

Report on the FCC and ISED Testing of the Trividia Health, Inc. SB-BLE-S036

In accordance with FCC 47 CFR Part 15.247

Prepared for: Trividia Health, Inc.
2400 N.W. 55th Court
Fort Lauderdale, FL 33309

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SIGNATURE

A handwritten signature of Pete Walsh in blue ink.

NAME	JOB TITLE	RESPONSIBLE FOR	ISSUE DATE
Pete Walsh	Service Line Manager	Authorized Signatory	2019-June-03

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD America, Inc. document control rules.

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EXECUTIVE SUMMARY

A sample of this product was tested and found to be compliant with FCC Part 15.247.



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Signatures of the individuals responsible for testing the product**ENGINEERING STATEMENT**

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC 47 CFR Part 15.247. The sample tested was found to comply with the requirements defined in the applied rules.

NAME	RESPONSIBLE FOR	SIGNATURE
Thierry Jean-Charles	Testing	

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1 GENERAL

1.1 Purpose

The purpose of this report is to demonstrate compliance with Part 15 Subpart C of the FCC's Code of Federal Regulations Section 15.247 for the tests documented herein for a permissive change.

The purpose of the permissive change is the integration of the module within a new host configuration. There are no changes to the hardware or the software of the module.

1.2 Applicant Information

Trividia Health, Inc.
2400 N.W. 55th Court
Fort Lauderdale, FL 33309

1.3 Product Description

The model is a Bluetooth Low Energy wireless module. The unit is integrated within a blood glucose monitor model True Metrix Air.

Technical Details

Mode of Operation: Bluetooth Low Energy (BLE)
Frequency Range: 2402 MHz - 2480 MHz
Number of Channels: 40
Channel Separation: 2 MHz
Data Rate: 1 Mbps
Modulations: GFSK
Antenna Type/Gain: PIFA, -1.5 dBi
Input Power: 3 VDC (CR2032 lithium battery)

Model Number: SB-BLE-S036

Test Sample Serial Number(s): TA0003389 (Host)

Test Sample Condition: The test samples were in good operating condition without any physical damages.

1.4 Test Methodology and Considerations

The EUT was evaluated for radiated emissions while integrated within the glucose meter. Preliminary measurements were collected for the EUT in three orthogonal orientations. The final measurements were performed using the orientations leading to the highest emissions. The band-edge emissions were observed to be worse for the EUT set sideways on the table top while the EUT flat on the table top led to the highest spurious emissions.

The EUT was also tested for compliance to the unintentional emissions requirements. The results are documented separately in a supplier's declaration of conformity test report.

2 TEST FACILITIES

2.1 Location

The radiated and conducted emissions test sites are located at the following address:

TÜV SÜD America, Inc.
3998 FAU Blvd, Suite 310
Boca Raton, Florida 33431
Phone: (561) 961-5585
Fax: (561) 961-5587
<http://www.tuv-sud-america.com>

Innovation, Science and Economic Development Canada Lab Code: 4175C

2.2 Laboratory Accreditations/Recognitions/Certifications

TÜV SÜD America, Inc. is accredited to ISO/IEC 17025 by American Association for Laboratory Accreditation (A2LA) and has been issued certificate number 2955.15 in recognition of this accreditation. Unless otherwise specified, all test methods described within this report are covered under the ISO/IEC 17025 scope of accreditation.

Main Site Information:

TÜV SÜD America, Inc.
5610 West Sligh Ave., Suite 100
Tampa, FL 33634
Phone: 813-284-2715
www.tuv-sud-america.com

FCC Designation Number US1063
FCC Test Firm Registration #: 160606
Innovation, Science, and Economic Development Canada Lab Code: 2087A-2

2.3 Radiated & Conducted Emissions Test Site Description

2.3.1 Semi-Anechoic Chamber Test Site

The EMC radiated test facility consists of an RF-shielded enclosure. The interior dimensions of the indoor semi-anechoic chamber are approximately 48 feet (14.6 m) long by 36 feet (10.8 m) wide by 24 feet (7.3 m) high and consist of rigid, 1/8 inch (0.32 cm) steel-clad, wood core modular panels with steel framing. In the shielded enclosure, the faces of the panels are galvanized, and the chamber is self-supporting. 8-foot RF absorbing cones are installed on 4 walls and the ceiling. The steel-clad ground plane is covered with vinyl flooring.

The turntable is driven by pneumatic motor, which can support a 2000 lb. load. The turntable is flush with the chamber floor which it is connected to, around its circumference, with a continuous metallic loaded spring. An EMCO Model 1060 Multi-device controller controls the turntable position.

A pneumatic motor is used to control antenna polarizations and height relative to the ground. The height information is displayed on the control unit EMCO Model 1050.

The control room is an RF shielded enclosure attached to the semi-anechoic chamber with two bulkhead panels for connecting RF, and control cables. The dimension of the room is 7.3 m x 4.9 m x 3 m high and the entrance doors of both control and conducted rooms are 3 feet (0.91 m) by 7 feet (2.13 m).

A diagram of the Semi-Anechoic Chamber Test Site is shown in Figure 2.3.1-1 below:

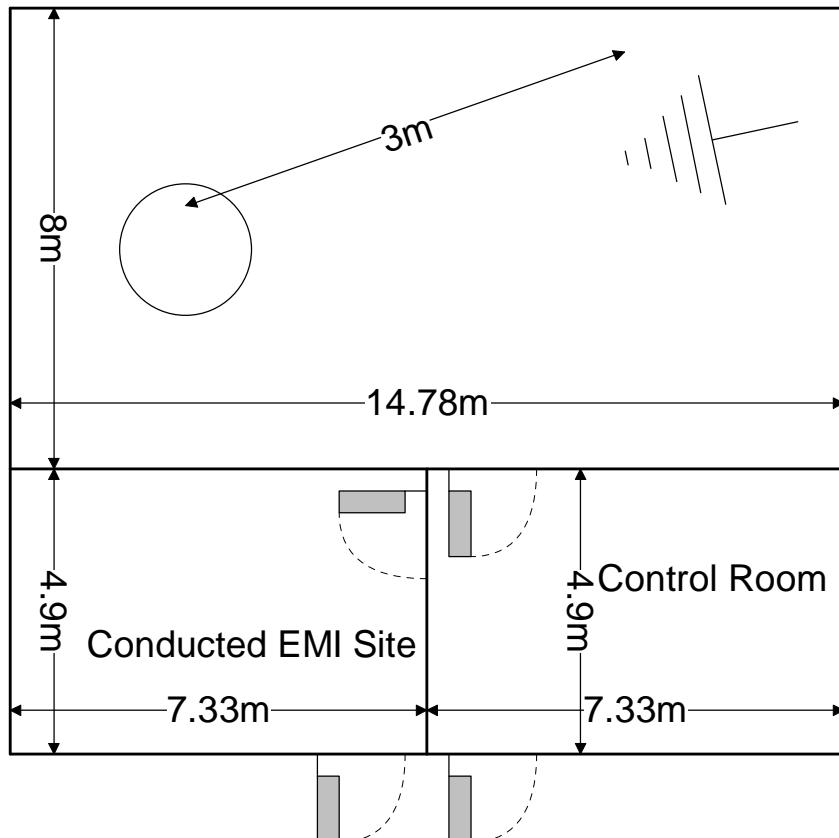


Figure 2.3.1-1: Semi-Anechoic Chamber Test Site

2.3.2 Conducted Emissions Test Site Description

The dimensions of the shielded conducted room are $7.3 \times 4.9 \times 3 \text{ m}^3$. The power line conducted emission site includes two LISNs: a Solar Model 8028-50 $50 \Omega/50 \mu\text{H}$ and an EMCO Model 3825/2R, which are installed as shown in the figure below. For evaluations requiring 230 V, 50 Hz AC input, a Polarad LISN (S/N 879341/048) is used in conjunction with a California Instruments signal generator Model 2001RP-OP1.

A diagram of the room is shown below in figure 2.3.2-1:

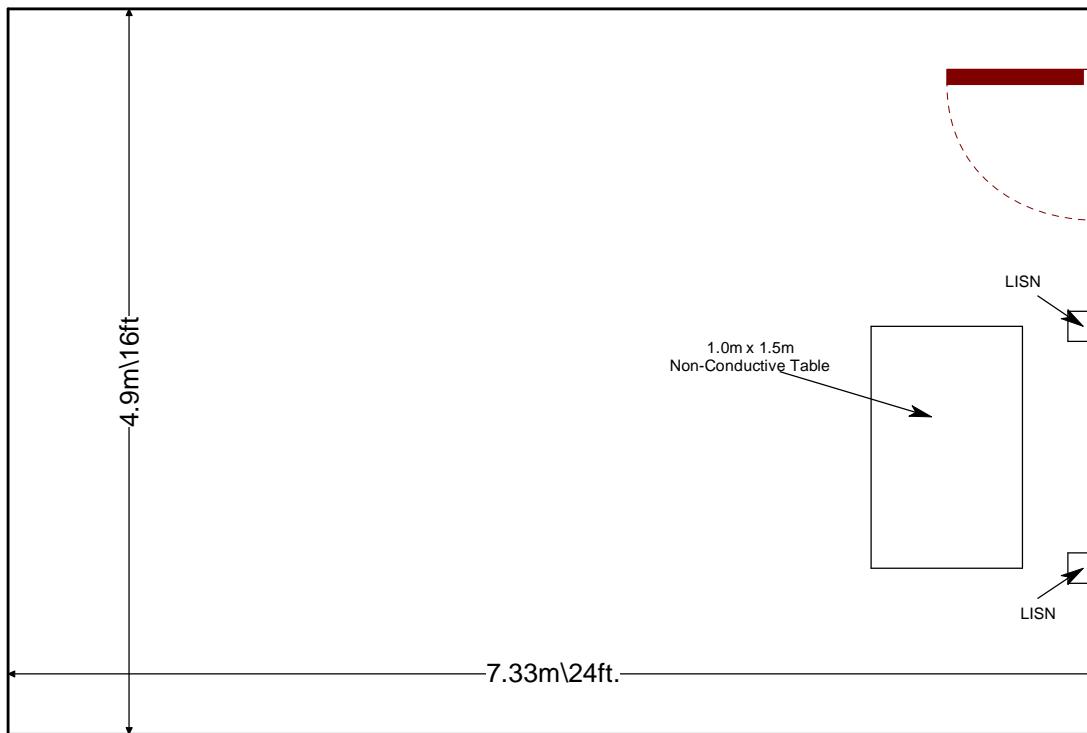


Figure 2.3.2-1: AC Mains Conducted EMI Site

3 APPLICABLE STANDARD REFERENCES

The following standards were used:

- ❖ ANSI C63.10-2013: American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
- ❖ US Code of Federal Regulations (CFR): Title 47, Part 2, Subpart J: Equipment Authorization Procedures, 2018.
- ❖ US Code of Federal Regulations (CFR): Title 47, Part 15, Subpart C: Radio Frequency Devices, Intentional Radiators, 2018
- ❖ FCC KDB 558074 D01 DTS Meas Guidance v05 - Guidance for Performing Compliance Measurements on Digital Transmission System, Frequency Hopping Spread Spectrum System, and Hybrid System Devices Operating Under Section 15.257 of the FCC Rules, August 24, 2018.

4 LIST OF TEST EQUIPMENT

The calibration interval of test equipment is annually or the manufacturer's recommendations. Where the calibration interval deviates from the annual cycle based on the instrument manufacturer's recommendations, it shall be stated below.

Table 4-1: Test Equipment List

AssetID	Manufacturer	Model #	Equipment Type	Serial #	Calibration Performed Date	Calibration Due Date
BEMC00078	EMCO	6502	Active Loop Antenna	9104-2608	5/9/2018	5/9/2020
BEMC00282	Microwave Circuits	H3G020G4	2-20GHz Band Pass Filter	74541	5/17/2018	5/17/2019
BEMC00523	Agilent	E7405A	9kHz-26.5GHz EMC analyzer/HYZ	MY45103293	11/27/2018	11/27/2020
BEMC00653	Suhner	SF-102A	Cable (40GHz)	0944/2A	10/9/2018	10/9/2019
BEMC02002	EMCO	3108	30 MHz to 200 MHz Biconical Antenna	2147	11/28/2017	11/30/2019
BEMC02004	EMCO	3146	200 MHz to 1 GHz Log Periodic Antenna	1385	12/27/2017	12/27/2019
BEMC02006	EMCO	3115	Linear Polarized Horn antenna, 1-18 GHz	2573	4/7/2017	4/7/2019
BEMC02008	COM-power	AH-826	Horn Antenna (18 GHz to 26.5 GHz)	81009	NCR	NCR
BEMC02011	Hewlett-Packard	HP 8447D	100 kHz to 1.3 GHz low-noise, high gain amplifier	2443A03952	10/18/2018	10/18/2019
BEMC02086	Merrimac	FAN-6-10K	10dB Attenuator	23148-83-1	10/17/2018	10/17/2019
BEMC02095	ETS Lindgren	TILE4! - Version 4.2.A	Tile Automation Software	85242	NCR	NCR
BEMC02121	Teledyne Storm Products	A81-0303	Radiated Cable Set	2121	7/26/2018	7/26/2019
BEMC02138	Hewlett Packard	8449B	Pre-Amplifier	3008A00320	11/26/2018	11/26/2019
TEMC00171	MegaPhase, LLC	1GVT4	4A & 4B Test Cables	NC12-K1K1-59, 394	5/30/2018	5/30/2020

Notes:

- **NCR=No Calibration Required**
- **The assets were only used during the active period of the calibration cycle.**

5 SUPPORT EQUIPMENT

Table 5-1: EUT and Support Equipment Description – Radiated Emissions

Item #	Type Device	Manufacturer	Model/Part #	Serial #
1	EUT	Trividia Health, Inc.	SB-BLE-S036	N/A
2	Host	Trividia Health, Inc.	True Metrix Air	TA0003389 (Host)
3	Checkstrip	Trividia Health, Inc.	BCS-PCB-Z10	N/A

Table 5-2: Cable Description – Radiated Emissions

Cable #	Cable Type	Length	Shield	Termination
A	The EUT does not include any provision for connection to accessory cable equipment.			

6 EQUIPMENT UNDER TEST SETUP BLOCK DIAGRAM

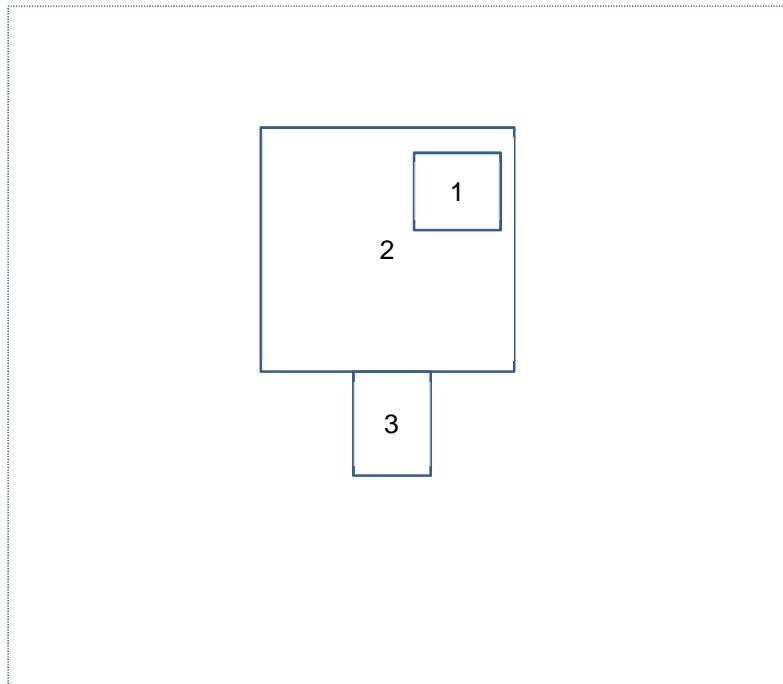


Figure 6-1: EUT and Support Equipment Block Diagram

7 SUMMARY OF TESTS

Along with the tabular data shown below, plots were taken of all signals deemed important enough to document.

Test Begin Date: February 26, 2019
Test End Date: March 4, 2019

Table 7-1: Summary of Tests

Requirements	FCC Rule Part	Test Results
Radiated Spurious Emissions into Restricted Frequency Bands	FCC: Sections 15.205, 15.209	Pass

7.1 Antenna Requirement – FCC: Section 15.203

The EUT uses a PIFA that is integral to the module. The antenna cannot be replaced without permanently damaging the product. The EUT meets the requirements of FCC Section 15.203.

7.2 Band-Edge Compliance and Spurious Emissions

7.2.1 Radiated Spurious Emissions into Restricted Frequency Bands – FCC: Sections 15.205, 15.209

7.2.1.1 Measurement Procedure

Radiated emissions tests were made over the frequency range of 9 kHz to 26 GHz, 10 times the highest fundamental frequency. Each emission found to be in a restricted band as defined by section 15.205, including any emission at the operational band-edge, was compared to the radiated emission limits as defined in Section 15.209.

For measurements below 30 MHz, the receive antenna height was set to 1 m and the EUT was rotated through 360 degrees. The resolution bandwidth was set to 200 Hz below 150 kHz and to 9 kHz above 150 kHz.

The EUT was rotated through 360° and the receive antenna height was varied from 1m to 4m so that the maximum radiated emissions level would be detected. For frequencies below 1000 MHz, quasi-peak measurements were made using a resolution bandwidth RBW of 120 kHz and a video bandwidth VBW of 300 kHz. For frequencies above 1000 MHz, peak measurements are made with RBW of 1 MHz and VBW of 3 MHz. Average measurements are performed in the linear scale using VBW of 10 kHz.

7.2.1.2 Measurement Results

Performed by: Jean Rene

Radiated band-edge and spurious emissions found in the restricted frequency bands of 9 kHz to 26 GHz are reported in the tables below.

Table 7.2.1.2-1: Radiated Spurious Emissions Tabulated Data

Frequency (MHz)	Level (dBuV)		Antenna Polarity (H/V)	Correction Factors (dB)	Corrected Level (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
	pk	Qpk/Avg			pk	Qpk/Avg	pk	Qpk/Avg	pk	Qpk/Avg
Low Channel										
4804	38.86	30.62	H	9.10	47.96	39.72	74.0	54.0	26.0	14.3
4804	39.42	31.41	V	9.10	48.52	40.51	74.0	54.0	25.5	13.5
Middle Channel										
4880	39.42	31.82	H	9.49	48.91	41.31	74.0	54.0	25.1	12.7
4880	39.37	31.76	V	9.49	48.86	41.25	74.0	54.0	25.1	12.8
7320	41.01	32.79	H	14.43	55.44	47.22	74.0	54.0	18.6	6.8
7320	41.87	33.23	V	14.43	56.30	47.66	74.0	54.0	17.7	6.3
High Channel										
2483.5	56.82	41.24	H	1.84	58.66	43.08	74.0	54.0	15.3	10.9
2483.5	58.21	41.39	V	1.84	60.05	43.23	74.0	54.0	14.0	10.8
4960	38.52	30.54	H	9.89	48.41	40.43	74.0	54.0	25.6	13.6
4960	38.65	31.04	V	9.89	48.54	40.93	74.0	54.0	25.5	13.1
7440	42.00	35.37	H	14.78	56.78	50.15	74.0	54.0	17.2	3.8
7440	42.39	35.62	V	14.78	57.17	50.40	74.0	54.0	16.8	3.6

Notes:

- All emissions above 7.44 GHz were attenuated below the limits and the noise floor of the measurement equipment.

7.2.2 Sample Calculation:

$$R_C = R_U + CFT$$

Where:

CFT = Total Correction Factor (AF+CA+AG)-DC (Average Measurements Only)
 RU = Uncorrected Reading
 RC = Corrected Level
 AF = Antenna Factor
 CA = Cable Attenuation
 AG = Amplifier Gain
 DC = Duty Cycle Correction Factor

Example Calculation: Peak

Corrected Level: $38.86 + 9.1 = 47.96 \text{ dB}\mu\text{V/m}$
 Margin: $74 \text{ dB}\mu\text{V/m} - 47.96 \text{ dB}\mu\text{V/m} = 26.04 \text{ dB}$

Example Calculation: Average

Corrected Level: $30.62 + 9.1 = 39.72 \text{ dB}\mu\text{V/m}$
 Margin: $54 \text{ dB}\mu\text{V/m} - 39.72 \text{ dB}\mu\text{V/m} = 14.28 \text{ dB}$

8 MEASUREMENT UNCERTAINTIES

The expanded laboratory measurement uncertainty figures (U_{Lab}) provided below correspond to an expansion factor (coverage factor) $k = 1.96$ which provide confidence levels of 95%.

Table 8-1: Measurement Uncertainties

Parameter	U_{lab}
Occupied Channel Bandwidth	$\pm 0.009 \%$
RF Conducted Output Power	$\pm 1.15 \text{ dB}$
Power Spectral Density	$\pm 1.15 \text{ dB}$
Antenna Port Conducted Emissions	$\pm 1.15 \text{ dB}$
Radiated Emissions $\leq 1\text{GHz}$	$\pm 5.86 \text{ dB}$
Radiated Emissions $> 1\text{GHz}$	$\pm 4.65 \text{ dB}$
Temperature	$\pm 0.860 \text{ }^{\circ}\text{C}$
Radio Frequency	$\pm 2.832 \times 10^{-8}$
AC Power Line Conducted Emissions	$\pm 3.72 \text{ dB}$

9 CONCLUSION

In the opinion of TÜV SÜD America, Inc. the models SB-BLE-S036, manufactured by Trividia Health, Inc., meets the requirements of FCC Part 15.247 for the tests documented herein.

END REPORT