

RRA-EMIESS22N644ALL-03Av0

Certification Radio test report

According to the standard:
CFR 47 FCC PART 15
RSS GEN – Issue 5

Equipment under test:
RS430 READER

FCC ID: *NQY-30023*
IC NUMBER: *4246A-30023*

Company:
ALLFLEX USA, Inc

Distribution: Mr LANGOUET

(Company: ALLFLEX USA, Inc)

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S61 RTY 000 INT 00018 [01]

DESIGNATION OF PRODUCT: *RS430 READER*

Serial number (S/N): *C151 00142*

Reference / model (P/N): *30020*

Software version 1: *15.38 – Jul 21 2022*
Software version 2: *1-5-9*

MANUFACTURER: *ALLFLEX USA, Inc*

COMPANY SUBMITTING THE PRODUCT:

Company: *ALLFLEX USA, Inc*

Address: *2805 East 14th Street
P.O. Box 612266
75261-2266 Dallas
Texas – USA*

Responsible: *Mr LANGOUET*

DATES OF TEST: *From 12-Oct-22 to 20-Oct-22*

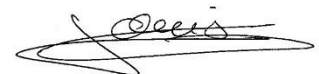
TESTING LOCATION: *EMITECH ANGERS laboratory at JUIGNE SUR LOIRE (49) FRANCE*

*FCC Accredited under US-EU MRA Designation Number: FR0009
Test Firm Registration Number: 873677*

*ISED Accredited under CANADA-EU MRA Designation Number: FR0001
Industry Canada Registration Number: 4452A*

TESTED BY: *S. LOUIS*

VISA:



WRITTEN BY: *S. LOUIS*

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REVISIONS HISTORY

Revision	Date	Modified pages	Modifications
0	25-Oct-22	/	Creation

1. INTRODUCTION

This report presents the results of radio test carried out on the following radio equipment: **RS430 Reader**, in accordance with normative reference.

The equipment under test integrates:

- a RFID radio part operational at 134.2kHz,
- NFC radio part operational at 13.56MHz,
- Bluetooth radio module already certified (FCC ID:X3ZBTMOD8 / IC: 8828A-MOD8)

All tests are performed, firstly on battery only then on representative AC/DC Adapter referenced **FJ-SW20181201500**.

This report concerns only RFID radio part.

2. PRODUCT DESCRIPTION

Category of equipment (ISED): I

Class: B

Utilization: Handheld control terminals

Antenna type and gain: Integral antenna (unknown gain)

Operating frequency: 134.2kHz

Number of channels: 1

Channel spacing: Not concerned

Modulation: ASK

Power source: 7.4Vdc Ni-MH batteries, Rechargeable
by AC/DC Adapter 100-240Vac to 12Vdc

The applicant declares that the equipment can emit during the recharge of batteries.

Power level, frequency range and channels characteristics are not user adjustable.
The details pictures of the product and the circuit boards are joined with this file.

3. NORMATIVE REFERENCE

The standards and testing methods related throughout this report are those listed below. They are applied on the whole test report even though the extensions (version, date and amendment) are not repeated.

CFR 47 FCC Part 15 (2022)	Radio Frequency Devices
ANSI C63.10	2013 Procedures for Compliance Testing of Unlicensed Wireless Devices.
RSP-100	Issue 12, August 2019 Certification of Radio Apparatus and Broadcasting equipment
RSS-Gen	Issue 5, April 2018 General Requirements for Compliance of Radio Apparatus

4. TEST METHODOLOGY

Radio performance tests procedures given in CFR 47 part 15:

Subpart C – Intentional Radiators

- Paragraph 203: Antenna requirement
- Paragraph 205: Restricted bands of operation
- Paragraph 207: Conducted limits
- Paragraph 209: Radiated emission limits; general requirements

Radio performance tests procedures given in RSS-Gen:

- Paragraph 2 - General
- Paragraph 3 - Normative publications and related documents
- Paragraph 4 - Labelling requirements
- Paragraph 6 - General administrative and technical requirements
- Paragraph 8 - Licence-exempt Radio Apparatus

5. TEST EQUIPMENT CALIBRATION DATES

Emitech Number	Model	Type	Last calibration	Calibration interval (years)	Next calibration due
0	BAT-EMC V3.18.0.26	Software	/	/	/
1406	EMCO 6502	Loop antenna	08/04/2022	1	08/04/2023
5275	R&S ESPC	Test receiver	13/07/2021	2	13/07/2023
6796	R&S FSP7	Spectrum Analyzer	30/07/2021	2	30/07/2023
7279	SUCOFLEX SF104 N 1.5m	Cable	21/05/2022	2	20/05/2024
7566	Testo 608-H1	Meteo station	22/10/2020	2	22/10/2022
8508	California instruments 1251RP	Power source	(1)	(1)	(1)
8590	RG214 N-5m	Cable	23/02/2022	2	23/02/2024
8719	Thurbly Thandar Instruments 1600	LISN	24/02/2022	2	24/02/2024
8732	Emitech	OATS	28/03/2022	3	27/03/2025
8785	N-1.5m Emitech	Cable	23/02/2022	2	23/02/2024
8855	EMITECH	Turntable and mat controller	/	/	/
8874	N-20m Gul Technologies	Cable	12/03/2022	2	11/03/2024
8896	ACQUISYS GPS8	Satellite synchronized frequency standard	/	/	/
9489	Absorber sheath current	Emitech	24/02/2022	2	24/02/2024
10651	EMITECH	Absorber sheath current	12/01/2022	2	12/01/2024
10759	COMTEST Cage 3	Anechoic chamber	/	/	/
10788	Emitech	Outside room Hors cage	/	/	/
10789	MATURO	Turntable and mat controller NCD	/	/	/
11832	N-8m - C&C	Cable	16/02/2022	2	16/02/2024
14475	Oregon Scientific BAR206	Meteo station	27/10/2021	2	27/10/2023
14539	R&S FSL18	Spectrum Analyzer	10/02/2022	2	10/02/2024
14831	Fluke 177	Multimeter	01/02/2022	2	01/02/2024
15666	R&S FSV40	Spectrum Analyzer	28/09/2022	2	27/09/2024
//	RS Commander V1.6.4	Software	/	/	/

(1) The equipment is not verified; instead, the output voltage is checked before each measurement with the calibrated multimeter.

6. TESTS RESULTS SUMMARY

6.1 CFR 47 part 15 requirements (subpart C)

Test procedure	Description of test	Criteria respected?				Comment
		Yes	No	NAp	NAs	
FCC Part 15.203	ANTENNA REQUIREMENT	X				Note 1
FCC Part 15.205	RESTRICTED BANDS OF OPERATION	X				
FCC Part 15.207	CONDUCTED LIMITS	X				
FCC Part 15.209	RADIATED EMISSION LIMITS; GENERAL REQUIREMENTS	X				

NAp: Not Applicable

NAs: Not Asked

Note 1: Integral antenna without standard connector.

6.2 RSS-Gen requirements

Test procedure	Description of test	Criteria respected ?				Comment
		Yes	No	NAp	NAs	
Paragraph 2	General	X				
Paragraph 3	Normative publications and related documents	X				
Paragraph 4	Labelling requirements	X				
Paragraph 6	General administrative and technical requirements	X				
§ 6.7	Occupied bandwidth (or 99% emission bandwidth) and x dB bandwidth	X				
Paragraph 8	Licence-exempt radio apparatus					
§ 8.1	Measurement Bandwidths and Detector Functions	X				
§ 8.2	Pulsed operation	X				
§ 8.3	Prohibition of amplifiers	X				
§ 8.4	User manual notice	X				see certification documents
§ 8.5	Measurement of licence-exempt devices on-site (in-situ)			X		
§ 8.6	Operating frequency range of devices in master/slave networks			X		
§ 8.7	Radio frequency identification (RFID) devices	X				
§ 8.8	AC power line conducted emissions limits	X				
§ 8.9	Transmitter emission limits	X				
§ 8.10	Restricted frequency bands	X				
§ 8.11	Frequency stability			X		

NAp: Not Applicable

NAs: Not Asked

7. MEASUREMENT UNCERTAINTY

To declare, or not, the compliance with the specifications, it was not explicitly taken into account of uncertainty associated with the result(s)

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for normal distribution corresponds to a coverage probability of approximately 95%.

Parameter	Emitech Uncertainty
RF power, conducted	± 0.8dB
Radiated emission valid to 26 GHz	
9kHz – 30MHz	± 2.7. dB
30MHz – 1GHz	± 5.0 dB
1GHz – 18GHz	± 5.3 dB
AC Power Lines conducted emissions	± 3.4 dB
Temperature	± 1 °C
Humidity	± 5 %

8. AC CONDUCTED EMISSION**Temperature (°C) :** 22.7**Humidity (%HR):** 43**Date :** October 20, 2022**Technician :** S. LOUIS**Standard:** FCC Part 15
RSS-GEN**Test procedure:**

For FCC Part 15: Paragraph 15.207

For RSS-Gen: Paragraph 8.8

Method of paragraph 6.2 of ANSI C63.10

Limits: Class B**Software used:** BAT-EMC V3.18.0.26**Test set up:**

The EUT is isolated and placed on a wooden table, 0.8 m over an horizontal reference plane and 0.4 m from a vertical reference plane. It is powered by an artificial main network placed on the ground reference plane. The equipment is powered with the AC power operating voltage of 120 V / 60 Hz.

See photos in appendix 2

Frequency range: 150 kHz - 30 MHz**Detection mode:** Peak / Quasi-peak / Average**Bandwidth:** 10 kHz / 9 kHz**Equipment under test operating condition:**

The equipment under test is blocked in alternance of emission and reception mode without tag.

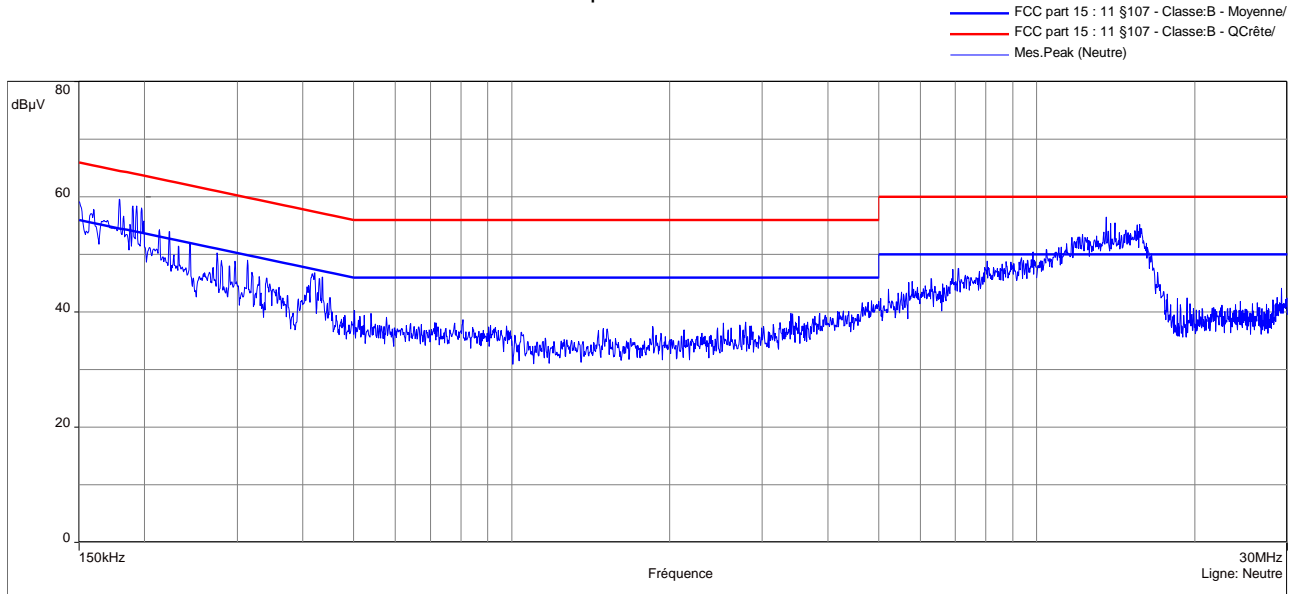
Results:

Sample N° 1

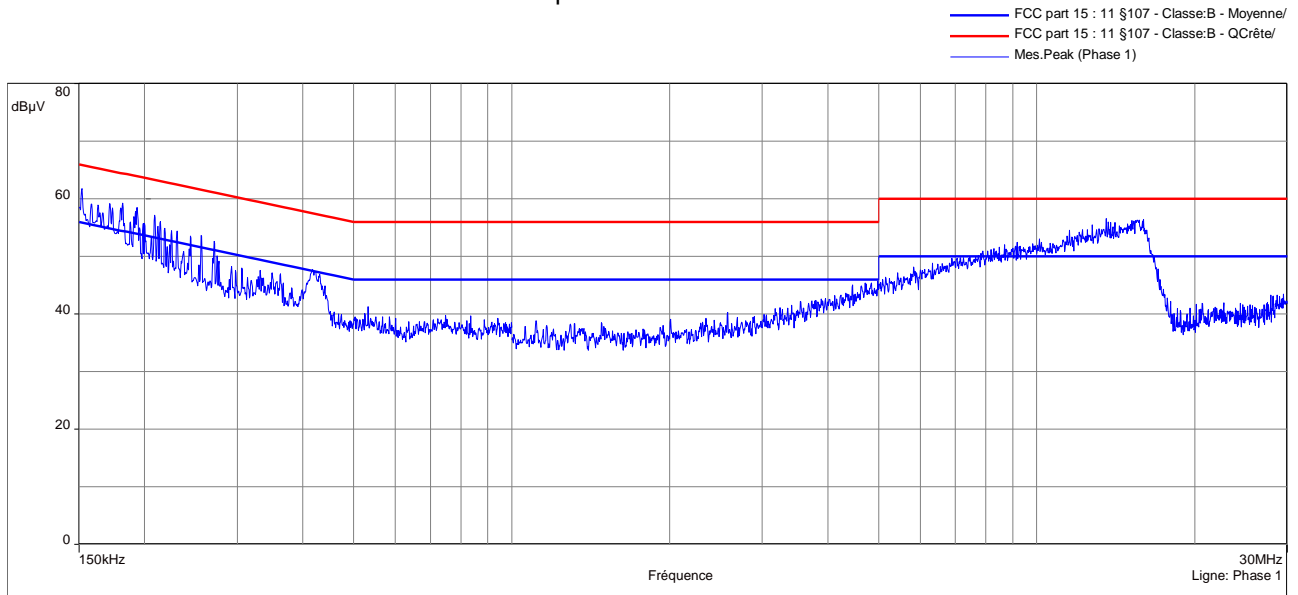
Measurement on the mains power supply:

The measurement is first realized with Peak detector.

Curve N° 1: measurement on the Neutral with peak detector



Curve N° 2: measurement on the Line with peak detector



The highest frequencies are then analyzed with Quasi-peak detector and Average detector

Table N° 1: measurement on the Neutral, for the frequency range:

Frequency (MHz)	Quasi-peak (dBµV)	QP Limit (dBµV)	QP margin (dB)	Frequency (MHz)	Average (dBµV)	Average Limit (dBµV)	Average margin (dB)
0.150	52.61	66.0	13.39	0.150	38.45	56.0	17.55
0.179	48.91	64.5	15.59	0.179	35.39	54.5	19.11
0.213	44.27	63.1	18.83	0.213	32.79	53.1	20.31
0.275	39.7	61.0	21.3	0.275	31.22	51.0	19.78
0.314	37.24	59.9	22.66	0.314	30.08	49.9	19.82
0.342	38.04	59.2	21.16	0.342	30.39	49.2	18.81
0.422	39.51	57.4	17.89	0.422	32.26	47.4	15.14
0.502	28.42	56.0	27.58	0.502	28.59	46.0	17.41
5.704	36.05	60.0	23.95	5.704	28.78	50.0	21.22
7.091	39.31	60.0	20.69	7.091	31.66	50.0	18.34
8.050	40.62	60.0	19.38	8.050	33.27	50.0	16.73
9.347	41.38	60.0	18.62	9.347	34.5	50.0	15.5
10.180	42	60.0	18	10.180	35.52	50.0	14.48
11.138	46.17	60.0	13.83	11.138	40.13	50.0	9.87
12.214	48.37	60.0	11.63	12.214	42.22	50.0	7.78
13.556	49.75	60.0	10.25	13.556	44.16	50.0	5.84
15.705	47.15	60.0	12.85	15.705	40.9	50.0	9.1
16.517	41.42	60.0	18.58	16.517	34.58	50.0	15.42
29.256	38.01	60.0	21.99	29.256	33.82	50.0	16.18

Table N° 2: measurement on the Line, for the frequency range:

Frequency (MHz)	Quasi-peak (dBμV)	QP Limit (dBμV)	QP margin (dB)	Frequency (MHz)	Average (dBμV)	Average Limit (dBμV)	Average margin (dB)
0.152	51.57	65.9	14.33	0.152	38.32	55.9	17.58
0.193	46.02	63.9	17.88	0.193	33.77	53.9	20.13
0.199	45.37	63.7	18.33	0.199	33.41	53.7	20.29
0.200	45.18	63.6	18.42	0.200	33.4	53.6	20.2
0.209	44.08	63.2	19.12	0.209	33.83	53.2	19.37
0.212	43.68	63.1	19.42	0.212	33.12	53.1	19.98
0.214	43.4	63.0	19.6	0.214	32.7	53.0	20.3
0.218	43.11	62.9	19.79	0.218	32.38	52.9	20.52
0.225	42.73	62.6	19.87	0.225	32.99	52.6	19.61
0.231	41.91	62.4	20.49	0.231	32.62	52.4	19.78
0.245	40.76	61.9	21.14	0.245	32.27	51.9	19.63
0.256	39.8	61.6	21.8	0.256	31.33	51.6	20.27
0.271	39.4	61.1	21.7	0.271	32.36	51.1	18.74
0.293	38.12	60.5	22.38	0.293	32.21	50.5	18.29
0.332	36.83	59.4	22.57	0.332	31.11	49.4	18.29
0.418	42.48	57.5	15.02	0.418	37.4	47.5	10.1
0.533	30.1	56.0	25.9	0.533	29.35	46.0	16.65
2.578	28.99	56.0	27.01	2.578	24.25	46.0	21.75
5.435	39.61	60.0	20.39	5.435	31.75	50.0	18.25
9.178	44.19	60.0	15.81	9.178	36.74	50.0	13.26
13.558	48.87	60.0	11.13	13.558	42.77	50.0	7.23

Test conclusion:

RESPECTED STANDARD

9. OCCUPIED BANDWIDTH

Temperature (°C) : 23.1 Humidity (%HR): 46 Date : October 19, 2022
 Technician : S. LOUIS

Standard: FCC Part 15
 RSS-GEN

Test procedure:
 Method of paragraphs 6.9.3 of ANSI C63.10 (99% Measurement)

Test set up:
 Test realized in near field.

Setting:

Measure	99%
Center frequency	The centre frequency of the channel under test
Detector	Peak
Span	1.5 to 5 times the OBW
RBW	1% to 5% of the OBW
VBW	3 x RBW
Trace	Max hold
Sweep	Auto

Test operating condition of the equipment:

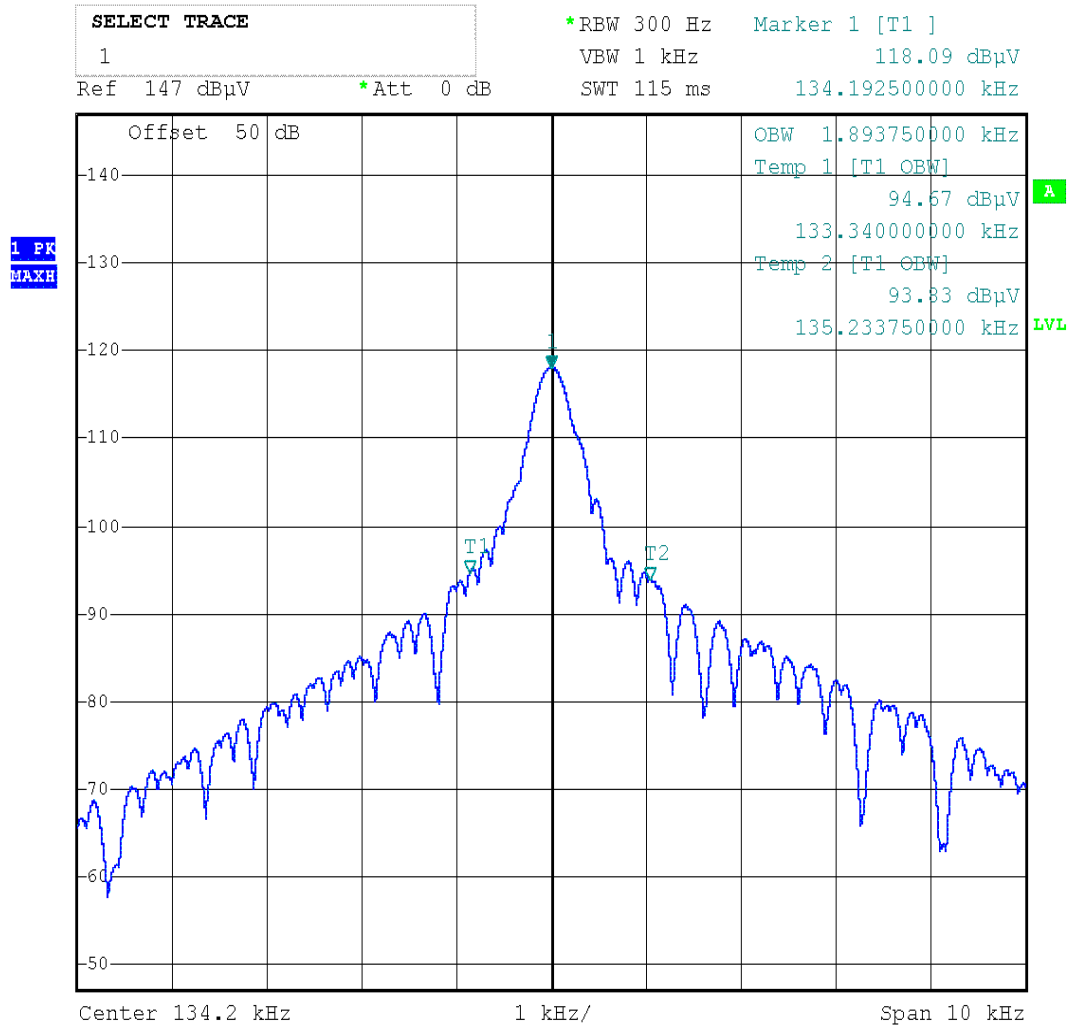
The equipment under test is blocked in continuous modulated transmission mode, at the highest output power level at which the transmitter is intended to operate.

We used for power source the internal battery of the equipment and we noted:
 Voltage at the beginning of test (Vdc): 7.73
 Voltage at the end of test (Vdc): 7.57
 Percentage of voltage drop during the test (%): 2.07

Results:

Sample N° 1

99% bandwidth – Channel 134.2kHz



Limit:

Measure realized for reporting only

10. RADIATED EMISSION LIMITS; GENERAL REQUIREMENTS**Temperature (°C) :** 21.6 / 24.7**Humidity (%HR):** 48 / 49**Date :** October 12, 2022 and
October 13, 2022**Technician :** S. LOUIS**Standard:** FCC Part 15
RSS-GEN**Test procedure:** For FCC Part 15: paragraph 209
For RSS-GEN: paragraph 8.9
Method of § 6.4 of ANSI C63.10**Test set up:**

First an exploratory radiated measurement was performed

During this phase the product is oriented in three orthogonal planes.

Then the final measurement is realized with the product on the most critical orientation.

The measure is realized on open area test site (OATS)., the EUT is placed on a rotating table, 0.8m from a ground plane.

Zero degree azimuths correspond to the front of the device under test.

Frequency range: From 9 kHz to 10th harmonic**Detection mode:** Quasi-peak ($F < 1$ GHz)

Except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000MHz. Radiated emission limits in these bands are based on measurements employing an average detector

Bandwidth: 200Hz ($9 \text{ kHz} < F < 150\text{kHz}$)
9 kHz ($150 \text{ kHz} < F < 30\text{MHz}$)
120 kHz ($30 \text{ MHz} < F < 1 \text{ GHz}$)
1 MHz ($F > 1 \text{ GHz}$)**Distance of antenna:** 10 meters (in open area test site)**Antenna height:** 1 meter**Antenna polarization:** vertical and horizontal (only the highest level is recorded)

Equipment under test operating condition:

The equipment under test is blocked in continuous modulated transmission mode, at the highest output power level at which the transmitter is intended to operate.

Charging mode:

Power source: 120 Vac by an external power supply

Percentage of voltage variation during the test (%): ± 1

Battery mode:

We used for power source the internal battery of the equipment and we noted:

Voltage at the beginning of test (Vdc): 7.4Vdc

Percentage of voltage drop during the test (%): ± 1

Results: Charging mode
Sample N° 1: Carrier = 134.2 kHz

Frequencies (kHz)	Detector P: Peak Av: Average	Field strength at 10 meters dB μ V/m ⁽¹⁾	Field strength at 300 meters dB μ V/m ⁽²⁾	Limits 300m dB μ V/m	Margin (dB)
134.2	P	85.14	26.06	45	18.94
134.2	Av	83.98	24.90	25	0.10

With antenna height: 100 cm; Azimuth: 261°; Polarization antenna: Parallel - Position 2

- (1) Field strength measured at 10 meters
(2) Field strength extrapolated at 300 meters using 40dB/decade fall off

Sample 1: Harmonics and spurious:

Frequencies (kHz)	Detector P: Peak Av: Average	Field strength at 10 meters dB μ V/m ⁽³⁾	Field strength at 300 meters dB μ V/m ⁽⁴⁾	Limits 300m dB μ V/m	Margin (dB)
268.4	P	43.93	-15.15	39	54.15
268.4	Av	41.63	-17.45	19	36.45
402.6	P	53.79	-5.29	35.5	40.79
402.6	Av	50.92	-8.16	15.5	23.66

- (3) Noise Floor measured at 10 meters
(4) Noise Floor extrapolated at 300 meters using 40dB/decade fall off

Frequencies (kHz)	Detector P: Peak Av: Average	Field strength at 10 meters dB μ V/m ⁽⁵⁾	Field strength at 30 meters dB μ V/m ⁽⁶⁾	Limits 30m dB μ V/m	Margin (dB)
671.0	QP	42.60	23.52	31.07	7.55
939.4	QP	41.99	22.91	28.15	5.24

- (5) Field strength measured at 10 meters
(6) Field strength extrapolated at 30 meters using 40dB/decade fall off

Results: Battery mode

Sample N° 1: Carrier = 134.2 kHz

Frequencies (kHz)	Detector P: Peak Av: Average	Field strength at 10 meters dB μ V/m (1)	Field strength at 300 meters dB μ V/m (2)	Limits 300m dB μ V/m	Margin (dB)
134.2	P	85.07	25.98	45	19.02
134.2	Av	83.91	24.83	25	0.17

With antenna height: 100 cm; Azimuth: 264°; Polarization antenna: Parallel - Position 2

- (1) Field strength measured at 10 meters
- (2) Field strength extrapolated at 300 meters using 40dB/decade fall off

Sample 1: Harmonics and spurious:

Frequencies (kHz)	Detector P: Peak Av: Average	Field strength at 10 meters dB μ V/m (3)	Field strength at 300 meters dB μ V/m (4)	Limits 300m dB μ V/m	Margin (dB)
268.4	P	42.08	-17.00	39	56.00
268.4	Av	39.78	-19.30	19	38.30
402.6	P	54.20	-4.88	35.5	40.38
402.6	Av	51.33	-7.75	15.5	23.25

- (3) Noise Floor measured at 10 meters
- (4) Noise Floor extrapolated at 300 meters using 40dB/decade fall off

Frequencies (kHz)	Detector P: Peak Av: Average	Field strength at 10 meters dB μ V/m (5)	Field strength at 30 meters dB μ V/m (6)	Limits 30m dB μ V/m	Margin (dB)
671.0	QP	42.68	23.60	31.07	7.47
939.4	QP	41.78	22.70	28.15	5.45

- (5) Field strength measured at 10 meters
- (6) Field strength extrapolated at 30 meters using 40dB/decade fall off

Applicable limits:

for 9 kHz \leq F \leq 490 kHz :	2400/F(kHz) at 300 meters
for 490 kHz < F \leq 1.705 MHz :	24000/F(kHz) at 30 meters
for 1.705 MHz < F \leq 30 MHz :	29.5 dB μ V/m at 30 meters
for 30 MHz < F \leq 88 MHz :	40 dB μ V/m at 3 meters
for 88 MHz < F \leq 216 MHz :	43.5 dB μ V/m at 3 meters
for 216 MHz < F \leq 960 MHz :	46 dB μ V/m at 3 meters
Above 960 MHz :	54 dB μ V/m at 3 meters

Test conclusion:

RESPECTED STANDARD

□□□ End of report, 1 appendix to be forwarded □□□

APPENDIX 1: Test equipment list

AC conducted emissions

TYPE	MANUFACTURER	EMITECH NUMBER
Outside room Hors cage	Emitech	10788
Satellite synchronized frequency standard GPS8	ACQUISYS	8896
Test receiver ESPC	Rohde & Schwarz	5275
Spectrum Analyzer FSP7	Rohde & Schwarz	6796
Spectrum Analyzer FSL18	Rohde & Schwarz	14539
LISN 1600	Thurbly Thandar Instruments	8719
Absorber sheath current	Emitech	9489
Absorber sheath current	Emitech	10651
Cable N-5m RG214	GYL Technologies	8590
Power source 1251RP	California instruments	8508
Multimeter 177	Fluke	14831
Meteo station 608-H1	Testo	7566
Software	BAT-EMC V3.18.0.26	0000

Occupied bandwidth

TYPE	MANUFACTURER	EMITECH NUMBER
Satellite synchronized frequency standard GPS8	ACQUISYS	8896
Spectrum Analyzer FSP7	Rohde & Schwarz	6796
N-1.5M Cable	SUCOFLEX	7279
Power source 1251RP	California instruments	8508
Multimeter 177	Fluke	14831
Meteo station 608-H1	Testo	7566
Software	RS Commander V1.6.4	//

Radiated emission limits; general requirements

TYPE	MANUFACTURER	EMITECH NUMBER
Open test site	EMITECH	8732
Turntable and mat controller	EMITECH	8855
Full anechoic chamber	EMITECH	10759
Turntable and mat controller NCD	MATURO	10789
Satellite synchronized frequency standard GPS8	ACQUISYS	8896
Test receiver ESPC	Rohde & Schwarz	5275
Spectrum Analyzer FSV40	Rohde & Schwarz	15666
Loop antenna 6502	EMCO	1406
N-1.5M-Cable	GYL Technologies	8785
N-20M Cable	Emitech	8874
N-8M Cable	C & C	11832
Power source 1251RP	California instruments	8508
Multimeter 177	Fluke	14831
Meteo station BAR 206	Oregon Scientific	14475
Meteo station 608-H1	Testo	7566
Software	BAT-EMC V3.18.0.26	0000