

TEST REPORT

Test report no.: 1-5865/13-01-03-A



Deutsche
Akkreditierungsstelle
D-PL-12076-01-01

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

RSI Video Technologies

Siège Social -Headquarters

25 rue Jacobi-Netter

67200 Strasbourg / FRANCE

Phone: +33 3 90 20 66 96

Fax: +33 3 88 29 04 00

Contact: Thierry Petri

e-mail: thierry.petri@rsivideotech.com

Phone: +33 3 90 20 66 96

Manufacturer

RSI Video Technologies

Siège Social -Headquarters

25 rue Jacobi-Netter

67200 Strasbourg / FRANCE

Test standard/s

47 CFR Part 15

Title 47 of the Code of Federal Regulations; Chapter I; Part 15 - Radio frequency devices

RSS - 210 Issue 8

Spectrum Management and Telecommunications Radio Standards Specification - Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment

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

Test Item

Kind of test item: LAN Alarm panel

Model name: XTIP620

FCC ID: X46XT05

IC 8816A-XT05

Frequency: ISM band 902 MHz – 928 MHz
(lowest channel 904.5 MHz; highest channel 926.1 MHz)

Technology tested: Proprietary FHSS system

Antenna: Integrated antenna

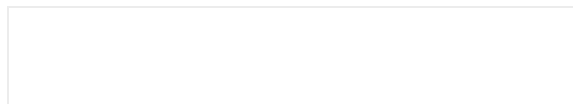
Power supply: 12.0 V DC by Lithium Battery

Temperature range: -10°C to +40°C



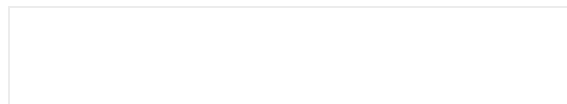
This test report is electronically signed and valid without handwriting signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

Test report authorised:



Stefan Bös
Senior Testing Manager

Test performed:



Christoph Schneider
Expert

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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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This test report is electronically signed and valid without handwritten 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:	2014-02-04
Date of receipt of test item:	2014-03-17
Start of test:	2014-04-03
End of test:	2014-04-03
Person(s) present during the test:	-/-

3 Test standard/s

Test standard	Date	Test standard description
47 CFR Part 15		Title 47 of the Code of Federal Regulations; Chapter I; Part 15 - Radio frequency devices
RSS - 210 Issue 8		Spectrum Management and Telecommunications Radio Standards Specification - Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment

4 Test environment

Temperature:	T_{nom}	+22 °C during room temperature tests
	T_{max}	+40 °C during high temperature tests
	T_{min}	-10 °C during low temperature tests
Relative humidity content:		55 %
Barometric pressure:		not relevant for this kind of testing
Power supply:	V_{nom}	12.0 V DC by Lithium Battery
	V_{max}	-/- V
	V_{min}	-/- V

5 Test item

Kind of test item	:	LAN Alarm panel
Type identification	:	XTIP620
S/N serial number	:	No information available
HW hardware status	:	No information available
SW software status	:	No information available
Frequency band [MHz]	:	ISM band 902 MHz – 928 MHz (lowest channel 904.5 MHz; highest channel 926.1 MHz)
Type of radio transmission	:	FHSS
Use of frequency spectrum	:	
Type of modulation	:	FSK
Number of channels	:	25
Antenna	:	Integrated antenna
Power supply	:	12.0 V DC by Lithium Battery
Temperature range	:	-10°C to +40 °C

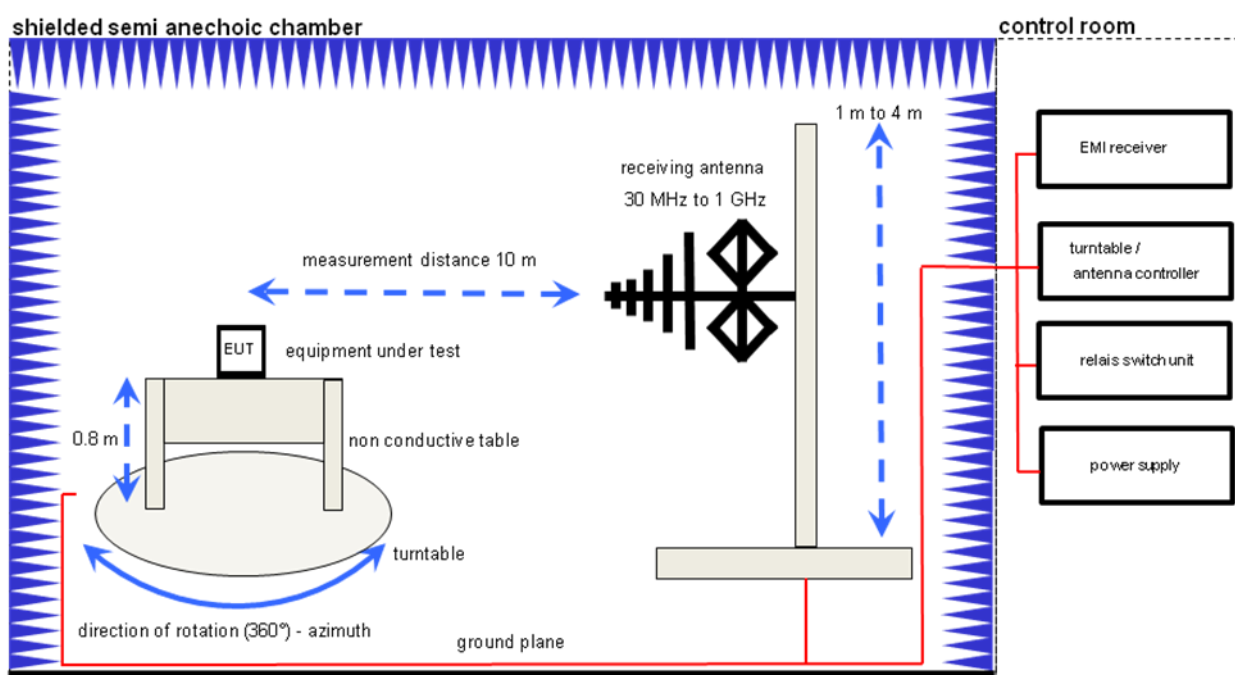
6 Test laboratories sub-contracted

None

7 Description of the test setup

7.1 Radiated measurements chamber F

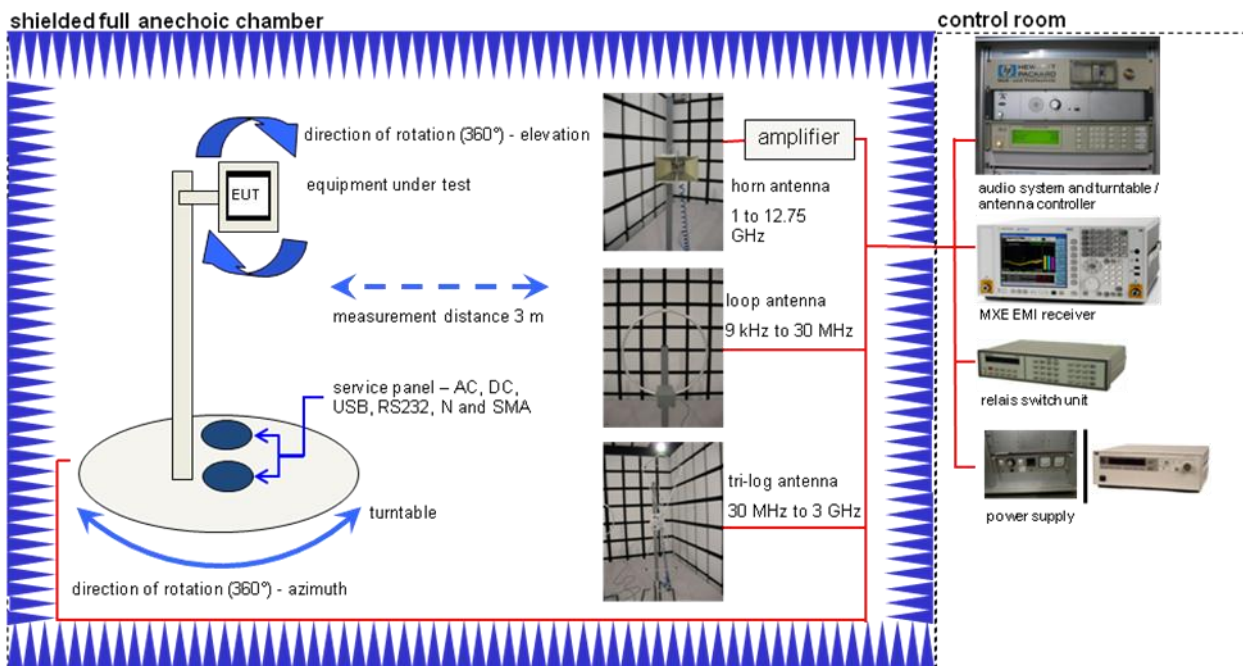
The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 1 GHz in semi-anechoic chambers. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber. The receiving antennas are confirmed with specifications ANSI C63. 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.



Equipment table:

Equipment	Type	Manufacturer	Serial No.	INV. No Cetecom
Switch-Unit	3488A	HP Meßtechnik	2719A14505	300000368
DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2920A04466	300000580
EMI Test Receiver	ESCI 3	R&S	100083	300003312
Amplifier	JS42-00502650-28-5A	MITEQ	1084532	300003379
Antenna Tower	Model 2175	ETS-LINDGREN	64762	300003745
Positioning Controller	Model 2090	ETS-LINDGREN	64672	300003746
Turntable Interface-Box	Model 105637	ETS-LINDGREN	44583	300003747
TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	295	300003787

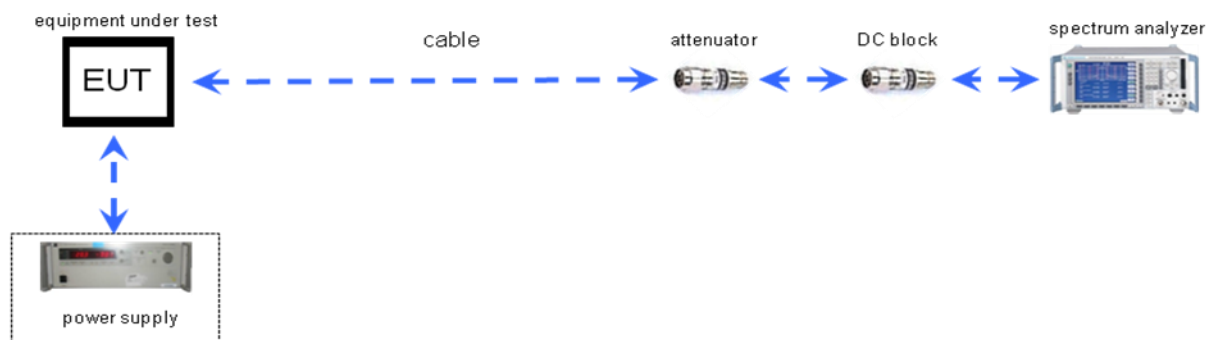
7.2 Radiated measurements chamber C



Equipment table:

Equipment	Type	Manufacturer	Serial No.	INV. No Cetecom
MXE EMI Receiver 20 Hz bis 26,5 GHz	N9038A	Agilent Technologies	MY51210197	300004405
TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	371	300003854
Band Reject filter	WRCG2400/2483-2375/2505-50/10SS	Wainwright	11	300003351
Highpass Filter	WHKX7.0/18G-8SS	Wainwright	18	300003789
Double-Ridged Waveguide Horn Antenna 1-18.0GHz	3115	EMCO	8812-3088	300001032
Active Loop Antenna	6502	EMCO	8905-2342	300000256
Anechoic chamber	FAC 3/5m	MWB / TDK	87400/02	300000996
Switch / Control Unit	3488A	HP Meßtechnik	*	300000199
Switch / Control Unit	3488A	HP Meßtechnik	2719A15013	300001156
Isolating Transformer	MPL IEC625 Bus Regeltrenntravo	ErFi	91350	300001155
Three-Way Power Splitter, 50 Ohm	11850C	HP Meßtechnik		300000997
Amplifier	js42-00502650-28-5a	Parzich GMBH	928979	300003143

7.3 Conducted measurements



Equipment table:

Equipment	Type	Manufacturer	Serial No.	INV. No Cetecom
Signal Analyzer 26.5 GHz	MXA	Agiland	N9020A	300004517

8 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	CFR Part 15	Passed	2014-04-29	See also 1-5865/13-09-02-A

Test specification clause	Test case	Temperature conditions	Power source voltages	Mode	Pass	Fail	NA	NP	Results (max.)
§15.247(b)(4)	Antenna Gain	Nominal	Nominal	TX	☐	☐	☐	☒	See 1-5865/13-09-02-A
§15.247(a)(1)(i) RSS-210 A8.1 (b)	Carrier Frequency Separation	Nominal	Nominal	TX	☐	☐	☐	☒	See 1-5865/13-09-02-A
§15.247(a)(1)(i) RSS-210 A8.1 (c)	Number of Hopping channels	Nominal	Nominal	TX	☐	☐	☐	☒	See 1-5865/13-09-02-A
§15.247(a)(1)(i) RSS-210 A8.1 (c)	Average Time of Occupancy (Dwell Time)	Nominal	Nominal	TX	☐	☐	☐	☒	See 1-5865/13-09-02-A
§15.247(a)(1)(i) RSS-210 A8.1 (c)	20dB Bandwidth	Nominal	Nominal	TX	☐	☐	☐	☒	See 1-5865/13-09-02-A
§15.247(b)(2) RSS-210 A8.4 (1)	Maximum Output Power Radiated	Nominal	Nominal	TX	☒	☐	☐	☐	Additionally see 1-5865/13-09-02-A
§15.247(b)(4) RSS-210 A8.4 (1)	Maximum Output Power Conducted	Nominal	Nominal	TX	☐	☐	☐	☒	See 1-5865/13-09-02-A
§15.247(d) §15.205(a)	Band-edge Compliance	Nominal	Nominal	TX	☐	☐	☐	☒	See 1-5865/13-09-02-A
§15.247(d)	TX Spurious Emission Conducted	Nominal	Nominal	TX	☐	☐	☐	☒	See 1-5865/13-09-02-A
§15.209(a)	TX Spurious Emission Radiated < 30 MHz	Nominal	Nominal	TX	☐	☐	☐	☒	See 1-5865/13-09-02-A
§15.247(d) §15.209 A8.5	TX Spurious Emission Radiated > 30 MHz	Nominal	Nominal	TX	☒	☐	☐	☐	Additionally see 1-5865/13-09-02-A
§15.109	RX Spurious Emissions Radiated	Nominal	Nominal	Idle	☐	☐	☐	☒	See 1-5865/13-09-02-A

Note: NA = Not Applicable; NP = Not Performed

8.1 Additional comments

Reference documents:	Only reduced delta tests performed! (According customer demand) For further information see test report 1-5865/13-09-02-A.
Special test descriptions:	The EUT has an additional antenna connector on the main board to perform the conducted measurements. This port can be activated by the test software. In normal use this port will be disabled.
Configuration descriptions:	None
Test mode:	☒ Special software is used. EUT is transmitting pseudo random data by itself

8.2 RSP100 test report cover sheet / performance test data

Test report number	:	1-5865/13-01-03-A / 1-5865/13-09-02-A
Equipment model number	:	XTIP620
Certification number	:	8816A-XT05
Manufacturer (complete address)	:	RSI Video Technologies Siège Social -Headquarters 25 rue Jacobi-Netter 67200 Strasbourg / FRANCE
Tested to radio standards specification no.	:	RSS 210, Issue 8
Open area test site IC No.	:	IC 3462C-1
Frequency range	:	ISM band 902 MHz to 928 MHz (lowest channel 904.5 MHz, highest channel 926.1 MHz)
RF-power [W] (max.)	:	Cond.: 20.61 mW* (FSK modulation) EIRP: 19.86 mW (FSK modulation)
Occupied bandwidth (99%-BW) [kHz]	:	317.6* (FSK modulation)
Type of modulation	:	FHSS technology with FSK modulation.
Emission designator (TRC-43)	:	318KFXD* (FSK modulation)
Antenna information	:	Integrated wire antenna
Transmitter spurious (worst case)[dBμV/m @ 3m]:	:	49 dBμV/m @ 12.7 GHz

All values marked with * extracted from test report 1-5865/13-09-02-A.

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:

2014-04-29

Christoph Schneider

Date

Name

Signature

9 Measurement results

9.1 Maximum Output Power Radiated

Measurement: Only highest channel measured (according customer demand). For further information see 1-5865/13-09-02-A.

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Resolution bandwidth:	1 MHz
Video bandwidth:	1 MHz
Span:	5 MHz
Trace-Mode:	Max Hold

Result:

Test Conditions		EIRP [dBm]		
		904.5 MHz	915.3 MHz	926.1 MHz
T_{nom}	V_{nom}	-/-	-/-	12.98
Measurement uncertainty		$\pm 3\text{dB}$		

Limits:

FCC	IC
EIRP	
For frequency hopping systems operating in the 902–928 MHz band: 1 watt (30 dBm) for systems employing at least 50 hopping channels; and, 0.25 watts (24 dBm) for systems employing less than 50 hopping channels, but at least 25 hopping channels, as permitted under paragraph (a)(1)(i) of this section.	

Result: Passed

9.2 Spurious Emissions Radiated (Transmitter) > 30 MHz

Description:

Measurement of the radiated spurious emissions in transmit mode. The measurement is performed at channel 24 (according customer demand). For further information see 1-5865/13-09-02-A.

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:	30 MHz to 25 GHz
Trace-Mode:	Max Hold
Measured Modulation	FSK

Limits:

ANSI C63.10 – FCC Public Notice DA 00-705

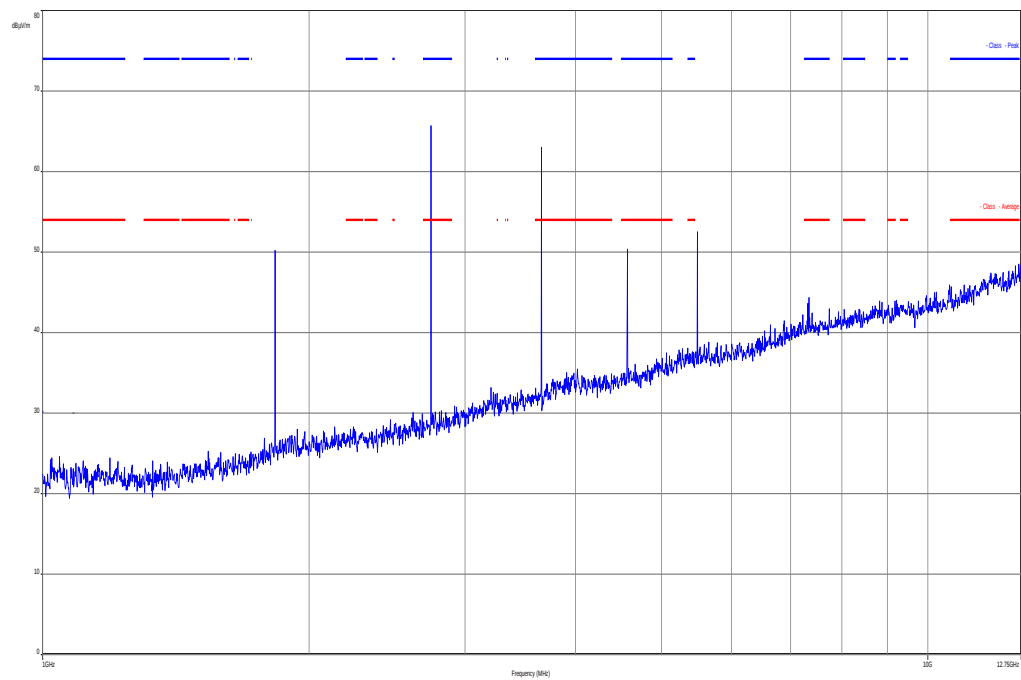
The average emission shall be determined by using Video averaging (VBW = 10 Hz). If the dwell time of the hopping signal is less than 100 ms (per channel), the VBW=10 Hz reading may be adjusted by a factor:
 $F = 20 \log (\text{dwell time}/100 \text{ ms})$

FCC		IC
Band-edge Compliance of conducted and radiated emissions		
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).		
Frequency (MHz)	Field Strength (dBμV/m)	Measurement distance
30 - 88	30.0	10
88 – 216	33.5	10
216 – 960	36.0	10
Above 960	54.0	3

Plot 1: 30 MHz – 1 GHz, horizontal & vertical polarisation

Not performed - See test report 1-5865/13-09-02-A for further information.

Plot 2: 1 GHz – 12.75 GHz, horizontal & vertical polarisation



Result:

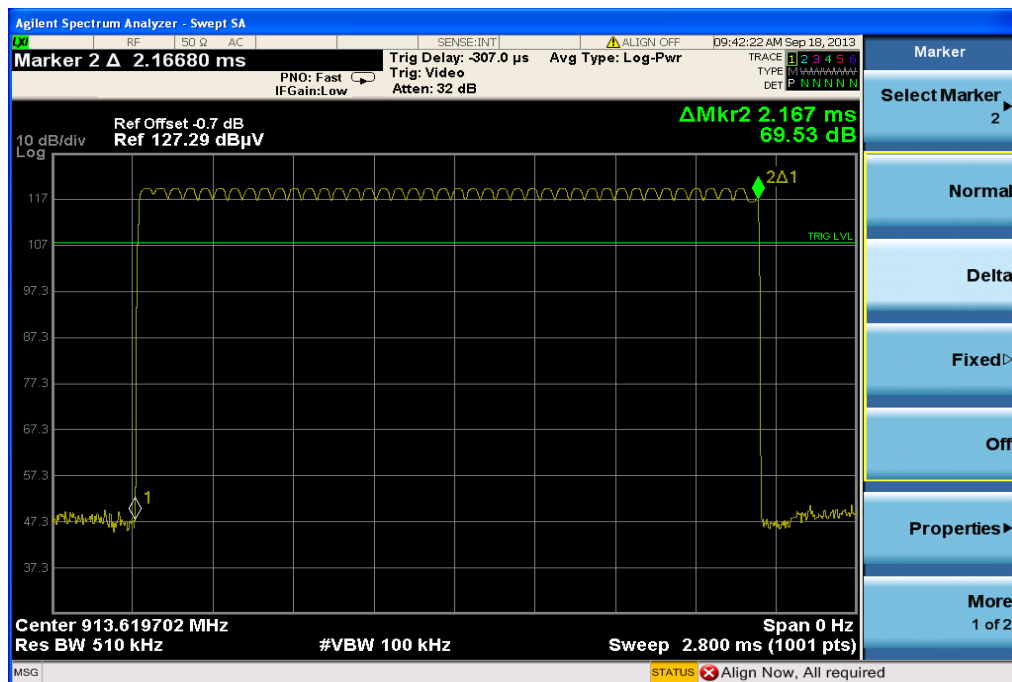
For radiated spurious emission the limits of 15.209 applies for all frequencies mentioned in 15.205. According to FCC Public Notice DA 00-705 (ANSI C63.10) the average emission shall be determined by using Video averaging (VBW = 10 Hz). If the dwell time of the hopping signal is less than 100 ms (per channel), the VBW=10 Hz reading may be adjusted by a factor:

$$F = 20 \cdot \log (\text{dwell time}/100 \text{ ms})$$

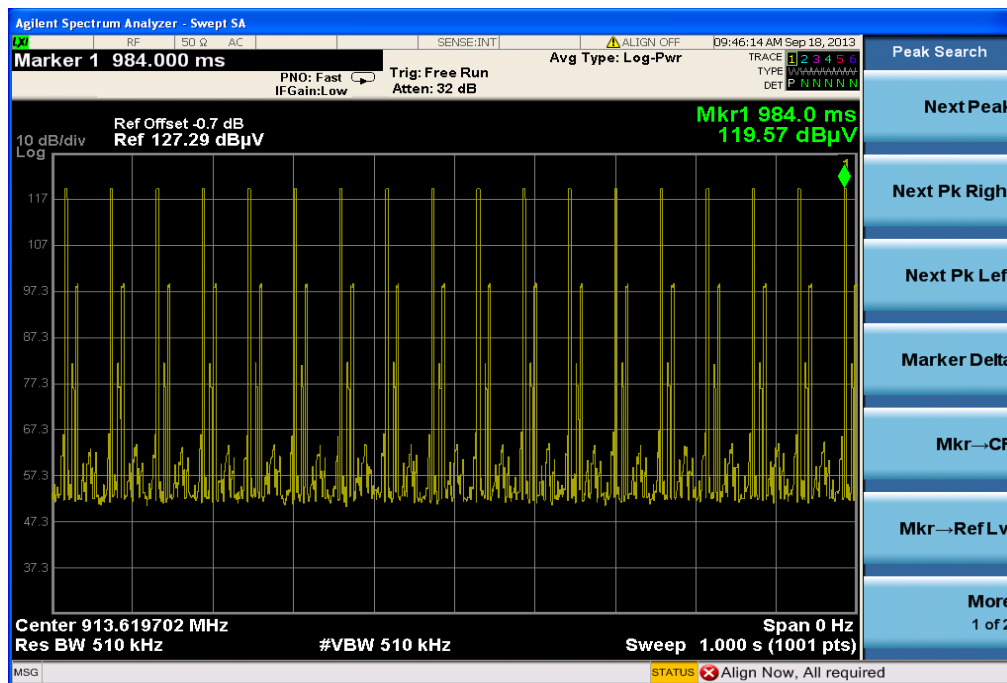
In a period of 100 ms, we have a maximum of 2 transmissions and that gives the correction factor for spurious measurement.

$$F = 20 \cdot \log (2 \cdot 2.167/100) = -27.26 \text{ dB}$$

Plot 7: Time slot length = 2.167 ms



Plot 8: Number of hopping channels in 1s = 18



SPURIOUS EMISSIONS LEVEL [dBμV/m]								
904.5 MHz			915.3 MHz			926.1 MHz		
Frequency [MHz]	Detector	Level [dBμV/m]	Frequency [MHz]	Detector	Level [dBμV/m]	Frequency [MHz]	Detector	Level [dBμV/m]
-/-	-/-	-/-	-/-	-/-	-/-	2778	Pk/ *AVG	68.2/36.04
						3703	Pk/ *AVG	65.3/32.33
For all other emissions see test report 1-5865/13-09-02-A.								
Measurement uncertainty			±3 dB					

*AVG: Detector Average corrected with the correction factor F = -27.26 dB

Result: **Passed**

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.	DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2818A03450	300001040	Ve	12.01.2012	12.01.2015
2	n. a.	Double-Ridged Waveguide Horn Antenna 1-18.0GHz	3115	EMCO	8812-3088	300001032	vIKI!	08.05.2013	08.05.2015
3	n. a.	Anechoic chamber	FAC 3/5m	MWB / TDK	87400/02	300000996	ev		
4	n. a.	Switch / Control Unit	3488A	HP Meßtechnik	*	300000199	ne		
5	9	Artificial Mains 9 kHz to 30 MHz	ESH3-Z5	R&S	828576/020	300001210	Ve	30.01.2014	30.01.2016
6	n. a.	Switch / Control Unit	3488A	HP Meßtechnik	2719A15013	300001156	ne		
7	9	Isolating Transformer	MPL IEC625 Bus Regeltrennt ravo	Erfi	91350	300001155	ne		
8	n. a.	Three-Way Power Splitter, 50 Ohm	11850C	HP Meßtechnik		300000997	ne		
9	90	Active Loop Antenna 10 kHz to 30 MHz	6502	Kontron Psychotech	8905-2342	300000256	k	13.06.2013	13.06.2015
10	n. a.	Amplifier	js42-00502650-28-5a	Parzich GMBH	928979	300003143	ne		
11	n. a.	Band Reject filter	WRCG185 5/1910-1835/1925-40/8SS	Wainwright	7	300003350	ev		
12	n. a.	Band Reject filter	WRCG240 0/2483-2375/2505-50/10SS	Wainwright	11	300003351	ev		
13	n. a.	Highpass Filter	WHKX7.0/1 8G-8SS	Wainwright	18	300003789	ne		
14	n. a.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	371	300003854	vIKI!	14.10.2011	14.10.2014
15	n. a.	MXE EMI Receiver 20 Hz bis 26,5 GHz	N9038A	Agilent Technologies	MY51210197	300004405	k	13.03.2014	13.03.2015

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
 vIKI! 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

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:

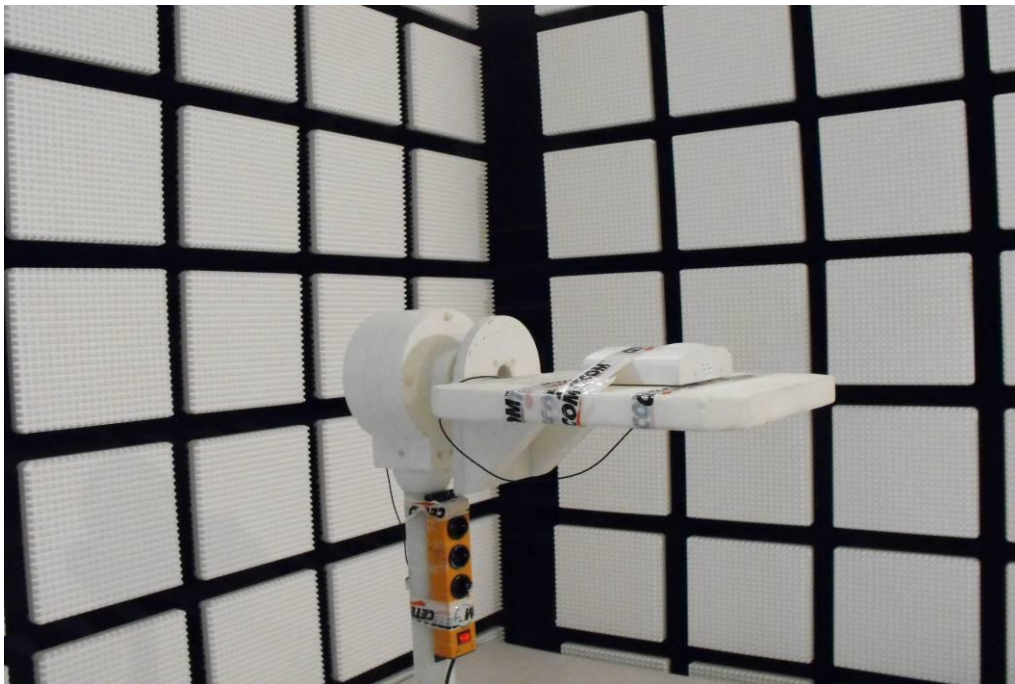


Photo 3:



Photo 4:

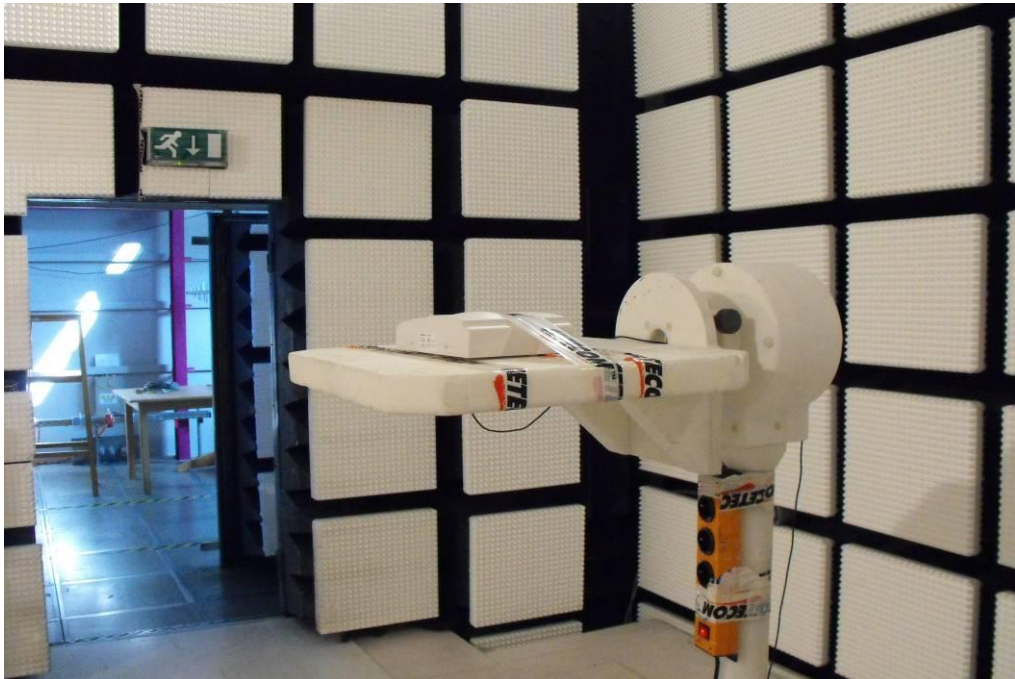


Photo 5:

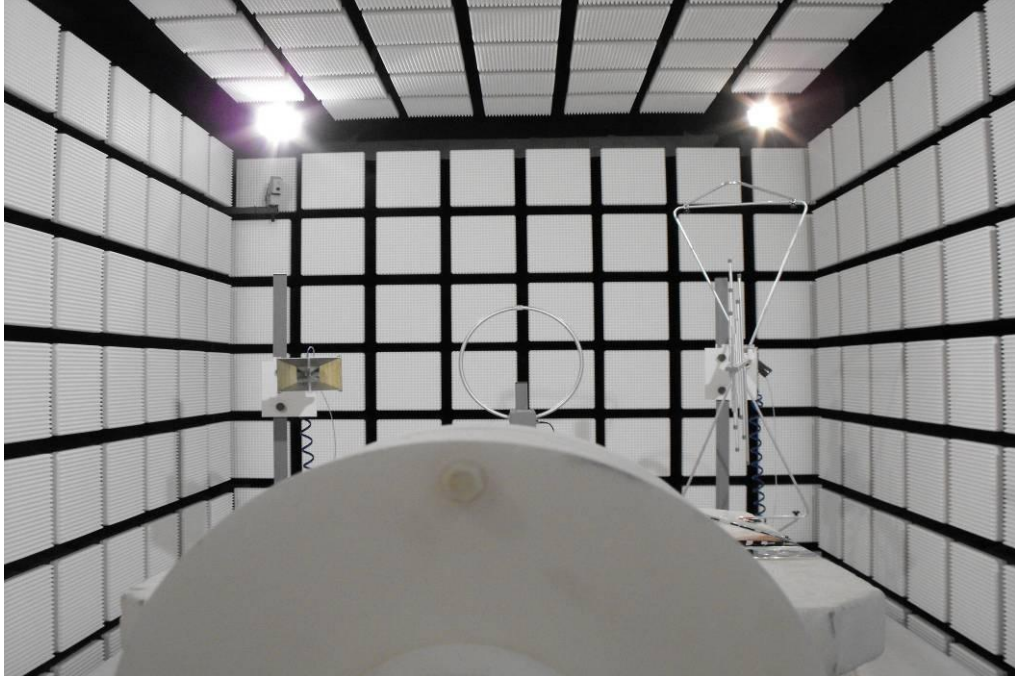
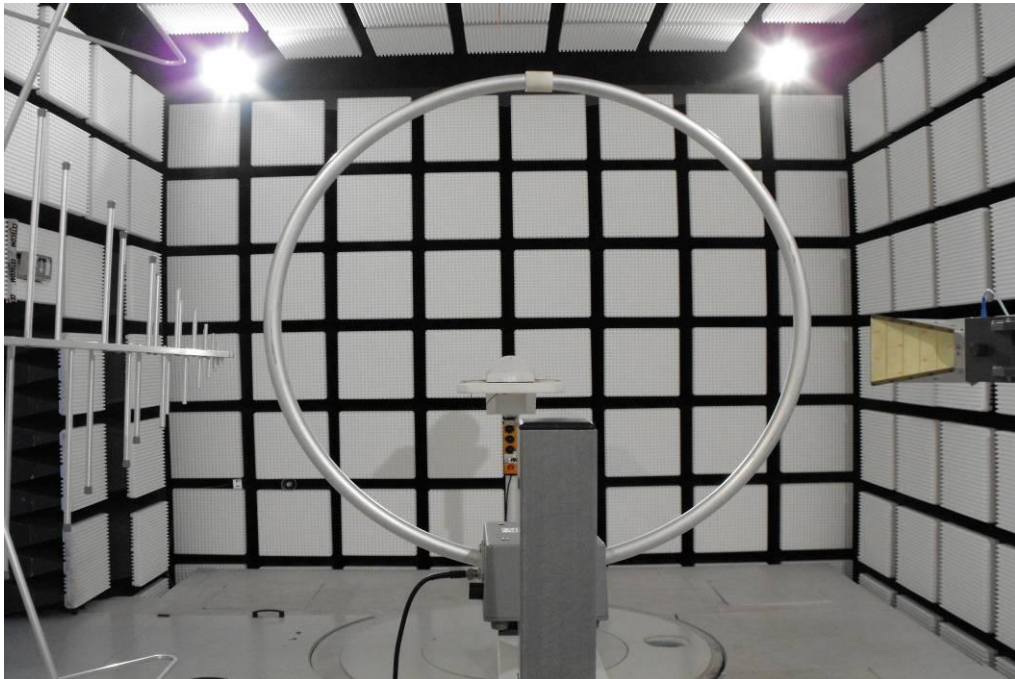


Photo 6:



Annex B External photographs of the EUT

Photo documentation:

Photo 1:



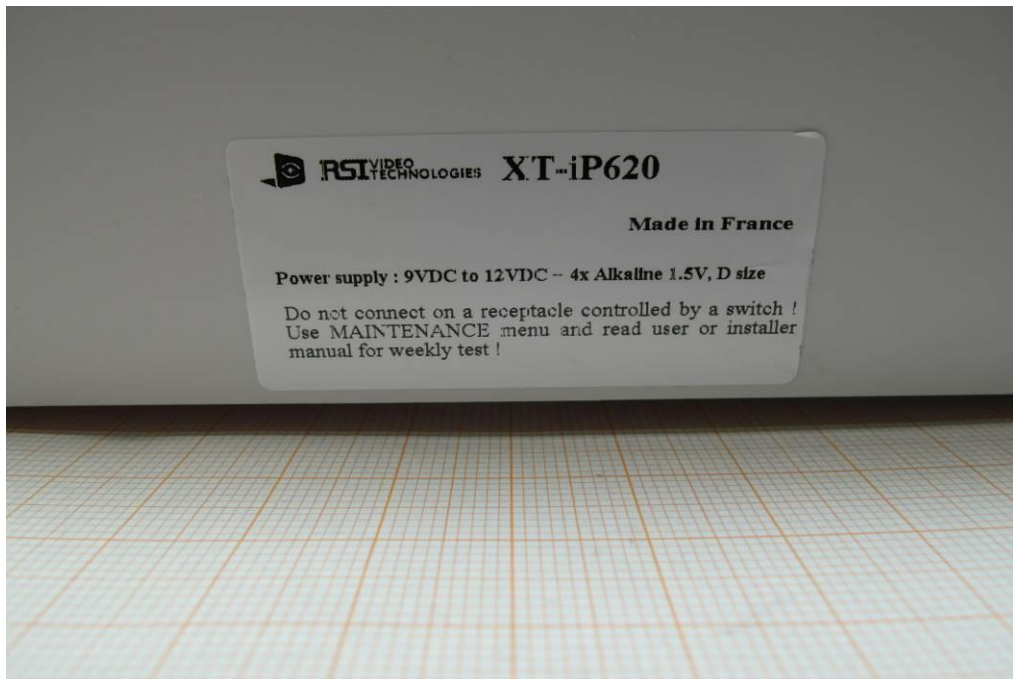
Photo 2:



Photo 3:



Photo 4:



Annex C Internal photographs of the EUT

Photo documentation:

Photo 1:



Photo 2:



Photo 3:

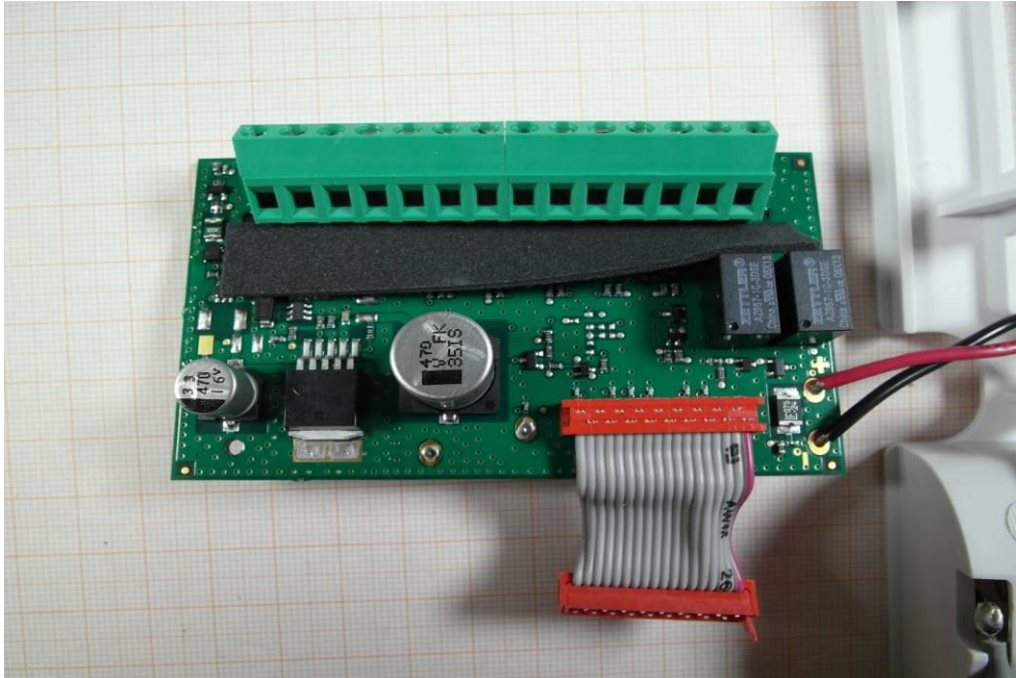


Photo 4:

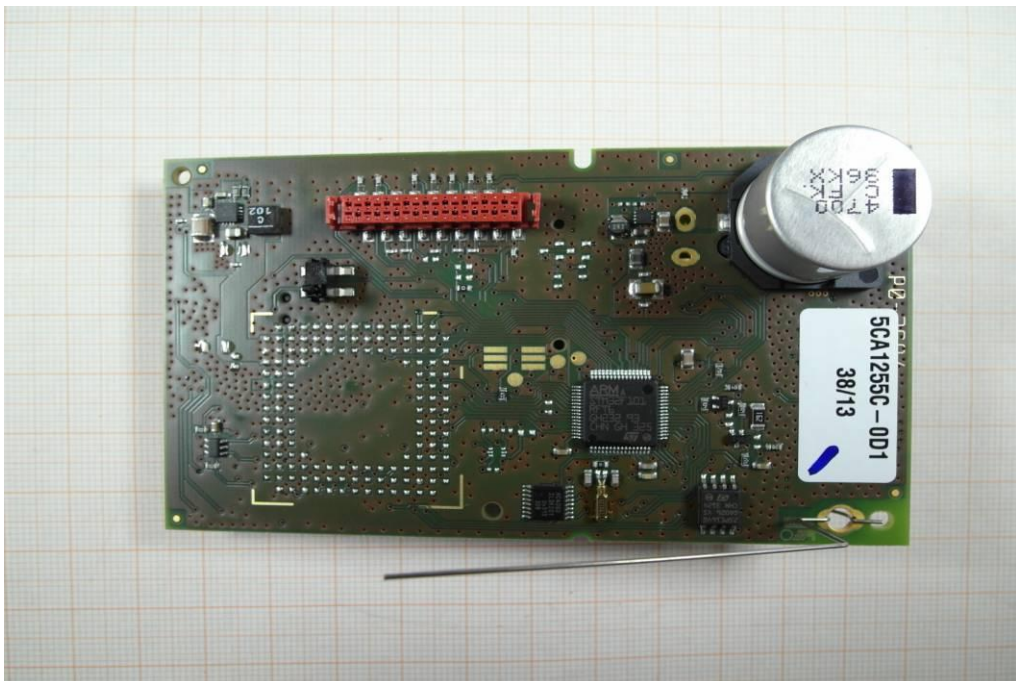


Photo 5:



Photo 6:



Annex D Document history

Version	Applied changes	Date of release
1.0	Initial release	2014-04-04
-A	Added information for IC, model name changed	2014-04-29

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

Back side of certificate