# RF TEST REPORT

Product Name: Laser Engraver

Model Name: SF-A9 enclose, SF-A9, SF-A9 enclose 20W, SF-A9 20W

FCC ID: 2BF27-SF-A9

Issued For : Shenzhen Sculpfun Technology Co., Ltd.

Room 201, Building B, Jinzhicai Factory, No. 1, Guihua Industrial Zone, Guanlan Street, Longhua District, Shenzhen City, Guangdong China

Issued By : Shenzhen LGT Test Service Co., Ltd.

Room 205, Building 13, Zone B, Zhenxiong Industrial Park, No.177, Renmin West Road, Jinsha, Kengzi Street, Pingshan District, Shenzhen, Guangdong, China

| | |
|---|---|
| Report Number: | LGT24D045HA02 |
| Sample Received Date: | Apr. 10, 2024 |
| Date of Test: | Apr. 10, 2024 – May 11, 2024 |
| Date of Issue: | May 11, 2024 |

# TEST REPORT CERTIFICATION

| | |
|---|---|
| **Applicant:** | Shenzhen Sculpfun Technology Co., Ltd. |
| Address: | Room 201, Building B, Jinzhicai Factory, No. 1, Guihua Industrial Zone, Guanlan Street, Longhua District, Shenzhen City, Guangdong China |
| **Manufacture:** | Shenzhen Sculpfun Technology Co., Ltd. |
| Address: | Room 201, Building B, Jinzhicai Factory, No. 1, Guihua Industrial Zone, Guanlan Street, Longhua District, Shenzhen City, Guangdong China |
| Product Name: | Laser Engraver |
| Trademark: | SCULPFUN |
| Model Name: | SF-A9 enclose, SF-A9, SF-A9 enclose 20W, SF-A9 20W |
| Sample Status: | Normal |

| **APPLICABLE STANDARDS** | |
|---|---|
| STANDARD | TEST RESULTS |
| FCC 47 CFR §2.1091<br>KDB 447498 D01 General RF Exposure Guidance v06 | PASS |

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## Revision History

| Rev. | Issue Date | Revisions |
|---|---|---|
| 00 | May 11, 2024 | Initial Issue |
| | | |

# 1. GENERAL INFORMATION

## 1.1 GENERAL DESCRIPTION OF THE EUT

| | | |
|---|---|---|
| Product Name: | Laser Engraver | |
| Trademark: | SCULPFUN | |
| Model Name: | SF-A9 enclose | |
| Series Model: | SF-A9, SF-A9 enclose 20W, SF-A9 20W | |
| Model Difference: | Only the model is different. | |
| Frequency Bands: | Bluetooth | 2402-2480MHz |
| | 2.4G WLAN | 802.11b/g/n(20MHz): 2412~2472MHz |
| Adapter: | Input: 100-240V, 50/60Hz, 5.0A<br>Output: 24.0V-10.0A 240.0Wmax | |
| Hardware Version: | N/A | |
| Software Version: | N/A | |

## 1.2 TEST LABORATORY

| | |
|---|---|
| Company Name: | Shenzhen LGT Test Service Co., Ltd. |
| Address: | Room 205, Building 13, Zone B, Zhenxiong Industrial Park, No.177, Renmin West Road, Jinsha, Kengzi Street, Pingshan District, Shenzhen, Guangdong, China |
| Accreditation Certificate | A2LA Certificate No.: 6727.01 |
| | FCC Registration No.: 746540 |
| | CAB ID: CN0136 |

## 2. FCC 47CFR §2.1091 REQUIREMENT

### 2.1 TEST STANDARDS

The limit for Maximum Permissible Exposure (MPE) specified in FCC 1.1310 is followed. The gain of the antennas used in the product is extracted from the Antenna data sheets provided and also the maximum total power input to the antenna is measured. Through the Friis transmission formula and the maximum gain of the antenna, we can calculate the distance, away from the product, where the limit of MPE is reached.
Although the Friis Transmission formula is far field assumption, the calculated result of that is an over-prediction for near field power density. It is taken as worst case to specify the safety range.

### 2.2 LIMIT

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environmental impact of the human exposure to radio-frequency (RF) radiation as specified in 1.1307 (b)

Limits for Maximum Permissible Exposure (MPE)

| Frequency Range (MHz) | Electric Field Strength (V/m) | Magnetic Field Strength (A/m) | Power Density ($mW/cm^2$) |
|---|---|---|---|
| Limits for Occupational / controlled Exposures | | | |
| 300 - 1500 | -- | -- | F/300 |
| 1500 – 100000 | -- | -- | 5.0 |
| Limits for General population / Uncontrolled Exposure | | | |
| 300 - 1500 | -- | -- | F/1500 |
| 1500 – 100000 | -- | -- | 1.0 |

F= Frequency in MHz

Friss Formula

Friss Transmission Formula: $Pd = (Pout * G) / (4*pi*r^2)$

Where

Pd = power density in $mW/cm^2$

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

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

If we know the maximum gain of the antenna and the total output power to the antenna, through calculation, we will know MPE value at distance 20cm.

### 2.3 EUT OPERATION CONDITION

EUT was enabled to transmit and receive at lowest, middle and highest channels.

### 2.4 CLASSIFICATION

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. Warning statement to the user for keeping at least 20cm or more separation distance from the antenna should be included in the User manual. So, this device is classified as Mobile device.

## 2.5 TEST RESULT

### Turn up Result

| Mode | Turn up Power |
|---|---|
| BT-GFSK | 2±1dBm |
| BT-π/4-DQPSK | 4±1dBm |
| BT-8DPSK | 4.5±1dBm |
| 2.4G WIFI-802.11b | 14.5±1dBm |
| 2.4G WIFI-802.11g | 14±1dBm |
| 2.4G WIFI-802.11n(HT20) | 12.5±1dBm |

**The MPE result of worst mode:**

| RF Function | Frequency (MHz) | Max Turn up Power (dBm) | Max Turn up Power (mW) | ANT Gain (dBi) | ANT Gain (gain of antenna in linear scale) | Power Density ($mW/cm^2$) | Limit ($mW/cm^2$) | Ratio | Result |
|---|---|---|---|---|---|---|---|---|---|
| BT | 2480 | 5.50 | 3.55 | 4.81 | 2.38 | 0.00214 | 1 | 0.000214 | Pass |
| 2.4G WIFI | 2412 | 15.50 | 35.48 | 4.81 | 2.38 | 0.02137 | 1 | 0.002137 | Pass |

**Note:**

1. The Bluetooth and WLAN can't simultaneous transmission at the same time.

2. The Maximum Power Density is less than the limit, complies with the exemption requirements.

※※※※※END OF THE REPORT※※※※※