

Test report nr. 25416FCC12

Measurements performed in accordance with:

**FCC Rules: code of Federal Regulations (CFR) no. 47
PART 15 – RADIO FREQUENCY DEVICES**

Product: Tubular motor with transceiver inside

Tested model: RolTopMxx/yy-915
SunTopMxx/yy-915
(xx = 2, 4, 7, 10, 16, 30, 36; yy = 108, 70, 28, 17, 12)

FCC ID YBURT915

Applicant: elero gmbh Antriebstechnik
Linsenhofer Str. 59-63
D-72660 Beuren
elero gmbh Antriebstechnik
Linsenhofer Str. 59-63
D-72660 Beuren

Manufacturer: elero gmbh Antriebstechnik
Linsenhofer Str. 59-63
D-72660 Beuren

Trademark: elero


Testing Laboratory Nice S.p.A.
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Registration number: 771316

Date of receipt sample: 27th May 2013

Testing date: 27th May – 11th June 2013

Issue date: 8 August 2013

Tested by: L. Pastres 

Checked by: E. Campion 

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General Description of Equipment under Test

1.1 Applicant

Name: elero gmbh Antriebstechnik

Address: Linsenhofer Str. 65
D-72660 Beuren

Country: GERMANY

1.2 Manufacturer

Name: elero gmbh Antriebstechnik

Address: Linsenhofer Str. 65
D-72660 Beuren

Country: GERMANY

1.3 Equipment classification

According to definition 15.3 (o) is a intentional Radiator operating within the Bands:

so it shall fulfil provisions of 47CFR Part 15 Subpart C – international radiators – and Section 15.209.

According to definition 15.3 (z) is a unintentional Radiator:

So it shall fulfil provisions of 47CFR Part 15 Subpart B – Unintentional radiator and section 15.107 and 15.109.

1.4 Basic Description of equipment under test

Parameters	Value
Type of equipment:	Tubular motor with transceiver 918MHz inside
Model:	RolTop Mxx/yy-915 SunTopMxx/yy-915
FCC ID:	YBURT915
Trade Name:	Elero gmbh Antriebstechnik
Data cable:	-
Telecom cable:	-
Power supply type:	120V, 60Hz
AC power input cable:	-
DC power input cable:	-

Model	Description
RolTopMxx/yy-915	The motors change only for torque and power supply. The control unit and transceiver are same.
SunTopMxx/yy-915	Same of RolTopMxx/yy but with different software related to operation of motor. The transceiver and radio part are same.

1.5 Feature of equipment under test

Parameters	Value
Power specification	120V, 60Hz
Operating frequency:	918,3MHz
Maximum RF output power:	77.9dBμV/m (at 3m) average 101.68dBμV/m (at 3m) peak
Occupied Bandwidth (99% BW):	123.5kHz
Emission Designator (ITU):	124KA1D
Modulation:	FSK
Channel spacing:	-
Antenna:	Integral
Rx Sensitivity:	
Main SW identification:	-
Main HW board identification:	-
Peripherals included (for system application):	-
Interfaces:	-
Integrated interfaces	-
AC adapter:	-

2

Test configuration of equipment under test

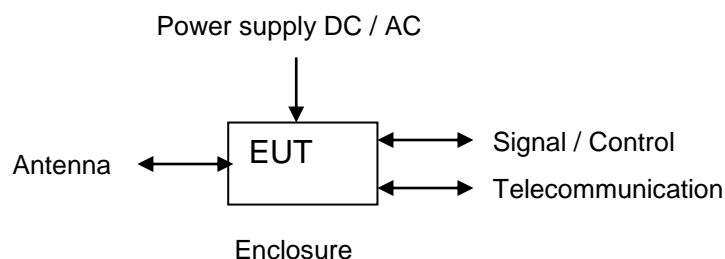
2.1 Environmental conditions

Test conditions	Measured
Ambient temperature:	20 ÷ 25°C
Relative humidity:	50 ÷ 60%
Atmospheric pressure:	900 ÷ 1010mb

2.2 Description of support equipment

Equipment	Manufacturer	Model
-	-	-

2.3 Interface identification and connection diagram of test system



#	Interface	Description	Maximum length	Ref. Document
1	Enclosure	Metallic	-	-
2	AC mains power input	Power supply 120V	-	-
3	DC power port	-	-	-
4	Signal / control port	-	-	-
5	Antenna port	-	-	-

3

Operation of equipment under test

3.1 Operating test conditions

#	Description
1	Standby
2	Transmission

4

Tests identification and result

CFR47 Part 15 Section	Title	Operating condition	Result
15.203 15.247 (b)(4)(i)	Antenna requirements	-	PASS
15.207 (a)	Conducted emission	#1, 2	PASS
15.209 (a) (f)	Radiated emission	#1, 2	PASS
15.35 (c)	Timing of the transmitter	#2	PASS
15.231 (a)	Transmit behaviour after releasing the TX-button	-	Not applicable
15.249 (a)	Radiated output power	#2	PASS
15.35 (c)	Typical pulse train of a signal	#2	PASS
15.249 (c)	Compliance with the limit of FCC	#2	PASS
15.249 (a)	Spurious emission - radiated	#2	PASS
15.215 (c)	Occupied bandwidth	#2	PASS

4.1 Methods of measurement

All compliance measurements have been carried out using the procedures described in the standard ANSI C63.4-2009 (excluding sub-par. 4.1.5.2, 5.7.9 and 14), C63.10-2009 and Section 15.31 of CFR47 Part 15 – Subpart A (General).

4.2 Frequency range investigated

- a) conducted emission tests: from 9kHz to 30MHz.
- b) Radiated emission tests: from 150kHz to tenth harmonic of fundamental.

5 Tests

5.1 Antenna requirements

Specify:

Base standard:	47CFR Part 15 Sections 15.203, 15.204
----------------	---------------------------------------

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirements does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219 or 15.221. Further, this requirements does not apply to intentional radiators which, in accordance with Section 15.31 (d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

Antenna Specification:

N° of authorized antenna type:	-
Antenna type:	Integral
Maximum total gain:	0dB
External power amplifiers:	-

Antenna description:

No.	Manufacturer	Model Type
-	-	-

Comments:

the antenna is integral to the product
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5.2 Conduced emission

Specify:

Base standard:	47CFR Part 15 Section 15.207
----------------	------------------------------

- 1) The EUT was placed on wooden table size 80cm, raised 80cm in which is located 40cm away from the vertical wall shielded room.
- 2) Each EUT powered input cord was individually connected through a 50Ω/50μH LISN to the input power source.
- 3) Exploratory measurements were made identify the frequency of the emission that had the highest amplitude relative to the limit by operating the EUT in a range of typical modes operation, cable position, and with a typical system equipment configuration and arrangement. Based on the exploratory tests of the EUT, the one EUT cable configuration and arrangement and mode of operation that had produced the emission with the highest amplitude relative to the limit was selected for the final measurement.
- 4) The final test on all current-carrying conductors of all of the power cords to the equipment that comprises the EUT (but not the cords associated with other non-EUT equipment is the system) was than performed over the frequency range of 0,15MHz to 30MHz.
- 5) The measurements were made with the detector set to PEAK and AVERAGE amplitude within a bandwidth of 10kHz during the measurements.
- 6) The measurements with Quasi-Peak detector are performed only for frequencies for which the Peak values are \geq (Q.P. limit – 6dB)

Test Requirements:

Test Setup:	ANSI C63.4
Limit of mains terminal disturbance voltage:	15.207 (a)
Frequency range:	9kHz – 150kHz 150kHz – 30MHz
IF Bandwidth:	200Hz 9kHz
EMC class	B

Limits ⁽¹⁾:

Frequency [MHz]	Quasi-Peak (dBμV)	Average (dBμV)
0,15 – 0,5	66 – 56	56 – 46
0,5 – 5	56	46
5 - 30	60	50

Note: (1) The lower limit shall apply at the transition frequencies.

(2) The limit decreases linearly with the logarithm of the frequency in the range 0,15 MHz to 0,50 MHz.

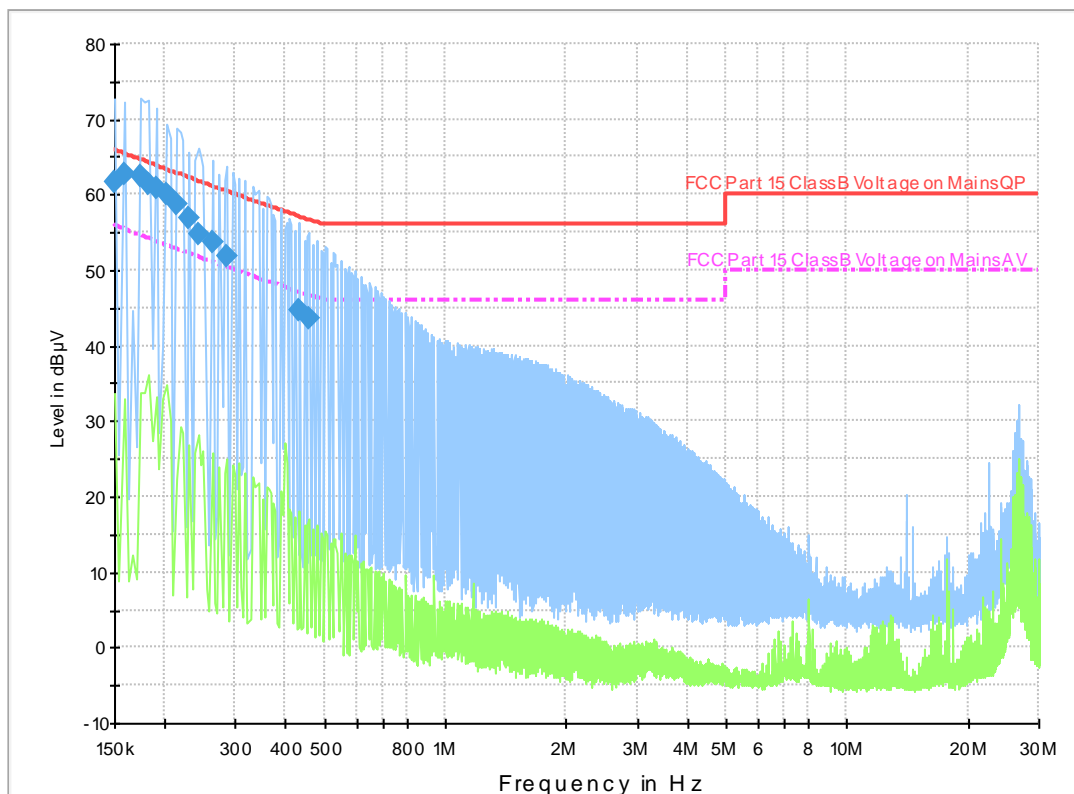
Test Data:

Port under test	Operating condition	Result
AC mains power input port	#1, 2	Complies

Comments:

Measure the worst cases between phases

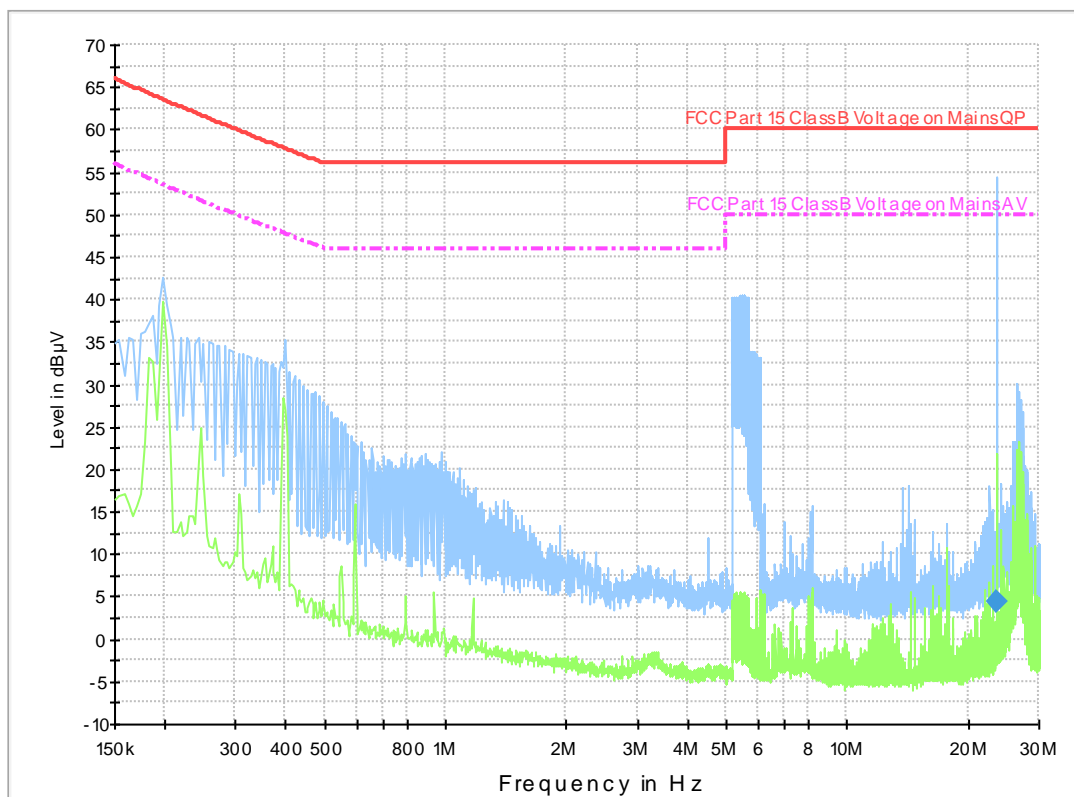
Motor in standby mode



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.150000	61.7	1000.0	9.000	GN	L1	2.0	4.3	66.0	
0.158000	62.6	1000.0	9.000	GN	N	1.8	2.9	65.5	
0.174000	62.4	1000.0	9.000	GN	N	1.7	2.3	64.7	
0.182000	61.5	1000.0	9.000	GN	L1	1.7	2.8	64.3	
0.190000	61.0	1000.0	9.000	GN	L1	1.7	2.9	63.9	
0.202000	60.1	1000.0	9.000	GN	N	1.5	3.2	63.4	
0.214000	58.8	1000.0	9.000	GN	N	1.4	4.1	62.9	
0.230000	56.8	1000.0	9.000	GN	N	1.3	5.5	62.3	
0.242000	54.7	1000.0	9.000	GN	L1	1.3	7.1	61.8	
0.262000	53.6	1000.0	9.000	GN	N	1.1	7.6	61.2	
0.286000	52.0	1000.0	9.000	GN	N	0.9	8.5	60.4	
0.434000	44.8	1000.0	9.000	GN	N	0.6	12.3	57.1	
0.458000	43.7	1000.0	9.000	GN	N	0.6	12.9	56.7	

Motor works



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
23.554000	4.5	1000.0	9.000	GN	L1	1.0	55.5	60.0	

5.3 Radiated emission

Specify:

Base standard:	47CFR Part 15 Section 15.209
----------------	------------------------------

- 1) The EUT was placed on turntable which is 0,8m above the ground plane.
- 2) The turntable shall rotate from 0° to 360° degrees to determine the position of maximum emission level.
- 3) The EUT is positioned 3m away from the receiving antenna which varied from 1 to 4m to find the highest emission.
- 4) The measurements were made with the detector set to PEAK and AVERAGE amplitude within a bandwidth of 100kHz below 1000MHz and 1MHz above 1000MHz.
- 5) The receiving antenna was positioned in both horizontal and vertical polarization.
- 6) The measurements with Quasi-Peak detector, below 1000MHz are performed only for frequencies for which the Peak values are \geq (Q.P. limit – 6dB).

Test Requirements:

Test Setup:	ANSI C63.4
Test facility:	Anechoic chamber
Test distance:	3m
Limits for radiated disturbances:	15.209 (a)
Frequency range:	150kHz to 1GHz
IF bandwidth (below 30MHz):	9kHz
IF bandwidth (below 1000MHz):	120kHz
IF bandwidth (above 1000MHz):	1MHz
EMC class:	B

Limits ⁽¹⁾:

<i>Frequency [MHz]</i>	<i>Field Strength (μV/m)</i>	<i>Measurement distance (m)</i>
0,0009 – 0,490	2400/F(kHz)	300
0,490 – 1,750	24000/F(kHz)	30
1,750 - 30	30	30
30 - 88	100	30
88 -216	150	3
216 - 960	200	3
above 960	500	3

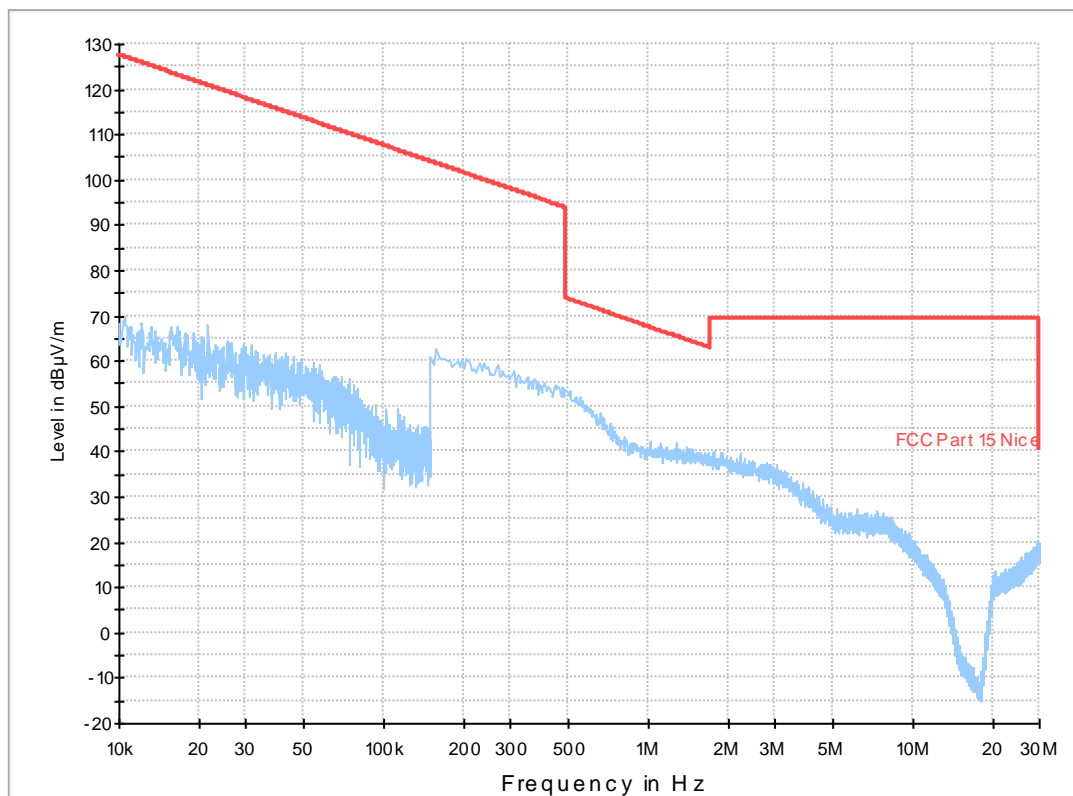
Note: ⁽¹⁾ to convert the measuring distance from 3m to 300m and 30m to 300m a correction factor from 40dB/decade was used

Test Data.:

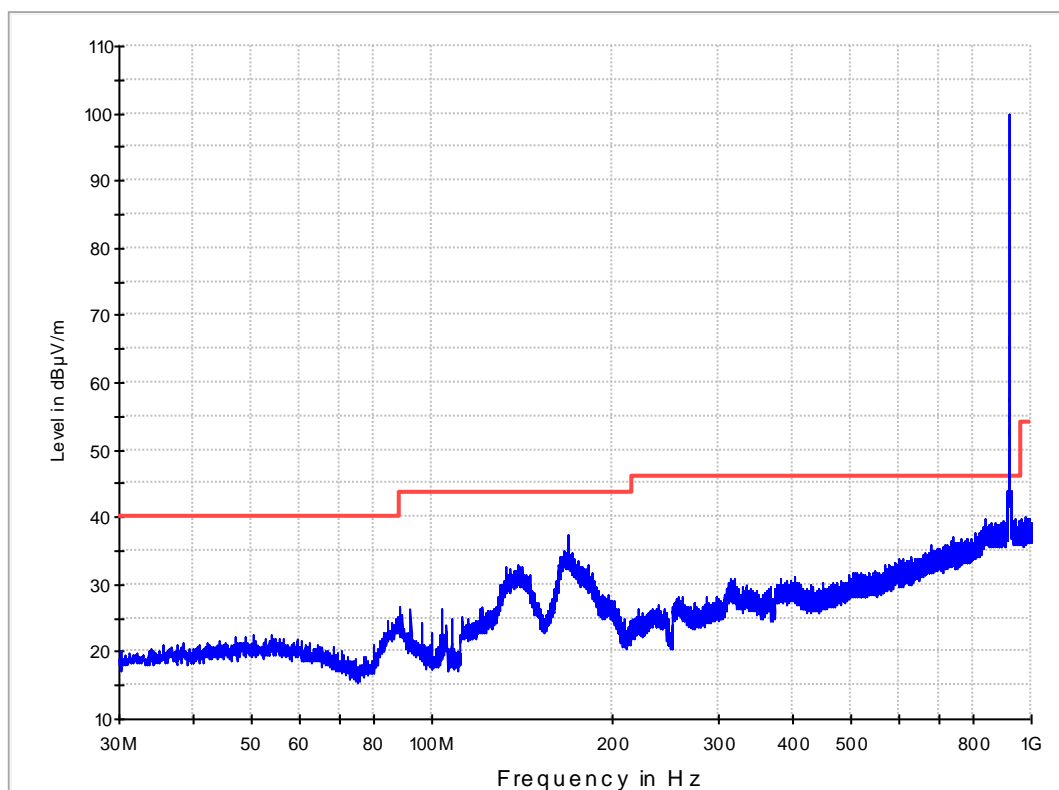
<i>Port under test</i>	<i>Operating condition</i>	<i>Result</i>
Enclosure	#1	Complies

Comments:

The results represent the worst case of emissions between three polarizations verified (X, Y and Z). The table was rotated of 360° and antenna receiving moved from 1m to 4m to find the maximum emission.



Transmisison



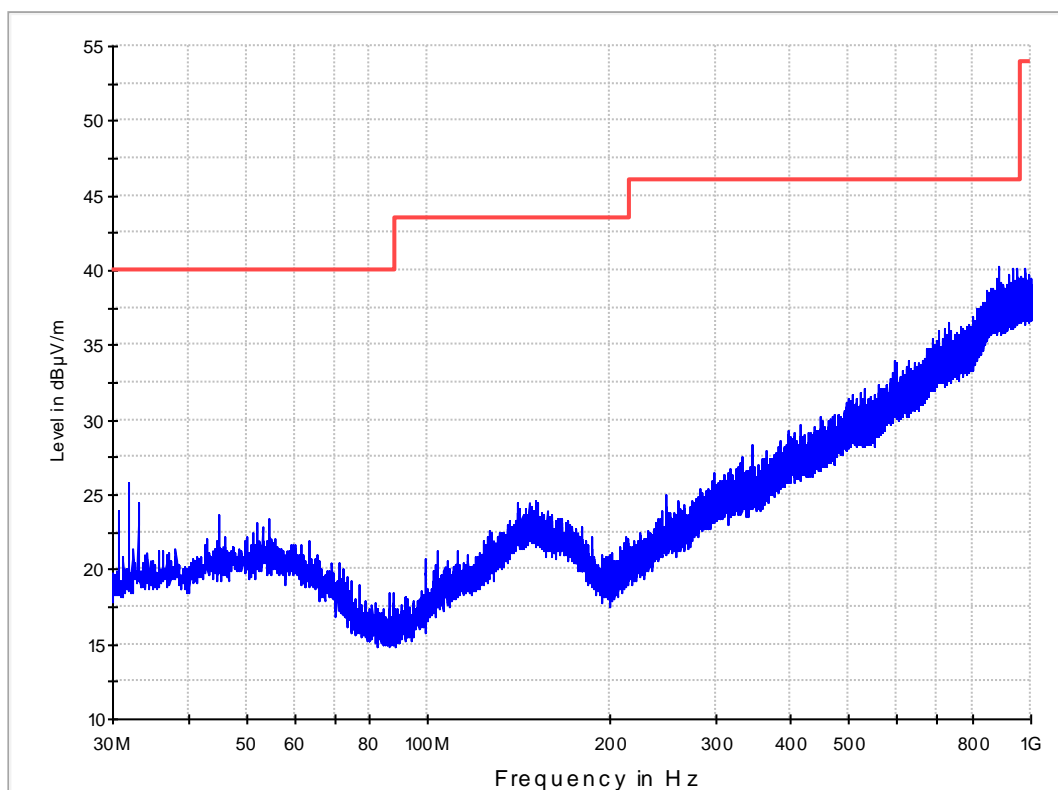
Copy of Auto Merge Results MaxPeak-ClearWrite

Frequency (MHz)	MaxPeak-ClearWrite (dBµV/m)	Height (cm)	Bandwidth (kHz)	Polarization	Azimuth (deg)	Corr. (dB)	Comment
44.000000	21.5	100.0	120	H	0.0	12.3	
53.800000	22.5	100.0	120	H	0.0	12.6	
88.000000	26.8	100.0	120	H	0.0	8.1	
138.960000	32.8	100.0	120	H	0.0	14.4	
169.040000	37.3	100.0	120	H	0.0	14.2	
318.640000	30.9	100.0	120	H	0.0	17.1	
549.080000	32.1	100.0	120	H	0.0	21.5	
835.680000	39.9	100.0	120	H	0.0	27.7	
918.320000	100.0	100.0	120	H	0.0	28.5	

Limit and Margin

Frequency (MHz)	MaxPeak-ClearWrite (dBµV/m)	Height (cm)	Bandwidth (kHz)	Polarization	Azimuth (deg)	Corr. (dB)	Margin - PK+ (dB)
44.000000	21.5	100.0	120	H	0.0	12.3	18.5
53.800000	22.5	100.0	120	H	0.0	12.6	17.5
88.000000	26.8	100.0	120	H	0.0	8.1	16.7
138.960000	32.8	100.0	120	H	0.0	14.4	10.7
169.040000	37.3	100.0	120	H	0.0	14.2	6.2
318.640000	30.9	100.0	120	H	0.0	17.1	15.1
549.080000	32.1	100.0	120	H	0.0	21.5	13.9
835.680000	39.9	100.0	120	H	0.0	27.7	6.1
918.320000	100.0	100.0	120	H	0.0	28.5	-54.0

Receiving



Copy of Auto Merge Results MaxPeak-ClearWrite

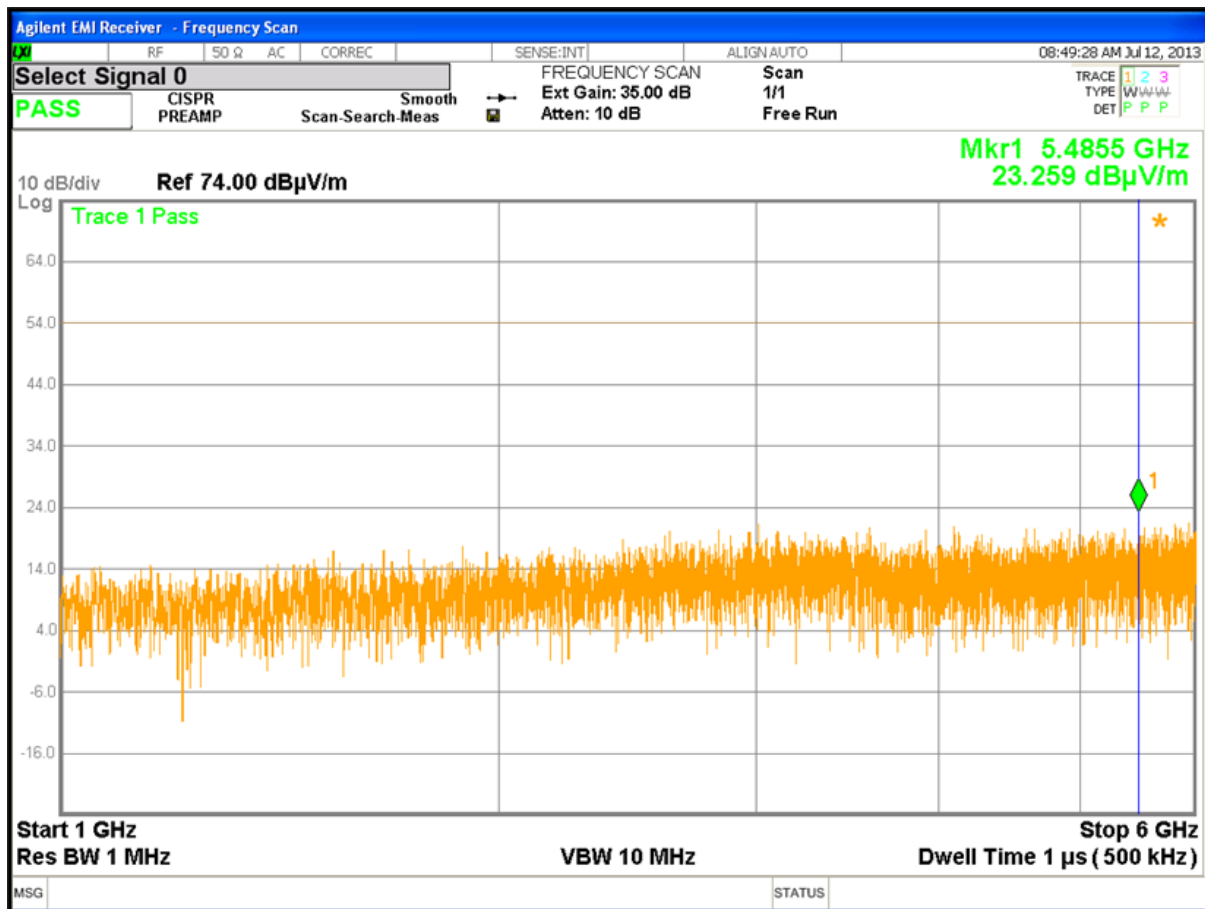
Frequency (MHz)	MaxPeak-ClearWrite (dBμV/m)	Height (cm)	Bandwidth (kHz)	Polarization	Azimuth (deg)	Corr. (dB)	Comment
31.880000	25.9	100.0	120.00	H	45.0	11.0	
54.480000	23.3	100.0	120.00	H	45.0	12.6	
103.400000	21.2	100.0	120.00	H	45.0	10.3	
150.840000	24.6	100.0	120.00	H	45.0	14.8	
164.480000	23.4	100.0	120.00	H	0.0	14.3	
343.800000	28.3	100.0	120.00	H	0.0	17.4	
559.560000	32.4	100.0	120.00	H	0.0	21.8	
855.320000	38.7	100.0	120.00	H	45.0	28.1	

Limit and Margin

Frequency (MHz)	MaxPeak-ClearWrite (dBμV/m)	Margin - PK+ (dB)	Limit - PK+ (dBμV/m)
31.880000	14.1	25.9	40.0
54.480000	16.7	23.3	40.0
103.400000	18.8	24.7	43.5
150.840000	15.4	28.1	43.5
164.480000	16.6	26.9	43.5
343.800000	18.7	27.3	46.0
559.560000	14.6	31.4	46.0
855.320000	8.3	37.7	46.0

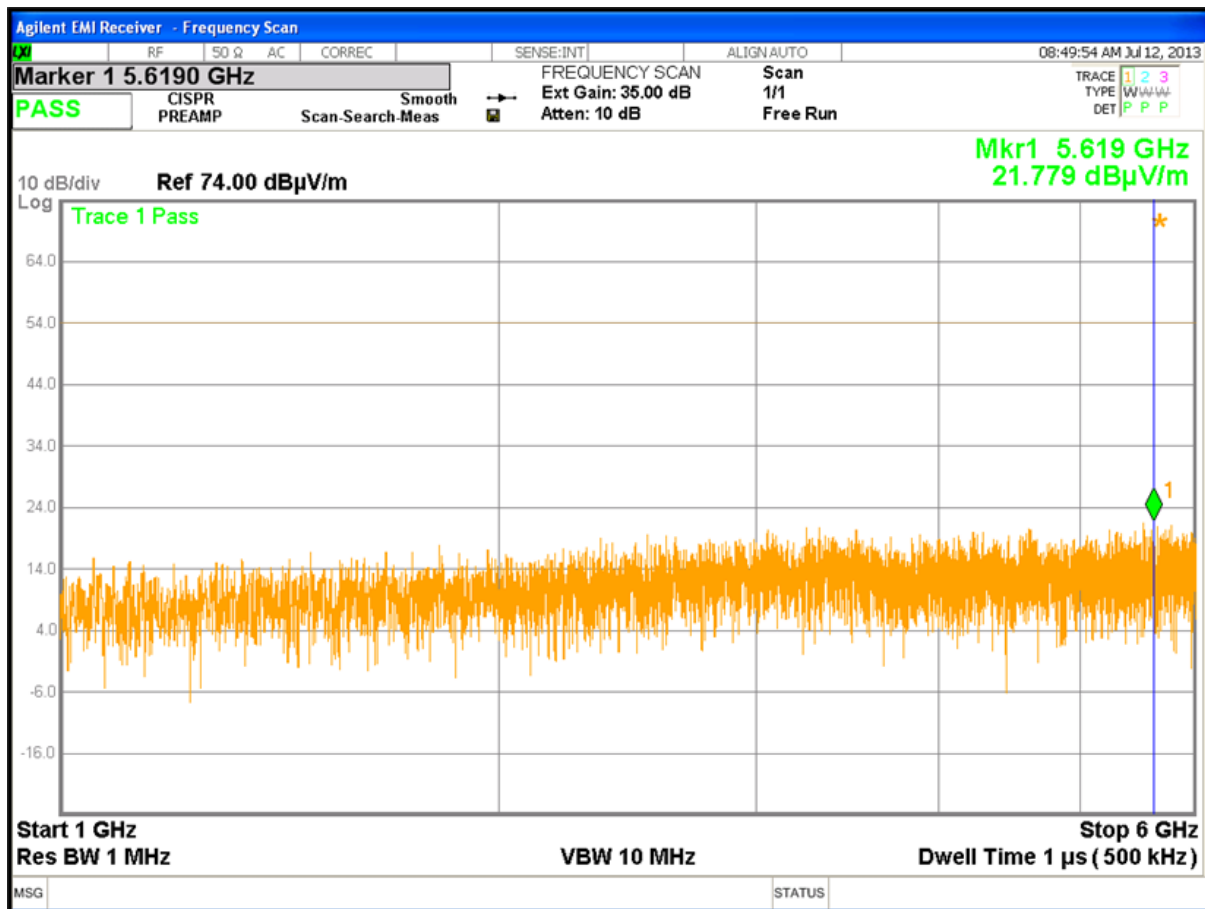
FCC test report

Transmission



FCC test report

Receiving



5.4 Timing of the transmitter

Specify:

Base standard:	CFR47 Part 15 Section 15.35 (c)
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Unless otherwise specified, e.g. Section 15.225 (b), when the radiated emission limits are expressed in term 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 exceeds 0,1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0,1 second interval strength shall be submitted with any application for certification or shall be retained in the measurement data file for equipment subjected to notification or verification.

Test requirements:

Test Setup:	CFR47 Part 15 Section 15.35 (c)
RBW:	1MHz
VBW:	3MHz

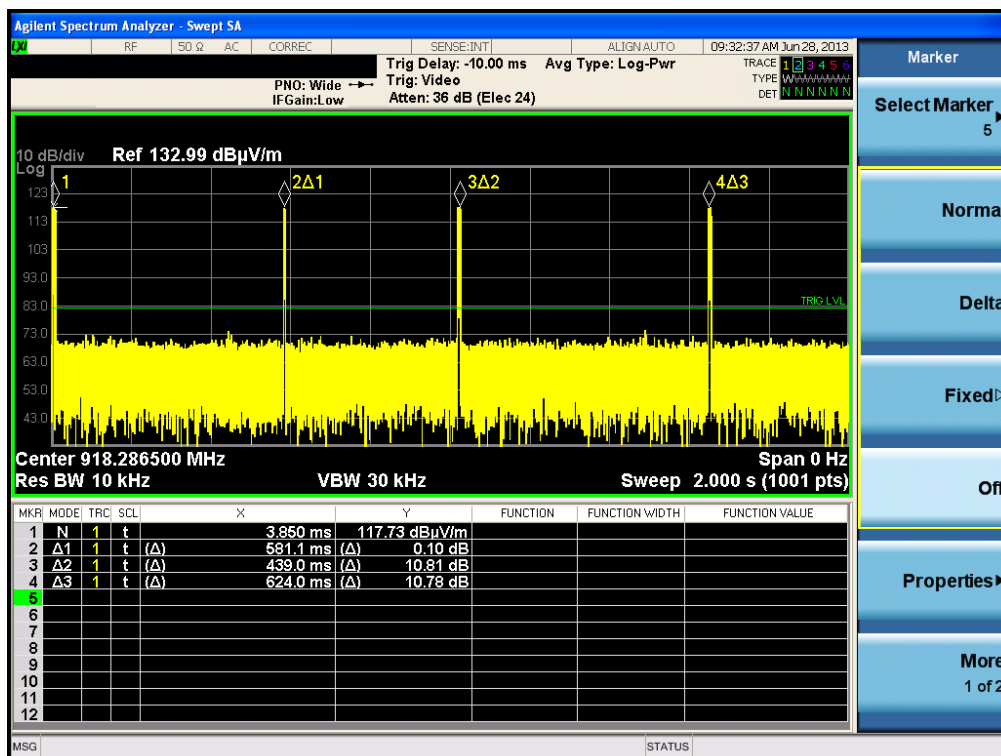
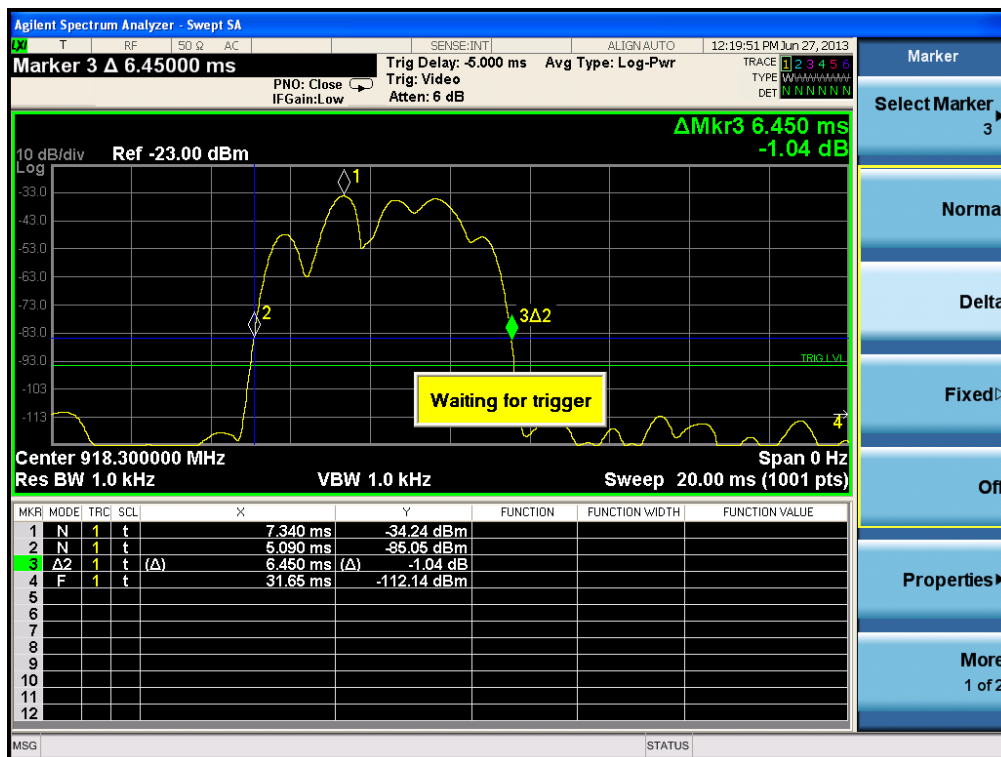
Test Data:

Frame period:	100ms
Pause:	-
Pulse train length:	-
ON Time:	6.45ms
OFF Time:	100ms

Comments:

Every 100ms is present a single impulse with duration of 6.45ms.
The duty-cycle is: $6.45/100 = 0.065$, therefore the correction is $20 \times \log(0.065) = -23.8\text{dB}$.

FCC test report



5.5 Transmit behaviour after releasing the TX-button

Specify:

Base standard:	47CFR Part 15 Section 15.231 (a)
----------------	----------------------------------

Test requirements:

Test Setup:	47CFR Part 15 Section 15.35 (c)
RBW:	1MHz
VBW:	3MHz

Test data:

T1:	-
T2:	-
T2-T1:	ms

Comments:

-

5.6 Radiated output power

Specify:

Base standard: FCC 15.249 (a)

Test Requirements:

RBW / VBW:

200Hz ($f < 150\text{kHz}$)
9kHz ($150\text{kHz} < f < 30\text{MHz}$)
120kHz ($30\text{MHz} < f < 1000\text{MHz}$)
1MHz ($f > 1000\text{MHz}$)

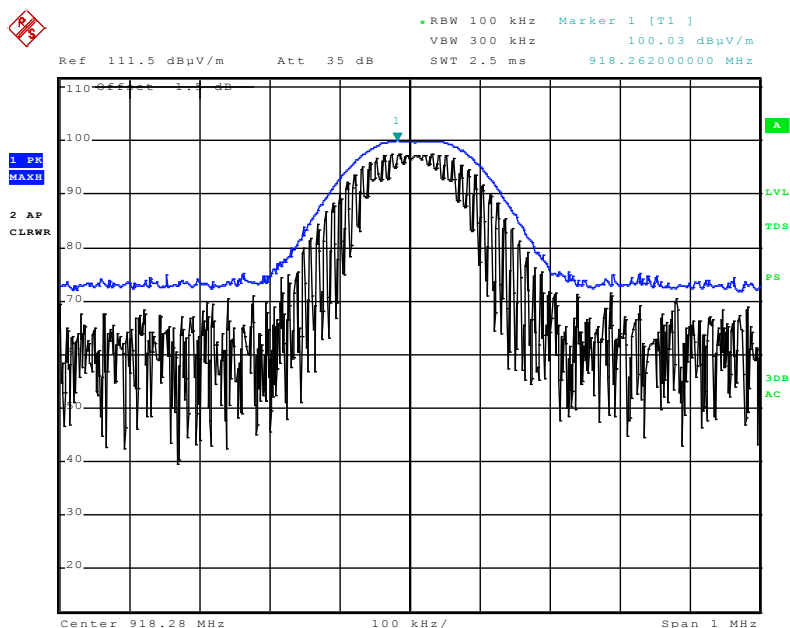
Test data:

Output radiated power (3m of distance): Peak 101.68 dB μ V/m at distance of 3m

Comments:

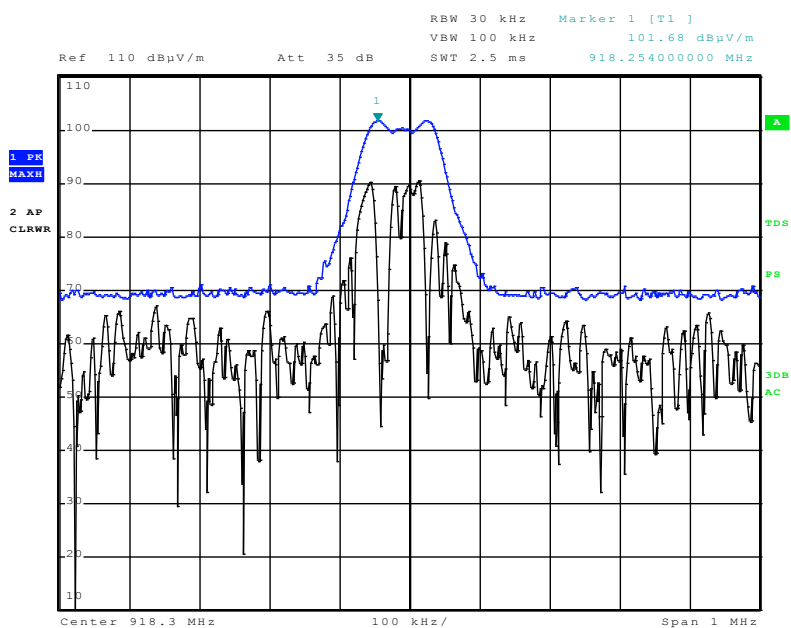
The results represent the worst case of emissions between three polarizations verified (X, Y and Z). The table was rotated of 360° and antenna receiving moved from 1m to 4m to find the maximum emission.

We performed a test with RBW as required and the maximum value is lower than that found with RBW 30kHz. We can keep the worst value.



Date: 12.JUL.2013 09:49:13

FCC test report



Date: 27.JUN.2013 09:55:20

FCC test report

5.7 Typical pulse train of a signal

Specify:

Base standard: 47CFR Part 15 Section 15.35 (c)

Test Setup:

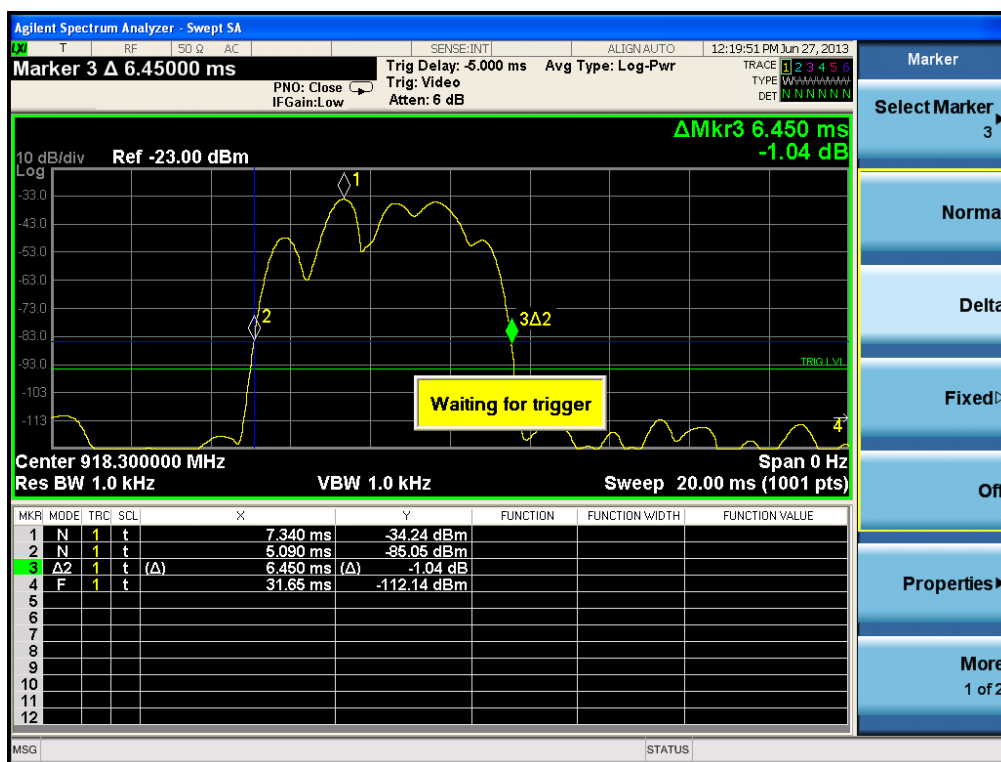
RBW: 1MHz
VBW: 3MHz

Test Data:

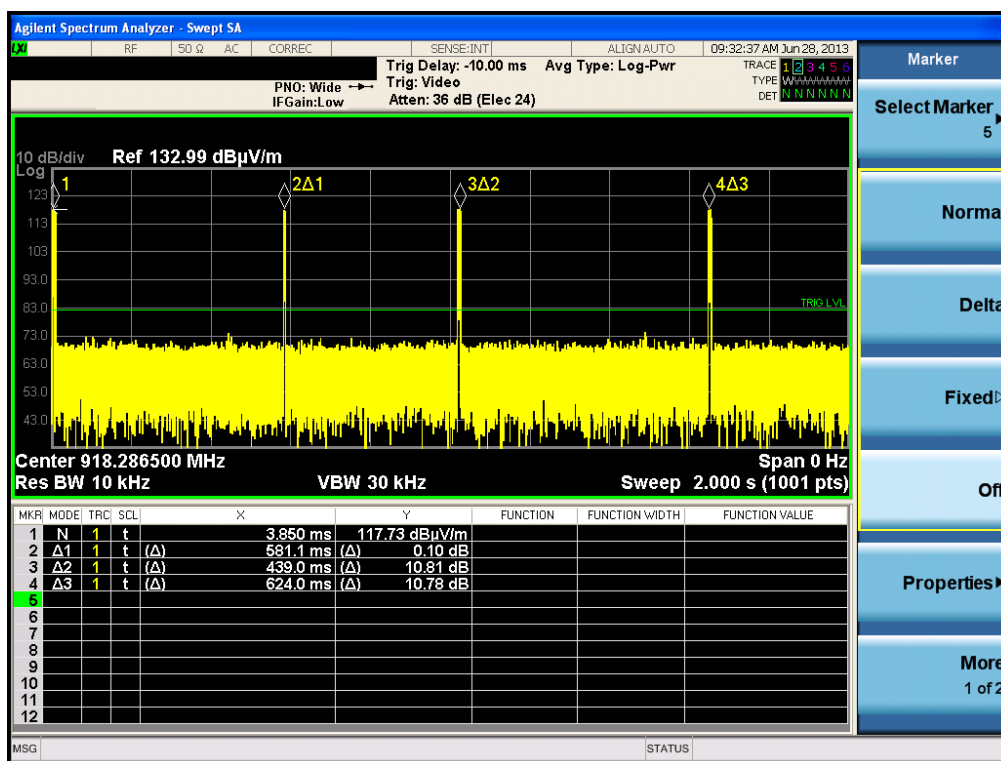
Duty-cycle: 0.065
TX on: 6.45ms
TX off: 100ms
Average correction factor ($20 \cdot \log(\text{duty cycle})$): $20 \log(6.45 / 100\text{ms}) = -23.8\text{dB}$

Comments:

Every 100ms is present a single impulse with duration of 6.45ms.
The duty-cycle is: $6.5/100 = 0.065$, therefore the correction is $20 \times \log(0.065) = -23.8\text{dB}$



FCC test report



5.8 Compliance with the limit of FCC

Specify:

Base standard:	47CFRF Part 15 Section 15.249 (c)
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Test Setup:

RBW / VBW:	200Hz ($f < 150\text{kHz}$) 9kHz ($150\text{kHz} < f < 30\text{MHz}$) 120kHz ($30\text{MHz} < f < 1000\text{MHz}$) 1MHz ($f > 1000\text{MHz}$)
------------	---

Limits:

Frequency [MHz]	Field Strength of the fundamental	Field Strength of spurious emissions
902 - 928	50mV/m / 94dB μ V/m	500 μ V/m / 54dB μ V/m
Note: -		

Test Result:

Frequency:	
Calculated average (3m of distance):	$(101.68 - 23.8) \text{ dB}\mu\text{V/m} = 77.9\text{dB}\mu\text{V/m} < 94\text{dB}\mu\text{V/m}$

Comments:

The results represent the worst case of emissions between three polarizations verified (X, Y and Z). *The table was rotated of 360° and antenna receiving moved from 1m to 4m to find the maximum emission.*

5.9 Spurious emission - radiated

Specify:

Base standard: 47CFR Part 15 Section 15.249 (a)

Test Setup:

-

Limits:

Frequency [MHz]	Field Strength of the fundamental	Field Strength of spurious emissions
above 470	50mV/m / 94dB μ V/m	500 μ V/m / 54dB μ V/m
Note: -		

Test Result:

Frequency [MHz]	Peak Amplitude of emission (dB μ V/m)	Average Amplitude of emission (dB μ V/m)	Limit maximum allowed emission power	Actual attenuation below frequency of operation (dB)	Results
918.28	94	102.64	82.64dB μ V/m	11.36	operating frequency
1836.26	50.4	30.4	54	23.6	complies
2754.84	< 50	< 30	54	> 24	Complies
3673.12	< 50	< 30	54	> 24	complies
4591.4	< 50	< 30	54	< 24	Complies
5509.68	< 50	< 30	54	< 24	Complies
6427.96	< 50	< 30	54	< 24	Complies
7346.24	< 50	< 30	54	< 24	Complies
8264.52	< 50	< 30	54	< 24	Complies
9182.80	< 50	< 30	54	< 24	Complies

Comments:

The results represent the worst case of emissions between three polarizations verified (X, Y and Z). The table was rotated of 360° and antenna receiving moved from 1m to 4m to find the maximum emission.

5.10 Occupied bandwidth

Specify:

Base standard:	47CFR Part 15.215 (c)
----------------	-----------------------

The bandwidth of the emission shall be no wider than 0,25% of the center frequency for devices operating above 70MHz and below 900MHz. For devices operating above 900MHz, the emission shall be no wider than 0,5% of the center frequency. Bandwidth is determined at the points 20dB down from the modulated carrier.

Test Setup:

RBW:	3kHz
VBW:	3kHz

Limits:

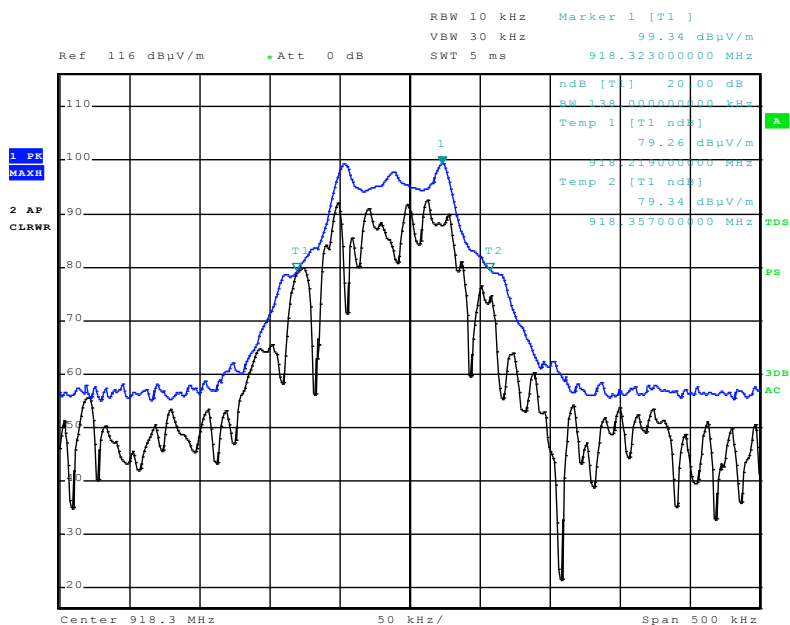
< 0,5% of the centre frequency, here 4.59MHz
--

Test Data:

Occupied bandwidth at -20dB:	138kHz < 4.59MHz
------------------------------	------------------

Comments:

-



Date: 27.JUN.2013 09:58:13

6

Measurement and Test Equipment instrumentation

Code	nr.	Manufacturer	Model	Serial number	Date of Calibration	Calibration Due
ANA	7	Agilent	N9020A	MY48011101	01/03/2013	01/03/2014
ANA	11	Rohde & Schwarz	FSL3	102362	02/05/2012	02/05/2014
ANA	12	Rohde & Schwarz	FSL3	102039		
ANA	13	Rohde & Schwarz	FLS3	101359	11/04/2013	11/04/2016
ANT	1	EMCO	3121C DB-4	9312-901		
ANT	3	Schwarzbeck	VULB9160	3180	13/06/2013	13/06/2015
ANT	4	AH System	SAS-571	684	13/06/2013	13/06/2015
ANT	5	AH System	SAS-562B	236	06/06/2011	06/06/2015
ANT	6	AH System	SAS-571	1025	13/06/2013	13/06/2015
ANT	7	Aaronia	BicoLOG 30100	1293	13/06/2013	13/06/2015
ANT	9	Schwarzbeck	VHBA 9123	525	13/06/2013	13/06/2015
ATT	1	-	PE7021-6		21/06/2011	21/06/2013
ATT	2	Tyco Electronics Co.	50WCW	-		

Code	nr.	Manufacturer	Model	Serial number	Date of Calibration	Calibration Due
ATT	5	RADIAL	R414.710.000	-		
ATT	6	RADIAL	R414.710.000	-		
ATT	7	RADIAL	R414.720.000	-		
CDN	1	FCC	FCC 801-M2-16A-SPJ	5024	13/06/2013	13/06/2015
CDN	2	FCC	FCC 801-M3-16A-S	5032	13/06/2013	13/06/2015
CDN	3	FCC	FCC801-150-50 CDN	05031 & 05032		
CDN	4	FCC	FCC 801-M1-16A	7035	13/06/2013	13/06/2015
CDN	5	FCC	FCC 801-150-50-CDN	07113 & 07114		
CDN	6	FCC	FCC 801-M4-16A	100726	24/01/2012	24/01/2014
CDN	7	FCC	FCC-801-M5-16A	100727	24/01/2012	24/01/2014
CSA	1	TESEO	EN 55022 EN 610004-3	NSA	29/04/2013	29/04/2014
				CISPR 16-1-4	14/04/2009	14/04/2014
				EN 61000-4-3	04/09/2012	04/09/2013
ECL	1	FCC	F-203I-23	466	13/06/2013	13/06/2015
ECL	2	FCC	F-203I-CF-23MM	445		
GEN	7	Rohde & Schwarz	SML 03	102178	25/01/2012	25/01/2014
GEN	8	Agilent	N5182A	MY48180288	11/09/2012	11/09/2013

FCC test report

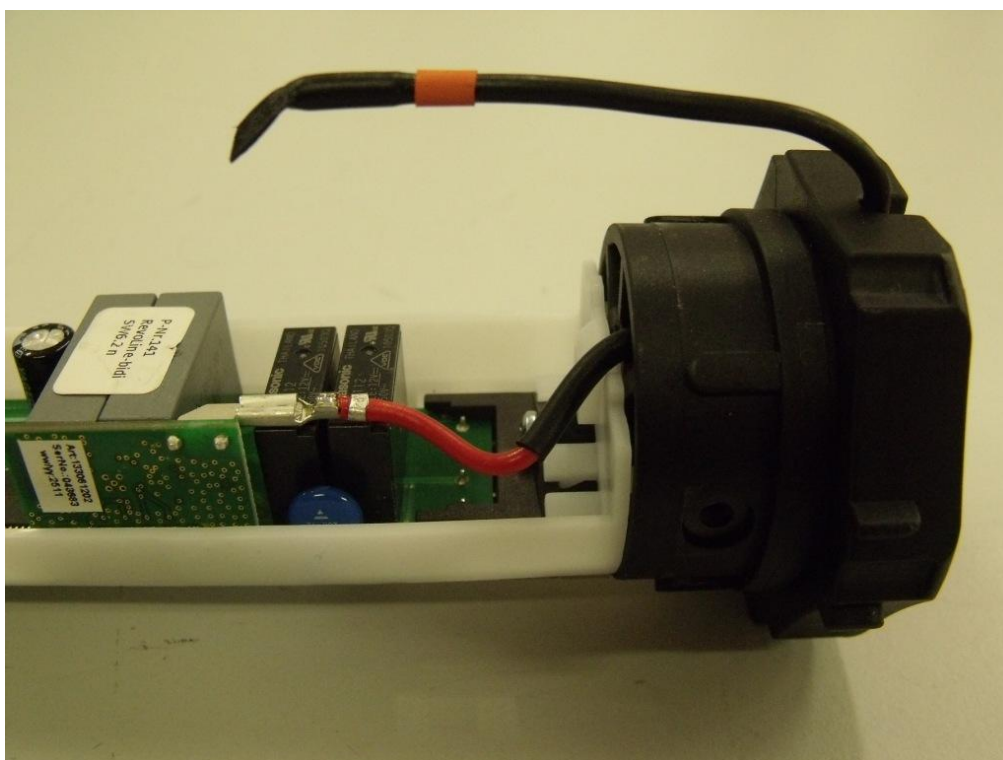
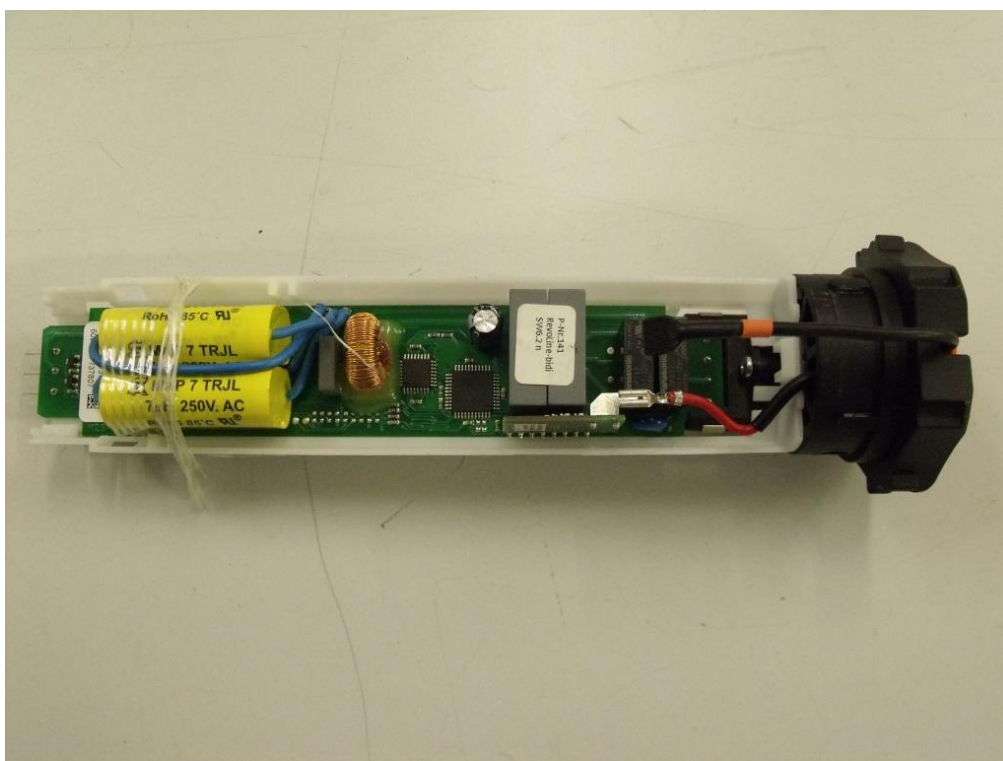
Code	nr.	Manufacturer	Model	Serial number	Date of Calibration	Calibration Due
LIS	2	Rohde & Schwarz	ESH2-Z5	100183	13/06/2013	13/06/2015
PAS	1	FCC	F-202	197	11/06/2012	11/06/2016
POW	1	Rohde & Schwarz	NRVD	101221	18/06/2012	18/06/2014
POW	2	Rohde & Schwarz	NRV-Z5	100314	20/06/2012	20/06/2014
POW	3	Rohde & Schwarz	NRV-Z5	100315	20/06/2012	20/06/2014
PRE	2	Schwarzbeck	BBV 9718	9718-178	13/04/2012	13/04/2014
RIC	1	Rohde & Schwarz	ESCI	100140	06/02/2013	06/02/2014
SCO	7	FCC	F-51	454	09/06/2011	07/06/2014
SCO	8	Teseo	EQ-51-1	D047	07/06/2011	07/06/2014
SCO	9	FCC	F-33-4	63	09/06/2011	07/06/2014
SOF	1	Rohde & Schwarz	EMC32	V8.53.0		

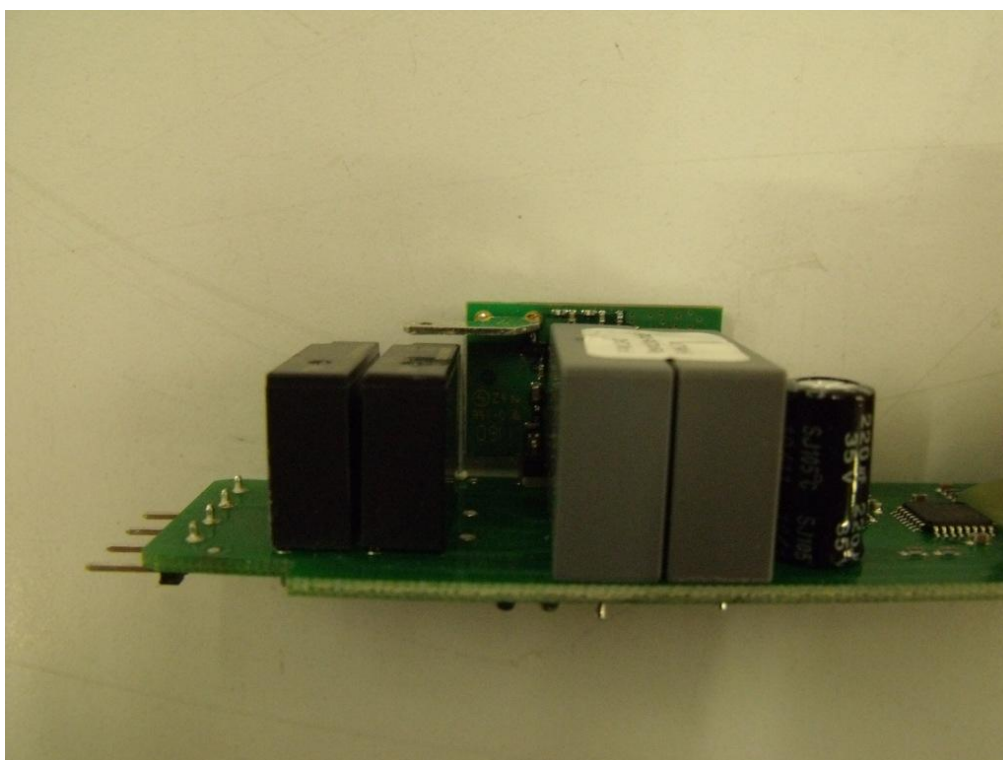
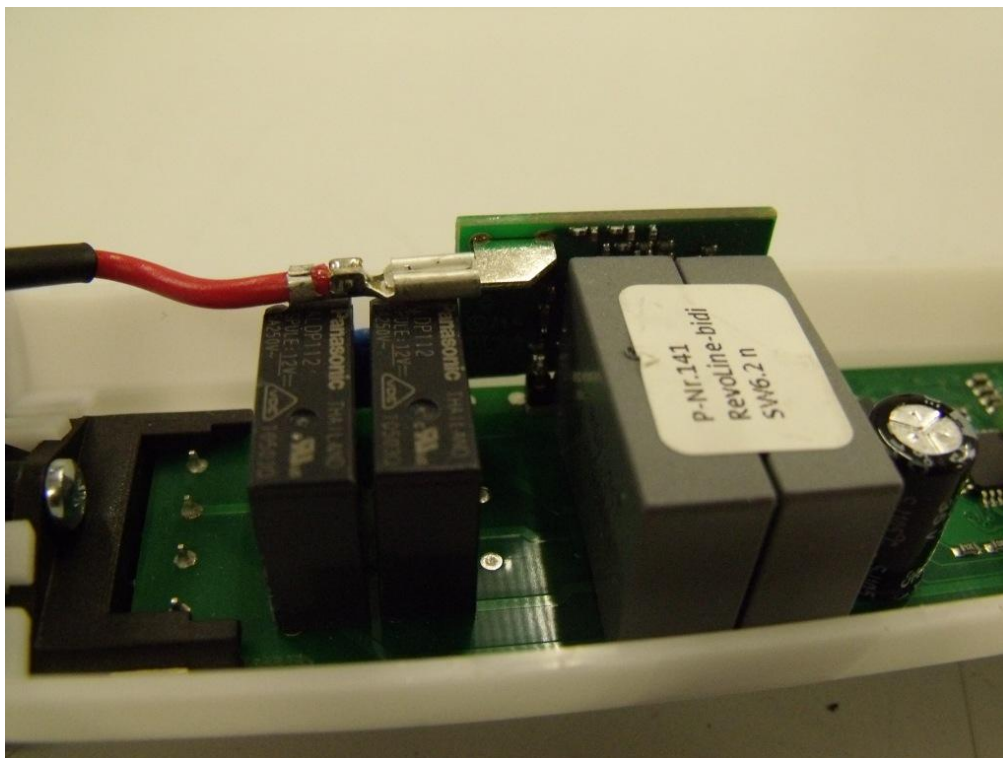
7

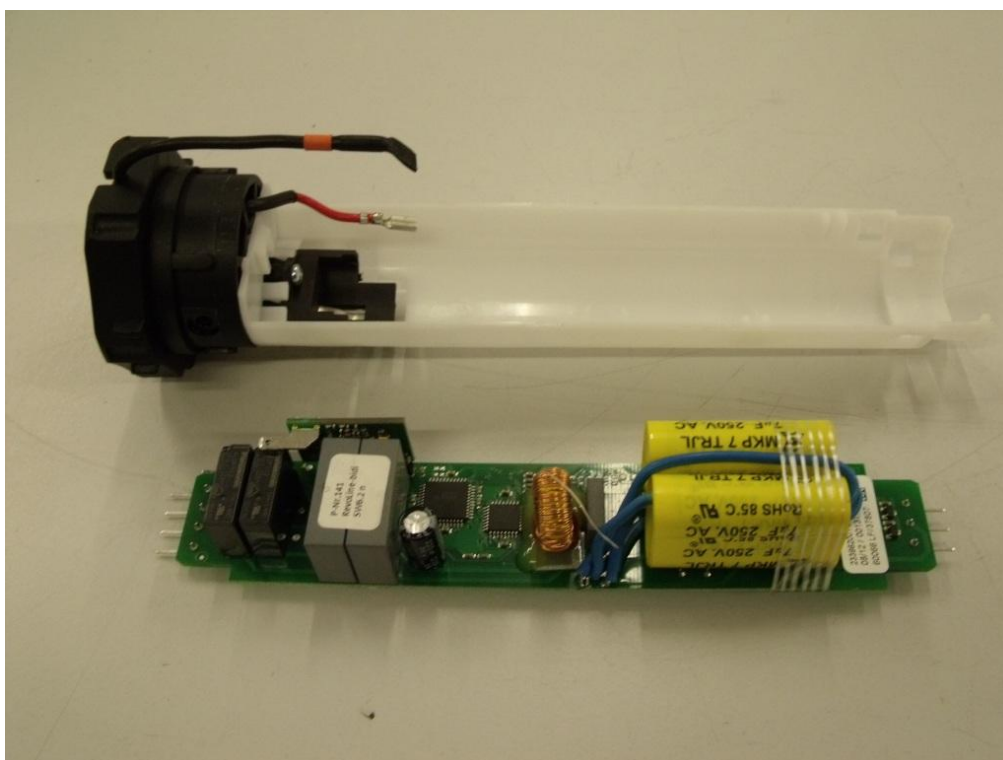
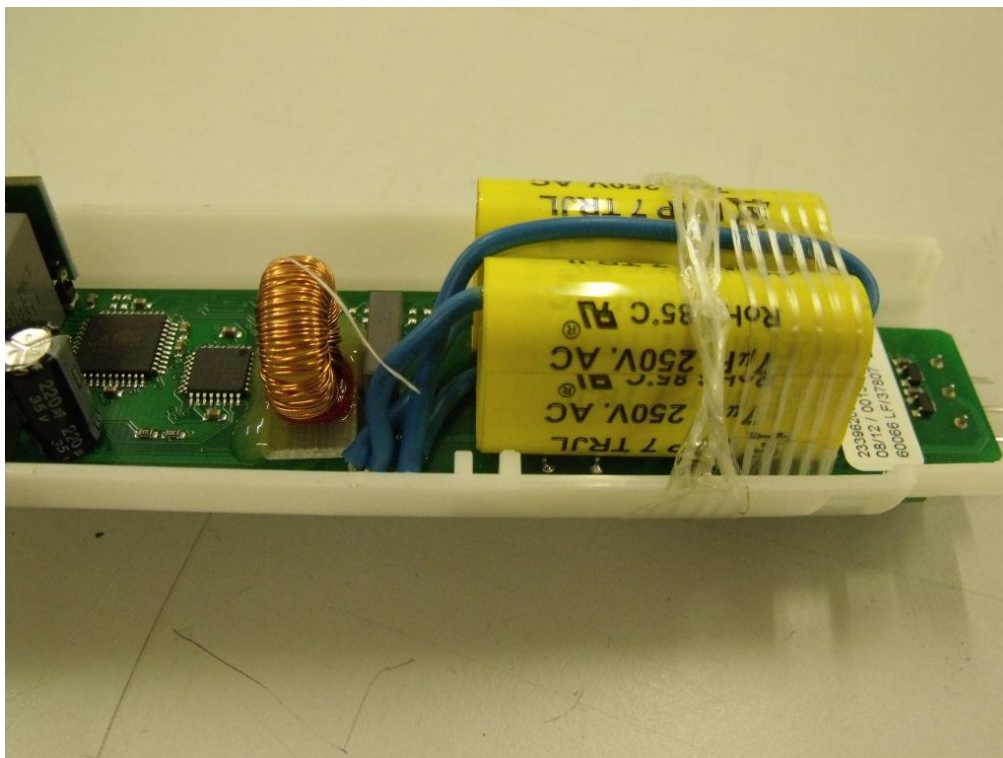
Photographic Documentation

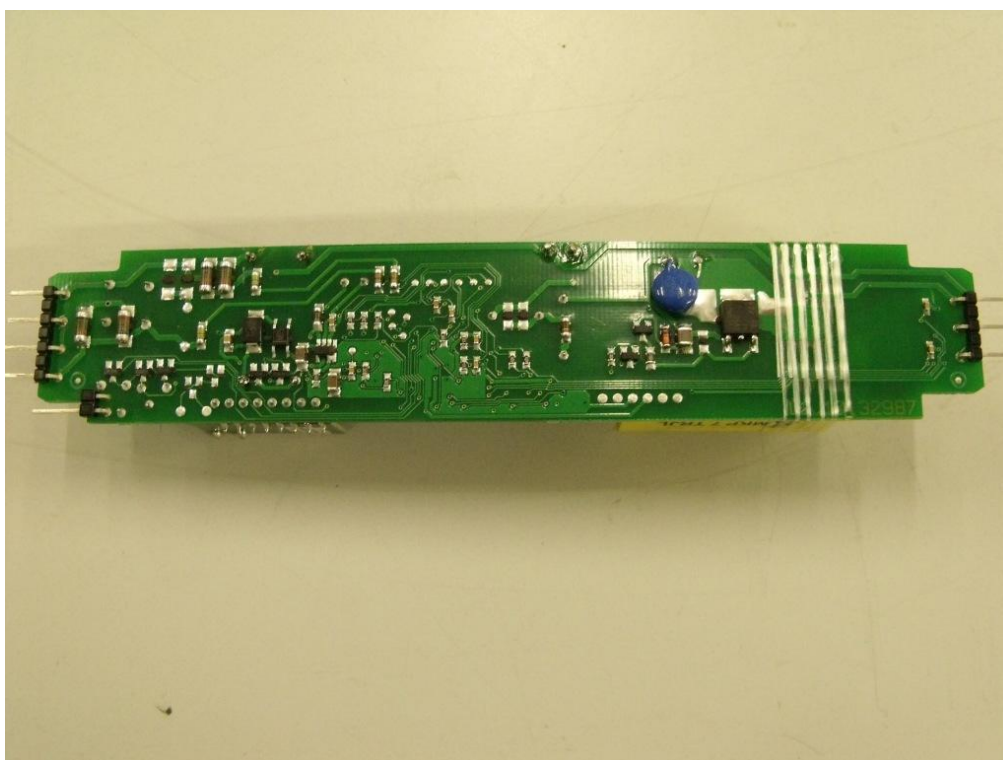
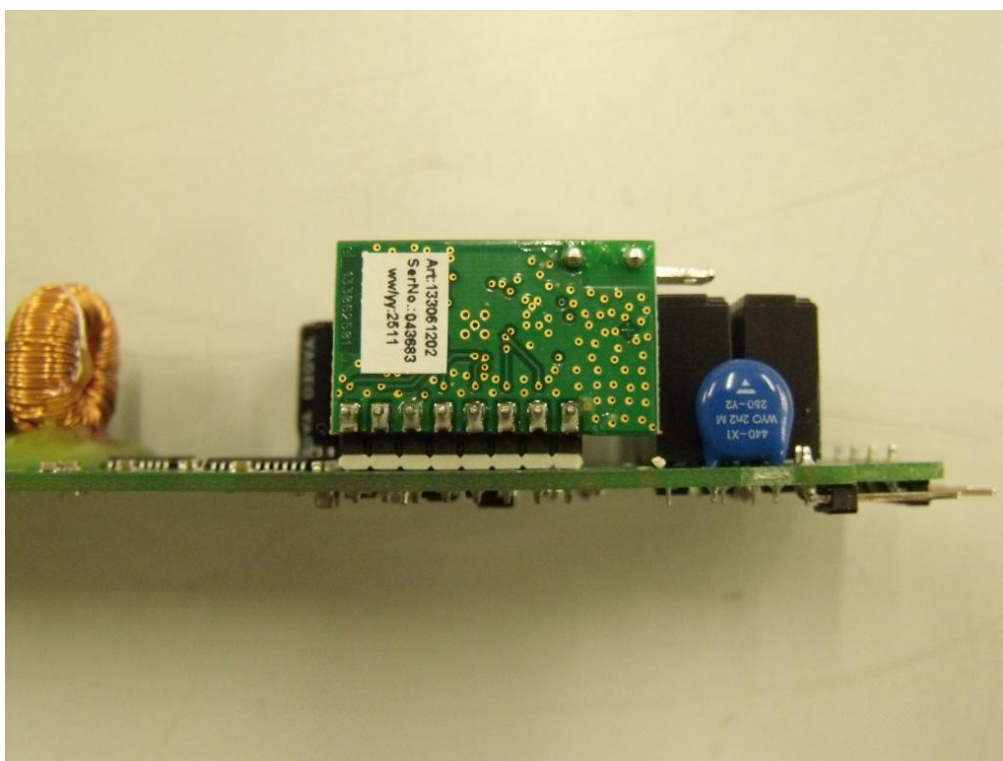
8.1 EUT Identification

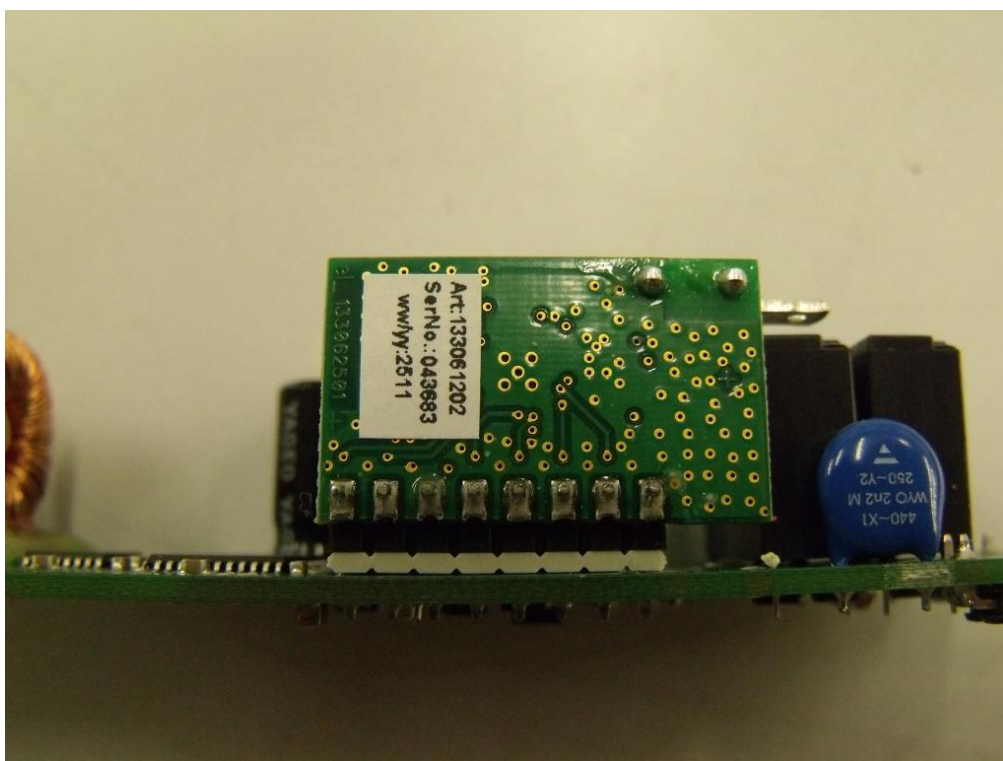






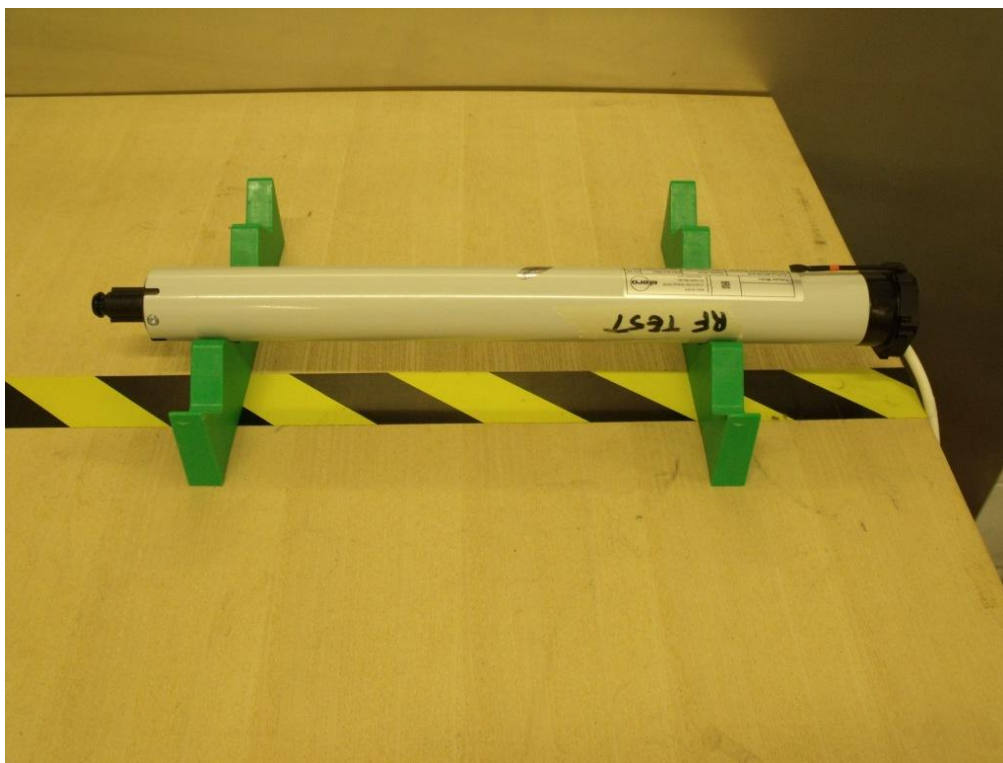






8.2 Test Set-up

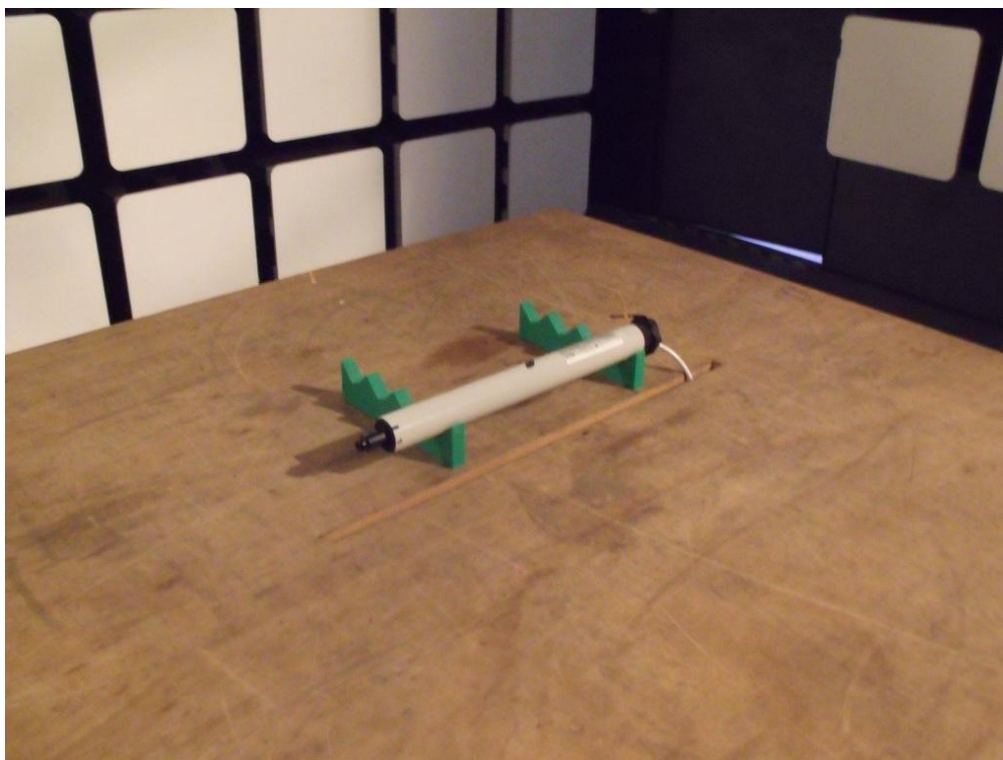
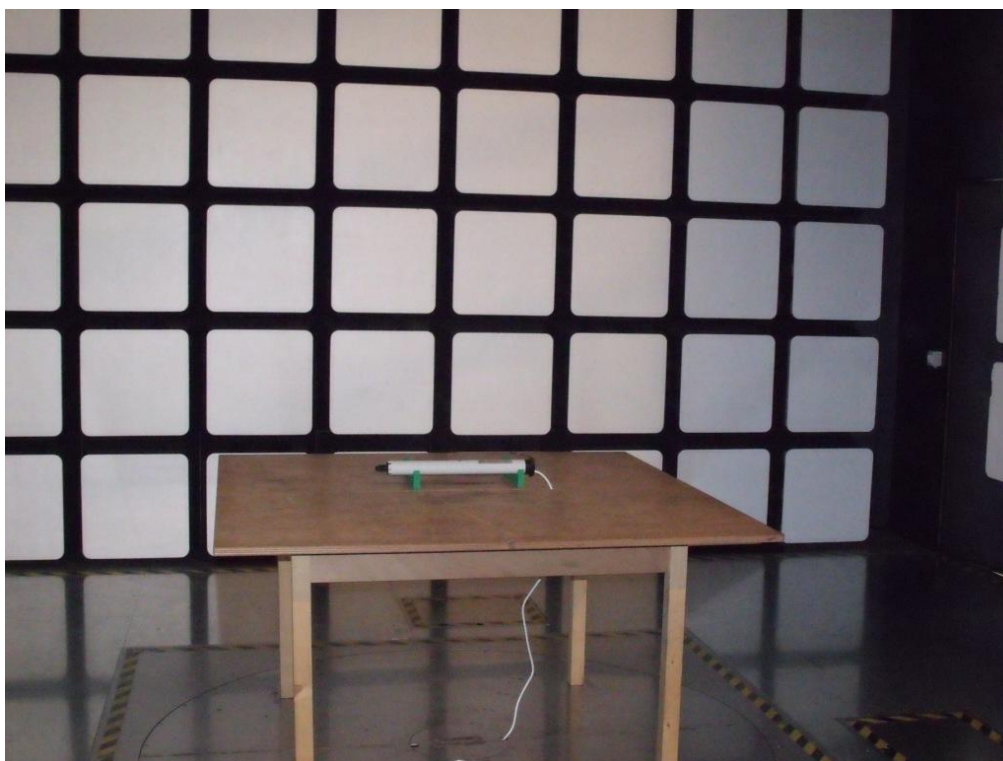
Conducted emission:







Radiated emissions:





Annex 1

Technical files



RF module system "Proline2" for Combio- XXX MHz, RoITop-XXX MHz

For: transceiver modules TMWA for Combio, RoITop

Brand: Elero GmbH Antriebstechnik
 Linsenhofstrasse 65
 D- 72660 Beuren (Germany)

1. Description of the product

The RF modul for using as transceiver in different products (Combio- XXX MHz, RoITop-XXX MHz) based on the transceiver chip CC1101 (TI) with antenna matching networks .
 The CC1101 module is controlled by a application MCU via SPI using a protocol stack for RX and TX mode for the RF communication, only in the bidirectional application mode the CC1101 will be used as transmitter and receiver simultaneously. All TX- and RX transmissions for bidirectional communication are packet oriented for short transmission times and use suitable LBT and CCA processes.

1.1 technical specifications

1.1.1 Duty cycle estimation

a) Transmitting specification Proline2 remote controls

Size of data protocol (including PHY)	41 Byte	min.(1 Destination or Group)
transfer rate packet mode	68 Byte	max. (10 Destinations)
transfer PHY	76.800 Bps	
	869,525 MHz/ deviation 32 kHz /RBW 210 kHz or	
	918,300 MHz/ deviation 32 kHz/ RBW 210 kHz	
Traffictime (time to air)	min. 4,3 ms / data protocol	
	max. 7,1 ms / data protocol	
Normally volume of traffic:	$\leq 8 \times \text{traffic events/d}$ by user about transmitter (= 0,33 traffic events per hour)	

b) Transmission modes

- Broadcast transmission (group > 10 destinations, no routing path)
 - ⇒ transmission of max. 1 * data protocol (4,3 ms)
 - ⇒ **< 5 ms** / user initiated event
- Unicast for 1 destination
 - ⇒ transmission of max. 2 * data protocol (2 * 4,3ms, cut off > 100 ms between sendings)
 - ⇒ **< 9 ms** / user initiated event
- Unicast for 10 destination
 - ⇒ transmission of max. 2 * data protocol (2 * 7,1 ms, cut off > 100 ms between sendings)
 - ⇒ **< 15 ms** / user initiated event

c) Estimation of duty cycle (worst case)

- Broadcast (group)
 - max. traffic time = 5 ms
 - ⇒ max. traffic time * Normally volume of traffic per hour = 5 ms * 0,33 = **0,0016 s / h**
- Unicast for 1 destination
 - max. traffic time = 9 ms
 - ⇒ max. traffic time * Normally volume of traffic per hour = 9 ms * 0,33 = **0,003 s / h**
- Unicast for 10 destinations
 - max. traffic time = 15 ms
 - ⇒ max. traffic time * Normally volume of traffic per hour = 15 ms * 0,33 = **0,005 s / h**

Files	Project	Author	Rev. No.	Rev. Date
technical files_RF system Proline2	Proline2 UL	PRR		11.02.2013

Annex 2

FEDERAL COMMUNICATIONS COMMISSION

Laboratory Division
7435 Oakland Mills Road
Columbia, MD 21046

May 17, 2013

Registration Number: 771316

NICE S.p.A.
Via Pezza Alta, 13,
,
Oderzo, 31046
Italy

Attention: Enrico Campion, Mr.

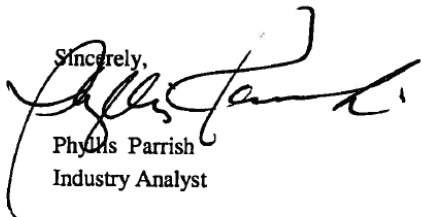
Re: Measurement facility located at Via Pezza Alta, 13 - I-31046 Oderzo
Anechoic chamber (3 meter)
Date of Renewal: May 17, 2013

Dear Sir or Madam:

Your request for renewal of the registration of the subject measurement facility has been received. The information submitted has been placed in your file and the registration has been renewed. The name of your organization will remain on the list of facilities whose measurement data will be accepted in conjunction with applications for Certification under Parts 15 or 18 of the Commission's Rules. Please note that the file must be updated for any changes made to the facility and the registration must be renewed at least every three years.

Measurement facilities that have indicated that they are available to the public to perform measurement services on a fee basis may be found on the FCC website www.fcc.gov under E-Filing, OET Equipment Authorization Electronic Filing, Test Firms.

Sincerely,



Phyllis Parrish
Industry Analyst