

# FCC SAR Exclusion Report

Report No. : SFBCIB-WTW-P22020171

Applicant : Quanta Computer Inc.

Address : No. 188, Wenhua 2nd Road, Guishan District, Taoyuan City 33377, Taiwan

Product Name : Emerge Wave-1

FCC ID : HFS-WAVE1

Brand : Emerge

Model No. : Emerge Wave-1

Standards : FCC 47 CFR Part 2 (2.1093), IEEE C95.1:1992, IEEE Std 1528:2013  
KDB 865664 D01 v01r04, KDB 865664 D02 v01r02, KDB 447498 D01 v06

Sample Received Date : Feb. 11, 2022

Date of Evaluation : May 10, 2022

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.

Prepared By :



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Approved By :



Gordon Lin / Manager



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## Release Control Record

| Issue No.            | Reason for Change | Date Issued  |
|----------------------|-------------------|--------------|
| SFBCIB-WTW-P22020171 | Initial release   | May 10, 2022 |
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# FCC SAR Exclusion Report

## 1. Summary of Maximum SAR Value

| Equipment Class | Mode      | Highest Reported SAR <sub>10g</sub> (W/kg) |
|-----------------|-----------|--------------------------------------------|
| DTS             | 2.4G WLAN | Not Required                               |
| NII             | 5.2G WLAN | Not Required                               |
|                 | 5.3G WLAN | Not Required                               |
|                 | 5.6G WLAN | Not Required                               |
|                 | 5.8G WLAN | Not Required                               |
| DSS             | Bluetooth | Not Required                               |

### Note:

1. The SAR criteria (**Head & Body: SAR-1g1.6 W/kg, and Extremity: SAR-10g 4.0 W/kg**) for general population/uncontrolled exposure is specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992.

# FCC SAR Exclusion Report

## 2. Description of Equipment Under Test

|                                                |                                                                                                   |
|------------------------------------------------|---------------------------------------------------------------------------------------------------|
| EUT Type                                       | Emerge Wave-1                                                                                     |
| FCC ID                                         | HFS-WAVE1                                                                                         |
| Brand Name                                     | Emerge                                                                                            |
| Model Name                                     | Emerge Wave-1                                                                                     |
| Tx Frequency Bands<br>(Unit: MHz)              | WLAN : 2412 ~ 2462, 5180 ~ 5240, 5260 ~ 5320, 5500 ~ 5700, 5745 ~ 5825<br>Bluetooth : 2402 ~ 2480 |
| Uplink Modulations                             | 802.11b : DSSS<br>802.11a/g/n/ac : OFDM<br>Bluetooth : GFSK, $\pi/4$ -DQPSK, 8-DPSK               |
| Maximum Tune-up Conducted Power<br>(Unit: dBm) | Please refer to Annex A                                                                           |
| Antenna Type                                   | Refer to Note as below                                                                            |
| EUT Stage                                      | Engineering Sample                                                                                |

### Note:

1. The antenna information is listed as below.

| Ant. Type                    | Dipole Antenna |      |      |      |      |      |
|------------------------------|----------------|------|------|------|------|------|
| Frequency (MHz)              | 2400           | 2440 | 2480 | 5150 | 5550 | 5850 |
| Peak Gain (dBi)<br>Main Ant  | 3.7            | 3.8  | 3.8  | 1.3  | 2.2  | 3.7  |
| Peak Gain (dBi)<br>Aux. Ant. | 3.2            | 3.1  | 2.5  | 2.5  | 2.3  | 2.5  |

2. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.
3. 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 Target Conducted Power

Refer to Annex A.

### 3.2 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  $\leq 50$  mm

$$\frac{\text{Max. Tune up Power}_{(mW)}}{\text{Min. Test Separation Distance}_{(mm)}} \times \sqrt{f_{(GHz)}} \leq 3.0 \text{ for SAR-1g, } \leq 7.5 \text{ for SAR-10g}$$

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

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

### <Extremity Exposure Evaluation>

| Mode        | Max. Tune-up Power (dBm) | Max. Tune-up Power (mW) | Separation Distance (mm) | Calculated Result | Require SAR Testing? |
|-------------|--------------------------|-------------------------|--------------------------|-------------------|----------------------|
| WLAN 2.4GHz | 17.5                     | 56.23                   | 26.33                    | 3.35              | No                   |
| WLAN 5.2GHz | 15                       | 31.62                   | 26.33                    | 2.75              | No                   |
| WLAN 5.3GHz | 15                       | 31.62                   | 26.33                    | 2.77              | No                   |
| WLAN 5.6GHz | 15                       | 31.62                   | 26.33                    | 2.87              | No                   |
| WLAN 5.8GHz | 15                       | 31.62                   | 26.33                    | 2.9               | No                   |
| BT          | 9                        | 7.94                    | 26.33                    | 0.47              | No                   |

#### Note:

- When separation distance  $\leq 50$  mm and the calculated result shown in above table is  $\leq 7.5$ , 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:

**Taiwan Huaya Lab:**

Add: No. 19, Huaya 2nd Rd., Guishan Dist., Taoyuan City 333, Taiwan  
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**Taiwan Linkou Lab:**

Add: No. 47-2, Baodoucuokeng, Linkou Dist., New Taipei City 244, Taiwan  
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**Taiwan Hsinchu Lab1:**

Add: E-2, No. 1, Lixing 1st Rd., East Dist., Hsinchu City 300, Taiwan  
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**Taiwan Hsinchu Lab2:**

Add: No. 49, Ln. 206, Wende Rd., Qionglin Township, Hsinchu County 307, Taiwan  
Tel: +886-(0)3-512-0595  
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**Taiwan Xindian Lab:**

Add: B2F., No. 215, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan  
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**Web Site:** <https://ee.bureauveritas.com.tw/BVInternet/Default>

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

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