



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
Email: ee.shenzhen@sgs.com

Report No.: SZEM170700755102
Page: 1 of 8

1 Cover page

RF Exposure Evaluation Report

Application No.: SZEM1707007551CR
Applicant: ShenZhen Longsys Technology Co., Ltd.
Address of Applicant: Room 306-310, Building 4, Software Park 1, 2nd Keji Mid Road, Nanshan District, Shenzhen City, Guangdong Province, China
Manufacturer: ShenZhen Longsys Technology Co., Ltd.
Address of Manufacturer: Room 306-310, Building 4, Software Park 1, 2nd Keji Mid Road, Nanshan District, Shenzhen City, Guangdong Province, China
Factory: ShenZhen Longsys Technology Co., Ltd.
Address of Factory: Room 306-310, Building 4, Software Park 1, 2nd Keji Mid Road, Nanshan District, Shenzhen City, Guangdong Province, China
Equipment Under Test (EUT):
Product Name: WIFI MODULE
Model No.: LTM3210
Trade mark: LONGSYS
FCC ID: 2AISR-LTM3210
Standards: 47 CFR Part 1.1307 (2016)
47 CFR Part 1.1310 (2016)
Date of Receipt: 2017-07-19
Date of Test: 2017-07-24 to 2017-07-25
Date of Issue: 2017-08-09

| | |
|----------------------|--------------|
| Test Result : | PASS* |
|----------------------|--------------|

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



Jack Zhang
EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Document.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.




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

Report No.: SZEM170700755102
Page: 2 of 8

2 Version

| Revision Record | | | | |
|-----------------|---------|------------|----------|----------|
| Version | Chapter | Date | Modifier | Remark |
| 01 | | 2017-08-09 | | Original |
| | | | | |
| | | | | |

| | | | | |
|--------------------------|--|---|--|--|
| Authorized for issue by: | | | | |
| | |  | | |
| | | Bill Chen/Project Engineer | | |
| | |  | | |
| | | Eric Fu /Reviewer | | |



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

Report No.: SZEM170700755102
Page: 3 of 8

3 Contents

| | Page |
|---|------|
| 1 COVER PAGE..... | 1 |
| 2 VERSION | 2 |
| 3 CONTENTS | 3 |
| 4 GENERAL INFORMATION..... | 4 |
| 4.1 GENERAL DESCRIPTION OF EUT | 4 |
| 4.2 TEST LOCATION | 5 |
| 4.3 TEST FACILITY | 5 |
| 4.4 DEVIATION FROM STANDARDS..... | 6 |
| 4.5 ABNORMALITIES FROM STANDARD CONDITIONS | 6 |
| 4.6 OTHER INFORMATION REQUESTED BY THE CUSTOMER | 6 |
| 5 RF EXPOSURE EVALUATION | 7 |
| 5.1 RF EXPOSURE COMPLIANCE REQUIREMENT | 7 |
| 5.1.1 Limits | 7 |
| 5.1.2 Test Procedure..... | 7 |
| 4.1.3 EUT RF EXPOSURE EVALUATION..... | 8 |



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

Report No.: SZEM170700755102
Page: 4 of 8

4 General Information

4.1 General Description of EUT

| | |
|----------------------|--|
| Product Name: | WIFI MODULE |
| Model No.: | LTM3210 |
| Trade Mark: | LONGSYS |
| Type of Modulation: | IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n (HT20 and HT40): OFDM (64QAM, 16QAM, QPSK, BPSK) |
| Operating Frequency: | IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz IEEE 802.11n(HT40): 2422MHz to 2452MHz |
| Channel Number: | IEEE 802.11b/g, IEEE 802.11n(HT20): 11 Channels IEEE 802.11n(HT40): 7 Channels |
| Channels Step: | 5MHz step |
| Sample Type: | Fixed production |
| Antenna Type: | PCB antenna |
| Antenna Gain: | 2dBi |
| Power Supply: | DC input 5.0V Test voltage: AC 120V 60Hz |



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

Report No.: SZEM170700755102
Page: 5 of 8

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:

- **CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **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 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-823, R-4188, T-1153 and C-2383 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.

- **Industry Canada (IC)**

Two 3m Semi-anechoic chambers and the 10m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1, 4620C-2, 4620C-3.



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

Report No.: SZEM170700755102
Page: 6 of 8

4.4 Deviation from Standards

None.

4.5 Abnormalities from Standard Conditions

None.

4.6 Other Information Requested by the Customer

None.



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

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.

5.1.2 Test Procedure

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



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

Report No.: SZEM170700755102
Page: 8 of 8

4.1.3 EUT RF Exposure Evaluation

Antenna Gain: 2dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.585 in linear scale.

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 = 20 cm (mW/cm ²) | Limit | Result |
|---------|--------------------|---|------------------------------------|--|-------|--------|
| Lowest | 2412 | 21.8 | 151.36 | 0.048 | 1.0 | PASS |

Note: Refer to report No. SZEM170700755101 for EUT test Max Conducted Peak Output Power value.

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