

TEST REPORT

Reference No...... : WTD21D04037657W002
FCC ID : ZLZ-WMTSN1
Applicant..... : Shenzhen Mindray BIO-Medical electronics Co.,LTD.
Address..... : Mindray Building, Keji 12th Road South, Hi-tech Ind, Shenzhen, China
Manufacturer : Shenzhen Mindray BIO-Medical electronics Co.,LTD.
Address..... : 1203 Nanhuan Avenue, Guangming District, Shenzhen, PEOPLE'S REPUBLIC OF CHINA
Product..... : patient monitor
Model(s) : BeneVision N1
Brand Name..... : Mindray
Standards..... : FCC PART 2.1091
Date of Receipt sample : 2021-04-23
Date of Test : 2021-04-23 to 2021-04-28
Date of Issue..... : 2021-06-01
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:

Approved by:



Andy Feng / Project Engineer



Daniel Liu / 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
WTD21D04037 657W002	2021-04-23	2021-04-23 to 2021-04-28	2021-06-01	original	-	Valid

4 General Information

4.1 General Description of E.U.T.

Product:	patient monitor
Model(s):	BeneVision N1
Model Description:	N/A
Support:	WMTS
Hardware Version:	1.0
Software Version:	01.23.00.01

4.2 Details of E.U.T.

Operation Frequency:	608MHz(608-614MHz) 1.4GHz(1395-1400MHz) 1.4GHz(1427-1432MHz)
Max. RF output power:	ANT 1:608MHz:103.05dBu/m, 1.4GHz: 100.60 dBu/m ANT 2: 608MHz: 103.23 dBu/m, 1.4GHz: 99.70 dBu/m
Type of Modulation:	GFSK
Antenna Gain:	ANT 1:608MHz:-0.83dBi, 1.4GHz: 1.45dBi ANT 2:608MHz:-0.51dBi, 1.4GHz: 1.13dBi
Antenna installation:	WMTS: External antenna
Ratings:	Battery DC 7.2V, 2500mAh DC 12V, 2.5A, charging from adapter or Dock (Adapter Input: 100-240V~50/60Hz 0.6-1A) (Dock Input: 100-240V~50/60Hz 0.35-0.65A)
Adapter:	Manufacturer: FSP GROUP INC. Model No.: FSP030-RCAM-G

5 Test Summary

Test Items	Test Requirement	Result
Maximum Permissible Exposure (Exposure of Humans to RF Fields)	1.1307(b)(1)	PASS

6 Test Facility

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

- **IC – 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, 2015.

- **FCC Test Site 1#– Registration No.: 880581**

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 880581, April 29, 2014.

- **FCC Test Site 2#– Registration No.: 328995**

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 328995, December 3, 2014.

7 RF Exposure

Test Requirement: FCC Part 1.1307

Test Mode: The EUT work in test mode(Tx).

7.1 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.

7.2 The procedures / limit

FCC Part 1.1307:

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

Note: f = frequency in MHz ; *Plane-wave equivalent power density

7.3 MPE Calculation Method

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

S = power density (in appropriate units, e.g. mW/cm²)

P = power input 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, d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained

ANT 1:

613.46MHz

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Max.Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (mW/cm ²)	Limit of Power Density (mW/cm ²)
613.46	-0.83	0.826	8.68	7.38	0.001213	0.409

Note: the following is Source-based time-averaged maximum output power Calculation

Frequency	Source-based time-averaged maximum output power	Substituted (0dBm)	Source-based time-averaged maximum output power
(MHz)	(dBμV/m)	(dBμV/m)	(dBm)
613.46	103.05	95.2	7.85

1431.5 MHz

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Max.Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (mW/cm ²)	Limit of Power Density (mW/cm ²)
1431.5	1.45	1.396	3.95	2.48	0.000690	0.95

Note: the following is Source-based time-averaged maximum output power Calculation

Frequency	Source-based time-averaged maximum output power	Substituted (0dBm)	Source-based time-averaged maximum output power
(MHz)	(dBμV/m)	(dBμV/m)	(dBm)
1431.5	100.60	95.2	5.4

ANT 2:

613.46MHz

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Max.Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (mW/cm ²)	Limit of Power Density (mW/cm ²)
613.46	-0.51	0.889	8.54	7.14	0.001264	0.409

Note: the following is Source-based time-averaged maximum output power Calculation

Frequency	Source-based time-averaged maximum output power	Substituted (0dBm)	Source-based time-averaged maximum output power
(MHz)	(dBμV/m)	(dBμV/m)	(dBm)
613.46	103.23	95.2	8.03

1431.5 MHz

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Max.Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (mW/cm ²)	Limit of Power Density (mW/cm ²)
1431.5	1.13	1.297	3.37	2.17	0.000561	0.95

Note: the following is Source-based time-averaged maximum output power Calculation

Frequency	Source-based time-averaged maximum output power	Substituted (0dBm)	Source-based time-averaged maximum output power
(MHz)	(dBμV/m)	(dBμV/m)	(dBm)
1431.5	99.70	95.2	4.5

8 Photographs of test setup and EUT.

Note: Please refer to appendix-BeneVision N1-Photo.

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