5 TEST CONDITIONS AND RESULTS

5.1 Conducted emissions

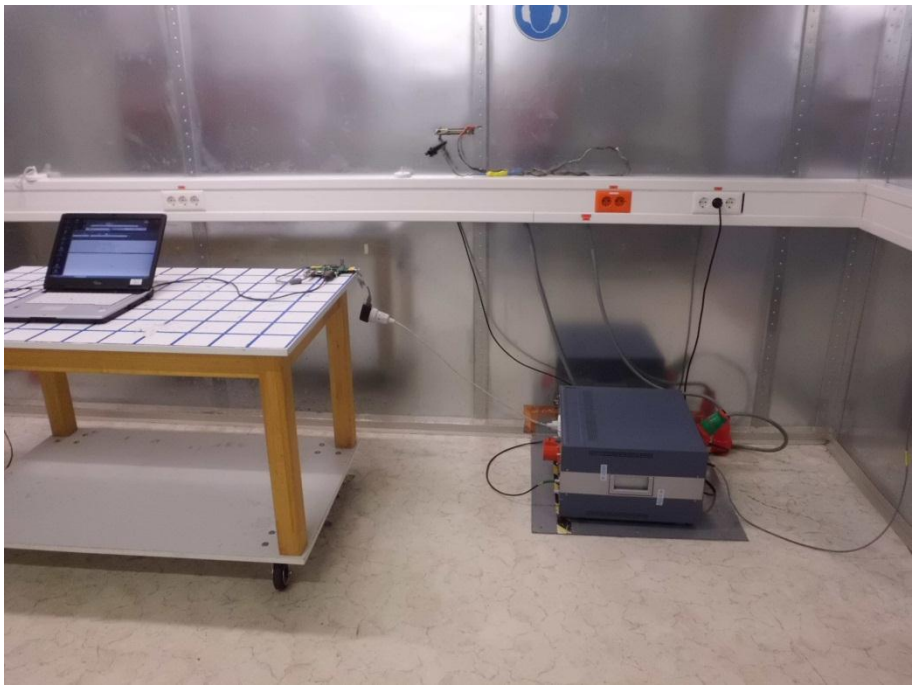
For test instruments and accessories used see section 6 Part **A 4**.

Legend for tables:
QP-L … QuasiPeak reading including correction factor
AV-L … Average reading including correction factor
D-Limit… Measured value to limit delta (margin)

5.1.1 Description of the test location

Test location: Shielded Room 2

5.1.2 Photo documentation of the test set-up



5.1.3 Applicable standard

According to FCC Part 15C, Section 15.207(a):
Intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto th AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz.

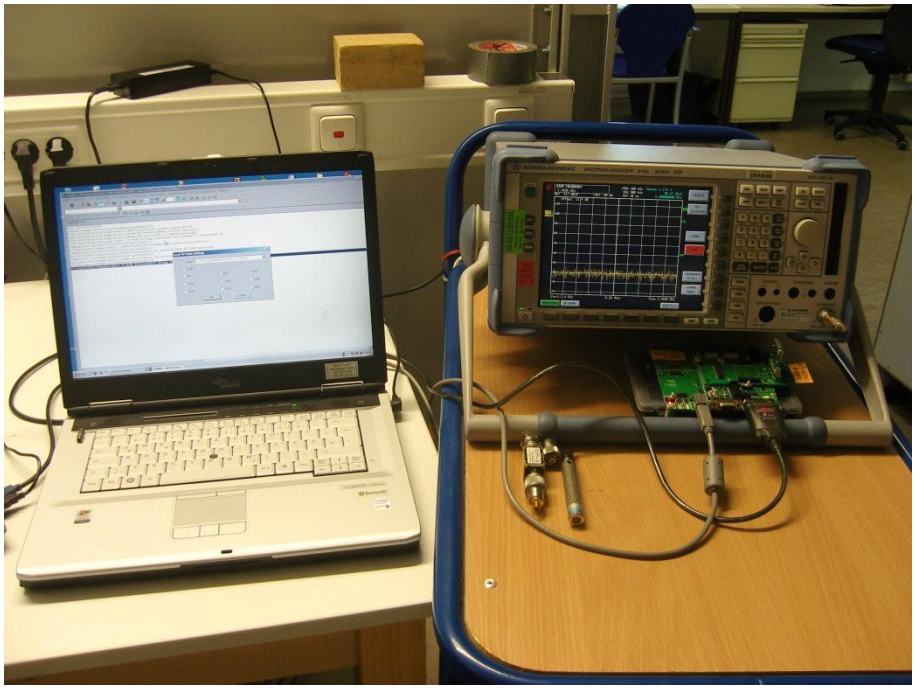
5.2 Emission bandwidth

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

5.2.1 Description of the test location

Test location: Shielded Room 4

5.2.2 Photo documentation of the test set-up



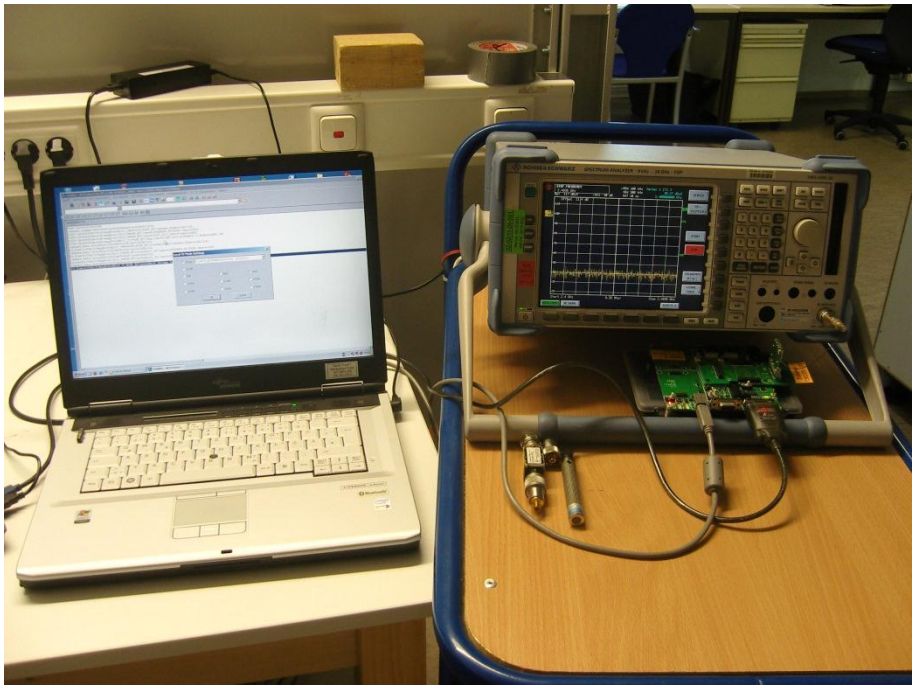
5.3 Occupied bandwidth

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

5.3.1 Description of the test location

Test location: Shielded Room 4

5.3.2 Photo documentation of the test set-up



5.3.1 Applicable standard

According to RSS-Gen, 4.6.1:
When an occupied bandwidth value is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99 % emission bandwidth, as calculated or measured.

5.3.2 Description of Measurement

The bandwidth was measured with the function “bandwidth measurement” of the spectrum analyser. The EUT is connected via suitable attenuator at the spectrum analyser. The measurement is repeated for every different modulation standard of the EUT and recorded.

Spectrum analyser settings:
RBW: 100 kHz, VBW: 300 kHz, Detector: Peak, Sweep time: auto

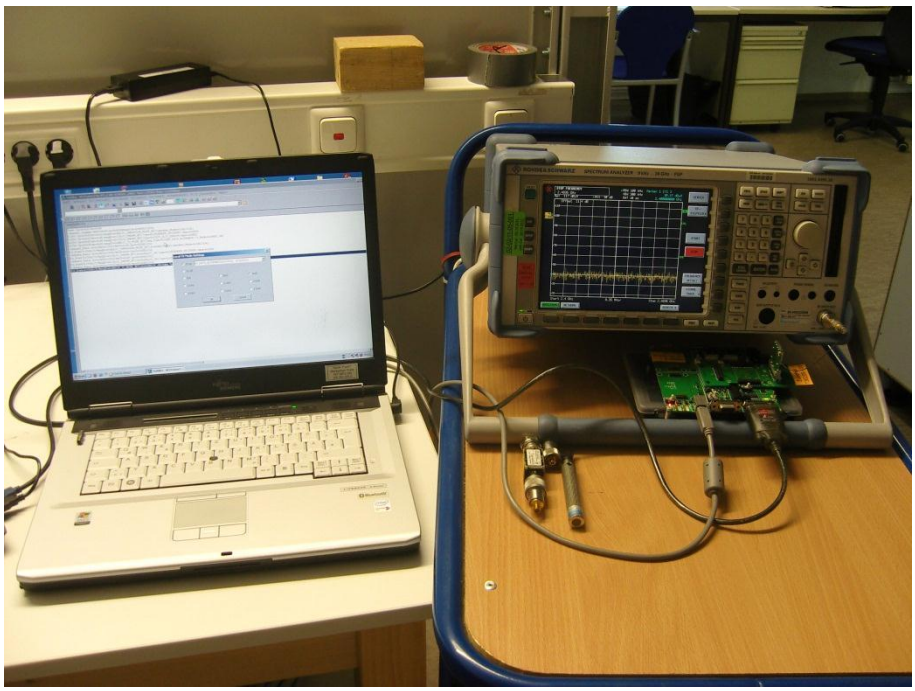
5.4 Maximum peak output power conducted

5.4.1 Description of the test location

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

Test location: Shielded Room 4

5.4.2 Photo documentation of the test set-up



5.4.3 Applicable standard

According to FCC Part 15C, Section 15.247(a)(1):
The maximum peak output power of an intentional radiator shall not exceed the limit defined in dependency of the channel separation and of the number of hopping channels.

5.4.4 Description of Measurement

A spectrum analyser is connected to the output of the transmitter via a suitable attenuator while EUT is operating in transmit mode using the assigned frequency according to DA 00-705. The cable loss and the 10 dB inline attenuator is summed up to a resulting attenuation of 11.4 dB which gives a correction factor. The correction factor is taken into account as offset during the measurements and is therefore not evident in the following tables.

Analyser settings:
RBW: 3 MHz, VBW ≥ RBW, Detector: Max peak, Trace: Max hold, Sweep time: auto

5.5 Spurious emissions conducted

For test instruments and accessories used see section 6 Part **SEC1, SEC2 and SEC3**.

5.5.1 Description of the test location

Test location: Shielded Room 4

5.5.2 Applicable standard

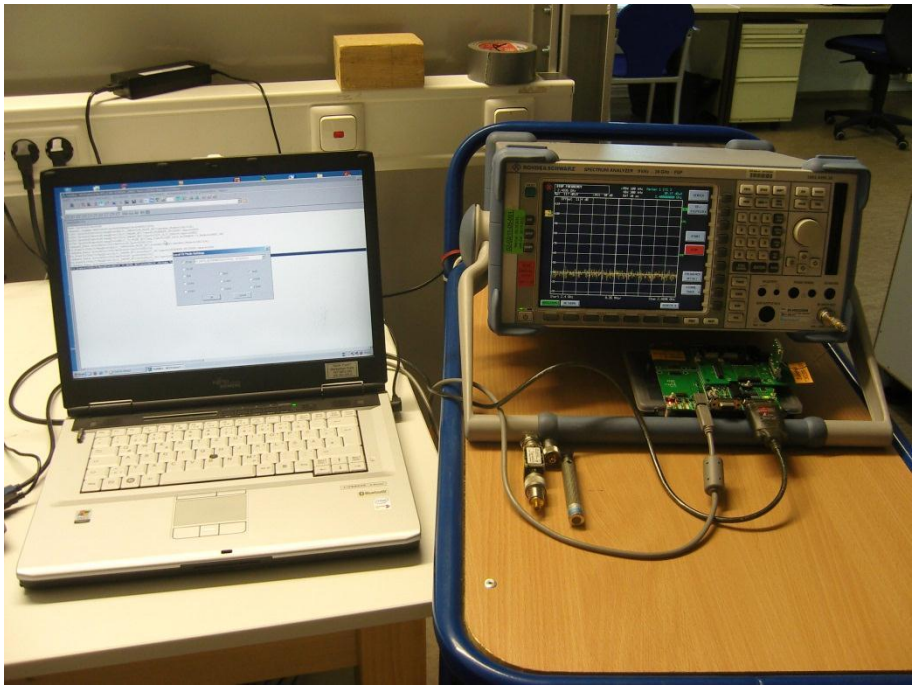
According to FCC Part 15C, Section 15.247(d):
In any 100 kHz bandwidth outside the frequency bands 2400 – 2483.5 MHz and 5725 – 5850 MHz, the digitally modulated radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or an radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required.

5.5.3 Description of Measurement

A spectrum analyser is connected to the output of the transmitter via a suitable attenuator while EUT is operating in transmit mode using the assigned frequency according to DA 00-705.

Spectrum analyser settings:
RBW: 100 kHz, VBW: 300 kHz, Detector: Max peak, Trace: Max hold, Sweep: auto

5.5.4 Photo documentation of the test set-up



5.6 Band edge compliance

For test instruments and accessories used see section 6 Part **SEC3**.

5.6.1 Description of the test location

Test location: Shielded Room 4

5.6.2 Applicable standard

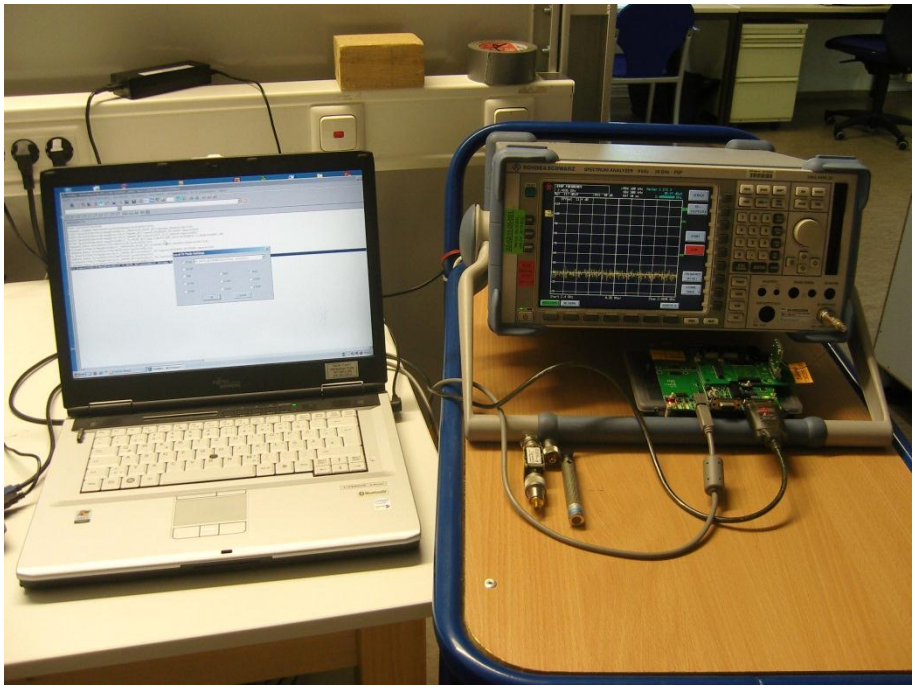
According to FCC Part 15C, Section 15.247(d):
In any 100 kHz bandwidth outside the frequency bands 2400 – 2483.5 MHz and 5725 – 5850 MHz, the digitally modulated radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or an radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required.

5.6.3 Description of Measurement

A spectrum analyser is connected to the output of the transmitter via a suitable attenuator while EUT was operating in transmit mode at the assigned frequency according DA 00-705:2000.

Spectrum analyser settings:
RBW: 100 kHz, VBW: 300 kHz, Detector: Max peak, Trace: Max hold, Sweep: auto

5.6.4 Photo documentation of the test set-up



5.7 Radiated emissions in restricted bands

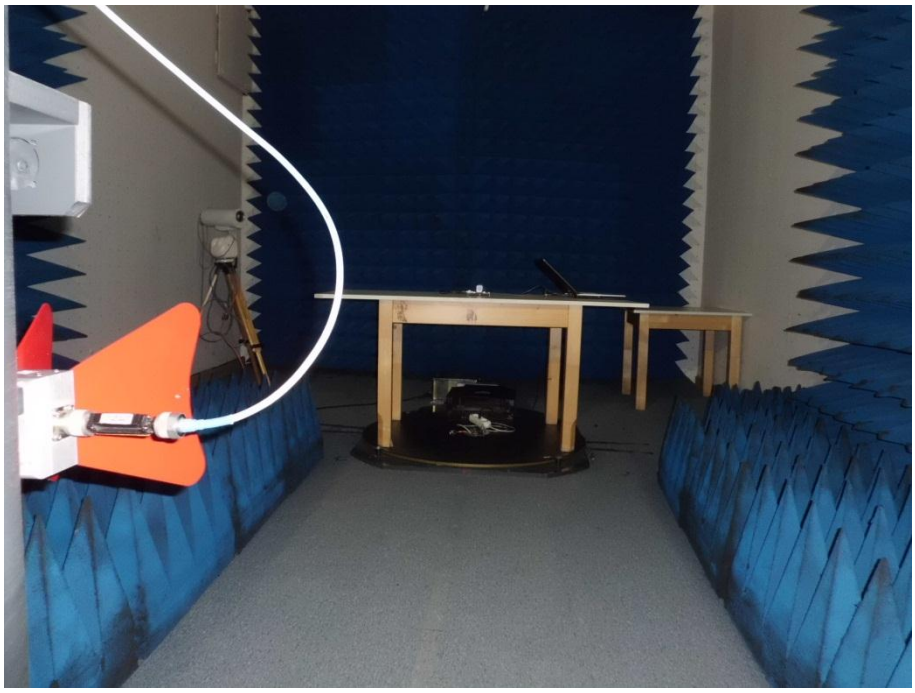
For test instruments and accessories used see section 6 Part **SEC3**.

5.7.1 Description of the test location

Test location: Shielded Room 4

5.7.2 Photo documentation of the test set-up

Test setup 1 – 25 GHz



5.7.3 Applicable standard

According to FCC Part 15, Section 15.205(a):
In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limit specified in Section 15.209(a). In this test it is considered only to perform the worst case modulation 3-DH5 for the restricted bands from 2310 MHz to 2390 MHz, 2483.5 MHz to 2500 MHz, from 2655 MHz to 2900 MHz (RSS 210) and from 4500 MHz to 5150 MHz.

5.7.4 Description of Measurement

The restricted bands are measured radiated. The span of the spectrum analyser was set wide enough to capture the restricted band and measure the peak level of the emission operating on the channel closest to the band edge, as well as any modulation products which fall outside of the authorized band of operation.

Spectrum analyser settings:
RBW: 1 MHz, VBW: 3 MHz, Sweep: Auto, Detector function: Peak

5.7.5 Test result

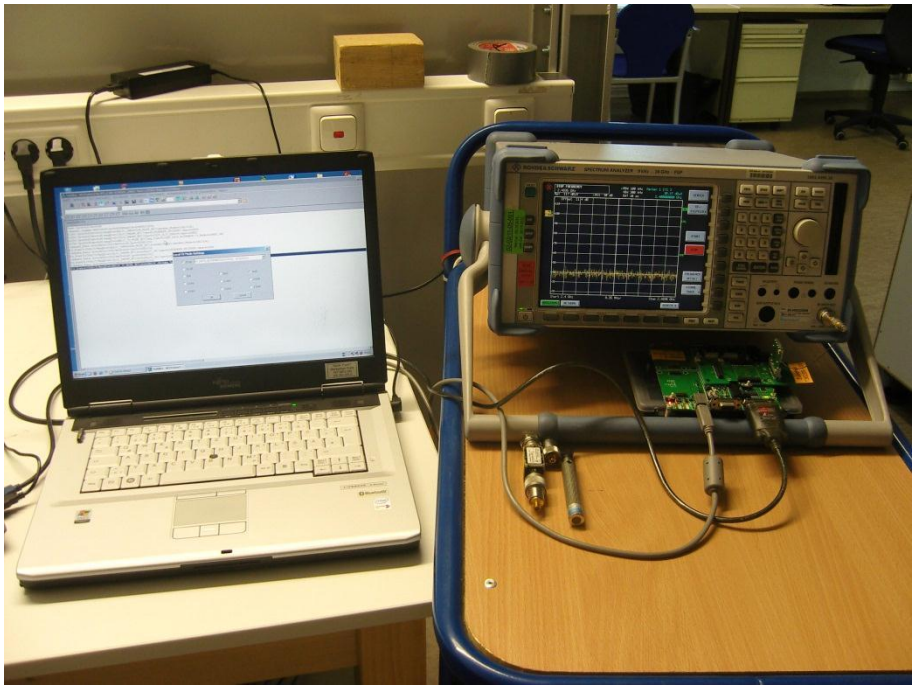
5.13 Carrier frequency separation

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

5.13.1 Description of the test location

Test location: Shielded Room 4

5.13.2 Photo documentation of the test set-up



5.13.3 Applicable standard

According to FCC Part 15, Section 15.247(a):
Frequency hopping systems operating in the frequency band of 2400 MHz – 2483.5 MHz may have hopping channel carrier frequencies that are separated by 25 kHz or 2/3 of the 20 dB bandwidth of the hopping channel.

5.13.4 Description of Measurement

The measurement is performed using a spectrum analyser in single sweep mode. A part of the operating frequency is used for better resolution. In normal application mode all the channels of the part of operating frequency are displayed and the separation is measured. The 20 dB OBW has to be measured before to compare whether the OBW requirement is fulfilled.

5.13.5 Test result

Channel separation in hybrid mode:
The nominal channel spacing of the Bluetooth system is 1MHz independent of the operating mode. The maximum "initial carrier frequency tolerance" which is allowed for Bluetooth is f_{center} = 75 kHz.
This was checked during the Bluetooth Qualification tests (Test Case: TRM/CA/07-E) for three frequencies (2402 MHz, 2441 MHz, and 2480 MHz) and approved.

FCC ID: CWTUGZZC / IC:1788F-UGZZC

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 (MHz)

The requirements are fulfilled

Remarks: _____

_____

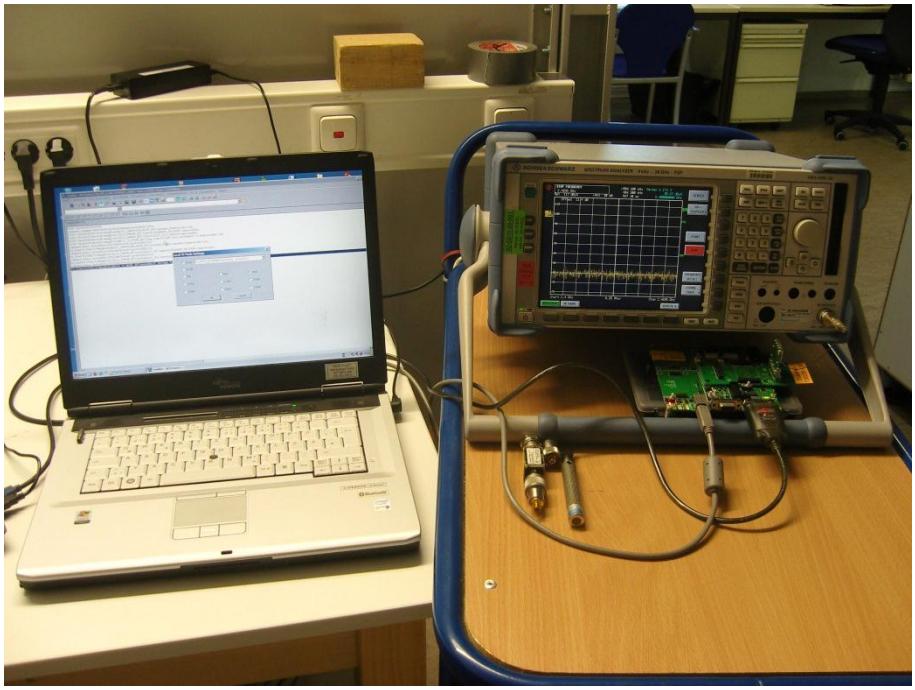
5.17 Receiver conducted emissions

For test instruments and accessories used see section 6 Part **SEC2** and **SEC3**.

Description of the test location

Test location: Shielded Room 4

5.17.1 Photo documentation of the test set-up



5.18 Receiver radiated emissions

For test instruments and accessories used see section 6 Part **SER2** and **SER3**.

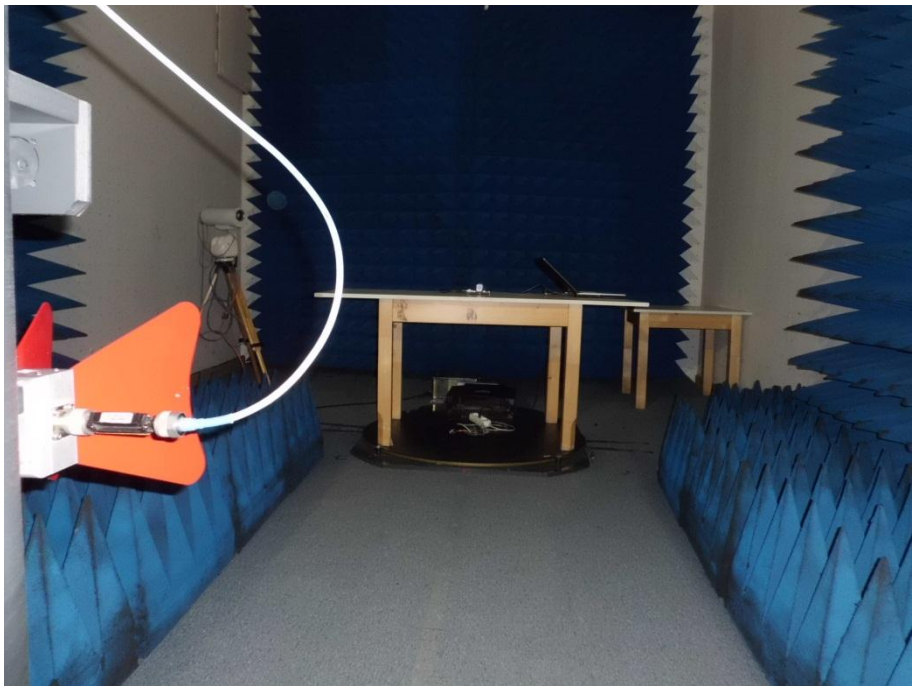
5.18.1 Description of the test location

Test location: OATS1
Test location: Anechoic Chamber A2

Test distance: 3 metres

5.18.2 Photo documentation of the test set-up

Test setup 1 – 18 GHz



5.18.3 According to RSS-Gen, Section 6.1:

Radiated spurious emission measurements shall be performed with the receiver antenna connected to the receiver antenna terminals. Spurious emissions from receivers shall not exceed the radiated limits shown in the table below.

5.18.4 Description of Measurement

Radiated emissions are measured according the requirements of ANSI C63.4. If the emission level in peak mode is lower as the average limit, then testing will be stopped and peak values of the EUT will be reported, otherwise, the emission will be measured in average mode again and reported.