



SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

SZEMC-TRF-01 Rev. A/0 Aug01,2022

Report No.: SZCR230400102803

Page: 1 of 7

RF Exposure Evaluation Report

Application No.: SZCR2304001028AT
Applicant: TREEL MOBILITY SOLUTIONS PRIVATE LIMITED
Address of Applicant: S.No.6/1B,6/4,7/4, Plot No.02, Shivane Laxmi Vishnupuram Amenities Business, NDA Road, 411023, Pune, India
Manufacturer: TREEL MOBILITY SOLUTIONS PRIVATE LIMITED
Address of Manufacturer: S.No.6/1B,6/4,7/4, Plot No.02, Shivane Laxmi Vishnupuram Amenities Business, NDA Road, 411023, Pune, India
Factory: TREEL MOBILITY SOLUTIONS PRIVATE LIMITED
Address of Factory: S.No.6/1B,6/4,7/4, Plot No.02, Shivane Laxmi Vishnupuram Amenities Business, NDA Road, 411023, Pune, India

Equipment Under Test (EUT):

EUT Name: TPMS BLE Sensor
Model No.: TR0001TV340101000, TR0001TV360101000, TR0001TV370101000 ♣
♣ Please refer to section 4.1 of this report which indicates which model was actually tested and which were electrically identical.

Trade Mark:



FCC ID: 2BA4YT01TV340101
Standards: 47 CFR Part 1.1307, 47 CFR Part 1.1310, 47 CFR Part 2.1091
Date of Receipt: 2023-04-12
Date of Test: 2023-04-13 to 2023-04-25
Date of Issue: 2023-04-26

Test Result :	PASS*
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* In the configuration tested, the EUT complied with the standards specified above.

Keny Xu
EMC Laboratory Manager



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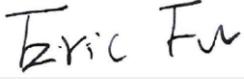
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2 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2023-04-26		Original

Authorized for issue by:			
			
		Edison Li/Project Engineer	
			
		Eric Fu/Reviewer	

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4 General Information

4.1 General Description of EUT

Power supply:	3V CR1632 Battery
Bluetooth Version:	V5.1
Operation Frequency:	2402MHz to 2480MHz
Modulation Type:	GFSK
Channel Spacing:	2MHz
Number of Channels:	40
Data rate:	1Mbps, 2Mbps
Antenna Type:	Metal Antenna
Antenna Gain:	-12.24dBi

Remark: The information in this section is provided by the applicant or manufacturer, SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.

Model No.: TR0001TV340101000, TR0001TV360101000, TR0001TV370101000

Only the model TR0001TV340101000 was tested, since according to the declaration from the applicant, the electrical circuit design, layout, components used, internal wiring and functions were identical for all the above models, with only difference on model no., application and type of vehicle on which it is fitted.

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4.2 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

No. 1 Workshop, M-10, Middle section, Science & Technology Park, Shenzhen, Guangdong, China
518057

Telephone: +86 (0) 755 2601 2053 Fax: +86 (0) 755 2671 0594

No tests were sub-contracted.

4.3 Test Facility

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

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- **VCCI**

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

- **FCC –Designation Number: CN1178**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

- **Innovation, Science and Economic Development Canada**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

4.4 Deviation from Standards

None.

4.5 Abnormalities from Standard Conditions

None.

4.6 Other Information Requested by the Customer

None.



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5 RF Exposure Evaluation

5.1 RF Exposure Compliance Requirement

5.1.1 Limits

According to FCC Part1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in part1.1307(b)

TABLE 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)
(A) Limits for Occupational/Controlled Exposures				
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
300–1500 .....	.....	.....	f/300	6
1500–100,000 .....	.....	.....	5	6
(B) 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
300–1500 .....	.....	.....	f/1500	30
1500–100,000 .....	.....	.....	1.0	30

F= Frequency in MHz

Friis Formula

Friis transmission formula: $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2)$

Where

P_d = power density in mW/cm^2

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

$\pi = 3.1416$

R = distance between observation point and center of the radiator in cm

P_d is the limit of MPE, $f/1500$ or 1 mW/cm^2 . If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

5.1.2 Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.



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4.1.3 EUT RF Exposure Evaluation

For Bluetooth LE:

Antenna Gain: -12.24dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 0.06 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Antenna	Max Antenna Gain (dBi)	Max Antenna Gain (Numeric)	Max tune-up tolerance power (dBm)	Max tune-up Tolerance power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit (mW/cm ²)	MPE Ratios	Result
1	-12.24	0.06	-5.05	0.31	0.000004	1	0.000004	PASS

Note: Refer to report No. SZCR230400102802 or EUT test Max Conducted Peak Output Power value.

The distance (4th column) calculated from the Friis transmission formula is far greater than 20 cm separation requirement;

- End of the Report -



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