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FCC SAR EXEMPTION REPORT

REPORT NUMBER: M2308006-2

TEST STANDARD: FCC KDB 447498 D01

CUSTOMER: RESMED INC

DEVICE: LEO

MODEL: 22601

DATE OF ISSUE: 13 NOVEMBER 2023

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REVISION TABLE

Version	Sec/Para Changed	Change Made	Date
1		Initial issue of document	13/11/2023



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FCC SAR EXEMPTION REPORT

Device: Leo
Model Number: 22601
Hardware Version: Leo Flex v3.0

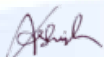
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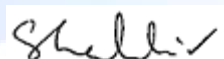
Tested for: Resmed Inc
Address: 9001 Spectrum Center Blvd, San Diego California United States 92123
Contact: Ryan Kirkpatrick
Phone: (619) 436-6399
Email: fcc.contact@resmed.com

Standards: **FCC KDB 447498 D01 General RF Exposure Guidance v6**
Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.

Result: Based on an assessment of the documentation provided the Leo, model 22601 exempted from SAR evaluation. Refer to Report M2308006-2 for full details

Issue Date: 13 November 2023

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1 INTRODUCTION

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

This report shows the SAR exclusion on the Leo, Model 22601, in accordance with FCC KDB 447498 D01 clause 4.3.1,

The test sample and the device information were 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 was performed at EMC Technologies' laboratory in Keilor Park, Victoria 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: AU0001 (Melb)
Canada	ISED Canada	Company Number: 3569B(Melb)
Japan	VCCI	Company Number: 785
Taiwan	BSMI	Lab Code SL2-IN-E-5001R

2 DEVICE DETAILS

(Information supplied by the Client)

The Leo, model 22601 is a medical monitoring wearable patch.

Manufacturer:	ResMed Pty Ltd
Test Sample:	Leo
Model Number:	22601
Distance from the human body in normal use:	Portable

Transmit parameters are shown below:

Table 2-1: Transmitter Parameters

Transmitter #1	
Wireless Interface:	STMicroelectronics BLUENRG-2 BLE
Operating Frequency:	2402-2480 MHz
Max. RF Output Power Level:	3.01 dBm (1.9999 mW)
Antenna Type:	Ceramic Chip Antenna ANT016008LCS2442MA1
Max Antenna gain:	1.6dBi

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

Table1: SAR test exclusion threshold 100 MHz- 6GHz

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	
835	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	
MHz	30	35	40	45	50	mm
150	232	271	310	349	387	SAR Test Exclusion Threshold (mW)
300	164	192	219	246	274	
450	134	157	179	201	224	
835	98	115	131	148	164	
900	95	111	126	142	158	
1500	73	86	98	110	122	
1900	65	76	87	98	109	
2450	57	67	77	86	96	
3600	47	55	63	71	79	
5200	39	46	53	59	66	
5400	39	45	52	58	65	
5800	37	44	50	56	62	

Note: 10-g Extremity SAR Test Exclusion Power Thresholds are 2.5 times higher than the 1-g SAR Test Exclusion Thresholds indicated above. These thresholds do not apply, by extrapolation or other means, to occupational exposure limits.

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

$$\frac{\text{max. power of channel, including tuneup tolerance (mW)}}{\text{min. test separation distance (mm)}} * \sqrt{f(\text{GHz})} \leq 3.0$$

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 5mm.

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

$$\frac{\text{max. power of channel, including tune – up tolerance (mW)}}{\text{min. test separation distance (mm)}} * \sqrt{f(\text{GHz})} \leq 3.0$$

Where

Minimum test separation distance (*mm*): 5

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

Maximum power of channel (*mW*): 2

Time-averaged maximum conducted output power.

$$\begin{aligned} \frac{\text{max. power of channel, including tune – up tolerance (mW)}}{\text{min. test separation distance (mm)}} * \sqrt{f(\text{GHz})} &= \frac{2\text{mW}}{5\text{mm}} * \sqrt{2.45 \text{ GHz}} \\ &= 0.6 \leq 3.0 \end{aligned}$$

As the transmitted power is 2.9 mW (4.61 dBm), less than 10 mW indicated in table (1) and the result of the above condition is 0.6 (less than 3), this transmitter exempted from SAR evaluation for FCC compliance purposes.

7 APPENDIX A

Referenced Documents

Document	Comments
Radio Report M2308006-1	Transmitter details
TDK Antenna catalogue	Antenna Details



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