5.6   Co-location and co-transmission

This WLAN-Module is co-located to a GSM 1900 module and a BT-Module. These functions are designed to be "either" "or" in operation but the software permits to switch BT on while WLAN is connected to a net and GSM is running. A co-transmission of the WLAN-Module in the same frequency range 2400 – 2483.5 MHz is not possible because the BT device adopt the hopset to avoid hopping on occupied channels, according to Part C 15.247(h) and the GSM device is operation in the 1900 MHz band. The radiated direction of each of the transmitter is in case of co-transmission different. Each transmitter use an own build-in antenna are scattered in any direction and therefore is not awaited a boost of the radiated emissions. This could be verified via the measurement of the radiated peak output power while operating all transmitters. The peak hold function helped to display the different frequency ranges with the peak output power. In no range could be recognised an increase of the radiation in relation to the output power measured while only the appropriate transmitter was active.

5.7   Maximum permissible exposure (MPE)

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

5.7.1   Description of the test location

Test location: AREA4

5.7.2   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).

5.7.3   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: $P_d = \dfrac{P_{out} * G}{4 * \Pi * r^2}$

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)

The EUT is according to FCC Rules 47CFR 2.1093(b) no portable device. The EUT is designed to be used that radiating structures are outside 20 cm of the body of the user (r=20 cm).

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File No. **T33864-00-01HS**, page **36** of **39**

Rev. No. 1.1

5.7.4 Test result

WLAN Standard 802.11b

Worst case: Internally antenna with an antenna gain of 2.7 dBi, Power setting: 30

Channel No.	Frequency	Max conducted power		Antenna gain	PD	Limit of PD
	(MHz)	(dBm)	(mW)	(dBi)	(mW/cm^2)	(mW/cm^2)
1	2412	23.0	200	2.7	0.074	1.0
6	2437	23.1	204	2.7	0.075	1.0
11	2462	22.9	195	2.7	0.072	1.0

WLAN Standard 802.11g

Worst case: Internally antenna with an antenna gain of 2.7 dBi, Power setting: 30

Channel No.	Frequency	Max conducted power		Antenna gain	PD	Limit of PD
	(MHz)	(dBm)	(mW)	(dBi)	(mW/cm^2)	(mW/cm^2)
1	2412	18.6	72	2.7	0.027	1.0
6	2437	18.5	71	2.7	0.026	1.0
11	2462	18.5	71	2.7	0.026	1.0

Limits for maximum permissible exposure (MPE)

Frequency (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:

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File No. **T33864-00-01HS**, page **37** of **39**

Rev. No. 1.1