# Radio Test Report

Report No.:CTA231129005H01

Issued for

Guangzhou Ganyuan Intelligent Technology Co.,Ltd

1st to 4th floors, No16, Ping shun street, Lanhe Town, Nansha District, Guangzhou, Guangdong, China

| | |
|---|---|
| Product Name: | GAN12ui Free play (charging base) |
| Brand Name: | GAN / MG / Swift |
| Model Name: | GAN 3x3 |
| Series Model(s): | GAN2x2, MG2x2, MG3x3, GAN4x4, MG4x4, GAN5x5, MG5x5, GAN6x6, MG6x6, GAN7x7, MG7x7, GAN Mega, MG Mega, GAN PYR, MG PYR, PYR, GAN ROBOT, GAN Skewb, MG Skewb, GAN Twist, MG Twist, Swift 3x3, GAN Mirror M, Swift 4x4, MG Mirror, Swift 5x5, Swift 6x6, GAN 328 10x10, GAN 328 6x6 |
| FCC ID: | 2BAB4GAN3X3 |
| Test Standards: | FCC 47CFR §2.1093 |

# TEST REPORT

| | |
|---|---|
| **Applicant's Name** | Guangzhou Ganyuan Intelligent Technology Co.,Ltd |
| Address | 1st to 4th floors, No16, Ping shun street, Lanhe Town, Nansha District, Guangzhou, Guangdong, China |
| **Manufacturer's Name** | Guangzhou Ganyuan Intelligent Technology Co.,Ltd |
| Address | 1st to 4th floors, No16, Ping shun street, Lanhe Town, Nansha District, Guangzhou, Guangdong, China |

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| **Test Standards** | FCC 47CFR §2.1093<br>447498 D04 Interim General RF Exposure Guidance v01 |

The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the ShenZhen CTA Test Services Co., Ltd.

| | |
|---|---|
| **Date of Test** | |
| Date of receipt of test item | 21 Nov. 2023 |
| Date (s) of performance of tests | 21 Nov. 2023 ~ 23 Nov. 2023 |
| Date of Issue | 23 Nov. 2023 |
| Test Result | **Pass** |

Testing Engineer : Zoey Cao

(Zoey Cao)

Technical Manager : Amy Wen

(Amy Wen)

Authorized Signatory : Eric Wang

(Eric Wang)

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## Revision History

| Rev. | Issue Date | Report No. | Effect Page | Contents |
|---|---|---|---|---|
| 00 | 23 Nov. 2023 | CTA231129005H01 | ALL | Initial Issue |
| | | | | |

# 1. GENERAL INFORMATION

## 1.1 GENERAL DESCRIPTION OF THE EUT

<table>
<tr><td>Product Name</td><td>GAN12ui Free play (charging base)</td></tr>
<tr><td>Brand Name</td><td>GAN / MG / Swift</td></tr>
<tr><td>Model Name</td><td>GAN 3x3</td></tr>
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<tr><td>Model Difference</td><td>Only the color and model name are different</td></tr>
<tr><td>Product Description</td><td>The EUT is GAN12ui Free play (charging base)
<table>
<tr><td>Operation Frequency:</td><td>2402~2480 MHz</td></tr>
<tr><td>Modulation Type:</td><td>GFSK</td></tr>
<tr><td>Antenna gain:</td><td>2.28 dBi</td></tr>
<tr><td>Antenna Designation:</td><td>Ceramic Antenna</td></tr>
</table></td></tr>
<tr><td>Rating</td><td>Input: DC 5.0V 150mA</td></tr>
<tr><td>Hardware Version</td><td>N/A</td></tr>
<tr><td>Software Version</td><td>N/A</td></tr>
</table>

1.2 TEST FACTORY

Shenzhen CTA Testing Technology Co., Ltd.
Room 106, Building 1, Yibaolai Industrial Park, Qiaotou Community,Fuhai Street, Bao'an District, Shenzhen, China

FCC test Firm Registration Number: 517856

IC test Firm Registration Number: 27890

A2LA Certificate No.: 6534.01

IC CAB ID: CN0127

## 2. FCC 47CFR §2.1093 REQUIREMENT

2.1 TEST STANDARDS

Follow the maximum permissible exposure (MPE) limits specified in 447498 D04 Interim General Radio Frequency Exposure Guidelines v01. The gain of the antenna used in the product was extracted from the supplied antenna data sheet and the maximum total power input to the antenna was also measured. Calculate the distance from the product to the MPE limit by the formula.

2.2 LIMIT

For single RF sources (i.e., any single fixed RF source, mobile device, or portable device, as defined in paragraph (b)(2) of this section): A single RF source is exempt if:

(A) The available maximum time-averaged power is no more than 1 mW, regardless of separation distance. This exemption may not be used in conjunction with other exemption criteria other than those in paragraph (b)(3)(ii)(A) of Part 1.1307. Medical implant devices may only use this exemption and that in paragraph (b)(3)(ii)(A);

(B) Or the available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold Pth (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive). Pth is given by:

$$P_{th}\ (\text{mW}) = \begin{cases} ERP_{20\,cm}(d/20\ \text{cm})^{x} & d \le 20\ \text{cm} \\ ERP_{20\,cm} & 20\ \text{cm} < d \le 40\ \text{cm} \end{cases}$$

Where

$$x = -\log_{10}\left(\frac{60}{ERP_{20\,cm}\sqrt{f}}\right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20\,cm}\ (\text{mW}) = \begin{cases} 2040f & 0.3\ \text{GHz} \le f < 1.5\ \text{GHz} \\ 3060 & 1.5\ \text{GHz} \le f \le 6\ \text{GHz} \end{cases}$$

$d$ = the separation distance (cm);

(C) Or using below table and the minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. For the exemption in Table 1 to apply, R must be at least λ/2π, where λ is the free-space operating wavelength in meters. If the ERP of a single RF source is not easily obtained, then the available maximum time-averaged power may be used in lieu of ERP if the physical dimensions of the radiating structure(s) do not exceed the electrical length of λ/4 or if the antenna gain is less than that of a half-wave dipole (1.64 linear value).

| RF Source frequency (MHz) | Threshold ERP(watts) |
|---|---|
| 0.3-1.34 | 1,920 $R^2$. |
| 1.34-30 | 3,450 $R^2/f^2$. |
| 30-300 | 3.83 $R^2$. |
| 300-1,500 | 0.0128 $R^2f$. |
| 1,500-100,000 | 19.2$R^2$. |

For multiple RF sources: Multiple RF sources are exempt if:

(A) The available maximum time-averaged power of each source is no more than 1 mW and there is a separation distance of two centimeters between any portion of a radiating structure operating and the nearest portion of any other radiating structure in the same device, except if the sum of multiple sources is less than 1 mW during the time-averaging period, in which case they may be treated as a single source (separation is not required). This exemption may not be used in conjunction with other exemption criteria other than those is paragraph (b)(3)(i)(A) of Part 1.1307. Medical implant devices may only use this exemption and that in paragraph (b)(3)(i)(A).

(B) in the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation.

$$\sum_{i=1}^{a} \frac{P_i}{P_{th,i}} + \sum_{j=1}^{b} \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^{c} \frac{Evaluated_k}{Exposure\ Limit_k} \leq 1$$

Where:

a = number of fixed, mobile, or portable RF sources claiming exemption using paragraph (b)(3)(i)(B) of Part 1.1307 for Pth, including existing exempt transmitters and those being added.

b = number of fixed, mobile, or portable RF sources claiming exemption using paragraph (b)(3)(i)(C) of Part 1.1307 for Threshold ERP, including existing exempt transmitters and those being added.

c = number of existing fixed, mobile, or portable RF sources with known evaluation for the specified minimum distance including existing evaluated transmitters.

Pi = the available maximum time-averaged power or the ERP, whichever is greater, for fixed, mobile, or portable RF source i at a distance between 0.5 cm and 40 cm (inclusive).

Pth,i = the exemption threshold power (Pth) according to paragraph (b)(3)(i)(B) of this section for fixed, mobile, or portable RF source i.

ERPj = the ERP of fixed, mobile, or portable RF source j.

ERPth,j = exemption threshold ERP for fixed, mobile, or portable RF source j, at a distance of at least λ/2π according to the applicable formula of paragraph (b)(3)(i)(C) of Part 1.1307.

Evaluatedk = the maximum reported SAR or MPE of fixed, mobile, or portable RF source k either in the device or at the transmitter site from an existing evaluation at the location of exposure.

Exposure Limitk = either the general population/uncontrolled maximum permissible exposure (MPE) or specific absorption rate (SAR) limit for each fixed, mobile, or portable RF source k, as applicable from § 1.1310.

2.3 TEST RESULT

Turn up

| Mode | Detector | Turn up Power |
|---|---|---|
| BLE | AV | -8±1dBm |

| Protocol | Fre. (GHz) | Separation distance (cm) | Max Turn up power (dBm) | ANT Gain ( dBi) | Max EIRP (dBm) | Maximum time-averaged power (mW) | Max EIRP (mW) | Limit (mW) | Result |
|---|---|---|---|---|---|---|---|---|---|
| BLE | 2.44 | 0.5 | -7 | 2.28 | -4.72 | 0.199526 | 0.33729 | 2.75284 | Pass |

Note: 1. The Maxinum power is less than the limit, complies with the exemption requirements.

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