MPE REPORT

FCC

APPLICANT

Tarana Wireless, Inc.

MODEL NAME

G1RN5AHB012

FCC ID

2ABOF-G1RN5AHB012

REPORT NUMBER

HA220826-TAR-006-R03

TEST REPORT

Date of Issue
November 15, 2022

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

Applicant	Tarana Wireless, Inc.
Applicant Address	590 Alder Drive, Milpitas, CA 95035
FCC ID	2ABOF-G1RN5AHB012
Model Name	G1RN5AHB012
EUT Type	5GHz RF Remote Node (RN)
FCC Classification	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 tested in accordance with the measurement procedures required. The results of testing 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	**Reviewed By**
Yongsoo Park	Sunwoo Kim
Test Engineer	Technical Manager

REVISION HISTORY

The revision history for this document is shown in table.

TEST REPORT NO.	DATE	DESCRIPTION
HA220826-TAR-006-R03	November 15, 2022	Initial Issue

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1. GENERAL INFORMATION

EUT DESCRIPTION

Model	G1RN5AHB012
Serial Number	S158T1223600281 (RF Conducted) S160T1223000007 (RF Radiated)
EUT Type	5GHz RF Remote Node (RN)
Description of Device	Fixed outdoor point-to-point device
Power Supply	PoE (Power over Ethernet) : 44 ~ 60 V d.c.
RF Specification	5 GHz RF : UNII 1 band / UNII 3 band Single Carrier : 10 / 20 / 40 MHz Multi-Carrier (Contiguous) : 10+10 / 20+20 / 20+40 / 40+20 / 40+40 MHz Multi-Carrier (Non-Contiguous) : 10+10 / 20+20 / 20+40 / 40+20 MHz
Transmitter Chain	8
Antenna Specification [1)]	Array Antenna RN Antenna Gain : 13.9 dBi (for U-NII 1), 14.5 dBi (for U-NII 3) Directional Gain with Array Gain : 19.92 dBi (for U-NII 1), 20.52 dBi (for U-NII 3)
Operating Environment	Outdoor
Operating Temperature	-40°C - 55°C

Note :
1. Antenna information is based on the document provided.

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/cm^2)
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

5 GHz RF (U-NII 1)				
Frequency (MHz)	5175 – 5245	MHz		
MPE Limit (mW/cm²)	1.0	mW/cm²		
Distance (R)	63.0	cm		
Max Tune-up Output Power (P)	30.00	dBm	1000.00	mW
Directional Antenna Gain (G)	19.92	dBi	98.17	-
Max e.i.r.p. at the worst case duty	46.13	dBm	41066.52	mW
Power density (S)	**0.823374**	mW/cm²	at 63 cm separation distance	

5 GHz RF (U-NII 3)				
Frequency (MHz)	5740 – 5830	MHz		
MPE Limit (mW/cm²)	1.0	mW/cm²		
Distance (R)	63.0	cm		
Max Tune-up Output Power (P)	30.00	dBm	1000.00	mW
Directional Antenna Gain (G)	20.52	dBi	112.72	-
Max e.i.r.p. at the worst case duty	46.73	dBm	47150.67	mW
Power density (S)	**0.945359**	mW/cm²	at 63 cm separation distance	

3.2. SUMMARY OF RESULTS

Band	Frequency Range (MHz)	Max e.i.r.p. (dBm)	Duty Cycle (%)	Max e.i.r.p. with duty (dBm)	Max e.i.r.p. with duty (mW)	Power Density (mW/cm²)	MPE Ratio (PD/Limit)
5 GHz RF (U-NII 1)	5175 – 5245	49.92	41.83	46.13	41066.52	0.823374	0.823374
5 GHz RF (U-NII 3)	5740 – 5830	50.52	41.83	46.73	47150.67	0.945359	0.945359

TOTAL MPE (at U-NII 3 band with 63 cm separation distance) = 0.945359 / 1.0 = **0.945359** < 1.0

END OF TEST REPORT

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