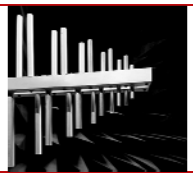
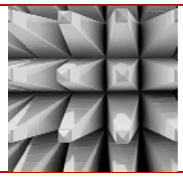




CETECOM ICT Services
consulting - testing - certification

TEST REPORT

Test report no.: 1-3458-01-03/11-B

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

Testing laboratory

CETECOM ICT Services GmbH
Untertuerkheimer Strasse 6 – 10
66117 Saarbruecken / Germany
Phone: + 49 681 5 98 - 0
Fax: + 49 681 5 98 - 9075
Internet: http://www.cetecom.com
e-mail: ict@cetecom.com

Accredited test laboratory:
The test laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025
DAkkS 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 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:	**active antenna combiner**
Model name:	**AC3200-II**
FCC ID:	**DMOAC3200A2**
IC:	**2099A-AC3200A2**
Frequency:	**500 MHz – 870 MHz**
Power supply:	**110 V AC**
Temperature range:	**24°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 performed:

cn=Jakob Reschke, o=CETECOM ICT Services GmbH, ou=RES-101109, email=Jakob.Reschke@cetecom.com, c=DE
2011.12.07 14:45:13 +01'00'

Jakob Reschke

Test report authorised:

cn=Michael Berg, o=Cetecom ICT Services GmbH, ou=BER-100614, email=michael.berg@ict.cetecom.de, c=DE
2011.12.07 15:15:30 +01'00'

Michael Berg

1 Table of contents

2 General information

2.1 Notes

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 generalisations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of CETECOM ICT Services GmbH.
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.

2.2 Application details

Date of receipt of order:	2011-06-14
Date of receipt of test item:	2011-06-14
Start of test:	2011-06-14
End of test:	2011-06-21
Person(s) present during the test:	-/-

3 Test standard/s

Test standard	Version	Test standard description
47 CFR Part 74	2009-10	Title 47 of the Code of Federal Regulations; Chapter I 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}	24	°C during room temperature tests
	T_{max}	-/-	°C during high temperature test
	T_{min}	-/-	°C during low temperature test
Relative humidity content:		54 %	
Air pressure:		not relevant for this kind of testing	
Power supply:	V_{nom}	110 V	AC
	V_{max}	-/- V	
	V_{min}	-/- V	

5 Test item

Kind of test item	:	**active antenna combiner**
Type identification	:	**AC3200-II**
S/N serial number	:	**0231001002**
HW hardware status	:	**Not defined**
SW software status	:	**Not defined**
Frequency band [MHz]	:	**500 MHz – 870 MHz**
Type of modulation	:	**-**
Antenna	:	**BNC connector**
Power supply	:	**110 V AC**
Temperature range	:	**24°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	2011-12-07	EUT is a active transmitter combiner

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	Nominal	Nominal	☒	☐	☐	☐	complies
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 § 74 RSS-123 Issue 2	Transmitter unwanted emissions (conducted)	Nominal	Nominal	☒	☐	☐	☐	complies

FCC 47 CFR § 15.209 RSS-123 Issue 2	Receiver spurious emissions (radiated)	Nominal	Nominal	☒	☐	☐	☐	complies
FCC 47 CFR § 15.209 RSS-123 Issue 2	Receiver spurious emissions (conducted)	Nominal	Nominal	☒	☐	☐	☐	complies
§15.107(a)	Spurious emissions conducted < 30 MHz	Nominal	Nominal	☒	☐	☐	☐	complies

Note: NA = Not Applicable; NP = Not Performed

7.1 RSP100 test report cover sheet / performance test data

Test Report Number	:	**1-3458-01-03/11-B**
Equipment Model Number	:	**AC3200-II**
Certification Number	:	**2099A-AC3200A2**
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	:	**Active antenna combiner Frequency Range of the EUT: 500 MHz – 870 MHz**
Output Power	:	**Max. 120.3 mW**
Occupied bandwidth (99%-BW) [kHz]	:	**-/-**
Type of modulation	:	**FM**
Emission Designator (TRC-43)	:	**F3E**
Antenna Information	:	**BNC connector**
Transmitter Spurious (worst case)	:	**-30 dBm**
Receiver Spurious (worst case) [µV/m @ 10m]:		**25 µV/m @ 102.55 MHz**

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:

2011-12-07	Jakob Reschke	
Date	Name	Signature

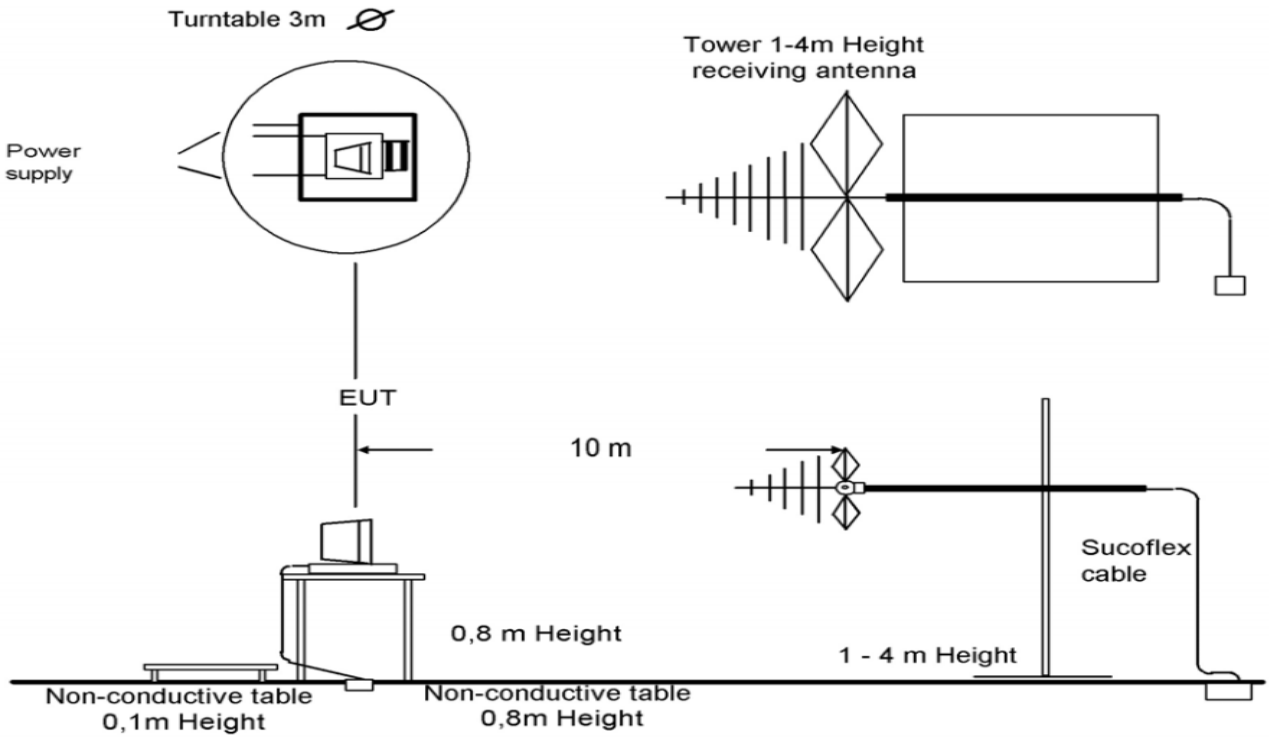
8 RF measurement testing

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



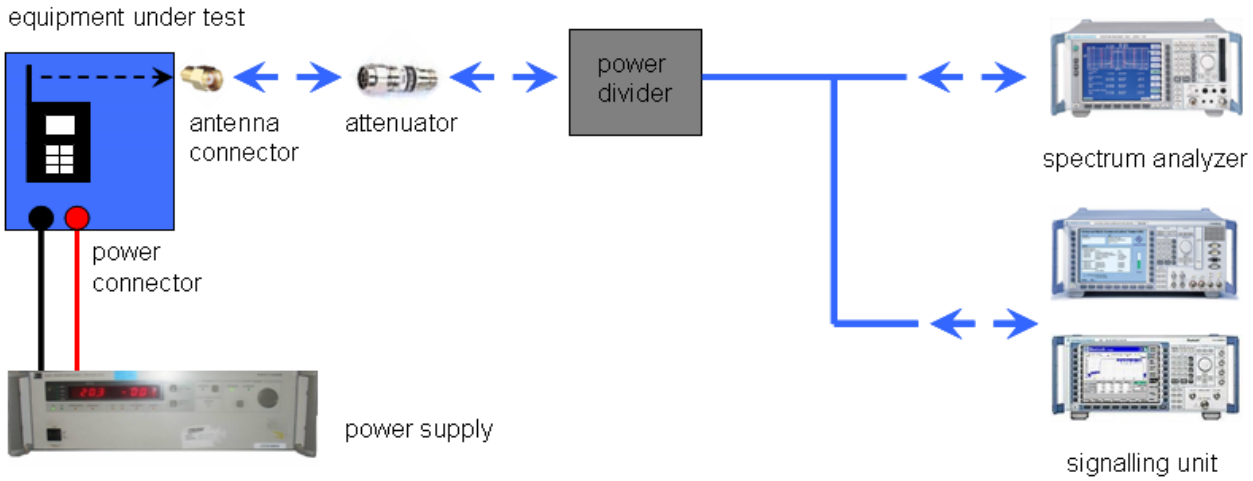
Picture 1: Diagram radiated measurements

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:

EUT was tested in idle and transmitting mode.
EUT was tested in transmitting mode with eight transmitters. The transmitters were connected to the input of the EUT and the antenna port was terminated with an attenuator and 50 Ohm for spurious emissions radiated.

The EUT is an active transmitter combiner.
To check if the combiner is working properly and don´t affect the signal the input and output signal were compared.

Frequency Range for FCC and CANDA:

470 MHz – 608 MHz
614 MHz – 698 MHz

Frequency Range EUT:

500 MHz – 870 MHz

Used channels:

EUT has eight inputs - four inputs were connected to a transmitter output.

Channel 1: 518.150 MHz
Channel 2: 536.000 MHz
Channel 3: 553.850 MHz
Channel 4: 643.850 MHz

9 Measurement results

9.1 Output power

Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	1 MHz
Video bandwidth:	1 MHz
Span:	5 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)	

Result:

Input Level: 100mW

Frequency (channel)	Deviation [dB]
518.150 MHz	+0.80
536.000 MHz	+0.70
553.850 MHz	+0.50
643.850 MHz	-0.30

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

9.2 Frequency stability

9.2.1 Frequency error vs. temperature

Not performed

9.2.2 Frequency error vs. voltage

Not performed

9.3 Modulation characteristics

Not performed

9.4 Occupied bandwidth

Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	3 kHz
Video bandwidth:	3 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:

Frequency (channel)	20dB Bandwidth
518.150 MHz	n.d.
536.000 MHz	n.d.
553.850 MHz	n.d.
643.850 MHz	n.d.

n.d. = No deviation found between input signal and output signal

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

9.5 Unwanted radiation (spectrum mask)

Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	1kHz
Video bandwidth:	1kHz
Span:	300kHz
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:

Frequency (channel)	20dB Bandwidth
518.150 MHz	n.d.
536.000 MHz	n.d.
553.850 MHz	n.d.
643.850 MHz	n.d.

n.d. = No deviation found between input signal and output signal

Result: The result of the measurement is passed.

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

This measurement was performed with eight transmitter connected to the EUT. The whole frequency range of the EUT was used from 470 MHz to 870 MHz to have the worst case.

Limits:

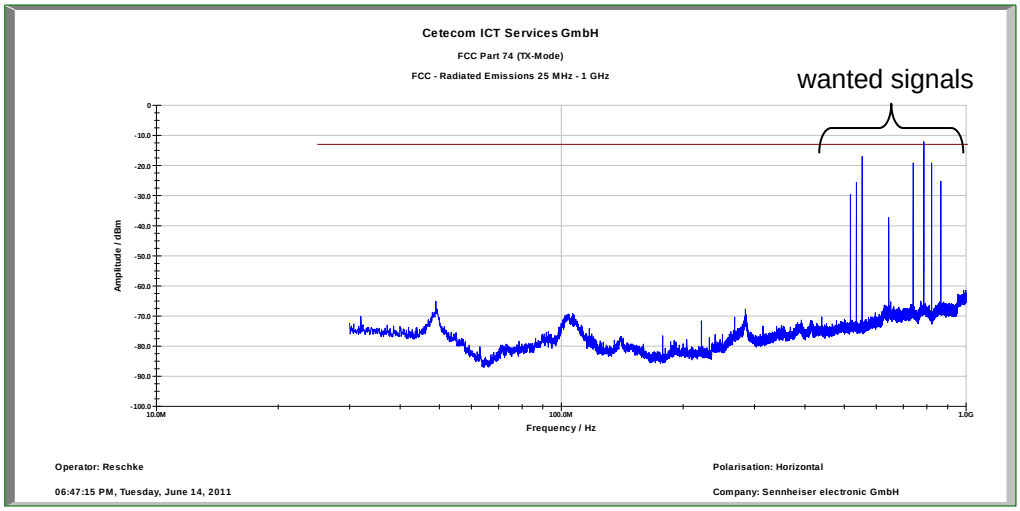
FCC	IC
Emissions for LPRS transmitters operating on standard band channels (25 kHz) shall be attenuated below the unmodulated carrier in accordance with the following: Emissions 12.5 kHz to 22.5 kHz away from the channel center frequency: at least 30 dB; and emissions more than 22.5 kHz away from the 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)								
8 Channels active								
Frequency	Detector	Level	Frequency	Detector	Level	Frequency	Detector	Level
No critical peaks found								
Measurement uncertainty ± 3 dB								

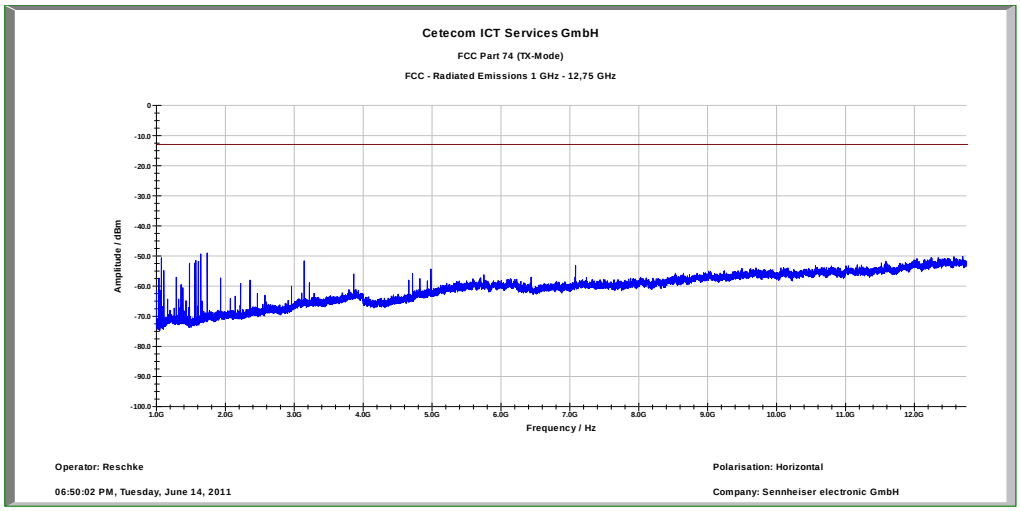
Result: **The result of the measurement is passed.**

Plots of the measurements

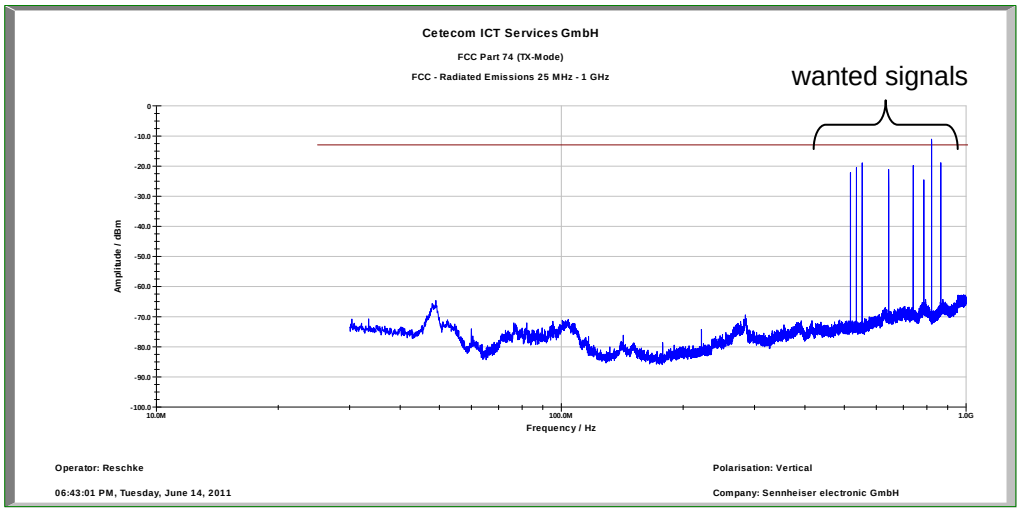
Plot 1: 30 MHz – 1 GHz (horizontal)



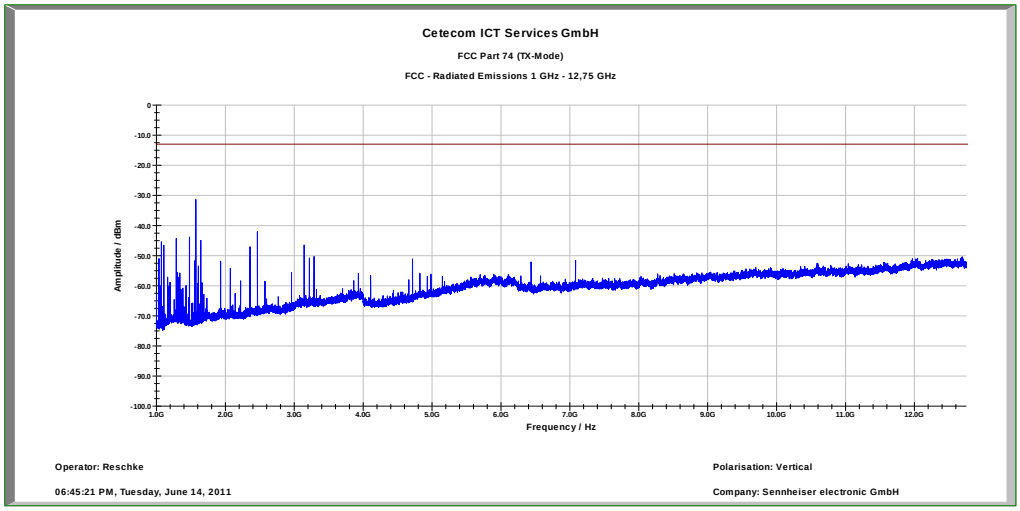
Plot 2: 1 GHz – 12.75 GHz (horizontal)



Plot 3: 30 MHz – 1 GHz (vertical)



Plot 4: 1 GHz – 12.75 GHz (vertical)



9.7 Transmitter unwanted emissions (conducted)

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:

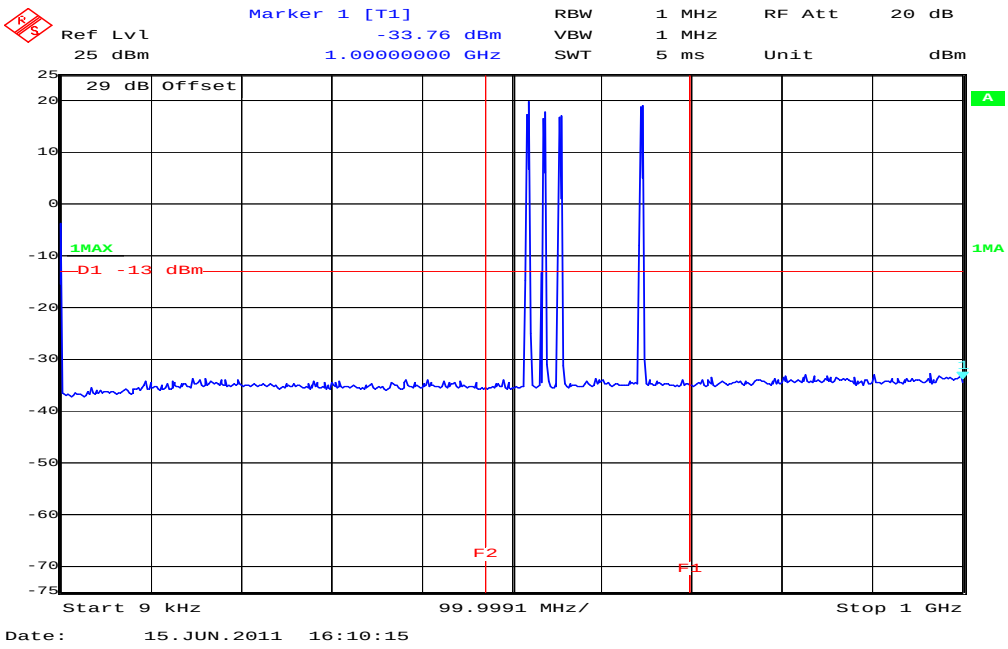
FCC	IC
Emissions for LPRS transmitters operating on standard band channels (25 kHz) shall be attenuated below the unmodulated carrier in accordance with the following: Emissions 12.5 kHz to 22.5 kHz away from the channel center frequency: at least 30 dB; and emissions more than 22.5 kHz away from the 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)								
8 Channels active								
Frequency	Detector	Level	Frequency	Detector	Level	Frequency	Detector	Level
No peaks detected								
Measurement uncertainty ± 3 dB								

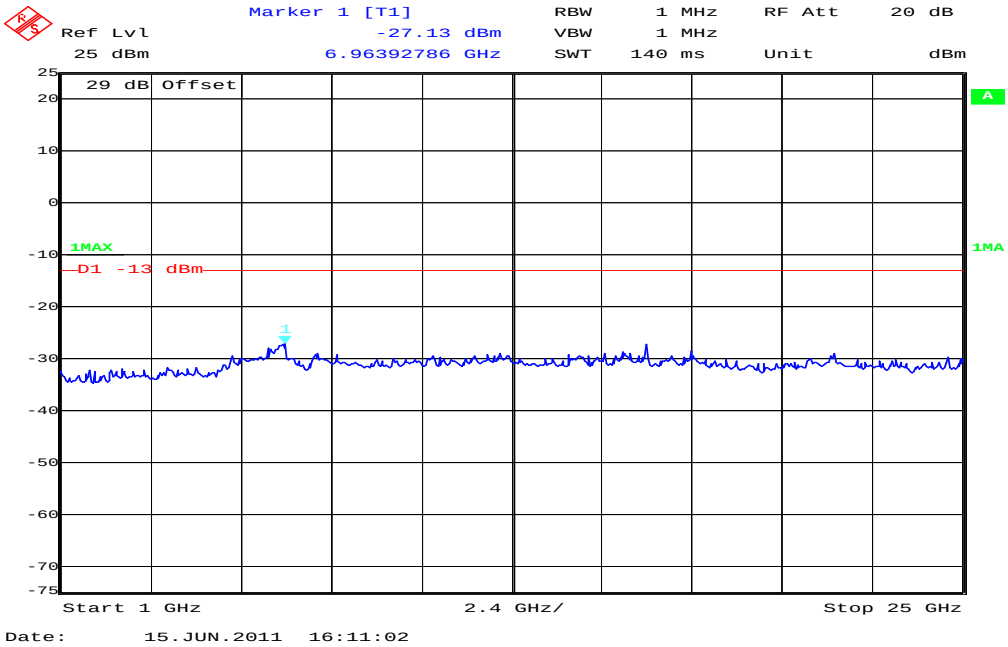
Result: **The result of the measurement is passed.**

Plots of the measurements

Plot 1: 30 MHz – 1 GHz



Plot 2: 1 GHz – 12.75 GHz



9.8 Receiver spurious emissions (radiated)

Measurement:

Measurement parameter	
Detector:	Peak / Quasi Peak
Sweep time:	Auto
Video bandwidth:	f < 1 GHz : 100 kHz f ≥ 1GHz : 1 MHz
Resolution 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

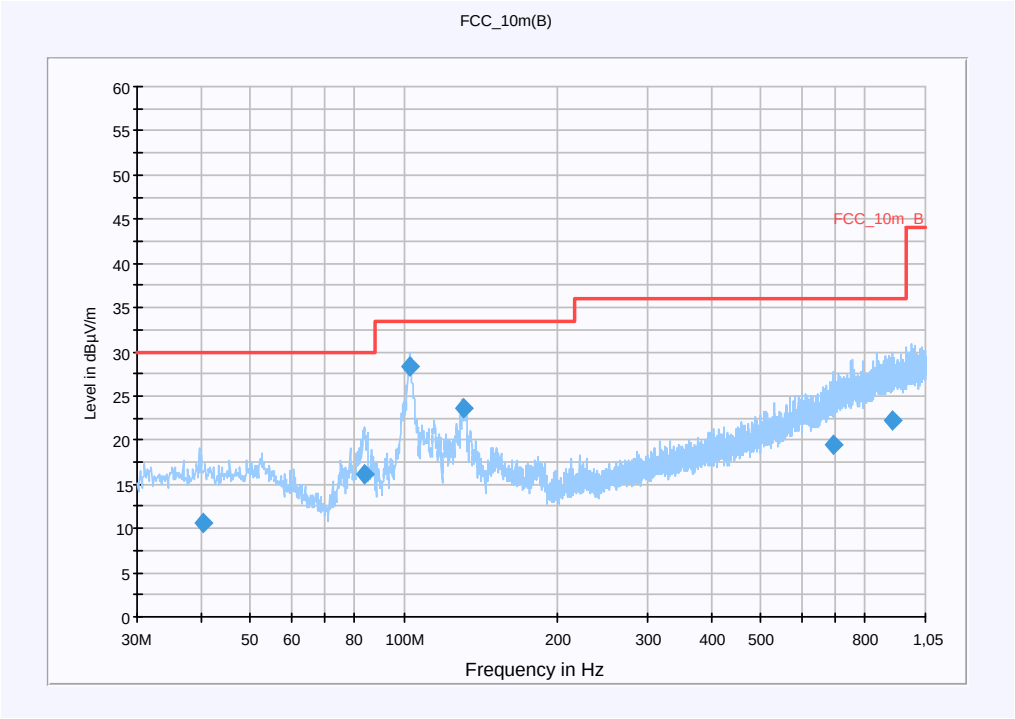
Common Information

EUT:	AC 3200-II
Serial Number:	0231001002
Test Description:	FCC part 15 B class B @ 10 m
Operating Conditions:	active (RF part idle) (antenna ports terminated)
Operator Name:	Hennemann
Comment:	AC: 115 V / 60 Hz

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup:	Electric Field (NOS)
Level Unit:	dBµV/m

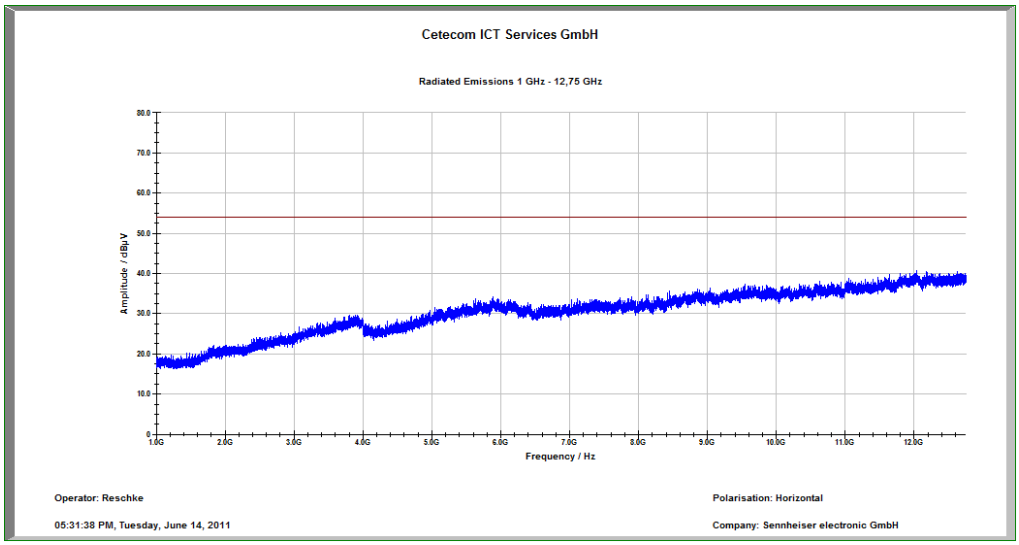
Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 2 GHz	QuasiPeak	120 kHz	15 s	Receiver



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
40.281600	10.5	15000.000	120.000	193.0	H	46.0	13.4	19.5	30.0	
83.478900	16.1	15000.000	120.000	208.0	V	135.0	9.6	13.9	30.0	
102.551850	28.2	15000.000	120.000	100.0	V	87.0	11.7	5.3	33.5	
130.536000	23.5	15000.000	120.000	115.0	V	269.0	9.4	10.0	33.5	
691.981350	19.6	15000.000	120.000	100.0	V	146.0	22.3	16.4	36.0	
903.509400	22.3	15000.000	120.000	200.0	H	325.0	25.2	13.7	36.0	

Plot 2: 1 GHz – 12.75 GHz



9.9 Receiver spurious emissions (conducted)

Measurement:

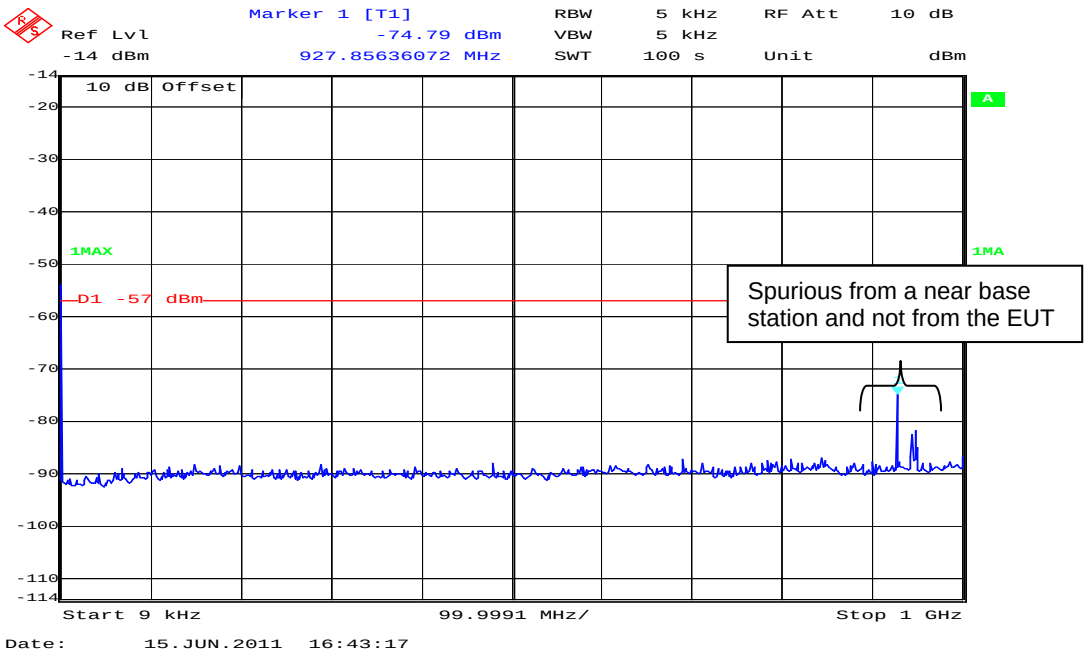
Measurement parameter	
Detector:	Peak / Quasi Peak
Sweep time:	Auto
Video bandwidth:	f < 1 GHz : 100 kHz f ≥ 1GHz : 1 MHz
Resolution bandwidth:	f < 1 GHz : 100 kHz f ≥ 1GHz : 1 MHz
Span:	-/-
Trace-Mode:	Max. hold

Limits:

FCC		IC
SUBCLAUSE § 15.109		RSS-123 Rev. 2
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

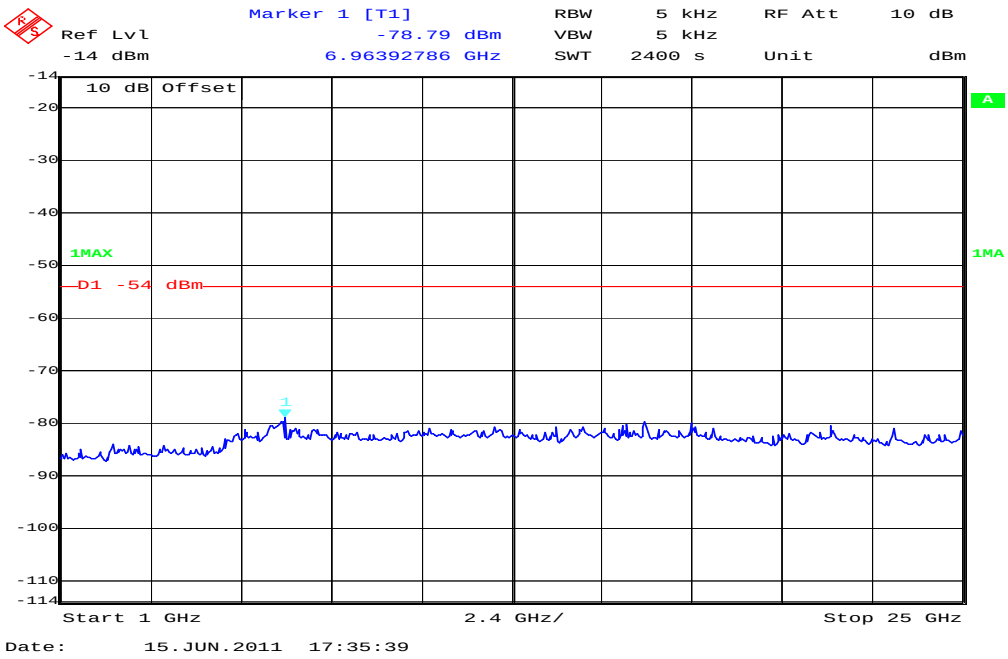
Plots of the measurements

Plot 1: 30 MHz – 1 GHz



The peak at the beginning of the plot is the LO from the spectrum analyzer.

Plot 2: 1 GHz – 12.75 GHz



9.10 Spurious emissions conducted < 30 MHz

Description:

Measurement of the conducted spurious emissions in transmit mode below 30 MHz. The EUT is set to channel 6. This measurement is repeated for DSSS and OFDM modulation. If critical peaks are found channel 1 and channel 11 will be measured too. The measurement is performed with the data rate producing the highest output power. Both power lines, phase and neutral line, are measured. Found peaks are remeasured with average and quasi peak detection to show compliance to the limits.

Measurement:

Measurement parameter	
Detector:	Peak - Quasi Peak / Average
Sweep time:	Auto
Video bandwidth:	F < 150 kHz: 200 Hz F > 150 kHz: 9 kHz
Resolution bandwidth:	F < 150 kHz: 1 kHz F > 150 kHz: 100 kHz
Span:	9 kHz to 30 MHz
Trace-Mode:	Max Hold

Limits:

FCC		IC
CFR Part 15.107(a)		ICES-003, Issue 4
TX Spurious Emissions Conducted < 30 MHz		
Frequency (MHz)	Quasi-Peak (dBµV/m)	Average (dBµV/m)
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 – 30.0	60	50

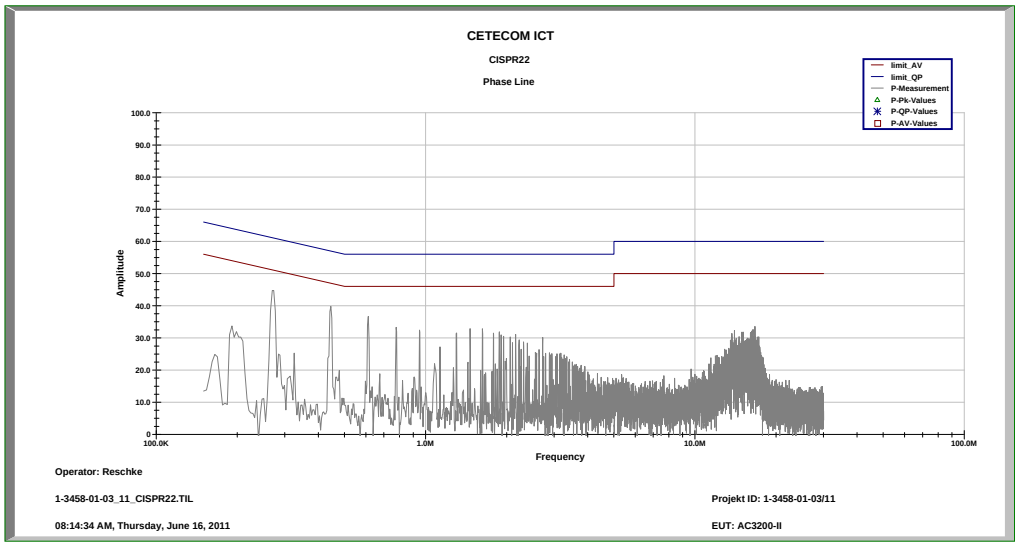
*Decreases with the logarithm of the frequency

Results:

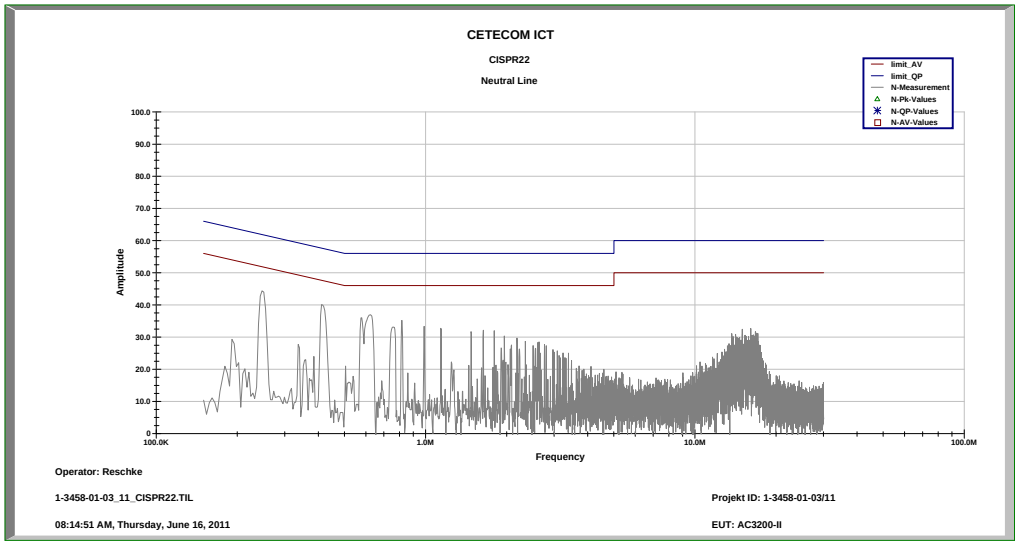
TX Spurious Emissions Conducted < 30 MHz [dBµV/m]		
F [MHz]	Detector	Level [dBµV/m]
No critical peaks found		
Measurement uncertainty	± 3 dB	

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

Plot 1: 9 kHz to 30 MHz, phase line



Plot 2: 9 kHz to 30 MHz, 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	45	Switch-Unit	3488A	HP Meßtechnik	2719A14505	300000368	g		
2	50	DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2920A04466	300000580	ne		
3	n. a.	software	SPS_PHE 1.4f	Spitzberger & Spieß	B5981; 5D1081;B5979	300000210	ne		
4	n. a.	EMI Test Receiver	ESCI 1166.5950.03	R&S	100083	300003312	k	05.01.2011	05.01.2013
5	n. a.	Analyzer-Reference-System (Harmonics and Flicker)	ARS 16/1	SPS	A3509 07/0 0205	300003314	k	31.07.2009	31.07.2011
6	n. a.	Amplifier	JS42-00502650-28-5A	MITEQ	1084532	300003379	ev		
7	n. a.	Antenna Tower	Model 2175	ETS-LINDGREN	64762	300003745	izw		
8	n. a.	Positioning Controller	Model 2090	ETS-LINDGREN	64672	300003746	izw		
9	n. a.	Turntable Interface-Box	Model 105637	ETS-LINDGREN	44583	300003747	izw		
10	n. a.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	295	300003787	k	01.04.2010	01.04.2012
11	n. a.	Spectrum-Analyzer	FSU26	R&S	200809	300003874	k	10.01.2011	10.01.2013
12	n. a.	Isolating Transformer	RT5A	Grundig	8041	300001626	g		
13	n. a.	DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2818A03450	300001040	Ve	08.01.2009	08.01.2012
14	n. a.	Coaxial Attenuator 30dB/500W	8325	Bird	1530	300001595	ev		
15	n. a.	Double-Ridged Waveguide Horn Antenna 1-18.0GHz	3115	EMCO	8812-3088	300001032	vIKI!	05.03.2009	05.09.2011
16	n. a.	Active Loop Antenna	6502	EMCO	2210	300001015	ne		
17	n. a.	Anechoic chamber	FAC 3/5m	MWB / TDK	87400/02	300000996		23.03.2009	
18	Spec.A. 2_2e	System rack for EMI measurement solution	85900	HP I.V.	*	300000222	ne		
19	9	Artificial Mains 9 kHz to 30 MHz	ESH3-Z5	R&S	828576/020	300001210	Ve	06.01.2010	06.01.2012
20	n. a.	Relais Matrix	3488A	HP Meßtechnik	2719A15013	300001156	ne		
21	n. a.	Relais Matrix	PSU	R&S	890167/024	300001168	ne		
22	n. a.	Isolating Transformer	RT5A	Grundig	9242	300001263	ne		
23	n. a.	Three-Way Power Splitter, 50 Ohm	11850C	HP Meßtechnik		300000997	ne		
24	n. a.	Switch / Control Unit	3488A	HP	2605e08770	300001443	ne		

25	n. a.	Amplifier	js42-00502650-28-5a	Parzich GMBH	928979	300003143	ne		
26	n. a.	Band Reject filter	WRCG1855/1910-1835/1925-40/8SS	Wainwright	7	300003350	ev		
27	n. a.	Band Reject filter	WRCG2400/2483-2375/2505-50/10SS	Wainwright	11	300003351	ev		
28	n. a.	TILE-Software Emission	Quantum Change, Modell TILE-ICS/FULL	EMCO	none	300003451	ne		
29	n. a.	Highpass Filter	WHKX2.9/18G-12SS	Wainwright	1	300003492	ev		
30	n. a.	Highpass Filter	WHK1.1/15G-10SS	Wainwright	3	300003255	ev		
31	n. a.	Highpass Filter	WHKX7.0/18G-8SS	Wainwright	18	300003789	ne		
32	n. a.	PSA Spectrum Analyzer 3 Hz - 26.5 GHz	E4440A	Agilent Technologies	MY48250080	300003812	k	08.09.2010	08.09.2012
33	n. a.	MXG Microwave Analog Signal Generator	N5183A	Agilent Technologies	MY47420220	300003813	k	13.09.2010	13.09.2012
34	n. a.	RF Filter Section 9kHz - 1GHz	N9039A	Agilent Technologies	MY48260003	300003825	vlKl!	08.09.2010	08.09.2012
35	n. a.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	371	300003854	vlKl!	17.12.2008	17.12.2011
36	n. a.	Audio Analyzer 2Hz - 300 kHz	UPD	R&S	841074/009	300001236	k	08.01.2010	08.01.2012
37	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
ne	not required (k, ev, izw, zw not required)
ev	periodic self verification
Ve	long-term stability recognized
vlkl!	Attention: extended calibration interval
NK!	Attention: not calibrated
EK	limited calibration
zw	cyclical maintenance (external cyclical maintenance)
izw	internal cyclical maintenance
g	blocked for accredited testing
*)	next calibration ordered / currently in progress

Annex A Photographs of the test setup

Photo documentation

Photo 1: Idle measurement

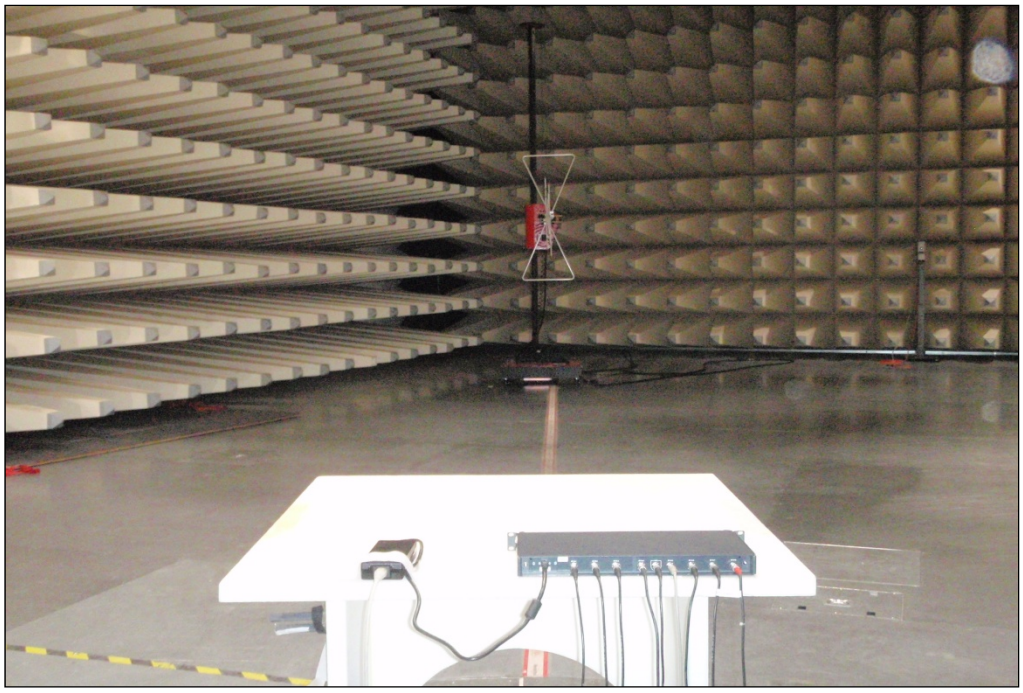


Photo 2: Transmitter measurement

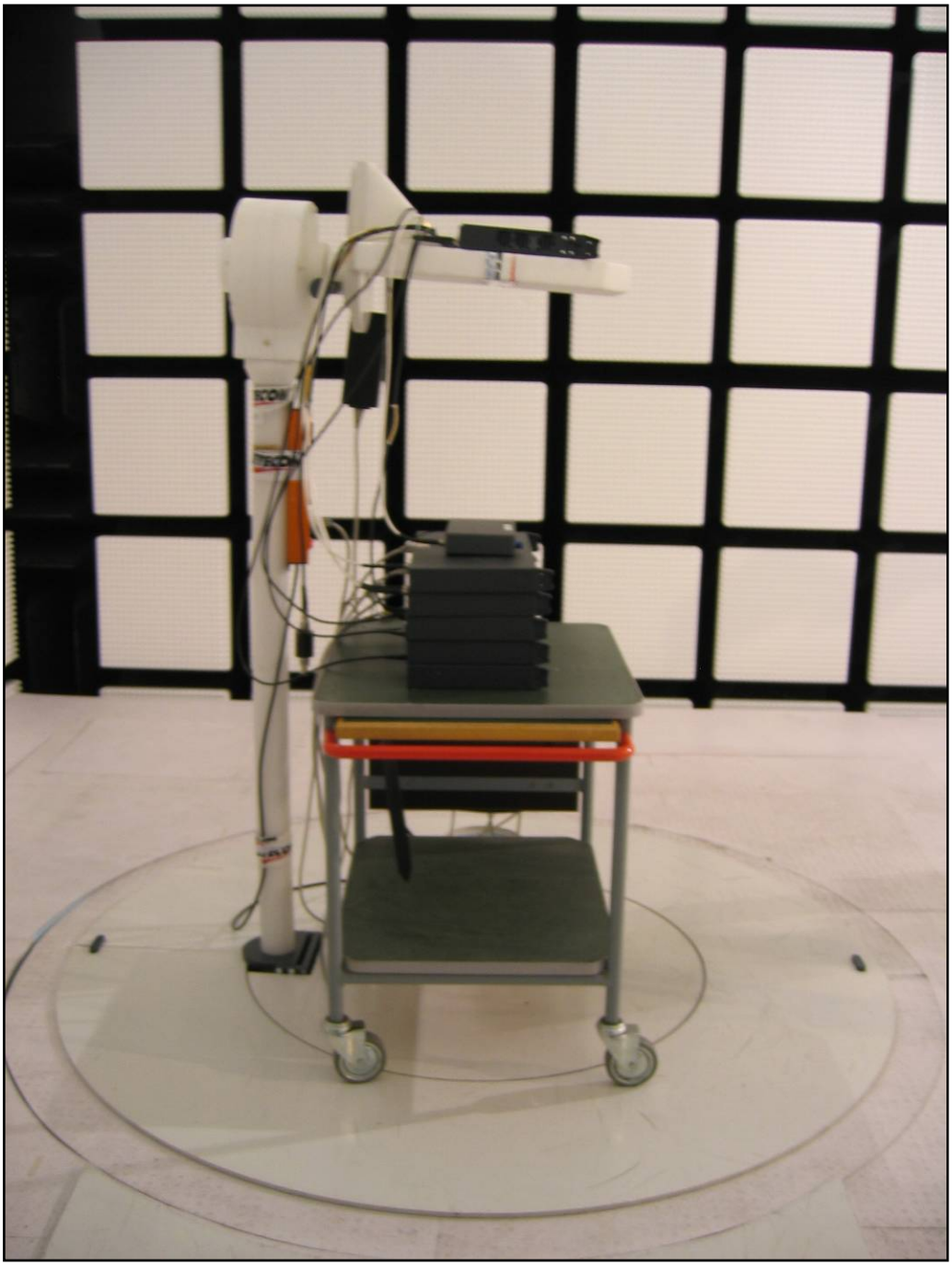


Photo 3: Transmitter measurement

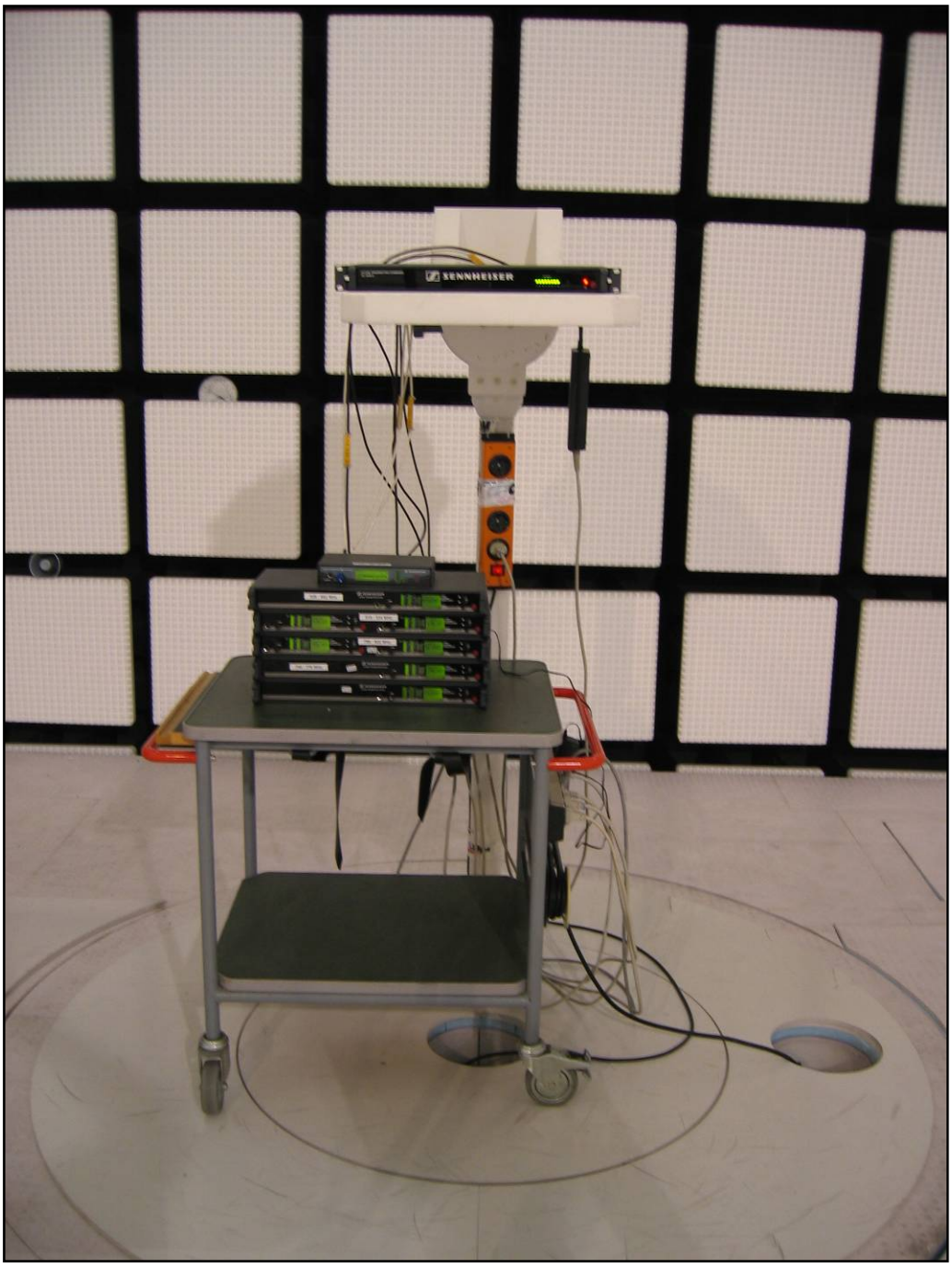
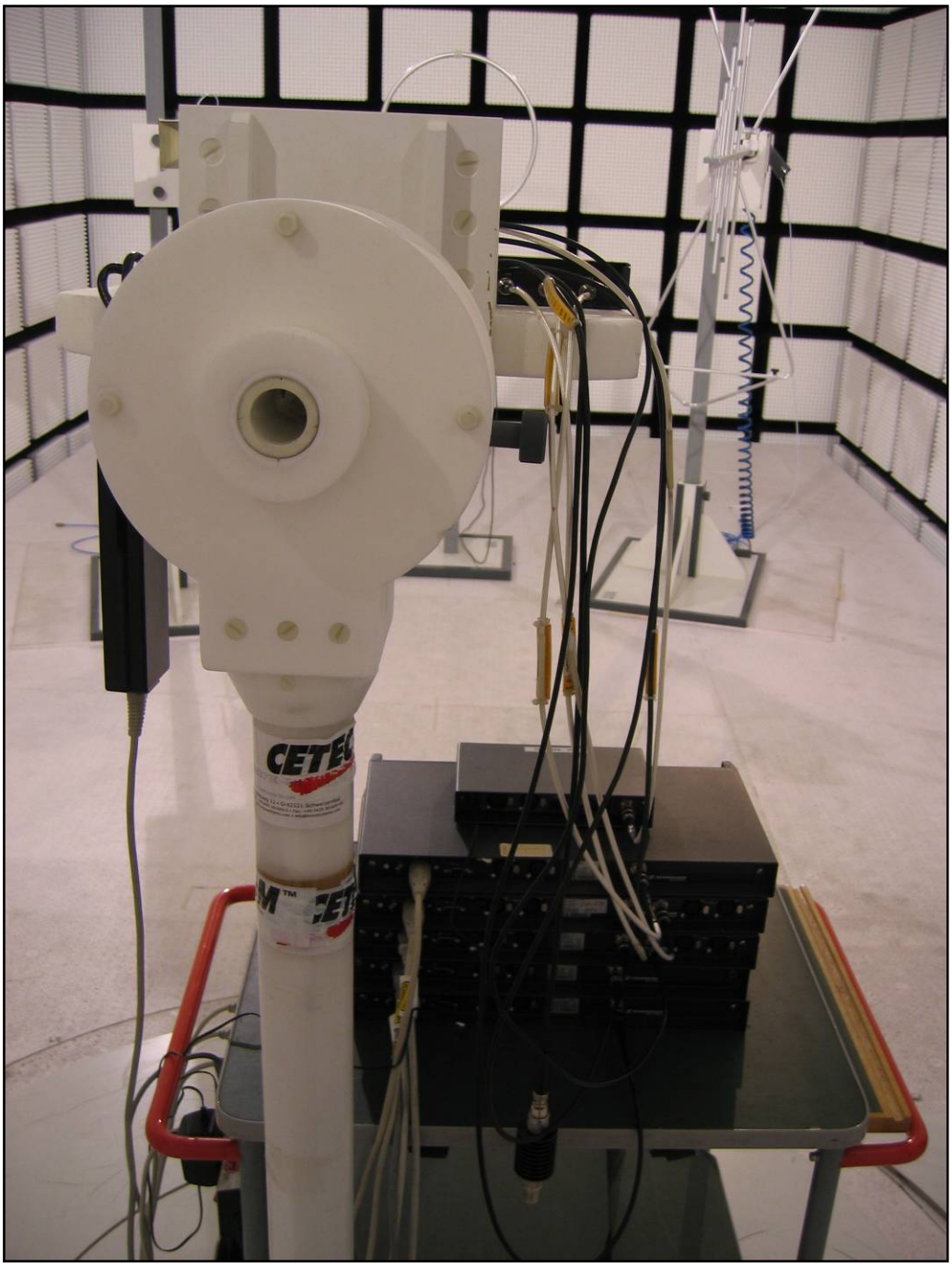


Photo 4: Transmitter measurement



Annex B External photographs of the EUT

Photo documentation

Photo 5:

Photo 6:

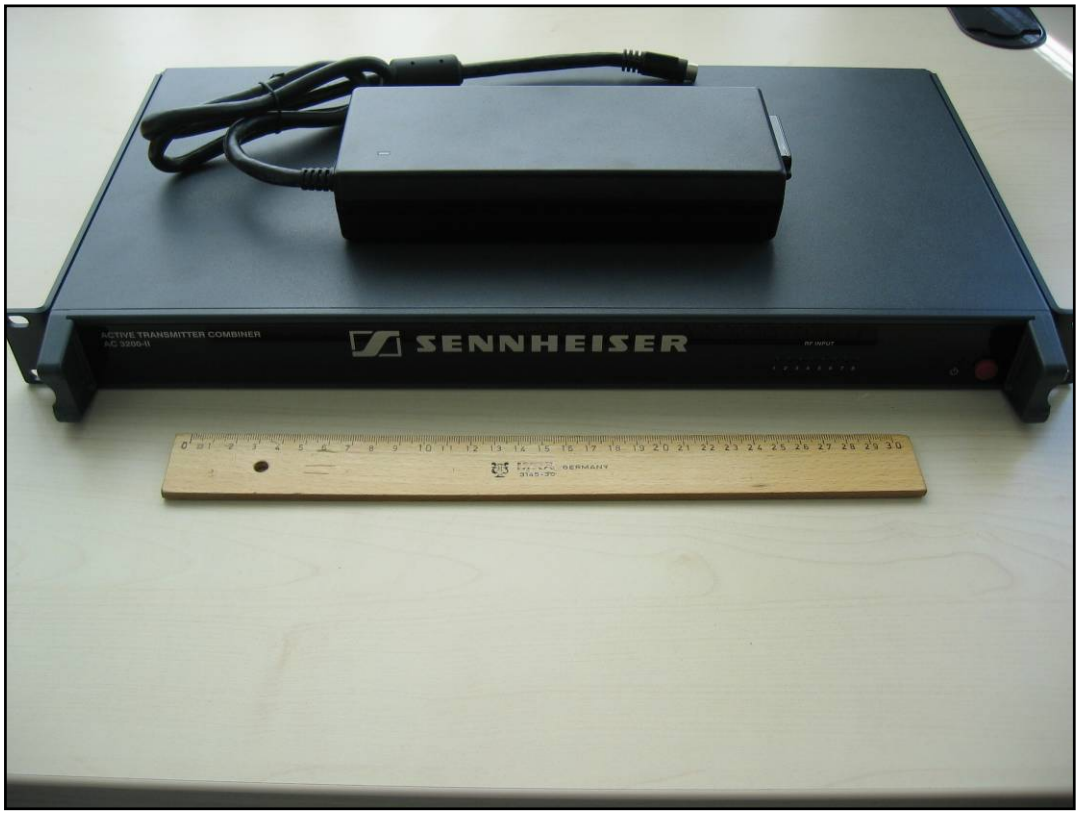


Photo 7:

Photo 8:

Photo 9:

Photo 10:

Photo 11:

Annex C Internal photographs of the EUT

Photo documentation

Photo 12:

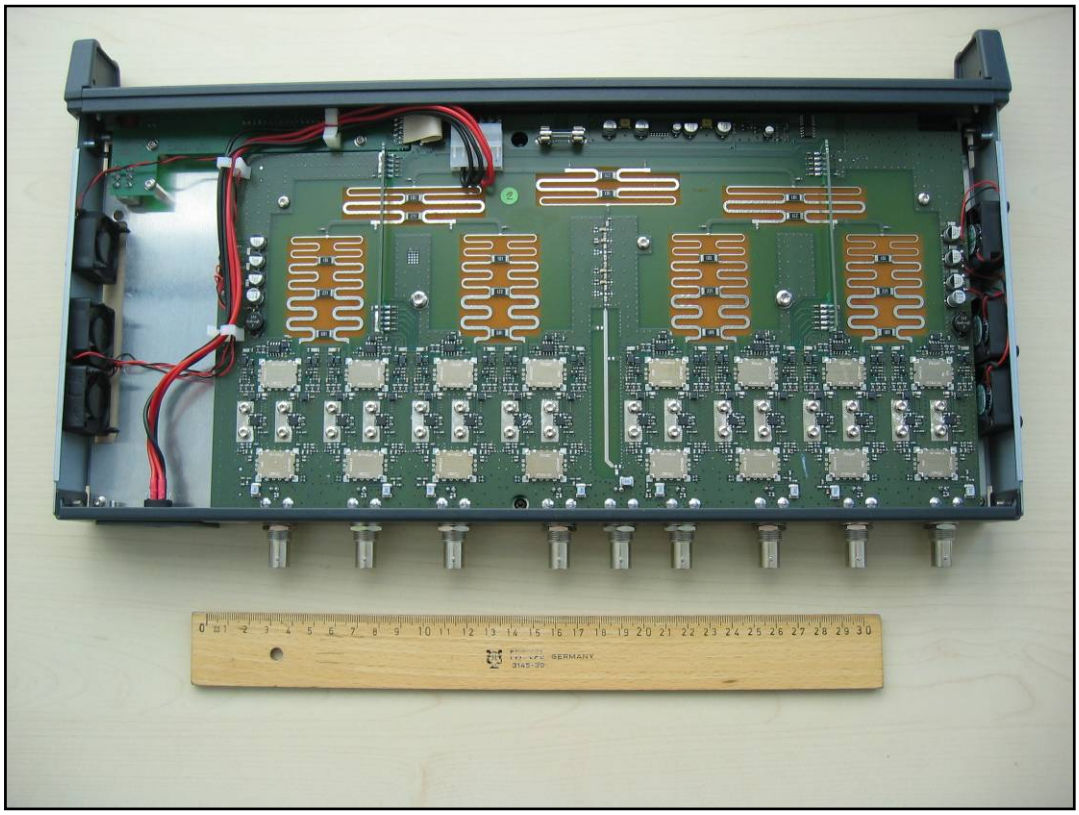


Photo 13:

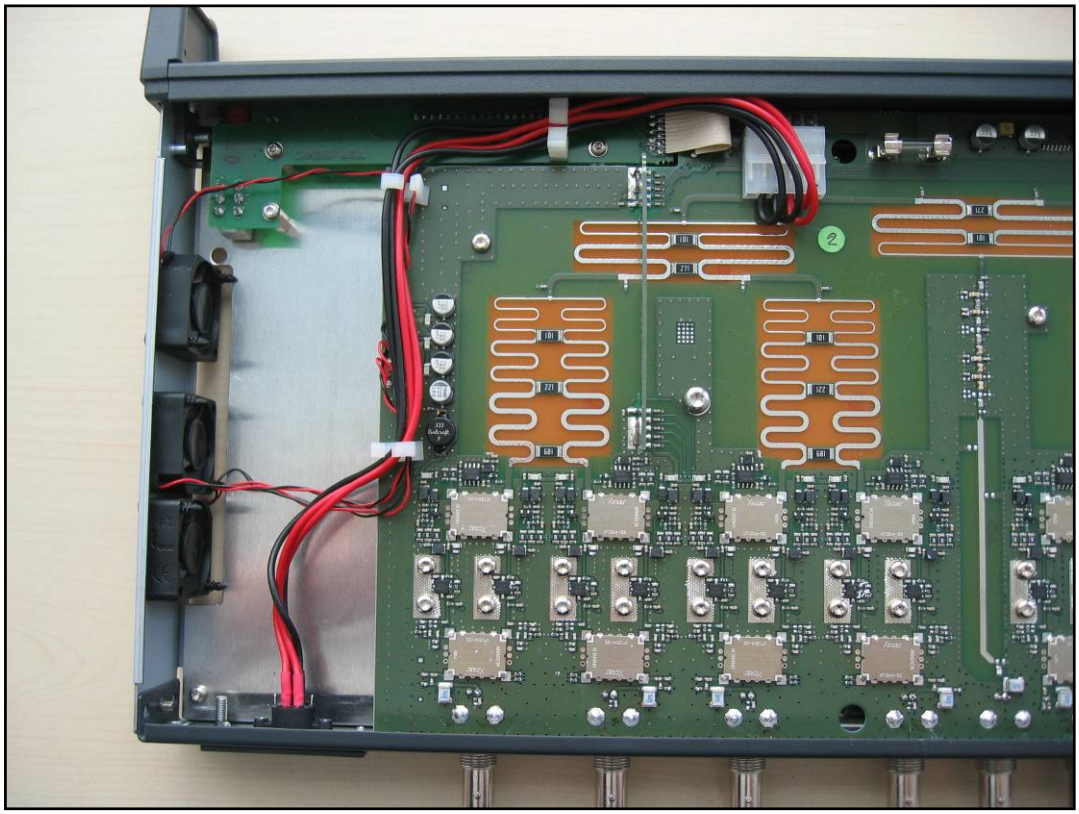


Photo 14:

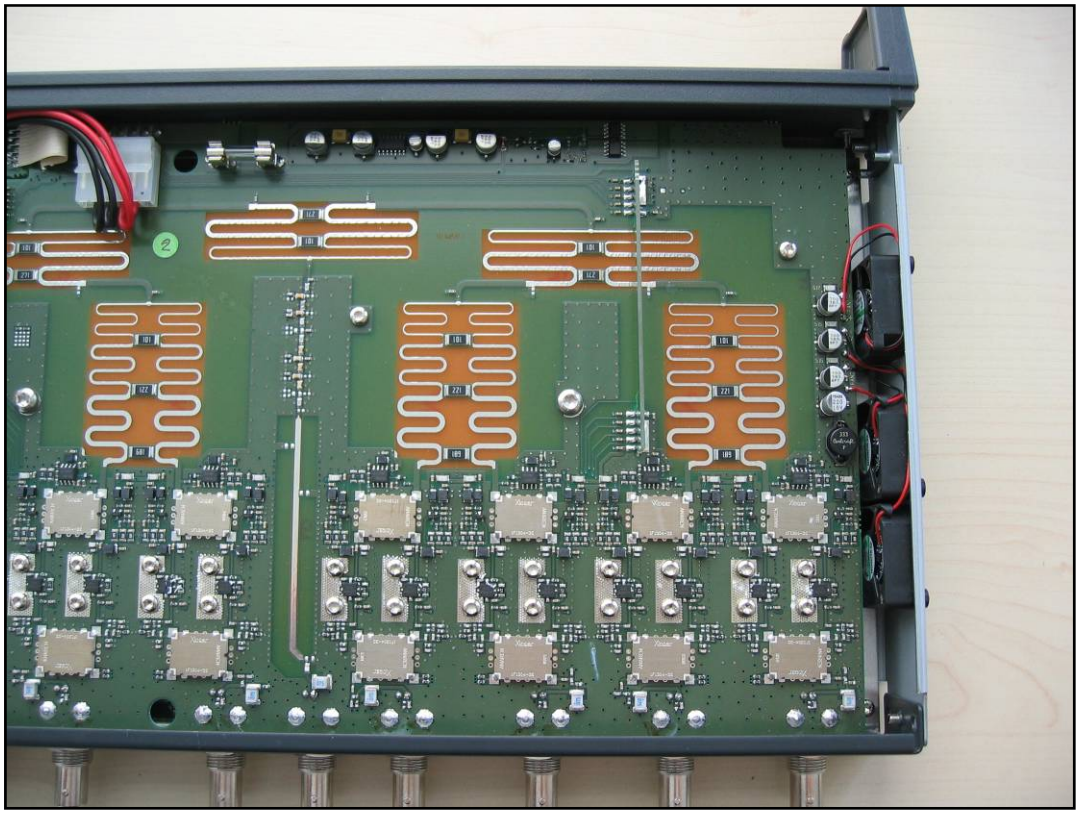


Photo 15:

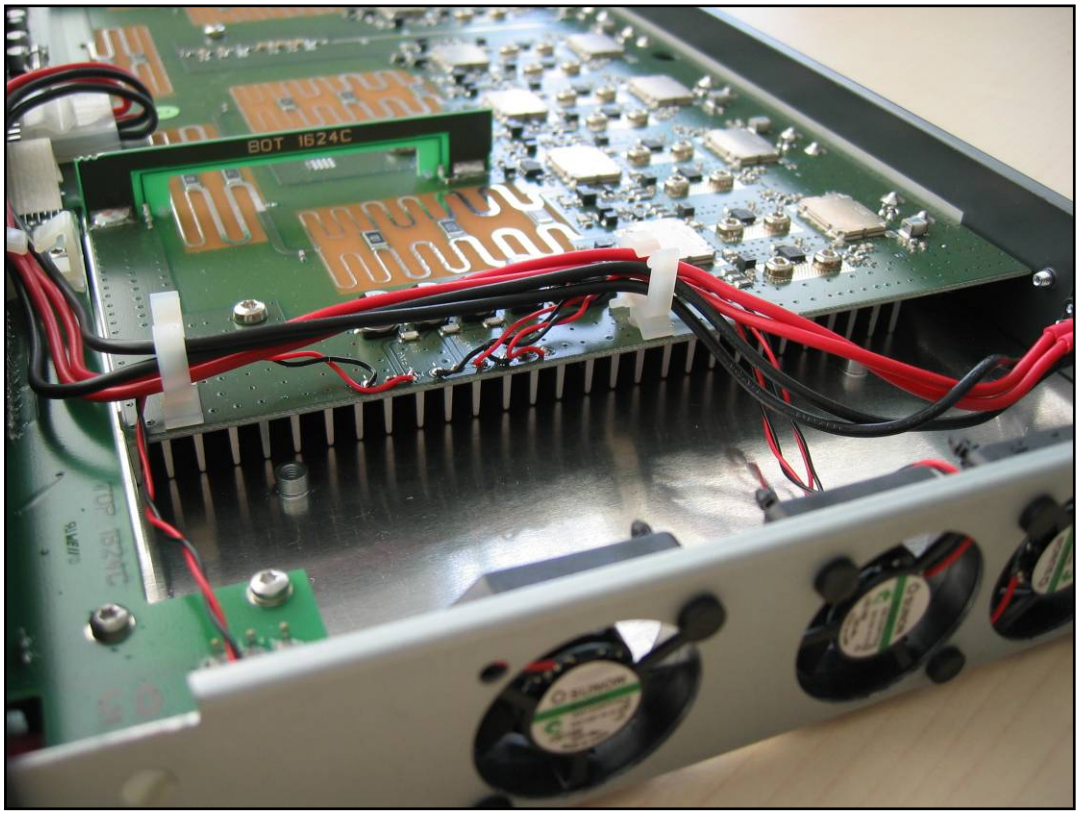


Photo 16:

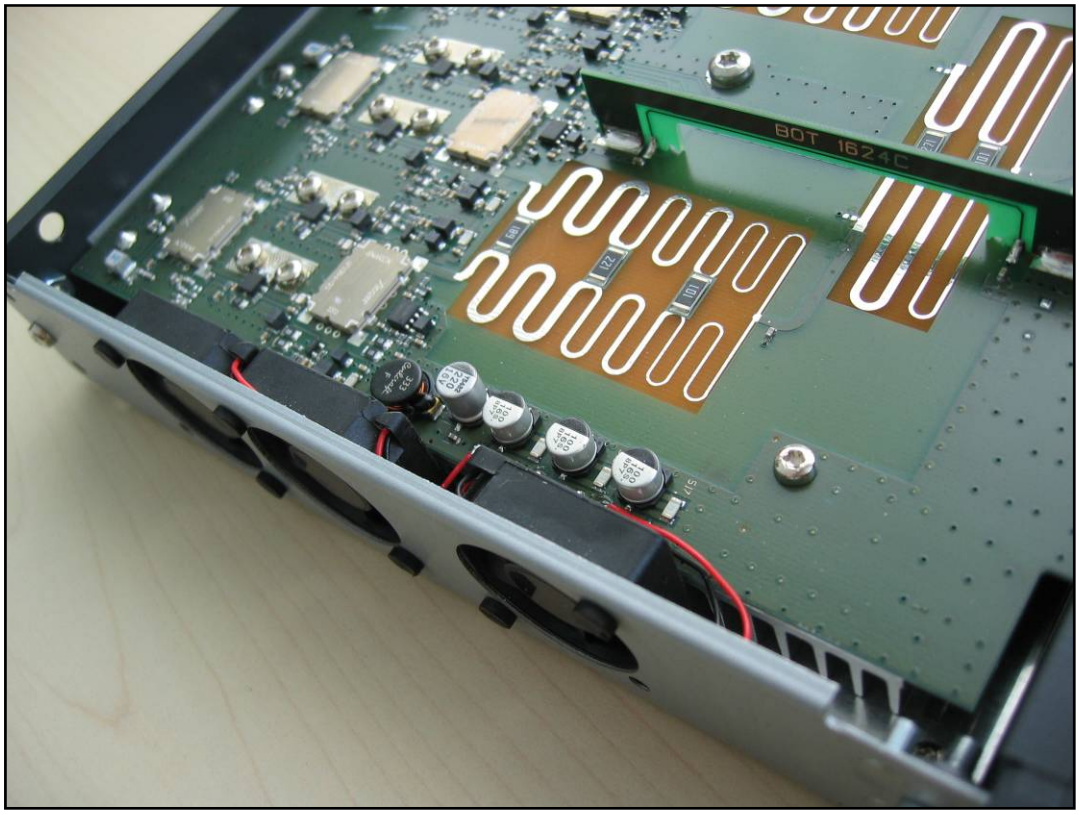
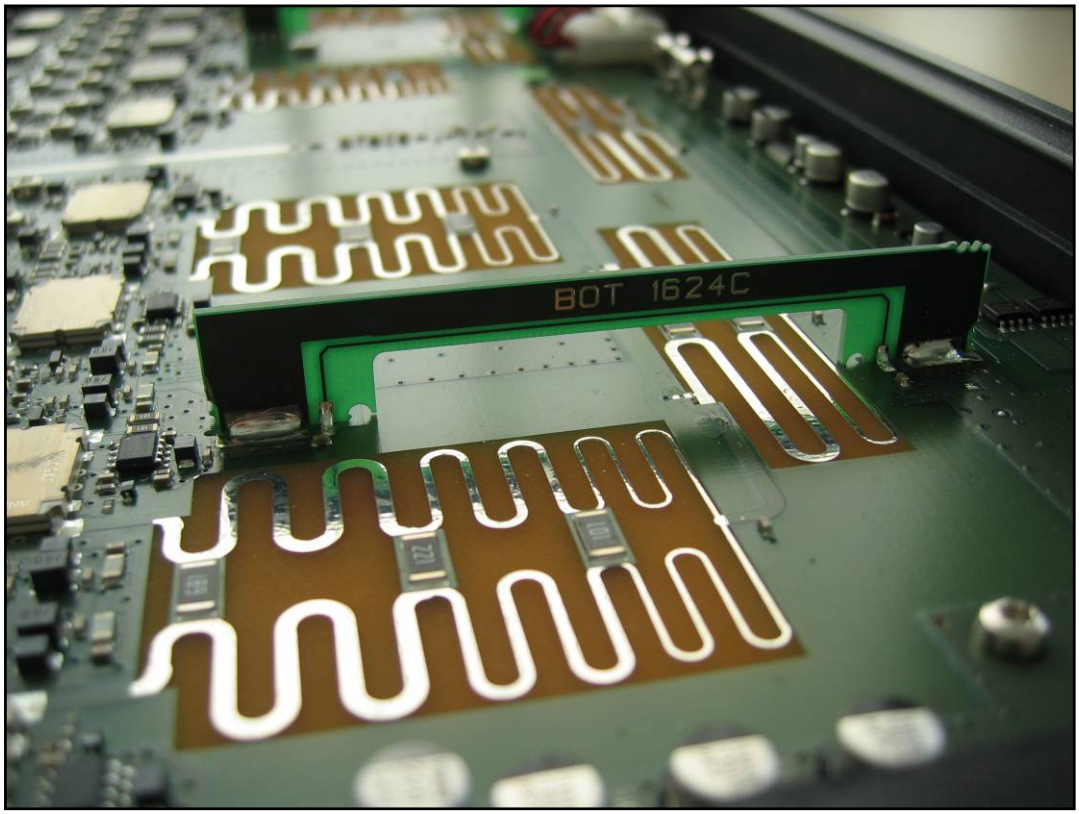


Photo 17:



Annex D Document history

Version	Applied changes	Date of release
1.0	Initial release	2011-06-21
-A	Changed picture of the label	2011-06-30
-B	Add information	2011-12-07

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