R041-07-100536-1A - RG / CHB

RADIO TEST REPORT

According to the standard(s):

FCC part 15 (02/2006)

Equipment under test:

Detector of immersion for swimming-pool
-Sensor Premium- ref. PRE007-US

FCC ID: UQJ - 010

Company:

MG International

Diffusion: Mr CHAUSSIN (Company: MG International)

Ed.1 | Number of pages: 28 including 4 annexes

Ed.	Date	Modified page(s)	Written by Name / Visa	Technical verification Name / Visa	Quality approval Name / Visa
0	28-Feb-07	Creation	Régis GONZALEZ	Olivier HEYER	Olivier HEYER
1	9-Mar-07	1; 3; 6 and 27-28	Régis GONZALEZ	Olivier HEYER	Olivier HEYER

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NAME OF THE EQUIPMENT UNDER TEST (E.U.T.)	:	Detector of immersion for swimming-pool Sensor Premium ref. : PRE007-US
Serial number	:	None
Part number	:	None
Software Version	:	None
MANUFACTURER'S NAME	:	MG International

APPLICANT'S ADRESS:

Company	:	MG International
Adress	:	Zone Industrielle Athelia II Avenue de la Sariette 13600 LA CIOTAT FRANCE
Person(s) present during the tests	:	Nobody
Responsible	:	Mr CHAUSSIN

DATE(S) OF TESTS	:	January, the 31st and February, the 1st 8th 12th 20th of 2007
TESTS LOCATION(S)	:	EMITECH Grand Sud laboratory in Vendargues (34) Open area test site in Salinelles (30) FCC Registration Number: 812719
TESTS SUPERVISOR(S)	:	None
TESTS OPERATOR(S)	:	Régis GONZALEZ

CONTENTS

1. INTRODUCTION

This document submits the results of Radio tests performed on the equipment Detector of immersion for swimming-pool Sensor Premium ref. PRE007-US (denominated hereafter E.U.T.: equipment under test) according to document(s) listed below.

2. REFERENCE DOCUMENT(S)

FCC Part 15 (02/2006)	Code of Federal Regulations Title 47 – Telecommunications Chapter 1 – Federal Communications Commision Part 15 – Radio frequency devices Subpart C – Intentional Radiators
ANSI C 63.4 (03)	American National Standard for Methods of measurement of Radio-Noise from low-voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

3. EQUIPMENT UNDER TEST CONFIGURATION

Equipment under test (E.U.T.) general description: Stand alone detector of immersion for swimming-pool included detector unit and receiver siren

Equipment control procedure during immunity tests: N.A. emission test only

Susceptibility criteria during a continuous disturbance: N.A. emission test only

Susceptibility criteria during a transitory disturbance: N.A. emission test only

Cycle and operating mode during emission tests: Permanent no modulated emission exepted for bandwidth measurement

Equipment modifications applied during tests: No

N.A.: Not applicable

4. EQUIPMENT CHARACTERISTIC

FCC ID: UQJ-010

ITU emission code: 7K00A1D

Utilization: Swimming-pool alarm system with radio siren control

Antenna type: Integrated wire antenna

Operating frequency: 433.92 MHz

Number of channels: 1

Channel spacing: Not concerned

Frequency generation: □ SAW Resonator □ Crystal ☒Synthetizer

Modulation: ☒ Amplitude (pulsed modulated device) □ Digital □ Frequency □ Phase

Power source: 4 x LR20 alkaline cells (4 x 1,5 V = 6 V)

5. EQUIPMENT UNDER TEST CONFIGURATION SCHEME

Equipment is set out on a wooden table at 0.8 m of the ground plane (see Photograph(s) in annex 1).

6. SUMMARY OF TEST RESULTS

Tests designation or section		Results satisfying?	Comments
15.33	Frequency range of radiated measurement	-	Considered
15.35	Measurement detector functions and bandwidths	-	Considered
15.107	Conducted limits	YES	For receiver in class B (Informative)
15.109	Radiated emission limits	YES	For receiver in class B (Informative)
15.203	Antenna requirement	YES	Nota 1
15.205	Restricted bands of operation	YES	
15.209	Radiated emission limits, general requirements	YES	Considered
15.231	Periodic operation in the band 40.66 – 40.70 MHz and above 70 MHz		
	a) Transmission requirements	YES	Nota 2
	b) Radiated emission	YES	Nota 3
	c) Occupied bandwidth	YES	Nota 4
	d) Frequency tolerance	N.A.	E.U.T. does not transmit in the band 40.60 – 40.70 MHz
	e) Periodic alternate field strength measurement	N.A.	Requirements of a) is used

N.P.: Not Performed. N.A.: Not Applicable.

Sample submitted to the tests complies with the regulations of the standard FCC part 15 (02/2006) according to limits specified in this tests report.

Nota 1: Internal antenna without connector

Nota 2: Periodic transmissions at regular predetermined intervals are used to determine system integrity of transmitter for safety application (swimming-pool alarm). Four transmissions per hour of 375 ms each are transmitted (See Photograph(s) in annex 3).

Ed.1 When manually operated transmission is used (switch on / off), the duration is less than 5s (see photo in annex 4)

Nota 3: Calculation of field strength limit of fundamental (433.92 MHz):
41.6667 (F) – 7083.3333 = 10 976 µV/m = 80.8 dBµV/m

Nota 4: The bandwidth of the emission at 20 dBc is 6.72 kHz (see Graph(s) in annex 2), less than 0.25 % of the center frequency (1084 kHz)

7. AC POWER LINE CONDUCTED EMISSION FOR RECEIVER

Standard: FCC part 15 (02/2006)

Test method: ANSI C 63-4:2003

Test configuration:

Tested cable	Measure with	E.U.T height (cm)
Power supply 115VAC 60 Hz (*)	LISN	40

Frequency band	Tested cable	Resolution Bandwidth	Video Bandwidth	Detection mode
Neutral				
150kHz-30MHz	Power supply 115VAC	10kHz	30kHz	Peak
Line				
150kHz-30MHz	Power supply 115VAC.	10kHz	30kHz	Peak

(*) Adapter FRIWO: FW75550/12
100-240V~ / 47-63 Hz / 400 mA
12V⎓ / 1.25 A

Test method deviation: No

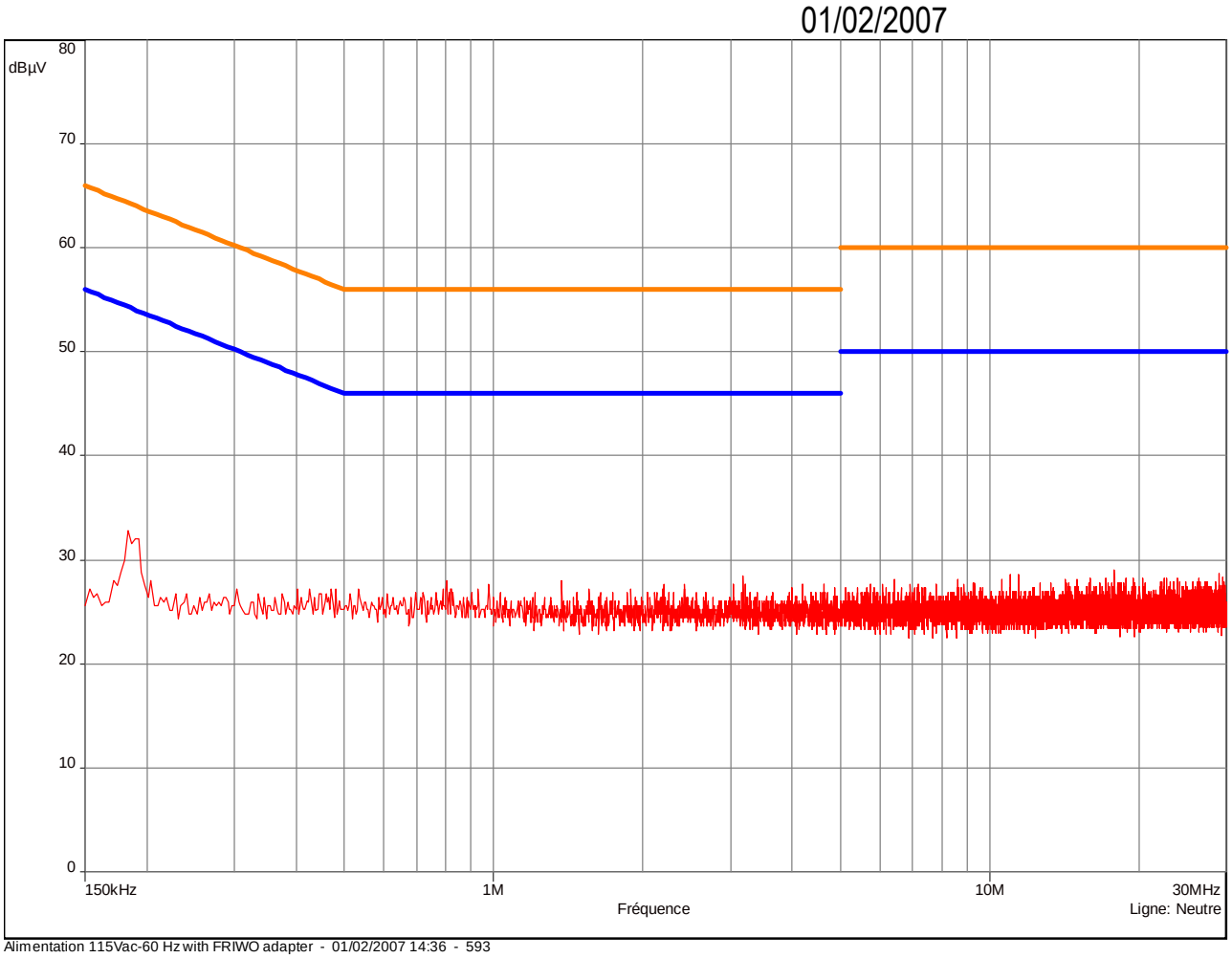
Instrumentation test list:

CATEGORIE	MARQUE	TYPE	N° EMITECH
LISN	PMM	L3 - 25	833
Shielded enclosure	Ray proof	C.GS1	1423
Software	Nexio	BAT EMC 3.1.7.1.	0000
Spectrum analyzer	Hewlett Packard	8568 B	809
Transient limiter	Hewlett Packard	11947 A	238

Results: See Graphs below. The limits showed on the curves are average (blue) and quasi peak (orange) limits

Receiver of SENSOR PREMIUM

Conducted voltage emission (measurement)-FCC part 15



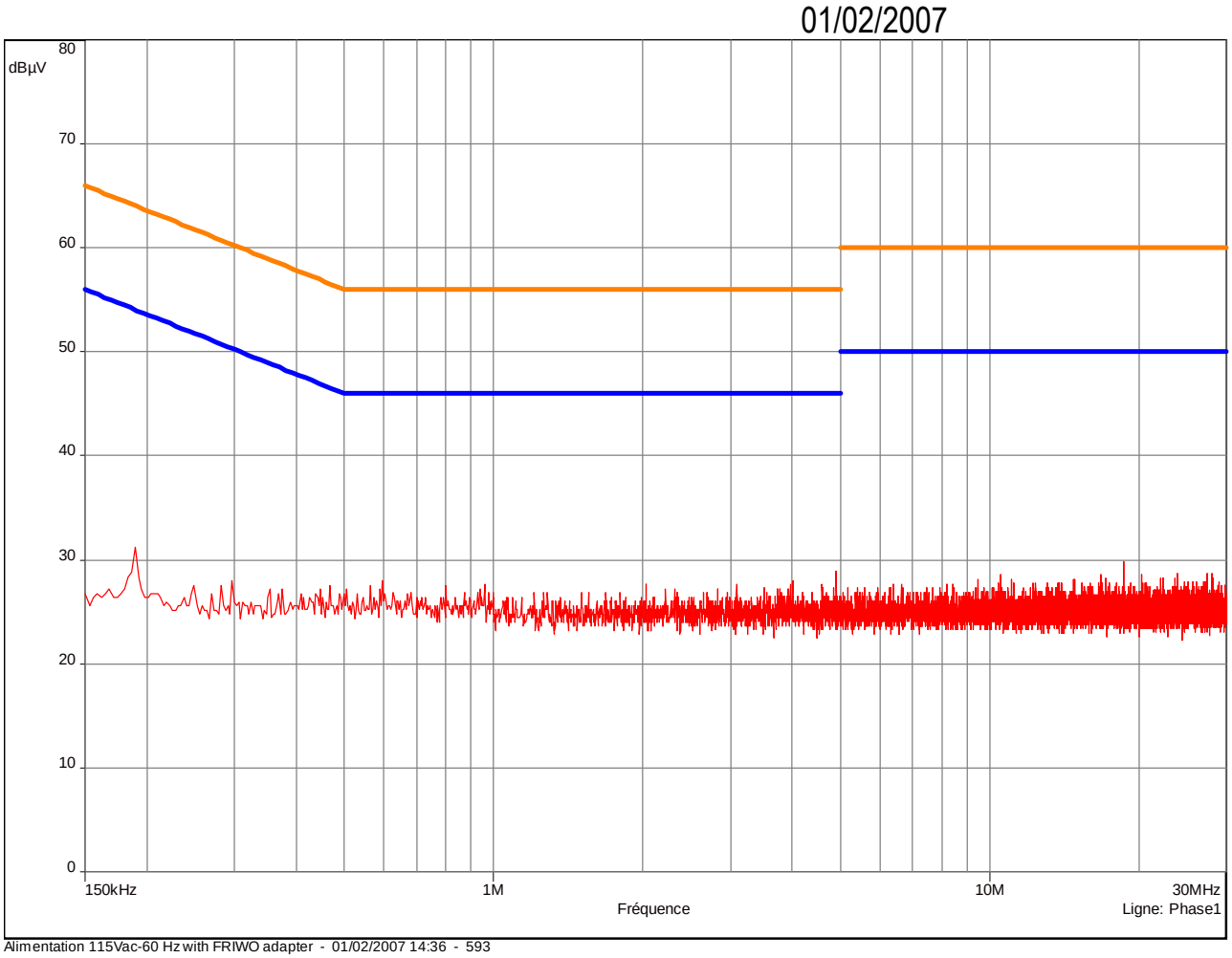
Limits: FCC Part 15 - Cl.B

Parameters:

Ligne	F min	F max	RBW
Neutral	150kHz	1MHz	10kHz
Neutral	1MHz	10MHz	10kHz
Neutral	10MHz	30MHz	10kHz

Receiver of SENSOR PREMIUM

Conducted voltage emission (measurement)-FCC part 15



Limits: FCC Part 15 - Cl.B

Parameters:

Ligne	F min	F max	RBW
Phase1	150kHz	1MHz	10kHz
Phase1	1MHz	10MHz	10kHz
Phase1	10MHz	30MHz	10kHz

8. RADIATED ELECTRIC FIELD MEASUREMENT

Standard: FCC part 15 (02/2006)

Test method: ANSI C 63.4:2003

Measurement on open area test site:

Test configuration: For each measured frequency, receiving antenna height varies between 1 m and 4 m, E.U.T. is set on a turntable in order to find the highest level.

Frequency band	Initial position (0°)	Resolution bandwidth	Measuring distance	Detection mode	E.U.T. height
30MHz-1GHz	0° is the front side	120kHz	3m	Peak	80cm
> 1GHz	0° is the front side	1 MHz	3m	Peak	80cm

Test method deviation: No

Test equipment list:

CATEGORY	BRAND	MODEL NUMBER	N° EMITECH
Horn antenna	Emco	RGA-60 (3115)	1053
Log-periodic antenna	Rohde & Schwarz	HL223	3126
OATS	Emitech	Salinelles	3482
Preamplifier	Microwave	C005180F-4B1	2165
Spectrum analyzer	Agilent Technologies	E7405A	2161

Results: See Board(s) below (only highest levels are recorded)

Detection unit

HORIZONTAL POLARIZATION

Frequency (MHz)	Azimut (degrees)	Antenna Height (cm)	Measure (dBµV/m) without DCF	Duty Cycle Factor (*) (dB)	Standard limit (dBµV/m)	Comments
Fundamental 433.92	320	100	82.40	-6.70	80.80	C
867.84	320	100	37.33	-6.70	60.80	C
1301.76	65	158	47.20	-6.70	54.00 (**)	C
1735.68	57	160	41.50	-6.70	60.80	C
2169.60	45	119	52.40	-6.70	60.80	C
2603.52	54	123	43.90	-6.70	60.80	C
3037.44	59	123	47.20	-6.70	60.80	C
3471.36	56	312	50.80	-6.70	60.80	C
3905.28	70	129	47.60	-6.70	60.80	C
4339.20	69	115	49.10	-6.70	54.00 (**)	C

C: Compliant NC: Not Compliant

VERTICAL POLARIZATION

Frequency (MHz)	Azimut (degrees)	Antenna Height (cm)	Measure (dBµV/m) without DCF	Duty Cycle Factor (*) (dB)	Standard limit (dBµV/m)	Comments
Fundamental 433.92	320	150	77.80	-6.70	80.80	C
867.84	320	150	44.80	-6.70	60.80	C
1301.76	60	115	50.20	-6.70	54.00 (**)	C
1735.68	169	124	37.90	-6.70	60.80	C
2169.60	40	129	41.40	-6.70	60.80	C
2603.52	60	131	38.90	-6.70	60.80	C
3037.44	52	143	41.20	-6.70	60.80	C
3471.36	60	132	46.80	-6.70	60.80	C
3905.28	67	135	44.60	-6.70	60.80	C
4339.20	68	126	46.00	-6.70	54.00 (**)	C

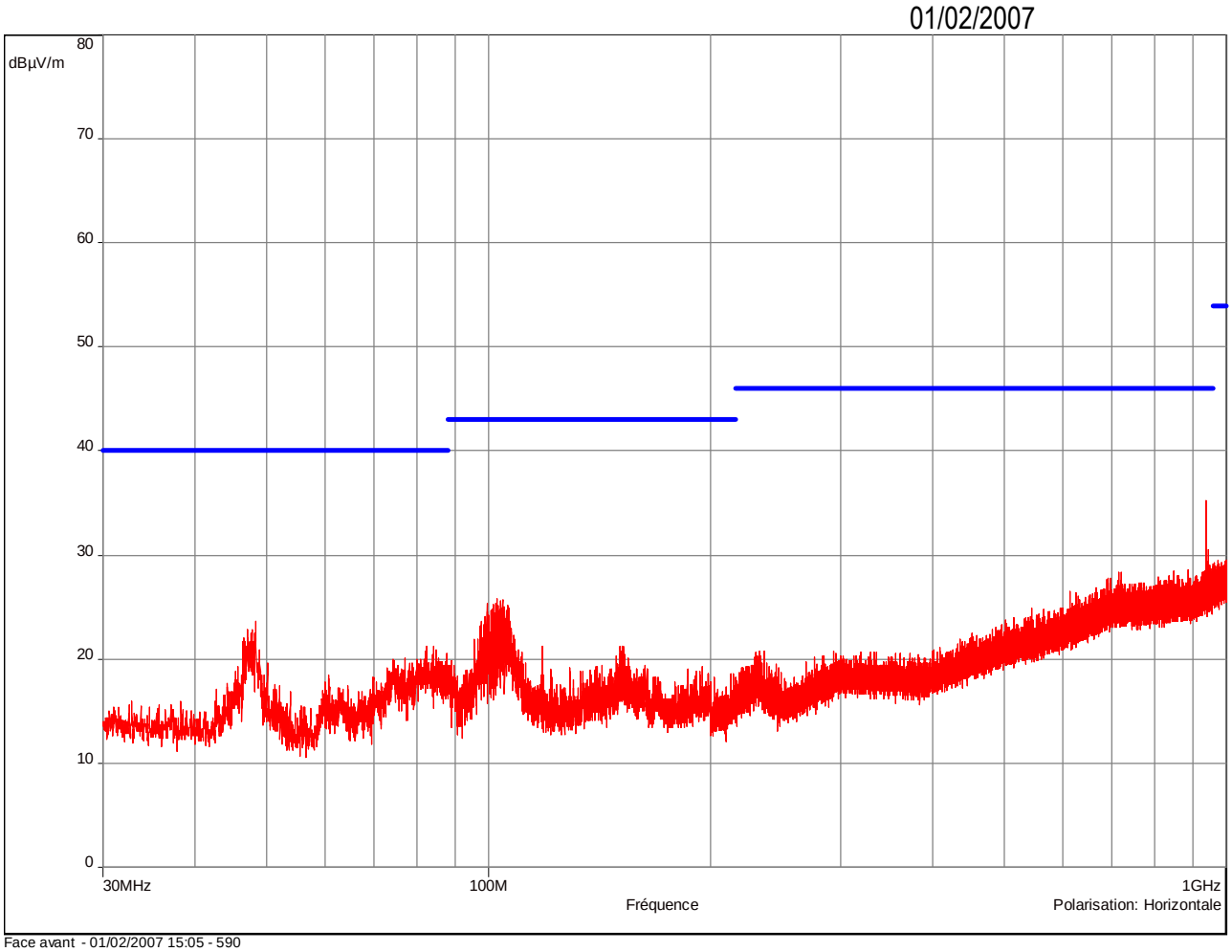
C: Compliant NC: Not Compliant

(*) Duty Cycle correction Factor is 20 Log (52/100)= -6.70 dB
(**) Restricted band of operation (15.205)

Receiver of Sensor Premium

Radiated electric emission (measurement)-FCC Part 15

Measure at 3 m in semi anechoic chamber in peak detection (informative)



Limits : FCC Part.15 general- Cl.B

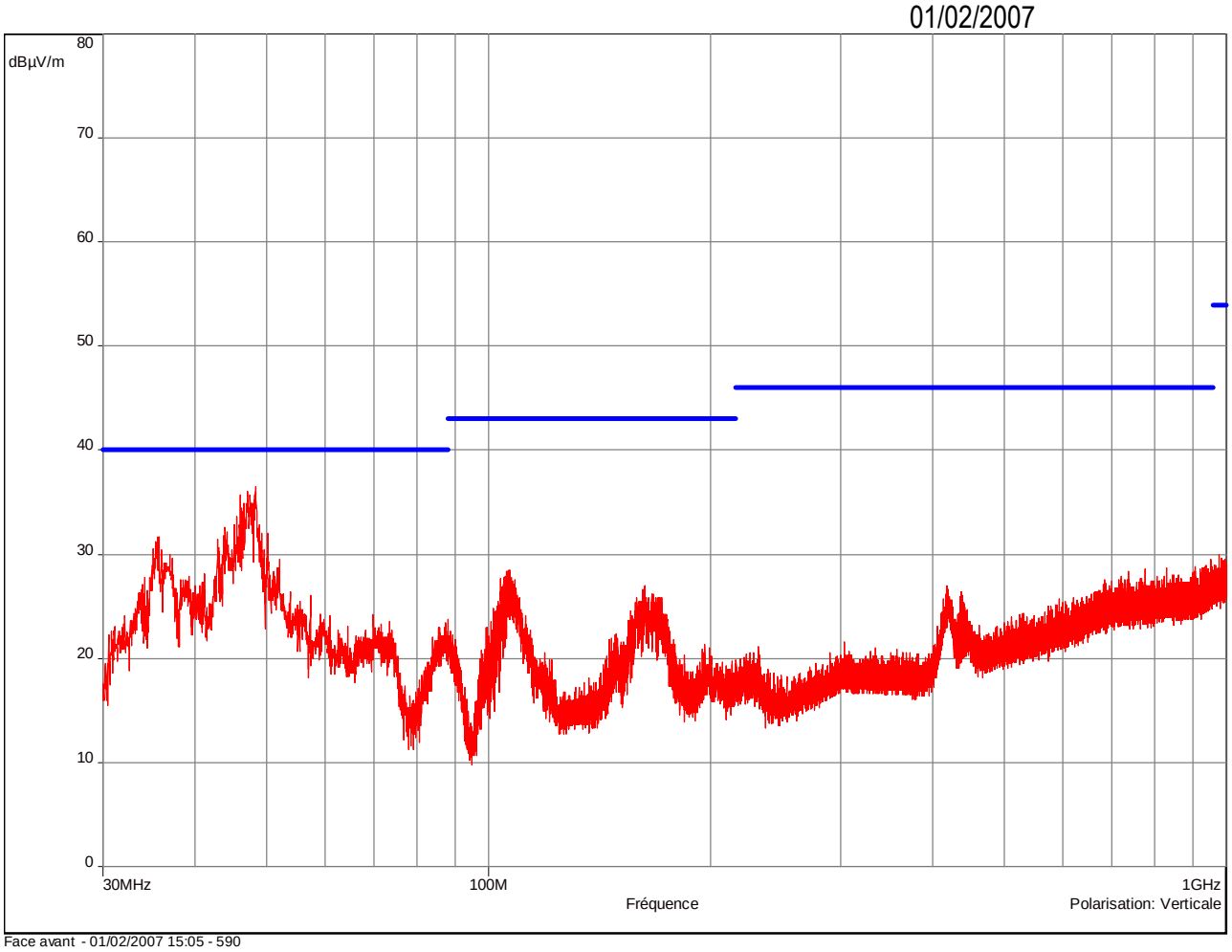
Parameters:

Polarisation	F min	F max	RBW
Horizontal	30MHz	200MHz	100kHz
Horizontal	200MHz	1GHz	100kHz

Receiver of Sensor Premium

Radiated electric emission (measurement)-FCC Part 15

Measure at 3 m in semi anechoic chamber in peak detection (informative)



Limites: FCC Part.15 general- Cl.B

Parameters:

Polarisation	F min	F max	RBW
Vertical	30MHz	200MHz	100kHz
Vertical	200MHz	1GHz	100kHz

Receiver unit

HORIZONTAL POLARIZATION

Frequency (MHz)	Azimut (degrees)	Antenna Height (cm)	Measure (dBµV/m)	Standard limit (dBµV/m)	Comments
48.40	0	400	16.70	40.00	C
103.70	0	400	17.80	43.00	C

C: Compliant NC: Not Compliant

HORIZONTAL POLARIZATION

Frequency (MHz)	Azimut (degrees)	Antenna Height (cm)	Measure (dBµV/m)	Standard limit (dBµV/m)	Comments
36.70	0	100	17.20	40.00	C
43.95	0	100	16.40 (*)	40.00	C
45.20	0	100	17.20 (*)	40.00	C
48.40	0	100	17.40	40.00	C

C: Compliant NC: Not Compliant

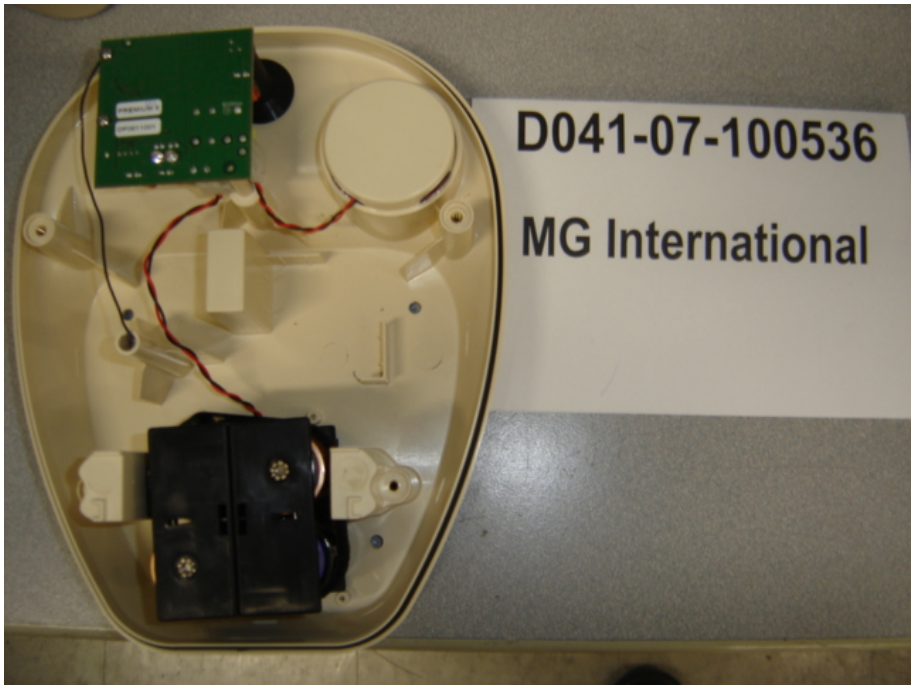
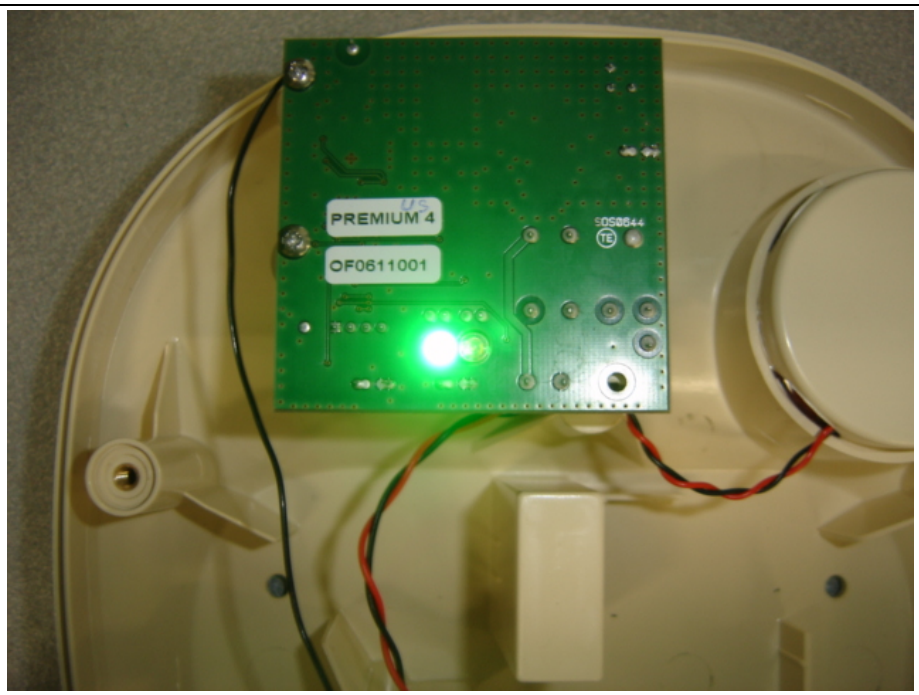
(*) Noise level

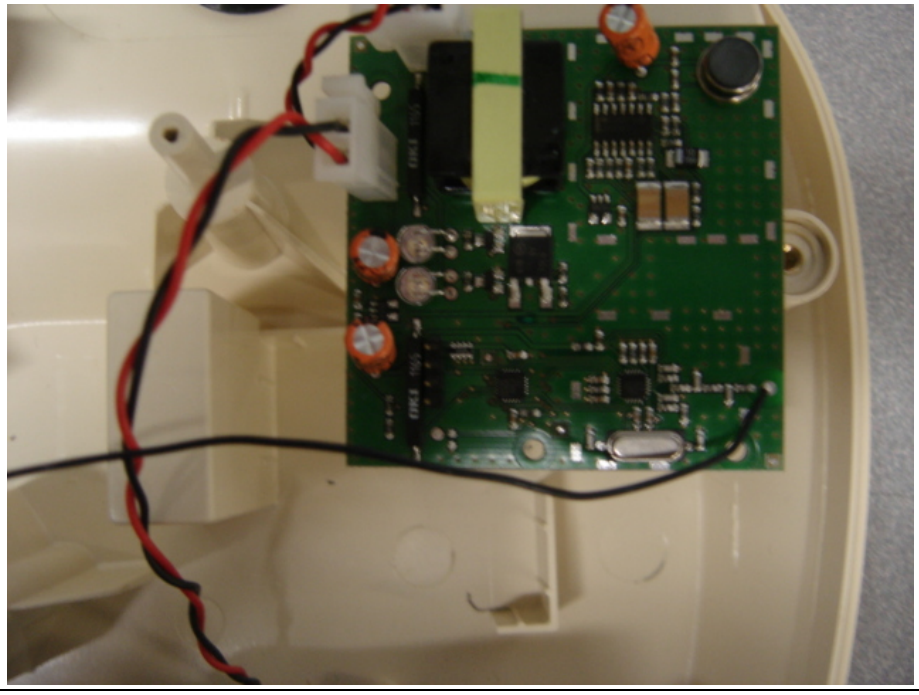
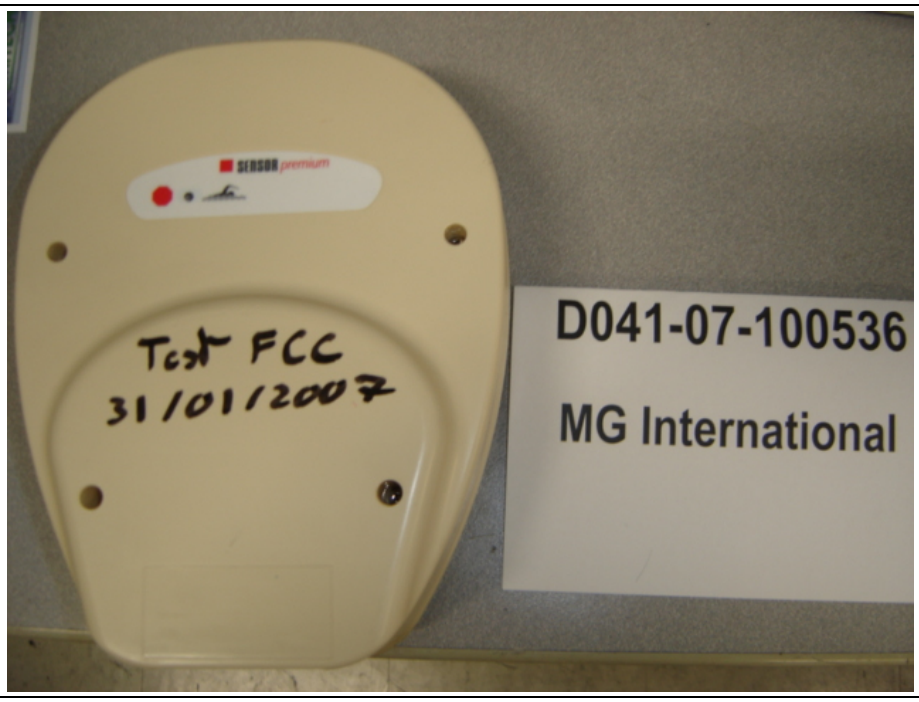
□□□ End of report – 3 annexes to be forwarded □□□

ANNEX 1:
PHOTOGRAPH(S)

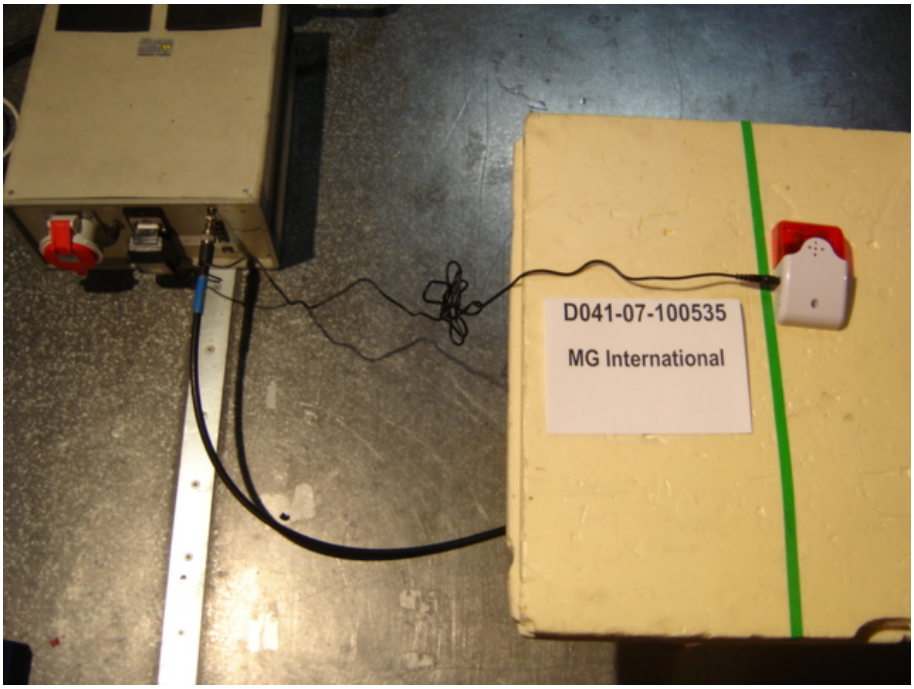
EQUIPEMENT UNDER TEST (E.U.T.) PHOTOGRAPH(S)

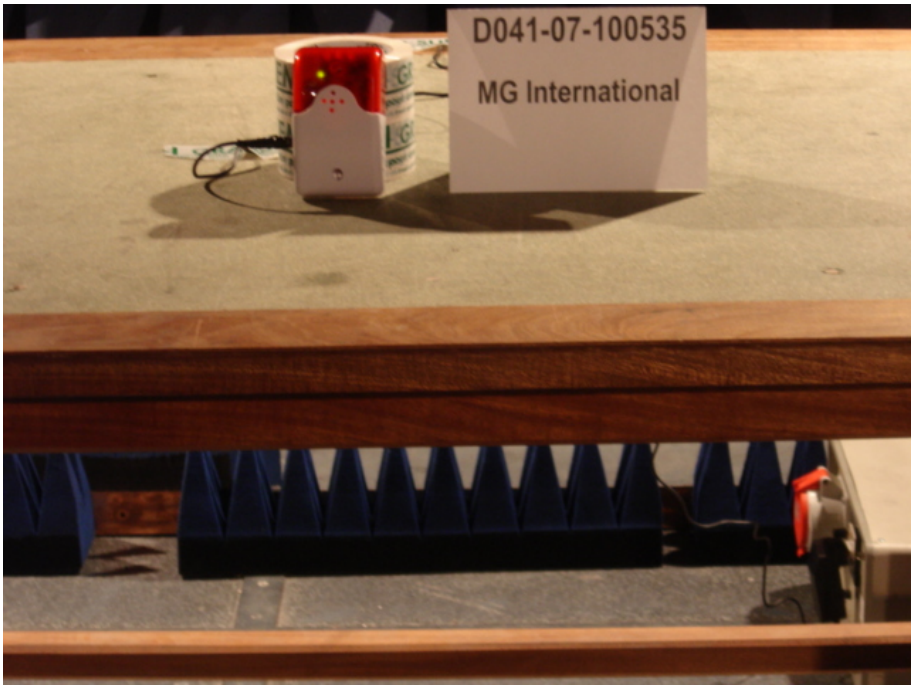
Detector of immersion for swimming-pool
-Sensor Premium- ref. PRE007-US

E.U.T. Photograph(s) (internal view)	
	

E.U.T. Photograph(s) (internal view)	
E.U.T.	

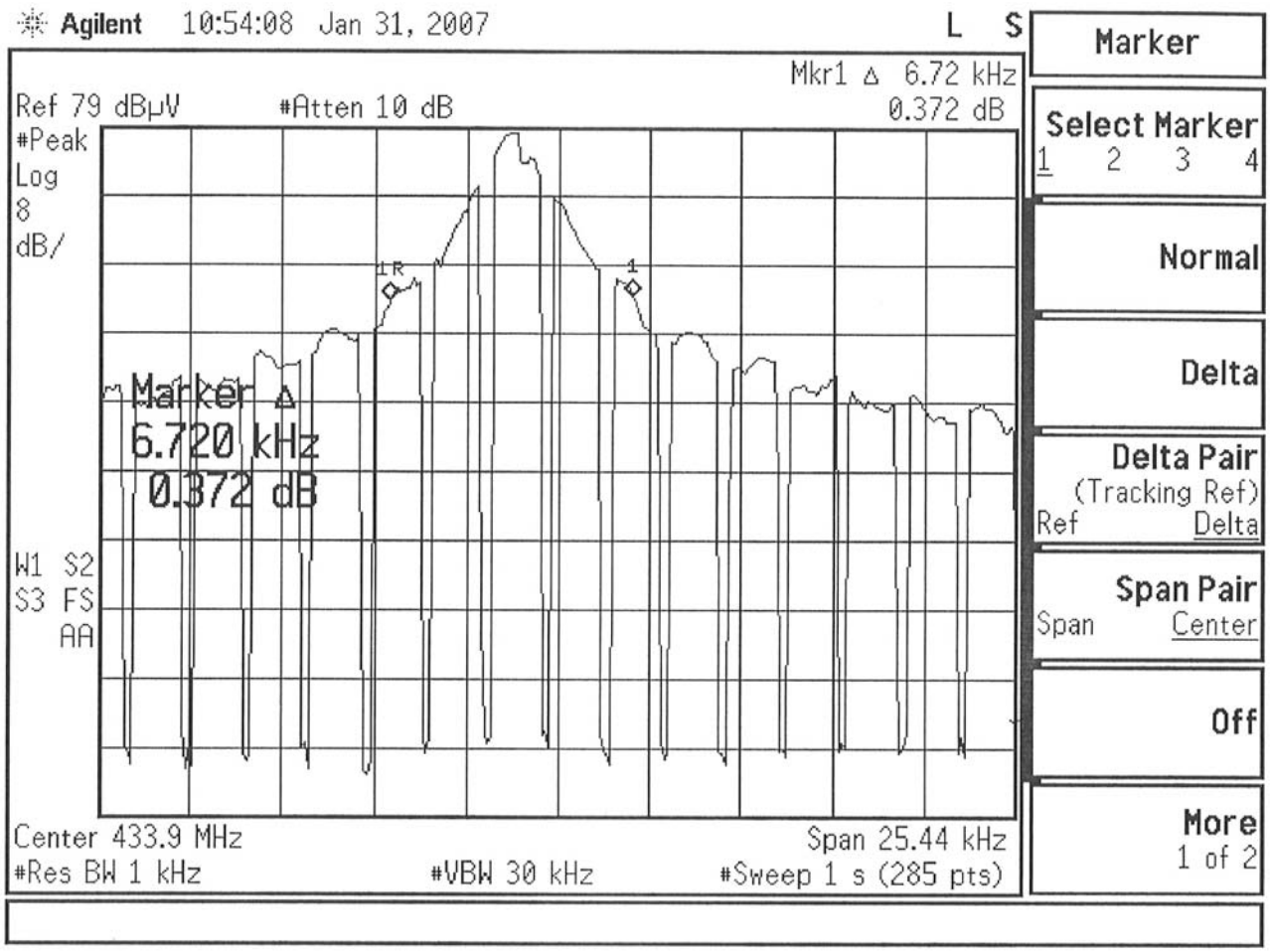
Radiated electric emission (measurement in OATS)	
	

Conducted emission	
	

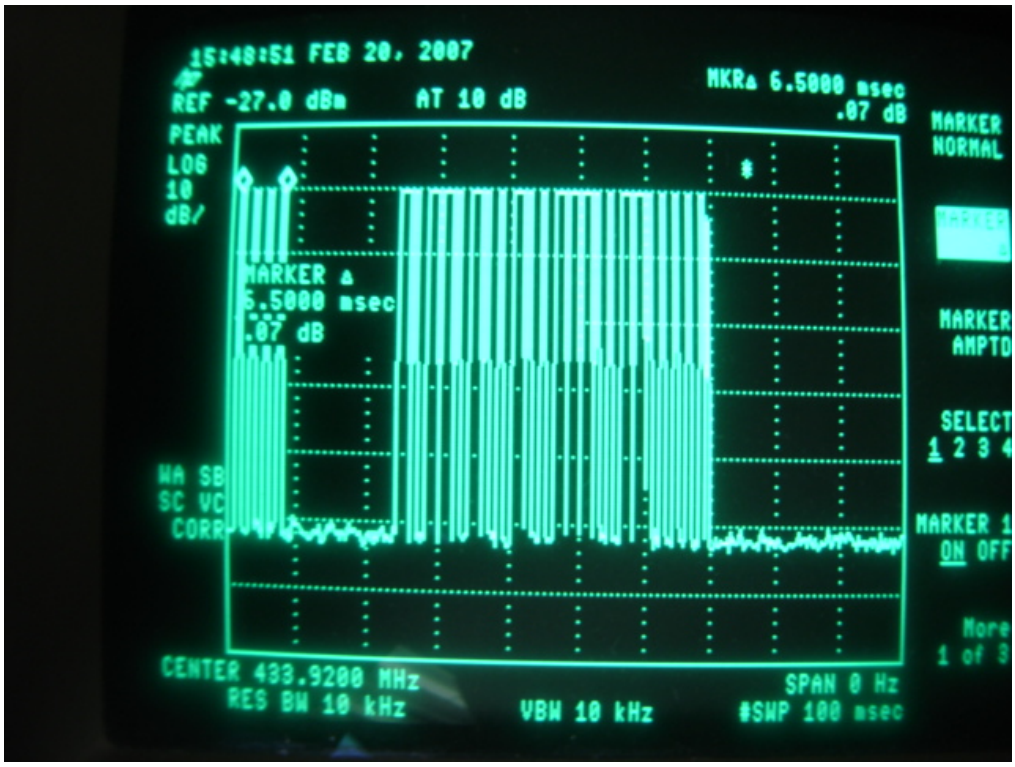
Radiated emission in chamber	
	

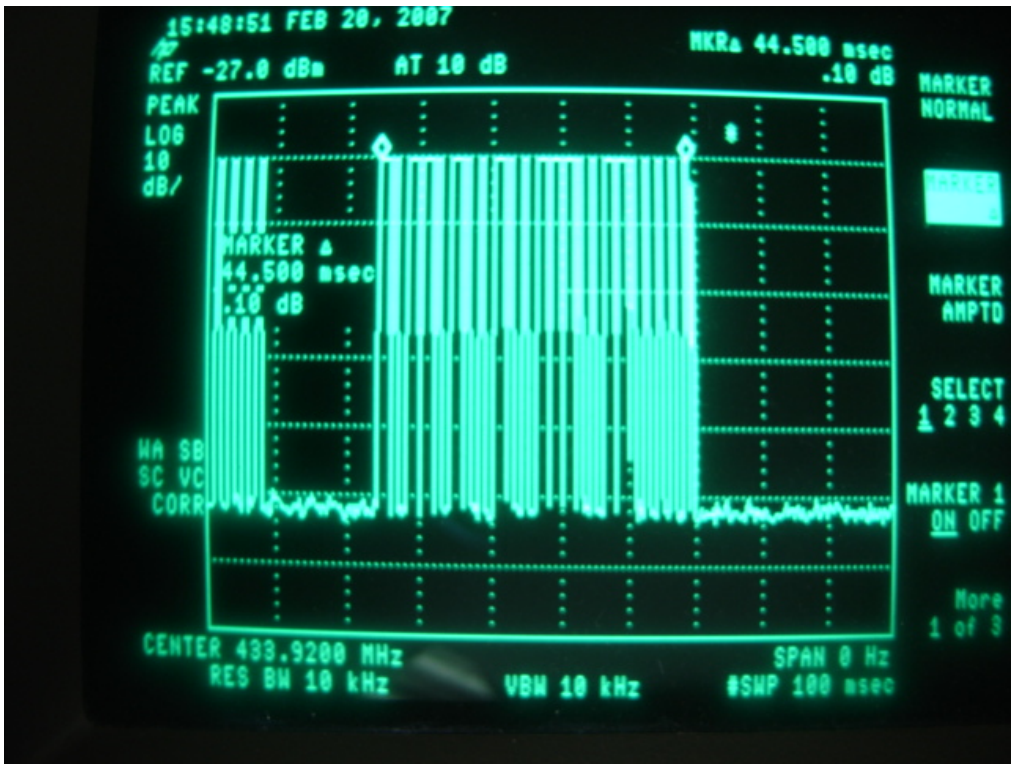
Radiated emission OATS	

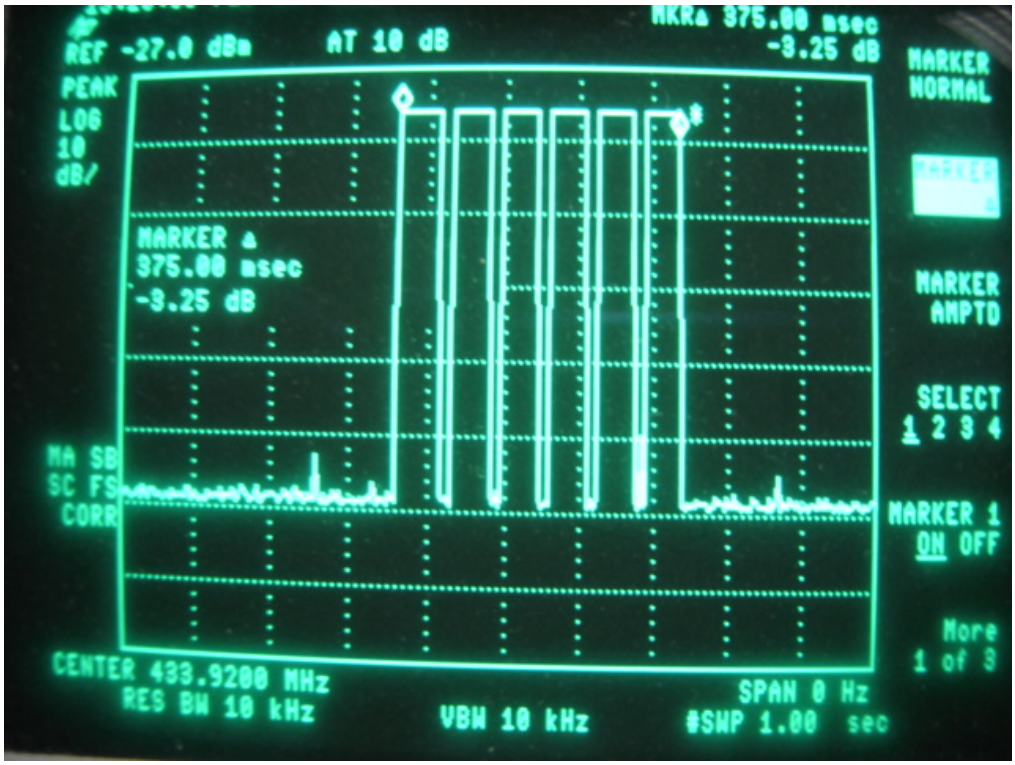
ANNEX 2:
EMISSION BANDWIDTH


Agilent 10:54:08 Jan 31, 2007
L S
Mkr1 Δ 6.72 kHz
0.372 dB
Ref 79 dBµV
#Atten 10 dB
#Peak
Log
8
dB/
1R
1
Marker Δ
6.720 kHz
0.372 dB
W1 S2
S3 FS
AA
Center 433.9 MHz
#Res BW 1 kHz
#VBW 30 kHz
Span 25.44 kHz
#Sweep 1 s (285 pts)
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2

ANNEX 3:
TRANSMISSION BURST


15:48:51 FEB 20, 2007
REF -27.0 dBm
AT 10 dB
MKR△ 6.5000 msec
.07 dB
PEAK
LOG
10
dB/
MARKER △
6.5000 msec
.07 dB
MARKER
NORMAL
MARKER
AMPTD
SELECT
1 2 3 4
MARKER 1
ON OFF
More
1 of 3
HA SB
SC VC
CORR
CENTER 433.9200 MHz
RES BW 10 kHz
VBW 10 kHz
SPAN 0 Hz
#SWP 100 msec


15:48:51 FEB 20, 2007
REF -27.0 dBm
AT 10 dB
MKR△ 44.500 msec
.10 dB
PEAK
LOG
10
dB/
MARKER △
44.500 msec
.10 dB
MARKER
NORMAL
MARKER
AMPTD
SELECT
1 2 3 4
MARKER 1
ON OFF
More
1 of 3
HA SB
SC VC
CORR
CENTER 433.9200 MHz
RES BW 10 kHz
VBW 10 kHz
SPAN 0 Hz
#SWP 100 msec


REF -27.0 dBm
AT 10 dB
MKRΔ 375.00 msec
-9.25 dB
PEAK
LOG
10
dB/
MARKER Δ
375.00 msec
-9.25 dB
MARKER
NORMAL
MARKER
AMPTD
SELECT
1 2 3 4
MARKER 1
ON OFF
More
1 of 3
CENTER 433.9200 MHz
RES BW 10 kHz
VBW 10 kHz
SPAN 0 Hz
#SWP 1.00 sec

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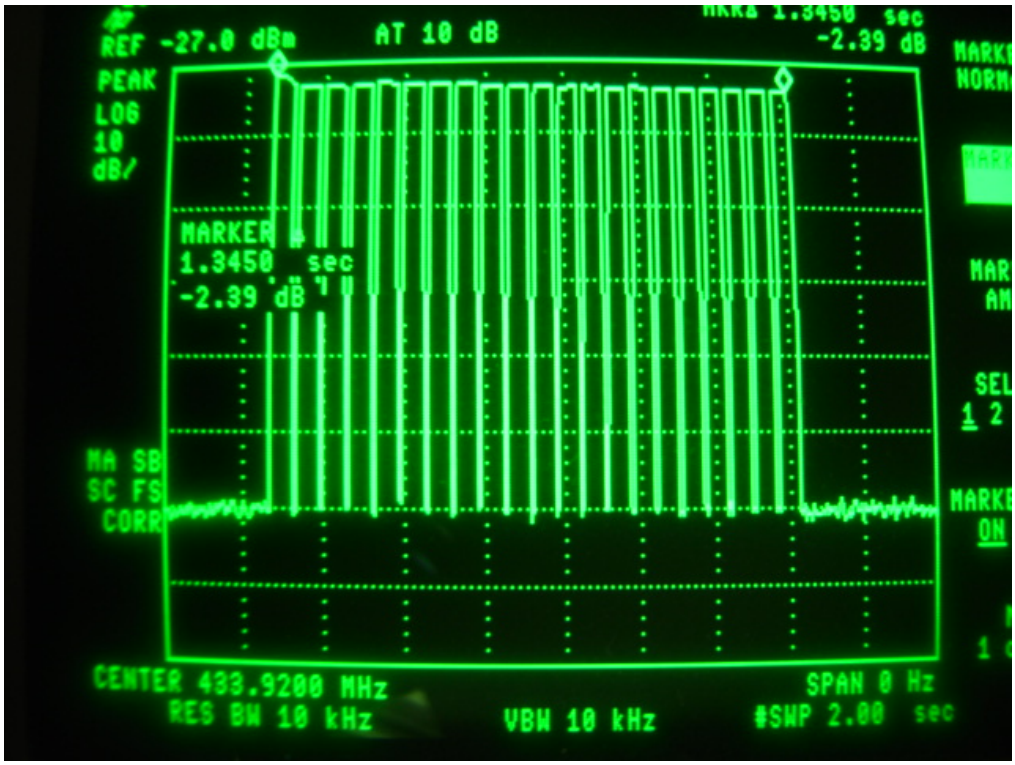
ANNEX 4:

MANUALLY OPERATED TRANSMISSION DURATION

Ed.1


REF -27.0 dBm
AT 10 dB
-2.39 dB
PEAK
LOG
10
dB/
MARKER
1.3450 sec
-2.39 dB
CENTER 433.9200 MHz
RES BW 10 kHz
VBW 10 kHz
SPAN 0 Hz
#SWP 2.00 sec