

RF Exposure Evaluation Report

Report Reference No......: MTEB24120364-H

FCC ID.....: 2BNAV-YDKCC13G

Compiled by

(position+printed name+signature)..: File administrators Alisa Luo



Supervised by

(position+printed name+signature)..: Test Engineer Sunny Deng



Approved by

(position+printed name+signature)..: Manager Yvette Zhou



Date of issue.....: **Dec.27,2024**

Representative Laboratory Name.: **Shenzhen Most Technology Service Co., Ltd.**

Address.....: No.5, 2nd Langshan Road, North District, Hi-tech Industrial Park, Nanshan, Shenzhen, Guangdong, China.

Applicant's name.....: **Shenzhen Yuxin iot Technology Co.,LTD.**

Address.....: Room 502, Building 2, Honghui Industrial Zone, No. 2 Liuxian Third Road, Xingdong Community, Xin'an Street, Bao'an District, Shenzhen City

Test specification/ Standard.....: **47 CFR Part 1.1307;47 CFR Part 1.1310**
KDB447498D01 General RF Exposure Guidance v06

TRF Originator.....: Shenzhen Most Technology Service Co., Ltd.

Shenzhen Most Technology Service Co., Ltd. All rights reserved.

This publication may be reproduced in whole or in part for non-commercial purposes as long as the Shenzhen Most Technology Service Co., Ltd. is acknowledged as copyright owner and source of the material. Shenzhen Most Technology Service Co., Ltd. takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.

Test item description.....: Electric Vehicle AC Charger

Trade Mark.....: goiot

Model/Type reference.....: A09-US48A

Listed Models: A08-US16A, A08-US32A, A08-US40A, A08-US48A, A09-US16A, A09-US32A, A09-US40A

Modulation Type.....: ASK

Operation Frequency.....: 13.56MHz

Hardware Version.....: V1.2

Software Version.....: V6

Rating.....: AC 240V/60Hz

Result.....: **PASS**

TEST REPORT

Equipment under Test : Electric Vehicle AC Charger

Model /Type : A09-US48A

Listed Models A08-US16A, A08-US32A, A08-US40A, A08-US48A, A09-US16A, A09-US32A, A09-US40A

Remark Only the model A09-US48A was tested, Their electrical circuit design, layout, components used and internal wiring are identical, Only the shape of the shell and the size of the current. The current is regulated through a DIP chip.

Applicant : **Shenzhen Yuxin iot Technology Co.,LTD.**

Address : Room 502, Building 2, Honghui Industrial Zone, No. 2 Liuxian Third Road, Xingdong Community, Xin'an Street, Bao'an District, Shenzhen City

Manufacturer : **Shenzhen Yuxin iot Technology Co.,LTD.**

Address : Room 502, Building 2, Honghui Industrial Zone, No. 2 Liuxian Third Road, Xingdong Community, Xin'an Street, Bao'an District, Shenzhen City

Test Result:	PASS
---------------------	-------------

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

1. Revision History

Revision	Issue Date	Revisions	Revised By
00	2024-12-27	Initial Issue	Alisa Luo

2. SAR Evaluation

2.1 RF Exposure Compliance Requirement

2.1.1 Standard Requirement

According to KDB447498D01 General RF Exposure Guidance v06

4.3.1. Standalone SAR test exclusion considerations

Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied.

2.1.2 Limits

According to FCC Part1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in part1.1307(b)

For frequencies below 100 MHz, the following may be considered for SAR test exclusion (also illustrated in Appendix C): 33

- 1) For test separation distances > 50 mm and < 200 mm, the power threshold at the corresponding test separation distance at 100 MHz in step b) is multiplied by $[1 + \log(100/f(\text{MHz}))]$
- 2) For test separation distances ≤ 50 mm, the power threshold determined by the equation in c) 1) for 50 mm and 100 MHz is multiplied by $\frac{1}{2}$
- 3) SAR measurement procedures are not established below 100 MHz.

When SAR test exclusion cannot be applied, a KDB inquiry is required to determine SAR evaluation requirements for any SAR test results below 100 MHz to be acceptable.34

2.1.3 EUT RF Exposure

For 13.56MHz wireless:

Field strength=79.5dBuV/m

EIRP =79.5dBuV/m-95.2+6= -15.7dBm

Channel	EIRP	Tune up tolerance (dBm)	Maximum tune-up Power (dBm)	Maximum tune-up Power (MW)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
13.56 MHz	-15.7dBm	±1	-14.7	0.034	0.0000068	0.9789	Pass

Note: 1) Refer to report MTEB24120364-R for EUT test Max Conducted average Output Power value.

Note: 2) $P_d = (EIRP)/(4 * \pi * R^2) = (0.034)/(4 * 3.1416 * 20^2) = 0.0000068$

Contains FCCID: 2AC7Z-ESP32WROOM32U

the numeric gain (G) of the antenna with a gain specified in dB is determined by
 Numeric gain (G)= $10^{\Delta}(\text{antenna gain}/10)$

Band	Maximum Conducted Output Power		Antenna Gain (dBi)	Numeric gain (dB)
	(dBm)	(mW)		
Wi-Fi 2.4G	15.90	38.905	2.33	1.710
BT	2.79	1.901	2.33	1.710
Bluetooth (Low Energy)	1.08	1.282	2.33	1.710

RF Exposure Calculations:

The following information provides the minimum separation distance for the highest gain antenna provided. This calculation is based on the conducted power, considering maximum power and antenna gain. The formula shown in KDB 447498 D01 is used in the calculation.

Equation from KDB 447498 D01 General RF Exposure Guidance v06 (10/23/2015) is:

$$S = PG / 4\pi R^2$$

Where: S = power density (in appropriate units, e.g. mW/cm²)

P = Time-average maximum tune up procedure (in appropriate units, e.g., mW)

G = the numeric gain of the antenna

R = distance to the center of radiation of the antenna (20 cm = limit for MPE)

Band	PG (mW)	Test Result (mW/cm ²)	Limit Value (mW/cm ²)	The MPE ratio
Wi-Fi 2.4G	66.527	0.0132	1.0	0.0132
BT	3.251	0.0006	1.0	0.0006
Bluetooth (Low Energy)	2.193	0.0004	1.0	0.0004
Note: R = 20 cm $\pi = 3.1416$ The MPE ratio = Mac Test Result ÷ Limit Value				

So the simultaneous transmitting antenna pairs as below:

Σ of MPE ratios= WiFi 2.4G + BT = 0.0132 + 0.0006 = 0.014 < 1

Note: For transmitters, minimum separation distance is 20cm, even if calculations indicate MPE distance is less.

Simultaneous TX (NFC+2.4G)

Mode	Power Density(mW/m ²)		Conclusion
	Results	Limit	
Simultaneous TX	0.013	1.0	PASS

$$\sum_{i=1}^a \frac{P_i}{P_{th,i}} + \sum_{j=1}^b \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^c \frac{Evaluated_k}{Exposure Limit_k} \leq 1$$

Results (NFC+2.4G) =0.0000068/0.9789+0.0132/1=0.013

Contains FCCID: XMR201909EC25AFX

Band	Maximum Conducted Output Power (dBm)	MAX. antenna gain (dBi)	PG		Test Result (mW/cm ²)	Limit Value (mW/cm ²)	Conclusion
			(dBm)	(mW)			
WCDMA II	25.00	8.000	33.000	1995.262	0.397	1.000	Pass
WCDMA IV	25.00	5.000	30.000	1000.000	0.199	1.000	Pass
WCDMA V	25.00	9.416	34.416	2764.394	0.550	0.550	Pass
LTE Band 2	25.00	8.000	33.000	1995.262	0.397	1.000	Pass
LTE Band 4	25.00	5.000	30.000	1000.000	0.199	1.000	Pass
LTE Band 5	25.00	9.416	34.416	2764.394	0.550	0.550	Pass
LTE Band 12	25.00	8.734	33.734	2362.653	0.470	0.470	Pass
LTE Band 13	25.00	9.173	34.173	2613.966	0.520	0.520	Pass
LTE Band 14	25.00	9.255	34.255	2663.790	0.530	0.530	Pass
LTE Band 66	25.00	5.000	30.000	1000.000	0.199	1.000	Pass
LTE Band 71	25.00	8.545	33.545	2262.039	0.450	0.450	Pass

Note: R = 20cm $\Delta = 3.1416$

Note: For transmitters, minimum separation distance is 20cm, even if calculations indicate MPE distance is less.

IMPORTANT NOTE: To comply with the FCC RF exposure compliance requirements, the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. No change to the antenna or the device is permitted. Any change to the antenna or the device could result in the device exceeding the RF exposure requirements and void user's authority to operate the device.

.....THE END OF REPORT.....