FCC C2PC
RF Exposure Report

Reference No.	:	WTD22D04074030W003
FCC ID	:	ZLZ-PMACS
Applicant	:	Shenzhen Mindray BIO-Medical electronics Co.,LTD.
Address	:	Mindray Building ,Keji 12th Road South,Hi-tech Ind, Shenzhen China
Brand Name	:	Mindray
Product	:	Embedded wireless module
Model(s)	:	SX-SDMAC-2832S+
Standards	:	47CFR FCC Part 2 Subpart J Section 2.1091
Date of Receipt sample	:	2022-04-20
Date of Test	:	2022-04-21 to 2022-05-10
Date of Issue	:	2023-03-27
Test Result	:	**Pass**

Remarks:
The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

Prepared By:
Waltek Testing Group Co., Ltd.
Address: No. 77, Houjie Section, Guantai Road, Houjie Town, Dongguan City, Guangdong, China
Tel: +86-769-2267 6998
Fax: +86-769-2267 6828

Compiled by:

Estel Qian / Project Engineer

Approved by:

Deval Qin / Designated Reviewer

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3. Revision History

Test Report No.	Date of Receipt Sample	Date of Test	Date of Issue	Purpose	Comment	Approved
WTD22D04074030W003	2022-04-20	2022-04-21 to 2022-05-10	2023-03-27	Original	-	Valid

4. General Information

This report is prepared for FCC Class II Permissive Change, add three optional antennas.

Ant.	Type	Operation Frequencies (MHz) /Antenna Gain (dBi)				
		2412~2462	5150~5250	5250~5350	5470~5725	5725~5850
Optional 1 RD542109NB86-1	FPC diploe	-0.95	0.50	0.98	2.59	3.29
Optional 2 RD542109NB86-2	FPC diploe	2.05	1.29	1.45	3.06	3.17
Optional 3 RD542109NB86-3	FPC diploe	1.80	0.70	1.07	2.12	2.77

Note: please refer to antenna specification for more details.

4.1. General Description of E.U.T.

Product:	Embedded wireless module
Model(s):	SX-SDMAC-2832S+
Model Description:	N/A

4.2. Details of E.U.T.

Ratings:	3.3V DC from mainboard
Operation Frequency:	2.4G 802.11b/g/n (HT20), 2412-2462MHz 11CH 802.11n (HT40), 2422-2452MHz 7CH U-NII-1 802.11a/n(HT20)/ac(HT20), 5180-5240MHz 4CH 802.11n(HT40)/ac(HT40), 5190-5230MHz 2CH 802.11ac(HT80), 5210MHz 1CH U-NII-2A 802.11a/n(HT20)/ac(HT20), 5260-5320MHz 4CH 802.11n(HT40)/ac(HT40), 5270-5310MHz 2CH 802.11ac(HT80), 5290MHz 1CH U-NII-2C 802.11a/n(HT20)/ac(HT20), 5500-5700MHz 11CH 802.11n(HT40)/ac(HT40), 5510-5670MHz 5CH 802.11ac(HT80), 5530MHz, 5610MHz 2CH U-NII-3 802.11a/n(HT20)/ac(HT20), 5745-5825MHz 5CH 802.11n(HT40)/ac(HT40), 5755-5795MHz 2CH 802.11ac(HT80), 5775MHz 1CH
Modulation Type:	802.11b: DBPSK, DQPSK, CCK 802.11a/g: OFDM(BPSK, QPSK, 16QAM, 64QAM) 802.11n: OFDM(BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM(BPSK, QPSK, 16QAM, 64QAM, 256QAM)
DFS Function:	Slave without radar detection
TPC Function:	Not support

4.3. Test Facility

The test facility has a test site registered with the following organizations:

ISED CAB identifier: CN0013. Test Firm Registration No.: 7760A.

Waltek Testing Group Co., Ltd. Has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration number 7760A, October 15, 2016.

FCC Designation No.: CN1201. Test Firm Registration No.: 523476.

Waltek Testing Group Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration number 523476, September 10, 2019.

4.4. Subcontracted

Whether parts of tests for the product have been subcontracted to other labs:

☐ Yes ☒ No

If Yes, list the related test items and lab information:

Test Lab: N/A

Lab address: N/A

Test items: N/A

4.5. Abnormalities from Standard Conditions

None.

5. Test Summary

Test Items	Test Requirement	Result
Maximum Permissible Exposure (Exposure of Humans to RF Fields)	FCC Part 2.1091	PASS

6. RF Exposure

Test Requirement: 47CFR FCC Part 2 Subpart J Section 2.1091

Evaluation Method: 47CFR FCC Part 1 Subpart I Section 1.1310,
KDB 447498 D01 General RF Exposure Guidance v06

6.1. Requirements

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2 m normally can be maintained between the user and the device.

6.2. The procedures / limit

Table 1 to § 1.1310(e)(1) – Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(i) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*(100)	≤6
3.0-30	1842/f	4.89/f	*($900/f^2$)	<6
30-300	61.4	0.163	1	<6
300-1,500	-	-	f/300	<6
1,500-100,000	-	-	5	<6
(ii) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	<30
1.34-30	824/f	2.19/f	*($180/f^2$)	<30
30-300	27.5	0.073	0.2	<30
300-1,500	-	-	f/1500	<30
1,500-100,000	-	-	1	<30

f = frequency in MHz. * = Plane-wave equivalent power density.

6.3. MPE Calculation Method

$$S = \frac{P \times G}{4 \times \pi \times R^2}$$

S = power density (in appropriate units, e.g. mW/cm^2)
P = output power to the antenna (in appropriate units, e.g., mW).
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain.
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

From the peak EUT RF output power, the minimum mobile separation distance, R=20cm, as well as the gain of the used antenna, the RF power density can be obtained

6.4. Radio Frequency Radiation Exposure Evaluation

Optional Antenna 1:

Band	Antenna Gain (dBi)	Antenna Gain (numeric)	Max. Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (mW/cm^2)	Limit (mW/cm^2)
2.4G Wi-Fi	0.95	1.245	26.56	452.90	0.112130	1.0
5G Wi-Fi U-NII-1	0.50	1.122	12.15	16.41	0.003662	1.0
5G Wi-Fi U-NII-2A	0.98	1.253	12.67	18.49	0.004610	1.0
5G Wi-Fi U-NII-2C	2.59	1.816	13.65	23.17	0.008370	1.0
5G Wi-Fi U-NII-3	3.29	2.133	13.94	24.77	0.010513	1.0

Optional Antenna 2:

Band	Antenna Gain (dBi)	Antenna Gain (numeric)	Max. Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (mW/cm^2)	Limit (mW/cm^2)
2.4G Wi-Fi	2.05	1.603	26.56	452.90	0.144451	1.0
5G Wi-Fi U-NII-1	1.29	1.346	12.15	16.41	0.004393	1.0
5G Wi-Fi U-NII-2A	1.45	1.396	12.67	18.49	0.005137	1.0
5G Wi-Fi U-NII-2C	3.06	2.023	13.65	23.17	0.009327	1.0
5G Wi-Fi U-NII-3	3.17	2.075	13.94	24.77	0.010226	1.0

Optional Antenna 3:

Band	Antenna Gain (dBi)	Antenna Gain (numeric)	Max. Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (mW/cm^2)	Limit (mW/cm^2)
2.4G Wi-Fi	1.80	1.514	26.56	452.90	0.136370	1.0
5G Wi-Fi U-NII-1	0.70	1.175	12.15	16.41	0.003835	1.0
5G Wi-Fi U-NII-2A	1.07	1.279	12.67	18.49	0.004707	1.0
5G Wi-Fi U-NII-2C	2.12	1.663	13.65	23.17	0.007669	1.0
5G Wi-Fi U-NII-3	2.77	1.892	13.94	24.77	0.009327	1.0

Note:

1. For conservativeness, the lowest frequency of each band is used to determine the MPE limit of that band.
2. Chose the maximum power to do MPE analysis.

Conclusion:

According to 47 CFR § 2.1091, the RF exposure analysis concludes that the RF Exposure is FCC compliant.

======End of Report======