



## 1 Cover Page

### ***RF Exposure Evaluation Report***

**Application No.:** SHEM2105005088CR  
**FCC ID:** UCZ-B241AJ-Z  
**IC:** 8575A-B241AJZ  
**Applicant:** Lorex Technology Inc.  
**Address of Applicant:** 250 Royal crest Court, Markham, L3R 3S1 Ontario, Canada.  
**Manufacturer:** Lorex Technology Inc.  
**Address of Manufacturer:** 250 Royal crest Court, Markham, L3R 3S1 Canada.  
**Equipment Under Test (EUT):**  
**EUT Name:** HD Video Doorbell  
**Model No.:** B241AJ-Z  
**Standard(s) :** FCC Rules 47 CFR §2.1091  
KDB447498 D01 General RF Exposure Guidance v06  
RSS-102 Issue 5 Amendment 1 (February 2, 2021)  
**Date of Receipt:** 2021-06-02  
**Date of Test:** 2021-06-04 to 2021-06-12  
**Date of Issue:** 2021-06-14

<b>Test Result:</b>	<b>Pass*</b>
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\* In the configuration tested, the EUT complied with the standards specified above.

Parlan Zhan

Parlan 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.



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t(86-21) 61915666 f(86-21) 61915678 www.sgs.com.cn  
t(86-21) 61915666 f(86-21) 61915678 e [sgs.china@sgs.com](mailto:sgs.china@sgs.com)



Revision Record			
Version	Description	Date	Remark
00	Original	2021-06-14	/

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



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t(86-21) 61915666 f(86-21) 61915678 e [sgs.china@sgs.com](mailto:sgs.china@sgs.com)



## 2 Contents

	Page
1 COVER PAGE.....	1
2 CONTENTS .....	3
3 GENERAL INFORMATION.....	4
3.1 GENERAL DESCRIPTION OF E.U.T. ....	4
3.2 TECHNICAL SPECIFICATIONS .....	4
3.3 TEST LOCATION .....	5
3.4 TEST FACILITY.....	5
4 TEST STANDARDS AND LIMITS .....	6
4.1 FCC RADIOFREQUENCY RADIATION EXPOSURE LIMITS: .....	6
4.2 IC RADIOFREQUENCY RADIATION EXPOSURE LIMITS: .....	6
5 MEASUREMENT AND CALCULATION .....	7
5.1 MAXIMUM TRANSMIT POWER .....	7
5.2 MPE CALCULATION .....	8





### 3 General Information

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

Power supply:	16V-24V~ 50/60Hz
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#### 3.2 Technical Specifications

2.4GHz

Antenna Gain:	Ant 1: 0dBi (Provided by the manufacturer) Ant 2: 3.3dBi (Provided by the manufacturer) Directional gain:4.82dBi
Antenna Type:	Antenna 1:PCB Antenna Antenna 2:PCB Antenna
Serial Number:	ND012104025801
Firmware Version:	V1.00
Channel Spacing:	5MHz
Modulation Type:	802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Data Rate:	802.11b:1/2/5.5/11Mbps 802.11g:6/9/12/18/24/36/48/54Mbps 802.11n: MCS 0 to 7 for HT20MHz MCS 0 to 7 for HT40MHz
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

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Testing Center E.U.T. (210500508802)

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### 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.



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Testing Center E1102 (Shanghai)

NO.588 West Jindu Road, Songjiang District, Shanghai, China 201612  
中国·上海·松江区金都西路588号 邮编: 201612

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## 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 <sup>2</sup> )	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



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Testing Center EMC Laboratory

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t:(86-21) 61915666 f:(86-21) 61915678 www.sgsgroup.com.cn  
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## 5 Measurement and Calculation

### 5.1 Maximum transmit power

The Power Data is based on the RF Test Report SHEM210500508801

Test Mode	Channel	Antenna 1 Power[dBm]	Antenna 2 Power[dBm]	MIMO Power[dBm]	Antenna 1 Power[mW]	Antenna 2 Power[mW]	MIMO Power[mW]
11B	2412	17.96	17.99	NA	62.52	62.95	N/A
11B	2437	17.73	18.34	NA	59.29	68.23	N/A
11B	2462	16.78	17.43	NA	47.64	55.34	N/A
11G	2412	21.13	20.26	NA	129.72	106.17	N/A
11G	2437	21.06	20.55	NA	127.64	113.50	N/A
11G	2462	20.33	19.72	NA	107.89	93.76	N/A
11N20MIMO	2412	20.06	19.19	22.66	101.39	82.99	184.50
11N20MIMO	2437	19.88	19.47	22.69	97.27	88.51	185.78
11N20MIMO	2462	19.19	18.78	22.00	82.99	75.51	158.49
11N40MIMO	2422	21.01	20.37	23.71	126.18	108.89	234.96
11N40MIMO	2437	21.19	20.75	23.99	<b>131.52</b>	<b>118.85</b>	<b>250.61</b>
11N40MIMO	2452	21.00	20.41	23.73	125.89	109.90	236.05



## 5.2 MPE Calculation

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/cm<sup>2</sup>

For 2.4G WiFi –Antenna1:

The max. antenna gain is		0	dBi		
Max. Conducted Power P(mW)	Gain in Linear Scale G	Operation Distance R(cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	Result
131.52	1.000	20	0.02617	1	Pass

For 2.4G WiFi –Antenna2:

The max. antenna gain is		3.3	dBi		
Max. Conducted Power P(mW)	Gain in Linear Scale G	Operation Distance R(cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	Result
118.85	2.138	20	0.05055	1	Pass

In MIMO mode:

The max. antenna gain is		4.82	dBi		
Max. Conducted Power P(mW)	Gain in Linear Scale G	Operation Distance R(cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	Result
250.61	3.034	20	0.15126	1	Pass

according to the KDB447498 section 7.2 determine the device is exclusion from SAR test

For IC:

For 2.4GHz WiFi SISO mode:

Antenna 1:E.I.R.P.= P\*G= 0.13152×1 =0.13W<2.68W

Antenna 2:E.I.R.P.= P\*G= 0.11885×2.138=0.25W<2.68W

For 2.4GHz WiFi MIMO mode: E.I.R.P.= P\*G= 0.25061×3.034=0.760W<2.68W

So the device is exclusion from SAR test

**--End of the Report--**



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