

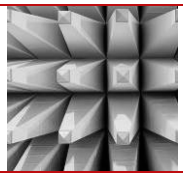

CETECOM ICT Services
consulting - testing - certification

TEST REPORT

Test report no.: 1-3890/11-01-04-A

Testing laboratory

CETECOM ICT Services GmbH
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Accredited Testing Laboratory:
The testing laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025 (2005) by the Deutsche Akkreditierungsstelle GmbH (DAkkS)
The accreditation is valid for the scope of testing procedures as stated in the accreditation certificate with the registration number: D-PL-12076-01-01
Area of Testing: Radio/Satellite Communications

Applicant

Sennheiser electronic GmbH & Co. KG
Am Labor 1
30900 Wedemark / GERMANY
Phone: +49 5130 600-0
Fax: +49 5130 600-574
Contact: Volker Bartsch
e-mail: volker.bartsch@sennheiser.com
Phone: +49 5130 600-465

Manufacturer

Sennheiser electronic GmbH & Co. KG
Am Labor 1
30900 Wedemark / GERMANY

Test standard/s

47 CFR Part 74	Title 47 of the Code of Federal Regulations; Chapter I Part 74 - Experimental radio, auxiliary, special broadcast and other program distribution services
RSS - 123 Issue 1 Rev. 2	Spectrum Management and Telecommunications Policy - Radio Standards Specification Low Power Licensed Radiocommunication Devices

For further applied test standards please refer to section 3 of this test report.

Test Item

Kind of test item:	**Plug-On Transmitter**
Model name:	**SKP 300 G3**
FCC ID:	**DMOG3SKP300**
IC:	**2099A-G3SKP300**
Frequency:	**Range-A: 516 MHz – 558 MHz** **Range-B: 626 MHz – 668 MHz** **Range-G: 566 MHz – 608 MHz**
Technology tested:	**Single carrier**
Antenna:	**Integrated Antenna**
Power Supply:	**3.00 V DC by 2 x battery Type AA**
Temperature Range:	**-30°C to +50 °C**

This test report is electronically signed and valid without handwriting signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

Test report authorised:

cn=Marco Bertolino, o=CETECOM ICT Services GmbH, ou=BTL-100826, email=marco.bertolino@cetecom.com, c=DE
2012.02.22 14:43:24 +01'00'

Marco Bertolino
Testing Manager

Test performed:

cn=Stefan Boes, o=CETECOM ICT Services GmbH, ou=BOE-111011, email=Stefan.Boes@cetecom.com, c=DE
2012.02.22 15:05:25 +01'00'

Stefan Bös
Senior Testing Manager

1 Table of contents

2 General information

2.1 Notes and disclaimer

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2.2 Application details

Date of receipt of order:	2011-11-14
Date of receipt of test item:	2011-12-01
Start of test:	2012-01-09
End of test:	2012-02-13
Person(s) present during the test:	-/-

3 Test standard/s

Test standard	Date	Test standard description
47 CFR Part 74	2010-10	Title 47 of the Code of Federal Regulations; Chapter I Part 74 - Experimental radio, auxiliary, special broadcast and other program distribution services
RSS - 123 Issue 1 Rev. 2	2000-03	Spectrum Management and Telecommunications Policy - Radio Standards Specification Low Power Licensed Radiocommunication Devices

4 Test environment

Temperature:	T_{nom}	+22 °C during room temperature tests
	T_{max}	+50 °C during high temperature tests
	T_{min}	-30 °C during low temperature tests
Relative humidity content:		55 %
Barometric pressure:		not relevant for this kind of testing
Power supply:	V_{nom}	3.00 V DC by 2 x battery Type AA
	V_{max}	3.30 V
	V_{min}	1.80 V

5 Test item

Kind of test item	**:**	**Plug-On Transmitter**
Type identification	**:**	**SKP 300 G3**
S/N serial number	**:**	**Range-A: 1441115079** **Range-B: 1441115091** **Range-G: 1441115082**
HW hardware status	**:**	**No information available!**
SW software status	**:**	**No information available!**
Frequency band [MHz]	**:**	**Range-A: 516 MHz – 558 MHz** **Range-B: 626 MHz – 668 MHz** **Range-G: 566 MHz – 608 MHz**
Type of radio transmission **Use of frequency spectrum**	**:** **:**	**Single carrier**
Type of modulation	**:**	**FM**
Number of channels	**:**	**No information available**
Antenna	**:**	**Integrated Antenna**
Power supply	**:**	**3.00 V DC by 2 x battery Type AA**
Temperature range	**:**	**-30 °C to +50 °C**

6 Test laboratories sub-contracted

None

7 Summary of measurement results

☒ **No deviations from the technical specifications were ascertained**

☐ There were deviations from the technical specifications ascertained

TC Identifier	Description	Verdict	Date	Remark
RF-Testing	FCC 47 CFR § 74.861 RSS-123 Issue 2	Pass	2012-02-22	-/-

Test Specification Clause	Test Case	Temperature Conditions	Power Source Voltages	Pass	Fail	NA	NP	Result
FCC 47 CFR § 74.861 (e)(1)(ii) RSS-123 §6.2 Issue 2	Output power (radiated)	Nominal	Nominal	☒	☐	☐	☐	complies
FCC 47 CFR § 74.861 RSS-123 §7 Issue 2	Frequency stability	Nominal	Extreme	☒	☐	☐	☐	complies
		Extreme	Nominal	☒	☐	☐	☐	
FCC 47 CFR § 2.1049 § 74.861	Modulation characteristics	Nominal	Nominal	☒	☐	☐	☐	complies
FCC 47 CFR § 2.1049 § 74.861 RSS-123 §6 Issue 2	Occupied bandwidth	Nominal	Nominal	☒	☐	☐	☐	complies
FCC 47 CFR § 74.861	Unwanted radiation (spectrum mask)	Nominal	Nominal	☒	☐	☐	☐	complies
FCC 47 CFR § 74 RSS-123 Issue 2	Field strength of spurious radiation Transmitter unwanted emissions	Nominal	Nominal	☒	☐	☐	☐	complies
FCC 47 CFR § 15.209 RSS-123 Issue 2	Receiver spurious emissions (radiated) / Transmitter Idle	Nominal	Nominal	☒	☐	☐	☐	complies

Note: NA = Not Applicable; NP = Not Performed

7.1 RSP100 test report cover sheet / performance test data

Test Report Number	:	**1-3890/11-01-04-A**
Equipment Model Number	:	**SKP 300 G3**
Certification Number	:	**2099A-G3SKP300**
Manufacturer (complete Address)	:	**Sennheiser electronic GmbH & Co. KG** **Am Labor 1** **30900 Wedemark / GERMANY**
Tested to radio standards specification no.	:	**RSS-123 Issue 2**
Open Area Test Site IC No.	:	**IC 3462C-1**
Frequency Range or fixed frequency	:	**Range-A: 516 MHz – 558 MHz** **Range-B: 626 MHz – 668 MHz** **Range-G: 566 MHz – 608 MHz**
Output Power [dBm]	:	**Range-A: 4.6 dBm** **Range-B: 12.8 dBm** **Range-G: 6.7 dBm**
Occupied bandwidth (99%-BW) [kHz]	:	**Range-A: 98.2 kHz** **Range-B: 96.2 kHz** **Range-G: 97.2 kHz**
Type of modulation	:	**FM**
Emission Designator (TRC-43)	:	**Range-A: 98K2F1E** **Range-B: 96K2F1E** **Range-G: 97K2F1E**
Antenna Information	:	**Integrated Antenna**
Transmitter Spurious (worst case) [dBm]	:	**-39.8 dBm @ 12.5 GHz (Noise floor)**
Receiver Spurious (worst case) [µV/m @ 3m]	:	**No receiver implemented**

ATTESTATION:
DECLARATION OF COMPLIANCE:

I attest that the testing was performed or supervised by me; that the test measurements were made in accordance with the above-mentioned Industry Canada standard(s); and that the equipment identified in this application has been subjected to all the applicable test conditions specified in the Industry Canada standards and all of the requirements of the standard have been met.

Laboratory Manager:

2012-02-22	Stefan Bös	Stefan Bös
Date	Name	Signature

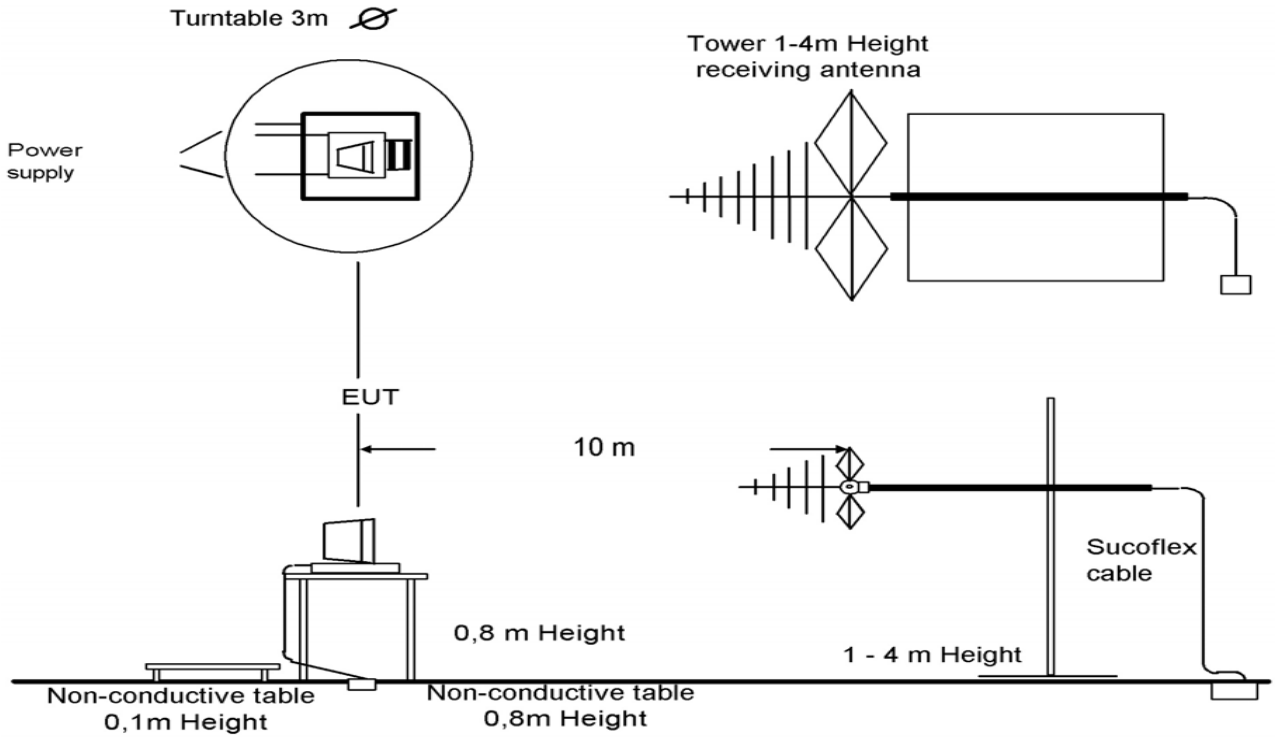
8 RF measurements

8.1 Description of test setup

8.1.1 Radiated measurements

The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 25 GHz in semi-anechoic chambers. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber. The receiving antennas are confirmed with specifications ANSI C63.2-1996 clause 15 and ANSI C63.4-2009 clause 4.1.5. These antennas can be moved over the height range between 1.0 m and 4.0 m in order to search for maximum field strength emitted from EUT. The measurement distances between EUT and receiving antennas are indicated in the test setups for the various frequency ranges. For each measurement, the EUT is rotated in all three axes until the maximum field strength is received. The wanted and unwanted emissions are received by spectrum analysers where the detector modes and resolution bandwidths over various frequency ranges are set according to requirement ANSI C63-4-2009 clause 4.2.
Antennas are confirmed with ANSI C63.2-1996 item 15.

Semi anechoic chamber



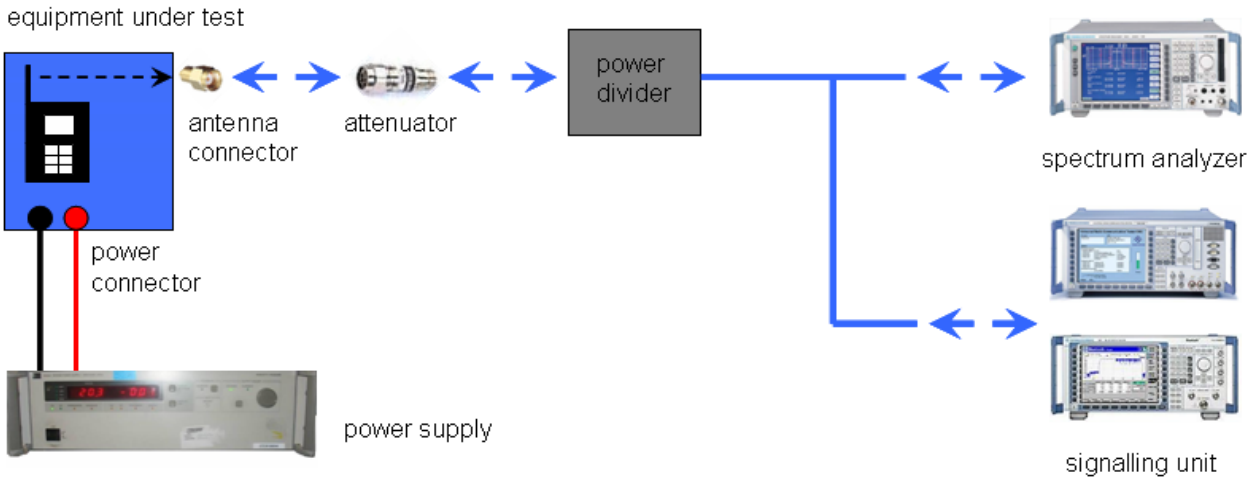
Picture 1: Diagram radiated measurements

9 kHz - 30 MHz:	active loop antenna
30 MHz – 1 GHz:	tri-log antenna
> 1 GHz:	horn antenna

The EUT is powered by an external power supply with nominal voltage. The signalling is performed from outside the chamber with a signalling unit (CMU200 or other) by air link using signalling antenna.

8.1.2 Conducted measurements

The EUT's RF signal is coupled out by the antenna connector which is supplied by the manufacturer. The signal is first 10dB attenuated before it is power divided (~6dB loss per branch). One of the signal paths is connected to the communication base Station (CMU200 or other), the other one is connected to the spectrum analyzer. The specific losses for both signal paths are first checked within a calibration. The measurement readings on the signalling unit/spectrum analyzer are corrected by the specific test set-up loss. The attenuator, power divider, signalling unit and the spectrum analyzer are impedance matched on 50 Ohm.



Picture 2: Diagram conducted measurements

8.2 Additional comments

Reference documents: None

Special test descriptions: None

Configuration descriptions: None

9 Measurement results

9.1 Output power (radiated)

Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	1 MHz
Video bandwidth:	1 MHz
Span:	3 MHz
Trace-Mode:	Max. hold

Limits:

FCC	IC
47 CFR § 74.861 (e)(1)(ii)	RSS-123 §6.2 Issue 2
Maximum transmitter power	
470-608 and 614-698MHz bands - 250mW (23.98dBm)	

Results:

Range-A:

Frequency	Radiated output power
516 MHz	4.6 dBm
537 MHz	4.0 dBm
558 MHz	4.2 dBm

Range-B:

Frequency	Radiated output power
626 MHz	9.0 dBm
647 MHz	9.6 dBm
668 MHz	12.8 dBm

Range-G:

Frequency	Radiated output power
566 MHz	6.4 dBm
587 MHz	6.7 dBm
608 MHz	6.0 dBm

Result: **The result of the measurement is passed.**

9.2 Frequency stability

9.2.1 Frequency error vs. temperature

Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	100 Hz
Video bandwidth:	100 Hz
Span:	1 kHz
Trace-Mode:	Max. hold
Voltage (nominal):	2.70 V

Limits:

FCC	IC
47 CFR § 74.861	RSS-123 §7 Issue 2
The frequency tolerance of the transmitter shall be 0.005 percent (50ppm)	

Range-A:

Results: low channel

Temperature	Frequency (MHz)	Deviation (kHz / ppm)
-30 °C	516	+3.15 / +6.1
-20 °C	516	+2.14 / +4.1
-10 °C	516	+2.67 / +5.2
0 °C	516	+2.59 / +5.0
10 °C	516	+2.28 / +4.4
20 °C	516	+2.12 / +4.1
30 °C	516	+1.78 / +3.4
40 °C	516	+1.83 / +3.5
50 °C	516	+1.96 / +3.8

Results: middle channel

Temperature	Frequency (MHz)	Deviation (kHz / ppm)
-30 °C	537	+4.12 / +7.7
-20 °C	537	+2.48 / +4.6
-10 °C	537	+2.77 / +5.2
0 °C	537	+2.63 / +4.9
10 °C	537	+2.36 / +4.4
20 °C	537	+1.86 / +3.5
30 °C	537	+1.76 / +3.3
40 °C	537	+1.84 / +3.4
50 °C	537	+1.86 / +3.5

Results: high channel

Temperature	Frequency (MHz)	Deviation (kHz / ppm)
-30 °C	558	+4.54 / +8.1
-20 °C	558	+2.55 / +4.6
-10 °C	558	+2.93 / +5.3
0 °C	558	+2.87 / +5.1
10 °C	558	+2.46 / +4.4
20 °C	558	+2.20 / +3.9
30 °C	558	+1.96 / +3.5
40 °C	558	+2.02 / +3.6
50 °C	558	+1.92 / +3.4

Range-B:

Results: low channel

Temperature	Frequency (MHz)	Deviation (kHz / ppm)
-30 °C	626	+2.08 / +3.3
-20 °C	626	+4.02 / +6.4
-10 °C	626	+4.30 / +6.9
0 °C	626	+3.80 / +6.1
10 °C	626	+3.26 / +5.2
20 °C	626	+2.14 / +3.4
30 °C	626	+2.52 / +4.0
40 °C	626	+3.02 / +4.8
50 °C	626	+2.98 / +4.8

Results: middle channel

Temperature	Frequency (MHz)	Deviation (kHz / ppm)
-30 °C	647	+2.14 / +3.3
-20 °C	647	+3.87 / +6.0
-10 °C	647	+4.38 / +6.8
0 °C	647	+4.12 / +6.4
10 °C	647	+2.92 / +4.5
20 °C	647	+2.34 / +3.6
30 °C	647	+2.78 / +4.3
40 °C	647	+2.88 / +4.5
50 °C	647	+2.68 / +4.1

Results: high channel

Temperature	Frequency (MHz)	Deviation (kHz / ppm)
-30 °C	668	+3.10 / +4.6
-20 °C	668	+4.39 / +6.6
-10 °C	668	+4.54 / +6.8
0 °C	668	+3.86 / +5.8
10 °C	668	+3.58 / +5.4
20 °C	668	+2.12 / +3.2
30 °C	668	+2.50 / +3.7
40 °C	668	+3.08 / +4.6
50 °C	668	+3.12 / +4.7

Range-G:

Results: low channel

Temperature	Frequency (MHz)	Deviation (kHz / ppm)
-30 °C	566	+7.52 / +13.3
-20 °C	566	+5.12 / +9.0
-10 °C	566	+4.24 / +7.5
0 °C	566	+2.96 / +5.2
10 °C	566	+2.08 / +3.7
20 °C	566	+2.20 / +3.9
30 °C	566	+2.30 / +4.1
40 °C	566	+2.38 / +4.2
50 °C	566	+3.17 / +5.6

Results: middle channel

Temperature	Frequency (MHz)	Deviation (kHz / ppm)
-30 °C	587	+8.32 / +14.2
-20 °C	587	+5.72 / +9.7
-10 °C	587	+4.00 / +6.8
0 °C	587	+3.60 / +6.1
10 °C	587	+1.99 / +3.4
20 °C	587	+2.08 / +3.5
30 °C	587	+2.40 / +4.1
40 °C	587	+2.38 / +4.0
50 °C	587	+3.56 / +6.1

Results: high channel

Temperature	Frequency (MHz)	Deviation (kHz / ppm)
-30 °C	608	+8.68 / +14.3
-20 °C	608	+5.44 / +8.9
-10 °C	608	+5.12 / +8.4
0 °C	608	+2.72 / +4.5
10 °C	608	+2.21 / +3.6
20 °C	608	+2.44 / +4.0
30 °C	608	+2.52 / +4.1
40 °C	608	+2.54 / +4.2
50 °C	608	+3.70 / +6.1

Result: **The result of the measurement is passed.**

9.2.2 Frequency error vs. voltage

Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	100 Hz
Video bandwidth:	100 Hz
Span:	1 kHz
Trace-Mode:	Max. hold
Temperature:	+22°C

Limits:

FCC	IC
47 CFR § 74.861	RSS-123 §7 Issue 2
The frequency tolerance of the transmitter shall be 0.005 percent (50ppm)	

Range-A:

Results: low channel

Voltage	Frequency (MHz)	Deviation (kHz / ppm)
1.8 V	516	+2.02 / +3.9
2.1 V	516	+1.96 / +3.8
2.4 V	516	+2.02 / +3.9
2.7 V	516	+2.02 / +3.9
3.0 V	516	+2.04 / +4.0
3.3 V	516	+2.02 / +3.9

Results: middle channel

Voltage	Frequency (MHz)	Deviation (kHz / ppm)
1.8 V	537	+2.10 / +3.9
2.1 V	537	+2.14 / +4.0
2.4 V	537	+2.14 / +4.0
2.7 V	537	+2.12 / +3.9
3.0 V	537	+2.12 / +3.9
3.3 V	537	+2.14 / +4.0

Results: high channel

Voltage	Frequency (MHz)	Deviation (kHz / ppm)
1.8 V	558	+2.26 / +4.1
2.1 V	558	+2.32 / +4.2
2.4 V	558	+2.28 / +4.1
2.7 V	558	+2.32 / +4.2
3.0 V	558	+2.26 / +4.1
3.3 V	558	+2.30 / +4.1

Range-B:

Results: low channel

Voltage	Frequency (MHz)	Deviation (kHz / ppm)
1.8 V	626	+2.46 / +3.9
2.1 V	626	+2.46 / +3.9
2.4 V	626	+2.42 / +3.9
2.7 V	626	+2.42 / +3.9
3.0 V	626	+2.42 / +3.9
3.3 V	626	+2.40 / +3.8

Results: middle channel

Voltage	Frequency (MHz)	Deviation (kHz / ppm)
1.8 V	647	+2.40 / +3.7
2.1 V	647	+2.40 / +3.7
2.4 V	647	+2.44 / +3.8
2.7 V	647	+2.42 / +3.7
3.0 V	647	+2.48 / +3.8
3.3 V	647	+2.42 / +3.7

Results: high channel

Voltage	Frequency (MHz)	Deviation (kHz / ppm)
1.8 V	668	+2.74 / +4.1
2.1 V	668	+2.68 / +4.0
2.4 V	668	+2.76 / +4.1
2.7 V	668	+2.80 / +4.2
3.0 V	668	+2.90 / +4.3
3.3 V	668	+2.90 / +4.3

Range-G:

Results: low channel

Voltage	Frequency (MHz)	Deviation (kHz / ppm)
1.8 V	566	+2.36 / +4.2
2.1 V	566	+2.40 / +4.3
2.4 V	566	+2.40 / +4.3
2.7 V	566	+2.42 / +4.4
3.0 V	566	+2.32 / +4.2
3.3 V	566	+2.36 / +4.2

Results: middle channel

Voltage	Frequency (MHz)	Deviation (kHz / ppm)
1.8 V	587	+2.38 / +4.1
2.1 V	587	+2.34 / +4.0
2.4 V	587	+2.34 / +4.0
2.7 V	587	+2.42 / +4.1
3.0 V	587	+2.38 / +4.1
3.3 V	587	+2.38 / +4.1

Results: high channel

Voltage	Frequency (MHz)	Deviation (kHz / ppm)
1.8 V	608	+2.64 / +4.3
2.1 V	608	+2.64 / +4.3
2.4 V	608	+2.62 / +4.3
2.7 V	608	+2.62 / +4.3
3.0 V	608	+2.62 / +4.3
3.3 V	608	+2.62 / +4.3

Result: **The result of the measurement is passed.**

9.3 Modulation characteristics

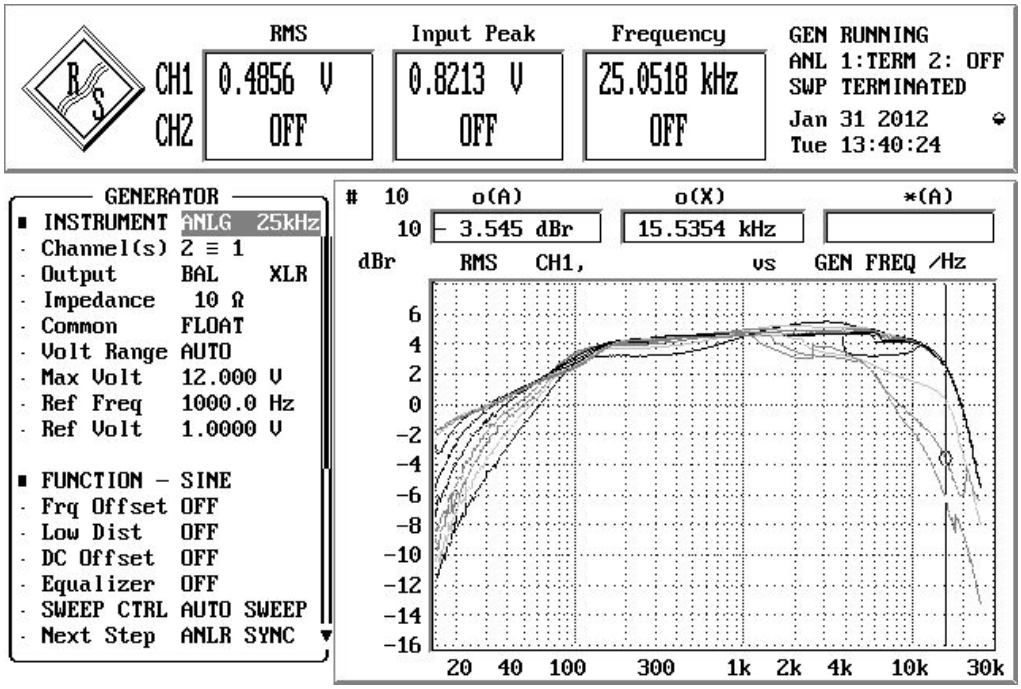
Measurement:

FCC	IC
47 CFR § 2.1047 47 CFR § 74.861	-/-

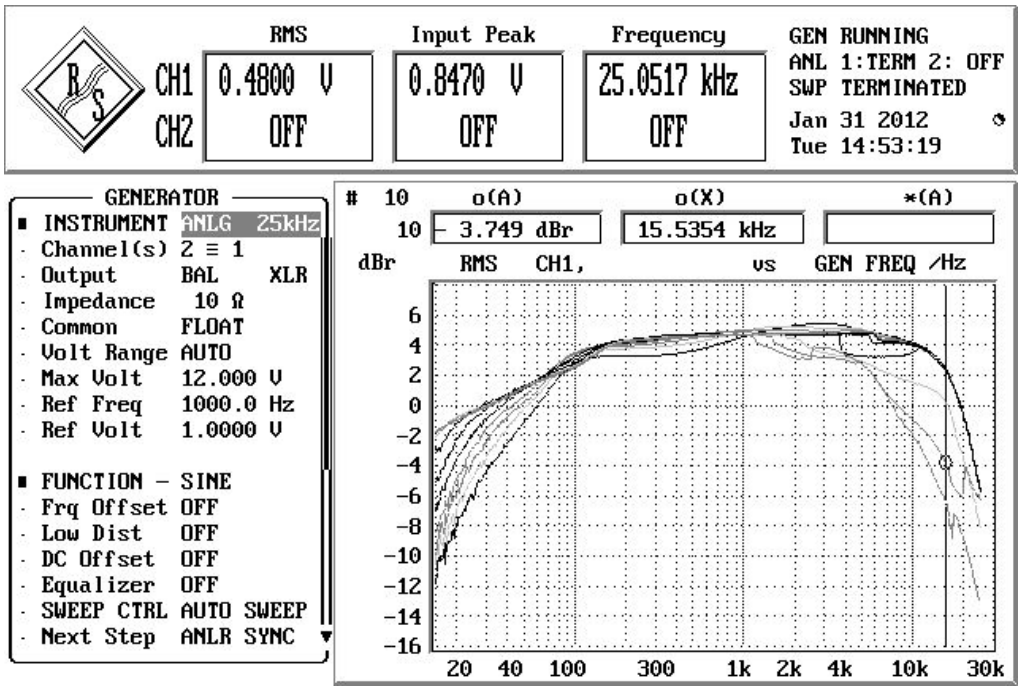
Method of measurement:

The audio frequency responds was measured in accordance with EIA/TIA 603. The plots shows 10 curves with different modulation levels, the frequency is varied from 15 Hz to 20 kHz.

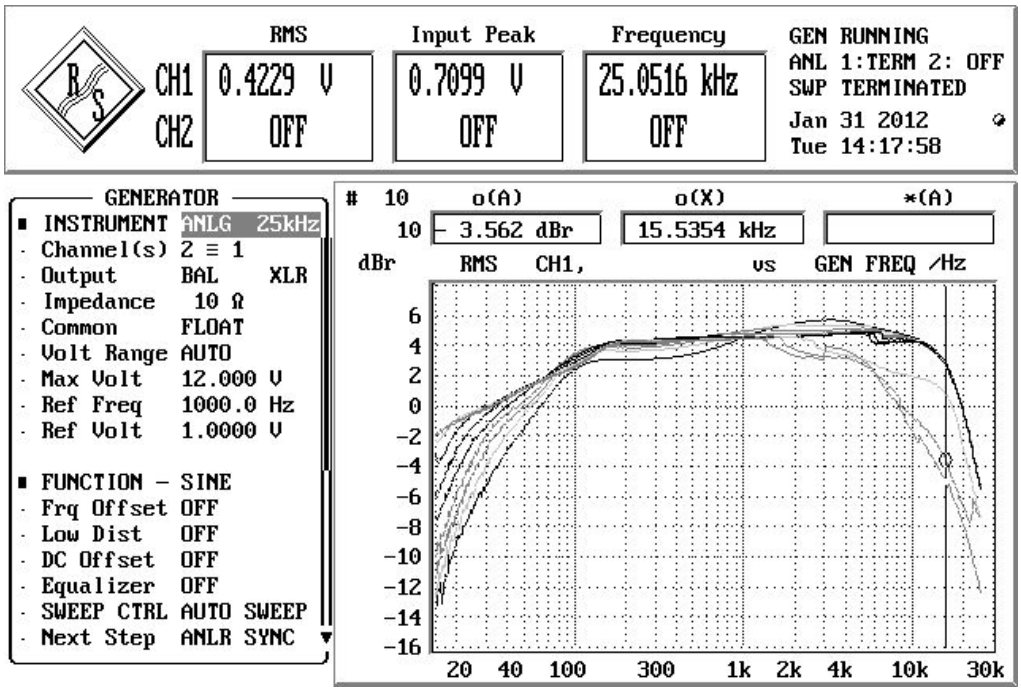
Range-A:



Range-B:



Range-G:



Result: **The result of the measurement is passed.**

9.4 Occupied bandwidth

Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	3 kHz
Video bandwidth:	10 kHz
Span:	500 kHz
Trace-Mode:	Max. hold

Limits:

FCC	IC
47 CFR § 74.861	RSS-123 §6 Issue 2
Occupied bandwidth 99%. Other than single sideband or independent sideband transmitters - when modulated by a 2500 Hz tone at an input level 16 dB greater than that necessary to produce 50 percent modulation. The input level shall be established at the frequency of maximum response of the audio modulating circuit.	
The operating bandwidth shall not exceed 200 kHz	

Result:

Range-A:

Frequency	20dB Bandwidth
516 MHz	96.2 kHz
537 MHz	97.2 kHz
558 MHz	98.2 kHz

Range-B:

Frequency	20dB Bandwidth
626 MHz	96.2 kHz
647 MHz	95.2 kHz
668 MHz	96.2 kHz

Range-G:

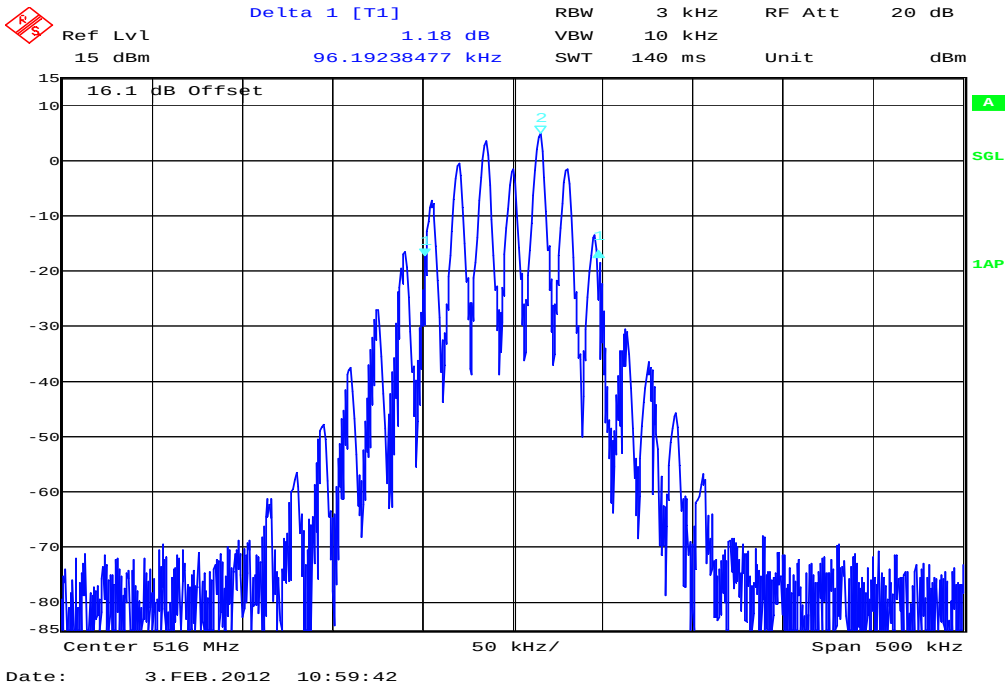
Frequency	20dB Bandwidth
566 MHz	94.2 kHz
587 MHz	97.2 kHz
608 MHz	95.2 kHz

Result: **The result of the measurement is passed.**

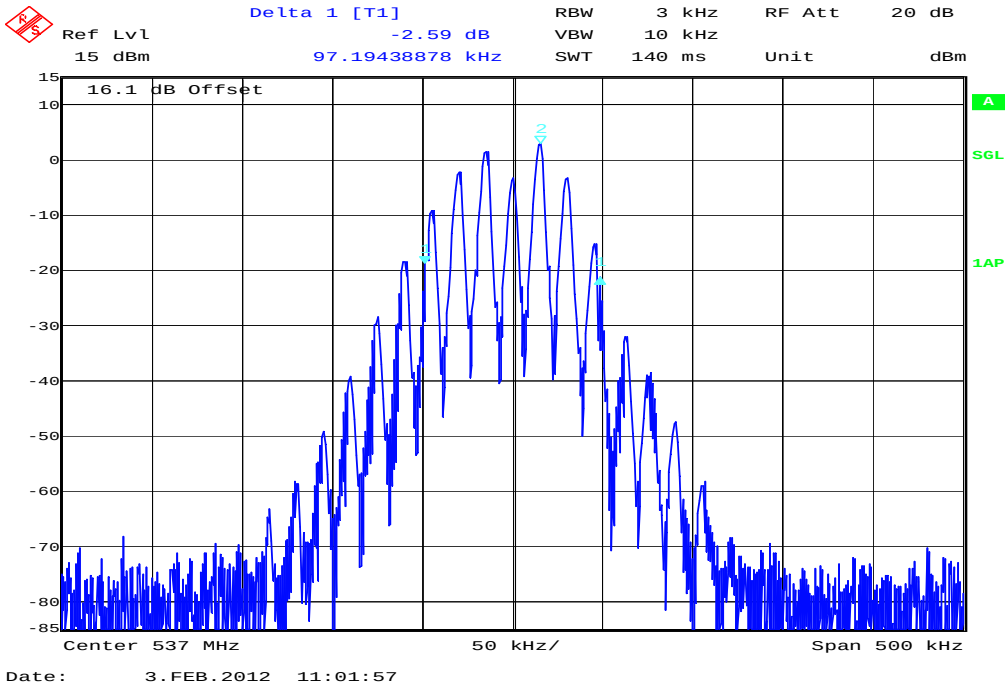
Plots of the measurements

Range-A:

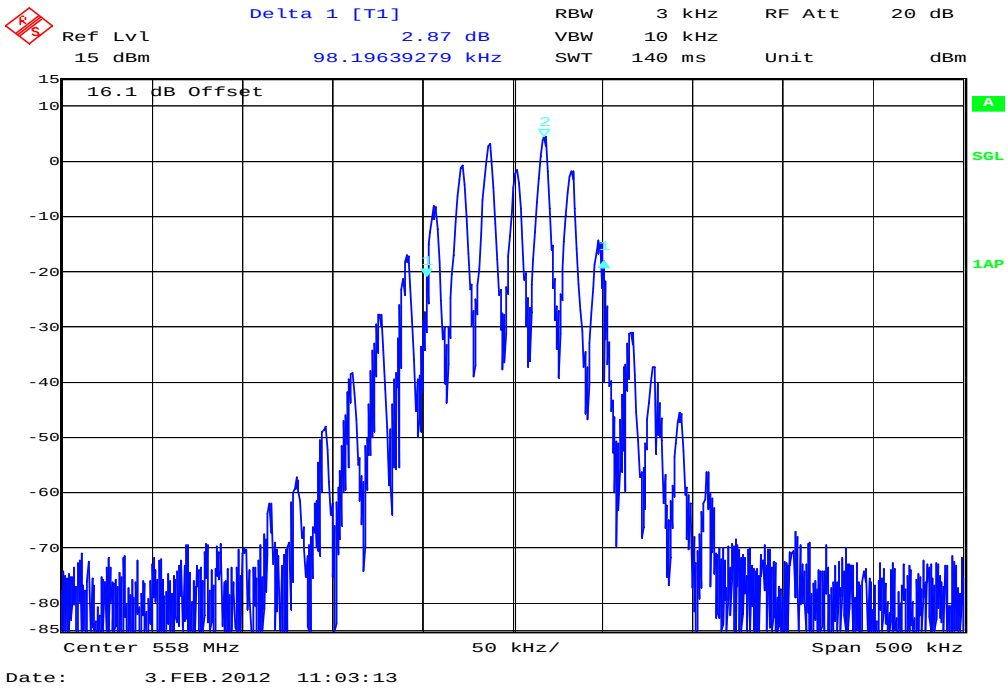
Plot 1: low channel



Plot 2: middle channel

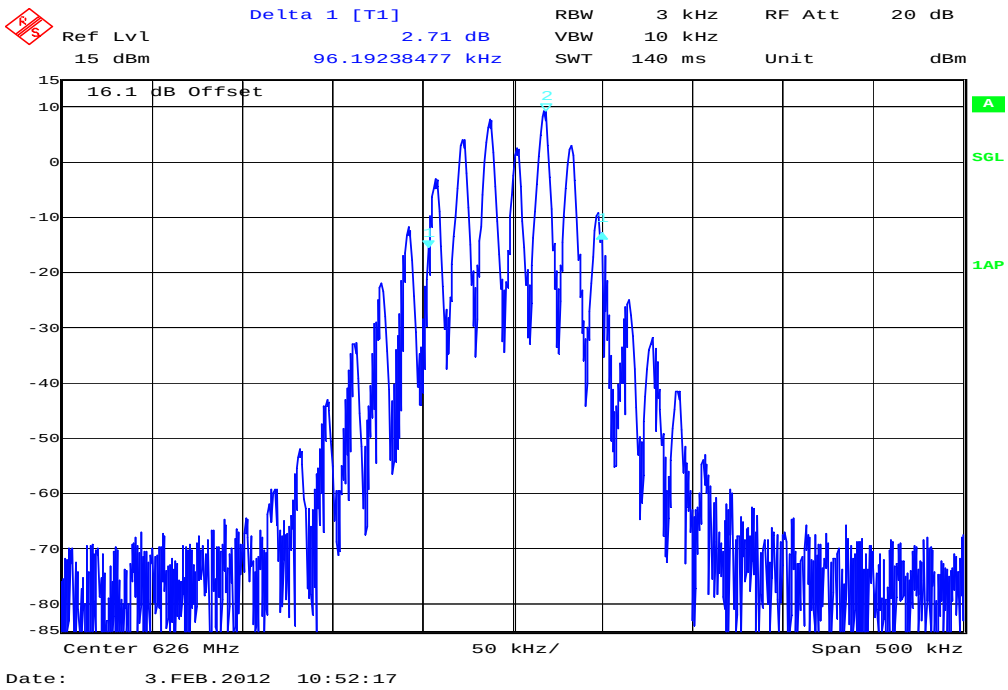


Plot 3: high channel

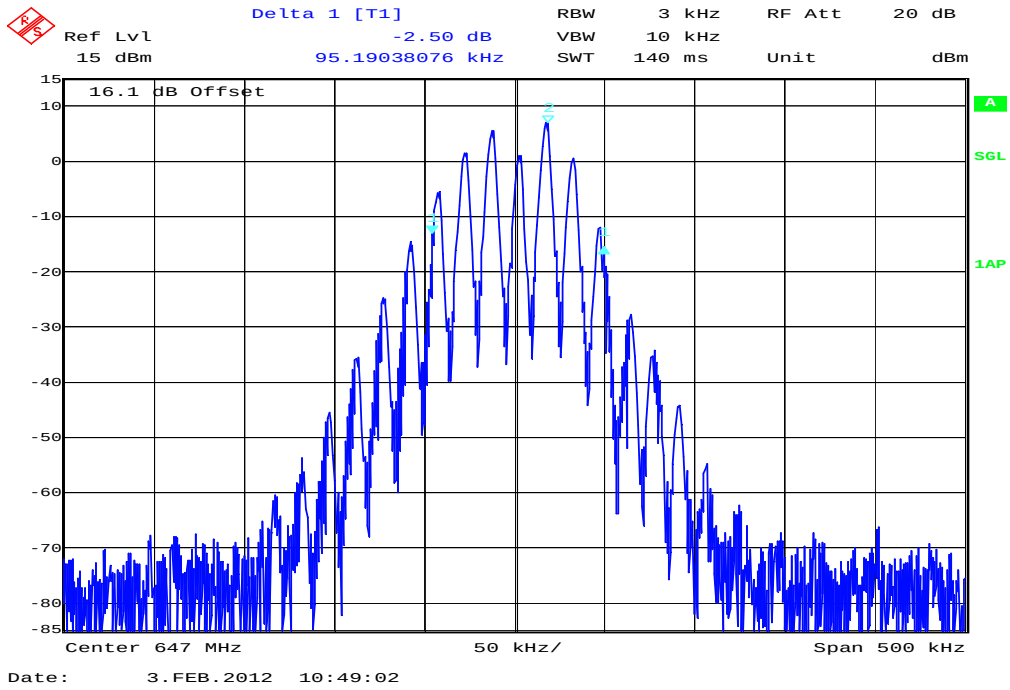


Range-B:

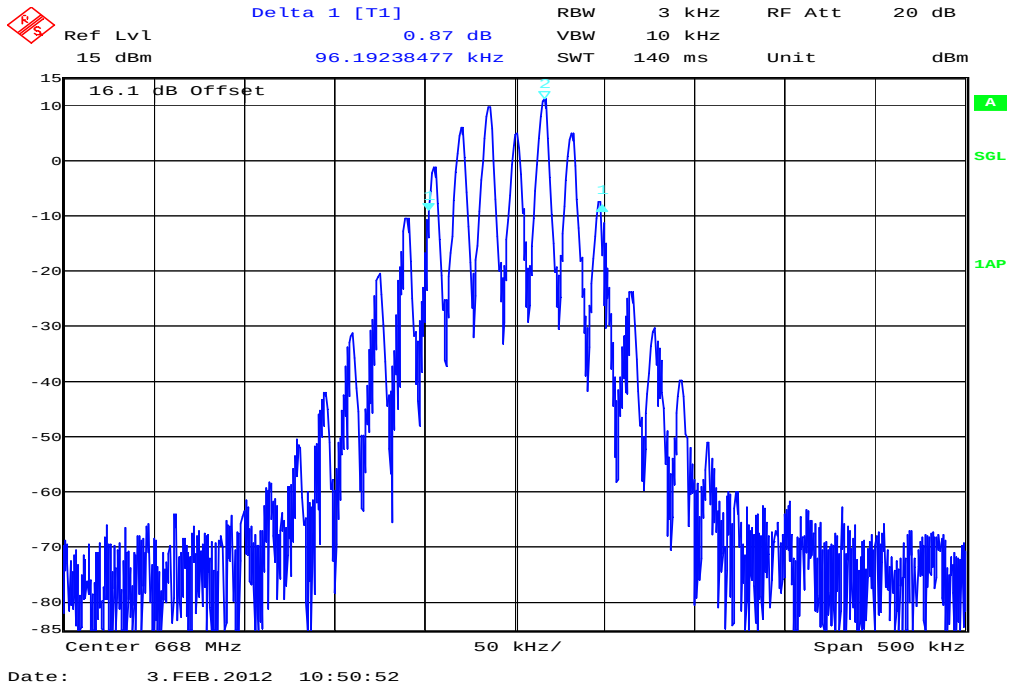
Plot 1: low channel



Plot 2: middle channel

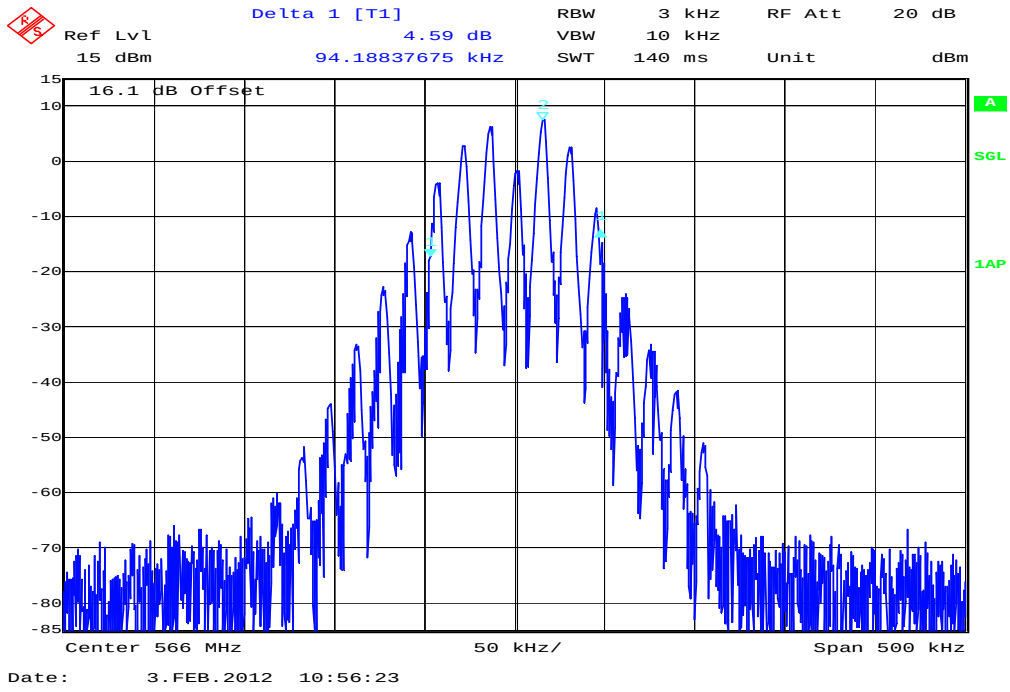


Plot 3: high channel

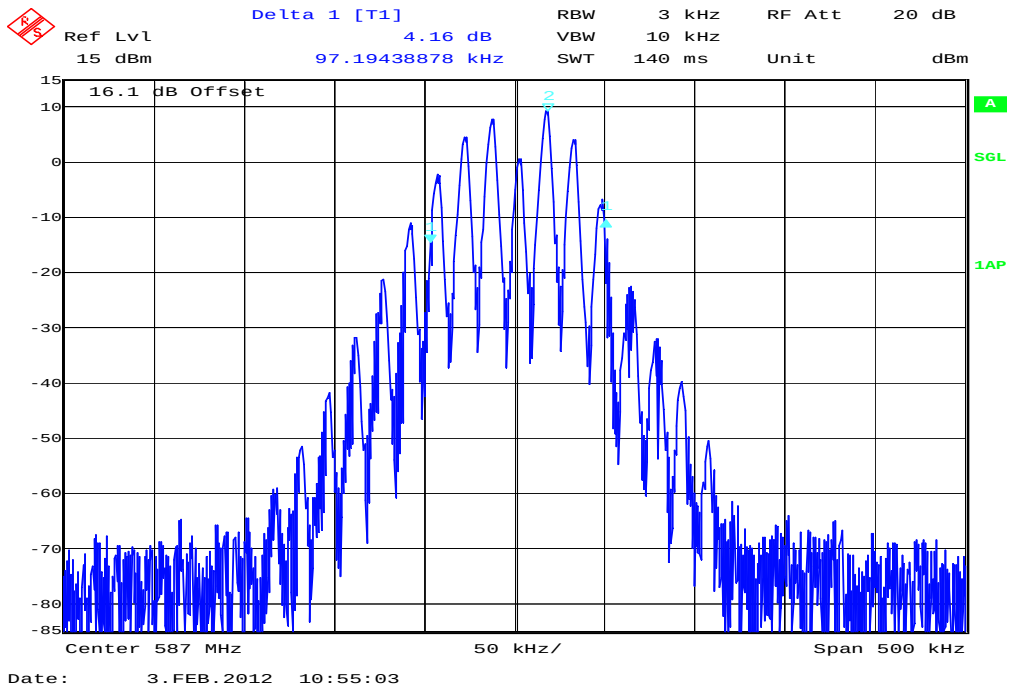


Range-G:

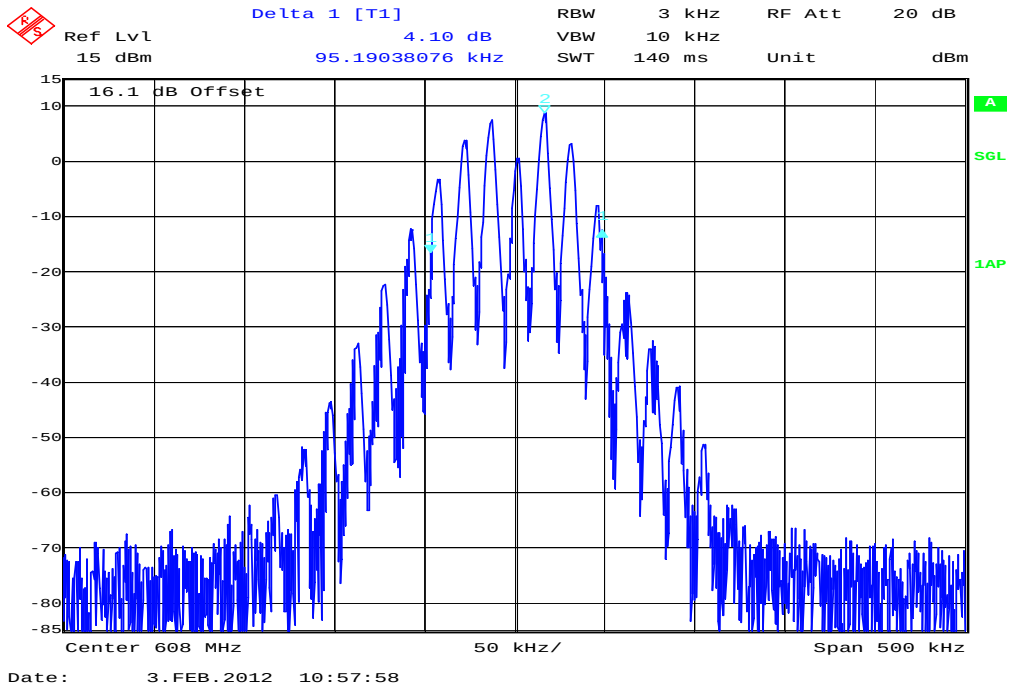
Plot 1: low channel



Plot 2: middle channel



Plot 3: high channel



9.5 Unwanted radiation (spectrum mask)

Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	3 kHz
Video bandwidth:	10 kHz
Span:	1.5 MHz
Trace-Mode:	Max. hold

Limits:

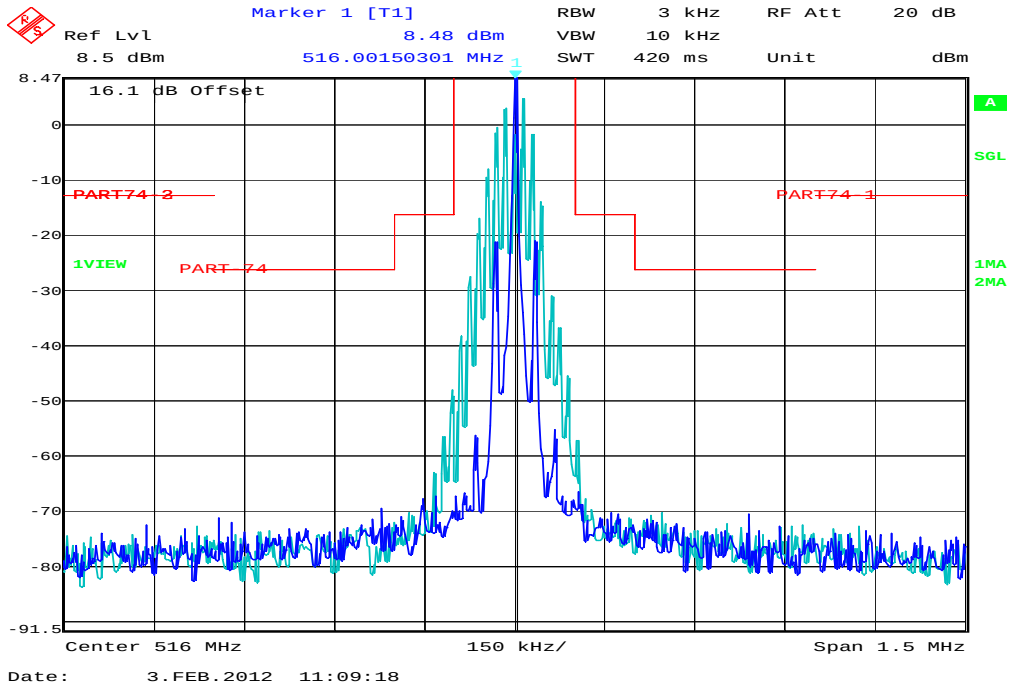
FCC	IC
47 CFR § 74.861	RSS-123 §5.5 Issue 2
The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the following schedule: (i) On any frequency removed from the operating frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth: at least 25 dB; (ii) On any frequency removed from the operating frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth: at least 35 dB; (iii) On any frequency removed from the operating frequency by more than 250 percent of the authorized bandwidth: at least 43+10log10 (mean output power in watts) dB.	

Result: **The result of the measurement is passed.**

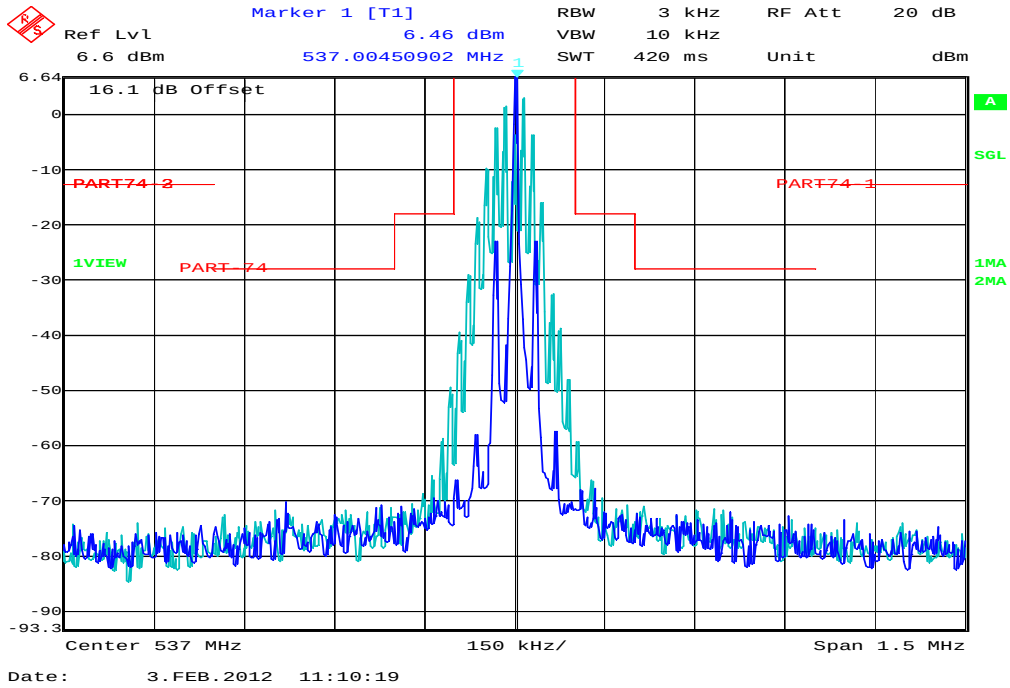
Plots of the measurements

Range-A:

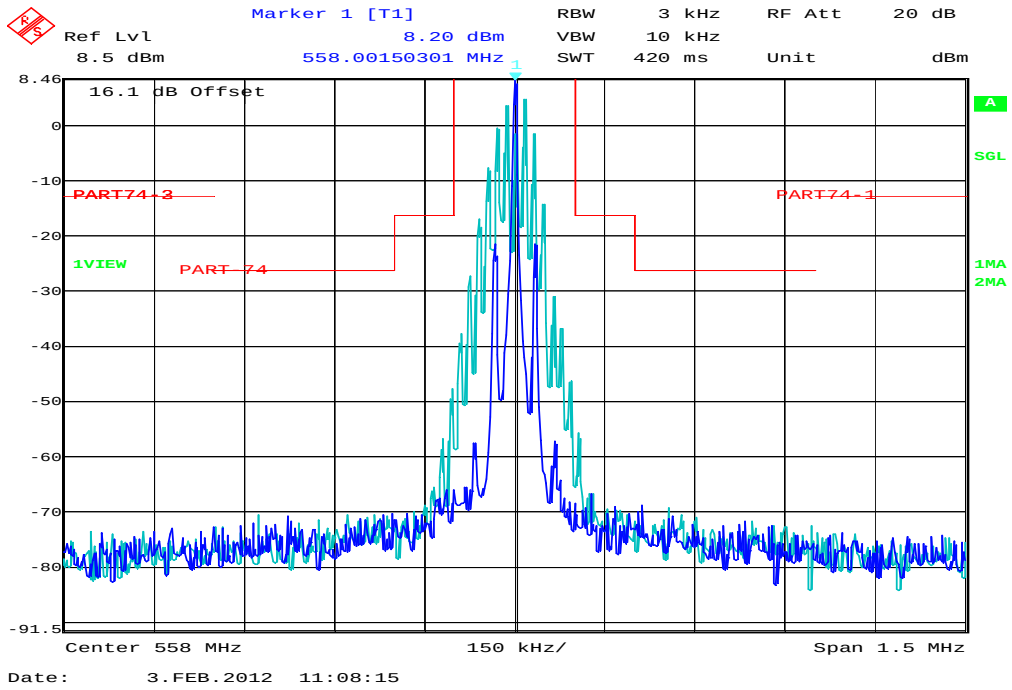
Plot 1: low channel



Plot 2: middle channel

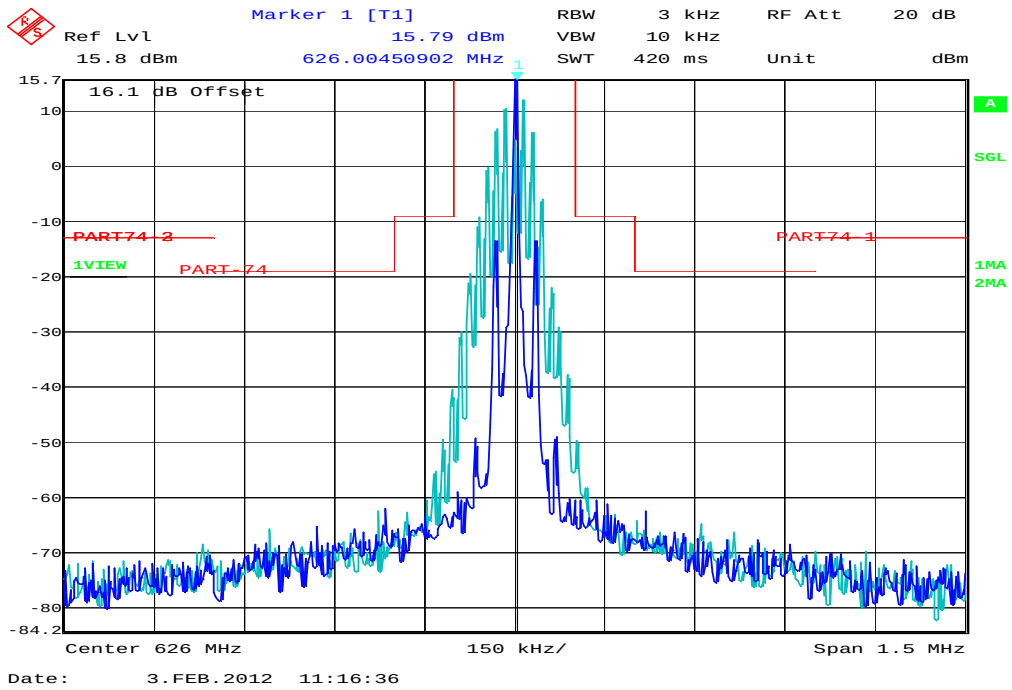


Plot 3: high channel

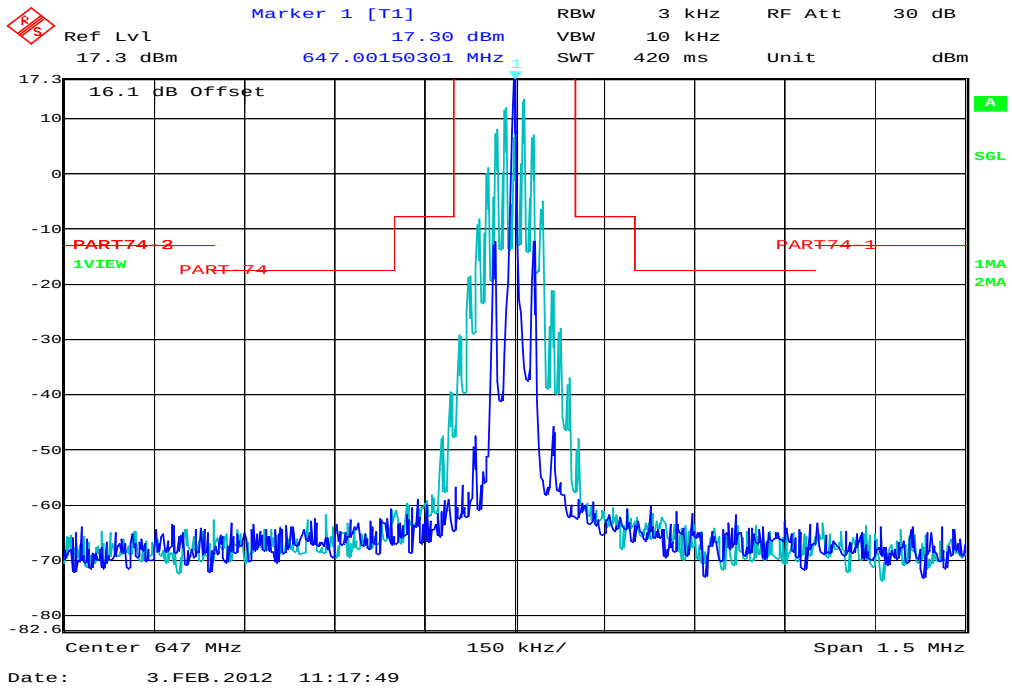


Range-B:

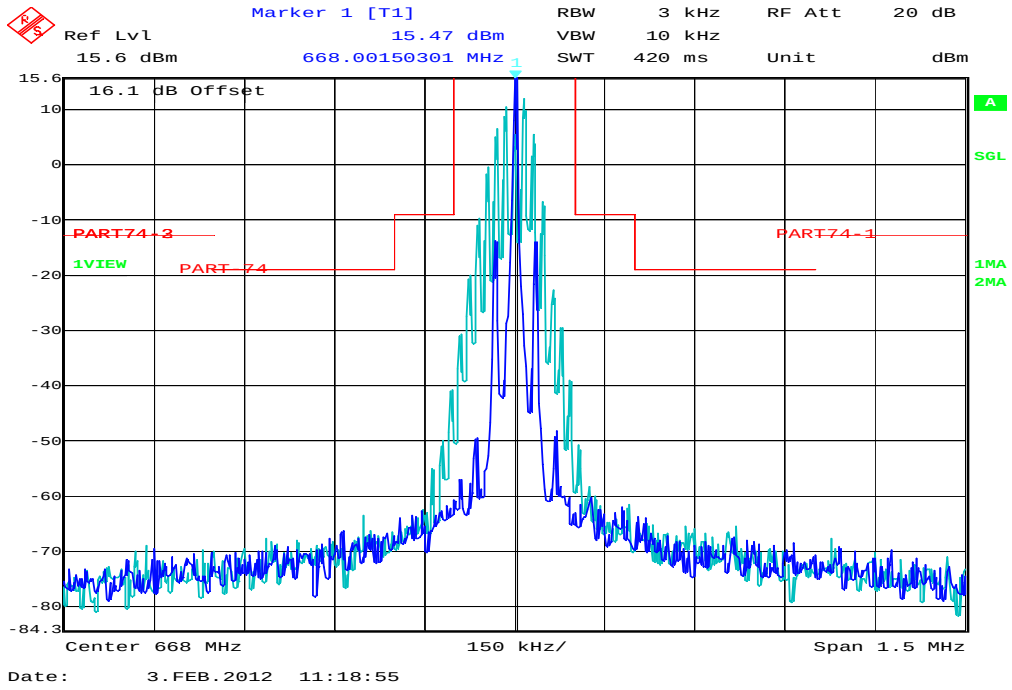
Plot 1: low channel



Plot 2: middle channel

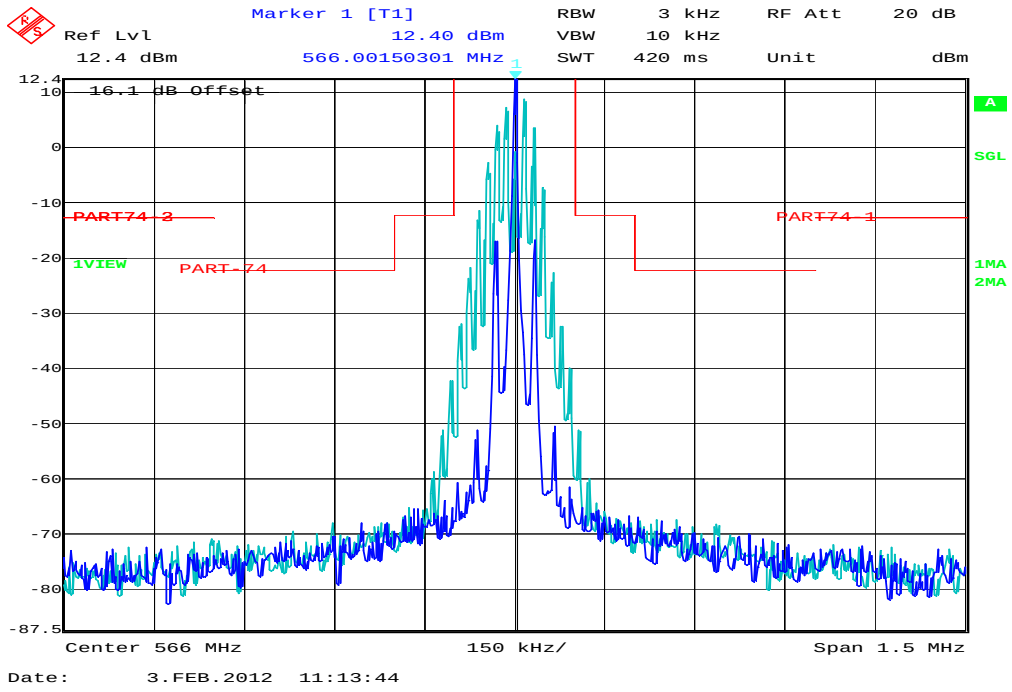


Plot 3: high channel

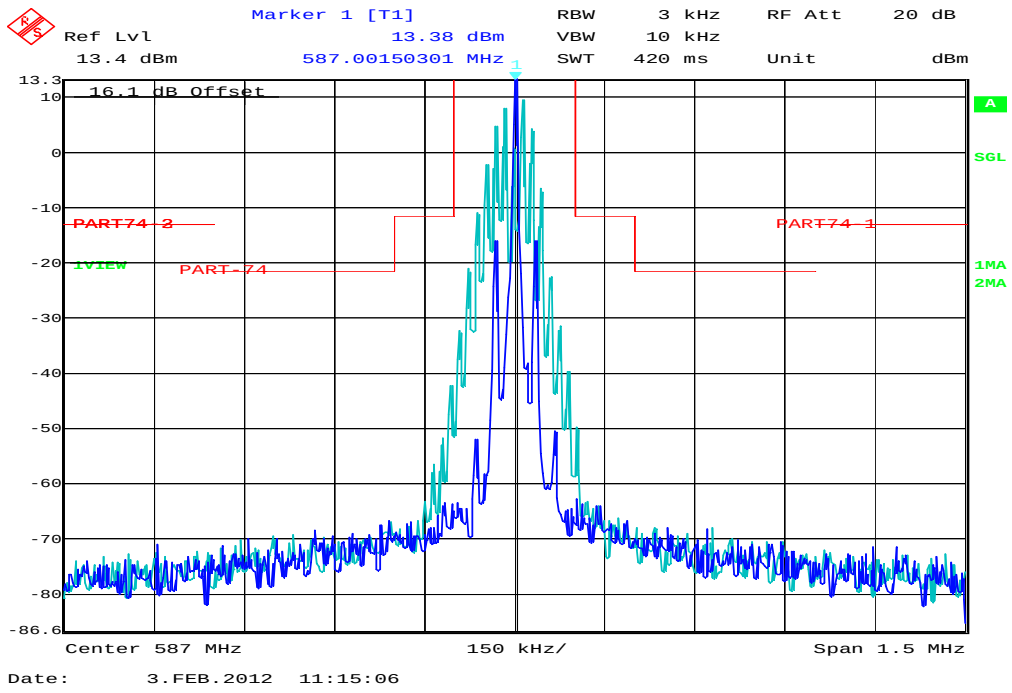


Range-G:

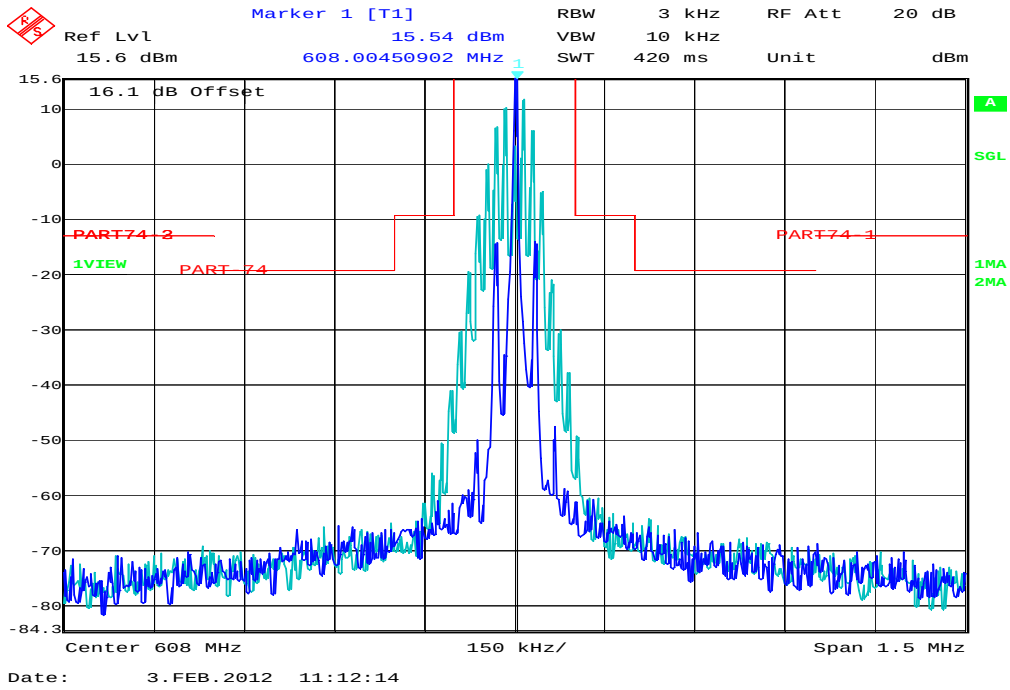
Plot 1: low channel



Plot 2: middle channel



Plot 3: high channel



9.6 Field strength of spurious radiation.

Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	f < 1 GHz : 100 kHz f ≥ 1GHz : 1 MHz
Video bandwidth:	f < 1 GHz : 100 kHz f ≥ 1GHz : 1 MHz
Span:	-/-
Trace-Mode:	Max. hold

Limits:

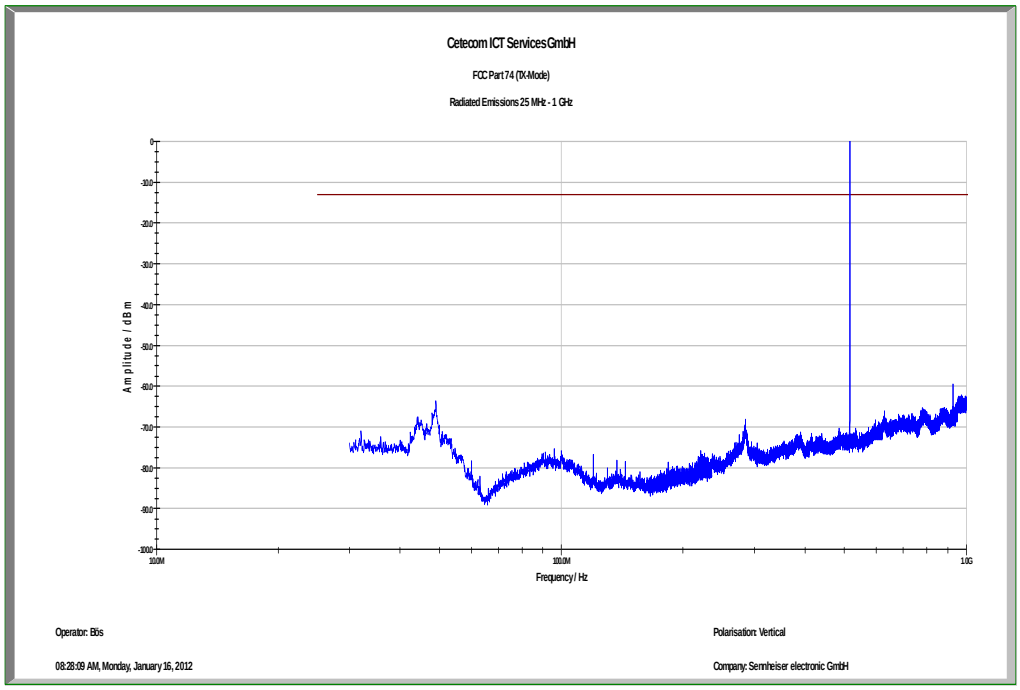
FCC	IC
Emissions for LPRS transmitters operating on standard band channels (25 kHz) shall be attenuated below the unmodulated carrier in accordance with the following: Emissions 12.5 kHz to 22.5 kHz away from the channel center frequency: at least 30 dB; and emissions more than 22.5 kHz away from the channel center frequency: **FCC:** at least 43 + 10log(carrier power in watts) dB **IC:** at least 55 + 10log(carrier power in watts) dB.	

SPURIOUS EMISSIONS LEVEL (dBm)								
Lowest channel			Middle channel			Highest channel		
Frequency	Detector	Level	Frequency	Detector	Level	Frequency	Detector	Level
No critical peaks found								
Measurement uncertainty ± 3 dB								

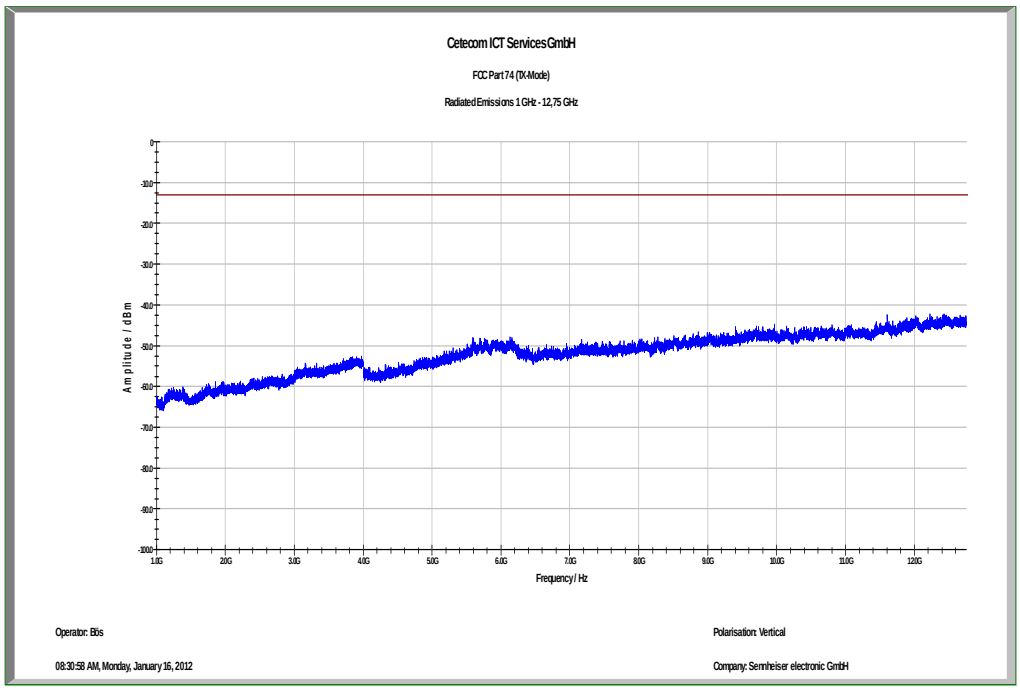
Result: **The result of the measurement is passed.**

Plots of the measurements (Range-A)

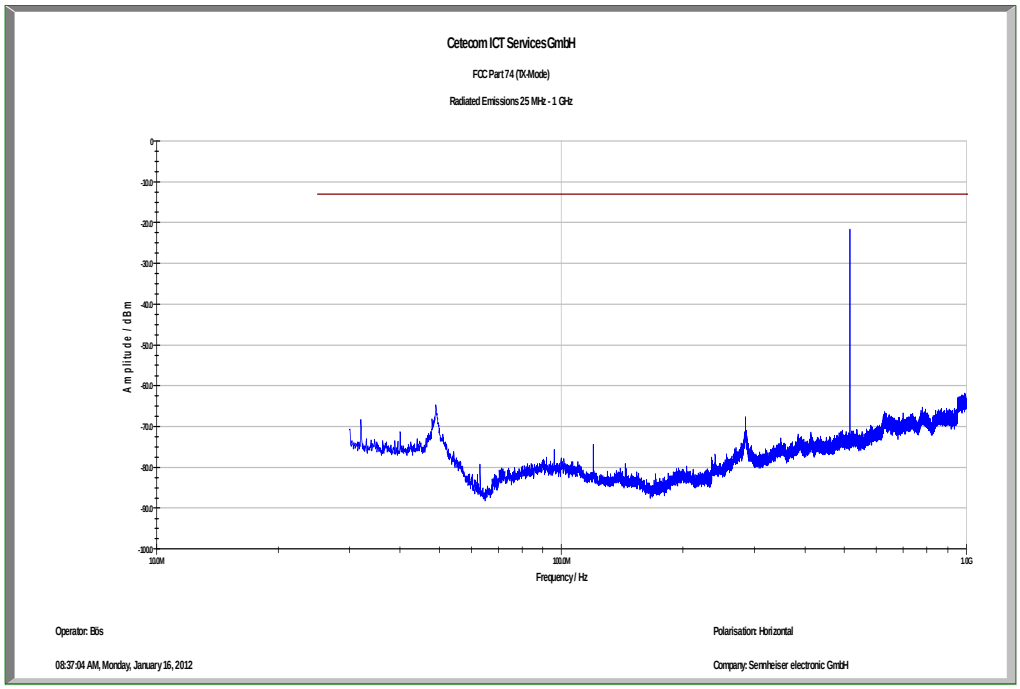
Plot 1: 30 MHz – 1 GHz, low channel, antenna vertical



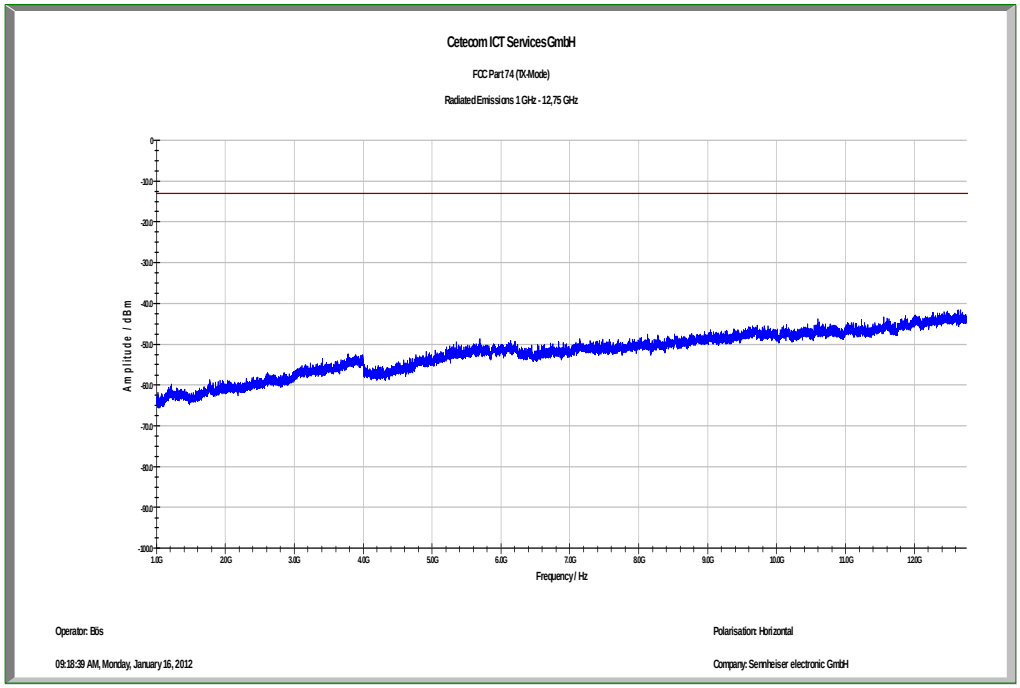
Plot 2: 1 GHz – 12.75 GHz, low channel, antenna vertical



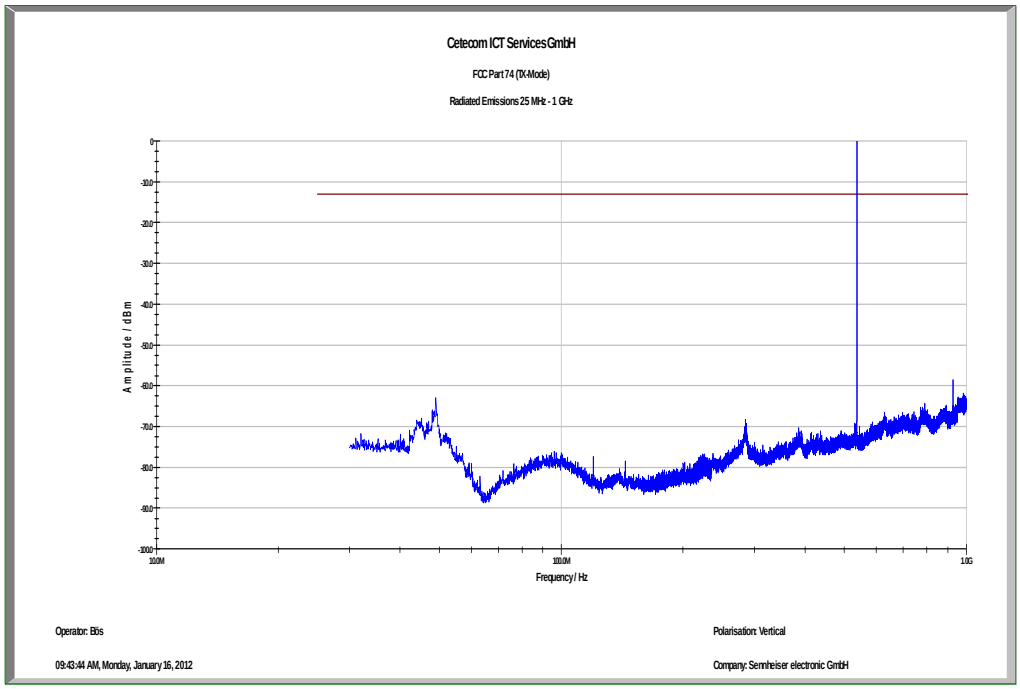
Plot 3: 30 MHz – 1 GHz, low channel, antenna horizontal



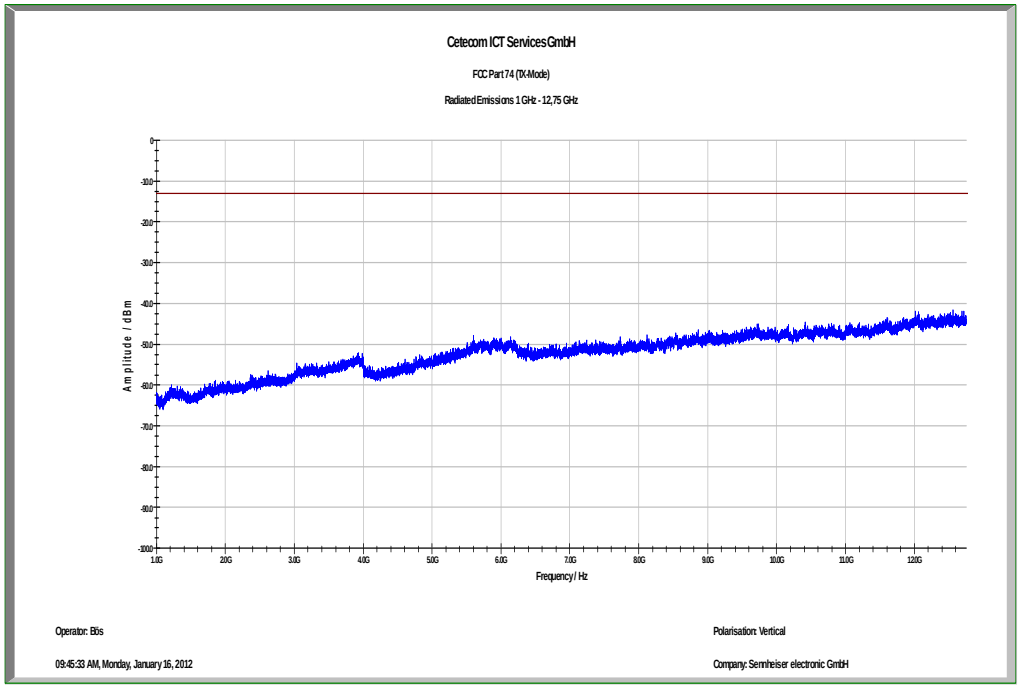
Plot 4: 1 GHz – 12.75 GHz, low channel, antenna horizontal



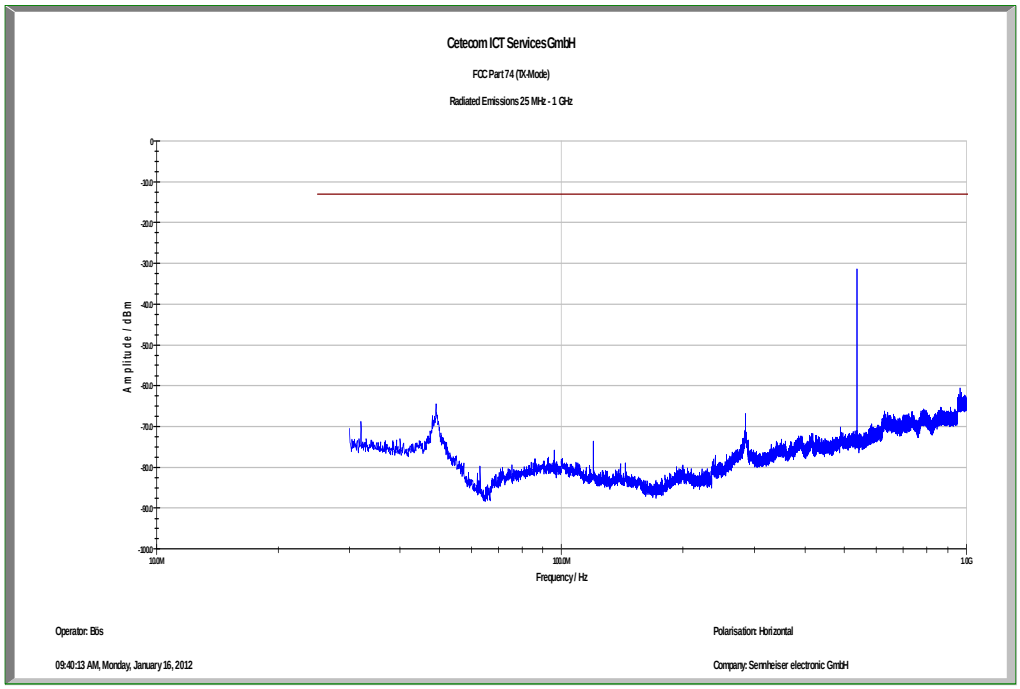
Plot 5: 30 MHz – 1 GHz, middle channel, antenna vertical



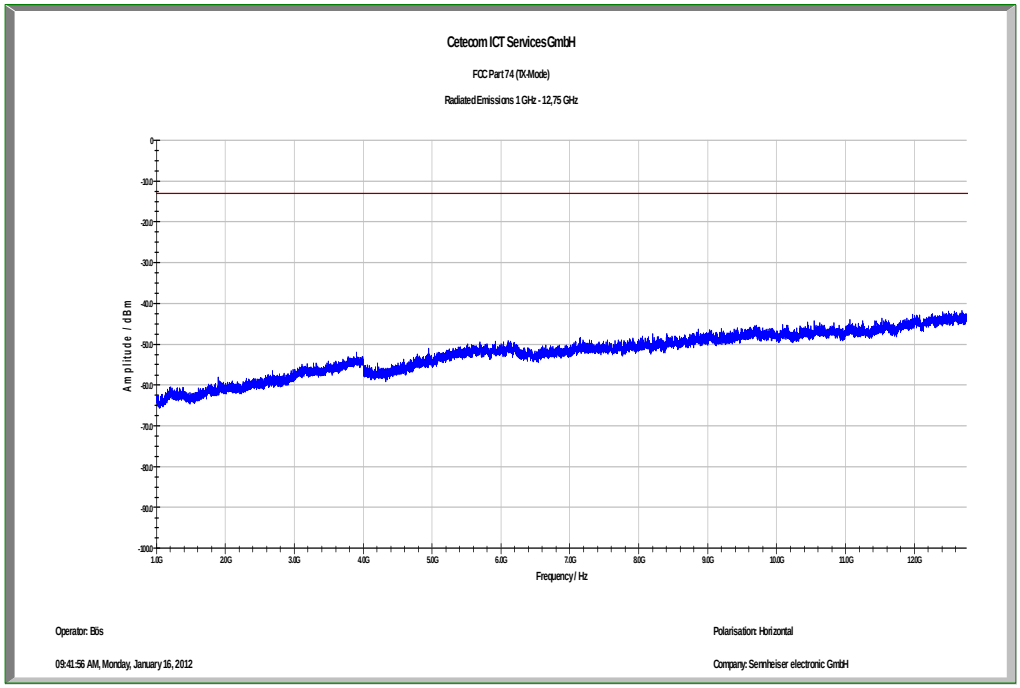
Plot 6: 1 GHz – 12.75 GHz, middle channel, antenna vertical



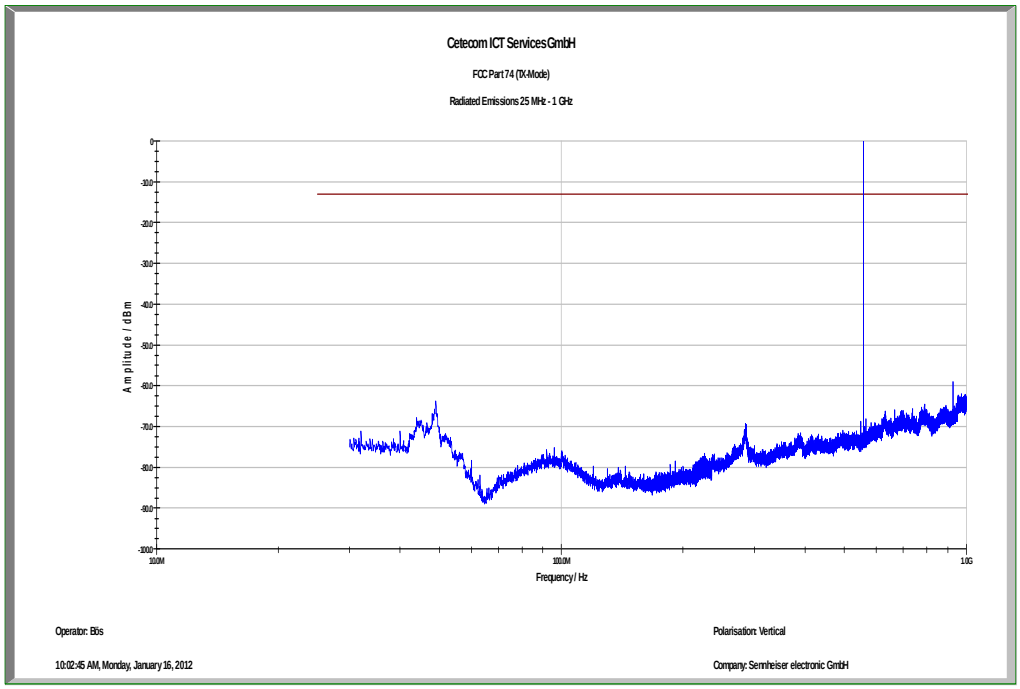
Plot 7: 30 MHz – 1 GHz, middle channel, antenna horizontal



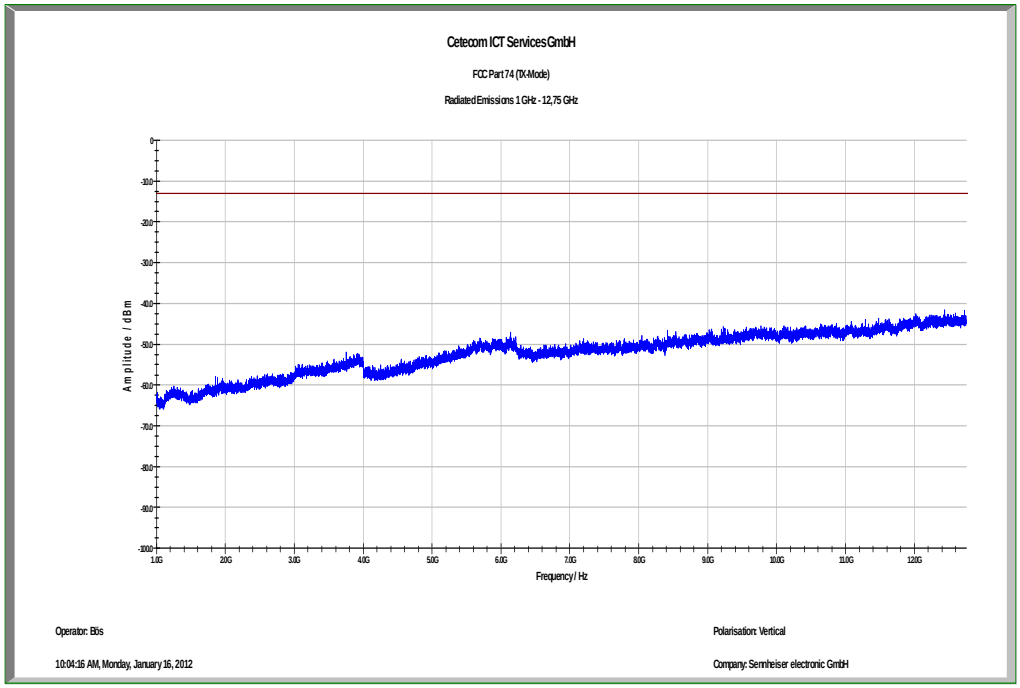
Plot 8: 1 GHz – 12.75 GHz, middle channel, antenna horizontal



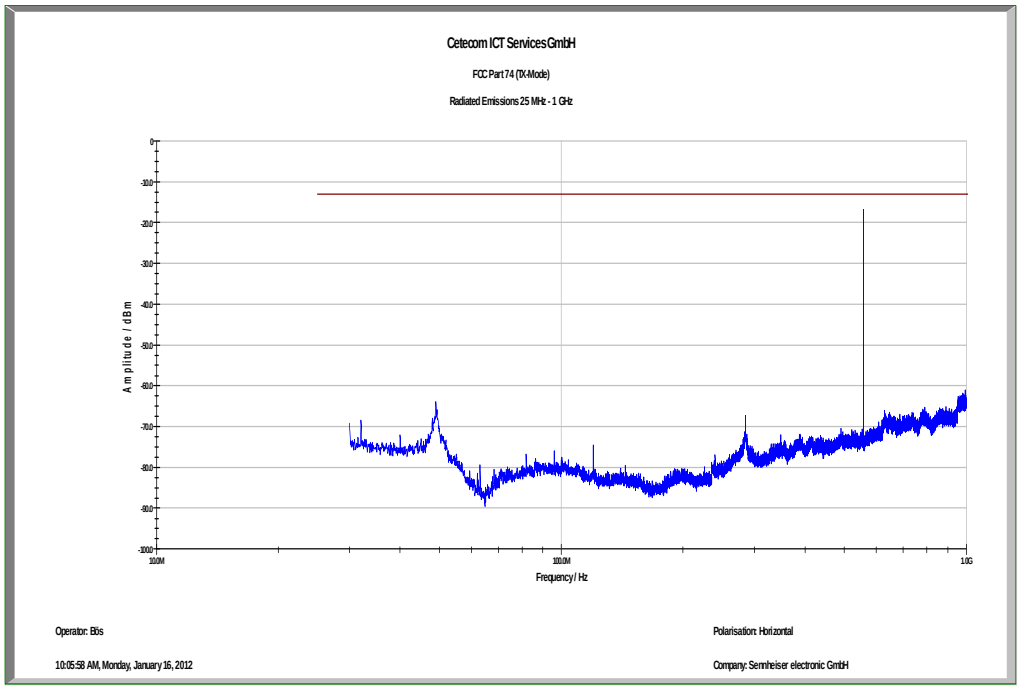
Plot 9: 30 MHz – 1 GHz, high channel, antenna vertical



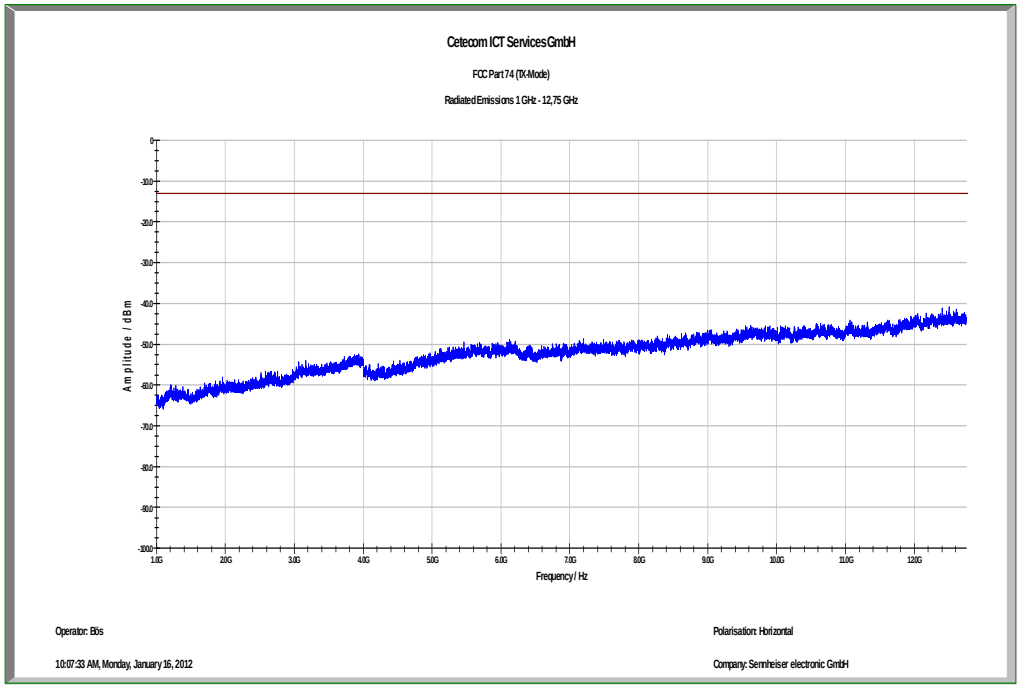
Plot 10: 1 GHz – 12.75 GHz, high channel, antenna vertical



Plot 11: 30 MHz – 1 GHz, high channel, antenna horizontal

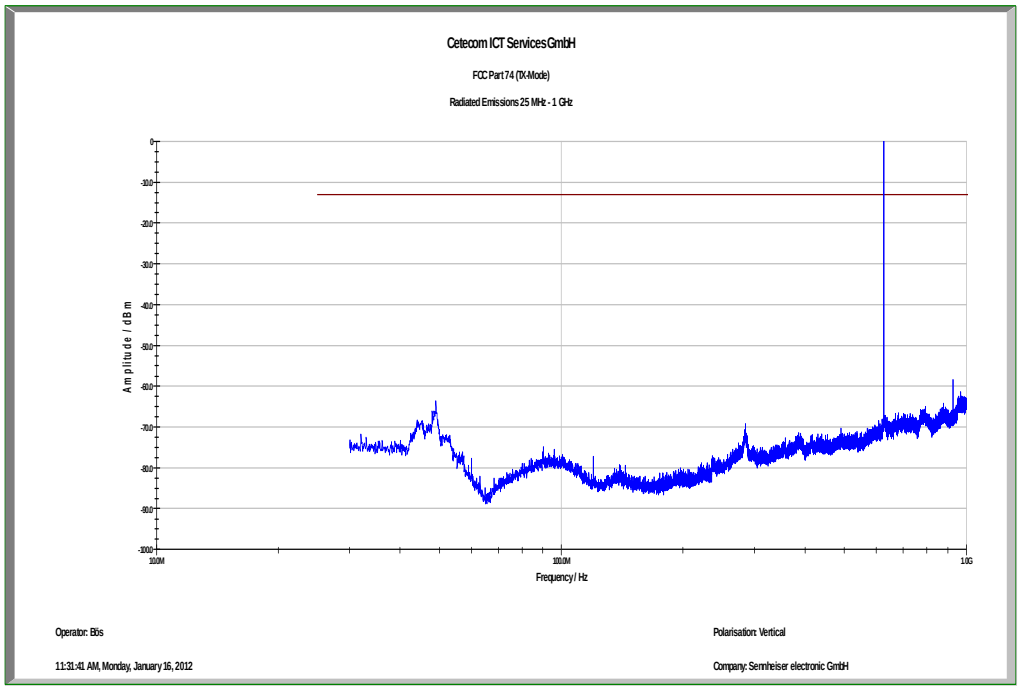


Plot 12: 1 GHz – 12.75 GHz, high channel, antenna horizontal

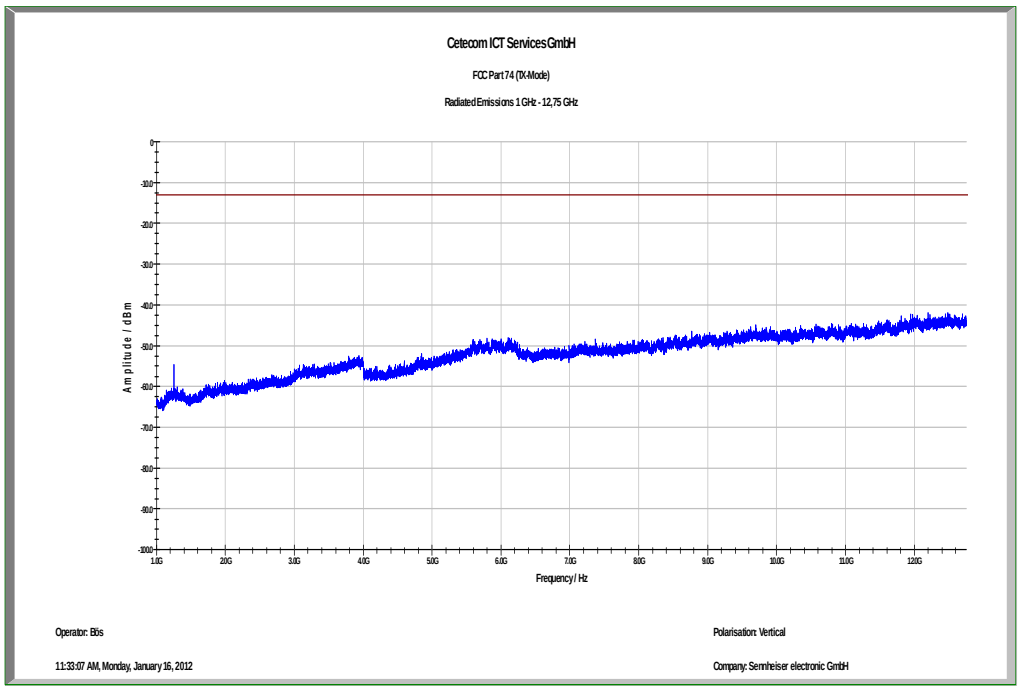


Plots of the measurements (Range-B)

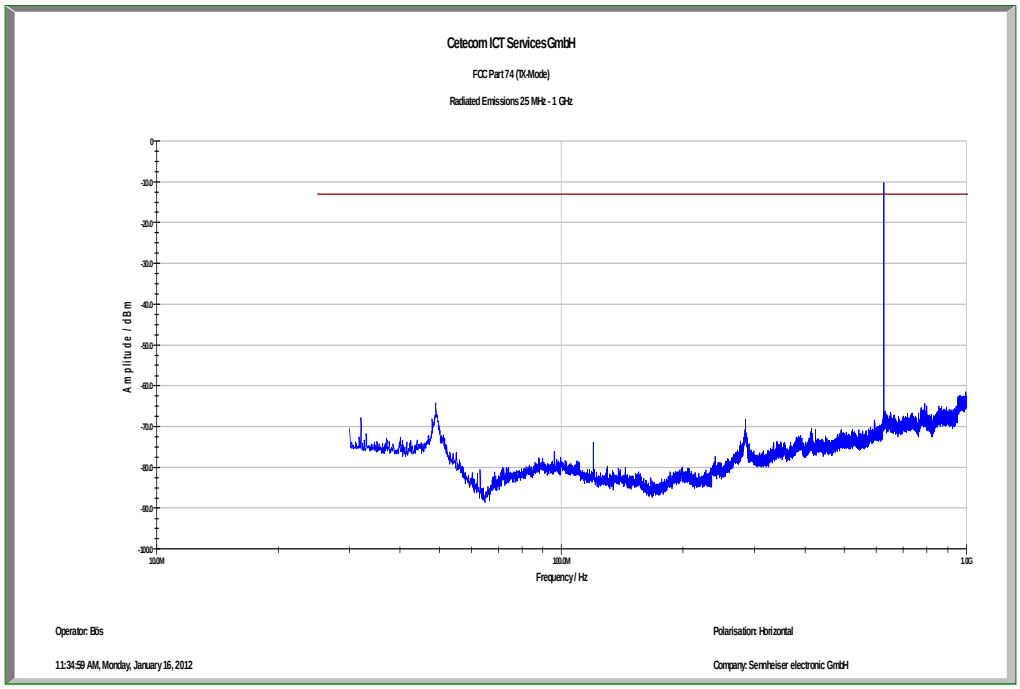
Plot 1: 30 MHz – 1 GHz, low channel, antenna vertical



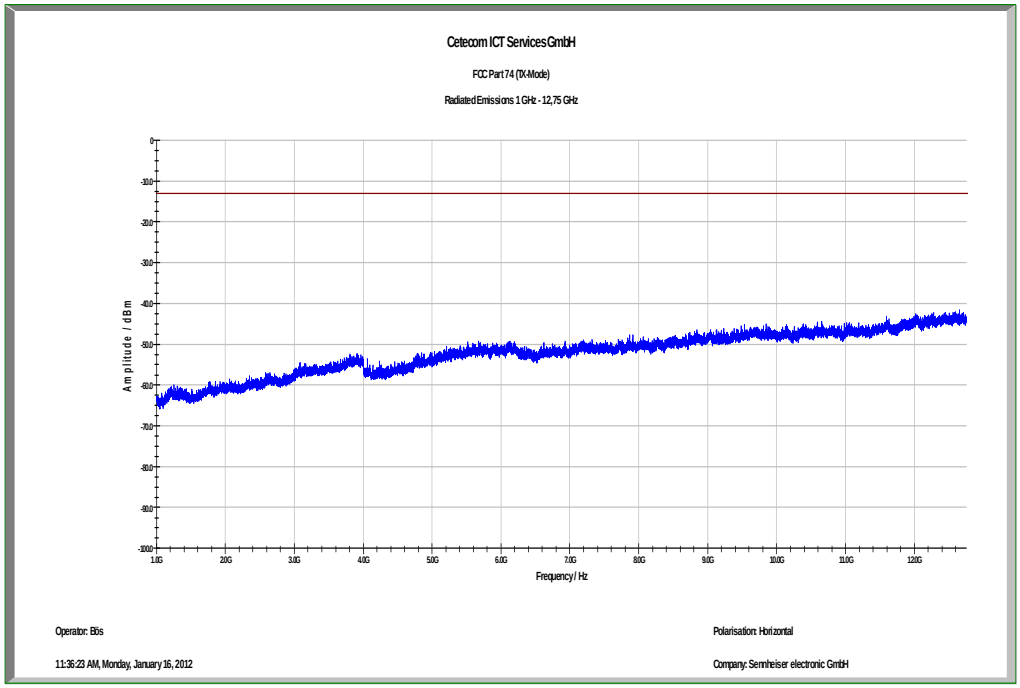
Plot 2: 1 GHz – 12.75 GHz, low channel, antenna vertical



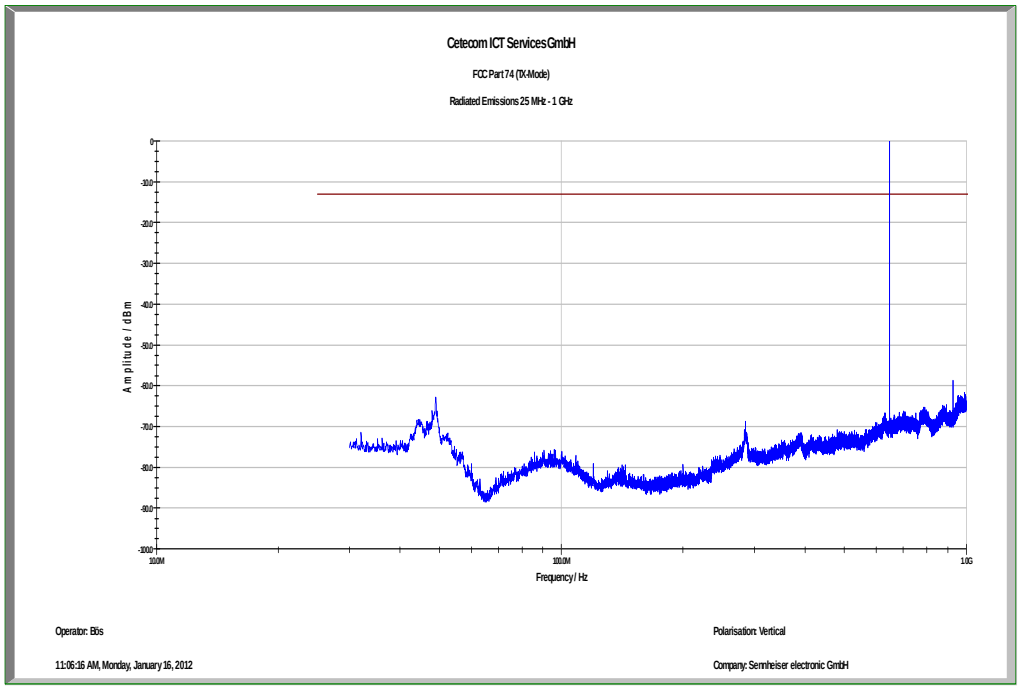
Plot 3: 30 MHz – 1 GHz, low channel, antenna horizontal



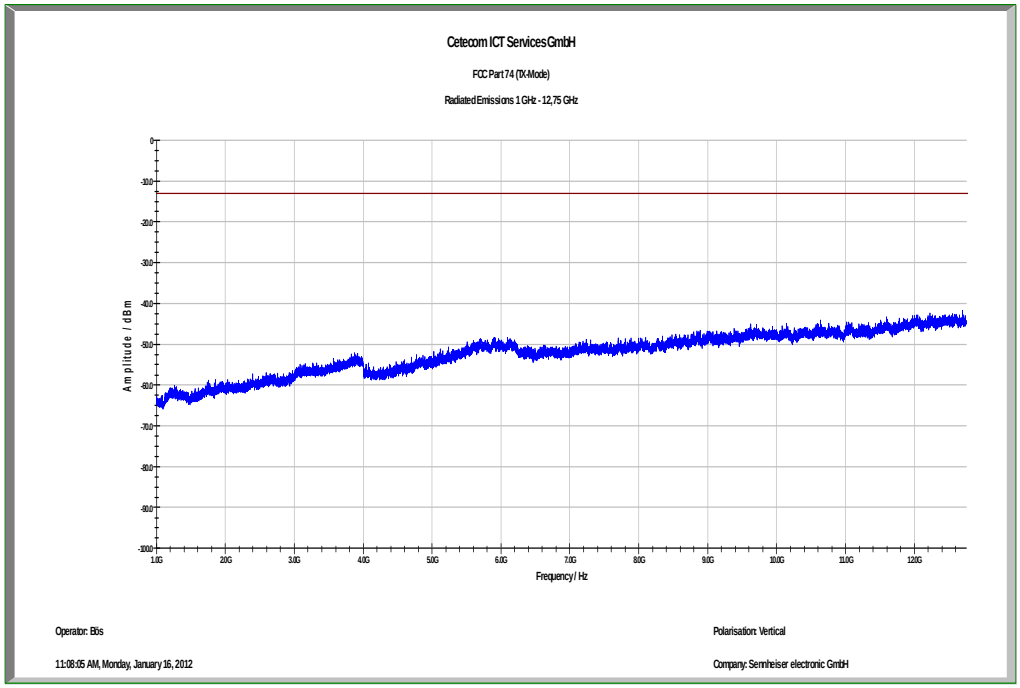
Plot 4: 1 GHz – 12.75 GHz, low channel, antenna horizontal



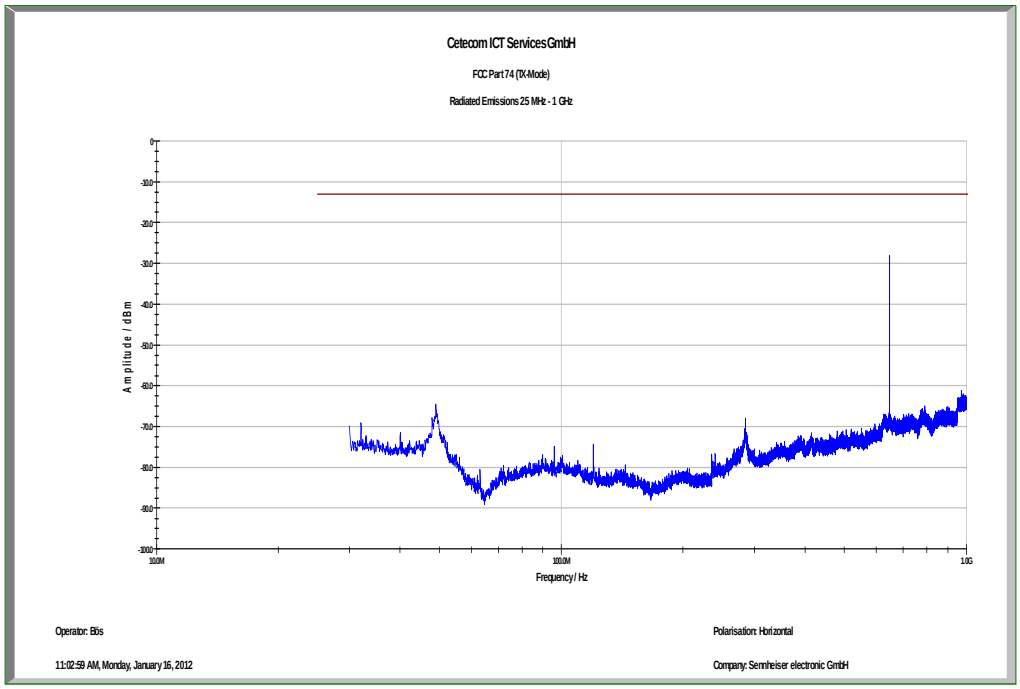
Plot 5: 30 MHz – 1 GHz, middle channel, antenna vertical



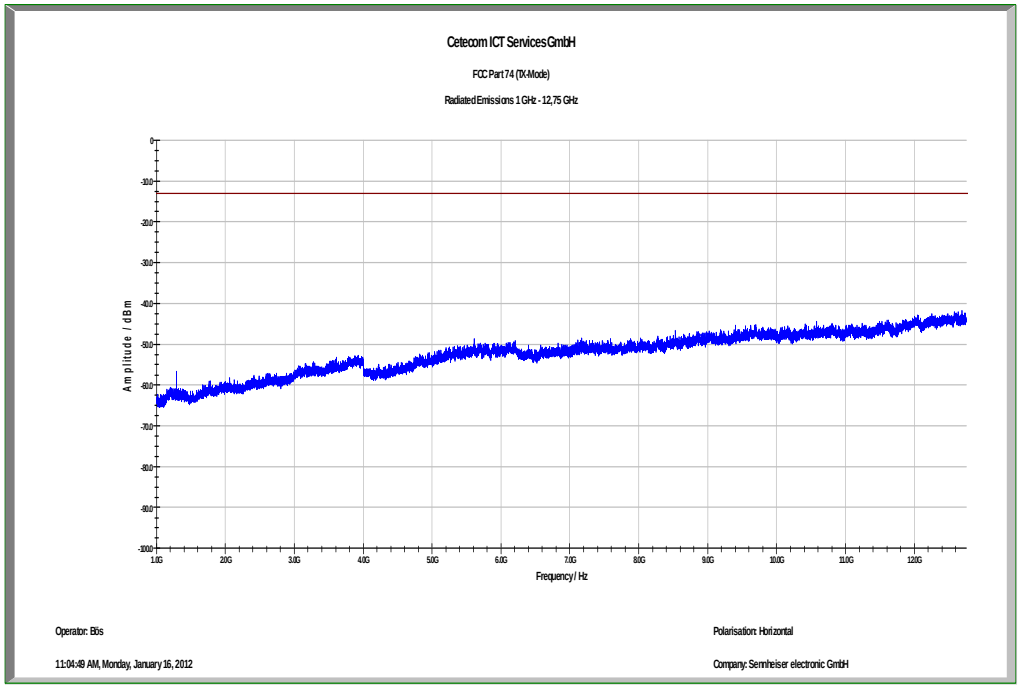
Plot 6: 1 GHz – 12.75 GHz, middle channel, antenna vertical



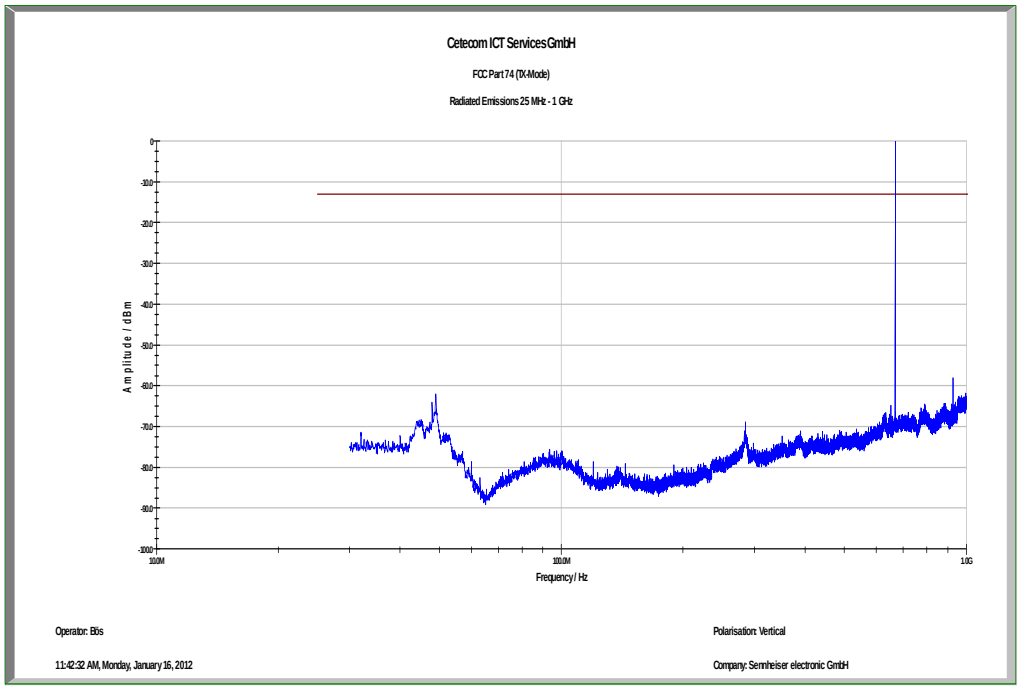
Plot 7: 30 MHz – 1 GHz, middle channel, antenna horizontal



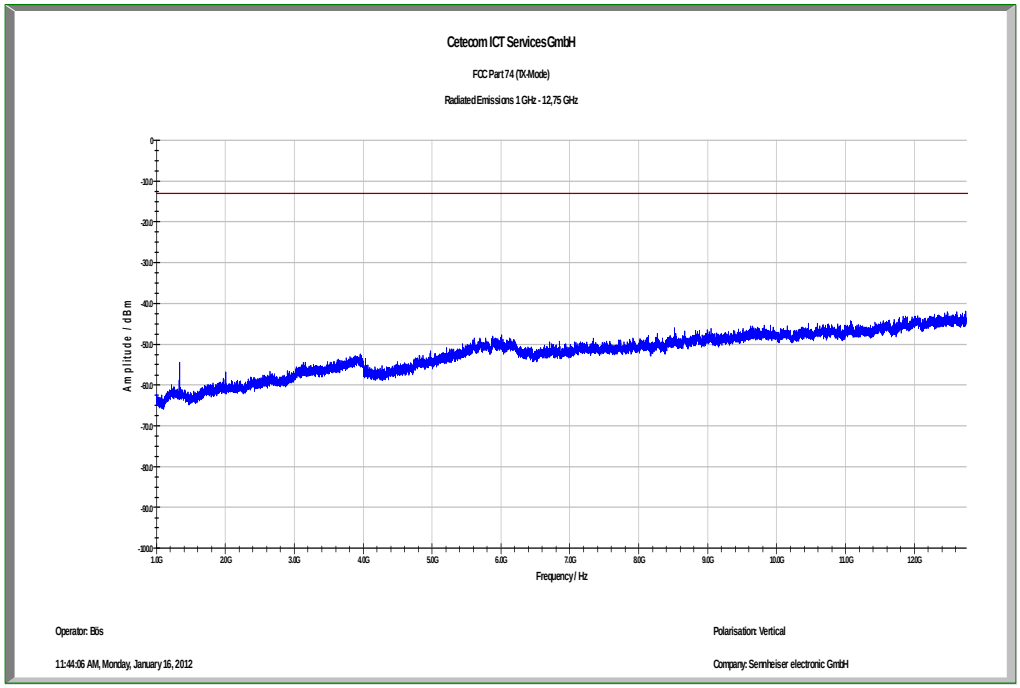
Plot 8: 1 GHz – 12.75 GHz, middle channel, antenna horizontal



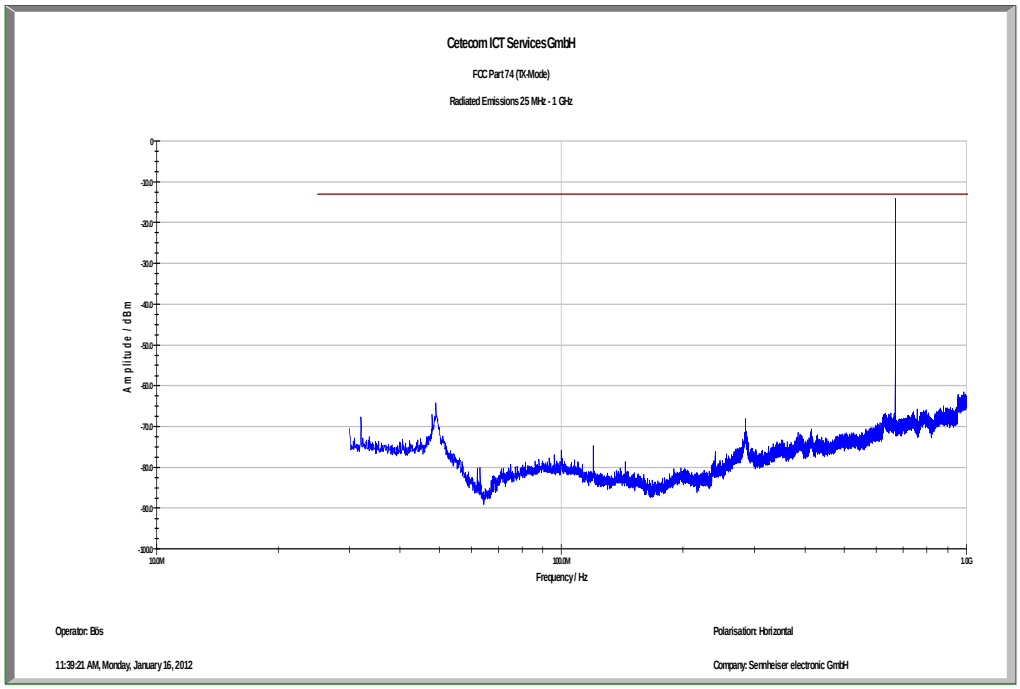
Plot 9: 30 MHz – 1 GHz, high channel, antenna vertical



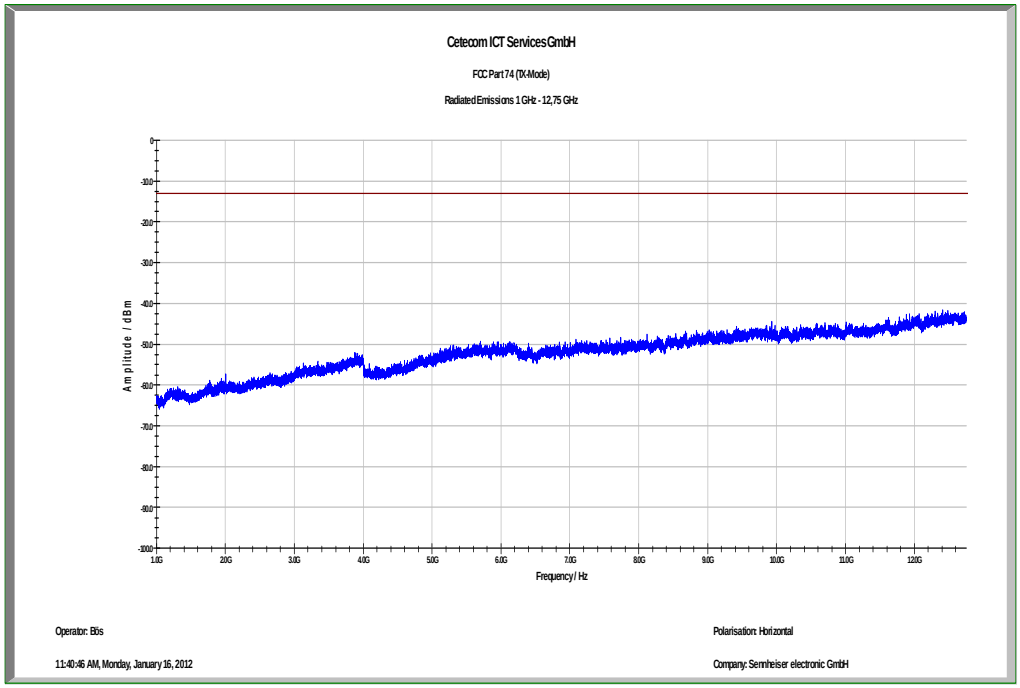
Plot 10: 1 GHz – 12.75 GHz, high channel, antenna vertical



Plot 11: 30 MHz – 1 GHz, high channel, antenna horizontal

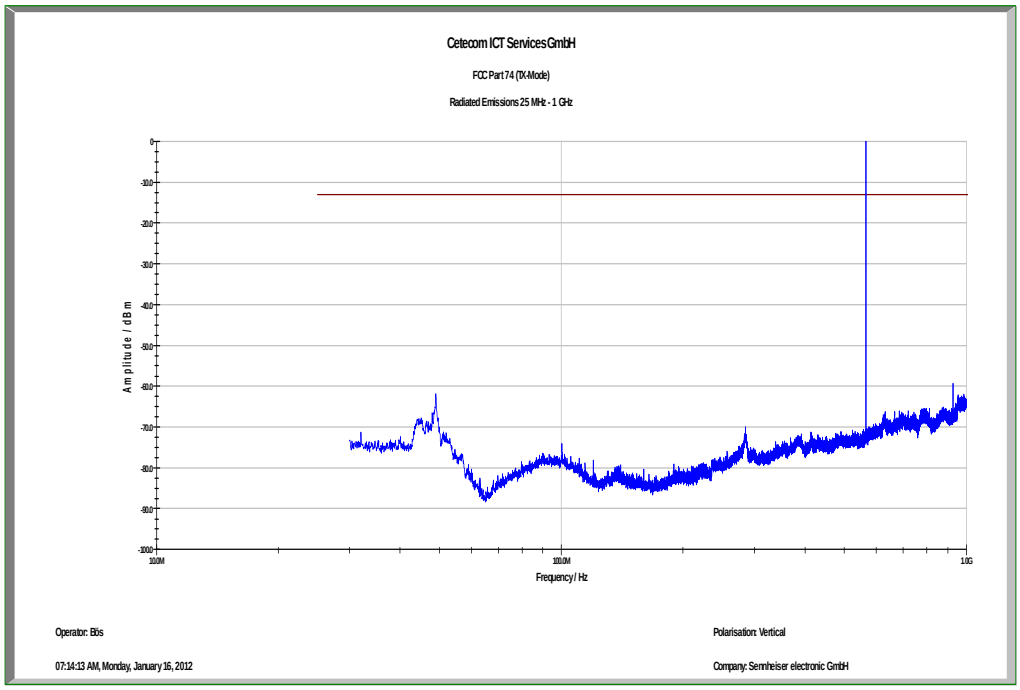


Plot 12: 1 GHz – 12.75 GHz, high channel, antenna horizontal

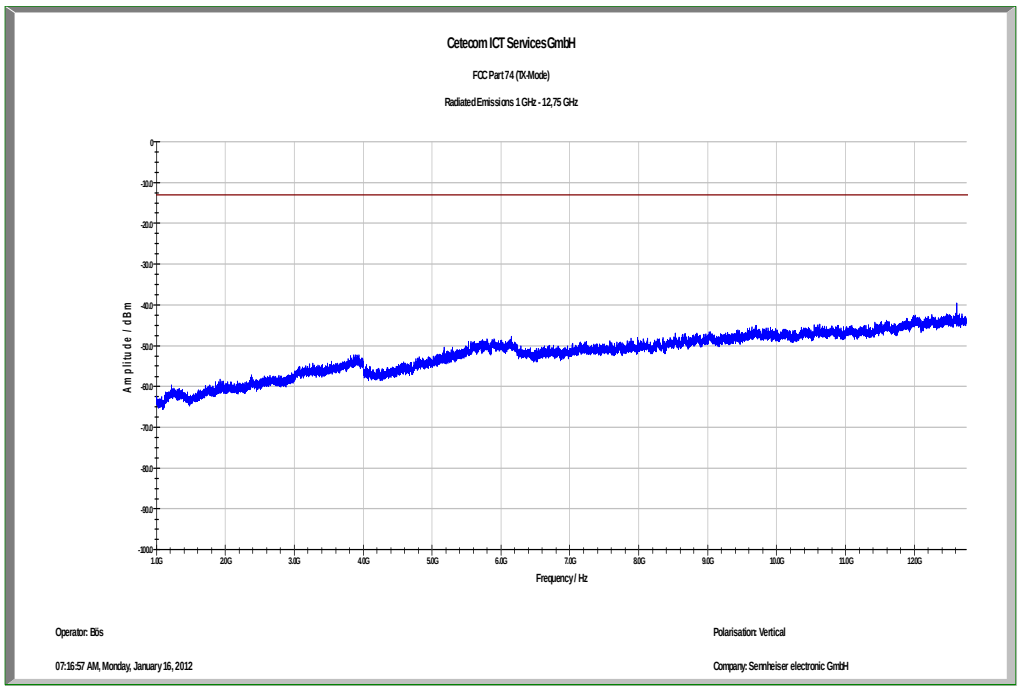


Plots of the measurements (Range-G)

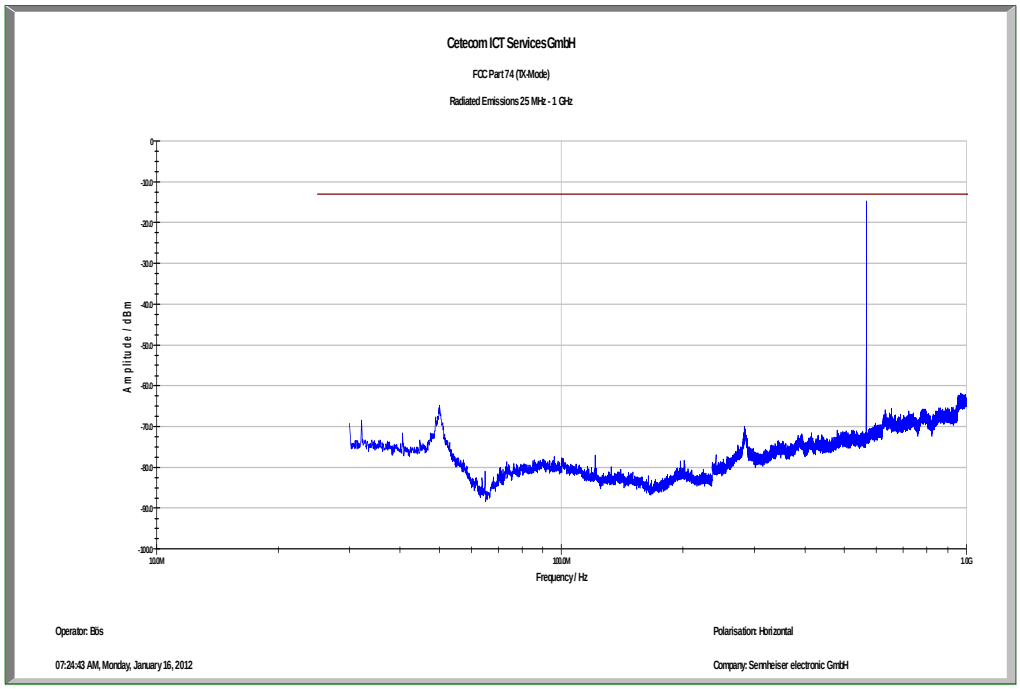
Plot 1: 30 MHz – 1 GHz, low channel, antenna vertical



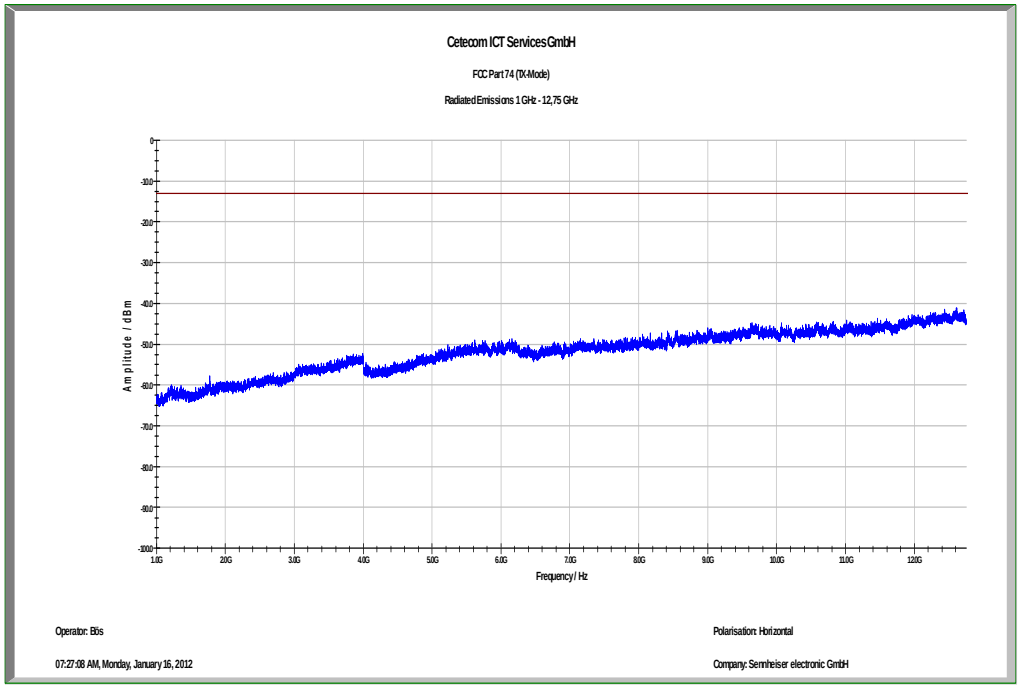
Plot 2: 1 GHz – 12.75 GHz, low channel, antenna vertical



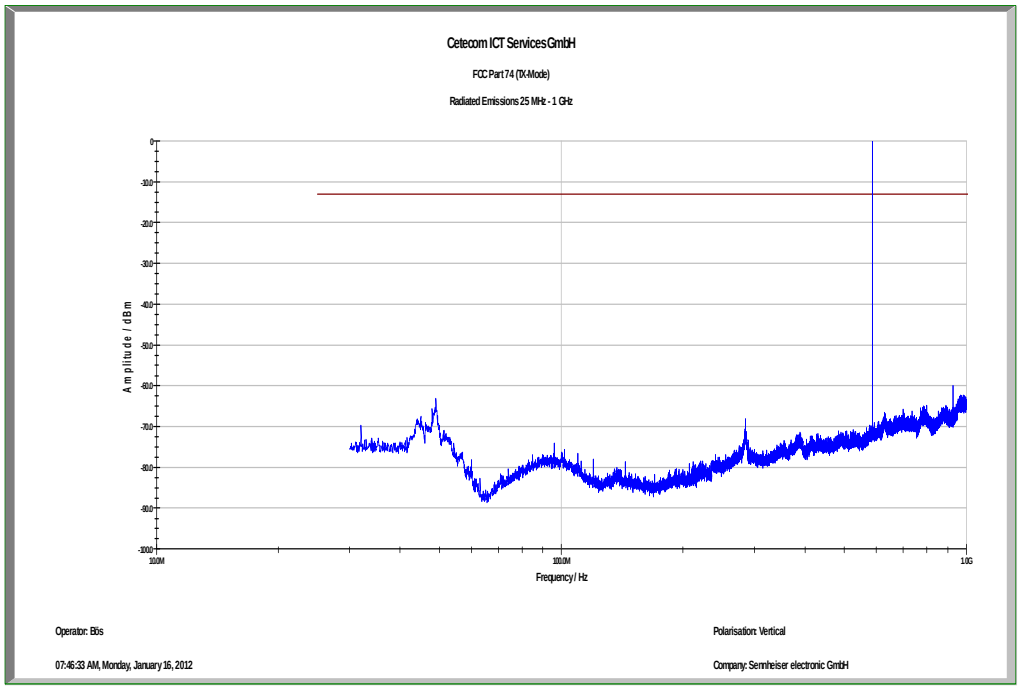
Plot 3: 30 MHz – 1 GHz, low channel, antenna horizontal



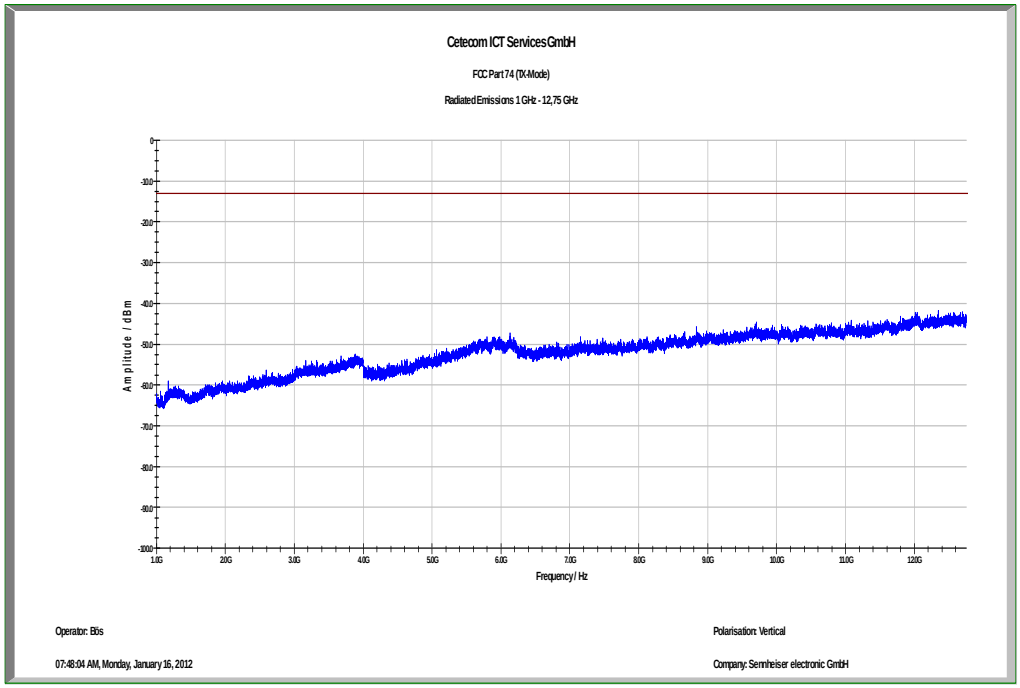
Plot 4: 1 GHz – 12.75 GHz, low channel, antenna horizontal



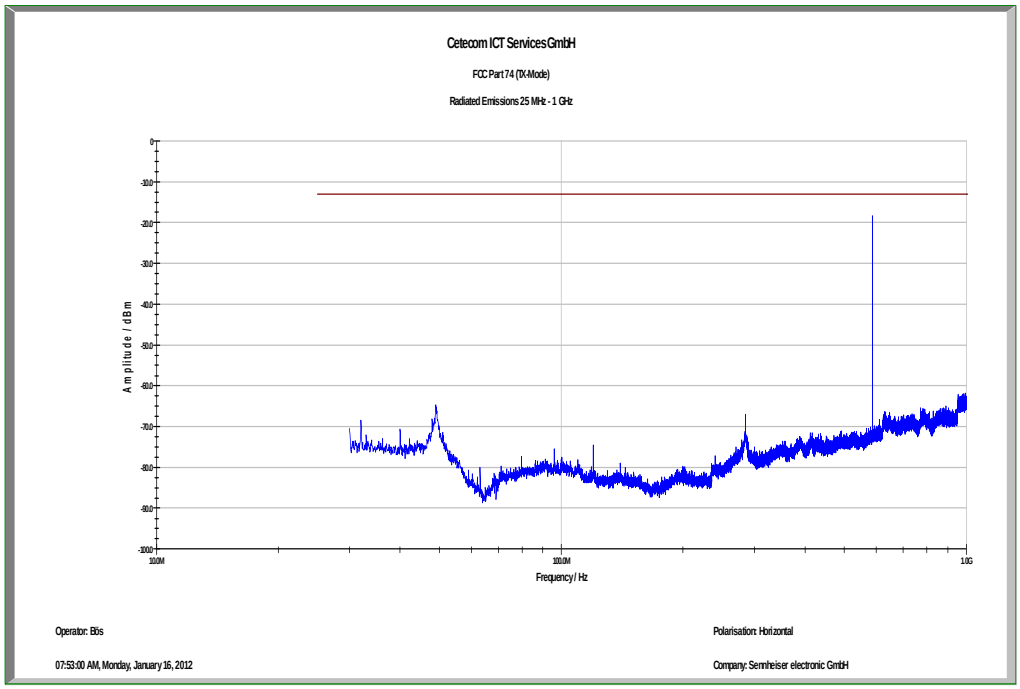
Plot 5: 30 MHz – 1 GHz, middle channel, antenna vertical



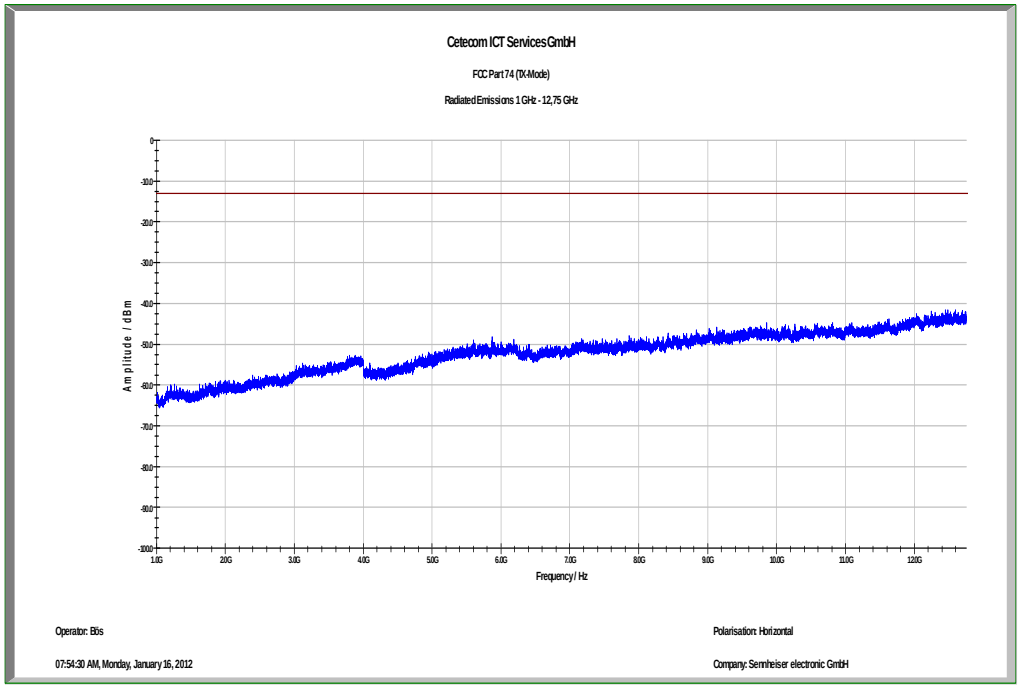
Plot 6: 1 GHz – 12.75 GHz, middle channel, antenna vertical



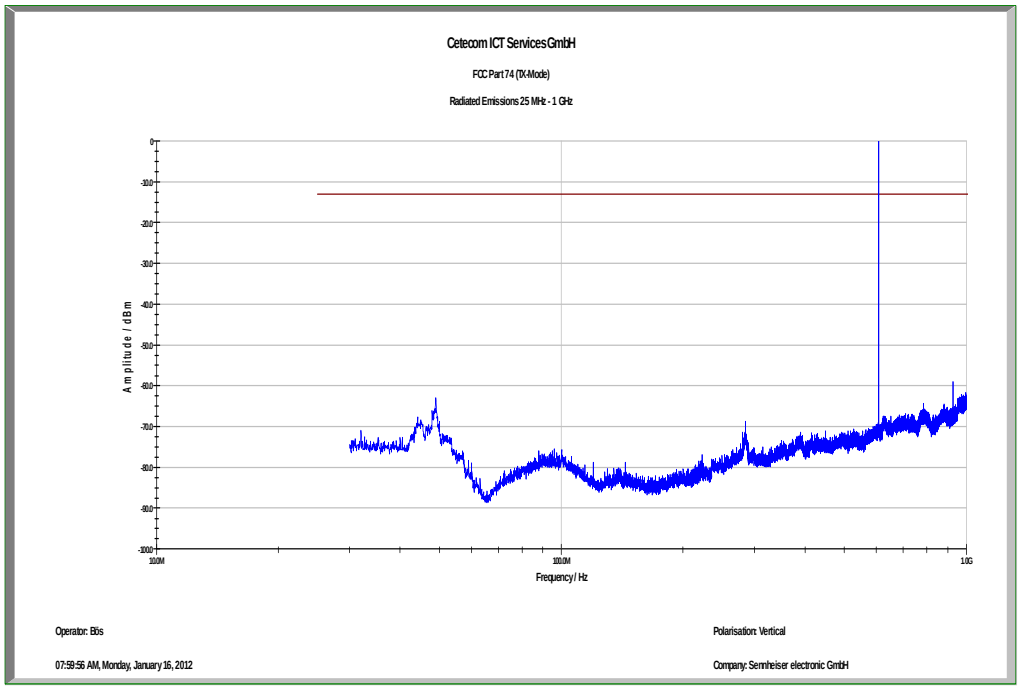
Plot 7: 30 MHz – 1 GHz, middle channel, antenna horizontal



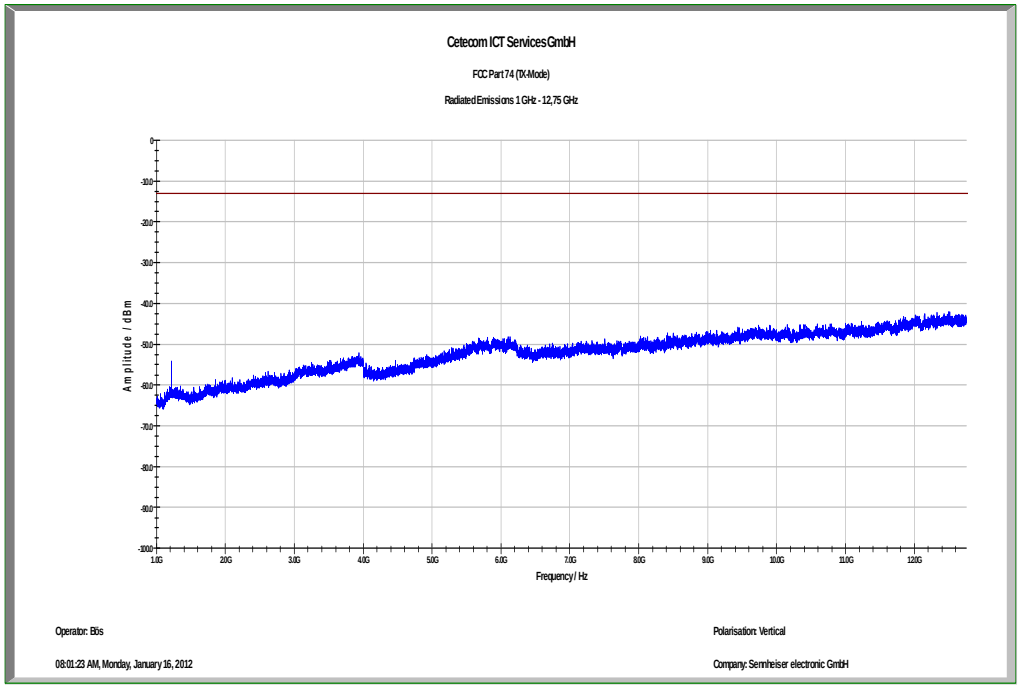
Plot 8: 1 GHz – 12.75 GHz, middle channel, antenna horizontal



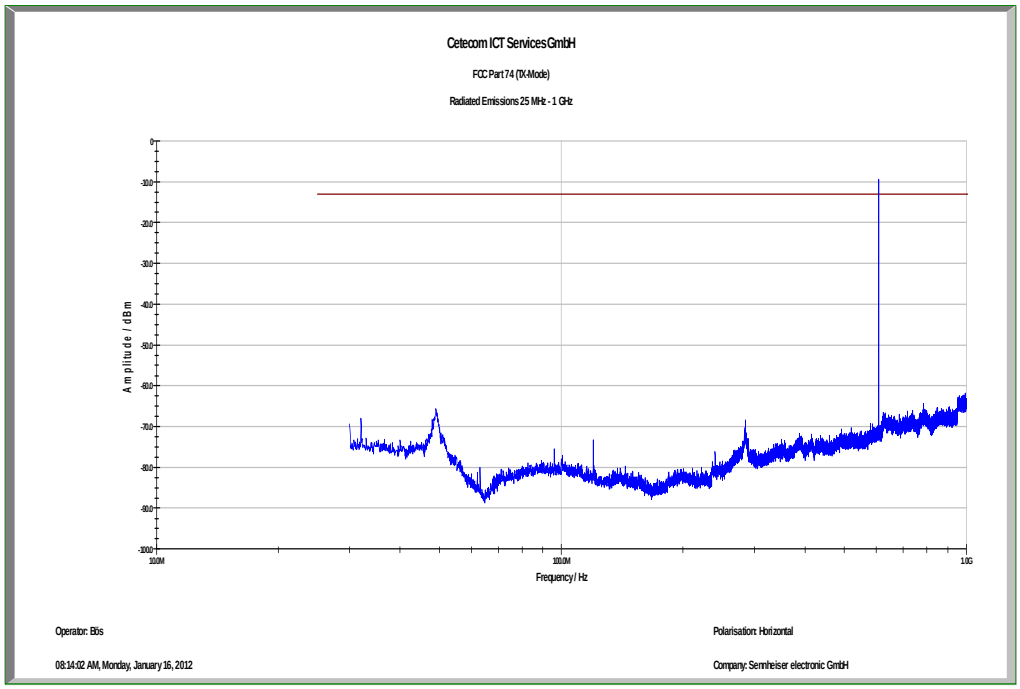
Plot 9: 30 MHz – 1 GHz, high channel, antenna vertical



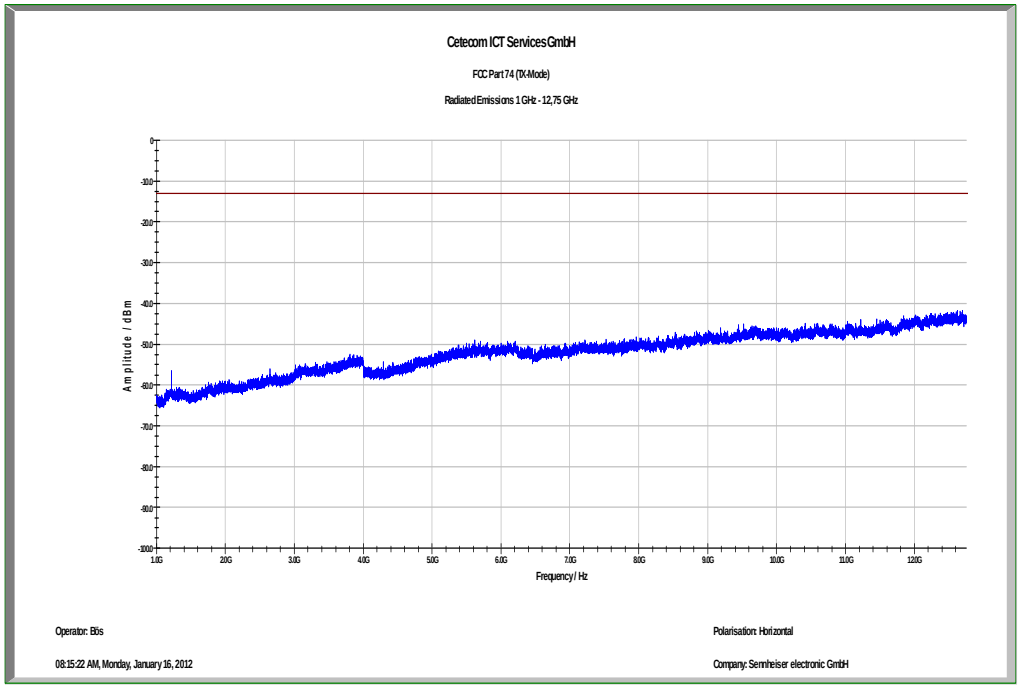
Plot 10: 1 GHz – 12.75 GHz, high channel, antenna vertical



Plot 11: 30 MHz – 1 GHz, high channel, antenna horizontal



Plot 12: 1 GHz – 12.75 GHz, high channel, antenna horizontal



9.7 Receiver spurious emissions / Transmitter Idle (radiated)

Measurement:

Measurement parameter	
Detector:	Peak / Quasi Peak
Sweep time:	Auto
Video bandwidth:	Sweep: 100 kHz Remeasurement: 10 Hz
Resolution bandwidth:	F < 1 GHz: 100 kHz F > 1 GHz: 1 MHz
Span:	9 kHz to 12.75 GHz
Trace-Mode:	Max Hold

Limits:

FCC	IC	
SUBCLAUSE § 15.109	RSS-GEN Issue 2 Section 6	
Receiver Spurious Emission / Transmitter Idle (radiated)		
Frequency (MHz)	**Field strength (µV/m)**	**Measurement distance (m)**
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
above 960	500	3

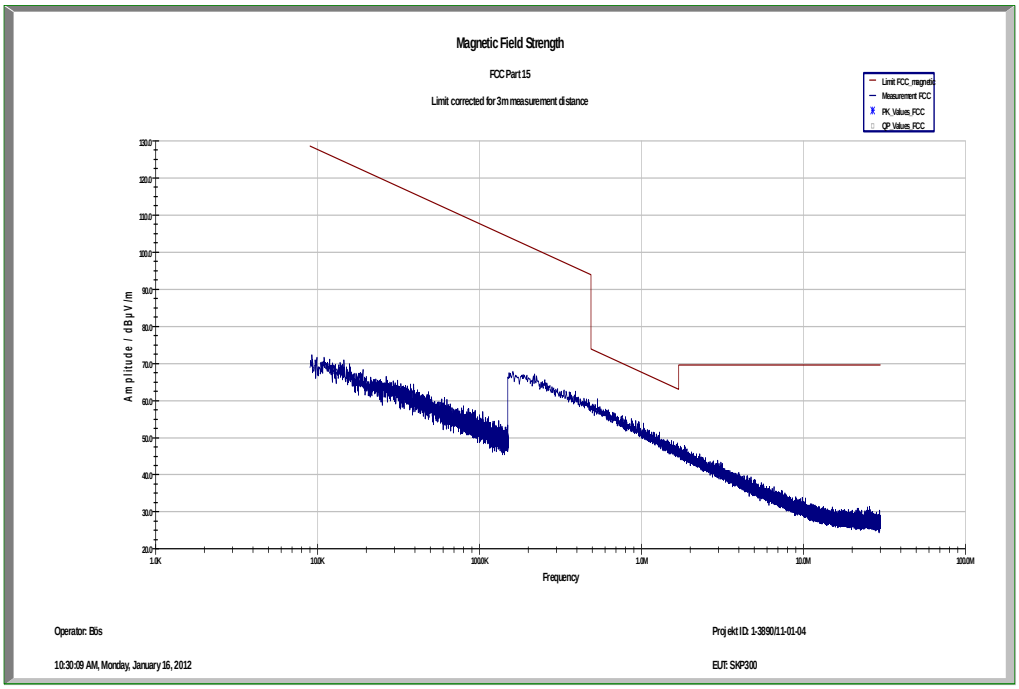
Results:

RX spurious emissions / Transmitter Idle radiated [dBµV/m]								
Range-A			Range-B			Range-G		
F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]	F [MHz]	Detector	Level [dBµV/m]
No critical peaks found			No critical peaks found			No critical peaks found		
Measurement uncertainty			± 3 dB					

Plots of the measurements

Range-A:

Plot 1: 9 kHz – 30 MHz



Plot 2: 30 MHz – 1 GHz

Common Information

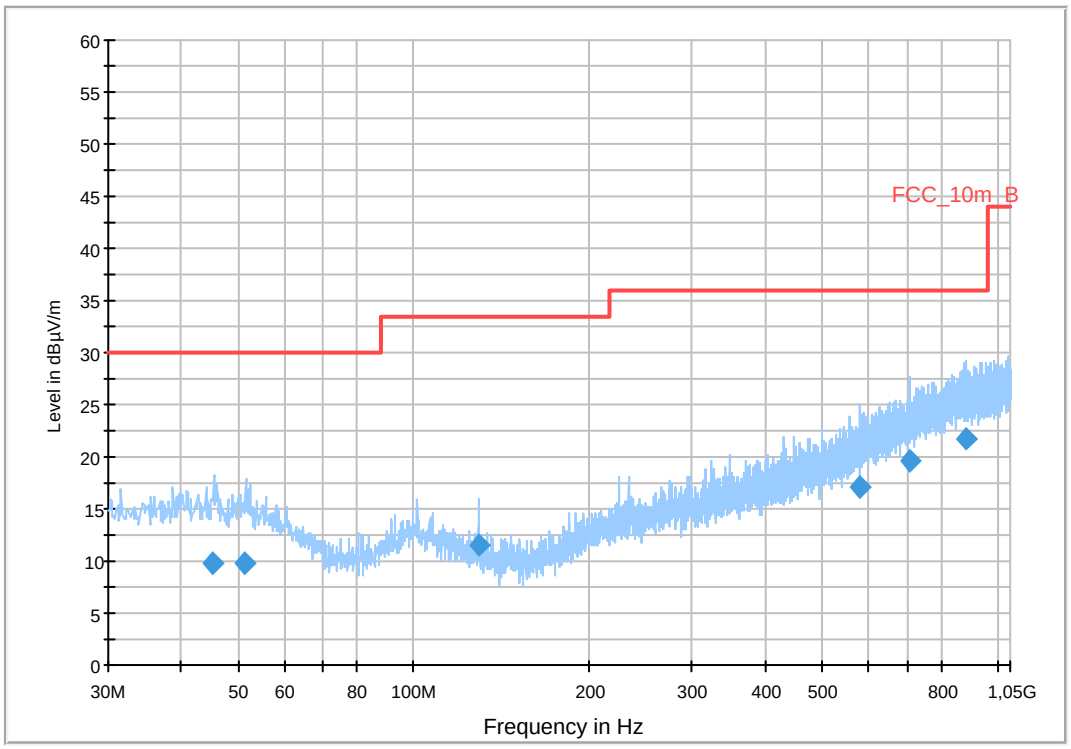
EUT:	SKP 300
Serial Number:	1441115079
Test Description:	FCC part 15 B class B @ 10 m
Operating Conditions:	idle
Operator Name:	Hennemann
Comment:	battery powered 2x AA (mignon)

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup:	Electric Field (NOS)
Receiver:	[ESCI 3]
Level Unit:	dBµV/m

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB

FCC_10m(B)_3



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
45.315750	9.9	1000.0	120.000	170.0	V	194.0	13.3	20.1	30.0	
51.186000	9.7	1000.0	120.000	98.0	H	84.0	13.3	20.3	30.0	
129.041100	11.5	1000.0	120.000	144.0	V	273.0	9.5	22.0	33.5	
581.119350	17.0	1000.0	120.000	98.0	V	179.0	20.3	19.0	36.0	
706.661250	19.5	1000.0	120.000	120.0	H	103.0	22.7	16.5	36.0	
880.415400	21.8	1000.0	120.000	106.0	H	79.0	25.0	14.2	36.0	

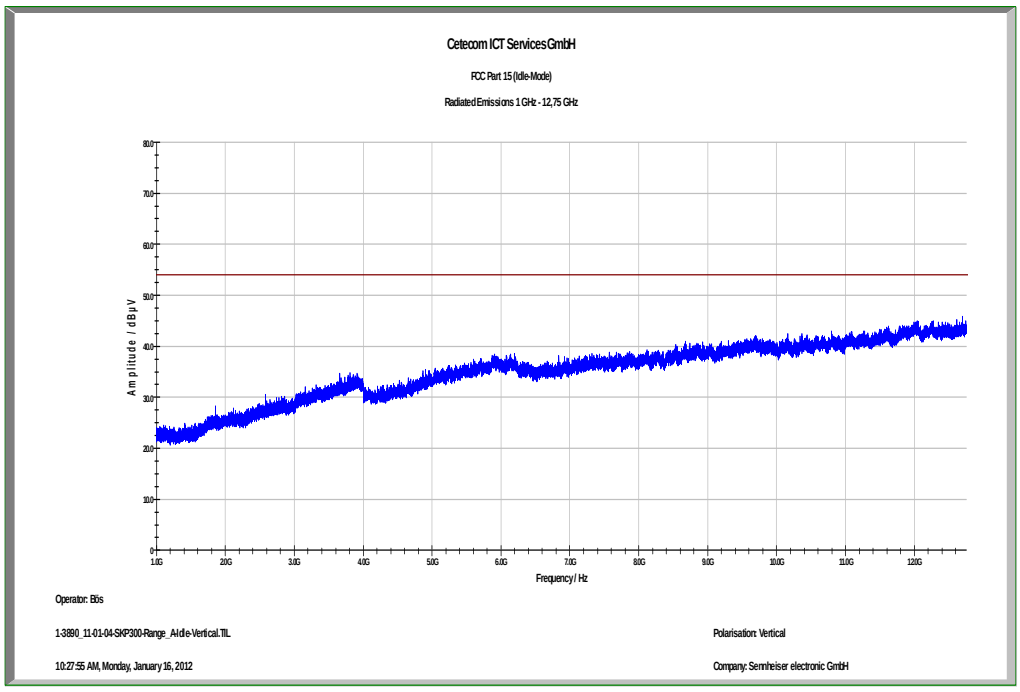
Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

Subrange 1

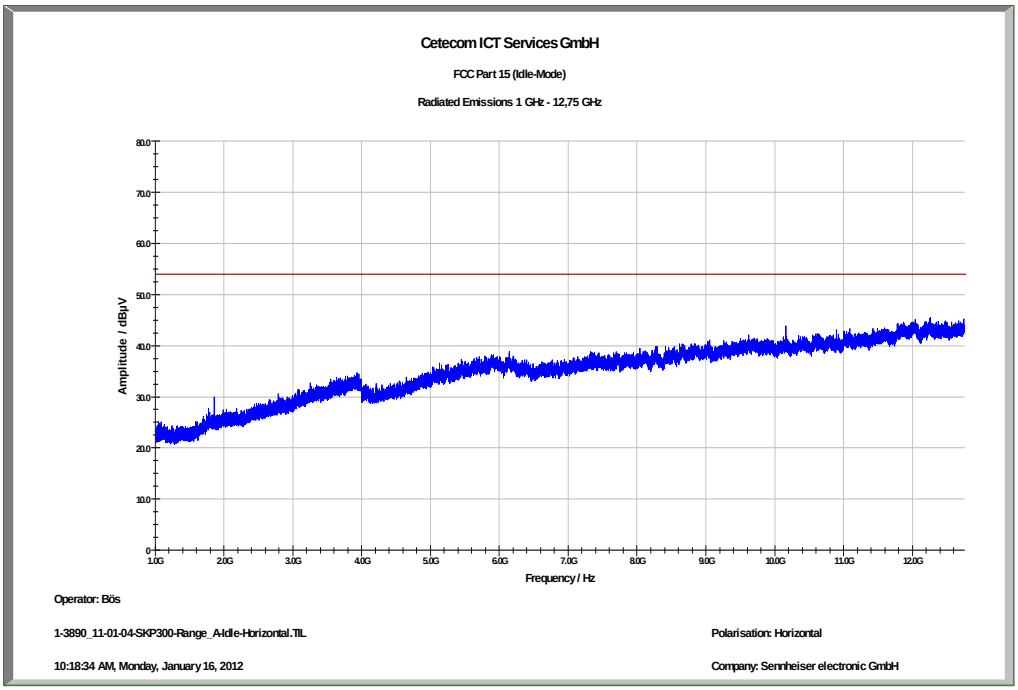
Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3] @ GPIB0 (ADR 20), SN 100083/003, FW 4.42
Signal Path:	without Notch FW 1.0
Antenna:	VULB 9163 SN 9163-295, FW --- Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table (vertical): Cable_EN_1GHz (1005) Correction Table (horizontal): Cable_EN_1GHz (1005)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower] @ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12

EMC 32 Version 8.10.00

Plot 3: 1 GHz – 12.75 GHz, antenna vertical

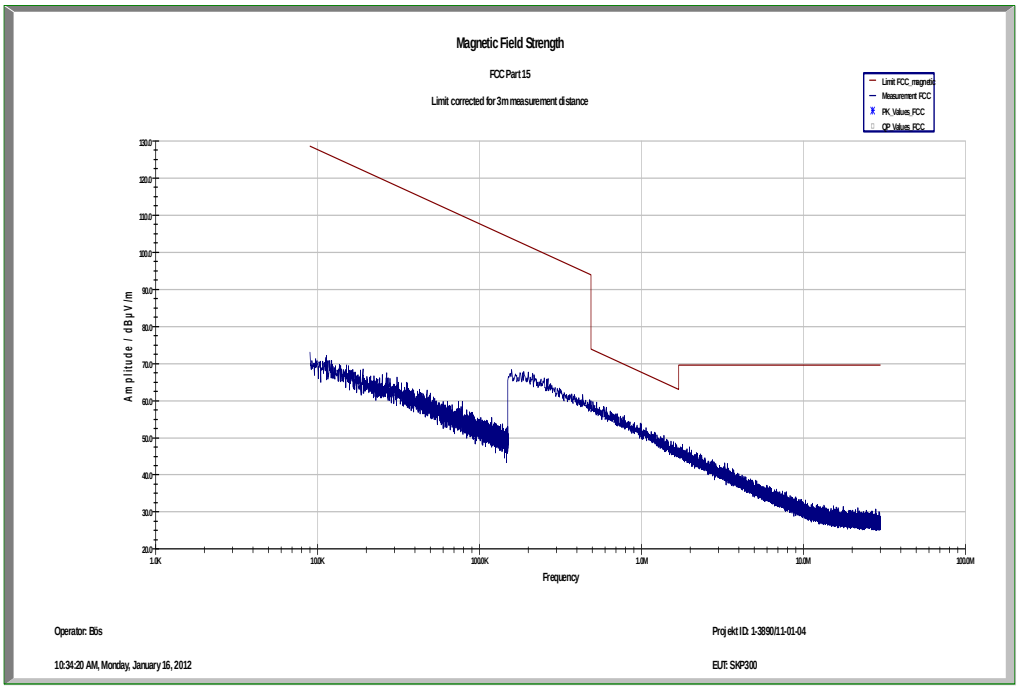


Plot 4: 1 GHz – 12.75 GHz, antenna horizontal



Range-B:

Plot 1: 9 kHz – 30 MHz



Plot 2: 30 MHz – 1 GHz

Common Information

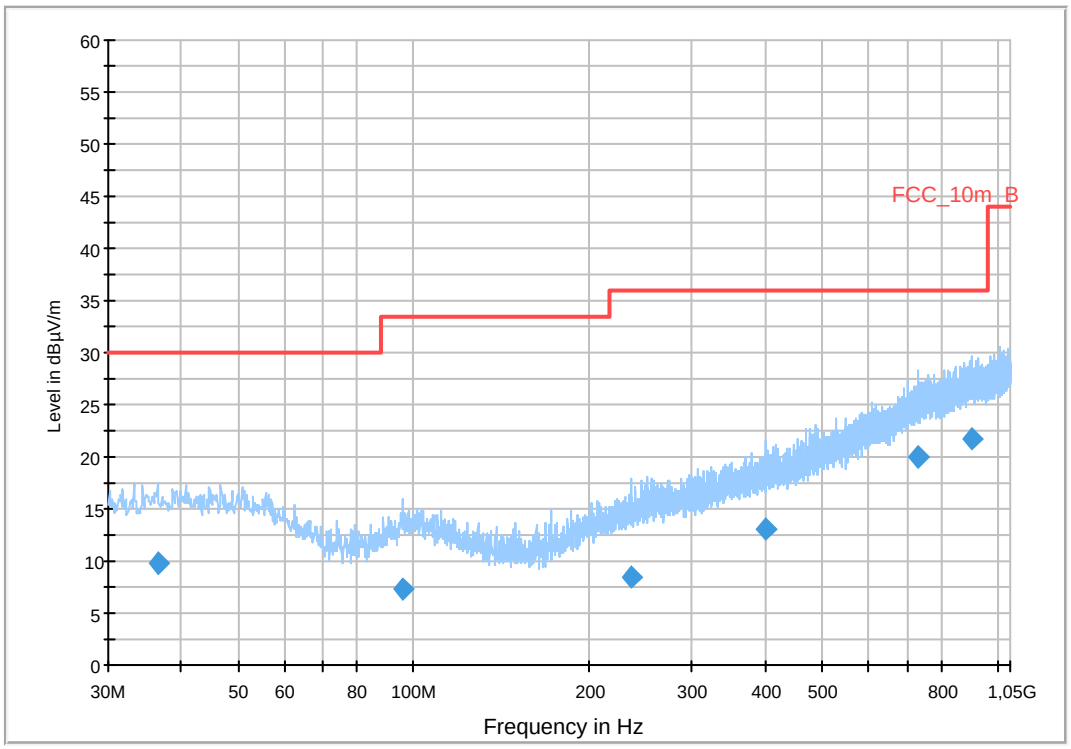
EUT:	SKP 300
Serial Number:	1441115091
Test Description:	FCC part 15 B class B @ 10 m
Operating Conditions:	idle
Operator Name:	Hennemann
Comment:	battery powered 2x AA (mignon)

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup:	Electric Field (NOS)
Receiver:	[ESCI 3]
Level Unit:	dBµV/m

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB

FCC_10m(B)



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
36.412800	9.8	1000.0	120.000	341.0	V	219.0	13.1	20.2	30.0	
95.537400	7.2	1000.0	120.000	200.0	V	158.0	11.3	26.3	33.5	
235.479600	8.5	1000.0	120.000	100.0	H	163.0	12.9	27.5	36.0	
399.795450	13.0	1000.0	120.000	100.0	H	289.0	16.9	23.0	36.0	
730.896750	20.1	1000.0	120.000	176.0	V	285.0	23.2	15.9	36.0	
904.596750	21.8	1000.0	120.000	177.0	H	113.0	25.2	14.2	36.0	

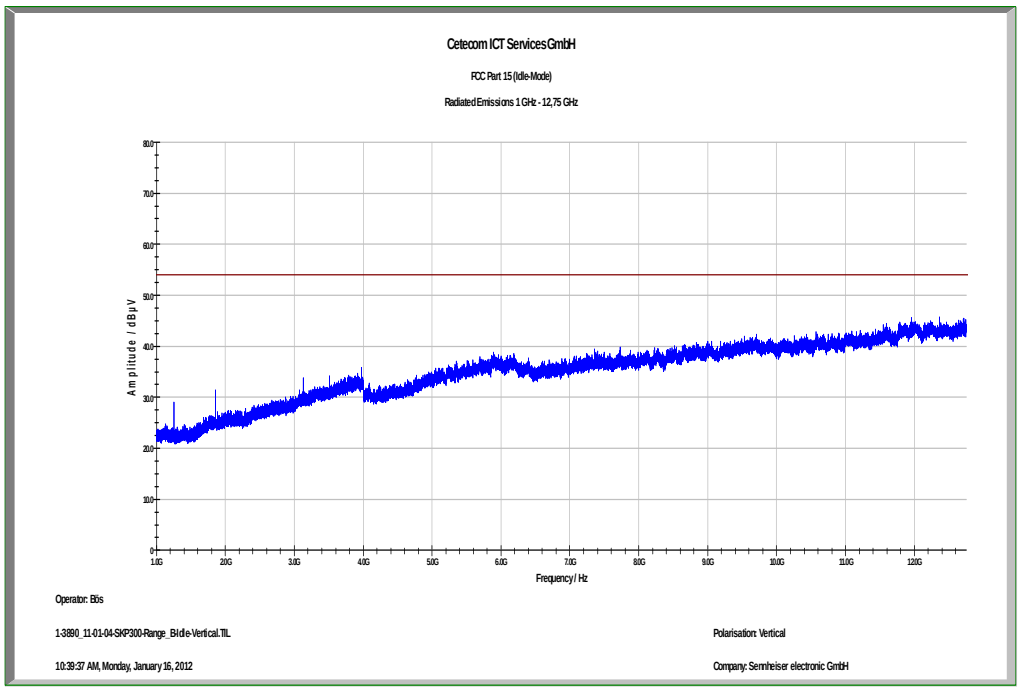
Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

Subrange 1

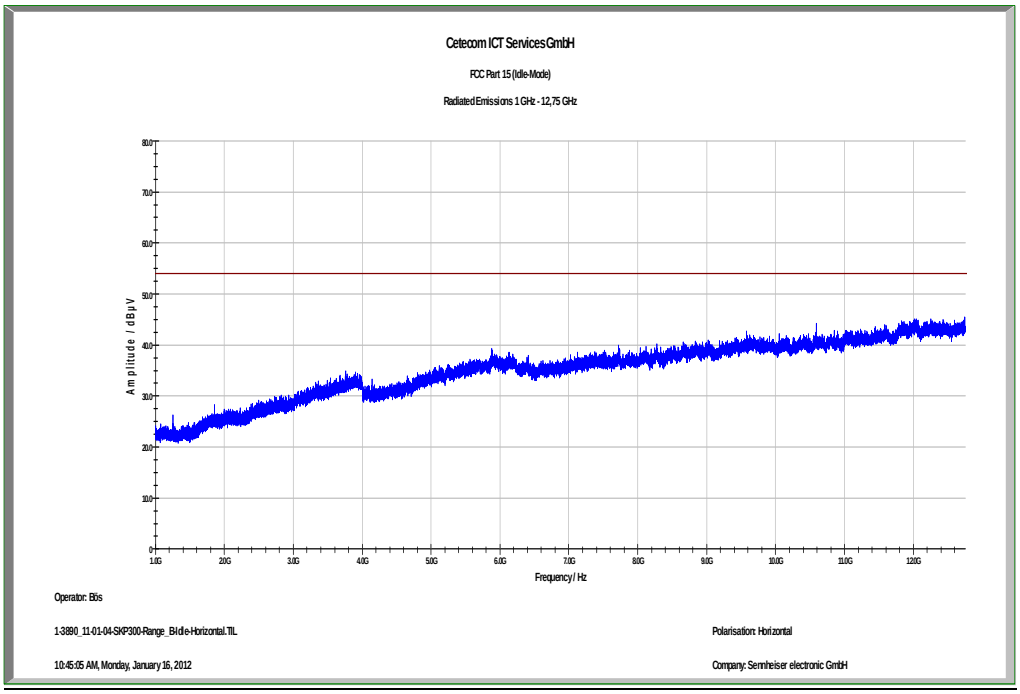
Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3] @ GPIB0 (ADR 20), SN 100083/003, FW 4.42
Signal Path:	without Notch FW 1.0
Antenna:	VULB 9163 SN 9163-295, FW --- Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table (vertical): Cable_EN_1GHz (1005) Correction Table (horizontal): Cable_EN_1GHz (1005)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower] @ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12

EMC 32 Version 8.10.00

Plot 3: 1 GHz – 12.75 GHz, antenna vertical

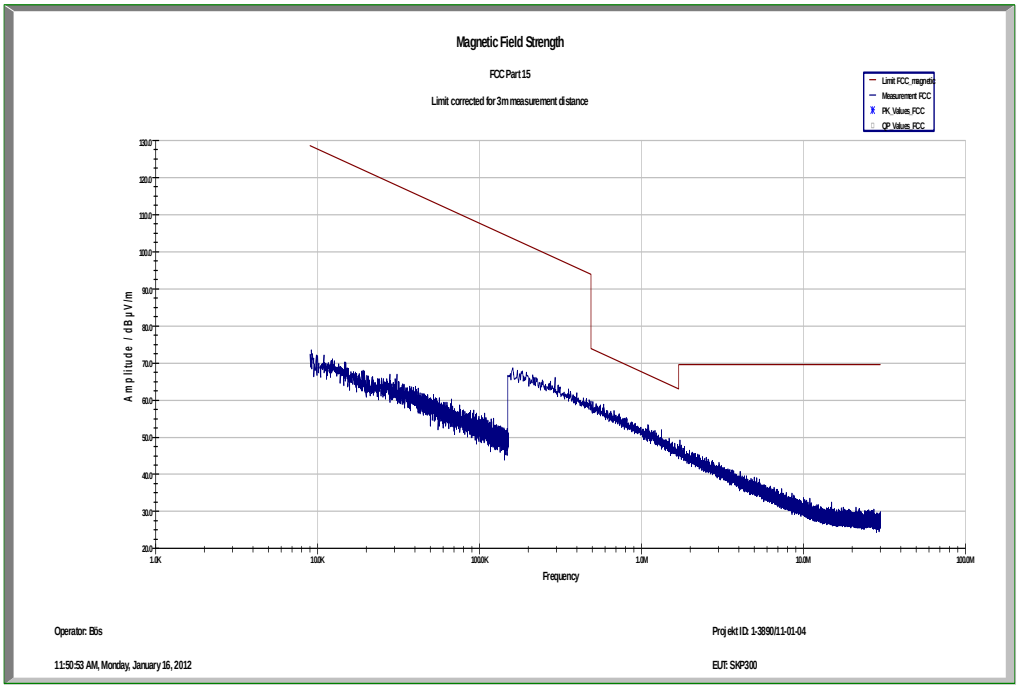


Plot 4: 1 GHz – 12.75 GHz, antenna horizontal



Range-G:

Plot 1: 9 kHz – 30 MHz



Plot 2: 30 MHz – 1 GHz

Common Information

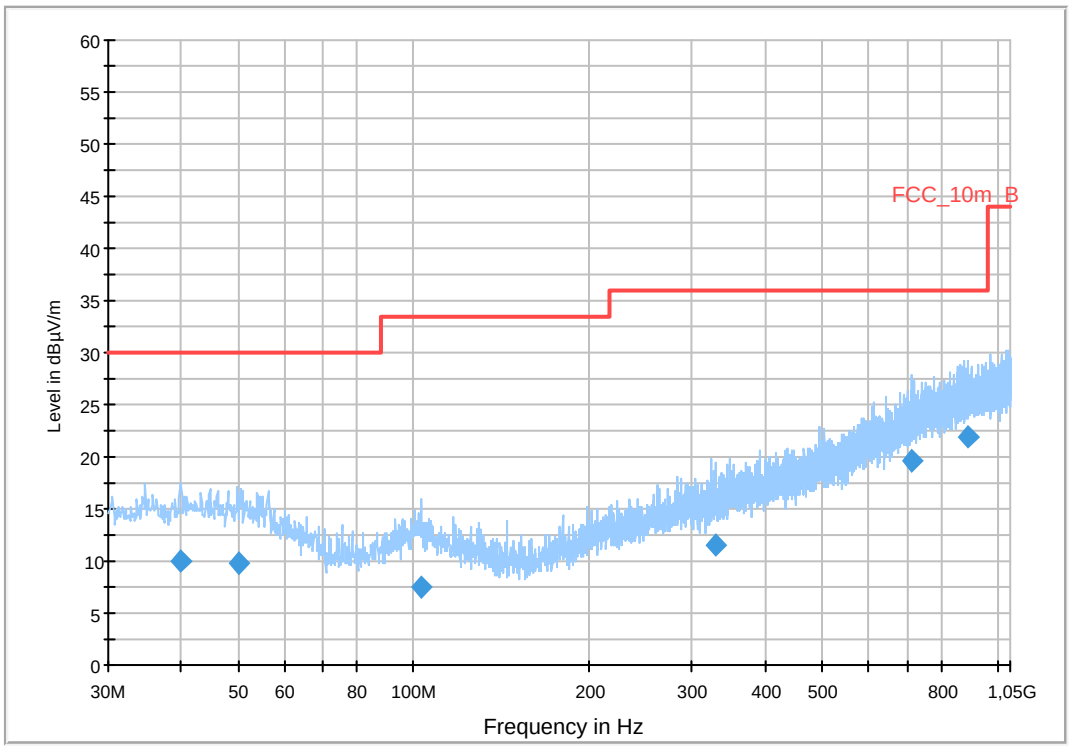
EUT:	SKP 300
Serial Number:	1441115082
Test Description:	FCC part 15 B class B @ 10 m
Operating Conditions:	idle
Operator Name:	Hennemann
Comment:	battery powered 2x AA (mignon)

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup:	Electric Field (NOS)
Receiver:	[ESCI 3]
Level Unit:	dBµV/m

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB

FCC_10m(B)_3



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
39.747600	10.0	1000.0	120.000	170.0	V	194.0	13.4	20.0	30.0	
50.177100	9.7	1000.0	120.000	113.0	V	-6.0	13.4	20.3	30.0	
102.494700	7.5	1000.0	120.000	98.0	H	273.0	11.7	26.0	33.5	
328.492500	11.6	1000.0	120.000	170.0	V	7.0	15.4	24.4	36.0	
712.310550	19.6	1000.0	120.000	170.0	V	194.0	22.8	16.4	36.0	
889.108500	21.8	1000.0	120.000	170.0	H	-6.0	25.1	14.2	36.0	

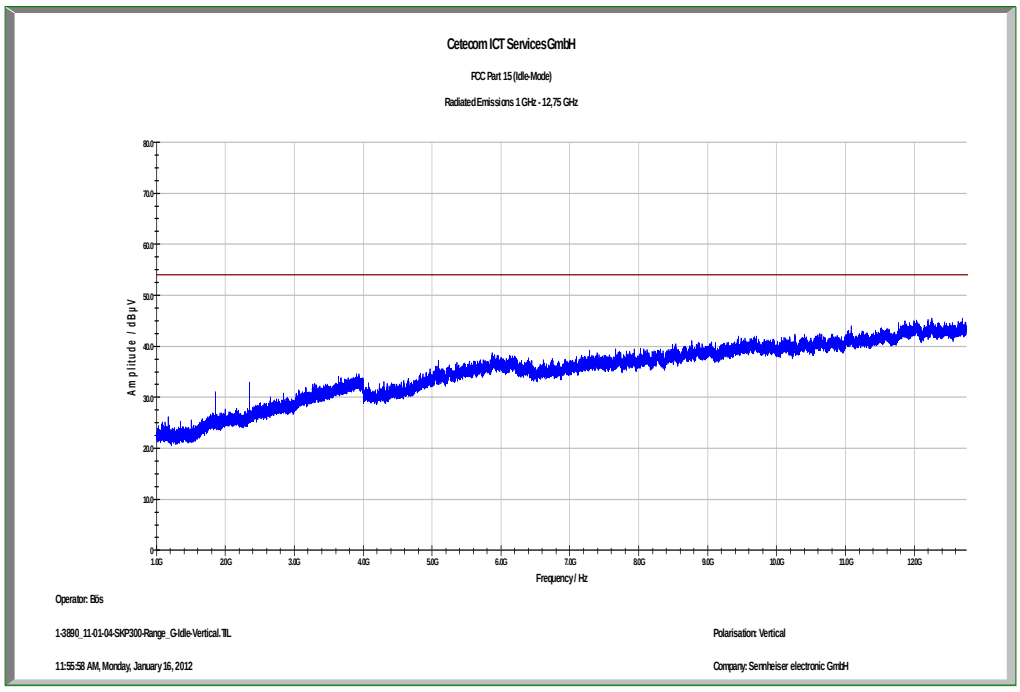
Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

Subrange 1

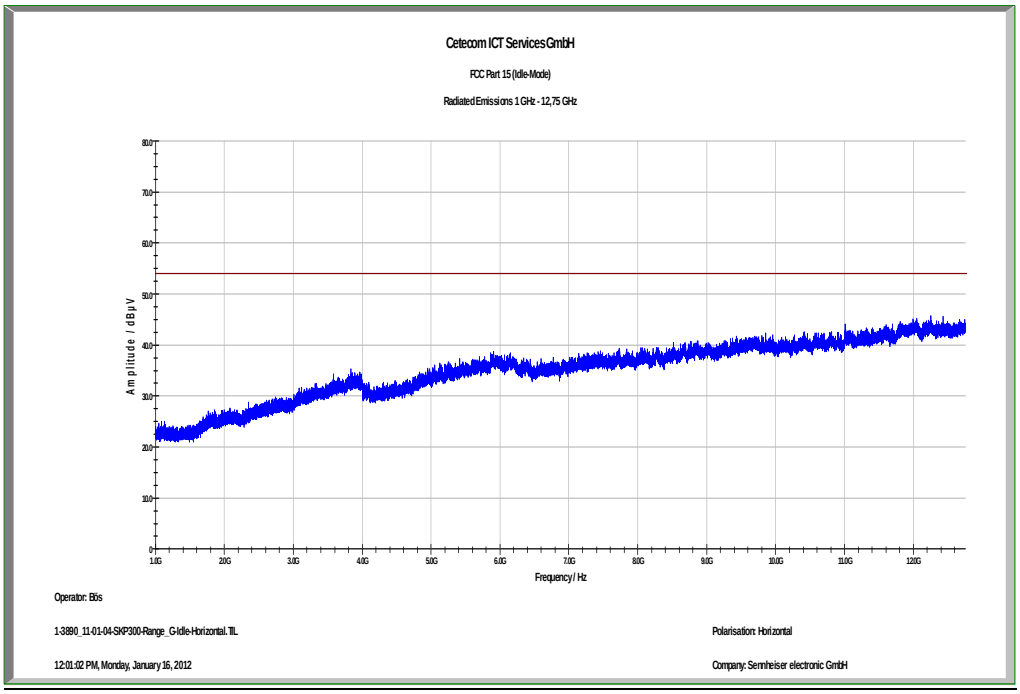
Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3] @ GPIB0 (ADR 20), SN 100083/003, FW 4.42
Signal Path:	without Notch FW 1.0
Antenna:	VULB 9163 SN 9163-295, FW --- Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table (vertical): Cable_EN_1GHz (1005) Correction Table (horizontal): Cable_EN_1GHz (1005)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower] @ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12

EMC 32 Version 8.10.00

Plot 3: 1 GHz – 12.75 GHz, antenna vertical



Plot 4: 1 GHz – 12.75 GHz, antenna horizontal



10 Test equipment and ancillaries used for tests

Typically, the calibrations of the test apparatus are commissioned to and performed by an accredited calibration laboratory. The calibration intervals are determined in accordance with the DIN EN ISO/IEC 17025. In addition to the external calibrations, the laboratory executes comparison measurements with other calibrated test systems or effective verifications. Weekly chamber inspections and range calibrations are performed. Where possible, rf-generating and signalling equipment as well as measuring receivers and analyzers are connected to an external high-precision 10 MHz reference (GPS-based or rubidium frequency standard).

In order to simplify the identification of the equipment used at some special tests, some items of test equipment and ancillaries can be provided with an identifier or number in the equipment list below (Labor/Item).

No.	Lab / Item	Equipment	Type	Manufact.	Serial No.	INV. No Cetecom	Kind of Calibration	Last Calibration	Next Calibration
1	n. a.	Isolating Transformer	RT5A	Grundig	8041	300001626	g		
2	n. a.	DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2818A03450	300001040	Ve	12.01.2012	12.01.2015
3	n. a.	Coaxial Attenuator 30dB/500W	8325	Bird	1530	300001595	ev		
4	n. a.	Double-Ridged Waveguide Horn Antenna 1-18.0GHz	3115	EMCO	8812-3088	300001032	vIKI!	11.05.2011	11.05.2013
5	n. a.	Active Loop Antenna	6502	EMCO	2210	300001015	ne		
6	n. a.	Anechoic chamber	FAC 3/5m	MWB / TDK	87400/02	300000996		23.03.2009	
7	Spec.A. 2_2e	System rack for EMI measurement solution	85900	HP I.V.	*	300000222	ne		
8	9	Artificial Mains 9 kHz to 30 MHz	ESH3-Z5	R&S	828576/020	300001210	Ve	06.01.2012	06.01.2014
9	n. a.	Relais Matrix	3488A	HP Meßtechnik	2719A15013	300001156	ne		
10	n. a.	Relais Matrix	PSU	R&S	890167/024	300001168	ne		
11	n. a.	Isolating Transformer	RT5A	Grundig	9242	300001263	ne		
12	n. a.	Three-Way Power Splitter, 50 Ohm	11850C	HP Meßtechnik		300000997	ne		
13	n. a.	Switch / Control Unit	3488A	HP	2605e08770	300001443	ne		
14	n. a.	Amplifier	js42-00502650-28-5a	Parzich GMBH	928979	300003143	ne		
15	n. a.	Band Reject filter	WRCG1855/1910-1835/1925-40/8SS	Wainwright	7	300003350	ev		
16	n. a.	Band Reject filter	WRCG2400/2483-2375/2505-50/10SS	Wainwright	11	300003351	ev		
17	n. a.	TILE-Software Emission	Quantum Change, Modell TILE-ICS/FULL	EMCO	none	300003451	ne		
18	n. a.	Highpass Filter	WHKX2.9/18G-12SS	Wainwright	1	300003492	ev		
19	n. a.	Highpass Filter	WHK1.1/15G-10SS	Wainwright	3	300003255	ev		
20	n. a.	Highpass Filter	WHKX7.0/18G-8SS	Wainwright	18	300003789	ne		
21	n. a.	PSA Spectrum Analyzer 3 Hz - 26.5 GHz	E4440A	Agilent Technologies	MY48250080	300003812	k	08.09.2010	08.09.2012
22	n. a.	MXG Microwave Analog Signal Generator	N5183A	Agilent Technologies	MY47420220	300003813	k	13.09.2010	13.09.2012
23	n. a.	RF Filter Section 9kHz - 1GHz	N9039A	Agilent Technologies	MY48260003	300003825	vIKI!	08.09.2010	08.09.2012
24	n. a.	TRILOG	VULB9163	Schwarzbeck	371	300003854	vIKI!	14.10.2011	14.10.2014

		Broadband Test-Antenna 30 MHz - 3 GHz							
25	4	Radiocom. Analyzer	CMTA 54	R&S	894043/010	300001175	NK!	06.06.2007	
26	10	Signal Generator 0.1-2000 MHz	SMH	R&S	864219/033	300001410	Ve	18.08.2010	18.08.2013
27	n. a.	DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2920A04590	300001041	Ve	12.01.2012	12.01.2015
28	n. a.	Temperature Test Chamber	VT 4002	Heraeus Voetsch	521/83761	300002326	Ve	20.09.2011	20.09.2013
29	n. a.	Audio Analyzer 2Hz - 300 kHz	UPD	R&S	841074/009	300001236	k	11.01.2012	11.01.2014
30	n. a.	Signal Analyzer 20Hz-26,5GHz-150 to + 30 DBM	FSiQ26	R&S	835111/0004	300002678	Ve	04.11.2010	04.11.2012

Agenda: Kind of Calibration

k	calibration / calibrated	EK	limited calibration
ne	not required (k, ev, izw, zw not required)	zw	cyclical maintenance (external cyclical maintenance)
ev	periodic self verification	izw	internal cyclical maintenance
Ve	long-term stability recognized	g	blocked for accredited testing
vlkl!	Attention: extended calibration interval		
NK!	Attention: not calibrated	*)	next calibration ordered / currently in progress

11 Observations

No observations exceeding those reported with the single test cases have been made.

Annex A Photographs of the test setup

Photo documentation:

Photo 1:

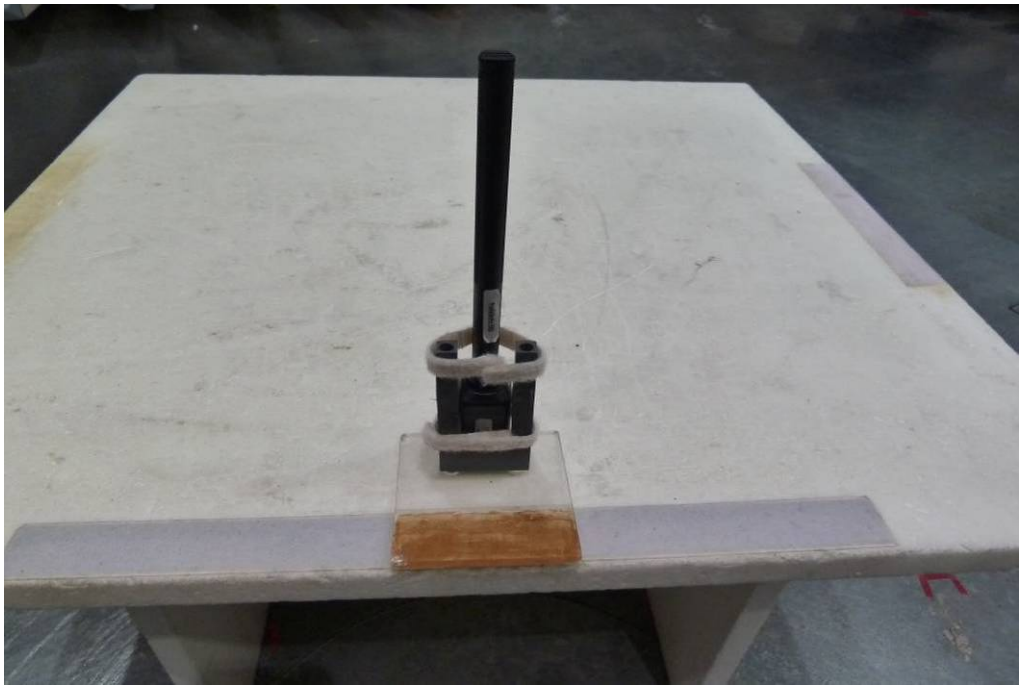
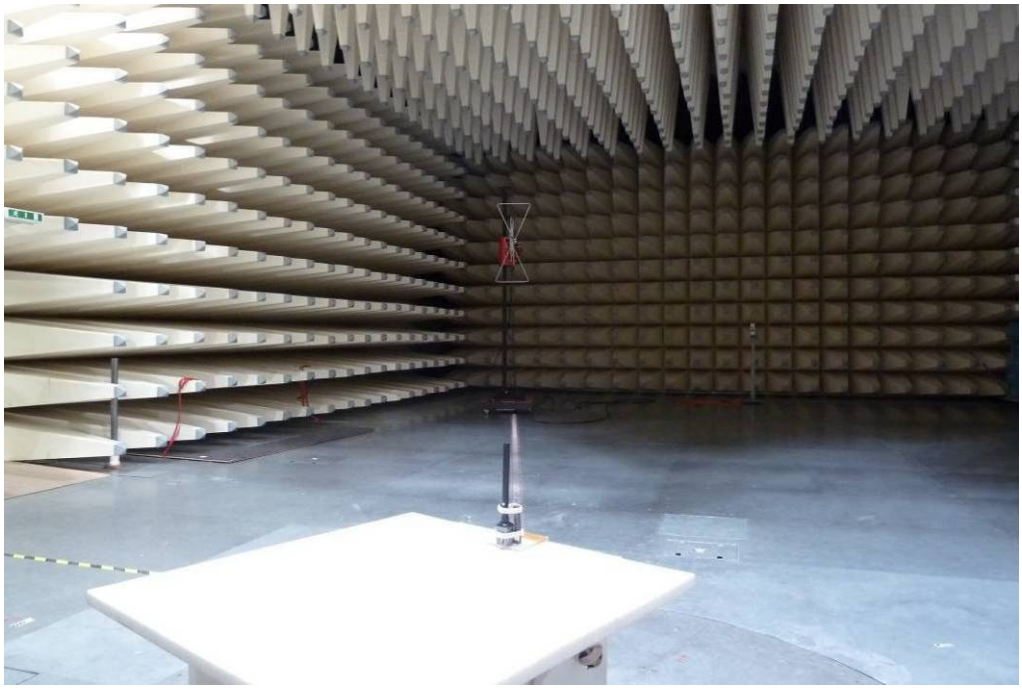


Photo 2:



Annex B External photographs of the EUT

Photo documentation:

Photo 1:

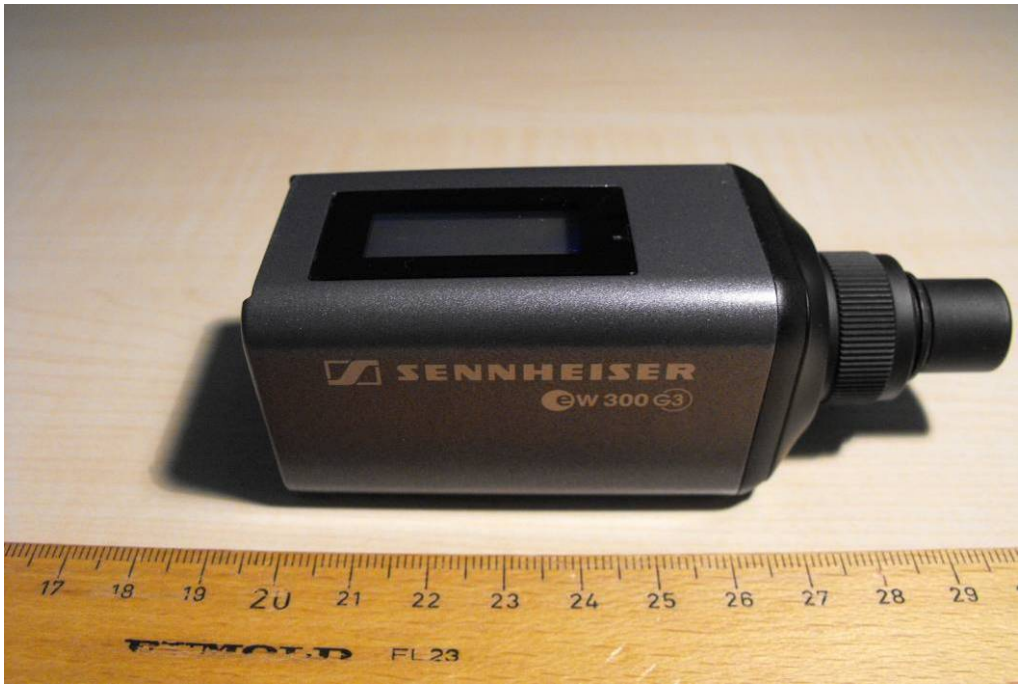


Photo 2:

Photo 3:

Photo 4:

Photo 5:

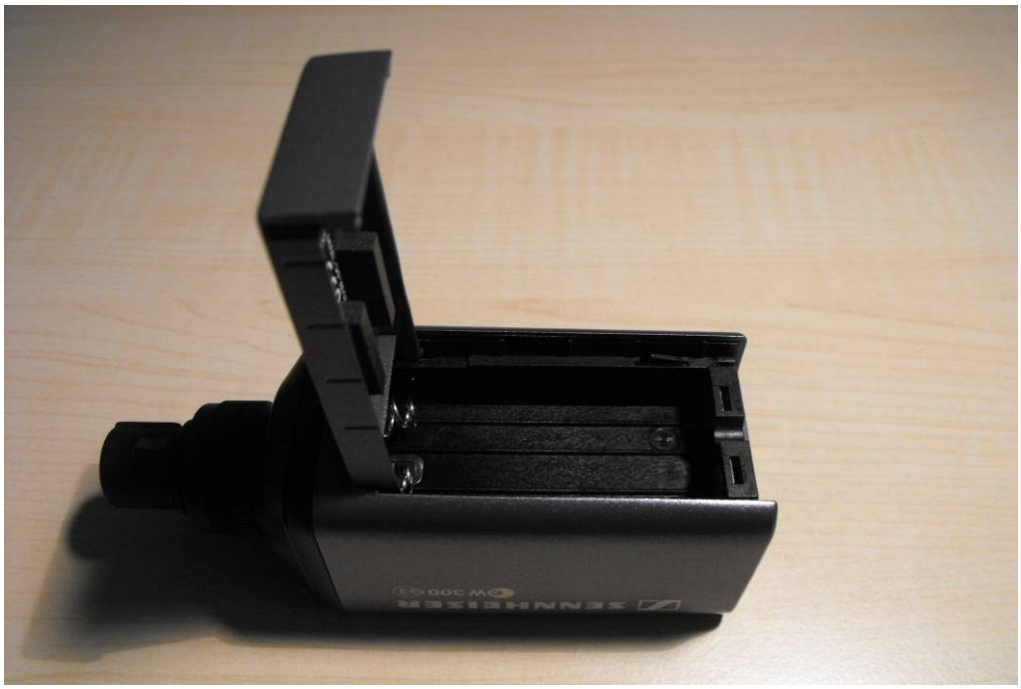


Photo 6:

Photo 7:

Photo 8:

Annex C Internal photographs of the EUT

Photo documentation:

Photo 1:

Photo 2:

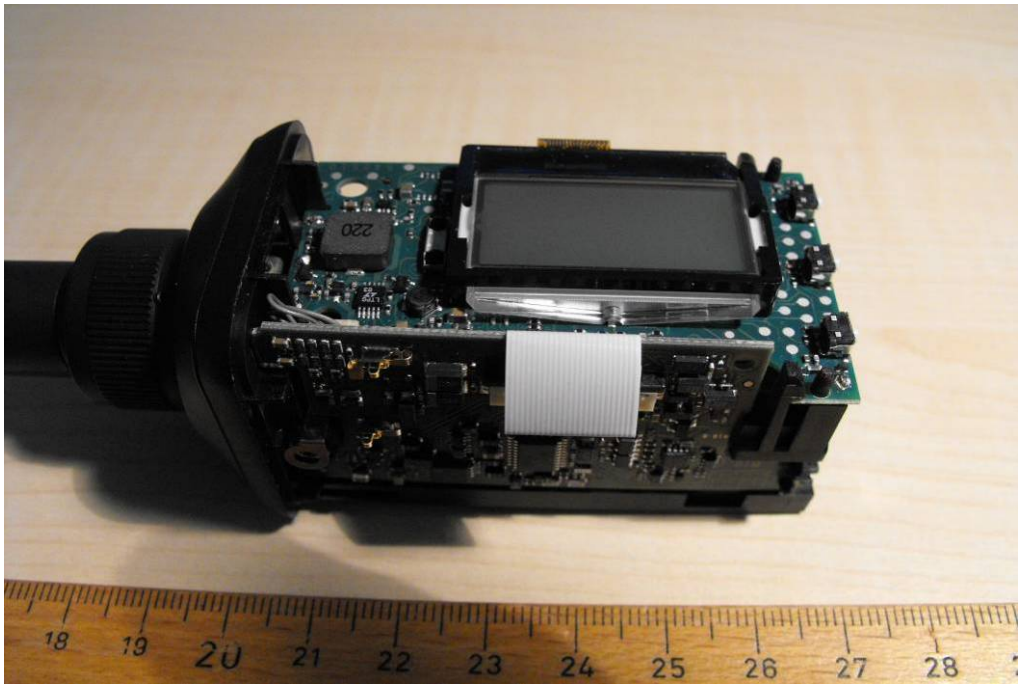


Photo 3:

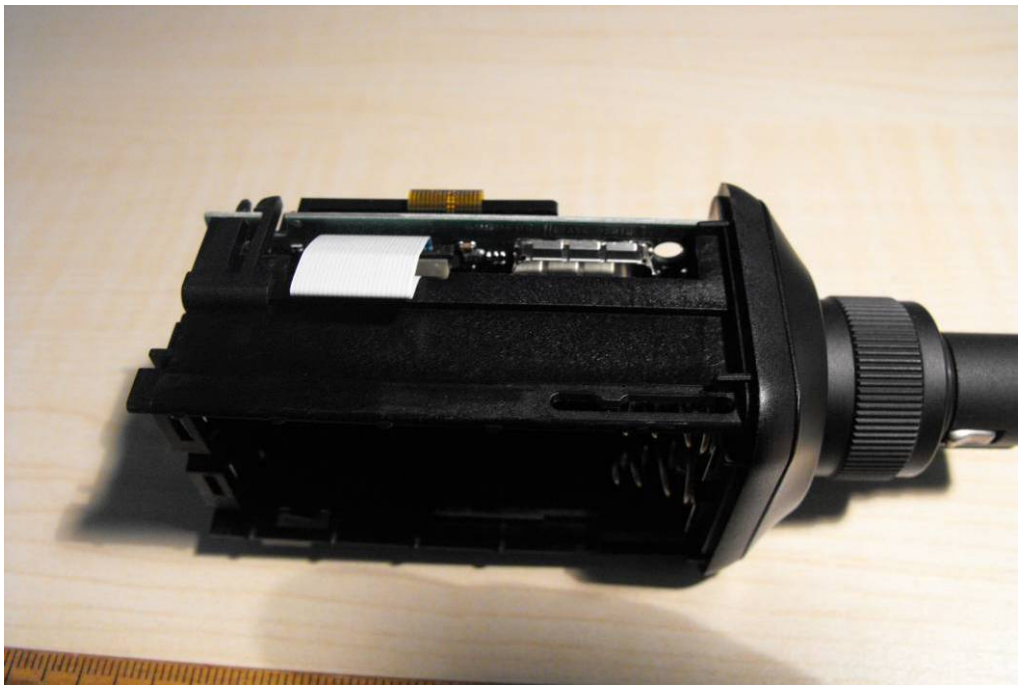


Photo 4:

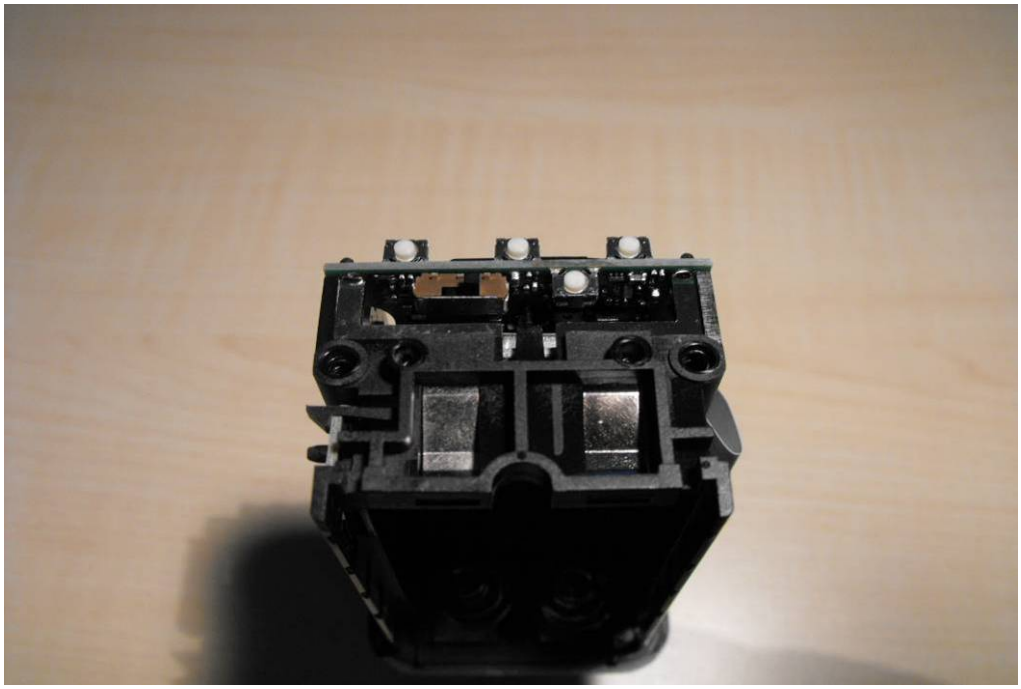


Photo 5:

Photo 6:

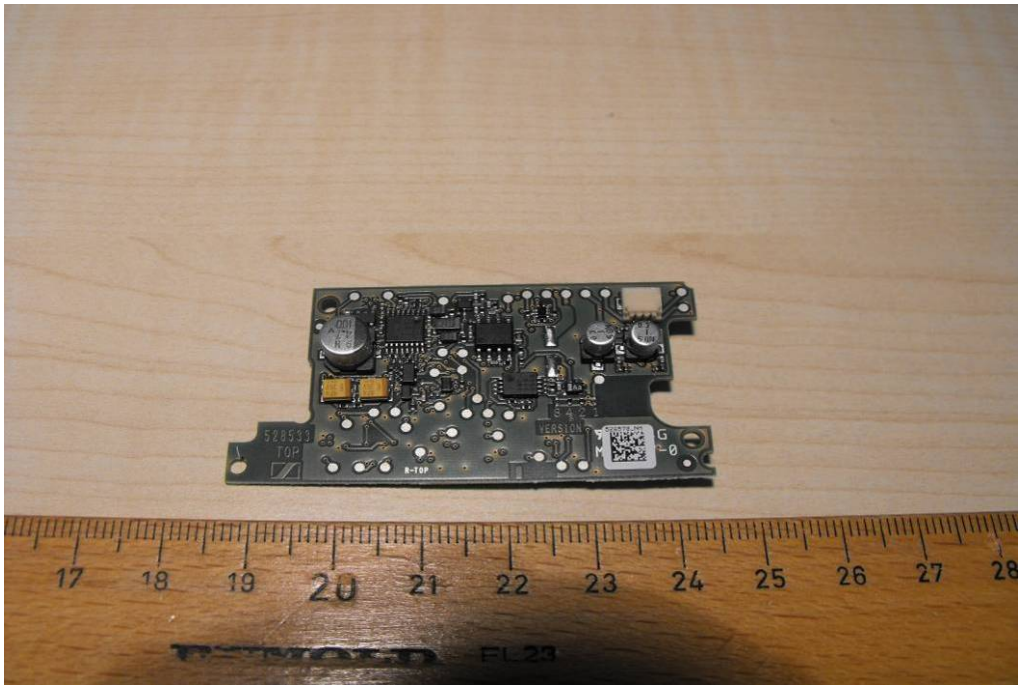


Photo 7:

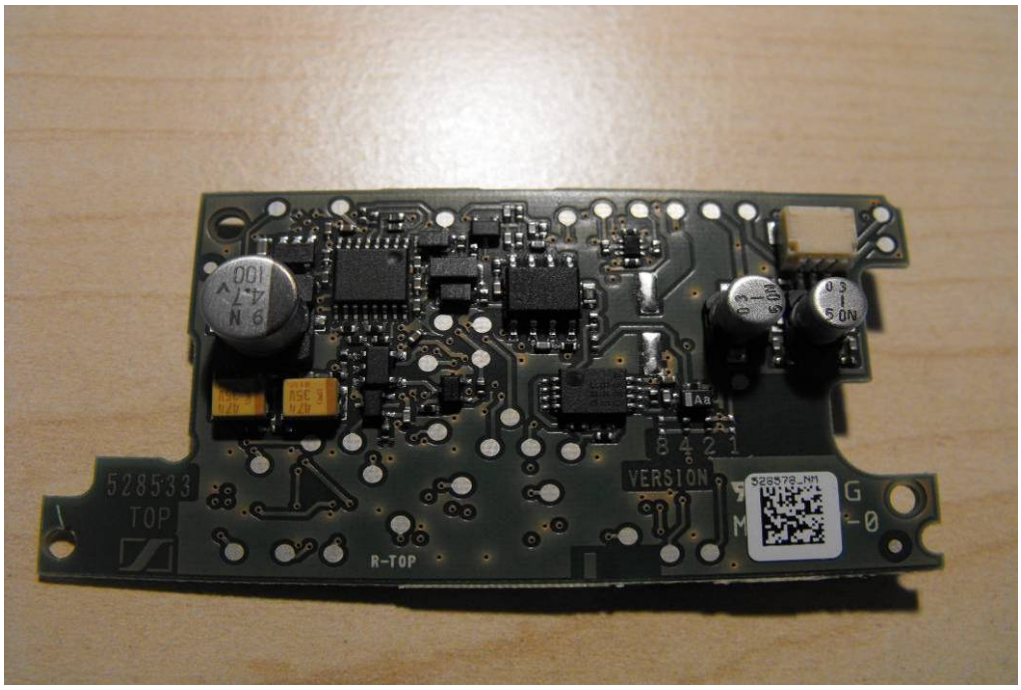


Photo 8:

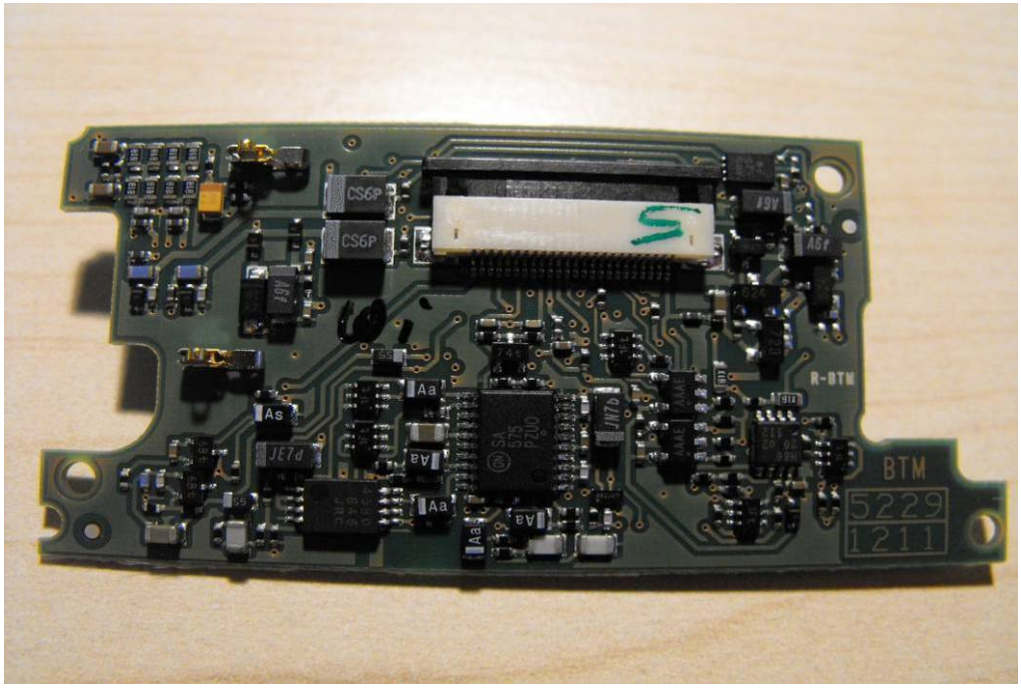


Photo 9:

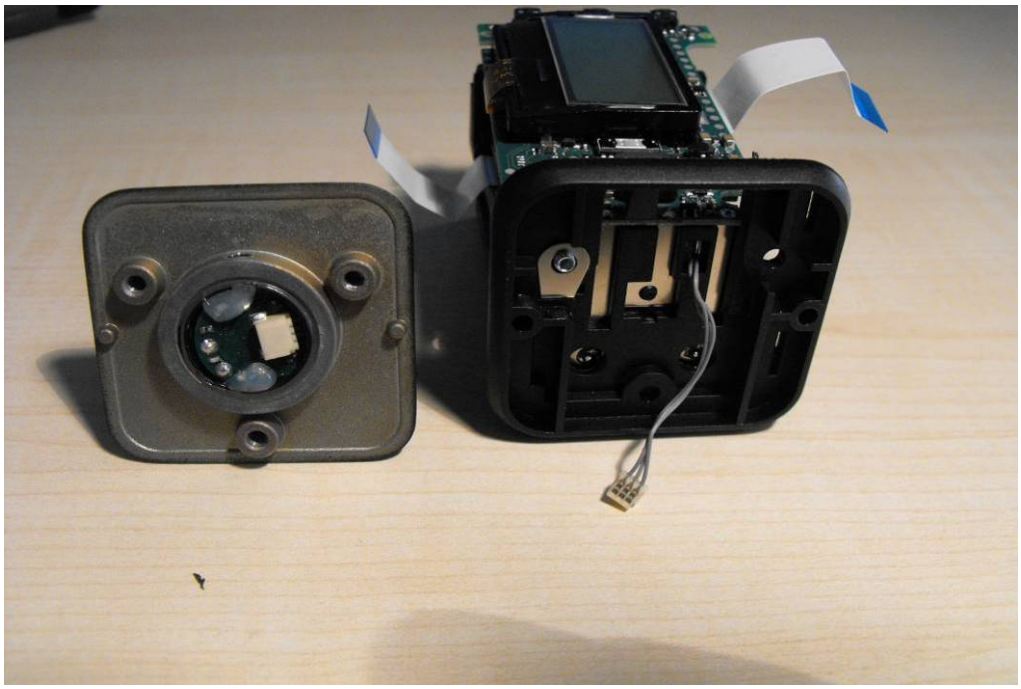


Photo 10:

Photo 11:

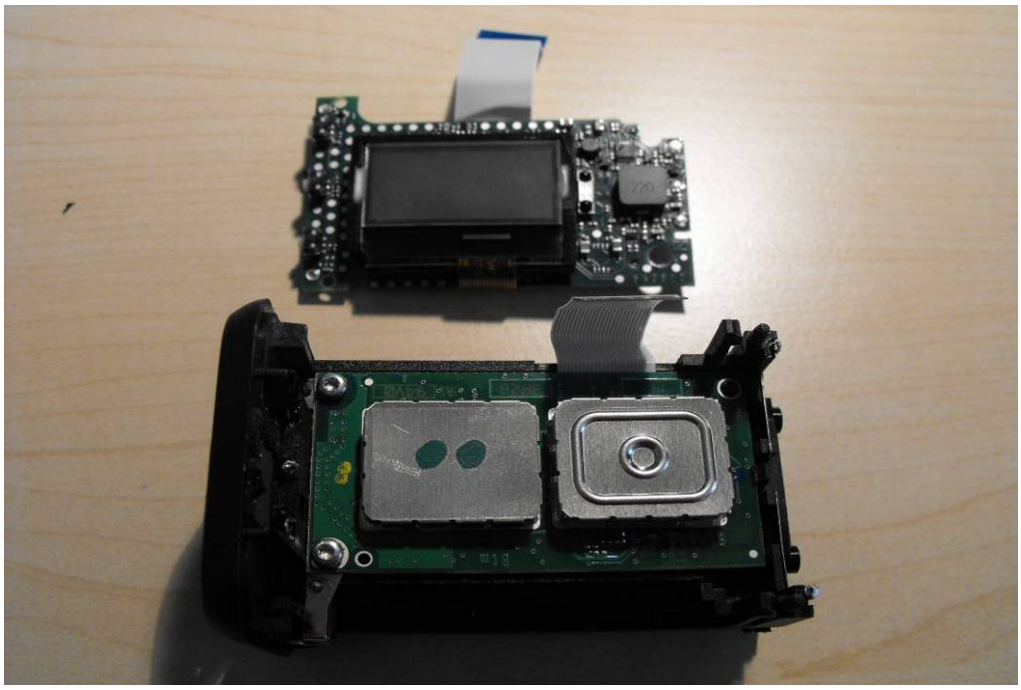


Photo 12:

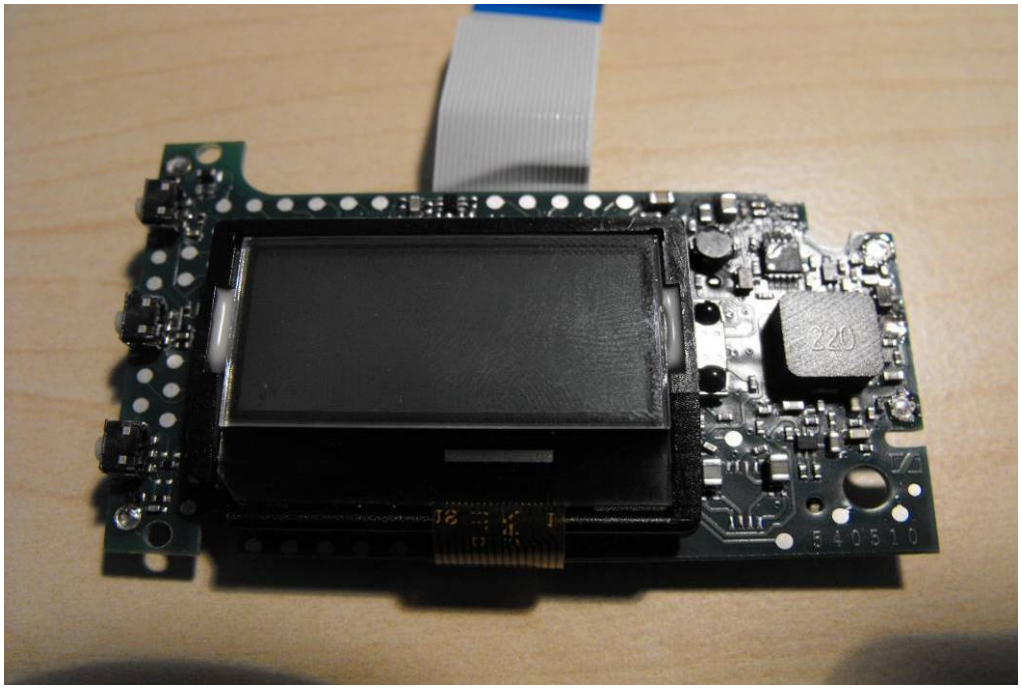


Photo 13:

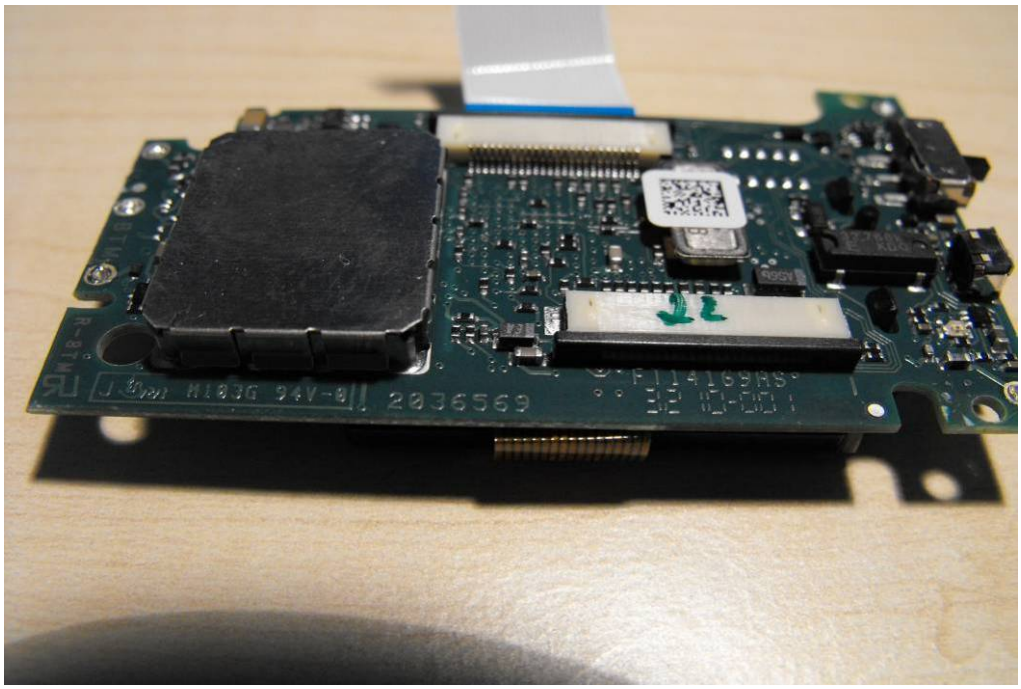


Photo 14:

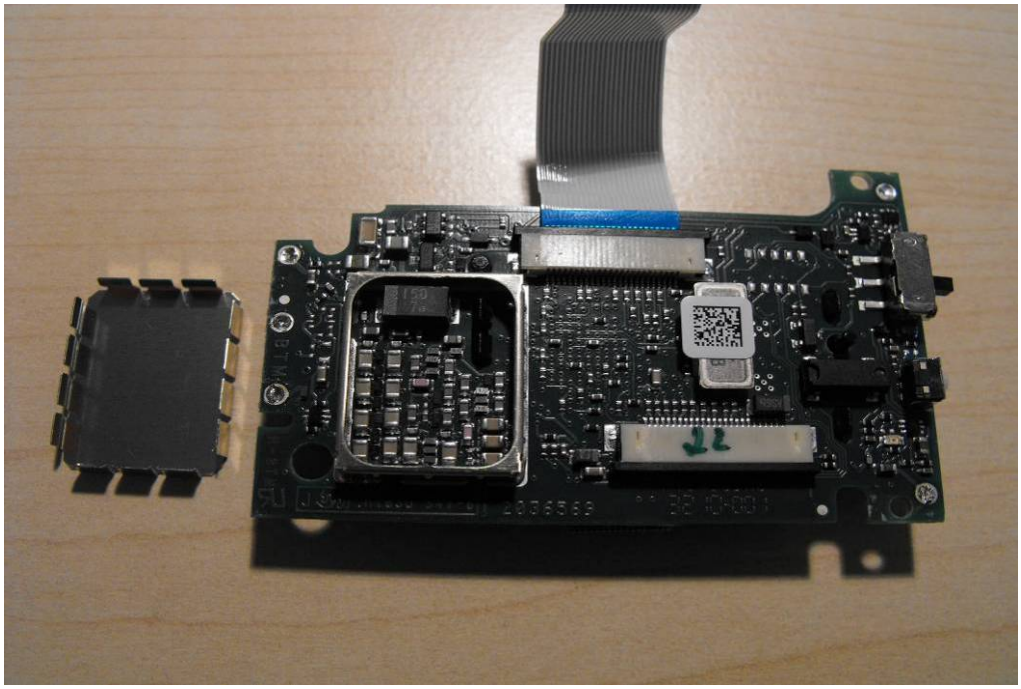


Photo 15:

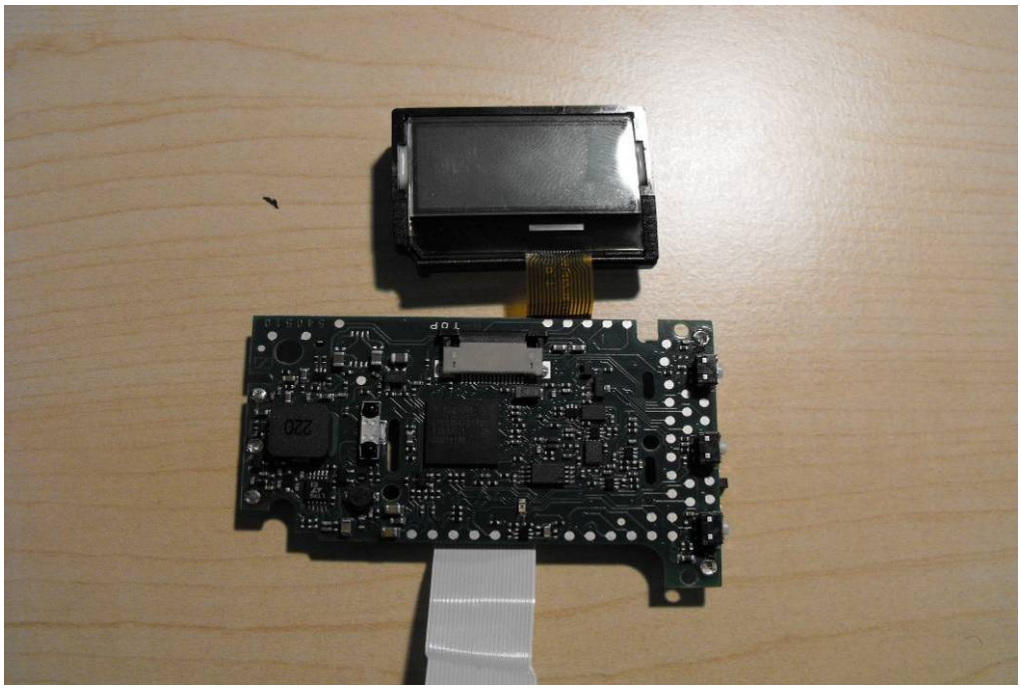


Photo 16:

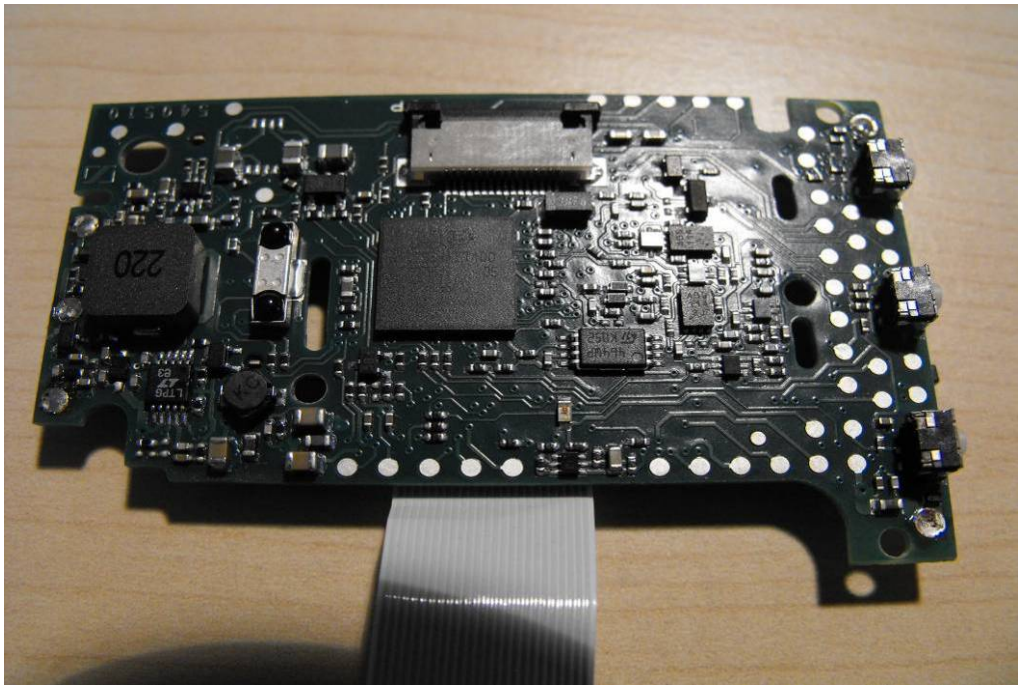
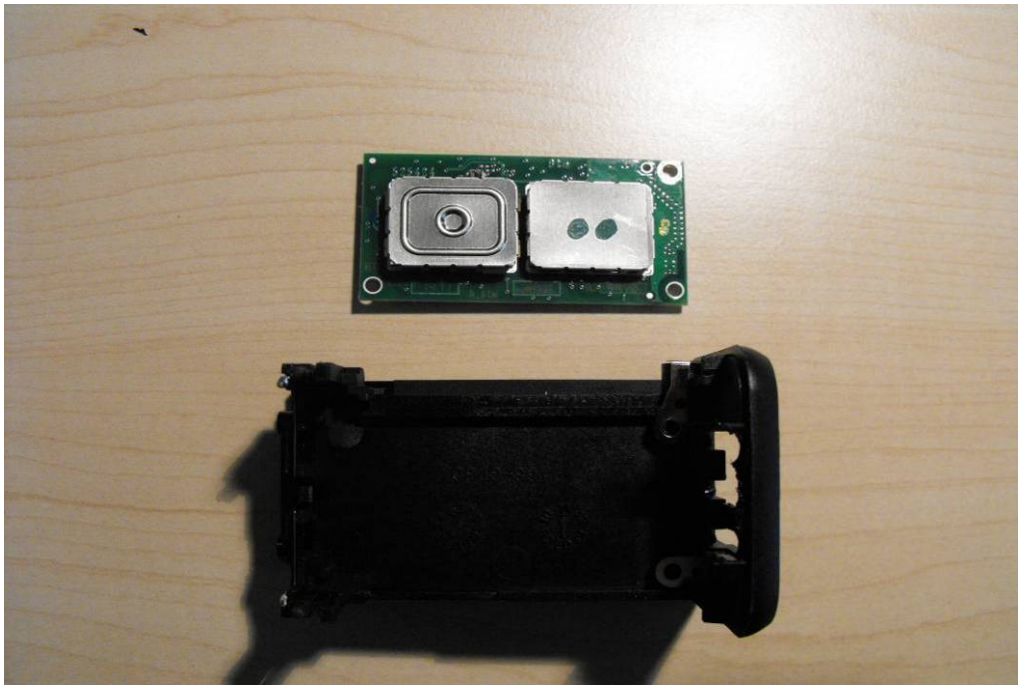


Photo 17:

Photo 18:



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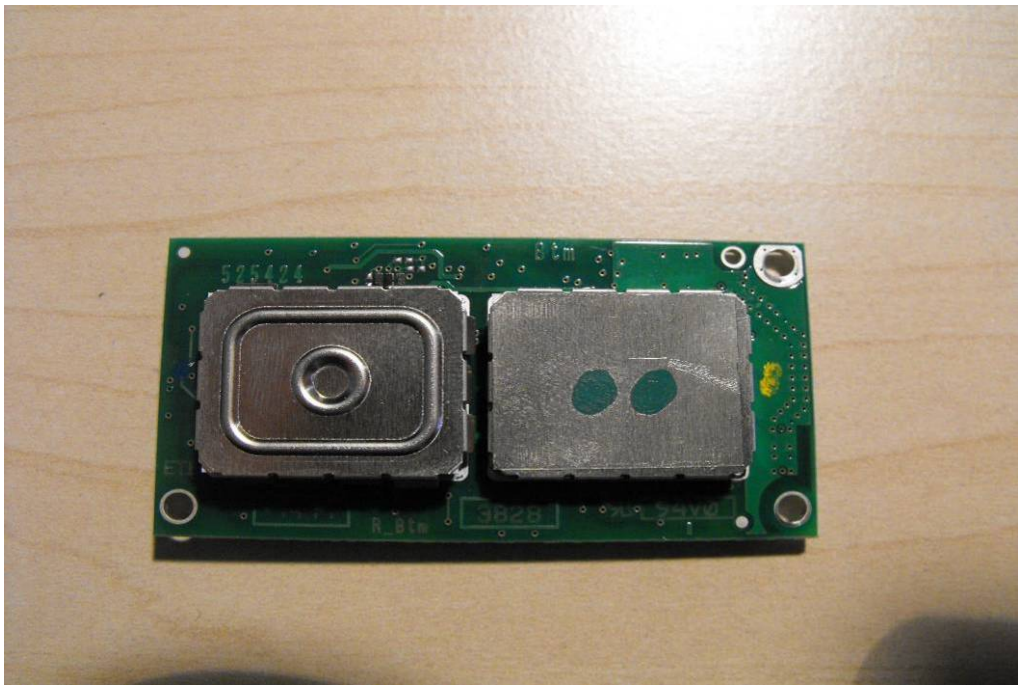

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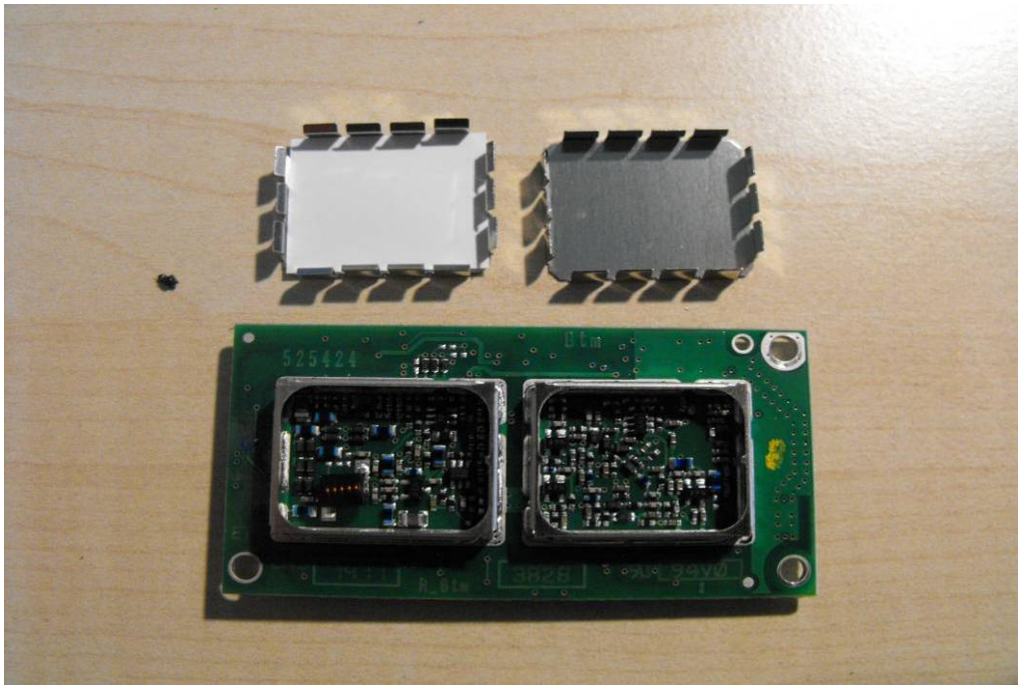

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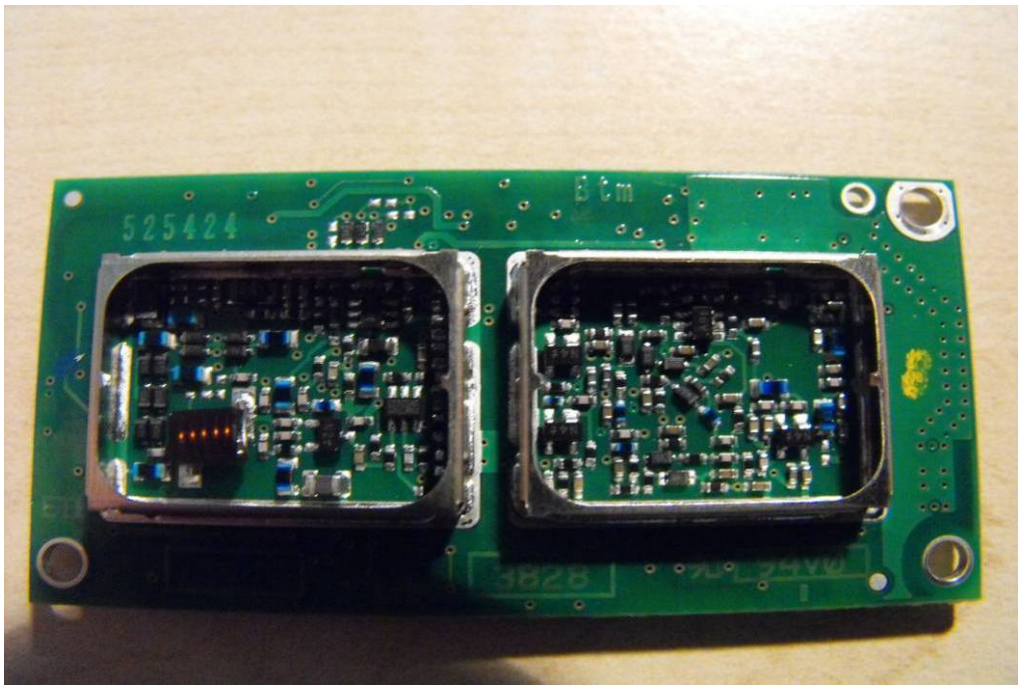

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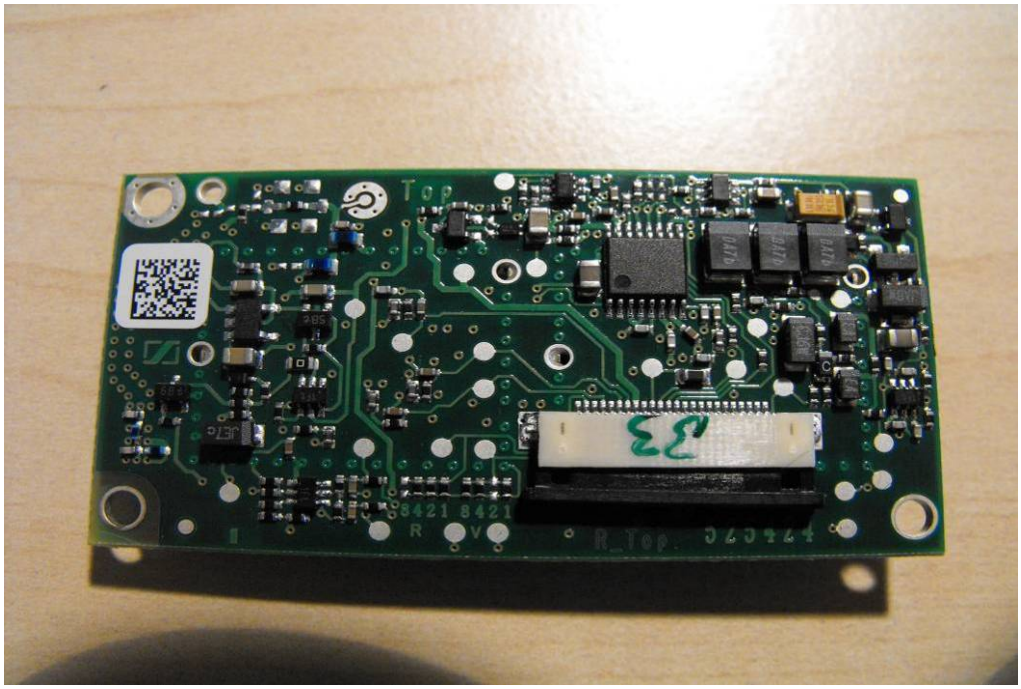

Annex D Document history

Version	Applied changes	Date of release
1.0	Initial release	2012-02-15
-A	FCC-Number and IC-Number corrected. This report replaces the report with the number 1-3890/11-01-04 dated from 2012-02-15.	2012-02-22

Annex E Further information

Glossary

AVG - Average
DUT - Device under test
EMC - Electromagnetic Compatibility
EN - European Standard
EUT - Equipment under test
ETSI - European Telecommunications Standard Institute
FCC - Federal Communication Commission
FCC ID - Company Identifier at FCC
HW - Hardware
IC - Industry Canada
Inv. No. - Inventory number
N/A - Not applicable
PP - Positive peak
QP - Quasi peak
S/N - Serial number
SW - Software

Annex F Accreditation Certificate

DAkkS
Deutsche Akkreditierungsstelle

Deutsche Akkreditierungsstelle GmbH
German Accreditation Body

Entrusted according to Section 8 subsection1 AkkStelleG in connection with Section 1 subsection 1 AkkStelleGBV
Signatory to the Multilateral Agreements of
EA, ILAC and IAF for Mutual Recognition

Accreditation

The Deutsche Akkreditierungsstelle GmbH (German Accreditation Body) attests that the testing laboratory

CETECOM ICT Services GmbH
Untertürkheimer Straße 6-10
66117 Saarbrücken

is competent under the terms of DIN EN ISO/IEC 17025:2005 to carry out tests in the following fields:

Wired communications and DECT
Acoustic
Radio
Shirt Range Devices (SRD)
RFID
WiMax and Richtfunk
Mobile radio (GSM / DCS), Over the Air (OTA) Performance
Electromagnetic Compatibility (EMC) incl. Automotive
Product safety
SAR and Hearing Aid Compatibility (HAC)
Environmental simulation
Smart Card Terminals
Bluetooth
WI-FI-Services

The accreditation certificate shall only apply in connection with the notice of accreditation of 13.04.2011 with the accreditation number D-PL-12076-01 and is valid until 03.09.2014. It comprises the cover sheet, the reverse side of the cover sheet and the following annex with a total of 82 pages.

Registration number of the certificate: **D-PL-12076-01-01**

Frankfurt am Main, 13.04.2011

Dipl.-Ing. (FH) Rolf Egner
Head of Division 2

This document is a translation. The definitive version is the original German accreditation certificate.

See notes overleaf.

Front side of certificate

Deutsche Akkreditierungsstelle GmbH

Office Berlin
Spittelmarkt 10
10117 Berlin

Office Frankfurt am Main
Gartenstraße 6
60594 Frankfurt am Main

Office Braunschweig
Bundesallee 100
38116 Braunschweig

The publication of extracts of the accreditation certificate is subject to the prior written approval by Deutsche Akkreditierungsstelle GmbH (DAkkS). Exempted is the unchanged form of separate disseminations of the cover sheet by the conformity assessment body mentioned overleaf.

No impression shall be made that the accreditation also extends to fields beyond the scope of accreditation attested by DAkkS.

The accreditation was granted pursuant to the Act on the Accreditation Body (AkkStelleG) of 31 July 2009 (Federal Law Gazette I p. 2625) and the Regulation (EC) No 765/2008 of the European Parliament and of the Council of 9 July 2008 setting out the requirements for accreditation and market surveillance relating to the marketing of products (Official Journal of the European Union L 218 of 9 July 2008, p. 30). DAkkS is a signatory to the Multilateral Agreements for Mutual Recognition of the European co-operation for Accreditation (EA), International Accreditation Forum (IAF) and International Laboratory Accreditation Cooperation (ILAC). The signatories to these agreements recognise each other's accreditations.

The up-to-date state of membership can be retrieved from the following websites:
EA: www.european-accreditation.org
ILAC: www.ilac.org
IAF: www.iaf.nu

Back side of certificate

Note:
The current certificate including annex is published on our website (see link below) or may be received from CETECOM ICT Services on request.

http://www.cetecom.com/fileadmin/de/CETECOM_D_Saarbruecken/accreditations_Jan_2010/DAKKS_Akkredi_Urk_EN17025-En_incl_Annex.pdf