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ATTACHMENT
TO WAVRAD_FCC.15365 TEST REPORT
according to 47CFR Part 15, §15.247 and subpart B
for
WaveIP Ltd.
EQUIPMENT UNDER TEST:
Wireless Radio for Internet Broadband Access
Model: GigAccess 2.4

This report is in conformity with and ISO/IEC 17025. The A2LA logo endorsement applies only to the test methods and the standards that are listed in the scope of Hermon Laboratories accreditation.
The test results relate only to the items tested. **This test report must not be reproduced in any form except in full with the approval of Hermon Laboratories Ltd.**

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1 Summary of tests

The GigAccess was found complying with the limits of 47CFR Part 15, §§15.209, 15.205 (a, c), 15.207 and CFR 47 part 15:2002 §15.107 class B.

Parameter	Subclause	C	NC	NT	NA	Tested by	Date tested	Remarks
Conducted emissions	15.107, 15.207	C				Mrs. E. Pitt, test engineer	February 9, 2003	
Spurious emissions (radiated) in restricted bands	15.209, 15.205 (a, c)	C				Mrs. E. Pitt, test engineer Mr. M. Feldman, test engineer Mr. Y. Neuman test engineer	February 9, 2003, February 10-12, 16, 17, 2003	
NOTE: C: The parameter is compliant with the requirements. NC: The parameter is not compliant with the requirements. NT: The parameter is not tested. NA: The test of this parameter is not applicable.								

Test report prepared by: Mrs. M. Cherniavsky, certification engineer

Test report approved by: Mr. A. Usoskin, QA manager



2 Tests results

2.1 Conducted emissions test according to §15.207, 15.107

METHOD OF MEASUREMENTS	ANSI 63.4 §13.1.3
DATE:	February 9, 2003
RELATIVE HUMIDITY:	47 %
AMBIENT TEMPERATURE:	22 °C
THE EUT WAS TESTED AS:	TABLE-TOP
DETECTOR USED:	QUASI-PEAK
FREQUENCY RANGE:	150 kHz – 30 MHz
RESOLUTION BANDWIDTH:	9 kHz
MEASUREMENT UNCERTAINTY, dB	+2.43 / -2.22

Quasi-peak detector

Frequency, MHz	Line identification	Measured emissions, dB (µV)	Specification QP limit, dB (µV)	Margin, dB	Pass/ Fail	Reference to Plots in Appendix A
0.177405	Ph	52.45	64.66	12.21	Pass	B1
0.187910	N	52.13	64.15	12.02	Pass	B2
0.274638	Ph	44.70	61.04	16.34	Pass	B1
0.275720	N	45.40	61.01	15.61	Pass	B2
0.537640	N	40.44	56.00	15.56	Pass	B2
0.557460	Ph	44.20	56.00	11.80	Pass	B1
0.621208	N	44.85	56.00	11.15	Pass	B2
0.647705	Ph	44.99	56.00	11.01	Pass	B1
0.648800	N	45.39	56.00	10.61	Pass	B2
2.327920	Ph	39.77	56.00	16.23	Pass	B1

**Average detector**

Frequency, MHz	Line identification	Measured emissions, dB (μV)	Specification AVRG limit, dB (μV)	Margin, dB	Pass/Fail	Reference to Plots in Appendix A
0.177405	Ph	40.58	54.66	14.08	Pass	B1
0.187910	N	40.64	54.15	13.51	Pass	B2
0.274638	Ph	34.16	51.04	16.88	Pass	B1
0.275720	N	35.44	51.01	15.57	Pass	B2
0.557460	Ph	33.80	46.00	12.20	Pass	B1
0.621208	N	33.54	46.00	12.46	Pass	B2
0.647705	Ph	32.85	46.00	13.15	Pass	B1
0.648800	N	33.68	46.00	12.32	Pass	B2

LIMIT

Frequency, MHz	Class B equipment, dB(μV)	
	QP	AVRG
0.15 - 0.5	66 - 56*	56 - 46*
0.5 - 5	56	46
5 - 30	60	50

*The limit decreases linearly with the logarithm of frequency.

TEST PROCEDURE

The measurements were performed at mains terminals by means of LISN, connected to spectrum analyzer in the frequency range as referred to in the table above. The unused coaxial connector of the LISN was terminated with 50 Ω. The measurements were made with quasi-peak and average detectors as referred to in the tables. The position of the EUT cables was varied to determine maximum emission level.

TEST EQUIPMENT USED:

HL 0163	HL 0521	HL 0787	HL 1003			
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2.2 Radiated emissions which fall in restricted bands test according to §15.247(c) and § 15.205, §15.209(a)

METHOD OF MEASUREMENTS	ANSI 63.4 §13.1.4
DATE:	February 10-12, 16, 17, 2003
RELATIVE HUMIDITY:	45 %
AMBIENT TEMPERATURE:	17°C
AIR PRESSURE:	1014 hPa
OPERATING FREQUENCY RANGE	2400-2483.5 MHz
MODULATION TECHNIQUE	DSSS
BIT RATE:	11 Mbps
FREQUENCY RANGE*	9 kHz - 25 GHz
MEASUREMENT UNCERTAINTY:	+5.42 dB/-5.26 dB

* The frequency spectrum was investigated from the lowest radio frequency signal generated in the equipment, without going below 9 kHz, up to the tenth harmonic of the highest fundamental frequency. All emissions were found below the specified limit. For test results refer to Plots B3 – B149.

LIMIT

Radiated emissions, which fall in the restricted bands, must comply with §15.209(a) limits.

TEST PROCEDURE

The test was performed with transmitter operating 3 carrier frequencies $F_{\min} = 2412$ MHz, $F_{\text{cent}} = 2442$ MHz, $F_{\max} = 2472$ MHz from 9 kHz to 25 GHz.

9 kHz – 30 MHz frequency range. The loop antenna was positioned with its plane horizontal. The loop center was 1 meter above the ground plane. To find maximum radiation the turntable was rotated 360°. Then the loop position was changed to vertical. To find maximum radiation the turntable was rotated 360° and the measuring antenna was rotated about its vertical axis. Plots B3, B4, B33, B34, B61, B62, B88, B89, B117, B118 in Appendix B refer to vertical antenna polarization as the worst case.

30 MHz – 24 GHz frequency range. The EUT was placed on a wooden 80 cm height turntable. To find maximum radiation the turntable was rotated 360°, measuring antenna height was changed from 1 to 4 m, and the antennas polarization was changed from vertical to horizontal.

TEST EQUIPMENT USED AT OATS:

HL 0038	HL 0041	HL 0091	HL 0275	HL 0287	HL 1424	HL 1940
HL 2260						

TEST EQUIPMENT USED IN ANECHOIC CHAMBER:

HL 0025	HL 0041	HL 0446	HL 0465	HL 0521	HL 0554	HL 0589
HL 0592	HL 0593	HL 0594	HL 0604	HL 0750	HL 0768	HL 0787
HL 1003	HL 1004	HL 1200	HL 1424	HL 1425	HL 1566	HL 1826
HL 1849	HL 1850	HL 1940	HL 1942	HL 1984	HL 2009	HL 2109
HL 2258	HL 2260					



The unit with Base Station Directional Antenna, 17 dBi
Power output level 18.5 dBm

Quasi-peak detector

Frequency, MHz	Antenna type	Ant. polariz.	Ant. hgt., m	TT pos. (°)	Radiated emissions, dB (μV/m)	Limit, dB (μV/m)	Margin, dB	Reference to Plots in Appendix B
120.0	Biconical	Vert	1	354	28.5	43.50	13.80	B24
264.0	Log- periodic	Horiz	1.4	321	38.3	46.00	7.7	B5, B15, B24

Peak detector

Frequency, MHz	Radiated emissions, dB (μV/m)	Limit, dB (μV/m)	Margin, dB	Reference to Plots in Appendix B
1660	58.17	74	15.83	B6, B7
2383.15	53.13	74	20.87	B17
2385.66	57.91	74	16.09	B8
2487.67	58.49	74	15.51	B18
2488.59	59.04	74	14.96	B27
4824	54.60	74	19.40	B11
4884	55.08	74	18.92	B20
4944	54.77	74	19.23	B29

The recorded test results were obtained through measurements with double ridged guide antenna in vertical polarization.

Average detector

Frequency, MHz	Antenna height, m	TT pos. (°)	Radiated emissions, dB (μV/m)	Limit, dB (μV/m)	Margin, dB	Reference to Plots in Appendix A
1660	1.56	335	44.82	54	9.18	B6, B7
1703	1.57	339	41.4	54	12.6	B16
2383.15	1.0	0	45.41	54	8.59	B17
2385.66	1.0	0	49.74	54	4.26	B8
2388.70	1.0	0	40.33	54	13.67	B26
2487.67	1.0	0	44.44	54	9.56	B18
2488.59	1.0	0	44.97	54	9.03	B27
2579.94	1.0	0	41.37	54	12.63	B9
4824	1.0	0	37.15	54	16.85	B11
4884	1.0	0	36.43	54	17.57	B20
4944	1.0	0	39.22	54	14.78	B29

The recorded test results were obtained through measurements with double ridged guide antenna in vertical polarization.

Table abbreviations:

Margin = dB below (negative if above) specification limit.

Ant. hgt. = antenna height.

TT pos. = turntable position in degrees, (EUT front panel = 0°).



The unit with Flat Panel Subscriber Integrated Antenna, 13.5 dBi
Power output level 18.5 dBm

Quasi-peak detector

Frequency, MHz	Antenna type	Ant. polariz.	Antenna height, m	TT pos. (°)	Radiated emissions, dB (μV/m)	Limit, dB (μV/m)	Margin, dB	Reference to Plots in Appendix B
264.0	Log- periodic	Horiz.	1.0	200	36.90	46.00	9.10	B35

Peak detector

Frequency, MHz	Radiated emissions, dB (μV/m)	Limit, dB (μV/m)	Margin, dB	Reference to Plots in Appendix B
2383.76	51.32	74	22.68	B37
2490.79	55.13	74	18.87	B55
4824	45.3	74	28.70	B40
4884	52.92	74	21.08	B49
4944	56.40	74	17.60	B57

The recorded test results were obtained through measurements with double ridged guide antenna in vertical polarization.

Average detector

Frequency, MHz	Antenna polarization	TT pos. (°)	Radiated emissions, dB (μV/m)	Limit, dB (μV/m)	Margin, dB	Reference to Plots in Appendix A
1660.40	V	335	42.50	54	11.50	B36
1722	V	5	35.30	54	18.70	B53
2381.20	H	186	38.66	54	15.34	B46
2383.76	V	0	37.21	54	16.79	B37
2489.56	H	173	37.32	54	16.68	B47
2490.79	V	0	47.96	54	6.04	B55
4824	V	0	33.9	54	20.1	B40
4884	V	0	34.50	54	19.50	B49
4944	V	0	35.60	54	18.50	B57

The recorded test results were obtained through measurements with double ridged guide antenna at 1 m height

Table abbreviations:

Margin = dB below (negative if above) specification limit.

Ant. pol. = antenna polarization (V-vertical, H-horizontal).

Ant. hgt. = antenna height.

TT pos. = turntable position in degrees, (EUT front panel = 0°).



The unit with Flat Panel Subscriber Integrated Antenna, 18 dBi
Power output level 17 dBm

Quasi-peak detector

Frequency, MHz	Antenna type	Antenna polariz.	Antenna height, m	TT pos. (°)	Radiated emissions, dB (μV/m)	Limit, dB (μV/m)	Margin, dB	Reference to Plots in Appendix B
264.0	Log- periodic	Horiz.	1.0	32	39.67	46.00	6.33	B63

Peak detector

Frequency, MHz	Radiated emissions, dB (μV/m)	Limit, dB (μV/m)	Margin, dB	Reference to Plots in Appendix B
2381.23	51.09	74	22.91	B65
2487.00	52.34	74	21.66	B82

The recorded test results were obtained through measurements with double ridged guide antenna in vertical polarization.

Average detector

Frequency, MHz	Antenna polarization	TT pos. (°)	Radiated emissions, dB (μV/m)	Limit, dB (μV/m)	Margin, dB	Reference to Plots in Appendix A
2381.23	V	0	38.02	54	15.98	B65
2383.14	V	0	32.26	54	17.74	B73
2487.00	V	0	38.70	54	15.30	B82
2493.91	H	273	35.96	54	18.04	B74

The recorded test results were obtained through measurements with double ridged guide antenna at 1 m height

Table abbreviations:

Margin = dB below (negative if above) specification limit.

Ant. pol. = antenna polarization (V-vertical, H-horizontal).

Ant. hgt. = antenna height.

TT pos. = turntable position in degrees, (EUT front panel = 0°).



The unit with Omni Directional Base Station Antenna, 12 dBi
Power output level 18.5 dBm

Quasi-peak detector

Frequency, MHz	Antenna type	Ant. polariz.	Ant. hgt., m	TT pos. (°)	Radiated emissions, dB (μV/m)	Limit, dB (μV/m)	Margin, dB	Reference to Plots in Appendix B
120.0	Biconical	Vert	1	342	29.70	43.50	13.80	B90
264.0	Log- periodic	Horiz	1.5	305	34.19	46.00	11.81	B90, B99

Peak detector

Frequency, MHz	Radiated emissions, dB (μV/m)	Limit, dB (μV/m)	Margin, dB	Reference to Plots in Appendix B
2388.70	60.67	74	13.33	B92
4824	50.94	74	23.06	B95
4884	55.33	74	18.67	B104
4944	50.48	74	23.52	B113

The recorded test results were obtained through measurements with double ridged guide antenna in vertical polarization.

Average detector

Frequency, MHz	Ant. hgt., m	TT pos. (°)	Radiated emissions, dB (μV/m)	Limit, dB (μV/m)	Margin, dB	Reference to Plots in Appendix A
1693.50	1.36	345	32.4	54	21.6	B100
2381.23	1.0	0	40.83	54	13.17	B101
2483.64	1.0	0	40.82	54	13.18	B102
2388.70	1.0	0	43.82	54	10.18	B92
2490.79	1.0	0	40.63	54	13.37	B111
4824	1.0	0	37.32	54	16.68	B95
4884	1.0	0	37.43	54	16.57	B104
4944	1.0	0	37.63	54	16.47	B113

The recorded test results were obtained through measurements with double ridged guide antenna in vertical polarization.

Table abbreviations:

Margin = dB below (negative if above) specification limit.

Ant. pol. = antenna polarization (V-vertical, H-horizontal).

Ant. hgt. = antenna height.

TT pos. = turntable position in degrees, (EUT front panel = 0°).



The unit with Parabolic Dish Antenna, 24 dBi
Power output level 11 dBm

Quasi-peak detector

Frequency, MHz	Antenna type	Ant. polariz.	Ant. hgt., m	TT pos. (°)	Radiated emissions, dB (μV/m)	Limit, dB (μV/m)	Margin, dB	Reference to Plots in Appendix B
38.21	Biconical	Vert	1.1	5	21.71	40.00	18.29	B119
125.0	Biconical	Vert	1.0	0	27.31	43.50	16.19	B119
264.0	Log- periodic	Horiz	1.0	305	28.93	46.00	17.07	B119

Peak detector

Frequency, MHz	Radiated emissions, dB (μV/m)	Limit, dB (μV/m)	Margin, dB	Reference to Plots in Appendix B
3854	43.70	74	30.03	B123
7336	46.40	74	27.60	B134
7556	49.30	74	24.70	B144
8252	45.80	74	28.20	B145
13660	50.00	74	24.00	B135
14482	48.60	74	25.40	B125
14910	50.50	74	23.50	B146

The recorded test results were obtained through measurements with double ridged guide antenna in vertical polarization.

Average detector

Frequency, MHz	Ant. polariz.	Ant. hgt., m	TT pos. (°)	Radiated emissions, dB (μV/m)	Limit, dB (μV/m)	Margin, dB	Reference to Plots in Appendix A
2387.08	V	1.0	0	41.62	54	12.38	B121
2487.67	V	1.0	0	40.04	54	13.95	B141

Table abbreviations:

Margin = dB below (negative if above) specification limit.
Ant. pol. = antenna polarization (V-vertical, H-horizontal).
Ant. hgt. = antenna height.
TT pos. = turntable position in degrees, (EUT front panel = 0°).



Appendix B Plots

Plot B 1

Conducted emissions on power line

LINE:

PHASE

10:20:49 FEB 09, 2003

START
150 kHz

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 100 kHz
46.65 dB μ V

MEASURE
AT MKR

ADD TO
LIST

MARKER
↓ CF

MARKER
△

NEXT
PEAK

NEXT PK
RIGHT

NEXT PK
LEFT

More
1 of 2

LOG REF 70.0 dB μ V

10
dB/
ATN
10 dB

PASS LIMIT

VA SB
SC FC
ACORR

START 150 kHz

RL #1F BW 9.0 kHz

AVG BW 30 kHz

STOP 30.00 MHz

SWP 2.49 sec



Plot B 2

Conducted emissions on power line

LINE: NEUTRAL

10:45:07 FEB 09, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 100 kHz
49.51 dBμV

MEASURE
AT MKR

ADD TO
LIST

MARKER
↓ CF

MARKER
▲

NEXT
PEAK

NEXT PK
RIGHT

NEXT PK
LEFT

More
1 of 2

LOG REF 70.0 dBμV

10
dB/
ATTN
10 dB

PASS LIMIT

VA SB
SC FC
ACORR

START 150 kHz STOP 30.00 MHz
RL #1F BW 9.0 kHz AVG BW 30 kHz SWP 2.49 sec



Plot B 3

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequencies 2412/2442/2472 MHz, 17 dBi antenna

13:16:30 FEB 10, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 9.7 kHz
61.65 dB μ V/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

LOG REF 110.0 dB μ V/m

10
dB/
ATN
30 dB

VA SB
SC FC
ACORR

START 9.0 kHz STOP 150.0 kHz
RL #1F BW 200 Hz AVG BW 300 Hz SWP 10.3 sec



Plot B 4

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequencies 2412/2442/2472 MHz, 17 dBi antenna

13:19:27 FEB 10, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 500 kHz
47.18 dB μ V/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

LOG REF 100.0 dB μ V/m

10
dB/
ATN
20 dB

VA SB
SC FC
ACORR

START 150 kHz STOP 30.00 MHz
RL #1F BW 9.0 kHz AVG BW 30 kHz SWP 2.49 sec



Plot B 5

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2412 MHz, 17 dBi antenna

14:48:15 FEB 09, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 261.5 MHz
36.88 dB μ V/m

MEASURE
AT MKR

ADD TO
LIST

CLEAR
WRITE B

MAX
HOLD B

VIEW B

BLANK B

Trace
A B C

More
1 of 3

LOG REF 60.0 dB μ V/m

10
dB/
#ATN
0 dB

VA SB
SC FC
ACORR

START 30.0 MHz

RL #1F BW 1.0 MHz

#AVG BW 10 kHz

STOP 1.0000 GHz

SWP 700 msec



Plot B 6

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2412 MHz, 17 dBi antenna

14:34:40 FEB 09, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 1.660 GHz
58.17 dB μ V/m

MEASURE
AT MKR

ADD TO
LIST

MARKER
↓ CF

MARKER
△

NEXT
PEAK

NEXT PK
RIGHT

NEXT PK
LEFT

More
1 of 2

LOG REF 70.0 dB μ V/m

10
dB/
#ATN
0 dB

VA SB
SC FC
ACORR

START 1.000 GHz

RL #1F BW 1.0 MHz

#AVG BW 10 kHz

STOP 2.000 GHz

SWP 300 msec



Plot B 7

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2412 MHz, 17 dBi antenna

14:33:11 FEB 09, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 1.66005 GHz
44.82 dB μ V/m

MEASURE
AT MKR

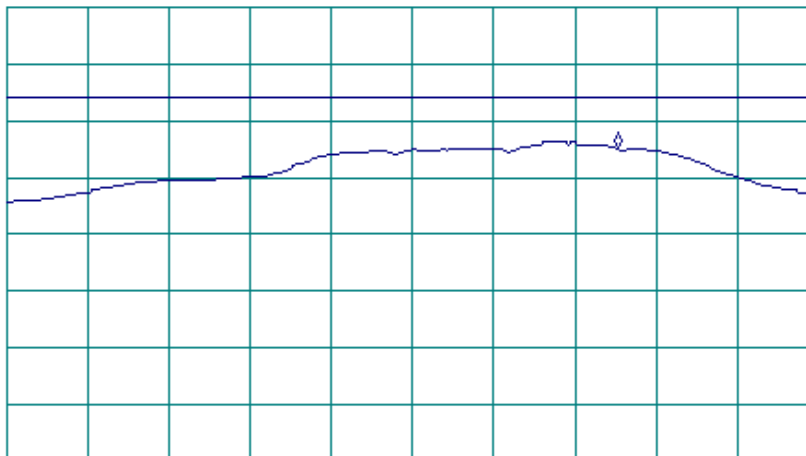
ADD TO
LIST

HOLD

LOG REF 70.0 dB μ V/m

10
dB/
#ATN
0 dB

VA SB
SC FC
ACORR



DSP LINE
ON OFF

Change
Title

Display
Config

INTENSITY

CENTER 1.65500 GHz

RL #1F BW 1.0 MHz

#AVG BW 10 Hz

SPAN 20.00 MHz

SWP 6.00 sec

More

1 of 2



Plot B 8

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2412 MHz, 17 dBi antenna

09:14:10 FEB 11, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 2.3871 GHz
57.89 dBμV/m

MEASURE
A1 MKR
ADD TO
LIST

CLEAR
WRITE A

MAX
HOLD A

VIEW A

BLANK A

Trace
A B C

More
1 of 3

LOG REF 70.0 dBμV/m

10
dB/
A1N
10 dB

MA SB
SC FC
ACORR

START 2.0000 GHz STOP 2.3900 GHz
RL 11F BW 1.0 MHz 1AUG BW 10 kHz SWP 117 msec



Plot B 9

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2412 MHz, 17 dBi antenna

09:23:27 FEB 11, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 2.5814 GHz
47.79 dBμV/m

MEASURE
A1 MKR
ADD TO
LIST

LOG REF 70.0 dBμV/m

PREAMP ON

CLEAR
WRITE A

10
dB/
A1N
10 dB

MAX
HOLD A

VIEW A

VA SB
SC FC
ACORR

BLANK A

Trace
A B C

START 2.4835 GHz

STOP 2.9000 GHz

RL 11F BW 1.0 MHz

AVG BW 10 kHz

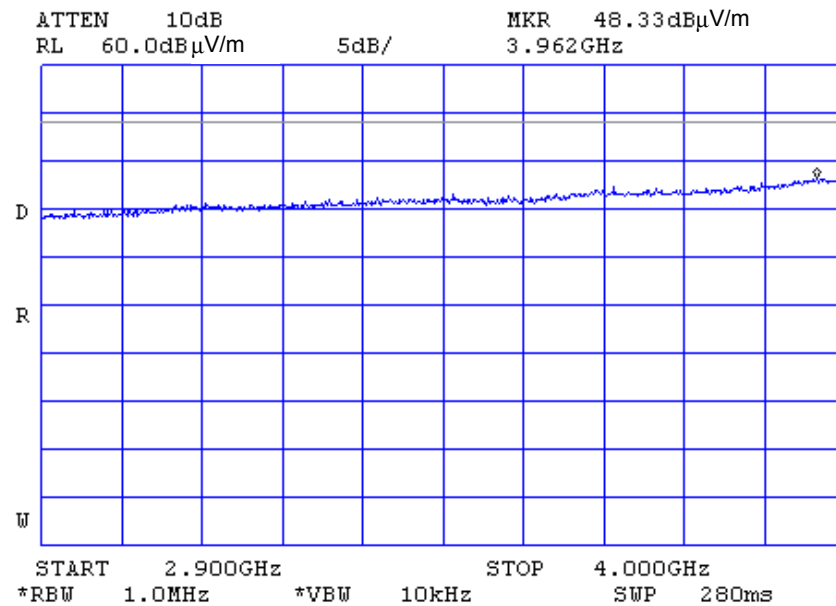
SWP 125 nsec

More
1 of 3



Plot B 10

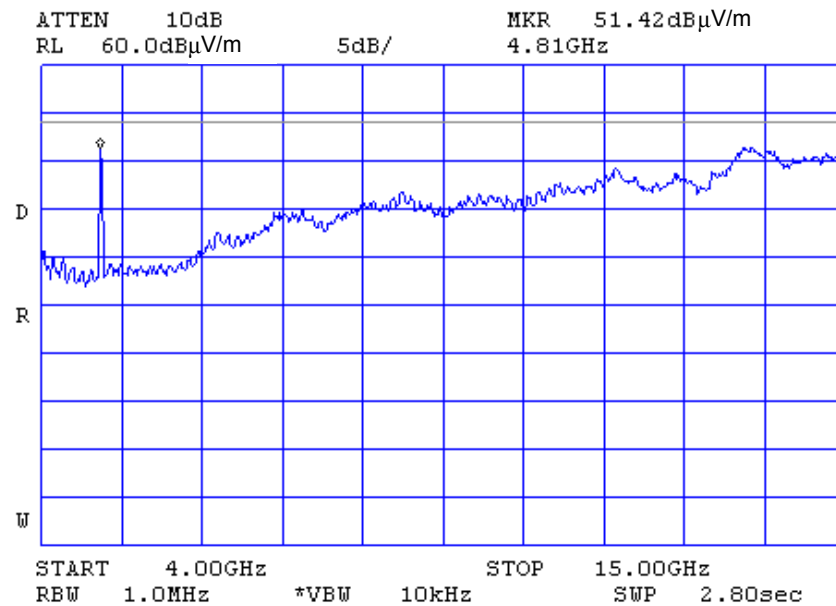
Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2412 MHz, 17 dBi antenna





Plot B 11

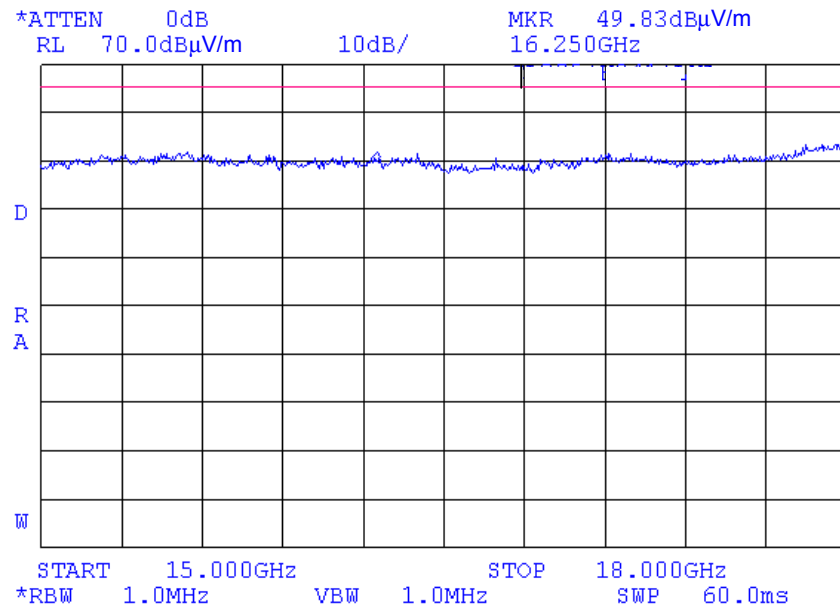
Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2412 MHz, 17 dBi antenna





Plot B 12

Radiated spurious emission measurements at the OATS @ 3 m distance,
carrier frequency 2412 MHz, 17 dBi antenna

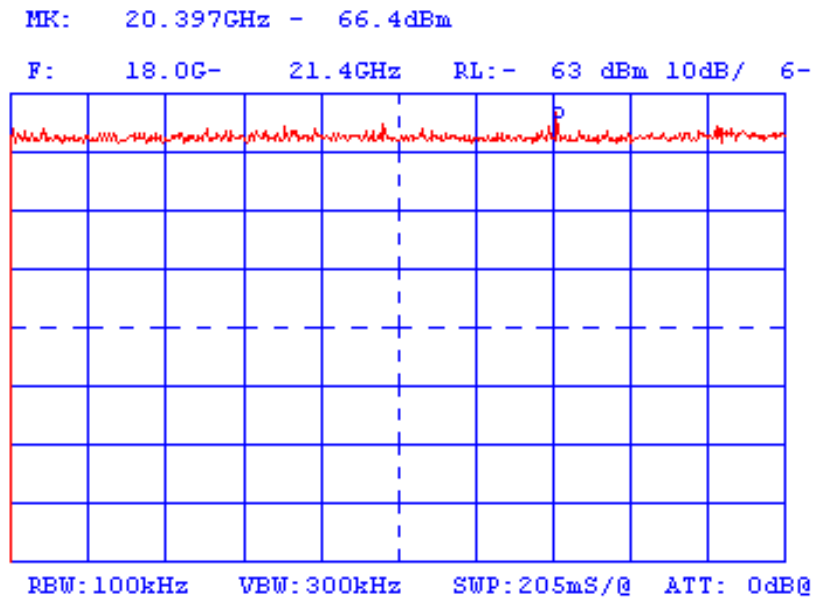


16.250 GHz – ambient noise



Plot B 13

Radiated spurious emission measurements in the anechoic chamber @ 1 m distance,
carrier frequency 2412 MHz, 17 dBi antenna



No spurious were found

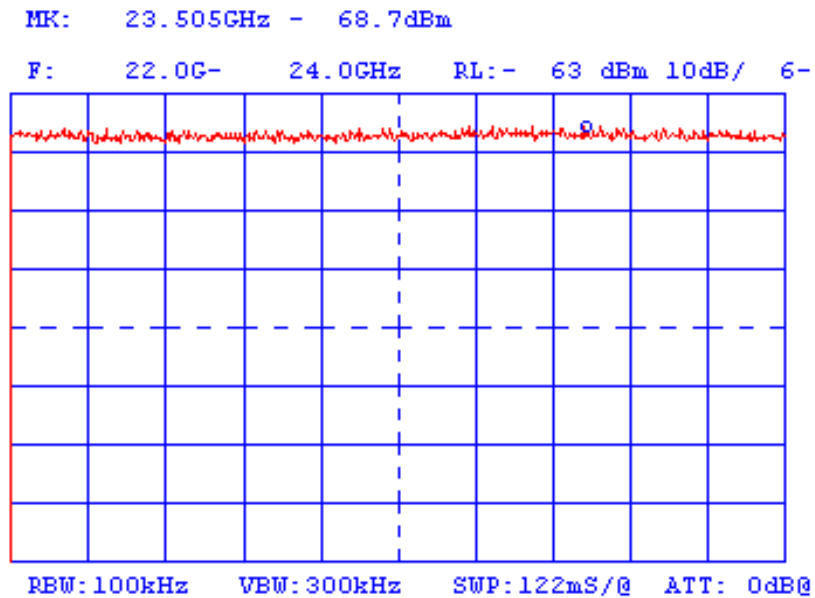
U_{SA} : -66.4 dBm = 40.6 dB μ V/m

Noise level: $U_{SA} + AF - \text{Ampl. gain} = 40.6 \text{ dB}(\mu\text{V/m}) + 32 \text{ dB}(1/\text{m}) - 43 \text{ dB} = 30 \text{ dB}(\mu\text{V/m})$



Plot B 14

Radiated spurious emission measurements in the anechoic chamber @ 1 m distance,
carrier frequency 2412 MHz, 17 dBi antenna



No spurious were found

U_{SA} : -68.7 dBm = 38.3 dB μ V/m

Noise level: $U_{SA} + AF - \text{Ampl. gain} = < 30 \text{ dB}(\mu\text{V/m})$



Plot B 15

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2442 MHz, 17 dBi antenna

15:11:44 FEB 09, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 264.1 MHz
36.89 dB μ V/m

MEASURE
AT MKR

ADD TO
LIST

CLEAR
WRITE B

MAX
HOLD B

VIEW B

BLANK B

Trace
A B C

More
1 of 3

LOG REF 60.0 dB μ V/m

10
dB/
#ATN
0 dB

VA SB
SC FC
ACORR

START 30.0 MHz

RL #1F BW 120 kHz

AVG BW 300 kHz

STOP 1.0000 GHz

SWP 909 msec



Plot B 16

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2442 MHz, 17 dBi antenna

15:16:33 FEB 09, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 1.705 GHz
50.21 dB μ V/m

MEASURE
AT MKR

ADD TO
LIST

MARKER
↓ CF

MARKER
△

NEXT
PEAK

NEXT PK
RIGHT

NEXT PK
LEFT

More
1 of 2

LOG REF 60.0 dB μ V/m

10
dB/
#ATN
0 dB

VA SB
SC FC
ACORR

START 1.000 GHz

RL #1F BW 1.0 MHz

#AVG BW 30 kHz

STOP 2.000 GHz

SWP 100 msec



Plot B 17

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2442 MHz, 17 dBi antenna

09:58:56 FEB 11, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 2.3812 GHz
60.90 dBμV/m

MEASURE
A1 MKR
ADD TO
LIST

CLEAR
WRITE A

MAX
HOLD A

VIEW A

BLANK A

Trace
A B C

More
1 of 3

LOG REF 70.0 dBμV/m

10
dB/
A1N
10 dB

VA SB
SC FC
ACORR

START 2.0000 GHz STOP 2.3900 GHz
RL 11F BW 1.0 MHz 1AUG BW 10 kHz SWP 117 nsec



Plot B 18

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2442 MHz, 17 dBi antenna

10:07:13 FEB 11, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 2.4835 GHz
59.94 dB μ V/m

MEASURE
A1 MKR
ADD TO
LIST

CLEAR
WRITE A

MAX
HOLD A

VIEW A

BLANK A

Trace
A B C

More
1 of 3

LOG REF 70.0 dB μ V/m

10

dB/

A1N

10 dB

VA SB

SC FC

ACORR

START 2.4835 GHz

RL 1F BW 1.0 MHz

AVG BW 10 kHz

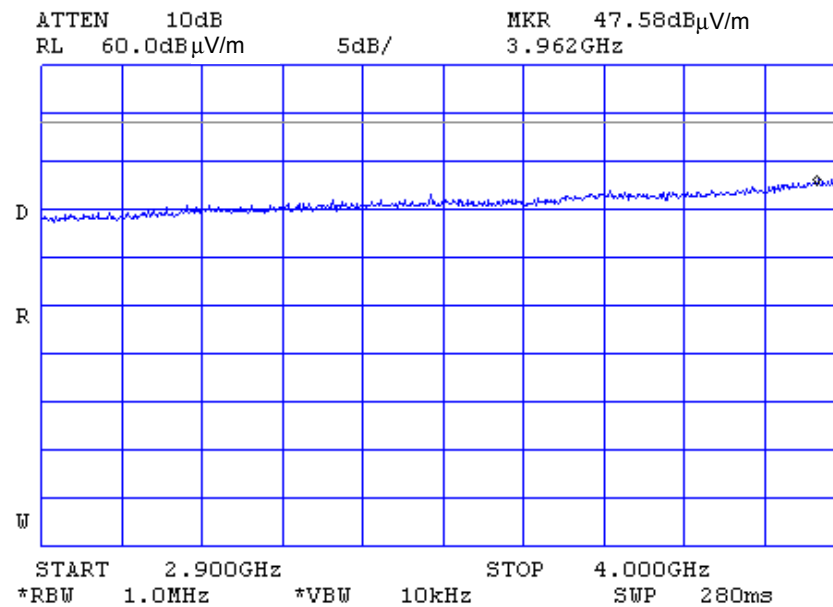
STOP 2.9000 GHz

SWP 125 msec



Plot B 19

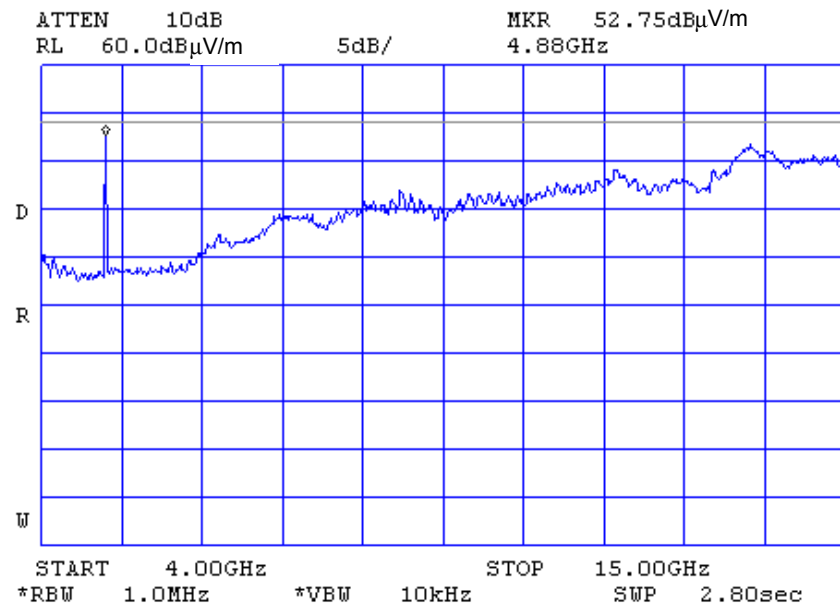
Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2442 MHz, 17 dBi antenna





Plot B 20

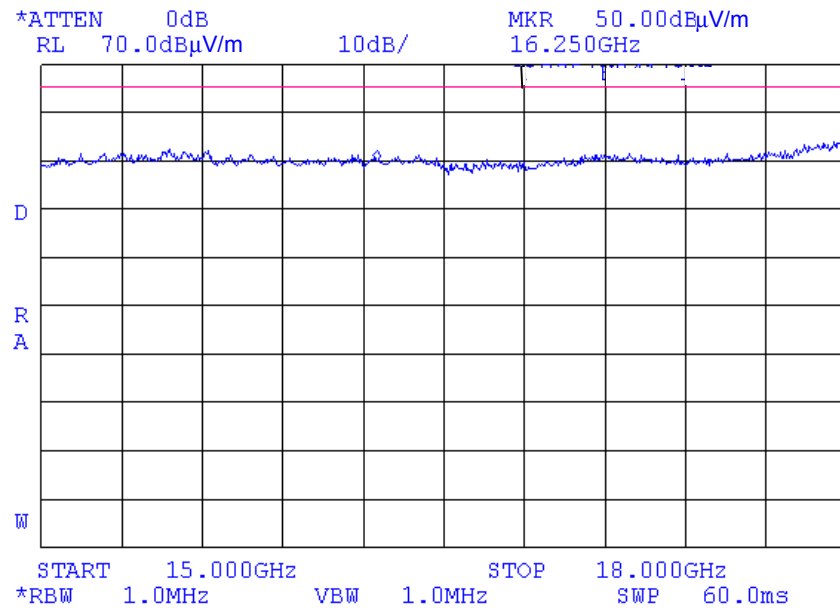
Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2442 MHz, 17 dBi antenna





Plot B 21

Radiated spurious emission measurements at the OATS @ 3 m distance,
carrier frequency 2442 MHz, 17 dBi antenna

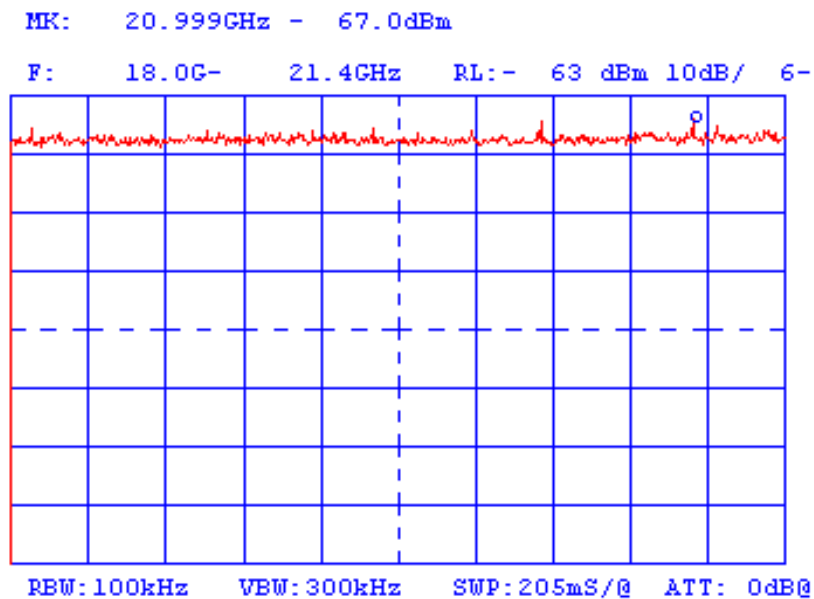


16.250 GHz – ambient noise



Plot B 22

Radiated spurious emission measurements in the anechoic chamber @ 1 m distance,
carrier frequency 2442 MHz, 17 dBi antenna



No spurious were found

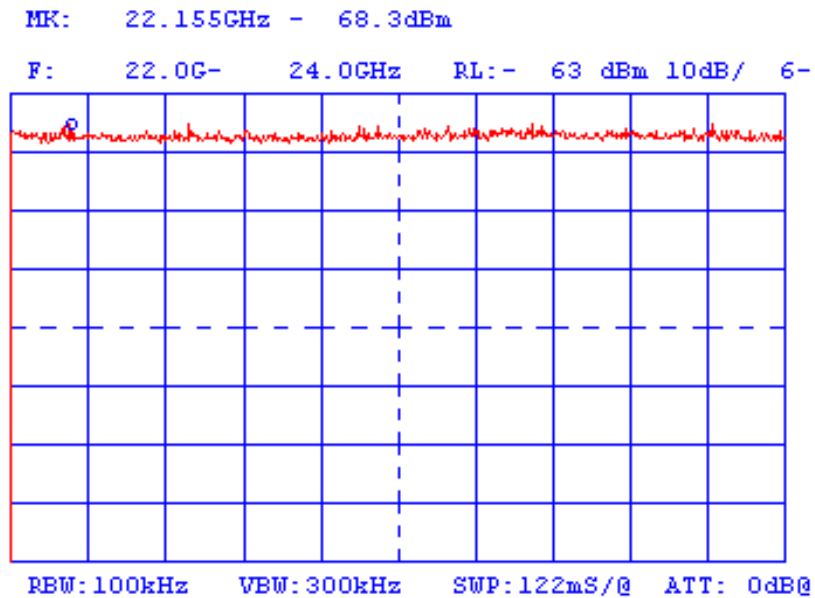
U_{SA} : -67.0 dBm = 40.0 dB μ V/m

Noise level: $U_{SA} + AF - \text{Ampl. gain} = 40.0 \text{ dB}(\mu\text{V/m}) + 32 \text{ dB}(1/\text{m}) - 43.5 \text{ dB} = 28.5 \text{ dB}(\mu\text{V/m})$



Plot B 23

Radiated spurious emission measurements in the anechoic chamber @ 1 m distance,
carrier frequency 2442 MHz, 17 dBi antenna



No spurious were found

U_{SA} : -68.3 dBm = 38.7 dB μ V/m

Noise level: $U_{SA} + AF - \text{Ampl. gain} = 38.7 \text{ dB}(\mu\text{V/m}) + 32 \text{ dB}(1/\text{m}) - 43 \text{ dB} = 27.7 \text{ dB}(\mu\text{V/m})$



Plot B 24

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2472 MHz, 17 dBi antenna

13:57:40 FEB 09, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 261.5 MHz
36.82 dB μ V/m

MEASURE
AT MKR

ADD TO
LIST

CLEAR
WRITE B

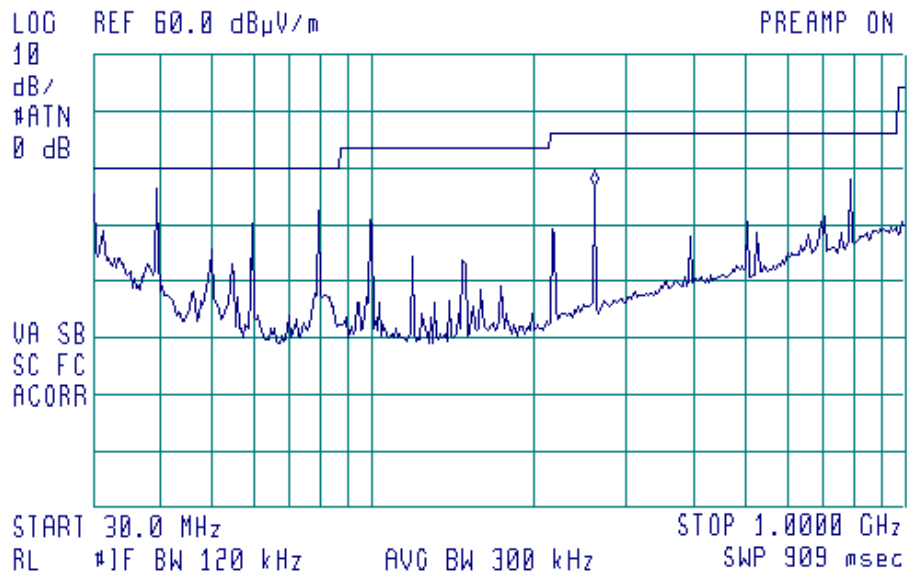
MAX
HOLD B

VIEW B

BLANK B

Trace
A B C

More
1 of 3





Plot B 25

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2472 MHz, 17 dBi antenna

14:00:22 FEB 09, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 1.980 GHz
48.34 dB μ V/m

MEASURE
AT MKR

ADD TO
LIST

MARKER
↓ CF

MARKER
△

NEXT
PEAK

NEXT PK
RIGHT

NEXT PK
LEFT

More
1 of 2

LOG REF 70.0 dB μ V/m

10
dB/
#ATN
0 dB

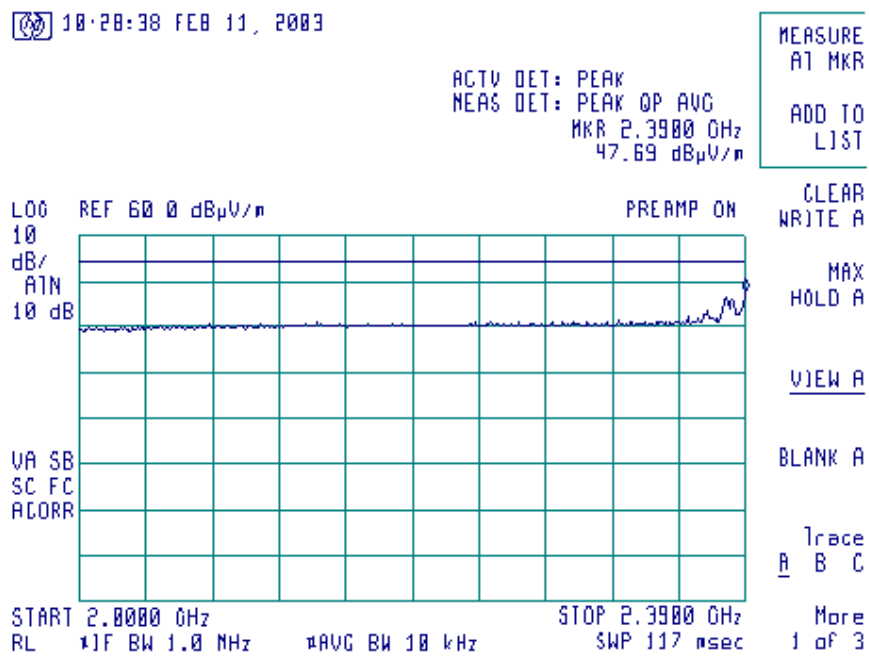
VA SB
SC FC
ACORR

START 1.000 GHz STOP 2.000 GHz
RL #1F BW 1.0 MHz #AVG BW 300 kHz SWP 20.0 msec



Plot B 26

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2472 MHz, 17 dBi antenna





Plot B 27

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2472 MHz, 17 dBi antenna

10:24:38 FEB 11, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 2.4866 GHz
59.84 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

LOG REF 70.0 dBμV/m

10

dB/

ATTN

10 dB

VA SB

SC FC

ACORR

START 2.4835 GHz

R 11F BW 1.0 MHz

1AVG BW 10 kHz

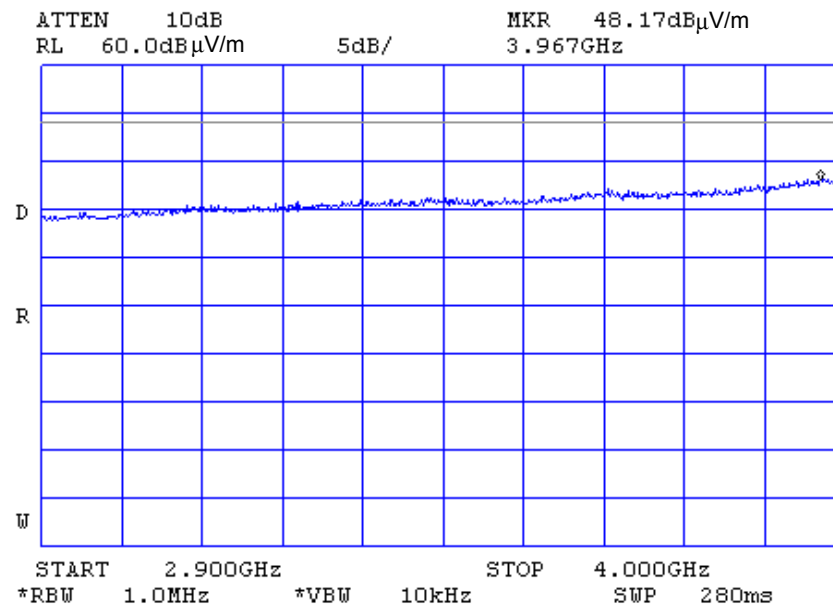
STOP 2.9000 GHz

SWP 125 msec



Plot B 28

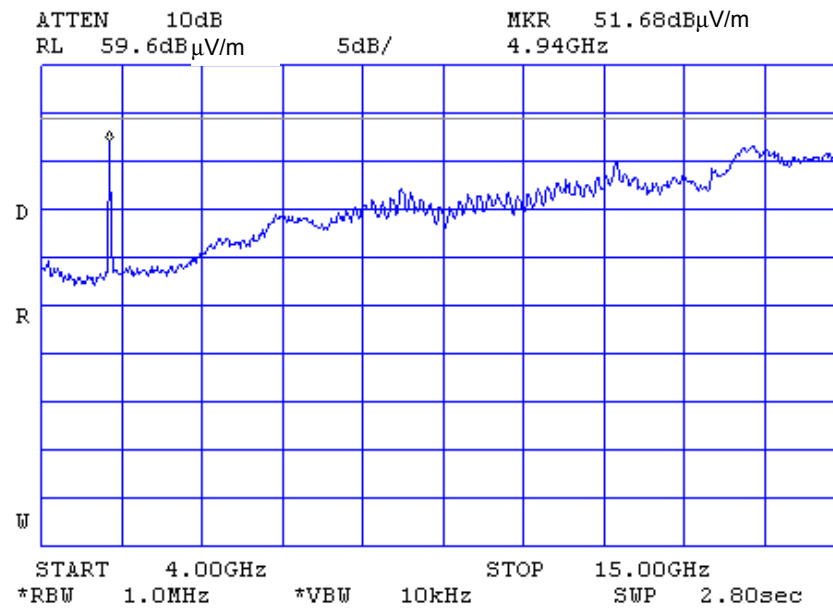
Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2472 MHz, 17 dBi antenna





Plot B 29

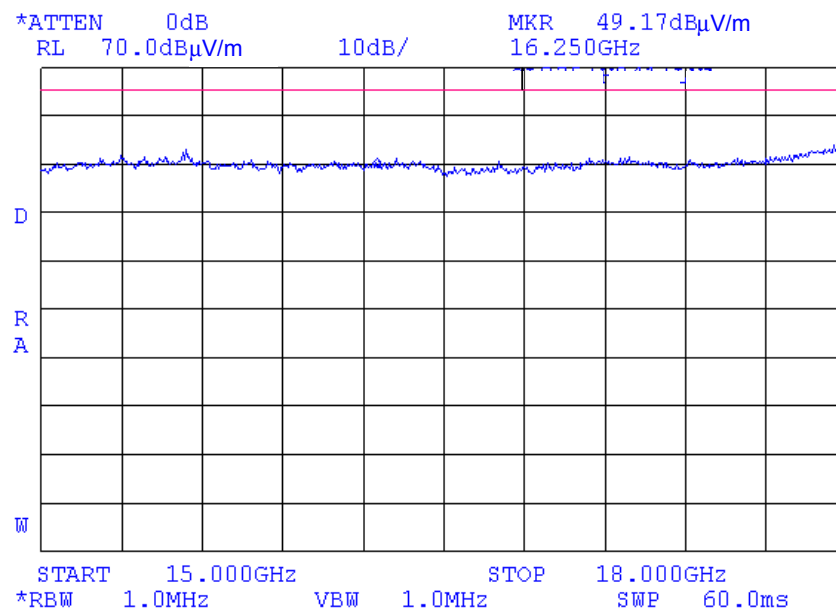
Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2472 MHz, 17 dBi antenna





Plot B 30

Radiated spurious emission measurements at the OATS @ 3 m distance,
carrier frequency 2472 MHz, 17 dBi antenna

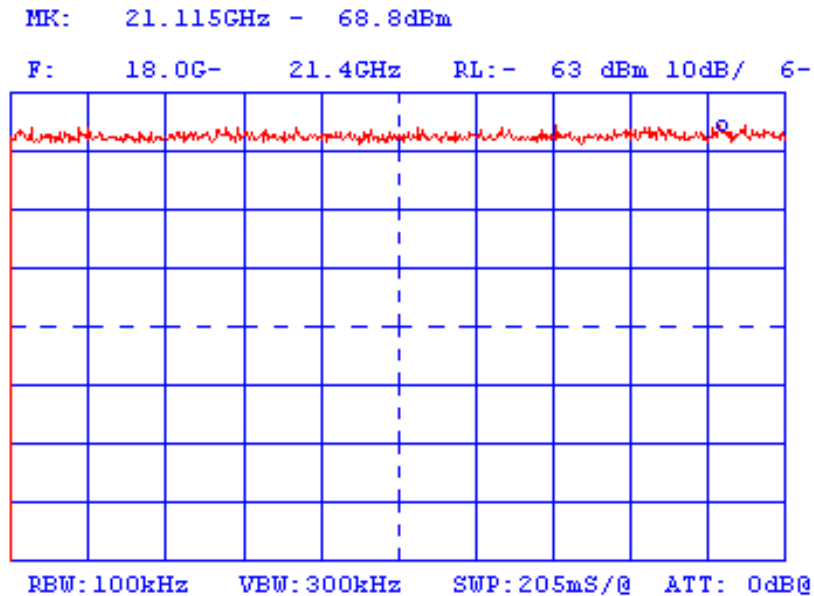


16.250 GHz – ambient noise



Plot B 31

Radiated spurious emission measurements in the anechoic chamber @ 1 m distance,
carrier frequency 2472 MHz, 17 dBi antenna



No spurious were found

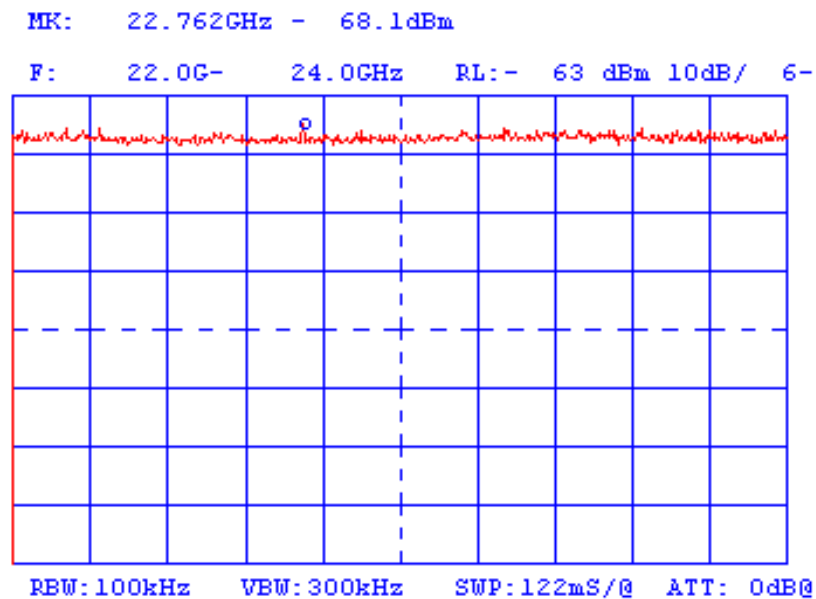
U_{SA} : -68.8 dBm = 38.2 dB μ V/m

Noise level: $U_{SA} + AF - \text{Ampl. gain} = 38.2 \text{ dB}(\mu\text{V/m}) + 32 \text{ dB}(1/\text{m}) - 43 \text{ dB} = 27.2 \text{ dB}(\mu\text{V/m})$



Plot B 32

Radiated spurious emission measurements in the anechoic chamber @ 1 m distance,
carrier frequency 2472 MHz, 17 dBi antenna



No spurious were found

U_{SA} : -68.1 dBm = 38.9 dB μ V/m

Noise level: $U_{SA} + AF - \text{Ampl. gain} = 38.9 \text{ dB}(\mu\text{V/m}) + 32 \text{ dB}(1/\text{m}) - 43 \text{ dB} = 27.9 \text{ dB}(\mu\text{V/m})$



Plot B 33

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequencies 2412/2442/2472 MHz, 13.5 dBi antenna

11:00:43 FEB 10, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 70.7 kHz
42.79 dB μ V/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

LOG REF 115.0 dB μ V/m

15
dB/
ATN
40 dB

VA SB
SC FC
ACORR

START 9.0 kHz

RL #1F BW 200 Hz

AVG BW 300 Hz

STOP 150.0 kHz

SWP 10.3 sec



Plot B 34

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequencies 2412/2442/2472 MHz, 13.5 dBi antenna

11:04:25 FEB 10, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 19.98 MHz
36.88 dB μ V/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

LOG REF 100.0 dB μ V/m

10
dB/
ATN
20 dB

VA SB
SC FC
ACORR

START 150 kHz STOP 30.00 MHz
RL #1F BW 9.0 kHz AVG BW 30 kHz SWP 2.49 sec



Plot B 35

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequencies 2412/2442/2472 MHz, 13.5 dBi antenna

09:11:48 FEB 10, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
Mkr 261.5 MHz
34.09 dB μ V/m

MEASURE
AT MKR

ADD TO
LIST

CLEAR
WRITE A

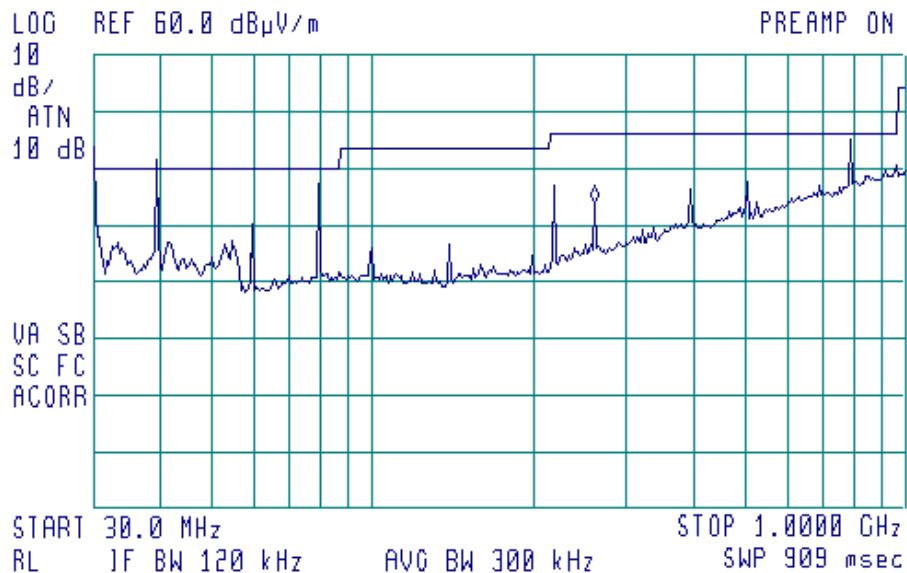
MAX
HOLD A

VIEW A

BLANK A

Trace
A B C

More
1 of 3





Plot B 36

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2412 MHz, 13.5 dBi antenna

11:32:36 FEB 10, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 1.660 GHz
46.62 dB μ V/m

MEASURE
AT MKR

ADD TO
LIST

CLEAR
WRITE A

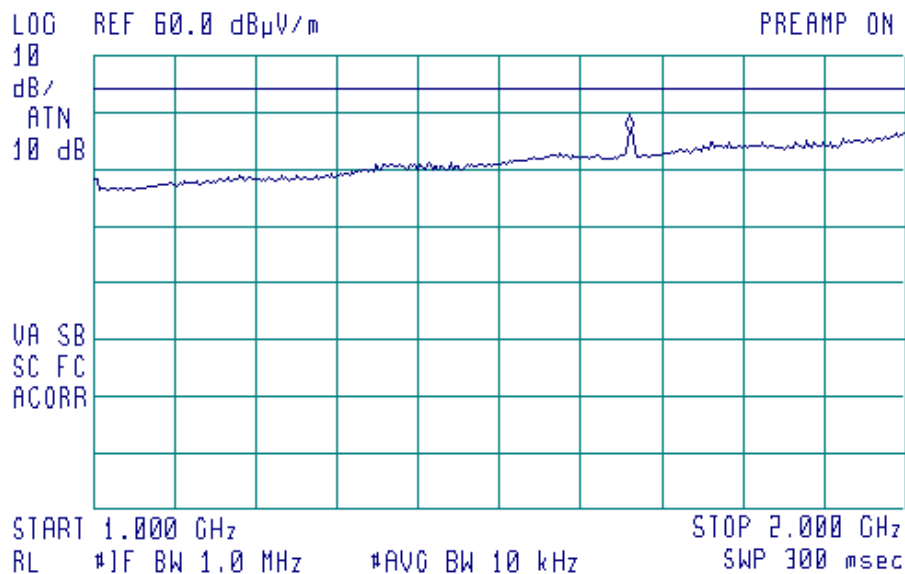
MAX
HOLD A

VIEW A

BLANK A

Trace
A B C

More
1 of 3





Plot B 37

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2412 MHz, 13.5 dBi antenna

16:51:17 FEB 10, 2003

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 2.3861 GHz
51.32 dBμV/m

MEASURE
AT MKR
ADD TO
LIST

LOG REF 70 0 dBμV/m

PREAMP ON

10
dB/
#AIN
0 dB

PASS LIMIT

CLEAR
WRITE A
MAX
HOLD A

VA SB
SC FC
ACORR

VIEW A

BLANK A

Trace
A B C

START 2.0000 GHz

STOP 2.3900 GHz

RL 11F BW 1.0 MHz

1AVG BW 10 kHz

SWP 117 nsec

More
1 of 3



Plot B 38

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2412 MHz, 13.5 dBi antenna

16:57:21 FEB 10, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 2.8927 GHz
42.28 dBμV/m

MEASURE
A1 MKR
ADD TO
LIST

LOG REF 70.0 dBμV/m

PREAMP ON

CLEAR
WRITE A

10
dB/
#ATTN
0 dB

PASS LIMIT

MAX
HOLD A

VIEW A

VA SB
SC FC
ACORR

BLANK A

Trace
A B C

START 2.4835 GHz

STOP 2.9000 GHz

RL 11F BW 1.0 MHz

AVG BW 10 kHz

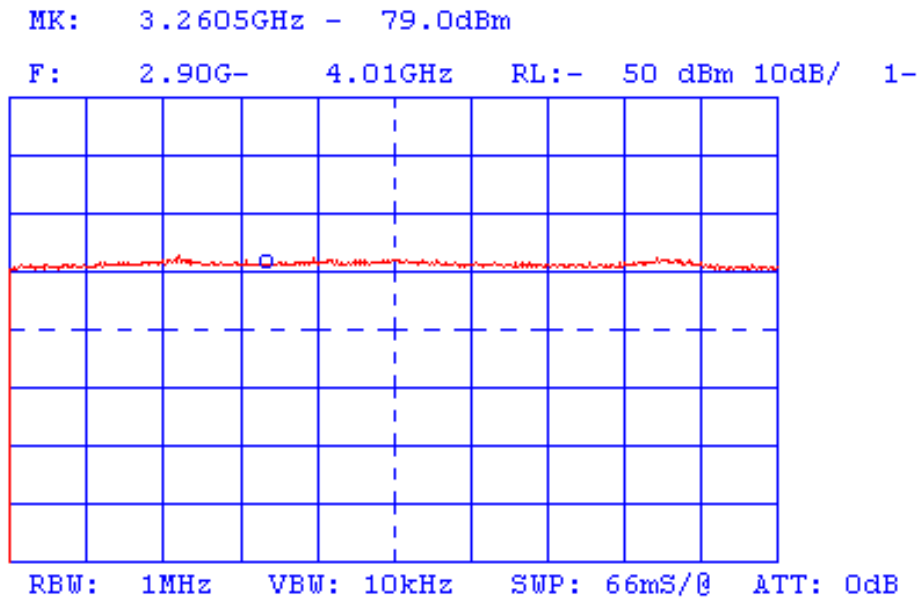
SWP 125 nsec

More
1 of 3



Plot B 39

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2412 MHz, 13.5 dBi antenna

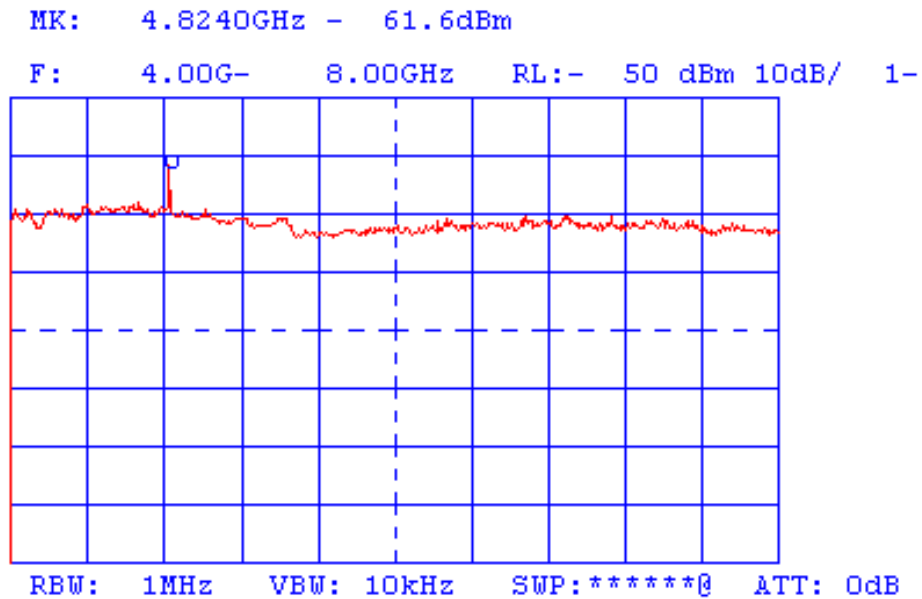


Average Limit = 54 dBuV/m
Usa+AF+Closs-Amplif.gain
 $28+32.5+1.8-20=42.3$ dBuV/m



Plot B 40

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2412 MHz, 13.5 dBi antenna

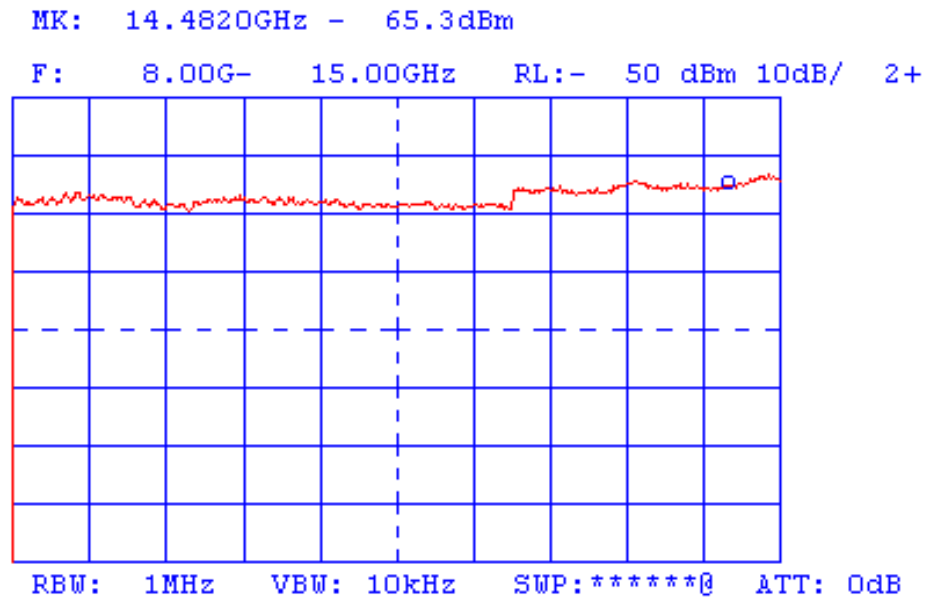


Average Limit = 54 dBuV/m
Usa+AF+Closs-Amplif.gain
Peak 49.6+35+1.9-37 =49.3 dBuV/m
Average-34+35+1.9-37 = 33.9 dBuV/m



Plot B 41

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2412 MHz, 13.5 dBi antenna

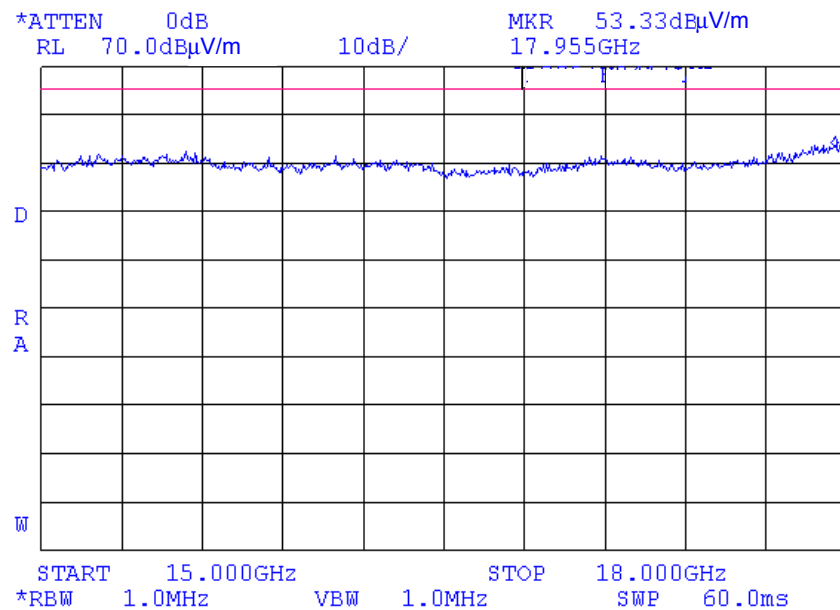


Limit = 54 dBuV/m
Usa+AF+Closs-Amplif.gain
 $41.7+38+4.2-35 = 48.9$ dBuV/m



Plot B 42

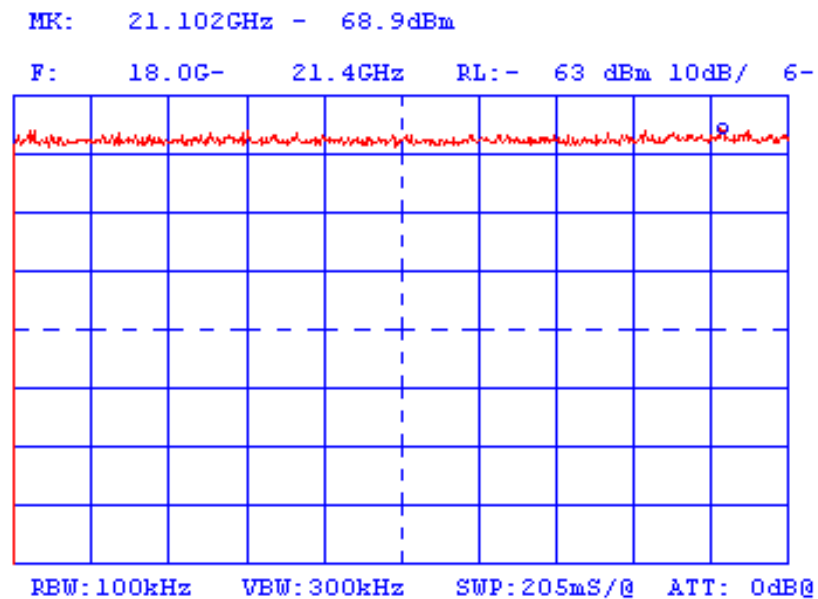
Radiated spurious emission measurements at the OATS @ 3 m distance,
carrier frequency 2412 MHz, 13.5 dBi antenna





Plot B 43

Radiated spurious emission measurements in the anechoic chamber @ 1 m distance,
carrier frequency 2412 MHz, 13.5 dBi antenna



No spurious were found

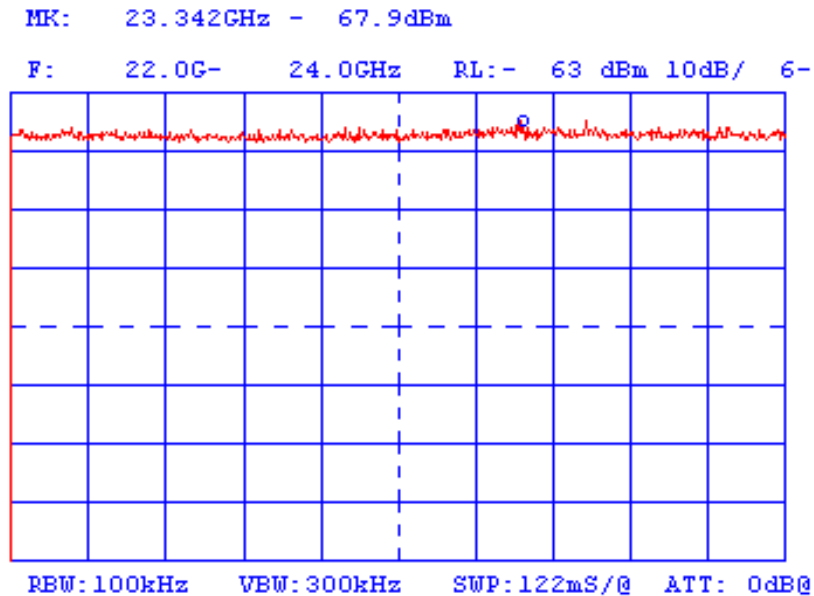
U_{SA} : -68.9 dBm = 38.1 dB μ V/m

Noise level: U_{SA} + AF - Ampl. gain = 38.1 dB(μ V/m) + 32 dB(1/m) - 43 dB = 27.1 dB(μ V/m)



Plot B 44

Radiated spurious emission measurements in the anechoic chamber @ 1 m distance,
carrier frequency 2412 MHz, 13.5 dBi antenna



No spurious were found

U_{SA} : -67.9 dBm = 39.1 dB μ V/m

Noise level: U_{SA} + AF - Ampl. gain = 39.1 dB(μ V/m) + 32 dB(1/m) - 43 dB = 28.1 dB(μ V/m)



Plot B 45

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2442 MHz, 13.5 dBi antenna

09:30:30 FEB 10, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
Mkr 1.905 GHz
34.17 dB μ V/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

LOG REF 60.0 dB μ V/m

PREAMP ON

10
dB/
#ATN
0 dB

VA SB
SC FC
ACORR

START 1.000 GHz

STOP 2.000 GHz

RL #1F BW 1.0 MHz

#AVG BW 10 kHz

SWP 300 msec



Plot B 46

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2442 MHz, 13.5 dBi antenna

14:52:54 FEB 10, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 2.3812 GHz
42.52 dBμV/m

MEASURE
A1 MKR

ADD TO
LIST

CLEAR
WRITE A

MAX
HOLD A

VIEW A

BLANK A

Trace
A B C

More
1 of 3

LOG REF 60 0 dBμV/m

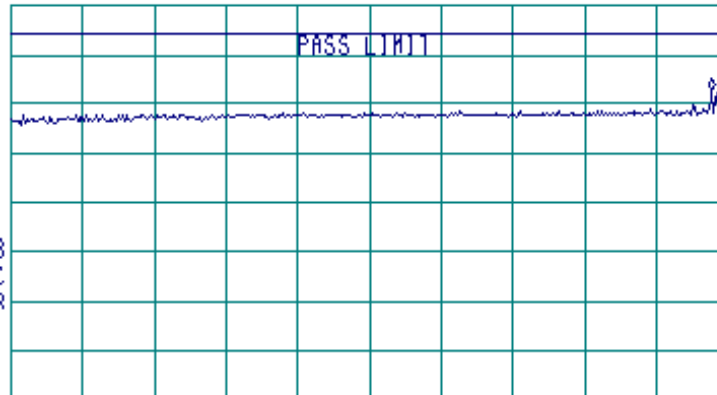
PREAMP ON

10
dB/
#AIN
0 dB

VA SB
SC FC
ACORR

START 2.0000 GHz STOP 2.3900 GHz
RL 1F BW 1.0 MHz AVG BW 10 kHz SWP 117 nsec

PASS LIMIT





Plot B 47

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2442 MHz, 13.5 dBi antenna

15:04:25 FEB 10, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 2.4900 GHz
42.73 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

LOG REF 60 0 dBμV/m

PREAMP ON

10
dB/
#ATTN
0 dB

PASS LIMIT

VA SB
SC FC
ACORR

START 2.4835 GHz

RL 1F BW 1.0 MHz

#AVG BW 10 kHz

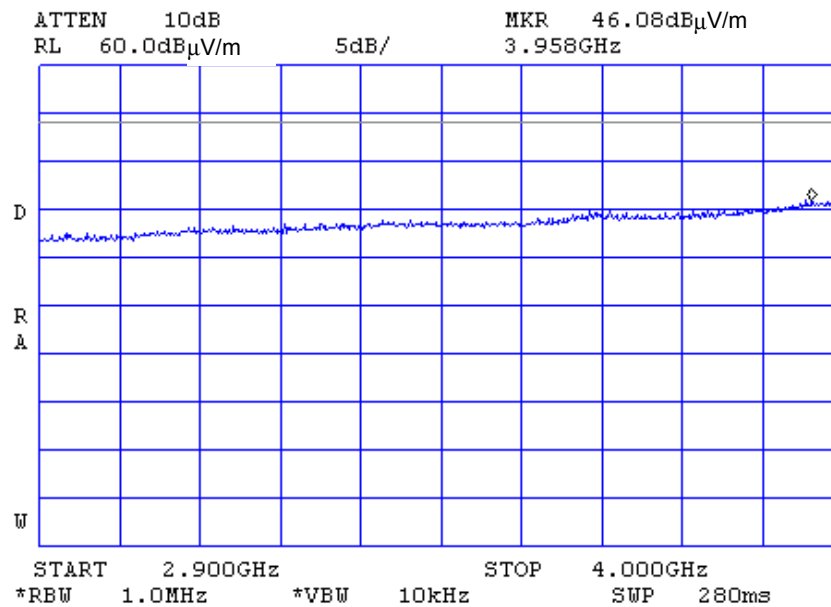
STOP 2.9000 GHz

SWP 125 msec



Plot B 48

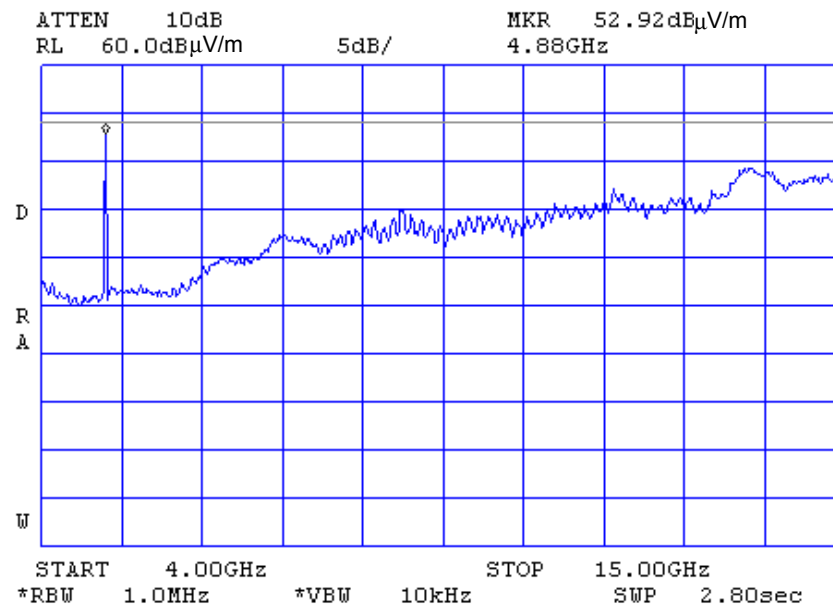
Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2442 MHz, 13.5 dBi antenna





Plot B 49

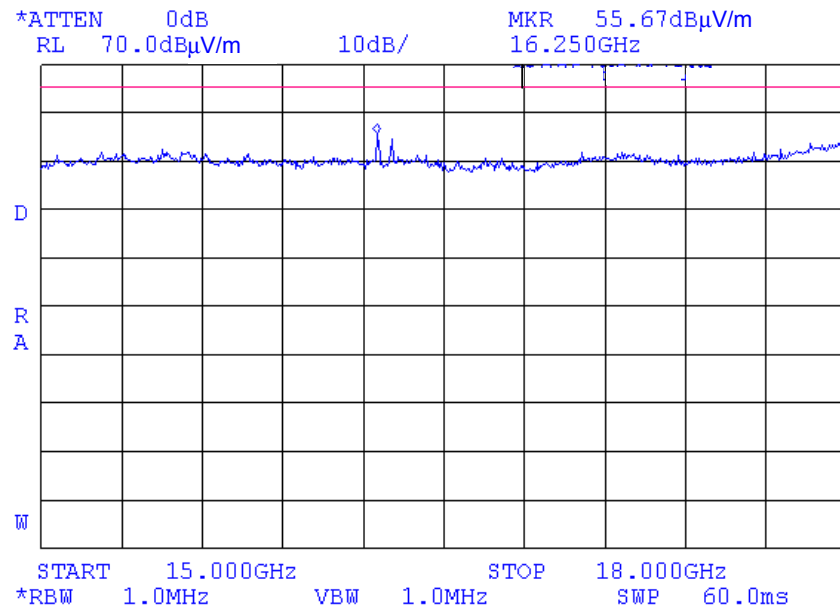
Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2442 MHz, 13.5 dBi antenna





Plot B 50

Radiated spurious emission measurements at the OATS @ 3 m distance,
carrier frequency 2442 MHz, 13.5 dBi antenna

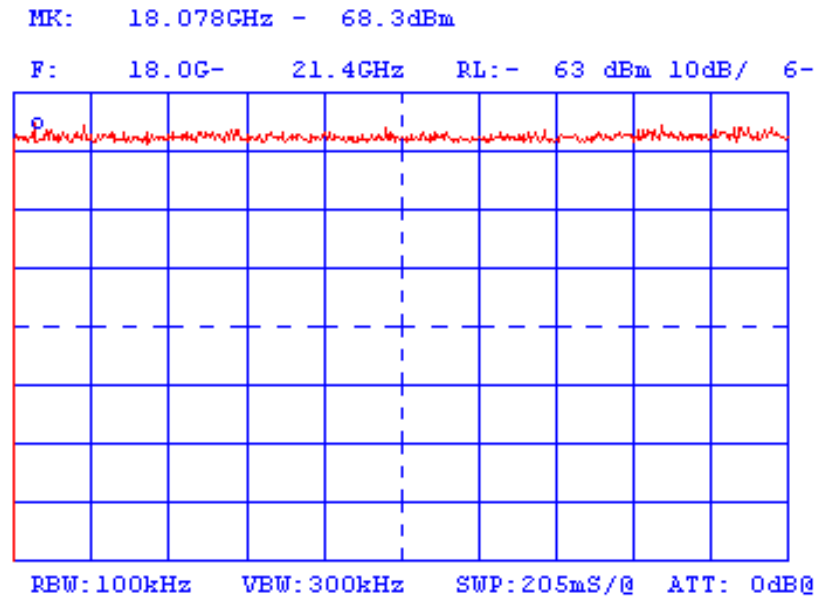


16.250 GHz-ambient noise



Plot B 51

Radiated spurious emission measurements in the anechoic chamber @ 1 m distance,
carrier frequency 2442 MHz, 13.5 dBi antenna



No spurious were found

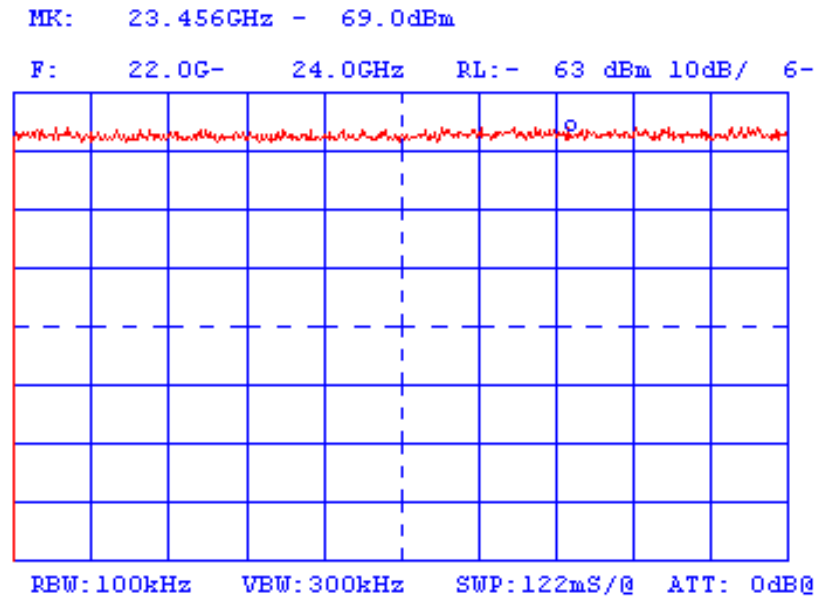
U_{SA} : -68.3 dBm = 38.7 dB μ V/m

Noise level: U_{SA} + AF - Ampl. gain = 38.7 dB(μ V/m) + 32 dB(1/m) - 43 dB = 27.7 dB(μ V/m)



Plot B 52

Radiated spurious emission measurements in the anechoic chamber @ 1 m distance,
carrier frequency 2442 MHz, 13.5 dBi antenna



No spurious were found

U_{SA} : -69.0 dBm = 38.0 dB μ V/m

Noise level: $U_{SA} + AF - \text{Ampl. gain} = 38.0 \text{ dB}(\mu\text{V/m}) + 32 \text{ dB}(1/\text{m}) - 43 \text{ dB} = 27.0 \text{ dB}(\mu\text{V/m})$



Plot B 53

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2472 MHz, 13.5 dBi antenna

10:01:45 FEB 10, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 1.723 GHz
37.85 dB μ V/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

LOG REF 60.0 dB μ V/m

PREAMP ON

10
dB/
#ATN
0 dB

VA SB
SC FC
ACORR

START 1.000 GHz

STOP 2.000 GHz

RL #1F BW 1.0 MHz

#AVG BW 10 kHz

SWP 300 msec



Plot B 54

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2472 MHz, 13.5 dBi antenna

17:02:46 FEB 10, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 2.2525 GHz
39.46 dBμV/m

MEASURE
A1 MKR
ADD TO
LIST

LOG REF 70.0 dBμV/m

PREAMP ON

CLEAR
WRITE A

10
dB/
#AIN
0 dB

PASS LIMIT

MAX
HOLD A

VIEW A

MA SB
SC FC
ACORR

BLANK A

Trace
A B C

START 2.0000 GHz

STOP 2.3900 GHz

RL 11F BW 1.0 MHz

AVG BW 10 kHz

SWP 117 nsec

More
1 of 3



Plot B 55

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2472 MHz, 13.5 dBi antenna

17:26:08 FEB 10, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 2.4877 GHz
55.13 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

LOG REF 70.0 dBμV/m

PREAMP ON

10
dB/
#ATTN
0 dB

VA SB
SC FC
ACORR

START 2.4835 GHz

RL 11F BW 1.0 MHz

1AVG BW 10 kHz

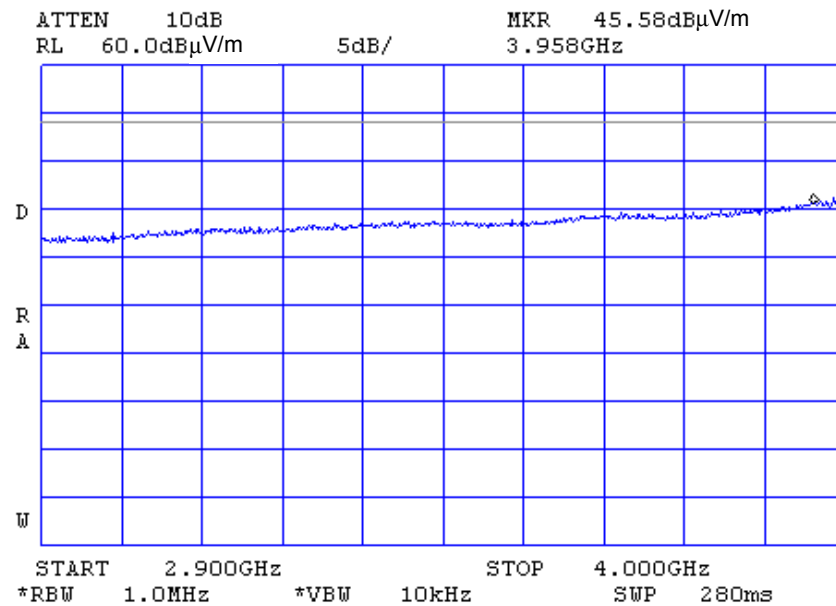
STOP 2.9000 GHz

SWP 125 msec



Plot B 56

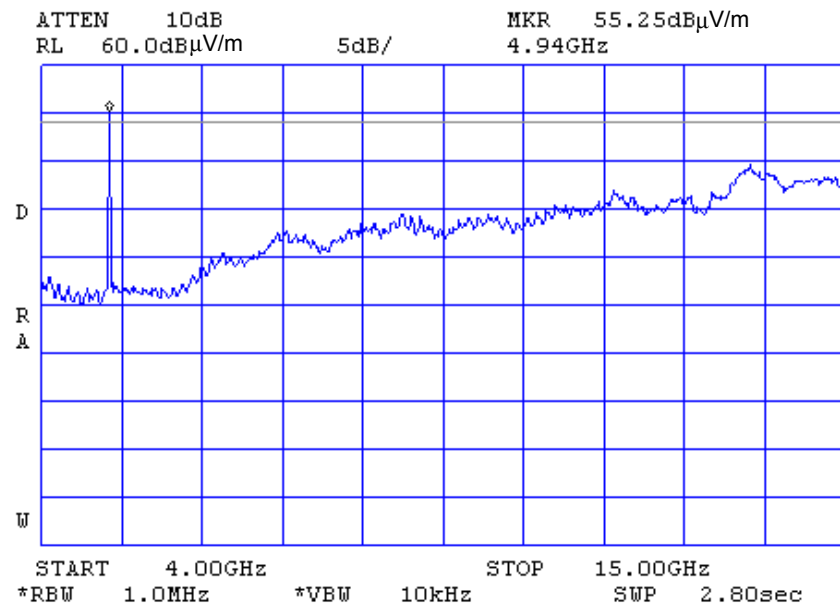
Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2472 MHz, 13.5 dBi antenna





Plot B 57

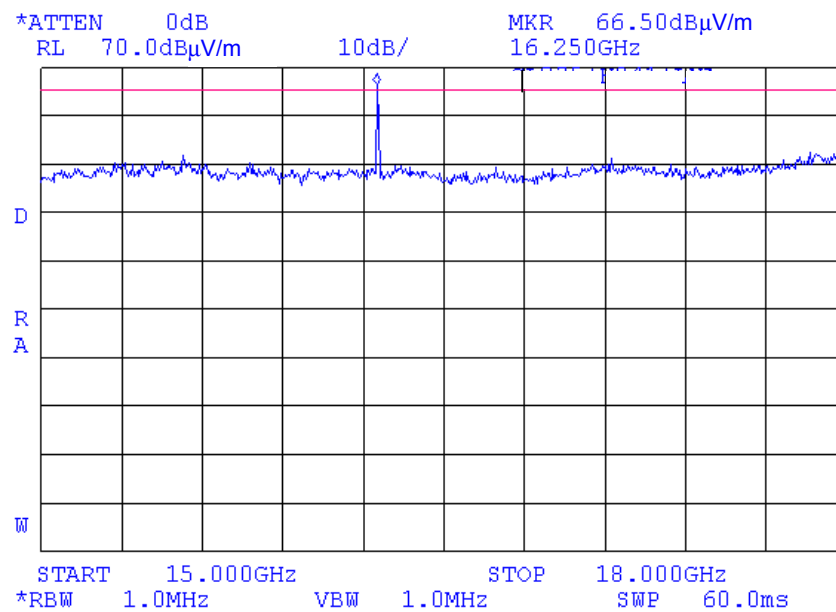
Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2472 MHz, 13.5 dBi antenna





Plot B 58

Radiated spurious emission measurements at the OATS @ 3 m distance,
carrier frequency 2472 MHz, 13.5 dBi antenna

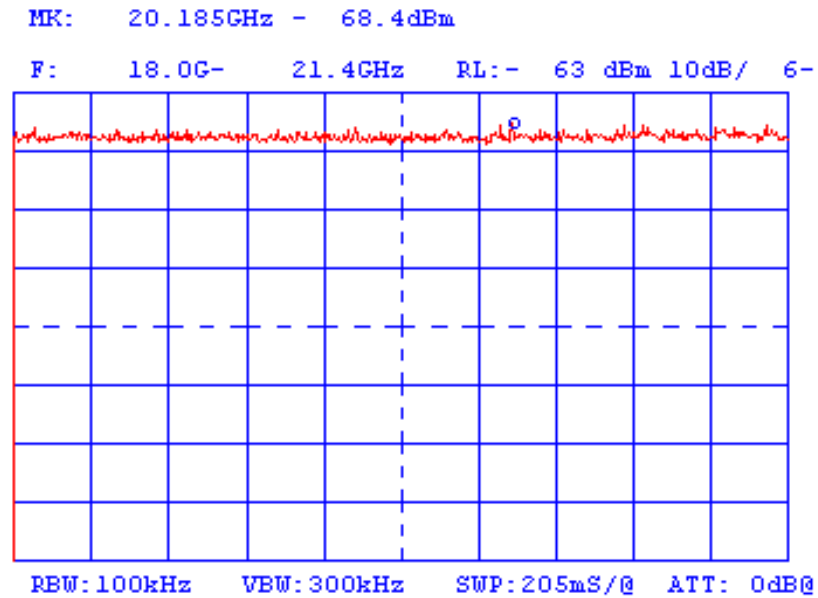


16.250 GHz-ambient noise



Plot B 59

Radiated spurious emission measurements in the anechoic chamber @ 1 m distance,
carrier frequency 2472 MHz, 13.5 dBi antenna



No spurious were found

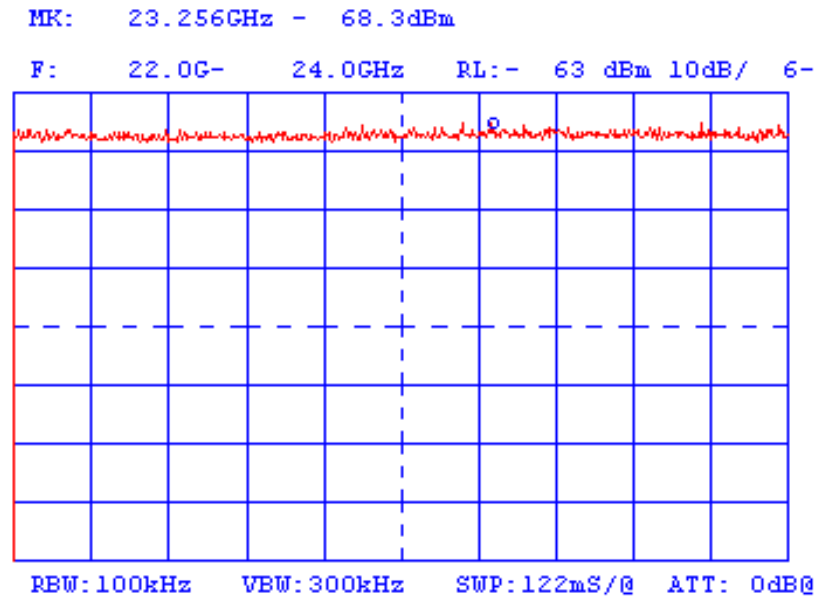
U_{SA} : -68.4 dBm = 38.6 dB μ V/m

Noise level: U_{SA} + AF - Ampl. gain = 38.6 dB(μ V/m) + 32 dB(1/m) - 43 dB = 27.6 dB(μ V/m)



Plot B 60

Radiated spurious emission measurements in the anechoic chamber @ 1 m distance,
carrier frequency 2472 MHz, 13.5 dBi antenna



No spurious were found

U_{SA} : -68.3 dBm = 38.7 dB μ V/m

Noise level: U_{SA} + AF - Ampl. gain = 38.7 dB(μ V/m) + 32 dB(1/m) - 43 dB = 27.7 dB(μ V/m)



Plot B 61

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequencies 2412/2442/2472 MHz, 18 dBi antenna

12:25:40 FEB 10, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 11.1 kHz
55.34 dB μ V/m

MEASURE
AT MKR

ADD TO
LIST

MARKER
↓ CF

MARKER
△

NEXT
PEAK

NEXT PK
RIGHT

NEXT PK
LEFT

More
1 of 2

LOG REF 110.0 dB μ V/m
10
dB/
ATN
30 dB

VA SB
SC FC
ACORR

START 9.0 kHz STOP 150.0 kHz
RL #1F BW 200 Hz AVG BW 300 Hz SWP 10.3 sec



Plot B 62

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequencies 2412/2442/2472 MHz, 18 dBi antenna

12:28:51 FEB 10, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
Mkr 19.98 MHz
48.64 dB μ V/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

LOG REF 100.0 dB μ V/m
10
dB/
ATN
20 dB

VA SB
SC FC
ACORR

START 150 kHz STOP 30.00 MHz
RL #1F BW 9.0 kHz AVG BW 30 kHz SWP 2.49 sec



Plot B 63

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequencies 2412/2442/2472 MHz, 18 dBi antenna

11:56:24 FEB 10, 2003

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 261.5 MHz
34.60 dB μ V/m

MEASURE
AT MKR

ADD TO
LIST

CLEAR
WRITE A

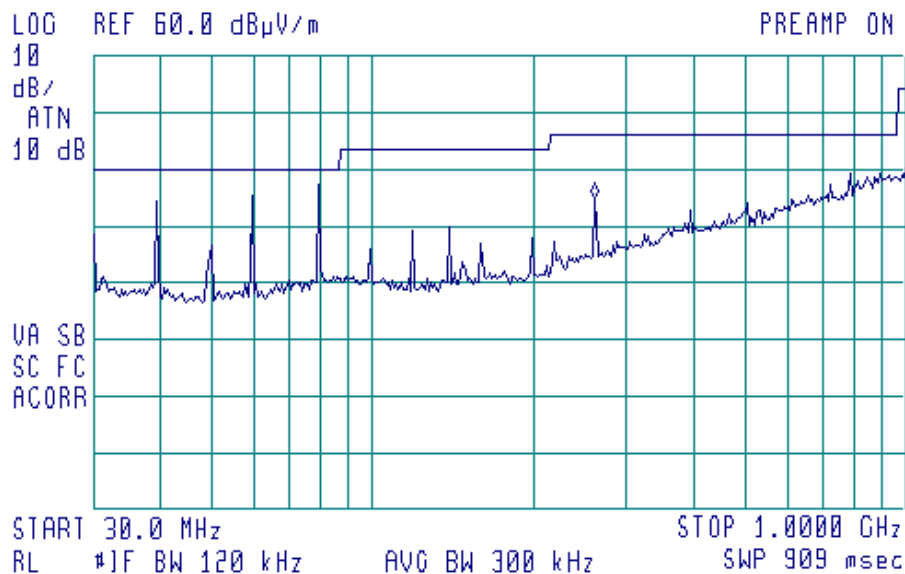
MAX
HOLD A

VIEW A

BLANK A

Trace
A B C

More
1 of 3





Plot B 64

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2412 MHz, 18 dBi antenna

11:45:41 FEB 10, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 1.660 GHz
44.59 dB μ V/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

LOG REF 60.0 dB μ V/m

PREAMP ON

10
dB/
ATN
10 dB

VA SB
SC FC
ACORR

START 1.000 GHz

STOP 2.000 GHz

RL #1F BW 1.0 MHz

#AVG BW 10 kHz

SWP 300 msec



Plot B 65

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2412 MHz, 18 dBi antenna

16:34:24 FEB 10, 2003

ACTV DET: PEAK
NEAS DET: PEAK OP AVG
MKR 2.3871 GHz
51.89 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

LOG REF 70 0 dBμV/m
10
dB/
#ATTN
0 dB

PREAMP ON

PASS LIMIT

VA SB
SC FC
ACORR

START 2.0000 GHz STOP 2.3900 GHz
R 11F BW 1.0 MHz 1AVG BW 10 kHz SWP 117 msec



Plot B 66

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2412 MHz, 18 dBi antenna

16:27:47 FEB 10, 2003

ACTV DET: PEAK
NEAS DET: PEAK OP AVG
MKR 2.9000 GHz
41.97 dBμV/m

MEASURE
AT MKR
ADD TO
LIST

LOG REF 70 0 dBμV/m
10
dB/
#ATTN
0 dB

PREAMP ON

CLEAR
WRITE A

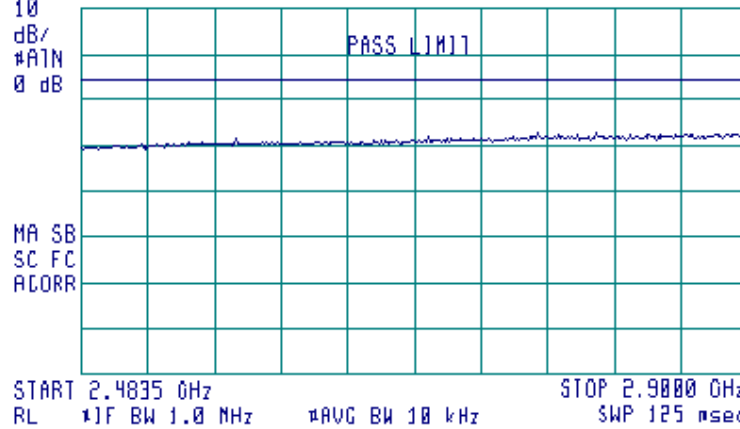
MAX
HOLD A

VIEW A

BLANK A

Trace
A B C

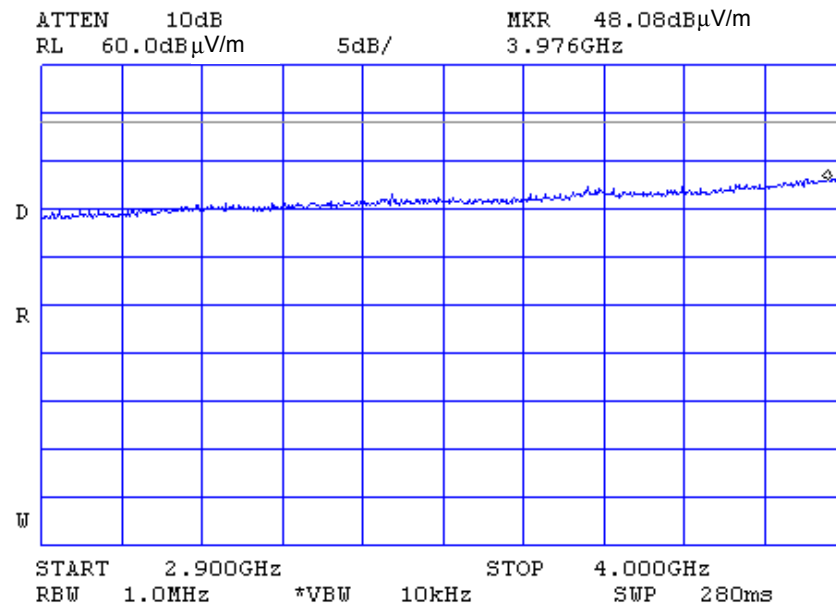
More
1 of 3





Plot B 67

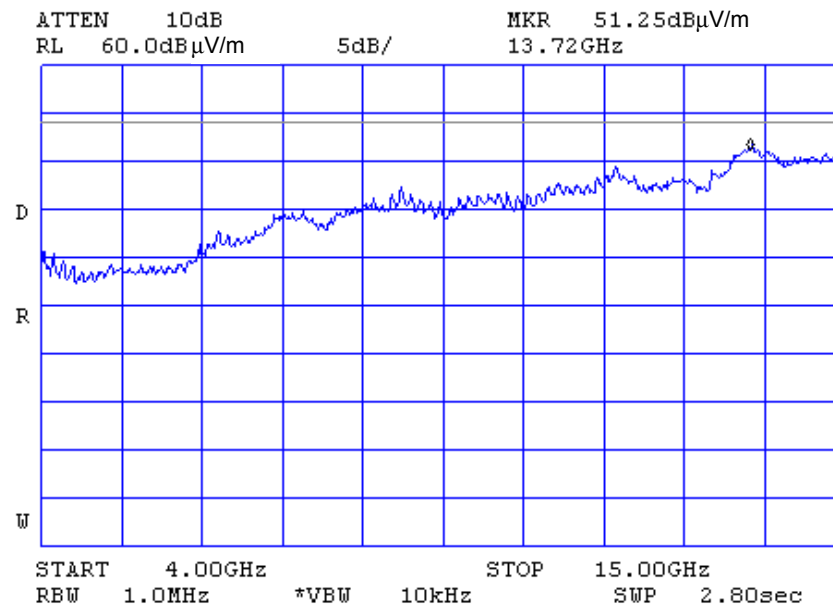
Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2412 MHz, 18 dBi antenna





Plot B 68

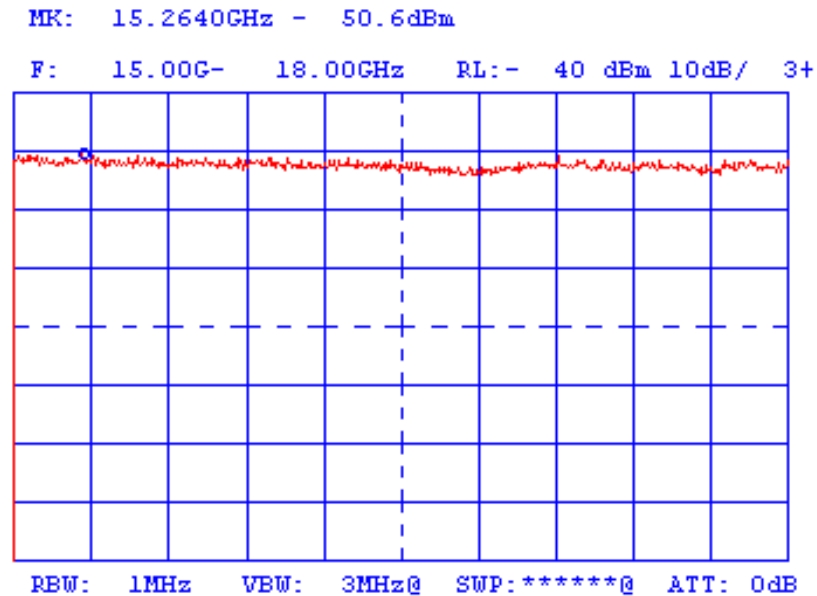
Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2412 MHz, 18 dBi antenna





Plot B 69

Radiated spurious emission measurements in the anechoic chamber @ 1 m distance,
carrier frequency 2412 MHz, 18 dBi antenna



No spurious were found

U_{SA} : -50.6 dBm = 56.4 dB μ V/m

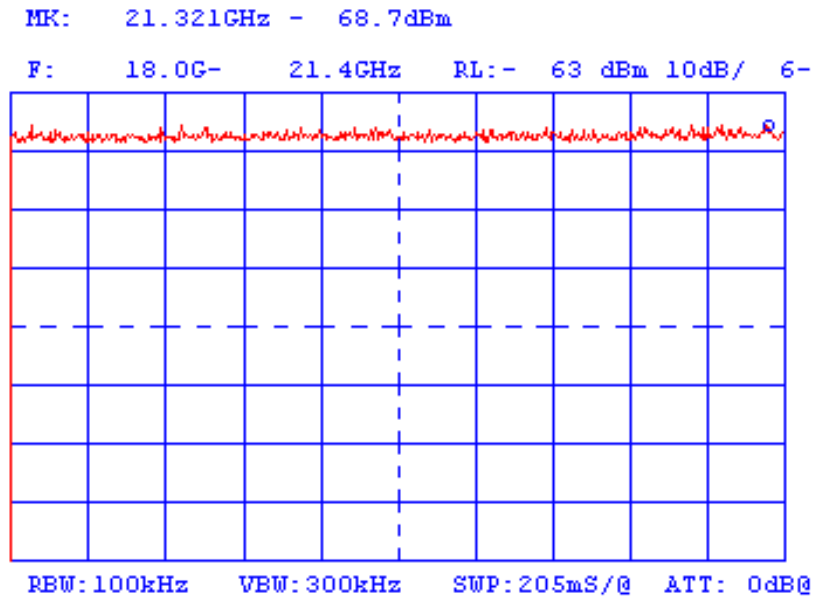
Noise level: $U_{SA} + AF + CL - \text{Ampl. gain} = 56.4 \text{ dB}(\mu\text{V/m}) + 38 \text{ dB}(1/\text{m}) + 4.6 \text{ dB} - 45 \text{ dB} = 54 \text{ dB}(\mu\text{V/m})$

Limit @ 1 meter: 63.5 dB μ V/m



Plot B 70

Radiated spurious emission measurements in the anechoic chamber @ 1 m distance,
carrier frequency 2412 MHz, 18 dBi antenna



No spurious were found

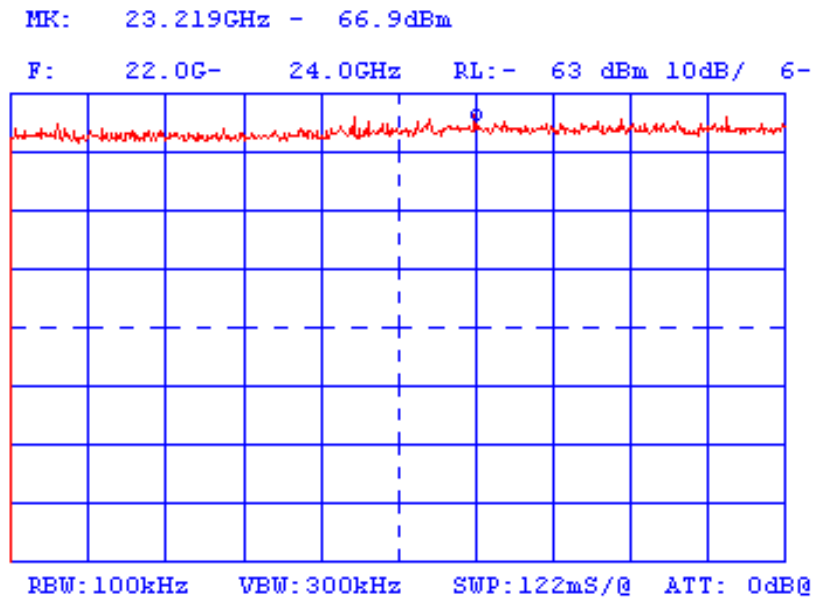
U_{SA} : -68.7 dBm = 38.3 dB μ V/m

Noise level: $U_{SA} + AF - \text{Ampl. gain} = 38.3 \text{ dB}(\mu\text{V/m}) + 32 \text{ dB}(1/\text{m}) - 43 \text{ dB} = 27.3 \text{ dB}(\mu\text{V/m})$



Plot B 71

Radiated spurious emission measurements in the anechoic chamber @ 1 m distance,
carrier frequency 2412 MHz, 18 dBi antenna



No spurious were found

U_{SA} : -66.9 dBm = 40.1 dB μ V/m

Noise level: $U_{SA} + AF - \text{Ampl. gain} = 40.1 \text{ dB}(\mu\text{V/m}) + 32 \text{ dB}(1/\text{m}) - 43 \text{ dB} = 29.1 \text{ dB}(\mu\text{V/m})$



Plot B 72

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2442 MHz, 18 dBi antenna

12:19:46 FEB 10, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
Mkr 1.773 GHz
44.45 dB μ V/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

LOG REF 60.0 dB μ V/m

PREAMP ON

10
dB/
ATN
10 dB

VA SB
SC FC
ACORR

START 1.000 GHz

STOP 2.000 GHz

RL #1F BW 1.0 MHz

#AVG BW 10 kHz

SWP 300 msec



Plot B 73

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2442 MHz, 18 dBi antenna

15:48:41 FEB 10, 2003

ACTV DET: PEAK
NEAS DET: PEAK OP AVG
MKR 2.3812 GHz
45.10 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

LOG REF 70.0 dBμV/m
10
dB/
#ATTN
0 dB

PREAMP ON

PASS LIMIT

VA SB
SC FC
ACORR

START 2.0000 GHz
R 11F BW 1.0 MHz 1AVG BW 10 kHz

STOP 2.3900 GHz
SWP 117 μsec



Plot B 74

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2442 MHz, 18 dBi antenna

15:41:04 FEB 10, 2003

ACTV DET: PEAK
NEAS DET: PEAK OP AVG
MKR 2.4900 MHz
44.86 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

LO0 REF 70.0 dBμV/m

PREAMP ON

10
dB/
#AIN
0 dB

VA SB
SC FC
ACORR

START 2.4835 MHz

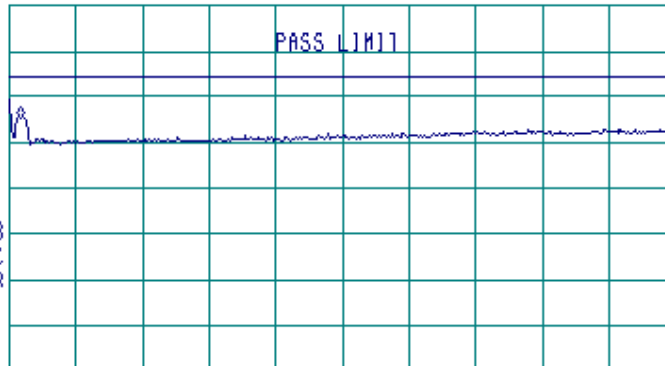
RL 11F BW 1.0 MHz

1AVG BW 10 kHz

STOP 2.9000 MHz

SWP 125 msec

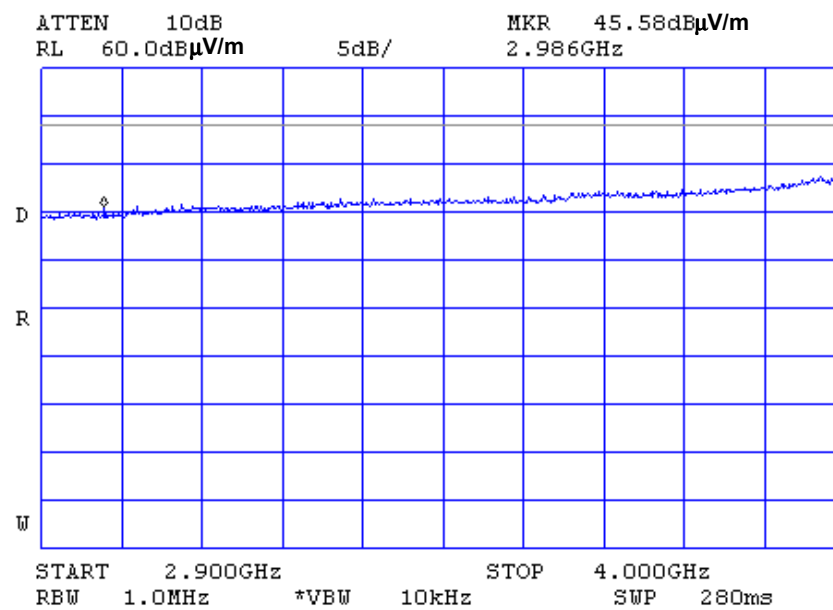
PASS LIMIT





Plot B 75

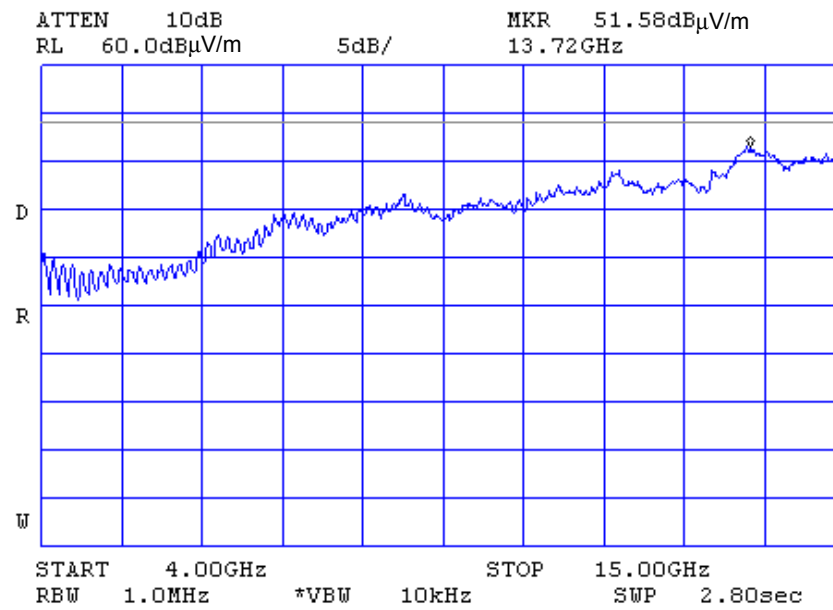
Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2442 MHz, 18 dBi antenna





Plot B 76

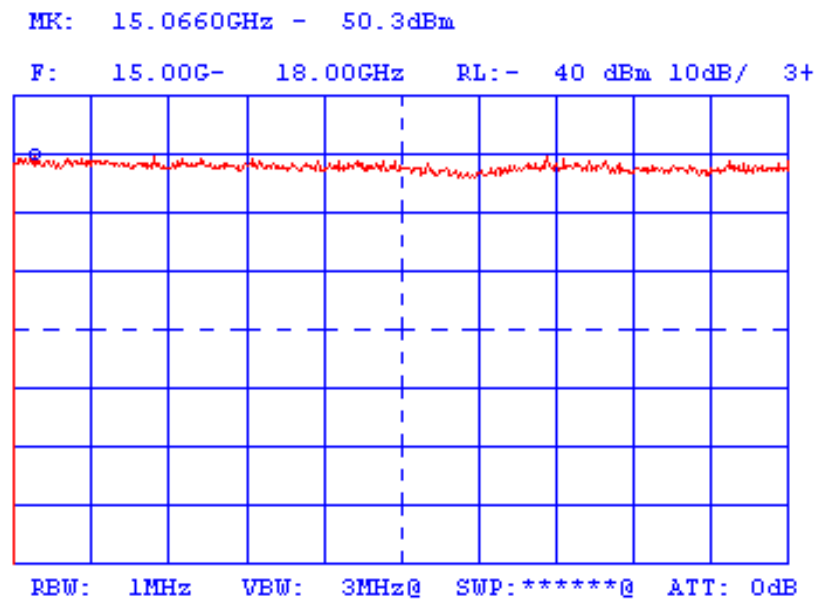
Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2442 MHz, 18 dBi antenna





Plot B 77

Radiated spurious emission measurements in the anechoic chamber @ 1 m distance,
carrier frequency 2442 MHz, 18 dBi antenna



No spurious were found

U_{SA} : -50.3 dBm = 56.7 dB μ V/m

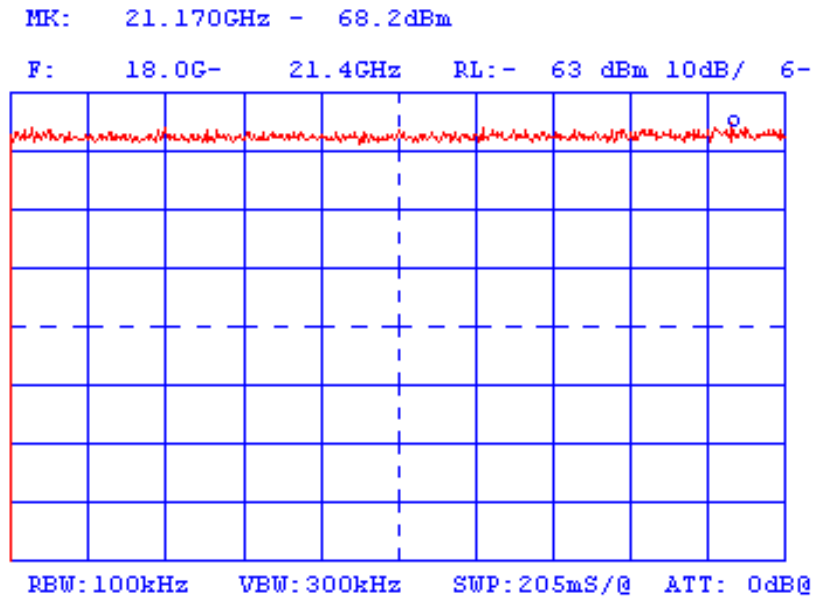
Noise level: $U_{SA} + AF + CL - \text{Ampl. gain} = 56.7 \text{ dB}(\mu\text{V/m}) + 38 \text{ dB}(1/\text{m}) + 4.6 \text{ dB} - 45 \text{ dB} = 54.3 \text{ dB}(\mu\text{V/m})$

Limit @ 1 meter: 63.5 dB(μ V/m)



Plot B 78

Radiated spurious emission measurements in the anechoic chamber @ 1 m distance,
carrier frequency 2442 MHz, 18 dBi antenna



No spurious were found

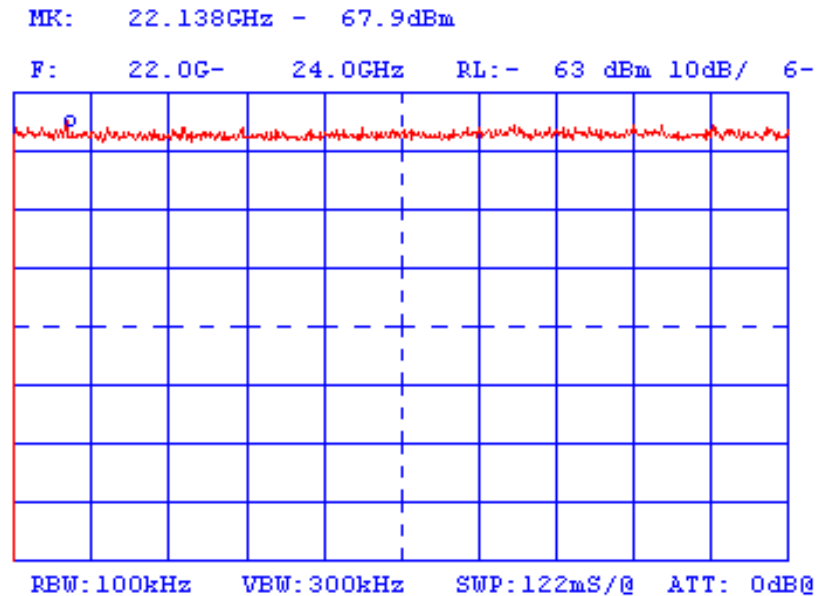
U_{SA} : -68.2 dBm = 38.8 dB μ V/m

Noise level: $U_{SA} + AF - \text{Ampl. gain} = 38.8 \text{ dB}(\mu\text{V/m}) + 32 \text{ dB}(1/\text{m}) - 43 \text{ dB} = 27.8 \text{ dB}(\mu\text{V/m})$



Plot B 79

Radiated spurious emission measurements in the anechoic chamber @ 1 m distance,
carrier frequency 2442 MHz, 18 dBi antenna



No spurious were found

U_{SA} : -67.9 dBm = 39.1 dB μ V/m

Noise level: $U_{SA} + AF - \text{Ampl. gain} = 39.1 \text{ dB}(\mu\text{V/m}) + 32 \text{ dB}(1/\text{m}) - 43 \text{ dB} = 28.1 \text{ dB}(\mu\text{V/m})$



Plot B 80

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2472 MHz, 18 dBi antenna

12:00:41 FEB 10, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
Mkr 1.750 GHz
44.86 dB μ V/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

LOG REF 60.0 dB μ V/m

PREAMP ON

10
dB/
ATN
10 dB

VA SB
SC FC
ACORR

START 1.000 GHz

STOP 2.000 GHz

RL #1F BW 1.0 MHz

#AVG BW 10 kHz

SWP 300 msec



Plot B 81

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2472 MHz, 18 dBi antenna

16:08:27 FEB 10, 2003

ACTV DET: PEAK
NEAS DET: PEAK OP AVG
MKR 2.3793 GHz
39.57 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

LOG REF 70.0 dBμV/m

PREAMP ON

10
dB/
#ATTN
0 dB

PASS LIMIT

VA SB
SC FC
ACORR

START 2.0000 GHz

RL 11F BW 1.0 MHz

1AVG BW 10 kHz

STOP 2.3900 GHz

SWP 117 μsec



Plot B 82

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2472 MHz, 18 dBi antenna

16:12:58 FEB 10, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 2.4866 GHz
52.34 dBμV/m

MEASURE
A1 MKR
ADD TO
LIST

LOG REF 70.0 dBμV/m

PREAMP ON

CLEAR
WRITE A

10
dB/
#ATTN
0 dB

PASS LIMIT

MAX
HOLD A

VIEW A

VA SB
SC FC
ACORR

BLANK A

Trace
A B C

START 2.4835 GHz

STOP 2.9000 GHz

RL 11F BW 1.0 MHz

1AUG BW 10 kHz

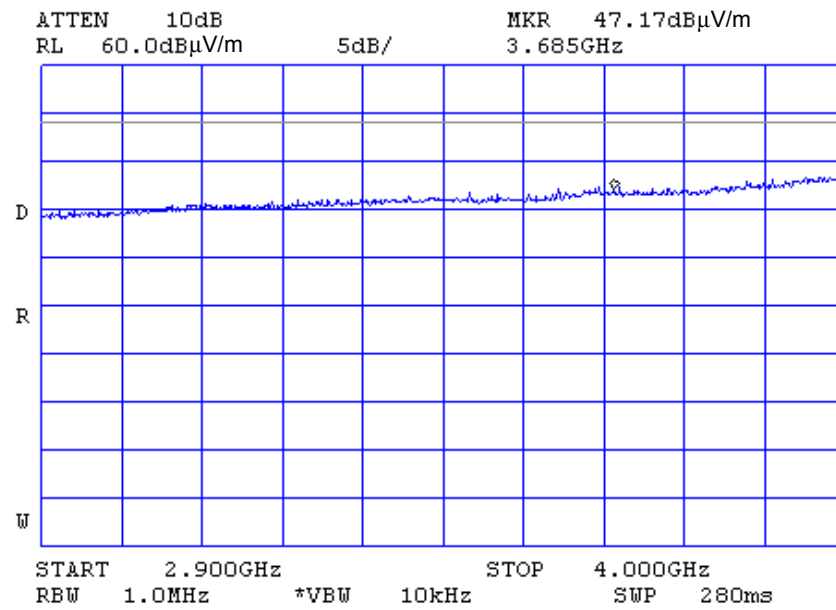
SWP 125 nsec

More
1 of 3



Plot B 83

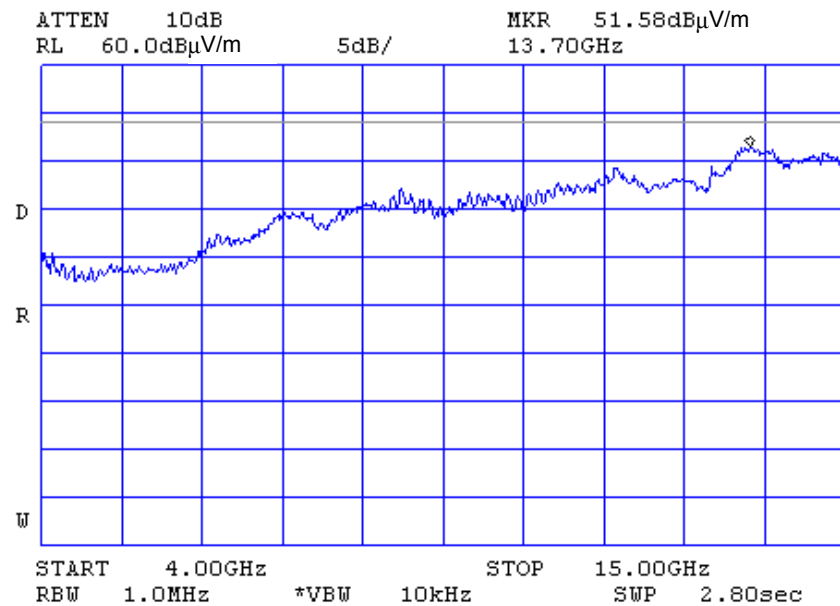
Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2472 MHz, 18 dBi antenna





Plot B 84

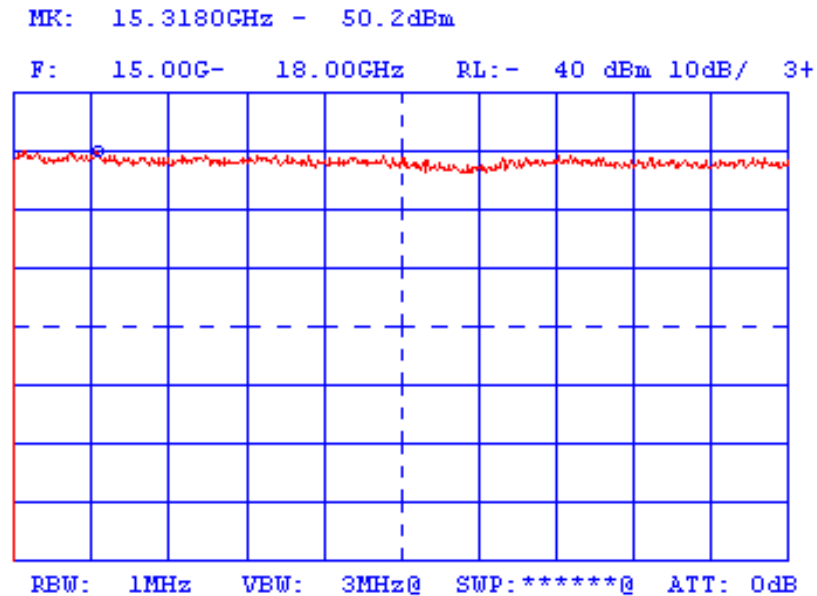
Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2472 MHz, 18 dBi antenna





Plot B 85

Radiated spurious emission measurements in the anechoic chamber @ 1 m distance,
carrier frequency 2472 MHz, 18 dBi antenna



No spurious were found

U_{SA} : -50.2 dBm = 56.8 dB μ V/m

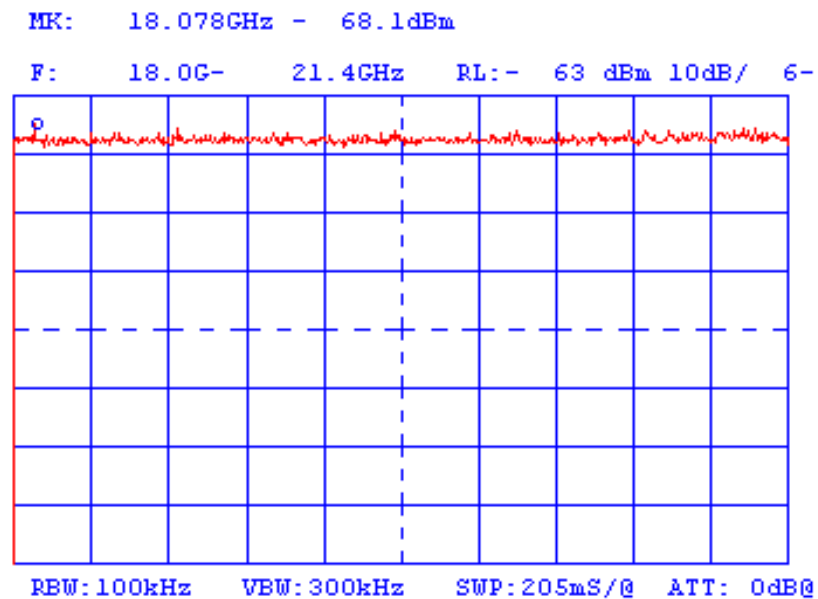
Noise level: $U_{SA} + AF + CL - \text{Ampl. gain} = 56.8 \text{ dB}(\mu\text{V/m}) + 38 \text{ dB}(1/\text{m}) + 4.6 \text{ dB} - 45 \text{ dB} = 54.4 \text{ dB}(\mu\text{V/m})$

Limit @ 1 meter: 63.5 dB μ V/m



Plot B 86

Radiated spurious emission measurements in the anechoic chamber @ 1 m distance,
carrier frequency 2472 MHz, 18 dBi antenna



No spurious were found

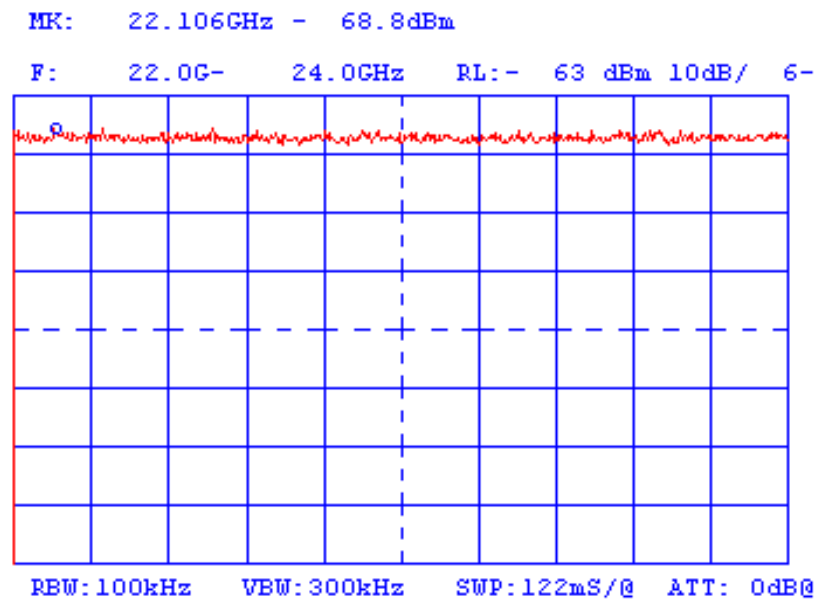
U_{SA} : -68.1 dBm = 38.9 dB μ V/m

Noise level: $U_{SA} + AF - \text{Ampl. gain} = 38.9 \text{ dB}(\mu\text{V/m}) + 32 \text{ dB}(1/\text{m}) - 43 \text{ dB} = 27.9 \text{ dB}(\mu\text{V/m})$



Plot B 87

Radiated spurious emission measurements in the anechoic chamber @ 1 m distance,
carrier frequency 2472 MHz, 18 dBi antenna



No spurious were found

U_{SA} : -68.8 dBm = 38.2 dB μ V/m

Noise level: U_{SA} + AF - Ampl. gain = 38.2 dB(μ V/m) + 32 dB(1/m) - 43 dB = 27.2 dB(μ V/m)



Plot B 88

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequencies 2412/2442/2472 MHz, 12 dBi antenna

12:44:01 FEB 10, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 9.2 kHz
59.08 dB μ V/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

LOG REF 110.0 dB μ V/m
10
dB/
ATN
30 dB

VA SB
SC FC
ACORR

START 9.0 kHz STOP 150.0 kHz
RL #1F BW 200 Hz AVG BW 300 Hz SWP 10.3 sec



Plot B 89

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequencies 2412/2442/2472 MHz, 12 dBi antenna

12:41:59 FEB 10, 2003

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 19.98 MHz
49.03 dB μ V/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

LOG REF 100.0 dB μ V/m

10
dB/
ATN
20 dB

VA SB
SC FC
ACORR

START 150 kHz

RL #1F BW 9.0 kHz

AVG BW 30 kHz

STOP 30.00 MHz

SWP 2.49 sec



Plot B 90

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2412 MHz, 12 dBi antenna

12:17:57 FEB 09, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 395.3 MHz
42.18 dB μ V/m

MEASURE
AT MKR

ADD TO
LIST

LOG REF 60.0 dB μ V/m

PREAMP ON

MARKER
CF

10
dB/
#ATN
0 dB

MARKER
A

VA SB
SC FC
ACORR

NEXT
PEAK

NEXT PK
RIGHT

NEXT PK
LEFT

START 30.0 MHz STOP 1.0000 GHz
RL IF BW 120 kHz AVG BW 300 kHz SWP 909 msec

More
1 of 2



Plot B 91

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2412 MHz, 12 dBi antenna

13:13:25 FEB 09, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 2.000 GHz
43.76 dB μ V/m

MEASURE
AT MKR

ADD TO
LIST

MARKER
↓ CF

MARKER
△

NEXT
PEAK

NEXT PK
RIGHT

NEXT PK
LEFT

More
1 of 2

LOG REF 60.0 dB μ V/m

PREAMP ON

10
dB/
#ATN
0 dB

VA SB
SC FC
ACORR

START 1.000 GHz

RL #1F BW 1.0 MHz

#AVG BW 300 kHz

STOP 2.000 GHz

SWP 700 msec



Plot B 92

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2412 MHz, 12 dBi antenna

10:49:20 FEB 11, 2003

ACTV DET: PEAK
NEAS DET: PEAK OP AVG
MKR 2.3871 GHz
60.67 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

LO0 REF 70 0 dBμV/m

10
dB/
ATTN
10 dB

VA SB
SC FC
ACORR

START 2.0000 GHz

RL 11F BW 1.0 MHz

1AVG BW 10 kHz

STOP 2.3900 GHz

SWP 117 msec



Plot B 93

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2412 MHz, 12 dBi antenna

10:55:10 FEB 11, 2003

ACTV DET: PEAK
NEAS DET: PEAK OP AVG
MKR 2.4910 GHz
41.66 dBμV/m

MEASURE
AT MKR

ADD TO
LIST

CLEAR
WRITE A

MAX
HOLD A

VIEW A

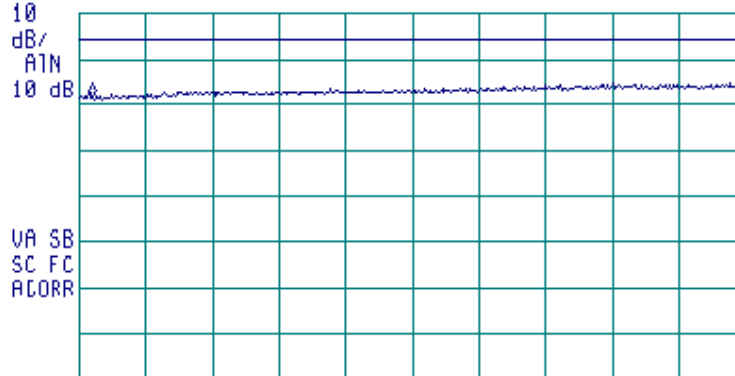
BLANK A

Trace
A B C

More
1 of 3

LO0 REF 60 0 dBμV/m

PREAMP ON



START 2.4835 GHz

STOP 2.9000 GHz

RL 11F BW 1.0 MHz

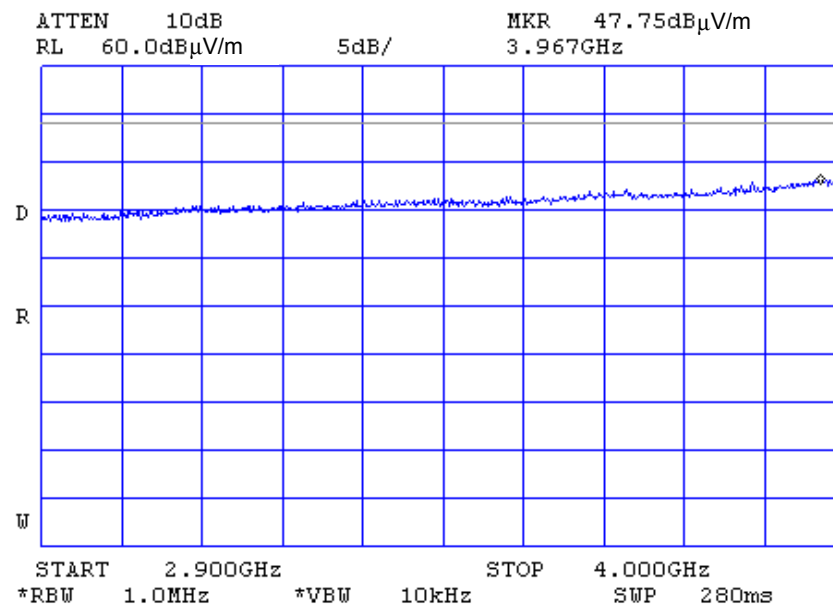
1AVG BW 10 kHz

SWP 125 nsec



Plot B 94

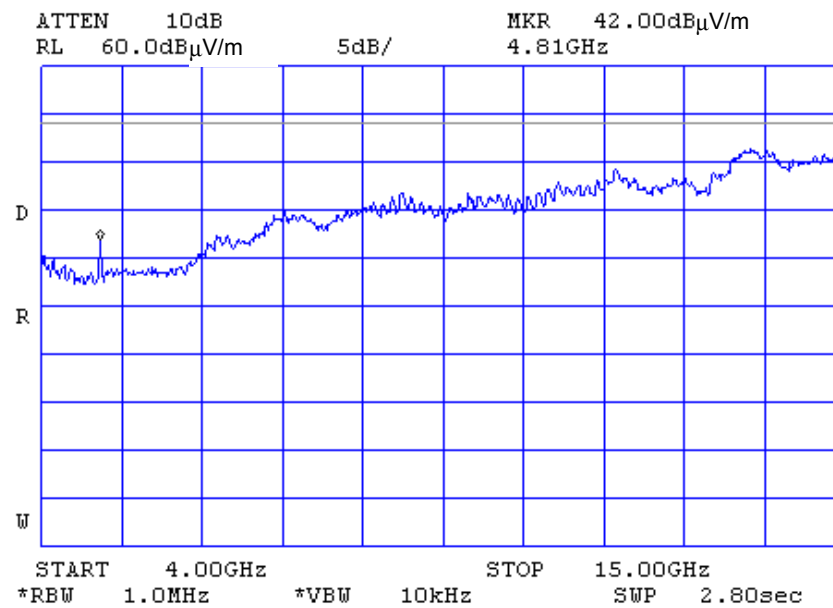
Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2412 MHz, 12 dBi antenna





Plot B 95

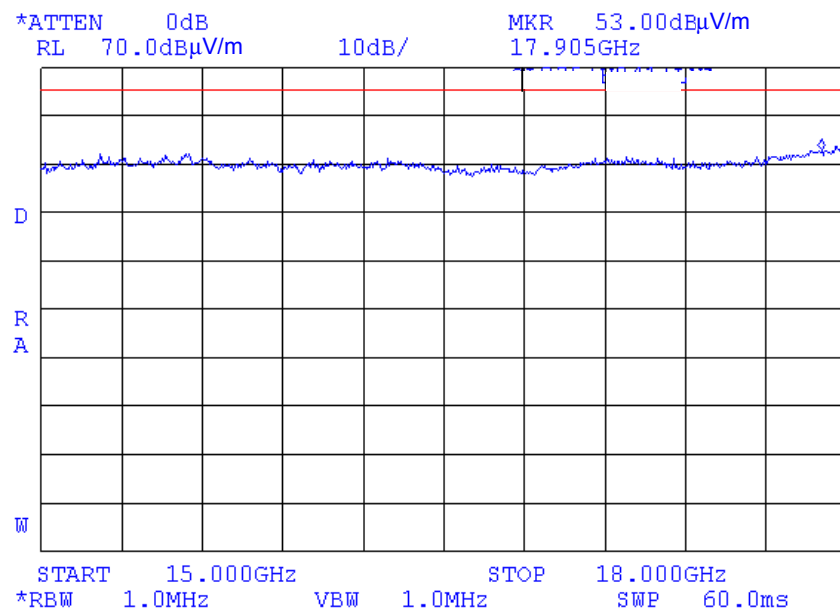
Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2412 MHz, 12 dBi antenna





Plot B 96

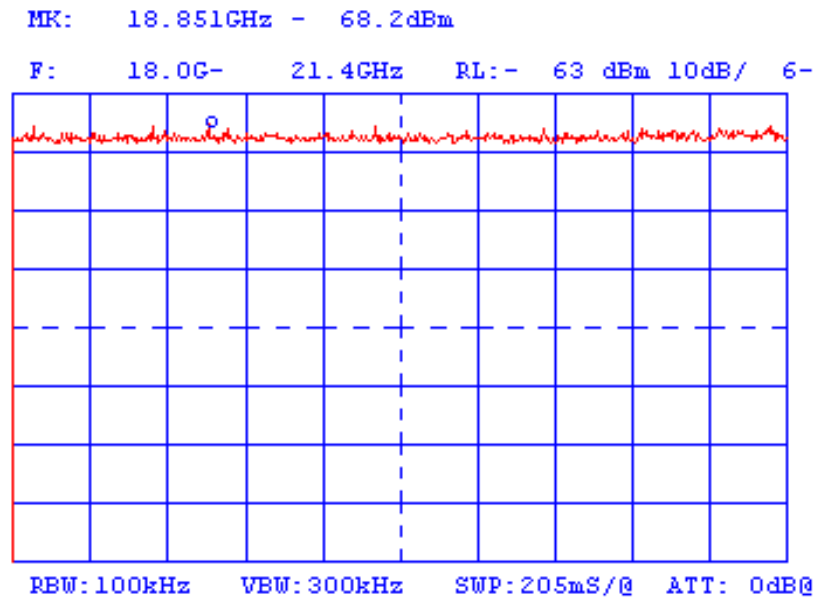
Radiated spurious emission measurements at the OATS @ 3 m distance,
carrier frequency 2412 MHz, 12 dBi antenna





Plot B 97

Radiated spurious emission measurements in the anechoic chamber @ 1 m distance,
carrier frequency 2412 MHz, 12 dBi antenna



No spurious were found

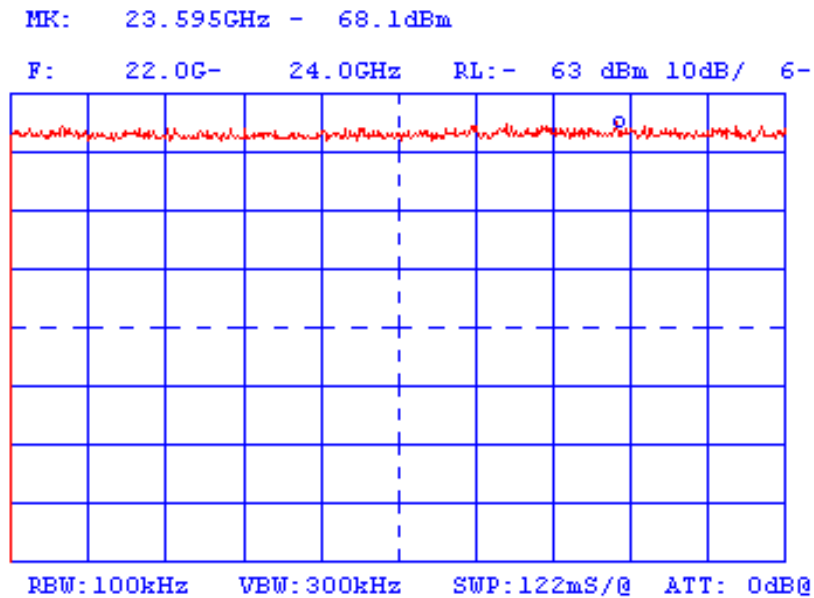
U_{SA} : -68.2 dBm = 38.8 dB μ V/m

Noise level: $U_{SA} + AF - \text{Ampl. gain} = 38.8 \text{ dB}(\mu\text{V/m}) + 32 \text{ dB}(1/\text{m}) - 43 \text{ dB} = 27.8 \text{ dB}(\mu\text{V/m})$



Plot B 98

Radiated spurious emission measurements in the anechoic chamber @ 1 m distance,
carrier frequency 2412 MHz, 12 dBi antenna



No spurious were found

U_{SA} : -68.1 dBm = 38.9 dB μ V/m

Noise level: $U_{SA} + AF - \text{Ampl. gain} = 38.9 \text{ dB}(\mu\text{V/m}) + 32 \text{ dB}(1/\text{m}) - 43 \text{ dB} = 27.9 \text{ dB}(\mu\text{V/m})$



Plot B 99

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2442 MHz, 12 dBi antenna

15:31:30 FEB 09, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 264.1 MHz
34.44 dB μ V/m

MEASURE
AT MKR

ADD TO
LIST

CLEAR
WRITE B

MAX
HOLD B

VIEW B

BLANK B

Trace
A B C

More
1 of 3

LOG REF 60.0 dB μ V/m

10
dB/
#ATN
0 dB

VA SB
SC FC
ACORR

START 30.0 MHz STOP 1.0000 GHz
RL #1F BW 120 kHz AVG BW 300 kHz SWP 909 msec



Plot B 100

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2442 MHz, 12 dBi antenna

15:43:22 FEB 09, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 1.693 GHz
42.46 dB μ V/m

MEASURE
AT MKR

ADD TO
LIST

LOG REF 60.0 dB μ V/m

PREAMP ON

MARKER
NORMAL

10
dB/
#ATN
0 dB

MARKER
 Δ

MARKER
AMPTD

VA SB
SC FC
ACORR

SELECT
1 2 3 4

MARKER 1
ON OFF

START 1.000 GHz

STOP 2.000 GHz

More

RL #1F BW 1.0 MHz

#AVG BW 300 kHz

SWP 20.0 msec

1 of 2



Plot B 101

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2442 MHz, 12 dBi antenna

11:14:30 FEB 11, 2003

ACTV DET: PEAK
NEAS DET: PEAK OP AVG
MKR 2.3812 GHz
45.38 dBμV/m

MEASURE
AT MKR

ADD TO
LIST

CLEAR
WRITE A

MAX
HOLD A

VIEW A

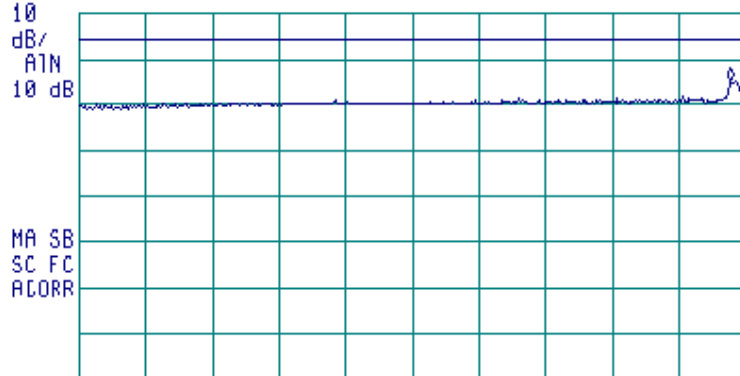
BLANK A

Trace
A B C

More
1 of 3

LOO REF 60 0 dBμV/m

PREAMP ON



RL 11F BW 1.0 MHz 1AVG BW 10 kHz SWP 117 nsec



Plot B 102

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2442 MHz, 12 dBi antenna

11:09:18 FEB 11, 2003

ACTV DET: PEAK
NEAS DET: PEAK OP AVG
MKR 2.4897 GHz
45.69 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

LO0 REF 60 0 dBμV/m

PREAMP ON

10

dB/

ATN

10 dB

VA SB

SC FC

ACORR

START 2.4835 GHz

R 11F BW 1.0 MHz

1AVG BW 10 kHz

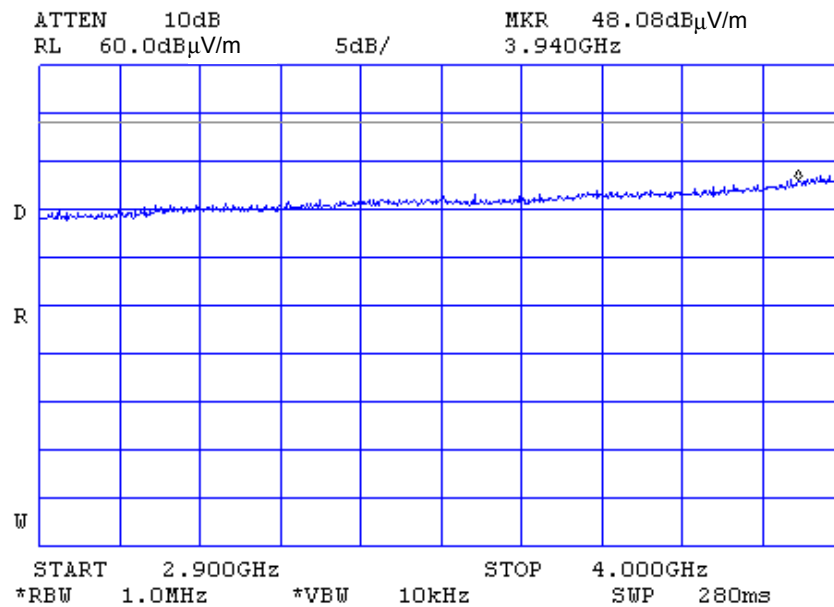
STOP 2.9000 GHz

SWP 125 nsec



Plot B 103

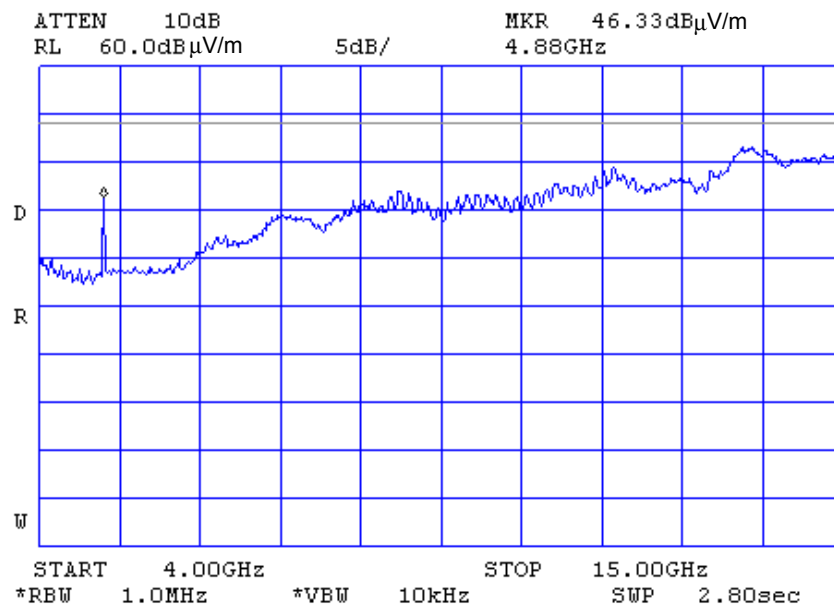
Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2442 MHz, 12 dBi antenna





Plot B 104

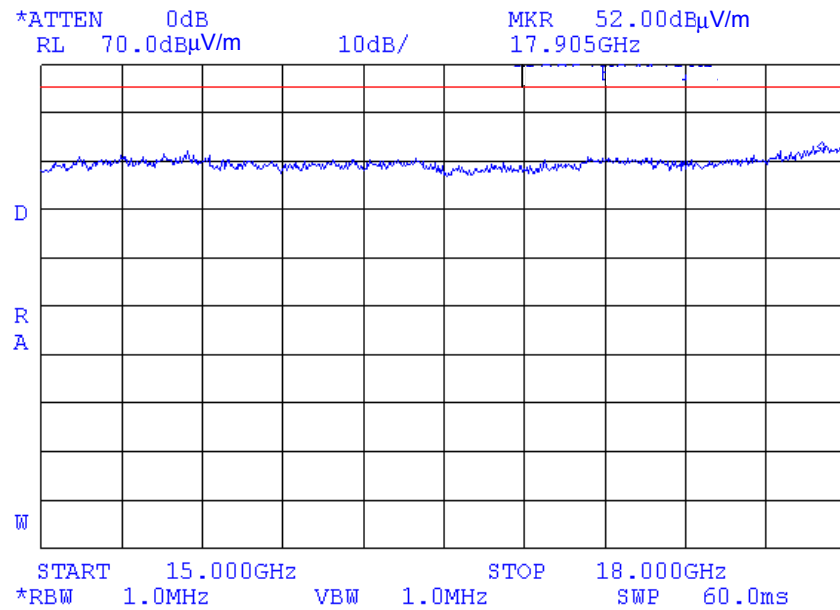
Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2442 MHz, 12 dBi antenna





Plot B 105

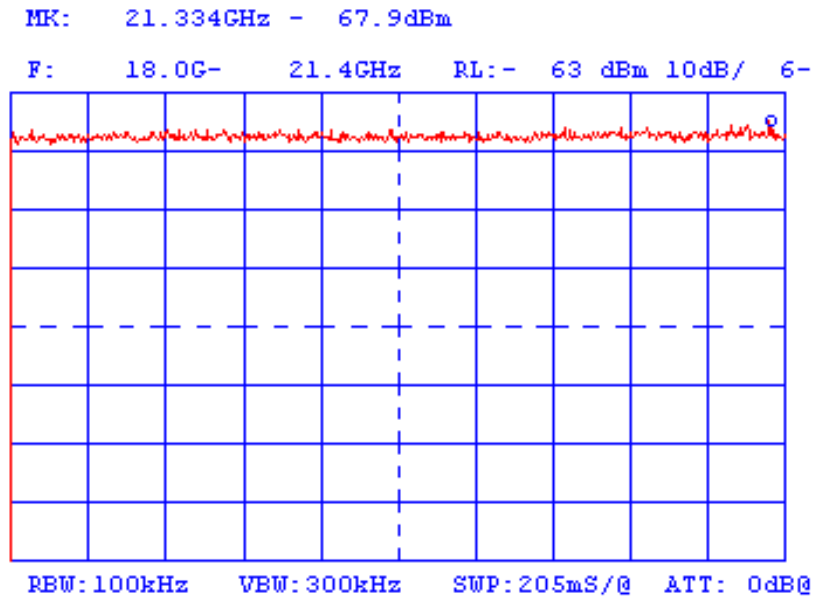
Radiated spurious emission measurements at the OATS @ 3 m distance,
carrier frequency 2442 MHz, 12 dBi antenna





Plot B 106

Radiated spurious emission measurements in the anechoic chamber @ 1 m distance,
carrier frequency 2442 MHz, 12 dBi antenna



No spurious were found

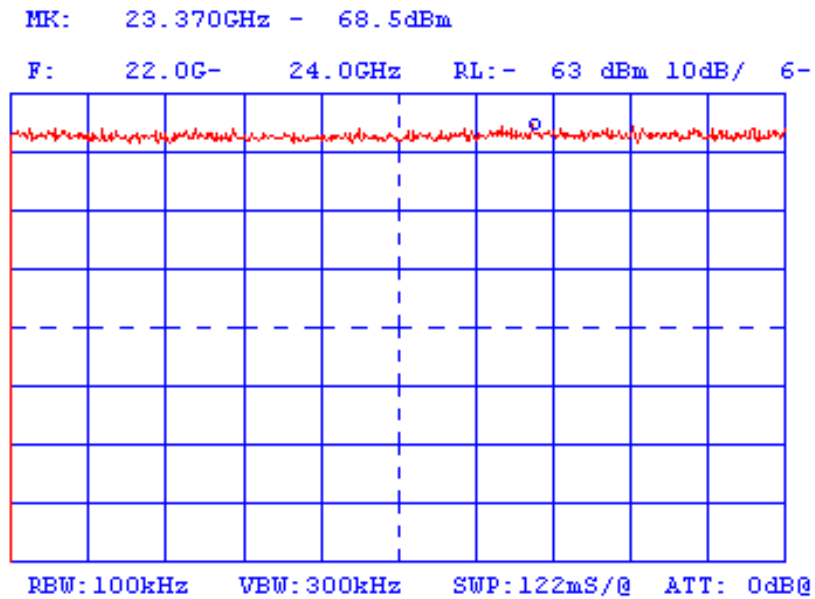
U_{SA} : -67.9 dBm = 39.1 dB μ V/m

Noise level: $U_{SA} + AF - \text{Ampl. gain} = 39.1 \text{ dB}(\mu\text{V/m}) + 32 \text{ dB}(1/\text{m}) - 43 \text{ dB} = 28.1 \text{ dB}(\mu\text{V/m})$



Plot B 107

Radiated spurious emission measurements in the anechoic chamber @ 1 m distance,
carrier frequency 2442 MHz, 12 dBi antenna



No spurious were found

U_{SA} : -68.5 dBm = 38.5 dB μ V/m

Noise level: $U_{SA} + AF - \text{Ampl. gain} = 38.5 \text{ dB}(\mu\text{V/m}) + 32 \text{ dB}(1/\text{m}) - 43 \text{ dB} = 27.5 \text{ dB}(\mu\text{V/m})$



Plot B 108

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2472 MHz, 12 dBi antenna

13:38:53 FEB 09, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 501.2 MHz
38.55 dB μ V/m

MEASURE
AT MKR

ADD TO
LIST

MARKER
CF

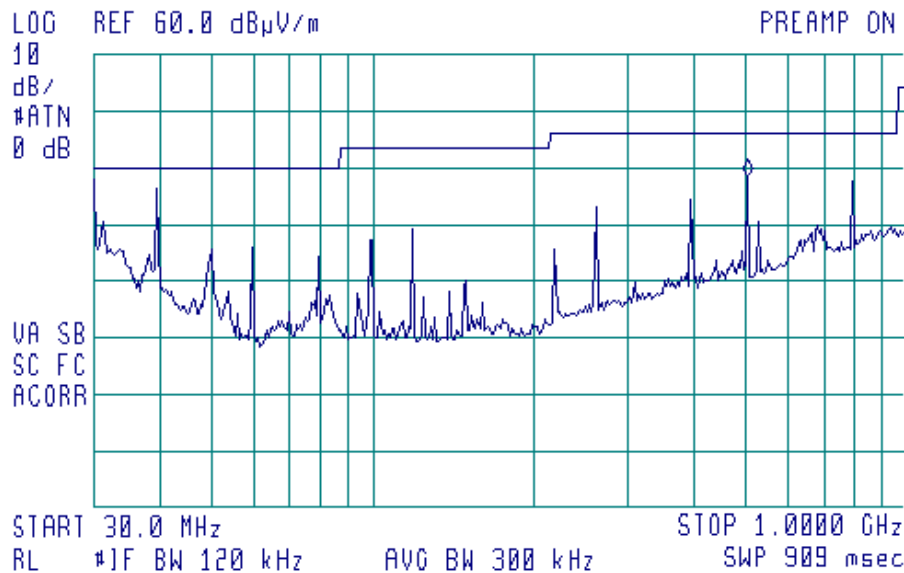
MARKER
A

NEXT
PEAK

NEXT PK
RIGHT

NEXT PK
LEFT

More
1 of 2





Plot B 109

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2472 MHz, 12 dBi antenna

13:26:30 FEB 09, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 1.722 GHz
44.19 dB μ V/m

MEASURE
AT MKR

ADD TO
LIST

CLEAR
WRITE B

MAX
HOLD B

VIEW B

BLANK B

Trace
A B C

More
1 of 3

LOG REF 60.0 dB μ V/m

PREAMP ON

10
dB/
#ATN
0 dB

VA SB
SC FC
ACORR

START 1.000 GHz

STOP 2.000 GHz

RL #1F BW 1.0 MHz

#AVG BW 300 kHz

SWP 700 msec

Frequency, MHz	Peak measurement, dB μ V/m	Average measurement, dB μ V/m	Limit, dB μ V/m	Comments
1723.35	44.3	33.14	54	Not restricted band



Plot B 110

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2472 MHz, 12 dBi antenna

11:23:43 FEB 11, 2003

ACTV DET: PEAK
NEAS DET: PEAK OP AVG
MKR 2.3890 GHz
41.07 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

LOG REF 60 0 dBμV/m

PREAMP ON

10
dB/
ATTN
10 dB

VA SB
SC FC
ACORR

START 2.0000 GHz

RL 11F BW 1.0 MHz

1AVG BW 10 kHz

STOP 2.3900 GHz

SWP 117 msec



Plot B 111

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2472 MHz, 12 dBi antenna

11:38:46 FEB 11, 2003

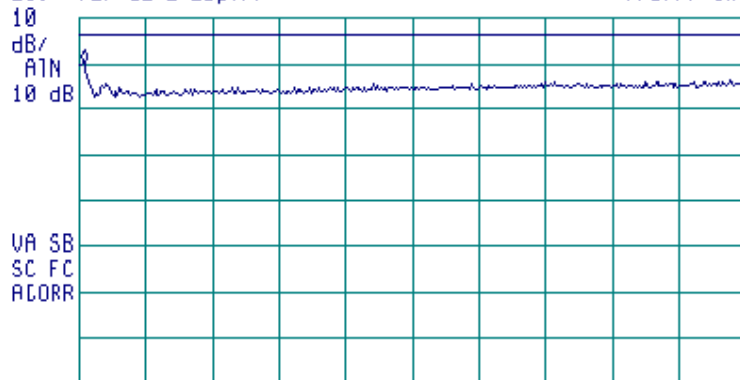
ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 2.4866 GHz
48.31 dBμV/m

MEASURE
A1 MKR
ADD TO
LIST

LOG REF 5B 0 dBμV/m

PREAMP ON

CLEAR
WRITE A



MAX
HOLD A

VIEW A

BLANK A

Trace
A B C

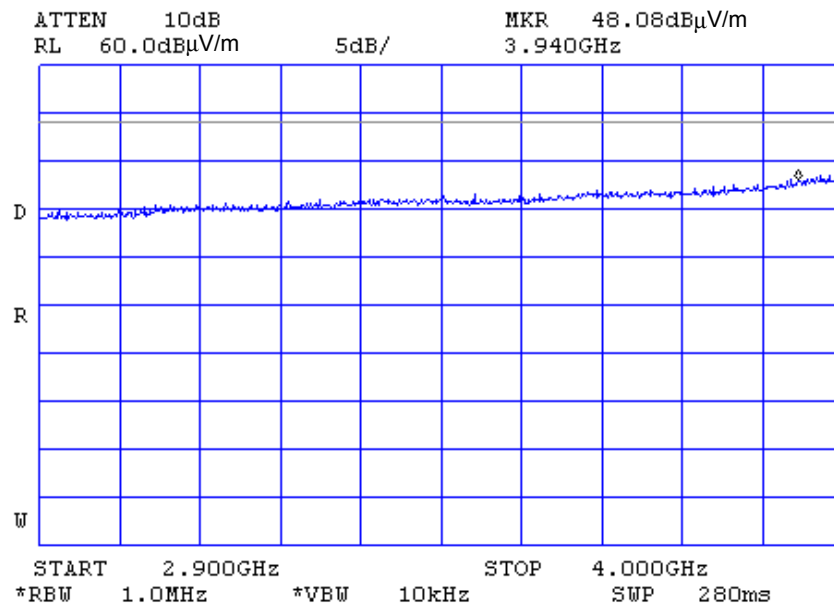
START 2.4835 GHz
RL 11F BW 1.0 MHz
AUG BW 10 kHz
STOP 2.9000 GHz
SWP 125 nsec

More
1 of 3



Plot B 112

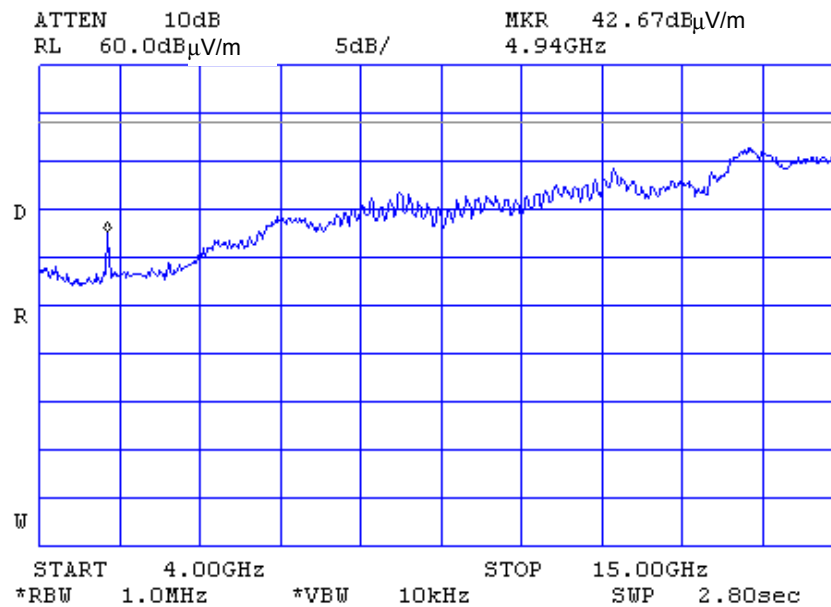
Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2472 MHz, 12 dBi antenna





Plot B 113

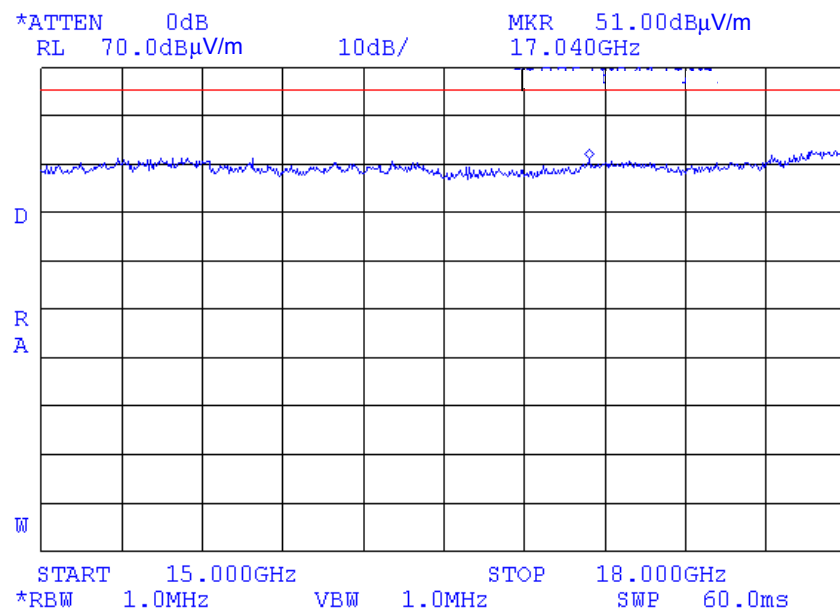
Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2472 MHz, 12 dBi antenna





Plot B 114

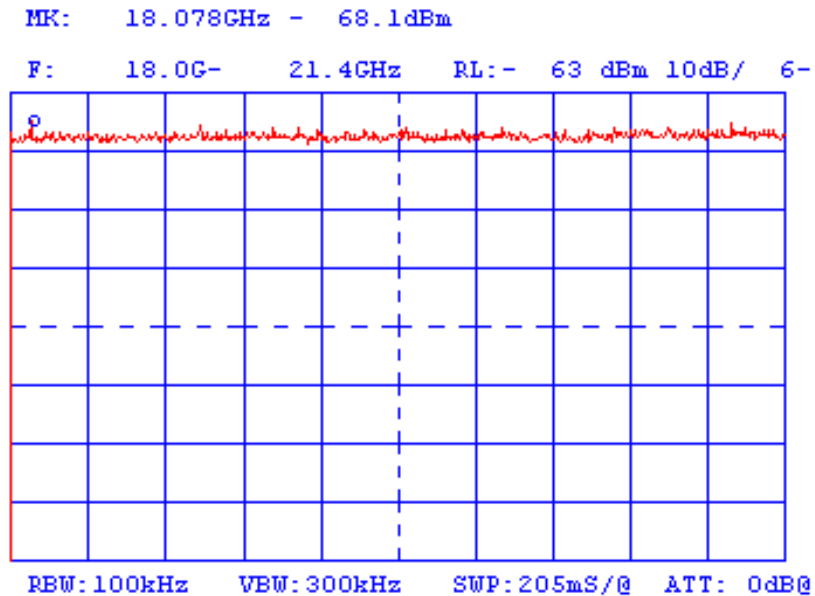
Radiated spurious emission measurements at the OATS @ 3 m distance,
carrier frequency 2472 MHz, 12 dBi antenna





Plot B 115

Radiated spurious emission measurements in the anechoic chamber @ 1 m distance,
carrier frequency 2472 MHz, 12 dBi antenna



No spurious were found

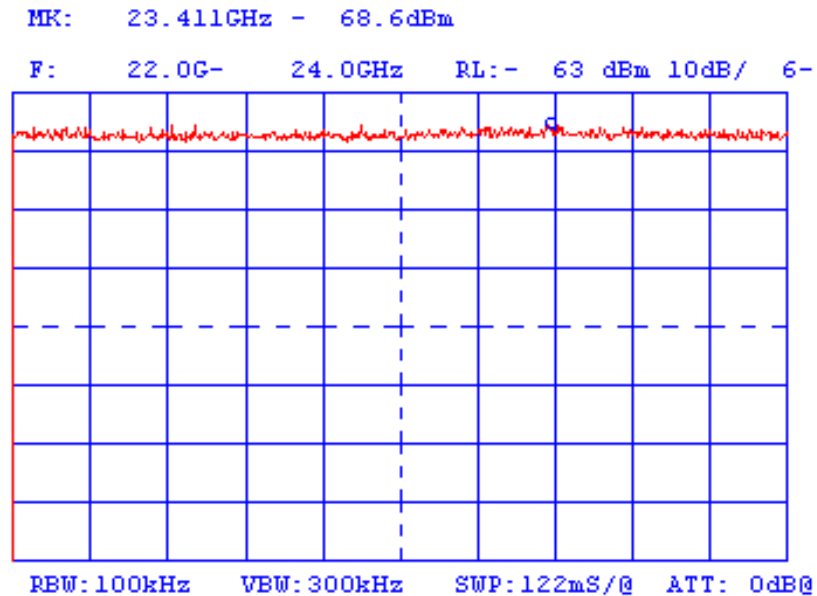
U_{SA} : -68.1 dBm = 38.9 dB μ V/m

Noise level: U_{SA} + AF - Ampl. gain = 38.9 dB(μ V/m) + 32 dB(1/m) - 43 dB = 27.9 dB(μ V/m)



Plot B 116

Radiated spurious emission measurements in the anechoic chamber @ 1 m distance,
carrier frequency 2472 MHz, 12 dBi antenna



No spurious were found

U_{SA} : -68.6 dBm = 38.4 dB μ V/m

Noise level: $U_{SA} + AF - \text{Ampl. gain} = 38.4 \text{ dB}(\mu\text{V/m}) + 32 \text{ dB}(1/\text{m}) - 43 \text{ dB} = 27.4 \text{ dB}(\mu\text{V/m})$



Plot B 117

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequencies 2412/2442/2472 MHz, 24 dBi antenna

14:58:04 FEB 16, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 10.6 kHz
60.76 dB μ V/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

LOG REF 110.0 dB μ V/m
10
dB/
ATN
30 dB

VA SB
SC FC
ACORR

START 9.0 kHz STOP 150.0 kHz
RL #1F BW 200 Hz AVG BW 300 Hz SWP 10.3 sec



Plot B 118

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequencies 2412/2442/2472 MHz, 24 dBi antenna

14:55:28 FEB 16, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 740 kHz
43.52 dB μ V/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

LOG REF 100.0 dB μ V/m

10
dB/
ATN
20 dB

VA SB
SC FC
ACORR

START 150 kHz STOP 30.00 MHz
RL #1F BW 9.0 kHz AVG BW 30 kHz SWP 2.49 sec



Plot B 119

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequencies 2412/2442/2472 MHz, 24 dBi antenna

14:25:47 FEB 16, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
Mkr 261.5 MHz
27.48 dB μ V/m

MEASURE
AT MKR

ADD TO
LIST

CLEAR
WRITE A

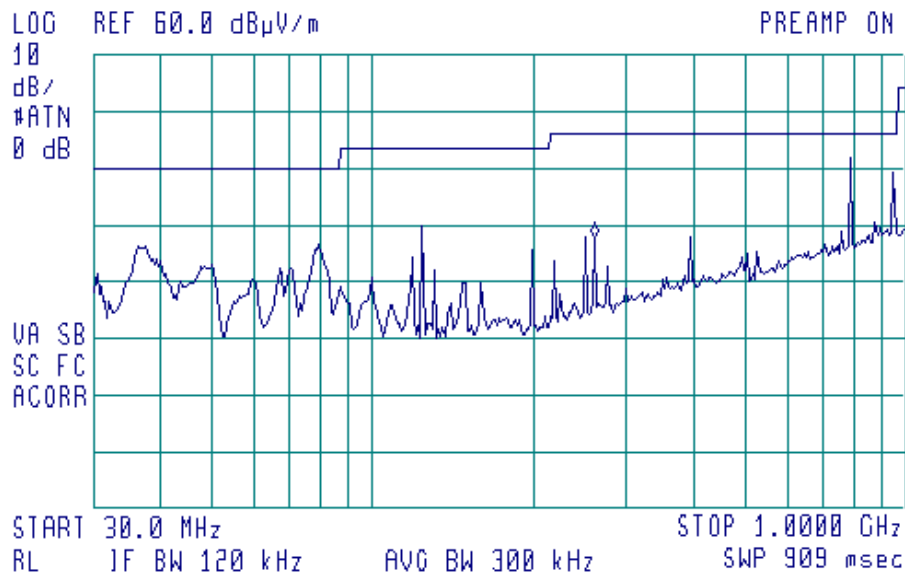
MAX
HOLD A

VIEW A

BLANK A

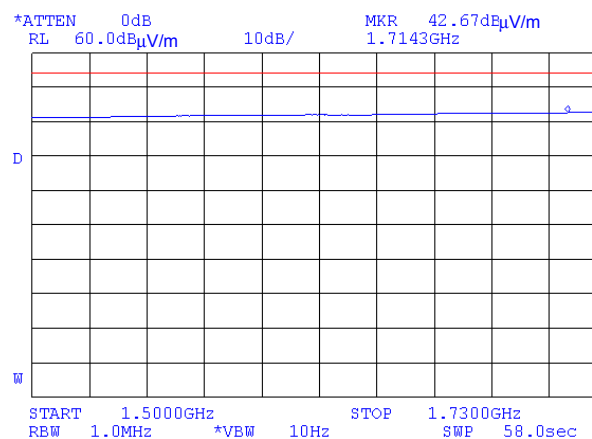
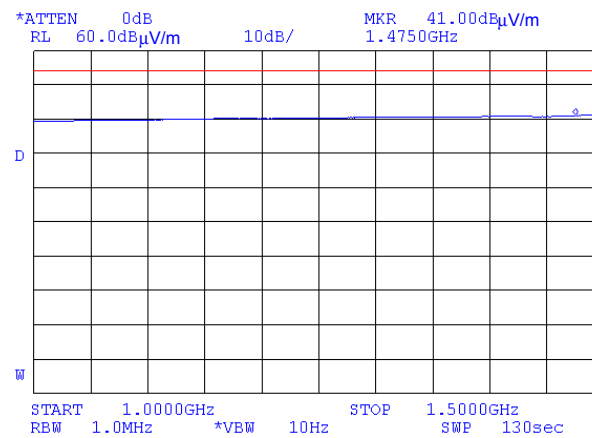
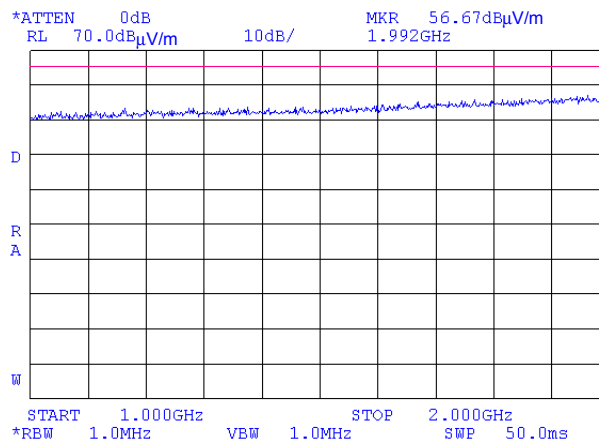
Trace
A B C

More
1 of 3





Plot B 120
Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2412 MHz, 24 dBi antenna





Plot B 121

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2412 MHz, 24 dBi antenna

12:12:45 FEB 11, 2003

ACTV DET: PEAK
NEAS DET: PEAK OP AVG
MKR 2.3871 GHz
48.39 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

LOG REF 60 0 dBμV/m

PREAMP ON

10
dB/
ATTN
10 dB

VA SB
SC FC
ACORR

START 2.0000 GHz

RL 11F BW 1.0 MHz

1AVG BW 10 kHz

STOP 2.3900 GHz

SWP 117 μsec



Plot B 122

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2412 MHz, 24 dBi antenna

12:20:12 FEB 11, 2003

ACTV DET: PEAK
NEAS DET: PEAK OP AVG
MKR 2.4856 GHz
41.78 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

LO0 REF 60 0 dBμV/m

PREAMP ON

10

dB/

ATN

10 dB

MA SB

SC FC

ACORR

START 2.4835 GHz

STOP 2.9880 GHz

RL 11F BW 1.0 MHz

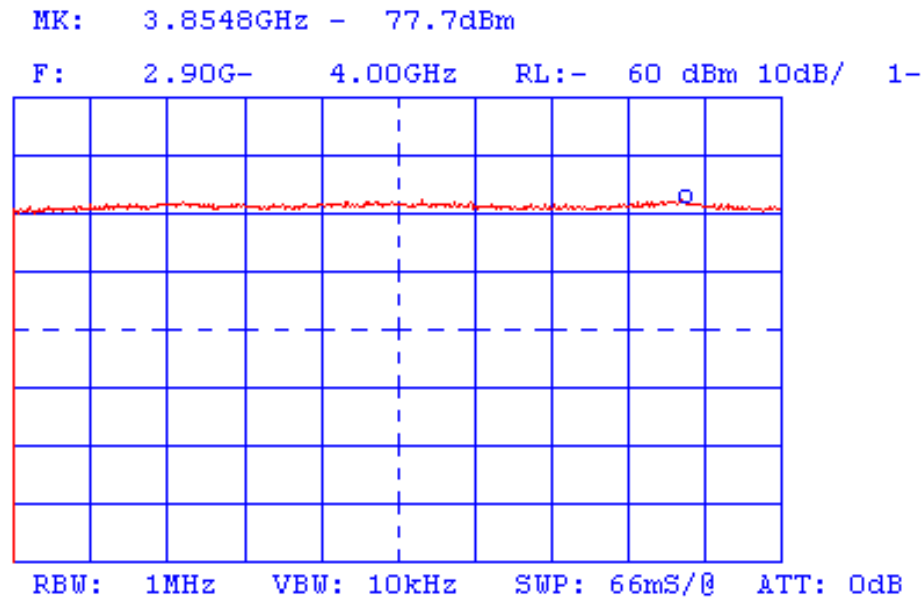
1AVG BW 10 kHz

SWP 125 msec



Plot B 123

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2412 MHz, 24 dBi antenna



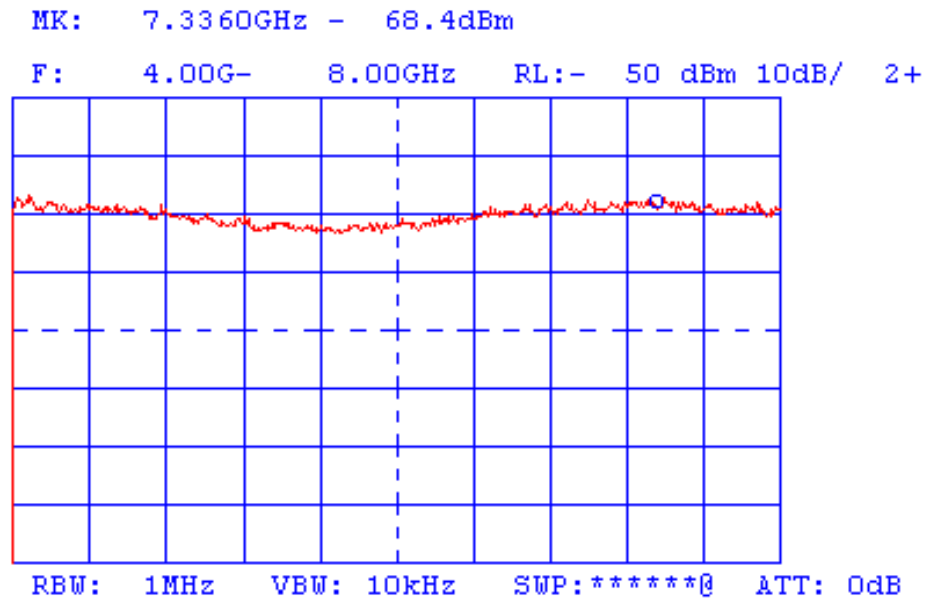
Limit = 54 dBuV/m

Usa peak+AF+Closs-Amplif.gain = 29.3+32.5+1.9-20 = 43.7 dBuV/m (peak)



Plot B 124

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2412 MHz, 24 dBi antenna



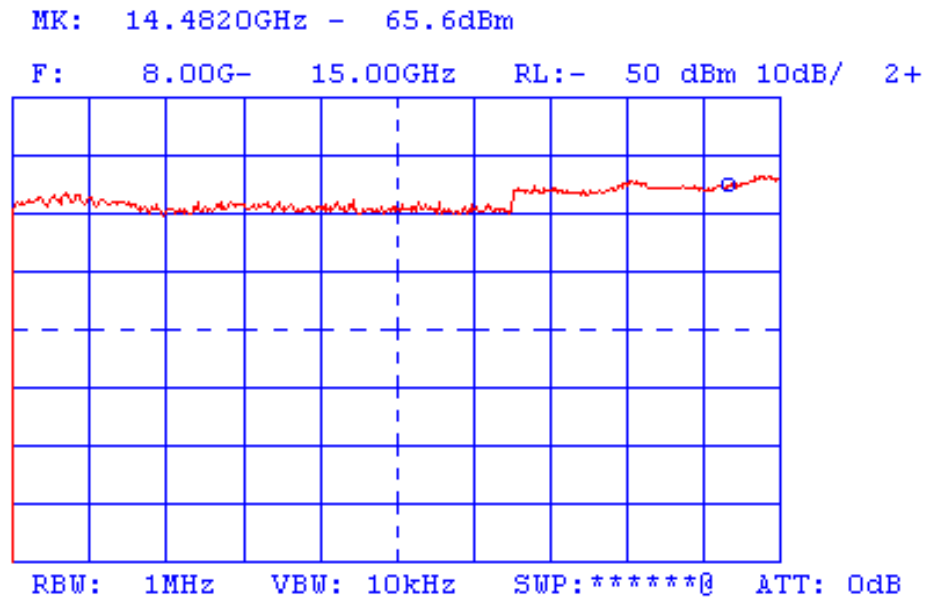
Limit = 54 dBuV/m

Usa+AF+Closs-Amplif.gain = 38.6+38+3-39=40.6 dBuV/m (peak)



Plot B 125

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2412 MHz, 24 dBi antenna

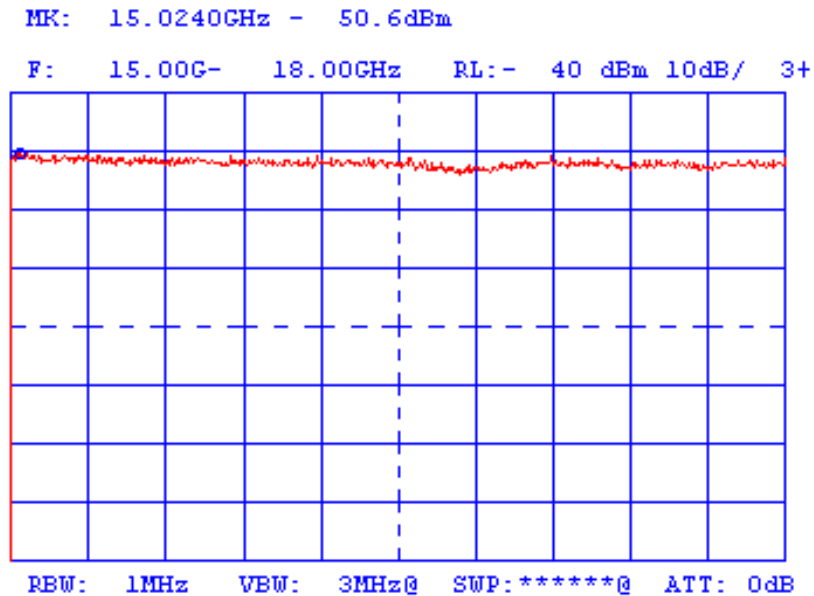


Limit = 54 dBuV/m
 $U_{sa} + AF + C_{loss} - \text{Amplif.gain} = 41.4 + 38 + 4.2 - 35 = 48.6 \text{ dBuV/m (peak)}$



Plot B 126

Radiated spurious emission measurements in the anechoic chamber @ 1 m distance,
carrier frequency 2412 MHz, 24 dBi antenna



No spurious were found

U_{SA} : -50.6 dBm = 56.4 dB μ V/m

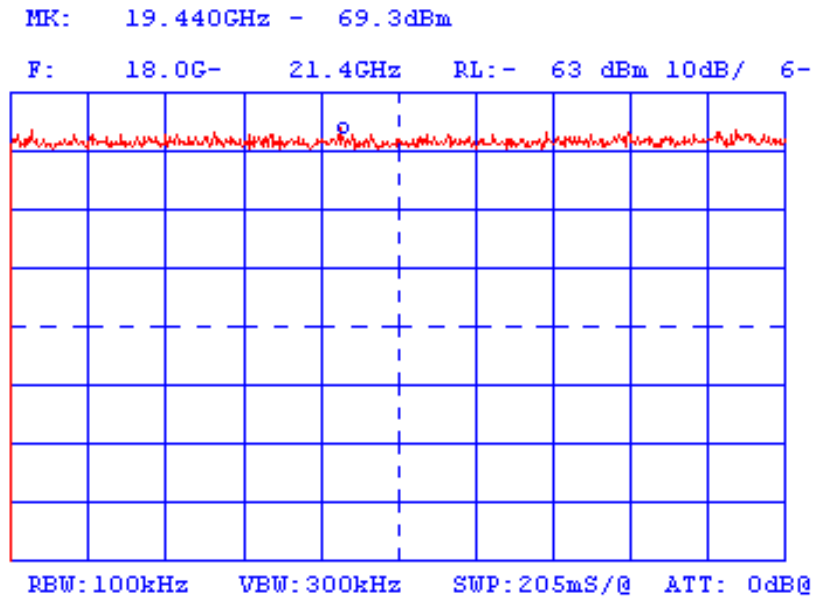
Noise level: $U_{SA} + AF + CL - \text{Ampl. gain} = 56.4 \text{ dB}(\mu\text{V/m}) + 38 \text{ dB}(1/\text{m}) + 4.6 \text{ dB} - 45 \text{ dB} = 54 \text{ dB}(\mu\text{V/m})$

Limit @ 1 meter: 63.5 dB(μ V/m)



Plot B 127

Radiated spurious emission measurements in the anechoic chamber @ 1 m distance,
carrier frequency 2412 MHz, 24 dBi antenna



No spurious were found

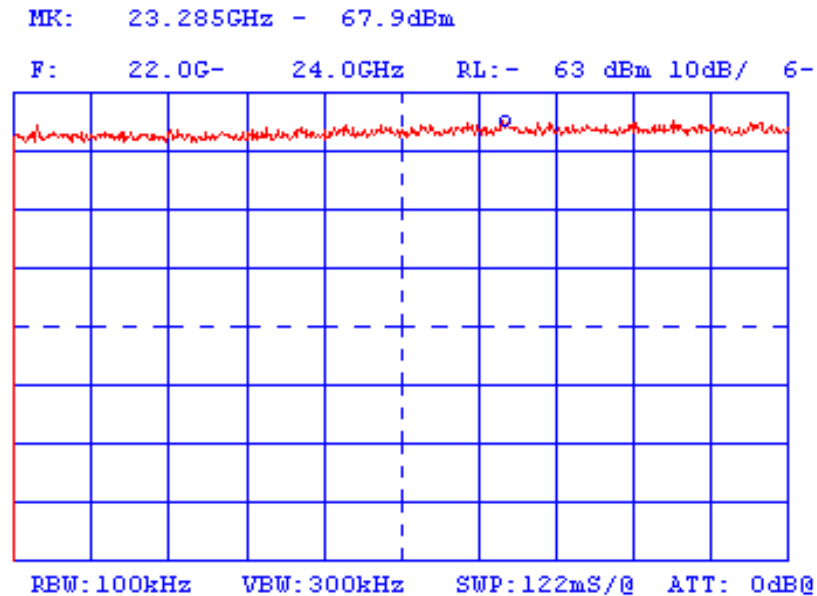
U_{SA} : -69.3 dBm = 37.7 dB μ V/m

Noise level: $U_{SA} + AF - \text{Ampl. gain} = 37.7 \text{ dB}(\mu\text{V/m}) + 32 \text{ dB}(1/\text{m}) - 43 \text{ dB} = 26.7 \text{ dB}(\mu\text{V/m})$



Plot B 128

Radiated spurious emission measurements in the anechoic chamber @ 1 m distance,
carrier frequency 2412 MHz, 24 dBi antenna



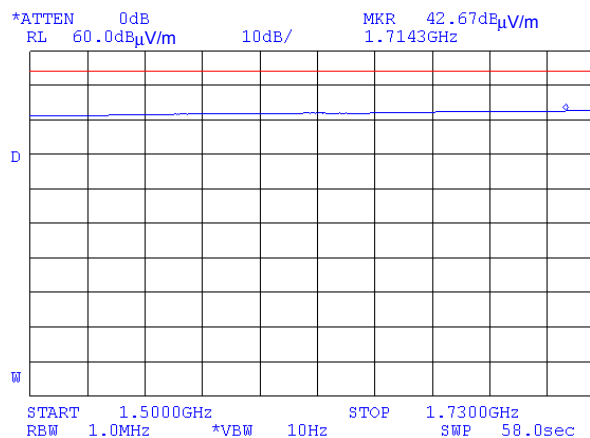
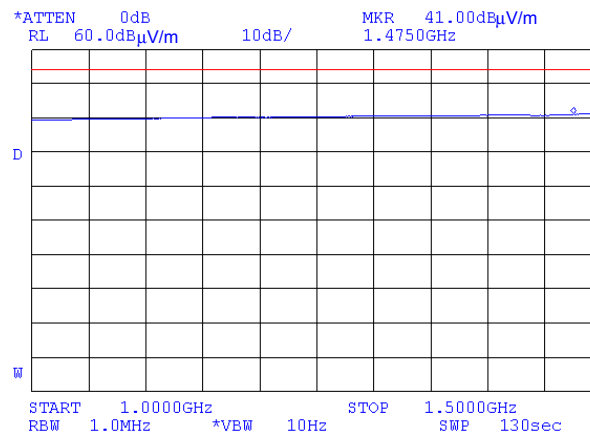
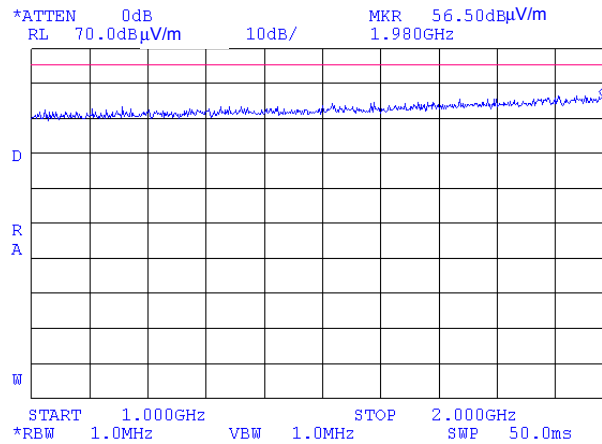
No spurious were found

U_{SA} : -67.9 dBm = 39.1 dB μ V/m

Noise level: $U_{SA} + AF - \text{Ampl. gain} = 39.1 \text{ dB}(\mu\text{V/m}) + 32 \text{ dB}(1/\text{m}) - 43 \text{ dB} = 28.1 \text{ dB}(\mu\text{V/m})$



Plot B 129
Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2442 MHz, 24 dBi antenna





Plot B 130

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2442 MHz, 24 dBi antenna

12:31:37 FEB 11, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 2.0351 GHz
39.55 dBμV/m

MEASURE
A1 MKR
ADD TO
LIST

LOG REF 60 0 dBμV/m

PREAMP ON

CLEAR
WRITE A

10
dB/
A1N
10 dB

MAX
HOLD A

VIEW A

VA SB
SC FC
ACORR

BLANK A

Trace
A B C

START 2.0000 GHz

STOP 2.3900 GHz

R 11F BW 1.0 MHz

1AVG BW 10 kHz

SWP 117 msec

More
1 of 3



Plot B 131

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2442 MHz, 24 dBi antenna

12:26:41 FEB 11, 2003

ACTV DET: PEAK
NEAS DET: PEAK OP AVG
MKR 2.5210 GHz
41.91 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

LOG REF 60 0 dBμV/m

PREAMP ON

10

dB/

ATTN

10 dB

VA SB

SC FC

ACORR

START 2.4835 GHz

RL 11F BW 1.0 MHz

1AVG BW 10 kHz

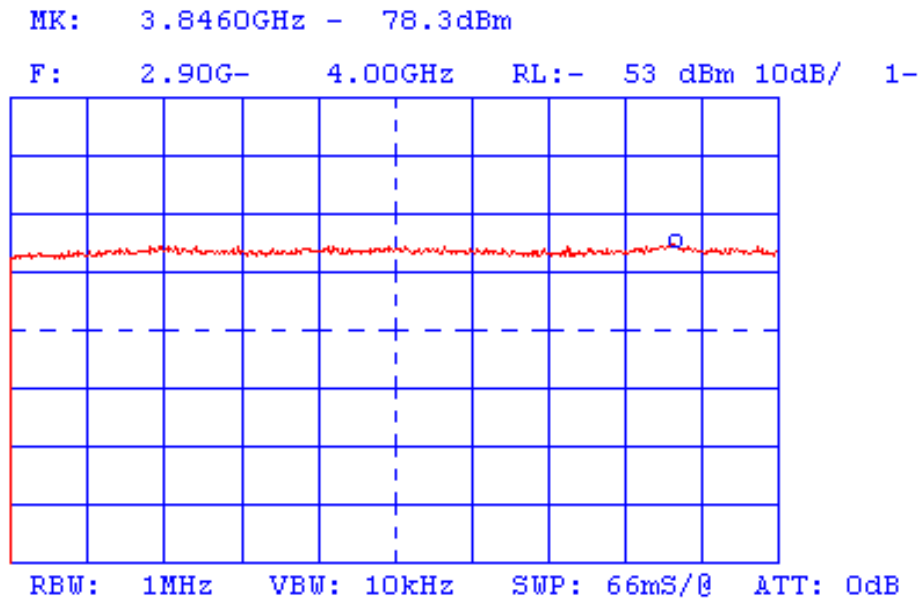
STOP 2.9000 GHz

SWP 125 msec



Plot B 132

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2442 MHz, 24 dBi antenna



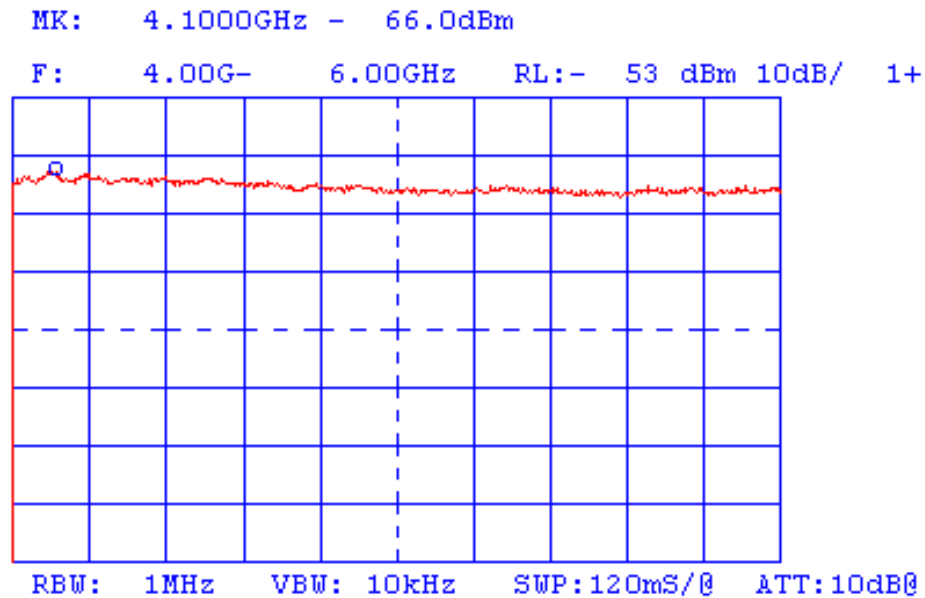
Limit = 54 dBuV/m

Usa+AF+Closs-Amplif.gain = 28.7+32.5+1.8-20 = 42.5 dBuV/m (peak)



Plot B 133

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2442 MHz, 24 dBi antenna



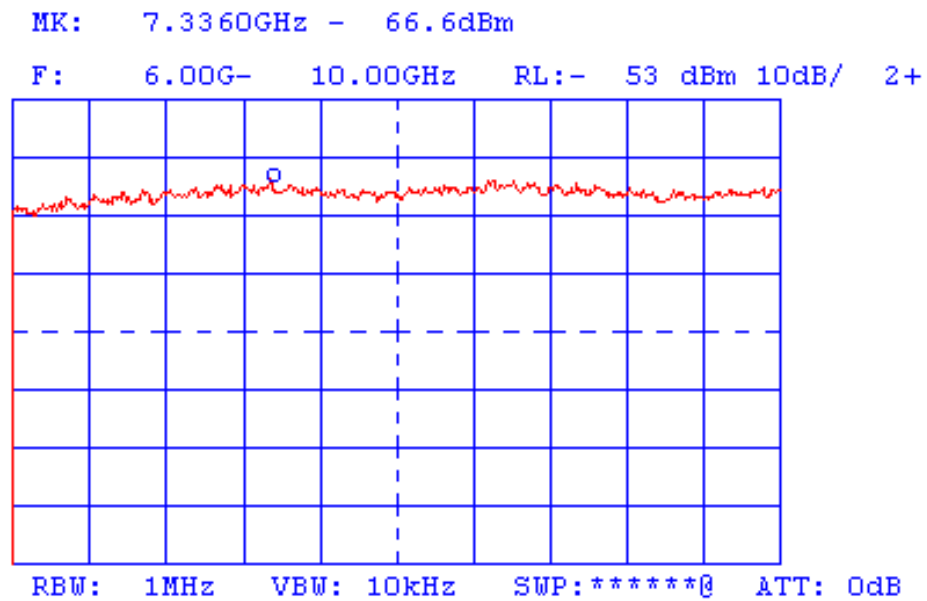
Limit = 54 dBuV/m

Usa+AF+Closs-Amplif.gain = 41+35+2.0 -35= 43 dBuV/m (peak)



Plot B 134

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2442 MHz, 24 dBi antenna

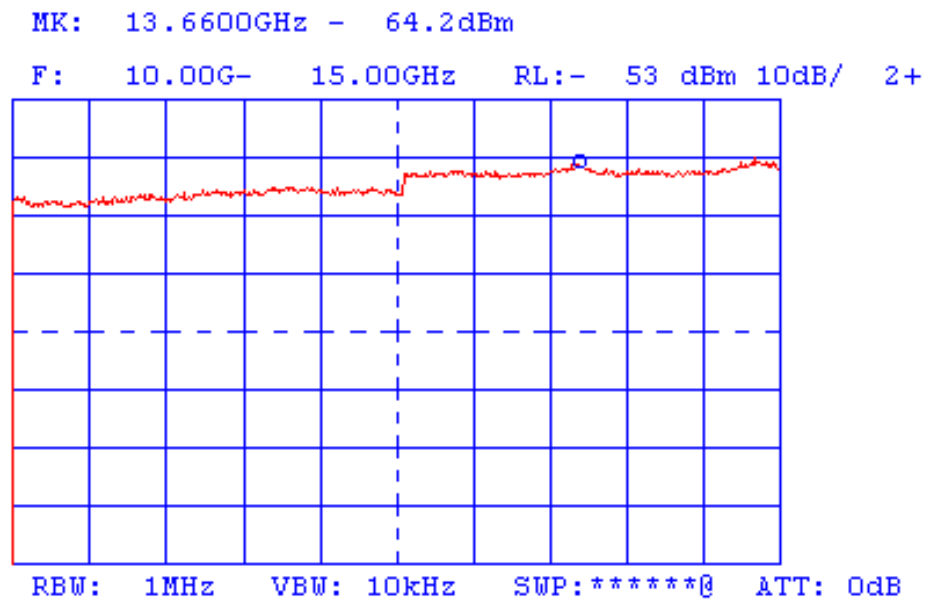


Limit = 54 dBuV/m
Usa+AF+Closs-Amplif.gain = 40.4+38+3.0-35 = 46.4 dBuV/m (peak)



Plot B 135

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2442 MHz, 24 dBi antenna

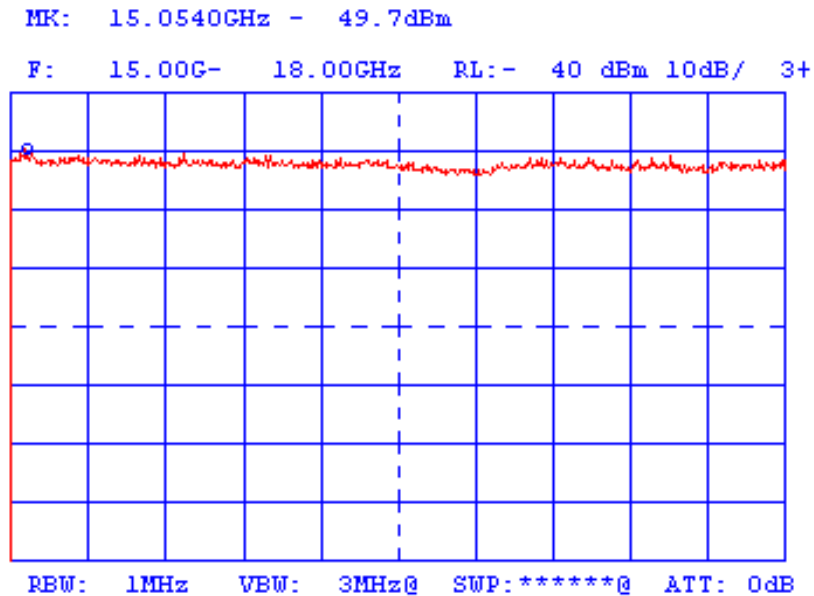


Limit = 54 dBuV/m
Usa+AF+Closs-Amplif.gain = 42.8+38+4.2-35=50 dBuV/m (peak)



Plot B 136

Radiated spurious emission measurements in the anechoic chamber @ 1 m distance,
carrier frequency 2442 MHz, 24 dBi antenna



No spurious were found

U_{SA} : -49.7 dBm = 57.3 dB μ V/m

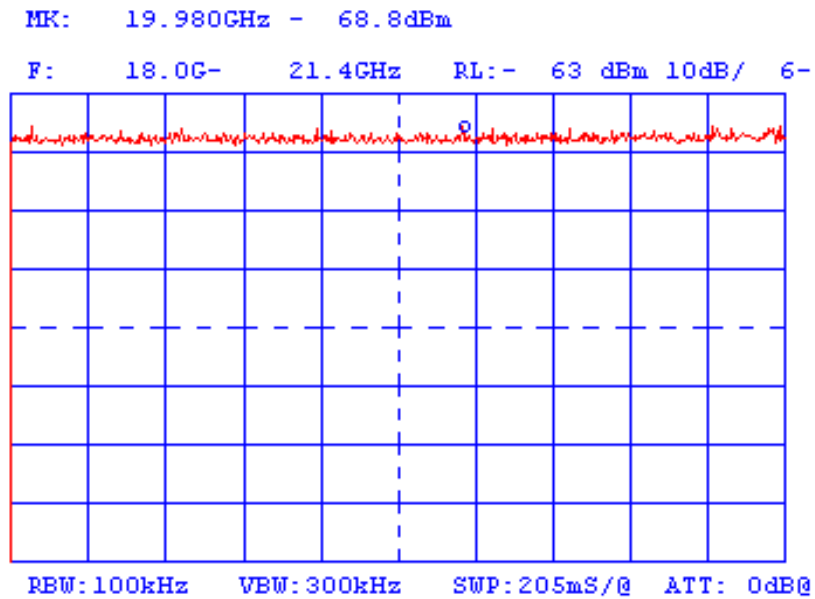
Noise level: $U_{SA} + AF + CL - \text{Ampl. gain} = 57.3 \text{ dB}(\mu\text{V/m}) + 38 \text{ dB}(1/\text{m}) + 4.6 \text{ dB} - 45 \text{ dB} = 54.9 \text{ dB}(\mu\text{V/m})$

Limit @ 1 meter: 63.5 dB(μ V/m)



Plot B 137

Radiated spurious emission measurements in the anechoic chamber @ 1 m distance,
carrier frequency 2442 MHz, 24 dBi antenna



No spurious were found

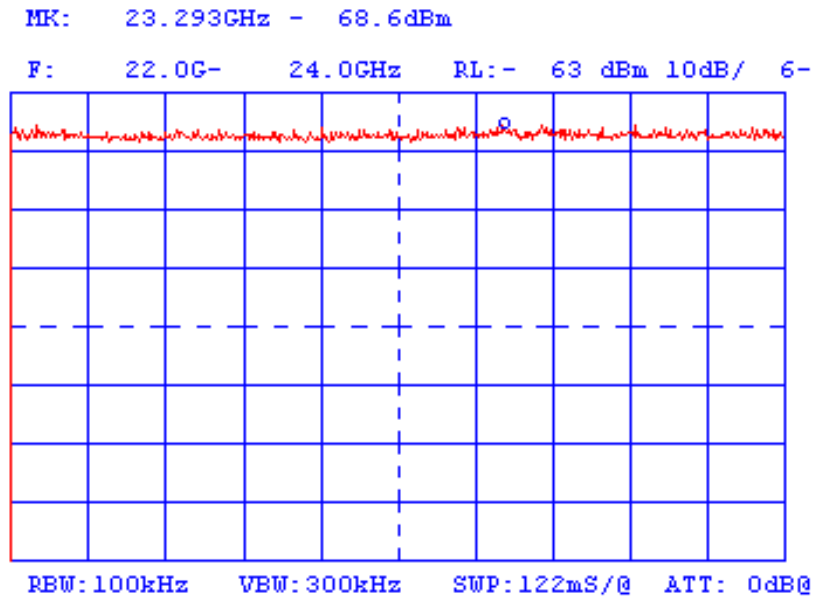
U_{SA} : -68.8 dBm = 38.2 dB μ V/m

Noise level: U_{SA} + AF - Ampl. gain = 38.2 dB(μ V/m) + 32 dB(1/m) - 43 dB = 27.2 dB(μ V/m)



Plot B 138

Radiated spurious emission measurements in the anechoic chamber @ 1 m distance,
carrier frequency 2442 MHz, 24 dBi antenna



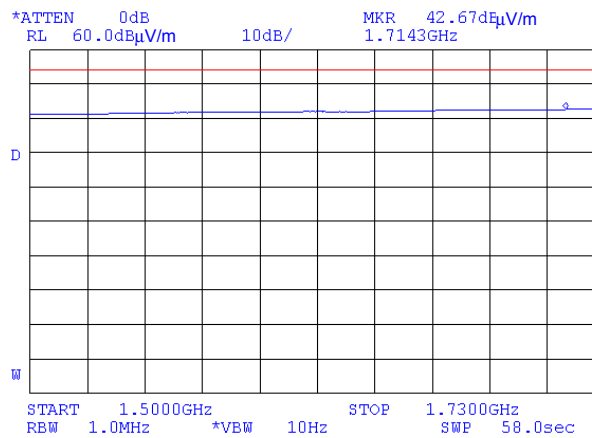
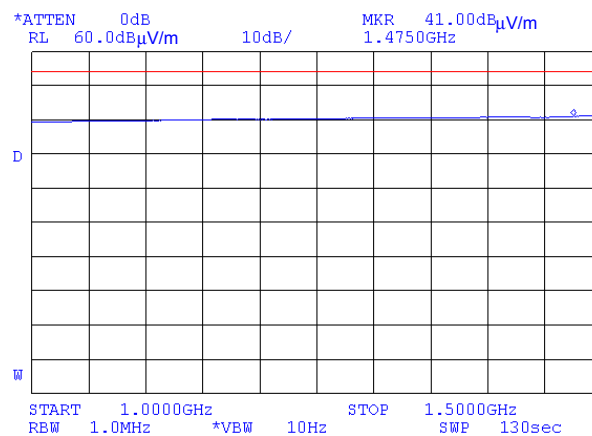
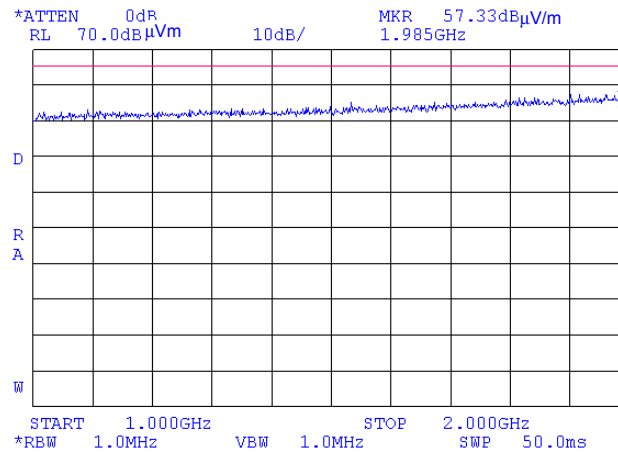
No spurious were found

U_{SA} : -68.6 dBm = 38.4 dB μ V/m

Noise level: $U_{SA} + AF - \text{Ampl. gain} = 38.4 \text{ dB}(\mu\text{V/m}) + 32 \text{ dB}(1/\text{m}) - 43 \text{ dB} = 27.4 \text{ dB}(\mu\text{V/m})$



Plot B 139
Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2472 MHz, 24 dBi antenna





Plot B 140

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2472 MHz, 24 dBi antenna

13:34:54 FEB 11, 2003

ACTV DET: PEAK
NEAS DET: PEAK OP AVG
MKR 2.3832 GHz
41.29 dBμV/m

MEASURE
AT MKR
ADD TO
LIST

LOG REF 60 0 dBμV/m

PREAMP ON

CLEAR
WRITE A

10
dB/
AIN
10 dB

MAX
HOLD A

VIEW A

MA SB
SC FC
ACORR

BLANK A

Trace
A B C

START 2.0000 GHz

STOP 2.3900 GHz

RL 11F BW 1.0 MHz

1AVG BW 10 kHz

SWP 117 nsec

More
1 of 3



Plot B 141

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2472 MHz, 24 dBi antenna

13:42:18 FEB 11, 2003

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 2.4866 GHz
46.12 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

LOG REF 60 0 dBμV/m

PREAMP ON

10

dB/

ATTN

10 dB

VA SB

SC FC

ACORR

START 2.4835 GHz

RL 11F BW 1.0 MHz

1AVG BW 10 kHz

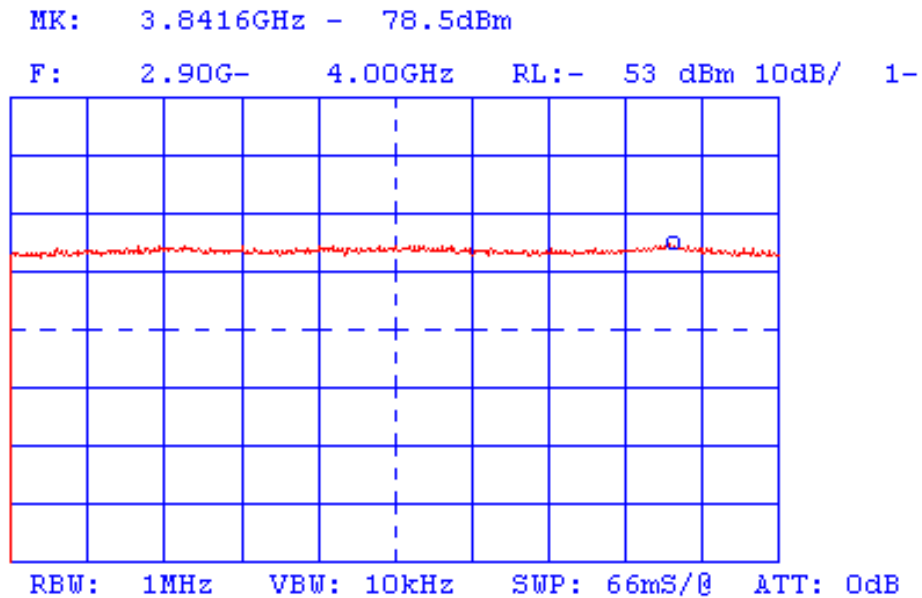
STOP 2.9000 GHz

SWP 125 msec



Plot B 142

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2472 MHz, 24 dBi antenna

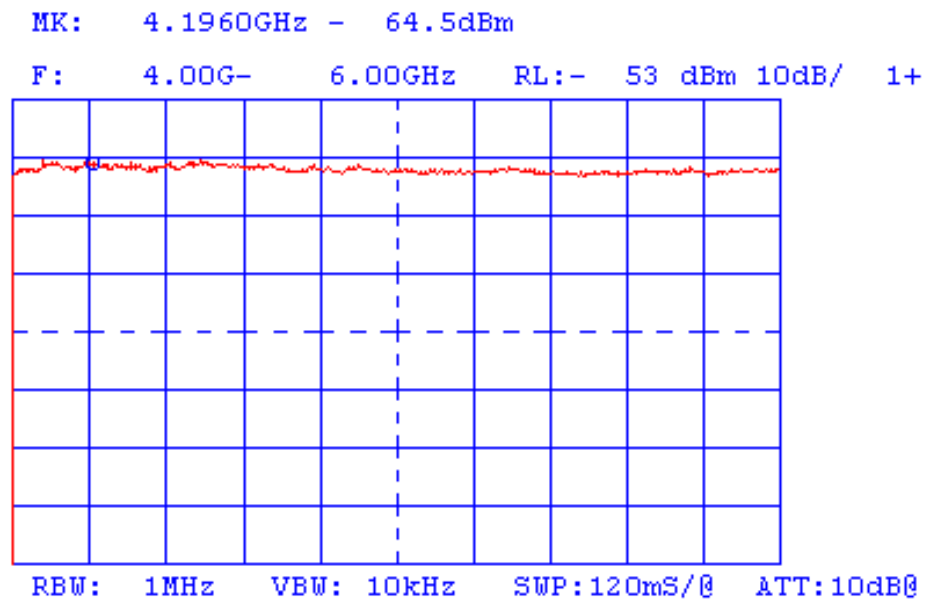


Limit line = 54 dBuV/m
Usa+AF+Closs-Amplif.gain = 28.5+32.5+1.9-20 = 42.9 dBuV/m (peak)



Plot B 143

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2472 MHz, 24 dBi antenna

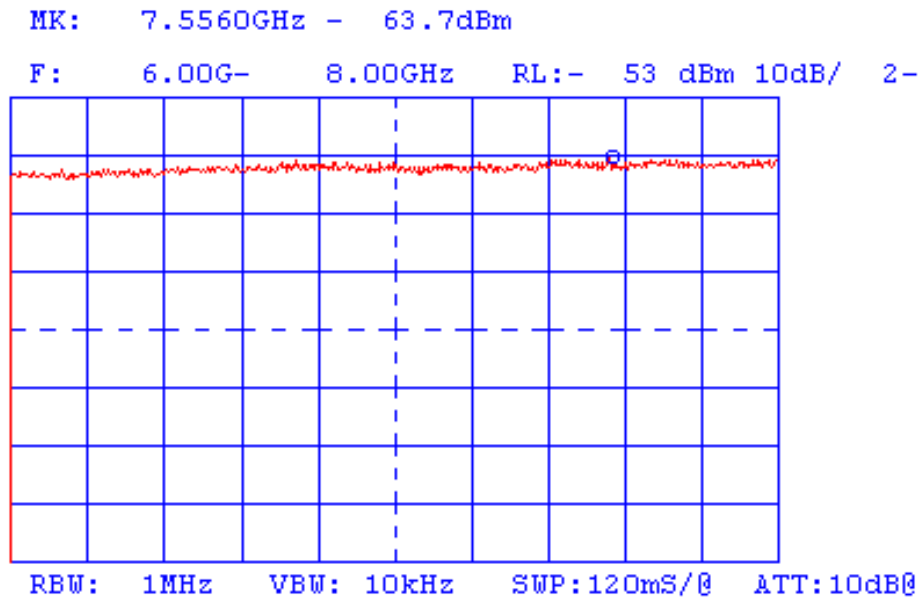


Limit line = 54 dBuV/m
Usa+AF+Closs-Amplif.gain = 42.5+35+2.6-35 = 45.1 dBuV/m
Margin = -8.9 dB



Plot B 144

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2472 MHz, 24 dBi antenna



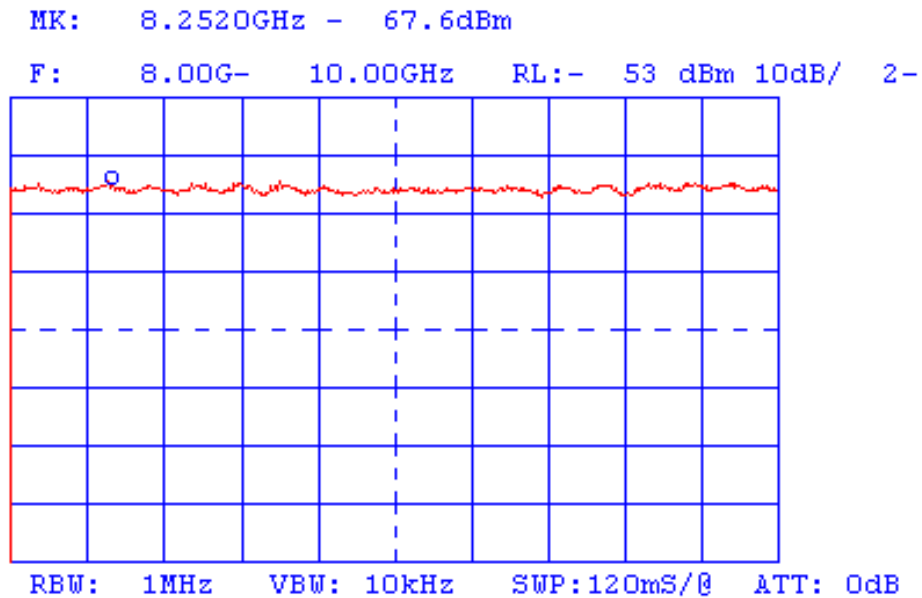
Limit = 54 dBuV/m

Usa+AF+Closs-Amplif.gain = 43.3 + 38+3.0-35 = 49.3 dBuV/m (peak)



Plot B 145

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2472 MHz, 24 dBi antenna

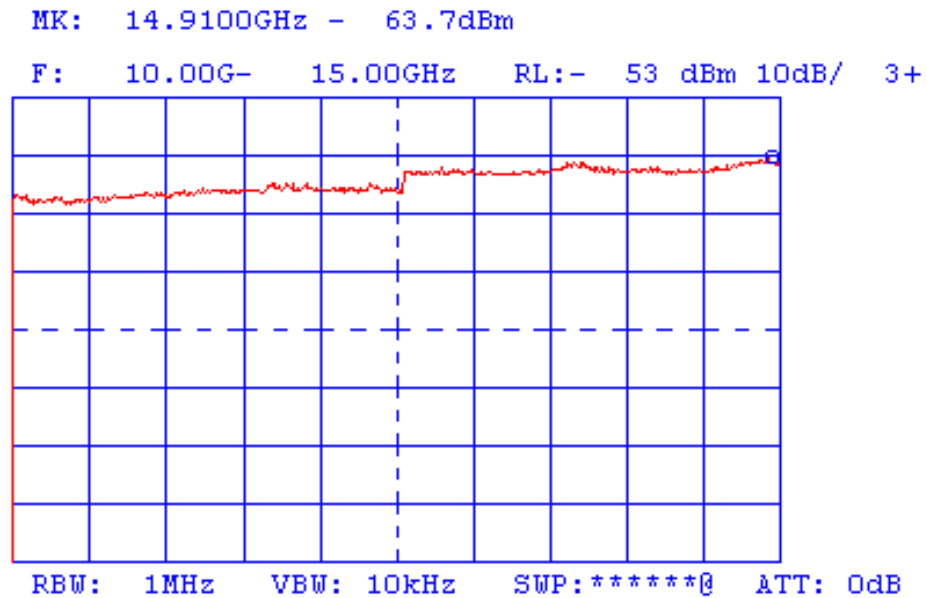


Limit = 54 dBuV/m
Usa+AF+Closs-Amplif.gain = 39.4+38+3.4-35=45.8 dBuV/m (peak)



Plot B 146

Radiated spurious emission measurements in the anechoic chamber @ 3 m distance,
carrier frequency 2472 MHz, 24 dBi antenna



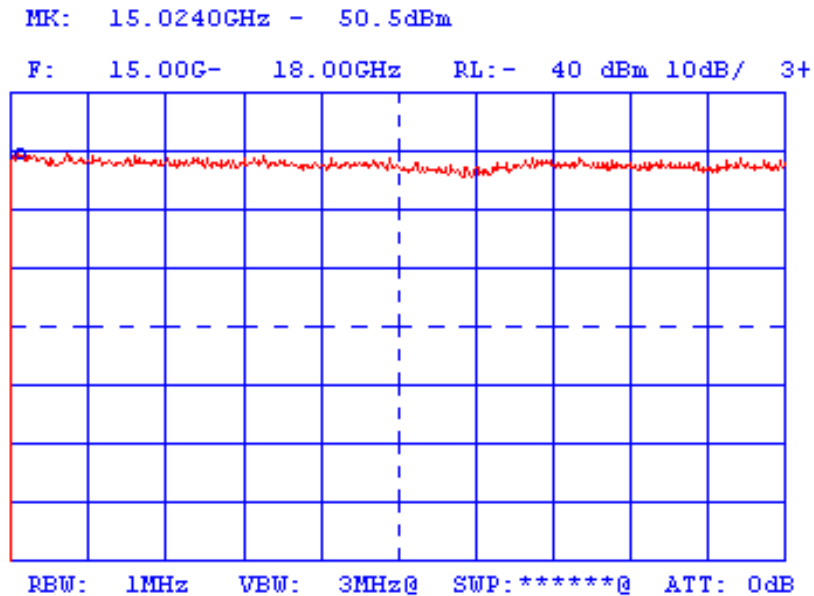
Limit = 54 dBuV/m

Usa+AF+Closs-Amplif.gain = 43.3+38+4.2-35=50.5 dBuV/m



Plot B 147

Radiated spurious emission measurements in the anechoic chamber @ 1 m distance,
carrier frequency 2472 MHz, 24 dBi antenna



No spurious were found

U_{SA} : -50.5 dBm = 56.5 dB μ V/m

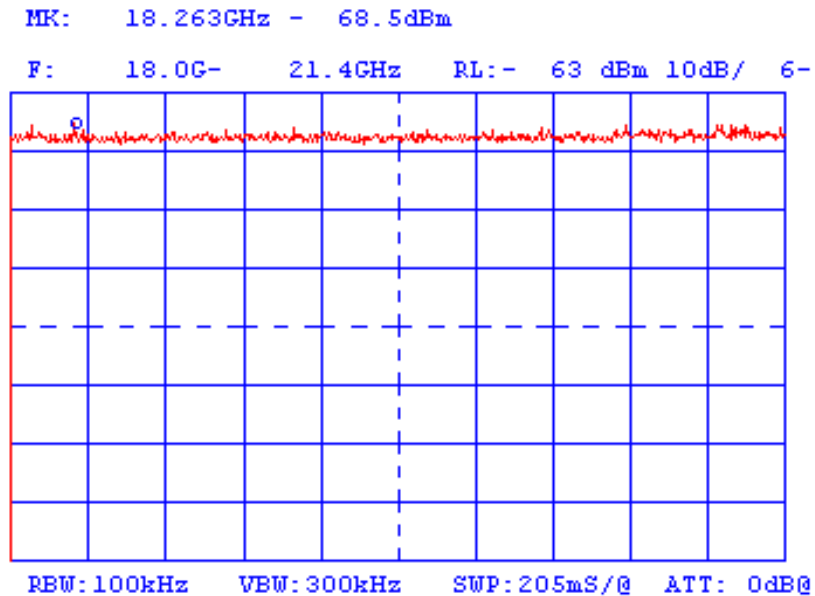
Noise level: $U_{SA} + AF + CL - \text{Ampl. gain} = 56.5 \text{ dB}(\mu\text{V/m}) + 38 \text{ dB}(1/\text{m}) + 4.6 \text{ dB} - 45 \text{ dB} = 54.1 \text{ dB}(\mu\text{V/m})$

Limit @ 1 meter: 63.5 dB(μ V/m)



Plot B 148

Radiated spurious emission measurements in the anechoic chamber @ 1 m distance,
carrier frequency 2472 MHz, 24 dBi antenna



No spurious were found

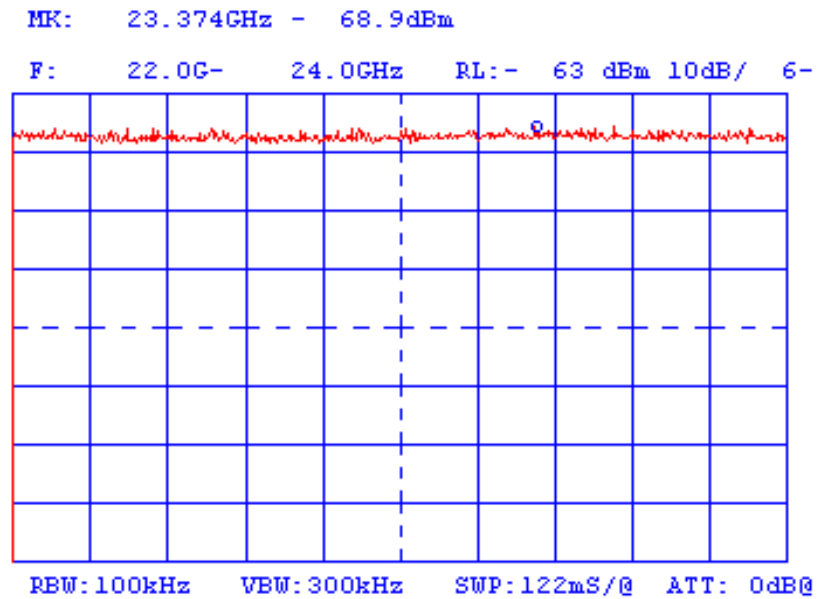
U_{SA} : -68.5 dBm = 38.5 dB μ V/m

Noise level: $U_{SA} + AF - \text{Ampl. gain} = 38.5 \text{ dB}(\mu\text{V/m}) + 32 \text{ dB}(1/\text{m}) - 43 \text{ dB} = 27.5 \text{ dB}(\mu\text{V/m})$



Plot B 149

Radiated spurious emission measurements in the anechoic chamber @ 1 m distance,
carrier frequency 2472 MHz, 24 dBi antenna



No spurious were found

U_{SA} : -68.9 dBm = 38.1 dB μ V/m

Noise level: $U_{SA} + AF - \text{Ampl. gain} = 38.1 \text{ dB}(\mu\text{V/m}) + 32 \text{ dB}(1/\text{m}) - 43 \text{ dB} = 27.1 \text{ dB}(\mu\text{V/m})$



Appendix C Test equipment used for tests

HL Serial No.	Description	Manufacturer information			Due Calibr. Month/ year
		Name	Model No.	Serial No.	
0025	Spectrum analyzer, 10 kHz-23 GHz	Anritsu	MS-710C	5837	10/03
0041	Double ridged guide antenna, 1-18 GHz	Electro-Metrics	RGA 50/60	2811	3/03
0091	Position controller for antenna mast + turntable, OFTS	Hermon Labs	CRL-2	NA	4/03 check
0163	LISN FCC/VDE/MIL -STD	Electro-Metrics	ANS-25/2	1314	10/03
0275	Table non-metallic, 1.5 x 1.0 x 0.8 m	Hermon Labs	TNM	040	3/03 check
0287	Turntable, motorized diameter, 2 m	Hermon Labs	TMD-2	042	11/03 check
0446	Active Loop Antenna, 10 kHz-30 MHz	Electro-Mechanics	6502	2857	10/03
0465	Anechoic chamber 9 (L) x 6.5 (W) x 5.5 (H) m	Hermon Labs	AC-1	023	10/05 check
0521	Spectrum analyzer with RF filter section (EMI receiver 9 kHz - 6.5 GHz)	Hewlett Packard	8546A	0319	9/03
0554	Amplifier, 2 – 18 GHz RF	Miteq	AFD-4	4300	12/03
0589	Cable coaxial, GORE A2POL118.2, 3 m	Hermon Labs	GORE-3	589	11/03
0592	Position controller	Hermon Labs	L2-SR3000	100	5/03 check
0593	Antenna mast, 1-4 m/ 1-6 m Pneumatic	Hermon Labs	AM-F1	101	2/04 check
0594	Turntable for anechoic chamber, flush mounted, d=1.2 m, pneumatic	Hermon Labs	WDC1	102	1/04 check
0604	Antenna biconilog log-periodic/T Bow-Tie, 26 - 2000 MHz	EMCO	3141	9611-1011	1/04
0750	Mixer, general purpose, waveguide, 18.0-26.5 GHz	Tektronix	119-0098-00	NA	6/03 check
0768	Antenna standard gain horn 18-26.5 GHz, WR-42, K-band, gain – 25 dB	Quinstar Technology	QWH-4200-BA	110	07/04 check
0787	Transient limiter	Hewlett Packard	11947A-8ZE	3107A01877	11/03
1003	Cable coaxial, M17/164, 10 m	Hermon Labs	C17164-10	161	11/03
1004	Cable, coaxial ANDREW PSWJ4, 6 m	Hermon Labs	ANDREW-6	163	12/03
1200	Quadruplexer, 1-12 GHz	Elettronica S.p.A. - Roma	UE 84	0240	4/03 check
1424	Spectrum analyzer, 30 Hz - 40 GHz	Agilent Technologies	8564EC	3946A00219	8/03
1425	EMI receiver, 9 kHz – 2.9 GHz	Agilent Technologies	8542E	3710A002223 705A00204	9/03
1566	Cable RF, 2 m	Huber-Suhner	Sucoflex 104PE	13094/4PE	12/03
1826	Antenna mast and turntable position controller	Sh. I. Machines	CRL-4	1	5/03 check
1849	Antenna mast with polarity control	Sh. I. Mashines	AM-F4	NA	1/03 check
1850	Turntable	Sh. I. Mashines	TT-M-3	NA	1/03 check
1940	Cable 40 GHz, 1.5 m, blue	Rhophase Microwave Ltd.	KPS-1503A-1500-KPS	T4663	10/03
1942	Cable 18 GHz, 4 m, blue	Rhophase Microwave Ltd.	SPS-1803A-4000-NPS	T4658	10/03
1984	Antenna, double ridged waveguide horn, 1-18 GHz, 300W, N-type	EMC Test Systems	3115	9911-5964	3/04
2009	Cable RF, 8 m	Alpha Wire	RG-214	C-56	12/03
2109	Anechoic chamber 6 (L) x 5.5 (W) x 2.95 (H) m	Hermon Labs	AC-2	NA	12/03 check
2254	Cable 40 GHz, 0.8 m, blue	Rhophase Microwave	KPS-1503A-800-KPS	W4907	11/03
2258	Amplifier Low Noise 2-20 GHz	Sophia Wireless	LNA0220-C	0222	11/03
2260	Amplifier Low Noise 14-33 GHz	Sophia Wireless	LNA28-B	0233	11/03



Appendix D General information

Test facility description

Tests were performed at Hermon Laboratories Ltd., which is a fully independent, private EMC, Safety and Telecommunication testing facility. Hermon Laboratories is listed by the Federal Communications Commission (USA) for all parts of Code of Federal Regulations 47 (CFR 47) and by Industry Canada for electromagnetic emissions (file numbers IC 2186-1 for OATS and IC 2186-2 for anechoic chamber), certified by VCCI, Japan (the registration numbers are R-808 for OATS, R-1082 for anechoic chamber, C-845 for conducted emissions site), assessed by TNO Certification EP&S (Netherlands) for a number of EMC, Telecommunications, Safety standards, and by AMTAC (UK) for safety of Medical Devices. The laboratory is accredited by American Association for Laboratory Accreditation (USA) according to ISO/IEC 17025 for Electromagnetic Compatibility, Product Safety, Telecommunications Testing and Environmental Simulation (for exact scope please refer to Certificate No. 839.01).

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e-mail: mail@hermonlabs.com

Person for contact: Mr. Alex Usoskin, QA manager.

Abbreviations and acronyms

The following abbreviations and acronyms are applicable to this test report:

cm	centimeter
dB	decibel
dBm	decibel referred to one milliwatt
dB(μ V)	decibel referred to one microvolt
dB(μ V/m)	decibel referred to one microvolt per meter
EMC	electromagnetic compatibility
EUT	equipment under test
GHz	gigahertz
H	height
Hz	hertz
kHz	kilohertz
kV	kilovolt
L	length
LISN	line impedance stabilization network
m	meter
MHz	megahertz
NA	not applicable
QP	quasi-peak
RF	radio frequency
RE	radiated emission
rms	root mean square
s	second
V	volt
W	width

Specification references

47CFR part 15: 2001	Radio Frequency Devices
ANSI C63.2: 1996	American National Standard for Instrumentation-Electromagnetic Noise and Field Strength, 10 kHz to 40 GHz-Specifications.
ANSI C63.4: 1992	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.



Appendix E Test equipment correction factors

**Antenna factor
Active Loop Antenna
Model 6502, S/N 2857, HL 0446**

Frequency, MHz	Magnetic antenna factor, dB	Electric antenna factor, dB
0.009	-32.8	18.7
0.010	-33.8	17.7
0.020	-38.3	13.2
0.050	-41.1	10.4
0.075	-41.3	10.2
0.100	-41.6	9.9
0.150	-41.7	9.8
0.250	-41.6	9.9
0.500	-41.8	9.8
0.750	-41.9	9.7
1.000	-41.4	10.1
2.000	-41.5	10.0
3.000	-41.4	10.2
4.000	-41.4	10.1
5.000	-41.5	10.1
10.000	-41.9	9.6
15.000	-41.9	9.6
20.000	-42.2	9.3
25.000	-42.8	8.7
30.000	-44.0	7.5

Antenna factor in dB(1/m) is to be added to receiver meter reading in dB(μ V) to convert it into field intensity in dB(μ V/m).



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 in dB(1/m) is to be added to receiver meter reading in dB(μ V) to convert it into field intensity in dB(μ V/m).



Antenna factor
Double ridged guide antenna
Model RGA-50/60, S/N 2811, HL 0041

Frequency, MHz	Antenna factor, dB(1/m)
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 in dB(1/m) is to be added to receiver meter reading in dB(μ V) to convert it into field intensity in dB(μ V/m).



Antenna factor
Double-ridged wave guide horn antenna
Model 3115, S/N 9911-5964, HL1984

Frequency, MHz	Antenna factor, dB(1/m)
1000.0	24.7
1500.0	25.7
2000.0	27.6
2500.0	28.9
3000.0	31.2
3500.0	32.0
4000.0	32.5
4500.0	32.7
5000.0	33.6
5500.0	35.1
6000.0	35.4
6500.0	34.9
7000.0	36.1
7500.0	37.8
8000.0	38.0
8500.0	38.1
9000.0	39.1
9500.0	38.3
10000.0	38.6
10500.0	38.2
11000.0	38.7
11500.0	39.5
12000.0	40.0
12500.0	40.4
13000.0	40.5
13500.0	41.1
14000.0	41.6
14500.0	41.7
15000.0	38.7
15500.0	38.2
16000.0	38.8
16500.0	40.5
17000.0	42.5
17500.0	45.9
18000.0	49.4

Antenna factor in dB(1/m) is to be added to receiver meter reading in dB(μ V) to convert it into field intensity in dB(μ V/m).



Antenna factor

for standard gain horn antennas

Antenna factor was derived from the following equation: $AF = 20 \log F - \text{Gain} - 29.8$

where F - frequency in MHz;
Gain - antenna gain in dBi; 25 dBi

f, MHz	Antenna factor, dB(1/m)	f, MHz	Antenna factor, dB(1/m)	f, MHz	Antenna factor, dB(1/m)	f, MHz	Antenna factor, dB(1/m)
18,000	30.31	48,500	38.91	79,000	43.15	109,500	45.99
18,500	30.54	49,000	39.00	79,500	43.21	110,000	46.03
19,000	30.78	49,500	39.09	80,000	43.26	110,500	46.07
19,500	31.00	50,000	39.18	80,500	43.32	111,000	46.11
20,000	31.22	50,500	39.27	81,000	43.37	111,500	46.15
20,500	31.44	51,000	39.35	81,500	43.42	112,000	46.18
21,000	31.64	51,500	39.44	82,000	43.48	112,500	46.22
21,500	31.85	52,000	39.52	82,500	43.53	113,000	46.26
22,000	32.05	52,500	39.60	83,000	43.58	113,500	46.30
22,500	32.24	53,000	39.69	83,500	43.63	114,000	46.34
23,000	32.43	53,500	39.77	84,000	43.69	114,500	46.38
23,500	32.62	54,000	39.85	84,500	43.74	115,000	46.41
24,000	32.80	54,500	39.93	85,000	43.79	115,500	46.45
24,500	32.98	55,000	40.01	85,500	43.84	116,000	46.49
25,000	33.16	55,500	40.09	86,000	43.89	116,500	46.53
25,500	33.33	56,000	40.16	86,500	43.94	117,000	46.56
26,000	33.50	56,500	40.24	87,000	43.99	117,500	46.60
26,500	33.66	57,000	40.32	87,500	44.04	118,000	46.64
27,000	33.83	57,500	40.39	88,000	44.09	118,500	46.67
27,500	33.99	58,000	40.47	88,500	44.14	119,000	46.71
28,000	34.14	58,500	40.54	89,000	44.19	119,500	46.75
28,500	34.30	59,000	40.62	89,500	44.24	120,000	46.78
29,000	34.45	59,500	40.69	90,000	44.28	120,500	46.82
29,500	34.60	60,000	40.76	90,500	44.33	121,000	46.86
30,000	34.74	60,500	40.84	91,000	44.38	121,500	46.89
30,500	34.89	61,000	40.91	91,500	44.43	122,000	46.93
31,000	35.03	61,500	40.98	92,000	44.48	122,500	46.96
31,500	35.17	62,000	41.05	92,500	44.52	123,000	47.00
32,000	35.30	62,500	41.12	93,000	44.57	123,500	47.03
32,500	35.44	63,000	41.19	93,500	44.62	124,000	47.07
33,000	35.57	63,500	41.26	94,000	44.66	124,500	47.10
33,500	35.70	64,000	41.32	94,500	44.71	125,000	47.14
34,000	35.83	64,500	41.39	95,000	44.75	125,500	47.17
34,500	35.96	65,000	41.46	95,500	44.80	126,000	47.21
35,000	36.08	65,500	41.52	96,000	44.85	126,500	47.24
35,500	36.20	66,000	41.59	96,500	44.89	127,000	47.28
36,000	36.33	66,500	41.66	97,000	44.94	127,500	47.31
36,500	36.45	67,000	41.72	97,500	44.98	128,000	47.34
37,000	36.56	67,500	41.79	98,000	45.02	128,500	47.38
37,500	36.68	68,000	41.85	98,500	45.07	129,000	47.41
38,000	36.80	68,500	41.91	99,000	45.11	129,500	47.45
38,500	36.91	69,000	41.98	99,500	45.16	130,000	47.48
39,000	37.02	69,500	42.04	100,000	45.20	130,500	47.51
39,500	37.13	70,000	42.10	100,500	45.24	131,000	47.55
40,000	37.24	70,500	42.16	101,000	45.29	131,500	47.58
40,500	37.35	71,000	42.23	101,500	45.33	132,000	47.61
41,000	37.46	71,500	42.29	102,000	45.37	132,500	47.64
41,500	37.56	72,000	42.35	102,500	45.41	133,000	47.68
42,000	37.66	72,500	42.41	103,000	45.46	133,500	47.71
42,500	37.77	73,000	42.47	103,500	45.50	134,000	47.74
43,000	37.87	73,500	42.53	104,000	45.54	134,500	47.77
43,500	37.97	74,000	42.58	104,500	45.58	135,000	47.81
44,000	38.07	74,500	42.64	105,000	45.62	135,500	47.84
44,500	38.17	75,000	42.70	105,500	45.67	136,000	47.87
45,000	38.26	75,500	42.76	106,000	45.71	136,500	47.90
45,500	38.36	76,000	42.82	106,500	45.75	137,000	47.93
46,000	38.46	76,500	42.87	107,000	45.79	137,500	47.97
46,500	38.55	77,000	42.93	107,500	45.83	138,000	48.00
47,000	38.64	77,500	42.99	108,000	45.87	138,500	48.03
47,500	38.73	78,000	43.04	108,500	45.91	139,000	48.06
48,000	38.82	78,500	43.10	109,000	45.95	139,500	48.09
						140,000	48.12



Cable loss
Cable coaxial, M17/164, model: C17164-10, s/n 161, HL 1003

No.	Frequency, MHz	Cable loss, dB	Tolerance, dB	Measurement uncertainty, dB
1	30	0.41	≤ 12.5	± 0.12
2	50	0.52		
3	100	0.75		
4	300	1.45		
5	500	2.01		
6	800	2.71		
7	1000	3.14		
8	1200	3.56		
9	1400	3.93		
10	1600	4.31		
11	1800	4.63		
12	2000	4.97		
13	2200	5.32		
14	2400	5.65		
15	2600	6.01	≤ 12.5	± 0.12
16	2800	6.42		
17	3000	6.76		
18	3300	7.12		
19	3600	7.53		
20	3900	7.95		± 0.17
21	4200	8.32		
22	4500	8.72		
23	4800	9.14		
24	5100	9.59		
25	5400	10.00		
26	5700	10.49		
27	6000	11.07		
28	6500	11.80		



Cable loss
Cable Coaxial, GORE A2P01POL118, 2.3 m, model:GORE-3, HL 0589
+ Cable Coaxial, ANDREW PSWJ4, 6m, model: ANDREW-6, HL 1004

No.	Frequency, MHz	Cable loss, dB	Tolerance, dB	Measurement uncertainty, dB
1	30	0.33	≤ 6.5	± 0.12
2	50	0.40		
3	100	0.57		
4	300	0.97		
5	500	1.25		
6	800	1.59		
7	1000	1.81		
8	1200	1.97		
9	1400	2.15		
10	1600	2.28		
11	1800	2.43		
12	2000	2.61		
13	2200	2.75		
14	2400	2.89		
15	2600	2.97		
16	2800	3.21	≤ 6.5	± 0.12
17	3000	3.32		
18	3300	3.47		± 0.17
19	3600	3.62		
20	3900	3.84		
21	4200	3.92		
22	4500	4.07		
23	4800	4.36		
24	5100	4.62		
25	5400	4.78		
26	5700	5.16		
27	6000	5.67		
28	6500	5.99		



Cable loss
RF cable 8 m, model RG-214, HL 2009

No.	Frequency, MHz	Cable loss, dB	Tolerance (Specification), dB	Measurement uncertainty, dB
1	1	0.10	NA	±0.12
2	10	0.14		
3	30	0.25		
4	50	0.34		
5	100	0.53		
6	300	0.99		
7	500	1.31		
8	800	1.73		
9	1000	1.98		
10	1100	2.11		
11	1200	2.21		
12	1300	2.35		
13	1400	2.46		
14	1500	2.55		
15	1600	2.68		
16	1700	2.78		
17	1800	2.88		
18	1900	2.98		
19	2000	3.09		



Cable loss
Cable RF, 2m, model: Sucoflex 104PE, S/N 13094/4PE, HL 1566

No.	Frequency, MHz	Cable loss, dB	Tolerance, dB	Measurement uncertainty, dB
1	30	0.10	≤ 5.0	±0.12
2	50	0.13		
3	100	0.20		
4	300	0.33		
5	500	0.45		
6	800	0.60		
7	1000	0.65		
8	1500	0.91		
9	2000	1.08		
10	2500	1.19		
11	3000	1.28		
12	3500	1.49		
13	4000	1.63		
14	4500	1.63		
15	5000	1.66	≤ 5.0	±0.17
16	5500	1.88		
17	6000	1.96		
18	6500	1.93		
19	7000	2.07		
20	7500	2.37		
21	8000	2.34		
22	8500	2.64		
23	9000	2.68		
24	9500	2.64		
25	10000	2.70		
26	10500	2.84		
27	11000	2.88		
28	11500	3.19		
29	12000	3.15		
30	12500	3.20	≤ 5.0	±0.26
31	13000	3.22		
32	13500	3.47		
33	14000	3.41		
34	14500	3.59		
35	15000	3.79		
36	15500	4.24		
37	16000	4.12		
38	16500	4.46		
39	17000	4.50		
40	17500	4.49		
41	18000	4.45		



Cable loss
Cable 40 GHz, 1.5 m, blue, model: KPS-1503A-1500-KPS, S/N T4663, HL 1940

Frequency, GHz	Cable loss, dB	Frequency, GHz	Cable loss, dB	Frequency, GHz	Cable loss, dB
0.03	0.13	5.10	1.33	15.00	2.27
0.05	0.14	5.30	1.33	15.50	2.32
0.10	0.19	5.50	1.38	16.00	2.39
0.20	0.25	5.70	1.41	16.50	2.41
0.30	0.31	5.90	1.43	17.00	2.36
0.40	0.37	6.10	1.50	17.50	2.42
0.50	0.41	6.30	1.47	18.00	2.50
0.60	0.46	6.50	1.56	18.50	2.89
0.70	0.49	6.70	1.50	19.00	2.86
0.80	0.53	6.90	1.53	19.50	2.84
0.90	0.56	7.10	1.53	20.00	2.77
1.00	0.59	7.30	1.56	20.50	2.73
1.10	0.62	7.50	1.59	21.00	3.05
1.20	0.65	7.70	1.62	21.50	3.07
1.30	0.68	7.90	1.68	22.00	2.97
1.40	0.70	8.10	1.67	22.50	2.91
1.50	0.73	8.30	1.70	23.00	3.02
1.60	0.76	8.50	1.69	23.50	3.29
1.70	0.77	8.70	1.70	24.00	3.31
1.80	0.80	8.90	1.68	24.50	3.49
1.90	0.82	9.10	1.70	25.00	3.37
2.00	0.84	9.30	1.70	25.50	3.56
2.10	0.85	9.50	1.77	26.00	3.56
2.20	0.87	9.70	1.80	26.50	3.33
2.30	0.88	9.90	1.88	27.00	3.52
2.40	0.90	10.10	1.93	28.00	3.38
2.50	0.91	10.30	1.94	29.00	3.34
2.60	0.93	10.50	1.99	30.00	3.33
2.70	0.95	10.70	1.91	31.00	3.48
2.80	0.97	10.90	2.00	32.00	3.63
2.90	0.98	11.10	1.92	33.00	3.69
3.10	1.02	11.30	1.97	34.00	3.79
3.30	1.05	11.50	1.98	35.00	3.77
3.50	1.09	11.70	1.99	36.00	3.92
3.70	1.12	11.90	2.06	37.00	3.94
3.90	1.15	12.10	2.01	38.00	3.80
4.10	1.18	12.40	2.08	39.00	4.15
4.30	1.21	13.00	2.05	40.00	4.03
4.50	1.24	13.50	2.15		
4.70	1.29	14.00	2.25		
4.90	1.27	14.50	2.26		



Cable loss
Cable 18 GHz, 4 m, blue, model: SPS-1803A-4000-NPS, S/N T4658, HL 1942

Frequency, GHz	Cable loss, dB
0.03	0.21
0.05	0.26
0.10	0.36
0.20	0.50
0.30	0.61
0.40	0.70
0.50	0.78
0.60	0.85
0.70	0.93
0.80	0.99
0.90	1.04
1.00	1.10
1.10	1.16
1.20	1.22
1.30	1.26
1.40	1.31
1.50	1.35
1.60	1.41
1.70	1.45
1.80	1.49
1.90	1.53
2.00	1.57
2.10	1.61
2.20	1.65
2.30	1.69
2.40	1.72
2.50	1.76
2.60	1.79
2.70	1.83
2.80	1.87
2.90	1.90
3.10	1.97
3.30	2.04
3.50	2.11
3.70	2.18
3.90	2.24
4.10	2.31
4.30	2.38
4.50	2.43
4.70	2.53
4.90	2.53
5.10	2.63
5.30	2.65
5.50	2.72
5.70	2.76
5.90	2.79

Frequency, GHz	Cable loss, dB
6.10	2.88
6.30	2.90
6.50	2.97
6.70	3.02
6.90	3.04
7.10	3.07
7.30	3.12
7.50	3.13
7.70	3.19
7.90	3.24
8.10	3.30
8.30	3.36
8.50	3.45
8.70	3.41
8.90	3.45
9.10	3.42
9.30	3.55
9.50	3.48
9.70	3.58
9.90	3.61
10.10	3.66
10.30	3.68
10.50	3.70
10.70	3.70
10.90	3.75
11.10	3.78
11.30	3.86
11.50	3.98
11.70	4.10
11.90	4.12
12.10	4.09
12.40	4.13
13.00	4.23
13.50	4.35
14.00	4.40
14.50	4.44
15.00	4.57
15.50	4.66
16.00	4.64
16.50	4.66
17.00	4.75
17.50	4.85
18.00	4.93



Cable loss
Cable 40 GHz, 0.8 m, blue, model: KPS-1503A-800-KPS, S/N W4907, HL 2254

Frequency, GHz	Cable loss, dB	Frequency, GHz	Cable loss, dB	Frequency, GHz	Cable loss, dB
0.03	0.04	5.10	0.80	15.00	1.49
0.05	0.07	5.30	0.83	15.50	1.49
0.10	0.09	5.50	0.83	16.00	1.46
0.20	0.15	5.70	0.84	16.50	1.47
0.30	0.19	5.90	0.87	17.00	1.50
0.40	0.25	6.10	0.86	17.50	1.57
0.50	0.29	6.30	0.89	18.00	1.63
0.60	0.33	6.50	0.90	18.50	1.57
0.70	0.37	6.70	0.89	19.00	1.63
0.80	0.41	6.90	0.93	19.50	1.65
0.90	0.44	7.10	0.92	20.00	1.64
1.00	0.45	7.30	0.95	20.50	1.75
1.10	0.48	7.50	0.96	21.00	1.72
1.20	0.51	7.70	0.97	21.50	1.78
1.30	0.53	7.90	1.01	22.00	1.76
1.40	0.54	8.10	1.00	22.50	1.72
1.50	0.57	8.30	1.05	23.00	1.83
1.60	0.59	8.50	1.04	23.50	1.80
1.70	0.04	8.70	1.07	24.00	1.90
1.80	0.07	8.90	1.11	24.50	1.81
1.90	0.09	9.10	1.09	25.00	1.98
2.00	0.15	9.30	1.14	25.50	1.91
2.10	0.19	9.50	1.12	26.00	2.02
2.20	0.25	9.70	1.15	26.50	1.92
2.30	0.29	9.90	1.16	27.00	1.97
2.40	0.33	10.10	1.16	28.00	2.02
2.50	0.37	10.30	1.19	29.00	1.95
2.60	0.41	10.50	1.14	30.00	1.94
2.70	0.44	10.70	1.19	31.00	2.11
2.80	0.45	10.90	1.17	32.00	2.17
2.90	0.48	11.10	1.13	33.00	2.27
3.10	0.61	11.30	1.20	34.00	2.27
3.30	0.64	11.50	1.13	35.00	2.29
3.50	0.65	11.70	1.20	36.00	2.35
3.70	0.68	11.90	1.18	37.00	2.37
3.90	0.69	12.10	1.14	38.00	2.40
4.10	0.71	12.40	1.19	39.00	2.57
4.30	0.73	13.00	1.34	40.00	2.36
4.50	0.75	13.50	1.33		
4.70	0.77	14.00	1.48		
4.90	0.79	14.50	1.45		



**Correction factor
Line impedance stabilization network
Model ANS-25/2
Electro-Metrics**

Frequency, kHz	Correction factor, dB
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

The correction factor in dB is to be added to meter readings of an interference analyzer or a spectrum analyzer.