1 Cover Page

RF MPE REPORT

Application No.:	SHCR2110000554AT
FCC ID:	UCZ-B241AJ-Z1
IC :	8575A-B241AJZ1
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, Ontario, Canada.

Equipment Under Test (EUT):

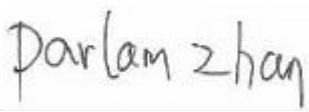
EUT Name:	2K QHD Video Doorbell
Model No.:	B241AJ-Z
HVIN:	B241AJ-Z1
Standard(s) :	FCC Rules 47 CFR §2.1091 KDB447498 D01 General RF Exposure Guidance v06 RSS-102 Issue 5 Amendment 1 (February 2, 2021)
Date of Receipt:	2021-10-25
Date of Test:	2021-11-06 to 2021-11-22
Date of Issue:	2021-11-23
Test Result:	**Pass***

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

Parlam Zhan

Parlam Zhan
E&E Section Manager

Revision Record			
Version	**Description**	**Date**	**Remark**
00	Original	2021-11-23	/

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

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2 Contents

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3 General Information

3.1 General Description of E.U.T.

Power supply:	16V-24V～50/60Hz,0.5A DC 3.7V rechargeable Li-ion Battery Battery model:1S1P652023P Rated voltage:3.7V Capacity:0.2Ah Energy:0.74Wh Charging voltage:4.2V
Serial Number:	ND012108054208
Firmware Version:	V2.8

3.2 Technical Specifications

2.4GHz

Antenna Gain:	Ant 1:1.2dBi; (Provided by manufacturer) Ant 2:2.6dBi (Provided by manufacturer) Directional Gain: 4.97dBi
Antenna Type:	Antenna 1: PCB Antenna Antenna 2: PCB Antenna
Channel Spacing:	5MHz
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
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

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.

Company Number: 2324E

• 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-20134, R-11600,C-11707, T-11499, G-10216 respectively.

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

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5 Measurement and Calculation

5.1 Maximum transmit power

The Power Data is based on the RF Test Report SHCR211000055401

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	14.23	13.86	NA	**26.49**	**24.32**	N/A
11B	2437	14.00	13.78	NA	25.12	23.88	N/A
11B	2462	13.26	13.22	NA	21.18	20.99	N/A
11G	2412	12.27	12.86	NA	16.87	19.32	N/A
11G	2437	12.59	12.66	NA	18.16	18.45	N/A
11G	2462	12.27	12.51	NA	16.87	17.82	N/A
11N20MIMO	2412	10.66	10.69	13.69	11.64	11.72	23.39
11N20MIMO	2437	10.40	10.27	13.35	10.96	10.64	21.63
11N20MIMO	2462	9.52	9.84	12.69	8.95	9.64	18.58
11N40MIMO	2422	11.53	11.75	14.65	14.22	14.96	**29.17**
11N40MIMO	2437	10.53	10.67	13.61	11.30	11.67	22.96
11N40MIMO	2452	10.12	10.14	13.14	10.28	10.33	20.61

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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/cm²

For FCC:

For 2.4G WiFi –Antenna1:

The max. antenna gain is		1.2	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
26.49	1.318	20	0.00695	1	Pass

For 2.4G WiFi –Antenna2:

The max. antenna gain is		2.6	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
24.32	1.820	20	0.00880	1	Pass

In MIMO mode:

Two antennas can transmit simultaneously and they are correlated.

The max. antenna gain is		4.97	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
29.17	3.141	20	0.01822	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= 0.02649×1.318=0.035W<2.68W

Antenna 2:E.I.R.P.= P*G= 0.02432×1.820=0.044W<2.68W

For 2.4GHz WiFi MIMO mode: E.I.R.P.= P*G= 0.02917×3.140=0.092W<2.68W

So the device is exclusion from SAR test

--End of the Report--