TYPE ACCEPTANCE APPLICATION FOR ACR/RLB-33S

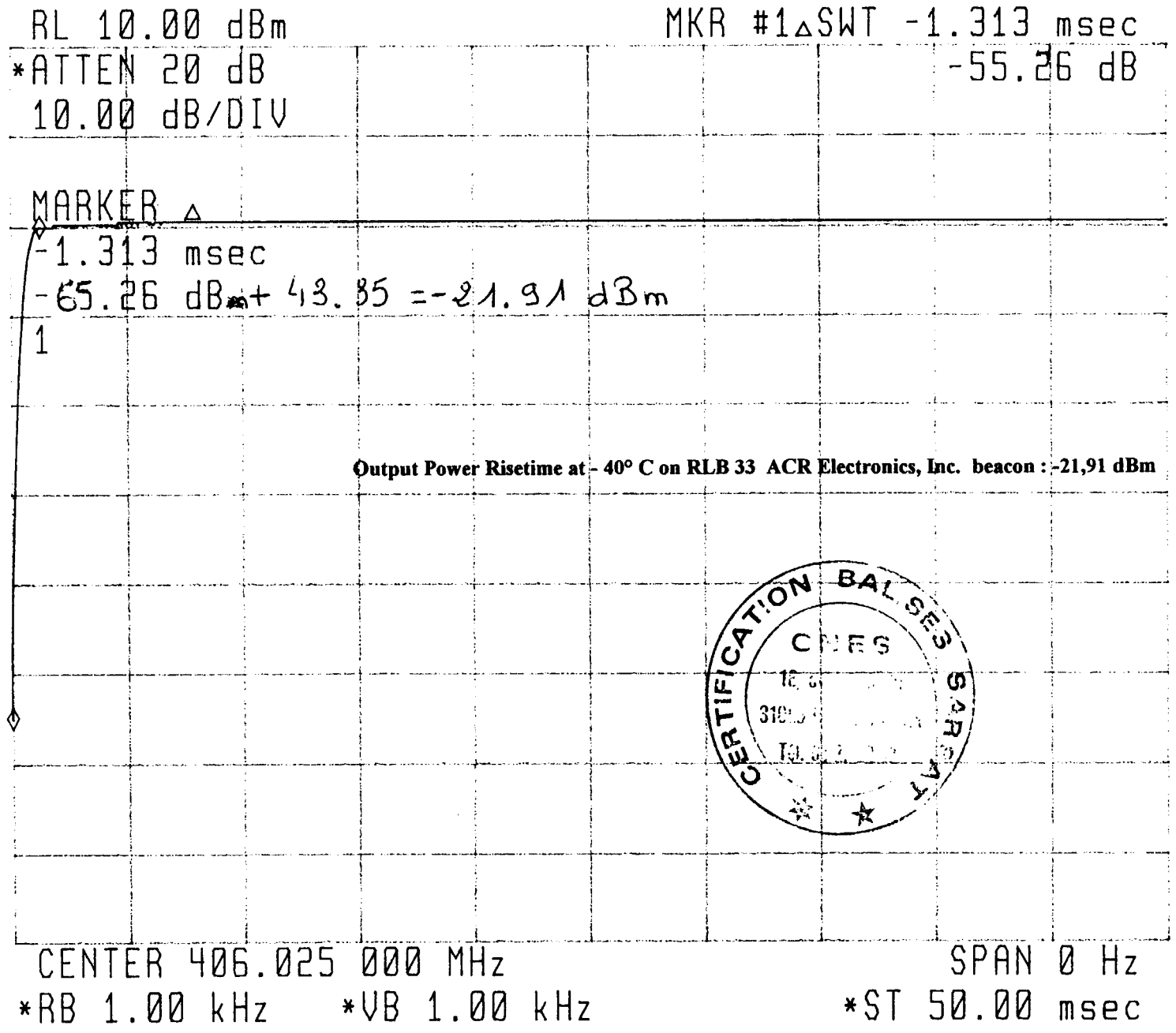
FCC Compliance Data:

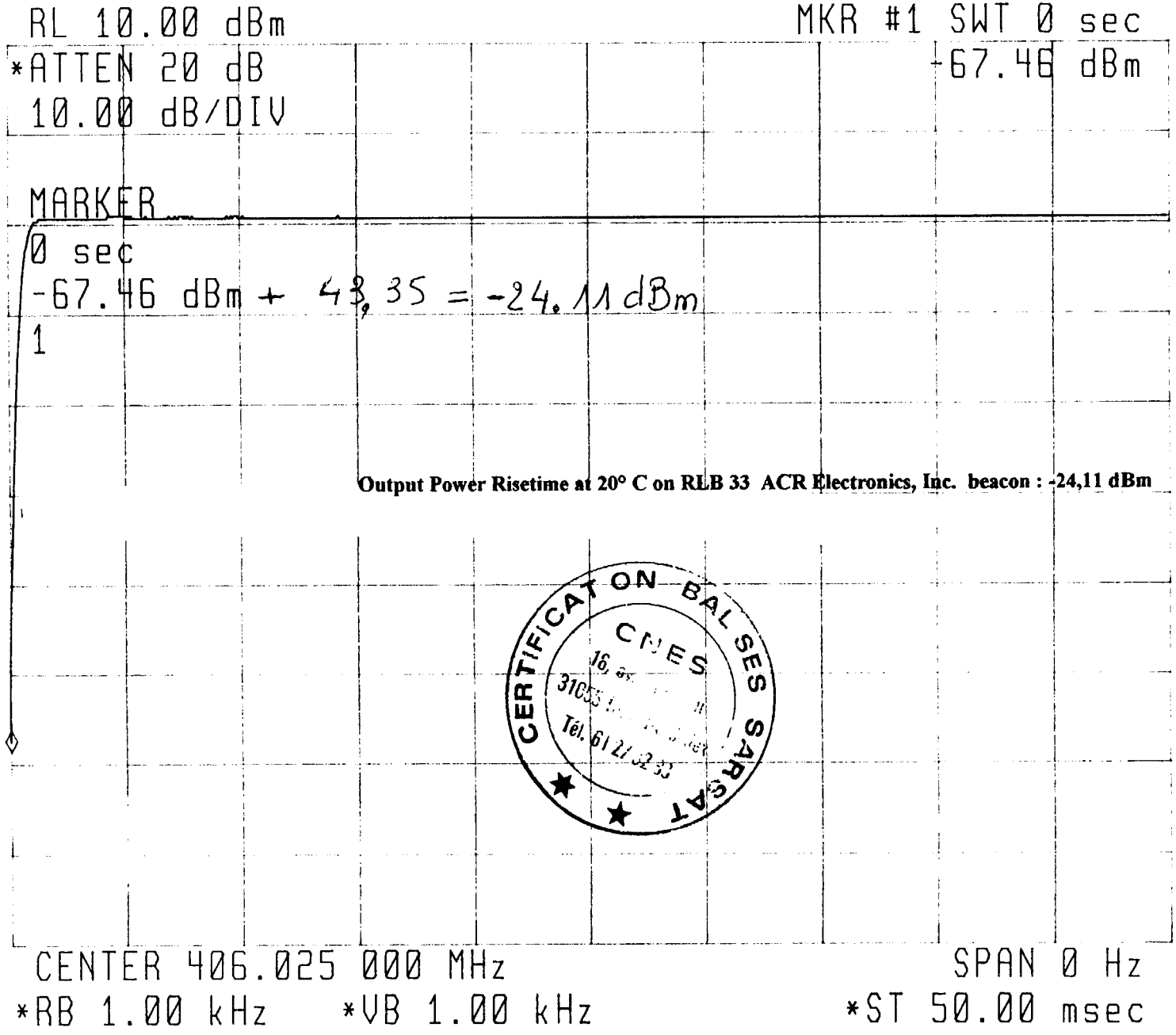
FCC REF.	RTCM RECOMMENDED STANDARDS FOR SSAS	ACR/RLB-32/33 T/A APPLICATION, APPENDIX 6: INTESPACE TEST REPORT
2.1046	4.2.2 Output Power	pg. 8
2.1047	4.2.4 Data Encoding	pg. 10
	4.2.5 Modulation	pg. 10
2.1049	4.2.1 Occupied Bandwidth	pg. 10
2.1051, 2.1053	4.2.3 Spurious Emissions	pg. 10
2.1055	4.2.1 Frequency Stability	pg. 10
2.057	4.2.3 Frequency Spectrum	pg. 10

Applicable pages from ACR/RLB-32/33 Type Approval Application, Appendix 6: Intespace Test Report are included for convenience.

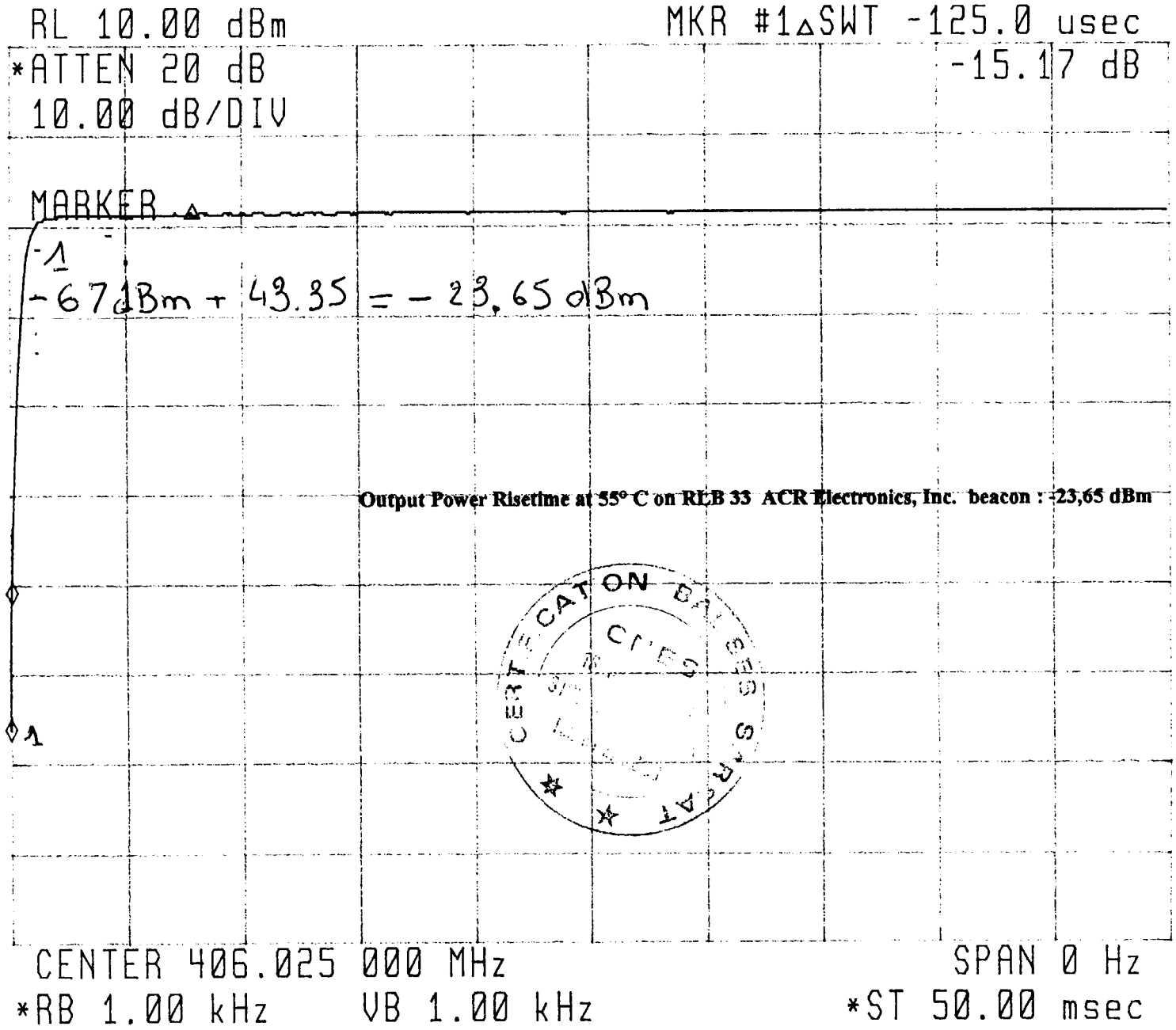
PARAMÈTRES TO BE MEASURED DURING TESTS		RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
				$T_{min.}$ -40°C (±3)	$T_{amb.}$ 20°C (±3)	$T_{max.}$ 55°C (±3)	
1 - POWER OUTPUT							
o transmitter power output		35 - 39	dBm	37,7	38,3	38,4	
o Power output rise time		< 5	ms	0,72	0,75	0,79	Graphs p, 28, 31 and 34
o power output 1 ms before burst		must be < -10 dBm	√ *	√	√	√	Graphs pages 21, 22 and 23
2 - DIGITAL MESSAGE	Bits number						Graphs pages 26, 29 and 32
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 data	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	110101	
o additional data/BCH (if applicable)	113-144	32 bits	√	√	√	√	
o position error (if applicable)		< 5	km	0,07	0,07	0,07	

PARAMÈTRES TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			$T_{min.}$ -40°C (±3)	$T_{amb.}$ 20°C (±3)	$T_{max.}$ 55°C (±3)	
4 - MODULATION						Data and graphs
o biphase-L		√	√	√	√	pages 26 to 34
o rise time	50 - 250	microsec.	80	90	90	
o fall time	50 - 250	microsec.	100	90	90	
o phase deviation : positive	+ (1.0 to 1.2)	radians	+ 1,15	+ 1,13	+ 1,15	
o phase deviation : negative	- (1.0 to 1.2)	radians	- 1,12	- 1,08	- 1,12	
o symmetry measurement	≤ 0.05		+ 0,0040	+ 0,0040	+ 0,000004	
5 - 406 MHz TRANSMITTED FREQUENCY						
o nominal value	406.023 - 406.027 or 406.027 - 406.029***	MHz	406,025225	406,025214	406,025204	Data pages 26, 29 and 32
o short term stability	≤ 2×10^{-9}	/100 ms	5,4E-11	8,7E-11	7,7E-11	
o medium term stability						
. slope	(-1 to +1) $\times 10^{-9}$	/minute	-4,2E-11	-7,9E-11	-2,51E-10	
. residual frequency variation	≤ 3×10^{-9}		1,06E-10	8,9E-11	1,78E-10	
6 - SPURIOUS EMISSION **** (into 50 ohms)						See graphs pages 39 to 41
o in-band (406.0o 406.1 MHz)	see spurious emission mask in C/S T.001	√	√	√	√	Just on the limit


RL 10.00 dBm
MKR #1△SWT -1.313 msec
*ATTEN 20 dB
-55.26 dB
10.00 dB/DIV
MARKER △
-1.313 msec
-65.26 dBm + 43.35 = -21.91 dBm
1
Output Power Risetime at - 40° C on RLB 33 ACR Electronics, Inc. beacon : -21,91 dBm
CERTIFICATION BALISES SARSAT
CNES
CENTER 406.025 000 MHz
SPAN 0 Hz
*RB 1.00 kHz
*VB 1.00 kHz
*ST 50.00 msec



Output Power Risetime at 20° C on RLB 33 ACR Electronics, Inc. beacon : -24,11 dBm


RL 10.00 dBm
MKR #1ΔSWT -125.0 usec
*ATTEN 20 dB
-15.17 dB
10.00 dB/DIV
MARKER Δ
1
-67dBm + 43.35 = -23,65 dBm
Output Power Risetime at 55° C on RLB 33 ACR Electronics, Inc. beacon : -23,65 dBm
1
CENTER 406.025 000 MHz
SPAN 0 Hz
*RB 1.00 kHz
VB 1.00 kHz
*ST 50.00 msec

Certification Test at -40°C

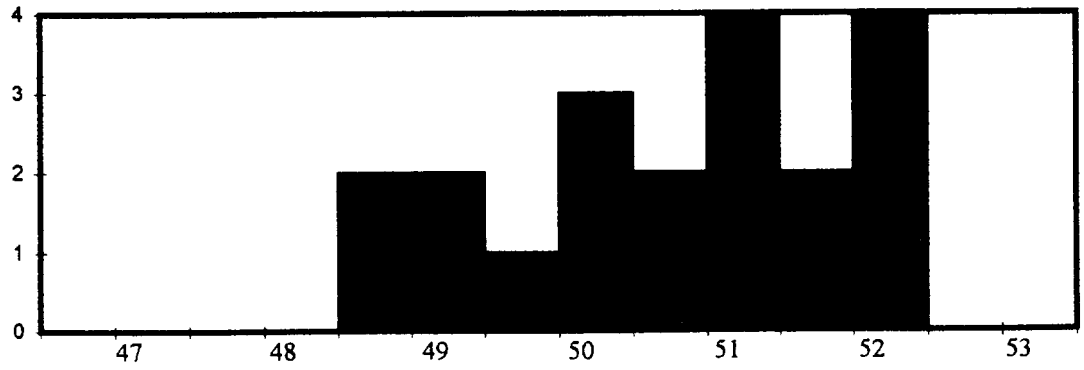
Manufacturer : ACR
Beacon Type : RLB 33
Number : 1
Date of test : 16-mar-99

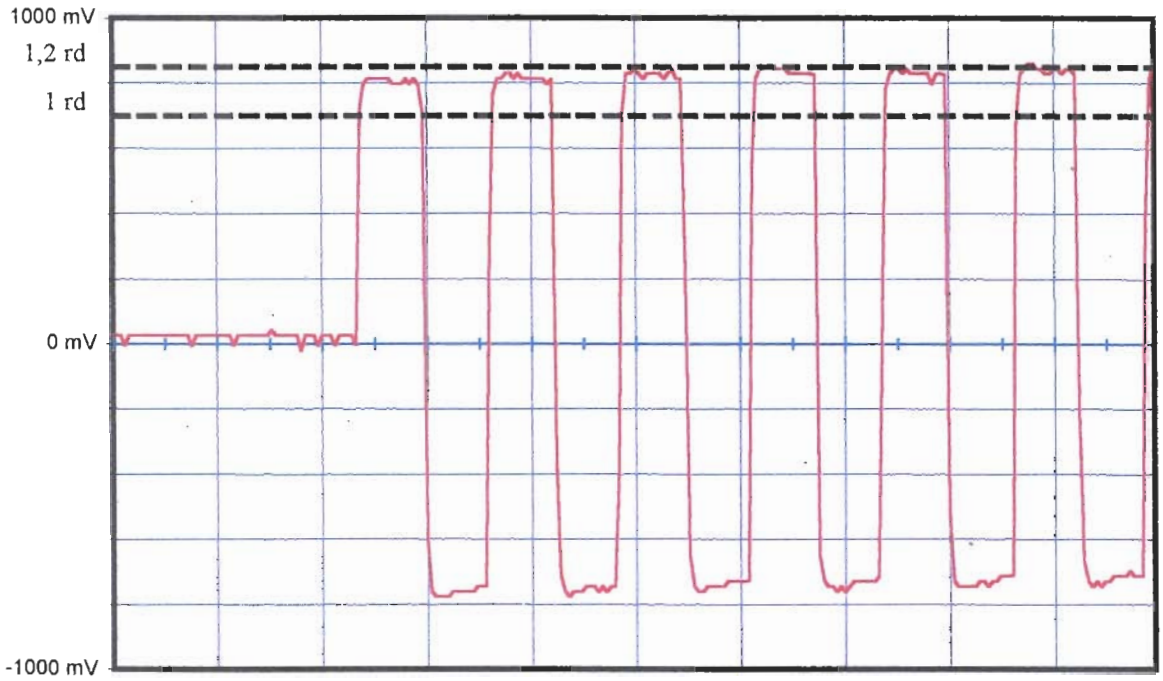
Message

Message received		FFFE2F96EE2EC0012B0027FE91F5DAED3A63
Format Flag	25	1
Protocol flag	26	0
Country Code/Country	27-36	366 / USA
Protocol Code : U/Std-Nat	37-39/37-40	1110
Ident./Position code	27-85	
Calculated BCH1	25-85	1FFA47
Readed BCH1	86-106	1FFA47
Identification		
Protocol		Test-Standard Location
Number		
Homing	112	1
Encod pos data	111	0
Fixed Data "1"	108	1 OK
Calculated BCH2	107-132	A63
Readed BCH2	133-144	A63
Latitude position		Nord 43° 22' 44"
Longitude position		Est 1° 13' 12"
Delta position		0,07 Km

Electrical and other parameters

CW preamble	ms 158,4 <	< 162,6	160,91
Total transmission time	ms 513,8 <	<526,2	522,05
Modulation frequency	Hz 395,4<	< 404,6	398,84
Phase deviation : total	rd	<=2,40	2,27
Phase deviation : positive	rd 1,00 <	< 1,20	1,15
Phase deviation : negative	rd -1,20 <	< -1,00	-1,12
Symmetry measurement	%	<=5 %	0,40
Nominal frequency : F2	Hz		406025224,73
SIGMA2			2,47E-10
SIGMA3			5,44E-11
Slope			-4,23E-11
Residual			1,06E-10
406 MHz power output	dBm		37,7
Homing frequency	MHz		121,50
121,5 MHz power output	dBm		16,9
Soak temperature	°C		-39,3
Extra feature			No



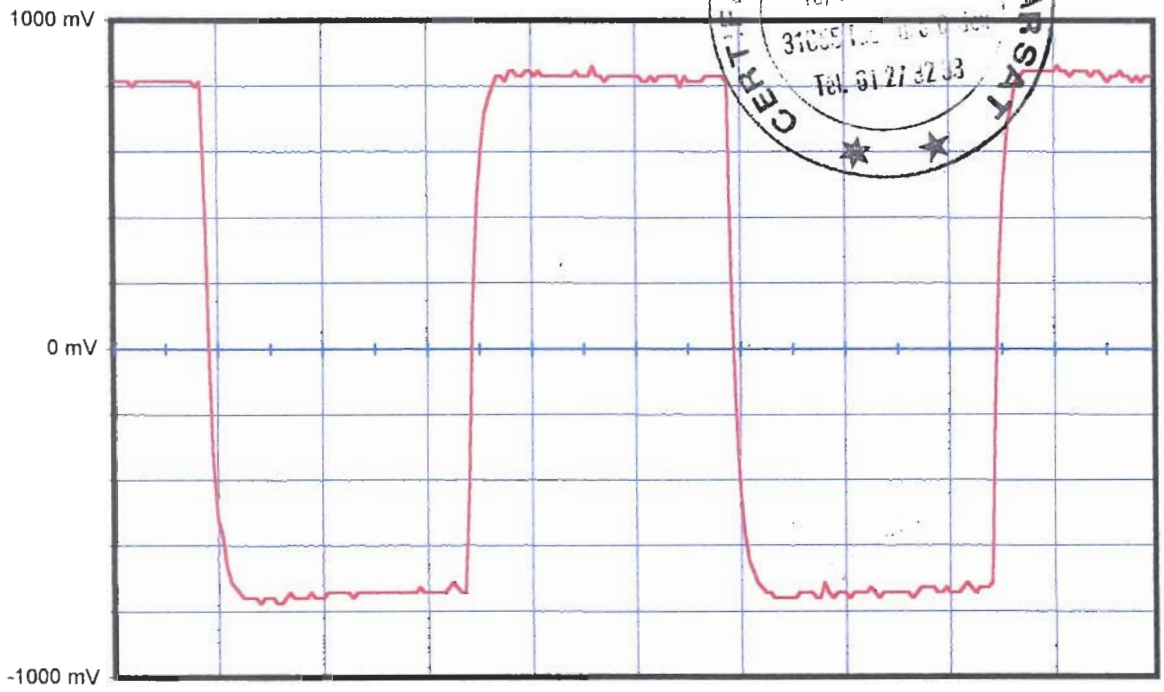


0 ms 10 ms 20 ms

Vmarker1 850 mv ==> 1,2 rd

Vmarker2 700 mv ==> 1 rd

2 ms/div.



8 ms 10,5 ms 13 ms

Duty Cycle : 0,00398804

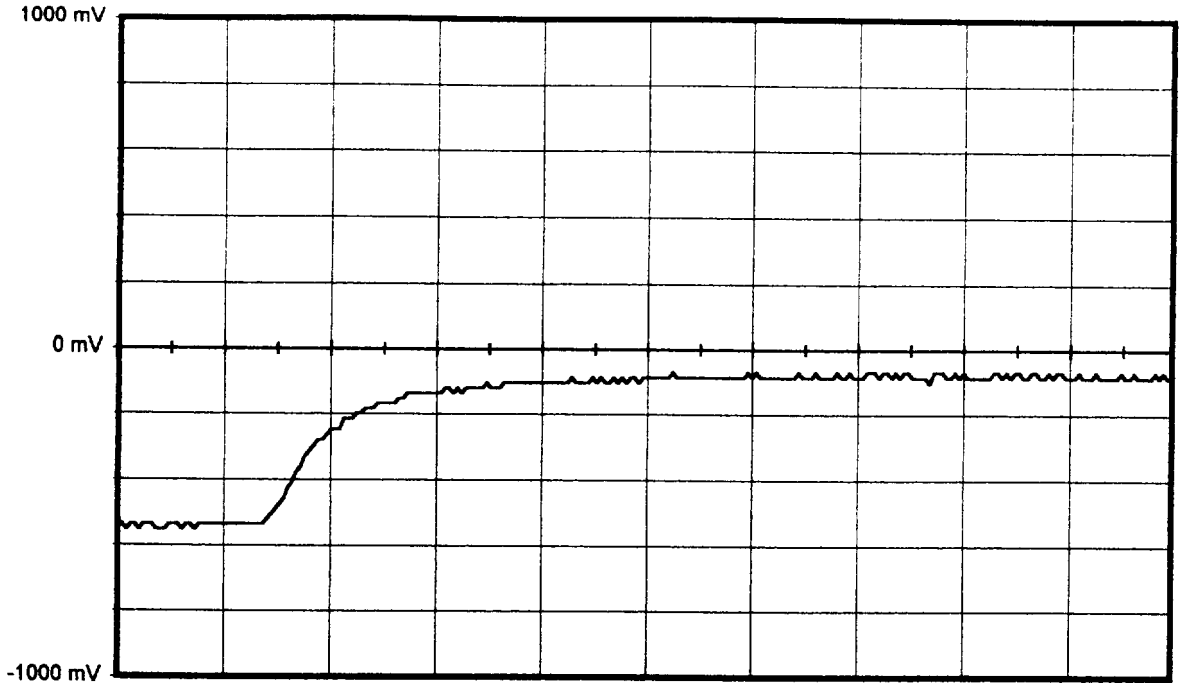
falltime(1)<= 99,8005 us

+width(1) 1,2475 ms

0,5 ms/div.

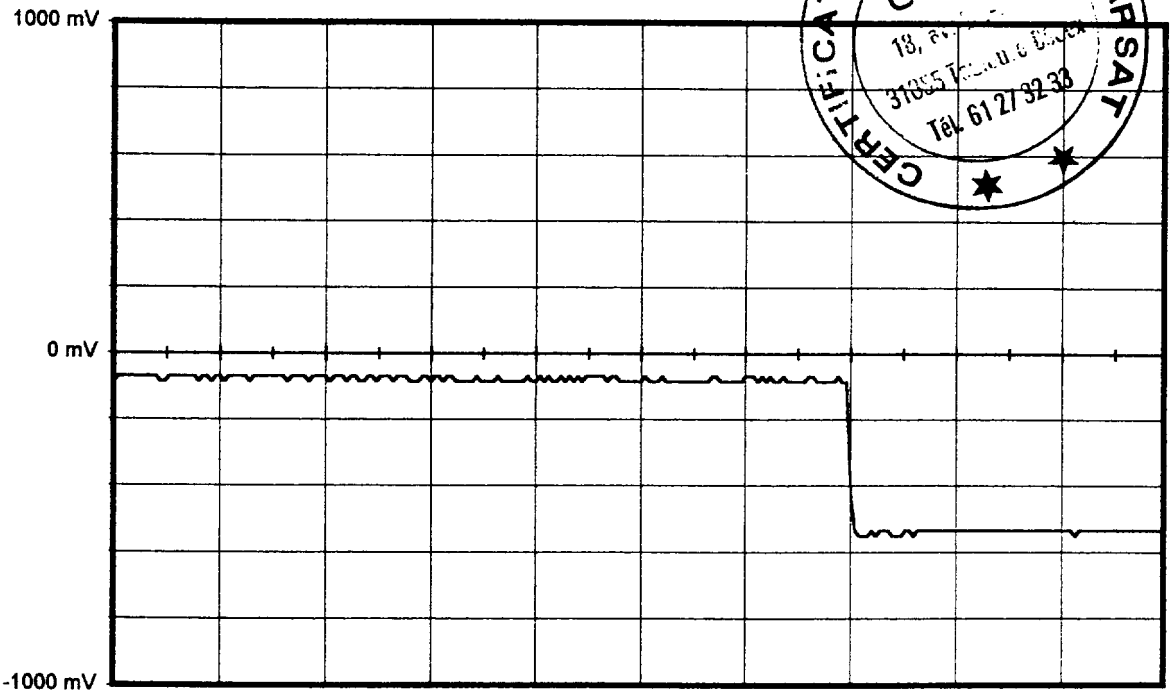
risetime(1)<= 79,8404 us

-widht(1) 1,25749 ms



-1 ms 1,5 ms 4 ms

risetime(1)<= 718,563 us 0,5 ms/div.



-3,5 ms -1 ms 1,5 ms

falltime(1)<= 29,9399 us 0,5 ms/div.

Certification Test at 20°C

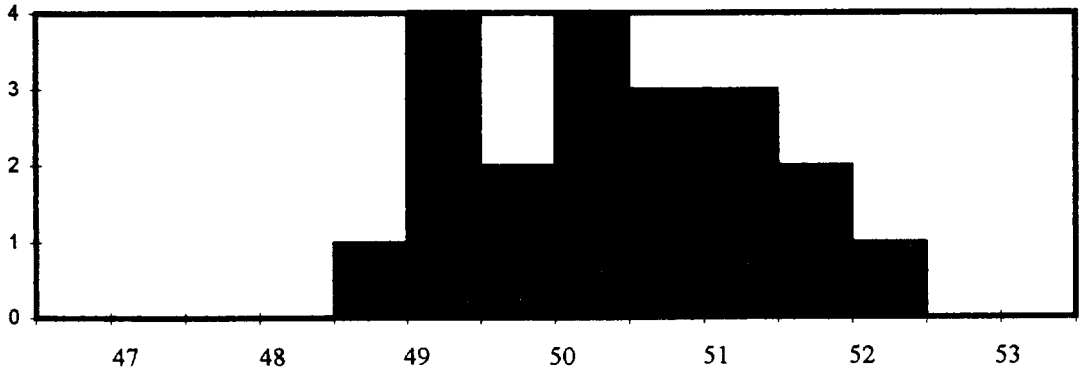
Manufacturer : ACR
Beacon Type : RLB 33
Number : 1
Date of test : 15-mar-1999

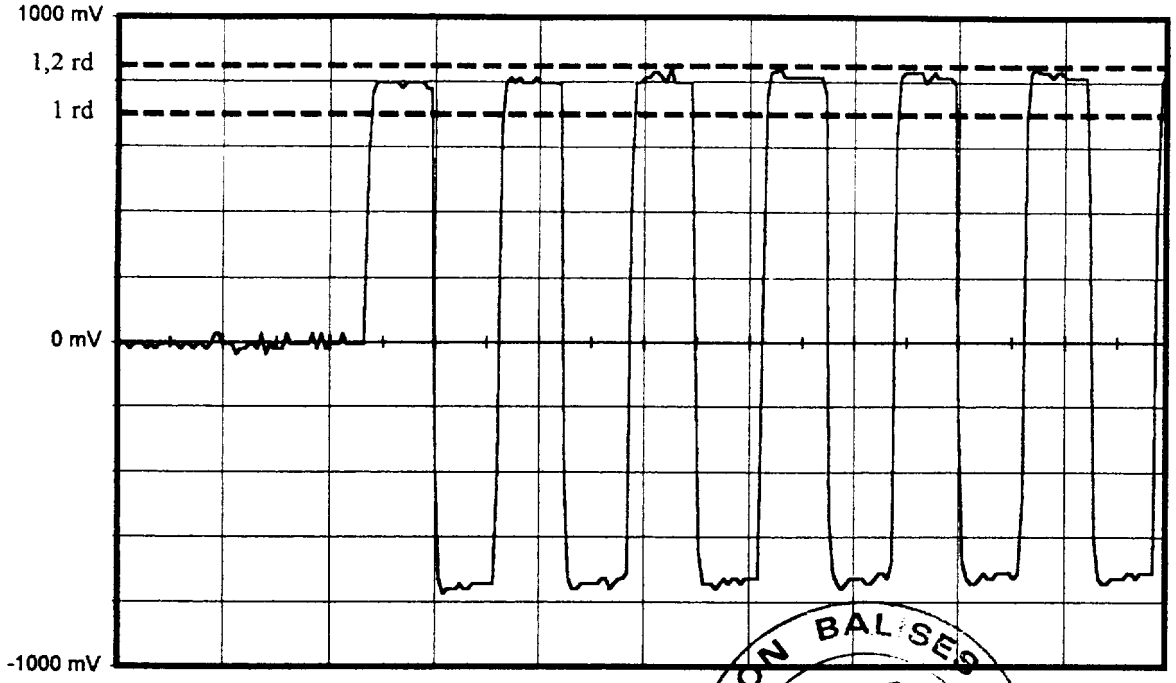
Message

Message received		FFFE2F96EE2EC0012B0027FE91F5DAED3A63
Format Flag	25	1
Protocol flag	26	0
Country Code/Country	27-36	366 / USA
Protocol Code : U/Std-Nat	37-39/37-40	1110
Ident./Position code	27-85	
Calculated BCH1	25-85	1FFA47
Readed BCH1	86-106	1FFA47
Identification		
Protocol		Test-Standard Location
Number		
Homing	112	1
Encod pos data	111	0
Fixed Data "1"	108	1
Calculated BCH2	107-132	A63
Readed BCH2	133-144	A63
Latitude position		Nord 43° 22' 44"
Longitude position		Est 1° 13' 12"
Delta position		0.07 Km

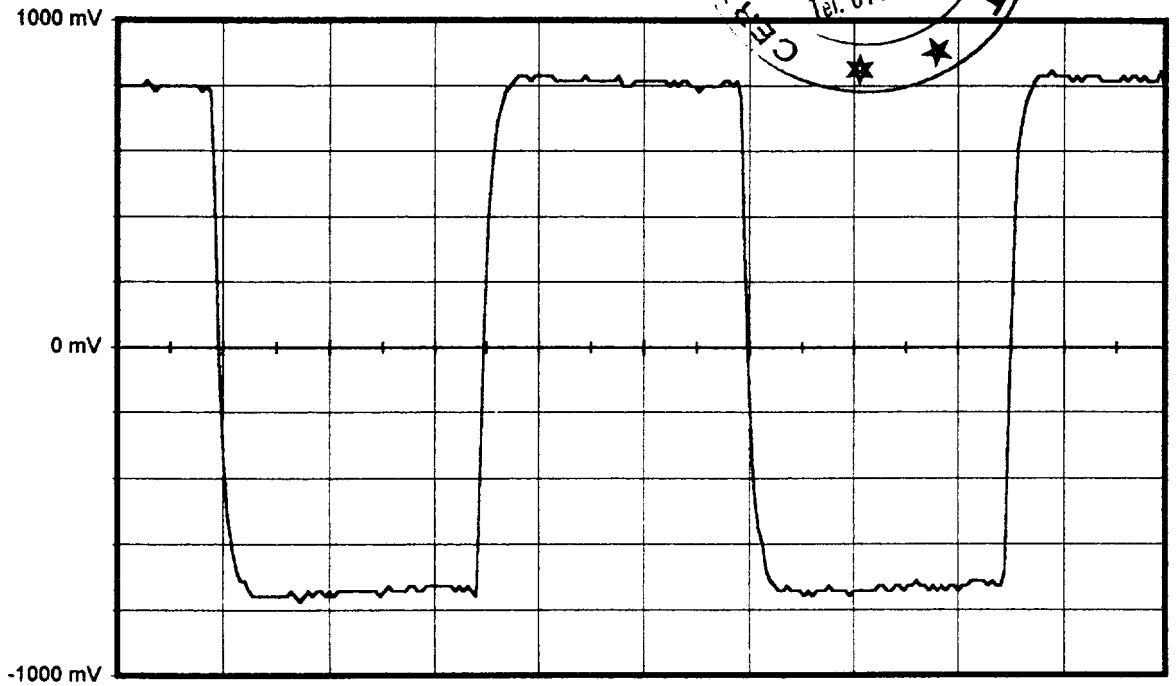
Electrical and other parameters

CW preamble	ms	158,4 <	< 162,6	160,93
Total transmission time	ms	434,6 <	<445,4	522,05
Modulation frequency	Hz	395,4<	< 404,6	398,85
Phase deviation : total	rd		<=2,40	2,21
Phase deviation : positive	rd	1,00 <	< 1,20	1,13
Phase deviation : negative	rd	-1,20 <	< -1,00	-1,08
Symmetry measurement	%		<=5 %	0,40
Nominal frequency : F2	Hz			406025214,22
SIGMA2				1,25E-10
SIGMA3				8,74E-11
Slope				-7,86E-11
Residual				8,88E-11
406 MHz power output	dBm			38,3
Homing frequency	MHz			121,50
121,5 MHz power output	dBm			16,6
Soak temperature	°C			20,1
Extra feature				No

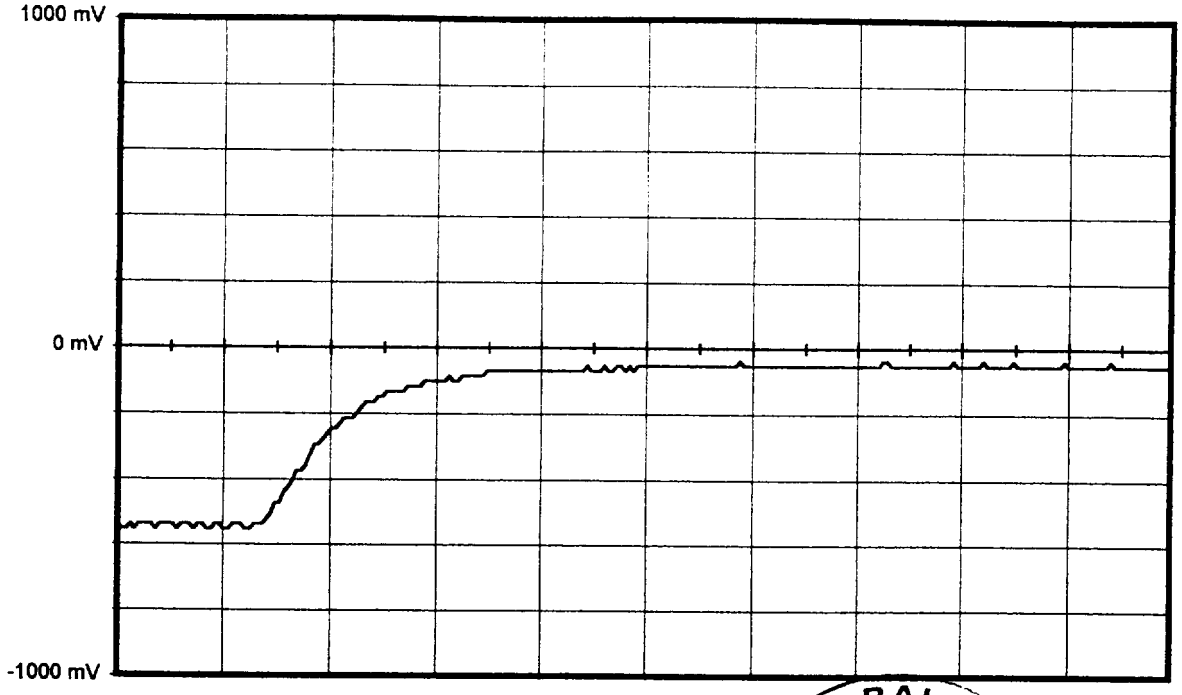




0 ms 10 ms 20 ms
Vmarker1 850 mv ==> 1,2 rd 2 ms/div
Vmarker2 700 mv ==> 1 rd



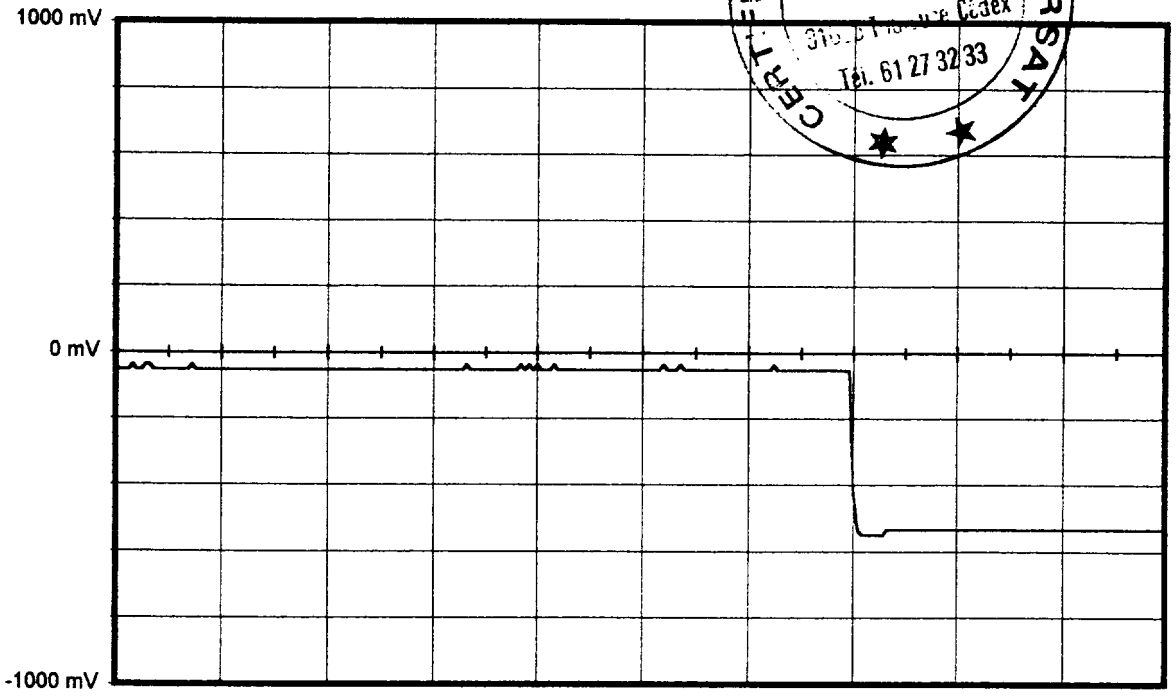
8 ms 10,5 ms 13 ms
Duty Cycle : 0,00398804 0,5 ms/div.
falltime(1)<= 89,8205 us risetime(1)<= 89,8205 us
+width(1) 1,2475 ms -widht(1) 1,25749 ms



-1 ms
risetime(1)<= 748,503 us

1,5 ms
0,5 ms/div.

4 ms



-3,5 ms
falltime(1)<= 29,9399 us

-1 ms
0,5 ms/div.

1,5 ms

Certification Test at 55°C

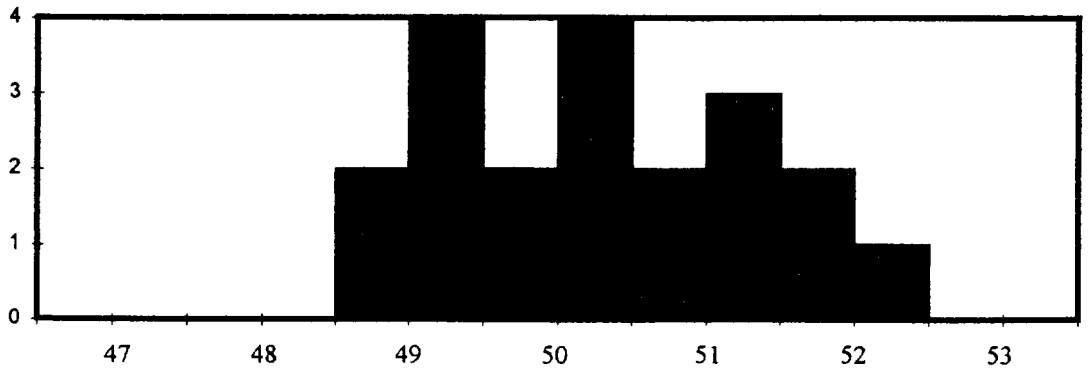
Manufacturer : ACR
Beacon Type : RLB 33
Number : 1
Date of test : 16-mar-1999

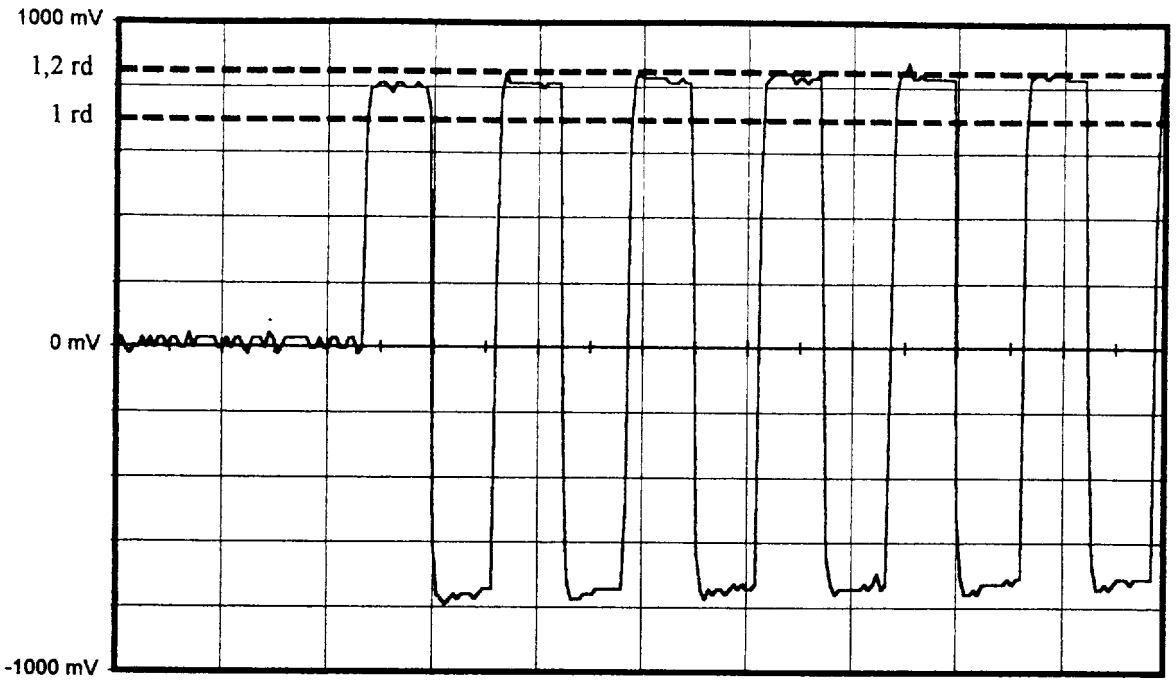
Message

Message received		FFFE2F96EE2EC0012B0027FE91F5DAED3A63
Format Flag	25	1
Protocol flag	26	0
Country Code/Country	27-36	366 / USA
Protocol Code : U/Std-Nat	37-39/37-40	1110
Ident./Position code	27-85	
Calculated BCH1	25-85	1FFA47
Readed BCH1	86-106	1FFA47
Identification		
Protocol		Test-Standard Location
Number		
Homing	112	1
Encod pos data	111	0
Fixed Data "1"	108	1
Calculated BCH2	107-132	A63
Readed BCH2	133-144	A63
Latitude position		Nord 43° 22' 44"
Longitude position		Est 1° 13' 12"
Delta position		0.07 Km

Electrical and other parameters

CW preamble	ms	158,4 <	< 162,6	160,93
Total transmission time	ms	434,6 <	<445,4	522,04
Modulation frequency	Hz	395,4<	< 404,6	398,85
Phase deviation : total	rd		<=2,40	2,26
Phase deviation : positive	rd	1,00 <	< 1,20	1,15
Phase deviation : negative	rd	-1,20 <	< -1,00	-1,12
Symmetry measurement	%		<=5 %	0,00
Nominal frequency : F2	Hz			406025203,88
SIGMA2				9,42E-11
SIGMA3				7,65E-11
Slope				-2,51E-10
Residual				1,78E-10
406 MHz power output	dBm			38,4
Homing frequency	MHz			121,50
121,5 MHz power output	dBm			16,1
Soak temperature	°C			53,2
Extra feature				No

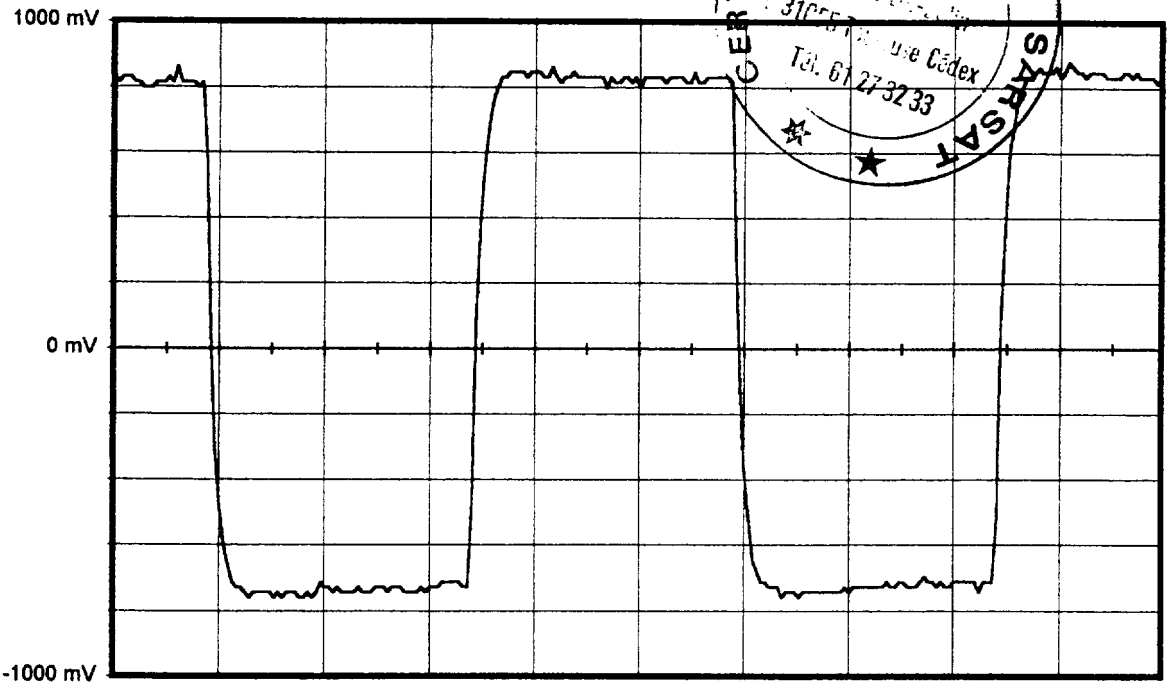




0 ms
Vmarker1 850 mv ==> 1,2 rd
Vmarker2 700 mv ==> 1 rd

10 ms
2 ms/div.

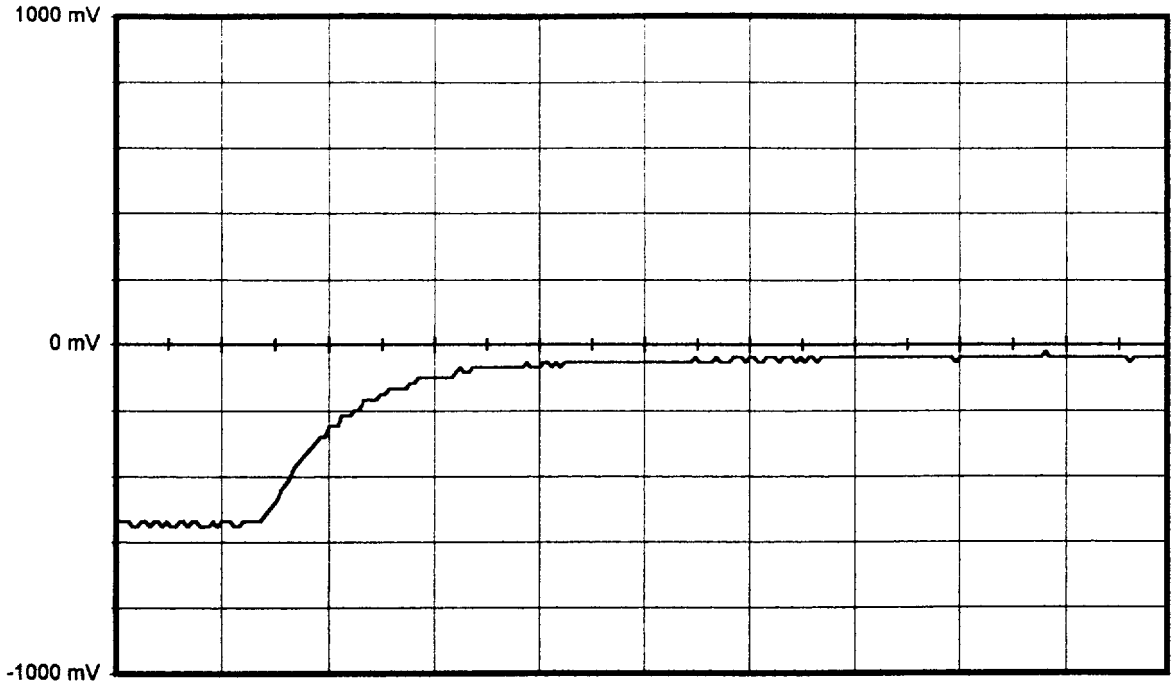
20 ms



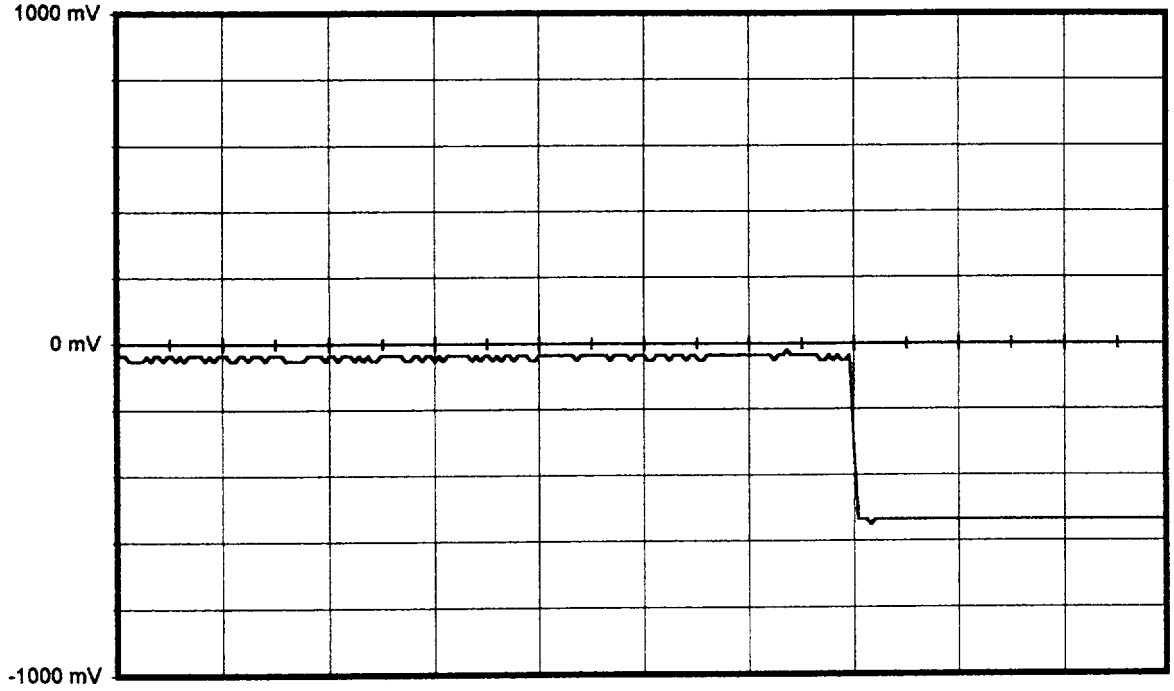
8 ms
Duty Cycle : 3,97619E-06
falltime(1)<= 89,8205 us
+width(1) 1,25748 ms

10,5 ms
0,5 ms/div.
risetime(1)<= 89,8205 us
-widht(1) 1,25749 ms

13 ms

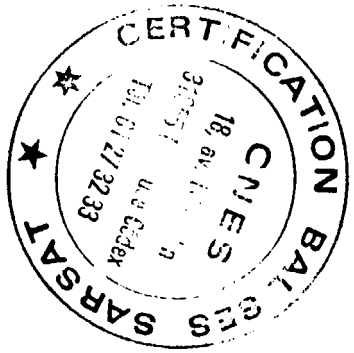


-1 ms 1,5 ms 4 ms
risetime(1)<= 0 us 0,5 ms/div.

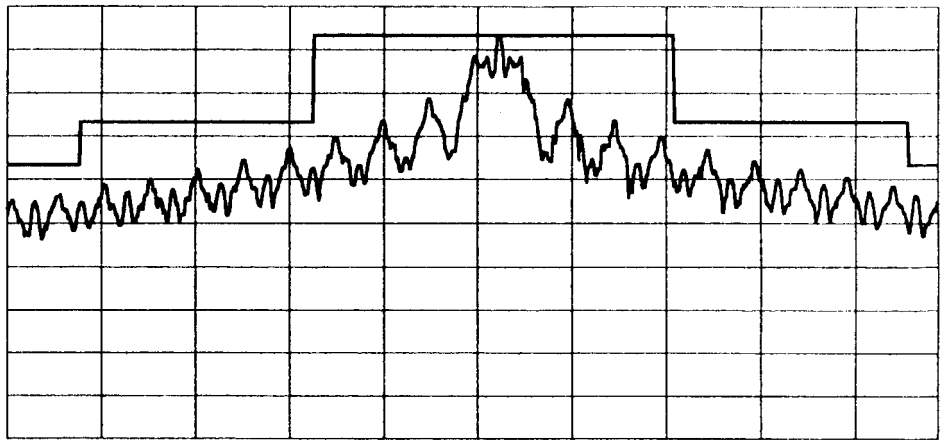


-3,5 ms -1 ms 1,5 ms
falltime(1)<= 29,9399 us 0,5 ms/div.

ACR Electronics, Inc.
RLB 33
1
Certification nominale
406 MHz
-40 °C

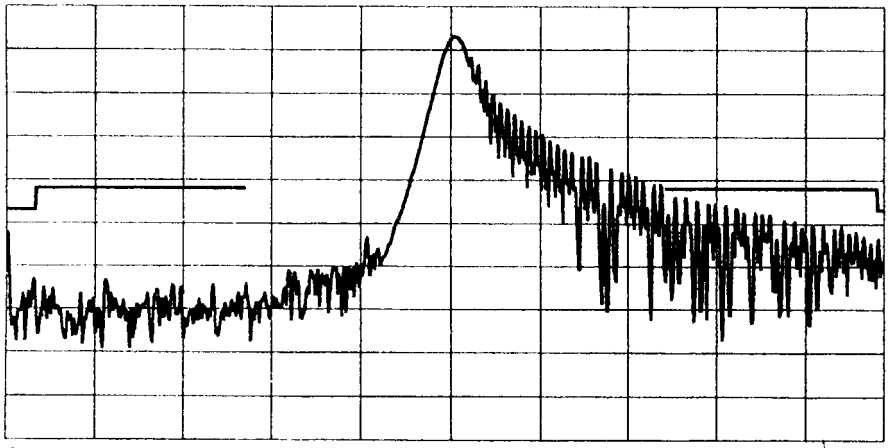


CF : 406,025 MHz SP : 16 KHz



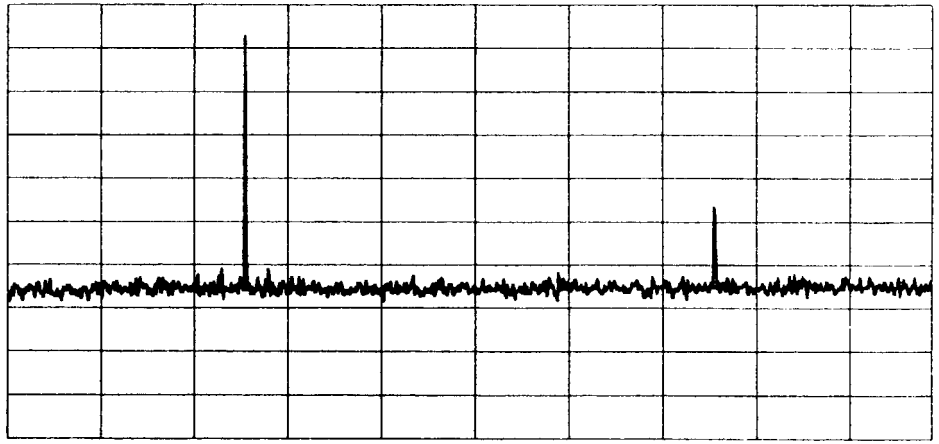
Rb : 0,1 KHz 10 dB/div. St : 4,8 S

CF : 406,025 MHz SP : 50 KHz



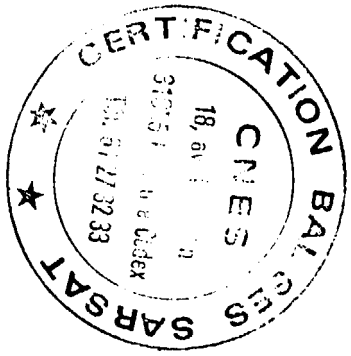
Rb : 1 KHz 10 dB/div. St : 0,305 S

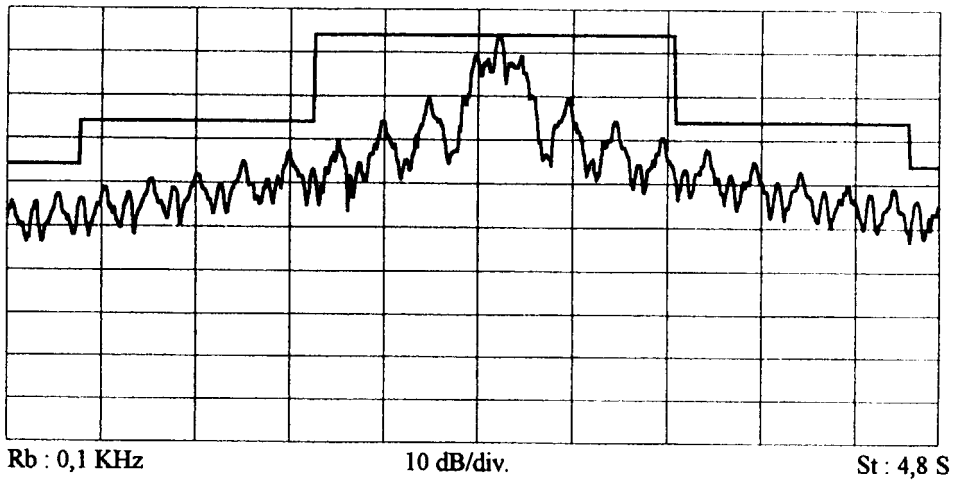
CF : 600 MHz Delta : -39,5 dB SP : 800000 KHz

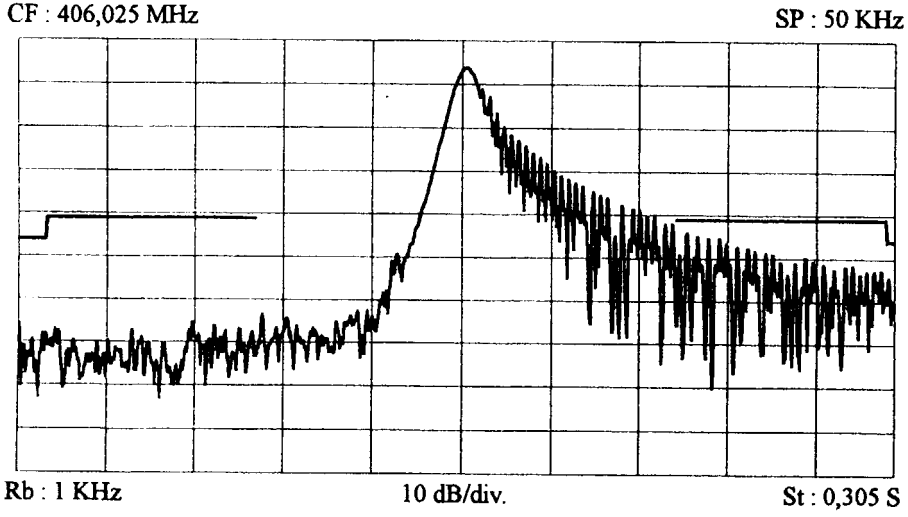


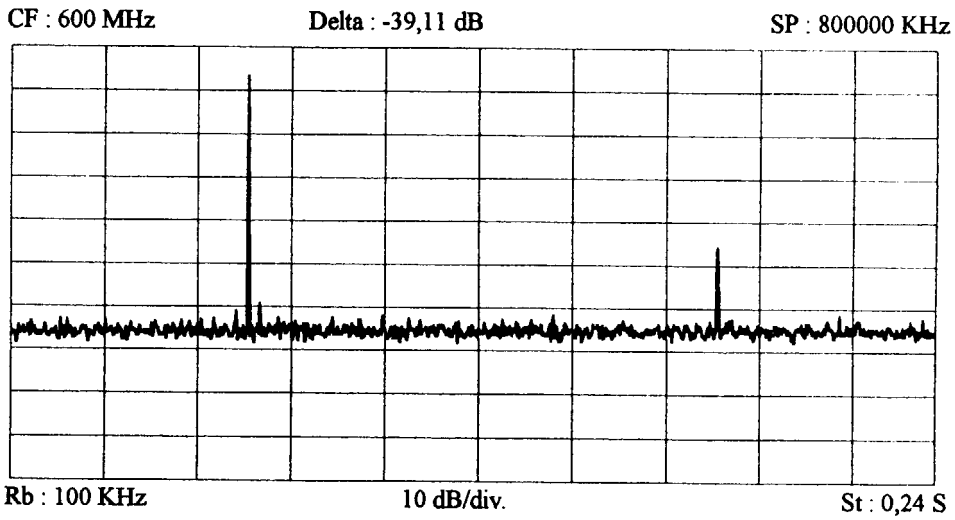
Rb : 100 KHz 10 dB/div. St : 0,24 S

ACR Electronics, Inc.
RLB 33
1
Certification nominale
406 MHz
20 °C

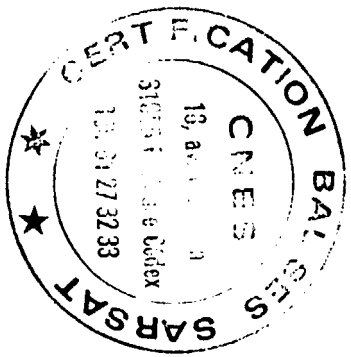




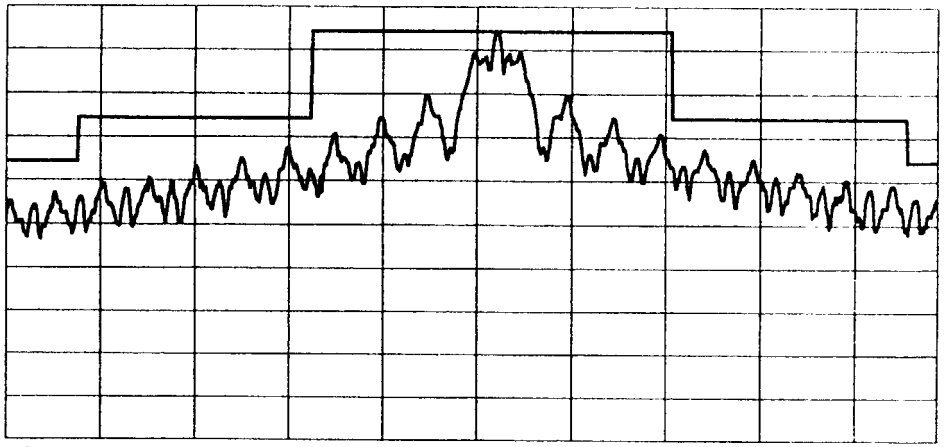




ACR Electronics, Inc.
RLB 33
1
Certification nominale
406 MHz
55 °C

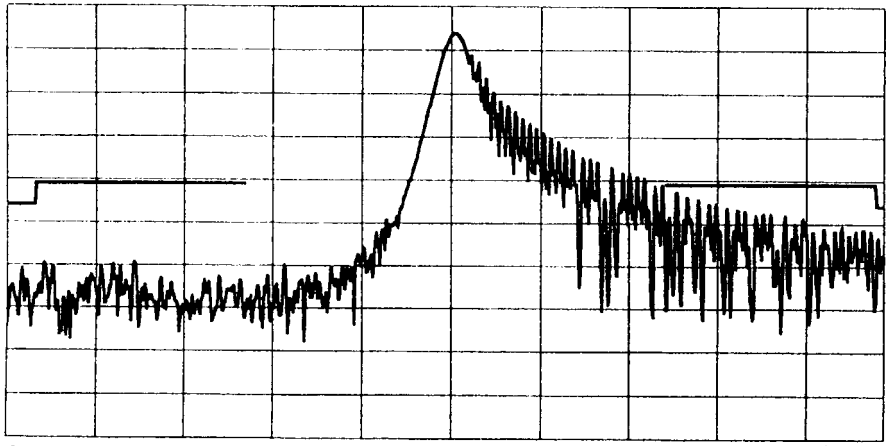


CF : 406,025 MHz SP : 16 KHz



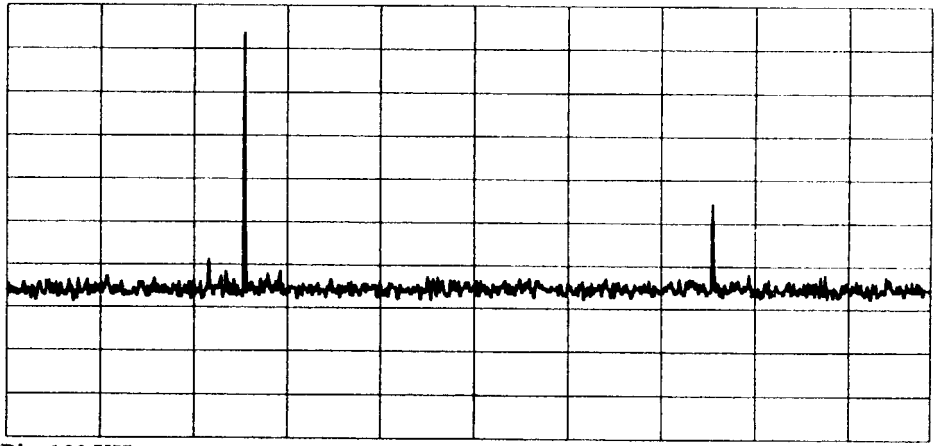
Rb : 0,1 KHz 10 dB/div. St : 4,8 S

CF : 406,025 MHz SP : 50 KHz



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

CF : 600 MHz Delta : -38,97 dB SP : 800000 KHz



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