

## RF Exposure Report

**Report No.:** SA200428E03

**FCC ID:** I88LTE5388-S905

**Test Model:** LTE5388-S905

**Received Date:** Apr. 28, 2020

**Test Date:** July 08, 2020

**Issued Date:** July 29, 2020

**Applicant:** Zyxel Communications Corporation

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

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Taiwan

**Test Location:** 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
SA200428E03	Original release.	July 29, 2020

## 1 Certificate of Conformity

**Product:** 4G LTE-A Indoor Router

**Brand:** ZYXEL

**Test Model:** LTE5388-S905

**Sample Status:** ENGINEERING SAMPLE

**Applicant:** Zyxel Communications Corporation

**Test Date:** July 08, 2020

**Standards:** FCC Part 2 (Section 2.1091)  
IEEE C95.3 -2002

**References Test Guidance:** KDB 447498 D01 General RF Exposure Guidance v06

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:** July 29, 2020  
Claire Kuan / Specialist

**Approved by :**  , **Date:** July 29, 2020  
Clark Lin / Technical 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				
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 20 cm away from the body of the user. So, this device is classified as **Mobile Device**.

## 2.4 Antenna Gain

Antenna No.	Antenna Net Gain (dBi)	Frequency range	Antenna Type	Connector Type
WLAN_2G-0	3.6	2.4~2.4835GHz	Dipole	i-pex(MHF)
WLAN_2G-1	3.6	2.4~2.4835GHz	Dipole	i-pex(MHF)
WWAN_Main(TX&RX)	3.6	3550 MHz to 3700 MHz	Dipole	i-pex(MHF)
WWAN_DIV1(RX only)	3.6	3550 MHz to 3700 MHz	Dipole	i-pex(MHF)
WWAN_DIV2(RX only)	3.9	3550 MHz to 3700 MHz	Dipole	i-pex(MHF)
WWAN_DIV3(RX only)	3	3550 MHz to 3700 MHz	Dipole	i-pex(MHF)

## 2.5 Calculation Result

Operation Mode	Evaluation Frequency (MHz)	Max AV. Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
WLAN (2.4GHz)	2412~2462	164.606	6.61	20	0.15003	1
WWAN (LTE Band 48)	3552.5 ~ 3697.5	82.985	3.6	20	0.03782	1

Note:

1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. 2.4GHz: Directional gain = 3.6dBi + 10log(2) = 6.61dBi

### 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

$$WLAN (2.4GHz) + WWAN (LTE) = 0.15003 / 1 + 0.03782 / 1 = 0.18785$$

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

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