
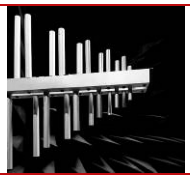
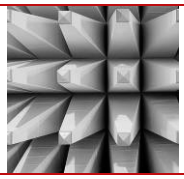

CETECOM™
CETECOM ICT Services
consulting - testing - certification

TEST REPORT

Test report no.: 1-3818/11-01-07-B

ilac-MRA DAkkS Deutsche Akkreditierungsstelle D-PL-12076-01-01

Testing laboratory

CETECOM ICT Services GmbH
Untertuerkheimer Strasse 6 – 10
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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

AKG Acoustics GmbH
Lemböckgasse 21-25
1230 Wien / AUSTRIA
Phone: +43 18 66 54-0
Fax: +43 18 66 54-1292
Contact: Erich Gärtner
e-mail: erich.gaertner@harman.com
Phone: +43 18 66 54-1357

Manufacturer

AKG Acoustics GmbH
Lemböckgasse 21-25
1230 Wien / AUSTRIA

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:	**Antenna combiner**
Model name:	**SPC 4500 (part of IVM4500)**
FCC ID:	**V3TSPC4500**
IC:	**-/-**
Frequency:	500 - 608 MHz 614 – 698 MHz
Technology tested:	Wireless Microphone
Antenna:	External Passive Directional Antenna Type SRA 2W-AKG
Power Supply:	12V DC by AC/DC power adapter
Temperature Range:	-20°C to +55 °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=Stefan Boes, o=CETECOM ICT Services GmbH, ou=BOE-111011, email=Stefan.Boes@cetecom.com, c=DE
2012.03.21 14:19:44 +01'00'

Stefan Bös
Senior Testing Manager

Test performed:

cn=Tobias Wittenmeier, o=CETECOM ICT Services GmbH, ou=WIT-111222, email=tobias.wittenmeier@cetecom.com, c=DE
2012.03.21 16:24:32 +01'00'

Tobias Wittenmeier

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2 General information

2.1 Notes and disclaimer

The test results of this test report relate exclusively to the test item specified in this test report. CETECOM ICT Services GmbH does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item.
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2.2 Application details

Date of receipt of order:	2011-09-30
Date of receipt of test item:	2011-11-11
Start of test:	2012-02-01
End of test:	2012-02-23
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}	+55 °C during high temperature tests
	T_{min}	-20 °C during low temperature tests
Relative humidity content:		55 %
Barometric pressure:		not relevant for this kind of testing
Power supply:	V_{nom}	12V DC by AC/DC power adapter

5 Test item

Kind of test item	**:**	**Antenna combiner**
Type identification	**:**	**SPC 4500 (part of IVM4500)**
S/N serial number	**:**	**unknown**
HW hardware status	**:**	**unknown**
SW software status	**:**	**unknown**
Frequency band [MHz]	**:**	**500 MHz – 608 MHz** **614 MHz – 698 MHz**
Type of radio transmission **Use of frequency spectrum**	**:** **:**	**Analog carrier**
Type of modulation	**:**	**FM**
Number of channels	**:**	**No information provided**
Antenna	**:**	**External Passive Directional Antenna Type SRA 2W-AKG**
Power supply	**:**	**12V DC by AC/DC power adapter**
Temperature range	**:**	**-20°C to +55 °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	Passed	2012-03-21	-/-

Test Specification Clause	Test Case	Temperature Conditions	Power Source Voltages	Pass	Fail	NA	NP	Results (max.)
FCC 47 CFR § 74.861 (e)(1)(ii) RSS-123 §6.2 Issue 2	Output power (radiated)	Nominal	Nominal	☐	☐	☐	☒	
FCC 47 CFR § 74.861 RSS-123 §7 Issue 2	Frequency stability	Nominal	Extreme	☐	☐	☐	☒	
		Extreme	Nominal	☐	☐	☐	☒	
FCC 47 CFR § 2.1049 § 74.861	Modulation characteristics	Nominal	Nominal	☐	☐	☐	☒	
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)	Nominal	Nominal	☒	☐	☐	☐	complies

Note: NA = Not Applicable; NP = Not Performed

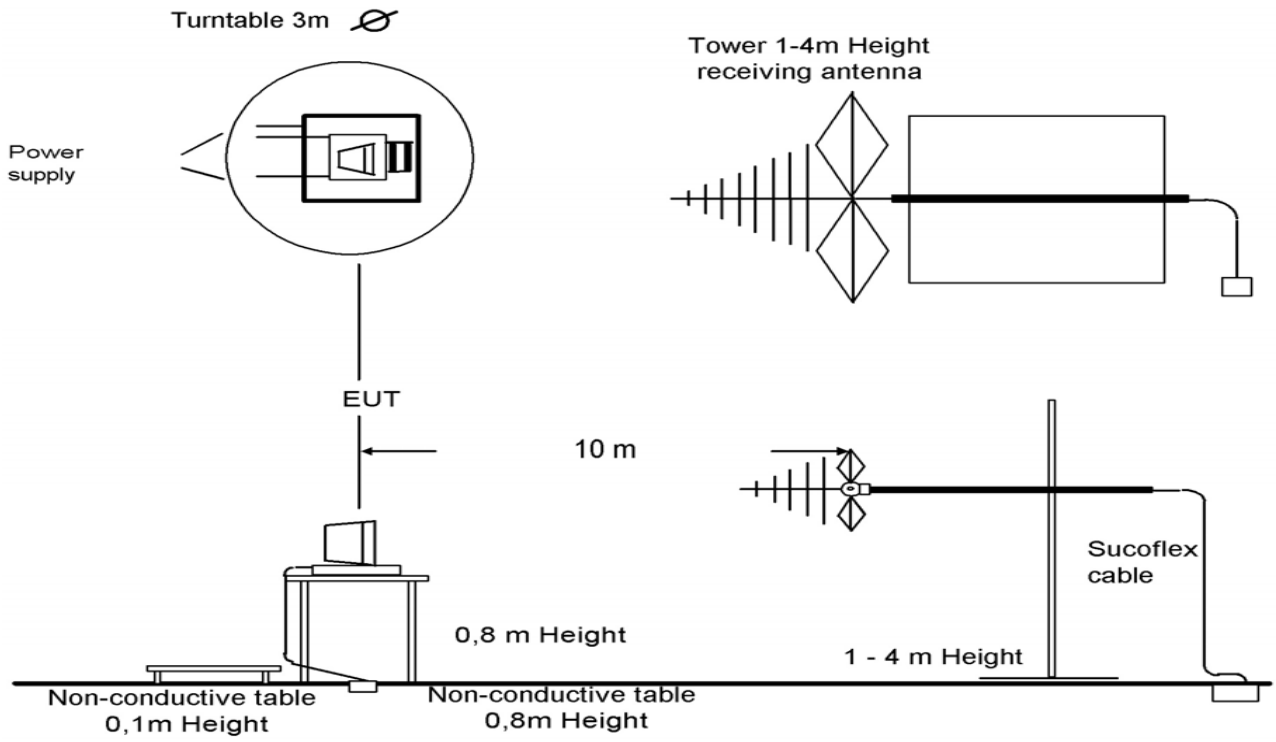
8 RF measurements

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



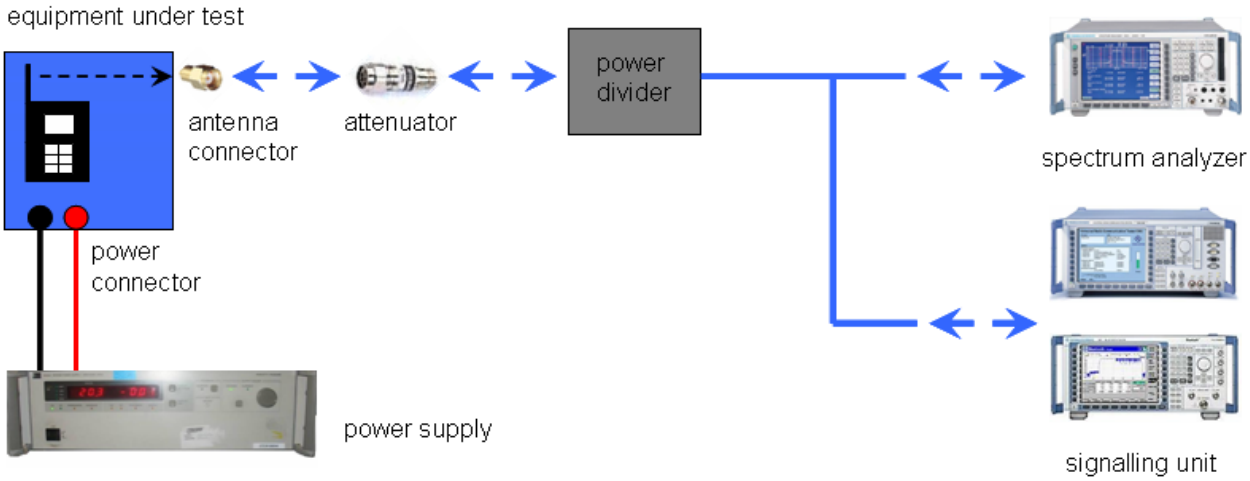
Picture 1: Diagram radiated measurements

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:

The EUT only operates with connected external antenna "SRA 2 W – AKG". Therefore a power splitter was used to connect the test setup with the spectrum analyser. To avoid atmospherical disturbance the external antenna was shielded (please take a look on the photos). The EUT was connected to the following 4 transmitter:
SST 4500-BD4 759.5 MHz – 789.9 MHz
SST 4500-BD7 500.1 MHz – 530.5 MHz
SST 4500-BD8 570.1 MHz – 600.5 MHz
SST 4500-BD9 600.1 MHz – 607.9 MHz
During the tests the transmitter were set to 100 mW at their middle frequency. For the occupied bandwidth and spectrum mask measurements the transmitters were exposed with a sinusoidal signal of 5 kHz. The signals from the transmitter were compared with the signals from the combiner with connected transmitter. The common input power at the combiner is 400 mW under all test conditions except the idle measurements.

Configuration descriptions: None

9 Measurement results

9.1 Output power (radiated)

Not performed

9.2 Output power (conducted)

In this measurement the output power from the antenna combiner was measured with 4 connected transmitters in TX mode.

Measurement parameters:

Instrument: Power Meter

Results:

Transmitter	Output power [dBm]
Bd 9; 615.3 MHz	13.77
Bd 1; 680.5 MHz	15.36
Bd 3; 720.1 MHz	15.49
Bd 4; 789.9 MHz	13.87
Combiner	19.94

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

9.3 Frequency stability

Not performed

9.3.1 Frequency error vs. voltage

Not performed

9.4 Modulation characteristics

Not performed

9.5 Occupied bandwidth

Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	100 Hz
Video bandwidth:	100 Hz
Span:	200 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	

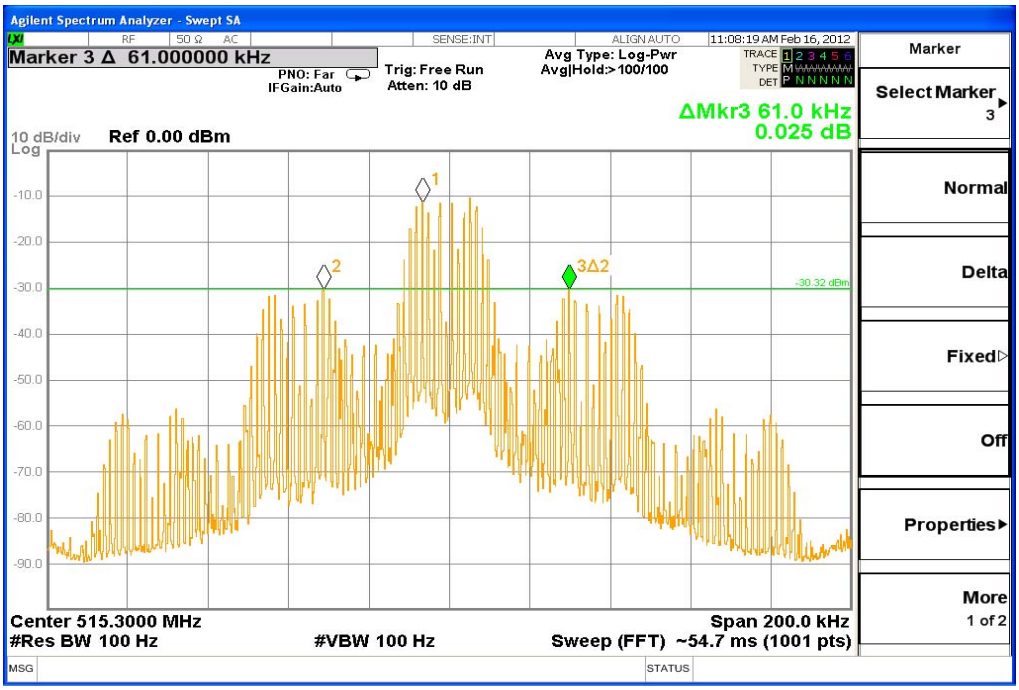
Result:

Frequency	20dB Bandwidth
515.3 MHz	60.4 kHz
585.3 MHz	60.4 kHz
615.3 MHz	60.6 kHz
789.9 MHz	60.4 kHz

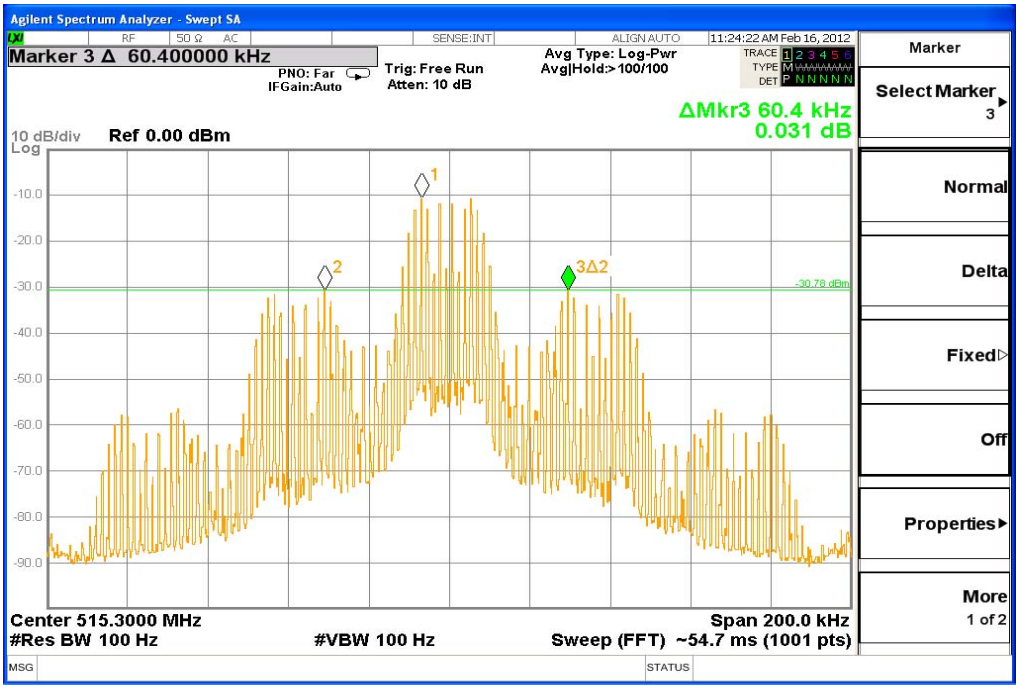
Result: **Passed**

Plots of the measurements (the plots show the comparison between the OBW of the transmitter and the combiner):

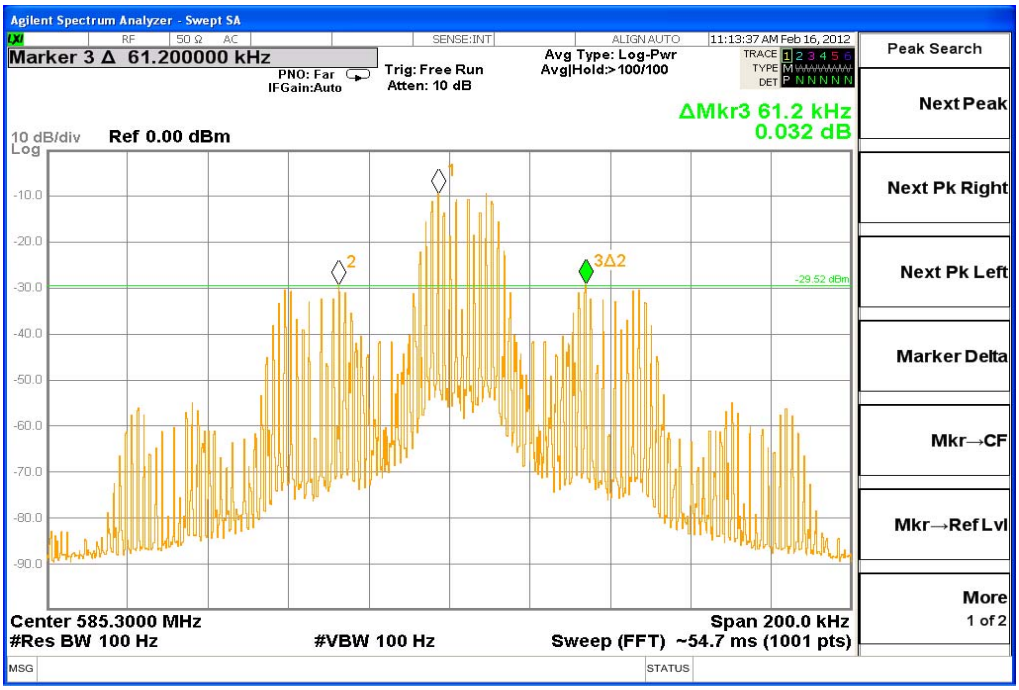
Plot 1: 515.3 MHz transmitter



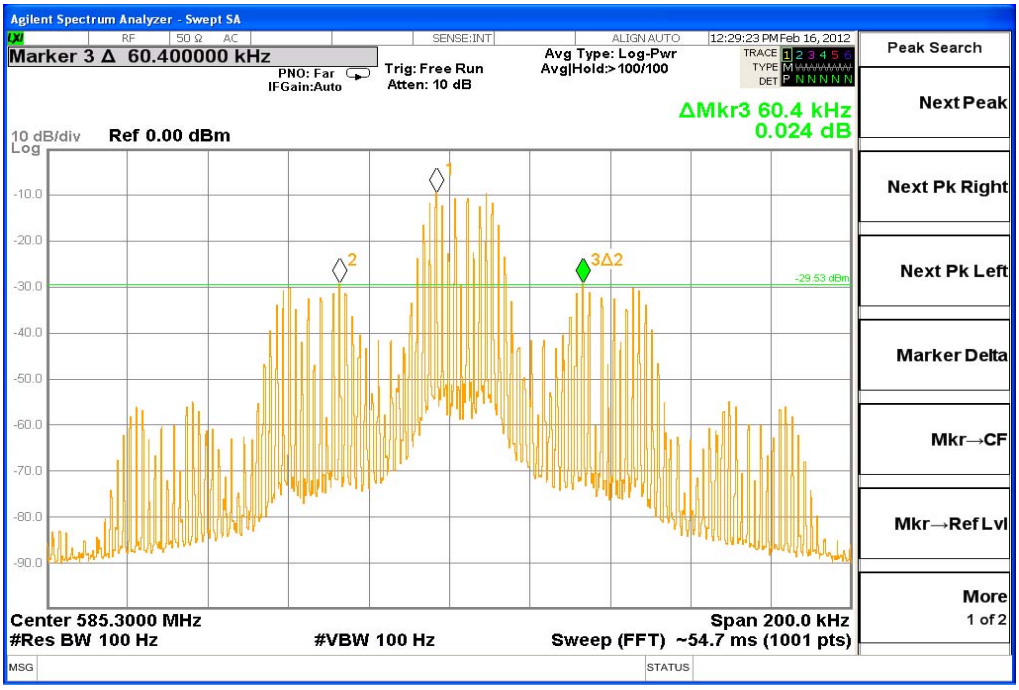
Plot 2: 515.3 MHz combiner



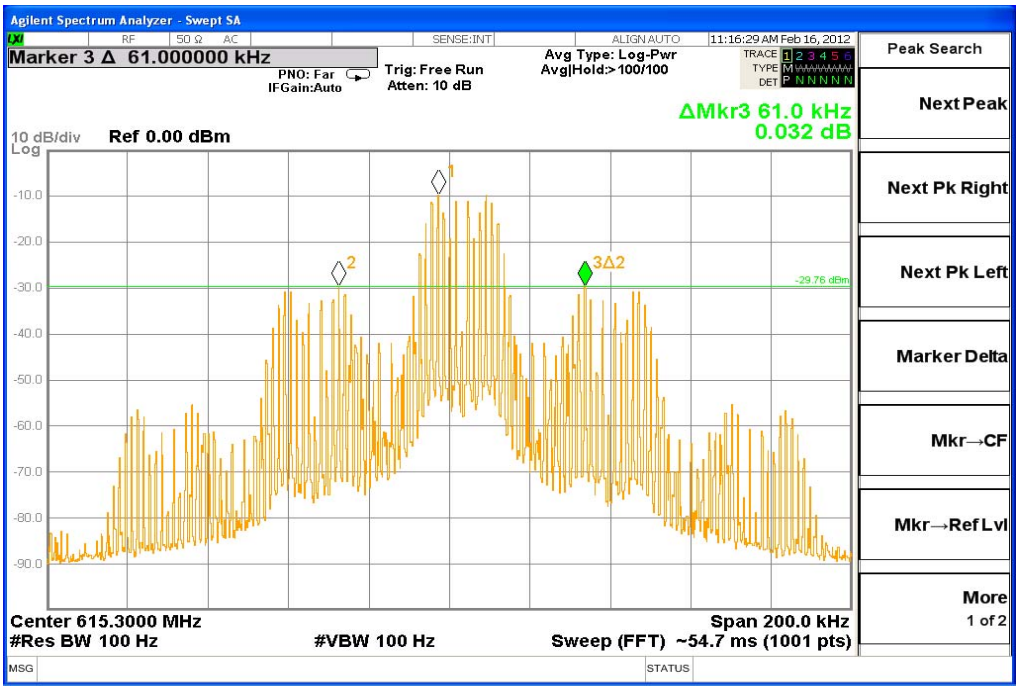
Plot 3: 585.3 MHz transmitter



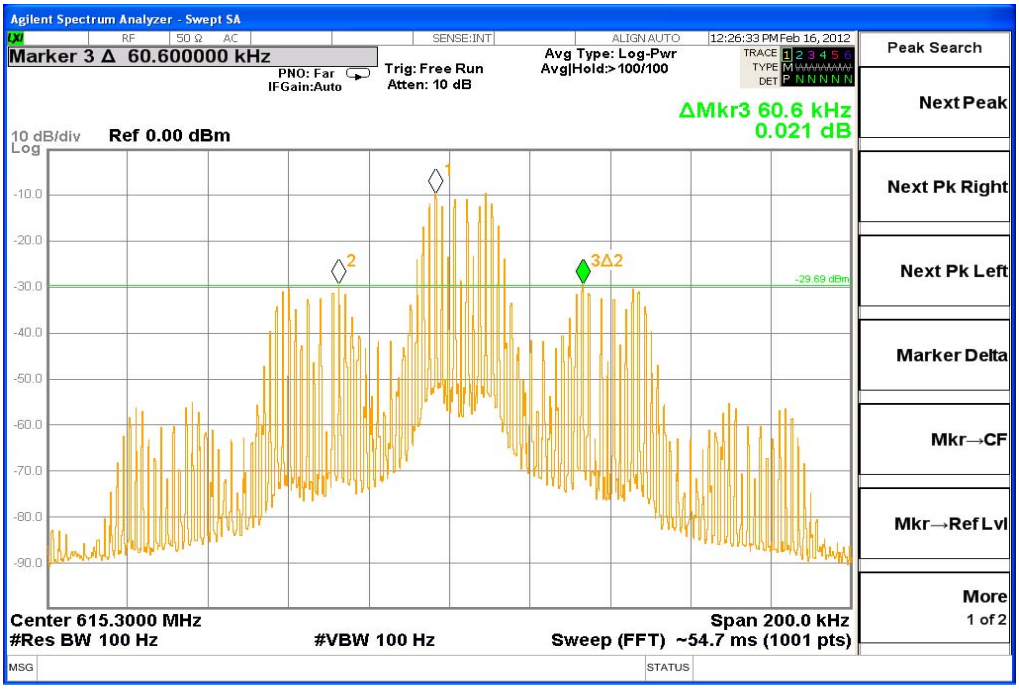
Plot 4: 585.3 MHz combiner



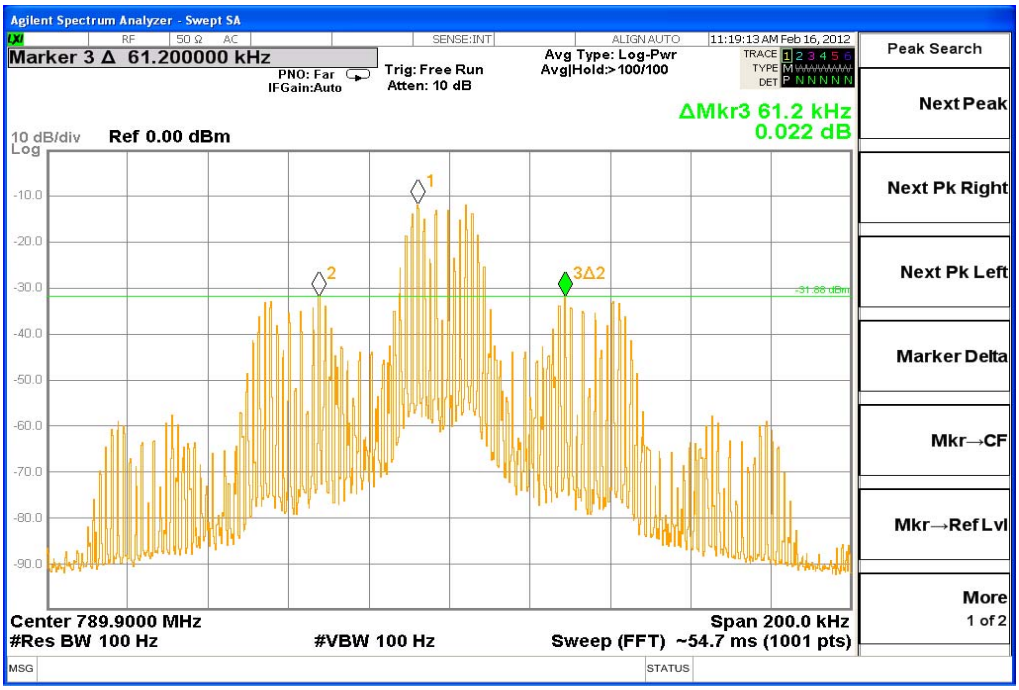
Plot 5: 615.3 MHz transmitter



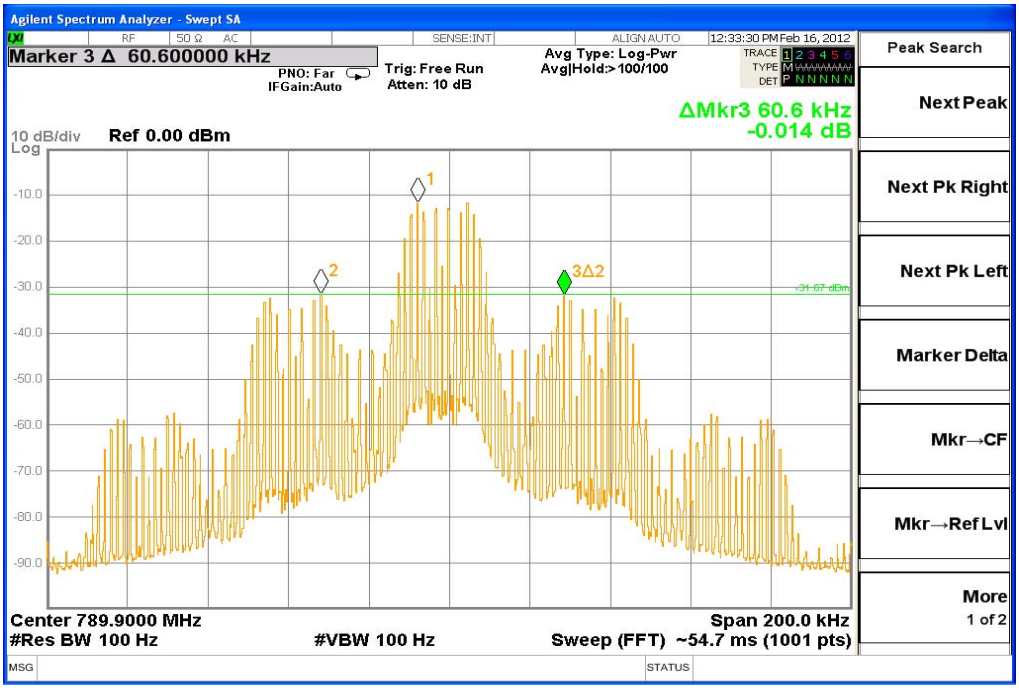
Plot 6: 615.3 MHz combiner



Plot 7: 789.9 MHz transmitter



Plot 8: 789.9 MHz combiner



9.6 Unwanted radiation (spectrum mask)

Measurement:

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

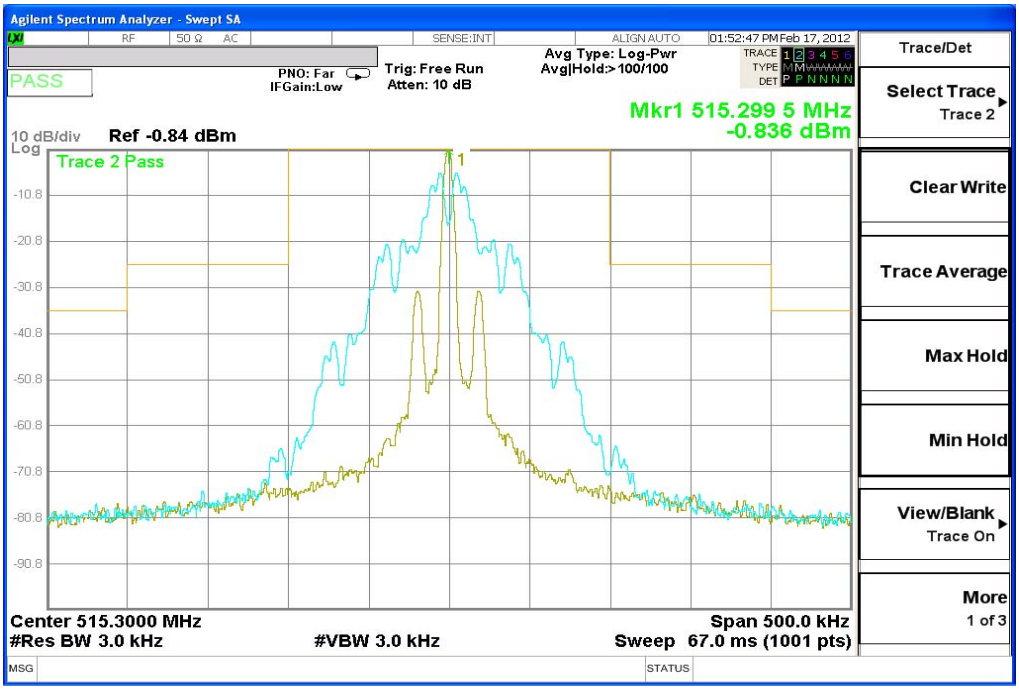
Limits:

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.	

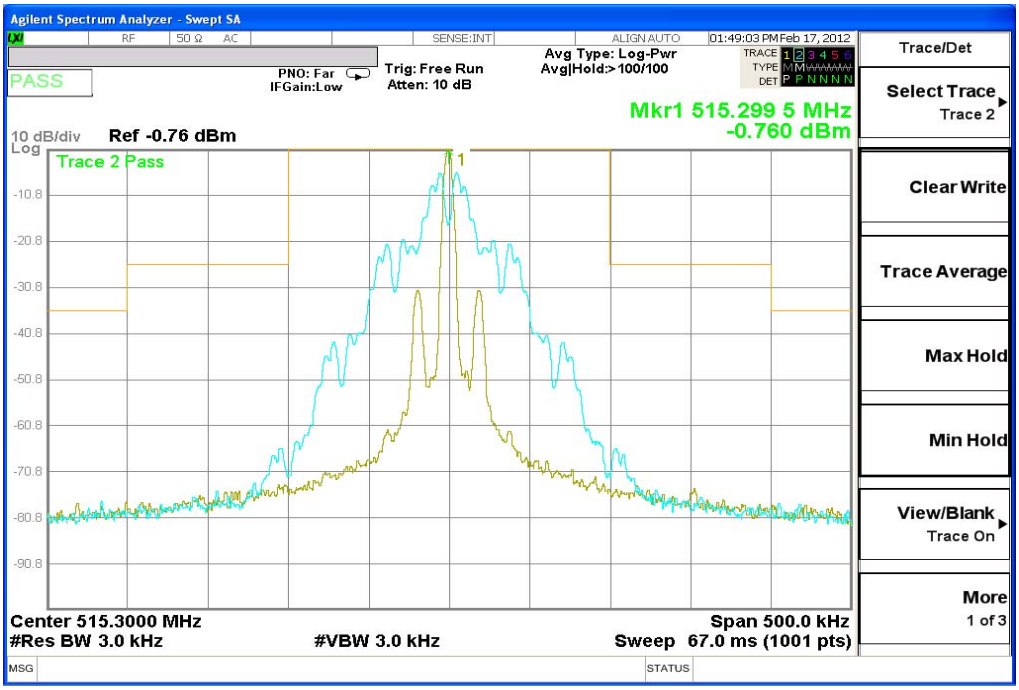
Result: **Passed**

Plots of the measurements (The plots show the comparison between the spectrum mask of the transmitter and the combiner).

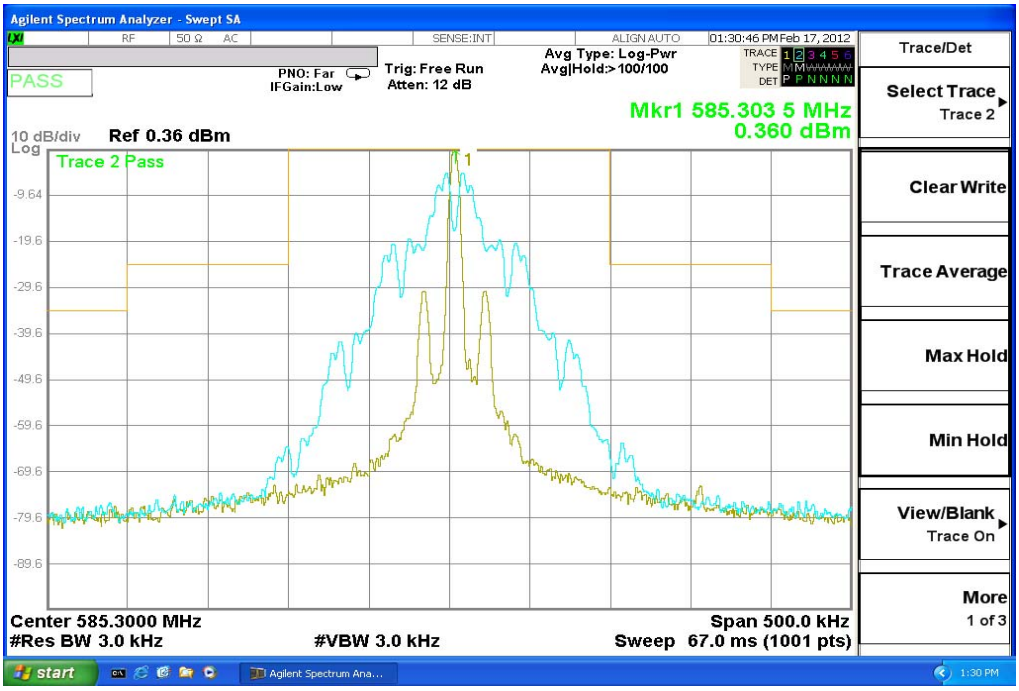
Plot 1: 515.3 MHz transmitter



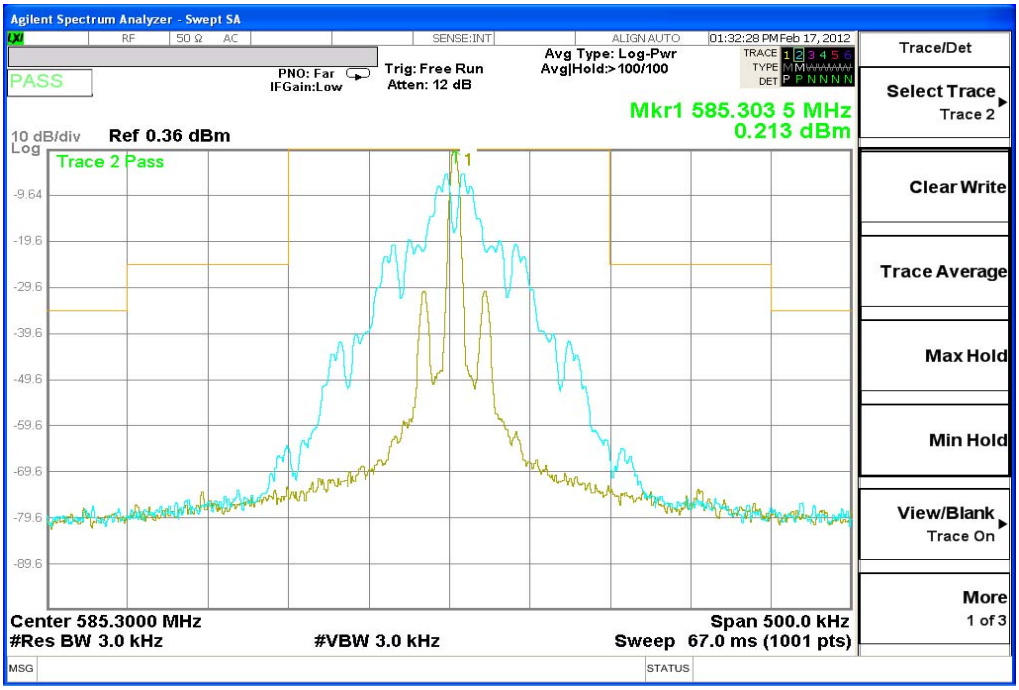
Plot 2: 515.3 MHz combiner



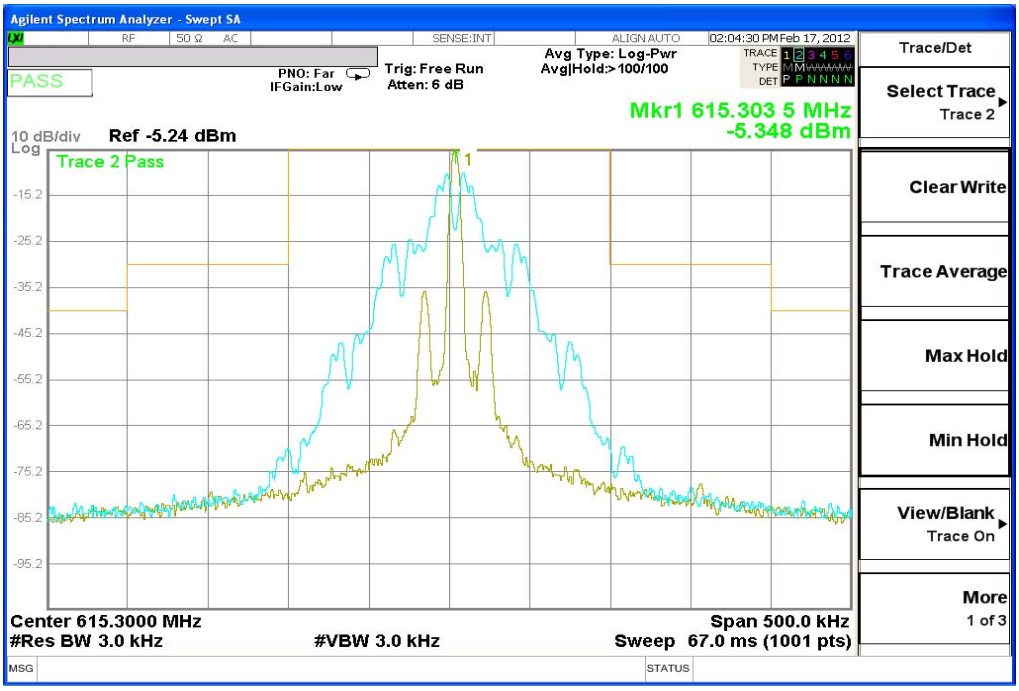
Plot 3: 585.3 transmitter



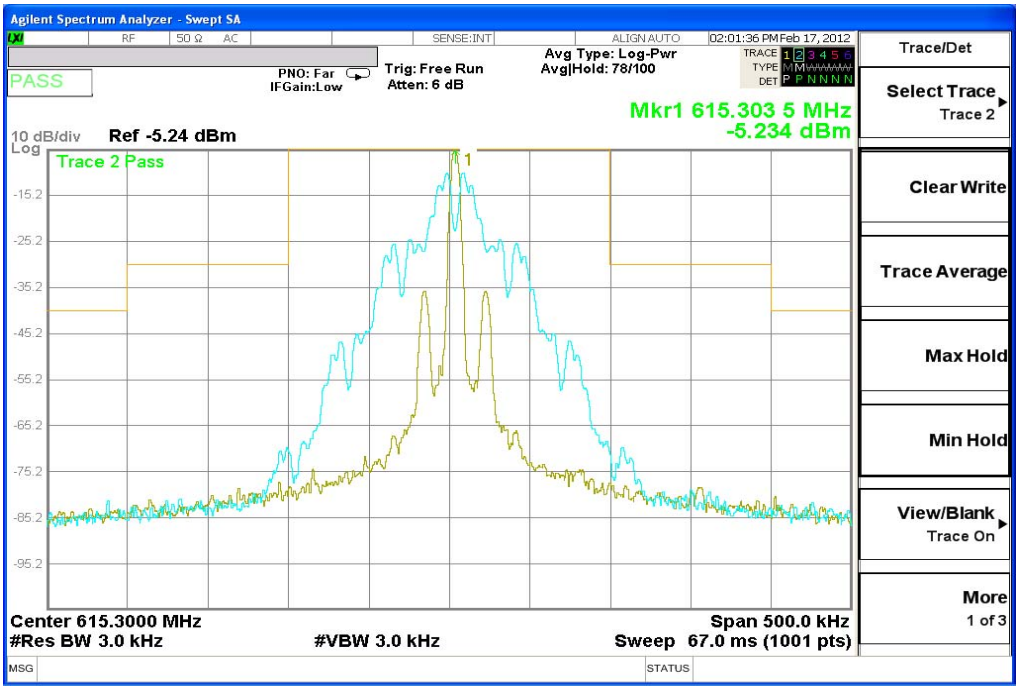
Plot 4: 585.3 combiner



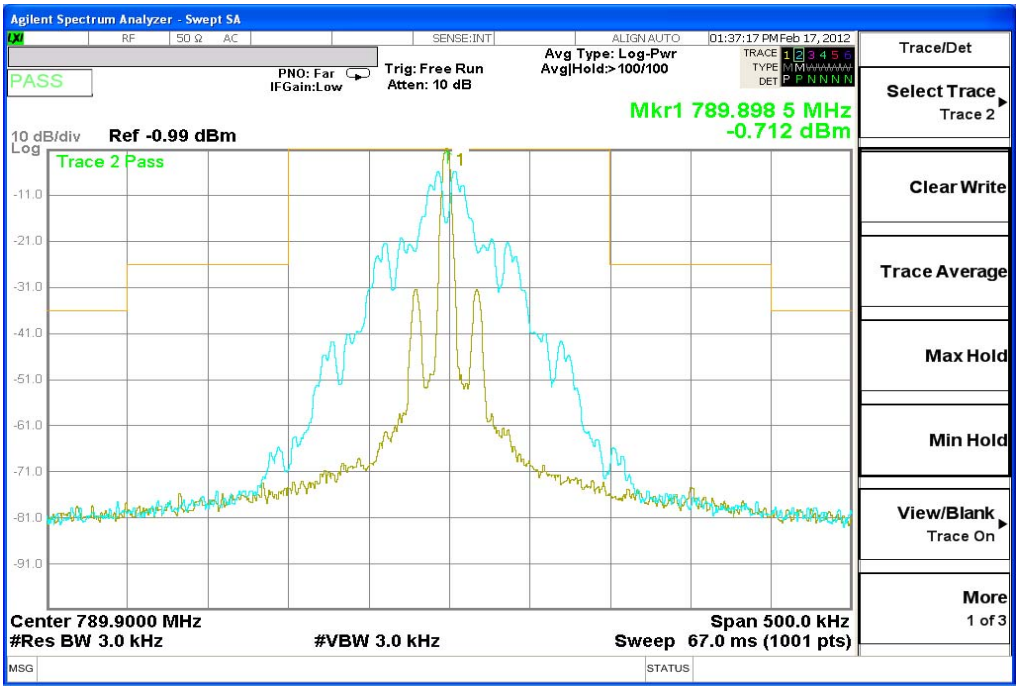
Plot 5: 615.3 MHz transmitter



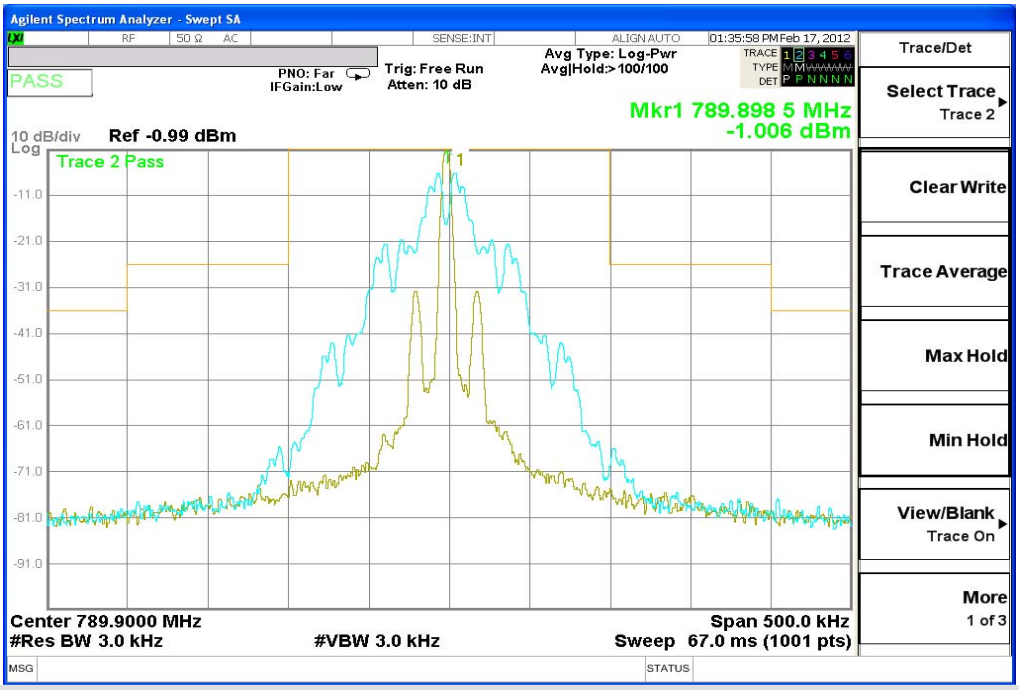
Plot 6: 615.3 MHz combiner



Plot 7: 789.9 MHz transmitter



Plot 8: 789.9 MHz combiner



9.7 Spurious emissions conducted

Description:

Measurement of the conducted spurious emissions in transmit mode. The measurement is performed at channel 1, 6 and 11. The measurement is repeated for all modulations.

Measurement:

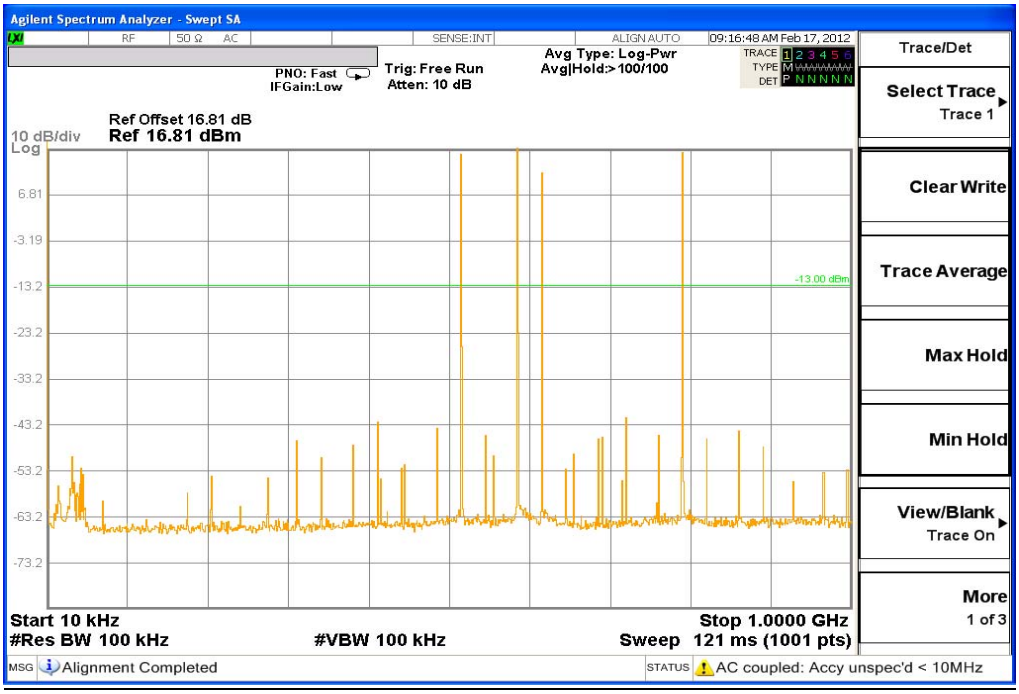
Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Video bandwidth:	F < 1 GHz: 100 kHz F > 1 GHz: 100 kHz
Resolution bandwidth:	F < 1 GHz: 100 kHz F > 1 GHz: 100 kHz
Span:	9 kHz to 25 GHz
Trace-Mode:	Max Hold

Limits:

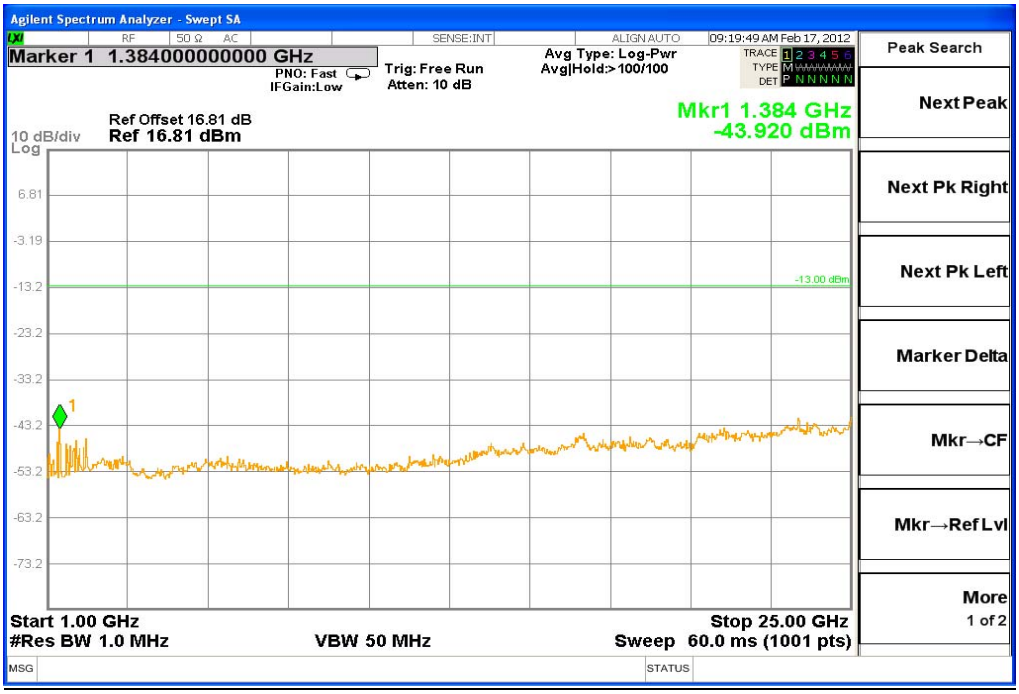
FCC	IC
CFR Part 74	-/-
TX Spurious Emissions Conducted	
Limit: -13dBm in TX mode	

Plots of the measurements

Plot 1: 10 KHz – 1 GHz, 4 transmitters on middle channel, output power 100 mW



Plot 2: 10 KHz – 1 GHz, 4 transmitters on middle channel, output power 100 mW



9.8 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:

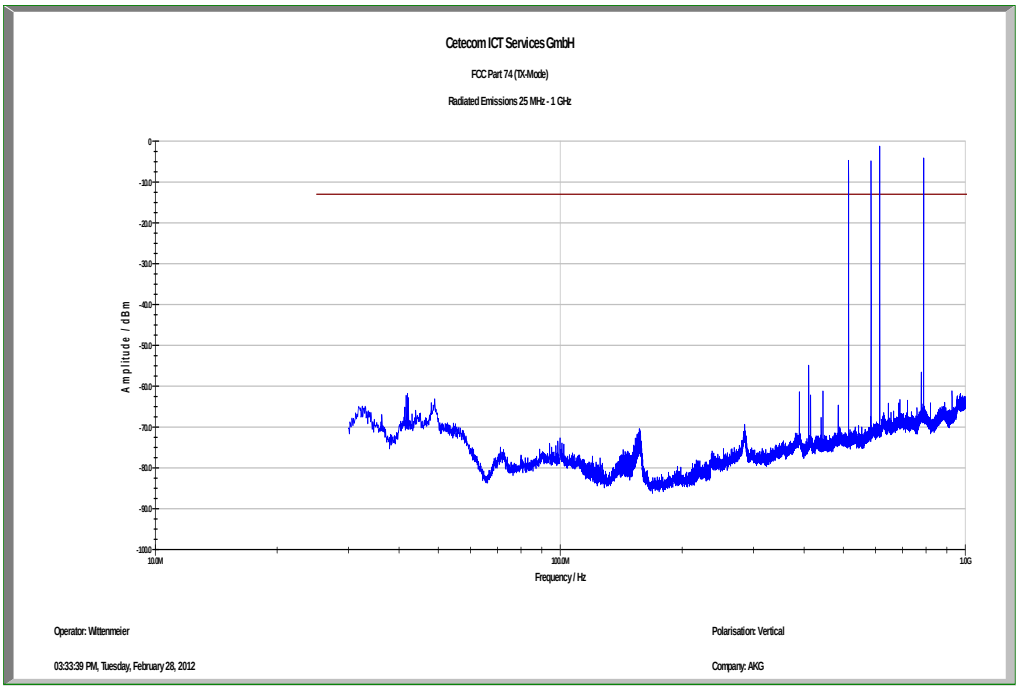
FCC	IC
Emissions for LPRS transmitters operating on standard band channels (25 kHz) shall be attenuated below the unmodulated carrier in accordance with the following: Emissions 12.5 kHz to 22.5 kHz away from the channel center frequency: at least 30 dB; and emissions more than 22.5 kHz away from the 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		
Frequency	Detector	Level
1350 MHz	Peak	-47.84 dBm
1950 MHz	Peak	-45.28 dBm
2720 MHz	Peak	-42.48 dBm
Measurement uncertainty ± 3 dB		

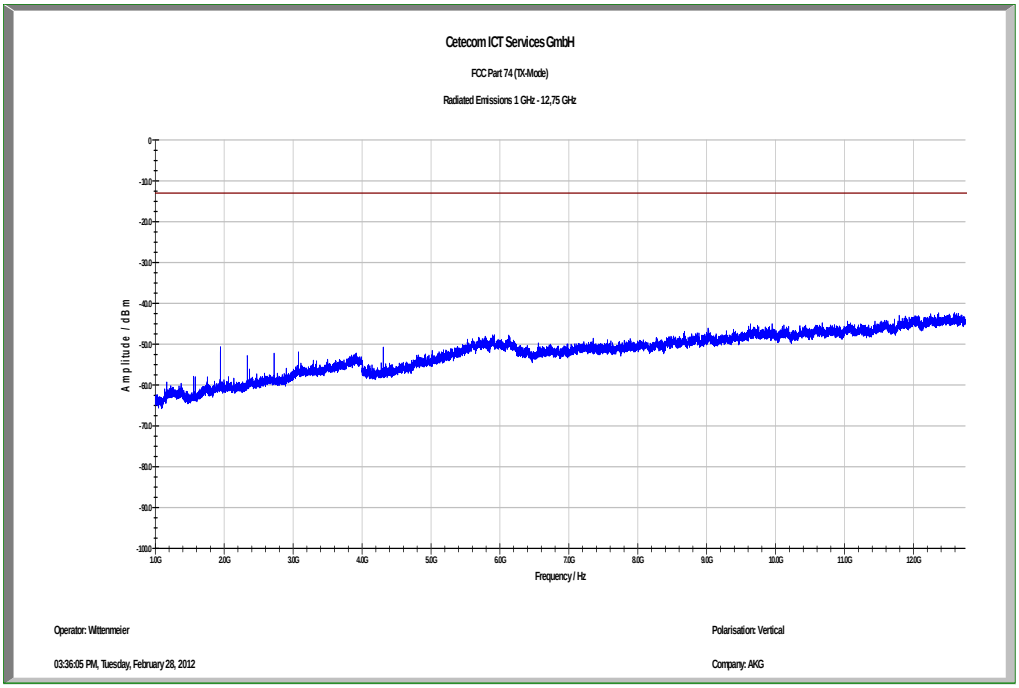
Result: **Passed.**

Plots of the measurements

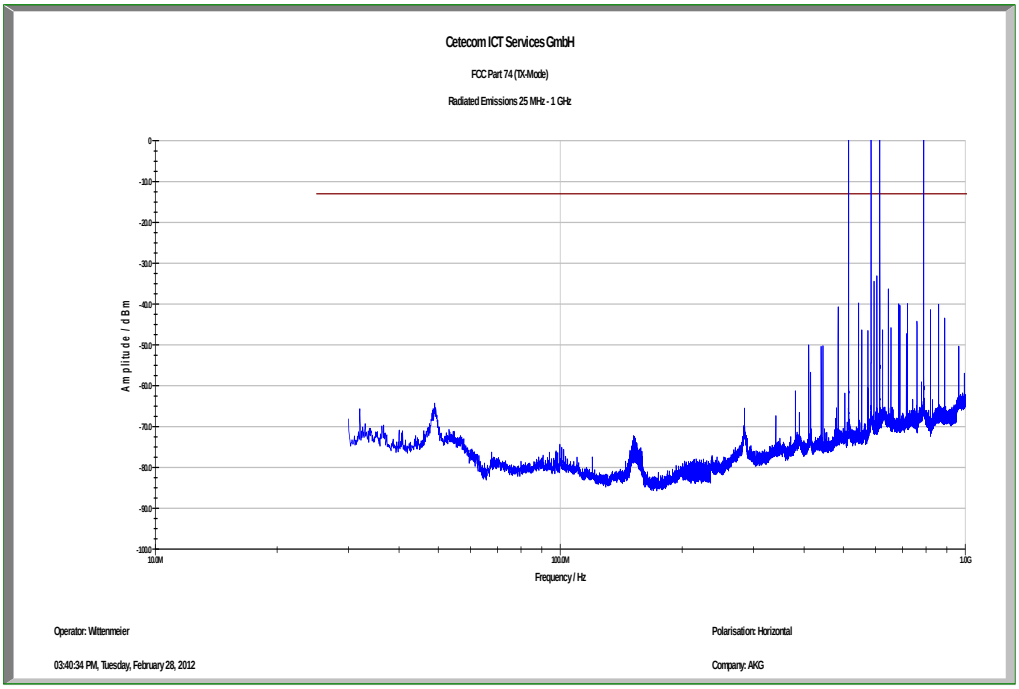
Plot 1: 30 MHz – 1 GHz, 4 transmitter on middle channel, antenna vertical (The 4 peaks are the carriers from the connected transmitter)



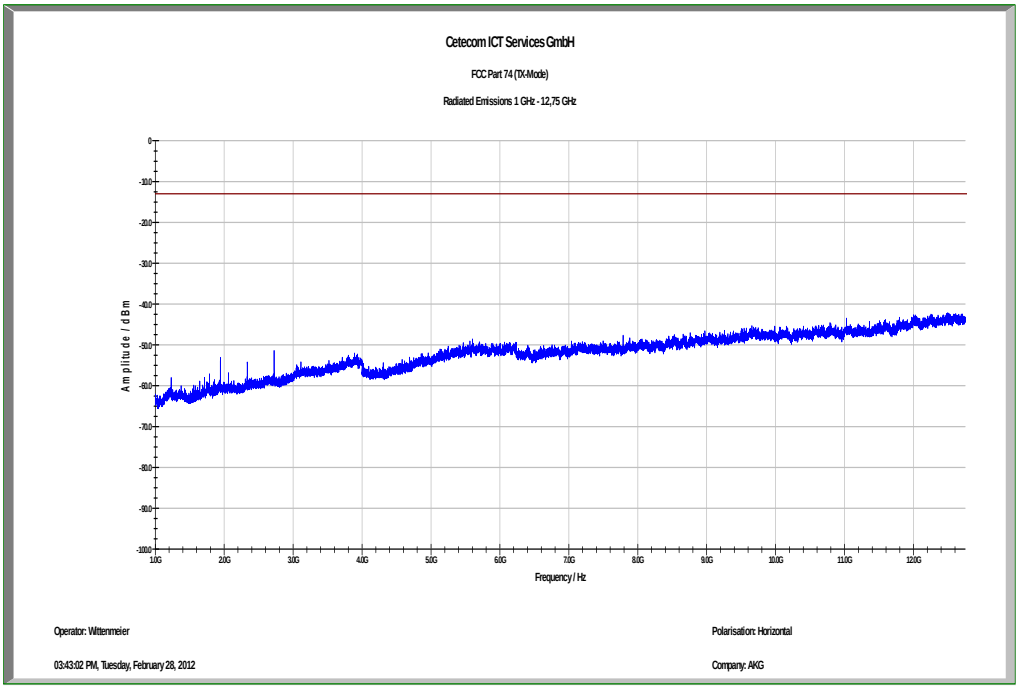
Plot 2: 1 GHz – 12.75 GHz, 4 transmitter on middle channel, antenna vertical



Plot 1: 30 MHz – 1 GHz, 4 transmitter on middle channel, antenna horizontal (The 4 peaks are the carriers from the connected transmitter)



Plot 4: 1 GHz – 12.75 GHz, 4 transmitter on middle channel, antenna horizontal



9.9 Receiver spurious emissions (radiated)

Measurement:

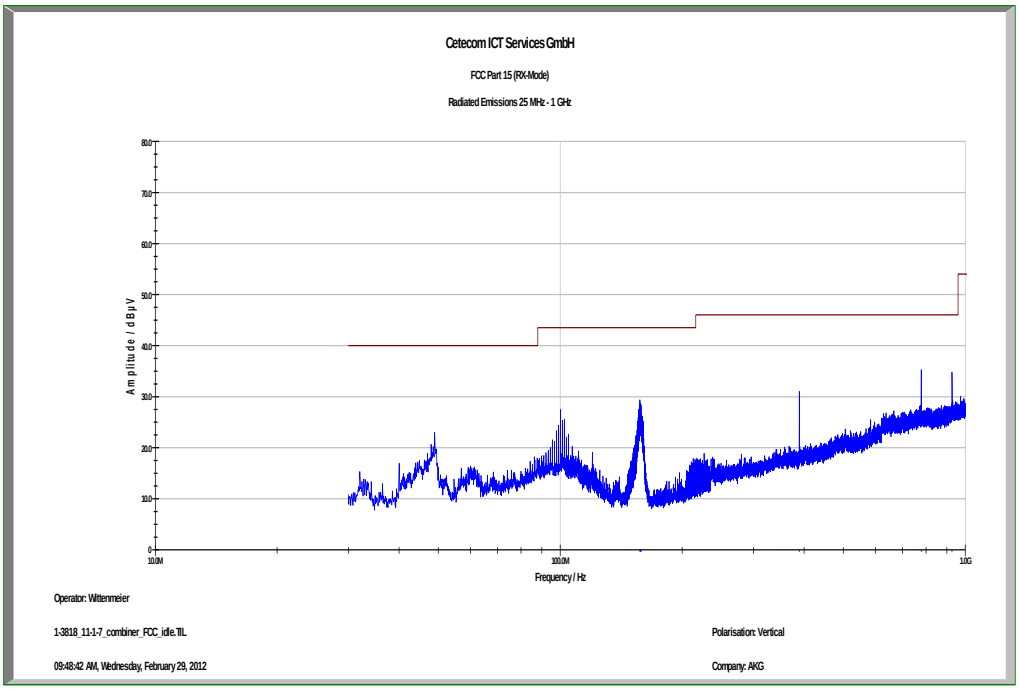
Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	f < 1 GHz : 100 kHz f ≥ 1GHz : 1 MHz
Video bandwidth:	f < 1 GHz : 100 kHz f ≥ 1GHz : 1 MHz
Span:	-/-
Trace-Mode:	Max. hold

Limits:

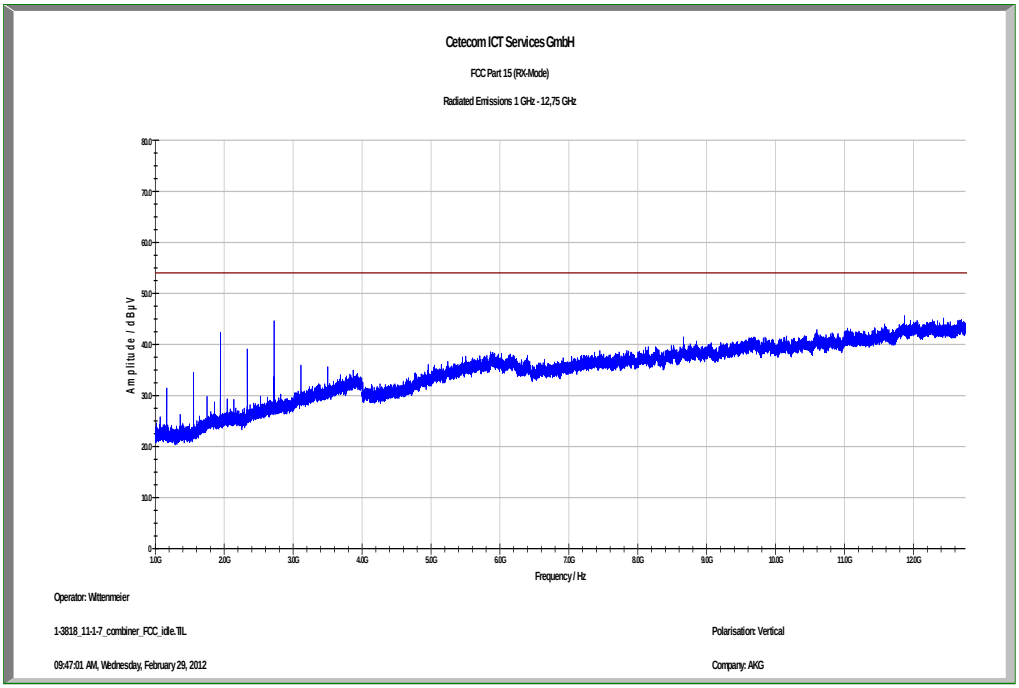
FCC		IC
SUBCLAUSE § 15.109		RSS-GEN Issue 2 Section 6
Receiver Spurious Emission (radiated)		
Frequency (MHz)	**Field strength (µV/m)**	**Measurement distance (m)**
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
above 960	500	3

Plots of the measurements

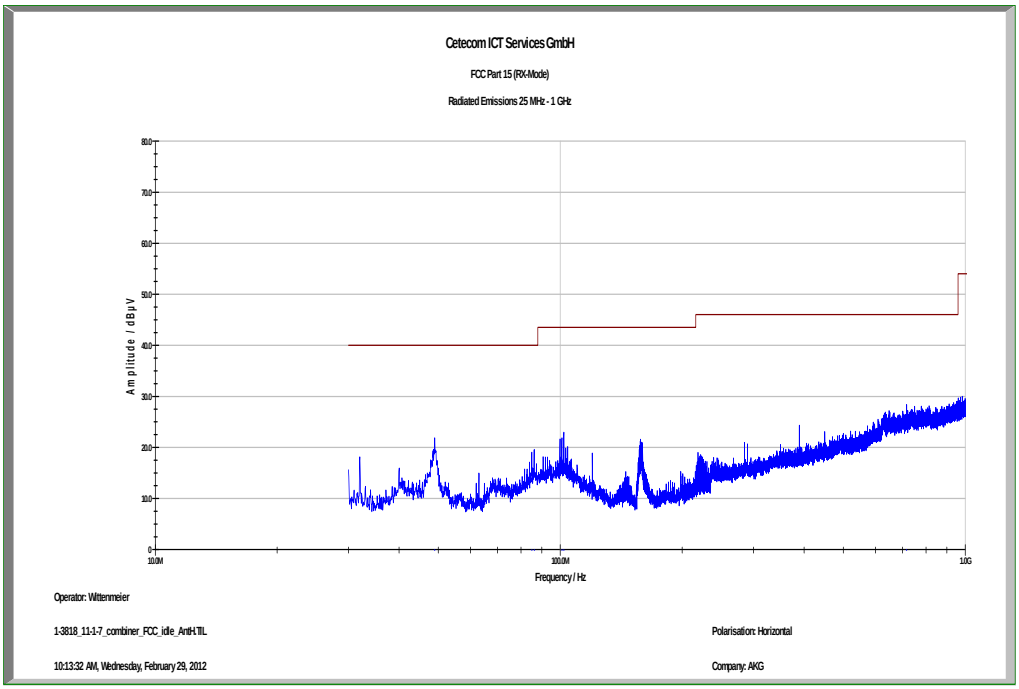
Plot 1: 30 MHz – 1 GHz, antenna vertical



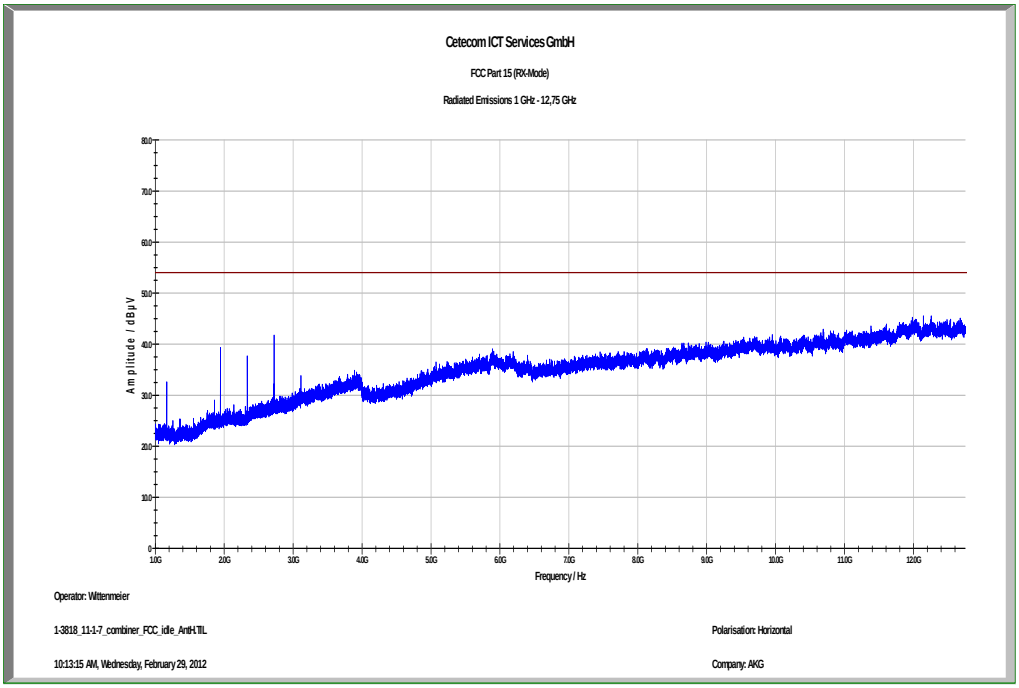
Plot 2: 1 GHz – 12.75 GHz, antenna vertical



Plot 1: 30 MHz – 1 GHz, antenna horizontal



Plot 4: 1 GHz – 12.75 GHz, antenna horizontal



9.10 Conducted limits

Limits:

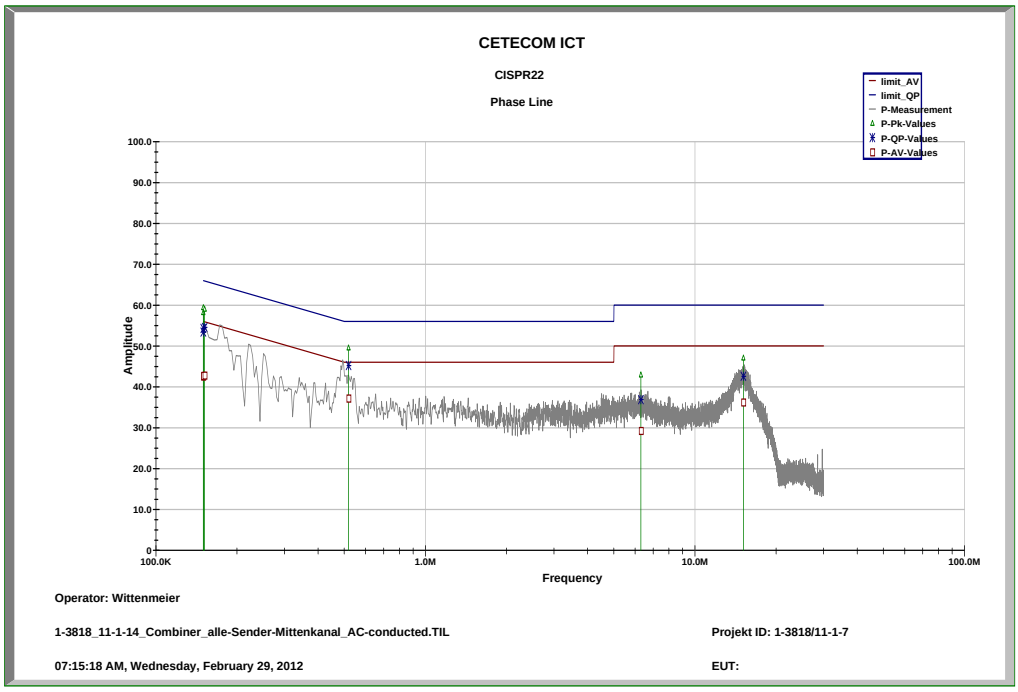
FCC		IC
SUBCLAUSE § 15.107 / 15.207		**-/-**
Conducted limits		
Frequency of Emission (MHz)	**Conducted Limit (dBµV)**	
	Quasi-peak	Average
0.15 – 0.5	66 to 56 *	56 to 46 *
0.5 – 5	56	46
5 - 30	60	50

*Decreases with the logarithm of the frequency

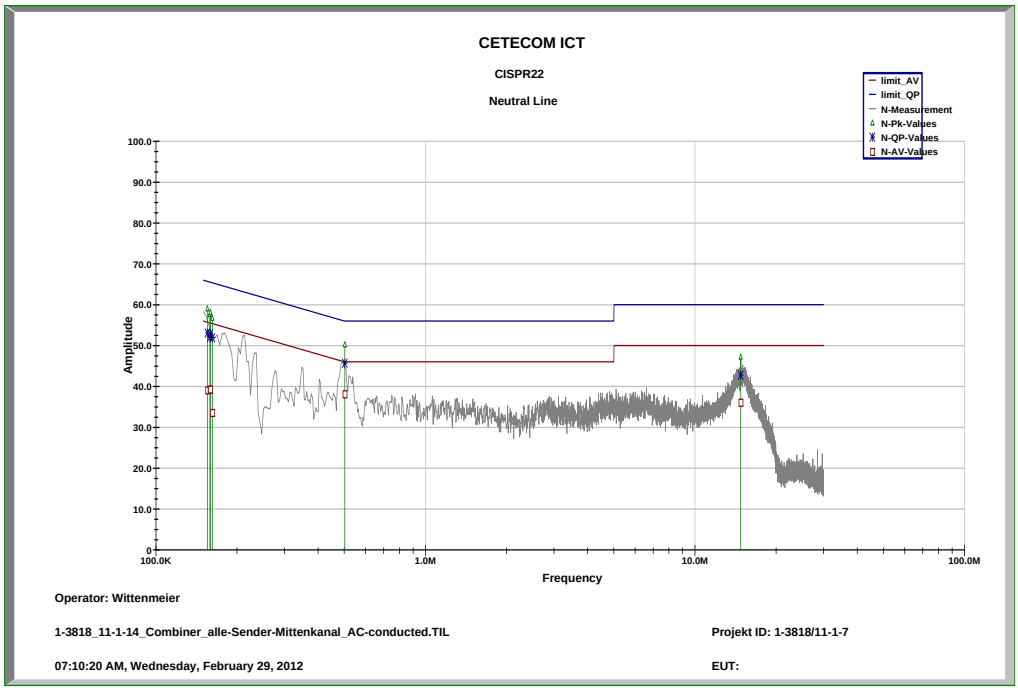
Result: **Passed.**

Plots of the measurements

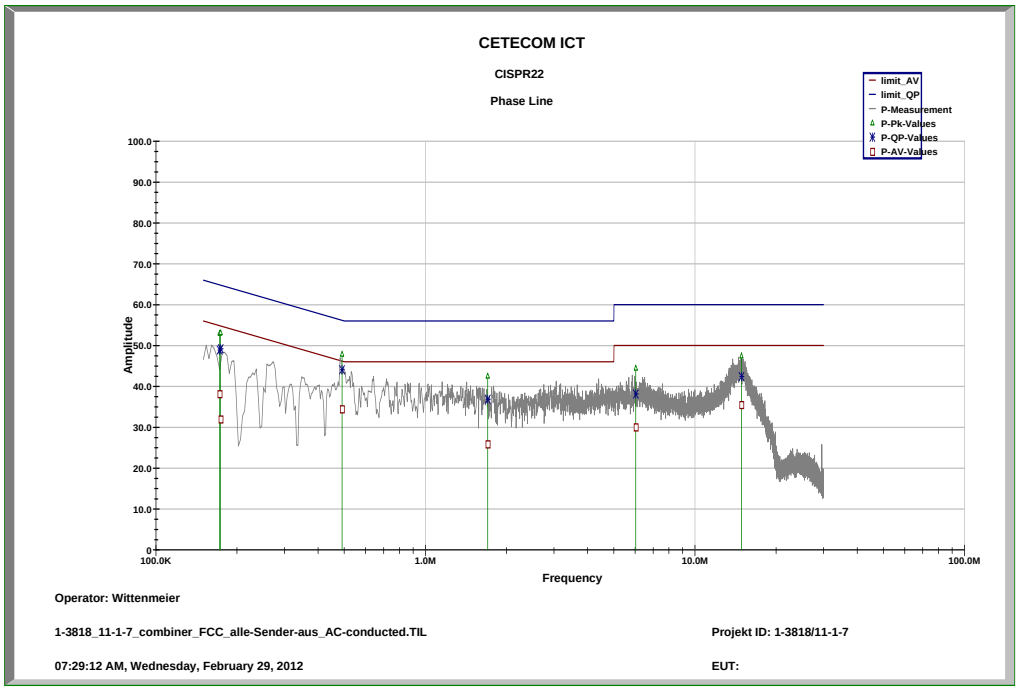
Plot 1: 4 transmitter on middle channel, phase line



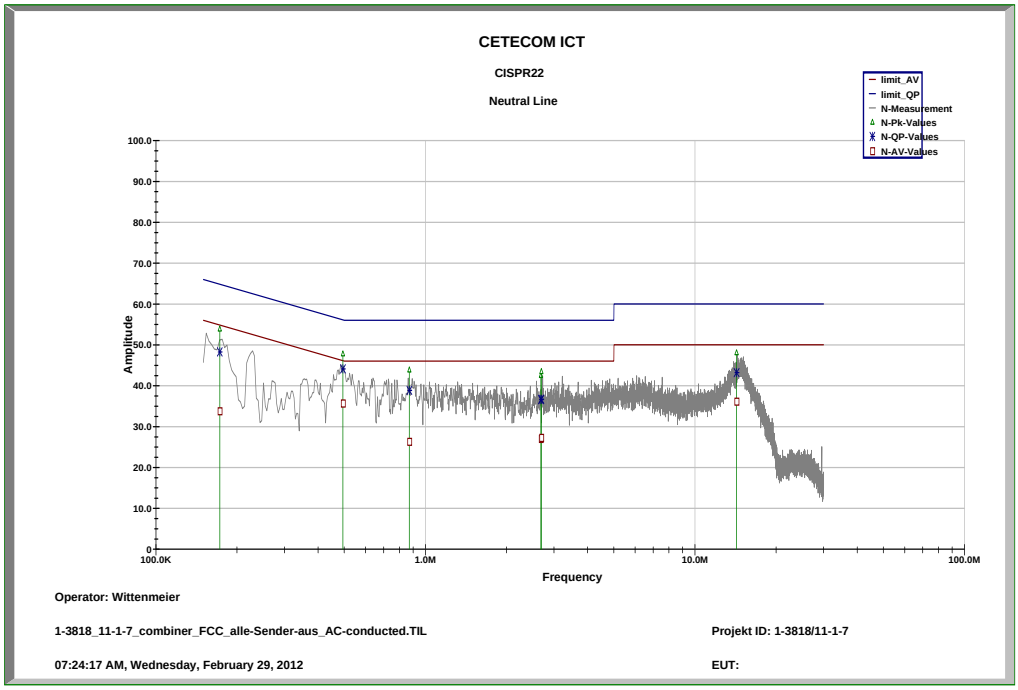
Plot 2: 4 transmitters on middle channel, neutral line



Plot 3: Idle-Mode, phase line



Plot 4: Idle-Mode, neutral line



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.	Power Sensor	NRP-Z22	R&S	100039	400000189	k	09.09.2010	09.09.2012
2	n. a.	MXA Signal Analyzer 20 Hz - 26.5 GHz	N9020A MXA Signal Analyzer	Agilent Vertr. Bad Hom	US46220229	300003805	k	08.09.2010	08.09.2012
3	n. a.	Isolating Transformer	RT5A	Grundig	8041	300001626	g		
4	n. a.	Coaxial Attenuator 30dB/500W	8325	Bird	1530	300001595	ev		
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.	RF Filter Section 9kHz - 1GHz	N9039A	Agilent Technologies	MY48260003	300003825	vlKl!	08.09.2010	08.09.2012
23	n. a.	TRILOG	VULB9163	Schwarzbe	371	30000385	vlKl!	14.10.2011	14.10.2014

		Broadband Test-Antenna 30 MHz - 3 GHz		ck		4			

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
vlkI!	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:

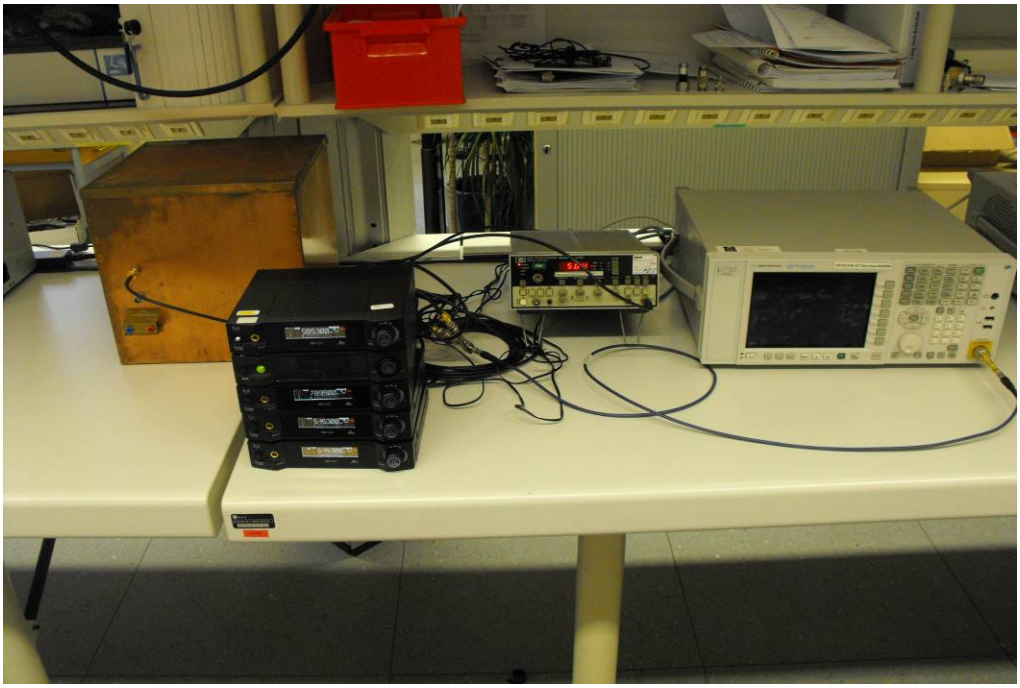


Photo 2:

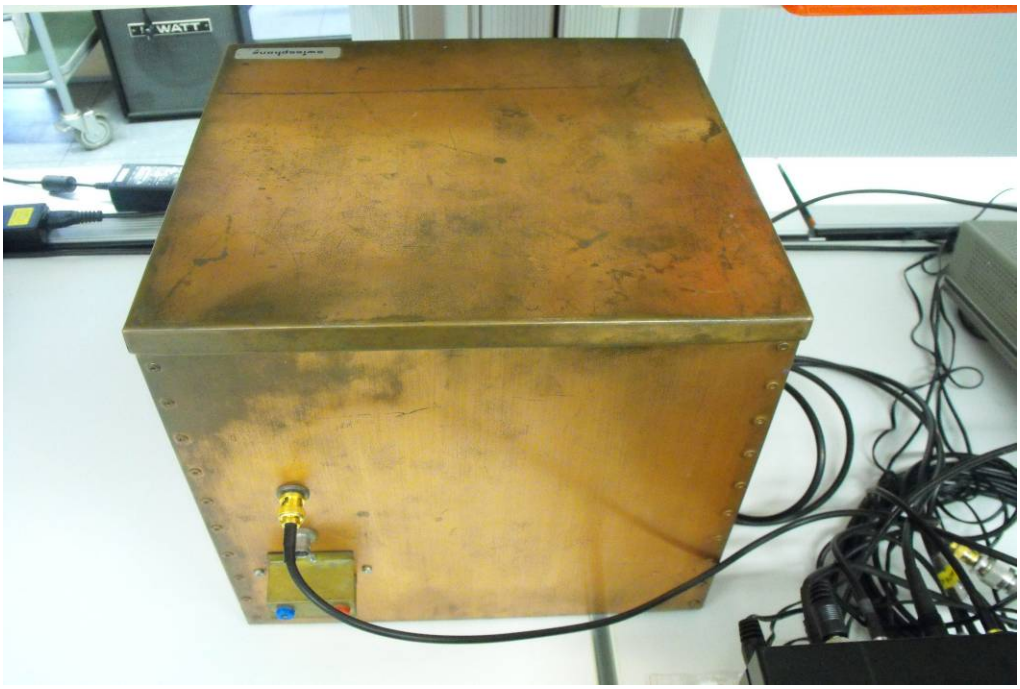


Photo 3:

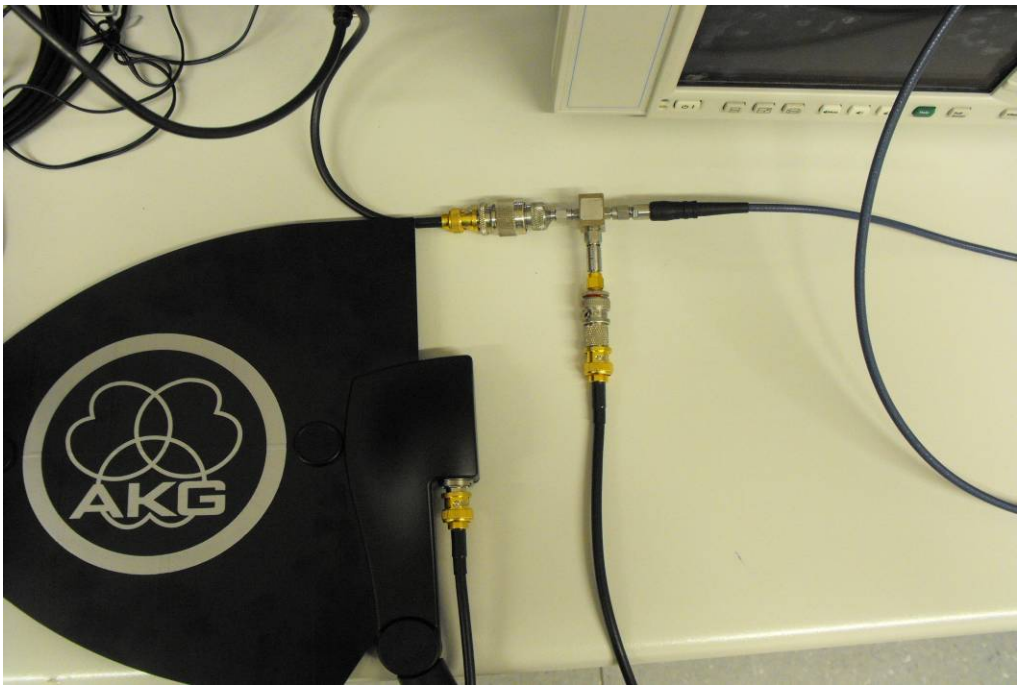
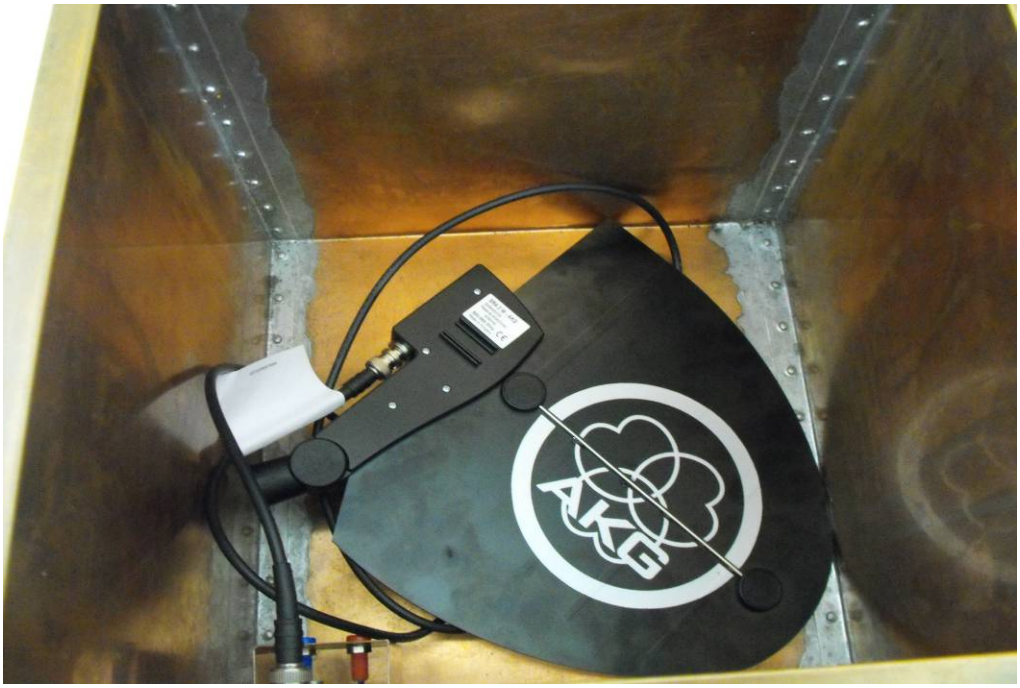


Photo 4:



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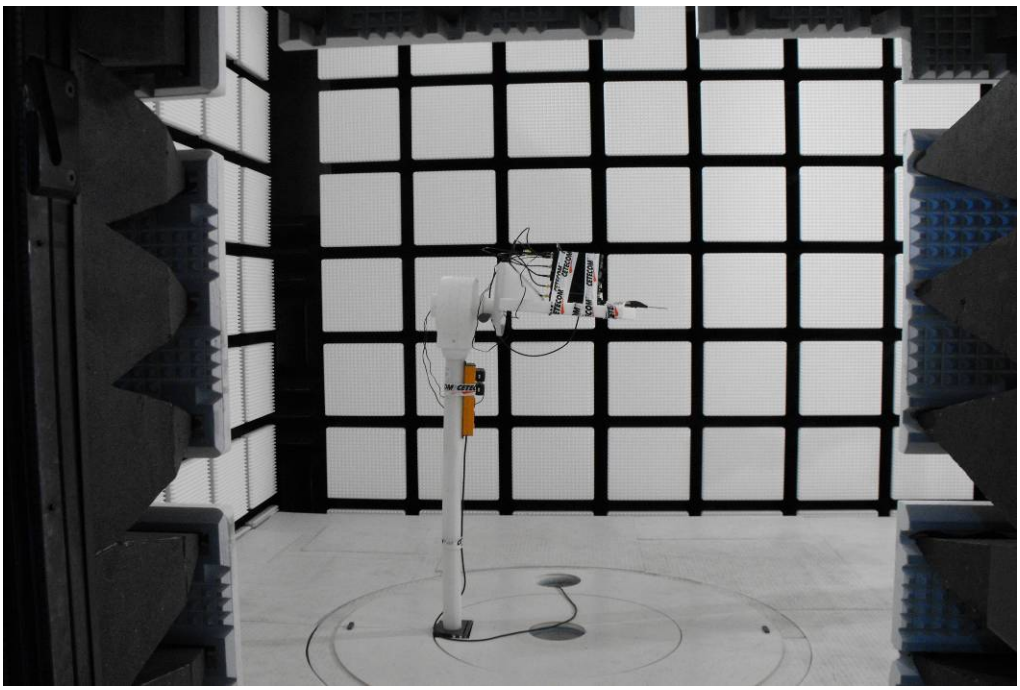


Photo 6:

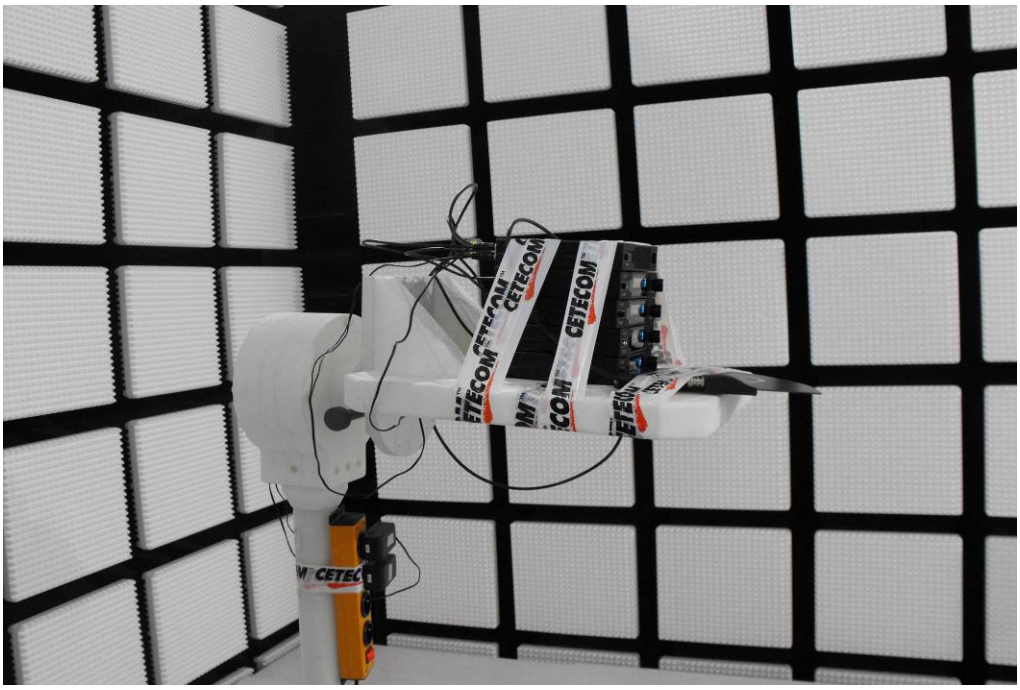


Photo 7:

Photo 8:

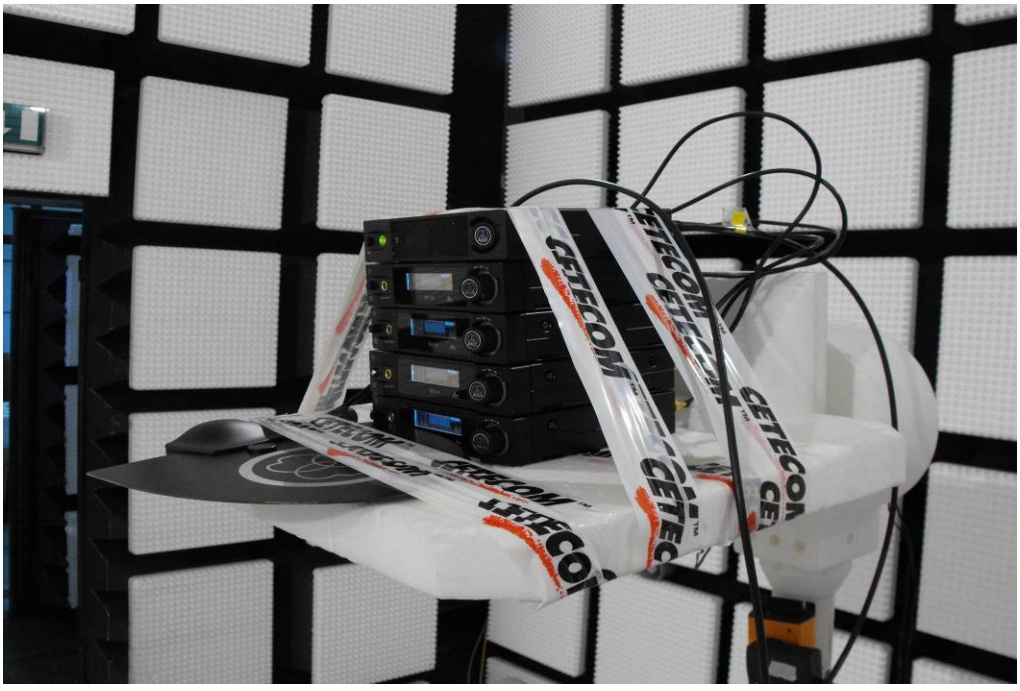
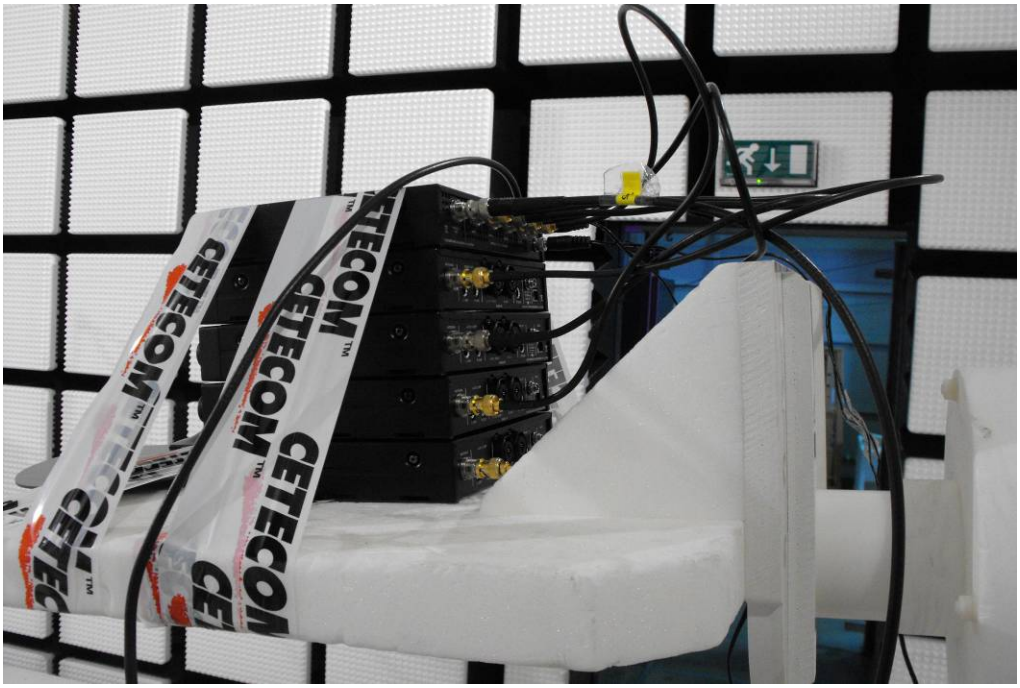


Photo 9:



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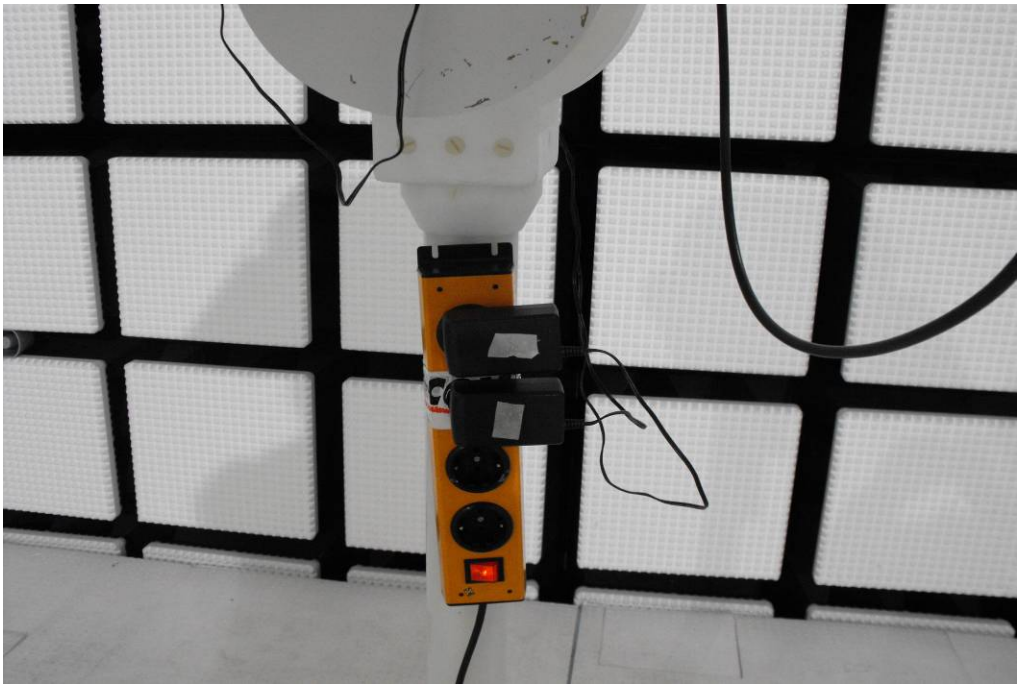


Photo 11:

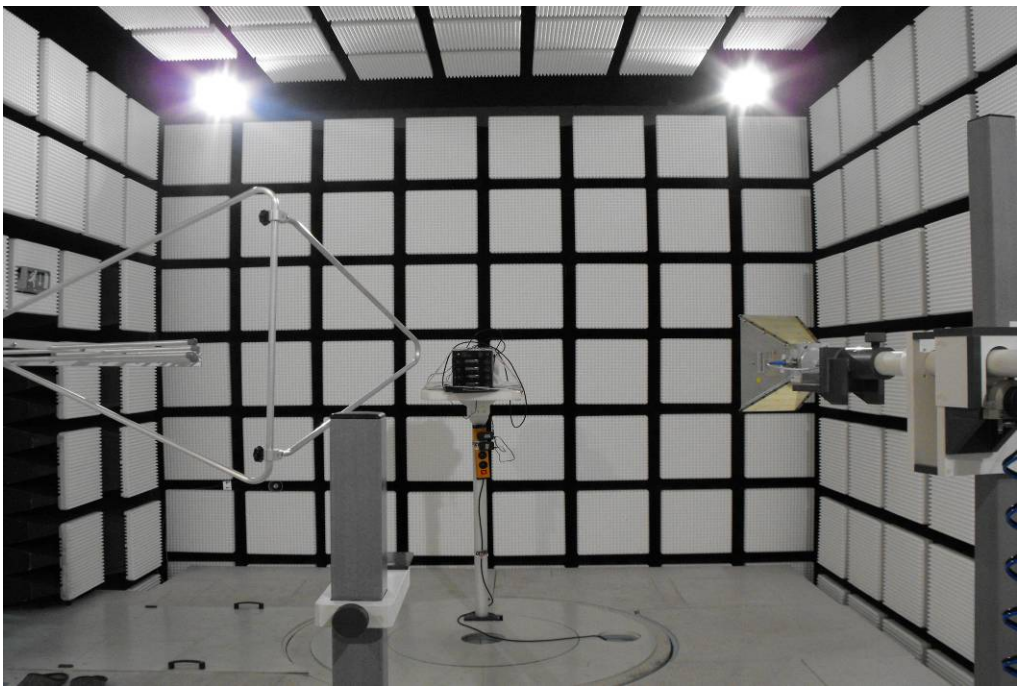
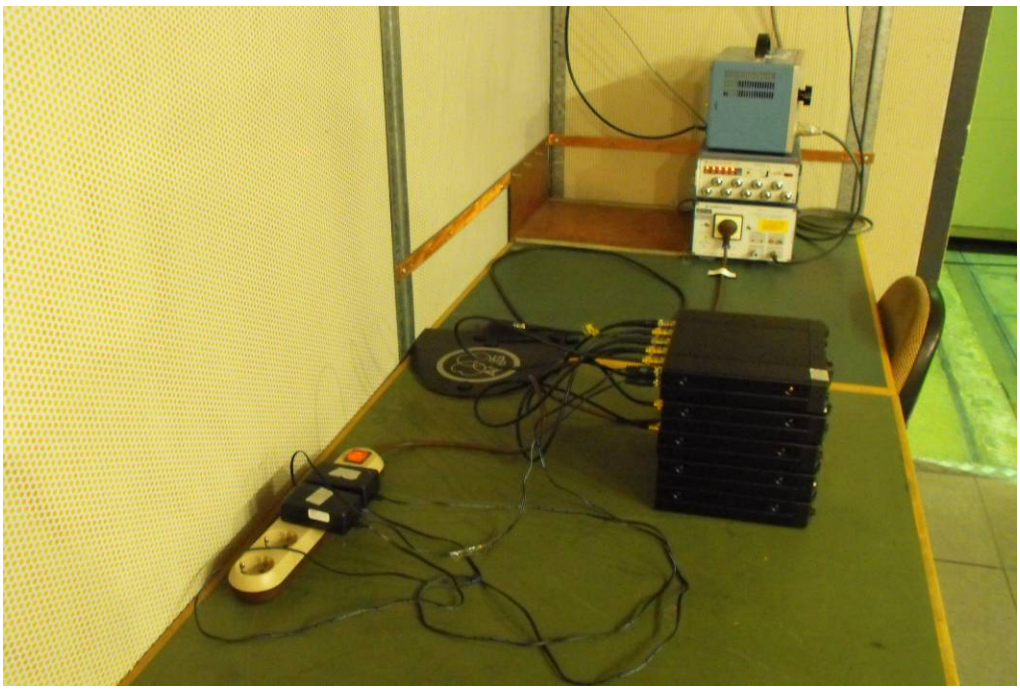


Photo 12:

Photo 13:



Annex B External photographs of the EUT

Photo documentation:

Photo 1:

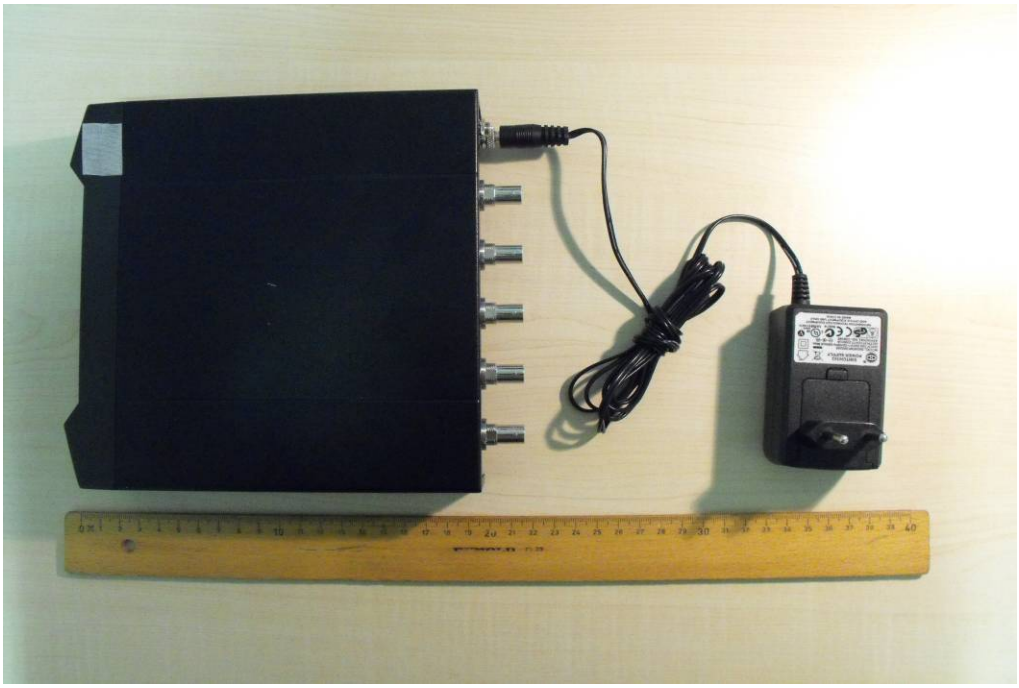


Photo 2:

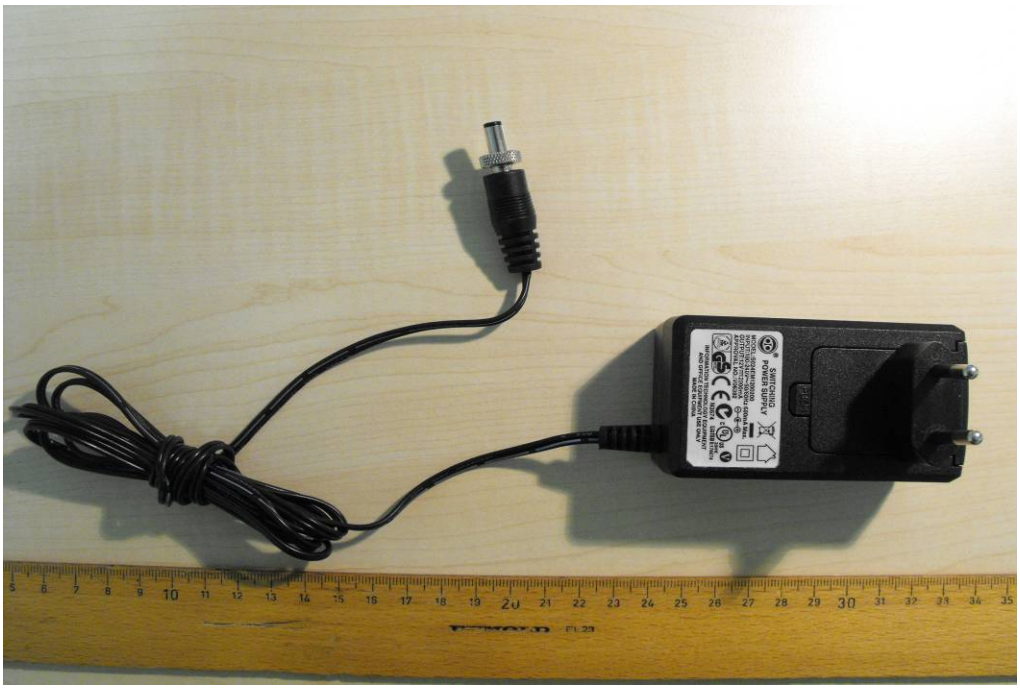


Photo 3:

Photo 4:

Photo 5:

Photo 6:

Photo 7:

Photo 8:

Photo 9:

Photo 10:

Photo 11:

Photo 12:

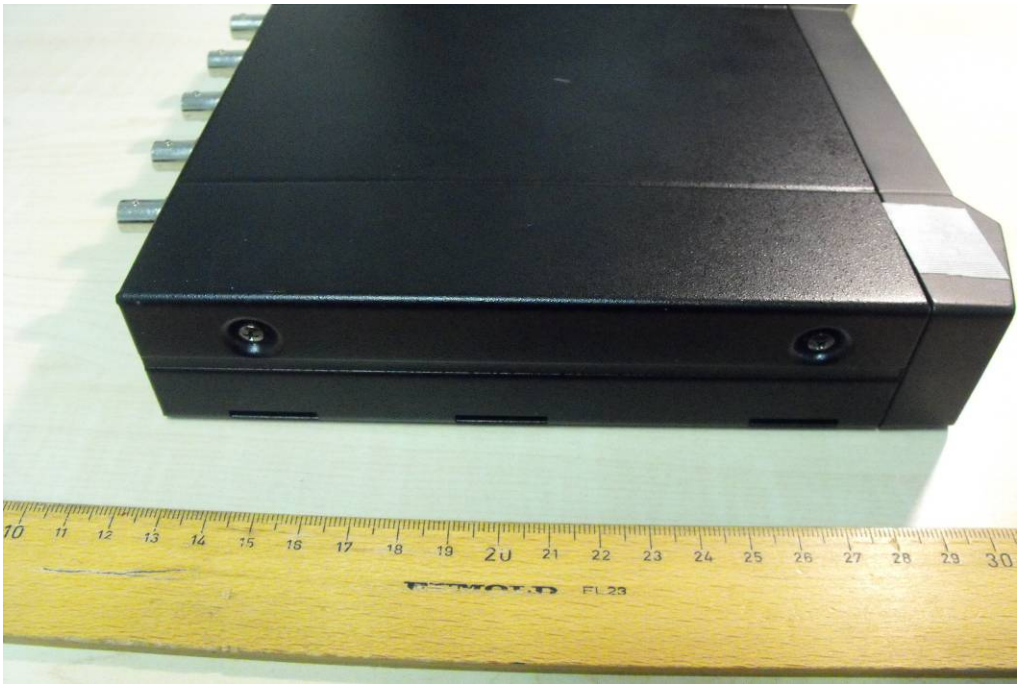


Photo 13:

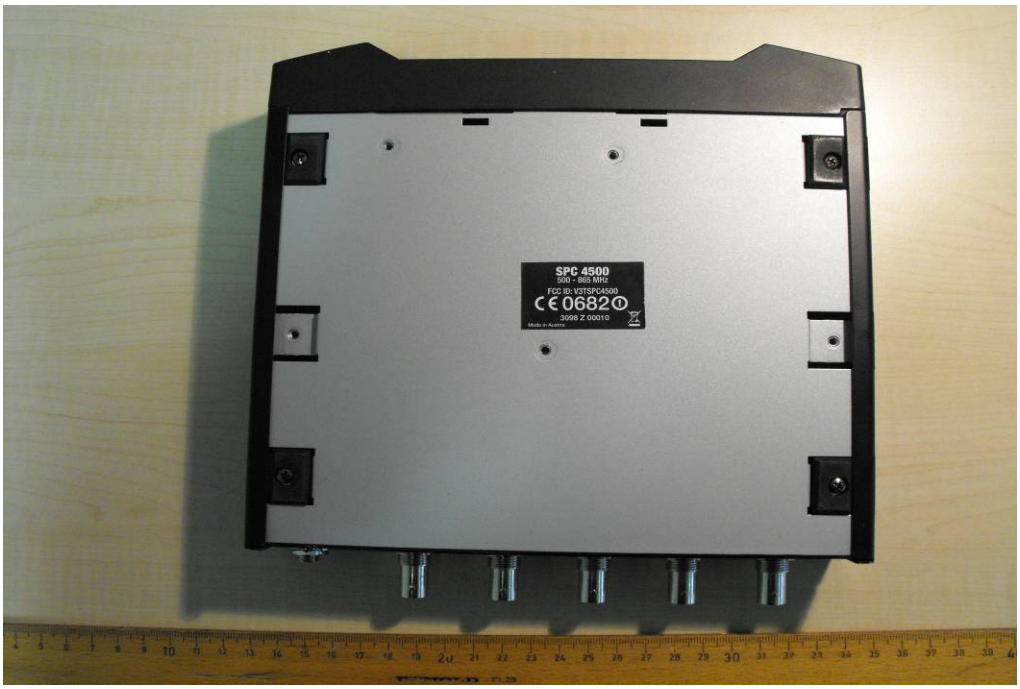


Photo 14:

Photo 15:


ANTENNA OUT
INPUT 1
INPUT 2
INPUT 3
INPUT 4
DC ONLY 12V / 1.4A SPC
DC ONLY 12V / 2A SST
DESIGNED AND ENGINEERED IN AUSTRIA
ANTENNA SIGNAL FROM SST

Annex C Internal photographs of the EUT

Photo documentation:

Photo 1:

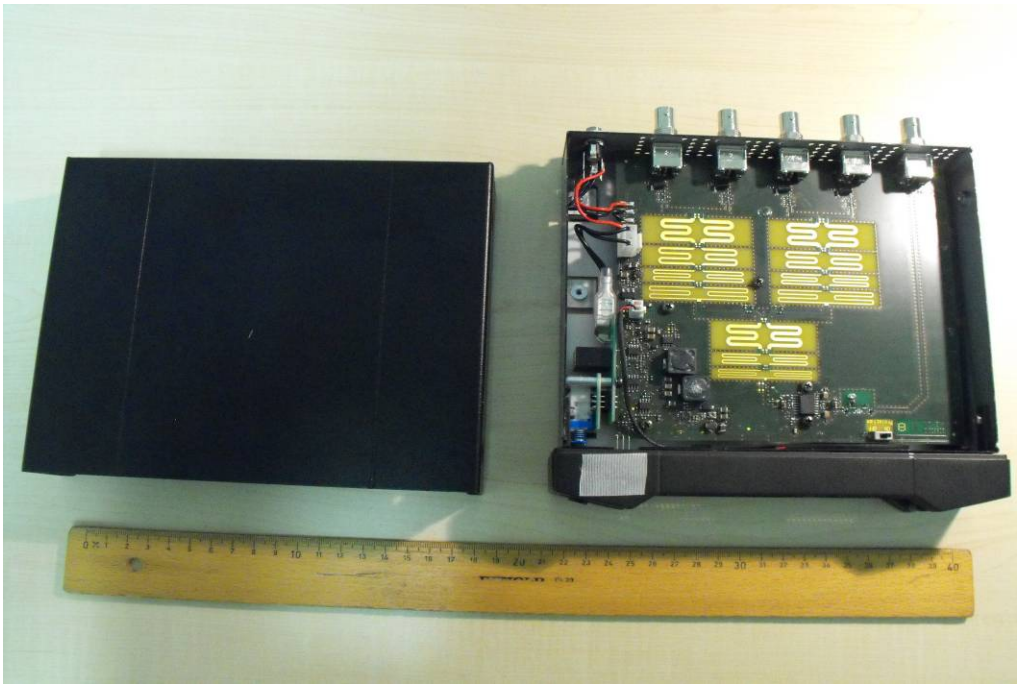


Photo 2:

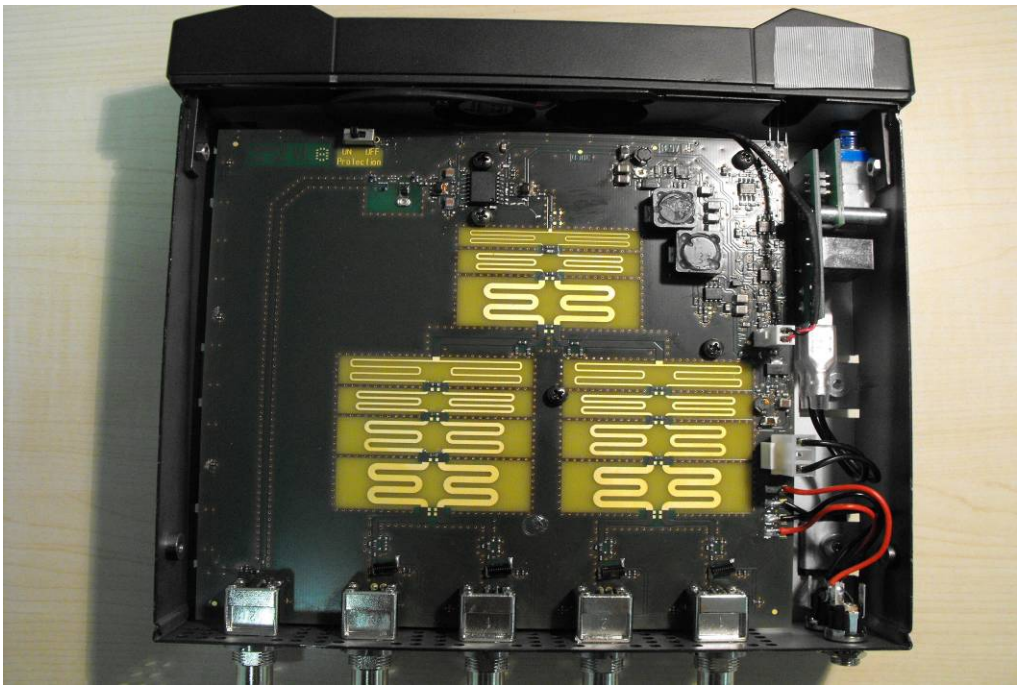


Photo 3:

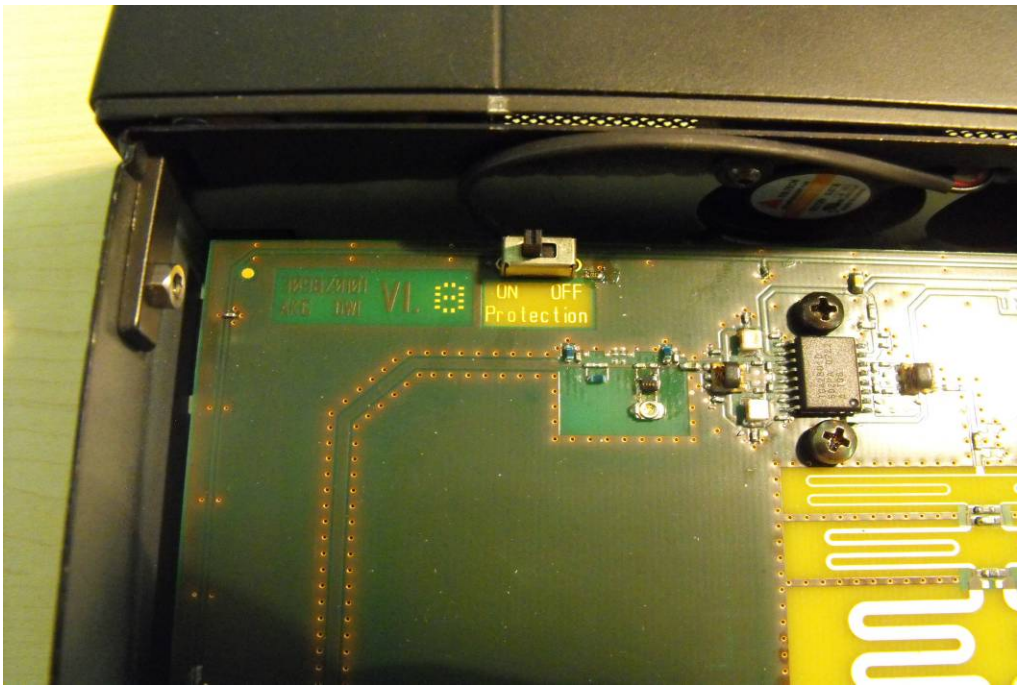


Photo 4:

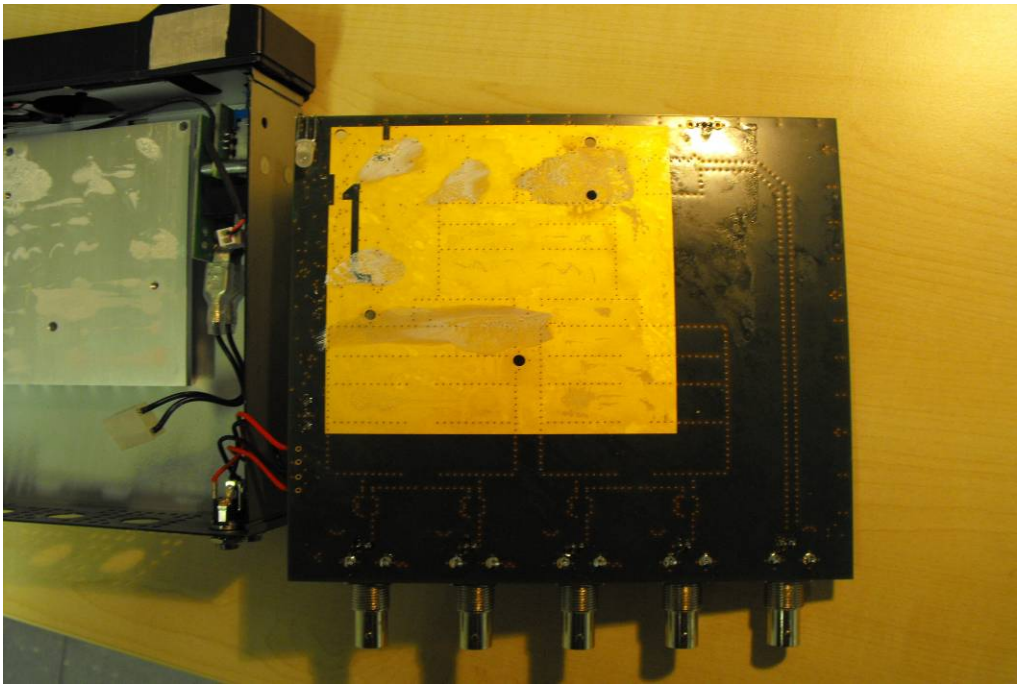
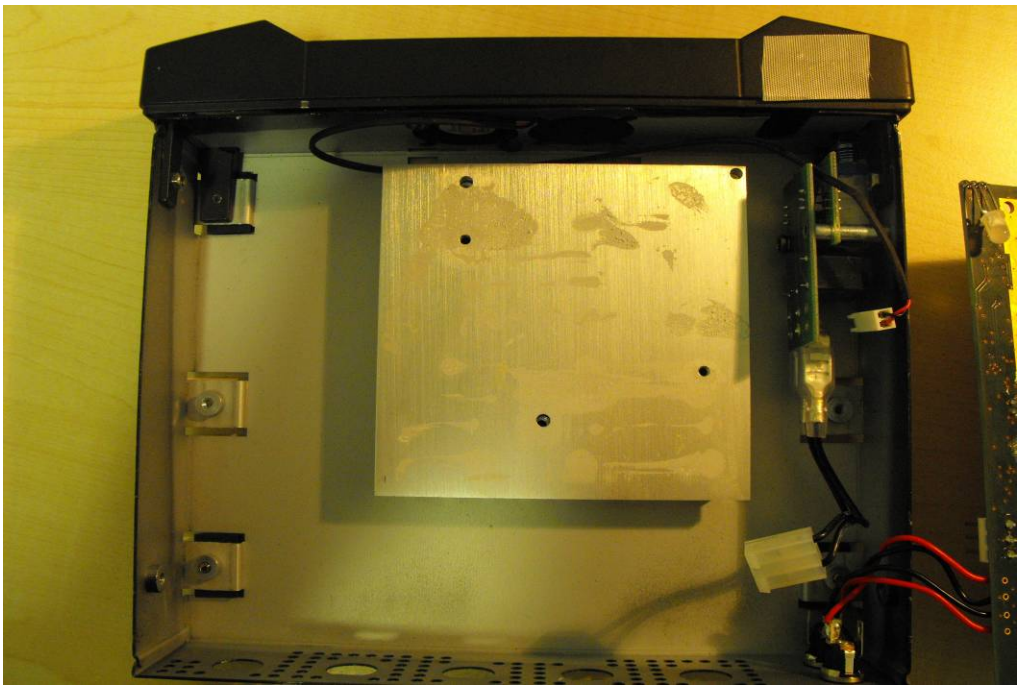


Photo 5:



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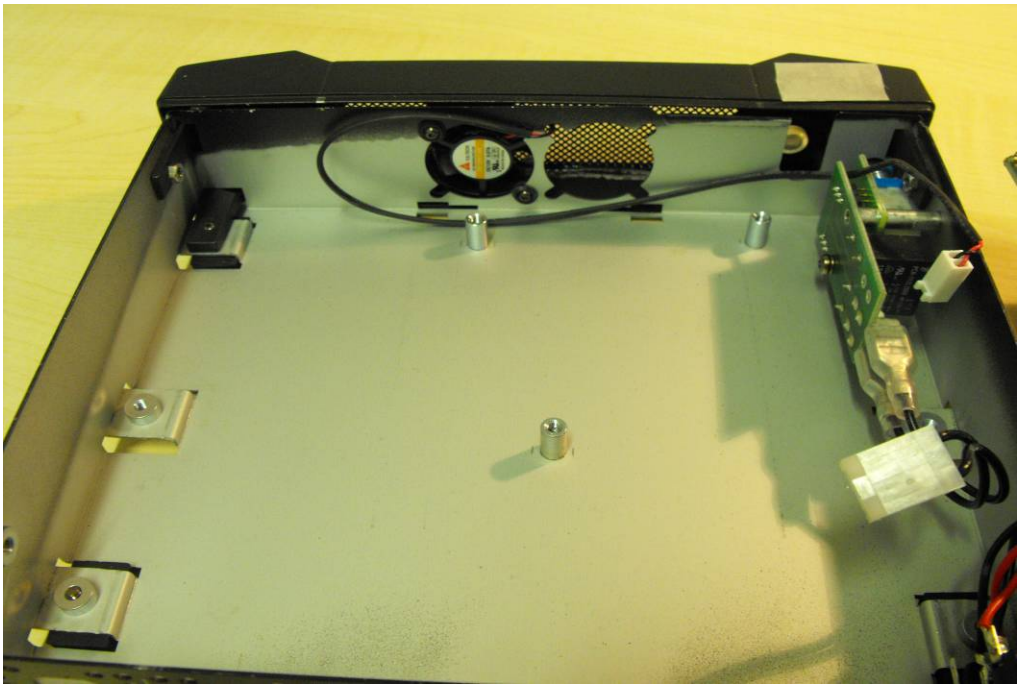


Photo 7:

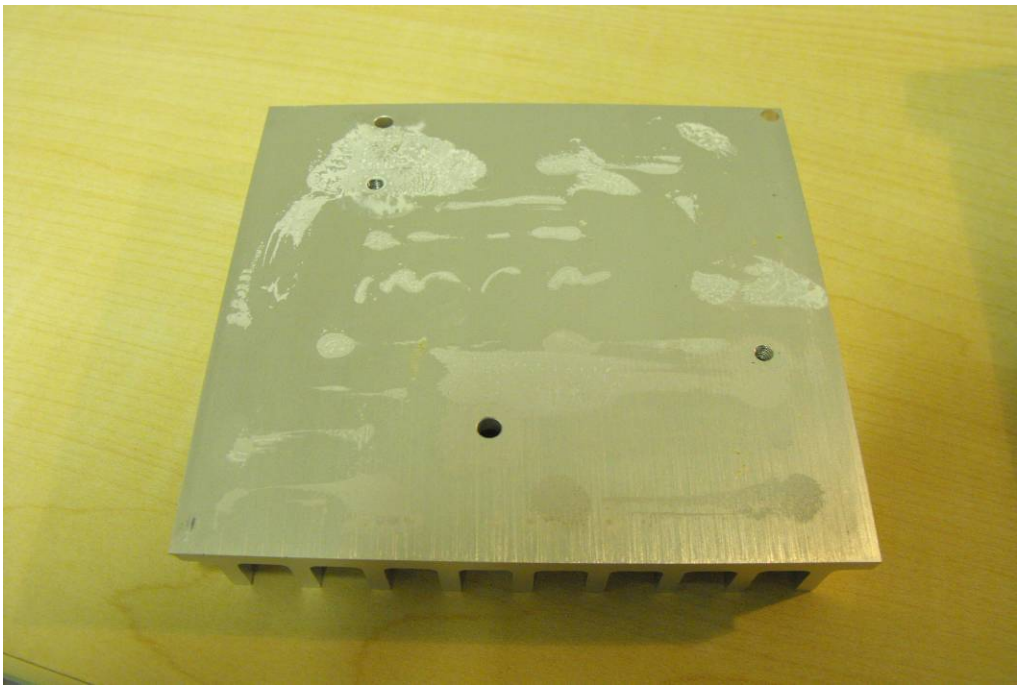
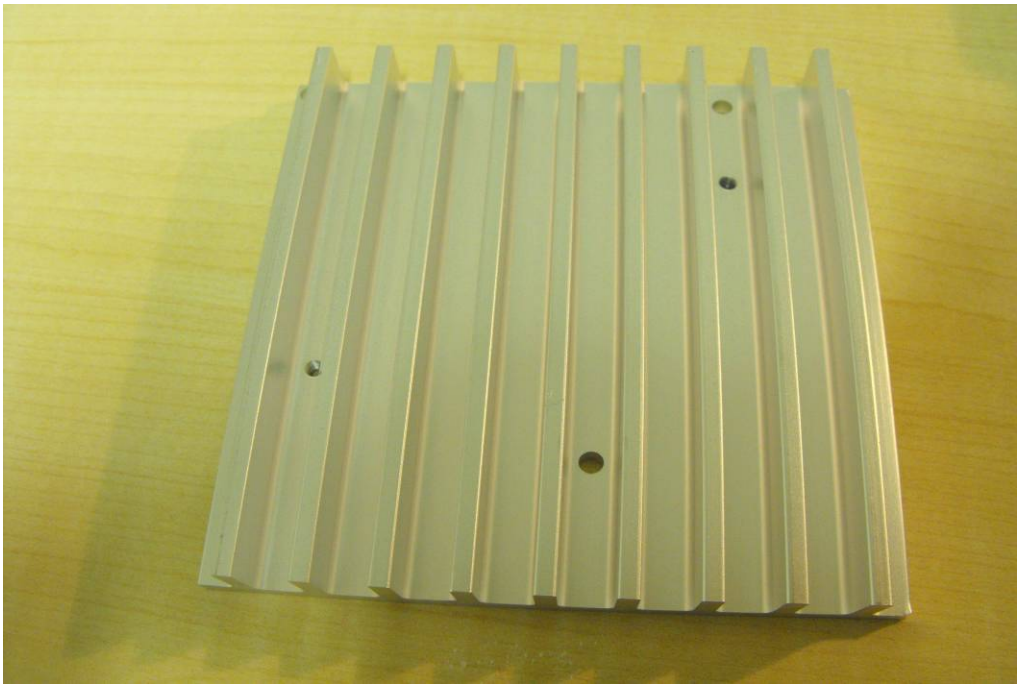


Photo 8:



Annex D Document history

Version	Applied changes	Date of release
1.0	Initial release	2012-02-23
-A	This test report replaces the report dated from 2012-02-23	2012-03-13
-B	This test report replaces the report dated from 2012-03-13	2012-03-21

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

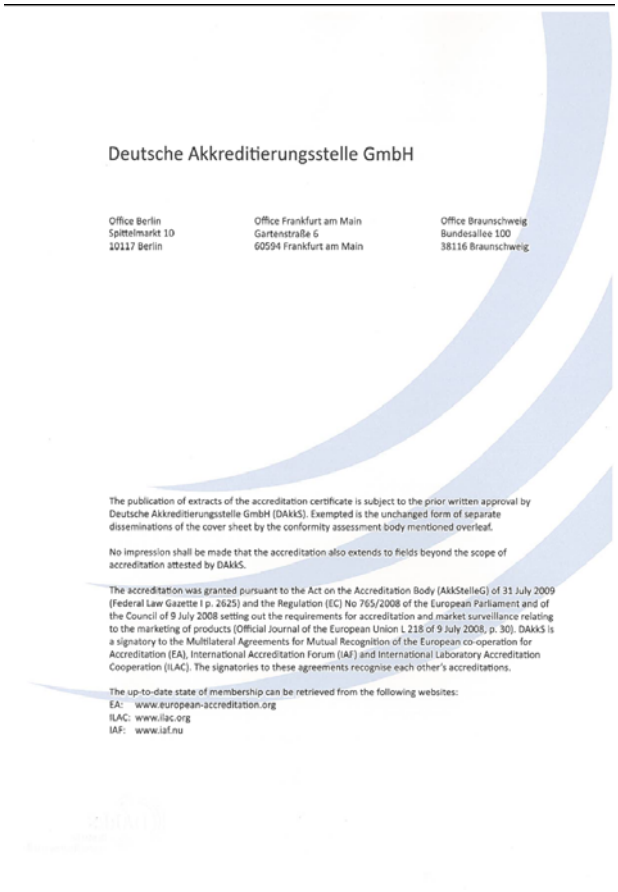
The accreditation certificate shall only apply in connection with the notice of accreditation of 13.04.2011 with the accreditation number D-PL-12076-01 and is valid until 03.09.2014. It comprises the cover sheet, the reverse side of the cover sheet and the following annex with a total of 82 pages.

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.



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

Front side of certificate

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