

RF EXPOSURE REPORT

CERTIFICATE OF CONFORMITY

FCC Rule Part: FCC Part 2 (Section 2.1091)

Report No.: MFBGDY-WTW-P25030083

FCC ID: U5X-CFLXRF

Product: Security Panel

Brand: CONNECT-FLX Security Panel

Model No.: CONNECT-FLX

Series Model: HUB-FLX

Received Date: 2025/3/3

Test Date: 2025/3/6

Issued Date: 2025/3/20

Applicant: Alula

Address: 428 Minnesota Street, Suite 300, St. Paul, MN 55101, USA

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lin Kou Laboratories

Lab Address: No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan

Test Location: No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, Taiwan

FCC Registration / 788550 / TW0003

Designation Number:

Approved by:

Jeremy Lin

, Date:

2025/3/20

Jeremy Lin / Project Engineer

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Prepared by : Celine Chou / Senior Specialist

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Release Control Record

Issue No.	Description	Date Issued
MFBGDY-WTW-P25030083	Original release.	2025/3/20

1 Certificate

Product: Security Panel

Brand: CONNECT-FLX Security Panel

Test Model: CONNECT-FLX

Series Model: HUB-FLX

Sample Status: Engineering sample

Applicant: Alula

Test Date: 2025/3/6

FCC Rule Part: FCC Part 2 (Section 2.1091)

Standard: KDB 447498 D04 Interim General RF Exposure Guidance v01

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

2 Applicable RF Exposure Limit

§ 1.1310 Radiofrequency radiation exposure limits.

(a) Specific absorption rate (SAR) shall be used to evaluate the environmental impact of human exposure to radiofrequency (RF) radiation as specified in § 1.1307(b) of this part within the frequency range of 100 kHz to 6 GHz (inclusive).

(b) The SAR limits for occupational/controlled exposure are 0.4 W/kg, as averaged over the whole body, and a peak spatial-average SAR of 8 W/kg, averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the parts of the human body treated as extremities, such as hands, wrists, feet, ankles, and pinnae, where the peak spatial-average SAR limit for occupational/controlled exposure is 20 W/kg, averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube). Exposure may be averaged over a time period not to exceed 6 minutes to determine compliance with occupational/controlled SAR limits.

(c) The SAR limits for general population/uncontrolled exposure are 0.08 W/kg, as averaged over the whole body, and a peak spatial-average SAR of 1.6 W/kg, averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the parts of the human body treated as extremities, such as hands, wrists, feet, ankles, and pinnae, where the peak spatial-average SAR limit is 4 W/kg, averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube). Exposure may be averaged over a time period not to exceed 30 minutes to determine compliance with general population/uncontrolled SAR limits.

(e) Maximum Permissible Exposure (MPE) to radiofrequency electromagnetic fields

➤ Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (minutes)
Limits For General Population / Uncontrolled Exposure				
0.3-1.34	614	1.63	(100)*	<30
1.34-30	824/f	2.19/f	(180/f ²)*	<30
30-300	27.5	0.073	0.2	<30
300-1,500	...	...	f/1500	<30
1,500-100,000	...	...	1.0	<30

f = frequency in MHz. * = Plane-wave equivalent power density.

➤ Limits for Occupational/Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (minutes)
Limits For General Population / Uncontrolled Exposure				
0.3-3.0	614	1.63	*(100)	≤6
3.0-30	1842/f	4.89/f	*(900/f ²)	<6
30-300	61.4	0.163	1.0	<6
300-1,500			f/300	<6
1,500-100,000			5	<6

f = frequency in MHz. * = Plane-wave equivalent power density.

MPE-based Exemption – §1.1307(b)(3)(i)(C)

- The minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. The MPE-based test exemption condition is in terms of ERP, defined as the product of the maximum antenna gain and the delivered maximum time-averaged power.
- Table applies to any RF source (i.e. single fixed, mobile, and portable transmitters) and specifies power and distance criteria for each of the five frequency ranges used for the MPE limits.

Antenna for each of the five frequency ranges used for the MRE limits.			
RF Source frequency (MHz)	Minimum Distance		Threshold ERP (watts)
	$\lambda_L/2\pi$	$\lambda_H/2\pi$	
0.3-1.34	159 m–35.6 m		1,920 R ² .
1.34-30	35.6 m–1.6 m		3,450 R ² /f ² .
30-300	1.6 m–159 mm		3.83 R ² .
300-1,500	159 mm–31.8 mm		0.0128 R ² f.
1,500-100,000	31.8 mm–0.5 mm		19.2 R ² .
R must be at least $\lambda/2\pi$, where λ is the free-space operating wavelength in meters.			

MPE-based Exemption – §1.1307(b)(3)(i)(B)

- For mobile devices that are not exempt per Table 1 of §1.1307(b)(1)(i)(C) and device at distances from 20 cm to 40 cm and in 0.3 GHz to 6 GHz. The MPE-based test exemption condition is in terms of ERP, defined as the product of the maximum antenna gain and the delivered maximum time-averaged power.

$$P_{th} \text{ (mW)} = ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases}$$

Fixed RF sources operating in the same time-averaging period – §1.1307(b)(3)(ii)(B)

- Either SAR-based or MPE-based exemption may be considered for test exemption for fixed, mobile, or portable device exposure conditions; therefore, the contributions from each exemption in conjunction with the measured SAR (Evaluated_k term) should be used to determine exemption for simultaneous transmission according to Formula below,

$$\sum_{i=1}^a \frac{P_i}{P_{th,i}} + \sum_{j=1}^b \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^c \frac{Evaluated_k}{Exposure Limit_k} \leq 1$$

The sum of the ratios of the applicable terms for SAR-based, MPE-based and measured SAR or MPE should be less than 1, to determine simultaneous transmission exposure compliance.

Where:

a = number of fixed, mobile, or portable RF sources claiming exemption using [paragraph \(b\)\(3\)\(i\)\(B\)](#) of this section for P_{th} , including existing exempt transmitters and those being added.

c = number of existing fixed, mobile, or portable RF sources with known evaluation for the specified minimum distance including existing evaluated transmitters.

$P_{th,i}$ = the exemption threshold power (P_{th}) according to [paragraph \(b\)\(3\)\(i\)\(B\)](#) of this section for fixed, mobile, or portable RF source i .

$ERP_{th,j}$ = exemption threshold ERP for fixed, mobile, or portable RF source j , at a distance of at least $\lambda/2\pi$ according to the applicable formula of [paragraph \(b\)\(3\)\(i\)\(C\)](#) of this section.

$Exposure Limit_k$ = either the general population/uncontrolled maximum permissible exposure (MPE) or specific absorption rate (SAR) limit for each fixed, mobile, or portable RF source k , as applicable from [§ 1.1310 of this chapter](#).

b = number of fixed, mobile, or portable RF sources claiming exemption using [paragraph \(b\)\(3\)\(i\)\(C\)](#) of this section for Threshold ERP, including existing exempt transmitters and those being added.

P_i = the available maximum time-averaged power or the ERP, whichever is greater, for fixed, mobile, or portable RF source i at a distance between 0.5 cm and 40 cm (inclusive).

ERP_j = the ERP of fixed, mobile, or portable RF source j .

$Evaluated_k$ = the maximum reported SAR or MPE of fixed, mobile, or portable RF source k either in the device or at the transmitter site from an existing evaluation at the location of exposure.

3 Test Results

Environmental Conditions:	25°C, 60% RH	Tested By:	Ted Chang
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For Single RF Source

RFID

MPE-based Exemption §1.1307(b)(3)(i)(C)							
Operation Mode	Frequency Band (MHz)	Average Power (mW)	Antenna Gain (dBi)	Maximum ERP (mW)	Distance (cm)	Limit Threshold (mW)	Test Result
RFID	433.92	-	-	0.0113	23	293.815	Pass

Notes:

- Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
- Calculate the ERP of 433.92MHz from the radiated field strength:

$$\text{ERP (dBm)} = \text{Radiated field strength (dBuV/m)} + 20 \times \log(d) - 104.77 - 2.15$$
 d is the distance in 3m.

$$\text{ERP} = 77.92 + 20 \times \log(3) - 104.77 - 2.15 = -19.458 \text{ dBm (0.0113 mW)}$$

WLAN, BT

MPE-based Exemption §1.1307(b)(3)(i)(C)							
Operation Mode	Frequency Band (MHz)	Target Power (mW)	Antenna Gain (dBi)	Maximum ERP (mW)	Distance (cm)	Limit Threshold (mW)	Test Result
WLAN 2.4 GHz	2412-2462	398.107	3.4	530.884	23	1015.68	Pass
Bluetooth	2402-2480	10	3.4	13.335	23	1015.68	Pass

Notes:

- Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
- The WLAN / Bluetooth target power refer to module (Brand: ESPRESSIF, Model: ESP32-WROOM, FCC ID: 2AC7Z-ESP32WROOM32E) certified report.

Cellular

MPE-based Exemption §1.1307(b)(3)(i)(C)							
Operation Mode	Frequency Band (MHz)	Max Tune-up Power (mW)	Antenna Gain (dBi)	Maximum ERP (mW)	Distance (cm)	Limit Threshold (mW)	Test Result
eMTC B2	1850-1910	251.189	3	305.493	23	1015.68	Pass
eMTC B4	1710-1755	251.189	3	305.493	23	1015.68	Pass
eMTC B5	824-849	251.189	0.7	179.887	23	557.946	Pass
eMTC B12	698-716	251.189	0.5	171.791	23	472.629	Pass
eMTC B13	777-787	251.189	0.5	171.791	23	526.122	Pass
eMTC B25	1850-1915	251.189	3	305.493	23	1015.68	Pass
eMTC B26	814-849	251.189	0.7	179.887	23	551.175	Pass
eMTC B66	1710-1780	251.189	3	305.493	23	1015.68	Pass
eMTC B85	700-716	251.189	0.5	171.791	23	473.984	Pass
NB-IoT B2	1850-1910	316.228	3	384.592	23	1015.68	Pass
NB-IoT B4	1710-1755	316.228	3	384.592	23	1015.68	Pass
NB-IoT B5	824-849	316.228	0.7	226.465	23	557.946	Pass
NB-IoT B12	698-716	316.228	0.5	216.272	23	472.629	Pass
NB-IoT B13	777-787	316.228	0.5	216.272	23	526.122	Pass
NB-IoT B25	1850-1915	316.228	3	384.592	23	1015.68	Pass
NB-IoT B26	814-849	316.228	0.7	226.465	23	551.175	Pass
NB-IoT B66	1710-1780	316.228	3	384.592	23	1015.68	Pass
NB-IoT B71	663-698	158.489	0.5	108.392	23	448.93	Pass
NB-IoT B85	700-716	316.228	0.5	216.272	23	473.984	Pass

Notes:

1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. The WWAN Max. tune-up power is refer to to WWAN module MPE report. (Brand: Telit, Model: ME310G1-WW, FCC ID: RI7ME310G1WW)

MPE-based Exemption §1.1307(b)(3)(i)(B)								
Operation Mode	Frequency Band (MHz)	Max Tune-up Power (mW)	Division factors (dB)	Antenna Gain (dBi)	Maximum time avg ERP (mW)	Distance (cm)	Limit Threshold (mW)	Test Result
GPRS850 (2 sslot)	824-849	2238.72	-6.02	0.7	400.867	23	1680.96	Pass
GPRS1900 (4 sslot)	1850-1910	794.33	-3.01	2.5	430.527	23	3060	Pass

Notes:

1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. For all GPRS850 and EGPRS850 sslots the maximun time avg ERP is GPRS850(2 sslot).
3. For all GPRS1900 and EGPRS1900 sslots the maximun time avg ERP is GPRS1900(4 sslot).
4. The WWAN Max. tune-up power and Diveision factors is refer to to WWAN module MPE report. (Brand: Telit, Model: ME310G1-WW, FCC ID: RI7ME310G1WW)

For Multiple RF Sources (Simultaneous Operations)

Multiple RF Sources (Simultaneous Operations)							
Exemption Evaluation					Sum of Ratios	Limit of Ratios	Test Result
Operation Mode	Frequency Band (MHz)	Maximum ERP (mW)	Limit Threshold (mW)	Ratio			
WLAN 2.4 GHz	2412-2462	530.884	1015.68	0.523	0.994038	1	Pass
Bluetooth	2402-2480	13.335	1015.68	0.013			
RFID	433.92	0.0113	293.815	0.000038			
Operation Mode	Frequency Band (MHz)	Maximum time avg ERP (mW)	Limit Threshold (mW)	Ratio			
NB-IoT B12	698-716	216.272	472.629	0.458			

4 Conclusion

Source-base time average power is below Exemption Criteria and/or Routine Evaluation MPE thresholds, therefore the device is compliant FCC RF exposure requirement.

5 Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

Lin Kou EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

Tel: 886-3-6668565

Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Lab

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@bureauveritas.com

Web Site: <http://ee.bureauveritas.com.tw>

The address and road map of all our labs can be found in our web site also.

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