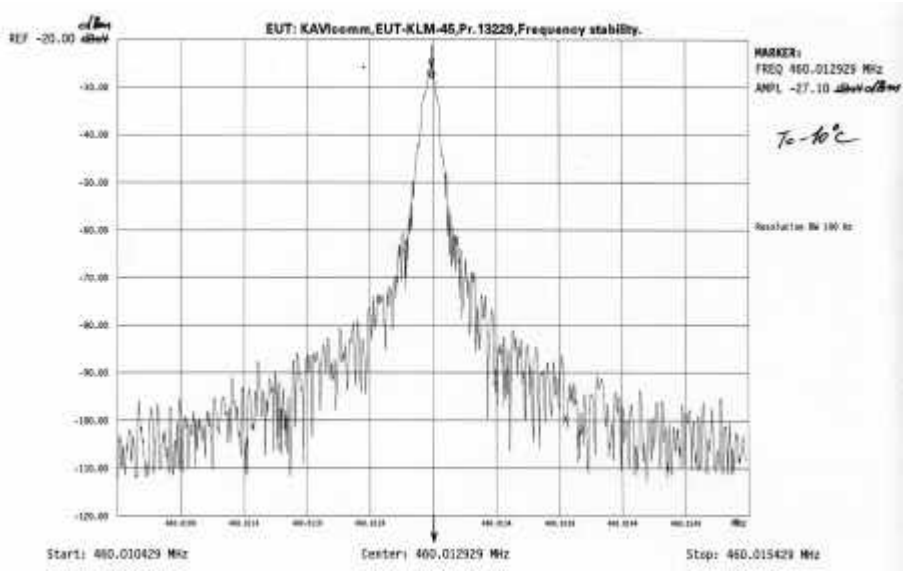
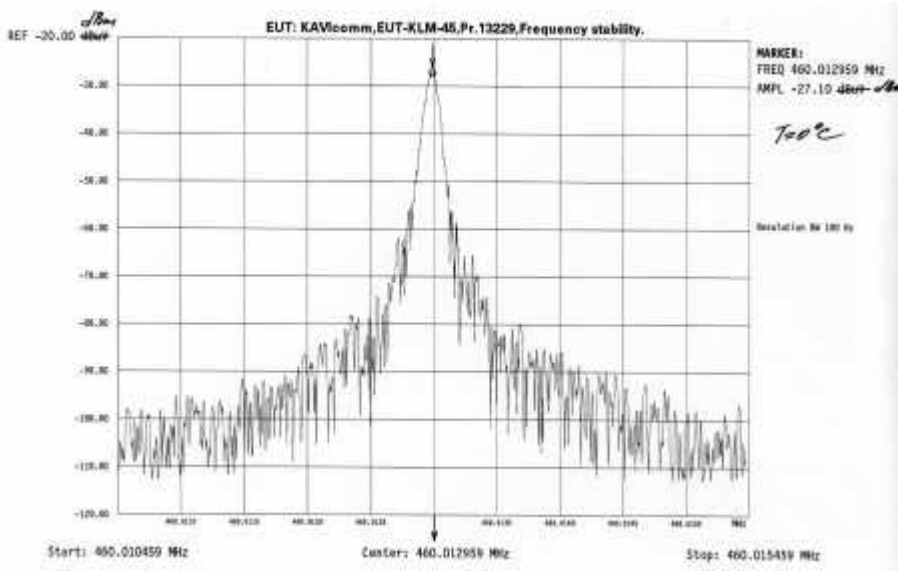
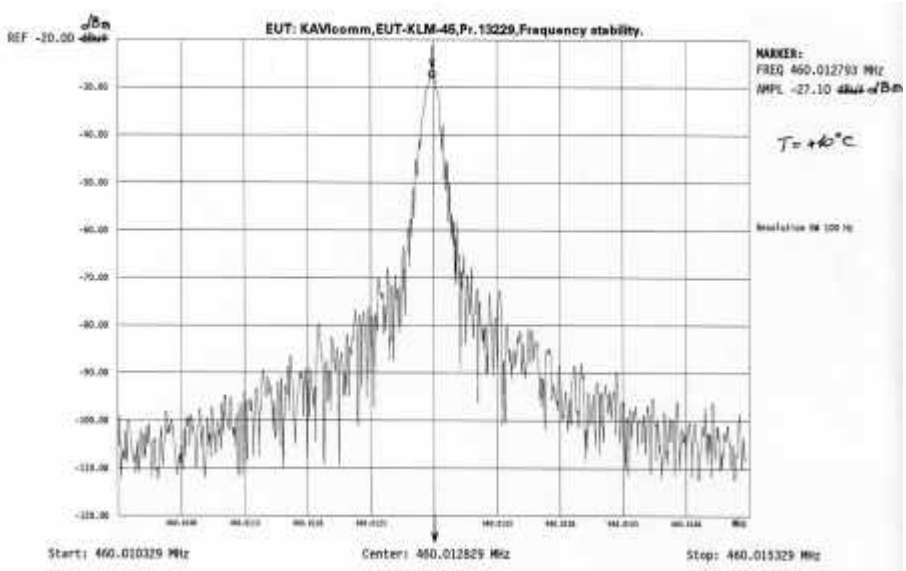
Plot 4.4.13
Frequency stability test results
F = 460.012591
Temperature – 10°



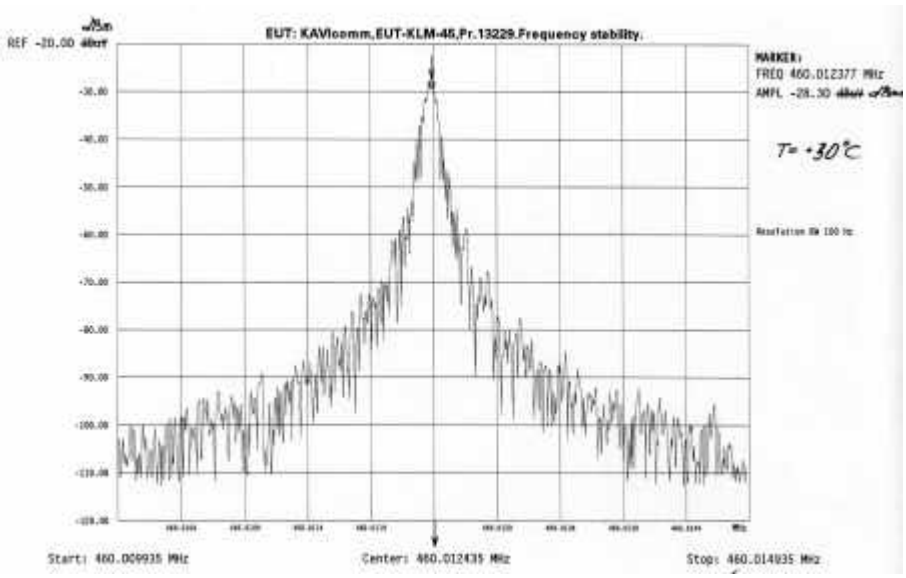
Plot 4.4.14
Frequency stability test results
F = 460.012591
Temperature 0°



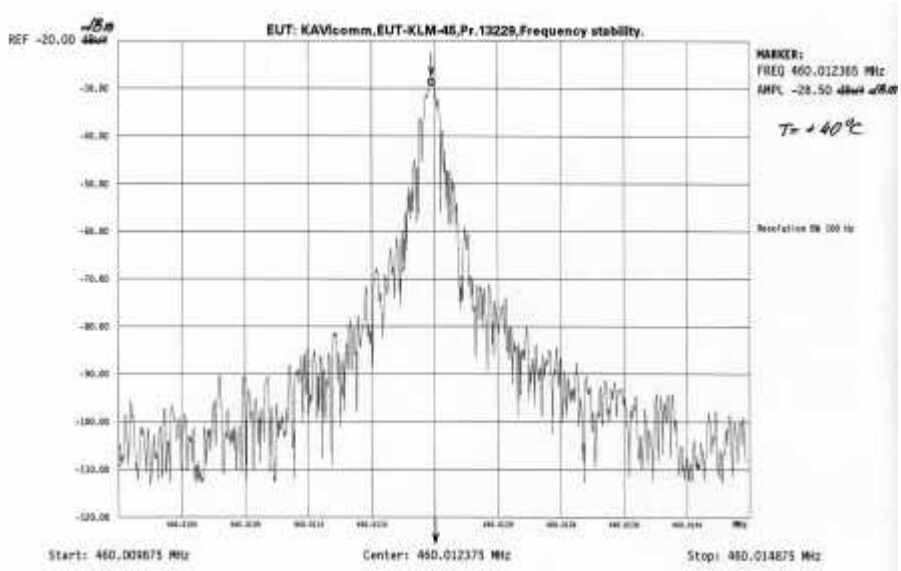
Plot 4.4.15
Frequency stability test results
F = 460.012591
Temperature + 10°



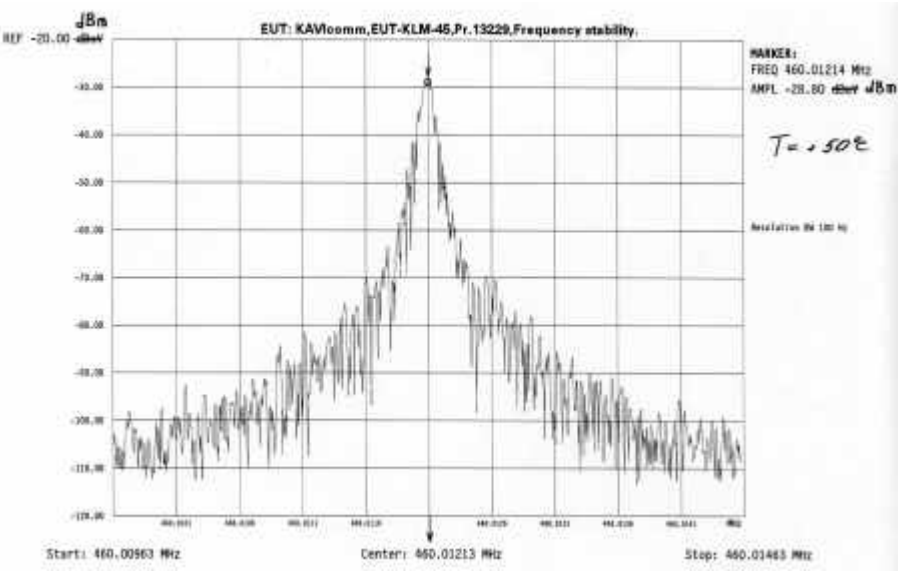
Plot 4.4.16
Frequency stability test results
F = 460.012591
Temperature + 30°



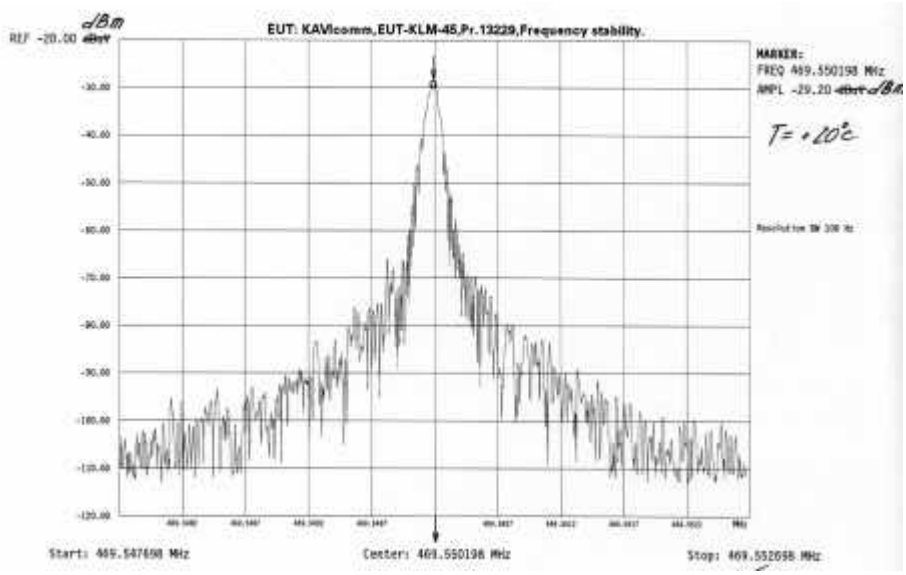
Plot 4.4.17
Frequency stability test results
F = 460.012591
Temperature + 40°



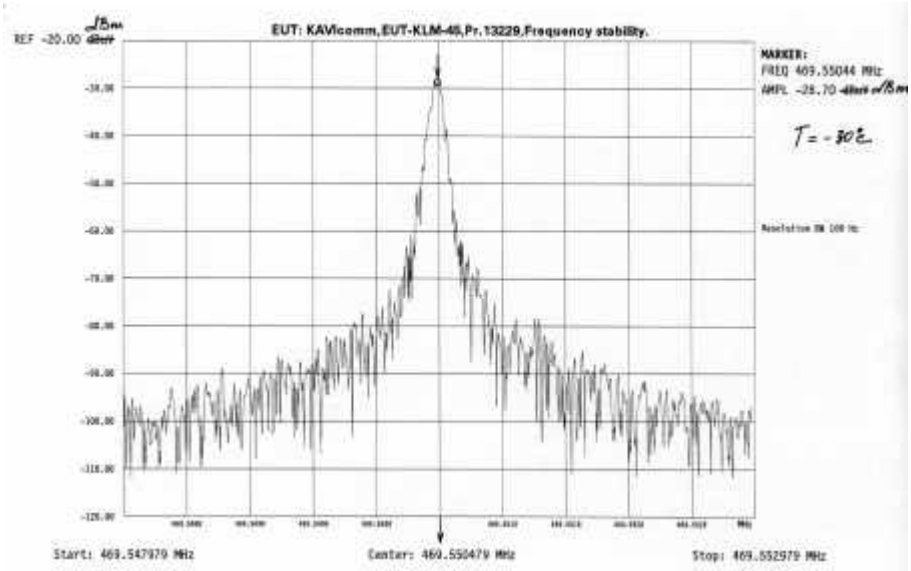
Plot 4.4.18
Frequency stability test results
F = 460.012591
Temperature + 50°



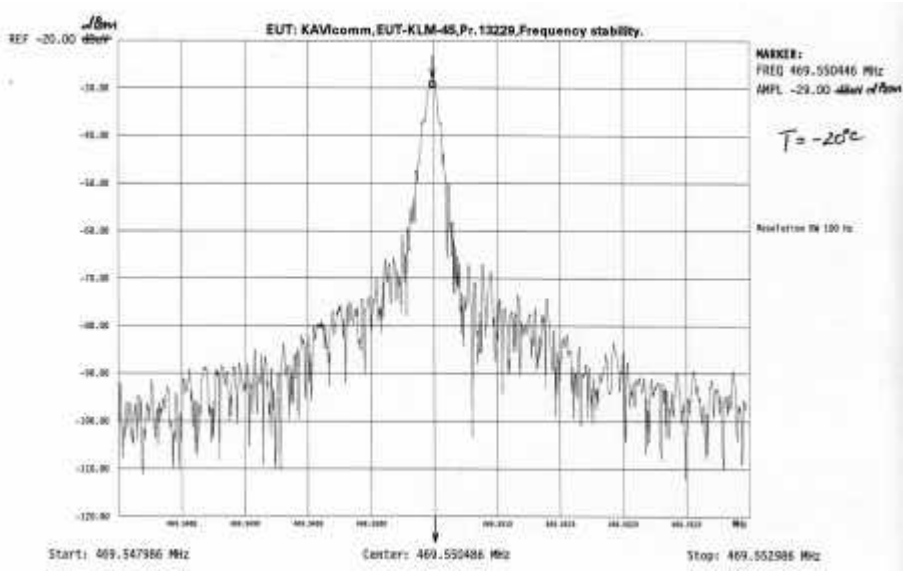
Plot 4.4.19
Frequency stability test results
F = 469.550198 (Reference)
Temperature + 20°



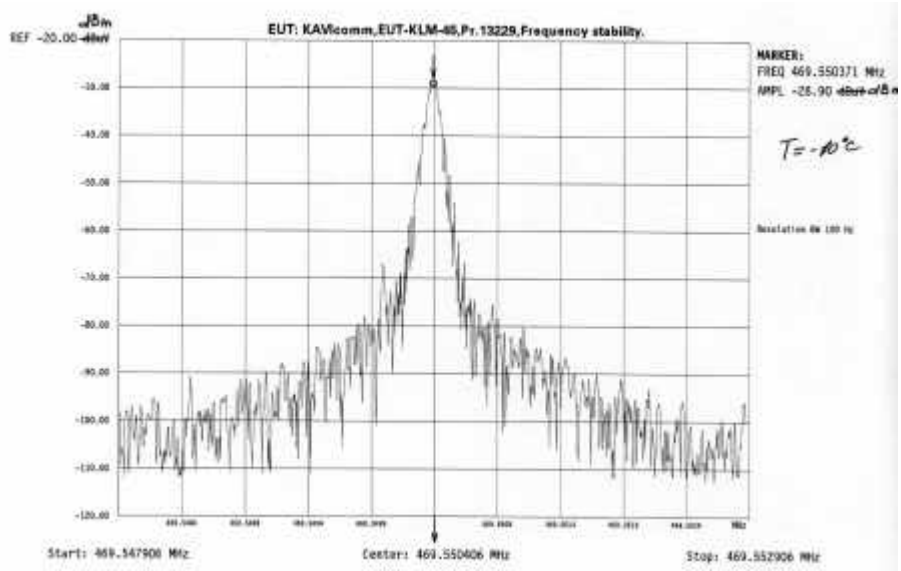
Plot 4.4.20
Frequency stability test results
F = 469.550198
Temperature – 30°



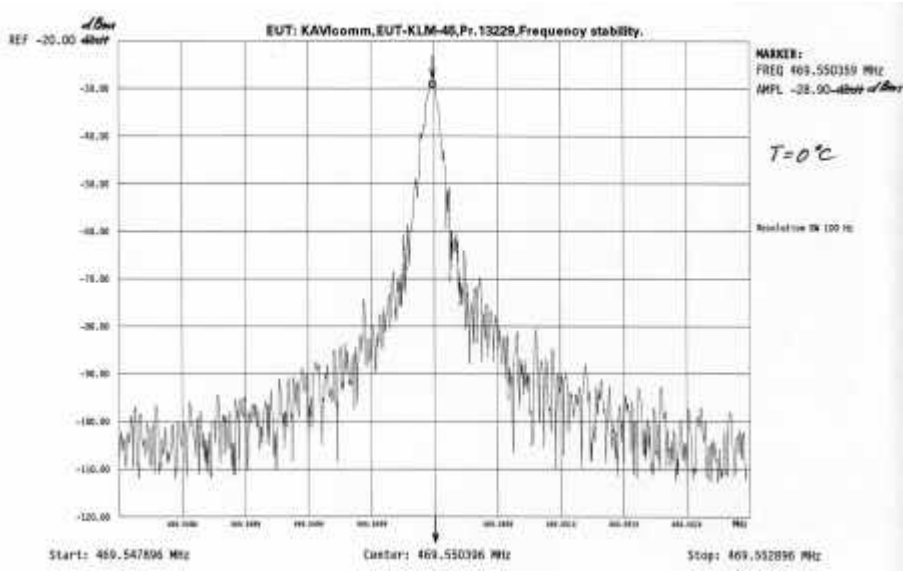
Plot 4.4.21
Frequency stability test results
F = 469.550198
Temperature – 20°



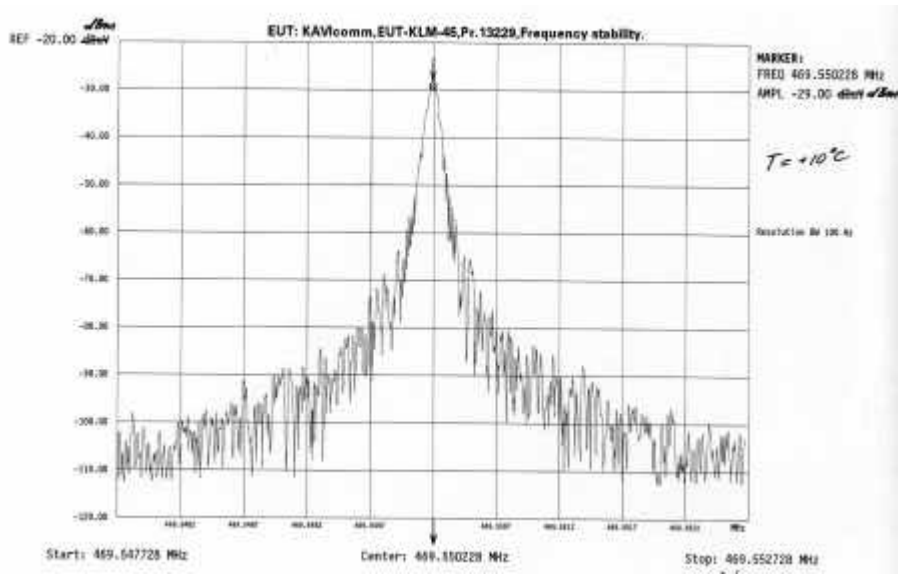
Plot 4.4.22
Frequency stability test results
F = 469.550198
Temperature – 10°



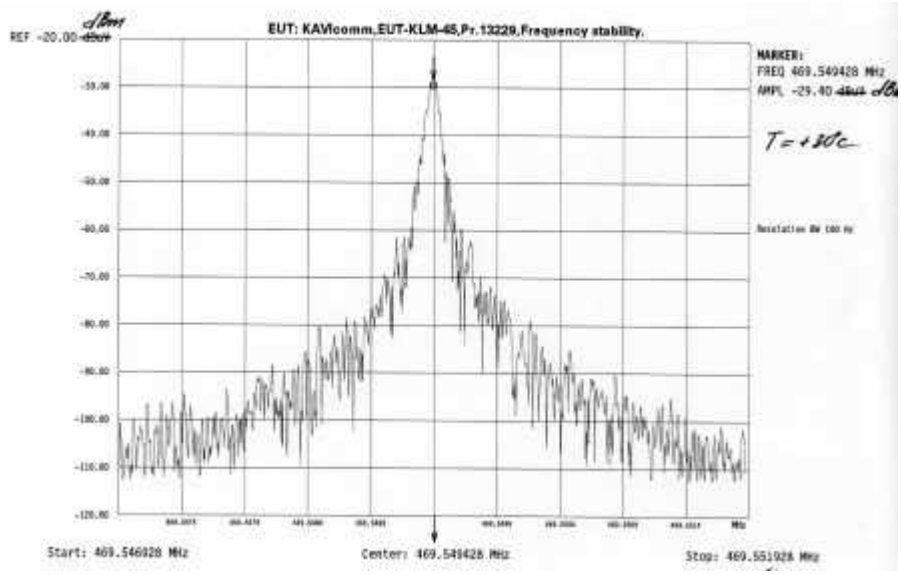
Plot 4.4.23
Frequency stability test results
F = 469.550198
Temperature 0°



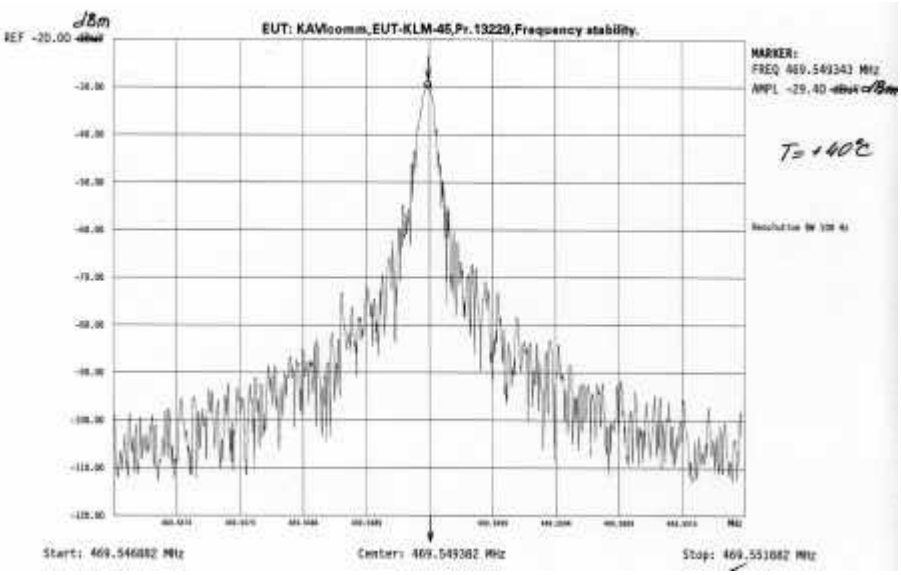
Plot 4.4.24
Frequency stability test results
F = 469.550198
Temperature + 10°



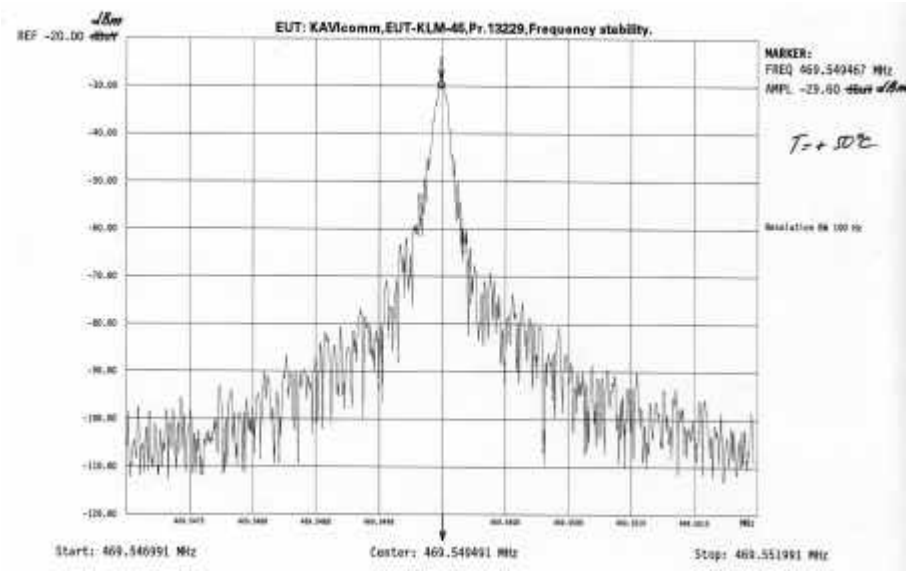
Plot 4.4.25
Frequency stability test results
F = 469.550198
Temperature + 30°



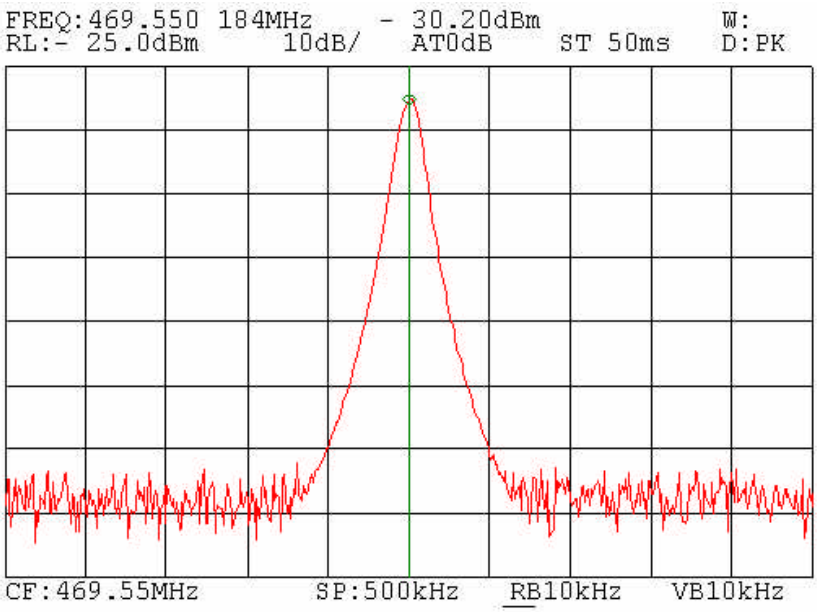
Plot 4.4.26
Frequency stability test results
F = 469.550198
Temperature + 40°



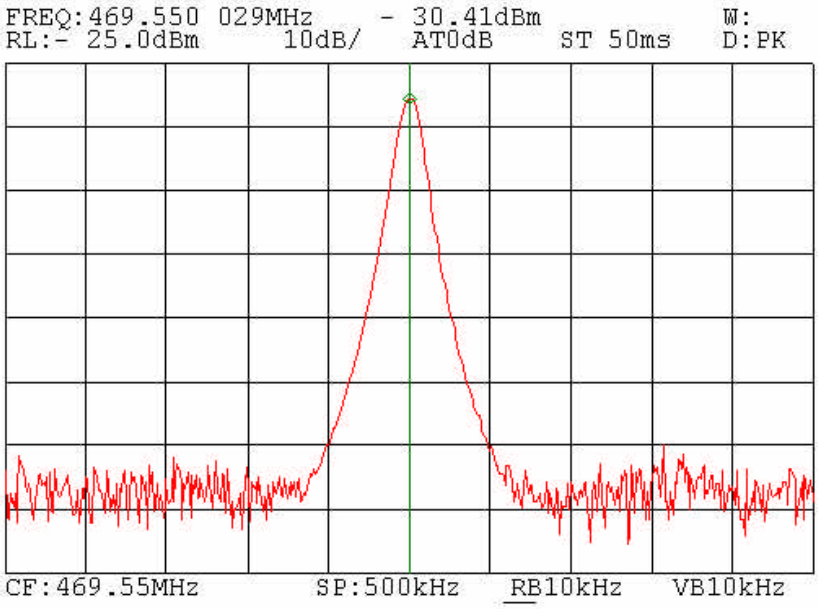
Plot 4.4.27
Frequency stability test results
F = 469.550198
Temperature + 50°



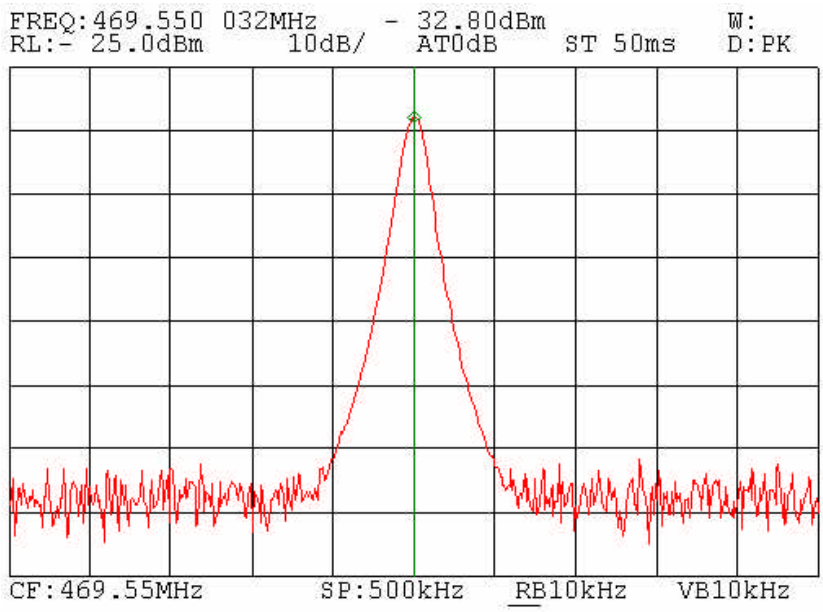
Plot 4.4.28
Frequency stability test results
F = 469.550000 (Reference)
Voltage 13.2 V, Time 0 min



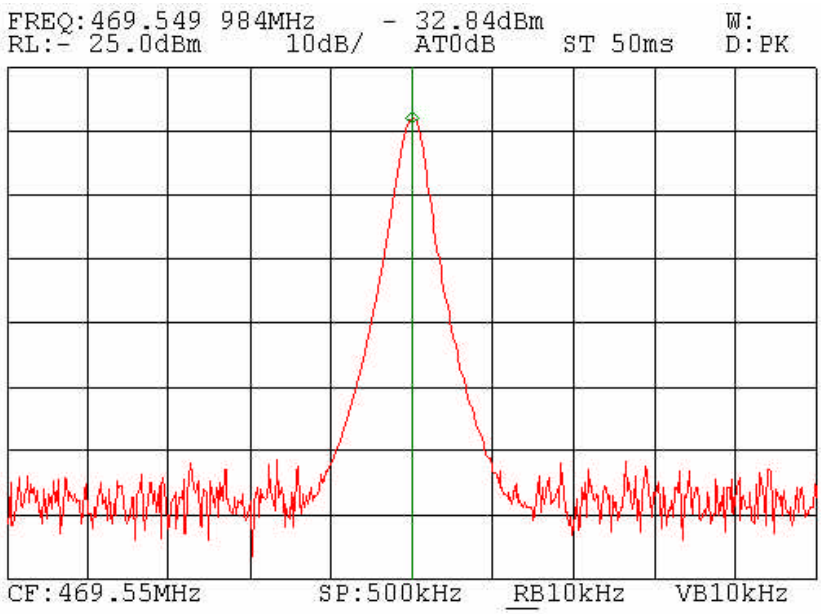
Plot 4.4.29
Frequency stability test results
F = 469.550000 (Reference)
Voltage 13.2 V, Time 2 min



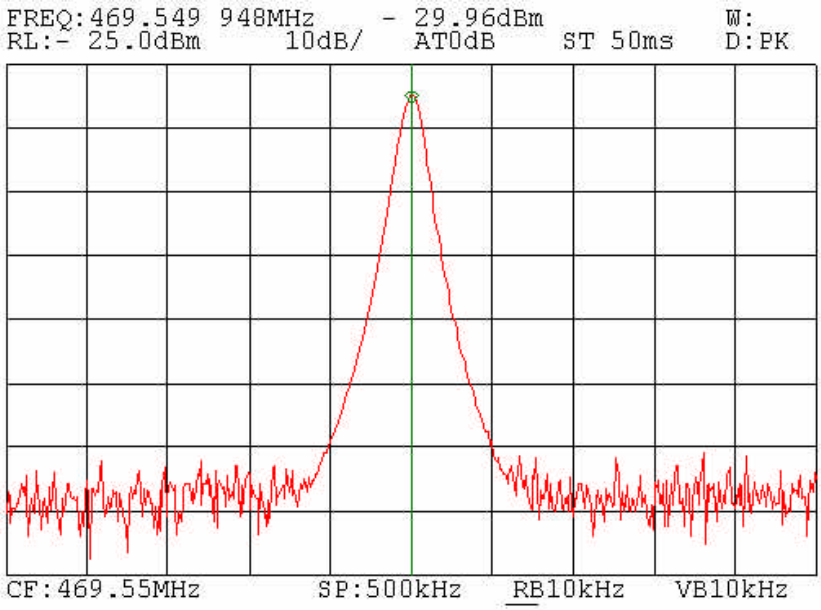
Plot 4.4.30
Frequency stability test results
F = 469.550000 (Reference)
Voltage 10.8 V, Time 0 min



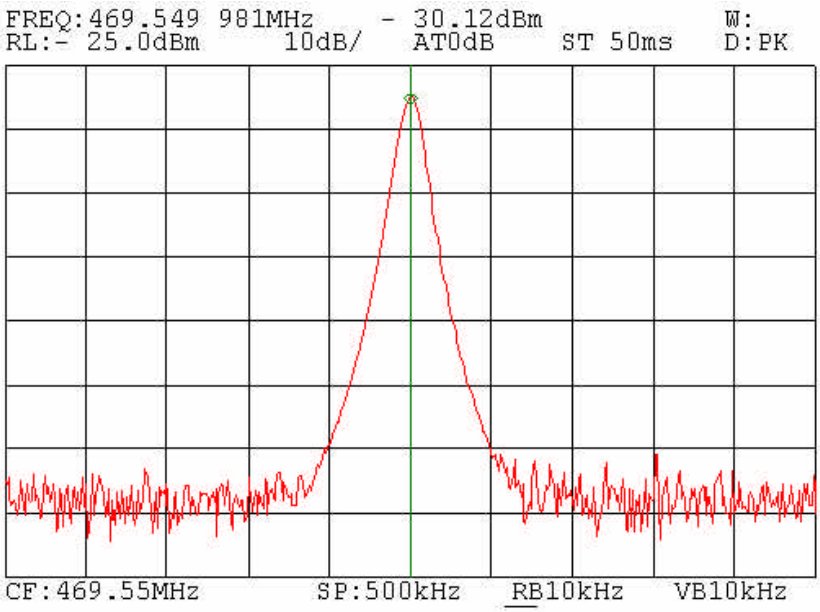
Plot 4.4.31
Frequency stability test results
F = 469.550000 (Reference)
Voltage 10.8 V, Time 2 min



Plot 4.4.32
Frequency stability test results
F = 469.550000
Voltage 15.6 V, Time 0 min



Plot 4.4.33
Frequency stability test results
F = 469.550000
Voltage 15.6 V, Time 2 min



4.5 Frequency modulation requirements according to FCC part 90 paragraph 211

4.5.1 General

The test is performed to show that the equipment will meet the modulation requirements of part 90, paragraph 210.

4.5.2 Test procedure

Maximum frequency deviation was measured by means of radio communication set, connected to the EUT RF output via attenuator 30 dB.

The test results are shown in Table 4.5.1.

Reference numbers of test equipment used

HL 0793	HL 0887

Full description is in Appendix A.

Table 4.5.1
Frequency deviation measurements

Frequency, MHz	Deviation, kHz
450.550	± 1.49
460.012	± 1.50
469.550	± 1.50

APPENDIX A - Test equipment and ancillaries used for tests

HL Serial No.	Serial No.	Description	Manufacturer	Model No.	Due Calibr.
0025	5837	Spectrum analyzer, 10 kHz-23 GHz	Anritsu	MS-710C	8/00
0026	3460	Spectrum analyzer, 100 Hz-2.2 GHz	Anritsu	MS 2601A	10/00
0041	2811	Double ridged guide antenna, 1-18 GHz	Electro-Metrics	RGA 50/60	8/00
0051	1640	Attenuator 50 Ohm, 100 W, 30 dB	Bird	8323	12/00
0052	NA	Attenuator 50 Ohm, 15 W, 0-4 GHz, 30 dB	Bird	8305-300-N	12/00
0120	149-1	Filter low-pass, 0-400MHz	Coaxial Dynamics	2082	1/01
0190	4742	Power meter, RF, -20+10 dBm, 10 MHz – 10 GHz	Hewlett Packard	432A	2/01
0205	0981	Power supply, DC, 40V, 30A	Hewlett Packard	6268B	9/00
0446	2857	Active Loop Antenna 10 kHz-30 MHz	Electro-Mechanics	6502	11/00
0493	4016	Oven temperature	Thermotron	S-1.2 Mini-Max	3/01
0507	2926U0 0162	Spectrum analyzer, 9 kHz - 1.8 GHz	Hewlett Packard	HP 8591A	5/00
0521	0319	Spectrum analyzer with RF filter section (EMI receiver 9 kHz - 6.5 GHz)	Hewlett Packard	8546A	7/00
0554	4300	Amplifier, 2 – 18 GHz RF	Miteq	AFD-4	12/00
0557	080	Signal Generator	Marconi Instruments	52023-002E	11/00
0559	0903	Multimeter Digital	Fluke	Fluke 76	3/00
0590	10	Attenuator 10 dB, 50 Ohm, N-type, 2W	Elisra Electronic Systems	MW2100-N-Type	6/00
0604	9611-1011	Antenna biconilog log-periodic/T bow-tie, 26 - 2000 MHz	EMCO	3141	7/00
0611	78692	Mount thermistor for the 4432A, 0.01-10 GHz, 200 Ohm	Hewlett Packard	478 A	1/01
0614	334	Antenna Dipole Tunable 200 –1000 MHz	Electro-Metrics	TDS 30-1/30-2	2/02
0645	NA	Ear artificial	Hermon Labs	GS-4	3/01
0661	0266	Generator Swept Signal, 10MHz to 40GHz+ 10dBm	Hewlett Packard	83640B	2/01
0793	2955	Radio communications test set	Marconi instruments	9507/179	2/01
0872	8767	Cable coax	Amplifier Research	PFP01P01039 4	7/00
0887	1639	Attenuator coaxial,30 dB, 100 W, 50 Ohm	Bird	8323	2/01
0888	563	Attenuator coaxial,30 dB, 500 W, 50 Ohm	Bird	8325	2/01
0940	8468	Attenuator, 50 Ohm, 2W, 0-12.4 GHZ,	Hewlett Packard	8491A	2/01

APPENDIX B-Test equipment correction factors

Active Loop Antenna
Model 6502
S/N 2857

Frequency, MHz	Antenna Factor, dB
0.009	-32.8
0.010	-33.8
0.020	-38.3
0.050	-41.1
0.075	-41.3
0.100	-41.6
0.150	-41.7
0.250	-41.6
0.500	-41.8
0.750	-41.9
1.000	-41.4
2.000	-41.5
3.000	-41.4
4.000	-41.4
5.000	-41.5
10.000	-41.9
15.000	-41.9
20.000	-42.2
25.000	-42.8
30.000	-44.0

Antenna factor is to be added to receiver meter reading in dB(µV) to convert to field intensity in dB(µV)/meter

Antenna Factor
Double Ridged Guide Antenna
Model RGA-50/60
S/N 2811

Frequency, MHz	Antenna Factor, dB
1000	24.3
1500	25.4
2000	28.4
2500	29.2
3000	30.5
3500	31.6
4000	33.7
4500	32.2
5000	34.5
5500	34.5
6000	34.6
6500	35.3
7000	35.5
7500	35.9
8000	36.6
8500	37.3
9000	37.7
9500	37.7
10000	38.2
10500	38.5
11000	39.0
11500	40.1
12000	40.2
12500	39.3
13000	39.9
13500	40.6
14000	41.1
14500	40.5
15000	39.9
15500	37.8
16000	39.1
16500	41.1
17000	41.7
17500	45.1
18000	44.3

Antenna factor is to be added to receiver meter reading in dB(µV) to convert to field intensity in dB(µV)/meter

Antenna factor
Biconilog antenna EMCO, model 3141
Ser.No.1011

Frequency, MHz	Antenna Factor, dB(1/m)	Frequency, MHz	Antenna Factor, dB(1/m)
26	7.8	940	24.0
28	7.8	960	24.1
30	7.8	980	24.5
40	7.2	1000	24.9
60	7.1	1020	25.0
70	8.5	1040	25.2
80	9.4	1060	25.4
90	9.8	1080	25.6
100	9.7	1100	25.7
110	9.3	1120	26.0
120	8.8	1140	26.4
130	8.7	1160	27.0
140	9.2	1180	27.0
150	9.8	1200	26.7
160	10.2	1220	26.5
170	10.4	1240	26.5
180	10.4	1260	26.5
190	10.3	1280	26.6
200	10.6	1300	27.0
220	11.6	1320	27.8
240	12.4	1340	28.3
260	12.8	1360	28.2
280	13.7	1380	27.9
300	14.7	1400	27.9
320	15.2	1420	27.9
340	15.4	1440	27.8
360	16.1	1460	27.8
380	16.4	1480	28.0
400	16.6	1500	28.5
420	16.7	1520	28.9
440	17.0	1540	29.6
460	17.7	1560	29.8
480	18.1	1580	29.6
500	18.5	1600	29.5
520	19.1	1620	29.3
540	19.5	1640	29.2
560	19.8	1660	29.4
580	20.6	1680	29.6
600	21.3	1700	29.8
620	21.5	1720	30.3
640	21.2	1740	30.8
660	21.4	1760	31.1
680	21.9	1780	31.0
700	22.2	1800	30.9
720	22.2	1820	30.7
740	22.1	1840	30.6
760	22.3	1860	30.6
780	22.6	1880	30.6
800	22.7	1900	30.6
820	22.9	1920	30.7
840	23.1	1940	30.9
860	23.4	1960	31.2
880	23.8	1980	31.6
900	24.1	2000	32.0
920	24.1		

Antenna factor is to be added to receiver meter reading in dB(µV) to convert to field intensity in dB(µV/meter).

Antenna, Tunable Dipole, TDS-30 (HL 0614)
Antenna factor and antenna gain

F, MHz	AF	Gain
200	14.3	2.12
225	15.2	2.04
250	16.1	2.06
275	17.0	1.99
300	18.0	1.74
325	18.6	1.84
350	19.2	1.88
400	20.4	1.84
450	22.3	0.96
500	24.2	-0.02
500	23.7	0.48
550	24.1	0.91
600	24.0	1.76
700	24.5	2.60
800	27.0	1.26
900	27.6	1.68
1000	28.1	2.10