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.

Address: 1111 W. Jefferson Street, Suite 400, Boise, ID 83702 USA

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

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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 : _____ , **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^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/cm^2

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	Connecter 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		
	6.89	5.725~5.85		
3 (Radio 3)	3.89	2.4~2.4835	PIFA	i-pex(MHF)
	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^2)	Limit (mW/cm^2)
2412-2462	721.992	7.19	27	0.41266	1

NOTE:

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

Radio 2:

Frequency Band (MHz)	Max. Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
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 = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2]$ = 9.19dBi

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

Radio 3:

Frequency Band (MHz)	Max. Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
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 + ……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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