Toulouse, 30 May 2007

INTESPACE reference : E7555-CS

C/S T.A. TEST REPORT OF 406 MHz DISTRESS BEACON

MANUFACTURER :	MARTEC
BEACON MODEL :	KANNAD XS3-GPS

Written : 30 May 2007
By : Gerard PEYROU
Visa :

Approved : 4 June 2007
By : Paul Eric DUPUIS
Visa :

Quality Control : 4 June 2007
By : André LOUIT
Visa : p.o. C. Balanda

Distribution :

- Mr	Stephane JINCHELEAU	MARTEC	(1 copy)
- Mr	Dany St PIERRE	COSPAS/SARSAT Sec	(1 copy)
- INTESPACE		ITS/ES (RLS)	(1 copy)

1 - ADMINISRATION

1.1. WORK ORDER

Manufacturer : MARTEC
Address : Z.I. des Cinq Chemins
56520 GUIDEL

Represented by : Mr Stephane JINCHELEAU

1.2. INTESPACE TEST CENTER

The test operations have been conducted by : Gerard PEYROU

1.3. SCHEDULE

Start of test: 9 November 2006
End of test : 10 May 2007

1.4. WORK REFERENCE : **E7555-CS**

1.5. EQUIPMENT UNDER TEST

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

- Commercial designation :
- Model : KANNAD XS3-GPS
- Sérial number: 35407-2

2 - TEST FACILITIES

- ARGOS - COSPAS/SARSAT Certification Test Bench.
- Anechoic chamber for antenna test .
- Toulouse CNES MCC .

3 - STANDARDS AND TEST PROCEDURES APPLICABLE

COSPAS-SARSAT standards :

- "C/S T. 001- Issue 3 - Revision 7 - November 2005 "
- "C/S T. 007- Issue 4 - Revision 1 - October 2006"

INTESPACE Radio Beacon Test Procédures :

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

4 - RESULTS

See the following pages :

- C/S Annex G : Application form for a COSPAS-SARSAT 406 MHz beacon Type Approval Certificate ,
- Summary of 406 MHz beacon test results
- Test results : data and graphs
- Annex A : Antenna test report
- Annex B : Navigation System test report
- Annex C : Manufacturer technical data

ANNEX G

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

G.1 INFORMATION PROVIDED BY THE BEACON MANUFACTUREUR

Beacon manufacturer	MARTEC Serpe-lesm
Beacon model	KANNAD XS3 GPS

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	X
	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)		

Beacon characteristics

Characteristic	Specification
Operating temperature range	-20 °C / +55°C
Operating lifetime	24 hours
Battery chemistry	Lithium
Battery cell size and number of cells	DL123 / 6
Battery manufacturer	DURACELL
Battery pack manufacturer and part number	Williamson / WILPA1655
Oscillator type (e.g. OCXO, MCXO, TCXO)	TCXO (see § 10)
Oscillator manufacturer	C-MAC (see § 10)
Oscillator part name and number	E4217LF
Oscillator satisfies long-term frequency stability requirements (Yes or No)	YES (see § 10)
Antenna type (Integrated or External)	Integrated
Antenna manufacturer	MARTEC
Antenna part name and number	0143563A
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 (see § 2.4.2)
Features in beacon that ensures erroneous position data is not encoded into the beacon message (Yes, No or N/A)	NO
Navigation device capable of supporting global coverage (Yes, No or N/A)	YES
For internal navigation devices - geodetic reference system (WGS84 or GTRF) - GNSS receiver cold start forced at every beacon activation (Yes or No) - Navigation device manufacturer - Navigation device model name and part number - GNSS system supported (e.g. GPS, GLONASS, Galileo)	See § 2.4 WGS84 YES FASTRAX ITRAX03-8 GPS

Characteristic	Specification
For external navigation devices - 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)	NOT APPLICABLE
Self-test mode characteristics - self-test has separate switch position (Yes or No) - Self-test switch automatically returns to normal position when released (Yes or No) - Self-test activation can cause an operational mode transmission (Yes or 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) - Results of self-test indicated by (e.g. Pass / Fail indicator Light, Strobe light, etc.) - Self-test can be activated from beacon remote activation points (Yes or 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) - Self-test transmits a signal(s) other than at 406 MHz (Yes & details or No) - Self-test can be activated directly at beacon (Yes or No) - List of items checked by self-test - Self-test transmission burst duration (440 or 520 ms) - Self-test format bit ("0" or "1")	 YES YES NO YES Pass / fail indicator light NO YES NO YES Battery voltage RF power at 406 MHz Phase locked loop 520ms 1
Beacon includes a homer transmitter (if yes identify frequency of transmission) - Homer transmit power - Homer duty cycle - Duty cycle of homer swept tone	121.5 MHz ±3kHz 50mW ± 3dB PERP 100 % 50 %
Beacon includes a strobe light (Yes or No) - Strobe light intensity - Strobe light flash rate	NO
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 distributer on the interval 47.5 to 52.5 seconds (Yes or No)	YES (see § 11.5)
Other ancillary devices (e.g. voice transceiver). List details on a separate sheet if insufficient space to describe	NO
Beacon includes automatic activation mechanism (Yes or No)	NO

G.2 INFORMATION PROVIDED BY THE COSPAS-SARSAT ACEPTED TEST FACILITY

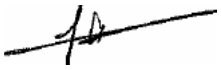
Name and Location of Beacon Test Facility: INTESPACE

Date of submission for Testing: 9 November 2006

Applicable C/S Standards:

Document	Issue	Revision
C/S T.001	3	7
C/S T.007	4	1

I hereby confirm that the 406 MHz beacon described above has been successfully tested in accordance with the COSPAS-SARSAT 406 MHz Beacon 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.

Dated : 30 May 2007 Signed : 

Gérard PEYROU
Intespace Distress Beacon Test Responsible

Note: The declaration is justified above by the hold in account of the uncertainties of measures granted to the test laboratories as definite in the document Cospas-Sarsat Acceptance of 406 MHz Beacon Type Approval Test Facilities (C/S T.008)

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	36,2	36,1	35,5	
o Power output rise time		< 5	ms	0,60	0,63	0,64	Graphs p, 22, 25 and 28
o power output 1 ms before burst		< -10 dBm	√ *	√	√	√	Graphs pages 16 to 18
2 - DIGITAL MESSAGE	Bits number						Data and graphs pages 19 to 28
o bit sync	1-15	15 bits "1"	√	√	√	√	
o frame sync	16-24	9 bits (000101111)	√	√	√	√	
o format flag	25	1 bit	√	1	1	1	
o protocol flag	26	1 bit	√	0	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	110111	110111	110111	
o additional data/BCH (if applicable)	113-144	32 bits	√	√	√	√	
o position error (if applicable)		< 0,5	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 19 to 28
o repetition rate T_R :						
average T_R =	48,5 - 51,5	seconds	50,04	49,98	49,89	
minimum T_R =	$47,5 \leq T_R \leq 48,0$	seconds	47,65	47,51	47,91	
maximum T_R =	$52,0 \leq T_R \leq 52,5$	seconds	52,28	52,17	52,17	
standard deviation =	0,5 - 2,0		1,50	1,48	1,38	
o bit rate						
minimum f_b =	396	bits/sec.	401,10	401,20	401,66	
maximum f_b =	404	bits/sec.	401,14	401,26	401,70	
o total transmission time :						
short message =	435.6 - 444.4	ms				
long message =	514.8 - 525.2	ms	520,47	520,30	519,71	
o unmodulated carrier						
minimum T_1 =	158,4	ms	160,50	160,42	160,25	
maximum T_1 =	161,6	ms	160,51	160,43	160,27	
o first burst delay	> 47,5	seconds	> 50 sec	> 50 sec	> 50 sec	

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
o biphase-L		√	√	√	√	pages 19 to 28
o rise time	50 - 250	microsec.	170	180	180	
o fall time	50 - 250	microsec.	170	160	170	
o phase deviation : positive	+ (1.0 to 1.2)	radians	+ 1,08	+ 1,09	+ 1,08	
o phase deviation : negative	- (1.0 to 1.2)	radians	- 1,08	- 1,08	- 1,09	
o symmetry measurement	≤ 0.05		4,02E-03	8,06E-03	4,04E-06	
5 - 406 MHz TRANSMITTED FREQUENCY						Data pages 20, 23 and 26
o nominal value	as specified in C/S T.001 and C/S T.012	MHz	406,0279350	406,0279330	406,0279353	start test date : 9 nov. 2006
o short term stability	≤ 2 x 10^{-9}	/100 ms	2,50E-10	2,14E-10	4,56E-10	
o medium term stability						
. slope	(-1 to +1) x 10^{-9}	/minute	-1,94E-10	-1,04E-11	3,27E-10	
. residual frequency variation	≤ 3 x 10^{-9}		1,36E-09	8,04E-10	5,18E-10	
6 - SPURIOUS EMISSION [1] (into 50 ohms) o in-band (406.0 - 406.1 MHz)	C/S T.001 mask	√	√	√	√	See graphs pages 29 to 32

[1] Include spectral plots of the 406,0-406,1 MHz band, showing the transmit signal and emission mask as defined in C/S T.001.

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)	
7 - 406 MHz VSWR CHECK after open circuit, short cicuit, then while VSWR is 3:1, measure :						See data and graphs pages 33 to 39
o nominal transmitted frequency	as specified in C/S T.001	MHz	406,0279379	406,0279265	406,0279405	
o Modulation :						
- rise time	50 - 250	microsec.	159,7	149,7	179,6	
- fall time	50 - 250	microsec.	169,7	189,6	179,6	
- phase deviation : positive	+ (1.0 to 1.2)	radians	1,06	1,09	1,06	
- phase deviation : negative	- (1.0 to 1.2)	radians	-1,10	-1,07	-1,09	
- symmetry measurement	≤ 0.05	√	4,04E-06	4,04E-06	4,01E-03	
- digital message	must be correct	√	√	√	√	
8 - SELF-TEST MODE (if applicable)						Data pages 40 to 42
o frame sync	9 bits (011010000)	√		√		
o format flag	1/0	bit		1		
o single radiated burst	≤ 440 /520 (+1%)	ms		520,06		
o default position data (if applicable)	must be correct	√		√		
o description provided		√		√		
o design data provided on protection against repetitive self-test mode transmissions	protection provided	√		√		Manufacturer doc. Annex C
o single burst verification	one burst	√		√		
o provides for beacon 15 Hex ID	correct	√		√		Data page 41
o 121,5 MHz RF power (if applicable)	self-test checks that RF power emitted	√		√		
o 406 MHz RF power	self-test checks that RF power emitted	√		√		

PARAMÈTRES TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS	COMMENTS
9 - THERMAL SHOCK[1] (30° C change)				Data and graphs pages 43 to 50
o Soak temperature :		°C	Tsoak = -10	
o Measurement temperature :		°C	TMeas = 22	
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	406,027924 / 406,027939	
- short term stability	≤ 2 x 10^{-9}	/100 ms	2,08E-10	
- medium term stability :				
. slope	(-2 to +2) x 10^{-9}	/minute	-3,7E-10 / 3E-10	
. residual frequency variation	≤ 3 x 10^{-9}		1,36E-10	
o Transmitted power output	35 - 39	dBm	35,7 / 36,0	
o Digital message	must be corect	√	√	

1 Attach graphs depicting test results.

PARAMÈTRES TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS	COMMENTS
10 - OPERATING LIFETIME AT MINIMUM TEMPERATURE[1]			3,68E-10 -4,68E-10	Data and graphs pages 51 to 60
o Duration	> 24	hours	30 hours at Tmin = -20°C (36 dBm)	
o Transmitted frequency :				
- nominal value	as specified in C/S T.001 and C/S T.012	MHz	406,027935 / 406,02795	
- short term stability	≤ 2 x 10^{-9}	/100 ms	≤ 1,5 x 10-9	
- medium term stability				
. slope	(-1 to +1) x 10^{-9}	/minute	-5E-10 / 4E-10	
. residual frequency variation	≤ 3 x 10^{-9}		< 2,5E-9	
o Transmitted power output	35 - 39	dBm	35,0 / 36,1	
o Digital message	must be corect	√	√	
11 - TEMPERATURE GRADIENT (5° C/hr)[1]				Data and graphs pages 61 to 78
o Transmitted frequency :				
- nominal value	as specified in C/S T.001 and C/S T.012	MHz	406,027898/ 406,027948	
- short term stability	≤ 2 x 10^{-9}	/100 ms	< 1,5 E-9	
- medium term stability				
. Slope (A to B, C+15 to D, and E+15 to F)	(-1 to +1) x 10^{-9}	/minute	-7E-10 / 7E-10	
. Slope (B to C+15, and D to E+15)	(-2 to +2) x 10^{-9}	/minute	-5E-10 / 1,5E-9	
. residual frequency variation	≤ 3 x 10^{-9}		< 3,0E-9	
o Transmitted power output	35 - 39	dBm	35,0 / 36,1	
o Digital message	must be corect	√	√	
12 - OSCILLATOR AGING (data provided)	C/S T.001	MHz	-2,030E-03	Manufacturer explanations in Annex C

1 Attach graphs depicting test results.

PARAMÈTRES TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS		COMMENTS
13 - PROTECTION AGAINST CONTINUOUS TRANSMISSION o Description provided	≤ 45	seconds	17 sec		Manufacturer explanations in Annex C
14 - SATELLITE QUALITATIVE TESTS[2] (results provided)	15 Hex ID provided by LUT and position within 5 km 80%	√	√		Satellite C/S Tables F-A pages 80, 81
15 - ANTENNA CHARACTERISTICS			B2 Configuration	B5 Configuration	Antenna test report Annex A
o Polarization	linear or RHCP		Like Circular		
o VSWR	≤ 1.5		N/A		
o ERPLOSS		dB	0,1		Out of C/S specification but according to the
o ERPmax EOL	≤ 43	dBm	41,2	36,1	measurement uncertainties (± 3 dB) the Beacon
o ERPmin EOL	≥ 32	dBm	30,36*	30,7	Antenna can be declared in EIRP Ref tolerance
o azimuth gain variation at 40° elevation angle	≤ 3	dB	2,6	3,3	
16 - BEACON CODING SOFTWARE[3]					
o sample message provided for each coding option of the applicable coding types	correct	√	√		Annex B : FC & FD Tables Annex C : manufacturer doc
o sample self-test message provided for each coding option of the applicable coding types	correct	√	√		

2 Attach a satellite qualitative test summary report (Appendix A to Annex F) for each test configuration.

3 Attach examples of each requested coding option as per Appendix D to Annex F.

PARAMÈTRES TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS	COMMENTS
17 - NAVIGATION SYSTEM[4]				
o position data default values	correct	√	√	Annex B : Nav. System test report
o position acquisition time	< 10 / 1	minutes	< 5	Annex B :
o position accuracy	C/S T.001		< 500	Table F.C 4
o encoded positon data update interval	> 20	minutes	23,75	
o positon clearance after deactivation	cleared	√	√	
o positon data input update interval (as applicable)	20 / 1	minutes	N/A	Annex B :
o positon data encoding	correct	√	√	Results per tables F-C.1, F-C.2 and F-C.3
o retained last valid position after navigation input lost	240 (± 5)	min	239,5	
o default position data transmitted after 240(± 5) minutes without valid position data	cleared	√	√	
o information provided on protection against beacon degradation due to navigation device, interface or signal failure or malfunction		√	√	Annex C : manufacturer doc

4 Attach navigation system test results as per Appendix C to Annex F

TRANSMITTER OUTPUT POWER RISE TIME TEST RESULT ON MARTEC

KANNAD XS3-GPS

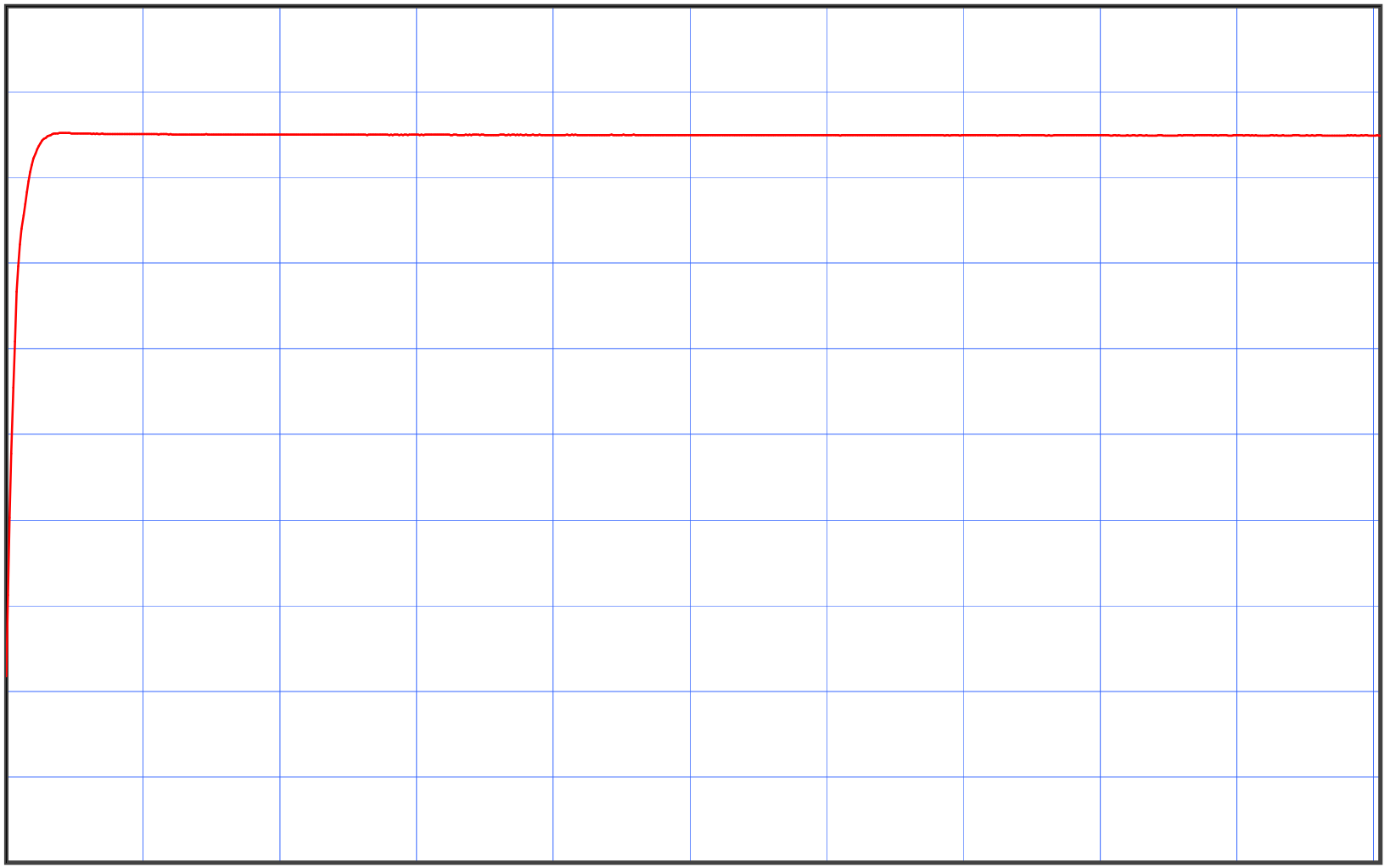
N° 35407-2

(1 ms before 10 % of the burst)

at -20° C, 22° C and 55° C

Output Power Risetime at -20°C

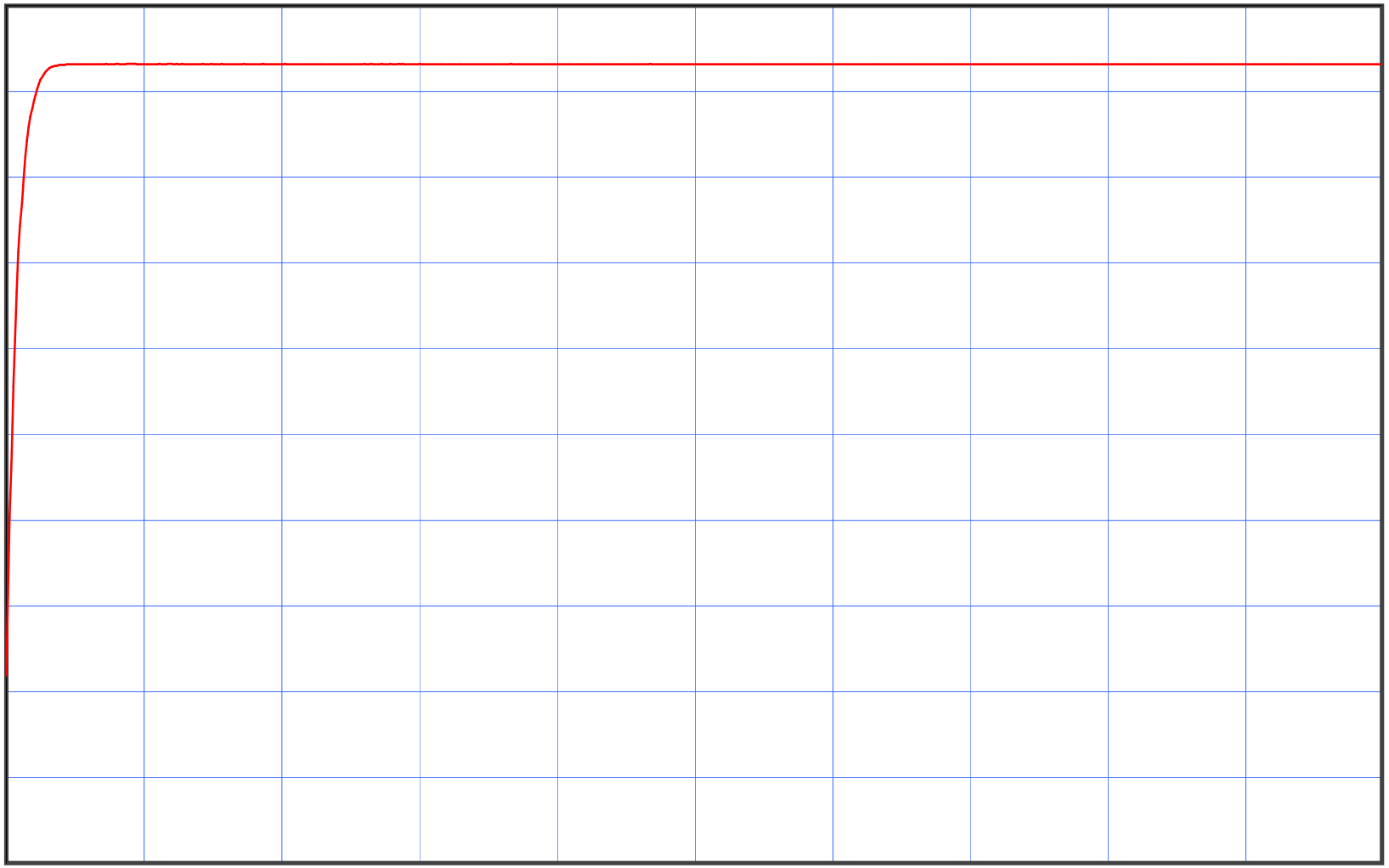
CF : 406,028 MHz **Output Power Risetime (1 ms before the burst) : -27,88 dBm** **SP : 0 KHz**



Rb : 1 KHz **10 dB/div.** **St : 0,05 S**

Output Power Risetime at 22°C

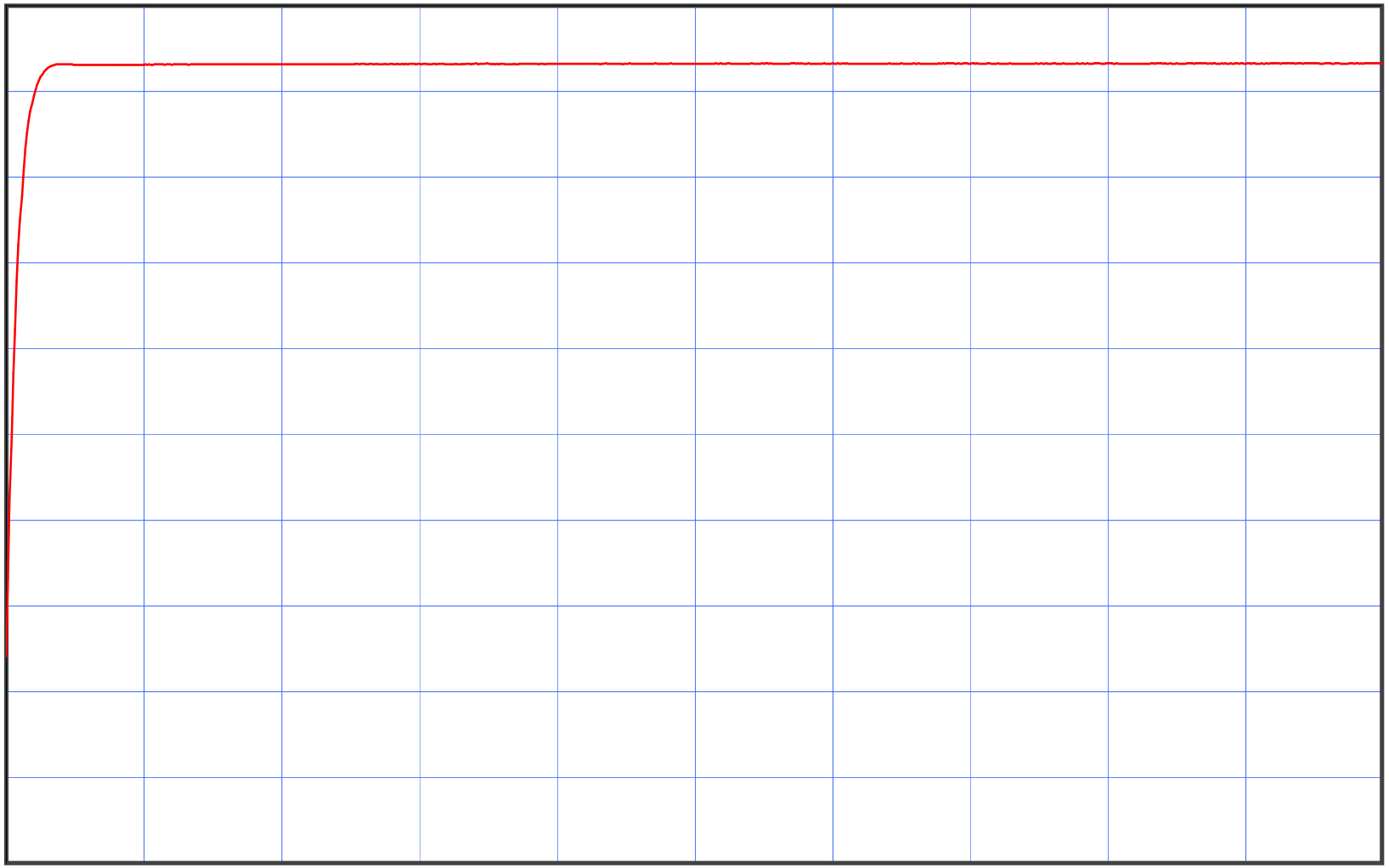
CF : 406,028 MHz **Output Power Risetime (1 ms before the burst) : -29,91 dBm** **SP : 0 KHz**



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) : -25,61 dBm** **SP : 0 KHz**



Rb : 1 KHz **10 dB/div.** **St : 0,05 S**

CERTIFICATION TEST RESULTS ON
MARTEC
KANNAD XS3-GPS
N° 35407-2
at -20° C, 22° C and 55° C

Certification Test at -20°C Date of test : 28-nov-06

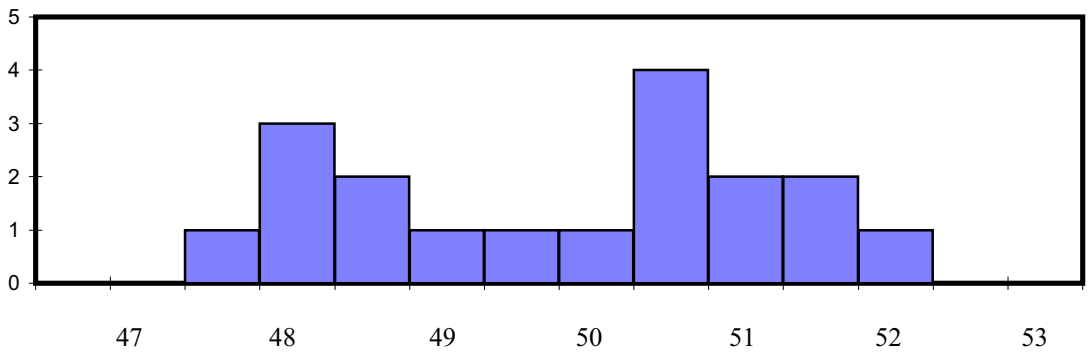
Manufacturer : MARTEC
Beacon Type : PLB OPALE
Number : 35407

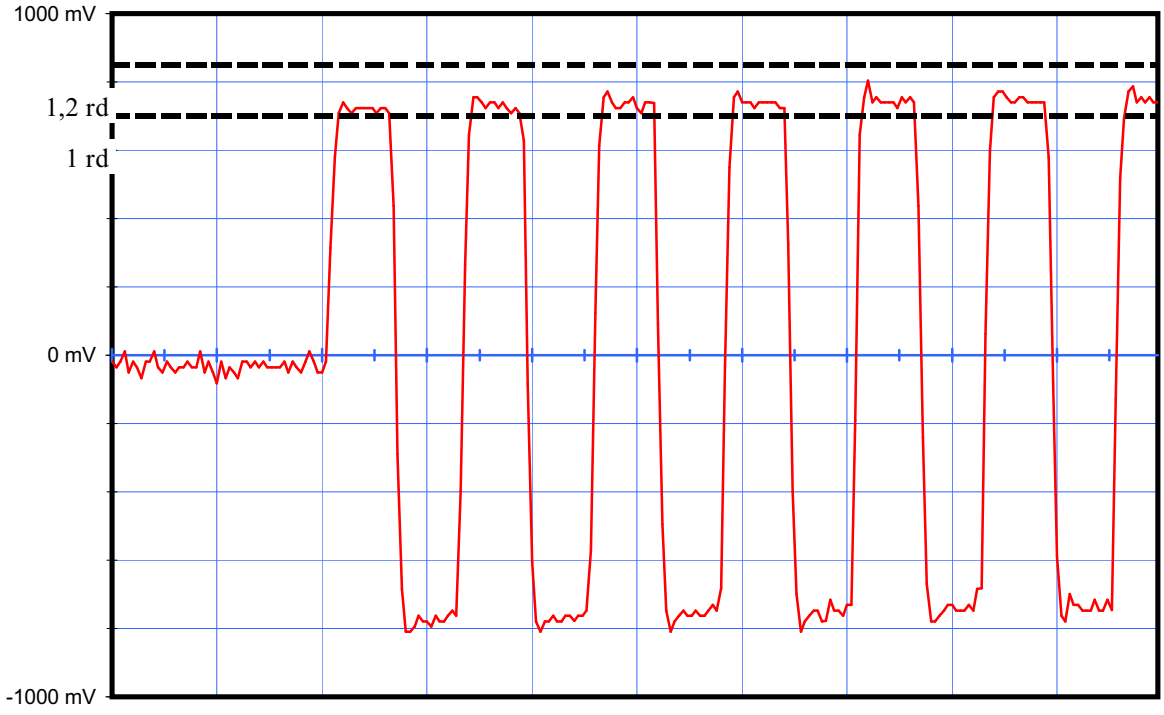
Message

Message received		FFFE2F8E3E2293E02B8036AFFAF78E0159E3	
Format Flag	25	1	
Protocol flag	26	0	
Ident./Position code	27-85	0	
Country Code/Country	27-36	227 / FRANCE	
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			
Calculated BCH1	25-85	1ABFEB	
Encoded BCH1	86-106	1ABFEB	
Homing	112	1	
Em.cod/nat.use/supp.data	107-112	110111	
Encod pos data	111	1	Internal
Fixed Data "1"	108	1	OK
Calculated BCH2	107-132	9E3	
Encoded BCH2	133-144	9E3	
Latitude position		Nord 43,5° 3' 32"	
Longitude position		Est 0,5° 58' 40"	
Delta position < 0,5 km		0,076 km	

Electrical and other parameters

CW preamble	ms 158,4 <	< 161,6	160,50
Total transmission time	ms 514,8 <	<525,2	520,47
Modulation frequency	Hz 396<	< 404	401,12
Phase deviation : total	rd	<=2,40	2,16
Phase deviation : positive	rd 1,00 <	< 1,20	1,08
Phase deviation : negative	rd -1,20 <	< -1,00	-1,08
Symmetry measurement	%	<=5 %	0,40
Nominal frequency : F2	Hz		406027935,05
Short term2			1,65E-10
Short term3			2,50E-10
Slope			-1,94E-10
Residual			1,36E-09
406 MHz power output	dBm		36,2
Homing frequency	MHz		121,50
121,5 MHz power output	dBm		17,4
Soak temperature	°C		-19,3
Extra feature			No



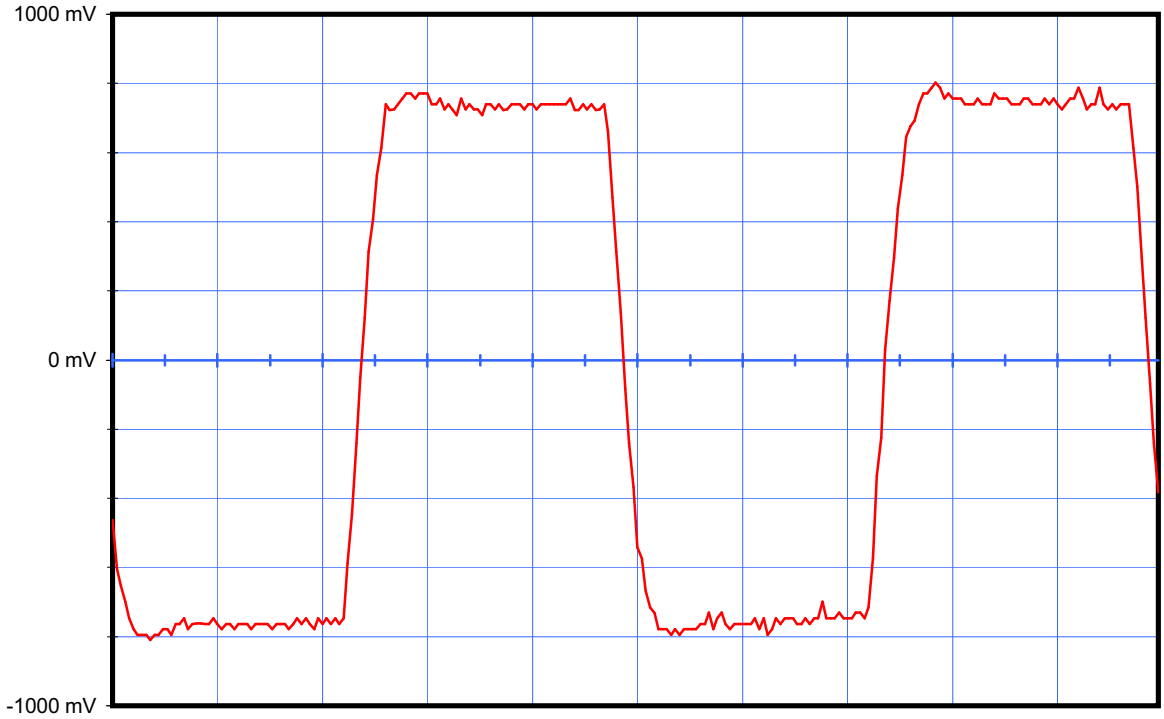


0 ms 10 ms 20 ms

Vmarker1 850 mv ==> 1,2 rd

Vmarker2 700 mv ==> 1 rd

2 ms/div.



8 ms 10,5 ms 13 ms

Duty Cycle : 0,004016064

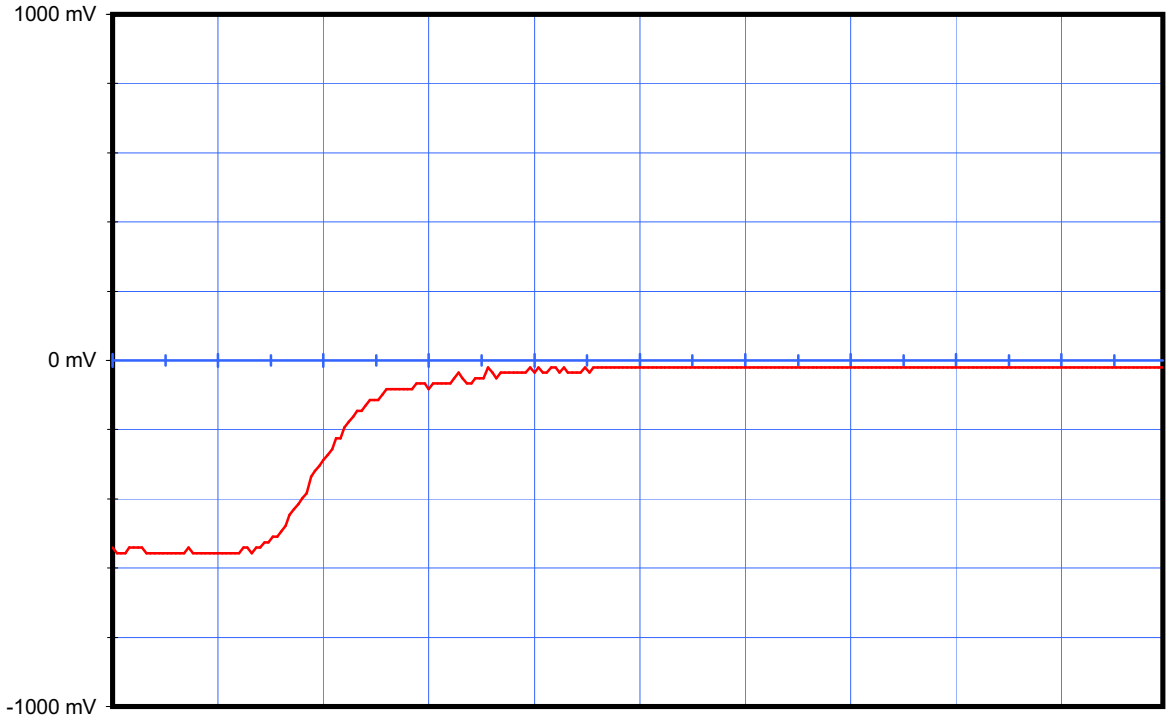
falltime(1)<= 169,661 us

+width(1) 1,2475 ms

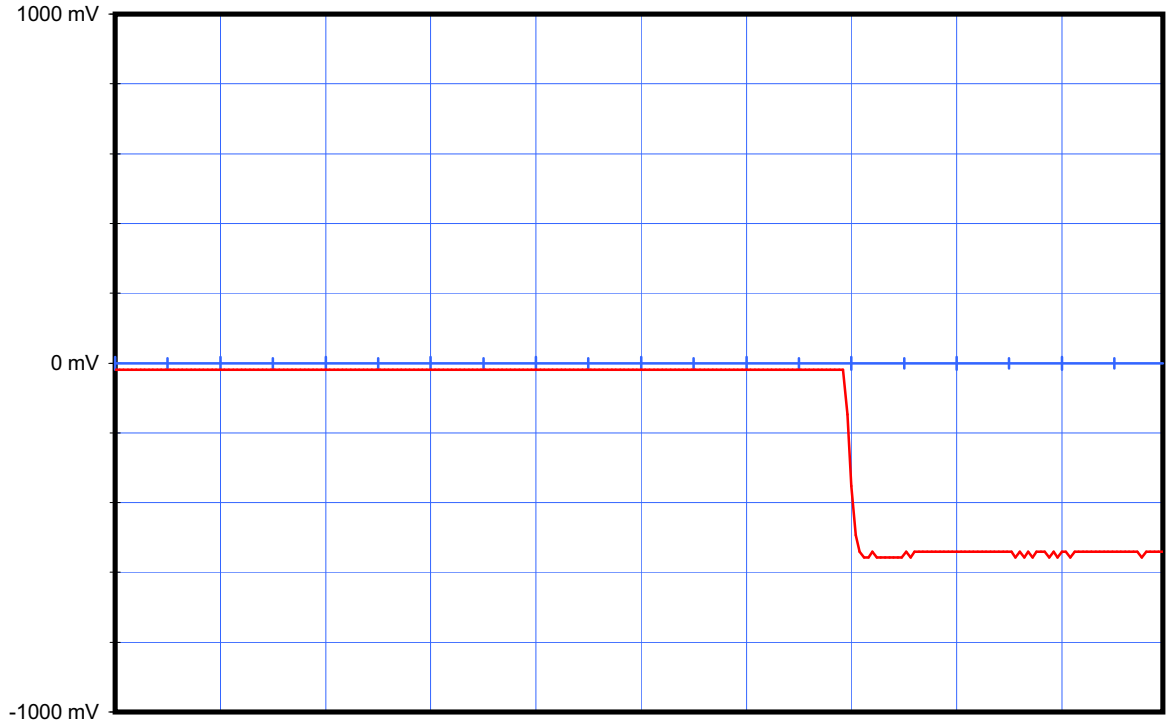
0,5 ms/div.

risetime(1)<= 169,66 us

-widht(1) 1,23752 ms



-1 ms 1,5 ms 4 ms
risetime(1)<= 598,802 us 0,5 ms/div.



-3,5 ms -1 ms 1,5 ms
falltime(1)<= 59,8801 us 0,5 ms/div.

Certification Test at 22°C Date of test : 27-nov-2006

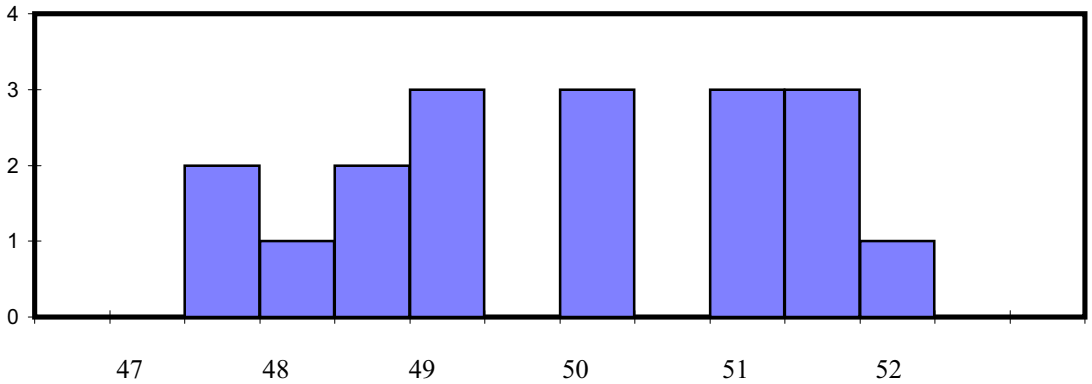
Manufacturer : MARTEC
Beacon Type : KANNAD XS3-GPS
Number : 35407

Message

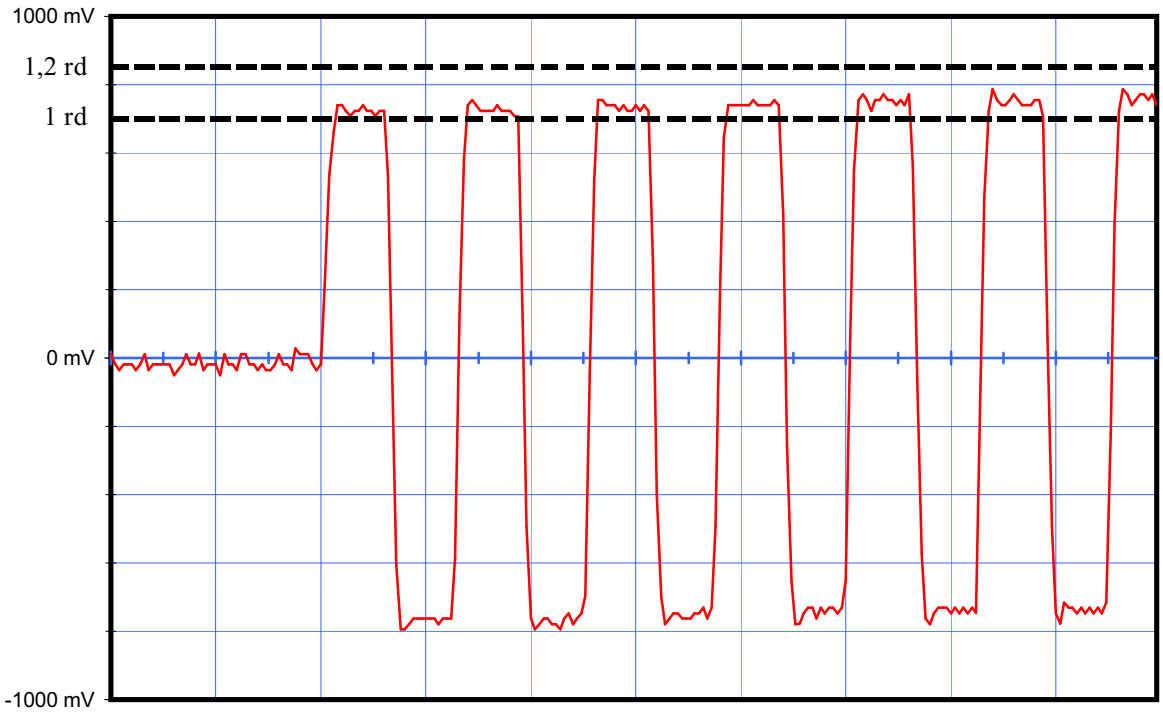
Message received		FFFE2F8E3E2293E02B8036AFFAF78E0159E3	
Format Flag	25	1	
Protocol flag	26	0	
Ident./Position code	27-85	0	
Country Code/Country	27-36	227 / FRANCE	
Protocol Code : U/Std-Nat	37-39/37-40	1110	
Protocol Code Used	37-39/37-40	Test-Standard Location	
Identification Data	40-85/41-64/41-58		
Identification Used			
Calculated BCH1	25-85	1ABFEB	
Encoded BCH1	86-106	1ABFEB	
Homing	112	1	
Em.cod/nat.use/supp.data	107-112	110111	
Encod pos data	111	1	Internal
Fixed Data "1"	108	1	OK
Calculated BCH2	107-132	9E3	
Encoded BCH2	133-144	9E3	
Latitude position		Nord 43° 33' 32"	
Longitude position		Est 1° 28' 40"	
Delta position < 0,5 km		0,076 km	

Electrical and other parameters

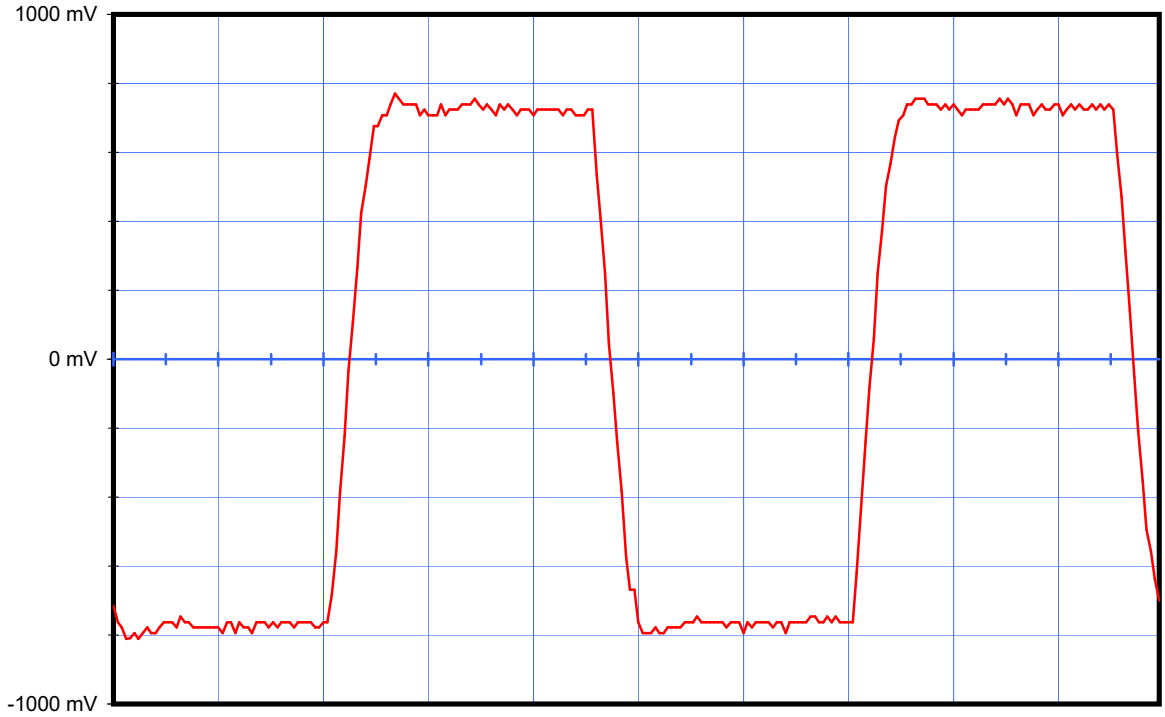
CW preamble	ms 158,4 <	< 161,6	160,43
Total transmission time	ms 514,8 <	<525,2	520,30
Modulation frequency	Hz 396<	< 404	401,23
Phase deviation : total	rd	<=2,40	2,16
Phase deviation : positive	rd 1,00 <	< 1,20	1,09
Phase deviation : negative	rd -1,20 <	< -1,00	-1,08
Symmetry measurement	%	<=5 %	0,81
Nominal frequency : F2	Hz		406027933,02
Short term2			1,23E-10
Short term3			2,14E-10
Slope			-1,04E-11
Residual			8,04E-10
406 MHz power output	dBm		36,1
Homing frequency	MHz		121,50
121,5 MHz power output	dBm		17,2
Soak temperature	°C		22,7
Extra feature			No



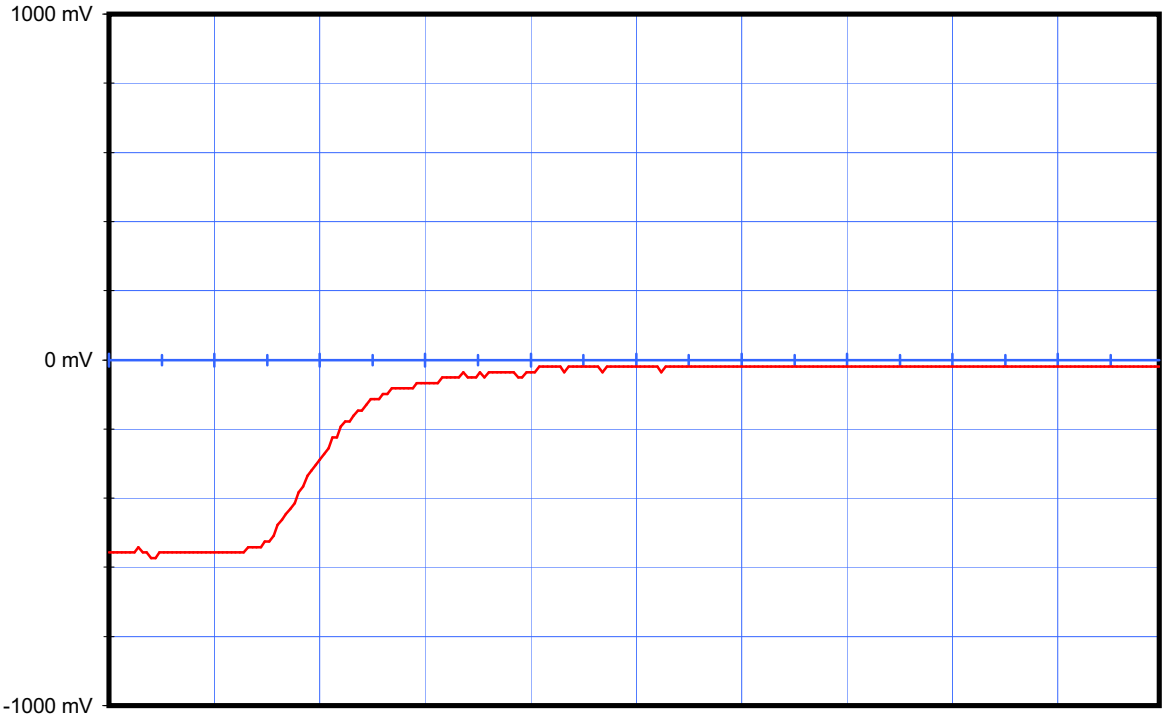
47 48 49 50 51 52



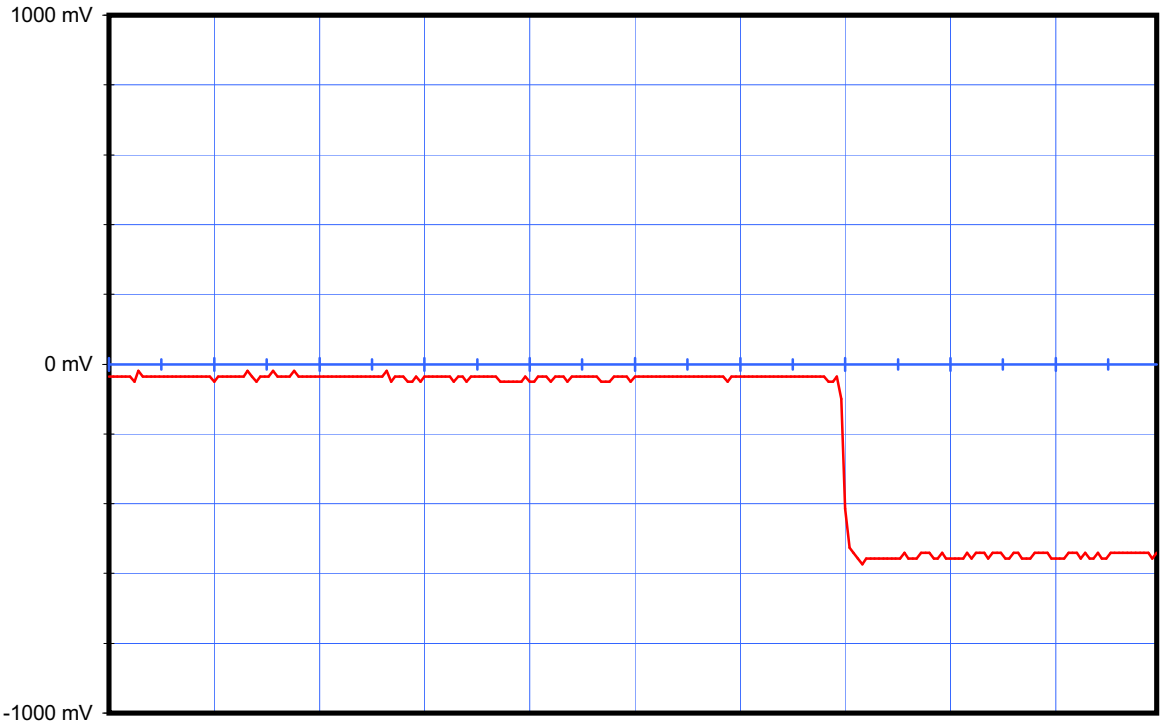
0 ms 10 ms 20 ms
Vmarker1 850 mv ==> 1,2 rd 2 ms/div.
Vmarker2 700 mv ==> 1 rd



8 ms 10,5 ms 13 ms
Duty Cycle : 0,008064516 0,5 ms/div.
falltime(1)<= 159,681 us risetime(1)<= 179,64 us
+width(1) 1,2475 ms -widht(1) 1,22754 ms



-1 ms 1,5 ms 4 ms
risetime(1)<= 628,743 us 0,5 ms/div.



-3,5 ms -1 ms 1,5 ms
falltime(1)<= 49,9 us 0,5 ms/div.

Certification Test at 55°C Date of test : 27-nov-2006

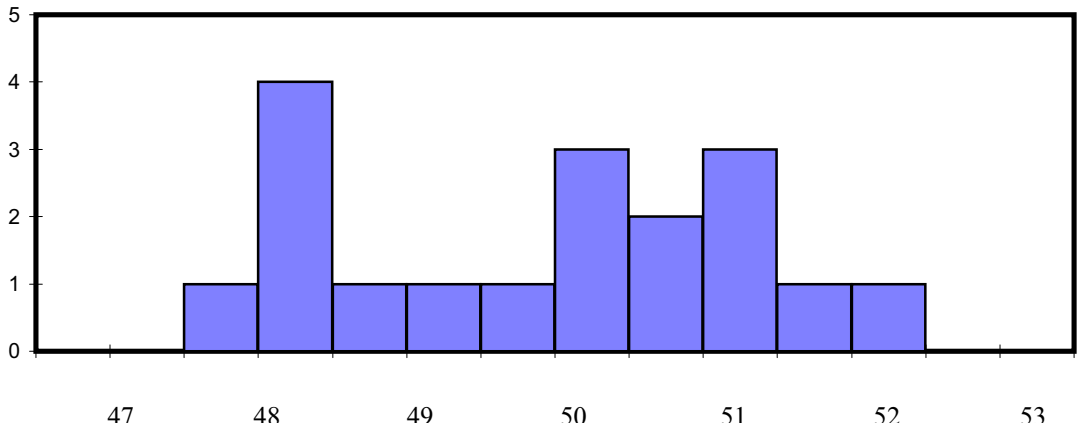
Manufacturer : MARTEC
Beacon Type : KANNAD XS3-GPS
Number : 35407

Message

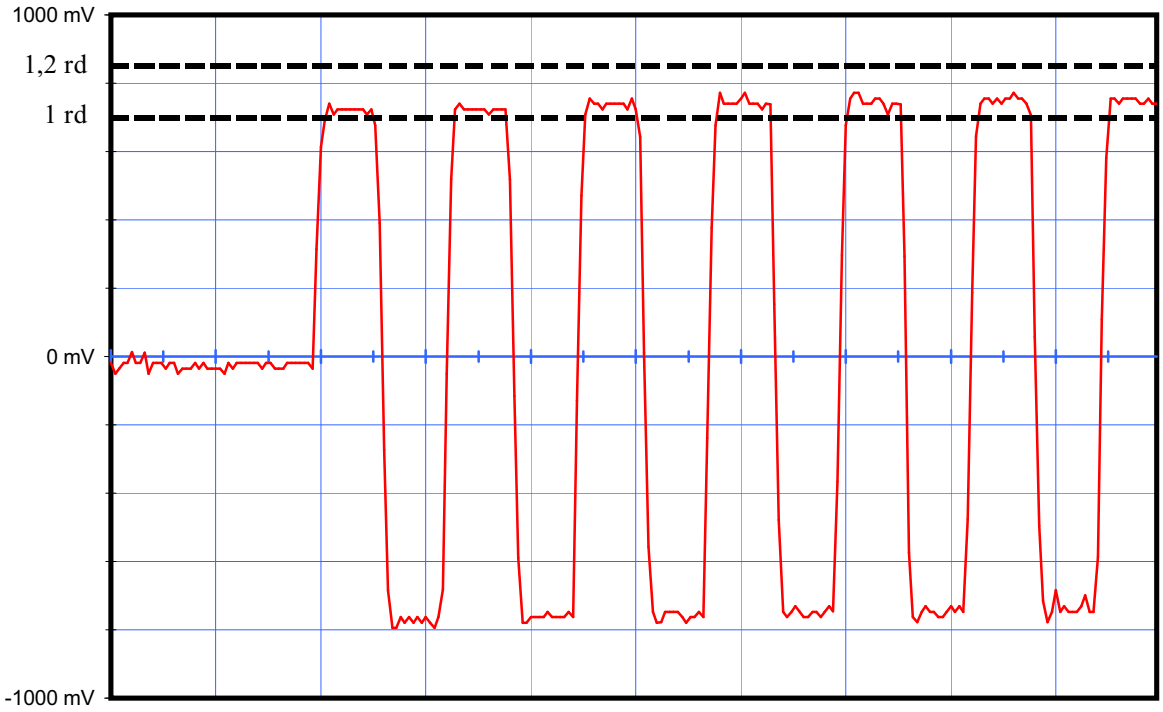
Message received		FFFE2F8E3E2293E02B8036AFFAF78E4141F0	
Format Flag	25	1	
Protocol flag	26	0	
Ident./Position code	27-85	0	
Country Code/Country	27-36	227 / FRANCE	
Protocol Code : U/Std-Nat	37-39/37-40	1110	
Protocol Code Used	37-39/37-40	Test-Standard Location	
Identification Data	40-85/41-64/41-58		
Identification Used			
Calculated BCH1	25-85	1ABFEB	
Encoded BCH1	86-106	1ABFEB	
Homing	112	1	
Em.cod/nat.use/supp.data	107-112	110111	
Encod pos data	111	1	Internal
Fixed Data "1"	108	1	OK
Calculated BCH2	107-132	1F0	
Encoded BCH2	133-144	1F0	
Latitude position		Nord 43° 33' 36"	
Longitude position		Est 1° 28' 44"	
Delta position < 0,5 km		0,076 km	

Electrical and other parameters

CW preamble	ms 158,4 <	< 161,6	160,26
Total transmission time	ms 514,8 <	<525,2	519,71
Modulation frequency	Hz 396<	< 404	401,68
Phase deviation : total	rd	<=2,40	2,16
Phase deviation : positive	rd 1,00 <	< 1,20	1,08
Phase deviation : negative	rd -1,20 <	< -1,00	-1,09
Symmetry measurement	%	<=5 %	4,04E-04
Nominal frequency : F2	Hz		406027935,31
Short term2			1,21E-10
Short term3			4,56E-10
Slope			3,27E-10
Residual			5,18E-10
406 MHz power output	dBm		35,5
Homing frequency	MHz		121,50
121,5 MHz power output	dBm		16,9
Soak temperature	°C		55,2
Extra feature			No

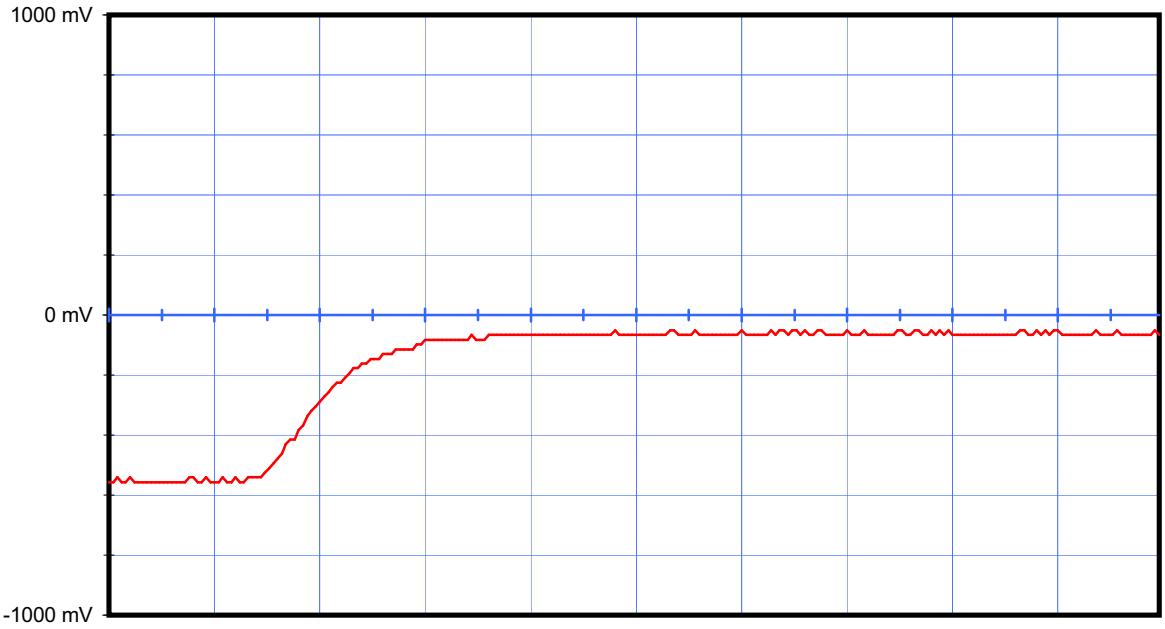


47 48 49 50 51 52 53

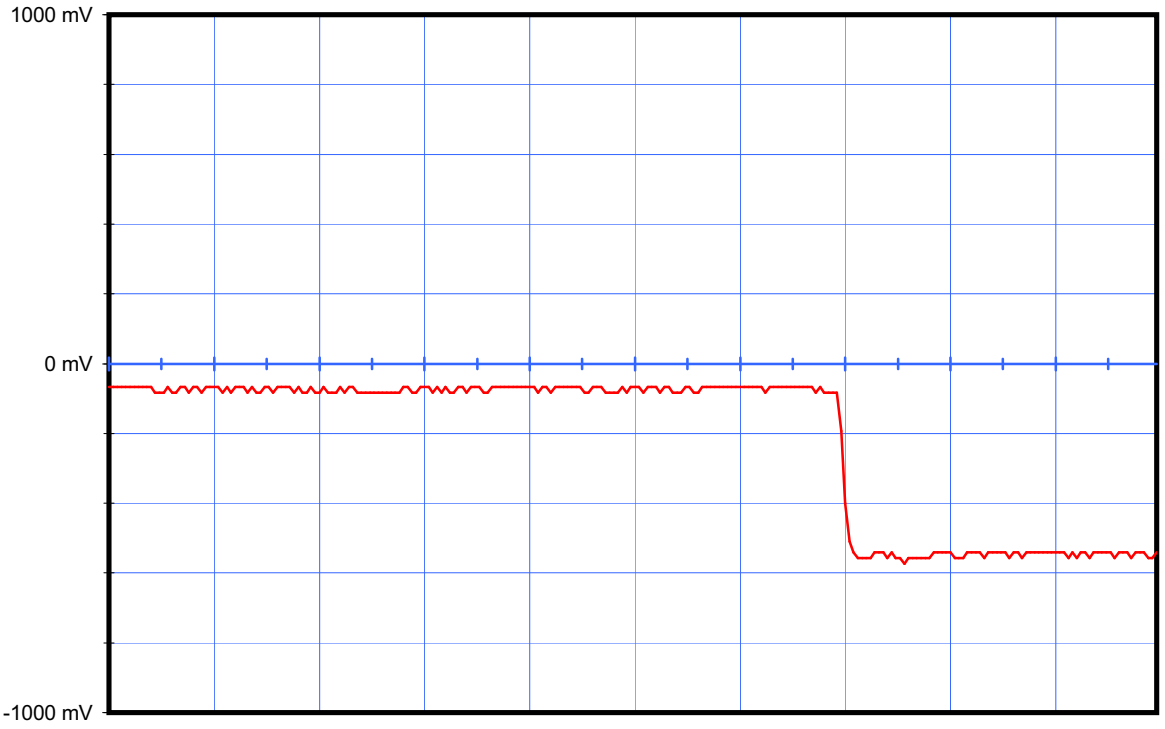


0 ms 10 ms 20 ms
Vmarker1 850 mv ==> 1,2 rd 2 ms/div.
Vmarker2 700 mv ==> 1 rd

8 ms 10,5 ms 13 ms
Duty Cycle : 4,04032E-06 0,5 ms/div.
falltime(1)<= 169,661 us risetime(1)<= 179,641 us
+width(1) 1,23752 ms -widht(1) 1,23753 ms



-1 ms 1,5 ms 4 ms
risetime(1)<= 638,723 us 0,5 ms/div.

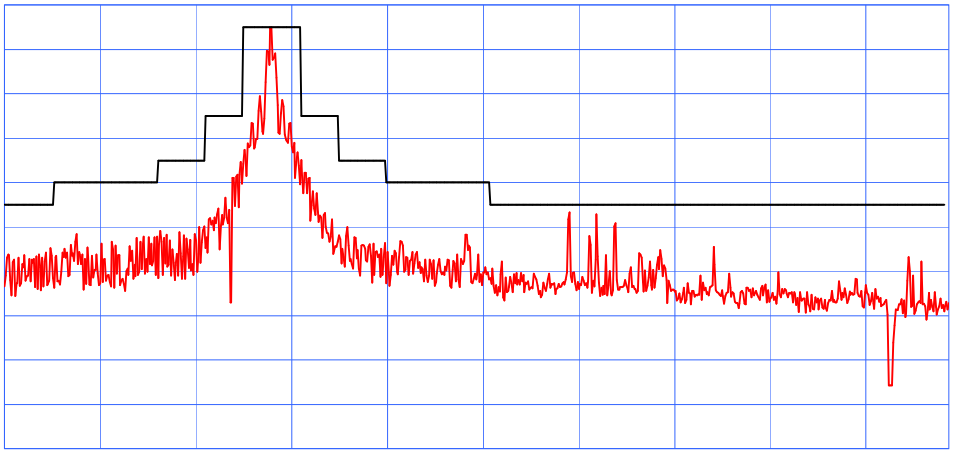


-3,5 ms -1 ms 1,5 ms
falltime(1)<= 49,9 us 0,5 ms/div.

SPURIOUS EMISSIONS RESULTS
MARTEC
KANNAD XS3-GPS
N° 35407-2
at -20° C, 22° C and 55° C

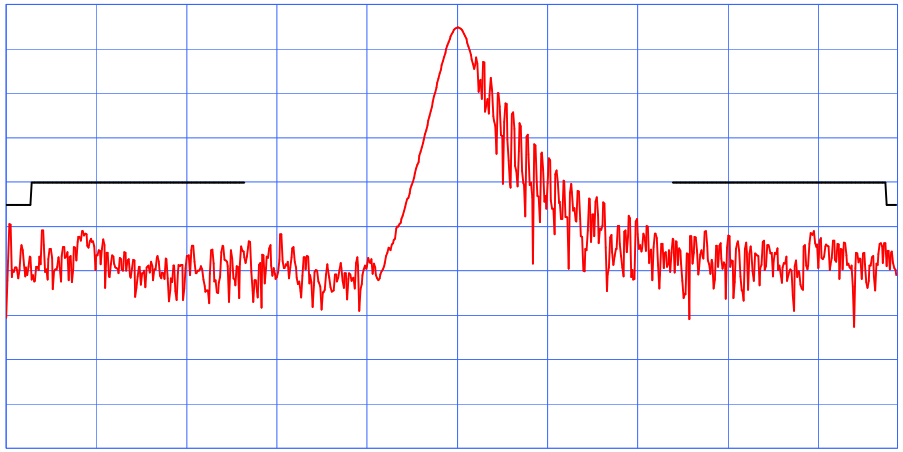
MARTEC
KANNAD XS3-GPS
35407-2
Certification nominale
406 MHz
-20 °C

CF : 406,05 MHz SP : 100 KHz



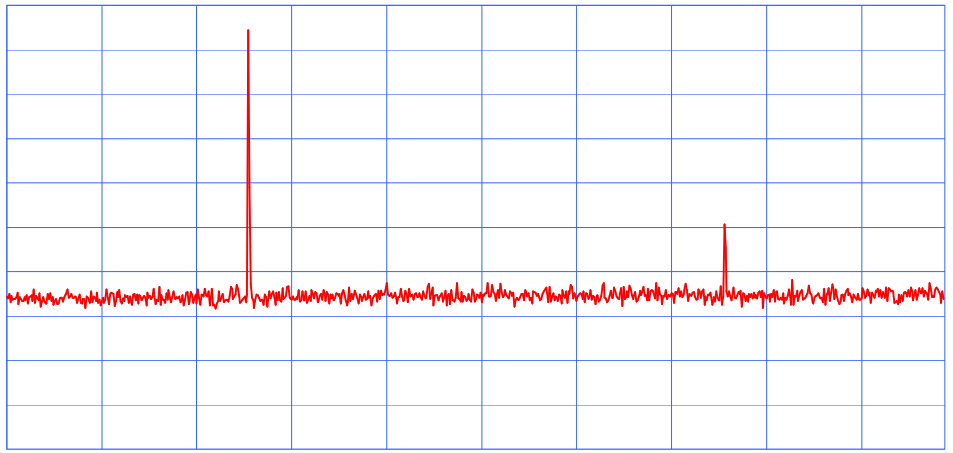
Rb : 0,1 KHz 10 dB/div. St : 30 S

CF : 406,028 MHz SP : 50 KHz



Rb : 1 KHz 10 dB/div. St : 0,305 S

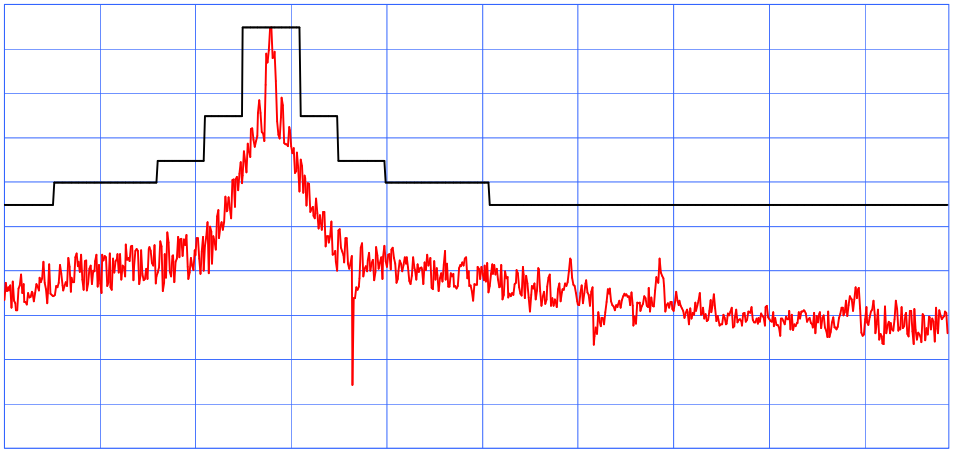
CF : 600 MHz Delta : -43,69 dB SP : 800000 KHz



Rb : 100 KHz 10 dB/div. St : 0,24 S

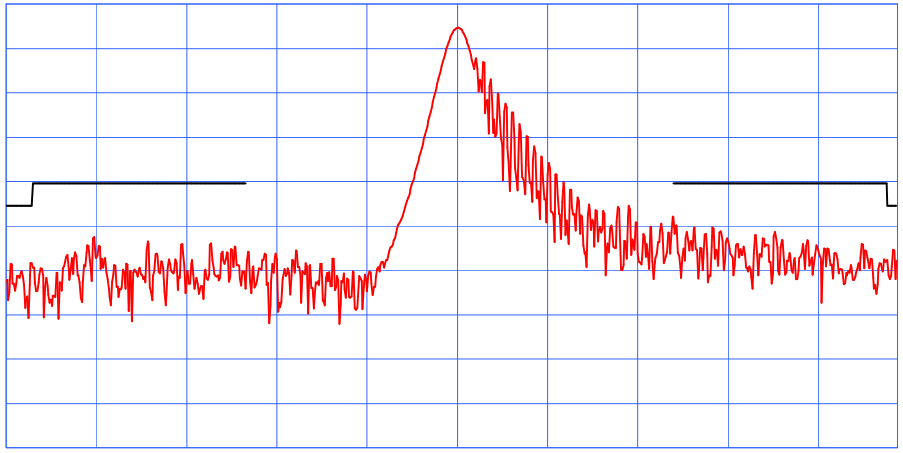
MARTEC
KANNAD XS3-GPS
35407-2
Certification nominale
406 MHz
22 °C

CF : 406,05 MHz SP : 100 KHz



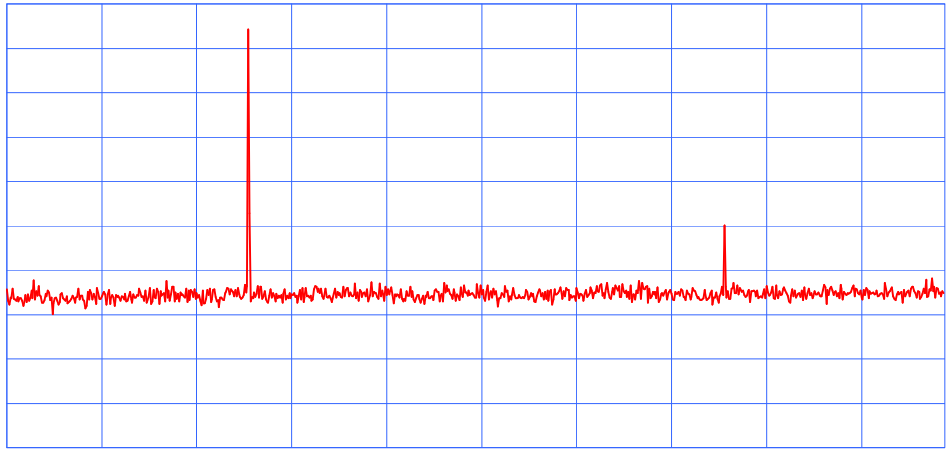
Rb : 0,1 KHz 10 dB/div. St : 30 S

CF : 406,028 MHz SP : 50 KHz



Rb : 1 KHz 10 dB/div. St : 0,305 S

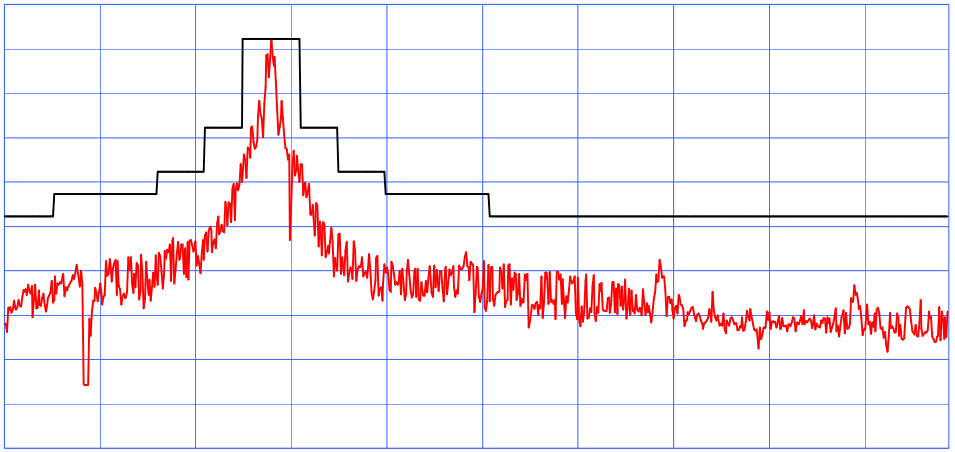
CF : 600 MHz Delta : -44,07 dB SP : 800000 KHz



Rb : 100 KHz 10 dB/div. St : 0,24 S

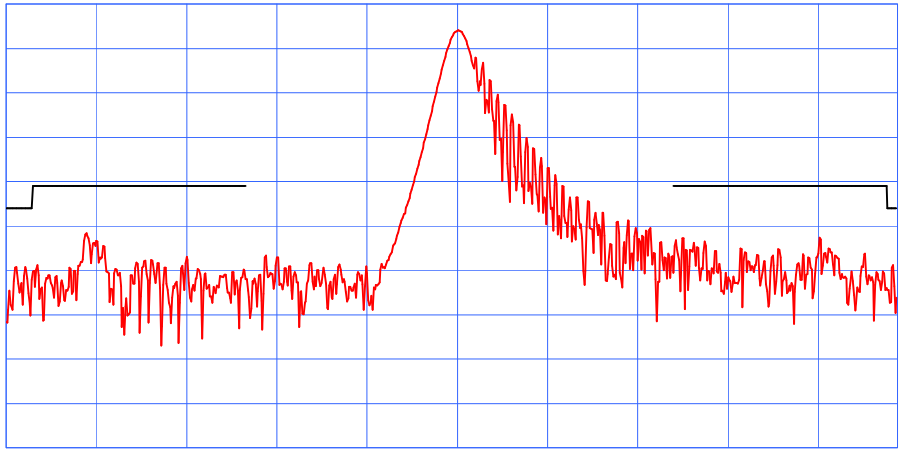
MARTEC
KANNAD XS3-GPS
35407-2
Certification nominale
406 MHz
55 °C

CF : 406,05 MHz SP : 100 KHz



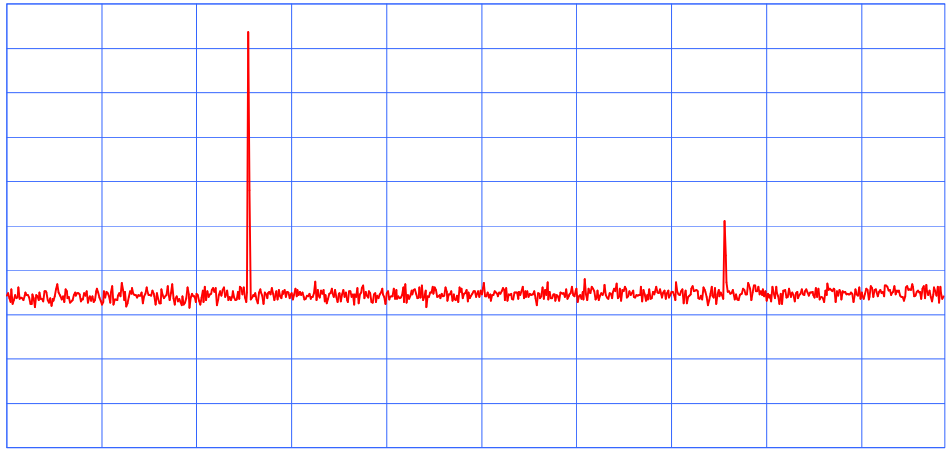
Rb : 0,1 KHz 10 dB/div. St : 30 S

CF : 406,028 MHz SP : 50 KHz



Rb : 1 KHz 10 dB/div. St : 0,305 S

CF : 600 MHz Delta : -42,66 dB SP : 800000 KHz



Rb : 100 KHz 10 dB/div. St : 0,24 S

406 MHz VSWR 3:1 TEST RESULTS ON
MARTEC
KANNAD XS3-GPS
N° 35407-2
at -20° C, 22° C and 55° C

Certification Test VSWR at -20°C Date of test : 28-nov-06

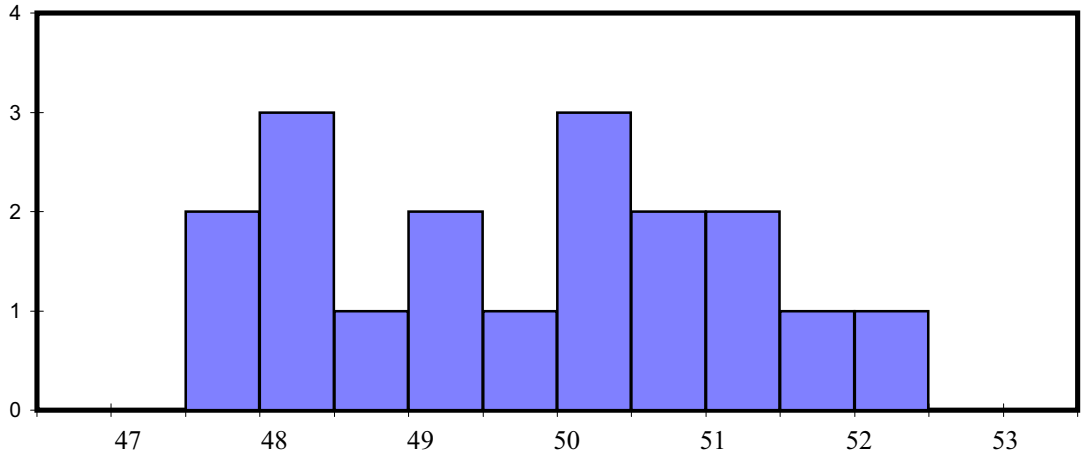
Manufacturer : MARTEC
Beacon Type : KANNAD XS3-GPS
Number : 35407

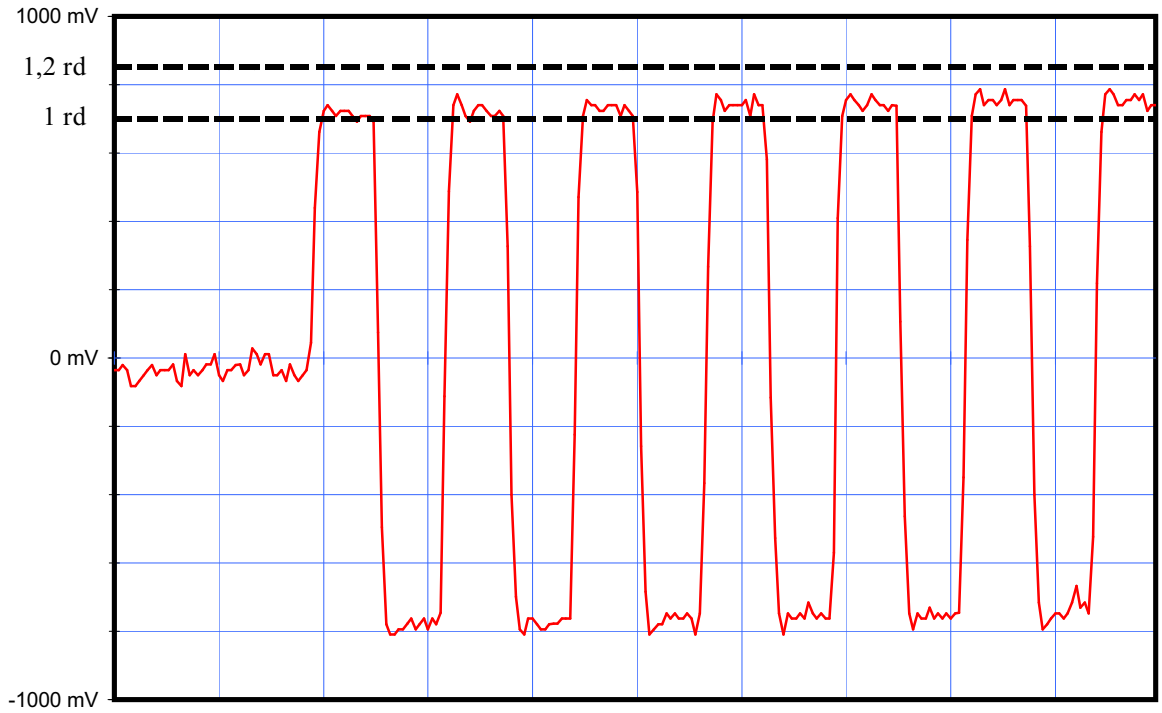
Message

Message received		FFFE2F8E3E2293E02B8036AFFAF78E4141F0	
Format Flag	25	1	
Protocol flag	26	0	
Ident./Position code	27-85	0	
Country Code/Country	27-36	227 / FRANCE	
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			
Calculated BCH1	25-85	1ABFEB	
Encoded BCH1	86-106	1ABFEB	
Homing	112	1	
Em.cod/nat.use/supp.data	107-112	110111	
Encod pos data	111	1	Internal
Fixed Data "1"	108	1	OK
Calculated BCH2	107-132	1F0	
Encoded BCH2	147-144	1F0	
Latitude position		Nord 43° 33' 36"	
Longitude position		Est 1° 28' 44"	
Delta position < 0,5 km		0,08 km	

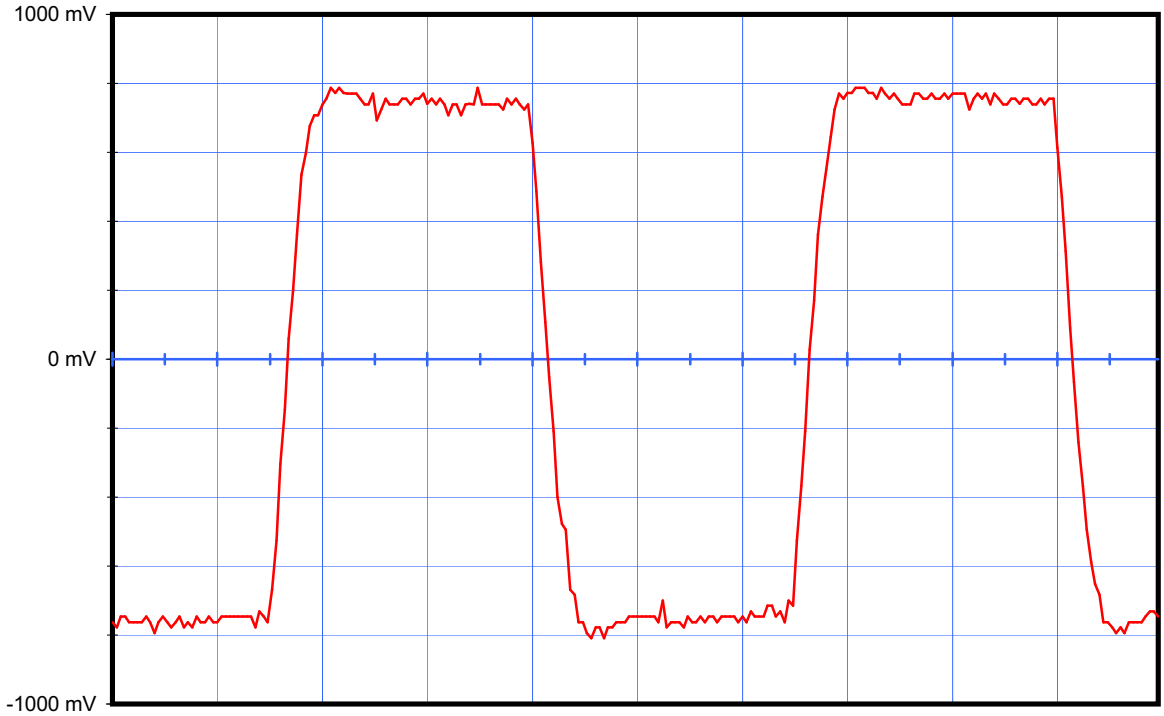
Electrical and other parameters

Rise time Modulation	ms			0,1597
Fall time Modulation	ms			0,1697
Phase deviation :positive	rd	1,00 <	< 1,20	1,06
Phase deviation : negative	rd	-1,20 <	< -1,00	-1,10
Symmetry measurement	%		<=5 %	4,04E-04
Nominal frequency : F2	Hz			406027937,92





Vmarker1 850 mv ==> 1,2 rd 2 ms/div.
Vmarker2 700 mv ==> 1 rd



Duty Cycle : 4,04E-06 0,5 ms/div.
falltime(1)<= 169,66 us risetime(1)<= 159,681 us
+width(1) 1,23752 ms -widht(1) 1,23753 ms

Certification Test VSWR at 22°C Date of test : 30 nov 2006

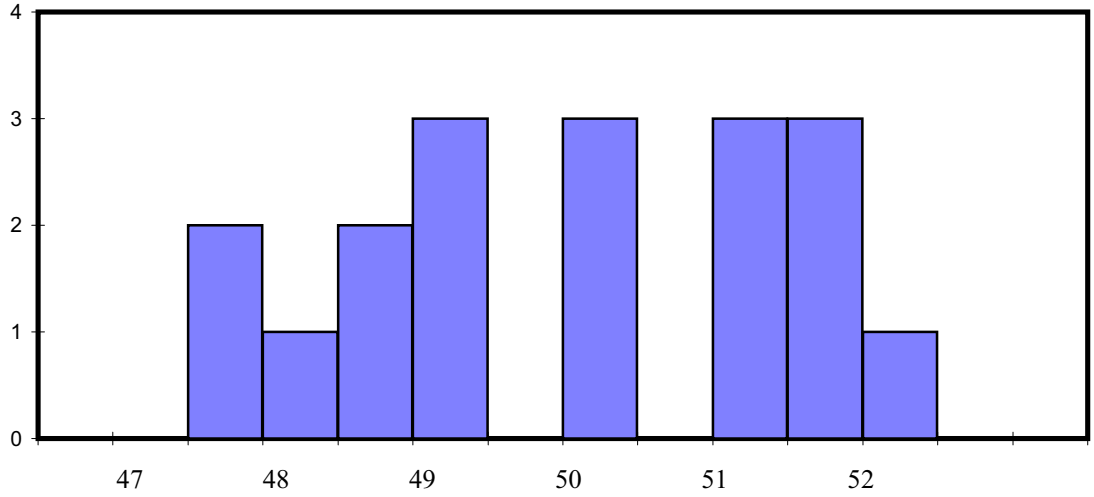
Manufacturer : MARTEC
Beacon Type : KANNAD XS3-GPS
Number : 35407

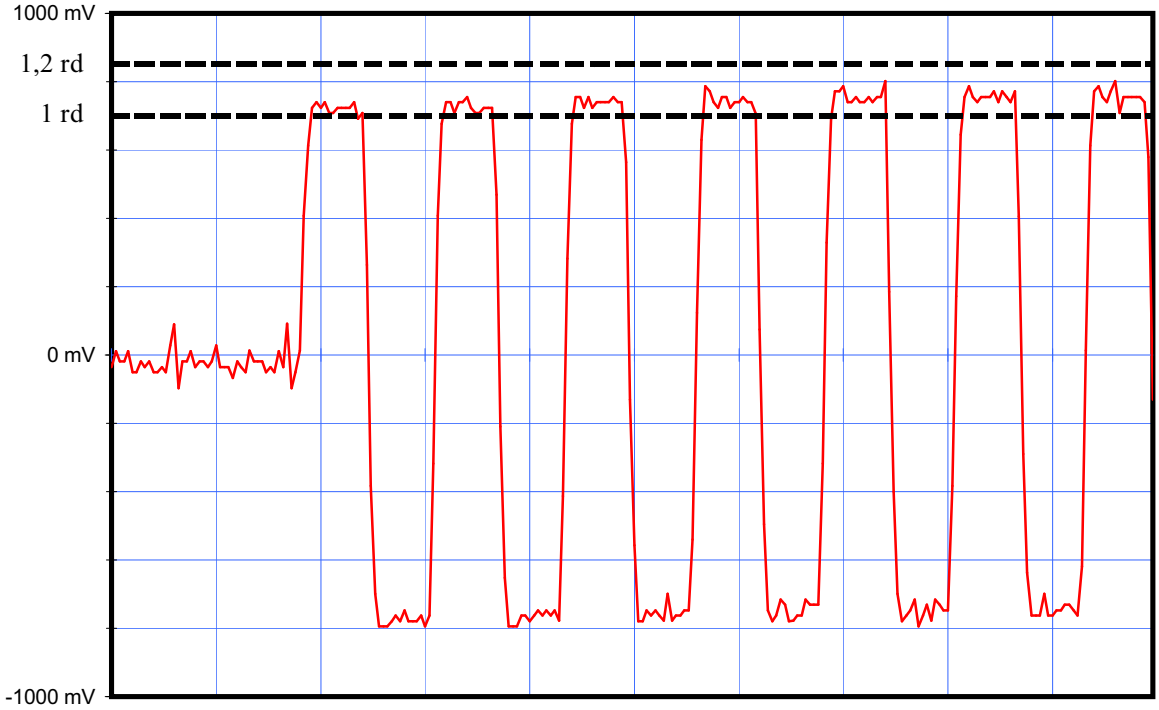
Message

Message received		FFFE2F8E3E2293E02B8036AFFAF78E014CDA	
Format Flag	25	1	
Protocol flag	26	0	
Ident./Position code	27-85	0	
Country Code/Country	27-36	227 / FRANCE	
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			
Calculated BCH1	25-85	1ABFEB	
Encoded BCH1	86-106	1ABFEB	
Homing	112	1	
Em.cod/nat.use/supp.data	107-112	110111	
Encod pos data	111	1	Internal
Fixed Data "1"	108	1	OK
Calculated BCH2	107-132	CDA	
Encoded BCH2	147-144	CDA	
Latitude position		Nord 43° 33' 32"	
Longitude position		Est 1° 28' 44"	
Delta position < 0,5 km		0,08 km	

Electrical and other parameters

Rise time Modulation	ms			0,1497
Fall time Modulation	ms			0,1896
Phase deviation :positive	rd	1,00 <	< 1,20	1,09
Phase deviation : negative	rd	-1,20 <	< -1,00	-1,07
Symmetry measurement	%		<=5 %	4,04E-04
Nominal frequency : F2	Hz			406027926,50





Vmarker1 850 mv ==> 1,2 rd 2 ms/div.
Vmarker2 700 mv ==> 1 rd

Duty Cycle : 4,04E-06 0,5 ms/div.
falltime(1)<= 189,62 us risetime(1)<= 149,701 us
+width(1) 1,23752 ms -widht(1) 1,23753 ms

Certification Test VSWR at 55°C Date of test : 30 nov 2006

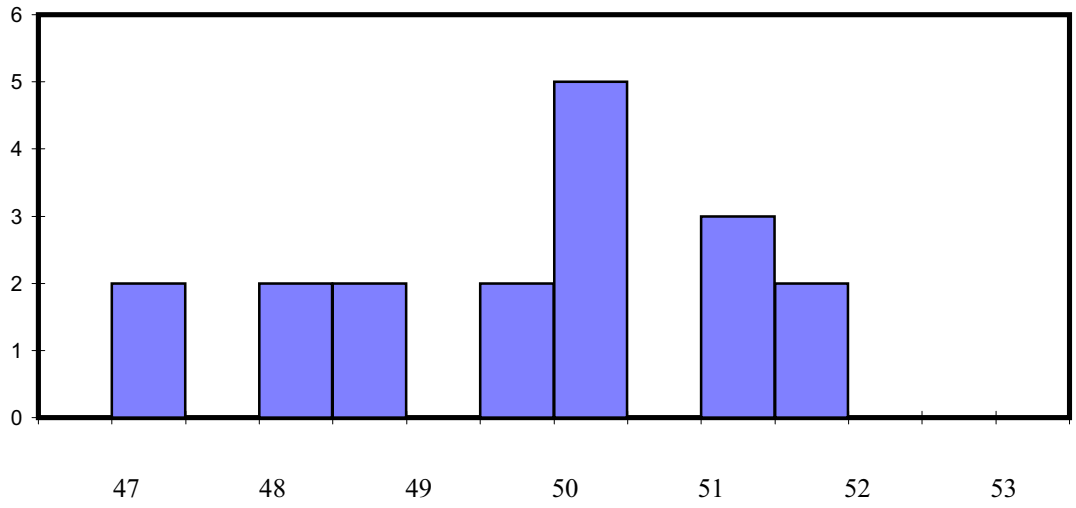
Manufacturer : MARTEC
Beacon Type : KANNAD XS3-GPS
Number : 35407

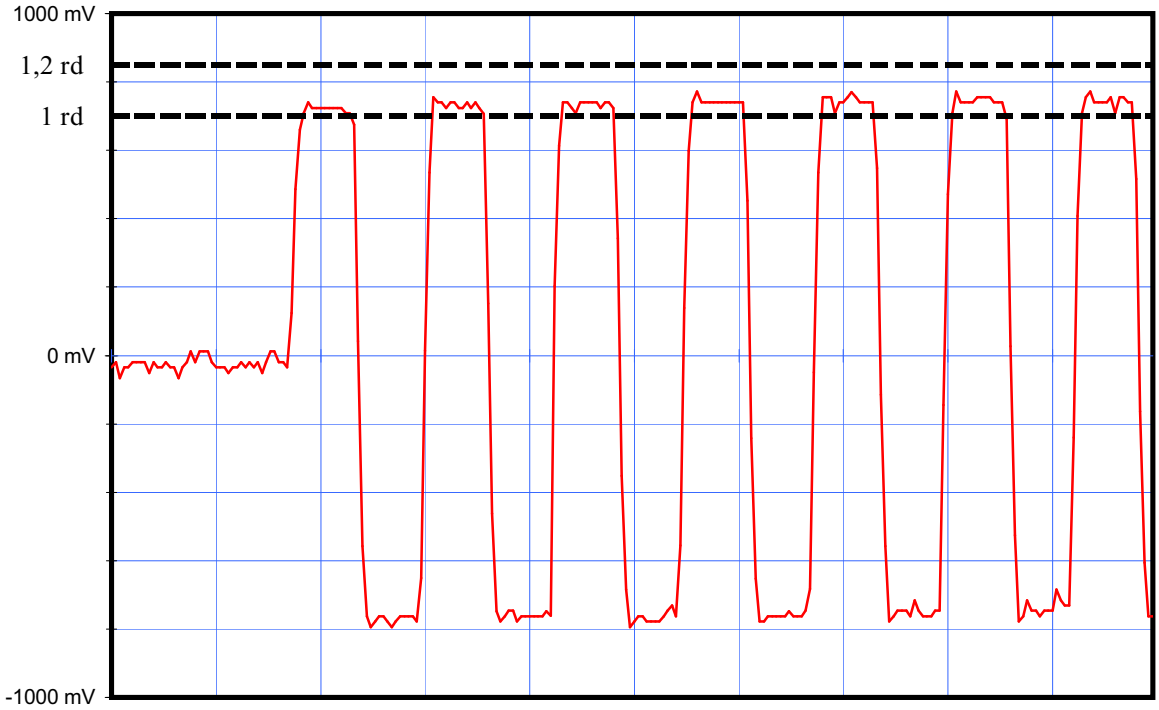
Message

Message received		FFFE2F8E3E2293E02B8036AFFAF78E4141F0	
Format Flag	25	1	
Protocol flag	26	0	
Ident./Position code	27-85	0	
Country Code/Country	27-36	227 / FRANCE	
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			
Calculated BCH1	25-85	1ABFEB	
Encoded BCH1	86-106	1ABFEB	
Homing	112	1	
Em.cod/nat.use/supp.data	107-112	110111	
Encod pos data	111	1	Internal
Fixed Data "1"	108	1	OK
Calculated BCH2	107-132	1F0	
Encoded BCH2	147-144	1F0	
Latitude position		Nord 43° 33' 36"	
Longitude position		Est 1° 28' 44"	
Delta position < 0,5 km		0,076 km	

Electrical and other parameters

Rise time Modulation	ms			0,1796
Fall time Modulation	ms			0,1796
Phase deviation :positive	rd	1,00 <	< 1,20	1,06
Phase deviation : negative	rd	-1,20 <	< -1,00	-1,09
Symmetry measurement	%		<=5 %	0,40
Nominal frequency : F2	Hz			406027940,48





Vmarker1 850 mv ==> 1,2 rd 2 ms/div.
Vmarker2 700 mv ==> 1 rd

Duty Cycle : 0,004012024 0,5 ms/div.
falltime(1)<= 179,641 us risetime(1)<= 179,641 us
+width(1) 1,23753 ms -widht(1) 1,2475 ms

SELF-TEST MODE CONTROL ON
MARTEC
KANNAD XS3-GPS
N° 35407-2
at 22° C

Message at -20°C

Manufacturer	MARTEC
Beacon model	KANNAD XS3-GPS
Serial number	35407
Date of test	28-nov-06
Temperature	-16,1
Message received	FFFED08E3E2293E07FDFFDF6D23783E0F66C
15 Hex ID	1C7C4527C0FFBFF
Frame synchro. pattern	011010000

Total transmission time	ms	514.8<	< 525.2	520,06

Message at 22°C

Manufacturer	MARTEC
Beacon model	KANNAD XS3-GPS
Serial number	35407
Date of test	28-nov-06
Temperature	-16,1
Message received	FFFED08E3E2293E07FDFFDF6D23783E0F66C
15 Hex ID	1C7C4527C0FFBFF
Frame synchro. pattern	011010000

Total transmission time	ms	514.8<	<525.2	520,06

Message at 55 °C

Manufacturer	MARTEC
Beacon model	KANNAD XS3-GPS
Serial number	35407
Date of test	27-nov-06
Temperature	55,8
Message received	FFFED08E3E2293E07FDFFDF6D23783E0F66C
15 Hex ID	1C7C4527C0FFBFF
Frame synchro. pattern	011010000

Total transmission time	ms	514.8<	<525.2	519,75

Self Test message decoded

ITEM	BITS	VALUE
Message format: long format	**25**	**1**
Protocol: Location Protocol	**26**	**0**
Country code: 227	**27-36**	**0011100011**
Type of location protocol: Standard Location - Test	**37-40**	**1110**
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	**41-64**	**001000101001001111100000**
Latitude Sign: default	**65**	**0**
Latitude Degrees: default	**66-72**	**1111111**
Latitude Minutes: default	**73-74**	**11**
Longitude Sign: default	**75**	**0**
Longitude Degrees: default	**76-83**	**11111111**
Longitude Minutes: default	**84-85**	**11**
BCH 1 Encoded:	**86-106**	**10111110110110100 1000**
BCH 1 Calculated:	**N/A**	**10111110110110100 1000**
Fixed bits (1101): Pass	**107-110**	**1101**
Position Data: Encoded Position Data Source From Internal Navigation Device	**111**	**1**
Aux Device: 121.5 MHz homer	**112**	**1**
Latitude Offset Sign: default	**113**	**1**
Latitude Offset Minutes: default	**114-118**	**00000**
Latitude Offset Seconds: default	**119-122**	**1111**
Longitude Offset Sign: default	**123**	**1**
Longitude Offset Minutes: default	**124-128**	**00000**
Longitude Offset Seconds: default	**129-132**	**1111**
BCH 2 Encoded:	**133-144**	**011001101100**
BCH 2 Calculated:	**N/A**	**011001101100**
Composite Latitude: default	**N/A**	**Composite Longitude: default**
15 Hex ID:	**N/A**	**1C7C4527C0FFBFF**

THERMAL SHOCK TEST RESULT ON
MARTEC
KANNAD XS3-GPS
N° 35407-2
-10°C to 22°C

Temperature Soak : -10°C
Temperature Measure : 22°C

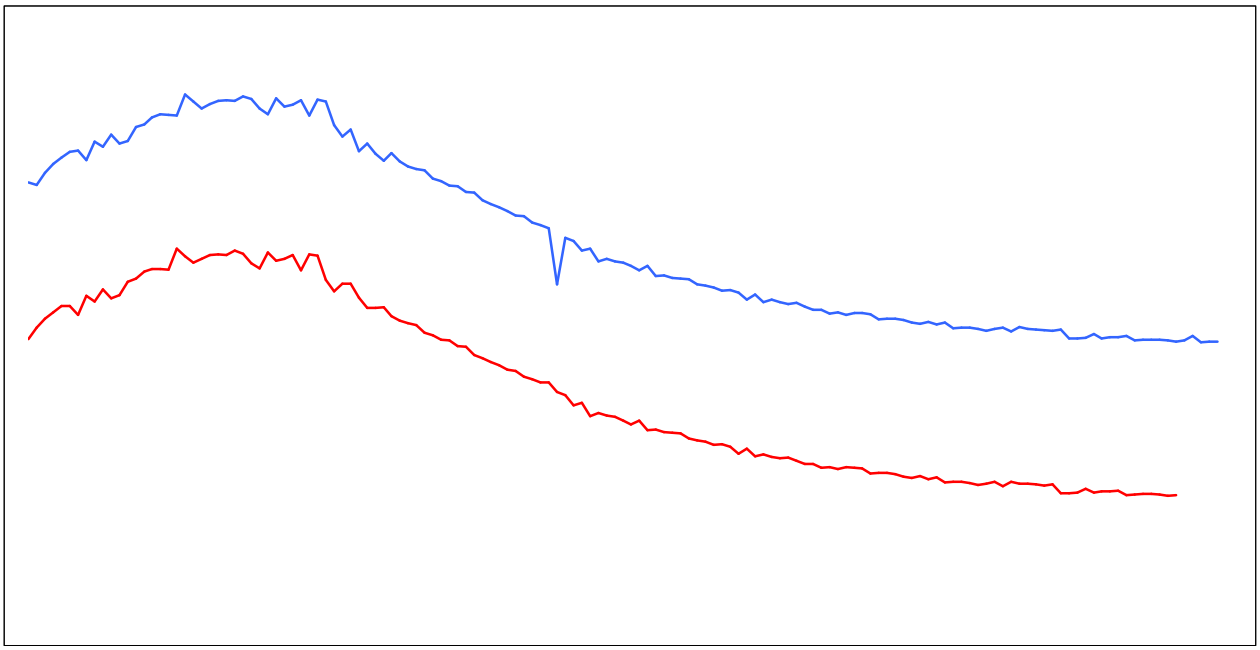
Warm Up	Δ Frequency (Hz)	Temp. (°C)	P406 (dBm)	P121.5 (dBm)
1	49955,38	-13,6	36,1	17,3
2	49947,24	22,7	36,1	17,4
3	49937,73	23,4	36,1	17,4
4	49927,40	23,6	36,1	17,3
5	49922,65	23,8	36,1	17,3
6	49922,67	23,9	36,1	17,3
7	49923,45	23,8	36,0	17,3
8	49924,64	23,8	36,0	17,3
9	49925,60	23,9	36,0	17,3
10	49926,72	23,9	36,0	17,3
11	49927,40	23,9	36,0	17,3
12	49928,04	23,9	36,0	17,3
13	49928,55	23,9	36,0	17,3
14	49929,05	23,9	36,0	17,3
15	49929,36	23,9	36,0	17,3
16	49929,82	23,9	35,9	17,3
17	49930,00	23,9	35,9	17,3
18	49930,12	23,9	35,9	17,3

No	Temp.	Slope	Sigma	P406	Short term	P121.5
1	24,0	-5,0E-10	1,4E-8	36,0	9,9E-11	17,3
18	23,8	3,0E-10	3,5E-10	35,9	2,1E-10	17,2
31	24,0	9,3E-11	4,5E-10	35,8	2,5E-10	17,2
61	24,0	-2,8E-10	1,5E-10	35,7	1,6E-10	17,2
91	23,9	-1,6E-10	1,3E-10	35,8	9,5E-11	17,2
121	23,6	-5,6E-11	1,1E-10	35,8	9,8E-11	17,2

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

Frequency variation

406027939



406027924

Initial tracing Smoothed tracing

FFFE2F8E3E2293E02B8036AFFAF78E416B82

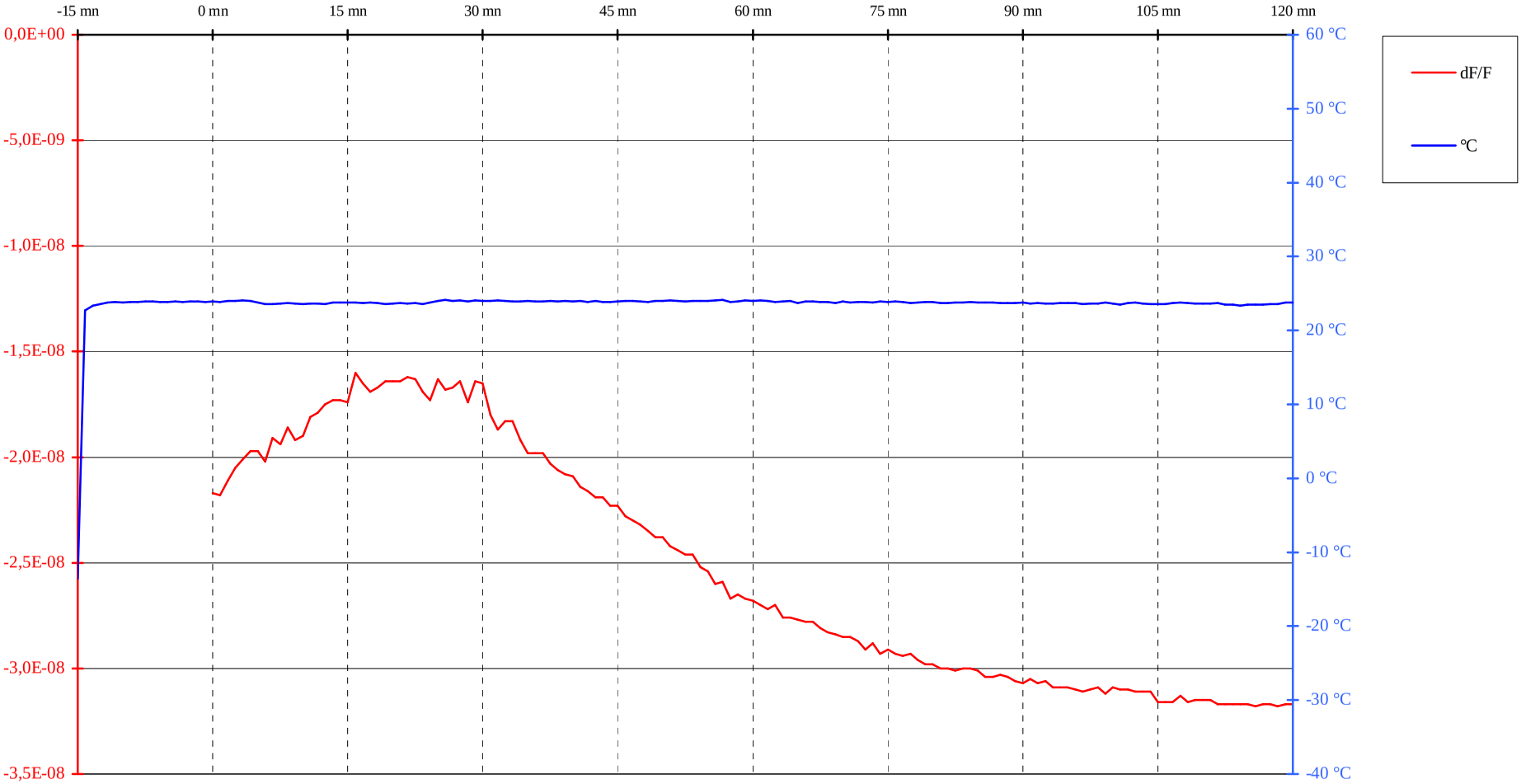
ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 227	27-36	0011100011
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bit	41-64	001000101001001111100000
Latitude Sign: North	65	0
Latitude Degrees: 43	66-72	0101011
Latitude Minutes: 30	73-74	10
Longitude Sign: East	75	0
Longitude Degrees: 1	76-83	00000001
Longitude Minutes: 30	84-85	10
BCH 1 Encoded:	86-106	11010101111111101011
BCH 1 Calculated:	N/A	11010101111111101011
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Intern	111	1
Aux Device: 121.5 MHz homer	112	1
Latitude Offset Sign: +	113	1
Latitude Offset Minutes: 3	114-118	00011
Latitude Offset Seconds: 36	119-122	1001
Longitude Offset Sign: -	123	0
Longitude Offset Minutes: 1	124-128	00001
Longitude Offset Seconds: 24	129-132	0110
BCH 2 Encoded:	133-144	101110000010
BCH 2 Calculated:	N/A	101110000010
Composite Latitude: 43.559999999999995 Degrees North	N/A	Composite Longitude: 1.4766666666666668 Degrees
15 Hex ID:	N/A	1C7C4527C0FFBFF

THERMAL SHOCK TEST / 30 °C change (-10 °C to 22 ° C)

Manufacturer : MARTEC
Model : KANNAD XS3-GPS
Number : 35407-2

Date : 28/11/2006
Time : 13:19:24

FREQUENCY VARIATION

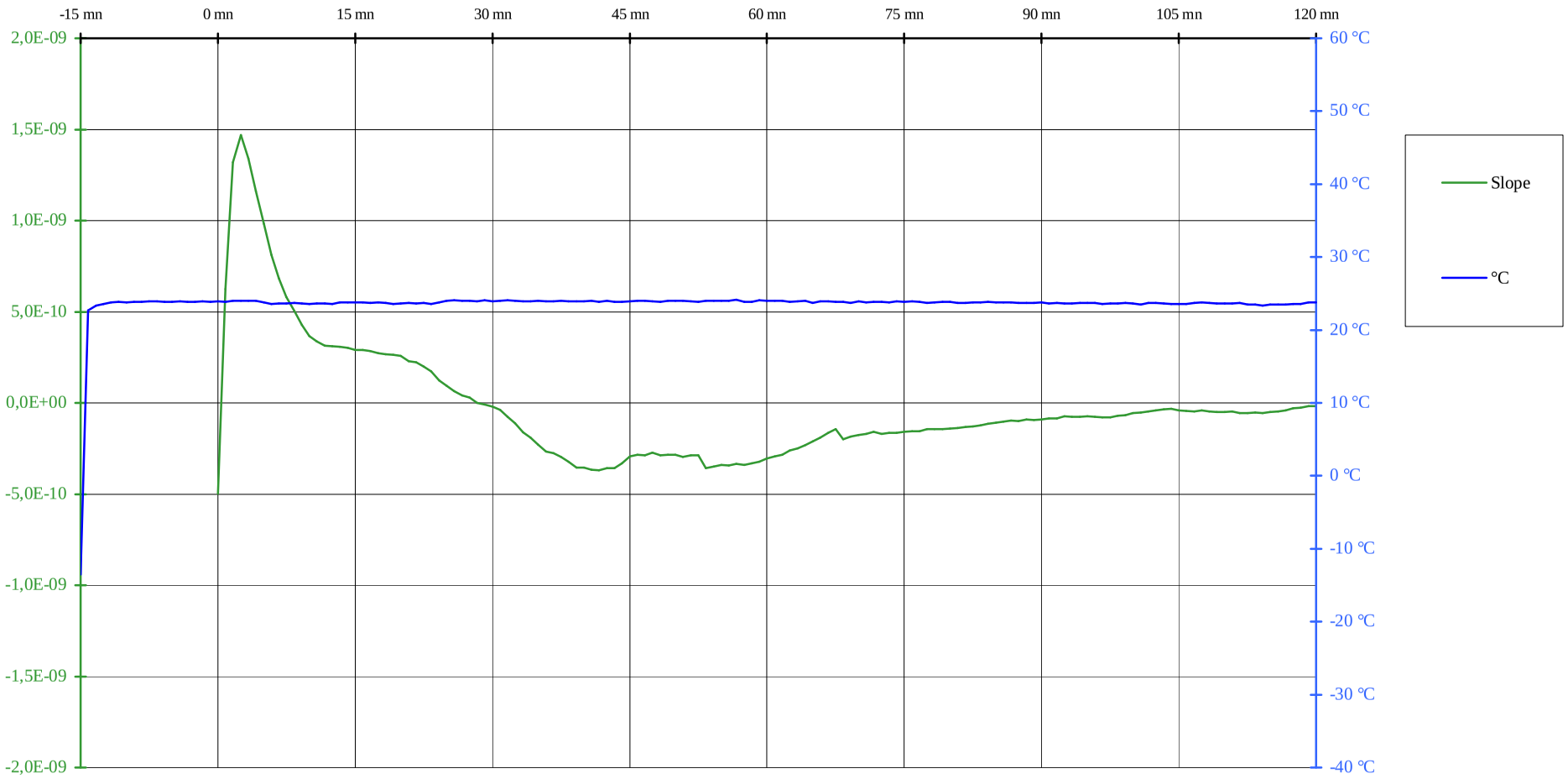


THERMAL SHOCK TEST / 30 °C change (-10 °C to 22 ° C)

Manufacturer : MARTEC
Model : KANNAD XS3-GPS
Number : 35407-2

Date : 28/11/2006
Time : 13:19:24

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

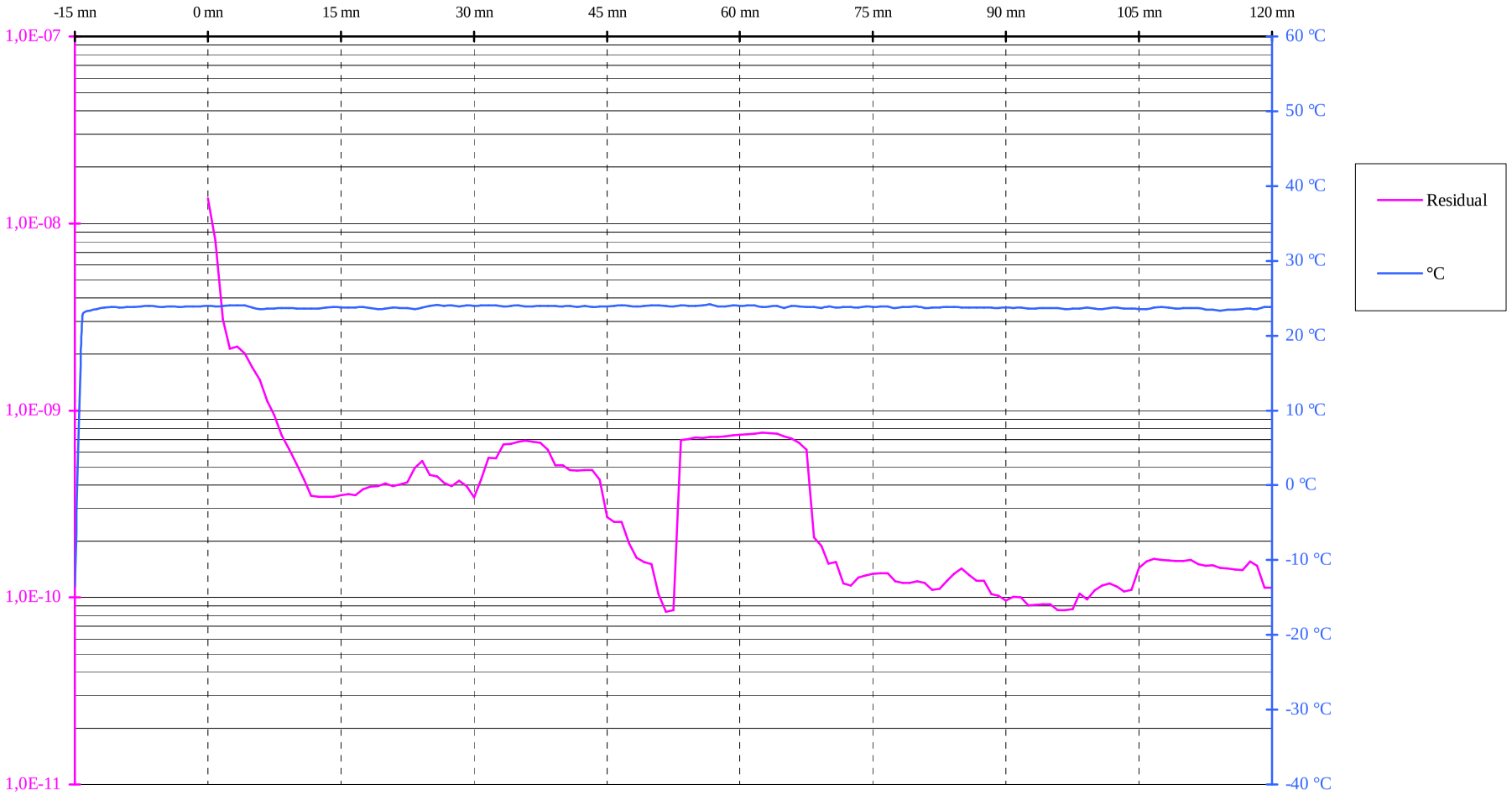


THERMAL SHOCK TEST / 30 °C change (-10 °C to 22 ° C)

Manufacturer : MARTEC
Model : KANNAD XS3-GPS
Number : 35407-2

Date : 28/11/2006
Time : 13:19:24

MEDIUM TERM STABILITY : RESIDUAL (≤ 3,0E-9)

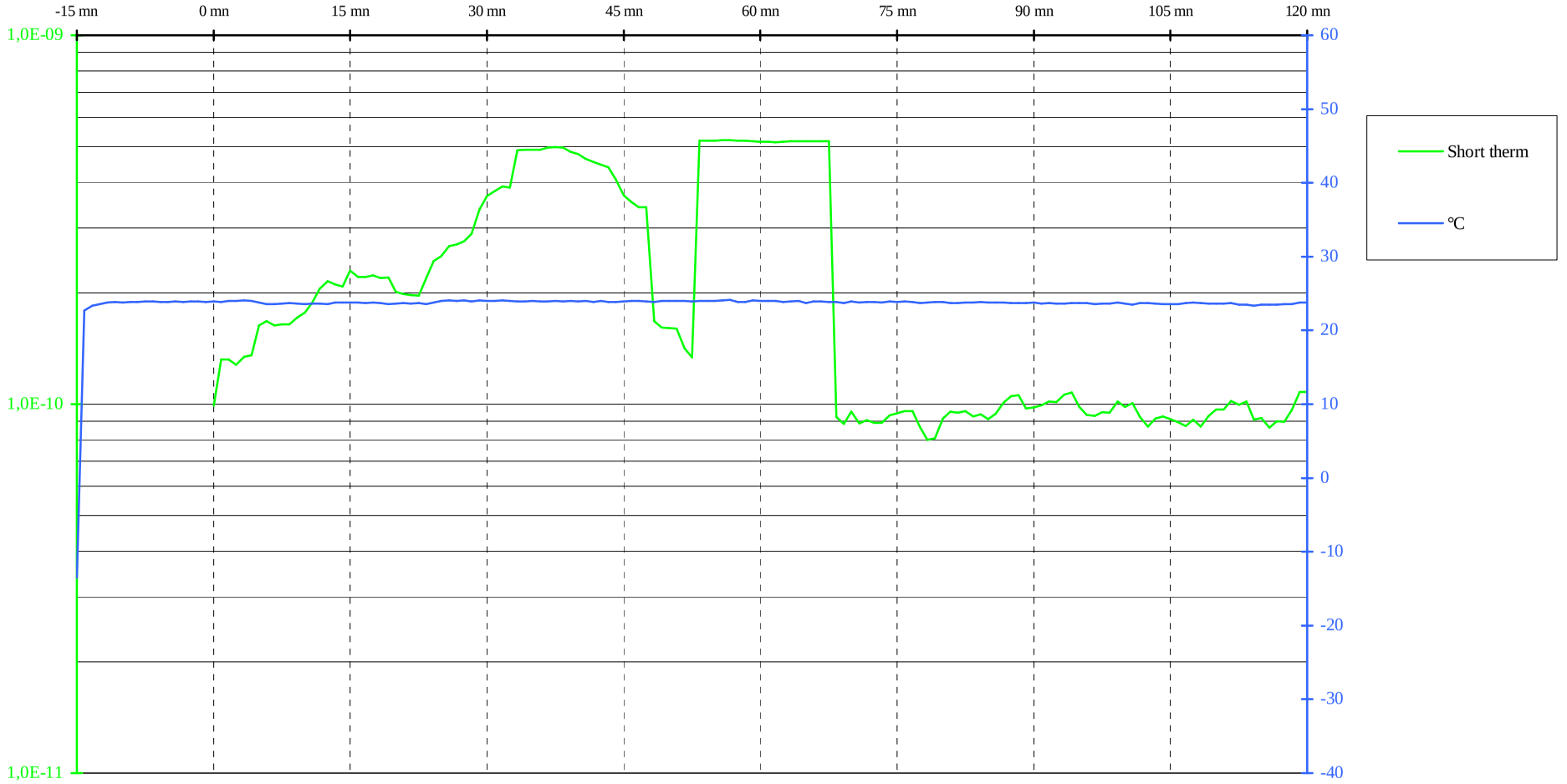


THERMAL SHOCK TEST / 30 °C change (-10 °C to 22 ° C)

Manufacturer : MARTEC
Model : KANNAD XS3-GPS
Number : 35407-2

Date : 28/11/2006
Time : 13:19:24

SHORT TERM STABILITY /100 mS (≤ 2,0E-9)

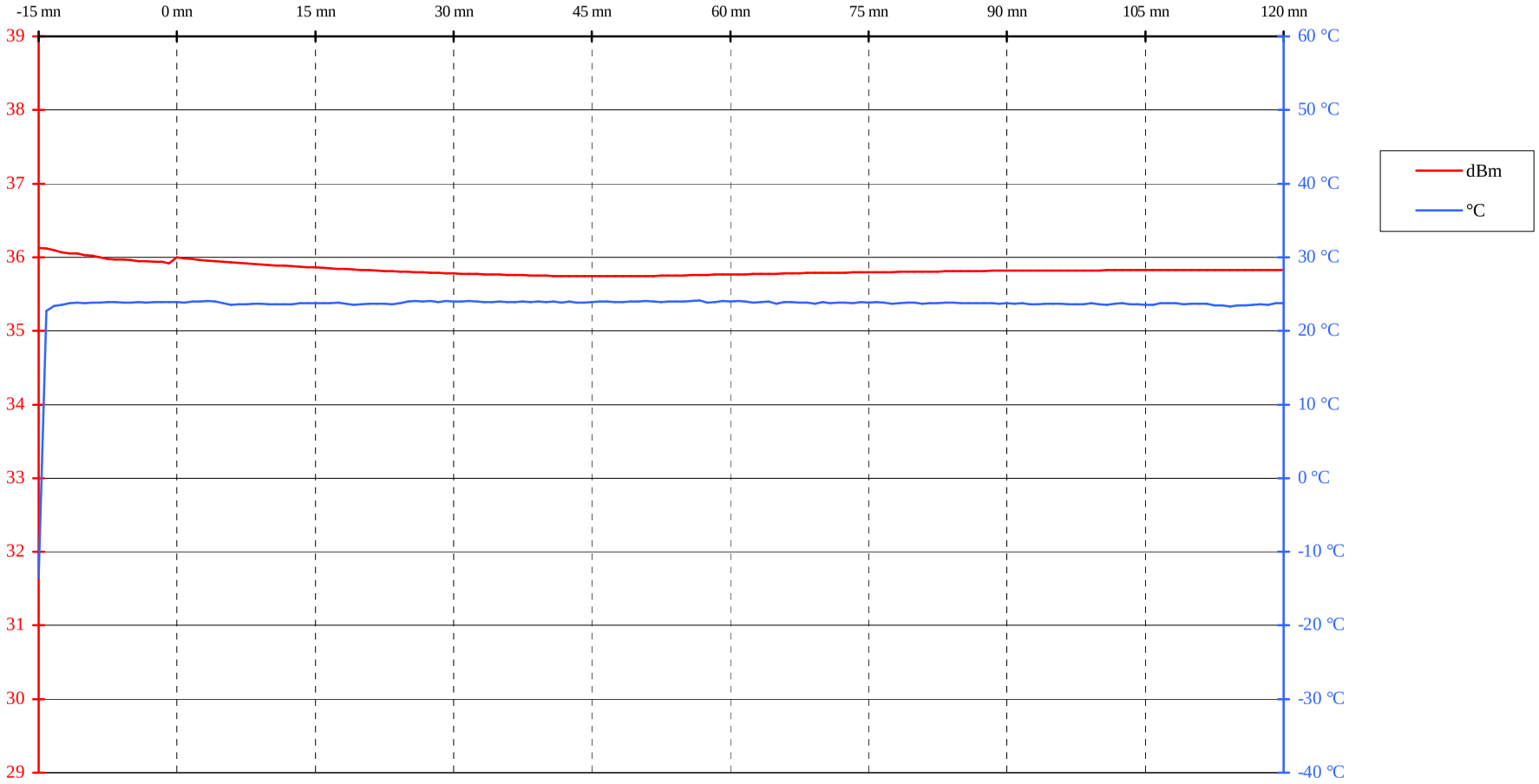


THERMAL SHOCK TEST / 30 °C change (-10 °C to 22 ° C)

Manufacturer : MARTEC
Model : KANNAD XS3-GPS
Number : 35407-2

Date : 28/11/2006
Time : 13:19:24

OUTPUT POWER (35 to 39 dBm)



OPERATING LIFE TEST RESULTS ON
MARTEC
KANNAD XS3-GPS
N° 35407-2
-20 °C

Note : Prior to the Operating Life Test and following manufacturer "Batteries Discharge Calculation " (Annex C) the battery pack capacity has been reduced by test laboratory during **3,74 hours**

The operating lifetime obtained is 30 hours with 36 dBm output power

Warm Up	Δ Frequency (Hz)	Temp. (°C)	P406 (dBm)	P121.5 (dBm)
1	49941,93	-20,1	36,1	0,0
2	49939,36	-20,1	36,1	0,0
3	49938,53	-20,1	36,1	17,2
4	49936,68	-20,1	36,1	17,2
5	49937,52	-20,1	36,1	17,2
6	49936,45	-20,1	36,1	17,2
7	49937,33	-20,1	36,1	17,2
8	49936,01	-20,1	36,1	17,2
9	49937,19	-20,1	36,1	17,2
10	49937,07	-20,1	36,1	17,2
11	49936,42	-20,1	36,1	17,2
12	49936,46	-20,1	36,1	17,2
13	49937,18	-20,1	36,1	17,1
14	49936,71	-20,1	36,0	17,1
15	49936,62	-20,1	36,0	17,2
16	49936,30	-20,1	36,0	17,2
17	49936,56	-20,1	36,0	17,2
18	49936,17	-20,1	36,0	17,2

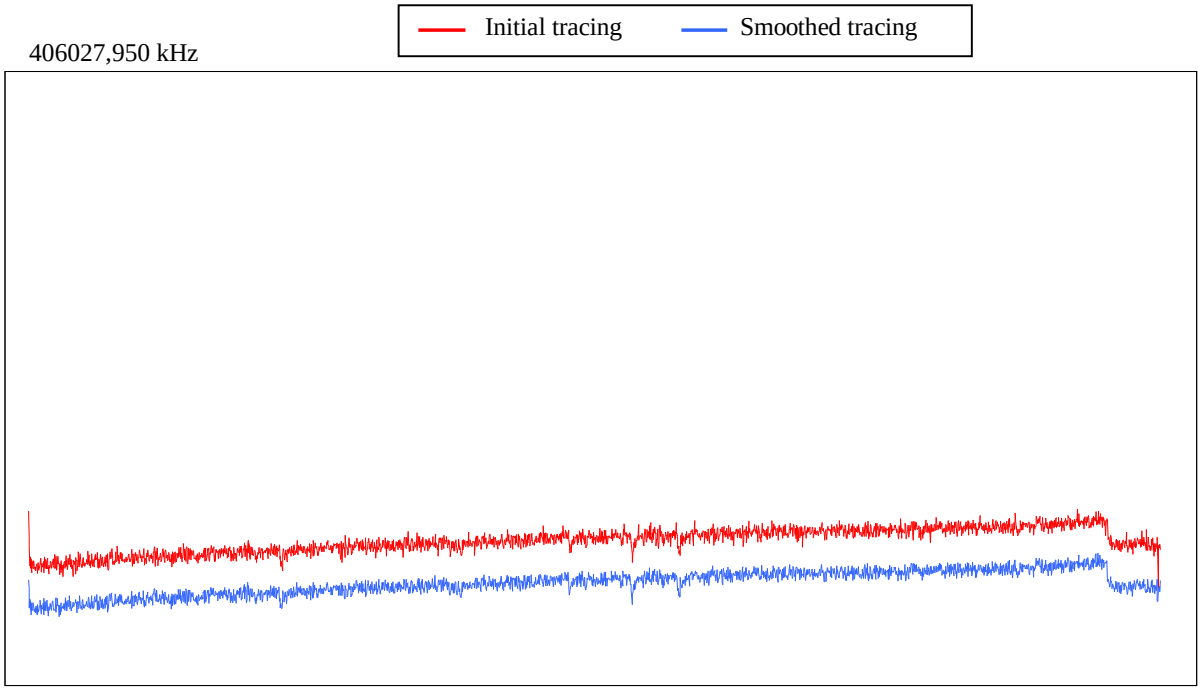
No	Temp.	Slope	Sigma	P406	Short term	P121.5
1	-20,1	-2,9E-10	1,6E-09	36,0	4,3E-10	0,0
18	-20,2	2,5E-11	9,7E-10	36,0	3,8E-10	17,2
31	-20,2	-3,2E-11	1,1E-09	36,0	4,5E-10	17,1
61	-20,2	-4,9E-11	1,1E-09	36,0	3,8E-10	17,2
91	-20,2	-1,0E-10	1,2E-09	36,0	3,7E-10	17,2
121	-20,2	8,5E-11	8,2E-10	36,0	3,4E-10	17,2
151	-20,2	2,1E-12	1,1E-09	36,0	4,6E-10	17,2
181	-20,2	3,5E-11	1,4E-09	36,1	3,7E-10	17,2
211	-20,3	-7,8E-11	6,4E-10	36,0	3,3E-10	17,2
241	-20,3	9,0E-11	9,4E-10	36,0	5,7E-10	17,2
271	-20,3	-1,5E-11	8,5E-10	36,0	5,4E-10	17,2
301	-20,3	9,0E-11	9,0E-10	36,0	4,6E-10	17,2
331	-20,3	7,4E-11	1,1E-09	36,0	3,7E-10	17,2
361	-20,3	6,7E-13	1,4E-09	36,0	3,3E-10	17,2
391	-20,3	1,3E-10	6,7E-10	36,0	3,0E-10	17,2
421	-20,3	-6,7E-11	9,9E-10	36,0	4,3E-10	17,2
451	-20,3	1,5E-11	8,0E-10	36,0	3,1E-10	17,2
481	-20,3	3,0E-11	1,0E-09	36,0	4,4E-10	17,2
511	-20,3	-1,4E-10	1,0E-09	36,1	3,7E-10	17,2
541	-20,3	4,0E-11	7,7E-10	36,0	3,0E-10	17,2
571	-20,2	-2,7E-10	1,2E-09	36,1	4,8E-10	17,2
601	-20,3	2,1E-12	7,8E-10	36,0	3,4E-10	17,2
631	-20,4	-4,9E-11	7,1E-10	36,0	4,6E-10	17,2
661	-20,3	8,8E-12	9,9E-10	36,0	4,1E-10	17,2
691	-20,4	-6,7E-11	7,6E-10	36,0	4,5E-10	17,2
721	-20,4	7,3E-11	1,5E-09	36,0	4,9E-10	17,2
751	-20,4	8,0E-11	8,7E-10	36,1	3,1E-10	17,2
781	-20,4	6,3E-11	1,1E-09	36,1	2,7E-10	17,2
811	-20,4	6,6E-11	9,8E-10	36,1	3,5E-10	17,2
841	-20,4	4,0E-11	8,8E-10	36,1	4,6E-10	17,2

No	Temp.	Slope	Sigma	P406	Short term	P121.5	
871	-20,5	-6,9E-11	1,1E-09	36,1	2,1E-10	17,2	
901	-20,4	-8,9E-11	1,2E-09	36,1	5,1E-10	0,0	
931	-20,5	-2,2E-11	8,1E-10	36,1	3,2E-10	17,2	
961	-20,4	-8,9E-11	9,5E-10	36,1	4,4E-10	17,1	
991	-20,4	-1,1E-10	1,2E-09	36,1	3,0E-10	17,2	
1021	-20,5	-4,6E-11	1,1E-09	36,1	3,5E-10	17,2	
1051	-20,5	-9,0E-11	9,8E-10	36,1	4,0E-10	17,2	
1081	-20,5	4,5E-13	8,6E-10	36,1	4,3E-10	17,2	
1111	-20,5	-3,9E-11	1,2E-09	36,1	2,7E-10	17,2	
1141	-20,5	5,8E-11	1,0E-09	36,1	3,6E-10	17,2	
1171	-20,5	9,0E-11	7,1E-10	36,1	3,3E-10	17,2	
1201	-20,5	9,0E-11	6,7E-10	36,1	5,0E-10	17,2	
1231	-20,5	4,4E-11	9,6E-10	36,1	4,4E-10	17,2	
1261	-20,5	7,0E-11	7,3E-10	36,0	4,2E-10	17,2	
1291	-20,5	1,3E-10	9,9E-10	36,0	3,2E-10	17,2	
1321	-20,5	4,5E-11	1,1E-09	36,0	5,2E-10	17,2	
1351	-20,5	2,0E-11	6,9E-10	36,0	3,7E-10	17,2	
1381	-20,5	-1,3E-10	8,8E-10	36,0	4,1E-10	0,0	
1411	-20,5	-5,5E-11	1,0E-09	36,0	4,5E-10	17,2	
1441	-20,5	-4,6E-11	1,4E-09	36,0	4,1E-10	17,2	
1471	-20,5	7,1E-11	9,4E-10	36,0	3,5E-10	17,2	
1501	-20,5	-2,2E-10	1,9E-09	36,0	3,5E-10	17,2	
1531	-20,5	9,1E-11	1,2E-09	36,0	3,9E-10	17,2	
1561	-20,6	-1,9E-12	8,7E-10	36,0	4,1E-10	17,2	
1591	-20,5	7,5E-11	1,1E-09	36,0	3,8E-10	17,2	
1621	-20,5	-8,5E-11	1,1E-09	36,0	4,7E-10	17,2	
1651	-20,6	1,9E-11	1,3E-09	36,0	3,1E-10	17,2	
1681	-20,6	-6,5E-11	9,6E-10	36,0	3,0E-10	17,2	
1711	-20,6	8,6E-11	1,1E-09	36,0	4,7E-10	17,2	24h
1741	-20,6	7,3E-12	1,1E-09	36,0	4,2E-10	0,0	
1771	-20,6	-7,7E-11	1,2E-09	36,0	3,5E-10	17,2	
1801	-20,6	-2,9E-11	7,2E-10	36,0	3,5E-10	17,2	
1831	-20,6	-1,6E-12	8,6E-10	36,0	2,9E-10	17,2	
1861	-20,6	-4,2E-11	9,6E-10	36,0	4,6E-10	17,2	
1891	-20,5	8,8E-12	9,4E-10	36,0	3,6E-10	17,2	
1921	-20,6	-6,1E-11	7,5E-10	36,0	4,3E-10	17,2	
1951	-20,5	4,2E-11	1,1E-09	36,0	3,1E-10	17,2	
1981	-20,6	-2,4E-11	6,9E-10	36,0	2,0E-10	17,2	
2011	-20,6	-3,6E-11	1,1E-09	36,0	3,6E-10	17,2	
2041	-20,6	7,2E-11	1,3E-09	36,0	3,3E-10	17,2	
2071	-20,5	1,4E-10	1,0E-09	36,0	4,8E-10	17,2	
2101	-20,6	6,3E-11	8,4E-10	36,0	3,2E-10	17,2	
2131	-20,6	1,6E-11	8,5E-10	36,0	2,8E-10	17,2	
2161	-20,6	1,6E-12	9,1E-10	36,0	4,7E-10	17,2	
2191	-20,6	-1,0E-12	1,0E-09	36,0	2,9E-10	17,2	
2221	-20,6	-2,6E-11	8,1E-10	35,9	4,4E-10	17,2	
2251	-20,6	-1,8E-11	8,6E-10	35,9	4,5E-10	17,2	
2281	-20,6	-2,5E-11	1,4E-09	35,8	3,3E-10	17,2	
2311	-20,6	-5,1E-11	6,5E-10	35,7	3,6E-10	17,2	
2341	-20,6	-1,3E-10	8,7E-10	35,6	4,0E-10	17,2	
2371	-20,6	5,3E-11	9,8E-10	35,5	3,8E-10	17,2	

No	Temp.	Slope	Sigma	P406	Short term	P121.5
2401	-20,6	5,6E-11	9,1E-10	35,4	5,2E-10	17,2
2431	-20,6	-5,9E-11	9,2E-10	35,3	4,6E-10	17,2
2461	-20,6	9,6E-11	9,2E-10	35,2	3,8E-10	17,2
2491	-20,6	-2,6E-10	1,4E-09	35,1	4,2E-10	17,2
2521	-20,6	3,9E-12	8,9E-10	35,1	9,3E-10	17,2
2551	-20,6	6,6E-11	9,2E-10	34,9	1,1E-9	17,2
2581	-20,6	-5,2E-11	1,3E-09	34,7	1,2E-9	17,2
2611	-20,6	-5,8E-11	2,5E-09	33,6	1,8E-9	17,2
2641						
2671						

35,3 h

Frequency variation



Sample Beacon message during the Operating Lifetime Test :

FFFE2F8E3E2293E02B8036AFFAF78E4141F0

ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 227	27-36	0011100011
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	41-64	0010001010010011111100000
Latitude Sign: North	65	0
Latitude Degrees: 43	66-72	0101011
Latitude Minutes: 30	73-74	10
Longitude Sign: East	75	0
Longitude Degrees: 1	76-83	00000001
Longitude Minutes: 30	84-85	10
BCH 1 Encoded:	86-106	11010101111111111101011
BCH 1 Calculated:	N/A	11010101111111111101011
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Device: 121.5 MHz homer	112	1
Latitude Offset Sign: +	113	1
Latitude Offset Minutes: 3	114-118	00011
Latitude Offset Seconds: 36	119-122	1001
Longitude Offset Sign: -	123	0
Longitude Offset Minutes: 1	124-128	00001
Longitude Offset Seconds: 16	129-132	0100
BCH 2 Encoded:	133-144	000111110000
BCH 2 Calculated:	N/A	000111110000
Composite Latitude: 43.559999999999995 Degrees North	N/A	Composite Longitude: 1.478888888888889 Degrees East
15 Hex ID:	N/A	1C7C4527C0FFBFF

FFFE2F8E3E2293E02B8036AFFAF78E0159E3

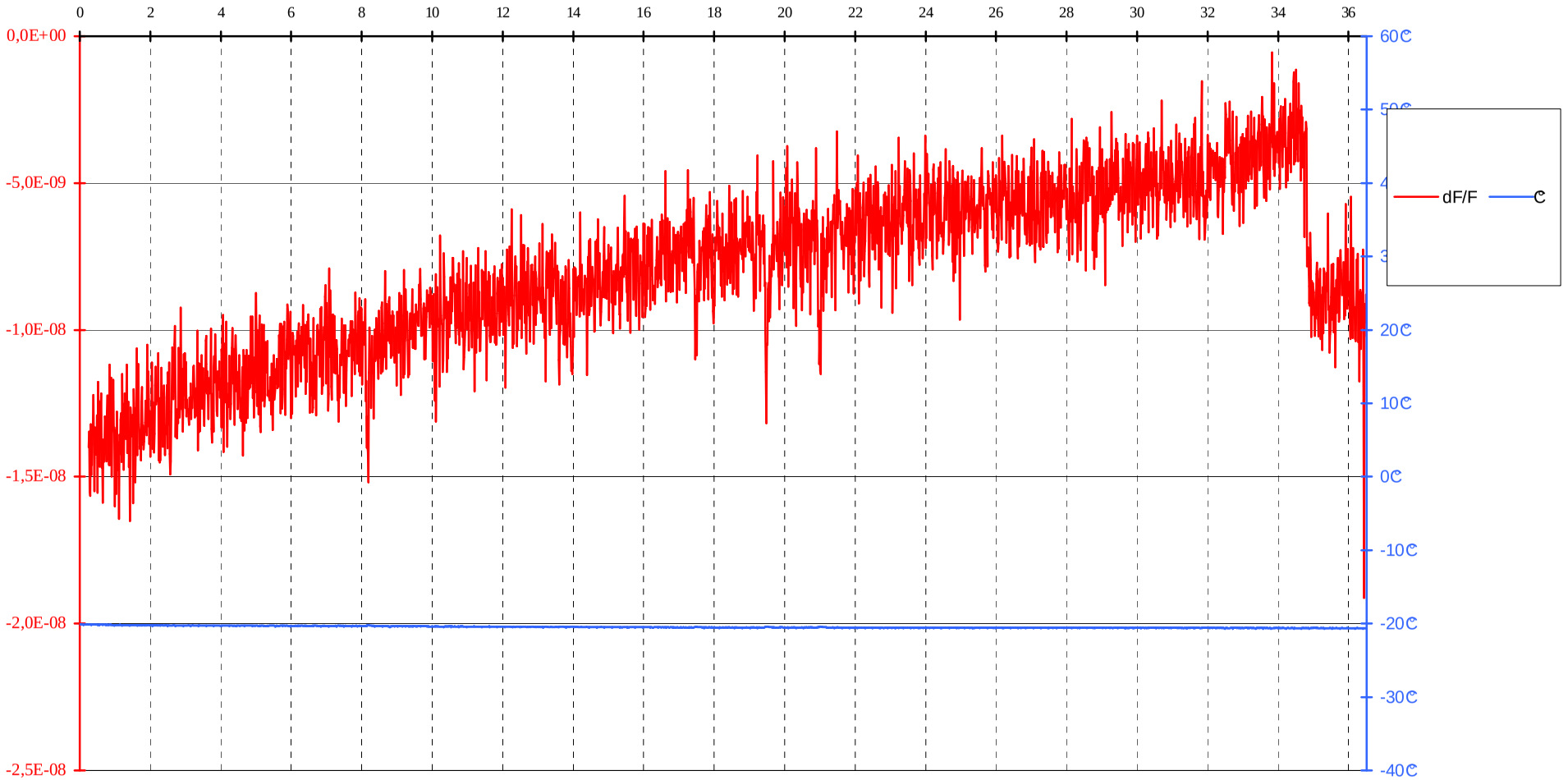
ITEM	BITS	VALUE
Message format: long format	25	1
Protocol: Location Protocol	26	0
Country code: 227	27-36	0011100011
Type of location protocol: Standard Location - Test	37-40	1110
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	41-64	0010001010010011111100000
Latitude Sign: North	65	0
Latitude Degrees: 43	66-72	0101011
Latitude Minutes: 30	73-74	10
Longitude Sign: East	75	0
Longitude Degrees: 1	76-83	00000001
Longitude Minutes: 30	84-85	10
BCH 1 Encoded:	86-106	11010101111111111101011
BCH 1 Calculated:	N/A	11010101111111111101011
Fixed bits (1101): Pass	107-110	1101
Position Data: Encoded Position Data Source From Internal Navigation Device	111	1
Aux Device: 121.5 MHz homer	112	1
Latitude Offset Sign: +	113	1
Latitude Offset Minutes: 3	114-118	00011
Latitude Offset Seconds: 32	119-122	1000
Longitude Offset Sign: -	123	0
Longitude Offset Minutes: 1	124-128	00001
Longitude Offset Seconds: 20	129-132	0101
BCH 2 Encoded:	133-144	100111100011
BCH 2 Calculated:	N/A	100111100011
Composite Latitude: 43.55888888888889 Degrees North	N/A	Composite Longitude: 1.4777777777777778 Degrees East
15 Hex ID:	N/A	1C7C4527C0FFBFF

LIFE TEST AT -20 °C

Manufacturer : MARTEC
Model : KANNAD XS3-GPS
Number : 35407-2

Date : 8 Dec 2006
Time : 11:53:08

FREQUENCY VARIATION

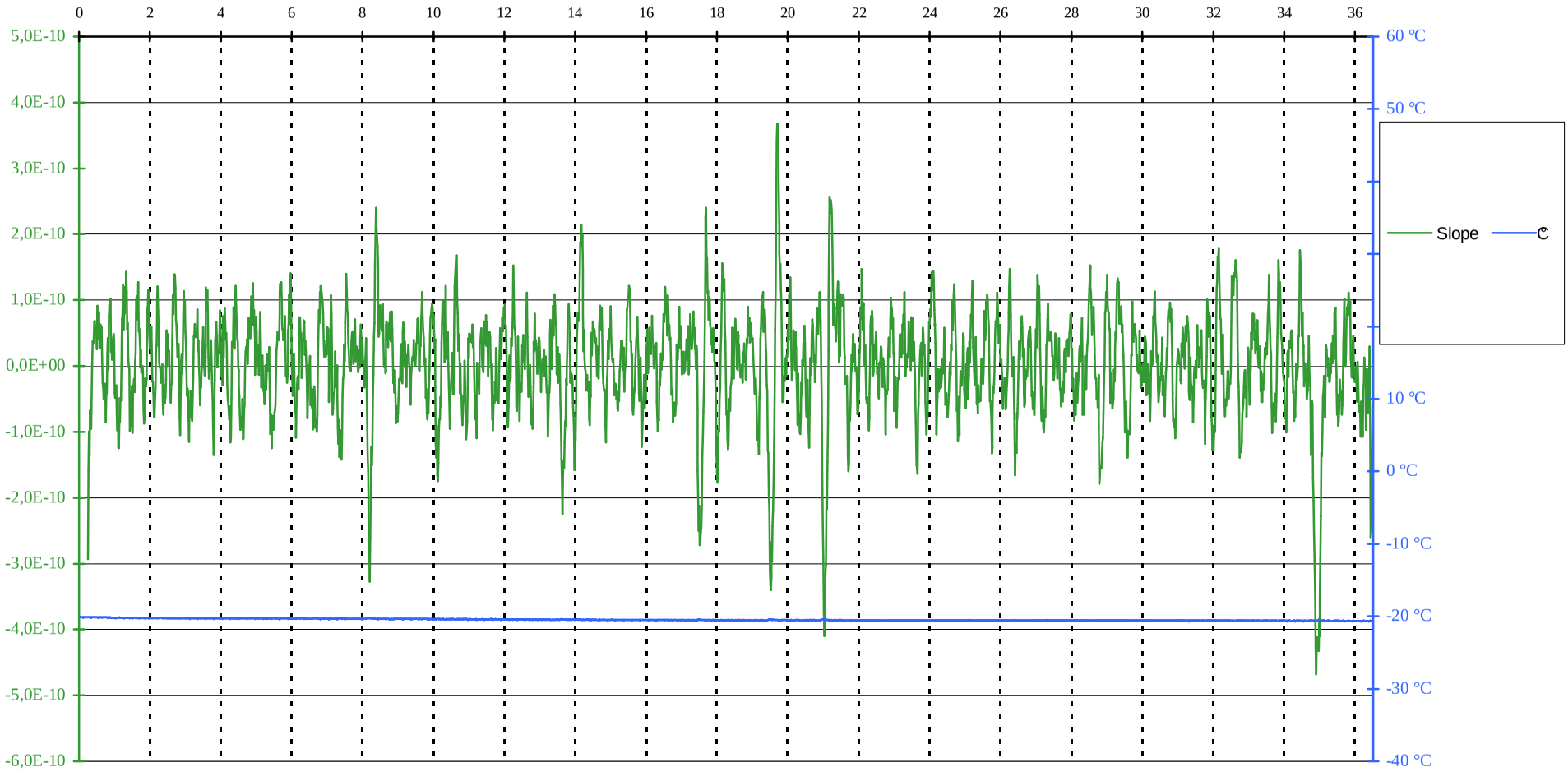


LIFE TEST AT -20 °C

Manufacturer : MARTEC
Model : KANNAD XS3-GPS
Number : 35407-2

Date : 8 Dec 2006
Time : 11:53:08

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

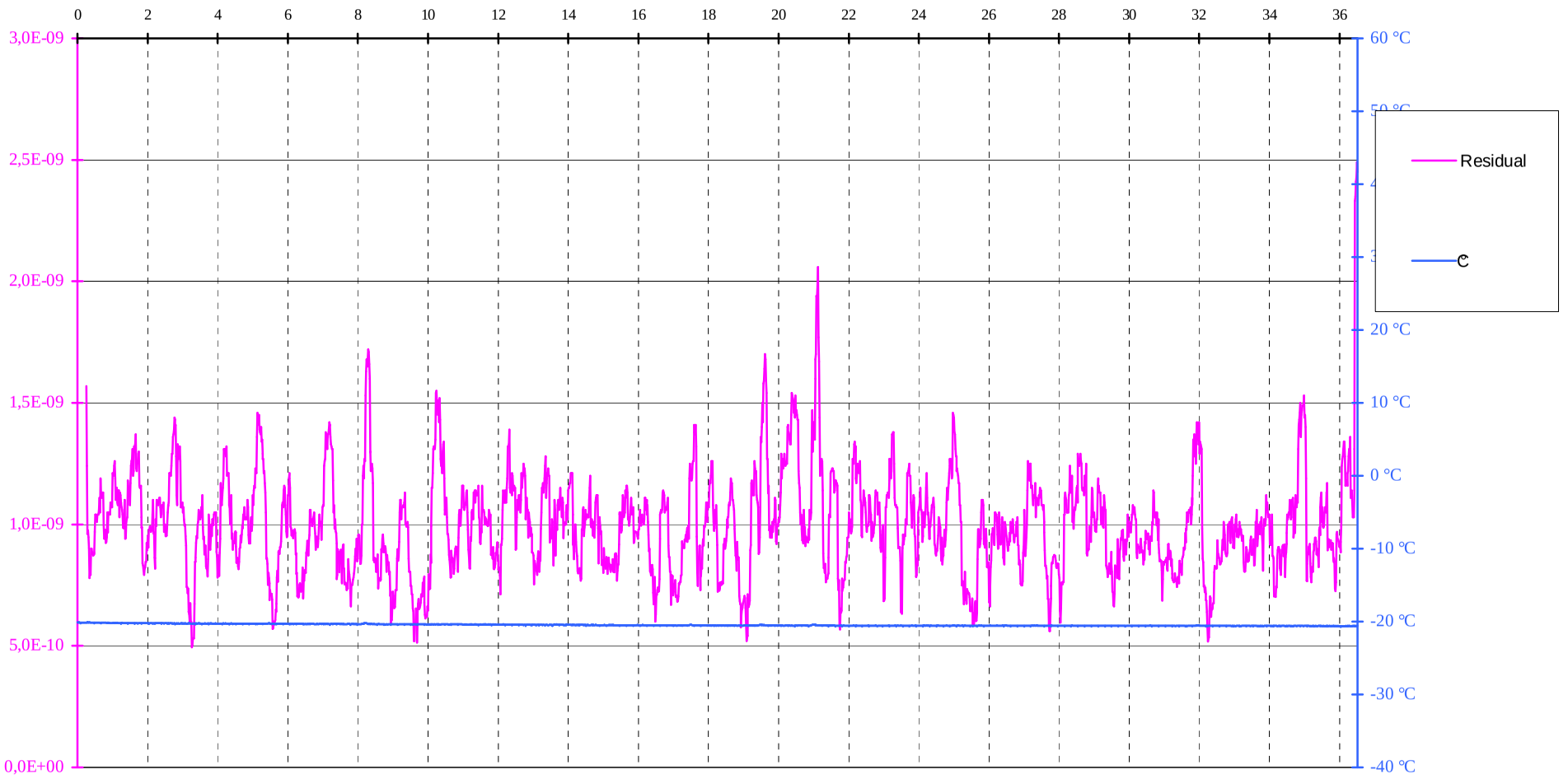


LIFE TEST AT -20 °C

Manufacturer : MARTEC
Model : KANNAD XS3-GPS
Number : 35407-2

Date : 8 Dec 2006
Time : 11:53:08

MEDIUM TERM STABILITY : RESIDUAL (≤ 3,0E-9)

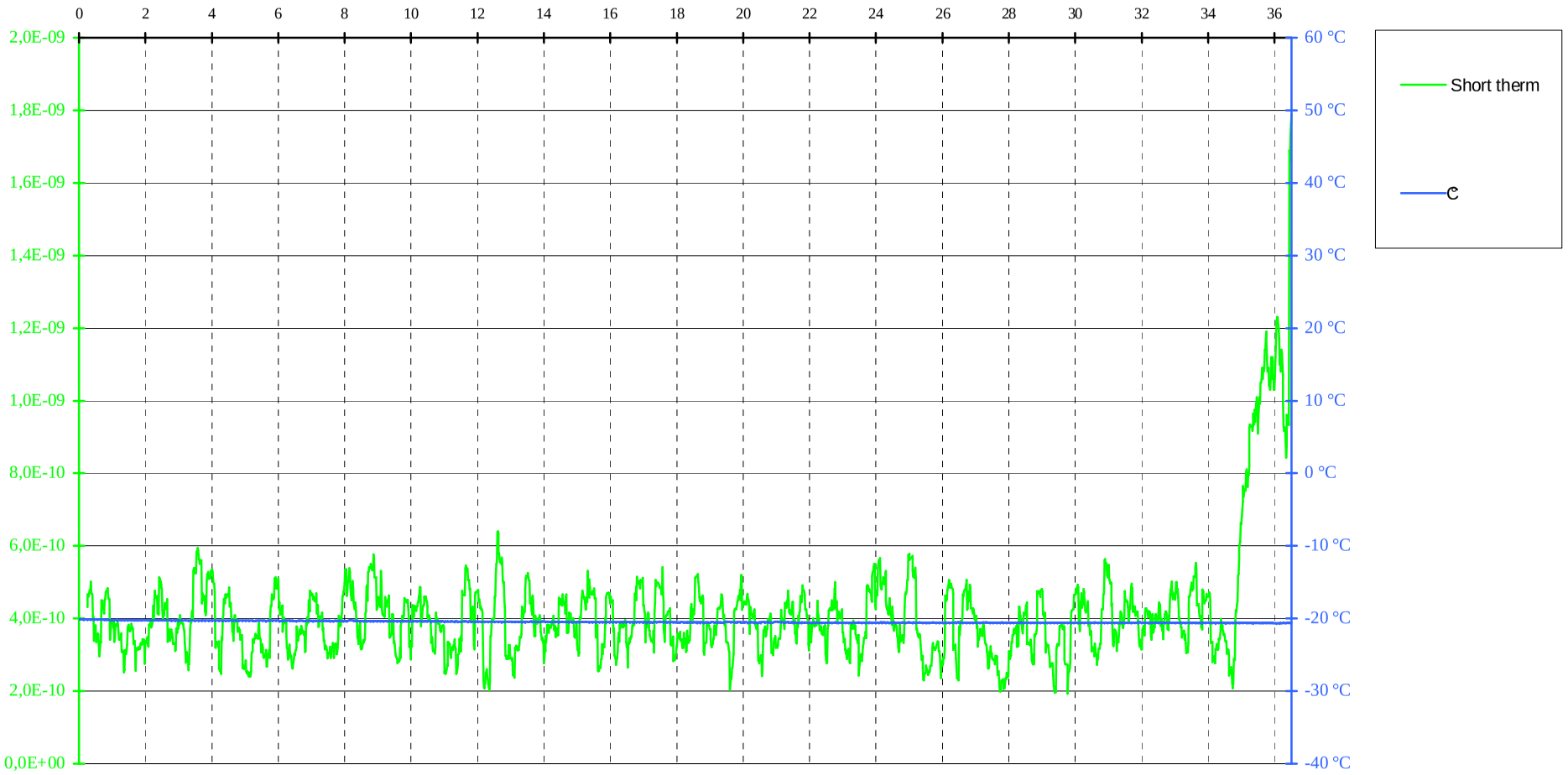


LIFE TEST AT -20 °C

Manufacturer : MARTEC
Model : KANNAD XS3-GPS
Number : 35407-2

Date : 8 Dec 2006
Time : 11:53:08

SHORT TERM STABILITY /100 mS (≤ 2,0E-9)

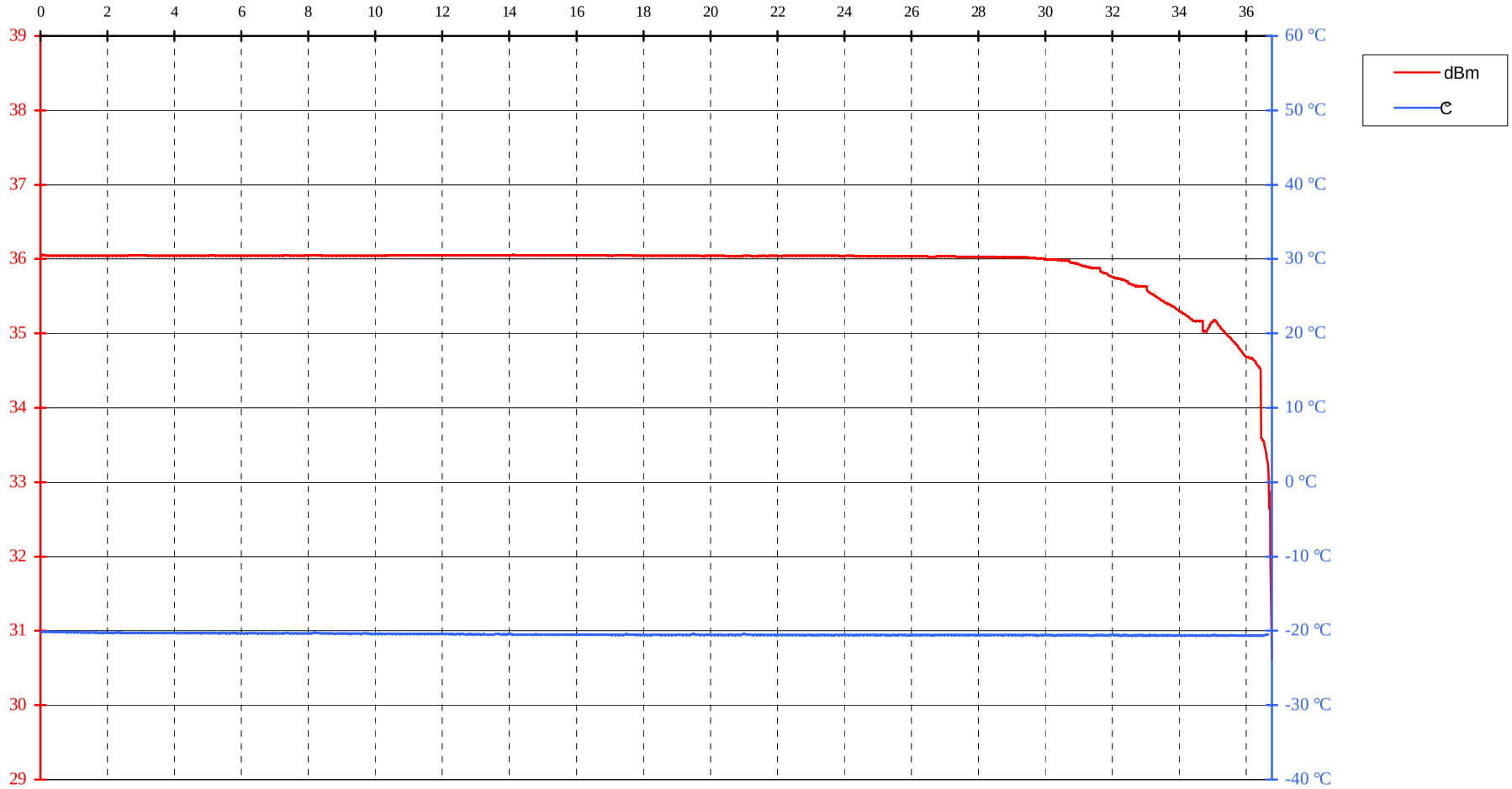


LIFE TEST AT -20 °C

Manufacturer : MARTEC
Model : KANNAD XS3-GPS
Numero : 35407-2

Date : 8 Dec 2006
Time : 11:53:08

OUTPUT POWER (35 to 39 dBm)



TEMPERATURE GRADIENT TEST RESULT ON
MARTEC
KANNAD XS3-GPS
N° 35407-2
1st part -20°c to 55°C (A-->D)

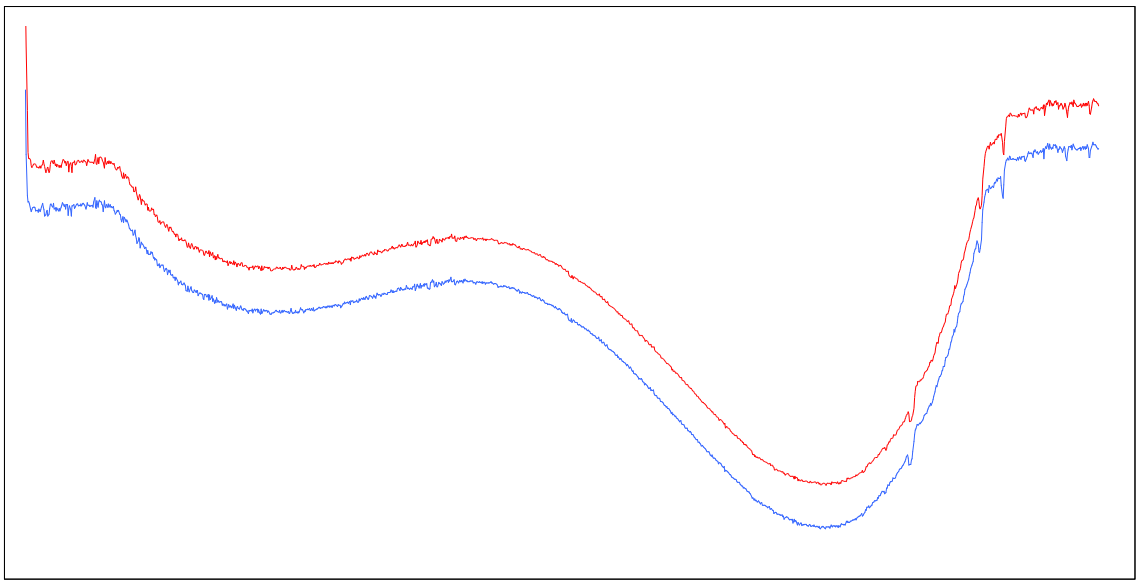
Warm Up	Δ Frequency (Hz)	Temp. (°C)	P406 (dBm)	P121.5 (dBm)
1	49979,85	-21,7	36,2	0,0
2	49977,13	-21,5	36,2	0,0
3	49973,64	-20,9	36,2	0,0
4	49969,42	-20,9	36,2	0,0
5	49963,96	-20,8	36,1	0,0
6	49957,64	-20,9	36,1	17,4
7	49949,80	-20,9	36,1	17,4
8	49941,40	-20,8	36,1	17,4
9	49937,03	-20,9	36,1	17,4
10	49936,53	-20,9	36,1	17,4
11	49937,47	-20,9	36,1	17,4
12	49936,29	-20,9	36,1	17,4
13	49936,57	-20,9	36,1	17,4
14	49936,26	-20,9	36,1	17,4
15	49937,48	-21,0	36,1	17,4
16	49937,59	-20,9	36,1	17,4
17	49937,34	-20,9	36,1	17,4
18	49937,25	-20,9	36,1	17,4

No	Temp.	Slope	Sigma	P406	Short term	P121.5
1	-20,0	-2,0E-10	7,9E-10	36,0	3,5E-10	17,1
18	-20,1	5,8E-11	1,1E-9	36,0	3,2E-10	17,1
31	-20,1	2,8E-11	7,2E-10	36,0	3,5E-10	17,1
61	-20,2	-2,7E-11	4,0E-10	36,0	3,1E-10	17,1
91	-20,1	-9,4E-11	6,9E-10	36,0	3,1E-10	17,1
121	-18,2	-4,1E-10	6,8E-10	36,0	3,0E-10	17,1
151	-16,1	-3,5E-10	6,0E-10	36,0	3,7E-10	0,0
181	-13,9	-2,3E-10	5,5E-10	36,0	2,6E-10	17,0
211	-11,8	-1,2E-10	6,2E-10	36,0	2,8E-10	17,0
241	-9,7	-4,9E-11	4,6E-10	36,0	2,3E-10	17,0
271	-7,6	-2,9E-11	4,2E-10	35,9	1,1E-10	17,0
301	-5,4	-2,3E-11	2,3E-10	35,9	2,1E-10	17,0
331	-3,3	1,2E-11	3,4E-10	35,9	2,8E-10	17,0
361	-1,2	5,2E-11	2,3E-10	35,9	2,3E-10	17,0
391	0,9	8,6E-11	3,1E-10	35,9	1,9E-10	17,0
421	3,0	6,4E-11	3,1E-10	35,8	2,7E-10	17,0
451	5,2	3,9E-11	3,3E-10	35,8	2,5E-10	17,0
481	7,4	3,5E-11	7,8E-10	35,8	5,7E-10	16,9
511	9,5	-1,9E-11	4,8E-10	35,8	7,0E-10	16,9
541	11,6	-1,3E-11	2,3E-10	35,8	1,9E-10	16,9
571	13,8	-4,3E-11	1,6E-10	35,8	2,2E-10	16,9
601	15,9	-1,3E-10	1,4E-10	35,8	2,4E-10	16,9
631	18,0	-1,6E-10	2,0E-10	35,9	2,4E-10	16,9
661	20,1	-1,8E-10	1,2E-10	35,9	2,1E-10	16,9
691	22,1	-2,5E-10	1,9E-10	35,9	2,2E-10	16,9
721	24,3	-3,0E-10	2,1E-10	35,8	2,1E-10	16,8
751	26,4	-3,2E-10	2,2E-10	35,8	1,9E-10	16,8
781	28,6	-3,0E-10	1,6E-10	35,8	1,8E-10	16,8
811	30,7	-2,9E-10	1,4E-10	35,8	1,8E-10	16,8
841	32,9	-2,7E-10	2,5E-10	35,8	1,2E-10	16,7

No	Temp.	Slope	Sigma	P406	Short term	P121.5
871	35,0	-2,2E-10	3,3E-10	35,7	1,4E-10	16,8
901	37,1	-1,0E-10	2,2E-10	35,7	1,8E-10	16,7
931	39,3	-4,4E-11	1,9E-10	35,7	1,8E-10	16,7
961	41,5	3,5E-11	2,0E-10	35,6	1,9E-10	16,7
991	43,9	1,6E-10	1,9E-10	35,6	1,7E-10	16,7
1021	46,2	2,7E-10	3,7E-10	35,5	1,5E-10	16,6
1051	48,3	2,1E-10	9,2E-10	35,5	1,5E-10	16,6
1081	50,4	4,5E-10	5,9E-10	35,4	1,2E-10	0,0
1111	52,6	8,1E-10	4,8E-10	35,4	1,6E-10	16,6
1141	54,6	1,5E-9	2,8E-9	35,4	2,5E-10	0,0
1171	55,0	6,6E-10	2,5E-9	35,3	2,0E-10	16,6
1201	54,9	1,5E-10	6,5E-10	35,3	2,3E-10	16,6
1231	55,0	-5,9E-11	6,0E-10	35,3	1,9E-10	16,6
1261	54,9	-2,7E-11	4,7E-10	35,3	2,1E-10	16,6
1291	54,2	-7,5E-10	4,8E-10	35,3	1,3E-10	16,6

Frequency variation

406027948



406027898

FFFE2F8E3E2293E02B8036AFFAF78E014CDA

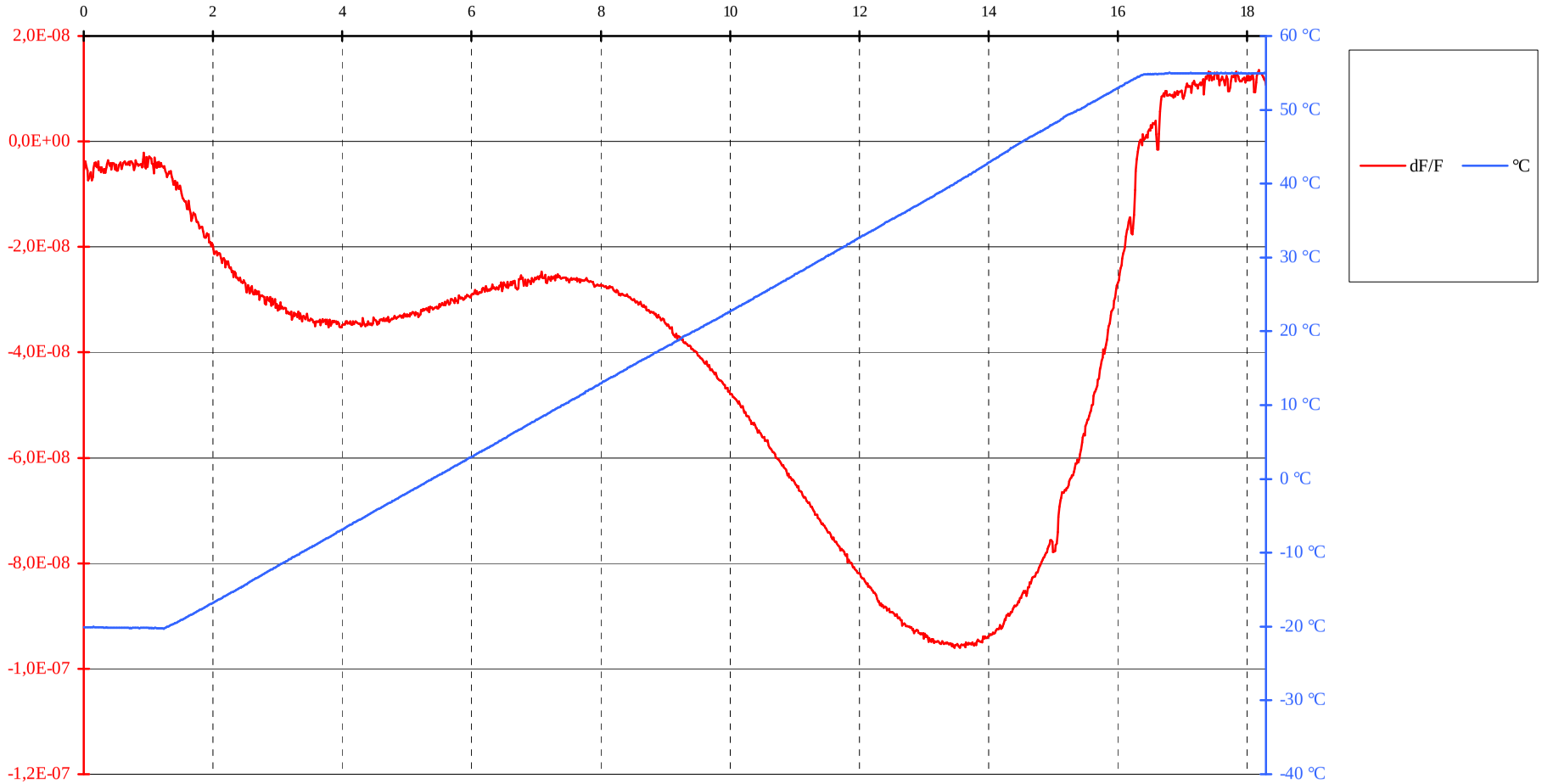
ITEM	BITS	VALUE
Message format: long format	**25**	**1**
Protocol: Location Protocol	**26**	**0**
Country code: 227	**27-36**	**0011100011**
Type of location protocol: Standard Location - Test	**37-40**	**1110**
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	**41-64**	**001000101001001111100000**
Latitude Sign: North	**65**	**0**
Latitude Degrees: 43	**66-72**	**0101011**
Latitude Minutes: 30	**73-74**	**10**
Longitude Sign: East	**75**	**0**
Longitude Degrees: 1	**76-83**	**00000001**
Longitude Minutes: 30	**84-85**	**10**
BCH 1 Encoded:	**86-106**	**11010101111111111101011**
BCH 1 Calculated:	**N/A**	**11010101111111111101011**
Fixed bits (1101): Pass	**107-110**	**1101**
Position Data: Encoded Position Data Source From Internal Navigation Device	**111**	**1**
Aux Device: 121.5 MHz homer	**112**	**1**
Latitude Offset Sign: +	**113**	**1**
Latitude Offset Minutes: 3	**114-118**	**00011**
Latitude Offset Seconds: 32	**119-122**	**1000**
Longitude Offset Sign: -	**123**	**0**
Longitude Offset Minutes: 1	**124-128**	**00001**
Longitude Offset Seconds: 16	**129-132**	**0100**
BCH 2 Encoded:	**133-144**	**110011011010**
BCH 2 Calculated:	**N/A**	**110011011010**
Composite Latitude: 43.55888888888889 Degrees North	**N/A**	**Composite Longitude: 1.478888888888889 Degrees East**
15 Hex ID:	**N/A**	**1C7C4527C0FFBFF**

TEMPERATURE GRADIENT TEST RESULTS (5 °C / hour) - 1st part -20°c to 55°C (A-->D)

Manufacturer : MARTEC
Model : KANNAD XS3-GPS
Number : 35407-2

Date : 12 Dec 2006
Time : 17:57:37

FREQUENCY VARIATION

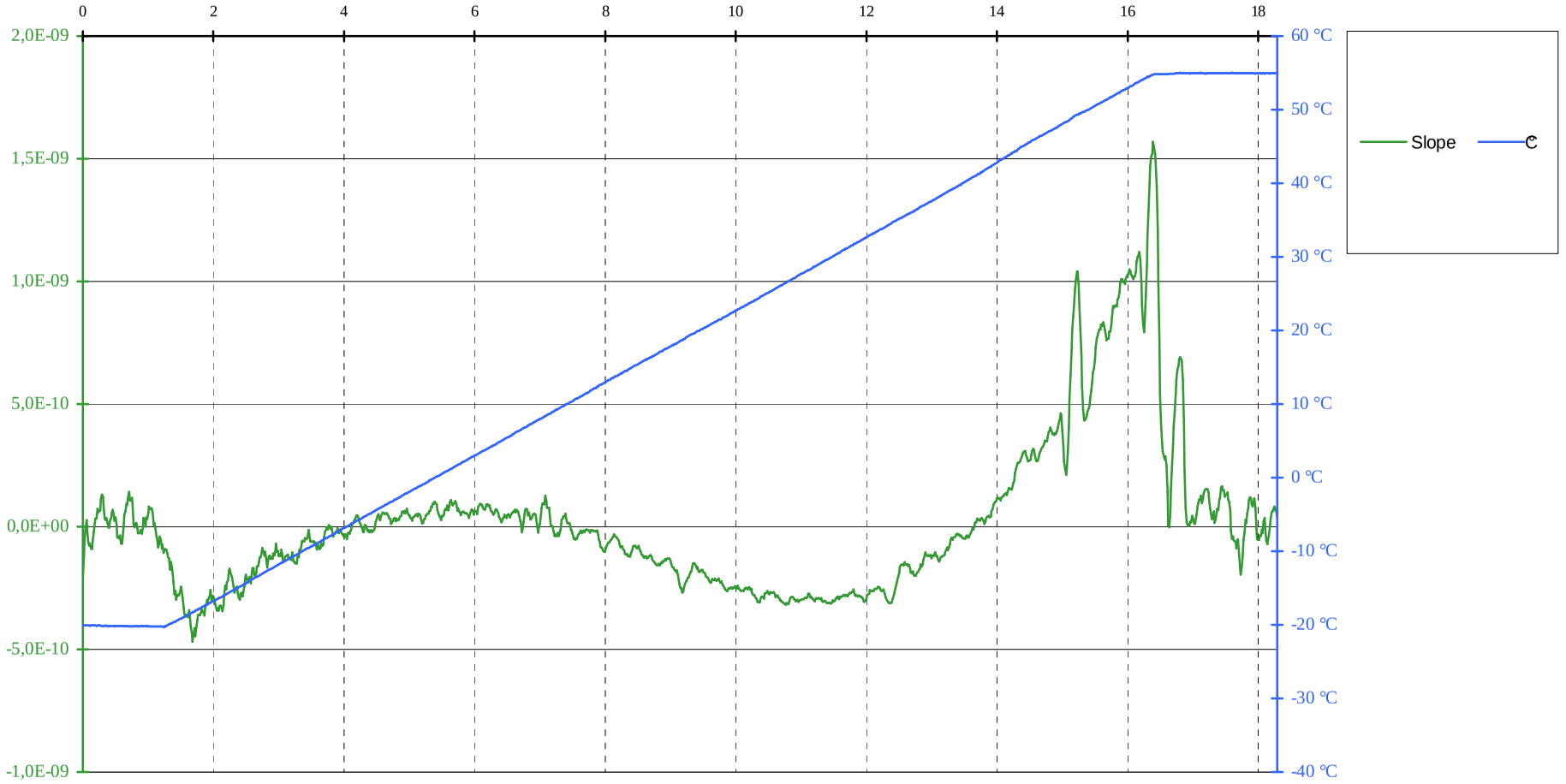


TEMPERATURE GRADIENT TEST RESULTS (5 °C / hour) - 1st part -20°c to 55°C (A-->D)

Manufacturer : MARTEC
Model : KANNAD XS3-GPS
Number :

Date : 12 Dec 2006
Time : 17:57:37

MEDIUM TERM STABILITY : MEAN SLOPE /mn A to B, C+15 to D, and E+15 to F (-1,0E-9 to 1,0E-9)
MEAN SLOPE /mn B to C+15, and D to E+15 (-2,0E-9 to 2,0E-9)

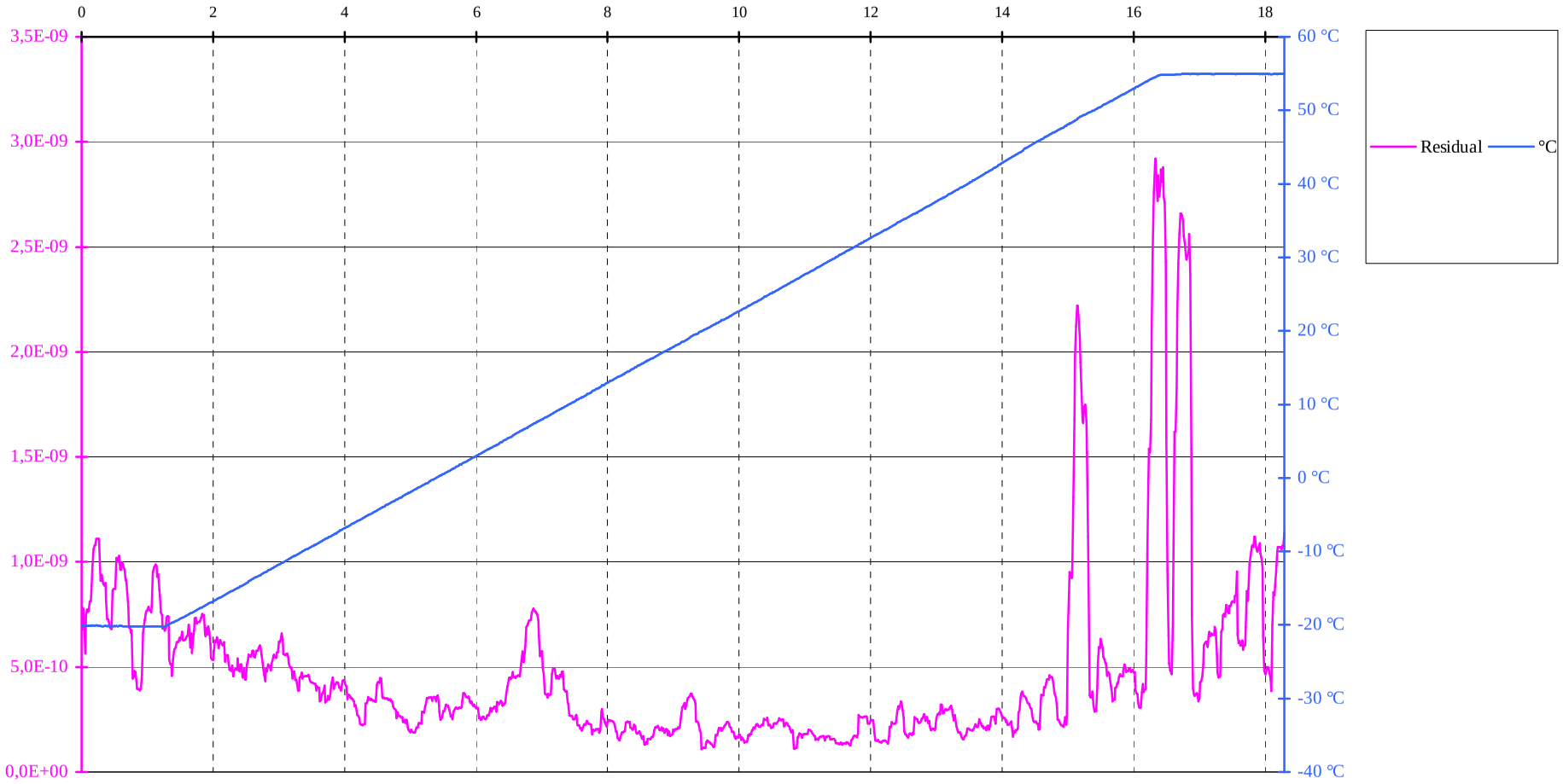


TEMPERATURE GRADIENT TEST RESULTS (5 °C / hour) - 1st part -20°c to 55°C (A-->D)

Manufacturer : MARTEC
Model : KANNAD XS3-GPS
Number : 35407-2

Date : 12 Dec 2006
Time : 17:57:37

MEDIUM TERM STABILITY : RESIDUAL (≤ 3,0E-9)

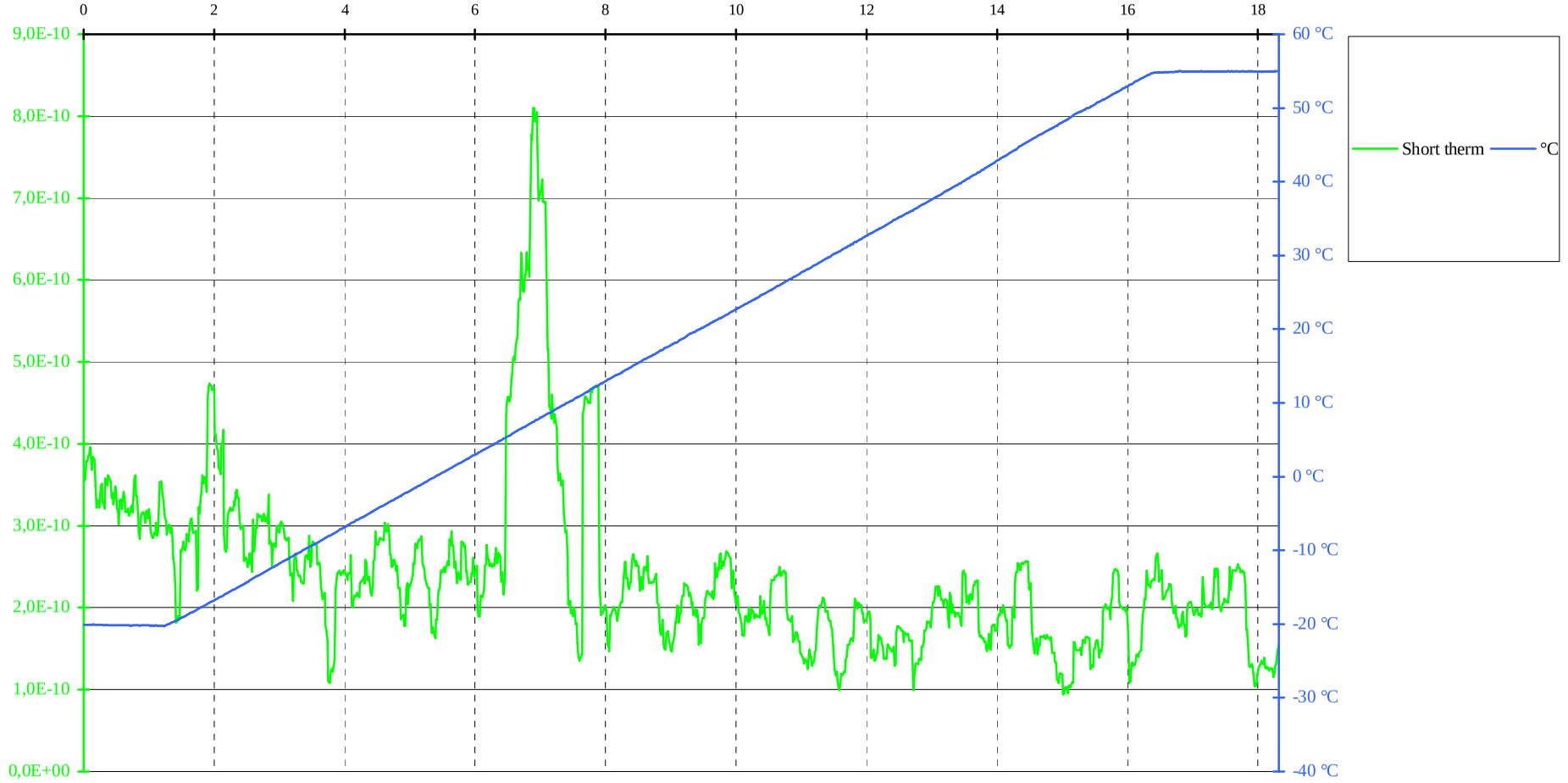


TEMPERATURE GRADIENT TEST RESULTS (5 °C / hour) - 1st part -20°c to 55°C (A-->D)

Manufacturer : MARTEC
Model : KANNAD XS3-GPS
Number : 35407-2

Date : 12 Dec 2006
Time : 17:57:37

SHORT TERM STABILITY /100 mS (≤ 2,0E-9)

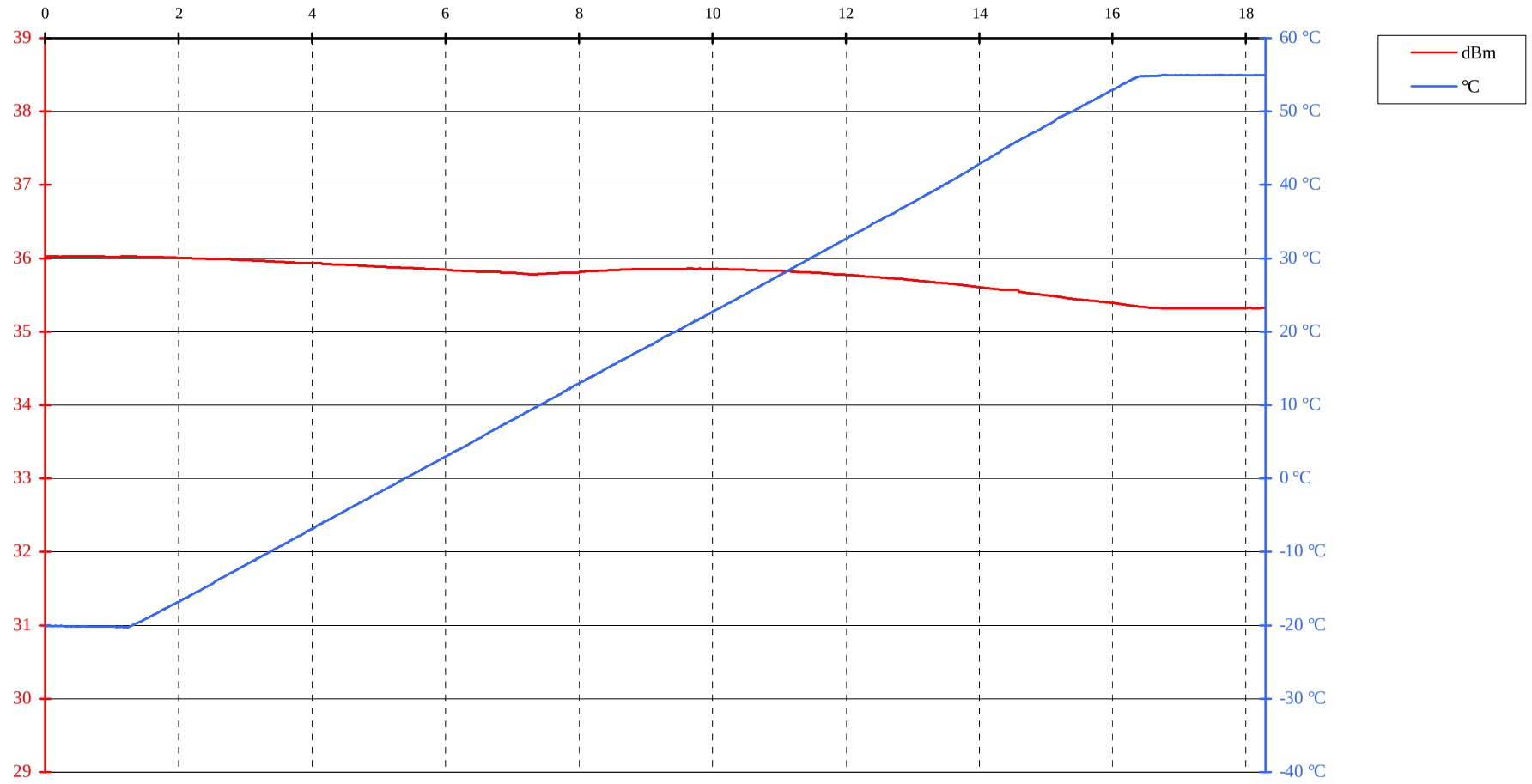


TEMPERATURE GRADIENT TEST RESULTS (5 °C / hour) - 1st part -20°c to 55°C (A-->D)

Manufacturer : MARTEC
Model : KANNAD XS3-GPS
Number : 35407-2

Date : 12 Dec 2006
Time : 17:57:37

OUTPUT POWER (35 to 39 dBm)



TEMPERATURE GRADIENT TEST RESULT ON
MARTEC
KANNAD XS3-GPS
N° 35407-2
2 nd part +55°C to -20°C (C-->D)

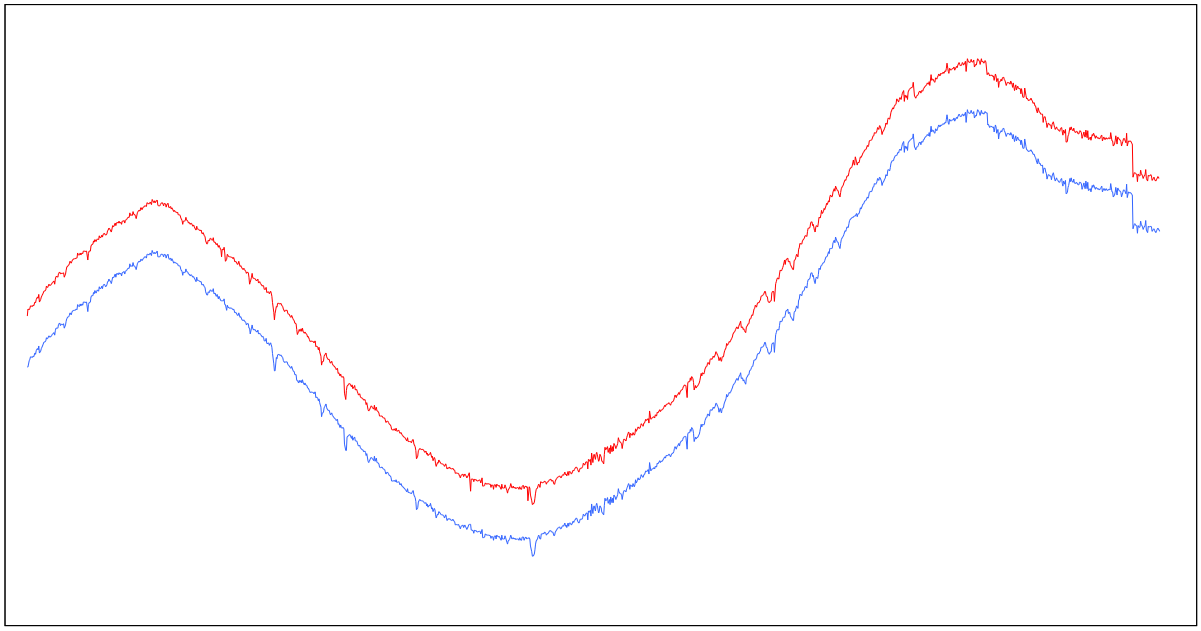
Warm Up	Δ Frequency (Hz)	Temp. (°C)	P406 (dBm)	P121.5 (dBm)
1	49912,09	54,9	35,2	16,2
2	49911,97	54,8	35,2	16,1
3	49912,10	54,6	35,2	16,1
4	49912,29	54,6	35,2	0,0
5	49911,77	54,7	35,2	0,0
6	49910,82	54,8	35,2	0,0
7	49910,46	54,7	35,2	16,2
8	49910,73	54,6	35,2	16,1
9	49911,39	54,7	35,2	16,1
10	49912,01	54,8	35,2	16,1
11	49912,36	54,6	35,2	16,1
12	49912,53	54,8	35,2	16,1
13	49912,72	54,9	35,2	16,1
14	49912,75	54,8	35,2	16,1
15	49912,88	54,8	35,2	16,1
16	49913,07	54,9	35,2	16,1
17	49913,12	55,0	35,2	16,1
18	49913,28	54,9	35,2	16,1

No	Temp.	Slope (MT)	Residual (MT)	P406	Short term	P121.5
1	54,8	3,3E-10	1,5E-9	35,2	2,1E-10	16,1
18	54,8	2,1E-10	4,2E-10	35,2	2,4E-10	16,1
31	54,8	2,4E-10	3,8E-10	35,2	2,2E-10	16,1
61	54,8	2,5E-10	3,8E-10	35,2	1,6E-10	16,1
91	54,8	2,7E-10	4,9E-10	35,2	2,4E-10	16,1
121	54,9	7,7E-11	2,4E-10	35,2	2,7E-10	16,1
151	54,6	1,3E-10	2,0E-10	35,2	2,4E-10	16,1
181	52,7	-1,2E-10	2,5E-10	35,2	1,6E-10	16,2
211	50,5	-1,4E-10	2,0E-10	35,2	4,0E-10	16,2
241	48,5	-2,3E-10	5,4E-10	35,2	4,2E-10	16,2
271	46,4	-2,6E-10	4,4E-10	35,3	3,1E-10	16,2
301	44,2	-3,9E-10	9,7E-10	35,3	2,8E-10	16,2
331	42,4	-3,2E-10	4,2E-10	35,4	1,3E-10	16,2
361	40,2	-3,1E-10	7,0E-10	35,4	3,3E-10	16,3
391	38,1	-3,0E-10	1,0E-9	35,5	3,0E-10	16,3
421	36,1	-1,7E-10	5,2E-10	35,5	2,4E-10	16,3
451	34,0	-1,6E-10	2,9E-10	35,5	2,0E-10	16,3
481	31,9	-1,5E-10	7,6E-10	35,6	2,1E-10	16,3
511	29,8	-8,4E-11	3,5E-10	35,6	3,0E-10	16,4
541	27,6	-8,5E-11	7,0E-10	35,6	7,2E-10	16,4
571	25,6	-3,0E-11	2,7E-10	35,6	3,8E-10	16,4
601	23,4	-1,1E-11	2,6E-10	35,6	3,7E-10	16,4
631	21,1	2,1E-10	7,0E-10	35,6	2,8E-10	16,4
661	19,3	7,0E-11	2,7E-10	35,6	2,8E-10	16,4
691	17,2	1,6E-10	5,9E-10	35,6	8,1E-10	16,4
721	15,3	1,2E-10	6,2E-10	35,7	6,5E-10	16,5
751	13,1	1,9E-10	2,9E-10	35,7	3,8E-10	16,5
781	11,0	1,4E-10	2,1E-10	35,7	3,3E-10	16,5
811	8,9	3,7E-11	9,3E-10	35,8	3,9E-10	16,5
841	6,6	5,4E-11	6,2E-10	35,8	1,6E-10	16,5

No	Temp.	Slope (MT)	Residual (MT)	P406	Short term	P121.5
871	4,6	6,6E-11	6,4E-10	35,8	2,5E-10	16,5
901	2,6	1,5E-11	7,5E-10	35,8	3,2E-10	16,5
931	0,4	4,1E-11	7,8E-10	35,9	3,1E-10	16,5
961	-1,8	1,6E-10	7,7E-10	35,9	3,4E-10	16,6
991	-3,8	1,6E-10	6,8E-10	35,9	2,9E-10	16,6
1021	-5,9	3,3E-10	2,4E-10	35,9	2,3E-10	16,5
1051	-8,1	4,1E-10	3,3E-10	35,9	3,6E-10	16,6
1081	-10,1	1,8E-12	8,7E-10	36,0	2,5E-10	16,6
1111	-12,4	1,1E-10	3,8E-10	36,0	5,2E-10	16,6
1141	-14,6	7,0E-11	4,8E-10	36,0	4,2E-10	16,6
1171	-16,6	-2,8E-10	6,3E-10	36,0	2,9E-10	16,6
1201	-18,8	-9,3E-11	3,8E-10	36,0	4,7E-10	16,6
1231	-20,4	-2,8E-10	3,9E-10	35,7	4,1E-10	16,6
1261	-20,5	-1,4E-10	5,8E-10	35,5	3,8E-10	16,6
1291	-20,5	-5,2E-11	5,7E-10	35,3	5,7E-10	16,6
1321	-20,6	-3,1E-11	5,7E-10	35,1	5,2E-10	16,6
1351	-20,6	-5,2E-10	1,8E-9	35,1	1,1E-9	16,6
1381						
1411						
1441						
1471						
1501						
1531						
1561						
1591						
1621						
1651						
1681						
1711						
1741						
1771						
1801						
1831						
1861						
1891						
1921						
1951						
1981						
2011						
2041						
2071						
2101						
2131						
2161						
2191						
2221						
2251						
2281						
2311						
2341						
2371						

Frequency variation

406027933



406027898

Initial tracing Smoothed tracing

Sample of beacon message recorded during the Frequency Stability Test with Temperature Gradient :
FFFE2F8E3E2293E02B8036AFFAF78E0159E3

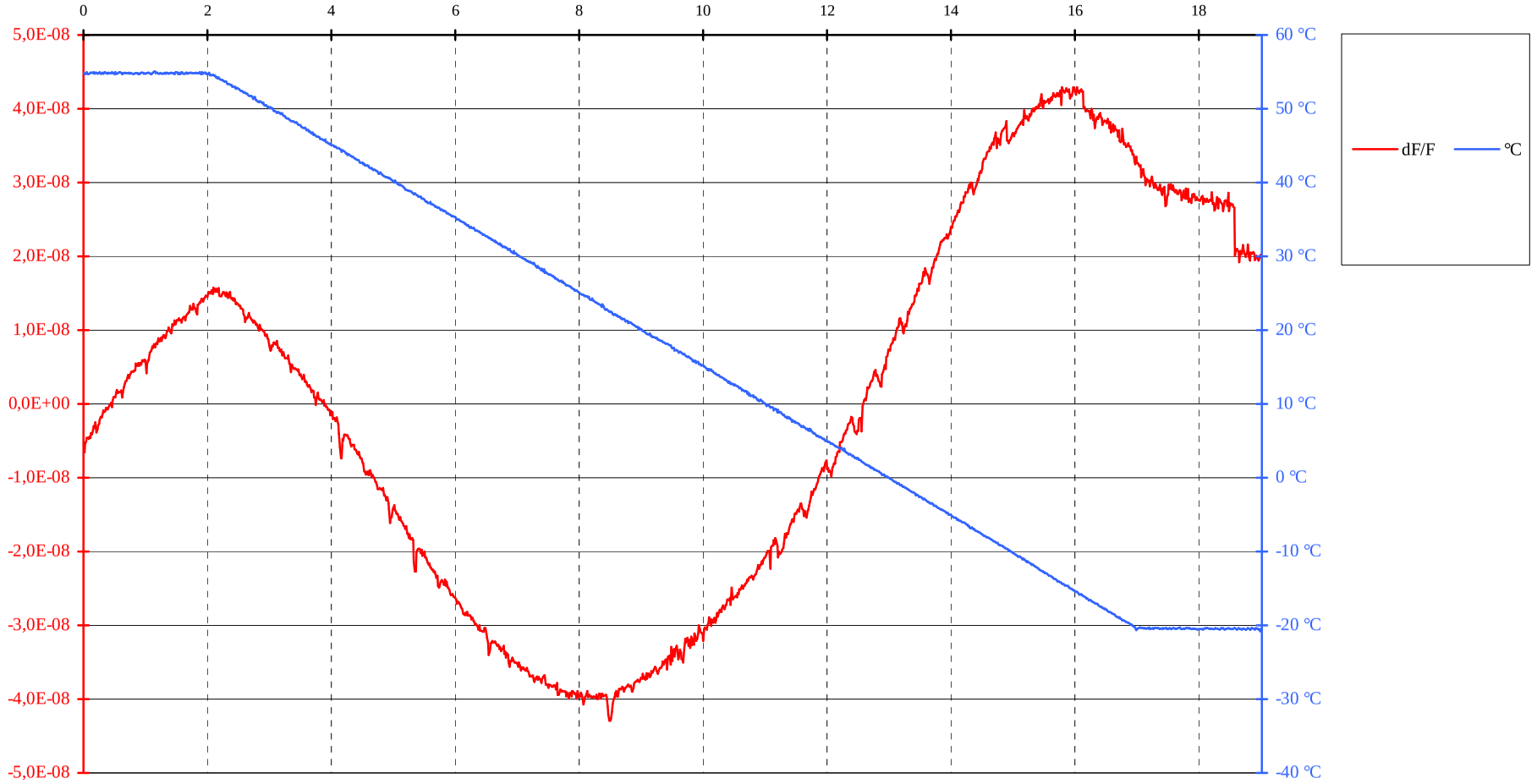
ITEM	BITS	VALUE
Message format: long format	**25**	**1**
Protocol: Location Protocol	**26**	**0**
Country code: 227	**27-36**	**0011100011**
Type of location protocol: Standard Location - Test	**37-40**	**1110**
Test Protocol: Test Protocol (No Decode information in bits 41 to 64)	**41-64**	**001000101001001111100000**
Latitude Sign: North	**65**	**0**
Latitude Degrees: 43	**66-72**	**0101011**
Latitude Minutes: 30	**73-74**	**10**
Longitude Sign: East	**75**	**0**
Longitude Degrees: 1	**76-83**	**00000001**
Longitude Minutes: 30	**84-85**	**10**
BCH 1 Encoded:	**86-106**	**11010101111111111101011**
BCH 1 Calculated:	**N/A**	**11010101111111111101011**
Fixed bits (1101): Pass	**107-110**	**1101**
Position Data: Encoded Position Data Source From Internal Navigation Device	**111**	**1**
Aux Device: 121.5 MHz homer	**112**	**1**
Latitude Offset Sign: +	**113**	**1**
Latitude Offset Minutes: 3	**114-118**	**00011**
Latitude Offset Seconds: 32	**119-122**	**1000**
Longitude Offset Sign: -	**123**	**0**
Longitude Offset Minutes: 1	**124-128**	**00001**
Longitude Offset Seconds: 20	**129-132**	**0101**
BCH 2 Encoded:	**133-144**	**100111100011**
BCH 2 Calculated:	**N/A**	**100111100011**
Composite Latitude: 43.55888888888889 Degrees North	**N/A**	**Composite Longitude: 1.4777777777777778 Degrees East**
15 Hex ID:	**N/A**	**1C7C4527C0FFBFF**

TEMPERATURE GRADIENT TEST RESULTS (5 °C / hour) - 2 nd part +55°C to -20°C (C-->D)

Manufacturer : MARTEC
Model : KANNAD XS3-GPS
Number : 35407-2

Date : 6 Feb 2007
Time : 17:21:11

FREQUENCY VARIATION

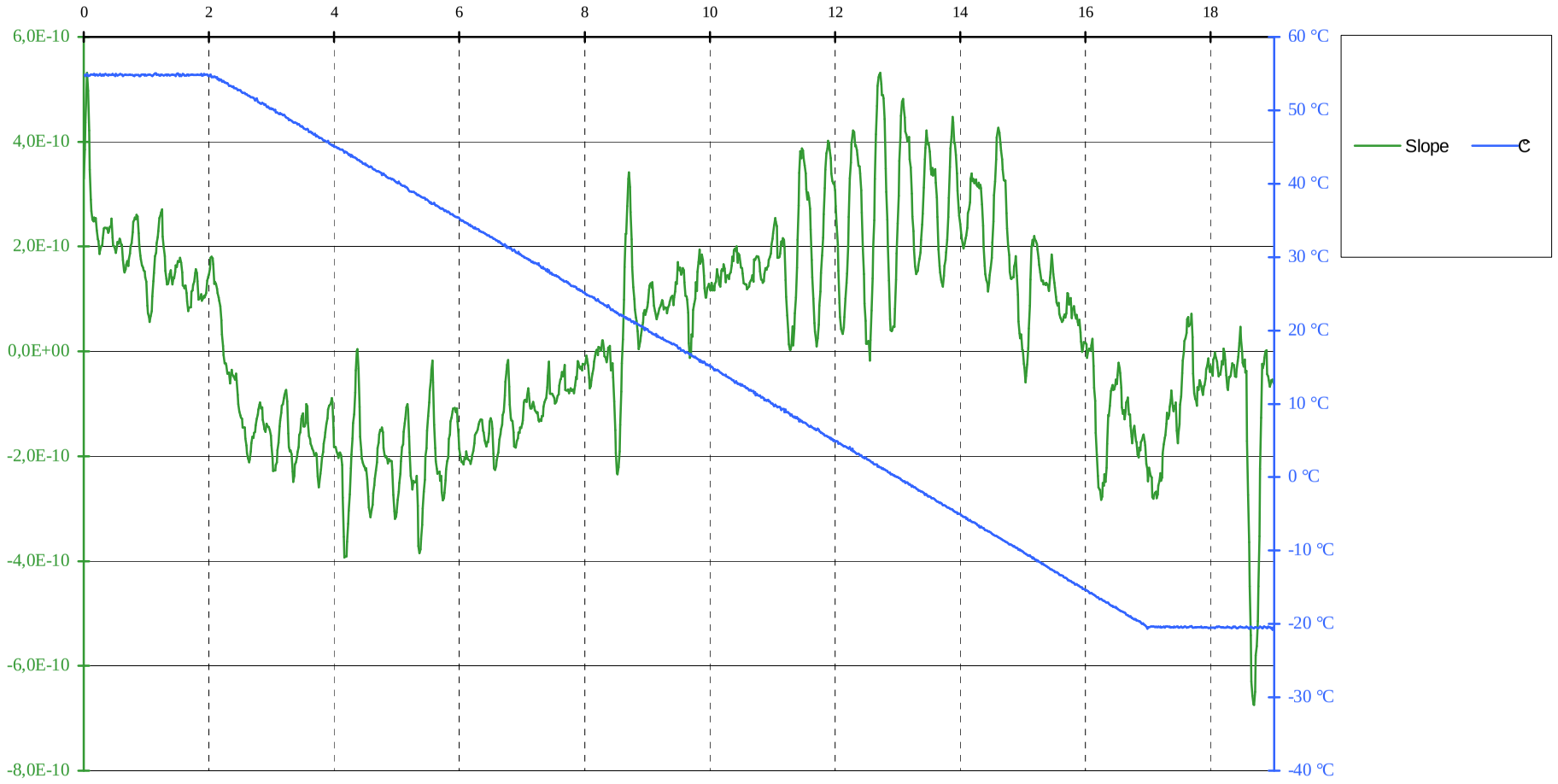


TEMPERATURE GRADIENT TEST RESULTS (5 °C / hour) - 2 nd part +55°C to -20°C (C-->D)

Manufacturer : MARTEC
Model : KANNAD XS3-GPS
Number :

Date : 6 Feb 2007
Time : 17:21:11

MEDIUM TERM STABILITY : MEAN SLOPE /mn A to B, C+15 to D, and E+15 to F (-1,0E-9 to 1,0E-9)
MEAN SLOPE /mn B to C+15, and D to E+15 (-2,0E-9 to 2,0E-9)

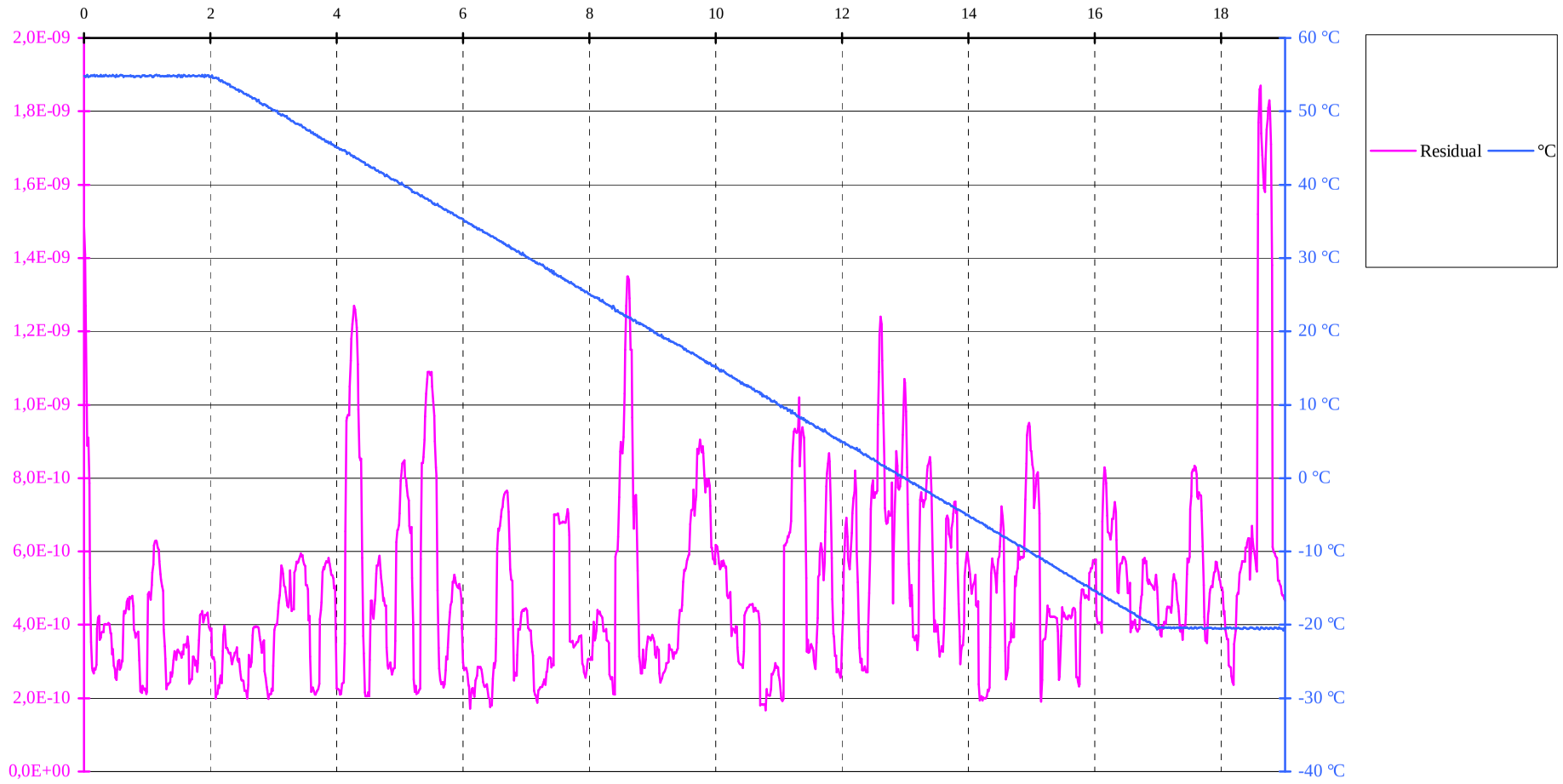


TEMPERATURE GRADIENT TEST RESULTS (5 °C / hour) - 2 nd part +55°C to -20°C (C-->D)

Manufacturer : MARTEC
Model : KANNAD XS3-GPS
Number : 35407-2

Date : 6 Feb 2007
Time : 17:21:11

MEDIUM TERM STABILITY : RESIDUAL (≤ 3,0E-9)

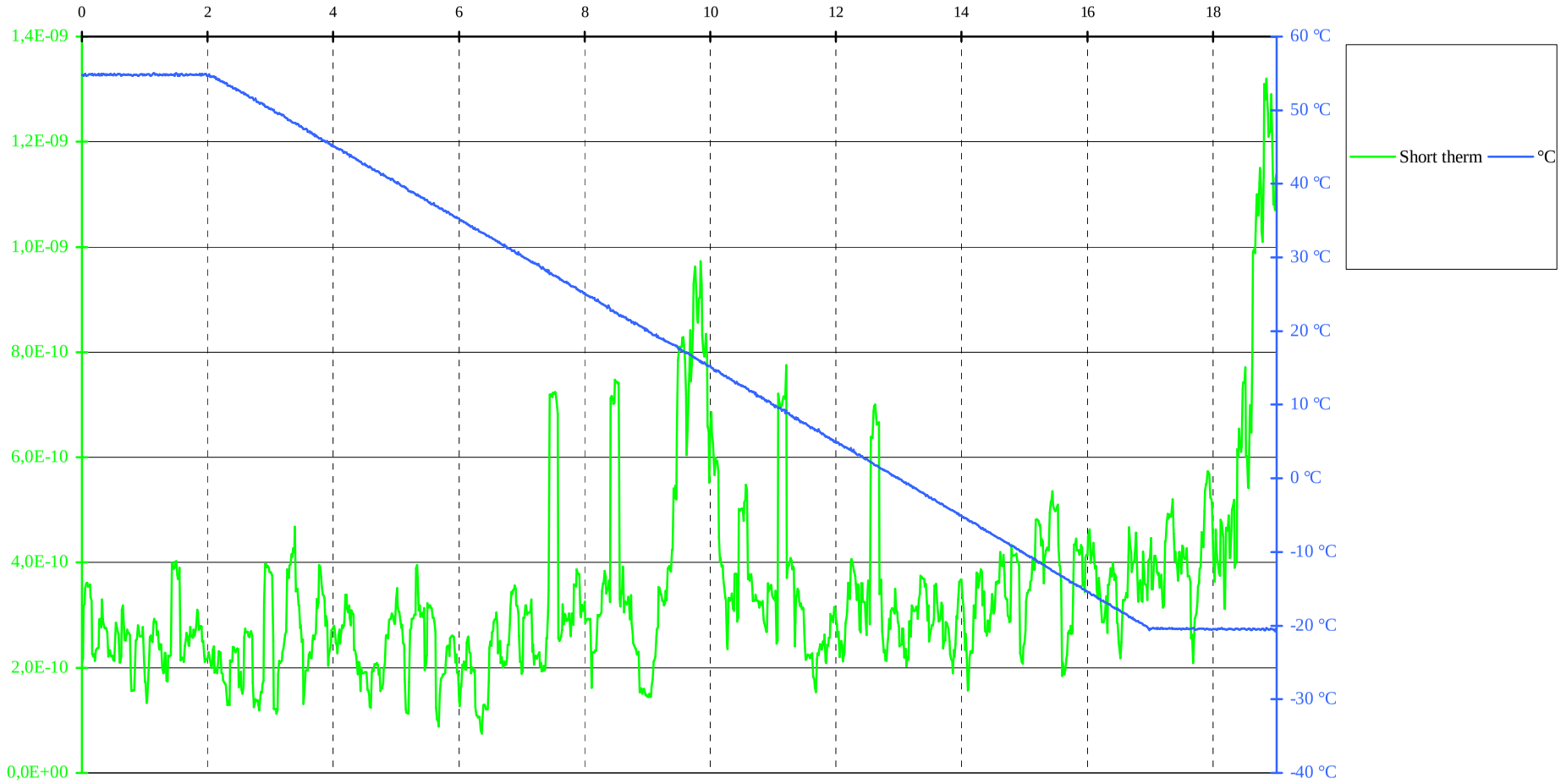


TEMPERATURE GRADIENT TEST RESULTS (5 °C / hour) - 2 nd part +55°C to -20°C (C-->D)

Manufacturer : MARTEC
Model : KANNAD XS3-GPS
Number : 35407-2

Date : 6 Feb 2007
Time : 17:21:11

SHORT TERM STABILITY /100 mS (≤ 2,0E-9)

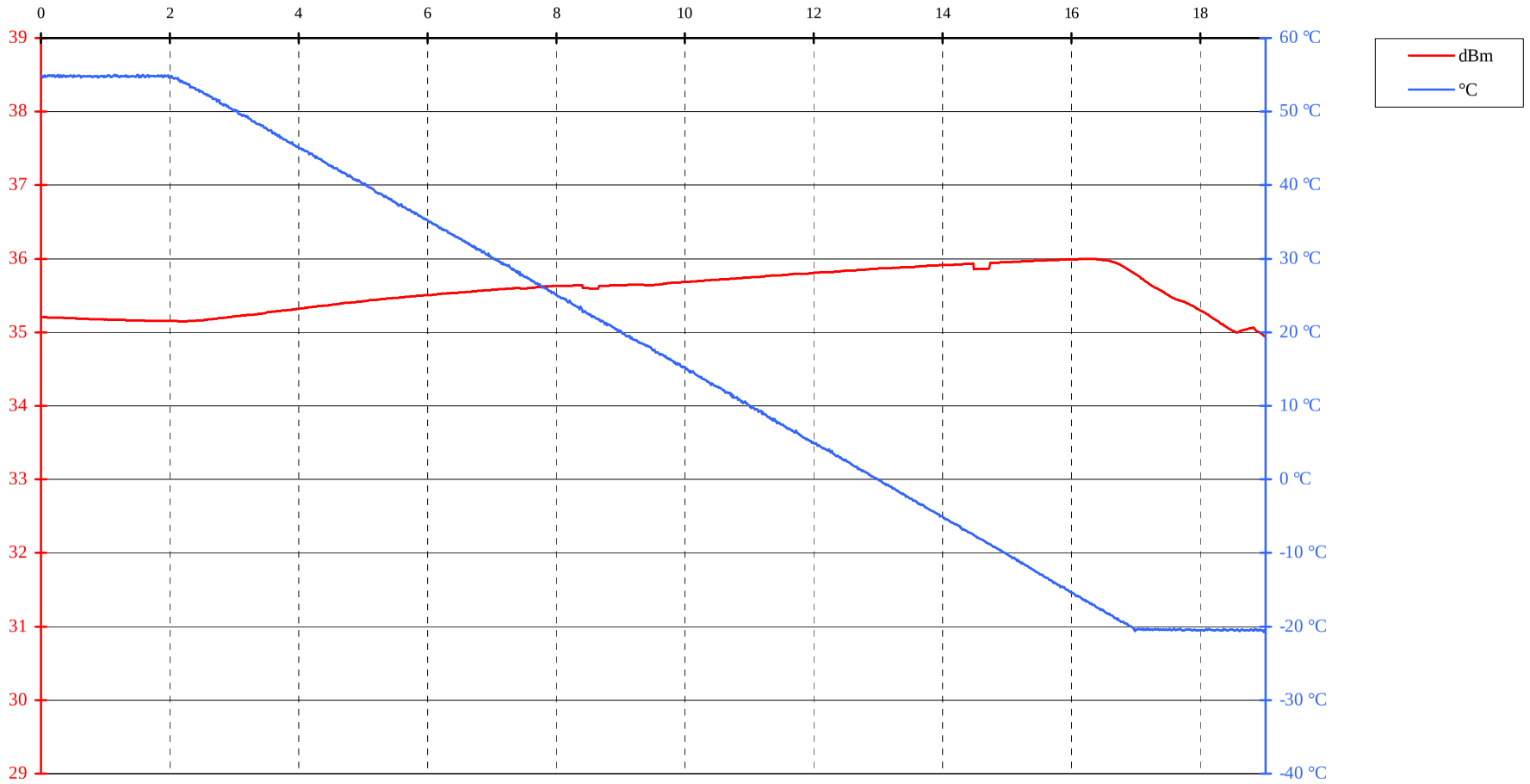


TEMPERATURE GRADIENT TEST RESULTS (5 °C / hour) - 2 nd part +55°C to -20°C (C-->D)

Manufacturer : MARTEC
Model : KANNAD XS3-GPS
Number : 35407-2

Date : 6 Feb 2007
Time : 17:21:11

OUTPUT POWER (35 to 39 dBm)



SATELLITE QUALITATIVE TEST RESULTS ON
MARTEC
KANNAD XS3-GPS
N° 35407-2

APPENDIX A TO ANNEX F

SATELLITE QUALITATIVE TEST SUMMARY REPORT

Date of the Test : 09/05/2007 to 10/05/2007
Time of the Test : 09/05/2007 14:12 to 09/05/2007 22:33 = 08:21
Beacon Model : Kannad XS3-GPS SN : 35407-2
Beacon 15 Hex ID : 1C7C4 527C0 FFBFF
Antenna Manufacturer & Model :
Actual location of the test beaco PASCAL C Latitude : 43,559 Longitude : 1,480
Beacon test configuration (e.g. on dry ground, floatting in water, etc) : Fixed ELT

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	
S08	34166	09/05/2007 14:12	10,8	1C7C4 527C0 FFBFF	43,568	1,47	1,29
S10	10141	09/05/2007 14:48	19,8	1C7C4 527C0 FFBFF	43,562	1,484	0,46
S07	46719	09/05/2007 14:58	17,6	1C7C4 527C0 FFBFF	43,569	1,476	1,16
S08	34167	09/05/2007 15:52	6,8	1C7C4 527C0 FFBFF	43,569	1,485	1,18
S07	46721	09/05/2007 18:18	17,2	1C7C4 527C0 FFBFF	43,566	1,485	0,88
S09	25325	09/05/2007 19:26	20,8	1C7C4 527C0 FFBFF	43,569	1,475	1,18
S11	2871	09/05/2007 20:17	6,1	1C7C4 527C0 FFBFF	43,561	1,481	0,24
S09	25326	09/05/2007 21:05	4,7	1C7C4 527C0 FFBFF	43,565	1,483	0,71
S11	2872	09/05/2007 21:57	11,8	1C7C4 527C0 FFBFF	43,557	1,482	0,27
S06	63723	09/05/2007 22:33	14,4	1C7C4 527C0 FFBFF	44,038	1,482	53,32

Ratio of successful solutions = $\frac{\text{number of Doppler solutions within 5 Km with 1°<CTA<21°}}{\text{number of satellites passes over test duration with 1°<CTA<21°}}$ X 100 = **90%**

APPENDIX A TO ANNEX F

SATELLITE QUALITATIVE TEST SUMMARY REPORT

Date of the Test : 10/05/2007 to 11/05/2007
Time of the Test : 10/05/2007 12:39 to 10/05/2007 21:36 = 8:57
Beacon Model : Kannad XS3-GPS SN : 35407-2
Beacon 15 Hex ID : 1C7C4 527C0 FFBFF
Antenna Manufacturer & Model : 43,55458333
Actual location of the test beaco "CST Mars Site" Latitude : 43,555 Longitude : 1,487
Beacon test configuration (e.g. on dry ground, floatting in water, (Dry Ground

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	
S09	25335	10/05/2007 12:39	20,1	1C7C4 527C0 FFBFF	43,554	1,485	0,17
S08	34180	10/05/2007 14:00	12,7	1C7C4 527C0 FFBFF	43,564	1,477	1,32
S10	10155	10/05/2007 14:37	17,9	1C7C4 527C0 FFBFF	43,568	1,492	1,55
S08	34181	10/05/2007 15:40	4,7	1C7C4 527C0 FFBFF	43,563	1,493	1,06
S07	46734	10/05/2007 16:13	5,1	1C7C4 527C0 FFBFF	43,571	1,485	1,83
S07	46735	10/05/2007 17:53	12,8	1C7C4 527C0 FFBFF	43,566	1,493	1,36
S11	2885	10/05/2007 19:56	9,6	1C7C4 527C0 FFBFF	43,561	1,489	0,73
S06	63736	10/05/2007 20:39	6	1C7C4 527C0 FFBFF	44,093	1,236	63,20
S09	25340	10/05/2007 20:42	8,7	1C7C4 527C0 FFBFF	43,562	1,487	0,83
S11	2886	10/05/2007 21:36	8	1C7C4 527C0 FFBFF	43,558	1,492	0,56
					43°33'36"	1°28'44" E	

Ratio of successful solutions = $\frac{\text{number of Doppler solutions within 5 Km with 1°<CTA<21°}}{\text{number of satellites passes over test duration with 1°<CTA<21°}}$ X 100 = **90%**