FCC Test Report

Report No.: AGC10862210401FE03

FCC ID	: 2AVVD-AC123
APPLICATION PURPOSE	: Original Equipment
PRODUCT DESIGNATION	: Remote
BRAND NAME	: A-OK
MODEL NAME	AC123-01, AC123-02, AC123-06, AC123-01D, AC123-02D, AC123-06D
APPLICANT	Guangdong A-OKTECHNOLOGY GRAND DEVELOPMENTCO, LTD
DATE OF ISSUE	: Apr. 30, 2021
STANDARD(S)	: FCC Part 15 Rules
REPORT VERSION	: V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd

Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Apr. 30, 2021	Valid	Initial Release

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Applicant	Guangdong A-OKTECHNOLOGY GRAND DEVELOPMENTCO, LTD		
Address	Hexing Road South side Sanhe Economic Development Zone, Huiyang, Huizhou, China		
Manufacturer	Juangdong A-OKTECHNOLOGY GRAND DEVELOPMENTCO, LTD		
Address	lexing Road South side Sanhe Economic Development Zone, Huiyang, Huizhou, China		
Factory	Juangdong A-OKTECHNOLOGY GRAND DEVELOPMENTCO, LTD		
Address	exing Road South side Sanhe Economic Development Zone, Huiyang, Huizhou, China		
Product Designation	remote control		
Brand Name	A-OK		
Test Model	AC123-01		
Series Model	AC123-02, AC123-06, AC123-01D, AC123-02D, AC123-06D		
Difference Description	All the series models are the same as the test model except for the model names, and the number of Indicator light.		
Date of test	Apr. 02, 2021 to Apr. 30, 2021		
Deviation	None		
Condition of Test Sample	Normal		
Report Template	AGCRT-US-BR/RF (2013-03-01)		

We hereby certify that:

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2003) and the energy emitted by the sample EUT tested as described in this report is in compliance with radiated emission limits of FCC Rules Part 15.231.

kerry chan Prepared By Kelly Cheng Apr. 30, 2021 (Project Engineer) Max 21 Reviewed By Max Zhang Apr. 30, 2021 (Reviewer) Approved By Forrest Lei Apr. 30, 2021 (Authorized Officer)

2. GENERAL INFORMATION

2.1. PRODUCT DESCRIPTION

A major technical description of EUT is described as following

Operation Frequency	433.92MHz	
Field Strength(3m)	433.92MHz: 74.62dBuV/m(PK)@3m	
	433.92MHz: 66.58dBuV/m(AV)@3m	
Modulation	ASK	
Number of channels	1	
Hardware Version	V4.1	
Software Version	200409B	
Antenna Designation	PCB antenna	
Antenna Gain	0.1dBi	
Power Supply	DC 3V by battery	

2.2. RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: 2AVVD-AC123** filing to comply with Section 15.231 of the FCC Part 15, Subpart C Rules.

2.3. TEST METHODOLOGY

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4 (2010). Radiated testing was performed at an antenna to EUT distance 3 meters.

2.4. SPECIAL ACCESSORIES

Refer to section 5.1.

2.5. EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

3. MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement y ±U, where expended uncertainty U is based on a standard

uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

- Uncertainty of Conducted Emission, Uc = ±3.2 dB
- Uncertainty of Radiated Emission below 1GHz, Uc = ±3.9 dB
- Uncertainty of Radiated Emission above 1GHz, Uc = ±4.8 dB
- Uncertainty of Occupied Channel Bandwidth: Uc = ±2 %

4. DESCRIPTION OF TEST MODES

NO.	TEST MODE DESCRIPTION
1	Transmitting mode
Note:	

1. The test modes can be supply by battery or adapter, only the result of the worst case was recorded in the report, if no other cases.

2. For Radiated Emission, 3axis were chosen for testing for each applicable mode.

3. For battery operated equipment, the equipment tests are performed using a new battery.

4. The EUT was transmitted manually.

5. SYSTEM TEST CONFIGURATION

5.1. EQUIPMENT USED IN EUT SYSTEM

ltem	Equipment	Model No.	ID or Specification	Remark
1	Remote	A-OK	2AVVD-AC123	N/A

5.2. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.203	Antenna Requirement	Compliant
§15.231(a)(1)	Activated manually	Compliant
§15.231(b)	Average Factor	Compliant
15.231(c)	-20dB Bandwidth	Compliant
§15.231(e) & §15.209	Field Strength of Fundamental and Spurious Emission	Compliant
15.207	Conducted Emission	Not applicable

Note: The conducted emission tests at AC port are not required for devices which only employ battery power for operation.

6. TEST FACILITY

Test Site	Attestation of Global Compliance (Shenzhen) Co., Ltd
Location	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Designation Number	CN1259
FCC Test Firm Registration Number	975832
A2LA Cert. No.	5054.02
Description	Attestation of Global Compliance(Shenzhen) Co., Ltd is accredited by A2LA

TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	May 15, 2020	May 14, 2021
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Dec. 07, 2020	Dec. 06, 2021
Attenuator	ZHINAN	E-002	N/A	Sep. 03, 2020	Sep. 02, 2022
Active loop antenna (9K-30MHz)	ZHINAN	ZN30900C	18051	May 22, 2020	May 21, 2022
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	May. 17, 2019	May. 16, 2021
Broadband Preamplifier	ETS LINDGREN	3117PA	00225134	Sep. 03, 2020	Sep. 02, 2022
ANTENNA	SCHWARZBECK	VULB9168	494	Sep. 20, 2019	Sep. 19, 2021
Test software	Tonscend	JS32-RE (Ver.2.5)	N/A	N/A	N/A

7. ANTENNA REQUIREMENT

According to §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

The EUT has PCB antenna, which accordance to the above sections, is considered sufficient to comply with the provisions of these sections. Please see EUT photo for details.



The requirements of section 15.203 are FULFILLED.

8. PROVISION FOR MOMENTARY OPERATION

8.1 MEASUREMENT PROCEDURE

- 1. Set the parameters of SPA as below: Centre frequency = Operation Frequency RBW=1MHz, VBW=3MHz Span: 0Hz Sweep time: 10S
- 2. Set the EUT to transmit by manually operated. Use the "View" function of SPA to find the transmission time of being released.
- 3. Record the data and Reported.

8.2 TEST SETUP



8.3 TEST RESULT

Test Mode: EUT @ 433.92MHz for RF Transmitter

The time of stopping transmission after automatically	Limit (s)
activation by alarm sensor(s)	
0.82	5.00

🔤 Keysight Spe	ectrum Analyzer - Swept SA							
L <mark>XI</mark>	RF 50 Ω AC		SENSE:I	NT	ALIGN AUTO	06:58:26 PM Apr 12,	2021	Save
Marker 1	1.68000 s	PNO: Fast ← IFGain:Low	Trig: Free Ru Atten: 30 dB	n	g Type: Log-Pwr	TYPE WWW DET NNN	456 WWW NNN	
10 dB/div	Ref 20.00 dBm					Mkr1 1.68 5.45 d	0 s Bm	State►
10.0 0.00	∮ 1 ¢	2∆1						Trace (+ State)
-10.0 -20.0 -30.0								
-40.0								
-60.0 -70.0				instalik – o otki k –	daal, mildaaad takaa	hand bet been a day the state		Data (Export) ► Trace 1
Center 43 Res BW 1	33.920000 MHz 1.0 MHz	#VB	W 3.0 MHz		Sweep	Span (10.00 s (1001) Hz pts)	Screen Image
MKR MODE TF 1 N 1 2 A1 1 3 4 5 6 7	RC SCL X t t (Δ)	1.680 s 820.0 ms (∆	Y 5.45 dBm () -0.08 dB	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE		
8 9 10 11 • MSG 1 File •	<screen_0075.png> s</screen_0075.png>	aved			STATUS	3	• •	

RESULT: PASS

9. DUTY CYCLE CORRECTION FACTOR

9.1 MEASUREMENT PROCEDURE

1. Set the parameters of SPA as below:

Centre frequency = Operation Frequency RBW=1MHz, VBW=3MHz Span: 0Hz

Sweep time: more than two pulse trains or more than each type of pulse occupancy time

- 2. Set the EUT to transmit by manually operated. Use the "Delta mark" function of SPA to find the period time between two pulse trains and each type of pulse occupancy time.
- 3. Record the plots and Reported.
- 9.2 TEST SETUP



9.3 TEST RESULT

Test Mode: EUT @ 433.92MHz for RF Transmitter

Duty Cycle:	(5.02+0.5571*19+0.2479*46)ms/68.12ms=27.0083ms/68.12ms=0.3965
Duty Cycle Correction Factor:	20lg(0.3965)=-8.04dB







10. RADIATED EMISSION

10.1. MEASUREMENT PROCEDURE

- 1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
- 2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
- 3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
- 4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
- 5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
- 6. For emissions below 1GHz, use 120KHz RBW and VBW>=3RBW for QP reading.
- 7. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
- 8. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
- 9. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
- 10. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
- 11. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High Low scan is not required in this case.
- 12. Only the worst case is reported.

The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting			
Start ~Stop Frequency	9KHz~150KHz/RBW 200Hz for QP			
Start ~Stop Frequency	150KHz~30MHz/RBW 9KHz for QP			
Start ~Stop Frequency	30MHz~1000MHz/RBW 120KHz for QP			
Start - Stan Eroquanay	1GHz~26.5GHz			
Start ~Stop Frequency	1MHz/1MHz for Peak, 1MHz/10Hz for Average			

Receiver Parameter	Setting			
Start ~Stop Frequency	9KHz~150KHz/RBW 200Hz for QP			
Start ~Stop Frequency	150KHz~30MHz/RBW 9KHz for QP			
Start ~Stop Frequency	30MHz~1000MHz/RBW 120KHz for QP			

Spectrum Analyzer / Receiver

10.2. TEST SETUP

3m RX Antenna S0cm 1m

Metal Full Soldered Ground Plane

System Simulator

Radiated Emission Test-Setup Frequency Below 30MHz





RADIATED EMISSION TEST SETUP ABOVE 1000MHz



10.3. TEST RESULT

Test Mode: EUT @ 433.92MHz for RF Transmitter RADIATED EMISSION BELOW 30MHZ

No emission found between lowest internal used/generated frequencies to 30MHz.

RADIATED EMISSION BELOW 1GHZ-Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	1	41.5500	5.79	21.07	26.86	43.50	-16.64	peak
2	3	15.1800	7.93	22.00	29.93	46.00	-16.07	peak
3	3	87.9300	6.71	24.56	31.27	46.00	-14.73	peak
4	4	33.9200	49.64	24.98	74.62	100.82	-26.20	peak
5	6	44.0100	7.43	27.48	34.91	46.00	-11.09	peak
6	8	68.2800	33.27	30.79	64.06	80.82	-16.76	peak
7	8	92.0800	11.60	31.29	42.89	46.00	-3.11	peak
8	9	04.9400	6.73	31.74	38.47	46.00	-7.53	peak

AV data list

Freq.	Peak Level	Duty cycle	AV Level	FCC Limit	Margin	Dolorization
[MHz]	(dBuV/m)	factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	Polarization
433.9200	74.62	-8.04	66.58	80.82	-14.24	Horizontal
868.2800	64.06	-8.04	56.02	60.82	-4.80	Horizontal



RADIATED EMISSION BELOW 1GHZ-Vertical

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	1	61.0399	6.40	17.79	24.19	40.00	-15.81	peak
2	1	36.7000	6.85	20.69	27.54	43.50	-15.96	peak
3	3	12.2699	5.62	21.90	27.52	46.00	-18.48	peak
4	4	33. <mark>9200</mark>	45.02	24.98	70.00	100.82	-30.82	peak
5	5	50.8899	6.70	25.99	32.69	46.00	-13.31	peak
6	6	61.4699	7.22	27.69	34.91	46.00	-11.09	peak
7	7	92.4199	6.39	30.24	36.63	46.00	-9.37	peak
8	8	68.0800	8.97	31.29	40.26	80.82	-40.56	peak

AV data list

Freq.	Peak Level	Duty cycle	AV Level	FCC Limit	Margin	Polarization
[MHz]	(dBuV/m)	factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	FUIdHZatiOH
433.9200	70.00	-8.04	61.96	80.82	-18.86	Vertical
868.0800	40.26	-8.04	32.22	60.82	-28.60	Vertical



RADIATED EMISSION ABOVE 1GHZ-Horizontal

Peak data list

PK D	PK Data List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity			
1	1404.8405	36.78	-17.04	80.82	44.04	100	170	Horizontal			
2	2165.0665	41.81	-11.13	80.82	39.01	100	130	Horizontal			
3	3080.5581	43.79	-9.05	80.82	37.03	100	310	Horizontal			
4	4801.1301	47.42	-4.91	74.00	26.58	100	70	Horizontal			
5	5730.4230	45.44	-4.55	80.82	35.38	100	100	Horizontal			
6	8931.1931	46.38	1.13	80.82	34.44	100	100	Horizontal			

AV data list

Freq.	Peak Level	Duty cycle	AV Level	FCC Limit	Margin	Delevization
[MHz]	(dBuV/m)	factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	Polarization
1404.8405	36.78	-8.04	28.74	60.82	32.08	Horizontal
2165.0665	41.81	-8.04	33.77	60.82	27.05	Horizontal
3080.5581	43.79	-8.04	35.75	60.82	25.07	Horizontal
4801,1301	47.42	-8.04	39.38	54.00	14.62	Horizontal
5730 4230	45.44	-8.04	37.4	60.82	23.42	Horizontal
8931.1931	46.38	-8.04	38.34	60.82	22.48	Horizontal



RADIATED EMISSION ABOVE 1GHZ-Vertical

Peak data list

PK Data List										
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity		
1	1347.3347	36.68	-16.98	74.00	37.32	100	230	Vertical		
2	2136.3136	41.27	-11.25	80.82	39.55	100	180	Vertical		
3	3584.3084	45.57	-7.41	80.82	35.25	100	70	Vertical		
4	4775.8276	46.64	-4.94	74.00	27.36	100	260	Vertical		
5	5775.2775	46.41	-4.41	80.82	34.41	100	180	Vertical		
6	8980.6481	45.99	1.49	80.82	34.83	100	260	Vertical		

AV data list

Freq.	Peak Level	Duty cycle	AV Level	FCC Limit	Margin	Polarization
[MHz]	(dBuV/m)	factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	
1347.3347	36.68	-8.04	28.64	54.00	25.36	Vertical
2136.3136	41.27	-8.04	33.23	60.82	27.59	Vertical
3584.3084	45.57	-8.04	37.53	60.82	23.29	Vertical
4775.8276	46.64	-8.04	38.6	54.00	15.40	Vertical
5775.2775	46.41	-8.04	38.37	60.82	22.45	Vertical
8980.6481	45.99	-8.04	37.95	60.82	22.87	Vertical

Note: Factor=Antenna Factor + Cable loss - Amplifier gain, Margin= Limit-Level.

The "Factor" value can be calculated automatically by software of measurement system.

RESULT: PASS

11. BANDWIDTH

11.1. MEASUREMENT PROCEDURE

1. Set the parameters of SPA as below:

Centre frequency = Operation Frequency RBW=0.3KHz VBW=1.0KHz Span: 60kHz Sweep time: Auto

- 2. Set the EUT to continue transmitting mode. Allow the trace to stabilize. Use the "N dB down" function of SPA to define the bandwidth.
- 3. Record the plots and Reported.

11.2. TEST SETUP



11.3. TEST RESULT

Test Mode: EUT @ 433.92MHz for RF Transmitter

-20dB bandwidth	LIMIT	RESULT					
16.34KHz	1084.8KHz	Pass					
Note: Limit= Operation Frequency ×0.25%							

Keysight Sp								
<mark>(X)</mark>	RF 50 Ω AC	Conto	SENSE:INT	ALIGN AUTO	04:34:10 PM Ap	pr 07, 2021	Frequency	
Center F	one							
	#IFGain:Low #Atten: 30 dB Radio Device: BTS							
10 dB/div								
10.00			An hould				Center Freq	
-10.0		. Milita	W WWWWWWWWWWWW				433.920000 MHz	
-20.0		A - A material	4-1	4.00				
-30.0	unlast al mar mar	Marily M. A. Marian		The hand a s	N			
-40.0				1. N. 15. M	the provision of the	$\lambda_{\eta} + \lambda_{\eta} + \lambda_{\eta$		
-50.0								
-60.0								
-70.0								
-80.0								
Center 4	Center 433.9200 MHz Span 60 kHz Span 60 kHz				6 7 me	CF Step		
#Res DV	2 300 HZ	"			Sweep of	0.7 1115	6.000 kHz	
Occu	pied Bandwidt	h	Total Powe	er 4.84	4 dBm		Auto Wan	
	2	6 202 VU-						
	2	0.333 KHZ					Freq Offset	
Trans	mit Freq Error	-3.898 kHz	% of OBW	Power 99	9.00 %		0 Hz	
v dB B	Bandwidth	16 34 647	v dB	-20				
A GD L	Bandwiddi	10.34 KHZ	A UD	-20.				
MSG				STATU	S			

APPENDIX A: PHOTOGRAPHS OF TEST SETUP

FCC RADIATED EMISSION TEST SETUP-BELOW 1GHz



FCC RADIATED EMISSION TEST SETUP-ABOVE 1GHz



APPENDIX B: PHOTOGRAPHS OF EUT Test Model:

ALL VIEW OF EUT



TOP VIEW OF EUT





BOTTOM VIEW OF EUT

FRONT VIEW OF EUT



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BACK VIEW OF EUT

LEFT VIEW OF EUT





RIGHT VIEW OF EUT

OPEN VIEW OF EUT





INTERNAL VIEW-1 OF EUT

INTERNAL VIEW-2 OF EUT





INTERNAL VIEW-3 OF EUT

INTERNAL VIEW-4 OF EUT





VIEW OF BATTERY

Series Model: ALL VIEW OF EUT





TOP VIEW OF EUT

BOTTOM VIEW OF EUT





FRONT VIEW OF EUT

BACK VIEW OF EUT





LEFT VIEW OF EUT

RIGHT VIEW OF EUT



----END OF REPORT----