

RF EXPOSURE REPORT



Applicant: Wacom Co., Ltd.
2-510-1 Toyonodai, Kazo-shi, Saitama 349-1148 Japan
Manufacturer: Wacom Co., Ltd.
2-510-1 Toyonodai, Kazo-shi, Saitama 349-1148 Japan
Product Name: Creative Pen Tablet
Brand Name: Wacom
Model No.: PTK870
Family Model No.: PTK870*****(* may be alphanumeric/symbol or blank)
Model Difference: For marketing purpose
FCC ID HV4PTK870
Issue Date: Aug. 08, 2024

Approved By

John Yeh

We hereby certify that:

The above equipment was evaluated by SGS Taiwan Ltd. Central RF Lab. The evaluation in this report is in compliance with FCC KDB 447498 D01v06.

The results of this report relate only to the sample identified in this report.

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Revision History

Report Number	Revision	Description	Issue Date	Revised By	Remark
TESA2406000420E5	00	Original	Aug. 08, 2024	Cindy Chou	

Note:

- 1、The remark "*" indicates modification of the report upon requests from certification body.
- 2、Variant information of model numbers is provided by the applicant, test results of this report are applicable to the sample EUT(s) received.
And are assessed as electrically identical in RF characteristics, therefore, no further assessment required for the variant(s).

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1 DESCRIPTION OF EQUIPMENT UNDER TEST (EUT)

1.1 Product Description

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2 RF EXPOSURE EVALUATION FOR PORTABLE CONDITIONS

2.1 KDB 447498 D01 4.3.1:

Step a: For 100 MHz to 6 GHz and test separation distances ≤ 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:

$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [Nf(\text{GHz})] \leq 3.0$ for 1-g Head & Body SAR and ≤ 7.5 for 10-g extremity Hand SAR, where

- $f(\text{GHz})$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison
- The values 3.0 and 7.5 are referred to as numeric thresholds in **step b)** below

Step b: For 100 MHz to 6 GHz and test separation distances > 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following (also illustrated in Appendix B):

- 1) $\{[\text{Power allowed at numeric threshold for 50 mm in step a)}] + [(\text{test separation distance} - 50 \text{ mm}) \cdot (f(\text{MHz})/150)]\}$ mW, for 100 MHz to 1500 MHz
- 2) $\{[\text{Power allowed at numeric threshold for 50 mm in step a)}] + [(\text{test separation distance} - 50 \text{ mm}) \cdot 10]\}$ mW, for > 1500 MHz and ≤ 6 GHz

Step c: For frequencies below 100 MHz, the following may be considered for SAR test exclusion (also illustrated in Appendix C):

- 1) For test separation distances > 50 mm and < 200 mm, the power threshold at the corresponding test separation distance at 100 MHz in step b) is multiplied by $[1 + \log(100/f(\text{MHz}))]$
- 2) For test separation distances ≤ 50 mm, the power threshold determined by the equation in c) 1) for 50 mm and 100 MHz is multiplied by $\frac{1}{2}$
- 3) SAR measurement procedures are not established below 100 MHz

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2.2 Standalone test exclusion for BLE:

Step a:

This is a portable device and the max. output power including tune-up tolerance is 1.995 (mW), lower than the threshold given and derived as formula given above, where

$$=1.995(\text{mW})/5(\text{mm})\cdot\sqrt{2.402(\text{GHz})} = 0.618 < 3.0$$

Frequency (MHz)	Max. output power including tune-up tolerance(dBm)	Max. output power including tune-up tolerance(mW)	Distance (mm)	Result	≤ 3.0 for 1-g SAR
2402	3	1.995	5	0.618	TRUE

From above, standalone BLE can be excluded from SAR testing.

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2.3 Standalone test exclusion for EMR:

Based on KDB447498D01v06 4.3.1 c), SAR test exclusion threshold for EMR (0.593MHz) shall be evaluated as below,

- For *test separation distances* ≤ 50 mm, the power threshold determined by the equation in 4.3.1 c) 1) for 50 mm and 100 MHz is multiplied by $\frac{1}{2}$
- The power threshold at 50mm/100 MHz in 4.3.1 b) is multiplied by $[1 + \log(100/f(\text{MHz}))]$ where f is 0.593MHz
- The power threshold in 4.3.1 b) is $[\text{Power allowed at numeric threshold for 50 mm in 4.3.1 a)} + [(\text{test separation distance} - 50 \text{ mm}) \cdot (f(\text{MHz})/150)] \text{ mW}$, for 100 MHz to 1500 MHz where test separation distance is 50mm, frequency is 100MHz.
- Power allowed at numeric threshold for 50 mm in 4.3.1 a) is $[3/\sqrt{f(\text{GHz})}] \cdot (\text{test separation distance})$

Hence, SAR test exclusion threshold is calculated in reverse sequence:

- $[3/\sqrt{0.1}] \cdot 50 = 474.3416 \text{ mW}$
- $474.3416 + (50-50) \cdot (100/150) = 474.3416 \text{ mW}$
- $474.3416 \cdot [1 + \log(100/0.593)] = 1530.674 \text{ mW}$
- $1530.674 \cdot 0.5 = 765.337 \text{ mW}$

So the SAR test exclusion power threshold for EMR(0.593MHz) is 765.337mW(equal to 28.84dBm).

Also, the maximum power of EMR is -67.62dBm (converted from 7.54 dBuV/m at 30m) and it is far below the exclusion threshold (28.84dBm), so SAR test for EMR can be excluded.

EMR

Freq. (MHz)	E-FIELD dBuV/m	Test Distance (m)	EIRP (dBm)	EIRP (mW)	Exemption Limit (mW)
0.593	7.54	30	-67.61757	0.00000017308	765.337

Note:

$$\text{EIRP (dBm)} = (\text{E-FIELD(dBuV/m)} + 20\log(d(\text{m})) - 104.7$$

$$\text{EIRP(W)} = (10^{(\text{EIRP(dBm)} / 10)}) / 1000$$

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2.4 Estimated SAR for BLE and EMR

Based on KDB447498D01v06 4.3.2 b), when an antenna qualifies for the standalone SAR test exclusion of 4.3.1 and also transmits simultaneously with other antennas, the standalone SAR value must be estimated according to the following to determine the simultaneous transmission SAR test exclusion criteria:

1) $[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})/x}] \text{ W/kg}$, for test separation distances $\leq 50 \text{ mm}$, where $x = 7.5$ for 1-g SAR and $x = 18.75$ for 10-g SAR.

BLE:

Max Freq.	Mode	Max. tune-up power(dBm)	Max. tune-up power(mW)	Test separation distance (mm)	Calculation value	Exclusion thresholds	Require SAR testing	Estimated SAR (W/kg)
2402	BLE	3	1.995	5	0.618	3.000	NO	0.082

EMR:

Using the most conservative test separation distance 5mm, so the estimated 1g-SAR for EMR would be 0.00000000355 W/Kg.

$$[0.00000017308/5] \cdot [\sqrt{0.000593/7.5}] = 0.00000000355 \text{ W/Kg}$$

2.5 Simultaneous transmission evaluation

FCC Reported SAR		Scenario 1
1	2	1+2 Summed 1g SAR (W/kg)
BLE	EMR	
1g estimate SAR (W/kg)	1g estimate SAR (W/kg)	
0.082	0.00000000355	0.082

2.6 Conclusion

The simultaneous transmission is compliant because the SAR sum is less than the corresponding criteria.

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