

## TEST REPORT

Test report no.: 1-5177/12-01-08



### Testing laboratory

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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 Communications & Compatibility Testing (RCT)

### Applicant

**Estelec Industrie**

10, rue du Sommerberg

67750 Scherwiller / FRANCE

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### Manufacturer

**Estelec Industrie**

10, rue du Sommerberg

67750 Scherwiller / FRANCE

### Test standard/s

47 CFR Part 15

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

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

### Test Item

**Kind of test item:** StreetLight ControlBox  
**Model name:** StreetLighting automation  
**FCC ID:** 2AAOFINEBOX001  
**IC:** Not available  
**Frequency:** 902 MHz – 928 MHz  
**Technology tested:** Proprietary  
**Antenna:** External antenna  
**Power supply:** 115V AC  
**Temperature range:** -/-°C to -/-°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:



Marco Bertolino  
Testing Manager

### Test performed:



Stefan Bös  
Senior Testing Manager

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## 2 General information

### 2.1 Notes and disclaimer

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

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### 2.2 Application details

Date of receipt of order:	2012-08-02
Date of receipt of test item:	2013-09-19
Start of test:	2013-09-19
End of test:	2013-11-22
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

## 4 Test environment

Temperature:	$T_{nom}$	+22 °C during room temperature tests
	$T_{max}$	-/- °C during high temperature tests
	$T_{min}$	-/- °C during low temperature tests
Relative humidity content:		54 %
Barometric pressure:		not relevant for this kind of testing
Power supply:	$V_{nom}$	115 V AC
	$V_{max}$	-/- V
	$V_{min}$	-/- V

## 5 Test item

Kind of test item	:	StreetLight ControlBox
Type identification	:	StreetLighting automation
S/N serial number	:	0072FF00013F
HW hardware status	:	1.4.0
SW software status	:	1.A.0
Frequency band [MHz]	:	902 MHz – 928 MHz
Type of radio transmission	:	Modulated carrier
Use of frequency spectrum	:	
Type of modulation	:	2-FSK
Number of channels	:	1
Antenna	:	External antenna via BNC-connector
Power supply	:	115 V AC
Temperature range	:	-/-°C to -/- °C

### 5.1 Additional information

Test setup- and EUT-photos are included in the test report:

1-5177\_13-01-01\_AnnexA

1-5177\_13-01-01\_AnnexB

1-5177\_13-01-01\_AnnexC

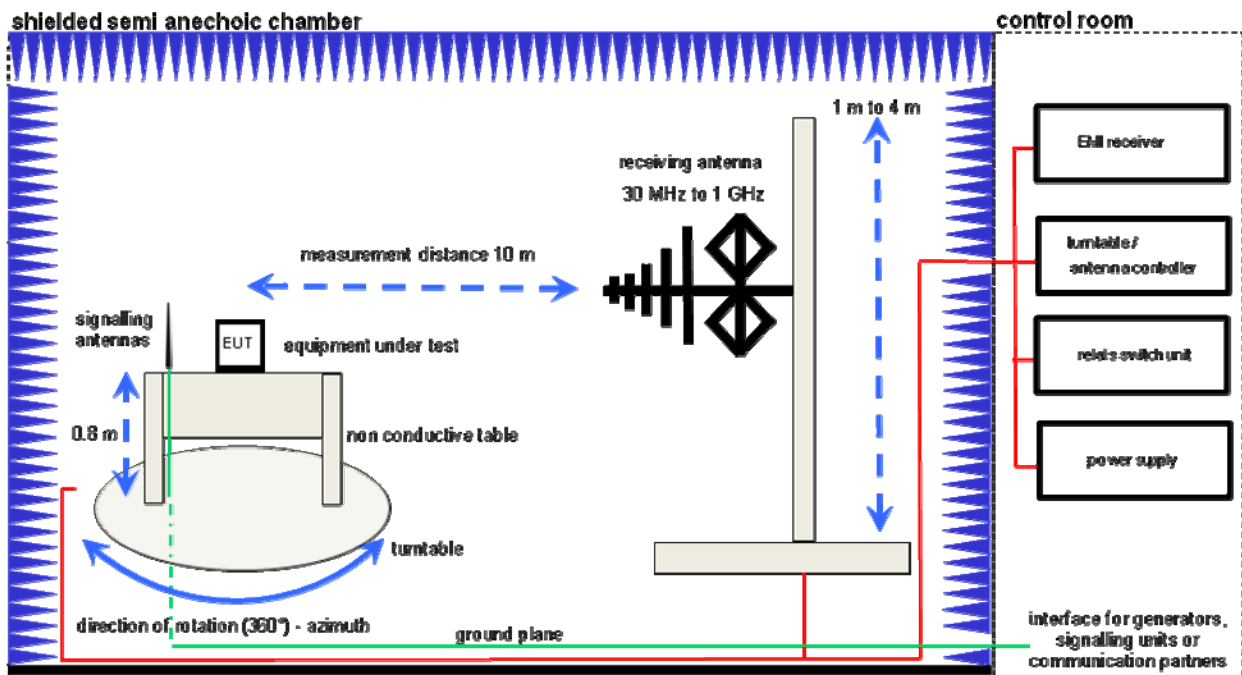
## 6 Test laboratories sub-contracted

None

## 7 Description of the test setup

### 7.1 Radiated measurements chamber F

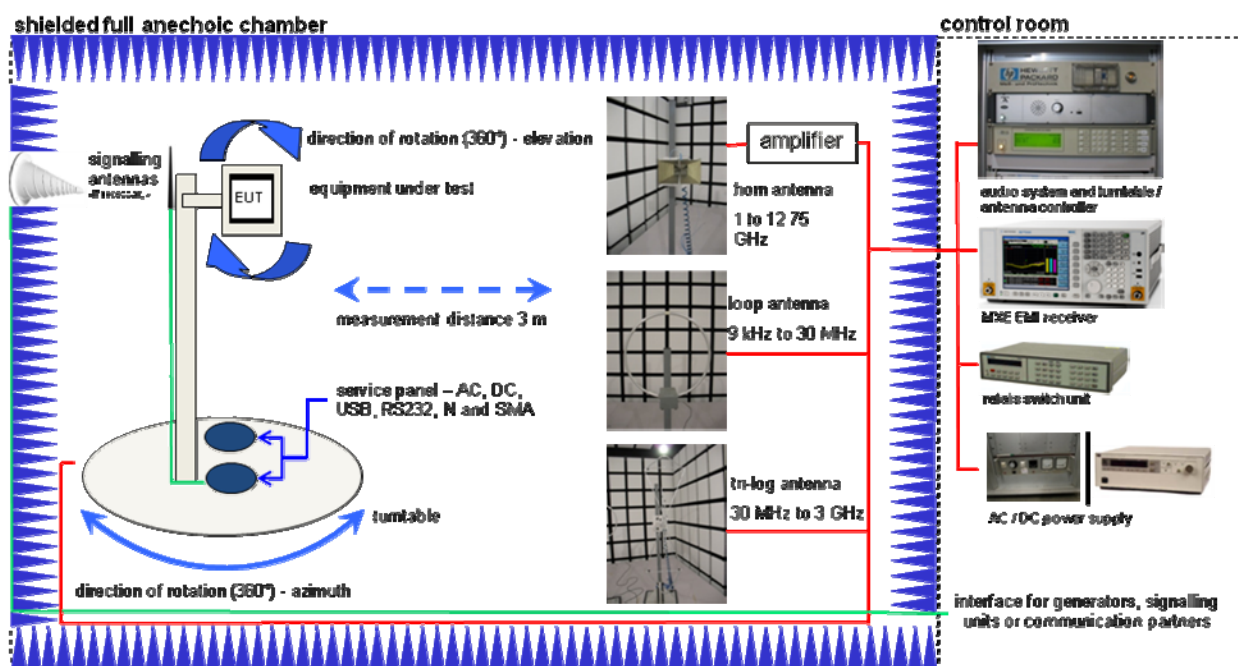
The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 1 GHz in semi-anechoic chambers. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber. The receiving antennas 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
CBT (Bluetooth Tester + EDR Signalling)	CBT 1153.9000K35, CBT-B55, CBT-K55	R&S	100313	300003516

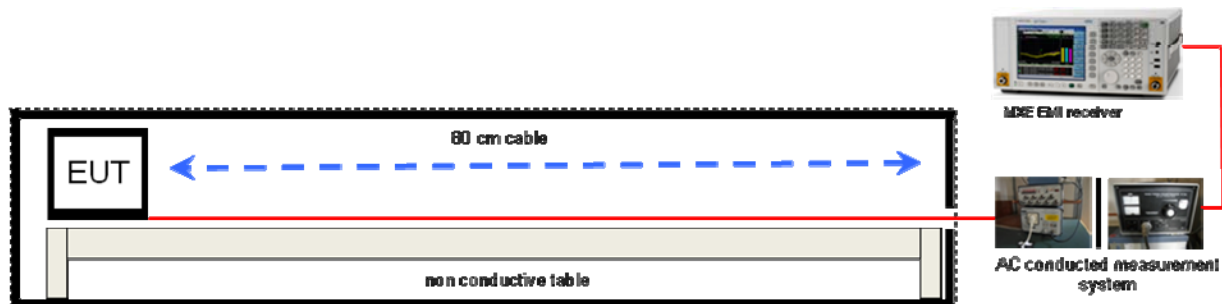
## 7.2 Radiated measurements chamber C



### 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	Erft	91350	300001155
Three-Way Power Splitter, 50 Ohm	11850C	HP Meßtechnik		300000997
Amplifier	js42-00502650-28-5a	Parzich GMBH	928979	300003143
CBT (Bluetooth Tester + EDR Signalling)	CBT 1153.9000K35, CBT-B55, CBT-K55	R&S	100313	300003516

### 7.3 AC conducted



#### Equipment table:

Equipment	Type	Manufacturer	Serial No.	INV. No Cetecom
MXE EMI Receiver 20 Hz bis 26,5 GHz	N9038A	Agilent Technologies	MY51210197	300004405
Isolating Transformer	MPL IEC625 Bus Regeltrenntravo	Erfi	91350	300001155
Switch / Control Unit	3488A	HP Meßtechnik	*	300000199
Switch / Control Unit	3488A	HP Meßtechnik	2719A15013	300001168
Artificial Mains 9 kHz to 30 MHz	ESH3-Z5	R&S	828576/020	300001210
CBT (Bluetooth Tester + EDR Signalling)	CBT 1153.9000K35, CBT-B55, CBT-K55	R&S	100313	300003516

## 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	47 CFR Part 15	Passed	2013-12-02	-/-

Test specification clause	Test case	Temperature conditions	Power source voltages	Pass	Fail	NA	NP	Results
§15.249(a)	Field strength of emissions (wanted signal)	Nominal	Nominal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies
§2.1049	Occupied bandwidth (99% bandwidth)	Nominal	Nominal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies
§15.209(a) / §15.249(b)(1)(2)(3)	Field strength of emissions (spurious)	Nominal	Nominal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies
§15.207(a)	Conducted emissions < 30 MHz	Nominal	Nominal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies
§15.109	Field strength of emissions (spurious)	Nominal	Nominal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	complies

**Note:** NA = Not Applicable; NP = Not Performed



## 9 RF measurements

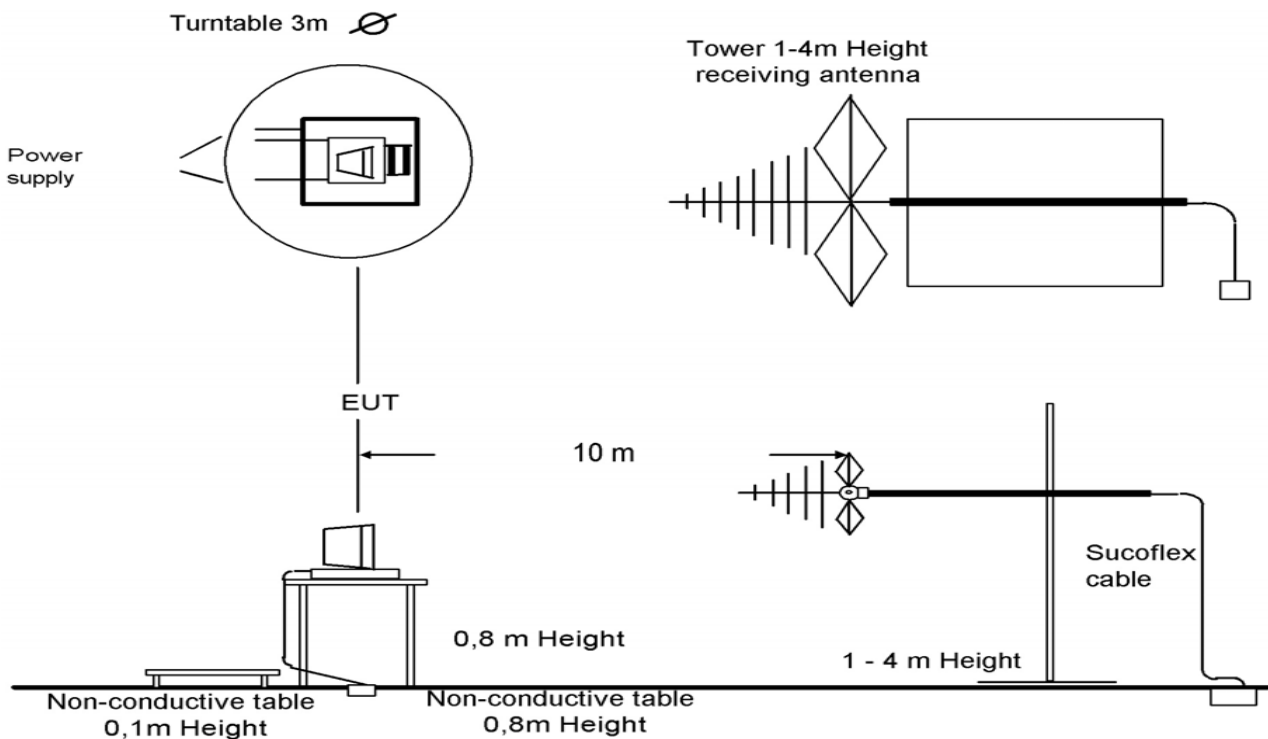
### 9.1 Description of test setup

#### 9.1.1 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 analyzers 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

### 9.1.2 Additional comments

Reference documents:       None

Special test descriptions:   None

Configuration descriptions:   None

Test mode:                   ☐   Normal operation, no special test mode available.

☒   Special software is used.

## 10 Measurement results

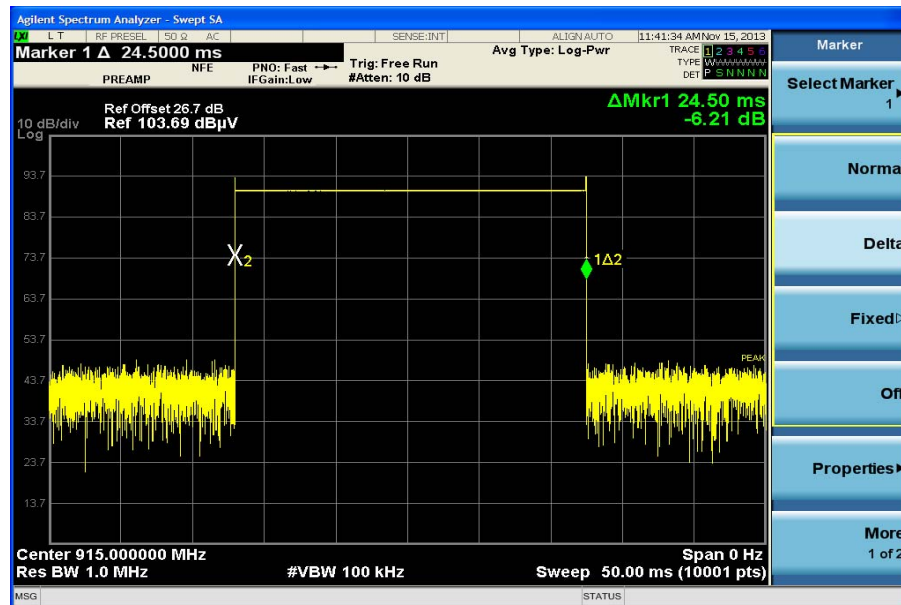
### 10.1 Timing of the transmitter

#### Measurement:

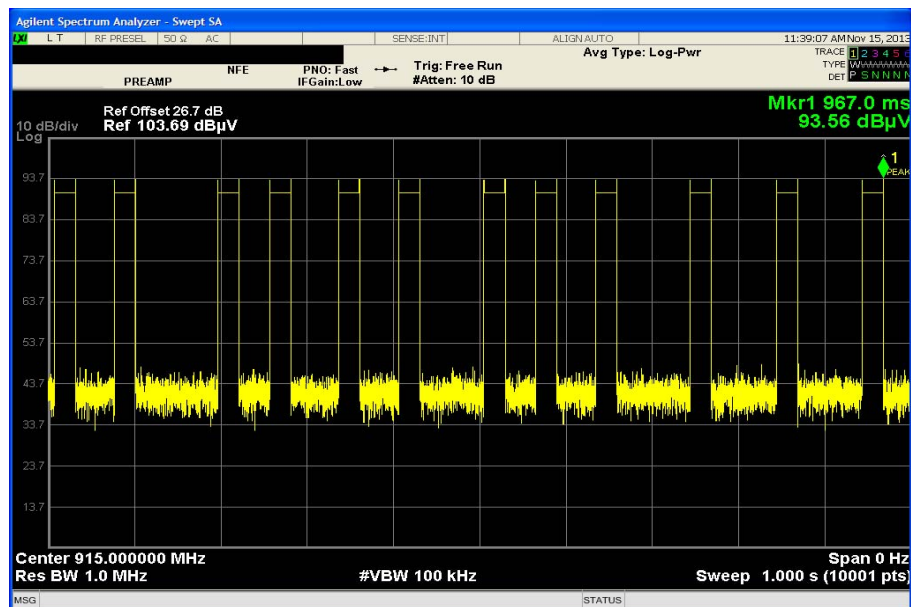
Measurement parameter	
Detector:	Peak
Sweep time:	See plots
Resolution bandwidth:	1 MHz
Video bandwidth:	100 kHz
Span:	Zero Span
Trace-Mode:	Single

#### **Limits:**

FCC	IC
Timing of the 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.	

**Result:****Plot 1: Transmit burst**

Transmit time (Tx on) = 24.5 ms (single transmission)

**Plot 2: Timing of the Transmitter**

The manufacturer declares a variable RX-time with a minimum RX-time of 23 ms.

Therefore the maximum possible transmit time within a 100 ms-period is:  $100 \text{ ms} - 2 \times (23 \text{ ms}) = 54 \text{ ms}$

The peak-to-average correction factor is calculated with  $20 \log [Tx \text{ on} / (Tx \text{ on} + Tx \text{ off})]$ .

Hereby the peak-to-average correction factor is.

**Correction factor =  $20 \log (54 \text{ ms} / 100 \text{ ms}) = -5.35 \text{ dB}$**

## 10.2 Field strength of emissions (wanted signal)

### Description:

Measurement of the maximum radiated field strength of the wanted signal.

### Measurement:

Measurement parameter	
Detector:	Pos-Peak
Sweep time:	Auto
Video bandwidth:	Auto
Resolution bandwidth:	1 MHz
Span:	max. 100 MHz
Trace-Mode:	Max Hold

### Limits:

FCC		
Field strength of emissions		
The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:		
Frequency [ MHz ]	Field Strength [ dBμV/m ]	Measurement distance
902 – 928 MHz	94	3

### Result:

Test condition	Maximum field strength	
	Frequency [ MHz ]	Field strength [dBμV/m] @ 3 m
$T_{nom} / V_{nom}$	914.95	85.8 @ 10 m (Peak) 96.3 @ 3 m (Peak) <sup>a</sup> 90.9 @ 3 m (Avg) <sup>b</sup>
Measurement uncertainty	± 3 dB	

<sup>a</sup> Re-calculated from 10m to 3m with 20 dB/decade according to FCC 15.31 (f2)

<sup>b</sup> Correction with duty cycle correction factor acc. chapter 10.1

**Result: Passed.**

### 10.3 Occupied bandwidth (99% bandwidth)

#### Description:

Measurement of the 99% bandwidth of the wanted signal.

#### Measurement:

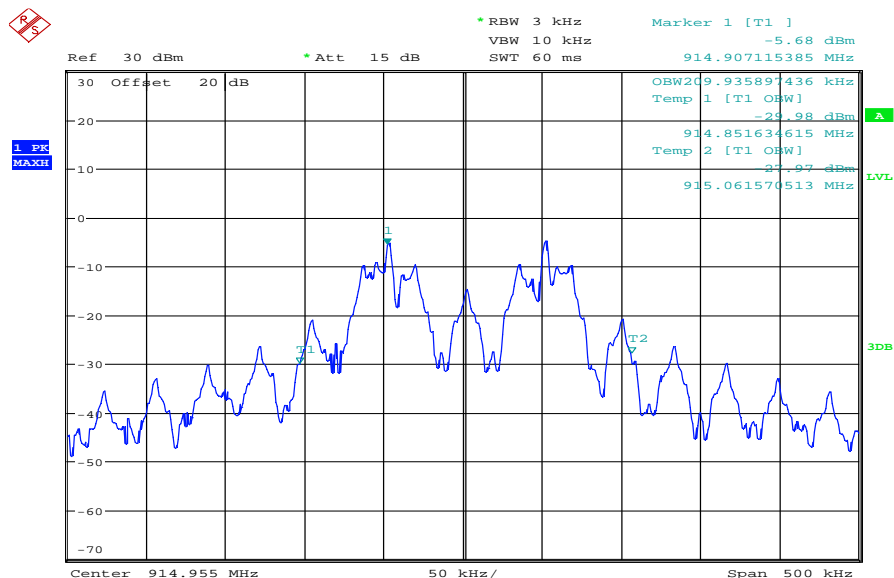
Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Video bandwidth:	3 kHz
Resolution bandwidth:	10 kHz
Span:	500 kHz
Trace-Mode:	Max Hold

#### Results:

Test condition	Occupied bandwidth	
	Frequency [ MHz ]	Occupied bandwidth [ kHz ]
$T_{nom} / V_{nom}$	914.95	209.9
Measurement uncertainty	$\pm 3$ dB	

Result: **Passed.**

Plot 1:



Date: 22.NOV.2013 12:41:29

## 10.4 Field strength of emissions (radiated spurious)

### Description:

Measurement of the radiated spurious emissions in transmit mode.

### Measurement:

Measurement parameter	
Detector:	Peak / Quasi Peak
Sweep time:	Auto
Video bandwidth:	Auto
Resolution bandwidth:	F < 1 GHz: 100 kHz F > 1 GHz: 1 MHz
Frequency range:	30 MHz to 100 GHz
Trace-Mode:	Max Hold

### Limits:

FCC		
Radiated Spurious Emissions		
Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is the lesser attenuation.		
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	30	30
30 – 88	30.0	10
88 – 216	33.5	10
216 – 960	36.0	10
Above 960	54.0	3



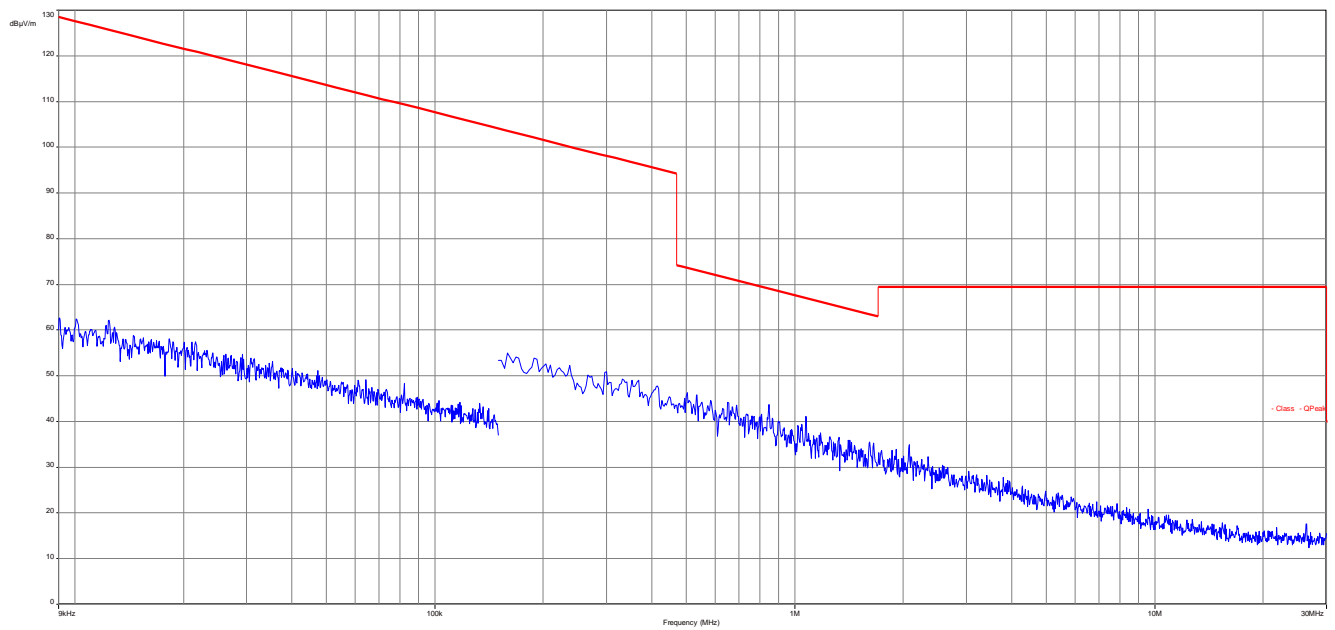
**Results:**

TX Spurious Emissions Radiated [dB $\mu$ V/m]								
914.95 MHz								
F [MHz]	Detector	Level [dB $\mu$ V/m]	F [MHz]	Detector	Level [dB $\mu$ V/m]	F [MHz]	Detector	Level [dB $\mu$ V/m]
3659.8	Peak	56.2						
3659.8	AVG*	50.85						
7319.6	Peak	59.2						
7319.6	AVG*	53.85						
Measurement uncertainty			$\pm 3$ dB					

\* Correction with duty cycle correction factor acc. chapter 10.1

**Result:** **Passed.**

**Plot 1: 9 kHz to 30 MHz**



## Plot 2: 30 MHz to 1 GHz, horizontal / vertical polarization – max hold

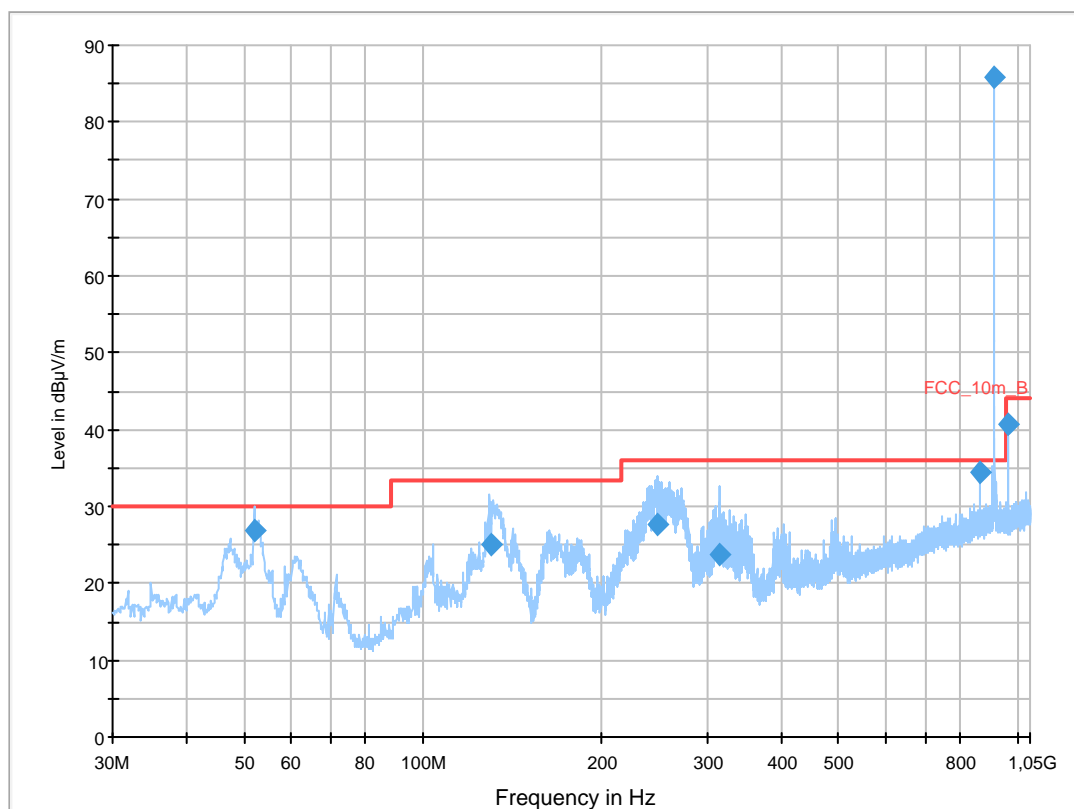
## Common Information

EUT: StreetLight ControlBox  
 Serial Number: 0072FF00013F (mod6)  
 Test Description: FCC part 15 class B  
 Operating Conditions: cont. tx@914MHz  
 Operator Name: Kraus  
 Comment: AC: 115 V / 60 Hz

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

Hardware Setup: Electric Field (NOS)  
 Receiver: [ESC1 3]  
 Level Unit: dB $\mu$ V/m

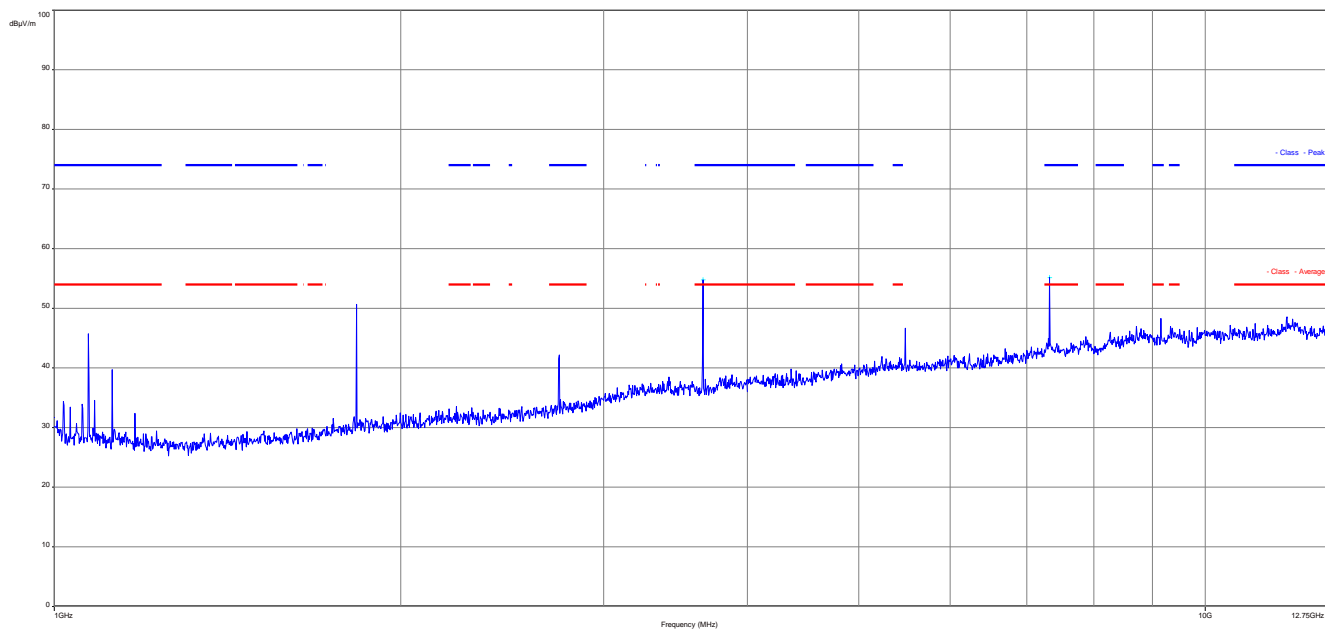
Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 2 GHz	60 kHz	QPK	120 kHz	1 s	20 dB



## Final Result 1

Frequency (MHz)	QuasiPeak (dB $\mu$ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V/m)	Comment
52.011900	27.0	1000.0	120.000	100.0	V	0.0	13.2	3.0	30.0	
130.006200	25.2	1000.0	120.000	114.0	V	270.0	9.4	8.3	33.5	
248.148450	27.8	1000.0	120.000	113.0	V	182.0	13.3	8.2	36.0	
315.947400	23.7	1000.0	120.000	100.0	V	215.0	15.0	12.3	36.0	
862.905450	34.4	1000.0	120.000	300.0	V	313.0	24.7	1.6	36.0	
914.906700	85.8	1000.0	120.000	278.0	V	89.0	25.2	-49.8	36.0	Peak
966.902700	40.8	1000.0	120.000	135.0	V	335.0	25.5	3.2	44.0	

**Plot 3: 1 GHz to 12.75 GHz, horizontal / vertical polarization – max hold**



## 10.5 Conducted spurious emissions < 30 MHz

### Description:

Measurement of the conducted spurious emissions in transmit mode below 30 MHz. Both power lines, phase and neutral line, are measured. Found peaks are re-measured 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		
Conducted Spurious Emissions < 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

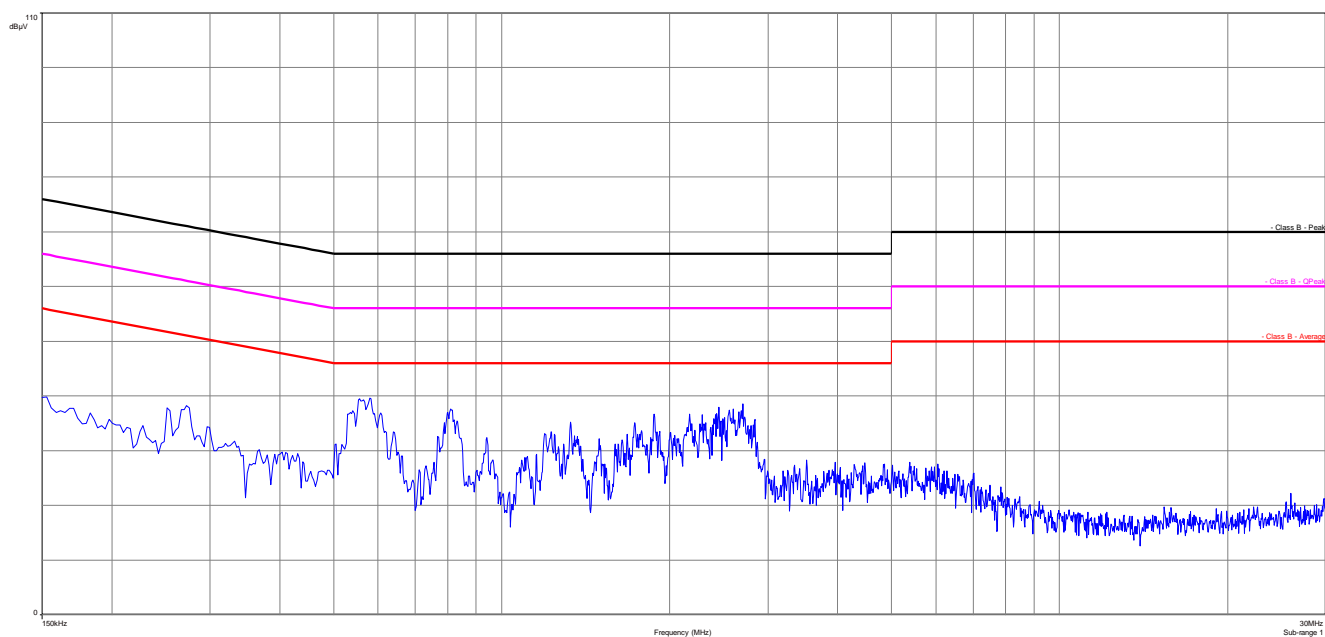
\*Decreases with the logarithm of the frequency

### Results:

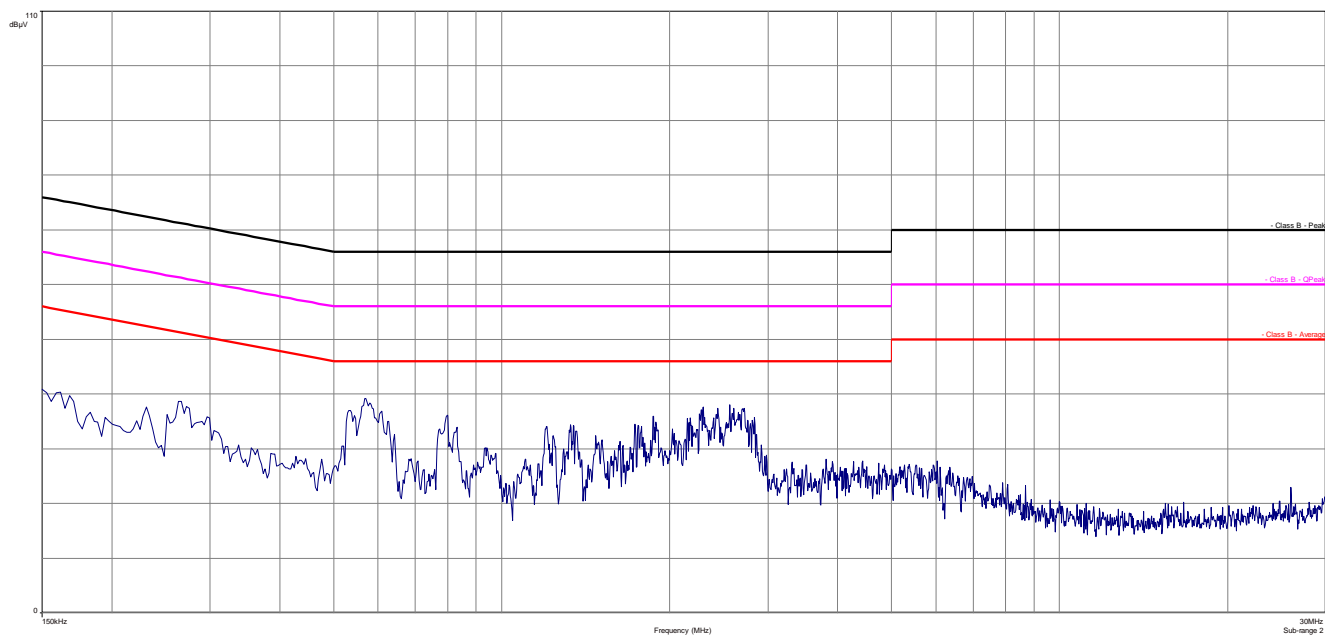
Conducted Spurious Emissions < 30 MHz [dBμV/m]		
F [MHz]	Detector	Level [dBμV/m]
No peaks found		
Measurement uncertainty	± 3 dB	

**Result: Passed.**

**Plot 1: Phase line**



**Plot 2: Neutral line**



## 10.1 Results receiver mode

### 10.1.1 Spurious emissions radiated – receiver mode

#### Description:

The measurement was performed in worst case.

#### Measurement:

Measurement parameters	
Detector:	Below 1 GHz Peak / QuasiPeak Above 1 GHz Peak / Average
Sweep time:	2 sec
Video bandwidth:	Below 1 GHz 100 kHz Above 1 GHz 1 MHz
Resolution bandwidth:	1 MHz
Span:	100 MHz Steps
Trace-Mode:	Max Hold

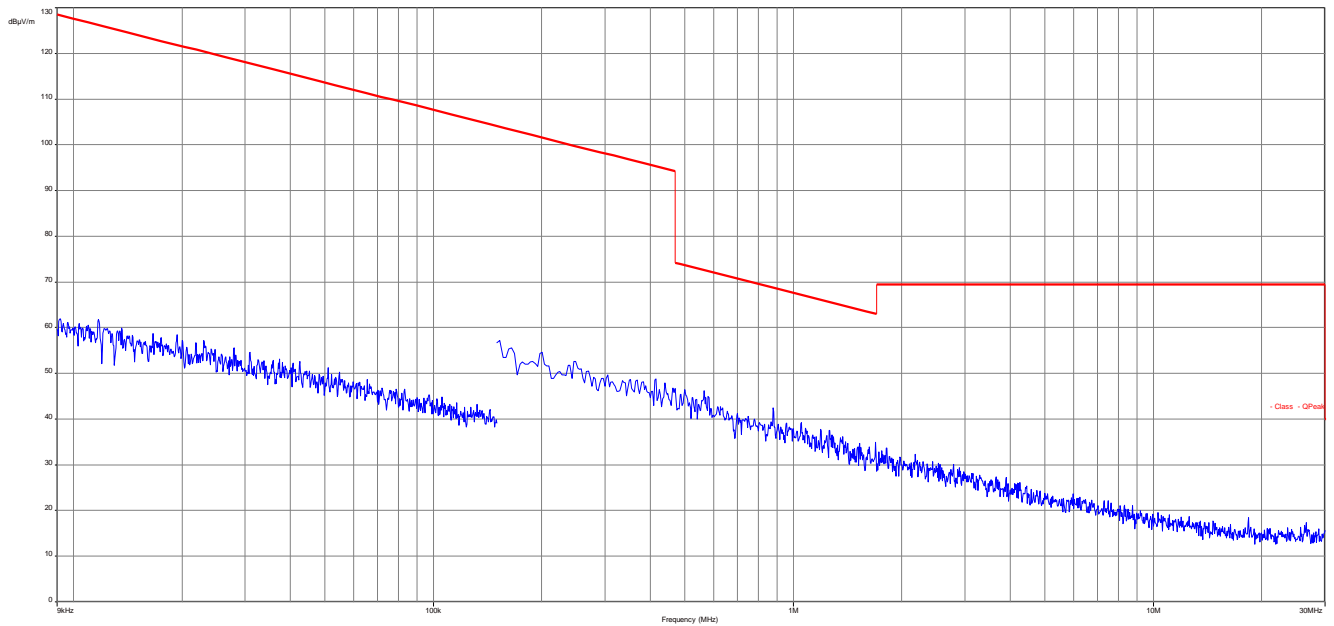
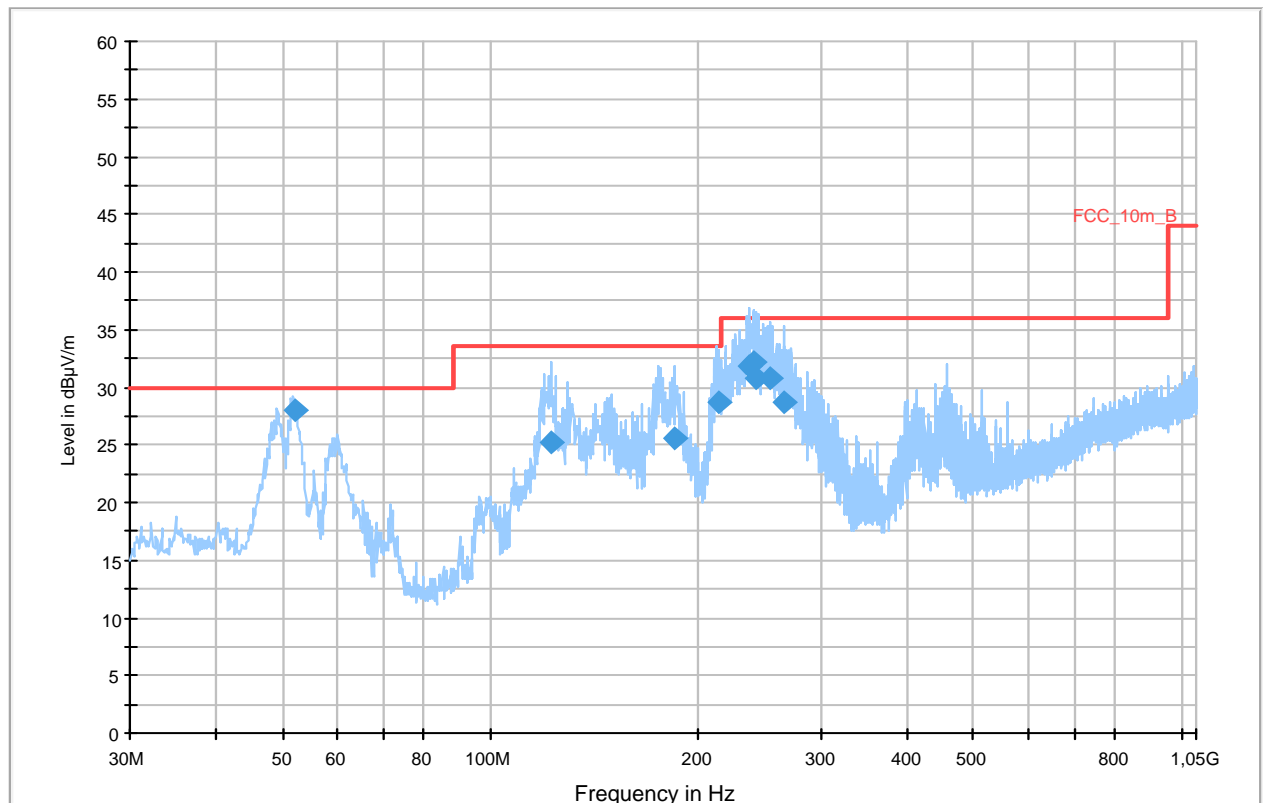
#### Limits:

FCC		IC
Spurious Emissions Radiated – Receiver Mode		
Frequency (MHz)	Field Strength (dB $\mu$ V/m)	Measurement distance (m)
30 – 88	30.0	10
88 - 216	33.5	10
216 – 960	36.0	10
Above 960	54.0	3

#### Results:

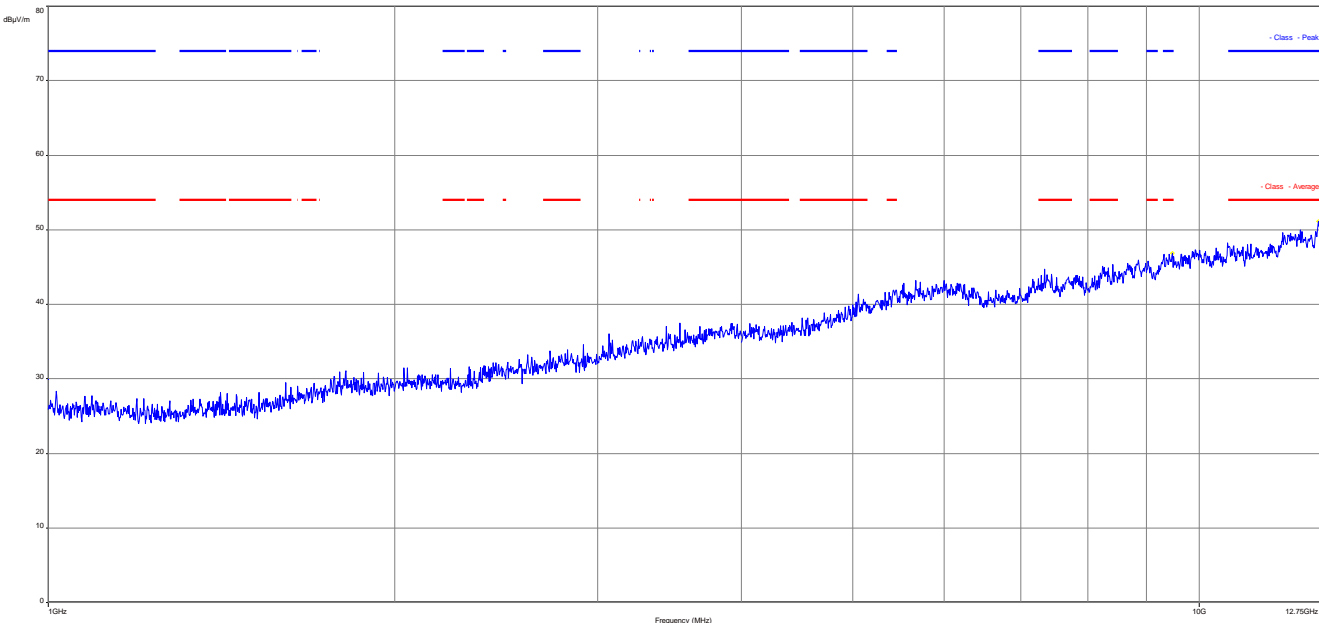
Spurious Emission Level (dB $\mu$ V/m)		
Frequency (MHz)	Detector	Level (dB $\mu$ V/m)
No peaks found		
Measurement uncertainty		$\pm 3$ dB

**Result:** **Passed**

**Plots:****Plot 1: Receiver mode up to 30 MHz****Plot 2: Receiver mode (30 MHz - 1 GHz)**



Plot 3: Receiver mode (1 GHz – 12.75 GHz)



## 11 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	06.01.2012	06.01.2014
6	n. a.	Switch / Control Unit	3488A	HP Meßtechnik	2719A15013	300001156	ne		
7	9	Isolating Transformer	MPL IEC625 Bus Regeltrenntravo	Erft	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	21.02.2013	21.02.2014
16	45	Switch-Unit	3488A	HP Meßtechnik	2719A14505	300000368	g		
17	50	DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2920A04466	300000580	ne		
18	n. a.	software	SPS_PHE 1.4f	Spitzberger & Spieß	B5981; 5D1081; B5979	300000210	ne		
19	n. a.	EMI Test Receiver	ESCI 3	R&S	100083	300003312	k	09.01.2013	09.01.2014
20	n. a.	Analyzer-Reference-System (Harmonics and	ARS 16/1	SPS	A3509 07/0 0205	300003314	Ve	14.07.2011	14.01.2014

		Flicker)							
21	n. a.	Amplifier	JS42-00502650-28-5A	MITEQ	1084532	300003379	ev		
22	n. a.	Antenna Tower	Model 2175	ETS-LINDGREN	64762	300003745	izw		
23	n. a.	Positioning Controller	Model 2090	ETS-LINDGREN	64672	300003746	izw		
24	n. a.	Turntable Interface-Box	Model 105637	ETS-LINDGREN	44583	300003747	izw		
25	n. a.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	295	300003787	k	12.04.2012	12.04.2014
26	n. a.	Spectrum-Analyzer	FSU26	R&S	200809	300003874	k	16.01.2013	16.01.2014

**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

## 12 Observations

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

**Annex A Document history**

Version	Applied changes	Date of release
1.0	Initial release	2013-12-02

**Annex B Further information****Glossary**

AVG	-	Average
DUT	-	Device under test
EMC	-	Electromagnetic Compatibility
EN	-	European Standard
EUT	-	Equipment under test
ETSI	-	European Telecommunications Standard Institute
FCC	-	Federal Communication Commission
FCC ID	-	Company Identifier at FCC
HW	-	Hardware
IC	-	Industry Canada
Inv. No.	-	Inventory number
N/A	-	Not applicable
PP	-	Positive peak
QP	-	Quasi peak
S/N	-	Serial number
SW	-	Software

## Annex C Accreditation Certificate

Front side of certificate



Deutsche Akkreditierungsstelle GmbH

Befehlens gemäß § 8 Absatz 1 AkkStelleG i.V.m. § 1 Absatz 1 AkkStelleGBV  
Unterzeichnerin der Multilateralen Abkommen  
von EA, ILAC und IAF zur gegenseitigen Anerkennung

Akkreditierung



Die Deutsche Akkreditierungsstelle GmbH bestätigt hiermit, dass das Prüflaboratorium

CETECOM ICT Services GmbH  
Untertürkheimer Straße 6-10, 66117 Saarbrücken

die Kompetenz nach DIN EN ISO/IEC 17025:2005 besitzt, Prüfungen in folgenden Bereichen  
durchzuführen:

Drahtgebundene Kommunikation einschließlich xDSL  
VoIP und DECT  
Akustik  
Funk einschließlich WLAN  
Short Range Devices (SRD)  
RFID  
WiMax und Richtfunk  
Mobilfunk (GSM / DCS, Over the Air (OTA) Performance)  
Elektromagnetische Verträglichkeit (EMV) einschließlich Automotive  
Produktsicherheit  
SAR und Hearing Aid Compatibility (HAC)  
Umweltsimulation  
Smart Card Terminals  
Bluetooth  
Wi-Fi-Services

Die Akkreditierungskunde gilt nur in Verbindung mit dem Bescheid vom 18.01.2013 mit der  
Akkreditierungsnummer D-PL-12076-01 und ist gültig 17.01.2018. Sie besteht aus diesem Deckblatt, der  
Rückseite des Deckblatts und der folgenden Anlage mit insgesamt 80 Seiten.

Registrierungsnummer der Urkunde: D-PL-12076-01-01

Frankfurt am Main, 18.01.2013

Bitte kleben auf der Rückseite

Im Auftrag  
Dirk J. (Prof.) Jäger  
Abteilungsleiter

Back side of certificate

Deutsche Akkreditierungsstelle GmbH

Standort Berlin  
Spittelmarkt 10  
10117 Berlin

Standort Frankfurt am Main  
Gartenstraße 6  
60594 Frankfurt am Main

Standort Braunschweig  
Rundelsbau 100  
38116 Braunschweig

Die auszugsweise Veröffentlichung der Akkreditierungskunde bedarf der vorherigen schriftlichen  
Zustimmung der Deutsche Akkreditierungsstelle GmbH (DAKKS). Ausgenommen davon ist die separate  
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unveränderter Form.

Es darf nicht der Anschein erweckt werden, dass sich die Akkreditierung auch auf Bereiche erstreckt,  
die über den durch die DAKKS bestätigten Akkreditierungsbereich hinausgehen.

Die Akkreditierung erfolgte gemäß des Gesetzes über die Akkreditierungsstelle (AkkStelleG) vom  
31. Juli 2009 (BGBl. I S. 2625) sowie der Verordnung (EG) Nr. 765/2008 des Europäischen Parlaments  
und des Rates vom 9. Juli 2008 über die Vorschriften für die Akkreditierung und Marktüberwachung  
im Zusammenhang mit der Vermarktung von Produkten (Abl. L 218 vom 9. Juli 2008, S. 30).  
Die DAKKS ist Unterzeichnerin der Multilateralen Abkommen zur gegenseitigen Anerkennung der  
European co-operation for Accreditation (EA), des International Accreditation Forum (IAF) und  
der International Laboratory Accreditation Cooperation (ILAC). Die Unterzeichner dieser Abkommen  
erkennen ihre Akkreditierungen gegenseitig an.

Der aktuelle Stand der Mitgliedschaft kann folgenden Webseiten entnommen werden:  
EA: [www.european-accreditation.org](http://www.european-accreditation.org)  
ILAC: [www.ilac.org](http://www.ilac.org)  
IAF: [www.iaf.nu](http://www.iaf.nu)

### 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>