

# TEST REPORT

**Reference No.** ..... : WTS16S0754770-3E V1  
**FCC ID.** ..... : RR3SH-GWAYL40A  
**Applicant** ..... : Li Seng Technology Limited  
**Address** ..... : 9/F, Shiu Fung Hong Building, 239-241 Wing Lok Street, Sheung Wan, Hong Kong  
**Manufacturer** ..... : Li Seng Technology Limited  
**Address** ..... : 9/F, Shiu Fung Hong Building, 239-241 Wing Lok Street, Sheung Wan, Hong Kong  
**Product Name** ..... : IoT GateWay  
**Model No.** ..... : SH-GWAYL40A, SH-GWAYXXXX-XX, (where the first 'X'=L/C, the second 'X'=4-9, the third and forth 'X'=0A-ZZ, the fifth 'X'=A-Z, the sixth 'X'=1-9 or A-Z)  
**Brand** ..... : liseng  
**Standards** ..... : FCC CFR47 Part 15 C Section 15.247:2015  
**Date of Receipt sample** ..... : Jul. 02, 2016  
**Date of Test** ..... : Jul. 03 – Aug. 27, 2016  
**Date of Issue** ..... : Sep. 28, 2016  
**Test Result** ..... : **Pass**

**Remarks:**

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company.

The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

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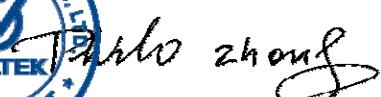
Compiled by:



Zero Zhou / Test Engineer



Approved by:



Philo Zhong / Manager

## 2 Test Summary

Test Items	Test Requirement	Result
Maximum Permissible Exposure (Exposure of Humans to RF Fields)	1.1307(b)(1)	PASS

### 3 Contents

	Page
<b>1 COVER PAGE</b>	1
<b>2 TEST SUMMARY</b>	2
<b>3 CONTENTS</b>	3
<b>4 REPORT REVISION HISTORY</b>	4
<b>5 GENERAL INFORMATION</b>	5
5.1 GENERAL DESCRIPTION OF E.U.T.	5
5.2 DETAILS OF E.U.T.	5
5.3 CHANNEL LIST	5
5.4 TEST FACILITY	6
<b>6 RF EXPOSURE</b>	7
6.1 REQUIREMENTS	7
6.2 THE PROCEDURES / LIMIT	7
6.3 MPE CALCULATION METHOD	8

## 4 Report Revision History

Report No.	Report Version	Description	Issue Date
WTS16S0754770-3E	NONE	Original	Aug. 30, 2016
WTS16S0754770-3E	V1	Version 1	Sep. 28, 2016

## 5 General Information

### 5.1 General Description of E.U.T.

Product Name:	IoT GateWay
Model No.:	SH-GWAYL40A, SH-GWAYXXXX-XX, (where the first 'X'=L/C, the second 'X'=4-9, the third and forth 'X'=0A-ZZ, the fifth 'X'=A-Z, the sixth 'X'=1-9 or A-Z)
Model Difference:	Only the model name is different, he model SH-GWAYL40A is the tested sample.
Zigbee:	support
WIFI:	Support 2.4GHz only
Antenna Gain	2 dBi for ZigBee, 2 dBi for WIFI

### 5.2 Details of E.U.T.

Technical Data:	DC 5V, 1.0A
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### 5.3 Channel List

ZigBee mode

Channel No.	Frequency (MHz)						
1	2405	2	2410	3	2415	4	2420
5	2425	6	2430	7	2435	8	2440
9	2445	10	2450	11	2455	12	2460
13	2465	14	2470	15	2475	16	2480

WIFI mode

Channel No.	Frequency (MHz)						
1	2412	2	2417	3	2422	4	2427
5	2432	6	2437	7	2442	8	2447
9	2452	10	2457	11	2462	12	-

## 5.4 Test Facility

The test facility has a test site registered with the following organizations:

- **IC – Registration No.: 7760A-1**

Waltek Services(Shenzhen) Co., Ltd. Has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration number 7760A-1, October 15, 2015.

- **FCC Test Site 1#– Registration No.: 880581**

Waltek Services(Shenzhen) Co., Ltd. EMC Laboratory `has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 880581, April 29, 2014.

- **FCC Test Site 2#– Registration No.: 328995**

Waltek Services(Shenzhen) Co., Ltd. EMC Laboratory `has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 328995, December 3, 2014.

## 6 RF Exposure

Test Requirement:	FCC Part 1.1307
Evaluation Method:	FCC Part 2.1091
	KDB 447498 D01 General RF Exposure Guidance v06

### 6.1 Requirements

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2 m normally can be maintained between the user and the device.

### 6.2 The procedures / limit

#### (A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm <sup>2</sup> )	Averaging Time  E  <sup>2</sup> , H  <sup>2</sup> or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	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

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm <sup>2</sup> )	Averaging Time  E  <sup>2</sup> , H  <sup>2</sup> or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

Note: f = frequency in MHz ; \*Plane-wave equivalent power density

### 6.3 MPE Calculation Method

$$S = \frac{P \times G}{4 \times \pi \times R^2}$$

S = power density (in appropriate units, e.g. mW/cm<sup>2</sup>)

P = output power to the antenna (in appropriate units, e.g., mW).

G = power gain of the antenna in the direction of interest relative to an isotropic radiator,  
the power gain factor, is normally numeric gain.

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

From the peak EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained

Zigbee

Antenna Gain (dBi)	Antenna Gain (numeric)	Max. Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (mW/cm <sup>2</sup> )	Limit of Power Density (mW/cm <sup>2</sup> )
2.00	1.585	9.35	8.61	0.002715	1

WIFI

Antenna Gain (dBi)	Antenna Gain (numeric)	Max. Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (mW/cm <sup>2</sup> )	Limit of Power Density (mW/cm <sup>2</sup> )
2.00	1.585	15.67	36.90	0.011634	1

Zigbee+ WIFI transmit simultaneously condition

0.001713 mW/cm<sup>2</sup>+0.001761 mW/cm<sup>2</sup>=0.003474 mW/cm<sup>2</sup> which is less than the limit.

=====End of Report=====