

# REPORT ON EXPOSURE TO ELECTROMAGNETIC FIELDS

No. 2204988STO-109

## EQUIPMENT

Equipment: Controller for wireless door lock  
Type/Model: EM03  
Additional type/model: --  
Manufacturer: ASSA ABLOY Inc.  
Tested by request of: Sigma Connectivity WSI AB


## SUMMARY

Based on the assessment in this statement, the equipment is determined to **comply** with the following requirements without testing:

CFR 47 §1.1307, §1.1310  
RSS-102 Issue 5

Date of issue: June 7, 2023

Tested by:

  
Ala El-Haery

Approved by:

  
Björn Utermöhl

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**Revision History**

Test report number	Date	Description	Changes
2204988STO-109	June 7, 2023	First release	

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### 3 TEST SPECIFICATIONS

#### 3.1 Standards

CFR 47: Code of Federal Regulations Title 47: Telecommunications §1.1307, §1.1310  
KDB447498 D01 v06

RSS-102: Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)

#### 3.2 Additions, deviations and exclusions from standards

No additions, deviations or exclusions have been made from standards.

### 4 SUMMARY

The evaluation has been carried out at the Intertek Semko AB premises in Kista, Sweden.  
The results in this report apply only to sample tested:

Test	Result
RF Exposure, single transmitter	PASS
RF Exposure, multiple simultaneous transmitters	NA <sup>1</sup>

<sup>1</sup>EUT only has a single transmitter or transmitters cannot operate simultaneously

5 RF EXPOSURE, SINGLE TRANSMITTER

Result:	PASS
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5.1 Limits

Reference: CFR 47 §1.1310 TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
<b>(A) Limits for Occupational/Controlled Exposure</b>				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f <sup>2</sup>	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f <sup>2</sup>	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

Reference: RSS-102 – Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands) Issue 5

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).

In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the e.i.r.p. was derived.

**5.2 Calculations**

EIRP:  $Power\ to\ antenna\ (dBm) + Antenna\ gain\ (dBi) = EIRP\ dBm$

**Conversion dBm to W:**

EIRP:  $1\ mW * 10^{(\frac{EIRP_{dBm}}{10})} = mW$

**MPE calculation**

A worst case calculation for power density:

$$S = \frac{G \times P}{4 \times \pi \times r^2}$$

P = conducted power

G = antenna gain

S = mW / cm<sup>2</sup>

r = 20 cm

S = mW / cm<sup>2</sup>

**5.3 Results**

**FCC §1.1310**

Mode	Frequency range (MHz)	Antenna gain		Conducted power		Evaluation distance (cm)	Power density (mW/cm <sup>2</sup> )	MPE Limit (mW/cm <sup>2</sup> )
		(dBi)	(Numeric)	(dBm)	(mW)			
BLE	2402-2480	3.0	1.9953	16.98	49.888	20	0.0198	1
WLAN 2.4G	2412-2462	3.0	1.9953	11.60	14.455	20	0.0058	1
WLAN 5 GHz	5150-5850	7.6	5.7544	14.18	26.182	20	0.0300	1

No modes can transmit simultaneously.

**Result:** MPE evaluation meets the requirement of standard.

**RSS-102**

Mode	Frequency range (MHz)	Max antenna gain (dBi)	Max conducted power at frequency		Maximum conducted or eirp (dBm)	Maximum conducted or eirp (W)	Limit (W)
			(dBm)	(MHz)			
BLE	2402-2480	3.0	16.98	2402	19.98	0.0995	2.68
WLAN 2.4G	2412-2462	3.0	11.60	2437	14.60	0.0289	2.70
WLAN 5 GHz	5150-5850	7.6	14.18	5825	21.78	0.1507	4.90

No modes can transmit simultaneously.

**Result:** MPE test exempted.