

FCC ID: SR5-17101100

5 TEST CONDITIONS AND RESULTS

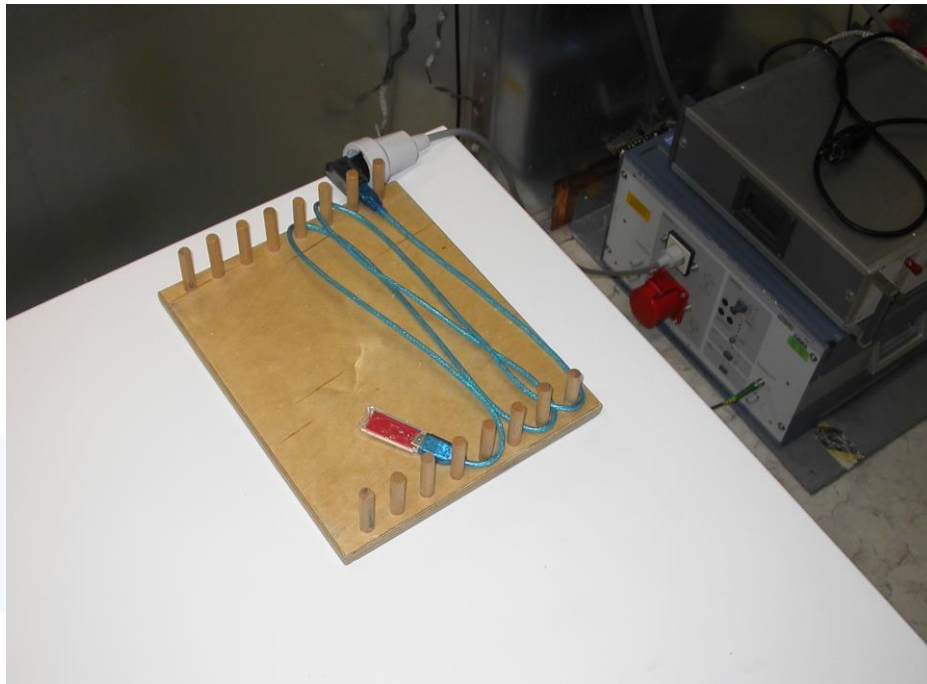
5.1 Conducted emissions

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 Applicable standard

According to FCC Part 15, Section 15.207(a):

Except as shown in paragraphs (b) and (c) of this Section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the given limits.

5.1.4 Description of Measurement

The measurements are performed following the procedures set out in ANSI C63.4 described under item 4.4.3. 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.

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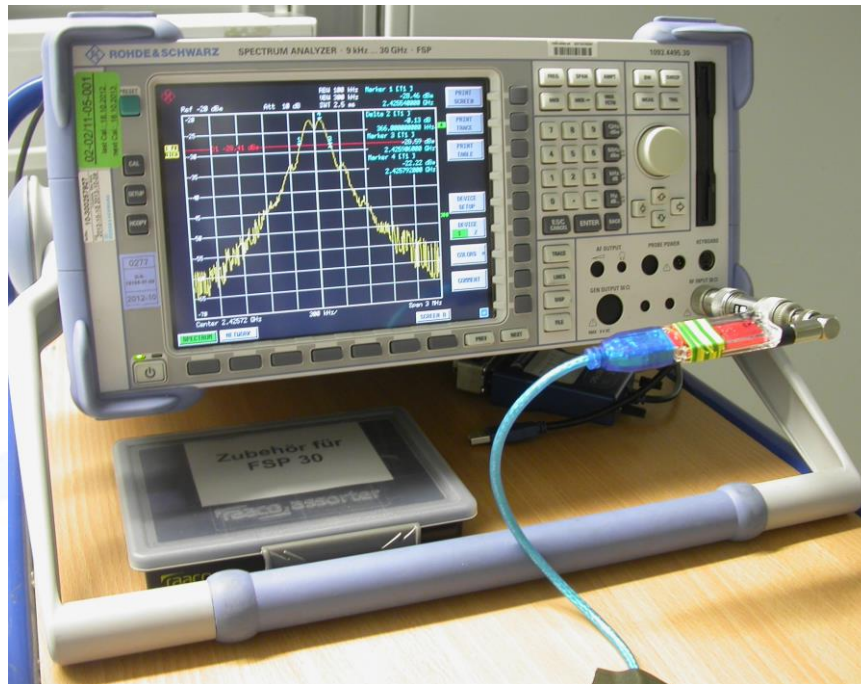
5.2 Emission bandwidth

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

5.2.1 Description of the test location

Test location: Shielded Room S4

5.2.2 Photo documentation of the test set-up



5.2.3 Applicable standard

According to FCC Part 15, Section 15.247(a)(2):

Systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 – 2483.5 MHz and 5725 – 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

5.2.4 Description of Measurement

The bandwidth was measured at an amplitude level reduced from the reference level of a modulated channel by a ratio of -6 dB. The reference level is the level of the highest signal amplitude observed at 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. An alternative is to use the bandwidth measurement of the analyzer.

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5.3 Radiated emission of the fundamental wave

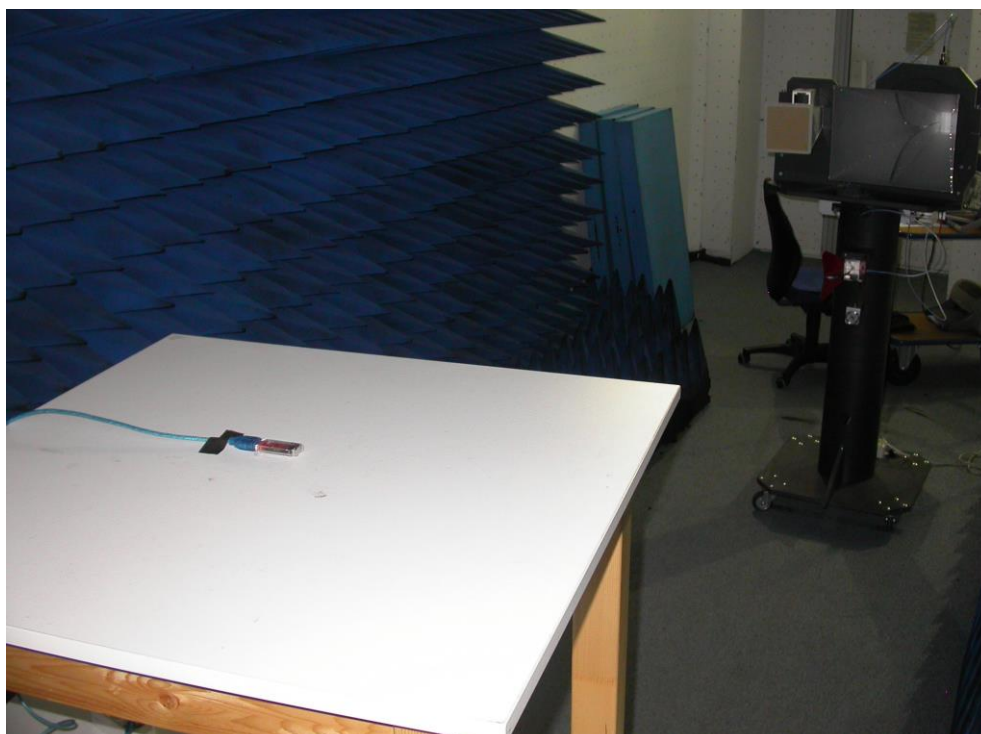
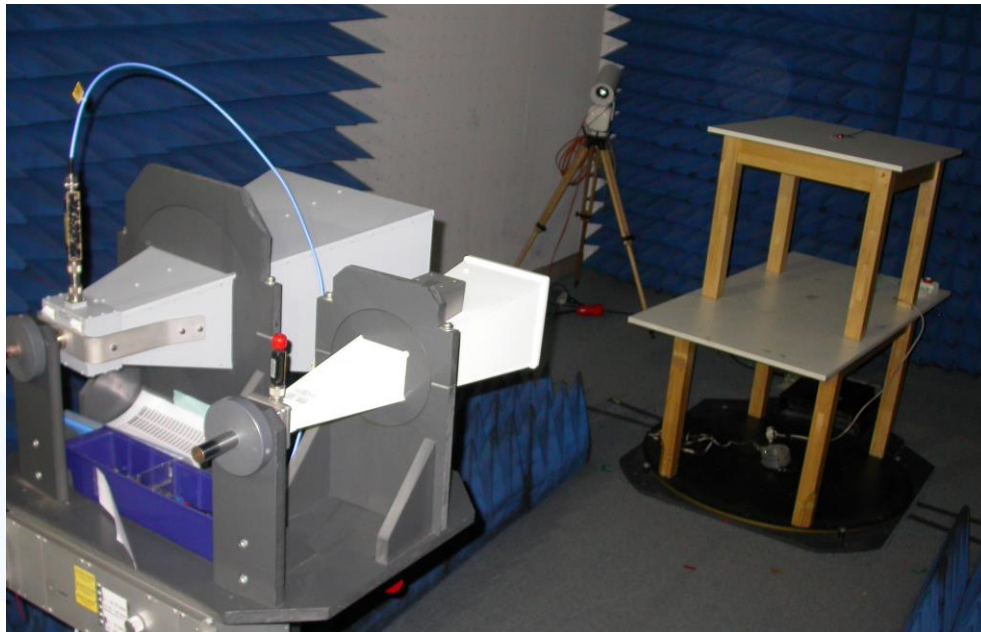
For test instruments and accessories used see section 6 Part CPR 3.

5.3.1 Description of the test location

Test location: Anechoic Chamber A2

Test distance: 3 metres

5.3.2 Photo documentation of the test set-up



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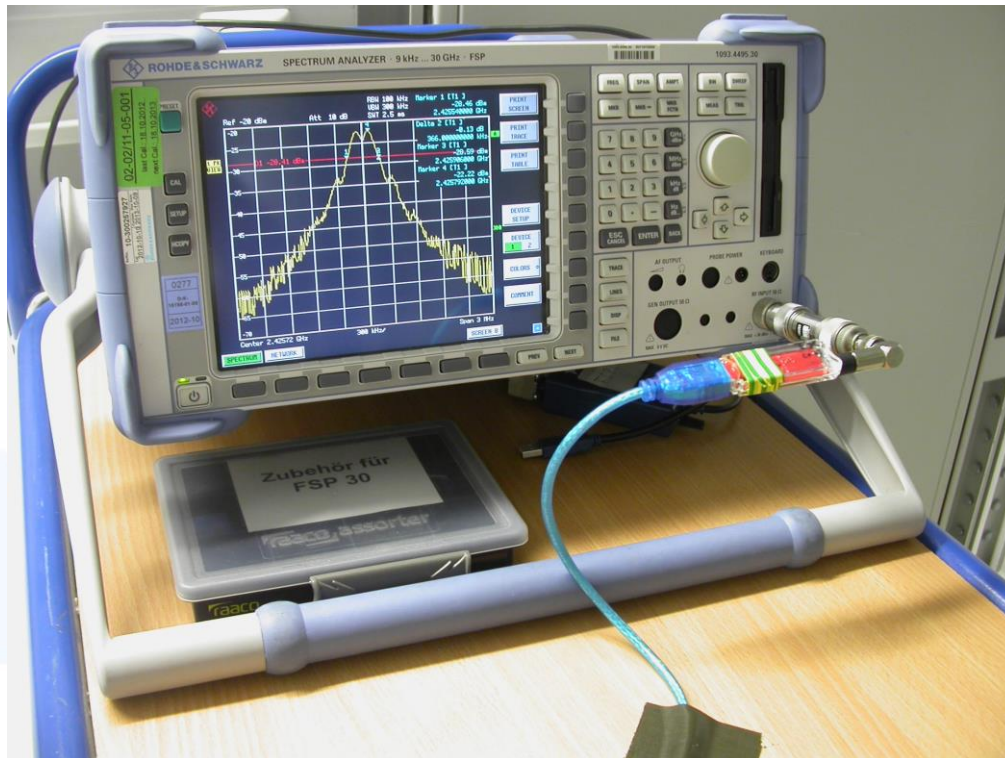
5.4 Maximum peak conducted output power

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

5.4.1 Description of the test location

Test location: Shielded Room S4

5.4.2 Photo documentation of the test set-up



5.4.3 Applicable standard

According to FCC Part 15, Section 15.247(b)(3):

For systems using digital modulation in the 2400-2483.5 MHz and 5725 – 5850 MHz bands, the maximum peak output power of the transmitter shall not exceed 1 Watt. The limit is based on transmitting antennas of directional gain that do not exceed 6 dBi.

5.4.4 Description of Measurement

The EuT was fixed mounted on the receiving antenna of the spectrum analyzer to find out the maximum power. An analyzer offset was tried to see the compliance to the measured radiated value.

The transmitter output was directly connected to the spectrum analyzer. The center frequency of the spectrum analyzer is set to the fundamental frequency. The span of the spectrum analyzer should be larger than the emission bandwidth (EBW). The channel bandwidth has been set to EBW. With peak detector and power mode "Max Hold" the result is the summed maximum output power of the EBW.

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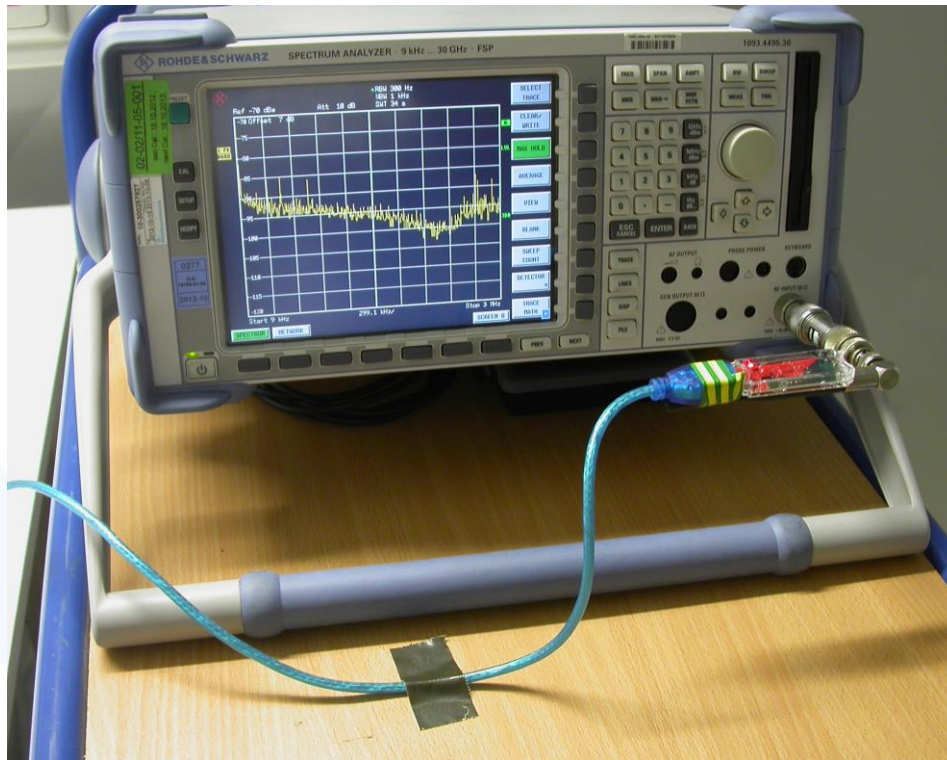
5.5 Spurious emissions conducted

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 S4

5.5.2 Photo documentation of the test set-up



5.5.3 Applicable standard

According to FCC Part 15C, Section 15.247(d):

In any 100 kHz bandwidth outside the frequency band 902 to 928 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.

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).

5.5.4 Description of measurement

A spectrum analyzer is connected to the output of the transmitter while EUT was operating in transmit mode at the assigned frequency.

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5.6 Spurious emissions

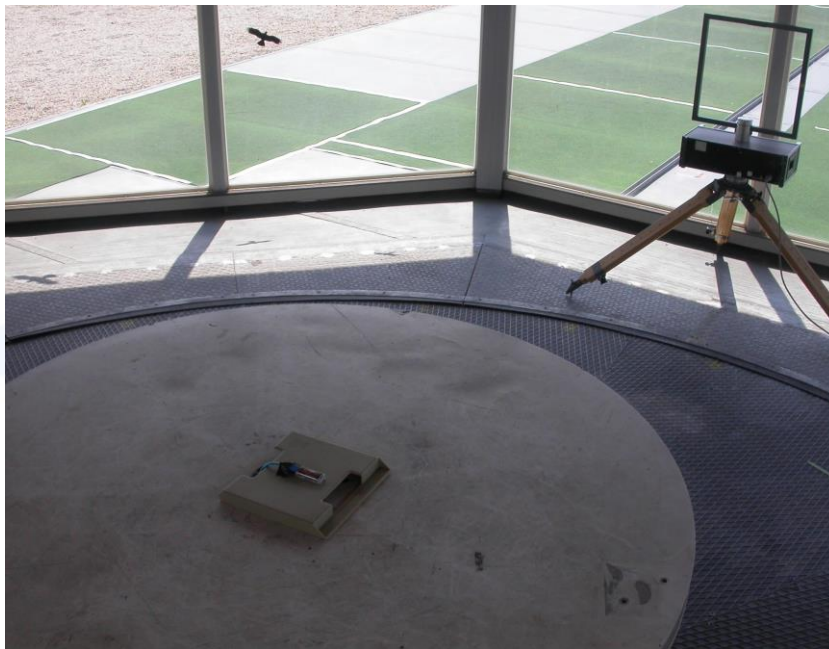
For test instruments and accessories used see section 6 Part SER 1, SER 2, SER 3.

5.6.1 Description of the test location

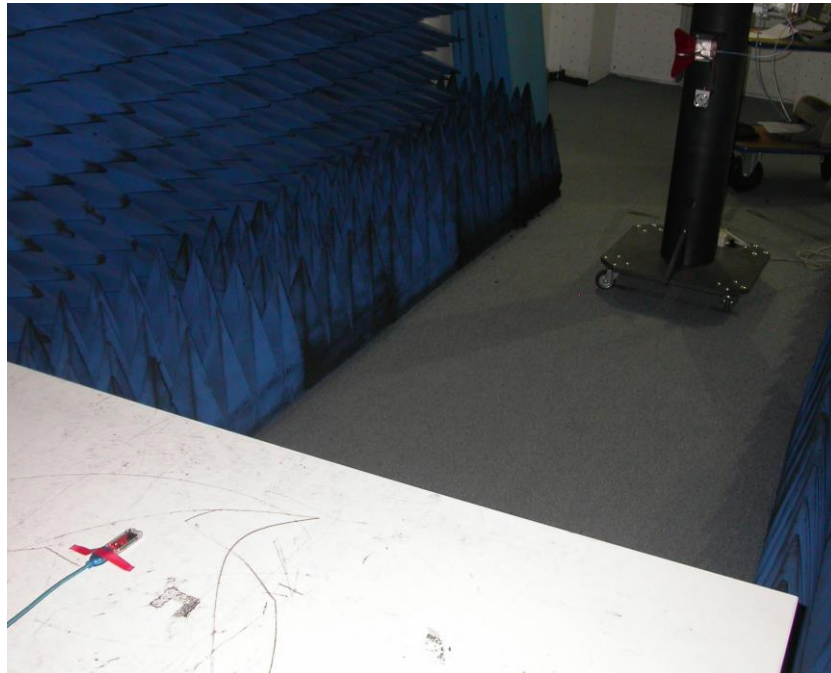
Test location: OATS1
Test distance: 3 metres

Test location: Anechoic Chamber A2
Test distance: 3 metres

5.6.2 Photo documentation of the test set-up



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5.6.3 Applicable standard

According to FCC Part 15, Section 15.247(d):

In any 100 kHz bandwidth outside the frequency bands 2400 – 2483.50 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. 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) (see Section 15.205(c)).

5.6.4 Description of Measurement

The radiated power of the spurious emission from the EUT is measured in a test setup following the procedures set out in ANSI C63.4. If the emission level of the EUT in peak mode complies with the average limit is 20 dB lower, 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.

5.6.4.1 Radiated emission test $f < 1$ GHz

In the frequency range from **9 kHz to 30 MHz** no emissions from the EuT could be measured.

In the frequency range from **30 MHz up to 1 GHz** no emissions from the EuT could be measured.

In both frequency ranges only ambient noises could be detected.

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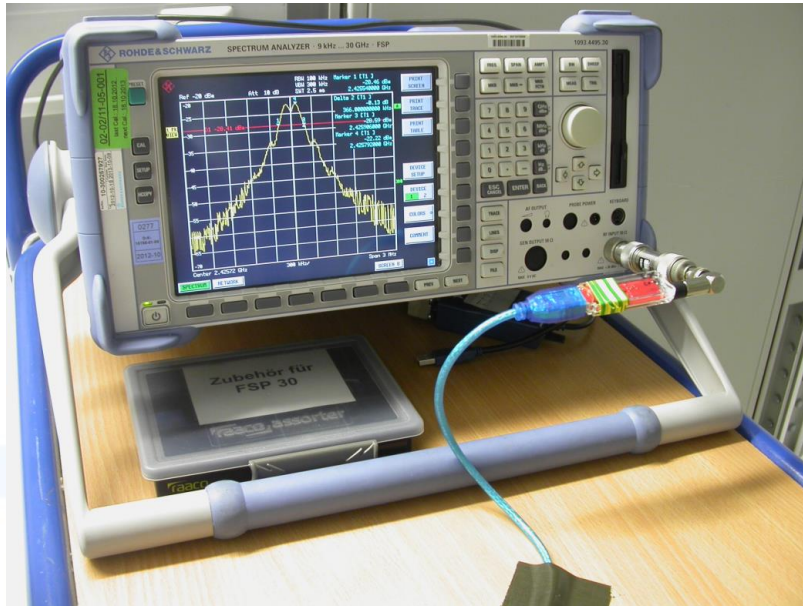
5.7 Power spectral density

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

5.7.1 Description of the test location

Test location: Shielded Room S4

5.7.2 Photo documentation of the test set-up



5.7.3 Applicable standard

According to FCC Part 15, Section 15.247(e):

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

5.7.4 Description of Measurement

The EUT was connected to the spectrum analyser with a suitable attenuator. The bandwidth of the fundamental frequency was measured with the spectrum analyser, set sweep time equal to span/3 kHz. The power spectral density was measured using the analyser function "Channel Power" in dBm/Hz. The result is calculated by adding - 15.2 dB (10 log 3 kHz/100 kHz) as bandwidth correction factor to the analyser reading.

Spectrum analyzer settings:
see attached plots

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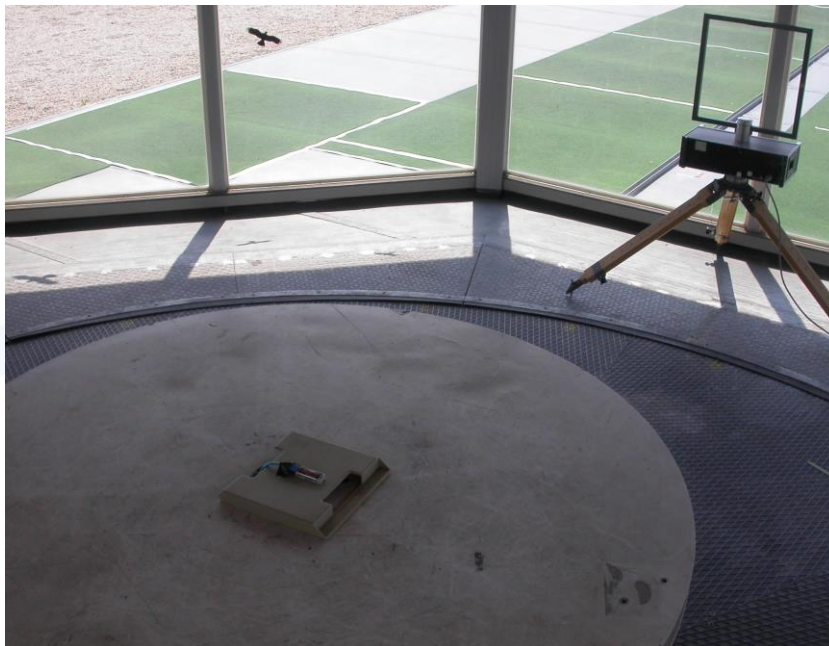
5.8 Receiver radiated emissions

For test instruments and accessories used see section 6 Part **SER1**, **SER2** and **SER3**.

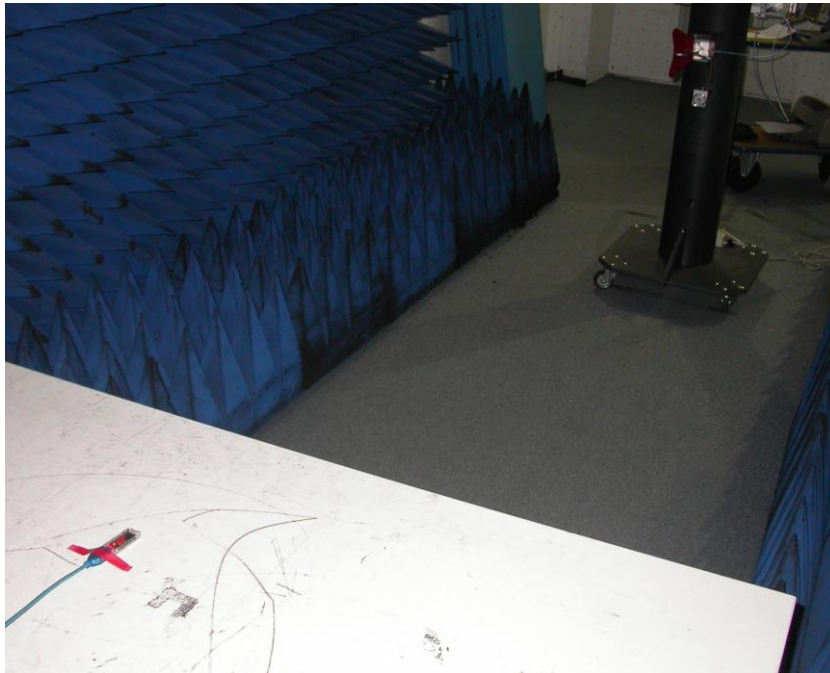
5.8.1 Description of the test location

Test location: OATS 1
Test location: Anechoic Chamber A2
Test distance: 3 metres

5.8.2 Photo documentation of the test set-up



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5.8.3 Applicable standard

According to FCC Part 15, Section 15.109 (a):
Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 m shall not exceed the given limit.

5.8.4 Description of Measurement

The radiated power of the spurious emission from the EUT is measured in a test setup following the procedures set out in ANSI C63.4. If the emission level of the EUT in peak mode complies with the average limit is 20 dB lower, 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.