

## RF Exposure Report

**Report No.:** SA180329C04

**FCC ID:** WS2-WS2119A0

**Test Model:** WS2119-A0

**Series Model:** WS2119-F0

**Received Date:** Mar. 29, 2018

**Date of Evaluation:** Jun. 07, 2018

**Issued Date:** Jun. 21, 2018

**Applicant:** JORJIN TECHNOLOGIES INC.

**Address:** 17F, No.239, Sec. 1, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan.

**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

**Lab Address:** No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan, R.O.C.

**Test Location:** No. 19, Hwa Ya 2nd Rd, Wen Hwa Vil, Kwei Shan Dist., Taoyuan City 33383, Taiwan (R.O.C)

**FCC Registration /**  
**Designation Number:** 788550 / TW0003



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### Release Control Record

Issue No.	Description	Date Issued
SA180329C04	Original Release	Jun. 21, 2018

## 1 Certificate of Conformity

**Product:** BLE and Sigfox wireless module

**Brand:** Jorjin

**Test Model:** WS2119-A0

**Series Model:** WS2119-F0

**Sample Status:** Engineering Sample

**Applicant:** JORJIN TECHNOLOGIES INC.

**Date of Evaluation:** Jun. 07, 2018

**Standards:** FCC Part 2 (Section 2.1091)

KDB 447498 D01 General RF Exposure Guidance v06

IEEE C95.1-1992

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

**Prepared by :** Evonne Lin, **Date:** Jun. 21, 2018  
Evonne Liu / Specialist

**Approved by :** Dylan Chiou, **Date:** Jun. 21, 2018  
Dylan Chiou / Project Engineer

## 2 RF Exposure

### 2.1 Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Average Time (minutes)
Limits For General Population / Uncontrolled Exposure				
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f <sup>2</sup> )*	30
30-300	27.5	0.073	0.2	30
300-1500	...	...	f/1500	30
1500-100,000	...	...	1.0	30

f = Frequency in MHz ; \*Plane-wave equivalent power density

### 2.2 MPE Calculation Formula

$$Pd = (Pout * G) / (4 * \pi * r^2)$$

where

Pd = power density in mW/cm<sup>2</sup>

Pout = output power to antenna in mW

G = gain of antenna in linear scale

$\pi$  = 3.1416

R = distance between observation point and center of the radiator in cm

### 2.3 Classification

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user.

So, this device is classified as **Mobile Device**.

## 2.4 Antenna Gain

Mode	Ant. Type	Brand	Model	Antenna Gain
Bluetooth LE	PCB	Unictron	H2B1BC2A1B0200	3.58
	PCB	Unictron	H2B1BE1A1B0200	<b>4.13</b>
	Dipole	WIESON	GPOT155-002	2.61
Sigfox	Dipole	SANAV	EEN-107	<b>3.53</b>
	PCB	Unictron	H2B1SD1A2C0100	1.9
	PCB	Unictron	H2B1SG2A2C0100	1.8

## 2.5 Calculation Result of Maximum Conducted Power

Band	Frequency Band (MHz)	Max Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
Sigfox	902.1375-904.6625	25.29	3.53	20	0.152	0.60
BT LE	2402-2480	8.66	4.13	20	0.004	1.00

### Conclusion:

The formula of calculated the MPE is:

$$CPD1 / LPD1 + CPD2 / LPD2 + \dots \text{etc.} < 1$$

CPD = Calculation power density

LPD = Limit of power density

$$\text{Sigfox} + \text{BT LE} = 0.152 + 0.004 = 0.156$$

**Therefore the maximum calculations of above situations are less than the "1" limit.**

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