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RF MPE REPORT

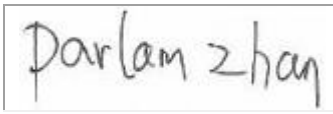
Application No.:	SHEM2005003400CR
FCC ID:	UCZ-AY41TR-Z
IC:	8575A-AY41TRZ
Applicant:	LOREX Technology Inc.
Address of Applicant:	250 Royal Crest Court, Markham, ON L3R 3S1 Canada
Manufacturer:	LOREX Technology Inc.
Address of Manufacturer:	250 Royal Crest Court, Markham, ON L3R 3S1 Canada
Equipment Under Test (EUT):	
EUT Name:	Sensor Hub
Model No.:	AY41TR-Z
Trade mark:	LOREX
Standard(s) :	FCC Rules 47 CFR §2.1091 KDB447498 D01 General RF Exposure Guidance v06 RSS-102 Issue 5 (March 2015)
Date of Receipt:	2020-05-08
Date of Test:	2020-05-07 to 2020-05-14
Date of Issue:	2020-05-22
Test Result:	Pass*

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

Parlam Zhan
E&E Section 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.

Revision Record			
Version	**Description**	**Date**	**Remark**
00	Original	2018-05-22	/

Authorized for issue by:				
				
		Micheal Niu / Project Engineer		
				
		Parlam Zhan /Reviewer		

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3 General Information

3.1 General Description of E.U.T.

Power supply:	DC 5V By Adapter Adapter: MODEL:NBS05B05100VUU INPUT 100V-240V,50/60Hz,0.2A OUTPUT 5V,1A
Serial Number:	ND012005043381
Firmware Version:	1.000.0000000.4.R.20200511
Cable:	USB cable 50cm

3.2 Technical Specifications

2.4G WiFi

Antenna Gain:	3 dBi
Antenna Type:	FPC Antenna
Channel Spacing:	5MHz
Modulation Type:	802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Number of Channels:	802.11b/g/n(HT20):11 802.11n(HT40):7
Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz 802.11n(HT40): 2422MHz to 2452MHz

BLE

Antenna Gain:	3 dBi
Antenna Type:	FPC Antenna
Bluetooth Version:	V5.0 BLE
Channel Spacing:	2MHz
Modulation Type:	GFSK
Number of Channels:	40
Operation Frequency:	2402MHz to 2480MHz

3.3 Test Location

All tests were performed at:
Compliance Certification Services (Kunshan) Inc.
No.10 Weiye Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China.
Tel: +86 512 5735 5888 Fax: +86 512 5737 0818
No tests were sub-contracted.

3.4 Test Facility

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

• CNAS (No. CNAS L4354)

CNAS has accredited Compliance Certification Services (Kunshan) Inc. to ISO/IEC 17025:2017 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. 2541.01)

Compliance Certification Services (Kunshan) Inc. is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 2541.01.

• FCC (Designation Number: CN1172)

Compliance Certification Services Inc. has been recognized as an accredited testing laboratory. Designation Number: CN1172.

• ISED (CAB identifier: CN0072)

Compliance Certification Services (Kunshan) Inc. has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory.
CAB Identifier: CN0072.

• VCCI (Member No.: 1938)

The 3m and 10m Semi-anechoic chamber and Shielded Room of Compliance Certification Services (Kunshan) Inc. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-1600, C-1707, T-1499, G-10216 respectively.

3.5 Deviation from Standards

None

3.6 Abnormalities from Standard Conditions

None

4 Test Standards and Limits

4.1 FCC Radiofrequency radiation exposure limits:

According to§1.1310, the limit for general population/uncontrolled exposures

Frequency	Power density(mW/cm^2)	Averaging time(minutes)
300MHz~1.5GHz	f/1500	30
1.5GHz~100GHz	1.0	30

4.2 IC Radiofrequency radiation exposure limits:

According to RSS-102 section 2.5.2, RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

below 20 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);

• at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $4.49/f^{0.5}$ W (adjusted for tune-up tolerance), where f is in MHz;

• at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);

• at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2}\ f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz;

• at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

For 2.4G device, the limit of worse case is 2.68 W

5 Measurement and Calculation

5.1 Maximum transmit power

The Power Data is based on the RF Test Report SHEM200500340001 & SHEM200500340002.

2.4G WiFi

Test Mode	Test Channel	Power [dBm]	Power [mW]
11B	2412	16.34	43.05
11B	2437	16.14	41.11
11B	2462	15.69	37.07
11G	2412	18.78	75.51
11G	2437	19.08	80.91
11G	2462	18.40	69.18
11N20SISO	2412	18.83	76.38
11N20SISO	2437	19.12	81.66
11N20SISO	2462	18.28	67.30
11N40SISO	2422	19.16	82.41
11N40SISO	2437	19.54	**89.95**
11N40SISO	2452	19.43	87.70

BLE

Test Mode	Frequency (MHz)	Power[dBm]	Power [mW]
1M	2402	8.42	6.95
	2440	8.65	7.33
	2480	8.33	6.81
2M	2402	8.45	7.00
	2440	**8.68**	7.38
	2480	8.36	6.85

5.2 MPE Calculation

For FCC:

According to the formula $S=P/4\pi R^2$, we can calculate S which is MPE.

Note:

1) P (mW)
2) R = distance to the center of radiation of antenna (in meter) = 20cm
3) MPE limit = 1mW/cm²

For 2.4G WiFi

The max. antenna gain is 3 dBi

Max. Conducted Power P(mW)	Gain in Linear Scale G	Operation Distance R(cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)	Result
89.95	1.995	20	0.03571	1	Pass

For BLE

The max. antenna gain is 3 dBi

Max. Conducted Power P(mW)	Gain in Linear Scale G	Operation Distance R(cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)	Result
7.38	1.995	20	0.00293	1	Pass

The BLE and the DTS modules can simultaneous transmitting at frequency 2.4GHz band.But the maximum rate of MPE is 0.0357/1.0+0.003/1.0 =0.039<=1.0. According to the KDB447498 section 7.2 determine the device is exclusion from SAR test.

For IC:

2.4G WIFI

E.I.R.P.= P*G= 0.08995W×1.995=0.179W＜2.68W

BLE

E.I.R.P.= P*G= 0.00738W×1.995=0.015W＜2.68W

The BLE and the WIFI can simultaneous transmitting at frequency 2.4GHz band.But the maximum rate of MPE is 0.179/2.68+0.015/2.68 =0.073<=1.0.

So the device is exclusion from SAR test.

--End of the Report--