



Shenzhen Most Technology Service Co., Ltd.

East A, 1 floor of New Aolin Factory buiding, Langshan Erlu, North District,
Hi-tech Industry Park, Nanshan,Shenzhen,Guangdong,China

RF Exposure Evaluation Report

Report Reference No.....: MTEB23080010-H

FCC ID..... : 2A3IW-R3N

Compiled by
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Date of issue.....: **Aug. 01,2023**

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

Address: East A, 1 Floor of New Aolin Factory Building, Langshan Erlu, North District, Hi-Tech Industry Park Nanshan, Shenzhen, Guangdong, People's Republic of 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.....: R3

Listed Models: N/A

Modulation Type: CCK/DSSS/ OFDM
OFDM

Operation Frequency.....: From 2412 - 2462MHz
From 5180MHz-5240MHz
5745MHz-5825MHz

Hardware Version.....: CHF43LOT-B-MAIN-A0

Software Version: R3-9-1-2023

Rating: DC 5V (by USB Port)
DC 5V (by Car Charger)

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

TEST REPORT

Equipment under Test : Car Dash Camera

Model /Type : R3

Listed Models : N/A

Remark : N/A.

Applicant : **Aarna Sales Corporation**

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

Manufacturer : **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	2023-08-01	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: $P_d = (P_{out} * G) / (4 * \pi * R^2)$ 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

Antenna Gain: 1.2dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2.4 in linear scale. Output Power Into Antenna & RF Exposure Evaluation Distance:

WIFI 2.4G

802.11b			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2412MHz)	12.51	12.51 ± 1	13.51
Middle(2437MHz)	13.29	13.29 ± 1	14.29
Highest(2462MHz)	11.36	11.36 ± 1	12.36

802.11g			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2412MHz)	14.42	14.42 ± 1	15.42
Middle(2437MHz)	15.27	15.27 ± 1	16.27
Highest(2462MHz)	12.55	12.55 ± 1	13.55

802.11n(H20)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2412MHz)	14.14	14.14 ± 1	15.14
Middle(2437MHz)	15.34	15.34 ± 1	16.34
Highest(2462MHz)	12.58	12.58 ± 1	13.58

802.11n(H40)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2422MHz)	11.35	11.35 ± 1	12.35
Middle(2437MHz)	14.64	14.64 ± 1	15.64
Highest(2452MHz)	13.31	13.31 ± 1	14.31

WIFI 2.4G

Worst case: 802.11n(H20)						
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)	16.34	43.05	1.2	0.011	1.0	Pass

Note: 1) Refer to report **MTEB23080010-R2** for EUT test Maximum tune-up Power.

Note: 2) $P_d = (P_{out} * G) / (4 * \pi * R^2) = (43.05 * 1.3) / (4 * 3.1416 * 20^2) = 0.011$

Antenna Gain B: 1.2dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2.4 in linear scale. Output Power Into Antenna & RF Exposure Evaluation Distance:

WIFI 5.1G

IEEE for 802.11a			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
36	5.7	5.7±1	5.782
40	9.85	9.85±1	9.934
44	9.99	9.99± 1	10.072

IEEE for 802.11n(HT20)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
36	9.03	9.03±1	10.03
40	8.83	8.83±1	9.83
44	9.24	9.24 ± 1	10.24

IEEE for 802.11n(HT40)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
38	8.99	8.99±1	9.99
46	9.24	9.24 ± 1	10.24

IEEE for 802.11ac(HT20)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
36	8.82	8.82±1	9.82
40	8.76	8.76±1	9.76
44	8.84	8.84±1	9.84

IEEE for 802.11 ac(HT40)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
38	10.66	10.66±1	11.66
46	8.28	8.28 ±1	9.28

IEEE for 802.11ac(HT80)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
42	8.47	8.47±1	9.47

Worst case: IEEE for 802.11a						
Channel	Maximum Conducted Output Power	Maximum Conducted Output Power	Antenna Gain	Power Density at R = 20 cm	Limit	Result
	(dBm)	(MW)	(dBi)	(mW/cm ²)		
Lowest (5220MHz)	11.66	14.66	1.2	0.0037	1.0	Pass

Note: 1) Refer to report **MTEB23080010-R1** for EUT test Maximum tune-up Power.

Note: 2) $P_d = (P_{out} * G) / (4 * \pi * R^2) = (14.66 * 1.3) / (4 * 3.1416 * 20^2) = 0.0037$

Antenna Gain B: 1.2dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2.4 in linear scale. Output Power Into Antenna & RF Exposure Evaluation Distance:

WIFI 5.8G

IEEE for 802.11a			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
149	8.02	8.02±1	9.02
157	8.23	8.23±1	9.23
165	8.38	8.38± 1	9.38

IEEE for 802.11n(HT20)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
149	7.0	7.0±1	8.0
157	8.15	8.15±1	9.15
165	7.48	7.48± 1	8.48

IEEE for 802.11n(HT40)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
151	7.49	7.49±1	8.49
159	8.52	8.52± 1	9.52

IEEE for 802.11ac(HT20)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
149	6.75	6.75±1	7.75
157	8.21	8.21±1	9.21
165	7.5	7.5± 1	8.5

IEEE for 802.11 ac(HT40)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
151	6.77	6.77±1	7.77
159	7.83	7.83 ±1	8.83

IEEE for 802.11ac(HT80)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
155	7.83	7.83±1	8.83

Worst case: IEEE for 802.11a						
Channel	Maximum Conducted Output Power	Maximum Conducted Output Power	Antenna Gain	Power Density at R = 20 cm	Limit	Result
	(dBm)	(MW)	(dBi)	(mW/cm ²)		
Lowest (5825MHz)	9.52	8.95	1.2	0.002	1.0	Pass

Note: 1) Refer to report **MTEB23080010-R1** for EUT test Maximum tune-up Power.

Note: 2) $P_d = (P_{out} * G) / (4 * \pi * R^2) = (8.95 * 1.3) / (4 * 3.1416 * 20^2) = 0.002$

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