

RF Exposure Evaluation Report

Product : millimeter wave radar
Trade mark : CHUHANG TECH
Model/Type reference : ARC2.33
Serial Number : N/A
Report Number : EED32Q80639902
FCC ID : 2A7HDARC233
Date of Issue : Jun. 18, 2024
Test Standards : 47 CFR Part 1.1307
47 CFR Part 1.1310
KDB 447498 D04 Interim General RF
Exposure Guidance v01
Test result : PASS

Prepared for:

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1 General Information

1.1 Client Information

Applicant:	Nanjing Chuhan Technology Co., Ltd.
Address of Applicant:	12F, Building A, No. 9, Yunzheng Street Nanjing, China
Manufacturer:	Nanjing Chuhan Technology Co., Ltd.
Address of Manufacturer:	12F, Building A, No. 9, Yunzheng Street Nanjing, China
Factory:	Anqing Chuhan Electronic Technology Co., Ltd.
Address of Factory:	Building 1, New Energy Vehicle Industrial Park, Economic and Technological Development Zone, Anqing, 246000 Anhui, P.R. China

1.2 General Description of EUT

Product Name:	millimeter wave radar
Model No.:	ARC2.33
Trade mark:	CHUHANG TECH
Product Type:	☒ Mobile ☐ Portable ☐ Fix Location
Type of Modulation:	FMCW
Operating Frequency	77.80GHz
Test Power Grade:	Default
Test Software of EUT:	ChuHangDV1.4.10.exe
Antenna Type:	PCB Antenna
Antenna Gain:	11.90dBi
Power Supply:	DC 9.0V to DC 32.0V
Test Voltage:	DC 24V
Sample Received Date:	Jun. 04, 2024
Sample tested Date:	Jun. 05, 2024 to Jun. 06, 2024
Remark:	Company Name and Address shown on Report, the sample(s) and sample Information was/ were provided by the applicant who should be responsible for the authenticity which CTI hasn't verified.

1.3 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd

Building C, Hongwei Industrial Park Block 70, Bao'an District, Shenzhen, China

Telephone: +86 (0) 755 33683668 Fax: +86 (0) 755 33683385

No tests were sub-contracted.

FCC Designation No.: CN1164

1.4 Deviation from Standards

None.

1.5 Abnormalities from Standard Conditions

None.

1.6 Other Information Requested by the Customer

None.

2 SAR Evaluation

2.1 RF Exposure Compliance Requirement

2.1.1 Limits

According to KDB 447498 D04 Interim General RF Exposure Guidance v01, for all devices, MPE limits in § 1.1310(e)(1) - Table 1. The SAR-based exemption formula of § 1.1310(e)(1), Table 1 to § 1.1310(e)(1) sets forth limits for Maximum Permissible Exposure (MPE) to radiofrequency electromagnetic fields.

Table 1 to § 1.1310(e)(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)	Averaging time (minutes)
(i) 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
(ii) 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.

Friis Formula,

Friis transmission formula: $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$;

Where,

P_d = power density in mW/cm²;

P_{out} = output power to antenna in mW;

G = gain of antenna in linear scale $P_i = 3.1416$;

R = distance between observation point and center of the radiator in cm .

General population/uncontrolled exposure limits apply in situations in which the general public may be exposed, or in which persons who are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure. For example, RF sources intended for consumer use shall be subject to the limits for general population/uncontrolled exposure in this section.

2.1.2 Test Mode

TX mode_Make EUT continuously emit radar signals.

2.1.3 EUT RF Exposure Evaluation

For Stand alone:

Frequency (GHz)	R (cm)	Corrected EIRP (dBm/MHz)	Tune-up EIRP (dBm)	Tune-up EIRP (mW)	Power density (mW/cm ²)	Limit (mW/cm ²)	Result
77.80	20	24.69	25.00	316.2278	0.0629	1	PASS

Note:

- ① $EIRP(mW) = 10^{(EIRP(dBm)/10)}$;
- ② The estimation distance is 20cm;
- ③ Tune-up EIRP was declared by manufacturer;
- ④ $Power\ density(mW/cm^2) = \frac{Tune-up\ EIRP(mW)}{4 \cdot \pi \cdot R(cm)^2}$;
- ⑤ The test data of Corrected EIRP please refer to the report of EED32Q80639901 and only the worst case data was recorded in the report.

The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CTI, this report can't be reproduced except in full.

*** End of Report ***