EMITECH GROUPE

RC-030-GTE-14-105110-6-A

"This report cancels and replaces the test report N° RC-030-GTE-14-105110-6-A Edition 0"

E.M.C Test Report

According to the standard:

FCC 47 CFR PART 15 : 2014 (§15.407)

Equipment under test:

Microphone
Type CONFIDEA DV G3
FCC ID: WM7CONFIDEAWDUG3

Company:

TELEVIC

FCC accredited: FR0004

DISTRIBUTION: Mr DUMEZ **(Company:** TELEVIC)

Number of pages: 51 with 4 annexes

Ed.	Date	Modified pages	Written by Name / Visa	Technical Verification and Quality Approval Name / Visa
1	04/03/15	1, 2, 3, 4, 5, 7, 9 to 22, 30, 32, 33	F. LHEUREUX FL	B. PELLERIN

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This document is the result of testing a specimen or a sample of the product submitted. It does not imply an assessment of the conformity of the whole production of the item tested.

TEST CERTIFICATION FOR:	FCC Certification
***NAME OF THE EQUIPMENT UNDER TEST*:**	Microphone Type: CONFIDEA DV G3
Serial number:	134101215110000
Reference / model (P/N):	71.98.0006
Software version:	-
NAME OF THE MANUFACTURER:	TELEVIC
ADDRESS OF THE APPLICANT:	
Company:	TELEVIC
Address:	Leo Bekaertlaan 1 8870 Izegem BELGIUM
Person in charge:	Mr DUMEZ
DATES OF TESTS:	From 03/10/2014 to 20/10/2014 and 25/02/2015
TESTS LOCATION:	Open area test site in Aunainville (28) - FRANCE
TESTS OPERATOR:	F. LHEUREUX

TABLE OF CONTENTS

1. INTRODUCTION

This document presents the results of Electromagnetic Compatibility tests performed on the equipment **« Microphone type: CONFIDEA DV G3»** according to references documents listed below.

2. REFERENCES DOCUMENTS

FCC 47 CFR Part 15: 2014
Code of Federal Regulations
Title 47- Telecommunication
Chapter 1- Federal Communication Commission
Part 15- Radio frequency devices

ANSI C63.4: 2003
Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronics Equipment in the range of 9 kHz to 40 GHz.

789033 D02 General UNII Test Procedures new rules v01
Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part 15, Subpart E

3. PRODUCT DESCRIPTION

Class: B (residential environment)

Antenna type and gain: Internal antenna: Not communicated

Modulation: OFDM @ 54 Mbits/sec

Power source: 7.2 Vdc

Software power setting: The microphone is paired with the wireless conference access point system. (The power is not adjustable, only the channels)

Operating frequency range: From 5150 MHz to 5250 MHz
From 5725 MHz to 5825 MHz

Operating mode: Slave device without radar detection[1]

Table for carrier frequency: 802.11 a (20 MHz)

Channel No.	36	40	44	48	149	153	157	161
CF (MHz)	5180	5200	5220	5240	5745	5765	5785	5805
Tested	X		X	X	X		X	X

[1] : The E.U.T. does not use the following frequencies bands:
5250 MHz to 5350 MHz
5470 MHz to 5725 MHz

Modification of the equipment during the tests: No

4. TESTS AND CONCLUSION

The following tables summarize test results of the EUT.

Subpart B of the standard FCC part 15 – Unintentional radiators

Test procedure	Designation of test	Test results				Comments
		Pass	Fail	N.A.	N.P.	
15.107	Measurement of conducted emission on AC mains ports			X		
15.109	Radiated emission limits	X				

Subpart C of the standard FCC part 15 – Intentional radiators

Test procedure	Designation of test	Test results				Comments
		Pass	Fail	N.A.	N.P.	
15.205	Restricted bands of operation	X				
15.207	Measurement of conducted emission on AC mains ports			X		
15.209	Radiated emission limits; general requirements	X				
15.215	Additional provisions to the general radiated emission limitations					
	(a) Alternative to general radiated emission limits	X				
	(b) Unwanted emissions outside of § 15.247 frequency bands	X				
	(c) 20 dB bandwidth and band-edge compliance			X		
15.407	Intentional radiated emissions					
	a) Power limits					
	a) (1) in the bands 5150–5250 MHz					
	- maximum conducted output power	X				
	- 26 dB bandwidth	X				
	- peak power spectral density	X				
	a) (2) in the bands 5250–5350 MHz and 5470-5725 MHz					
	- maximum conducted output power			X		
	- 26 dB bandwidth			X		
	- peak power spectral density			X		
	a) (3) in the bands 5725–5825 MHz					
	- maximum conducted output power	X				
	- 6 dB bandwidth	X				
	- peak power spectral density	X				
	a) (6) peak excursion ratio	X				
	b) Undesirable emission limits					
	b) (1) outside of the bands 5150–5250 MHz	X				
	b) (2) outside of the bands 5250–5350 MHz			X		
	b) (3) outside of the bands 5470-5725 MHz			X		
	b) (4) outside of the bands 5725–5825 MHz	X				
	c) Operation in the absence of information to transmit	X				
	g) Frequency Stability	X				
	h) Transmit Power Control (TPC) and Dynamic Frequency Selection (DFS)			X		
	h) (1) TPC operating in the bands 5250-5350 MHz and 5470-5725MHz			X		output power < 500mW
	h) (2) DFS operating in the bands 5250-5350 MHz and 5470-5725MHz			X		

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

Conclusion:

The tested sample " **Microphone type: CONFIDEA DV G3** " submitted to the tests complies with the requirements of the standard:

- FCC 47 CFR PART 15 : 2014

According to the limits specified in this report.

5. 6 dB BANDWIDTH, 26 dB BANDWIDTH AND 99 % OCCUPIED BANDWIDTH

Standard: FCC 47 CFR PART 15 : 2014

Sections: 15.407 a) (1) and (3)

Test configuration:

The system is tested in an open area test site (OATS).

The test unit is placed on a rotating table, 0.8 m from a ground plane. Zero degree azimuth corresponds to the front of the equipment under test.

The level was maximised in antenna height, azimuth and polarization. The maximum level measured on the spectrum analyser was recorded.

Test procedure:

789033 D02 General UNII test Procedures new rules v01

Distance of antenna: 3 meters

Instrumentation test list:

CATEGORY	BRAND	TYPE	Nr EMITECH
Antenna	Emco	3115	3374
Antenna mast	Maturo	AM 4.0-O	7625
Cable	Micro-Coax	N-13m	8063
Open area test site	Emitech	Aunainville	0187
Receiver	Rohde & Schwarz	FSU8	9129
Turntable	Maturo	MCU	7626

Equipment under test operating condition:

EUT is in continuous transmission mode.

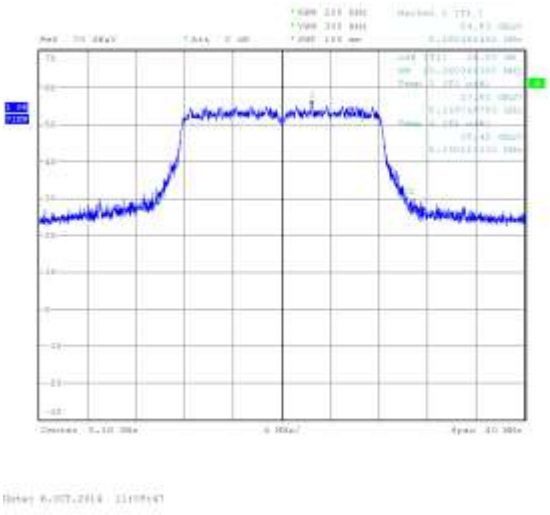
Measure conditions:

Ambient temperature (°C): 14
Relative humidity (%): 69
Power source: 7.2 Vdc

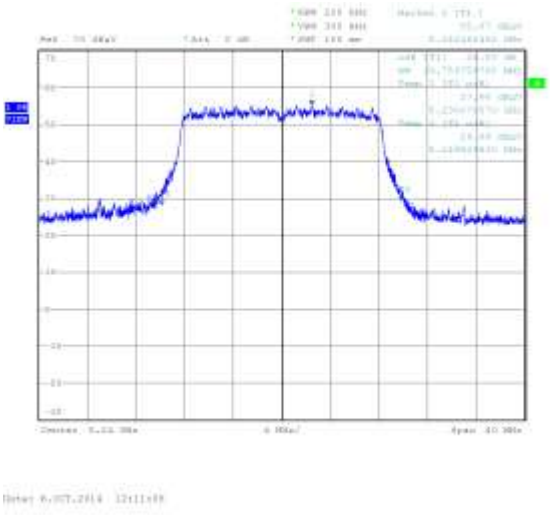
Results:

26 dB Bandwidth

Channel	Mode	Results	Comments
36 (5180 MHz)	802.11a	20.36 MHz	See curve n°1
44 (5220 MHz)		20.67 MHz	See curve n°27
48 (5240 MHz)		19.76 MHz	See curve n°2



Curve 1



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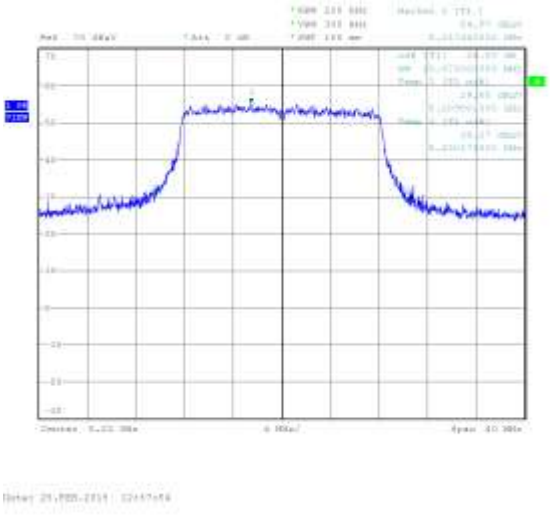
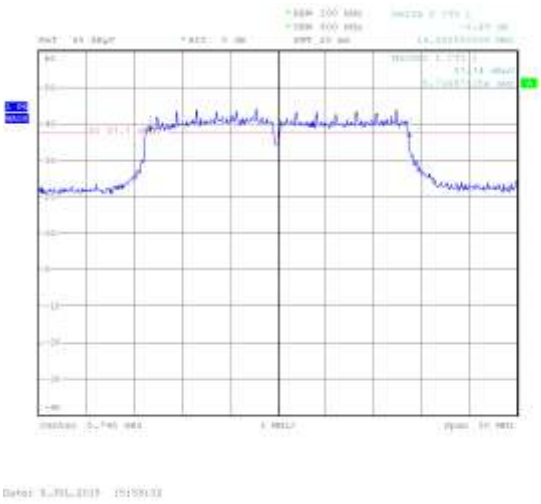


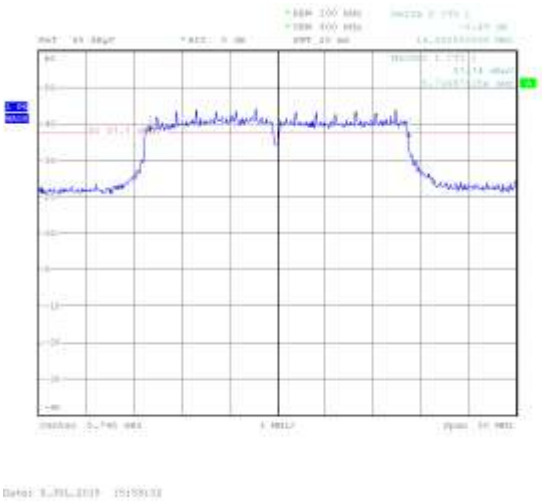
Curve 27

6 dB Bandwidth

Channel	Mode	Results	Comments
149 (5745 MHz)	802.11a	16.25 MHz	See curve n°3
157 (5785 MHz)		16.49 MHz	See curve n°28
161 (5805 MHz)		16.39 MHz	See curve n°4



Curve 3



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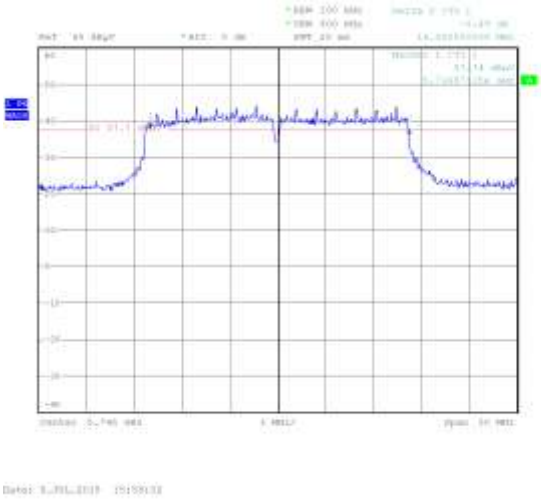
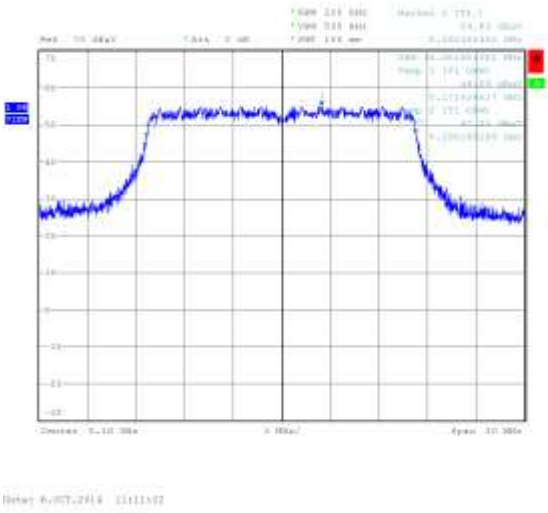


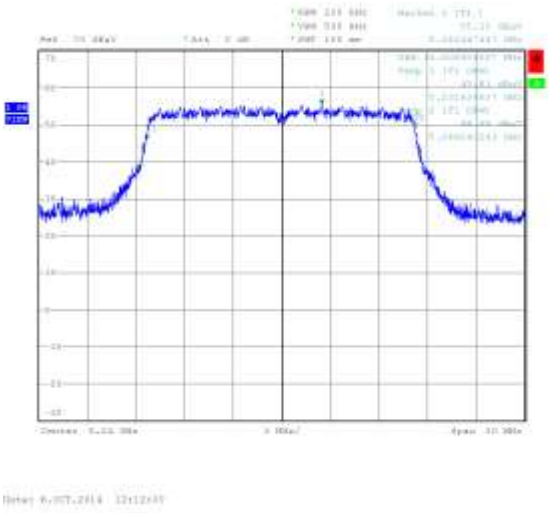
Curve 28

99 % Occupied bandwidth

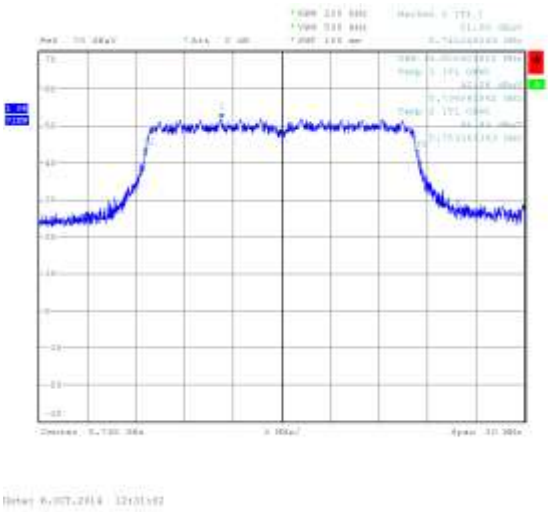
Channel	Mode	Results	Comments
36 (5180 MHz)	802.11a	16.65 MHz	See curve n°5
44 (5220 MHz)		16.68 MHz	See curve n°29
48 (5240 MHz)		16.60 MHz	See curve n°6
149 (5745 MHz)	802.11a	16.80 MHz	See curve n°7
157 (5785 MHz)		16.78 MHz	See curve n°30
161 (5805 MHz)		16.79 MHz	See curve n°8



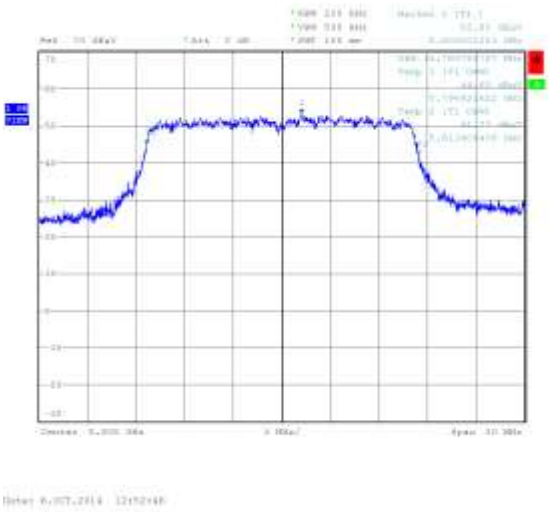
Curve 5



Curve 6



Curve 7



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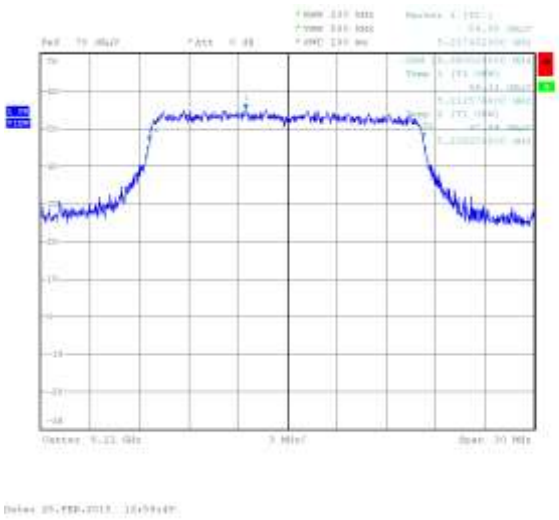
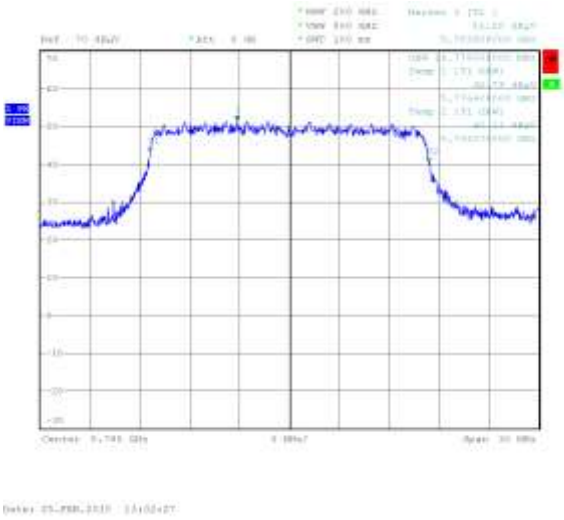


Curve 29



Curve 30

6. MAXIMUM OUTPUT POWER

Standard: FCC 47 CFR PART 15 : 2014

Sections: 15.407 a) (1) and (3)

Test configuration:

The system is tested in an open area test site (OATS).

The test unit is placed on a rotating table, 0.8 m from a ground plane. Zero degree azimuth corresponds to the front of the equipment under test.

The level was maximised in antenna height, azimuth and polarization. The maximum level measured on the spectrum analyser was recorded.

Test procedure:

789033 D02 General UNII test Procedures new rules v01

Distance of antenna: 3 meters

Instrumentation test list:

CATEGORY	BRAND	TYPE	Nr EMITECH
Antenna	Emco	3115	3374
Antenna mast	Maturo	AM 4.0-O	7625
Cable	Micro-Coax	N-13m	8063
Open area test site	Emitech	Aunainville	0187
Receiver	Rohde & Schwarz	FSU8	9129
Turntable	Maturo	MCU	7626

Equipment under test operating condition:

EUT is in continuous transmission mode.

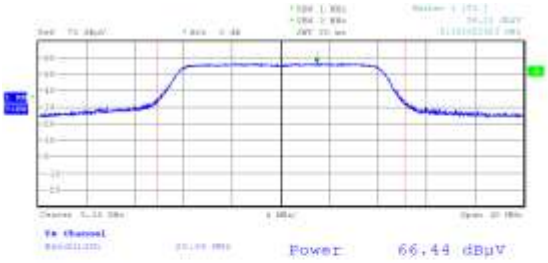
Measure conditions:

Ambient temperature (°C): 14
Relative humidity (%): 69
Resolution bandwidth: 1 MHz
Power source: 7.2 Vdc

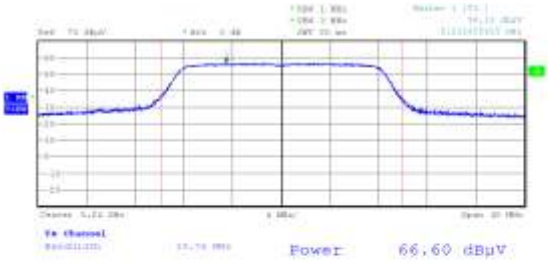
Results:

Channel	Mode	Electro-magnetic field (dBµV/m)	Maximum output power* (dBm)	Limits (dBm)	Comments
36 (5180 MHz)	802.11a	107.64	12.4	17	See curve n°9
44 (5220 MHz)		106.80	11.6	17	See curve n°31
48 (5240 MHz)		107.80	12.6	17	See curve n°10
149 (5745 MHz)	802.11a	104.57	9.4	30	See curve n°11
157 (5785 MHz)		103.55	8.3	30	See curve n°32
161 (5805 MHz)		105.20	10.0	30	See curve n°12

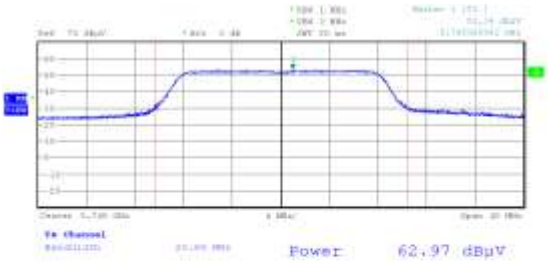
* Maximum output power = E (dBµV/m) – 95.2 for d = 3 m



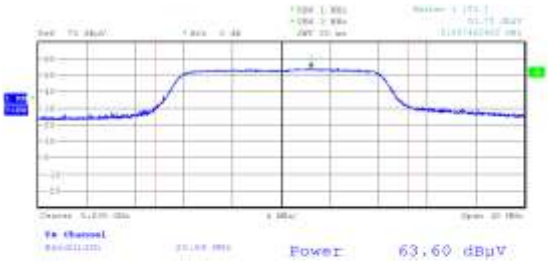
Curve 9



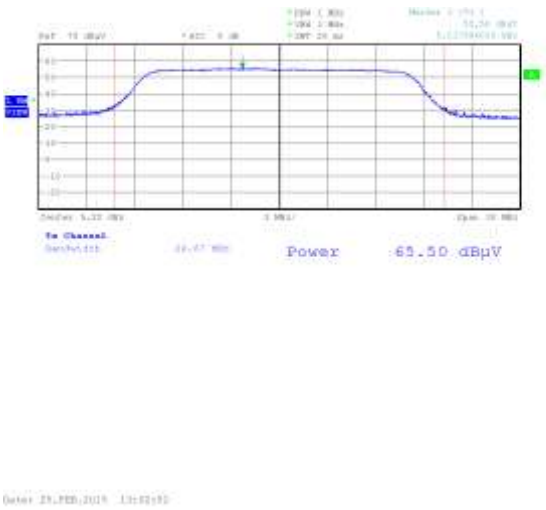
Curve 10



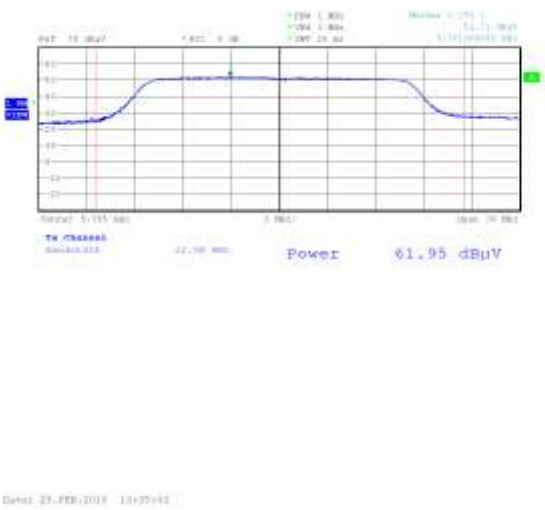
Curve 11



Curve 12



Curve 31



Curve 32

Test conclusion: Complies with the requirements of the standard.

7. PEAK POWER SPECTRAL DENSITY

Standard: FCC 47 CFR PART 15 : 2014

Sections: 15.407 a) (1) and (3)

Test configuration:

The system is tested in an open area test site (OATS).

The test unit is placed on a rotating table, 0.8 m from a ground plane. Zero degree azimuth corresponds to the front of the equipment under test.

The level was maximised in antenna height, azimuth and polarization. The maximum level measured on the spectrum analyser was recorded.

Test procedure:

789033 D01 General UNII test Procedures v01r03

Distance of antenna: 3 meters

Instrumentation test list:

CATEGORY	BRAND	TYPE	Nr EMITECH
Antenna	Emco	3115	3374
Antenna mast	Maturo	AM 4.0-O	7625
Cable	Micro-Coax	N-13m	8063
Open area test site	Emitech	Aunainville	0187
Receiver	Rohde & Schwarz	FSU8	9129
Turntable	Maturo	MCU	7626

Equipment under test operating condition:

EUT is in continuous transmission mode.

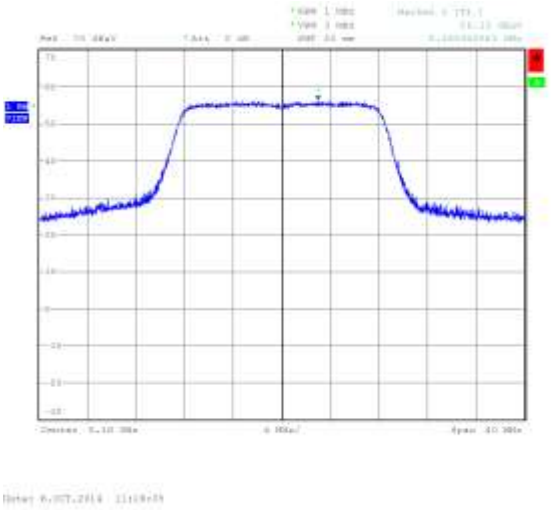
Measure conditions:

Ambient temperature (°C): 14
Relative humidity (%): 69
Resolution bandwidth: 1 MHz (5150 – 5250 MHz) / 500 kHz (5725 – 5850 MHz)
Power source: 7.2 Vdc

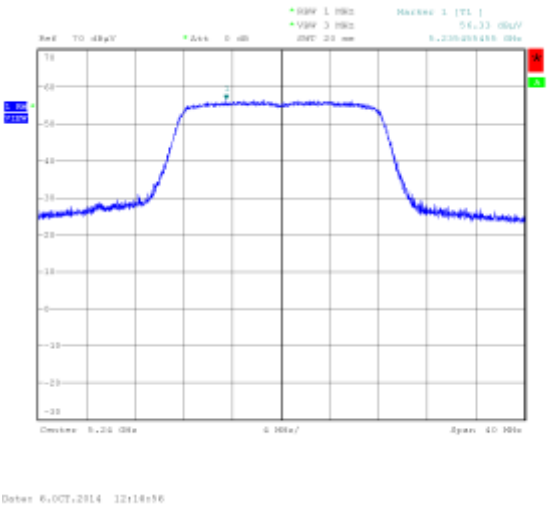
Results:

Channel	Mode	Electro-magnetic field (dBµV/m)	PPSD* (dBm)	Limits (dBm)	Comments
36 (5180 MHz)	802.11a	97.33	2.13	4	See curve n°13
44 (5220 MHz)		96.80	1.60	4	See curve n°33
48 (5240 MHz)		97.63	2.43	4	See curve n°14
149 (5745 MHz)	802.11a	93.70	- 1.49	17	See curve n°15
157 (5785 MHz)		93.30	-1.94	17	See curve n°34
161 (5805 MHz)		92.80	- 2.39	17	See curve n°16

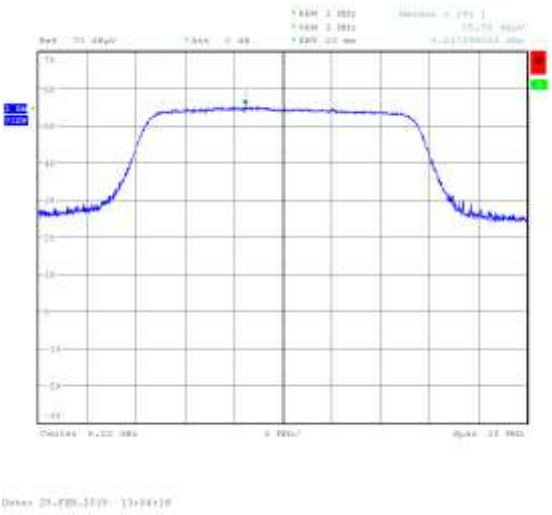
* PPSD = E (dBµV/m) – 95.2 for d = 3 m



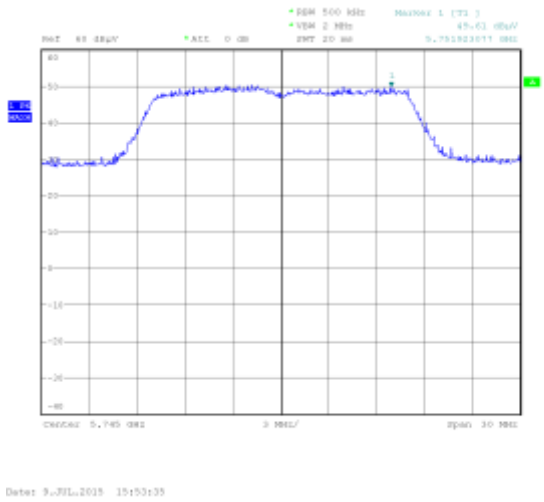
Curve 13



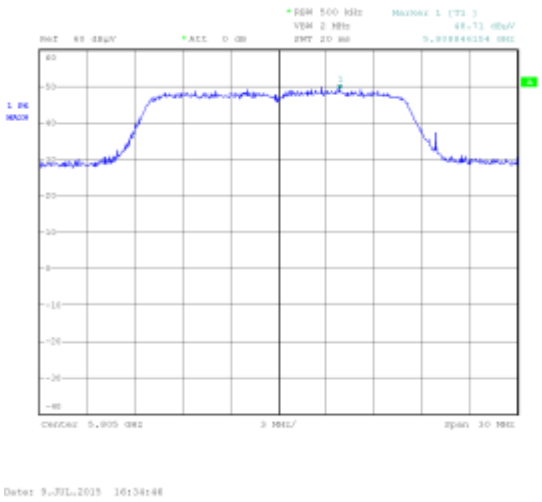
Curve 14



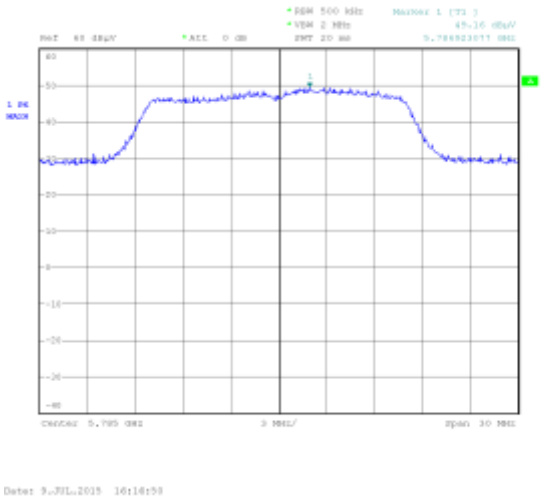
Curve 33



Curve 15



Curve 16



Curve 34

Test conclusion: Complies with the requirements of the standard.

8. PEAK EXCURSION RATIO

Standard: FCC 47 CFR PART 15 : 2014

Section: 15.407 a) (6)

Test configuration:

The system is tested in an open area test site (OATS).

The test unit is placed on a rotating table, 0.8 m from a ground plane. Zero degree azimuth corresponds to the front of the equipment under test.

The level was maximised in antenna height, azimuth and polarization. The maximum level measured on the spectrum analyser was recorded.

Test procedure:

789033 D02 General UNII test Procedures new rules v01

Distance of antenna: 3 meters

Instrumentation test list:

CATEGORY	BRAND	TYPE	Nr EMITECH
Antenna	Emco	3115	3374
Antenna mast	Maturo	AM 4.0-O	7625
Cable	Micro-Coax	N-13m	8063
Open area test site	Emitech	Aunainville	0187
Receiver	Rohde & Schwarz	FSU8	9129
Turntable	Maturo	MCU	7626

Equipment under test operating condition:

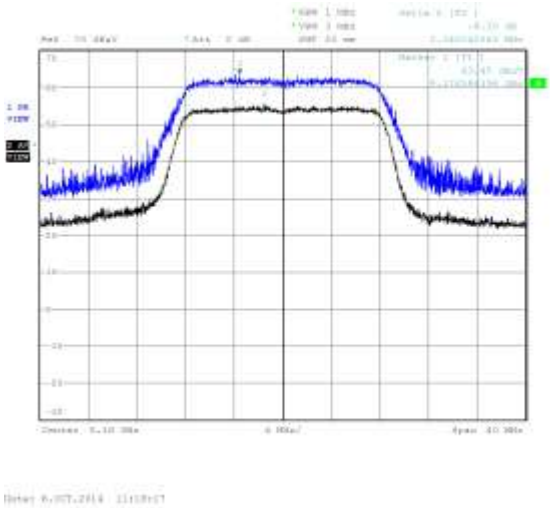
EUT is in continuous transmission mode.

Measure conditions:

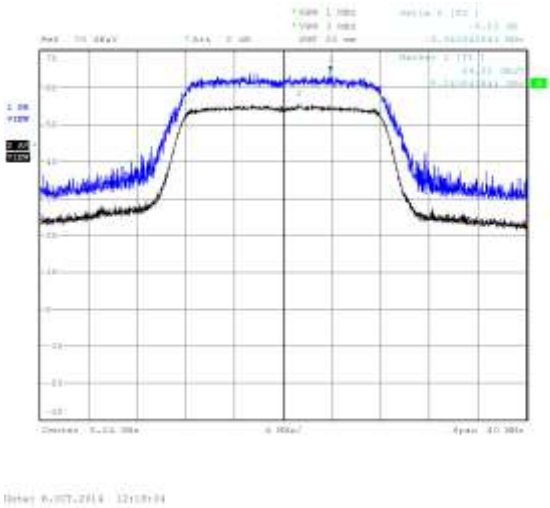
Ambient temperature (°C): 14
Relative humidity (%): 69
Resolution bandwidth: 1 MHz
Power source: 7.2 Vdc

Results:

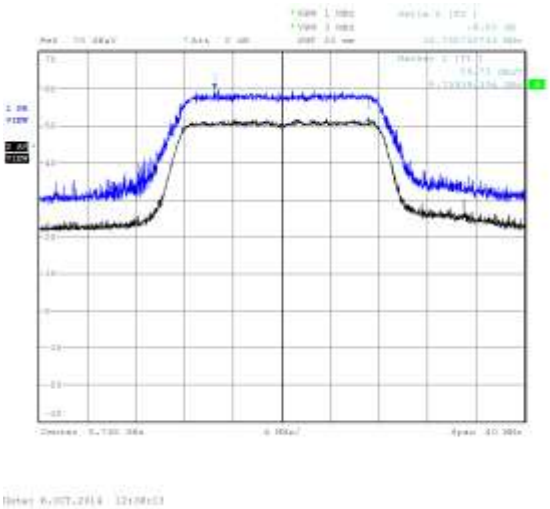
Channel	Mode	Peak excursion to average ratio (dB)	Limit (dB)	Comments
36 (5180 MHz)	802.11a	8.30	<13	See curve n°17
44 (5220 MHz)		7.91	<13	See curve n°35
48 (5240 MHz)		9.03	<13	See curve n°18
149 (5745 MHz)	802.11a	8.00	<13	See curve n°19
157 (5785 MHz)		8.13	<13	See curve n°36
161 (5805 MHz)		7.56	<13	See curve n°20



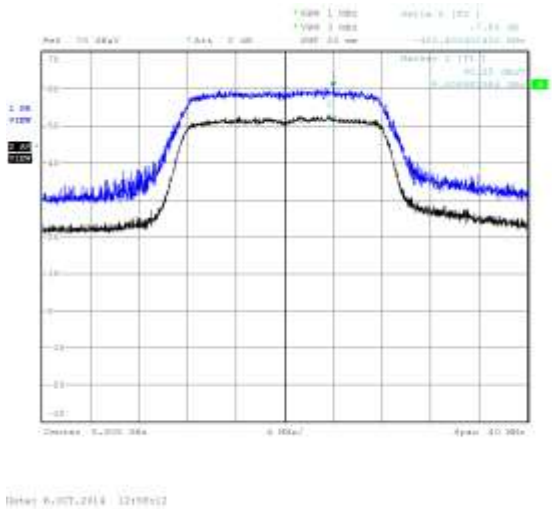
Curve 17



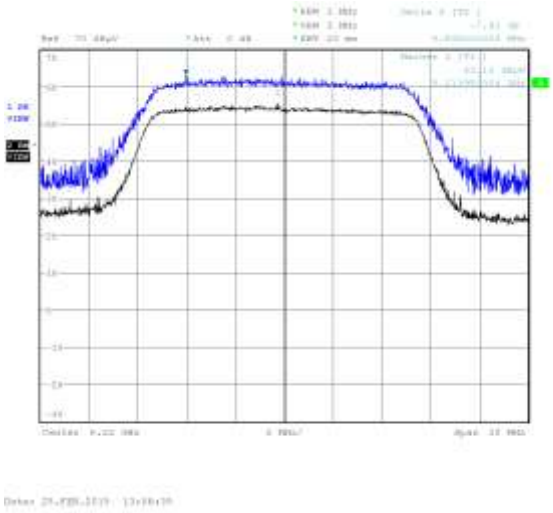
Curve 18



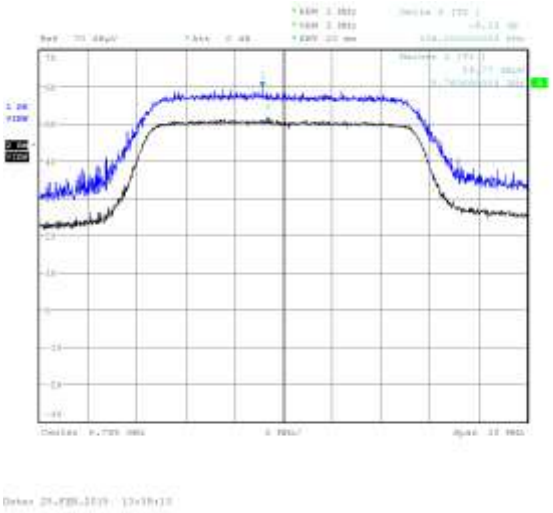
Curve 19



Curve 20



Curve 35



Curve 36

Test conclusion: Complies with the requirements of the standard.

9. ADDITIONAL PROVISIONS TO THE GENERAL RADIATED EMISSIONS LIMITATION

Standard: FCC 47 CFR PART 15 : 2014

Section: 15.215 (b)

Instrumentation test list:

CATEGORY	BRAND	TYPE	Nr EMITECH
Antenna	Emco	3115	3374
Antenna mast	Maturo	AM 4.0-O	7625
Cable	Micro-Coax	N-13m	8063
Open area test site	Emitech	Aunainville	0187
Receiver	Rohde & Schwarz	FSU8	9129
Turntable	Maturo	MCU	7626

Equipment under test arrangement:

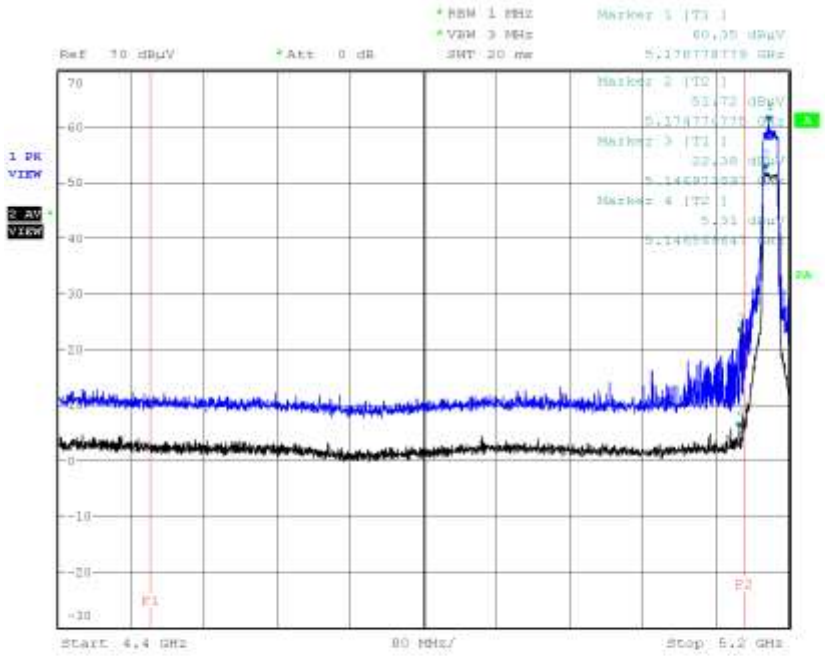
The system is tested in an open area test site (OATS).
The test unit is placed on a rotating table, 0.8 m from a ground plane. Zero degree azimuth corresponds to the front of the equipment under test.

Results:

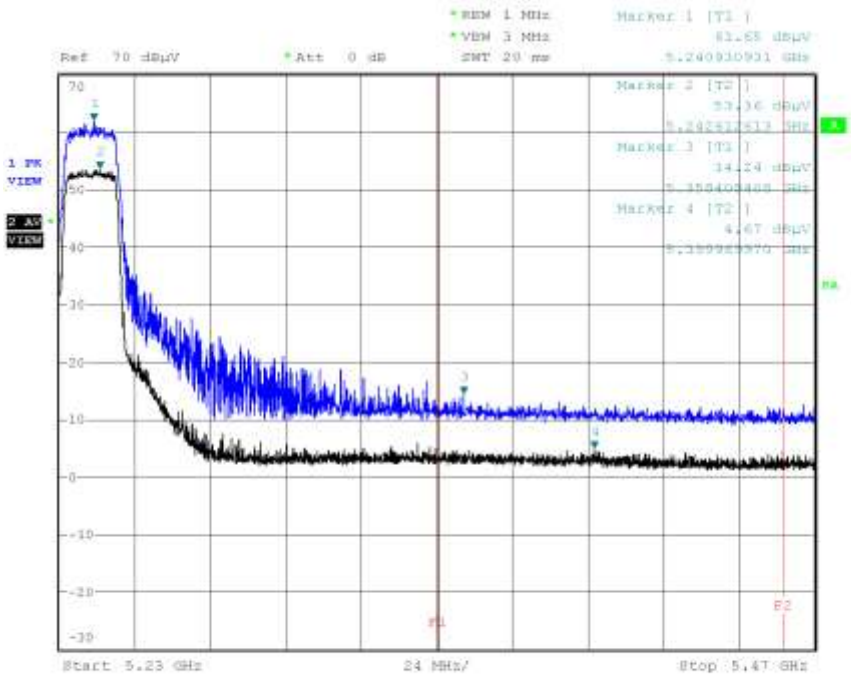
Ambient temperature (°C): 14
Relative humidity (%): 69

Restricted band: from 4500 MHz to 5150 MHz and from 5350 MHz to 5460 MHz

Channel	Mode	Detector (Peak or Average)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Comments
36	802.11a	Peak	63.58	68.2	4.62	See curve n°21
36	802.11a	Average	46.51	54.0	7.49	See curve n°21
48	802.11a	Peak	55.54	68.2	12.66	See curve n°22
48	802.11a	Average	45.97	54.0	8.03	See curve n°22



Curve 21



Curve 22

10. BAND EDGE

Standard: FCC 47 CFR PART 15 : 2014

Sections: 15.407 b) (1) and (4)

Equipment under test arrangement:

The equipment under test (EUT) is placed on a non-conductive test table at 0.8 m above the horizontal metal ground plane.

For maximum meter reading at each frequency, the antenna height is adjusted between 1 m and 4 m above the ground plane. A 360 degrees rotation of the EUT is performed in vertical and horizontal polarization. The frequency azimuth and antenna height are presented in the table on the next pages.

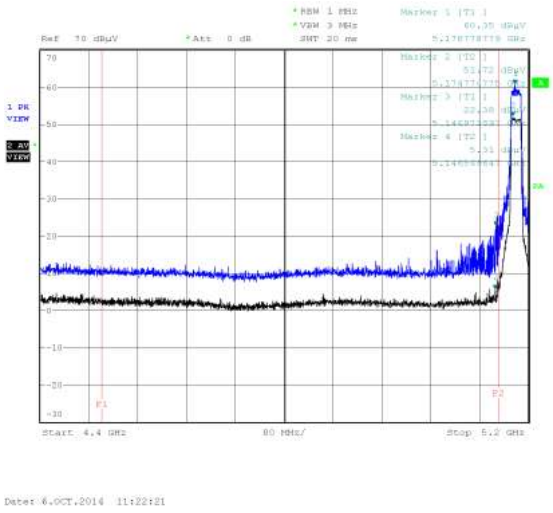
The E.U.T. is blocked in continuous transmission.

Results:

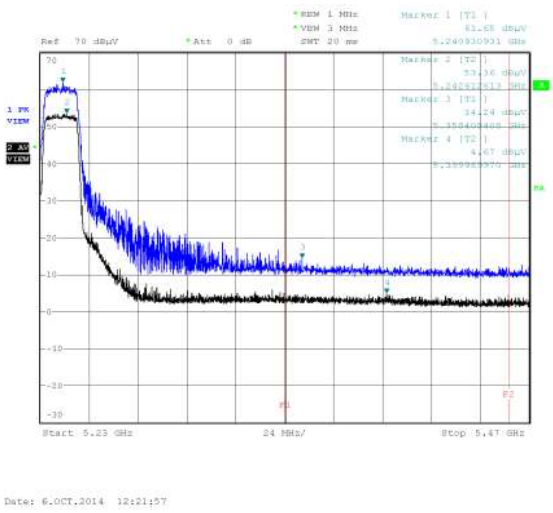
Ambient temperature (°C): 14
Relative humidity (%): 69

Band edge: from 5150 MHz to 5350 MHz and from 5725 MHz to 5825 MHz

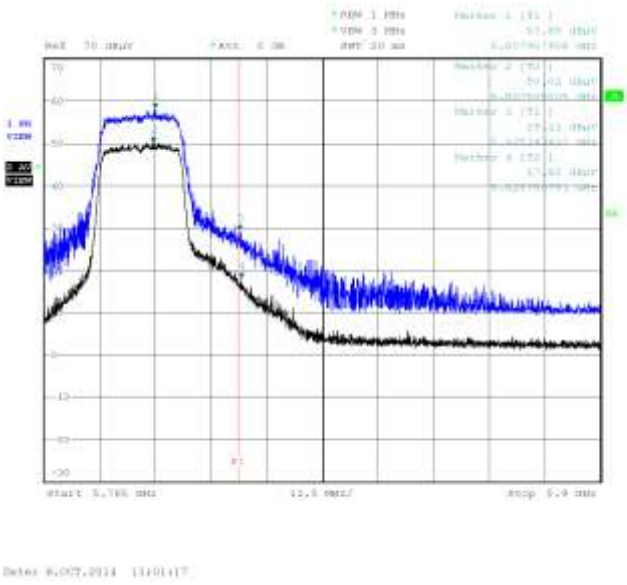
Channel	Mode	Detector (Peak or Average)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Comments
36	802.11a	Peak	63.58	68.2	4.62	See curve n°23
36	802.11a	Average	46.51	54.0	7.49	See curve n°23
48	802.11a	Peak	55.54	68.2	12.66	See curve n°24
48	802.11a	Average	45.97	54.0	8.03	See curve n°24
149	802.11a	Peak	67.59	78.2	10.61	No curve
149	802.11a	Average	52.89	78.2	25.31	No curve
161	802.11a	Peak	70.71	78.2	7.49	See curve n°26
161	802.11a	Average	59.42	78.2	18.78	See curve n°26



Curve 23



Curve 24



Curve 26

11. UNINTENTIONAL RADIATED EMISSIONS AND TRANSMITTER UNWANTED EMISSION IN THE BAND 9 KHz – 40 GHz

Standard: FCC 47 CFR PART 15 : 2014

Sections: 15.205; 15.209 and 15.407

Equipment under test arrangement:

The equipment under test (EUT) is placed on a non-conductive test table at 0.8 m above the horizontal metal ground plane.

For maximum meter reading at each frequency, the antenna height is adjusted between 1 m and 4 m above the ground plane. A 360 degrees rotation of the EUT is performed in vertical and horizontal polarization. The frequency azimuth and antenna height are presented in the table on the next pages.

The E.U.T. is blocked in continuous transmission.

Frequency range:
9 kHz – 30 MHz
30 MHz - 1 GHz
1 GHz – 26 GHz
26 GHz – 40 GHz

Detection mode:
Quasi-peak for 9 kHz – 30 MHz
Quasi-peak for 30 MHz - 1 GHz
Average for 1 GHz – 40 GHz

Resolution bandwidth:
200 Hz for 9 kHz – 150 kHz
9 kHz for 150 kHz – 30 MHz
120 kHz for 30 MHz - 1 GHz
1 MHz for 1 GHz – 40 GHz

Measurement distance:
30 meters from 9 kHz to 30 MHz
3 meters from 30 MHz to 26 GHz
1 meter from 26 GHz to 40 GHz

- Limit for emission radiated outside the frequency band, except the harmonics, shall be attenuated by at least 20 dB below the level of fundamental or the general radiated emission limits in § 15.407 (see table).

From 9 kHz to 30 MHz

Frequency range	Limit µV/m
9 – 490 kHz	2400/F (F in kHz) *
490 – 1705 kHz	24000/F (F in kHz)
1.705 – 30 MHz	30

* Limits in µV/m can be extrapolated to 30 m using 20 dB / decade.

From 30 MHz to 40 GHz

Frequency range (MHz)	Limit (dBµV/m)	µV/m
30 to 88	40.0	100
88 to 216	43.5	150
216 to 960	46.0	200
Above 960	54.0	500

Instrumentation test list:

CATEGORY	BRAND	TYPE	Nr EMITECH
Antenna	Oritel	Cornet CM 42-25	1045
Antenna	Emco	Cornet 3115	3374
Antenna	Chase	Bilog CBL6111	4428
Antenna	Eaton	Cadre Eaton 96009/2	4713
Antenna	Amplifier research	Cornet WBH18-40K	6950
Antenna mast	Maturo	AM 4.0-O	7625
Cable	Câbles & Connectiques	N-13m	2452
Cable	-	N-2m	2805
Cable	Câbles & Connectiques	N-SMA	2864
Cable	-	N-30m	4359
Cable	-	Câbles Orgeval	6000
Cable	N-0.5m	N-0.5m	6037
Cable	Micro-Coax	N-13m	8063
Cable	C&C	K	11133
Câble	-	N-8m	8021
Filter	Micro-tronics	Passe haut	4692
Filter	FILTEK	Passe haut	6356
Filter	Micro-Tronics	Passe haut	6361
Open area test site	Emitech	Site champ libre	0187
Preamplifier	Hewlett Packard	HF	0051
Preamplifier	ALC	HF	4354
Preamplifier	Mini Circuits	RF	5437
Receiver	Rohde & Schwarz	R&S FSU8	9129
Spectrum analyzer	Rohde & Schwarz	R&S FSP40	5175
Turntable	Maturo	MCU	7626
Voltmeter	Rohde & Schwarz	R&S ESVS10	1216
Wattmeter	Agilent Technologies	Agilent E7405A	2205
Wattmeter	Advantest	Advantest R3361	5644

Ambient temperature (°C): 15
Relative humidity (%): 69
Power source: 7.2 Vdc

Results:

Frequency 5180 MHz

FREQUENCY (MHz)	Detector	Antenna height (cm)	Azimuth (degree)	Resolution bandwidth (kHz)	Polarization H: Horizontal V: Vertical	Field strength (dBµV/m)	Limits (dBµV/m)	Margin (dB)
344.072	Quasi-peak	155	20	120	V	36.1	46.0	9.9
344.072	Quasi-peak	100	270	120	H	34.7	46.0	11.3

Frequency 5220 MHz

FREQUENCY (MHz)	Detector	Antenna height (cm)	Azimuth (degree)	Resolution bandwidth (kHz)	Polarization H: Horizontal V: Vertical	Field strength (dBµV/m)	Limits (dBµV/m)	Margin (dB)
344.072	Quasi-peak	155	20	120	V	36.1	46.0	9.9
344.072	Quasi-peak	100	270	120	H	34.7	46.0	11.3

Frequency 5240 MHz

FREQUENCY (MHz)	Detector	Antenna height (cm)	Azimuth (degree)	Resolution bandwidth (kHz)	Polarization H: Horizontal V: Vertical	Field strength (dBµV/m)	Limits (dBµV/m)	Margin (dB)
344.072	Quasi-peak	155	20	120	V	36.1	46.0	9.9
344.072	Quasi-peak	100	270	120	H	34.7	46.0	11.3

Frequency 5745 MHz

FREQUENCY (MHz)	Detector	Antenna height (cm)	Azimuth (degree)	Resolution bandwidth (kHz)	Polarization H: Horizontal V: Vertical	Field strength (dBµV/m)	Limits (dBµV/m)	Margin (dB)
344.072	Quasi-peak	155	20	120	V	36.1	46.0	9.9
344.072	Quasi-peak	100	270	120	H	34.7	46.0	11.3

Frequency 5785 MHz

FREQUENCY (MHz)	Detector	Antenna height (cm)	Azimuth (degree)	Resolution bandwidth (kHz)	Polarization H: Horizontal V: Vertical	Field strength (dBµV/m)	Limits (dBµV/m)	Margin (dB)
344.072	Quasi-peak	155	20	120	V	36.1	46.0	9.9
344.072	Quasi-peak	100	270	120	H	34.7	46.0	11.3

Frequency 5805 MHz

FREQUENCY (MHz)	Detector	Antenna height (cm)	Azimuth (degree)	Resolution bandwidth (kHz)	Polarization H: Horizontal V: Vertical	Field strength (dBµV/m)	Limits (dBµV/m)	Margin (dB)
344.072	Quasi-peak	155	20	120	V	36.1	46.0	9.9
344.072	Quasi-peak	100	270	120	H	34.7	46.0	11.3

No significant frequency has been found other than those given above between 9 kHz to 30 MHz and 1 GHz to 40 GHz.

Test conclusion:

The equipment complies with the requirements of the standard.

12. RADIATED EMISSION LIMIT

Standard: FCC 47 CFR PART 15 : 2014

Section: 15.109

Instrumentation test list:

CATEGORY	BRAND	TYPE	Nr EMITECH
Antenna	Oritel	Cornet CM 42-25	1045
Antenna	Emco	Cornet 3115	3374
Antenna	Chase	Bilog CBL6111	4428
Antenna	EATON	Cadre Eaton 96009/2	4713
Antenna	Amplifier research	Cornet WBH18-40K	6950
Antenna mast	Maturo	AM 4.0-O	7625
Cable	Câbles & Connectiques	N-13m	2452
Cable	-	N-2m	2805
Cable	Câbles & Connectiques	N-SMA	2864
Cable	-	N-30m	4359
Cable	-	Câbles Orgeval	6000
Cable	N-0.5m	N-0.5m	6037
Cable	-	N-8m	8021
Cable	Micro-Coax	N-13m	8063
Filter	Micro-tronics	passe haut	4692
Filter	FILTEK	passe haut	6356
Filter	Micro-Tronics	passe haut	6361
Open area test site	Emitech	Site champ libre	0187
Preamplifier	Hewlett Packard	HF	0051
Preamplifier	ALC	HF	4354
Preamplifier	Mini Circuits	RF	5437
Spectrum analyzer	Rohde & Schwarz	R&S FSP40	5175
Turntable	Maturo	MCU	7626
Voltmeter	Rohde & Schwarz	R&S ESVS10	1216
Wattmeter	Agilent Technologies	Agilent E7405A	2205
Wattmeter	Advantest	Advantest R3361	5644

Equipment under test arrangement:

The system is tested in an open area test site (OATS).
The test unit is placed on a rotating table, 0.8 m from a ground plane. Zero degree azimuth corresponds to the front of the equipment under test.

Frequency range: from 30 MHz to harmonic 5 (highest frequency used = 5805 MHz).

Bandwidth: 120 kHz (F<1 GHz)
1 MHz (F>1 GHz)

Detection mode: Quasi-peak (F < 1 GHz)
Average (F > 1 GHz)

Distance of antenna: 3 meters for 30 MHz to 26 GHz.
1 meter for 26 GHz to 30 GHz

Antenna height: 1 to 4 meters

Antenna polarization: vertical and horizontal, only the highest level is recorded.

Operating mode during the test:

The E.U.T. is blocked in continuous transmission mode.

Ambient temperature (°C): 16
Relative humidity (%): 69
Power source: 7.2 Vdc

Results:

Frequency 5180 MHz

FREQUENCY (MHz)	Detector	Antenna height (cm)	Azimuth (degree)	Resolution bandwidth (kHz)	Polarization H: Horizontal V: Vertical	Field strength (dBµV/m)	Limits (dBµV/m)	Margin (dB)
344.072	Quasi-peak	155	20	120	V	36.1	46.0	9.9
344.072	Quasi-peak	100	270	120	H	34.7	46.0	11.3

Frequency 5220 MHz

FREQUENCY (MHz)	Detector	Antenna height (cm)	Azimuth (degree)	Resolution bandwidth (kHz)	Polarization H: Horizontal V: Vertical	Field strength (dBµV/m)	Limits (dBµV/m)	Margin (dB)
344.072	Quasi-peak	155	20	120	V	36.1	46.0	9.9
344.072	Quasi-peak	100	270	120	H	34.7	46.0	11.3

Frequency 5240 MHz

FREQUENCY (MHz)	Detector	Antenna height (cm)	Azimuth (degree)	Resolution bandwidth (kHz)	Polarization H: Horizontal V: Vertical	Field strength (dBµV/m)	Limits (dBµV/m)	Margin (dB)
344.072	Quasi-peak	155	20	120	V	36.1	46.0	9.9
344.072	Quasi-peak	100	270	120	H	34.7	46.0	11.3

Frequency 5745 MHz

FREQUENCY (MHz)	Detector	Antenna height (cm)	Azimuth (degree)	Resolution bandwidth (kHz)	Polarization H: Horizontal V: Vertical	Field strength (dBµV/m)	Limits (dBµV/m)	Margin (dB)
344.072	Quasi-peak	155	20	120	V	36.1	46.0	9.9
344.072	Quasi-peak	100	270	120	H	34.7	46.0	11.3

Frequency 5785 MHz

FREQUENCY (MHz)	Detector	Antenna height (cm)	Azimuth (degree)	Resolution bandwidth (kHz)	Polarization H: Horizontal V: Vertical	Field strength (dBµV/m)	Limits (dBµV/m)	Margin (dB)
344.072	Quasi-peak	155	20	120	V	36.1	46.0	9.9
344.072	Quasi-peak	100	270	120	H	34.7	46.0	11.3

Frequency 5805 MHz

FREQUENCY (MHz)	Detector	Antenna height (cm)	Azimuth (degree)	Resolution bandwidth (kHz)	Polarization H: Horizontal V: Vertical	Field strength (dBµV/m)	Limits (dBµV/m)	Margin (dB)
344.072	Quasi-peak	155	20	120	V	36.1	46.0	9.9
344.072	Quasi-peak	100	270	120	H	34.7	46.0	11.3

No significant frequency has been found other than those given above between 1 GHz to 30 GHz.

Test conclusion: Standard respected

« □□□ End of report, 4 annexes to be forwarded □□□ »

ANNEX 1

ANTENNA FACTORS, INSERTION LOSSES AND AMPLIFIER VALUES

BILL OF MATERIAL

The test antenna used for the radiated emission between 9 kHz and 30 MHz is the active loop antenna n°4713. Antenna factors are given in table 1.

The test antenna used for the radiated emission between 30 MHz and 1 GHz is the biclog antenna n°4428. Antenna factors are given in table 2.

The measuring receiver n°1216 used in the frequency range 30 MHz to 1 GHz has an integrated preamplifier.

The spectrum analyzer n°2205 is used in the frequency range 1 GHz to 26 GHz and the spectrum analyzer n°5175 is used in frequency range 26 GHz to 40 GHz.

The test cable used between 9 kHz and 30 MHz to connect the antennas to the receiver for measurements at a distance of 30 meters has losses given in table 3.

The test cable used between 30 MHz and 1 GHz to connect the antennas to the receiver for measurements at a distance of 3 meters has losses given in table 4.

The test antenna used for the radiated emission between 1 GHz and 18 GHz is the horn antenna n°3374. Factors are given in table 5.

The test antenna used for the radiated emission between 18 GHz and 26 GHz is the horn antenna n°1045. Factors are given in table 6.

The test antenna used for the radiated emission between 26 GHz and 40 GHz is the horn antenna n°6950. Factors are given in table 7.

The amplifier n°3229 used to connect the spectrum analyzer to the test cable has gain values given in the table 8.

The amplifier n°4354 used to connect the spectrum analyzer to the test cable has gain values given in the table 9.

The test cable used between 1 GHz and 26 GHz to connect the horn antenna to the amplifier for measurements at a distance of 3 meters has losses given in table 10.

The test cable used between 26 GHz and 40 GHz to connect the horn antenna to the amplifier for measurements at a distance of 1 meter has losses given in table 11.

Frequency (MHz)	Antenna factor (dB/m)	Frequency (MHz)	Antenna factor (dB/m)
0.009	26.3	0.8	9.9
0.01	25.6	1	10.0
0.015	22.8	1.5	10.1
0.02	21.0	2	10.1
0.03	18.7	3	10.0
0.05	15.4	5	10.0
0.08	12.8	8	9.8
0.1	11.8	10	9.7
0.15	10.5	15	9.2
0.2	9.9	20	8.5
0.3	9.7	25	7.4
0.5	9.7	30	5.6

TABLE 1 : ACTIVE LOOP ANTENNA

Frequency (MHz)	Antenna factor (dB/m)	Frequency (MHz)	Antenna factor (dB/m)
30	20.2	180	9.6
35	17.4	200	11.7
40	13.9	250	12.0
45	12.8	300	13.7
50	10.2	400	16.5
60	7.0	500	18.3
70	6.9	600	20.3
80	8.0	700	21.6
90	9.2	800	22.2
100	11.0	900	23.2
120	12.3	1000	23.7
140	11.4	-	-
160	10.9	-	-

TABLE 2 : BILOG ANTENNA

Frequency (MHz)	Loss (dB)	Frequency (MHz)	Loss (dB)
0.009	0.0	6.000	0.5
0.020	0.0	7.000	0.5
0.050	0.0	8.000	0.5
0.100	0.1	9.000	0.6
0.500	0.1	10.00	0.6
1.000	0.2	15.00	0.8
2.000	0.3	20.00	0.9
3.000	0.3	25.00	1.0
4.000	0.4	30.00	1.1
5.000	0.4	-	-

TABLE 3 : TEST CABLE FOR 30M MEASUREMENT INTO 9 kHz AND 30 MHz

Frequency (MHz)	Loss (dB)	Frequency (MHz)	Loss (dB)
30	0.7	250	1.8
40	0.7	300	2.1
50	0.9	400	2.3
60	0.9	500	2.5
70	0.9	600	3.0
80	0.9	700	3.4
90	1.1	800	3.6
100	1.1	900	3.9
150	1.4	1000	4.1
200	1.6	-	-

TABLE 4 : TEST CABLE FOR 3M MEASUREMENT INTO 30 MHz AND 1 GHz

Frequency (GHz)	Antenna factor (dB/m)	Frequency (GHz)	Antenna factor (dB/m)
1.0	23.7	10.0	37.6
1.5	25.0	10.5	37.8
2.0	27.5	11.0	38.1
2.5	28.8	11.5	38.3
3.0	29.8	12.0	38.8
3.5	31.2	12.5	38.8
4.0	32.5	13.0	39.4
4.5	32.5	13.5	40.0
5.0	33.5	14.0	40.1
5.5	34.1	14.5	40.6
6.0	34.1	15.0	40.6
6.5	34.4	15.5	39.7
7.0	35.4	16.0	39.3
7.5	36.6	16.5	39.9
8.0	36.6	17.0	41.4
8.5	37.0	17.5	45.1
9.0	37.1	18.0	46.3
9.5	37.2	-	-

TABLE 5 : HORN ANTENNA

Frequency (GHz)	Antenna factor (dB/m)	Frequency (GHz)	Antenna factor (dB/m)
18.0	31.5	22.5	32.7
18.5	31.8	23.0	33.2
19.0	31.9	23.5	33.1
19.5	32.1	24.0	33.2
20.0	32.2	24.5	33.3
20.5	32.4	25.0	33.3
21.0	32.5	25.5	33.2
21.5	32.4	26.0	33.1
22.0	32.4	-	-

TABLE 6 : HORN ANTENNA

Frequency (GHz)	Antenna factor (dB/m)	Frequency (GHz)	Antenna factor (dB/m)
26.0	44.2	33.5	45.3
26.5	44.3	34.0	45.0
27.0	44.2	34.5	44.9
27.5	44.0	35.0	45.7
28.0	44.0	35.5	46.3
28.5	45.0	36.0	46.4
29.0	45.3	36.5	47.0
29.5	45.5	37.0	47.2
30.0	45.8	37.5	47.5
30.5	45.9	38.0	47.7
31.0	45.6	38.5	47.9
31.5	45.5	39.0	48.3
32.0	45.6	39.5	49.0
32.5	45.6	40.0	48.9
33.0	45.6	-	-

TABLE 7 : HORN ANTENNA

Frequency (GHz)	Gain value (dB)	Frequency (GHz)	Gain value (dB)
1.0	33.4	13.0	32.5
1.5	33.7	14.0	31.6
2.0	33.9	15.0	33.0
2.5	34.0	16.0	33.5
3.0	33.9	17.0	33.9
4.0	34.3	18.0	34.3
5.0	35.2	19.0	34.4
6.0	34.7	20.0	32.9
7.0	34.0	21.0	33.2
8.0	33.7	22.0	34.3
9.0	31.8	23.0	34.6
9.5	31.1	24.0	34.4
10.0	30.5	25.0	34.5
10.5	30.7	26.0	32.5
11.0	31.1	-	-
12.0	32.4	-	-

TABLE 8 : AMPLIFIER GAIN VALUE

Frequency (GHz)	Gain value (dB)	Frequency (GHz)	Gain value (dB)
26.0	34.6	33.5	35.3
26.5	35.2	34.0	35.1
27.0	33.9	34.5	34.2
27.5	34.1	35.0	33.4
28.0	34.5	35.5	32.9
28.5	33.6	36.0	32.2
29.0	33.7	36.5	33.0
29.5	34.3	37.0	33.5
30.0	34.5	37.5	31.7
30.5	35.9	38.0	32.8
31.0	35.4	38.5	31.4
31.5	34.9	39.0	34.0
32.0	34.7	39.5	34.0
32.5	35.9	40.0	35.0
33.0	36.0	-	-

TABLE 9 : AMPLIFIER GAIN VALUE

Frequency (GHz)	Loss (dB)	Frequency (GHz)	Loss (dB)
1.0	3.2	12.0	11.8
1.5	4.0	13.0	12.2
2.0	4.6	14.0	12.4
2.5	5.2	15.0	12.9
3.0	5.7	16.0	13.4
3.5	6.2	17.0	13.9
4.5	7.1	18.0	14.5
5	7.3	19.0	14.7
6	7.9	20.0	15.4
8	9.3	22.0	16.3
10	10.5	24.0	16.9
11.0	11.1	26.0	17.7

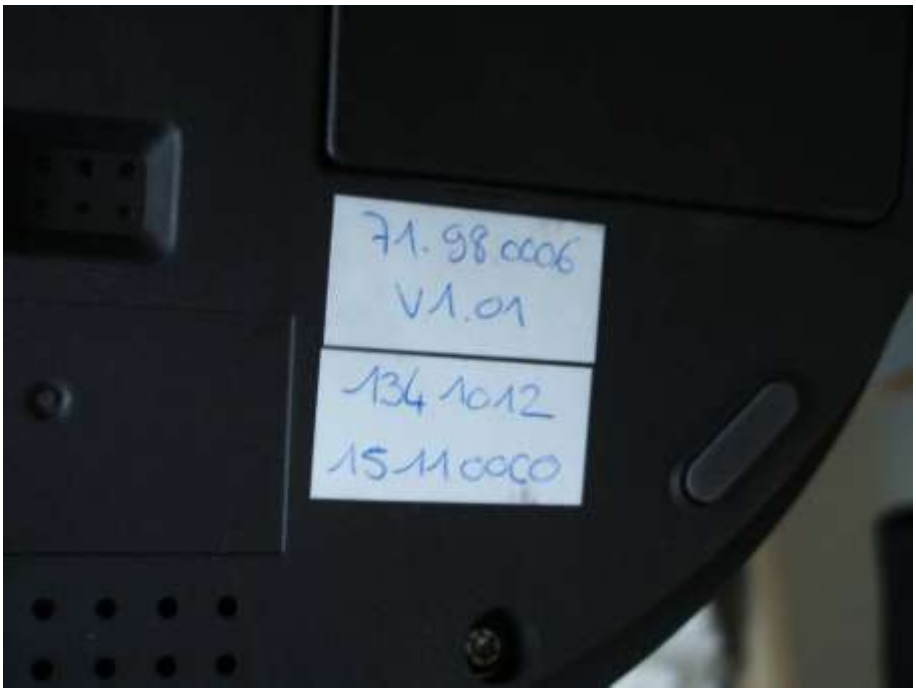
TABLE 10: TEST CABLE FOR 3M MEASUREMENT INTO 1 TO 26 GHz

Frequency (GHz)	Loss (dB)	Frequency (GHz)	Loss (dB)
26	4.6	34	5.3
27	4.7	35	5.3
28	4.7	36	5.3
29	4.8	37	5.5
30	4.9	38	5.7
31	5.0	39	5.5
32	5.1	40	5.9
33	5.1	-	-

TABLE 11: TEST CABLE FOR 1M MEASUREMENT INTO 26 TO 40 GHz

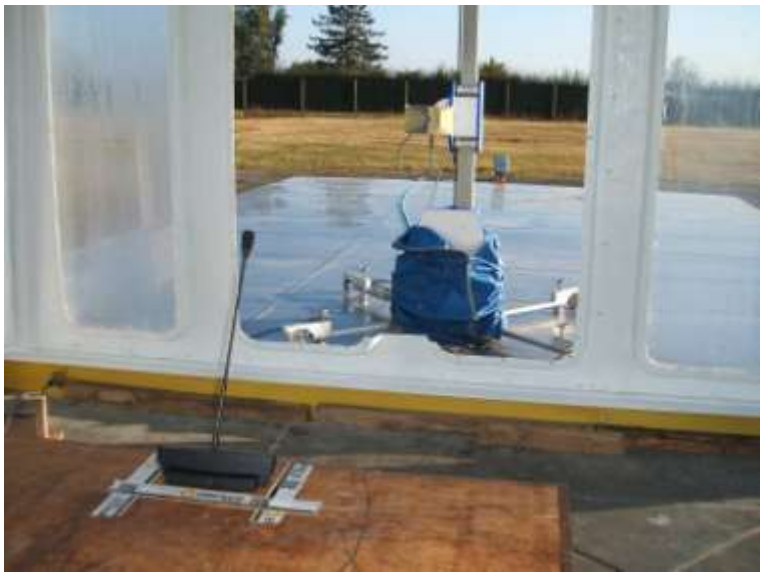
ANNEX 2

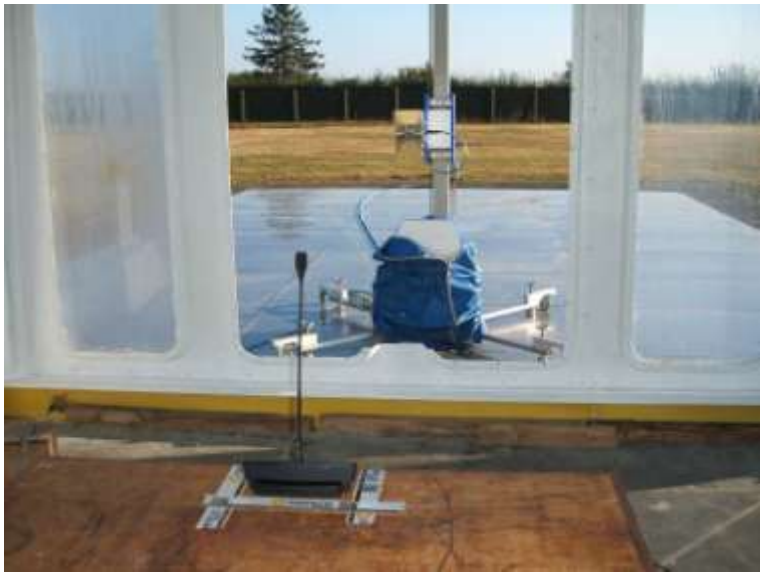
EXTERNAL PHOTOGRAPHIES

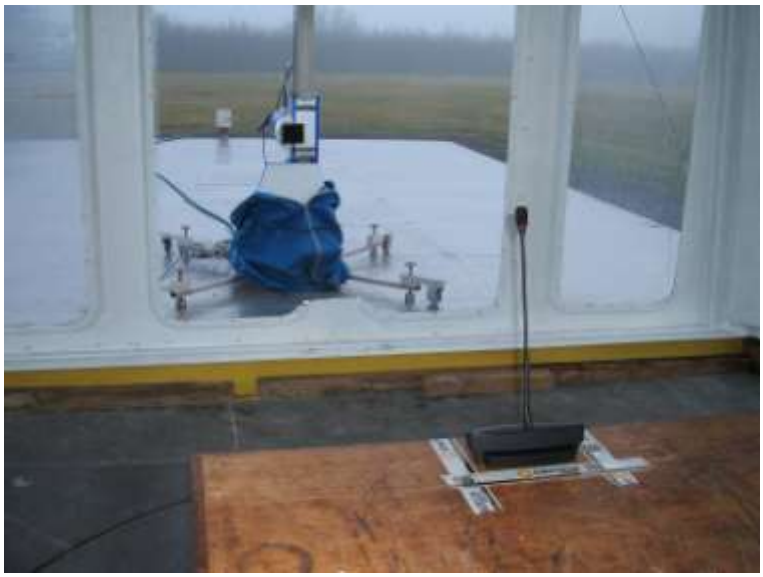

71.98 0006
V1.01
134 1012
15 11 0000

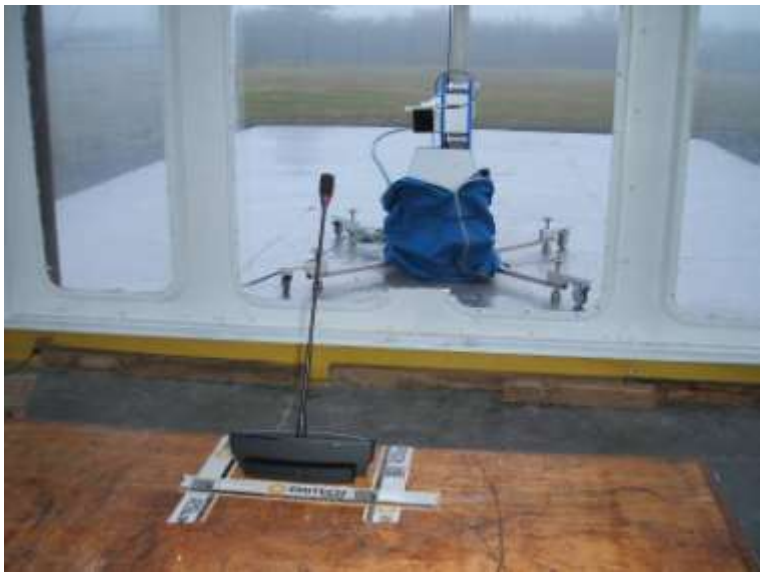
ANNEX 3

TEST SETUP PHOTOGRAPHIES










EMITECH


EMITECH

ANNEX 4

CALIBRATION DATES

N° EMITECH	LAST CALIBRATION	CALIBRATION DUE DATE
1216	23/04/2014	23/04/2016
0187	15/03/2013	15/03/2016
4428	25/02/2014	25/02/2018
2452	24/10/2012	24/10/2014
2805	01/08/2013	01/08/2015
3374	08/02/2012	08/02/2016
2864	06/01/2014	06/01/2016
8063	23/07/2014	23/07/2016
1097	15/03/2013	15/03/2015
1529	15/03/2013	15/03/2015
4691	15/03/2013	15/03/2015
2205	12/06/2013	12/06/2015
4713	11/02/2014	11/02/2016
4359	27/06/2014	27/06/2016
1045	13/12/2010	13/12/2014
0051	09/06/2014	09/06/2015
8021	22/02/2013	22/02/2015
5175	23/06/2014	23/06/2016
4354	21/07/2014	21/07/2015
11133	10/03/2014	10/03/2016
6950	20/04/2012	20/04/2016