

FCC SAR Exclusion Report

Report No. : SFBDKG-WTW-P23020527
Applicant : Logitech Far East Ltd.
Address : 3930 North First Street, San Jose, California United States 95134
Product : Wireless receiver
Brand : Logitech G ,G
FCC ID : JNZCU0022
Model No. : CU0022
FCC Rule Part : CFR §2.1093
Standards : IEEE Std 1528:2013
 KDB 865664 D01 v01r04, KDB 865664 D02 v01r02, KDB 447498 D01 v06
Sample Received Date : Mar. 10, 2023
Date of Evaluation : Apr. 11, 2023
Lab Address : No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
Test Location : No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City, Taiwan

CERTIFICATION: The above equipment have been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch – Lin Kou Laboratories**, 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 SAR characteristics under the conditions specified in this report. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product certification, approval, or endorsement by TAF or any government agencies.

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FCC Accredited No.: TW0003

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Release Control Record

Issue No.	Reason for Change	Date Issued
SFBDKG-WTW-P23020527	Initial release	Apr. 26, 2023

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1. Summary of Maximum SAR Value

Equipment Class	Mode	Highest Reported SAR _{1g} (W/kg)
DTS	Bluetooth	Not Required

Note:

1. The SAR limit (**Head & Body: SAR_{1g} 1.6 W/kg**) for general population / uncontrolled exposure is specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992.

Test Reference Guidance: FCC-19-126

2. Description of Equipment Under Test

EUT Type	Wireless receiver
Brand Name	Logitech G ,G
FCC ID	JNZCU0022
Model Name	CU0022
Tx Frequency Bands (Unit: MHz)	Bluetooth : 2402 ~ 2480
Uplink Modulations	Bluetooth : GFSK
Maximum Tune-up Conducted Power (Unit: dBm)	Please refer to section 3.1 of this report
Antenna Type	IFA Antenna
Antenna Peak Gain	1.58 dBi
EUT Stage	Engineering Sample

Note:

1. The above EUT information is declared by manufacturer and for more detailed features description please refers to the manufacturer's specifications or User's Manual.

3. SAR Measurement Evaluation

3.1 Maximum Output Power

The maximum conducted power (Unit: dBm) including tune-up tolerance is shown as below.

Bluetooth			
Mode	Channel	Frequency	Max Tune-up
LE	0	2402	16.5
	19	2440	16.5
	39	2480	16.5

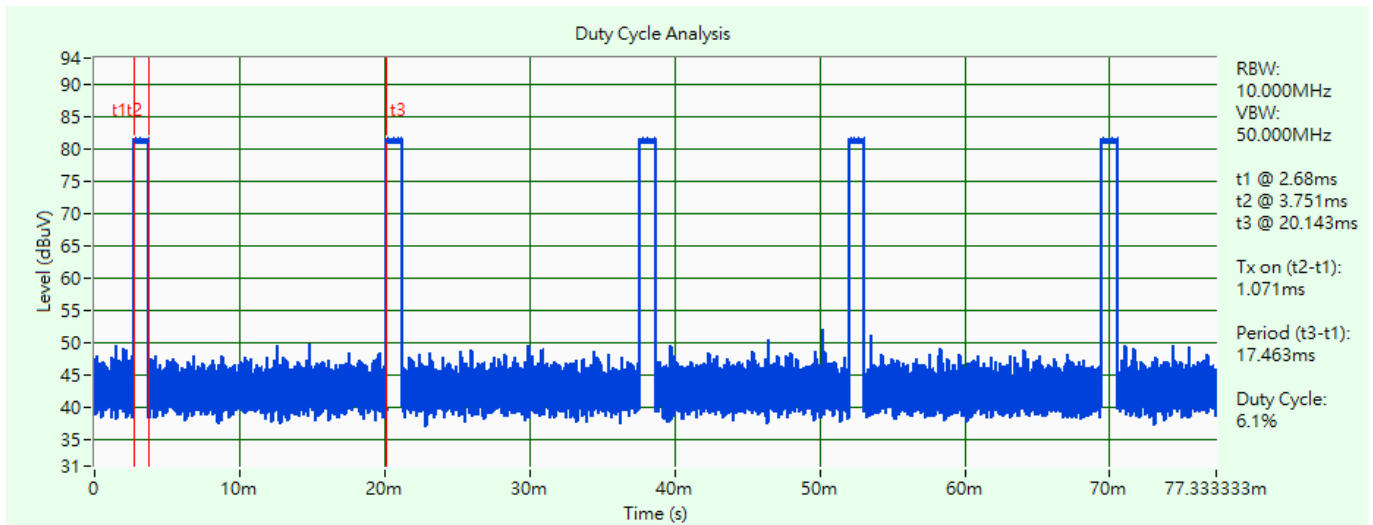
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3.2 Time-Avg. Power calculation.

<Considerations Related to Bluetooth for Setup and Testing>

This device has installed Bluetooth engineering testing software which can provide continuous transmitting RF signal. During Bluetooth SAR testing, this device was operated to transmit continuously at the maximum transmission duty with specified transmission mode, operating frequency, lowest data rate, and maximum output power.

The EUT was set to LE mode at the maximum output power. Its duty factor was calculated as below, it specified and designed from manufacturer when devices operate at normal usage condition.



Time-domain plot for Bluetooth transmission signal

The duty factor of Bluetooth signal has been calculated as following.

BT-LE 1M : Duty Factor = 2.116 ms / 34.929 ms x 100% = 6.1%

BT-LE 2M : Duty Factor = 1.071 ms / 17.463 ms x 100% = 6.1%

Note : For power averaging (RMS) mode, the correction factor is $10 * \log (1/\text{Duty cycle})$ and for linear voltage averaging mode, the correction factor is $20 * \log (1/\text{Duty cycle})$

The calculation of time-averaged power with duty cycle are performed as below.

<The calculation of time-averaged power with duty cycle>

Mode	Max. Tune-up (dBm)	Max. Tune-up (mW)	Duty Cycle (%)	Source-based time-averaged Max. Tune-up Power (mw)
LE	16.5	44.67	6.1	2.72

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3.3 SAR Testing Exclusions

According to KDB 447498 D01, the SAR test exclusion condition is based on source-based time-averaged maximum conducted output power, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions. The SAR exclusion threshold is determined by the following formula.

- For the test separation distance ≤ 50 mm

$$\frac{\text{Max. Tune up Power}_{(mW)}}{\text{Min. Test Separation Distance}_{(mm)}} \times \sqrt{f_{(GHz)}} \leq 3.0$$

When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

- For the test separation distance > 50 mm, and the frequency at 100 MHz to 1500 MHz

$$\left[(\text{Threshold at 50 mm in Step 1}) + (\text{Test Separation Distance} - 50 \text{ mm}) \times \left(\frac{f_{(MHz)}}{150} \right) \right]_{(mW)}$$

- For the test separation distance > 50 mm, and the frequency at > 1500 MHz to 6 GHz

$$[(\text{Threshold at 50 mm in Step 1}) + (\text{Test Separation Distance} - 50 \text{ mm}) \times 10]_{(mW)}$$

Mode	Frequency (GHz)	Source-based time-averaged Max. Tune-up Power (mw)	Exclusion Level < 3 ?	Require SAR Testing?
BT	2.4	2.72	$0.86 < 3$	No

Note:

- When separation distance ≤ 50 mm and the calculated result shown in above table is ≤ 3.0 , the SAR testing exclusion is applied.

Summary:

Since the SAR testing for all device orientations apply SAR test exclusion per KDB 447498, SAR testing for this device is not required.

4. Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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The road map of all our labs can be found in our web site also.

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