

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.

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Annex A. Maximum Target Conducted Power



Release Control Record

Issue No.	Reason for Change	Date Issued
SFBCIB-WTW-P22020171	Initial release	May 10, 2022

1. Summary of Maximum SAR Value

Equipment Class	Mode	Highest Reported SAR _{10g} (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:

- 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.

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 (Unit: MHz)	WLAN : 2412 ~ 2462, 5180 ~ 5240, 5260 ~ 5320, 5500 ~ 5700, 5745 ~ 5825 Bluetooth : 2402 ~ 2480
Uplink Modulations	802.11b : DSSS 802.11a/g/n/ac : OFDM Bluetooth : GFSK, $\pi/4$ -DQPSK, 8-DPSK
Maximum Tune-up Conducted Power (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) Main Ant	3.7	3.8	3.8	1.3	2.2	3.7
Peak Gain (dBi) Aux. Ant.	3.2	3.1	2.5	2.5	2.3	2.5

- 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.
- 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.

1. For the test separation distance ≤ 50 mm

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

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

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

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

3. 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:

1. When separation distance ≤ 50 mm and the calculated result shown in above table is ≤ 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:

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

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