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RF Exposure Evaluation Report

Report No. : CQASZ20250300702E-04
Applicant: Shenzhen PioCreat 3d Technology Co., Ltd.
Address of Applicant: 3rd Floor, Building 1, No. 156 Huawang Road, Langkou Community, Dalang Street, Longhua District, Shenzhen, China

Equipment Under Test (EUT):

EUT Name: 3D Printer
Model No.: HALOT-X1, HALOT-X1 Combo
Test Model No.: HALOT-X1
Brand Name: N/A
Standards: EN IEC 62311:2020
Date of Receipt: 2025-03-31
Date of Test: 2025-03-31 to 2025-05-15
Date of Issue: 2025-05-30
Test Result : **PASS***

*In the configuration tested, the EUT complied with the standards specified above

Tested By: _____

Lewis Zhou

(Lewis Zhou)

Reviewed By: _____

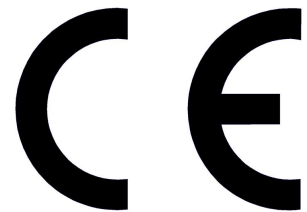
Timo Lei

(Timo Lei)

Approved By: _____

Jack Ai

(Jack Ai)



The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CQA, this report can't be reproduced except in full.

1 Version

Revision History of Report

| Report No. | Version | Description | Issue Date |
|----------------------|---------|----------------|------------|
| CQASZ20250300702E-04 | Rev.01 | Initial report | 2025-05-30 |

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3 General Information

3.1 Client Information

| | |
|--------------------------|--|
| Applicant: | Shenzhen PioCreat 3d Technology Co., Ltd. |
| Address of Applicant: | 3rd Floor, Building 1, No. 156 Huawang Road, Langkou Community, Dalang Street, Longhua District, Shenzhen, China |
| Manufacturer: | Shenzhen PioCreat 3d Technology Co., Ltd. |
| Address of Manufacturer: | 3rd Floor, Building 1, No. 156 Huawang Road, Langkou Community, Dalang Street, Longhua District, Shenzhen, China |
| Factory: | Shenzhen PioCreat 3d Technology Co., Ltd. |
| Address of Factory: | 3rd Floor, Building 1, No. 156 Huawang Road, Langkou Community, Dalang Street, Longhua District, Shenzhen, China |

3.2 General Description of EUT

| | |
|---------------------------------|--|
| Product Name: | 3D Printer |
| Model No.: | HALOT-X1, HALOT-X1 Combo |
| Test Model No.: | HALOT-X1 |
| Trade Mark: | N/A |
| EUT Supports Radios application | 2.4GHz: Wi-Fi:802.11b/g/n(HT20): 2412MHz ~2472 MHz |
| Software Version:: | V1.0 |
| Hardware Version: | V1.2 |
| Power Supply: | AC100-120V~,200-240V.50-60Hz, 350W |

3.3 General Description of 2.4G WIFI

| | |
|-----------------------|--|
| Type of Modulation: | IEEE for 802.11b:DSSS(CCK,DQPSK,DBPSK) IEEE for 802.11g:OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE for 802.11n(HT20): OFDM (64QAM, 16QAM,QPSK,BPSK) |
| Operating Frequency: | IEEE 802.11b/g/n(HT20): 2412MHz to 2472MHz |
| Channel Number: | IEEE 802.11b/g, IEEE 802.11n HT20: 13 Channels |
| ChannelsStep: | Channels with 5MHz step |
| Transmit Data Rate: | 802.11b:1M/2M/5.5M/11M bps 802.11g:6M/9M/12M/18M/24M/36M/48M/54M bps 802.11n(HT20): 6.5M/13M/19.5M/26M/39M/52M/58.5M/64M bps |
| Test Software of EUT: | adb |
| Antenna Type: | FPC antenna |
| Antenna Gain: | 2.54dBi |

3.4 Test Location

All tests were performed at:

Shenzhen Huaxia Testing Technology Co., Ltd.,

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua District, Shenzhen, China

3.5 Deviation from Standards

None.

3.6 Abnormalities from Standard Conditions

None.

3.7 Other Information Requested by the Customer

None.

4 Equipment List

| Equipment | Manufacturer | Model No | Inventory No | Cal Date | Cal Due Date |
|--------------------------------------|-----------------|------------------------|--------------|------------|--------------|
| Horn Antenna | R&S | HF906 | CQA-012 | 2023/11/01 | 2026/10/31 |
| Bilog Antenna | R&S | HL562 | CQA-011 | 2023/9/7 | 2026/9/6 |
| EMI Test Receiver | R&S | ESR7 | CQA-005 | 2024/9/2 | 2025/9/1 |
| Spectrum analyzer | R&S | FSU26 | CQA-038 | 2024/9/2 | 2025/9/1 |
| Spectrum analyzer | R&S | FSV40 | CQA-075 | 2024/9/2 | 2025/9/1 |
| Preamplifier | MITEQ | AMF-6D-02001800-29-20P | CQA-036 | 2024/9/2 | 2025/9/1 |
| Universal Radio Communication Tester | Rohde & Schwarz | CMW500 | CQA-022 | 2024/9/2 | 2025/9/1 |
| high-low temperature chamber | Auchno | OJN-9606 | CQA-S003 | 2024/9/2 | 2025/9/1 |
| Signal generator | R&S | SME06 | CQA-024 | 2024/9/2 | 2025/9/1 |
| Vector signal generator | R&S | SMBV100A | CQA-039 | 2024/9/2 | 2025/9/1 |
| DC power | KEYSIGHT | E3631A | CQA-028 | 2024/9/2 | 2025/9/1 |
| RF Control Unit | Tonsced | JS0806-2 | CQA-057 | 2024/9/2 | 2025/9/1 |
| Coaxial Cable (Above 1GHz) | CQA | N/A | C007 | 2024/9/2 | 2025/9/1 |
| Coaxial Cable (Below 1GHz) | CQA | N/A | C013 | 2024/9/2 | 2025/9/1 |
| RF Cable (9KHz~40GHz) | CQA | N/A | C005 | 2024/9/2 | 2025/9/1 |

5 Technical Requirements Specification in EN IEC 62311

5.1.1 General Description of Applied Standards

EN IEC 62311 Generic standard to demonstrate the compliance of electronic and electrical apparatus with the basic restrictions related to human exposure to electromagnetic fields (0 Hz–300 GHz) is to demonstrate the compliance of apparatus with the basic restrictions or reference levels on exposure of the general public related to electric, magnetic, electromagnetic fields as well as induced and contact current.

5.1.2 RF Exposure Evaluation

5.1.2.1 Limit

According to EN IEC 62311, the criteria listed in the below table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified table 2 of Council Recommendation 1999/519/EC.

Reference levels for electric, magnetic and electromagnetic fields
(0 Hz to 300 GHz, unperturbed rms values)

| Frequency range | E-field strength (V/m) | H-field strength (A/m) | B-field (μT) | Equivalent plane wave power density S_{eq} (W/m ²) |
|-----------------|------------------------|------------------------|---------------------|--|
| 0-1 Hz | — | $3,2 \times 10^4$ | 4×10^4 | — |
| 1-8 Hz | 10 000 | $3,2 \times 10^4/f^2$ | $4 \times 10^4/f^2$ | — |
| 8-25 Hz | 10 000 | $4\,000/f$ | $5\,000/f$ | — |
| 0,025-0,8 kHz | $250/f$ | $4/f$ | $5/f$ | — |
| 0,8-3 kHz | $250/f$ | 5 | 6,25 | — |
| 3-150 kHz | 87 | 5 | 6,25 | — |
| 0,15-1 MHz | 87 | $0,73/f$ | $0,92/f$ | — |
| 1-10 MHz | $87/f^{1/2}$ | $0,73/f$ | $0,92/f$ | — |
| 10-400 MHz | 28 | 0,073 | 0,092 | 2 |
| 400-2 000 MHz | $1,375 f^{1/2}$ | $0,0037 f^{1/2}$ | $0,0046 f^{1/2}$ | $f/200$ |
| 2-300 GHz | 61 | 0,16 | 0,20 | 10 |

Notes:

1. f as indicated in the frequency range column.

5.1.2.2 Test Method

The antenna of the product, under normal use condition is at least 20cm away from the body of the user. Warning statement to the user for keeping 20cm separation distance and the prohibition of operating to a person has been printed on the user manual. So, this product under normal use is located on electromagnetic far field between the human body.

Far Field Calculation Formula

$$E = \frac{\sqrt{30PG(\theta, \phi)}}{r}$$

G = antenna gain relative to an isotropic antenna
 θ, ϕ = elevation and azimuth angles to point of investigation
 r = distance from observation point to the antenna

5.1.2.3 Test Data and Test Result

Distance to human body (r): 20cm

The worst data:

REALTEK

For 2.4G WIFI:

| Mode | EIRP(dBm) | Output Power (mW) | E Field Strength(V/m) | E Field Strength Limit (V/m) | Result |
|-------|-----------|-------------------|-----------------------|------------------------------|--------|
| 11B | 12.94 | 19.68 | 3.84 | 61 | Pass |
| 11G | 12.97 | 19.82 | 3.86 | 61 | Pass |
| 11N20 | 13 | 19.95 | 3.87 | 61 | Pass |

PHOTOGRAPHS OF EUT Constructional Details

Refer to APPENDIX 2 PHOTOGRAPHS OF EUT for CQASZ20250300702E-1.

*** END OF REPORT ***