

Test report nr. 23512FCC10

Measurements performed in accordance with:

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

Product: Transmitter

Tested model: FLO1R-S/A, FLO2R-S/A, FLO4R-S/A

FCC ID PML433FRA

Applicant: Nice S.p.A.
Via Pezza alta, 13 I-31046 Rustignè di Oderzo (TV)

Manufacturer: Nice S.p.A.
via Pezza Alta ,13 I-31046 Rustignè di Oderzo (TV)

Trademark: Nice

Testing Laboratory Nice S.p.A.
Via Pezza Alta, 13
I-31046 Rustignè di Oderzo (TV)

Registration number: 771316

Date of receipt sample: 3 August 2010

Testing date: 3 - 13 august 2010

Issue date: 23 November 2010

Tested by: M. Cosmin



Checked by: E. Campion



Notice: The result of tests and checks reported in this Test Report refer exclusively to the samples tested and described in the Report itself.
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1

General Description of Equipment under Test**1.1 Applicant**

Name: Nice S.p.A.
Address: via Pezza Alta ,13
31046 Rustignè di Oderzo (TV)
Country: Italy

1.2 Manufacturer

Name: Nice S.p.A.
Address: via Pezza Alta, 13
31046 Rustignè di Oderzo (TV)
Country: Italy

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:	transmitter LPD at 433MHz
Model:	FLO1R-S/A, FLO2R-S/A, FLO4R-S/A
FCC ID:	PML433FRA
Trade Name:	Nice
Data cable:	not present
Telecom cable:	not present
Power supply type:	with battery 12Vdc type 23A
AC power input cable:	not present
DC power input cable:	not present

Model	Description
FLO1R-S/A	transmitter LPD at 433,92MHz with 1 channel for control of automation systems such as opening devices for doors, gates and roller shutters etc.
FLO2R-S/A	transmitter LPD at 433,92MHz with 2 channel for control of automation systems such as opening devices for doors, gates and roller shutters etc.
FLO4R-S/A	transmitter LPD at 433,92MHz with 1 channel for control of automation systems such as opening devices for doors, gates and roller shutters etc.

1.5 Feature of equipment under test

Parameters	Value
Power specification	-
Operating frequency:	433,92MHz
Field strength at distance:	
Occupied Bandwidth (99% BW):	9kHz
Emission Designator (ITU):	9K0A1D
Modulation:	AM (OOK)
Channel spacing:	no channel spacing
Antenna:	integral
Rx Sensitivity:	none
Main SW identification:	none
Main HW board identification:	none
Peripherals included (for system application):	none
Interfaces:	none
Integrated interfaces	none
AC adapter:	none

1.6 Scope of tests

The purpose of the tests is to verify the compliance of the transmitters about the FCC rules for Low Power Device.

2

Test configuration of equipment under test

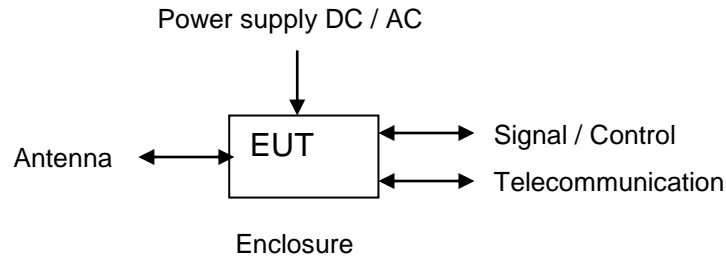
2.1 Environmental conditions

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
none	none	none

2.3 Interface identification and connection diagram of test system



#	Interface	Description	Maximum length	Ref. Document
1	Enclosure	plastic	73mm	none
2	AC mains power input	none	none	none
3	DC power port	none	none	none
4	Signal / control port	none	none	none
5	Antenna port	none	none	none

3

Operation of equipment under test

3.1 Operating test conditions

#	Description
1	transmit
2	standby

4

Tests identification and result

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

4.1 Methods of measurement

All compliance measurements have been carried out using the procedures described in the standard ANSI C63.4-2003 (excluding sub-par. 4.1.5.2, 5.7.9 and 14) 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 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⁾:

Frequency [MHz]	Field Strength (μ V/m)	Measurement distance (m)
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.:

Port under test	Operating condition	Result
Enclosure	#1	Complies

Comments:

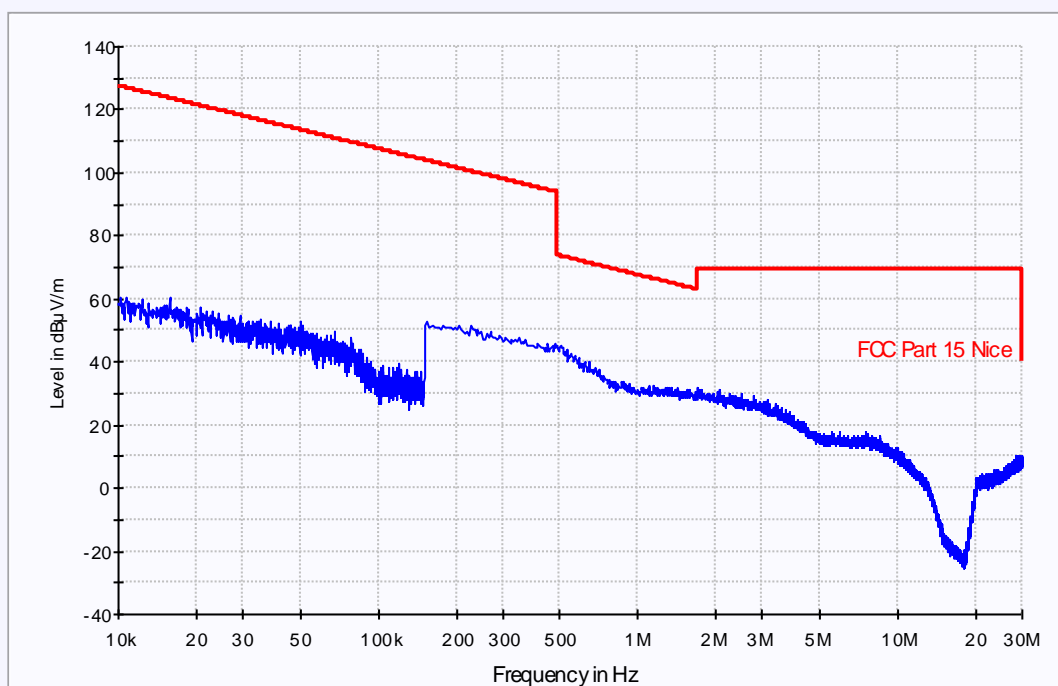
-

EMC32 Report

Common Information

EUT name:	FLOxR-S/A
Test Description:	Radiated emission
Serial number:	2010_235/3
Operating Conditions:	transmission
Operator Name:	Enrico

Emissione Loop Attivo dBuV PK



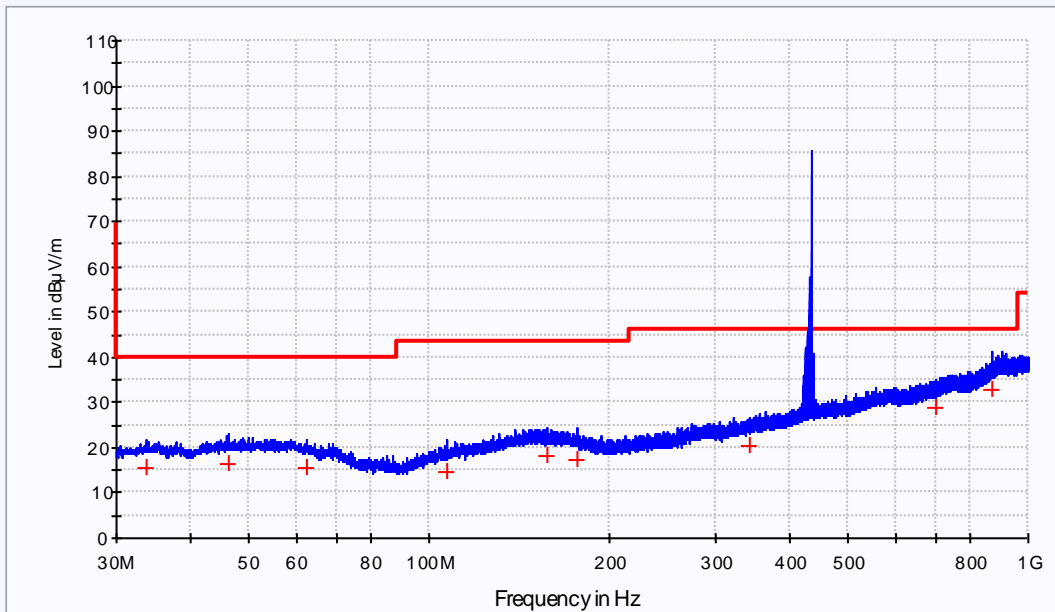
— MaxPeak-ClearWrite — Limit

EMC32 Report

Common Information

EUT name: FLOxR-S/A
 Test Description: Radiated emission
 Serial number: 2010_235/3
 Operating Conditions: transmission
 Operator Name: Enrico

Copy of Emissione radiata PK EN 55022



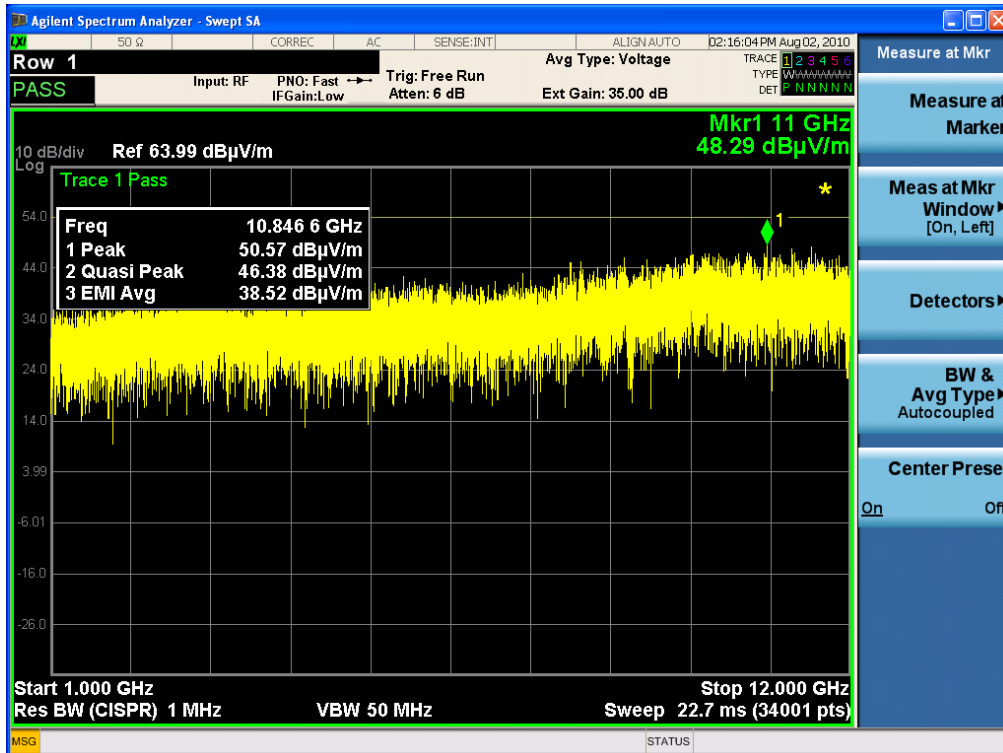
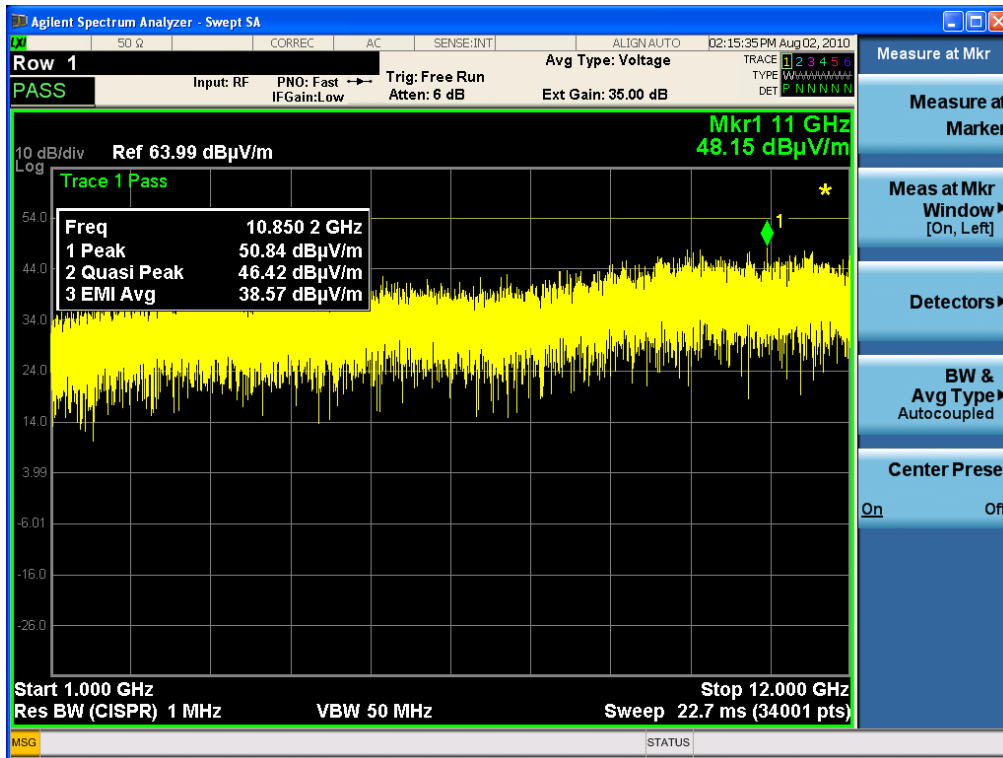
—	MaxPeak-ClearWrite	—	Limit	×	MaxPeak (Single)
—	MaxPeak-ClearWrite(1)	+	QuasiPeak (Single)	×	Average (Single)
+	RMS (Single)	×	MinPeak (Single)	×	CAverage (Single)
×	CRMS (Single)	×	ACVideO (Single)		

Result Table_Single

Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Average (dBµV/m)	RMS (dBµV/m)	MinPeak (dBµV/m)	CAverage (dBµV/m)	CRMS (dBµV/m)	ACVideo (dBµV/m)
33.680000	---	15.6	---	---	---	---	---	---
46.240000	---	16.6	---	---	---	---	---	---
62.320000	---	15.7	---	---	---	---	---	---
106.800000	---	14.7	---	---	---	---	---	---
157.080000	---	18.0	---	---	---	---	---	---
176.080000	---	17.4	---	---	---	---	---	---
342.160000	---	20.5	---	---	---	---	---	---
701.920000	---	28.9	---	---	---	---	---	---
868.040000	---	32.7	---	---	---	---	---	---

(continuation of the "Result Table_Single" table from column 9 ...)

Frequency (MHz)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Comment
33.680000	1000.000	120.000	100.0	H	0.0	11.8	
46.240000	1000.000	120.000	100.0	H	0.0	12.7	
62.320000	1000.000	120.000	100.0	H	0.0	12.0	
106.800000	1000.000	120.000	100.0	H	0.0	11.4	
157.080000	1000.000	120.000	100.0	H	0.0	14.7	
176.080000	1000.000	120.000	100.0	H	0.0	14.0	
342.160000	1000.000	120.000	100.0	H	0.0	17.3	
701.920000	1000.000	120.000	100.0	H	0.0	25.2	
868.040000	1000.000	120.000	100.0	H	0.0	28.2	



5.2 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

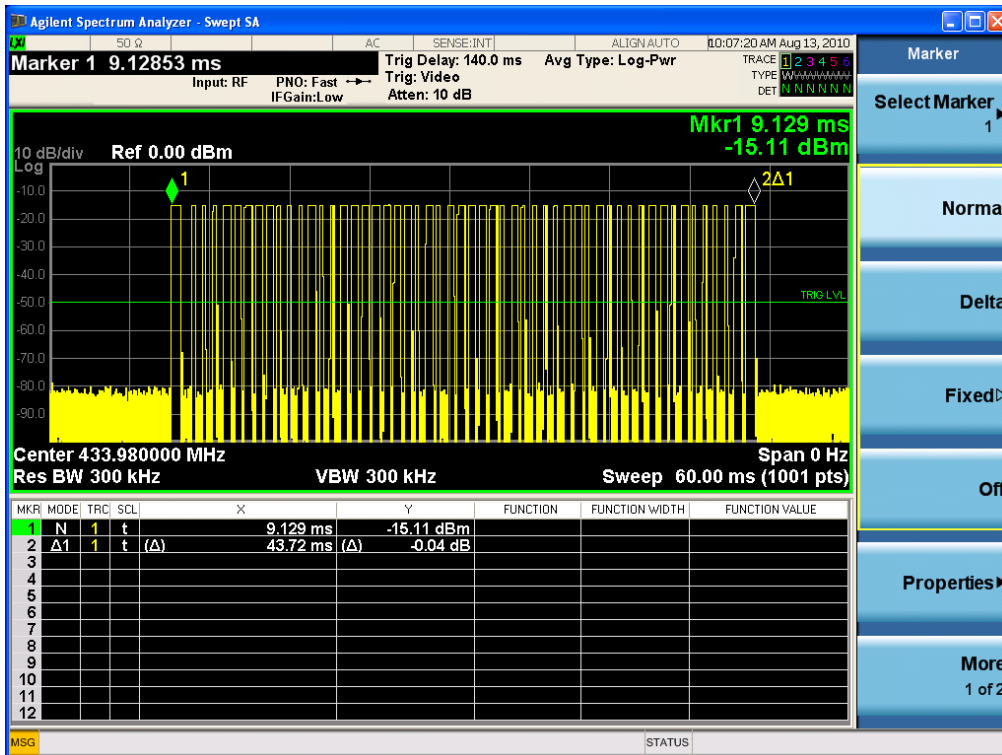
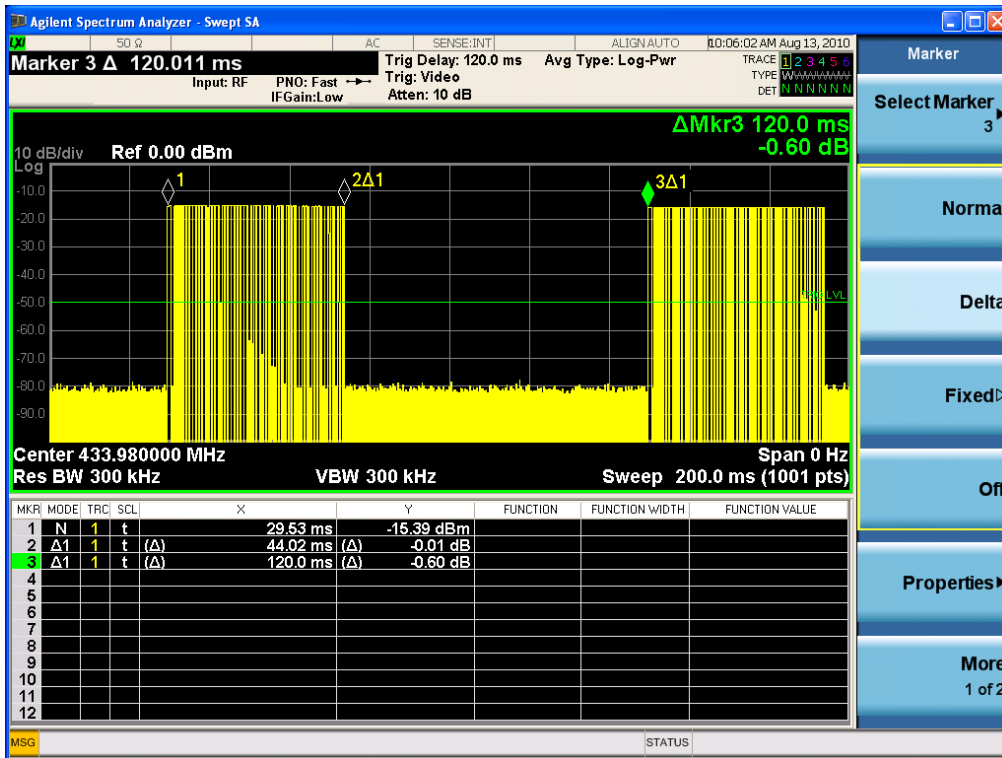
Test Data:

Timing of the transmitter:	120,0ms
Transmit button pressed shorter than:	-
Pulse train length:	120,0ms
ON Time:	43,72ms
OFF Time:	76,28ms

Comments:

-

FCC test report



5.3 Transmit behaviour after releasing the TX-button

Specify:

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

Test requirements:

Test Setup: 47CFR Part 15 Section 15.35 (c)

RBW: 1MHz

VBW: 3MHz

Test data:

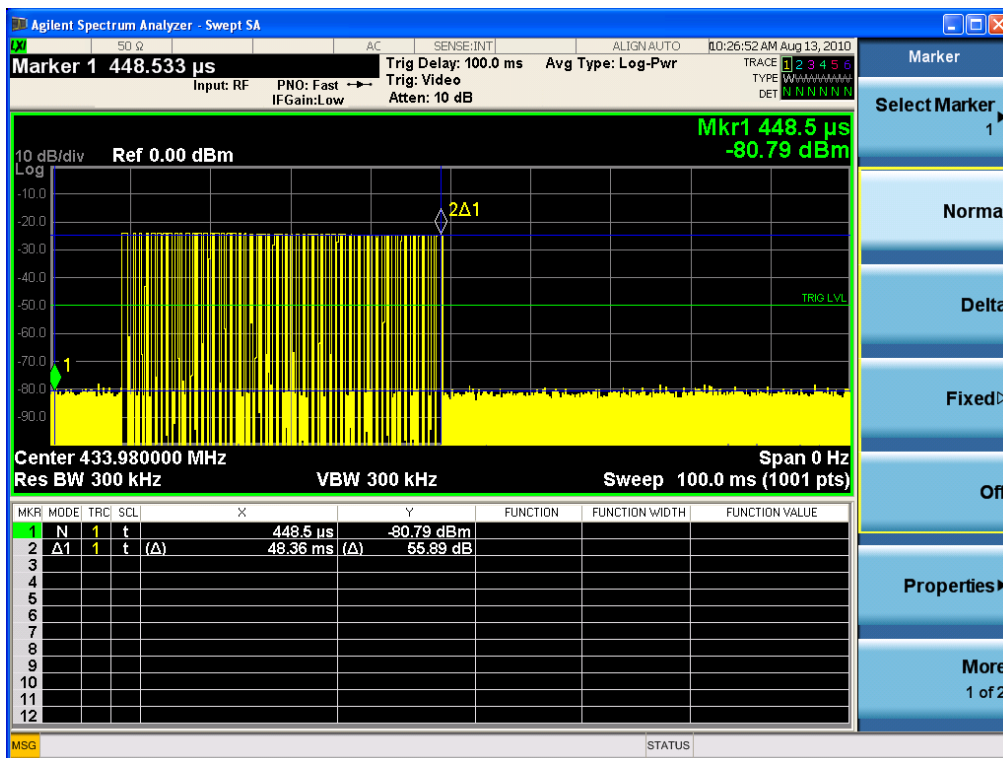
T1: 0,48ms

T2: 48,36ms

T2-T1: 47,91ms

Comments:

the transmitter stops transmitting before 5s after releasing the button



5.4 Radiated output power

Specify:

Base standard: FCC 15.231 (b)

Test Requirements:

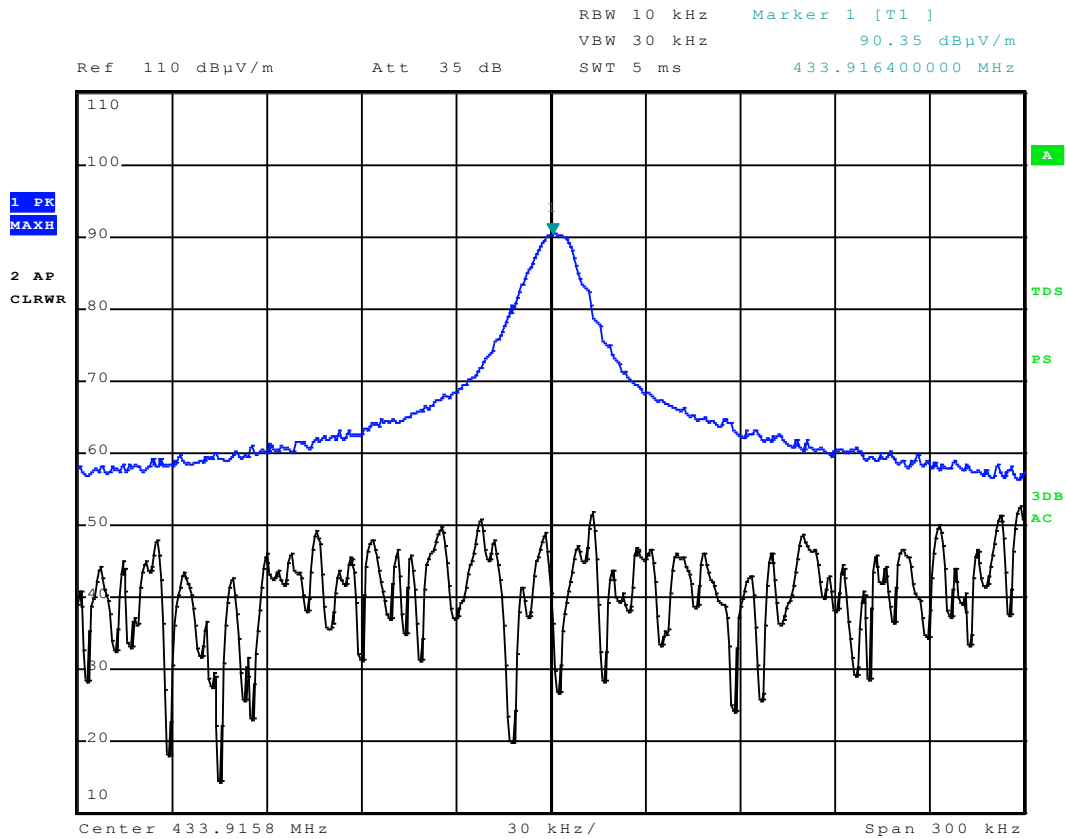
RBW / VBW:	200Hz ($f < 150\text{kHz}$) 9kHz ($150\text{kHz} < f < 30\text{MHz}$) 120kHz ($30\text{MHz} < f < 1000\text{MHz}$) 1MHz ($f > 1000\text{MHz}$)
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Test data:

Output radiated power (3m of distance): 90,35dB μ V/m at distance of 3m

Comments:

-



Date: 2.AUG.2010 15:51:18

5.5 Typical pulse train of a signal

Specify:

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

RBW:	1MHz
VBW:	3MHz

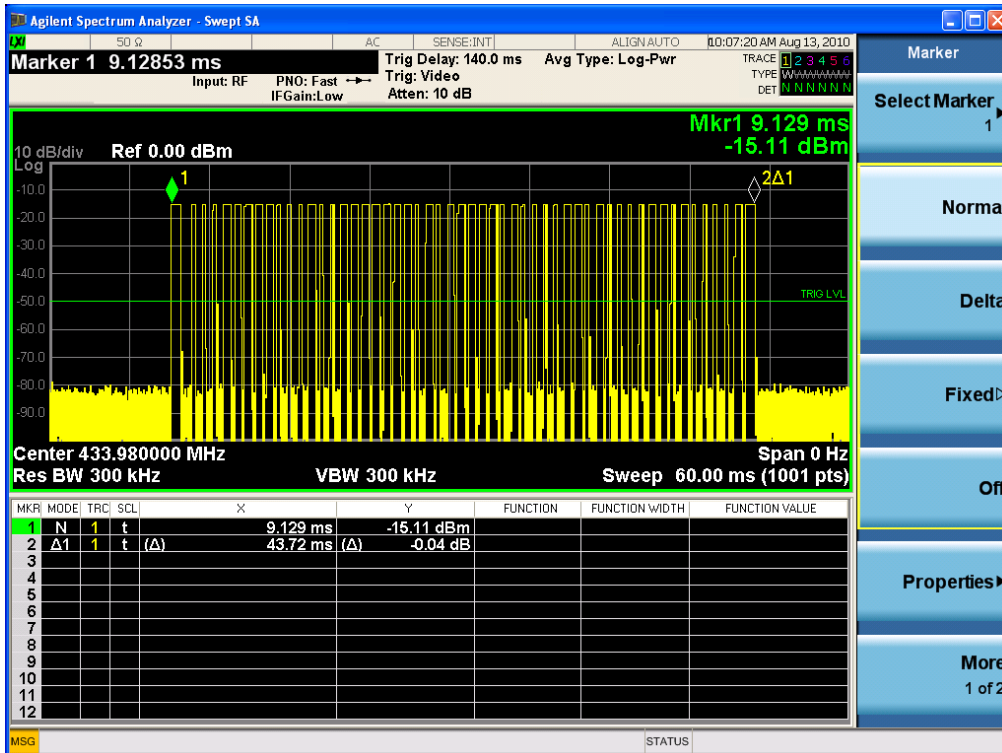
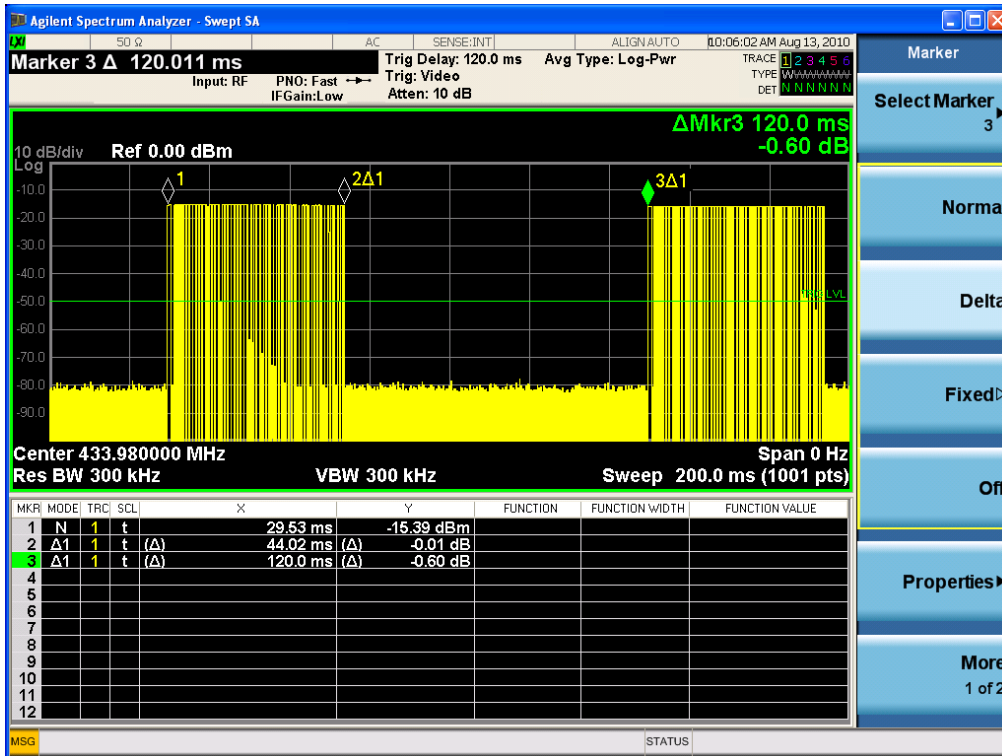
Test Data:

Duty-cycle	-
TX on	43,72ms
TX off	76,28ms
Average correction factor ($20 \cdot \log(\text{duty cycle})$):	$20 \log ((43,72 \cdot 0,5) / 100\text{ms}) = -13,20\text{dB}$

Comments:

Ton with a on-time from 50% in 100ms

FCC test report



5.6 Compliance with the limit of FCC

Specify:

Base standard:	47CFRF Part 15 Section 15.231 (b)
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Test Setup:

RBW / VBW:	200Hz (f < 150kHz) 9kHz (150kHz < f < 30MHz) 120kHz (30MHz < f < 1000MHz) 1MHz (f > 1000MHz)
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Limits:

Frequency [MHz]	Field Strength of the fundamental	Field Strength of spurious emissions
40,66 – 40,70	2 250 μ V/m / 67dB μ V/m	225 μ V/m / 47dB μ V/m
70 – 130	1 250 μ V/m / 62dB μ V/m	125 μ V/m / 42dB μ V/m
130 - 174	1 250 μ V/m to 3 750 μ V/m ⁽¹⁾ 62 μ V/m to 71,5 μ V/m	125 μ V/m to 375 μ V/m ⁽¹⁾ 42dB μ V/m to 51,5dB μ V/m
174 – 260	3 750 μ V/m / 71,5dB μ V/m	375 μ V/m / 51,5dB μ V/m
260 – 470	3 750 μ V/m to 12 500 μ V/m ⁽¹⁾ 71,5 dB μ V/m to 82 dB μ V/m	375 μ V/m to 1 250 μ V/m ⁽¹⁾ 51,5dB μ V/m to 62dB μ V/m
above 470	12 500 μ V/m / 82dB μ V/m	1 250 μ V/m / 62dB μ V/m

Note: ⁽¹⁾ linear interpolations
 for 130 to 174MHz the interpolation is: 56,8182*f – 6136,36 (f in MHz)
 for 260 to 470MHz the interpolation is: 41,667*f – 7083,33 (f in MHz)

Test Result:

Frequency:	
Calculated average (3m of distance):	(90,35 – 13,20) dB μ V/m = 77,15 dB μ V/m < 80,82dB μ V/m

Comments:

Limit = 41,667 * 433,92 – 7083,33 = 10996,814 μ V/m = 80,82dB μ V/m

5.7 Spurious emission - radiated

Specify:

Base standard: 47CFR Part 15 Section 15.231 (b)

Test Setup:

-

Limits:

Frequency [MHz]	Field Strength of the fundamental	Field Strength of spurious emissions
40,66 – 40,70	2 250 μ V/m / 67dB μ V/m	225 μ V/m / 47dB μ V/m
70 – 130	1 250 μ V/m / 62dB μ V/m	125 μ V/m / 42dB μ V/m
130 - 174	1 250 μ V/m to 3 750 μ V/m ⁽¹⁾ 62 μ V/m to 71,5 μ V/m	125 μ V/m to 375 μ V/m ⁽¹⁾ 42dB μ V/m to 51,5dB μ V/m
174 – 260	3 750 μ V/m / 71,5dB μ V/m	375 μ V/m / 51,5dB μ V/m
260 – 470	3 750 μ V/m to 12 500 μ V/m ⁽¹⁾ 71,5 dB μ V/m to 82 dB μ V/m	375 μ V/m to 1 250 μ V/m ⁽¹⁾ 51,5dB μ V/m to 62dB μ V/m
above 470	12 500 μ V/m / 82dB μ V/m	1 250 μ V/m / 62dB μ V/m

Note: ⁽¹⁾ linear interpolations
for 130 to 174MHz the interpolation is: $56,8182 \cdot f - 6136,36$ (f in MHz)
for 260 to 470MHz the interpolation is: $41,667 \cdot f - 7083,33$ (f in MHz)

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
433,9164	90,35	77,15	80,82dB μ V/m	-	operating frequency
867,8328	55,38	42,18	-20dBc	18,64	complies
1301,7474	54,52	41,00	54,0dB μ V/m	13,00	complies
1735,6662	63,62	50,42	-20dBc	10,40	complies
2169,5820	52,73	39,53	-20dBc	21,29	complies
2603,4984	50,85	37,65	-20dBc	23,17	complies
3037,4148	52,04	38,84	-20dBc	21,98	complies
3471,3312	55,63	42,43	-20dBc	18,39	complies
3905,2476	50,11	36,91	54,0dB μ V/m	17,09	complies
4339,1640	43,30	30,10	54,0dB μ V/m	23,90	complies

Comments:

-

5.8 Occupied bandwidth

Specify:

Base standard: 47CFR Part 15.231 (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:

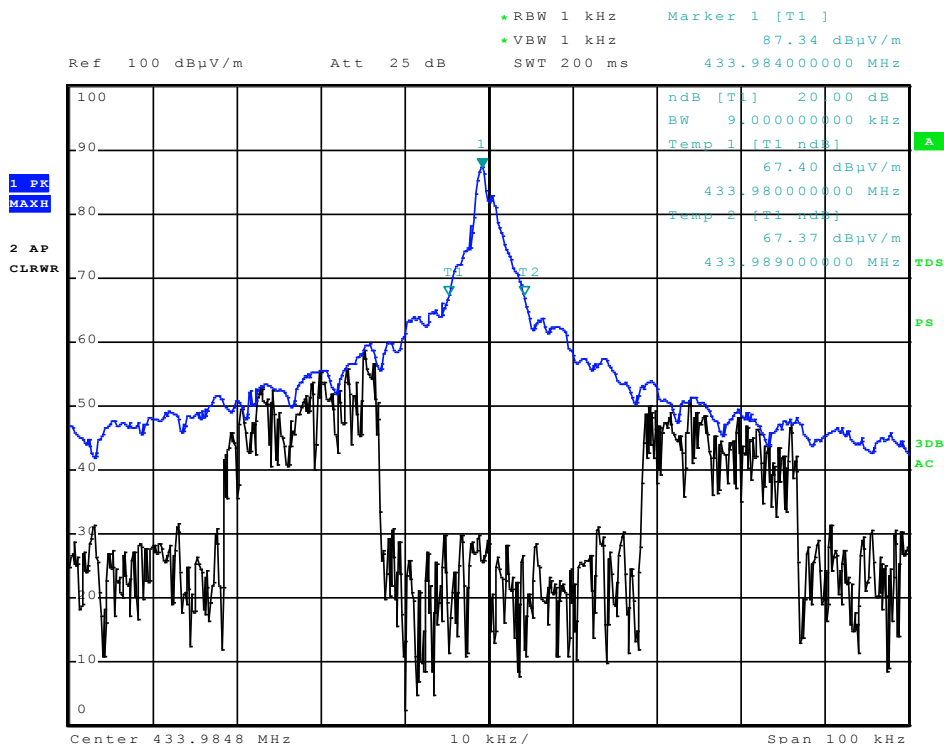
< 0,25% of the centre frequency, here 1,08MHz

Test Data:

Occupied bandwidth at -20dB: 9,0kHz

Comments:

-



Date: 4.AUG.2010 10:55:06

6

Measurement and Test Equipment instrumentation

Code	nr.	Manufacturer	Model	Serial number	Date of Calibration	Calibration Due
ANA	7	Agilent	N9020A	MY48011101	28/01/2010	28/01/2012
ANT	1	EMCO	3121C DB-4	9312-901	29/05/2009	29/05/2011
ANT	3	Schwarzbeck	VULB9160	3180	26/05/2009	26/05/2011
ANT	4	AH System	SAS-571	684	29/05/2009	29/05/2011
ANT	5	AH System	SAS-562B	236	27/05/2009	27/05/2011
ANT	6	AH System	SAS-571	1025	08/10/2009	08/10/2011
ANT	7	Aaronia	BicoLOG 30100	1293	18/05/2010	18/05/2012
ATT	1	-	PE7021-6		17/06/2009	17/06/2011
ATT	2	Tyco Electronics Co.	50WCW	-	17/06/2009	17/06/2011
ATT	5	RADIALL	R414.710.000	-	23/05/2008	23/05/2013
ATT	6	RADIALL	R414.710.000	-	23/05/2008	23/05/2013
ATT	7	RADIALL	R414.720.000	-	23/05/2008	23/05/2013
CAV	1	Rohde & Schwarz	HFU2-Z5	-	21/06/2006	21/06/2011

Code	nr.	Manufacturer	Model	Serial number	Date of Calibration	Calibration Due
CAV	2	Rohde & Schwarz	HFU2-Z4	-	21/06/2006	21/06/2011
CAV	3	TESEO	CAVO A	-	21/06/2006	21/06/2011
CAV	4	TESEO	CAVO B	-	21/06/2006	21/06/2011
CAV	5	TESEO	CAVO C	-	21/06/2006	21/06/2011
CAV	6	TESEO	CAVO D	-	21/06/2006	21/06/2011
CAV	7	TESEO	CAVO E	-	21/06/2006	21/06/2011
CAV	13	TESEO	CAVO G	-	27/07/2006	27/07/2011
CAV	14	TESEO	CAVO H	-	27/07/2006	27/07/2011
CAV	15	TESEO	CAVO I	-	27/07/2006	27/07/2011
CAV	16	Rohde & Schwarz	9111505/200 (CAVO J)	5995-12-161-6890	22/04/2008	22/04/2013
CAV	17	Nice	CAVO K	-	28/05/2010	28/05/2015
CAV	18	Nice	CAVO L	-	28/05/2010	28/05/2015
CDN	1	FCC	FCC 801-M2-16A-SPJ	5024	27/05/2009	27/05/2011
CDN	2	FCC	FCC 801-M3-16A-S	5032	27/05/2009	27/05/2011
CDN	3	FCC	FCC801-150-50 CDN	05031 & 05032		
CDN	4	FCC	FCC 801-M1-16A	7035	27/05/2009	27/05/2011
CDN	5	FCC	FCC 801-150-50-CDN	07113 & 07114		

Code	nr.	Manufacturer	Model	Serial number	Date of Calibration	Calibration Due
CDN	6	FCC	FCC 801-M4-16A	100726	25/05/2010	28/05/2012
CDN	7	FCC	FCC-801-M5-16A	100727	28/05/2010	28/05/2012
CSA	1	TESEO	EN 55022	NSA	12/08/2010	12/08/2011
				CISPR 16-1-4	14/04/2009	14/04/2014
				EN 61000-4-3	10/08/2010	10/08/2011
ECL	1	FCC	F-203I-23	466	25/05/2009	25/05/2011
ECL	2	FCC	F-203I-CF-23MM	445		
GEN	7	Rohde & Schwarz	SML 03	102178	17/12/2009	17/12/2011
GEN	8	Agilent	N5182A	MY48180288	09/08/2008	09/08/2011
LIS	2	Rohde & Schwarz	ESH2-Z5	100183	27/05/2008	27/05/2011
PAS	1	FCC	F-202	197	29/05/2009	29/05/2011
POW	1	Rohde & Schwarz	NRVD	101221	10/11/2009	10/11/2011
POW	2	Rohde & Schwarz	NRV-Z5	100314	09/11/2009	09/11/2011
POW	3	Rohde & Schwarz	NRV-Z5	100315	10/11/2009	10/11/2011
PRE	2	Schwarzbeck	BBV 9718	9718-178	23/02/2010	23/02/2012
RIC	1	Rohde & Schwarz	ESCI	100140	04/12/2009	04/12/2010
SCO	7	FCC	F-51	454	18/05/2010	18/05/2012

Code	nr.	Manufacturer	Model	Serial number	Date of Calibration	Calibration Due
SCO	8	Teseo	EQ-51-1	D047	18/05/2010	18/05/2012
SCO	9	FCC	F-33-4	63	18/05/2010	18/05/2012
SOF	1	Rohde & Schwarz	EMC32	V5.20.2		

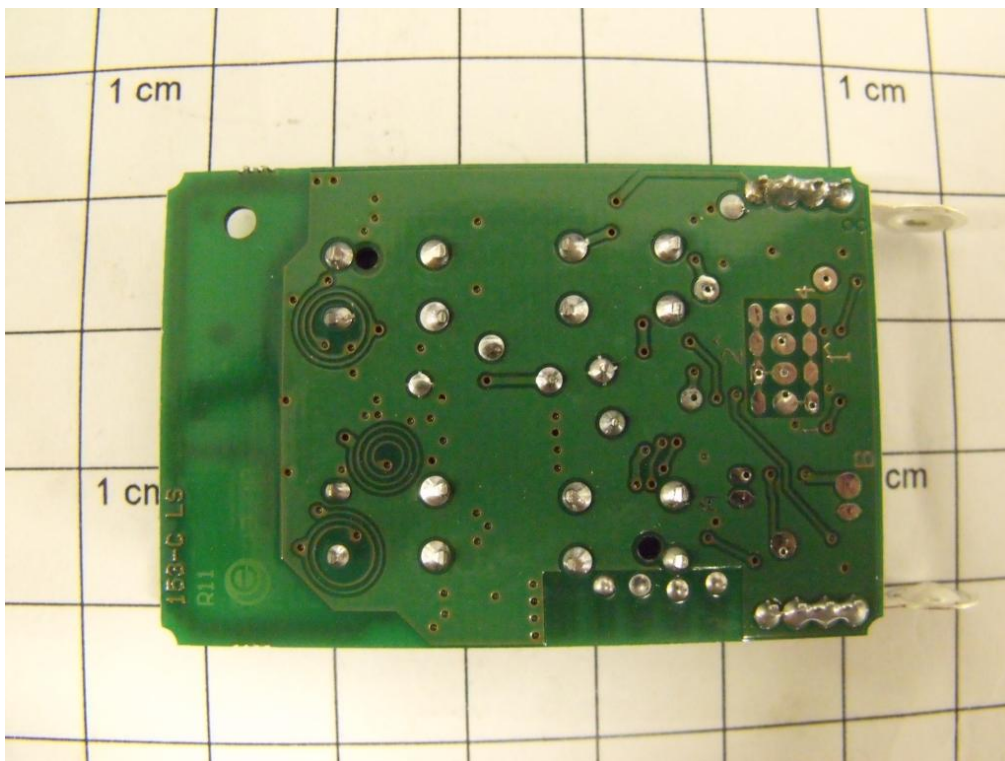
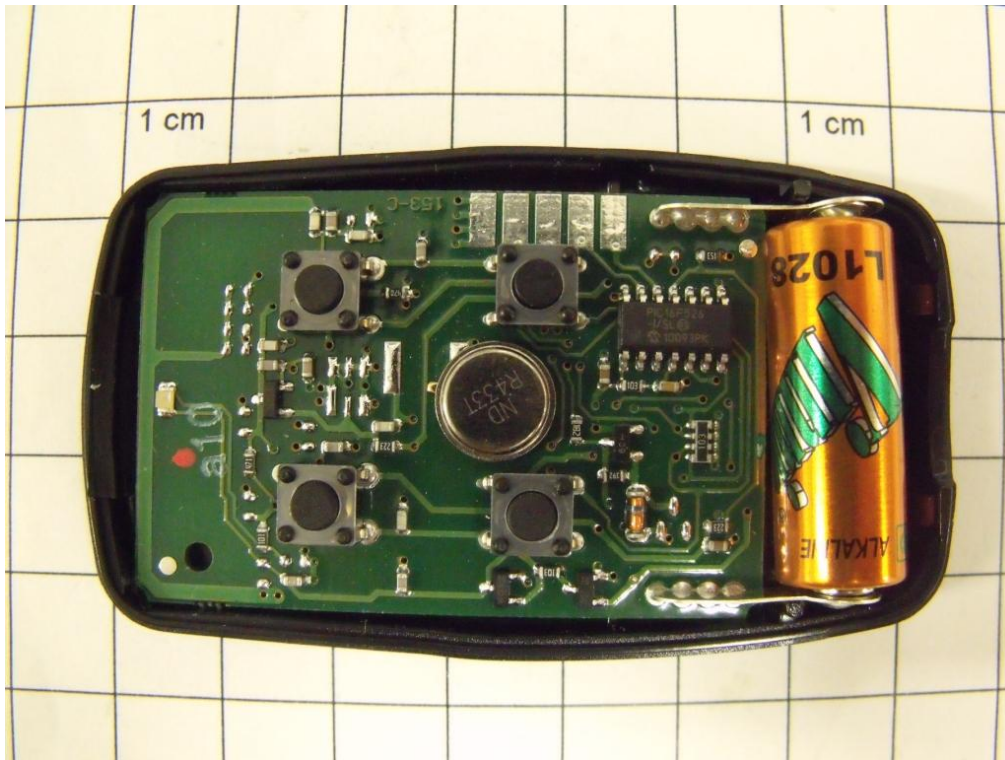
7

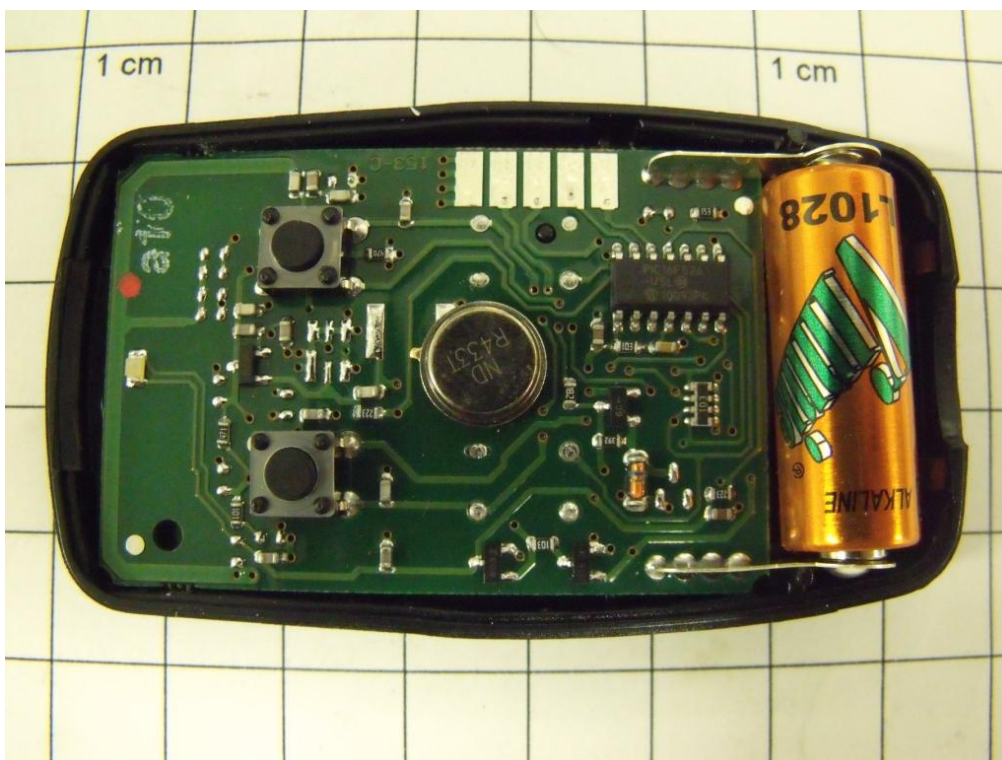
Photographic Documentation

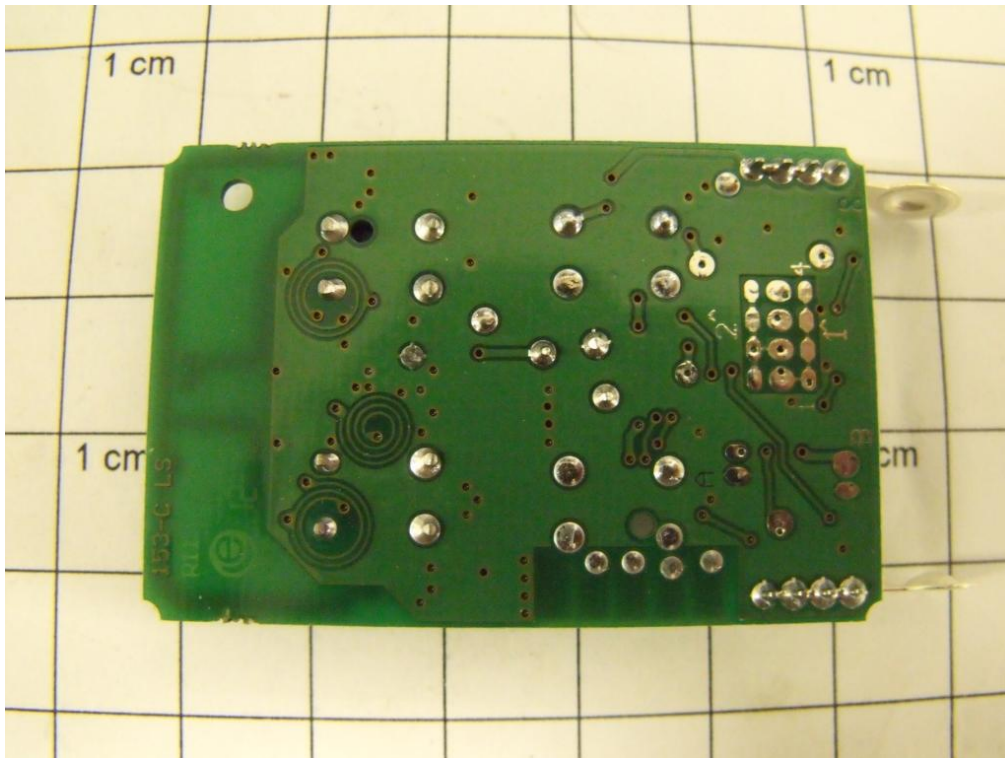
8.1 EUT Identification



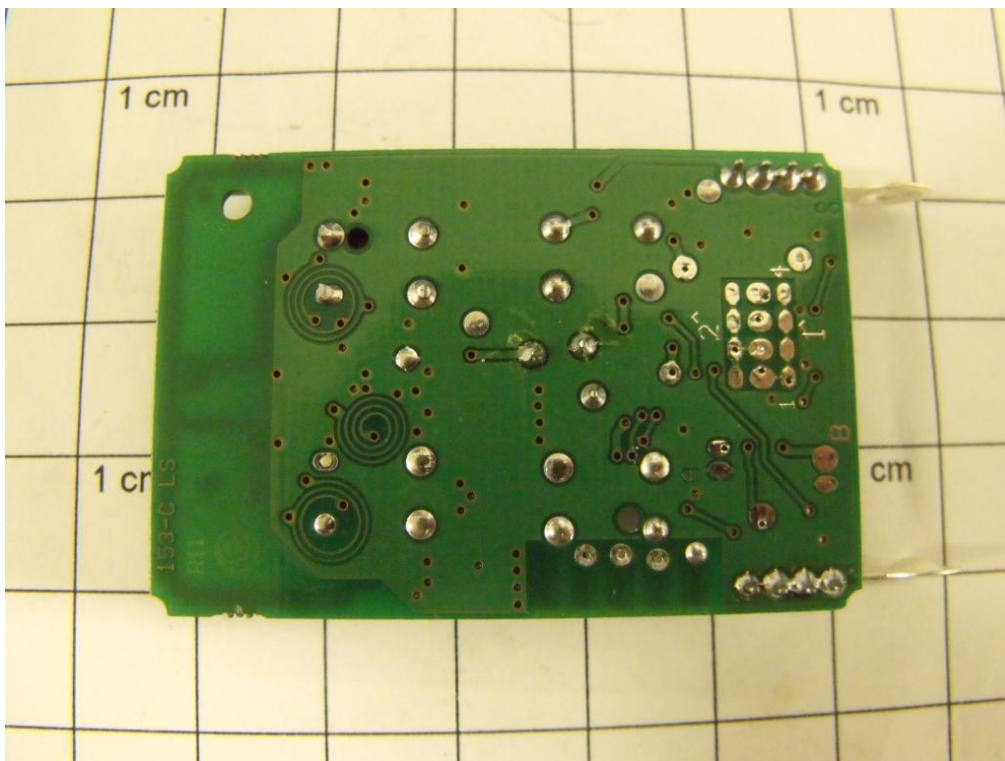
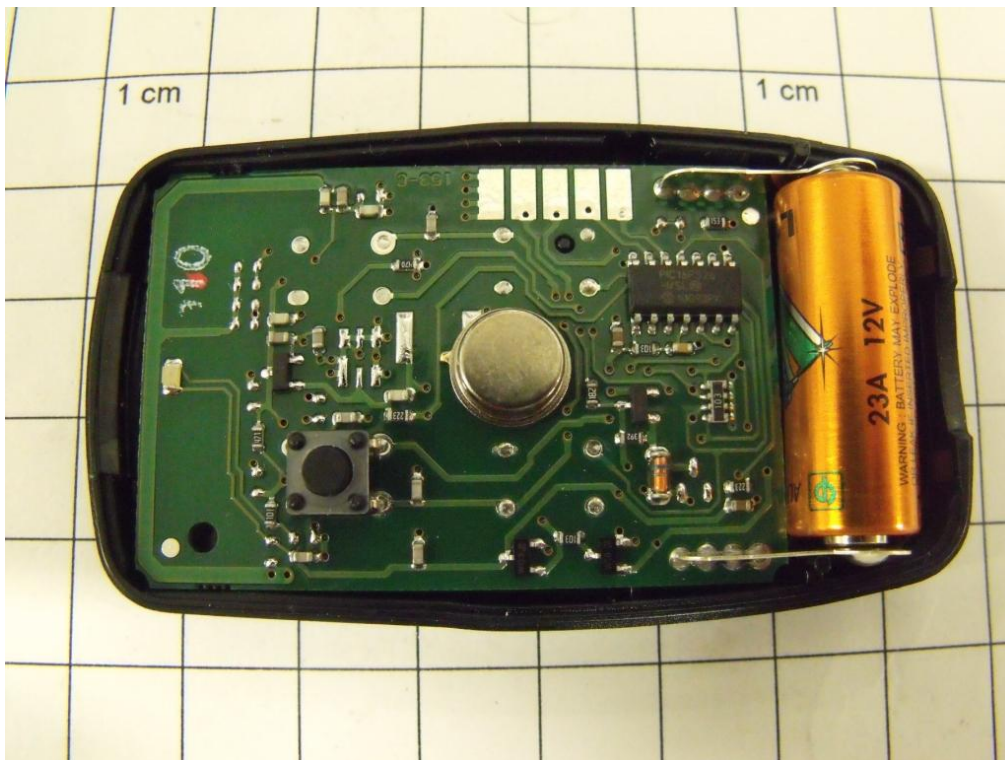
FCC test report







FCC test report



8.2 Test Set-up

