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RF Exposure Evaluation Report

Report No.:	CQASZ20230500771E-03
Applicant:	Miraclink Medical Technology (Shenzhen) Co. Ltd.
Address of Applicant:	1 Tongkangfu Industry Park 4th Floor Unit A, Shiyan Jiedao Yingrenshi Shequ, Bao An District Shenzhen China

Equipment Under Test (EUT):

EUT Name:	Sleep micro-motion monitoring belt
Test Model No.:	M-30P
Model No.:	M-30P
Brand Name:	N/A
FCC ID:	2BAOQ-M-30P
Standards:	47 CFR Part 1.1307 47 CFR Part 2.1093 447498 D04 Interim General RF Exposure Guidance v01
Date of Receipt:	2023-05-12
Date of Test:	2023-05-12 to 2023-06-15
Date of Issue:	2023-06-15
Test Result:	**PASS***

***In the configuration tested, the EUT complied with the standards specified above**

Tested By: lewis zhou
(Lewis Zhou)

Reviewed By: Timo Lei
(Timo Lei)

Approved By: Jack
(Jack Ai)

1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20230500771E-03	Rev.01	Initial report	2023-06-15

2 Contents

3 General Information

3.1 Client Information

Applicant:	Miraclink Medical Technology (Shenzhen) Co. Ltd.
Address of Applicant:	1 Tongkangfu Industry Park 4th Floor Unit A, Shiyan Jiedao Yingrenshi Shequ, Bao An District Shenzhen China
Manufacturer:	Miraclink Medical Technology (Shenzhen) Co. Ltd.
Address of Manufacturer:	1 Tongkangfu Industry Park 4th Floor Unit A, Shiyan Jiedao Yingrenshi Shequ, Bao An District Shenzhen China
Factory:	Miraclink Medical Technology (Shenzhen) Co. Ltd.
Address of Factory:	1 Tongkangfu Industry Park 4th Floor Unit A, Shiyan Jiedao Yingrenshi Shequ, Bao An District Shenzhen China

3.2 General Description of EUT

Product Name:	Sleep micro-motion monitoring belt
Model No.:	M-30P
Test Model No	M-30P
Trade Mark:	N/A
EUT Supports Radios application:	Bluetooth mode 2402-2480MHz
Software Version:	J1657W_V079_1
Hardware Version:	1657W-T V1.1
Sample Type:	☐ Mobile ☒ Portable
EUT Power Supply:	Power supply DC5V form adaptor

3.3 General Description of BLE

Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	V5.0
Modulation Technique:	Non Frequency Hopping Spread Spectrum(NFHSS)
Modulation Type:	GFSK
Number of Channel:	BLE:40
Transfer Rate:	BLE:1Mbps
Test Software of EUT:	Noridc
Antenna Type:	Chip antenna
Antenna Gain:	0.5dBi

3.4 General Description of 2.4G WIFI

Operation Frequency:	IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz
Modulation Type:	IEEE for 802.11b: DSSS(CCK,DQPSK,DBPSK) IEEE for 802.11g : OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE for 802.11n(HT20) : OFDM (64QAM, 16QAM, QPSK, BPSK)
Number of Channel:	IEEE 802.11b/g, IEEE 802.11n HT20: 11 Channels
Transfer Rate:	IEEE for 802.11b: 1Mbps/2Mbps/5.5Mbps/11Mbps

	IEEE for 802.11g : 6Mbps/9Mbps/12Mbps/18Mbps/24Mbps/36Mbps/48Mbps/54Mbps IEEE for 802.11n(HT20) : 6.5Mbps/13Mbps/19.5Mbps/26Mbps/39Mbps/52Mbps/58.5Mbps/65Mbps
Test Software of EUT:	EspRFTestTool_v2.8_Manual
Antenna Type:	PCB antenna
Antenna Gain:	2dBi

4 SAR Evaluation

4.1 RF Exposure Compliance Requirement

4.1.1 Standard Requirement

447498 D04 Interim General RF Exposure Guidance v01

3.2. SAR Test Reduction Guidance

SAR test reduction procedures [Glossary] allow using a particular set of test data as representative of other, similar, test conditions. This may be applied for data within different test positions (e.g. body, head, extremity), wireless modes (e.g. Wi-Fi, cellular), and frequency bands.This test reduction process provides for the use of test data for one specific channel, while referencing to those data for demonstrating compliance in other required channels for each test position of an exposure condition, within the operating mode of a frequency band. This is limited specifically to when the reported 1-g or 10-g SAR for the mid-band or highest output power channel meets any of the following conditions.

4.1.2 Limits

SAR-based thresholds are derived based on frequency, power, and separation distance of the RF source. The formula defines the thresholds in general for either available maximum time averaged power or maximum time-averaged ERP, whichever is greater.

If the ERP of a device is not easily determined, such as for a portable device with a small form factor, the applicant may use the available maximum time-averaged power exclusively if the device antenna or radiating structure does not exceed an electrical length of λ/4.

As for devices with antennas of length greater than λ/4 where the gain is not well defined, but always less than that of a half-wave dipole (length λ/2), the available maximum time-averaged power generated by the device may be used in place of the maximum time-averaged ERP, where that value is not known.

The separation distance is the smallest distance from any part of the antenna or radiating structure for all persons, during operation at the applicable ERP. In the case of mobile or portable devices, the separation distance is from the outer housing of the device where it is closest to the antenna.

The SAR-based exemption formula of § 1.1307(b)(3)(i)(B), repeated here as Formula (B.2), applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power or effective radiated power (ERP), whichever is greater, of less than or equal to the threshold Pth (mW).

This method shall only be used at separation distances from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz (inclusive). Pth is given by Formula (B.2).

$$P_{\text{th}}\ (\text{mW}) = \begin{cases} ERP_{20\,\text{cm}}(d/20\ \text{cm})^{x} & d \le 20\ \text{cm} \\ ERP_{20\,\text{cm}} & 20\ \text{cm} < d \le 40\ \text{cm} \end{cases} \qquad \text{(B.2)}$$

where

$$x = -\log_{10}\left(\frac{60}{ERP_{20\,\text{cm}}\sqrt{f}}\right)$$

and f is in GHz, d is the separation distance (cm), and $ERP_{20\text{cm}}$ is per Formula (B.1). The example values shown in Table B.2 are for illustration only.

Table B.2—Example Power Thresholds (mW)

Frequency (MHz)	Distance (mm)										
	5	10	15	20	25	30	35	40	45	50
300	39	65	88	110	129	148	166	184	201	217
450	22	44	67	89	112	135	158	180	203	226
835	9	25	44	66	90	116	145	175	207	240
1900	3	12	26	44	66	92	122	157	195	236
2450	3	10	22	38	59	83	111	143	179	219
3600	2	8	18	32	49	71	96	125	158	195
5800	1	6	14	25	40	58	80	106	136	169

4.1.3 EUT RF Exposure

Measurement Data

BLE

Channel	Conducted Peak Output Power (dBm)	EIRP (dBm)	ERP (dBm)	Maximum tune-up Power (mW)	Exclusion threshold (mW)
Lowest (2402MHz)	-8.1	-7.6	-9.75	0.11	3.0
Middle (2440MHz)	-6.53	-6.03	-8.18	0.15	
Highest (2480MHz)	-7.5	-7	-9.15	0.12	

Remark: The Max Conducted Peak Output Power data refer to report Report No.: CQASZ20230500771E-01.

2.4G WIFI

Channel	Conducted Peak Output Power (dBm)	EIRP (dBm)	ERP (dBm)	Maximum tune-up Power (mW)	Exclusion threshold (mW)
Lowest (2412MHz)	0.29	2.29	0.14	1.03	3.0
Middle (2437MHz)	1.27	3.27	1.12	1.29	
Highest (2462MHz)	0.87	2.87	0.72	1.18	

Remark: The Max Conducted Peak Output Power data refer to report Report No.: CQASZ20230500771E-01.

*** END OF REPORT ***