FCC ID: LYHMPCI1V1

EMI -- T E S T R E P O R T

Test Report No. :	**T31583-00-00KG**	April 02, 2007 Date of issue

Type / Model Name : EAP Family

Product Description : Wireless-LAN-Accesspoint

Applicant **:** Siemens AG

Address : Östliche Rheinbrückenstr. 50

D-76187 Karlsruhe

Manufacturer **:** Siemens AG

Address : Östliche Rheinbrückenstr. 50

D-76187 Karlsruhe

Licence holder **:** Siemens AG

Address : Östliche Rheinbrückenstr. 50

D-76187 Karlsruhe

Test Result according to the standards listed in clause 1 test standards:	**POSITIVE**

Deutscher Akkreditierungs Rat DAR

DAT-P-207/0500

Contents

1 TEST STANDARDS

The tests were performed according to following standards:

FCC Rules and Regulations Part 15 Subpart C - Intentional Radiators (October 01, 2006)

Part 15, Subpart C, Section 15.207(a)	Power line emissions
Part 15, Subpart C, Section 15.209(a)	Radiated emissions, general requirements
Part 15, Subpart C, Section 15.247(c)	Radiated emissions, outside the used frequency band
Part 15, Subpart C, Section 15.203	Antenna requirement
Part 15, Subpart C, Section 15.204	External radio frequency power amplifiers and antenna modifications
Part 15, Subpart C, Section 15.247(a)(2)	Spectrum Bandwidth requirement
Part 15, Subpart C, Section 15.247(b)	Maximum Peak output Power of intentional radiator
Part 15, Subpart C, Section 15.247(e)	Maximum Power spectral density
Part 15, Subpart C, Section 15.247(d)	Band edge measurement

FCC Rules and Regulations Part 15 Subpart E - Unlicensed National Information Infrastructure Devices (October 01, 2006)

Part 15, Subpart E, Section 15.407(a)(1)(2)(3)	Maximum Peak output Power
Part 15, Subpart E, Section 15.407(a)(1)(2)(3)	Peak power spectral density
Part 15, Subpart E, Section 15.407(a)(6)	Peak power excursion measurement
Part 15, Subpart E, Section 15.407(b)(1)(4)	Radiated Emissions
Part 15, Subpart E, Section 15.407(b)(1)(4)	Band edge measurement
Part 15, Subpart E, Section 15.407(g)	Frequency stability

FCC Rules and Regulations Part 15 Subpart B - Unintentional Radiators (October 01, 2006)

Part 15, Subpart B, Section 15.109(a)	Radiated emissions, general requirements

Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment

RSS-210 Issue6, September 2005	Low Power Licence – Exempt Radicommunication Devices (All Frequency Bands): Category I Equipment
RSS-Gen Issue1, September 2005	General Requirements and Information for the Certification of Radiocommunication Equipment

2 SUMMARY

GENERAL REMARKS:

For the unit EAP are different variants with following applications existing:

Variant	Certification-Name	WLAN Modules	Ethernet	Antennas
V01	EAP-W1-RJ-E1	1	RJ45	2 x R-SMA
V02	EAP-W1-RJ-I1	1	RJ45	1 x intern
V03	EAP-W2-RJ-E2	2	RJ45	4 x R-SMA
V04	EAP-W2-RJ-I2	2	RJ45	2 x intern
V05	EAP-W3-RJ-E3	3	RJ45	6 x R-SMA
V06	EAP-W1-MM-E1	1	optical	2 x R-SMA
V07	EAP-W1-MM-I2	1	optical	1 x intern
V08	EAP-W2-MM-E2	2	optical	4 x R-SMA
V09	EAP-W2-MM-I2	2	optical	2 x intern
V10	EAP-W3-MM-E3	3	optical	6 x R-SMA

The used WLAN modules (Atheros AR5414) are compatible with 802.11a, 802.11b and 802.11g modulation.
The WLAN modules are able to operate in 2.4 GHz and 5 GHz on following Frequency bands:

- 802.11a Mode 5.15 GHz – 5.25 GHz and 5.75 GHz – 5.85 GHz
- 802.11b/g Mode 2400 – 2483.5 MHz

The module used DSSS or OFDM modulation and is cabable to provide following data rates:

- 802.11b Mode 11, 5.5, 2, 1 Mbps, auto-fallback
- 802.11g Mode 54, 48, 36, 24, 18, 12, 9, 6 Mbps, auto-fallback
- 802.11g turbo Mode 108, 96, 72, 54, 48, 36, 24, 18, 12 Mbps, auto-fallback
- 802.11a 54, 48, 36, 24, 18, 12, 9, 6 Mbps, auto-fallback
- 802.11a turbo Mode 108, 96, 72, 54, 48, 36, 24, 18, 12 Mbps, auto-fallback

There are different external antennas provided, which are listed in following table:

Number	Characteristics	Certification name	Connection	Frequency	Gain
1*	Omni	ANT795-6MN	N	2,4 GHz band 5 GHz bands	6dBi 8dBi
2	Omni	ANT792-6MN	N	2,4 GHz band	6 dBi
3	Omni	ANT793-6MN	N	5 GHz bands	5 dBi
4*	Patch	ANT795-6DN	N	2,4 GHz band 5 GHz bands	9 dBi 9 dBi
5	Directed	ANT792-8DN	N	2,4 GHz band	14 dBi
6	Directed	ANT793-8DN	N	5 GHz bands	18 dBi
7	Helix	ANT792-4DN	N	2,4 GHz band	4 dBi
8	Λ5/8	ANT793-4MN	N	5 GHz band	6 dBi
9	R-Coax	IWLAN Rcoax PE 1/2" 2,4 GHz	N	2,4 GHz band	0 dBi
10	R-Coax	IWLAN Rcoax PE 1/2" 5 GHz	N	5 GHz band	0 dBi
11*	Patch	A5E00982361	R-SMA	2,4 GHz band 5 GHz bands	3 dBi 3,5 dBi
12*	Patch	A5E00982362	R-SMA	2,4 GHz band 5 GHz bands	3 dBi 3,5 dBi

*) marked antennas are dual band antennas which can be used both in 2.4 GHz and 5 GHz bands.

Following channels are provided to this EUT:

Operation in 2400 – 2483.5 MHz band:

802.11b/g mode:

Channel	Frequency	Channel	Frequency
***1**	**2412 MHz**	7	2442 MHz
2	2417 MHz	8	2447 MHz
3	2422 MHz	9	2452 MHz
4	2427 MHz	10	2457 MHz
5	2432 MHz	***11**	**2462 MHz**
***6**	**2437 MHz**		

802.11g turbo mode:

Channel	Frequency
***6**	**2437 MHz**

802.11a mode
Operation in 5750 MHz – 5850 MHz band – ISM band

Channel	Frequency
***165**	**5825 MHz**

***)Note: The above modes were tested according to FCC Part 15.247 and RSS 210, Annex A8. The tested channels are marked.**

Operation in 5150 MHz – 5250 MHz (UNII-1) band

802.11a mode:

Channel	Frequency
***36**	**5180 MHz**
40	5200 MHz
44	5220 MHz
***48**	**5240 MHz**

802.11a turbo mode:

Channel	Frequency
***42**	**5180 MHz**

Operation in 5750 MHz – 5828 MHz (UNII-3) band

802.11a mode:

Channel	Frequency
***149**	**5745 MHz**
153	5765 MHz
157	5785 MHz
***161**	**5805 MHz**

802.11a turbo mode:

Channel	Frequency
***152**	**5760 MHz**
***160**	**5800 MHz**

***) Note: The above modes were tested according to FCC Part 15.407 and RSS 210, Annex A9. The tested channels are marked.**

Software power setting

To fulfil all the requirements according to FCC Part 15.247 and RSS-210, Issue 6, Annex A8 following software power setting is necessary:

802.11b Mode

Channel	Ant.- No. 1 ANT795-6MN	Ant.- No. 2 ANT792-6MN	Ant.- No. 4 ANT795-6DN	Ant.- No. 5 ANT792-8DN	Ant.- No. 7 ANT792-4DN	Ant.- No. 9 IWLAN 2.4 GHz	Ant.- No. 11 A5E00982361	Ant.- No. 12 A5E00982362
1	0	0	0	-9	0	0	0	0
6	0	0	0	-3	0	0	0	0
11	0	0	0	-9	0	0	0	0

802.11g Mode

Channel	Ant.- No. 1 ANT795-6MN	Ant.- No. 2 ANT792-6MN	Ant.- No. 4 ANT795-6DN	Ant.- No. 5 ANT792-8DN	Ant.- No. 7 ANT792-4DN	Ant.- No. 9 IWLAN 2.4 GHz	Ant.- No. 11 A5E00982361	Ant.- No. 12 A5E00982362
1	0	-3	-3	-9	0	0	0	0
6	0	-3	0	-6	0	0	0	0
11	0	-3	0	-9	0	0	0	0

802.11g turbo Mode

Channel	Ant.- No. 1 ANT795-6MN	Ant.- No. 2 ANT792-6MN	Ant.- No. 4 ANT795-6DN	Ant.- No. 5 ANT792-8DN	Ant.- No. 7 ANT792-4DN	Ant.- No. 9 IWLAN 2.4 GHz	Ant.- No. 11 A5E00982361	Ant.- No. 12 A5E00982362
6	0	-6	-3	-9	0	0	0	0

802.11a ISM-band CH 165

Channel	Ant.- No. 1 ANT795-6MN	Ant.- No. 3 ANT793-6MN	Ant.- No. 4 ANT795-6DN	Ant.- No. 6 ANT793-8DN	Ant.- No. 8 ANT793-4DN	Ant.-No.10 IWLAN 5 GHz	Ant.- No. 11 A5E00982361	Ant.- No. 12 A5E00982362
165	0	0	0	-9	0	0	0	0

To fulfil all the requirements according to FCC Part 15.407 and RSS-210, Issue 6, Annex A9 following software power setting is necessary:

802.11a UNII-1 band

Channel	Ant.- No. 1 ANT795-6MN	Ant.- No. 3 ANT793-6MN	Ant.- No. 4 ANT795-6DN	Ant.- No. 8 ANT793-4MN	Ant.-No.10 IWLAN 5 GHz	Ant.- No. 11 A5E00982361	Ant.- No. 12 A5E00982362
36	0	-3	-6	0	0	0	0
48	0	-3	-3	0	0	0	0

802.11a turbo UNII-1 band

Channel	Ant.- No. 1 ANT795-6MN	Ant.- No. 3 ANT793-6MN	Ant.- No. 4 ANT795-6DN	Ant.- No. 8 ANT793-4MN	Ant.-No.10 IWLAN 5 GHz	Ant.- No. 11 A5E00982361	Ant.- No. 12 A5E00982362
42	-3	-3	-6	0	0	0	0

802.11a UNII-3 band

Channel	Ant.- No. 1 ANT795-6MN	Ant.- No. 3 ANT793-6MN	Ant.- No. 4 ANT795-6DN	Ant.- No. 6 ANT793-8DN	Ant.- No. 8 ANT793-4MN	Ant.-No.10 IWLAN 5 GHz	Ant.- No. 11 A5E00982361	Ant.- No. 12 A5E00982362
149	0	0	0	-9	0	0	0	0
161	0	0	0	-9	0	0	0	0

802.11a turbo UNII-3 band

Channel	Ant.- No. 1 ANT795-6MN	Ant.- No. 3 ANT793-6MN	Ant.- No. 4 ANT795-6DN	Ant.- No. 6 ANT793-8DN	Ant.- No. 8 ANT793-4MN	Ant.-No.10 IWLAN 5 GHz	Ant.- No. 11 A5E00982361	Ant.- No. 12 A5E00982362
152	0	0	0	-9	0	0	0	0
160	0	0	0	-9	0	0	0	0

FINAL ASSESSMENT:

The equipment under test **fulfills** the EMI requirements cited in clause 1 test standards.

Date of receipt of test sample : acc. to storage records

Testing commenced on : 02. March 2007

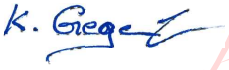
Testing concluded on : 23. March 2007

Checked by:

Thomas Weise
Ich bestätige die Richtigkeit und Integrität dieses Dokuments
2007.04.02 16:15:05 +02'00'

Thomas Weise
Dipl.-Ing.(FH)
Laboratory Manager

Tested by:



Klaus Gegenfurtner
Ich bin der Verfasser dieses Dokuments
2007.04.02 16:13:25 +02'00'

Klaus Gegenfurtner
Dipl.-Ing.(FH)

3 EQUIPMENT UNDER TEST

3.1 Photo documentation of the EuT – Detailed photos see Attachment A and B

3.2 Power supply system utilised

Power supply voltage : 48 V DC

3.3 Short description of the Equipment under Test (EuT)

Industrial Outdoor Access Point (iOAP) with integrated WLAN-Mini PCI cards which can operates both in the 2.4 GHz and in the 5 GHz bands.

Number of tested samples: 1
Serial number EAS: Prototype

EuT operation mode:

The equipment under test was operated during the measurement under the following conditions:

- Continuous transmit mode of 1 module

EuT configuration:

(The CDF filled by the applicant can be viewed at the test laboratory.)

The following peripheral devices and interface cables were connected during the measurements:

- PSU (Power Supply Unit) GlobTek Model : GT-2S5024D-R, S/N RoHS00984803/06
- DC Power supply 48VDC Model : 6000A
- Model :
- Model :
- Model :
- Model :

4 TEST ENVIRONMENT

4.1 Address of the test laboratory

mikes-testingpartners gmbh
Ohmstrasse 2-4
94342 Strasskirchen
Germany

4.2 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15-35 ° C
Humidity:	30-60 %
Atmospheric pressure:	86-106 kPa

4.3 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16-4-2 /11.2003 „Uncertainties, statistics and limit modelling – Uncertainty in EMC measurements“ and is documented in the quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

4.4 Measurement Protocol for FCC, VCCI and AUSTEL

4.4.1 GENERAL INFORMATION

4.4.1.1 Test Methodology

Conducted and radiated disturbance testing is performed according to the procedures in International Special Committee on Radio Interference (CISPR) Publication 22, European Standard EN 55022 as shown under section 1 of this report.

In compliance with 47 CFR Part 15 Subpart A Section 15.38 testing for FCC compliance may be done following the ANSI C63.4-2003 procedures and using the CISPR 22 Limits.

4.4.1.2 Justification

The Equipment Under Test (EUT) is configured in a typical user arrangement in accordance with the manufacturer's instructions. A cable is connected to each available port and either terminated with a peripheral using the appropriate impedance characteristic or left unterminated. Where appropriate, cables are manually manipulated with respect to each other thus obtaining maximum disturbances from the unit.

4.4.2 DETAILS OF TEST PROCEDURES

4.4.2.1 General Standard Information

The test methods used comply with CISPR Publication 22, EN 55022 - " Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement" and with ANSI C63.4-2003 - "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" and with RSS-Gen "General Requirements and Information for the Certification of Radiocommunication Equipment".The Open Area test site is a listed Open Site under the Canadian Test-Sites File-No:

IC 3009

4.5 Discovery of worst case measurement conditions

Pre-scans have been conducted to determine the worst case condition with all possible combinations between available modulations, data rates and antennas.
The worst case condition for the EAP has been assumed the settings declared by the manufacturer.

Due to the pre-scans and according the band edges following channels were selected for the final tests as listed below:

Power line Conducted Emission test:

Mode	Tested channel	Modulation type	Data Rate
802.11a	149, 157, 165	OFDM	54 Mbps

Radiated Emission test (Below 1 GHz):

Mode	Tested channel	Modulation type	Data Rate
802.11g	6	OFDM	54 Mbps
802.11a	149	OFDM	54 Mbps

Radiated Emission test (Above 1 GHz):

Mode	Tested channel	Modulation type	Data Rate
802.11b	1, 6, 11	DSSS	11 Mbps
802.11g	1, 6, 11	OFDM	54 Mbps
802.11g turbo	6	OFDM	108 Mbps
802.11a ISM Band	165	OFDM	54 Mbps
802.11a UNII-1 Band	36, 48	OFDM	54 Mbps
802.11a UNII-3 Band	149, 161	OFDM	54 Mbps
802.11a turbo UNII-1 Band	42	OFDM	108 Mbps
802.11a turbo UNII-3 Band	152, 160	OFDM	108 Mbps

Bandedge Measurements:

Mode	Tested channel	Modulation type	Data Rate
802.11b	1, 6, 11	DSSS	11 Mbps
802.11g	1, 6, 11	OFDM	54 Mbps
802.11g turbo	6	OFDM	108 Mbps
802.11a ISM Band	165	OFDM	54 Mbps
802.11a UNII-1 Band	36, 48	OFDM	54 Mbps
802.11a UNII-3 Band	149, 161	OFDM	54 Mbps
802.11a turbo UNII-1 Band	42	OFDM	108 Mbps
802.11a turbo UNII-3 Band	152, 160	OFDM	108 Mbps

Antenna Port conducted measurements:

Mode	Tested channel	Modulation type	Data Rate
802.11b	1, 6, 11	DSSS	11 Mbps
802.11g	1, 6, 11	OFDM	54 Mbps
802.11g turbo	6	OFDM	108 Mbps
802.11a ISM Band	165	OFDM	54 Mbps
802.11a UNII-1 Band	36, 48	OFDM	54 Mbps
802.11a UNII-3 Band	149, 161	OFDM	54 Mbps
802.11a turbo UNII-1 Band	42	OFDM	108 Mbps
802.11a turbo UNII-3 Band	152, 160	OFDM	108 Mbps

5 TEST CONDITIONS AND RESULTS

Test results according to §15.107/15.207 and §15.109/15.209

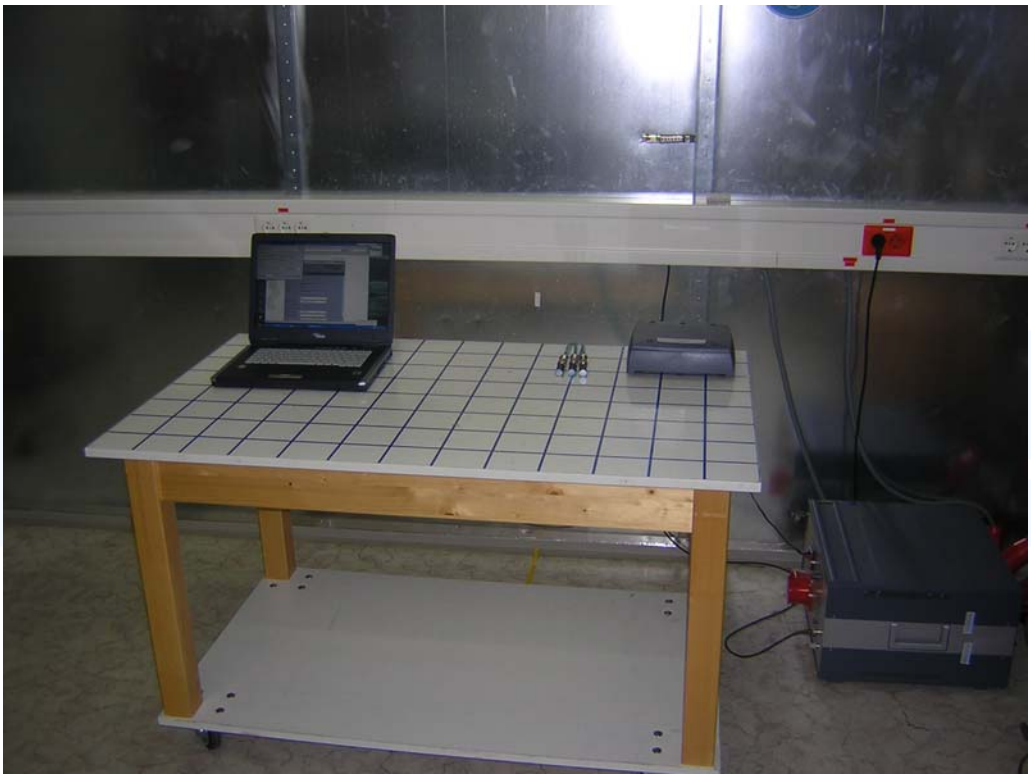
5.1 Power Line conducted emissions (Worst case data)

For test instruments and accessories used see section 6 Part **A 4**.

5.1.1 Description of the test location

Test location: Shielded room S2

5.1.2 Photo documentation of the test set-up



5.1.3 Description of Measurement

The final level, expressed in dBμV, is arrived at by taking the reading directly from the EMI receiver. This level is compared directly to the FCC Limit or to the CISPR limit.

To convert between dBμV and μV, the following conversions apply:

dBμV = 20(log μV)

μV = Inverse log(dBμV/20)

Conducted emissions on the 50 Hz and/or 60 Hz power interface of the EuT are measured in the frequency range of 150 kHz to 30 MHz. The measurements are performed using a receiver, which has CISPR characteristic bandwidth and quasi-peak detection and a Line Impedance Stabilization Network (LISN) with 50Ω/50 μH (CISPR 16) characteristics. Table top equipment is placed on a non-conducting table 80 centimeters above the floor and is positioned 40 centimeters from the vertical ground plane (wall) of the screen room. If the minimum limit margin appears to be less than 20 dB with a peak mode measurement, the emissions are remeasured using a tuned receiver with quasi-peak and average detection and recorded on the data sheets.

5.1.4 Test result

Frequency range: 0.15 MHz - 30 MHz

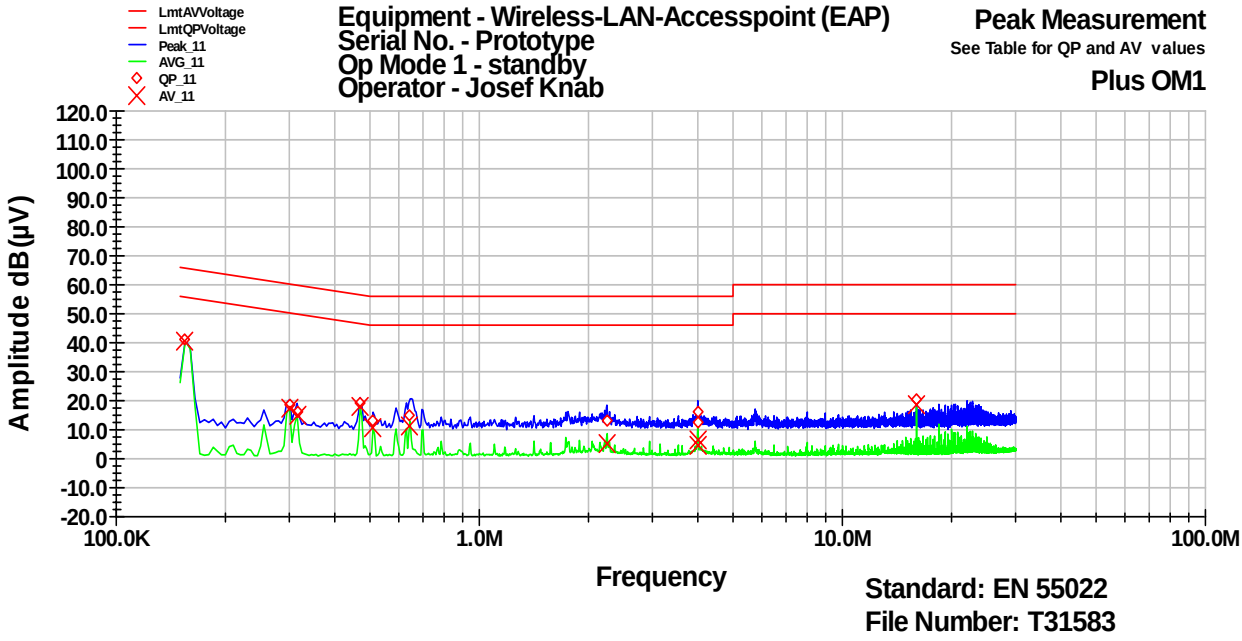
Min. limit margin 10.9 dB at 0.155 MHz

The requirements are **FULFILLED.**

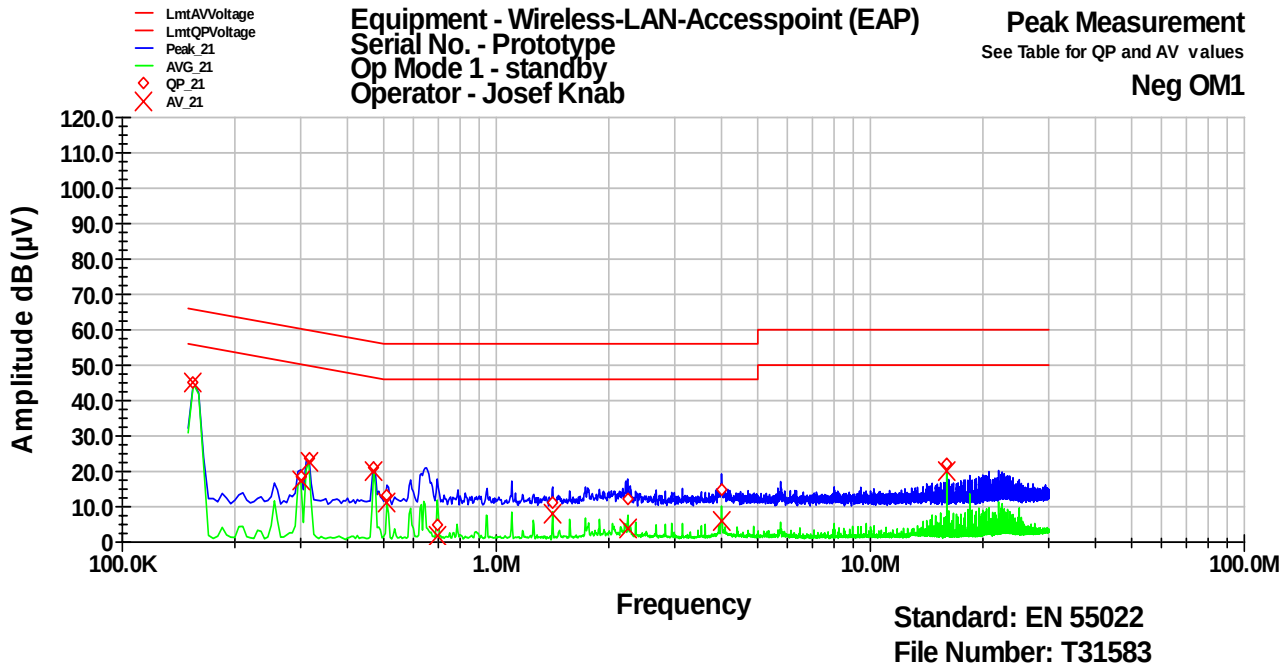
Remarks: As worst case model an EAP variant with 3 connected WLAN modules was tested.

For the test all 3 modules transmitted with full power at the same time..

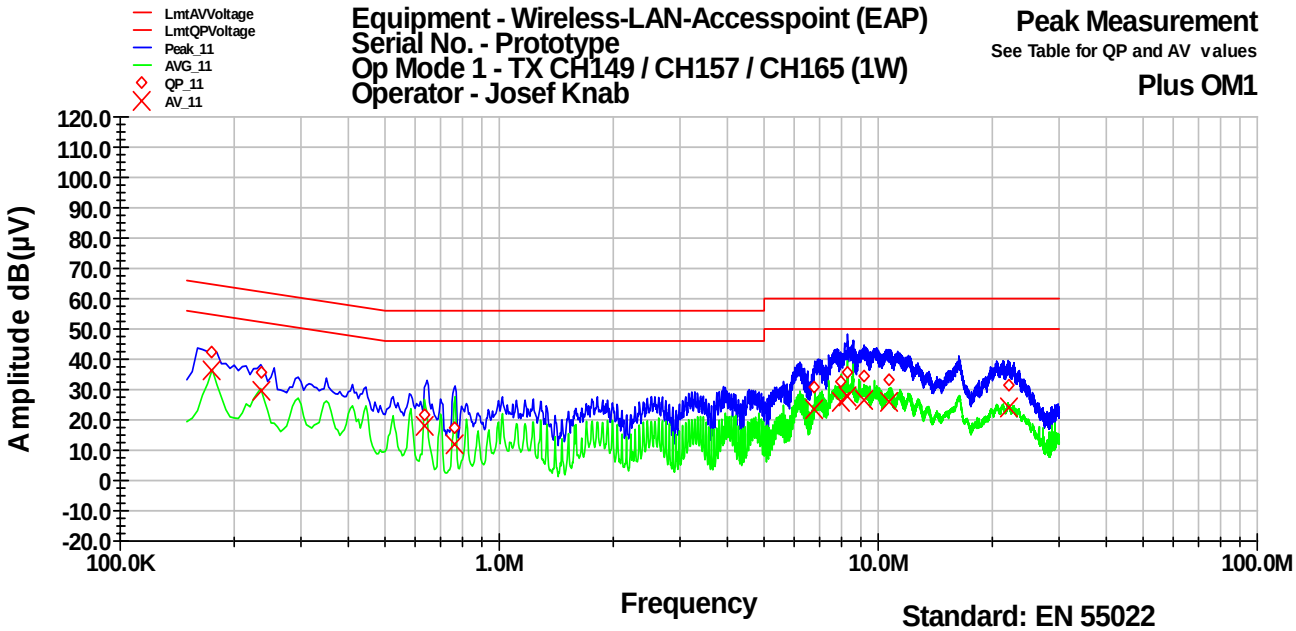
5.1.5 Test protocol



Frequency	QP Level	QP Margin	QP Limit	AV Level	AV Margin	AV Limit
MHz	dB(µV)	dB	dB	dB(µV)	dB	dB
0.155	40.9	-24.8	65.7	40.7	-15.1	55.7
0.3	18.6	-41.6	60.2	17.4	-32.9	50.2
0.315	16.4	-43.4	59.8	14.9	-34.9	49.8
0.47	19.1	-37.4	56.5	17.8	-28.7	46.5
0.51	13.2	-42.8	56.0	10.8	-35.2	46.0
0.645	14.9	-41.1	56.0	11.2	-34.8	46.0
2.25	13.3	-42.7	56.0	5.0	-41.0	46.0
4	15.9	-40.0	56.0	6.4	-39.6	46.0
4.005	12.7	-43.3	56.0	4.7	-41.3	46.0
16	20.4	-39.6	60.0	18.4	-31.6	50.0

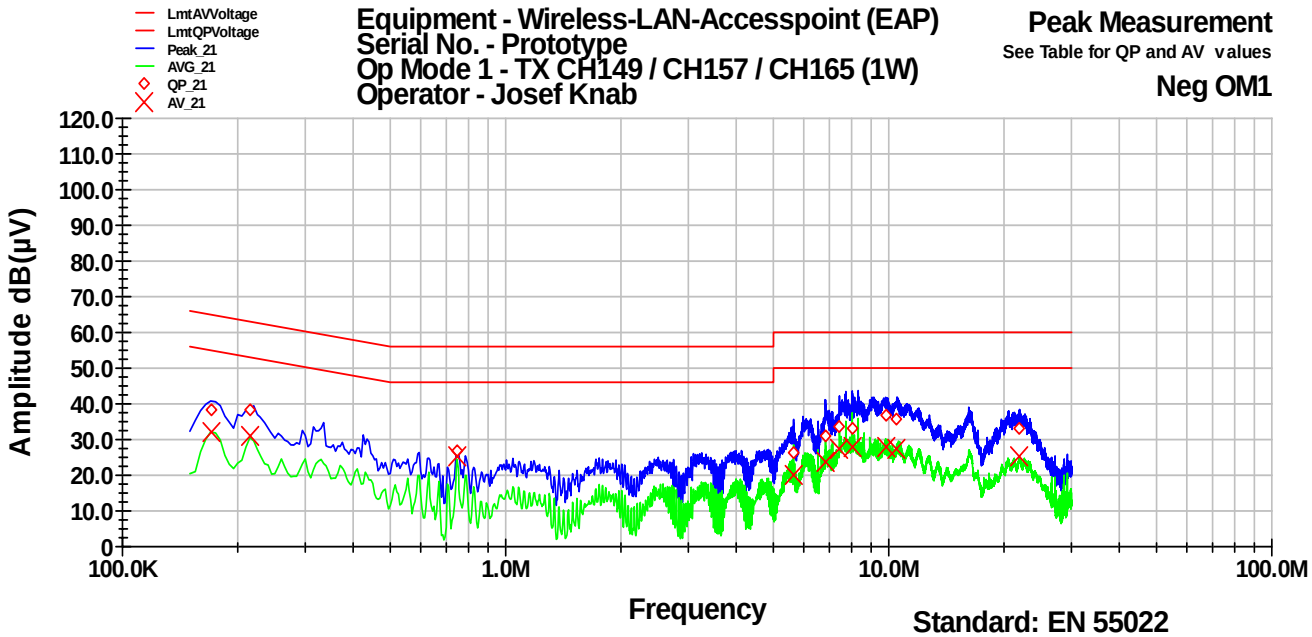


Frequency	QP Level	QP Margin	QP Limit	AV Level	AV Margin	AV Limit
MHz	dB(µV)	dB	dB	dB(µV)	dB	dB
0.155	45.2	-20.6	65.7	44.8	-10.9	55.7
0.3	18.6	-41.6	60.2	17.3	-32.9	50.2
0.315	23.7	-36.2	59.8	22.9	-26.9	49.8
0.47	21.3	-35.2	56.5	20.3	-26.2	46.5
0.51	13.2	-42.8	56.0	10.9	-35.1	46.0
0.695	5.1	-50.9	56.0	1.5	-44.5	46.0
1.415	11.0	-45.0	56.0	8.2	-37.8	46.0
2.245	12.2	-43.8	56.0	4.1	-41.9	46.0
4	14.7	-41.3	56.0	5.7	-40.3	46.0
16	22.0	-38.0	60.0	20.0	-30.0	50.0



Standard: EN 55022
File Number: T31583

Frequency	QP Level	QP Margin	QP Limit	AV Level	AV Margin	AV Limit
MHz	dB(µV)	dB	dB	dB(µV)	dB	dB
0.175	42.6	-22.1	64.7	36.6	-18.1	54.7
0.235	35.5	-26.7	62.3	29.7	-22.6	52.3
0.635	21.8	-34.2	56.0	18.0	-28.0	46.0
0.765	17.4	-38.6	56.0	12.0	-34.0	46.0
6.805	30.9	-29.1	60.0	23.3	-26.7	50.0
7.99	32.4	-27.6	60.0	26.2	-23.8	50.0
8.285	35.5	-24.5	60.0	27.5	-22.5	50.0
9.165	34.6	-25.4	60.0	26.5	-23.5	50.0
10.66	33.5	-26.5	60.0	25.6	-24.4	50.0
22.005	31.7	-28.3	60.0	23.9	-26.1	50.0



Standard: EN 55022
File Number: T31583

Frequency	QP Level	QP Margin	QP Limit	AV Level	AV Margin	AV Limit
MHz	dB(µV)	dB	dB	dB(µV)	dB	dB
0.17	38.3	-26.7	65.0	31.8	-23.1	55.0
0.215	38.2	-24.8	63.0	31.0	-22.0	53.0
0.745	27.1	-28.9	56.0	25.2	-20.8	46.0
5.645	26.3	-33.7	60.0	20.2	-29.8	50.0
6.82	30.8	-29.2	60.0	23.5	-26.5	50.0
7.43	33.4	-26.6	60.0	27.3	-22.7	50.0
8.025	33.1	-26.9	60.0	27.7	-22.3	50.0
9.805	36.5	-23.5	60.0	27.8	-22.2	50.0
10.505	35.7	-24.3	60.0	27.1	-22.9	50.0
21.935	33.0	-27.0	60.0	25.2	-24.8	50.0

5.2 Radiated emissions (electric field)

For test instruments and accessories used see section 6 Part **SER 2, SER 3**.

5.2.1 Description of the test location

Test location: OATS1
Test location: Anechoic Chamber A2

Test distance: 10 metres (30-1000MHz)
Test distance: 3 metres (1000-2000)

5.2.2 Photo documentation of the test set-up

5.2.3 Description of Measurement

Radiated emissions from the EuT are measured in the frequency range of 30 MHz to 1000 MHz using a tuned receiver and appropriate broadband linearly polarized antennas. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB bandwidth and quasi-peak detection. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimetres above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. The set up of the Equipment under test will be in accordance to ANSI C63.4-2003.
The Interface cables that are closer than 40 centimetres to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimetres from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area. The antenna was positioned 3, 10 or 30 meters horizontally from the EuT. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 meters, measurement scans are made with both horizontal and vertical antenna polarization`s and the EuT are rotated 360 degrees.

The final level, expressed in dBµV/m, is arrived by taking the reading from the EMI receiver (Level dBµV) and adding the correction factors and cable loss factor (Factor dB) to it. This is done automatically in the EMI receiver, where the correction factors are stored. This result then has the FCC or CISPR limit subtracted from it to provide the Delta which gives the tabular data as shown in the data sheets at page.

The radiated emissions from the EuT are measured in the frequency range of 1 GHz to maximum frequency as specified in section 15.33, using a tuned receiver (Spectrum Analyser) and appropriate linearly polarized antennas. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimetres above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. The set up of the Equipment under test will be in accordance to ANSI C63.4-2003.
The Interface cables that are closer than 40 centimetres to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimetres from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area. The antenna was positioned 3 horizontally from the EuT.

Measurement are made in both the horizontal and vertical planes of polarization in a fully anechoic room using a spectrum analyzer with the detector function set to peak and resolution as well as video bandwith set to 1 MHz. All tests are performed at a test-distance of 3 meters. Hand-held or body-worn devices are rotated through three orthogonal axes to determine which attitude and configuration procedure the highest emission relative the limit and therefore shall be used for final testing. During the tests the EUT is rotated all around to find the maximum levels of emissions. The cables and equipment were placed and moved within the range of position likely to find their maximum emissions. When the EuT is larger than the beamwidth of the measuring antenna, the measurement antenna will be moved over the surfaces for the four sides or the test distance will be reduced to demonstrate that emissions were at maximum at the limit distance.

The resolution bandwidth during the measurement is as follows:
30 MHz – 1000 MHz: ResBW: 120 kHz
Above 1000 MHz ResBW: 1 MHz

5.2.4 Test result

Testresult in detail:(<1GHz)

Frequency [MHz]	Bandwidth [kHz]	L: QP [dBµV/m]	Limit [dBµV/m]	Delta [dB]
125.0	120	25.6	30	-4.6
151.5	120	23.8	30	-6.2
328.6	120	25.6	37	-11.4
331.5	120	24.7	37	-12.3
363.0	120	32.0	37	-5.0
462.0	120	34.0	37	-3.0

Testresult in detail:(>1GHz)

Frequency [MHz]	L: PK [dBµV]	L: AV [dBµV]	Bandwidth [kHz]	Correct. [dB]	L: PK [dBµV/m]	L: AV [dBµV/m]	Limit PK [dBµV/m]	Limit AV [dBµV/m]	Delta [dB]
1056	72.1	53.7	1000	-13.9	58.2	39.8	74.0	54.0	-14.1
1316	69.4	45.5	1000	-14.3	55.1	31.2	74.0	54.0	-18.9
1588	62.3	41.8	1000	-13.8	48.5	28.0	74.0	54.0	-25.5
1719	65.4	42.0	1000	-13.0	52.4	29.0	74.0	54.0	-21.5

Limit according to CISPR 22 and FCC Subpart 15.209 (a)

Frequency [MHz]	15.109 Limits [dBµV/m]
30-230	30 (QP)
230-1000	37 (QP)
Above 960	54(QP) ; 74(PK)

The requirements are **FULFILLED.**

Remarks: According to FCC Part 15.33(b), the measurement was performed up to 2000 MHz.

Test results according to §15.247 and RSS-210, Annex 8

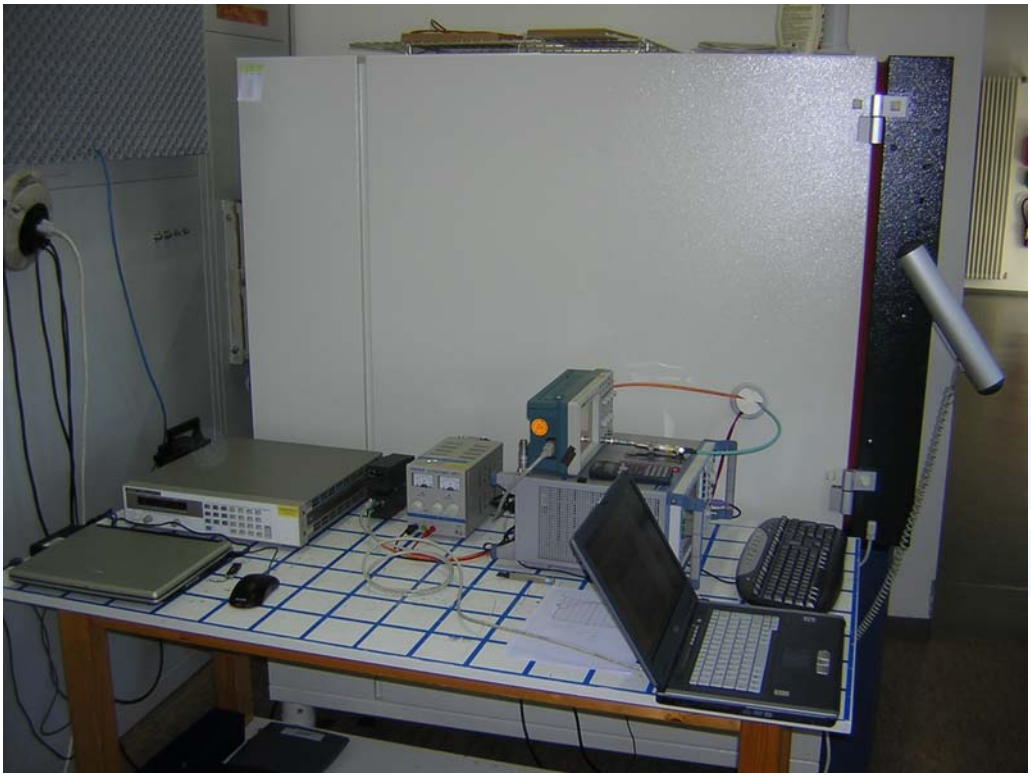
5.3 Maximum Output Power conducted

For test instruments and accessories used see section 6 Part **CPC 3**.

5.3.1 Description of the test location

Test location: AREA4

5.3.2 Photo documentation of the test set-up



5.3.3 Description of Measurement

Conducted maximum output power:

A spectrum analyzer / EMI test receiver is connected to the ouput of the transmitter via a suitable attenuator while EuT was operating in transmit mode using the assigned frequency.
Analyzer Settings:

- Detector: Max hold
- RBW: greater than 20 dB Bandwidth
- VBW: ≥ RBW
- Sweep Time: Coupled

Alternative test procedure:
If antenna conducted tests cannot be performed on the EuT, radiated tests to show compliance with the various conducted requirements of Section 15.247 and RSS-Gen are performed. A pre-amp have been used in making the following requirements.

Radiated maximum peak output power:

Radiated maximum peak output power from the EuT is measured in the frequency range of 30 MHz to 1000 MHz using a tuned receiver and appropriate broadband linearly polarized antennas. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB bandwidth and quasi-peak detection. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimetres above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. The set up of the Equipment under test will be in accordance to ANSI C63.4-2003 and RSS-Gen / RSS-212
The Interface cables that are closer than 40 centimetres to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimetres from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area. The antenna was positioned 3, 10 or 30 meters horizontally from the EuT. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 meters, measurement scans are made with both horizontal and vertical antenna polarization`s and the EuT are rotated 360 degrees.

The final level, expressed in dBµV/m, is arrived by taking the reading from the EMI receiver (Level dBµV) and adding the correction factors and cable loss factor (Factor dB) to it. This is done automatically in the EMI receiver, where the correction factors are stored. This result then has the FCC or CISPR limit subtracted from it to provide the Delta which gives the tabular data as shown in the data sheets at page.

Radiated maximum peak output power from the EuT is measured above 1 GHz, using a tuned receiver (Spectrum Analyser) and appropriate linearly polarized antennas. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimetres above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. The set up of the Equipment under test will be in accordance to ANSI C63.4-2003 and RSS-Gen / RSS-212
The Interface cables that are closer than 40 centimetres to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimetres from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area.

Measurement are made in both the horizontal and vertical planes of polarization in a fully anechoic room using a spectrum analyzer with the detector function set to peak and resolution as well as video bandwith set to 1 MHz.
All tests are performed at a test-distance of 3 meters. Hand-held or body-worn devices are rotated through three orthogonal axes to determine which attitude and configuration procedure the highest emission relative the limit and therefore shall be used for final testing. During the tests the EUT is rotated all around to find the maximum levels of emissions. The cables and equipment were placed and moved within the range of position likely to find their maximum emissions. When the EuT is larger than the beamwidth of the measuring antenna, the measurement antenna will be moved over the surfaces for the four sides or the test distance will be reduced to demonstrate that emissions were at maximum at the limit distance.
Analyzer Settings:

- Detector: Max Peak
- RBW: 1 MHz
- VBW: ≥ RBW
- Sweep Time: Coupled

5.3.4 Test result

Frequency band 2400-2483.5 MHz

802.11b
DSSS Modulation; Data Rate: 11 Mbps
Conducted Measurement

Channel	Frequency [MHz]	Software Power Setting [dB]	Max. Power Output (dBm)	Power Limit (dBm)	Delta [dB]
1	2412	0	20.2	30	-9.8
6	2437	0	19.9	30	-10.1
11	2462	0	20.0	30	-10.0

802.11b
Antennas-No.: 1(Gain: 6dBi); **2**(6dBi); **7**(4dBi); **9**(0dBi); **11**(3dBi); **12**(3dBi)

Channel	Frequency [MHz]	Software Power Setting [dB]	Max. Power Output (dBm)	Max. Gain [dBi]	Power Limit conducted (dBm)
1	2412	0	20.2	6	30
6	2437	0	19.9	6	30
11	2462	0	20.0	6	30

802.11b
Antenna-No.: 4(9dBi)

Channel	Frequency [MHz]	Software Power Setting [dB]	Max. Power Output (dBm)	Max. Gain [dBi]	Power Limit conducted (dBm)
1	2412	0	20.2	9	27
6	2437	0	19.9	9	27
11	2462	0	20.0	9	27

802.11b
Antenna-No.: 5(14dBi)

Channel	Frequency [MHz]	Software Power Setting [dB]	Max. Power Output (dBm)	Max. Gain [dBi]	Power Limit conducted (dBm)
1	2412	-9*	11.2	14	22
6	2437	-3*	16.9	14	22
11	2462	-9*	11.0	14	22

* Reduced power setting, because a negative result by the radiated spurious emissions.

802.11g
OFDM Modulation; Data Rate: 54 Mbps
Conducted Measurement

Channel	Frequency [MHz]	Software Power Setting [dB]	Max. Power Output (dBm)	Power Limit (dBm)	Delta [dB]
1	2412	0	19.9	30	-10.1
6	2437	0	20.4	30	-9.6
11	2462	0	18.6	30	-11.38

802.11g
Antennas-No.: 1(6dBi); **7**(4dBi); **9**(0dBi); **11**(3dBi); **12**(3dBi)

Channel	Frequency [MHz]	Software Power Setting [dB]	Max. Power Output (dBm)	Max. Gain [dBi]	Power Limit conducted (dBm)
1	2412	0	19.9	6	30
6	2437	0	20.4	6	30
11	2462	0	18.6	6	30

802.11g
Antenna-No.: 2(6dBi)

Channel	Frequency [MHz]	Software Power Setting [dB]	Max. Power Output (dBm)	Max. Gain [dBi]	Power Limit conducted (dBm)
1	2412	-3*	16.9	6	30
6	2437	-3*	17.4	6	30
11	2462	-3*	15.6	6	30

* Reduced power setting, because a negative result by the radiated spurious emissions.

802.11g
Antenna-No.: 4(9dBi)

Channel	Frequency [MHz]	Software Power Setting [dB]	Max. Power Output (dBm)	Max. Gain [dBi]	Power Limit conducted (dBm)
1	2412	-3*	16.9	9	27
6	2437	0	20.4	9	27
11	2462	0	15.6	9	27

* Reduced power setting, because a negative result by the radiated spurious emissions.

802.11g
Antenna-No.: 5(14dBi)

Channel	Frequency [MHz]	Software Power Setting [dB]	Max. Power Output (dBm)	Max. Gain [dBi]	Power Limit conducted (dBm)
1	2412	-9dB*	10.9	14	22
6	2437	-6dB*	14.4	14	22
11	2462	-9dB*	9.6	14	22

* Reduced power setting, because a negative result by the radiated spurious emissions.

802.11g turbo
OFDM Modulation; Data Rate: 108 Mbps
Conducted Measurement

Channel	Frequency [MHz]	Software Power Setting [dB]	Max. Power Output (dBm)	Power Limit (dBm)	Delta [dB]
6	2437	0	22.3	30	-7.7

802.11g turbo
Antennas-No.: 1(Gain: 6dBi); **7**(4dBi); **9**(0dBi); **11**(3dBi); **12**(3dBi)

Channel	Frequency [MHz]	Software Power Setting [dB]	Max. Power Output (dBm)	Max. Gain [dBi]	Power Limit conducted (dBm)
6	2437	0	22.3	6	30

802.11g turbo
Antenna-No.: 2(6dBi)

Channel	Frequency [MHz]	Software Power Setting [dB]	Max. Power Output (dBm)	Max. Gain [dBi]	Power Limit conducted (dBm)
6	2437	-6*	16.3	6	30

* Reduced power setting, because a negative result by the radiated spurious emissions.

802.11g turbo
Antenna-No.: 4(9dBi)

Channel	Frequency [MHz]	Software Power Setting [dB]	Max. Power Output (dBm)	Max. Gain [dBi]	Power Limit conducted (dBm)
6	2437	-3*	19.3	9	27

* Reduced power setting, because a negative result by the radiated spurious emissions.

802.11g turbo
Antenna-No.: 5(14dBi)

Channel	Frequency [MHz]	Software Power Setting [dB]	Max. Power Output (dBm)	Max. Gain [dBi]	Power Limit conducted (dBm)
6	2437	-9dB*	13.3	14	22

* Reduced power setting, because a negative result by the radiated spurious emissions.

Frequency band 5750-5850 MHz

802.11a ISM band
OFDM Modulation; Data Rate: 54 Mbps
Conducted Measurement

Channel	Frequency [MHz]	Software Power Setting [dB]	Max. Power Output (dBm)	Power Limit (dBm)	Delta [dB]
165	5825	0	14.4	30	-15.6

802.11a ISM band
Antenna no.: 3(5dBi); **8**(6dBi); **10**(0dBi); **11**(3,5dBi); **12**(3,5dBi)

Channel	Frequency [MHz]	Software Power Setting [dB]	Max. Power Output (dBm)	Max. Gain [dBi]	Power Limit conducted (dBm)
165	5825	0	14.4	6	30

802.11a ISM band
Antenna no.: 1(8dBi);

Channel	Frequency [MHz]	Software Power Setting [dB]	Max. Power Output (dBm)	Max. Gain [dBi]	Power Limit conducted (dBm)
165	5825	0	14.4	8	28

802.11a ISM band
Antenna no.: 4(9dBi)

Channel	Frequency [MHz]	Software Power Setting [dB]	Max. Power Output (dBm)	Max. Gain [dBi]	Power Limit conducted (dBm)
165	5825	0	14.4	9	27

802.11a ISM band
Antenna no.: 6(18dBi)

Channel	Frequency [MHz]	Software Power Setting [dB]	Max. Power Output (dBm)	Max. Gain [dBi]	Power Limit conducted (dBm)
165	5825	-9	5.4	18	30

* Reduced power setting, because a negative result by the radiated spurious emissions.

Conducted Power Limit according to FCC Subpart 15.247 (b) (3) / RSS-210, Issue 6, A8.4 (4)

Frequency (MHz)	Peak Power Limit	
	(dBm)	(Watt)
902-928	30	1,0
2400-2483.5	**30**	**1,0**
5725-5850	**30**	**1,0**

The requirements are **FULFILLED.**

5.4 Radiated emissions 9 kHz – 25 GHz

For test instruments and accessories used see section 6 Part **SER 1, SER2 and SER 3**.

5.4.1 Description of the test location

Test location: OATS1
Test location: Anechoic Chamber A2

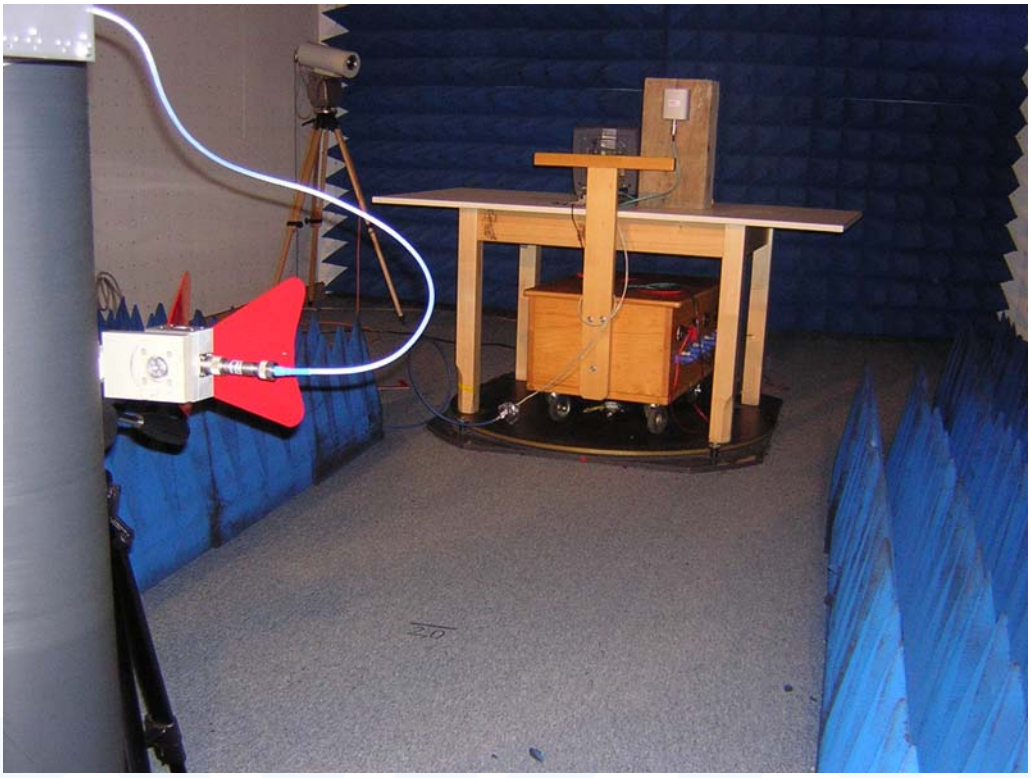
Test distance: 3 metres

5.4.2 Photo documentation of the test set-up

SER 1

SER2

SER 3



5.4.3 Description of Measurement

The spurious emissions from the EuT will be measured on an open area test site in the frequency range of 9 kHz to 30 MHz using a tuned receiver and a shielded loop antenna. The antenna was positioned 3, 10 or 30 meters horizontally from the EuT. Measurements have been made in all three orthogonal axes and the shielded loop antenna was rotated to locate the maximum of the emissions. In the case where larger measuring distances are required the results will extrapolated based on the values measured on the closer distances according to Section 15.31 (f) (2) [2] and RSS-Gen. The final measurement will be performed with an EMI Receiver set to Quasi Peak detector except for the frequency bands 9 kHz to 90 kHz and 110 to 490 kHz where an average detector will be used according to Section 15.209 (d) [2] and RSS-Gen.

The final level, expressed in dBµV/m, is arrived at by taking the reading from the EMI receiver (Level dBµV) and adding the antenna correction factor and cable loss factor (Factor dB) to it. This result then has to be compared with the relevant FCC – and RSS-210 Limit.
The resolution bandwidth during the measurement is as follows:
9 kHz – 150 kHz: ResBW: 200 Hz
150 kHz – 30 MHz: ResBW: 9 kHz

Radiated spurious emissions from the EuT are measured in the frequency range of 30 MHz to 1000 MHz using a tuned receiver and appropriate broadband linearly polarized antennas. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB bandwidth and quasi-peak detection. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimetres above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. The set up of the Equipment under test will be in accordance to ANSI C63.4-2003 and RSS-Gen.
The Interface cables that are closer than 40 centimetres to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimetres from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area. The antenna was positioned 3, 10 or 30 meters horizontally from the EuT. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 meters, measurement scans are made with both horizontal and vertical antenna polarization`s and the EuT are rotated 360 degrees.

The final level, expressed in dBµV/m, is arrived by taking the reading from the EMI receiver (Level dBµV) and adding the correction factors and cable loss factor (Factor dB) to it. This is done automatically in the EMI receiver, where the correction factors are stored. This result then has the FCC, RSS-210 or CISPR limit subtracted from it to provide the Delta which gives the tabular data as shown in the data sheets at page.

The radiated emissions from the EuT are measured in the frequency range of 1 GHz to maximum frequency as specified in section 15.33, using a tuned receiver (Spectrum Analyser) and appropriate linearly polarized antennas. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimetres above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. The set up of the Equipment under test will be in accordance to ANSI C63.4-2003 and RSS-Gen.
The Interface cables that are closer than 40 centimetres to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimetres from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area. The antenna was positioned 3m horizontally from the EuT.

Measurement are made in both the horizontal and vertical planes of polarization in a fully anechoic room using a spectrum analyzer with the detector function set to peak and resolution as well as video bandwidth set to 100 kHz and for any spurious emission or modulation product that falls in Restricted Band, as defined in Section 15.205 and Table of RSS-210, set the resolution and video bandwidth to 1 MHz.
All tests are performed at a test-distance of 3 meters. Hand-held or body-worn devices are rotated through three orthogonal axes to determine which attitude and configuration procedure the highest emission relative the limit and therefore shall be used for final testing. During the tests the EUT is rotated all around to find the maximum levels of emissions. The cables and equipment were placed and moved within the range of position likely to find their maximum emissions. When the EuT is larger than the beamwidth of the measuring antenna, the measurement

antenna will be moved over the surfaces for the four sides or the test distance will be reduced to demonstrate that emissions were at maximum at the limit distance.

Analyzer Settings (EMI receiver) for spurious emissions which fall not in Restricted Band:

- Detector: Max hold
- RBW: 100 kHz for f ≥ 1GHz, 120 kHz for f ≤ 1GHz
- VBW: ≥ RBW
- Sweep Time: Coupled
- Detector function: Peak

Analyzer Settings (EMI receiver) for spurious emissions which fall in Restricted Band:

- Detector: Max hold
- RBW: 1 MHz for f ≥ 1GHz, 120 kHz for f ≤ 1GHz
- VBW: ≥ RBW
- Sweep Time: Coupled
- Detector function: Peak for f ≥ 1GHz, Quasi Peak for f ≤ 1GHz

5.4.4 Test result

5.5.4.1 Test results (<1GHz) (Worst case data) according to FCC 15.247 (d) and RSS 210, A8.5

Frequency band 2400-2483.5 MHz

802.11g
Data rate: 54 Mbps
Worst case antenna: ANT795-6DN
Power setting: 0dB (Full power)

Corrected field strength of fundamental wave as reference for radiated emissions: 115.0 dBµV/m

Channel 6: 2437 MHz												
Frequency [MHz]	Restricted Band	Reading Level QP [dBµV]	Reading Level AV [dBµV]	Reading Level PK [dBµV]	Bandwidth [kHz]	Correct. factor [dB]	Corrected Level QP [dBµV/m]	Corrected Level AV [dBµV/m]	Corrected Level PK [dBµV/m]	Limit [dBµV/m]		Delta [dB]
										PK	QP	
9 kHz-1.7	■				10		< 20					
1.705-30	■				10		<20				29.5	>-9.5
30-88	■				120		< 30				40	> -10,0
88-216	■				120		<30				43.5	>-13.5
216-960	■				120		<30				46	>-16
961.2	■				120		32				54	-22.0
960-1000	■				120		< 30				54	> -24,0

Radiated limits according to FCC Part 15 Subpart 15.209(a) and for spurious emissions:

Frequency (MHz)	Field strength of spurious emissions		Measurement distance (meters)
	(µV/m)	dB (µV/m)	
0,0090,490	2400/F(kHz)		300
0,490-1,705	24000/F(kHz)		30
1,705-30	30	29,5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

5.5.4.2 Test results (>1GHz) (worst case data) according to FCC 15.247 (d) and RSS-210, A 8.5

Frequency band 2400-2483.5 MHz

802.11b
Data rate: 11 Mbps
Worst case antenna: No. 4 - ANT795-6DN
Power setting: 0dB (Full power)

Channel 1: 2412 MHz											
Frequency [MHz]	Restricted Band	Reading Level PK [dBµV]	Corr. Duty Cycle [dB]	Level AV [dBµV] *)	Band-width [kHz]	Correct. Factor [dB]	Corrected Level PK [dBµV/m]	Corrected Level AV [dBµV/m]	Limit PK [dBµV/m]	Limit AV [dBµV/m]	Delta [dB]
1056	■	72.1	---	53.7	1000	-13.9	58.2	39.8	74.0	54.0	-14.1
1316	■	69.4	---	45.5	1000	-14.3	55.1	31.2	74.0	54.0	-18.9
1588	■	62.3	---	41.8	1000	-13.8	48.5	28.0	74.0	54.0	-25.5
1719	■	65.4	---	42.0	1000	-13.0	52.4	29.0	74.0	54.0	-21.5
2385	■	78.7	---	63.3	1000	-9.5	69.2	53.8	74.0	54.0	-0.2

802.11b
Data rate: 11 Mbps
Worst case antenna: No. 5 - ANT792-8DN
Power setting: -3dB

Channel 6: 2437 MHz											
Frequency [MHz]	Restricted Band	Reading Level PK [dBµV]	Corr. Duty Cycle [dB]	Level AV [dBµV] *)	Band-width [kHz]	Correct. Factor [dB]	Corrected Level PK [dBµV/m]	Corrected Level AV [dBµV/m]	Limit PK [dBµV/m]	Limit AV [dBµV/m]	Delta [dB]
1056	■	72.1	---	53.7	1000	-13.9	58.2	39.8	74.0	54.0	-14.1
1316	■	69.4	---	45.5	1000	-14.3	55.1	31.2	74.0	54.0	-18.9
1588	■	62.3	---	41.8	1000	-13.8	48.5	28.0	74.0	54.0	-25.5
1719	■	65.4	---	42.0	1000	-13.0	52.4	29.0	74.0	54.0	-21.5
2381	■	73.4	---	58.6	1000	-9.5	63.9	49.1	74.0	54.0	-4.9
2484	■	75.8	---	75.8	1000	-9.5	66.3	50.3	74.0	54.0	-3.7

802.11b
Data rate: 11 Mbps
Worst case antenna: No. 2 - ANT792-6MN
Power setting: 0dB (Full power)

Channel 1: 2412 MHz											
Frequency [MHz]	Restricted Band	Reading Level PK [dBµV]	Corr. Duty Cycle [dB]	Level AV [dBµV] *)	Band-width [kHz]	Correct. Factor [dB]	Corrected Level PK [dBµV/m]	Corrected Level AV [dBµV/m]	Limit PK [dBµV/m]	Limit AV [dBµV/m]	Delta [dB]
1056	■	72.1	---	53.7	1000	-13.9	58.2	39.8	74.0	54.0	-14.1
1316	■	69.4	---	45.5	1000	-14.3	55.1	31.2	74.0	54.0	-18.9
1588	■	62.3	---	41.8	1000	-13.8	48.5	28.0	74.0	54.0	-25.5
1719	■	65.4	---	42.0	1000	-13.0	52.4	29.0	74.0	54.0	-21.5
2488	■	76.0	---	61.6	1000	-9.5	66.5	52.1	74.0	54.0	-1.9

802.11g
Data rate: 54 Mbps
Worst case antenna: No. 4 - ANT795-6DN
Power setting: -3dB

Channel 1: 2412 MHz											
Frequency [MHz]	Restricted Band	Reading Level PK [dBµV]	Corr. Duty Cycle [dB]	Level AV [dBµV] *)	Band-width [kHz]	Correct. Factor [dB]	Corrected Level PK [dBµV/m]	Corrected Level AV [dBµV/m]	Limit PK [dBµV/m]	Limit AV [dBµV/m]	Delta [dB]
1056	■	72.1	---	53.7	1000	-13.9	58.2	39.8	74.0	54.0	-14.1
1316	■	69.4	---	45.5	1000	-14.3	55.1	31.2	74.0	54.0	-18.9
1588	■	62.3	---	41.8	1000	-13.8	48.5	28.0	74.0	54.0	-25.5
1719	■	65.4	---	42.0	1000	-13.0	52.4	29.0	74.0	54.0	-21.5
2390	■	81.1	---	62.2	1000	-9.5	71.6	52.7	74.0	54.0	-1.3

802.11g
Data rate: 54 Mbps
Worst case antenna: No. 5 - ANT792-8DN
Power setting: -6dB

Channel 6: 2437 MHz											
Frequency [MHz]	Restricted Band	Reading Level PK [dBµV]	Corr. Duty Cycle [dB]	Level AV [dBµV] *)	Band-width [kHz]	Correct. Factor [dB]	Corrected Level PK [dBµV/m]	Corrected Level AV [dBµV/m]	Limit PK [dBµV/m]	Limit AV [dBµV/m]	Delta [dB]
1056	■	72.1	---	53.7	1000	-13.9	58.2	39.8	74.0	54.0	-14.1
1316	■	69.4	---	45.5	1000	-14.3	55.1	31.2	74.0	54.0	-18.9
1588	■	62.3	---	41.8	1000	-13.8	48.5	28.0	74.0	54.0	-25.5
1719	■	65.4	---	42.0	1000	-13.0	52.4	29.0	74.0	54.0	-21.5
2383	■	78.5	---	61.9	1000	-9.5	69.0	52.4	74.0	54.0	-1.6
2484	■	77.3	---	61.6	1000	-9.5	67.8	52.1	74.0	54.0	-1.9

802.11g
Data rate: 54 Mbps
Worst case antenna: No. 2 - ANT792-6MN
Power setting: -3dB

Channel 1: 2412 MHz											
Frequency [MHz]	Restricted Band	Reading Level PK [dBµV]	Corr. Duty Cycle [dB]	Level AV [dBµV] *)	Band-width [kHz]	Correct. Factor [dB]	Corrected Level PK [dBµV/m]	Corrected Level AV [dBµV/m]	Limit PK [dBµV/m]	Limit AV [dBµV/m]	Delta [dB]
1056	■	72.1	---	53.7	1000	-13.9	58.2	39.8	74.0	54.0	-14.1
1316	■	69.4	---	45.5	1000	-14.3	55.1	31.2	74.0	54.0	-18.9
1588	■	62.3	---	41.8	1000	-13.8	48.5	28.0	74.0	54.0	-25.5
1719	■	65.4	---	42.0	1000	-13.0	52.4	29.0	74.0	54.0	-21.5
2488	■	82.7	---	62.4	1000	-9.5	73.2	52.9	74.0	54.0	-0.8

802.11g turbo
Data rate: 108 Mbps
Worst case antenna: No. 4 - ANT795-6DN
Power setting: -3dB

Channel 6: 2437 MHz											
Frequency [MHz]	Restricted Band	Reading Level PK [dBµV]	Corr. Duty Cycle [dB]	Level AV [dBµV] *)	Band-width [kHz]	Correct. Factor [dB]	Corrected Level PK [dBµV/m]	Corrected Level AV [dBµV/m]	Limit PK [dBµV/m]	Limit AV [dBµV/m]	Delta [dB]
1056	■	72.1	---	53.7	1000	-13.9	58.2	39.8	74.0	54.0	-14.1
1316	■	69.4	---	45.5	1000	-14.3	55.1	31.2	74.0	54.0	-18.9
1588	■	62.3	---	41.8	1000	-13.8	48.5	28.0	74.0	54.0	-25.5
1719	■	65.4	---	42.0	1000	-13.0	52.4	29.0	74.0	54.0	-21.5
2390	■	82.4	---	62.6	1000	-9.5	72.9	53.1	74.0	54.0	-0.9
2484	■	76.7	---	59.5	1000	-9.5	67.2	50.5	74.0	54.0	-3.5

Frequency band 5750-5850 MHz

ISM band CH 165
Data rate: 54 Mbps
Worst case antenna: No. 4 - ANT795-6DN
Power setting: 0dB (Full power)

Channel 165: 5825 MHz											
Frequency [MHz]	Restricted Band	Reading Level PK [dBµV]	Corr. Duty Cycle [dB]	Level AV [dBµV] *)	Band-width [kHz]	Correct. Factor [dB]	Corrected Level PK [dBµV/m]	Corrected Level AV [dBµV/m]	Limit PK [dBµV/m]	Limit AV [dBµV/m]	Delta [dB]
1056	■	72.1	---	53.7	1000	-13.9	58.2	39.8	74.0	54.0	-14.1
1316	■	69.4	---	45.5	1000	-14.3	55.1	31.2	74.0	54.0	-18.9
1588	■	62.3	---	41.8	1000	-13.8	48.5	28.0	74.0	54.0	-25.5
1719	■	65.4	---	42.0	1000	-13.0	52.4	29.0	74.0	54.0	-21.5

Peak-Limit according to FCC Subpart 15.247(c)

In any 100 kHz bandwidth outside the frequency band 2400 – 2483.50 MHz and 5725-5850 MHz, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in §15.209(a) is not required.
In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limit specified in §15.209(a) (see §15.205(c)).

Radiated limits according to FCC Part 15 Subpart 15.209(a) for spurious emissions which fall in restricted band:

Frequency (MHz)	Field strength of spurious emissions		Measurement distance (meters)
	(µV/m)	dB (µV/m)	
0,0090,490	2400/F(kHz)		300
0,490-1,705	24000/F(kHz)		30
1,705-30	30	29,5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

Restricted bands of operation:

The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in §15.209

MHz	MHz	GHz
25.5 – 25.67	960 – 1240	4.5 – 5.15
37.5 – 38.25	1300 – 1427	5.35 – 5.46
73 – 74.6	1435 – 1626.5	7.25 – 7.75
74.8 – 75.2	1645.5 – 1646.5	8.025 – 8.5
108 – 121.94	1660 – 1710	9.0 – 9.2
123 – 138	1718.8 – 1722.2	9.3 – 9.5
149.9 – 150.05	2200 – 2300	10.6 – 12.7
156.52475 – 156.52525	2310 – 2390	13.25 – 13.4
156.7 – 156.9	2483.5 – 2500	14.47 – 14.5
162.0125 – 167.17	2655 – 2900	15.35 – 16.2
167.72 – 173.2	3260 – 3267	17.7 – 21.4
240 – 285	3332 – 3339	22.01 – 23.12
322 – 335.4	3345.8 – 3358	23.6 – 24.0
399.9 – 410	3600 – 4400	31.2 – 31.8
608 – 614		36.43 – 36.5

Peak-Limit according to RSS-210, A 8.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the radio frequency power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under section A8.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Tables 2 and 3 is not required. In addition, radiated emissions which fall in the restricted bands of Table 1 must also comply with the radiated emission limits specified in Tables 2 and 3.

Radiated limits according to RSS-210 Issue 6 Table 2,3 for spurious emissions which fall in restricted band:

Frequency (MHz)	Field strength of spurious emissions		Measurement distance (meters)
	(µV/m)	dB (µV/m)	
0,0090,490	2400/F(kHz)		300
0,490-1,705	24000/F(kHz)		30
1,705-30	30	29,5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

Restricted bands of operation:

The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in RSS-210 table 1.

MHz	MHz	MHz	GHz
0.0900.110	13.36-13.41	960 – 1427	5.35 – 5.46
2.1735-2.190	16.42-16.423	1435 – 1626.5	7.25 – 7.75
3.020-3.026	16.69475-16.69525	1645.5 – 1646.5	8.025 – 8.5
4.125-4.128	16.80425-16.80475	1660 – 1710	9.0 – 9.2
4.17725-4.17775	25.5 – 25.67	1718.8 – 1722.2	9.3 – 9.5
4.20725-4.20775	37.5 – 38.25	2200 – 2300	10.6 – 12.7
5.677-5.683	73 – 74.6	2310 – 2390	13.25 – 13.4
6.215-6.218	74.8 – 75.2	2655 – 2900	14.47 – 14.5
6.26775-6.26825	108 – 138	3260 – 3267	15.35 – 16.2
6.31175-6.31225	156.52475 – 156.52525	3332 – 3339	17.7 – 21.4
8.291-8.294	156.7 – 156.9	3345.8 – 3358	22.01 – 23.12
8.362-8.366	240 – 285	3500 – 4400	23.6 – 24.0
8.37625-8.38675	322 – 335.4	4500 – 5150	31.2 – 31.8
8.41425-8.41475	399.9 – 410		36.43 – 36.5
12.29-12.293	608 – 614		Above 38.6
12.51975-12.52025			
12.57675-12.57725			

The requirements are **FULFILLED.**

Remarks: Spurious emissions which were falling not in restricted bands have been measured conducted. The measurement was performed up to the 10th harmonic (25000MHz) for 2.4 GHz bands and up to 40 GHz for the 5 GHz band.

5.5 Spurious RF Conducted Emission

For test instruments and accessories used see section 6 Part **SEC 1, SEC 2 and SEC 3**.

5.5.1 Description of the test location

Test location: AREA4

5.5.2 Description of Measurement

A Spectrum analyzer / EMI test receiver is connected to the ouput of the transmitter via a suitable attenuator while EuT was operating in transmit mode using the assigned frequency.
Analyzer Settings:

- Detector: Max Hold
- RBW: 100 kHz
- VBW: ≥ RBW
- Sweep Time: Coupled
- Detecter function: Peak

5.5.3 Photo documentation of the test set-up

5.5.4 Test result

802.11b; Data rate: 11 Mbps; Full power

Corrected field strength of fundamental wave as reference for conducted emissions: 115.0 dBµV

Channel 1: 2412 MHz											
Frequency [MHz]	Restricted Band	Reading Level PK [dBµV]	Corr. Duty Cycle [dB]	Level AV [dBµV] *)	Band-width [kHz]	Correct. Factor [dB]	Corrected Level PK [dBµV]	Reference Level [dBµV]	Limit PK [dBµV]	Limit AV [dBµV]	Delta [dB]
9 kHz- 30					100		< 50	115	95		>45
30-1000					100		< 50	115	95		>45
1-25 GHz					100		< 50	115	95		>45

Corrected field strength of fundamental wave as reference for conducted emissions: 115.0 dBµV

Channel 6: 2437 MHz											
Frequency [MHz]	Restricted Band	Reading Level PK [dBµV]	Corr. Duty Cycle [dB]	Level AV [dBµV] *)	Band-width [kHz]	Correct. Factor [dB]	Corrected Level PK [dBµV]	Reference Level [dBµV]	Limit PK [dBµV]	Limit AV [dBµV]	Delta [dB]
9 kHz- 30					100		< 50	115	95		>45
30-1000					100		< 50	115	95		>45
1-25 GHz					100		< 50	115	95		>45

Corrected field strength of fundamental wave as reference for conducted emissions: 115.7 dBµV

Channel 11: 2448 MHz											
Frequency [MHz]	Restricted Band	Reading Level PK [dBµV]	Corr. Duty Cycle [dB]	Level AV [dBµV] *)	Band-width [kHz]	Correct. Factor [dB]	Corrected Level PK [dBµV]	Reference Level [dBµV]	Limit PK [dBµV]	Limit AV [dBµV]	Delta [dB]
9 kHz- 30					100		< 50	115.7	95.7		>45
30-1000					100		< 50	115.7	95.7		>45
1-25 GHz					100		< 50	115.7	95.7		>45

802.11g; Data rate: 54 Mbps; Full power

Corrected field strength of fundamental wave as reference for conducted emissions: 109.5 dBµV

Channel 1: 2412 MHz											
Frequency [MHz]	Restricted Band	Reading Level PK [dBµV]	Corr. Duty Cycle [dB]	Level AV [dBµV] *)	Band-width [kHz]	Correct. Factor [dB]	Corrected Level PK [dBµV]	Reference Level [dBµV]	Limit PK [dBµV]	Limit AV [dBµV]	Delta [dB]
9 kHz- 30					100		< 50	109.5	89.5		>39.5
30-1000					100		< 50	109.5	89.5		>39.5
1-25 GHz					100		< 50	109.5	89.5		>39.5

Corrected field strength of fundamental wave as reference for conducted emissions: 113 dBµV

Channel 6: 2437 MHz											
Frequency [MHz]	Restricted Band	Reading Level PK [dBµV]	Corr. Duty Cycle [dB]	Level AV [dBµV] *)	Band-width [kHz]	Correct. Factor [dB]	Corrected Level PK [dBµV]	Reference Level [dBµV]	Limit PK [dBµV]	Limit AV [dBµV]	Delta [dB]
9 kHz- 30					100		< 50	113	93		>43
30-1000					100		< 50	113	93		>43
1-25 GHz					100		< 50	113	93		>43

Corrected field strength of fundamental wave as reference for conducted emissions: 110.9 dBµV

Channel 11: 2448 MHz											
Frequency [MHz]	Restricted Band	Reading Level PK [dBµV]	Corr. Duty Cycle [dB]	Level AV [dBµV] *)	Band-width [kHz]	Correct. Factor [dB]	Corrected Level PK [dBµV]	Reference Level [dBµV]	Limit PK [dBµV]	Limit AV [dBµV]	Delta [dB]
9 kHz- 30					100		< 50	110.9	90.9		>40.9
30-1000					100		< 50	110.9	90.9		>40.9
1-25 GHz					100		< 50	110.9	90.9		>40.9

802.11g turbo; Data rate: 108 Mbps; Full power

Corrected field strength of fundamental wave as reference for conducted emissions: 113.3 dBµV

Channel 6: 2437 MHz											
Frequency [MHz]	Restricted Band	Reading Level PK [dBµV]	Corr. Duty Cycle [dB]	Level AV [dBµV] *)	Band-width [kHz]	Correct. Factor [dB]	Corrected Level PK [dBµV]	Reference Level [dBµV]	Limit PK [dBµV]	Limit AV [dBµV]	Delta [dB]
9 kHz- 30					100		< 50	113.3	93.3		>43.3
30-1000					100		< 50	113.3	93.3		>43.3
7312					100		61.7	110.9	93.9		32.2
1-25 GHz					100		< 50	113.3	93.3		>43.3

ISM band; Data rate: 54 Mbps; Full power

Corrected field strength of fundamental wave as reference for conducted emissions: 106.7 dBµV

Channel 165: 5825 MHz											
Frequency [MHz]	Restricted Band	Reading Level PK [dBµV]	Corr. Duty Cycle [dB]	Level AV [dBµV] *)	Band-width [kHz]	Correct. Factor [dB]	Corrected Level PK [dBµV]	Reference Level [dBµV]	Limit PK [dBµV]	Limit AV [dBµV]	Delta [dB]
9 kHz - 30					100		< 50	106.7	86.7		>36.7
30 - 1000					100		< 50	106.7	86.7		>36.7
1-40 GHz					100		< 50	106.7	86.7		>36.7

Peak-Limit according to FCC Subpart 15.247(c)

In any 100 kHz bandwidth outside the frequency band 2400 – 2483.50 MHz and 5725 – 5850 MHz, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in §15.209(a) is not required.
In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limit specified in §15.209(a) (see §15.205(c)).

Peak-Limit according to RSS-210, A 8.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the radio frequency power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under section A8.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Tables 2 and 3 is not required. In addition, radiated emissions which fall in the restricted bands of Table 1 must also comply with the radiated emission limits specified in Tables 2 and 3.

The requirements are **FULFILLED.**

Remarks: Only spurious emissions which are falling not in restricted bands have been measured conducted.

Spurious emissions which are falling in restricted band have been measured radiated. Please refer to „Radiated emissions 9kHz – 25 GHz“in clause 5.3 of the present test report.

5.6 6 dB Bandwidth

For test instruments and accessories used see section 6 Part **MB**.

5.6.1 Description of the test location

Test location: AREA4

5.6.2 Photo documentation of the test set-up

5.6.3 Description of Measurement

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio of -6 dB. The reference level is the level of the highest amplitude signal observed from the transmitter at either the fundamental frequency or the first-order modulation products in all typical modes of operation, including the unmodulated carrier, even if atypical.
The resolution bandwidth of measuring instrument was set to a value as shown in the following table below according to ANSI C63.4-2003 and RSS-Gen.

Fundamental frequency	Minimum resolution bandwidth
1000 MHz to 40 GHz	100 kHz

5.6.4 Test result according to FCC 15.247 / RSS-210 A8.2 (1)

802.11b

Channel number	Fundamental Frequency [MHz]	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)
1	2412	12.56	0,5
6	2437	12.64	0,5
11	2462	13.12	0,5

802.11g

Channel number	Fundamental Frequency [MHz]	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)
1	2412	16.48	0,5
6	2437	16.40	0,5
11	2462	16.56	0,5

802.11g turbo

Channel number	Fundamental Frequency [MHz]	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)
6	2437	33.00	0,5

ISM Band

Channel number	Fundamental Frequency [MHz]	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)
165	5825	16.56	0,5

Limit according to FCC Subpart 15.247 (a)(2) and RSS-210 A8.2 (1)

The minimum 6 dB bandwidth shall be at least 500 kHz

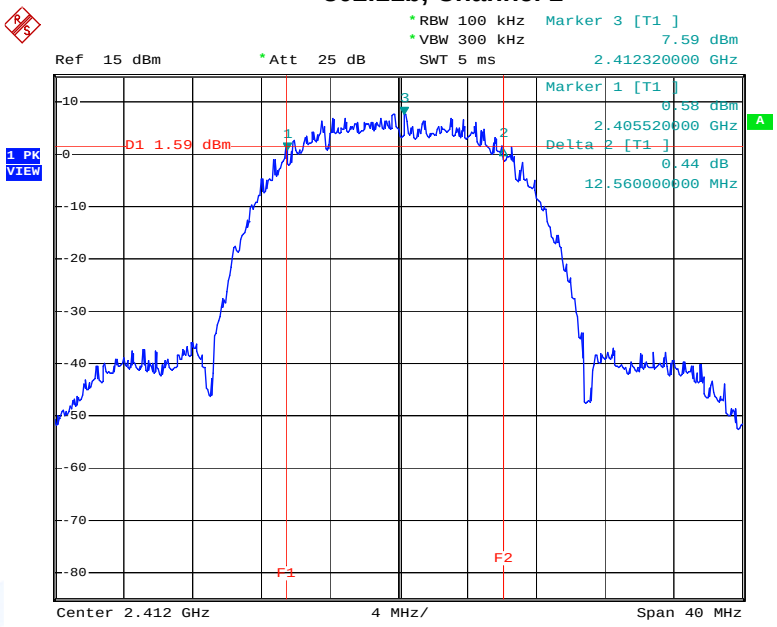
The requirements are **FULFILLED.**

Remarks: For detailed test results please refer to following test protocols.

5.6.5 Test protocol

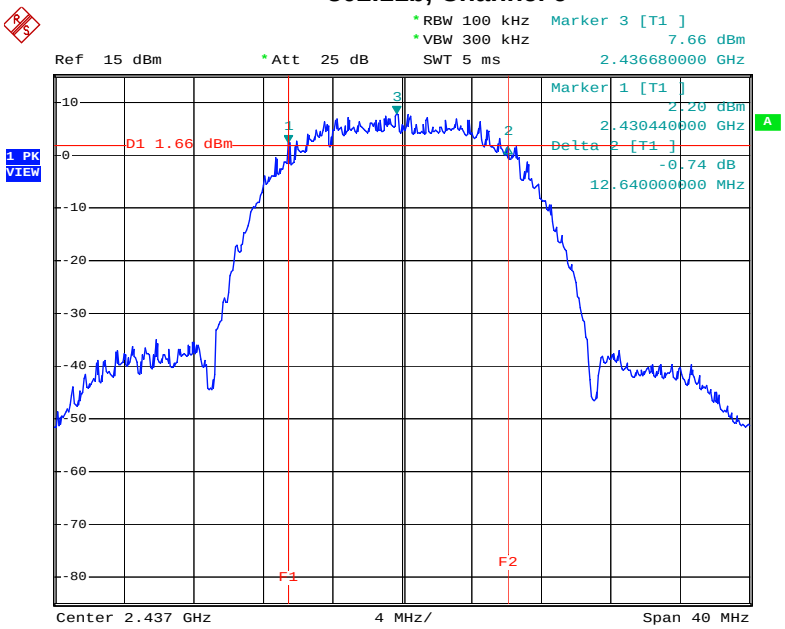
6dB Bandwidth Measurement
FCC Part 15 Subpart 15.247(a)(2)
RSS-210 A8.2 (1)

802.11b, Channel 1



Date: 8.MAR.2007 09:53:18

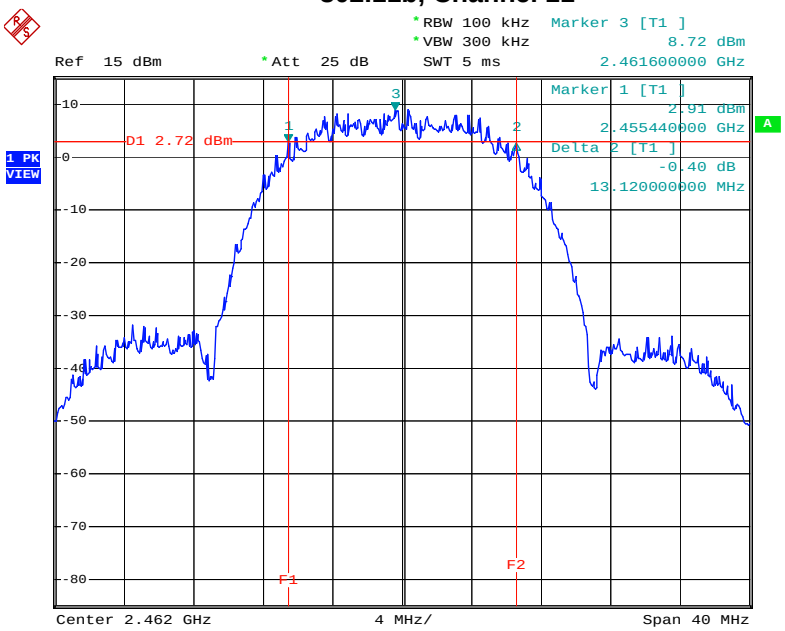
802.11b, Channel 6



Date: 8.MAR.2007 10:02:14

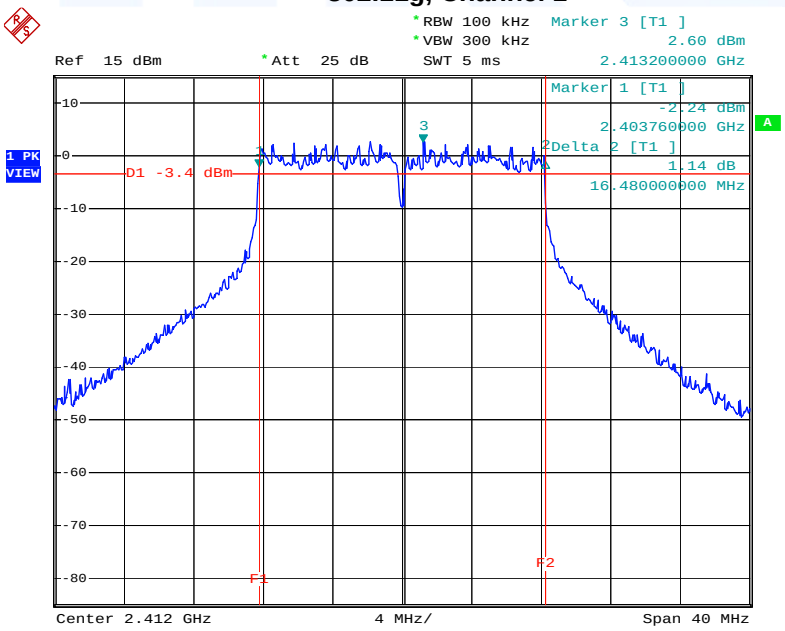
6dB Bandwidth Measurement
FCC Part 15 Subpart 15.247(a)(2)
RSS-210 A8.2 (1)

802.11b, Channel 11



Date: 8.MAR.2007 10:04:12

802.11g, Channel 1

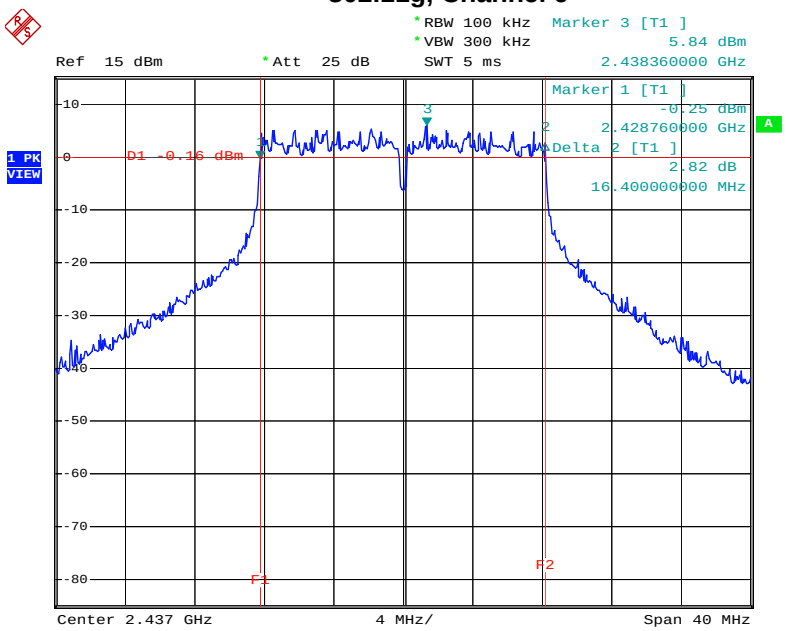


Date: 8.MAR.2007 10:12:59

6dB Bandwidth Measurement

FCC Part 15 Subpart 15.247(a)(2)
RSS-210 A8.2 (1)

802.11g, Channel 6



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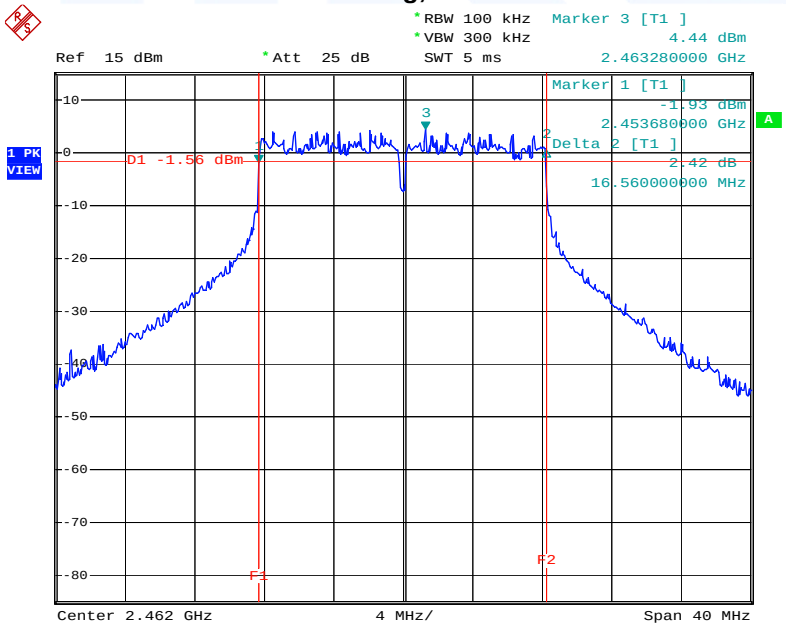
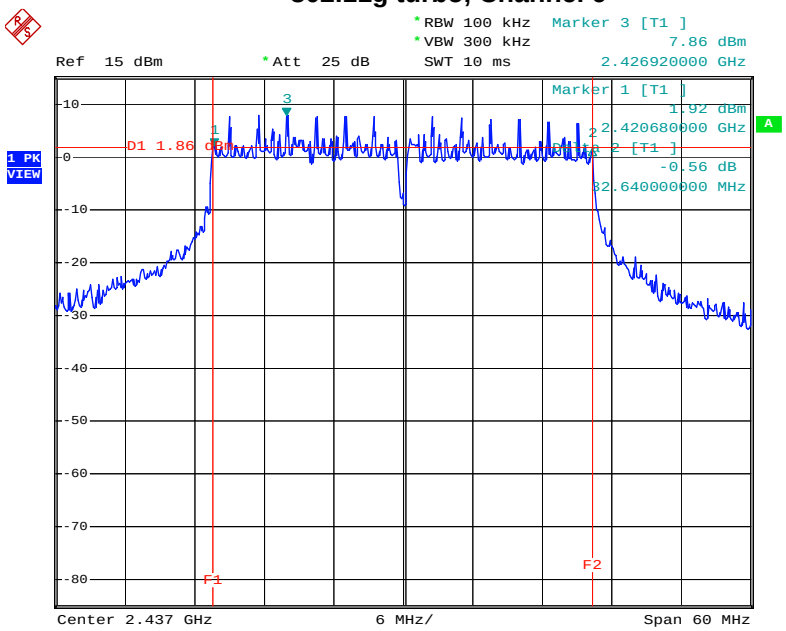
802.11g, Channel 11



Date: 8.MAR.2007 10:22:52

6dB Bandwidth Measurement
FCC Part 15 Subpart 15.247(a)(2)
RSS-210 A8.2 (1)

802.11g turbo, Channel 6



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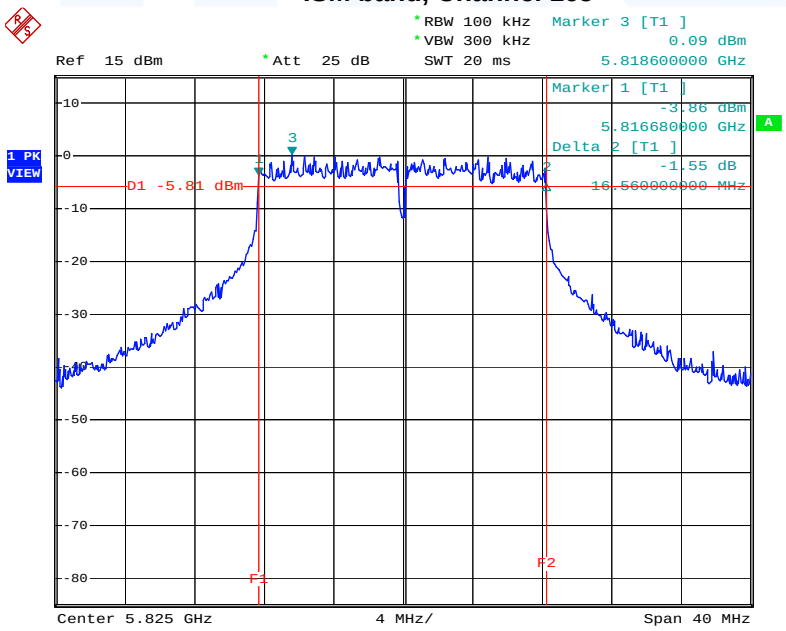
ISM band, Channel 165



Date: 8.MAR.2007 10:37:26

5.7 99%-Bandwidth

For test instruments and accessories used see section 6 Part **MB**.

5.7.1 Description of the test location

Test location: AREA4

5.7.2 Photo documentation of the test set-up

5.7.3 Description of Measurement

The 99%bandwidth is measured at either the fundamental frequency or the first-order modulation products in all typical modes of operation, including the unmodulated carrier, even if atypical.
The resolution bandwidth of measuring instrument was set to a value as shown in the following table below according to ANSI C63.4-2003 and RSS-Gen.

Fundamental frequency	Minimum resolution bandwidth
1000 MHz to 40 GHz	100 kHz

5.7.4 Test result according to RSS-GEN

802.11b

Channel number	Fundamental Frequency [MHz]	99%- BANDWIDTH (MHz)
1	2412	15.44
6	2437	15.44
11	2462	15.44

802.11g

Channel number	Fundamental Frequency [MHz]	99%- BANDWIDTH (MHz)
1	2412	16.48
6	2437	16.48
11	2462	16.48

802.11g turbo

Channel number	Fundamental Frequency [MHz]	99%- BANDWIDTH (MHz)
6	2437	32.64

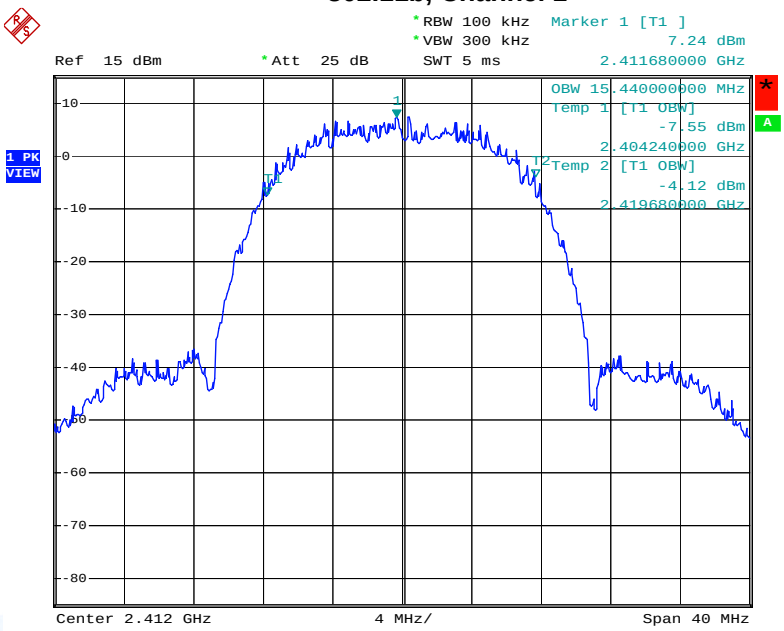
ISM Band

Channel number	Fundamental Frequency [MHz]	99%- BANDWIDTH (MHz)
165	5825	16.56

5.7.5 Test protocol

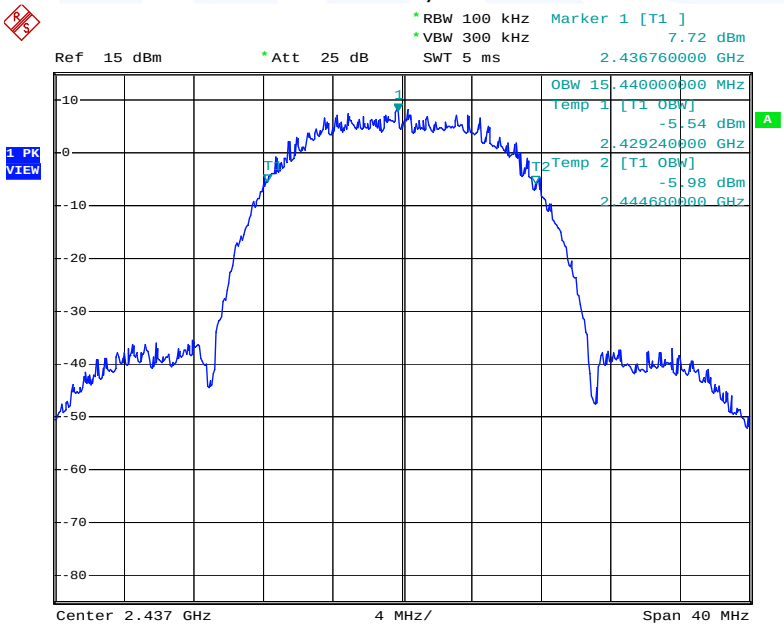
99% Bandwidth Measurement
RSS-GEN

802.11b, Channel 1



Date: 8.MAR.2007 09:57:30

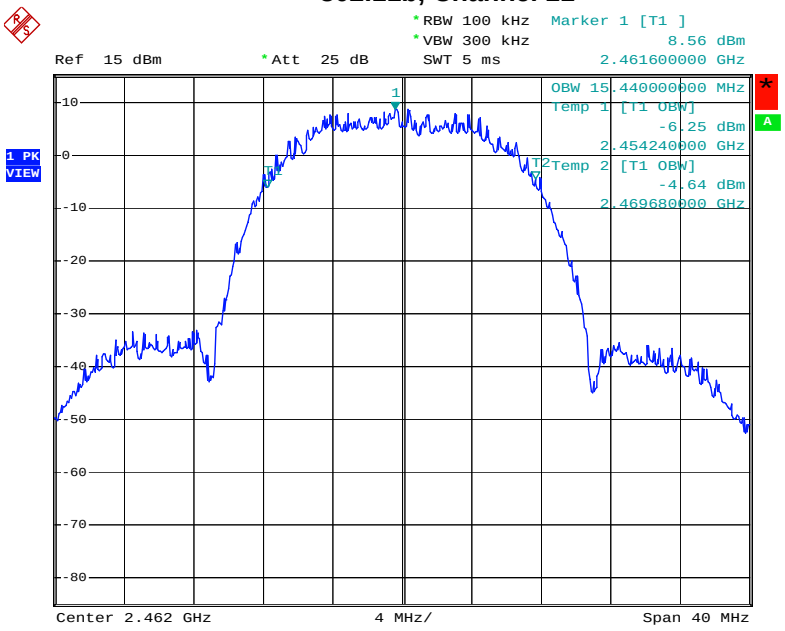
802.11b, Channel 6



Date: 8.MAR.2007 09:59:50

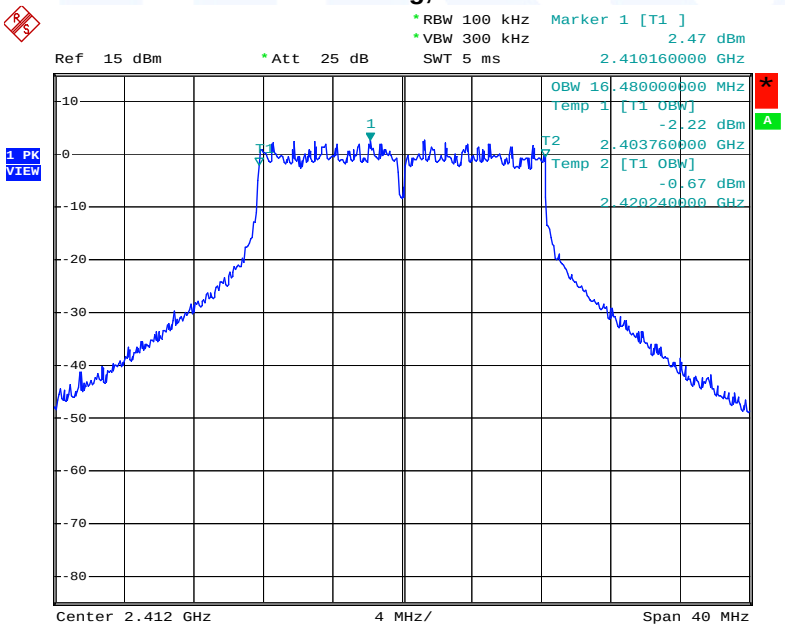
99% Bandwidth Measurement
RSS-GEN

802.11b, Channel 11



Date: 8.MAR.2007 10:05:31

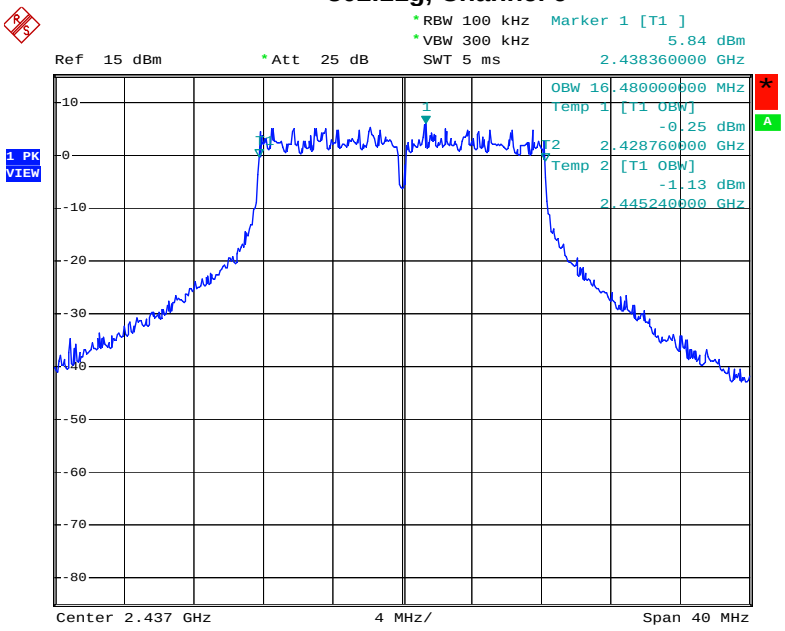
802.11g, Channel 1



Date: 8.MAR.2007 10:11:06

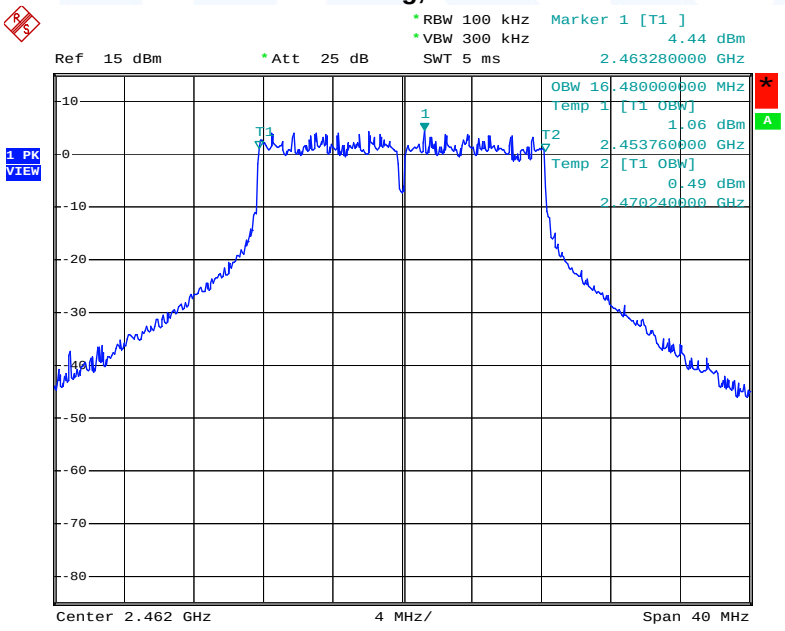
99% Bandwidth Measurement
RSS-GEN

802.11g, Channel 6



Date: 8.MAR.2007 10:17:13

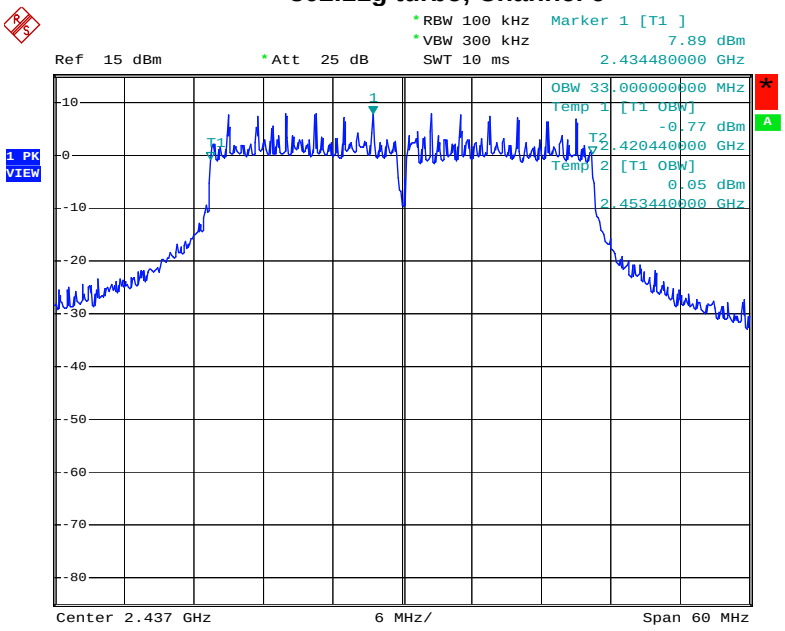
802.11g, Channel 11



Date: 8.MAR.2007 10:23:20

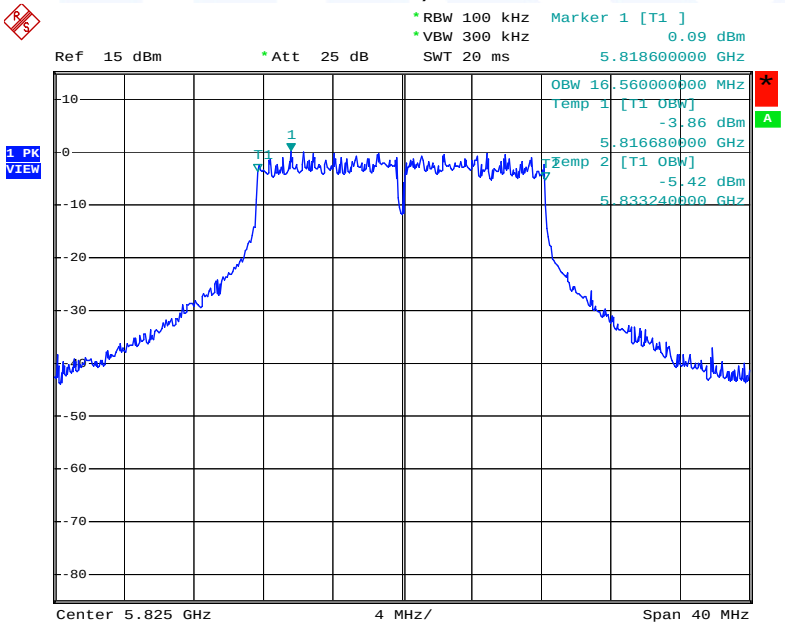
99% Bandwidth Measurement
RSS-GEN

802.11g turbo, Channel 6



Date: 8.MAR.2007 10:25:40

ISM band, Channel 165



Date: 8.MAR.2007 10:55:11

5.8 Band edge test

For test instruments and accessories used see section 6 Part **MB**.

5.8.1 Description of the test location

Test location: AREA4

5.8.2 Photo documentation of the test set-up

5.8.3 Description of Measurement

The EuT was connected to the spectrum analyzer with a suitable attenuator. The span of the spectrum analyzer was set wide enough to capture the peak level of the emission operating on the channel closest to the bandedge, as well as any modulation products which fall outside of the authorized band of operation. The highest amplitude appearing on sprectal display was measured and it was set as the reference level for the emission mask.
It was allowed the trace to stabilize and after then it was set the emission mask on the reference level to show the compliance with the bandedge requirements.
To show the compliance with the limits in the restricted bands the measured radiated Peak Power Output in the tables below have been reduced by the amount of the contacted measured value (dBc) of the difference between maximum carrier and the maximum emission in the restricted band.

Example (Table 802.11b): Radiated Peak power at 2412 MHz: 120.1 dBµV/m
Contacted carrier: 10.94 dBm
Maximum value in restricted band (<2390 MHz): -56 dBc
Calculation for the maximum fieldstrength in the restricted band:
120.1 dBµV/m-56 dBc=64.1 dBµV/m which is under 74 dBµV/m limit.

Further settings on the spectrum analyzer:
RBW: ≥ 1% of the span
VBW: ≥ RBW
Sweep: Auto
Detector function: Peak

5.8.4 Test result

5.8.4.1 According to FCC 15.247 / RSS-210, A 8.5

802.11b

Frequency [MHz]	Peak Power Output [dBµV/m]	Spurious emission related value [dBµV/m]	Result of Band edge [dBc]	Band edge LIMIT [dBµV/m]
< 2400	115.88	69.79	46.09	≥ 20
> 2483,5	115.88	59.19	56.69	≥ 20

802.11g; Data rate:

Frequency [MHz]	Peak Power Output [dBµV/m]	Spurious emission related value [dBµV/m]	Result of Band edge [dBc]	Band edge LIMIT [dBµV/m]
< 2400	109.71	80.62	29.09	≥ 20
> 2483,5	111.16	57.37	51.79	≥ 20

802.11g turbo; Data rate: 108 Mbps; Full power

Frequency [MHz]	Peak Power Output [dBµV/m]	Spurious emission related value [dBµV/m]	Result of Band edge [dBc]	Band edge LIMIT [dBµV/m]
< 2400	114.98	76.75	38.23	≥ 20
> 2483,5	114.52	62.25	52.27	≥ 20

ISM-Band; Data rate: 54Mbps; Full power

Frequency [MHz]	Peak Power Output [dBm]	Spurious emission read value [dBm]	Result of Band edge [dBc]	Band edge LIMIT [dBc]
< 5725	106.45	55.25	51.2	≥ 20
> 5850	107.44	66.12	47.3	≥ 20

Peak-Limit according to FCC Subpart 15.247(d)

In any 100 kHz bandwidth outside the frequency band 2400 – 2483.50 MHz and 5725 – 5875 MHz, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in §15.209(a) is not required.
In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limit specified in §15.209(a) (see §15.205(c)).

Peak-Limit according to RSS-210, A 8.5

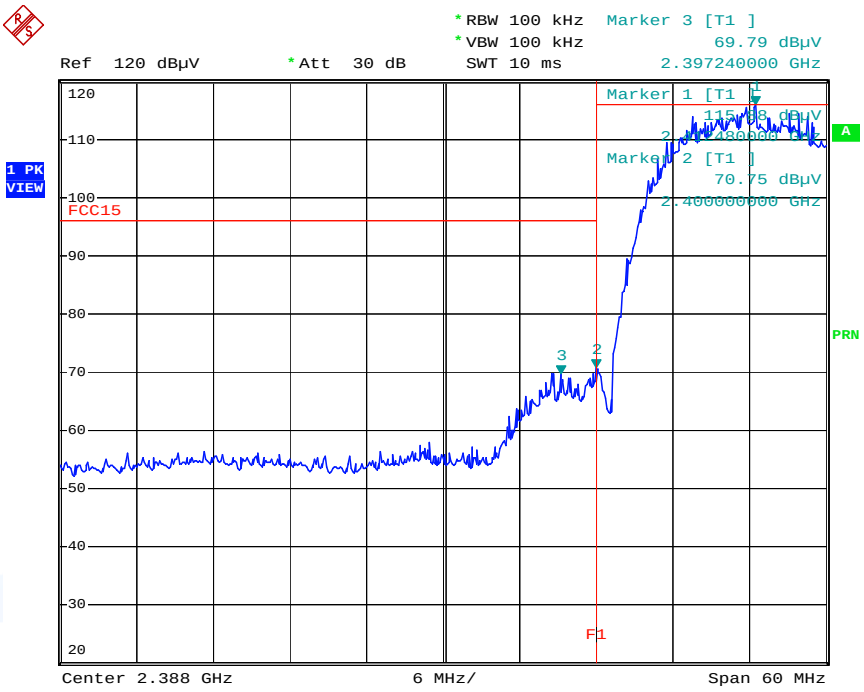
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the radio frequency power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under section A8.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Tables 2 and 3 is not required. In addition, radiated emissions which fall in the restricted bands of Table 1 must also comply with the radiated emission limits specified in Tables 2 and 3.

The requirements are **FULFILLED.**

Remarks: For detailed test results please refer to following test protocols.

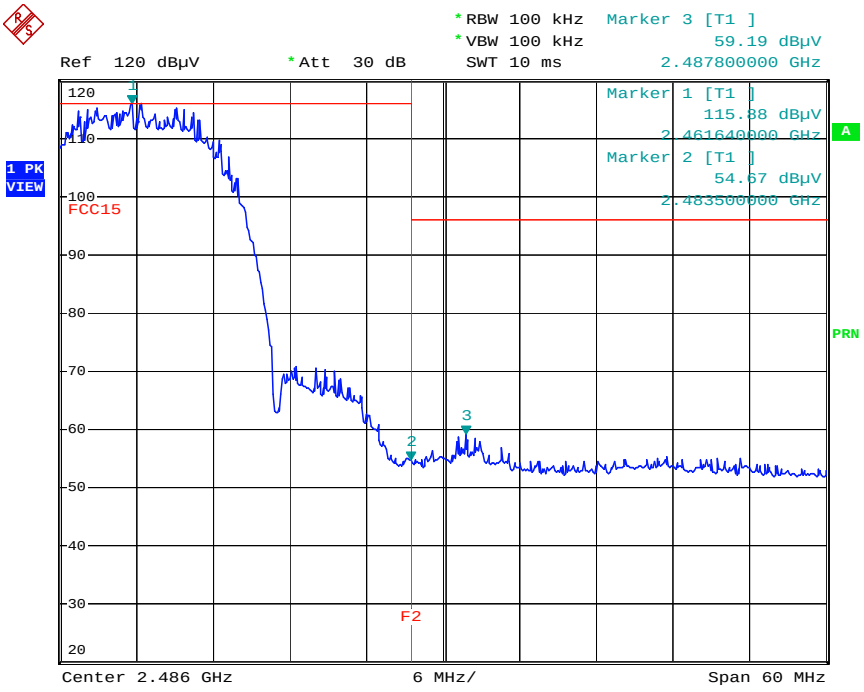
5.8.5 Test protocol

802.11b
Lower Channel
2412 MHz



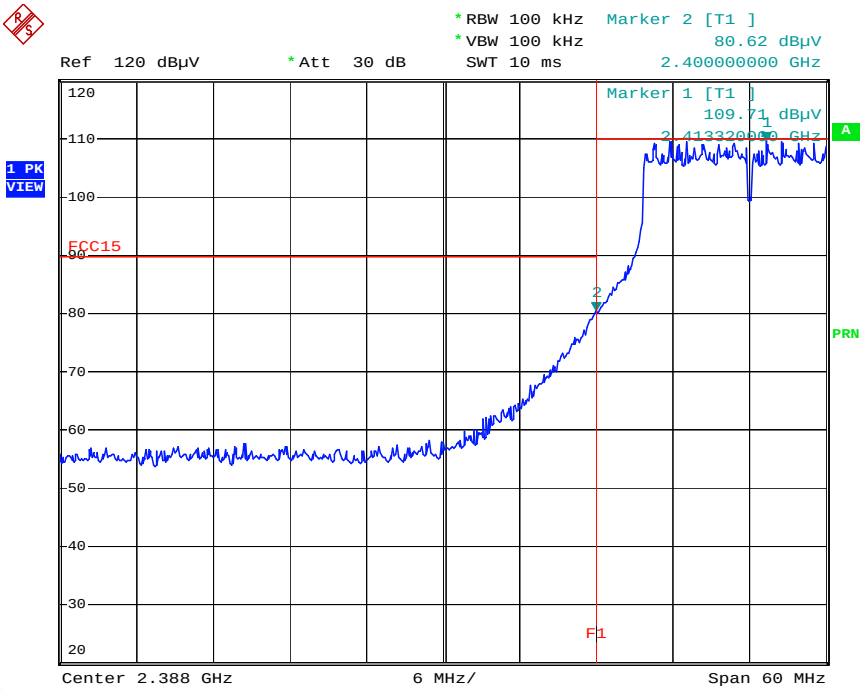
Date: 5.MAR.2007 15:52:52

Higher Channel
2462 MHz



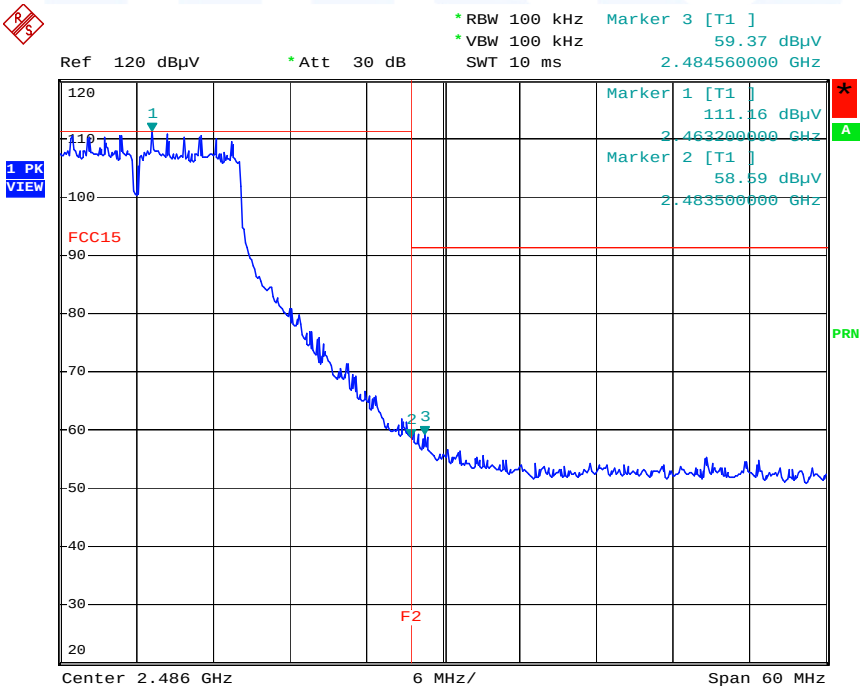
Date: 5.MAR.2007 15:48:59

802.11g
Lower Channel
2412 MHz



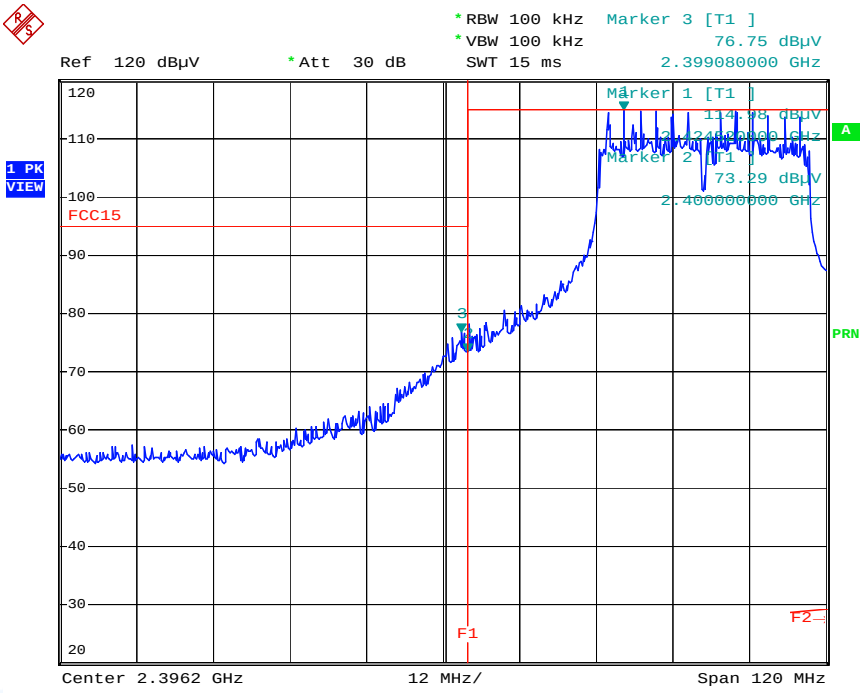
Date: 5.MAR.2007 16:02:56

Higher Channel
2462 MHz



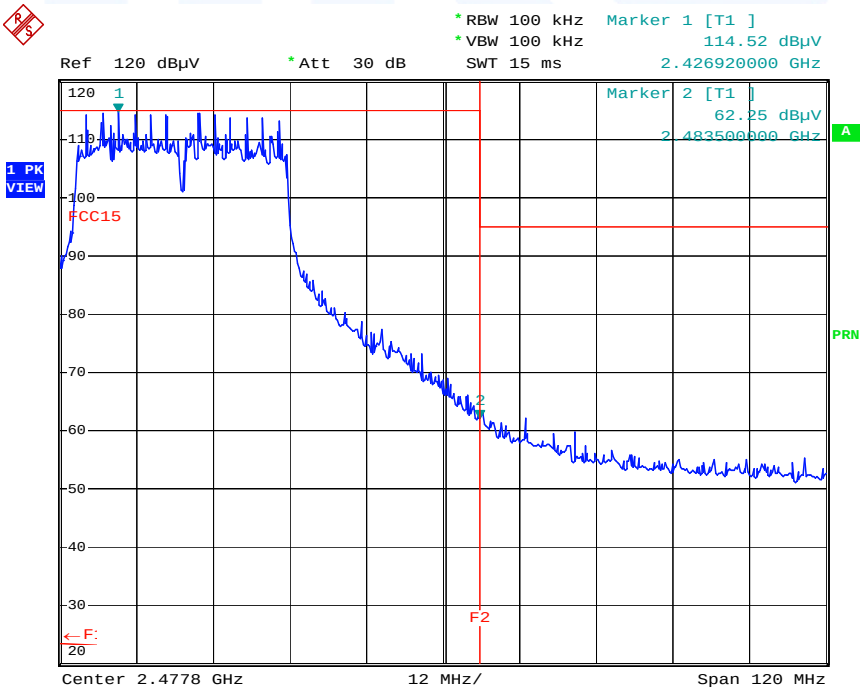
Date: 5.MAR.2007 15:45:13

802.11g turbo
Lower band edge
2437 MHz



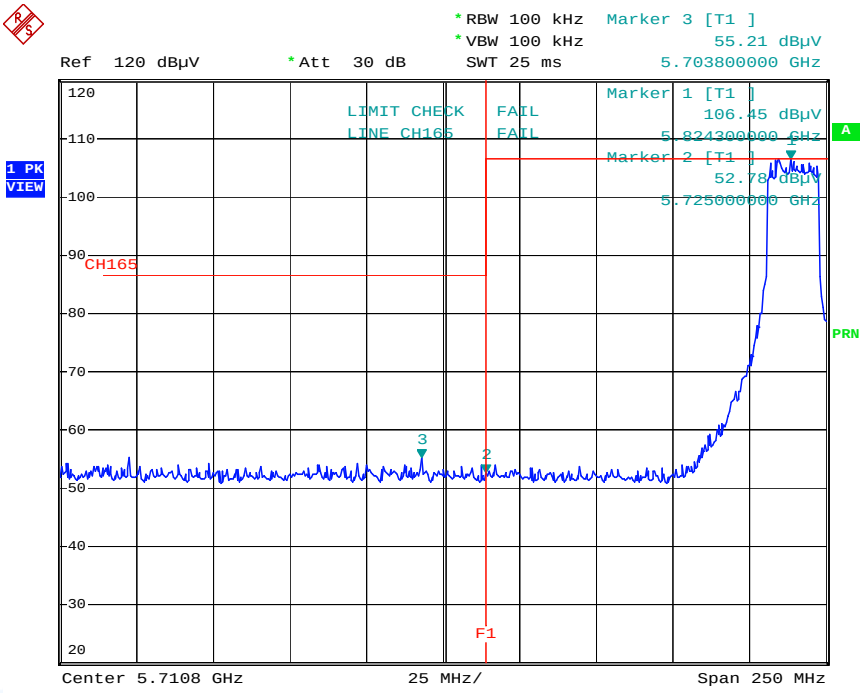
Date: 5.MAR.2007 16:07:01

802.11g turbo
Higher band edge
2437 MHz



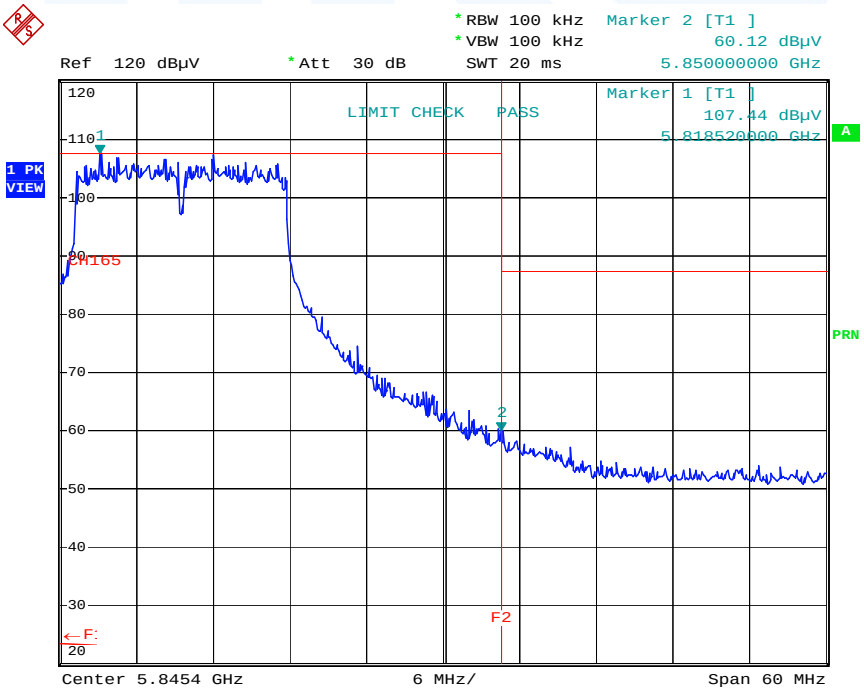
Date: 5.MAR.2007 16:10:01

ISM band
Lower band edge
5825 MHz



Date: 5.MAR.2007 16:21:50

ISM band
Higher band edge
5825 MHz



Date: 5.MAR.2007 16:17:51

5.9 Power Spectral Density

For test instruments and accessories used see section 6 Part **CPC 3**.

5.9.1 Description of the test location

Test location: AREA4

5.9.2 Photo documentation of the test set-up

5.9.3 Description of Measurement

The EuT was connected to the spectrum analyzer with a suitable attenuator. The bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3 kHz RBW and 30 kHz VBW, set sweep time equal to span/3 kHz. The power spectral density was measured and recorded.
Settings on the spectrum analyzer:

RBW:	3 kHz
VBW:	30 kHz
Sweep:	auto
Detecter function:	Peak

5.9.4 Test result

802.11b; Data rate: 11 Mbps; Full power

Channel	Fundamental Frequency [MHz]	Power Spectral Density (dBm)
1	2412	-3.9
6	2437	-6.0
11	2462	-3.8

802.11g; Data rate: 1 Mbps; Full power

Channel	Fundamental Frequency [MHz]	Power Spectral Density (dBm)
1	2412	-7.4
6	2437	-7.3
11	2462	-6.6

802.11g turbo; Data rate: 108 Mbps; Full power

Channel	Fundamental Frequency [MHz]	Power Spectral Density (dBm)
6	2437	-11.5

802.11a ISM band; Data rate: 6 Mbps; Full power

Channel	Fundamental Frequency [MHz]	Power Spectral Density (dBm)
165	5825	-12.3

Limit according to FCC Subpart 15.247 (e) / RSS-210, A8.2 (2)

The peak power spectral density shall not be greater than 8 dBm in any 3 kHz band.

The requirements are **FULFILLED.**

Remarks: _____

Test results according to §15.407 and RSS-210, Annex 9

5.10 Maximum Output Power - Conducted

For test instruments and accessories used see section 6 Part **CPC 3**

5.10.1 Description of the test location

Test location: AREA4

5.10.2 Photo documentation of the test set-up

5.10.3 Description of Measurement

Conducted maximum output power:

A spectrum analyzer / EMI test receiver is connected to the ouput of the transmitter via a suitable attenuator while EuT was operating in transmit mode using the assigned frequency.
Analyzer Settings:

- Detector: Max hold
- RBW: greater than 20 dB Bandwidth
- VBW: ≥ RBW
- Sweep Time: Coupled

Alternative test procedure:
If antenna conducted tests cannot be performed on the EuT, radiated tests to show compliance with the various conducted requirements of Section 15.247 and RSS-Gen are performed. A pre-amp have been used in making the following requirements.

Radiated maximum peak output power:

Radiated maximum peak output power from the EuT is measured in the frequency range of 30 MHz to 1000 MHz using a tuned receiver and appropriate broadband linearly polarized antennas. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB bandwidth and quasi-peak detection. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimetres above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. The set up of the Equipment under test will be in accordance to ANSI C63.4-2003 and RSS-Gen / RSS-212
The Interface cables that are closer than 40 centimetres to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimetres from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area. The antenna was positioned 3, 10 or 30 meters horizontally from the EuT. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 meters, measurement scans are made with both horizontal and vertical antenna polarization`s and the EuT are rotated 360 degrees.

The final level, expressed in dBµV/m, is arrived by taking the reading from the EMI receiver (Level dBµV) and adding the correction factors and cable loss factor (Factor dB) to it. This is done automatically in the EMI receiver, where the correction factors are stored. This result then has the FCC or CISPR limit subtracted from it to provide the Delta which gives the tabular data as shown in the data sheets at page.

Radiated maximum peak output power from the EuT is measured above 1 GHz, using a tuned receiver (Spectrum Analyser) and appropriate linearly polarized antennas. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimetres above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. The set up of the Equipment under test will be in accordance to ANSI C63.4-2003 and RSS-Gen / RSS-212
The Interface cables that are closer than 40 centimetres to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimetres from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area.

Measurement are made in both the horizontal and vertical planes of polarization in a fully anechoic room using a spectrum analyzer with the detector function set to peak and resolution as well as video bandwith set to 1 MHz.
All tests are performed at a test-distance of 3 meters. Hand-held or body-worn devices are rotated through three orthogonal axes to determine which attitude and configuration procedure the highest emission relative the limit and therefore shall be used for final testing. During the tests the EUT is rotated all around to find the maximum levels of emissions. The cables and equipment were placed and moved within the range of position likely to find their maximum emissions. When the EuT is larger than the beamwidth of the measuring antenna, the measurement antenna will be moved over the surfaces for the four sides or the test distance will be reduced to demonstrate that emissions were at maximum at the limit distance.
Analyzer Settings:

- Detector: Max Peak
- RBW: 1 MHz
- VBW: ≥ RBW
- Sweep Time: Coupled

5.10.4 Test result

Frequency band 5150-5250 MHz

802.11a UNII-1
OFDM Modulation; Data Rate: 54 Mbps
Conducted Measurement

Channel	Frequency [MHz]	Software Power Setting [dB]	Max. Power Output (dBm)	Power Limit (dBm)	Delta [dB]
36	5180	0	14.26	17	-2.74
48	5240	0	13.49	17	-3.51

802.11a UNII-1
Antenna no.: 3(5dBi); **8**(6dBi); **10**(0dBi); **11**(3,5dBi); **12**(3,5dBi)

Channel	Frequency [MHz]	Software Power Setting [dB]	Max. Power Output (dBm)	Max. Gain [dBi]	Power Limit conducted (dBm)
36	5180	0	14.26	5	17
48	5240	0	13.49	5	17

802.11a UNII-1
Antenna no.: 1(8dBi);

Channel	Frequency [MHz]	Software Power Setting [dB]	Max. Power Output (dBm)	Max. Gain [dBi]	Power Limit conducted (dBm)
36	5180	0	14.26	8	15
48	5240	0	13.49	8	15

802.11a UNII-1
Antenna no.: 4(9dBi)

Channel	Frequency [MHz]	Software Power Setting [dB]	Max. Power Output (dBm)	Max. Gain [dBi]	Power Limit conducted (dBm)
36	5180	-3	11.26	9	14
48	5240	0	13.49	9	14

802.11a UNII-1
Antenna no.: 6(18dBi)

Note: This antenna will not be used for this frequency band.

802.11a turbo UNII-1
OFDM Modulation; Data Rate: 108 Mbps
Conducted Measurement

Channel	Frequency [MHz]	Software Power Setting [dB]	Max. Power Output (dBm)	Power Limit (dBm)	Delta [dB]
42	5210	0	13.45	17	13.55

802.11a turbo UNII-1
Antenna no.: 3(5dBi); **8**(6dBi); **10**(0dBi); **11**(3,5dBi); **12**(3,5dBi)

Channel	Frequency [MHz]	Software Power Setting [dB]	Max. Power Output (dBm)	Max. Gain [dBi]	Power Limit conducted (dBm)
42	5210	0	13.45	6	17

802.11a turbo UNII-1
Antenna no.: 1(8dBi);

Channel	Frequency [MHz]	Software Power Setting [dB]	Max. Power Output (dBm)	Max. Gain [dBi]	Power Limit conducted (dBm)
42	5210	0	13.45	8	15

802.11a turboUNII-1
Antenna no.: 4(9dBi)

Channel	Frequency [MHz]	Software Power Setting [dB]	Max. Power Output (dBm)	Max. Gain [dBi]	Power Limit conducted (dBm)
42	5210	0	13.45	9	14

802.11a UNII-1
Antenna no.: 6(18dBi)

Note: This antenna will not be used for this frequency band.

Frequency band 5725-5825 MHz

802.11a UNII-3
OFDM Modulation; Data Rate: 54 Mbps
Conducted Measurement

Channel	Frequency [MHz]	Software Power Setting [dB]	Max. Power Output (dBm)	Power Limit (dBm)	Delta [dB]
149	5745	0	15.82	30	-14.94
161	5805	0	12.82	30	-17.94

802.11a UNII-3
Antenna no.: 3(5dBi); **8**(6dBi); **10**(0dBi); **11**(3,5dBi); **12**(3,5dBi)

Channel	Frequency [MHz]	Software Power Setting [dB]	Max. Power Output (dBm)	Max. Gain [dBi]	Power Limit conducted (dBm)
149	5745	0	15.82	5	30
161	5805	0	12.82	5	30

802.11a UNII-3
Antenna no.: 1(Gain: 8dBi);

Channel	Frequency [MHz]	Software Power Setting [dB]	Max. Power Output (dBm)	Max. Gain [dBi]	Power Limit conducted (dBm)
149	5745	0	15.82	8	28
161	5805	0	12.82	8	28

802.11a UNII-3
Antenna no.: 4(9dBi)

Channel	Frequency [MHz]	Software Power Setting [dB]	Max. Power Output (dBm)	Max. Gain [dBi]	Power Limit conducted (dBm)
149	5745	0	15.82	9	27
161	5805	0	12.82	9	27

802.11a UNII-3
Antenna no.: 6(18dBi)

Channel	Frequency [MHz]	Software Power Setting [dB]	Max. Power Output (dBm)	Max. Gain [dBi]	Power Limit conducted (dBm)
149	5745	-9	6.82	18	18
161	5805	-9	3.82	18	18

802.11a turboUNII-3
OFDM Modulation; Data Rate: 108 Mbps
Conducted Measurement

Channel	Frequency [MHz]	Software Power Setting [dB]	Max. Power Output (dBm)	Power Limit (dBm)	Delta [dB]
152	5760	0	14.32	30	-15.68
160	5800	0	12.79	30	-17.21

802.11a turboUNII-3
Antenna no.: 3(5dBi); **8**(6dBi); **10**(0dBi); **11**(3,5dBi); **12**(3,5dBi)

Channel	Frequency [MHz]	Software Power Setting [dB]	Max. Power Output (dBm)	Max. Gain [dBi]	Power Limit conducted (dBm)
152	5760	0	14.32	5	30
160	5800	0	12.79	5	30

802.11a turboUNII-3
Antenna no.: 1(8dBi);

Channel	Frequency [MHz]	Software Power Setting [dB]	Max. Power Output (dBm)	Max. Gain [dBi]	Power Limit conducted (dBm)
152	5760	0	14.32	8	28
160	5800	0	12.79	8	28

802.11a turbo UNII-3
Antenna no.: 4(9dBi)

Channel	Frequency [MHz]	Software Power Setting [dB]	Max. Power Output (dBm)	Max. Gain [dBi]	Power Limit conducted (dBm)
152	5760	0	14.32	9	27
160	5800	0	12.79	9	27

802.11a turboUNII-3
Antenna no.: 6(18dBi)

Channel	Frequency [MHz]	Software Power Setting [dB]	Max. Power Output (dBm)	Max. Gain [dBi]	Power Limit conducted (dBm)
152	5760	-9	5.32	18	18
160	5800	-9	3.79	18	18

Peak Power Limit according to FCC Subpart 15.407

Frequency (MHz)	Peak Power Limit	
	(dBm)	(mWatt)
5150 - -5250	17	50
5745 - 5850	30	1000

Peak Power Limit according to RSS-210 Annex 9.2

Frequency (MHz)	Peak Power Limit	
	(dBm)	(mWatt)
5745 - 5850	30	1000

The requirements are **FULFILLED.**

Remarks: _____

5.11 Maximum Peak Output Power - Radiated

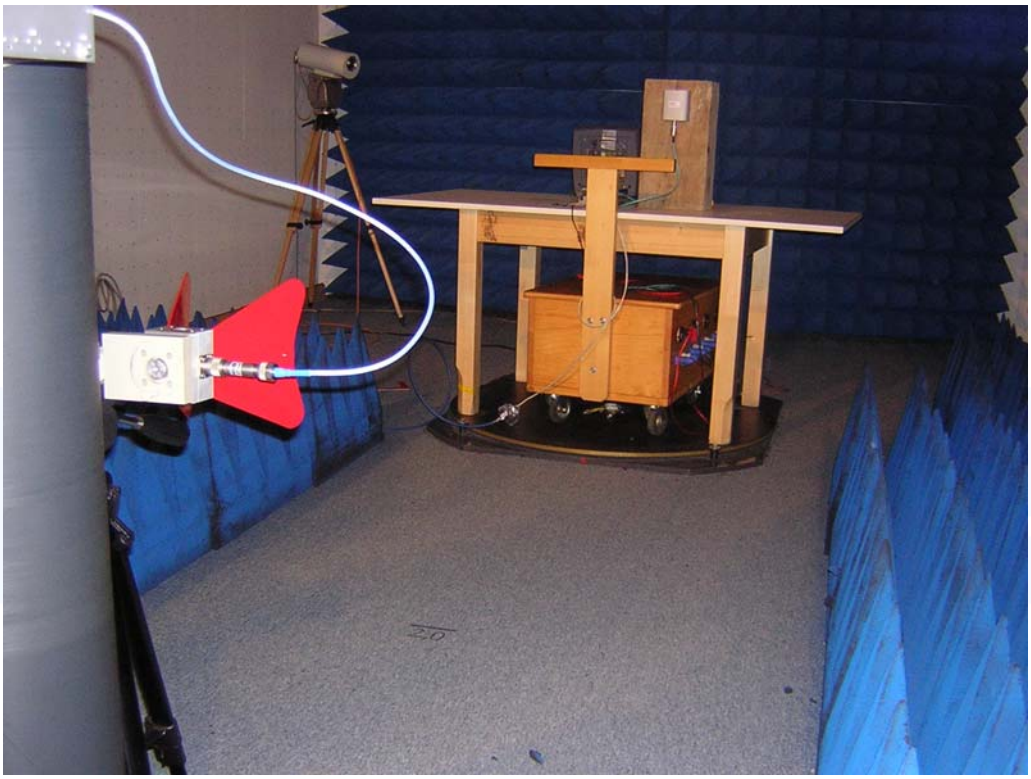
For test instruments and accessories used see section 6 Part **CPR 3**

5.11.1 Description of the test location

Test location: Anechoic Chamber A2

Test distance: 3 metres

5.11.2 Photo documentation of the test set-up



5.11.3 Description of Measurement

Conducted maximum peak output power:

A spectrum analyzer / EMI test receiver is connected to the ouput of the transmitter via a suitable attenuator while EuT was operating in transmit mode using the assigned frequency.
Analyzer Settings:

- Detector: Max hold
- RBW: greater than 20 dB Bandwidth
- VBW: ≥ RBW
- Sweep Time: Coupled

Alternative test procedure**:**
If antenna conducted tests cannot be performed on the EuT, radiated tests to show compliance with the various conducted requirements of Section 15.247 and RSS-Gen are performed. A pre-amp have been used in making the following requirements.

Radiated maximum peak output power:

Radiated maximum peak output power from the EuT is measured in the frequency range of 30 MHz to 1000 MHz using a tuned receiver and appropriate broadband linearly polarized antennas. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB bandwidth and quasi-peak detection. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimetres above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. The set up of the Equipment under test will be in accordance to ANSI C63.4-2003 and RSS-Gen / RSS-212
The Interface cables that are closer than 40 centimetres to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimetres from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area. The antenna was positioned 3, 10 or 30 meters horizontally from the EuT. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 meters, measurement scans are made with both horizontal and vertical antenna polarization`s and the EuT are rotated 360 degrees.

The final level, expressed in dBµV/m, is arrived by taking the reading from the EMI receiver (Level dBµV) and adding the correction factors and cable loss factor (Factor dB) to it. This is done automatically in the EMI receiver, where the correction factors are stored. This result then has the FCC or CISPR limit subtracted from it to provide the Delta which gives the tabular data as shown in the data sheets at page.

Radiated maximum peak output power from the EuT is measured above 1 GHz, using a tuned receiver (Spectrum Analyser) and appropriate linearly polarized antennas. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimetres above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. The set up of the Equipment under test will be in accordance to ANSI C63.4-2003 and RSS-Gen / RSS-212
The Interface cables that are closer than 40 centimetres to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimetres from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area.

Measurement are made in both the horizontal and vertical planes of polarization in a fully anechoic room using a spectrum analyzer with the detector function set to peak and resolution as well as video bandwith set to 1 MHz.
All tests are performed at a test-distance of 3 meters. Hand-held or body-worn devices are rotated through three orthogonal axes to determine which attitude and configuration procedure the highest emission relative the limit and therefore shall be used for final testing. During the tests the EUT is rotated all around to find the maximum levels of emissions. The cables and equipment were placed and moved within the range of position likely to find their maximum emissions. When the EuT is larger than the beamwidth of the measuring antenna, the measurement antenna will be moved over the surfaces for the four sides or the test distance will be reduced to demonstrate that emissions were at maximum at the limit distance.
Analyzer Settings:

- Detector: Max Peak
- RBW: 1 MHz
- VBW: ≥ RBW
- Sweep Time: Coupled

5.11.4 Test result

Frequency band 5150-5250 MHz

Modulation: 802.11a; Channel 36
OFDM Modulation; Data rate: 54 Mbps
Antenna no.: 1(8dBi); **3**(5dBi); **4**(9dBi); **8**(6dBi); **10**(0dBi); **11**(3,5dBi); **12**(3,5dBi)

Channel	Frequency [MHz]	Software Power Setting [dB]	Antenna No.	Gain [dBi]	Power Output radiated (dBm)	Peak Power Limit radiated (dBm)	Delta [dB]
36	5180	0	1	8	21.3	23	-1.7
36	5180	-3	3	5	21.9	23	-1.1
36	5180	-6	4	9	21.2	23	-1.8
36	5180	0	8	6	19.1	23	-3.9
36	5180	0	10	0	14.7	23	-8.3
36	5180	0	11	3.5	22.5	23	-0.5
36	5180	0	12	3.5	22.6	23	-0.4

Modulation: 802.11a turbo; Channel 48
OFDM Modulation; Data rate: 54 Mbps
Antenna no.: 1(8dBi); **3**(5dBi); **4**(9dBi); **8**(6dBi); **10**(0dBi); **11**(3,5dBi); **12**(3,5dBi)

Channel	Frequency [MHz]	Software Power Setting [dB]	Antenna No.	Gain [dBi]	Power Output radiated (dBm)	Peak Power Limit radiated (dBm)	Delta [dB]
48	5240	0	1	8	19.7	23	-3.3
48	5240	-3	3	5	20.7	23	-2.3
48	5240	-3	4	9	21.8	23	-1.2
48	5240	0	8	6	16.0	23	-7.0
48	5240	0	9	0	11.8	23	-11.2
48	5240	0	11	3.5	22.0	23	-1.0
48	5240	0	12	3.5	22.0	23	-1.0

Modulation: 802.11a turbo; Channel 42
OFDM Modulation; Data rate: 108 Mbps
Antenna no.: 1(8dBi); **3**(5dBi); **4**(9dBi); **8**(6dBi); **10**(0dBi); **11**(3,5dBi); **12**(3,5dBi)

Channel	Frequency [MHz]	Software Power Setting [dB]	Antenna No.	Gain [dBi]	Power Output radiated (dBm)	Peak Power Limit radiated (dBm)	Delta [dB]
42	5210	-3	1	8	20.4	23	-2.6
42	5210	-3	3	5	22.6	23	-0.4
42	5210	-6	4	9	20.3	23	-2.7
48	5240	0	8	6	18.6	23	-4.4
42	5210	0	9	0	13.4	23	-9.6
42	5210	0	11	3.5	22.5	23	-0.5
42	5210	0	12	3.5	22.5	23	-0.4

Note: The antenna No. 6 (18dBi) will not be used for this frequency band.

Peak Power Limit according to RSS-210 Annex 9.2

Frequency (MHz)	Peak Power Limit	
	(dBm)	(mWatt)
5150 -5250	23	200

The requirements are **FULFILLED.**

Remarks: _____

5.12 Radiated emissions 9 kHz – 40 GHz

For test instruments and accessories used see section 6 Part **SER 1, SER2 and SER 3**.

5.12.1 Description of the test location

Test location: OATS1
Test location: Anechoic Chamber A2

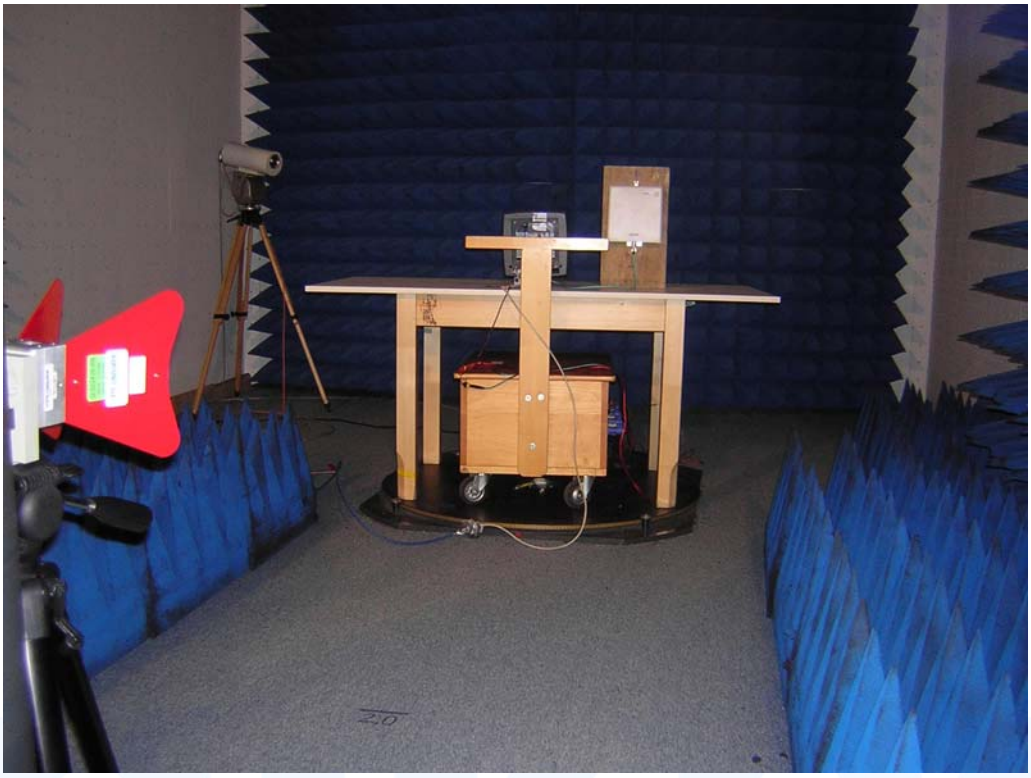
Test distance: 3 metres

5.12.2 Photo documentation of the test set-up

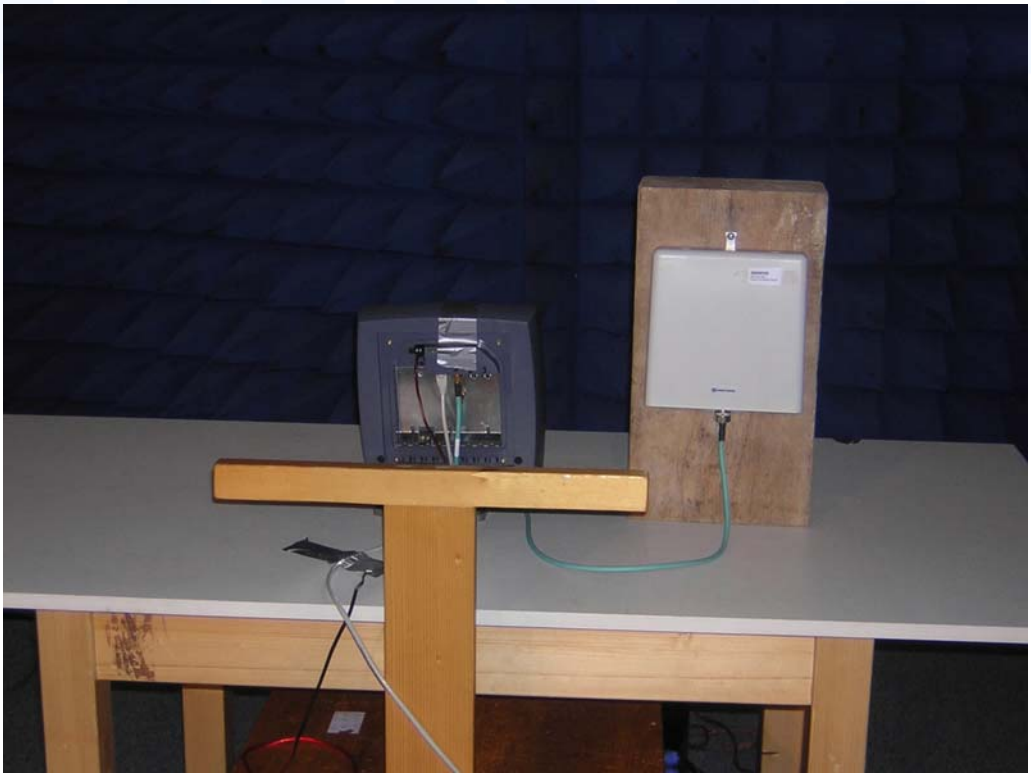
SER 1

SER2

SER 3



SER 3



5.12.3 Description of Measurement

The spurious emissions from the EuT will be measured on an open area test site in the frequency range of 9 kHz to 30 MHz using a tuned receiver and a shielded loop antenna. The antenna was positioned 3, 10 or 30 meters horizontally from the EuT. Measurements have been made in all three orthogonal axes and the shielded loop antenna was rotated to locate the maximum of the emissions. In the case where larger measuring distances are required the results will extrapolated based on the values measured on the closer distances according to Section 15.31 (f) (2) [2] and RSS-Gen. The final measurement will be performed with an EMI Receiver set to Quasi Peak detector except for the frequency bands 9 kHz to 90 kHz and 110 to 490 kHz where an average detector will be used according to Section 15.209 (d) [2] and RSS-Gen.

The final level, expressed in dBµV/m, is arrived at by taking the reading from the EMI receiver (Level dBµV) and adding the antenna correction factor and cable loss factor (Factor dB) to it. This result then has to be compared with the relevant FCC – and RSS-210 Limit.
The resolution bandwidth during the measurement is as follows:
9 kHz – 150 kHz: ResBW: 200 Hz
150 kHz – 30 MHz: ResBW: 9 kHz

Radiated spurious emissions from the EuT are measured in the frequency range of 30 MHz to 1000 MHz using a tuned receiver and appropriate broadband linearly polarized antennas. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB bandwidth and quasi-peak detection. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimetres above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. The set up of the Equipment under test will be in accordance to ANSI C63.4-2003 and RSS-Gen.
The Interface cables that are closer than 40 centimetres to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimetres from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area. The antenna was positioned 3, 10 or 30 meters horizontally from the EuT. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 meters, measurement scans are made with both horizontal and vertical antenna polarization`s and the EuT are rotated 360 degrees.

The final level, expressed in dBµV/m, is arrived by taking the reading from the EMI receiver (Level dBµV) and adding the correction factors and cable loss factor (Factor dB) to it. This is done automatically in the EMI receiver, where the correction factors are stored. This result then has the FCC, RSS-210 or CISPR limit subtracted from it to provide the Delta which gives the tabular data as shown in the data sheets at page.

The radiated emissions from the EuT are measured in the frequency range of 1 GHz to maximum frequency as specified in section 15.33, using a tuned receiver (Spectrum Analyser) and appropriate linearly polarized antennas. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimetres above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. The set up of the Equipment under test will be in accordance to ANSI C63.4-2003 and RSS-Gen.
The Interface cables that are closer than 40 centimetres to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimetres from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area. The antenna was positioned 3m horizontally from the EuT.

Measurement are made in both the horizontal and vertical planes of polarization in a fully anechoic room using a spectrum analyzer with the detector function set to peak and resolution as well as video bandwidth set to 100 kHz and for any spurious emission or modulation product that falls in Restricted Band, as defined in Section 15.205 and Table of RSS-210, set the resolution and video bandwidth to 1 MHz.
All tests are performed at a test-distance of 3 meters. Hand-held or body-worn devices are rotated through three orthogonal axes to determine which attitude and configuration procedure the highest emission relative the limit and therefore shall be used for final testing. During the tests the EUT is rotated all around to find the maximum levels of emissions. The cables and equipment were placed and moved within the range of position likely to find their maximum emissions. When the EuT is larger than the beamwidth of the measuring antenna, the measurement

antenna will be moved over the surfaces for the four sides or the test distance will be reduced to demonstrate that emissions were at maximum at the limit distance.

Analyzer Settings (EMI receiver) for spurious emissions which fall not in Restricted Band:

- Detector: Max hold
- RBW: 100 kHz for f ≥ 1GHz, 120 kHz for f ≤ 1GHz
- VBW: ≥ RBW
- Sweep Time: Coupled
- Detector function: Peak

Analyzer Settings (EMI receiver) for spurious emissions which fall in Restricted Band:

- Detector: Max hold
- RBW: 1 MHz for f ≥ 1GHz, 120 kHz for f ≤ 1GHz
- VBW: ≥ RBW
- Sweep Time: Coupled
- Detector function: Peak for f ≥ 1GHz, Quasi Peak for f ≤ 1GHz

5.12.4 Test result

5.9.4.1 Test results (<1GHz) (Worst case data)

802.11a
Data rate: 54 Mbps
Worst case antenna: ANT793-8DN
Power setting: -9dB

Channel 149: 5745 MHz												
Frequency [MHz]	Restricted Band	Reading Level QP [dBµV]	Reading Level AV [dBµV]	Reading Level PK [dBµV]	Bandwidth [kHz]	Correct. factor [dB]	Corrected Level QP [dBµV/m]	Corrected Level AV [dBµV/m]	Corrected Level PK [dBµV/m]	Limit [dBµV/m]		Delta [dB]
										PK	QP	
9 kHz-1.7	■				10		< 20					
1.705-30	■				10		<20				29.5	>-9.5
30-88	■				120		< 30				40	> -10,0
88-216	■				120		<30				43.5	>-13.5
216-960	■				120		<30				46	>-16
960-1000	■				120		< 30				54	> -24,0

Radiated limits according to FCC Part 15 Subpart 15.209(a) and for spurious emissions:

Frequency (MHz)	Field strength of spurious emissions		Measurement distance (meters)
	(µV/m)	dB (µV/m)	
0,0090,490	2400/F(kHz)		300
0,490-1,705	24000/F(kHz)		30
1,705-30	30	29,5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

5.5.4.2 Test results (>1GHz) (worst case data) according to FCC 15.407 (b) and RSS-210, A9.3

Frequency band 5150-5350 MHz

802.11a
Data rate: 54 Mbps
Worst case antenna: No. 4 - ANT795-6DN
Power setting: 0dB (Full Power)

Channel 36: 5180 MHz											
Frequency [MHz]	Restricted Band	Reading Level PK [dBµV]	Corr. Duty Cycle [dB]	Level AV [dBµV] *)	Band-width [kHz]	Correct. Factor [dB]	Corrected Level PK [dBµV/m]	Corrected Level AV [dBµV/m]	Limit PK [dBµV/m]	Limit AV [dBµV/m]	Delta [dB]
1056	■	72.1	---	53.7	1000	-13.9	58.2	39.8	74.0	54.0	-14.1
1316	■	69.4	---	45.5	1000	-14.3	55.1	31.2	74.0	54.0	-22.8
1588	■	62.3	---	41.8	1000	-13.8	48.5	28.0	74.0	54.0	-26.0
1719	■	65.4	---	42.0	1000	-13.0	52.4	29.0	74.0	54.0	-25.0
5149	■	65.8	---	49.1	1000	1.2	67.0	50.3	74.0	54.0	-3.7

802.11a
Data rate: 54 Mbps
Worst case antenna: No. 4 - ANT795-6DN
Power setting: 0dB (Full Power)

Channel 48: 5240 MHz											
Frequency [MHz]	Restricted Band	Reading Level PK [dBµV]	Corr. Duty Cycle [dB]	Level AV [dBµV] *)	Band-width [kHz]	Correct. Factor [dB]	Corrected Level PK [dBµV/m]	Corrected Level AV [dBµV/m]	Limit PK [dBµV/m]	Limit AV [dBµV/m]	Delta [dB]
1056	■	72.1	---	53.7	1000	-13.9	58.2	39.8	74.0	54.0	-14.1
1316	■	69.4	---	45.5	1000	-14.3	55.1	31.2	74.0	54.0	-22.8
1588	■	62.3	---	41.8	1000	-13.8	48.5	28.0	74.0	54.0	-26.0
1719	■	65.4	---	42.0	1000	-13.0	52.4	29.0	74.0	54.0	-25.0
5149	■	65.8	---	49.1	1000	1.2	67.0	50.3	74.0	54.0	-3.7

802.11a turbo
Data rate: 108 Mbps
Worst case antenna: No. 1 – ANT795-6MN
Power setting: 0dB (Full power)

Channel 42: 5210 MHz											
Frequency [MHz]	Restricted Band	Reading Level PK [dBµV]	Corr. Duty Cycle [dB]	Level AV [dBµV] *)	Band-width [kHz]	Correct. Factor [dB]	Corrected Level PK [dBµV/m]	Corrected Level AV [dBµV/m]	Limit PK [dBµV/m]	Limit AV [dBµV/m]	Delta [dB]
1056	■	72.1	---	53.7	1000	-13.9	58.2	39.8	74.0	54.0	-14.1
1316	■	69.4	---	45.5	1000	-14.3	55.1	31.2	74.0	54.0	-22.8
1588	■	62.3	---	41.8	1000	-13.8	48.5	28.0	74.0	54.0	-26.0
1719	■	65.4	---	42.0	1000	-13.0	52.4	29.0	74.0	54.0	-25.0
5150	■	56.0	---	37.3	1000	1.2	57.2	38.5	74.0	54.0	-15.5
5440	■	49.6	---	35.1	1000	1.9	51.5	37.0	74.0	54.0	-17.0

Frequency band 5725-5825 MHz

802.11a
Data rate: 54 Mbps
Worst case antenna: No. 4 - ANT793-8DN
Power setting: -9dB

Channel 149: 5745 MHz											
Frequency [MHz]	Restricted Band	Reading Level PK [dBµV]	Corr. Duty Cycle [dB]	Level AV [dBµV] *)	Band-width [kHz]	Correct. Factor [dB]	Corrected Level PK [dBµV/m]	Corrected Level AV [dBµV/m]	Limit PK [dBµV/m]	Limit AV [dBµV/m]	Delta [dB]
1056	■	72.1	---	53.7	1000	-13.9	58.2	39.8	74.0	54.0	-14.1
1316	■	69.4	---	45.5	1000	-14.3	55.1	31.2	74.0	54.0	-22.8
1588	■	62.3	---	41.8	1000	-13.8	48.5	28.0	74.0	54.0	-26.0
1719	■	65.4	---	42.0	1000	-13.0	52.4	29.0	74.0	54.0	-25.0
5120	■	56.2	---	46.2	1000	1.3	57.5	47.5	74.0	54.0	-6.5
5440	■	57.6	---	47.6	1000	1.7	59.3	49.3	74.0	54.0	-4.7

802.11a
Data rate: 54 Mbps
Worst case antenna: No. 5 - ANT793-8DN
Power setting: -9dB

Channel 161: 5805 MHz											
Frequency [MHz]	Restricted Band	Reading Level PK [dBµV]	Corr. Duty Cycle [dB]	Level AV [dBµV] *)	Band-width [kHz]	Correct. Factor [dB]	Corrected Level PK [dBµV/m]	Corrected Level AV [dBµV/m]	Limit PK [dBµV/m]	Limit AV [dBµV/m]	Delta [dB]
1056	■	72.1	---	53.7	1000	-13.9	58.2	39.8	74.0	54.0	-14.1
1316	■	69.4	---	45.5	1000	-14.3	55.1	31.2	74.0	54.0	-22.8
1588	■	62.3	---	41.8	1000	-13.8	48.5	28.0	74.0	54.0	-26.0
1719	■	65.4	---	42.0	1000	-13.0	52.4	29.0	74.0	54.0	-25.0
5120	■	58.6	---	48.9	1000	1.3	59.9	50.2	74.0	54.0	-3.8
5440	■	59.3	---	48.5	1000	1.7	61.0	50.2	74.0	54.0	-3.8

802.11a turbo
Data rate: 108 Mbps
Worst case antenna: No. 2 - ANT7932-8DN
Power setting: -9dB

Channel 152: 5760 MHz											
Frequency [MHz]	Restricted Band	Reading Level PK [dBµV]	Corr. Duty Cycle [dB]	Level AV [dBµV] *)	Band-width [kHz]	Correct. Factor [dB]	Corrected Level PK [dBµV/m]	Corrected Level AV [dBµV/m]	Limit PK [dBµV/m]	Limit AV [dBµV/m]	Delta [dB]
1056	■	72.1	---	53.7	1000	-13.9	58.2	39.8	74.0	54.0	-14.1
1316	■	69.4	---	45.5	1000	-14.3	55.1	31.2	74.0	54.0	-22.8
1588	■	62.3	---	41.8	1000	-13.8	48.5	28.0	74.0	54.0	-26.0
1719	■	65.4	---	42.0	1000	-13.0	52.4	29.0	74.0	54.0	-25.0
5120	■	57.8	---	45.1	1000	1.3	59.1	46.4	74.0	54.0	-7.6
5440	■	58.5	---	44.1	1000	1.7	60.2	45.8	74.0	54.0	-8.2

802.11g turbo
Data rate: 108 Mbps
Worst case antenna: No. 4 - ANT793-8DN
Power setting: -9dB

Channel 160: 5800 MHz											
Frequency [MHz]	Restricted Band	Reading Level PK [dBµV]	Corr. Duty Cycle [dB]	Level AV [dBµV] *)	Band-width [kHz]	Correct. Factor [dB]	Corrected Level PK [dBµV/m]	Corrected Level AV [dBµV/m]	Limit PK [dBµV/m]	Limit AV [dBµV/m]	Delta [dB]
1056	■	72.1	---	53.7	1000	-13.9	58.2	39.8	74.0	54.0	-14.1
1316	■	69.4	---	45.5	1000	-14.3	55.1	31.2	74.0	54.0	-22.8
1588	■	62.3	---	41.8	1000	-13.8	48.5	28.0	74.0	54.0	-26.0
1719	■	65.4	---	42.0	1000	-13.0	52.4	29.0	74.0	54.0	-25.0
5120	■	59.7	---	45.2	1000	1.3	61.0	46.5	74.0	54.0	-7.5
5440	■	57.6	---	43.6	1000	1.7	59.3	45.3	74.0	54.0	-8.7

Radiated limits according to FCC Part 15 Subpart 15.209(a) for spurious emissions which fall in restricted band:

Frequency (MHz)	Field strength of spurious emissions		Measurement distance (meters)
	(µV/m)	dB (µV/m)	
0,0090,490	2400/F(kHz)		300
0,490-1,705	24000/F(kHz)		30
1,705-30	30	29,5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

Restricted bands of operation:

The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in §15.209

MHz	MHz	GHz
25.5 – 25.67	960 – 1240	4.5 – 5.15
37.5 – 38.25	1300 – 1427	5.35 – 5.46
73 – 74.6	1435 – 1626.5	7.25 – 7.75
74.8 – 75.2	1645.5 – 1646.5	8.025 – 8.5
108 – 121.94	1660 – 1710	9.0 – 9.2
123 – 138	1718.8 – 1722.2	9.3 – 9.5
149.9 – 150.05	2200 – 2300	10.6 – 12.7
156.52475 – 156.52525	2310 – 2390	13.25 – 13.4
156.7 – 156.9	2483.5 – 2500	14.47 – 14.5
162.0125 – 167.17	2655 – 2900	15.35 – 16.2
167.72 – 173.2	3260 – 3267	17.7 – 21.4
240 – 285	3332 – 3339	22.01 – 23.12
322 – 335.4	3345.8 – 3358	23.6 – 24.0
399.9 – 410	3600 – 4400	31.2 – 31.8
608 – 614		36.43 – 36.5

Radiated limits according to RSS-210 Issue 6 Table 2,3 for spurious emissions which fall in restricted band:

Frequency (MHz)	Field strength of spurious emissions		Measurement distance (meters)
	(µV/m)	dB (µV/m)	
0,0090,490	2400/F(kHz)		300
0,490-1,705	24000/F(kHz)		30
1,705-30	30	29,5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

Restricted bands of operation:

The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in RSS-210 table 1.

MHz	MHz	MHz	GHz
0.0900.110	13.36-13.41	960 – 1427	5.35 – 5.46
2.1735-2.190	16.42-16.423	1435 – 1626.5	7.25 – 7.75
3.020-3.026	16.69475-16.69525	1645.5 – 1646.5	8.025 – 8.5
4.125-4.128	16.80425-16.80475	1660 – 1710	9.0 – 9.2
4.17725-4.17775	25.5 – 25.67	1718.8 – 1722.2	9.3 – 9.5
4.20725-4.20775	37.5 – 38.25	2200 – 2300	10.6 – 12.7
5.677-5.683	73 – 74.6	2310 – 2390	13.25 – 13.4
6.215-6.218	74.8 – 75.2	2655 – 2900	14.47 – 14.5
6.26775-6.26825	108 – 138	3260 – 3267	15.35 – 16.2
6.31175-6.31225	156.52475 – 156.52525	3332 – 3339	17.7 – 21.4
8.291-8.294	156.7 – 156.9	3345.8 – 3358	22.01 – 23.12
8.362-8.366	240 – 285	3500 – 4400	23.6 – 24.0
8.37625-8.38675	322 – 335.4	4500 – 5150	31.2 – 31.8
8.41425-8.41475	399.9 – 410		36.43 – 36.5
12.29-12.293	608 – 614		Above 38.6
12.51975-12.52025			
12.57675-12.57725			

The requirements are **FULFILLED.**

Remarks: Spurious emissions which were falling not in restricted bands have been measured conducted.

The measurement was performed up to the up to 40 GHz.

5.13 Spurious RF Conducted Emission

For test instruments and accessories used see section 6 Part **SEC 3**.

5.13.1 Description of the test location

Test location: AREA4

5.13.2 Description of Measurement

A Spectrum analyzer / EMI test receiver is connected to the ouput of the transmitter via a suitable attenuator while EuT was operating in transmit mode using the assigned frequency.
Analyzer Settings:

- Detector: Max Hold
- RBW: 100 kHz
- VBW: ≥ RBW
- Sweep Time: Coupled
- Detecter function: Peak

5.13.3 Photo documentation of the test set-up

5.13.4 Test result

Frequency band 5150-5350 MHz

802.11a
Data rate: 54 Mbps
Power setting: 0dB (Full Power)

SPURIOUS EMISSIONS LEVEL [dBm]								
CH36			CH48					
f[MHz]	Bandwidth [kHz]	Level [dBm]	f[MHz]	Bandwidth [kHz]	Level [dBm]	f[MHz]	Bandwidth [kHz]	Level [dBm]
1-40 GHz	100	<-60	1-40 GHz	100	<-60			

Frequency band 5150-5350 MHz

802.11a
Data rate: 108 Mbps
Power setting: 0dB (Full Power)

SPURIOUS EMISSIONS LEVEL [dBm]								
CH42								
f[MHz]	Bandwidth [kHz]	Level [dBm]	f[MHz]	Bandwidth [kHz]	Level [dBm]	f[MHz]	Bandwidth [kHz]	Level [dBm]
1-40 GHz	100	<-60						

Frequency band 5725-5825 MHz

802.11a
Data rate: 54 Mbps
Power setting: 0dB (Full Power)

SPURIOUS EMISSIONS LEVEL [dBm]								
CH149			CH161					
f[MHz]	Bandwidth [kHz]	Level [dBm]	f[MHz]	Bandwidth [kHz]	Level [dBm]	f[MHz]	Bandwidth [kHz]	Level [dBm]
1-40 GHz	100	<-60	1-40 GHz	100	<-60			

802.11a turbo
Data rate: 108 Mbps
Power setting: 0dB (Full Power)

SPURIOUS EMISSIONS LEVEL [dBm]								
CH152			CH160					
f[MHz]	Bandwidth [kHz]	Level [dBm]	f[MHz]	Bandwidth [kHz]	Level [dBm]	f[MHz]	Bandwidth [kHz]	Level [dBm]
1-40 GHz	100	<-60	1-40 GHz	100	<-60			

Peak-Limit according to FCC Subpart 15.407 (b) (1), (2), (3) / RSS-210 A9.3

All emissions outside of the 5.15-5.35 GHz band and 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm.

The requirements are **FULFILLED.**

Remarks: Only spurious emissions which are falling not in restricted bands have been measured conducted.

Spurious emissions which are falling in restricted band have been measured radiated. Please refer to „Radiated emissions 9kHz – 40 GHz“ in clause 5.11 of the present test report.

5.14 Band edge test

For test instruments and accessories used see section 6 Part **MB**.

5.14.1 Description of the test location

Test location: AREA4

5.14.2 Photo documentation of the test set-up

5.14.3 Description of Measurement

The EuT was connected to the spectrum analyzer with a suitable attenuator. The span of the spectrum analyzer was set wide enough to capture the peak level of the emission operating on the channel closest to the bandedge, as well as any modulation products which fall outside of the authorized band of operation. The highest amplitude appearing on sprectal display was measured and it was set as the reference level for the emission mask.
It was allowed the trace to stabilize and after then it was set the emission mask on the reference level to show the compliance with the bandedge requirements.

Further settings on the spectrum analyzer:

RBW:	≥ 1% of the span
VBW:	≥ RBW
Sweep:	Auto
Detector function:	Peak

Frequency band 5150-5350 MHz

802.11a
Data rate: 54 Mbps
Power setting: 0dB (Full Power)

Frequency [MHz]	Peak Power Output [dBm]	Level at Band edge [dBm]	Limit [dBm]	Margin [MHz]
< 5150	9.22	-42.96	-27	-15.96
> 5350	9.14	-51.41	-27	-24.41

Frequency band 5150-5350 MHz

802.11a
Data rate: 108 Mbps
Power setting: 0dB (Full Power)

Frequency [MHz]	Peak Power Output [dBm]	Level at Band edge [dBm]	Limit [dBm]	Margin [MHz]
< 5150	12.12	-38.47	-27	-11.47
> 5350	10.90	-53.64	-27	-26.64

Frequency band 5725-5825 MHz

802.11a
Data rate: 54 Mbps
Power setting: 0dB (Full Power)

Frequency [MHz]	Peak Power Output [dBm]	Level at Band edge [dBm]	Limit [dBm]	Margin [MHz]
< 5725	12.57	-19.86	-17	-2.86
> 5805	10.81	-26.02	-17	-9.02

802.11a turbo
Data rate: 108 Mbps
Power setting: 0dB (Full Power)

Frequency [MHz]	Peak Power Output [dBm]	Level at Band edge [dBm]	Limit [dBm]	Margin [MHz]
< 5725	7.96	-29.78	-27	-2.78
> 5825	6.69	-31.43	-27	-4.43

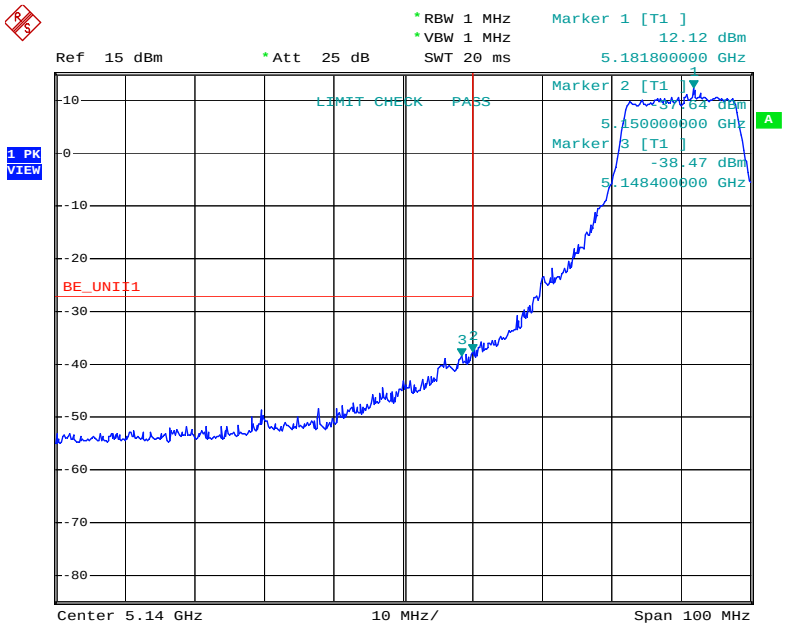
Peak-Limit according to FCC Subpart 15.407 (b) (1), (2), (3) / RSS-210 A9.3

All emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm.
All emissions outside of the 5.725-5.825 GHz band shall not exceed an EIRP of -17 dBm.

The requirements are **FULFILLED.**

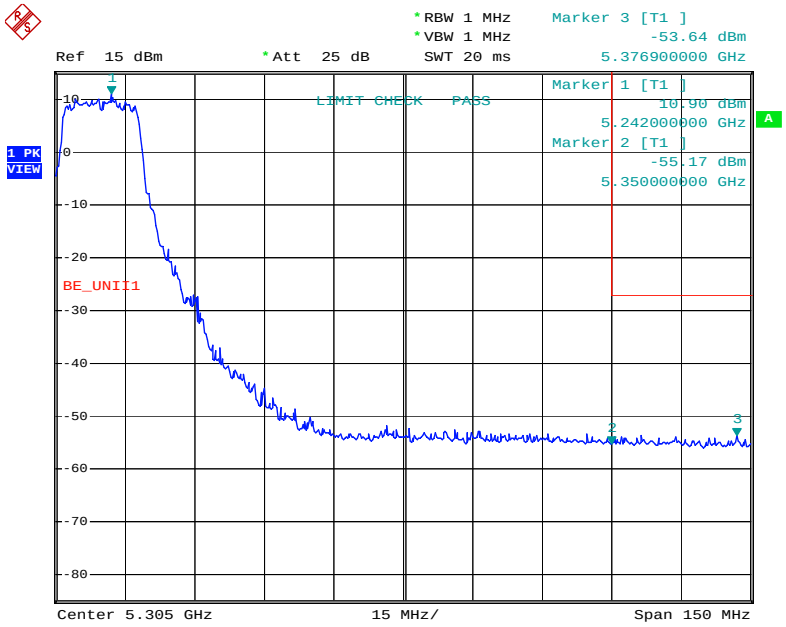
Remarks: For detailed test results please refer to following test protocols.

802.11a UNII-1
Lower Channel
5180 MHz



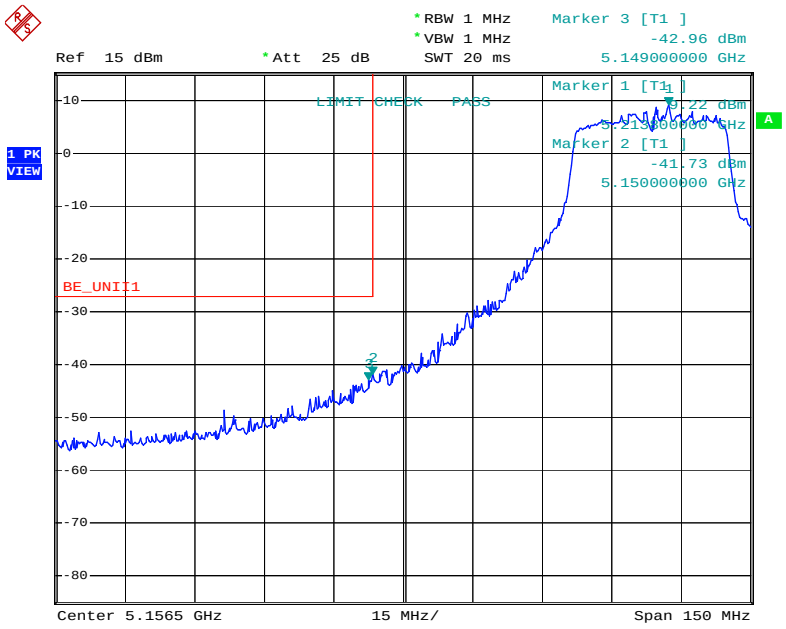
Date: 7.MAR.2007 14:15:51

Higher Channel
5240 MHz



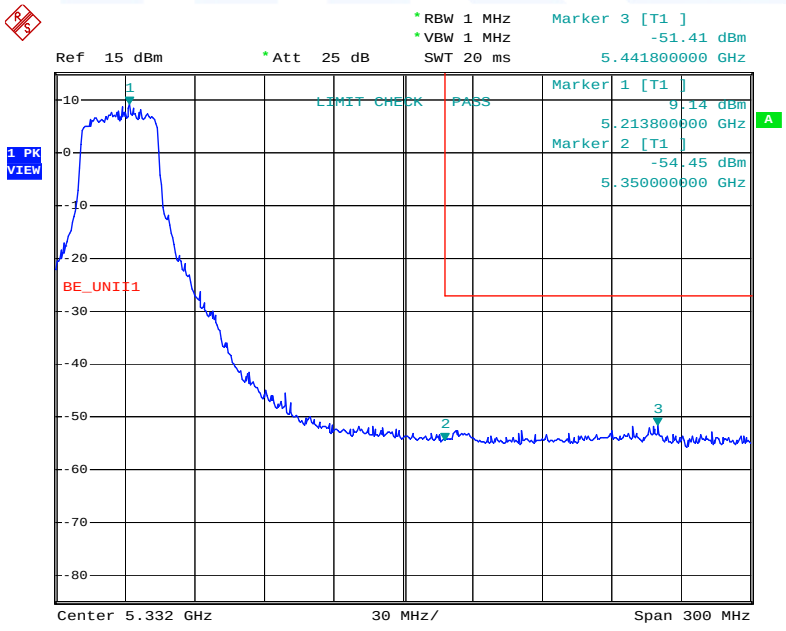
Date: 7.MAR.2007 14:22:15

802.11a turbo UNII-1
5210 MHz
Lower band edge



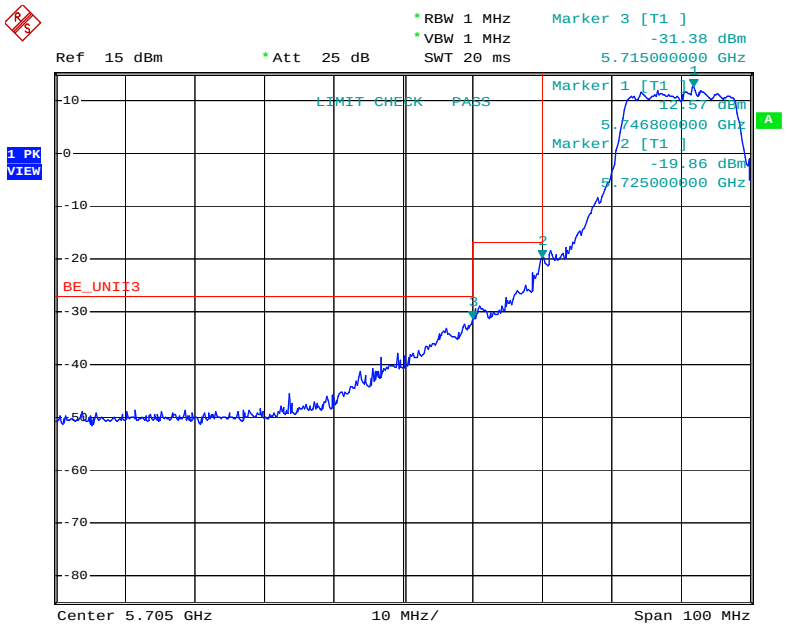
Date: 7.MAR.2007 15:15:10

Higher Band edge



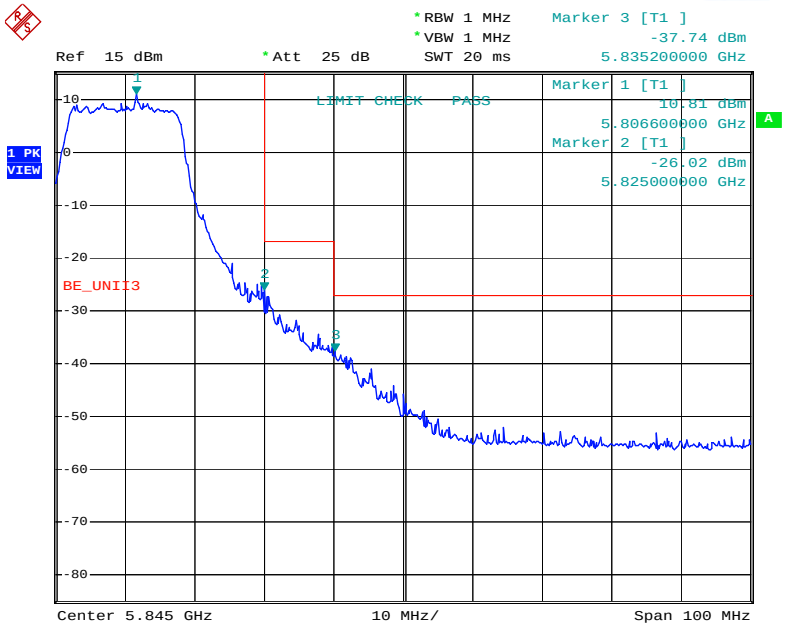
Date: 7.MAR.2007 14:51:00

802.11a UNII-3
Lower Channel
5745 MHz



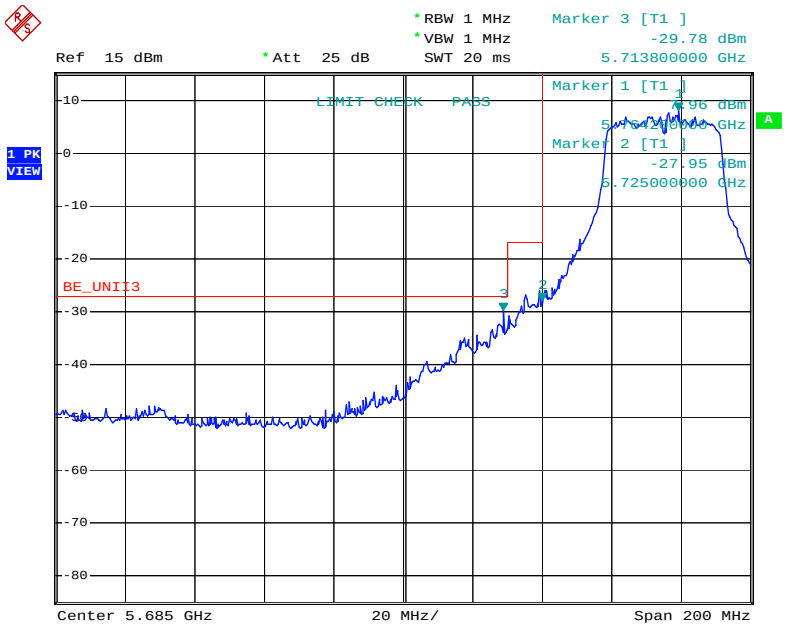
Date: 7.MAR.2007 14:30:17

Higher Channel
5805 MHz



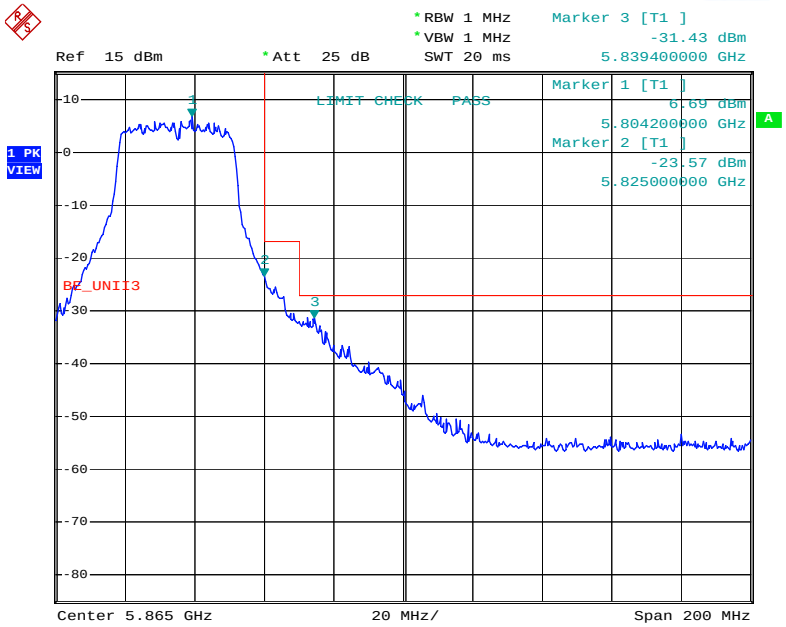
Date: 7.MAR.2007 14:35:16

802.11a turbo UNII-1
Lower Channel
5760 MHz



Date: 7.MAR.2007 14:39:54

Higher Channel
5800 MHz



Date: 7.MAR.2007 14:43:11

5.15 26 dB Bandwidth

For test instruments and accessories used see section 6 Part **MB**.

5.15.1 Description of the test location

Test location: AREA4

5.15.2 Photo documentation of the test set-up

5.15.3 Description of Measurement

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio of -26 dB. The reference level is the level of the highest amplitude signal observed from the transmitter at either the fundamental frequency or the first-order modulation products in all typical modes of operation, including the unmodulated carrier, even if atypical.
The resolution bandwidth of measuring instrument was set to a value as shown in the following table below according to ANSI C63.4-2003 and RSS-Gen.

Fundamental frequency	Minimum resolution bandwidth
1000 MHz to 40 GHz	100 kHz

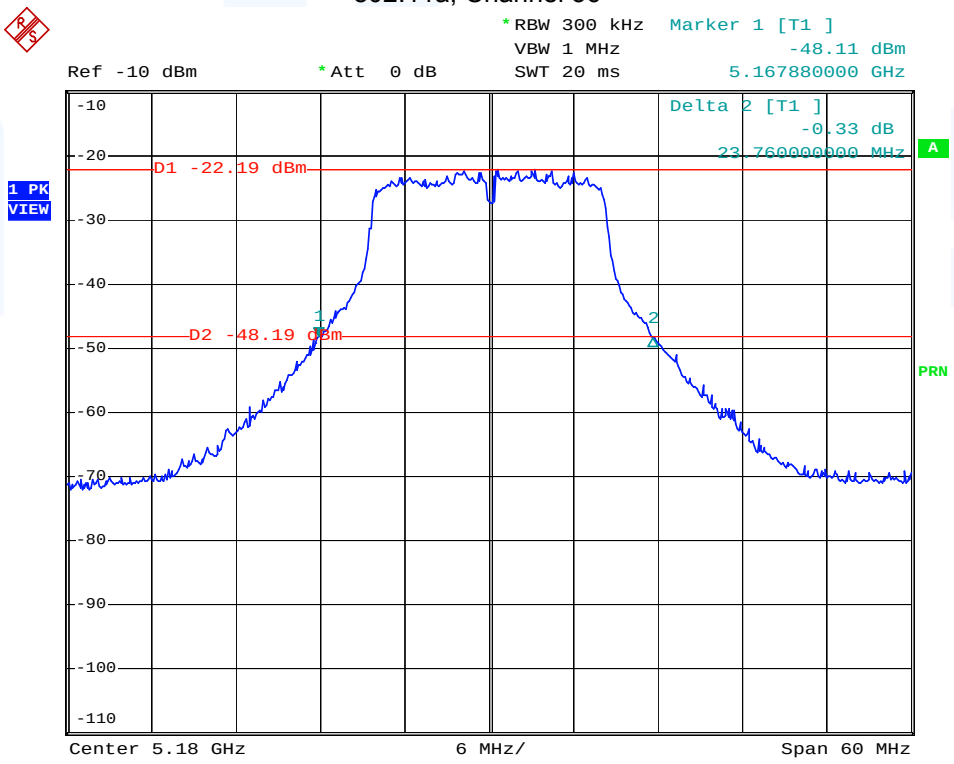
5.15.4 Test result

802.11a

Channel number	Fundamental Frequency [MHz]	26 dB BANDWIDTH (MHz)
36	5180	23.76
48	5240	23.88
42	5210	39.84
149	5745	24.64
161	5805	24.16
152	5760	44.80
160	5800	43.84

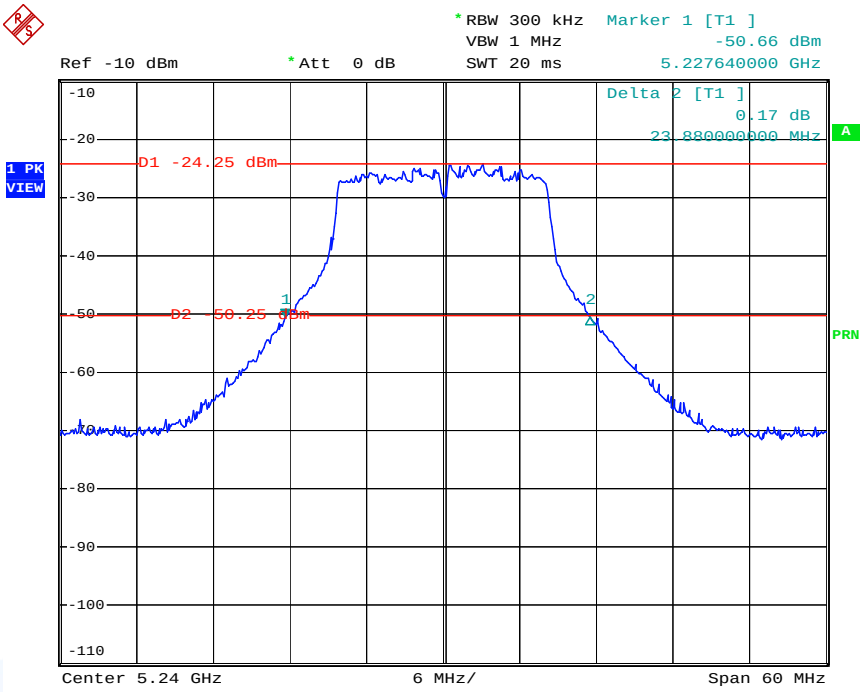
Remarks: For detailed test result please refer to following test protocols.

26dB Bandwidth Measurement
FCC Part 15 Subpart 15.407
802.11a, Channel 36



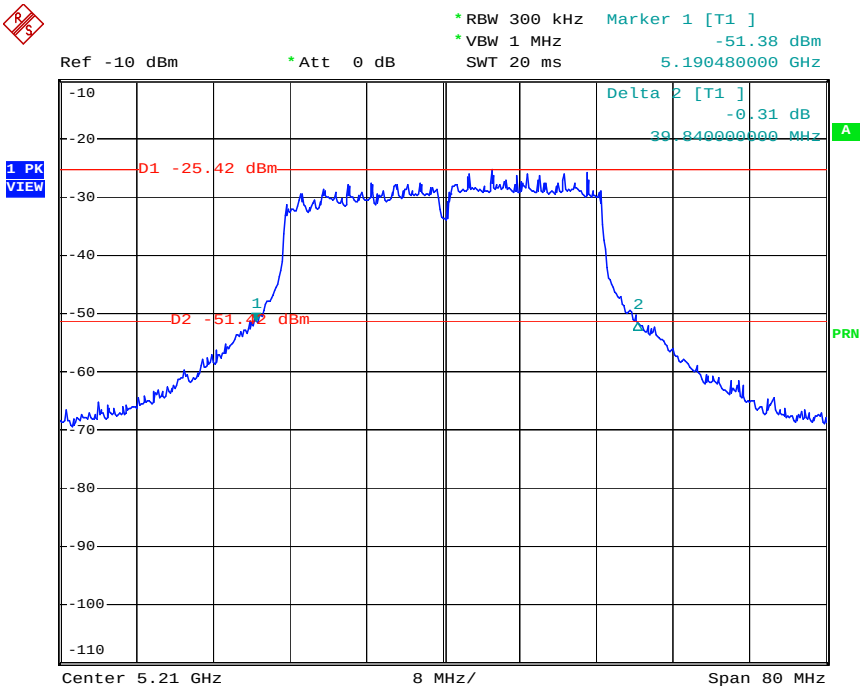
Date: 21.MAR.2007 18:25:26

26dB Bandwidth Measurement
FCC Part 15 Subpart 15.407
802.11a, Channel 48



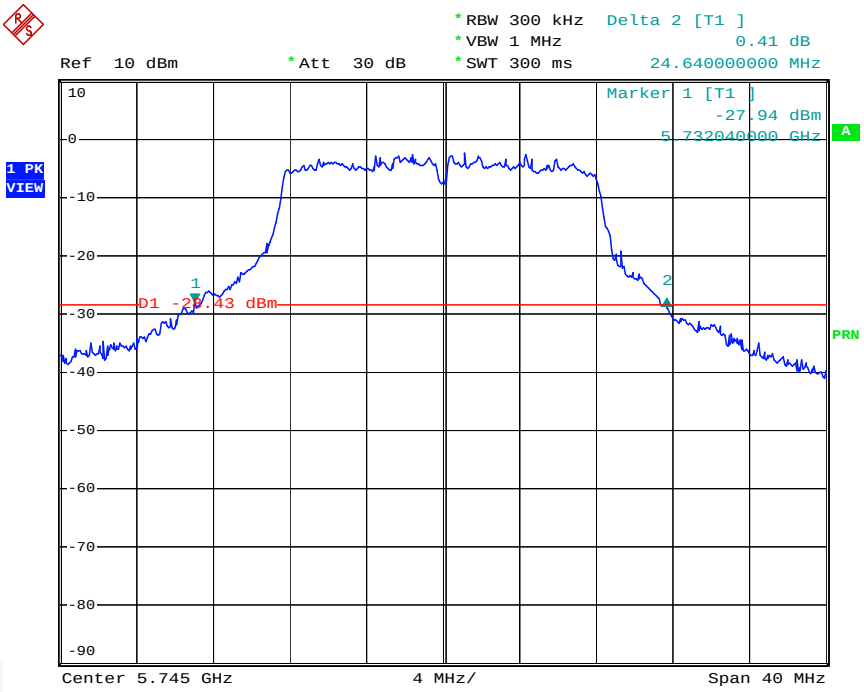
Date: 21.MAR.2007 18:22:01

26dB Bandwidth Measurement
FCC Part 15 Subpart 15.407
802.11a turbo, Channel 42



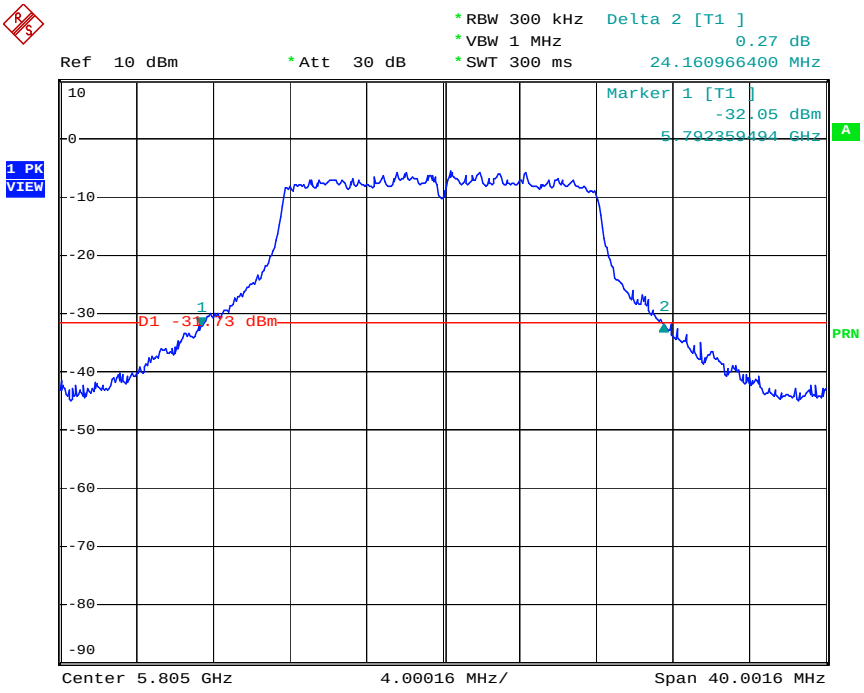
Date: 22.MAR.2007 20:22:07

26dB Bandwidth Measurement
FCC Part 15 Subpart 15.407
802.11a, Channel 149



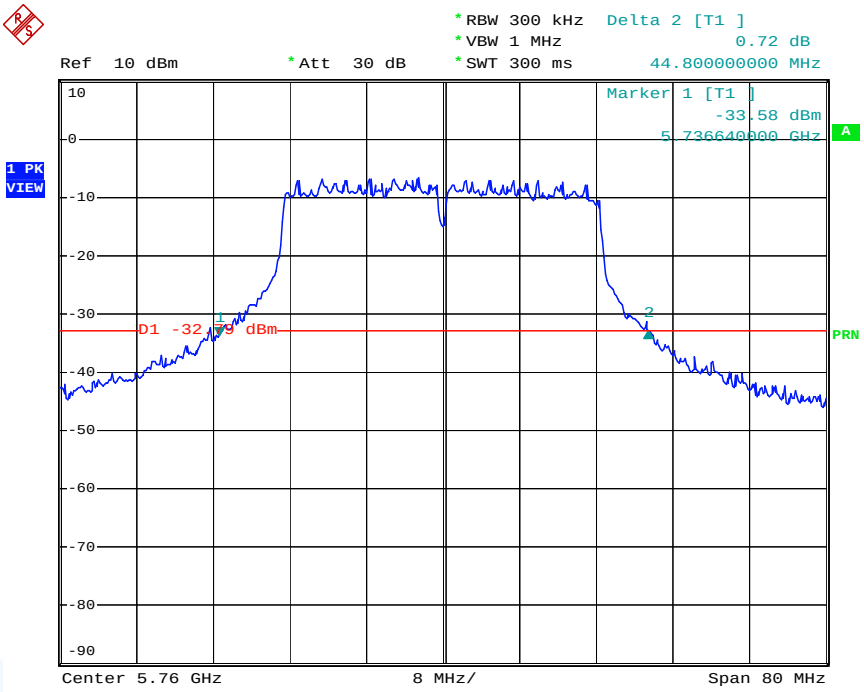
Date: 6.MAR.2007 15:12:24

26dB Bandwidth Measurement
FCC Part 15 Subpart 15.407
802.11a, Channel 161



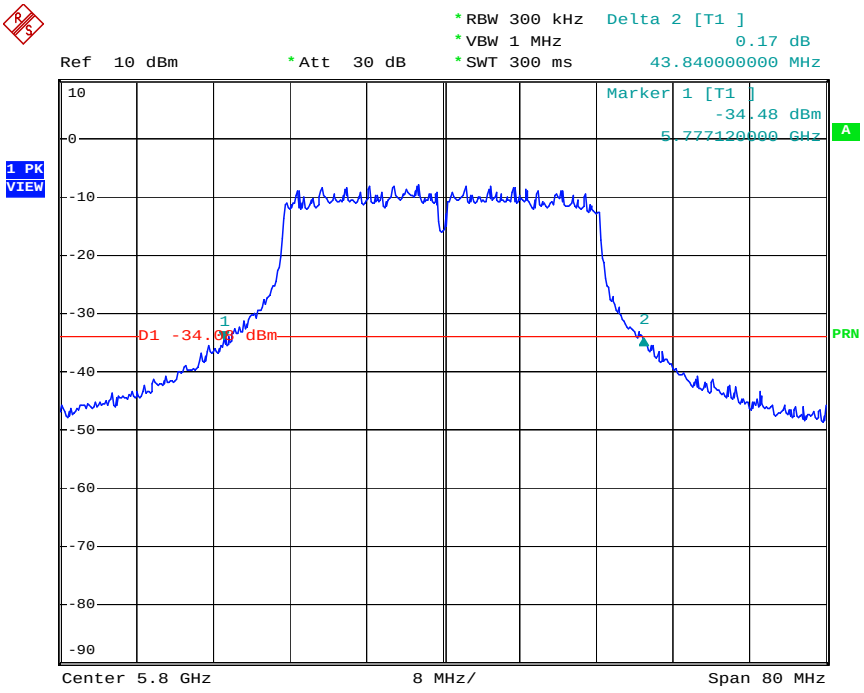
Date: 6.MAR.2007 15:17:47

26dB Bandwidth Measurement
FCC Part 15 Subpart 15.407
802.11a turbo, Channel 152



Date: 6.MAR.2007 14:38:43

26dB Bandwidth Measurement
FCC Part 15 Subpart 15.407
802.11a turbo, Channel 160



Date: 6.MAR.2007 14:48:50

5.16 Peak power excursion measurement

For test instruments and accessories used see section 6 Part **MB**.

5.16.1 Description of the test location

Test location: AREA4

5.16.2 Photo documentation of the test set-up

5.16.3 Description of Measurement

The EuT was connected to the spectrum analyzer with a suitable attenuator. The bandwidth of the fundamental frequency was measured a Trace 1 with the spectrum analyzer using 1 MHz RBW and 3 MHz VBW in Max hold function. Than a second Trace (Trace 2) was measured using 1 MHz RBW and 300 kHz VBW.
The largest difference between Trace1 and Trace 2 in any MHz band was recorded.

5.16.4 Test result

802.11a UNII-1; Data rate: 54 Mbps; Full power

Channel	Fundamental Frequency [MHz]	Max. Peak Power Excursion (dB)
36	5180	6.74
48	5240	6.70

802.11a UNII-3; Data rate: 54 Mbps; Full power

Channel	Fundamental Frequency [MHz]	Max. Peak Power Excursion (dB)
149	5745	6.76
161	5805	6.92

802.11a turbo UNII-3; Data rate: 108 Mbps; Full power

Channel	Fundamental Frequency [MHz]	Max. Peak Power Excursion (dB)
152	5760	8.74
160	5800	9.18

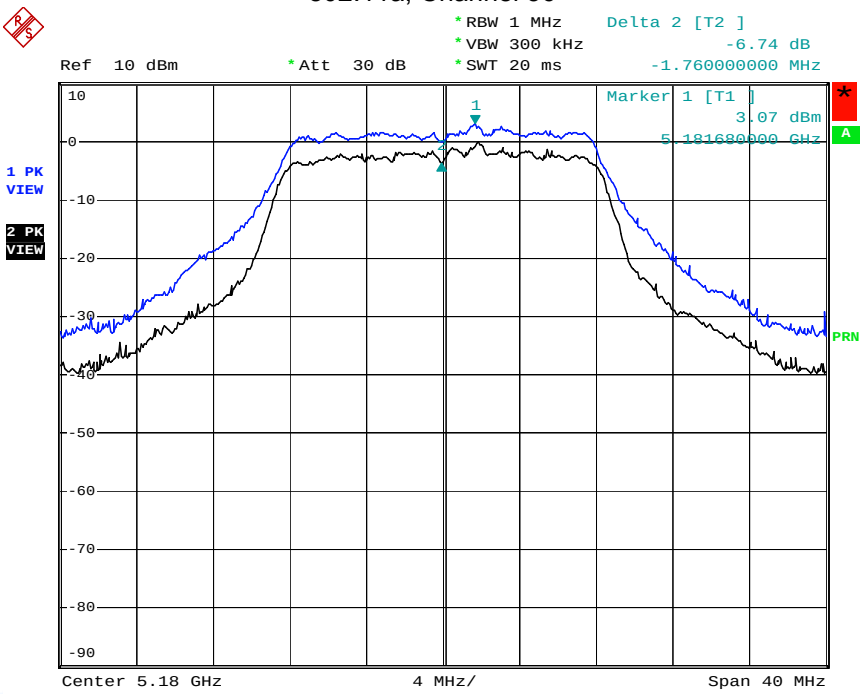
Limit according to FCC Subpart 15.407 (a)(6)

The peak power excursion shall not be greater than 13 dB.

The requirements are **FULFILLED.**

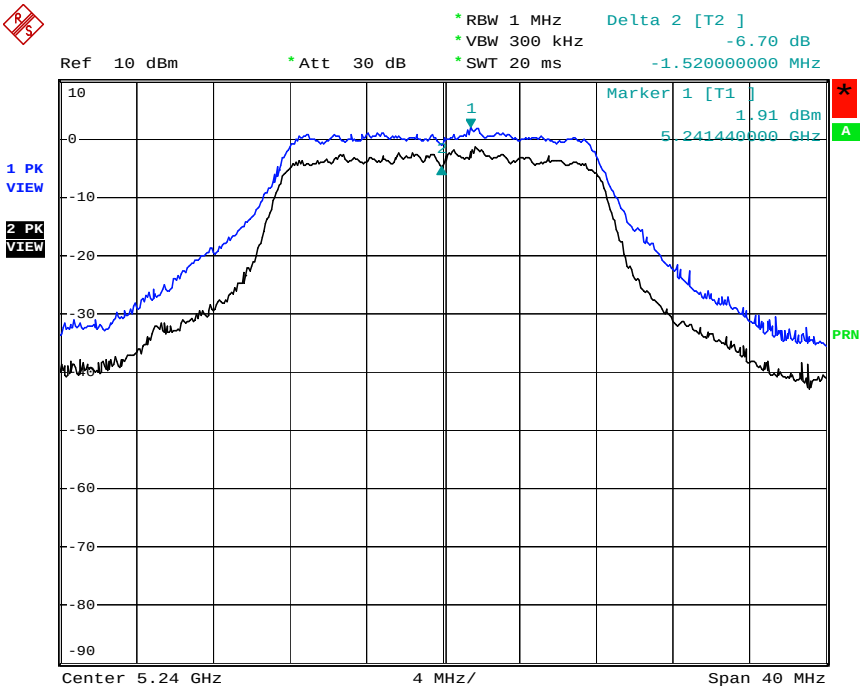
Remarks: _____

Peak Power Excursion measurement
FCC Part 15 Subpart 15.407
802.11a, Channel 36



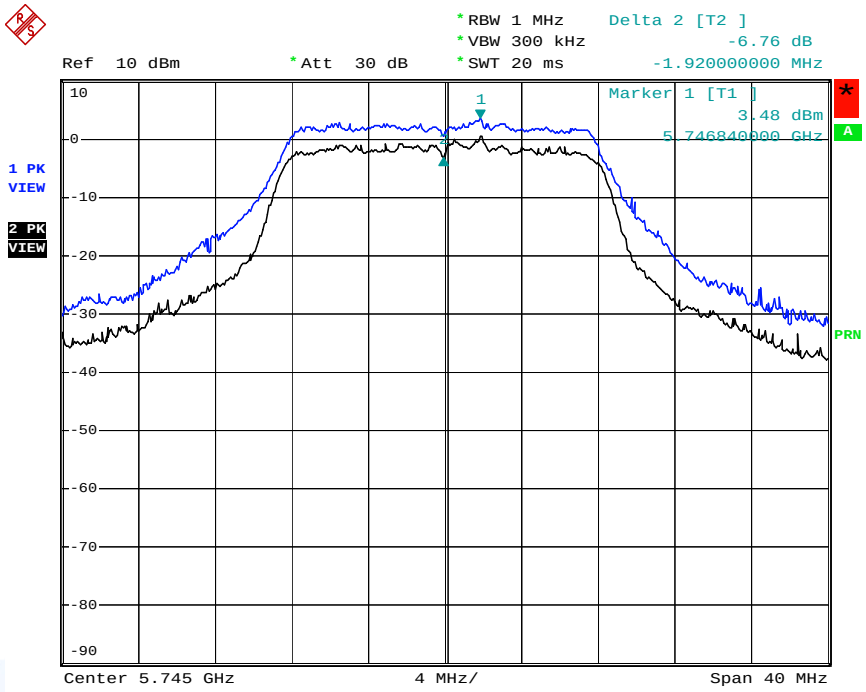
Date: 6.MAR.2007 16:48:02

Peak Power Excursion measurement
FCC Part 15 Subpart 15.407
802.11a, Channel 48



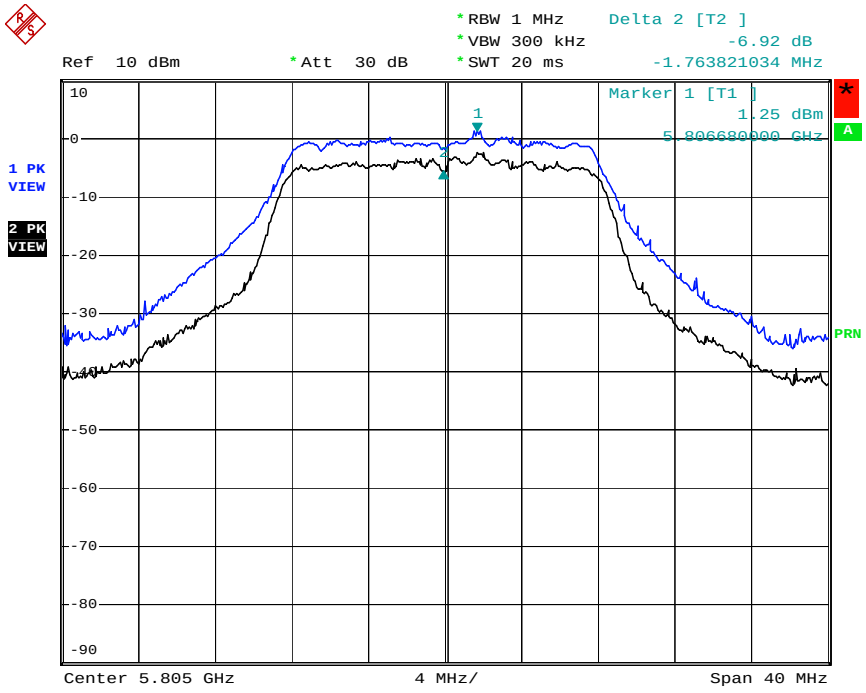
Date: 6.MAR.2007 16:27:49

Peak Power Excursion measurement
FCC Part 15 Subpart 15.407
802.11a, Channel 149



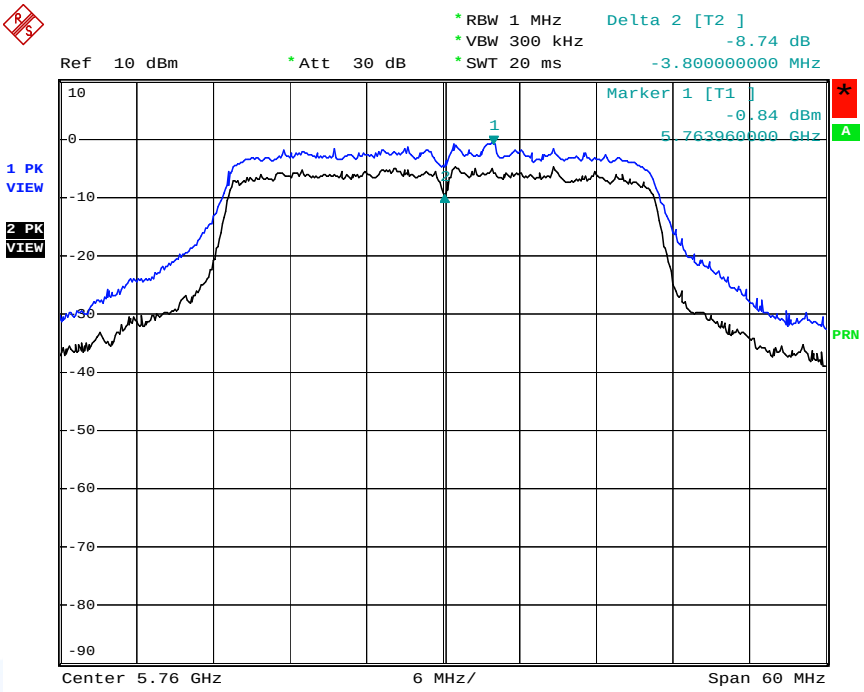
Date: 6.MAR.2007 16:54:38

Peak Power Excursion measurement
FCC Part 15 Subpart 15.407
802.11a, Channel 161



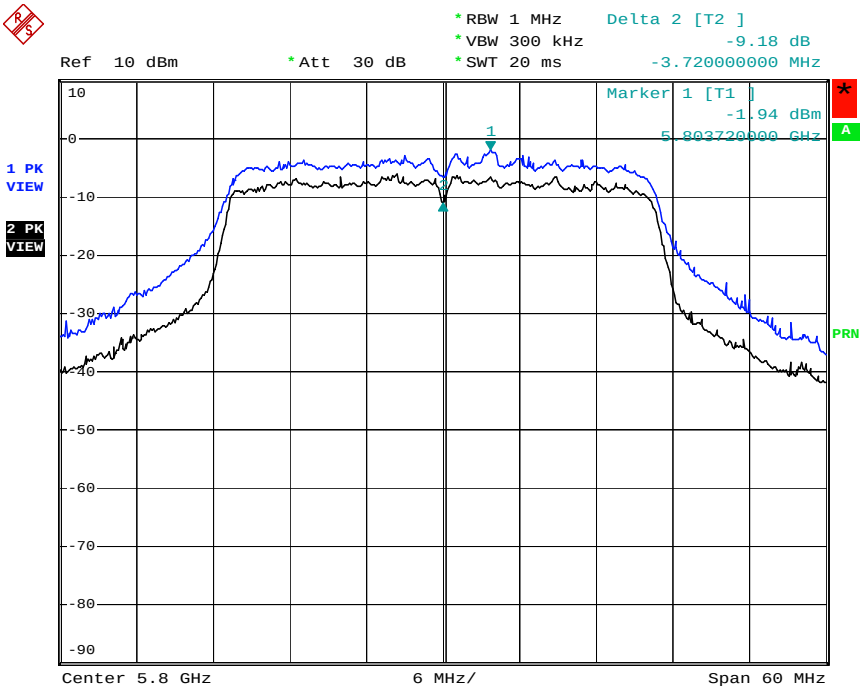
Date: 6.MAR.2007 16:00:38

Peak Power Excursion measurement
FCC Part 15 Subpart 15.407
802.11a turbo, Channel 152



Date: 6.MAR.2007 16:37:09

Peak Power Excursion measurement
FCC Part 15 Subpart 15.407
802.11a turbo, Channel 160



Date: 6.MAR.2007 16:41:45

5.17 Power Spectral Density

For test instruments and accessories used see section 6 Part **CPC3**.

5.17.1 Description of the test location

Test location: AREA4

5.17.2 Photo documentation of the test set-up

5.17.3 Description of Measurement

The EuT was connected to the spectrum analyzer with a suitable attenuator. The bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3 kHz RBW and 30 kHz VBW, set sweep time equal to span/3 kHz. The power spectral density was measured and recorded.
Settings on the spectrum analyzer:

RBW:	3 kHz
VBW:	30 kHz
Sweep:	auto
Detecter function:	Peak

5.17.4 Test result

802.11a UNII-1; Data rate: 54 Mbps; Full power

Channel	Fundamental Frequency [MHz]	Power Spectral Density (dBm)
36	5180	-5.15
48	5240	-7.74

802.11a turbo UNII-1; Data rate: 108 Mbps; Full power

Channel	Fundamental Frequency [MHz]	Power Spectral Density (dBm)
42	5210	0.25

802.11a UNII-3; Data rate: 54 Mbps; Full power

Channel	Fundamental Frequency [MHz]	Power Spectral Density (dBm)
149	5745	0.36
161	5805	-3.37

802.11a turbo UNII-3; Data rate: 108 Mbps; Full power

Channel	Fundamental Frequency [MHz]	Power Spectral Density (dBm)
152	5760	-4.50
160	5800	-6.21

Limit according to FCC Subpart 15.407 (a)(1)(2)(3) / RSS-210, A9.2

The peak power spectral density shall not be greater than 4 dBm in any 1MHz band.

The requirements are **FULFILLED.**

Remarks: _____

5.18 Antenna application

5.18.1 Antenna requirements

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.
And according to FCC 47 CFR Section 15.407 (a), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

5.18.2 Result

There are different external antennas provided, which are listed under general remark of this test report.
Only these types will be used with the device.

All provided antennas met the requirement of FCC part 15C section 15.203 and 15.204.

For the power reduction of the antennas exceeds 6dBi, please refer to see detailed information under max. output power of this test report.

The requirements are **FULFILLED.**

Remarks: _____

5.19 Frequency stability

5.19.1 Limit of Frequency stability according to RSS-210, A9.5(e)

The frequency tolerance of the carrier signal shall be better than ±10ppm.

5.19.2 Result

According to a declaration of the module manufacturer, the frequency tolerance is under extreme test conditions for the 2.4 GHz band max. -8.83 ppm and for the 5 GHz bands max. -8.72 ppm.

The requirements are **FULFILLED.**

Remarks: _____

6 USED TEST EQUIPMENT AND ACCESSORIES

All test instruments used, in addition to the test accessories, are calibrated and verified regularly.

The calibration intervals and the calibration history will be given out on request.

Test Report No: T31583-00-00KG
Beginning of Testing: 02 März 2007
End of Testing: 23 März 2007

Test ID	Model Type	Kind of Equipment	Manufacturer	Equipment No.
A 4	ESHS 30	EMI Test Receiver	Rohde & Schwarz München	02-02/03-05-002
	NNLK 8129	LISN	Schwarzbeck Mess-Elektronik	02-02/20-05-001
	ESH 2 - Z 5	LISN	Rohde & Schwarz München	02-02/20-05-004
	ESH 3 - Z 2	Pulse Limiter	Rohde & Schwarz München	02-02/50-05-001
	N-4000-BNC	RF Cable	mikes-testingpartners gmbh	02-02/50-05-138
	N-1500-N	RF Cable	mikes-testingpartners gmbh	02-02/50-05-140
CPC 3	Detector	201B	Tactron Elektronik	02-02/07-06-004
	FSP 30	Spectrum Analyzer	Rohde & Schwarz München	02-02/11-05-001
	WK-340/40	Climatic Chamber	Weiss Umwelttechnik GmbH	02-02/45-05-001
	50 Ohm / 10 dB / 18 GHz	Attenuator	Huber + Suhner	02-02/50-05-078
	6543A	Power Supply	HP Hewelett-Packard	02-02/50-05-157
	TDS210	Oscilloscope	Tektronix GmbH	02-03/13-05-001
CPR 3	AFS4-01000400-10-10P-4	RF Amplifier 1-4 GHz	PARZICH GMBH	02-02/17-05-003
	AMF-4F-04001200-15-10P	RF Amplifier 4-12 GHz	PARZICH GMBH	02-02/17-05-004
	AFS5-12001800-18-10P-6	RF Amplifier 12-18 GHz	PARZICH GMBH	02-02/17-06-002
	3117	Horn Antenna 1-18 GHz	EMCO Elektronik GmbH	02-02/24-05-009
	Sucoflex N-1600-SMA	RF Cable	novotronik Signalverarbeitung	02-02/50-05-073
	Sucoflex N-2000-SMA	RF Cable	novotronik Signalverarbeitung	02-02/50-05-075
MB	FSP 7	Spectrum Analyzer	Rohde & Schwarz München	01-02/11-05-002
	FSP 30	Spectrum Analyzer	Rohde & Schwarz München	02-02/11-05-001
	WK-340/40	Climatic Chamber	Weiss Umwelttechnik GmbH	02-02/45-05-001
	WLJS 1200-3EF	Low Pass Filter	Wainwright Instruments GmbH	02-02/50-05-041
	50 Ohm / 10 dB / 18 GHz	Attenuator	Huber + Suhner	02-02/50-05-078
	6543A	Power Supply	HP Hewelett-Packard	02-02/50-05-157
	WHK3.0/18G-10EF	High Pass Filter	Wainwright Instruments GmbH	02-02/50-05-180
SEC 1-3	FSP 7	Spectrum Analyzer	Rohde & Schwarz München	01-02/11-05-002
	FSP 30	Spectrum Analyzer	Rohde & Schwarz München	02-02/11-05-001
	WK-340/40	Climatic Chamber	Weiss Umwelttechnik GmbH	02-02/45-05-001
	WLJS 1200-3EF	Low Pass Filter	Wainwright Instruments GmbH	02-02/50-05-041
	50 Ohm / 10 dB / 18 GHz	Attenuator	Huber + Suhner	02-02/50-05-078
	6543A	Power Supply	HP Hewelett-Packard	02-02/50-05-157
	WHK3.0/18G-10EF	High Pass Filter	Wainwright Instruments GmbH	02-02/50-05-180

Test Report No: T31583-00-00KG
Beginning of Testing: 02 März 2007
End of Testing: 23 März 2007

Test ID	Model Type	Kind of Equipment	Manufacturer	Equipment No.
SER 1	FMZB 1516	Magnetic Field Antenna	Schwarzbeck Mess-Elektronik	01-02/24-01-018
	ESCI	EMI Test Receiver	Rohde & Schwarz München	02-02/03-05-004
SER 2	ESVS 30	EMI Test Receiver	Rohde & Schwarz München	02-02/03-05-006
	VULB 9168	Trilog-Broadband Antenna	Schwarzbeck Mess-Elektronik	02-02/24-05-005
	S10162-B/+11N-50-10-5/+11N		RF Cable 33m	Huber + Suhner
	02-02/50-05-031			
	KK-EF393-21N-16	RF Cable 20m	Huber + Suhner	02-02/50-05-033
	NW-2000-NB	RF Cable	Huber + Suhner	02-02/50-05-113
SER 3	AFS4-01000400-10-10P-4	RF Amplifier 1-4 GHz	PARZICH GMBH	02-02/17-05-003
	AMF-4F-04001200-15-10P	RF Amplifier 4-12 GHz	PARZICH GMBH	02-02/17-05-004
	AFS5-12001800-18-10P-6	RF Amplifier 12-18 GHz	PARZICH GMBH	02-02/17-06-002
	3117	Horn Antenna 1-18 GHz	EMCO Elektronik GmbH	02-02/24-05-009
	Sucoflex N-1600-SMA	RF Cable	novotronik Signalverarbeitung	02-02/50-05-073
	Sucoflex N-2000-SMA	RF Cable	novotronik Signalverarbeitung	02-02/50-05-075