

Report No.: SEWM2311000489RG05
 Rev.: 01
 Page: 1 of 6

RF Exposure Evaluation Report

Application No.: SEWM2311000489RG
Applicant: Marquardt GmbH
Address of Applicant: Schloss-Straße 16, 78604 Rietheim-Weilheim, Germany
Manufacturer: Marquardt GmbH
Address of Manufacturer: Schloss-Straße 16, 78604 Rietheim-Weilheim, Germany
EUT Description: NFC Door Handle Sensor
Model No.: HH5
Trade Mark: Marquardt
FCC ID: IYZHH5
 FCC 47 CFR Part 1.1307
Standards: FCC 47 CFR Part 1.1310
 FCC KDB 447498 D01 v06
Date of Receipt: 2023/12/01
Date of Issue: 2024/01/30

Test Result:	PASS*
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* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Well Wei
 Wireless Laboratory Manager




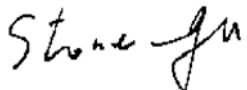
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1 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2024/01/30		Original

Prepared By		 <hr/> (Yves Cheng) / Test Engineer
Checked By		 <hr/> (Stone Gu) / Reviewer



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2 General Information

2.1 Client Information

Applicant:	Marquardt GmbH
Address of Applicant:	Schloss-Straße 16, 78604 Rietheim-Weilheim, Germany
Manufacturer:	Marquardt GmbH
Address of Manufacturer:	Schloss-Straße 16, 78604 Rietheim-Weilheim, Germany

2.2 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• **A2LA (Certificate No. 6336.01)**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 6336.01.

• **Innovation, Science and Economic Development Canada**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0120.

IC#: 27594.

• **FCC –Designation Number: CN1312**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized as an accredited testing laboratory.

Designation Number: CN1312.

Test Firm Registration Number: 717327



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2.3 General Description of EUT

EUT Description:	NFC Door Handle Sensor
Model No.:	HH5
Trade Mark:	Marquardt
Hardware Version:	H12
Software Version:	223010.0
Operation Frequency:	13.56MHz
Modulation Type:	ASK
Antenna Type:	PCB trace Antenna
Remark:	As above information is provided and confirmed by the applicant. SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.



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3 RF Exposure Evaluation

3.1 RF Exposure Compliance Requirement

3.1.1 Limit:

Based on KDB447498D01v06 4.3.1 c), SAR test exclusion threshold for NFC (13.56MHz) 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 13.56MHz

The power threshold in 4.3.1 b) is [Power allowed at numeric threshold for 50 mm in 4.3.1 a)] + [(test separation distance – 50 mm)·(f(MHz)/150)] 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:

- a): $[3/\sqrt{0.1}] \cdot 50 = 474.3416\text{mW}$
- b): $474.3416 + (50-50) \cdot (100/150) = 474.3416\text{mW}$
- c): $474.3416 \cdot [1 + \log(100/13.56)] = 885.9470\text{mW}$
- d): $885.9470 \cdot 0.5 = 442.974\text{mW}$

So the SAR test exclusion power threshold for NFC(13.56MHz) is 442.974mW(equal to 26.464dBm).

3.1.2 Test Result

Also, the maximum power of NFC is -28.99dBm (converted from 66.27 dBuV/m at 3m) and it is far below the exclusion threshold (26.464dBm), so SAR test for NFC can be excluded.

---End of Report---



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