

RF Exposure Evaluation Report

Report Reference No......: **MTEB24080008-H**

FCC ID.....: **2AHCR-C316W**

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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.....: **AKUVOX (XIAMEN) NETWORKS CO., LTD.**

Address.....: 10/F, No.56 Guanri Road, Software Park II, Xiamen 361009,
China

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.....: Indoor Monitor

Trade Mark.....: Akuvox

Model/Type reference.....: C316W

Listed Models: N/A

Modulation Type.....: GFSK, $\pi/4$ DQPSK, 8DPSK
b: DSSS, CCK; g/n: BPSK, QPSK, QAM
OFDM

Operation Frequency.....: From 2402MHz to 2480MHz
From 2412MHz - 2462MHz
From 5180MHz-5240MHz
5260MHz-5320MHz
5500MHz-5700MHz
From 5745MHz-5825MHz

Hardware Version.....: V0.95

Software Version.....: V316.30.12.113

Rating.....: DC 12V $\pm$ 10%
POE power supply(48V)

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

TEST REPORT

Equipment under Test : Indoor Monitor

Model /Type : C316W

Listed Models : N/A

Remark : N/A

Applicant : AKUVOX (XIAMEN) NETWORKS CO., LTD.

Address : 10/F, No.56 Guanri Road , Software Park II , Xiamen 361009, China

Manufacturer : AKUVOX (XIAMEN) NETWORKS CO., LTD.

Address : 10/F, No.56 Guanri Road , Software Park II , Xiamen 361009, 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	2024.08.02	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**BLE**

GFSK			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2402 MHz)	7.827	7.827 ± 1	8.827
Middle(2440MHz)	7.549	7.549 ± 1	8.549
Highest(2480MHz)	7.030	7.030 ± 1	8.03

BLE

Worst case: GFSK						
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
Lowest(2402 MHz)	8.827	7.63	4.5	0.0043	1.0	Pass

Note: 1) Refer to report MTEB24080008-R3 for EUT test Max Conducted average Output Power value.

Note: 2) $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2) = (7.63 \cdot 2.82) / (4 \cdot 3.1416 \cdot 20^2) = 0.0043$

BT classic

GFSK			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2402MHz)	7.853	7.853 ± 1	8.853
Middle(2441MHz)	7.566	7.566 ± 1	8.566
Highest(2480MHz)	7.130	7.130 ± 1	8.13

$\pi/4$ DQPSK			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2402MHz)	6.728	6.728 ± 1	7.728
Middle(2441MHz)	6.507	6.507 ± 1	7.507
Highest(2480MHz)	6.020	6.020 ± 1	7.02

8DPSK			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2402MHz)	7.289	7.289 ± 1	8.289
Middle(2441MHz)	7.043	7.043 ± 1	8.043
Highest(2480MHz)	6.587	6.587 ± 1	7.587

Worst case: GFSK						
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
Lowest(2402MHz)	8.853	7.68	4.5	0.0043	1.0	Pass

Note: 1) Refer to report MTEB24080008-R4 for EUT test Max Conducted average Output Power value.

Note: 2) $P_d = (P_{out} * G) / (4 * \pi * R^2) = (7.68 * 2.82) / (4 * 3.1416 * 20^2) = 0.0043$

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

WIFI 2.4G

802.11b			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2412MHz)	21.30	21.30 ± 1	22.3
Middle(2437MHz)	15.35	15.35 ± 1	16.35
Highest(2462MHz)	16.33	16.33 ± 1	17.33

802.11g			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2412MHz)	16.78	16.78 ± 1	17.78
Middle(2437MHz)	17.56	17.56 ± 1	18.56
Highest(2462MHz)	16.86	16.86 ± 1	17.86

802.11n(H20)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2412MHz)	17.38	17.38 ± 1	18.38
Middle(2437MHz)	18.03	18.03 ± 1	19.03
Highest(2462MHz)	17.67	17.67 ± 1	18.67

802.11n(H40)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
Lowest(2422MHz)	17.38	17.38 ± 1	18.38
Middle(2437MHz)	18.06	18.06 ± 1	19.06
Highest(2452MHz)	17.98	17.98 ± 1	18.98

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
Lowest(2412MHz)	22.3	169.82	4.5	0.0953	1.0	Pass

Note: 1) Refer to report MTEB24080008-R for EUT test Max Conducted average Output Power value.

Note: 2) $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2) = (169.82 \cdot 2.82) / (4 \cdot 3.1416 \cdot 20^2) = 0.0953$

WIFI 5G

IEEE for 802.11a			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
5180	11.006	11.006 ± 1	12.006
5200	11.654	11.654 ± 1	12.654
5240	12.110	12.110 ± 1	13.11
5260	12.290	12.290 ± 1	13.29
5280	11.852	11.852 ± 1	12.852
5320	11.518	11.518 ± 1	12.518
5500	10.129	10.129 ± 1	11.129
5600	9.974	9.974 ± 1	10.974
5700	8.627	8.627 ± 1	9.627

IEEE for 802.11n(HT20)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
5180	14.447	14.447 ± 1	15.447
5200	14.855	14.855 ± 1	15.855
5240	15.359	15.359 ± 1	16.359
5260	15.711	15.711 ± 1	16.711
5280	15.307	15.307 ± 1	16.307
5320	14.913	14.913 ± 1	15.913
5500	13.948	13.948 ± 1	14.948
5600	13.619	13.619 ± 1	14.619
5700	12.334	12.334 ± 1	13.334

IEEE for 802.11n(HT40)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
5190	14.308	14.308 ± 1	15.308
5230	14.827	14.827 ± 1	15.827
5270	15.502	15.502 ± 1	16.502
5310	14.245	14.245 ± 1	15.245
5510	13.273	13.273 ± 1	14.273
5590	13.751	13.751 ± 1	14.751
5670	12.286	12.286 ± 1	13.286

IEEE for 802.11ac(HT20)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
5180	12.193	12.193 ± 1	13.193
5200	13.047	13.047 ± 1	14.047
5240	14.246	14.246 ± 1	15.246
5260	14.131	14.131 ± 1	15.131
5280	13.719	13.719 ± 1	14.719
5320	13.670	13.670 ± 1	14.67
5500	13.279	13.279 ± 1	14.279
5600	11.236	11.236 ± 1	12.236
5700	9.773	9.773 ± 1	10.773

IEEE for 802.11 ac(HT40)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
5190	12.373	12.373 ± 1	13.373
5230	13.537	13.537 ± 1	14.537
5270	13.547	13.547 ± 1	14.547
5310	13.091	13.091 ± 1	14.091
5510	12.111	12.111 ± 1	13.111
5590	11.150	11.150 ± 1	12.15
5670	10.108	10.108 ± 1	11.108

IEEE for 802.11 ac(HT80)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
5210	12.531	12.531 ± 1	13.531
5290	13.211	13.211 ± 1	14.211
5530	12.206	12.206 ± 1	13.206
5610	11.196	11.196 ± 1	12.196

U-NII 1

Worst case: IEEE for 802.11n(HT20)						
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)		
5240	16.359	43.24	2.3	0.0165	1.0	Pass

Note: 1) Refer to report MTEB24080008–R1 for EUT test Max Conducted average Output Power value.

Note: 2) $P_d = (P_{out} * G) / (4 * \pi * R^2) = (43.24 * 1.92) / (4 * 3.1416 * 20^2) = 0.0165$

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

U-NII 2A

Worst case: IEEE for 802.11n(HT20)						
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)		
5260	16.711	46.89	2.3	0.0179	1.0	Pass

Note: 1) Refer to report MTEB24080008–R1 for EUT test Max Conducted average Output Power value.

Note: 2) $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2) = (46.89 \cdot 1.92) / (4 \cdot 3.1416 \cdot 20^2) = 0.0179$

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

U-NII 2C

Worst case: IEEE for 802.11n(HT20)						
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)		
5500	14.948	31.25	3.5	0.0175	1.0	Pass

Note: 1) Refer to report MTEB24080008–R1 for EUT test Max Conducted average Output Power value.

Note: 2) $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2) = (31.25 \cdot 2.23) / (4 \cdot 3.1416 \cdot 20^2) = 0.0138$

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

U-NII 3

IEEE for 802.11a			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
5745	9.052	9.052±1	10.052
5785	8.416	8.416±1	9.416
5825	8.410	8.410±1	9.41

IEEE for 802.11n(HT20)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
5745	12.532	12.532±1	13.532
5785	12.001	12.001±1	13.001
5825	11.836	11.836±1	12.836

IEEE for 802.11n(HT40)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
5755	12.713	12.713±1	13.713
5795	11.906	11.906±1	12.906

IEEE for 802.11ac(HT20)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
5745	10.151	10.151±1	11.151
5785	9.274	9.274±1	10.274
5825	8.860	8.860±1	9.86

IEEE for 802.11 ac(HT40)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
5755	10.057	10.057±1	11.057
5795	8.828	8.828±1	9.828

IEEE for 802.11 ac(HT80)			
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power
			(dBm)
5775	9.127	9.127±1	10.127

U-NII 3

Worst case: IEEE for 802.11n(HT40)						
Channel	Maximum Peak Conducted	Maximum Peak Conducted Output Power	Antenna Gain	Power Density at R = 20 cm	Limit	Result
	(dBm)	(MW)	(dBi)	(mW/cm ²)		
5755	13.713	23.51	3.6	0.0107	1.0	Pass

Note: 1) Refer to report MTEB24080008–R2 for EUT test Max Conducted average Output Power value.

Note: 2) $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2) = (23.51 \cdot 2.29) / (4 \cdot 3.1416 \cdot 20^2) = 0.0107$

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

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