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LAB N° 1347

RAPPORTO DI PROVA

TEST REPORT

Rif. / Ref. n.	**MPETR_177285-1**	Data / Date:	**29/04/2020**	Pagine / Pages:	**8**

Scopo delle prove *Test object*	Prove di tipo in accordo alla Norma *Type test according to standards* **FCC Cfr 47 part 2 - §2.1093** **RSS-102:2015**
Richiedente *Applicant*	**B810 S.r.l.** Via E. Lazzaretti 2 – 42122 Reggio Emilia – Italy Tel.: +39 0522 510200
Marchio commerciale *Trade mark*	GEOX
Fabbricante *Manufacturer*	**GEOX S.p.A.** Via Feltrina Centro 16 – 31044 Montebelluna – Treviso – Italy Tel.: +39 0423 2822
Prodotto *Product*	BLE communication device
Modello testato *Tested model*	**JR PLAYKIX HW**
Identificativo FCC *FCC ID*	**2AQ7NPKIXH**
Identificativo IC *IC ID*	**24328-PKIXH**
Data ricevimento campioni *Date of test samples receipt*	05/12/2019
Campioni verificati *No. Of tested samples*	1 – Sampled by the Manufacturer
Data verifiche *Testing date*	05-09/12/2019
Sito di prova *Testing site*	PRSLAB S.r.l. Unipersonale – Via Campagna 92 – 22020 Faloppio – Como – Italy
Esito delle valutazioni *Assessment results*	**CONFORME / COMPLIANT**

Verifiche effettuate da *Verifications carried out by*	**Daniele AOSANI** Tecnico laboratorio EMC & RADIO *EMC & RADIO Test Engineer*	Daniele Aosani
Approvato *Approved by*	**Riccardo PFEIFFER** Responsabile laboratori EMC & RADIO EMC & RADIO *Laboratory manager*	Riccardo Pfeiffer

I risultati delle prove riportati nel presente rapporto di prova si riferiscono solo ai campioni esaminati.
The test results reported in this test report shall refer only to the samples tested.
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CONTENUTO

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0. RELEASE CONTROL RECORD

TEST REPORT NUMBER	REASON OF CHANGE	DATE OF ISSUE
MPETR_177285-0	Original Release	28/02/2020
MPETR_177285-1	Added some IC evaluation	29/04/2020

1. TECHNICAL INFORMATION OF EQUIPMENT UNDER TEST (EUT)

1.1 EUT Identification

DESCRIPTION	BLE communication device
MODEL NAME	JR PLAYKIX HW
FCC ID	2AQ7NPKIXH
IC ID	24328-PKIXH
PRODUCT CODE	P124XMOVE
SERIAL NO.	00000299
TRADEMARK	GEOX
MANUFACTURER	GEOX S.p.A.
COUNTRY OF MANUFACTURER	Italy
SINGLE UNIT OR SYSTEM	Single
POWER SOURCE	Internal lithium battery CR2477
SUPPLY VOLTAGE	3Vdc
BATTERY CAPACITY	950mAh
HW VERSION	2.0
SW VERSION	01.04.10
OPERATING TEMPERATURE	-10°C ÷ +50°C
DIMENSIONS	32 x 32 x 17 mm
EUT STANDING	Mounted in the shoes

1.1 Bluetooth module technical data

CHIP MANUFACTURER	NORDIC SEMICONDUCTOR
CHIP TYPE	**nRF52832**
ETS CATEGORY	Bluetooth Low Energy
RF CATEGORY	Transceiver
FREQUENCY BAND	2400 – 2483.5MHz
NUMBER OF CHANNELS	40
CHANNEL BANDWIDTH	2MHz
CHANNEL SEPARATION	2MHz
TRANSFER RATE	1Mbps
SENSITIVITY	-96dBm
TYPE OF MODULATION	GSFK
ANTENNA TYPE	PCB printed
ANTENNA GAIN	---
Note: FCC classifies Bluetooth LE as a system using digital modulation techniques.	

1.2 Ports identification

	PORT	DESCRIPTION	CONNECTION	NOTES
☒	Enclosure	Plastic	Snaps	---
☐	AC Power input	Port not present	---	---
☐	DC Power input	Internal battery	---	---
☐	Signal/Control port	Port not present	---	---
☐	Telecomm. Port	Port not present	---	---
☐	Antenna Port	PCB printed	---	---

Note:
During the tests all cables must be what provided the manufacturer or the same that used in the real employment of the EUT.

1.3 Modifications incorporated in E.U.T.

The following items are the modifications introduced in the equipment under test:

- None

1.4 Auxiliary equipment

- Laboratory Tablet to set BLE channels.

2. REFERENCE STANDARDS

REFERENCE STANDARD	
Title 47 Part 1 Subpart I § 1.1310	Procedures Implementing the National Environmental Policy Act of 1969. Radiofrequency radiation exposure limits.
Title 47 Part 2 Subpart J § 2.1091	Radiofrequency radiation exposure evaluation: mobile devices.
ANSI C63.4	American National Standard for Methods of Measuring of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz – 40 GHz
RSS 102:2015	Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)

3. MEASUREMENTS AND CALCULATION RESULTS

3.1 SAR exemption

This device has been excluded from SAR testing based on source-based time-averaged conducted output power and KDB 447498 D01 section 4.3.1 1). This document serves as the RF exposure exhibit in the FCC Form 731 application in lieu of a SAR report.

3.2 Operational Description

The JR Playkix HW is a communication device based on BLE 5.0 technology intended to be housed in a recess obtained in the sole of a shoe located in the heel area. It is necessary a calculation for portable use demonstrating that the transmitter can be excluded from SAR testing.

3.3 RF Exposure Conditions:

The device is intended for use in the portable exposure condition and the General Population / Uncontrolled RF exposure environment.

3.4 RF Output Power:

Tx frequency range: 2402 – 2480 MHz
Maximum Output Power: 4dBm (2,5mW)
Maximum Output Power + Tune-up Tolerance: 5dBm (3,1mW)

3.5 FCC Calculation method and limits

SAR Test Exclusion Thresholds:

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] · [Vf(GHz)] ≤ 3.0 (for 1-g body SAR) or 7.5 (for 10-g extremity SAR)

where respectively

- f(GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

3.6 FCC Calculation results

Measured Output Power, including tune-up tolerance: 3,1mW
Min Test separation distance: 5mm
f: 2.480GHz (as worst case)
Exclusion Threshold Limb: 7.5 (10-g extremity SAR)

$$\frac{3.1mW}{5mm} * \sqrt{2.480} = 0.98 \leq 7.5$$

Exclusion Threshold body: 3 (10-g extremity SAR)

$$\frac{3.1mW}{5mm} * \sqrt{2.480} = 0.98 \leq 3$$

RESULT: The device is excluded from SAR testing.

3.7 ISED Calculation method and limits

SAR evaluation is required if the separation distance between the user and/or bystander and the antenna and/or radiating element of the device is less than or equal to 20 cm, except when the device operates at or below the applicable output power level (adjusted for tune-up tolerance) for the specified separation distance defined in Table 1.

Table 1: SAR evaluation – Exemption limits for routine evaluation based on frequency and separation distance[4,5]

Frequency (MHz)	Exemption Limits (mW)				
	At separation distance of ≤5 mm	At separation distance of 10 mm	At separation distance of 15 mm	At separation distance of 20 mm	At separation distance of 25 mm
≤300	71 mW	101 mW	132 mW	162 mW	193 mW
450	52 mW	70 mW	88 mW	106 mW	123 mW
835	17 mW	30 mW	42 mW	55 mW	67 mW
1900	7 mW	10 mW	18 mW	34 mW	60 mW
2450	4 mW	7 mW	15 mW	30 mW	52 mW
3500	2 mW	6 mW	16 mW	32 mW	55 mW
5800	1 mW	6 mW	15 mW	27 mW	41 mW

Frequency (MHz)	Exemption Limits (mW)				
	At separation distance of 30 mm	At separation distance of 35 mm	At separation distance of 40 mm	At separation distance of 45 mm	At separation distance of ≥50 mm
≤300	223 mW	254 mW	284 mW	315 mW	345 mW
450	141 mW	159 mW	177 mW	195 mW	213 mW
835	80 mW	92 mW	105 mW	117 mW	130 mW
1900	99 mW	153 mW	225 mW	316 mW	431 mW
2450	83 mW	123 mW	173 mW	235 mW	309 mW
3500	86 mW	124 mW	170 mW	225 mW	290 mW
5800	56 mW	71 mW	85 mW	97 mW	106 mW

Output power level shall be the higher of the maximum conducted or equivalent isotropically radiated power (e.i.r.p.) source-based, time-averaged output power. For controlled use devices where the 8 W/kg for 1 gram of tissue applies, the exemption limits for routine evaluation in Table 1 are multiplied by a factor of 5. For limb-worn devices where the 10 gram value applies, the exemption limits for routine evaluation in Table 1 are multiplied by a factor of 2.5. If the operating frequency of the device is between two frequencies located in Table 1, linear interpolation shall be applied for the applicable separation distance. For test separation distance less than 5 mm, the exemption limits for a separation distance of 5 mm can be applied to determine if a routine evaluation is required.
For medical implants devices, the exemption limit for routine evaluation is set at 1 mW. The output power of a medical implants device is defined as the higher of the conducted or e.i.r.p to determine whether the device is exempt from the SAR evaluation.

3.8 ISED Calculation results

Frequency (MHz)	Maximum measured output Power (mW)	Limit for Body Worn (mW)	Limit for limb (mW)	Result
2450	3,1	4	10	SAR exempt