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FCC SAR EXEMPTION REPORT

REPORT NUMBER: S220305-6

TEST STANDARD: FCC KDB 447498 D01

FCC ID: PN2-PRO1

CLIENT: ADHERIUM (NZ) LTD

DEVICE: HAILIE SENSOR

MODEL: NF0110

DATE OF ISSUE: 14/10/2022

REVISION TABLE

Version	Sec/Para Changed	Change Made	Date
1		Initial issue of document	14/10/2022

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FCC SAR EXEMPTION REPORT

Device:	Hailie Sensor
Model Number:	NF0110
Serial Number:	773DEMC2
Manufacturer:	Adherium (NZ) Ltd
Tested for:	Adherium (NZ) Ltd
Address:	Level 2, 63 Albert Street Auckland, New Zealand 1010
Phone Number:	+61 430 348 565
Contact:	Igbal Syre
Email:	igbals@adherium.com
FCC ID:	FCC ID: PN2-PRO1
Standards:	**FCC KDB 447498 D01 General RF Exposure Guidance v6.0** Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.
Result:	Based on an assessment of the documentation provided the Hailie Sensor, Model NF0110 exempted from SAR evaluation. Refer to Report S220305-6 for full details
Assessment Date:	11 May 2022
Issue Date:	14 October 2022
Assessment Engineer:	Dong Feng
Authorised Signatory:	Emad Mansour **EMC Technologies Pty Ltd**

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1 INTRODUCTION

The transmitter was assessed against FCC KDB 447498 D01 General RF Exposure Guidance v6.0.

This report shows the SAR exclusion on the Hailie Sensor, Model NF0110, in accordance with FCC KDB 447498 D01 clause 4.3.1,

The test sample was provided by the Client. The conclusion herein is based on the information provided by the client.

1.1 Laboratory Overview

EMC Technologies Pty. Ltd. is an independently owned Australian company that is NATA accredited to ISO 17025 for both testing and calibration and ISO 17020 for Inspection. – **Accreditation Number 5292.**

1.2 Test Laboratory/Accreditations

Inspection were performed at EMC Technologies' laboratory in Seven Hills, NSW, Australia.

Table 1-1: Accreditations for Conformity Assessment

Country/Region	Body	
Australia/New Zealand	NATA	Accreditation Number: 5292
Europe	European Union	Notified Body Number: 0819
USA	FCC	Designation Number: AU0002 (Syd)
Canada	ISED Canada	Company Number: 4207A (Syd)
Japan	VCCI	Company Number: 785
Taiwan	BSMI	Lab Code SL2-IN-E-5001R

2 DEVICE DETAILS

(Information supplied by the Client)

Manufacturer: Adherium (NZ) Ltd
Test Sample: Hailie Sensor
Model Number: NF0110
Serial Number: 773DEMC2

Transmit parameters were provided by the customer and are shown below:

Table 2-1: Transmitter Parameters

Frequency Band:	2.400-2.4835GHz ISM band (Bluetooth Low Energy)
Modulation:	GFSK (1Mb/s)
Operating Frequency:	2.4 GHz
Nominal Power:	1.0 mW
Antenna type and gain:	Internal Omnidirectional 1dBi
Peak Output Power:	-5.8 dbm

**Refer to report S220305-5, section 3.5.*

3 SAR TEST EXCLUSION THRESHOLD FOR 100MHZ TO 6GHZ AND ≤50MM

Table1: SAR test exclusion threshold 100 MHz- 6GHz

Frequency (MHz)	5	10	15	20	25	mm
150	39	77	116	155	194	SAR Test Exclusion Threshold (mW)
300	27	55	82	110	137	
450	22	45	67	89	112	
435	16	33	49	66	82	
900	16	32	47	63	79	
1500	12	24	37	49	61	
1900	11	22	33	44	54	
2450	10	19	29	38	48	
3600	8	16	24	32	40	
5200	7	13	20	26	33	
5400	6	13	19	26	32	
5800	6	12	19	25	31	

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$$\left(\frac{max.channel\ power,mW}{min.separation\ distance,mm}\right) \times \sqrt{f(GHz)} \leq 3.0$$

Where

- f(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 test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz.
- The minimum test separation distance is 5 mm.

4 UNCERTAINTY

EMC Technologies has evaluated the tools and methods used to perform Radiated Electromagnetic Field predictions.

The estimated inspection uncertainties for the test shown within this report are as follows:

Electromagnetic Modelling

30 MHz to 100GHz ±2.8 dB

The above expanded uncertainties are based on standard uncertainties multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

5 ASSUMPTIONS IN THIS ASSESSMENT

This assessment does not include accumulated RF fields from nearby sites/antennas or possible radio signal reflections or attenuation due to buildings or the general environment.

Antenna Parameters and power settings were supplied by the customer.

A 100% duty cycle is assumed.

The aperture of the radiating element assumed to be a point source in free space and far field conditions.

6 EVALUATION RESULT

The standalone transmitter is exempted from SAR if the below condition satisfied in conjunction with threshold power condition in table 1

$$\left(\frac{max.channel\ power,mW}{min.separation\ distance,mm}\right) \times \sqrt{f(GHz)} \leq 3.0$$

Where

Minimum test separation distance ($5mm$):

The minimum test separation distance is determined by the smallest distance from the antenna (radiating structures) to the outer surface of the device

Maximum measured conducted power = -5.8dBm = 0.26mW

Time-averaged maximum conducted output power

(0.26mW / 5 mm) × √ 2.48 GHz = 0.08 < 3.0

As the transmitted power is -5.8 dBm (0.26 mW) less than 10 mW indicated in table (1) and the result of the above condition is 0.08 (less than 3), hence this transmitter excepted from SAR evaluation.

7 CONCLUSION

Based on an assessment of the documentation provided the Hailie Sensor, model NF0110 exempted from SAR evaluation based on the test exclusion guidance in FCC KDP 447498 D01 clause 4.3.1.