

Radio test report 99594634

based on:

- FCC Part 15 Subpart C, section 15.247 (10-1-05 Edition)
- RSS-210, Issue 6 (Sept. 2005 edition)

Tablet PC with integral IEEE 802.11a/b/g WLAN
ads-tec
Compact3

Contents

MAIN MODULE.....	3
1 INTRODUCTION	3
2 PRODUCT	4
3 TEST SCHEDULE	4
4 PRODUCT DOCUMENTATION.....	5
5 OBSERVATIONS AND COMMENTS	5
6 MODIFICATIONS TO THE SAMPLE.....	6
7 SUMMARY.....	6
8 CONCLUSIONS.....	7
TEST RESULTS MODULE	8
1.1 Equipment information.....	8
1.2 Tested channels.....	8
1.3 Summary of test data (IEEE 802.11b).....	8
1.4 Summary of test data (IEEE 802.11g).....	9
2 EMISSION TESTS 802.11B & 802.11G.....	10
2.1 Power line conducted emissions.....	10
3 EMISSION TESTS 802.11B.....	12
3.1 Minimum 6 dB bandwidth.....	12
3.2 Peak power output	14
3.3 Peak power spectral density.....	15
3.4 Field strength of unwanted emissions 30 - 1000 MHz (exploratory)	16
3.5 Field strength of unwanted emissions > 1000 MHz	17
3.6 Field strength of unwanted emissions in restricted band 4.5 – 5.15 GHz	21
3.7 Field strength of unwanted emissions in lower adjacent restricted band.....	22
3.8 Field strength of unwanted emissions in upper adjacent restricted band.....	24
4 EMISSION TESTS 802.11G.....	26
4.1 Minimum 6 dB bandwidth.....	26
4.2 Peak power output	28
4.3 Peak power spectral density.....	29
4.4 Field strength of unwanted emissions 30 – 1000 MHz (exploratory)	30
4.5 Field strength of unwanted emissions > 1000 MHz	31
4.6 Field strength of unwanted emissions in restricted band 4.5 – 5.15 GHz	35
4.7 Field strength of unwanted emissions in lower adjacent restricted band.....	36
4.8 Field strength of unwanted emissions in upper adjacent restricted band.....	38
USED TEST EQUIPMENT MODULE	40
CROSS REFERENCE TABLE	41

This report comprises of four modules. The total number of pages is: 41

Main module

1 Introduction

This report contains the result of tests performed by:

Telefication B.V.
Edisonstraat 12a
6902 PK Zevenaar
The Netherlands

Telefication complies with the accreditation criteria for test laboratories as laid down in ISO/IEC 17025:1999. The accreditation covers the quality system of the laboratory as well as the specific activities as described in the authorized annex bearing the accreditation number L021 and is granted on 30 November 1990 by the Dutch Council For Accreditation (RvA: Raad voor Accreditatie). The contents of this test report, if reproduced, shall be copied in full, unless special consent in writing for reproduction in part is granted by Telefication. Copyright of this test report is reserved to Telefication.

Ordering party:

Company name : ads-tec GmbH
Address : Raiffeisenstrasse 14
Zipcode : 70771
City/town : Leinfelden-Echterdingen, Oteraichen
Country : Germany
Date of order : 27 September 2005

2 Product

A sample of the following product was submitted for testing:

Product description	: Tablet PC with integral IEEE 802.11a/b/g WLAN
Manufacturer	: ads-tec GmbH
Trade mark	: ads-tec
Type designation	: Compact3
FCC ID	: T9GMPC6015
Hardware version	: --
Serial number	: --
Software release	: --

3 Test schedule

Tests were carried out in accordance with the specification detailed in chapter 7 “Summary” of this report.

Tests were carried out at the following location:

- Telefication, Zevenaar

The samples of the product were received on:

- 10 October 2005

Tests were carried out from:

- 13 October 2005 to 16 March 2006

4 Product documentation

For production of this report the following product documentation was used:

Description:	Date:	Identification:
Gerätehandbuch, version 1.7	Not dated	060110_ Gerätehandbuch_IM-PC.doc
Test tool description	28 Sept. 2005	ART-TOOL-ANLEITUNG.DOC

The above-mentioned documentation will be filed at Telefication for a period of 10 years following the issue of this test report.

5 Observations and comments

For all tests the default RF power setting was used.
This was enabled by the Atheros test tool named “ART”(Atheros Radio Test).

All measurements were carried out with the mounting mechanism of the sample in 70° position (see also the user manual).

On request of the applicant, tests on the IEEE 802.11a part are not carried out.

6 Modifications to the sample

No modifications were made to the sample.

7 Summary

The product is intended for use in the following application area(s):

INTENTIONAL RADIATOR OPERATING IN THE FREQUENCY BAND 2400 - 2483.5 MHz

The sample was tested according to the following specification(s):

FCC Part 15 Subpart C, section 15.247 (10-1-05 Edition);
RSS-210, Issue 6 (Sept. 2005 edition).

8 Conclusions

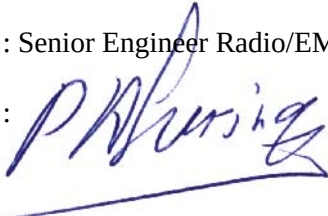
The samples of the product showed **NO NON-COMPLIANCES** to the specification stated in chapter 7 of this report.

The results of the tests as stated in this report, are exclusively applicable to the product items as identified in this test report. Telefication does not accept any responsibility for the results stated in this test report, with respect to the properties of product items not involved in these tests.

All tests are performed by:

name : ing. P.A. Suringa

function : Senior Engineer Radio/EMC

signature : 

Review of test report by:

name : S.J. van Spijker

function : Test Engineer

signature : 

The above conclusions have been verified by the following signatory:

Date : 17 May 2006

name : J.P. van de Poll

function : Co-ordinator Test Group

signature : 

Test results module

1.1 Equipment information

Operating frequency range	2412 – 2462 MHz
Occupied bandwidth (calculated)	11 MHz (IEEE 802.11b); 16.6 MHz (IEEE 802.11g)
ITU emission class	11M0G1D (IEEE 802.11b);16M6W1D (IEEE 802.11g)
FCC ID	--

1.2 Tested channels

	Channel 1	Channel 6/7	Channel 11
IEEE 802.11b	2412 MHz	2437/2442 MHz	2462 MHz
IEEE 802.11g	2412 MHz	2437/2442 MHz	2462 MHz

1.3 Summary of test data (IEEE 802.11b)

NAME OF TEST	PARA. NO.	Limit	MEAS.	RESULT
Power line conducted emissions	15.207(a)	66 dB μ V	50 dB μ V	Complies
Minimum 6 dB bandwidth	15.247(a)(2)	500 kHz	12.72 MHz	Complies
Maximum Peak Power Output	15.247(b)(3)	36 dBm E.I.R.P.	16.1 dBm E.I.R.P.	Complies
Peak Power Spectral Density	15.247(e)	8 dBm/3 kHz	-21.2 dBm/3 kHz	Complies
Spurious Emissions (Radiated)	15.247(d)	> 20 dB below fundamental	$\geq$ 26 dB	Complies
Restricted band edge emission levels (radiated)	15.205(a)	54 dB μ V/m(av) 74 dB μ V/m(pk)	48.57 dB μ V/m 55.73 dB μ V/m	Complies
4.5 –5.15 GHz restricted band emission	15.205(a)	54 dB μ V/m(av) 74 dB μ V/m(pk)	63.9 dB μ V/m 49.9 dB μ V/m	Complies

1.4 Summary of test data (IEEE 802.11g)

NAME OF TEST	PARA. NO.	Limit	MEAS.	RESULT
Power line conducted emissions	15.207(a)	66 dB μ V	50 dB μ V	Complies
Minimum 6 dB bandwidth	15.247(a)(2)	500 kHz	16.56 MHz	Complies
Maximum Peak Power Output	15.247(b)(3)	36 dBm E.I.R.P.	14.7 dBm E.I.R.P.	Complies
Peak Power Spectral Density	15.247(e)	8 dBm/3 kHz	-24.0 dBm/3 kHz	Complies
Spurious Emissions (Radiated)	15.247(d)	> 20 dB below fundamental	$\geq$ 36 dB	Complies
Restricted band edge emission levels (radiated)	15.205(a)	54 dB μ V/m(av) 74 dB μ V/m(pk)	64.0 dB μ V/m 53.7 dB μ V/m	Complies
4.5 –5.15 GHz restricted band emission	15.205(a)	54 dB μ V/m(av) 74 dB μ V/m(pk)	62.4 dB μ V/m 49.2 dB μ V/m	Complies

2 Emission tests 802.11b & 802.11g

2.1 Power line conducted emissions

Compliance standard : FCC part 15, subpart C, section 15.207 (a)
Method of test : ANSI C63.4-2003, sections 7 & 11.5
Ambient temperature : 20 °C
Relative humidity : 42 %
EUT condition : Transmitting

Time: 10:29:22 Date: 27-03-2006

Signal measured on "Neutral".

Measurement ==>		QPeak		Av	
Frequency	Level	Limit	Frequency	Level	Limit
(MHz)	dB	dB	(MHz)	dB	dB
Range	(uV)	(uV)		(uV)	(uV)
01	0.17200	50.0	0.17200	40.1	54.9
02	0.23050	44.5	0.23050	40.3	52.5
03	0.28680	39.2	0.28680	36.9	50.7
04	0.34540	40.1	0.40400	39.1	47.8
05	0.51820	40.1	0.52080	39.2	46
06	0.63420	40.1	0.63420	39.9	46
07	0.92470	40.2	0.92470	40.2	46
08	1.04050	40.5	1.04050	40.5	46
09	1.38980	40.1	1.56400	39.7	46
10	1.79740	39.7	1.79740	39.3	46
11	2.20570	38.4	2.20570	38.0	46
12	2.78990	37.0	2.78990	36.2	46
13	3.72510	32.2	3.72510	30.8	46
14	5.94230	31.6	6.00630	30.7	50
15	6.18540	31.1	6.18540	28.9	50
16	Below	30.0	Below	30.0	50
17	Below	30.0	Below	30.0	50
18	Below	30.0	Below	30.0	50
19	19.0572	22.8	19.0572	17.4	50
20	Below	30.0	Below	30.0	50

This product is in compliance with FCC part 15C, section 15.207 (a).

* ==> exceeding the limit

The frequency range 0.15 - 30 MHz is divided into 20 subranges.
For every subrange the highest emission component is given in the table.

In ranges marked "Below" the maximum level of the components measured, is below 30 dBuV. For this evaluation, peak detection is used.

Time: 10:49:18 Date: 27-03-2006

Signal measured on "Life".

Measurement =>		QPeak		Av		
Frequency	Level	Limit	Frequency	Level	Limit	
(MHz)	dB	dB	(MHz)	dB	dB	
Range	(uV)	(uV)		(uV)	(uV)	

01	0.17600	47.3	64.7	0.17340	36.6	54.8
02	0.23290	42.8	62.4	0.23290	38.7	52.4
03	0.29240	38.9	60.5	0.29280	36.8	50.5
04	0.35120	40.0	59.0	0.40880	39.3	47.7
05	0.52880	39.4	56	0.52560	39.1	46
06	0.64460	39.4	56	0.64460	38.9	46
07	0.93830	39.5	56	0.93830	39.4	46
08	1.17410	39.7	56	1.05650	39.6	46
09	1.58660	39.7	56	1.58660	39.2	46
10	1.70460	39.6	56	1.70460	38.9	46
11	2.17610	38.3	56	2.17610	38.0	46
12	2.82870	36.6	56	2.82870	36.3	46
13	3.70970	31.8	56	3.82970	30.6	46
14	5.95530	32.9	60	5.95530	31.5	50
15	6.13300	31.3	60	6.19580	30.2	50
16	Below	30.0	60	Below	30.0	50
17	Below	30.0	60	Below	30.0	50
18	Below	30.0	60	Below	30.0	50
19	19.0744	29.0	60	19.0744	24.8	50
20	Below	30.0	60	Below	30.0	50

This product is in compliance with FCC part 15C, section 15.207 (a).

* ==> exceeding the limit

The frequency range 0.15 - 30 MHz is divided into 20 subranges.
For every subrange the highest emission component is given in the table.

In ranges marked "Below" the maximum level of the components measured,
is below 30 dBuV. For this evaluation, peak detection is used.

Measurement uncertainty: +3.70/-3.70 dB

3 Emission tests 802.11b

3.1 Minimum 6 dB bandwidth

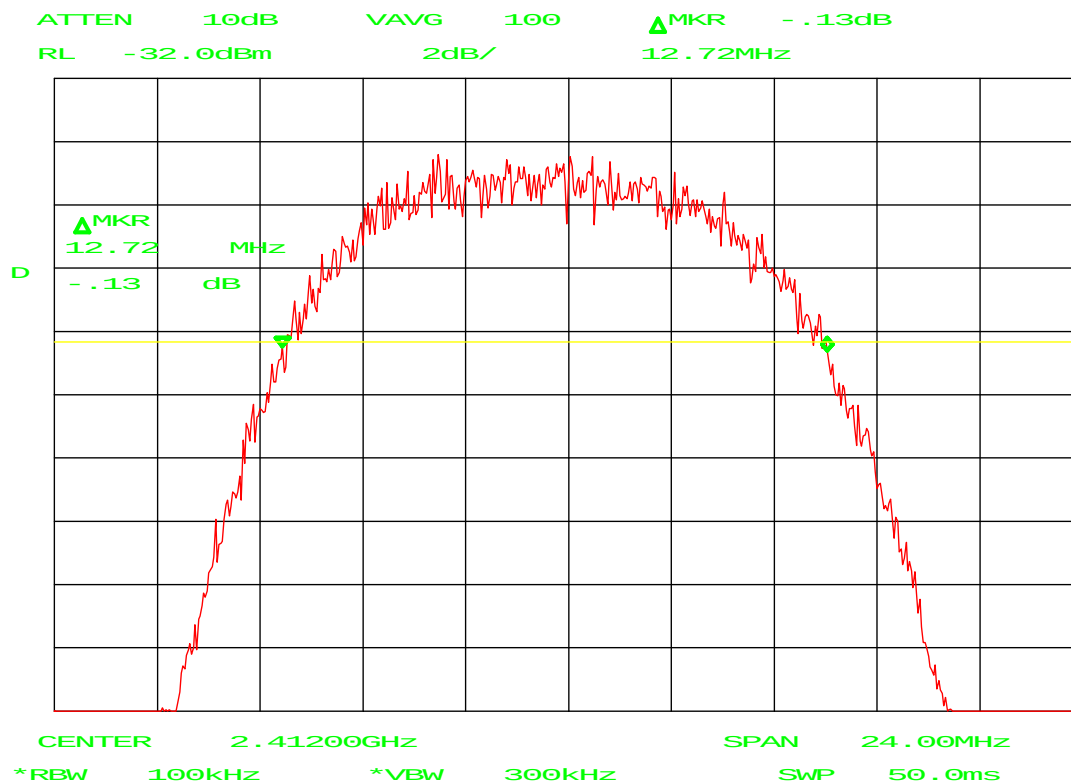
Compliance standard : FCC part 15, subpart C, section 15.247 (a)(2)
Method of test : KDB Publication No. 558074

Ambient temperature : 20 °C
Relative humidity : 42 %

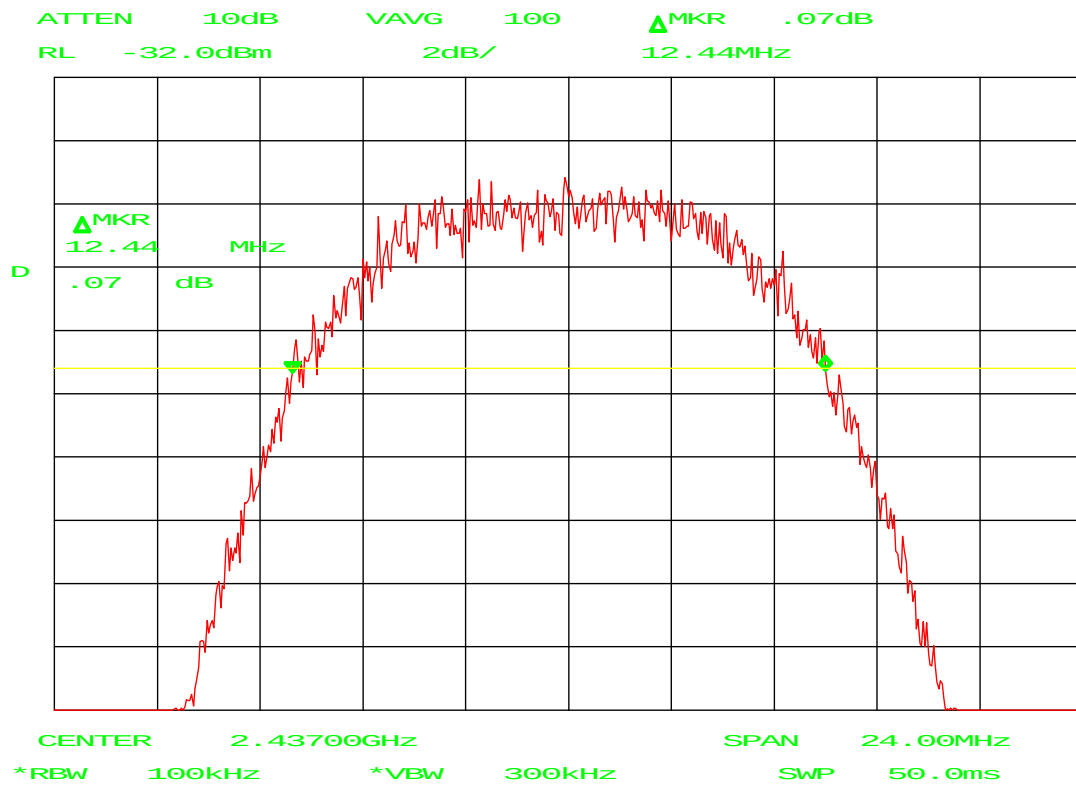
Test results :

Channel 1	Channel 6	Channel 11
12.72 MHz	12.44 MHz	12.52 MHz

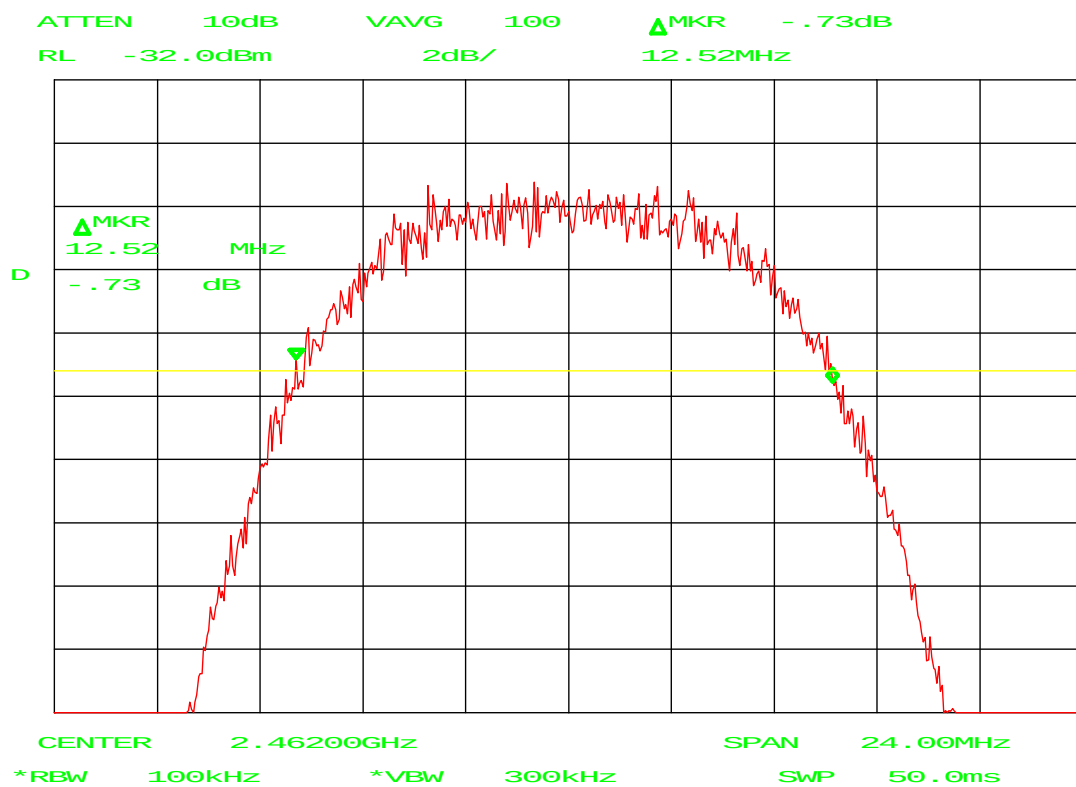
Channel 1 plot



Channel 6 plot



Channel 11 plot



Measurement uncertainty: + 23/- 23 kHz

3.2 Peak power output

Compliance standard : FCC part 15, subpart C, section 15.247 (b)(3)
Method of test : KDB Publication No. 558074 (alternative procedures)

Ambient temperature : 20 °C
Relative humidity : 42 %

Test results :

Channel 1	Channel 7	Channel 11
16.1 dBm e.i.r.p.	14.9 dBm e.i.r.p.	13.8 dBm e.i.r.p.

Measurement uncertainty: + 1.6/ -1.9 dB

3.3 Peak power spectral density

Compliance standard : FCC part 15, subpart C, section 15.247 (e)
Method of test : FCC KDB Publication No. 558074 (alternative procedures)
Ambient temperature : 20 °C
Relative humidity : 42 %

Test results :

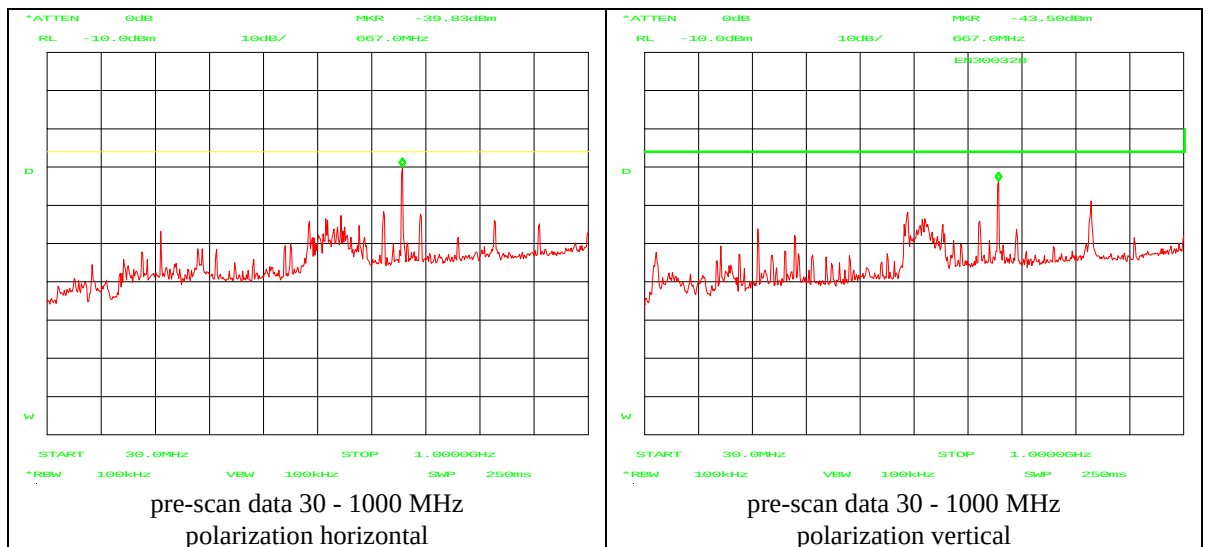
Channel 1	Channel 7	Channel 11
-22.1 dBm/3 kHz	-21.2 dBm/3 kHz	-21.9 dBm/3 kHz

Measurement uncertainty: + 3.7/ -4.5 dB

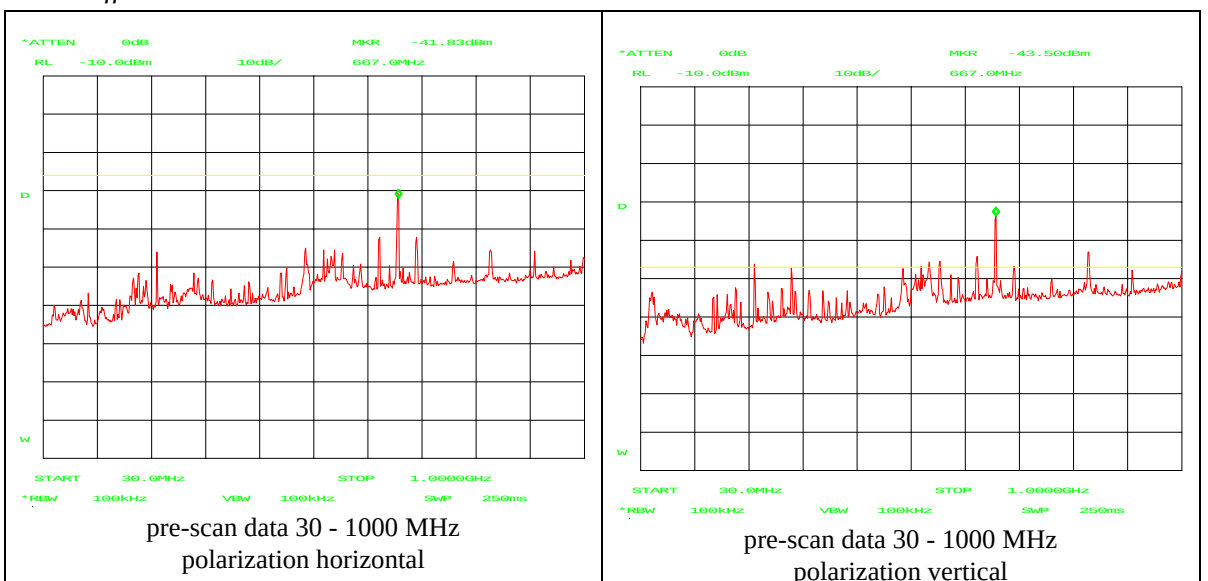
3.4 Field strength of unwanted emissions 30 - 1000 MHz (exploratory)

Compliance standard : FCC part 15, subpart C, section 15.209 (d)
Method of test : ANSI C63.4-2003, sections 5.4, 8.2.3, 8.2.4 & 8.3.1.2;
FCC part 15, subpart A, section 15.31(m), 15.33, 15.35.
Ambient temperature : 20 °C
Relative humidity : 42 %
EUT condition : Transmitting
Test results :

WLAN on



WLAN off



No unwanted emissions in the frequency range 30 - 1000 MHz as a result of the delta measurement (WLAN on/off) were detected during the exploratory measurements. Accordingly, measurements on an Open Area Test Site were judged unnecessary.

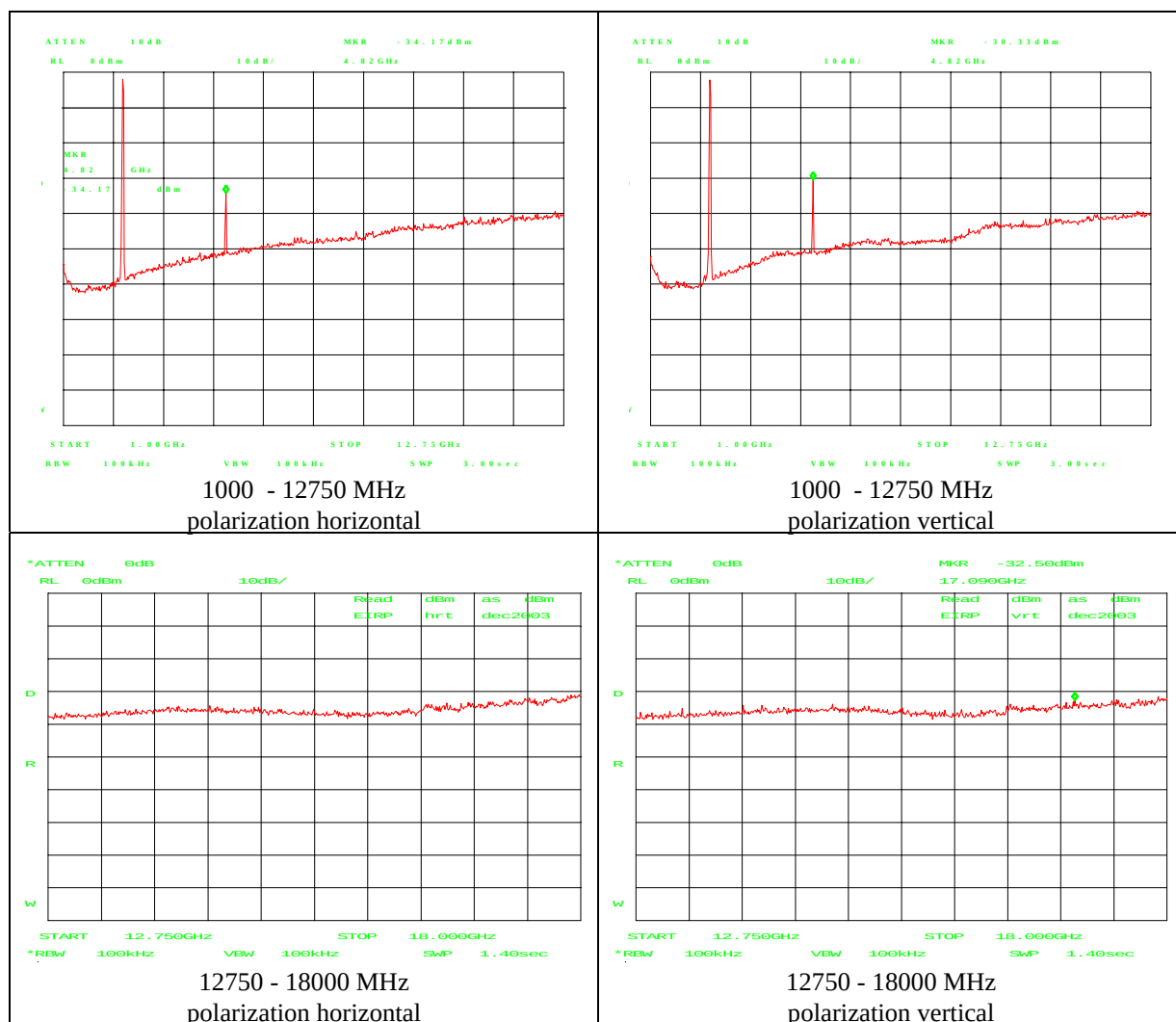
Measurement uncertainty: N/A

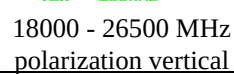
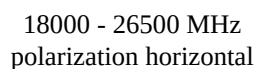
3.5 Field strength of unwanted emissions > 1000 MHz

Compliance standard : FCC part 15, subpart C, section 15.247(d)
Method of test : ANSI C63.4-2003, sections 5.5, 8.2.3, 8.2.4 & 8.3.1.2;
FCC part 15, subpart A, section 15.31(m), 15.33, 15.35.
Ambient temperature : 20 °C
Relative humidity : 42 %

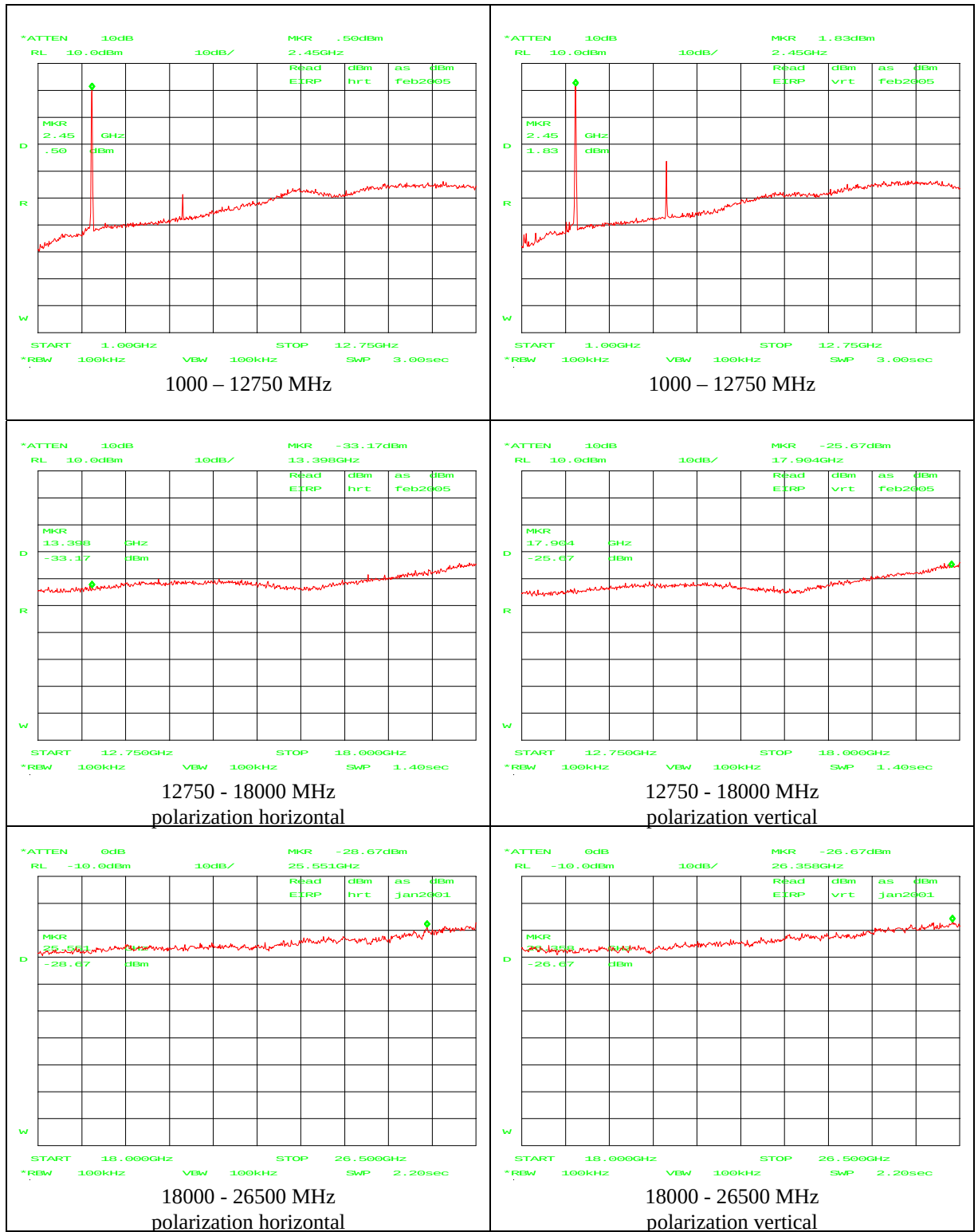
Test results :

CH 1 TX:

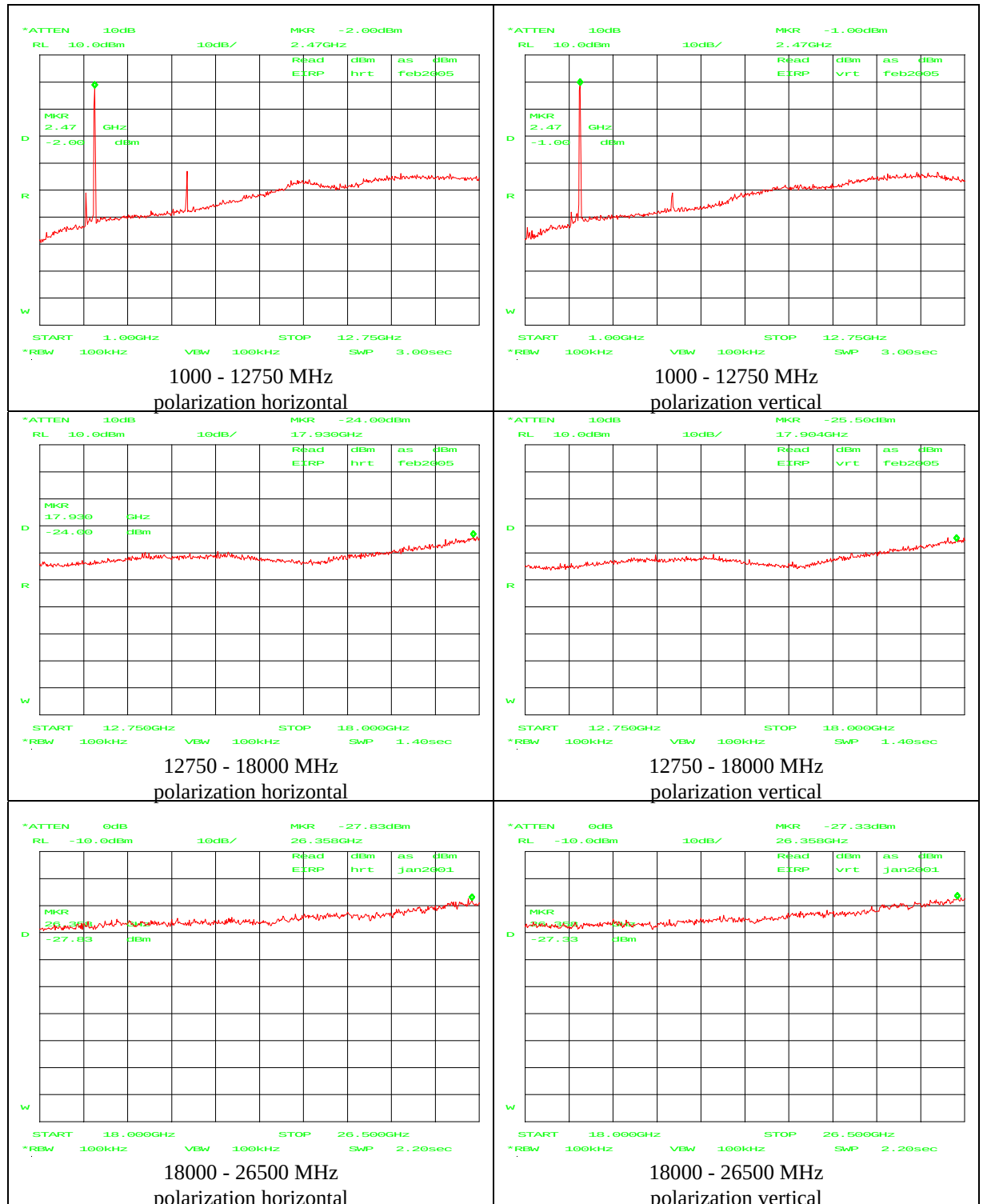




CH 6 TX:



CH 11 TX:



To convert from dBm to dBμV/m : reading in dBm + 95.2

Measurement uncertainty: +4.5 dB / -6.0 dB

3.6 Field strength of unwanted emissions in restricted band 4.5 – 5.15 GHz

Compliance standard : FCC part 15, subpart C, section 15.205(a)
Method of test : FCC Public Notice DA 00-705

Ambient temperature : 20 °C
Relative humidity : 42 %

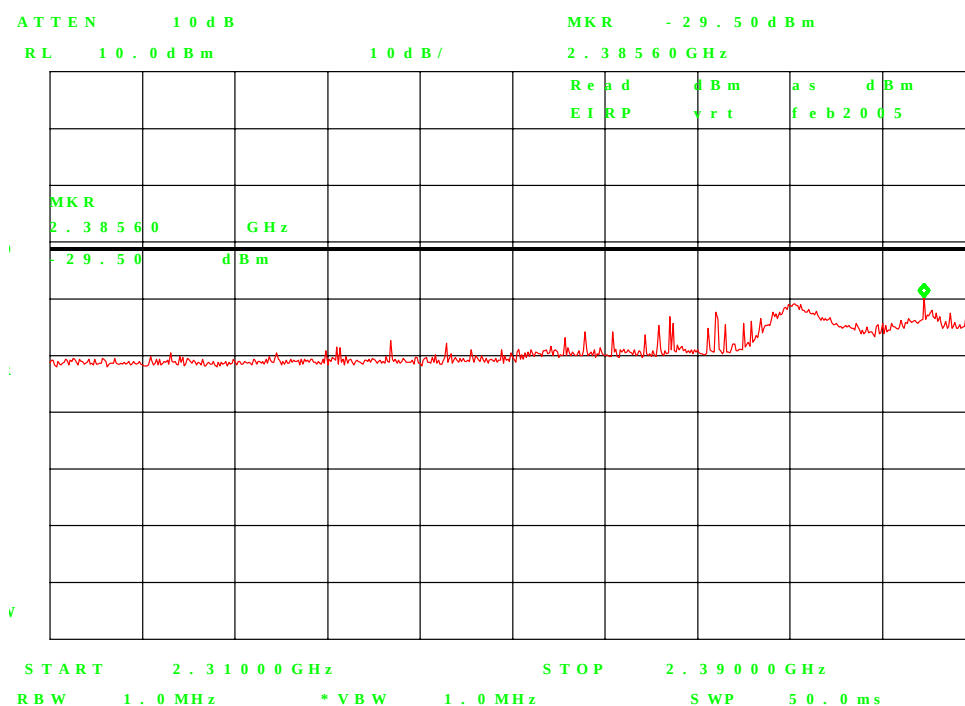
	Peak value (dB μ V/m)	Average value (dB μ V/m)
CH 1, 2 nd harm.	-33.2 + 95.2 = 62.0	-47.3 + 95.2 = 47.9
CH 6, 2 nd harm	-31.3 + 95.2 = 63.9	-45.3 + 95.2 = 49.9
CH 11, 2 nd harm.	-33.5 + 95.2 = 61.7	-47.7 + 95.2 = 47.5

Measurement uncertainty: +4.5 dB / -6.0 dB

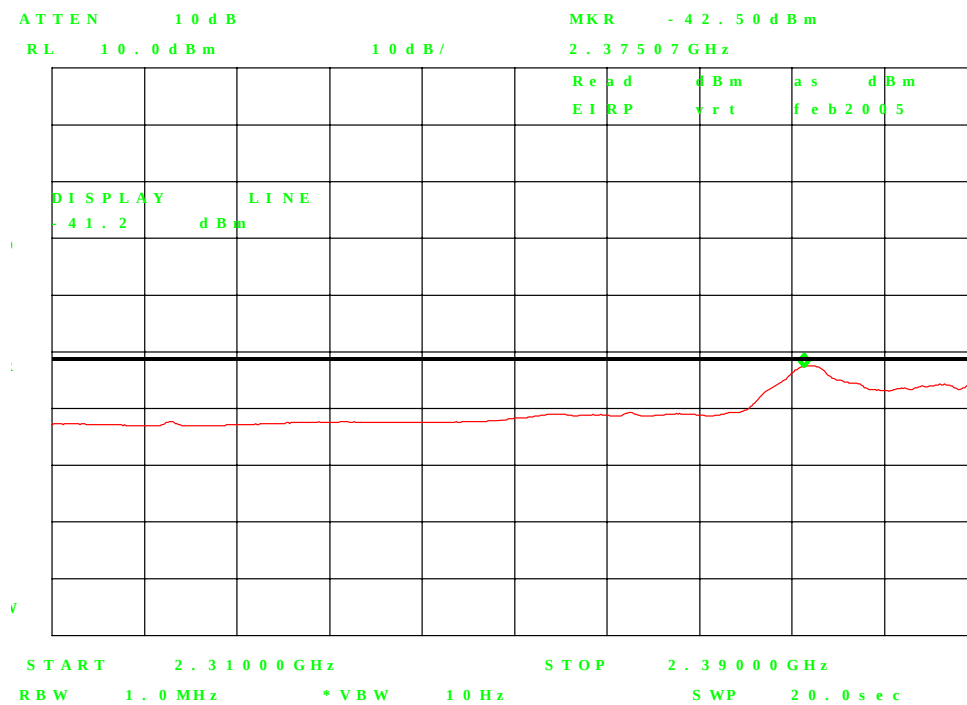
3.7 Field strength of unwanted emissions in lower adjacent restricted band

Compliance standard : FCC part 15, subpart C, section 15.205(a)
Method of test : FCC Public Notice DA 00-705

Peak detector measurement



Average detector measurement

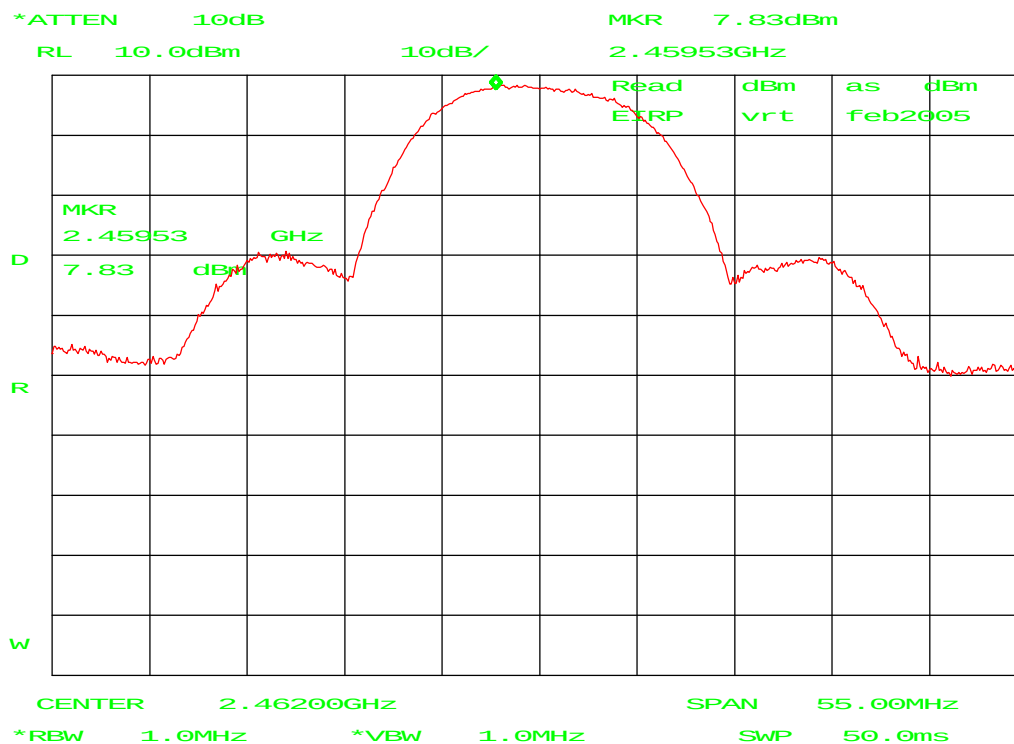


Measurement uncertainty: +4.5 dB / -6.0 dB

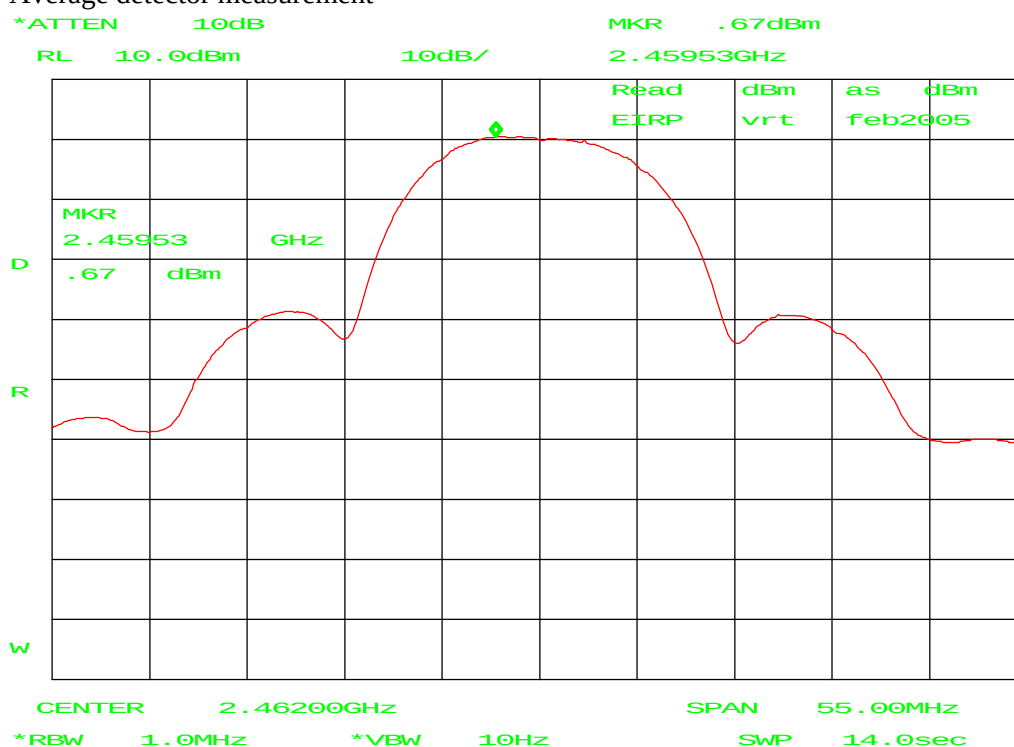
3.8 Field strength of unwanted emissions in upper adjacent restricted band

Compliance standard : FCC part 15, subpart C, section 15.205(a)
Method of test : FCC Public Notice DA 00-705

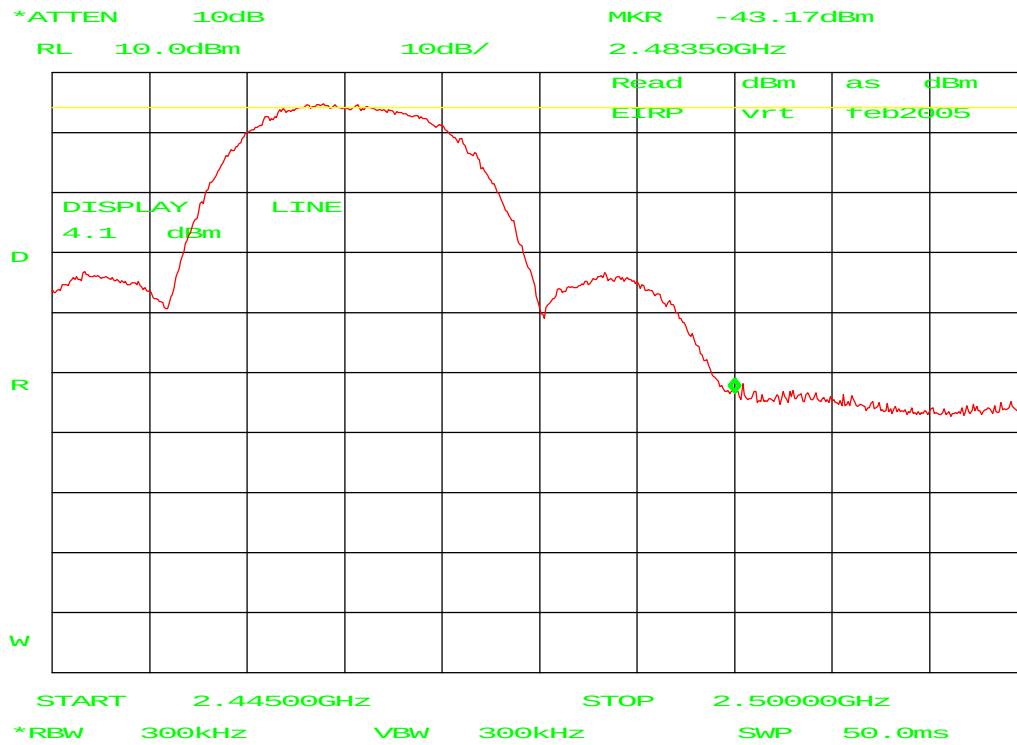
Peak detector measurement



Average detector measurement



Delta marker measurement


band edge emission level (peak): $7.83 + 95.2 - 47.3 = 55.73 \text{ dB}\mu\text{V/m}$

band edge emission level (average): $0.67 + 95.2 - 47.3 = 48.57 \text{ dB}\mu\text{V/m}$

Measurement uncertainty: +4.5 dB / -6.0 dB

4 Emission tests 802.11g

4.1 Minimum 6 dB bandwidth

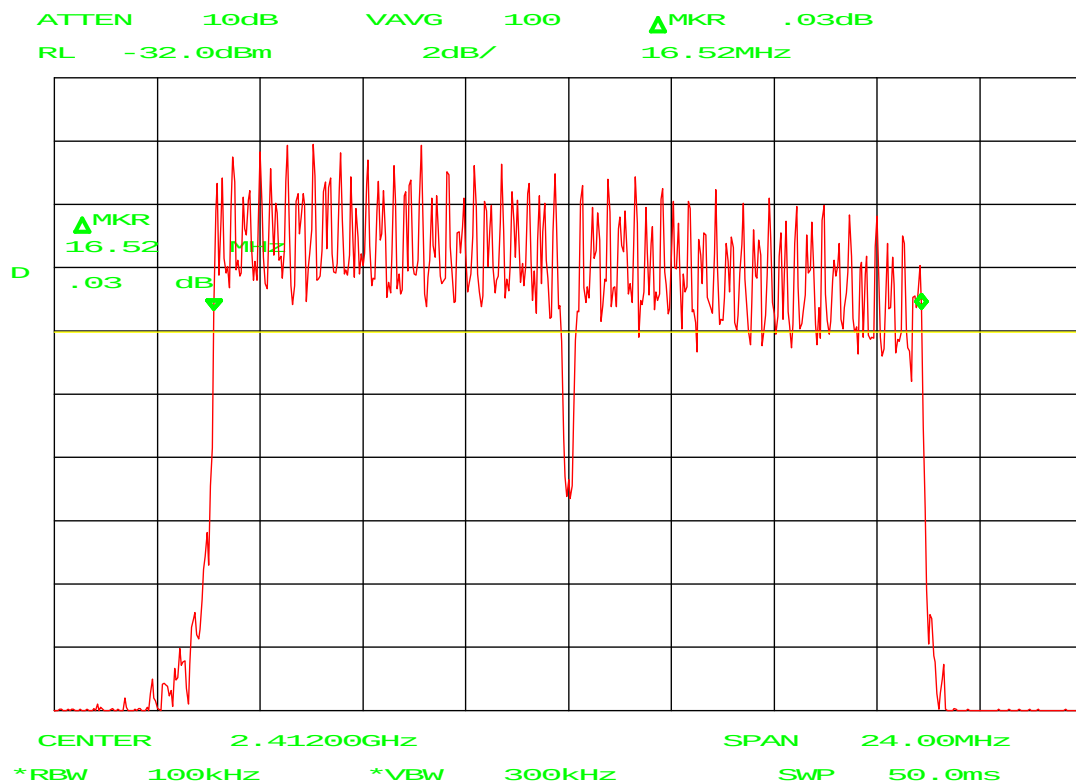
Compliance standard : FCC part 15, subpart C, section 15.247 (a)(2)
Method of test : KDB Publication No. 558074

Ambient temperature : 20 °C
Relative humidity : 42 %

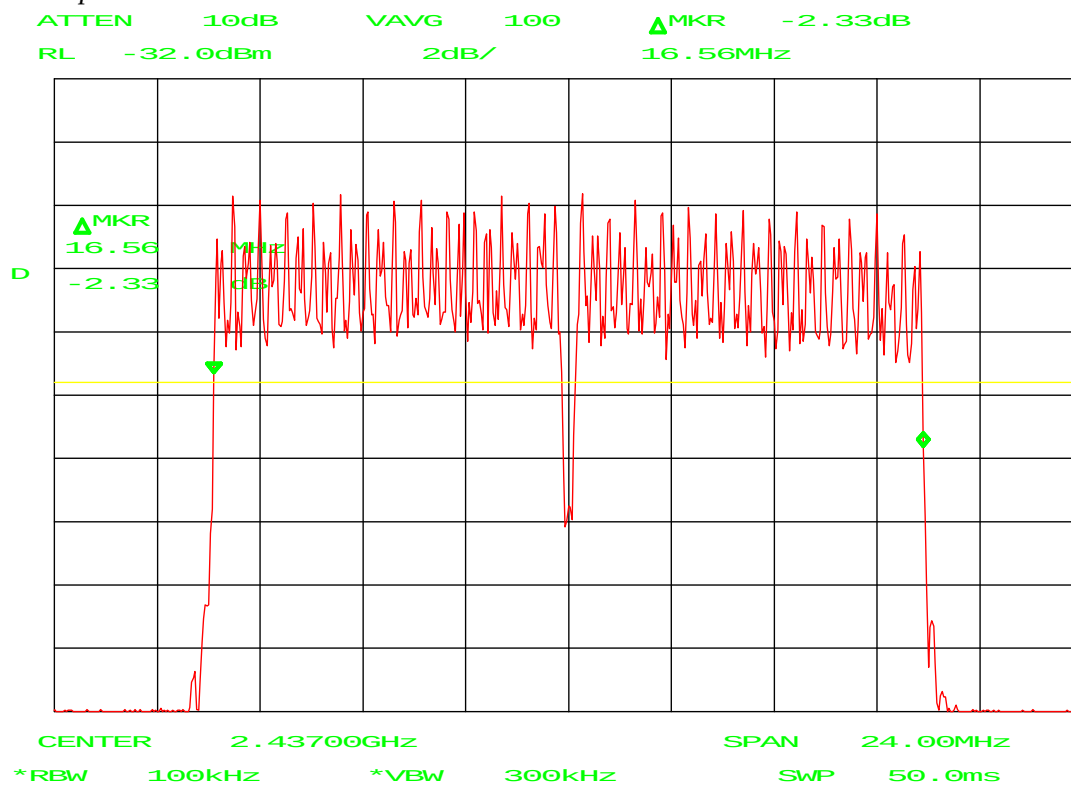
Test results :

Channel 1	Channel 6	Channel 11
16.52 MHz	16.56 MHz	16.52 MHz

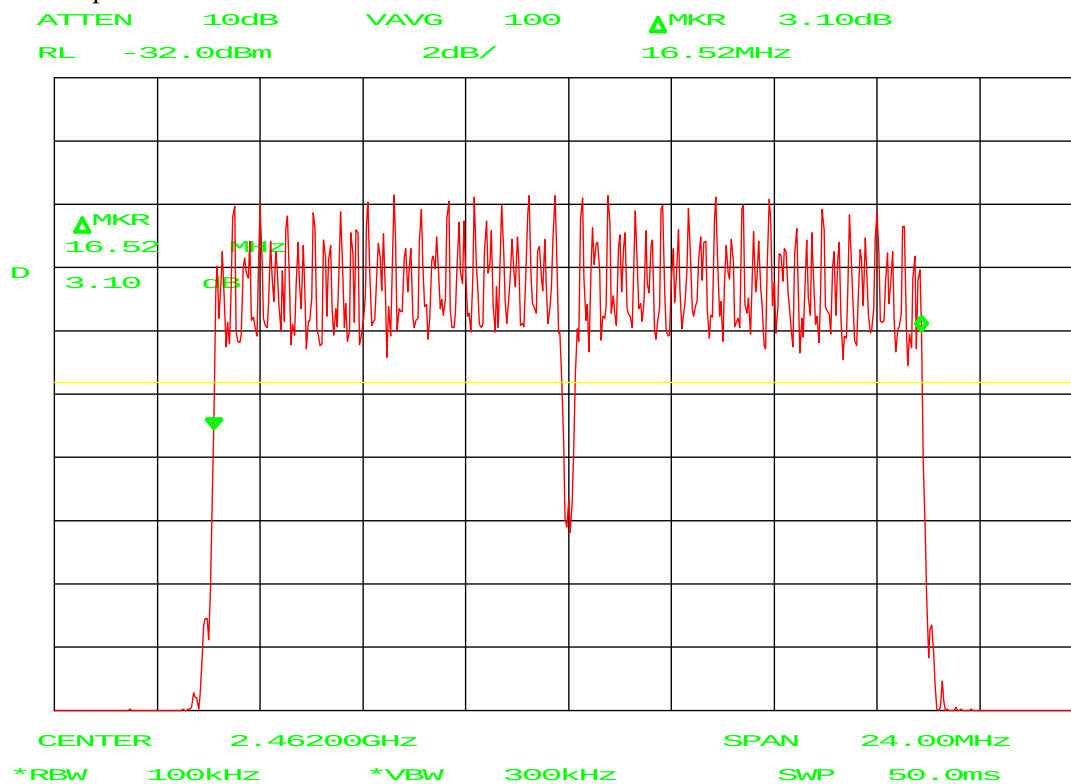
CH 1 plot



CH 6 plot



CH 11 plot



Measurement uncertainty: + 23/- 23 kHz

4.2 Peak power output

Compliance standard : FCC part 15, subpart C, section 15.247 (b)(3)
Method of test : KDB Publication No. 558074 (alternative procedures)

Ambient temperature : 20 °C
Relative humidity : 42 %

Test results :

Channel 1	Channel 7	Channel 11
14.7 dBm e.i.r.p.	14.5 dBm e.i.r.p.	13.6 dBm e.i.r.p.

Measurement uncertainty: + 1.6/ -1.9 dB

4.3 Peak power spectral density

Compliance standard : FCC part 15, subpart C, section 15.247 (e)
Method of test : KDB Publication No. 558074 (alternative procedures)

Ambient temperature : 20 °C
Relative humidity : 42 %

Test results :

Channel 1	Channel 7	Channel 11
-24.7 dBm/3 kHz	-24.0 dBm/3 kHz	-24.7 dBm/3 kHz

Measurement uncertainty: + 3.7/ -4.5 dB

4.4 Field strength of unwanted emissions 30 – 1000 MHz (exploratory)

Compliance standard	:	FCC part 15, subpart C, section 15.247(d)
Method of test	:	ANSI C63.4-2003, sections 5.4, 8.2.3, 8.2.4 & 8.3.1.2; FCC part 15, subpart A, section 15.31(m), 15.33, 15.35.
Ambient temperature	:	20 °C
Relative humidity	:	42 %
Test results	:	

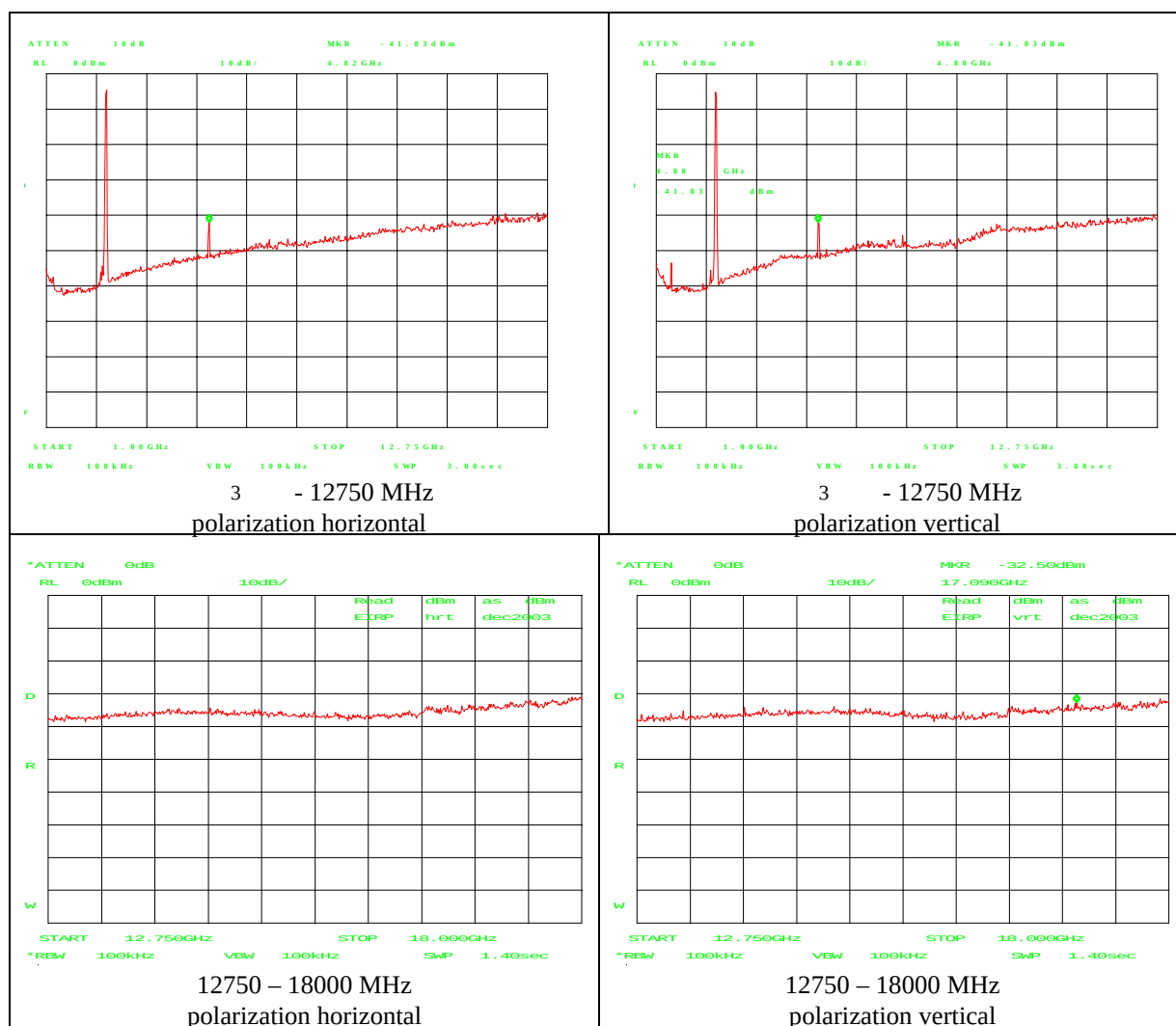
As the emissions appeared to be WLAN independent, see section 3.4 for the results.

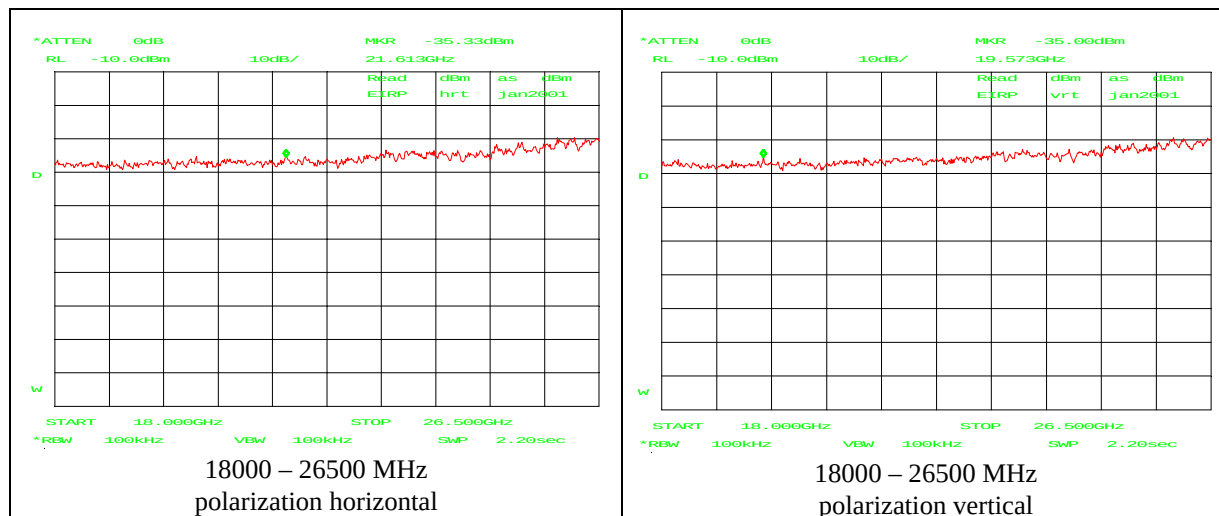
4.5 Field strength of unwanted emissions > 1000 MHz

Compliance standard : FCC part 15, subpart C, section 15.247 (d)
Method of test : ANSI C63.4-2003, sections 5.5, 8.2.3, 8.2.4 & 8.3.1.2;
FCC part 15, subpart A, section 15.31(m), 15.33, 15.35.
Ambient temperature : 20 °C
Relative humidity : 42 %

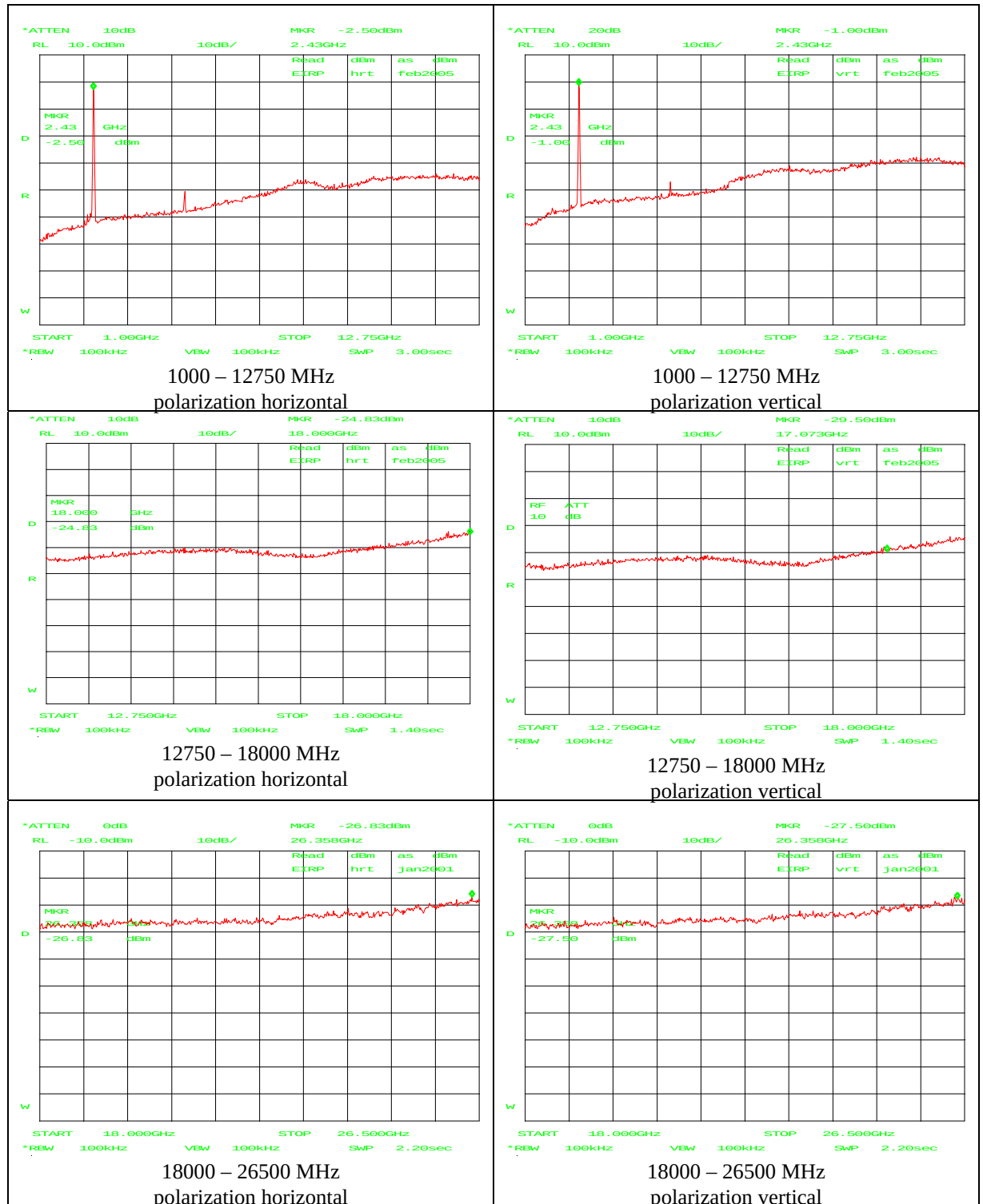
Test results :

CH 1 TX:

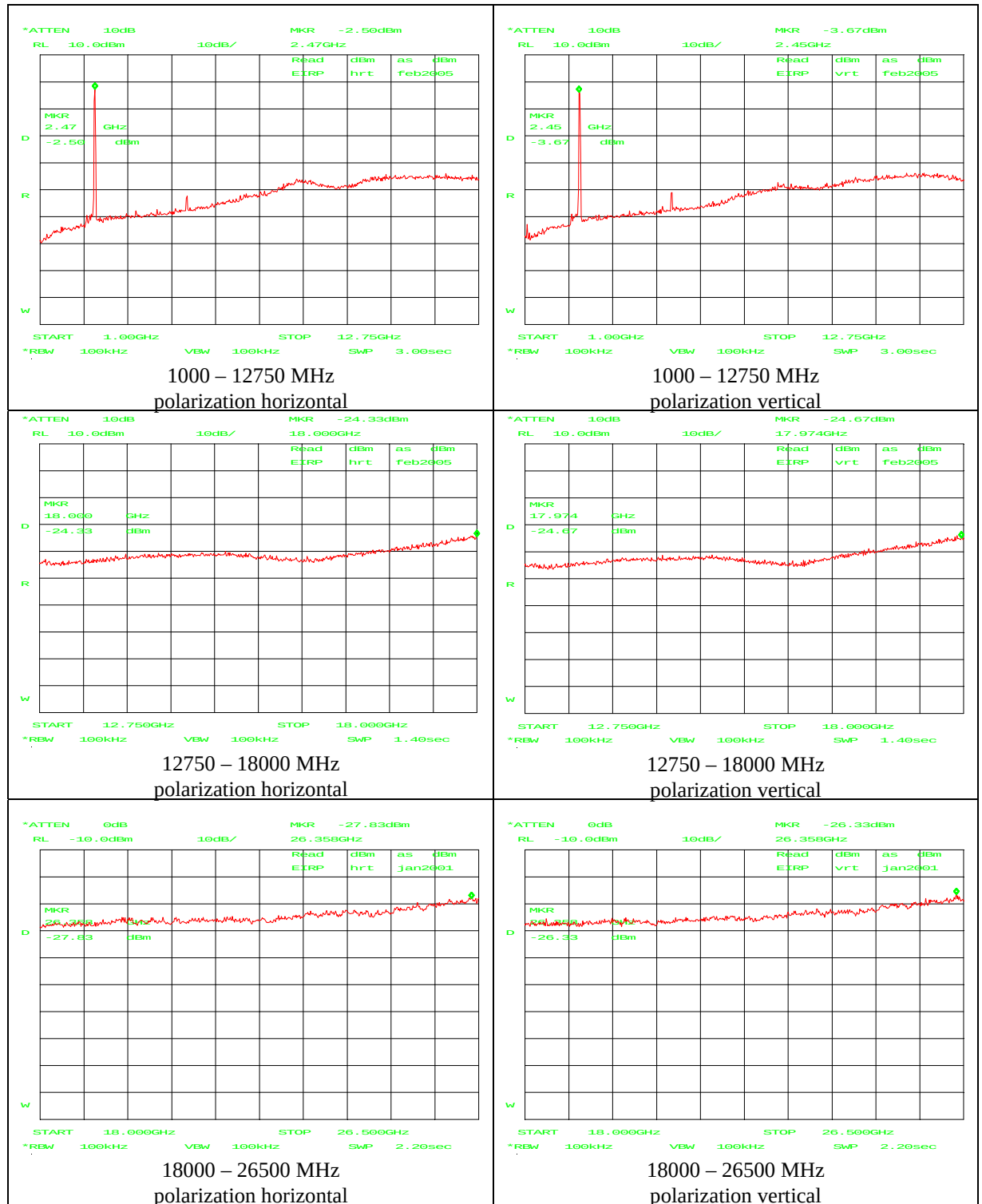




CH 6 TX:



CH 11 TX:



To convert from dBm to dB μ V/m : reading in dBm + 95.2

Measurement uncertainty: +4.5 dB / -6.0 dB

4.6 Field strength of unwanted emissions in restricted band 4.5 – 5.15 GHz

Compliance standard : FCC part 15, subpart C, section 15.205(a)
Method of test : FCC Public Notice DA 00-705

Ambient temperature : 20 °C
Relative humidity : 42 %

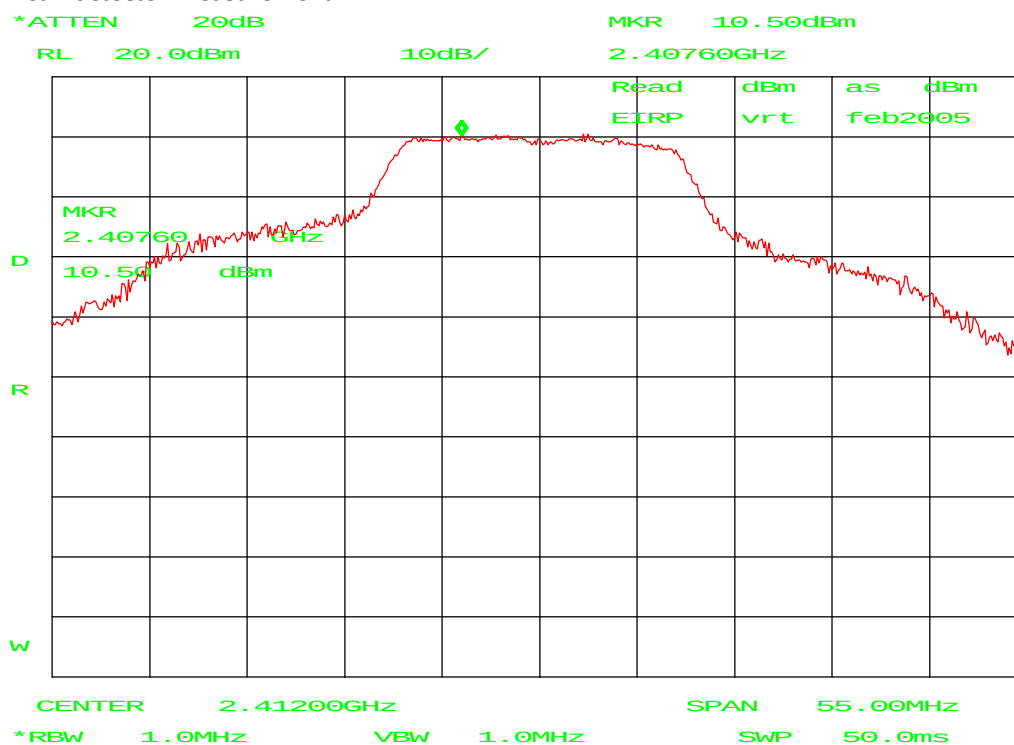
	Peak value (dB μ V/m)	Average value (dB μ V/m)
CH 1, 2 nd harm.	$-37.7 + 95.2 = 57.5$	$-50.8 + 95.2 = 44.4$
CH 6, 2 nd harm	$-35.7 + 95.2 = 59.5$	$-49.0 + 95.2 = 46.2$
CH 11, 2 nd harm.	$-32.8 + 95.2 = 62.4$	$-46.0 + 95.2 = 49.2$

Measurement uncertainty: +4.5 dB / -6.0 dB

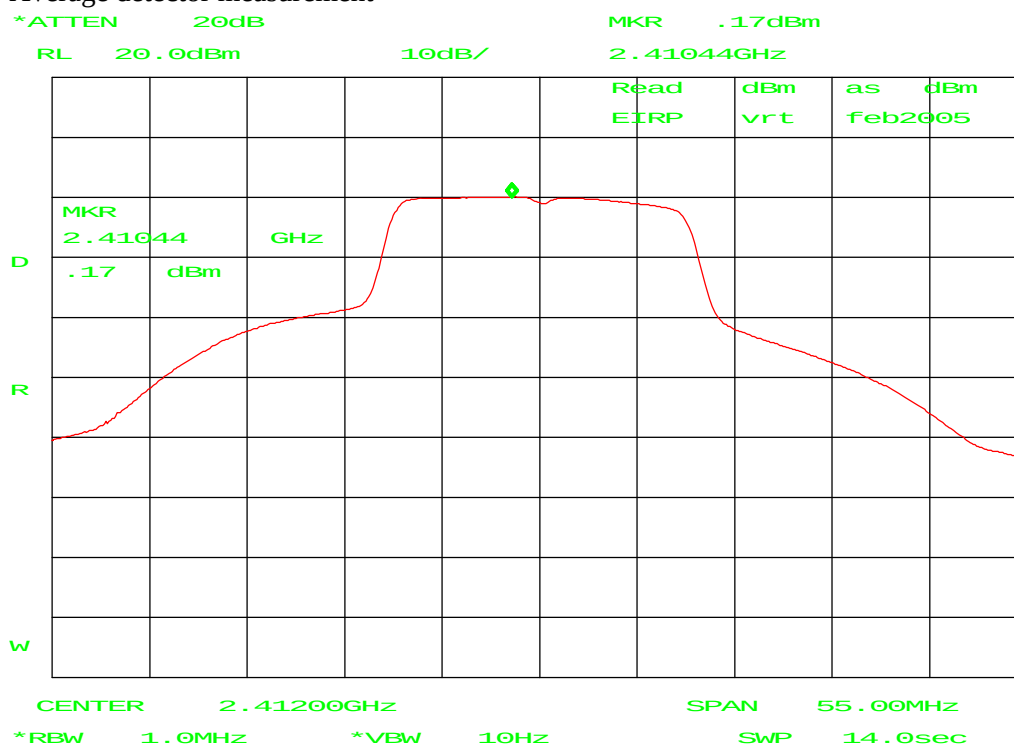
4.7 Field strength of unwanted emissions in lower adjacent restricted band

Compliance standard : FCC part 15, subpart C, section 15.205(a)
Method of test : FCC Public Notice DA 00-705

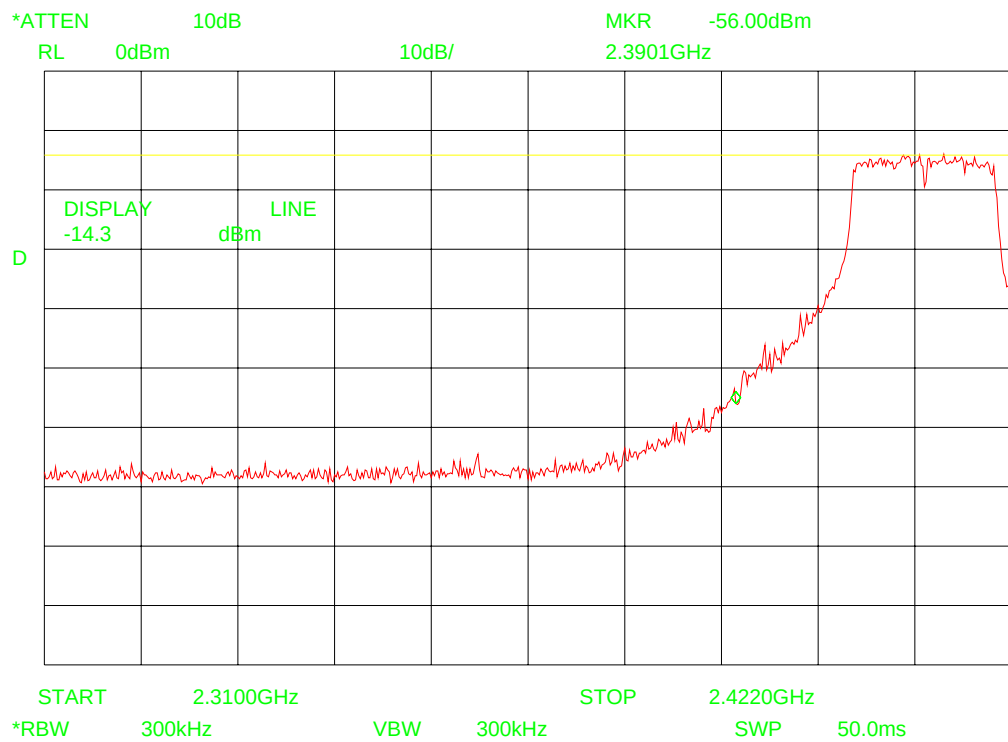
Peak detector measurement



Average detector measurement



Delta marker measurement



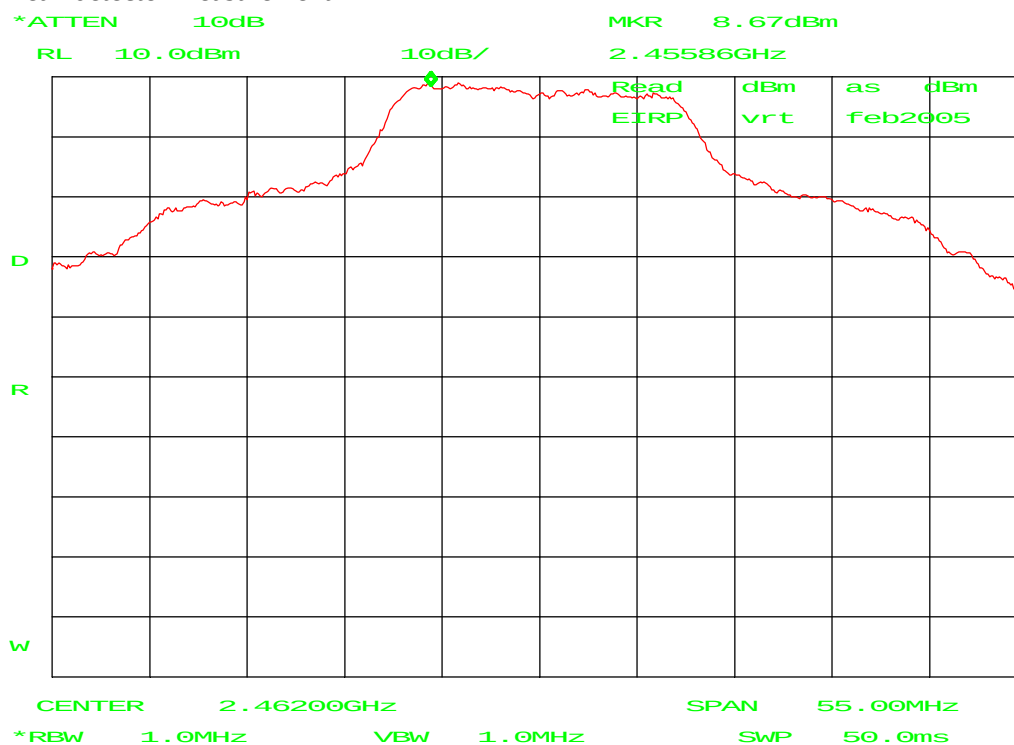
band edge emission level (peak): $10.50 + 95.2 - 41.7 = 64.0 \text{ dB}\mu\text{V/m}$
band edge emission level (average): $0.17 + 95.2 - 41.7 = 53.7 \text{ dB}\mu\text{V/m}$

Measurement uncertainty: +4.5 dB / -6.0 dB

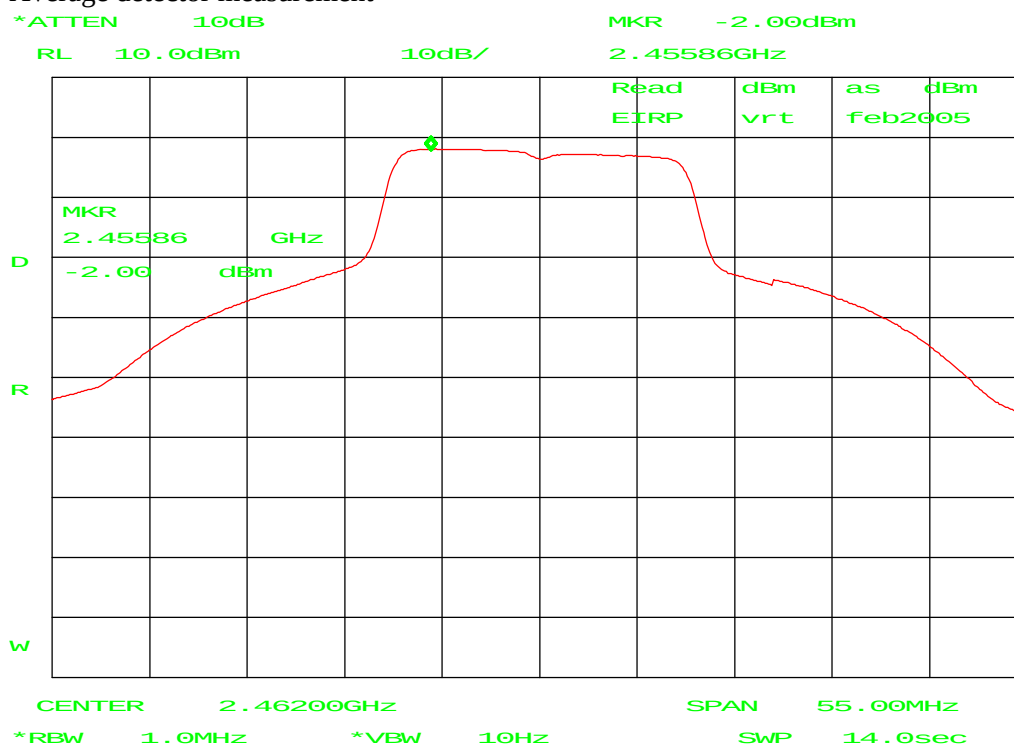
4.8 Field strength of unwanted emissions in upper adjacent restricted band

Compliance standard : FCC part 15, subpart C, section 15.205(a)
Method of test : FCC Public Notice DA 00-705

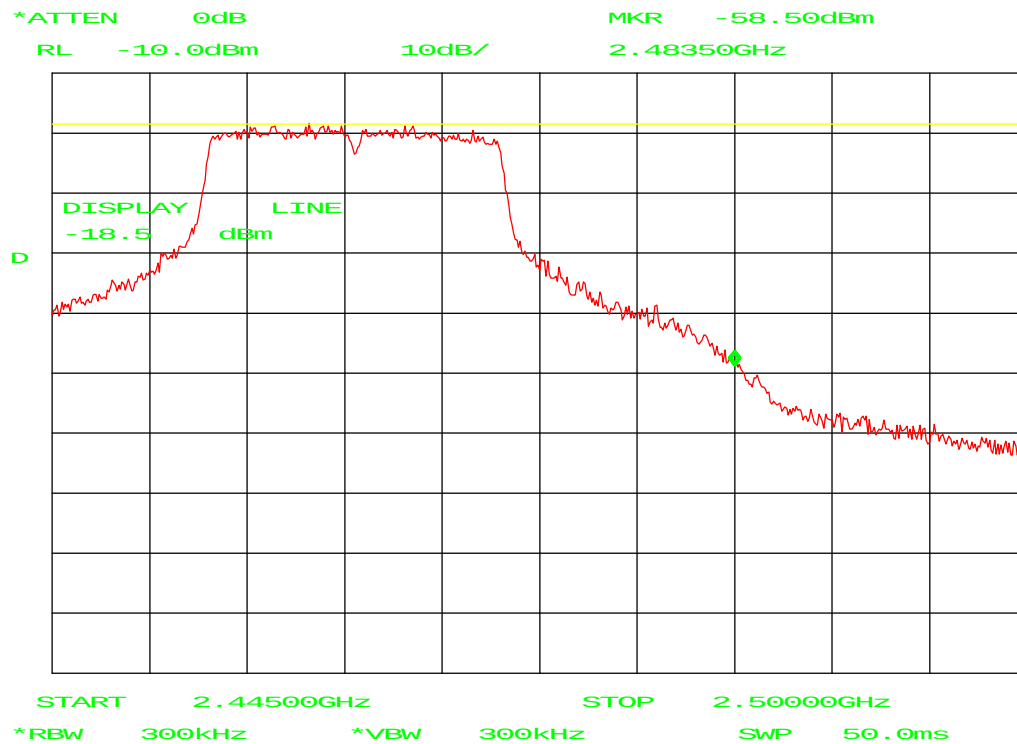
Peak detector measurement



Average detector measurement



Delta marker measurement



band edge emission level (peak): $8.67 + 95.2 - 40.0 = 63.87 \text{ dB}\mu\text{V/m}$

band edge emission level (average): $-2.00 + 95.2 - 40.0 = 53.2 \text{ dB}\mu\text{V/m}$

Measurement uncertainty: +4.5 dB / -6.0 dB

Used test equipment module

The following measurement equipment was used:

Description	Telef. ID	Manufacturer	Model	Used at par.
Spectrum Analyzer	TE 00481	Hewlett Packard	HP8563E	3.1, 3.3, 3.5, 3.6, 3.7, 3.8 4.1, 4.3, 4.5, 4.6, 4.7, 4.8
Power meter	TE 00489	Hewlett Packard	437B	3.2, 4.2,
Power sensor	TE 00355	Hewlett Packard	8481A	3.2, 4.2
RF Pre-amplifier up to 1000 MHz	TE 00098	Rohde & Schwarz	ESV-Z3	3.4
RF Pre-amplifier 1 - 26.5 GHz	TE 00093	Hewlett Packard	HP8449B	3.2, 3.3, 3.5, 3.6, 3.7, 3.8, 4.2, 4.3, 4.5, 4.6, 4.7, 4.8
Biconilog antenna	TE 00700	Emco	3143	3.4
Horn Antenna 1 - 18 GHz	TE 00532	Emco	3115	3.5, 3.6, 3.7, 3.8, 4.2, 4.3, 4.5, 4.6, 4.7, 4.8
Horn Antenna 18 - 40 GHz	TE 00533	Emco	3116	3.5, 4.5
Anechoic Chamber	TE 01064	Euroshield	RFD-F-100	3.1, 3.2, 3.3, 3.5, 3.7, 3.7, 3.8, 4.1, 4.2, 4.3, 4.5, 4.7, 4.7, 4.8
Antenna tower	--	HD	AS 620p	3.1, 3.2, 3.3, 3.5, 3.7, 3.7, 3.8, 4.1, 4.2, 4.3, 4.5, 4.7, 4.7, 4.8
Turntable	--	HD	DS 412	3.1, 3.2, 3.3, 3.5, 3.7, 3.7, 3.8, 4.1, 4.2, 4.3, 4.5, 4.7, 4.7, 4.8
Turntable controller	--	HD	HD 050	3.1, 3.2, 3.3, 3.5, 3.7, 3.7, 3.8, 4.1, 4.2, 4.3, 4.5, 4.7, 4.7, 4.8

Cross reference table

Transmitter	
IC RSS-210 Issue 6, Annex 8	FCC 47 CFR Ch. 1 part 15, subpart C (10-1-05 Edition)
A8.2 (1)	§ 15.247 (a) (2)
A8.4 (4)	§ 15.247 (b) (3)
A8.2 (2)	§ 15.247 (e)
A8.5	§ 15.247 (d)
IC RSS-Gen	FCC 47 CFR Ch. 1 part 15, subpart C (10-1-05 Edition)
7.2.2	§ 15.207 (a)