FCC REPORT

Applicant: Teladoc Health, Inc.

Address of Applicant: 150 W. Evelyn, Suite 150, Mountain View, CA 94041

Equipment Under Test (EUT)

Product Name: Livongo Blood Glucose Monitoring System

Model No.: BG1000

Trade mark: Livongo

FCC ID: 2AA92LV02795

Applicable standards: FCC CFR Title 47 Part 15 Subpart B

Date of sample receipt: 04 Jul., 2021

Date of Test: 05 Jul., to 23 Nov., 2021

Date of report issued: 13 Dec., 2021

Test Result: PASS *

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

Tested by:	Mike.ou ***Test Engineer***	***Date:***	*13 Dec., 2021*
Reviewed by:	Winner Zhang ***Project Engineer***	***Date:***	*13 Dec., 2021*
Approved by:	Eric Zhang ***Manager***	***Date:***	*13 Dec., 2021*

2 Version

Version No.	Date	Description
00	*13 Dec., 2021*	*Original*

3 Contents

Page

4 Test Summary

Test Item	Section in CFR 47	Result
Conducted Emission	Part 15.107	Pass
Radiated Emission	Part 15.109	Pass
Remark: *1. Pass: The EUT complies with the essential requirements in the standard.*		
Test Method:	*ANSI C63.4:2014*	

5 General Information

5.1 Client Information

Applicant:	Teladoc Health, Inc.
Address:	150 W. Evelyn, Suite 150, Mountain View, CA 94041
Manufacturer:	Teladoc Health, Inc.
Address:	150 W. Evelyn, Suite 150, Mountain View, CA 94041

5.2 General Description of E.U.T.

Product Name:	Livongo Blood Glucose Monitoring System		
Model No.:	BG1000		
Frequency Bands:	Band	TX Frequency (MHz)	RX Frequency (MHz)
	GSM850:	824~849	869~894
	GSM1900	1850~1910	1930~1990
	WCDMA Band II:	1850~1910	1930~1990
	WCDMA Band IV:	1710~1755	2110~2155
	WCDMA Band V:	824~849	869~894
	LTE Band 2:	1850~1910	1930~1990
	LTE Band 4:	1710~1755	2110~2155
	LTE Band 5:	824~849	869~894
	LTE Band 12:	699~716	729~746
	LTE Band 66:	1710~1780	2110~2200
	LTE Band 71:	663~698	617~652
Power supply:	Rechargeable Li-ion Polymer Battery DC 3.85V, 2400mAh Manufacturer: ShenZhen BYD Lithium Battery Company Limited		
AC adapter:	Adapter 1: Model: PSAA05E-050QL6W-R Input: AC100-240V, 50/60Hz, 0.2A Output: DC 5.0V, 1.0A Adapter 2: Model: PSAA05A-050QL6W-R Input: AC100-240V, 50/60Hz, 0.2A Output: DC 5.0V, 1.0A Adapter 3: Model: PSAA05K-050QL6W-R Input: AC100-240V, 50/60Hz, 0.2A Output: DC 5.0V, 1.0A Note: Only the pins are different between different models		
Test Sample Condition:	The test samples were provided in good working order with no visible defects.		

5.3 Test Mode

Operating mode	Detail description
TM 1 mode	Keep the EUT in Camera on + Adapter mode(Worst case)
TM 2 mode	Keep the EUT in GSM 850 idle + Adapter mode
TM 3 mode	Keep the EUT in PCS 1900 idle + Adapter mode
TM 4 mode	Keep the EUT in WCDMA Band II idle + Adapter mode
TM 5 mode	Keep the EUT in WCDMA Band IV idle + Adapter mode
TM 6 mode	Keep the EUT in WCDMA Band V idle + Adapter mode
TM 7 mode	Keep the EUT in LTE Band 2 idle + Adapter mode
TM 8 mode	Keep the EUT in LTE Band 4 idle + Adapter mode
TM 9 mode	Keep the EUT in LTE Band 5 idle + Adapter mode
TM 10 mode	Keep the EUT in LTE Band 12 idle + Adapter mode
TM 11 mode	Keep the EUT in LTE Band 66 idle + Adapter mode
TM 12 mode	Keep the EUT in LTE Band 71 idle + Adapter mode
The sample was placed 0.8m above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.	

5.4 Measurement Uncertainty

Parameter	Expanded Uncertainty (Confidence of 95%)
Conducted Emission (9kHz ~ 150KHz) for V-AMN	3.11 dB
Conducted Emission (150kHz ~ 30MHz) for V-AMN	2.62 dB
Conducted Emission (150kHz ~ 30MHz) for AAN	3.54 dB
Radiated Emission (9kHz ~ 30MHz electric field) for 3m SAC	3.13 dB
Radiated Emission (9kHz ~ 30MHz magnetic field) for 3m SAC	3.13 dB
Radiated Emission (30MHz ~ 1GHz) for 3m SAC	4.45 dB
Radiated Emission (1GHz ~ 18GHz) for 3m SAC	5.34 dB
Radiated Emission (18GHz ~ 40GHz) for 3m SAC	5.34 dB

5.5 Description of Support Units

Test Equipment	Manufacturer	Model No.	Serial No.
Simulated Station	Rohde & Schwarz	CMW500	140493

5.6 Related Submittal(s) / Grant (s)

This is an original grant, no related submittals and grants.

5.7 Description of Cable Used

Cable Type	Vendor	Model Name	Description	Length
Detached USB Cable	Shenzhen BaoYuanda Electronics Co., LTD	B123W181-100	Shielding	100cm

5.8 Additions to, deviations, or exclusions from the method

No

5.9 Laboratory Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **FCC - Designation No.: CN1211**

JianYan Testing Group Shenzhen Co., Ltd. has been accredited as a testing laboratory by FCC(Federal Communications Commission). The test firm Registration No. is 727551.

- **ISED – CAB identifier.: CN0021**

The 3m Semi-anechoic chamber of JianYan Testing Group Shenzhen Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

- **A2LA - Registration No.: 4346.01**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: https://portal.a2la.org/scopepdf/4346-01.pdf

5.10 Laboratory Location

JianYan Testing Group Shenzhen Co., Ltd.
Address: No.101, Building 8, Innovation Wisdom Port, No.155 Hongtian Road, Huangpu Community, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, People's Republic of China.
Tel: +86-755-23118282, Fax: +86-755-23116366
Email: info-JYTee@lets.com, Website: http://www.ccis-cb.com

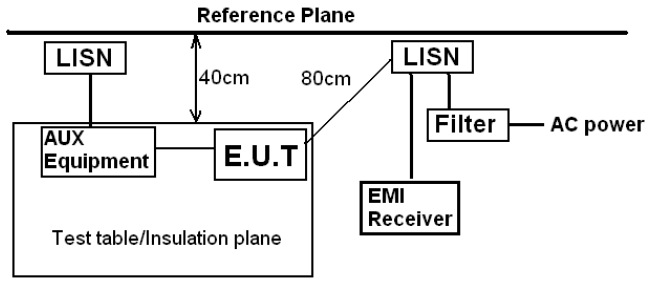
5.11 Test Instruments list

Radiated Emission:					
Test Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
3m SAC	ETS	RFD-100	Q1984	04-14-2021	04-13-2024
BiConiLog Antenna	SCHWARZBECK	VULB9163	9163-1246	03-07-2021	03-06-2022
Biconical Antenna	SCHWARZBECK	VUBA 9117	9117#359	06-17-2021	06-17-2022
Horn Antenna	SCHWARZBECK	BBHA9120D	912D-916	03-07-2021	03-06-2022
Broad-Band Horn Antenna	SCHWARZBECK	BBHA9170	1067	04-02-2021	04-01-2022
Broad-Band Horn Antenna	SCHWARZBECK	BBHA9170	1068	04-02-2021	04-01-2022
EMI Test Receiver	Rohde & Schwarz	ESRP7	101070	03-03-2021	03-02-2022
Spectrum analyzer	Rohde & Schwarz	FSP30	101454	03-03-2021	03-02-2022
Spectrum analyzer	Keysight	N9010B	MY60240202	11-27-2020	11-26-2021
Low Pre-amplifier	SCHWARZBECK	BBV9743B	00305	03-07-2021	03-06-2022
High Pre-amplifier	SKET	LNPA_0118G-50	MF280208233	03-07-2021	03-06-2022
Cable	Qualwave	JYT3M-1G-NN-8M	JYT3M-1	03-07-2021	03-06-2022
Cable	Qualwave	JYT3M-18G-NN-8M	JYT3M-2	03-07-2021	03-06-2022
Cable	Qualwave	JYT3M-1G-BB-5M	JYT3M-3	03-07-2021	03-06-2022
Cable	Bost	JYT3M-40G-SS-8M	JYT3M-4	04-02-2021	04-01-2022
EMI Test Software	Tonscend	TS+	Version:3.0.0.1		

Conducted Emission:					
Test Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date (mm-dd-yy)**	**Cal. Due date (mm-dd-yy)**
EMI Test Receiver	Rohde & Schwarz	ESCI 3	101189	03-03-2021	03-02-2022
LISN	Rohde & Schwarz	ENV432	101602	04-06-2021	04-05-2022
LISN	Rohde & Schwarz	ESH3-Z5	843862/010	06-18-2020	06-17-2022
RF Switch	TOP PRECISION	RSU0301	N/A	03-03-2021	03-02-2022
Cable	Bost	JYTCE-1G-NN-2M	JYTCE-1	03-03-2021	03-02-2022
Cable	Bost	JYTCE-1G-BN-3M	JYTCE-2	03-03-2021	03-02-2022
EMI Test Software	AUDIX	E3	Version: 6.110919b		

6 Test results and Measurement Data

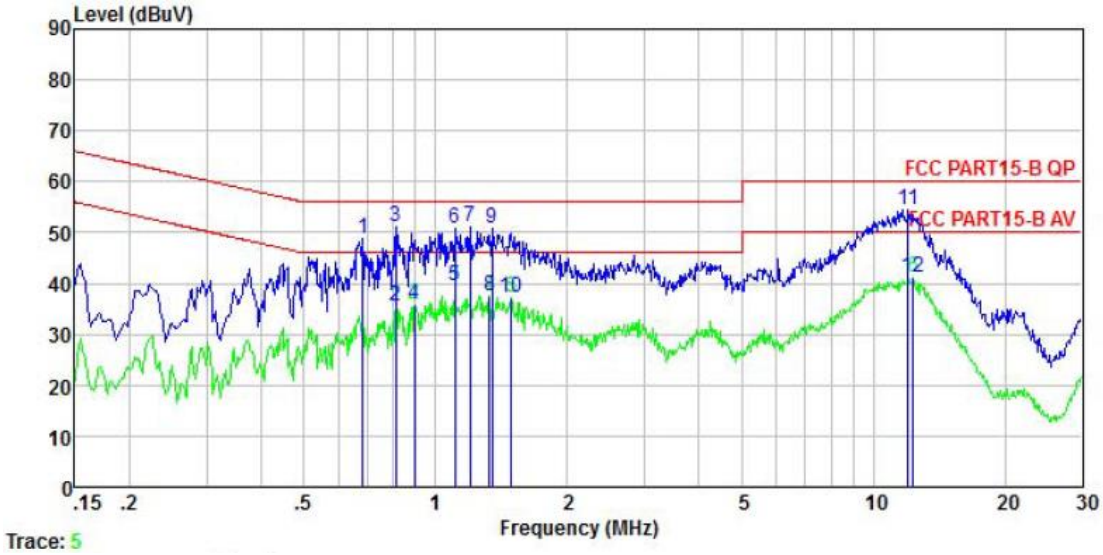
6.1 Conducted Emission

<table>
<tr><td>Test Requirement:</td><td colspan="3">FCC Part 15 B Section 15.107</td></tr>
<tr><td>Test Frequency Range:</td><td colspan="3">150kHz to 30MHz</td></tr>
<tr><td>Class / Severity:</td><td colspan="3">Class B</td></tr>
<tr><td>Receiver setup:</td><td colspan="3">RBW=9kHz, VBW=30kHz</td></tr>
<tr><td>Limit:</td><td rowspan="2">Frequency range (MHz)</td><td colspan="2">Limit (dBµV)</td></tr>
<tr><td>Quasi-peak</td><td>Average</td></tr>
<tr><td></td><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr>
<tr><td></td><td>0.5-5</td><td>56</td><td>46</td></tr>
<tr><td></td><td>0.5-30</td><td>60</td><td>50</td></tr>
<tr><td></td><td colspan="3">* Decreases with the logarithm of the frequency.</td></tr>
<tr><td>Test setup:</td><td colspan="3"> 

Remark:
E.U.T: Equipment Under Test
LISN: Line Impedence Stabilization Network
Test table height=0.8m</td></tr>
<tr><td>Test procedure</td><td colspan="3">1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network(L.I.S.N.). The provide a 50ohm/50uH coupling impedance for the measuring equipment.
2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs).
3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4(latest version) on conducted measurement.</td></tr>
<tr><td>Test Instruments:</td><td colspan="3">Refer to section 5.11 for details</td></tr>
<tr><td>Test mode:</td><td colspan="3">Refer to section 5.3 for details</td></tr>
<tr><td>Test results:</td><td colspan="3">Pass</td></tr>
</table>

Measurement data:

Product name:	Livongo Blood Glucose Monitoring System	**Product model:**	BG1000
Test by:	Mike	**Test mode:**	TM 1
Test frequency:	150 kHz ~ 30 MHz	**Phase:**	Line
Test voltage:	AC 120 V/60 Hz	**Environment:**	Temp: 23℃ Huni: 55%

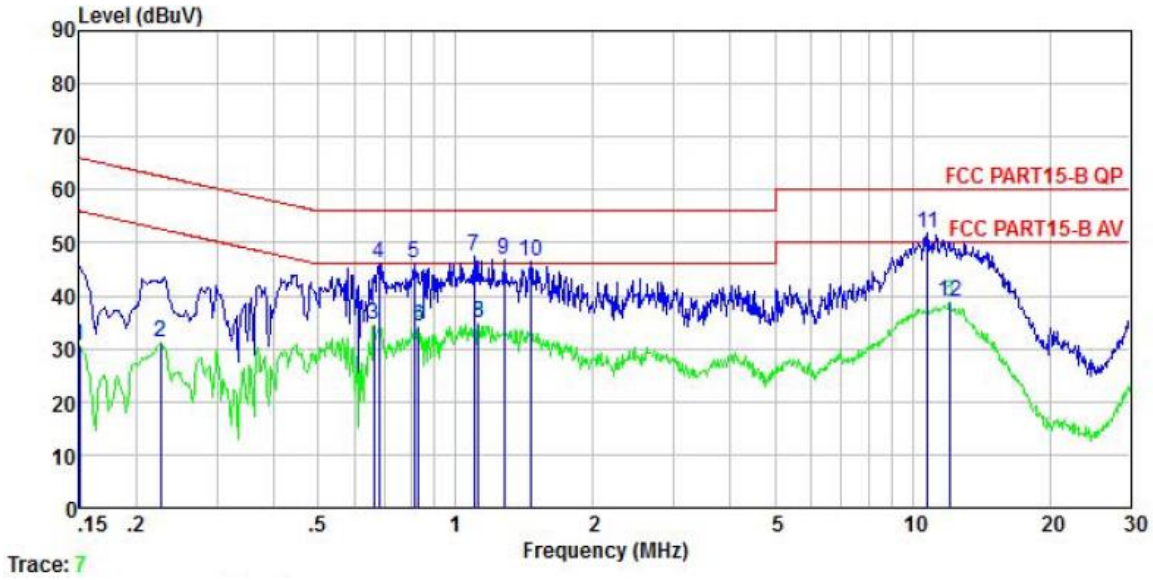


	Freq	Read Level	LISN Factor	Aux Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.683	38.76	10.30	-0.40	0.03	48.69	56.00	-7.31	QP
2	0.813	25.18	10.31	-0.05	0.03	35.47	46.00	-10.53	Average
3	0.813	40.70	10.31	-0.05	0.03	50.99	56.00	-5.01	QP
4	0.894	25.30	10.31	0.19	0.04	35.84	46.00	-10.16	Average
5	1.106	28.72	10.32	0.35	0.07	39.46	46.00	-6.54	Average
6	1.106	40.00	10.32	0.35	0.07	50.74	56.00	-5.26	QP
7	1.197	40.48	10.32	0.26	0.09	51.15	56.00	-4.85	QP
8	1.331	26.92	10.32	0.14	0.12	37.50	46.00	-8.50	Average
9	1.345	40.12	10.32	0.13	0.12	50.69	56.00	-5.31	QP
10	1.487	26.72	10.33	0.01	0.14	37.20	46.00	-8.80	Average
11	11.996	41.16	10.67	2.68	0.10	54.61	60.00	-5.39	QP
12	12.318	27.60	10.69	2.78	0.10	41.17	50.00	-8.83	Average

Notes:

1. *An initial pre-scan was performed on the line and neutral lines with peak detector.*
2. *Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.*
3. *Final Level =Receiver Read level + LISN Factor + AuxFactor + Cable Loss.*

Product name:	Livongo Blood Glucose Monitoring System	**Product model:**	BG1000
Test by:	Mike	**Test mode:**	TM 1
Test frequency:	150 kHz ~ 30 MHz	**Phase:**	Neutral
Test voltage:	AC 120 V/60 Hz	**Environment:**	Temp: 23℃ Huni: 55%



	Freq	Read Level	LISN Factor	Aux Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.150	20.34	10.19	0.01	0.01	30.55	56.00	-25.45	Average
2	0.226	20.82	10.23	0.00	0.02	31.07	52.61	-21.54	Average
3	0.661	24.12	10.30	0.04	0.03	34.49	46.00	-11.51	Average
4	0.679	35.87	10.30	0.04	0.03	46.24	56.00	-9.76	QP
5	0.813	35.85	10.30	0.06	0.03	46.24	56.00	-9.76	QP
6	0.830	23.89	10.30	0.06	0.03	34.28	46.00	-11.72	Average
7	1.100	36.88	10.31	0.09	0.07	47.35	56.00	-8.65	QP
8	1.123	24.52	10.31	0.09	0.08	35.00	46.00	-11.00	Average
9	1.276	36.25	10.31	0.11	0.11	46.78	56.00	-9.22	QP
10	1.464	35.81	10.32	0.13	0.14	46.40	56.00	-9.60	QP
11	10.790	39.19	10.62	1.71	0.12	51.64	60.00	-8.36	QP
12	12.060	25.95	10.65	2.19	0.10	38.89	50.00	-11.11	Average

Notes:

1. *An initial pre-scan was performed on the line and neutral lines with peak detector.*
2. *Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.*
3. *Final Level =Receiver Read level + LISN Factor + AuxFactor + Cable Loss.*

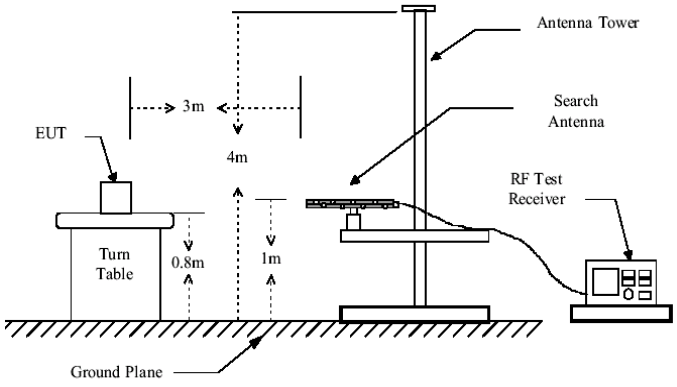
6.2 Radiated Emission

Test Requirement:	FCC Part 15 B Section 15.109				
Test Frequency Range:	30MHz to 18000MHz				
Test site:	Measurement Distance: 3m (Semi-Anechoic Chamber)				
Receiver setup:	Frequency	Detector	RBW	VBW	Remark
	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		RMS	1MHz	3MHz	Average Value

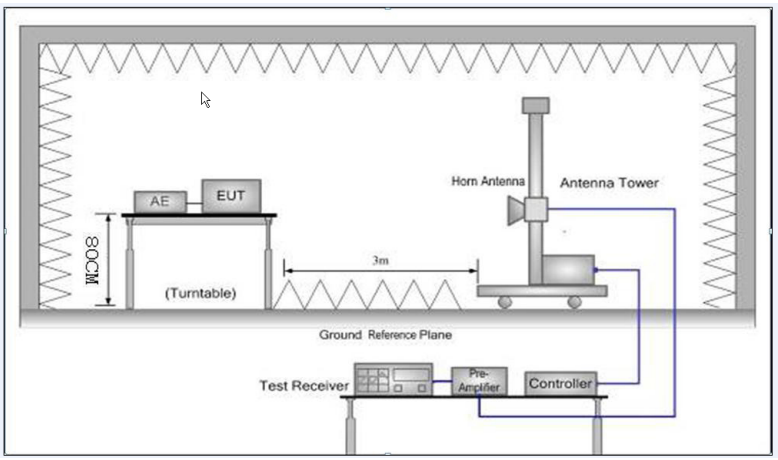
Limit:	Frequency	Limit (dBuV/m @3m)	Remark
	30MHz-88MHz	40.0	Quasi-peak Value
	88MHz-216MHz	43.5	Quasi-peak Value
	216MHz-960MHz	46.0	Quasi-peak Value
	960MHz-1GHz	54.0	Quasi-peak Value
	Above 1GHz	54.0	Average Value
		74.0	Peak Value

Test setup:

Below 1GHz



Above 1GHz



Test Procedure:

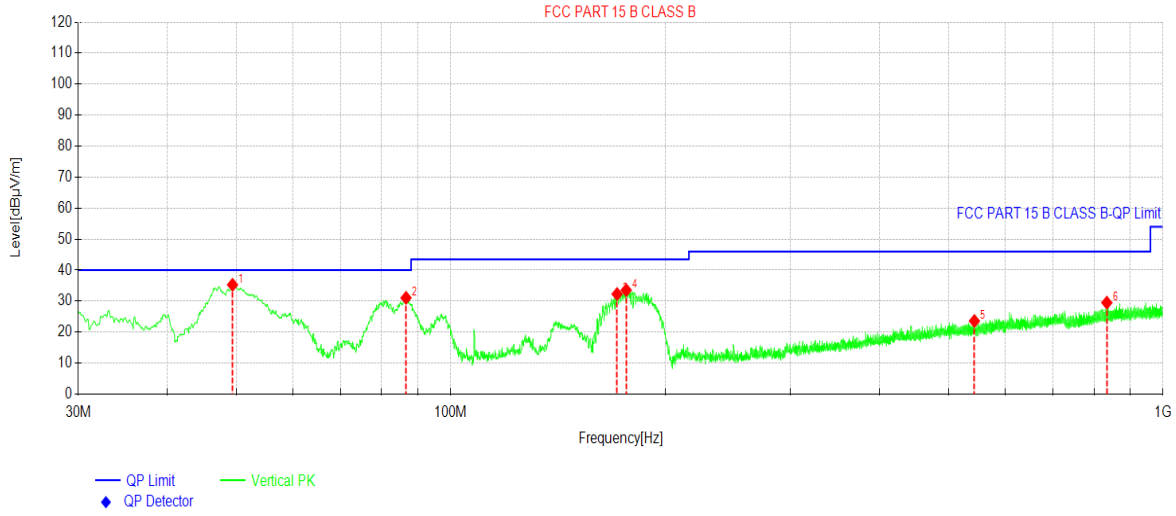
1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

	4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
Test Instruments:	Refer to section 5.11 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data:

Below 1GHz:

Product Name:	Livongo Blood Glucose Monitoring System	**Product Model:**	BG1000
Test By:	Mike	**Test mode:**	TM 1
Test Frequency:	30 MHz ~ 1 GHz	**Polarization:**	Vertical
Test Voltage:	AC 120/60Hz	**Environment:**	Temp: 24℃ Huni: 57%



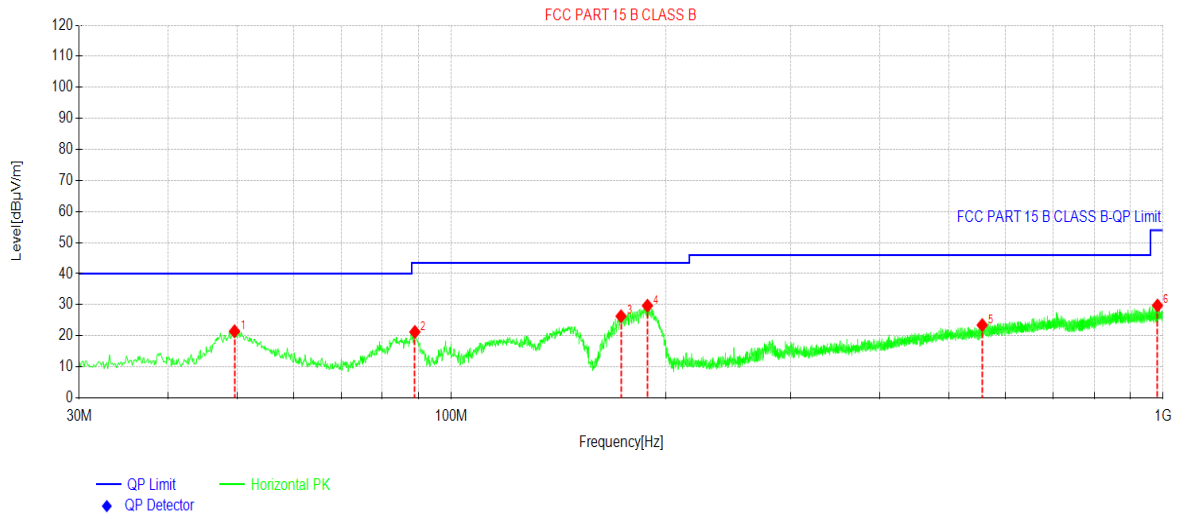
Suspected Data List

NO.	Freq. [MHz]	Reading[dBµV/m]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Trace	Polarity
1	49.4019	50.03	35.28	-14.75	40.00	4.72	PK	Vertical
2	86.5567	48.56	31.06	-17.50	40.00	8.94	PK	Vertical
3	171.246	49.28	32.28	-17.00	43.50	11.22	PK	Vertical
4	176.387	50.45	33.53	-16.92	43.50	9.97	PK	Vertical
5	543.569	30.42	23.59	-6.83	46.00	22.41	PK	Vertical
6	834.016	31.44	29.51	-1.93	46.00	16.49	PK	Vertical

Remark:

1. *Final Level = Receiver Read level + Factor (Antenna Factor + Cable Loss – Preamplifier Factor).*
2. *The emission levels of below 30MHz are lower than the limit 20dB and not show in test report.*

Product Name:	Livongo Blood Glucose Monitoring System	Product Model:	BG1000
Test By:	Mike	Test mode:	TM 1
Test Frequency:	30 MHz ~ 1 GHz	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24℃ Huni: 57%



Suspected Data List

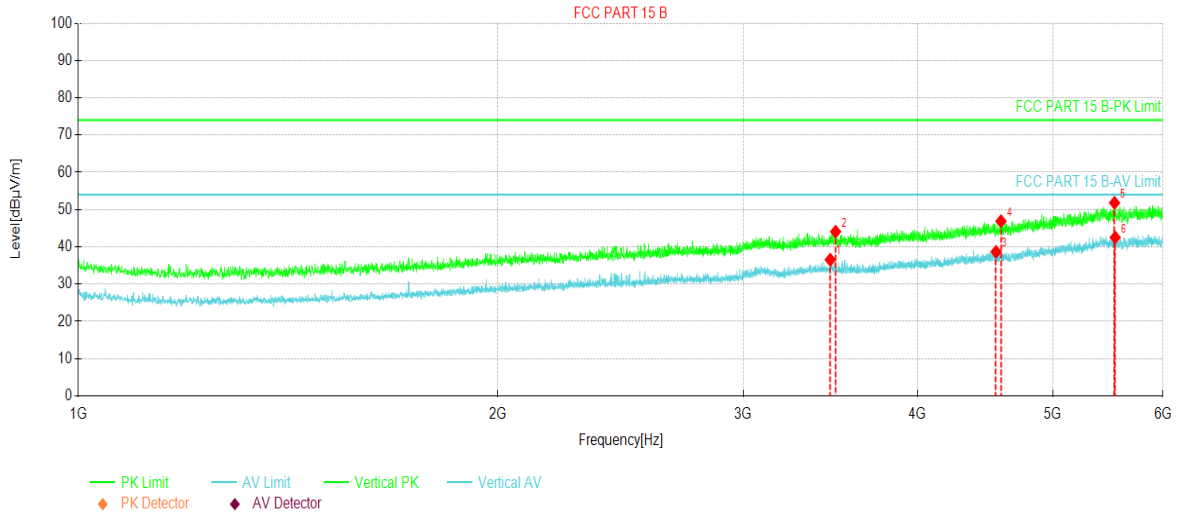
NO.	Freq. [MHz]	Reading[dBµV/m]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Trace	Polarity
1	49.5960	36.19	21.45	-14.74	40.00	18.55	PK	Horizontal
2	88.8849	38.74	21.23	-17.51	43.50	22.27	PK	Horizontal
3	173.186	43.30	26.31	-16.99	43.50	17.19	PK	Horizontal
4	188.610	45.70	29.67	-16.03	43.50	13.83	PK	Horizontal
5	557.053	30.08	23.44	-6.64	46.00	22.56	PK	Horizontal
6	982.344	30.60	29.74	-0.86	54.00	24.26	PK	Horizontal

Remark:

1. *Final Level = Receiver Read level + Factor (Antenna Factor + Cable Loss – Preamplifier Factor).*
2. *The emission levels of below 30MHz are lower than the limit 20dB and not show in test report.*

Above 1GHz:

Product Name:	Livongo Blood Glucose Monitoring System	**Product Model:**	BG1000
Test By:	Mike	**Test mode:**	TM 1
Test Frequency:	1 GHz ~ 6 GHz	**Polarization:**	Vertical
Test Voltage:	AC 120/60Hz	**Environment:**	Temp: 24℃ Huni: 57%



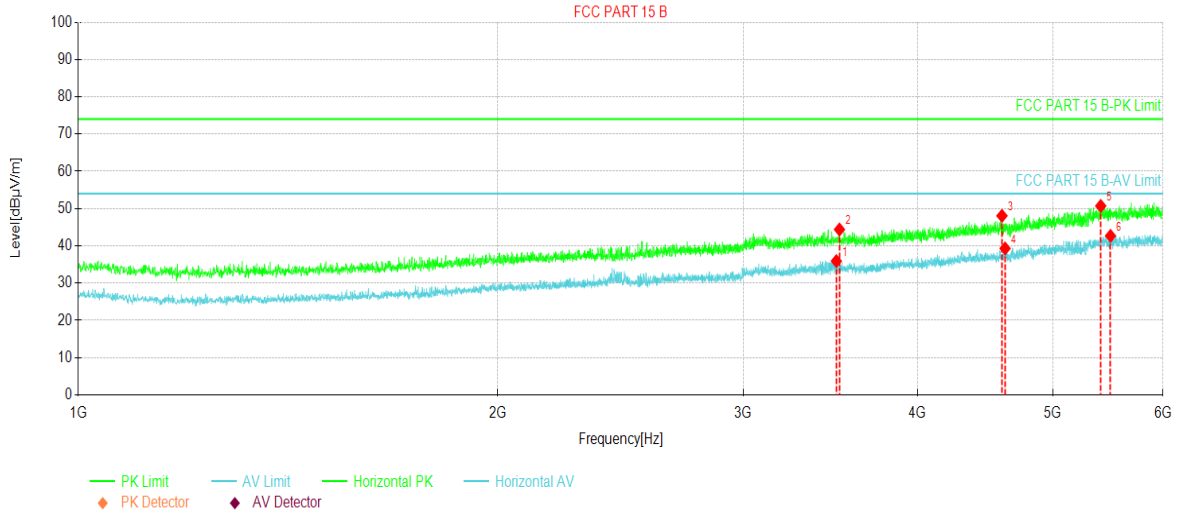
Suspected Data List

NO.	Freq. [MHz]	Reading [dBµV/m]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Trace	Polarity
1	3463.12	51.54	36.53	-15.01	54.00	17.47	AV	Vertical
2	3493.75	58.94	44.07	-14.87	74.00	29.93	PK	Vertical
3	4553.75	49.22	38.65	-10.57	54.00	15.35	AV	Vertical
4	4591.25	57.27	46.87	-10.40	74.00	27.13	PK	Vertical
5	5538.75	57.88	51.80	-6.08	74.00	22.20	PK	Vertical
6	5544.37	48.59	42.51	-6.08	54.00	11.49	AV	Vertical

Remark:

1. *Final Level = Receiver Read level + Factor (Antenna Factor + Cable Loss – Preamplifier Factor).*
2. *The emission levels of above 6GHz are lower than the limit 20dB and not show in test report.*

Product Name:	Livongo Blood Glucose Monitoring System	Product Model:	BG1000
Test By:	Mike	Test mode:	TM 1
Test Frequency:	1 GHz ~ 6 GHz	Polarization:	Horizontal
Test Voltage:	AC 120/60Hz	Environment:	Temp: 24℃ Huni: 57%



Suspected Data List

NO.	Freq. [MHz]	Reading [dBµV/m]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Trace	Polarity
1	3498.12	50.76	35.91	-14.85	54.00	18.09	AV	Horizontal
2	3516.25	59.22	44.37	-14.85	74.00	29.63	PK	Horizontal
3	4598.75	58.42	48.05	-10.37	74.00	25.95	PK	Horizontal
4	4622.50	49.52	39.30	-10.22	54.00	14.70	AV	Horizontal
5	5413.75	56.65	50.70	-5.95	74.00	23.30	PK	Horizontal
6	5501.87	48.75	42.67	-6.08	54.00	11.33	AV	Horizontal

Remark:

1. *Final Level = Receiver Read level + Factor (Antenna Factor + Cable Loss – Preamplifier Factor).*
2. *The emission levels of above 6GHz are lower than the limit 20dB and not show in test report.*

7 Test Setup Photo

Reference to the test setup photos: 15B-Test Setup Photo

8 EUT Constructional Details

Reference to the External photo and Internal photo.

------End of report------