Radio Frequency Exposure Evaluation Report

For:

Ezlo Inc.

Model Name:

e550-US, EzloSecure-US

Product Description:

Smart Home Controller

FCC ID: 2AIYW-E550
IC ID: 26382-E550

Per:

CFR Part Part1 (1.1307 &1.1310), Part 2 (2.1091),
FCC KDB 447498 D01 General RF Exposure Guidance v06
ISEDC RSS-102 Issue 5

Report number: EMC_EZLOI-001-20001_FCC_ISED_MPE

DATE: 2020-10-23

***CETECOM* Inc.**
411 Dixon Landing Road ◆ Milpitas, CA 95035 ◆ U.S.A.
Phone: + 1 (408) 586 6200 ◆ Fax: + 1 (408) 586 6299 ◆ E-mail: info@cetecom.com ◆ http://www.cetecom.com
CETECOM Inc. is a Delaware Corporation with Corporation number: 2905571

1 Assessment

This RF Exposure evaluation report provides evidence for compliance of the below identified device with the RF Exposure limits for mobile devices as defined in FCC CFR Part 1 (1.1307 &1.1310), Part 2 (2.1091) and IC standard RSS-102 issue 5 under worst case conditions (measured or rated RF output power, antenna gain, distance towards human body, multiple transmitter information as presented by the applicant).
In addition, maximum antenna gain or minimum distance towards the human body is calculated respectively, where relevant.

The device meets the limits as stipulated by the above given FCC and IC rule parts based on available specifications for worst case conditions at 20cm distance to the body.

Company	Description	Model #
Ezlo Inc.	Smart Home Controller	e550-US, EzloSecure-US

Report reviewed by: TCB Evaluator

Date	Section	Name	Signature
2020-10-23	Compliance	Cindy Li (EMC Lab Manager)	Cindy Li Digitally signed by cindy.li@cetecom.com DN: CN=cindy.li@cetecom.com Reason: I have reviewed this document Location: Date: 2020-10-23 21:40:10

Responsible for the Report:

Date	Section	Name	Signature
2020-10-23	Compliance	Kevin Wang (Senior EMC Engineer)	kevin.wang@cetecom.com Digitally signed by: kevin.wang@cetecom.com DN: CN = kevin.wang@cetecom.com Date: 2020.10.23 17:50:17 -07'00'

2 Administrative Data

2.1 Identification of the Testing Laboratory Issuing the Test Report

Company Name:	CETECOM Inc.
Department:	Compliance
Street Address:	411 Dixon Landing Road
City/Zip Code	Milpitas, CA 95035
Country	USA
Telephone:	+1 (408) 586 6200
Fax:	+1 (408) 586 6299
Lab Manager:	Cindy Li
Responsible Project Leader:	Akanksha Baskaran

2.2 Identification of the Client / Manufacturer

Client's Name:	Ezlo Inc.
Street Address:	1255 Broad St.
City/Zip Code	Clifton, NJ / 07013
Country	US

Identification of the Manufacturer

Manufacturer's Name:	Same as Client
Manufacturers Address:	
City/Zip Code	
Country	

3 Equipment under Assessment

Marketing name:	e550-US, EzloSecure-US
HW Version :	1.4
SW Version :	2.0.1.1112.7
Firmware Version Identification Number (FVIN):	N/A
Hardware Version Identification Number (HVIN):	e550-US, EzloSecure-US
Product Marketing Name (PMN):	Ezlo Secure, Smart Home Controller, CC Compass Monitoring Hub, Connect Hub 2.0
Regulatory Band:	❖ **Cellular Module:** ▪ WCDMA/UMTS FDD BAND II: 1852.4 ~ 1907.6 MHz ▪ WCDMA/UMTS FDD BAND IV: 1712.4 ~ 1752.6 MHz ▪ WCDMA/UMTS FDD BAND V: 826.4 ~ 846.6 MHz ▪ LTE BAND 2: 1857.5 ~ 1902.5 MHz ▪ LTE BAND 4: 1717.5 ~ 1747.5 MHz ▪ LTE BAND 5: 824.7 ~ 848.3 MHz ▪ LTE BAND 12: 699.7 ~ 715.3 MHz ▪ LTE BAND 13: 777 ~ 787 MHz ▪ LTE BAND 14: 788 ~ 798 MHz ▪ LTE BAND 66: 1710 ~ 1780 MHz ▪ LTE BAND 71: 663 ~ 698 MHz ❖ **Bluetooth / BLE:** ▪ Nominal band: 2400 MHz – 2483.5 MHz; ▪ Center to center: 2402 MHz – 2480 MHz ❖ **Zwave:** ▪ Nominal band: 908.42MHz; ❖ **Zigbee:** ▪ Nominal band: 2400 MHz – 2483.5 MHz; ▪ Center to center: 2405 MHz – 2480 MHz ❖ **WLAN 2.4GHz:** ▪ Nominal band: 2400 MHz – 2483.5 MHz; ▪ Center to center: 2412 MHz (ch 1) – 2462 MHz (ch 11), 11 channels ❖ **WLAN 5GHz UNII-1:** ▪ Nominal band: 5150 MHz – 5250 MHz; ❖ **WLAN 5GHz UNII-2A:**

	▪ Nominal band: 5250 MHz – 5350 MHz; ❖ **WLAN 5GHz UNII-2C:** ▪ Nominal band: 5470 MHz – 5725 MHz; ❖ **WLAN 5GHz UNII-3:** ▪ Nominal band: 5725 MHz – 5850 MHz;
Integrated Module Info:	• Cellular Module: Quectel EG25-AF • Wi-Fi/Bluetooth Module: Ampak AP6256 • Zigbee Module: SiLabs EFR32MG13P732F512GM48 • Zwave Module: SiLabs EFR32ZG14
Antenna Type:	Cellular Antenna: 5 dBi Wi-Fi/Bluetooth Antenna: 2.3 dBi Zigbee Antenna: 1 dBi Zwave Antenna: 2.1 dBi
Power Supply/ Rated Operating Voltage Range:	4.8V (Low) / 5.0V (Nominal) / 5.2V (Max)
Operating Temperature Range:	0°C to +35°C
Sample Revision:	☐Prototype Unit; ■Production Unit; ☐Pre-Production

4 RF Exposure Limits and FCC and IC Basic Rules

For the specific described radio apparatus the following basic limits and rules apply for both, FCC and IC where not indicated differently.

4.1 Power Density Limits acc. to FCC 1.1310(e) / RSS-102 i5, cl. 4:

FCC

Frequency Range (MHz)	Power density (mW/cm^2)	Averaging time (minutes)
300 – 1500	f (MHz) /1500	30
1500 – 100000	1.0	30

IC

300 – 6000	0.02619 x f (MHz) $^{0.6834}$	6

4.2 Routine Environmental Evaluation Categorical Exclusion Limits acc. to FCC 2.1091(c) / RSS-102, cl. 2.5 (rounded to 1 decimal point):

FCC
operating frequency < 1.5GHz: excluded if ERP < 1.5W / 31.8dBm (EIRP: 33.9 dBm);
operating frequency > 1.5GHz: excluded if ERP < 3.0W / 34.8dBm (EIRP: 36.9 dBm);

IC
300MHz < = operating frequency < 6 GHz: excluded if EIRP < 0.0131 x f (MHz) $^{0.6834}$ W

4.3 RF Exposure Estimation (MPE Estimation)

Having available the source based average output power and peak antenna gain or the ERP/EIRP of the specified device and for a known minimum distance of its radiating structures from the body of persons according to its use cases (at least 20cm) the power density at that distance can be estimated by the following formula for plane-wave equivalent conditions (far-field conditions), when ground reflection is neglected.

where: S = power density (mW/cm^2 or W/m^2)
P = power input to the antenna (mW or W)
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna (cm or m)

5 Evaluations

5.1 Analysis of RF Exposure for simultaneous transmission

- Evaluations are based on worst case power density limits for Canada.
- Calculations are made for 20cm.
- Evaluations are based on ERP/EIRP measured or calculated from known gain and conducted output power.
- Cellular can transmit simultaneously with Zigbee and Zwave.

Radio	Freq MHz	MaxPower conducted from radio report (W)	MaxPower from radio report (dBm)	Ant Gain (dBi)	Ant Gain lin	EIRP(W) calculated	IC Limit (W/m2)	FCC Limit (W/m2)	Actual (W/m2)	How much of limit is used up
WCDMA II	1850	0.32	25.000	5	3.16	1.000	4.476	10.000	1.989	44.44%
WCDMA IV	1710	0.32	25.000	5	3.16	1.000	4.242	10.000	1.989	46.90%
WCDMA V	824	0.32	25.000	5	3.16	1.000	2.576	5.493	1.989	77.24%
LTE 2	1850	0.32	25.000	5	3.16	1.000	4.476	10.000	1.989	44.44%
LTE 4	1710	0.32	25.000	5	3.16	1.000	4.242	10.000	1.989	46.90%
LTE 5	824	0.32	25.000	5	3.16	1.000	2.576	5.493	1.989	77.24%
LTE 12	699	0.32	25.000	5	3.16	1.000	2.302	4.660	1.989	86.44%
LTE 13	777	0.32	25.000	5	3.16	1.000	2.474	5.180	1.989	80.40%
LTE 14	788	0.32	25.000	5	3.16	1.000	2.498	5.253	1.989	79.62%
LTE 66	1710	0.32	25.000	5	3.16	1.000	4.242	10.000	1.989	46.90%
LTE 71	663	0.32	25.000	5	3.16	1.000	2.220	4.420	1.989	89.59%
BT	2402	0.01	7.060	2.3	1.70	0.009	5.351	10.000	0.017	0.32%
BT-LE	2402	0.00	5.570	2.3	1.70	0.006	5.351	10.000	0.012	0.22%
Zwave	908.42	-	-	2.1	1.62	0.003	2.753	6.056	0.006	0.18%
Zigbee	2402	0.00	-2.290	1	1.26	0.001	5.351	10.000	0.001	0.02%
WLAN 2.4	2400	0.06	17.720	2.3	1.70	0.100	5.348	10.000	0.200	3.72%
WLAN 5	5150	0.02	11.960	2.3	1.70	0.027	9.011	10.000	0.053	0.59%

Note1： The calculation is based on the distance of 20cm

5.2 Conclusion:

The worst-case simultaneous transmission is Cellular with Zigbee and Zwave, which is using 89.79% of a limit of 100%. The equipment is passing RF exposure requirements for 20cm distance.

6 Revision History

Date	Report Name	Changes to report	Report prepared by
2020-10-20	EMC_EZLOI-001-20001_FCC_ISED_MPE	Initial Version	Kevin Wang

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