

## RF Exposure Test Report

<b>Test Report No. :</b> <b>T31583-00-01AA</b>	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

<b>Test Result</b> according to the standards listed in clause 1 test standards:	<b>POSITIVE</b>
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The test report merely corresponds to the test sample. It is not permitted to copy extracts of these test results without the written permission of the test laboratory.

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## **1 TEST STANDARDS**

The tests were performed according to following standards:

### **FCC Rules and Regulations Part 15 Subpart C - Intentional Radiators (October 01, 2005)**

Part 15, Subpart C, Section 15.209(a)	Radiated emissions, general requirements
Part 15, Subpart C, Section 15.247(b)(1)	Maximum Peak output Power of intentional radiator
Part 15, Subpart C, Section 15.215(c)	Additional Provisions to the general radiated emission limitations

### **FCC Rules and Regulations Part 15 Subpart E – Unlicensed National Information Infrastructure Devices (October 01, 2005)**

Part 15, Subpart E, Section 15.407	General technical requirements
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### **FCC Rules and Regulations Part 1 Subpart I - Procedures Implementing the National Environmental Policy Act of 1969**

Part 1, Subpart I, Section 1.1310	Radiofrequency radiation exposure limits.
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**OET Bulletin 65, 65A, 65B, 65C Edition 97-01, August 1997 – Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields.**

## 2 SUMMARY

### GENERAL REMARKS:

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

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 technology. The WLAN module is 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 capable 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:

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

**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 : 07. March 2007

Testing concluded on : 28. March 2007

Checked by:

Tested by:

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

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Anton Altmann  
Dipl.-Ing.(FH)

### 3 EQUIPMENT UNDER TEST

#### 3.1 Power supply system utilised

Power supply voltage : 48 V DC

#### 3.2 Short description of the Equipment under Test (EuT)

The EuT is a WLAN Industrial Outdoor Access Point (iOAP). There are different variants of antenna options (Internal and external connections).

Number of tested samples: 1  
Serial number CB3000: Prototype

#### EuT operation mode:

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

- Continuous transmit mode

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#### 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:

- 48 VDC Battery Model : 2 wire unscreened
- Ethernet cable Model : \_\_\_\_\_
- \_\_\_\_\_ 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

### 4.4.1 GENERAL INFORMATION

#### 4.4.1.1 Test Methodology

The maximum total power input to the antenna has been measured conducted. Through the Friis transmission formula, which is a far field assumption and the known maximum gain of the antenna, the maximum MPE at a distance of 20 cm away from the product, can be calculated.

#### Friis Formula

$$\text{Friis transmission formula: } P_d = \frac{P_{out} * G}{4 * \Pi * r^2}$$

where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

G = gain of antenna (linear scale)

r = distance between antenna and observation point [cm]

#### 4.4.1.2 Justification

The Equipment Under Test (EUT) is configured in a typical user arrangement in accordance with the manufacturer's instructions.

### 4.4.2 DETAILS OF TEST PROCEDURES

The test methods used comply with ANSI/IEEE C95.1-1992, "IEEE Standard for Safety Levels with respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz".

This test report shows the compliance with the limits for Maximum Permissible Exposure (MPE) specified in FCC 1.1310 and the criteria to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in FCC 1.1307(b).

#### Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Averaging Time (minutes)
<b>(A) Limits for Occupational / Controlled Exposure</b>				
300-1500	---	---	f/300	6
1500-100000	---	---	5.0	6
<b>(B) Limits for General Population / Uncontrolled Exposure</b>				
300-1500	---	---	f/1500	30
1500-100000	---	---	1.0	30

f = Frequency in MHz



## **5 TEST CONDITIONS AND RESULTS**

### **5.1 Maximum Permissible Exposure (MPE)**

For test instruments and accessories used see section 6 Part MPE.

#### **5.1.1 Description of the test location**

Test location: AREA4

#### **5.1.2 Description of Measurement**

Conducted maximum output power:

##### **5.1.2.1 Test procedure in the 2.4 GHz band**

At first the output of the EuT has been connected by a diode detector to an oscilloscope. Then the EuT has been replaced by a generator and adjusted to the center frequency of the measured channel of the EuT. Record the output power of the generator.

##### **5.1.2.2 Test procedure in the 5 GHz band**

A spectrum analyzer has been connected to the output of the transmitter via a suitable attenuator while EuT was operating in transmit mode using the assigned frequency.

Analyzer Settings:

- Detector: Peak detector
- RBW: 1 MHz
- VBW:  $\geq 1/T$
- Sweep Time: free run
- Band power measurement function

Computing power by integrating the spectrum across the 26 dB EBW or apply a bandwidth correction factor of 10 log (EBW/ 1MHz) to the spectral peak of the emission. The integration has been performed using the spectrum analyzer's band power measurement function with band limits set equal to the band edges.

#### **5.1.3 Compliance regarding co-location and co-transmission**

There is no co-location issue with 2 and 3 transmitters operating simultaneously. The reason for this is, that one module with the test software transmits with the highest possible duty cycle. If more than one module is active, the duty cycle for each module will be reduced. It is not possible (controlled by host computer) that the modules transmit at the same time slot.

5.1.4 Test result

Results of power density in relation to the limit at a distance of 20 cm

- 5.1.4.1 Antenna type: ANT795-6MN
- Antenna gain at 2.4 GHz: 6 dBi
- Antenna gain at 5 GHz: 8 dBi

802.11b  
DSSS Modulation

Frequency band: 2400 -2483.5 MHz

Channel No.	Software Power Setting (dB)	Frequency (MHz)	Max Power Output to Antenna (mW)	Power Density (mW/cm <sup>2</sup> )	Limit of Power Density (mW/cm <sup>2</sup> )
1	0	2412	104,713	0,083	1.0
6	0	2437	97,724	0,077	1.0
11	0	2462	100,000	0,079	1.0

802.11g  
OFDM Modulation

Frequency band: 2400 -2483.5 MHz

Channel No.	Software Power Setting (dB)	Frequency (MHz)	Max Power Output to Antenna (mW)	Power Density (mW/cm <sup>2</sup> )	Limit of Power Density (mW/cm <sup>2</sup> )
1	0	2412	97,724	0,077	1.0
6	0	2437	109,648	0,087	1.0
6 (turbo)	0	2437	169,824	0,135	1.0
11	0	2462	72,444	0,057	1.0

802.11a  
OFDM Modulation

Frequency band: 5150 -5250 MHz

Channel	Software Power Setting (dB)	Frequency (MHz)	Max Power Output to Antenna (mW)	Power Density (mW/cm <sup>2</sup> )	Limit of Power Density (mW/cm <sup>2</sup> )
36	-0	5180	26,669	0,033	1.0
42 (turbo)	-3	5210	12,882	0,016	1.0
48	0	5240	22,336	0,028	1.0

Frequency band: 5725 – 5850 MHz

Channel	Software Power Setting (dB)	Frequency (MHz)	Max Power Output to Antenna (mW)	Power Density (mW/cm <sup>2</sup> )	Limit of Power Density (mW/cm <sup>2</sup> )
149	0	5745	38,194	0,048	1.0
152 (turbo)	0	5760	27,040	0,034	1.0
160 (turbo)	0	5800	19,011	0,024	1.0
161	0	5805	19,143	0,024	1.0
165	0	5825	27,669	0,035	1.0

5.1.4.2 Antenna type: ANT792-6MN  
Antenna gain at 2.4 GHz: 6 dBi

802.11b  
DSSS Modulation

Frequency band: 2400 -2483.5 MHz

Channel No.	Software Power Setting (dB)	Frequency (MHz)	Max Power Output to Antenna (mW)	Power Density (mW/cm <sup>2</sup> )	Limit of Power Density (mW/cm <sup>2</sup> )
1	0	2412	104,713	0,083	1.0
6	0	2437	97,724	0,077	1.0
11	0	2462	100,000	0,079	1.0

802.11g  
OFDM Modulation

Frequency band: 2400 -2483.5 MHz

Channel No.	Software Power Setting (dB)	Frequency (MHz)	Max Power Output to Antenna (mW)	Power Density (mW/cm <sup>2</sup> )	Limit of Power Density (mW/cm <sup>2</sup> )
1	-3	2412	48,978	0,039	1.0
6	-3	2437	54,954	0,044	1.0
6 (turbo)	-6	2437	42,658	0,034	1.0
11	-3	2462	36,308	0,029	1.0

5.1.4.3 Antenna type: ANT793-6MN  
Antenna gain at 5 GHz: 5 dBi

802.11a  
OFDM Modulation

Frequency band: 5150 -5250 MHz

Channel	Software Power Setting (dB)	Frequency (MHz)	Max Power Output to Antenna (mW)	Power Density (mW/cm <sup>2</sup> )	Limit of Power Density (mW/cm <sup>2</sup> )
36	-3	5180	13,366	0,008	1.0
42 (turbo)	-3	5210	12,882	0,008	1.0
48	-3	5240	11,194	0,007	1.0

Frequency band: 5725 – 5850 MHz

Channel	Software Power Setting (dB)	Frequency (MHz)	Max Power Output to Antenna (mW)	Power Density (mW/cm <sup>2</sup> )	Limit of Power Density (mW/cm <sup>2</sup> )
149	0	5745	38,194	0,024	1.0
152 (turbo)	0	5760	27,040	0,017	1.0
160 (turbo)	0	5800	19,011	0,012	1.0
161	0	5805	19,143	0,012	1.0
165	0	5825	27,669	0,017	1.0

5.1.4.4 Antenna type: ANT795-6DN  
 Antenna gain at 2.4 GHz: 9 dBi  
 Antenna gain at 5 GHz: 9 dBi

802.11b  
 DSSS Modulation

Frequency band: 2400 -2483.5 MHz

Channel No.	Software Power Setting (dB)	Frequency (MHz)	Max Power Output to Antenna (mW)	Power Density (mW/cm <sup>2</sup> )	Limit of Power Density (mW/cm <sup>2</sup> )
1	0	2412	104,713	0,165	1.0
6	0	2437	97,724	0,154	1.0
11	0	2462	100,000	0,158	1.0

802.11g  
 OFDM Modulation

Frequency band: 2400 -2483.5 MHz

Channel No.	Software Power Setting (dB)	Frequency (MHz)	Max Power Output to Antenna (mW)	Power Density (mW/cm <sup>2</sup> )	Limit of Power Density (mW/cm <sup>2</sup> )
1	-3	2412	48,978	0,077	1.0
6	0	2437	109,648	0,173	1.0
6 (turbo)	-3	2437	85,114	0,135	1.0
11	-0	2462	72,444	0,114	1.0

802.11a  
 OFDM Modulation

Frequency band: 5150 -5250 MHz

Channel	Software Power Setting (dB)	Frequency (MHz)	Max Power Output to Antenna (mW)	Power Density (mW/cm <sup>2</sup> )	Limit of Power Density (mW/cm <sup>2</sup> )
36	-12	5180	6,699	0,011	1.0
42 (turbo)	-3	5210	6,457	0,010	1.0
48	-12	5240	11,194	0,018	1.0

Frequency band: 5725 – 5850 MHz

Channel	Software Power Setting (dB)	Frequency (MHz)	Max Power Output to Antenna (mW)	Power Density (mW/cm <sup>2</sup> )	Limit of Power Density (mW/cm <sup>2</sup> )
149	0	5745	38,194	0,060	1.0
152 (turbo)	0	5760	27,040	0,043	1.0
160 (turbo)	0	5800	19,011	0,030	1.0
161	0	5805	19,143	0,030	1.0
165	0	5825	27,669	0,040	1.0

5.1.4.5 Antenna type: ANT792-8DN  
Antenna gain at 2.4 GHz: 14

802.11b  
DSSS Modulation

Frequency band: 2400 -2483.5 MHz

Channel No.	Software Power Setting (dB)	Frequency (MHz)	Max Power Output to Antenna (mW)	Power Density (mW/cm <sup>2</sup> )	Limit of Power Density (mW/cm <sup>2</sup> )
1	-9	2412	13,183	0,066	1.0
6	-3	2437	48,978	0,245	1.0
11	-9	2462	12,589	0,063	1.0

802.11g  
OFDM Modulation

Frequency band: 2400 -2483.5 MHz

Channel No.	Software Power Setting (dB)	Frequency (MHz)	Max Power Output to Antenna (mW)	Power Density (mW/cm <sup>2</sup> )	Limit of Power Density (mW/cm <sup>2</sup> )
1	-9	2412	12,303	0,061	1.0
6	-6	2437	27,542	0,138	1.0
6 (turbo)	-9	2437	21,380	0,107	1.0
11	-9	2462	9,120	0,046	1.0

5.1.4.6 Antenna type: ANT793-8DN  
Antenna gain at 5 GHz: 18 dBi

Frequency band: 5725 – 5850 MHz

Channel	Software Power Setting (dB)	Frequency (MHz)	Max Power Output to Antenna (mW)	Power Density (mW/cm <sup>2</sup> )	Limit of Power Density (mW/cm <sup>2</sup> )
149	-9	5745	4,808	0,060	1.0
152 (turbo)	-9	5760	3,404	0,043	1.0
160 (turbo)	-9	5800	2,393	0,030	1.0
161	-9	5805	2,410	0,030	1.0
165	-9	5825	3,483	0,044	1.0

5.1.4.7 Antenna type: ANT792-4DN  
Antenna gain at 2.4 GHz:

802.11b  
DSSS Modulation

Frequency band: 2400 -2483.5 MHz

Channel No.	Software Power Setting (dB)	Frequency (MHz)	Max Power Output to Antenna (mW)	Power Density (mW/cm <sup>2</sup> )	Limit of Power Density (mW/cm <sup>2</sup> )
1	0	2412	104,713	0,052	1.0
6	0	2437	97,724	0,049	1.0
11	0	2462	100,000	0,050	1.0

802.11g  
OFDM Modulation

Frequency band: 2400 -2483.5 MHz

Channel No.	Software Power Setting (dB)	Frequency (MHz)	Max Power Output to Antenna (mW)	Power Density (mW/cm <sup>2</sup> )	Limit of Power Density (mW/cm <sup>2</sup> )
1	0	2412	97,724	0,049	1.0
6	0	2437	109,648	0,055	1.0
6 (turbo)	0	2437	169,824	0,085	1.0
11	0	2462	72,444	0,036	1.0

5.1.4.8 Antenna type: ANT793-4MN  
Antenna gain at 5 GHz: 6 dBi

802.11a  
OFDM Modulation

Frequency band: 5150 -5250 MHz

Channel	Software Power Setting (dB)	Frequency (MHz)	Max Power Output to Antenna (mW)	Power Density (mW/cm <sup>2</sup> )	Limit of Power Density (mW/cm <sup>2</sup> )
36	0	5180	26,669	0,021	1.0
42 (turbo)	0	5210	25,704	0,020	1.0
48	0	5240	22,336	0,018	1.0

Frequency band: 5725 – 5850 MHz

Channel	Software Power Setting (dB)	Frequency (MHz)	Max Power Output to Antenna (mW)	Power Density (mW/cm <sup>2</sup> )	Limit of Power Density (mW/cm <sup>2</sup> )
149	0	5745	38,194	0,030	1.0
152 (turbo)	0	5760	27,040	0,021	1.0
160 (turbo)	0	5800	19,011	0,015	1.0
161	0	5805	19,143	0,015	1.0
165	0	5825	27,669	0,022	1.0

5.1.4.9 Antenna type: IWLAN Rcoax PE ½” 2.4 GHz  
Antenna gain at 2.4 GHz: 0 dBi

802.11b  
DSSS Modulation

Frequency band: 2400 -2483.5 MHz

Channel No.	Software Power Setting (dB)	Frequency (MHz)	Max Power Output to Antenna (mW)	Power Density (mW/cm <sup>2</sup> )	Limit of Power Density (mW/cm <sup>2</sup> )
1	0	2412	104,713	0,021	1.0
6	0	2437	97,724	0,019	1.0
11	0	2462	100,000	0,020	1.0

802.11g  
OFDM Modulation

Frequency band: 2400 -2483.5 MHz

Channel No.	Software Power Setting (dB)	Frequency (MHz)	Max Power Output to Antenna (mW)	Power Density (mW/cm <sup>2</sup> )	Limit of Power Density (mW/cm <sup>2</sup> )
1	0	2412	97,724	0,019	1.0
6	0	2437	109,648	0,022	1.0
6 (turbo)	0	2437	169,824	0,034	1.0
11	0	2462	72,444	0,014	1.0

5.1.4.10 Antenna type: IWLAN Rcoax PE ½” 5 GHz  
Antenna gain at 5 GHz: 0 dBi

802.11a  
OFDM Modulation

Frequency band: 5150 -5250 MHz

Channel	Software Power Setting (dB)	Frequency (MHz)	Max Power Output to Antenna (mW)	Power Density (mW/cm <sup>2</sup> )	Limit of Power Density (mW/cm <sup>2</sup> )
36	0	5180	26,669	0,005	1.0
42 (turbo)	0	5210	25,704	0,005	1.0
48	0	5240	22,336	0,004	1.0

Frequency band: 5725 – 5850 MHz

Channel	Software Power Setting (dB)	Frequency (MHz)	Max Power Output to Antenna (mW)	Power Density (mW/cm <sup>2</sup> )	Limit of Power Density (mW/cm <sup>2</sup> )
149	0	5745	38,194	0,008	1.0
152 (turbo)	0	5760	27,040	0,005	1.0
160 (turbo)	0	5800	19,011	0,004	1.0
161	0	5805	19,143	0,004	1.0
165	0	5825	27,669	0,006	1.0

5.1.4.11 Antenna type: A5E00982361  
 Antenna gain at 2.4 GHz: 3 dBi  
 Antenna gain at 5 GHz: 3.5 dBi

802.11b  
 DSSS Modulation

Frequency band: 2400 -2483.5 MHz

Channel No.	Software Power Setting (dB)	Frequency (MHz)	Max Power Output to Antenna (mW)	Power Density (mW/cm <sup>2</sup> )	Limit of Power Density (mW/cm <sup>2</sup> )
1	0	2412	104,713	0,042	1.0
6	0	2437	97,724	0,039	1.0
11	0	2462	100,000	0,040	1.0

802.11g  
 OFDM Modulation

Frequency band: 2400 -2483.5 MHz

Channel No.	Software Power Setting (dB)	Frequency (MHz)	Max Power Output to Antenna (mW)	Power Density (mW/cm <sup>2</sup> )	Limit of Power Density (mW/cm <sup>2</sup> )
1	0	2412	97,724	0,039	1.0
6	0	2437	109,648	0,044	1.0
6 (turbo)	0	2437	169,824	0,067	1.0
11	0	2462	72,444	0,029	1.0

802.11a  
 OFDM Modulation

Frequency band: 5150 -5250 MHz

Channel	Software Power Setting (dB)	Frequency (MHz)	Max Power Output to Antenna (mW)	Power Density (mW/cm <sup>2</sup> )	Limit of Power Density (mW/cm <sup>2</sup> )
36	0	5180	26,669	0,012	1.0
42 (turbo)	0	5210	25,704	0,011	1.0
48	0	5240	22,336	0,010	1.0

Frequency band: 5725 – 5850 MHz

Channel	Software Power Setting (dB)	Frequency (MHz)	Max Power Output to Antenna (mW)	Power Density (mW/cm <sup>2</sup> )	Limit of Power Density (mW/cm <sup>2</sup> )
149	0	5745	38,194	0,017	1.0
152 (turbo)	0	5760	27,040	0,012	1.0
160 (turbo)	0	5800	19,011	0,008	1.0
161	0	5805	19,143	0,009	1.0
165	0	5825	27,669	0,012	1.0



5.1.4.12 Antenna type: A5E00982362  
 Antenna gain at 2.4 GHz: 3 dBi  
 Antenna gain at 5 GHz: 3.5 dBi

802.11b  
 DSSS Modulation

Frequency band: 2400 -2483.5 MHz

Channel No.	Software Power Setting (dB)	Frequency (MHz)	Max Power Output to Antenna (mW)	Power Density (mW/cm <sup>2</sup> )	Limit of Power Density (mW/cm <sup>2</sup> )
1	0	2412	104,713	0,042	1.0
6	0	2437	97,724	0,039	1.0
11	0	2462	100,000	0,040	1.0

802.11g  
 OFDM Modulation

Frequency band: 2400 -2483.5 MHz

Channel No.	Software Power Setting (dB)	Frequency (MHz)	Max Power Output to Antenna (mW)	Power Density (mW/cm <sup>2</sup> )	Limit of Power Density (mW/cm <sup>2</sup> )
1	0	2412	97,724	0,039	1.0
6	0	2437	109,648	0,044	1.0
6 (turbo)	0	2437	169,824	0,067	1.0
11	0	2462	72,444	0,029	1.0

802.11a  
 OFDM Modulation

Frequency band: 5150 -5250 MHz

Channel	Software Power Setting (dB)	Frequency (MHz)	Max Power Output to Antenna (mW)	Power Density (mW/cm <sup>2</sup> )	Limit of Power Density (mW/cm <sup>2</sup> )
36	0	5180	26,669	0,012	1.0
42 (turbo)	0	5210	25,704	0,011	1.0
48	0	5240	22,336	0,010	1.0

Frequency band: 5725 – 5850 MHz

Channel	Software Power Setting (dB)	Frequency (MHz)	Max Power Output to Antenna (mW)	Power Density (mW/cm <sup>2</sup> )	Limit of Power Density (mW/cm <sup>2</sup> )
149	0	5745	38,194	0,017	1.0
152 (turbo)	0	5760	27,040	0,012	1.0
160 (turbo)	0	5800	19,011	0,008	1.0
161	0	5805	19,143	0,009	1.0
165	0	5825	27,669	0,012	1.0

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.

<b>Test ID</b>	<b>Model / Type</b>	<b>Kind of Equipment</b>	<b>Manufacturer</b>	<b>Equipment No.</b>
MPE	SMR 20	Signal Generator	Rohde & Schwarz München	01-02/05-05-002
	Waverunner 204XI	Oscilloscope	LeCroy Europe GmbH	01-02/13-07-001
	6000A	DC Supply Unit	Peak Tech	01-05/50-05-005
	Detector	201B	Tactron Elektronik	02-02/07-06-004
	FSP 30	Spectrum Analyzer	Rohde & Schwarz München	02-02/11-05-001

mikes