

## RF Exposure Report

**Report No.:** SA151005E12A

**FCC ID:** MCQ-50M1899

**Test Model:** 50001899-03

**Series Model:** 50001899-XX (X=0~9)

**Received Date:** Oct. 05, 2015

**Test Date:** Jan. 06, 2016

**Issued Date:** June 13, 2016

**Applicant:** Digi International Inc.

**Address:** 11001 Bren Road East, Minnetonka, MN 55343

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

**Lab Address:** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,  
Taiwan R.O.C.

**Test Location (1):** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,  
Taiwan R.O.C.

**Test Location (2):** No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin  
Chu Hsien 307, Taiwan R.O.C.

This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification. The report must not be used by the client to claim product certification, approval, or endorsement by any government agencies.



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**Report Issue History Record of EUT (50001899-03)**

Issue No.	Description	Date Issued
SA151005E12	Original release.	May 16, 2016
SA151005E12A	Add DFS band (5250-5350MHz & 5470-5725)	June 13, 2016

**Release Control Record**

Issue No.	Description	Date Issued
SA151005E12A	Original release.	June 13, 2016

## 1 Certificate of Conformity

**Product:** TransPort LR54

**Brand:** Digi International

**Test Model:** 50001899-03

**Series Model:** 50001899-XX (X=0~9)

**Sample Status:** ENGINEERING SAMPLE

**Applicant:** Digi International Inc.

**Test Date:** Jan. 06, 2016

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

KDB 447498 D01 General RF Exposure Guidance v06

IEEE C95.1-2005

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.

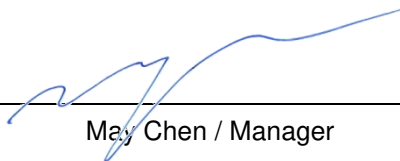
**Prepared by :**



**Date:** June 13, 2016

Claire Kuan / Specialist

**Approved by :**



**Date:** June 13, 2016

May Chen / 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 <sup>2</sup> )	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

$$Pd = (P_{out} * G) / (4 * \pi * r^2)$$

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 27cm away from the body of the user.

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

## 2.4 Antenna Gain

WLAN Antenna Spec.				
Transmitter Circuit	Antenna Type	Antenna Connector	Gain(dBi) including cable loss	Frequency (MHz to MHz)
Chain (0)	Dipole	R-SMA	4.6	2400~2483.5
			6.3	5150~5850
Chain (1)	Dipole	R-SMA	5	2400~2483.5
			7.4	5150~5850
WWAN Antenna Spec.				
Transmitter Circuit	Antenna Type	Antenna Connector	Gain(dBi) including cable loss	Frequency (MHz to MHz)
Chain (0)	Dipole	SMA	4.18	1850 to 1915
			2.59	824 to 849
			5.12	1710 to 1785
			3.33	816 to 824
			2.22	777 to 787
			1.97	699 to 716
			2.97	2300 to 2325
			4.11	2496 to 2690
Chain (1)	Dipole	SMA	3.6	1850 to 1915
			2.47	824 to 849
			5.14	1710 to 1785
			3.2	816 to 824
			1.6	777 to 787
			1.6	699 to 716
			4.27	2300 to 2325
			3.56	2496 to 2690

### 3 Calculation Result Of Maximum Conducted Power

For 2.4GHz and 5GHz (U-NII-1 band and U-NII-3 band) data was copied from the original test report (Report No.: SA151005E12)

#### WLAN

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
2412-2462	651.784	7.81	27	0.42970	1
5180-5240	307.971	9.88	27	0.32702	1
5250~5350	181.148	9.88	27	0.19235	1
5470~5725	177.857	9.88	27	0.18886	1
5745-5825	351.295	9.88	27	0.37302	1

NOTE:

2.4GHz: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 7.81\text{dBi}$

5.GHz: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 9.88\text{dBi}$

#### WWAN(3G) , LTE(4G)

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
814-849	250	3.33	27	0.05875	0.5427

#### 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

$WLAN(2.4GHz) + WLAN(5GHz) + WWAN(3G) \text{ or } LTE(4G) = 0.42971/1 + 0.37302/1 + 0.05875/0.5427 = 0.911$

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

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