

RF Exposure Lab

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CERTIFICATE OF COMPLIANCE RF EXPOSURE & NERVE STIMULATION EVALUATION

Life Fitness
10601 W. Belmont
Franklin Park, IL 60131

Dates of Test: February 27-28, 2024

Test Report Number: SAR.20240216

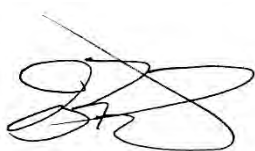
Revision B

Lab Designation Number: US1195

Contains FCC ID:	LM6-LF10WQWC, LM6-LFNFCCR1, WP5-TWN4F3, SQG-60SIPT, XRH-NPE101
Model(s):	Symbio Product Line & Discover SE4
Serial Number:	ILLCONM23120034
Equipment Type:	Wireless Exercise Monitor
Classification:	Portable Transmitter Next to Extremity
TX Frequency Range:	125 kHz, 134 kHz (Elatec) & 125 kHz (WPT)
Frequency Tolerance:	± 2.5 ppm
Maximum RF Output:	125 kHz – 17.67 dBm, 134 kHz – 17.67 dBm EIRP
Signal Modulation:	ASK
Antenna Type:	Internal
Application Type:	Certification
Standard(s):	KDB680106 v04
Maximum E-Field	61.53 V/m
Maximum H-Field	1.58 A/m
Distance to Probe:	0 mm

This wireless mobile device has been shown to meet the requirements for RF exposure testing for uncontrolled environment/general exposure limits specified in above listed standards. The device has also been shown to meet the simultaneous requirements of each standard as well (See test report).

I attest to the accuracy of the data. I assume full responsibility for the completeness of these calculations and vouch for the qualifications of all persons making them.



Jay M. Moulton
Vice President



Testing Certificate # 2387.01

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Comment/Revision	Date
Original Release	May 1, 2024
Revision A – Add the ANT+ FCC ID to the product	May 1, 2024
Revision B – Add Discover SE4 as a family member	May 2, 2024

Note: The latest version supersedes all previous versions listed in the above table. The latest version shall be used.

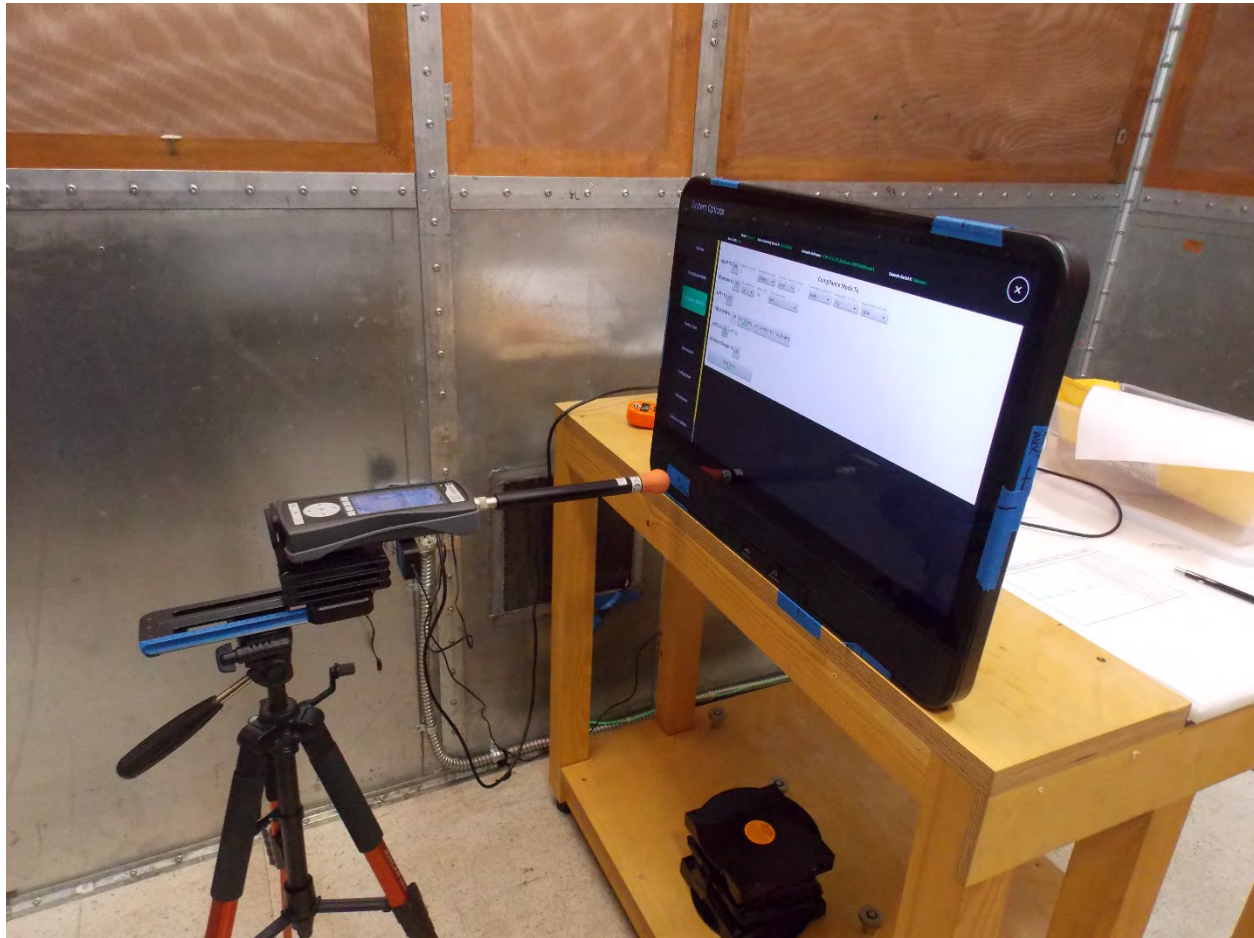
1. Introduction

This report shows RF exposure evaluation of the Life Fitness Model Symbio Product Line & Discover SE4 Wireless Exercise Monitor with KDB680106 v04.

2. Radiation Sources

Radio	Description	
Elatec	Frequency (MHz)	125 kHz
	Maximum Power (dBm)	17.67 dBm (EIRP)
	Maximum Duty Cycle (%)	100%
Elatec	Frequency (MHz)	134 kHz
	Maximum Power (dBm)	17.67 dBm (EIRP)
	Maximum Duty Cycle (%)	100%
Life Fitness	Frequency (MHz)	125 kHz
	Maximum Power (dBm)	40.00 dBm (EIRP)
	Maximum Duty Cycle (%)	100%

3. Symbio Product Line



Testing Position for RFID



Testing Position for Wireless Power Transfer

4. RF Exposure Classifications

Device Types	
Fixed	A fixed device is defined as a device physically secured at one fixed location and cannot be easily re-located.
Mobile	A mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons.
Portable	A portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 20 centimeters of the body of the user.

Exposure Categories	
Occupational / Controlled	Limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.
General population / uncontrolled	Exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

5. RF Exposure Limits

FCC Requirements

ECFR CONTENT				
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	1.0	<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			1.0	<30
f = frequency in MHz. * = Plane-wave equivalent power density.				

Note: For frequencies below 300 MHz, use the limits at 300 MHz.

6. General Conditions

- This report is only in reference to the item that has undergone the assessment.
- This report does not constitute or imply on its own an approval of the product by the Certification Bodies or Competent Authorities.

7. Environmental Conditions

The following limits were not exceeded during the test:

Temperature	Min. = 15 °C Max. = 35 °C
Relative Humidity	Min. = 30% Max. = 60%

8. Test Equipment

	Serial Number	Last Cal. Date	Cal. Due Date
• Wavecontrol SMP2	19SN1179	04/13/2022	04/13/2024
• WP400-3	19WP120054	04/13/2022	04/13/2024
• WPH60	19WP110048	04/13/2022	04/13/2024
• WPF6	19WP060233	04/13/2022	04/13/2024
• Positioning Apparatus used is a plastic tripod to hold the meter and probe at a specified position			

9. EUT Description

The description of the antenna is listed below

- There is one antenna in the device for the Elatec 125 kHz and 134 kHz transmitter
- There is one antenna in the Wireless Power Transfer optional device
- The element is a flat concentric wound with an impedance of 490 μ H for the RFID
- The element is a flat concentric wound with an impedance of 1.01 μ H for the WPT
- The shielding or field shaping is not applicable
- The overall dimensions of the PCB for the RFID is 70 mm x 50 mm
- The distance from the antenna to the outside of the enclosure is 6 mm
- The position of the antenna is located in the lower left corner of the monitor
- The enclosure over the antenna is a plastic material

10. RF exposure Evaluation Results

The measurements for the Symbio Product Line was conducted at 20 mm distance from the device to the center of the probe diameter. A pre-scan of the around the antenna was conducted first by moving the probe around all areas of the device being tested. The movement was conducted at a very slow pace to find the peak value for the device. Once the peak position was determined for the device, the meter and probe were installed on the positioning apparatus for conducting the final measurements.

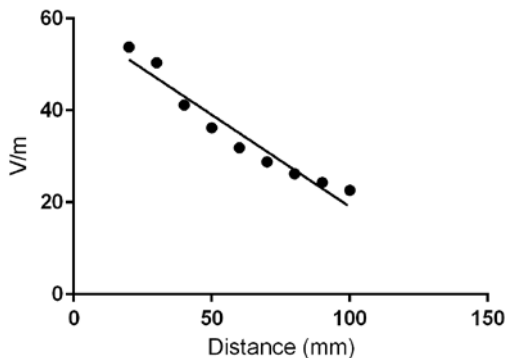
The highest value of the device was then tested every 10 mm moving away from the antenna. All the values were used to extrapolate to the 0 mm distance. The equation used to extrapolate the value to zero is $y = mx + b$, where x is the independent variable, y is the dependent variable, m is the estimated slope and b is the estimated intercept. Below are all the measured values for the e- and h-field.

125 kHz (Elatec)			
E-Field		H-Field	
Distance	Meas. Value	Distance	Meas. Value
20 mm	53.78 V/m	20 mm	1.18 A/m
30 mm	50.37 V/m	30 mm	0.97 A/m
40 mm	41.19 V/m	40 mm	0.88 A/m
50 mm	36.23 V/m	50 mm	0.91 A/m
60 mm	31.89 V/m	60 mm	0.77 A/m
70 mm	28.83 V/m	70 mm	0.70 A/m
80 mm	26.24 V/m	80 mm	0.65 A/m
90 mm	24.31 V/m	90 mm	0.59 A/m
100 mm	22.63 V/m	100 mm	0.53 A/m

The slope for the E-Field calculates to be -0.4001 ± 0.03775 .

The Y-intercept for the E-Field calculates to be 59.06 ± 2.466 .

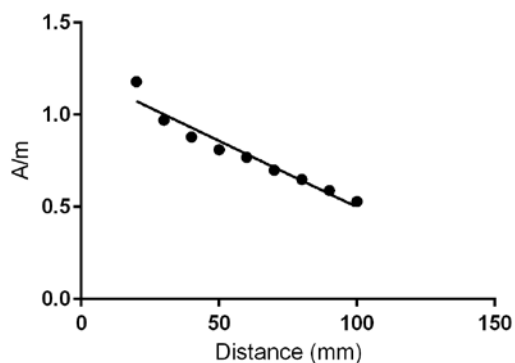
Below is the scatter plot for all the measurements.



The slope for the H-Field calculates to be -0.007183 ± 0.0006726 .

The Y-intercept for the H-Field calculates to be 1.218 ± 0.04393 .

Below is the scatter plot for all the measurements.



The following table shows the maximum value of the device in both the H-Field and E-Field requirement with the limit. The value is the extrapolated value at 0 mm listed in the tables including the tolerance.

Frequency	E-Field Measurement	Limit [V/m]	% Limit	Verdict
125 kHz	61.53	614	10.0	Pass

Frequency	H-Field Measurement	Limit [A/m]	% Limit	Verdict
125 kHz	1.26	1.63	77.3	Pass

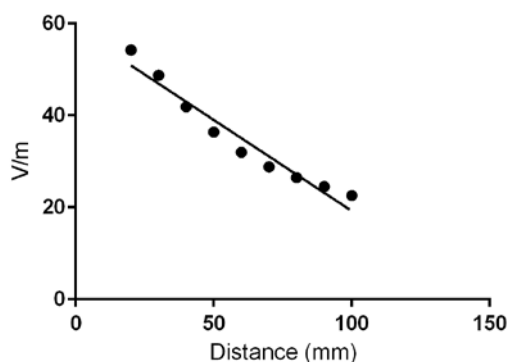
134 kHz (Elatec)

E-Field		H-Field	
Distance	Meas. Value	Distance	Meas. Value
20 mm	54.20 V/m	20 mm	0.68 A/m
30 mm	48.72 V/m	30 mm	0.57 A/m
40 mm	41.87 V/m	40 mm	0.51 A/m
50 mm	36.37 V/m	50 mm	0.42 A/m
60 mm	31.96 V/m	60 mm	0.33 A/m
70 mm	28.81 V/m	70 mm	0.25 A/m
80 mm	26.46 V/m	80 mm	0.16 A/m
90 mm	24.53 V/m	90 mm	0.08 A/m
100 mm	22.59 V/m	100 mm	0.06 A/m

The slope for the E-Field calculates to be -0.3957 ± 0.03478 .

The Y-intercept for the E-Field calculates to be 58.80 ± 2.272 .

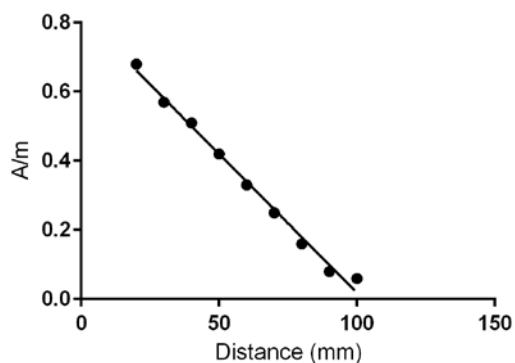
Below is the scatter plot for all the measurements.



The slope for the H-Field calculates to be -0.008033 ± 0.0002757 .

The Y-intercept for the H-Field calculates to be 0.822 ± 0.01801 .

Below is the scatter plot for all the measurements.



The following table shows the maximum value of the device in both the H-Field and E-Field requirement with the limit. The value is the extrapolated value at 0 mm listed in the tables including the tolerance.

Frequency	E-Field Measurement	Limit [V/m]	% Limit	Verdict
134 kHz	61.07	614	9.9	Pass

Frequency	H-Field Measurement	Limit [A/m]	% Limit	Verdict
134 kHz	0.84	1.63	51.5	Pass

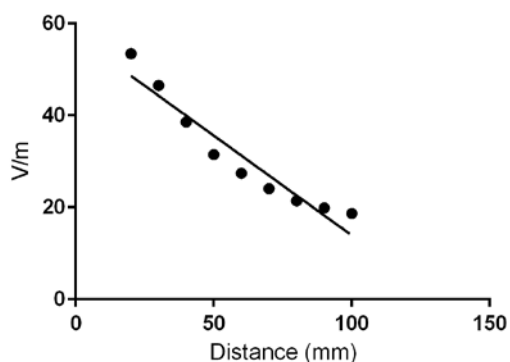
125 kHz (WPT)

E-Field		H-Field	
Distance	Meas. Value	Distance	Meas. Value
20 mm	53.41 V/m	20 mm	1.18 A/m
30 mm	46.51 V/m	30 mm	0.97 A/m
40 mm	38.56 V/m	40 mm	0.88 A/m
50 mm	31.47 V/m	50 mm	0.91 A/m
60 mm	27.43 V/m	60 mm	0.77 A/m
70 mm	24.09 V/m	70 mm	0.70 A/m
80 mm	21.44 V/m	80 mm	0.65 A/m
90 mm	19.89 V/m	90 mm	0.59 A/m
100 mm	18.68 V/m	100 mm	0.53 A/m

The slope for the E-Field calculates to be -0.434 ± 0.04791 .

The Y-intercept for the E-Field calculates to be 57.32 ± 3.13 .

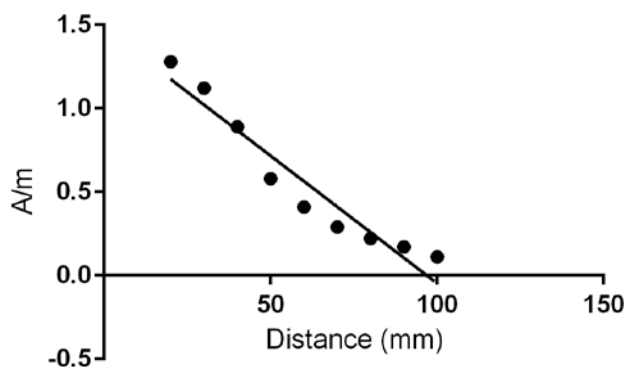
Below is the scatter plot for all the measurements.



The slope for the H-Field calculates to be -0.01527 ± 0.001606 .

The Y-intercept for the H-Field calculates to be 1.479 ± 0.1049 .

Below is the scatter plot for all the measurements.



The following table shows the maximum value of the device in both the H-Field and E-Field requirement with the limit. The value is the extrapolated value at 0 mm listed in the tables including the tolerance.

Frequency	E-Field Measurement	Limit [V/m]	% Limit	Verdict
125 kHz	60.45	614	9.9	Pass

Frequency	H-Field Measurement	Limit [A/m]	% Limit	Verdict
125 kHz	1.58	1.63	96.9	Pass

Appendix A – Calibration Certificates



Certificate of Calibration

ISO/IEC 17025:2017 and ANSI/NCSL Z540.1-1994

Certificate Number 220411-085519-f52052



Model Number WP400-3; SMP2
Manufacturer Wavecontrol
Description Field Probe
Serial Number 19WP120054; 19SN1179
Customer Asset No. N/A

Customer
RF Exposure Lab, LLC
802 N. Twin Oaks Valley Rd
Suite 105
San Marcos, CA 92069
USA

Date of Calibration 04/13/2022
Temperature 23°C
Humidity 48% RH

Location of Calibration
Keysight Technologies Inc.
1346 Yellowwood Road
Kimballton, IA 51543
United States

This certifies that the equipment has been calibrated using applicable Keysight Technologies procedures and in compliance with ISO/IEC 17025:2017 and ANSI/NCSL Z540.1-1994 (R2002). The quality management system is registered to ISO 9001:2015.

Calibration Standard(s)
IEEE Std 1309-2013

Calibration Method(s)
Substitution

Calibration Procedure(s)
909579

Calibration Software
Probe Comparison 1.4.1

As Received Conditions
The measured values of the equipment were observed in specification at the points tested.

Action Taken
No action was taken.

As Completed Conditions
The measured values of the equipment were observed in specification at the points tested.

Calibration Due
Based on the customer's request, the next calibration is due on 13 Apr 2024

Remarks or Special Requirements

This calibration report shall not be reproduced, except in full. The documented results relate to the equipment calibrated only.

The test limits stated in the report correspond to the published specifications of the equipment, at the points tested.

Keysight Technologies, Inc.
1346 Yellowwood Road
Kimballton, IA 51543
United States

Brandt Langer Iowa Service Center Manager



Certificate of Calibration

ISO/IEC 17025:2017 and ANSI/NCSL Z540.1-1994

Certificate Number 220411-085519-f52052



Traceability Information

Technician Name Dave Grabill

Measurements are traceable to the International System of Units (SI) via national metrology institutes (www.keysight.com/find/NMI) that are signatories to the CIPM Mutual Recognition Arrangement.

Calibration Equipment Used

Manufacturer	Model Number	Model Description	Equipment ID	Cal Due Date	Certificate Number
Agilent Technologies, Inc.	33250A	Function/Arbitrary Waveform Generator	11101	06/03/2022	210602-130008-794ded
AR	350AH1	Amp	11453	NA	NA
Crown	5002VZ	Amp	11069	NA	NA
EMCO	5101	TEM Cell	10420	NA	2003121920
Hewlett-Packard	8564E	Spectrum Analyzer	10029	06/02/2022	210527-143459-612042
Combinova	FD1	Field Detector	10348	01/31/2023	220104-091355-ad0560
Combinova	FD2	Field Detector	10347	02/28/2023	220201-110452-66d607
Schwarzbeck Mess-Elektronik	FESP 5133-7/41	Loop	11285	10/31/2022	211018-135220-351697
Schwarzbeck Mess-Elektronik	HHS 5204-12	Helmholtz Coil	11091	NA	NA
Holaday	HI-3624	ELF Magnetic Field Meter	10569	09/30/2022	210901-094617-c4f116
Holaday	HI-3627	ELF Magnetic Field Meter	10570	03/31/2023	220309-140426-5aaae9

Compliance with Specification

Unless otherwise noted, the calibration results are reported without factoring in the effect of uncertainty on the assessment of compliance/specification.

In Specification/Out of Specification Explanation

The standard criteria to determine the "In Specification/Out of Specification" status is based on one or more of the following conditions, as requested by the client:

1. If the manufacturer has a specified specification for the item being calibrated, then the calibration values are compared to this specification, and the values must fall within the manufacturer's specification. The specification may be obtained from the manufacturer's web site, data sheets, equipment manuals, etc.
2. Where specifications are called out in a published standard, the calibration results are compared to this specification, and the measured values must fall within the standard's specification.
3. In cases where the manufacturer, standard, or client does not identify any relevant specifications, applicable calibration results are compared to historical data with a +/- 3 dB specification.

Uncertainty of Measurement

The uncertainty evaluation has been performed in accordance with ISO/IEC Guide 98-3:2008(GUM). The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k such that the coverage probability corresponds to approximately 95%. This probability corresponds to a coverage factor of k=2 for a normal distribution.

Parameter	Range	MU (+/-)
Magnetic Field Strength Meters - AC	0.20 mG to 20 G	0.33% + 1.2 mG

Customer Name: RF Exposure Lab, LLC

Probe Manufacturer: Wavecontrol

Probe Model: WP400-3; SMP2

Probe Serial No.: 19WP120054; 19SN1179

Notes:

CAL CERT #: 220411-085519-f52052

Electric Field

E Field (V/m)	Linearity - 50Hz						Mean CF
	X axis CF	X axis dB	Y axis CF	Y axis dB	Z axis CF	Z axis dB	
800	1.05	0.41	1.04	0.34	1.04	0.35	1.04
750	1.04	0.32	1.04	0.33	1.03	0.27	1.04
500	1.04	0.30	1.03	0.22	1.02	0.18	1.03
250	1.04	0.32	1.04	0.35	1.04	0.32	1.04
100	1.01	0.09	1.03	0.29	0.99	-0.05	1.01
50	1.03	0.22	1.03	0.30	1.03	0.23	1.03
20	1.01	0.05	1.04	0.32	1.04	0.31	1.03

Frequency Response

25Hz-100kHz: 750V/m / 10Hz, 200-400kHz: 300V/m

Freq Hz							Mean CF
	X axis CF	X axis dB	Y axis CF	Y axis dB	Z axis CF	Z axis dB	
10	1.31	2.37	1.30	2.31	1.31	2.37	1.31
25	1.14	1.16	1.16	1.26	1.15	1.23	1.15
50	1.06	0.54	1.07	0.56	1.07	0.61	1.07
100	1.09	0.77	1.09	0.77	1.10	0.83	1.10
500	1.10	0.82	1.09	0.72	1.10	0.81	1.09
1000	1.10	0.82	1.09	0.71	1.10	0.83	1.10
2000	1.18	1.44	1.17	1.33	1.17	1.39	1.17
10000	1.07	0.57	1.05	0.45	1.07	0.57	1.06
100000	1.07	0.56	1.06	0.50	1.06	0.48	1.06
200000	1.00	0.04	1.00	0.03	1.00	0.02	1.00
300000	1.05	0.44	1.05	0.46	1.05	0.43	1.05
400000	1.06	0.51	1.03	0.27	1.06	0.48	1.05

Customer Name: RF Exposure Lab, LLC

Probe Manufacturer: Wavecontrol

Probe Model: WP400-3; SMP2

Probe Serial No.: 19WP120054; 19SN1179

Notes:

CAL CERT #: 220411-085519-f52052

Magnetic Field

Linearity - 50Hz							
B Field (uT)	X axis CF	X axis dB	Y axis CF	Y axis dB	Z axis CF	Z axis dB	Mean CF
2000	1.00	0.02	1.00	0.00	1.00	0.00	1.00
1500	0.97	-0.26	0.96	-0.33	0.96	-0.36	0.96
1000	0.97	-0.26	0.97	-0.23	0.97	-0.28	0.97
750	0.96	-0.37	0.96	-0.35	0.95	-0.40	0.96
500	0.96	-0.35	0.96	-0.32	0.96	-0.37	0.96
250	0.97	-0.30	0.97	-0.24	0.97	-0.29	0.97
100	0.95	-0.41	0.96	-0.35	0.95	-0.41	0.96
50	0.97	-0.30	0.97	-0.23	0.97	-0.28	0.97
10	0.97	-0.25	0.98	-0.18	0.98	-0.22	0.98
5	0.98	-0.20	0.98	-0.15	0.98	-0.19	0.98

Frequency Response							
10Hz-2kHz: 100uT / 10-200kHz: 25uT							
Freq Hz	X axis CF	X axis dB	Y axis CF	Y axis dB	Z axis CF	Z axis dB	Mean CF
10	0.93	-0.67	0.93	-0.65	0.93	-0.63	0.93
30	1.02	0.15	1.02	0.17	1.02	0.19	1.02
50	0.95	-0.46	0.95	-0.44	0.95	-0.43	0.95
100	0.98	-0.17	0.98	-0.15	0.98	-0.14	0.98
500	1.01	0.08	1.01	0.12	1.02	0.13	1.01
1000	0.95	-0.43	0.96	-0.38	0.96	-0.38	0.96
2000	0.94	-0.52	0.95	-0.49	0.95	-0.49	0.94
10000	0.88	-1.09	0.88	-1.14	0.88	-1.12	0.88
100000	0.87	-1.16	0.87	-1.25	0.87	-1.26	0.87
200000	0.88	-1.16	0.86	-1.30	0.86	-1.28	0.87