



# **TEST REPORT**

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



#### **Testing laboratory**

#### **CETECOM ICT Services GmbH**

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ict@cetecom.com

#### **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

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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: Alarm control unit

 Model name:
 XT-iP630

 FCC ID:
 X46XT03

 IC:
 8816A-XT03

Frequency: ISM band 902 MHz – 928 MHz

(lowest channel 904.5 MHz; highest channel 926.1 MHz

Technology tested: Proprietary FHSS system with FSK modulation

Antenna: Integrated antenna

Power Supply: 12.0V 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:	Test performed:
Andreas Luckenbill Expert	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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In no case this test report can be considered as a Letter of Approval.

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: 2013-02-05
Date of receipt of test item: 2013-05-13
Start of test: 2013-05-21
End of test: 2013-05-22

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

#### 3 Test standard/s

Test standard	Date	Test standard description
47 CFR Part 15	01.10.2012	Title 47 of the Code of Federal Regulations; Chapter I Part 15 - Radio frequency devices
RSS - 210 Issue 8	01.12.2012	Spectrum Management and Telecommunications - Radio Standards Specification Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment

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## **Test environment**

 $T_{\mathsf{nom}}$ +22 °C during room temperature tests Temperature:

+40 °C during high temperature tests  $T_{\text{max}}$ 

 $\mathsf{T}_{\mathsf{min}}$ -10 °C during low temperature tests

Relative humidity content: 55 %

Barometric pressure: not relevant for this kind of testing

> $V_{\text{nom}} \\$ 12.0 V DC by Lithium battery

-/- V -/- V Power supply:  $V_{max}$ 

 $V_{\text{min}}$ 

#### 5 **Test item**

Kind of test item	:	Alarm control unit	
Type identification	:	XT-iP630	
S/N serial number	:	Unknown	
HW hardware status	:	Unknown	
SW software status	:	Unknown	
Francisco bond (MU-1		ISM band 902 MHz - 928 MHz	
Frequency band [MHz]	•	(lowest channel 904.5 MHz; highest channel 926.1 MHz	
Type of radio transmission	:	FUCC	
Use of frequency spectrum	:	FHSS	
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	

## **Test laboratories sub-contracted**

None

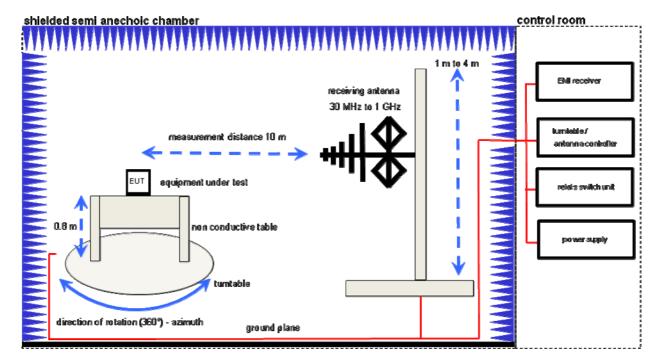
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## 7 Description of the test setup

#### 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.



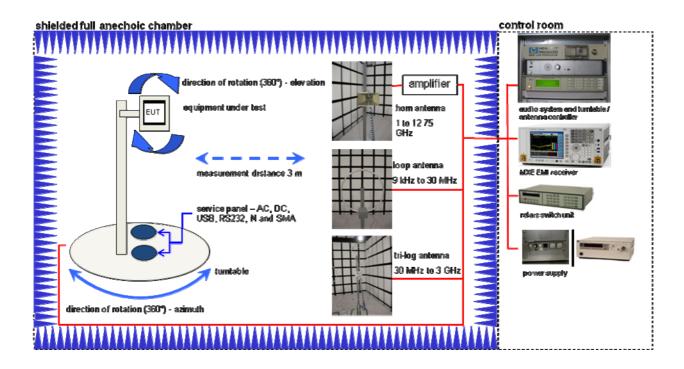
#### **Equipment table:**

Equipment	Туре	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

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## 7.2 Radiated measurements chamber C



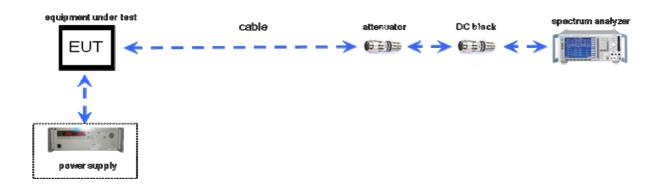
## **Equipment table:**

Equipment	Туре	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	2210	300001015	
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 30		300001155	
Three-Way Power Splitter, 50 Ohm	11850C	HP Meßtechnik		300000997	
Amplifier	js42-00502650-28-5a	a Parzich GMBH 928979 30000		300003143	

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# 7.3 Conducted measurements



## **Equipment table:**

Equipment	Туре	Manufacturer	Serial No.	INV. No Cetecom
Spectrum Analyzer 9kHz to 30GHz - 140+30dBm	FSP30	R&S	100886	300003575

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8 Summary of measurement	results
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$\boxtimes$	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	Passed	2013-06-13	-/-

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	$\boxtimes$				complies
§15.247(a)(1) (i) RSS-210 A8.1 (b)	Carrier Frequency Separation	Nominal	Nominal	TX	$\boxtimes$				complies
§15.247(a)(1)(i) RSS-210 A8.1 (c)	Number of Hopping channels	Nominal	Nominal	TX	$\boxtimes$				complies
§15.247(a)(1)(i) RSS-210 A8.1 (c)	Average Time of Occupancy (Dwell Time)	Nominal	Nominal	TX	$\boxtimes$				complies
§15.247(a)(1)(i) RSS-210 A8.1 (c)	20dB Bandwidth	Nominal	Nominal	TX	⊠				complies
§15.247(b)(2) RSS-210 A8.4 (1)	Maximum Output Power Radiated	Nominal	Nominal	TX					complies
§15.247(b)(4) RSS-210 A8.4 (1)	Maximum Output Power Conducted	Nominal	Nominal	TX					complies
§15.247(d) §15.205(a)	Band-edge Compliance	Nominal	Nominal	TX	$\boxtimes$				complies
§15.247(d)	TX Spurious Emission Conducted	Nominal	Nominal	TX	$\boxtimes$				complies
§15.209(a)	TX Spurious Emission Radiated < 30 MHz	Nominal	Nominal	TX	$\boxtimes$				complies
§15.247(d) §15.209 A8.5	TX Spurious Emission Radiated > 30 MHz	Nominal	Nominal	TX	⊠				complies
§15.109	RX Spurious Emissions Radiated	Nominal	Nominal	ldle	⊠				complies

Note: NA = Not Applicable; NP = Not Performed

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## 9 Additional comments

Reference documents: None

Special test descriptions: None

Configuration descriptions: None

Test mode: Special software is used.

EUT is transmitting pseudo random data by itself

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## 10 RSP100 test report cover sheet / performance test data

Test report number :	1-5865/13-03-02-A
Equipment model number :	XT-iP630
Certification number :	8816A-XT03
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.: 34.91 mW (FSK modulation) EIRP: 54.95 mW (FSK modulation)
Occupied bandwidth (99%-BW) [kHz] :	332 (FSK modulation)
Type of modulation :	FHSS technology with FSK modulation.
Emission designator (TRC-43) :	332KFXD (FSK modulation)
Antenna information :	Integrated wire antenna
Transmitter spurious (worst case) [dBμV/m @ 3m]:	68.18 Peak / 38.57 Average @ 3704 MHz
Receiver spurious (worst case) [dBμV/m @ 3m]:	21.7 dBμV/m (noise floor)

# 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:**

2013-06-13	Tobias Wittenmeier	
Date	Name	Signature

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#### 11 Measurement results

## 11.1 Antenna gain

The antenna gain of the complete system is calculated by the difference of radiated power in EIRP and the conducted power of the module.

	Low channel 904.5 MHz	Middle channel 915.3 MHz	High channel 926.1 MHz
Conducted power [dBm]	15.43	15.33	15.32
Radiated power [dBm]	15.0	16.0	17.4
Gain [dBi] Calculated	-0.43	+0.67	+2.08

#### Limits:

FCC	IC	
Antenna gain		

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

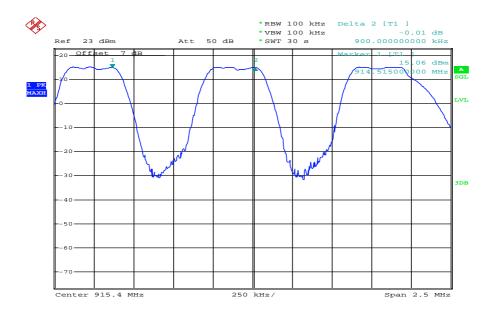
Result: Passed

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# 11.2 Carrier Frequency Separation

#### Plot 1:



Date: 21.MAY.2013 15:03:54

Result: The channel separation is: 900 kHz

#### Limits:

FCC	IC
Carrier Frequency Separation	

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

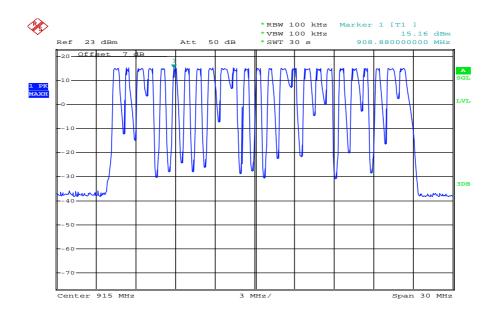
**Result: Passed** 

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## 11.3 Number of Hopping Channels

#### Plot 1:



Date: 21.MAY.2013 15:00:39

**Result:** The number of hopping channels is: 25

#### Limits:

FCC	IC	
Number of Hopping Channels		

For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies.

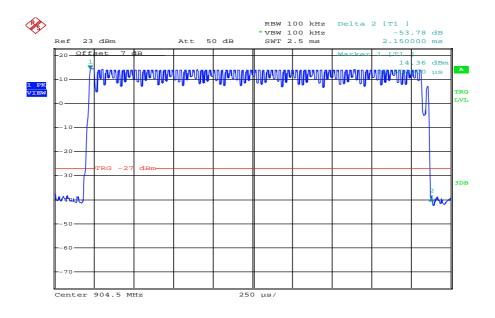
**Result: Passed** 

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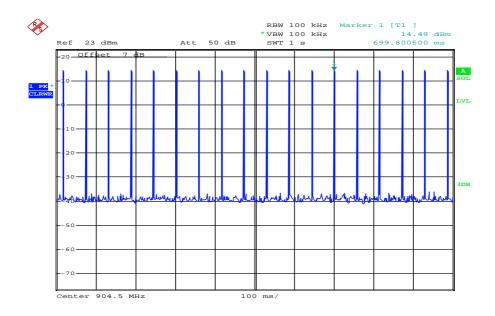
## 11.4 Average Time of Occupancy

Plot 1: Time slot length = 2.15 ms



Date: 21.MAY.2013 15:25:52

Plot 2: hops / channel @ 1s = 18



Date: 21.MAY.2013 15:20:43

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**Result:** The time slot length is = 2.15 ms

Number of hops / channel @ 1s = 18

Within 10 s period, the average time of occupancy = 10 s \* 18 \* 2.15 ms

→ The average time of occupancy = 387 ms

#### Limits:

FCC	IC	
Average time of occupancy		

For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within 10 second period.

**Result: Passed** 

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# 11.5 20 dB Bandwidth

## **Description:**

Measurement of the 20 dB bandwidth of the modulated signal.

## **Measurement:**

Measurement parameter		
Detector:	Peak	
Sweep time:	Auto	
Video bandwidth:	10 kHz	
Resolution bandwidth:	30 kHz	
Span:	See plots	
Trace-Mode:	Max Hold	

## Result:

Test Conditions		20dB BANDWIDTH [kHz]		
		904.5 MHz	915.3 MHz	926.1 MHz
T <sub>nom</sub>	$V_{nom}$	330	332	326
Measurement uncertainty		± 30 kHz		

## Limits:

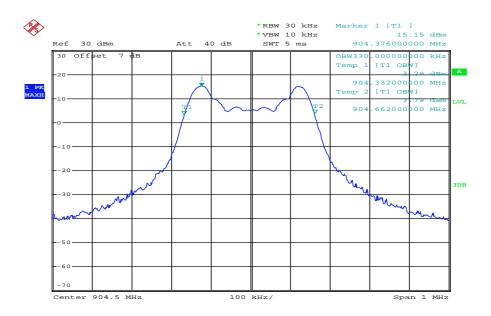
FCC	IC	
20dB Bandwidth		
The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.		

**Result: Passed** 

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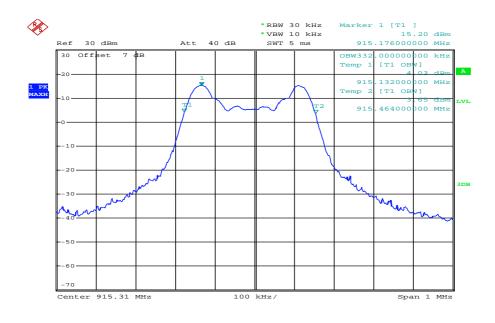


Plot 1: Low Channel



Date: 21.MAY.2013 14:29:35

Plot 2: Middle Channel

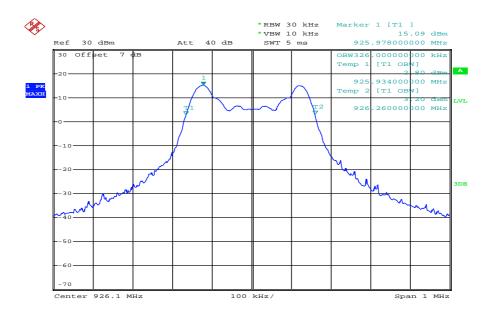


Date: 21.MAY.2013 14:28:13

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# Plot 3: High Channel



Date: 21.MAY.2013 14:26:50

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## 11.6 Maximum Output Power Radiated

#### **Measurement:**

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 <sub>nom</sub>	$V_{nom}$	15.0	16.1	17.4
Measurement uncertainty		± 3dB		

#### 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** 

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## 11.7 Maximum Output Power Conducted

#### **Measurement:**

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		Maximum Output Power Conducted [dBm]		
		904.5 MHz	915.3 MHz	926.1 MHz
T <sub>nom</sub>	$V_{nom}$	15.43	15.33	15.32
Measuremer	nt uncertainty		± 3 dB	

#### Limits:

FCC	IC	
Maximum Output Power Conducted		

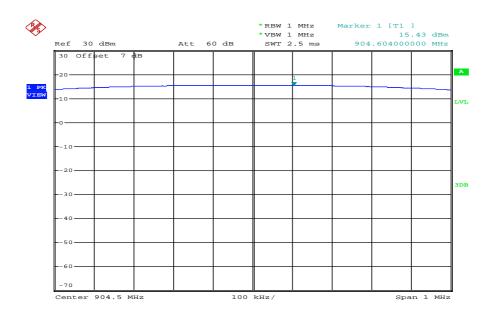
For frequency hopping systems operating in the 902–928 MHz band: 1 watt (30 dBm) for systems employing at least 50 hopping channels; and, 0.25 watts (24 dBm) for systems employing less than 50 hopping channels, but at least 25 hopping channels, as permitted under paragraph (a)(1)(i) of this section.

**Result: Passed** 

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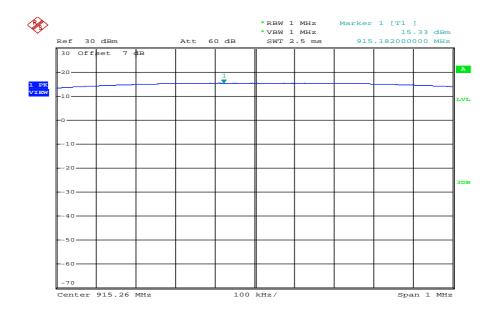


Plot 1: Low Channel



Date: 21.MAY.2013 14:21:11

Plot 2: Middle Channel

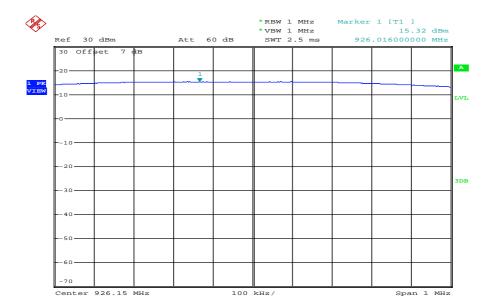


Date: 21.MAY.2013 14:22:55

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# Plot 3: High Channel



Date: 21.MAY.2013 14:24:27

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## 11.8 Spurious Emissions Conducted (Transmitter)

#### **Description:**

Measurement of the conducted spurious emissions in transmit mode. The measurement is performed at channel 00, 12 and 24.

#### **Measurement:**

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

## Limits:

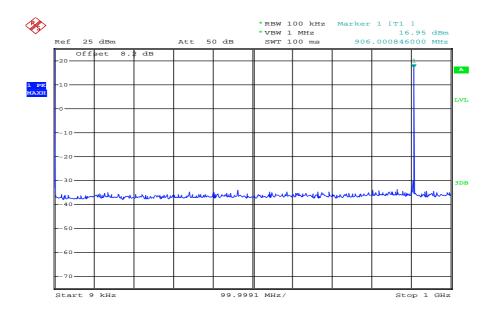
FCC	IC	
Spurious emissions conducted		

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)).

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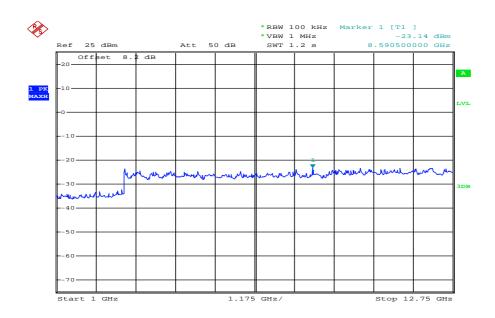


Plot 1: Low channel



Date: 21.MAY.2013 14:34:31

Plot 2: Low channel

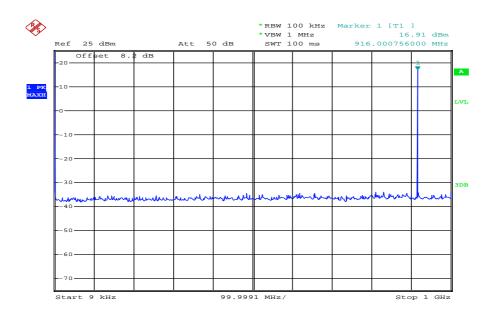


Date: 21.MAY.2013 14:40:52

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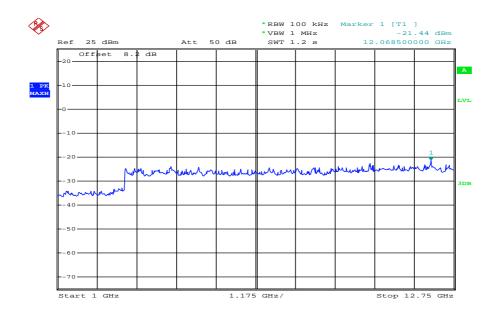


Plot 3: Middle channel



Date: 21.MAY.2013 14:35:21

Plot 4: Middle channel

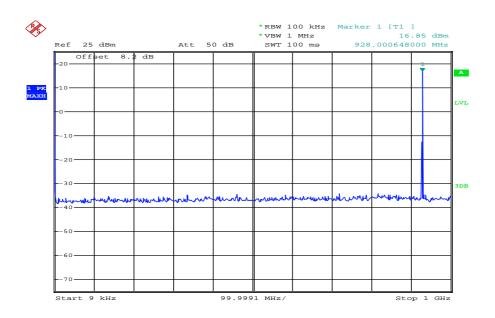


Date: 21.MAY.2013 14:38:41

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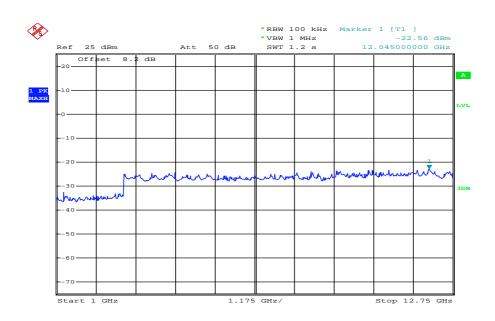


Plot 5: High channel



Date: 21.MAY.2013 14:36:12

Plot 6: High channel



Date: 21.MAY.2013 14:37:42

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#### Result:

Emission Limitation					
Frequency [MHz]		Amplitude of emission [dBm]	Limit max. allowed emission power	actual attenuation below frequency of operation [dB]	Results
904.5		16.95	24 dBm		Operating frequency
No	peaks detec	ted!	-20 dBc		Passed
915.3		16.91	24 dBm		Operating frequency
No peaks detected!		-20 dBc		Passed	
926.1		16.85	24 dBm		Operating frequency
No peaks detected!		-20 dBc		Passed	
Measurement uncertainty ± 3dB					

#### Limits:

FCC	IC
Spurious emiss	sions conducted

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)).

Result: Passed

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## 11.9 Spurious Emissions Radiated < 30 MHz

#### **Description:**

Measurement of the radiated spurious emissions in transmit mode below 30 MHz. The EUT is set to channel 12. This measurement is representative for all channels and modes. If any peaks are found channel 00 and channel 24 will be measured too. The limits are recalculated to a measurement distance of 3 m with 40 dB/decade according CFR Part 2.

#### **Measurement:**

Measurement parameter		
Detector:	Peak / Quasi Peak	
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:

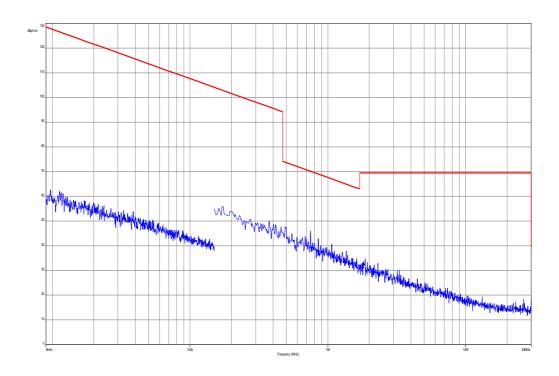
FCC		IC	
Spurious Emissions Radiated < 30 MHz		Z	
Frequency (MHz)	Field Strength (dBµV/m)		Measurement distance
0.009 - 0.490	2400/F(kHz)		300
0.490 – 1.705	24000/F(kHz)		30
1.705 – 30.0	3	0	30

Result: Passed

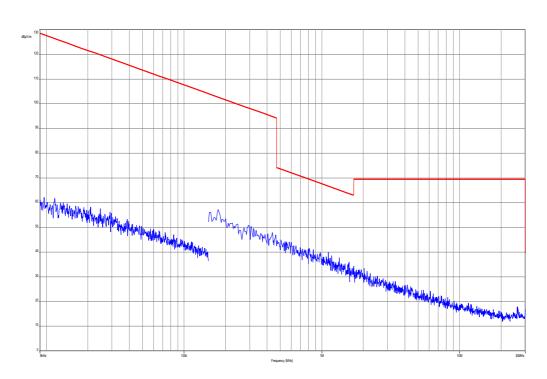
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Plot 1: TX-Mode



Plot 2: RX-Mode



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#### 11.10 Spurious Emissions Radiated (Transmitter) > 30 MHz

#### **Description:**

Measurement of the radiated spurious emissions in transmit mode. The measurement is performed at channel 00, 12 and 24.

#### **Measurement:**

Measurement parameter			
Detector:	Peak / Quasi Peak		
Sweep time:	Auto		
Video bandwidth:	Sweep: Remeasurement:	100 kHz 10 Hz	
Resolution bandwidth:	F < 1 GHz: F > 1 GHz:	100 kHz 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:  $F = 20\log (dwell time/100 ms)$ 

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

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Plot 1: 30 MHz – 1 GHz, horizontal & vertical polarisation (lowest channel)

## **Common Information**

EUT: XT-iP630

Serial Number: imei:353836050015494
Test Description: FCC part 15 C class B @ 10 m

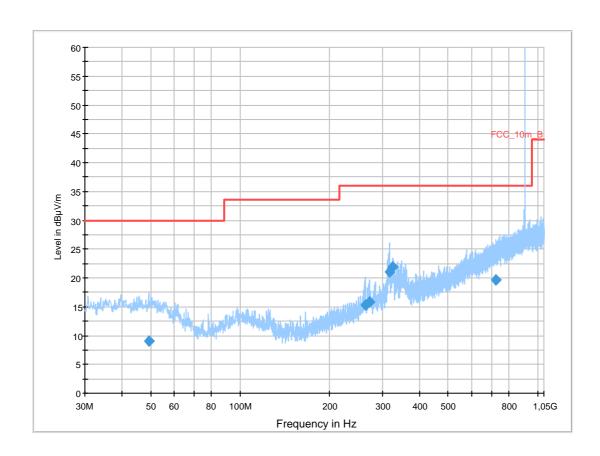
Operating Conditions: tx ch0
Operator Name: Wolsdorfer
Comment: battery powered

# Scan Setup: STAN\_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)

Receiver: [ESCI 3] Level Unit:  $dB\mu V/m$ 

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



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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
49.452300	9.1	1000.0	120.000	144.0	Н	280.0	13.4	20.9	30.0	
262.837350	15.3	1000.0	120.000	170.0	Н	10.0	13.6	20.7	36.0	
271.973550	15.8	1000.0	120.000	170.0	Н	180.0	13.9	20.2	36.0	
316.772100	21.0	1000.0	120.000	111.0	V	270.0	15.1	15.0	36.0	
326.001000	21.9	1000.0	120.000	170.0	Н	10.0	15.3	14.1	36.0	
721.300500	19.6	1000.0	120.000	120.0	V	190.0	23.0	16.4	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]

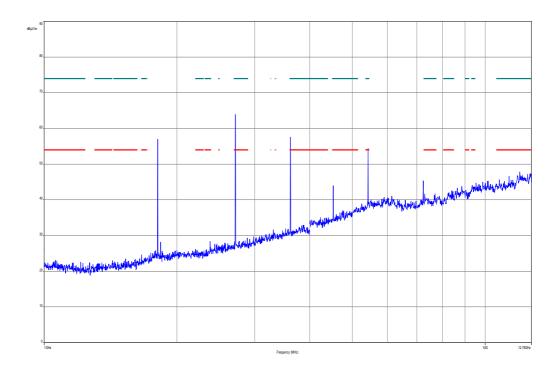
@ GPIB0 (ADR 9), FW REV 3.12

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Plot 2: 1 GHz – 12.75 GHz, horizontal & vertical polarisation (lowest channel)



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Plot 3: 30 MHz – 1 GHz, horizontal & vertical polarisation (middle channel)

## **Common Information**

EUT: XT-iP630

Serial Number: imei:353836050015494
Test Description: FCC part 15 C class B @ 10 m

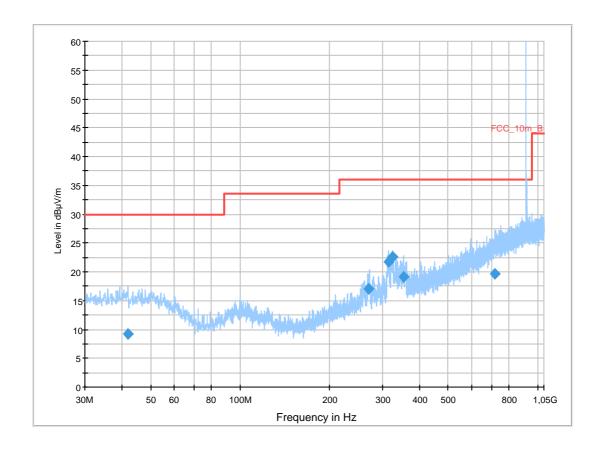
Operating Conditions: tx ch12
Operator Name: Wolsdorfer
Comment: battery powered

# Scan Setup: STAN\_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)

Receiver: [ESCI 3] Level Unit: dBµV/m

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



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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
41.950800	9.2	1000.0	120.000	152.0	V	0.0	13.4	20.8	30.0	
270.572700	17.1	1000.0	120.000	170.0	Н	171.0	13.8	18.9	36.0	
314.751000	21.8	1000.0	120.000	113.0	V	280.0	15.0	14.2	36.0	
324.867900	22.7	1000.0	120.000	170.0	Н	10.0	15.3	13.3	36.0	
354.060750	19.2	1000.0	120.000	170.0	Н	178.0	16.1	16.8	36.0	
718.630200	19.6	1000.0	120.000	170.0	Н	81.0	22.9	16.4	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]

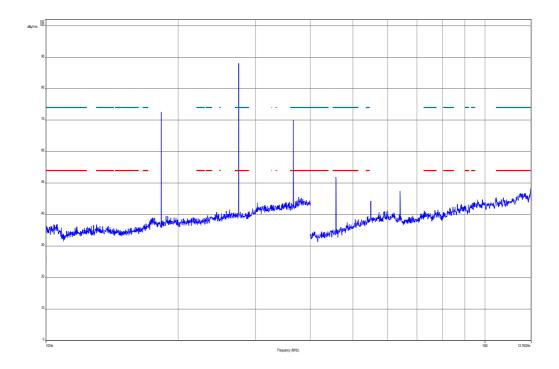
@ GPIB0 (ADR 9), FW REV 3.12

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Plot 4: 1 GHz – 12.75 GHz, horizontal & vertical polarisation (middle channel)



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Plot 5: 30 MHz – 1 GHz, horizontal & vertical polarisation (highest channel)

## **Common Information**

EUT: XT-iP630

Serial Number: imei:353836050015494
Test Description: FCC part 15 C class B @ 10 m

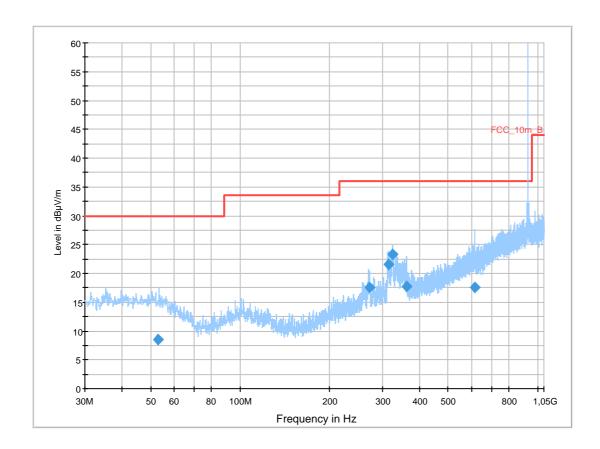
Operating Conditions: tx ch24
Operator Name: Wolsdorfer
Comment: battery powered

## Scan Setup: STAN\_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)

 $\begin{array}{ll} \text{Receiver:} & \quad \text{[ESCI 3]} \\ \text{Level Unit:} & \quad \text{dB}\mu\text{V/m} \end{array}$ 

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



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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
52.889100	8.6	1000.0	120.000	104.0	Н	182.0	13.1	21.4	30.0	
271.230600	17.5	1000.0	120.000	170.0	Н	0.0	13.8	18.5	36.0	
315.546300	21.6	1000.0	120.000	98.0	V	260.0	15.0	14.4	36.0	
325.992600	23.4	1000.0	120.000	170.0	Н	190.0	15.3	12.6	36.0	
361.561350	17.8	1000.0	120.000	98.0	V	100.0	16.3	18.2	36.0	
612.771750	17.5	1000.0	120.000	170.0	V	280.0	20.9	18.5	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]

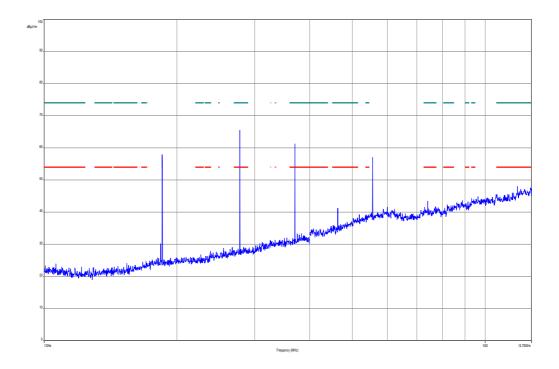
@ GPIB0 (ADR 9), FW REV 3.12

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Plot 6: 1 GHz – 12.75 GHz, horizontal & vertical polarisation (highest channel)



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#### Result:

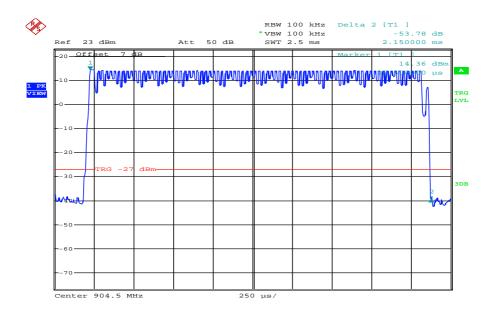
For radiated spurious emission the limits of 15.209 applies for all frequencies mentioned in 15.205. According to FCC Public Notice DA 00-705 (ANSI C63.10) the average emission shall be determined by using Video averaging (VBW = 10 Hz). If the dwell time of the hopping signal is less than 100 ms (per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

#### F = 20\*log (dwell time/100 ms)

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

$$F = 20*log (2*2.15/100) = -27.33 dB$$

Plot 7: Time slot length = 2.15 ms

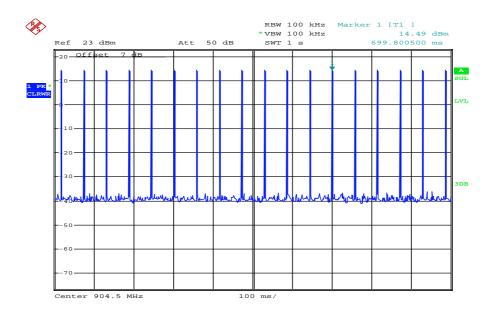


Date: 21.MAY.2013 15:25:52

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



Date: 21.MAY.2013 15:20:43

	SPURIOUS EMISSIONS LEVEL [dBµV/m]									
	904.5 MH	łz		915.3 MH	z		926.1 MH	lz		
Frequency [MHz]	Detector	Level [dBµV/m]	Frequency Detector Level [dBµV/m]		Frequency [MHz]	Detector	Level [dBµV/m]			
1809	Pk	58.42	2745	Pk/AVG*	67.21/38.94	1852	Pk	61.12		
2710	Pk/AVG*	65.87/36.99	3661	Pk/AVG*	66.77/37.01	2778	Pk/AVG*	67.29/38.56		
3620	Pk/AVG*	65.20/36.98		Pk/AVG*		3704	Pk/AVG*	68.18/38.57		
5428	Pk/AVG*	* 61.92/29.68 Pk/AVG* 5556 Pk 63.13								
Measurement uncertainty ±3 dB										

\*AVG: Detector Average corrected with the correction factor F = -27.33 dB

**Result: Passed** 

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## 11.11 RX spurious emissions radiated

## **Description:**

Measurement of the radiated spurious emissions in idle/receive mode.

## **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 26 GHz							
Trace-Mode:	Max Hold							

#### Limits:

FCC		IC			
Frequency (MHz)	Field Streng	th (dBµV/m)	Measurement distance		
30 - 88	4	0	3		
88 – 216	43	3.5	3		
216 – 960	46	5.0	3		
Above 960	54	l.0	3		

## Result:

	SPURIOUS EMISSIONS LEVEL [dBµV/m]								
	RX			-//-					
Frequency [MHz]	Detector	Level [dBµV/m]	Frequency [MHz]	Detector	Level [dBµV/m]	Frequency [MHz]	Detector	Level [dBµV/m]	
No en	nissions de	tected!							
Measu	Measurement uncertainty ±3 dB								

Result: Passed

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

#### **Common Information**

EUT: XT-iP630 Serial Number: H200D40113D

Test Description: FCC part 15 B class B @ 10 m

Operating Conditions: rx

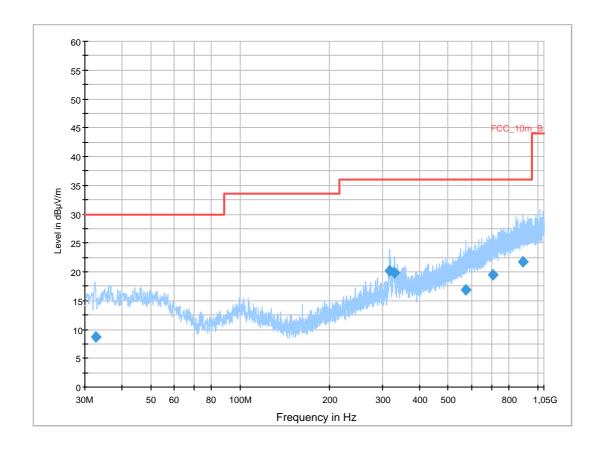
Operator Name: Wolsdorfer Comment: battery powered

# Scan Setup: STAN\_Fin [EMI radiated]

Hardware Setup: Electric Field (NOS)

Receiver: [ESCI 3] Level Unit: dBµV/m

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



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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
32.760300	8.7	1000.0	120.000	168.0	Н	265.0	12.8	21.3	30.0	
316.593750	20.1	1000.0	120.000	98.0	V	266.0	15.0	15.9	36.0	
329.385600	19.9	1000.0	120.000	168.0	Н	12.0	15.4	16.1	36.0	
574.754850	16.8	1000.0	120.000	168.0	Н	12.0	20.1	19.2	36.0	
708.073500	19.4	1000.0	120.000	168.0	Н	12.0	22.7	16.6	36.0	
889.740750	21.7	1000.0	120.000	168.0	Н	90.0	25.1	14.3	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]

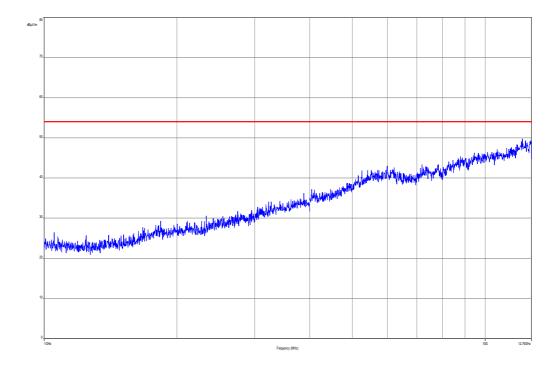
@ GPIB0 (ADR 9), FW REV 3.12

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



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#### 12 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	n. a.	Spectrum Analyzer 9kHz to 30GHz - 140+30dBm	FSP30	R&S	100886	300003575	k	22.08.2012	22.08.2014
2	n. a.	Double-Ridged Waveguide Horn Antenna 1-18.0GHz	3115	EMCO	8812-3088	300001032	vIKI!	11.05.2011	11.05.2013
3	n. a.	Active Loop Antenna	6502	EMCO	2210	300001015	ne		
4	n. a.	Anechoic chamber	FAC 3/5m	MWB / TDK	87400/02	300000996	ev		
5	n. a.	Switch / Control Unit	3488A	HP Meßtechnik	*	300000199	ne		
6	n. a.	Switch / Control Unit	3488A	HP Meßtechnik	2719A15013	300001156	ne		
7	n. a.	Three-Way Power Splitter, 50 Ohm	11850C	HP Meßtechnik		300000997	ne		
8	n. a.	Amplifier	js42- 00502650- 28-5a	Parzich GMBH	928979	300003143	ne		
9	n. a.	Band Reject filter	WRCG185 5/1910- 1835/1925- 40/8SS	Wainwright	7	300003350	ev		
10	n. a.	Band Reject filter	WRCG240 0/2483- 2375/2505- 50/10SS	Wainwright	11	300003351	ev		
11	n. a.	Highpass Filter	WHKX7.0/1 8G-8SS	Wainwright	18	300003789	ne		
12	n. a.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbe ck	371	300003854	vlKI!	14.10.2011	14.10.2014
13	n. a.	MXE EMI Receiver 20 Hz bis 26,5 GHz	N9038A	Agilent Technologi es	MY51210197	300004405	k	21.02.2013	21.02.2014
14	45	Switch-Unit	3488A	HP Meßtechnik	2719A14505	300000368	g		
15	50	DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2920A04466	300000580	ne		
16	n. a.	software	SPS_PHE 1.4f	Spitzberger & Spieß	B5981; 5D1081;B597 9	300000210	ne		
17	n. a.	EMI Test Receiver	ESCI 1166.5950. 03	R&S	100083	300003312	k	04.01.2012	04.01.2013
18	n. a.	Analyzer- Reference- System (Harmonics and Flicker)	ARS 16/1	SPS	A3509 07/0 0205	300003314	k	14.07.2011	14.07.2013
19	n. a.	Amplifier	JS42- 00502650- 28-5A	MITEQ	1084532	300003379	ev		
20	n. a.	Antenna Tower	Model 2175	ETS- LINDGREN	64762	300003745	izw		

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21	n. a.	Positioning Controller	Model 2090	ETS- LINDGREN	64672	300003746	izw	
22	n. a.	Turntable Interface-Box	Model 105637	ETS- LINDGREN	44583	300003747	izw	
23	n. a.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbe ck	295	300003787	k	

Agenda: Kind of Calibration

k calibration / calibrated ΕK limited calibration cyclical maintenance (external cyclical maintenance) ne not required (k, ev, izw, zw not required) zw periodic self verification internal cyclical maintenance ev izw blocked for accredited testing Ve long-term stability recognized vlkl! Attention: extended calibration interval

\*) next calibration ordered / currently in progress

#### 13 Observations

NK!

Attention: not calibrated

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

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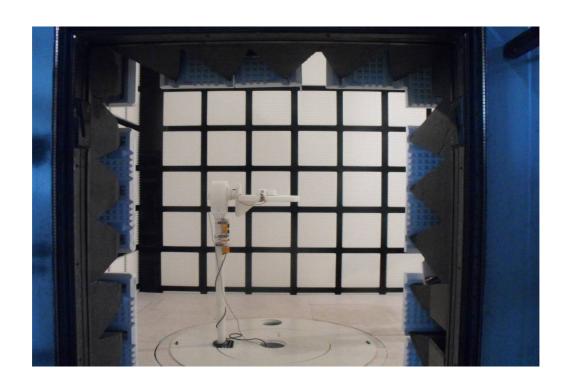
# Annex A Photographs of the test setup

Photo documentation:

Photo 1:



Photo 2:



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Photo 3:

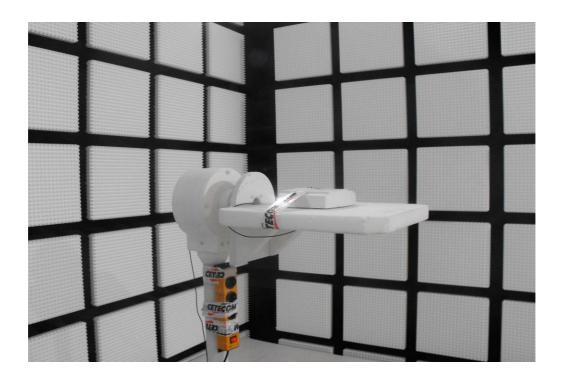


Photo 4:



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Photo 5:



Photo 6:



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## Photo 7:



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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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Photo 5:

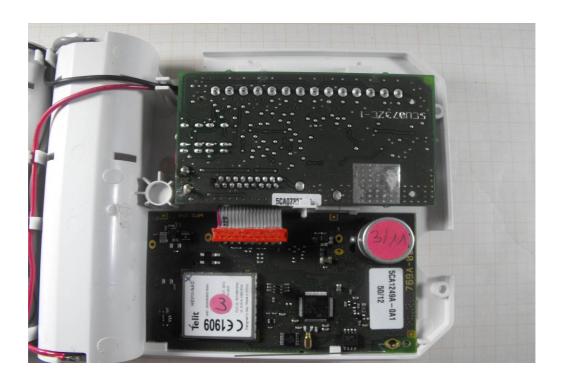
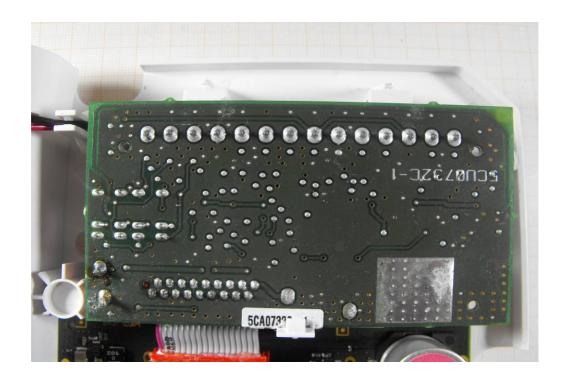


Photo 6:



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Photo 7:

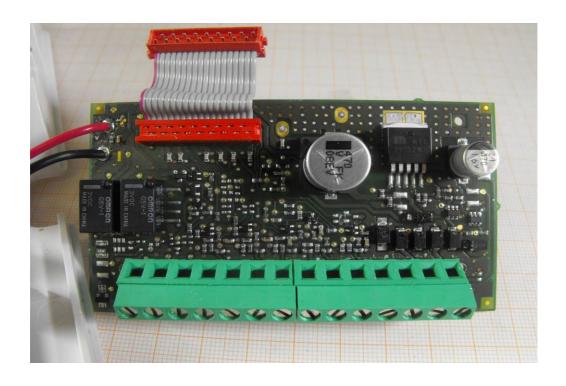


Photo 8:



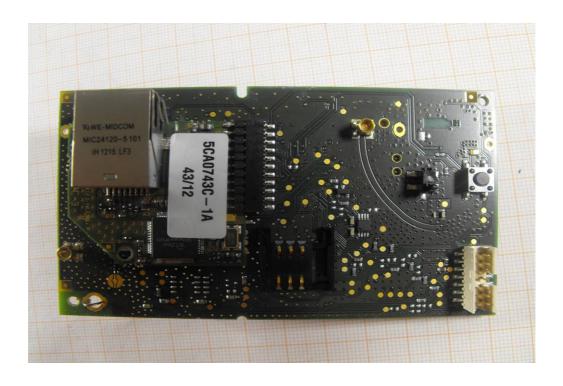
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Photo 9:



Photo 10:



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Photo 11:



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## Annex D Document history

Version	Applied changes	Date of release
1.0	Initial release	2013-06-05
-A	Editorial changings	2013-06-13

#### Annex E Further information

#### **Glossary**

SW

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

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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