

MPE REPORT

FCC

APPLICANT

eero LLC

MODEL NAME

R010001

FCC ID

2AEM4-41123474

REPORT NUMBER

HA210810-AER-001-R12

TEST REPORT

Date of Issue

December 3, 2021

Test SiteHyundai C-Tech, Inc. dba HCT America, Inc.
1726 Ringwood Ave, San Jose, CA 95131, USA

Applicant	eero LLC
Applicant Address	660 3 rd Street, 4 th Floor, San Francisco, CA 94107, USA
FCC ID	2AEM4-41123474
Model Name	R010001
EUT Type	Wireless Router / Access Point
FCC Classification	Digital Transmission System (DTS) Unlicensed National Information Infrastructure (NII)
FCC Rule Part(s)	Part 1 (§1.1310), Part 2 (§2.1091)
Test Procedure	KDB 447498 D01 v06

The device bearing the trade name and model specified above, has been shown to comply with the applicable technical standards as indicated in the measurement report and was in accordance with the procedures specified in §2.947. The results in this report apply only to the product which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Hyundai C-Tech, Inc. dba HCT America, Inc. certifies that no party to application has been denied the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C 862

Tested By

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REVISION HISTORY

The revision history for this document is shown in table.

TEST REPORT NO.	DATE	DESCRIPTION
HA210810-AER-001-R12	December 3, 2021	Initial Issue

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1. EUT DESCRIPTION

Model	R010001	
EUT Type	Wireless Router / Access Point	
Power Supply	5 V d.c. (USB type C - External adaptor)	
RF Specification	WIFI 2.4 GHz : 802.11b/g/n(HT20/40)/ ax(HE20/40) WIFI 5 GHz : 802.11a/n(HT20/40)/ ac(VHT20/40/80/160)/ ax(HE20/40/80/160) Bluetooth 5.0 LE (1M) IEEE 802.15.4	
Transmitter Chain	WIFI 2.4 GHz / 5 GHz : 2x2 MIMO Bluetooth LE / IEEE 802.15.4 : SISO	
Antenna Specification	WIFI 2.4 GHz	3.39 dBi Uncorrelated / 6.39 dBi Correlated
	WIFI 5 GHz	4.36 dBi Uncorrelated / 7.37 dBi Correlated
	BLE / IEEE 802.15.4	2.90 dBi
Operating Environment	Indoor	
Operating Temperature	0 °C ~ +40 °C	

2. INTRODUCTION

2.1. LIMIT

The limit for Maximum Permissible Exposure (MPE), specified in FCC Rule Part §1.1310 listed in the table below, shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation specified in §1.1310 (b)

Frequency Range (MHz)	E- Field Strength (V/m)	H- Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (Minutes)
(A) Limits for Occupational / Controlled Exposure				
0.3 – 3.0	614	1.63	*100	6
3.0 – 30	1842 / f	4.89 / f	*900 / f ²	6
30 – 300	61.4	0.163	1.0	6
300 – 1,500	-	-	f / 300	6
1,500 – 100,000	-	-	5	6
(B) 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 – 1,500	-	-	f / 1500	30
1,500 – 100,000	-	-	1.0	30

f = frequency in MHz, * = Plane-wave equivalent power density

2.2. MAXIMUM PERMISSIBLE EXPOSURE PREDICTION

Prediction of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

S : Power density (mW/cm²)

P : Output power to antenna (mW)

G : Antenna gain in linear scale

R : Distance between the center of radiator and observation point (cm)

3. RESULT

3.1. MPE Calculation

Bluetooth LE				
Frequency (MHz)	2402 - 2480	MHz		
MPE Limit (mW/cm ²)	1	mW/cm ²		
Distance (R)	20	Cm		
Output Power (P)	21	dBm	125.89	mW
Antenna Gain (G)	2.90	dBi	1.95	-
Power density (S) at distance 20 cm	0.048835	mW/cm ²	at 20 cm separation distance	

IEEE 802.15.4				
Frequency (MHz)	2405 - 2480	MHz		
MPE Limit (mW/cm ²)	1	mW/cm ²		
Distance (R)	20	Cm		
Output Power (P)	21	dBm	125.89	mW
Antenna Gain (G)	2.90	dBi	1.95	-
Power density (S) at distance 20 cm	0.048835	mW/cm ²	at 20 cm separation distance	

WIFI 2.4 GHz				
Frequency (MHz)	2412 - 2462	MHz		
MPE Limit (mW/cm ²)	1	mW/cm ²		
Distance (R)	20	Cm		
Output Power (P)	26	dBm	398.11	mW
Antenna Gain (G)	3.39	dBi	2.18	-
Power density (S) at distance 20 cm	0.172874	mW/cm ²	at 20 cm separation distance	

WIFI 5 GHz				
Frequency (MHz)	5180 - 5240 / 5745 - 5825	MHz		
MPE Limit (mW/cm ²)	1	mW/cm ²		
Distance (R)	20	Cm		
Output Power (P)	28	dBm	630.96	mW
Antenna Gain (G)	4.36	dBi	2.73	-
Power density (S) at distance 20 cm	0.342555	mW/cm ²	at 20 cm separation distance	

3.2. SUMMARY OF RESULTS

Mode	Frequency Range (MHz)	Ant Gain (dBi)	MPE Calculation (mW/cm ²)	MPE Ratio (PD/MPE Limit)
BLE	2402 – 2480	2.90	0.048835	0.048835
IEEE 802.15.4	2405 – 2480	2.90	0.048835	0.048835
WIFI 2.4 GHz	2412 – 2462	3.39 ¹⁾	0.172874	0.172874
WIFI 5 GHz	5180 – 5240 5745 – 5825	4.36 ¹⁾	0.342555	0.342555

1) Uncorrelated directional gain was applied for the final MPE calculation.

The worst-case configuration is simultaneous transmission of WIFI 2.4 GHz and 5 GHz band. Bluetooth LE or IEEE 802.15.4 does not transmit with the WIFI at the same time. Therefore, the worst-case MPE will be WIFI 2.4 GHz + WIFI 5 GHz and the calculated MPE at 20cm is 0.515429.

Sample Calculation

TOTAL MPE (20cm distance) = $0.172874/1.0 + 0.342555/1.0 = 0.515429 < 1.0$

END OF TEST REPORT