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 using a receiver, which has CISPR characteristic bandwidth and quasi-peak detection and a line impedance stabilization network (LISN) with 50Ω/50 μH (CISPR 16) characteristics. Table top equipment is placed on a non-conducting table 80 cm above the floor and is positioned 40 cm from the vertical ground plane (wall) of the screen room. 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.

To convert between dBμV and μV, the following conversions apply:

dBμV = 20 log μV
μV = 10^(dBμV/20)

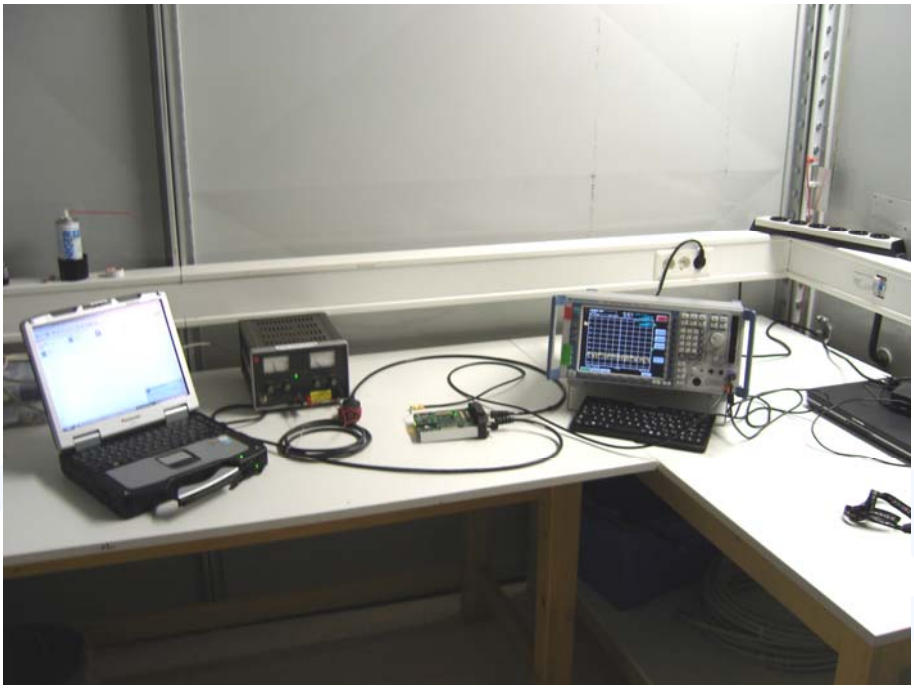
5.2 Emission bandwidth

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

5.2.1 Description of the test location

Test location: AREA4

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.

Spectrum analyzer settings:

RBW	1 MHz
VBW	3 MHz
Detector	Peak
Sweep time	auto

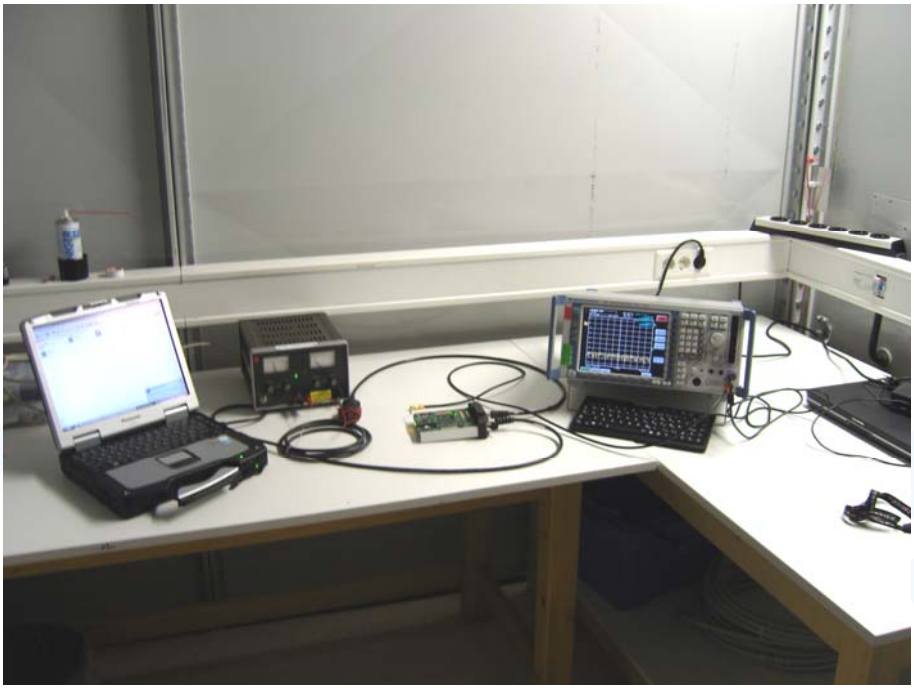
5.3 Maximum peak conducted output power

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

5.3.1 Description of the test location

Test location: AREA4

5.3.2 Photo documentation of the test set-up



5.3.3 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.

5.3.4 Description of Measurement

The transmitter output was connected to the power meter with thermal test head. To determine the max output power the worst case power setting is used. The cable loss or other external attenuation was taken into account and expressed in a correction factor. The absolute maximum peak output power is calculated by adding the reading of the meter plus correction and compared with the limit.

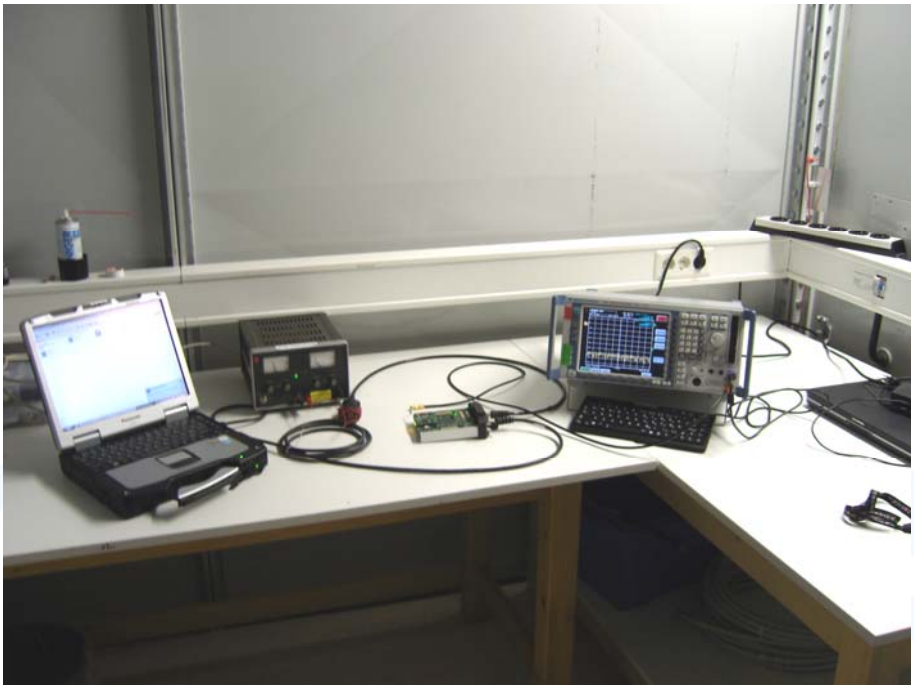
5.4 Spurious emissions conducted

For test instruments and accessories used see section 6 Part **SEC 2** and **SEC 3**.

5.4.1 Description of the test location

Test location: AREA4

5.4.2 Photo documentation of the test set-up



5.4.3 Applicable standard

According to FCC Part 15, Section 15.247(d):
In any 100 kHz bandwidth outside the operating frequency band of intentional radiator spouriuos emissions shall exceed the appropriate based on an RF conducted measurement.

5.4.4 Description of measurement

The spurious emissions have been measured conducted using a spectrum analyser. The measurement has been made while the transmitter was set to the lowest operating frequency (CH1), the middle of the band (CH6) and to the highest operating frequency (CH11). The frequency spectrum outside from the operating frequency range (2400 - 2483.5 MHz) has been scanned for emissions that exceed the defined limit. In the frequency range below 1 GHz a low pass filter has been used and above 3 GHz a highpass filter. The measurement has been performed at normal test conditions in modulated TX continuous mode.

Spectrum analyzer search setting:

RBW:	100 kHz	VBW:	300 kHz
Detector:	Max peak	Trace Mode:	Max hold
Level:	Adjust to the middle of the range	Sweep time:	1 s

5.5 Spurious emissions radiated

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

5.5.1 Description of the test location

Test location: Anechoic Chamber A2
Test distance: 3 metres

5.5.2 Photo documentation of the test set-up

Anechoic chamber

5.5.3 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 15.205(c)).

5.5.4 Description of Measurement

Radiated spurious emissions from the EUT are measured in the frequency range of 30 MHz to 1000 MHz using a tuned receiver and appropriate broadband linear polarized antennas. The measurements are made with 120 kHz bandwidth and quasi-peak detection. The EUT is placed on a 1.0 X 1.5 m non-conducting table 80 cm above the ground plane. The set up of the equipment under test will be in accordance to ANSI C63.4. To locate maximum

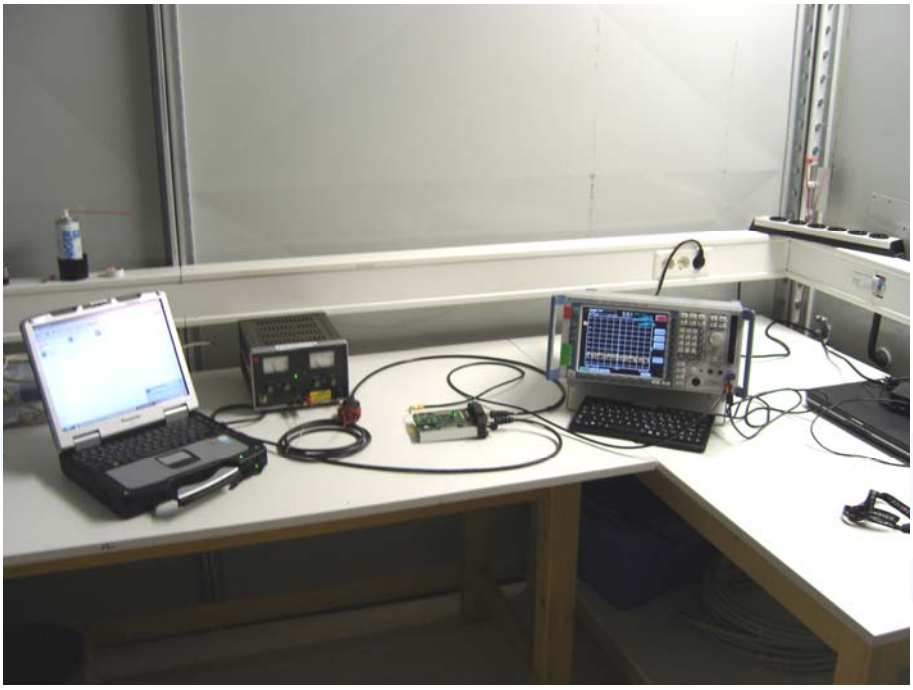
5.6 Power spectral density

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

5.6.1 Description of the test location

Test location: AREA4

5.6.2 Photo documentation of the test set-up



5.6.3 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.

5.6.4 Description of Measurement

The EUT was connected to the spectrum analyzer with a suitable attenuator. The bandwidth of the fundamental frequency was measured with the spectrum analyzer, set sweep time equal to span/3 kHz. The power spectral density was measured using the analyzer function “Channel Power” in dBm/Hz. The result is calculated by adding 35 dB (10 log 3000 Hz/Hz) as bandwidth correction factor to the analyzer reading.

Spectrum analyzer settings:

RBW	1 MHz	VBW	1 MHz
Detector	AV	Sweep time	auto
Function: Channel power measurement		Channel bandwidth	10 MHz