

**RF EXPOSURE EVALUATION REPORT**

<b>Application No.:</b>	GZCR2110021230AT
<b>Applicant:</b>	Monument Labs, Inc..
<b>Address of Applicant:</b>	222 W Merchandise Mart Plaza, Ste 1212, Chicago, IL 60657, USA
<b>Manufacturer:</b>	Monument Labs, Inc..
<b>Address of Manufacturer:</b>	222 W Merchandise Mart Plaza, Ste 1212, Chicago, IL 60657, USA
<b>Factory:</b>	GUANGDONG GADMEI INTELLIGENT TECHNOLOGY CO., LTD.
<b>Address of Factory:</b>	Yin Zhan, QingCheng District, QingYuan City, GuangDong Province, China.
<b>Equipment Under Test (EUT):</b>	
<b>EUT Name:</b>	Photo Storage & Management Device
<b>Model No.:</b>	312A12, 312D12 ♣
♣	Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.
<b>Trade Mark:</b>	Monument
<b>Standard(s) :</b>	47 CFR Part 1.1307 47 CFR Part 1.1310 47 CFR Part 2.1091
<b>Date of Receipt:</b>	2021-10-15
<b>Date of Evaluation:</b>	2021-10-15 to 2021-10-20
<b>Date of Issue:</b>	2021-10-28
<b>Evaluation Result:</b>	<b>Pass*</b>

\* In the configuration evaluated, the EUT complied with the standards specified above.



Kobe Jian  
EMC Laboratory Manager



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<b>Revision Record</b>				
<b>Version</b>	<b>Chapter</b>	<b>Date</b>	<b>Modifier</b>	<b>Remark</b>
01		2021-10-28		Original

<b>Authorized for issue by</b>			
Tested By		Curry Wu/Project Engineer	
Reviewed By		Ricky Liu/Reviewer	

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## 2 Evaluation Summary

**Note:**

E.U.T./EUT means Equipment Under Test.

Pass means the test result passed the test standard requirement, please find the detailed decision rule in the report relative section.

**Declaration of EUT Family Grouping:**

Model No.: 312A12, 312D12

Only the model 312D12 was tested, since according to the declaration from the applicant, the electrical circuit design, PCB layout, components used and internal wiring and functions were identical for the above models, with only difference on adapter plug.



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### 3 Contents

	Page
<b>1 Cover Page .....</b>	<b>1</b>
<b>2 Evaluation Summary .....</b>	<b>3</b>
<b>3 Contents .....</b>	<b>4</b>
<b>4 General Information.....</b>	<b>5</b>
4.1    Details of E.U.T .....	5
4.2    Evaluating Location .....	6
4.3    Facility .....	7
4.4    Deviation from Standards.....	7
4.5    Abnormalities from Standard Conditions .....	7
<b>5 Radio Spectrum Technical Requirement .....</b>	<b>8</b>
5.1    RF Exposure Compliance Requirement .....	8
5.1.1    Limits.....	8
5.1.2    Test Procedure .....	8
5.1.3    EUT RF Exposure Evaluation.....	9
<b>6 EUT Constructional Details (EUT Photos) .....</b>	<b>11</b>



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## 4 General Information

### 4.1 Details of E.U.T.

Power supply:

Adapter:

Model: A122-05025001D

Input: AC100-240V 50/60Hz 0.4A

Output: DC 5.0V 2.5A 12.5W

Cable(s):

DC cable: 146cm unshielded

**For BT:**

Operation Frequency:

2402MHz to 2480MHz

Bluetooth Version:

V5.0 Dual mode

Modulation Type:

GFSK, pi/4DQPSK, 8DPSK

Number of Channels:

79

Channel Spacing:

1MHz

Spectrum Spread Technology:

Frequency Hopping Spread Spectrum(FHSS)

Antenna Type:

PIFA Antenna

Antenna Gain:

3.59dBi

**For BLE:**

Operation Frequency:

2402MHz to 2480MHz

Bluetooth Version:

V5.0 Dual mode

Modulation Type:

GFSK

Number of Channels:

40

Channel Spacing:

2MHz

Data rate:

1M/bits and 2M/bits

Antenna Type:

PIFA Antenna

Antenna Gain:

3.59dBi

**For 2.4G:**

Operation Frequency:

802.11b/g/n(HT20): 2412MHz to 2462MHz

Modulation Type:

802.11b: DSSS (CCK, DQPSK, DBPSK);

802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)

Number of Channels:

802.11b/g/n(HT20): 11

Channel Spacing:

5MHz

Antenna Type:

PIFA Antenna

Antenna Gain:

Antenna 1: 3.59dBi    Antenna 2: 3.59dBi

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**For 5G:**

Operation (20MHz):	Frequency	U-NII-1: 5180-5240MHz; U-NII-2A: 5260-5320MHz; U-NII-2C: 5500-5700MHz; U-NII-3: 5745-5825MHz
Operation (40MHz):	Frequency	U-NII-1: 5190-5230MHz; U-NII-2A: 5270-5310MHz; U-NII-2C: 5510-5670MHz; U-NII-3: 5755-5795MHz
Operation (80MHz):	Frequency	U-NII-1: 5210MHz; U-NII-2A: 5290MHz; U-NII-2C: 5530-5610MHz; U-NII-3: 5775MHz
Modulation Type:		802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK); 802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM); 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)
Channel Spacing:		802.11a/n(HT20)/ac(HT20): 20MHz; 802.11n(HT40)/ac(HT40): 40MHz; 802.11ac(HT80): 80MHz
DFS Function:		Slave with Radar detection
TPC Function:		Without TPC function
Antenna Type:		PIFA Antenna
Antenna Gain:		Antenna 1 3.58dBi Antenna 2:3.58dBi

## 4.2 Evaluating Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou Branch EMC Laboratory,  
198 Kezhu Road, Scientech Park, Guangzhou Economic & Technology Development District,  
Guangzhou, China 510663

Tel: +86 20 82155555 Fax: +86 20 82075059

No tests were sub-contracted.



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#### 4.3 Facility

The facility is recognized, certified, or accredited by the following organizations:

- **NVLAP (Lab Code: 200611-0)**

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

- **ACMA**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian/New Zealand Regulatory Compliance Mark (RCM).

- **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO**

Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

- **CNAS (Lab Code: L0167)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAS-CL01:2018 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2017 General Requirements) for the Competence of Testing Laboratories.

- **FCC Recognized Accredited Test Firm(Registration No.: 486818)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been accredited and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation Number: CN5016, Test Firm Registration Number: 486818.

- **ISED (Registration No.: 4620B, CAB identifier: CN0052)**

SGS-CSTC Standards Technical Services Co., Ltd., has been registered by Innovation Science and Economic Development Canada for Wireless Device Testing laboratories to test to Canadian radio equipment requirements. Registration No. 4620B, CAB identifier: CN0052.

- **VCCI (Registration No.: R-12460, C-12584, G-20107 and T-11179)**

The 10m Semi-anechoic chamber, 966 Anechoic Chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-12460, C-12584, G-20107 and T-11179 respectively.

- **CBTL (Lab Code: TL129)**

SGS-CSTC Standards Technical Services Co., Ltd., E&E Laboratory has been assessed and fully comply with the requirements of ISO/IEC 17025:2017, the Basic Rules, IECEE 01 and Rules of procedure IECEE 02, and the relevant IECEE CB-Scheme Operational documents.

#### 4.4 Deviation from Standards

None

#### 4.5 Abnormalities from Standard Conditions

None

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## 5 Radio Spectrum Technical Requirement

### 5.1 RF Exposure Compliance Requirement

#### 5.1.1 Limits

According to FCC Part1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in part1.1307(b)

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
<b>(A) Limits for Occupational/Controlled Exposures</b>				
0.3–3.0 .....	614	1.63	*(100)	6
3.0–30 .....	1842/f	4.89/f	*(900/f <sup>2</sup> )	6
30–300 .....	61.4	0.163	1.0	6
300–1500 .....	.....	.....	f/300	6
1500–100,000 .....	.....	.....	5	6
<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
0.3–1.34 .....	614	1.63	*(100)	30
1.34–30 .....	824/f	2.19/f	*(180/f <sup>2</sup> )	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

Friis Formula

Friis transmission formula:  $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2)$

Where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

$G$  = gain of antenna in linear scale

$\pi = 3.1416$

$R$  = distance between observation point and center of the radiator in cm

$P_d$  is the limit of MPE, 1 mW/cm<sup>2</sup>. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance  $r$  where the MPE limit is reached.

#### 5.1.2 Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.



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**5.1.3 EUT RF Exposure Evaluation****For BT:**

Antenna Gain: Antenna :3.59dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2.29 in linear scale.

Output Power Into Antenna &amp; RF Exposure Evaluation Distance:

Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )	Limit	Result
2402	9.61	9.14	0.0042	1.0	PASS

Note: Refer to report No. GZCR211002123001 for EUT test Max Conducted Peak Output Power value.

The distance r (4th column) calculated from the Fries transmission formula is far greater than 20 cm separation requirement.

**For BLE:**

Antenna Gain: Antenna :3.59dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2.29 in linear scale.

Output Power Into Antenna &amp; RF Exposure Evaluation Distance:

Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )	Limit	Result
2402	7.06	5.08	0.0023	1.0	PASS

Note: Refer to report No. GZCR211002123002 for EUT test Max Conducted Peak Output Power value.

The distance r (4th column) calculated from the Fries transmission formula is far greater than 20 cm separation requirement.

**For 2.4GHz Wifi:**

Antenna Gain: Antenna 1&amp;2:3.59dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2.29 in linear scale.

Output Power Into Antenna &amp; RF Exposure Evaluation Distance:



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## SISO:

Frequency (MHz)	Antenna	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )	Limit	Result
2412	2	22.57	180.72	0.0823	1.0	PASS

## MIMO:

Frequency (MHz)	Antenna	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )	Limit	Result
2412	1+2	24.48	280.54	0.1278	1.0	PASS

Note: Refer to report No. GZCR211002123003 for EUT test Max Conducted Peak Output Power value.

The distance r (4th column) calculated from the Friis transmission formula is far greater than 20 cm separation requirement.

## For 5GHz Wifi:

Antenna Gain: Antenna 1&2: 3.58dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber are Antenna 1&2: 2.28 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

## SISO:

Frequency (MHz)	Antenna	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )	Limit	Result
5825	2	17.57	57.15	0.0259	1.0	PASS

## MIMO:

Frequency (MHz)	Antenna	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )	Limit	Result
5825	1+2	20.35	108.39	0.0492	1.0	PASS

Note: Refer to report No. GZCR211002123004 for EUT test Max Conducted Peak Output Power value.

The distance r (4th column) calculated from the Friis transmission formula is far greater than 20 cm separation requirement.

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## 6 EUT Constructional Details (EUT Photos)

Refer to appendix - external and internal photos for GZCR2110021230AT

- End of the Report -



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