RF Exposure Evaluation

FCC ID: 2BD8V-9KEY

1. Client Information

Applicant	:	Zhongshan Aoteng Electronic Technology Co.,Ltd
Address	:	1, 3/F, West Building, No. 33, Shuncheng Industrial Zone, Haizhou Sha Yuan, Guzhen Town, Zhongshan City, Guangdong Province, China
Manufacturer	:	Zhongshan Aoteng Electronic Technology Co.,Ltd
Address	:	1, 3/F, West Building, No. 33, Shuncheng Industrial Zone, Haizhou Sha Yuan, Guzhen Town, Zhongshan City, Guangdong Province, China

2. General Description of EUT

EUT Name	:	433MHz remote control	
Model No.	:	AOQ-433-9KEY- RF-01 TS210715PQA_V1.0_9, AOQ-15KEY 433PLZ_V2.0,TS220922PLZ_V1.0 , TX-9A-RZ , HS-433-TX-15B-V05 ,CF-SWPCB1 , CF-433-TX-18A-03 -,AQO-Cideal -15KEY-433B02 ,AQO-Cideal -15KEY-433B03 ;AOQ-9KEY-433M-TX ,AOQ-433-342-,AOQ-433-423-,AOQ-433-567-,AOQ-433-683-,AOQ-433-772-,AOQ-433-863-,AOQ-433-942-,AOQ-433-AP782-,AOQ-433-OL891-	
Sample ID	:	202405-0084-1-1# & 202405-0084-1-2#	
Product Description	:	Operation Frequency:	433.95MHz
		Antenna Gain:	-3dBi PCB Antenna
Power Rating	:	3V DC (powered by 2pcs AAA batteries)	
Software Version	:	TS220907CQA_V4.0	
Hardware Version	:	AOQ-433-9KEY- RF-01	
Remark: The antenna gain provided by the applicant, and verified for the RF conduction test and adapter provided by TOBY test lab.			

Note: More test information about the EUT please refer the RF Test Report.

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The RF Exposure Evaluation for FCC:

SAR Test Exclusion Calculations

FCC: According to 447498 D04 Interim General RF Exposure Guidance v01.

The SAR-based exemption formula of § 1.1307(b)(3)(i)(B), repeated here as Formula (B.2), applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power or effective radiated power (ERP), whichever is greater, of less than or equal to the threshold P_{th} (mW).

This method shall only be used at separation distances from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz (inclusive). P_{th} is given by Formula (B.2).

$$P_{\text{th}}\ (\text{mW}) = \begin{cases} ERP_{20\ \text{cm}}(d/20\ \text{cm})^{x} & d \le 20\ \text{cm} \\ ERP_{20\ \text{cm}} & 20\ \text{cm} < d \le 40\ \text{cm} \end{cases}$$

where

$$x = -\log_{10}\left(\frac{60}{ERP_{20\ \text{cm}}\sqrt{f}}\right)$$

and f is in GHz, d is the separation distance (cm), and ERP_{20cm} is per Formula (B.1). The example values shown in Table B.2 are for illustration only.

Table B.2—Example Power Thresholds (mW)

Frequency (MHz)	Distance (mm)										
	5	10	15	20	25	30	35	40	45	50
300	39	65	88	110	129	148	166	184	201	217
450	22	44	67	89	112	135	158	180	203	226
835	9	25	44	66	90	116	145	175	207	240
1900	3	12	26	44	66	92	122	157	195	236
2450	3	10	22	38	59	83	111	143	179	219
3600	2	8	18	32	49	71	96	125	158	195
5800	1	6	14	25	40	58	80	106	136	169

Calculation:

Frequency (MHz)	Max. Output Power (dBuV/m)	Max. Output Power (dBm)	Tolerance ± (dB)	Output power (Max. Turn-up Procedure) (mW)	Limit P_{th}(mW)
433.95MHz	62.05	-37.90	±1	0.00016	**22**

Note: For conducted measurements below 1000 MHz, the field strength shall be computed as specified in item d), and then an additional 4.7 dB shall be added as an upper bound on the field strength that would be observed on a test range with a ground plane for frequencies between 30 MHz and 1000 MHz, or an additional 6 dB shall be added for frequencies below 30 MHz.

$$E = \mathrm{EIRP} - 20\log d + 104.8$$

where

E is the electric field strength in dBμV/m
EIRP is the equivalent isotropically radiated power in dBm
d is the specified measurement distance in m

So: EIRP=E+20log3-104.8-(4.7 or 6)

Note: At separation distance of ≤5 mm

The measurement results comply with the FCC Limit per 47 CFR 2.1093 for the uncontrolled RF Exposure and SAR Exclusion Threshold per KDB 447498 D04, No SAR is required.

-----END OF THE REPORT-----