

RC-030-GTE-14-105110-4-A

"This report cancels and replaces the test report N° RC-030-GTE-14-105110-4-A Edition 0"

## E.M.C. TESTS REPORT

**According to the standard:**  
FCC 47 CFR part 15 : 2014 (§15.225)

**Equipment under test:**  
Microphone  
Type CONFIDEA DV G3  
FCC ID : WM7CONFIDEA WDUG3


**Company:**  
TELEVIC

FCC accredited: FR0004

**Distribution:** Mr DUMEZ

(Company: TELEVIC)

**Number of pages:** 32 with 3 annexes

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			Name	Visa	Name	Visa
1	15/02/15	1	F. LHEUREUX FL		B. Pellegrin 	

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***NAME OF THE EQUIPMENT UNDER TEST (E.U.T.)*** : Microphone Type: CONFIDEA DV G3

***Serial number*** : 134101215110000

***Part number*** : 71.98.0006

***Software Version*** : -

***MANUFACTURER'S NAME*** : TELEVIC

**APPLICANT'S ADDRESS:**

**Company** : TELEVIC

**Address** : Leo Bekaertlaan 1  
8870 Izegem  
BELGIUM

**Person present during the tests** : -

**Responsible** : Mr. DUMEZ

***DATES OF TESTS*** : 10/10/2014 and 23/10/2014

***TESTS LOCATIONS*** : Open area test site in Aunainville (28)  
FRANCE and Emitech laboratory in  
Montigny le Bretonneux (78) FRANCE

***TESTS OPERATOR*** : F. LHEUREUX

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## 1. INTRODUCTION

This document submits the results of Electromagnetic Compatibility tests performed on the equipment «**Microphone Type: CONFIDEA DV G3** » (denominated hereafter E.U.T.: equipment under test) according to document listed below.

## 2. REFERENCE DOCUMENT

### **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.

## 3. EQUIPMENT UNDER TEST CONFIGURATION

### **Equipment under test (E.U.T.) description:**

Class: B (residential environment)

Utilization: The units (delegates/chairman) are table top units that make a wireless link to a Wireless Conference Access Point called WCAP G3.

Antenna type and gain: internal antenna: Not communicated

Operating frequency range: from 13.553 MHz to 13.567 MHz

Number of channels: 1

Power source: 7.2 Vdc

Software power setting: The microphone is paired with the wireless conference access point system.

Modification of the equipment during the tests: No.

### **Cycle and operating mode during emission tests:**

In continuous emission at 13.56 MHz and standby.

**Equipment modifications applied during tests:** No

#### 4. SUMMARY OF TESTS RESULTS

The following table summarizes 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				
15.225	intentional radiated emissions in the band 13.110 MHz – 14.010 MHz					
	a) 13.553 MHz - 13.567 MHz	X				
	b) 13.410-13.553 MHz and 13.567-13.710 MHz	X				
	c) 13.110-13.410 MHz and 13.710-14.010 MHz	X				
	d) outside 13.110 MHz and 14.010 MHz	X				
	e) Frequency drift	X				
	f) Tag			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.

*To declare or not compliance with the specification, it has not been given explicit account of the uncertainty associated with result(s).*

**5. INTENTIONAL RADIATED EMISSIONS IN THE BAND 13.553 MHz – 13.567 MHz**

**Standard:** FCC 47 CFR PART 15 : 2014

**Section:** 15.225 (a)

**Test configuration:**

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

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

Antenna height is 1 m above the ground plane.

For each frequency corresponding to an emission, EUT carried out a rotation through 360° with the aid of the turntable, with the aim to find the maximum of signal.

The test antenna is oriented in all orientations. Only the highest level is recorded.

**Frequency range:** 13.553 MHz – 13.567 MHz

**Detection mode:** Quasi-peak.

**Resolution bandwidth:** 9 kHz

**Measurement distance:** 3 meters.

**Limit:**

Frequency range (MHz)	Frequency field strength		Frequency measurement distance (meters)
	µV/m	dBµV/m	
13.553 – 13.567	15848	84.0	30
	-	124.0 ①	3

①:  $84 \text{ dB}\mu\text{V/m} + 20 \log(30/3)^2$

**Operating mode during the test:**

EUT is in permanent transmission.

**Instrumentation test list:**

CATEGORY	BRAND	TYPE	N <sup>R</sup> EMITECH
Antenna	Eaton	Cadre Eaton 96009/2	4713
Cable	Câbles & Connectiques	N-13m	2452
Cable	-	N-2m	2805
Cable	-	N-30m	4359
Cable	-	Câbles Orgeval	6000
Open area test site	Emitech	Site champ libre	0187
Wattmeter	Rohde & Schwarz	R&S ESH3	0181
Wattmeter	Agilent Technologies	Agilent E7405A	2205

**Results:**

Ambient temperature (°C): 15

Relative humidity (%): 69

Power source: 7.2 Vdc

FREQUENCY (MHz)	ANTENNA ORIENTATION	AZIMUTH (degrees)	MEASUREMENT (dB $\mu$ V/m)	LIMIT (dB $\mu$ V/m)	MARGIN (dB)
13.5589	Parallel	180	55.7	124.0	68.3

**Test conclusion:** Complies with the requirements of the standard.



<b>6. INTENTIONAL RADIATED EMISSIONS IN THE BAND 13.110 MHz – 14.010 MHz</b>
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**Standard:** FCC 47 CFR PART 15 : 2014

**Section:** 15.225 (b) (c)

**Test configuration:**

The measure is realized in near field and the results are correlated with the intentional radiated emission at 3 meters.

Field at 3 m = 55.7 dB $\mu$ V/m  $\rightarrow$  field at 30 m = 15.7 dB $\mu$ V/m

**Frequency range:** 13.110 MHz – 14.010 MHz

**Detection mode:** Peak

**Resolution bandwidth:** 10 kHz

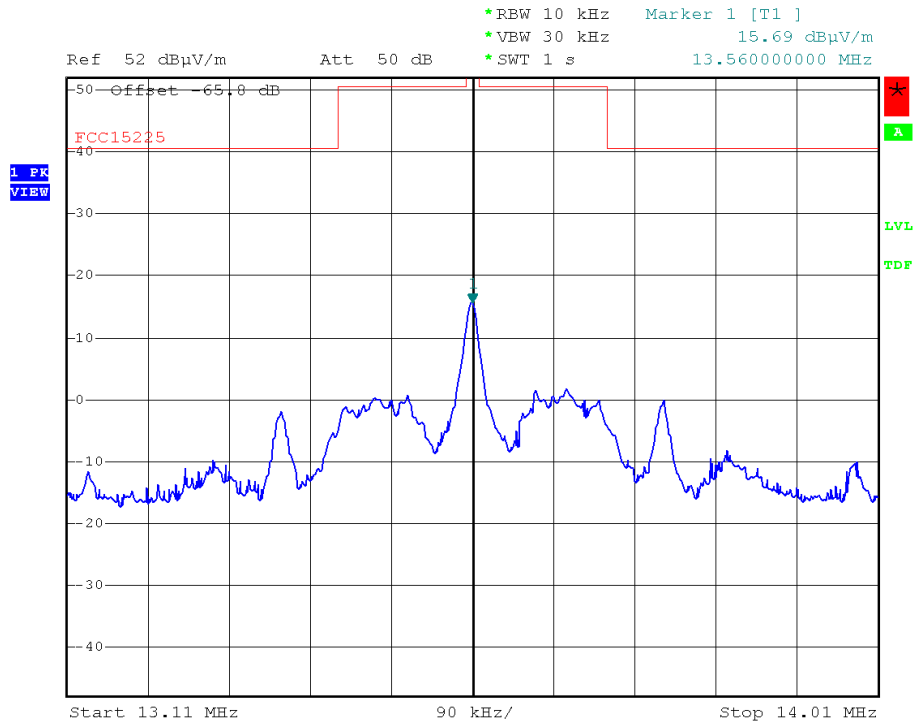
**Limit:**

Frequency range (MHz)	Frequency field strength		Frequency measurement distance (meters)
	$\mu$ V/m	dB $\mu$ V/m	
13.110 – 13.410 and 13.710 – 14.010	106.0	40.5	30
13.410 – 13.553 and 13.567 – 13.710	334.0	50.5	30
13.110 – 13.410 and 13.710 – 14.010	-	80.5 <sup>①</sup>	3
13.410 – 13.553 and 13.567 – 13.710	-	90.5 <sup>①</sup>	3

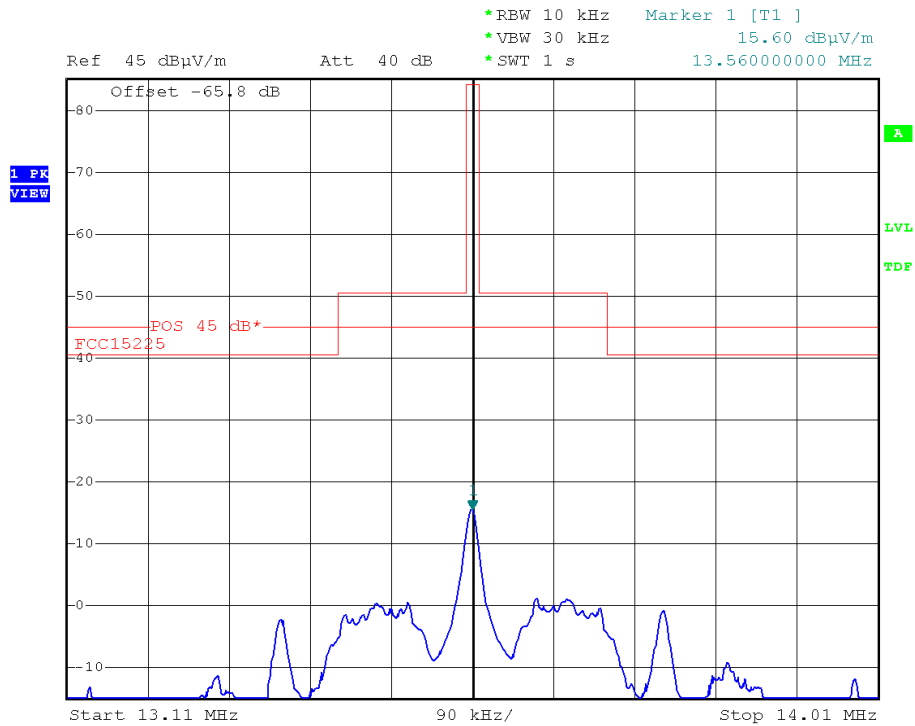
①:  $E \text{ (dB}\mu\text{V/m)} + 20\log(30/3)^2$

**Results:**

Ambient temperature (°C): 21  
 Relative humidity (%): 60  
 Power source: 7.2 Vdc



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**7. UNINTENTIONAL RADIATED EMISSIONS IN THE BAND 9 KHz – 30 MHz**

**Standard:** FCC 47 CFR PART 15 : 2014

**Sections:** 15.109 and 15.209

**Equipment under test arrangement**

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

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

Antenna height is 1 m.

For each frequency corresponding to an emission, EUT carried out a rotation through 360° with the aid of the turntable, with the aim to find the maximum of signal.

The test antenna is oriented in all orientations. Only the highest level is recorded.

**Frequency range:** 9 kHz - 30 MHz.

**Detection mode:** Quasi-peak except frequency bands 9-90 kHz and 110-490 kHz (average).

**Resolution bandwidth:** 200 Hz from 9 kHz to 150 kHz.  
9 kHz from 150 kHz to 30 MHz

**Measurement distance:** 30 meters.

**Limit:**

Frequency range (MHz)	Frequency field strength (µV/m)	Frequency measurement distance (meters)
0.009-0.490	2400/F (kHz)	300
0.490-1.705	24000/F (kHz)	30
1.705-30.0	30	30

Limits in dBµV/m can be extrapolated to 30 m using 40 dB / decade.

**Instrumentation test list:**

CATEGORY	BRAND	TYPE	N <sup>R</sup> EMITECH
Antenna	Eaton	Cadre Eaton 96009/2	4713
Cable	Câbles & Connectiques	N-13m	2452
Cable	-	N-2m	2805
Cable	-	N-30m	4359
Cable	-	Câbles Orgeval	6000
Open area test site	Emitech	Site champ libre	0187
Wattmeter	Rohde & Schwarz	R&S ESH3	0181
Wattmeter	Agilent Technologies	Agilent E7405A	2205

**Results:**

Ambient temperature (°C): 15

Relative humidity (%): 69

Power source: 7.2 Vdc

No frequency has been measured above the ambient noise in standby and in continuous transmission.

**Test conclusion:** Complies with the requirements of the standard.

**8. UNINTENTIONAL RADIATED EMISSIONS IN THE BAND 30 MHz – 1 GHz**

**Standard:** FCC 47 CFR PART 15 : 2014

**Sections:** 15.109 and 15.209

**Equipment under test arrangement:**

The equipment under test (EUT) is placed on a non-conductive test table at 0.8 m above the horizontal reference 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 tables on the next pages.

**Frequency range:** 30 MHz - 1 GHz

**Detection mode:** Quasi-peak

**Resolution bandwidth:** 120 kHz

**Measurement distance:** 3 meters

**Limit:** The EUT must satisfy requirements of the section 15.109 and 15.209 as shown in table below.

Frequency range (MHz)	Limit (dB $\mu$ V/m)
30 to 88	40.0
88 to 216	43.5
216 to 960	46.0
960 to 1000	54.0

**Instrumentation test list:**

CATEGORY	BRAND	TYPE	N <sup>R</sup> EMITECH
Antenna	Chase	Bilog CBL6111	4428
Antenna mast	Maturo	AM 4.0-O	7625
Cable	Câbles & Connectiques	N-13m	2452
Cable	-	N-2m	2805
Cable	-	Câbles Orgeval	6000
Cable	N-0.5m	N-0.5m	6037
Cable	-	N-8m	8021
Preamplifier	Mini Circuits	RF	5437
Receiver	Rohde & Schwarz	R&S FSU8	9129
Turntable	Maturo	MCU	7626
Voltmeter	Rohde & Schwarz	R&S ESVS10	1216
Wattmeter	Rohde & Schwarz	R&S ESH3	0181

**Results:**

Ambient temperature (°C): 14

Relative humidity (%): 69

Power source: 7.2 Vdc

In continuous transmission

FREQUENCY (MHz)	POLARIZATION	ANTENNA HEIGHT (cm)	AZIMUTH (degrees)	MEASUREMENT (dB $\mu$ V/m)	LIMIT (dB $\mu$ V/m)	MARGIN (dB)
40.683	Vertical	100	85	32.5	40.0	7.5
40.683	Horizontal	240	180	31.6	40.0	8.4
162.734	Vertical	100	180	26.1	43.5	17.4
162.734	Horizontal	150	270	21.7	43.5	21.8
176.284	Vertical	100	270	26.4	43.5	17.1
176.284	Horizontal	150	180	27.8	43.5	15.7
271.208	Vertical	180	90	31.9	46.0	14.1
271.208	Horizontal	180	180	22.4	46.0	23.6
344.083	Vertical	150	0	37.4	46.0	8.6
344.083	Horizontal	100	270	34.7	46.0	11.3
442.385	Vertical	140	50	30.3	46.0	15.7
442.385	Horizontal	240	0	37.1	46.0	8.9

In standby

FREQUENCY (MHz)	POLARIZATION	ANTENNA HEIGHT (cm)	AZIMUTH (degrees)	MEASUREMENT (dB $\mu$ V/m)	LIMIT (dB $\mu$ V/m)	MARGIN (dB)
344.072	Vertical	155	20	36.1	46.0	9.9
344.072	Horizontal	100	270	34.7	46.0	11.3

**Test conclusion:** Complies with the requirements of the standard.

**9. FREQUENCY DRIFT**

**Standard:** FCC 47 CFR Part 15 : 2014

**Section:** 15.225 (e)

**Test configuration:**

The measure is realized in near field and the results are correlated with the intentional radiated emission at 3 meters.

Field at 3 m = 55.7 dB $\mu$ V/m  $\rightarrow$  field at 30 m = 15.7 dB $\mu$ V/m

**Test equipment used:**

CATEGORY	BRAND	TYPE	Nr EMITECH
Climatic enclosure	Flonic Schlumberger	200P	2694
Spectrum analyzer	Rohde & Schwarz	R&S FSP40	5175

**Measurement conditions:**

Resolution bandwidth: 10 kHz

Video bandwidth: 30 kHz

**Test operating conditions of the equipment:**

The transmitter is in transmission with modulation.



**Results:**

			F (MHz)	Deviation (kHz)	Curve	Limit (1)
<b>Normal test conditions</b>	Nominal power source (7.2 V)	Temperature (+20°C) Humidity (50%)	13.5596000	- 0.400	1	± 1.356 kHz
	Minimal power source		N.A.	N.A.	N.A.	
	Maximal power source		N.A.	N.A.	N.A.	
<b>Extreme test conditions</b>	Minimal temperature (-20°C)	Nominal power source (7.2 V)	13.5596000	- 0.400	2	
	Maximal temperature (+50°C)		13.5596000	- 0.400	3	

(1) ± 0.01 % of the operating frequency.

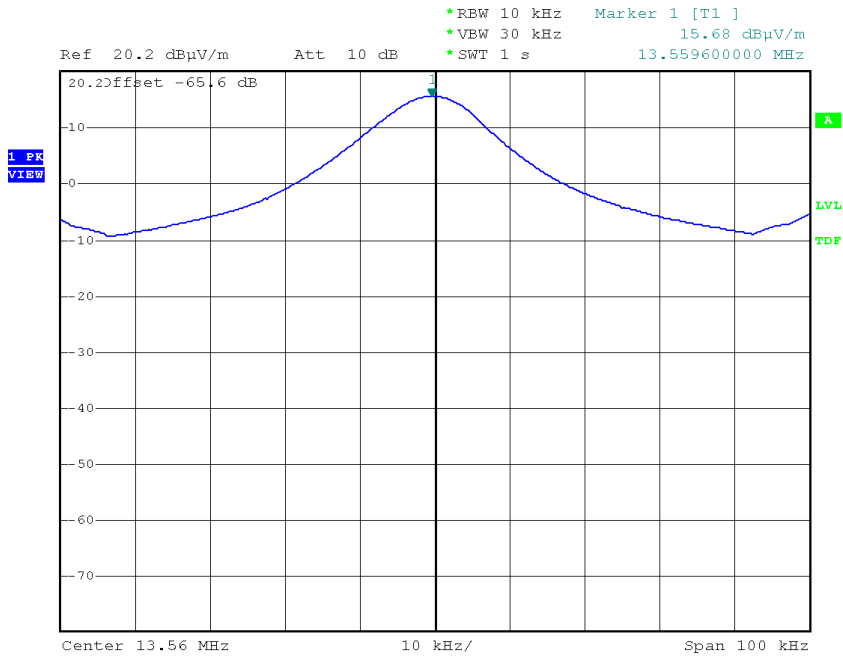
N.A. : Not Applicable

Note : A battery charging is carried out before to testing.

**Measurement uncertainty:** ± 1 x 10<sup>-7</sup>

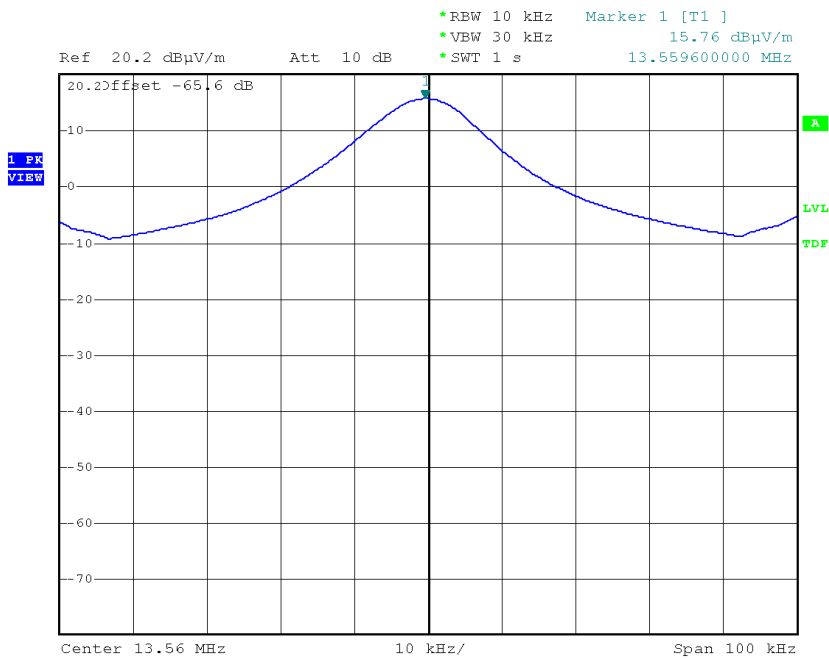
**Test conclusion:** Complies with the requirements of the standard.

Curve 1



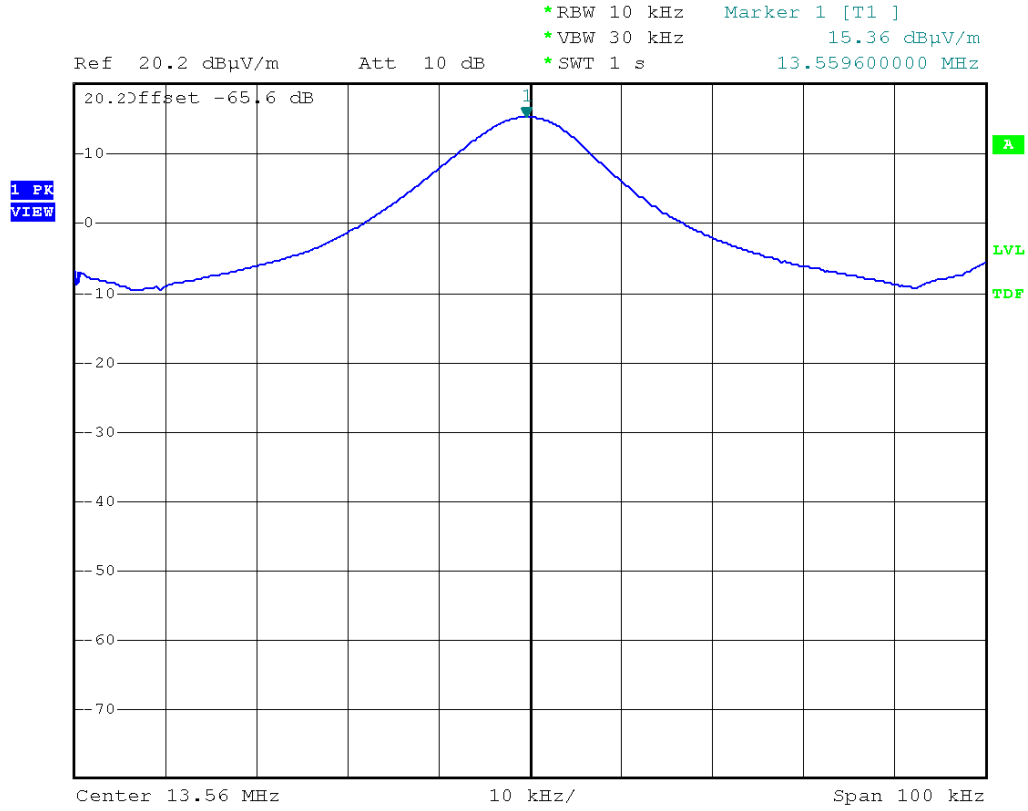
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Curve 2



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**Curve 3**



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**10. 20 DB BANDWIDTH**

**Standard:** FCC 47 CFR Part 15 : 2014

**Section:** 15.215 (c)

**Test configuration:**

The measure is realized in near field and the results are correlated with the intentional radiated emission at 3 meters.

Field at 3 m = 55.7 dB $\mu$ V/m  $\rightarrow$  field at 30 m = 15.7 dB $\mu$ V/m

**Test equipment used:**

CATEGORY	BRAND	TYPE	N° EMITECH
Climatic enclosure	Flonic Schlumberger	200P	2694
Spectrum analyzer	Rohde & Schwarz	R&S FSP40	5175

**Measurement conditions:**

Resolution bandwidth: 1 kHz

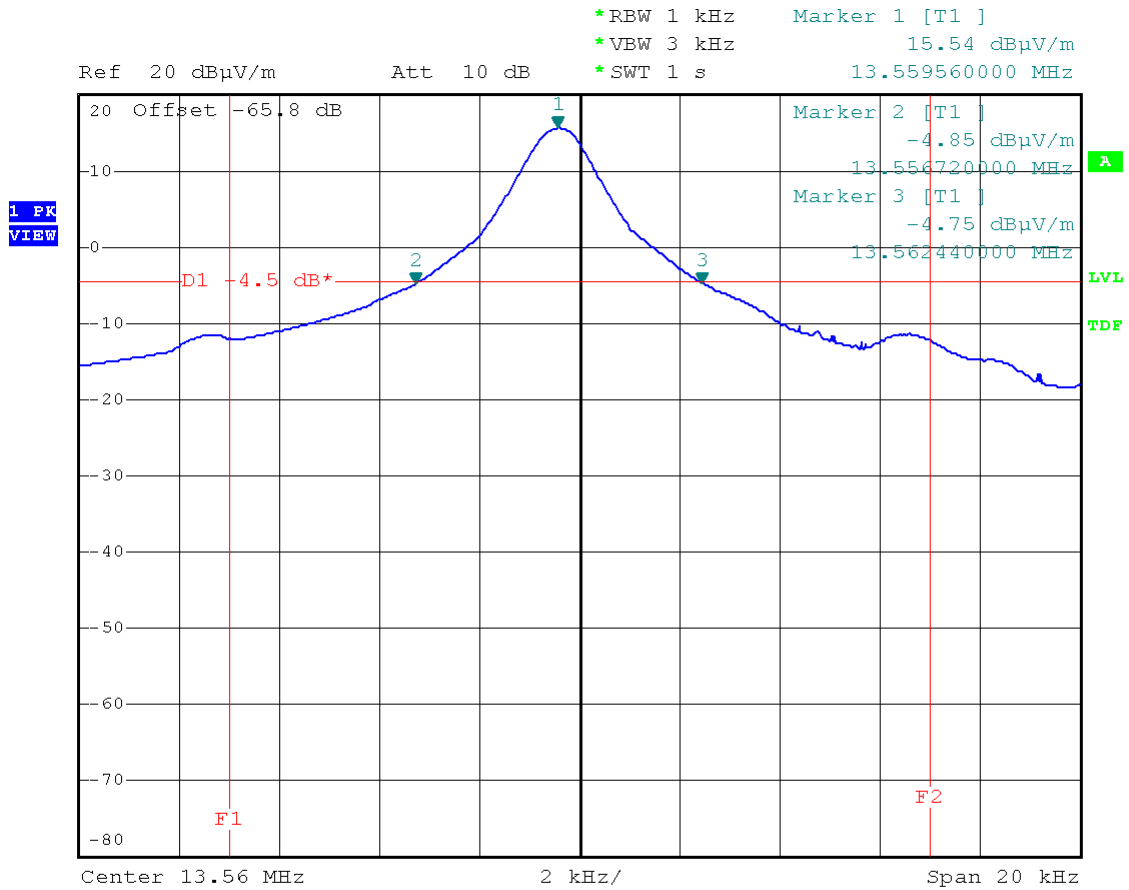
Video bandwidth: 3 kHz

**Test operating conditions of the equipment:**

The transmitter is in transmission with modulation.

**Results:**

20 dBc point (Low)	20 dBc point (High)	Operating frequency band (MHz)
13.556720 MHz	13.562440 MHz	13.553 to 13.567



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**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 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.

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**

# **ANNEX 2:**

## ***PHOTOGRAPHIES***

EQUIPMENT UNDER TEST (E.U.T.) PHOTOGRAPHIES









# **ANNEX 3:**

## ***CALIBRATION DATES***



<b>N° EMITECH</b>	<b>LAST CALIBRATION</b>	<b>CALIBRATION DUE DATE</b>
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
2205	12/06/2013	12/06/2015
4713	11/02/2014	11/02/2016
4359	27/06/2014	27/06/2016
8021	22/02/2013	22/02/2015