

RF Exposure Report

Report No.: SA170620C22

FCC ID: Y6S-IOTADV

Test Model: IoT Platform Advance

Series Model: 72201R Lumewave IoT Platform

Received Date: Apr. 26, 2017

Test Date: Apr. 27 ~ Aug. 31, 2017

Issued Date: Nov. 28, 2017

Applicant: Ionics EMS, Inc.

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

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Release Control Record

Issue No.	Description	Date Issued
SA170620C22	Original release	Nov. 28, 2017

1 Certificate of Conformity

Product: IOT PLATFORM

Brand: Ionics, Lumewave

Test Model: IoT Platform Advance

Series Model: 72201R Lumewave IoT Platform

Sample Status: Engineering sample

Applicant: Ionics EMS, Inc.

Test Date: Apr. 27 ~ Aug. 31, 2017

Standards: FCC Part 2 (Section 2.1091)
KDB 447498 D03 (January 17, 2014)
IEEE C95.1

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 :  , **Date:** Nov. 28, 2017
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Approved by :  , **Date:** Nov. 28, 2017
Ken Liu / Senior Manager

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 ²)	Average Time (minutes)
Limits For General Population / Uncontrolled Exposure				
300-1500	F/1500	30
1500-100,000	1.0	30

F = Frequency in MHz

2.2 MPE Calculation Formula

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

where

Pd = power density in mW/cm²

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**.

3 Calculation Result of Maximum Conducted Power

Frequency Band (MHz)	Max Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
WLAN					
2412-2462	21.74	-0.06	20	0.029	1
BT LE					
2402-2480	8.51	-0.06	20	0.001	1
BT EDR					
2402-2480	4.46	-0.06	20	0.001	1
RFID: 906~924MHz					
906~924	25.13	5.34	20	0.222	0.609

RFID

Mode	Electric field (dBuV/m) @3m	Electric field (dBuV/m) @0.2m	Max Power (dBm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
908MHz	92.3	115.82	-2.93	0.0001	0.605

908MHz: $92.3 + 20 \log(3/0.2) = 115.82 \text{ dBuV/m}$

Frequency Band	Max. Power (dBm)			Total Power (dBm)	Power Limit (dBm)
	WLAN	BT LE	BT EDR		
2.4GHz	21.74	8.51	-	21.94	30
2.4GHz	21.74	-	4.46	21.82	30

CONCLUSION:

The WLAN & BT LE & RFID or WLAN & BT EDR & RFID can transmit simultaneously, the formula of calculated the MPE is:

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

CPD = Calculation power density

LPD = Limit of power density

$$\text{WLAN} + \text{BT LE} + \text{RFID (908MHz)} + \text{RFID (906~924MHz)} = 0.029 + 0.001 + 0.0001 + 0.222 = 0.2521$$

$$\text{WLAN} + \text{BT EDR} + \text{RFID (908MHz)} + \text{RFID (906~924MHz)} = 0.029 + 0.001 + 0.0001 + 0.222 = 0.2521$$

Therefore, the maximum calculation of this situation is 0.2521, which is less than the "1" limit.

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