

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

Matériel testé :
Equipment under test:

MOTOBLINKERS – MBK1 TX
(Trademark / Marketing name or product reference)

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

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

Référence de la proposition : 062021-24968
Proposal number:

Numéro d'affaire : 14435
Work number :

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

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

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

Test réalisé par : Géraldine Guyennot
Test realized by:

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

Ed.	Date	Modifications Pages	Written by:	Approved by: Visa
1	April 19 th , 2022	Initial Edition	Géraldine Guyennot	Laurent CHAPUS
2	July 22 th , 2022	Correction after TCB review	Test operator	Technical Manager

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Changes made to a new edition of this report are indicated by a vertical line to the left of the page.



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Rapport d'essai / *Test Report*

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1. Normative references

Standard:

FCC qualification according to:		
Standards	Applied	Title
ANSI C63.4 (2014 + A1/20017)	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 + A1/20017)	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.



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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 / <i>Conducted emissions at power supply ports</i> 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 / <i>Radiated emissions</i> 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 / <i>Conducted emissions at power supply ports</i> 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 / <i>Radiated emissions</i> 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.

• General conclusion:

Measurements and tests performed on the sample of the products *Motoblinders – MBK1 TX*, in configuration and description presented in this test report, show compliance with standards FCC CFR 47, PART 15, Subpart B and ICES-003.



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3. Equipment Under Test (EUT)

Nom /
Identification

MOTOBLINKERS – MBK1 TX
(Trademark / Marketing name or product reference)

PN: MBK1 TX
Sn: None

Alimentation /
Power supply

3V DC internal battery

Auxiliaires /
Auxiliaries

Motoblinders – Receiver (MBK1 RXD & RXG)

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.

Fréquence max interne EST /
Max internal EUT frequency

32MHz

Dimensions de l'EST /
Dimensions of EUT

Transmitter: 55mmx28mmx25mm

Information sur l'équipement /
Equipment information

- RF communication: BLE
- RF approval type: Modular approval (Contains FCC ID: A8TBM70ABCDEF GH / 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 3V 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.



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





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4. Test conditions

Power supply voltage:

Equipment under test : 3V DC internal battery

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: Expanded 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
<u>Method:</u> 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	25°C ± 2	
Relative Humidity	25 - 65 %	40% ± 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 15 th , 2022 by G. GUYENNOT			
Power supply voltage: 3V 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



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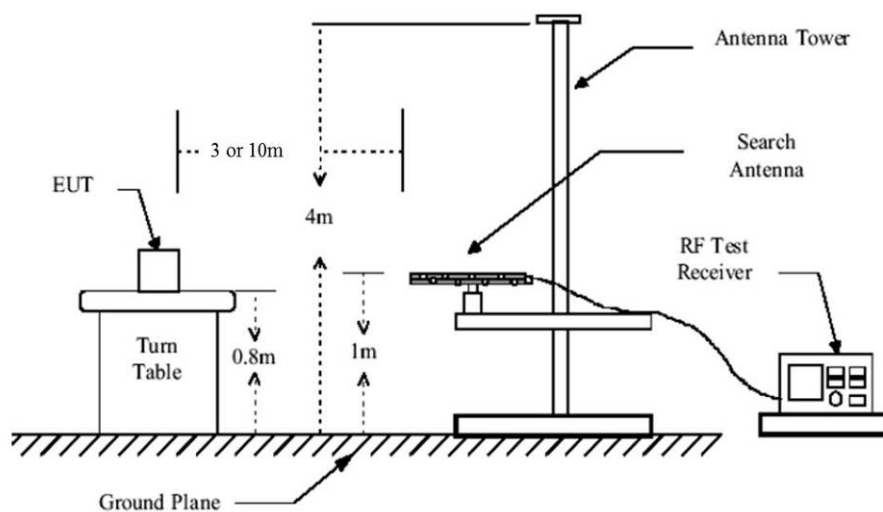
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Test Equipment Used

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
Levels are at least 10dB below applicable limits								
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					



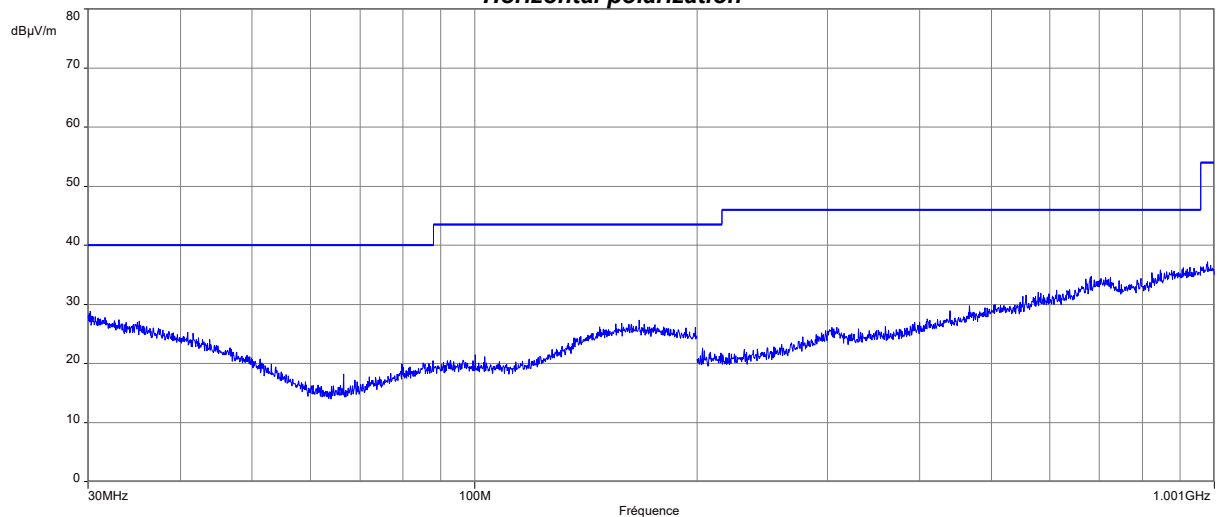
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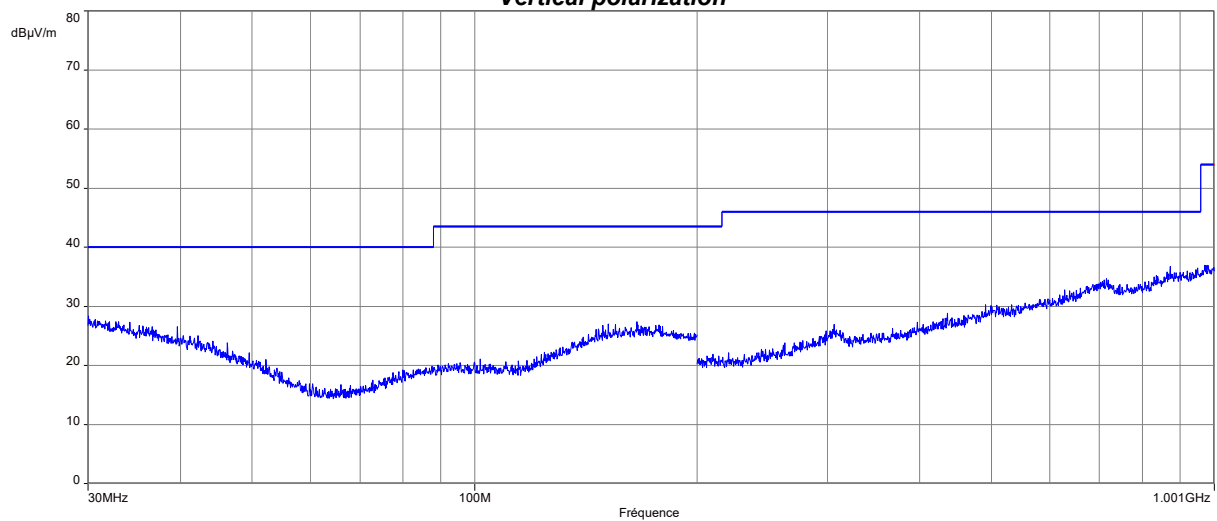
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Graphical representation of Radiated Disturbance Measurement (Peak detection, Semi Anechoic Room pre-scan, 30MHz-1GHz / 3m)

Horizontal polarization



Vertical polarization



----- : Peak measure

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

END OF TEST REPORT