FCC RADIO EXPOSURE TEST REPORT

FCC ID	:	UXX-S5A950A
Equipment	:	Advanced Edge Router with 4x4 dual-band AP
Brand Name	:	Cradlepoint
Model Name	:	S5A950A
Applicant	:	Cradlepoint, Inc. 1111 West Jefferson Street ,Boise ,Idaho,United States 83702
Manufacturer	:	Cradlepoint, Inc. 1111 West Jefferson Street ,Boise ,Idaho,United States 83702
Standard	:	47 CFR Part 2.1091

The product was received on Oct. 23, 2019, and testing was started from Nov. 07, 2019 and completed on Jan. 02, 2020. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in 47 CFR Part 2.1091 and shown compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Cliff Chang

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)

Table of Contents

History of this test report

Report No.	Version	Description	Issued Date
FA9O2202	01	Initial issue of report	Jan. 14, 2020

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
2	-	Exposure evaluation	PASS	-

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Sam Chen

Report Producer: Sandy Chuang

1 General Description

1.1 EUT General Information

RF General Information			
Evaluation Mode	**Frequency Range (MHz)**	**Operating Frequency (MHz)**	**Modulation Type**
2.4GHz WLAN	2400-2483.5	2412-2462	802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) VHT: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
5GHz WLAN	5150-5250 5725-5850	5180-5240 5745-5825	802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)

RF General Information			
Evaluation Mode	**Downlink Frequency Range (MHz)**	**Uplink Frequency Range (MHz)**	**Modulation Type**
WCDMA Band 2	1930~1990	1850~1910	QPSK/HSDPA/HSUPA
WCDMA Band 4	2110~2115	1710~1755	
WCDMA Band 5	869-894	824~849	
Evaluation Mode	**Downlink Frequency Range (MHz)**	**Uplink Frequency Range (MHz)**	**Modulation Type**
LTE Band 2	1930~1990	1850~1910	QPSK/16QAM/64QAM
LTE Band 4	2110~2115	1710~1755	
LTE Band 5	869-894	824~849	
LTE Band 7	2620-2690	2500~2570	
LTE Band 12	729-746	699~716	
LTE Band 13	746-756	777~787	
LTE Band 14	758-768	788~798	
LTE Band 17	734-746	704~716	
LTE Band 18	860-875	815~830	
LTE Band 19	875-890	830~845	
LTE Band 25	1930-1995	1850~1915	
LTE Band 26	859-894	814~849	
LTE Band 30	2350-2620	2305~2315	
LTE Band 38	2570-2620	2570~2620	
LTE Band 41	2496-2690	2496~2690	
LTE Band 66	2110-2200	1710~1780	
LTE Band 71	617-652	663~698	

Note: This device cotains transmiter module FCC ID: RI7LM960.

1.2 Table of WWAN module

Module	Brand Name	Model Name	FCC ID	Function	Remark
1	Telit	LM960	RI7LM960	WCDMA Band 2, 4, 5 / LTE Band 2, 4, 5, 7, 12, 13, 14, 17, 18, 19, 25, 26, 30, 38, 41, 66, 71	Internal module (would be marketed)
2	Cradlepoint	MC400-1200M	Contain FCC ID: RI7LM960		External module (would not be marketed)

1.3 Testing Location

Testing Location			
☐	HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-327-0973	
☒	JHUBEI	ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. TEL : 886-3-656-9065 FAX : 886-3-656-9085	

Test site Designation No. TW0006 with FCC.

Test site registered number IC 4086D with Industry Canada.

2 Maximum Permissible Exposure

2.1 Limit of Maximum Permissible Exposure

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm²)	Averaging Time |E|²,|H|² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm²)	Averaging Time |E|²,|H|² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

Note: f = frequency in MHz ; *Plane-wave equivalent power density

2.2 MPE Calculation Method

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

E (V/m) = $\frac{\sqrt{30 \times P \times G}}{d}$ Power Density: *Pd* (W/m²) = $\frac{E^2}{377}$

E = Electric field (V/m)

P = RF output power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

Pd = $\frac{30 \times P \times G}{377 \times d^2}$

2.3 Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm^2)	S Limit (mW/cm^2)
2.4G;G1D	7.59	22.67	30.26	0.50	30.76	1.19124	20	0.23698	1.00000
5.2G;D1D	6.99	24.65	31.64	0.50	32.14	1.63682	20	0.32563	1.00000
5.8G;D1D	6.99	24.55	31.54	0.50	32.04	1.59956	20	0.31822	1.00000

Simultaneous Transmission Analysis Mode: WLAN 2.4GHz + WLAN 5GHz + external module

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm^2)	S Limit (mW/cm^2)	Ratio (S/Limit)
2.4G;G1D	7.59	22.67	30.26	0.50	30.76	1.19124	20	0.23698	1.00000	0.23698
5.2G;D1D	6.99	24.65	31.64	0.50	32.14	1.63682	20	0.32563	1.00000	0.32563
LTE Band 41	2.19	27.50	29.69	0.00	29.69	0.93111	20	0.18523	1.00000	0.18523
									Sum Ratio	0.74784
									Ratio Limit	1

Simultaneous Transmission Analysis Mode: WLAN 2.4GHz + WLAN 5GHz + internal module

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm^2)	S Limit (mW/cm^2)	Ratio (S/Limit)
2.4G;G1D	7.59	22.67	30.26	0.50	30.76	1.19124	20	0.23698	1.00000	0.23698
5.2G;D1D	6.99	24.65	31.64	0.50	32.14	1.63682	20	0.32563	1.00000	0.32563
LTE Band 41	2.19	27.50	29.69	0.00	29.69	0.93111	20	0.18523	1.00000	0.18523
									Sum Ratio	0.74784
									Ratio Limit	1

Note: The above antenna gain was declared by manufacturer.

THE END