

TEST REPORT

Application No.: SZCR2406002352MO
Applicant: ThingsX Inc.
Address of Applicant: 9442 Capital of Texas Hwy North, Plaza one, Suite 500, Austin TX 78759
Manufacturer: ThingsX Inc.
Address of Manufacturer: 9442 Capital of Texas Hwy North, Plaza one, Suite 500, Austin TX 78759
EUT Description: CAT-M Module
Model No.: TX520-GL
Trade Mark: THINGSX
FCC ID: 2BF7TTX520GL
Standards: FCC 47 CFR Part 2.1091
FCC KDB 447498 D01 v06
Date of Receipt: 2024-06-19
Date of Issue: 2024-07-17

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

Keny Xu

Keny Xu
EMC Laboratory Manager



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

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

SZEMC-TRF-01 Rev. A/1

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Page: 2 of 7

1 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2024-07-17		Original

Authorized for issue by:				
		Donjon Huang		
		Donjon Huang/Project Engineer		
		Eric Fu		
		Eric Fu/Reviewer		



SGS-CSTC Standards Technical Services Co., Ltd.
Shenzhen Branch Inspection & Testing Laboratory

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Contents

1	VERSION	2
2	GENERAL INFORMATION.....	4
2.1	CLIENT INFORMATION	4
2.2	TEST FACILITY	4
2.3	GENERAL DESCRIPTION OF EUT	5
3	RF EXPOSURE EVALUATION	6
3.1	RF EXPOSURE COMPLIANCE REQUIREMENT	6



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2 General Information

2.1 Client Information

Applicant:	ThingsX Inc.
Address of Applicant:	9442 Capital of Texas Hwy North, Plaza one, Suite 500, Austin TX 78759
Manufacturer:	ThingsX Inc.
Address of Manufacturer:	9442 Capital of Texas Hwy North, Plaza one, Suite 500, Austin TX 78759

2.2 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.



2.3 General Description of EUT

EUT Description:	CAT-M Module			
Model No.:	TX520-GL			
Trade Mark:	THINGSX			
Hardware Version:	V1.4			
Software Version:	69400.1000.00.22.04.30			
Antenna Type:	<input checked="" type="checkbox"/> External, <input type="checkbox"/> Integrated			
Antenna Gain:	GSM850:	3dBi	GSM1900:	3dBi
	LTE Cat M1 Band 2:	3dBi	LTE Cat M1 Band 4:	3dBi
	LTE Cat M1 Band 5:	3dBi	LTE Cat M1 Band 12:	3dBi
	LTE Cat M1 Band 13:	3dBi	LTE Cat M1 Band 14:	3dBi
	LTE Cat M1 Band 25:	3dBi	LTE Cat M1 Band 26:	3dBi
	LTE Cat M1 Band 66:	3dBi	LTE Cat M1 Band 85:	3dBi
	<p>Note:</p> <p>The antenna gain are derived from the gain information report provided by the manufacturer.</p>			
<p>Note:</p> <p>*Since the above data and/or information is provided by the client relevant results or conclusions of this report are only made for these data and/or information , SGS is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion.</p> <p>Remark:</p> <p>As above information is provided and confirmed by the applicant. SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.</p>				



3 RF Exposure Evaluation

3.1 RF Exposure Compliance Requirement

3.1.1 Limits

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
 *=Plane-wave equivalent power density
 RF exposure compliance will need to be determined with respect to 1.1307(c) and (d) of the FCC rules. The emissions should be within the limits at 300kHz in Table 1 of 1.1310(use the 300kHz limits for 150kHz:614V/m,1.63A/m).

Friis Formula

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

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

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

P_d is the limit of MPE, 1 mW/cm². 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.



3.1.2 Test Procedure

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

3.1.3 EUT RF Exposure Evaluation

Output Power Into Antenna & RF Exposure Evaluation Distance:

This confirmed that the device comply with MPE limit.

Operating Band	Frequency (MHz)	Antenna Gain (dBi)	Max Conducted Power (dBm)	EIRP(ERP) (dBm)	EIRP(ERP) Limit (dBm)	Power Density at R = 20 cm (mW/cm ²)	Limit (mW/cm ²)	Gain according to EIRP(ERP) (dBi)	Gain according to Pd (dBi)	Max Gain Allowed (dBi)	conclusion
GSM850	824.2	3.00	34.50	35.35	38.45	0.1348	0.5495	6.10	9.10	6.10	Pass
GSM1900	1850.2	3.00	30.00	33.00	33.00	0.0478	1.0000	3.00	16.20	3.00	Pass
LTE B2	1850.7	3.00	22.00	25.00	33.00	0.0629	1.0000	11.00	15.01	11.00	Pass
LTE B4	1710.7	3.00	22.00	25.00	30.00	0.0629	1.0000	8.00	15.01	8.00	Pass
LTE B5	824.7	3.00	22.00	22.85	38.45	0.0629	0.5498	18.60	12.41	12.41	Pass
LTE B12	699.7	3.00	22.00	22.85	34.77	0.0629	0.4665	14.92	11.70	11.70	Pass
LTE B13	779.5	3.00	22.00	22.85	34.77	0.0629	0.5197	14.92	12.16	12.16	Pass
LTE B14	790.5	3.00	22.00	22.85	34.77	0.0629	0.5270	14.92	12.23	12.23	Pass
LTE B25	1852.5	3.00	22.00	25.00	33.00	0.0629	1.0000	11.00	15.01	11.00	Pass
LTE B26(814-824)	814.7	3.00	22.00	22.85	NA	0.0629	0.5431	NA	12.36	12.36	Pass
LTE B26(814-824)	824.7	3.00	22.00	22.85	38.45	0.0629	0.5498	18.60	12.41	12.41	Pass
LTE B66	1710.7	3.00	22.00	25.00	30.00	0.0629	1.0000	8.00	15.01	8.00	Pass
LTE B85	700.5	3.00	22.00	22.85	34.77	0.0629	0.4670	14.92	11.70	11.70	Pass

Remark: Frame-average power=Burst power+ Division Factors(-9.19)

---End of Report---

