

RF Exposure Report

Report No.: SA180308E06

FCC ID: 2AMRIER2500TC1

Test Model: ER2500T-NA-CAT1

Series Model: ER2500T-VZ-CAT1

Received Date: Mar. 08, 2018

Test Date: Mar. 21, 2018

Issued Date: Mar. 31, 2018

Applicant: Connected IO, Inc.

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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Test Location (1): E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,
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**FCC Registration /
Designation Number:** 723255 / TW2022

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Release Control Record

Issue No.	Description	Date Issued
SA180308E06	Original release.	Mar. 31, 2018

1 Certificate of Conformity

Product: M2M Router

Brand: Connected IO, Inc.

Test Model: ER2500T-NA-CAT1

Series Model: ER2500T-VZ-CAT1

Sample Status: ENGINEERING SAMPLE

Applicant: Connected IO, Inc.

Test Date: Mar. 21, 2018

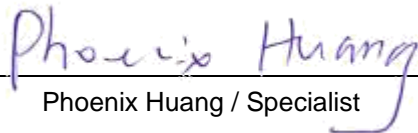
Standards: FCC Part 2 (Section 2.1091)

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 :


Phoenix Huang / Specialist

Date:

Mar. 31, 2018

Approved by :


May Chen / Manager

Date:

Mar. 31, 2018

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				
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f ²)*	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/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**. This device must needs installed by professional service personnel.

2.4 Antenna Gain

WLAN					
Antenna No.	Chain No.	Antenna Gain (dBi)	Frequency Range (GHz)	Antenna Type	Connector Type
1	Chain 0	2	2.4~2.4835	Dipole	SMA
2	Chain 1	2	2.4~2.4835	Dipole	SMA
WWAN – 3G / LTE					
Antenna No.	Antenna Gain (dBi)	Frequency Range (MHz)	Antenna Type	Connector Type	
3	1	698~960	Dipole	SMA	
	2	1710~2710			
4	1	698~960	Dipole	SMA	
	2	1710~2710			

2.5 Calculation Result of Maximum Conducted Power

The EUT inside has one WWAN-3G/LTE technology module which FCC ID: R17LE910NAV2.

WLAN

Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
2412-2462	573.785	5.01	20	0.36181	1

Note: Directional gain = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 5.01\text{dBi}$

WCDMA

Frequency Band (MHz)	Max. Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
875-885	229	1	20	0.05735	0.5509

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

$WLAN + WWAN-3G/LTE = 0.36181 / 1 + 0.05735 / 0.5509 = 0.46591$

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

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