

RF Exposure Evaluation Report

Under:
47 CFR Part 2.1091 & Part 15.255(g)
KDB 447498 D01 Interim General RF Exposure Guidance v06

Prepared for:
AiWave Technologies
ul. Niska 3, 27-200 Starachowice Poland

FCC ID: 2BCCA-ANGEL0G1RM1

EUT: Angel Eye

Model: ANGEL0G1RM1

December 11, 2023

Issue Date:

Original Report

Report Type:



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Reviewed & Approved by: Apollo Liu / Manager



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Report Revision History

Report #	Version	Description	Issued Date
KSZ2023053101J04_DXX_MPE	Rev.01	Initial issue of report	December 11, 2023

1. General Information

1. 1 Notes

The test results of this report relate exclusively to the test item specified in 1.6. The Ke Mei Ou Laboratory does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the Ke Mei Ou Laboratory.

1. 2 Testing Laboratory

Test Firm Name:	Ke Mei Ou Lab Co., Ltd.
Test Firm Address:	2013-2016, 20th Floor, Business Center, Jiahui Xin Cheng, No 3027, Shen Nan Road, Fu Tian, Shen Zhen, Guang Dong, P. R. China
FCC Designation Number:	CN1532
Test Firm Registration Number:	344480
Internet:	www.kmolab.com
Email:	kmo@kmolab.com
ANSI-ASQ National Accreditation Board/ACLASS ISO/IEC 17025 Accredited Lab for telecommunication standards. The Registration Number is AT-1532. The testing quality system meets with ISO/IEC-17025 requirements. This approval results is accepted by MRA of ILAC.	

1. 3 Details of Applicant

Name	AiWave Technologies
Address	ul. Niska 3, 27-200 Starachowice Poland

1. 4 Application Details

Date of Receipt of Application	: May 31, 2023
Date of Receipt of Test Item	: October 13, 2023
Date of Test	: October 13, 2023 ~ December 11, 2023

1. 5 Details of Manufacturer

Name	AiWave Technologies
Address	ul. Niska 3, 27-200 Starachowice Poland

1. 6 Test Item

EUT Feature	
EUT Description:	Angel Eye
Brand Name:	N/A
Basic Mode:	ANGEL0G1RM1
Family Model:	N/A
HW Version:	1.3
SW Version:	1.0
Equipment Class:	☒ DXX-Part 15 Low Power Communication Device Transmitter
EUT Stage:	☒ Identical Prototype
Note:	The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

Additional Information

Standard Product Specification					
Tx/Rx Frequency Range	☒ 57-71GHz				
Number of Channels	Channel		Frequency (GHz)		BW (MHz)
	☒	1	57-64		3300
	☒	2	61-61.5		300
	☒	3	57-64		1300
	☒	4	57-64		5100
Antenna Type / Gain	Chain Number		Ant Gain (dBi)	Internal	External
	1		5.0	☒ PCB	☐ Dipole
Type of Modulation	☒ -				
EUT Operational Condition	☐ AC à ☐ Other				
	☒ DC à ☒ External AC/DC adapter à ☐ From Battery ☐ -				
Specification of Accessory					
☒ AC/DC Adapter # (Charger)	Brand Name		Raspberry Pi	Model Name	27W USB-C Power Supply EU
	Power Rating		IP: 100-240Vac~50/60Hz 0.8A; OP: 5.1Vdc/5.0A 25.5W, 9.0Vdc/3.0A 27.0W, 12.0Vdc/2.25A 27.0W, 15.0Vc/1.8A 27.0W		

1. 7 Applicable Standards

Applicable Standards	
According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards: 47 CFR Part 2.1091 & Part 15.255(g)	
Note:	All test items were verified and recorded according to the standards and without any deviation during the test.

2. Technical Test

2.1 Summary of Test Results

The EUT has been tested according to the following specifications:

FCC Rules	Test Type	Limit	Result	Notes
47 CFR Part 2.1091 & Part 15.255(g)	Exposure Evaluation	< 1.0m W/cm ²	Pass	Complies

Conformity Decision Rule

The applied conformity decision rule is based on ILAC G8:09/2019 clause 4.2.1 Binary Statement for Simple Acceptance Rule ($w = 0$).

3. EUT Modifications

No modification by test lab.

4. FCC Maximum Permissible Exposure (MPE)

4.1 Limit of MPE

(A) Limits for Occupational/Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
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

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
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 *Plane-wave equivalent power density

4.2 RF Exposure Requirements

RF Exposure Requirements	
The MPE was calculated to show compliance with the power density limit.	
$S = \frac{P * G}{4 * \pi * r^2}$ Where: - Ø S=Power density - Ø P=Power input to antenna - Ø G=Power gain of the antenna relative to an isotropic radiator - Ø R=Distance to the center of radiation of the antenna	$E(V/m) = \frac{\sqrt{30 * P * G}}{r}; S(W/m^2) = \frac{E^2}{377} \text{ or } S = \frac{30 * P * G}{377 * r^2}$ Where: - Ø E=Electric field (V/m) - Ø P=Power output power (W) - Ø G=Power gain of the antenna relative to an isotropic radiator - Ø R= Distance to the center of radiation of the antenna

4.3 Conclusion

FCC ID: 2BCCA-ANGEL0G1RM1								
☑ Test Mode 1~4		Compliance with FCC Rules -> Normal						
Mode/Band (GHz)	Prediction distance(cm)	G _{EUT} (dBi)	EIRP _{Max} (dBm)	Tolerance (dB)	EIRP _{Max} (dBm)	EIRP _{Max} (mW)	Power Density (mW/m ²)	MPE Limit (mW/m ²)
62600.00	20.00	5.00	-10.66	0.00	-10.66	0.09	0.000017	1.00
61250.00	20.00	5.00	-7.75	0.00	-7.75	0.17	0.000033	1.00
60925.00	20.00	5.00	-11.92	0.00	-11.92	0.06	0.000013	1.00
62875.00	20.00	5.00	-13.94	0.00	-13.94	0.04	0.000008	1.00

FCC ID: 2BCCA-ANGEL0G1RM1 with FCC ID: 2BCCA-6235ZRRB											
☑ Other		Compliance with FCC Rules -> Simultaneous Transmission Analysis									
Mode/Band	Prediction distance (cm)	G _{EUT} (dBi)	Peak Power (dBm)	Peak Power (mW)	EIRP _{Max} (dBm)	Tolerance (dB)	EIRP _{Max} (dBm)	EIRP _{Max} (mW)	Power Density (mW/m ²)	MPE Limit (mW/m ²)	Ratio (S/Limit)
BT_2.4G	20.00	2.77	7.1	5.13	9.87	0.00	9.87	9.71	0.001931	1.00	0.001931
WiFi_2.4G	20.00	2.77	6.72	4.70	9.49	0.00	9.49	8.89	0.001769	1.00	0.001769
WiFi_5G	20.00	0.84	8.24	6.67	9.08	0.00	9.08	8.09	0.001610	1.00	0.001610
60GHz	20.00	5.00	-12.75	0.05	-7.75	0.00	-7.75	0.17	0.000033	1.00	0.000033
Sum Ratio											0.005343
Ratio Limit											1.00
Conclusion: EUT complies with the FCC requirement.											
Device Category:		☑ Other									
Exposure Evaluation:		☑ MPE									

-----End of Report-----