

RF EXPOSURE REPORT

OF
Applicant: Cadi Scientific Pte Ltd
31 Ubi Road 1, #07-01A Aztech Building, Singapore 408694
Product Name: SmartNODE
Brand Name: Cadi
Model No.: SMN-823W
Model Difference: N/A
Report Number: ER/2019/80082
FCC ID VPE-SMN-823W
FCC Rule Part Part 2.1093
Issue Date: Nov. 22, 2019
Date of EUT Received: Aug. 15, 2019

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. The test data, data evaluation in this report is in compliance with FCC Rules Part 2.

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

John Yeh
Approved By: _____

John Yeh / Assistant Manager



Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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Revision History

Revision	Description	Issue Date	Remark
Rev.00	Original.	Nov. 12, 2019	Revised by: Karen Huang
Rev.01	Update FCC rule part	Nov. 22, 2019	Revised by: Karen Huang

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1 DESCRIPTION OF EQUIPMENT UNDER TEST (EUT)

General:

Product Name:	SmartNODE
Brand Name:	Cadi
Model No.:	SMN-823W
Model Difference:	N/A
Hardware Version:	0v4
Software Version:	12
Power Supply:	3.6Vdc from Lithium Thionyl Chloride Battery

2.4G WLAN:

Wi-Fi	Frequency Range	Channels	Rated Power in dBm (Avg.)	Rated Power in dBm (Peak)	Modulation Technology		
802.11b	2412-2462	11	10.30	12.55	DSSS,		
802.11g			9.65	17.41	OFDM		
802.11n HT20			9.52	17.10			
Modulation type:	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM						
Transition Rate:	802.11 b: 1/2/5.5/11 Mbps 802.11 g: 6/9/12/18/24/36/48/54 Mbps 802.11 n_20MHz: 6.5 – 72.2Mbps						

Antenna Information:

Antenna Type	Supplier	Antenna Part No.	Peak Antenna Gain (dBi)
Chip	YAGEO	ANT8010LL04R2400A	5.46

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2 RF EXPOSURE

2.1 Standard Applicable:

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

This is a Portable device with its physical nature to be used nearby, the distance between radiating structure and human is less than 20cm.

As per KDB 447498 D01 4.3.1, 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:

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

*f (GHz) is the RF channel transmit frequency in GHz
Power and distance are rounded to the nearest mW and mm before calculation*

2.2 Measurement Result:

Step 1:

This is a portable device and the max. output power including tune-up tolerance is 10.715 (mW), lower than the threshold given and derived as formula given above, where

$$=10.715(\text{mW})/5(\text{mm}) \cdot \sqrt{2.412 \text{ (GHz)}} = 3.328 < 7.5$$

Frequency (MHz)	Max. output power including tune-up tolerance(dBm)	Max. output power including tune-up tolerance(mW)	Distance (mm)	Result
2412	10.3	10.715	5	3.328

As the result of calculation result indicates, the RF exposure generating from given transmitter (transmitter employed digital modulation) can be excluded from SAR measurement, and is deemed compliant with RF exposure as per FCC.

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The table of quick reference in terms of power threshold

SAR Test Exclusion Thresholds for 100 MHz – 6 GHz and ≤ 50 mm

Approximate SAR Test Exclusion Power Thresholds at Selected Frequencies and Test Separation Distances are illustrated in the following Table.

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	

Note that the table present above is the table of quick reference, indexing the level of power threshold with respect to the corresponding frequency. The value of the index may be deviated, and therefore, the derivation of exemption based on KDB447498 D01 is used in this test report, relevantly.

~ End of Report ~

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