EMITECH GROUPE

RC-300-PTC-16-105409-2-A

"This report cancels and replaces the initial report RC-300-PTC-16-105409-2-A Edition 2"

E.M.C. TESTS REPORT

According to the standards

FCC 47 CFR part 15 : 2016 (§15.225)
RSS-Gen Issue 4 : 2014
RSS-210 Issue 9 : 2016
ICES-003 / NMB-003 : 2016 (Partial)

Equipment under test:

Access Controlers
ARCS-x35-G/BT1
with RFID and BLE functions
FCC ID: OVNAC4
IC: 10520A-ARCS

Company:

STid

FCC accredited: FR0004
IC accredited: 4379A

Distribution: Mr. SILVE **(Company:** STID)

Number of pages: 42 with 2 annexes

Ed.	Date	Modified page	Written by Name / Visa	Technical Verification and Quality Name / Visa
3	26/09/2017	2, 12, 42	F. LHEUREUX FL	B. Pellerin

Duplication of this report is only permitted for an integral photographic facsimile. It includes the number of pages referenced above.
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.

NAME OF THE EQUIPMENT UNDER TEST (E.U.T.)	:	Access Controller ARCS-x35-G/BT1 with RFID and BLE functions
Serial number	:	Not communicated
Model number (HVIN)	:	ARC-AC4
Part number	:	Not communicated
Software Version	:	Not communicated
MANUFACTURER'S NAME	:	STid

APPLICANT'S ADDRESS:

Company	:	STid
Address	:	20 Parc d'activités des Pradeaux 13850 GREASQUE
Person present during the tests	:	Mrs. MONET
Responsible	:	Mr. SILVE
DATES OF TESTS	:	From 05/12/2016 to 09/12/2016 From 30/01/2017 to 01/02/2017
TESTS LOCATIONS	:	Emitech laboratory in Montigny le Bretonneux (78) – FRANCE Open area test site in Aunainville (28) FRANCE.
TESTS OPERATORS	:	A. BERNARD / F. LHEUREUX

TABLE OF CONTENTS

1. INTRODUCTION

This document submits the results of Electromagnetic Compatibility tests performed on the equipment «Access Controller ARCS-x35-G/BT1 with RFID and BLE functions» (denominated hereafter E.U.T.: equipment under test) according to documents listed below.

2. REFERENCE DOCUMENTS

FCC 47 CFR Part 15: 2016
Code of Federal Regulations
Title 47- Telecommunication
Chapter 1- Federal Communication Commission
Part 15- Radio frequency devices

RSS-Gen Issue 4 : November 2014
General Requirements and Information for the Certification of Radio Apparatus

RSS-210 Issue 9 : 2016
Low-power licence-exempt.
Radiocommunication devices (all frequency bands).
Category 1 Equipment.

ICES-003 / NMB-003 : 2016
Spectrum management – Interference-causing equipment standard – Digital apparatus.

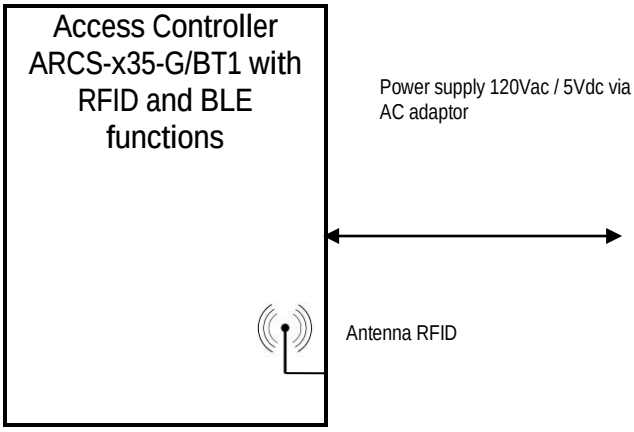
ANSI C63.4: 2014
Methods of Measurement of Radio-Noise Emissions from Low Voltage Electrical and Electronics Equipment in the range of 9 kHz to 40 GHz.

ANSI C63.10 : 2013
Testing Unlicensed Wireless Devices.

3. EQUIPMENT UNDER TEST CONFIGURATION

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

Class: A (commercial, industrial or business environment)



E.U.T.

Antenna type and gain:	internal antenna: Not communicated
Operating frequency range:	from 13.553 MHz to 13.567 MHz for RFID from 2400MHz to 2483.5MHz for BLE (the BLE module is already certified)
Number of channels:	1 for RFID 3 for BLE in advertising mode and 79 in transmission mode
Power source:	5 Vdc by AC adaptor

Modification of the equipment during the tests:
Modification ①: A ferrite, reference 74271221 WURTH ELECTRONIK, was placed on the power cable (1 turn), on the PC side.

Modification ②: Change of software version : New version 05

Cycle and operating mode during emission tests: EUT is in continuous transmission mode with modulation.

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				With Modification ①

ICES-003 / NMB-003

Test procedure	Designation of test	Test results				Comments
		Pass	Fail	N.A.	N.P.	
ANSI C63.4 §6.1	Measurement of conducted emission on AC mains ports	X				
ANSI C63.4 §6.2	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				With Modification ①
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				With Modification ①②
	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

Standard RSS-210_Issue 9 : 2016

Designation of test	Test results				Comments
	Pass	Fail	N.A.	N.P.	
1. Scope					
2. General Information					
2.1 Licensing Requirements					
2.2 Related Documents					
3. General Requirements					
3.1 RSS-gen compliance			X		See RSS-Gen
4. Technical Specifications					
4.1 Emissions Falling Within Restricted Frequency Bands			X		See RSS-Gen
4.2 Cordless Telephones (General Conditions)			X		See CS-03
4.3 General Field Strength Limits	X				See RSS-Gen
4.4 Transmitters With Wanted Emissions That are Within the General Field Strength Limits			X		See RSS-Gen
Annex B – Devices Operating in Frequency Bands for Any Application					
AB.1 Band 160-190 kHz			X		
AB.2 Band 510-1705 kHz			X		
AB.3 Band 1.705-10 MHz			X		
AB.4 Band 1.705-37 MHz Swept Frequency			X		
AB.5 Band 6.765-6.795 MHz			X		
AB.6 Band 13.110-14.010 MHz	X				With Modification ①②
AB.7 Band 40.66-40.70 MHz			X		
AB.8 Band 44-49 MHz			X		
AB.9 Band 88-108 MHz			X		
AB.10 Bands 902-928, 2400-2483.5 and 5725-5875 MHz			X		
AB.11 Bands 17.15 and 94 GHz			X		

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

Standard RSS-Gen Issue 4 : November 2014

Designation of test	Test results				Comments
	Pass	Fail	N.A.	N.P.	
1. Scope					
2. Purpose and application					
2.1 Certification of Radio Apparatus			X		
2.2 Categories of radio Equipment					*Category 1*
2.3 Exclusions			X		
2.4 Determination of Interference			X		
3. Normative Reference Publications					
4. application for an Exemption					
5. Receivers					
5.1 Scanner Receivers			X		
5.2 Stand-Alone Receivers Operating in the Band 30-960 MHz (Category II)			X		
5.3 Receivers Exempted From Industry Canada Requirement (Category II)			X		
6. Technical Requirements					
6.1 Test Site Facilities					*See ANSI C63.4-2014*
6.2 Test report					
6.3 External control			X		
6.4 Near Field Measurement Method Below 30 MHz	X				
6.5 Measurement Distance Above 30 MHz	X				
6.6 Occupied Bandwidth	X				With Modification ②
6.7 Transmitter Antenna for Licensed Radio Apparatus			X		
6.8 Operating Bands and Selection of Test Frequencies			X		
6.9 CISPR Quasi-peak Detector	X				
6.10 Pulsed Operation			X		
6.11 Transmitter Frequency Stability	X				With Modification ②
6.12 Transmitter Output Power			X		
6.13 Transmitter unwanted Emissions	X				With Modification ①
7. Receiver limit					
8. Licence-Exempt radio Apparatus					
8.1 Measurement Bandwiths and Detector Functions	X				
8.2 Amplifiers			X		
8.3 Transmitter Antenna for Licence-Exempt Radio Apparatus			X		
8.4 User Manual notice for Licence-Exempt Radio Apparatus			X		
8.5 Measurement of Licence-Exempt Devices On-Site (in-situ)			X		
8.6 Operating frequency Range of Device in Master/Slave networks			X		
8.7 Radio Frequency identification (RFID) Devices	X				
8.8 AC Power Line Conducted Emission Limits for licence-Exempt Radio Apparatus	X				
8.9 Transmitter Emission limits for Licence-Exempt Radio Apparatus	X				
8.10 Restricted Frequency bands			X		
8.11 Frequency Stability for Licence-Exempt transmitters	X				

Designation of test	Test results				Comments
	Pass	Fail	N.A.	N.P.	
7. Licence-exempt Radio Apparatus					
7.1 General Informations					
7.1.1 External Amplifiers			X		
7.1.2 Transmitter Antenna			X		
7.1.3 User manual Notice			X		*User manual shall include the required statements*
7.1.4 Radio Apparatus Containing Digital Circuits			X		*See ICES-003*
7.1.5 Measurement After Installation			X		
7.1.6 operating Frequency range of Devices in Master/Slave Networks			X		
7.1.7 Home-built Devices			X		
7.1.8 RFID Devices			X		
7.2 Measurement Methods and Standard Specifications					
7.2.1 Measurement Bandwidths and Detector Functions	X				
7.2.2 Emissions Falling Within Restricted Frequency Bands			X		
7.2.3 Devices Employing Pulsed Operation			X		
7.2.4 AC Power Line Conducted Emissions Limits	X				
7.2.5 Transmitter Spurious Emission Limits	X				
7.2.6 Transmitter Frequency Stability	X				
7.2.7 Measurement Distance			X		

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

Note 1: *Single / Split / limited modular transmitter.*
The host devices of the certified module(s) shall be properly labeled to identify the module(s) within.

Note 2: Spectrum investigated from 30 MHz or the lowest radio frequency signal generated in the equipment, whichever is lower, without going below 9 kHz to the 10th harmonic of the highest fundamental frequency or 40 GHz, whichever is lower (F<10 GHz) or to the 5th harmonic of the highest fundamental frequency or 100 GHz, whichever is lower (F≥10 GHz).

Note 3: Spectrum investigated from the lowest frequency internally generated or used in the receiver or 30 MHz, whichever is higher to at least 3 times the highest tuneable or local oscillator frequency, whichever is higher without exceeding 40 GHz.

Note 4: *The certificate holder shall be able to demonstrate a quality control process used for production. Inspection and testing in accordance with good engineering practices.*

Note 5: *The device must be properly identified and labeled.*

Note 6: *Suppliers of radio apparatus shall provide notices and user information in both English and French.*

Note 7: *The device shall not have any external controls accessible to the user.*

Note 8: *When transitioning between bands, the equipment shall not actively transmit*

Conclusion:

The tested sample "Access Controller ARCS-x35-G/BT1 with RFID and BLE functions" submitted to the tests complies with the requirements of the standards:

- FCC 47 CFR PART 15: 2016
- RSS-Gen Issue 4 : 2014
- RSS-210 Issue 9 : 2016

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

Standards: FCC 47 CFR PART 15 : 2016
RSS-210 Issue 9 : 2016

Sections: 15.225 (a) of FCC 47 CFR PART 15 : 2016
§AB.6 (a) of RSS-210 issue 9 : 2016

Test configuration:

The system is tested in normalized test site.

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: 30 meters.

Limit:

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

Operating mode during the test:

EUT is in continuous transmission mode with modulation

Instrumentation test list:

CATEGORY	BRAND	TYPE	N^{R} EMITECH
Antenna	Emco	6502	7179
Cable	Micro-Coax	N-2m	11514
Cable	Câbles et Connectiques	N-13m	2452
Cable	/	N-9m syn-C1-1/1	6000
Cable	/	N-30m	4359
Open Area Test Site	Emitech	Aunainville	0187
Spectrum analyzer	Rohde & Schwarz	ESR7	12811

Results:

Ambient temperature (°C): 16
Relative humidity (%): 38
Power source: 120Vac

FREQUENCY (MHz)	ANTENNA ORIENTATION	AZIMUTH (degrees)	MEASUREMENT (dBµV/m)	LIMIT (dBµV/m)	MARGIN (dB)	Software version
13.56	Perpendicular	270	39.6	84.0	44.4	05

Test conclusion: Complies with the requirements of the standards.

6. INTENTIONAL RADIATED EMISSIONS IN THE BAND 13.110 MHz – 14.010 MHz

Standards: FCC 47 CFR PART 15 : 2016
RSS-210 Issue 9 : 2016

Sections: 15.225 (b) (c) of FCC 47 CFR PART 15 : 2016
§A.6 (b), (c), (d) of RSS-210 issue 9 : 2016

Test configuration:

The measure is realized in near field and the results are correlated with the intentional radiated emission at 30 meters.

Field at 30 m = 39.6 dBµV/m

Frequency range: 13.110 MHz – 14.010 MHz

Detection mode: Peak

Resolution bandwidth: 10 kHz

Limit:

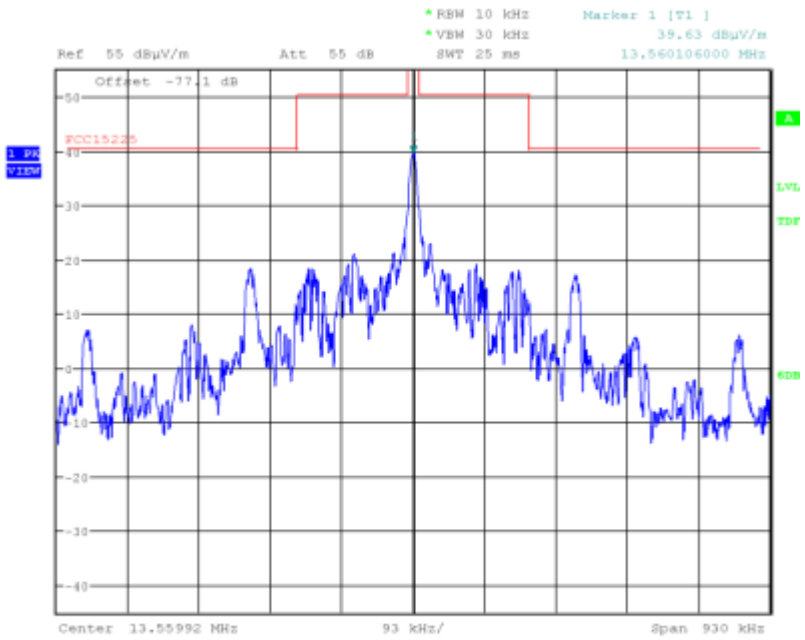
Frequencies range (MHz)	Frequency field strength		Frequency measurement distance (meters)
	µV/m	dBµV/m	
13.110 – 13.410 and 13.710 – 14.010	106.0	40.5	30
13.410 – 13.553 and 13.567 – 13.710	334.0	50.5	30

Instrumentation test list:

CATEGORY	BRAND	TYPE	Nr EMITECH
Climatic enclosure	Flonic Schlumberger	200P	2694
Receiver	Rohde & Schwarz	FSU8	9129
Tests enclosure	Emitech	LER	12079

Results:

Ambient temperature (°C): 20
Relative humidity (%): 39
Power source: 120Vac



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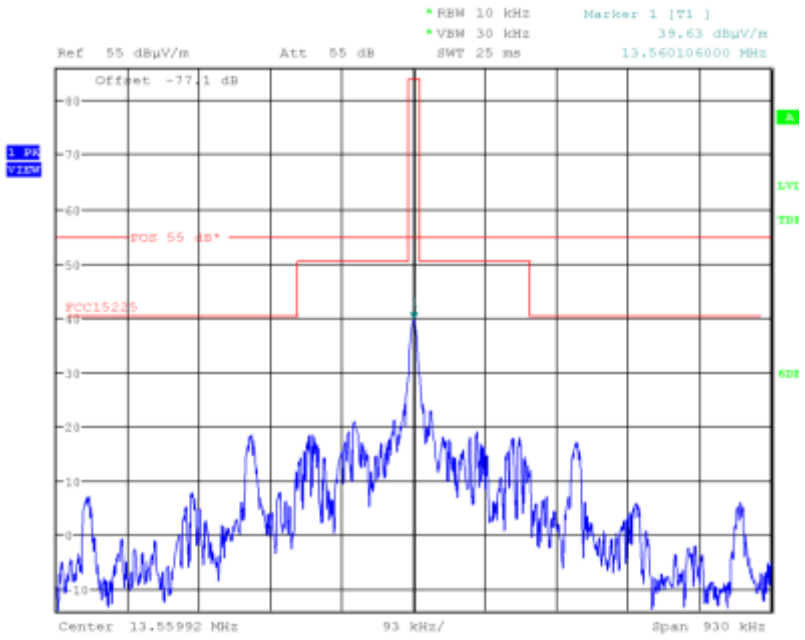

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Test conclusion: Complies with the requirements of the standards.

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

Standards: FCC 47 CFR PART 15 : 2016
RSS-Gen Issue 4 : 2014

Sections: 15.109 and 15.209 of FCC 47 CFR PART 15 : 2016
§6.4 and 8.9 of RSS-Gen Issue 4 : 2014

Equipment under test arrangement

The system is tested in open area test site.

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^{R} EMITECH
Antenna	Emco	6502	7179
Antenna	Emco	6502	9579
Cable	Micro-Coax	N-2m	11514
Cable	Câbles et Connectiques	N-13m	2452
Cable	/	N-9m syn-C1-1/1	6000
Cable	/	N-30m	4359
Cable	/	N-2m	2805
Cable	/	N-30m	4359
Cable	Câbles et Connectiques	N-13m	2452
Cable	/	N-10m	6395
Open Area Test Site	Emitech	Aunainville	0187
Receiver	Rohde & Schwarz	FSU8	9129
Receiver	Rohde & Schwarz	ESH3 (V 335.8017.52)	6569
Spectrum analyzer	Rohde & Schwarz	ESR7	12811

Results:

Ambient temperature (°C): 16
Relative humidity (%): 39
Power source: 120Vac

FREQUENCY (MHz)	ANTENNA ORIENTATION	AZIMUTH (degrees)	MEASUREMENT (dBµV/m)	LIMIT (dBµV/m)	MARGIN (dB)	Software version
27.1200	Perpendicular	180	23.2	30.0	6.8	04
27.1214	Perpendicular	180	19.2	30.0	10.8	05

Test conclusion: Complies with the requirements of the standards.

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

Standards: FCC 47 CFR PART 15 : 2016
RSS-Gen Issue 4 : 2014

Sections: 15.109 and 15.209 of FCC 47 CFR PART 15 : 2016
§6.4 and 8.9 of RSS-Gen Issue 4 : 2014

Equipment under test arrangement:

The system is tested in normalized test site.

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:

Frequency range (MHz)	Limit (dBµV/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	NR EMITECH
Antenna	Schwarzbeck	UHALP 9108	3106
Antenna	Schwarzbeck	VHA 9103	0317
Antenna mast	Maturo	MCU	8410
Antenna mast	Maturo	AM 4.0-O	8411
Cable	C&C	N-2m	11181
Cable	C&C	N-10m	11136
Cable	C&C	N-2m	11182
Cable	C&C	N-8m	11174
Preamplifier	Mini-circuit	RF	6368
Receiver	Rohde & Schwarz	R&S ESRP7 (AS)	10517
Shielded enclosure	SIDT	C.4	0549

Results:

Ambient temperature (°C): 21
Relative humidity (%): 45
Power source: 120 Vac

RFID Only

FREQUENCY (MHz)	ANTENNA ORIENTATION	HEIGHT ANTENNA (cm)	AZIMUTH (degrees)	MEASUREMENT (dBµV/m)	LIMIT (dBµV/m)	MARGIN (dB)
40.690	Vertical	100	220	37.4	40	2.6
54.233	Vertical	100	270	31.1	40	8.9

RFID and BLE Colocation

FREQUENCY (MHz)	ANTENNA ORIENTATION	HEIGHT ANTENNA (cm)	AZIMUTH (degrees)	MEASUREMENT (dBµV/m)	LIMIT (dBµV/m)	MARGIN (dB)
40.690	Vertical	100	220	37.4	40	2.6
54.233	Vertical	100	270	31.1	40	8.9

Test conclusion: Complies with the requirements of the standards.

9. UNINTENTIONAL RADIATED EMISSIONS IN THE BAND 1 GHz-13GHz

Standards: FCC 47 CFR PART 15 : 2016
RSS-Gen

Sections: 15.31 (k)

Equipment under test arrangement:

The system is tested in normalized test site.

The equipment under test (EUT) is placed on a non-conductive test table at 1.5 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: 1 GHz – 13 GHz

Detection mode: Average

Resolution bandwidth: 1MHz

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 (dBµV/m)
1000 to 13000	54.0

Instrumentation test list:

CATEGORY	BRAND	TYPE	NR EMITECH
Antenna	Emco	3115	0941
Antenna mast	Maturo	MCU	8410
Antenna mast	Maturo	AM 4.0-O	8411
Cable	C&C	N-2m	11181
Cable	C&C	N-10m	11136
Cable	C&C	N-2m	11182
Cable	C&C	N-8m	11174
Cable	C&C	N-2m	11176
Preamplifier	Mini-circuit	RF	3229
Receiver	Rohde & Schwarz	R&S ESRP7 (AS)	10517
Shielded enclosure	SIDT	C.4	0549
Spectrum analyzer	Agilent Technologies	E4407B	8092

Results:

Ambient temperature (°C): 21
Relative humidity (%): 45
Power source: 120 Vac

RFID Only (BLE desactivated)

Not any spurious has been detected.

Test conclusion: Complies with the requirements of the standard.

10. CONDUCTED EMISSION

Standards: FCC 47 CFR PART 15 : 2016
RSS-Gen Issue 4: 2014
ICES-003 / NMB-003: 2016

Test methods: Part 15.107 and 15.207
§ 8.8 of RSS-Gen Issue 4: 2014
§ 6.1 of ICES-003/NMB-003: 2016

Test configuration:

Tested cable	Measure with	E.U.T. height
Power supply 110 Vac / 60 Hz	L.I.S.N.	80 cm

Frequency band	Tested cable	Resolution bandwidth	Video bandwidth
150 kHz - 1 MHz	Power supply 110 Vac / 60 Hz	10 kHz	30 kHz
1 MHz - 30 MHz	Power supply 110 Vac / 60 Hz	10 kHz	30 kHz

Test method deviation: No

Test equipment list:

CATEGORY	BRAND	TYPE	Nr EMITECH
Cable	C&C	BNC-0.3m	9952
Cable	-	N-2m	2812
Cable	-	N-4m	2808
Limiter	Hewlett Packard	11947A	1061
LISN	Rohde & Schwarz	ESH2-Z5	0326
QP Adapter	Hewlett Packard	HP 85650 A	0491
Sheath current absorber	Emitech	Absorbeur courant de gaine	12366
Software	Nexio	BAT EMC v3.6.0.32	0000
Spectrum analyzer	Hewlett Packard	HP 8568 B	0019
Tests enclosure	Emitech	JD1	1804

Results:

See curves below including detections and limits in peak (red), average (green) and quasi-peak (blue).

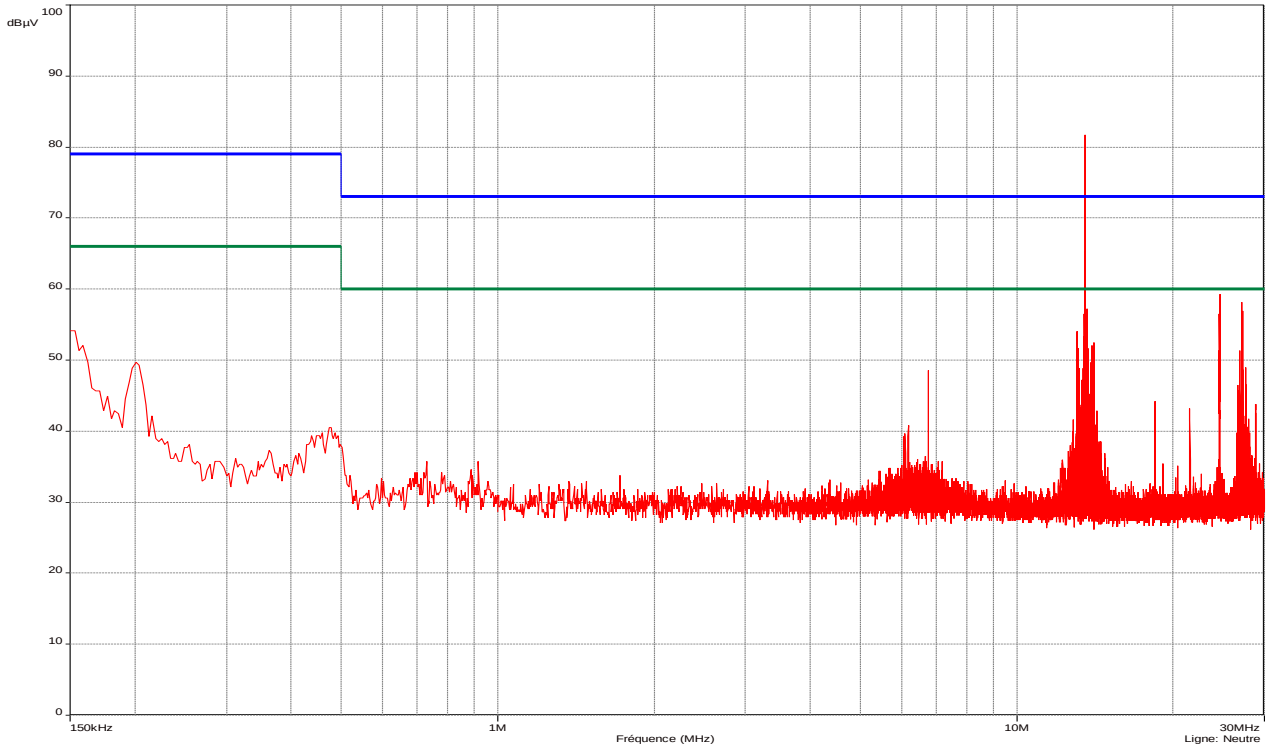
FREQUENCY (MHz)	OUTPUT	MEASUREMENT IN QUASI-PEAK DETECTION (dBµV/m)	LIMIT QUASI-PEAK DETECTION (dBµV/m)	MEASUREMENT IN AVERAGE DETECTION (dBµV/m)	LIMIT AVERAGE DETECTION (dBµV/m)
6.152	Neutral	52.6	73	29.1	60
27.120	Neutral	72.9	73	43.0	60
27.120	Phase	71.5	73	42.6	60
6.130	Phase	57.1	73	48.9	60
20.300	Phase	34.5	73	23.8	60
24.602	Phase	49.9	73	31.6	60

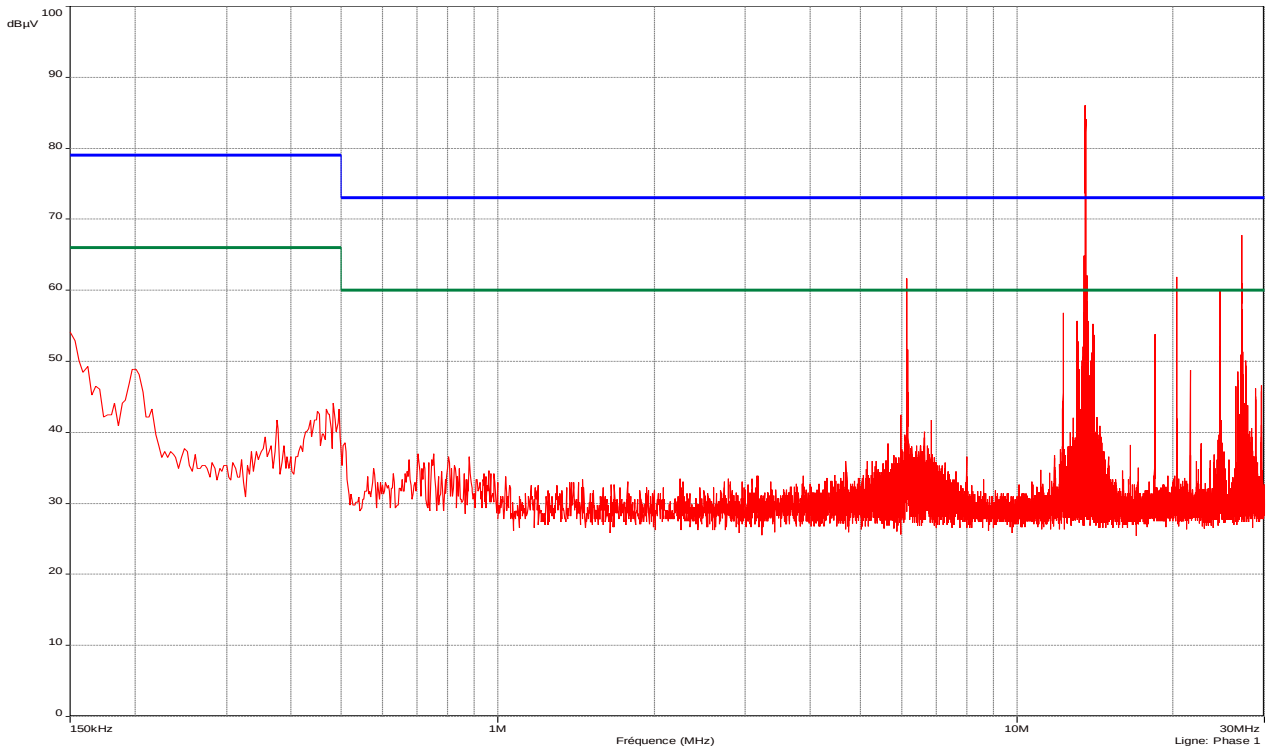
Curves 1 and 2

Access Controller ARCS-x35-G/BT1 with RFID and BLE functions

Conducted voltage emission (measurement): Power supply 110 Vac / 60 Hz in peak value detection

05/12/2016





Class: A of the standards

11. FREQUENCY DRIFT

Standards: FCC 47 CFR Part 15 : 2016
RSS-210 Issue 6 : 2016

Sections: 15.225 (e) of FCC 47 CFR PART 15 : 2016
§AB.6 of RSS-210 Issue 9 : 2016

Test configuration:

The measure is realized in near field and the results are correlated with the intentional radiated emission at 30 meters.

Field at 30 m = 39.9 dBµV/m

Test equipment used:

CATEGORY	BRAND	TYPE	Nr EMITECH
Climatic enclosure	Flonic Schlumberger	200P	2694
Receiver	Rohde & Schwarz	FSU8	9129
Resistance thermometer	GHM Greisinger	GMH 3710	12832
Tests enclosure	Emitech	LER	12079

Measurement conditions:

Resolution bandwidth: 10 kHz

Video bandwidth: 30 kHz

Test operating conditions of the equipment:

EUT is in continuous transmission mode with modulation

Results:

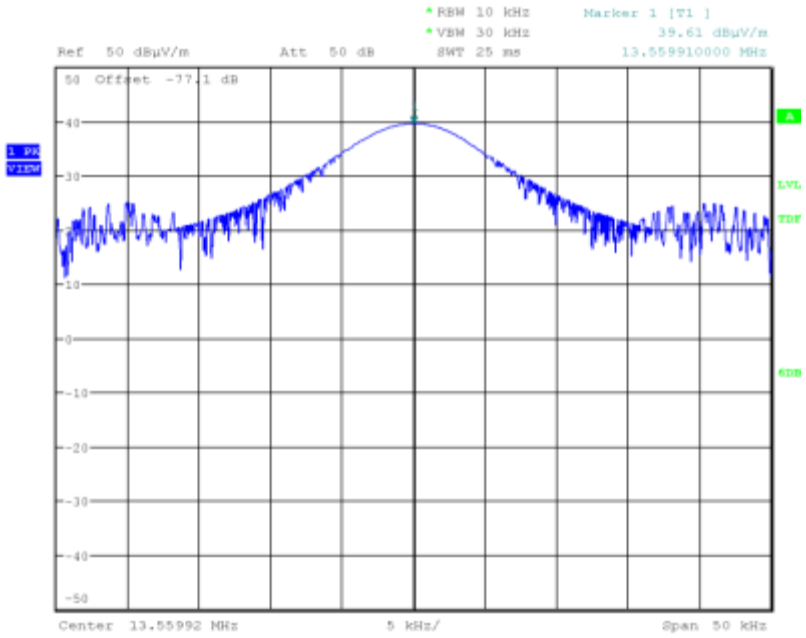
			F (MHz)	Deviation (kHz)	Curve	Limit (1)
Normal test conditions	Nominal power source (5.0 V)	Temperature (+20°C) Humidity (50%)	13.559910	- 0.090	1	± 1.356 kHz
	Minimal power source (4.25 V)		13.559960	- 0.040	2	
	Maximal power source (5.25 V)		13.559880	- 0.120	3	
Extreme test conditions	Minimal temperature (-30°C)	Nominal power source (5.0 V)	13.559990	- 0.010	4	
	Maximal temperature (+50°C)		13.559880	- 0.120	5	

(1) ± 0.01 % of the operating frequency.

Measurement uncertainty: $\pm 1 \times 10^{-7}$

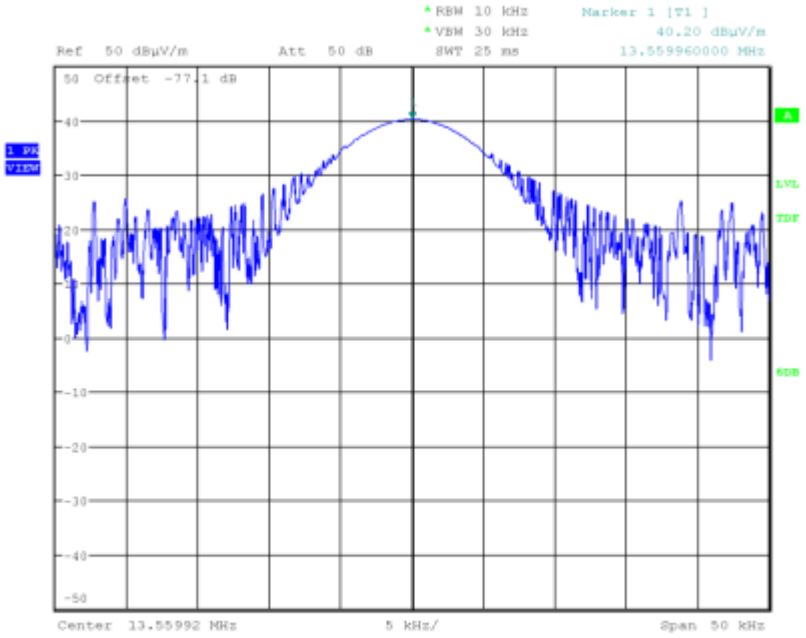
Test conclusion: Complies with the requirements of the standards.

Curve 1



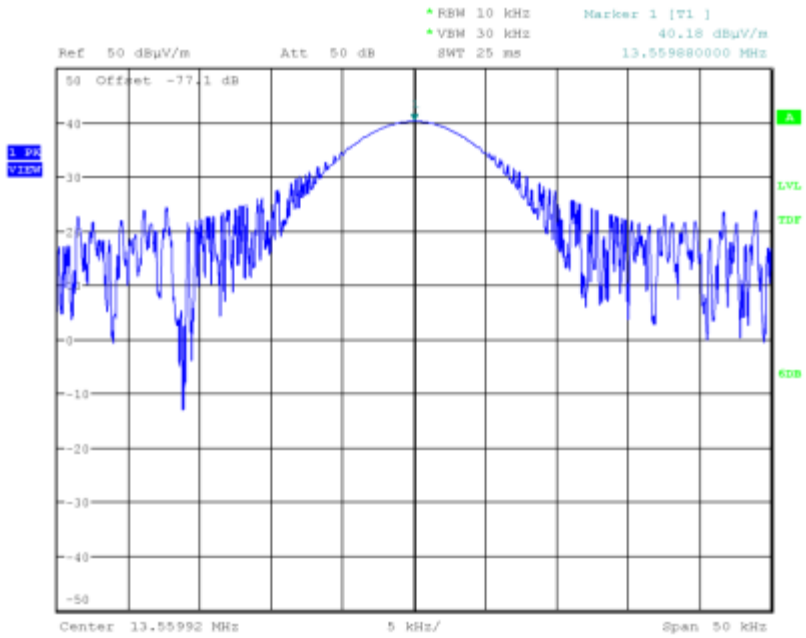
Date: 31.JAN.2017 10:37:56

Curve 2

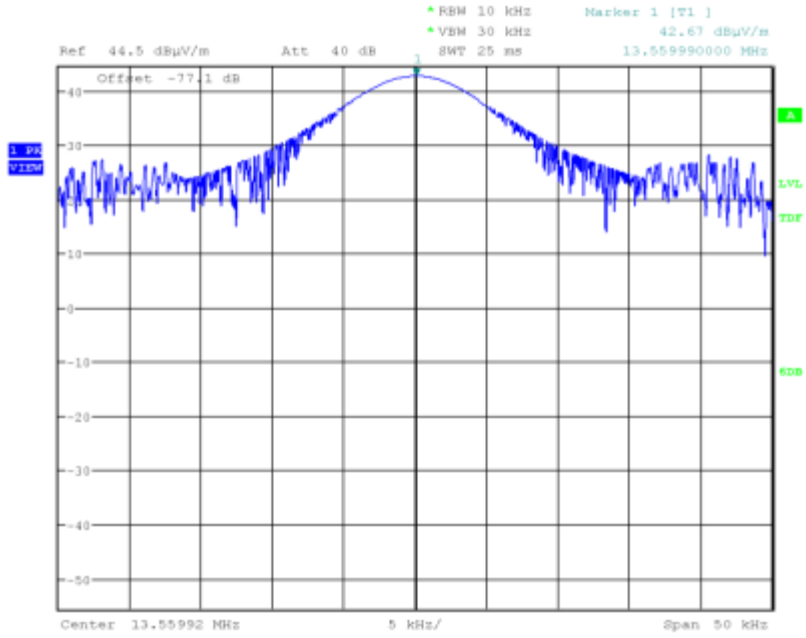


Date: 31.JAN.2017 10:40:55

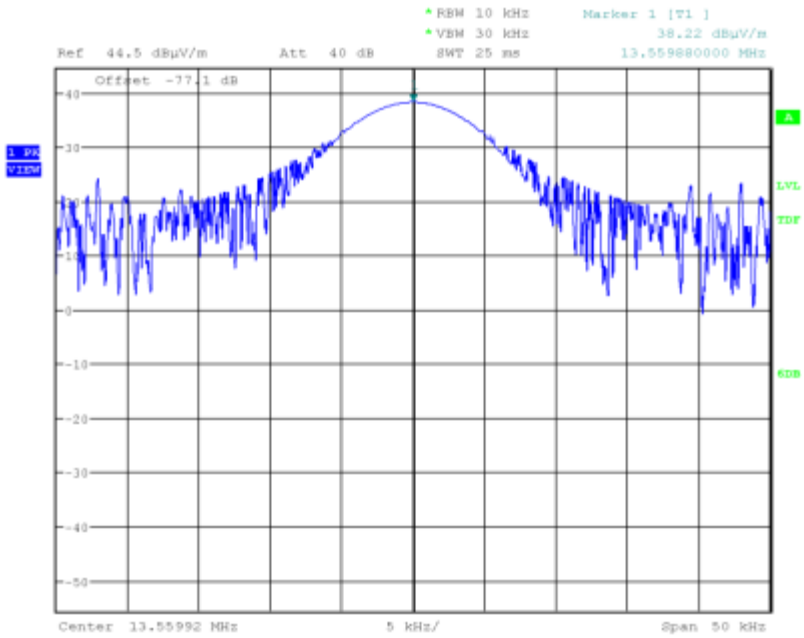
Curve 3



Curve 4



Curve 5


RBW 10 kHz
VBW 30 kHz
SWT 25 ms
Marker 1 [T1]
38.22 dBµV/m
13.559880000 MHz
Ref 44.5 dBµV/m
Att 40 dB
Offset -77.1 dB
1 PK
VIEW
A
LVL
TDF
6DB
Center 13.55992 MHz
5 kHz/
Span 50 kHz
Date: 31.JAN.2017 12:14:41

12. 20 dB BANDWIDTH

Standard: FCC 47 CFR Part 15 : 2016

Section: 15.215 (c)

Test configuration:

The measure is realized in near field and the results are correlated with the intentional radiated emission at 30 meters.

Field at 30 m = 39.9 dBµV/m

Test equipment used:

CATEGORY	BRAND	TYPE	Nr EMITECH
Climatic enclosure	Flonic Schlumberger	200P	2694
Receiver	Rohde & Schwarz	FSU8	9129
Tests enclosure	Emitech	LER	12079

Measurement conditions:

Resolution bandwidth: 1 kHz

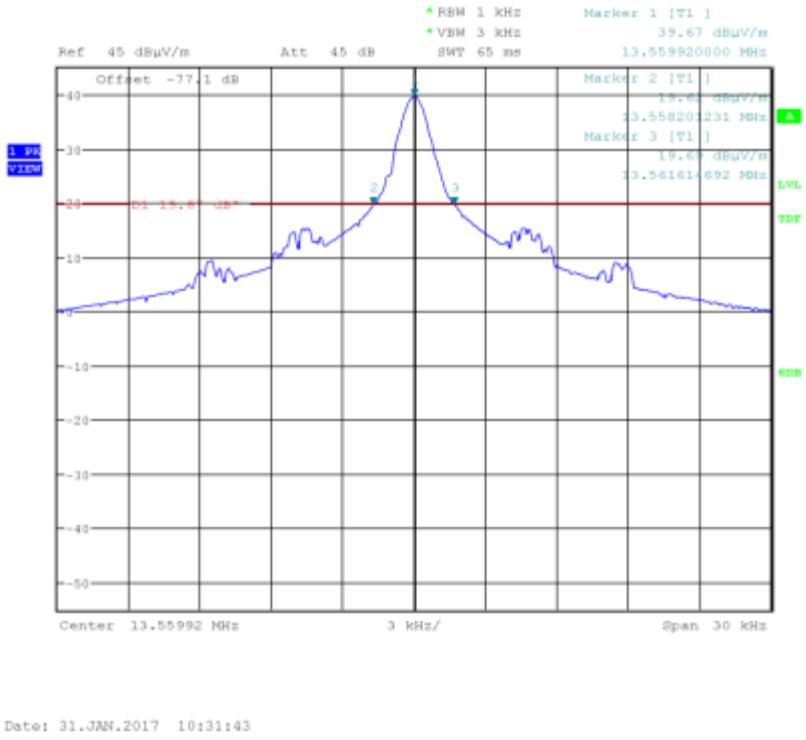
Video bandwidth: 3 kHz

Test operating conditions of the equipment:

EUT is in continuous transmission mode with modulation.

Results:

20 dBc point (Low)	20 dBc point (High)	Operating frequency band (MHz)
13.558201 MHz	13.561615 MHz	13.553 to 13.567



Test conclusion: Complies with the requirements of the standard.

13. OCCUPIED BANDWIDTH

Standard: RSS-Gen Issue 4 : 2014

Section: §6.6 of RSS-Gen Issue 4 : 2014

Test configuration:

The measure is realized in near field and the results are correlated with the intentional radiated emission at 30 meters.

Field at 30 m = 39.6 dBµV/m

Measurement conditions:

Resolution bandwidth: 9 kHz

Video bandwidth: 30 kHz

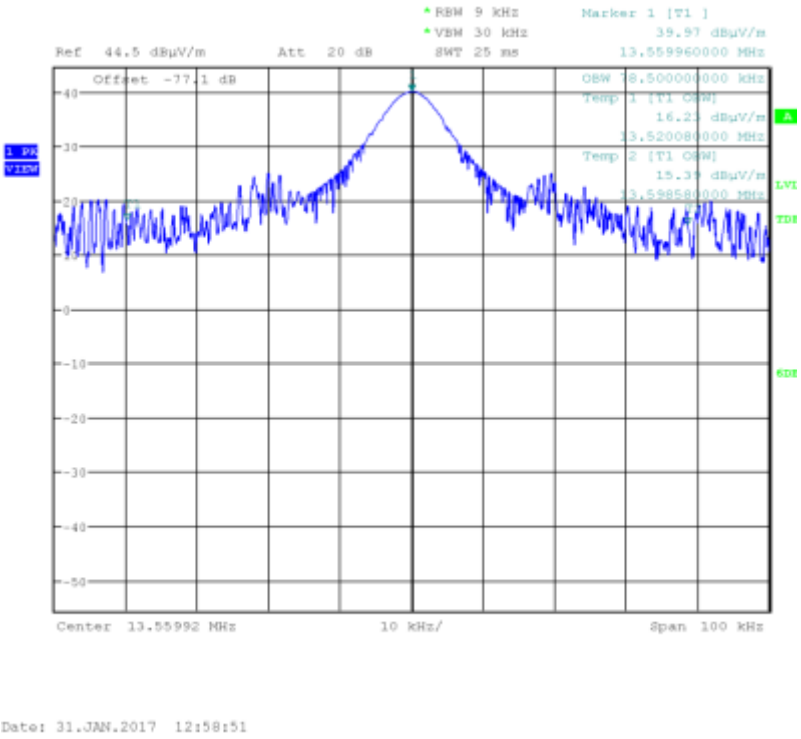
Instrumentation test list:

CATEGORY	BRAND	TYPE	Nr EMITECH
Climatic enclosure	Flonic Schlumberger	200P	2694
Receiver	Rohde & Schwarz	FSU8	9129
Tests enclosure	Emitech	LER	12079

Equipment under test operating condition:

EUT is in continuous transmission mode.

Results:



Occupied bandwidth = 78.50 kHz

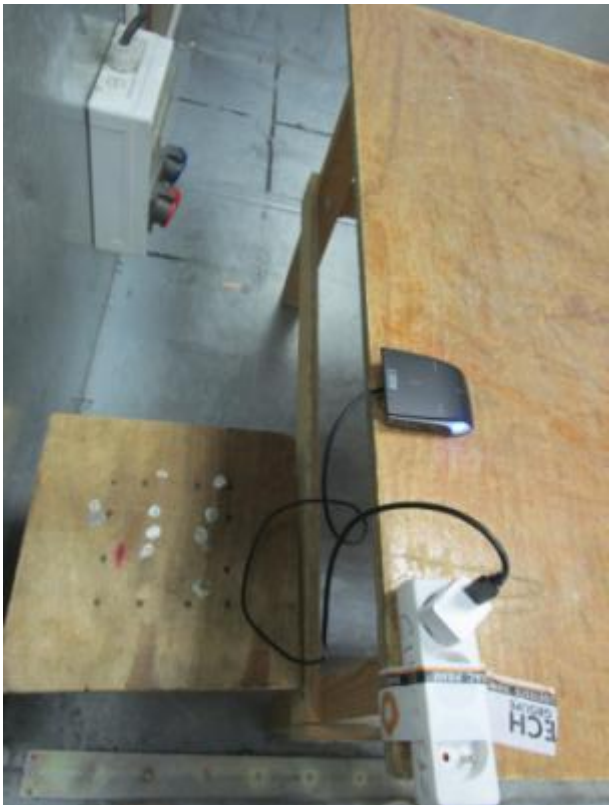
Test conclusion: Complies with the requirements of the standard.

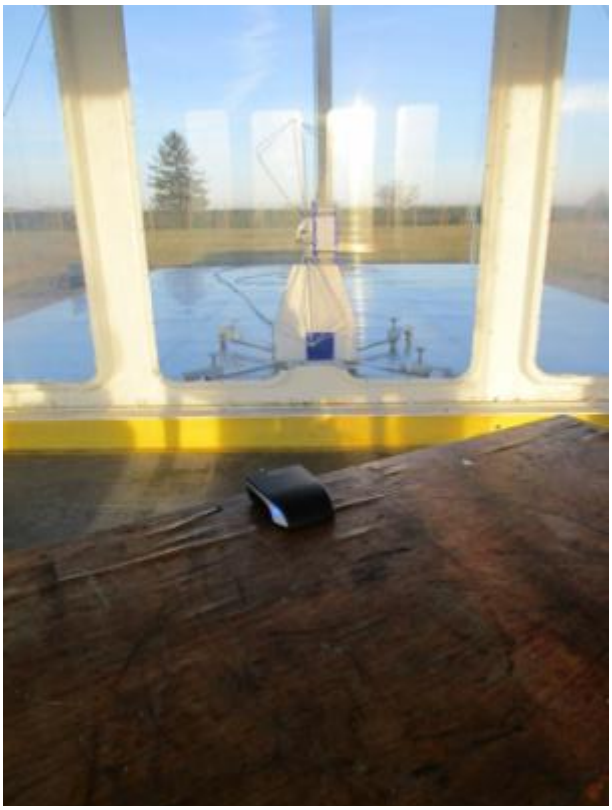
□□□ *End of report - 2 annexes to be forwarded* □□□

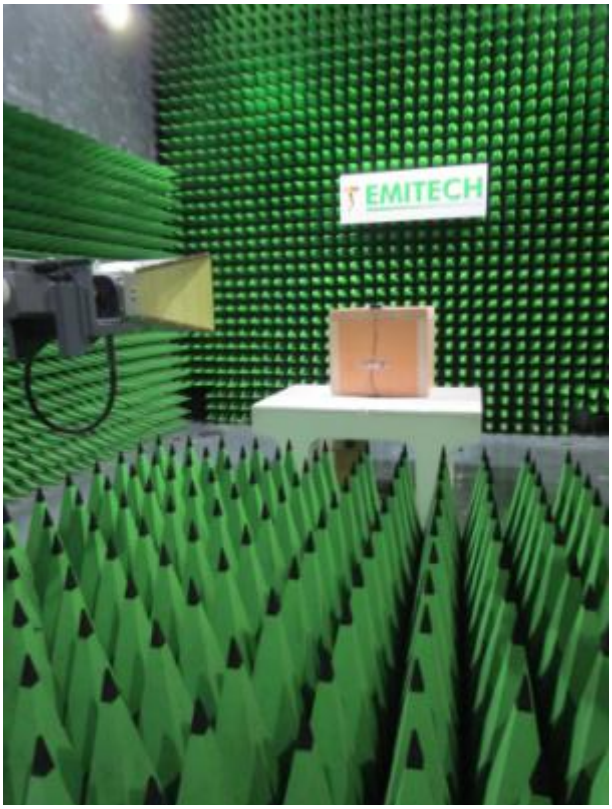
ANNEX 1:

PHOTOGRAPHIES

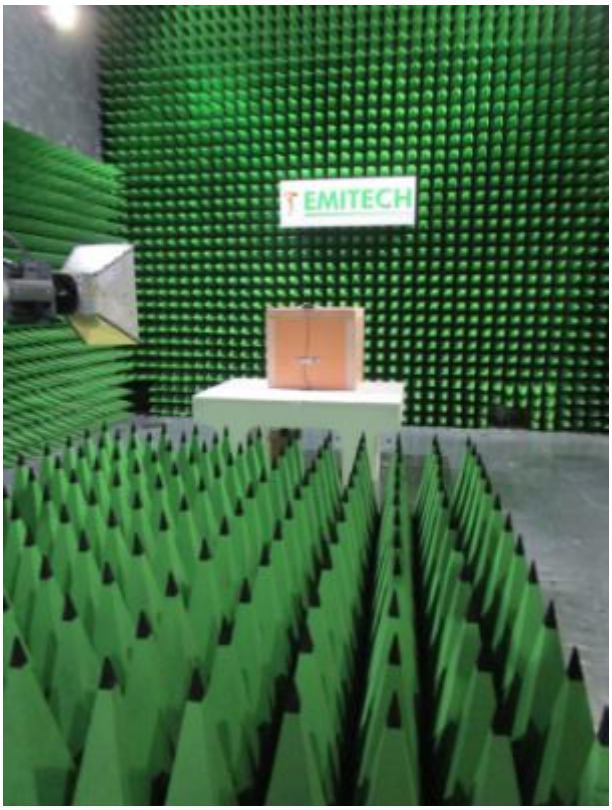
EQUIPMENT UNDER TEST (E.U.T.) AND SET-UP PHOTOGRAPHIES

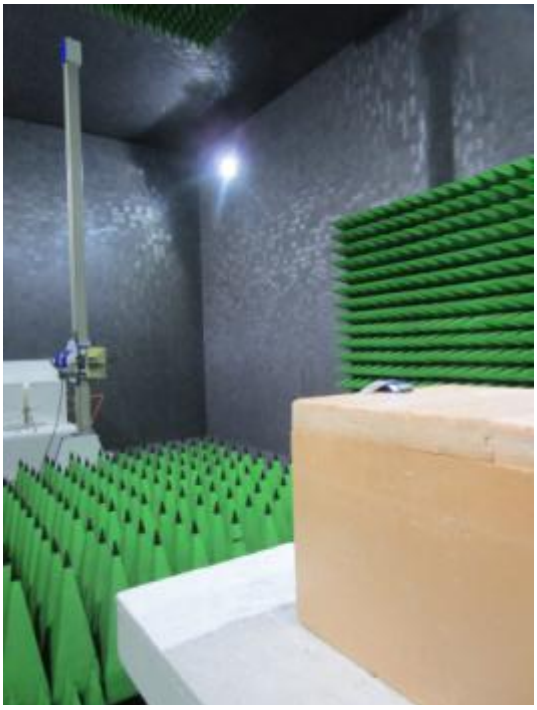





EMITECH


EMITECH


EMITECH



ANNEX 2:

CALIBRATION DATES

N° EMITECH	LAST CALIBRATION	CALIBRATION DUE DATE
0019	10/03/2016	10/05/2018
0187	24/10/2014	24/12/2017
0317	18/02/2015	18/02/2017
0326	14/05/2016	14/07/2018
0491	14/03/2016	14/05/2018
0549	16/02/2015	16/02/2018
0941	28/10/2015	28/12/2018
1061	22/12/2014	26/01/2017
2452	12/05/2015	12/05/2017
2805	14/08/2015	14/10/2017
2808	02/06/2016	02/08/2018
2812	16/04/2016	16/06/2018
3106	18/02/2015	18/02/2017
3374	28/10/2015	28/10/2018
4359	03/08/2016	03/08/2018
5175	01/04/2016	01/04/2018
6000	14/12/2016	14/02/2019
6395	11/08/2015	11/10/2017
6569	08/04/2016	08/06/2018
7179	04/05/2016	04/05/2017
8092	05/10/2015	05/12/2017
9129	04/08/2016	04/10/2018
9579	21/08/2015	21/10/2017
9952	05/03/2015	05/05/2017
10517	18/11/2016	18/01/2018
11136	01/04/2016	01/04/2018
11174	18/04/2016	18/04/2018
11176	18/04/2016	18/06/2018
11181	16/04/2016	16/04/2018
11182	20/04/2016	20/04/2018
11514	07/10/2015	07/10/2017
12366	28/10/2015	28/12/2017
12811	18/05/2016	01/08/2017
12832	10/05/2016	21/07/2017