

SAR Exclusion Report

FCC Rule Part : CFR §2.1093

Standards : IEEE Std 1528:2013
KDB 865664 D01 v01r04, KDB 865664 D02 v01r02,
KDB 447498 D01_v06_2015.10.23_General RF Exposure Guidance

Report No. : SFBIDGE-WTW-P24090005

Applicant : DELL INC.

Address : One Dell Way Round Rock, Texas 78682 United States

Product : RFID 13.56MHz Wireless Module

Brand : DELL

Model No. : DWRFID2403

FCC ID : E2K-DWRFID2403

Sample Received Date : Sep. 02, 2024

Date of Evaluation : Dec. 10, 2024

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

FCC Accredited No. : TW0003

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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Release Control Record

Issue No.	Reason for Change	Date Issued
SFBDGE-WTW-P24090005	Initial release	Dec. 16, 2024

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1. Summary of Maximum SAR Value

Equipment Class	Mode	Highest Reported SAR _{1g} (W/kg)
DXX	RFID	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.

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2. Description of Equipment Under Test

EUT Type	RFID 13.56MHz Wireless Module
Brand Name	DELL
Model Name	DWRFID2403
FCC ID	E2K-DWRFID2403
Tx Frequency Bands	13.56 MHz
Uplink Modulations	ASK
Maximum Tune-up Conducted Power (Unit: dBm)	Please refer to section 3.1 of this report
Antenna Type	Loop Antenna
EUT Stage	Engineering Sample

Note:

1. The EUT is authorized for use in specific End-product. Please refer to below for more details.

Product	Brand	Model
Portable Computer	DELL	P196G

2. 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.

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3. SAR Measurement Evaluation

3.1 Maximum Output Power

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

RFID			
Mode	Channel	Frequency (MHz)	Max. Tune-up
ASK	1	13.56	-43.53

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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.

A. For the test separation distance ≤ 50 mm

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

- 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

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

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

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

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.

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

C. For frequencies below 100 MHz, the following may be considered for SAR test exclusion.

- 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 $[1 + \log(100/f_{(\text{MHz})})]$
- 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 $\frac{1}{2}$
- SAR measurement procedures are not established below 100 MHz.

Mode	Frequency (MHz)	Max. Tune-up Power (dBm)	Max. Tune-up Power (mW)	Exclusion (mW)	Require SAR Testing?
RFID	13.56	-43.53	0.00004436	2997.21	No

Note:

- When the device output power is less than the power threshold shown in above table, the SAR testing exclusion is applied.
- The exclusion is multiplied by 2.5 for extremity limits.

Summary:

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

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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 FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

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

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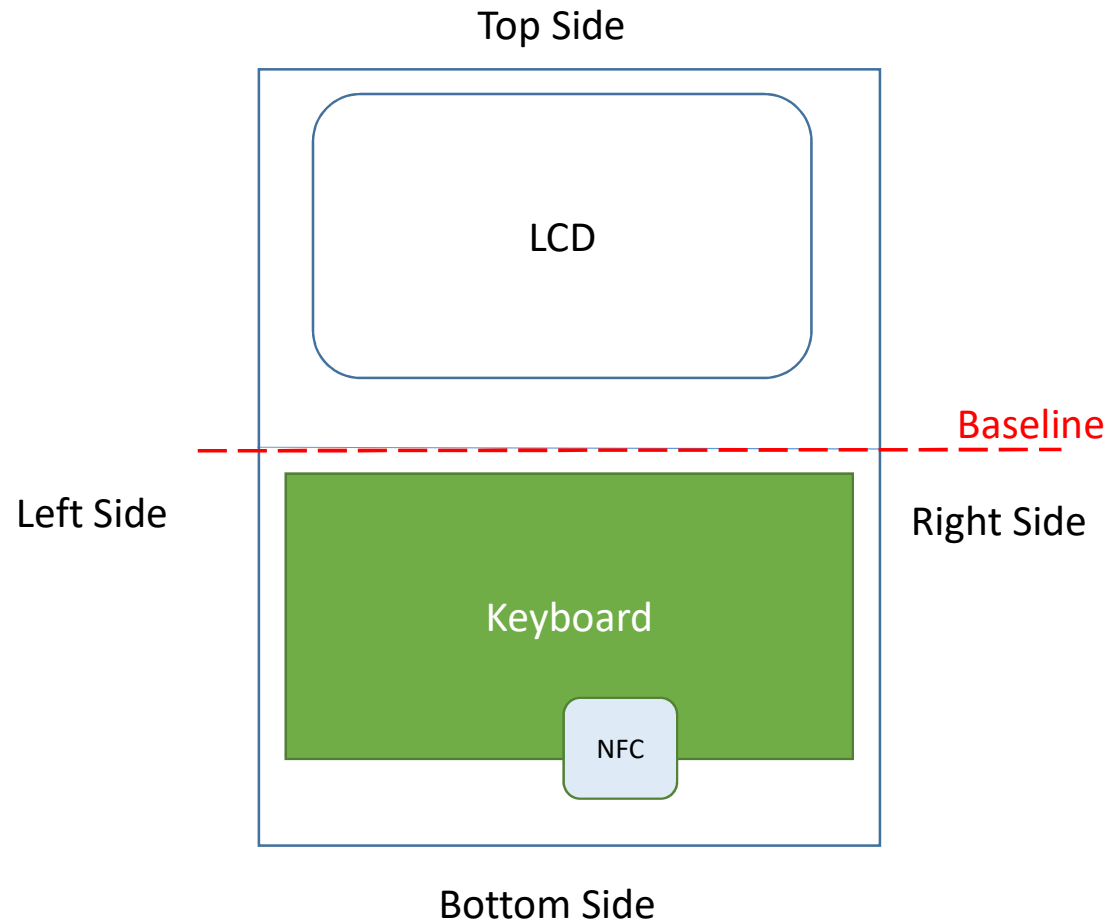
The address and road map of all our labs can be found in our web site also.

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Photographs of EUT Setup and Antenna Location

The photographs of EUT and setup for SAR testing are shown as follows.

<Front Face View> Laptop Mode (180°)



<Right Side View> Laptop Mode(90°)

