5.5 Maximum permissible exposure (MPE)

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

5.5.1 Description of the test location

Test location: AREA 4

5.5.2 Applicable standard

According to FCC Part 15, Section 15.247(i):
Systems operating under the provisions of this section shall be operated in a manner that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines.
The test methods used comply with ANSI/IEEE C95.1, "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 Part 1, Section 1.1310 and the criteria to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in FCC Part 1, Section 1.1307(b).

5.5.3 Description of Measurement

The maximum total power input to the antenna has been measured conducted as described in clause 5.3 of this document. Through the Friis transmission formula, the known maximum gain of the antenna and the maximum power, can be calculated the MPE in a defined distance away from the product.

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

where

P_d =power density (mW/cm^2)
P_{out} = output power to antenna (mW)
G = gain of antenna (linear scale)
r = distance between antenna and observation point (cm)

According to FCC Rules 47CFR 2.1093(b) the EuT is not a portable device. The EuT is designed to be used that radiating structures are 20 cm outside of the body of the user.

5.5.4 Test result

WLAN Standard 802.11b

Worst case: Antenna Nahfeldkoppler with an antenna gain of 2.7 dBi, Power setting: 22

Channel No.	Frequency	Max power output to antenna		Antenna gain	Power density	Limit of power density
	(MHz)	(dBm)	(mW)	(dBi)	(mW/cm^2)	(mW/cm^2)
1	2412	21.2	131.8	2.7	0.049	1.0
6	2437	21.4	138.0	2.7	0.051	1.0
11	2462	21.6	144.5	2.7	0.054	1.0

WLAN Standard 802.11g

Worst case: Antenna Nahfeldkoppler with an antenna gain of 2.7 dBi, Power setting: 18

Channel No.	Frequency	Max power output to antenna		Antenna gain	Power density	Limit of power density
	(MHz)	(dBm)	(mW)	(dBi)	(mW/cm^2)	(mW/cm^2)
1	2412	17.4	55.0	2.7	0.020	1.0
6	2437	17.0	50.1	2.7	0.019	1.0
6 (turbo)	2437	16.5	44.7	2.7	0.017	1.0
11	2462	17.5	56.2	2.7	0.021	1.0

WLAN Standard 802.11a

Worst case: Antenna Nahfeldkoppler with an antenna gain of 3.0 dBi, Power setting: 18

Channel No.	Frequency	Max power output to antenna		Antenna gain	Power density	Limit of power density
	(MHz)	(dBm)	(mW)	(dBi)	(mW/cm^2)	(mW/cm^2)
149	5745	17.5	56.2	3.0	0.022	1.0
157	5785	18.4	69.2	3.0	0.027	1.0
165	5825	18.8	75.9	3.0	0.030	1.0

Limits for maximum permissible exposure (MPE):

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(B) Limits for General Population / Uncontrolled Exposure				
0.3 – 3.0	614	1.63	100	30
3.0 – 30	824/*f*	2.19/*f*	180/ f^2	30
30 - 300	27.5	0.073	0.2	30
300-1500	---	---	*f*/1500	30
1500-100000	**---**	**---**	**1.0**	**30**

f = Frequency in MHz

The requirements are **FULFILLED.**

Remarks: Addition of new antennas would not change previous results.