

RF Exposure Report

Report No.: SABHAT-WTW-P20110381

FCC ID: R68OQ865S

Test Model: Open-Q 865XR SOM

Received Date: Nov. 12, 2020

Test Date: Nov. 30 ~ Dec. 16, 2020

Issued Date: Jan. 04, 2021

Applicant: Lantronix

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FCC Registration / 788550 / TW0003
Designation Number:



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Release Control Record

Issue No.	Description	Date Issued
SABHAT-WTW-P20110381	Original release	Jan. 04, 2021

1 Certificate of Conformity

Product: Open-Q 865 SOM

Brand: Lantronix

Test Model: Open-Q 865XR SOM

Sample Status: Engineering sample

Applicant: Lantronix

Test Date: Nov. 30 ~ Dec. 16, 2020

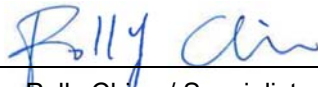
Standards: FCC Part 2 (Section 2.1091)

References Test KDB 447498 D01 General RF Exposure Guidance v06

Guidance: IEEE C95.3 -2002

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 RF characteristics under the conditions specified in this report.

Prepared by :



Polly Chen / Specialist

Date:

Jan. 04, 2021

Approved by :



Bruce Chen / Senior Project Engineer

Date:

Jan. 04, 2021

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

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

where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 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 Average Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
WLAN					
CDD Mode					
2412-2462	25.93	6.33	20	0.335	1
5180-5240	16.82	9.12	20	0.078	1
5260-5320	16.06	9.12	20	0.066	1
5500-5720	23.83	9.12	20	0.392	1
5745-5825	24.17	9.12	20	0.424	1
Beamforming Mode					
2412-2462	25.34	6.33	20	0.292	1
5180-5240	13.82	9.12	20	0.039	1
5260-5320	13.05	9.12	20	0.033	1
5500-5720	20.83	9.12	20	0.197	1
5745-5825	24.17	9.12	20	0.424	1
BT EDR					
2402-2480	16.63	3.32	20	0.020	1
BT LE					
2402-2480	15.70	3.32	20	0.016	1

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

Note:

1. Directional gain:

2.4GHz Band: $=3.32\text{dBi} + 10\log(2) = 6.33\text{dBi}$

5GHz: Directional Gain $= 6.11\text{dBi} + 10\log(2) = 9.12\text{dBi}$

BT antenna gain: 3.32dBi

2. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

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

The simultaneous operation mode was determined by client.

1. WLAN 2.4G+ 5GHz = $0.335/1 + 0.424/1 = 0.759$
2. WLAN 2.4G+ BT = $0.335/1 + 0.020/1 = 0.355$
3. WLAN 5G+ BT = $0.424/1 + 0.020/1 = 0.444$

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

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