

RF Exposure Evaluation Report

Report Reference No...... : **MTEB24060336-H**

FCC ID..... : **2A3IW-R2-4K-DUAL**

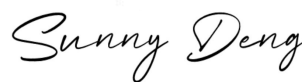
Compiled by

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



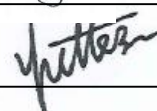
Supervised by

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



Approved by

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



Date of issue.....: June 26, 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.....: **Aarna Sales Corporation**

Address.....: 1940 N Municipal Way, UNIT 2020, Round Lake, IL 60073

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.

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Test item description.....: Car Dash Camera

Trade Mark.....: ROVE

Model/Type reference.....: ROVE R2-4K DUAL

Listed Models: N/A

Modulation Type.....: CCK/DSSS/ OFDM

Operation Frequency.....: From 2402MHz to 2480MHz; 2412MHz~2462MHz
5180MHz-5240MHz ; 5745MHz-5825MHz

Hardware Version.....: V01

Software Version.....: R2-DUAL-07-01-2024-V1

Rating.....: DC 5V by USB Port
DC 5V by Car Charger

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

TEST REPORT

Equipment under Test : Car Dash Camera

Model /Type : ROVE R2-4K DUAL

Listed Models : N/A

Remark : N/A

Applicant : Aarna Sales Corporation

Address : 1940 N Municipal Way, UNIT 2020, Round Lake, IL 60073

Manufacturer(1) : Shenzhen Samoon Technology Co.,Ltd

Address : Floor 6, Building 7, Zhongyuntai Science and Technology Industrial Factory, Songbai Road, Shiyan Street, Baoan District, Shenzhen China

Test Result:	PASS
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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	2024.06.26	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)

TABLE 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)
(A) Limits for Occupational/Controlled Exposures				
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
300–1500			f/300	6
1500–100,000			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
300–1500			f/1500	30
1500–100,000			1.0	30

F= Frequency in MHz

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

π = 3.1416

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

P_d is the limit of MPE, 1 mW/cm². If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

2.1.3 EUT RF Exposure

WIFI 2.4G

802.11b			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2412MHz)	25.03	25.03 ± 1	26.03
Middle(2437MHz)	24.94	24.94 ± 1	25.94
Highest(2462MHz)	24.04	24.04 ± 1	25.04

802.11g			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2412MHz)	19.82	19.82 ± 1	20.82
Middle(2437MHz)	20.88	20.88 ± 1	21.88
Highest(2462MHz)	20.84	20.84 ± 1	21.84

802.11n(H20)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2412MHz)	21.14	21.14 ± 1	22.14
Middle(2437MHz)	19.23	19.23 ± 1	20.23
Highest(2462MHz)	19.21	19.21 ± 1	20.21

802.11n(H40)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2422MHz)	19.85	19.85 ± 1	20.85
Middle(2437MHz)	22.23	22.23 ± 1	23.23
Highest(2452MHz)	17.30	17.30 ± 1	18.30

802.11Ax(H20)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2412MHz)	18.43	18.43 ± 1	19.43
Middle(2437MHz)	16.05	16.05 ± 1	17.05
Highest(2462MHz)	17.78	17.78 ± 1	18.78

802.11Ax(H40)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2422MHz)	16.01	16.01 ± 1	17.01
Middle(2437MHz)	12.22	12.22 ± 1	13.22
Highest(2452MHz)	15.31	15.31 ± 1	16.31

WIFI 2.4G

Worst case: 802.11b						
Channel	Maximum tune-up Power (dBm)	Maximum tune-up Power (MW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
Middle(2437MHz)	25.94	392.64	2.23	0.13	1.0	Pass

Note: 1) Refer to report MTEB24060336-R3 for EUT test Max Conducted average Output Power value.

Note: 2) $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2) = (392.64 \cdot 1.67) / (4 \cdot 3.1416 \cdot 20^2) = 0.13$

Note: 3) EUT's Bluetooth module is more than 20cm away from the human body.

WIFI 5.1G

IEEE for 802.11a			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
5180	17.16	17.16±1	14.217
5200	17.71	17.71±1	15.588
5240	19.17	19.17±1	16.489

IEEE for 802.11n(HT20)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
5180	16.74	16.74±1	14.237
5200	17.62	17.62±1	15.316
5240	19.16	19.16±1	16.128

IEEE for 802.11n(HT40)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
5190	21.23	21.23±1	12.125
5230	22.7	22.7±1	15.853

IEEE for 802.11ac(HT20)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
5180	16.22	16.22±1	13.344
5200	16.8	16.8±1	13.945
5240	18.24	18.24±1	14.767

IEEE for 802.11 ac(HT40)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
5190	16.99	16.99±1	10.885
5230	19.23	19.23±1	12.535

IEEE for 802.11ac(HT80)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
5210	17.26	17.26±1	10.256

IEEE for 802.11Ax(HT20)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
5180	11.0	11.0±1	13.344
5200	11.73	11.73±1	13.945
5240	12.96	12.96±1	14.767

IEEE for 802.11 Ax(HT40)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
5190	10.48	10.48±1	10.885
5230	12.22	12.22±1	12.535

Worst case: IEEE for 802.11a						
Channel	Maximum Peak Conducted	Maximum Peak Conducted Output Power	Antenna Gain	Power Density at R = 20 cm	Limit	Result
	(dB)	(MW)	(dBi)	(mW/cm ²)		
Highest (5240MHz)	16.489	44.56	3.79	0.021	1.0	Pass

Note: 1) Refer to report MTEB24060336-R2 for EUT test Max Conducted average Output Power value.

Note: 2) $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2) = (44.56 \cdot 2.39) / (4 \cdot 3.1416 \cdot 20^2) = 0.021$

Note: 3) EUT's Bluetooth module is more than 20cm away from the human body.

WIFI 5.8G

IEEE for 802.11a			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
5745	14.68	14.68±1	15.68
5785	14.25	14.25±1	15.25
5825	15.43	15.43±1	16.43

IEEE for 802.11n(HT20)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
5745	14.88	14.88±1	15.88
5785	14.48	14.48±1	15.48
5825	18.0	18.0±1	19.0

IEEE for 802.11n(HT40)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
5755	17.22	17.22±1	18.22
5795	17.74	17.74±1	18.74

IEEE for 802.11ac(HT20)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
5745	14.72	14.72±1	15.72
5785	14.38	14.38±1	15.38
5825	15.14	15.14±1	16.14

IEEE for 802.11 ac(HT40)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
5755	17.75	17.75±1	18.75
5795	17.68	17.68±1	18.68

IEEE for 802.11ac(HT80)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
5775	17.77	17.77±1	18.77

IEEE for 802.11Ax(HT20)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
5745	17.4	17.4±1	18.4
5785	16.51	16.51±1	17.51
5825	16.83	16.83±1	17.83

IEEE for 802.11 Ax(HT40)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
5755	16.6	16.6±1	16.6
5795	17.02	17.02±1	18.02

Worst case: IEEE for 802.11n20						
Channel	Maximum Peak Conducted Output Power	Maximum Peak Conducted Output Power	Antenna Gain	Power Density at R = 20 cm	Limit	Result
	(dBm)	(MW)	(dBi)	(mW/cm2)		
Hightest(5825M Hz)	19.0	79.43	3.05	0.032	1.0	Pass

Note: 1) Refer to report MTEB24060336-R for EUT test Max Conducted average Output Power value.

Note: 2) $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2) = (79.43 \cdot 2.02) / (4 \cdot 3.1416 \cdot 20^2) = 0.032$

Note: 3) EUT's Bluetooth module is more than 20cm away from the human body.

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