
o nominal value	as specified in C/S T.001 and C/S T.012	MHz	406,0278010	406,0277529	406,0277156	
o short term stability	≤ 2 x 10 ⁻⁹	/100 ms	3,29E-10	2,34E-10	2,53E-10	
o medium term stability . slope	(-1 to +1) x 10 ⁻⁹	/minute	-5,16E-12	3,32E-11	-2,28E-10	
. residual frequency variation	≤ 3 x 10 ⁻⁹		7,83E-10	9,36E-10	5,14E-10	

Table C2-3 : SUMMARY OF 406 MHz BEACON TEST RESULTS (AMERI-KING AK-451 ()Series ELT and PLB Soft LiMnO₂)

PARAMÈTRES TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS	COMMENTS
9 - THERMAL SHOCK¹ (30° C change)				Data and graphs pages 24 to 31 of E6567-CS Annex D
o Soak temperature :		°C	Tsoak = 23	
o Measurement temperature :		°C	TMeas = -10	
the following parameters are to be met within 15 minutes of beacon and maintained for 2 hours				
o Transmitted frequency :				
- nominal value	as specified in C/S T.001 and C/S T.012	MHz	406,027772 / 406,027798	
- short term stability	$\leq 2 \times 10^{-9}$	/100 ms	$< 4,00\text{E-}10$	
- medium term stability :				
. slope	$(-2 \text{ to } +2) \times 10^{-9}$	/minute	$< 1,4\text{E-}09$	
. residual frequency variation	$\leq 3 \times 10^{-9}$		$< 1,2\text{E-}9$	
o Transmitted power output	35 - 39	dBm	36,3 / 36,5	
o Digital message	must be correct	√	√	

1 Attach graphs depicting test results.

Table C2-3 : SUMMARY OF 406 MHz BEACON TEST RESULTS (AMERI-KING AK-451 ()Series ELT and PLB Soft LiMnO₂)

PARAMÈTRES TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS	COMMENTS
10 - OPERATING LIFETIME AT MINIMUM TEMPERATURE¹ o Duration o Transmitted frequency : - nominal value - short term stability - medium term stability . slope .residual frequency variation o Transmitted power output o Digital message	> 24 as specified in C/S T.001 and C/S T.012 $\leq 2 \times 10^{-9}$ (-1 to +1) x 10⁻⁹ $\leq 3 \times 10^{-9}$ 35 - 39 must be corect	hours MHz /100 ms /minute dBm √	24 hours for 406 MHz and around 82 hours (97 hrs - 14,86 hrs) for 121,5/243 MHz 406,027762 / 406,027779 < 5E-10 -8E-10 / 1E-10 < 2E-9 36,2 / 36,4 √	Data and graphs pages 32 to 45 of E6567-CS Annex D
14 - SATELLITE QUALITATIVE TESTS² (results provided)	15 Hex ID provided by LUT and position within 5 km 80% of time	√	√	Table F-A7 page 11 of E6567-CS Annex D

- 1 Attach graphs depicting test results.
- 2 Attach a satellite qualitative test summary report (Appendix A to Annex F) for each test configuration.

APPENDIX A TO ANNEX F

SATELLITE QUALITATIVE TEST SUMMARY REPORT

Table F-A.7 : BUT on Ground Plane Conf B2

Date of the Test : 03/07/06 to 07/07/06
Time of the Test : 05/07/06 17:30 to 06/07/2006 02:06 = 8,6 hours
Beacon Model : AK-451- () Series ELT &PLB BUT 2 (S/N 007)
Antenna Manufacturer & Model : Ameri-King Portable Antenna AK 451017-4 S (Portable)
Beacon 15 Hex ID : 193D5 E1E1E FFBFF
Actual location of the test beacon : Latitude : 43,559 North Longitude : 1,479 East
Beacon or Antenna test configuration (e.g. on dry ground, floating in water, etc) : on ground plane conf. B.2
Battery Type SAFT / LM33600 (LiMnO₂)
LUT ID : 2271



Satellite ID	Satellite Pass Number	TIME OF Closest Approach (TCA)	Cross Track Angle	15 Hex ID Provided by LUT	Doppler Location		Location Error (km)
					Lat	Long	
6	59370	05/07/06 18:47	19,7	193D5 E1E1E FFBFF	43,582 N	1,475 E	2,58
7	42336	05/07/06 18:50	19,7	193D5 E1E1E FFBFF	43,563 N	1,486 E	0,72
6	59371	05/07/06 20:26	3,4	193D5 E1E1E FFBFF	43,575 N	1,495 E	2,20
9	20944	05/07/06 20:57	7,6	193D5 E1E1E FFBFF	43,566 N	1,478 E	0,78
6	59372	05/07/06 22:07	14,7	193D5 E1E1E FFBFF	43,581 N	1,467 E	2,63
9	20945	05/07/06 22:37	10,2	193D5 E1E1E FFBFF	43,562 N	1,483 E	0,46
10	5803	06/07/06 00:37	17,0	193D5 E1E1E FFBFF	43,551 N	1,483 E	0,95
8	29824	06/07/06 02:06	18,5	193D5 E1E1E FFBFF	43,559 N	1,484 E	0,40

$$\text{Ratio of successful solutions} = \frac{\text{number of Doppler solutions within 5 Km with } 1^\circ < \text{CTA} < 21^\circ}{\text{number of satellites passes over test duration with } 1^\circ < \text{CTA} < 21^\circ} \times 100 = \underline{\underline{100\%}}$$



Ref : E6557-CS ANNEX D (Bat Saft LiMnO2)

TRANSMITTER OUTPUT POWER RISE TIME TEST RESULT ON

Ameri-King Corp.

AK-451 ()Series (AF)(AP)(S)(PLB)

N° C/S 07 (But n°2) (Saft LM33600)

(1 ms before 10 % of the burst)

at -20° C, 22° C and 55° C

Output Power Risettime at -20°C**CF : 406,028 MHz****Output Power Risettime (1 ms before the burst) : 35,33 dBm****SP : 0 KHz****Rb : 1 KHz****10 dB/div.****St : 0,05 S**

Output Power Risettime at 22°C

CF : 406,028 MHz

Output Power Risettime (1 ms before the burst) : 34,91 dBm

SP : 0 KHz



Rb : 1 KHz

10 dB/div.

St : 0,05 S

Output Power Risetime at 55°C

CF : 406,028 MHz

Output Power Risetime (1 ms before the burst) : 34,97 dBm

SP : 0 KHz



Rb : 1 KHz

10 dB/div.

St : 0,05 S

CERTIFICATION TEST RESULTS ON
Ameri-King Corp.
AK-451 ()Series (AF)(AP)(S)(PLB)
N° C/S 07 (But n°2) (Saft LM33600)
at -20° C, 22° C and 55° C

Certification Test at -20°C

Date of test : 11-juil-06

Manufacturer : Ameri-King

Beacon Type : AK-451 ()Series (AF)(AP)(S)(PL

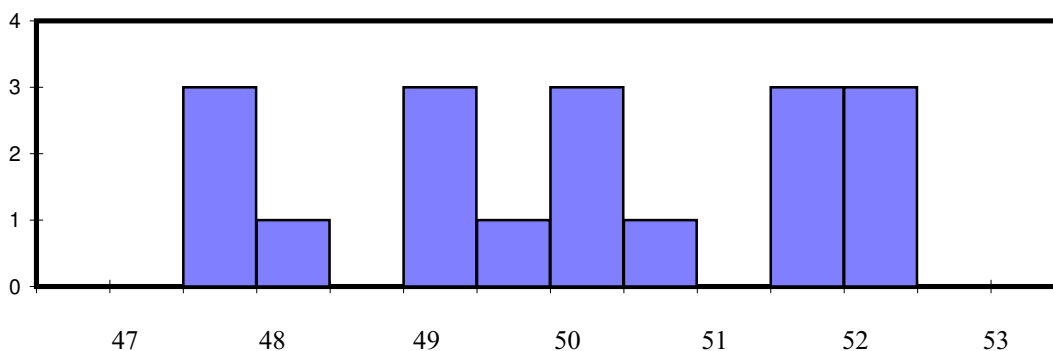
Number : C/S 07 (But n°2)

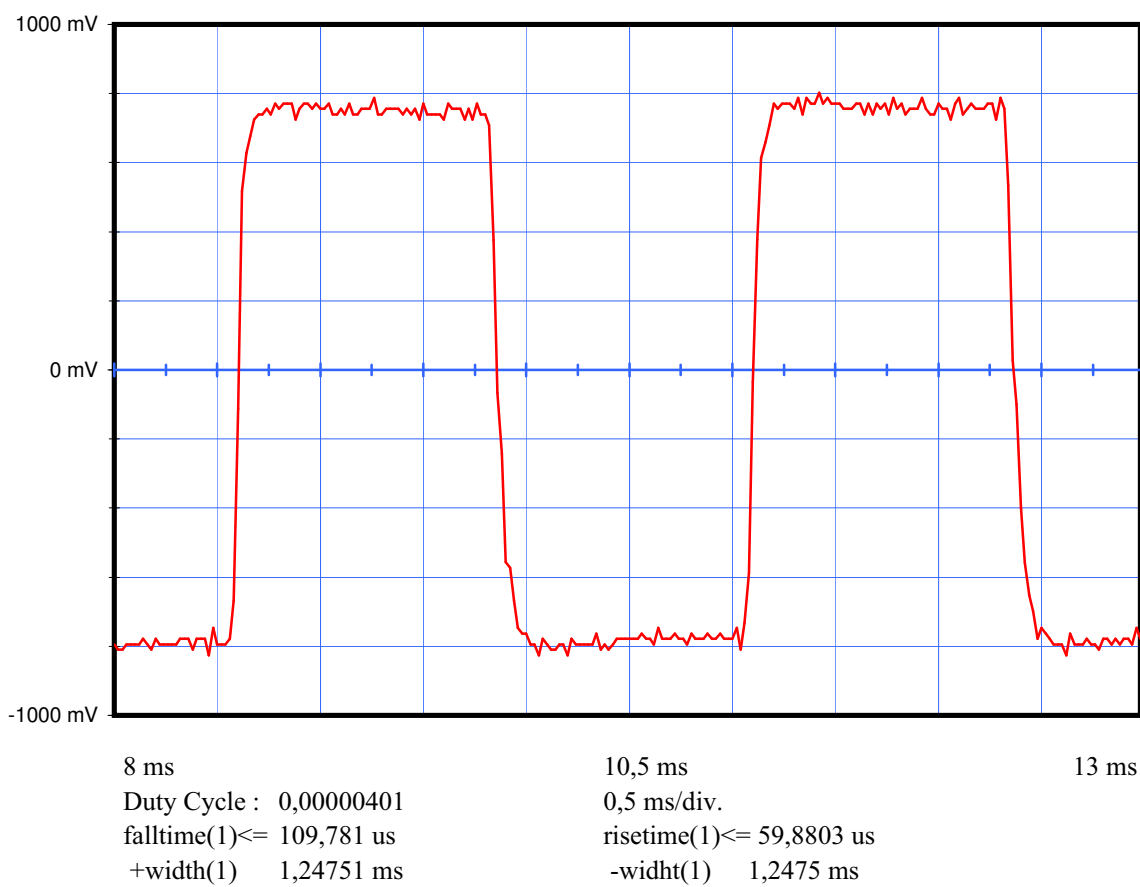
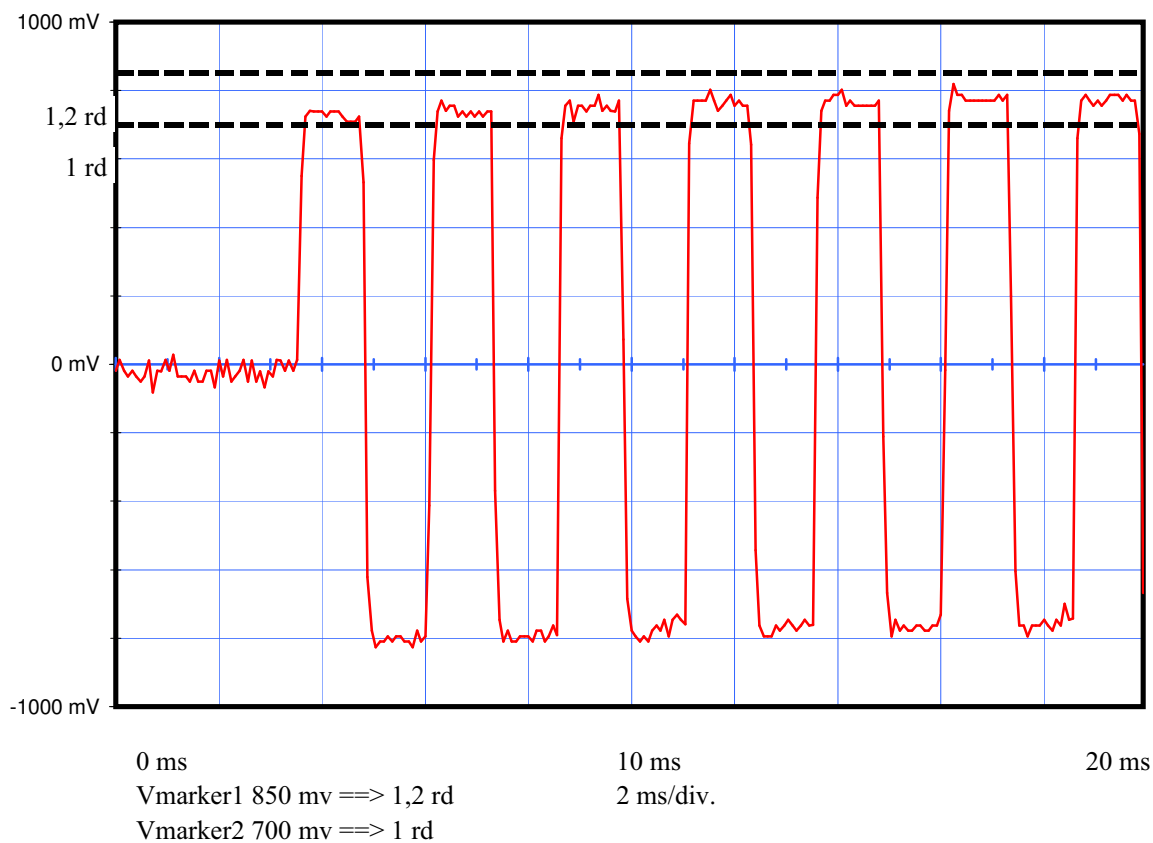
Message

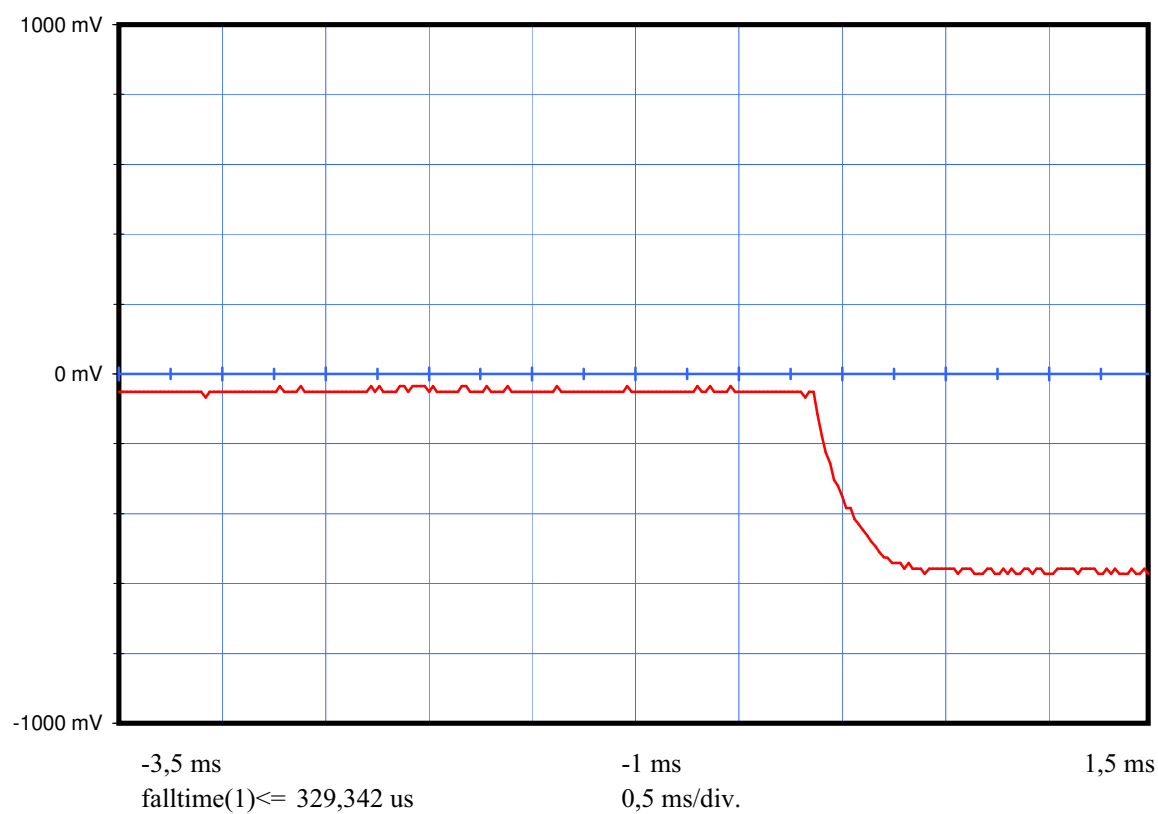
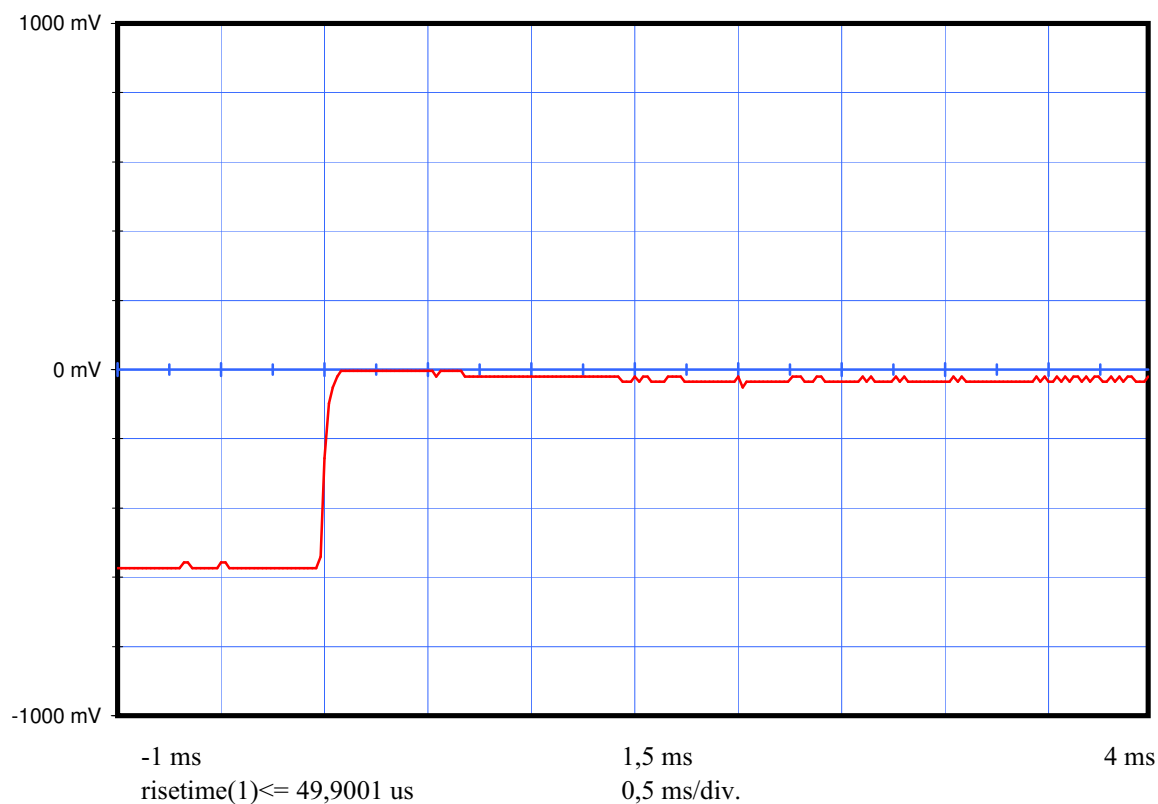
Message received		FFFE2F8C9EAF0F0F2B80348B18758E01401E
Format Flag	25	1
Protocol flag	26	0
Ident./Position code	27-85	0
Country Code/Country	27-36	201 / ALBANIA
Protocol Code : U/Std-Nat	37-39/37-40	1110
Protocol Code Used	37-39/37-40	Test-Standard Location
Identification Data	40-85/41-64/41-58	
Identification Used		0
Calculated BCH1	25-85	122C61
Encoded BCH1	86-106	122C61
Homing	112	1
Em.cod/nat.use/supp.data	107-112	110101
Encod pos data	111	0
Fixed Data "1"	108	1 OK
Calculated BCH2	107-132	01E
Encoded BCH2	133-144	01E
Latitude position		North 43° 33' 32"
Longitude position		East 1° 28' 44"
Delta position		0,076 km

Electrical and other parameters

CW preamble	ms	158,4 <	< 161,6	159,86
Total transmission time	ms	514,8 <	< 525,2	520,39
Modulation frequency	Hz	396 <	< 404	399,79
Phase deviation : total	rd		<=2,40	2,28
Phase deviation : positive	rd	1,00 <	< 1,20	1,12
Phase deviation : negative	rd	-1,20 <	< -1,00	-1,16
Symmetry measurement	%		<=5 %	0,00
Nominal frequency : F2	Hz			406027801,04
Short term2				2,53E-10
Short term3				3,29E-10
Slope				-5,16E-12
Residual				7,83E-10
406 MHz power output	dBm			35,9
Homing frequency	MHz			121,50
121,5 MHz power output	dBm			22,3
Soak temperature	°C			-20,4
Extra feature				G-Switch







Certification Test at 22°C

Date of test : 11-juil-2006

Manufacturer : Ameri-King

Beacon Type : AK-451 ()Series (AF)(AP)(S)(PL

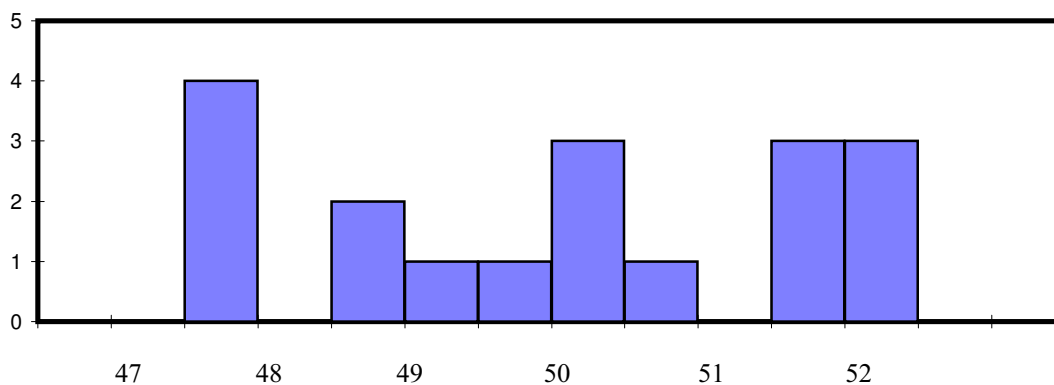
Number : C/S 07 (But n°2)

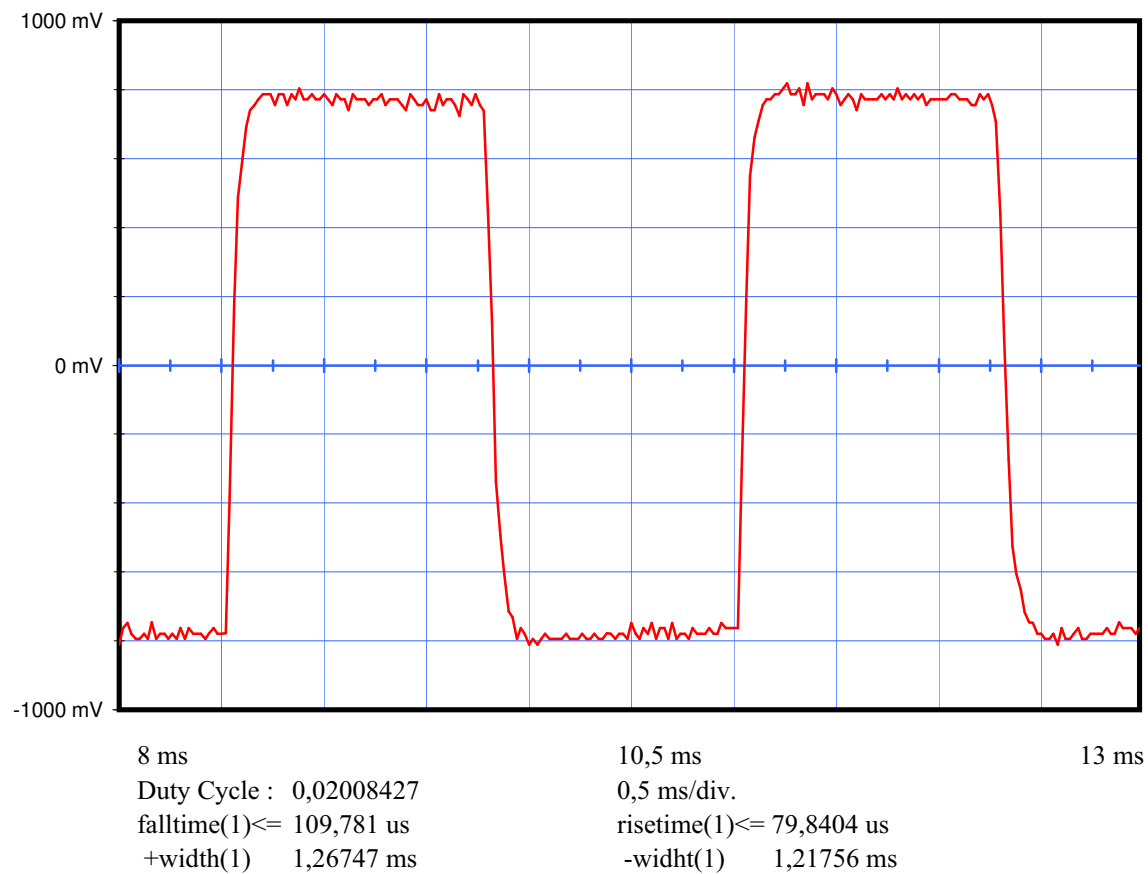
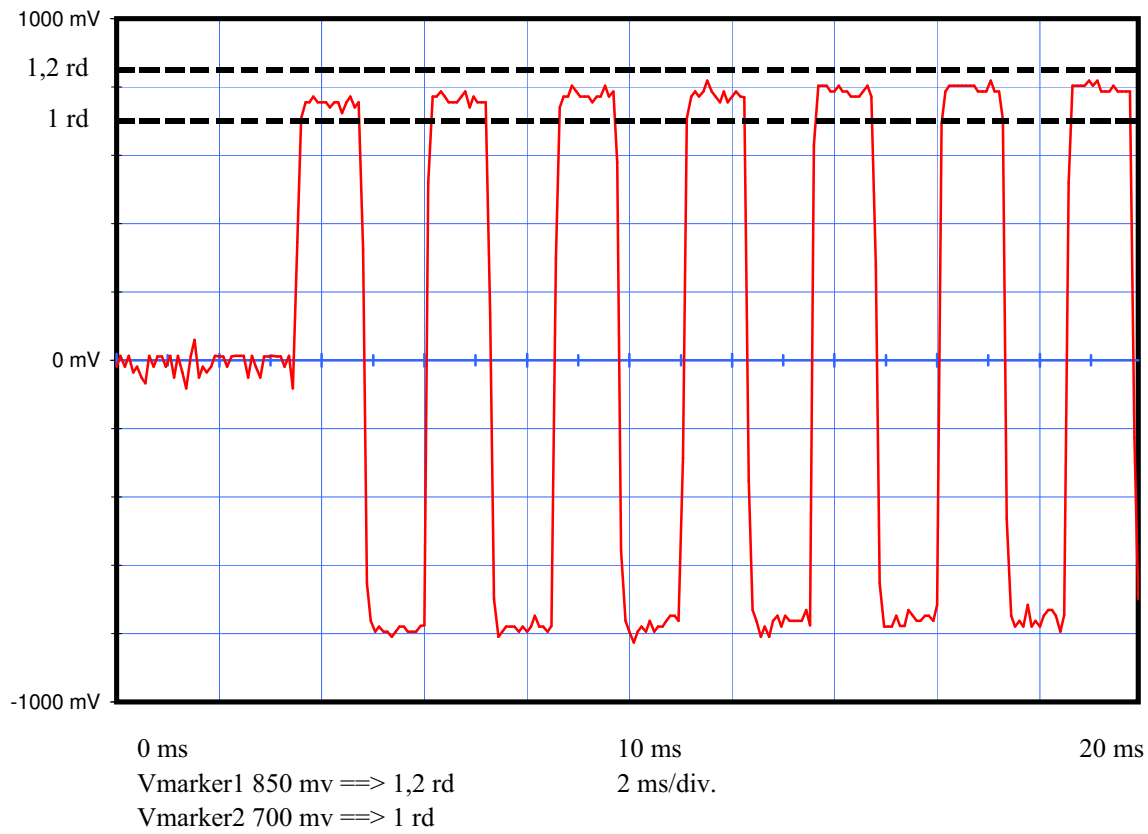
Message

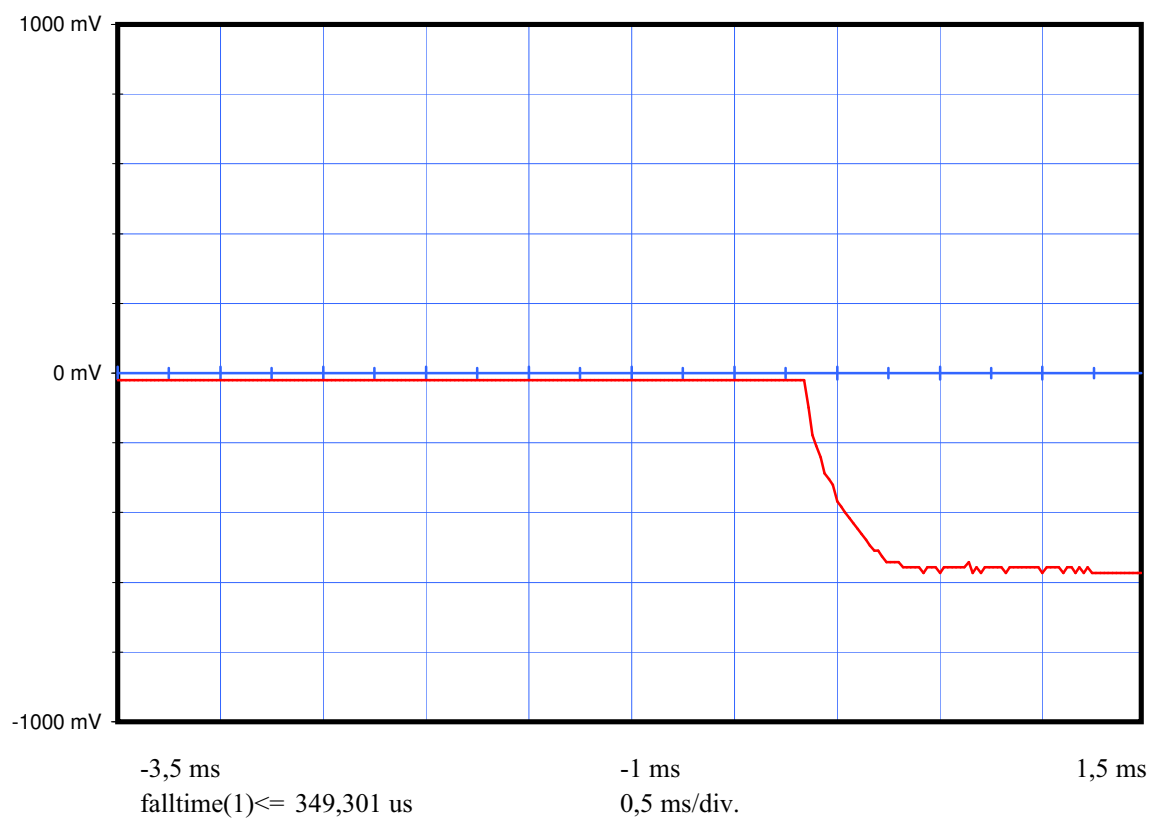
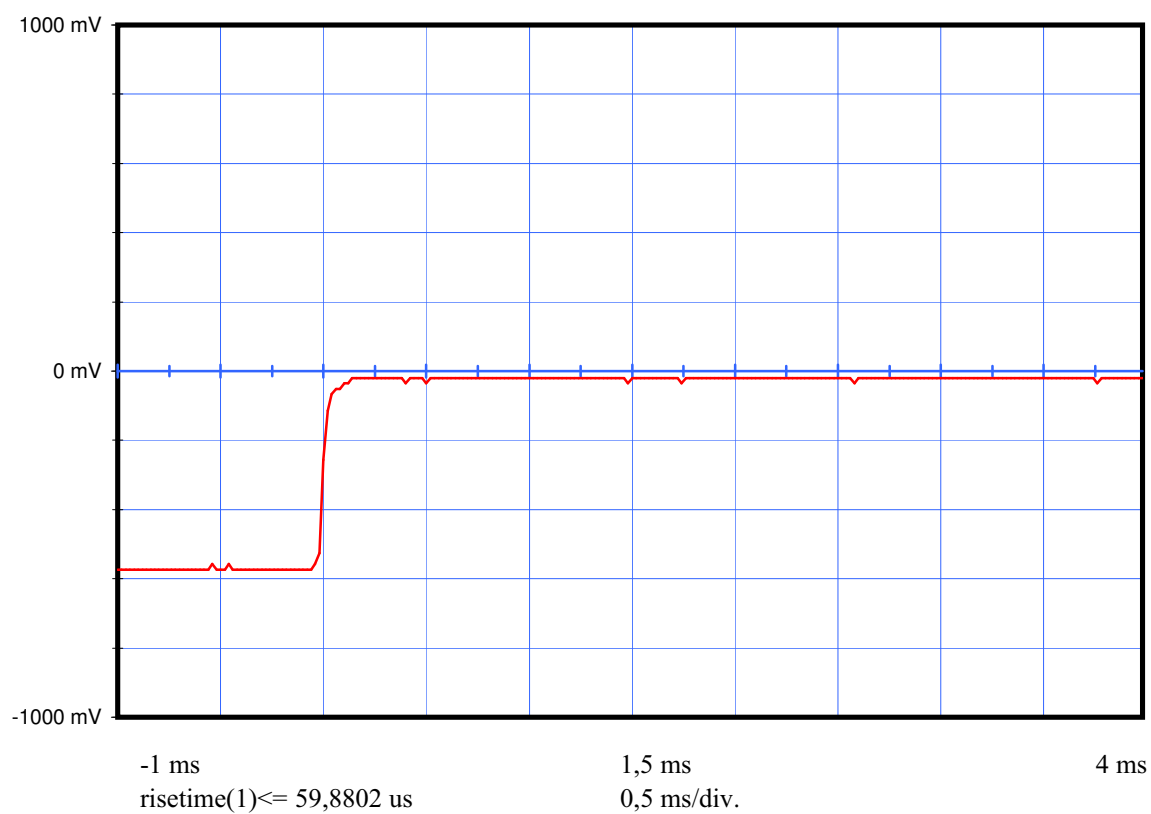
Message received		FFFE2F8C9EAF0F0F2B80348B18758E01401E
Format Flag	25	1
Protocol flag	26	0
Ident./Position code	27-85	0
Country Code/Country	27-36	201 / ALBANIA
Protocol Code : U/Std-Nat	37-39/37-40	1110
Protocol Code Used	37-39/37-40	Test-Standard Location
Identification Data	40-85/41-64/41-58	
Identification Used		0
Calculated BCH1	25-85	122C61
Encoded BCH1	86-106	122C61
Homing	112	1
Em.cod/nat.use/supp.data	107-112	110101
Encod pos data	111	0
Fixed Data "1"	108	1 OK
Calculated BCH2	107-132	01E
Encoded BCH2	133-144	01E
Latitude position		North 43° 33' 32"
Longitude position		East 1° 28' 44"
Delta position		0,076 km

Electrical and other parameters

CW preamble	ms	158,4 < < 161,6	159,82
Total transmission time	ms	514,8 < < 525,2	520,34
Modulation frequency	Hz	396 < < 404	399,79
Phase deviation : total	rd	<=2,40	2,33
Phase deviation : positive	rd	1,00 < < 1,20	1,13
Phase deviation : negative	rd	-1,20 < < -1,00	-1,20
Symmetry measurement	%	<=5 %	2,01
Nominal frequency : F2	Hz		406027752,91
Short term2			2,35E-10
Short term3			2,34E-10
Slope			3,32E-11
Residual			9,36E-10
406 MHz power output	dBm		36,3
Homing frequency	MHz		121,50
121,5 MHz power output	dBm		23,1
Soak temperature	°C		23,6
Extra feature			G-Switch







Certification Test at 55°C

Date of test : 12-juil-2006

Manufacturer : Ameri-King

Beacon Type : AK-451 ()Series (AF)(AP)(S)(PL

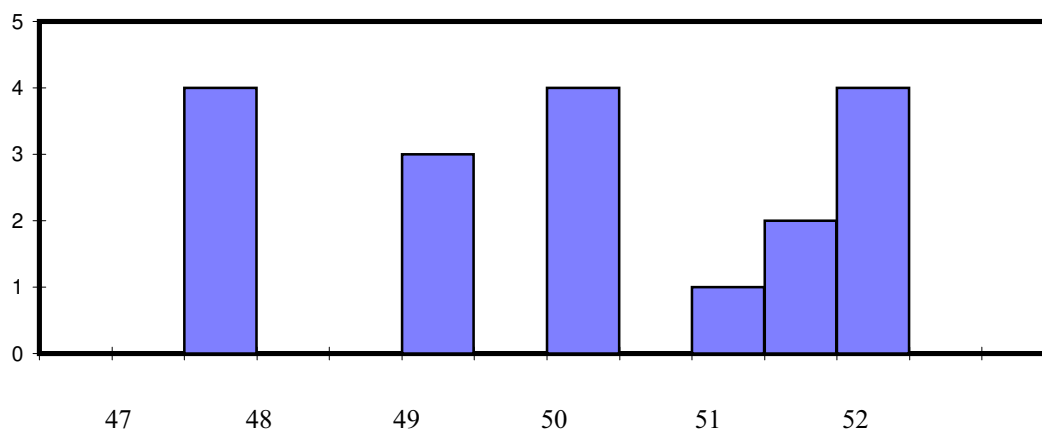
Number : C/S 07 (But n°2)

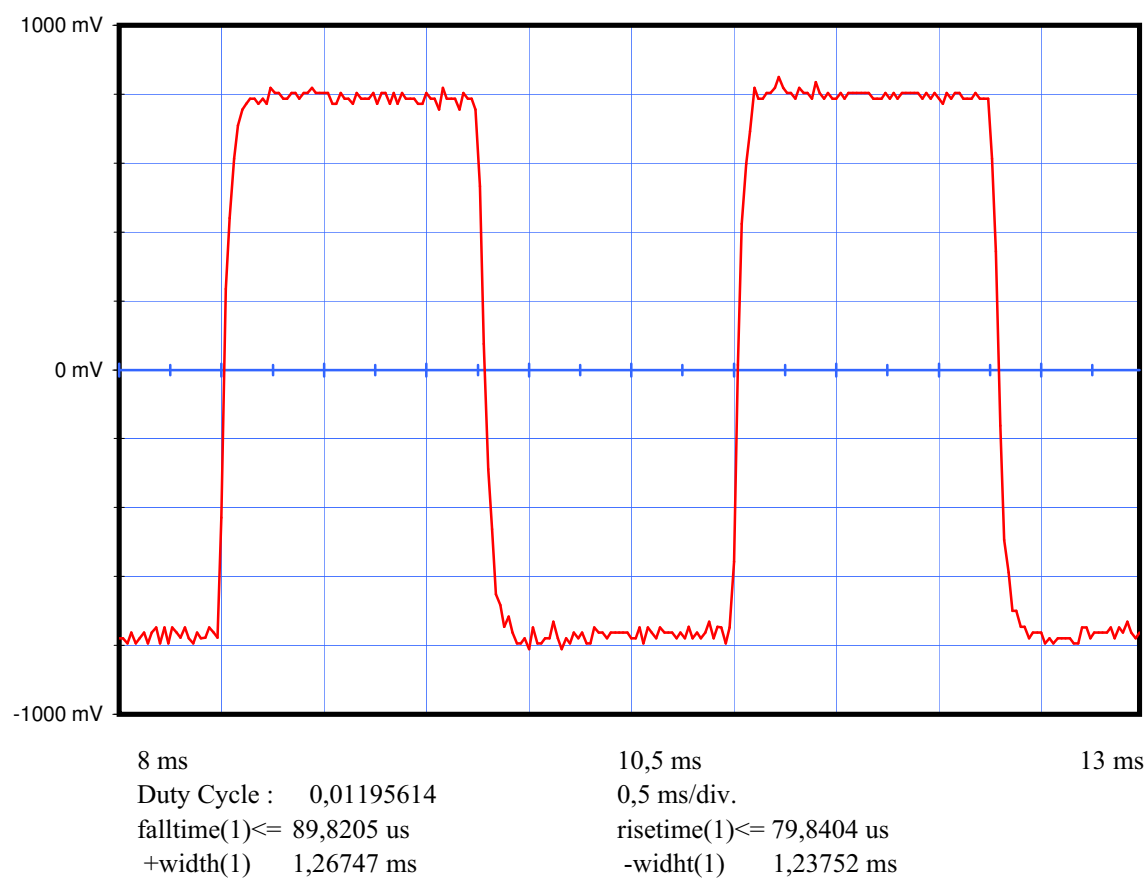
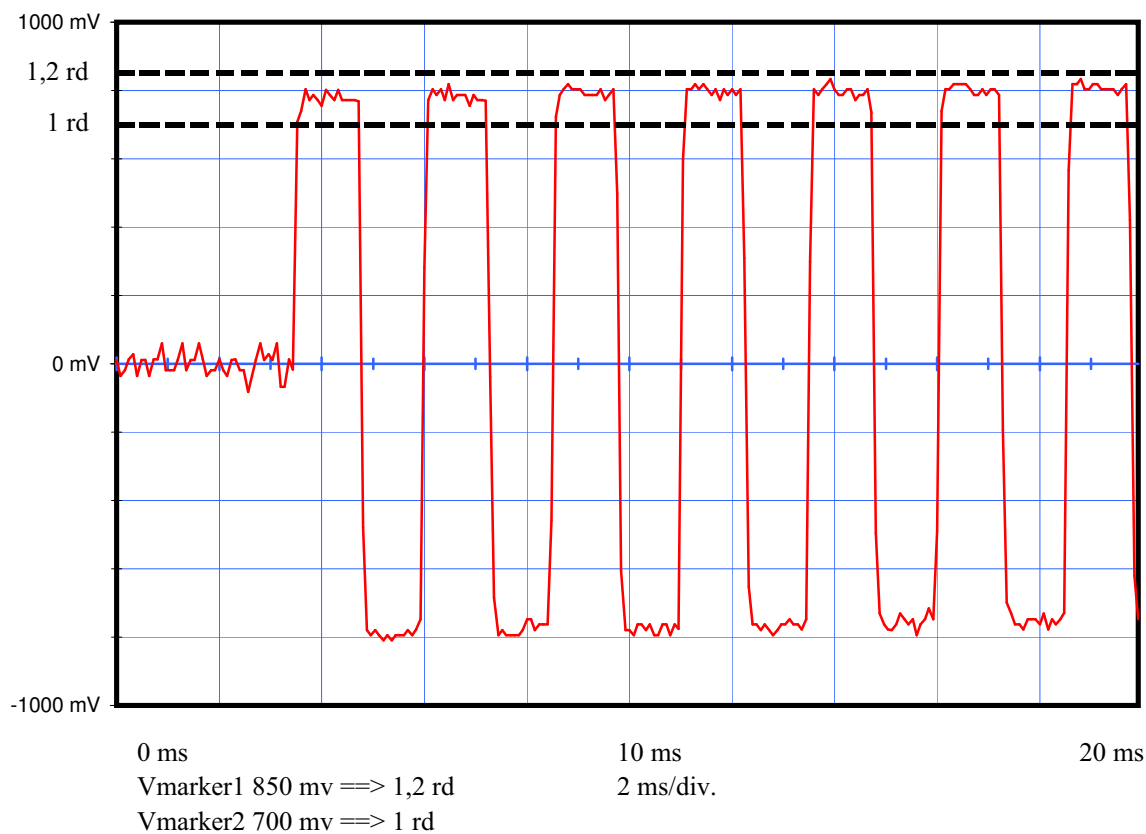
Message

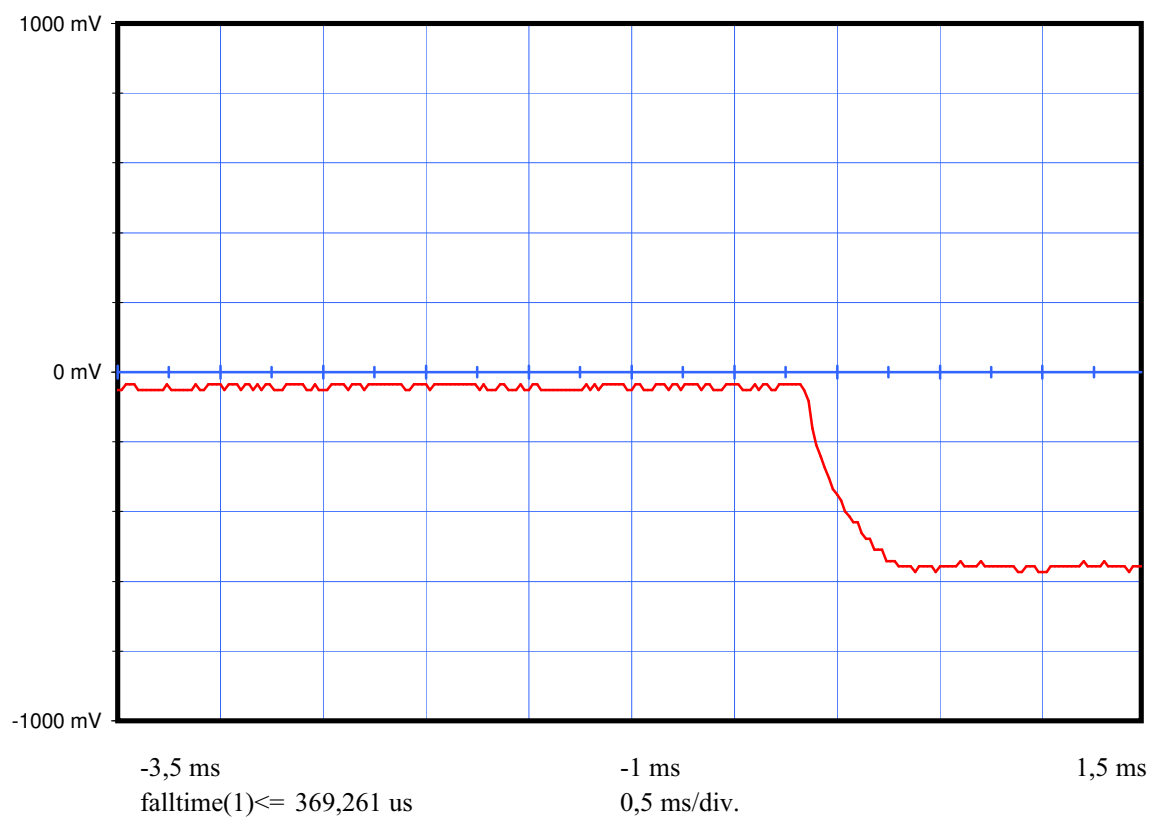
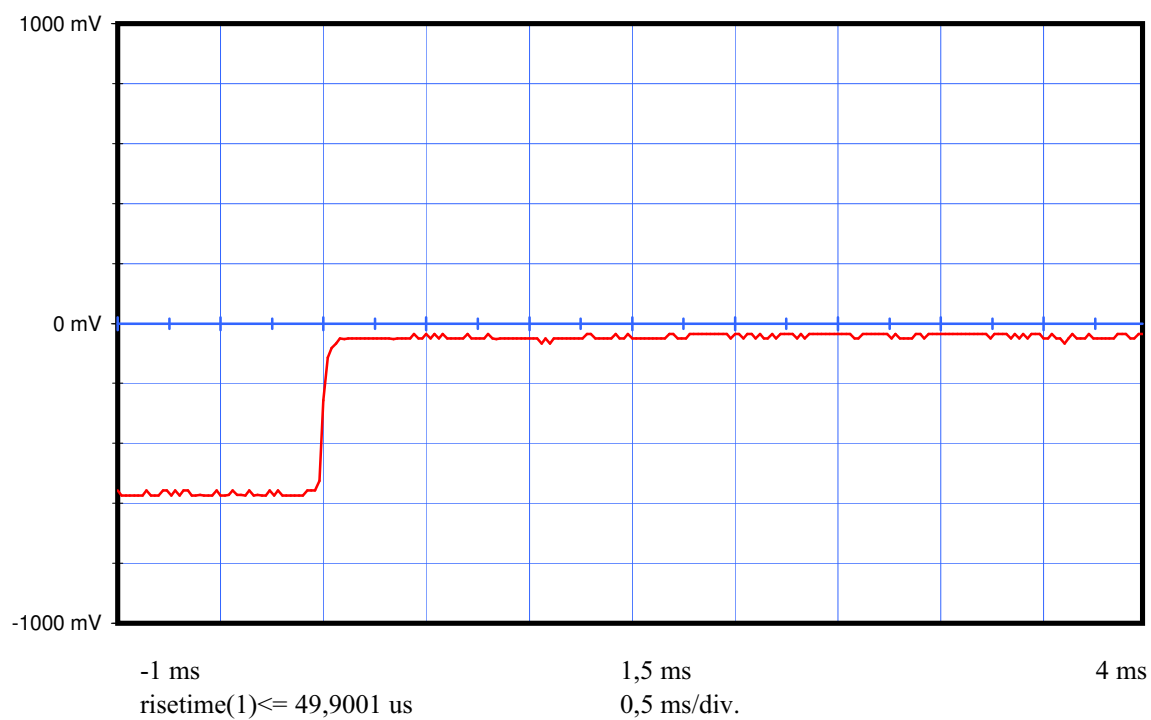
Message received		FFFE2F8C9EAF0F0F2B80348B18758E015527
Format Flag	25	1
Protocol flag	26	0
Ident./Position code	27-85	0
Country Code/Country	27-36	201 / ALBANIA
Protocol Code : U/Std-Nat	37-39/37-40	1110
Protocol Code Used	37-39/37-40	Test-Standard Location
Identification Data	40-85/41-64/41-58	
Identification Used		0
Calculated BCH1	25-85	122C61
Encoded BCH1	86-106	122C61
Homing	112	1
Em.cod/nat.use/supp.data	107-112	110101
Encod pos data	111	0
Fixed Data "1"	108	1 OK
Calculated BCH2	107-132	527
Encoded BCH2	133-144	527
Latitude position		North 43° 33' 32"
Longitude position		East 1° 28' 40"
Delta position		0,076 km

Electrical and other parameters

CW preamble	ms	158,4 < < 161,6	159,78
Total transmission time	ms	514,8 < < 525,2	520,33
Modulation frequency	Hz	396 < < 404	399,76
Phase deviation : total	rd	<=2,40	2,36
Phase deviation : positive	rd	1,00 < < 1,20	1,18
Phase deviation : negative	rd	-1,20 < < -1,00	-1,18
Symmetry measurement	%	<=5 %	1,20
Nominal frequency : F2	Hz		406027715,63
Short term2			1,88E-10
Short term3			2,53E-10
Slope			-2,28E-10
Residual			5,14E-10
406 MHz power output	dBm		35,9
Homing frequency	MHz		121,50
121,5 MHz power output	dBm		23,3
Soak temperature	°C		55,2
Extra feature			G-Switch







THERMAL SHOCK TEST RESULT ON**Ameri-King Corp.****AK-451 ()Series (AF)(AP)(S)(PLB)****N° C/S 07 (But n°2) (Saft LM33600)****23°C to -10°C**

Temperature Soak : 23°C
Temperature Measure : -10°C

Warm Up	Δ Frequency (Hz)	Temp. (°C)	P406 (dBm)	P121.5 (dBm)
1	49761,82	22,9	36,2	22,8
2	49760,60	-10,8	36,2	22,8
3	49760,81	-10,6	36,2	22,8
4	49761,05	-10,1	36,2	22,8
5	49761,47	-9,6	36,3	22,8
6	49762,64	-9,7	36,3	22,8
7	49763,48	-9,7	36,3	22,7
8	49764,26	-9,8	36,3	22,7
9	49765,07	-9,8	36,3	22,7
10	49765,99	-9,8	36,3	22,7
11	49766,54	-9,8	36,3	22,7
12	49768,04	-9,9	36,3	22,7
13	49769,22	-9,8	36,3	22,6
14	49770,35	-9,8	36,3	22,6
15	49770,93	-9,9	36,3	22,6
16	49771,80	-9,9	36,4	22,6
17	49772,29	-10,0	36,4	22,6
18	49773,31	-9,9	36,4	22,6

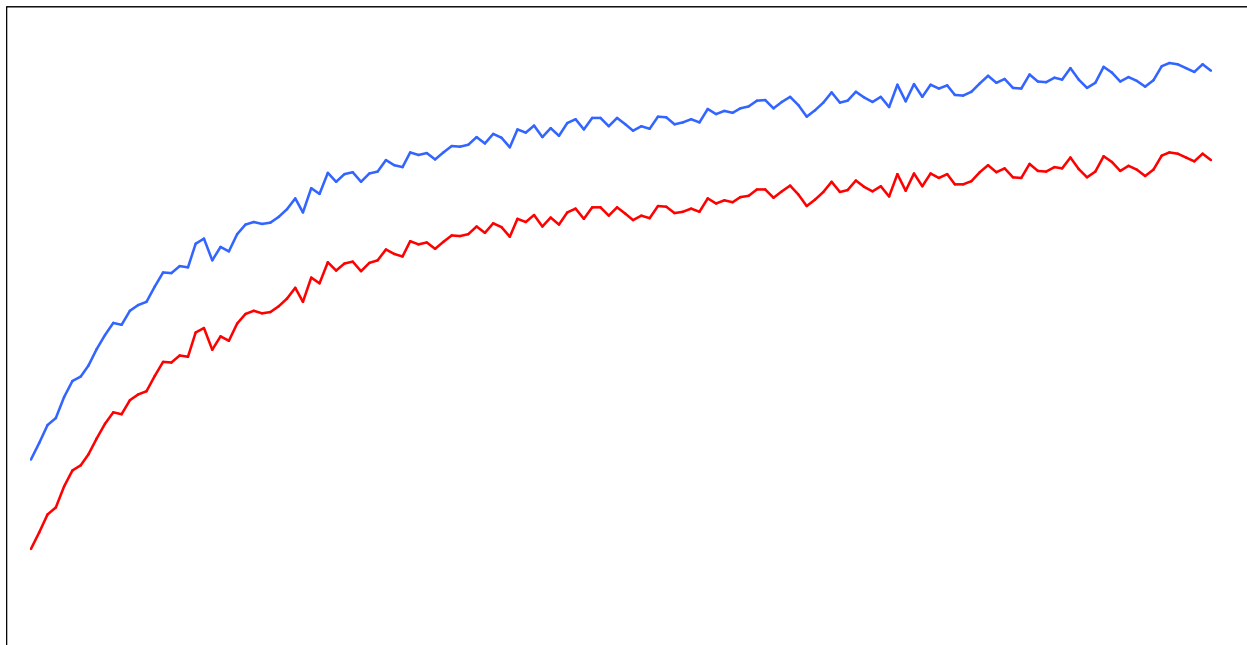
No	Temp.	Slope	Sigma	P406	Short term	P121.5
1	-9,9	2,5E-9	1,1E-9	36,3	2,1E-10	22,5
18	-10,0	1,4E-9	8,9E-10	36,4	1,9E-10	22,4
31	-10,1	6,5E-10	9,1E-10	36,4	3,0E-10	22,4
61	-10,2	2,5E-10	5,2E-10	36,4	2,5E-10	22,3
91	-10,1	2,1E-10	4,3E-10	36,5	1,5E-10	22,3
121	-10,2	2,0E-11	8,0E-10	36,5	2,0E-10	22,3

Beacon message during and at the end of Thermal Shock Test :

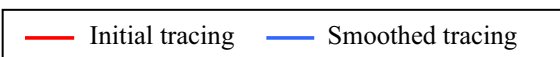
FFFE2F8C9EAF0F0F2B80348B18758E01401E

Frequency variation

406027798



406027772



THERMAL SHOCK TEST / 30 °C change (23 °C to -10 ° C)

Manufacturer : Ameri-King Corp.

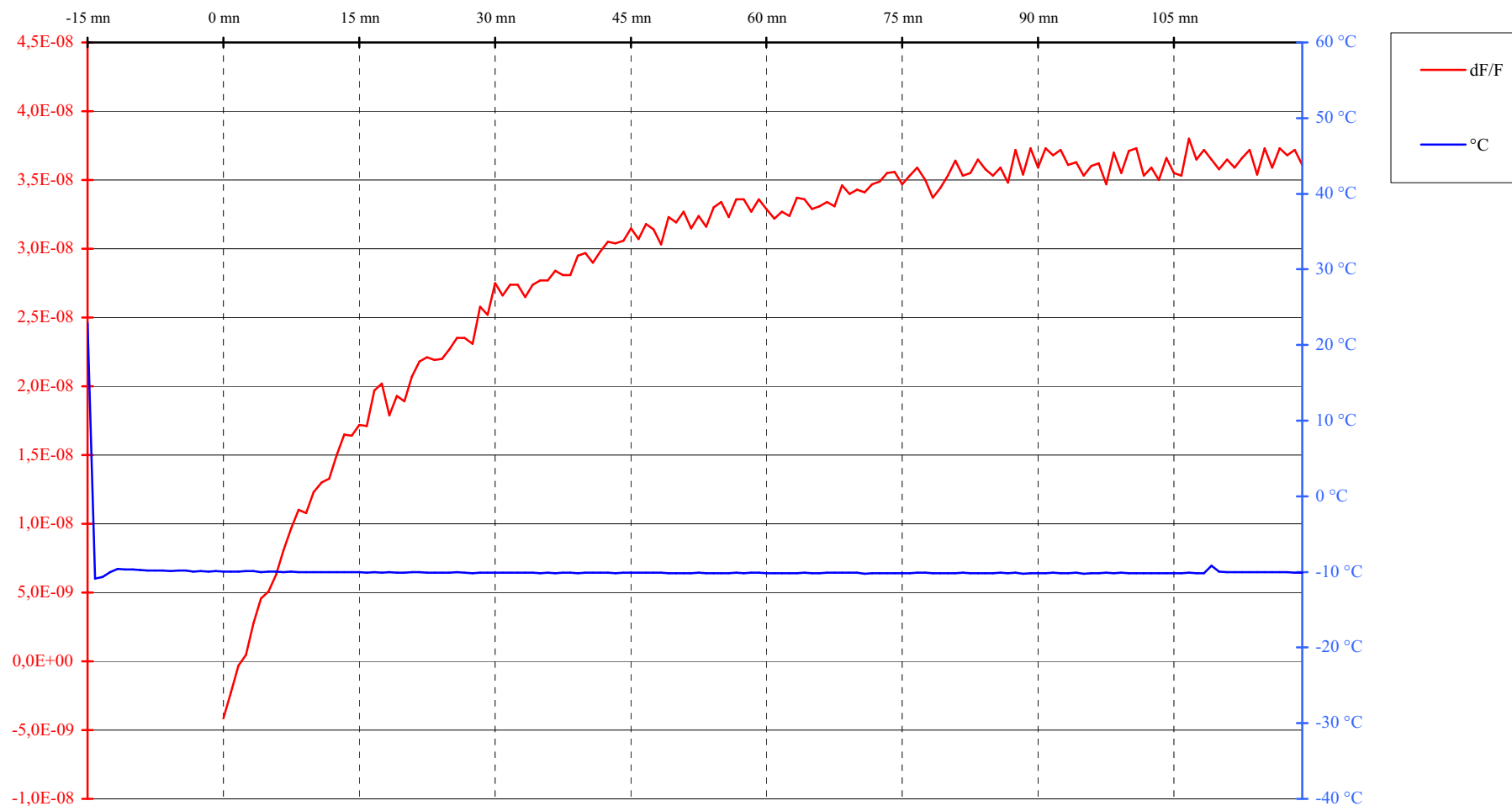
Model : AK-451 ()Series (AF)(AP)(S)(PLB)

Number : C/S 07 (But n°2) (Saft LM33600)

Date : 7 Jul 2006

Time : 10:52:14

FREQUENCY VARIATION



THERMAL SHOCK TEST / 30 °C change (23 °C to -10 °C)

Manufacturer : Ameri-King Corp.

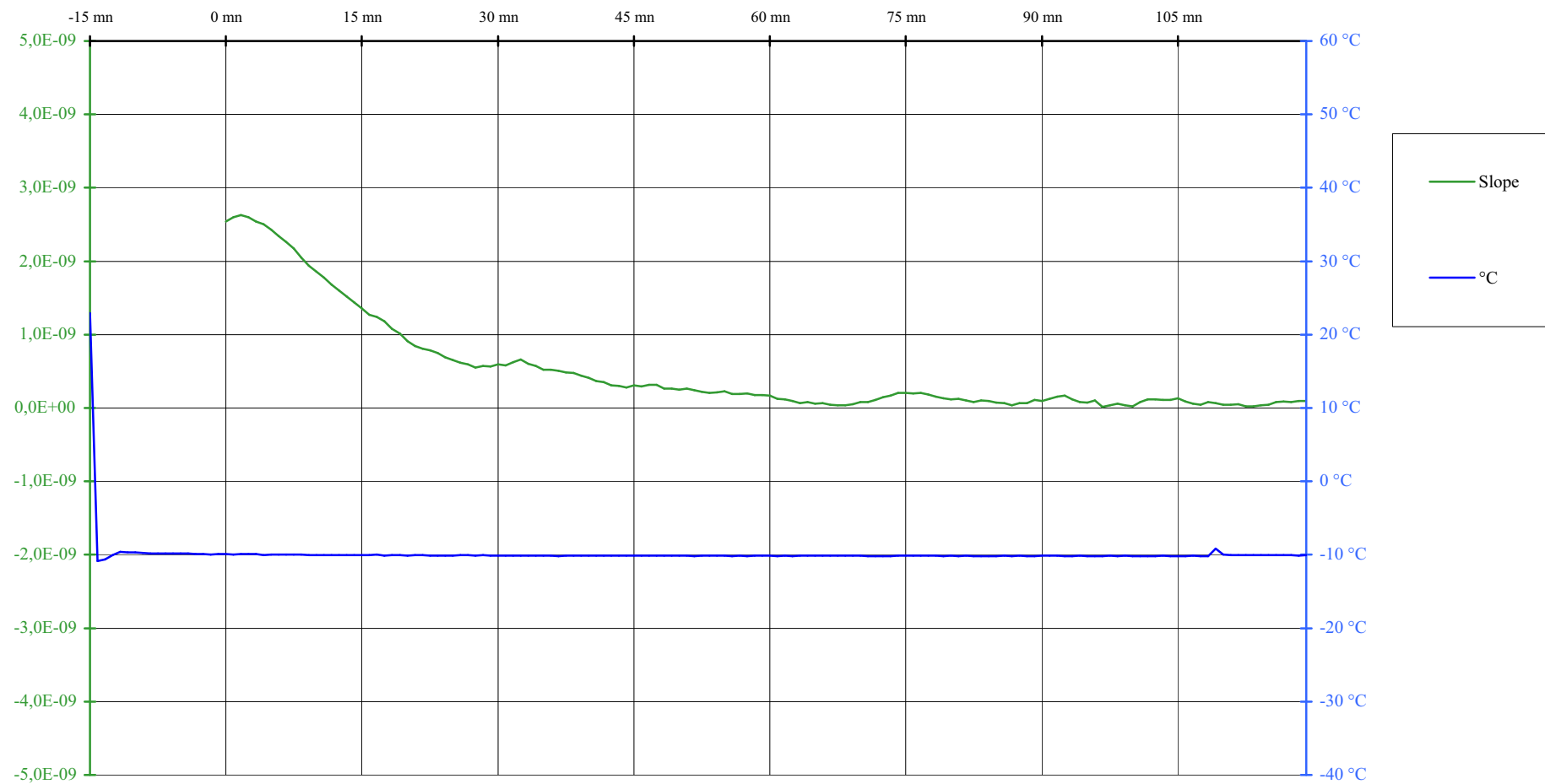
Model : AK-451 ()Series (AF)(AP)(S)(PLB)

Number : C/S 07 (But n°2) (Saft LM33600)

Date : 7 Jul 2006

Time : 10:52:14

MEDIUM TERM STABILITY : MEAN SLOPE /mn (-1,0E-9 to 1,0E-9)



THERMAL SHOCK TEST / 30 °C change (23 °C to -10 ° C)

Manufacturer : Ameri-King Corp.

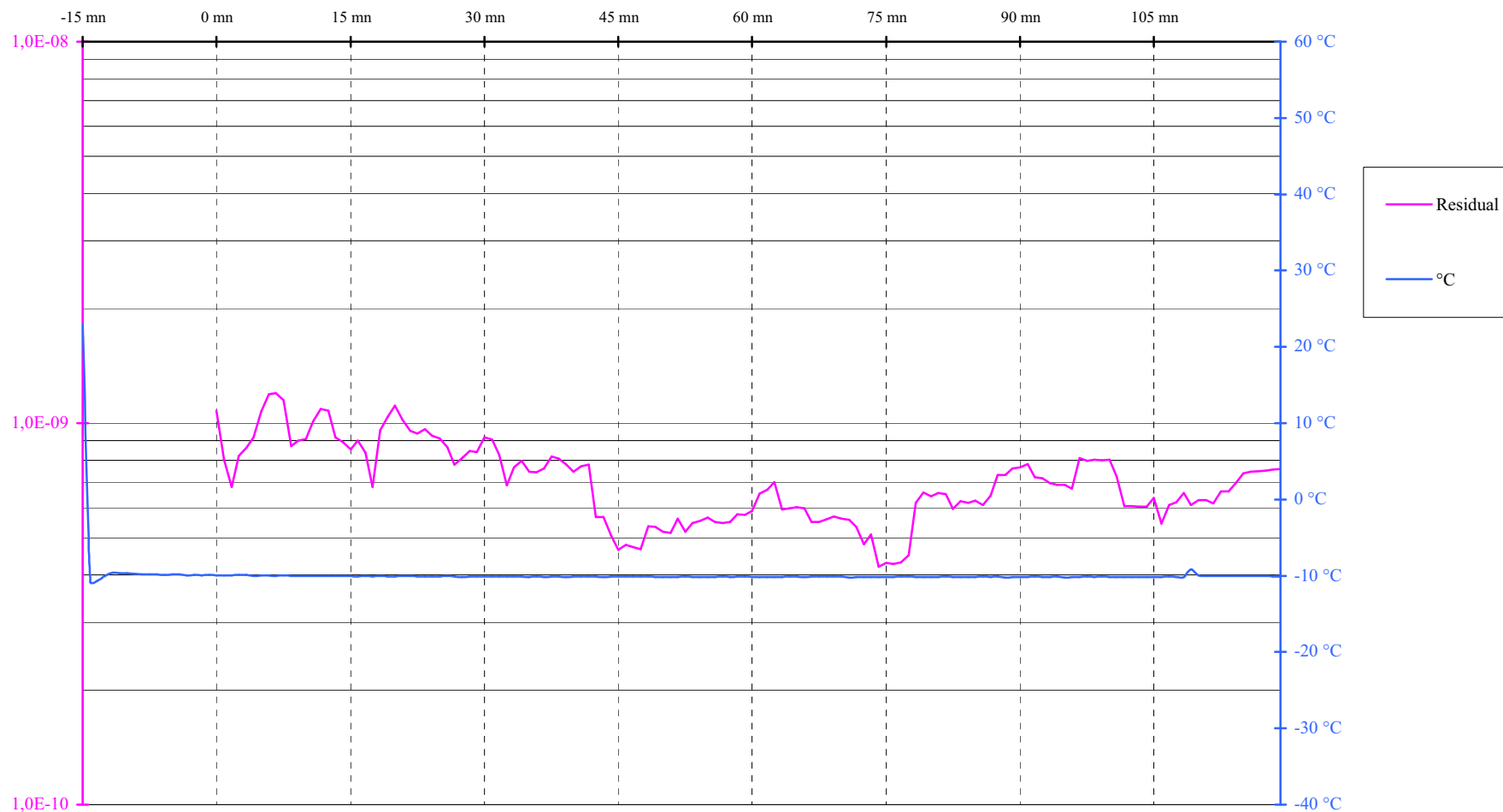
Model : AK-451 ()Series (AF)(AP)(S)(PLB)

Number : C/S 07 (But n°2) (Saft LM33600)

Date : 7 Jul 2006

Time : 10:52:14

MEDIUM TERM STABILITY : RESIDUAL ($\leq 3,0E-9$)



THERMAL SHOCK TEST / 30 °C change (23 °C to -10 ° C)

Manufacturer : Ameri-King Corp.

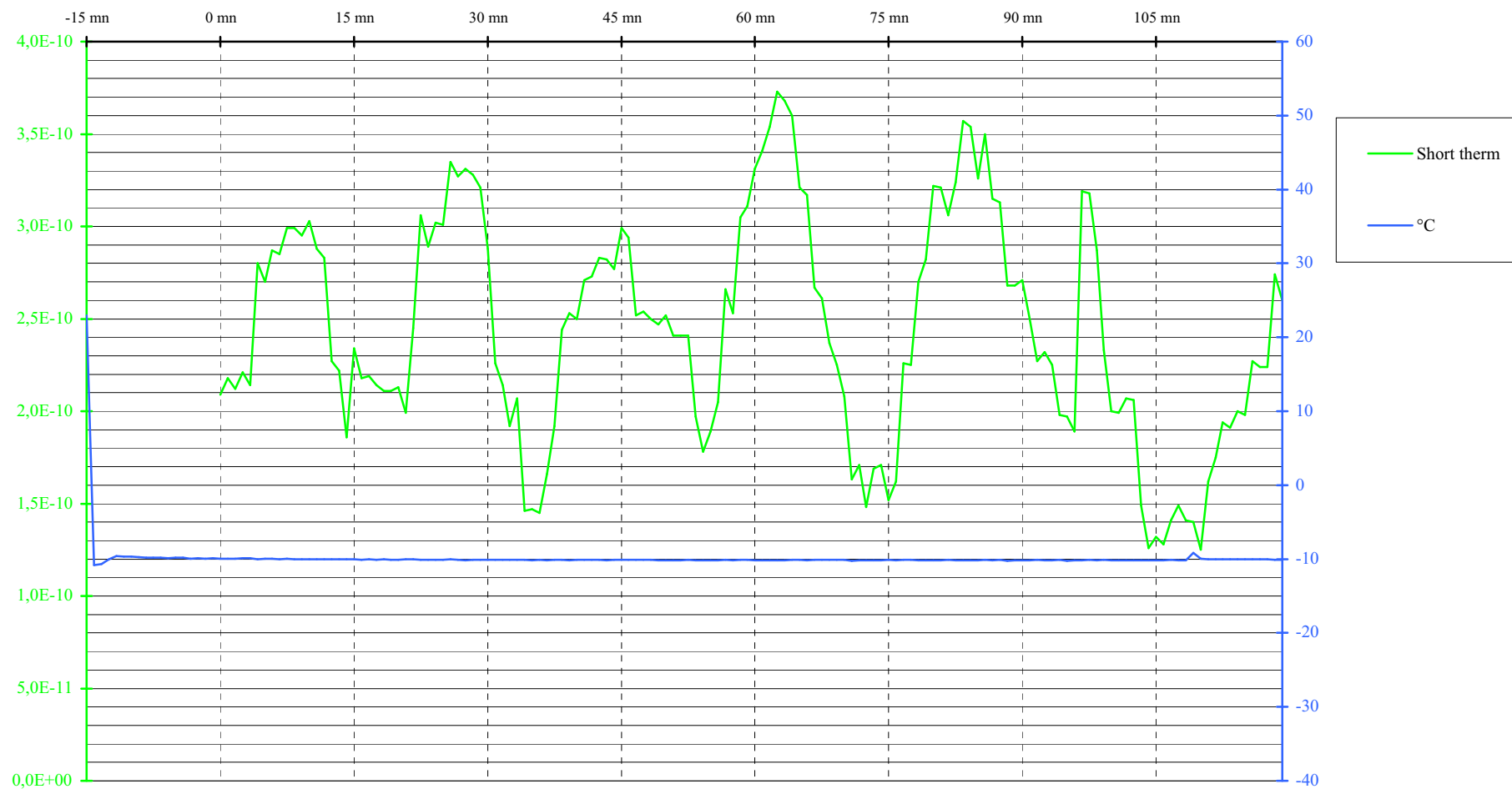
Model : AK-451 ()Series (AF)(AP)(S)(PLB)

Number : C/S 07 (But n°2) (Saft LM33600)

Date : 7 Jul 2006

Time : 10:52:14

SHORT TERM STABILITY /100 mS ($\leq 2,0E-9$)



THERMAL SHOCK TEST / 30 °C change (23 °C to -10 ° C)

Manufacturer : Ameri-King Corp.

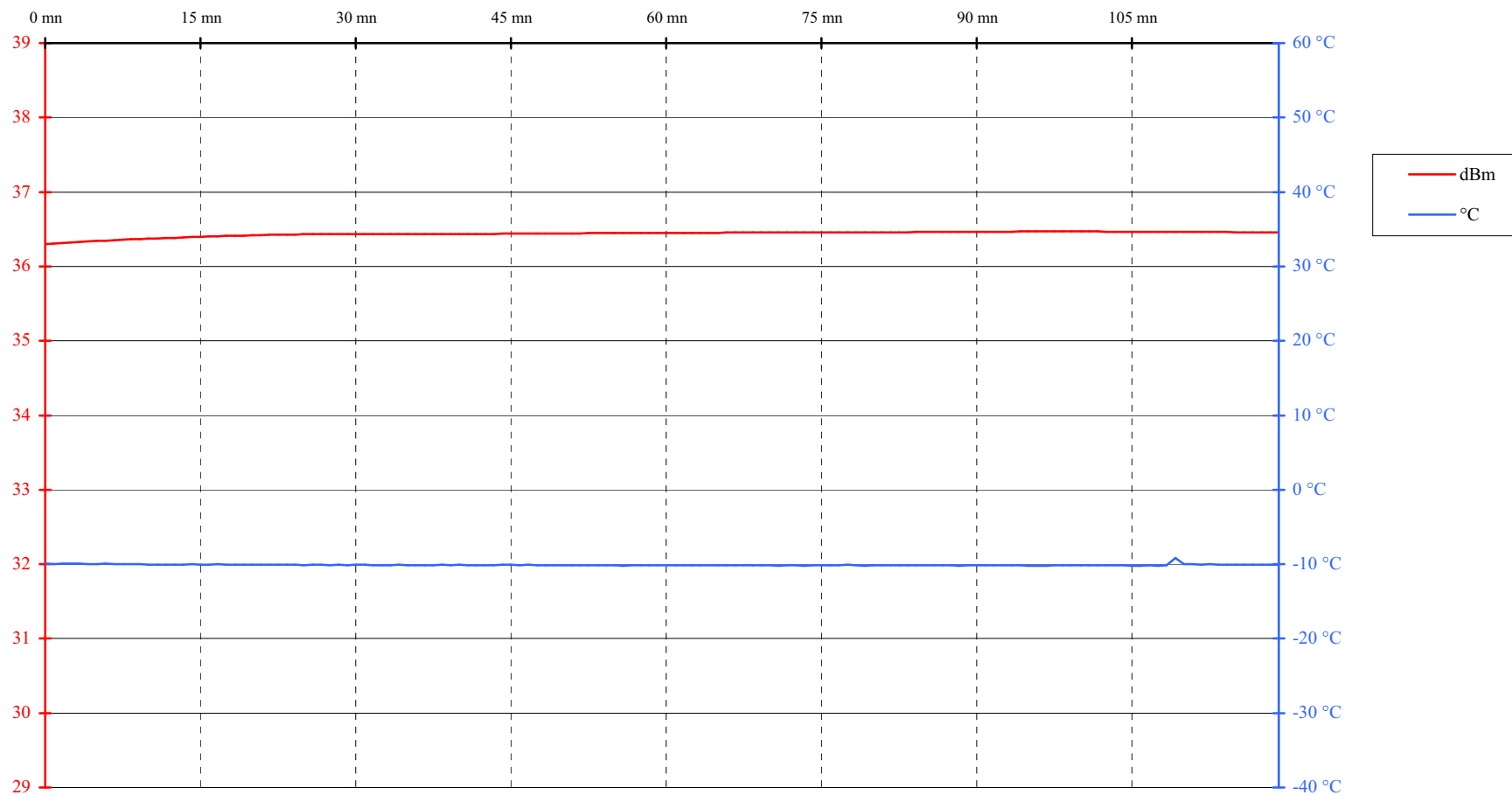
Model : AK-451 ()Series (AF)(AP)(S)(PLB)

Number : C/S 07 (But n°2) (Saft LM33600)

Date : 7 Jul 2006

Time : 10:52:14

OUTPUT POWER (35 to 39 dBm)



OPERATING LIFE TEST RESULTS ON
Ameri-King Corp.
AK-451 ()Series (AF)(AP)(S)(PLB)
N° C/S 09 (But n°1) (Saft LM33600)
-20 °C

Note: Following the table below, manufacturer calculation of battery discharge during 5 years beacon stowage, the operating lifetime at minimum temperature with the Saft L0263XC battery pack is :

- 24 hours for 406 MHz and
- around 82 hours (97 hrs - 14,86 hrs) for 121,5/243 MHz

4 CELL CONFIGURATION	
VHF(121.5/243.0)	: 0.100 Amp
UHF 406	: 1.700 Amp $\frac{0.520 \text{ sec}}{50 \text{ sec}} = 0.01768 \text{ Amp}$
Total	: $I_{ave} = 0.11768 \text{ Amp}$
Self Test: 5sec / month for 5 YRS = 300sec	
Self Test Discharge : $0.11768 \frac{300 \text{ sec}}{3600 \text{ sec / HR}} = 0.0098066 \text{ AH}$	
Self Test Discharge /w 1.65 COEFF: = 0.01618 AH with 1.6564	
450-0010-3 Saft LiMN2	Bat self discharge: $2\%(10.5\text{AH})(5\text{yrs})(1.65)=1.7325\text{AH}$ $\frac{1.748680}{0.11768} = 14.859 \text{ Hrs}$

Warm Up	Δ Frequency (Hz)	Temp. (°C)	P406 (dBm)	P121.5 (dBm)
1	49773,96	-20,7	36,4	21,7
2	49772,39	-21,9	36,4	21,7
3	49771,22	-21,4	36,4	21,7
4	49770,06	-21,0	36,3	21,7
5	49769,69	-20,6	36,4	21,7
6	49769,37	-20,5	36,3	21,8
7	49768,44	-20,4	36,3	21,8
8	49768,24	-20,4	36,3	21,8
9	49768,23	-20,4	36,3	21,8
10	49767,65	-20,5	36,3	21,8
11	49768,11	-20,5	36,3	21,8
12	49767,36	-20,4	36,3	21,8
13	49767,60	-20,3	36,3	21,8
14	49767,34	-20,4	36,3	21,9
15	49767,15	-20,4	36,3	21,8
16	49766,62	-20,4	36,3	21,8
17	49766,60	-20,4	36,3	21,8
18	49766,47	-20,4	36,3	21,8

No	Temp.	Slope	Sigma	P406	Short term	P121.5
1	-20,4	-8,3E-10	1,6E-09	36,3	2,7E-10	21,9
18	-20,4	-1,8E-10	5,8E-10	36,3	2,5E-10	21,9
31	-20,4	8,9E-13	5,1E-10	36,3	3,1E-10	21,9
61	-20,4	6,4E-11	4,3E-10	36,3	2,4E-10	21,9
91	-20,5	4,3E-11	6,1E-10	36,3	2,6E-10	21,9
121	-20,5	2,6E-11	4,3E-10	36,3	4,3E-10	21,9
151	-20,5	2,1E-11	5,9E-10	36,3	1,9E-10	21,9
181	-20,5	2,1E-11	3,8E-10	36,3	3,0E-10	21,9
211	-20,6	-3,1E-11	4,3E-10	36,3	2,1E-10	21,9
241	-20,5	3,0E-11	4,3E-10	36,3	2,8E-10	21,9
271	-20,6	-1,4E-11	4,4E-10	36,3	3,8E-10	22,0
301	-20,6	-3,2E-11	7,0E-10	36,3	2,2E-10	21,9
331	-20,6	5,1E-11	3,5E-10	36,3	1,8E-10	21,9
361	-20,6	3,5E-11	3,2E-10	36,3	2,4E-10	21,9
391	-20,6	-2,2E-11	5,2E-10	36,3	2,9E-10	21,9
421	-20,6	6,8E-11	5,5E-10	36,3	1,9E-10	21,9
451	-20,6	-3,1E-11	4,0E-10	36,3	3,1E-10	22,0
481	-20,6	-9,6E-12	5,0E-10	36,3	1,9E-10	21,9
511	-20,5	4,2E-11	5,2E-10	36,3	2,8E-10	21,9
541	-20,6	2,9E-11	4,5E-10	36,3	2,4E-10	21,9
571	-20,6	-3,7E-11	4,6E-10	36,3	2,9E-10	21,9
601	-20,6	3,2E-11	4,2E-10	36,3	2,4E-10	21,9
631	-20,6	5,5E-11	3,9E-10	36,3	2,7E-10	21,9
661	-20,6	1,1E-11	5,5E-10	36,3	3,1E-10	22,0
691	-20,6	-2,5E-11	3,8E-10	36,3	1,2E-10	22,0
721	-20,5	2,7E-11	3,8E-10	36,3	2,5E-10	21,9
751	-20,5	-3,1E-11	5,4E-10	36,3	2,1E-10	21,9
781	-20,5	1,3E-13	6,3E-10	36,3	2,5E-10	21,9
811	-20,5	4,8E-11	4,4E-10	36,3	2,9E-10	21,9
841	-20,5	-4,0E-12	5,4E-10	36,3	2,5E-10	21,9

No	Temp.	Slope	Sigma	P406	Short term	P121.5
871	-20,6	-2,4E-11	4,5E-10	36,3	2,5E-10	21,9
901	-20,5	-2,3E-12	8,3E-10	36,3	1,9E-10	21,9
931	-20,6	-4,6E-11	5,6E-10	36,3	1,7E-10	21,9
961	-20,5	-3,2E-11	5,4E-10	36,3	1,9E-10	21,9
991	-20,6	4,6E-11	4,1E-10	36,3	2,5E-10	21,9
1021	-20,6	-1,3E-11	3,7E-10	36,3	3,3E-10	22,0
1051	-20,5	-9,6E-12	5,8E-10	36,3	3,0E-10	22,0
1081	-20,6	3,3E-12	4,2E-10	36,3	2,9E-10	21,9
1111	-20,6	9,8E-12	4,2E-10	36,3	1,5E-10	22,0
1141	-20,6	-6,4E-11	5,5E-10	36,3	2,1E-10	22,0
1171	-20,6	4,2E-11	4,8E-10	36,3	2,6E-10	22,0
1201	-20,6	3,9E-12	5,3E-10	36,3	1,5E-10	22,0
1231	-20,6	-6,5E-12	5,7E-10	36,3	1,6E-10	22,0
1261	-20,6	-2,7E-11	7,0E-10	36,3	2,0E-10	22,0
1291	-20,6	-3,8E-11	5,0E-10	36,3	2,2E-10	22,0
1321	-20,6	-6,7E-12	4,7E-10	36,3	3,0E-10	22,0
1351	-20,7	-4,4E-11	5,6E-10	36,3	3,2E-10	22,0
1381	-20,6	-1,3E-11	4,7E-10	36,3	1,6E-10	22,0
1411	-20,6	3,4E-12	4,3E-10	36,3	3,0E-10	22,0
1441	-20,6	4,2E-11	4,0E-10	36,3	2,3E-10	22,0
1471	-20,6	-7,1E-12	5,1E-10	36,3	1,8E-10	22,0
1501	-20,6	1,4E-11	4,4E-10	36,3	2,6E-10	22,0
1531	-20,6	2,2E-11	4,1E-10	36,3	4,2E-10	22,0
1561	-20,6	-2,2E-11	5,2E-10	36,3	2,1E-10	22,0
1591	-20,6	-7,0E-12	5,1E-10	36,3	2,9E-10	22,0
1621	-20,6	-2,0E-12	5,0E-10	36,3	2,3E-10	22,0
1651	-20,6	1,2E-11	4,8E-10	36,3	1,8E-10	22,0
1681	-20,7	-1,6E-11	2,8E-10	36,3	2,0E-10	22,0
1711	-20,7	-5,4E-12	4,2E-10	36,3	2,6E-10	22,0
1741	-20,7	-6,6E-11	4,7E-10	36,3	1,9E-10	21,9
1771	-20,7					22,0
1801	-20,7					21,9
1831	-20,7					22,0
1861	-20,7					21,9
1891	-20,7					21,9
1921	-20,7					21,9
1951	-20,7					21,9
1981	-20,7					21,9
2011	-20,7					21,9
2041	-20,7					22,0
2071	-20,7					22,0
2101	-20,7					22,0
2131	-20,8					21,9
2161	-20,7					22,0
2191	-20,7					21,9
2221	-20,7					22,0
2251	-20,8					21,9
2281	-20,8					22,0
2311	-20,8					22,0
2341	-20,7					21,9
2371	-20,8					21,9

24h

No	Temp.	Slope	Sigma	P406	Short term	P121.5
2401	-20,7					21,9
2431	-20,8					21,9
2461	-20,8					21,9
2491	-20,8					21,9
2521	-20,8					21,9
2551	-20,8					21,9
2581	-20,8					21,9
2611	-20,8					22,0
2641	-20,8					21,9
2671	-20,8					21,9
2701	-20,8					21,9
2731	-20,8					21,9
2761	-20,8					21,9
2791	-20,8					21,9
2821	-20,8					21,9
2851	-20,7					22,0
2881	-20,8					21,9
2911	-20,8					22,0
2941	-20,8					21,9
2971	-20,8					22,0
3001	-20,8					22,0
3031	-20,8					22,0
3061	-20,8					22,0
3091	-20,8					22,0
3121	-20,8					21,9
3151	-20,8					21,9
3181	-20,8					22,0
3211	-20,8					21,9
3241	-20,8					22,0
3271	-20,8					21,9
3301	-20,8					22,0
3331	-20,8					21,9
3361	-20,8					21,9
3391	-20,8					22,0
3421	-20,8					22,0
3451	-20,8					22,0
3481	-20,8					22,0
3511	-20,8					22,0
3541	-20,8					22,0
3571	-20,8					22,0
3601	-20,8					22,0
3631	-20,8					22,0
3661	-20,8					22,0
3691	-20,8					22,0
3721	-20,8					21,9
3751	-20,8					22,0
3781	-20,7					22,0
3811	-20,8					22,0
3841	-20,8					21,9
3871	-20,8					22,0
3901	-20,8					21,9

48h

No	Temp.	Slope	Sigma	P406	Short term	P121.5
3931	-20,8					22,0
3961	-20,8					21,9
3991	-20,8					22,0
4021	-20,8					21,9
4051	-20,8					22,0
4081	-20,8					22,0
4111	-20,7					22,0
4141	-20,7					22,0
4171	-20,7					21,9
4201	-20,7					22,0
4231	-20,7					21,9
4261	-20,7					22,0
4291	-20,7					21,9
4321	-20,8					22,0
4351	-20,7					22,0
4381	-20,7					22,0
4411	-20,7					22,0
4441	-20,7					22,0
4471	-20,7					22,0
4501	-20,7					22,0
4531	-20,8					22,0
4561	-20,7					22,0
4591	-20,7					22,0
4621	-20,7					22,0
4651	-20,7					22,0
4681	-20,7					22,0
4711	-20,7					22,0
4741	-20,7					21,9
4771	-20,7					22,0
4801	-20,7					22,0
4831	-20,6					22,0
4861	-20,7					22,0
4891	-20,7					22,0
4921	-20,6					21,9
4951	-20,6					22,0
4981	-20,7					22,0
5011	-20,7					22,0
5041	-20,7					22,0
5071	-20,7					21,9
5101	-20,6					22,0
5131	-20,7					22,0
5161	-20,6					22,0
5191	-20,6					22,0
5221	-20,6					22,0
5251	-20,7					22,0
5281	-20,6					22,0
5311	-20,7					22,0
5341	-20,7					22,0
5371	-20,7					22,0
5401	-20,7					22,0
5431	-20,7					22,0

No	Temp.	Slope	Sigma	P406	Short term	P121.5
5461	-20,6					22,0
5491	-20,6					22,0
5521	-20,7					22,0
5551	-20,7					22,0
5581	-20,6					21,9
5611	-20,7					22,0
5641	-20,7					22,0
5671	-20,6					22,0
5701	-20,7					22,0
5731	-20,7					22,0
5761	-20,7					21,9
5791	-20,6					22,0
5821	-20,7					22,0
5851	-20,7					22,0
5881	-20,6					22,0
5911	-20,7					22,0
5941	-20,7					22,0
5971	-20,7					22,0
6001	-20,7					22,0
6031	-20,7					22,0
6061	-20,7					22,0
6091	-20,7					22,0
6121	-20,7					22,0
6151	-20,7					21,9
6181	-20,7					22,0
6211	-20,6					22,0
6241	-20,7					22,0
6271	-20,7					22,0
6301	-20,7					22,0
6331	-20,7					22,0
6361	-20,7					22,0
6391	-20,7					22,0
6421	-20,6					22,0
6451	-20,7					22,0
6481	-20,7					22,0
6511	-20,7					22,0
6541	-20,6					22,0
6571	-20,7					21,9
6601	-20,7					22,0
6631	-20,7					22,0
6661	-20,6					22,0
6691	-20,7					21,9
6721	-20,7					22,0
6751	-20,7					21,9
6781	-20,6					22,0
6811	-20,7					22,0
6841	-20,7					22,0
6871	-20,7					22,0
6901	-20,7					22,0
6931	-20,7					22,0
6961	-20,7					22,0

No	Temp.	Slope	Sigma	P406	Short term	P121.5
6991	-20,7					22,0
7021	-20,7			97 hours	with 121,5 / 243 MHz	21,8
7051	-20,7					21,9
7081	-20,7					21,8
7111	-20,8					21,8
7141	-20,8					21,7
7171	-20,7					21,6
7201	-20,7					21,5
7231	-20,8					21,5
7261	-20,8					21,4
7291	-20,8					21,4
7321	-20,7					21,3
7351	-20,8					21,1
7381	-20,9					20,8
7411	-20,8					20,5
7441	-20,8					20,0
7471	-20,8					19,7
7501	-20,8					19,3
7531	-20,8					19,0
7561	-20,8					18,6
7591	-20,9					18,3
7621	-20,8					18,0
7651	-20,9					17,7
7681	-20,9					17,0
7711	-20,9					16,2
7741	-20,9					15,7
7771	-20,9					15,3
7801	-20,9					14,7
7831	-20,9					14,0
7861	-20,9					12,3
7891	-20,9					9,4
7921	-20,9					8,2
7951	-20,9					6,0
7981	-20,9					4,6
8011	-20,9					3,4
8041	-20,9					2,8
8071	-20,9					2,4
8101	-20,9					2,0

Samples of Beacon message during 24 of Operating Lifetime Test :

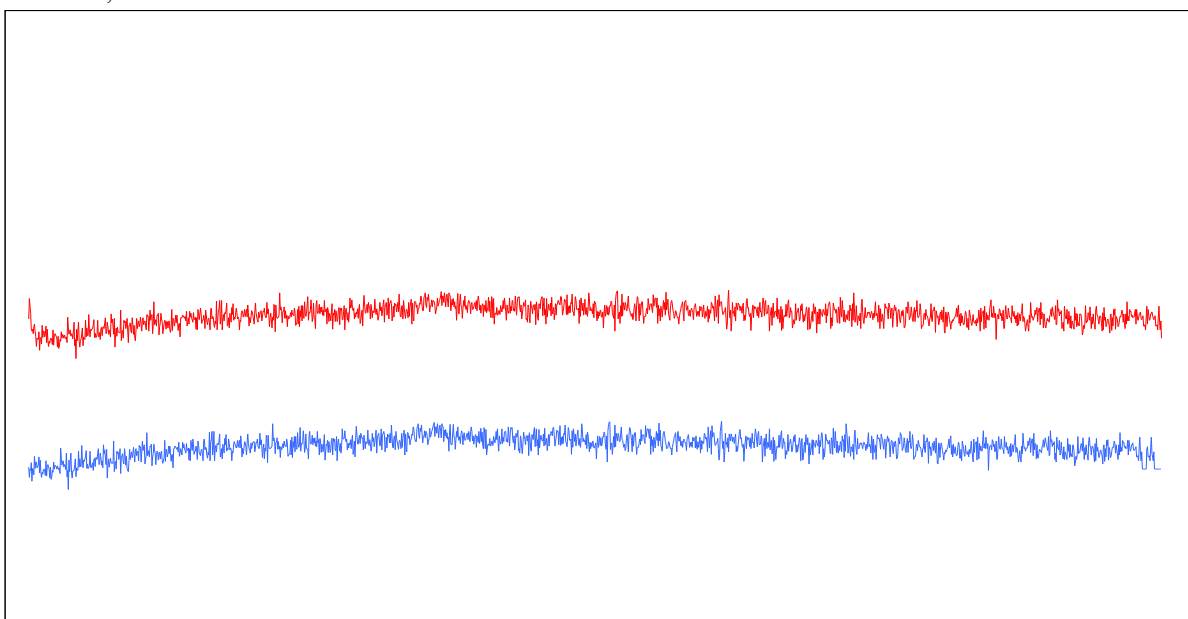
FFFE2F8C9EAF0F0F2B80348B18758E414D34

FFFE2F8C9EAF0F0F2B80348B18758E01401E

FFFE2F8C9EAF0F0F2B80348B18758E41580D

Frequency variation

406027,779 kHz



406027,762 kHz

— Initial tracing — Smoothed tracing

LIFE TEST AT -20 °C

Manufacturer : Ameri-King Corp.

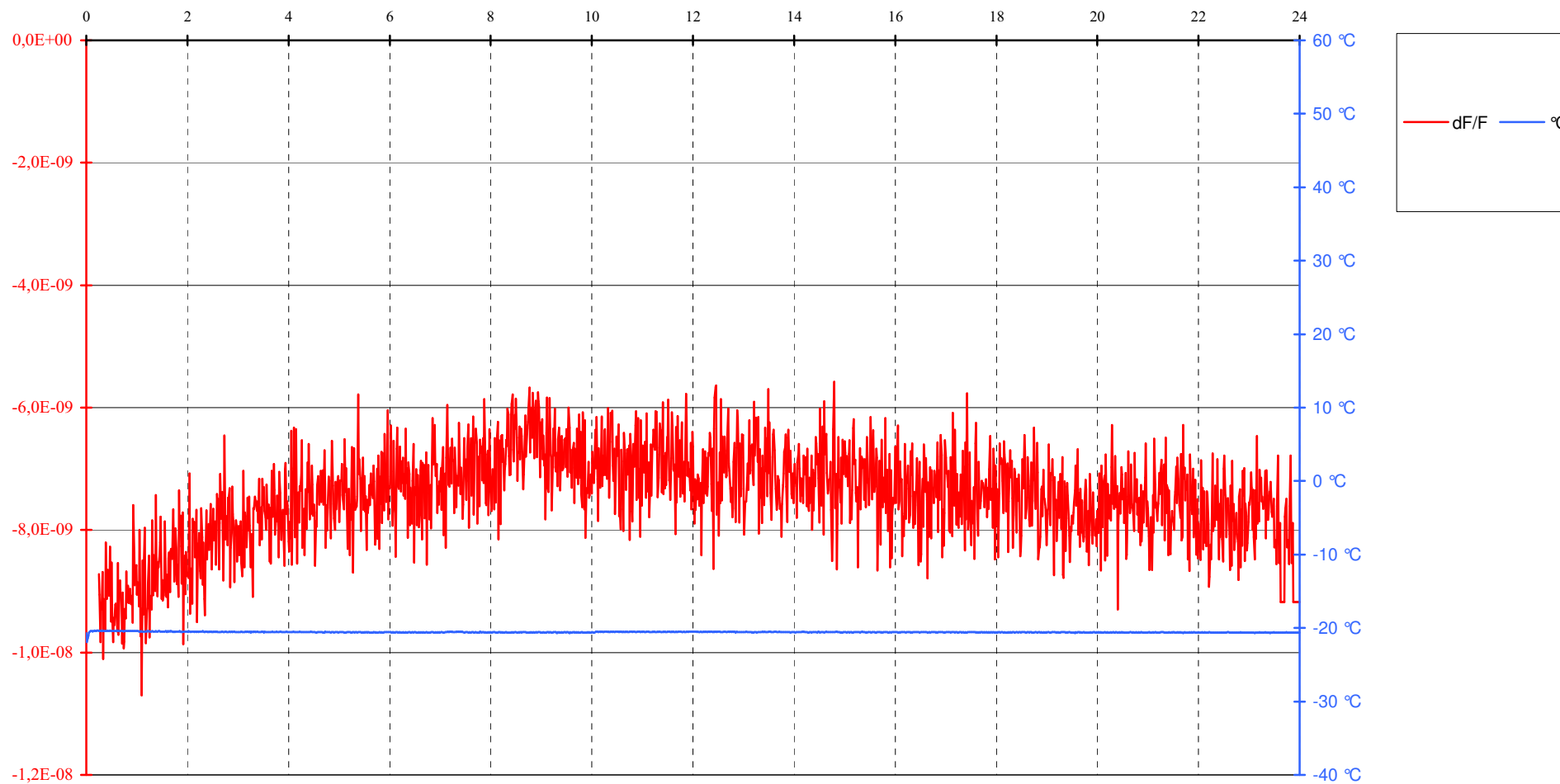
Model : AK-451 ()Series (AF)(AP)(S)(PLB)

Number : C/S 09 (But n°1) (Saft LM33600)

Date : 15/09/2006

Time : 17:46:52

FREQUENCY VARIATION



LIFE TEST AT -20 °C

Manufacturer : Ameri-King Corp.

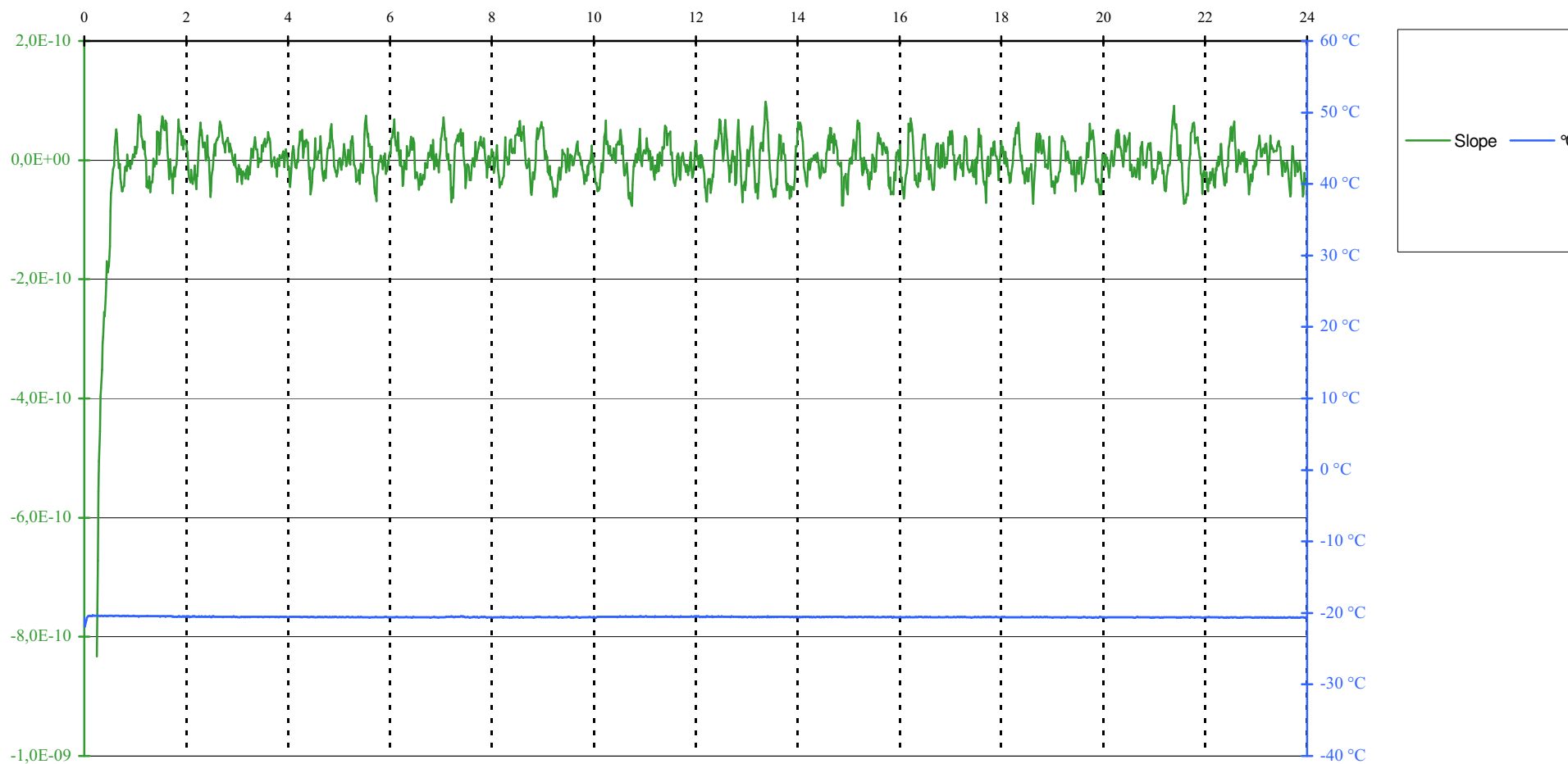
Model : AK-451 ()Series (AF)(AP)(S)(PLB)

Number : C/S 09 (But n°1) (Saft LM33600)

Date : 15/09/2006

Time : 17:46:52

MEDIUM TERM STABILITY : MEAN SLOPE /mn (-1,0E-9 to 1,0E-9)



LIFE TEST AT -20 °C

Manufacturer : Ameri-King Corp.

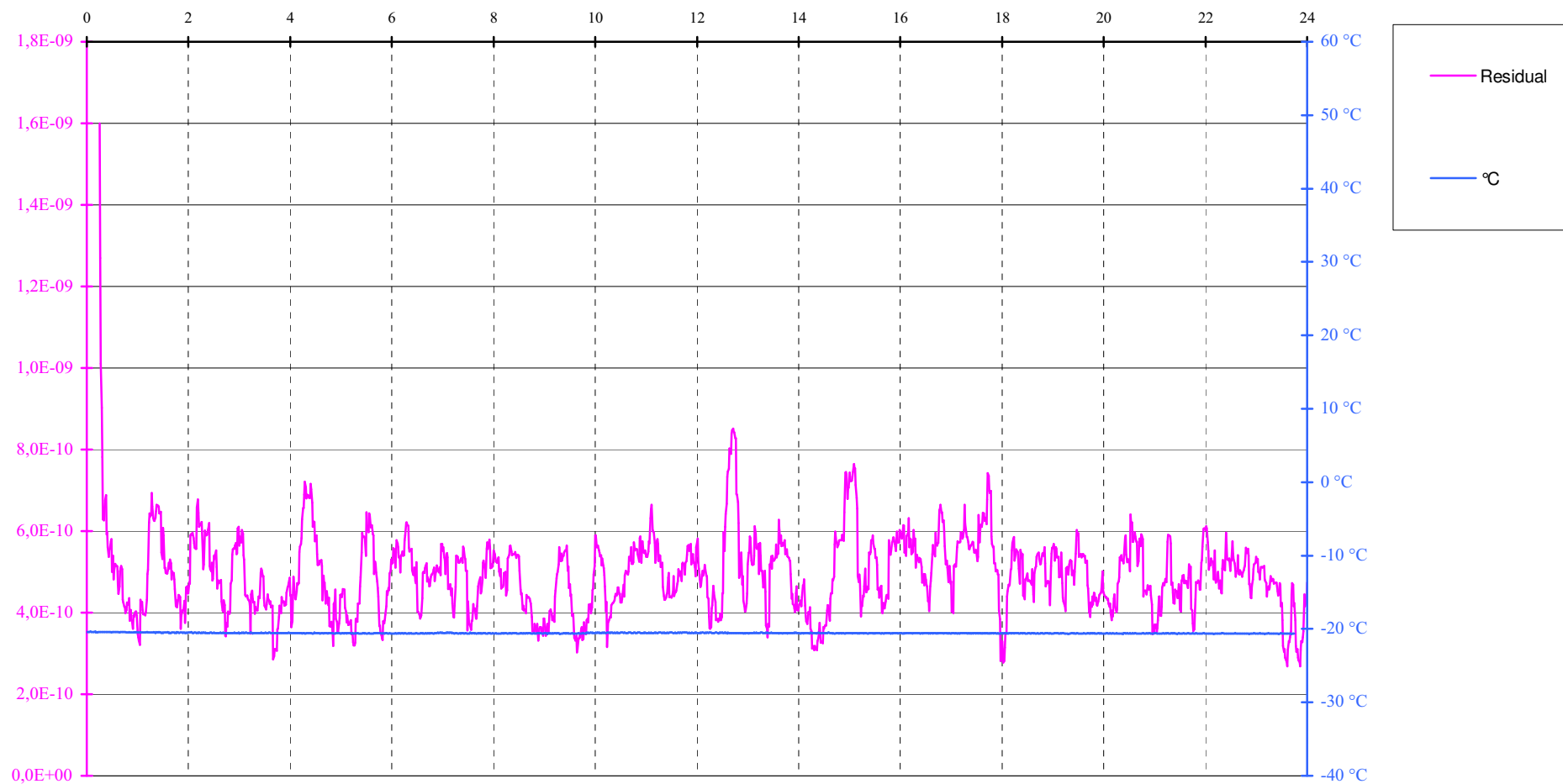
Model : AK-451 ()Series (AF)(AP)(S)(PLB)

Number : C/S 09 (But n°1) (Saft LM33600)

Date : 15/09/2006

Time : 17:46:52

MEDIUM TERM STABILITY : RESIDUAL ($\leq 3,0E-9$)



LIFE TEST AT -20 °C

Manufacturer : Ameri-King Corp.

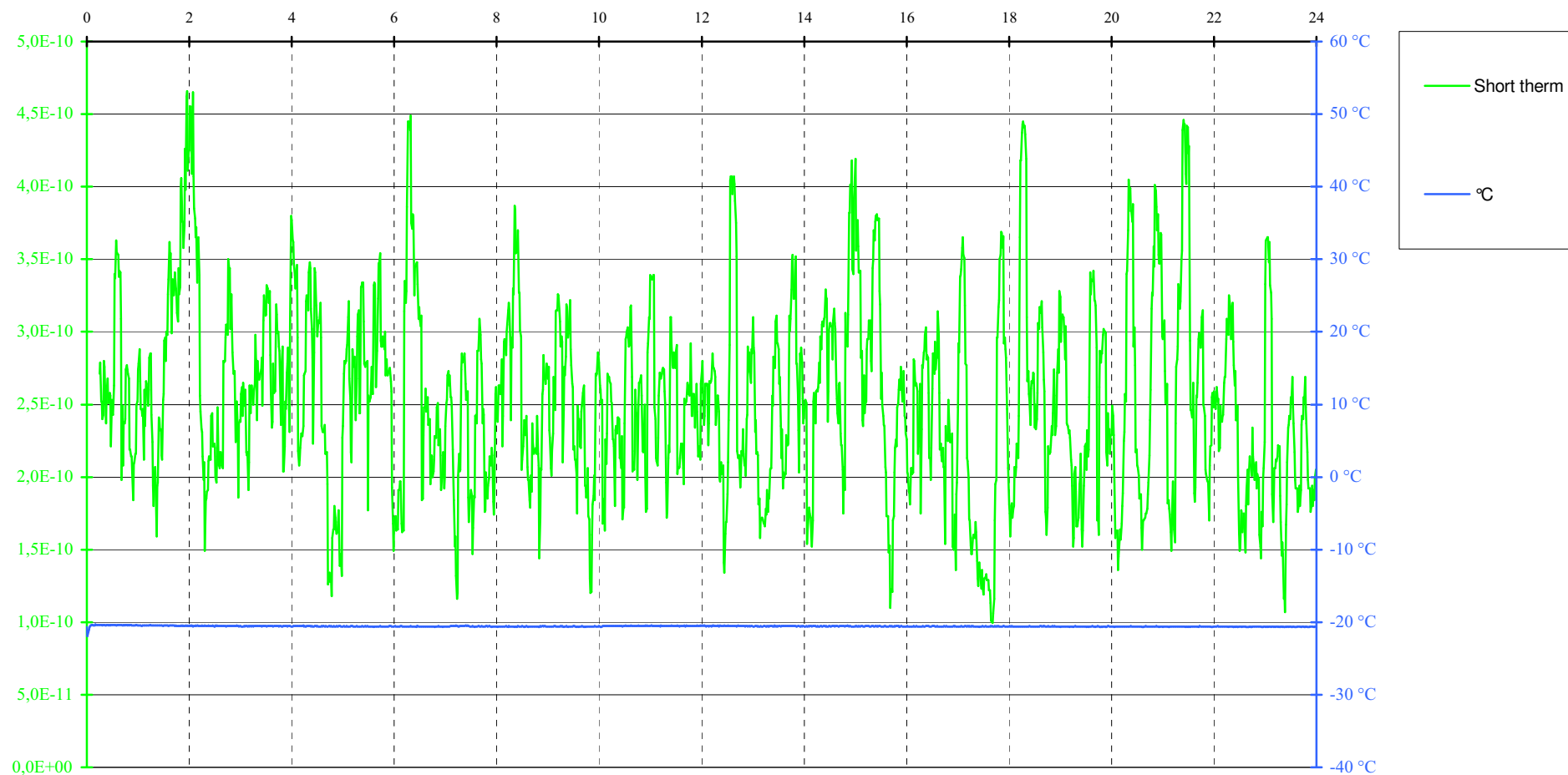
Model : AK-451 ()Series (AF)(AP)(S)(PLB)

Number : C/S 09 (But n°1) (Saft LM33600)

Date : 15/09/2006

Time : 17:46:52

SHORT TERM STABILITY /100 mS ($\leq 2,0E-9$)



LIFE TEST AT -20 °C

Manufacturer : Ameri-King Corp.

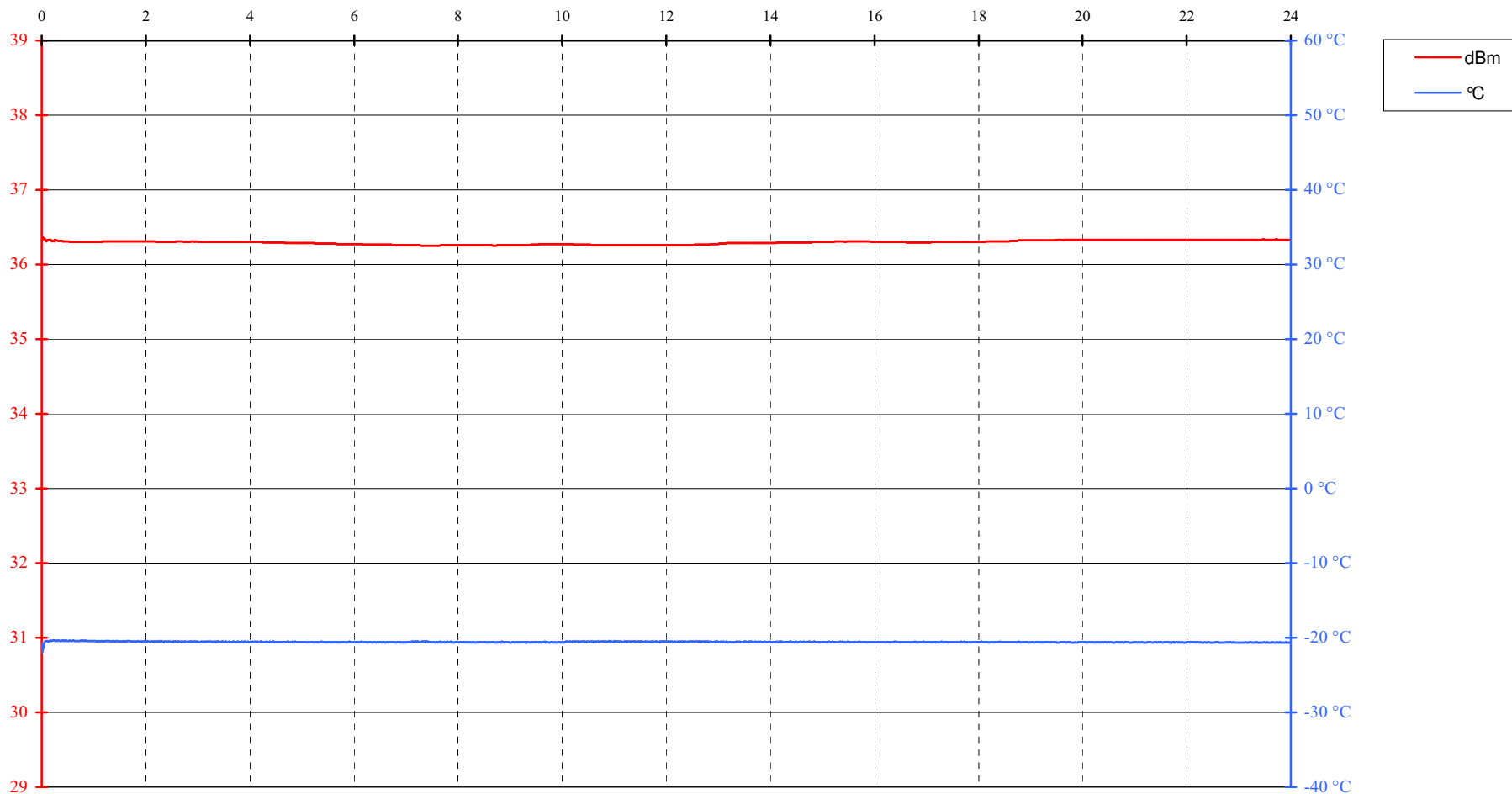
Model : AK-451 ()Series (AF)(AP)(S)(PLB)

Numero : C/S 09 (But n°1) (Saft LM33600)

Date : 15/09/2006

Time : 17:46:52

406 MHz OUTPUT POWER (35 to 39 dBm)

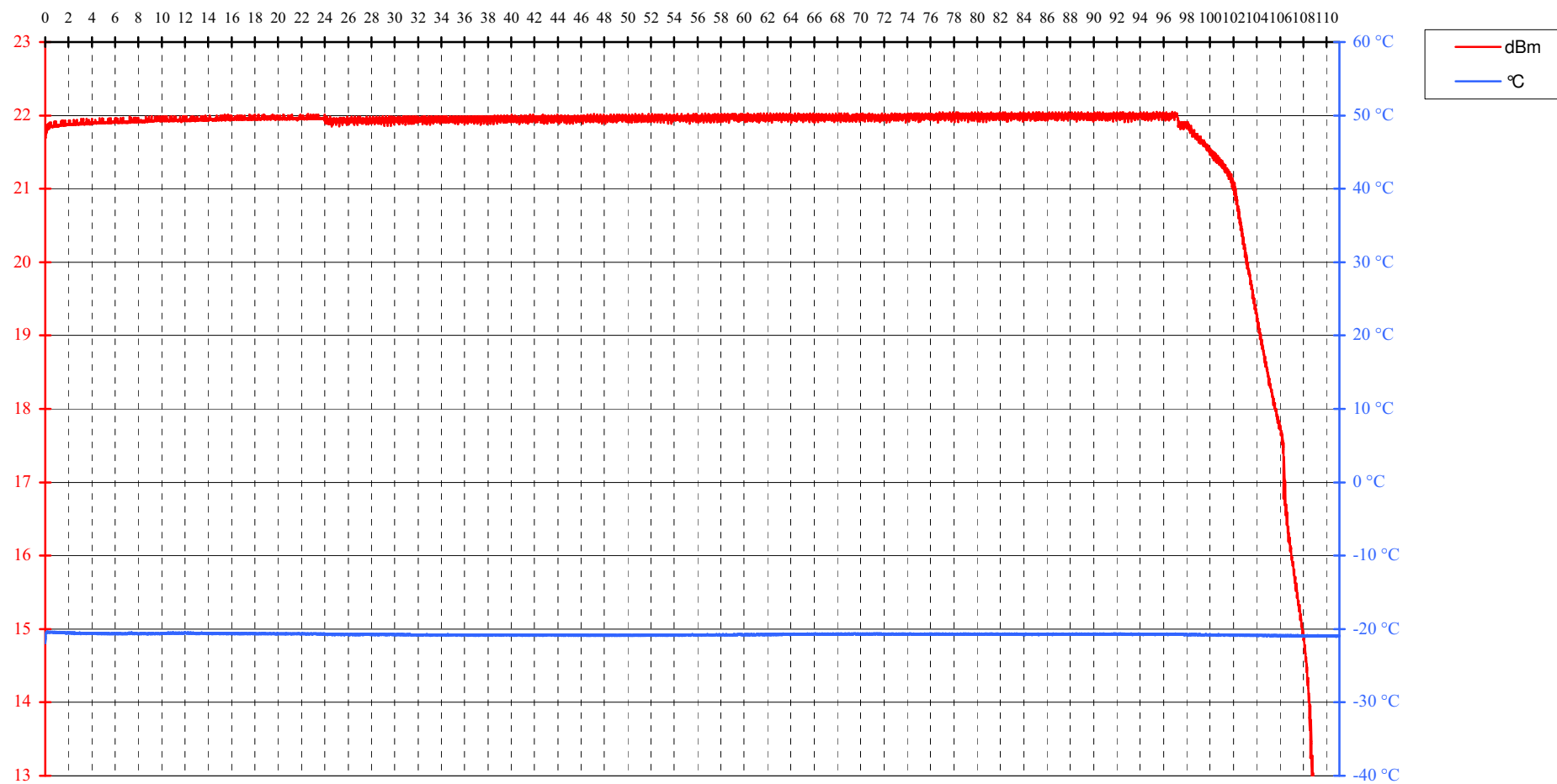


LIFE TEST AT -20 °C

Manufacturer : Ameri-King Corp.
 Model : AK-451 ()Series (AF)(AP)(S)(PLB)
 Numero : C/S 09 (But n°1) (Saft LM33600)

Date : 15/09/2006
 Time : 17:46:52

121,5 MHz OUTPUT POWER (22 +/-1 dBm)



ANNEX E

BEACON CODING SOFTWARE RESULTS

See the following pages :

- Table C.1: CODING VALUES FOR BEACON MESSAGE CODING TESTING
- Tables F.C: NAVIGATION SYSTEM TEST RESULTS (C/S T.007 - Appendix C to Annex F)
- Tables F.D: BEACON CODING SOFTWARE RESULTS (C/S T.007 - Appendix D to Annex F)

Note : For theses verifications the data of scripts have been generated with PC software and transmitted to the beacon via RS232 link

Table C.1: CODING VALUES FOR BEACON MESSAGE CODING TESTING

Data Element	Value
Format Flag	As required by the specific protocol
Protocol Flag	As required by the specific protocol
Country Code	201
Protocol Code	As required by the specific protocol
MMSI	999999
Radio Call Sign	XPA02
Cospas-Sarsat Type Approval Certificate Number	999
Beacon Serialised Number	99
Any National Use Data Elements	Default values as specified in C/S T.001
Aircraft Registration Marking	C7518
Aircraft Operator Designator and a serial number	AAA1000
Aircraft 24-bit Address	11472655 (Base 10 representation)
Specific Beacon	Assume only 1 beacon on vessel or aircraft
Non-Protected Data Field	Default values specified in C/S T.001
Auxiliary Radio Locating Device	As appropriate for the beacon design ¹
Manual / Automatic Activation	As appropriate for the beacon design ¹

¹ In cases where the beacon has several variants (i.e. with and without an automatic activation capability, with and without a 121.5 MHz homer), the report shall provide examples of the coding assuming automatic activation and the 121.5 MHz homer.

APPENDIX C TO ANNEX F

NAVIGATION SYSTEM TEST RESULTS

Table F-C.1: Position Data Encoding Results User-Location Protocol

Script Reference (See Table D.1)	Value of Encoded Location Bits Transmitted by Beacon (Hexadecimal)	Confirmation that BCH Correct (✓)
1	Bits 108-132= FE0FF0	✓
2	Bits 108 – 132= 23011 Number of seconds after providing navigation data that beacon transmitted the above encoded location information: <u>50</u>	✓
3	Bits 108-132= 6D052	✓

Table F-C.2: Position Data Encoding Results Standard Location Protocol

Script Reference (See Table D.2)	Value of Encoded Location Bits Transmitted by Beacon (Hexadecimal)	Confirmation that BCH Correct (✓)
1	Bits 65-85= FFBFF Bits 113-132= 83E0F	✓
2	Bits 65-85= 2404 Bits 113-132= 8E227 Number of seconds after providing navigation data that beacon transmitted the above encoded location information: <u>50</u>	✓
3	Bits 65-85= 2404 Bits 113-132= F8227	✓
4	Bits 65-85= 3404 Bits 113-132= 88227	✓
5	Bits 65-85= 3404 Bits 113-132= 74627	✓
6	Bits 65-85= 2404 Bits 113-132= 8227	✓
7	Bits 65-85= 2404 Bits 113-132= 83D7	✓
8	Bits 65-85= 2406 Bits 113-132= 8227	✓
9	Bits 65-85= 2406 Bits 113-132= 81B8	✓
10	Bits 65-85= 2402 Bits 113-132= 8206	✓

Table F-C.3: Position Data Encoding Results National Location Protocol

Script Reference (See Table D.3)	Value of Encoded Location Bits Transmitted by Beacon (Hexadecimal)	Confirmation that BCH Correct (√)
1	Bits 59-85= 3F81FE0 Bits 113-126= 27CF	√
2	Bits 59-85= A8A0C2 Bits 113-126= 2489 Number of seconds after providing navigation data that beacon transmitted the above encoded location information: <u>50</u>	√
3	Bits 59-85= A8A0C2 Bits 113-126= 3F09	√
4	Bits 59-85= D8A0C2 Bits 113-126= 2189	√
5	Bits 59-85= D8A0C2 Bits 113-126= B09	√
6	Bits 59-85= C8B67D Bits 113-126= 749	√
7	Bits 59-85= C8B67D Bits 113-126= 77E	√
8	Bits 59-85= C8967C Bits 113-126= 702	√
9	Bits 59-85= C8967C Bits 113-126= 77E	√
10	Bits 59-85= C8B67D Bits 113-126= 749	√

Table F-C.5: Position Acquisition Time and Position Accuracy
(External Navigation Devices)

C/S T.007 Section A3.8.2.1		C/S T.007 Section A3.8.2.2	
Time to Acquire Position (sec)	Location Error in metres	Time to Acquire Position (sec)	Location Error in metres
50	22	51	66

APPENDIX D TO ANNEX F

BEACON CODING SOFTWARE RESULTS

Table F-D.1: Examples of User Protocol Beacon Messages
(Examples required for each protocol requested for inclusion on the type approval certificate)

Protocol	Operational Message (in hexadecimal including bit and frame synchronisation bits)	Self-Test Message (in hexadecimal including bit and frame synchronisation bits)
Maritime User Protocol with MMSI	N/A	N/A
Maritime User Protocol with Radio Call Sign	N/A	N/A
Radio Call Sign User Protocol	N/A	N/A
Serial User: Float-Free EPIRB with Serial Number	N/A	N/A
Serial User: Non Float-Free EPIRB with Serial Number	N/A	N/A
Aviation User Protocol	FFFE2F4C9269B7380BA60B571C1F	FFFED04C9269B7380BA60B571C1F
Serial User: ELT with Serial Number	FFFE2F4C962000C6007CEE044F5F	FFFED04C962000C6007CEE044F5F
Serial User: ELT with Aircraft Operator Designator & Serial Number	FFFE2F4C967C71C031FCED09181F	FFFED04C967C71C031FCED09181F
Serial User: ELT with Aircraft 24-bit address	FFFE2F4C96F5E1E1E07CE9F59D9F	FFFEE04C96F5E1E1E07CE9F59D9F
Serial User: PLB with Serial Number	FFFE2F4C97A000C6007CEBC6BCDF	FFFED04C97A000C6007CEBC6BCDF
National User (Short)	FFFE2FCC980000000000003AAC25F	FFFE2FCC980000000000003AAC25F
National User (Long)	FFFE2F CC980000000000003AAC25F000007C3	FFFED0 CC980000000000003AAC25F000007C3

APPENDIX D TO ANNEX F

BEACON CODING SOFTWARE RESULTS

Table F-D.2: Examples of Location Protocol Beacon Messages

(Examples required for each protocol requested for inclusion on the type approval certificate)

Protocol	Operational Message (in hexadecimal including bit and frame synchronisation bits)		Self-Test Message (in hexadecimal including bit and frame synchronisation bits)	Location coordinates	
	Location "A" ¹	Location "B" ¹		Location "A"	Location "B"
Standard Location: EPIRB with MMSI	N/A	N/A	N/A	N 43° 33' 36" E 1° 28' 39"	N 43° 33' 33" E 1° 39' 42"
Standard Location: EPIRB with Serial Number	N/A	N/A	N/A		
Standard Location: ELT with 24-bit Address	FFFE2F 8C93AF0F0F2B80337042B58E41580D	FFFE2F 8C93AF0F0F2B803AC63A758E0548F7	FFFED0 8C93AF0F0F7FDFF8296A7583E0FAA8		
Standard Location: ELT with Serial Number	FFFE2F 8C94F9C0632B80367B05358E41580D	FFFE2F 8C94F9C0632B803FCD7DF58E0548F7	FFFED0 8C94F9C0637FDFFD222DF583E0FAA8		
Standard Location: ELT with Aircraft Operator Designator	FFFE2F 8C95C630082B8031EA83358E41580D	FFFE2F 8C95C630082B80385CFBF58E0548F7	FFFED0 8C95C630087FDFFAB3ABF583E0FAA8		
Standard Location: PLB with Serial Number	FFFE2F 8C970040012B80354A2CCD8E4157FE	FFFE2F 8C970040012B803CFC540D8E054704	FFFED0 8C970040017FDFFE13040D83E0F55B		
National Location: EPIRB	N/A	N/A	N/A		
National Location: ELT	FFFE2F 8C980018CAE20171509CB50D2B0778	FFFE2F 8C980018CAE201A784D6B50E1305CC	FFFED0 8C980018DFC0FF061D86B59F3F0548		
National Location: PLB	FFFE2F 8C9B0018CAE2017363034D0D28FC3B	FFFE2F 8C9B0018CAE201A5B7494D0E10FE8F	FFFED0 8C9B0018DFC0FF042E194D9F3CFE0B		
User-Location ²	FFFE2F CC962000C6007CEDFCEC4570017F76	FFFE2F CC962000C6007CEDFCEC457001A828	FFFED0 CC962000C6007CEDFCEC4FE0FF0F61		

¹ Location "A" and location "B" must be separated by at least 500 metres for the Standard and National location protocols, and by at least 10 km for the User-Location protocol.

² Conformance of User-Location protocol demonstrated by a single example of "A", "B", and self-test messages provided in Table F-D.2 supplemented by Table F-D.1 completed with the specific User protocol variations requested.

TABLE OF ARTICLES

ARTICLE	PAGE
i. TECHNICAL DATA	2
a. ANNEX F.....	7
APPENDIX C.....	7
b. ANNEX G	12
c. ANNEX L	17
ii. DESIGN SPECIFICATION	19
iii. EWOS 2520	41
iv. PACT AK451	44
v. DATA FOR LONG TERM	48
vi. C000260 BOARD OUT	65
vii. TYPE APPROVAL CERTIFICATE SAMPLE.....	73
viii. BEACON LABEL (NAMEPLATE DRAWING)	76
ix. BATTERY DATA.....	78
x. BROCHURE & PHOTOGRAPHS	87

ARTICLE I
TECHNICAL DATA

5. TECHNICAL DATA

The technical data submitted to the Cospas-Sarsat Secretariat shall include the following:

- a. an application form (see Annex G) for a Cospas-Sarsat Type Approval Certificate, signed by the Cospas-Sarsat accepted test facility confirming that the beacon was tested in accordance with C/S T.007 and complies with C/S T.001, and signed by the manufacturer to confirm the technical details of the beacon, including:
 - i. List of operational configurations supported:

ELT, types (AF)(AP)(S)
PLB
 - ii. Detail of battery pack:

450 0010-1 Ultralife, P/N U 10014, Li-MN2, 3V, 4 cell, D size
450 0010-2 Saft, P/N L0 26 SXC, LiSO2, 2.8V, 4 cell, D size
450 0010-3 Saft, P/N LM 33600, Li MN2, 3V, 4 cell, D size
 - iii. Detail on the special features of the beacon:

Homer 121.5 MHz
 - iv. Information on the beacon navigation system:

RS232 Aviation Data Format (Serial 3 wire)
 - v. Description of beacon self test characteristic:

(440ms-short) (520ms-long) burst on 406MHz signal
Frame sync pattern 011010000 (C/S T001)
121 / 243 MHz continuous wave during 1s

Self test result sent on serial link and LED indicator

Checks:

Correct ID in Eeprom
Power output level 121/243/406MHz
Battery Voltage Level
Internal regulated voltage level
Lock signal from PLL
- b. a summary of the beacon and antenna test results (see ANNEX F, table F.1), with supporting test data, as designated in Annex F, including:
 - i. satellite qualitative test results as per Appendix A-(1,2,3,4) to Annex F,
 - ii. beacon antenna test results as per Appendix B-(1,2,3,4) to Annex F,
 - iii. navigation system test results as per Appendix C to Annex F,

iv. sample messages generated by the beacon coding software for each coding option applicable to the beacon model as per **Appendix D to Annex F1**;

c. analysis and calculations from the manufacturer that support the pre-test battery discharge figures required for the operating lifetime at minimum temperature test;

4 D CELL CONFIGURATION	
VHF(121.5/243.0) : 0.100 Amp UHF 406 : 1.700 Amp $\frac{0.520 \text{ sec}}{50 \text{ sec}} = 0.01768 \text{ Amp}$ Total : $I_{ave} = 0.11768 \text{ Amp}$ Self Test: 5sec / month for 5 YRS = 300sec Self Test Discharge : $0.11768 \frac{300 \text{ sec}}{3600 \text{ sec / HR}} = 0.0098066 \text{ AH}$ Self Test Discharge /w 1.65 COEFF: = 0.01618 AH with 1.65 Coeff	
450-0010-1 Ultralife LiMN2	Bat self discharge: 1-1/2% (10.4 AH) 5years = 0.78AH Bat self discharge /w 1.65 coeff : $(0.78)(1.65) = 1.287\text{AH}$ /w 1.65 coeff AH total bat must be discharged : $0.01618+1.287=1.303 \text{ AH}$ $\frac{1.303 \text{ AH}}{0.11768\text{A}} = 11.07 \text{ Hrs}$ with UHF(406) & VHF(121.5/243.0) Loads $\frac{1.303 \text{ AH}}{0.100 \text{ A}} = 13.03 \text{ Hrs}$ with VHF(121.5/243.0) Loads only
450-0010-2 Saft LiSO2	Bat self discharge: $3\%(9.2\text{AH})(5\text{yrs})(1.65)=2.277\text{AH}$ Total bat must be discharged: $0.01618+2.277=2.293\text{AH}$ $\frac{2.293 \text{ AH}}{0.11768 \text{ A}} = 19.48 \text{ Hrs}$ with UHF(406) & VHF(121.5/243.0) Loads $\frac{2.293 \text{ AH}}{0.100 \text{ A}} = 22.93 \text{ Hrs}$ with VHF(121.5/243.0) Loads only
450-0010-3 Saft LiMN2	Bat self discharge: $2\%(10.5\text{AH})(5\text{yrs})(1.65)=1.7325\text{AH}$ $\frac{1.748680}{0.11768} = 14.859 \text{ Hrs}$ with UHF(406) & VHF(121.5/243.0) Loads

	0.11768
	$\frac{1.748680}{0.100} = 14.859$ Hrs with VHF(121.5/243.0) Loads only

- d. for beacons with multiple operator selectable and / or automatic modes of operation (e.g. voice transceivers, internal GNSS receivers, homers, etc.), analysis supported by test results that identifies:

(NOT APPLICABLE)

- i. the operating mode that draws the maximum battery energy,
- ii. operating modes that have pulse loads greater than in i. above;

- e. beacon operating instructions and a technical data sheet;

(Please refer to Article ii, Design Specification)

- f. brochure and photographs of the beacon, with its antenna deployed whilst in all manufacturer declared configurations (e.g. floating in water, resting on ground, held by operator, etc.);

(Please refer to Article X, Brochure & Photographs)

- g. the technical data sheet for the battery cells used in the beacon and the electric diagram of the beacon's battery pack;

(Please refer to Article iX, Battery Data)

- h. a copy of the beacon label;

(Please refer to Article viii, Beacon Label (Name Plate Drawing)

- i. the technical data sheet of the reference oscillator, including oscillator type and specifications;

(Please refer to Article iii, **EWOS 2520**)

- j. descriptions, complete with diagrams as necessary, to demonstrate that the design:

- i. provides protection against continuous transmission

(Please Article iv, PACT AK451),

- ii. meets the frequency stability requirements over 5 years

(Please refer to Article v, DATA FOR LONG TERM),

- iii. provides protection from repetitive self-test mode transmissions

(Please refer to Article iv, PACT 451);

- k. a technical description and analysis of the matching network supplied for testing

purposes per section A.1, or for cases where a matching network is not required, information shall be provided that confirms that the nominal output impedance of the beacon power amplifier is 50 Ohms and the beacon antenna VSWR measured relative to 50 Ohms is within a ratio of 1.5:1;

(Please refer to Article vi, C000260 BOARD OUT)

l. for ELT separated antennas, a statement of the beacon manufacturer if they do not want to have their own antenna included on the Secretariat-maintained list of accepted ELT antennas (for antennas of their own design and having their own part number, see Annex K);

(NOT APPLICABLE)

m. the beacon quality assurance plan

(Please refer to Annex L).

For separated ELT antennas, the antenna test results requested under (b) above may be replaced by a reference to the proper entry in the Secretariat-maintained list of accepted antennas¹, along with:

- test laboratory VSWR measurements conducted in the appropriate configuration(s), as per Annex B; and

- a completed Table F-B.1 that includes the calculated EIRP levels for each azimuth and elevation, and the calculated maximum and minimum EIRP levels at the end of life taking into account the beacon power and EIRPLOSS figure measured by the test laboratory.

(NOT APPLICABLE)

APPENDIX C TO ANNEX F

NAVIGATION SYSTEM TEST RESULTS

Table F-C.1: Position Data Encoding Results User-Location Protocol

Script Reference (See Table D.1)	Value of Encoded Location Bits Transmitted by Beacon (Hexadecimal)	Confirmation that BCH Correct (✓)
1 Full Hex	Bits 108-132= FE0FF0 FFFE2FCC962000C6007CEDFCEC4FE0FF0F61	✓ ☐
2 Full Hex	Bits 108 – 132= 23011 FFFE2FCC962000C6007CEDFCEC4023011ED3 Number of seconds after providing navigation data that beacon transmitted the above encoded location information: <u>50</u>	☐ ✓ ☐ ☐ ☐ ✓
3 Full Hex	Bits 108-132= 6D052 FFFE2FCC962000C6007CEDFCEC406D052E88	✓ ☐ ☐

Table F-C.2: Position Data Encoding Results Standard Location Protocol

Script Reference (See Table D.2)	Value of Encoded Location Bits Transmitted by Beacon (Hexadecimal)	Confirmation that BCH Correct (✓)
1 Full Hex	Bits 65-85= FFBFF Bits 113-132= 83E0F FFFE2F8C93AF0F0F7FDFF8296A7583E0FAA8	✓ ☐ ☐
2 Full Hex	Bits 65-85= 2404 Bits 113-132= 8E227 FFFE2F8C93AF0F0F01202111F6358E22705C Number of seconds after providing navigation data that beacon transmitted the above encoded location information: <u>50</u>	☐ ☐ ✓ ☐ ☐ ☐ ☐ ☐
3 Full Hex	Bits 65-85= 2404 Bits 113-132= F8227 FFFE2F8C93AF0F0F01202111F635F8227B1A	☐ ☐ ✓ ☐ ☐
4 Full Hex	Bits 65-85= 3404 Bits 113-132= 88227 FFFE2F8C93AF0F0F01A022D0D3B58822775D	☐ ☐ ✓ ☐ ☐
5 Full Hex	Bits 65-85= 3404 Bits 113-132= 74627 FFFE2F8C93AF0F0F01A022D0D3B574627B03	☐ ☐ ✓ ☐ ☐

6	Bits 65-85= 2404 Bits 113-132= 8227	☐ ☐ √
Full Hex	FFFE2F8C93AF0F0F01202111F6350822746C	☐
7	Bits 65-85= 2404 Bits 113-132= 83D7	☐ ☐ √
Full Hex	FFFE2F8C93AF0F0F01202111F635083D7824	☐
8	Bits 65-85= 2406 Bits 113-132= 8227	☐ ☐ √
Full Hex	FFFE2F8C93AF0F0F0120327D07B50822746C	☐
9	Bits 65-85= 2406 Bits 113-132= 81B8	√ ☐
Full Hex	FFFE2F8C93AF0F0F0120327D07B5081B859C	☐
10	Bits 65-85= 2402 Bits 113-132= 8206	☐ ☐ √
Full Hex	FFFE2F8C93AF0F0F012014A4E4B508206FBD	☐

Table F-C.3: Position Data Encoding Results National Location Protocol

Script Reference (See Table D.3)	Value of Encoded Location Bits Transmitted by Beacon (Hexadecimal)	Confirmation that BCH Correct (✓)
1 Full Hex	Bits 59-85= 3F81FE0 Bits 113-126= 27CF FFFE2F8C980018DFC0FF061D86B79F3F098C	✓ ☐ ☐
2 Full Hex	Bits 59-85= A8A0C2 Bits 113-126= 2489 FFFE2F8C980018C5450613F350F792270150 Number of seconds after providing navigation data that beacon transmitted the above encoded location information: <u>50</u>	☐ ☐ ✓ ☐ ☐ ☐ ☐ ☐
3 Full Hex	Bits 59-85= A8A0C2 Bits 113-126= 3F09 FFFE2F8C980018C5450613F350F7FC27032B	☐ ☐ ✓ ☐ ☐
4 Full Hex	Bits 59-85= D8A0C2 Bits 113-126= 2189 FFFE2F8C980018C6C506148AACF78627066F	☐ ☐ ✓ ☐ ☐
5 Full Hex	Bits 59-85= D8A0C2 Bits 113-126= B09 FFFE2F8C980018C6C506148AACF72C2709DF	☐ ☐ ✓ ☐ ☐

6	Bits 59-85= C8B67D Bits 113-126= 749	☐ √
Full Hex	FFFE2F8C980018C645B3EEF9EB771D27057F	☐
7	Bits 59-85= C8B67D Bits 113-126= 77E	☐ √
Full Hex	FFFE2F8C980018C645B3EEF9EB771DFB02EC	☐
8	Bits 59-85= C8967C Bits 113-126= 702	☐ √
Full Hex	FFFE2F8C980018C644B3E0CDD8B71C0B040B	☐
9	Bits 59-85= C8967C Bits 113-126= 77E	☐ √
Full Hex	FFFE2F8C980018C644B3E0CDD8B71DFB02EC	☐
10	Bits 59-85= C8B67D Bits 113-126= 749	☐ √
Full Hex	FFFE2F8C980018C645B3EEF9EB771D27057F	

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

G.1 INFORMATION PROVIDED BY THE BEACON MANUFACTURER

Beacon Manufacturer and Beacon Model

Beacon Manufacturer	AMERI-KING CORPORATION
Beacon Model	AK-451-() SERIES

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)		