

RF Exposure Report

Report No.: SABAOZ-WTW-P20090314

FCC ID: WT8DNWAP840E

Test Model: AP840E

Received Date: Sep. 08, 2020

Test Date: Oct. 20, 2020

Issued Date: Jan. 21, 2021

Applicant: Datto, 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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Table of Contents

Release Control Record	3
1 Certificate of Conformity.....	4
2 RF Exposure.....	5
2.1 Limits for Maximum Permissible Exposure (MPE)	5
2.2 MPE Calculation Formula	5
2.3 Classification	5
2.4 Antenna Gain	6
2.5 Calculation Result of Maximum Conducted Power	7

Release Control Record

Issue No.	Description	Date Issued
SABAOZ-WTW-P20090314	Original release.	Jan. 21, 2021

1 Certificate of Conformity

Product: WiFi6 outdoor-indoor (IP55) Access Point

Brand: datto

Test Model: AP840E

Sample Status: ENGINEERING SAMPLE

Applicant: Datto, Inc.

Test Date: Oct. 20, 2020

Standards: FCC Part 2 (Section 2.1091)

IEEE C95.3 -2002

References Test Guidance: 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 : Cherry Chuo , **Date:** Jan. 21, 2021
Cherry Chuo / Specialist

Approved by : Clark Lin , **Date:** Jan. 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

Mode 1: (Dipole Antenna):

The antenna of this product, under normal use condition, is at least 43 cm away from the body of the user. So, this device is classified as **Mobile Device**.

Mode 2: (Patch Antenna):

The antenna of this product, under normal use condition, is at least 45 cm away from the body of the user. So, this device is classified as **Mobile Device**.

2.4 Antenna Gain

Ant. Set No.	RF Chain No.	Brand	Model No.	Ant. Net Gain (dBi)	Freq. Range (GHz)	Ant. Type	Connector Type	Cable Length
1	Chain 0 Chain 1 Chain 2 Chain 3	Nienyi	NYS4436	3.5 6.5	2.4~2.4835 5.15~5.85	Dipole	R-SMA	200 mm
2	Chain 0 Chain 1 Chain 2 Chain 3	TerraWave	M6060060M P1D43620	6 6	2.4~2.4835 5.15~5.85	Patch	R-SMA	914.4 mm (36" w/ connector)
3 (Background Ant)	-	Hong Lin	290-20458	6.45 4.5	2.4~2.4835 5.15~5.85	PIFA	i-pex(MHF)	140 mm
4 (BT Ant)	-	Hong Lin	290-20458	3.79	2.4~2.4835	PIFA	i-pex(MHF)	130 mm

*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

Mode 1: (Dipole Antenna)

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	682.775	9.52	43	0.26311	1
WLAN (U-NII-1)	5180~5240	454.676	12.52	43	0.34959	1
WLAN (U-NII-3)	5745~5825	825.623	12.52	43	0.6348	1
Bluetooth	2402~2480	5.808	3.79	43	0.00060	1

Note:

- Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
- 2.4GHz: Directional gain = 3.5dBi + 10log(4) = 9.52dBi.
5GHz: Directional gain = 6.5dBi + 10log(4) = 12.52dBi.

Mode 2: (Patch Antenna)

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	436.049	12.02	45	0.27284	1
WLAN (U-NII-1)	5180~5240	482.55	12.02	45	0.30193	1
WLAN (U-NII-3)	5745~5825	946.467	12.02	45	0.5922	1
Bluetooth	2402~2480	5.808	3.79	45	0.00055	1

Note:

- Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
- 2.4GHz: Directional gain = 6dBi + 10log(4) = 12.02dBi.
5GHz: Directional gain = 6dBi + 10log(4) = 12.02dBi.

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

Mode 1: (Dipole Antenna):

WLAN 2.4GHz + WLAN 5GHz + Bluetooth = $0.26311 / 1 + 0.63480 / 1 + 0.00060 / 1 = 0.89851$

Mode 2: (Patch Antenna):

WLAN 2.4GHz + WLAN 5GHz + Bluetooth = $0.27284 / 1 + 0.59220 / 1 + 0.00055 / 1 = 0.86559$

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

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