

RF Exposure Report

Report No.: SABCKS-WTW-P21020435-2

FCC ID: 2AZFR-AR1

Test Model: AR1

Received Date: Feb. 20, 2021

Test Date: Mar. 16 to 18, 2021

Issued Date: July 21, 2021

Applicant: Palo Alto Networks Inc.

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Hsin Chu Laboratory

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Test Location: E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,
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**FCC Registration /
Designation Number:** 723255 / TW2022



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Release Control Record

Issue No.	Description	Date Issued
SABCKS-WTW-P21020435-2	Original release.	July 21, 2021

1 Certificate of Conformity

Product: Okyo Garde
Brand: OKYO
Test Model: AR1
Sample Status: Engineering sample
Applicant: Palo Alto Networks Inc.
Test Date: Mar. 16 to 18, 2021
Standards: FCC Part 2 (Section 2.1091)
KDB 447498 D01 General RF Exposure Guidance v06

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by : Phoenix Huang, **Date:** July 21, 2021
Phoenix Huang / Specialist

Approved by : Clark Lin, **Date:** July 21, 2021
Clark Lin / Technical Manager

2 RF Exposure

2.1 Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (minutes)
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 ; *Plane-wave equivalent power density

2.2 MPE Calculation Formula

$$P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$$

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

2.3 Classification

The antenna of this product, under normal use condition, is at least 32 cm away from the body of the user. So, this device is classified as **Mobile Device**.

2.4 Antenna Gain

Antenna No.	RF Chain No.	Antenna Net Gain (dBi)	Frequency Range	Antenna Type	Connector Type	Cable Length
1	2.4G Chain3	3.6	2.4~2.4835 GHz	PCB	i-pex(MHF)	105 mm
	5G (Low Band) Chain3	5.2	5.15~5.35 GHz			
2	2.4G Chain2	2.9	2.4~2.4835 GHz	PCB	i-pex(MHF)	146 mm
	5G (Low Band) Chain2	4.6	5.15~5.35 GHz			
3	2.4G Chain1	3.6	2.4~2.4835 GHz	PCB	i-pex(MHF)	53 mm
	5G (Low Band) Chain1	4.7	5.15~5.35 GHz			
4	2.4G Chain0	3.5	2.4~2.4835 GHz	PCB	i-pex(MHF)	122 mm
	5G (Low Band) Chain0	4.5	5.15~5.35 GHz			
5	5G (High Band) Chain3	4.5	5.47~5.85 GHz	PCB	i-pex(MHF)	71 mm
6	5G (High Band) Chain2	4.6	5.47~5.85 GHz	PCB	i-pex(MHF)	119 mm
7	5G (High Band) Chain1	4.8	5.47~5.85 GHz	PCB	i-pex(MHF)	75 mm
8	5G (High Band) Chain0	4.4	5.47~5.85 GHz	PCB	i-pex(MHF)	54 mm

Note: The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

2.5 Calculation Result of Maximum Conducted Power

For 2.4GHz and 5GHz (U-NII-1 band and U-NII-3 band) data was copied from the original test report (Report No.: SABCKS-WTW-P21020435)

CDD Mode

Operation Mode	Evaluation Frequency (MHz)	Max. Average Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
WLAN (2.4GHz)	2412~2462	475.491	3.6	32	0.08465	1
WLAN (U-NII-1)	5180~5240	441.267	5.2	32	0.11355	1
WLAN (U-NII-2A)	5260~5320	247.522	5.2	32	0.06369	1
WLAN (U-NII-2C)	5500~5720	242.505	4.8	32	0.05691	1
WLAN (U-NII-3)	5745~5825	467.378	4.8	32	0.10969	1

Beamforming Mode

Operation Mode	Evaluation Frequency (MHz)	Max. Average Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
WLAN (2.4GHz)	2412~2462	449.66	9.43	32	0.30646	1
WLAN (U-NII-1)	5180~5240	331.426	10.77	32	0.30752	1
WLAN (U-NII-2A)	5260~5320	83.005	10.77	32	0.07702	1
WLAN (U-NII-2C)	5500~5720	86.533	10.6	32	0.07721	1
WLAN (U-NII-3)	5745~5825	343.809	10.6	32	0.30677	1

Note:

- Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
- 2.4GHz: Directional gain = $10 \log[(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 4] = 9.43 \text{ dBi}$
- 5GHz:
For U-NII-1, U-NII-2A: Directional gain = $10 \log[(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 4] = 10.77 \text{ dBi}$
For U-NII-2C, U-NII-3: Directional gain = $10 \log[(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 4] = 10.6 \text{ dBi}$

Conclusion:

The formula of calculated the MPE is:

$CPD1 / LPD1 + CPD2 / LPD2 + \dots \text{etc.} < 1$

CPD = Calculation power density

LPD = Limit of power density

CDD Mode

$WLAN \ 2.4GHz + WLAN \ 5GHz \ (U-NII-1) + WLAN \ 5GHz \ (U-NII-3) = 0.08465 / 1 + 0.11355 / 1 + 0.10969 / 1 = 0.30789$

Beamforming Mode

$WLAN \ 2.4GHz + WLAN \ 5GHz \ (U-NII-1) + WLAN \ 5GHz \ (U-NII-3) = 0.30646 / 1 + 0.30752 / 1 + 0.30677 / 1 = 0.92075$

Therefore the maximum calculations of above situations are less than the “1” limit.

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