

## RF Exposure Report

**Report No.:** SA171011E02

**FCC ID:** UXX-S5A750A

**Test Model:** S5A750A

**Received Date:** Oct. 11, 2017

**Test Date:** Nov. 07 to 08, 2017

**Issued Date:** Nov. 17, 2017

**Applicant:** Cradlepoint, Inc.

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

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## Table of Contents

<b>Release Control Record</b> .....	<b>3</b>
<b>1 Certificate of Conformity</b> .....	<b>4</b>
<b>2 RF Exposure</b> .....	<b>5</b>
2.1 Limits For Maximum Permissible Exposure (MPE) .....	5
2.2 MPE Calculation Formula .....	5
2.3 Classification .....	5
2.4 Antenna Gain .....	6
2.5 Calculation Result .....	7

### Release Control Record

Issue No.	Description	Date Issued
SA171011E02	Original release.	Nov. 17, 2017

## 1 Certificate of Conformity

**Product:** WiFi Access Point

**Brand:** cradlepoint

**Test Model:** S5A750A

**Sample Status:** ENGINEERING SAMPLE

**Applicant:** Cradlepoint, Inc.

**Test Date:** Nov. 07 to 08, 2017

**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 :**

*Mary Ko*

**Date:**

Nov. 17, 2017

Mary Ko / Specialist

**Approved by :**

*May Chen*

**Date:**

Nov. 17, 2017

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				
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 27cm 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 (GHz)	Antenna Type	Connector Type
1 (Radio 1, 2)	5.19	2.4~2.4835	PIFA	i-pex(MHF)
	4.81	5.15~5.25		
	5.91	5.25~5.35		
	4.90	5.47~5.725		
	6.69	5.725~5.85		
2 (Radio 1, 2)	3.04	2.4~2.4835	PIFA	i-pex(MHF)
	7.37	5.15~5.25		
	6.90	5.25~5.35		
	6.65	5.47~5.725		
3 (Radio 3)	6.89	5.725~5.85	PIFA	i-pex(MHF)
	3.89	2.4~2.4835		
	6.58	5.15~5.25		
	6.87	5.25~5.35		
	6.27	5.47~5.725		
	7.01	5.725~5.85		

## 2.5 Calculation Result

Simultaneously transmission condition:

Condition	Technology		
1	WLAN (Radio 1) (2.4GHz-2TX)	WLAN (Radio 2) (5GHz-2TX)	WLAN (Radio 3) (5GHz-1TX)
2	WLAN (Radio 1) (2.4GHz-2TX)	WLAN (Radio 2) (5GHz-2TX)	WLAN (Radio 3) (2.4GHz-1TX)

### Radio 1:

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	721.992	7.19	27	0.41266	1

NOTE:

Directional gain =  $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 7.19\text{dBi}$

### Radio 2:

Frequency Band (MHz)	Max. Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
5180-5240	368.707	9.19	27	0.33400	1
5745-5825	424.356	9.80	27	0.44238	1

NOTE:

U-NII-1: Directional gain =  $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 9.19\text{dBi}$

U-NII-3: Directional gain =  $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 9.8\text{dBi}$

### Radio 3:

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	211.349	3.89	27	0.05650	1
5180-5240	75.858	6.58	27	0.03768	1
5745-5825	92.045	7.01	27	0.05047	1

### 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

#### Condition 1:

WLAN 2.4GHz (Radio 1) + WLAN 5GHz (Radio 2) + WLAN 5GHz (Radio 3) =  $0.41266 / 1 + 0.44238 / 1 + 0.05047 / 1 = 0.90551$

#### Condition 2:

WLAN 2.4GHz (Radio 1) + WLAN 5GHz (Radio 2) + WLAN 2.4GHz (Radio 3) =  $0.41266 / 1 + 0.44238 / 1 + 0.05650 / 1 = 0.91154$

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

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