

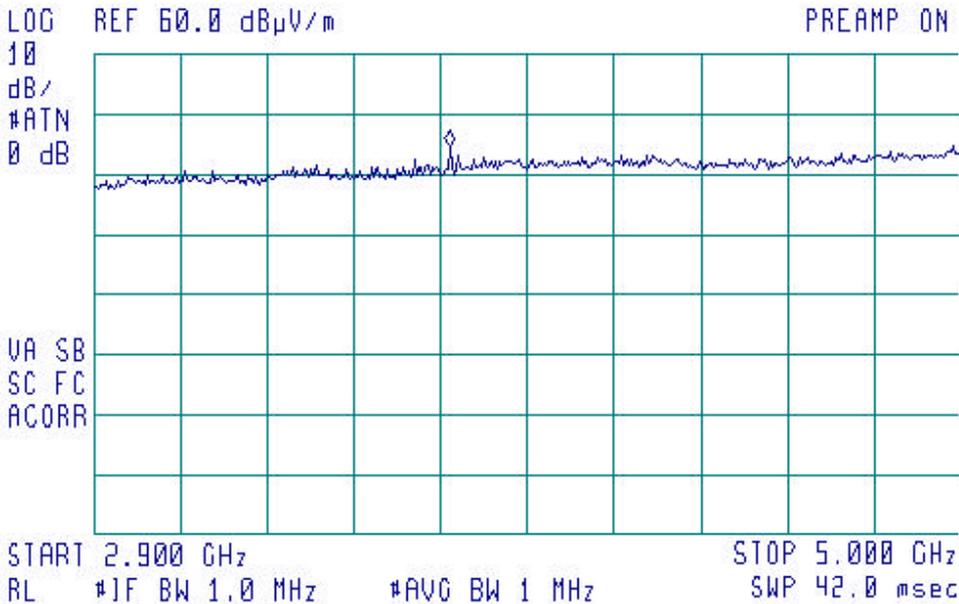


Plot 4.5.17
Spurious emissions, F₀ = 469.98

15:54:36 12 JAN 2000 EMISSION MASK
PR.13823 HEAD CONNECTION PAWN 460C FCC 90.210(d)
ACTV DET: PEAK
MEAS DET: PEAK
MKR 3.761 GHz
44.64 dBμV/m

MEASURE
AT MKR

ADD TO
LIST



CLEAR
WRITE A

MAX
HOLD A

VIEW A

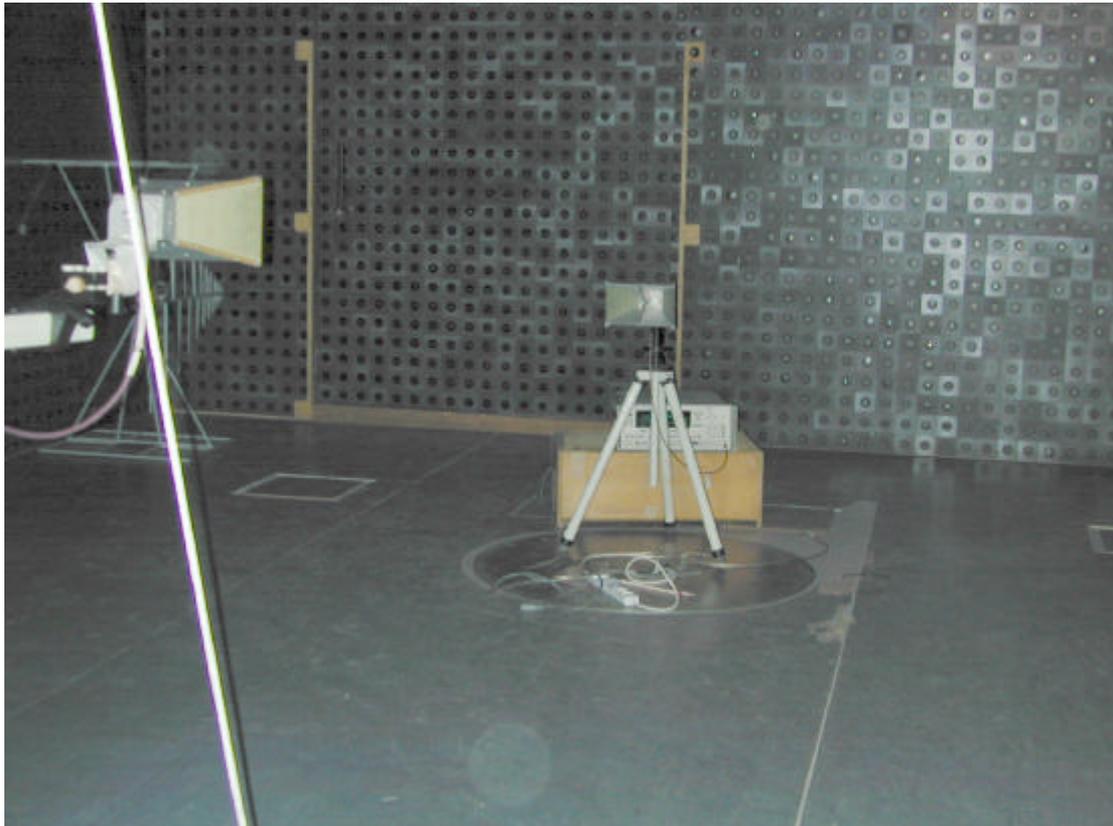
BLANK A

Trace
A B C

More
1 of 3



Photograph 4.5.1
Harmonics emissions measurements,
substitution method,
frequency range 1GHz – 5 GHz





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4.6 Frequency stability measurements according to FCC part 90 paragraph 213

4.6.1 General

According to paragraph 90.213, the minimum frequency stability limit (in parts per million) is 2.5 ppm for mobile equipment designed to operate with a 12.5 kHz channel bandwidth in frequency range 421 – 512 MHz.

For frequency 451017.5 Hz the specified limit is 1128 Hz.

For frequency 460648.7 Hz the specified limit is 1152 Hz

For frequency 469979.6 Hz the specified limit is 1175 Hz

4.6.2 Test procedure

The EUT was set up as shown in Photographs 4.6.1, 4.6.2.

The frequency stability was investigated for various temperatures in the range from –30°C to +50°C.

Test results are recorded in Table 4.6.1.

The EUT was found to comply with requirements of paragraph 90.213.

Reference numbers of test equipment used

HL 0026	HL 0493
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Full description is in Appendix A.



Table 4.6.1
Frequency stability test results

Temperature, °C	Displacement for F = 451.0175, kHz	Displacement for F = 460.6487, kHz	Displacement for F = 469.9796, kHz
-30	+ 0.6	+ 0.6	+ 1.02
-20	+ 0.5	+ 0.7	+ 0.9
-10	+ 0.5	+ 0.7	+ 0.93
0	+ 0.3	+ 0.7	+ 1.07
10	- 0.3	+ 0.2	+ 0.4
20	- 0.4	- 0.3	- 0.1
22, Vmax	reference	reference	reference
22, Vmin	+ 0.7	+ 0.8	+ 1.1
30	- 0.7	- 0.7	- 0.4
40	- 0.2	- 0.3	+ 0.3
50	+ 0.7	+ 0.5	+ 0.6



Photograph 4.6.1
Frequency stability test setup





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Photograph 4.6.2
Frequency stability test setup



**APPENDIX A - Test equipment and ancillaries used for tests**

HL Serial No.	Serial No.	Description	Manufacturer	Model No.	Due Calibr.
0026	3460	Spectrum analyzer, 100 Hz-2.2 GHz	Anritsu	MS 2601A	10/00
0029	297	Antenna, dipole, tunable 200-1000 MHz	Electro-Metrics	TDS 25/30-1	4/00
0041	2811	Double ridged guide antenna, 1-18 GHz	Electro-Metrics	RGA 50/60	8/00
0411	933876 8	Cable, coax, microwave, DC-18 GHz, N-N, 2 m	Given Imaging	36Q01Q0107 8.8	9/00
0447	0447	LISN, 16/2, 300 V RMS	Hermon Labs	LISN 16-1	12/99
0465	023	Anechoic chamber 9 (L) x 6.5 (W) x 5.5 (H) m	Hermon Labs	AC-1	3/01
0493	4016	Oven temperature	Thermotron	S-1.2 Mini-Max	3/01
0521	0319	Spectrum analyzer with RF filter section (EMI receiver 9 kHz - 6.5 GHz)	Hewlett Packard	8546A	7/00
0557	080	Signal generator	Marconi Instruments	52023-002E	11/00
0580	580	DC block adaptor 10 kHz-2.2 GHz	Anritsu	MA8601 A	1/01
0589	589	Cable coaxial, GORE A2POL118.2, 3m	Hermon Labs	GORE-3	11/00
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
0614	334	Antenna Dipole Tunable 200 -1000 MHz	Electro-Metrics	TDS 30-1/30-2	2/02
0661	0266	Generator swept signal, 10MHz to 40GHz+ 10dBm	Hewlett Packard	83640B	2/01
1116	186	Double ridged guide antenna, 1-18 GHz	Hermon Labs	A1-18	4/00
1175	NA	Microwave 5 m cable	Gore	01C02245.2	2/01



APPENDIX B-Test equipment correction factors

**Correction Factor
Line Impedance Stabilization Network
Model LISN 16 - 1
Hermon Laboratories**

Frequency, kHz	Correction Factor
10	4.9
15	2.86
20	1.83
25	1.25
30	0.91
35	0.69
40	0.53
50	0.35
60	0.25
70	0.18
80	0.14
90	0.11
100	0.09
125	0.06
150	0.04



**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(μ V) to convert to field intensity in dB(μ V)/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(μ V) to convert to field intensity in dB(μ V/meter).