



TEST REPORT

Test report no.: 1-5865/13-02-03



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

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

Low-power Licence-exempt Radiocommunication Devices (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: Wireless Keypad Alarm Model name: WMB611/WMB621

FCC ID: X46WMB621
IC: 8816A-WM00
Frequency: 13.56 MHz
Technology tested: RFID

Antenna: Integrated coil antenna

Power Supply: 3.6V DC by Lithium battery (SAFT LS14500)

Temperature Range: -30°C to +60°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:
Tobias Wittenmeier 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: 2013-02-04
Date of receipt of test item: 2013-02-25
Start of test: 2013-02-25
End of test: 2013-02-27

Person(s) present during the test: -/-

3 Test standard/s

Test standard	Date	Test standard description
47 CFR Part 15	2010-10	Title 47 of the Code of Federal Regulations; Chapter I Part 15 - Radio frequency devices
RSS - 210 Issue 8	2010-12	Spectrum Management and Telecommunications - Radio Standards Specification Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment

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4 Test environment

T_{nom} +22 °C during room temperature tests

Temperature: T_{max} +60 °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

V_{nom} 3.6 V DC by Lithium battery (SAFT LS14500)

Power supply: V_{max} 3.9 V

 V_{min} 3.3 V

5 Test item

Kind of test item	:	Wireless Keypad Alarm		
Type identification	:	WMB611/WMB621		
S/N serial number	:	Rad. 4B434912C61A0005		
HW hardware status	:	Unknown		
SW software status	:	Unknown		
Frequency band [MHz]	:	13.56 MHz		
Type of radio transmission	:	Modulated carrier		
Use of frequency spectrum	:	Modulated Carrier		
Type of modulation	:	NON		
Number of channels	:	1		
Antenna	:	Integrated coil antenna		
Power supply	:	3.6 V DC by Lithium battery (SAFT LS14500)		
Temperature range	:	-30°C to +60 °C		

6 Test laboratories sub-contracted

None

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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	CFR Part 15 RSS 210, Issue 8, Annex 2.6	Passed	2013-03-19	-/-

Test Specification Clause	Test Case	Temperature Conditions	Power Source Voltages	Pass	Fail	NA	NP	Remark
§ 15.35 (c)/ RSS-GEN Issue 3	Timing of the transmitter (Duty cycle correction factor)	Nominal	Nominal					complies
RSS-GEN Issue 3	99 % emission bandwidth	Nominal	Nominal					complies
§ 15.225 (a)/ RSS-210 Issue 8 Annex 2.6	Fieldstrength of Fundamental	Nominal	Nominal	\boxtimes				complies
§ 15.209/ RSS-210 Issue 8 Annex 2.6	Fieldstrength of harmonics and spurious	Nominal	Nominal	\boxtimes				complies
§ 15.225 (e)/	Eroguenov telerance	Nominal	Extreme	\boxtimes				complies
RSS-210 Issue 8 Annex 2.6	Frequency tolerance	Extreme	Nominal	\boxtimes				complies

Note: NA = Not Applicable; NP = Not Performed

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8 RF measurements

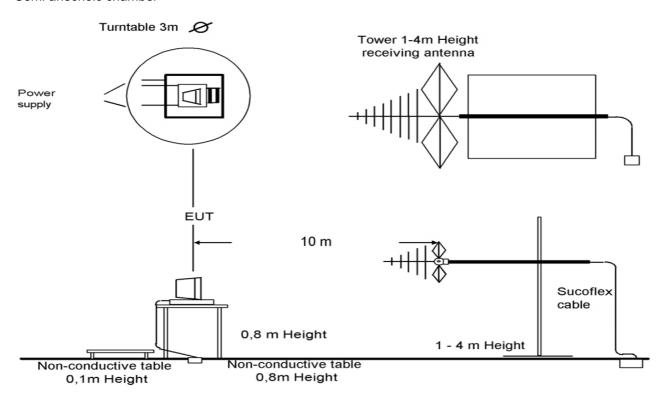
8.1 Description of test setup

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

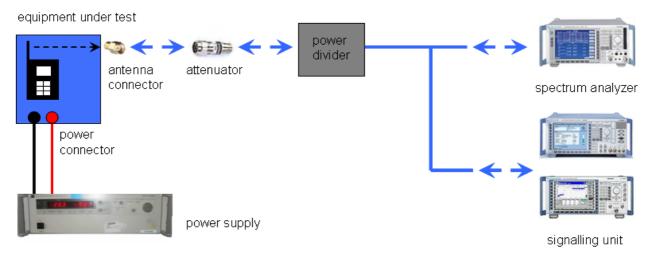
The EUT is powered by an external power supply with nominal voltage. The signalling is performed from outside the chamber with a signalling unit (CMU200 or other) by air link using signalling antenna.

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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

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8.3 RSP100 test report cover sheet / performance test data

Test Report Number	:	1-5865/13-02-03
Equipment Model Number	:	WMB611/WMB621
Certification Number	:	8816A-WM00
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, A2.6
Open Area Test Site IC No.	:	IC 3462C-1
Frequency Range or fixed frequency	:	13.56 MHz
Field Strength [dBµV/m] (at which distance)	:	68.5 @ 10m
Occupied bandwidth (99%-BW) [MHz]	:	8.6 kHz
Type of modulation	:	NON
Emission Designator (TRC-43)	:	8K6N0N
Antenna Information	:	Integrated coil antenna
Transmitter Spurious (worst case) [dBμV/m @ 3m]	:	26.1 dBμV/m @ 678.0 MHz Quasi - Peak

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:

2013-03-19 Tobias Wittenmeier

Date Name Signature

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9 Measurement results

9.1 Timing of the transmitter

Measurement:

Measurement parameter					
Detector:	-/-				
Sweep time:	-/-				
Resolution bandwidth:	-/-				
Video bandwidth:	-/-				
Span:	-/-				
Trace-Mode:	-/-				

Limits:

FCC	IC
Timing of the	e transmitter

(c) Unless otherwise specified, e.g. Section 15.255(b), when the radiated emission limits are expressed in terms of the average value of the emission, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value. The exact method of calculating the average field strength shall be submitted with any application for certification or shall be retained in the measurement data file for equipment subject to notification or verification.

Duty cycle: 100%

Result: passed

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9.2 Field strength of the fundamental

Measurement:

Measurement parameter				
Detector:	Quasi Peak			
Resolution bandwidth:	200 Hz up to 150 kHz, 9 kHz up to 30 MHz, 120 kHz up to 1 GHz			
Video bandwidth:	≥ RBW			
Trace-Mode:	Max Hold			

Limits:

FCC		IC		
Fundamental Frequency (MHz)	Field strength o (µV/m / d		Measurement distance (m)	
	15848 μV/m (84 dBµV/m)	30	
13.553 to 13.567 158489 (104 dB)		•	10 (Recalculated acc. to FCC part15.31 (f2)	

Result:

TEST CO	NDITIONS	MAXIMUM POWER (dBμV/m)			
Frequ	uency	13.56 MHz 13.56 MHz			
Mo	ode	at 10 m distance	at 30 m distance		
T _{nom}	T _{nom} V _{nom}		48.5*		
Measuremen	nt uncertainty	±30	IB		

^{*} Limits recalculated from 10m to 30m with 40 dB/decade according to FCC 15.31 (f2).

Result: passed

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9.3 99 % emission bandwidth

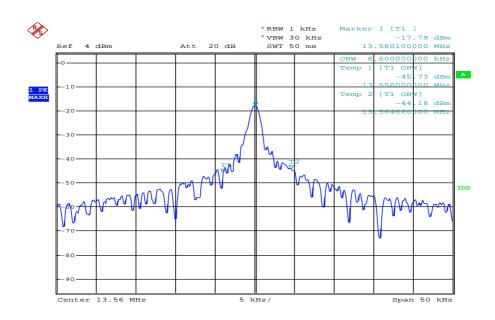
Measurement:

Measurement parameter					
Detector:	Peak				
Resolution bandwidth:	> 1 % span				
Video bandwidth:	≥ RBW				
Trace-Mode:	Max Hold				

Results:

	NDITIONS	99 % emission bandwidth 13.56 MHz		
Frequency		10.00 WI IZ		
T _{nom}	V _{nom}	8.6 kHz		
Measureme	nt uncertainty	± RBW		

Plot:



Date: 27.FEB.2013 09:07:37

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9.4 Field strength of the harmonics and spurious

Measurement:

Measurement parameter					
Detector:	Quasi Peak / Average				
Sweep time:	Auto				
Resolution bandwidth:	120 kHz				
Video bandwidth:	300 kHz				
Span:	See plots!				
Trace-Mode:	Max hold				

Limits:

FCC			IC	
Fie	eld strength of the ha	rmonics and sp	urious.	
Frequency (MHz)	Field streng	jth (μV/m)	Measurement dis	stance (m)
0.009 - 0.490	2400/F	(kHz)	300	
0.490 - 1.705	24000/F	(kHz)	30	
1.705 – 30	30 (29.5 c	lBμV/m)	30	
30 – 88	100 (40 d	BµV/m)	3	
88 – 216	150 (43.5	dBμV/m)	3	
216 – 960	200 (46 d	BμV/m)	3	

Result:

	EMISSION LIMITATIONS						
f [MHz]	Detector	Results					
			No critical peaks detected!				

Result: passed

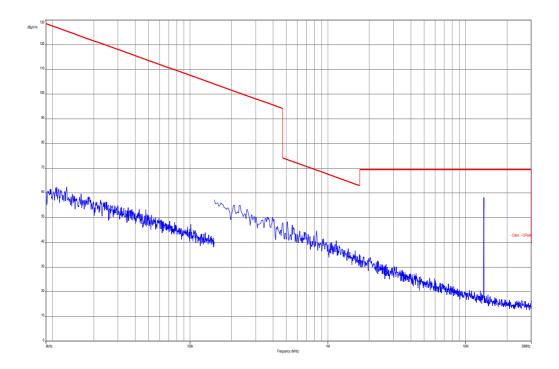
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Plots of the measurements

Plot 1: 9 kHz – 30 MHz; Part 15.209 Magnetics, Measurement distance 3m

Transmit frequency 13.56 MHz



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Plot 2: 30 MHz - 1000 MHz; Transmit frequency 13.56 MHz

CETECOM ICT Services GmbH

Common Information

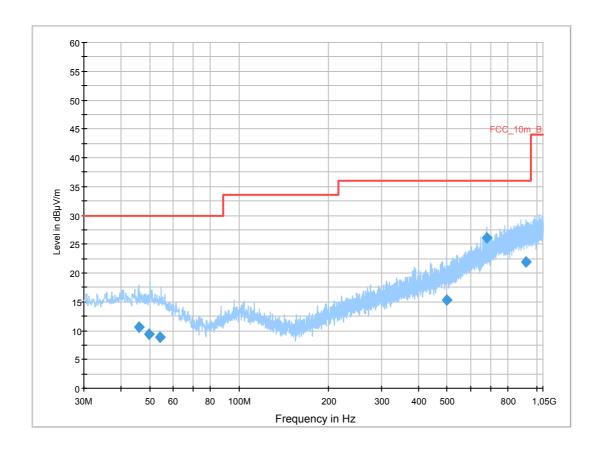
EUT: WMB621 Keypad
Serial Number: 4B434912C61A0005
Test Description: FCC part 15 class B @ 10m
Operating Conditions: cont. TX 13,56 MHz (RFID)

Operator Name: Hennemann
Comment: battery powered

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)

Receiver: [ESCI 3] Level Unit: dBµV/m



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Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidt h (kHz)	Height (cm)	Polarizatio n	Azimut h (deg)	Corr. (dB)	Margi n (dB)	Limit (dBµV/m)	Comment
45.991350	10.6	1000.0	120.000	170.0	Н	-10.0	13.3	19.4	30.0	
49.527450	9.4	1000.0	120.000	155.0	Н	261.0	13.4	20.6	30.0	
54.162450	8.8	1000.0	120.000	170.0	V	81.0	13.0	21.2	30.0	
498.928350	15.3	1000.0	120.000	170.0	Н	280.0	18.7	20.7	36.0	
677.994000	26.1	1000.0	120.000	135.0	Н	3.0	21.9	9.9	36.0	
921 187650	21.9	1000.0	120.000	170.0	Н	10.0	25.3	14.1	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]

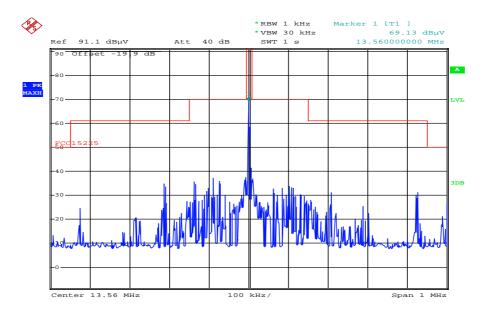
@ GPIB0 (ADR 9), FW REV 3.12

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Plot 3: Spectrum mask part15.225 (a, b, c, d)

Limits recalculated from 30 m to 10 m with 40 dB/decade according to FCC 15.31 (f2)



Date: 27.FEB.2013 09:37:22

The transmitter holds the requirements of FCC 15.225 (a, b, c and d)

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9.5 Frequency tolerance

Measurement:

Measurement parameter					
Detector:	Positive peak				
Sweep time:	Auto				
Resolution bandwidth:	10 Hz				
Video bandwidth:	30 Hz				
Trace-Mode:	Clear – write				

Limits:

FCC

The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.

Result: passed

	Frequency tolerance									
Over	temperature v	ariation	Over voltage variation							
Lir	nit is +/- 1.356	kHz	Lin	nit is +/- 1.356	kHz		-/-			
T (°C)]	Frequency	result	Power voltage	Frequency	result	F [MHz]	Detector	Level [µV/m]		
-30°	13.55993	Pass	3.3 V	13.56004	Pass					
-20°	13.56001	Pass	3.4 V	13.56004	Pass					
-10°	13.56008	Pass	3.5 V	13.56004	Pass					
0°	13.56008	Pass	3.6 V	13.56004	Pass					
10°	13.56007	Pass	3.7 V	13.56004	Pass		-/-			
20°	13.56006	Pass	3.8 V	13.56004	Pass		-/-			
30°	13.56003	Pass	3.9 V	13.56004	Pass					
40°	13.56001	Pass								
50°	13.55999	Pass								
60°	13.56000	Pass								
Mea	surement unce	ertainty			±100	Hz				

9.6 AC line conducted

Not applicable!

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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	Туре	Manufact.	Serial No.	INV. No Cetecom	Kind of Calibration	Last Calibration	Next Calibration
1	ECT-0002	Temperature and Climatic Test Chamber	VUK04/150 0	Heraeus Voetsch	31098	300001507	ev	20.09.2011	20.09.2013
2	n. a.	Power Supply	LA30/5GA	Zentro Elektronik	2046	300000711	NK!		
3	n. a.	Spectrum Analyzer 9kHz to 30GHz - 140+30dBm	FSP30	R&S	100886	300003575	k	22.08.2012	22.08.2014
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	ev		
7	n. a.	Switch / Control Unit	3488A	HP Meßtechnik	*	300000199	ne		
8	n. a.	Switch / Control Unit	3488A	HP Meßtechnik	2719A15013	300001156	ne		
9	n. a.	Three-Way Power Splitter, 50 Ohm	11850C	HP Meßtechnik		300000997	ne		
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	Schwarzbe ck	371	300003854	vlKI!	14.10.2011	14.10.2014
15	n. a.	MXE EMI Receiver 20 Hz bis 26,5 GHz	N9038A	Agilent Technologi es	MY51210197	300004405	k	19.12.2011	19.02.2014

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

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11 Observations

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

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Annex A Photographs of the test setup

Photo documentation:

Photo 1:

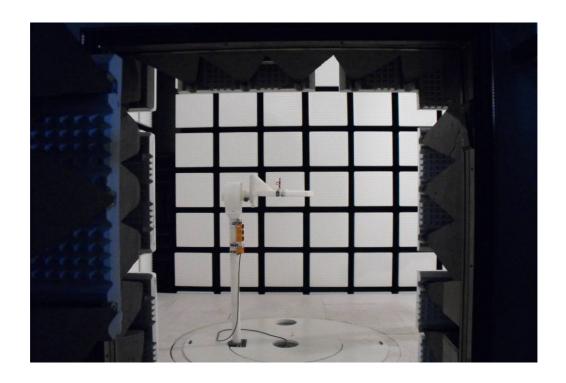
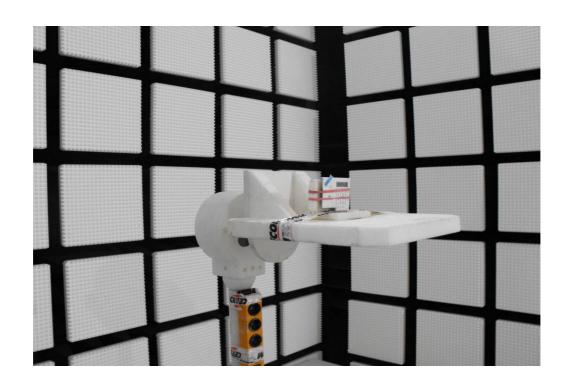


Photo 2:



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Photo 3:

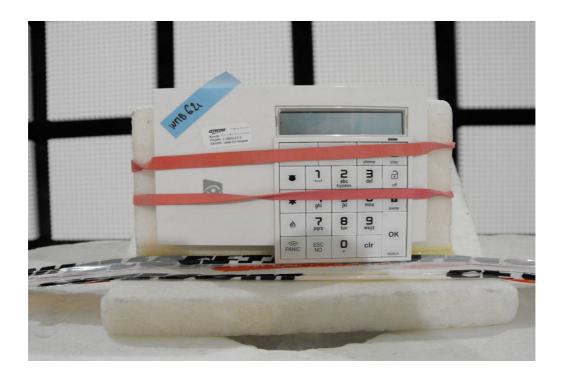


Photo 4:



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Photo 5:



Photo 6:



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Photo 7:

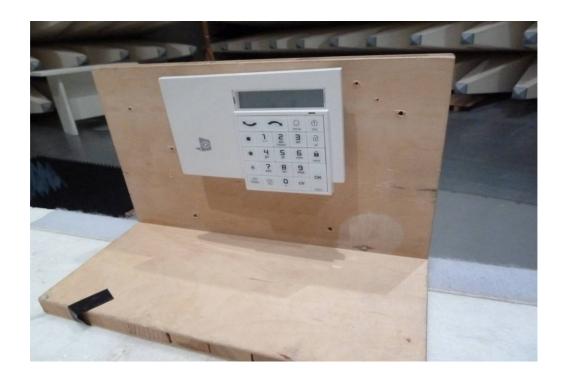
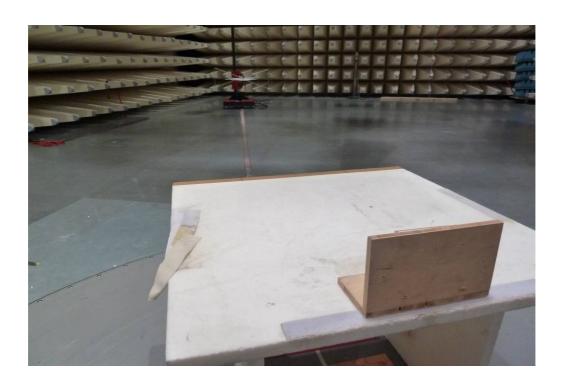


Photo 8:



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Annex B External photographs of the EUT

Photo documentation:

Photo 1:



Photo 2:



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Photo 3:



Photo 4:



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Photo 5:



Photo 6:



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Annex C Internal photographs of the EUT

Photo documentation:

Photo 1:



Photo 2:



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Photo 3:

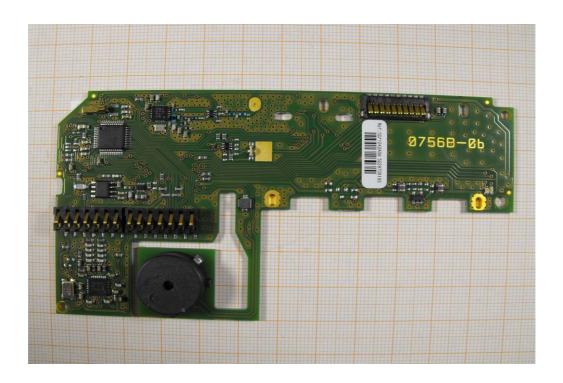


Photo 4:



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Annex D Document history

Version	Applied changes	Date of release	
1.0	Initial release	2013-03-19	

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

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Annex F Accreditation 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/eu/de/cetecom-group/europa/deutschland-saarbruecken/akkreditierungen.html

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