



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

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

Report No.: SZCR230300089102

Page: 1 of 9

# RF EXPOSURE EVALUATION REPORT

**Application No.:** SZCR2303000891AT  
**Applicant:** SHENZHEN SATLEAD TECHNOLOGY CO., LTD.  
**Address of Applicant:** TCL Science Park, NO.1001 Zhongshanyuan Road Shenzhen China  
**Manufacturer:** SHENZHEN SATLEAD TECHNOLOGY CO., LTD.  
**Address of Manufacturer:** TCL Science Park, NO.1001 Zhongshanyuan Road Shenzhen China  
**Equipment Under Test (EUT):**  
**EUT Name:** Wireless data transceiver  
**Model No.:** HX-DU1022D  
**FCC ID:** 2BA39HX-DU1022D  
**Standard(s) :** 47 CFR PART 1, Subpart I, Section 1.1307  
47 CFR PART 2, Subpart J, Section 2.1091  
**Date of Receipt:** 2023-03-30  
**Date of Evaluation:** 2023-05-01 to 2023-06-01  
**Date of Issue:** 2023-06-02

**Evaluation Result:**

**Pass\***

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

Keny Xu

Keny Xu  
EMC Laboratory Manager



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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2023-05-18		Original

Authorized for issue by:				
		Darren Yuan		
		Darren Yuan/Project Engineer		
		Eric Fu		
		Eric Fu/Reviewer		



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## 2 Evaluation Summary

**Note:**

E.U.T./EUT means Equipment Under Test.

Pass means the test result passed the test standard requirement, please find the detailed decision rule in the report relative section.



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## 4 General Information

### 4.1 Details of E.U.T.

Power supply:	DC 3.3V
Internal source:	More than 108MHz
Frequency Range:	421MHz to 470MHz
Modulation Type:	GMSK, 4FSK
Channel Separation:	12.5KHz
Number of Channels:	The equipment is able to operate on any designated channel within the specified frequency range.
Antenna Type:	IPEX Antenna Connector
Antenna Gain:	4dBi



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### 4.2 Evaluating 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, Nanshan District, Shenzhen, Guangdong, China. 518057.

Tel: +86 755 2601 2053 Fax: +86 755 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 (Member No. 1937)

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. Shenzhen EMC laboratory 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: CN1336

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

Designation Number: CN1336. Test Firm Registration Number: 787754.

#### • 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



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## 5 Technical Requirements Specification

### 5.1 RF Exposure Evaluation

#### 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 <sup>2</sup> )	Averaging time (minutes)
<b>(A) Limits for Occupational/Controlled Exposures</b>				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*(900/f <sup>2</sup> )	6
30–300	61.4	0.163	1.0	6
300–1500			f/300	6
1500–100,000			5	6
<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f <sup>2</sup> )	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:  $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = 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, 1 mW/cm<sup>2</sup>. 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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## 5.1.3 EUT RF Exposure Evaluation

Antenna Gain: 4dBi

Output Power Into Antenna & RF Exposure Evaluation Distance:

Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 30 cm (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	Result
Lowest	421.025	31.00	959.84	0.279	0.281	PASS
Middle	429.975	31.00	1006.24	0.279	0.286	PASS
Middle	450.025	31.00	1068.81	0.279	0.300	PASS
Highest	469.025	31.00	1088.43	0.279	0.312	PASS

Note: Refer to the tune-up procedure for EUT test Max Conducted Peak Output Power value.

The distance r (4th column) calculated from the Fries transmission formula is far greater than 30 cm separation requirement.



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## 6 EUT Constructional Details (EUT Photos)

Refer to appendix - external and internal photos for SZCR2303000891AT

- End of the Report -



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