Rapport d'essais / *Test Report*

N° : **14435-FCC/IC-1**

FCC Test Firm Designation Number: FR0014
ISED Wireless Device Testing Laboratory CAB Number: FR0004

Matériel testé : *Equipment under test*:	**MOTOBLINKERS – MBK1 (RXD & RXG)** *(Trademark / Marketing name or product reference)*

Client :
Customer:
SGS France
135, rue René Descartes / CS 30584
13857 Aix en Provence cedex 3 – France

Demandeur de certification :
Applicant for certification:
MOTOBLINKERS SAS
32 rue Aristide Briand
77340 Pontault-Combault France

Référence de la proposition :
Proposal number:
062021-24968

Numéro d'affaire :
Work number :
14435

Date de l'essai :
Date of test:
Le 15 avril 2022
April 15th, 2022

Objectif des essais :
Test purpose:
EMC qualification according to standard CFR 47, FCC Part 15, Subpart B & Industry Canada ICES-003 (Issue 7/2020)
Equipment type: Class B digital device
Measurement standard: ANSI C63.4 (2014+A1/2017)

Lieu du test:
Test location:
SMEE, 385 rue René Rambaud
38500 VOIRON - France

Test réalisé par :
Test realized by:
Géraldine Guyennot

Conclusion :
Conclusion:
L'équipement satisfait aux prescriptions et essais des normes citées en référence.
The appliance complies with requirements and tests of above mentioned standards.

Ed.	Date	Modifications / Pages	Written by:	Approved by: Visa
1	April 19th, 2022	Initial Edition	Géraldine Guyennot *Test operator* Signature numérique de Géraldine Guyennot	Laurent CHAPUS *Technical Manager*

COORDONNEES
SMEE
385 rue René Rambaud – ZA Le Parvis 2
38500 VOIRON - France
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1. Normative references

Standard:

FCC qualification according to:		
Standards	**Applied**	**Title**
ANSI C63.4 (2014 + A1/2017)	X	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.
CFR47, Part 15 (April 2022)	X	Telecommunication – Federal Communication Commission – Radio frequency devices, Subpart B — Unintentional Radiators. Sections 15.107 / 15.109

ISED Canada qualification according to:		
Standards	**Applied**	**Title**
ANSI C63.4 (2014 + A1/2017)	X	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.
ICES-003 (Issue 7 - 2020)	X	ISED Canada ICES-003 (Information Technology Equipment (ITE)) — Limits and methods of measurement.

Deviation from the standard: None.

2. Test synthesis

Class B digital device:

ESSAI D'EMISSION / ***EMISSION TEST***	**LIMITES FCC CFR 47, PART 15 /** ***LIMITS FCC CFR 47, PART 15***			**RESULTATS /** ***RESULTS***
Emissions conduites sur les bornes d'alimentation / *Conducted emissions at power supply ports* 150kHz-30MHz	**Freq**	**Quasi-Peak (dBµV)**	**Average (dBµV)**	N/A (1)
	150-500kHz	66 \ 56	56 \ 46	
	0.5-5MHz	56	46	
	5-30MHz	60	50	
Emissions rayonnées / *Radiated emissions* 30MHz-1GHz	**Measure at 3m** 30MHz-88MHz : 40.0 dBµV/m (QP) 88MHz-216MHz : 43.5 dBµV/m (QP) 216MHz-960MHz : 46.0 dBµV/m (QP) 960MHz-1GHz : 54.0 dBµV/m (QP) **Measure at 3m** 1GHz-2GHz : 54.0 dBµV/m (AV) 74.0 dBµV/m (PK)			**PASS**

ESSAI D'EMISSION / ***EMISSION TEST***	**LIMITES ICES-003 /** ***LIMITS ICES-003***			**RESULTATS /** ***RESULTS***
Emissions conduites sur les bornes d'alimentation / *Conducted emissions at power supply ports* 150kHz-30MHz	**Freq**	**Quasi-Peak (dBµV)**	**Average (dBµV)**	N/A (1)
	150-500kHz	66 \ 56	56 \ 46	
	0.5-5MHz	56	46	
	5-30MHz	60	50	
Emissions rayonnées / *Radiated emissions* 30MHz-1GHz	**Measure at 3m** 30MHz-88MHz : 40.0 dBµV/m (QP) 88MHz-216MHz : 43.5 dBµV/m (QP) 216MHz-230MHz : 46.0 dBµV/m (QP) 230MHz-960MHz : 47.0 dBµV/m (QP) 960MHz-1GHz : 54.0 dBµV/m (QP) **Measure at 3m** 1GHz-2GHz : 54.0 dBµV/m (AV) 74.0 dBµV/m (PK)			**PASS**

Note: FCC part 15.109 limits applied as worst case.
N/A: Not applicable
(1): Equipment operates solely from internal battery

- **General conclusion:**

Measures and tests performed on the sample of the products *MOTOBLINKERS – MBK1 (RXD & RXG)*, in configuration and description presented in this test report, show compliance with standards FCC CFR 47, PART 15, Subpart B and ICES-003.

3. Equipment Under Test (EUT)

Nom / *Identification*	**MOTOBLINKERS – MBK1 (Rx)** *(Trademark / Marketing name or product reference)*	PN: RXD & RXG Sn: None
Fabricant / *Manufacturer*	**MOTOBLINKERS SAS** Armindo SIMOES 32 rue Aristide Briand 77340 Pontault-Combault France	
FCC ID: **Model / HVIN:**	2A6IB-MBK1RX MBK1 RXD / MBK1RXG	
Alimentation / *Power supply*	9V internal battery for each receiver	
Auxiliaires / *Auxiliaries*	Motoblinkers – Transmitter (Remote control)	

Entrées-Sorties / *Input / Output*

	Câbles pour essai / *Cables for test*	Blindé / *Shielded*	Prévu pour >3m / *Intended for >3m*
None	-	-	-

Version programme / *Firmware version*	N.C.
Mode de fonctionnement / *Running mode*	Test mode: The transmitter send a command to blinkers (2 receivers) every 1 second. Each blinker (left and right) opens and closes every seconds. Both blinkers are mounted on a horse harness.
Fréquence max interne EST / *Max internal EUT frequency*	32MHz
Dimensions de l'EST / *Dimensions of EUT*	Receiver system: 400mmx250mmx160mm (RXD or RXG device)
Information sur l'équipement / Equipment information	- RF communication: BLE - RF approval type: Modular approval (Contains FCC ID: A8TBM70ABCDEFGH / IC : 12246A-BM70BLES1F2) - Frequency band: 2400 to 2483.5 MHz (Tx & Rx, Wideband Data Transmission systems) - BLE Power Setting: No setting - Modulation: Bluetooth Low Energy (1Mbps) - Powered by 9V DC from internal battery - Equipment intended for use as a portable device - Equipment designed for continuous operation
Note / *Note*	Information above are declared by the applicant and are under his responsibility.

Photographies de l'équipement sous test /
Photography of the equipment under test

4. Test conditions

Power supply voltage:
Equipment under test : 9V internal battery for each receiver
AC mains : none

5. Modifications of the EUT

None

6. Special accessories

None

7. Measurement Uncertainty

Test Description	Expanded uncertainty
Conducted emissions test (150k-30MHz, AC mains)	± 3.5dB
Radiated emission test (30-300MHz, SAR)	± 5.6dB
Radiated emission test (300-1000MHz, SAR)	± 5.3dB
Radiated emission test (1-18GHz, FAR)	± 5.6dB
Temperature	± 1°C
AC and DC voltage	±1%

Note: Expended uncertainty at 95% confidence (k=2)

8. Field Strength Calculation

The field strength (level) is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation is as follow:
FS = RA + AF + CF – AG
Where FS = Field Strength (Level)
RA = Receiver Amplitude (Meter Reading)
AF = Antenna Factor
CF = Cable Factor
AG = Amplifier Gain
Total factor = AF+CF-AG
Margin value = Emission level – Limit value

Example:
RA: 14.0dBµV / AF: 16.5 dBm^{-1} / CF: 3.5dB / AG: 15dB
→ Total factor: 5dBm^{-1}
→ Field level: 19.0dBµV/m (-21.0dB for margin if limit is 40dBµV/m)

9. Radiated Emission Measurement (30MHz-1GHz)

TEST: Limits for radiated disturbance 30 MHz – 1 GHz		**Verdict**
Method: Measurements were made in a 3-meter Semi Anechoic Room (SAR) up to 1GHz and in a 3-meter Full Anechoic Room (FAR) from 1GHz that complies to CISPR16 / ANSI C63.4. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 3 meter. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in horizontal and vertical polarities. Final measurements (Peak, Quasi-peak, Average) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4 m. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.		**PASS**
Laboratory Parameters:	Required prior to the test	During the test
Ambient Temperature	17 - 27 °C	22°C ± 2
Relative Humidity	25 - 65 %	37% ± 5
Fully configured sample scanned over the following frequency range	Frequency range on each side of line	Measurement Point
	30MHz – 1GHz	3m

Limits

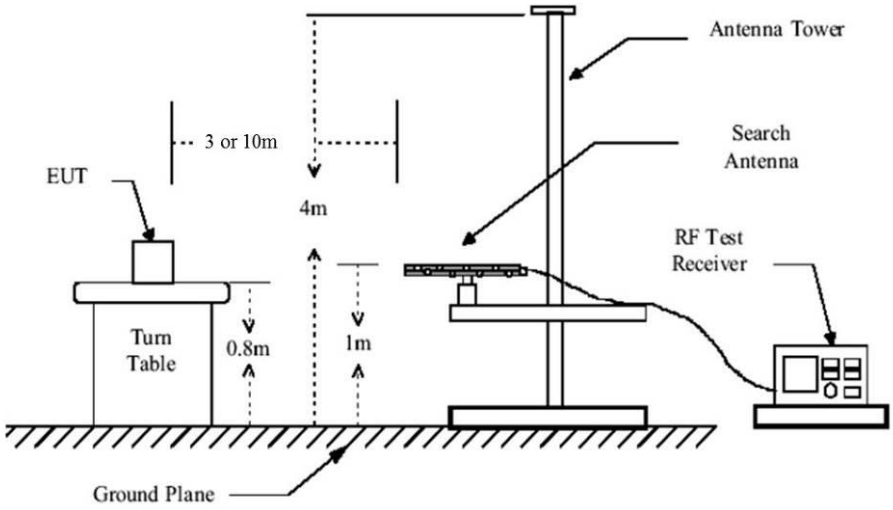
Frequency (MHz)	Limit (dBµV/m)	
	Level / Detector / Distance	Results
30 to 88	40.0 / QP / 3m	**Pass**
88 to 216	43.5 / QP / 3m	**Pass**
216 to 960	46.0 / QP / 3m	**Pass**
960 to 1000	54.0 / QP / 3m	**Pass**
Above 1GHz	54.0 / AV / 3m 74.0 / PK / 3m	N/A

Supplementary information:
Test location: SMEE
Test date: April 15th, 2022 by G. GUYENNOT
Power supply voltage: 9V DC with internal battery

Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Biconnic antenna	COM-POWER	AB- 900A	ANT-201-021	2020/12	2022/12
Log-periodic antenna	EMCO	3146	ANT-191-019	2021/7	2023/7
RF cable	HUBER+SUHNER	SF104/3m	CAB-141-030	2022/4	2023/3
RF cable	TMS	LMR-400 / 9m	CAB-201-039	2022/4	2023/3
Semi anechoic room	COMTEST	218292	CAG-201-002	2022/4	2025/2
Antenna mast	Innco- Systems	MA4640-XP-ET	MAT-201-002	-	-
Turntable	Innco- Systems	DS1500-S-1t	PLA-201-003	-	-
Measuring Rec	Rohde&Schwarz	ESRP	REC-151-002	2021/12	2023/12

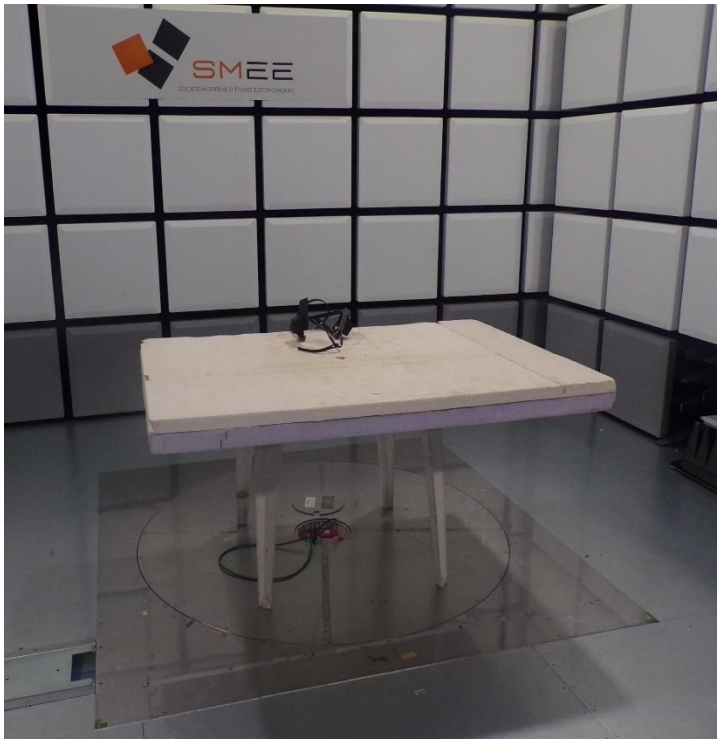
Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
EMC Software	NEXIO	BAT EMC V3.21	SOF-101-001	-	-
Ref. Comb generator	SMEE	EMR-10M	REF-111-002	-	-

Test Setup for radiated emission



Test setup for 30MHz-1GHz

Photo of test setup for Radiated Disturbance



Measurement < 1GHz, in semi anechoic room

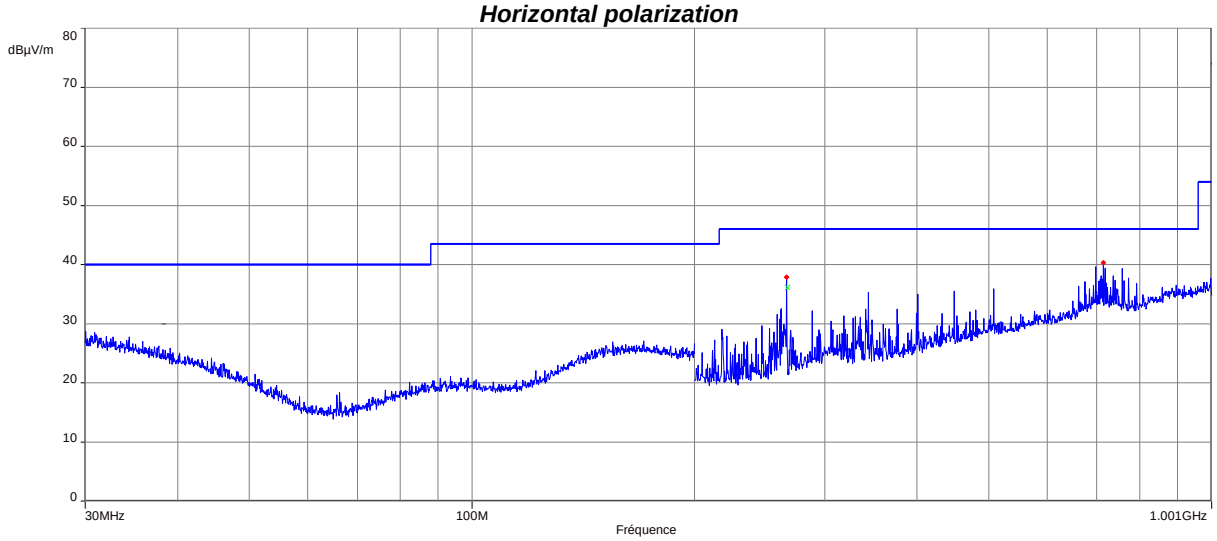
Tabulated Results for Radiated Disturbance (3m measurement in semi anechoic room, 30MHz-1GHz)								
FREQ	**Field level**	**Field level**	**CF total**	**Pol**	**Antenna height**	**Table angle**	**Limit**	**Margin**
MHz	(QP) dBµV/m	(Pk) dBµV/m	dB		m	Degree	(QP) dBµV/m	dB
267.067	18.81	36.12	13.53	H	1.72	4.1	46	**-27.19**
714.461	22.88	37.02	23.19	H	1	178.6	46	**-23.12**
732.236	20.98	35.47	22.8	V	1.27	69.6	46	**-25.02**

Supplementary information:
Frequency list measured in the semi anechoic room has been created with pre-scan results.
Note: Worst case measurements for all positions of the equipment.

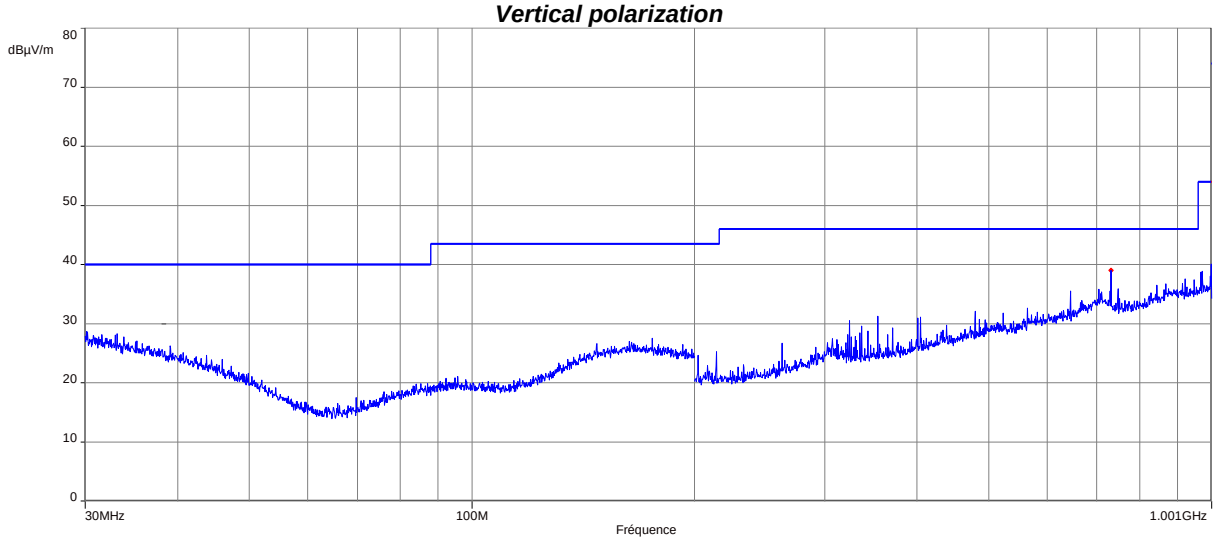
Frequency band investigated:	30MHz-1GHz
RBW:	120kHz
Measurement distance:	3m
Limit:	FCC Part 15.109 / ICES-0003, Class B
Final measurement detector:	Quasi-Peak
RESULT:	PASS

Graphical representation of Radiated Disturbance Measurement
(Peak detection, Semi Anechoic Room pre-scan, 30MHz-1GHz / 3m)

Horizontal polarization



Vertical polarization



------ : Peak measure	------ : Class B limit (FCC/ISED / 3m)

END OF TEST REPORT