



R041-12-104857-2A - DM / CV-CHB

## RADIO TEST REPORT

According to the standard(s):

FCC part 15 Subpart C  
 RSS-Gen:2010  
 RSS-210:2010  
 OET Bulletin 65 (1997), RSS 102 (2010)

Equipment under test:

TERMINAL EP10 HF-KRX-2S  
 FCC ID: GM3HFKR2SEP10  
 IC ID: 2739D-HFK2EP10


Company:

PSION

Diffusion: Mr FORNIER

(Company: PSION)

Number of pages: 30 including 1 annex

Ed.	Date	Modified page(s)	Written by		Technical verification and Quality approval	
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*NAME OF THE EQUIPMENT UNDER TEST (E.U.T.)* : TERMINAL EP10 HF-KRX-2S

*Serial number* : Prototype

*Part number* : Prototype

*Software Version* : None

*MANUFACTURER'S NAME* : PSION

*APPLICANT'S ADDRESS:*

*Company* : PSION

*Address* : 135 Rue René Descartes  
13591 AIX EN PROVENCE CEDEX 3  
FRANCE

*Person(s) present during the tests* : Nobody

*Responsible* : Mr FORNIER

*DATE(S) OF TESTS* : September 12<sup>th</sup> to 13<sup>th</sup> of 2012

*TESTS LOCATION(S)* : Emitech Grand Sud Laboratory in  
VENDARGUES (34) - FRANCE  
: Open area test site in Salinelles (30)  
FCC Registration number: 8127-19  
IC Filling number : 4379C-1

*TESTS SUPERVISOR(S)* : None

*TESTS OPERATOR(S)* : David MONTAULON

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### 1. INTRODUCTION

This document submits the results of Electromagnetic Compatibility tests performed on the equipment TERMINAL EP10 HF-KRX-2S (denominated hereafter E.U.T.: equipment under test) according to document(s) listed below.

### 2. REFERENCE DOCUMENT(S)

FCC Part 15	Code of Federal Regulations Title 47 – Telecommunications Chapter 1 – Federal Communications Commission Part 15 – Radio frequency devices Subpart C – Intentional Radiators
ANSI C 63.4 (2003)	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
RSS-210:2010 Issue 8, December 2010	Dispositifs de radio communication de faible puissance, exempts de licence (pour toutes les bandes de fréquences) : matériel de catégorie I
RSS-Gen: 2010 Issue 3, December 2010	Exigences générales et information relatives à la certification du matériel de radiocommunication

### 3. EQUIPMENT UNDER TEST CONFIGURATION

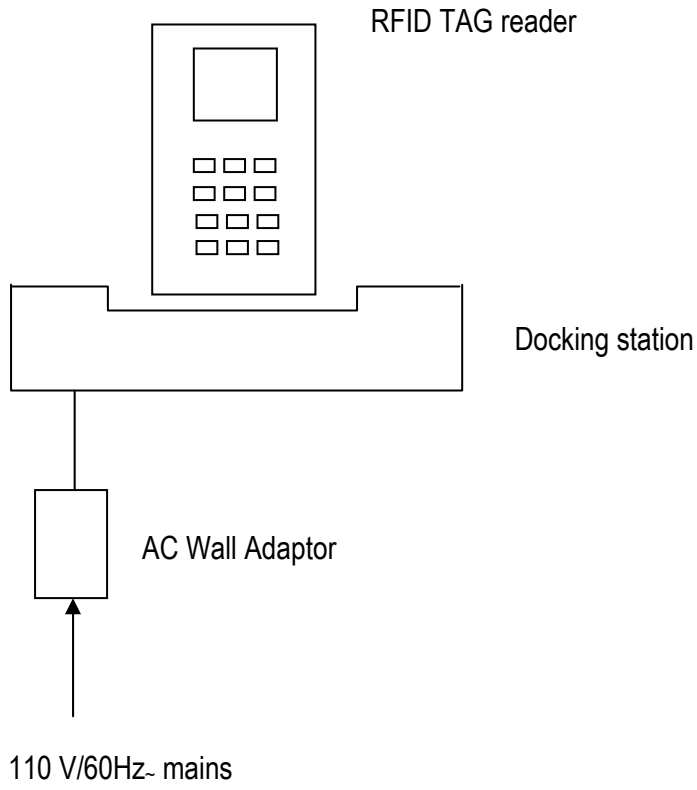
#### Product description:

The EP10 HF-KRX-2S is radio equipment with a contactless card interface, wifi, Bluetooth and GSM radio links.

FCC ID: GM3HFKR2SEP10  
IC ID: 2739D-HFK2EP10  
Utilization: RFID TAG reader  
Antenna type: Incorporated antenna  
Antenna gain: Unknown  
Operating frequency range: 13.56MHz (Rfid); 2402MHz (Bluetooth); 2457MHz (Wifi); 836.4MHz (GSM); 1860MHz (GSM)  
Internal highest frequency: 2457MHz  
Power source: 5 Vdc (stand alone) or mains voltage (with docking)  
Power level and frequency range are not user adjustable

Modifications of E.U.T. applied during tests: No

**4. EQUIPMENT UNDER TEST CONFIGURATION SCHEME**



**5. SUMMARY OF TEST RESULTS**

Tests designation	Results satisfying?	Comments
Antenna requirement - Section 15.203	YES	Integrated antenna
Restricted band of operation - Section 15.205	YES	
Conducted emissions - Section 15.207, RSS-Gen: 2010 § 7.2.2.	YES	
Radiated emissions (below 30MHz) - Section 15.209 & RSS-210: 2010 (§2.7 table 3)	YES	
Radiated emissions (above 30MHz) - Section 15.209, RSS-210: 2010 (§2.7 table 2)	YES	
Field strength - Section 15.225, RSS-210: 2010 (annex A.2.6)	YES	
Frequency tolerance - Section 15.225	YES	
Occupied bandwidth - CNR-Gen § 4.6	YES	
Radiated emissions - Section 15-247 – RSS-210:2010	YES	
ERP EIRP and spurious measurement - Sections 22.913 and 22.917 and subpart H	YES	

N.P.: Not Performed.

N.A.: Not Applicable.

## 6. CONDUCTED EMISSION

Standard: FCC part 15, RSS-210:2010

Test method: FCC part 15.207, RSS-Gen: 2010 § 7.2.2.

Test configuration:

Tested cable(s)	Measure with	E.U.T. height
110Vac/60Hz power supply	L.I.S.N.	40cm
110Vac/60Hz power supply / RF on 50 Ohms load	L.I.S.N.	40cm

Frequency band	Tested cable(s)	Resolution bandwidth	Video bandwidth	Detection mode
150kHz-30MHz	110Vac/60Hz power supply	10kHz	30kHz	Peak and average
150kHz-30MHz	110Vac/60Hz power supply / RF on 50 Ohms load	10kHz	30kHz	Peak and average

Test method deviation: No

Test equipment list:

CATEGORY	BRAND	TYPE	N° EMITECH	CAL DATE	DUE DATE
Cable		N-1m	2701	11 oct 2010	11 dec 2012
Cable		N-2m	3239	17 jul 2010	17 sep 2012
Limiter	Hewlett Packard	11947A	0239	06 oct 2011	06 dec 2012
LISN	PMM	L3-25	0833	8 sep 2011	08 sep 2013
Receiver	Agilent Technologies	E7405A	2161	11 jun 2012	11 aug 2014
Shielded enclosure	RAY PROOF	C.GS3	1123	-	-
Software	Nexio	BAT EMC	0000	-	-

*BAT-EMC software version: V3.6.0.24*

Results: See Graph(s) hereafter.

Limits on the graphs are average and quasi-peak limits (upper limit).

**Conducted voltage emission (measurement)**  
**110Vac/60Hz power supply**

**EMI973**

- C.E.M. (civl)/EN 55022 - Class B - Moyenne/
- C.E.M. (civl)/EN 55022 - Class B - QCrête/
- Mes.Peak (Neutre)
- Mes.Avg (Neutre)
- ◊ Peak/LimAvg (Neutre)

Date: 12/09/2012 09:13:22

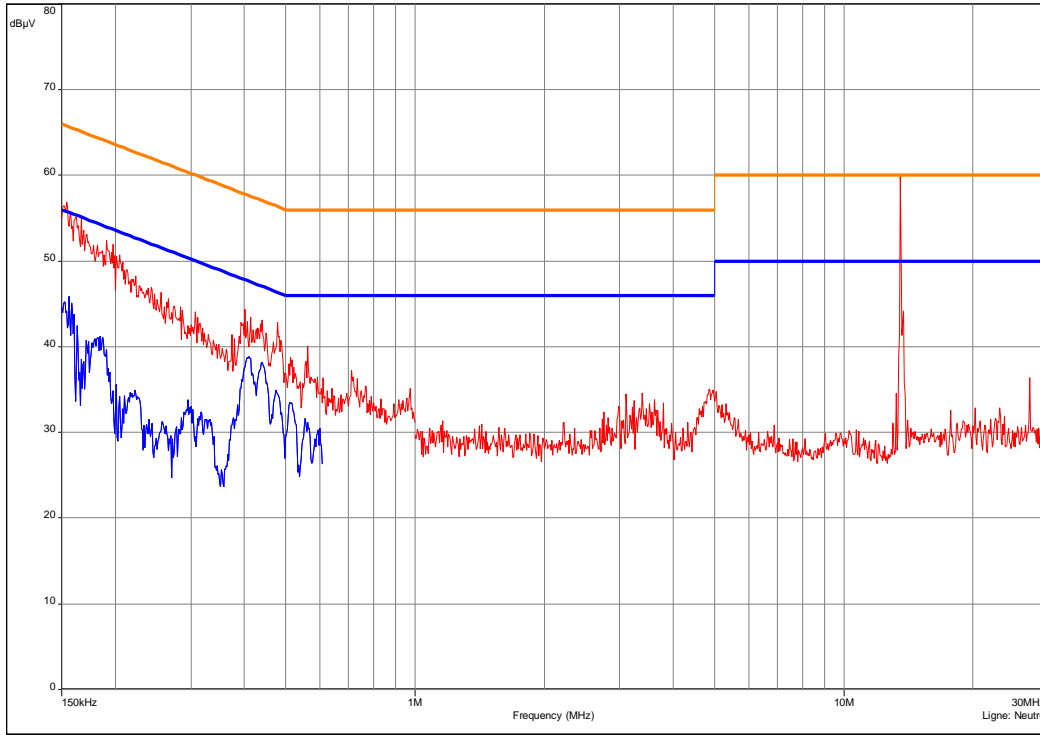
Technician: DM

Class: B of the standard

Detection:  
 Peak and average

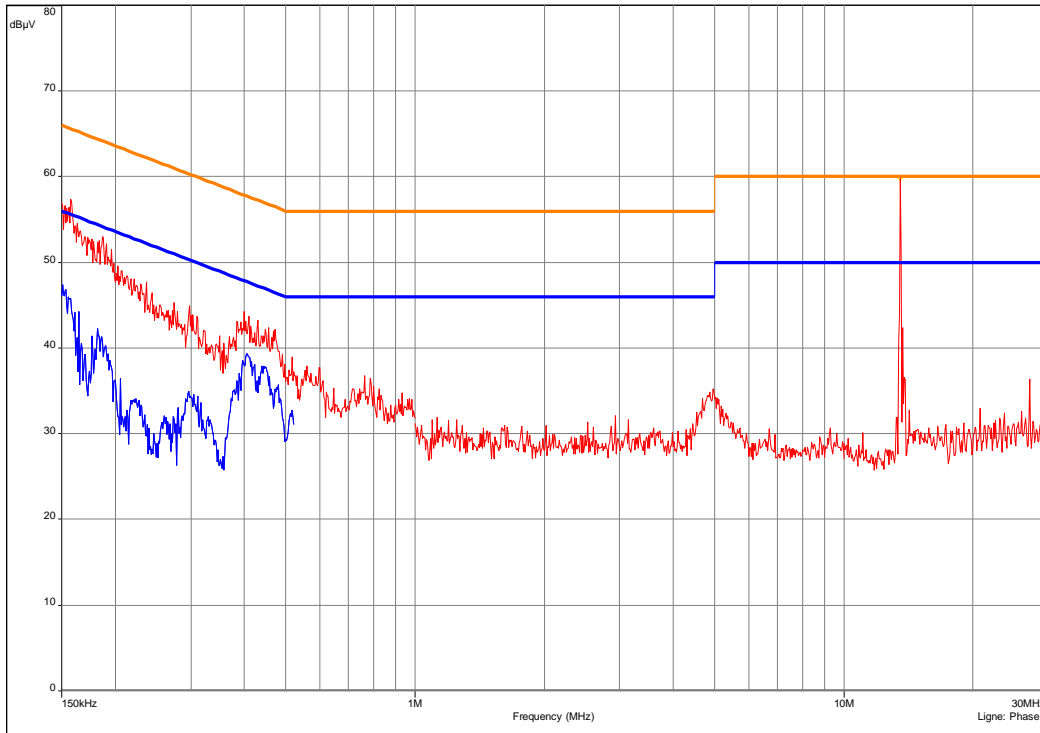
T (°C): 25.1  
 H (%): 59.8  
 P (hpa): 1005

Modification(s) during test:



110Vac/60Hz power supply - 09/12/2012 09:13 - 973

- C.E.M. (civl)/EN 55022 - Class B - Moyenne/
- C.E.M. (civl)/EN 55022 - Class B - QCrête/
- Mes.Peak (Phase1)
- Mes.Avg (Phase1)
- ◊ Peak/LimAvg (Phase1)



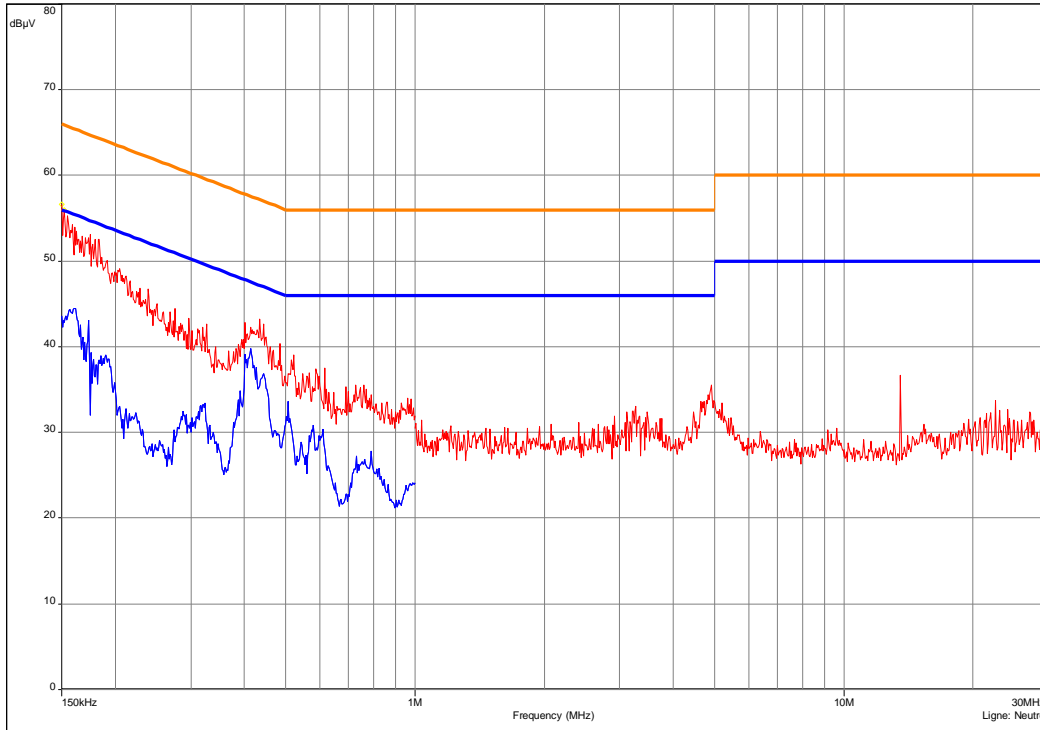
110Vac/60Hz power supply - 09/12/2012 09:13 - 973



**Conducted voltage emission (measurement)**  
**110Vac/60Hz power supply / RF on 50 Ohms load**

**EMI975**

- C.E.M. (civl)/EN 55022 - Class B - Moyenne/
- C.E.M. (civl)/EN 55022 - Class B - QCrête/
- Mes.Peak (Neutre)
- Mes.Avg (Neutre)
- Peak/LimAvg (Neutre)



110Vac/60Hz power supply / RF on 50 Ohms load - 09/12/2012 09:53 - 975

Date: 12/09/2012 09:53:47

Technician: DM

Class: B of the standard

Detection:  
 Peak and average

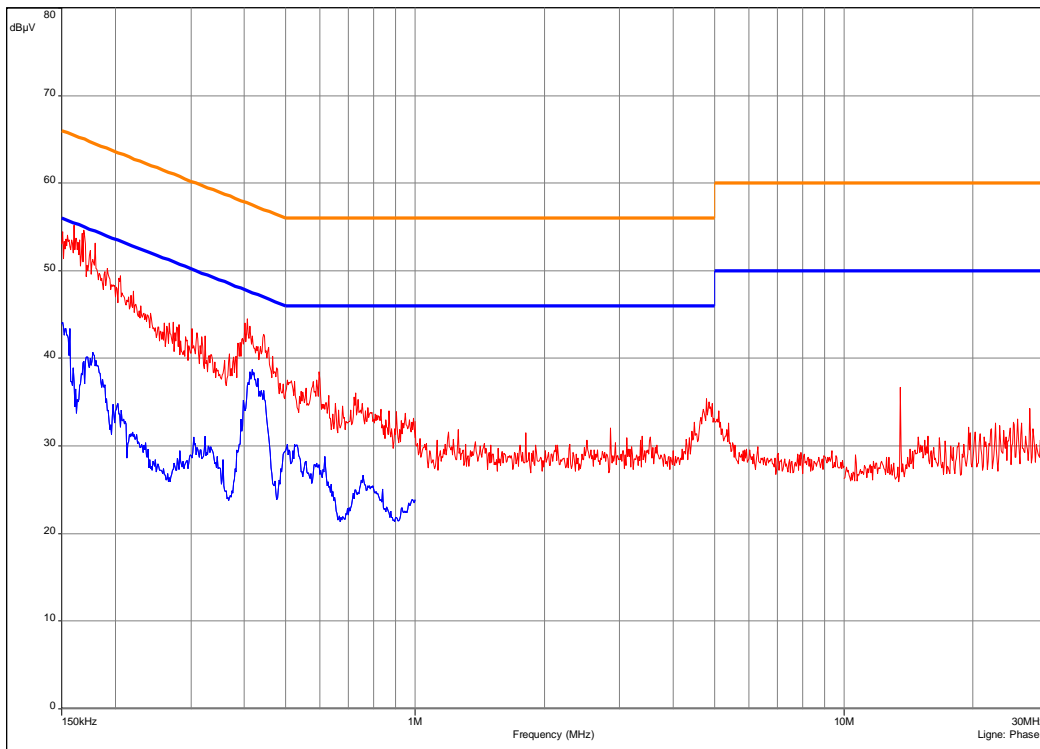
T (°C): 25.1

H (%): 59.8

P (hpa): 1005

Modification(s) during test:

- C.E.M. (civl)/EN 55022 - Class B - Moyenne/
- C.E.M. (civl)/EN 55022 - Class B - QCrête/
- Mes.Peak (Phase1)
- Mes.Avg (Phase1)



110Vac/60Hz power supply / RF on 50 Ohms load - 09/12/2012 09:53 - 975

**7. RADIATED EMISSIONS – SECTION 15.209 – RSS-210:2010 (§2.7 TABLE 2 & 3)**

Temperature (°C): 27

Humidity (%HR): 58.5

Pressure (hPa): 1004

**a) Radiated emissions (below 30MHz)**
Standards: FCC part 15 Subpart C 15.209 & RSS-210: 2010 (§2.7)

Test methods: ANSI C63.4:2003 & RSS-Gen: 2010

Test configuration:

Frequency band	Tested side	Resolution bandwidth	Video bandwidth	Detection mode	E.U.T. height
9kHz-150kHz	Front side / antenna 0°	200Hz	1kHz	Peak	80cm
9kHz-150kHz	Front side / antenna 45°	200Hz	1kHz	Peak	80cm
9kHz-150kHz	Front side / antenna 90°	200Hz	1kHz	Peak	80cm
150kHz-30MHz	Front side / antenna 0°	10kHz	30kHz	Peak	80cm
150kHz-30MHz	Front side / antenna 45°	10kHz	30kHz	Peak	80cm
150kHz-30MHz	Front side / antenna 90°	10kHz	30kHz	Peak	80cm

Measurement is done with an antenna position of 0°, 90° and 45°.

Test method deviation:

Measurements are made in peak detection instead of average mode in frequency band 9 kHz-500 kHz

- Measurements are given in dB $\mu$ A/m instead of  $\mu$ V/m
- Measuring distance is 3 meters instead of 30 and 300 meters

Radiated emissions limits in this frequency band are specified at 30 or 300 meters. Measurement distance used during the test, subject of this report, is 3 meters. Then published limits come from a theoretical conversion using an extrapolation factor of 40dB / decade.

Test equipment list:

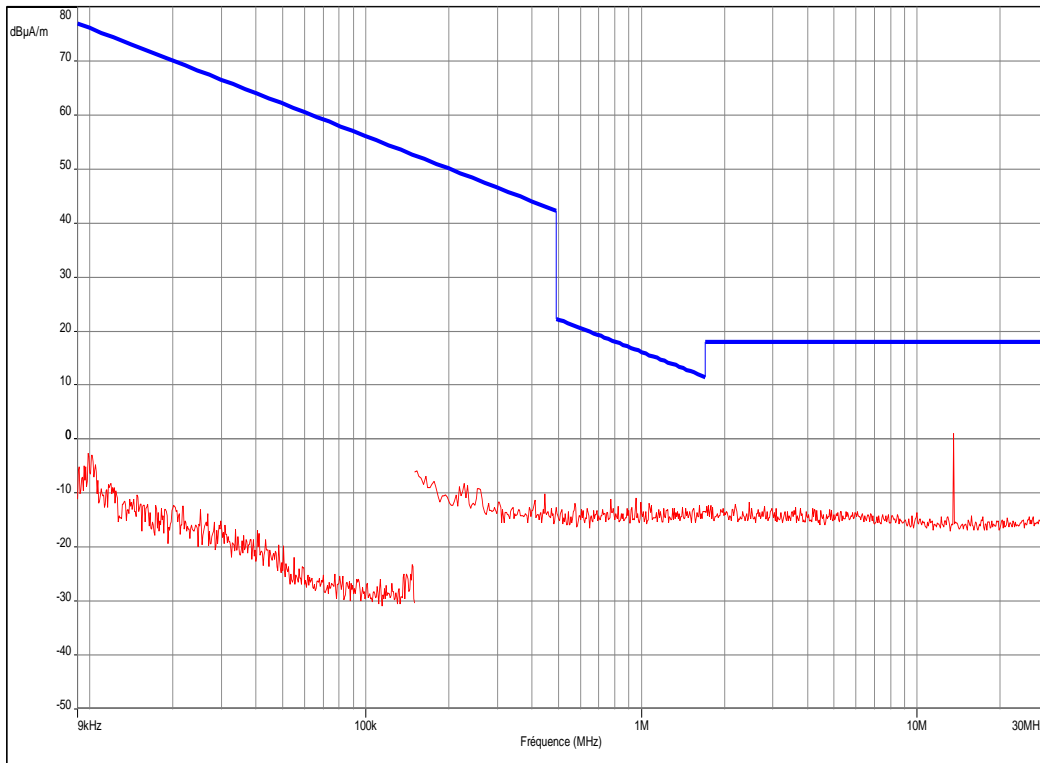
CATEGORY	BRAND	TYPE	N° EMITECH	CAL DATE	DUE DATE
Antenna	Rohde & Schwarz	HFH2-Z2	5825	20 aug 2010	20 oct 2012
Cable	Câbles & Connetiques	N-1.5m	4202	27 oct 2011	27 dec 2012
Cable		N-2m	3239	17 jul 2010	17 sep 2012
Cable		N-5m	2716	12 jan 2011	12 mar 2013
Receiver	Agilent Technologies	E7405A	2161	11 jun 2012	11 aug 2014
Shielded enclosure	RAY PROOF	C.GS3	1123	-	-
Software	Nexio	BAT EMC	0000	-	-

*BAT-EMC software version: V3.6.0.24*
Results: See Graph(s) hereafter (pre-measurement).

**Radiated magnetic field emission (measurement)**  
**HFKR1 2S / Front side / antenna 0°**

**EMI957**

— RADIO/FCC part15.209 (40dB/dec) - Classe:SS - Créte/3.0m/  
 — Mes.Peak



Date: 17/07/2012 14:31:30

Technician: DM

Class: Tr of the standard

Detection:  
 Peak

T (°C): 23

H (%): 35

P (hpa): 1005

Modification(s) during test:

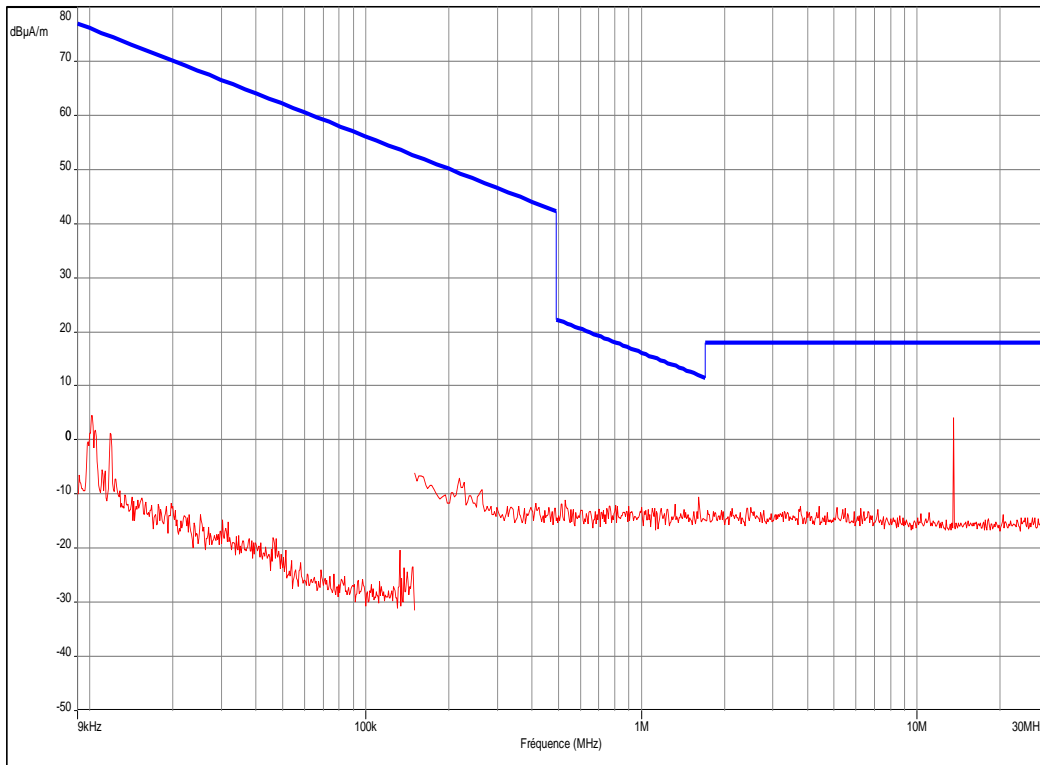
HFKR1 2S / Face avant / antenne 0° - 17/07/2012 14:31 - 957

Limit indicated on this plot is calculated with 40 dB/decade extrapolation factor and 51.5 dB conversion factor.

**Radiated magnetic field emission (measurement)**  
**HFKR1 2S / Front side / antenna 45°**

**EMI958**

— RADIO/FCC part15.209 (40dB/dec) - Classe:ss - Créte/3.0m/  
 — Mes.Peak



Date: 17/07/2012 14:37:44

Technician: DM

Class: Tr of the standard

Detection:  
 Peak

T (°C): 23

H (%): 35

P (hpa): 1005

Modification(s) during test:

HFKR1 2S / Face avant / antenne 45° - 17/07/2012 14:37 - 958

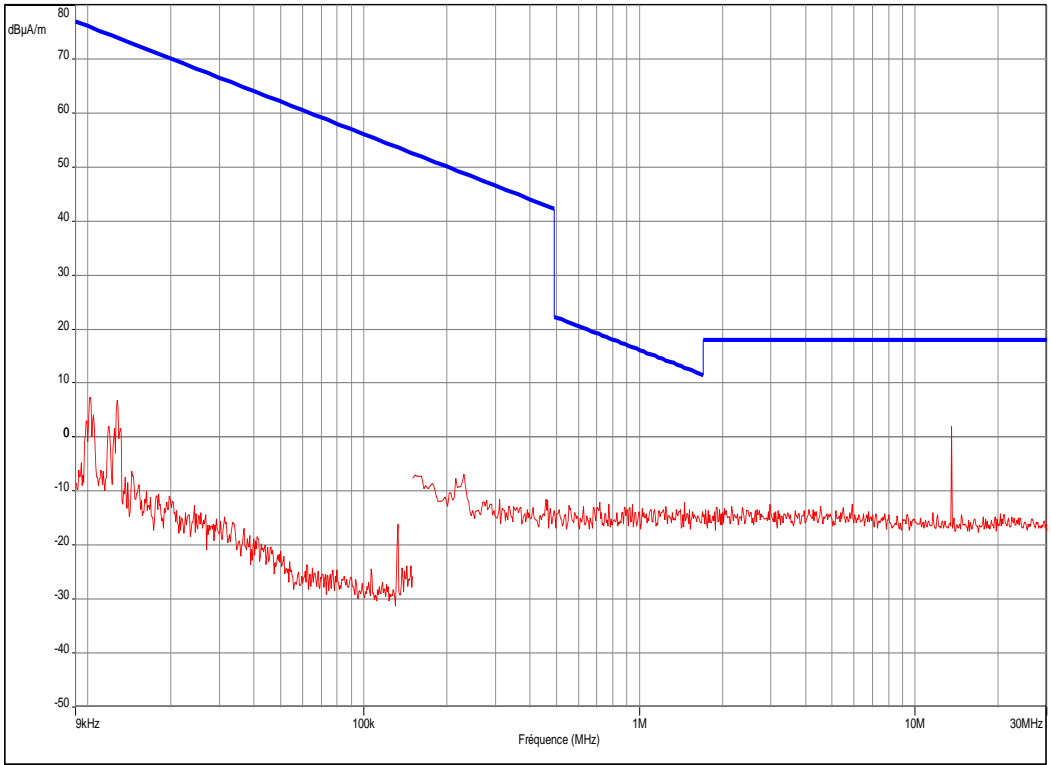
Limit indicated on this plot is calculated with 40 dB/decade extrapolation factor and 51.5 dB conversion factor.

**Radiated magnetic field emission (measurement)**

**EMI959**

HFKR1 2S / Front side / antenna 90°

— RADIO/FCC part15.209 (40dB/dec) - Classe:SS - Créteil/3.0m/  
 — Mes.Peak



Date: 17/07/2012 14:47:43

Technician: DM

Class: Tr of the standard

Detection:  
Peak

T (°C): 23

H (%): 35

P (hpa): 1005

Modification(s) during test:

HFKR1 2S / Face avant / antenne 90° - 17/07/2012 14:47 - 959

Limit indicated on this plot is calculated with 40 dB/decade extrapolation factor and 51.5 dB conversion factor.

*b) Radiated emissions pre-measurement (above 30MHz)*

Standards: FCC part 15 Subpart C 15.209 & RSS-210: 2010 (§2.7)

Test methods: ANSI C63.4:2003 & RSS-Gen: 2010

Test configuration:

Frequency band	Tested side	Resolution bandwidth	Video bandwidth	Detection mode	E.U.T. height
30MHz-1GHz	Front side (pre-measurement in semi anechoic chamber)	100kHz	300kHz	Peak	80cm

Test method deviation: No

Measuring distance: 3 meters

Test equipment list:

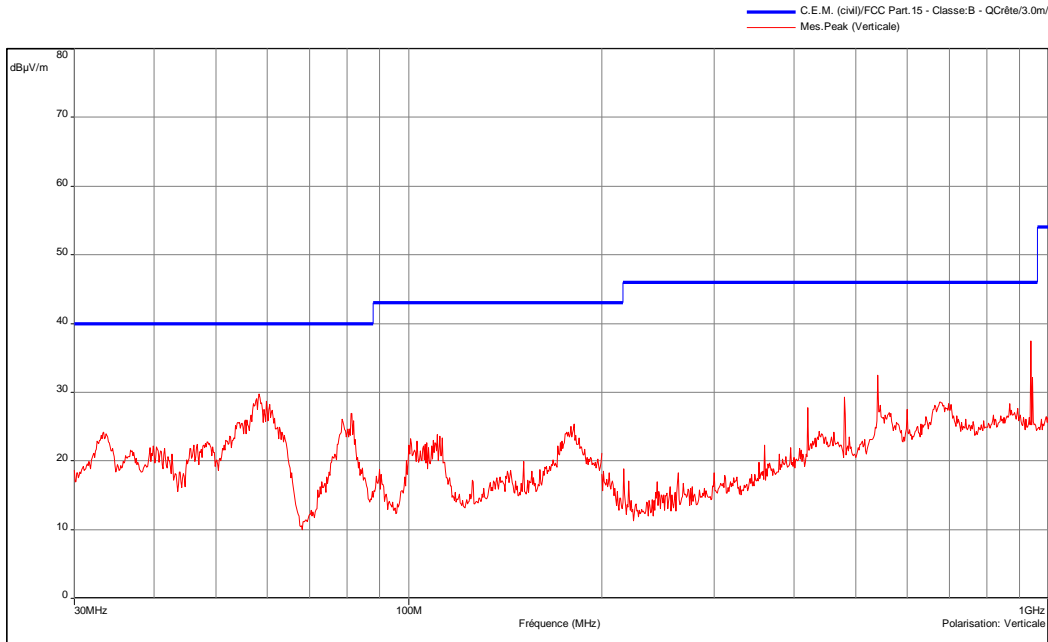
CATEGORY	BRAND	TYPE	N° EMITECH	CAL DATE	DUE DATE
Antenna	Electro-Metrics	BIA-30HF	1107	03 mar 2011	03 may 2015
Antenna	Rohde & Schwarz	HL223	1137	03 mar 2011	03 may 2015
Cable		N-1.5m	3621	25 jul 2011	29 sep 2013
Cable	C&C	N-6m	5015	11 oct 2010	11 dec 2012
Receiver	Agilent Technologies	E7405A	2161	11 jun 2012	11 aug 2014
Shielded enclosure	RAY PROOF	C.GS3	1123	-	-
Software	Nexio	BAT EMC	0000	-	-

*BAT-EMC software version: V3.6.0.24*

Results: See Graph(s) (indoor pre-measurement)

**Radiated electric emission (measurement)**  
**HFKR1 2S / Front side**

**EMI963**



HFKR1 2S / Face avant - 17/07/2012 13:56 - 963

Date: 17/07/2012 13:56:41

Technician: DM

Class: Tr of the standard

Detection:  
 Peak

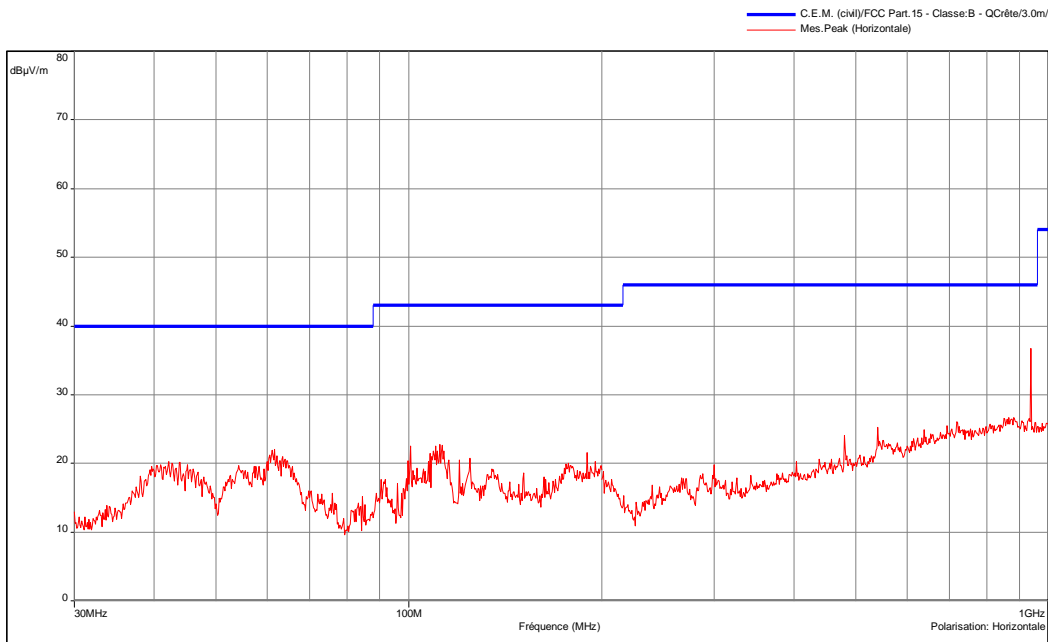
T (°C): 24

H (%): 35

P (hpa): 1005

Frequency identification :  
 940MHz : Ambient GSM

Modification(s) during test:



HFKR1 2S / Face avant - 17/07/2012 13:56 - 963

c) Final radiated electric emission on Open Area Test Site
Test configuration:

Frequency band	Tested side	Resolution bandwidth	Video bandwidth	Detection mode	E.U.T. height
30MHz-1GHz	(Open area measurement)	120kHz	300kHz	Quasi peak	3cm

For each measured frequencies, E.U.T. is set via a turntable in order to find the highest level. Test antenna is set between 1m and 4m in order to find the highest level in vertical and horizontal polarization.

Only highest levels are recorded.

E.U.T. is powered at its nominal power supply.

Measuring distance: 3 meters

Test equipment list (Open area measurement):

CATEGORY	BRAND	TYPE	N° EMITECH	CAL DATE	DUE DATE
Antenna	Electro-Metrics	BIA-30HF	1107	03 mar 2011	03 may 2015
Antenna	Rohde & Schwarz	HL223	3126	03 mar 2011	03 may 2015
Antenna mast	Heinrich Deisel	HD100	4036	-	-
Antenna mast	Heinrich Deisel	MA240	4037	-	-
Cable		N-10m	8472	03 nov 2011	03 jan 2014
Open area test site	Emitech	Salinelles	3482	04 mar 2011	04 may 2014
Receiver	Agilent Technologies	E7405A	2161	07 dec 2011	07 fev 2014
Turntable	Heinrich Deisel	D4420	4038	-	-

Results: See Board(s) below

Frequency (MHz)	Polarization	Azimut (degree)	Antenna Height (cm)	Measure (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Comments
420.04	Vertical	0	135	32.54	46	C
540.03	Vertical	130	100	36.60	46	C

C= Compliant

NC= Not compliant



**8. OPERATION WITHIN THE BAND 13.110-14.010 MHZ – SECTION 15.225 & RSS-210:2010**
Field strength

Standards: FCC part 15 Subpart C 15.225 & RSS-210:2010

Test methods: ANSI C63.4:2003 & RSS-Gen: 2010

Test configuration:

Frequency	Test configuration	Resolution bandwidth	Video bandwidth	Detection mode	E.U.T. height
13.56MHz	Test antenna 0°	10kHz	30kHz	Quasi -peak	80cm
13.56MHz	Test antenna 45°	10kHz	30kHz	Quasi -peak	80cm
13.56MHz	Test antenna 90°	10kHz	30kHz	Quasi -peak	80cm

E.U.T. internal functions are all active (GSM 850 or 1900, Wifi is active, Bluetooth is active, and Rfid is active).

GSM communication link is established via a CMU 200(Rohde & Schwarz).

Measure is done with an antenna position of 0°, 90° and 45°.

Test method deviation: Measurements are given in dB $\mu$ A/m instead of dB $\mu$ V/m (conversion factor: 51.5dB).

Measuring distance is 10 meters instead of 30.

Test equipment list:

CATEGORY	BRAND	TYPE	N° EMITECH	CAL DATE	DUE DATE
Antenna	Rohde & Schwarz	HFH2-Z2	5825	20/08/2008	20/10/2012
Cable	N	20m	8385	25/08/2011	25/10/2013
Controller	Heinrich Deisel	HD100	4036	-	-
Open area test site	Emitech	Salinelles	3482	04/03/2011	04/05/2014
Radio communication tester	Rohde & Schwarz	CMU 200	7015	25/10/2011	25/12/2013
Receiver	Agilent	E4440A	5824	24/08/2011	24/08/2013
Turntable	Heinrich Deisel	D4420	4038	-	-

Results: See Graph(s) hereafter.

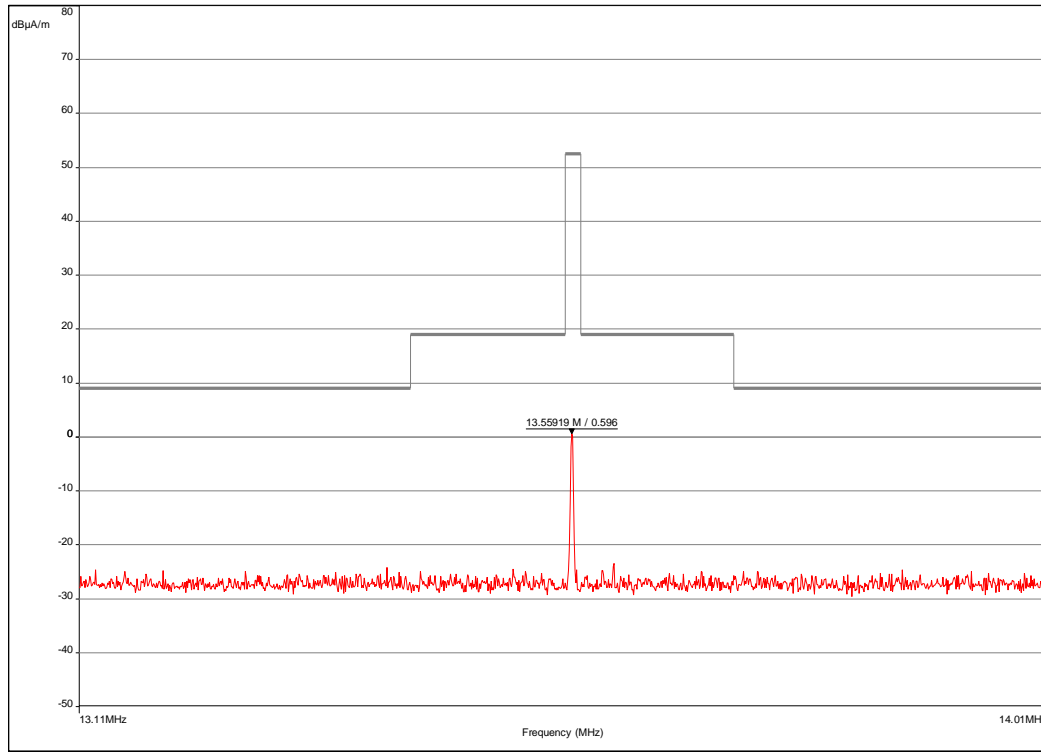
Carrier measurement at 10m: 1.58 dB $\mu$ A/m ( $\approx$  53.08dB $\mu$ V/m)

Using an extrapolation factor of 40 dB/decade (as described in section 15.31 (f)), the level is about 33.08dB $\mu$ V/m (45.08 $\mu$ V/m) for a limit at 15.848 mV/m.

**Radiated magnetic field emission (measurement)**  
**Front side / antenna 0°**

**EMI924**

Frequency (MHz) : 13.11 MHz - 14.01 MHz (Analyzer mode) — RADIO/FCC Part.15 (13.56MHz) - Class:em - QCrête/3.0m/  
 Settings: RBW: 1 kHz, VBW: 3 kHz, Holding time: 1 ms/Pt, sweep count 10 — Mes.Peak  
 Polarisation : Circulaire  
 Distance: 3 m



Date: 10/09/2012 14:00:39

Technician: DM

Class: em of the standard

Detection:  
 Peak

T (°C): 26.99

H (%): 58.5

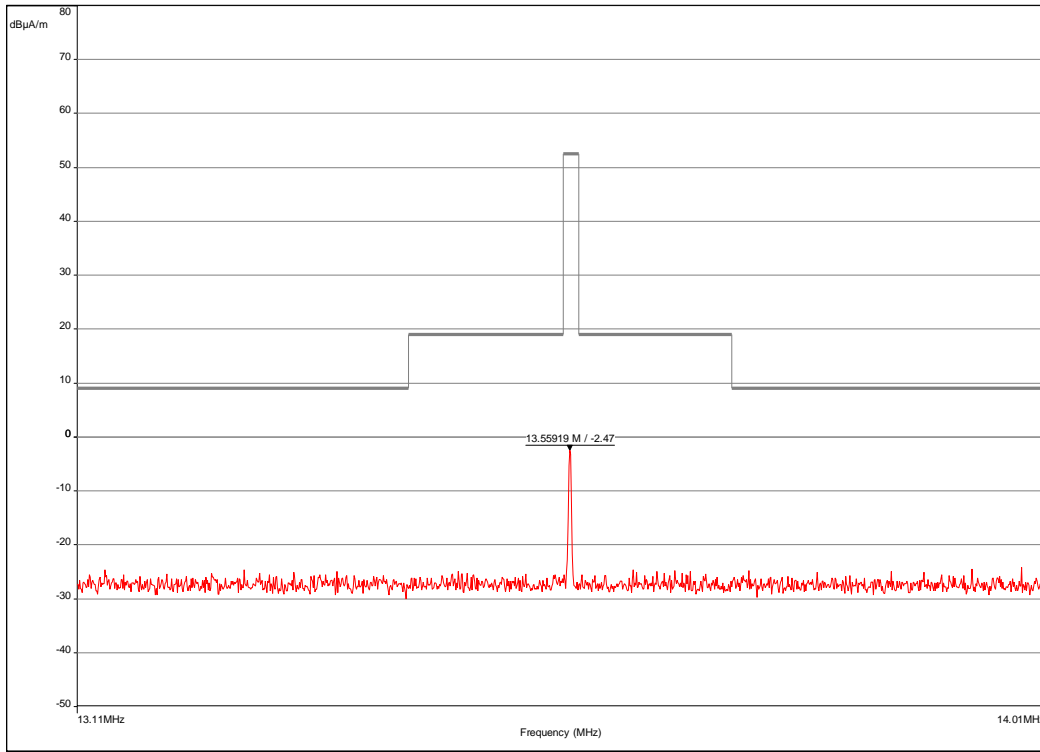
P (hpa): 1004

Modification(s) during test:

**Radiated magnetic field emission (measurement)**  
**Front side / antenna 45°**

**EMI933**

Frequency (MHz) : 13.11 MHz - 14.01 MHz (Analyzer mode) — RADIO/FCC Part.15 (13.56MHz) - Class:em - QCrête/3.0m/  
 Settings: RBW: 1 kHz, VBW: 3 kHz, Holding time: 1 ms/Pt, sweep count 10 — Mes.Peak  
 Polarisation : Circulaire  
 Distance: 3 m



Date: 10/09/2012 14:04:39

Technician: DM

Class: em of the standard

Detection:  
 Peak

T (°C): 26.99

H (%): 58.5

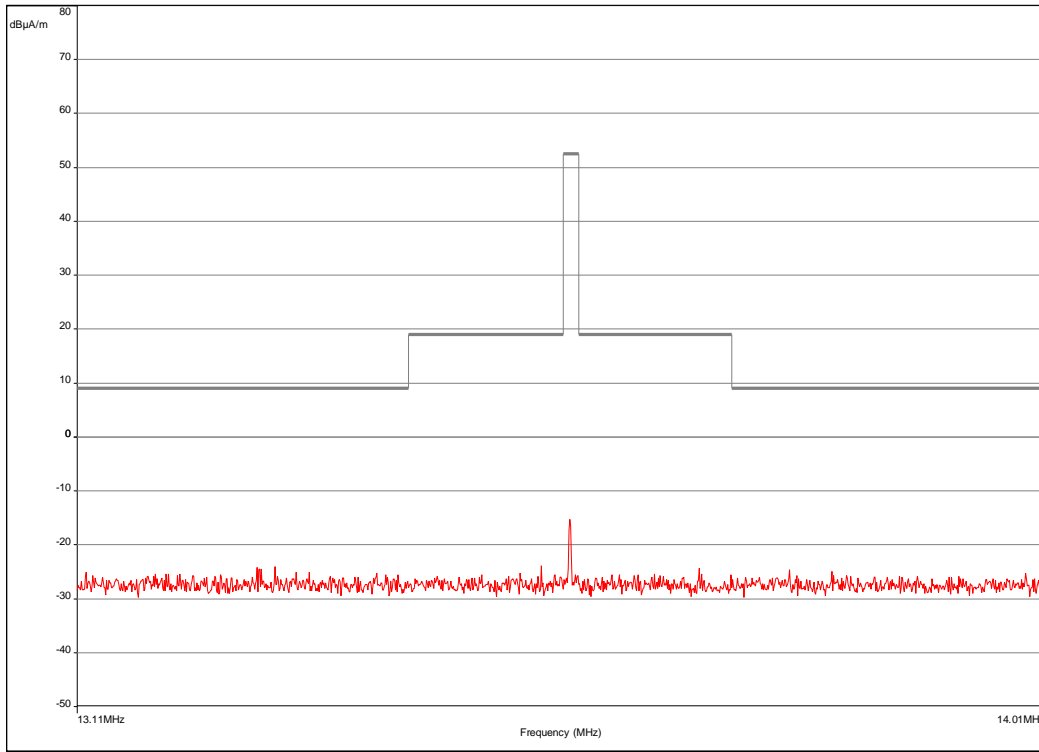
P (hpa): 1004

Modification(s) during test:

**Radiated magnetic field emission (measurement)**  
**Front side / antenna 90°**

**EMI934**

Frequency (MHz) : 13.11 MHz - 14.01 MHz (Analyzer mode) — RADIO/FCC Part.15 (13.56MHz) - Class.em - QCrête/3.0m/  
 Settings: RBW: 1 kHz, VBW: 3 kHz, Holding time: 1 ms/Pt, sweep count 10 — Mes.Peak  
 Polarisation : Circulaire  
 Distance: 3 m



Date: 10/09/2012 14:10:21

Technician: DM

Class: em of the standard

Detection:  
 Peak

T (°C): 26.99

H (%): 58.5

P (hpa): 1004

Modification(s) during test:

**9. FREQUENCY TOLERANCE – SECTION 15.225**

Standard: FCC part 15 Subpart C 15.225 (07/2008)

Test method: FCC part 15 Subpart C 15.225 (07/2008)

Test configuration: A near field probe detects field near equipment (relative measurement).

Resolutions:

Frequency	Resolution bandwidth	Video bandwidth
13.56MHz	3Hz	10Hz

Test method deviation: E.U.T. is powered by 110Vac/60Hz power voltage by an external source.

Test equipment list:

CATEGORY	BRAND	TYPE	N° EMITECH	CAL DATE	DUE DATE
Antenna	Emitech	3.5 cm	4653	-	-
Climatic enclosure	Secasi	SM600C	1670	20 jan 2012	20 mar 2014
Power supply	KIKUSUI	PCR2000L	0800	-	-
Spectrum analyser	Agilent Technologies	E4440A	5824	24 aug 2011	24 oct 2013

Standard limits: +/- 0.01% of the operating frequency

Results: See Board(s) below

E.U.T. operating mode: with modulation

Condition	Temperature	Power supply	Measured Frequency (MHz)	Frequency tolerance (kHz)	Limit (kHz)
Normal condition	20°C Humidity 31%	110Vac	13.559038	-	+/-1.35606
		93.5Vac	13.559049	+0.011	
		126.5Vac	13.559044	+0.006	
Extreme condition	-30°C	110Vac	13.559275	+0.237	
		93.5Vac	13.559264	+0.226	
		126.5Vac	13.559257	+0.219	
	+50°C	110Vac	13.558947	-0.091	
		93.5Vac	13.558967	-0.071	
		126.5Vac	13.558943	-0.095	

N.P.: Not Performed.

**10. OCCUPIED BANDWIDTH – CNR-Gen § 4.6**

Standard: CNR-Gen § 4.6

Test method: CNR-Gen § 4.6

Test configuration: A near field probe detects field near equipment (relative measurement).

Resolutions:

Frequency	Resolution bandwidth	Video bandwidth
13.56MHz	300Hz	1kHz

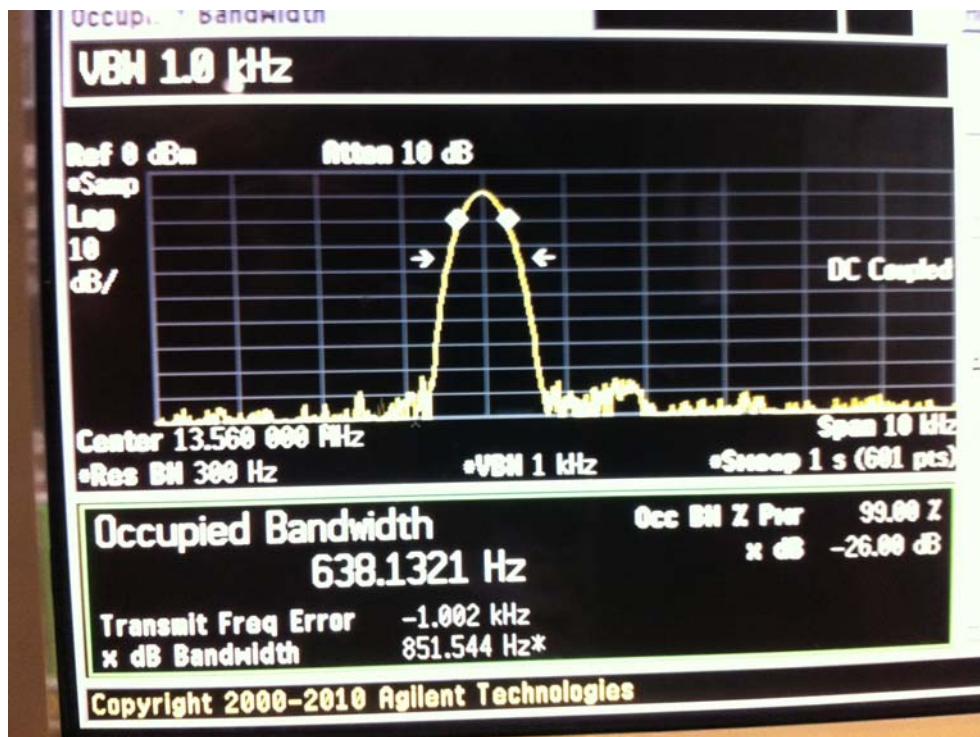
Test method deviation: E.U.T. is powered by 115Vac/60Hz power voltage.

Test equipment list:

CATEGORY	BRAND	TYPE	N° EMITECH	CAL DATE	DUE DATE
Antenna	Emitech	3.5 cm	4653	-	-
Power supply	KIKUSUI	PCR2000L	0800	-	-
Spectrum analyser	Agilent Technologies	E4440A	5824	19/04/10	18/06/10

Standard limits: 14 kHz

Results: Occupied bandwidth = 638.13kHz



**11. RADIATED EMISSIONS – SECTION 15-247**
Radiated emissions (above 1GHz)

Standards: FCC part 15.247: 2011 & RSS-210:2010

Test method: ANSI C63.4:2003

Test configuration:

Frequency band	Configuration	Resolution bandwidth	Video bandwidth	Detection mode	E.U.T. height
1GHz-18GHz	Open area measurement	1MHz	1MHz	Peak	80cm

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.

E.U.T. internal functions are all active (GSM 850 1900 or AWS BAND IV are active, Wifi is active, Bluetooth is active, Rfid is active).

GSM/AWS BAND IV communication links are established via a CMU 200(Rohde & Schwarz).

Test method deviation: Wifi and Bluetooth are in permanent emission, measurements are done in peak detection (worst case).

Measuring distance: 3 m

Test equipment list:

CATEGORY	BRAND	TYPE	N° EMITECH	CAL DATE	DUE DATE
Antenna	ETS LINDGREN	3117	8387	26 aug 2011	26 oct 2015
Antenna mast	Heinrich Deisel	MA240	4037	-	-
Cable	N	14m	8146	09 mar 2013	09 may 2013
Cable	Cables & Connetiques	N-1.5m	4203	27 oct 2011	27 dec 2013
Controller	Heinrich Deisel	HD100	4036	-	-
Open area test site	Emitech	Salinelles	3482	04 mar 2011	04 may 2014
Preamplifier	Microwave	C005180F-4B1	2165	06 oct 2011	06 dec 2012
Radio communication tester	Rohde & Schwarz	CMU 200	7015	25 oct 2011	25 dec 2013
Receiver	Agilent	E4440A	5824	24 aug 2011	24 oct 2013
Turntable	Heinrich Deisel	D4420	4038	-	-

Results: See Board(s) hereafter

1) Wifi radiated field strength:

Frequency (MHz)	Polarization	Azimuth (degrees)	Antenna height (cm)	Peak Measure (dB $\mu$ V/m)	Standard limit (dB $\mu$ V/m)	Comments
2484.00	Vertical	336	170	114.47	125.2 (*)	C
2484.00	Horizontal	177	120	109.61	125.2 (*)	C

C= Compliant

NC= Not compliant

No Wifi spurious radiations were detected

2) Bluetooth radiated field strength:

Frequency (MHz)	Polarization	Azimuth (degrees)	Antenna height (cm)	Measure (dB $\mu$ V/m)	Standard limit (dB $\mu$ V/m)	Comments
2402.00	Vertical	333	150	105.73	125.2 (*)	C
2402.00	Horizontal	177	104	104.8	125.2 (*)	C

C= Compliant

NC= Not compliant

No Bluetooth spurious radiations were detected.

All other radiated emissions are more than 20 dB below the limit.

(\*) This limit is a theoretical conversion of standard limit given for 1W conducted power. E.U.T. antenna gain is less than 6dBi. Limit is reached by the following calculation:

$$E = \frac{\sqrt{30 \times P \times G}}{d}$$

with P in Watt (conducted power limit)  
G= 1 (dipole antenna theoretical gain)  
d= 3 m (test distance)  
E= Equivalent radiated electric field (V/m)



## 12. ERP, EIRP AND SPURIOUS MEASUREMENT

Standards: FCC part 22.913 and 22.917: 2005 and subpart H

Test method: ANSI C63.4:2003

Test configuration: Spurious emission level is measured by substitution method. Test are done in vertical and horizontal antenna polarization, E.U.T. is set on a turntable in order to find the highest level. Only highest levels are recorded.

Frequency band	Configuration	Resolution bandwidth	Video bandwidth	Detection mode	E.U.T. height
824-849MHz	Open area measurement	100kHz	300kHz	Peak	80cm
1710–1755 MHz	Open area measurement	100kHz	300kHz	Peak	80cm
1850-1910MHz	Open area measurement	100kHz	300kHz	Peak	80cm

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.

E.U.T. internal functions are all active (GSM 850 or 1900 or AWS Band IV, Wifi is active, Bluetooth is active, Rfid is active).

GSM communication link is established via a CMU 200 (Rohde & Schwarz).

Test method deviation: Wifi and Bluetooth are in permanent emission. Measurements are done in peak detection (worst case).

Measuring distance: 3 m

Test equipment list:

CATEGORY	BRAND	TYPE	N° EMITECH	CAL DATE	DUE DATE
Antenna	ETS LINDGREN	3117	5456	17 aug 2012	17 oct 2016
Antenna	ETS LINDGREN	3117	8387	26 aug 2011	26 oct 2015
Antenna	Rohde & Schwarz	HL223	3126	03 mar 2011	03 may 2015
Antenna	Schwarzbeck	UHA 9105	4660	03 mar 2011	03 may 2015
Antenna mast	Heinrich Deisel	MA240	4037	-	-
Cable	N	14m	8146	09 mar 2013	09 may 2013
Cable	Cables & Connetiques	N-1.5m	4203	27 oct 2011	27 dec 2013
Cable	Huber Sumner	N-10m	8472	03 nov 2013	03 jan 2014
Controller	Heinrich Deisel	HD100	4036	-	-
Filter	Micro-Tronics	HPM 11630	4392	19 jan 2012	19 mar 2014
Open area test site	Emitech	Seminoles	3482	04 mar 2011	04 may 2014

CATEGORY	BRAND	TYPE	N° EMITECH	CAL DATE	DUE DATE
Preamplifier	Microwave	C005180F-4B1	2165	06 oct 2011	06 dec 2012
Radio communication tester	Rohde & Schwarz	CMU 200	7015	25 oct 2011	25 dec 2013
Receiver	Agilent	E4440A	5824	24 aug 2011	24 aug 2013
Synthesizer	Anritsu	MG3692A	3131	24 fev 2012	24 apr 2014
Turntable	Heinrich Deisel	D4420	4038	-	-

Results: See Board(s) hereafter

1) GSM850 radiated field strength:

Frequency (MHz)	Polarization	Field strength (dBm)	Standard limit (dBm)	Comments
836.93	Vertical	32.23	38	C

C= Compliant

NC= Not compliant

No GSM850 spurious radiations were detected

2) AWS band 4 radiated field strength:

Frequency (MHz)	Polarization	Field strength (dBm)	Standard limit (dBm)	Comments
1713.00	Vertical	22	33	C

C= Compliant

NC= Not compliant

No GSM1900 spurious radiations were detected

3) GSM1900 radiated field strength:

Frequency (MHz)	Polarization	Field strength (dBm)	Standard limit (dBm)	Comments
1870.00	Vertical	25	33	C

C= Compliant

NC= Not compliant

No GSM1900 spurious radiations were detected

□□□ End of report – 1 annex to be forwarded □□□

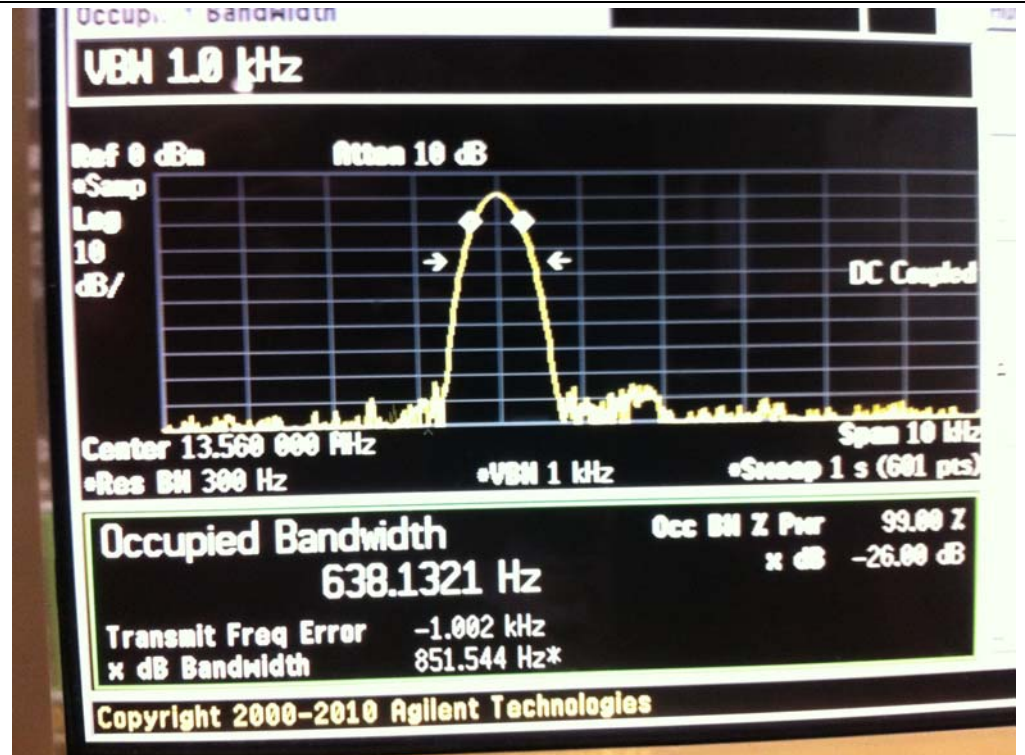
# **ANNEX: PHOTOGRAPH(S)**

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

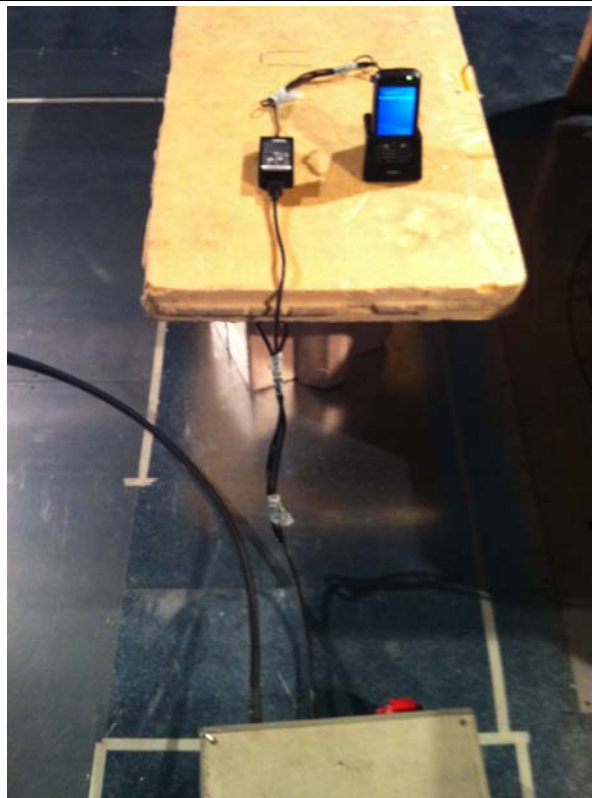
TERMINAL EP10 HF-KRX-2S

<p>E.U.T. power supply marking plate</p>	
<p>Frequency tolerance</p>	

Occupied bandwidth



Conducted emissions





Radiated  
measurement

